

TXZ™ Family M3H Group

TOKYO—Toshiba Electronic Devices & Storage Corporation (“Toshiba”) has added the “M3H Group” to its “TXZ™ Family” of Arm® Cortex®-M-based microcontrollers for consumer and industrial equipment. The new microcontrollers are now in mass production.

The M3H Group has two groups based on their functional level. “M3H Group (1)” offers standard functions, while “M3H Group (2)” offers an expanded package line-up and memory size and supports high-speed processing (80MHz). Together, they offer a rich line-up with 13 packages (32 pins to 144 pins) and flash memory ranging from 32KB to 512KB.



Toshiba plans to release groups of microcontrollers for communications control for high-speed data processing, and devices equipped with high-precision analog circuits for control of low- to medium-speed motors. The Company continues to expand the TXZ family to meet the needs of the motor control and global sensing market.

Features

- High-performance ARM Cortex-M3 core, operating at up to 80MHz
- A comprehensive line-up of memory and package variations
- General-purpose microcontrollers for diverse applications

Applications

- Air-conditioners, washing machines, refrigerators, office automation equipment, housing and facility equipment, audio-visual equipment, motor control applications (consumer and industrial applications).

Product Specifications

Product series		TXZ3 Series	
Product group		M3H Group (1)	M3H Group (2)
CPU core		Arm Cortex-M3	
Maximum operating frequency		40MHz	80MHz
Internal oscillator		10MHz($\pm 1\%$)*1	*1:Factory default setting
Built-in memory	Flash (code)	32K to 128KB	256K to 512KB
	Flash (data)	8K to 32KB	32KB
	RAM	8K to 18KB	66KB with parity
I/O port		24 to 87	56 to 134
CRC calculation circuit (CRC)		None	1 channel
Communication function	UART	2 to 3 channels	5 to 6 channels
	TSPI	1 to 2 channels	1 to 5 channels
	I ² C	1 to 3 channels	2 to 4 channels
12-bit AD converter (ADC)	Channel input	4 to 16 channels	19 to 21 channels
	Conversion time	1.5 μ s	
8-bit DA converter (DAC)		0 to 2 channels	2 channels
Programmable motor driver (PMD+)		1 channel	None
Advanced programmable motor driver (A-PMD)		None	1 channel
Advanced encoder input circuit (A-ENC)		1 channel	
Remote control signal processor (RMC)		0 to 1 channel	1 channel
Timer		Used as 32-bit timer : 6 channels Used as 16-bit timer \times 2 channels: 12 channels	Used as 32-bit timer: 8 channels Used as 16-bit timer \times 2 channels: 16 channels
Real time clock (RTC)		0 to 1 channel	1 channel
Watchdog timer (WDT)		1 channel	1 channel
DMA controller (DMAC)		32 channels / 1 unit	64 channels / 2 units
Operating temperature range		-40~+85 $^{\circ}$ C	
Supply voltage		2.7 to 5.5V	
Number of pins		32 to 100 pins	64 to 144 pins

M3H Group (1) Lineup

Product Name	Memory				Package
	Code Flash (KB)	Data Flash (KB)	RAM (KB)	Backup RAM (KB)	
TMPM3H6FWFG	128	32	16	2	LQFP100 (14mm x 14mm, 0.5mm pitch)
TMPM3H6FUFG	96	32	12		
TMPM3H6FSFG	64	16	8		
TMPM3H6FWDFG	128	32	16	2	QFP100 (14mm x 20mm, 0.65mm pitch)
TMPM3H6FUDFG	96	32	12		
TMPM3H6FSDFG	64	16	8		
TMPM3H5FWFG	128	32	16	2	LQFP80 (12mm x 12mm, 0.5mm pitch)
TMPM3H5FUFG	96	32	12		
TMPM3H5FSFG	64	16	8		
TMPM3H5FWDFG	128	32	16	2	LQFP80 (14mm x 14mm, 0.65mm pitch)
TMPM3H5FUDFG	96	32	12		
TMPM3H5FSDFG	64	16	8		
TMPM3H4FWUG	128	32	16	2	LQFP64 (10mm x 10mm, 0.5mm pitch)
TMPM3H4FUUG	96	32	12		
TMPM3H4FSUG	64	16	8		
TMPM3H4FWFG	128	32	16	2	LQFP64 (10mm x 10mm, 0.5mm pitch)
TMPM3H4FUFG	96	32	12		
TMPM3H4FSFG	64	16	8		
TMPM3H3FWUG	128	32	16	2	LQFP52 (10mm x 10mm, 0.65mm pitch)
TMPM3H3FUUG	96	32	12		
TMPM3H3FSUG	64	16	8		
TMPM3H2FWDUG	128	32	16	2	LQFP48 (7mm x 7mm, 0.5mm pitch)
TMPM3H2FUDUG	96	32	12		
TMPM3H2FSDUG	64	16	8		
TMPM3H2FWQG	128	32	16	2	VQFN48 (6mm x 6mm, 0.4mm pitch)
TMPM3H2FUQG	96	32	12		
TMPM3H2FSQG	64	16	8		
TMPM3H1FWUG	128	32	16	2	LQFP44 (10mm x 10mm, 0.8mm pitch)
TMPM3H1FUUG	96	32	12		
TMPM3H1FSUG	64	16	8		
TMPM3H1FPUG	48	8	6		
TMPM3H0FSDUG	64	16	8	2	LQFP32 (7mm x 7mm, 0.8mm pitch)
TMPM3H0FMDUG	32	8	6		

