

2024H2 Professional MCU Design House



笙泉科技股份有限公司
Megawin Technology Co.,Ltd.



MG Website



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Company Overview

Megawin Technology Co., Ltd., a fabless IC design house, was formed by a group of intellectual IC design and sale specialists in 1999. Headquartered in Taiwan, the Company offers outstanding technical support along with dependable product and quality.

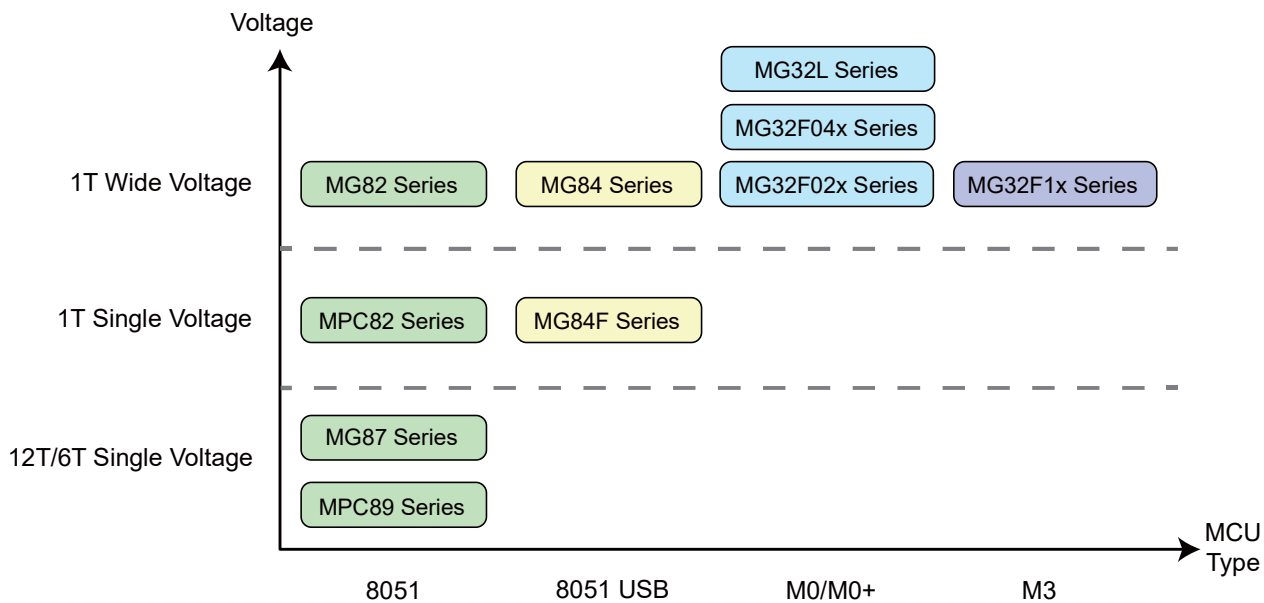
Regarding IC operating conditions, Megawin targets better immunity, wider operation voltage and temperature range, as well as lower power consumption. In addition to the USB series MCU, based on the excellent noise immunity of the traditional 8051 MCU and great encryption technology, the Company 32-bit MG32F Series MCU with Arm® Cortex®-M0/M3 as the core. The Company's easy-to-use development tool (such as ICE, Writer, and ISP Programmer) and comprehensive product manual also enable users to create optimum designs which reduce time to market.

We have also been investing in the development of new products for new energy and energy-saving applications since 2023, and has made progress in steadily launching solutions for power management ICs (PMICs) containing LDOs, Battery Management System (BMS) IC and MOSFETs, and MCUs dedicated to BLDC motor control.

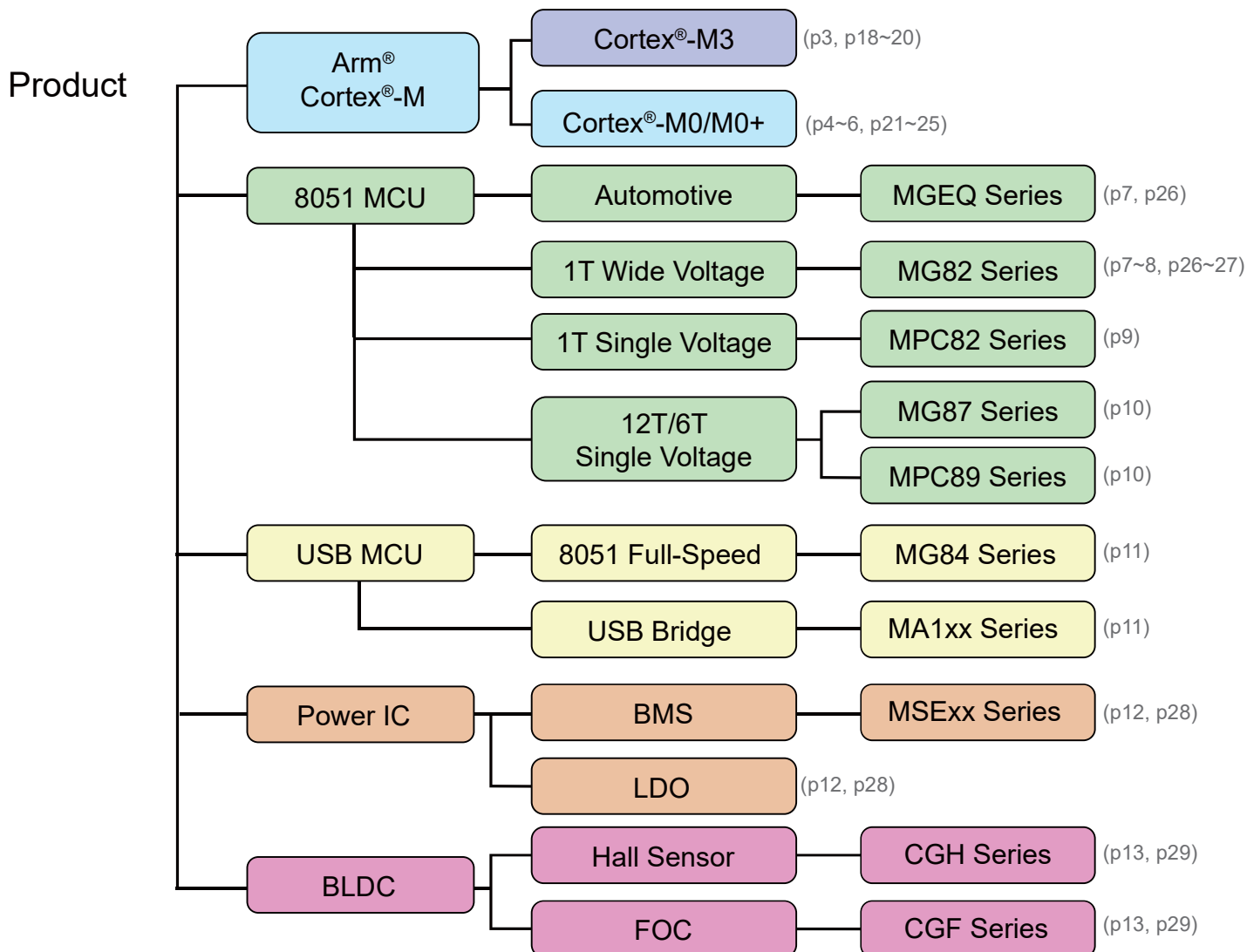
Megawin Technology has branded itself with the motto "be practical and be creative." In order to become a qualified worldwide MCU supplier, the Company would keep developing innovative products constantly and continuously.

2024 Product Selection Guide

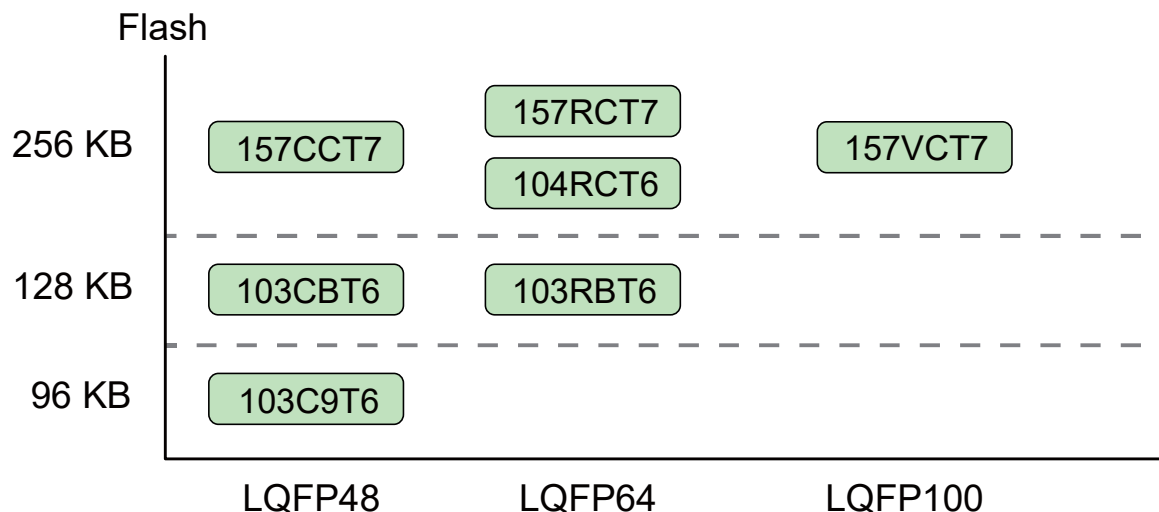
8-Bit 8051/32-Bit Arm® Cortex®-M0/M0+/M3 Flash MCUs



Product Category:



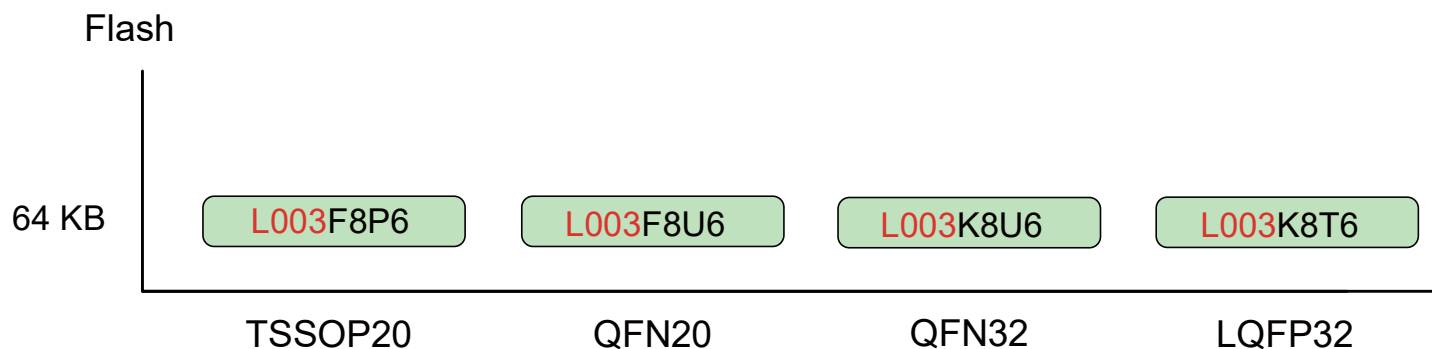
Arm® Cortex®-M3 Base Line : MG32F1x Series



Item	Vdd	Flash ROM	Data RAM	Max Freq.	20-Bit Timer	IO	12-Bit ADC	Comp.	Features	Package
MG32F103C9T6	2V~3.6V	96KB	28KB	72MHz	4+RTC	37	10-CH	2	UARTx3, I ² C x2, SPI Mx1, SPI S x2, QSPI, I ² S, USB, LED SEG x8	LQFP48
MG32F103CBT6	2V~3.6V	128KB	28KB	72MHz	4+RTC	37	10-CH	2	UARTx3, I ² C x2, SPI Mx1, SPI S x2, QSPI, I ² S, USB, LED SEG x8	LQFP48
MG32F103RBT6	2V~3.6V	128KB	28KB	72MHz	4+RTC	51	16-CH	2	UARTx3, I ² C x2, SPI Mx1, SPI S x2, QSPI, I ² S, USB, LED SEG x8	LQFP64
MG32F104RCT6	2V~3.6V	256KB	36KB	96MHz	4+RTC	51	16-CH	2	UARTx3, I ² C x2, SPI Mx1, SPI S x2, QSPI, I ² S, USB, LED SEG x8	LQFP64
MG32F157CCT7	2V~3.6V	256KB	64KB	96MHz	8+RTC	37	18-CH	3 ¹	UARTx5, I ² C x2, SPIx3, QSPI, CAN, USB, SDIO, CRC, OPA x3, AES, DAC x2, ADC x3	LQFP48
MG32F157RCT7	2V~3.6V	256KB	64KB	96MHz	8+RTC	51	18-CH	3 ¹	UARTx5, I ² C x2, SPIx3, QSPI, CAN, USB, SDIO, CRC, OPA x3, AES, DAC x2, ADC x3	LQFP64
MG32F157VCT7	2V~3.6V	256KB	64KB	96MHz	8+RTC	80	18-CH	3 ¹	UARTx5, I ² C x2, SPIx3, QSPI, CAN, USB, SDIO, CRC, OPA x3, AES, DAC x2, ADC x3	LQFP100

¹ Comparator shared with OPA

Low-Power Line Arm® Cortex®-M0+ : MG32L003 Series



Item	Vdd	Flash ROM	Data RAM	Max Freq.	Timer	IO	12-Bit ADC	ACMP.	Features	CCP ⁴	ISP/IAP	Package
MG32L003 ^{*1}	2.5V~5.5V	64KB	4KB	24MHz	9+RTC LP Timer	16/28	15-CH	1 ⁶	UART ² x2, LPUART, I ² C, SPI, PWM, CRC16, 1-Wire	6-CH	YES ³	TSSOP20 QFN20 QFN32 LQFP32

