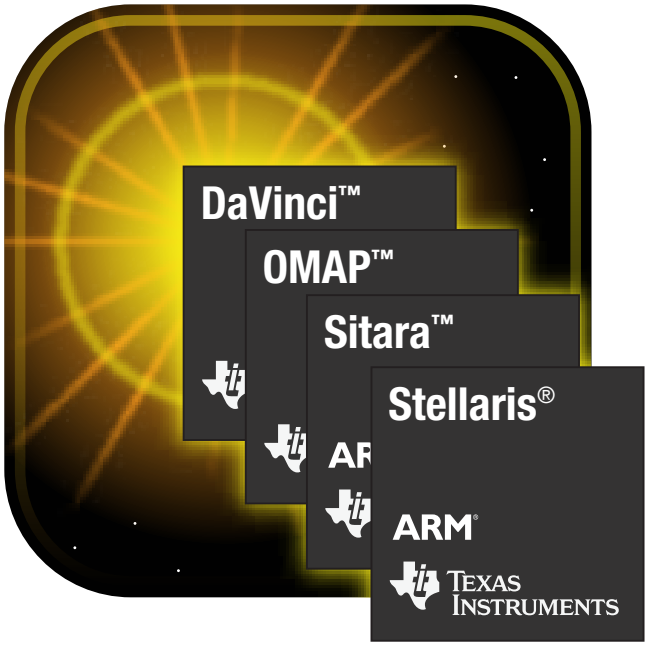
ARM® Platform Technical Overview

Texas Instruments

TI's ARM portfolio spans Cortex™-M3, Cortex-A8 and ARM9™ family cores



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4Q 2009

TI's ARM® Processor-Based Portfolio: New Sitara™ product family, Stellaris® family, OMAP™ mobile applications processors and DaVinci™ video processors

TI's ARM portfolio offers the most ARM-based products supported by any single manufacturer. This portfolio offers the right combination of application-specific peripherals, packages and temperature ranges as well as the complete signal chain including analog, power and mixed signal. TI's ARM solutions leverage and enhance the scalability, performance and efficiency of the ARM Cortex™-A8, ARM9™ and Cortex-M3 cores to empower customers to innovate in a diverse mix of industries including applications such as industrial automation, test and measurement, medical instrumentation, HVAC, remote monitoring, motion control and point-of-sale, among many others.

By offering an extensive portfolio of embedded ARM devices that span instruction-set compatible ARM architectures, TI enables developers to scale performance and peripherals to drive down system cost while providing sufficient headroom for differentiated features and future growth.

TI Developer Network supports ARM-based products

The TI Developer Network is a worldwide community of respected, well-established companies offering products and services that support TI's products. Products and services include a broad range of end-equipment solutions, embedded software, engineering services and development tools that help customers accelerate development efforts and cut time-to-market.
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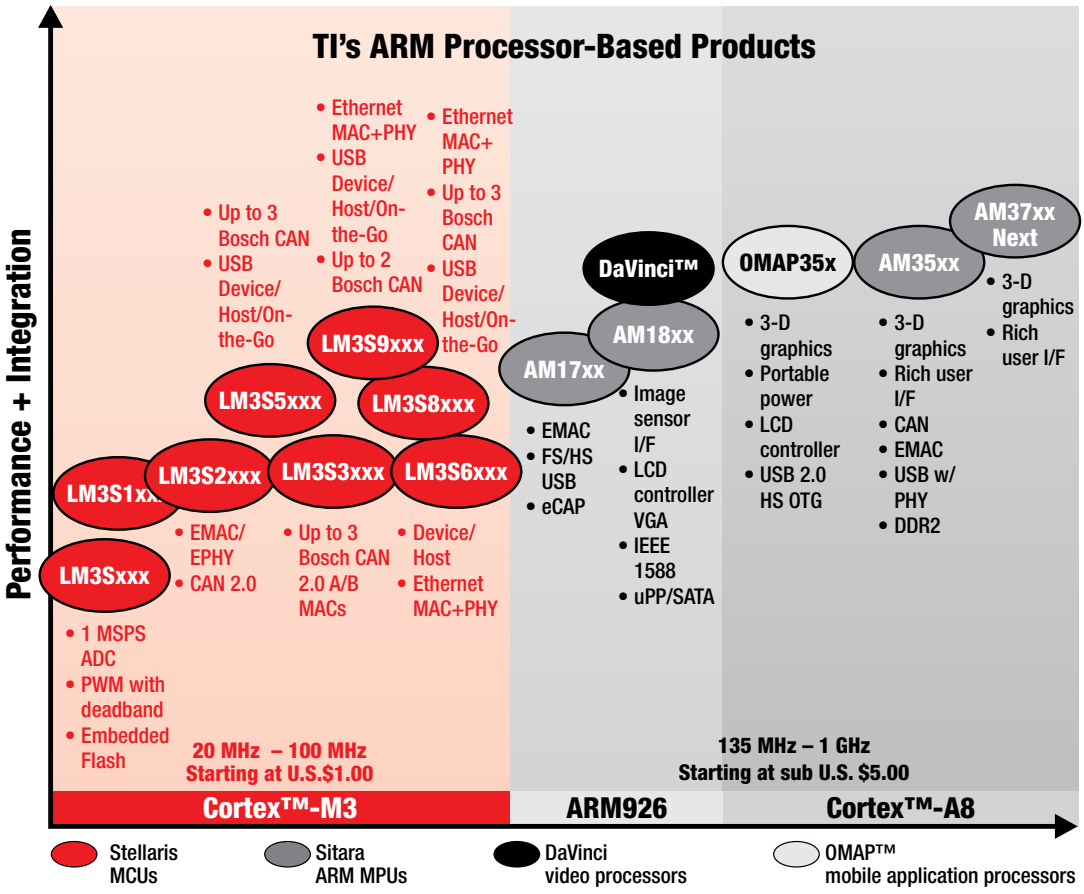

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Sitara™ ARM® MPU Product Family

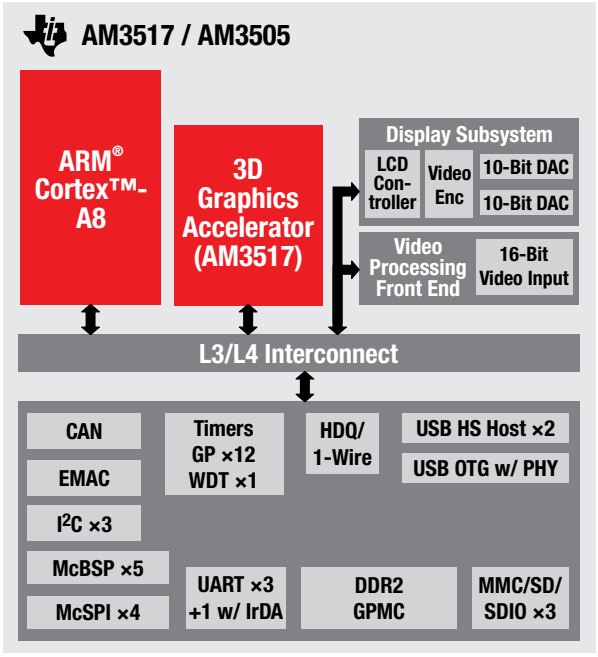
The new Sitara MPU product family includes high-performance Cortex™-A8 and ARM9™-based embedded microprocessors with speeds ranging from 200 MHz to greater than 1 GHz in future roadmap devices. Sitara shares common foundation software and tools with TI's popular OMAP™ processors to ensure portability and compatibility. These devices also leverage the power technology developed for OMAP devices making low power consumption a key product feature of the new Sitara chips.

