# 1. Overview

## 1.1 Features

The M16C Family offers a robust platform of 32-/16-bit CISC microcomputers (MCUs) featuring high ROM code efficiency, extensive EMI/EMS noise immunity, ultra-low power consumption, high-speed processing in actual applications, and numerous and varied integrated peripherals. Extensive device scalability from low- to high-end, featuring a single architecture as well as compatible pin assignments and peripheral functions, provides support for a vast range of application fields.

The R32C/100 Series is a high-end microcontroller series in the M16C Family. With a 4-Gbyte memory space, it achieves maximum code efficiency and high-speed processing with 32-bit CISC architecture, multiplier, multiply-accumulate unit, and floating point unit. The selection from the broadest choice of on-chip peripheral devices — UART, CRC, DMAC, A/D and D/A converters, timers, $I^2C$-bus interface, and watchdog timer enables to minimize external components.

The R32C/153 Group is the MCU specific to vehicle networks within the R32C/100 Series. This product, provided as 144-pin plastic molded LQFP package, has four channels of CAN module, eight channels of LIN module, and standard peripherals.

### 1.1.1 Applications

Automotive, communication equipment, industrial equipment, etc.

### 1.1.2 Performance Overview

Tables 1.1 and 1.2 show the performance overview of the R32C/153 Group.

**Table 1.1 Performance Overview (1/2)**

| Unit | Function | Explanation |
|---|---|---|
| CPU | Central processing unit | R32C/100 Series CPU Core<br>• Basic instructions: 108<br>• Minimum instruction execution time: 15.625 ns (f(CPU) = 64 MHz)<br>• Multiplier: 32-bit × 32-bit → 64-bit<br>• Multiply-accumulate unit: 32-bit × 32-bit + 64-bit → 64-bit<br>• IEEE-754 compatible FPU: Single precision<br>• 32-bit barrel shifter<br>• Operating mode: Single-chip mode |
| Memory | | Flash memory: 768 Kbytes, 1 Mbyte<br>RAM: 48 Kbytes<br>Data flash: 4 Kbytes × 2 blocks<br>E2dataFlash: none (1)/8 Kbytes<br>Refer to Table 1.3 for details |
| Voltage Detector | Low voltage detector | Optional (2)<br>Low voltage detection interrupt |
| Clock | Clock generator | • 4 circuits (main clock, sub clock, PLL, on-chip oscillator)<br>• Oscillation stop detector: Main clock oscillator stop/restart detection<br>• Frequency divide circuit: Divide-by-2 to divide-by-24 selectable<br>• Low power modes: Wait mode, stop mode |
| Interrupts | | Interrupt vectors: 261<br>External interrupt inputs: $\overline{\text{NMI}}$, $\overline{\text{INT}}$ × 9, key input × 4<br>Interrupt priority levels: 7 |
| Watchdog Timer | | 15 bits × 1 (selectable input frequency from prescaler output)<br>Automatic timer start function is available |
| DMA | DMAC | 4 channels<br>• Cycle-steal transfer mode<br>• Request sources: 52<br>• 2 transfer modes: Single transfer, repeat transfer |
| | DMAC II | • Triggered by an interrupt request of any peripheral<br>• 3 characteristic transfer functions: Immediate data transfer, calculation result transfer, chain transfer |
| I/O Ports | Programmable I/O ports | • 2 input-only ports<br>• 120 CMOS I/O ports<br>• A pull-up resistor is selectable for every 4 input ports |
| Timer | Timer A | 16-bit timer × 5<br>Timer mode, event counter mode, one-shot timer mode, pulse-width modulation (PWM) mode<br>Two-phase pulse signal processing in event counter mode (two-phase encoder input) × 3 |
| | Timer B | 16-bit timer × 6<br>Timer mode, event counter mode, pulse frequency measurement mode, pulse-width measurement mode |
| | Three-phase motor control timer | Three-phase motor control timer × 1 (timers A1, A2, A4, and B2 used)<br>8-bit programmable dead time timer |

Notes:
1. Contact a Renesas Electronics sales office to use the non-E2dataFlash version.
2. Contact a Renesas Electronics sales office to use the optional features.

**Table 1.2 Performance Overview (2/2)**

| Unit | Function | Explanation |
|---|---|---|
| Serial Interface | UART0 to UART4 | Asynchronous/synchronous serial interface × 5 channels<br>• $I^2C$-bus (UART0 to UART2)<br>• Special mode 2 (UART0 to UART2) |
| A/D Converter | | 10-bit resolution × 34 channels<br>Sample and hold functionality integrated<br>Self test/Open-circuit detection assist |
| D/A Converter | | 8-bit resolution × 2 |
| CRC Calculator | | CRC-CCITT ($X^{16} + X^{12} + X^5 + 1$) |
| X-Y Converter | | 16 bits × 16 bits |
| Intelligent I/O | | Time measurement (input capture): 16 bits × 32<br>Digital debounce circuit contained<br>Waveform generation (output compare): 16 bits × 32<br>Phase shift waveform output mode contained |
| Serial Bus Interface | | 3 channels<br>• Synchronous serial communication mode<br>• 4-wire serial bus mode<br>Programmable character length: 8 to 16 bits |
| LIN Module | | 8 channels |
| CAN Module | | 4 channels<br>CAN functionality compliant with ISO 11898-1<br>32 mailboxes |
| Flash Memory | | Programming and erasure supply voltage: VCC = 3.0 to 5.5 V<br>Minimum endurance: 1,000 program/erase cycles<br>Security protection: ROM code protect, ID code protect<br>Debugging: On-chip debug, on-board flash programming |
| $E^2$dataFlash | | Minimum endurance: 100,000 program/erase cycles |
| Operating Frequency/Supply Voltage | | 64 MHz/VCC = 3.0 to 5.5 V |
| Operating Temperature | | -40°C to 85°C (J version)<br>-40°C to 105°C (L version) (1)<br>-40°C to 125°C (K version) |
| Current Consumption | | 43 mA (VCC = 5.0 V, f(CPU) = 64 MHz)<br>8 µA (VCC = 3.3 V, f(XCIN) = 32.768 kHz, wait mode) |
| Package | | 144-pin plastic molded LQFP (PLQP0144KA-A) |

Note:
1. Contact a Renesas Electronics sales office to use the L version products.

## 1.2 Product Information

Table 1.3 lists the product information and Figure 1.1 shows the details of the part number.

**Table 1.3 R32C/153 Group Product List** **As of August, 2013**

| Part Number | Package Code (1) | ROM Capacity (2) | RAM Capacity | E2dataFlash | Remarks |
|---|---|---|---|---|---|
| R5F64534JFD | PLQP0144KA-A | 768 Kbytes + 8 Kbytes | 48 Kbytes | 8 Kbytes | J version |
| R5F64534LFD | | | | | L version (3) |
| R5F64534KFD | | | | | K version |
| R5F6453MJFD | | | | NA (3) | J version |
| R5F6453MLFD | | | | | L version (3) |
| R5F6453MKFD | | | | | K version |
| R5F64535JFD | | 1 Mbyte + 8 Kbytes | | 8 Kbytes | J version |
| R5F64535LFD | | | | | L version (3) |
| R5F64535KFD | | | | | K version |
| R5F6453NJFD | | | | NA (3) | J version |
| R5F6453NLFD | | | | | L version (3) |
| R5F6453NKFD | | | | | K version |

Notes:
1. The old package code is as follows:
   PLQP0144KA-A: 144P6Q-A
2. “8 Kbytes” in the ROM capacity indicates the data flash capacity.
3. Contact a Renesas Electronics sales office to use the non-E2dataFlash version or the L version products.

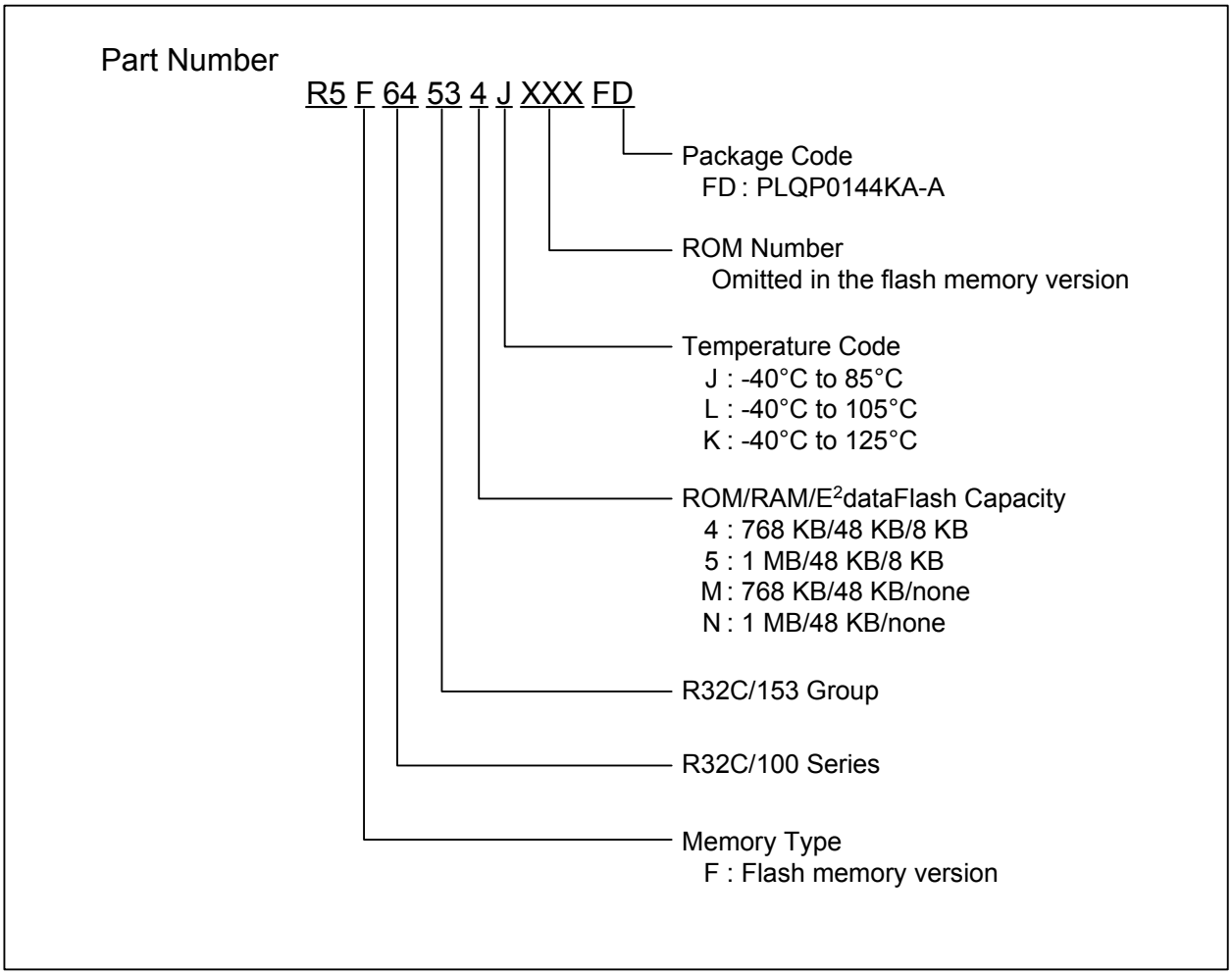



**Figure 1.1 Part Numbering**

## 1.3 Block Diagram

Figure 1.2 shows a block diagram of the R32C/153 Group.

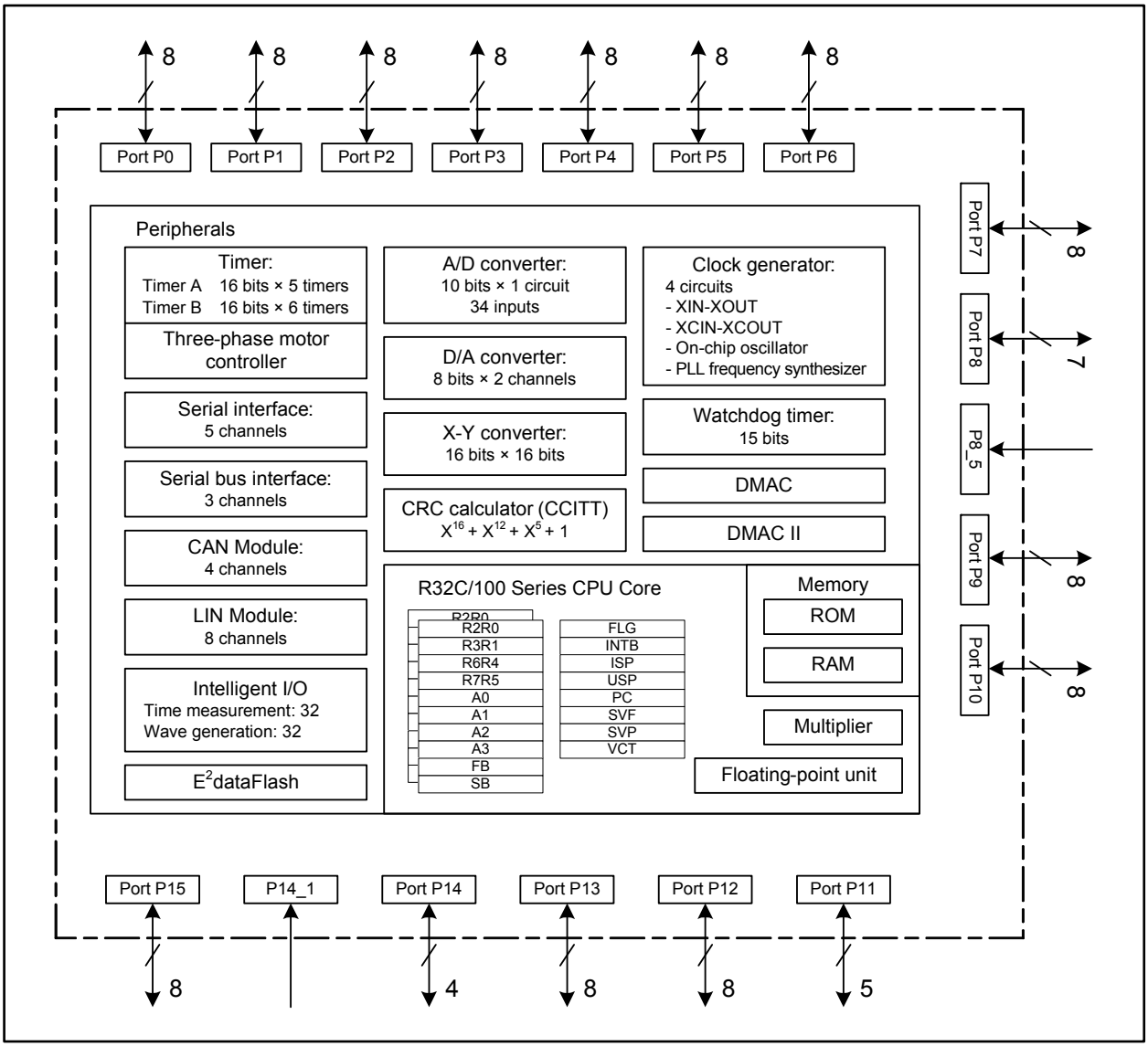
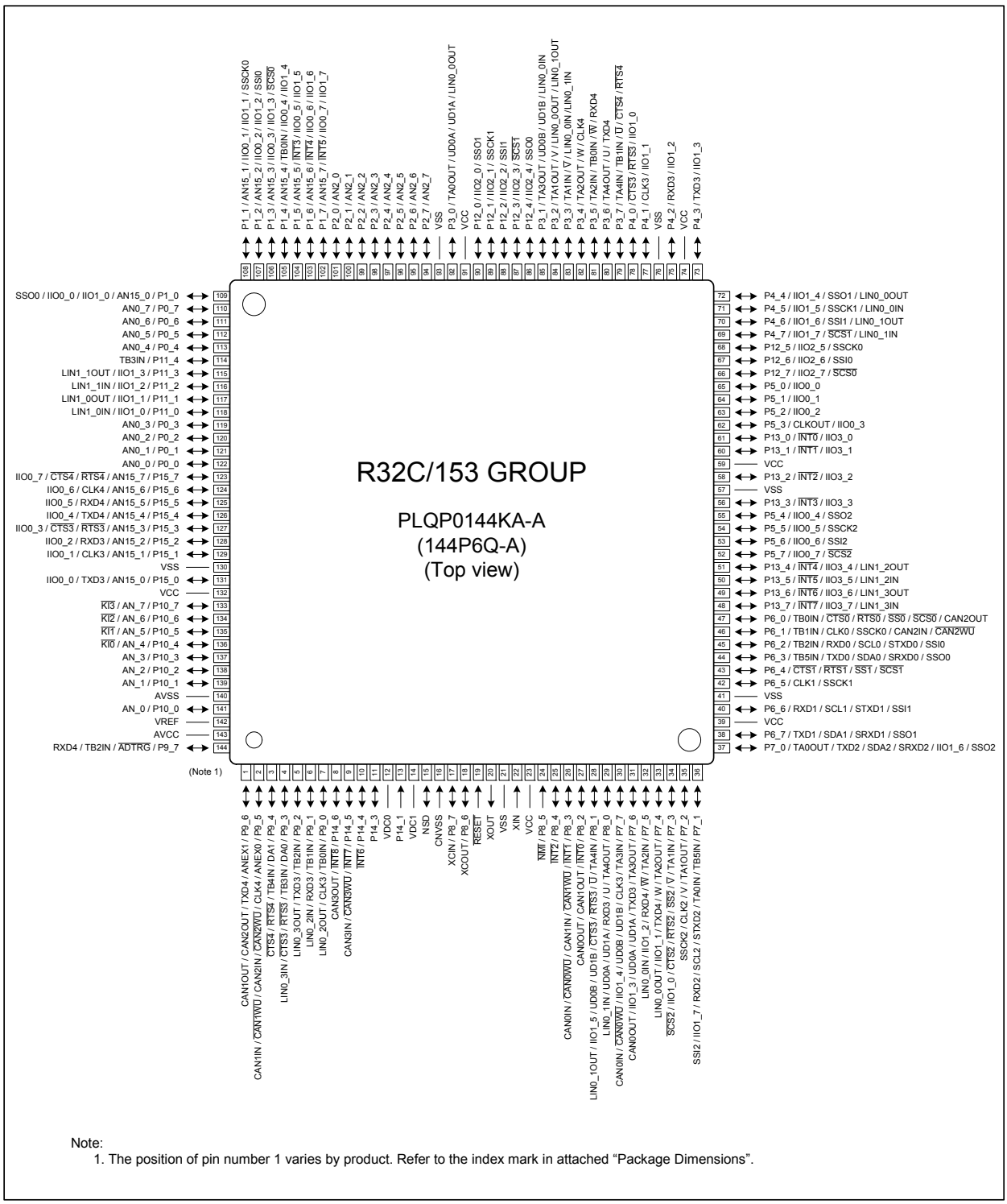



**Figure 1.2 R32C/153 Group Block Diagram**

## 1.4 Pin Assignment

Figure 1.3 shows the pin assignment (top view) and Tables 1.4 to 1.7 show the pin characteristics.




Note:
1. The position of pin number 1 varies by product. Refer to the index mark in attached “Package Dimensions”.

**Figure 1.3 Pin Assignment (top view)**

**Table 1.4 Pin Characteristics (1/4)**

| Pin No. | Control Pin | Port | Interrupt Pin | Timer Pin | UART Pin | Intelligent I/O Pin | LIN / CAN Module Pin | Analog Pin |
|---|---|---|---|---|---|---|---|---|
| 1 | | P9_6 | | | TXD4 | | CAN1OUT/ CAN2OUT | ANEX1 |
| 2 | | P9_5 | | | CLK4 | | CAN1IN/$\overline{\text{CAN1WU}}$/ CAN2IN/$\overline{\text{CAN2WU}}$ | ANEX0 |
| 3 | | P9_4 | | TB4IN | $\overline{\text{CTS4}}$/$\overline{\text{RTS4}}$ | | | DA1 |
| 4 | | P9_3 | | TB3IN | $\overline{\text{CTS3}}$/$\overline{\text{RTS3}}$ | | LIN0_3IN | DA0 |
| 5 | | P9_2 | | TB2IN | TXD3 | | LIN0_3OUT | |
| 6 | | P9_1 | | TB1IN | RXD3 | | LIN0_2IN | |
| 7 | | P9_0 | | TB0IN | CLK3 | | LIN0_2OUT | |
| 8 | | P14_6 | $\overline{\text{INT8}}$ | | | | CAN3OUT | |
| 9 | | P14_5 | $\overline{\text{INT7}}$ | | | | CAN3IN/$\overline{\text{CAN3WU}}$ | |
| 10 | | P14_4 | $\overline{\text{INT6}}$ | | | | | |
| 11 | | P14_3 | | | | | | |
| 12 | VDC0 | | | | | | | |
| 13 | | P14_1 | | | | | | |
| 14 | VDC1 | | | | | | | |
| 15 | NSD | | | | | | | |
| 16 | CNVSS | | | | | | | |
| 17 | XCIN | P8_7 | | | | | | |
| 18 | XCOUT | P8_6 | | | | | | |
| 19 | $\overline{\text{RESET}}$ | | | | | | | |
| 20 | XOUT | | | | | | | |
| 21 | VSS | | | | | | | |
| 22 | XIN | | | | | | | |
| 23 | VCC | | | | | | | |
| 24 | | P8_5 | $\overline{\text{NMI}}$ | | | | | |
| 25 | | P8_4 | $\overline{\text{INT2}}$ | | | | | |
| 26 | | P8_3 | $\overline{\text{INT1}}$ | | | | CAN0IN/$\overline{\text{CAN0WU}}$/ CAN1IN/$\overline{\text{CAN1WU}}$ | |
| 27 | | P8_2 | $\overline{\text{INT0}}$ | | | | CAN0OUT/ CAN1OUT | |
| 28 | | P8_1 | | TA4IN/$\overline{\text{U}}$ | $\overline{\text{CTS3}}$/$\overline{\text{RTS3}}$ | IIO1_5/UD0B/UD1B | LIN0_1OUT | |
| 29 | | P8_0 | | TA4OUT/U | RXD3 | UD0A/UD1A | LIN0_1IN | |
| 30 | | P7_7 | | TA3IN | CLK3 | IIO1_4/UD0B/UD1B | CAN0IN/$\overline{\text{CAN0WU}}$ | |
| 31 | | P7_6 | | TA3OUT | TXD3 | IIO1_3/UD0A/UD1A | CAN0OUT | |
| 32 | | P7_5 | | TA2IN/$\overline{\text{W}}$ | RXD4 | IIO1_2 | LIN0_0IN | |
| 33 | | P7_4 | | TA2OUT/W | TXD4 | IIO1_1 | LIN0_0OUT | |
| 34 | | P7_3 | | TA1IN/$\overline{\text{V}}$ | $\overline{\text{CTS2}}$/$\overline{\text{RTS2}}$/$\overline{\text{SS2}}$/ $\overline{\text{SCS2}}$ | IIO1_0 | | |
| 35 | | P7_2 | | TA1OUT/V | CLK2/SSCK2 | | | |
| 36 | | P7_1 | | TA0IN/ TB5IN | RXD2/SCL2/ STXD2/SSI2 | IIO1_7 | | |
| 37 | | P7_0 | | TA0OUT | TXD2/SDA2/ SRXD2/SSO2 | IIO1_6 | | |

**Table 1.5 Pin Characteristics (2/4)**

| Pin No. | Control Pin | Port | Interrupt Pin | Timer Pin | UART Pin | Intelligent I/O Pin | LIN / CAN Module Pin | Analog Pin |
|---|---|---|---|---|---|---|---|---|
| 38 | | P6_7 | | | TXD1/SDA1/ SRXD1/SSO1 | | | |
| 39 | VCC | | | | | | | |
| 40 | | P6_6 | | | RXD1/SCL1/ STXD1/SSI1 | | | |
| 41 | VSS | | | | | | | |
| 42 | | P6_5 | | | CLK1/SSCK1 | | | |
| 43 | | P6_4 | | | $\overline{\text{CTS1}}$/RTS1/$\overline{\text{SS1}}$/ $\overline{\text{SCS1}}$ | | | |
| 44 | | P6_3 | | TB5IN | TXD0/SDA0/ SRXD0/SSO0 | | | |
| 45 | | P6_2 | | TB2IN | RXD0/SCL0/ STXD0/SSI0 | | | |
| 46 | | P6_1 | | TB1IN | CLK0/SSCK0 | | CAN2IN/$\overline{\text{CAN2WU}}$ | |
| 47 | | P6_0 | | TB0IN | $\overline{\text{CTS0}}$/$\overline{\text{RTS0}}$/$\overline{\text{SS0}}$/ $\overline{\text{SCS0}}$ | | CAN2OUT | |
| 48 | | P13_7 | $\overline{\text{INT7}}$ | | | IIO3_7 | LIN1_3IN | |
| 49 | | P13_6 | $\overline{\text{INT6}}$ | | | IIO3_6 | LIN1_3OUT | |
| 50 | | P13_5 | $\overline{\text{INT5}}$ | | | IIO3_5 | LIN1_2IN | |
| 51 | | P13_4 | $\overline{\text{INT4}}$ | | | IIO3_4 | LIN1_2OUT | |
| 52 | | P5_7 | | | $\overline{\text{SCS2}}$ | IIO0_7 | | |
| 53 | | P5_6 | | | SSI2 | IIO0_6 | | |
| 54 | | P5_5 | | | SSCK2 | IIO0_5 | | |
| 55 | | P5_4 | | | SSO2 | IIO0_4 | | |
| 56 | | P13_3 | $\overline{\text{INT3}}$ | | | IIO3_3 | | |
| 57 | VSS | | | | | | | |
| 58 | | P13_2 | $\overline{\text{INT2}}$ | | | IIO3_2 | | |
| 59 | VCC | | | | | | | |
| 60 | | P13_1 | $\overline{\text{INT1}}$ | | | IIO3_1 | | |
| 61 | | P13_0 | $\overline{\text{INT0}}$ | | | IIO3_0 | | |
| 62 | CLKOUT | P5_3 | | | | IIO0_3 | | |
| 63 | | P5_2 | | | | IIO0_2 | | |
| 64 | | P5_1 | | | | IIO0_1 | | |
| 65 | | P5_0 | | | | IIO0_0 | | |
| 66 | | P12_7 | | | $\overline{\text{SCS0}}$ | IIO2_7 | | |
| 67 | | P12_6 | | | SSI0 | IIO2_6 | | |
| 68 | | P12_5 | | | SSCK0 | IIO2_5 | | |
| 69 | | P4_7 | | | $\overline{\text{SCS1}}$ | IIO1_7 | LIN0_1IN | |
| 70 | | P4_6 | | | SSI1 | IIO1_6 | LIN0_1OUT | |
| 71 | | P4_5 | | | SSCK1 | IIO1_5 | LIN0_0IN | |
| 72 | | P4_4 | | | SSO1 | IIO1_4 | LIN0_0OUT | |

**Table 1.6 Pin Characteristics (3/4)**

| Pin No. | Control Pin | Port | Interrupt Pin | Timer Pin | UART Pin | Intelligent I/O Pin | LIN / CAN Module Pin | Analog Pin |
|---|---|---|---|---|---|---|---|---|
| 73 | | P4_3 | | | TXD3 | IIO1_3 | | |
| 74 | VCC | | | | | | | |
| 75 | | P4_2 | | | RXD3 | IIO1_2 | | |
| 76 | VSS | | | | | | | |
| 77 | | P4_1 | | | CLK3 | IIO1_1 | | |
| 78 | | P4_0 | | | $\overline{\text{CTS3}}$/$\overline{\text{RTS3}}$ | IIO1_0 | | |
| 79 | | P3_7 | | TA4IN/ TB1IN/$\overline{\text{U}}$ | $\overline{\text{CTS4}}$/$\overline{\text{RTS4}}$ | | | |
| 80 | | P3_6 | | TA4OUT/U | TXD4 | | | |
| 81 | | P3_5 | | TA2IN/ TB0IN/$\overline{\text{W}}$ | RXD4 | | | |
| 82 | | P3_4 | | TA2OUT/W | CLK4 | | | |
| 83 | | P3_3 | | TA1IN/$\overline{\text{V}}$ | | | LIN0_0IN/LIN0_1IN | |
| 84 | | P3_2 | | TA1OUT/V | | | LIN0_0OUT/ LIN0_1OUT | |
| 85 | | P3_1 | | TA3OUT | | UD0B/UD1B | LIN0_0IN | |
| 86 | | P12_4 | | | SSO0 | IIO2_4 | | |
| 87 | | P12_3 | | | $\overline{\text{SCS1}}$ | IIO2_3 | | |
| 88 | | P12_2 | | | SSI1 | IIO2_2 | | |
| 89 | | P12_1 | | | SSCK1 | IIO2_1 | | |
| 90 | | P12_0 | | | SSO1 | IIO2_0 | | |
| 91 | VCC | | | | | | | |
| 92 | | P3_0 | | TA0OUT | | UD0A/UD1A | LIN0_0OUT | |
| 93 | VSS | | | | | | | |
| 94 | | P2_7 | | | | | | AN2_7 |
| 95 | | P2_6 | | | | | | AN2_6 |
| 96 | | P2_5 | | | | | | AN2_5 |
| 97 | | P2_4 | | | | | | AN2_4 |
| 98 | | P2_3 | | | | | | AN2_3 |
| 99 | | P2_2 | | | | | | AN2_2 |
| 100 | | P2_1 | | | | | | AN2_1 |
| 101 | | P2_0 | | | | | | AN2_0 |
| 102 | | P1_7 | $\overline{\text{INT5}}$ | | | IIO0_7/IIO1_7 | | AN15_7 |
| 103 | | P1_6 | $\overline{\text{INT4}}$ | | | IIO0_6/IIO1_6 | | AN15_6 |
| 104 | | P1_5 | $\overline{\text{INT3}}$ | | | IIO0_5/IIO1_5 | | AN15_5 |
| 105 | | P1_4 | | TB0IN | | IIO0_4/IIO1_4 | | AN15_4 |
| 106 | | P1_3 | | | $\overline{\text{SCS0}}$ | IIO0_3/IIO1_3 | | AN15_3 |
| 107 | | P1_2 | | | SSI0 | IIO0_2/IIO1_2 | | AN15_2 |
| 108 | | P1_1 | | | SSCK0 | IIO0_1/IIO1_1 | | AN15_1 |

**Table 1.7 Pin Characteristics (4/4)**

| Pin No. | Control Pin | Port | Interrupt Pin | Timer Pin | UART Pin | Intelligent I/O Pin | LIN / CAN Module Pin | Analog Pin |
|---|---|---|---|---|---|---|---|---|
| 109 | | P1_0 | | | SSO0 | IIO0_0/IIO1_0 | | AN15_0 |
| 110 | | P0_7 | | | | | | AN0_7 |
| 111 | | P0_6 | | | | | | AN0_6 |
| 112 | | P0_5 | | | | | | AN0_5 |
| 113 | | P0_4 | | | | | | AN0_4 |
| 114 | | P11_4 | | TB3IN | | | | |
| 115 | | P11_3 | | | | IIO1_3 | LIN1_1OUT | |
| 116 | | P11_2 | | | | IIO1_2 | LIN1_1IN | |
| 117 | | P11_1 | | | | IIO1_1 | LIN1_0OUT | |
| 118 | | P11_0 | | | | IIO1_0 | LIN1_0IN | |
| 119 | | P0_3 | | | | | | AN0_3 |
| 120 | | P0_2 | | | | | | AN0_2 |
| 121 | | P0_1 | | | | | | AN0_1 |
| 122 | | P0_0 | | | | | | AN0_0 |
| 123 | | P15_7 | | | $\overline{CTS4}$/$\overline{RTS4}$ | IIO0_7 | | AN15_7 |
| 124 | | P15_6 | | | CLK4 | IIO0_6 | | AN15_6 |
| 125 | | P15_5 | | | RXD4 | IIO0_5 | | AN15_5 |
| 126 | | P15_4 | | | TXD4 | IIO0_4 | | AN15_4 |
| 127 | | P15_3 | | | $\overline{CTS3}$/$\overline{RTS3}$ | IIO0_3 | | AN15_3 |
| 128 | | P15_2 | | | RXD3 | IIO0_2 | | AN15_2 |
| 129 | | P15_1 | | | CLK3 | IIO0_1 | | AN15_1 |
| 130 | VSS | | | | | | | |
| 131 | | P15_0 | | | TXD3 | IIO0_0 | | AN15_0 |
| 132 | VCC | | | | | | | |
| 133 | | P10_7 | $\overline{KI3}$ | | | | | AN_7 |
| 134 | | P10_6 | $\overline{KI2}$ | | | | | AN_6 |
| 135 | | P10_5 | $\overline{KI1}$ | | | | | AN_5 |
| 136 | | P10_4 | $\overline{KI0}$ | | | | | AN_4 |
| 137 | | P10_3 | | | | | | AN_3 |
| 138 | | P10_2 | | | | | | AN_2 |
| 139 | | P10_1 | | | | | | AN_1 |
| 140 | AVSS | | | | | | | |
| 141 | | P10_0 | | | | | | AN_0 |
| 142 | VREF | | | | | | | |
| 143 | AVCC | | | | | | | |
| 144 | | P9_7 | | TB2IN | RXD4 | | | $\overline{ADTRG}$ |

## 1.5 Pin Definitions and Functions

Table 1.8 to Table 1.10 show the pin definitions and functions.

**Table 1.8 Pin Definitions and Functions (1/3)**

| Function | Symbol | I/O | Description |
|---|---|---|---|
| Power supply | VCC, VSS | I | Applicable as follows: VCC = 3.0 to 5.5 V, VSS = 0 V |
| Analog power supply | AVCC, AVSS | I | Power supply for the A/D converter. AVCC and AVSS should be connected to VCC and VSS, respectively |
| Connecting pins for decoupling capacitor | VDC0, VDC1 | — | A decoupling capacitor for internal voltage should be connected between VDC0 and VDC1 |
| Reset input | $\overline{\text{RESET}}$ | I | The MCU is reset when this pin is driven low |
| CNVSS | CNVSS | I | This pin should be connected to VSS via a resistor |
| Debug port | NSD | I/O | This pin is to communicate with a debugger. It should be connected to VCC via a resistor of 1 to 4.7 kΩ |
| Main clock input | XIN | I | Input/output for the main clock oscillator. A crystal, or a ceramic resonator should be connected between pins XIN and XOUT. An external clock should be input at the XIN while leaving the XOUT open |
| Main clock output | XOUT | O | |
| Sub clock input | XCIN | I | Input/output for the sub clock oscillator. A crystal oscillator should be connected between pins XCIN and XCOUT. An external clock should be input at the XCIN while leaving the XCOUT open |
| Sub clock output | XCOUT | O | |
| Clock output | CLKOUT | O | Output of the clock with the same frequency as low speed clocks, f8, or f32 |
| External interrupt input | $\overline{\text{INT0}}$ to $\overline{\text{INT8}}$ | I | Input for external interrupts |
| NMI input | P8_5/$\overline{\text{NMI}}$ | I | Input for NMI |
| Key input interrupt | $\overline{\text{KI0}}$ to $\overline{\text{KI3}}$ | I | Input for the key input interrupt |

**Table 1.9 Pin Definitions and Functions (2/3)**

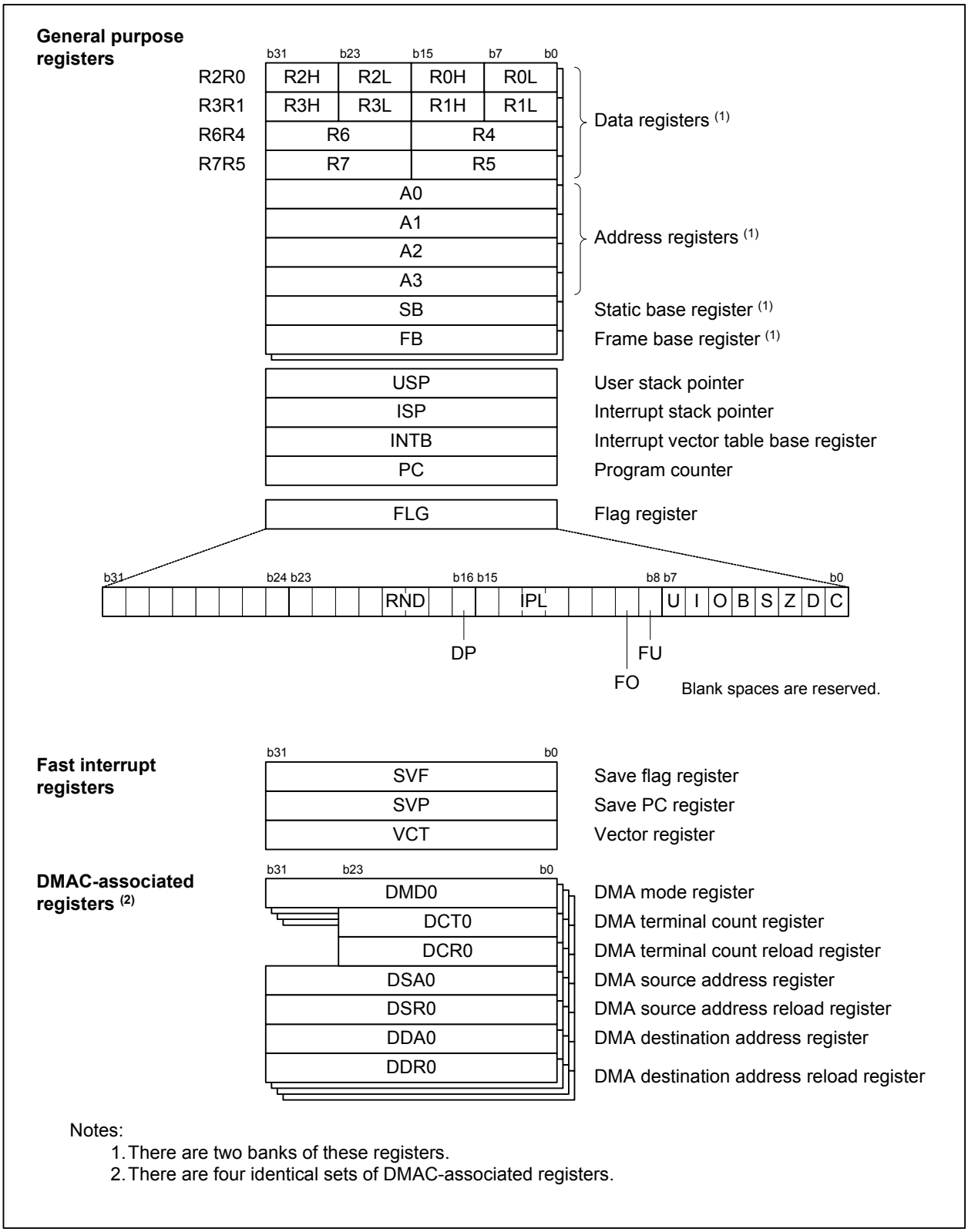
| Function | Symbol | I/O | Description |
|---|---|---|---|
| I/O ports | P0_0 to P0_7,<br>P1_0 to P1_7,<br>P2_0 to P2_7,<br>P3_0 to P3_7,<br>P4_0 to P4_7,<br>P5_0 to P5_7,<br>P6_0 to P6_7,<br>P7_0 to P7_7,<br>P8_0 to P8_4,<br>P8_6, P8_7,<br>P9_0 to P9_7,<br>P10_0 to P10_7,<br>P11_0 to P11_4,<br>P12_0 to P12_7,<br>P13_0 to P13_7,<br>P14_3 to P14_6,<br>P15_0 to P15_7 | I/O | I/O ports in CMOS. Each port can be programmed to input or output under the control of the direction register. Pull-up resistors are selected for the following 4-pin units:Pi_0 to Pi_3 and Pi_4 to Pi_7 (i = 0 to 15); however, they are enabled only for the input pins |
| Input port | P14_1 | I | Input port in CMOS. Pull-up resistors are selectable for P14_1 and P14_3 |
| Timer A | TA0OUT to TA4OUT | I/O | Timers A0 to A4 input/output |
| | TA0IN to TA4IN | I | Timers A0 to A4 input |
| Timer B | TB0IN to TB5IN | I | Timers B0 to B5 input |
| Three-phase motor control timer output | U, $\overline{U}$, V, $\overline{V}$, W, $\overline{W}$ | O | Three-phase motor control timer output |
| Serial interface | $\overline{CTS0}$ to $\overline{CTS4}$ | I | Handshake input |
| | $\overline{RTS0}$ to $\overline{RTS4}$ | O | Handshake output |
| | CLK0 to CLK4 | I/O | Transmit/receive clock input/output |
| | RXD0 to RXD4 | I | Serial data input |
| | TXD0 to TXD4 | O | Serial data output |
| $I^2C$-bus (simplified) | SDA0 to SDA2 | I/O | Serial data input/output |
| | SCL0 to SCL2 | I/O | Transmit/receive clock input/output |
| Serial interface special functions | STXD0 to STXD2 | O | Serial data output in slave mode |
| | SRXD0 to SRXD2 | I | Serial data input in slave mode |
| | $\overline{SS0}$ to $\overline{SS2}$ | I | Input to control serial interface special functions |

**Table 1.10 Pin Definitions and Functions (3/3)**

| Function | Symbol | I/O | Description |
|---|---|---|---|
| A/D converter | AN_0 to AN_7, AN0_0 to AN0_7, AN2_0 to AN2_7, AN15_0 to AN15_7 | I | Analog input for the A/D converter |
| | $\overline{\text{ADTRG}}$ | I | External trigger input for the A/D converter |
| | ANEX0 | I/O | Expanded analog input for the A/D converter and output in external op-amp connection mode |
| | ANEX1 | I | Expanded analog input for the A/D converter |
| D/A converter | DA0, DA1 | O | Output for the D/A converter |
| Reference voltage input | VREF | I | Reference voltage input for the A/D converter and D/A converter |
| Intelligent I/O | IIO0_0 to IIO0_7 | I/O | Input/output for Intelligent I/O group 0. Either input capture or output compare is selectable |
| | IIO1_0 to IIO1_7 | I/O | Input/output for Intelligent I/O group 1. Either input capture or output compare is selectable |
| | IIO2_0 to IIO2_7 | I/O | Input/output for Intelligent I/O group 2. Either input capture or output compare is selectable |
| | IIO3_0 to IIO3_7 | I/O | Input/output for Intelligent I/O group 3. Either input capture or output compare is selectable |
| | UD0A, UD1A, UD0B, UD1B | I | Input for the two-phase encoder |
| Serial bus interface | SSO0 to SSO2 | I/O | Serial data output. Functions as serial data input/output in 4-wire serial bus mode |
| | SSI0 to SSI2 | I/O | Serial data input. Functions as serial data input/output in 4-wire serial bus mode |
| | SSCK0 to SSCK2 | I/O | Transmit/receive clock input/output |
| | $\overline{\text{SCS0}}$ to $\overline{\text{SCS2}}$ | I/O | Input/output to control the synchronous serial interface |
| LIN module | LIN0_0OUT to LIN0_3OUT | O | Transmit data output for the LIN communications |
| | LIN0_0IN to LIN0_3IN | I | Receive data input for the LIN communications |
| | LIN1_0OUT to LIN1_3OUT | O | Transmit data output for the LIN communications |
| | LIN1_0IN to LIN1_3IN | I | Receive data input for the LIN communications |
| CAN module | CAN0IN to CAN3IN | I | Receive data input for the CAN communications |
| | CAN0OUT to CAN3OUT | O | Transmit data output for the CAN communications |
| | $\overline{\text{CAN0WU}}$ to $\overline{\text{CAN3WU}}$ | I | Input for the CAN wake-up interrupt |

# 2. Central Processing Unit (CPU)

The CPU contains the registers shown below. There are two register banks each consisting of registers R2R0, R3R1, R6R4, R7R5, A0 to A3, SB, and FB.