^{*1} Support M-LINK ICE;

^{*2} All UART support SPI Master;

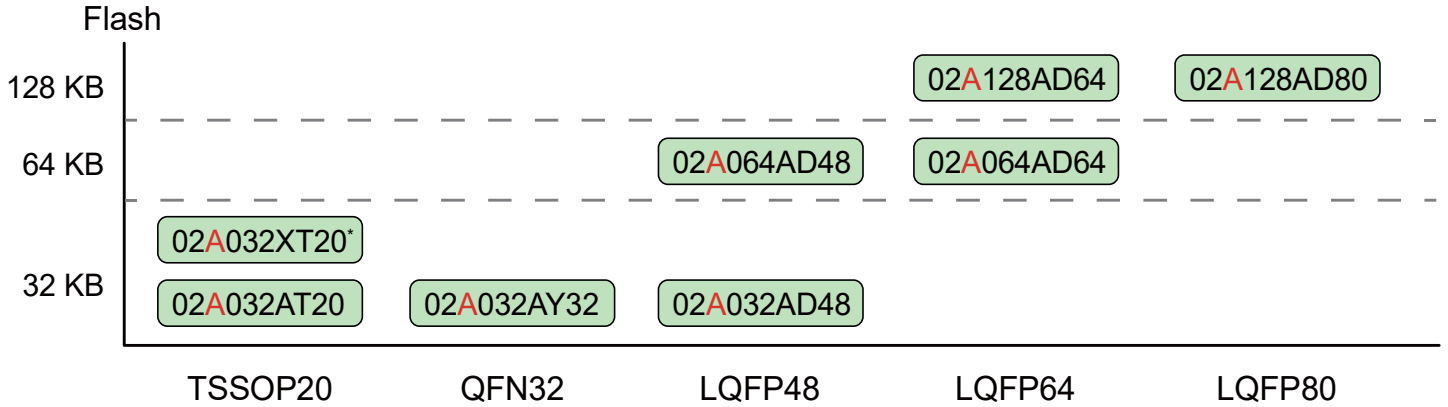
^{*3} Share with all Flash zone;

^{*4} CCP: Input Capture/Output Compare/PWM;

^{*5} Advanced UART x2 : Support SPI Master/Slave. (UART 0/1 modules)

^{*6} Low Voltage Detector (LVD) / Voltage Comparator (ACMP)

Arm® Cortex®-M0 Base Line: MG32F02A Series



Item	Vdd	Flash ROM	Data RAM	Max. Freq.	Timer	IO	12-Bit ADC	Comp.	Features	CCP ⁴	ISP/IAP	Package
MG32F02A032¹	1.8V~5.5V	32KB	4KB	48MHz	5+RTC	17/29/44	12-CH	2	UART ² x2, I ² C, SPI/QPI, PWM, CRC32, DMA	4-CH	YES ³	TSSOP20 QFN32 LQFP48
MG32F02A064¹	1.8V~5.5V	64KB	8KB	48MHz	7+RTC	44/59	16-CH	2	UART ⁵ x7, I ² Cx2, SPI ⁶ x4, CRC32, DMA, DAC, EMB	8-CH	YES ³	LQFP48 LQFP64
MG32F02A128¹	1.8V~5.5V	128KB	16KB	48MHz	7+RTC	59/73	16-CH	2	UART ⁵ x7, I ² Cx2, SPI ⁶ x4, CRC32, DMA, DAC, EMB	8-CH	YES ³	LQFP64 LQFP80

* MG32F02A032XT20 Supports operation temperature: -40~125°C;

¹ Support M-LINK ICE;

² All UART support SPI Master;

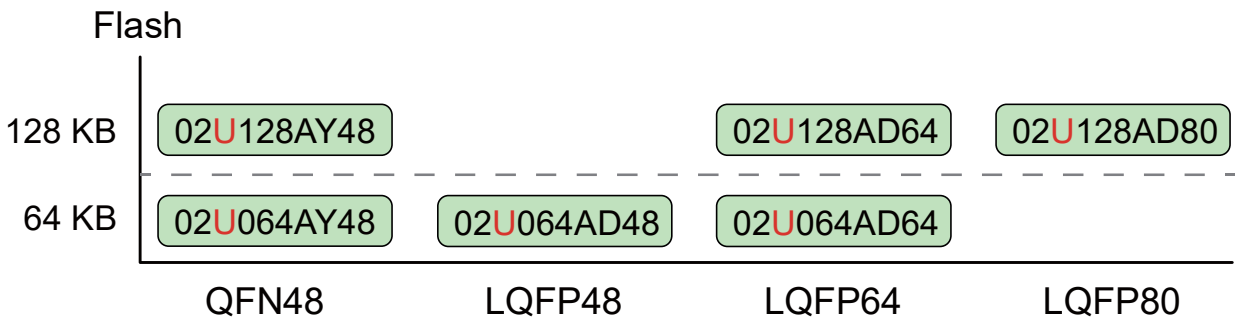
³ Share with all Flash zone;

⁴ CCP: Input Capture/Output Compare/PWM;

⁵ Advanced UART x 3: Support SPI Master/Slave (UART 0/1/2 modules); Basic UART x 4: UART only (UART 4/5/6/7 modules).

⁶ Advanced SPI x 1: Support SPI/QPI/OPI (SPI 0 modules); Basic SPI x 3: Standard SPI only (Configurable in UART 0/1/2 modules).

Arm® Cortex®-M0 USB Line : MG32F02U Series



Item	Vdd	Flash ROM	Data RAM	Max. Freq.	Timer	IO	12-Bit ADC	Comp.	Features	CCP ³	ISP/IAP	Package
MG32F02U064¹	1.8V~5.5V	64KB	16KB	48MHz	7+RTC	41/56	16-CH	2	UART ⁴ x7, I ² C x2, SPI ⁵ x4, USB, CRC32, DMA, DAC, EMB	8-CH	YES ²	QFN48 LQFP48 LQFP64
MG32F02U128¹	1.8V~5.5V	128KB	16KB	48MHz	7+RTC	56/70	16-CH	2	UART ⁴ x7, I ² C x2, SPI ⁵ x4, USB, CRC32, DMA, DAC, EMB	8-CH	YES ²	QFN48 LQFP64 LQFP80

¹ Support M-LINK ICE;

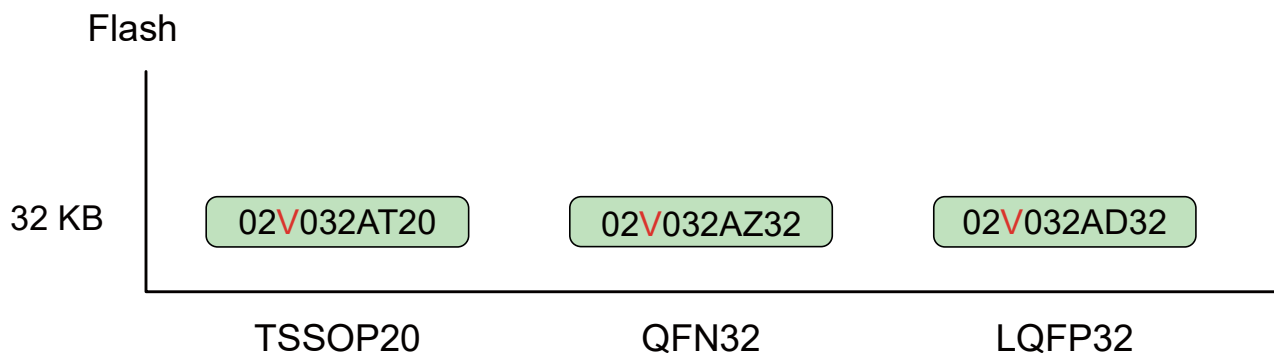
² Share with all Flash zone;

³ CCP: Input Capture/Output Compare/PWM;

⁴ Advanced UART x 3: Support SPI Master/Slave (UART 0/1/2 modules); Basic UART x 4: UART only (UART 4/5/6/7 modules);

⁵ Advanced SPI x 1: Support SPI/QPI/OPI (SPI 0 module); Basic SPI x 3: Standard SPI only (Configurable in UART 0/1/2 modules).

Arm® Cortex®-M0 Value Line: MG32F02V Series



Item	Vdd	Flash ROM	Data RAM	Max Freq.	Timer	IO	12-Bit ADC	Comp.	Features	CCP ⁴	ISP/IAP	Package
MG32F02V032*1	1.8V~3.6V	32KB	4KB	48MHz	6+RTC	17/29	8-CH	NA	UART ⁵ x3, I ² C x2 SPI/QPI, PWM CRC32, DMA, ASB	6-CH	YES ³	TSSOP20 LQFP32 QFN32

*1 Support M-LINK ICE;

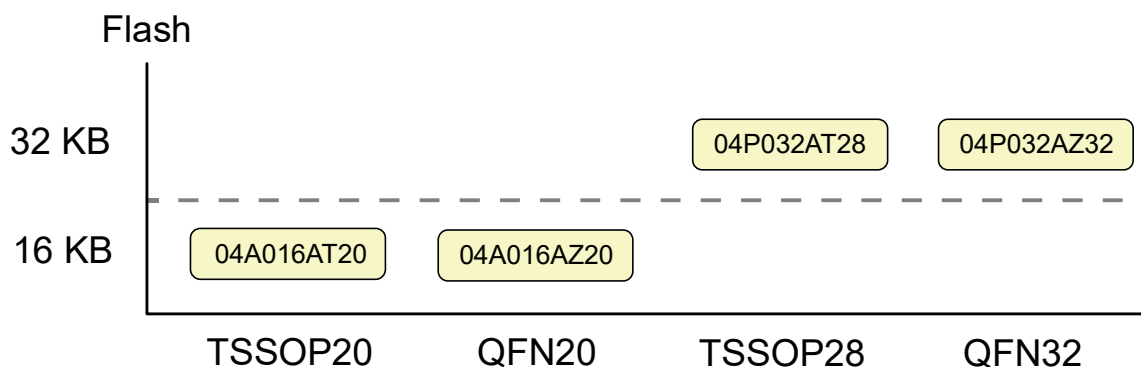
*2 All UART support SPI Master;

*3 Share with all Flash zone;

*4 CCP: Input Capture/Output Compare/PWM;

*5 Advanced UART x2 : Support SPI Master/Slave.(UART 0/1 modules)

Arm® Cortex®-M0 High CP Line Series



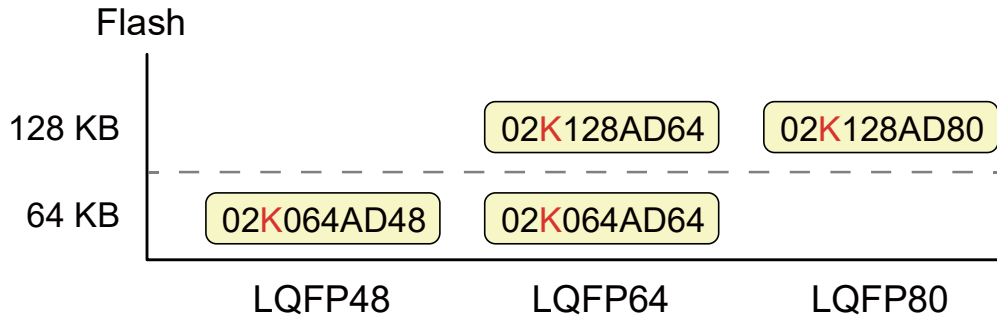
Item	Vdd	Flash ROM	Data RAM	Max Freq.	Timer	IO	12-Bit ADC	Comp.	Features	CCP ²	IAP	Package
MG32F04A016*1	2V~5.5V	16KB	2KB	48MHz	3	18	8-CH	NA	UARTx2, SPI, I ² C, CRC32, UID	5-CH	YES	QFN20 TSSOP20
MG32F04P032*1	2.5V~5.5V	32KB	4KB	60MHz	5	26	10-CH	2	OPAx2, USART, DMAx2, UID, HW Divider	5-CH	YES	TSSOP28 QFN32

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*1 Support M-LINK ICE;

*2 CCP: Input Capture/Output Compare/PWM.

Arm® Cortex®-M0 LCD Line: MG32F02K Series



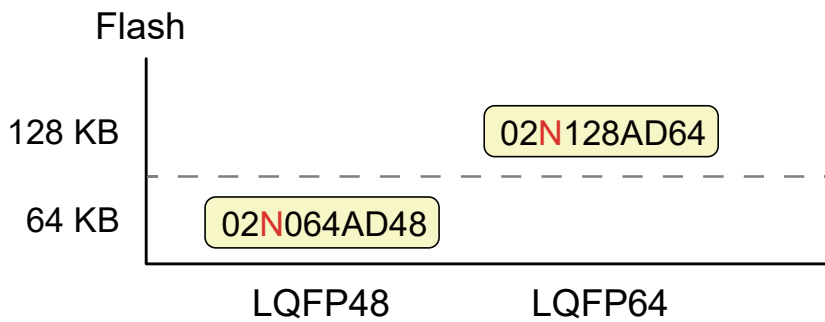
Item	Vdd	Flash ROM	Data RAM	Max. Freq.	Timer	IO	12-Bit ADC	Comp.	Features	CCP ³	ISP/IAP	Package
MG32F02K064 ^{*1}	1.8V~5.5V	64KB	10KB	48MHz	7+RTC	44/59	16-CH	2	UARTx7,I ² Cx2,SPIx4,LIN,LCD,OPA,DMAx5,CRC32	8-CH	YES ^{*2}	LQFP48 LQFP64
MG32F02K128 ^{*1}	1.8V~5.5V	128KB	16KB	48MHz	7+RTC	59/73	16-CH	2	UARTx7,I ² Cx2,SPIx4,LIN,LCD,OPA,DMAx5,CRC32	8-CH	YES ^{*2}	LQFP64 LQFP80

^{*1} Support M-LINK ICE;

^{*2} Share with all Flash zone;

^{*3} CCP: Input Capture/Output Compare/PWM.