AM3505 and AM3517: The first two Sitara processors are Cortex-A8 devices

- Unique peripherals and accelerators to drive down system cost and enable multiple connectivity options
- Active community of Linux developers complemented by TI's extensive ecosystem of development partners
- Extensive offering of other operating systems and application code supported by TI and TI third parties

AM3505 key features

- Superscalar 500MHz ARM Cortex-A8 core provides 1000 Dhrystone million instructions per second (MIPS)
- Integrated CAN controller supports the increasing use of CAN for local control of sensors and controllers
- Industrial temperature options (–40 to 105°C) allow customers to operate in harsh development environments ranging from sub-freezing temperatures to extreme heat
- Sub-one Watt power consumption eliminates the need for heat sinks and fans so industrial developers can design silent and air-tight enclosed solutions
- Connectivity options with a high-speed USB 2.0 on-the-go with built in PHY to conserve board space and a 10/100 EMAC for network communications and control of industrial devices, including remote rebooting, thus reducing the need for technicians to physically monitor and service devices
- DDR2 support reduces overall cost of system memory
- 3.3V I/O eliminates the need for level shifters and lowers costs to help designers with tight budgets
- Display subsystem with picture-in-picture, color space conversion, rotation and resizing support provides flexibility to connect to LCD display for vibrant, crisp and high-resolution images



▲ *AM3517 processor block diagram*

AM3517 key features

- AM3517 builds on the AM3505 with an additional PowerVR™ SGX graphics engine to incorporate value-added HMI capabilities through a professional and attractive GUI. The accelerator is capable of processing up to 10 Mpolygons/sec and supports OpenGL® ES 2.0.

AM3505/17 development tools

▲ *Sitara development kit*

The AM3517 evaluation module and Linux Software development kit are available. Windows® Embedded CE support is planned for 4Q09 and additional operating systems are planned for 1Q 2010.

Please refer to the selection table on 12 for more product information.

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OMAP™ Applications Processor Product Family

OMAP35x processors

The OMAP35x platform is based on the market's first broad offering of the ARM® Cortex™-A8 core. With more than four times the processing power of today's 300MHz ARM9™ devices, OMAP35x devices integrate the superscalar Cortex-A8 core and TI's TMS320C64x+™ DSP into four applications processors: OMAP3503, OMAP3515, OMAP3525 and OMAP3530.

Key features

- Applications processors based on the superscalar ARM Cortex-A8 core offering 4× performance over ARM9 devices
- Scalable platform of processors available with multimedia rich peripherals, OpenGL® ES 2.0 compatible graphics engine and DaVinci technology for digital video capabilities
- Optimized laptop-like performance at handheld power levels in a single chip
- Utilize TI's SmartReflex™ technology for even greater power savings
- Evaluation module, Linux board support package and OMAP Developer Network help take designs from concept to production quickly and efficiently

Development tools

OMAP35x Evaluation Module (EVM)

▲ *OMAP35x Evaluation Module*

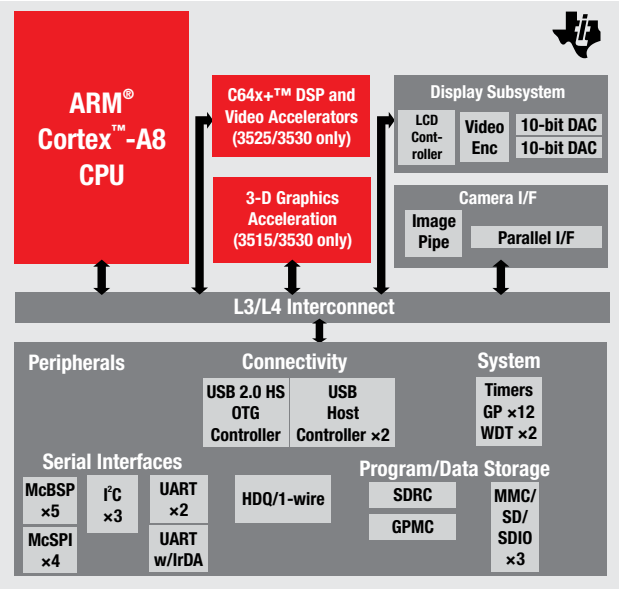
The OMAP35x EVM includes code/software (DVSDK) to provide a complete hardware and software platform for evaluating all OMAP35x processors. The EVM has complementary power management and analog solutions, Linux board support package (BSP), VGA touch screen LCD, 128-MB memory, peripheral drivers and daughter expansion capabilities.

BeagleBoard

An open design with all design material freely available, the 3-inch by 3-inch BeagleBoard is a low-cost, USB-powered development board with no peripherals or software. It spurs creative application implementation by utilizing USB and standard PC peripherals. Developers are encouraged to work with the open source community to find support and develop updates.

▲ *BeagleBoard*

Please refer to the selection table on page 12 for more product information.



▲ *OMAP35x processor block diagram*

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OMAP-L1x processors

OMAP-L1x applications processors include ARM9™-plus-DSP architectures and offer a variety of peripherals for networking and run Linux or the DSP/BIOS™ real-time kernel for operating system flexibility. The product line is also pin-for-pin compatible with various devices in the new TMS320C674x DSP generation.

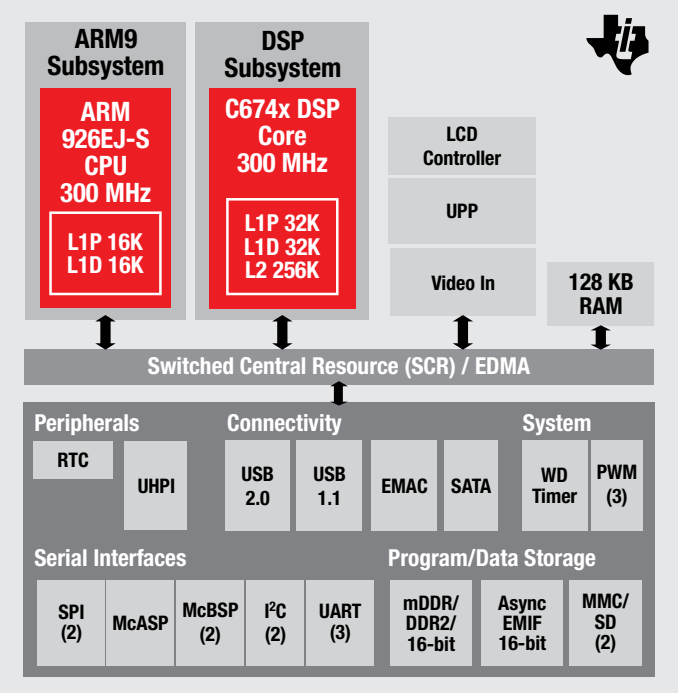
Key features

- Networking simplified with advanced peripherals
- Supports Linux and DSP/BIOS real-time kernel
- Pin-for-pin compatible with select C674x devices
- Power consumption ranging from 6 mW deep sleep mode power to 435 mW total power in active mode
- Smaller, ergonomic products with 13×13-mm packaging
- Integrate feature-rich GUIs into portable designs

Development tools

OMAP-L137/TMS320C6747 Floating-Point Starter Kit

This low-cost development platform uses USB communications for true plug-and-play functionality. Both experienced and novice designers can get started immediately with innovative product designs by utilizing the starter kit's full-featured Code Composer Studio™ integrated development environment (IDE) and eXpressDSP™ software which includes the DSP/BIOS kernel. This kit also includes a demo version of MontaVista Linux Pro 5.0 tool chain.