Notes:
1. There are two banks of these registers.
2. There are four identical sets of DMAC-associated registers.

**Figure 2.1 CPU Registers**

## 2.1 General Purpose Registers

### 2.1.1 Data Registers (R2R0, R3R1, R6R4, and R7R5)

These 32-bit registers are primarily used for transfers and arithmetic/logic operations.
Each of the registers can be divided into upper and lower 16-bit registers, e.g. R2R0 can be divided into R2 and R0, R3R1 can be divided into R3 and R1, etc.
Moreover, data registers R2R0 and R3R1 can be divided into four 8-bit data registers: upper (R2H and R3H), mid-upper (R2L and R3L), mid-lower (R0H and R1H), and lower (R0L and R1L).

### 2.1.2 Address Registers (A0, A1, A2, and A3)

These 32-bit registers have functions similar to data registers. They are also used for address register indirect addressing and address register relative addressing.

### 2.1.3 Static Base Register (SB)

This 32-bit register is used for SB relative addressing.

### 2.1.4 Frame Base Register (FB)

This 32-bit register is used for FB relative addressing.

### 2.1.5 Program Counter (PC)

This 32-bit counter indicates the address of the instruction to be executed next.

### 2.1.6 Interrupt Vector Table Base Register (INTB)

This 32-bit register indicates the start address of a relocatable vector table.

### 2.1.7 User Stack Pointer (USP) and Interrupt Stack Pointer (ISP)

Two types of 32-bit stack pointers (SPs) are provided: user stack pointer (USP) and interrupt stack pointer (ISP).
Use the stack pointer select flag (U flag) to select either the user stack pointer (USP) or the interrupt stack pointer (ISP). The U flag is bit 7 in the flag register (FLG). Refer to 2.1.8 “Flag Register (FLG)” for details.
To minimize the overhead of interrupt sequence due to less memory access, set the user stack pointer (USP) or the interrupt stack pointer (ISP) to a multiple of 4.

### 2.1.8 Flag Register (FLG)

This 32-bit register indicates the CPU status.

#### 2.1.8.1 Carry Flag (C flag)

This flag retains a carry, borrow, or shifted-out bit generated by the arithmetic logic unit (ALU).

#### 2.1.8.2 Debug Flag (D flag)

This flag is only for debugging. Only set this bit to 0.

#### 2.1.8.3 Zero Flag (Z flag)

This flag becomes 1 when the result of an operation is 0; otherwise it is 0.

#### 2.1.8.4 Sign Flag (S flag)

This flag becomes 1 when the result of an operation is a negative value; otherwise it is 0.

#### 2.1.8.5 Register Bank Select Flag (B flag)

This flag selects a register bank. It indicates 0 when register bank 0 is selected, and 1 when register bank 1 is selected.

#### 2.1.8.6 Overflow Flag (O flag)

This flag becomes 1 when the result of an operation overflows; otherwise it is 0.

#### 2.1.8.7 Interrupt Enable Flag (I flag)

This flag enables maskable interrupts. To disable maskable interrupts, set this flag to 0. To enable them, set this flag to 1. When an interrupt is accepted, the flag becomes 0.

#### 2.1.8.8 Stack Pointer Select Flag (U flag)

To select the interrupt stack pointer (ISP), set this flag to 0. To select the user stack pointer (USP), set this flag to 1.
It becomes 0 when a hardware interrupt is accepted or when an INT instruction designated by a software interrupt number from 0 to 127 is executed.

#### 2.1.8.9 Floating-point Underflow Flag (FU flag)

This flag becomes 1 when an underflow occurs in a floating-point operation; otherwise it is 0. It also becomes 1 when the operand contains invalid numbers (subnormal numbers).

#### 2.1.8.10 Floating-point Overflow Flag (FO flag)

This flag becomes 1 when an overflow occurs in a floating-point operation; otherwise it is 0. It also becomes 1 when the operand contains invalid numbers (subnormal numbers).

#### 2.1.8.11 Processor Interrupt Priority Level (IPL)

The processor interrupt priority level (IPL), consisting of 3 bits, selects a processor interrupt priority level from level 0 to 7. An interrupt is enabled when the interrupt request level is higher than the selected IPL.
When the processor interrupt priority level (IPL) is set to 111b (level 7), all interrupts are disabled.

#### 2.1.8.12 Fixed-point Radix Point Designation Bit (DP bit)

This bit designates the radix point. It also specifies which portion of the fixed-point multiplication result to extract. It is used for the MULX instruction.

#### 2.1.8.13 Floating-point Rounding Mode (RND)

The 2-bit floating-point rounding mode selects a rounding mode for floating-point calculation results.

#### 2.1.8.14 Reserved

Only set this bit to 0. The read value is undefined.

## 2.2 Fast Interrupt Registers

The following three registers are provided to minimize the overhead of the interrupt sequence.

### 2.2.1 Save Flag Register (SVF)

This 32-bit register is used to save the flag register when a fast interrupt occurs.

### 2.2.2 Save PC Register (SVP)

This 32-bit register is used to save the program counter when a fast interrupt occurs.

### 2.2.3 Vector Register (VCT)

This 32-bit register is used to indicate a jump address when a fast interrupt occurs.

## 2.3 DMAC-associated Registers

There are seven types of DMAC-associated registers.

### 2.3.1 DMA Mode Registers (DMD0, DMD1, DMD2, and DMD3)

These 32-bit registers are used to set DMA transfer mode, bit rate, etc.

### 2.3.2 DMA Terminal Count Registers (DCT0, DCT1, DCT2, and DCT3)

These 24-bit registers are used to set the number of DMA transfers.

### 2.3.3 DMA Terminal Count Reload Registers (DCR0, DCR1, DCR2, and DCR3)

These 24-bit registers are used to set the reloaded values for DMA terminal count registers.

### 2.3.4 DMA Source Address Registers (DSA0, DSA1, DSA2, and DSA3)

These 32-bit registers are used to set DMA source addresses.

### 2.3.5 DMA Source Address Reload Registers (DSR0, DSR1, DSR2, and DSR3)

These 32-bit registers are used to set the reloaded values for DMA source address registers.

### 2.3.6 DMA Destination Address Registers (DDA0, DDA1, DDA2, and DDA3)

These 32-bit registers are used to set DMA destination addresses.

### 2.3.7 DMA Destination Address Reload Registers (DDR0, DDR1, DDR2, and DDR3)

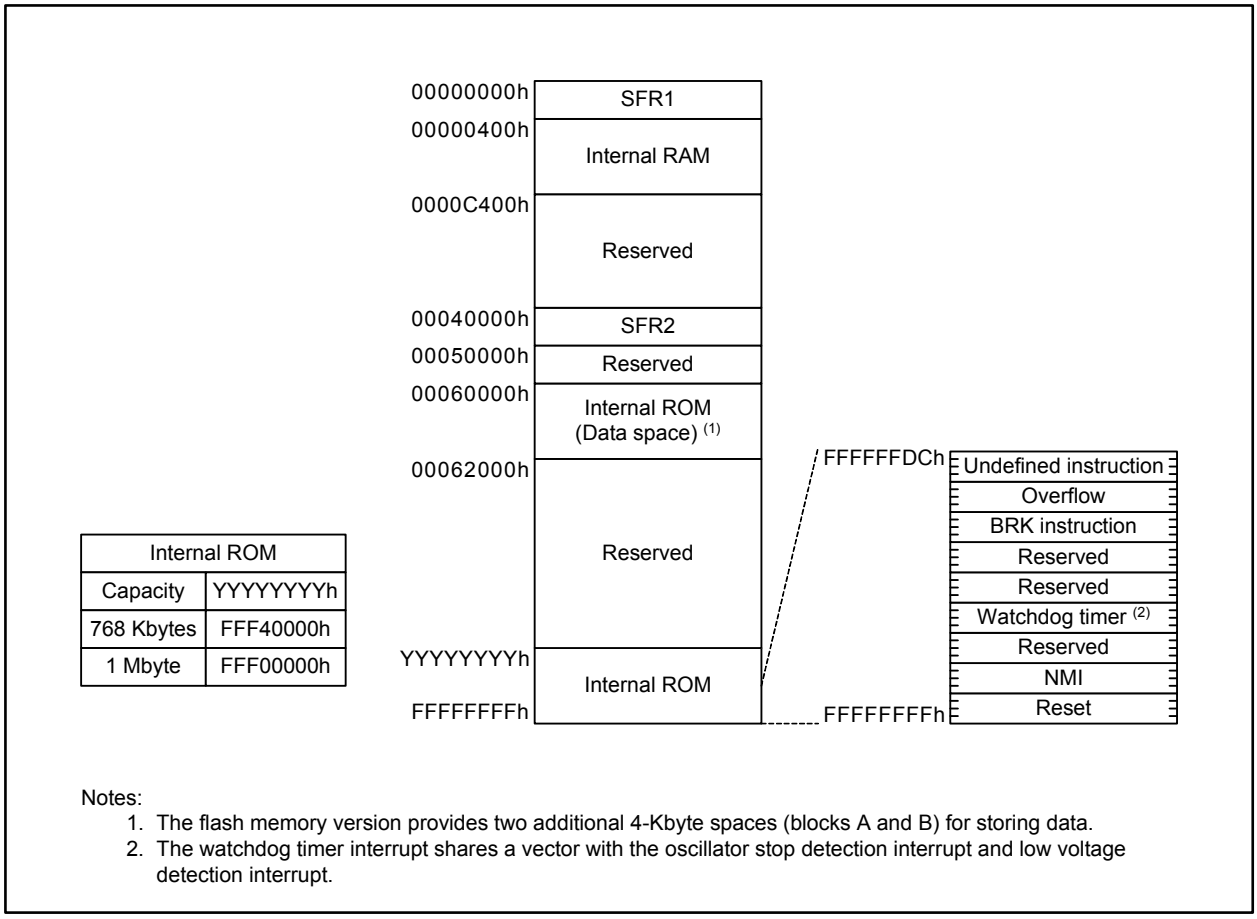
These 32-bit registers are used to set reloaded values for DMA destination address registers.

# 3. Memory

Figure 3.1 shows the memory map of the R32C/153 Group.
The R32C/153 Group provides a 4-Gbyte address space from 00000000h to FFFFFFFFh.

The internal ROM is mapped from address FFFFFFFFh in the inferior direction. For example, the 1-Mbyte internal ROM is mapped from FFF00000h to FFFFFFFFh.
The fixed interrupt vector table contains the start address of interrupt handlers and is mapped from FFFFFFDCh to FFFFFFFFh.
The internal RAM is mapped from address 00000400h in the superior direction. For example, the 48-Kbyte internal RAM is mapped from 00000400h to 0000C3FFh. Besides being used for data storage, the internal RAM functions as a stack(s) for subroutine calls and/or interrupt handlers.

Special function registers (SFRs), which are control registers for peripheral functions, are mapped from 00000000h to 000003FFh, and from 00040000h to 0004FFFFh. Unoccupied SFR locations are reserved, and no access is allowed.




Notes:
1. The flash memory version provides two additional 4-Kbyte spaces (blocks A and B) for storing data.
2. The watchdog timer interrupt shares a vector with the oscillator stop detection interrupt and low voltage detection interrupt.

**Figure 3.1 Memory Map**

# 4. Special Function Registers (SFRs)

SFRs are memory-mapped peripheral registers that control the operation of peripherals. Table 4.1 SFR List (1) to Table 4.87 SFR List (87) list the SFR details.

**Table 4.1 SFR List (1)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000000h | | | |
| 000001h | | | |
| 000002h | | | |
| 000003h | | | |
| 000004h | Clock Control Register | CCR | 0001 1000b |
| 000005h | | | |
| 000006h | Flash Memory Control Register | FMCR | 0000 0001b |
| 000007h | Protect Release Register | PRR | 00h |
| 000008h | | | |
| 000009h | | | |
| 00000Ah | | | |
| 00000Bh | | | |
| 00000Ch | | | |
| 00000Dh | | | |
| 00000Eh | | | |
| 00000Fh | | | |
| 000010h | | | |
| 000011h | | | |
| 000012h | | | |
| 000013h | | | |
| 000014h | | | |
| 000015h | | | |
| 000016h | | | |
| 000017h | | | |
| 000018h | | | |
| 000019h | | | |
| 00001Ah | | | |
| 00001Bh | | | |
| 00001Ch | Flash Memory Rewrite Bus Control Register | FEBC | 0000h |
| 00001Dh | | | |
| 00001Eh | Peripheral Bus Control Register | PBC | 0504h |
| 00001Fh | | | |
| 000020h to 00005Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.2 SFR List (2)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000060h | | | |
| 000061h | Timer B5 Interrupt Control Register | TB5IC | XXXX X000b |
| 000062h | | | |
| 000063h | UART2 Receive/ACK Interrupt Control Register | S2RIC | XXXX X000b |
| 000064h | | | |
| 000065h | | | |
| 000066h | | | |
| 000067h | | | |
| 000068h | DMA0 Transfer Complete Interrupt Control Register | DM0IC | XXXX X000b |
| 000069h | UART0 START Condition/STOP Condition Detection Interrupt Control Register | BCN0IC | XXXX X000b |
| 00006Ah | DMA2 Transfer Complete Interrupt Control Register | DM2IC | XXXX X000b |
| 00006Bh | A/D Converter 0 Convert Completion Interrupt Control Register | AD0IC | XXXX X000b |
| 00006Ch | Timer A0 Interrupt Control Register | TA0IC | XXXX X000b |
| 00006Dh | Intelligent I/O Interrupt Control Register 0 | IIO0IC | XXXX X000b |
| 00006Eh | Timer A2 Interrupt Control Register | TA2IC | XXXX X000b |
| 00006Fh | Intelligent I/O Interrupt Control Register 2 | IIO2IC | XXXX X000b |
| 000070h | Timer A4 Interrupt Control Register | TA4IC | XXXX X000b |
| 000071h | Intelligent I/O Interrupt Control Register 4 | IIO4IC | XXXX X000b |
| 000072h | UART0 Receive/ACK Interrupt Control Register | S0RIC | XXXX X000b |
| 000073h | Intelligent I/O Interrupt Control Register 6 | IIO6IC | XXXX X000b |
| 000074h | UART1 Receive/ACK Interrupt Control Register | S1RIC | XXXX X000b |
| 000075h | Intelligent I/O Interrupt Control Register 8 | IIO8IC | XXXX X000b |
| 000076h | Timer B1 Interrupt Control Register | TB1IC | XXXX X000b |
| 000077h | Intelligent I/O Interrupt Control Register 10 | IIO10IC | XXXX X000b |
| 000078h | Timer B3 Interrupt Control Register | TB3IC | XXXX X000b |
| 000079h | | | |
| 00007Ah | INT5 Interrupt Control Register | INT5IC | XX00 X000b |
| 00007Bh | CAN0 Wake-up Interrupt Control Register | C0WIC | XXXX X000b |
| 00007Ch | INT3 Interrupt Control Register | INT3IC | XX00 X000b |
| 00007Dh | CAN2 Wake-up Interrupt Control Register | C2WIC | XXXX X000b |
| 00007Eh | INT1 Interrupt Control Register | INT1IC | XX00 X000b |
| 00007Fh | LIN0 Low Detection Interrupt Control Register | L0LDIC | XXXX X000b |
| 000080h | | | |
| 000081h | UART2 Transmit/NACK Interrupt Control Register | S2TIC | XXXX X000b |
| 000082h | | | |
| 000083h | | | |
| 000084h | | | |
| 000085h | | | |
| 000086h | | | |
| 000087h | UART2 START Condition/STOP Condition Detection Interrupt Control Register | BCN2IC | XXXX X000b |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.3 SFR List (3)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000088h | DMA1 Transfer Complete Interrupt Control Register | DM1IC | XXXX X000b |
| 000089h | UART1 START Condition/STOP Condition Detection Interrupt Control Register | BCN1IC | XXXX X000b |
| 00008Ah | DMA3 Transfer Complete Interrupt Control Register | DM3IC | XXXX X000b |
| 00008Bh | Key Input Interrupt Control Register | KUPIC | XXXX X000b |
| 00008Ch | Timer A1 Interrupt Control Register | TA1IC | XXXX X000b |
| 00008Dh | Intelligent I/O Interrupt Control Register 1 | IIO1IC | XXXX X000b |
| 00008Eh | Timer A3 Interrupt Control Register | TA3IC | XXXX X000b |
| 00008Fh | Intelligent I/O Interrupt Control Register 3 | IIO3IC | XXXX X000b |
| 000090h | UART0 Transmit/NACK Interrupt Control Register | S0TIC | XXXX X000b |
| 000091h | Intelligent I/O Interrupt Control Register 5 | IIO5IC | XXXX X000b |
| 000092h | UART1 Transmit/NACK Interrupt Control Register | S1TIC | XXXX X000b |
| 000093h | Intelligent I/O Interrupt Control Register 7 | IIO7IC | XXXX X000b |
| 000094h | Timer B0 Interrupt Control Register | TB0IC | XXXX X000b |
| 000095h | Intelligent I/O Interrupt Control Register 9 | IIO9IC | XXXX X000b |
| 000096h | Timer B2 Interrupt Control Register | TB2IC | XXXX X000b |
| 000097h | Intelligent I/O Interrupt Control Register 11 | IIO11IC | XXXX X000b |
| 000098h | Timer B4 Interrupt Control Register | TB4IC | XXXX X000b |
| 000099h | | | |
| 00009Ah | INT4 Interrupt Control Register | INT4IC | XX00 X000b |
| 00009Bh | CAN1 Wake-up Interrupt Control Register | C1WIC | XXXX X000b |
| 00009Ch | INT2 Interrupt Control Register | INT2IC | XX00 X000b |
| 00009Dh | CAN3 Wake-up Interrupt Control Register | C3WIC | XXXX X000b |
| 00009Eh | INT0 Interrupt Control Register | INT0IC | XX00 X000b |
| 00009Fh | LIN1 Low Detection Interrupt Control Register | L1LDIC | XXXX X000b |
| 0000A0h | Intelligent I/O Interrupt Request Register 0 | IIO0IR | 0000 0XX1b |
| 0000A1h | Intelligent I/O Interrupt Request Register 1 | IIO1IR | 0000 0XX1b |
| 0000A2h | Intelligent I/O Interrupt Request Register 2 | IIO2IR | 0000 0X01b |
| 0000A3h | Intelligent I/O Interrupt Request Register 3 | IIO3IR | 0000 XXX1b |
| 0000A4h | Intelligent I/O Interrupt Request Register 4 | IIO4IR | 000X XXX1b |
| 0000A5h | Intelligent I/O Interrupt Request Register 5 | IIO5IR | 0000 XXX1b |
| 0000A6h | Intelligent I/O Interrupt Request Register 6 | IIO6IR | 0000 XXX1b |
| 0000A7h | Intelligent I/O Interrupt Request Register 7 | IIO7IR | 000X XXX1b |
| 0000A8h | Intelligent I/O Interrupt Request Register 8 | IIO8IR | 000X XXX1b |
| 0000A9h | Intelligent I/O Interrupt Request Register 9 | IIO9IR | 0X00 XXX1b |
| 0000AAh | Intelligent I/O Interrupt Request Register 10 | IIO10IR | 0X00 XXX1b |
| 0000ABh | Intelligent I/O Interrupt Request Register 11 | IIO11IR | 0X0X XXX1b |
| 0000ACh | | | |
| 0000ADh | | | |
| 0000AEh | | | |
| 0000AFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.4 SFR List (4)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0000B0h | Intelligent I/O Interrupt Enable Register 0 | IIO0IE | 00h |
| 0000B1h | Intelligent I/O Interrupt Enable Register 1 | IIO1IE | 00h |
| 0000B2h | Intelligent I/O Interrupt Enable Register 2 | IIO2IE | 00h |
| 0000B3h | Intelligent I/O Interrupt Enable Register 3 | IIO3IE | 00h |
| 0000B4h | Intelligent I/O Interrupt Enable Register 4 | IIO4IE | 00h |
| 0000B5h | Intelligent I/O Interrupt Enable Register 5 | IIO5IE | 00h |
| 0000B6h | Intelligent I/O Interrupt Enable Register 6 | IIO6IE | 00h |
| 0000B7h | Intelligent I/O Interrupt Enable Register 7 | IIO7IE | 00h |
| 0000B8h | Intelligent I/O Interrupt Enable Register 8 | IIO8IE | 00h |
| 0000B9h | Intelligent I/O Interrupt Enable Register 9 | IIO9IE | 00h |
| 0000BAh | Intelligent I/O Interrupt Enable Register 10 | IIO10IE | 00h |
| 0000BBh | Intelligent I/O Interrupt Enable Register 11 | IIO11IE | 00h |
| 0000BCh | | | |
| 0000BDh | | | |
| 0000BEh | | | |
| 0000BFh | | | |
| 0000C0h | Serial Bus Interface 0 Interrupt Control Register | SS0IC | XXXX X000b |
| 0000C1h | CAN0 Transmit Interrupt Control Register | C0TIC | XXXX X000b |
| 0000C2h | Serial Bus Interface 2 Interrupt Control Register | SS2IC | XXXX X000b |
| 0000C3h | CAN0 Error Interrupt Control Register | C0EIC | XXXX X000b |
| 0000C4h | | | |
| 0000C5h | CAN1 Receive Interrupt Control Register | C1RIC | XXXX X000b |
| 0000C6h | | | |
| 0000C7h | CAN2 Transmit Interrupt Control Register | C2TIC | XXXX X000b |
| 0000C8h | | | |
| 0000C9h | CAN2 Error Interrupt Control Register | C2EIC | XXXX X000b |
| 0000CAh | | | |
| 0000CBh | CAN3 Receive Interrupt Control Register | C3RIC | XXXX X000b |
| 0000CCh | | | |
| 0000CDh | | | |
| 0000CEh | | | |
| 0000CFh | | | |
| 0000D0h | CAN0 Transmit FIFO Interrupt Control Register | C0FTIC | XXXX X000b |
| 0000D1h | | | |
| 0000D2h | CAN1 Transmit FIFO Interrupt Control Register | C1FTIC | XXXX X000b |
| 0000D3h | | | |
| 0000D4h | CAN2 Transmit FIFO Interrupt Control Register | C2FTIC | XXXX X000b |
| 0000D5h | LIN0_0 Interrupt Control Register | L0_0IC | XXXX X000b |
| 0000D6h | CAN3 Transmit FIFO Interrupt Control Register | C3FTIC | XXXX X000b |
| 0000D7h | LIN0_2 Interrupt Control Register | L0_2IC | XXXX X000b |
| 0000D8h | $E^2$dataFlash Interrupt Control Register | E2FIC | XXXX X000b |
| 0000D9h | LIN1_0 Interrupt Control Register | L1_0IC | XXXX X000b |
| 0000DAh | | | |
| 0000DBh | LIN1_2 Interrupt Control Register | L1_2IC | XXXX X000b |
| 0000DCh | | | |
| 0000DDh | UART3 Transmit Interrupt Control Register | S3TIC | XXXX X000b |
| 0000DEh | INT7 Interrupt Control Register | INT7IC | XX00 X000b |
| 0000DFh | UART4 Transmit Interrupt Control Register | S4TIC | XXXX X000b |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.5 SFR List (5)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0000E0h | Serial Bus Interface 1 Interrupt Control Register | SS1IC | XXXX X000b |
| 0000E1h | CAN0 Receive Interrupt Control Register | C0RIC | XXXX X000b |
| 0000E2h | | | |
| 0000E3h | CAN1 Transmit Interrupt Control Register | C1TIC | XXXX X000b |
| 0000E4h | | | |
| 0000E5h | CAN1 Error Interrupt Control Register | C1EIC | XXXX X000b |
| 0000E6h | | | |
| 0000E7h | CAN2 Receive Interrupt Control Register | C2RIC | XXXX X000b |
| 0000E8h | | | |
| 0000E9h | CAN3 Transmit Interrupt Control Register | C3TIC | XXXX X000b |
| 0000EAh | | | |
| 0000EBh | CAN3 Error Interrupt Control Register | C3EIC | XXXX X000b |
| 0000ECh | | | |
| 0000EDh | | | |
| 0000EEh | | | |
| 0000EFh | | | |
| 0000F0h | CAN0 Receive FIFO Interrupt Control Register | C0FRIC | XXXX X000b |
| 0000F1h | | | |
| 0000F2h | CAN1 Receive FIFO Interrupt Control Register | C1FRIC | XXXX X000b |
| 0000F3h | | | |
| 0000F4h | CAN2 Receive FIFO Interrupt Control Register | C2FRIC | XXXX X000b |
| 0000F5h | LIN0_1 Interrupt Control Register | L0_1IC | XXXX X000b |
| 0000F6h | CAN3 Receive FIFO Interrupt Control Register | C3FRIC | XXXX X000b |
| 0000F7h | LIN0_3 Interrupt Control Register | L0_3IC | XXXX X000b |
| 0000F8h | | | |
| 0000F9h | LIN1_1 Interrupt Control Register | L1_1IC | XXXX X000b |
| 0000FAh | | | |
| 0000FBh | LIN1_3 Interrupt Control Register | L1_3IC | XXXX X000b |
| 0000FCh | INT8 Interrupt Control Register | INT8IC | XX00 X000b |
| 0000FDh | UART3 Receive Interrupt Control Register | S3RIC | XXXX X000b |
| 0000FEh | INT6 Interrupt Control Register | INT6IC | XX00 X000b |
| 0000FFh | UART4 Receive Interrupt Control Register | S4RIC | XXXX X000b |
| 000100h | Group 1 Time Measurement/Waveform Generation Register 0 | G1TM0/G1PO0 | XXXXh |
| 000101h | | | |
| 000102h | Group 1 Time Measurement/Waveform Generation Register 1 | G1TM1/G1PO1 | XXXXh |
| 000103h | | | |
| 000104h | Group 1 Time Measurement/Waveform Generation Register 2 | G1TM2/G1PO2 | XXXXh |
| 000105h | | | |
| 000106h | Group 1 Time Measurement/Waveform Generation Register 3 | G1TM3/G1PO3 | XXXXh |
| 000107h | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.6 SFR List (6)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000108h | Group 1 Time Measurement/Waveform Generation Register 4 | G1TM4/G1PO4 | XXXXh |
| 000109h | | | |
| 00010Ah | Group 1 Time Measurement/Waveform Generation Register 5 | G1TM5/G1PO5 | XXXXh |
| 00010Bh | | | |
| 00010Ch | Group 1 Time Measurement/Waveform Generation Register 6 | G1TM6/G1PO6 | XXXXh |
| 00010Dh | | | |
| 00010Eh | Group 1 Time Measurement/Waveform Generation Register 7 | G1TM7/G1PO7 | XXXXh |
| 00010Fh | | | |
| 000110h | Group 1 Waveform Generation Control Register 0 | G1POCR0 | 0000 X000b |
| 000111h | Group 1 Waveform Generation Control Register 1 | G1POCR1 | 0X00 X000b |
| 000112h | Group 1 Waveform Generation Control Register 2 | G1POCR2 | 0X00 X000b |
| 000113h | Group 1 Waveform Generation Control Register 3 | G1POCR3 | 0X00 X000b |
| 000114h | Group 1 Waveform Generation Control Register 4 | G1POCR4 | 0X00 X000b |
| 000115h | Group 1 Waveform Generation Control Register 5 | G1POCR5 | 0X00 X000b |
| 000116h | Group 1 Waveform Generation Control Register 6 | G1POCR6 | 0X00 X000b |
| 000117h | Group 1 Waveform Generation Control Register 7 | G1POCR7 | 0X00 X000b |
| 000118h | Group 1 Time Measurement Control Register 0 | G1TMCR0 | 00h |
| 000119h | Group 1 Time Measurement Control Register 1 | G1TMCR1 | 00h |
| 00011Ah | Group 1 Time Measurement Control Register 2 | G1TMCR2 | 00h |
| 00011Bh | Group 1 Time Measurement Control Register 3 | G1TMCR3 | 00h |
| 00011Ch | Group 1 Time Measurement Control Register 4 | G1TMCR4 | 00h |
| 00011Dh | Group 1 Time Measurement Control Register 5 | G1TMCR5 | 00h |
| 00011Eh | Group 1 Time Measurement Control Register 6 | G1TMCR6 | 00h |
| 00011Fh | Group 1 Time Measurement Control Register 7 | G1TMCR7 | 00h |
| 000120h | Group 1 Base Timer Register | G1BT | XXXXh |
| 000121h | | | |
| 000122h | Group 1 Base Timer Control Register 0 | G1BCR0 | 0000 0000b |
| 000123h | Group 1 Base Timer Control Register 1 | G1BCR1 | 0000 0000b |
| 000124h | Group 1 Time Measurement Prescaler Register 6 | G1TPR6 | 00h |
| 000125h | Group 1 Time Measurement Prescaler Register 7 | G1TPR7 | 00h |
| 000126h | Group 1 Function Enable Register | G1FE | 00h |
| 000127h | Group 1 Function Select Register | G1FS | 00h |
| 000128h | | | |
| 000129h | | | |
| 00012Ah | | | |
| 00012Bh | | | |
| 00012Ch | | | |
| 00012Dh | | | |
| 00012Eh | | | |
| 00012Fh | | | |
| 000130h to 00013Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.7 SFR List (7)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000140h | Group 2 Time Measurement/Waveform Generation Register 0 | G2TM0/G2PO0 | XXXXh |
| 000141h | | | |
| 000142h | Group 2 Time Measurement/Waveform Generation Register 1 | G2TM1/G2PO1 | XXXXh |
| 000143h | | | |
| 000144h | Group 2 Time Measurement/Waveform Generation Register 2 | G2TM2/G2PO2 | XXXXh |
| 000145h | | | |
| 000146h | Group 2 Time Measurement/Waveform Generation Register 3 | G2TM3/G2PO3 | XXXXh |
| 000147h | | | |
| 000148h | Group 2 Time Measurement/Waveform Generation Register 4 | G2TM4/G2PO4 | XXXXh |
| 000149h | | | |
| 00014Ah | Group 2 Time Measurement/Waveform Generation Register 5 | G2TM5/G2PO5 | XXXXh |
| 00014Bh | | | |
| 00014Ch | Group 2 Time Measurement/Waveform Generation Register 6 | G2TM6/G2PO6 | XXXXh |
| 00014Dh | | | |
| 00014Eh | Group 2 Time Measurement/Waveform Generation Register 7 | G2TM7/G2PO7 | XXXXh |
| 00014Fh | | | |
| 000150h | Group 2 Waveform Generation Control Register 0 | G2POCR0 | 0000 X000b |
| 000151h | Group 2 Waveform Generation Control Register 1 | G2POCR1 | 0X00 X000b |
| 000152h | Group 2 Waveform Generation Control Register 2 | G2POCR2 | 0X00 X000b |
| 000153h | Group 2 Waveform Generation Control Register 3 | G2POCR3 | 0X00 X000b |
| 000154h | Group 2 Waveform Generation Control Register 4 | G2POCR4 | 0X00 X000b |
| 000155h | Group 2 Waveform Generation Control Register 5 | G2POCR5 | 0X00 X000b |
| 000156h | Group 2 Waveform Generation Control Register 6 | G2POCR6 | 0X00 X000b |
| 000157h | Group 2 Waveform Generation Control Register 7 | G2POCR7 | 0X00 X000b |
| 000158h | Group 2 Time Measurement Control Register 0 | G2TMCR0 | 00h |
| 000159h | Group 2 Time Measurement Control Register 1 | G2TMCR1 | 00h |
| 00015Ah | Group 2 Time Measurement Control Register 2 | G2TMCR2 | 00h |
| 00015Bh | Group 2 Time Measurement Control Register 3 | G2TMCR3 | 00h |
| 00015Ch | Group 2 Time Measurement Control Register 4 | G2TMCR4 | 00h |
| 00015Dh | Group 2 Time Measurement Control Register 5 | G2TMCR5 | 00h |
| 00015Eh | Group 2 Time Measurement Control Register 6 | G2TMCR6 | 00h |
| 00015Fh | Group 2 Time Measurement Control Register 7 | G2TMCR7 | 00h |
| 000160h | Group 2 Base Timer Register | G2BT | XXXXh |
| 000161h | | | |
| 000162h | Group 2 Base Timer Control Register 0 | G2BCR0 | 0000 0000b |
| 000163h | Group 2 Base Timer Control Register 1 | G2BCR1 | 0000 0000b |
| 000164h | Group 2 Time Measurement Prescaler Register 6 | G2TPR6 | 00h |
| 000165h | Group 2 Time Measurement Prescaler Register 7 | G2TPR7 | 00h |
| 000166h | Group 2 Function Enable Register | G2FE | 00h |
| 000167h | Group 2 Function Select Register | G2FS | 00h |
| 000168h | | | |
| 000169h | | | |
| 00016Ah | | | |
| 00016Bh | | | |
| 00016Ch | | | |
| 00016Dh | | | |
| 00016Eh | | | |
| 00016Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.8 SFR List (8)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000170h | | | |
| 000171h | | | |
| 000172h | | | |
| 000173h | | | |
| 000174h | | | |
| 000175h | | | |
| 000176h | | | |
| 000177h | | | |
| 000178h | | | |
| 000179h | | | |
| 00017Ah | | | |
| 00017Bh | | | |
| 00017Ch | | | |
| 00017Dh | | | |
| 00017Eh | | | |
| 00017Fh | | | |
| 000180h | Group 0 Time Measurement/Waveform Generation Register 0 | G0TM0/G0PO0 | XXXXh |
| 000181h | | | |
| 000182h | Group 0 Time Measurement/Waveform Generation Register 1 | G0TM1/G0PO1 | XXXXh |
| 000183h | | | |
| 000184h | Group 0 Time Measurement/Waveform Generation Register 2 | G0TM2/G0PO2 | XXXXh |
| 000185h | | | |
| 000186h | Group 0 Time Measurement/Waveform Generation Register 3 | G0TM3/G0PO3 | XXXXh |
| 000187h | | | |
| 000188h | Group 0 Time Measurement/Waveform Generation Register 4 | G0TM4/G0PO4 | XXXXh |
| 000189h | | | |
| 00018Ah | Group 0 Time Measurement/Waveform Generation Register 5 | G0TM5/G0PO5 | XXXXh |
| 00018Bh | | | |
| 00018Ch | Group 0 Time Measurement/Waveform Generation Register 6 | G0TM6/G0PO6 | XXXXh |
| 00018Dh | | | |
| 00018Eh | Group 0 Time Measurement/Waveform Generation Register 7 | G0TM7/G0PO7 | XXXXh |
| 00018Fh | | | |
| 000190h | Group 0 Waveform Generation Control Register 0 | G0POCR0 | 0000 X000b |
| 000191h | Group 0 Waveform Generation Control Register 1 | G0POCR1 | 0X00 X000b |
| 000192h | Group 0 Waveform Generation Control Register 2 | G0POCR2 | 0X00 X000b |
| 000193h | Group 0 Waveform Generation Control Register 3 | G0POCR3 | 0X00 X000b |
| 000194h | Group 0 Waveform Generation Control Register 4 | G0POCR4 | 0X00 X000b |
| 000195h | Group 0 Waveform Generation Control Register 5 | G0POCR5 | 0X00 X000b |
| 000196h | Group 0 Waveform Generation Control Register 6 | G0POCR6 | 0X00 X000b |
| 000197h | Group 0 Waveform Generation Control Register 7 | G0POCR7 | 0X00 X000b |
| 000198h | Group 0 Time Measurement Control Register 0 | G0TMCR0 | 00h |
| 000199h | Group 0 Time Measurement Control Register 1 | G0TMCR1 | 00h |
| 00019Ah | Group 0 Time Measurement Control Register 2 | G0TMCR2 | 00h |
| 00019Bh | Group 0 Time Measurement Control Register 3 | G0TMCR3 | 00h |
| 00019Ch | Group 0 Time Measurement Control Register 4 | G0TMCR4 | 00h |
| 00019Dh | Group 0 Time Measurement Control Register 5 | G0TMCR5 | 00h |
| 00019Eh | Group 0 Time Measurement Control Register 6 | G0TMCR6 | 00h |
| 00019Fh | Group 0 Time Measurement Control Register 7 | G0TMCR7 | 00h |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.9 SFR List (9)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0001A0h | Group 0 Base Timer Register | G0BT | XXXXh |
| 0001A1h | | | |
| 0001A2h | Group 0 Base Timer Control Register 0 | G0BCR0 | 0000 0000b |
| 0001A3h | Group 0 Base Timer Control Register 1 | G0BCR1 | 0000 0000b |
| 0001A4h | Group 0 Time Measurement Prescaler Register 6 | G0TPR6 | 00h |
| 0001A5h | Group 0 Time Measurement Prescaler Register 7 | G0TPR7 | 00h |
| 0001A6h | Group 0 Function Enable Register | G0FE | 00h |
| 0001A7h | Group 0 Function Select Register | G0FS | 00h |
| 0001A8h | | | |
| 0001A9h | | | |
| 0001AAh | | | |
| 0001ABh | | | |
| 0001ACh | | | |
| 0001ADh | | | |
| 0001AEh | | | |
| 0001AFh | | | |
| 0001B0h | | | |
| 0001B1h | | | |
| 0001B2h | | | |
| 0001B3h | | | |
| 0001B4h | | | |
| 0001B5h | | | |
| 0001B6h | | | |
| 0001B7h | | | |
| 0001B8h | | | |
| 0001B9h | | | |
| 0001BAh | | | |
| 0001BBh | | | |
| 0001BCh | | | |
| 0001BDh | | | |
| 0001BEh | | | |
| 0001BFh | | | |
| 0001C0h | | | |
| 0001C1h | | | |
| 0001C2h | | | |
| 0001C3h | | | |
| 0001C4h | | | |
| 0001C5h | | | |
| 0001C6h | | | |
| 0001C7h | | | |
| 0001C8h | | | |
| 0001C9h | | | |
| 0001CAh | | | |
| 0001CBh | | | |
| 0001CCh | | | |
| 0001CDh | | | |
| 0001CEh | | | |
| 0001CFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.10 SFR List (10)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0001D0h | | | |
| 0001D1h | | | |
| 0001D2h | | | |
| 0001D3h | | | |
| 0001D4h | | | |
| 0001D5h | | | |
| 0001D6h | | | |
| 0001D7h | | | |
| 0001D8h | | | |
| 0001D9h | | | |
| 0001DAh | | | |
| 0001DBh | | | |
| 0001DCh | | | |
| 0001DDh | | | |
| 0001DEh | | | |
| 0001DFh | | | |
| 0001E0h | UART3 Transmit/Receive Mode Register | U3MR | 00h |
| 0001E1h | UART3 Bit Rate Register | U3BRG | XXh |
| 0001E2h | UART3 Transmit Buffer Register | U3TB | XXXXh |
| 0001E3h | | | |
| 0001E4h | UART3 Transmit/Receive Control Register 0 | U3C0 | 00X0 1000b |
| 0001E5h | UART3 Transmit/Receive Control Register 1 | U3C1 | XXXX 0010b |
| 0001E6h | UART3 Receive Buffer Register | U3RB | XXXXh |
| 0001E7h | | | |
| 0001E8h | UART4 Transmit/Receive Mode Register | U4MR | 00h |
| 0001E9h | UART4 Bit Rate Register | U4BRG | XXh |
| 0001EAh | UART4 Transmit Buffer Register | U4TB | XXXXh |
| 0001EBh | | | |
| 0001ECh | UART4 Transmit/Receive Control Register 0 | U4C0 | 00X0 1000b |
| 0001EDh | UART4 Transmit/Receive Control Register 1 | U4C1 | XXXX 0010b |
| 0001EEh | UART4 Receive Buffer Register | U4RB | XXXXh |
| 0001EFh | | | |
| 0001F0h | UART3, UART4 Transmit/Receive Control Register 2 | U34CON | X000 0000b |
| 0001F1h | | | |
| 0001F2h | | | |
| 0001F3h | | | |
| 0001F4h | | | |
| 0001F5h | | | |
| 0001F6h | | | |
| 0001F7h | | | |
| 0001F8h | | | |
| 0001F9h | | | |
| 0001FAh | | | |
| 0001FBh | | | |
| 0001FCh | | | |
| 0001FDh | | | |
| 0001FEh | | | |
| 0001FFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.11 SFR List (11)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000200h | Group0 Phase Shift Waveform Output Mode Clock Division Setting Register | G0SDR | 00h |
| 000201h | Group0 Phase Shift Waveform Output Mode Control Register | G0PSCR | 00h |
| 000202h | Group1 Phase Shift Waveform Output Mode Clock Division Setting Register | G1SDR | 00h |
| 000203h | Group1 Phase Shift Waveform Output Mode Control Register | G1PSCR | 00h |
| 000204h | Group2 Phase Shift Waveform Output Mode Clock Division Setting Register | G2SDR | 00h |
| 000205h | Group2 Phase Shift Waveform Output Mode Control Register | G2PSCR | 00h |
| 000206h | Group3 Phase Shift Waveform Output Mode Clock Division Setting Register | G3SDR | 00h |
| 000207h | Group3 Phase Shift Waveform Output Mode Control Register | G3PSCR | 00h |
| 000208h | Timer B Event Clock Select Register | TBECKS | 0000 0000b |
| 000209h | | | |
| 00020Ah | | | |
| 00020Bh | | | |
| 00020Ch | | | |
| 00020Dh | | | |
| 00020Eh | | | |
| 00020Fh | | | |
| 000210h | IIO0_7 Digital Debounce Register | IC07DDR | FFh |
| 000211h | IIO1_7 Digital Debounce Register | IC17DDR | FFh |
| 000212h | IIO2_7 Digital Debounce Register | IC27DDR | FFh |
| 000213h | IIO3_7 Digital Debounce Register | IC37DDR | FFh |
| 000214h | | | |
| 000215h | | | |
| 000216h | | | |
| 000217h | | | |
| 000218h | | | |
| 000219h | | | |
| 00021Ah | | | |
| 00021Bh | | | |
| 00021Ch | | | |
| 00021Dh | | | |
| 00021Eh | | | |
| 00021Fh | | | |
| 000220h | Timer A1 Mirror Register | TA1M | XXXXh |
| 000221h | | | |
| 000222h | Timer A1-1 Mirror Register | TA11M | XXXXh |
| 000223h | | | |
| 000224h | Timer A2 Mirror Register | TA2M | XXXXh |
| 000225h | | | |
| 000226h | Timer A2-1 Mirror Register | TA21M | XXXXh |
| 000227h | | | |
| 000228h | Timer A4 Mirror Register | TA4M | XXXXh |
| 000229h | | | |
| 00022Ah | Timer A4-1 Mirror Register | TA41M | XXXXh |
| 00022Bh | | | |
| 00022Ch | | | |
| 00022Dh | | | |
| 00022Eh | | | |
| 00022Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.12 SFR List (12)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000230h to 00023F | | | |
| 000240h | Group 3 Time Measurement/Waveform Generation Register 0 | G3TM0/G3PO0 | XXXXh |
| 000241h | | | |
| 000242h | Group 3 Time Measurement/Waveform Generation Register 1 | G3TM1/G3PO1 | XXXXh |
| 000243h | | | |
| 000244h | Group 3 Time Measurement/Waveform Generation Register 2 | G3TM2/G3PO2 | XXXXh |
| 000245h | | | |
| 000246h | Group 3 Time Measurement/Waveform Generation Register 3 | G3TM3/G3PO3 | XXXXh |
| 000247h | | | |
| 000248h | Group 3 Time Measurement/Waveform Generation Register 4 | G3TM4/G3PO4 | XXXXh |
| 000249h | | | |
| 00024Ah | Group 3 Time Measurement/Waveform Generation Register 5 | G3TM5/G3PO5 | XXXXh |
| 00024Bh | | | |
| 00024Ch | Group 3 Time Measurement/Waveform Generation Register 6 | G3TM6/G3PO6 | XXXXh |
| 00024Dh | | | |
| 00024Eh | Group 3 Time Measurement/Waveform Generation Register 7 | G3TM7/G3PO7 | XXXXh |
| 00024Fh | | | |
| 000250h | Group 3 Waveform Generation Control Register 0 | G3POCR0 | 0000 X000b |
| 000251h | Group 3 Waveform Generation Control Register 1 | G3POCR1 | 0X00 X000b |
| 000252h | Group 3 Waveform Generation Control Register 2 | G3POCR2 | 0X00 X000b |
| 000253h | Group 3 Waveform Generation Control Register 3 | G3POCR3 | 0X00 X000b |
| 000254h | Group 3 Waveform Generation Control Register 4 | G3POCR4 | 0X00 X000b |
| 000255h | Group 3 Waveform Generation Control Register 5 | G3POCR5 | 0X00 X000b |
| 000256h | Group 3 Waveform Generation Control Register 6 | G3POCR6 | 0X00 X000b |
| 000257h | Group 3 Waveform Generation Control Register 7 | G3POCR7 | 0X00 X000b |
| 000258h | Group 3 Time Measurement Control Register 0 | G3TMCR0 | 00h |
| 000259h | Group 3 Time Measurement Control Register 1 | G3TMCR1 | 00h |
| 00025Ah | Group 3 Time Measurement Control Register 2 | G3TMCR2 | 00h |
| 00025Bh | Group 3 Time Measurement Control Register 3 | G3TMCR3 | 00h |
| 00025Ch | Group 3 Time Measurement Control Register 4 | G3TMCR4 | 00h |
| 00025Dh | Group 3 Time Measurement Control Register 5 | G3TMCR5 | 00h |
| 00025Eh | Group 3 Time Measurement Control Register 6 | G3TMCR6 | 00h |
| 00025Fh | Group 3 Time Measurement Control Register 7 | G3TMCR7 | 00h |
| 000260h | Group 3 Base Timer Register | G3BT | XXXXh |
| 000261h | | | |
| 000262h | Group 3 Base Timer Control Register 0 | G3BCR0 | 0000 0000b |
| 000263h | Group 3 Base Timer Control Register 1 | G3BCR1 | 0000 0000b |
| 000264h | Group 3 Time Measurement Prescaler Register 6 | G3TPR6 | 00h |
| 000265h | Group 3 Time Measurement Prescaler Register 7 | G3TPR7 | 00h |
| 000266h | Group 3 Function Enable Register | G3FE | 00h |
| 000267h | Group 3 Function Select Register | G3FS | 00h |
| 000268h | | | |
| 000269h | | | |
| 00026Ah | | | |
| 00026Bh | | | |
| 00026Ch | | | |
| 00026Dh | | | |
| 00026Eh | | | |
| 00026Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.13 SFR List (13)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000270h to 0002BFh | | | |
| 0002C0h | X0 Register/Y0 Register | X0R/Y0R | XXXXh |
| 0002C1h | | | |
| 0002C2h | X1 Register/Y1 Register | X1R/Y1R | XXXXh |
| 0002C3h | | | |
| 0002C4h | X2 Register/Y2 Register | X2R/Y2R | XXXXh |
| 0002C5h | | | |
| 0002C6h | X3 Register/Y3 Register | X3R/Y3R | XXXXh |
| 0002C7h | | | |
| 0002C8h | X4 Register/Y4 Register | X4R/Y4R | XXXXh |
| 0002C9h | | | |
| 0002CAh | X5 Register/Y5 Register | X5R/Y5R | XXXXh |
| 0002CBh | | | |
| 0002CCh | X6 Register/Y6 Register | X6R/Y6R | XXXXh |
| 0002CDh | | | |
| 0002CEh | X7 Register/Y7 Register | X7R/Y7R | XXXXh |
| 0002CFh | | | |
| 0002D0h | X8 Register/Y8 Register | X8R/Y8R | XXXXh |
| 0002D1h | | | |
| 0002D2h | X9 Register/Y9 Register | X9R/Y9R | XXXXh |
| 0002D3h | | | |
| 0002D4h | X10 Register/Y10 Register | X10R/Y10R | XXXXh |
| 0002D5h | | | |
| 0002D6h | X11 Register/Y11 Register | X11R/Y11R | XXXXh |
| 0002D7h | | | |
| 0002D8h | X12 Register/Y12 Register | X12R/Y12R | XXXXh |
| 0002D9h | | | |
| 0002DAh | X13 Register/Y13 Register | X13R/Y13R | XXXXh |
| 0002DBh | | | |
| 0002DCh | X14 Register/Y14 Register | X14R/Y14R | XXXXh |
| 0002DDh | | | |
| 0002DEh | X15 Register/Y15 Register | X15R/Y15R | XXXXh |
| 0002DFh | | | |
| 0002E0h | X-Y Control Register | XYC | XXXX XX00b |
| 0002E1h | | | |
| 0002E2h | | | |
| 0002E3h | | | |
| 0002E4h | UART1 Special Mode Register 4 | U1SMR4 | 00h |
| 0002E5h | UART1 Special Mode Register 3 | U1SMR3 | 00h |
| 0002E6h | UART1 Special Mode Register 2 | U1SMR2 | 00h |
| 0002E7h | UART1 Special Mode Register | U1SMR | 00h |
| 0002E8h | UART1 Transmit/Receive Mode Register | U1MR | 00h |
| 0002E9h | UART1 Bit Rate Register | U1BRG | XXh |
| 0002EAh | UART1 Transmit Buffer Register | U1TB | XXXXh |
| 0002EBh | | | |
| 0002ECh | UART1 Transmit/Receive Control Register 0 | U1C0 | 0000 1000b |
| 0002EDh | UART1 Transmit/Receive Control Register 1 | U1C1 | 0000 0010b |
| 0002EEh | UART1 Receive Buffer Register | U1RB | XXXXh |
| 0002EFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.14 SFR List (14)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0002F0h | | | |
| 0002F1h | | | |
| 0002F2h | | | |
| 0002F3h | | | |
| 0002F4h | | | |
| 0002F5h | | | |
| 0002F6h | | | |
| 0002F7h | | | |
| 0002F8h | | | |
| 0002F9h | | | |
| 0002FAh | | | |
| 0002FBh | | | |
| 0002FCh | | | |
| 0002FDh | | | |
| 0002FEh | | | |
| 0002FFh | | | |
| 000300h | Count Start Register for Timers B3, B4, and B5 | TBSR | 000X XXXXb |
| 000301h | | | |
| 000302h | Timer A1-1 Register | TA11 | XXXXh |
| 000303h | | | |
| 000304h | Timer A2-1 Register | TA21 | XXXXh |
| 000305h | | | |
| 000306h | Timer A4-1 Register | TA41 | XXXXh |
| 000307h | | | |
| 000308h | Three-phase PWM Control Register 0 | INVC0 | 00h |
| 000309h | Three-phase PWM Control Register 1 | INVC1 | 00h |
| 00030Ah | Three-phase Output Buffer Register 0 | IDB0 | XX11 1111b |
| 00030Bh | Three-phase Output Buffer Register 1 | IDB1 | XX11 1111b |
| 00030Ch | Dead Time Timer | DTT | XXh |
| 00030Dh | Timer B2 Interrupt Generating Frequency Set Counter | ICTB2 | XXh |
| 00030Eh | | | |
| 00030Fh | | | |
| 000310h | Timer B3 Register | TB3 | XXXXh |
| 000311h | | | |
| 000312h | Timer B4 Register | TB4 | XXXXh |
| 000313h | | | |
| 000314h | Timer B5 Register | TB5 | XXXXh |
| 000315h | | | |
| 000316h | | | |
| 000317h | | | |
| 000318h | | | |
| 000319h | | | |
| 00031Ah | | | |
| 00031Bh | Timer B3 Mode Register | TB3MR | 00XX 0000b |
| 00031Ch | Timer B4 Mode Register | TB4MR | 00XX 0000b |
| 00031Dh | Timer B5 Mode Register | TB5MR | 00XX 0000b |
| 00031Eh | | | |
| 00031Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.15 SFR List (15)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000320h | | | |
| 000321h | | | |
| 000322h | | | |
| 000323h | | | |
| 000324h | | | |
| 000325h | | | |
| 000326h | | | |
| 000327h | | | |
| 000328h | | | |
| 000329h | | | |
| 00032Ah | | | |
| 00032Bh | | | |
| 00032Ch | | | |
| 00032Dh | | | |
| 00032Eh | | | |
| 00032Fh | | | |
| 000330h | | | |
| 000331h | | | |
| 000332h | | | |
| 000333h | | | |
| 000334h | UART2 Special Mode Register 4 | U2SMR4 | 00h |
| 000335h | UART2 Special Mode Register 3 | U2SMR3 | 00h |
| 000336h | UART2 Special Mode Register 2 | U2SMR2 | 00h |
| 000337h | UART2 Special Mode Register | U2SMR | 00h |
| 000338h | UART2 Transmit/Receive Mode Register | U2MR | 00h |
| 000339h | UART2 Bit Rate Register | U2BRG | XXh |
| 00033Ah | UART2 Transmit Buffer Register | U2TB | XXXXh |
| 00033Bh | | | |
| 00033Ch | UART2 Transmit/Receive Control Register 0 | U2C0 | 0000 1000b |
| 00033Dh | UART2 Transmit/Receive Control Register 1 | U2C1 | 0000 0010b |
| 00033Eh | UART2 Receive Buffer Register | U2RB | XXXXh |
| 00033Fh | | | |
| 000340h | Count Start Register | TABSR | 0000 0000b |
| 000341h | Clock Prescaler Reset Register | CPSRF | 0XXX XXXXb |
| 000342h | One-shot Start Register | ONSF | 0000 0000b |
| 000343h | Trigger Select Register | TRGSR | 0000 0000b |
| 000344h | Increment/Decrement Select Register | UDF | 0000 0000b |
| 000345h | | | |
| 000346h | Timer A0 Register | TA0 | XXXXh |
| 000347h | | | |
| 000348h | Timer A1 Register | TA1 | XXXXh |
| 000349h | | | |
| 00034Ah | Timer A2 Register | TA2 | XXXXh |
| 00034Bh | | | |
| 00034Ch | Timer A3 Register | TA3 | XXXXh |
| 00034Dh | | | |
| 00034Eh | Timer A4 Register | TA4 | XXXXh |
| 00034Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.16 SFR List (16)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000350h | Timer B0 Register | TB0 | XXXXh |
| 000351h | | | |
| 000352h | Timer B1 Register | TB1 | XXXXh |
| 000353h | | | |
| 000354h | Timer B2 Register | TB2 | XXXXh |
| 000355h | | | |
| 000356h | Timer A0 Mode Register | TA0MR | 0000 0000b |
| 000357h | Timer A1 Mode Register | TA1MR | 0000 0000b |
| 000358h | Timer A2 Mode Register | TA2MR | 0000 0000b |
| 000359h | Timer A3 Mode Register | TA3MR | 0000 0000b |
| 00035Ah | Timer A4 Mode Register | TA4MR | 0000 0000b |
| 00035Bh | Timer B0 Mode Register | TB0MR | 00XX 0000b |
| 00035Ch | Timer B1 Mode Register | TB1MR | 00XX 0000b |
| 00035Dh | Timer B2 Mode Register | TB2MR | 00XX 0000b |
| 00035Eh | Timer B2 Special Mode Register | TB2SC | XXXX XXX0b |
| 00035Fh | Count Source Prescaler Register | TCSPR | 0000 0000b |
| 000360h | | | |
| 000361h | | | |
| 000362h | | | |
| 000363h | | | |
| 000364h | UART0 Special Mode Register 4 | U0SMR4 | 00h |
| 000365h | UART0 Special Mode Register 3 | U0SMR3 | 00h |
| 000366h | UART0 Special Mode Register 2 | U0SMR2 | 00h |
| 000367h | UART0 Special Mode Register | U0SMR | 00h |
| 000368h | UART0 Transmit/Receive Mode Register | U0MR | 00h |
| 000369h | UART0 Bit Rate Register | U0BRG | XXh |
| 00036Ah | UART0 Transmit Buffer Register | U0TB | XXXXh |
| 00036Bh | | | |
| 00036Ch | UART0 Transmit/Receive Control Register 0 | U0C0 | 0000 1000b |
| 00036Dh | UART0 Transmit/Receive Control Register 1 | U0C1 | 0000 0010b |
| 00036Eh | UART0 Receive Buffer Register | U0RB | XXXXh |
| 00036Fh | | | |
| 000370h | | | |
| 000371h | | | |
| 000372h | | | |
| 000373h | | | |
| 000374h | | | |
| 000375h | | | |
| 000376h | | | |
| 000377h | | | |
| 000378h | | | |
| 000379h | | | |
| 00037Ah | | | |
| 00037Bh | | | |
| 00037Ch | CRC Data Register | CRCD | XXXXh |
| 00037Dh | | | |
| 00037Eh | CRC Input Register | CRCIN | XXh |
| 00037Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.17 SFR List (17)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 000380h | A/D0 Register 0 | AD00 | 00XXh |
| 000381h | | | |
| 000382h | A/D0 Register 1 | AD01 | 00XXh |
| 000383h | | | |
| 000384h | A/D0 Register 2 | AD02 | 00XXh |
| 000385h | | | |
| 000386h | A/D0 Register 3 | AD03 | 00XXh |
| 000387h | | | |
| 000388h | A/D0 Register 4 | AD04 | 00XXh |
| 000389h | | | |
| 00038Ah | A/D0 Register 5 | AD05 | 00XXh |
| 00038Bh | | | |
| 00038Ch | A/D0 Register 6 | AD06 | 00XXh |
| 00038Dh | | | |
| 00038Eh | A/D0 Register 7 | AD07 | 00XXh |
| 00038Fh | | | |
| 000390h | | | |
| 000391h | | | |
| 000392h | A/D0 Control Register 4 | AD0CON4 | XXXX 00XXb |
| 000393h | A/D0 Control Register 5 | AD0CON5 | 00h |
| 000394h | A/D0 Control Register 2 | AD0CON2 | X00X X000b |
| 000395h | A/D0 Control Register 3 | AD0CON3 | XXXX X000b |
| 000396h | A/D0 Control Register 0 | AD0CON0 | 00h |
| 000397h | A/D0 Control Register 1 | AD0CON1 | 00h |
| 000398h | D/A Register 0 | DA0 | XXh |
| 000399h | | | |
| 00039Ah | D/A Register 1 | DA1 | XXh |
| 00039Bh | | | |
| 00039Ch | D/A Control Register | DACON | XXXX XX00b |
| 00039Dh | | | |
| 00039Eh | | | |
| 00039Fh | | | |
| 0003A0h | | | |
| 0003A1h | | | |
| 0003A2h | | | |
| 0003A3h | | | |
| 0003A4h | | | |
| 0003A5h | | | |
| 0003A6h | | | |
| 0003A7h | | | |
| 0003A8h | | | |
| 0003A9h | | | |
| 0003AAh | | | |
| 0003ABh | | | |
| 0003ACh | | | |
| 0003ADh | | | |
| 0003AEh | | | |
| 0003AFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.18 SFR List (18)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0003B0h | | | |
| 0003B1h | | | |
| 0003B2h | | | |
| 0003B3h | | | |
| 0003B4h | | | |
| 0003B5h | | | |
| 0003B6h | | | |
| 0003B7h | | | |
| 0003B8h | | | |
| 0003B9h | | | |
| 0003BAh | | | |
| 0003BBh | | | |
| 0003BCh | | | |
| 0003BDh | | | |
| 0003BEh | | | |
| 0003BFh | | | |
| 0003C0h | Port P0 Register | P0 | XXh |
| 0003C1h | Port P1 Register | P1 | XXh |
| 0003C2h | Port P0 Direction Register | PD0 | 0000 0000b |
| 0003C3h | Port P1 Direction Register | PD1 | 0000 0000b |
| 0003C4h | Port P2 Register | P2 | XXh |
| 0003C5h | Port P3 Register | P3 | XXh |
| 0003C6h | Port P2 Direction Register | PD2 | 0000 0000b |
| 0003C7h | Port P3 Direction Register | PD3 | 0000 0000b |
| 0003C8h | Port P4 Register | P4 | XXh |
| 0003C9h | Port P5 Register | P5 | XXh |
| 0003CAh | Port P4 Direction Register | PD4 | 0000 0000b |
| 0003CBh | Port P5 Direction Register | PD5 | 0000 0000b |
| 0003CCh | Port P6 Register | P6 | XXh |
| 0003CDh | Port P7 Register | P7 | XXh |
| 0003CEh | Port P6 Direction Register | PD6 | 0000 0000b |
| 0003CFh | Port P7 Direction Register | PD7 | 0000 0000b |
| 0003D0h | Port P8 Register | P8 | XXh |
| 0003D1h | Port P9 Register | P9 | XXh |
| 0003D2h | Port P8 Direction Register | PD8 | 00X0 0000b |
| 0003D3h | Port P9 Direction Register | PD9 | 0000 0000b |
| 0003D4h | Port P10 Register | P10 | XXh |
| 0003D5h | Port P11 Register | P11 | XXh |
| 0003D6h | Port P10 Direction Register | PD10 | 0000 0000b |
| 0003D7h | Port P11 Direction Register | PD11 | XXX0 0000b |
| 0003D8h | Port P12 Register | P12 | XXh |
| 0003D9h | Port P13 Register | P13 | XXh |
| 0003DAh | Port P12 Direction Register | PD12 | 0000 0000b |
| 0003DBh | Port P13 Direction Register | PD13 | 0000 0000b |
| 0003DCh | Port P14 Register | P14 | XXh |
| 0003DDh | Port P15 Register | P15 | XXh |
| 0003DEh | Port P14 Direction Register | PD14 | X000 0X0Xb |
| 0003DFh | Port P15 Direction Register | PD15 | 0000 0000b |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.19 SFR List (19)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0003E0h | | | |
| 0003E1h | | | |
| 0003E2h | | | |
| 0003E3h | | | |
| 0003E4h | | | |
| 0003E5h | | | |
| 0003E6h | | | |
| 0003E7h | | | |
| 0003E8h | | | |
| 0003E9h | | | |
| 0003EAh | | | |
| 0003EBh | | | |
| 0003ECh | | | |
| 0003EDh | | | |
| 0003EEh | | | |
| 0003EFh | | | |
| 0003F0h | Pull-up Control Register 0 | PUR0 | 0000 0000b |
| 0003F1h | Pull-up Control Register 1 | PUR1 | XXXX 0000b |
| 0003F2h | Pull-up Control Register 2 | PUR2 | 0000 0000b |
| 0003F3h | Pull-up Control Register 3 | PUR3 | 0000 0000b |
| 0003F4h | Pull-up Control Register 4 | PUR4 | XXXX 0000b |
| 0003F5h | | | |
| 0003F6h | | | |
| 0003F7h | | | |
| 0003F8h | | | |
| 0003F9h | | | |
| 0003FAh | | | |
| 0003FBh | | | |
| 0003FCh | | | |
| 0003FDh | | | |
| 0003FEh | | | |
| 0003FFh | Port Control Register | PCR | XXXX XXX0b |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.20 SFR List (20)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 040000h | Flash Memory Control Register 0 | FMR0 | 0X01 XX00b |
| 040001h | Flash Memory Status Register 0 | FMSR0 | 1000 0000b |
| 040002h | | | |
| 040003h | | | |
| 040004h | | | |
| 040005h | | | |
| 040006h | | | |
| 040007h | | | |
| 040008h | Flash Register Protection Unlock Register 0 | FPR0 | 00h |
| 040009h | Flash Memory Control Register 1 | FMR1 | 0000 0010b |
| 04000Ah | Block Protect Bit Monitor Register 0 | FBPM0 | ??X? ????b (1) |
| 04000Bh | Block Protect Bit Monitor Register 1 | FBPM1 | XXX? ????b (1) |
| 04000Ch | | | |
| 04000Dh | | | |
| 04000Eh | | | |
| 04000Fh | | | |
| 040010h | | | |
| 040011h | Block Protect Bit Monitor Register 2 | FBPM2 | ???? ????b (1) |
| 040012h | | | |
| 040013h | | | |
| 040014h | | | |
| 040015h | | | |
| 040016h | | | |
| 040017h | | | |
| 040018h | | | |
| 040019h | | | |
| 04001Ah | | | |
| 04001Bh | | | |
| 04001Ch | | | |
| 04001Dh | | | |
| 04001Eh | | | |
| 04001Fh | | | |
| 040020h | PLL Control Register 0 | PLC0 | 0000 0001b |
| 040021h | PLL Control Register 1 | PLC1 | 0001 1111b |
| 040022h | | | |
| 040023h | | | |
| 040024h | PLL Status Register | PLS | 1XXX XX00b |
| 040025h | | | |
| 040026h | | | |
| 040027h | | | |
| 040028h | | | |
| 040029h | | | |
| 04002Ah | | | |
| 04002Bh | | | |
| 04002Ch | | | |
| 04002Dh | | | |
| 04002Eh | | | |
| 04002Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

