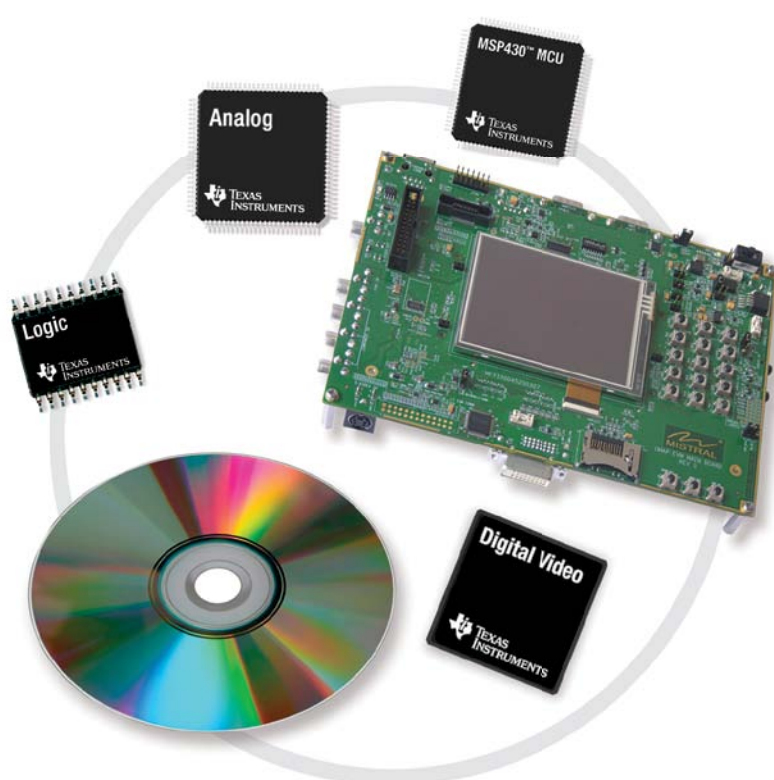


Video and Vision Guide



- Consumer Devices
- Digital Signage
- Home Entertainment
- Network Projector
- Video Communications
- Video Infrastructure
- Video Surveillance
- Vision





TI's Solutions Cover the Entire Video Chain

TI has been involved in the video market for more than 25 years. The steps in the video chain span everything from the creation of the original content to the final viewing experience.

Customers can leverage TI's vast expertise in video compression and transcoding to launch differentiated products quickly and cost effectively. TI has a number of customized solutions for various market segments that simplify development by providing access to software, tools, third parties and local support. For more information on TI's market expertise and solutions for the entire video chain, see www.ti.com/video.

Video Chain

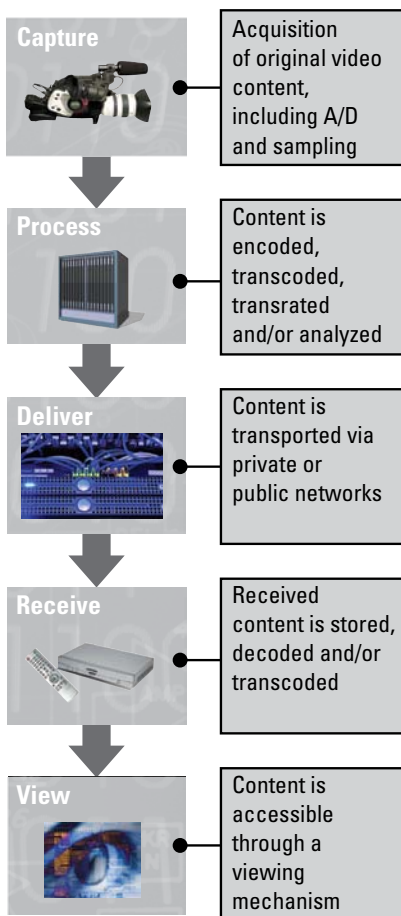


Table of Contents

Consumer Devices

Baby Monitor	3
Digital Picture Frame	4
Digital Still Camera	5
Portable Media Player	6
Video Doorbell	7

Digital Signage Solution

Digital Signage	8
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Home Entertainment Solutions

DLP® Front-End Projection	9
High-Definition (HD) Television	10
STB/Digital Video Recorder/Streaming Media	11