▲ *OMAP-L138 processor block diagram*

▲ *OMAP-L138 Evaluation Module*

OMAP-L138/TMS320C6748 Evaluation Module

The OMAP-L138/C6748 EVM provides a complete hardware and software platform for evaluating all OMAP-L138 processors. The EVM includes complementary power management and analog solutions as well as full peripheral access.

Please refer to the selection table on page 13 for more product information.

www.ti.com/omapl1x

DaVinci™ Video Processor Products

DaVinci video processors are signal processing-based solutions tailored for digital video applications that provide video equipment manufacturers with integrated processors, software, tools and support to simplify the design process and accelerate innovation. The portfolio of DaVinci processors consists of scalable, programmable signal processing system on chips (SoCs), accelerators and peripherals. The newest DaVinci device is the TMS320DM365 processor.

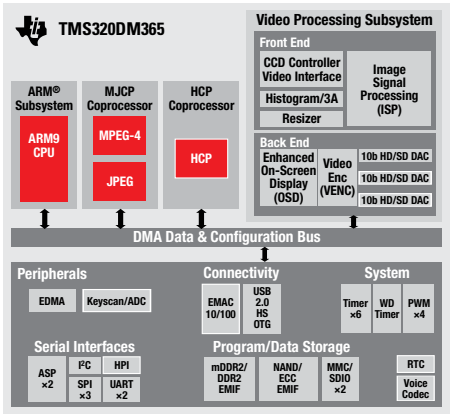
Key features

- Broad offering scalable across low-cost and cutting-edge video and imaging applications requiring multi-format, multi-channel, multi-rate capabilities
- Robust set of development tools/ reference collateral and partner ecosystems to enable fast time-to-market for video applications
- Free software codecs and multimedia frameworks to ease development
- Processors optimized for digital video systems with lowest BOM cost

Development tools

Digital Video Evaluation Module (DVEVM) – DVEVMs come with a Digital Video Software Development Kit (DVSDK) which includes Linux Board Support Package (LSP), multimedia frameworks and codecs to provide customers the software needed to get into production.

- TMS320DM365 DVEVM
- TMS320DM6446 DVEVM
- TMS320DM355 DVEVM
- TMS320DM6467 DVEVM
- TMS320DM648 DVDP
- TMS320DM643x DVDP



▲ *TMS320DM365 block diagram*

Please refer to the selection tables on pages 13 and 14 for more product information.

▲ *TMS320DM6446 DVEVM*

▲ *TMS320DM365 DVEVM*

▲ *TMS320DM6467 DVEVM*

▲ *TMS320DM355 DVEVM*

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Stellaris® MCU Product Family

DID YOU KNOW?

Texas Instruments is the lead partner for the ARM® Cortex™-A8, Cortex-R4 and Cortex-M3.

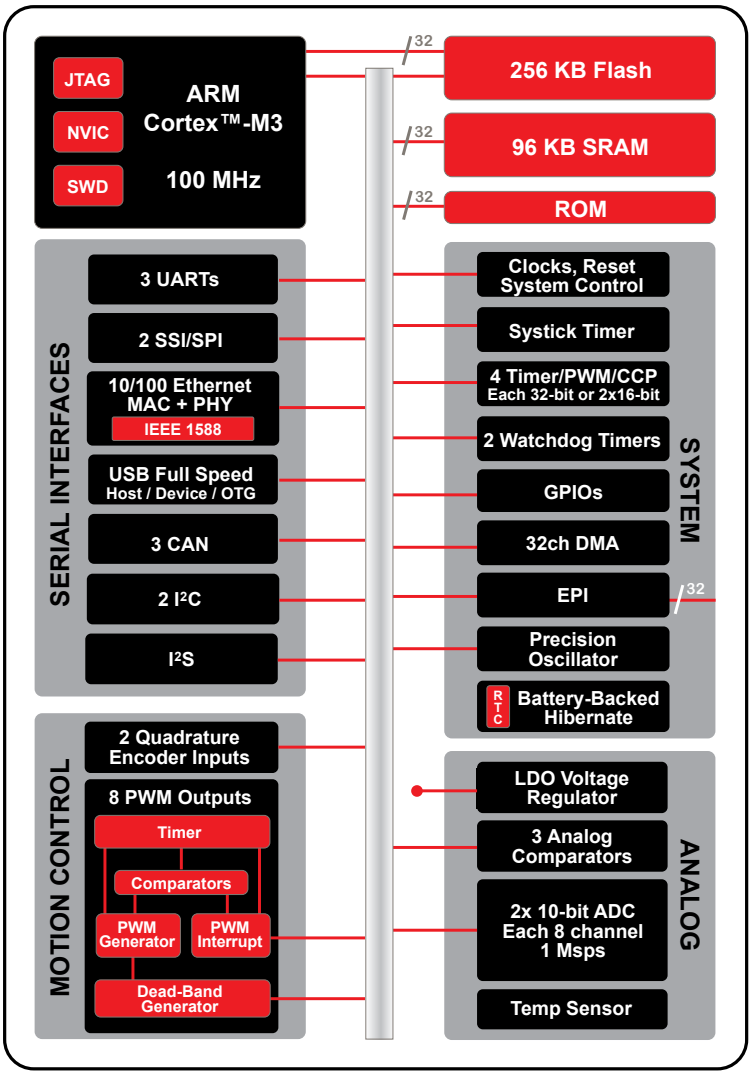
Texas Instruments is the industry leader in bringing 32-bit capabilities and the full benefits of ARM Cortex-M3-based microcontrollers to the broadest reach of the microcontroller market. Now with over 160 compatible ARM Cortex-M3-based Stellaris microcontrollers and over 30 Stellaris evaluation, development and reference design kits, Stellaris fits the performance, integration, power and price-point requirements of nearly any industrial application.

Stellaris with Cortex-M3 offers a direct path to the strongest ecosystem of development tools, software and knowledge in the industry. Designers who migrate to Stellaris will benefit from great tools, small code footprint and outstanding performance. Even more important, designers can enter the ARM ecosystem with full confidence in a compatible roadmap from $1 to 1 GHz. You will never need to change architectures again.