Note:
1. The reset value reflects the value of the protect bit for each block in the flash memory.

**Table 4.21 SFR List (21)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 040030h to 04003Fh | | | |
| 040040h | | | |
| 040041h | | | |
| 040042h | | | |
| 040043h | | | |
| 040044h | Processor Mode Register 0 | PM0 | 1000 0000b |
| 040045h | | | |
| 040046h | System Clock Control Register 0 | CM0 | 0000 1000b |
| 040047h | System Clock Control Register 1 | CM1 | 0010 0000b |
| 040048h | Processor Mode Register 3 | PM3 | 00h |
| 040049h | | | |
| 04004Ah | Protect Register | PRCR | XXXX X000b |
| 04004Bh | | | |
| 04004Ch | Protect Register 3 | PRCR3 | 0000 0000b |
| 04004Dh | Oscillator Stop Detection Register | CM2 | 00h |
| 04004Eh | | | |
| 04004Fh | | | |
| 040050h | | | |
| 040051h | | | |
| 040052h | | | |
| 040053h | Processor Mode Register 2 | PM2 | 00h |
| 040054h | | | |
| 040055h | | | |
| 040056h | | | |
| 040057h | | | |
| 040058h | | | |
| 040059h | | | |
| 04005Ah | Low Speed Mode Clock Control Register | CM3 | XXXX XX00b |
| 04005Bh | | | |
| 04005Ch | | | |
| 04005Dh | | | |
| 04005Eh | | | |
| 04005Fh | | | |
| 040060h | Voltage Regulator Control Register | VRCR | 0000 0000b |
| 040061h | | | |
| 040062h | Low Voltage Detector Control Register | LVDC | 0000 XX00b |
| 040063h | | | |
| 040064h | Detection Voltage Configuration Register | DVCR | 0000 XXXXb |
| 040065h | | | |
| 040066h | | | |
| 040067h | | | |
| 040068h to 040093h | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.22 SFR List (22)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 040094h | | | |
| 040095h | | | |
| 040096h | | | |
| 040097h | Three-phase Output Buffer Control Register | IOBC | 0XXX XX0Xb |
| 040098h | Input Function Select Register 0 | IFS0 | 0000 0000b |
| 040099h | Input Function Select Register 1 | IFS1 | XXX0 X0X0b |
| 04009Ah | Input Function Select Register 2 | IFS2 | 0000 0000b |
| 04009Bh | | | |
| 04009Ch | | | |
| 04009Dh | Input Function Select Register 5 | IFS5 | XXX0 0000b |
| 04009Eh | Input Function Select Register 6 | IFS6 | XXXX 0000b |
| 04009Fh | Input Function Select Register 7 | IFS7 | XXXX XXX0b |
| 0400A0h | Port P0_0 Function Select Register | P0_0S | 0XXX X000b |
| 0400A1h | Port P1_0 Function Select Register | P1_0S | 0XXX X000b |
| 0400A2h | Port P0_1 Function Select Register | P0_1S | 0XXX X000b |
| 0400A3h | Port P1_1 Function Select Register | P1_1S | 0XXX X000b |
| 0400A4h | Port P0_2 Function Select Register | P0_2S | 0XXX X000b |
| 0400A5h | Port P1_2 Function Select Register | P1_2S | 0XXX X000b |
| 0400A6h | Port P0_3 Function Select Register | P0_3S | 0XXX X000b |
| 0400A7h | Port P1_3 Function Select Register | P1_3S | 0XXX X000b |
| 0400A8h | Port P0_4 Function Select Register | P0_4S | 0XXX X000b |
| 0400A9h | Port P1_4 Function Select Register | P1_4S | 0XXX X000b |
| 0400AAh | Port P0_5 Function Select Register | P0_5S | 0XXX X000b |
| 0400ABh | Port P1_5 Function Select Register | P1_5S | 0XXX X000b |
| 0400ACh | Port P0_6 Function Select Register | P0_6S | 0XXX X000b |
| 0400ADh | Port P1_6 Function Select Register | P1_6S | 0XXX X000b |
| 0400AEh | Port P0_7 Function Select Register | P0_7S | 0XXX X000b |
| 0400AFh | Port P1_7 Function Select Register | P1_7S | 0XXX X000b |
| 0400B0h | Port P2_0 Function Select Register | P2_0S | 0XXX X000b |
| 0400B1h | Port P3_0 Function Select Register | P3_0S | XXXX X000b |
| 0400B2h | Port P2_1 Function Select Register | P2_1S | 0XXX X000b |
| 0400B3h | Port P3_1 Function Select Register | P3_1S | XXXX X000b |
| 0400B4h | Port P2_2 Function Select Register | P2_2S | 0XXX X000b |
| 0400B5h | Port P3_2 Function Select Register | P3_2S | XXXX X000b |
| 0400B6h | Port P2_3 Function Select Register | P2_3S | 0XXX X000b |
| 0400B7h | Port P3_3 Function Select Register | P3_3S | XXXX X000b |
| 0400B8h | Port P2_4 Function Select Register | P2_4S | 0XXX X000b |
| 0400B9h | Port P3_4 Function Select Register | P3_4S | XXXX X000b |
| 0400BAh | Port P2_5 Function Select Register | P2_5S | 0XXX X000b |
| 0400BBh | Port P3_5 Function Select Register | P3_5S | XXXX X000b |
| 0400BCh | Port P2_6 Function Select Register | P2_6S | 0XXX X000b |
| 0400BDh | Port P3_6 Function Select Register | P3_6S | XXXX X000b |
| 0400BEh | Port P2_7 Function Select Register | P2_7S | 0XXX X000b |
| 0400BFh | Port P3_7 Function Select Register | P3_7S | XXXX X000b |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.23 SFR List (23)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0400C0h | Port P4_0 Function Select Register | P4_0S | XXXX X000b |
| 0400C1h | Port P5_0 Function Select Register | P5_0S | XXXX X000b |
| 0400C2h | Port P4_1 Function Select Register | P4_1S | XXXX X000b |
| 0400C3h | Port P5_1 Function Select Register | P5_1S | XXXX X000b |
| 0400C4h | Port P4_2 Function Select Register | P4_2S | XXXX X000b |
| 0400C5h | Port P5_2 Function Select Register | P5_2S | XXXX X000b |
| 0400C6h | Port P4_3 Function Select Register | P4_3S | XXXX X000b |
| 0400C7h | Port P5_3 Function Select Register | P5_3S | XXXX X000b |
| 0400C8h | Port P4_4 Function Select Register | P4_4S | XXXX X000b |
| 0400C9h | Port P5_4 Function Select Register | P5_4S | XXXX X000b |
| 0400CAh | Port P4_5 Function Select Register | P4_5S | XXXX X000b |
| 0400CBh | Port P5_5 Function Select Register | P5_5S | XXXX X000b |
| 0400CCh | Port P4_6 Function Select Register | P4_6S | XXXX X000b |
| 0400CDh | Port P5_6 Function Select Register | P5_6S | XXXX X000b |
| 0400CEh | Port P4_7 Function Select Register | P4_7S | XXXX X000b |
| 0400CFh | Port P5_7 Function Select Register | P5_7S | XXXX X000b |
| 0400D0h | Port P6_0 Function Select Register | P6_0S | XXXX X000b |
| 0400D1h | Port P7_0 Function Select Register | P7_0S | XXXX X000b |
| 0400D2h | Port P6_1 Function Select Register | P6_1S | XXXX X000b |
| 0400D3h | Port P7_1 Function Select Register | P7_1S | XXXX X000b |
| 0400D4h | Port P6_2 Function Select Register | P6_2S | XXXX X000b |
| 0400D5h | Port P7_2 Function Select Register | P7_2S | XXXX X000b |
| 0400D6h | Port P6_3 Function Select Register | P6_3S | XXXX X000b |
| 0400D7h | Port P7_3 Function Select Register | P7_3S | XXXX X000b |
| 0400D8h | Port P6_4 Function Select Register | P6_4S | XXXX X000b |
| 0400D9h | Port P7_4 Function Select Register | P7_4S | XXXX X000b |
| 0400DAh | Port P6_5 Function Select Register | P6_5S | XXXX X000b |
| 0400DBh | Port P7_5 Function Select Register | P7_5S | XXXX X000b |
| 0400DCh | Port P6_6 Function Select Register | P6_6S | XXXX X000b |
| 0400DDh | Port P7_6 Function Select Register | P7_6S | XXXX X000b |
| 0400DEh | Port P6_7 Function Select Register | P6_7S | XXXX X000b |
| 0400DFh | Port P7_7 Function Select Register | P7_7S | XXXX X000b |
| 0400E0h | Port P8_0 Function Select Register | P8_0S | XXXX X000b |
| 0400E1h | Port P9_0 Function Select Register | P9_0S | XXXX X000b |
| 0400E2h | Port P8_1 Function Select Register | P8_1S | XXXX X000b |
| 0400E3h | Port P9_1 Function Select Register | P9_1S | XXXX X000b |
| 0400E4h | Port P8_2 Function Select Register | P8_2S | XXXX X000b |
| 0400E5h | Port P9_2 Function Select Register | P9_2S | XXXX X000b |
| 0400E6h | Port P8_3 Function Select Register | P8_3S | XXXX X000b |
| 0400E7h | Port P9_3 Function Select Register | P9_3S | 0XXX X000b |
| 0400E8h | Port P8_4 Function Select Register | P8_4S | XXXX X000b |
| 0400E9h | Port P9_4 Function Select Register | P9_4S | 0XXX X000b |
| 0400EAh | | | |
| 0400EBh | Port P9_5 Function Select Register | P9_5S | 0XXX X000b |
| 0400ECh | Port P8_6 Function Select Register | P8_6S | XXXX X000b |
| 0400EDh | Port P9_6 Function Select Register | P9_6S | 0XXX X000b |
| 0400EEh | Port P8_7 Function Select Register | P8_7S | XXXX X000b |
| 0400EFh | Port P9_7 Function Select Register | P9_7S | XXXX X000b |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.24 SFR List (24)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0400F0h | Port P10_0 Function Select Register | P10_0S | 0XXX X000b |
| 0400F1h | Port P11_0 Function Select Register | P11_0S | XXXX X000b |
| 0400F2h | Port P10_1 Function Select Register | P10_1S | 0XXX X000b |
| 0400F3h | Port P11_1 Function Select Register | P11_1S | XXXX X000b |
| 0400F4h | Port P10_2 Function Select Register | P10_2S | 0XXX X000b |
| 0400F5h | Port P11_2 Function Select Register | P11_2S | XXXX X000b |
| 0400F6h | Port P10_3 Function Select Register | P10_3S | 0XXX X000b |
| 0400F7h | Port P11_3 Function Select Register | P11_3S | XXXX X000b |
| 0400F8h | Port P10_4 Function Select Register | P10_4S | 0XXX X000b |
| 0400F9h | Port P11_4 Function Select Register | P11_4S | XXXX X000b |
| 0400FAh | Port P10_5 Function Select Register | P10_5S | 0XXX X000b |
| 0400FBh | | | |
| 0400FCh | Port P10_6 Function Select Register | P10_6S | 0XXX X000b |
| 0400FDh | | | |
| 0400FEh | Port P10_7 Function Select Register | P10_7S | 0XXX X000b |
| 0400FFh | | | |
| 040100h | Port P12_0 Function Select Register | P12_0S | XXXX X000b |
| 040101h | Port P13_0 Function Select Register | P13_0S | XXXX X000b |
| 040102h | Port P12_1 Function Select Register | P12_1S | XXXX X000b |
| 040103h | Port P13_1 Function Select Register | P13_1S | XXXX X000b |
| 040104h | Port P12_2 Function Select Register | P12_2S | XXXX X000b |
| 040105h | Port P13_2 Function Select Register | P13_2S | XXXX X000b |
| 040106h | Port P12_3 Function Select Register | P12_3S | XXXX X000b |
| 040107h | Port P13_3 Function Select Register | P13_3S | XXXX X000b |
| 040108h | Port P12_4 Function Select Register | P12_4S | XXXX X000b |
| 040109h | Port P13_4 Function Select Register | P13_4S | XXXX X000b |
| 04010Ah | Port P12_5 Function Select Register | P12_5S | XXXX X000b |
| 04010Bh | Port P13_5 Function Select Register | P13_5S | XXXX X000b |
| 04010Ch | Port P12_6 Function Select Register | P12_6S | XXXX X000b |
| 04010Dh | Port P13_6 Function Select Register | P13_6S | XXXX X000b |
| 04010Eh | Port P12_7 Function Select Register | P12_7S | XXXX X000b |
| 04010Fh | Port P13_7 Function Select Register | P13_7S | XXXX X000b |
| 040110h | | | |
| 040111h | Port P15_0 Function Select Register | P15_0S | 0XXX X000b |
| 040112h | | | |
| 040113h | Port P15_1 Function Select Register | P15_1S | 0XXX X000b |
| 040114h | | | |
| 040115h | Port P15_2 Function Select Register | P15_2S | 0XXX X000b |
| 040116h | Port P14_3 Function Select Register | P14_3S | XXXX X000b |
| 040117h | Port P15_3 Function Select Register | P15_3S | 0XXX X000b |
| 040118h | Port P14_4 Function Select Register | P14_4S | XXXX X000b |
| 040119h | Port P15_4 Function Select Register | P15_4S | 0XXX X000b |
| 04011Ah | Port P14_5 Function Select Register | P14_5S | XXXX X000b |
| 04011Bh | Port P15_5 Function Select Register | P15_5S | 0XXX X000b |
| 04011Ch | Port P14_6 Function Select Register | P14_6S | XXXX X000b |
| 04011Dh | Port P15_6 Function Select Register | P15_6S | 0XXX X000b |
| 04011Eh | | | |
| 04011Fh | Port P15_7 Function Select Register | P15_7S | 0XXX X000b |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.25 SFR List (25)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 040120h to 04403Fh | | | |
| 044040h | | | |
| 044041h | | | |
| 044042h | | | |
| 044043h | | | |
| 044044h | | | |
| 044045h | | | |
| 044046h | | | |
| 044047h | | | |
| 044048h | | | |
| 044049h | | | |
| 04404Ah | | | |
| 04404Bh | | | |
| 04404Ch | Protect Register 4 | PRCR4 | 0000 0000b |
| 04404Dh | Watchdog Timer Clock Control Register | WDK | 0000 0000b |
| 04404Eh | Watchdog Timer Start Register | WDTS | XXXX XXXXb |
| 04404Fh | Watchdog Timer Control Register | WDC | 000X XXXXb |
| 044050h | | | |
| 044051h | | | |
| 044052h | | | |
| 044053h | | | |
| 044054h | | | |
| 044055h | | | |
| 044056h | | | |
| 044057h | | | |
| 044058h | | | |
| 044059h | | | |
| 04405Ah | | | |
| 04405Bh | | | |
| 04405Ch | | | |
| 04405Dh | | | |
| 04405Eh | | | |
| 04405Fh | Protect Register 2 | PRCR2 | 0XXX XXXXb |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.26 SFR List (26)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 044060h | | | |
| 044061h | | | |
| 044062h | | | |
| 044063h | | | |
| 044064h | | | |
| 044065h | | | |
| 044066h | | | |
| 044067h | | | |
| 044068h | | | |
| 044069h | | | |
| 04406Ah | | | |
| 04406Bh | | | |
| 04406Ch | | | |
| 04406Dh | External Interrupt Request Source Select Register 1 | IFSR1 | XXXX X000b |
| 04406Eh | | | |
| 04406Fh | External Interrupt Request Source Select Register 0 | IFSR0 | 0000 0000b |
| 044070h | DMA0 Request Source Select Register 2 | DM0SL2 | XX00 0000b |
| 044071h | DMA1 Request Source Select Register 2 | DM1SL2 | XX00 0000b |
| 044072h | DMA2 Request Source Select Register 2 | DM2SL2 | XX00 0000b |
| 044073h | DMA3 Request Source Select Register 2 | DM3SL2 | XX00 0000b |
| 044074h | | | |
| 044075h | | | |
| 044076h | | | |
| 044077h | | | |
| 044078h | DMA0 Request Source Select Register | DM0SL | XXX0 0000b |
| 044079h | DMA1 Request Source Select Register | DM1SL | XXX0 0000b |
| 04407Ah | DMA2 Request Source Select Register | DM2SL | XXX0 0000b |
| 04407Bh | DMA3 Request Source Select Register | DM3SL | XXX0 0000b |
| 04407Ch | | | |
| 04407Dh | Wake-up IPL Setting Register 2 | RIPL2 | XX0X 0000b |
| 04407Eh | | | |
| 04407Fh | Wake-up IPL Setting Register 1 | RIPL1 | XX0X 0000b |
| 044080h | External Interrupt Input Filter Select Register 0 | INTF0 | 0000 0000b |
| 044081h | | | |
| 044082h | External Interrupt Input Filter Select Register 1 | INTF1 | 0000 0000b |
| 044083h | | | |
| 044084h | External Interrupt Input Filter Select Register 2 | INTF2 | 0000 0000b |
| 044085h | | | |
| 044086h | | | |
| 044087h | | | |
| 044088h | External Interrupt Input Pin Select Register | INTSR | 0000 0000b |
| 044089h | | | |
| 04408Ah | | | |
| 04408Bh | | | |
| 04408Ch | | | |
| 04408Dh | | | |
| 04408Eh | | | |
| 04408Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.27 SFR List (27)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 044090h to 044DFFh | | | |
| 044E00h | LIN0 Channel Window Select/Input Signal Low Detection Status Register | L0CW | 0000 0000b |
| 044E01h | LIN0 Baud Rate Generator Control Register | L0BRG | 0000 0000b |
| 044E02h | LIN0 Baud Rate Prescaler 0 | L0BRP0 | 00h |
| 044E03h | LIN0 Baud Rate Prescaler 1 | L0BRP1 | 00h |
| 044E04h | LIN0 Mode Register 0 | L0MD0 | 0000 0000b |
| 044E05h | LIN0 Mode Register 1 | L0MD1 | 00h |
| 044E06h | LIN0 Wake-up Setting Register | L0WUP | 00h |
| 044E07h | | | |
| 044E08h | LIN0 Break Field Setting Register | L0BRK | 0000 0000b |
| 044E09h | LIN0 Space Setting Register | L0SPC | 0000 0000b |
| 044E0Ah | LIN0 Response Field Setting Register | L0RFC | 0000 0000b |
| 044E0Bh | LIN0 ID Buffer Register | L0IDB | 00h |
| 044E0Ch | LIN0 Status Control Register | L0SC | 0000 0000b |
| 044E0Dh | LIN0 Transmission Control Register | L0TC | 0000 0000b |
| 044E0Eh | LIN0 Status Register | L0ST | 0000 0000b |
| 044E0Fh | LIN0 Error Status Register | L0EST | 0000 0000b |
| 044E10h | LIN0 Data 1 Buffer Register | L0DB1 | 00h |
| 044E11h | LIN0 Data 2 Buffer Register | L0DB2 | 00h |
| 044E12h | LIN0 Data 3 Buffer Register | L0DB3 | 00h |
| 044E13h | LIN0 Data 4 Buffer Register | L0DB4 | 00h |
| 044E14h | LIN0 Data 5 Buffer Register | L0DB5 | 00h |
| 044E15h | LIN0 Data 6 Buffer Register | L0DB6 | 00h |
| 044E16h | LIN0 Data 7 Buffer Register | L0DB7 | 00h |
| 044E17h | LIN0 Data 8 Buffer Register | L0DB8 | 00h |
| 044E18h | | | |
| 044E19h | | | |
| 044E1Ah | | | |
| 044E1Bh | | | |
| 044E1Ch | | | |
| 044E1Dh | | | |
| 044E1Eh | | | |
| 044E1Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.28 SFR List (28)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 044E20h | LIN1 Channel Window Select/Input Signal Low Detection Status Register | L1CW | 0000 0000b |
| 044E21h | LIN1 Baud Rate Generator Control Register | L1BRG | 0000 0000b |
| 044E22h | LIN1 Baud Rate Prescaler 0 | L10BRP0 | 00h |
| 044E23h | LIN1 Baud Rate Prescaler 1 | L1BRP1 | 00h |
| 044E24h | LIN1 Mode Register 0 | L1MD0 | 0000 0000b |
| 044E25h | LIN1 Mode Register 1 | L1MD1 | 00h |
| 044E26h | LIN1 Wake-up Setting Register | L1WUP | 00h |
| 044E27h | | | |
| 044E28h | LIN1 Break Field Setting Register | L1BRK | 0000 0000b |
| 044E29h | LIN1 Space Setting Register | L1SPC | 0000 0000b |
| 044E2Ah | LIN1 Response Field Setting Register | L1RFC | 0000 0000b |
| 044E2Bh | LIN1 ID Buffer Register | L1IDB | 00h |
| 044E2Ch | LIN1 Status Control Register | L1SC | 0000 0000b |
| 044E2Dh | LIN1 Transmission Control Register | L1TC | 0000 0000b |
| 044E2Eh | LIN1 Status Register | L1ST | 0000 0000b |
| 044E2Fh | LIN1 Error Status Register | L1EST | 0000 0000b |
| 044E30h | LIN1 Data 1 Buffer Register | L1DB1 | 00h |
| 044E31h | LIN1 Data 2 Buffer Register | L1DB2 | 00h |
| 044E32h | LIN1 Data 3 Buffer Register | L1DB3 | 00h |
| 044E33h | LIN1 Data 4 Buffer Register | L1DB4 | 00h |
| 044E34h | LIN1 Data 5 Buffer Register | L1DB5 | 00h |
| 044E35h | LIN1 Data 6 Buffer Register | L1DB6 | 00h |
| 044E36h | LIN1 Data 7 Buffer Register | L1DB7 | 00h |
| 044E37h | LIN1 Data 8 Buffer Register | L1DB8 | 00h |
| 044E38h | | | |
| 044E39h | | | |
| 044E3Ah | | | |
| 044E3Bh | | | |
| 044E3Ch | | | |
| 044E3Dh | | | |
| 044E3Eh | | | |
| 044E3Fh | | | |
| 044E40h | | | |
| 044E41h | | | |
| 044E42h | | | |
| 044E43h | | | |
| 044E44h | | | |
| 044E45h | | | |
| 044E46h | | | |
| 044E47h | | | |
| 044E48h | | | |
| 044E49h | | | |
| 044E4Ah | | | |
| 044E4Bh | | | |
| 044E4Ch | | | |
| 044E4Dh | | | |
| 044E4Eh | | | |
| 044E4Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.29 SFR List (29)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 044E50h to 044EFFh | | | |
| 044F00h | | | |
| 044F01h | | | |
| 044F02h | | | |
| 044F03h | | | |
| 044F04h | | | |
| 044F05h | | | |
| 044F06h | SS0 Receive Data Register | SS0RDR | FFh |
| 044F07h | SS0 Receive Data Register (H) | SS0RDR (H) | FFh |
| 044F08h | SS0 Control Register H | SS0CRH | 00h |
| 044F09h | SS0 Control Register L | SS0CRL | 0111 1101b |
| 044F0Ah | SS0 Mode Register | SS0MR | 0001 0000b |
| 044F0Bh | SS0 Enable Register | SS0ER | 00h |
| 044F0Ch | SS0 Status Register | SS0SR | 00h |
| 044F0Dh | SS0 Mode Register 2 | SS0MR2 | 00h |
| 044F0Eh | SS0 Transmit Data Register | SS0TDR | FFh |
| 044F0Fh | SS0 Transmit Data Register (H) | SS0TDR (H) | FFh |
| 044F10h | | | |
| 044F11h | | | |
| 044F12h | | | |
| 044F13h | | | |
| 044F14h | | | |
| 044F15h | | | |
| 044F16h | SS1 Receive Data Register | SS1RDR | FFh |
| 044F17h | SS1 Receive Data Register (H) | SS1RDR (H) | FFh |
| 044F18h | SS1 Control Register H | SS1CRH | 00h |
| 044F19h | SS1 Control Register L | SS1CRL | 0111 1101b |
| 044F1Ah | SS1 Mode Register | SS1MR | 0001 0000b |
| 044F1Bh | SS1 Enable Register | SS1ER | 00h |
| 044F1Ch | SS1 Status Register | SS1SR | 00h |
| 044F1Dh | SS1 Mode Register 2 | SS1MR2 | 00h |
| 044F1Eh | SS1 Transmit Data Register | SS1TDR | FFh |
| 044F1Fh | SS1 Transmit Data Register (H) | SS1TDR (H) | FFh |
| 044F20h | | | |
| 044F21h | | | |
| 044F22h | | | |
| 044F23h | | | |
| 044F24h | | | |
| 044F25h | | | |
| 044F26h | SS2 Receive Data Register | SS2RDR | FFh |
| 044F27h | SS2 Receive Data Register (H) | SS2RDR (H) | FFh |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.30 SFR List (30)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 044F28h | SS2 Control Register H | SS2CRH | 00h |
| 044F29h | SS2 Control Register L | SS2CRL | 0111 1101b |
| 044F2Ah | SS2 Mode Register | SS2MR | 0001 0000b |
| 044F2Bh | SS2 Enable Register | SS2ER | 00h |
| 044F2Ch | SS2 Status Register | SS2SR | 00h |
| 044F2Dh | SS2 Mode Register 2 | SS2MR2 | 00h |
| 044F2Eh | SS2 Transmit Data Register | SS2TDR | FFh |
| 044F2Fh | SS2 Transmit Data Register (H) | SS2TDR (H) | FFh |
| 044F30h | | | |
| 044F31h | | | |
| 044F32h | | | |
| 044F33h | | | |
| 044F34h | | | |
| 044F35h | | | |
| 044F36h | | | |
| 044F37h | | | |
| 044F38h | | | |
| 044F39h | | | |
| 044F3Ah | | | |
| 044F3Bh | | | |
| 044F3Ch | | | |
| 044F3Dh | | | |
| 044F3Eh | | | |
| 044F3Fh | | | |
| 044F40h | | | |
| 044F41h | | | |
| 044F42h | | | |
| 044F43h | | | |
| 044F44h | | | |
| 044F45h | | | |
| 044F46h | | | |
| 044F47h | | | |
| 044F48h | | | |
| 044F49h | | | |
| 044F4Ah | | | |
| 044F4Bh | | | |
| 044F4Ch | | | |
| 044F4Dh | | | |
| 044F4Eh | | | |
| 044F4Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.31 SFR List (31)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 044F50h to 044FDFh | | | |
| 044FE0h | E²dataFlash Address Register | E2FA | XXXX 0000h |
| 044FE1h | | | |
| 044FE2h | | | |
| 044FE3h | | | |
| 044FE4h | | | |
| 044FE5h | | | |
| 044FE6h | | | |
| 044FE7h | | | |
| 044FE8h | E²dataFlash Instruction Register | E2FI | XX00h |
| 044FE9h | | | |
| 044FEAh | | | |
| 044FEBh | | | |
| 044FECh | E²dataFlash Data Register | E2FD | XXXXh |
| 044FEDh | | | |
| 044FEEh | | | |
| 044FEFh | | | |
| 044FF0h | E²dataFlash Mode Register | E2FM | 0000 0000b |
| 044FF1h | | | |
| 044FF2h | E²dataFlash Control Register | E2FC | XXXX XXX0b |
| 044FF3h | | | |
| 044FF4h | E²dataFlash Status Register 1 | E2FS1 | XXXX XXX0b |
| 044FF5h | | | |
| 044FF6h | | | |
| 044FF7h | | | |
| 044FF8h | | | |
| 044FF9h | | | |
| 044FFAh | | | |
| 044FFBh | | | |
| 044FFCh | | | |
| 044FFDh | | | |
| 044FFEh | | | |
| 044FFFh | | | |
| 045000h | | | |
| 045001h | E²dataFlash Status Register 0 | E2FS0 | XXXX XXXXb |
| 045002h | | | |
| 045003h | | | |
| 045004h | | | |
| 045005h | | | |
| 045006h | | | |
| 045007h | | | |
| 045008h to 045FFFh | | | |
| 046000h to 0467FFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.32 SFR List (32)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046800h to 046BFFh | | | |
| 046C00h | CAN3 Mailbox 0: Message Identifier | C3MB0 | XXXX XXXXh |
| 046C01h | | | |
| 046C02h | | | |
| 046C03h | | | |
| 046C04h | | | |
| 046C05h | CAN3 Mailbox 0: Data Length | | XXh |
| 046C06h | CAN3 Mailbox 0: Data Field | | XXXX XXXX |
| 046C07h | | | XXXX XXXXh |
| 046C08h | | | |
| 046C09h | | | |
| 046C0Ah | | | |
| 046C0Bh | | | |
| 046C0Ch | | | |
| 046C0Dh | | | |
| 046C0Eh | CAN3 Mailbox 0: Time Stamp | | XXXXh |
| 046C0Fh | | | |
| 046C10h | CAN3 Mailbox 1: Message Identifier | C3MB1 | XXXX XXXXh |
| 046C11h | | | |
| 046C12h | | | |
| 046C13h | | | |
| 046C14h | | | |
| 046C15h | CAN3 Mailbox 1: Data Length | | XXh |
| 046C16h | CAN3 Mailbox 1: Data Field | | XXXX XXXX |
| 046C17h | | | XXXX XXXXh |
| 046C18h | | | |
| 046C19h | | | |
| 046C1Ah | | | |
| 046C1Bh | | | |
| 046C1Ch | | | |
| 046C1Dh | | | |
| 046C1Eh | CAN3 Mailbox 1: Time Stamp | | XXXXh |
| 046C1Fh | | | |
| 046C20h | CAN3 Mailbox 2: Message Identifier | C3MB2 | XXXX XXXXh |
| 046C21h | | | |
| 046C22h | | | |
| 046C23h | | | |
| 046C24h | | | |
| 046C25h | CAN3 Mailbox 2: Data Length | | XXh |
| 046C26h | CAN3 Mailbox 2: Data Field | | XXXX XXXX |
| 046C27h | | | XXXX XXXXh |
| 046C28h | | | |
| 046C29h | | | |
| 046C2Ah | | | |
| 046C2Bh | | | |
| 046C2Ch | | | |
| 046C2Dh | | | |
| 046C2Eh | CAN3 Mailbox 2: Time Stamp | | XXXXh |
| 046C2Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.33 SFR List (33)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046C30h | CAN3 Mailbox 3: Message Identifier | C3MB3 | XXXX XXXXh |
| 046C31h | | | |
| 046C32h | | | |
| 046C33h | | | |
| 046C34h | | | |
| 046C35h | CAN3 Mailbox 3: Data Length | | XXh |
| 046C36h | CAN3 Mailbox 3: Data Field | | XXXX XXXX |
| 046C37h | | | XXXX XXXXh |
| 046C38h | | | |
| 046C39h | | | |
| 046C3Ah | | | |
| 046C3Bh | | | |
| 046C3Ch | | | |
| 046C3Dh | | | |
| 046C3Eh | CAN3 Mailbox 3: Time Stamp | | XXXXh |
| 046C3Fh | | | |
| 046C40h | CAN3 Mailbox 4: Message Identifier | C3MB4 | XXXX XXXXh |
| 046C41h | | | |
| 046C42h | | | |
| 046C43h | | | |
| 046C44h | | | |
| 046C45h | CAN3 Mailbox 4: Data Length | | XXh |
| 046C46h | CAN3 Mailbox 4: Data Field | | XXXX XXXX |
| 046C47h | | | XXXX XXXXh |
| 046C48h | | | |
| 046C49h | | | |
| 046C4Ah | | | |
| 046C4Bh | | | |
| 046C4Ch | | | |
| 046C4Dh | | | |
| 046C4Eh | CAN3 Mailbox 4: Time Stamp | | XXXXh |
| 046C4Fh | | | |
| 046C50h | CAN3 Mailbox 5: Message Identifier | C3MB5 | XXXX XXXXh |
| 046C51h | | | |
| 046C52h | | | |
| 046C53h | | | |
| 046C54h | | | |
| 046C55h | CAN3 Mailbox 5: Data Length | | XXh |
| 046C56h | CAN3 Mailbox 5: Data Field | | XXXX XXXX |
| 046C57h | | | XXXX XXXXh |
| 046C58h | | | |
| 046C59h | | | |
| 046C5Ah | | | |
| 046C5Bh | | | |
| 046C5Ch | | | |
| 046C5Dh | | | |
| 046C5Eh | CAN3 Mailbox 5: Time Stamp | | XXXXh |
| 046C5Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.34 SFR List (34)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046C60h | CAN3 Mailbox 6: Message Identifier | C3MB6 | XXXX XXXXh |
| 046C61h | | | |
| 046C62h | | | |
| 046C63h | | | |
| 046C64h | | | |
| 047065h | CAN3 Mailbox 6: Data Length | | XXh |
| 046C66h | CAN3 Mailbox 6: Data Field | | XXXX XXXX |
| 046C67h | | | XXXX XXXXh |
| 046C68h | | | |
| 046C69h | | | |
| 046C6Ah | | | |
| 046C6Bh | | | |
| 046C6Ch | | | |
| 046C6Dh | | | |
| 046C6Eh | CAN3 Mailbox 6: Time Stamp | | XXXXh |
| 046C6Fh | | | |
| 046C70h | CAN3 Mailbox 7: Message Identifier | C3MB7 | XXXX XXXXh |
| 046C71h | | | |
| 046C72h | | | |
| 046C73h | | | |
| 046C74h | | | |
| 046C75h | CAN3 Mailbox 7: Data Length | | XXh |
| 046C76h | CAN3 Mailbox 7: Data Field | | XXXX XXXX |
| 046C77h | | | XXXX XXXXh |
| 046C78h | | | |
| 046C79h | | | |
| 046C7Ah | | | |
| 046C7Bh | | | |
| 046C7Ch | | | |
| 046C7Dh | | | |
| 046C7Eh | CAN3 Mailbox 7: Time Stamp | | XXXXh |
| 046C7Fh | | | |
| 046C80h | CAN3 Mailbox 8: Message Identifier | C3MB8 | XXXX XXXXh |
| 046C81h | | | |
| 046C82h | | | |
| 046C83h | | | |
| 046C84h | | | |
| 046C85h | CAN3 Mailbox 8: Data Length | | XXh |
| 046C86h | CAN3 Mailbox 8: Data Field | | XXXX XXXX |
| 046C87h | | | XXXX XXXXh |
| 046C88h | | | |
| 046C89h | | | |
| 046C8Ah | | | |
| 046C8Bh | | | |
| 046C8Ch | | | |
| 046C8Dh | | | |
| 046C8Eh | CAN3 Mailbox 8: Time Stamp | | XXXXh |
| 046C8Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.35 SFR List (35)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046C90h | CAN3 Mailbox 9: Message Identifier | C3MB9 | XXXX XXXXh |
| 046C91h | | | |
| 046C92h | | | |
| 046C93h | | | |
| 046C94h | | | |
| 046C95h | CAN3 Mailbox 9: Data Length | | XXh |
| 046C96h | CAN3 Mailbox 9: Data Field | | XXXX XXXX |
| 046C97h | | | XXXX XXXXh |
| 046C98h | | | |
| 046C99h | | | |
| 046C9Ah | | | |
| 046C9Bh | | | |
| 046C9Ch | | | |
| 046C9Dh | | | |
| 046C9Eh | CAN3 Mailbox 9: Time Stamp | | XXXXh |
| 046C9Fh | | | |
| 046CA0h | CAN3 Mailbox 10: Message Identifier | C3MB10 | XXXX XXXXh |
| 046CA1h | | | |
| 046CA2h | | | |
| 046CA3h | | | |
| 046CA4h | | | |
| 046CA5h | CAN3 Mailbox 10: Data Length | | XXh |
| 046CA6h | CAN3 Mailbox 10: Data Field | | XXXX XXXX |
| 046CA7h | | | XXXX XXXXh |
| 046CA8h | | | |
| 046CA9h | | | |
| 046CAAh | | | |
| 046CABh | | | |
| 046CACh | | | |
| 046CADh | | | |
| 046CAEh | CAN3 Mailbox 10: Time Stamp | | XXXXh |
| 046CAFh | | | |
| 046CB0h | CAN3 Mailbox 11: Message Identifier | C3MB11 | XXXX XXXXh |
| 046CB1h | | | |
| 046CB2h | | | |
| 046CB3h | | | |
| 046CB4h | | | |
| 046CB5h | CAN3 Mailbox 11: Data Length | | XXh |
| 046CB6h | CAN3 Mailbox 11: Data Field | | XXXX XXXX |
| 046CB7h | | | XXXX XXXXh |
| 046CB8h | | | |
| 046CB9h | | | |
| 046CBAh | | | |
| 046CBBh | | | |
| 046CBCh | | | |
| 046CBDh | | | |
| 046CBEh | CAN3 Mailbox 11: Time Stamp | | XXXXh |
| 046CBFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.36 SFR List (36)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046CC0h | CAN3 Mailbox 12: Message Identifier | C3MB12 | XXXX XXXXh |
| 046CC1h | | | |
| 046CC2h | | | |
| 046CC3h | | | |
| 046CC4h | | | |
| 046CC5h | CAN3 Mailbox 12: Data Length | | XXh |
| 046CC6h | CAN3 Mailbox 12: Data Field | | XXXX XXXX |
| 046CC7h | | | XXXX XXXXh |
| 046CC8h | | | |
| 046CC9h | | | |
| 046CCAh | | | |
| 046CCBh | | | |
| 046CCCh | | | |
| 046CCDh | | | |
| 046CCEh | CAN3 Mailbox 12: Time Stamp | | XXXXh |
| 046CCFh | | | |
| 046CD0h | CAN3 Mailbox 13: Message Identifier | C3MB13 | XXXX XXXXh |
| 046CD1h | | | |
| 046CD2h | | | |
| 046CD3h | | | |
| 046CD4h | | | |
| 046CD5h | CAN3 Mailbox 13: Data Length | | XXh |
| 046CD6h | CAN3 Mailbox 13: Data Field | | XXXX XXXX |
| 046CD7h | | | XXXX XXXXh |
| 046CD8h | | | |
| 046CD9h | | | |
| 046CDAh | | | |
| 046CDBh | | | |
| 046CDCh | | | |
| 046CDDh | | | |
| 046CDEh | CAN3 Mailbox 13: Time Stamp | | XXXXh |
| 046CDFh | | | |
| 046CE0h | CAN3 Mailbox 14: Message Identifier | C3MB14 | XXXX XXXXh |
| 046CE1h | | | |
| 046CE2h | | | |
| 046CE3h | | | |
| 046CE4h | | | |
| 046CE5h | CAN3 Mailbox 14: Data Length | | XXh |
| 046CE6h | CAN3 Mailbox 14: Data Field | | XXXX XXXX |
| 046CE7h | | | XXXX XXXXh |
| 046CE8h | | | |
| 046CE9h | | | |
| 046CEAh | | | |
| 046CEBh | | | |
| 046CECh | | | |
| 046CEDh | | | |
| 046CEEh | CAN3 Mailbox 14: Time Stamp | | XXXXh |
| 046CEFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.37 SFR List (37)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046CF0h | CAN3 Mailbox 15: Message Identifier | C3MB15 | XXXX XXXXh |
| 046CF1h | | | |
| 046CF2h | | | |
| 046CF3h | | | |
| 046CF4h | | | |
| 046CF5h | CAN3 Mailbox 15: Data Length | | XXh |
| 046CF6h | CAN3 Mailbox 15: Data Field | | XXXX XXXX |
| 046CF7h | | | XXXX XXXXh |
| 046CF8h | | | |
| 046CF9h | | | |
| 046CFAh | | | |
| 046CFBh | | | |
| 046CFCh | | | |
| 046CFDh | | | |
| 046CFEh | CAN3 Mailbox 15: Time Stamp | | XXXXh |
| 046CFFh | | | |
| 046D00h | CAN3 Mailbox 16: Message Identifier | C3MB16 | XXXX XXXXh |
| 046D01h | | | |
| 046D02h | | | |
| 046D03h | | | |
| 046D04h | | | |
| 046D05h | CAN3 Mailbox 16: Data Length | | XXh |
| 046D06h | CAN3 Mailbox 16: Data Field | | XXXX XXXX |
| 046D07h | | | XXXX XXXXh |
| 046D08h | | | |
| 046D09h | | | |
| 046D0Ah | | | |
| 046D0Bh | | | |
| 046D0Ch | | | |
| 046D0Dh | | | |
| 046D0Eh | CAN3 Mailbox 16: Time Stamp | | XXXXh |
| 046D0Fh | | | |
| 046D10h | CAN3 Mailbox 17: Message Identifier | C3MB17 | XXXX XXXXh |
| 046D11h | | | |
| 046D12h | | | |
| 046D13h | | | |
| 046D14h | | | |
| 046D15h | CAN3 Mailbox 17: Data Length | | XXh |
| 046D16h | CAN3 Mailbox 17: Data Field | | XXXX XXXX |
| 046D17h | | | XXXX XXXXh |
| 046D18h | | | |
| 046D19h | | | |
| 046D1Ah | | | |
| 046D1Bh | | | |
| 046D1Ch | | | |
| 046D1Dh | | | |
| 046D1Eh | CAN3 Mailbox 17: Time Stamp | | XXXXh |
| 046D1Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.38 SFR List (38)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046D20h | CAN3 Mailbox 18: Message Identifier | C3MB18 | XXXX XXXXh |
| 046D21h | | | |
| 046D22h | | | |
| 046D23h | | | |
| 046D24h | | | |
| 046D25h | CAN3 Mailbox 18: Data Length | | XXh |
| 046D26h | CAN3 Mailbox 18: Data Field | | XXXX XXXX |
| 046D27h | | | XXXX XXXXh |
| 046D28h | | | |
| 046D29h | | | |
| 046D2Ah | | | |
| 046D2Bh | | | |
| 046D2Ch | | | |
| 046D2Dh | | | |
| 046D2Eh | CAN3 Mailbox 18: Time Stamp | | XXXXh |
| 046D2Fh | | | |
| 046D30h | CAN3 Mailbox 19: Message Identifier | C3MB19 | XXXX XXXXh |
| 046D31h | | | |
| 046D32h | | | |
| 046D33h | | | |
| 046D34h | | | |
| 046D35h | CAN3 Mailbox 19: Data Length | | XXh |
| 046D36h | CAN3 Mailbox 19: Data Field | | XXXX XXXX |
| 046D37h | | | XXXX XXXXh |
| 046D38h | | | |
| 046D39h | | | |
| 046D3Ah | | | |
| 046D3Bh | | | |
| 046D3Ch | | | |
| 046D3Dh | | | |
| 046D3Eh | CAN3 Mailbox 19: Time Stamp | | XXXXh |
| 046D3Fh | | | |
| 046D40h | CAN3 Mailbox 20: Message Identifier | C3MB20 | XXXX XXXXh |
| 046D41h | | | |
| 046D42h | | | |
| 046D43h | | | |
| 046D44h | | | |
| 046D45h | CAN3 Mailbox 20: Data Length | | XXh |
| 046D46h | CAN3 Mailbox 20: Data Field | | XXXX XXXX |
| 046D47h | | | XXXX XXXXh |
| 046D48h | | | |
| 046D49h | | | |
| 046D4Ah | | | |
| 046D4Bh | | | |
| 046D4Ch | | | |
| 046D4Dh | | | |
| 046D4Eh | CAN3 Mailbox 20: Time Stamp | | XXXXh |
| 046D4Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.39 SFR List (39)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046D50h | CAN3 Mailbox 21: Message Identifier | C3MB21 | XXXX XXXXh |
| 046D51h | | | |
| 046D52h | | | |
| 046D53h | | | |
| 046D54h | | | |
| 046D55h | CAN3 Mailbox 21: Data Length | | XXh |
| 046D56h | CAN3 Mailbox 21: Data Field | | XXXX XXXX |
| 046D57h | | | XXXX XXXXh |
| 046D58h | | | |
| 046D59h | | | |
| 046D5Ah | | | |
| 046D5Bh | | | |
| 046D5Ch | | | |
| 046D5Dh | | | |
| 046D5Eh | CAN3 Mailbox 21: Time Stamp | | XXXXh |
| 046D5Fh | | | |
| 046D60h | CAN3 Mailbox 22: Message Identifier | C3MB22 | XXXX XXXXh |
| 046D61h | | | |
| 046D62h | | | |
| 046D63h | | | |
| 046D64h | | | |
| 046D65h | CAN3 Mailbox 22: Data Length | | XXh |
| 046D66h | CAN3 Mailbox 22: Data Field | | XXXX XXXX |
| 046D67h | | | XXXX XXXXh |
| 046D68h | | | |
| 046D69h | | | |
| 046D6Ah | | | |
| 046D6Bh | | | |
| 046D6Ch | | | |
| 046D6Dh | | | |
| 046D6Eh | CAN3 Mailbox 22: Time Stamp | | XXXXh |
| 046D6Fh | | | |
| 046D70h | CAN3 Mailbox 23: Message Identifier | C3MB23 | XXXX XXXXh |
| 046D71h | | | |
| 046D72h | | | |
| 046D73h | | | |
| 046D74h | | | |
| 046D75h | CAN3 Mailbox 23: Data Length | | XXh |
| 046D76h | CAN3 Mailbox 23: Data Field | | XXXX XXXX |
| 046D77h | | | XXXX XXXXh |
| 046D78h | | | |
| 046D79h | | | |
| 046D7Ah | | | |
| 046D7Bh | | | |
| 046D7Ch | | | |
| 046D7Dh | | | |
| 046D7Eh | CAN3 Mailbox 23: Time Stamp | | XXXXh |
| 046D7Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.40 SFR List (40)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046D80h | CAN3 Mailbox 24: Message Identifier | C3MB24 | XXXX XXXXh |
| 046D81h | | | |
| 046D82h | | | |
| 046D83h | | | |
| 046D84h | | | |
| 046D85h | CAN3 Mailbox 24: Data Length | | XXh |
| 046D86h | CAN3 Mailbox 24: Data Field | | XXXX XXXX |
| 046D87h | | | XXXX XXXXh |
| 046D88h | | | |
| 046D89h | | | |
| 046D8Ah | | | |
| 046D8Bh | | | |
| 046D8Ch | | | |
| 046D8Dh | | | |
| 046D8Eh | CAN3 Mailbox 24: Time Stamp | | XXXXh |
| 046D8Fh | | | |
| 046D90h | CAN3 Mailbox 25: Message Identifier | C3MB25 | XXXX XXXXh |
| 046D91h | | | |
| 046D92h | | | |
| 046D93h | | | |
| 046D94h | | | |
| 046D95h | CAN3 Mailbox 25: Data Length | | XXh |
| 046D96h | CAN3 Mailbox 25: Data Field | | XXXX XXXX |
| 046D97h | | | XXXX XXXXh |
| 046D98h | | | |
| 046D99h | | | |
| 046D9Ah | | | |
| 046D9Bh | | | |
| 046D9Ch | | | |
| 046D9Dh | | | |
| 046D9Eh | CAN3 Mailbox 25: Time Stamp | | XXXXh |
| 046D9Fh | | | |
| 046DA0h | CAN3 Mailbox 26: Message Identifier | C3MB26 | XXXX XXXXh |
| 046DA1h | | | |
| 046DA2h | | | |
| 046DA3h | | | |
| 046DA4h | | | |
| 046DA5h | CAN3 Mailbox 26: Data Length | | XXh |
| 046DA6h | CAN3 Mailbox 26: Data Field | | XXXX XXXX |
| 046DA7h | | | XXXX XXXXh |
| 046DA8h | | | |
| 046DA9h | | | |
| 046DAAh | | | |
| 046DABh | | | |
| 046DACh | | | |
| 046DADh | | | |
| 046DAEh | CAN3 Mailbox 26: Time Stamp | | XXXXh |
| 046DAFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.41 SFR List (41)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046DB0h | CAN3 Mailbox 27: Message Identifier | C3MB27 | XXXX XXXXh |
| 046DB1h | | | |
| 046DB2h | | | |
| 046DB3h | | | |
| 046DB4h | | | |
| 046DB5h | CAN3 Mailbox 27: Data Length | | XXh |