Arm® Cortex®-M0 CAN Line : MG32F02N Series



Item	Vdd	Flash ROM	Data RAM	Max. Freq.	Timer	IO	12-Bit ADC	Comp.	Features	CCP ³	ISP/IAP	Package
MG32F02N064 ^{*1}	1.8V~5.5V	64KB	10KB	48MHz	5+RTC	44	16-CH	2	UARTx5,I ² Cx2,SPI,LIN,LCD,CAN,OPA,DMAx5,CRC32	8-CH	YES ^{*2}	LQFP48
MG32F02N128 ^{*1}	1.8V~5.5V	128KB	16KB	48MHz	5+RTC	59	16-CH	2	UARTx5,I ² Cx2,SPI,LIN,LCD,CAN,OPA,DMAx5,CRC32	8-CH	YES ^{*2}	LQFP64

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^{*1} Support M-LINK ICE;

^{*2} Share with all Flash zone;

^{*3} CCP: Input Capture/Output Compare/PWM.

Automotive-Grade MCU: MGEQ1C064

Item	Operating Voltage	Flash ROM		Max. Operation Freq.	Timer (16-Bit)		12-Bit ADC	Features	PCA PWM	WDT	ISP		Package
		Data RAM			IO	ACMP					IAP		
MGEQ1C064 ^{*1}	2.4V~5.5V	64KB	36MHz	5 + RTC	16-CH	UART ² x2, SPI, I ² Cx2 S/W I ² C, LIN, CRC16	1	YES ^{*2}	7.5KB Max.	LQFP48			
		4KB		44	3		8-CH		63.5KB Max. ^{*3}				

Passed the certification of AEC-Q100 Grade 2 (Support operation temperature: -40~105°C)

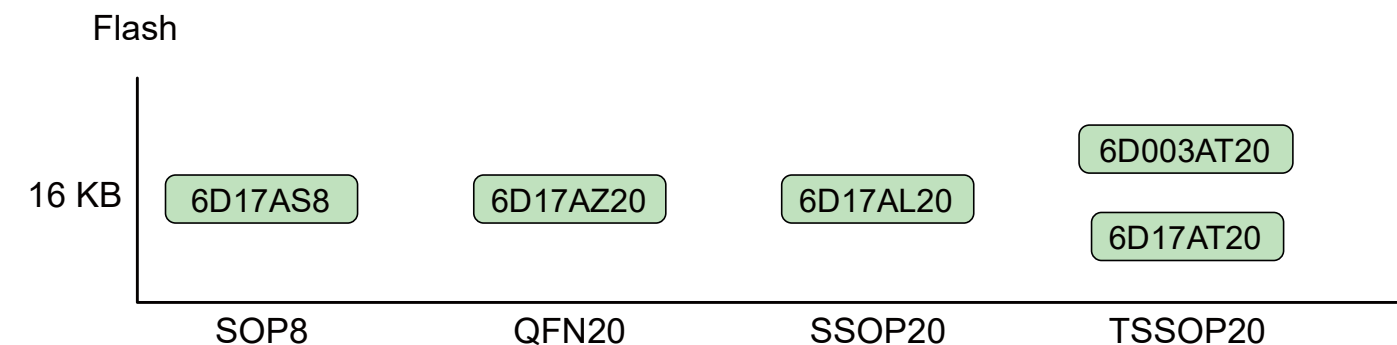
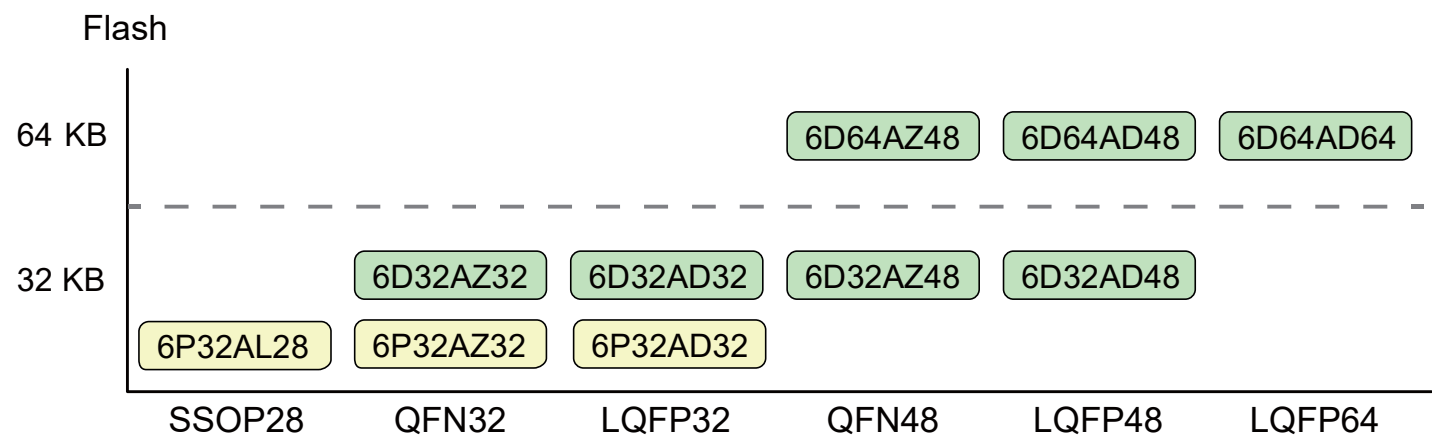
Support Code Protection

^{*1} Support SPI Master Mode;

^{*2} Support Watch Mode;

^{*3} Support S/W setting.

1T 8051 Wide Voltage Base Line: MG82F6D/6P Series with 12 Bit ADC



Item	Operating Voltage	Flash ROM		Max. Operation Freq.	Timer (16-Bit)		12-Bit ADC	Features	PCA PWM	WDT	ISP		Package
		Data RAM			IO	ACMP					IAP		
MG82F6D003 ^{*1}	1.8V~5.5V	16KB	36MHz ^{*5}	4 + RTC	8-CH	UART ² x2, SPI, I ² C S/W I ² C, LIN, CRC16	1	YES ^{*3}	7.5KB Max.	TSSOP20			
		1KB		17	NA		8-CH		15.5KB Max. ^{*4}				
MG82F6D17 ^{*1}	1.8V~5.5V	16KB	36MHz ^{*5}	4 + RTC	8-CH	UART ² x2, SPI, I ² C S/W I ² C, LIN, CRC16	1	YES ^{*3}	7.5KB Max.	SOP8 QFN20 SSOP20 TSSOP20			
		1KB		5/17	NA		8-CH		15.5KB Max. ^{*4}				
MG82F6P32 ^{*1}	1.8V~5.5V	32KB	32MHz ^{*5}	6 + RTC	8-CH	OPAx2, PGA, PD decode, UART ² x2, SPI, I ² Cx2 S/W I ² C, CRC16/32	2	YES ^{*3}	7.5KB Max.	SSOP28 QFN32 LQFP32			
		2KB		25/29	2		8-CH		31.5KB Max. ^{*4}				
MG82F6D32 ^{*1}	1.8V~5.5V	32KB	36MHz ^{*5}	4 + RTC	10-CH	UART ² x2, SPI, I ² Cx2 S/W I ² C, LIN, CRC16	1	YES ^{*3}	7.5KB Max.	QFN32 LQFP32 QFN48 LQFP48			
		2KB		29/44	2		8-CH		31.5KB Max. ^{*4}				
MG82F6D64 ^{*1}	1.8V~5.5V	64KB	36MHz ^{*5}	5 + RTC	16-CH	UART ² x4, SPI, I ² Cx2 S/W I ² C, LIN, CRC16	1	YES ^{*3}	7.5KB Max	QFN48 LQFP48 LQFP64			
		4KB		44/59	3		8-CH		63.5KB Max. ^{*4}				

<The yellow background represents coming soon.> Support Code Protection

^{*1} Support M-LINK ICE, except SOP8;

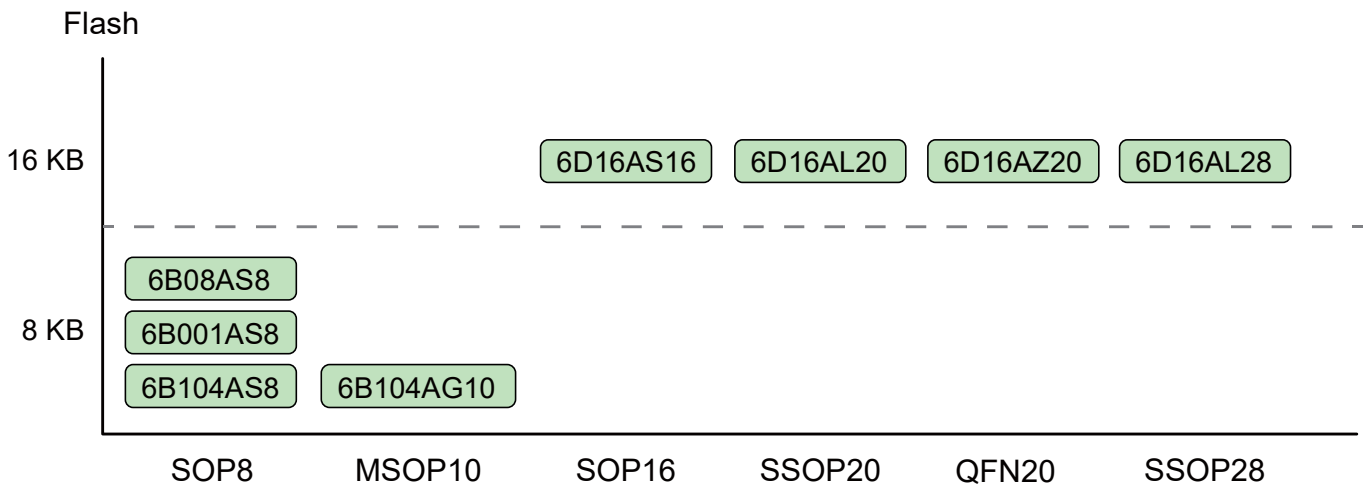
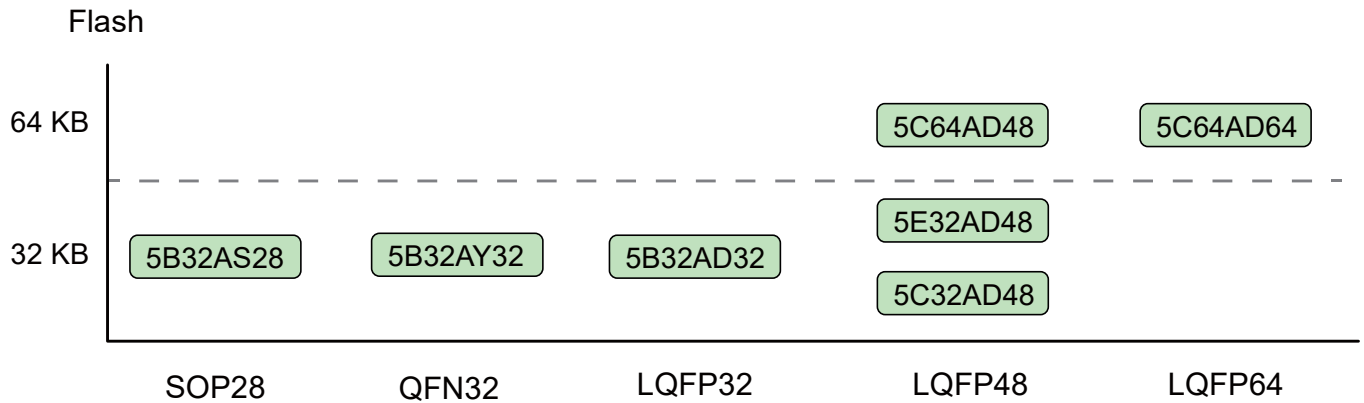
^{*2} Support SPI Master Mode;

^{*3} Support Watch Mode;

^{*4} Support S/W setting;

^{*5} 12MHz and 11.059MHz as internal RC oscillator, used 12MHz as default. Frequency deviation: at 25°C, under ±1% ; at -40°C~105°C, under ±2%.