Network Projector Solution

Network Projector Front End	12
---------------------------------------	----

Video Communications Solutions

Video Conferencing and Communications Systems	13
Embedded Camera System	15

Video Infrastructure Solutions

Video Broadcasting and Infrastructure: Scalable Platform	16
Video Broadcasting: IP-Based Multi-Format Transcoder	17

Video Surveillance Solutions

Digital Video Recorder/Digital Video Server	18
IP Camera	20
Video Analytics Server	23

Vision Solutions

Automotive Vision	25
Intelligent Occupancy Sensing	26
Machine Vision: Camera	27
Machine Vision: Frame Grabber	29

Selection Guides

Digital Media Processors	30
Digital Signal Processors	33
OMAP™ Applications Processors	35
Video Data Converters and Encoders/Decoders	36
AFE and Support Chips and Vertical Drivers	37
HDMI, Video Switches/MUXes, Audio Codecs, Digital Audio, Line Drivers	38
Video Amplifiers	39
Audio Codecs	40
Audio Converters	41
Speaker Amps, PWM Processors and PWM-Input Class-D Power Stages	42
Audio Amplifiers	43
Amplifiers, Sample Rate Converters and Transceivers	45
Low-Power RF	46
Audio Amps, Volume Control, LCD Gamma Correction	48
Touch-Screen Controllers	49
Analog Switches and Digital Bus Switches	50
Clocks by Application	51
Logic	52
Interface	53
MSP430 Ultra Low-Power Microcontrollers	60
Digital Temperature Sensors and Switches	65
USB and PoE Power Devices, Load Switches	66
Power Management Solutions	67

Resources

DaVinci™ Technology Support	70
OMAP™ Development Tools	71
Digital Signal Processing Development Tools	72
DLP Technology Development Tools	77
eXpressDSP™ Software and Development Tools	78
Support	79
TI Worldwide Technical Support	80

Baby Monitor



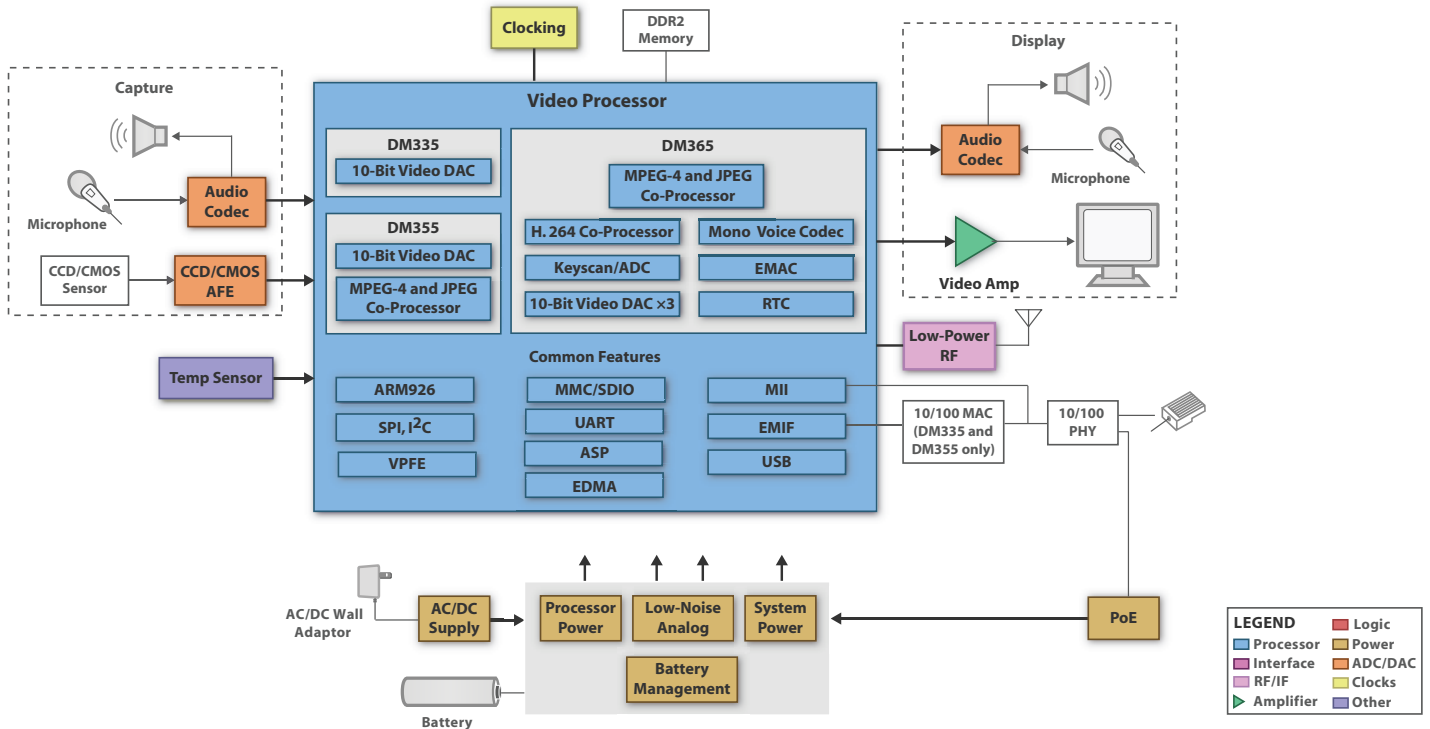
Baby monitor is a capture and display system used to remotely watch infants. At the capture side, a microphone and a camera are placed near the child to transmit audio and video to the caregiver. A parent talk-back audio system is