| 046DB6h | CAN3 Mailbox 27: Data Field | | XXXX XXXX |
| 046DB7h | | | XXXX XXXXh |
| 046DB8h | | | |
| 046DB9h | | | |
| 046DBAh | | | |
| 046DBBh | | | |
| 046DBCh | | | |
| 046DBDh | | | |
| 046DBEh | CAN3 Mailbox 27: Time Stamp | | XXXXh |
| 046DBFh | | | |
| 046DC0h | CAN3 Mailbox 28: Message Identifier | C3MB28 | XXXX XXXXh |
| 06DC1h | | | |
| 046DC2h | | | |
| 046DC3h | | | |
| 046DC4h | | | |
| 046DC5h | CAN3 Mailbox 28: Data Length | | XXh |
| 046DC6h | CAN3 Mailbox 28: Data Field | | XXXX XXXX |
| 046DC7h | | | XXXX XXXXh |
| 046DC8h | | | |
| 046DC9h | | | |
| 046DCAh | | | |
| 046DCBh | | | |
| 046DCCh | | | |
| 046DCDh | | | |
| 046DCEh | CAN3 Mailbox 28: Time Stamp | | XXXXh |
| 046DCFh | | | |
| 046DD0h | CAN3 Mailbox 29: Message Identifier | C3MB29 | XXXX XXXXh |
| 046DD1h | | | |
| 046DD2h | | | |
| 046DD3h | | | |
| 046DD4h | | | |
| 046DD5h | CAN3 Mailbox 29: Data Length | | XXh |
| 046DD6h | CAN3 Mailbox 29: Data Field | | XXXX XXXX |
| 046DD7h | | | XXXX XXXXh |
| 046DD8h | | | |
| 046DD9h | | | |
| 046DDAh | | | |
| 046DDBh | | | |
| 046DDCh | | | |
| 046DDDh | | | |
| 046DDEh | CAN3 Mailbox 29: Time Stamp | | XXXXh |
| 046DDFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.42 SFR List (42)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046DE0h | CAN3 Mailbox 30: Message Identifier | C3MB30 | XXXX XXXXh |
| 046DE1h | | | |
| 046DE2h | | | |
| 046DE3h | | | |
| 046DE4h | | | |
| 046DE5h | CAN3 Mailbox 30: Data Length | | XXh |
| 046DE6h | CAN3 Mailbox 30: Data Field | | XXXX XXXX |
| 046DE7h | | | XXXX XXXXh |
| 046DE8h | | | |
| 046DE9h | | | |
| 046DEAh | | | |
| 046DEBh | | | |
| 046DECh | | | |
| 046DEDh | | | |
| 046DEEh | CAN3 Mailbox 30: Time Stamp | | XXXXh |
| 046DEFh | | | |
| 046DF0h | CAN3 Mailbox 31: Message Identifier | C3MB31 | XXXX XXXXh |
| 046DF1h | | | |
| 046DF2h | | | |
| 046DF3h | | | |
| 046DF4h | | | |
| 046DF5h | CAN3 Mailbox 31: Data Length | | XXh |
| 046DF6h | CAN3 Mailbox 31: Data Field | | XXXX XXXX |
| 046DF7h | | | XXXX XXXXh |
| 046DF8h | | | |
| 046DF9h | | | |
| 046DFAh | | | |
| 046DFBh | | | |
| 046DFCh | | | |
| 046DFDh | | | |
| 046DFEh | CAN3 Mailbox 31: Time Stamp | | XXXXh |
| 046DFFh | | | |
| 046E00h | CAN3 Mask Register 0 | C3MKR0 | XXXX XXXXh |
| 046E01h | | | |
| 046E02h | | | |
| 046E03h | | | |
| 046E04h | CAN3 Mask Register 1 | C3MKR1 | XXXX XXXXh |
| 046E05h | | | |
| 046E06h | | | |
| 046E07h | | | |
| 046E08h | CAN3 Mask Register 2 | C3MKR2 | XXXX XXXXh |
| 046E09h | | | |
| 046E0Ah | | | |
| 046E0Bh | | | |
| 046E0Ch | CAN3 Mask Register 3 | C3MKR 3 | XXXX XXXXh |
| 046E0Dh | | | |
| 046E0Eh | | | |
| 046E0Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.43 SFR List (43)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046E10h | CAN3 Mask Register 4 | C3MKR4 | XXXX XXXXh |
| 046E11h | | | |
| 046E12h | | | |
| 046E13h | | | |
| 046E14h | CAN3 Mask Register 5 | C3MKR5 | XXXX XXXXh |
| 046E15h | | | |
| 046E16h | | | |
| 046E17h | | | |
| 046E18h | CAN3 Mask Register 6 | C3MKR6 | XXXX XXXXh |
| 046E19h | | | |
| 046E2Ah | | | |
| 046E2Bh | | | |
| 046E2Ch | CAN3 Mask Register 7 | C3MKR7 | XXXX XXXXh |
| 046E2Dh | | | |
| 046E2Eh | | | |
| 0462EFh | | | |
| 046E20h | CAN3 FIFO Received ID Compare Register 0 | C3FIDCR0 | XXXX XXXXh |
| 046E21h | | | |
| 046E22h | | | |
| 046E23h | | | |
| 046E24h | CAN3 FIFO Received ID Compare Register 1 | C3FIDCR1 | XXXX XXXXh |
| 046E25h | | | |
| 046E26h | | | |
| 046E27h | | | |
| 046E28h | CAN3 Mask Invalid Register | C3MKIVLR | XXXX XXXXh |
| 046E29h | | | |
| 046E2Ah | | | |
| 046E2Bh | | | |
| 046E2Ch | CAN3 Mailbox Interrupt Enable Register | C3MIER | XXXX XXXXh |
| 046E2Dh | | | |
| 046E2Eh | | | |
| 046E2Fh | | | |
| 046E30h | | | |
| 046E31h | | | |
| 046E32h | | | |
| 046E33h | | | |
| 046E34h | | | |
| 046E35h | | | |
| 046E36h | | | |
| 046E37h | | | |
| 046E38h | | | |
| 046E39h | | | |
| 046E3Ah | | | |
| 046E3Bh | | | |
| 046E3Ch | | | |
| 046E3Dh | | | |
| 046E3Eh | | | |
| 046E3Fh | | | |
| 046E40h to 046F1Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.44 SFR List (44)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046F20h | CAN3 Message Control Register 0 | C3MCTL0 | 00h |
| 046F21h | CAN3 Message Control Register 1 | C3MCTL1 | 00h |
| 046F22h | CAN3 Message Control Register 2 | C3MCTL2 | 00h |
| 046F23h | CAN3 Message Control Register 3 | C3MCTL3 | 00h |
| 046F24h | CAN3 Message Control Register 4 | C3MCTL4 | 00h |
| 046F25h | CAN3 Message Control Register 5 | C3MCTL5 | 00h |
| 046F26h | CAN3 Message Control Register 6 | C3MCTL6 | 00h |
| 046F27h | CAN3 Message Control Register 7 | C3MCTL7 | 00h |
| 046F28h | CAN3 Message Control Register 8 | C3MCTL8 | 00h |
| 046F29h | CAN3 Message Control Register 9 | C3MCTL9 | 00h |
| 046F2Ah | CAN3 Message Control Register 10 | C3MCTL10 | 00h |
| 046F2Bh | CAN3 Message Control Register 11 | C3MCTL11 | 00h |
| 046F2Ch | CAN3 Message Control Register 12 | C3MCTL12 | 00h |
| 046F2Dh | CAN3 Message Control Register 13 | C3MCTL13 | 00h |
| 046F2Eh | CAN3 Message Control Register 14 | C3MCTL14 | 00h |
| 046F2Fh | CAN3 Message Control Register 15 | C3MCTL15 | 00h |
| 046F30h | CAN3 Message Control Register 16 | C3MCTL16 | 00h |
| 046F31h | CAN3 Message Control Register 17 | C3MCTL17 | 00h |
| 046F32h | CAN3 Message Control Register 18 | C3MCTL18 | 00h |
| 046F33h | CAN3 Message Control Register 19 | C3MCTL19 | 00h |
| 046F34h | CAN3 Message Control Register 20 | C3MCTL20 | 00h |
| 046F35h | CAN3 Message Control Register 21 | C3MCTL21 | 00h |
| 046F36h | CAN3 Message Control Register 22 | C3MCTL22 | 00h |
| 046F37h | CAN3 Message Control Register 23 | C3MCTL23 | 00h |
| 046F38h | CAN3 Message Control Register 24 | C3MCTL24 | 00h |
| 046F39h | CAN3 Message Control Register 25 | C3MCTL25 | 00h |
| 046F3Ah | CAN3 Message Control Register 26 | C3MCTL26 | 00h |
| 046F3Bh | CAN3 Message Control Register 27 | C3MCTL27 | 00h |
| 046F3Ch | CAN3 Message Control Register 28 | C3MCTL28 | 00h |
| 046F3Dh | CAN3 Message Control Register 29 | C3MCTL29 | 00h |
| 046F3Eh | CAN3 Message Control Register 30 | C3MCTL30 | 00h |
| 046F3Fh | CAN3 Message Control Register 31 | C3MCTL31 | 00h |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.45 SFR List (45)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 046F40h | CAN3 Control Register | C3CTLR | 0000 0101b |
| 046F41h | | | 0000 0000b |
| 046F42h | CAN3 Status Register | C3STR | 0000 0101b |
| 046F43h | | | 0000 0000b |
| 046F44h | CAN3 Bit Configuration Register | C3BCR | 00 0000h |
| 046F45h | | | |
| 046F46h | | | |
| 046F47h | CAN3 Clock Select Register | C3CLKR | 000X 0000b |
| 046F48h | CAN3 Receive FIFO Control Register | C3RFCR | 1000 0000b |
| 046F49h | CAN3 Receive FIFO Pointer Control Register | C3RFPCR | XXh |
| 046F4Ah | CAN3 Transmit FIFO Control Register | C3TFCR | 1000 0000b |
| 046F4Bh | CAN3 Transmit FIFO Pointer Control Register | C3TFPCR | XXh |
| 046F4Ch | CAN3 Error Interrupt Enable Register | C3EIER | 00h |
| 046F4Dh | CAN3 Error Interrupt Factor Judge Register | C3EIFR | 00h |
| 046F4Eh | CAN3 Receive Error Count Register | C3RECR | 00h |
| 046F4Fh | CAN3 Transmit Error Count Register | C3TECR | 00h |
| 046F50h | CAN3 Error Code Store Register | C3ECSR | 00h |
| 046F51h | CAN3 Channel Search Support Register | C3CSSR | XXh |
| 046F52h | CAN3 Mailbox Search Status Register | C3MSSR | 1000 0000b |
| 046F53h | CAN3 Mailbox Search Mode Register | C3MSMR | 0000 0000b |
| 046F54h | CAN3 Time Stamp Register | C3TSR | 0000h |
| 046F55h | | | |
| 046F56h | CAN3 Acceptance Filter Support Register | C3AFSR | XXXXh |
| 046F57h | | | |
| 046F58h | CAN3 Test Control Register | C3TCR | 00h |
| 046F59h | | | |
| 046F5Ah | | | |
| 046F5Bh | | | |
| 046F5Ch | | | |
| 046F5Dh | | | |
| 046F5Eh | | | |
| 046F5Fh | | | |
| 046F60h to 0473FFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.46 SFR List (46)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047400h | CAN2 Mailbox 0: Message Identifier | C2MB0 | XXXX XXXXh |
| 047401h | | | |
| 047402h | | | |
| 047403h | | | |
| 047404h | | | |
| 047405h | CAN2 Mailbox 0: Data Length | | XXh |
| 047406h | CAN2 Mailbox 0: Data Field | | XXXX XXXX |
| 047407h | | | XXXX XXXXh |
| 047408h | | | |
| 047409h | | | |
| 04740Ah | | | |
| 04740Bh | | | |
| 04740Ch | | | |
| 04740Dh | | | |
| 04740Eh | CAN2 Mailbox 0: Time Stamp | | XXXXh |
| 04740Fh | | | |
| 047410h | CAN2 Mailbox 1: Message Identifier | C2MB1 | XXXX XXXXh |
| 047411h | | | |
| 047412h | | | |
| 047413h | | | |
| 047414h | | | |
| 047415h | CAN2 Mailbox 1: Data Length | | XXh |
| 047416h | CAN2 Mailbox 1: Data Field | | XXXX XXXX |
| 047417h | | | XXXX XXXXh |
| 047418h | | | |
| 047419h | | | |
| 04741Ah | | | |
| 04741Bh | | | |
| 04741Ch | | | |
| 04741Dh | | | |
| 04741Eh | CAN2 Mailbox 1: Time Stamp | | XXXXh |
| 04741Fh | | | |
| 047420h | CAN2 Mailbox 2: Message Identifier | C2MB2 | XXXX XXXXh |
| 047421h | | | |
| 047422h | | | |
| 047423h | | | |
| 047424h | | | |
| 047425h | CAN2 Mailbox 2: Data Length | | XXh |
| 047426h | CAN2 Mailbox 2: Data Field | | XXXX XXXX |
| 047427h | | | XXXX XXXXh |
| 047428h | | | |
| 047429h | | | |
| 04742Ah | | | |
| 04742Bh | | | |
| 04742Ch | | | |
| 04742Dh | | | |
| 04742Eh | CAN2 Mailbox 2: Time Stamp | | XXXXh |
| 04742Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.47 SFR List (47)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047430h | CAN2 Mailbox 3: Message Identifier | C2MB3 | XXXX XXXXh |
| 047431h | | | |
| 047432h | | | |
| 047433h | | | |
| 047434h | | | |
| 047435h | CAN2 Mailbox 3: Data Length | | XXh |
| 047436h | CAN2 Mailbox 3: Data Field | | XXXX XXXX |
| 047437h | | | XXXX XXXXh |
| 047438h | | | |
| 047439h | | | |
| 04743Ah | | | |
| 04743Bh | | | |
| 04743Ch | | | |
| 04743Dh | | | |
| 04743Eh | CAN2 Mailbox 3: Time Stamp | | XXXXh |
| 04743Fh | | | |
| 047440h | CAN2 Mailbox 4: Message Identifier | C2MB4 | XXXX XXXXh |
| 047441h | | | |
| 047442h | | | |
| 047443h | | | |
| 047444h | | | |
| 047445h | CAN2 Mailbox 4: Data Length | | XXh |
| 047446h | CAN2 Mailbox 4: Data Field | | XXXX XXXX |
| 047447h | | | XXXX XXXXh |
| 047448h | | | |
| 047449h | | | |
| 04744Ah | | | |
| 04744Bh | | | |
| 04744Ch | | | |
| 04744Dh | | | |
| 04744Eh | CAN2 Mailbox 4: Time Stamp | | XXXXh |
| 04744Fh | | | |
| 047450h | CAN2 Mailbox 5: Message Identifier | C2MB5 | XXXX XXXXh |
| 047451h | | | |
| 047452h | | | |
| 047453h | | | |
| 047454h | | | |
| 047455h | CAN2 Mailbox 5: Data Length | | XXh |
| 047456h | CAN2 Mailbox 5: Data Field | | XXXX XXXX |
| 047457h | | | XXXX XXXXh |
| 047458h | | | |
| 047459h | | | |
| 04745Ah | | | |
| 04745Bh | | | |
| 04745Ch | | | |
| 04745Dh | | | |
| 04745Eh | CAN2 Mailbox 5: Time Stamp | | XXXXh |
| 04745Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.48 SFR List (48)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047460h | CAN2 Mailbox 6: Message Identifier | C2MB6 | XXXX XXXXh |
| 047461h | | | |
| 047462h | | | |
| 047463h | | | |
| 047464h | | | |
| 047465h | CAN2 Mailbox 6: Data Length | | XXh |
| 047466h | CAN2 Mailbox 6: Data Field | | XXXX XXXX |
| 047467h | | | XXXX XXXXh |
| 047468h | | | |
| 047469h | | | |
| 04746Ah | | | |
| 04746Bh | | | |
| 04746Ch | | | |
| 04746Dh | | | |
| 04746Eh | CAN2 Mailbox 6: Time Stamp | | XXXXh |
| 04746Fh | | | |
| 047470h | CAN2 Mailbox 7: Message Identifier | C2MB7 | XXXX XXXXh |
| 047471h | | | |
| 047472h | | | |
| 047473h | | | |
| 047474h | | | |
| 047475h | CAN2 Mailbox 7: Data Length | | XXh |
| 047476h | CAN2 Mailbox 7: Data Field | | XXXX XXXX |
| 047477h | | | XXXX XXXXh |
| 047478h | | | |
| 047479h | | | |
| 04747Ah | | | |
| 04747Bh | | | |
| 04747Ch | | | |
| 04747Dh | | | |
| 04747Eh | CAN2 Mailbox 7: Time Stamp | | XXXXh |
| 04747Fh | | | |
| 047480h | CAN2 Mailbox 8: Message Identifier | C2MB8 | XXXX XXXXh |
| 047481h | | | |
| 047482h | | | |
| 047483h | | | |
| 047484h | | | |
| 047485h | CAN2 Mailbox 8: Data Length | | XXh |
| 047486h | CAN2 Mailbox 8: Data Field | | XXXX XXXX |
| 047487h | | | XXXX XXXXh |
| 047488h | | | |
| 047489h | | | |
| 04748Ah | | | |
| 04748Bh | | | |
| 04748Ch | | | |
| 04748Dh | | | |
| 04748Eh | CAN2 Mailbox 8: Time Stamp | | XXXXh |
| 04748Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.49 SFR List (49)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047490h | CAN2 Mailbox 9: Message Identifier | C2MB9 | XXXX XXXXh |
| 047491h | | | |
| 047492h | | | |
| 047493h | | | |
| 047494h | | | |
| 047495h | CAN2 Mailbox 9: Data Length | | XXh |
| 047496h | CAN2 Mailbox 9: Data Field | | XXXX XXXX |
| 047497h | | | XXXX XXXXh |
| 047498h | | | |
| 047499h | | | |
| 04749Ah | | | |
| 04749Bh | | | |
| 04749Ch | | | |
| 04749Dh | | | |
| 04749Eh | CAN2 Mailbox 9: Time Stamp | | XXXXh |
| 04749Fh | | | |
| 0474A0h | CAN2 Mailbox 10: Message Identifier | C2MB10 | XXXX XXXXh |
| 0474A1h | | | |
| 0474A2h | | | |
| 0474A3h | | | |
| 0474A4h | | | |
| 0474A5h | CAN2 Mailbox 10: Data Length | | XXh |
| 0474A6h | CAN2 Mailbox 10: Data Field | | XXXX XXXX |
| 0474A7h | | | XXXX XXXXh |
| 0474A8h | | | |
| 0474A9h | | | |
| 0474AAh | | | |
| 0474ABh | | | |
| 0474ACh | | | |
| 0474ADh | | | |
| 0474AEh | CAN2 Mailbox 10: Time Stamp | | XXXXh |
| 0474AFh | | | |
| 0474B0h | CAN2 Mailbox 11: Message Identifier | C2MB11 | XXXX XXXXh |
| 0474B1h | | | |
| 0474B2h | | | |
| 0474B3h | | | |
| 0474B4h | | | |
| 0474B5h | CAN2 Mailbox 11: Data Length | | XXh |
| 0474B6h | CAN2 Mailbox 11: Data Field | | XXXX XXXX |
| 0474B7h | | | XXXX XXXXh |
| 0474B8h | | | |
| 0474B9h | | | |
| 0474BAh | | | |
| 0474BBh | | | |
| 0474BCh | | | |
| 0474BDh | | | |
| 0474BEh | CAN2 Mailbox 11: Time Stamp | | XXXXh |
| 0474BFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.50 SFR List (50)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0474C0h | CAN2 Mailbox 12: Message Identifier | C2MB12 | XXXX XXXXh |
| 0474C1h | | | |
| 0474C2h | | | |
| 0474C3h | | | |
| 0474C4h | | | |
| 0474C5h | CAN2 Mailbox 12: Data Length | | XXh |
| 0474C6h | CAN2 Mailbox 12: Data Field | | XXXX XXXX |
| 0474C7h | | | XXXX XXXXh |
| 0474C8h | | | |
| 0474C9h | | | |
| 0474CAh | | | |
| 0474CBh | | | |
| 0474CCh | | | |
| 0474CDh | | | |
| 0474CEh | CAN2 Mailbox 12: Time Stamp | | XXXXh |
| 0474CFh | | | |
| 0474D0h | CAN2 Mailbox 13: Message Identifier | C2MB13 | XXXX XXXXh |
| 0474D1h | | | |
| 0474D2h | | | |
| 0474D3h | | | |
| 0474D4h | | | |
| 0474D5h | CAN2 Mailbox 13: Data Length | | XXh |
| 0474D6h | CAN2 Mailbox 13: Data Field | | XXXX XXXX |
| 0474D7h | | | XXXX XXXXh |
| 0474D8h | | | |
| 0474D9h | | | |
| 0474DAh | | | |
| 0474DBh | | | |
| 0474DCh | | | |
| 0474DDh | | | |
| 0474DEh | CAN2 Mailbox 13: Time Stamp | | XXXXh |
| 0474DFh | | | |
| 0474E0h | CAN2 Mailbox 14: Message Identifier | C2MB14 | XXXX XXXXh |
| 0474E1h | | | |
| 0474E2h | | | |
| 0474E3h | | | |
| 0474E4h | | | |
| 0474E5h | CAN2 Mailbox 14: Data Length | | XXh |
| 0474E6h | CAN2 Mailbox 14: Data Field | | XXXX XXXX |
| 0474E7h | | | XXXX XXXXh |
| 0474E8h | | | |
| 0474E9h | | | |
| 0474EAh | | | |
| 0474EBh | | | |
| 0474ECh | | | |
| 0474EDh | | | |
| 0474EEh | CAN2 Mailbox 14: Time Stamp | | XXXXh |
| 0474EFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.51 SFR List (51)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0474F0h | CAN2 Mailbox 15: Message Identifier | C2MB15 | XXXX XXXXh |
| 0474F1h | | | |
| 0474F2h | | | |
| 0474F3h | | | |
| 0474F4h | | | |
| 0474F5h | CAN2 Mailbox 15: Data Length | | XXh |
| 0474F6h | CAN2 Mailbox 15: Data Field | | XXXX XXXX |
| 0474F7h | | | XXXX XXXXh |
| 0474F8h | | | |
| 0474F9h | | | |
| 0474FAh | | | |
| 0474FBh | | | |
| 0474FCh | | | |
| 0474FDh | | | |
| 0474FEh | CAN2 Mailbox 15: Time Stamp | | XXXXh |
| 0474FFh | | | |
| 047500h | CAN2 Mailbox 16: Message Identifier | C2MB16 | XXXX XXXXh |
| 047501h | | | |
| 047502h | | | |
| 047503h | | | |
| 047504h | | | |
| 047505h | CAN2 Mailbox 16: Data Length | | XXh |
| 047506h | CAN2 Mailbox 16: Data Field | | XXXX XXXX |
| 047507h | | | XXXX XXXXh |
| 047508h | | | |
| 047509h | | | |
| 04750Ah | | | |
| 04750Bh | | | |
| 04750Ch | | | |
| 04750Dh | | | |
| 04750Eh | CAN2 Mailbox 16: Time Stamp | | XXXXh |
| 04750Fh | | | |
| 047510h | CAN2 Mailbox 17: Message Identifier | C2MB17 | XXXX XXXXh |
| 047511h | | | |
| 047512h | | | |
| 047513h | | | |
| 047514h | | | |
| 047515h | CAN2 Mailbox 17: Data Length | | XXh |
| 047516h | CAN2 Mailbox 17: Data Field | | XXXX XXXX |
| 047517h | | | XXXX XXXXh |
| 047518h | | | |
| 047519h | | | |
| 04751Ah | | | |
| 04751Bh | | | |
| 04751Ch | | | |
| 04751Dh | | | |
| 04751Eh | CAN2 Mailbox 17: Time Stamp | | XXXXh |
| 04751Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.52 SFR List (52)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047520h | CAN2 Mailbox 18: Message Identifier | C2MB18 | XXXX XXXXh |
| 047521h | | | |
| 047522h | | | |
| 047523h | | | |
| 047524h | | | |
| 047525h | CAN2 Mailbox 18: Data Length | | XXh |
| 047526h | CAN2 Mailbox 18: Data Field | | XXXX XXXX |
| 047527h | | | XXXX XXXXh |
| 047528h | | | |
| 047529h | | | |
| 04752Ah | | | |
| 04752Bh | | | |
| 04752Ch | | | |
| 04752Dh | | | |
| 04752Eh | CAN2 Mailbox 18: Time Stamp | | XXXXh |
| 04752Fh | | | |
| 047530h | CAN2 Mailbox 19: Message Identifier | C2MB19 | XXXX XXXXh |
| 047531h | | | |
| 047532h | | | |
| 047533h | | | |
| 047534h | | | |
| 047535h | CAN2 Mailbox 19: Data Length | | XXh |
| 047536h | CAN2 Mailbox 19: Data Field | | XXXX XXXX |
| 047537h | | | XXXX XXXXh |
| 047538h | | | |
| 047539h | | | |
| 04753Ah | | | |
| 04753Bh | | | |
| 04753Ch | | | |
| 04753Dh | | | |
| 04753Eh | CAN2 Mailbox 19: Time Stamp | | XXXXh |
| 04753Fh | | | |
| 047540h | CAN2 Mailbox 20: Message Identifier | C2MB20 | XXXX XXXXh |
| 047541h | | | |
| 047542h | | | |
| 047543h | | | |
| 047544h | | | |
| 047545h | CAN2 Mailbox 20: Data Length | | XXh |
| 047546h | CAN2 Mailbox 20: Data Field | | XXXX XXXX |
| 047547h | | | XXXX XXXXh |
| 047548h | | | |
| 047549h | | | |
| 04754Ah | | | |
| 04754Bh | | | |
| 04754Ch | | | |
| 04754Dh | | | |
| 04754Eh | CAN2 Mailbox 20: Time Stamp | | XXXXh |
| 04754Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.53 SFR List (53)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047550h | CAN2 Mailbox 21: Message Identifier | C2MB21 | XXXX XXXXh |
| 047551h | | | |
| 047552h | | | |
| 047553h | | | |
| 047554h | | | |
| 047555h | CAN2 Mailbox 21: Data Length | | XXh |
| 047556h | CAN2 Mailbox 21: Data Field | | XXXX XXXX |
| 047557h | | | XXXX XXXXh |
| 047558h | | | |
| 047559h | | | |
| 04755Ah | | | |
| 04755Bh | | | |
| 04755Ch | | | |
| 04755Dh | | | |
| 04755Eh | CAN2 Mailbox 21: Time Stamp | | XXXXh |
| 04755Fh | | | |
| 047560h | CAN2 Mailbox 22: Identifier | C2MB22 | XXXX XXXXh |
| 047561h | | | |
| 047562h | | | |
| 047563h | | | |
| 047564h | | | |
| 047565h | CAN2 Mailbox 22: Data Length | | XXh |
| 047566h | CAN2 Mailbox 22: Data Field | | XXXX XXXX |
| 047567h | | | XXXX XXXXh |
| 047568h | | | |
| 047569h | | | |
| 04756Ah | | | |
| 04756Bh | | | |
| 04756Ch | | | |
| 04756Dh | | | |
| 04756Eh | CAN2 Mailbox 22: Time Stamp | | XXXXh |
| 04756Fh | | | |
| 047570h | CAN2 Mailbox 23: Message Identifier | C2MB23 | XXXX XXXXh |
| 047571h | | | |
| 047572h | | | |
| 047573h | | | |
| 047574h | | | |
| 047575h | CAN2 Mailbox 23: Data Length | | XXh |
| 047576h | CAN2 Mailbox 23: Data Field | | XXXX XXXX |
| 047577h | | | XXXX XXXXh |
| 047578h | | | |
| 047579h | | | |
| 04757Ah | | | |
| 04757Bh | | | |
| 04757Ch | | | |
| 04757Dh | | | |
| 04757Eh | CAN2 Mailbox 23: Time Stamp | | XXXXh |
| 04757Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.54 SFR List (54)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047580h | CAN2 Mailbox 24: Message Identifier | C2MB24 | XXXX XXXXh |
| 047581h | | | |
| 047582h | | | |
| 047583h | | | |
| 047584h | | | |
| 047585h | CAN2 Mailbox 24: Data Length | | XXh |
| 047586h | CAN2 Mailbox 24: Data Field | | XXXX XXXX |
| 047587h | | | XXXX XXXXh |
| 047588h | | | |
| 047589h | | | |
| 04758Ah | | | |
| 04758Bh | | | |
| 04758Ch | | | |
| 04758Dh | | | |
| 04758Eh | CAN2 Mailbox 24: Time Stamp | | XXXXh |
| 04758Fh | | | |
| 047590h | CAN2 Mailbox 25: Message Identifier | C2MB25 | XXXX XXXXh |
| 047591h | | | |
| 047592h | | | |
| 047593h | | | |
| 047594h | | | |
| 047595h | CAN2 Mailbox 25: Data Length | | XXh |
| 047596h | CAN2 Mailbox 25: Data Field | | XXXX XXXX |
| 047597h | | | XXXX XXXXh |
| 047598h | | | |
| 047599h | | | |
| 04759Ah | | | |
| 04759Bh | | | |
| 04759Ch | | | |
| 04759Dh | | | |
| 04759Eh | CAN2 Mailbox 25: Time Stamp | | XXXXh |
| 04759Fh | | | |
| 0475A0h | CAN2 Mailbox 26: Message Identifier | C2MB26 | XXXX XXXXh |
| 0475A1h | | | |
| 0475A2h | | | |
| 0475A3h | | | |
| 0475A4h | | | |
| 0475A5h | CAN2 Mailbox 26: Data Length | | XXh |
| 0475A6h | CAN2 Mailbox 26: Data Field | | XXXX XXXX |
| 0475A7h | | | XXXX XXXXh |
| 0475A8h | | | |
| 0475A9h | | | |
| 0475AAh | | | |
| 0475ABh | | | |
| 0475ACh | | | |
| 0475ADh | | | |
| 0475AEh | CAN2 Mailbox 26: Time Stamp | | XXXXh |
| 0475AFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.55 SFR List (55)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0475B0h | CAN2 Mailbox 27: Message Identifier | C2MB27 | XXXX XXXXh |
| 0475B1h | | | |
| 0475B2h | | | |
| 0475B3h | | | |
| 0475B4h | | | |
| 0475B5h | CAN2 Mailbox 27: Data Length | | XXh |
| 0475B6h | CAN2 Mailbox 27: Data Field | | XXXX XXXX |
| 0475B7h | | | XXXX XXXXh |
| 0475B8h | | | |
| 0475B9h | | | |
| 0475BAh | | | |
| 0475BBh | | | |
| 0475BCh | | | |
| 0475BDh | | | |
| 0475BEh | CAN2 Mailbox 27: Time Stamp | | XXXXh |
| 0475BFh | | | |
| 0475C0h | CAN2 Mailbox 28: Message Identifier | C2MB28 | XXXX XXXXh |
| 0475C1h | | | |
| 0475C2h | | | |
| 0475C3h | | | |
| 0475C4h | | | |
| 0475C5h | CAN2 Mailbox 28: Data Length | | XXh |
| 0475C6h | CAN2 Mailbox 28: Data Field | | XXXX XXXX |
| 0475C7h | | | XXXX XXXXh |
| 0475C8h | | | |
| 0475C9h | | | |
| 0475CAh | | | |
| 0475CBh | | | |
| 0475CCh | | | |
| 0475CDh | | | |
| 0475CEh | CAN2 Mailbox 28: Time Stamp | | XXXXh |
| 0475CFh | | | |
| 0475D0h | CAN2 Mailbox 29: Message Identifier | C2MB29 | XXXX XXXXh |
| 0475D1h | | | |
| 0475D2h | | | |
| 0475D3h | | | |
| 0475D4h | | | |
| 0475D5h | CAN2 Mailbox 29: Data Length | | XXh |
| 0475D6h | CAN2 Mailbox 29: Data Field | | XXXX XXXX |
| 0475D7h | | | XXXX XXXXh |
| 0475D8h | | | |
| 0475D9h | | | |
| 0475DAh | | | |
| 0475DBh | | | |
| 0475DCh | | | |
| 0475DDh | | | |
| 0475DEh | CAN2 Mailbox 29: Time Stamp | | XXXXh |
| 0475DFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.56 SFR List (56)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0475E0h | CAN2 Mailbox 30: Message Identifier | C2MB30 | XXXX XXXXh |
| 0475E1h | | | |
| 0475E2h | | | |
| 0475E3h | | | |
| 0475E4h | | | |
| 0475E5h | CAN2 Mailbox 30: Data Length | | XXh |
| 0475E6h | CAN2 Mailbox 30: Data Field | | XXXX XXXX |
| 0475E7h | | | XXXX XXXXh |
| 0475E8h | | | |
| 0475E9h | | | |
| 0475EAh | | | |
| 0475EBh | | | |
| 0475ECh | | | |
| 0475EDh | | | |
| 0475EEh | CAN2 Mailbox 30: Time Stamp | | XXXXh |
| 0475EFh | | | |
| 0475F0h | CAN2 Mailbox 31: Message Identifier | C2MB31 | XXXX XXXXh |
| 0475F1h | | | |
| 0475F2h | | | |
| 0475F3h | | | |
| 0475F4h | | | |
| 0475F5h | CAN2 Mailbox 31: Data Length | | XXh |
| 0475F6h | CAN2 Mailbox 31: Data Field | | XXXX XXXX |
| 0475F7h | | | XXXX XXXXh |
| 0475F8h | | | |
| 0475F9h | | | |
| 0475FAh | | | |
| 0475FBh | | | |
| 0475FCh | | | |
| 0475FDh | | | |
| 0475FEh | CAN2 Mailbox 31: Time Stamp | | XXXXh |
| 0475FFh | | | |
| 047600h | CAN2 Mask Register 0 | C2MKR0 | XXXX XXXXh |
| 047601h | | | |
| 047602h | | | |
| 047603h | | | |
| 047604h | CAN2 Mask Register 1 | C2MKR1 | XXXX XXXXh |
| 047605h | | | |
| 047606h | | | |
| 047607h | | | |
| 047608h | CAN2 Mask Register 2 | C2MKR2 | XXXX XXXXh |
| 047609h | | | |
| 04760Ah | | | |
| 04760Bh | | | |
| 04760Ch | CAN2 Mask Register 3 | C2MKR3 | XXXX XXXXh |
| 04760Dh | | | |
| 04760Eh | | | |
| 04760Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.57 SFR List (57)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047610h | CAN2 Mask Register 4 | C2MKR4 | XXXX XXXXh |
| 047611h | | | |
| 047612h | | | |
| 047613h | | | |
| 047614h | CAN2 Mask Register 5 | C2MKR5 | XXXX XXXXh |
| 047615h | | | |
| 047616h | | | |
| 047617h | | | |
| 047618h | CAN2 Mask Register 6 | C2MKR6 | XXXX XXXXh |
| 047619h | | | |
| 04761Ah | | | |
| 04761Bh | | | |
| 04761Ch | CAN2 Mask Register 7 | C2MKR7 | XXXX XXXXh |
| 04761Dh | | | |
| 04761Eh | | | |
| 04761Fh | | | |
| 047620h | CAN2 FIFO Received ID Compare Register 0 | C2FIDCR0 | XXXX XXXXh |
| 047621h | | | |
| 047622h | | | |
| 047623h | | | |
| 047624h | CAN2 FIFO Received ID Compare Register 1 | C2FIDCR1 | XXXX XXXXh |
| 047625h | | | |
| 047626h | | | |
| 047627h | | | |
| 047628h | CAN2 Mask Invalid Register | C2MKIVLR | XXXX XXXXh |
| 047629h | | | |
| 04762Ah | | | |
| 04762Bh | | | |
| 04762Ch | CAN2 Mailbox Interrupt Enable Register | C2MIER | XXXX XXXXh |
| 04762Dh | | | |
| 04762Eh | | | |
| 04762Fh | | | |
| 047630h | | | |
| 047631h | | | |
| 047632h | | | |
| 047633h | | | |
| 047634h | | | |
| 047635h | | | |
| 047636h | | | |
| 047637h | | | |
| 047638h | | | |
| 047639h | | | |
| 04763Ah | | | |
| 04763Bh | | | |
| 04763Ch | | | |
| 04763Dh | | | |
| 04763Eh | | | |
| 04763Fh | | | |
| 047640h to 04771Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.58 SFR List (58)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047720h | CAN2 Message Control Register 0 | C2MCTL0 | 00h |
| 047721h | CAN2 Message Control Register 1 | C2MCTL1 | 00h |
| 047722h | CAN2 Message Control Register 2 | C2MCTL2 | 00h |
| 047723h | CAN2 Message Control Register 3 | C2MCTL3 | 00h |
| 047724h | CAN2 Message Control Register 4 | C2MCTL4 | 00h |
| 047725h | CAN2 Message Control Register 5 | C2MCTL5 | 00h |
| 047726h | CAN2 Message Control Register 6 | C2MCTL6 | 00h |
| 047727h | CAN2 Message Control Register 7 | C2MCTL7 | 00h |
| 047728h | CAN2 Message Control Register 8 | C2MCTL8 | 00h |
| 047729h | CAN2 Message Control Register 9 | C2MCTL9 | 00h |
| 04772Ah | CAN2 Message Control Register 10 | C2MCTL10 | 00h |
| 04772Bh | CAN2 Message Control Register 11 | C2MCTL11 | 00h |
| 04772Ch | CAN2 Message Control Register 12 | C2MCTL12 | 00h |
| 04772Dh | CAN2 Message Control Register 13 | C2MCTL13 | 00h |
| 04772Eh | CAN2 Message Control Register 14 | C2MCTL14 | 00h |
| 04772Fh | CAN2 Message Control Register 15 | C2MCTL15 | 00h |
| 047730h | CAN2 Message Control Register 16 | C2MCTL16 | 00h |
| 047731h | CAN2 Message Control Register 17 | C2MCTL17 | 00h |
| 047732h | CAN2 Message Control Register 18 | C2MCTL18 | 00h |
| 047733h | CAN2 Message Control Register 19 | C2MCTL19 | 00h |
| 047734h | CAN2 Message Control Register 20 | C2MCTL20 | 00h |
| 047735h | CAN2 Message Control Register 21 | C2MCTL21 | 00h |
| 047736h | CAN2 Message Control Register 22 | C2MCTL22 | 00h |
| 047737h | CAN2 Message Control Register 23 | C2MCTL23 | 00h |
| 047738h | CAN2 Message Control Register 24 | C2MCTL24 | 00h |
| 047739h | CAN2 Message Control Register 25 | C2MCTL25 | 00h |
| 04773Ah | CAN2 Message Control Register 26 | C2MCTL26 | 00h |
| 04773Bh | CAN2 Message Control Register 27 | C2MCTL27 | 00h |
| 04773Ch | CAN2 Message Control Register 28 | C2MCTL28 | 00h |
| 04773Dh | CAN2 Message Control Register 29 | C2MCTL29 | 00h |
| 04773Eh | CAN2 Message Control Register 30 | C2MCTL30 | 00h |
| 04773Fh | CAN2 Message Control Register 31 | C2MCTL31 | 00h |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.59 SFR List (59)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047740h | CAN2 Control Register | C2CTLR | 0000 0101b |
| 047741h | | | 0000 0000b |
| 047742h | CAN2 Status Register | C2STR | 0000 0101b |
| 047743h | | | 0000 0000b |
| 047744h | CAN2 Bit Configuration Register | C2BCR | 00 0000h |
| 047745h | | | |
| 047746h | | | |
| 047747h | CAN2 Clock Select Register | C2CLKR | 000X 0000b |
| 047748h | CAN2 Receive FIFO Control Register | C2RFCR | 1000 0000b |
| 047749h | CAN2 Receive FIFO Pointer Control Register | C2RFPCR | XXh |
| 04774Ah | CAN2 Transmit FIFO Control Register | C2TFCR | 1000 0000b |
| 04774Bh | CAN2 Transmit FIFO Pointer Control Register | C2TFPCR | XXh |
| 04774Ch | CAN2 Error Interrupt Enable Register | C2EIER | 00h |
| 04774Dh | CAN2 Error Interrupt Factor Judge Register | C2EIFR | 00h |
| 04774Eh | CAN2 Receive Error Count Register | C2RECR | 00h |
| 04774Fh | CAN2 Transmit Error Count Register | C2TECR | 00h |
| 047750h | CAN2 Error Code Store Register | C2ECSR | 00h |
| 047751h | CAN2 Channel Search Support Register | C2CSSR | XXh |
| 047752h | CAN2 Mailbox Search Status Register | C2MSSR | 1000 0000b |
| 047753h | CAN2 Mailbox Search Mode Register | C2MSMR | 0000 0000b |
| 047754h | CAN2 Time Stamp Register | C2TSR | 0000h |
| 047755h | | | |
| 047756h | CAN2 Acceptance Filter Support Register | C2AFSR | XXXXh |
| 047757h | | | |
| 047758h | CAN2 Test Control Register | C2TCR | 00h |
| 047759h | | | |
| 04775Ah | | | |
| 04775Bh | | | |
| 04775Ch | | | |
| 04775Dh | | | |
| 04775Eh | | | |
| 04775Fh | | | |
| 047760h to 0477FFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.60 SFR List (60)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047800h | CAN1 Mailbox 0: Message Identifier | C1MB0 | XXXX XXXXh |
| 047801h | | | |
| 047802h | | | |
| 047803h | | | |
| 047804h | | | |
| 047805h | CAN1 Mailbox 0: Data Length | | XXh |
| 047806h | CAN1 Mailbox 0: Data Field | | XXXX XXXX |
| 047807h | | | XXXX XXXXh |
| 047808h | | | |
| 047809h | | | |
| 04780Ah | | | |
| 04780Bh | | | |
| 04780Ch | | | |
| 04780Dh | | | |
| 04780Eh | CAN1 Mailbox 0: Time Stamp | | XXXXh |
| 04780Fh | | | |
| 047810h | CAN1 Mailbox 1: Message Identifier | C1MB1 | XXXX XXXXh |
| 047811h | | | |
| 047812h | | | |
| 047813h | | | |
| 047814h | | | |
| 047815h | CAN1 Mailbox 1: Data Length | | XXh |
| 047816h | CAN1 Mailbox 1: Data Field | | XXXX XXXX |
| 047817h | | | XXXX XXXXh |
| 047818h | | | |
| 047819h | | | |
| 04781Ah | | | |
| 04781Bh | | | |
| 04781Ch | | | |
| 04781Dh | | | |
| 04781Eh | CAN1 Mailbox 1: Time Stamp | | XXXXh |
| 04781Fh | | | |
| 047820h | CAN1 Mailbox 2: Message Identifier | C1MB2 | XXXX XXXXh |
| 047821h | | | |
| 047822h | | | |
| 047823h | | | |
| 047824h | | | |
| 047825h | CAN1 Mailbox 2: Data Length | | XXh |
| 047826h | CAN1 Mailbox 2: Data Field | | XXXX XXXX |
| 047827h | | | XXXX XXXXh |
| 047828h | | | |
| 047829h | | | |
| 04782Ah | | | |
| 04782Bh | | | |
| 04782Ch | | | |
| 04782Dh | | | |
| 04782Eh | CAN1 Mailbox 2: Time Stamp | | XXXXh |
| 04782Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.61 SFR List (61)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047830h | CAN1 Mailbox 3: Message Identifier | C1MB3 | XXXX XXXXh |
| 047831h | | | |
| 047832h | | | |
| 047833h | | | |
| 047834h | | | |
| 047835h | CAN1 Mailbox 3: Data Length | | XXh |
| 047836h | CAN1 Mailbox 3: Data Field | | XXXX XXXX |
| 047837h | | | XXXX XXXXh |
| 047838h | | | |
| 047839h | | | |
| 04783Ah | | | |
| 04783Bh | | | |
| 04783Ch | | | |
| 04783Dh | | | |
| 04783Eh | CAN1 Mailbox 3: Time Stamp | | XXXXh |
| 04783Fh | | | |
| 047840h | CAN1 Mailbox 4: Message Identifier | C1MB4 | XXXX XXXXh |
| 047841h | | | |
| 047842h | | | |
| 047843h | | | |
| 047844h | | | |
| 047845h | CAN1 Mailbox 4: Data Length | | XXh |
| 047846h | CAN1 Mailbox 4: Data Field | | XXXX XXXX |
| 047847h | | | XXXX XXXXh |
| 047848h | | | |
| 047849h | | | |
| 04784Ah | | | |
| 04784Bh | | | |
| 04784Ch | | | |
| 04784Dh | | | |
| 04784Eh | CAN1 Mailbox 4: Time Stamp | | XXXXh |
| 04784Fh | | | |
| 047850h | CAN1 Mailbox 5: Message Identifier | C1MB5 | XXXX XXXXh |
| 047851h | | | |
| 047852h | | | |
| 047853h | | | |
| 047854h | | | |
| 047855h | CAN1 Mailbox 5: Data Length | | XXh |
| 047856h | CAN1 Mailbox 5: Data Field | | XXXX XXXX |
| 047857h | | | XXXX XXXXh |
| 047858h | | | |
| 047859h | | | |
| 04785Ah | | | |
| 04785Bh | | | |
| 04785Ch | | | |
| 04785Dh | | | |
| 04785Eh | CAN1 Mailbox 5: Time Stamp | | XXXXh |
| 04785Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.62 SFR List (62)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047860h | CAN1 Mailbox 6: Message Identifier | C1MB6 | XXXX XXXXh |
| 047861h | | | |
| 047862h | | | |
| 047863h | | | |
| 047864h | | | |
| 047865h | CAN1 Mailbox 6: Data Length | | XXh |
| 047866h | CAN1 Mailbox 6: Data Field | | XXXX XXXX |
| 047867h | | | XXXX XXXXh |
| 047868h | | | |
| 047869h | | | |
| 04786Ah | | | |
| 04786Bh | | | |
| 04786Ch | | | |
| 04786Dh | | | |
| 04786Eh | CAN1 Mailbox 6: Time Stamp | | XXXXh |
| 04786Fh | | | |
| 047870h | CAN1 Mailbox 7: Message Identifier | C1MB7 | XXXX XXXXh |
| 047871h | | | |
| 047872h | | | |
| 047873h | | | |
| 047874h | | | |
| 047875h | CAN1 Mailbox 7: Data Length | | XXh |
| 047876h | CAN1 Mailbox 7: Data Field | | XXXX XXXX |
| 047877h | | | XXXX XXXXh |
| 047878h | | | |
| 047879h | | | |
| 04787Ah | | | |
| 04787Bh | | | |
| 04787Ch | | | |
| 04787Dh | | | |
| 04787Eh | CAN1 Mailbox 7: Time Stamp | | XXXXh |
| 04787Fh | | | |
| 047880h | CAN1 Mailbox 8: Message Identifier | C1MB8 | XXXX XXXXh |
| 047881h | | | |
| 047882h | | | |
| 047883h | | | |
| 047884h | | | |
| 047885h | CAN1 Mailbox 8: Data Length | | XXh |
| 047886h | CAN1 Mailbox 8: Data Field | | XXXX XXXX |
| 047887h | | | XXXX XXXXh |
| 047888h | | | |
| 047889h | | | |
| 04788Ah | | | |
| 04788Bh | | | |
| 04788Ch | | | |
| 04788Dh | | | |
| 04788Eh | CAN1 Mailbox 8: Time Stamp | | XXXXh |
| 04788Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.63 SFR List (63)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047890h | CAN1 Mailbox 9: Message Identifier | C1MB9 | XXXX XXXXh |
| 047891h | | | |
| 047892h | | | |
| 047893h | | | |
| 047894h | | | |
| 047895h | CAN1 Mailbox 9: Data Length | | XXh |
| 047896h | CAN1 Mailbox 9: Data Field | | XXXX XXXX |
| 047897h | | | XXXX XXXXh |
| 047898h | | | |
| 047899h | | | |
| 04789Ah | | | |
| 04789Bh | | | |
| 04789Ch | | | |
| 04789Dh | | | |
| 04789Eh | CAN1 Mailbox 9: Time Stamp | | XXXXh |
| 04789Fh | | | |
| 0478A0h | CAN1 Mailbox 10: Message Identifier | C1MB10 | XXXX XXXXh |
| 0478A1h | | | |
| 0478A2h | | | |
| 0478A3h | | | |
| 0478A4h | | | |
| 0478A5h | CAN1 Mailbox 10: Data Length | | XXh |
| 0478A6h | CAN1 Mailbox 10: Data Field | | XXXX XXXX |
| 0478A7h | | | XXXX XXXXh |
| 0478A8h | | | |
| 0478A9h | | | |
| 0478AAh | | | |
| 0478ABh | | | |
| 0478ACh | | | |
| 0478ADh | | | |
| 0478AEh | CAN1 Mailbox 10: Time Stamp | | XXXXh |
| 0478AFh | | | |
| 0478B0h | CAN1 Mailbox 11: Message Identifier | C1MB11 | XXXX XXXXh |
| 0478B1h | | | |
| 0478B2h | | | |
| 0478B3h | | | |
| 0478B4h | | | |
| 0478B5h | CAN1 Mailbox 11: Data Length | | XXh |
| 0478B6h | CAN1 Mailbox 11: Data Field | | XXXX XXXX |
| 0478B7h | | | XXXX XXXXh |
| 0478B8h | | | |
| 0478B9h | | | |
| 0478BAh | | | |
| 0478BBh | | | |
| 0478BCh | | | |
| 0478BDh | | | |
| 0478BEh | CAN1 Mailbox 11: Time Stamp | | XXXXh |
| 0478BFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.64 SFR List (64)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0478C0h | CAN1 Mailbox 12: Message Identifier | C1MB12 | XXXX XXXXh |