1T 8051 Wide Voltage Base Line: MG82FG 5x/6x Series with 10 Bit ADC



Item	Operating Voltage	Flash ROM		Max Operation Freq.	Timer (16-Bit)		10-Bit ADC	Features	PCA		WDT	ISP		Package
		Data	RAM		IO	ACMP			PWM	IAP				
MG82F6B08 ¹	2.4V~5.5V	8KB		16/22.12 MHz ⁶	3 + RTC	6-CH	UART ² ,SPI,LIN S/W I ² C,I ² C,CRC16	1	YES ³	3.5KB Max. EEPROM 512B IAP Default NA	SOP8 MSOP10			
MG82F6B001 ¹		1KB			6/8	1		4-CH						
MG82F6B104 ¹														
MG82F6D16 ¹	1.8V~5.5V	16KB		32MHz ⁵	3 + RTC	8-CH	UART ² ,SPI,LIN I ² C,S/W I ² C,CRC16	1	YES ³	7.5KB Max. 15.5KB Max. ⁴	SOP16 SSOP20 SSOP28 QFN20			
		1KB			13/17/25	1		6-CH						
MG82FG5B32 ¹	1.8V~5.5V	32KB		25MHz ⁵	3 + RTC	8-CH	UART ² x2,SPI ISO-7816,LIN,I ² Cx2	1	YES ³	4KB Max. 31.5KB Max. ⁴	QFN32 LQFP32			
		2KB			29	NA		8-CH						
MG82F5B32 ¹	1.8V~5.5V	32KB		32MHz	3 + RTC	8-CH ⁷	UART ² x2,SPI ISO-7816,LIN,I ² C	1	YES ³	4KB Max. 31.5KB Max. ⁴	SOP28 LQFP32			
		2KB			25/29	NA		8-CH						
MG82FG5C32 ¹	1.8V~5.5V	32KB		32MHz ⁵	5 + RTC	16-CH	UART ² x4,SPI/QPI I ² Cx2,LIN,ISO-7816x3	2	YES ³	7.5KB Max. 31.5KB Max. ⁴	LQFP48			
		2KB			44	3		12-CH						
MG82FG5C64 ¹	1.8V~5.5V	64KB		32MHz ⁵	5 + RTC	16-CH	UART ² x4,SPI/QPI I ² Cx2,LIN,ISO-7816x3	2	YES ³	7.5KB Max. 63.5KB Max. ⁴	LQFP48 LQFP64			
		4KB			59	3		12-CH						
MG82G5E32 ¹	1.8V~5.5V	32KB		32MHz ⁵	4 + RTC	8-CH	UART ² x2,SPI,I ² C S/W I ² C,CRC16	1	YES ³	7.5KB Max. 31.5KB Max. ⁴	LQFP48			
		2KB			44	2		8-CH						

Support Code Protection; ¹ Support M-LINK ICE, except SOP8; ² Support SPI Master Mode;

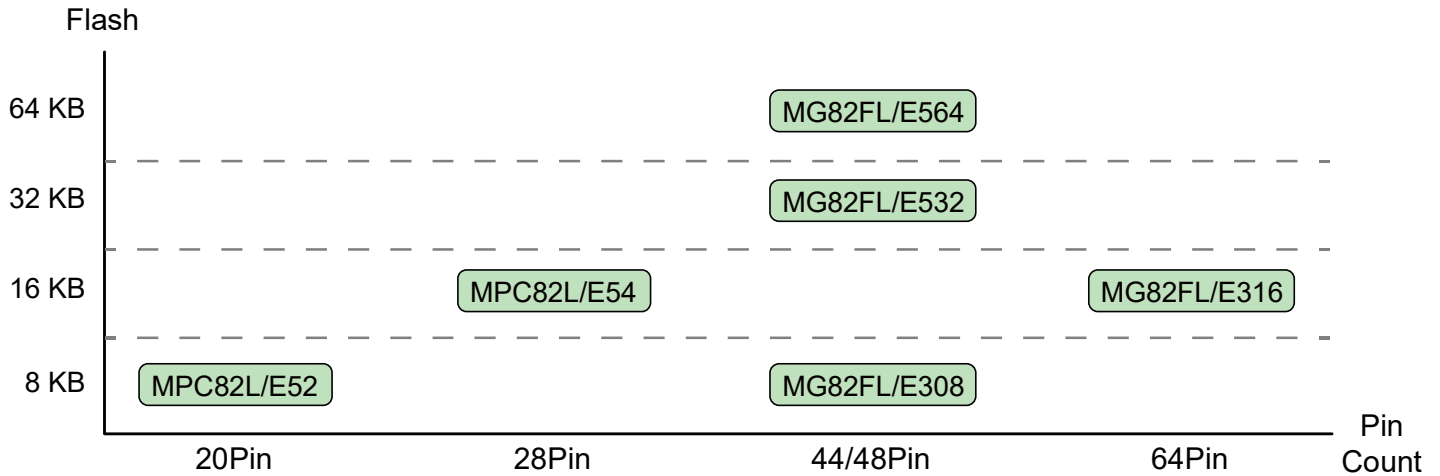
³ Support Watch Mode; ⁴ Support S/W setting;

⁵ 12MHz and 11.059MHz as internal RC oscillator, used 12MHz as default. Frequency deviation: at 25°C, under ±1%; at -40°C~85°C, under ±2%;

⁶ 16MHz and 22.12MHz as internal RC oscillator. Frequency deviation: at 25°C, under ±2%; at -40°C~85°C, under ±3.8%;

⁷ Factory default 10 Bit,200Ksps; Program adjustment 12 Bit,400Ksps.

1T 8051 Single Voltage MCU: MPC82 / MG82F Series



Item	Operating Voltage	Flash ROM	Max Operation Freq.	Timer (16-Bit)	ADC	Comm.	PCA	WDT	Code Protection	ISP	Package
		Data RAM		IO	ACMP		PWM			IAP	
MPC82L/E52	L:2.4V~3.6V E:4.5V~5.5V	8KB	25MHz	2	8-Bit,8-CH	UART,SPI	1	YES	YES	3KB Max.	PDIP20 SOP20 TSSOP20
		256B		15	NA		2-CH			7.5KB Max.	
MPC82L/E54	L:2.4V~3.6V E:4.5V~5.5V	15.5KB	25MHz	2	10-Bit,8-CH	UART,SPI	1	YES	YES	3.5KB Max.	PDIP28 SOP28 SSOP28
		512B		23	NA		4-CH			15KB Max.	
MG82FL/E532 ^{*1}	L:2.4V~3.6V E:4.5V~5.5V	32KB	24MHz ^{*2}	3	10-Bit,8-CH	UARTx2,SPI	1	YES ^{*4}	YES	4KB Max.	LQFP44 LQFP48
		1280B		45	NA		6-CH			32KB Max. ^{*5}	
MG82FL/E564 ^{*1}	L:2.4V~3.6V E:4.5V~5.5V	64KB	24MHz ^{*2}	3	10-Bit,8-CH	UARTx2,SPI	1	YES ^{*4}	YES	4KB Max.	LQFP44 LQFP48
		1280B		45	NA		6-CH			63.5KB Max. ^{*5}	
MG82FL/E308	L:2.4V~3.6V E:4.5V~5.5V	8KB	24MHz ^{*3}	3	NA	UART	NA	YES	YES	4KB Max.	LQFP48
		512B		45	1		1-CH			8KB Max. ^{*5}	
MG82FL/E316	L:2.4V~3.6V E:4.5V~5.5V	16KB	24MHz ^{*3}	3	NA	UART	NA	YES	YES	4KB Max.	LQFP64
		512B		57	1		1-CH			15.5KB Max. ^{*5}	

^{*1} Support M-LINK ICE;

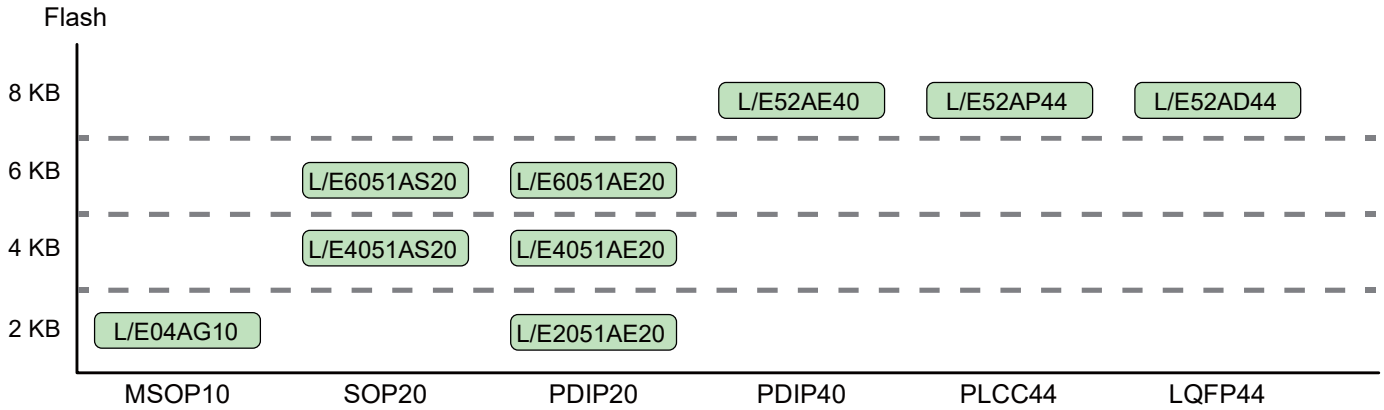
^{*2} Used internal RC oscillator 22.118MHz as default. Frequency deviation: at 25°C, under ±1%; at -20°C ~50°C, under ±2% ; at -40°C ~85°C, under ±4%;

^{*3} Internal RC oscillator 12MHz as default. Frequency deviation: at 25°C, under ±1%; at -20°C ~50°C, under ±2% ; at -40°C ~85°C, under ±4%;

^{*4} Support Watch Mode;

^{*5} Support S/W setting.

12T/6T 8051 Single Voltage with internal RC oscillator MCU: MG87 Series

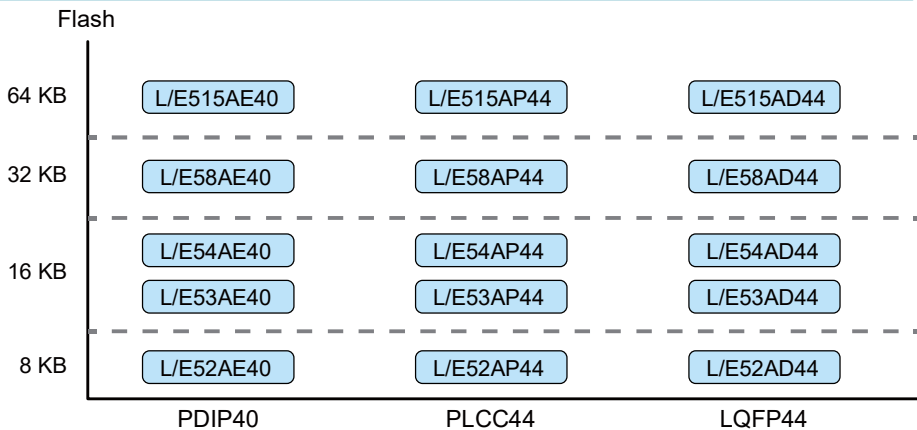


Item	Operating Voltage	Flash ROM Data RAM	Max. Operation Freq.	Timer (16-Bit)		ACMP	Comm.	PCA PWM	WDT	ISP IAP	Package
				IO							
MG87FL/E52*	L:2.4V~3.6V E:4.5V~5.5V	8KB	48MHz @ 12T 24MHz @ 6T	3	32/36	NA	UART	NA	YES	3.5KB Max.	PDIP40 PLCC44 LQFP44
		256B		NA				S/W setting			
MG87FL/E2051*	L:2.4V~3.6V E:4.5V~5.5V	2KB	48MHz @ 12T 24MHz @ 6T	2	17	1	UART	NA	YES	3.5KB Max.	PDIP20
		256B		1-CH				S/W setting			
MG87FL/E4051*	L:2.4V~3.6V E:4.5V~5.5V	4KB	48MHz @ 12T 24MHz @ 6T	2	17	1	UART	NA	YES	3.5KB Max.	PDIP20 SOP20
		256B		1-CH				S/W setting			
MG87FL/E6051*	L:2.4V~3.6V E:4.5V~5.5V	6KB	48MHz @ 12T 24MHz @ 6T	2	17	1	UART	NA	YES	3.5KB Max.	PDIP20 SOP20
		256B		1-CH				S/W setting			
MG87FL/E04	L:2.4V~3.6V E:4.5V~5.5V	4KB	22.118MHz/Int RC	2	7	1	UART	NA	YES	1.5KB	MSOP10
		256B		1-CH				S/W setting			

Support Code Protection

* Built-in internal RC oscillator with $\pm 1\%$ frequency deviation at 25°C. And there are 6 kinds of frequency selectable: 6M/11.059M/12M/22.118M/24M/24.576MHz.

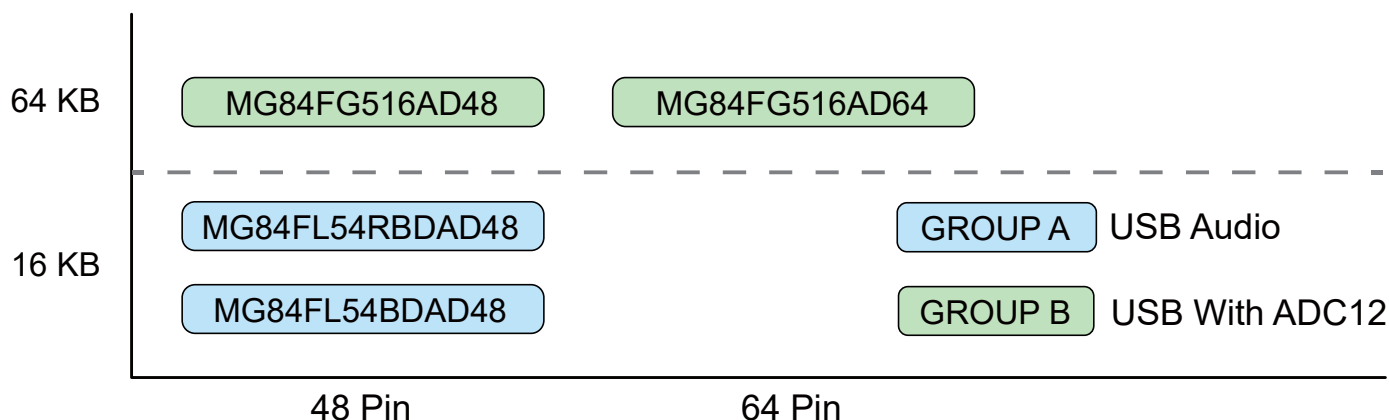
12T/6T 8051 Single Voltage without internal RC oscillator MCU : MPC89 Series