also provided where baby can listen to the voice of the caregiver.

At the heart of this system is the TMS320DM3xx platform of low-power processors. Live video display without video encoding (for compression or

storage) can be implemented with roughly less than 100 mW total system power consumption. Even with full video encoding, it requires less than 400 mW total system power consumption. For the latest information on TI's baby monitor solutions, see www.ti.com/babymonitor.

Baby Monitor System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
Analog Front End	VSP2582	37	Processor	TMS320DM335	31
	VSP2562	37		TMS320DM355	31
Audio Codec	TLV320AIC3101	40		TMS320DM365	31
	TLV320AIC3104	40	Temperature Sensor	TMP100	65
Clocking	CDCE913	51		TMP75	65
	CDCE925	51	Video Amplifier	OPA360	39
	CDCE949	51		THS7303	39
	CDCE937	51		THS7315	39
Low-Power RF	CC2500	47		THS7316	39
Power over Ethernet Controller	TPS2375	66		THS7314	39
	TPS23750	66		THS7374	39
	TPS2376-H	66			

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

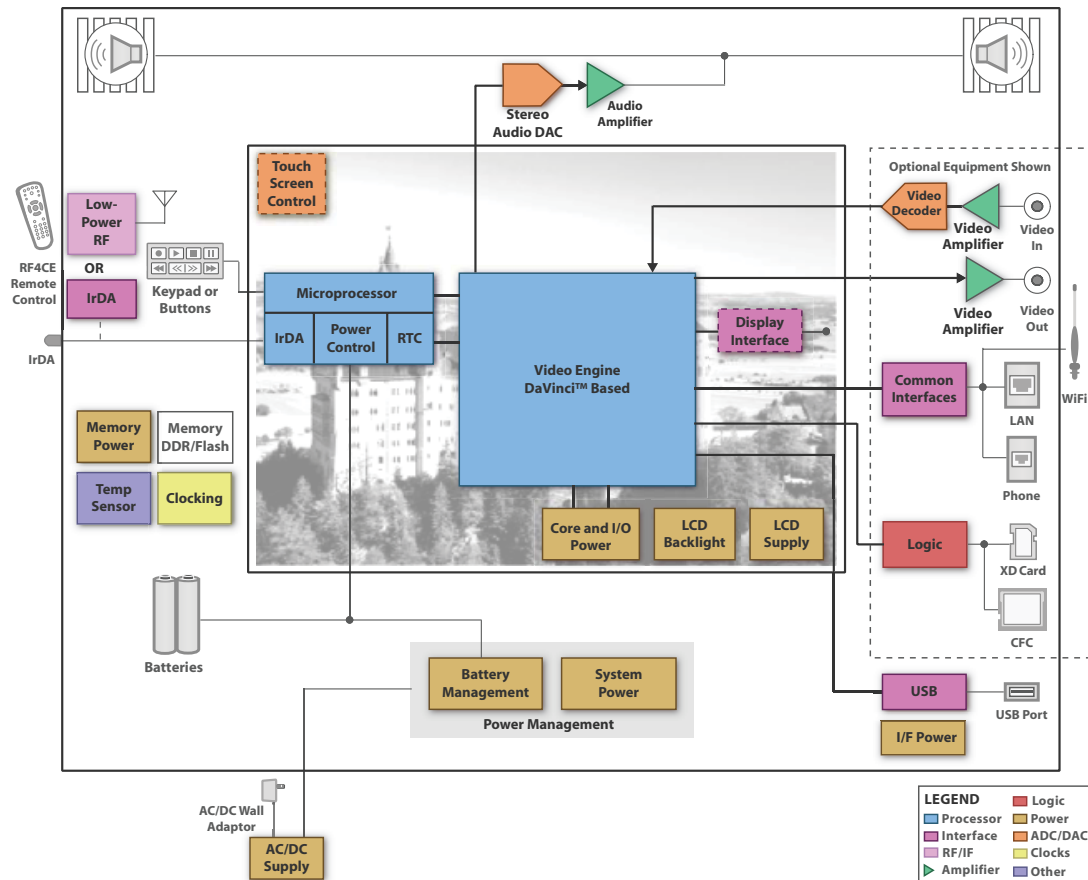
➔ Digital Picture Frame

The Digital Picture Frame (DPF) solves the problem of displaying digital photos (optional also music and videos) without a computer. While the basic function models can just show JPEG pictures in a slide show, multimedia features (zoom and rotate pictures, play music and

