16-bit RF Microcontroller for RF4CE

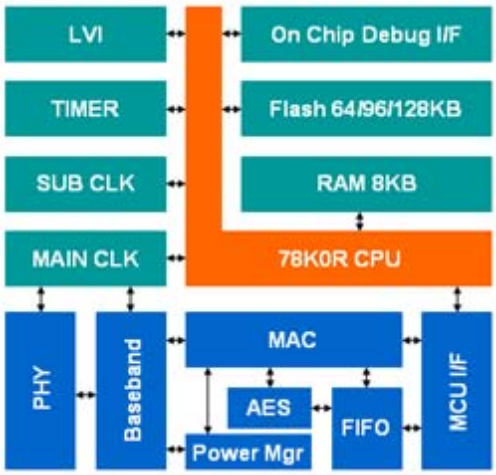
uPD78F8056/57/58

RF4CE (Radio Frequency for Consumer Electronics) is a radio network protocol specification, constructed on the IEEE802.15.4 MAC/PHY layer. RF4CE enables remote controllers omnidirectional, bi-directional, and secured connections, which will offer additional values in consumer electronics. The uPD78F8056/57/58 microcontroller is a 16-bit microcontroller offered to meet the RF4CE requirements by integrating the low power IEEE802.15.4 compliant radio transceiver, the 1.8V programmable/erasable Flash EEPROM, and ultra low power 78K0R-L CPU core in a QFN 56pin package. RF4CE SDK (Software Development Kit) with RF4CE library, AT commands, and 3ch Real-time Sniffer, and the TK-RF8058+SB evaluation kit are offered for quick start-up of development of consumer electronics.

Features

- ✓ **Low power of 19mA during reception and 21mA during transmission**
- ✓ **Flash programming, erasing, and EEPROM emulation at 1.8V**
- ✓ **RF4CE library and AT commands are ready**
- ✓ **The 3ch Real-time Sniffer/Sniffer Viewer is available**

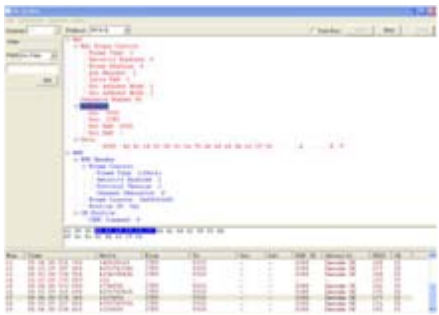
●Block Diagram of uPD78F8056/57/58





●RF4CE SDK

- ➢ RF4CE library
- ➢ AT command
- ➢ 3ch Real-time Sniffer captures packets at 2425, 2450, and 2475 MHz simultaneously, analyzes them in the main window, and displays the network configuration. It also supports decoding of an encrypted payload.



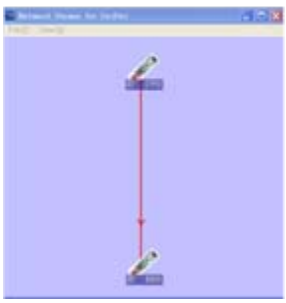
●Evaluation Module MB-RF8058



●Evaluation Kit TK-RF8058+SB



The support board offers battery sockets, USB I/F, MINICUBE2 Emulator I/F, consumed current measurement terminals of the module. An executable file of the RF4CE stack, a free compiler, a Flash writer and a free debugger are included in the kit.



➢**Sniffer Viewer** displays the network configuration based on the info collected by the Sniffer.

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Specifications

uPD78F8056 uPD78F8057 uPD78F8058 Renesas Electronics Corporation	CPU	78K0R-L core, Max CPU clock: 20MHz, Recommended 4MHz for RF4CE
	Flash	64KB/96KB/128KB, Programming, erasing, and reading at 1.8V – 3.6V
	RAM	8KB, 1KB is occupied by EEPROM emulation
	RF transceiver	Offset-QPSK, 250K/1M/2Mbps, 2405～2480MHz 16ch Sensitivity -95dBmTYP, EVM 12%TYP
	Clocks	Main clock: 32MHz crystal Main clock can be divided to 2/4/8/16MHz for CPU clock, or On-chip oscillator of 1/8/20MHz is available for CPU 32.768kHz sub-clock is available for Real Time Counter On–chip oscillator specialized for Watch Dog Timer 100kHz on-chip oscillator for stand-by
	Cryptography	AES 128-bit hardware crypto engine
	Peripherals	16bit timer x 12, CSI(SPI)/UART/Simple I2C x 1, UART x 1, External INT x 3
	Operating Voltage	1.8V - 3.6V, -40 - +85C, with LVI and POC
	Package	Quad Flat Non-leaded (QFN) 56pin, 8mm x 8mm, 0.5mm pin pitch
	Consumed Current	19mA during reception, 21mA during transmission including CPU, Stop current: 0.5uA, Standby Current: 1.1uA during 32.768kHz sub-clock, Standby current: 4.0uA during 100kHz on-chip oscillation
RF4CE SDK for 78K0R Skyley Networks Inc.	RF4CE Library	Stacks of CERC profile and NWK/MAC/PHY layers
	AT Command	ATINFO, ATSCAN, ATEDSCAN, ATAUTOANS, ATSTART, ATPAIR, ATUNPAIR, ATRESET, ATWAKE, ATSLEEP, ATSETPS, ATTXDATA, ATSREG
	3 channel Real-time Sniffer	Captures packets on three designated RF channels simultaneously and analyzes the packets. Requires 3 78K0R UD Sticks
		Text Display: Filtering by types of frames and commands, sorting by time stamp and destination addresses. Import and export of log files
		Sniffer Viewer: Graphical display of the network configuration
		Crypto key setting: Decoding of encrypted payload automatically and displays it
TK-RF8058+SB Evaluation Kit Tessera Technology Inc.	Evaluation Module	MB-RF8058 module with uPD78F8058
	Support board	On-chip debug and Flash programming/erasing via USB On-chip debug and Flash programming/erasing via MINICUBE2 Power source: One dry battery, two dry batteries, USB power, or external voltage source. Measurement terminal of consumed current in the module
	Software bundled in the kit	Packet error rate test, Quasi-modulated transmission, Non-modulated carrier transmission, An execution file of the RF4CE stack with AT commands, Free compiler, debugger, and project manager

[How to purchase] Available through the sales channel of Renesas Electronics
[Vendor Web sites]
Skyley Networks Inc.: www.skyley.com
Tessera Technology Inc.: www.tessera.co.jp
Renesas Electronics Corporation: www2.renesas.com/micro/en/technology/zigbee/index.html

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