

# TMS470M and TMS570 Transportation and Safety MCUs

Transportation  
MCU



The TMS470M and TMS570 microcontroller family enables developers to easily create safety-related applications for the transportation industry. TMS470M microcontrollers use the widely adopted ARM® Cortex™-M3 CPU running at 80MHz while the TMS570 microcontrollers integrate dual ARM® Cortex™-R4F floating point processors in lock-step running up to 160MHz. Both series of microcontrollers are qualified to the AEC-Q100 specification and are specifically designed with many integrated safety features that make it easier to certify to automotive and transportation safety standards. There is also a wide range of flash memory configurations, connectivity and control peripherals including CAN, FlexRay, LIN/UART, multi-buffered SPI, multi-buffered Analog to Digital converters and the powerful High End Timer co-processor module (HET).

## TMS470M

- Efficient 16/32-bit ARM® Cortex™-M3 CPU available today up to 80MHz
- Developed specifically for safety critical systems needing IEC61508 SIL1 or SIL2 ratings
- Scalable embedded Flash memory options between 256KB to 640KB

## TMS570

- High Performance ARM® Cortex™-R4F floating-point CPU available today up to 160MHz
- Developed specifically for safety critical systems and IEC61508 SIL3 certified by exida
- Scalable embedded Flash memory options between 1MB and 2MB

### TMS470Mx

ARM® Cortex™ M3 80MHz	Memory	Power, clock and safety	
	Up to 640KB Flash with ECC	OSC PLL	VREG
CPU and RAM Self test	Up to 64KB RAM with ECC	PBIST	CRC
	Memory protection	LBIST	RTI
		Debug/Trace	
		JTAG Debug	
Enhanced system bus			
Vectored interrupt management			
Serial I/F	Network I/F	ADC	Timers/I/O
MibSPI1 64 Buffers; 8 CS	CAN1 (32 mb)	MibADC 64 Buffers 10-bit, 16ch	High End Timer (NHET) 64 words, 16ch
MibSPI2 64 Buffers; 4 CS	CAN2 (16 mb)		
	UART1 (LIN1)		
	UART2 (LIN2)		GIO (4)

### TMS570LS20216

ARM® Cortex™ R4F 160MHz	Memory	Power, clock and safety	
	2 MB Flash with ECC	OSC PLL	POR
Fail safe detection	160 KB RAM with ECC	PBIST	CRC
	Memory protection	LBIST	RTI
		Memory interface	
		ASYNCH EMIF	
		DMA	
Enhanced system bus and vectored interrupt management			
Serial I/F	Network I/F	ADC	Timers/I/O
MibSPI1 128 Buffers; 4 CS	2 ch FlexRay 8K message RAM	MibADC1 64 Buffers 12-bit, 16ch (8ch shared)	High End Timer (NHET) 128 words, 32 ch
MibSPI3 128 Buffers; 4 CS	CAN1 (64 mb)	MibADC2 64 Buffers 12-bit, 16ch (8ch shared)	
MibSPI5 128 Buffers; 4 CS	CAN2 (64 mb)		GIOA/INTA (8)
	CAN3 (32 mb)		GIOB (8)
	UART1 (LIN1)		
	UART2 (LIN2)		