videos, support of all popular memory cards, internal memory, auto on/off, etc.) require high-end components but staying on the low-end side on power consumption. Next-generation multimedia picture frames offer the possibility to connect to the Internet

and download pictures or information (weather, news, etc.) from a server. For the latest information on TI's digital picture frame solutions, see www.ti.com/dpf.

Digital Picture Frame System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

➔ Featured Products

Product	TI Part #	Page	Product	TI Part #	Page
Audio Amplifier – Class AB	TPA6017A2	44	Memory Power	TPS512001	68
Audio Amplifier – Class D	TPA2050D4	48	Processor	TMS320DM335	31
	TPA2054D4	48		TMS320DM355	31
Clocking	CDCE906	51		TMS320DM365	31
	CDCE949	51	Stereo Audio DAC	TLV320DAC32	41
Core and I/O Power	TPS62260	69	Temperature Sensor	TMP102	65
	TPS73101	68		TMP20	65
Infrared Data Access	TIR1000	57	Touch-Screen Controller	TSC2046	49
LCD Backlight	TPS61161A	69		TSC2117	49
Load Switch	TPS22902	66	USB Power Switch	TPS2041B	66
Low-Power RF	CC2530	47	Video Amp	THS7314	39
MCU	MSP430F2112	61		THS7316	39
	MSP430F5435	64		THS7353	39

