

M16C/62P – The Uniquely Versatile Standard 16-bit Microcontroller

M16C/62P



Description

The M16C/62P Series is an easy to design-in 16-bit industrial quasi-standard microcontroller, utilized in endless applications worldwide. It provides a high level of performance, combined with internal peripherals, which reduce the need for external components.

More than 70 variations make the M16C/62P the ideal solution for a flexible industrial design with a line-up of 80, 100 and 128-pin (L)QFP packages. A new 145pin FLGA package has been introduced shortly. The memory density range from 64K to 512K Flash covered by M16C/62P is unique in the MCU market. Beside the focused Flash products, Renesas offers also Mask and ROMless options. 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.

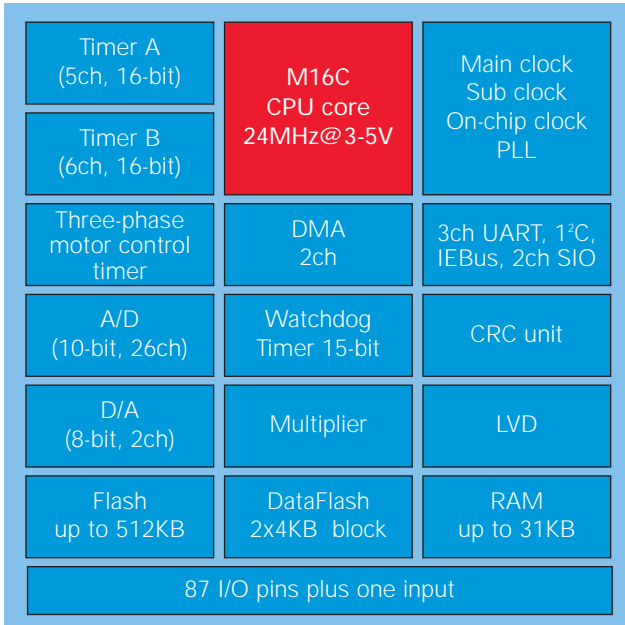
The architecture makes it fast with efficient code execution. A hardware multiplier circuit and two direct memory access controller (DMAC) channels, which help to speed up the processing, are also implemented. The M16C/62P utilizes several design techniques aimed at providing the best EMI/EMS performance 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.

Key Features:

- High CPU performance 24MHz @ 5V and 3V
- Up to 512KB Flash with 31KB RAM
- 4KB embedded DataFlash
- Two DMA channels
- PLL, Main, Sub, and on-chip oscillator
- Three serial ports USART including I2C
- Two serial synchronous ports
- 26ch 10-bit ADC
- 2ch 8-bit DAC
- 11ch 16-bit Timer
- Up to 87 available I/O pins in 100-pin package
- High efficient M16C family low power modes
- Best EMI/EMS performance