Item	Operating Voltage	Flash ROM Data RAM	Max. Operation Freq.	Timer (16-Bit)		ACMP	Comm.	PCA PWM	WDT	Code Protection	ISP IAP	Package
				IO								
MPC89L/E52	L:2.4V~3.6V E:4.5V~5.5V	8KB	48MHz @ 12T 24MHz @ 6T	3	32/36	NA	UART	NA	YES	YES	4KB Max.	PDIP40 PLCC44 LQFP44
		512B		NA				6KB Max.				
MPC89L/E53	L:2.4V~3.6V E:4.5V~5.5V	15KB	48MHz @ 12T 24MHz @ 6T	3	32/36	NA	UART	NA	YES	YES	4KB Max.	PDIP40 PLCC44 LQFP44
		512B		NA				NA				
MPC89L/E54	L:2.4V~3.6V E:4.5V~5.5V	16KB	48MHz @ 12T 24MHz @ 6T	3	32/36	NA	UART	NA	YES	YES	4KB Max.	PDIP40 PLCC44 LQFP44
		1280B		NA				46KB Max.				
MPC89L/E58	L:2.4V~3.6V E:4.5V~5.5V	32KB	48MHz @ 12T 24MHz @ 6T	3	32/36	NA	UART	NA	YES	YES	4KB Max.	PDIP40 PLCC44 LQFP44
		1280B		NA				30KB Max.				
MPC89L/E515	L:2.4V~3.6V E:4.5V~5.5V	63KB	48MHz @ 12T 24MHz @ 6T	3	32/36	NA	UART	NA	YES	YES	4KB Max.	PDIP40 PLCC44 LQFP44
		1280B		NA				NA				

8051 USB MCU

Memory



MG84 (USB FS)

Item	Operating Voltage	Flash ROM Data RAM	Max. Operation Freq.	Timer (16-Bit)		ADC ACMP	Comm.	PCA PWM	WDT	End Points	ISP IAP	Package
				IO								
MG84FL54BD	2.7V~3.6V	16KB	24MHz	3	NA	USB, UART, TWI(I ² C), SPI	NA	NA	NA	4	4KB Max.	LQFP48
		832B		36	NA						15KB Max.	
MG84FL54RBD	2.7V~3.6V	16KB	24MHz	3	NA	USB, UART, TWI(I ² C), SPI	NA	NA	NA	6	4KB Max.	LQFP48
		256B		31	NA						15KB Max.	
MG84FG516 ^{*1}	2.0V~5.5V	64KB	32MHz ^{*2}	4	12-Bit, 8-CH	USB, UARTx2, TWI(I ² C), SPI	1	YES ^{*4}	11	4KB Max.	4KB Max.	LQFP48
		4352B		41/55	NA						63.5KB Max. ^{*5}	

^{*1} Support M-LINK ICE;

^{*2} Used internal RC oscillator 12MHz as default. Frequency deviation: at 25°C, under ±1% ; at -40°C~85°C, under ±1.5% ; at USB activated, under ±0.25%;

^{*3} Support SPI Master Mode;

^{*4} Support Watch Mode;

^{*5} Support S/W setting.

MA1xx Series USB Bridge

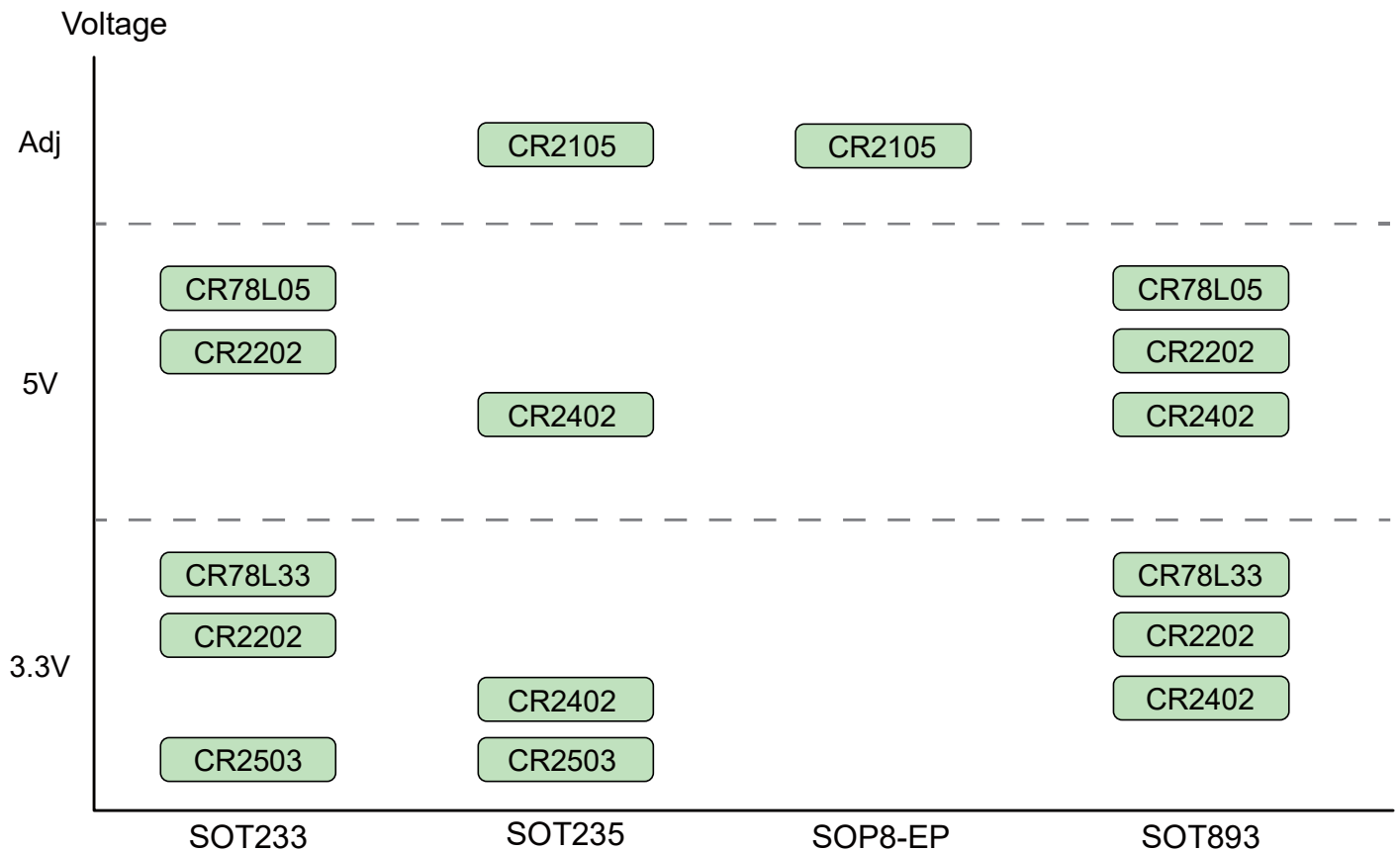
Item	Operating Voltage	USB Speed	Function	Features	Driver	Package
MA111	2.4V~5.5V	Full Speed ^{*1}	USB HID to Serial Bridge	UART, SPI Master, TWI(I ² C) Master, GPIO	FREE	SOP16, QFN16
MA112	3.0V~5.5V	Full Speed ^{*1}	USB to UART Data Bridge MS Windows Driver Supported	Virtual COM (TXD/RXD)	OS	SOP16, QFN16
MA113	3.0V~5.5V	Full Speed ^{*1}	USB Data Bridge for UART, RS-232 Modem signal, RS-485 MS Windows Standard Driver supported	Virtual COM(TXD/RXD), RS-232 Modem Signals RS-485 Transceiver Control	OS	SOP16, QFN16

^{*1} Built in internal RC oscillator 12MHz as default. Frequency deviation: at 25°C, under ±1% ; at -40°C~85°C, under ±1.5%, USB online mode ±0.25%.

Power IC (BMS) Product

Part No.	Type	Number of series cells	Battery chemistry	Operating Voltage	Feature	Package
MSE03GM1	Gauge	3	Lithium	8.1V ~ 12.75V	UART、I ² C	LQFP48

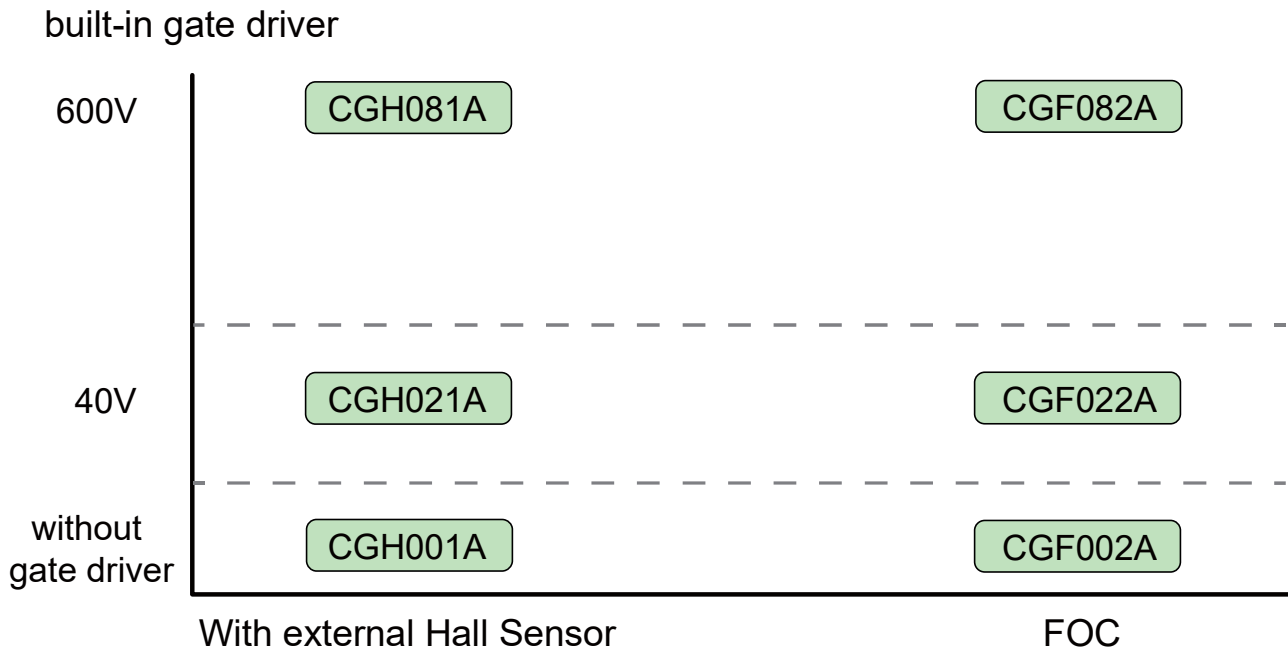
Power IC (LDO) Product



Part No.	Min. V _{IN} (V)	Max. V _{IN} (V)	I _{OUT} (mA)	V _{OUT} (V)	I _Q (uA)	ΔV _{LINE} (%)	ΔV _{LOAD} (%)	PSRR @1KHz (dB)	C _{OUT} (uF)	EN	Package
CR78L33 CR78L05	7	30	100	3.3/5	300	0.24	0.4	84	0.1	NA	SOT233 SOT893
CR2105	7	100	50	Adj ^{*1}	23	0.06	0.4	65	10	Yes	SOT235 SOP8-EP
CR2202	2.7	24	150	3.3/5	1.5	0.04	0.15	80	1	NA	SOT233 SOT893
CR2402	2.7	40	250	3.3/5	1.5	0.04	0.4	80	1	Yes	SOT235 SOT893
CR2503	2.5	6	300	3.3	0.5	0.6	1	60	1	Yes	SOT233 SOT235

*1 Adj: means the voltage can be adjusted.

BLDC Product



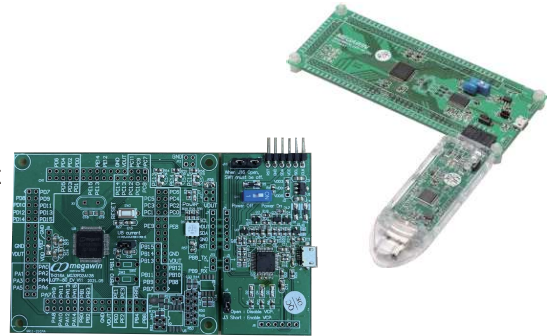
Part No.	Mode	Gate Driver		V _{IN}	LDO	VDD	Max Freq.	ADC 10Bit	Capture 16-Bit	OPA ^{*1}	Operation Temp.	Package
		Voltage	Type									
CGH001A	Hall	NA		5V	NA	4.5~5.5V	48MHz	8 CH	1 CH	1 set	-40°C~105°C	SSOP28 QFN32
CGH021A	Hall	40V	P+N	40V	5V/30mA	4.5~5.5V	48MHz	8 CH	1 CH	1 set	-40°C~105°C	QFN40
CGH081A	Hall	600V	N+N	15V	5V/30mA	4.5~5.5V	48MHz	8 CH	1 CH	1 set	-40°C~105°C	LQFP48
CGF002A	FOC	NA		5V	NA	4.5~5.5V	48MHz	8 CH	1 CH	1 set	-40°C~105°C	LQFP48
CGF022A	FOC	40V	P+N	40V	5V/30mA	4.5~5.5V	48MHz	8 CH	1 CH	1 set	-40°C~105°C	LQFP48
CGF082A	FOC	600V	N+N	15V	5V/30mA	4.5~5.5V	48MHz	8 CH	1 CH	1 set	-40°C~105°C	LQFP48

*1 OPA: For peripheral use.

