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Part Number List: 32-Bit Microcontrollers 製品品番一覧表: 32ビットマイクロコントローラ



SEMICONDUCTOR & STORAGE PRODUCTS

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32-Bit Microcontrollers / 32ビットマイクロコントローラ

TXZ3 Series / TXZ3 シリーズ

M3H Group / M3H グループ (1)

Part Number	ROM (Bytes)	RAM (Bytes)	Data Flash (Bytes)	Maximum Operating Frequency (MHz)	DMA Controller (ch)	UART (ch)	I ² C (ch)	TSPI/SIO (ch) (32)	12-Bit AD Converter (ch)	8-Bit DA Converter (ch)	32-Bit (16-Bit) Timer/Counter (ch) (38)	Remote Control Preprocessor (ch)	3-Phase PWM Generator (PMD) (ch)	Incremental Encoder Input (ch)	External Interrupt Pins (Pins)	RTC (ch)	Low Level Detection Circuit (LVD)	Oscillation Frequency Detector (OFD)	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package																			
TMPM3H6FWFG	**	128K	18K	40	32	3	3	2	16	2	6 (12)	1	1	1	16	1	Yes	Yes	87	2.7 to 5.5	-40 to 85	LQFP100 (14 x 14 mm)																			
TMPM3H6FWDFG	**																						40	32	3	3	2	16	2	6 (12)	1	1	1	16	1	Yes	Yes	87	2.7 to 5.5	-40 to 85	QFP100 (14 x 20 mm)
TMPM3H5FWFG	**																						40	32	3	3	2	10	2	6 (12)	1	1	1	15	1	Yes	Yes	67	2.7 to 5.5	-40 to 85	LQFP80 (12 x 12 mm)
TMPM3H5FWDFG	**																						40	32	3	3	2	10	2	6 (12)	1	1	1	15	1	Yes	Yes	67	2.7 to 5.5	-40 to 85	LQFP80 (14 x 14 mm)
TMPM3H4FWUG	**																						40	32	3	3	2	8	1	6 (12)	1	1	1	11	1	Yes	Yes	53	2.7 to 5.5	-40 to 85	LQFP64 (10 x 10 mm)
TMPM3H4FWFG	**																						40	32	3	3	2	8	1	6 (12)	1	1	1	11	1	Yes	Yes	53	2.7 to 5.5	-40 to 85	LQFP64 (14 x 14 mm)
TMPM3H3FWUG	**																						40	32	3	3	2	8	1	6 (12)	1	1	1	8	1	Yes	Yes	43	2.7 to 5.5	-40 to 85	LQFP52 (10 x 10 mm)
TMPM3H2FWDUG	**																						40	30	3	2	2	8	1	6 (12)	1	1	1	7	1	Yes	Yes	40	2.7 to 5.5	-40 to 85	LQFP48 (7 x 7 mm)
TMPM3H2FWQG	**																						40	30	3	2	2	8	1	6 (12)	1	1	1	7	1	Yes	Yes	40	2.7 to 5.5	-40 to 85	VQFN48 (6 x 6 mm)
TMPM3H1FWUG	**																						40	30	3	2	2	8	0	6 (12)	1	1	1	6	0	Yes	Yes	36	2.7 to 5.5	-40 to 85	LQFP44 (10 x 10 mm)
TMPM3H6FUFG	**	96K	14K	40	32	3	3	2	16	2	6 (12)	1	1	1	16	1	Yes	Yes	87	2.7 to 5.5	-40 to 85	LQFP100 (14 x 14 mm)																			
TMPM3H6FUDFG	**																						40	32	3	3	2	16	2	6 (12)	1	1	1	16	1	Yes	Yes	87	2.7 to 5.5	-40 to 85	QFP100 (14 x 20 mm)
TMPM3H5FUFG	**																						40	32	3	3	2	10	2	6 (12)	1	1	1	15	1	Yes	Yes	67	2.7 to 5.5	-40 to 85	LQFP80 (12 x 12 mm)
TMPM3H5FUDFG	**																						40	32	3	3	2	10	2	6 (12)	1	1	1	15	1	Yes	Yes	67	2.7 to 5.5	-40 to 85	LQFP80 (14 x 14 mm)
TMPM3H4FUUG	**																						40	32	3	3	2	8	1	6 (12)	1	1	1	11	1	Yes	Yes	53	2.7 to 5.5	-40 to 85	LQFP64 (10 x 10 mm)
TMPM3H4FUFG	**																						40	32	3	3	2	8	1	6 (12)	1	1	1	11	1	Yes	Yes	53	2.7 to 5.5	-40 to 85	LQFP64 (14 x 14 mm)
TMPM3H3FUUG	**																						40	32	3	3	2	8	1	6 (12)	1	1	1	8	1	Yes	Yes	43	2.7 to 5.5	-40 to 85	LQFP52 (10 x 10 mm)
TMPM3H2FUDUG	**																						40	30	3	2	2	8	1	6 (12)	1	1	1	7	1	Yes	Yes	40	2.7 to 5.5	-40 to 85	LQFP48 (7 x 7 mm)
TMPM3H2FUQG	**																						40	30	3	2	2	8	1	6 (12)	1	1	1	7	1	Yes	Yes	40	2.7 to 5.5	-40 to 85	VQFN48 (6 x 6 mm)
TMPM3H1FUUG	**																						40	30	3	2	2	8	0	6 (12)	1	1	1	6	0	Yes	Yes	36	2.7 to 5.5	-40 to 85	LQFP44 (10 x 10 mm)
TMPM3H6FSFG	**	64K	10K	40	32	3	3	2	16	2	6 (12)	1	1	1	16	1	Yes	Yes	87	2.7 to 5.5	-40 to 85	LQFP100 (14 x 14 mm)																			
TMPM3H6FSDFG	**																						40	32	3	3	2	16	2	6 (12)	1	1	1	16	1	Yes	Yes	87	2.7 to 5.5	-40 to 85	QFP100 (14 x 20 mm)
TMPM3H5FSFG	**																						40	32	3	3	2	10	2	6 (12)	1	1	1	15	1	Yes	Yes	67	2.7 to 5.5	-40 to 85	LQFP80 (12 x 12 mm)
TMPM3H5FSDFG	**																						40	32	3	3	2	10	2	6 (12)	1	1	1	15	1	Yes	Yes	67	2.7 to 5.5	-40 to 85	LQFP80 (14 x 14 mm)
TMPM3H4FSUG	**																						40	32	3	3	2	8	1	6 (12)	1	1	1	11	1	Yes	Yes	53	2.7 to 5.5	-40 to 85	LQFP64 (10 x 10 mm)
TMPM3H4FSFG	**																						40	32	3	3	2	8	1	6 (12)	1	1	1	11	1	Yes	Yes	53	2.7 to 5.5	-40 to 85	LQFP64 (14 x 14 mm)
TMPM3H3FSUG	**																						40	32	3	3	2	8	1	6 (12)	1	1	1	8	1	Yes	Yes	43	2.7 to 5.5	-40 to 85	LQFP52 (10 x 10 mm)
TMPM3H2FSDUG	**																						40	30	3	2	2	8	1	6 (12)	1	1	1	7	1	Yes	Yes	40	2.7 to 5.5	-40 to 85	LQFP48 (7 x 7 mm)
TMPM3H2FSQG	**																						40	30	3	2	2	8	1	6 (12)	1	1	1	7	1	Yes	Yes	40	2.7 to 5.5	-40 to 85	VQFN48 (6 x 6 mm)
TMPM3H1FSUG	**																						40	30	3	2	2	8	0	6 (12)	1	1	1	6	0	Yes	Yes	36	2.7 to 5.5	-40 to 85	LQFP44 (10 x 10 mm)
TMPM3H0FSUG	**	40	24	2	1	1	4	0	6 (12)	1	1	1	6	0	Yes	Yes	24	2.7 to 5.5	-40 to 85	LQFP32 (7 x 7 mm)																					
TMPM3H1FPUG	**	48K	8K	8K	40	30	3	2	2	8	0	6 (12)	1	1	1	6	0	Yes	Yes	36	2.7 to 5.5	-40 to 85	LQFP44 (10 x 10 mm)																		
TMPM3H0FMUG	**	32K			40	24	2	1	1	4	0	6 (12)	1	1	1	6	0	Yes	Yes	24	2.7 to 5.5	-40 to 85	LQFP32 (7 x 7 mm)																		