Stellaris family features

The Stellaris family of ARM Cortex-M3 MCUs features:

- ARM Cortex-M3 v7-M processor core
  - Up to 100 MHz
  - Up to 125 MIPS (at 100 MHz)
- On-chip memory
  - 256-KB Flash; 96-KB SRAM
  - ROM loaded with Stellaris DriverLib, BootLoader, AES tables and CRC
- External Peripheral Interface (EPI)
  - 32-bit dedicated parallel bus for external peripherals
  - Supports SDRAM, SRAM/Flash, M2M
- Advanced serial integration
  - 10/100 Ethernet MAC and PHY
  - 3 CAN 2.0 A/B controllers
  - USB (full speed) OTG / Host / Device
  - 3 UARTs with IrDA and ISO 7816 support (one UART features full modem controls)
  - 2 I²Cs
  - 2 Synchronous serial interfaces (SSI)
  - Integrated interchip sound (I²S)
- System integration
  - 32-channel DMA controller
  - Internal precision 16MHz oscillator
  - Two watchdog timers with separate clock domains
  - ARM Cortex Systick timer
  - 4 32-bit timers (up to 8 16-bit timers) with RTC capability
  - Lower-power battery-backed hibernation module
  - Flexible pin-muxing capability
- Advanced motion control
  - 8 advanced PWM outputs for motion and energy applications
  - 2 quadrature encoder inputs (QEI)



Stellaris family block diagram

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- Analog
  - 2× 8-ch 10-bit ADC (for a total of 16 channels) with dual sample/hold
  - 3 analog comparators
  - On-chip voltage regulator (1.2V internal operation)

Stellaris® family advantages in an ARM® Cortex™-M3 MCU:

- *Space* and *cost* saving integration
  - Stellaris is the *only* ARM MCU with 10/100 Ethernet MAC / PHY integrated on chip.
  - *Only* Stellaris offers a complete, fully functional and efficient driver library in ROM.
- *Fast* I/O and Flash performance
  - *Only* Stellaris runs peripherals at full system speed.
  - *Only* Stellaris enables single-cycle Flash and SRAM access up to 50 MHz.
- *Bigger* and *better* memory
  - *Only* Stellaris offers up to 96-KB SRAM.
  - *Only* Stellaris enables the MPU to flexibly protect your memory.
- *Stronger* tools, solutions, and software
  - *Easiest* time-to-market with quick start EVKs, open-tool RDKs and "ASSP" production modules.
  - *Richest* collection of "fire-and-forget" software libraries with StellarisWare®.
- *Straightforward* engineering and documentation
  - Stellaris *does not compromise* peripherals through complicated buffer sharing.
  - Stellaris documents are written *for* engineers *by* engineers – and do not mislead!
- *The one-stop for everything* ARM Cortex
  - *Only* TI is the lead partner for Cortex A, R and M series microprocessors.
  - From Stellaris to OMAP™, *only* TI offers the entire Cortex roadmap of standardized embedded processors and controllers.

Stellaris MCU "Full Solution Approach"

In the "traditional" semiconductor world, semiconductor vendors practice a near-myopic approach to solving customers' problems; still depending on the behavior established in the 1980s and 1990s – "if I build it [MCU], they will come". On a refreshing contrary, TI's Stellaris Full Solution Approach is intended to empathize with how our customer thinks, innovates, decides, invests, operates and struggles to get to production. For instance, adding a graphical, interactive human-machine interface to control a motion-controlled system, whether from scratch or from retrofitting an existing design, would seem a daunting task. Furthermore, not every customer has the same problem to solve, the same experience in graphics, connectivity and motion control, the same budget, or the same timeframe. This is precisely why the Stellaris Full Solution Approach is so refreshing; because it allows anyone at nearly any level of expertise to design and adopt the benefits of the ARM Cortex-M3 architecture – with the confidence that the solution will accomplish the designer's goals and product aspirations.

Stellaris Quickstart Evaluation and Full-Featured Development Kits

Stellaris Kit	Use for these devices
DK-LM3S9B96 Ethernet+USB OTG+CAN+I²S+EPI Development Kit	All Stellaris MCUs
EK-LM3S9B92 Ethernet+USB OTG Evaluation Kits	9000 Series
EK-LM3S9B90 Ethernet+USB OTG Evaluation Kits	9000 Series
EK-LM3S8962 Ethernet+CAN Evaluation Kits	8000 Series
EK-LM3S6965 Ethernet Evaluation Kits	6000 Series
EK-LM3S3748 USB H/D Evaluation Kits	3000 & 5000 Series
EK-LM3S2965 CAN Evaluation Kits	2000 Series
EK-LM3S1968 Evaluation Kits	1000 Series
EK-LM3S811 Evaluation Kits	800 Series, 600 Series, 300 Series, 100 Series

Easy to use with 10-minute Out-of-the-Box Stellaris evaluation kits

The Stellaris Full Solution Approach begins with an exceptional microcontroller portfolio; designed (from the ground-up) specifically for the robust and deterministic needs of industrial market segments. The Stellaris family extends the benefits of the ARM Cortex-M3 architecture with integration of advanced motion control and connectivity features, with over 160 microcontroller combinations to fit the specific needs and price point in any industrial segment. Evaluation of and development with Stellaris is eased through inexpensive, 10-minute Out-of-the-Box evaluation kits and full-featured development kits, packaged with a choice of evaluative tools from today's leading ARM software tools providers.

Easy to learn and adopt with complete, open-tool Stellaris reference design kits and production modules

To accelerate the design cycle, TI also offers customizable, production-ready modules for direct implementation into a customer's system. The

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modules include choices for motor control (supporting several different types of motors), connectivity applications – especially CAN and Ethernet – and user interface. What's important is that customers can confidently make the decision to adopt a Stellaris® application module from TI because, while TI is happy to offer the module for the duration of the customer's product life cycle, the customer has the flexibility to copy the design of the module exactly – or tweak the design to alter the effective module functionality – without having to pay a licensing fee. The design is Open Tool – both the hardware and the software! This includes schematics, placement files, bill of materials, gerbers, the application and StellarisWare® source files and control and config GUIs used to control/monitor the application. Since TI's ultimate goal is to

▲ *Stellaris EK-LM3S9B92 quickstart Ethernet + USB evaluation kit*

▲ *Stellaris DK-LM3S9B96 full-featured development kit*

▲ *Stellaris RDK-IDM-SBC single-board computer intelligent display reference design kit*

▲ *Stellaris RDK-BLDC brushless DC motor control with connectivity reference design kit*

Stellaris Open-Tool Reference Design Kits and Production Modules

Stellaris Kit	Based on Stellaris MCU	Part Number
Stepper Motor Reference Design Kit	LM3S617	RDK-STEPPER
Stepper Motor Production Module		MDL-STEPPER
AC Induction Motor Reference Design Kit	LM3S818	RDK-ACIM
AC Induction Motor Production Module		MDL-ACIM
Brushless DC Motor Reference Design Kit	LM3S8971	RDK-BLDC
Brushless DC Motor Production Module		MDL-BLDC
Brushed DC Motor Reference Design Kit	LM3S2616	RDK-BDC
Brushed DC Motor Production Module		MDL-BDC
Serial-to-Ethernet Reference Design Kit	LM3S6432	RDK-S2E
Serial-to-Ethernet Production Module		MDL-S2E
Ethernet-Enabled Intelligent Display Reference Design Kit (2.8" Portrait Display, Power-over-Ethernet)	LM3S6918	RDK-IDM
Ethernet-Enabled Intelligent Display Production Module (2.8" Portrait Display, Power-over-Ethernet)		MDL-IDM
Ethernet-Enabled Intelligent Display Production Module (2.8" Portrait Display, Ethernet)		MDL-IDM28
Intelligent Display Module Reference Design Kit (3.5" Landscape Display, Serial I/O)	LM3S1958	RDK-IDM-L35
Intelligent Display Module Production Module (3.5" Landscape Display, Serial I/O)		MDL-IDM-L35
Intelligent Display Module Single-Board Computer (3.5" Landscape Display, Ethernet, USB Host, CAN)	LM3S9B92	RDK-IDM-SBC
Intelligent Display Module Single-Board Computer Production Module (3.5" Landscape Display, Ethernet, USB Host, CAN)		MDL-IDM-SBC