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

Digital Still Camera

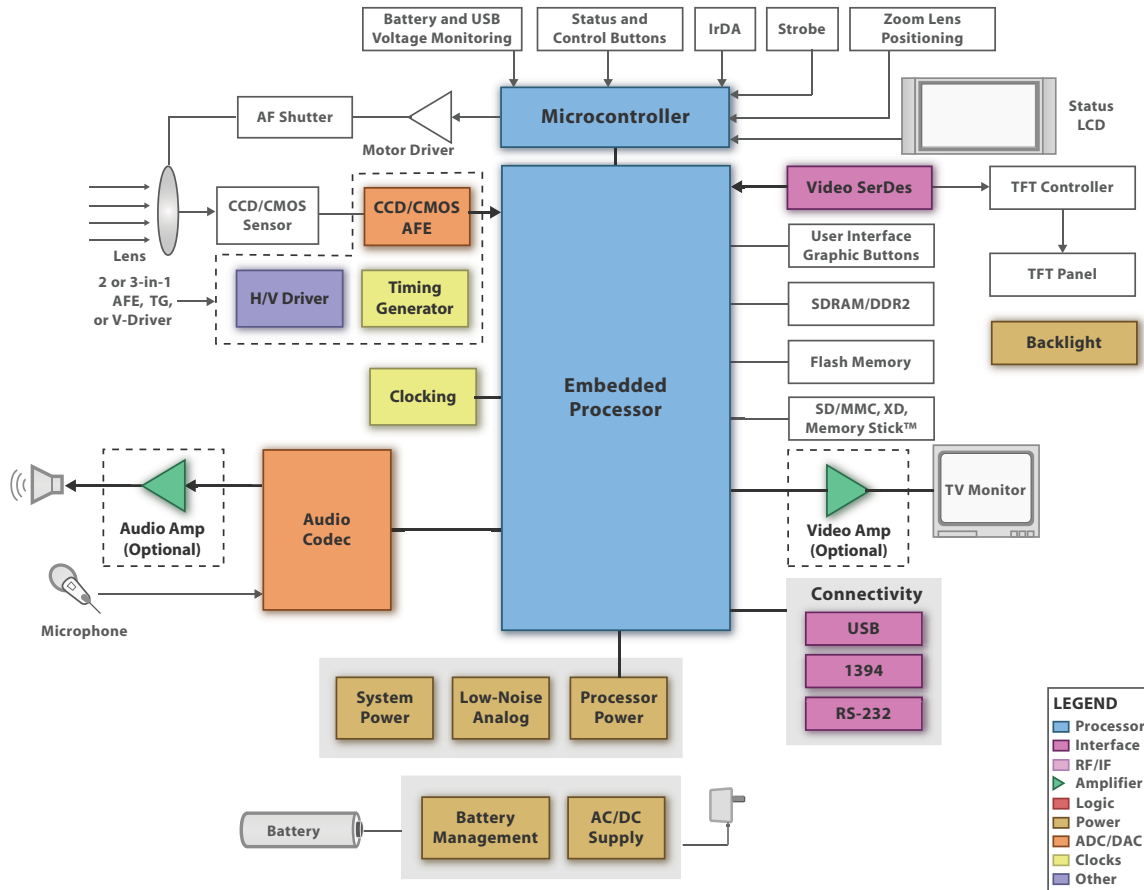


Over the last few years, digital cameras have become more and more sophisticated, enabling many advanced features such as noise filtering, instant red-eye removal, high-quality prints extracted from video, image and video stabilization, in-camera editing of pictures and wireless transmission of photos.

Texas Instruments has a long history of providing expertise and superior products to the video market. TI's comprehensive solutions cover the entire video chain – everything from the initial capture of video content to the final viewing experience. TI's optimized digital camera solutions, along with

a sophisticated and easy-to-use development environment, enable camera manufacturers to advance next-generation digital photography. For more specific information about digital still camera solutions, see www.ti.com/digitalcamera.

Digital Camera System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
1394	TSB41BA3D	56	Processor (cont'd)	TMS320DM355	31
Audio Codec	TLV320AIC3007	40		TMS320DM640	32
Clocking	CDCE913	51	RS-232	TRSF3238E	54
	CDCM61001	51	USB – ESD Solutions	TPD2E001	57
	CDCM61002	51		TPD2E009	57
	CDCM61004	51	USB Transceiver	TUSB1106	58
Load Switch	TPS22902	66	Video Amp	OPA360	39
Low-Noise Analog	TPS79901	69		THS7303	39
Microcontroller	MSP430F412	62		THS7316	39
Processor	TMS320VC5402	34			
	TMS320VC5509A	34			