Note (32), (38): Please refer to page 14. / P.15 をご参照ください。

** : Under planning / 計画中

• All products listed above incorporate a watchdog timer, a clock gear, an on-chip debug unit, power-on reset and voltage detection circuits.

** : Under development / 開発中

• ウォッチドッグタイマ、クロックギア機能、オンチップデバッグ機能、パワーオンリセット、電圧検出回路は上記製品に内蔵されています。

M3H Group / M3Hグループ (2)

Part Number	ROM (Bytes)	RAM (Bytes)	Data Flash (Bytes)	Maximum Operating Frequency (MHz)	DMA Controller (ch)	UART (ch)	I ² C (ch)	TSPI/SIO (ch) ⁽³²⁾	12-Bit AD Converter (ch)	8-Bit DA Converter (ch)	32-Bit (16-Bit) Timer/Counter (ch) ⁽³⁸⁾	Remote Control Preprocessor (ch)	3-Phase PWM Generator (PMD) (ch)	Incremental Encoder Input (ch)	External Interrupt Pins (Pins)	RTC (ch)	Low Level Detection Circuit (LVD)	Oscillation Frequency Detector (OFD)	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package
TMPM3HQDFG **	512K			80	64	6	4	5	21	2	8 (16)	1	1	1	32	1	Yes	Yes	134	2.7 to 5.5	-40 to 85	LQFP144 (20 x 20 mm)
TMPM3HPDFG **				80	64	6	4	5	19	2	8 (16)	1	1	1	29	1	Yes	Yes	118	2.7 to 5.5	-40 to 85	LQFP128 (14 x 14 mm)
TMPM3HNFDFG **				80	64	6	3	4	13	2	8 (16)	1	1	1	19	1	Yes	Yes	92	2.7 to 5.5	-40 to 85	LQFP100 (14 x 14 mm)
TMPM3HNFDDFG **				80	64	6	3	4	13	2	8 (16)	1	1	1	19	1	Yes	Yes	92	2.7 to 5.5	-40 to 85	QFP100 (14 x 20 mm)
TMPM3HMFDFG **				80	62	6	3	4	10	2	8 (16)	1	1	1	15	1	Yes	Yes	72	2.7 to 5.5	-40 to 85	LQFP80 (12 x 12 mm)
TMPM3HQFZFG **	384K	66K	32K	80	64	6	4	5	21	2	8 (16)	1	1	1	32	1	Yes	Yes	134	2.7 to 5.5	-40 to 85	LQFP144 (20 x 20 mm)
TMPM3HPFZFG **				80	64	6	4	5	19	2	8 (16)	1	1	1	29	1	Yes	Yes	118	2.7 to 5.5	-40 to 85	LQFP128 (14 x 14 mm)
TMPM3HNFZFG **				80	64	6	3	4	13	2	8 (16)	1	1	1	19	1	Yes	Yes	92	2.7 to 5.5	-40 to 85	LQFP100 (14 x 14 mm)
TMPM3HNFZDFG **				80	64	6	3	4	13	2	8 (16)	1	1	1	19	1	Yes	Yes	92	2.7 to 5.5	-40 to 85	QFP100 (14 x 20 mm)
TMPM3HMFZFG **				80	62	6	3	4	10	2	8 (16)	1	1	1	15	1	Yes	Yes	72	2.7 to 5.5	-40 to 85	LQFP80 (12 x 12 mm)
TMPM3HQFYFG **	256K			80	64	6	4	5	21	2	8 (16)	1	1	1	32	1	Yes	Yes	134	2.7 to 5.5	-40 to 85	LQFP144 (20 x 20 mm)
TMPM3HPFYFG **				80	64	6	4	5	19	2	8 (16)	1	1	1	29	1	Yes	Yes	118	2.7 to 5.5	-40 to 85	LQFP128 (14 x 14 mm)
TMPM3HNFYFG **				80	64	6	3	4	13	2	8 (16)	1	1	1	19	1	Yes	Yes	92	2.7 to 5.5	-40 to 85	LQFP100 (14 x 14 mm)
TMPM3HNFYDFG **				80	64	6	3	4	13	2	8 (16)	1	1	1	19	1	Yes	Yes	92	2.7 to 5.5	-40 to 85	QFP100 (14 x 20 mm)
TMPM3HMFYFG **				80	62	6	3	4	10	2	8 (16)	1	1	1	15	1	Yes	Yes	72	2.7 to 5.5	-40 to 85	LQFP80 (12 x 12 mm)

Note (32),(38): Please refer to page 14. / P.15をご参照ください。

** : Under development / 開発中

- ・ All products listed above incorporate a watchdog timer, a clock gear, a CRC circuit, an on-chip debug unit, power-on reset and voltage detection circuits.
- ・ ウォッチドッグタイマ、クロックギア機能、CRC回路、オンチップデバッグ機能、パワーオンリセット、電圧検出回路は上記製品に内蔵されています。