Development Tools(1)

EVB + M-Link (TH185)

- USB Plug & Play
- Support Keil RVMDK development environment
- Support on-line debug
- Support on-line chip programming



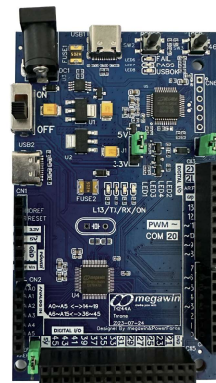
U1 Plus-D Writer (TH200)

- USB Plug & Play
- Support online and offline programming modes
- Automatic serial number insertion
- Maximum programming counts limitation support
- Online software update
- User-defined IAP space
- User-defined ISP space for self ISP code insertion
- Support LCD Display
- Provide signals such as start,busy,pass and fail, which can be combined with automatic programmer



Arduino-Throne Development Kit (TH244A001)

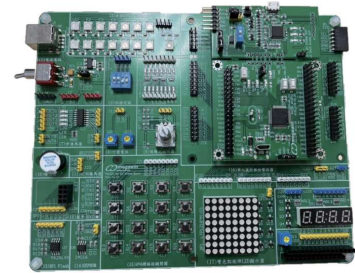
- M0 MCU (MG32F02U128), operating frequency up to 36MHz
- 128KB Flash; 16KB SRAM
- Supports USB2.0
- Built-in ADC, DAC, I²C, SPI, UART
- 47 GPIO for Arduino pinout at pitch 2.54mm female connectors
- Supports Arduino IDE



Development Tools(2)

Arm® Cortex®-M0 Internship Group (TS101A)

- BLE
- RGB LED
- SPI Flash
- EEPROM
- Step Motor
- ARGB LED
- 4x7-SEG LED
- RC Servo Motor
- M-Link+EasyCOM
- MG32F02U128(USB Device)
- 2 Colors of LED Module(8x8)
- 16x2 LCM/TFT LCD Display



MA111 Bridge Develop Board (TH192)

- Driver free HID Bridge for Windows 7, Windows 8.1, Windows 10
- Crystal free
- Support GPIO & Interface Bridge of UART, SPI master and I2C master
- UART Baud Rate: 600,1200,2400,4800,9600,19200,38400,51200,57600, 102400,115200 and 230400
- UART Parity:Odd, Even, Mark, Space and None-parity
- Support Line-Break/CTS/RTS and RS-485 DE control
- Provide UART multi-Processor communication(Master or Slave)
- Remote wakeup: WKP0 & WKP1



MA112 Bridge Develop Board (TH193)

- Virtual COM Bridge for Windows 7, Windows 8.1, Windows 10,Windows 11
- Crystal free
- Support UART data bridge on TXD/RXD
- UART Baud Rate: 600,1200,2400,4800,9600,19200,38400,51200,57600, 102400,115200 and 230400
- UART Parity:Odd, Even, Mark, Space and None-parity
- Stop bit:1 bit, 2 bits
- Line Break detection and transmission
- Support multi-processor communication(Master or Slave)



MA113 Bridge Develop Board (TH246)

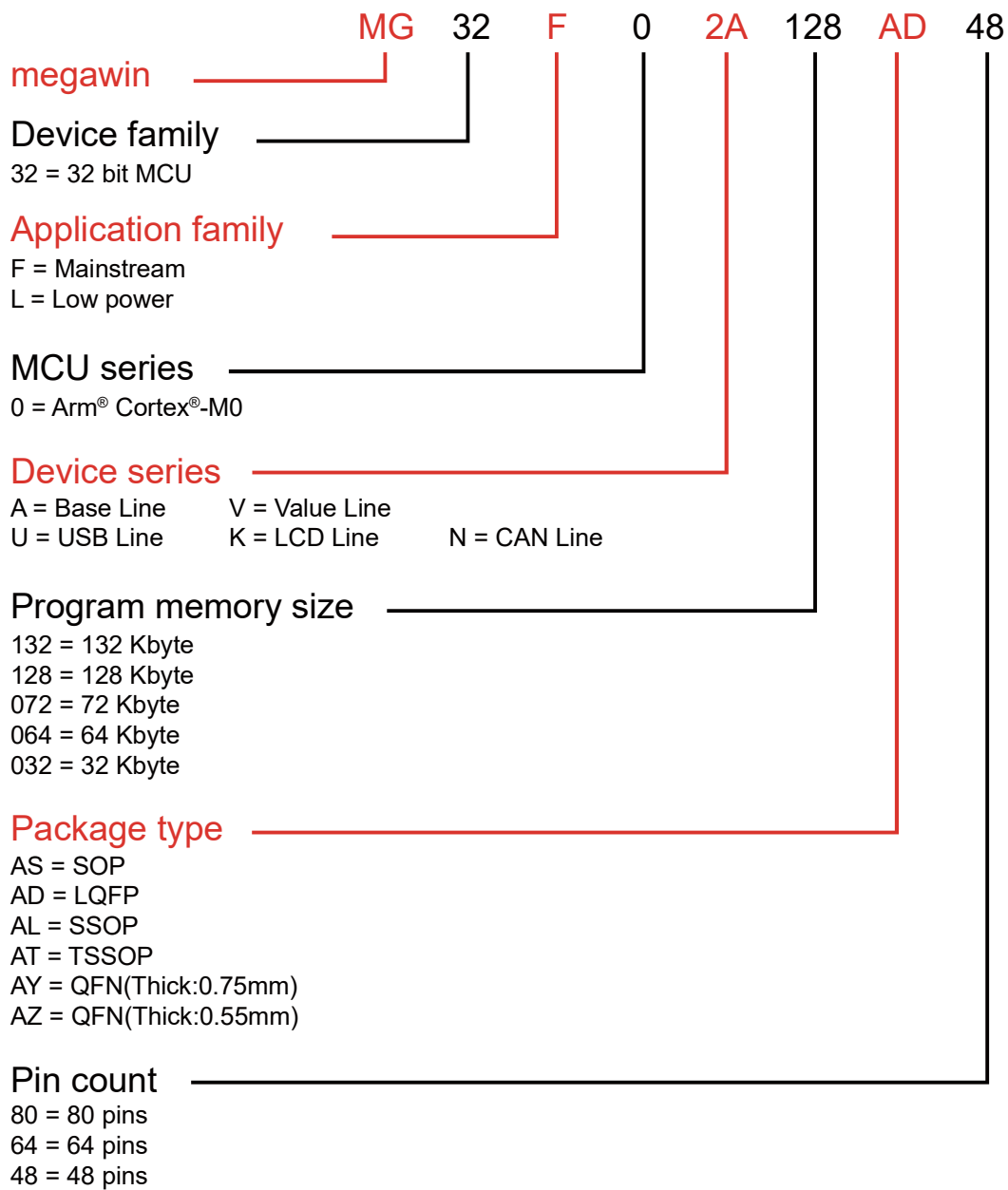
- Virtual COM Bridge for Windows 7, Windows 8.1, Windows 10, Windows 11
- Crystal free
- Support UART data bridge on TXD/RXD
- UART Baud Rate: 600,1200,2400,4800,9600,19200,38400,51200,57600, 102400,115200 and 230400
- UART Parity:Odd, Even, Mark, Space and None-parity
- Stop bit:1 bit, 2 bits
- Line Break detection and transmission
- Support multi-processor communication(Master or Slave)
- Provide DE for RS485 transceiver control
- Support RS-232 flow control CTS/RTS/DSR/DTR



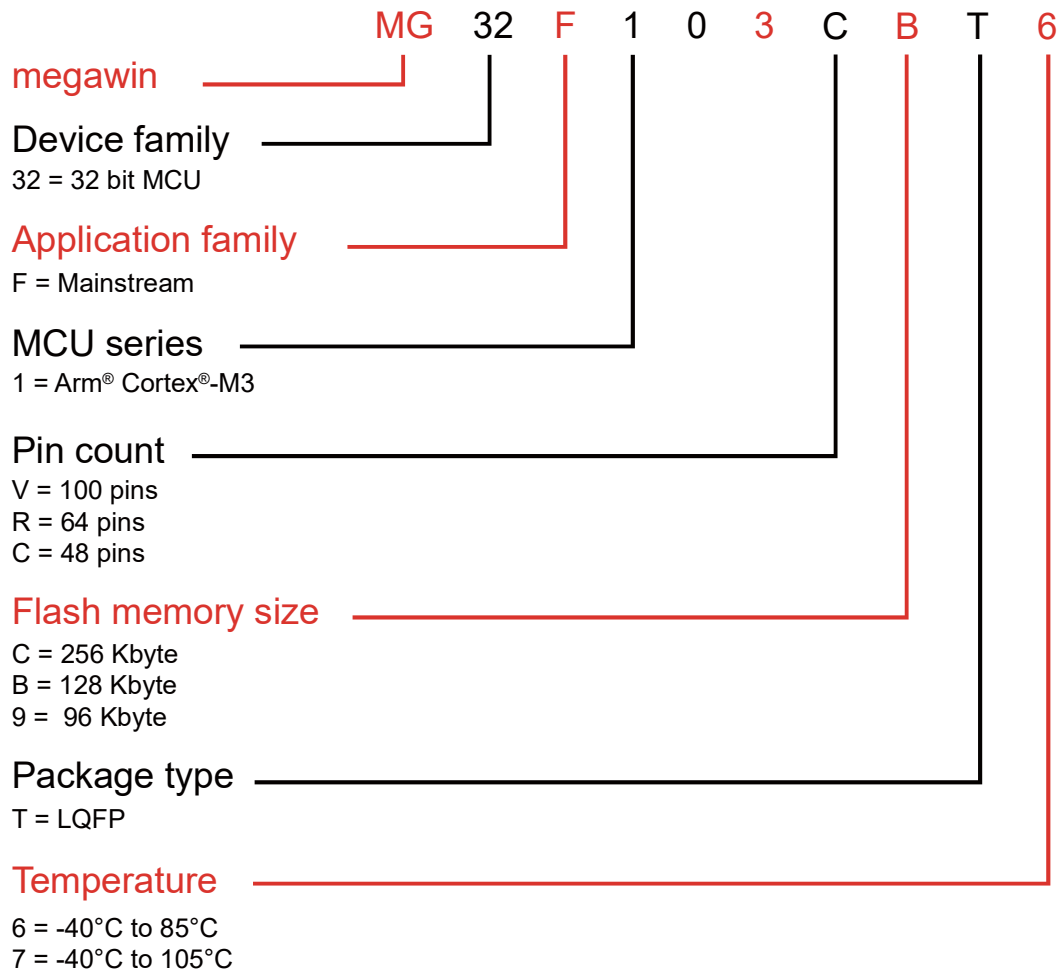
Package Type

Code	Description	Code	Description	Code	Description
AB	COB	AC	LQFP (10mm x 10mm)	AD	LQFP (7mm x 7mm)
AE	PDIP	AF	PQFP	AG	MSOP
AL	SSOP	AM	TQFP	AP	PLCC
AS	SOP	AT	TSSOP	AY	QFN (Thick:0.75mm)
HS	SOP (Heat Sink)	AK	TOxxx	AZ	QFN (Thick:0.55mm)
AR	SOT	AI	Ink die	AN	DFN
AW	Wafer	WL	SSOPW (209mil Outline Dimensions)	AH	DICE

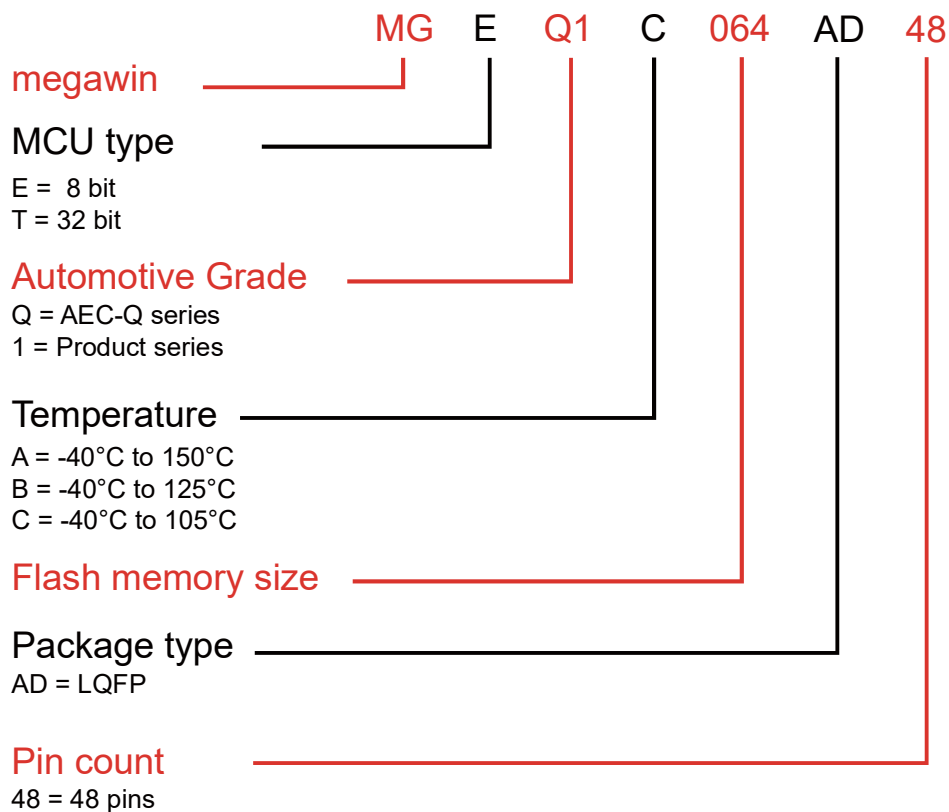
Ordering Information - M0



Ordering Information-M3



Ordering Information - Automotive MCU



M3 Series Features & Apps.