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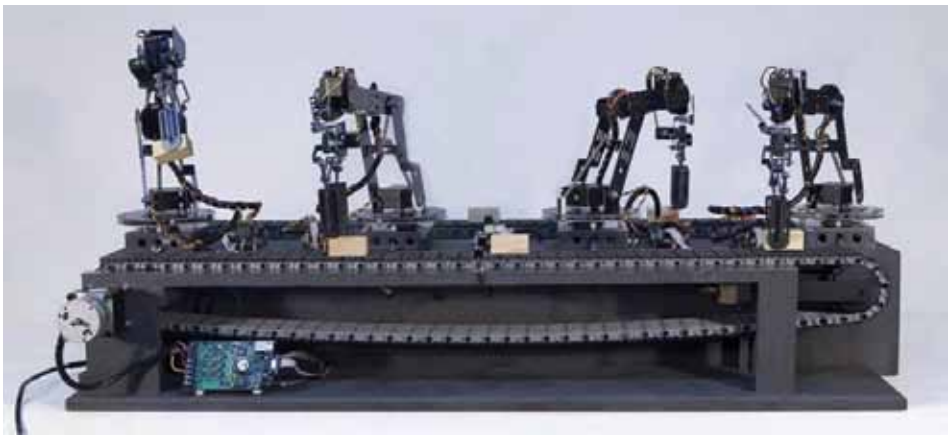
provide customers a near effortless approach to adopting the world's finest microcontroller architecture for industrial applications, TI tries not to restrict how customers use Stellaris® hardware and software resources for Stellaris-based designs.

For each and every Stellaris module TI offers, TI also offers a complete reference design kit, which would include (of course) the Stellaris application module, plus all the cables, motors, adapters, software and design files required to demonstrate the functionality of the application module of interest – for a tremendous out-of-box demonstration. The most extreme example is the RDK-ACIM AC Induction Motor Control Module Reference Design Kit, which ships complete with a 17-lb Selni AC motor!



▲ *Stellaris Ethernet + CAN factory automation demonstration*

Easy to program with "Fire and Forget" StellarisWare® software

With Stellaris microcontrollers, you can choose to keep all your programming in C/C++, even interrupt service routines and startup code. Texas Instruments makes it even easier by providing StellarisWare software that includes source code and royalty-free libraries for applications support. StellarisWare software compiles on ARM/Keil Microcontroller Development Toolkit for ARM, IAR Embedded Workbench, Code Red Technologies' RedSuite, CodeSourcery's Sourcery G++ and generic GNU development tools. The key functional areas are: StellarisWare Peripheral Driver Library, USB Library, Graphics Library and IEC 60730 Library. The StellarisWare Peripheral Driver Library is a royalty-free set of functions for controlling every peripheral found on Stellaris MCUs. Vastly superior to a GUI peripheral configuration tool, the StellarisWare Peripheral Driver Library performs both peripheral initialization and peripheral control functions with a choice of polled or interrupt-driven peripheral support. The StellarisWare USB Library provides several programming interfaces, ranging from the thinnest layer which merely abstracts the underlying USB controller hardware, to high-level interfaces offering simple APIs supporting specific devices. Written almost entirely in efficient C, the freely licensed and royalty-free StellarisWare Graphics Library supports basic graphical primitives, like lines, circles, rectangles and text rendering and also provides more complex widgets, like push buttons, check boxes, radio buttons, sliders, text or image canvas elements. The library also features special utilities that allow you to render personal fonts, convert image files and add 3-D buttons to your application. The StellarisWare Library suite now includes programming support for the IEC 60730 standard, especially useful for manufacturers of household appliances, including washing machines, dryers, refrigerators, freezers and cookers/stoves.

Design with confidence: TI's focus on Stellaris end-product applications

Finally, TI goes above and beyond to ensure that Stellaris microcontrollers, modules and software solutions are well-suited for their intended applications, going so far as to build end-product application examples using Stellaris technology to ensure that the pieces work together seamlessly and as intended. This is key because it means that TI is adding one more level of quality assurance to Stellaris technology – testing Stellaris products in target applications before Stellaris customers have to. From the Stellaris factory automation demo to our CNC machine… to the official kit of parts *FIRST* Robotics Competition (www.usfirst.org) Stellaris MDL-BDC "Jaguar" speed controller… these exercises have allowed TI to refine the Stellaris hardware and software offering so that Stellaris customers can design with confidence.

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Stellaris® Third-Party Ecosystem

The vast ARM® ecosystem is made up of companies that provide development tools, training and support, design tools, design services, operating systems and production support. Because of the strength of the ARM architecture in the wider market, the ARM ecosystem is one of the strongest and most vibrant third-party infrastructures in the world. Today's ARM partners are shipping silicon at a rate exceeding 4.6 billion units a year. In the 32-bit embedded market, ARM currently holds greater than 80 percent market share by architecture, and 25 percent of the world's electronic devices are now powered by ARM processor cores. Therefore, it is no wonder why the third-party ecosystem sustains itself. Below is a list of Stellaris third-party providers that TI works closest with prior to each Stellaris product launch.

Stellaris Third-Party Software Developer Network

Product	Third Party	Description
Compiler / Debugger	Code Red	Red Suite (GNU C/C++ Compiler, code_probe / Eclipse Debugger / IDE)
	CodeSourcery	CodeSourcery G++ (C/C++ Compiler), GDB / Eclipse Debugger / IDE
	IAR	IAR C/C++ Compiler, C-SPY / Embedded Workbench Debugger / IDE
	Keil	RealView C/C++ Compiler, µVision Debugger / IDE
	Rowley	CrossWorks for ARM (C/C++ Compiler, CrossStudio Debugger / IDE)
RTOS	CMX	CMX-RTX™ RTOS offering small footprint, fast context switch times
	Express Logic	ThreadX advanced RTOS designed specifically for deeply embedded applications
	FreeRTOS.org	FreeRTOS.org™ Open-Source mini real-time kernel
	IAR	PowerPac™ fully featured RTOS combined with a high-performance file system
	Keil	RTX flexible royalty-free RTOS with source code
	Micrium	Portable, scalable, preemptive real-time, multitasking kernel (RTOS)
	Micro Digital	SMX® no-royalty, modular, multitasking RTOS for embedded systems
	Quadros	RTXC for embedded applications
	RoweBots	Unison ultra-tiny embedded Linux and POSIX-compatible RTOS
	WITTENSTEIN	SAFERTOS™ RTOS kernal for certified and critical applications
	SCIOPTA	SCIOPTA real-time operating system for safety-critical applications
	SEGGER	embOS RTOS for embedded applications
Stacks / Specialty	CMX	CMX-USB device, CMX-CANopen™, CMX MicroNet, and TCP/IP protocol stacks
	eLua	Embedded Lua programming language for Stellaris
	Express Logic	NetX™ TCP/IP and USBX™ supporting USB host and device
	Interniche	NicheLite and ARM network evaluation kits
	Micrium	µC/USB device, µC/USB host, µC/TCP-IP, µC/Modbus, µC/CAN protocol stacks
	Micro Digital	smxUSBD device, smxUSBH host, and smxUSBO On-the-Go (OTG) stacks
	port GmbH	CANopen Library for Stellaris microcontrollers
	Quadros	RTXCusb host and device stacks, CANopenRT CAN stack, and QuadNet TCP/IP
	RTA Automation	RTA Automation DeviceNet™ protocol stacks
	SEGGER	embOS/IP TCP/IP and emUSB device stack
	zhaw	IEEE1588
	SEVENSTAX	SEVENSTAX TCP/IP-stack and embedded web server