TXZ4 Series / TXZ4 シリーズ
M4K Group / M4K グループ

Part Number	ROM (Bytes)	RAM (Bytes)	Data Flash (Bytes)	Maximum Operating Frequency (MHz)	DMA Controller (ch)	UART (ch)	I ² C (ch)	TSP/SIO (ch) ⁽³²⁾	12-Bit AD Converter (ch)	8-Bit DA Converter (ch)	32-Bit (16-Bit) Timer/Counter (ch)	3-Phase PWM Generator (A-PMO) (ch)	Advanced Vector Engine Plus (A-VE+) (ch)	Advanced Encoder (A-ENC) (ch)	Op Amp (ch)	Comparator (ch)	External Interrupt Pins (Pins)	RTC (ch)	Low Level Detection Circuit (LVD)	Oscillation Frequency Detector (OFD)	Non Break Debug (NBD) ⁽³⁷⁾	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package
TMPM4K4FYAUG **	256K			80	32	4	1	4	13	6 (12)	2	1	1	3	11				Yes	Yes	Yes	52	2.7 to 5.5	-40 to 105	LQFP64 (10 x 10 mm)
TMPM4K4FYAFG **				80	32	4	1	4	13	6 (12)	2	1	1	3	11				Yes	Yes	Yes	52	2.7 to 5.5	-40 to 105	LQFP64 (14 x 14 mm)
TMPM4K2FYADUG **				80	26	3	1	2	11	6 (12)	2	1	1	3	10				Yes	Yes		40	2.7 to 5.5	-40 to 105	LQFP48 (7 x 7 mm)
TMPM4K1FYAUG **				80	24	2	1	2	10	6 (12)	1	1	1	3	9				Yes	Yes		36	2.7 to 5.5	-40 to 105	LQFP44 (10 x 10 mm)
TMPM4K4FWAUG **	128K			80	32	4	1	4	13	6 (12)	2	1	1	3	11				Yes	Yes	Yes	52	2.7 to 5.5	-40 to 105	LQFP64 (10 x 10 mm)
TMPM4K4FWAFG **				80	32	4	1	4	13	6 (12)	2	1	1	3	11				Yes	Yes	Yes	52	2.7 to 5.5	-40 to 105	LQFP64 (14 x 14 mm)
TMPM4K2FWADUG **				80	26	3	1	2	11	6 (12)	2	1	1	3	10				Yes	Yes		40	2.7 to 5.5	-40 to 105	LQFP48 (7 x 7 mm)
TMPM4K1FWAUG **				80	24	2	1	2	10	6 (12)	1	1	1	3	9				Yes	Yes		36	2.7 to 5.5	-40 to 105	LQFP44 (10 x 10 mm)
TMPM4K4FUAUG **	96K	18K		80	32	4	1	4	13	6 (12)	2	1	1	3	11				Yes	Yes	Yes	52	2.7 to 5.5	-40 to 105	LQFP64 (10 x 10 mm)
TMPM4K4FUAFG **				80	32	4	1	4	13	6 (12)	2	1	1	3	11				Yes	Yes	Yes	52	2.7 to 5.5	-40 to 105	LQFP64 (14 x 14 mm)
TMPM4K2FUADUG **				80	26	3	1	2	11	6 (12)	2	1	1	3	10				Yes	Yes		40	2.7 to 5.5	-40 to 105	LQFP48 (7 x 7 mm)
TMPM4K1FUAUG **				80	24	2	1	2	10	6 (12)	1	1	1	3	9				Yes	Yes		36	2.7 to 5.5	-40 to 105	LQFP44 (10 x 10 mm)
TMPM4K4FSAUG **	64K			80	32	4	1	4	13	6 (12)	2	1	1	3	11				Yes	Yes	Yes	52	2.7 to 5.5	-40 to 105	LQFP64 (10 x 10 mm)
TMPM4K4FSAFG **				80	32	4	1	4	13	6 (12)	2	1	1	3	11				Yes	Yes	Yes	52	2.7 to 5.5	-40 to 105	LQFP64 (14 x 14 mm)
TMPM4K2FSADUG **				80	26	3	1	2	11	6 (12)	2	1	1	3	10				Yes	Yes		40	2.7 to 5.5	-40 to 105	LQFP48 (7 x 7 mm)
TMPM4K1FSAUG **				80	24	2	1	2	10	6 (12)	1	1	1	3	9				Yes	Yes		36	2.7 to 5.5	-40 to 105	LQFP44 (10 x 10 mm)
TMPM4K0FSADUG **				80	20	2		1	8	6 (12)	1	1	1	3	6				Yes	Yes		24	2.7 to 5.5	-40 to 105	LQFP32 (7 x 7 mm)

Note (32),(37): Please refer to page 14. / P.15 をご参照ください。

** : Under development / 開発中

- All products listed above incorporate a watchdog timer, a clock gear, an on-chip debug unit, power-on reset and voltage detection circuits.
- ウォッチドッグタイマ、クロックギア機能、オンチップデバッグ機能、パワーオンリセット、電圧検出回路は上記製品に内蔵されています。

TX00 Series / TX00 シリーズ
M030 Group / M030 グループ

Part Number	ROM (Bytes)	SRAM (Bytes)	Maximum Operating Frequency (MHz)	LED Driver (ch)	LCD Driver (Seg. x Com.)	SSP (ch) ⁽²⁸⁾	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	CAN (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	24-Bit ΔΣ AD Converter (ch)	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	3-Phase PWM Generator (PMD) (ch)	Multi-Purpose Timer (MPT) (ch)	Incremental Encoder Input (ch)	Power Calculation Engine	Temp. Sensor	External Interrupt Pins (Pins)	RTC (ch)	Dual Clocks	Trace Function	Oscillation Frequency Detector	Power-On Reset	Voltage Detecting Circuit	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package
TMPM036FWFG	128K	16K	20				6	2						8				14						6						Yes	Yes	86	2.3 to 3.6	-40 to 85	LQFP100 (14 x 14 mm)
TMPM037FWUG	128K	16K	20				5	1						8				10						6						Yes	Yes	52	2.3 to 3.6	-40 to 85	LQFP64 (10 x 10 mm)

Note (28): Please refer to page 14. / P.15 をご参照ください。

- ・ All products listed above incorporate a watchdog timer, a clock gear and an on-chip debug unit.
- ・ ウォッチドッグタイマ/クロックギア機能/オンチップデバッグ機能は上記製品に内蔵されています。

M060 Group / M060 グループ

Part Number	ROM (Bytes)	SRAM (Bytes)	Maximum Operating Frequency (MHz)	DMA Controller (ch)	LED Driver (ch)	LCD Driver (Seg. x Com.)	SSP (ch) ⁽²⁸⁾	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	TSP1 (ch)	USB (Full-Speed) (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	24-Bit ΔΣ AD Converter (ch)	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	3-Phase PWM Generator (PMD) (ch)	Multi-Purpose Timer (MPT) (ch)	Incremental Encoder Input (ch)	Power Calculation Engine	Temp. Sensor	External Interrupt Pins (Pins)	RTC (ch)	Dual Clocks	Trace Function	Oscillation Frequency Detector	Power-On Reset	Voltage Detecting Circuit	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package
TMPM061FWFG	128K	8K	16		40 x 4		4				1			2		3		9					Yes	Yes	4	1	Yes				Yes	64	1.8 to 3.6	-40 to 85	LQFP100 (14 x 14 mm)
TMPM066FWUG		24	28				2	2	1	1	8						11							6						Yes	48	LQFP64 (10 x 10 mm)			
TMPM067FWQG		16K	24	28				2	2	1	1	8						11						6						Yes	32	QFN48 (7 x 7 mm)			
TMPM068FWXBG		24	28					2	2	1	1	8						11						6						Yes	40	VFBA57 (5 x 5 mm)			

Note (28): Please refer to page 14. / P.15 をご参照ください。

- ・ All products listed above incorporate a watchdog timer, a clock gear and an on-chip debug unit.
- ・ ウォッチドッグタイマ/クロックギア機能/オンチップデバッグ機能は上記製品に内蔵されています。

