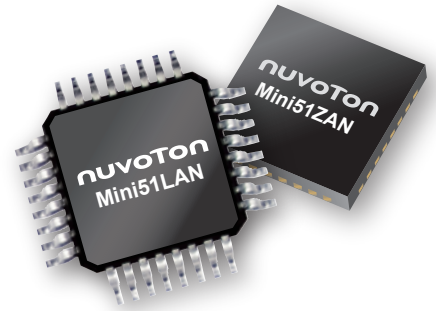




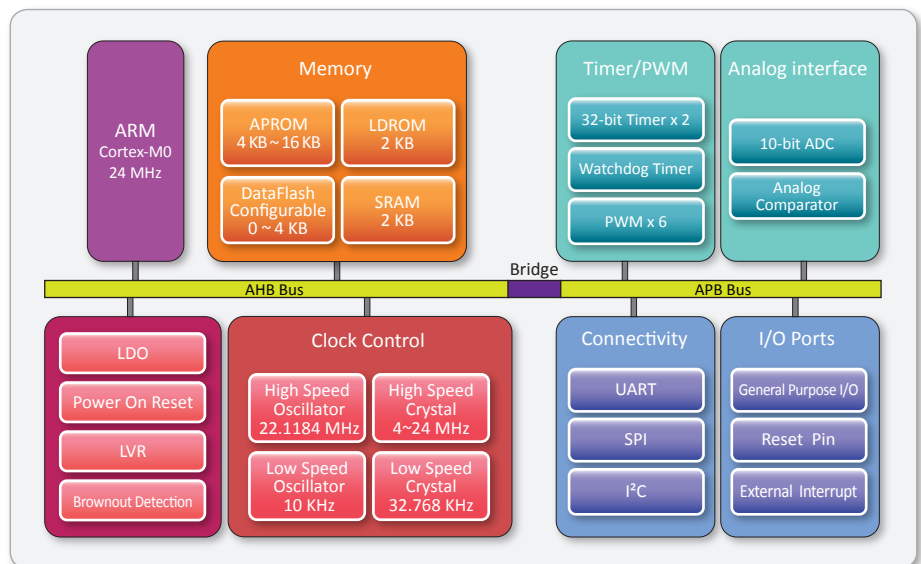
Nuvoton NuMicro™ Family

NuMicro Mini51™ Series

A high performance and cost-effective
low pin count Cortex™-M0 MCU

» Applications

- ◆ Industrial Control
- ◆ Data Communications
- ◆ Auto-control System
- ◆ Small System Control
- ◆ General purpose Control



» Selection Guide

Part No.	Flash	SRAM	Data Flash	ISP Loader ROM	I/O	Timer	Connectivity			PWM	ADC	Comparator	EBI	ISP ICP	IRC 22MHz	Package
							UART	SPI	I²C							
Mini51LAN	4K	2K	Configurable	2K	up to 30	2x32-bit	1	1	1	6	8x10-bit	2	-	v	v	LQFP48
Mini51ZAN	4K	2K	Configurable	2K	up to 29	2x32-bit	1	1	1	6	8x10-bit	2	-	v	v	QFN33
Mini52LAN	8K	2K	Configurable	2K	up to 30	2x32-bit	1	1	1	6	8x10-bit	2	-	v	v	LQFP48
Mini52ZAN	8K	2K	Configurable	2K	up to 29	2x32-bit	1	1	1	6	8x10-bit	2	-	v	v	QFN33
Mini54LAN	16K	2K	Configurable	2K	up to 30	2x32-bit	1	1	1	6	8x10-bit	2	-	v	v	LQFP48
Mini54ZAN	16K	2K	Configurable	2K	up to 29	2x32-bit	1	1	1	6	8x10-bit	2	-	v	v	QFN33

Contact us: NuMicro@nuvoton.com

» Features of Mini51 series

◆ Core

- ARM® Cortex™-M0 core runs up to 24 MHz
- One 24-bit system timer
- Support low power Idle mode
- Single-cycle 32-bit hardware multiplier
- NVIC for the 32 interrupt inputs, each with 4-levels of priority
- Support Serial Wire Debug (SWD) interface and 2 watchpoints/4 breakpoints

◆ Memory

- 4K/8K/16K bytes flash memory for program memory (APROM)
- Configurable 0/1/2/4K bytes flash memory for data memory (DataFlash)
- 2K bytes flash memory for loader memory (LDROM)
- 4K bytes embedded SRAM
- Support In System Programming (ISP) update APROM
- Support 2 wire In Circuit Programming (ICP) update APROM or LDROM or DataFlash
- Support fast parallel programming mode to update APROM or LDROM or DataFlash

◆ Clock Control

- Programmable system clock source
 - Switch clock sources on-the-fly
- 4 ~ 24 MHz external crystal input
- 22.1184 MHz internal oscillator (trimmed to 1% accuracy)
 - Dynamic calibrating the 22.1184 MHz RC OSC to +/-1% from -40°C to 85°C by external 32.768K crystal oscillator
- 10 KHz low power oscillator for Watchdog timer and Idle mode wake-up
- 32.768K crystal oscillator

◆ Timers

- Provide two channel 32-bit timers, one 8-bit pre-scale counter with 24-bit up-timer for each timer.
- Support event counter mode
- Support toggle output mode
- Support pulse width capture mode for frequency or pulse width measurement

◆ PWM

- Built-in up to three 16-bit PWM generators; providing six PWM outputs or three complementary paired PWM outputs
- Individual clock source, clock divider, 8-bit pre-scale and Dead-Zone generator for each PWM generator
- PWM interrupt synchronized to PWM period
- Support edge alignment or center alignment
- Support fault detection

◆ ADC

- 10-bit SAR ADC with 150K SPS
- Up to 8-ch single-ended input and one internal input from band gap
- Conversion can be started either by software trigger or external pin trigger

◆ Communication Interface

- 1 UART
- 1 SPI up to 24 MHz (Master@5V), 4 MHz (Slave)
- 1 I²C master/slave
- Support IrDA (SIR) function
- Support RS485, LIN

◆ Analog Comparator

- 2 analog comparators with programmable 16-level internal voltage reference
- External input or internal band gap voltage selectable at negative node

◆ Wake-Up Sources

- Timer, Watchdog timer, all GPIOs, UARTs, Comparators, BOD

◆ Brownout Detector

- With 3 levels: 3.8V / 2.7V / 2.0V
- Support brownout interrupt and reset option

◆ GPIOs

- Up to 30 general-purpose I/O (GPIO) pins
- Four I/O modes:
 - Quasi bi-direction
 - Push-Pull output
 - Open-Drain output
 - Input only with high impedance
- TTL/Schmitt trigger input selectable
- All GPIO pins can be configured as interrupt source with edge/level setting

◆ Built-in LDO for Wide Operating Voltage Range

- 2.5V to 5.5V

◆ Operating Temperature

- -40°C ~ 85°C

◆ Packages (RoHS)

- QFN33 (5x5mm)
- LQFP48 (7x7mm)