| 0478C1h | | | |
| 0478C2h | | | |
| 0478C3h | | | |
| 0478C4h | | | |
| 0478C5h | CAN1 Mailbox 12: Data Length | | XXh |
| 0478C6h | CAN1 Mailbox 12: Data Field | | XXXX XXXX |
| 0478C7h | | | XXXX XXXXh |
| 0478C8h | | | |
| 0478C9h | | | |
| 0478CAh | | | |
| 0478CBh | | | |
| 0478CCh | | | |
| 0478CDh | | | |
| 0478CEh | CAN1 Mailbox 12: Time Stamp | | XXXXh |
| 0478CFh | | | |
| 0478D0h | CAN1 Mailbox 13: Message Identifier | C1MB13 | XXXX XXXXh |
| 0478D1h | | | |
| 0478D2h | | | |
| 0478D3h | | | |
| 0478D4h | | | |
| 0478D5h | CAN1 Mailbox 13: Data Length | | XXh |
| 0478D6h | CAN1 Mailbox 13: Data Field | | XXXX XXXX |
| 0478D7h | | | XXXX XXXXh |
| 0478D8h | | | |
| 0478D9h | | | |
| 0478DAh | | | |
| 0478DBh | | | |
| 0478DCh | | | |
| 0478DDh | | | |
| 0478DEh | CAN1 Mailbox 13: Time Stamp | | XXXXh |
| 0478DFh | | | |
| 0478E0h | CAN1 Mailbox 14: Message Identifier | C1MB14 | XXXX XXXXh |
| 0478E1h | | | |
| 0478E2h | | | |
| 0478E3h | | | |
| 0478E4h | | | |
| 0478E5h | CAN1 Mailbox 14: Data Length | | XXh |
| 0478E6h | CAN1 Mailbox 14: Data Field | | XXXX XXXX |
| 0478E7h | | | XXXX XXXXh |
| 0478E8h | | | |
| 0478E9h | | | |
| 0478EAh | | | |
| 0478EBh | | | |
| 0478ECh | | | |
| 0478EDh | | | |
| 0478EEh | CAN1 Mailbox 14: Time Stamp | | XXXXh |
| 0478EFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.65 SFR List (65)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0478F0h | CAN1 Mailbox 15: Message Identifier | C1MB15 | XXXX XXXXh |
| 0478F1h | | | |
| 0478F2h | | | |
| 0478F3h | | | |
| 0478F4h | | | |
| 0478F5h | CAN1 Mailbox 15: Data Length | | XXh |
| 0478F6h | CAN1 Mailbox 15: Data Field | | XXXX XXXX |
| 0478F7h | | | XXXX XXXXh |
| 0478F8h | | | |
| 0478F9h | | | |
| 0478FAh | | | |
| 0478FBh | | | |
| 0478FCh | | | |
| 0478FDh | | | |
| 0478FEh | CAN1 Mailbox 15: Time Stamp | | XXXXh |
| 0478FFh | | | |
| 047900h | CAN1 Mailbox 16: Message Identifier | C1MB16 | XXXX XXXXh |
| 047901h | | | |
| 047902h | | | |
| 047903h | | | |
| 047904h | | | |
| 047905h | CAN1 Mailbox 16: Data Length | | XXh |
| 047906h | CAN1 Mailbox 16: Data Field | | XXXX XXXX |
| 047907h | | | XXXX XXXXh |
| 047908h | | | |
| 047909h | | | |
| 04790Ah | | | |
| 04790Bh | | | |
| 04790Ch | | | |
| 04790Dh | | | |
| 04790Eh | CAN1 Mailbox 16: Time Stamp | | XXXXh |
| 04790Fh | | | |
| 047910h | CAN1 Mailbox 17: Message Identifier | C1MB17 | XXXX XXXXh |
| 047911h | | | |
| 047912h | | | |
| 047913h | | | |
| 047914h | | | |
| 047915h | CAN1 Mailbox 17: Data Length | | XXh |
| 047916h | CAN1 Mailbox 17: Data Field | | XXXX XXXX |
| 047917h | | | XXXX XXXXh |
| 047918h | | | |
| 047919h | | | |
| 04791Ah | | | |
| 04791Bh | | | |
| 04791Ch | | | |
| 04791Dh | | | |
| 04791Eh | CAN1 Mailbox 17: Time Stamp | | XXXXh |
| 04791Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.66 SFR List (66)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047920h | CAN1 Mailbox 18: Message Identifier | C1MB18 | XXXX XXXXh |
| 047921h | | | |
| 047922h | | | |
| 047923h | | | |
| 047924h | | | |
| 047925h | CAN1 Mailbox 18: Data Length | | XXh |
| 047926h | CAN1 Mailbox 18: Data Field | | XXXX XXXX |
| 047927h | | | XXXX XXXXh |
| 047928h | | | |
| 047929h | | | |
| 04792Ah | | | |
| 04792Bh | | | |
| 04792Ch | | | |
| 04792Dh | | | |
| 04792Eh | CAN1 Mailbox18: Time Stamp | | XXXXh |
| 04792Fh | | | |
| 047930h | CAN1 Mailbox 19: Message Identifier | C1MB19 | XXXX XXXXh |
| 047931h | | | |
| 047932h | | | |
| 047933h | | | |
| 047934h | | | |
| 047935h | CAN1 Mailbox 19: Data Length | | XXh |
| 047936h | CAN1 Mailbox 19: Data Field | | XXXX XXXX |
| 047937h | | | XXXX XXXXh |
| 047938h | | | |
| 047939h | | | |
| 04793Ah | | | |
| 04793Bh | | | |
| 04793Ch | | | |
| 04793Dh | | | |
| 04793Eh | CAN1 Mailbox 19: Time Stamp | | XXXXh |
| 04793Fh | | | |
| 047940h | CAN1 Mailbox 20: Message Identifier | C1MB20 | XXXX XXXXh |
| 047941h | | | |
| 047942h | | | |
| 047943h | | | |
| 047944h | | | |
| 047945h | CAN1 Mailbox 20: Data Length | | XXh |
| 047946h | CAN1 Mailbox 20: Data Field | | XXXX XXXX |
| 047947h | | | XXXX XXXXh |
| 047948h | | | |
| 047949h | | | |
| 04794Ah | | | |
| 04794Bh | | | |
| 04794Ch | | | |
| 04794Dh | | | |
| 04794Eh | CAN1 Mailbox 20: Time Stamp | | XXXXh |
| 04794Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.67 SFR List (67)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047950h | CAN1 Mailbox 21: Message Identifier | C1MB21 | XXXX XXXXh |
| 047951h | | | |
| 047952h | | | |
| 047953h | | | |
| 047954h | | | |
| 047955h | CAN1 Mailbox 21: Data Length | | XXh |
| 047956h | CAN1 Mailbox 21: Data Field | | XXXX XXXX |
| 047957h | | | XXXX XXXXh |
| 047958h | | | |
| 047959h | | | |
| 04795Ah | | | |
| 04795Bh | | | |
| 04795Ch | | | |
| 04795Dh | | | |
| 04795Eh | CAN1 Mailbox 21: Time Stamp | | XXXXh |
| 04795Fh | | | |
| 047960h | CAN1 Mailbox 22: Identifier | C1MB22 | XXXX XXXXh |
| 047961h | | | |
| 047962h | | | |
| 047963h | | | |
| 047964h | | | |
| 047965h | CAN1 Mailbox 22: Data Length | | XXh |
| 047966h | CAN1 Mailbox 22: Data Field | | XXXX XXXX |
| 047967h | | | XXXX XXXXh |
| 047968h | | | |
| 047969h | | | |
| 04796Ah | | | |
| 04796Bh | | | |
| 04796Ch | | | |
| 04796Dh | | | |
| 04796Eh | CAN1 Mailbox 22: Time Stamp | | XXXXh |
| 04796Fh | | | |
| 047970h | CAN1 Mailbox 23: Message Identifier | C1MB23 | XXXX XXXXh |
| 047971h | | | |
| 047972h | | | |
| 047973h | | | |
| 047974h | | | |
| 047975h | CAN1 Mailbox 23: Data Length | | XXh |
| 047976h | CAN1 Mailbox 23: Data Field | | XXXX XXXX |
| 047977h | | | XXXX XXXXh |
| 047978h | | | |
| 047979h | | | |
| 04797Ah | | | |
| 04797Bh | | | |
| 04797Ch | | | |
| 04797Dh | | | |
| 04797Eh | CAN1 Mailbox 23: Time Stamp | | XXXXh |
| 04797Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.68 SFR List (68)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047980h | CAN1 Mailbox 24: Message Identifier | C1MB24 | XXXX XXXXh |
| 047981h | | | |
| 047982h | | | |
| 047983h | | | |
| 047984h | | | |
| 047985h | CAN1 Mailbox 24: Data Length | | XXh |
| 047986h | CAN1 Mailbox 24: Data Field | | XXXX XXXX |
| 047987h | | | XXXX XXXXh |
| 047988h | | | |
| 047989h | | | |
| 04798Ah | | | |
| 04798Bh | | | |
| 04798Ch | | | |
| 04798Dh | | | |
| 04798Eh | CAN1 Mailbox 24: Time Stamp | | XXXXh |
| 04798Fh | | | |
| 047990h | CAN1 Mailbox 25: Message Identifier | C1MB25 | XXXX XXXXh |
| 047991h | | | |
| 047992h | | | |
| 047993h | | | |
| 047994h | | | |
| 047995h | CAN1 Mailbox 25: Data Length | | XXh |
| 047996h | CAN1 Mailbox 25: Data Field | | XXXX XXXX |
| 047997h | | | XXXX XXXXh |
| 047998h | | | |
| 047999h | | | |
| 04799Ah | | | |
| 04799Bh | | | |
| 04799Ch | | | |
| 04799Dh | | | |
| 04799Eh | CAN1 Mailbox 25: Time Stamp | | XXXXh |
| 04799Fh | | | |
| 0479A0h | CAN1 Mailbox 26: Message Identifier | C1MB26 | XXXX XXXXh |
| 0479A1h | | | |
| 0479A2h | | | |
| 0479A3h | | | |
| 0479A4h | | | |
| 0479A5h | CAN1 Mailbox 26: Data Length | | XXh |
| 0479A6h | CAN1 Mailbox 26: Data Field | | XXXX XXXX |
| 0479A7h | | | XXXX XXXXh |
| 0479A8h | | | |
| 0479A9h | | | |
| 0479AAh | | | |
| 0479ABh | | | |
| 0479ACh | | | |
| 0479ADh | | | |
| 0479AEh | CAN1 Mailbox 26: Time Stamp | | XXXXh |
| 0479AFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.69 SFR List (69)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0479B0h | CAN1 Mailbox 27: Message Identifier | C1MB27 | XXXX XXXXh |
| 0479B1h | | | |
| 0479B2h | | | |
| 0479B3h | | | |
| 0479B4h | | | |
| 0479B5h | CAN1 Mailbox 27: Data Length | | XXh |
| 0479B6h | CAN1 Mailbox 27: Data Field | | XXXX XXXX |
| 0479B7h | | | XXXX XXXXh |
| 0479B8h | | | |
| 0479B9h | | | |
| 0479BAh | | | |
| 0479BBh | | | |
| 0479BCh | | | |
| 0479BDh | | | |
| 0479BEh | CAN1 Mailbox 27: Time Stamp | | XXXXh |
| 0479BFh | | | |
| 0479C0h | CAN1 Mailbox 28: Message Identifier | C1MB28 | XXXX XXXXh |
| 0479C1h | | | |
| 0479C2h | | | |
| 0479C3h | | | |
| 0479C4h | | | |
| 0479C5h | CAN1 Mailbox 28: Data Length | | XXh |
| 0479C6h | CAN1 Mailbox 28: Data Field | | XXXX XXXX |
| 0479C7h | | | XXXX XXXXh |
| 0479C8h | | | |
| 0479C9h | | | |
| 0479CAh | | | |
| 0479CBh | | | |
| 0479CCh | | | |
| 0479CDh | | | |
| 0479CEh | CAN1 Mailbox 28: Time Stamp | | XXXXh |
| 0479CFh | | | |
| 0479D0h | CAN1 Mailbox 29: Message Identifier | C1MB29 | XXXX XXXXh |
| 0479D1h | | | |
| 0479D2h | | | |
| 0479D3h | | | |
| 0479D4h | | | |
| 0479D5h | CAN1 Mailbox 29: Data Length | | XXh |
| 0479D6h | CAN1 Mailbox 29: Data Field | | XXXX XXXX |
| 0479D7h | | | XXXX XXXXh |
| 0479D8h | | | |
| 0479D9h | | | |
| 0479DAh | | | |
| 0479DBh | | | |
| 0479DCh | | | |
| 0479DDh | | | |
| 0479DEh | CAN1 Mailbox 29: Time Stamp | | XXXXh |
| 0479DFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.70 SFR List (70)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 0479E0h | CAN1 Mailbox 30: Message Identifier | C1MB30 | XXXX XXXXh |
| 0479E1h | | | |
| 0479E2h | | | |
| 0479E3h | | | |
| 0479E4h | | | |
| 0479E5h | CAN1 Mailbox 30: Data Length | | XXh |
| 0479E6h | CAN1 Mailbox 30: Data Field | | XXXX XXXX |
| 0479E7h | | | XXXX XXXXh |
| 0479E8h | | | |
| 0479E9h | | | |
| 0479EAh | | | |
| 0479EBh | | | |
| 0479ECh | | | |
| 0479EDh | | | |
| 0479EEh | CAN1 Mailbox 30: Time Stamp | | XXXXh |
| 0479EFh | | | |
| 0479F0h | CAN1 Mailbox 31: Message Identifier | C1MB31 | XXXX XXXXh |
| 0479F1h | | | |
| 0479F2h | | | |
| 0479F3h | | | |
| 0479F4h | | | |
| 0479F5h | CAN1 Mailbox 31: Data Length | | XXh |
| 0479F6h | CAN1 Mailbox 31: Data Field | | XXXX XXXX |
| 0479F7h | | | XXXX XXXXh |
| 0479F8h | | | |
| 0479F9h | | | |
| 0479FAh | | | |
| 0479FBh | | | |
| 0479FCh | | | |
| 0479FDh | | | |
| 0479FEh | CAN1 Mailbox 31: Time Stamp | | XXXXh |
| 0479FFh | | | |
| 047A00h | CAN1 Mask Register 0 | C1MKR0 | XXXX XXXXh |
| 047A01h | | | |
| 047A02h | | | |
| 047A03h | | | |
| 047A04h | CAN1 Mask Register 1 | C1MKR1 | XXXX XXXXh |
| 047A05h | | | |
| 047A06h | | | |
| 047A07h | | | |
| 047A08h | CAN1 Mask Register 2 | C1MKR2 | XXXX XXXXh |
| 047A09h | | | |
| 047A0Ah | | | |
| 047A0Bh | | | |
| 047A0Ch | CAN1 Mask Register 3 | C1MKR3 | XXXX XXXXh |
| 047A0Dh | | | |
| 047A0Eh | | | |
| 047A0Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.71 SFR List (71)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047A10h | CAN1 Mask Register 4 | C1MKR4 | XXXX XXXXh |
| 047A11h | | | |
| 047A12h | | | |
| 047A13h | | | |
| 047A14h | CAN1 Mask Register 5 | C1MKR5 | XXXX XXXXh |
| 047A15h | | | |
| 047A16h | | | |
| 047A17h | | | |
| 047A18h | CAN1 Mask Register 6 | C1MKR6 | XXXX XXXXh |
| 047A19h | | | |
| 047A1Ah | | | |
| 047A1Bh | | | |
| 047A1Ch | CAN1 Mask Register 7 | C1MKR7 | XXXX XXXXh |
| 047A1Dh | | | |
| 047A1Eh | | | |
| 047A1Fh | | | |
| 047A20h | CAN1 FIFO Received ID Compare Register 0 | C1FIDCR0 | XXXX XXXXh |
| 047A21h | | | |
| 047A22h | | | |
| 047A23h | | | |
| 047A24h | CAN1 FIFO Received ID Compare Register 1 | C1FIDCR1 | XXXX XXXXh |
| 047A25h | | | |
| 047A26h | | | |
| 047A27h | | | |
| 047A28h | CAN1 Mask Invalid Register | C1MKIVLR | XXXX XXXXh |
| 047A29h | | | |
| 047A2Ah | | | |
| 047A2Bh | | | |
| 047A2Ch | CAN1 Mailbox Interrupt Enable Register | C1MIER | XXXX XXXXh |
| 047A2Dh | | | |
| 047A2Eh | | | |
| 047A2Fh | | | |
| 047A30h | | | |
| 047A31h | | | |
| 047A32h | | | |
| 047A33h | | | |
| 047A34h | | | |
| 047A35h | | | |
| 047A36h | | | |
| 047A37h | | | |
| 047A38h | | | |
| 047A39h | | | |
| 047A3Ah | | | |
| 047A3Bh | | | |
| 047A3Ch | | | |
| 047A3Dh | | | |
| 047A3Eh | | | |
| 047A3Fh | | | |
| 047A40h to 047B1Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.72 SFR List (72)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047B20h | CAN1 Message Control Register 0 | C1MCTL0 | 00h |
| 047B21h | CAN1 Message Control Register 1 | C1MCTL1 | 00h |
| 047B22h | CAN1 Message Control Register 2 | C1MCTL2 | 00h |
| 047B23h | CAN1 Message Control Register 3 | C1MCTL3 | 00h |
| 047B24h | CAN1 Message Control Register 4 | C1MCTL4 | 00h |
| 047B25h | CAN1 Message Control Register 5 | C1MCTL5 | 00h |
| 047B26h | CAN1 Message Control Register 6 | C1MCTL6 | 00h |
| 047B27h | CAN1 Message Control Register 7 | C1MCTL7 | 00h |
| 047B28h | CAN1 Message Control Register 8 | C1MCTL8 | 00h |
| 047B29h | CAN1 Message Control Register 9 | C1MCTL9 | 00h |
| 047B2Ah | CAN1 Message Control Register 10 | C1MCTL10 | 00h |
| 047B2Bh | CAN1 Message Control Register 11 | C1MCTL11 | 00h |
| 047B2Ch | CAN1 Message Control Register 12 | C1MCTL12 | 00h |
| 047B2Dh | CAN1 Message Control Register 13 | C1MCTL13 | 00h |
| 047B2Eh | CAN1 Message Control Register 14 | C1MCTL14 | 00h |
| 047B2Fh | CAN1 Message Control Register 15 | C1MCTL15 | 00h |
| 047B30h | CAN1 Message Control Register 16 | C1MCTL16 | 00h |
| 047B31h | CAN1 Message Control Register 17 | C1MCTL17 | 00h |
| 047B32h | CAN1 Message Control Register 18 | C1MCTL18 | 00h |
| 047B33h | CAN1 Message Control Register 19 | C1MCTL19 | 00h |
| 047B34h | CAN1 Message Control Register 20 | C1MCTL20 | 00h |
| 047B35h | CAN1 Message Control Register 21 | C1MCTL21 | 00h |
| 047B36h | CAN1 Message Control Register 22 | C1MCTL22 | 00h |
| 047B37h | CAN1 Message Control Register 23 | C1MCTL23 | 00h |
| 047B38h | CAN1 Message Control Register 24 | C1MCTL24 | 00h |
| 047B39h | CAN1 Message Control Register 25 | C1MCTL25 | 00h |
| 047B3Ah | CAN1 Message Control Register 26 | C1MCTL26 | 00h |
| 047B3Bh | CAN1 Message Control Register 27 | C1MCTL27 | 00h |
| 047B3Ch | CAN1 Message Control Register 28 | C1MCTL28 | 00h |
| 047B3Dh | CAN1 Message Control Register 29 | C1MCTL29 | 00h |
| 047B3Eh | CAN1 Message Control Register 30 | C1MCTL30 | 00h |
| 047B3Fh | CAN1 Message Control Register 31 | C1MCTL31 | 00h |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.73 SFR List (73)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047B40h | CAN1 Control Register | C1CTLR | 0000 0101b |
| 047B41h | | | 0000 0000b |
| 047B42h | CAN1 Status Register | C1STR | 0000 0101b |
| 047B43h | | | 0000 0000b |
| 047B44h | CAN1 Bit Configuration Register | C1BCR | 00 0000h |
| 047B45h | | | |
| 047B46h | | | |
| 047B47h | CAN1 Clock Select Register | C1CLKR | 000X 0000b |
| 047B48h | CAN1 Receive FIFO Control Register | C1RFCR | 1000 0000b |
| 047B49h | CAN1 Receive FIFO Pointer Control Register | C1RFPCR | XXh |
| 047B4Ah | CAN1 Transmit FIFO Control Register | C1TFCR | 1000 0000b |
| 047B4Bh | CAN1 Transmit FIFO Pointer Control Register | C1TFPCR | XXh |
| 047B4Ch | CAN1 Error Interrupt Enable Register | C1EIER | 00h |
| 047B4Dh | CAN1 Error Interrupt Factor Judge Register | C1EIFR | 00h |
| 047B4Eh | CAN1 Receive Error Count Register | C1RECR | 00h |
| 047B4Fh | CAN1 Transmit Error Count Register | C1TECR | 00h |
| 047B50h | CAN1 Error Code Store Register | C1ECSR | 00h |
| 047B51h | CAN1 Channel Search Support Register | C1CSSR | XXh |
| 047B52h | CAN1 Mailbox Search Status Register | C1MSSR | 1000 0000b |
| 047B53h | CAN1 Mailbox Search Mode Register | C1MSMR | 0000 0000b |
| 047B54h | CAN1 Time Stamp Register | C1TSR | 0000h |
| 047B55h | | | |
| 047B56h | CAN1 Acceptance Filter Support Register | C1AFSR | XXXXh |
| 047B57h | | | |
| 047B58h | CAN1 Test Control Register | C1TCR | 00h |
| 047B59h | | | |
| 047B5Ah | | | |
| 047B5Bh | | | |
| 047B5Ch | | | |
| 047B5Dh | | | |
| 047B5Eh | | | |
| 047B5Fh | | | |
| 047B60h to 047BFFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.74 SFR List (74)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047C00h | CAN0 Mailbox 0: Message Identifier | C0MB0 | XXXX XXXXh |
| 047C01h | | | |
| 047C02h | | | |
| 047C03h | | | |
| 047C04h | | | |
| 047C05h | CAN0 Mailbox 0: Data Length | | XXh |
| 047C06h | CAN0 Mailbox 0: Data Field | | XXXX XXXX |
| 047C07h | | | XXXX XXXXh |
| 047C08h | | | |
| 047C09h | | | |
| 047C0Ah | | | |
| 047C0Bh | | | |
| 047C0Ch | | | |
| 047C0Dh | | | |
| 047C0Eh | CAN0 Mailbox 0: Time Stamp | | XXXXh |
| 047C0Fh | | | |
| 047C10h | CAN0 Mailbox 1: Message Identifier | C0MB1 | XXXX XXXXh |
| 047C11h | | | |
| 047C12h | | | |
| 047C13h | | | |
| 047C14h | | | |
| 047C15h | CAN0 Mailbox 1: Data Length | | XXh |
| 047C16h | CAN0 Mailbox 1: Data Field | | XXXX XXXX |
| 047C17h | | | XXXX XXXXh |
| 047C18h | | | |
| 047C19h | | | |
| 047C1Ah | | | |
| 047C1Bh | | | |
| 047C1Ch | | | |
| 047C1Dh | | | |
| 047C1Eh | CAN0 Mailbox 1: Time Stamp | | XXXXh |
| 047C1Fh | | | |
| 047C20h | CAN0 Mailbox 2: Message Identifier | C0MB2 | XXXX XXXXh |
| 047C21h | | | |
| 047C22h | | | |
| 047C23h | | | |
| 047C24h | | | |
| 047C25h | CAN0 Mailbox 2: Data Length | | XXh |
| 047C26h | CAN0 Mailbox 2: Data Field | | XXXX XXXX |
| 047C27h | | | XXXX XXXXh |
| 047C28h | | | |
| 047C29h | | | |
| 047C2Ah | | | |
| 047C2Bh | | | |
| 047C2Ch | | | |
| 047C2Dh | | | |
| 047C2Eh | CAN0 Mailbox 2: Time Stamp | | XXXXh |
| 047C2Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.75 SFR List (75)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047C30h | CAN0 Mailbox 3: Message Identifier | C0MB3 | XXXX XXXXh |
| 047C31h | | | |
| 047C32h | | | |
| 047C33h | | | |
| 047C34h | | | |
| 047C35h | CAN0 Mailbox 3: Data Length | | XXh |
| 047C36h | CAN0 Mailbox 3: Data Field | | XXXX XXXX |
| 047C37h | | | XXXX XXXXh |
| 047C38h | | | |
| 047C39h | | | |
| 047C3Ah | | | |
| 047C3Bh | | | |
| 047C3Ch | | | |
| 047C3Dh | | | |
| 047C3Eh | CAN0 Mailbox 3: Time Stamp | | XXXXh |
| 047C3Fh | | | |
| 047C40h | CAN0 Mailbox 4: Message Identifier | C0MB4 | XXXX XXXXh |
| 047C41h | | | |
| 047C42h | | | |
| 047C43h | | | |
| 047C44h | | | |
| 047C45h | CAN0 Mailbox 4: Data Length | | XXh |
| 047C46h | CAN0 Mailbox 4: Data Field | | XXXX XXXX |
| 047C47h | | | XXXX XXXXh |
| 047C48h | | | |
| 047C49h | | | |
| 047C4Ah | | | |
| 047C4Bh | | | |
| 047C4Ch | | | |
| 047C4Dh | | | |
| 047C4Eh | CAN0 Mailbox 4: Time Stamp | | XXXXh |
| 047C4Fh | | | |
| 047C50h | CAN0 Mailbox 5: Message Identifier | C0MB5 | XXXX XXXXh |
| 047C51h | | | |
| 047C52h | | | |
| 047C53h | | | |
| 047C54h | | | |
| 047C55h | CAN0 Mailbox 5: Data Length | | XXh |
| 047C56h | CAN0 Mailbox 5: Data Field | | XXXX XXXX |
| 047C57h | | | XXXX XXXXh |
| 047C58h | | | |
| 047C59h | | | |
| 047C5Ah | | | |
| 047C5Bh | | | |
| 047C5Ch | | | |
| 047C5Dh | | | |
| 047C5Eh | CAN0 Mailbox 5: Time Stamp | | XXXXh |
| 047C5Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.76 SFR List (76)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047C60h | CAN0 Mailbox 6: Message Identifier | C0MB6 | XXXX XXXXh |
| 047C61h | | | |
| 047C62h | | | |
| 047C63h | | | |
| 047C64h | | | |
| 047C65h | CAN0 Mailbox 6: Data Length | | XXh |
| 047C66h | CAN0 Mailbox 6: Data Field | | XXXX XXXX |
| 047C67h | | | XXXX XXXXh |
| 047C68h | | | |
| 047C69h | | | |
| 047C6Ah | | | |
| 047C6Bh | | | |
| 047C6Ch | | | |
| 047C6Dh | | | |
| 047C6Eh | CAN0 Mailbox 6: Time Stamp | | XXXXh |
| 047C6Fh | | | |
| 047C70h | CAN0 Mailbox 7: Message Identifier | C0MB7 | XXXX XXXXh |
| 047C71h | | | |
| 047C72h | | | |
| 047C73h | | | |
| 047C74h | | | |
| 047C75h | CAN0 Mailbox 7: Data Length | | XXh |
| 047C76h | CAN0 Mailbox 7: Data Field | | XXXX XXXX |
| 047C77h | | | XXXX XXXXh |
| 047C78h | | | |
| 047C79h | | | |
| 047C7Ah | | | |
| 047C7Bh | | | |
| 047C7Ch | | | |
| 047C7Dh | | | |
| 047C7Eh | CAN0 Mailbox 7: Time Stamp | | XXXXh |
| 047C7Fh | | | |
| 047C80h | CAN0 Mailbox 8: Message Identifier | C0MB8 | XXXX XXXXh |
| 047C81h | | | |
| 047C82h | | | |
| 047C83h | | | |
| 047C84h | | | |
| 047C85h | CAN0 Mailbox 8: Data Length | | XXh |
| 047C86h | CAN0 Mailbox 8: Data Field | | XXXX XXXX |
| 047C87h | | | XXXX XXXXh |
| 047C88h | | | |
| 047C89h | | | |
| 047C8Ah | | | |
| 047C8Bh | | | |
| 047C8Ch | | | |
| 047C8Dh | | | |
| 047C8Eh | CAN0 Mailbox 8: Time Stamp | | XXXXh |
| 047C8Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.77 SFR List (77)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047C90h | CAN0 Mailbox 9: Message Identifier | C0MB9 | XXXX XXXXh |
| 047C91h | | | |
| 047C92h | | | |
| 047C93h | | | |
| 047C94h | | | |
| 047C95h | CAN0 Mailbox 9: Data Length | | XXh |
| 047C96h | CAN0 Mailbox 9: Data Field | | XXXX XXXX |
| 047C97h | | | XXXX XXXXh |
| 047C98h | | | |
| 047C99h | | | |
| 047C9Ah | | | |
| 047C9Bh | | | |
| 047C9Ch | | | |
| 047C9Dh | | | |
| 047C9Eh | CAN0 Mailbox 9: Time Stamp | | XXXXh |
| 047C9Fh | | | |
| 047CA0h | CAN0 Mailbox 10: Message Identifier | C0MB10 | XXXX XXXXh |
| 047CA1h | | | |
| 047CA2h | | | |
| 047CA3h | | | |
| 047CA4h | | | |
| 047CA5h | CAN0 Mailbox 10: Data Length | | XXh |
| 047CA6h | CAN0 Mailbox 10: Data Field | | XXXX XXXX |
| 047CA7h | | | XXXX XXXXh |
| 047CA8h | | | |
| 047CA9h | | | |
| 047CAAh | | | |
| 047CABh | | | |
| 047CACh | | | |
| 047CADh | | | |
| 047CAEh | CAN0 Mailbox 10: Time Stamp | | XXXXh |
| 047CAFh | | | |
| 047CB0h | CAN0 Mailbox 11: Message Identifier | C0MB11 | XXXX XXXXh |
| 047CB1h | | | |
| 047CB2h | | | |
| 047CB3h | | | |
| 047CB4h | | | |
| 047CB5h | CAN0 Mailbox 11: Data Length | | XXh |
| 047CB6h | CAN0 Mailbox 11: Data Field | | XXXX XXXX |
| 047CB7h | | | XXXX XXXXh |
| 047CB8h | | | |
| 047CB9h | | | |
| 047CBAh | | | |
| 047CBBh | | | |
| 047CBCh | | | |
| 047CBDh | | | |
| 047CBEh | CAN0 Mailbox 11: Time Stamp | | XXXXh |
| 047CBFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.78 SFR List (78)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047CC0h | CAN0 Mailbox 12: Message Identifier | C0MB12 | XXXX XXXXh |
| 047CC1h | | | |
| 047CC2h | | | |
| 047CC3h | | | |
| 047CC4h | | | |
| 047CC5h | CAN0 Mailbox 12: Data Length | | XXh |
| 047CC6h | CAN0 Mailbox 12: Data Field | | XXXX XXXX |
| 047CC7h | | | XXXX XXXXh |
| 047CC8h | | | |
| 047CC9h | | | |
| 047CCAh | | | |
| 047CCBh | | | |
| 047CCCh | | | |
| 047CCDh | | | |
| 047CCEh | CAN0 Mailbox 12: Time Stamp | | XXXXh |
| 047CCFh | | | |
| 047CD0h | CAN0 Mailbox 13: Message Identifier | C0MB13 | XXXX XXXXh |
| 047CD1h | | | |
| 047CD2h | | | |
| 047CD3h | | | |
| 047CD4h | | | |
| 047CD5h | CAN0 Mailbox 13: Data Length | | XXh |
| 047CD6h | CAN0 Mailbox 13: Data Field | | XXXX XXXX |
| 047CD7h | | | XXXX XXXXh |
| 047CD8h | | | |
| 047CD9h | | | |
| 047CDAh | | | |
| 047CDBh | | | |
| 047CDCh | | | |
| 047CDDh | | | |
| 047CDEh | CAN0 Mailbox 13: Time Stamp | | XXXXh |
| 047CDFh | | | |
| 047CE0h | CAN0 Mailbox 14: Message Identifier | C0MB14 | XXXX XXXXh |
| 047CE1h | | | |
| 047CE2h | | | |
| 047CE3h | | | |
| 047CE4h | | | |
| 047CE5h | CAN0 Mailbox 14: Data Length | | XXh |
| 047CE6h | CAN0 Mailbox 14: Data Field | | XXXX XXXX |
| 047CE7h | | | XXXX XXXXh |
| 047CE8h | | | |
| 047CE9h | | | |
| 047CEAh | | | |
| 047CEBh | | | |
| 047CECh | | | |
| 047CEDh | | | |
| 047CEEh | CAN0 Mailbox 14: Time Stamp | | XXXXh |
| 047CEFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.79 SFR List (79)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047CF0h | CAN0 Mailbox 15: Message Identifier | C0MB15 | XXXX XXXXh |
| 047CF1h | | | |
| 047CF2h | | | |
| 047CF3h | | | |
| 047CF4h | | | |
| 047CF5h | CAN0 Mailbox 15: Data Length | | XXh |
| 047CF6h | CAN0 Mailbox 15: Data Field | | XXXX XXXX |
| 047CF7h | | | XXXX XXXXh |
| 047CF8h | | | |
| 047CF9h | | | |
| 047CFAh | | | |
| 047CFBh | | | |
| 047CFCh | | | |
| 047CFDh | | | |
| 047CFEh | CAN0 Mailbox 15: Time Stamp | | XXXXh |
| 047CFFh | | | |
| 047D00h | CAN0 Mailbox 16: Message Identifier | C0MB16 | XXXX XXXXh |
| 047D01h | | | |
| 047D02h | | | |
| 047D03h | | | |
| 047D04h | | | |
| 047D05h | CAN0 Mailbox 16: Data Length | | XXh |
| 047D06h | CAN0 Mailbox 16: Data Field | | XXXX XXXX |
| 047D07h | | | XXXX XXXXh |
| 047D08h | | | |
| 047D09h | | | |
| 047D0Ah | | | |
| 047D0Bh | | | |
| 047D0Ch | | | |
| 047D0Dh | | | |
| 047D0Eh | CAN0 Mailbox 16: Time Stamp | | XXXXh |
| 047D0Fh | | | |
| 047D10h | CAN0 Mailbox 17: Message Identifier | C0MB17 | XXXX XXXXh |
| 047D11h | | | |
| 047D12h | | | |
| 047D13h | | | |
| 047D14h | | | |
| 047D15h | CAN0 Mailbox 17: Data Length | | XXh |
| 047D16h | CAN0 Mailbox 17: Data Field | | XXXX XXXX |
| 047D17h | | | XXXX XXXXh |
| 047D18h | | | |
| 047D19h | | | |
| 047D1Ah | | | |
| 047D1Bh | | | |
| 047D1Ch | | | |
| 047D1Dh | | | |
| 047D1Eh | CAN0 Mailbox 17: Time Stamp | | XXXXh |
| 047D1Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.80 SFR List (80)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047D20h | CAN0 Mailbox 18: Message Identifier | C0MB18 | XXXX XXXXh |
| 047D21h | | | |
| 047D22h | | | |
| 047D23h | | | |
| 047D24h | | | |
| 047D25h | CAN0 Mailbox 18: Data Length | | XXh |
| 047D26h | CAN0 Mailbox 18: Data Field | | XXXX XXXX |
| 047D27h | | | XXXX XXXXh |
| 047D28h | | | |
| 047D29h | | | |
| 047D2Ah | | | |
| 047D2Bh | | | |
| 047D2Ch | | | |
| 047D2Dh | | | |
| 047D2Eh | CAN0 Mailbox 18: Time Stamp | | XXXXh |
| 047D2Fh | | | |
| 047D30h | CAN0 Mailbox 19: Message Identifier | C0MB19 | XXXX XXXXh |
| 047D31h | | | |
| 047D32h | | | |
| 047D33h | | | |
| 047D34h | | | |
| 047D35h | CAN0 Mailbox 19: Data Length | | XXh |
| 047D36h | CAN0 Mailbox 19: Data Field | | XXXX XXXX |
| 047D37h | | | XXXX XXXXh |
| 047D38h | | | |
| 047D39h | | | |
| 047D3Ah | | | |
| 047D3Bh | | | |
| 047D3Ch | | | |
| 047D3Dh | | | |
| 047D3Eh | CAN0 Mailbox 19: Time Stamp | | XXXXh |
| 047D3Fh | | | |
| 047D40h | CAN0 Mailbox 20: Message Identifier | C0MB20 | XXXX XXXXh |
| 047D41h | | | |
| 047D42h | | | |
| 047D43h | | | |
| 047D44h | | | |
| 047D45h | CAN0 Mailbox 20: Data Length | | XXh |
| 047D46h | CAN0 Mailbox 20: Data Field | | XXXX XXXX |
| 047D47h | | | XXXX XXXXh |
| 047D48h | | | |
| 047D49h | | | |
| 047D4Ah | | | |
| 047D4Bh | | | |
| 047D4Ch | | | |
| 047D4Dh | | | |
| 047D4Eh | CAN0 Mailbox 20: Time Stamp | | XXXXh |
| 047D4Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.81 SFR List (81)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047D50h | CAN0 Mailbox 21: Message Identifier | C0MB21 | XXXX XXXXh |
| 047D51h | | | |
| 047D52h | | | |
| 047D53h | | | |
| 047D54h | | | |
| 047D55h | CAN0 Mailbox 21: Data Length | | XXh |
| 047D56h | CAN0 Mailbox 21: Data Field | | XXXX XXXX |
| 047D57h | | | XXXX XXXXh |
| 047D58h | | | |
| 047D59h | | | |
| 047D5Ah | | | |
| 047D5Bh | | | |
| 047D5Ch | | | |
| 047D5Dh | | | |
| 047D5Eh | CAN0 Mailbox 21: Time Stamp | | XXXXh |
| 047D5Fh | | | |
| 047D60h | CAN0 Mailbox 22: Message Identifier | C0MB22 | XXXX XXXXh |
| 047D61h | | | |
| 047D62h | | | |
| 047D63h | | | |
| 047D64h | | | |
| 047D65h | CAN0 Mailbox 22: Data Length | | XXh |
| 047D66h | CAN0 Mailbox 22: Data Field | | XXXX XXXX |
| 047D67h | | | XXXX XXXXh |
| 047D68h | | | |
| 047D69h | | | |
| 047D6Ah | | | |
| 047D6Bh | | | |
| 047D6Ch | | | |
| 047D6Dh | | | |
| 047D6Eh | CAN0 Mailbox 22: Time Stamp | | XXXXh |
| 047D6Fh | | | |
| 047D70h | CAN0 Mailbox 23: Message Identifier | C0MB23 | XXXX XXXXh |
| 047D71h | | | |
| 047D72h | | | |
| 047D73h | | | |
| 047D74h | | | |
| 047D75h | CAN0 Mailbox 23: Data Length | | XXh |
| 047D76h | CAN0 Mailbox 23: Data Field | | XXXX XXXX |
| 047D77h | | | XXXX XXXXh |
| 047D78h | | | |
| 047D79h | | | |
| 047D7Ah | | | |
| 047D7Bh | | | |
| 047D7Ch | | | |
| 047D7Dh | | | |
| 047D7Eh | CAN0 Mailbox 23: Time Stamp | | XXXXh |
| 047D7Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.82 SFR List (82)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047D80h | CAN0 Mailbox 24: Message Identifier | C0MB24 | XXXX XXXXh |
| 047D81h | | | |
| 047D82h | | | |
| 047D83h | | | |
| 047D84h | | | |
| 047D85h | CAN0 Mailbox 24: Data Length | | XXh |
| 047D86h | CAN0 Mailbox 24: Data Field | | XXXX XXXX |
| 047D87h | | | XXXX XXXXh |
| 047D88h | | | |
| 047D89h | | | |
| 047D8Ah | | | |
| 047D8Bh | | | |
| 047D8Ch | | | |
| 047D8Dh | | | |
| 047D8Eh | CAN0 Mailbox 24: Time Stamp | | XXXXh |
| 047D8Fh | | | |
| 047D90h | CAN0 Mailbox 25: Message Identifier | C0MB25 | XXXX XXXXh |
| 047D91h | | | |
| 047D92h | | | |
| 047D93h | | | |
| 047D94h | | | |
| 047D95h | CAN0 Mailbox 25: Data Length | | XXh |
| 047D96h | CAN0 Mailbox 25: Data Field | | XXXX XXXX |
| 047D97h | | | XXXX XXXXh |
| 047D98h | | | |
| 047D99h | | | |
| 047D9Ah | | | |
| 047D9Bh | | | |
| 047D9Ch | | | |
| 047D9Dh | | | |
| 047D9Eh | CAN0 Mailbox 25: Time Stamp | | XXXXh |
| 047D9Fh | | | |
| 047DA0h | CAN0 Mailbox 26: Message Identifier | C0MB26 | XXXX XXXXh |
| 047DA1h | | | |
| 047DA2h | | | |
| 047DA3h | | | |
| 047DA4h | | | |
| 047DA5h | CAN0 Mailbox 26: Data Length | | XXh |
| 047DA6h | CAN0 Mailbox 26: Data Field | | XXXX XXXX |
| 047DA7h | | | XXXX XXXXh |
| 047DA8h | | | |
| 047DA9h | | | |
| 047DAAh | | | |
| 047DABh | | | |
| 047DACh | | | |
| 047DADh | | | |
| 047DAEh | CAN0 Mailbox 26: Time Stamp | | XXXXh |
| 047DAFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.83 SFR List (83)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047DB0h | CAN0 Mailbox 27: Message Identifier | C0MB27 | XXXX XXXXh |
| 047DB1h | | | |
| 047DB2h | | | |
| 047DB3h | | | |
| 047DB4h | | | |
| 047DB5h | CAN0 Mailbox 27: Data Length | | XXh |
| 047DB6h | CAN0 Mailbox 27: Data Field | | XXXX XXXX |
| 047DB7h | | | XXXX XXXXh |
| 047DB8h | | | |
| 047DB9h | | | |
| 047DBAh | | | |
| 047DBBh | | | |
| 047DBCh | | | |
| 047DBDh | | | |
| 047DBEh | CAN0 Mailbox 27: Time Stamp | | XXXXh |
| 047DBFh | | | |
| 047DC0h | CAN0 Mailbox 28: Message Identifier | C0MB28 | XXXX XXXXh |
| 047DC1h | | | |
| 047DC2h | | | |
| 047DC3h | | | |
| 047DC4h | | | |
| 047DC5h | CAN0 Mailbox 28: Data Length | | XXh |
| 047DC6h | CAN0 Mailbox 28: Data Field | | XXXX XXXX |
| 047DC7h | | | XXXX XXXXh |
| 047DC8h | | | |
| 047DC9h | | | |
| 047DCAh | | | |
| 047DCBh | | | |
| 047DCCh | | | |
| 047DCDh | | | |
| 047DCEh | CAN0 Mailbox 28: Time Stamp | | XXXXh |
| 047DCFh | | | |
| 047DD0h | CAN0 Mailbox 29: Message Identifier | C0MB29 | XXXX XXXXh |
| 047DD1h | | | |
| 047DD2h | | | |
| 047DD3h | | | |
| 047DD4h | | | |
| 047DD5h | CAN0 Mailbox 29: Data Length | | XXh |
| 047DD6h | CAN0 Mailbox 29: Data Field | | XXXX XXXX |
| 047DD7h | | | XXXX XXXXh |
| 047DD8h | | | |
| 047DD9h | | | |
| 047DDAh | | | |
| 047DDBh | | | |
| 047DDCh | | | |
| 047DDDh | | | |
| 047DDEh | CAN0 Mailbox 29: Time Stamp | | XXXXh |
| 047DDFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.84 SFR List (84)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047DE0h | CAN0 Mailbox 30: Message Identifier | C0MB30 | XXXX XXXXh |
| 047DE1h | | | |
| 047DE2h | | | |
| 047DE3h | | | |
| 047DE4h | | | |
| 047DE5h | CAN0 Mailbox 30: Data Length | | XXh |
| 047DE6h | CAN0 Mailbox 30: Data Field | | XXXX XXXX |
| 047DE7h | | | XXXX XXXXh |
| 047DE8h | | | |
| 047DE9h | | | |
| 047DEAh | | | |
| 047DEBh | | | |
| 047DECh | | | |
| 047DEDh | | | |
| 047DEEh | CAN0 Mailbox 30: Time Stamp | | XXXXh |
| 047DEFh | | | |
| 047DF0h | CAN0 Mailbox 31: Message Identifier | C0MB31 | XXXX XXXXh |
| 047DF1h | | | |
| 047DF2h | | | |
| 047DF3h | | | |
| 047DF4h | | | |
| 047DF5h | CAN0 Mailbox 31: Data Length | | XXh |
| 047DF6h | CAN0 Mailbox 31: Data Field | | XXXX XXXX |
| 047DF7h | | | XXXX XXXXh |
| 047DF8h | | | |
| 047DF9h | | | |
| 047DFAh | | | |
| 047DFBh | | | |
| 047DFCh | | | |
| 047DFDh | | | |
| 047DFEh | CAN0 Mailbox 31: Time Stamp | | XXXXh |
| 047DFFh | | | |
| 047E00h | CAN0 Mask Register 0 | C0MKR0 | XXXX XXXXh |
| 047E01h | | | |
| 047E02h | | | |
| 047E03h | | | |
| 047E04h | CAN0 Mask Register 1 | C0MKR1 | XXXX XXXXh |
| 047E05h | | | |
| 047E06h | | | |
| 047E07h | | | |
| 047E08h | CAN0 Mask Register 2 | C0MKR2 | XXXX XXXXh |
| 047E09h | | | |
| 047E0Ah | | | |
| 047E0Bh | | | |
| 047E0Ch | CAN0 Mask Register 3 | C0MKR3 | XXXX XXXXh |
| 047E0Dh | | | |
| 047E0Eh | | | |
| 047E0Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.85 SFR List (85)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047E10h | CAN0 Mask Register 4 | C0MKR4 | XXXX XXXXh |
| 047E11h | | | |
| 047E12h | | | |
| 047E13h | | | |
| 047E14h | CAN0 Mask Register 5 | C0MKR5 | XXXX XXXXh |
| 047E15h | | | |
| 047E16h | | | |
| 047E17h | | | |
| 047E18h | CAN0 Mask Register 6 | C0MKR6 | XXXX XXXXh |
| 047E19h | | | |
| 047E1Ah | | | |
| 047E1Bh | | | |
| 047E1Ch | CAN0 Mask Register 7 | C0MKR7 | XXXX XXXXh |
| 047E1Dh | | | |
| 047E1Eh | | | |
| 047E1Fh | | | |
| 047E20h | CAN0 FIFO Receive ID Compare Register 0 | C0FIDCR0 | XXXX XXXXh |
| 047E21h | | | |
| 047E22h | | | |
| 047E23h | | | |
| 047E24h | CAN0 FIFO Receive ID Compare Register 1 | C0FIDCR1 | XXXX XXXXh |
| 047E25h | | | |
| 047E26h | | | |
| 047E27h | | | |
| 047E28h | CAN0 Mask Invalid Register | C0MKIVLR | XXXX XXXXh |
| 047E29h | | | |
| 047E2Ah | | | |
| 047E2Bh | | | |
| 047E2Ch | CAN0 Mailbox Interrupt Enable Register | C0MIER | XXXX XXXXh |
| 047E2Dh | | | |
| 047E2Eh | | | |
| 047E2Fh | | | |
| 047E30h | | | |
| 047E31h | | | |
| 047E32h | | | |
| 047E33h | | | |
| 047E34h | | | |
| 047E35h | | | |
| 047E36h | | | |
| 047E37h | | | |
| 047E38h | | | |
| 047E39h | | | |
| 047E3Ah | | | |
| 047E3Bh | | | |
| 047E3Ch | | | |
| 047E3Dh | | | |
| 047E3Eh | | | |
| 047E3Fh | | | |
| 047E40h to 047F1Fh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.86 SFR List (86)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047F20h | CAN0 Message Control Register 0 | C0MCTL0 | 00h |
| 047F21h | CAN0 Message Control Register 1 | C0MCTL1 | 00h |
| 047F22h | CAN0 Message Control Register 2 | C0MCTL2 | 00h |
| 047F23h | CAN0 Message Control Register 3 | C0MCTL3 | 00h |
| 047F24h | CAN0 Message Control Register 4 | C0MCTL4 | 00h |
| 047F25h | CAN0 Message Control Register 5 | C0MCTL5 | 00h |
| 047F26h | CAN0 Message Control Register 6 | C0MCTL6 | 00h |
| 047F27h | CAN0 Message Control Register 7 | C0MCTL7 | 00h |
| 047F28h | CAN0 Message Control Register 8 | C0MCTL8 | 00h |
| 047F29h | CAN0 Message Control Register 9 | C0MCTL9 | 00h |
| 047F2Ah | CAN0 Message Control Register 10 | C0MCTL10 | 00h |
| 047F2Bh | CAN0 Message Control Register 11 | C0MCTL11 | 00h |
| 047F2Ch | CAN0 Message Control Register 12 | C0MCTL12 | 00h |
| 047F2Dh | CAN0 Message Control Register 13 | C0MCTL13 | 00h |
| 047F2Eh | CAN0 Message Control Register 14 | C0MCTL14 | 00h |
| 047F2Fh | CAN0 Message Control Register 15 | C0MCTL15 | 00h |
| 047F30h | CAN0 Message Control Register 16 | C0MCTL16 | 00h |
| 047F31h | CAN0 Message Control Register 17 | C0MCTL17 | 00h |
| 047F32h | CAN0 Message Control Register 18 | C0MCTL18 | 00h |
| 047F33h | CAN0 Message Control Register 19 | C0MCTL19 | 00h |
| 047F34h | CAN0 Message Control Register 20 | C0MCTL20 | 00h |
| 047F35h | CAN0 Message Control Register 21 | C0MCTL21 | 00h |
| 047F36h | CAN0 Message Control Register 22 | C0MCTL22 | 00h |
| 047F37h | CAN0 Message Control Register 23 | C0MCTL23 | 00h |
| 047F38h | CAN0 Message Control Register 24 | C0MCTL24 | 00h |
| 047F39h | CAN0 Message Control Register 25 | C0MCTL25 | 00h |
| 047F3Ah | CAN0 Message Control Register 26 | C0MCTL26 | 00h |
| 047F3Bh | CAN0 Message Control Register 27 | C0MCTL27 | 00h |
| 047F3Ch | CAN0 Message Control Register 28 | C0MCTL28 | 00h |
| 047F3Dh | CAN0 Message Control Register 29 | C0MCTL29 | 00h |
| 047F3Eh | CAN0 Message Control Register 30 | C0MCTL30 | 00h |
| 047F3Fh | CAN0 Message Control Register 31 | C0MCTL31 | 00h |