TX03 Series / TX03シリーズ

M310 Group / M310グループ

Part Number	ROM (Bytes)		Program RAM (Bytes)		Data RAM (Bytes)		Maximum Operating Frequency (MHz)	LED Driver (ch)	LCD Driver (Seg. x Com.)	SSP (ch) ⁽²⁸⁾	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	CAN (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	24-Bit ΔΣ AD Converter (ch) ⁽³⁹⁾	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	3-Phase PWM Generator (PMD) (ch)	Multi-Purpose Timer (MPT) (ch)	Incremental Encoder Input (ch)	Power Calculation Engine ⁽³³⁾	Temp. Sensor	External Interrupt Pins (Pins)	RTC (ch)	Dual Clocks	Trace Function	Oscillation Frequency Detector	Power-On Reset	Voltage Detecting Circuit	I/O Port (Pins)	Operating Voltage Range (V) ⁽³⁹⁾	Operating Temperature (°C)	Package
	NA	16K	5K	24	1	1																																	
TMPM311CHDUG	NA	16K	5K	24			1	1											4		5				Yes	Yes	2					Yes	23	2.7 to 3.6	-40 to 85	LQFP48 (7 x 7 mm)			

Note (28),(33),(39): Please refer to page 14. / P.15をご参照ください。

- Above product incorporate a watchdog timer, a clock gear and an on-chip debug unit.
- ウォッチドッグタイマ/クロックギア機能/オンチップデバッグ機能は上記製品に内蔵されています。

M320 Group / M320グループ

Part Number	ROM (Bytes)		SRAM (Bytes)		DRAM (Bytes)		Maximum Operating Frequency (MHz)	Audio DSP (unit)	DMA Controller (ch)	Static Memory Controller (ch)	Serial Flash controller (ch)	Sampling rate converter (ch)	SSP (ch) ⁽²⁸⁾	UART (ch)	SIO/UART (ch)	I ² C/SIO (ch)	I ² C (ch)	PCM interface (unit)	CAN (ch)	USB Embedded Host (Full-Speed) (ch)	USB Embedded Host (High-Speed) (ch)	SD Host controller (ch)	10-Bit AD Converter (ch)	16-Bit AD Converter (ch)	Remote Control Preprocessor (ch)	External Interrupt Pins (Pins)	RTC (ch)	Watch dog Timer (ch)	On-Chip Debug Unit	Trace Function	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package							
	NA	1664K	NA	96	1	16																													1	1	2	2	4	5	2
TMPM32EC1EFG		1664K	NA	96	1	16																																			
TMPM32FC1EFG		1664K	NA	96	1	16																																			
TMPM32BC2DFG		2560K	NA	96	1	16																																			
TMPM32DC2DFG		2560K	NA	96	1	16																																			

Note (28): Please refer to page 14. / P.15をご参照ください。

M330 Group / M330 グループ

Part Number	ROM (Bytes)	SRAM (Bytes)	Maximum Operating Frequency (MHz) ⁽¹¹⁾	DMA Controller (ch)	SSP (ch) ⁽²⁸⁾	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	CAN (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	EtherMAC (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	CEC (ch) ⁽²⁹⁾	Remote Control Preprocessor (ch)	Vector Engine (VE)	3-Phase PWM Generator (PMD) (ch)	Multi-Purpose Timer (MPT) (ch)	Incremental Encoder Input (ch)	Op Amp (ch)	Comparator (ch)	External Interrupt Pins (Pins)	CS/WAIT Controller (ch)	RTC (ch)	Oscillation Frequency Detector	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package
TMPM330FWFG	128K	8K	40		3			3						12		10		1	2								8	1	78	2.7 to 3.6	-20 to 85	LQFP100 (14 x 14 mm)		
TMPM332FWUG			40		2			2							8		10		1	1								5	1			44	LQFP64 (10 x 10 mm)	
TMPM333FWFG			40		3				3						12		10												8			1	78	
TMPM330FYFG	256K	16K	40		3			3						12		10		1	2								8	1	78	2.7 to 3.6	-40 to 85	LQFP100 (14 x 14 mm)		
TMPM330FYWFG			40		3			3							12		10		1	2							8	1	78					
TMPM333FYFG			40		3				3						12		10											8	1				78	
TMPM330FDFG	512K	32K	40		3			3						12		10		1	2								8	1	78	2.7 to 3.6	-20 to 85	LQFP100 (14 x 14 mm)		
TMPM330FDWFG			40		3			3							12		10		1	2							8	1	78					
TMPM333FDFG			40		3				3						12		10											8	1				78	

Note (11),(28),(29): Please refer to page 14. / P.15 をご参照ください。

- ・ All products listed above incorporate a watchdog timer, a clock gear and an on-chip debug unit.
- ・ ウォッチドッグタイマ、クロックギア機能、オンチップデバッグ機能は上記製品に内蔵されています。

M340 Group / M340 グループ

Part Number	ROM (Bytes)	SRAM (Bytes)	PSC SRAM (Bytes)	Maximum Operating Frequency (MHz)	DMA Controller (ch)	SSP (ch) ⁽²⁸⁾	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	TSP1 (ch) ⁽³²⁾	Variable Data Length Serial Interface (VSIO) (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	EtherMAC (ch)	12-Bit AD Converter (ch)	16-Bit ΔΣ AD Converter (ch)	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	2-Phase Pulse Counter (PHC) (ch)	Enhanced 2-phase pulse counter (EPHC) (ch)	3-Phase PWM Generator (PMD) (ch)	Programmable Servo/Sequence controller (PSC) (ch)	Motor Driver (MCD) (ch)	Multi-Purpose Timer (MPT) (ch)	Incremental Encoder Input (ch)	Op Amp (ch)	Variable Gain Control Amp (ch)	Comparator (ch)	External Interrupt Pins (Pins)	CS/WAIT Controller (ch)	RTC (ch)	Trace Function	Oscillation Frequency Detector	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package
TMPM341FYXBG	256K	32K	54	4	1	5			2							15	2	10	2	4										12	2	Yes	Yes	86	⁽¹⁴⁾ 1.65 to 3.6	-40 to 85	TFBGA113 (6 x 6 mm)		
TMPM342FYXBG		32K	4K	40	4	1	3	1	1		1					⁽³¹⁾ 12	⁽³¹⁾ 4	4	10	8	2			1	7.5			6	2	8		Yes	Yes	63	⁽¹⁵⁾ 2.7 to 3.6	⁽¹⁶⁾ -40 to 85	VF BGA142 (7 x 7 mm)		
TMPM341FDXBG	512K	32K	54	4	1	5			2							15	2	10	2	4										12	2	Yes	Yes	86	⁽¹⁴⁾ 1.65 to 3.6	-40 to 85	TFBGA113 (6 x 6 mm)		
TMPM343FDXBG		48K	32K	50	6	1	1	1	5							16	6	16	8	3	4	8			6	4	8	6	4	16		Yes	Yes	59	⁽³⁰⁾ 2.7 to 3.6		VF BGA162 (7 x 7 mm)		
TMPM343F10XBG	1024K	64K	32K	50	6	1	1	1	5						16	6	16	8	3	4	8			6	4	8	6	4	16		Yes	Yes	59	⁽³⁰⁾ 2.7 to 3.6		VF BGA162 (7 x 7 mm)			