Please refer to the selection table on page 15 for more product information.

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Product Selection Tables

Sitara™ Processors

Part Number	CPU	Graphics	ARM® MHz (Max)	L1P (Bytes)	L1D (Bytes)	L2 (Bytes)	RAM (Bytes)	ROM (Bytes)	External Memory I/F	DMA (Ch)	Timers	Serial Ports	Misc	Voltage (V)		Packaging	1-KU Approx. Price[1]
														Core	I/O		
AM3517	ARM Cortex™-A8	PowerVR SGX™	500	16 K	16 K	256 K	64 K	352 K	NAND, DDR2	1	12	I²C, SPI, UART, Synch Serial, USB, MMC/ SDIO, EMAC, CAN	8-bit video port, 16-bit video port, 186 GPIO	1.2	1.8/ 3.3	491-pin sBGA, 17mm×17mm, 0.65-mm pitch	24.00
AM3505	ARM Cortex-A8		500	16 K	16 K	256 K	64 K	352 K	NAND, DDR2	1	12	I²C, SPI, UART, Synch Serial, USB, MMC/ SDIO, EMAC, CAN	8-bit video port, 16-bit video port, 186 GPIO	1.2	1.8/ 3.3	491-pin sBGA, 17mm×17mm, 0.65-mm pitch	21.45

[1] Prices are quoted in U.S. dollars and represent year 2009 suggested resale pricing. All prices are subject to change. Customers are advised to obtain the most current and complete pricing information from TI before placing orders. TI may verify final pricing before accepting any order.

*New devices are listed in **bold red**.*

OMAP35x Applications Processors

Part Number	CPU	Graphics	Frequency (MHz)	L1P (Bytes)	L1D (Bytes)	L2 (Bytes)	RAM (Bytes)	ROM (Bytes)	External Memory I/F	DMA (Ch)	Timers	Serial Ports	Misc	Voltage (V)		Packaging	1-KU Price[1]
														Core	I/O		
OMAP3530	ARM Cortex-A8, C64x+™	PowerVR SGX	600 430	16 K 32 K	16 K 32 K + 48 K SRAM	256 K 64 K + 32 K SRAM	64 K	112 K 64 K	LPDDR, NOR, NAND, OneNAND, SRAM	32 64	12 GP, 2 WDT	5 McBSP, 4 McSPI, 3 I²C, 1 HS USB 2.0 OTG, 1 HS USB Host (3 port), 1 HDQ/1-Wire, 3 UART (1 IrDA+CSI)	HW video accelerator, NEON coprocessor, LCD, TV out, Camera I/F, MMU, 3 MMC/SD/SDIO, 196 GPIO (shared)	1.35	1.8†	0.4 mm PoP, 515-pin PBGA (12mm×12mm), 0.5-mm PoP, 515-pin PBGA (14mm×14mm), 0.65 mm, 423-pin PBGA (16mm×16mm)	41.70
OMAP3525	ARM Cortex-A8, C64x+	–	600 430	32 K 32 K	16 K 32 K + 48 K SRAM	256 K 64 K + 32 K SRAM	64 K	112 K 16 K	LPDDR, NOR, NAND, OneNAND, SRAM	32 64	12 GP, 2 WDT	5 McBSP, 4 McSPI, 3 I²C, 1 HS USB 2.0 OTG, 1 HS USB Host (3 port), 1 HDQ/1-Wire, 3 UART (1 IrDA+CSI)	HW video accelerator, NEON coprocessor, LCD, TV out, Camera I/F, MMU, 3 MMC/SD/SDIO, 196 GPIO (shared)	1.35	1.8†	0.4 mm PoP, 515-pin PBGA (12mm×12mm), 0.5-mm PoP, 515-pin PBGA (14mm×14mm), 0.65 mm, 423-pin PBGA (16mm×16mm)	37.50
OMAP3515	ARM Cortex-A8	POWERVR SGX	600	16 K	16 K	256 K	64 K	112 K	LPDDR, NOR, NAND, OneNAND, SRAM	32	12 GP, 2 WDT	5 McBSP, 4 McSPI, 3 I²C, 1 HS USB 2.0 OTG, 1 HS USB Host (3 port), 1 HDQ/1-Wire, 3 UART (1 IrDA+CSI)	NEON coprocessor, LCD, TV out, Camera I/F, MMU, 3 MMC/SD/SDIO, 196 GPIO (shared)	1.35	1.8†	0.4 mm PoP, 515-pin PBGA (12mm×12mm), 0.5-mm PoP, 515-pin PBGA (14mm×14mm), 0.65 mm, 423-pin PBGA (16mm×16mm)	33.85
OMAP3503	ARM Cortex-A8	–	600	16 K	16 K	256 K	64 K	112 K	LPDDR, NOR, NAND, OneNAND, SRAM	32	12 GP, 2 WDT	5 McBSP, 4 McSPI, 3 I²C, 1 HS USB 2.0 OTG, 1 HS USB Host (3 port), 1 HDQ/1-Wire, 3 UART (1 IrDA+CSI)	NEON coprocessor, LCD, TV out, Camera I/F, MMU, 3 MMC/SD/SDIO, 196 GPIO (shared)	1.35	1.8†	0.4 mm 515-pin pBGA (12mm×12mm) 0.65 mm 423-pin pBGA (16mm×16mm)	22.55

[1] Prices are quoted in U.S. dollars and represent year 2009 suggested resale pricing. All prices are subject to change. Customers are advised to obtain the most current and complete pricing information from TI before placing orders. TI may verify final pricing before accepting any order.

† MMC1 is 3.0 V.

