

M16C/64 – The Next Level of standard 16-bit Microcontroller

M16C/64



Description

The M16C/64 Series is an easy to design-in 16-bit industrial quasi-standard microcontroller, part of the M16C Platform product line-up utilized in endless applications worldwide. It provides a high level of performance, combined with internal peripherals, which reduce the need for external components.

The M16C core has been designed to take advantage of the best features of both accumulator and register based architectures. The CPU has a total of thirteen 16-bit registers, seven of which come in two sets of register banks. The architecture makes it fast with efficient code execution. A hardware multiplier circuit and four direct memory access controller channels (DMAC) are implemented to speed up the processing. The M16C/64 utilizes several design techniques aimed at providing the best EMI/EMS performance without the need for external components, making it the best solution for effective designs for electrically noisy environments. Using the devices of the M16C Platform makes the CE marking for your end product to an easy task.

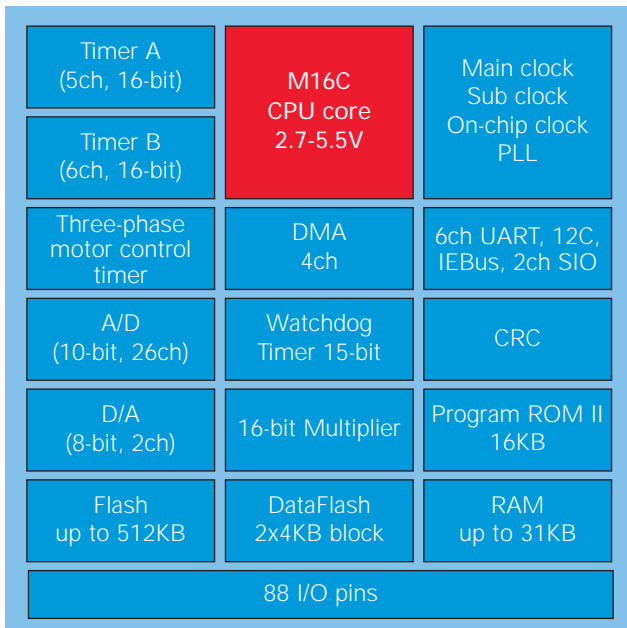
More than 12 variations make the M16C/64 to an ideal solution for a flexible industrial design with a line-up of 100 (L)QFP packages. The memory density range from 128K to 512K Flash covered by M16C/64 is also proven replacement of M16C/62P designs due to pin to pin capability.

Key Features:

- High CPU performance 25MHz@ 2.7V to 5.5V
- Up to 512k Flash with 31k RAM
- 8KB embedded DataFlash
- 4 DMA channels
- PLL, Main-, Sub- and On Chip oscillator
- 6 serial ports USART including IIC
- 2 serial synchronous ports
- 26ch 10-bit ADC (1.72us conversion time)
- 2ch 8-bit DAC
- Up to 88 available IO pins in 100pin package
- Three phase motor control unit
- High efficient M16C family low power modes
- Best EMI/EMS performance

Group	Memory Type	Memory Size (bytes)		Device	Temperature Suffix		Package Type	
		+ROM DataFlash	RAM					
M16C/64	Flash	128K + 8K	12K	R5F36406NFA	-20°C/ +85°C		100 pin 14 x 20mm QFP 0.65mm pitch	
		256K + 8K	16K	R5F3640DNFA				
		512K + 8K	31K	R5F3640MNFA				
		128K + 8K	12K	R5F36406DFA	-40°C/ +85°C			
		256K + 8K	16K	R5F3640DDFA				
		512K + 8K	31K	R5F3640MDFA				
			128K + 8K	12K	R5F36406NFB	-20°C/ +85°C		100 pin 14 x 14mm LQFP 0.5mm pitch
			256K + 8K	16K	R5F3640DNFB			
			512K + 8K	31K	R5F3640MDFB			
			128K + 8K	12K	R5F36406DFB	-40°C/ +85°C		
			256K + 8K	16K	R5F3640DDFB			
			512K + 8K	31K	R5F3640MDFB			

M16C/64 – 100-pin Block Diagram



M16C CPU Core (16-bit)

- 25 MHz, 2.7V-5.5V;
- Single chip mode, memory expansion and microprocessor mode

Clock generation circuit

- Main clock with Xin/Xout
- Sub clock with Xcin/Xcout
- On chip oscillator with 125kHz
- PLL frequency synthesizer
- Main clock stop / Re-oscillation detection

Peripherals

- Timers
 - Timer A 16-bit 5ch
 - Timer B 16-bit 6ch
 - Three phase motor control 1ch
- Serial I/O
 - USART, I2C, IEBus 6ch
 - SIO 2ch
- DMA 4ch
- Watchdog Timer 1ch
- A/D Converter (10-Bit) 26ch
- D/A Converter (8-bit) 2ch
- I/O ports 88pins
- Interrupts (7 priority levels)
 - Internal sources 28
 - External sources 13
 - Software sources 4
- CRC (CRC-CCITT) 1ch

M16C/64 Development Tools



M16C/64 Starter Kit (RSK)

The kit includes:

- CPU board with target microcontroller
- LCD panel for user/diagnostic interaction
- E8a On Chip Debugger
- Trial C compiler and IDE
- Tutorial session
- Sample peripheral driver code

E8a On Chip debugger

Low cost On Chip Debugger
 • (Part: ROE00008AKCE00)

E100 Full Specification Emulator

Full Trace, breakpoint & performance analysis
 • (Part: E100 + M16C/64 MCU board)

Compiler

- Renesas Embedded Workbench HEW4.0, C-Compiler
- IAR
- Tasking
- GNU