Note (14),(15),(16),(28),(30),(31),(32): Please refer to page 14. / P.15 をご参照ください。

- ・ All products listed above incorporate a watchdog timer, a clock gear and an on-chip debug unit.
- ・ ウォッチドッグタイマ、クロックギア機能、オンチップデバッグ機能は上記製品に内蔵されています。

TX03 Series / TX03シリーズ

M360 Group / M360グループ

Part Number	ROM (Bytes)	SRAM (Bytes)	Maximum Operating Frequency (MHz)	DMA Controller (ch)	SSP (ch) (28)	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	TSP1 (ch) (32)	CAN (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	EtherMAC (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	2-Phase Pulse Counter (PHC) (ch)	CEC (ch) (29)	Remote Control Preprocessor (ch)	Vector Engine (VE)	3-Phase PWM Generator (PMD) (ch)	Programmable Servo/Sequence controller (PSC) (ch)	Motor Driver (MCD) (ch)	Multi-Purpose Timer (MPT) (ch)	Incremental Encoder Input (ch)	Op Amp (ch)	Variable Gain Control Amp (ch)	Comparator (ch)	External Interrupt Pins (Pins)	CS/WAIT Controller (ch)	RTC (ch)	Oscillation Frequency Detector	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package									
TMPM366FWFG	128K	32K	48	4	3	2	1	2				1			12	10																		10	2		74	2.7 to 3.6	-40 to 85	LQFP100 (14 x 14 mm)								
TMPM365FYXBG		24K	48	2	2			2				1			12	10																					74	(13)		LFBGA105 (9 x 9 mm)								
TMPM366FYFG		256K	48	4	3	2	1	2				1			12	10																					74		LQFP100 (14 x 14 mm)									
TMPM366FYXBG			48K	48	4	3	2	1	2				1			12	10																				74		TFBGA109 (9 x 9 mm)									
TMPM36BFYFG		66K	80	32	3	4	2	3							16	8						1		(10) 1			4	1						16	4	1	Yes	74	2.7 to 3.6		LQFP100 (14 x 14 mm)							
TMPM366FDFG		64K	48	4	3	2	1	2				1			12	10																						74	(13)		LQFP100 (14 x 14 mm)							
TMPM366FDXBG			48	4	3	2	1	2					1			12	10																					74		TFBGA109 (9 x 9 mm)								
TMPM367FDFG		512K	80	32	3	4	2	3				1			8	2	8					1		(10) 1			4	1												60		LQFP100 (14 x 14 mm)						
TMPM367FDXBG			80	32	3	4	2	3					1			8	2	8					1		(10) 1			4	1											60		TFBGA109 (9 x 9 mm)						
TMPM368FDFG		128K	80	32	3	4	2	3		1	1	1			8	2	8					1		(10) 1			4	1													60	(13)		LQFP100 (14 x 14 mm)				
TMPM368FDXBG			80	32	3	4	2	3		1	1	1				8	2	8					1		(10) 1			4	1												60		TFBGA109 (9 x 9 mm)					
TMPM369FDFG			80	32	3	4	2	3		1	1	1	1		16	2	8					1		(10) 2			4	2														102		LQFP144 (20 x 20 mm)				
TMPM369FDXBG			80	32	3	4	2	3		1	1	1	1		16	2	8					1		(10) 2			4	2															102		TFBGA177 (11 x 11 mm)			
TMPM361F10FG		64K	64	2	1	5	1	3							8	16						1	1																		76	2.7 to 3.6	-20 to 85	LQFP100 (14 x 14 mm)				
TMPM362F10FG			64	2	1	12			5							16	16						1	2																	120		LQFP144 (20 x 20 mm)					
TMPM363F10FG		1024K	(17) 64	2	1	5	1	3		1	1				8	16						1	1																				74	(13)		LQFP100 (14 x 14 mm)		
TMPM364F10FG			(17) 64	2	1	12			5		1	1				16	16						1	2																				118		LQFP144 (20 x 20 mm)		
TMPM36BF10FG		258K	64	32	3	4	2	3							16	8						1		(10) 1			4	1																	74	2.7 to 3.6		LQFP100 (14 x 14 mm)

Note (10),(13),(17),(28),(29),(32): Please refer to page 14. / P.15 をご参照ください。

- All products listed above incorporate a watchdog timer, a clock gear and an on-chip debug unit.
- Power-on reset and voltage detection circuits are available with all devices except: TMPM361, TMPM362, TMPM363, TMPM364, TMPM365, TMPM366
- ウォッチドッグタイマ、クロックギア機能、オンチップデバッグ機能は上記製品に内蔵されています。
- パワーオンリセット、電圧検出回路は下記の製品を除きすべての製品に内蔵されています。TMPM361, TMPM362, TMPM363, TMPM364, TMPM365, TMPM366

M370 Group / M370 グループ

Part Number	ROM (Bytes)		SRAM (Bytes)		Maximum Operating Frequency (MHz) (11)		DMA Controller (ch)	SSP (ch) (28)	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	CAN (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	EtherMAC (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	CEC (ch) (29)	Remote Control Preprocessor (ch)	Vector Engine (VE)	3-Phase PWM Generator (PMD) (ch)	Multi-Purpose Timer (MPT) (ch)	Incremental Encoder Input (ch)	Op Amp (ch)	Comparator (ch)	External Interrupt Pins (Pins)	CS/WAIT Controller (ch)	RTC (ch)	Oscillation Frequency Detector	I/O Port (Pins)	3-Phase Full-Wave Pre-Driver	Operating Voltage Range (V)	Operating Temperature (°C)	Package	
	64K	4K	40	(12) 2		(28) 2																		Yes	1		1	1	3		Yes	21							
TMPM375FSDMG	64K	4K	40	(12) 2		(28) 2											4	4					Yes	1		1	1	3		Yes	21					4.5 to 5.5	-40 to 105	SSOP30	
TMPM37AFSQG	64K	4K	40		1			1									5	4					Yes	1		1	3		Yes	13	(36) Yes					4.5 to 5.5	-40 to 85	VQFN32 (5 x 5 mm)	
TMPM372FWUG	128K	6K	(a)80 (b)32		4												11	8					Yes	1		1	10		Yes	53					4.5 to 5.5	(a) -40 to 85 (b) -40 to 105	LQFP64 (10 x 10 mm)		
TMPM373FWDUG			(a)80 (b)32		3													7	8					Yes	1		1	8		Yes	37					4.5 to 5.5	(a) -40 to 85 (b) -40 to 105	LQFP48 (7 x 7 mm)	
TMPM374FWUG			(a)80 (b)32		3														6	8					Yes	1		1	7		Yes	33					4.5 to 5.5	(a) -40 to 85 (b) -40 to 105	LQFP44 (10 x 10 mm)
TMPM370FYDFG	256K	10K	80		4												22	8					Yes	2		2	4	4	16		Yes	76					4.5 to 5.5	-40 to 85	QFP100 (14 x 20 mm)
TMPM370FYFG			80		4													22	8					Yes	2		2	4	4	16		Yes	76					4.5 to 5.5	-40 to 85
TMPM376FDDFG	512K	32K	80		4		1										22	8					Yes	2		2		16		Yes	82					4.5 to 5.5	-40 to 85	QFP100 (14 x 20 mm)	
TMPM376FDFG			80		4		4		1									22	8					Yes	2		2		16		Yes	82						4.5 to 5.5	-40 to 85