M3 Features:

- Core efficiency improvement
- Flash equipped Cache to enhance efficiency
 - ▲Flash 96~256KB
- Clock source up to 96MHz
- All series support USB 2.0 Device
- **MG32F157 other features:**
 - ▲Flash 256KB · RAM 64KB
 - ▲Support 1 **CAN2.0B**, communications interface increased to 15
 - ▲Support **hardware AES encryption algorithm**
 - ▲3 sets of ADCs, 2 sets can be synchronously sampled
 - ▲Support 3 sets of OPA and 2 sets of DAC
 - ▲Support 3 sets of I²S
 - ▲Support SDIO
 - ▲up to 100 Pin, multiple pins support 5V input; no conversion circuit required

Typical Applications:

- Sweeping Robot
- High-end Smart Lock
- Aerial Camera
- Thermal Printer / POS
- Brushless Motor Control
- Outdoor Energy Storage Power Supply
- Charging Station/Charging Gun



Recommended App.(1): Smart Lock

● Electronic Lock MCU Control

- ▲ Keyboard(I/O)
- ▲ Touch(I²C)
- ▲ Fingerprint(SPI/UART)
- ▲ NFC(UART)
- ▲ Motor(PWM)
- ▲ Voice(DAC/Flash)
- ▲ RF(SPI)
- ▲ Data record(EEPROM/Flash)



Recommended App.(2): Thermal printer

● Thermal printer application usually use M3

- ▲ 128K ~256K Flash; ▲ At least 20K RAM
- ▲ Generate QR code: 72MHz~120MHz

● Print width of printer

- ▲ 58~72mm; ▲ Taxi, store



Recommended App.(3): Energy Storage Power Supply

- 3 x 12-Bit ADC (charge detection / current and voltage sampling)
- 1 x CAN2.0B bus(as communication)
- Support SMBus (as BMS communication)
- 96MHz High-speed main frequency (energy saving)
- Sine wave PWM (for inverter)





Recommended App.(4): Charging Gun & Charging Station

AC Charging Gun (IC-CPD) solution, its achievable functions:

- Set indicator lights and digital display to show operating status
- Protection functions such as leakage, short circuit, overvoltage, undervoltage, and overcurrent to ensure safe and reliable operation of the charging gun.
- Charging power, default 7KW, optional 1.7KW, 3.3KW, 7KW, 12KW
- Optional charging current display
- Optional emergency stop switch power-off protection to prevent unexpected situations
- Required Input voltage: 220V±15%
- Charging time: 6-7 hours to fully charge

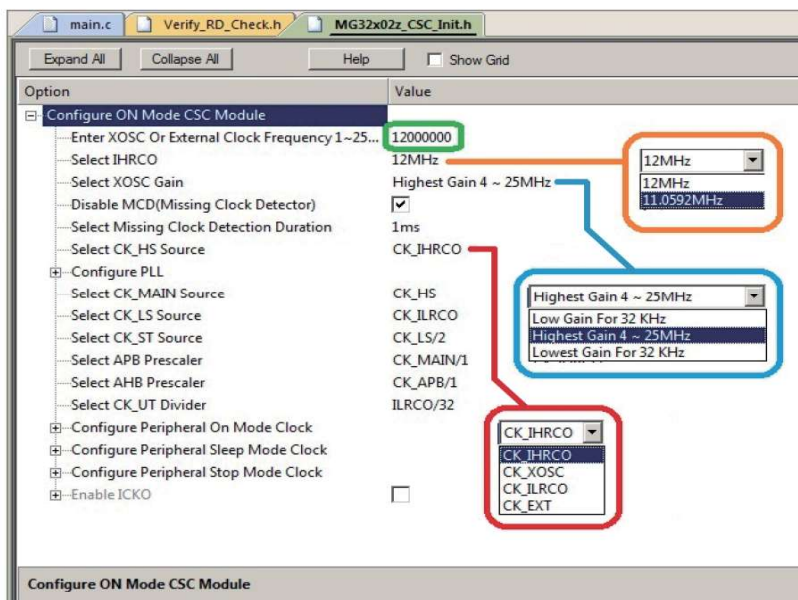


M0 Features:

- ADC (Analog-to-digital converter)
- DAC (Digital-to-analog converter)
- NCO (Numerically Controlled Oscillator)
- CCL (Configurable Custom Logic)
- EMB + 8080 LCD/OLED interface
- Signal Capture W/ DMA
- Hardware Divider
- Support USB 2.0 (total 15 end-points)
- Low power consumption: power down to 1.25uA
- ASB(ARGB Serial Bus)
- PWM: up to 96MHz (output 2 different frequency)
- Built-in a temperature sensor in ADC macro
- Easily initialize various peripherals (Keil Wizard, MG32CoGen)

Development tool: Keil Wizard

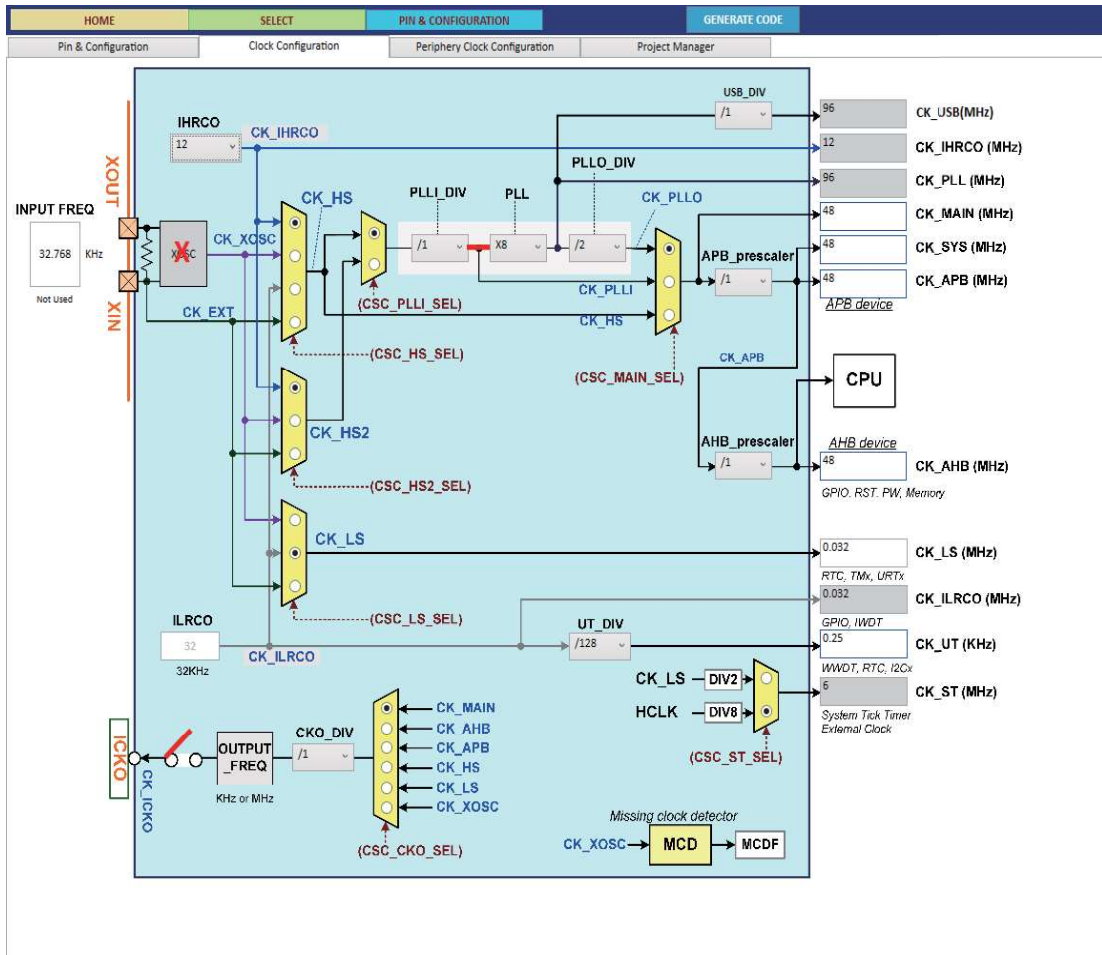
- Easy-to-use Keil Wizard supports all M0 series
- Code generated quickly by combo box and check box
- Support rich peripherals



M0 Series Features & Apps.

Development tool: MG32CoGen

- Megawin GUI Code Generator(MG32CoGen)
- **MG32CoGen 2.0** adds a variety of new peripheral initialization: ADC, UART, TIMER, SPI...
- Graphic interface help developer quickly complete I/O pin configuration and Clock system planning
- Intuitive use interface reduce development period effectively



Name	Function	Output Level	Mode	Pull-up Resistance	Output Drive Strength	Output High Speed Mode	Input Inverse	Input Filter	Divider	User Label
PA7	GRA7	High	open drain out	ENABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA8	TM16_ETR	High	push pull out	ENABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA9	TM10_CK0	High	push pull out	ENABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA10	TM10_CK1	High	push pull out	ENABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA11	URT2_TX	High	push pull out	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA12	DM1_TRG1	High	Digital input	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA13	TM20_OC02	High	push pull out	ENABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA14	MCE	High	push pull out	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA15	MA08	High	push pull out	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA16	MAD9	High	push pull out	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA17	DM1_TRG0	High	push pull out	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA18	IMAD10	High	push pull out	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA19	TM20_TRG0	High	push pull out	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA20	CMP0_PO	High	open drain out	ENABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA21	CMP1_PO	High	open drain out	ENABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA22	URT2_DE	High	open drain out	ENABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA23	URT1_CLK	High	Digital input	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA24	URT1_CLK	High	Digital input	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		
PA25	URT0_CLK	High	analog IO	DISABLE	Drive strength-full	DISABLE	DISABLE	Bypass Filter		

Function Switching

URT1_CLK can be set to: PB12(current), PA12(PC), (used), PC13(used), PC13_P02, P03(used)

Function Switching

Output Level: High

Mode: Digital Input

Pull-up Resistance: DISABLE

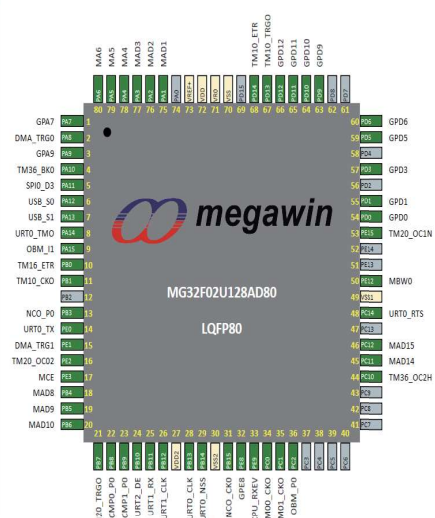
Output Drive Strength: Drive strength-full

Output High Speed Mode: DISABLE

Input Inverse: DISABLE

Input Filter Divider: bypass filter

User Label:



Development Platform:

● Megawin MCU Easy-to-use Development Platform

Feature 01(HW)

- *M-Link simulator supporting Keil C
- *U1 Plus-D for download

Feature 02(SDK)

- *More than 700 Driver API
- *Detailed code comments and high readability

Feature 03(TOOL)

- *Keil Wizard assists in quick project setup
- *Support fast platform switching

Feature 04(DOC)

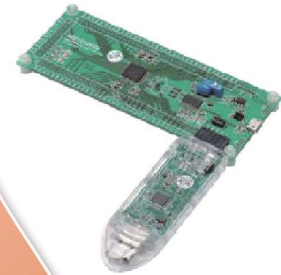
- *Software and hardware documents
- *U1 Plus-D for download

Development hardware

Lots of reference codes

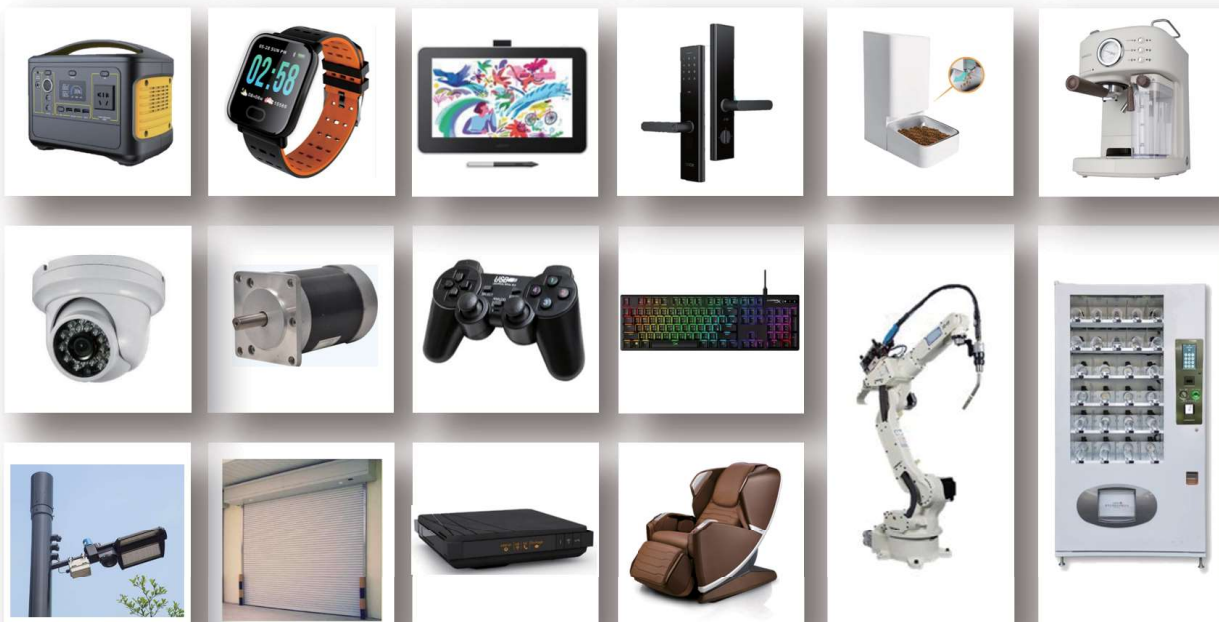
Easy to use wizard

Detailed documentation



Typical Applications:

- Motor Applications
- Robot Arm
- Industrial Control Instrument
- Electric Metering / BMS / PES
- Modem / Router
- Rolling Shutter Door
- Smart Street Light, LED Light Strip(ARGB)
- Monitoring System
- Smart Bracelet
- Electronic Drawing Board
- Smart Electronic Locks
- Pet feeder
- Coffee Machine



M0 Series Features & Apps.