Group	Device	Package Type	Memory Type	Memory Size		
				ROM + DataFlash	RAM	
M16C/62P	M30622F8PYY	Set YY to GP for: 100-pin 14x14mm LQFP 0.5mm pitch	Flash	64K + 4K	4K	
	M30620FCPYY			128K + 4K	10K	
	M3062LFGPYY			256K + 4K	20K	
	M30626FHPYY			384K + 4K	31K	
	M30626FJPYY			512K + 4K	31K	
	M30622M6P-xxxYY		Set YY to GP for: 100-pin 14x14mm LQFP 0.5mm pitch	Mask	48K	4K
	M30622M8P-xxxYY				64K	4K
	M30622MAP-xxxYY				96K	5K
	M30620MCP-xxxYY				128K	10K
	M30622MEP-xxxYY				192K	12K
	M30622MGP-xxxYY		Set YY to FP for: 100-pin 14x20mm QFP 0.65mm pitch	Mask	256K	12K
	M30624MGP-xxxYY				256K	20K
	M30622MWP-xxxYY				320K	16K
	M30624MWP-xxxYY				320K	24K
	M30626MWP-xxxYY				320K	31K
	M30622MHP-xxxYY	Set YY to FP for: 100-pin 14x20mm QFP 0.65mm pitch	Mask	384K	16K	
	M30624MHP-xxxYY			384K	24K	
	M30626MHP-xxxYY			384K	31K	
	M30626MJP-xxxYY			512K	31K	
	M30622SPYY			Set YY to FP for: 100-pin 14x20mm QFP 0.65mm pitch	ROMless	-
	M30620SPYY	-	10K			
	M30624SPYY	-	20K			
	M30626SPYY	-	31K			
	M30623F8PGP	80-pin 14x14mm QFP 0.65mm pitch	Flash			64K + 4K
	M30621FCPGP			128K + 4K	10K	
	M30623M8P-xxxGP		Mask	64K	4K	
	M30623MAP-xxxGP			96K	5K	
	M30621MCP-xxxGP			128K	10K	
	M30625FGPGP			256K + 4K	20K	
	M30627FHGP			384 + 4K	31K	
M30627FJGP	512K + 4K			31K		
M30623MEP-xxxGP	128-pin 14x20mm LQFP 0.5mm pitch			Mask	192K	12K
M30625MGP-xxxGP					256K	20K
M30623MWP-xxxGP		320K	16K			
M30625MWP-xxxGP		320K	24K			
M30627MWP-xxxGP		320K	31K			
M30623MHP-xxxGP		384K	16K			
M30625MHP-xxxGP		384K	24K			
M30627MHP-xxxGP		384K	31K			
M30627MJP-xxxGP	512K	31K				
M30627FJPWG	145pin 10x10mm TFLGA 0.65mm pitch	Flash	512K + 4K	31K		

M16C/62P - 100-pin Block Diagram



- **M16C CPU Core (16-bit)**

- 24 MHz, 3V - 5V

Single chip, (+memory expansion and microprocessor mode)

- **Clock generation circuit**

- Main clock with Xin/Xout
- Sub clock with Xcin/Xcout
- On-chip oscillator with 1MHz
- PLL frequency synthesizer
- Main clock stop / Re-oscillation detection

Pin count	80-pin	100-pin	128/ 145-pin
Peripherals			
• Timer			
- Timer A 16-bit	5ch	5ch	5ch
- Timer B 16-bit	6ch	6ch	6ch
- Three-phase motor control	1ch	1ch	1ch
• Serial I/O			
USART, I ² C, IEBus	2ch	3ch	3ch
SIO, I ² C, IEBus	1ch	-	-
SIO	2ch	2ch	2ch
• DMA	2ch	2ch	2ch
• Watchdog Timer	1ch	1ch	1ch
• A/D Converter (10-bit)	26ch	26ch	26ch
• D/A Converter (8-bit)	2ch	2ch	2ch
• I/O ports (plus one input only pin)	70-pins	87-pins	113-pins
• Interrupts (7 priority levels)			
- Internal sources	28	29	29
- External sources	5	8	8
- Software sources	4	4	4
• CRC (CRC-CCITT)	1ch	1ch	1ch

M16C/62P Development Tools



M16C/62P 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
- (Part: R0K33062PS001BE)

E8a On-chip Debugger (OCD)

- Low cost OCD
- (Part: R0E00008AKCE00)

Compact Emulator

- Low cost emulator with limited trace and breakpoint
- (Part: M3062PT3-CPE1 for 80-pin package)
- (Part: M3062PT3-CPE3 for 100-pin 0.5mm pitch package)
- (Part: M3062PT3-CPE5 for 100-pin 0.65mm pitch package)
- (Part: M3062PT3-CPE4 for 128-pin package)

Full Specification Emulator

- Full Trace, breakpoint and performance analysis
- (Part: PC7501 + M3062PT2-EPB)

Compiler

Renesas Embedded Workbench HEW4.0, C-Compiler

- IAR
- Tasking
- GNU