X: Undefined
Blanks are reserved. No access is allowed.

**Table 4.87 SFR List (87)**

| Address | Register | Symbol | Reset Value |
|---|---|---|---|
| 047F40h | CAN0 Control Register | C0CTLR | 0000 0101b |
| 047F41h | | | 0000 0000b |
| 047F42h | CAN0 Status Register | C0STR | 0000 0101b |
| 047F43h | | | 0000 0000b |
| 047F44h | CAN0 Bit Configuration Register | C0BCR | 00 0000h |
| 047F45h | | | |
| 047F46h | | | |
| 047F47h | CAN0 Clock Select Register | C0CLKR | 000X 0000b |
| 047F48h | CAN0 Receive FIFO Control Register | C0RFCR | 1000 0000b |
| 047F49h | CAN0 Receive FIFO Pointer Control Register | C0RFPCR | XXh |
| 047F4Ah | CAN0 Transmit FIFO Control Register | C0TFCR | 1000 0000b |
| 047F4Bh | CAN0 Transmit FIFO Pointer Control Register | C0TFPCR | XXh |
| 047F4Ch | CAN0 Error Interrupt Enable Register | C0EIER | 00h |
| 047F4Dh | CAN0 Error Interrupt Factor Judge Register | C0EIFR | 00h |
| 047F4Eh | CAN0 Receive Error Count Register | C0RECR | 00h |
| 047F4Fh | CAN0 Transmit Error Count Register | C0TECR | 00h |
| 047F50h | CAN0 Error Code Store Register | C0ECSR | 00h |
| 047F51h | CAN0 Channel Search Support Register | C0CSSR | XXh |
| 047F52h | CAN0 Mailbox Search Status Register | C0MSSR | 1000 0000b |
| 047F53h | CAN0 Mailbox Search Mode Register | C0MSMR | 0000 0000b |
| 047F54h | CAN0 Time Stamp Register | C0TSR | 0000h |
| 047F55h | | | |
| 047F56h | CAN0 Acceptance Filter Support Register | C0AFSR | XXXXh |
| 047F57h | | | |
| 047F58h | CAN0 Test Control Register | C0TCR | 00h |
| 047F59h | | | |
| 047F5Ah | | | |
| 047F5Bh | | | |
| 047F5Ch | | | |
| 047F5Dh | | | |
| 047F5Eh | | | |
| 047F5Fh | | | |
| 047F60h to 047FFFh | | | |
| 048000h to 04FFFFh | | | |

X: Undefined
Blanks are reserved. No access is allowed.