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

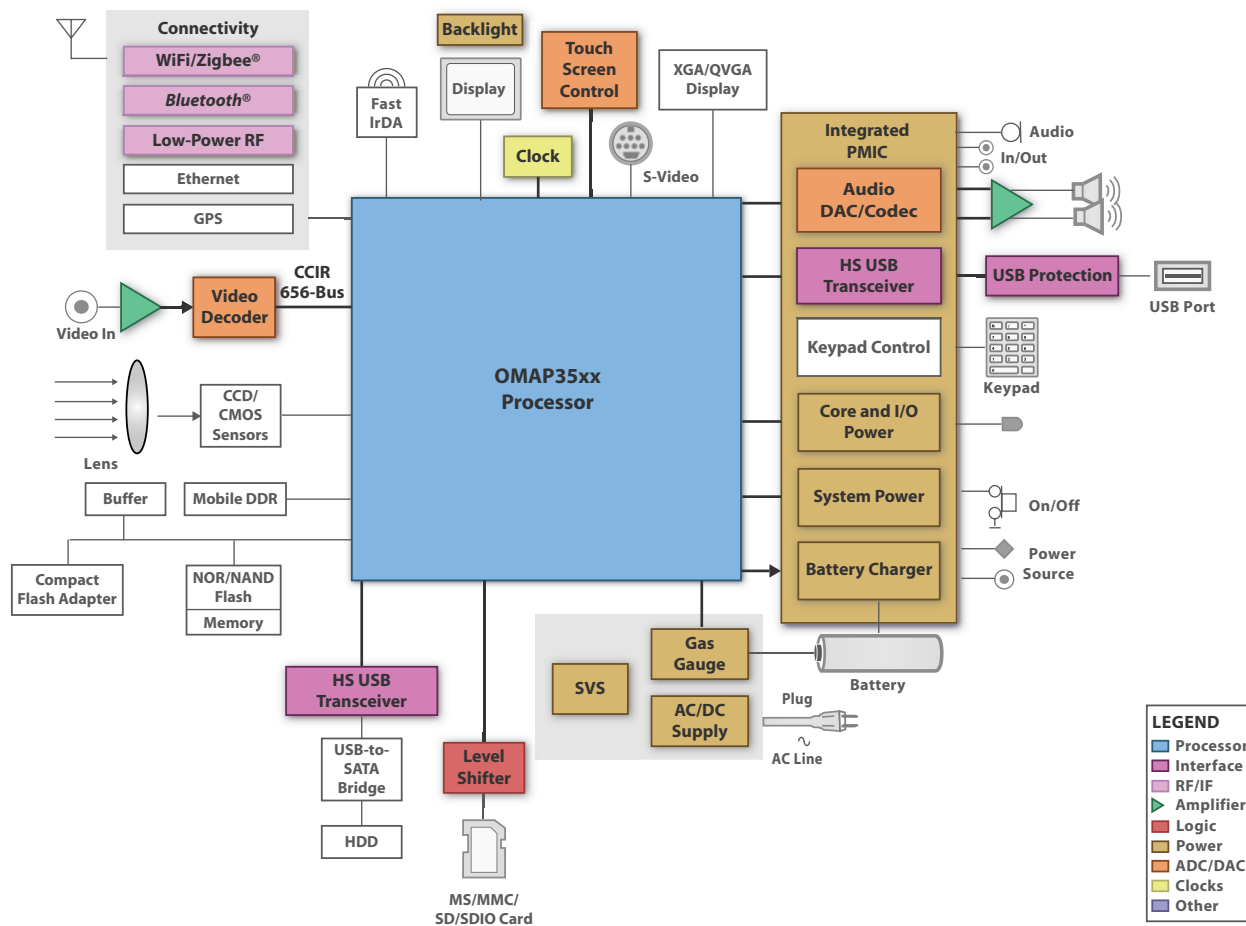
→ Portable Media Player

Typically hard-disk or Flash media based, these devices hold hours of content and provide entertainment. Sometimes called audio-video jukeboxes, portable media players or portable video players,

portable multimedia jukeboxes are handheld audio/video systems that can record and playback audio/video (A/V) from a TV, DVD player, camera, or from a media file downloaded from the Internet.

For more specific information about portable media player solutions, see www.ti.com/pmp.

Portable, Multi-Functional Digital Media Device System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

→ Featured Products

Product	TI Part #	Page	Product	TI Part #	Page
Backlight	TPS61161	69	Processor	OMAP3525	35
Clocking	CDCM61001	51		OMAP3530	35
	CDC3S04	51		TMS320DM365	31
Directionless Level Translation	TXB0102	55	SVS	TPS3808G01	69
Dual Supply Translator	SN74AVC24T245	55	Touch-Screen Control	TSC2007	49
Level Translation for Memory	SN74AVCA406	59		TSC2004	49
	TXS0206	55 / 59		TSC2046	49
Load Switch	TPS22902	66		TSC2200	49
Low-Power RF – 2.4 GHz	CC2500	47	USB Transceiver	TUSB1105	58
	CC2510F16	47		TUSB1106	58
	CC2510F32	47	Video Amplifier	THS7319	39
	CC2510F8	47			
	CC2530	47			