## TMS470M and TMS570 – A good fit for transportation and safety



Automotive safety systems



Hybrids and electric vehicles



Off road vehicles



Railway



Aerospace

## TMS470M and TMS570 – Device configurations

Device	Speed	Flash	RAM	FlexRay	CAN	MibSPI (CS)	UART (LIN)	HET (ch)	MibADC(ch)	EMIF	GPIO (Int)	ETM (Data)	RTP (Data)	DMM (Data)	Package	Temp
TMS470MF03107SPZ	80 MHz	256 K	16 kB	–	2	2 (12)	2 (2)	(16)	1 (16)	–	4	–	–	–	100QFP	-40..+125C
TMS470MF04207SPZ	80 MHz	384 K	24 kB	–	2	2 (12)	2 (2)	(16)	1 (16)	–	4	–	–	–	100QFP	-40..+125C
TMS470MF06607SPZ	80 MHz	512 K	128 kB	–	2	2 (12)	2 (2)	(16)	1 (16)	–	4	–	–	–	100QFP	-40..+125C
TMS570LS10106SPGE	140 MHz	1 MB	128 kB	–	2	3	2 (2)	(25)	2 (20)	–	8 (8)	–	–	–	144QFP	-40..+125C
TMS570LS10106SZWT	160 MHz	1 MB	128 kB	–	3	3	2 (2)	(32)	2 (24)	Yes	16 (8)	(32)	(16)	(16)	337BGA	-40..+125C
TMS570LS10116SPGE	140 MHz	1 MB	128 kB	2 ch	2	3	2 (2)	(25)	2 (20)	–	8 (8)	–	–	–	144QFP	-40..+125C
TMS570LS10116SZWT	160 MHz	1 MB	128 kB	2 ch	3	3	2 (2)	(32)	2 (24)	Yes	16 (8)	(32)	(16)	(16)	337BGA	-40..+125C
TMS570LS10206SPGE	140 MHz	1 MB	160 kB	–	2	3	2 (2)	(25)	2 (20)	–	8 (8)	–	–	–	144QFP	-40..+125C
TMS570LS10206SZWT	160 MHz	1 MB	160 kB	–	3	3	2 (2)	(32)	2 (24)	Yes	16 (8)	(32)	(16)	(16)	337BGA	-40..+125C
TMS570LS10216SPGE	140 MHz	1 MB	160 kB	2 ch	2	3	2 (2)	(25)	2 (20)	–	8 (8)	–	–	–	144QFP	-40..+125C
TMS570LS10216SZWT	160 MHz	1 MB	160 kB	2 ch	3	3	2 (2)	(32)	2 (24)	Yes	16 (8)	(32)	(16)	(16)	337BGA	-40..+125C
TMS570LS20206SPGE	140 MHz	2 MB	160 kB	–	2	3	2 (2)	(25)	2 (20)	–	8 (8)	–	–	–	144QFP	-40..+125C
TMS570LS20206SZWT	160 MHz	2 MB	160 kB	–	3	3	2 (2)	(32)	2 (24)	Yes	16 (8)	(32)	(16)	(16)	337BGA	-40..+125C
TMS570LS20216SPGE	140 MHz	2 MB	160 kB	2 ch	2	3	2 (2)	(25)	2 (20)	–	8 (8)	–	–	–	144QFP	-40..+125C
TMS570LS20216SZWT	160 MHz	2 MB	160 kB	2 ch	3	3	2 (2)	(32)	2 (24)	Yes	16 (8)	(32)	(16)	(16)	337BGA	-40..+125C

Note: For orderable part numbers, replace 'TMS470' with 'S4' and 'TMS570' with 'S5'

## TMS470M and TMS570 – Software tools



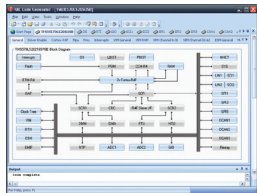
### Program and debug code using Code Composer Studio™ IDE:

- Full featured debugger
- Compiler
- Linker
- Integrated Flash programming



### Safety MCU demos:

- Safety feature demo
- Ambient light demo
- Temperature sensor demo
- LED light show
- Source Code viewable via CCS



### HALCoGen:

- User input on high abstraction level
- Graphical base code generation
- Easy configuration
- Quick start for new projects

### Other software and tools:

- HET IDE
- PLL calculators
- ECC generator tools
- nowFlash Flash programming tool
- RTOS support

## Development kits

### USB Development Stick Kits:

- TMS470M = **TMDX470MF066USB**; TMS570 = **TMDX570LS20SUSB**
- USB powered
- On board USB XDS100v2 JTAG debug
- On board SCI to PC serial communication
- Access to select signal pin test points
- CAN transceiver
- LEDs, temp sensor, light sensor
- QFP packaged MCU



### Full Featured Development Kits:

- TMS570 = **TMDX570LS20SMDK**
- On board USB XDS100v2 JTAG debug
- External high speed emulation via JTAG
- On board SCI to PC serial communication
- Access to signal pin test points
- CAN, LIN and FlexRay transceivers
- LEDs, temp sensor, light sensor



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### Applications

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Energy and Lighting	<a href="http://www.ti.com/energy">www.ti.com/energy</a>
Industrial	<a href="http://www.ti.com/industrial">www.ti.com/industrial</a>
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