M0 Series Spec Comparison:

Part No.	MG32F02U064	MG32F02U128	Description
Basic Feature	CPU Core	Arm® Cortex®-M0	
	Flash ROM	64KB	128KB
	SRAM	16KB	16KB
	Operation Voltage	1.8V ~ 5.5V	
	Max. CPU Frequency	48MHz	
System Clock	Internal Clock Source	ILRCO + IHRCO	
	XTAL Frequency	32KHz, 4 to 25MHz	
	EXTCK Frequency	36MHz	
	WDT	IWDT + WWDT	
	RTC	32-Bit	
	Voltage Detector	LVR+BOD0/1/2	
Analog/Digital	ADC	16-CH	12-Bit , 1.5MHz sps
	DAC	12-Bit , 1-CH	Voltage DAC, 12Bit, 1 Msps
	Analog Comparator	2-CH	
	Timers	16-Bit*2 + 32-Bit*5	
	PWM	8-CH	8CH * 16-Bit, 16CH * 8-Bit
Communication	USART	2 sets	3 sets
	2 nd UART	4 sets	4 sets
	Primary SPI	1 set	
	I ² C	2 sets	
	ISO-7816-3	2 sets	3 sets
	LIN	2 sets	3 sets
	CRC	CRC8+16+32	
	DMA	5-CH	
	EMB	16/8-Bit	
Other Feature	USB	8-CH	15 Endpoints, 512 Bytes FIFO
	Divider	Device	
	Temperature sensor	Yes	
	Package	QFN48/LQFP48/64	QFN48/LQFP64/80
	IO Number	41/56	56/70
Operating Temp.	-40~105°C		

Arduino®-Throne v.s Arduino® UNO R3

	Arduino® Official	Megawin Technology
Development Board	Arduino® UNO R3	Arduino®-Throne (TH244A001)
MCU Core	8-bit AVR®, 16MHz MCU (AVR ATmega328P)	32-bit Arm® Cortex®-M0, 36MHz MG32F02U128 (64-pin LQFP)
Flash / EEPROM / SRAM	32KB / 1KB / 2KB	128KB / - / 16KB
Operating Voltage	5V	3.3V/5V switchable
Communication Interface	I ² C 、 SPI 、 UART	I ² C 、 SPI 、 UART 、 USB
Development Environment	Arduino®	Arduino® 、 Keil
I/O Drive Current	20mA	40mA (5V) / 13mA (3.3V)
I/O Numbers	14	47 (46 of them are on-board buttons, which are convenient for users to use as pushbuttons)
On-board Buttons	0	1 set
External Interrupts	2	Any pin can be set as an external interrupt input
PWM	6-CH (Not support fast frequency modification)	7-CH, 8-bit default 1KHz, Specialized design of functions to support rapid modification of frequency 300Hz~5KHz adjustable
Analog Input ADC	6-CH, 8-bit	16-CH, 10-bit (8-bit/10-bit/12-bit)
Programming Method	Programming via COM port	Programming via COM port

Megawin Arduino[®]-Throne

Product: **Arduino[®]-Throne**

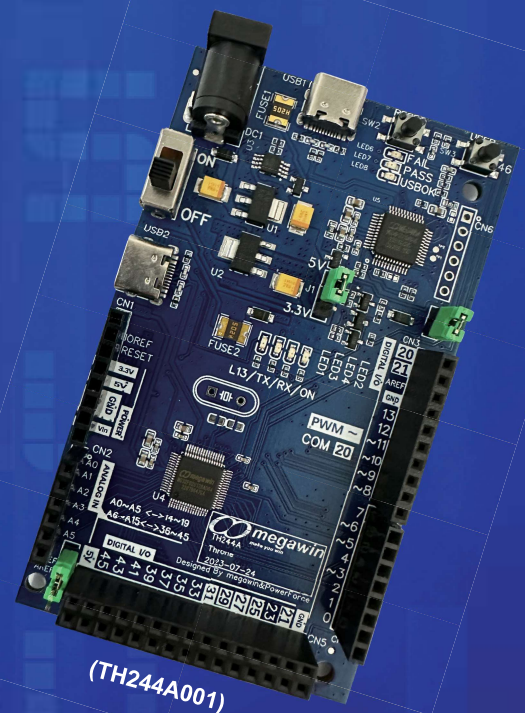
Features:

- 1 Supports Arduino[®] IDE
- 2 Based on 32-Bit MCU core, operating frequency up to 36MHz
- 3 128KB Flash, 16KB SRAM for more programming capacity
- 4 Switchable 3.3V/5V MCU power, supports multiple sensors power
- 5 **Up to 47 GPIO pins**, all of which can be set as external interrupt inputs
- 6 Increase pin drive current to drive sensors with different currents
- 7 Supports I²C/SPI/UART and **USB 2.0 Full-Speed**
- 8 Provides 7 sets of 8-bit PWMs with frequency and duty cycle fast adjustment
- 9 Supports 16 ADC channels for setting different reference voltage sources
- 10 Provides one 12-bit DAC with adjustable voltage output



Buy “**Arduino[®]-Throne**” on **eBay**
(Store name: **megawin.taiwan**)

or <https://www.ebay.com/str/megawintaiwan>



MGEQ1C064 Features:

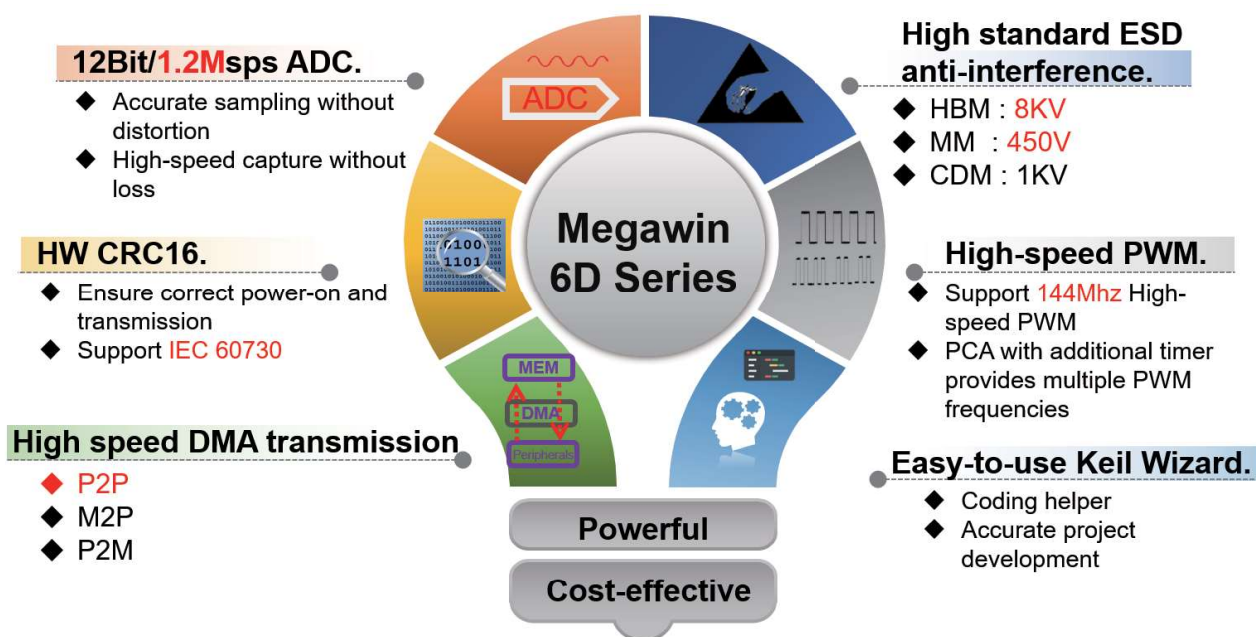
Automotive Grade Processes (AEC-Q100 Grade 2 Certification)

- 64K Flash \ 4K SRAM
- Operating Voltage: 2.4~5.5V
- Max. Operation Freq.: 36MHz
- UART 4 sets \ Have QPI / SPI / IIC
- Support LIN bus protocol
- ADC 16-Channel 1.0Msps
- Central Aligned PWM 144MHz
- CRC16 (Cyclic Redundancy Check)
- EMB (External Memory Bus) can use with DMA
- IO Number 44, Package LQFP48
- Operating Temperature: -40~105°C
- For future upgrades: support OTA (Over-the-Air Technology)



MG82F6D Series Features:

6D Series excellent features



Other features:

- Up to 4 sets of UARTs, which can be connected to various sensors
- Exclusive hardware Duty Capture to capture pulse and high-speed PWM signal
- Provides EMB (External Memory Bus) to expand NAND/8080LCM

6D Series Typical Applications:

- Industrial Instruments
- Industrial Control and Automation
- Home Appliance Display Panel
- Wireless Charging
- Mahjong Machine
- Sensor Applications
- Power Converter
- Electronic Cigarette
- LED Display Equipment/Light Control
- Battery Management System (BMS)
 - ▲ Power Tools
 - ▲ Electric Vehicles
 - ▲ UPS
 - ▲ Charging Pile
- Electronic Lock
- Sensor Alarm
- UV Disinfection Lamp
- Medical Device Control



Power IC Series Features & Apps.

BMS Features:

- Megawin Smooth Energy Gauge Algorithm, provide SOC/SOH
- Wake-up with current detection, include Voltage / Current / Temperature measurement function
- Provide storage area for cell production history data
- Automatic cell behavior (abnormality) status recording

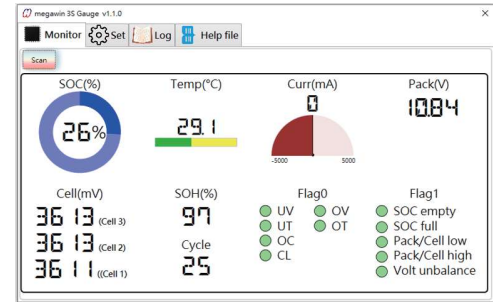
BMS Applications:

- Power tool battery pack
- Electric Drill
- Electric Wrench
- Military Knife Saw
- Vacuum cleaner
- Shoe washing brush
- Toy
- Small Fan



BMS (MSE03GM1) GUI

- Support adjust the parameters, includes V/I/T battery information
- Built-in calibration provides quick li-battery calibration
- Product Monitoring Functions , display SOC/SOH et.
- Built-in Battery Abnormal Record Condition , read history data for analysis



LDO Features:

- EN turns off LDO to save power
(notes: If there is an EN Pin requirement, the EN pin function must be selected, and it is a SOT 235 package.)
- Superior Line Regulation, high PSRR anti-ripple interference
- Ultra-low I_Q value, improve voltage conversion efficiency

LDO: Voltage/current/power selection:

- Choose the right LDO according to the application
 - Input voltage : 100V (max)
 - Output voltage : 5V/3.3V (CR2105: V_{out} is adjustable)
 - Input current : 0.3A (max)
- Power is related to package limitations, resulting in temperature rise

Formula $P_{LDO} = (V_{in} - V_{out}) \times I_{out}$
 Condition : $V_{out} = 3.3V, I_{out} = 50mA$

When $V_{in} = 9V$, LDO power 0.285W
 When $V_{in} = 15V$, LDO power 0.585W
 Due to the power, the latter can only choose SOP8-EP packages.

Package	Power (Max)
SOT233	0.4W
SOT235	0.4W
SOT893	1.8W
SOP8-EP	2.2W

LDO Applications:

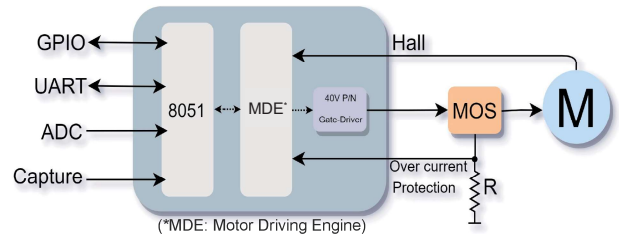
- Motor, Fan, Servo Motor Applications
- Charger application
- Intelligent detection
- Smart Meter/ Smart Water Meter
- Mouse, Power Bank
- Telcom and Servo Power
- Battery Management (BMS)



Features:

- With external Hall IC(CGH0x1A)
- FOC* Control(CGf0x2A)
- Sensorless series can be collaborated to **FOC Intelligent Tuning System** to optimize the motor performance.
- 40V~600V Gate Driver & 5V LDO built-in
 - ▲ CGH001A/CGF002A: without Gate Driver
- Built-in **MDE HW** efficient computing and protection
- Can be used with various gate drivers according to the applications
- MOSFET elements P+N / N+N

Function Diagram(CGh021A)



Option	Value
Motor basic parameters	
Stator Line-Line Resistance (unit : mΩ)	2930
Stator Line-Line Inductance (unit : uH)	2850
PWM frequency (unit : Hz)	14000
DC bus Voltage (unit : V)	36
Rshunt(unit: 0.1mR)	1000
OPA GAIN	2.5 Gain
Motor Pole	8
Motor rated maximum speed	6000
Watt Maximum	60

Motor basic parameters

(*FOC : Field-Oriented Control)

Typical Applications:

- Crossflow Fan
- Standing Fan, Wall Fan, Air Purifier
- Fresh Air System
- Ceiling Fan
- High-Speed Hair Dryer





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