Note (11),(12),(28),(29),(36): Please refer to page 14. / P.15 をご参照ください。

- ・ All products listed above incorporate a watchdog timer, a clock gear, an on-chip debug unit, power-on reset and voltage detection circuits.
- ・ ウォッチドッグタイマ、クロックギア機能、オンチップデバッグ機能、パワーオンリセット、電圧検出回路は上記製品に内蔵されています。

TX03 Series / TX03シリーズ
M380 Group / M380グループ

Part Number	ROM (Bytes)	SRAM (Bytes)	Maximum Operating Frequency (MHz) ⁽¹¹⁾													Operating Voltage Range (V)	Operating Temperature (°C)	Package													
			DMA Controller (ch)	SSP (ch) ⁽²⁸⁾	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	CAN (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	EtherMAC (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	10-Bit DA Converter (ch)				16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	CEC (ch) ⁽²⁹⁾	Remote Control Preprocessor (ch)	Vector Engine (VE)	3-Phase PWM Generator (PMD) (ch)	Multi-Purpose Timer (MPT) (ch)	Incremental Encoder Input (ch)	Op Amp (ch)	Comparator (ch)	External Interrupt Pins (Pins)	CS/WAIT Controller (ch)	RTC (ch)
TMPM383FSEFG	64K	8K	40	1	2	1	1						10	8			1								8	1	Yes	48	3.9 to 5.5	-40 to 85	QFP64 (14 x 14 mm)
TMPM383FSUG			40	1	2	1	1							10	8			1								8	1	Yes			48
TMPM380FWDFG		12K	40	2	2	5		2					18	8			1		⁽¹⁰⁾ 2	3	2			16	1	Yes	84	4.0 to 5.5		QFP100 (14 x 20 mm)	
TMPM380FWFG			40	2	2	5		2						18	8			1		⁽¹⁰⁾ 2	3	2			16	1	Yes			84	LQFP100 (14 x 14 mm)
TMPM381FWDFG	128K	10K	40	1	3	1	1						18	8			1								16	1	Yes	84	3.9 to 5.5	-40 to 85	QFP100 (14 x 20 mm)
TMPM381FWFG			40	1	3	1	1							18	8			1								16	1	Yes			84
TMPM383FWEFG		40	40	1	2	1	1						10	8			1								8	1	Yes	48			QFP64 (14 x 14 mm)
TMPM383FWUG			40	1	2	1	1							10	8			1								8	1	Yes			48
TMPM380FYDFG	256K	16K	40	2	2	5		2					18	8			1		⁽¹⁰⁾ 2	3	2			16	1	Yes	84	4.0 to 5.5		QFP100 (14 x 20 mm)	
TMPM380FYFG			40	2	2	5		2						18	8			1		⁽¹⁰⁾ 2	3	2			16	1	Yes			84	LQFP100 (14 x 14 mm)
TMPM380FDFG	512K	32K	40	2	2	5		2					18	8			1		⁽¹⁰⁾ 2	3	2			16	1	Yes	84	4.0 to 5.5			
TMPM384FDFG			40	2	2	5		2						22	12			1		⁽¹⁰⁾ 2	4	2			16	1	Yes			121	LQFP144 (20 x 20 mm)

Note (10),(11),(28),(29): Please refer to page 14. / P.15をご参照ください。

- All products listed above incorporate a watchdog timer, a clock gear, an on-chip debug unit, power-on reset and voltage detection circuits.
- ウォッチドッグタイマ、クロックギア機能、オンチップデバッグ機能、パワーオンリセット、電圧検出回路は上記製品に内蔵されています。

M390 Group / M390グループ

Part Number	ROM (Bytes)	SRAM (Bytes)	Maximum Operating Frequency (MHz) ⁽¹¹⁾													Operating Voltage Range (V)	Operating Temperature (°C)	Package													
			DMA Controller (ch)	SSP (ch) ⁽²⁸⁾	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	CAN (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	EtherMAC (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	10-Bit DA Converter (ch)				16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	CEC (ch) ⁽²⁹⁾	Remote Control Preprocessor (ch)	Vector Engine (VE)	3-Phase PWM Generator (PMD) (ch)	Multi-Purpose Timer (MPT) (ch)	Incremental Encoder Input (ch)	Op Amp (ch)	Comparator (ch)	External Interrupt Pins (Pins)	CS/WAIT Controller (ch)	RTC (ch)
TMPM390FWFG **	128K	8K	20	1	3	1	1						12	10			1	2							8	1	Yes	74	1.7 to 3.6	-40 to 85	LQFP100 (14 x 14 mm)
TMPM395FWAXBG			20	4	3	1	1							12	10			1	2							11	1	Yes			91

Note (11),(28),(29): Please refer to page 14. / P.15をご参照ください。

** : Under development / 開発中

- All products listed above incorporate a watchdog timer, a clock gear, an on-chip debug unit, power-on reset and voltage detection circuits.
- ウォッチドッグタイマ、クロックギア機能、オンチップデバッグ機能、パワーオンリセット、電圧検出回路は上記製品に内蔵されています。

TX04 Series / TX04 シリーズ
M440 Group / M440 グループ

Part Number	ROM (Bytes)	SRAM (Bytes)	Maximum Operating Frequency (MHz)	DMA Controller (ch)	SSP (ch) ⁽²⁸⁾	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	CAN (ch)	Enhanced Serial I/O (ESIO) (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	EtherMAC (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	32-Bit Timer (unit)	High-Res. 16-Bit Timer/PPG Gen. (ch)	2-Phase Pulse Counter (PHC) (ch)	Enhanced 2-phase pulse counter (EPHC) (ch)	Programmable Servo/Sequence controller (PSC) (ch)	GEC (ch) ⁽²⁹⁾	Remote Control Preprocessor (ch)	Multi-Purpose Timer (MPT) (ch)	External Interrupt Pins (Pins)	Key-On Wake-Up (KWUP) (ch)	Key Matrix Scan (KSCAN) (Column x Row)	CSWAIT Controller (ch)	RTC (ch)	Trace Function	Oscillation Frequency Detector	Power-On Reset	Low Voltage Detection Circuit (LVD)	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package
TMPM440FEXBG	768K	80K	100	6	6	2	1				3				20	2	20	20	1	4	2	1	1			24	40	8 x 8	2	1	Yes		Yes		228	2.7 to 3.6	-40 to 85	VFBGA289 (11 x 11 mm)	
TMPM440F10XBG	1024K	80K	100	6	6	2	1				3				20	2	20	20	1	4	2	1	1			24	40	8 x 8	2	1	Yes		Yes		228				