*New devices are listed in **bold red.***

OMAP-L1x Applications Processors

Part Number	CPU	Frequency (MHz)	L1P (Bytes)	L1D (Bytes)	L2 (Bytes)	RAM (Bytes)	External Memory I/F	DMA (Ch)	Timers	Serial Ports	Misc	Voltage (V)		Packaging	1-KU Price[1]
												Core	I/O		
OMAP-L137	ARM926EJS, C674x	300 300	16 K 32 K	16 K 32 K	256 K	128 K Shared	SDRAM, NAND, NOR	32	1 GP, 1 GP/WD	USB 2.0 HS OTG, USB 1.1, 3 McASP, 2 SPI 2 I²C, 3 UART	10/100 Ethernet MAC, MMC/SD, 3 PWMs, LCD controller, 3 eCAP, 2 eQEP, UHPI	1.2	1.8/3.3	1.0-mm 256-pin BGA (17mm×17mm)	16.35
OMAP-L138	ARM926EJS, C674x	300 300	16 K 32 K	16 K 32 K	256 K	128 K Shared	DDR2, mDDR, NAND, NOR, SDRAM	64	3 GP, 1 GP/WD	USB 2.0 HS OTG, USB 1.1, 1 McASP, 2 McBSP, 2 I²C, 3 UART, 2 SPI	10/100 Ethernet MAC, 2 MMC/SD, 2 PWMs, LCD controller, video interface, UHPI, SATA, 3 eCAP	1.0–1.2	1.8/3.3	0.8-mm 361-pin BGA (16mm×16mm), 0.65-mm 361-pin BGA (13mm×13mm)	18.60

[1] Prices are quoted in U.S. dollars and represent year 2009 suggested resale pricing. All prices are subject to change. Customers are advised to obtain the most current and complete pricing information from TI before placing orders. TI may verify final pricing before accepting any order.

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DaVinci™ Digital Media Processors

Device	CPU	Frequency (MHz)	L1/ SRAM (Bytes)	L2/ SRAM (Bytes)	ROM (Bytes)	External Memory I/F	EDMA	Video Ports (Configur-able)	Serial I/F	Connectivity I/F	Program/Data Storage	Voltage		Packaging	1-KU Price[1]
												Core	I/O		
TMS320DM6446AZWT	C64x+™, ARM9™ DaVinci Video	594 (DSP) 297 (ARM)	112 K (DSP) 40 K (ARM)	64 K (DSP)	16 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64 Ch	1 Input, 1 Output	ASP, I²C, SPI, 3 UARTs	USB 2.0, VLYNQ™, 10/100 EMAC	Async SRAM, DDR2 SDRAM NAND Flash, SmartMedia/xD	1.2	1.8/ 3.3	361 BGA, 16×16 mm	35.63
TMS320DM6446AZWTA	C64x+, ARM9 DaVinci Video	594 (DSP) 256.5 (ARM)	112 K (DSP) 40 K (ARM)	64 K (DSP)	16 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64 Ch	1 Input, 1 Output	ASP, I²C, SPI, 3 UARTs	USB 2.0, VLYNQ, 10/100 EMAC	Async SRAM, DDR2 SDRAM NAND Flash, SmartMedia/xD	1.2	1.8/ 3.3	361 BGA, 16×16 mm	35.63
TMS320DM6443AZWT	C64x+, ARM9, DaVinci Video	594 (DSP) 297 (ARM)	112 K (DSP) 40 K (ARM)	64 K (DSP)	16 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64 Ch	1 Output	ASP, I²C, SPI, 3 UARTs	USB 2.0, VLYNQ, 10/100 EMAC	Async SRAM, DDR2 SDRAM, NAND Flash, SmartMedia/xD	1.2	1.8/ 3.3	361 BGA, 16×16 mm	30.54
TMS320DM6441AZWT	C64x+, ARM9, DaVinci Video	513/405 (DSP) 256/202.5 (ARM)	112 K (DSP) 40 K (ARM)	64 K (DSP)	16 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64 Ch	1 Input, 1 Output	ASP, I²C, SPI, 3 UARTs	USB 2.0, VLYNQ, 10/100 EMAC	Async SRAM, DDR2 SDRAM NAND Flash, SmartMedia/xD	1.2/ 1.05	1.8/ 3.3	361 BGA, 16×16 mm	30.35

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[2] Q designates Q100 automotive reliability.

[3] McBSP can be configured as an SPI peripheral.