# 5. Electrical Characteristics

**Table 5.1 Absolute Maximum Ratings (1)**

| Symbol | Characteristic | | Condition | Value | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply voltage | | $V_{CC} = AV_{CC}$ | -0.3 to 6.0 | V |
| $AV_{CC}$ | Analog supply voltage | | $V_{CC} = AV_{CC}$ | -0.3 to 6.0 | V |
| $V_I$ | Input voltage | XIN, $\overline{RESET}$, CNVSS, NSD, $V_{REF}$, P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | | -0.3 to $V_{CC}$ + 0.3 | V |
| $V_O$ | Output voltage | XOUT, P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | | -0.3 to $V_{CC}$ + 0.3 | V |
| $P_d$ | Power consumption | | $T_a$ = 25°C | 500 | mW |
| — | Operating temperature range | | | -40 to 125 | °C |
| $T_{stg}$ | Storage temperature range | | | -65 to 150 | °C |

Note:

1. Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**Table 5.2 Operating Conditions (1/6) (1)**

| Symbol | Characteristic | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $V_{CC}$ | Digital supply voltage | | 3.0 | 5.0 | 5.5 | V |
| $AV_{CC}$ | Analog supply voltage | | | $V_{CC}$ | | V |
| $V_{REF}$ | Reference voltage | | 3.0 | | $V_{CC}$ | V |
| $V_{SS}$ | Digital ground voltage | | | 0 | | V |
| $AV_{SS}$ | Analog ground voltage | | | 0 | | V |
| $dV_{CC}/dt$ | $V_{CC}$ ramp up rate ($V_{CC}$ < 2.0 V) | | 0.05 | | | V/ms |
| $V_{IH}$ | High level input voltage | XIN, $\overline{\text{RESET}}$, CNVSS, NSD | 0.8 × $V_{CC}$ | | $V_{CC}$ | V |
| | | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_7 (2), P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | 0.7 × $V_{CC}$ | | $V_{CC}$ | V |
| $V_{IL}$ | Low level input voltage | XIN, $\overline{\text{RESET}}$, CNVSS, NSD | 0 | | 0.2 × $V_{CC}$ | V |
| | | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_7 (2), P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | 0 | | 0.3 × $V_{CC}$ | V |
| $T_{opr}$ | Operating temperature range | J version | -40 | | 85 | °C |
| | | L version | -40 | | 105 | °C |
| | | K version | -40 | | 125 | °C |

Notes:
1. The device is operationally guaranteed under these operating conditions.
2. $V_{IH}$ and $V_{IL}$ for P8_7 are specified for P8_7 as a programmable port. These values are not applicable for P8_7 as XCIN.

**Table 5.3 Operating Conditions (2/6)**
**($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a = T_{opr}$, unless otherwise noted) (1)**

| Symbol | Characteristic | | Value (2) | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $C_{VDC}$ | Decoupling capacitance for voltage regulator | Inter-pin voltage: 1.5 V | 2.4 | | 10.0 | µF |

Notes:
1. The device is operationally guaranteed under these operating conditions.
2. This value should be met with due consideration to the following conditions: operating temperature, DC bias, aging, etc.

**Table 5.4 Operating Conditions (3/6)**
**($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted) (1)**

| Symbol | Characteristic | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $I_{OH(peak)}$ | High level peak output current (2) | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | | | -10.0 | mA |
| $I_{OH(avg)}$ | High level average output current (3) | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | | | -5.0 | mA |
| $I_{OL(peak)}$ | Low level peak output current (2) | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | | | 10.0 | mA |
| $I_{OL(avg)}$ | Low level average output current (3) | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | | | 5.0 | mA |

Notes:
1. The device is operationally guaranteed under these operating conditions.
2. The following conditions should be satisfied:
   - The sum of $I_{OL(peak)}$ of ports P0, P1, P2, P8_6, P8_7, P9, P10, P11, P14, and P15 is 80 mA or less.
   - The sum of $I_{OL(peak)}$ of ports P3, P4, P5, P6, P7, P8_0 to P8_4, P12, and P13 is 80 mA or less.
   - The sum of $I_{OH(peak)}$ of ports P0, P1, P2, and P11 is -40 mA or less.
   - The sum of $I_{OH(peak)}$ of ports P8_6, P8_7, P9, P10, P14, and P15 is -40 mA or less.
   - The sum of $I_{OH(peak)}$ of ports P3, P4, P5, P12, and P13 is -40 mA or less.
   - The sum of $I_{OH(peak)}$ of ports P6, P7, and P8_0 to P8_4 is -40 mA or less.
3. Average value within 100 ms.

**Table 5.5 Operating Conditions (4/6)**

**($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted) (1)**

| Symbol | Characteristic | Value | | | Unit |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| $f_{(XIN)}$ | Main clock oscillator frequency | 4 | | 8 | MHz |
| $f_{(XRef)}$ | Reference clock frequency | 2 | | 4 | MHz |
| $f_{(PLL)}$ | PLL clock oscillator frequency | 96 | | 144 | MHz |
| $f_{(Base)}$ | Base clock frequency | | | 64 | MHz |
| $t_{c(Base)}$ | Base clock cycle time | 15.625 | | | ns |
| $f_{(CPU)}$ | CPU operating frequency | | | 64 | MHz |
| $t_{c(CPU)}$ | CPU clock cycle time | 15.625 | | | ns |
| $f_{(BCLK)}$ | Peripheral bus clock operating frequency | | | 32 | MHz |
| $t_{c(BCLK)}$ | Peripheral bus clock cycle time | 31.25 | | | ns |
| $f_{(PER)}$ | Peripheral clock source frequency | | | 32 | MHz |
| $f_{(XCIN)}$ | Sub clock oscillator frequency | | 32.768 | 50 | kHz |

Note:
1. The device is operationally guaranteed under these operating conditions.

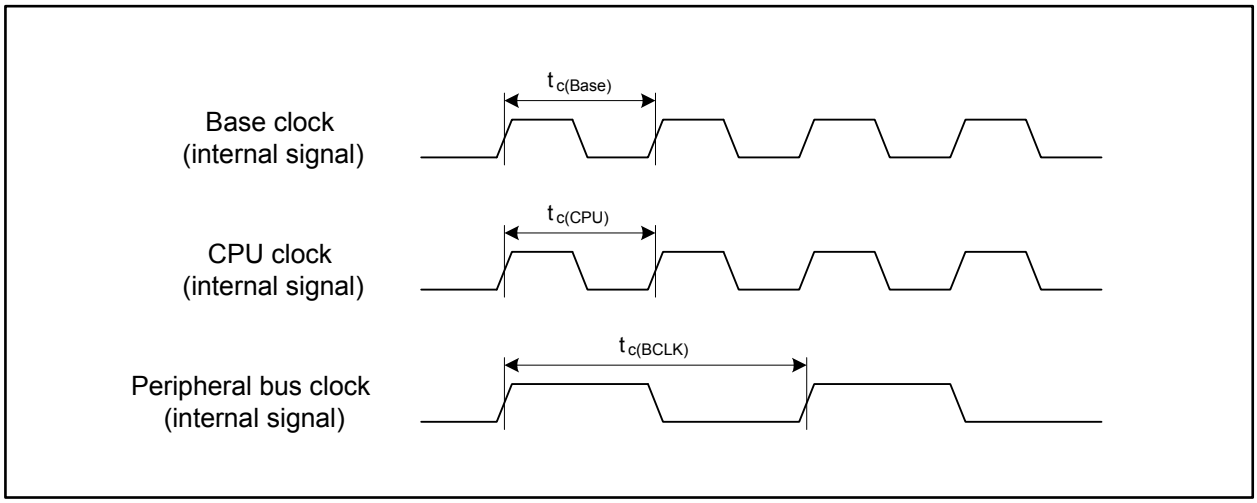



**Figure 5.1 Clock Cycle Time**

**Table 5.6 Operating Conditions (5/6)**

**($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted) (1, 2)**

| Symbol | Characteristic | | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $I_{IC(H)}$ | High input injection current | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_5, P7_7, P8_0 to P8_5, P9_1, P9_3 to P9_6, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | $V_I > V_{CC}$ | | | 2 | mA |
| $I_{IC(L)}$ | Low input injection current | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_5, P7_7, P8_0 to P8_5, P9_1, P9_3 to P9_6, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | $V_I < V_{SS}$ | | | -2 | mA |
| $\Sigma\|I_{IC}\|$ | Total injection current | | | | | 20 | mA |

Notes:
1. The device is operationally guaranteed under these operating conditions.
2. These conditions are applicable when each port is designated as input.

**Table 5.7 Operating Conditions (6/6)**
**($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted) (1)**

| Symbol | Characteristic | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $V_{r(VCC)}$ | Allowable ripple voltage | $V_{CC}$ = 5.0 V | | | 0.5 | Vp-p |
| | | $V_{CC}$ = 3.0 V | | | 0.3 | Vp-p |
| $dV_{r(VCC)}/dt$ | Ripple voltage gradient | $V_{CC}$ = 5.0 V | | | ±0.3 | V/ms |
| | | $V_{CC}$ = 3.0 V | | | ±0.3 | V/ms |
| $f_{r(VCC)}$ | Allowable ripple frequency | | | | 10 | kHz |

Note:
1. The device is operationally guaranteed under these operating conditions.

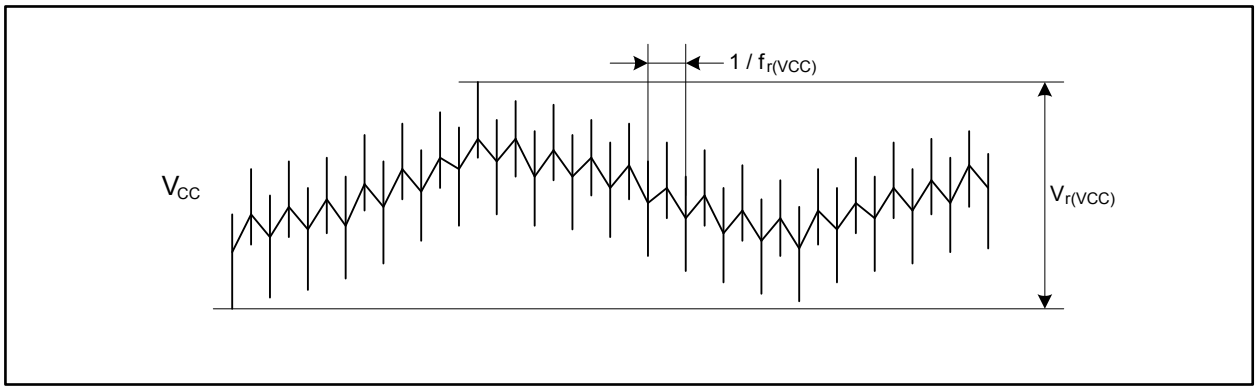



**Figure 5.2 Ripple Waveform**

**Table 5.8 Electrical Characteristics of Flash Memory**
**($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and Ta = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristic | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| — | Program/erase cycles (1) | Program area | 1000 | | | Cycles |
| | | Data area | 10000 | | | Cycles |
| — | 4-word program time | Program area | | 150 | 900 | µs |
| | | Data area | | 300 | 1700 | µs |
| — | Lock bit program time | Program area | | 70 | 500 | µs |
| | | Data area | | 140 | 1000 | µs |
| — | Block erasure time | 4-Kbyte block | | 0.12 | 3.0 | s |
| | | 32-Kbyte block | | 0.17 | 3.0 | s |
| | | 64-Kbyte block | | 0.20 | 3.0 | s |
| — | Data retention (2) | $T_a$ = 55°C (3, 4) | 20 | | | Years |

Notes:
1. Program/erase definition
   This value represents the number of erasures per block.
   When the number of program/erase cycles is n, each block can be erased n times.
   For example, if a 4-word write is performed in 512 different addresses in the 4-Kbyte block A and then the block is erased, this is counted as a single program/erase operation.
   However, the same address cannot be written to more than once per erasure (overwrite disabled).
2. Data retention includes periods when no supply voltage is applied and no clock is provided.
3. This data retention includes 3000 hours in $T_a$ = 125°C and 7000 hours in $T_a$ = 85°C.
4. Contact a Renesas Electronics sales office for data retention times other than the above condition.

**Table 5.9 Electrical Characteristics of E²dataFlash**
**($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristic | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| — | Program/erase cycles (1) | | 100000 | | | Cycles |
| — | Word program time | | | 100 | 2000 | µs |
| — | Block erasure time | 32 byte block | | 15 | 200 | ms |
| $t_{PS}$ | Flash memory circuit start-up stabilization time | | | 35 | 50 | µs |
| — | Data retention (2) | $T_a$ = 55°C (3, 4) | 20 | | | Years |

Notes:
1. Program/erase definition
   This value represents the number of erasure per block.
   When the number of program/erase cycles is n, each block can be erased n times.
   For example, if a word write is performed in 16 different addresses in a block and then the block is erased, this is counted as a single program/erase operation. However, the same address cannot be written to more than once per erasure (overwrite disabled).
2. Data retention includes periods when no supply voltage is applied and no clock is provided.
3. This data retention includes 3000 hours in $T_a$ = 125°C and 7000 hours in $T_a$ = 85°C.
4. Contact a Renesas Electronics sales office for data retention times other than the above condition.

**Table 5.10 Power Supply Circuit Timing Characteristics**
**($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristic | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $t_{d(P-R)}$ | Internal power supply start-up stabilization time after the main power supply is turned on | | | | 2 | ms |

$t_{d(P-R)}$
Internal power supply start-up stabilization time after the main power supply is turned on

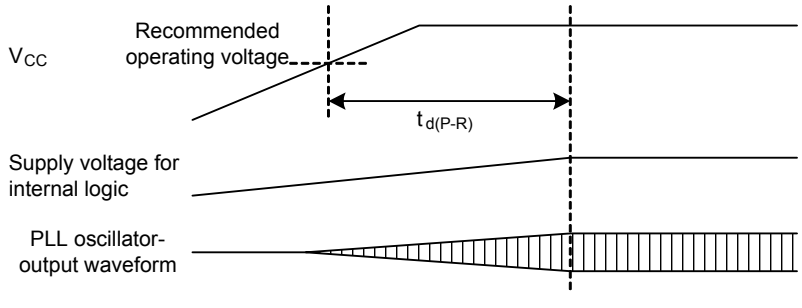



**Figure 5.3 Power Supply Circuit Timing**

**Table 5.11 Electrical Characteristics of Voltage Regulator for Internal Logic ($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristics | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $V_{VDC1}$ | Output voltage | | | 1.5 | | V |

**Table 5.12 Electrical Characteristics of Low Voltage Detector ($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristics | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| ΔVdet | Detected voltage error | | | | ±0.2 | V |
| Vdet(R)-Vdet(F) | Hysteresis width | | 0 | | | V |
| — | Self-consuming current | $V_{CC}$ = 5.0 V, low voltage detector enabled | | 4 | | μA |
| $t_{d(E-A)}$ | Operation start time of low voltage detector | | | | 150 | μs |

**Table 5.13 Electrical Characteristics of Oscillator ($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristics | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $f_{SO(PLL)}$ | PLL clock self-oscillation frequency | | 35 | 57 | 80 | MHz |
| $\|\Delta f_{LOCK}\|$ | Lock detection (1) | | | | 2 | % |
| $\|\Delta f_{UNLOCK}\|$ | Unlock detection (1) | | 2 | | | % |
| $t_{LOCK(PLL)}$ | PLL lock time (2, 3) | $f_{(XRef)}$ = 4 MHz | | | 1 | ms |
| $t_{jitter(p-p)}$ | PLL jitter period (p-p) | | | | 2.0 | ns |
| $f_{(OCO)}$ | On-chip oscillator frequency | | 94 | 125 | 156 | kHz |

Notes:
1. This value is the deviation from target frequency.
2. This value is applicable only when the main clock oscillation is stable.
3. This value is the time until the PLF1 bit in the PLS register becomes 1.

**Table 5.14 Electrical Characteristics of Clock Circuitry**
**($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristics | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $t_{rec(WAIT)}$ | Recovery time from wait mode to low power mode | | | | 225 | µs |
| $t_{rec(STOP)}$ | Recovery time from stop mode (1) | | | | 225 | µs |

Note:
1. The recovery time from stop mode does not include the main clock oscillation stabilization time. The CPU starts operating before the oscillator is stabilized.

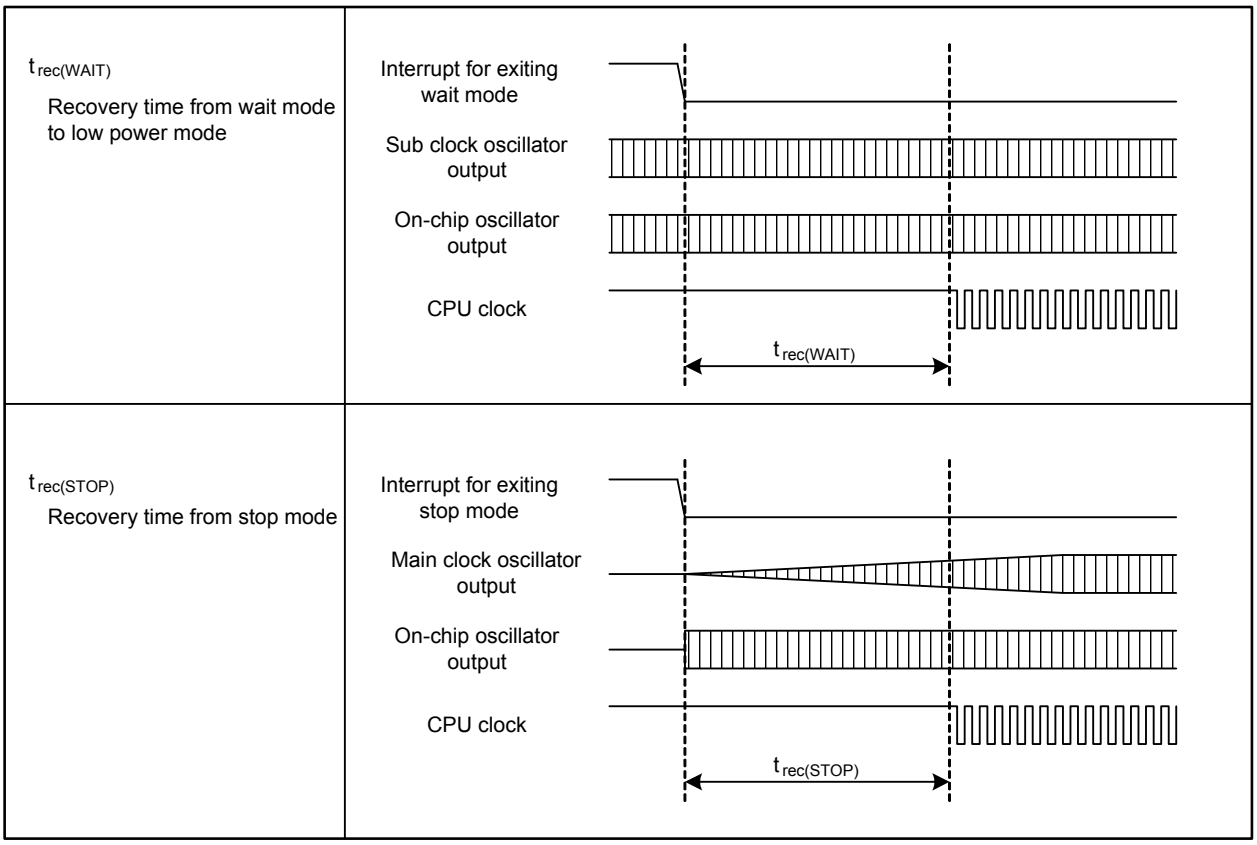



**Figure 5.4 Clock Circuit Timing**

**Timing Requirements ($V_{CC}$ = 3.0 to 5.5 V, $V_{SS}$ = 0 V, and Ta = $T_{opr}$, unless otherwise noted)**

**Table 5.15 Flash Memory CPU Rewrite Mode Timing**

| Symbol | Characteristics | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{cR}$ | Read cycle time | 200 | | ns |
| $t_{su(S-R)}$ | Chip-select setup time before read | 200 | | ns |
| $t_{h(R-S)}$ | Chip-select hold time after read | 0 | | ns |
| $t_{su(A-R)}$ | Address setup time before read | 200 | | ns |
| $t_{h(R-A)}$ | Address hold time after read | 0 | | ns |
| $t_{w(R)}$ | Read pulse width | 100 | | ns |
| $t_{cW}$ | Write cycle time | 200 | | ns |
| $t_{su(S-W)}$ | Chip-select setup time before write | 0 | | ns |
| $t_{h(W-S)}$ | Chip-select hold time after write | 30 | | ns |
| $t_{su(A-W)}$ | Address setup time before write | 0 | | ns |
| $t_{h(W-A)}$ | Address hold time after write | 30 | | ns |
| $t_{w(W)}$ | Write pulse width | 50 | | ns |

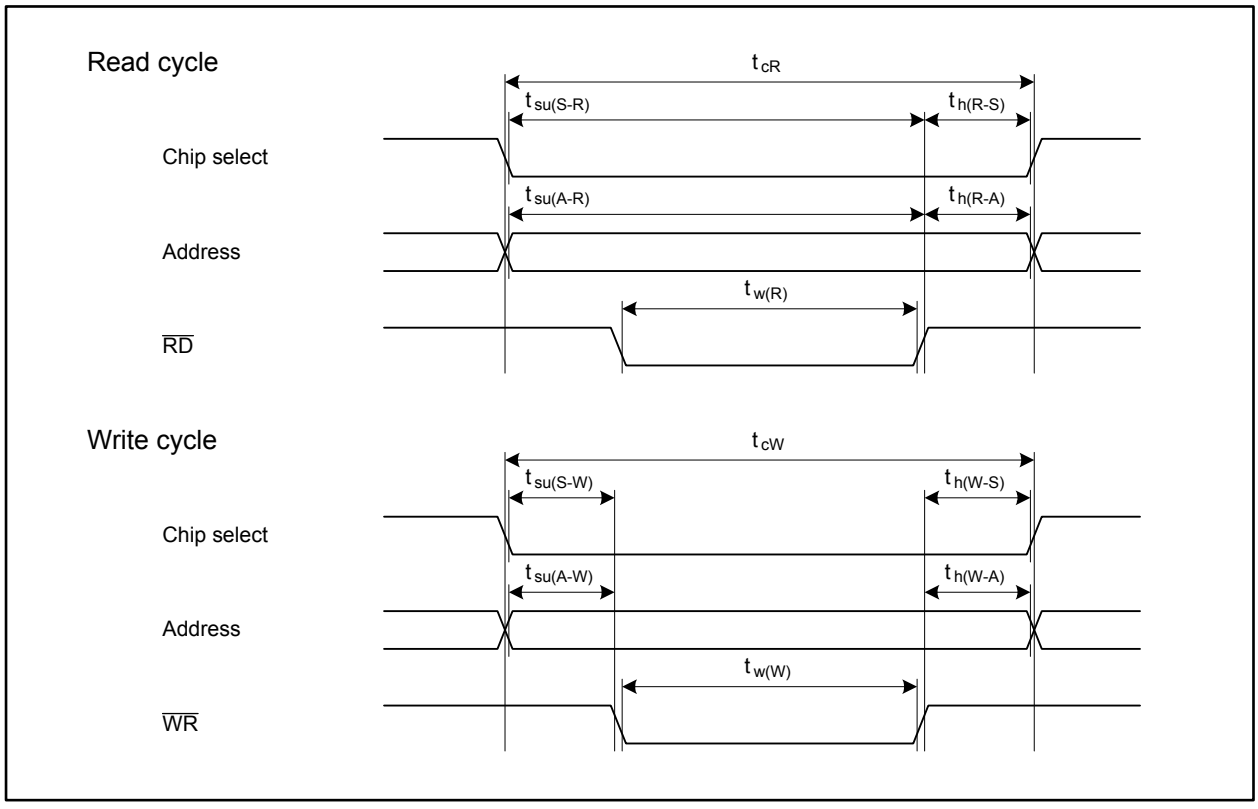



**Figure 5.5 Flash Memory CPU Rewrite Mode Timing**

$V_{CC}$ = 5 V

**Table 5.16 Electrical Characteristics (1/3)**
**($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, $T_a$ = $T_{opr}$, and $f_{(CPU)}$ = 64 MHz, unless otherwise noted)**

| Symbol | Characteristic | | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $V_{OH}$ | High level output voltage | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | $I_{OH}$ = -5 mA | $V_{CC}$ - 2.0 | | $V_{CC}$ | V |
| | | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | $I_{OH}$ = -200 µA | $V_{CC}$ - 0.3 | | $V_{CC}$ | V |
| $V_{OL}$ | Low level output voltage | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | $I_{OL}$ = 5 mA | | | 2.0 | V |
| | | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | $I_{OL}$ = 200 µA | | | 0.45 | V |

$V_{CC}$ = 5 V

**Table 5.17 Electrical Characteristics (2/3)**
**($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, $T_a$ = $T_{opr}$, and $f_{(CPU)}$ = 64 MHz, unless otherwise noted)**

| Symbol | Characteristic | | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $V_{T+} - V_{T-}$ | Hysteresis | $\overline{NMI}$, $\overline{INT0}$ to $\overline{INT8}$, $\overline{KI0}$ to $\overline{KI3}$, TA0IN to TA4IN, TA0OUT to TA4OUT, TB0IN to TB5IN, $\overline{CTS0}$ to $\overline{CTS4}$, CLK0 to CLK4, RXD0 to RXD4, SCL0 to SCL2, SDA0 to SDA2, $\overline{SS0}$ to $\overline{SS2}$, SRXD0 to SRXD2, $\overline{ADTRG}$, IIO0_0 to IIO0_7, IIO1_0 to IIO1_7, IIO2_0 to IIO2_7, IIO3_0 to IIO3_7, UD0A, UD0B, UD1A, UD1B, $\overline{SCS0}$ to $\overline{SCS2}$, SSCK0 to SSCK2, SSI0 to SSI2, SSO0 to SSO2, LIN0_0IN to LIN0_3IN, LIN1_0IN to LIN1_3IN, CAN0IN to CAN3IN, $\overline{CAN0WU}$ to $\overline{CAN3WU}$ | | 0.2 | | 1.0 | V |
| | | $\overline{RESET}$ | | 0.2 | | 1.8 | V |
| $I_{IH}$ | High level input current | XIN, $\overline{RESET}$, CNVSS, NSD, P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | $V_I$ = 5 V | | | 1.0 | µA |
| $I_{IL}$ | Low level input current | XIN, $\overline{RESET}$, CNVSS, NSD, P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | $V_I$ = 0 V | | | -1.0 | µA |
| $R_{PULLUP}$ | Pull-up resistor | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | $V_I$ = 0 V | 30 | 50 | 170 | kΩ |
| $R_{fXIN}$ | Feedback resistor | XIN | | | 1.5 | | MΩ |
| $R_{fXCIN}$ | Feedback resistor | XCIN | | | 15 | | MΩ |

$V_{CC}$ = 5 V

**Table 5.18 Electrical Characteristics (3/3)**
**($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristic | Measurement Condition | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $I_{CC}$ | Power supply current | In single-chip mode, output pins are left open and others are connected to $V_{SS}$<br><br>XIN-XOUT<br>Drive strength: low<br><br>XCIN-XCOUT<br>Drive strength: low | $f_{(CPU)}$ = 64 MHz, $f_{(BCLK)}$ = 32 MHz,<br>$f_{(XIN)}$ = 8 MHz,<br>Active: XIN, PLL,<br>Stopped: XCIN, OCO | | 43 | 70 | mA |
| | | | $f_{(CPU)}$ = $f_{SO(PLL)}$/24 MHz,<br>Active: PLL (self-oscillation),<br>Stopped: XIN, XCIN, OCO | | 7 | | mA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = $f_{(XIN)}$/256 MHz,<br>$f_{(XIN)}$ = 8 MHz,<br>Active: XIN,<br>Stopped: PLL, XCIN, OCO | | 1.2 | | mA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = 32.768 kHz,<br>Active: XCIN,<br>Stopped: XIN, PLL, OCO,<br>Main regulator: shutdown | | 220 | | µA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = $f_{(OCO)}$/4 kHz,<br>Active: OCO,<br>Stopped: XIN, PLL, XCIN,<br>Main regulator: shutdown | | 230 | | µA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = $f_{(XIN)}$/256 MHz,<br>$f_{(XIN)}$ = 8 MHz,<br>Active: XIN,<br>Stopped: PLL, XCIN, OCO,<br>$T_a$ = 25°C, Wait mode | | 960 | 1600 | µA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = 32.768 kHz,<br>Active: XCIN,<br>Stopped: XIN, PLL, OCO,<br>Main regulator: shutdown,<br>$T_a$ = 25°C, Wait mode | | 8 | 140 | µA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = $f_{(OCO)}$/4 kHz,<br>Active: OCO,<br>Stopped: XIN, PLL, XCIN,<br>Main regulator: shutdown,<br>$T_a$ = 25°C, Wait mode | | 10 | 150 | µA |
| | | | Stopped: all clocks,<br>Main regulator: shutdown,<br>$T_a$ = 25°C | | 5 | 70 | µA |
| | | | Stopped: all clocks,<br>Main regulator: shutdown,<br>$T_a$ = 85°C | | | 400 | µA |
| | | | Stopped: all clocks,<br>Main regulator: shutdown,<br>$T_a$ = 105°C | | | 1200 | µA |
| | | | Stopped: all clocks,<br>Main regulator: shutdown,<br>$T_a$ = 125°C | | | 2000 | µA |

$V_{CC}$ = 5 V

**Table 5.19 A/D Conversion Characteristics ($V_{CC}$ = $AV_{CC}$ = $V_{REF}$ = 4.2 to 5.5 V, $V_{SS}$ = $AV_{SS}$ = 0 V, $T_a$ = $T_{opr}$, and $f_{(BCLK)}$ = 32 MHz, unless otherwise noted)**

| Symbol | Characteristic | Measurement Condition | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| — | Resolution | $V_{REF}$ = $V_{CC}$ | | | | 10 | Bits |
| — | Absolute error | $V_{REF}$ = $V_{CC}$ = 5 V | AN_0 to AN_7, AN0_0 to AN0_7, AN2_0 to AN2_7, AN15_0 to AN15_7, ANEX0, ANEX1 | | | ±3 | LSB |
| | | | External op-amp connection mode | | | ±7 | LSB |
| INL | Integral non-linearity error | $V_{REF}$ = $V_{CC}$ = 5 V | AN_0 to AN_7, AN0_0 to AN0_7, AN2_0 to AN2_7, AN15_0 to AN15_7, ANEX0, ANEX1 | | | ±3 | LSB |
| | | | External op-amp connection mode | | | ±7 | LSB |
| DNL | Differential non-linearity error | | | | | ±1 | LSB |
| — | Offset error | | | | | ±3 | LSB |
| — | Gain error | | | | | ±3 | LSB |
| $R_{LADDER}$ | Resistor ladder | $V_{REF}$ = $V_{CC}$ | | 4 | | 20 | kΩ |
| $t_{CONV}$ | Conversion time (10 bits) | $\phi_{AD}$ = 16 MHz, with sample and hold function | | 2.06 | | | µs |
| | | $\phi_{AD}$ = 16 MHz, without sample and hold function | | 3.69 | | | µs |
| $t_{CONV}$ | Conversion time (8 bits) | $\phi_{AD}$ = 16 MHz, with sample and hold function | | 1.75 | | | µs |
| | | $\phi_{AD}$ = 16 MHz, without sample and hold function | | 3.06 | | | µs |
| $t_{SAMP}$ | Sampling time | $\phi_{AD}$ = 16 MHz | | 0.188 | | | µs |
| $V_{IA}$ | Analog input voltage | | | 0 | | $V_{REF}$ | V |
| $\phi_{AD}$ | Operating clock frequency | Without sample and hold function | | 0.25 | | 16 | MHz |
| | | With sample and hold function | | 1 | | 16 | MHz |
| $R_{PU(AST)}$ | Pull-up resistor for open-circuit detection | | | 5 | 10 | 15 | kΩ |
| $R_{PD(AST)}$ | Pull-down resistor for open-circuit detection | | | 5 | 10 | 15 | kΩ |

$V_{CC}$ = 5 V

**Table 5.20 D/A Conversion Characteristics ($V_{CC}$ = $AV_{CC}$ = $V_{REF}$ = 4.2 to 5.5 V, $V_{SS}$ = $AV_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristic | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| — | Resolution | | | | 8 | Bits |
| — | Absolute precision | | | | 1.0 | % |
| $t_S$ | Settling time | | | | 3 | µs |
| $R_O$ | Output resistance | | 4 | 10 | 20 | kΩ |
| $I_{VREF}$ | Reference input current | See Note 1 | | | 1.5 | mA |

Note:
1. One D/A converter is used. The DAi register (i = 0, 1) of the other unused converter is set to 00h. The resistor ladder for the A/D converter is not considered.
Even when the VCUT bit in the AD0CON1 register is set to 0 ($V_{REF}$ disconnected), $I_{VREF}$ is supplied.

## $V_{CC}$ = 5 V

**Timing Requirements ($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.21 External Clock Input**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(X)}$ | External clock input period | 125 | 250 | ns |
| $t_{w(XH)}$ | External clock input high level pulse width | 50 | | ns |
| $t_{w(XL)}$ | External clock input low level pulse width | 50 | | ns |
| $t_{r(X)}$ | External clock input rise time | | 5 | ns |
| $t_{f(X)}$ | External clock input fall time | | 5 | ns |
| $t_w$ / $t_c$ | External clock input duty | 40 | 60 | % |

$V_{CC}$ = 5 V

**Timing Requirements ($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.22 Timer A Input (counting input in event counter mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TA)}$ | TAiIN input clock cycle time | 200 | | ns |
| $t_{w(TAH)}$ | TAiIN input high level pulse width | 80 | | ns |
| $t_{w(TAL)}$ | TAiIN input low level pulse width | 80 | | ns |

**Table 5.23 Timer A Input (gating input in timer mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TA)}$ | TAiIN input clock cycle time | 400 | | ns |
| $t_{w(TAH)}$ | TAiIN input high level pulse width | 180 | | ns |
| $t_{w(TAL)}$ | TAiIN input low level pulse width | 180 | | ns |

**Table 5.24 Timer A Input (external trigger input in one-shot timer mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TA)}$ | TAiIN input clock cycle time | 200 | | ns |
| $t_{w(TAH)}$ | TAiIN input high level pulse width | 80 | | ns |
| $t_{w(TAL)}$ | TAiIN input low level pulse width | 80 | | ns |

**Table 5.25 Timer A Input (external trigger input in pulse-width modulation mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{w(TAH)}$ | TAiIN input high level pulse width | 80 | | ns |
| $t_{w(TAL)}$ | TAiIN input low level pulse width | 80 | | ns |

**Table 5.26 Timer A Input (increment/decrement switching input in event counter mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(UP)}$ | TAiOUT input clock cycle time | 2000 | | ns |
| $t_{w(UPH)}$ | TAiOUT input high level pulse width | 1000 | | ns |
| $t_{w(UPL)}$ | TAiOUT input low level pulse width | 1000 | | ns |
| $t_{su(UP-TIN)}$ | TAiOUT input setup time | 400 | | ns |
| $t_{h(TIN-UP)}$ | TAiOUT input hold time | 400 | | ns |

$V_{CC}$ = 5 V

**Timing Requirements ($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.27 Timer B Input (counting input in event counter mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TB)}$ | TBiIN input clock cycle time (one edge counting) | 200 | | ns |
| $t_{w(TBH)}$ | TBiIN input high level pulse width (one edge counting) | 80 | | ns |
| $t_{w(TBL)}$ | TBiIN input low level pulse width (one edge counting) | 80 | | ns |
| $t_{c(TB)}$ | TBiIN input clock cycle time (both edges counting) | 200 | | ns |
| $t_{w(TBH)}$ | TBiIN input high level pulse width (both edges counting) | 80 | | ns |
| $t_{w(TBL)}$ | TBiIN input low level pulse width (both edges counting) | 80 | | ns |

**Table 5.28 Timer B Input (pulse period measure mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TB)}$ | TBiIN input clock cycle time | 400 | | ns |
| $t_{w(TBH)}$ | TBiIN input high level pulse width | 180 | | ns |
| $t_{w(TBL)}$ | TBiIN input low level pulse width | 180 | | ns |

**Table 5.29 Timer B Input (pulse-width measure mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TB)}$ | TBiIN input clock cycle time | 400 | | ns |
| $t_{w(TBH)}$ | TBiIN input high level pulse width | 180 | | ns |
| $t_{w(TBL)}$ | TBiIN input low level pulse width | 180 | | ns |

$V_{CC}$ = 5 V

**Timing Requirements ($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.30 Serial Interface**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(CK)}$ | CLKi input clock cycle time | 200 | | ns |
| $t_{w(CKH)}$ | CLKi input high level pulse width | 80 | | ns |
| $t_{w(CKL)}$ | CLKi input low level pulse width | 80 | | ns |
| $t_{su(D-C)}$ | RXDi input setup time | 80 | | ns |
| $t_{h(C-D)}$ | RXDi input hold time | 90 | | ns |

**Table 5.31 A/D Trigger Input**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{w(ADH)}$ | $\overline{ADTRG}$ input high level pulse width<br>Hardware trigger input high level pulse width | $\frac{3}{\phi_{AD}}$ | | ns |
| $t_{w(ADL)}$ | $\overline{ADTRG}$ input low level pulse width<br>Hardware trigger input high level pulse width | 125 | | ns |

**Table 5.32 External Interrupt $\overline{INTi}$ Input**

| Symbol | Characteristic | | Value | | Unit |
|---|---|---|---|---|---|
| | | | Min. | Max. | |
| $t_{w(INH)}$ | $\overline{INTi}$ input high level pulse width (1) | Edge sensitive | 250 | | ns |
| | | Level sensitive | $t_{c(CPU)}$ + 200 | | ns |
| $t_{w(INL)}$ | $\overline{INTi}$ input low level pulse width (1) | Edge sensitive | 250 | | ns |
| | | Level sensitive | $t_{c(CPU)}$ + 200 | | ns |

Note:
1. The values are applied in case the filtering function is disabled.

