

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

TMS570LS20216

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

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



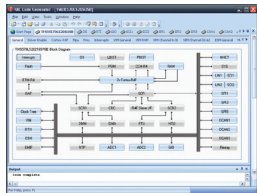
Program and debug code using Code Composer Studio™ IDE:

- 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



Important Notice: The products and services of Texas Instruments Incorporated and its subsidiaries described herein are sold subject to TI's standard terms and conditions of sale. Customers are advised to obtain the most current and complete information about TI products and services before placing orders. TI assumes no liability for applications assistance, customer's applications or product designs, software performance, or infringement of patents. The publication of information regarding any other company's products or services does not constitute TI's approval, warranty or endorsement thereof.

The platform bar and Code Composer Studio are trademarks of Texas Instruments.
All other trademarks are the property of their respective owners.

A122010

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Transportation and Automotive	www.ti.com/automotive
Video and Imaging	www.ti.com/video
Wireless	www.ti.com/wireless-apps

TI E2E Community Home Page

e2e.ti.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2011, Texas Instruments Incorporated