*New devices are listed in **bold red.***

DaVinci™ Digital Media Processors

Device	CPU	Frequency (MHz)	L1/ SRAM (Bytes)	L2/ SRAM (Bytes)	ROM (Bytes)	External Memory I/F	EDMA (Ch)	Video Ports (Config-urable)	Serial I/F	Connectivity I/F	Program/Data Storage	Voltage		Packaging	1-KU Price[1]
												Core	I/O		
TMS320DM6467ZUT	C64x+™, ARM9™ DaVinci HD Video	594 (DSP) 297 (ARM)	64 K (DSP) 56 K (ARM)	128 K (DSP)	8 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64	See Note 2	2 McASPs, I²C, SPI, 3 UARTs (with IrDA and CIR support)	32-Bit PCI (33 MHz), USB 2.0, PHY, VLYNQ, 10/100/1000 EMAC (w/ MII, GMII, & MDIO support), 32-/16-Bit HPI	Async SRAM, DDR2 SDRAM SmartMedia/ SSFDC/xD, NAND Flash, NOR Flash	1.2	1.8/ 3.3	529 BGA, 19 × 19 mm	66.82
TMS320DM6467ZUT7	C64x+, ARM9 DaVinci HD Video	729 (DSP) 364.5 (ARM)	64 K (DSP) 56 K (ARM)	128 K (DSP)	8 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64	See Note 2	2 McASPs, I²C, SPI, 3 UARTs (with IrDA and CIR support)	32-Bit PCI (33 MHz), USB 2.0, PHY, VLYNQ, 10/100/1000 EMAC (w/ MII, GMII, & MDIO support), 32-/16-Bit HPI	Async SRAM, DDR2 SDRAM SmartMedia/ SSFDC/xD, NAND Flash, NOR Flash	1.2	1.8/ 3.3	529 BGA, 19 × 19 mm	83.53
TMS320DM6467ZUTA	C64x+, ARM9 DaVinci HD Video	594 (DSP) 297 (ARM)	64 K (DSP) 56 K (ARM)	128 K (DSP)	8 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64	See Note 2	2 McASPs, I²C, SPI, 3 UARTs (with IrDA and CIR support)	32-Bit PCI (33 MHz), USB 2.0, PHY, VLYNQ, 10/100/1000 EMAC (w/ MII, GMII, & MDIO support), 32-/16-Bit HPI	Async SRAM, DDR2 SDRAM SmartMedia/ SSFDC/xD, NAND Flash, NOR Flash	1.2	1.8/ 3.3	529 BGA, 19 × 19 mm	80.18
TMS320DM6467ZUTAV	C64x+, ARM9 DaVinci HD Video	594 (DSP) 297 (ARM)	64 K (DSP) 56 K (ARM)	128 K (DSP)	8 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64	See Note 2	2 McASPs, I²C, SPI, 3 UARTs (with IrDA and CIR support)	32-Bit PCI (33 MHz), USB 2.0, PHY, VLYNQ, 10/100/1000 EMAC (w/ MII, GMII, & MDIO support), 32-/16-Bit HPI	Async SRAM, DDR2 SDRAM SmartMedia/ SSFDC/xD, NAND Flash, NOR Flash	1.2/ 1.05	1.8/ 3.3	529 BGA, 19 × 19 mm	80.18
TMS320DM6467ZUTD7	C64x+, ARM9 DaVinci HD Video	729 (DSP) 364.5 (ARM)	64 K (DSP) 56 K (ARM)	128 K (DSP)	8 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64	See Note 2	2 McASPs, I²C, SPI, 3 UARTs (with IrDA and CIR support)	32-Bit PCI (33 MHz), USB 2.0, PHY, VLYNQ, 10/100/1000 EMAC (w/ MII, GMII, & MDIO support), 32-/16-Bit HPI	Async SRAM, DDR2 SDRAM SmartMedia/ SSFDC/xD, NAND Flash, NOR Flash	1.2/ 1.05	1.8/ 3.3	529 BGA, 19 × 19 mm	93.55
TMS320DM6467ZUTV	C64x+, ARM9 DaVinci HD Video	594 (DSP) 297 (ARM)	64 K (DSP) 56 K (ARM)	128 K (DSP)	8 K (ARM)	1 16-/8-Bit EMIFA 1 32-/16-Bit DDR2	64	See Note 2	2 McASPs, I²C, SPI, 3 UARTs (with IrDA and CIR support)	32-Bit PCI (33 MHz), USB 2.0, PHY, VLYNQ, 10/100/1000 EMAC (w/ MII, GMII, & MDIO support), 32-/16-Bit HPI	Async SRAM, DDR2 SDRAM SmartMedia/ SSFDC/xD, NAND Flash, NOR Flash	1.2/ 1.05	1.8/ 3.3	529 BGA, 19 × 19 mm	66.82
TMX320DM335ZCE135 **TMX320DM335ZCE216**	ARM9, DaVinci Video	135 216	32 K	–	8 K	1 16-/8-Bit EMIFA, 1 16-Bit mDDR/ DDR2	64	1 Input, 1 Output	3 SPI, 2 ASP, 3 UARTs, I²C	USB 2.0 HS	Async SRAM, mDDR/DDR2 SDRAM, OneNAND, NAND Flash, SmartMedia/ xD	1.3	1.8/ 3.3	337 BGA, 13 × 13 mm	9.05 10.25
TMX320DM355ZCE216 TMX320DM355ZCE270	ARM9, DaVinci Video	216 270	–	–	8 K	1 16-/8-Bit EMIFA, 1 16-Bit mDDR/ DDR2	64	1 Input, 1 Output	3 SPI, 2 ASP, 3 UARTs, I²C	USB 2.0 HS	Async SRAM, mDDR/DDR2 SDRAM, NAND Flash, SmartMedia/ xD	1.3	1.8/ 3.3	329 BGA, 13 × 13 mm	13.85 18.55
TMX320DM357ZWT	ARM9, DaVinci Video	270	–	–	8 K	1 16-/8-Bit EMIFA, 1 32-/ 16-Bit DDR2	64	1 Input, 1 Output	1 SPI, 1 ASP, 3 UARTs, 1 MMD/SD, I²C	USB 2.0 HS	Async SRAM, DDR2 SDRAM, NAND Flash, SmartMedia/ xD	1.2	1.8/ 3.3	361 nFBGA, 16 × 16 mm	18.30
TMX320DM365ZCE270 **TMX320DM365ZCE300**	ARM9, DaVinci Video	270 300	32 K	–	16 K	1 16-/8-Bit EMIFA, 1 16-Bit mDDR/ DDR2	64	1 Input, 3 Outputs	5 SPI, 2 ASP, 2 UARTs, 2 SD MMC, I²C	USB 2.0 HS, EMAC	Async SRAM, mDDR/DDR2 SDRAM, OneNAND, NAND Flash, SmartMedia/ xD	1.2/ 1.35	1.8/ 3.3	338 BGA, 13 × 13 mm	19.25 25.05

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[2] Video port [config. for dual 8-bit SD (BT.565), single 16-bit HD (BT.1120), or single 8-/10-/12-bit raw capture chs]. 1 video port [configured for dual 8-bit SD (BT.565) or single 16-bit HD (BT.1120) display chs], 2 transport stream interface for MPEG transport stream, 1 VDCE for horizontal/vertical downscaling, chroma conversion, edge padding and anti-alias filtering.

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		Flash (KB)	SRAM (KB)	ROM S/W Library	Ext. Peripheral I/F	Max Speed (MHz)	Internal Precision Oscillator	32-Bit Timer	16-Bit Timer	Watchdog Timers	CCP	RTC	Outputs	Fault Inputs	QEI	10/100 Ethernet MAC+PHY	IEEE 1588	CAN MAC	USB Full Speed	UART	I²C	SSI/SPI	I²S	ADC Channels	ADC Speed (Ksps)	Internal Temp Sensor	LDO Voltage Regulator	Analog Comparators	Digital Comparators	GPIOs (5 V)	Hibernate	Package Options
LM3S100s	2	8	2	–	–	20	–	2	4	1	2	✔	–	–	–	–	–	–	–	1	1	1	–	–	–	–	✔	2	–	18	–	48-LQFP 48-QFN
LM3S300s	8	16	4	–	–	25	–	3	6	1	6	✔	6	1	–	–	–	–	–	2	1	1	–	8	500	✔	✔	3	–	36	–	48-LQFP 48-QFN
LM3S600s	11	32	8	–	–	50	–	3	6	1	6	✔	6	1	1	–	–	–	–	2	1	1	–	8	1000	✔	✔	3	–	36	–	48-LQFP 48-QFN
LM3S800s	9	34	8	–	–	50	–	3	6	1	6	✔	6	1	1	–	–	–	–	2	1	1	–	8	1000	✔	✔	3	–	36	–	48-LQFP 48-QFN
LM3S1000s	37	256	64	✔	✔	50	✔	4	8	2	8	✔	8	3	2	–	–	–	–	3	2	2	–	8	1000	✔	✔	3	16	67	✔	64-LQFP 100-LQFP 108-BGA
LM3S2000s	26	256	96	✔	✔	80	✔	4	8	2	8	✔	8	4	2	–	–	2	–	3	2	2	✔	16	1000	✔	✔	3	16	67	✔	64-LQFP 100-LQFP 108-BGA
LM3S3000s	9	256	64	✔	✔	50	✔	4	8	2	8	✔	8	4	1	–	–	–	O/H/D	3	2	2	–	8	1000	✔	✔	3	16	67	✔	64-LQFP 100-LQFP
LM3S5000s	26	256	96	✔	✔	80	✔	4	8	2	8	✔	8	4	2	–	–	2	O/H/D	3	2	2	✔	16	1000	✔	✔	3	16	71	✔	64-LQFP 100-LQFP
LM3S6000s	19	256	64	–	–	50	–	4	8	1	6	✔	6	1	2	✔	✔	–	–	3	2	2	–	8	1000	✔	✔	3	–	46	✔	100-LQFP 108-BGA
LM3S8000s	12	256	64	–	–	50	–	4	8	1	6	✔	6	1	2	✔	✔	3	–	3	2	2	–	8	1000	✔	✔	3	–	46	✔	100-LQFP 108-BGA
LM3S9000s	8	256	96	✔	✔	100	✔	4	8	2	8	✔	8	4	2	✔	✔	2	O/H/D	3	2	2	✔	16	1000	✔	✔	3	16	65	✔	100-LQFP

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