## $V_{CC}$ = 5 V

**Timing Requirements ($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.33 Serial Bus Interface**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $f_{(SSCK)}$ | SSCKi frequency | | 4 | MHz |
| $t_{c(SSCK)}$ | SSCKi clock cycle time | 250 | | ns |
| $t_{w(SSCKH)}$ | SSCKi input high level pulse width | 0.35 × $t_{c(SSCK)}$ | 0.6 × $t_{c(SSCK)}$ | ns |
| $t_{w(SSCKL)}$ | SSCKi input low level pulse width | 0.35 × $t_{c(SSCK)}$ | 0.6 × $t_{c(SSCK)}$ | ns |
| $t_{r(SSCK)}$ | SSCKi input rising time | | 1 | µs |
| $t_{f(SSCK)}$ | SSCKi input falling time | | 1 | µs |
| $t_{su(SCS-SSCK)}$ | SCSi input setup time | $t_{c(BCLK)}$ + 50 | | ns |
| $t_{h(SSCK-SCS)}$ | SCSi input hold time | $t_{c(BCLK)}$ + 50 | | ns |
| $t_{su(SSI-SSCK)}$ | SSI input setup time | 80 | | ns |
| $t_{h(SSCK-SSI)}$ | SSI input hold time | 10 | | ns |
| $t_{su(SSO-SSCK)}$ | SSO input setup time | 80 | | ns |
| $t_{h(SSCK-SSO)}$ | SSO input hold time | 20 | | ns |

$V_{CC}$ = 5 V

**Switching Characteristics ($V_{CC}$ = 4.2 to 5.5 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.34 Serial Interface**

| Symbol | Characteristic | Measurement Condition | Value | | Unit |
|---|---|---|---|---|---|
| | | | Min. | Max. | |
| $t_{d(C-Q)}$ | TXDi output delay time | Refer to Figure 5.6 | | 80 | ns |
| $t_{h(C-Q)}$ | TXDi output hold time | | 0 | | ns |

**Table 5.35 Serial Bus Interface**

| Symbol | Characteristic | Measurement Condition | Value | | Unit |
|---|---|---|---|---|---|
| | | | Min. | Max. | |
| $t_{w(SSCKH)}$ | SSCKi output high level pulse width | Refer to Figure 5.6 | 0.35 × $t_{c(SSCK)}$ | 0.6 × $t_{c(SSCK)}$ | ns |
| $t_{w(SSCKL)}$ | SSCKi output low level pulse width | | 0.35 × $t_{c(SSCK)}$ | 0.6 × $t_{c(SSCK)}$ | ns |
| $t_{r(SSCK)}$ | SSCKi output rising time | | | 20 | ns |
| $t_{f(SSCK)}$ | SSCKi output falling time | | | 20 | ns |
| $t_{d(SCS-SSCK)}$ | SSCKi output delay time for SCSi | | | 0.5 × $t_{c(SSCK)}$ + 20 | ns |
| $t_{d(SSCK-SCS)}$ | SCSi output delay time for SSCKi | | 0.5 × $t_{c(SSCK)}$ - 20 | | ns |
| $t_{en(SCS-SSO)}$ | SSOi output enable time | | | 1.5 × $t_{c(BCLK)}$ + 100 | ns |
| $t_{dis(SCS-SSO)}$ | SSOi output disable time | | | 1.5 × $t_{c(BCLK)}$ + 100 | ns |
| $t_{en(SCS-SSI)}$ | SSIi output enable time | | | 1.5 × $t_{c(BCLK)}$ + 100 | ns |
| $t_{dis(SCS-SSI)}$ | SSIi output disable time | | | 1.5 × $t_{c(BCLK)}$ + 100 | ns |
| $t_{d(SSCK-SSO)}$ | SSOi output delay time for SSCKi | | | 30 | ns |
| $t_{d(SSCK-SSI)}$ | SSIi output delay time for SSCKi | | | 85 | ns |
| $t_{rec(SCS)}$ | SCSi output high level period in continuous transmission | | | 0.625 × $t_{c(SSCK)}$ | ns |

$V_{CC}$ = 3.3 V

**Table 5.36 Electrical Characteristics (1/3) ($V_{CC}$ = 3.0 to 3.6 V, $V_{SS}$ = 0 V, $T_a$ = $T_{opr}$, and $f_{(CPU)}$ = 64 MHz, unless otherwise noted)**

| Symbol | Characteristic | | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $V_{OH}$ | High level output voltage | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | $I_{OH}$ = -1 mA | $V_{CC}$ - 0.6 | | $V_{CC}$ | V |
| $V_{OL}$ | Low level output voltage | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_3 to P14_6, P15_0 to P15_7 | $I_{OL}$ = 1 mA | | | 0.5 | V |

$V_{CC}$ = 3.3 V

**Table 5.37 Electrical Characteristics (2/3) ($V_{CC}$ = 3.0 to 3.6 V, $V_{SS}$ = 0 V, $T_a$ = $T_{opr}$, and $f_{(CPU)}$ = 64 MHz, unless otherwise noted)**

| Symbol | Characteristic | | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $V_{T+} - V_{T-}$ | Hysteresis | NMI, INT0 to INT8, KI0 to KI3, TA0IN to TA4IN, TA0OUT to TA4OUT, TB0IN to TB5IN, CTS0 to CTS4, CLK0 to CLK4, RXD0 to RXD4, SCL0 to SCL2, SDA0 to SDA2, SS0 to SS2, SRXD0 to SRXD2, ADTRG, IIO0_0 to IIO0_7, IIO1_0 to IIO1_7, IIO2_0 to IIO2_7, IIO3_0 to IIO3_7, UD0A, UD0B, UD1A, UD1B, SCS0 to SCS2, SSCK0 to SSCK2, SSI0 to SSI2, SSO0 to SSO2, LIN0_0IN to LIN0_3IN, LIN1_0IN to LIN1_3IN, CAN0IN to CAN3IN, CAN0WU to CAN3WU | | 0.2 | | 1.0 | V |
| | | RESET | | 0.2 | | 1.8 | V |
| $I_{IH}$ | High level input current | XIN, RESET, CNVSS, NSD, P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | $V_I$ = 3.3 V | | | 1.0 | µA |
| $I_{IL}$ | Low level input current | XIN, RESET, CNVSS, NSD, P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | $V_I$ = 0 V | | | -1.0 | µA |
| $R_{PULLUP}$ | Pull-up resistor | P0_0 to P0_7, P1_0 to P1_7, P2_0 to P2_7, P3_0 to P3_7, P4_0 to P4_7, P5_0 to P5_7, P6_0 to P6_7, P7_0 to P7_7, P8_0 to P8_4, P8_6, P8_7, P9_0 to P9_7, P10_0 to P10_7, P11_0 to P11_4, P12_0 to P12_7, P13_0 to P13_7, P14_1, P14_3 to P14_6, P15_0 to P15_7 | $V_I$ = 0 V | 50 | 100 | 500 | kΩ |
| $R_{fXIN}$ | Feedback resistor | XIN | | | 3 | | MΩ |
| $R_{fXCIN}$ | Feedback resistor | XCIN | | | 25 | | MΩ |

$V_{CC}$ = 3.3 V

**Table 5.38 Electrical Characteristics (3/3)**
**($V_{CC}$ = 3.0 to 3.6 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristic | Measurement Condition | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $I_{CC}$ | Power supply current | In single-chip mode, output pins are left open and others are connected to $V_{SS}$<br><br>XIN-XOUT<br>Drive strength: low<br><br>XCIN-XCOUT<br>Drive strength: low | $f_{(CPU)}$ = 64 MHz, $f_{(BCLK)}$ = 32 MHz,<br>$f_{(XIN)}$ = 8 MHz,<br>Active: XIN, PLL,<br>Stopped: XCIN, OCO | | 43 | 70 | mA |
| | | | $f_{(CPU)}$ = $f_{SO(PLL)}$/24 MHz,<br>Active: PLL (self-oscillation),<br>Stopped: XIN, XCIN, OCO | | 7 | | mA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = $f_{(XIN)}$/256 MHz,<br>$f_{(XIN)}$ = 8 MHz,<br>Active: XIN,<br>Stopped: PLL, XCIN, OCO | | 670 | | µA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = 32.768 kHz,<br>Active: XCIN,<br>Stopped: XIN, PLL, OCO,<br>Main regulator: shutdown | | 180 | | µA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = $f_{(OCO)}$/4 kHz,<br>Active: OCO,<br>Stopped: XIN, PLL, XCIN,<br>Main regulator: shutdown | | 190 | | µA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = $f_{(XIN)}$/256 MHz,<br>$f_{(XIN)}$ = 8 MHz,<br>Active: XIN,<br>Stopped: PLL, XCIN, OCO,<br>$T_a$ = 25°C, Wait mode | | 500 | 900 | µA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = 32.768 kHz,<br>Active: XCIN,<br>Stopped: XIN, PLL, OCO,<br>Main regulator: shutdown,<br>$T_a$ = 25°C, Wait mode | | 8 | 140 | µA |
| | | | $f_{(CPU)}$ = $f_{(BCLK)}$ = $f_{(OCO)}$/4 kHz,<br>Active: OCO,<br>Stopped: XIN, PLL, XCIN,<br>Main regulator: shutdown,<br>$T_a$ = 25°C, Wait mode | | 10 | 150 | µA |
| | | | Stopped: all clocks,<br>Main regulator: shutdown,<br>$T_a$ = 25°C | | 5 | 70 | µA |
| | | | Stopped: all clocks,<br>Main regulator: shutdown,<br>$T_a$ = 85°C | | | 400 | µA |
| | | | Stopped: all clocks,<br>Main regulator: shutdown,<br>$T_a$ = 105°C | | | 1200 | µA |
| | | | Stopped: all clocks,<br>Main regulator: shutdown,<br>$T_a$ = 125°C | | | 2000 | µA |

$V_{CC}$ = 3.3 V

**Table 5.39 A/D Conversion Characteristics ($V_{CC}$ = $AV_{CC}$ = $V_{REF}$ = 3.0 to 3.6 V, $V_{SS}$ = $AV_{SS}$ = 0 V, $T_a$ = $T_{opr}$, and $f_{(BCLK)}$ = 32 MHz, unless otherwise noted)**

| Symbol | Characteristic | Measurement Condition | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| — | Resolution | $V_{REF}$ = $V_{CC}$ | | | | 10 | Bits |
| — | Absolute error | $V_{REF}$ = $V_{CC}$ = 3.3 V | AN_0 to AN_7, AN0_0 to AN0_7, AN2_0 to AN2_7, AN15_0 to AN15_7, ANEX0, ANEX1 | | | ±5 | LSB |
| | | | External op-amp connection mode | | | ±7 | LSB |
| INL | Integral non-linearity error | $V_{REF}$ = $V_{CC}$ = 3.3 V | AN_0 to AN_7, AN0_0 to AN0_7, AN2_0 to AN2_7, AN15_0 to AN15_7, ANEX0, ANEX1 | | | ±5 | LSB |
| | | | External op-amp connection mode | | | ±7 | LSB |
| DNL | Differential non-linearity error | $V_{REF}$ = $V_{CC}$ = 3.3 V | | | | ±1 | LSB |
| — | Offset error | | | | | ±3 | LSB |
| — | Gain error | | | | | ±3 | LSB |
| $R_{LADDER}$ | Resistor ladder | $V_{REF}$ = $V_{CC}$ | | 4 | | 20 | kΩ |
| $t_{CONV}$ | Conversion time (10 bits) | $\phi_{AD}$ = 10 MHz, with sample and hold function | | 3.3 | | | µs |
| $t_{CONV}$ | Conversion time (8 bits) | $\phi_{AD}$ = 10 MHz, with sample and hold function | | 2.8 | | | µs |
| $t_{SAMP}$ | Sampling time | $\phi_{AD}$ = 10 MHz | | 0.3 | | | µs |
| $V_{IA}$ | Analog input voltage | | | 0 | | $V_{REF}$ | V |
| $\phi_{AD}$ | Operating clock frequency | Without sample and hold function | | 0.25 | | 10 | MHz |
| | | With sample and hold function | | 1 | | 10 | MHz |
| $R_{PU(AST)}$ | Pull-up resistor for open-circuit detection | | | 5 | 10 | 15 | kΩ |
| $R_{PD(AST)}$ | Pull-down resistor for open-circuit detection | | | 5 | 10 | 15 | kΩ |

$V_{CC}$ = 3.3 V

**Table 5.40 D/A Conversion Characteristics ($V_{CC}$ = $AV_{CC}$ = $V_{REF}$ = 3.0 to 3.6 V, $V_{SS}$ = $AV_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

| Symbol | Characteristic | Measurement Condition | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| — | Resolution | | | | 8 | Bits |
| — | Absolute precision | | | | 1.0 | % |
| $t_S$ | Settling time | | | | 3 | µs |
| $R_O$ | Output resistance | | 4 | 10 | 20 | kΩ |
| $I_{VREF}$ | Reference input current | See Note 1 | | | 1.0 | mA |

Note:
1. One D/A converter is used. The DAi register (i = 0, 1) of the other unused converter is set to 00h. The resistor ladder for the A/D converter is not considered.
Even when the VCUT bit in the AD0CON1 register is set to 0 ($V_{REF}$ disconnected), $I_{VREF}$ is supplied.

$V_{CC}$ = 3.3 V

**Timing Requirements ($V_{CC}$ = 3.0 to 3.6 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.41 External Clock Input**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(X)}$ | External clock input period | 125 | 250 | ns |
| $t_{w(XH)}$ | External clock input high level pulse width | 50 | | ns |
| $t_{w(XL)}$ | External clock input low level pulse width | 50 | | ns |
| $t_{r(X)}$ | External clock input rise time | | 5 | ns |
| $t_{f(X)}$ | External clock input fall time | | 5 | ns |
| $t_w$ / $t_c$ | External clock input duty | 40 | 60 | % |

$V_{CC}$ = 3.3 V

**Timing Requirements ($V_{CC}$ = 3.0 to 3.6 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.42 Timer A Input (counting input in event counter mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TA)}$ | TAiIN input clock cycle time | 200 | | ns |
| $t_{w(TAH)}$ | TAiIN input high level pulse width | 80 | | ns |
| $t_{w(TAL)}$ | TAiIN input low level pulse width | 80 | | ns |

**Table 5.43 Timer A Input (gating input in timer mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TA)}$ | TAiIN input clock cycle time | 400 | | ns |
| $t_{w(TAH)}$ | TAiIN input high level pulse width | 180 | | ns |
| $t_{w(TAL)}$ | TAiIN input low level pulse width | 180 | | ns |

**Table 5.44 Timer A Input (external trigger input in one-shot timer mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TA)}$ | TAiIN input clock cycle time | 200 | | ns |
| $t_{w(TAH)}$ | TAiIN input high level pulse width | 80 | | ns |
| $t_{w(TAL)}$ | TAiIN input low level pulse width | 80 | | ns |

**Table 5.45 Timer A Input (external trigger input in pulse-width modulation mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{w(TAH)}$ | TAiIN input high level pulse width | 80 | | ns |
| $t_{w(TAL)}$ | TAiIN input low level pulse width | 80 | | ns |

**Table 5.46 Timer A Input (increment/decrement switching input in event counter mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(UP)}$ | TAiOUT input clock cycle time | 2000 | | ns |
| $t_{w(UPH)}$ | TAiOUT input high level pulse width | 1000 | | ns |
| $t_{w(UPL)}$ | TAiOUT input low level pulse width | 1000 | | ns |
| $t_{su(UP-TIN)}$ | TAiOUT input setup time | 400 | | ns |
| $t_{h(TIN-UP)}$ | TAiOUT input hold time | 400 | | ns |

$V_{CC}$ = 3.3 V

**Timing Requirements ($V_{CC}$ = 3.0 to 3.6 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.47 Timer B Input (counting input in event counter mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TB)}$ | TBiIN input clock cycle time (one edge counting) | 200 | | ns |
| $t_{w(TBH)}$ | TBiIN input high level pulse width (one edge counting) | 80 | | ns |
| $t_{w(TBL)}$ | TBiIN input low level pulse width (one edge counting) | 80 | | ns |
| $t_{c(TB)}$ | TBiIN input clock cycle time (both edges counting) | 200 | | ns |
| $t_{w(TBH)}$ | TBiIN input high level pulse width (both edges counting) | 80 | | ns |
| $t_{w(TBL)}$ | TBiIN input low level pulse width (both edges counting) | 80 | | ns |

**Table 5.48 Timer B Input (pulse period measure mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TB)}$ | TBiIN input clock cycle time | 400 | | ns |
| $t_{w(TBH)}$ | TBiIN input high level pulse width | 180 | | ns |
| $t_{w(TBL)}$ | TBiIN input low level pulse width | 180 | | ns |

**Table 5.49 Timer B Input (pulse-width measure mode)**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(TB)}$ | TBiIN input clock cycle time | 400 | | ns |
| $t_{w(TBH)}$ | TBiIN input high level pulse width | 180 | | ns |
| $t_{w(TBL)}$ | TBiIN input low level pulse width | 180 | | ns |

$V_{CC}$ = 3.3 V

**Timing Requirements ($V_{CC}$ = 3.0 to 3.6 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.50 Serial Interface**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{c(CK)}$ | CLKi input clock cycle time | 200 | | ns |
| $t_{w(CKH)}$ | CLKi input high level pulse width | 80 | | ns |
| $t_{w(CKL)}$ | CLKi input low level pulse width | 80 | | ns |
| $t_{su(D-C)}$ | RXDi input setup time | 80 | | ns |
| $t_{h(C-D)}$ | RXDi input hold time | 90 | | ns |

**Table 5.51 A/D Trigger Input**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $t_{w(ADH)}$ | $\overline{ADTRG}$ input high level pulse width<br>Hardware trigger input high level pulse width | $\frac{3}{\phi_{AD}}$ | | ns |
| $t_{w(ADL)}$ | $\overline{ADTRG}$ input low level pulse width<br>Hardware trigger input high level pulse width | 125 | | ns |

**Table 5.52 External Interrupt $\overline{INTi}$ Input**

| Symbol | Characteristic | | Value | | Unit |
|---|---|---|---|---|---|
| | | | Min. | Max. | |
| $t_{w(INH)}$ | $\overline{INTi}$ input high level pulse width (1) | Edge sensitive | 250 | | ns |
| | | Level sensitive | $t_{C(CPU)}$ + 200 | | ns |
| $t_{w(INL)}$ | $\overline{INTi}$ input low level pulse width (1) | Edge sensitive | 250 | | ns |
| | | Level sensitive | $t_{C(CPU)}$ + 200 | | ns |

Note:
1. The values are applied in case filtering function is disabled.

## $V_{CC}$ = 3.3 V

**Timing Requirements ($V_{CC}$ = 3.0 to 3.6 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.53 Serial Bus Interface**

| Symbol | Characteristic | Value | | Unit |
|---|---|---|---|---|
| | | Min. | Max. | |
| $f_{(SSCK)}$ | SSCKi frequency | | 4 | MHz |
| $t_{c(SSCK)}$ | SSCKi clock cycle time | 250 | | ns |
| $t_{w(SSCKH)}$ | SSCKi input high level pulse width | 0.35 × $t_{c(SSCK)}$ | 0.6 × $t_{c(SSCK)}$ | ns |
| $t_{w(SSCKL)}$ | SSCKi input low level pulse width | 0.35 × $t_{c(SSCK)}$ | 0.6 × $t_{c(SSCK)}$ | ns |
| $t_{r(SSCK)}$ | SSCKi input rising time | | 1 | µs |
| $t_{f(SSCK)}$ | SSCKi input falling time | | 1 | µs |
| $t_{su(SCS-SSCK)}$ | SCSi input setup time | $t_{c(BCLK)}$ + 50 | | ns |
| $t_{h(SSCK-SCS)}$ | SCSi input hold time | $t_{c(BCLK)}$ + 50 | | ns |
| $t_{su(SSI-SSCK)}$ | SSI input setup time | 100 | | ns |
| $t_{h(SSCK-SSI)}$ | SSI input hold time | 10 | | ns |
| $t_{su(SSO-SSCK)}$ | SSO input setup time | 100 | | ns |
| $t_{h(SSCK-SSO)}$ | SSO input hold time | 20 | | ns |

$V_{CC}$ = 3.3 V

**Switching Characteristics ($V_{CC}$ = 3.0 to 3.6 V, $V_{SS}$ = 0 V, and $T_a$ = $T_{opr}$, unless otherwise noted)**

**Table 5.54 Serial Interface**

| Symbol | Characteristic | Measurement Condition | Value | | Unit |
|---|---|---|---|---|---|
| | | | Min. | Max. | |
| $t_{d(C-Q)}$ | TXDi output delay time | Refer to Figure 5.6 | | 80 | ns |
| $t_{h(C-Q)}$ | TXDi output hold time | | 0 | | ns |

**Table 5.55 Serial Bus Interface**

| Symbol | Characteristic | Measurement Condition | Value | | Unit |
|---|---|---|---|---|---|
| | | | Min. | Max. | |
| $t_{w(SSCKH)}$ | SSCKi output high level pulse width | Refer to Figure 5.6 | 0.35 × $t_{c(SSCK)}$ | 0.6 × $t_{c(SSCK)}$ | ns |
| $t_{w(SSCKL)}$ | SSCKi output low level pulse width | | 0.35 × $t_{c(SSCK)}$ | 0.6 × $t_{c(SSCK)}$ | ns |
| $t_{r(SSCK)}$ | SSCKi output rising time | | | 35 | ns |
| $t_{f(SSCK)}$ | SSCKi output falling time | | | 35 | ns |
| $t_{d(SCS-SSCK)}$ | SSCKi output delay time for SCSi | | | 0.5 × $t_{c(SSCK)}$ + 40 | ns |
| $t_{d(SSCK-SCS)}$ | SCSi output delay time for SSCKi | | 0.5 × $t_{c(SSCK)}$ - 40 | | ns |
| $t_{en(SCS-SSO)}$ | SSOi output enable time | | | 1.5 × $t_{c(BCLK)}$ + 100 | ns |
| $t_{dis(SCS-SSO)}$ | SSOi output disable time | | | 1.5 × $t_{c(BCLK)}$ + 100 | ns |
| $t_{en(SCS-SSI)}$ | SSIi output enable time | | | 1.5 × $t_{c(BCLK)}$ + 100 | ns |
| $t_{dis(SCS-SSI)}$ | SSIi output disable time | | | 1.5 × $t_{c(BCLK)}$ + 100 | ns |
| $t_{d(SSCK-SSO)}$ | SSOi output delay time for SSCKi | | | 50 | ns |
| $t_{d(SSCK-SSI)}$ | SSIi output delay time for SSCKi | | | 120 | ns |
| $t_{rec(SCS)}$ | SCSi output high level period in continuous transmission | | | 0.625 × $t_{c(SSCK)}$ | ns |

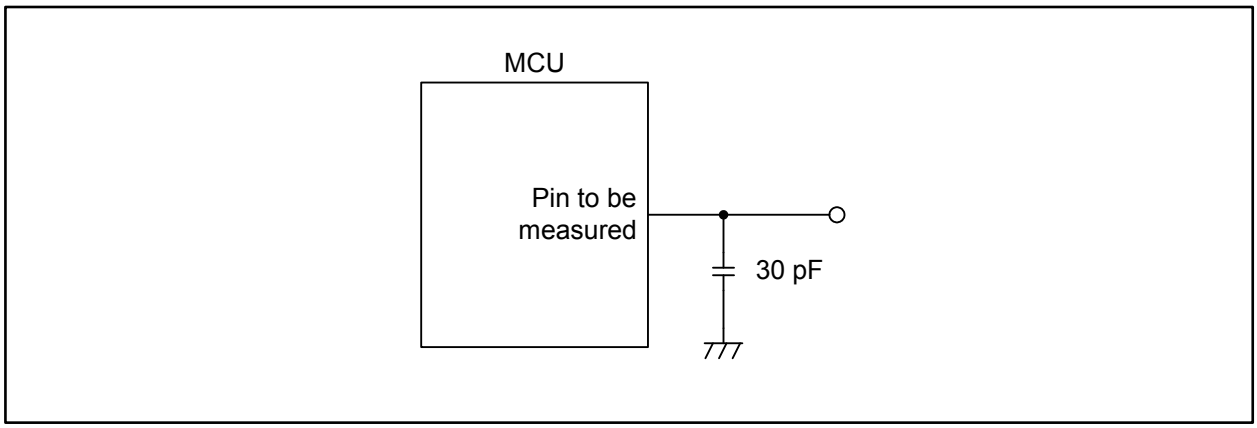



**Figure 5.6 Switching Characteristic Measurement Circuit**

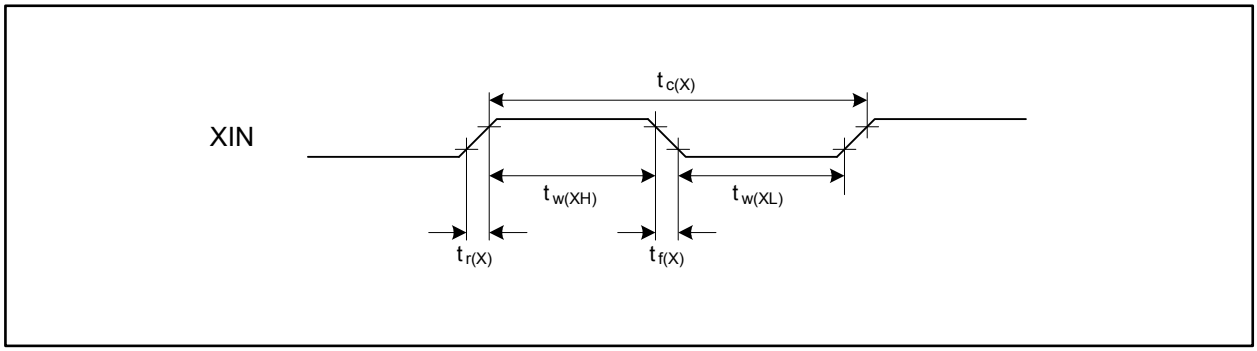



**Figure 5.7 External Clock Input Timing**

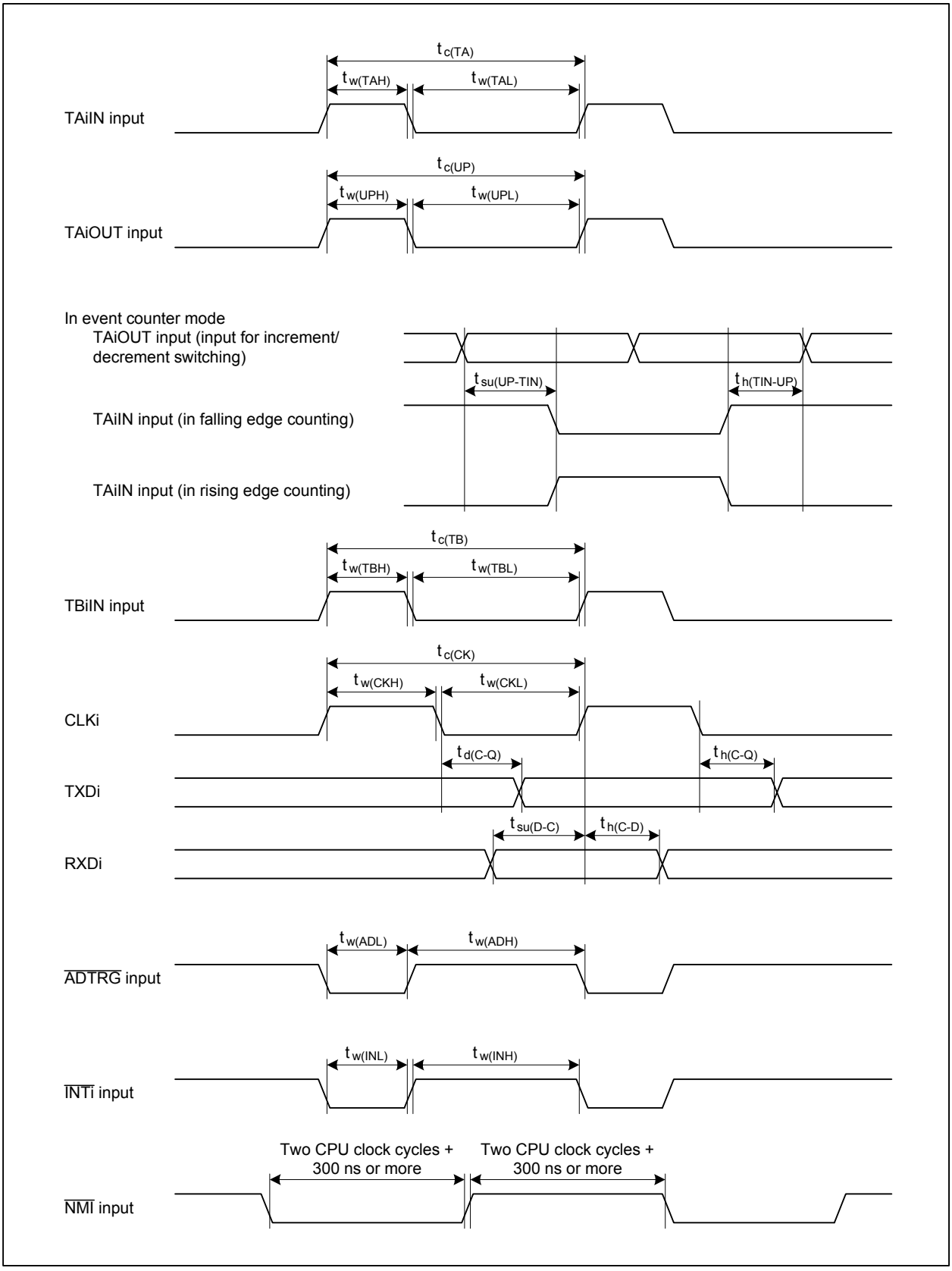



**Figure 5.8 Timing of Peripherals**

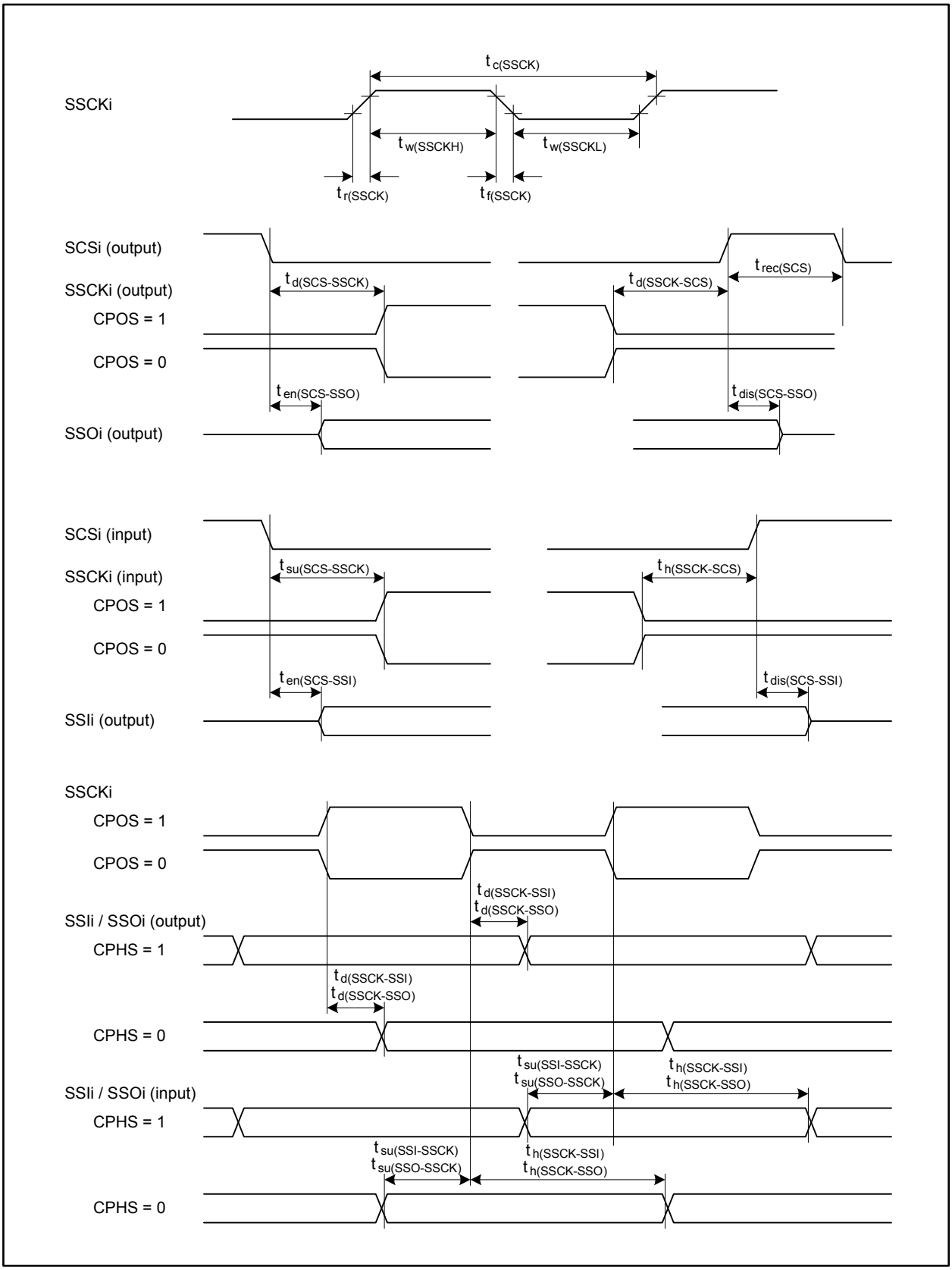
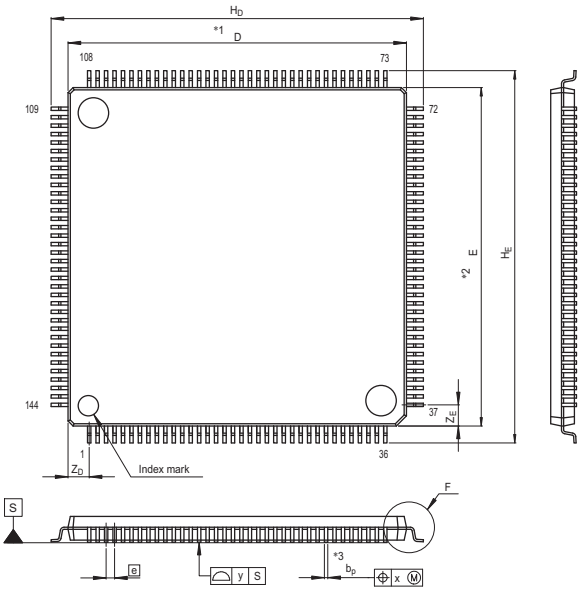
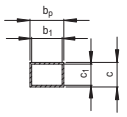



**Figure 5.9 Timing of Serial Bus Interface**

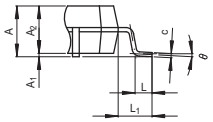
# Appendix 1. Package Dimensions

| JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|
| P-LQFP144-20x20-0.50 | PLQP0144KA-A | 144P6Q-A / FP-144L / FP-144LV | 1.2g |




Terminal cross section




Detail F

NOTE)
1. DIMENSIONS "*1" AND "*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION "*3" DOES NOT INCLUDE TRIM OFFSET.

| Reference Symbol | Dimension in Millimeters | | |
|---|---|---|---|
| | Min | Nom | Max |
| D | 19.9 | 20.0 | 20.1 |
| E | 19.9 | 20.0 | 20.1 |
| $A_2$ | — | 1.4 | — |
| $H_D$ | 21.8 | 22.0 | 22.2 |
| $H_E$ | 21.8 | 22.0 | 22.2 |
| A | — | — | 1.7 |
| $A_1$ | 0.05 | 0.1 | 0.15 |
| $b_p$ | 0.17 | 0.22 | 0.27 |
| $b_1$ | — | 0.20 | — |
| c | 0.09 | 0.145 | 0.20 |
| $c_1$ | — | 0.125 | — |
| θ | 0° | — | 8° |
| e | — | 0.5 | — |
| x | — | — | 0.08 |
| y | — | — | 0.10 |
| $Z_D$ | — | 1.25 | — |
| $Z_E$ | — | 1.25 | — |
| L | 0.35 | 0.5 | 0.65 |
| $L_1$ | — | 1.0 | — |

| Revision History | R32C/153 Group Datasheet |
|---|---|

| Rev. | Date | Description | |
|---|---|---|---|
| | | Page | Summary |
| 0.30 | Feb 14, 2008 | — | Initial release |
| 1.02 | Nov 30, 2009 | — | Second edition released |
| | | | **Chapter 1. Overview** |
| | | — | • Made minor text modifications to this chapter |
| | | 1 | • Added “(MCUs)” to line 1 of **1.1** |
| | | 3 | • Changed the following expressions in **Table 1.2**: “erase/program” to “program/erase”, “Read protection” to “Security protection”, “ID code check” to “ID code protect”, and “on-board flash re-programming” to “on-board flash programming” |
| | | 5 | • Deleted hyphen before ROM number in **Figure 1.1** |
| | | 6 | • Changed **Figure 1.2** |
| | | 7 | • Modified “$\overline{K13}$” to “$\overline{K10}$” for pins 133 to 136 in **Figure 1.3** to “$\overline{KI3}$” to “$\overline{KI0}$” |
| | | 10 | • Corrected a typo “LIN // CAN Module Pin” in **Table 1.6** to “LIN / CAN Module Pin” |
| | | 12-14 | • Changed descriptions “Functional Category” and “Function” in **Tables 1.8 to 1.10** to “Function” and “Description”, respectively |
| | | | **Chapter 2. Central Processing Unit** |
| | | — | • Made major text modifications to this chapter |
| | | 15, 16 | • Changed description “Interrupt table register” in **Figure 2.1 and 2.1.6** to “Interrupt vector table base register” |
| | | | **Chapter 3. Memory** |
| | | — | • Made major text modifications to this chapter |
| | | | **Chapter 4. Special Function Registers** |
| | | 20 | • Changed hexadecimal format of reset values for registers CCR and FMCR in **Table 4.1** to binary |
| | | 21-22 | • Changed the following expressions “DMAi Interrupt” and “Start/Stop Condition” in **Tables 4.2 to 4.3** to “DMAi Transfer Complete Interrupt” and “Start Condition/Stop Condition”, respectively |
| | | 26 | • Deleted “6” from register name for register G2FS in **Table 4.7** |
| | | 29 | • Changed binary format of reset values for U3RB and U4RB in **Table 4.10** to hexadecimal |
| | | 31 | • Changed register symbols “G3TMi/G0POj” in **Table 4.12** to “G3TMi/G3POj” |
| | | 32 | • Changed expression of register name “Xi Register Yi Register” and symbol “XiR, YiR” in **Table 4.13** to “Xi Register/Yi Register” and “XiR/YiR”, respectively |
| | | 37 | • Changed hexadecimal format of reset values for registers PDi in **Table 4.18** to binary |
| | | 39 | • Modified reset value for register PLS in **Table 4.20** to “1XXX XX00b” |
| | | 41 | • Modified reset value for register IFS7 in **Table 4.22** to “XXXX XXX0b” |
| | | 41-43 | • Modified register name “Port Pi_j Port Function Select Register” in **Tables 4.22 to 4.24** to “Port Pi_j Function Select Register” |

| Rev. | Date | Description | |
|---|---|---|---|
| | | Page | Summary |
| | | 45 | • Modified the following register names in **Table 4.26**: “DMAi Source Select Register 2” to “DMAi Request Source Select Register 2” and “DMAi Source Select Register 1” to “DMAi Request Source Select Register”; Changed expression “Wake-up/Interrupt Priority Level Control Register” to “Wake-up IPL Setting Register” |
| | | 46-47 | • Modified “X” in reset values for unassigned bits to “0” for the following registers in **Tables 4.27 to 4.28**: LiCW, LiBRG, LiMD0, LiBRK, LiSPC, LiRFC, LiSC, LiTC, LiST, and LiEST |
| | | 47 | • Corrected register symbol “L1FRC” in **Table 4.28** to “L1RFC” |
| | | 64, 78, 92, 106 | • Modified reset value “00h” for C3CLKR in **Table 4.45**, C2CLKR in **Table 4.59**, C1CLKR in **Table 4.73**, and C0CLKR in **Table 4.87** to “000X 0000b” |
| | | 106 | • Added addresses “047F60h to 047FFFh” and “048000h to 04FFFFh” to **Table 4.87** |
| | | | **Chapter 5. Electrical Characteristics** |
| | | — | • Added initially |
| 1.10 | Sep 06, 2010 | — | Third edition released |
| | | | This manual in general |
| | | — | • Applied new Renesas templates and formats to the manual<br>• Changed company name to “Renesas Electronics Corporation” and changed related descriptions due to business merger of Renesas Technology Corporation and NEC Electronics Corporation (under Chapters 1 and 5)<br>• Modified expressions “version J”, “version L”, and “version K” to “J version”, “L version”, and “K version”, respectively (under Chapters 1 and 5) |
| | | | **Chapter 1. Overview** |
| | | 4 | • Completed all “under development” phases in **Table 1.3** |
| | | 7 | • Revised **Figure 1.3** |
| | | 12 | • Modified expression “fC” in **Table 1.8** to “low speed clocks” |
| | | | **Chapter 4. SFRs** |
| | | 25, 28, 31 | • Changed register name “Group i Timer Measurement Prescaler Register” in **Tables 4.6, 4.9, and 4.12** to “Group i Time Measurement Prescaler Register” |
| | | 32 | • Modified expression “XY Control Register” in **Table 4.13** to “X-Y Control Register” |
| | | 34 | • Changed register name “UART2 Transmission/Receive Mode Register” in **Table 4.15** to “UART2 Transmit/Receive Mode Register”; Changed hexadecimal format of reset values for registers TABSR, ONSF, and TRGSR to binary |
| | | 45 | • Changed register name “External Interrupt Source Select Register i” in **Table 4.26** to “External Interrupt Request Source Select Register i” |
| | | 64, 78, 92, 106 | • Modified register names “CANi Reception Error Count Register” and “CANi Transmission Error Count Register” in **Tables 4.45, 4.59, 4.73, and 4.87** to “CANi Receive Error Count Register” and “CANi Transmit Error Count Register”, respectively |

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| | | Page | Summary |
| | | | **Chapter 5. Electrical Characteristics** |
| | | — | • Changed expression “clock period” to “clock cycle time” |
| | | 116 | • Changed typical and maximum values for “$f_{SO(PLL)}$” in **Table 5.13**; Added values for “$\|\Delta f_{LOCK}\|$” and “$\|\Delta f_{UNLOCK}\|$” |
| | | 118 | • Changed expressions “$\overline{CS0}$” and “A23 to A0, $\overline{BC3}$ to $\overline{BC0}$” in **Figure 5.5** to “Chip select” and “Address”, respectively |
| | | | **Appendix 1. Package Dimensions** |
| | | 144 | • Added a seating plane to the drawing of package dimension |
| 1.20 | Aug 07, 2013 | — | Fourth edition released |
| | | | This manual in general |
| | | — | • Changed document number “REJ03B0232-0110” to “R01DS0074EJ0120” |
| | | | **Chapter 1. Overview** |
| | | — | • Modified wording and enhanced description in this chapter |
| | | 1 | • Modified expression “$I^2C$” in line 9 of **1.1** to “$I^2C$-bus interface” |
| | | 2 | • Modified expressions “Main clock oscillator stop/re-oscillation detection”, “calculation transfer”, “chained transfer”, and “inputs/ outputs” in **Table 1.1** to “Main clock oscillator stop/restart detection”, “calculation result transfer”, “chain transfer”, and “I/O ports”, respectively |
| | | 8, 10 | • Changed the order of timer pins for pin no. 36 in **Table 1.4** and pin nos. 79 and 81 in **Table 1.6** |
| | | 13 | • Modified expression “$I^2C$ bus” in **Table 1.9** to “$I^2C$-bus” |
| | | | **Chapter 2. CPU** |
| | | — | • Modified wording and enhanced description in this chapter |
| | | 16 | • Corrected a typo “R3R0” in line 3 of **2.1.1** to “R3R1” |
| | | | **Chapter 3. Memory** |
| | | — | • Modified wording and enhanced description in this chapter |
| | | | **Chapter 4. SFRs** |
| | | 25, 26, 28, 31 | • Changed hexadecimal format of reset values for registers GiBCR0 in **Tables 4.6, 4.7, 4.9 and 4.12** to binary |
| | | 34 | • Changed register name “Increment/Decrement Counting Select Register” in **Table 4.15** to “Increment/Decrement Select Register” |
| | | 47 | • Added the missing address “044E40h” to **Table 4.28** |
| | | 61, 62, 75, 76, 89, 90, 103, 104 | • Changed register name “CANi Acceptance Mask Register k” in **Tables 4.42, 4.43, 4.56, 4.57, 4.70, 4.71, 4.84, and 4.85** to “CANi Mask Register k” |
| | | 64, 78, 92, 106 | • Corrected reset value “XXXX XX00b” for CiMSMR register in **Tables 4.45, 4.59, 4.73, and 4.87** to “0000 0000b” |
| | | | **Chapter 5. Electrical Characteristics** |
| | | — | • Modified wording and enhanced description in this chapter |
| | | 114, 115 | • Changed expression “Programming and erasure endurance of flash memory” in **Tables 5.8 and 5.9** to “Program/erase cycles”; Changed its unit “times” to “Cycles” |

| Revision History | R32C/153 Group Datasheet |
|---|---|

| Rev. | Date | Description | |
|---|---|---|---|
| | | Page | Summary |
| | | 121, 132 | • Modified description “Drive power” in **Tables 5.18 and 5.38** to “Drive strength” |

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## General Precautions in the Handling of MPU/MCU Products

The following usage notes are applicable to all MPU/MCU products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Handling of Unused Pins

   Handle unused pins in accord with the directions given under Handling of Unused Pins in the manual.

   — The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment when power is supplied.

   — The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.
   In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.
   In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

   — When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

   Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

   — The characteristics of an MPU or MCU in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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