

Multi-Chip Package Solution

R5F10L, R5F10U

The R5F10L and the R5F10U are multi-chip package solutions with a RL78 16-bit microcontroller and a LIN system basic chip (SBC) assembled in a single 48-pin QFN 7 mm x 7 mm package.

The RL78 16-bit microcontroller provides an excellent combination of general purpose peripheral functions, like timers, A/D converters, serial communication interfaces and a dedicated hardware LIN protocol support.

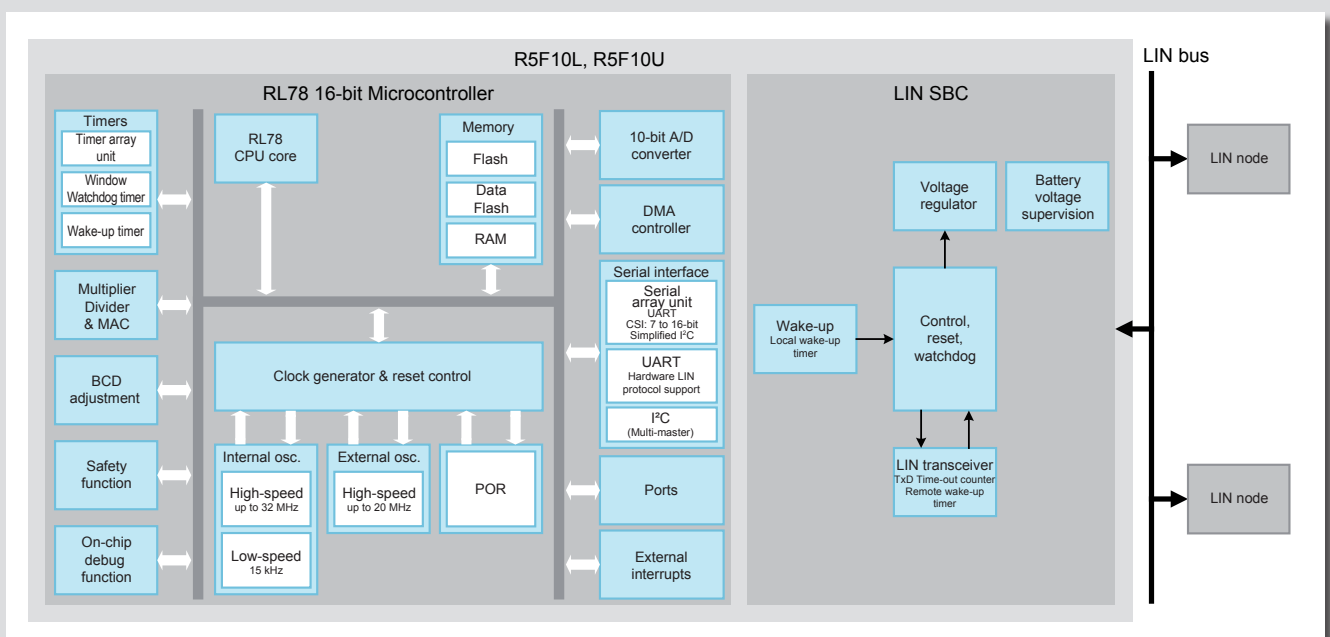
The LIN SBC with voltage regulator, battery voltage supervision and watchdog timer provides beside the LIN transceiver the peripheral power supply, reset generation for the microcontroller and a fail-safe system.



Applications

These MCP solutions are ideally suitable for development of complete LIN nodes consisting of only one IC. All pins of the microcontroller and the SBC are bonded out for keeping the same flexibility as when using discrete parts. The necessary board space will be reduced to a minimum.

Block Diagram



Features

RL78 Microcontroller

- 16-bit CISC CPU core
- Up to 20 MHz external/32 MHz internal clock frequency
- 15 kHz internal oscillator
- 16/32/48/64 KB single-voltage Flash with secure self-programming support
- 1/2/3/4 KB RAM
- 4 KB Data Flash for EEPROM emulation
- Flexible multi-purpose 16-bit timer array unit
- Wake-up timer
- Window watchdog timer
- 10-bit A/D converter
- DMA controller
- Flexible serial array unit
 - » 7 to 16-bit CSI
 - » UART
 - » Simplified I²C (single-master only)
- UART with hardware LIN protocol support
- Multi-master capable I²C interface
- Power-on reset

LIN SBC

- Supply voltage range 6 V to 28 V
Limited functional range 3.8 V to 40 V
- Peripheral supply up to 60mA
- Current consumption in sleep mode 10 µA (typ.)
- Current consumption in standby mode 70 µA (typ.)
- Voltage regulator output voltage: 5.0 V/3.3 V ± 2% in active mode
- Voltage regulator output voltage: 5.0 V/3.3 V ± 5% in standby mode
- Window watchdog timer with adjustable cycle time with extended first open window and watchdog debugging mode
- Internal battery voltage supervision
- LIN transceiver, version 2.1, SAE-J2602
 - » TxD permanent low time-out
- Local and remote wake-up detection via WAKE_N pin, LIN bus and VS pin
- Fail-safe system with
 - » Thermal shut-down
 - » LIN over-current protection
 - » Voltage regulator over-current protection
 - » LIN GND loss
 - » Power-on reset
 - » Safe power-down

Devices

Part Number	Memory			Voltage Regulator Output Voltage	Package
	Flash	RAM	Data Flash		
R5F10LGA	16 K	1 K	4 K	5.0 V	48-pin QFN with exposed pad (7 mm x 7 mm, 0.5 mm lead pitch)
R5F10LGC	32 K	2 K			
R5F10LGD	48 K	3 K			
R5F10LGE	64 K	4 K			
R5F10UGA	16 K	1 K	4 K	3.3 V	
R5F10UGC	32 K	2 K			
R5F10UGD	48 K	3 K			
R5F10UGE	64 K	4 K			

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