Note (28),(29): Please refer to page 14. / P.15 をご参照ください。

M460 Group / M460 グループ

Part Number	ROM (Bytes)	SRAM (Bytes)	Maximum Operating Frequency (MHz)	DMA Controller (ch)	SSP (ch) ⁽²⁸⁾	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	CAN (ch)	Enhanced Serial I/O (ESIO) (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	EtherMAC (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	32-Bit Timer (unit)	AES Processor (AES) (ch)	Secure Hash Algorithm Processor (SHA) (ch)	Entropy Seed Generator (ESG) (ch)	Multiple Length Arithmetic Coprocessor (MLA) (ch)	SLC NAND Flash Controller (ch)	GEC (ch) ⁽²⁹⁾	Remote Control Preprocessor (ch)	Multi-Purpose Timer (MPT) (ch)	External Interrupt Pins (Pins)	Key-On Wake-Up (KWUP) (ch)	Key Matrix Scan (KSCAN) (Column x Row)	CSWAIT Controller (ch)	RTC (ch)	Trace Function	Oscillation Frequency Detector	Power-On Reset	Low Voltage Detection Circuit (LVD)	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package
TMPM461F10FG		193K	120	32	3	6	2	5							20		16								1	1		2	16		4	1	Yes	Yes	Yes	111	2.7 to 3.6	-40 to 85	LQFP144 (20 x 20 mm)	
TMPM462F10FG	1024K		120	32	3	10	2	5							20		16								1	2		2	16		4	1	Yes	Yes	Yes	139			LQFP176 (20 x 20 mm)	
TMPM46BF10FG		514K	120	32	3	4	2	3						8		8				1	1	1	1	1				4	16		4	1	Yes		Yes	72			LQFP100 (14 x 14 mm)	
TMPM461F15FG		193K	120	32	3	6	2	5							20		16								1	1		2	16		4	1	Yes	Yes	Yes	111			LQFP144 (20 x 20 mm)	
TMPM462F15FG	1536K		120	32	3	10	2	5							20		16								1	2		2	16		4	1	Yes	Yes	Yes	139			LQFP176 (20 x 20 mm)	

Note (28),(29),(34): Please refer to page 14. / P.15 をご参照ください。

TX04 Series / TX04 シリーズ
M470 Group / M470 グループ

Part Number	ROM (Bytes)		SRAM (Bytes)		Maximum Operating Frequency (MHz) (11)		DMA Controller (ch)	SSP (ch) (28)	UART/SIO (ch)	UART (ch)	I ² C (ch)	I ² C/SIO (ch)	CAN (ch)	USB Embedded Host (Full-Speed) (ch)	USB (Full-Speed) (ch)	EtherMAC (ch)	10-Bit AD Converter (ch)	12-Bit AD Converter (ch)	10-Bit DA Converter (ch)	16-Bit Timer/Counter (ch)	High-Res. 16-Bit Timer/PPG Gen. (ch)	CEC (ch) (29)	Remote Control Preprocessor (ch)	Advanced Vector Engine (A-VE) (ch)	3-Phase PWM Generator (PMD) (ch)	Multi-Purpose Timer (MPT) (ch)	Advanced Encoder (A-ENC) (ch)	Op Amp (ch)	Comparator (ch)	External Interrupt Pins (Pins)	CS/WAIT Controller (ch)	RTC (ch)	Oscillation Frequency Detector	I/O Port (Pins)	Operating Voltage Range (V)	Operating Temperature (°C)	Package
TMPM470FYFG	256K	18K	120	32	4	1											20	10					2	2	2			16		Yes	79	4.5 to 5.5	-40 to 85	LQFP100 (14 x 14 mm)			
TMPM475FYFG			120	32	4	1	1											20	10					2	2	2			16		Yes				79		
TMPM470FZFG	384K	34K	120	32	4	1											20	10					2	2	2			16		Yes	79						
TMPM475FZFG			120	32	4	1	1											20	10					2	2	2			16		Yes				79		
TMPM470DFDG	512K	34K	120	32	4	1											20	10					2	2	2			16		Yes	79						
TMPM475DFDG			120	32	4	1	1											20	10					2	2	2			16		Yes				79		

Note (11),(28),(29): Please refer to page 14. / P.15 をご参照ください。

- ・ All products listed above incorporate a watchdog timer, a clock gear, an on-chip debug unit, power-on reset and voltage detection circuits.
- ・ ウォッチドッグタイマ、クロックギア機能、オンチップデバッグ機能、パワーオンリセット、電圧検出回路は上記製品に内蔵されています。

32-Bit Microcontrollers for Automotive / 車載用32ビットマイクロコントローラ

TX03 Series / TX03 シリーズ

Part Number	ROM (Bytes)	SRAM (Bytes)	Maximum Operating Frequency (MHz)	CAN (ch)	DMA Controller (ch)	ESEI (ch)	UART/SIO (ch)	12-Bit AD Converter (ch)	Timer/Compare (32 bit) (ch)	Timer/Capture (32 bit) (ch)	PWM (24 bit) (ch)	Vector Engine (VE)	Programmable Motor Drive (PMD) (ch)	Resolver Digital Converter (RDC)	Watchdog Timer	On-Chip Debug Unit	Trace Function	I/O Port (Pins)	Supply Voltage (V)	Operating Temperature (°C)	Package
TMPM350FDTFG	512K	48K	88	2	32	1	2	20	3	7	6		1		Yes	Yes	Yes	43	⁽²³⁾	-40 to 105	LQFP100 (14 x 14 mm)
TMPM351F10TFG	1024K	64K	144	2	32	1	2	20	3	7	6		1		Yes	Yes	Yes	43	⁽³⁵⁾	-40 to 105	
TMPM358FDTFG ⁽²⁵⁾	512K	80K	40	3	32	3	2	20	5	3	3				Yes	Yes	Yes	35	4.5 to 5.5	-40 to 105	
TMPM354F10TAFG	1024K	64K	96	3	64	2	3	21	5	6	4	Yes	1	1	Yes	Yes	Yes	54	⁽²⁴⁾	-40 to 125	HQFP144 (20 x 20 mm)