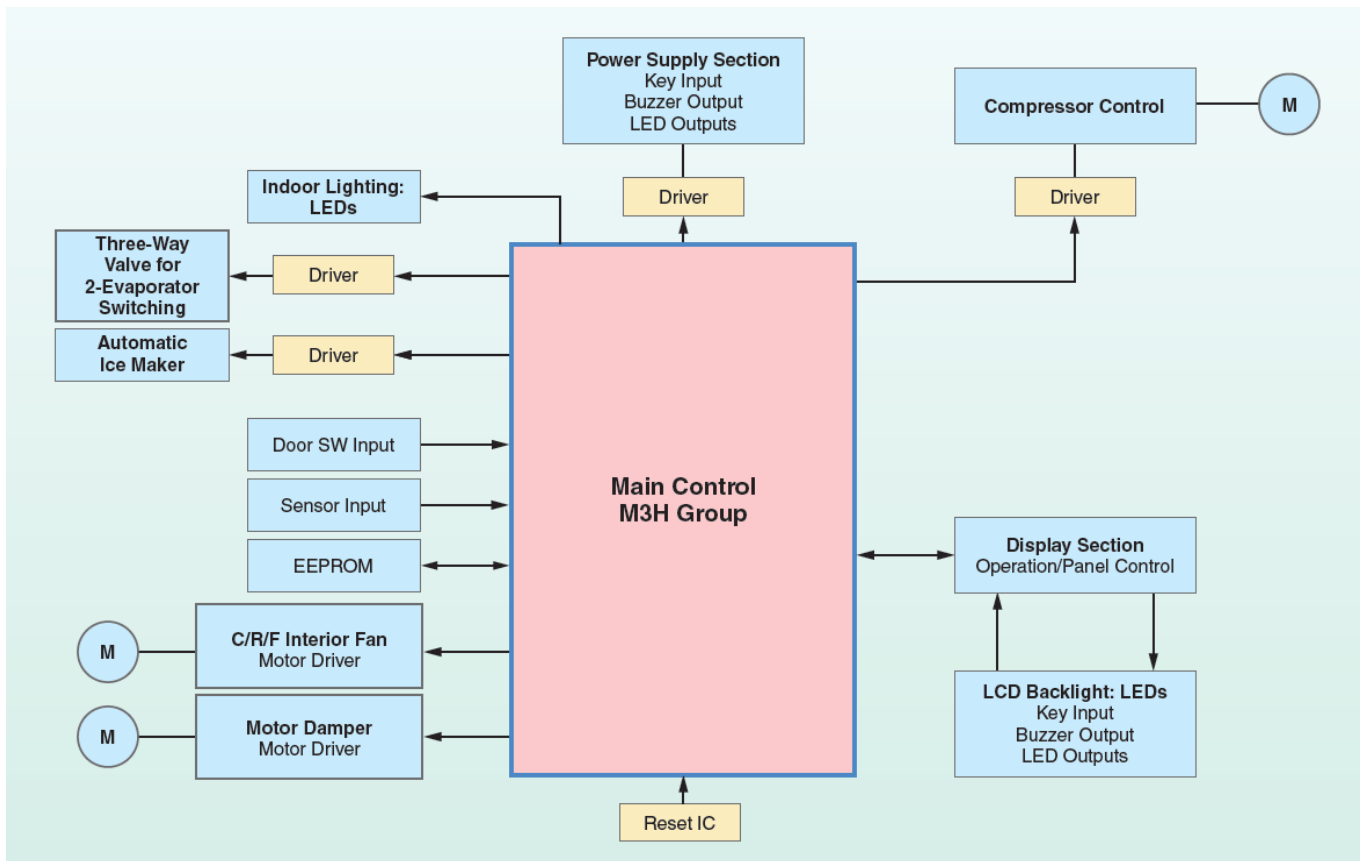
M3H Group (2) Lineup

Product Name	Memory				Package
	Code Flash (KB)	Data Flash (KB)	RAM (KB)	Backup RAM (KB)	
TMPM3HQFDFG	512	32	64	2	LQFP144 (20mm x 20mm, 0.5mm pitch)
TMPM3HQFZFG	384	32	64		
TMPM3HQFYFG	256	32	64		
TMPM3HPFDFG	512	32	64	2	LQFP128 (14mm x 14mm, 0.4mm pitch)
TMPM3HPFZFG	384	32	64		
TMPM3HPFYFG	256	32	64		
TMPM3HNFDFG	512	32	64	2	LQFP100 (14mm x 14mm, 0.5mm pitch)
TMPM3HNFZFG	384	32	64		
TMPM3HNFYFG	256	32	64		
TMPM3HNFDDFG	512	32	64	2	QFP100 (14mm x 20mm, 0.65mm pitch)
TMPM3HNFZDFG	384	32	64		
TMPM3HNFYDFG	256	32	64		
TMPM3HMFDFG	512	32	64	2	LQFP80 (12mm x 12mm, 0.5mm pitch)
TMPM3HMFZFG	384	32	64		
TMPM3HMFYFG	256	32	64		
TMPM3HLFDUG	512	32	64	2	LQFP64 (10mm x 10mm, 0.5mm pitch)
TMPM3HLFZUG	384	32	64		
TMPM3HLFYUG	256	32	64		

Pin Assignment

	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51
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Application Circuit Example (Refrigerators)



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