Note (23),(24),(25),(35): Please refer to page 14. / P.15 をご参照ください。

Reference

- Note (1): Configurable as UART or SIO. Also, selectable from I²C and SIO.
One SIO channel can be used simultaneously. As for the TMP89FS60, up to two SIO channels can be used simultaneously.
- (2): The on-chip debug unit is available with the flash versions, but not with the mask ROM versions.
- (3): Minimum instruction execution times (a) to (c) correspond to (a) to (c) of both supply voltage and operating temperature.
- (4): The minimum instruction execution time in Low-Speed mode is 122 μ s (at 32.768 kHz).
- (5): The erase/program power supply voltage is 3.0 to 3.6 V.
- (6): Two ports are reserved for high-speed oscillator pins and cannot be used as I/O ports.
- (7): The AD conversion accuracy differs between the flash and mask ROM versions. For details, see the datasheet.
- (8): Dual power supplies: 1.4 V to 1.6 V for internal circuitry, 3.0 V to 3.6 V for input/output interface.
- (9): Minimum instruction execution times (a) and (b) correspond to (a) and (b) of operating temperature.
- (10): Either the Programmable Motor Driver (PMD) or the Multi-Purpose Timer (MPT) is selectable.
- (11): Maximum Operating Frequency (a) and (b) correspond to Operating Temperatures (a) and (b).
- (12): One channel is configurable only as UART.
- (13): 3.0 to 3.45 V when USB is used.
- (14): When the supply voltage is less than 2.7 V, part of the peripheral blocks (the external bus interface and the SSP) can be used.
- (15): MCD analog supply voltage: 3.1 V to 3.5 V
MCD motor supply voltage: 2.5 V to 5.5 V
- (16): The operating temperature of the Motor Control Driver (MCD) and the operating temperature of the D/A converter of the MCU are between -25 and 85°C .
When the operating temperature is between -40 and -25°C , the MCD is used in stand-by state, and the D/A converter of the MCU is used in stop state.
- (17): 48 MHz when USB is used.
- (18): The following three power supplies are available:
- (i) For general ports, and A/D converter: 3.0 V to 3.6 V
 - (ii) For USB Embedded Host: 3.15 V to 3.45 V
 - (iii) For internal circuitry: 1.1 V to 1.3 V
- (19): The on-chip ROM can be programmed only once and cannot be reprogrammed.
- (20): Configurable as SIO or UART.
- (21): Configurable as I²C or SIO. Up to two SIO channels can be used simultaneously.
- (22): Configurable as SEI or UART.
- (23): The following two power supplies are available:
- (i) For internal circuitry: 1.4 V to 1.65 V
 - (ii) For general ports and A/D converter: 4.5 V to 5.5 V
- (24): The following two power supplies are available:
- (i) For internal circuitry: 1.35 V to 1.65 V
 - (ii) For general ports and A/D converter: 4.5 V to 5.5 V
- (25): Low-power modes are available.
- (26): SEI: Serial Expansion Interface
- (27): SPI: Serial Peripheral Interface
- (28): SSP: Synchronous Serial Port
- (29): CEC: Consumer Electronics Control
- (30): MCD motor supply voltage: 2.5 V to 5.5 V
- (31): Built-in 12-bit SAR type AD converter: 2 units/12 (8+4) channels.
Built-in 16-bit $\Delta\Sigma$ type AD converter: 1 unit/4 channels.
- (32): TSPi: Toshiba Serial Peripheral Interface
- (33): It is the software IP.
- (34): 16-bit timer mode and IGBT mode are available.
- (35): The following two power supplies are available:
- (i) For internal circuitry: 1.08 V to 1.32 V
 - (ii) For general ports and A/D converter: 4.5 V to 5.5 V
- (36): Supply voltage $V_M = 6$ V to 32 V, Pre-driver is P-ch/N-ch configuration.
- (37): Debug interface for RAMScope of Yokogawa Digital Computer Corporation.
- (38): Became 32-Bit Timer/Counter by linking two 16-Bit Timer/Counter.
- (39): 2.9 V to 3.6 V when 24-Bit $\Delta\Sigma$ AD Converter is used.

参照

- Note (1): UARTまたはSIOのいずれか一方を選択可能です。I²CまたはSIOのいずれか一方を選択可能です。同時に使用できるSIOは1chとなります。TMP89FS60が、同時に使用できるSIOは2chとなります。
- (2): オンチップ機能はFlash版だけの対応です。
- (3): 最小命令実行時間の(a)–(c)は、それぞれ電源電圧、動作温度の(a)–(c)に対応しています。
- (4): 低速動作モードの最小命令実行時間は122 μs (32.768 kHz時)です。
- (5): 消去/書き込み時の電源電圧は3.0 to 3.6 Vとなります。
- (6): 2端子は高周波発振用端子として使われるため、入出力ポートとして使用できません。
- (7): Flash品とMask品では、AD変換精度の保証値が異なります。詳細につきましては、テクニカルデータシートをご参照ください。
- (8): 電源電圧は、内部回路用: 1.4 V to 1.6 V、外部IO用: 3.0 V to 3.6 Vの2電源です。
- (9): 最小命令実行時間の(a)–(b)は、それぞれ動作温度の(a)–(b)に対応しています。
- (10): 3相PWM出力(PMD)は、多目的タイマ(MPT)と兼用です。
- (11): 最大動作周波数の(a)–(b)は、それぞれの動作温度の(a)–(b)に対応しています。
- (12): 1chはUARTだけです。
- (13): USB使用時は、3.0 V to 3.45 Vとなります。
- (14): 電圧範囲が2.7 V未満の場合、一部の周辺機能(外部バスインタフェース、SSP)が動作可能です。
- (15): MCD部アナログ電源電圧: 3.1 V to 3.5 V
MCD部モータ電源電圧: 2.5 V to 5.5 V
- (16): Motor Control Driver (MCD)部のファンクション動作温度およびMCU部のD/Aコンバータ動作温度は–25 ~ 85°Cの範囲です。
–40 ~ –25°Cの範囲ではMCD部はスタンバイ状態、MCU部のD/Aコンバータは停止状態でのご使用となります。
- (17): USB Embedded Host使用時は、48 MHzとなります。
- (18): 電源電圧は以下の3電源です。
- (i) I/O用, ADコンバータ用: 3.0 V to 3.6 V
(ii) USB Embedded Host用: 3.15 V to 3.45 V
(iii) 内部回路用: 1.1 V to 1.3 V
- (19): 書き込みは1回のみです。書き換えはできません。
- (20): UARTまたはSIOのいずれか一方を選択可能です。
- (21): I²CまたはSIOのいずれか一方を選択可能です。また同時に使用できるSIOは2chとなります。
- (22): SEIまたはUARTのいずれか一方を選択可能です。
- (23): 電源電圧は以下の2電源です。
- (i) 内部回路用: 1.4 V to 1.65 V
(ii) I/O用, ADコンバータ用: 4.5 V to 5.5 V
- (24): 電源電圧は以下の2電源です。
- (i) 内部回路用: 1.35 V to 1.65 V
(ii) I/O用, ADコンバータ用: 4.5 V to 5.5 V
- (25): 低消費モードを内蔵しています。
- (26): SEI : シリアル拡張インタフェース
- (27): SPI : シリアルバス的一种
- (28): SSP: 同期式シリアルインタフェース
- (29): CEC: Consumer Electronics Control
- (30): MCD部モータ電源電圧: 2.5 V to 5.5 V
- (31): SAR型12ビットADコンバータが2ユニット/8+4チャンネル、 $\Delta\Sigma$ 型16ビットADコンバータが1ユニット/4チャンネル内蔵されています。
- (32): TSPi: 東芝シリアルペリフェラルインタフェース
- (33): ソフトウェアIPとなります。
- (34): IGBT制御と16ビットタイマが内蔵されています。
- (35): 電源電圧は以下の2電源です。
- (i) 内部回路用: 1.08 V to 1.32 V
(ii) I/O用, ADコンバータ用: 4.5 V to 5.5 V
- (36): 電源電圧 $V_M = 6 V$ to 32 V。ブリドライバはPch/Nch構成です。
- (37): 横河デジタルコンピュータ株式会社製のRAMScopeに対応するデバッグインタフェースです。
- (38): 2つの16ビットタイマ/カウンタをつなげることで、32ビットタイマ/カウンタになります。
- (39): 24ビット $\Delta\Sigma$ ADコンバータ使用時は、2.9 V ~ 3.6 Vになります。

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