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

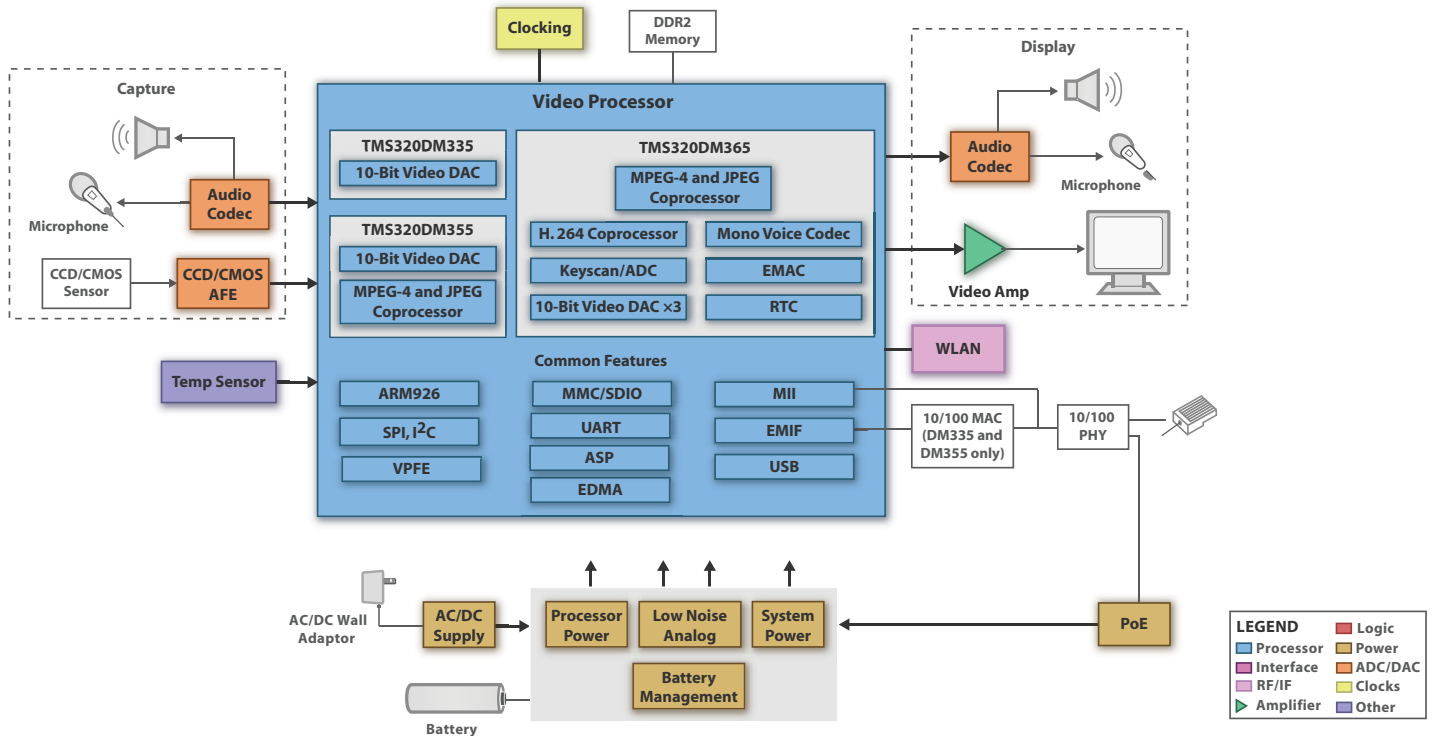
Video Doorbell 

A video doorbell system provides added security by transferring outside video and audio to an indoor display or speaker. At the heart of this system is the TMS320DM3xx platform of low-power processors which process

video and audio as well as control the user interface. The core subsystem, which Texas Instruments offers multiple solutions for, includes 1) video compression, processing and display, 2) connectivity via Ethernet, 3) audio I/Os,

and 4) power conversion products. For more specific information about video doorbell solutions, see www.ti.com/videodoorbell.

Video Doorbell System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
Clocking	CDCE913	51	Processor	TMS320DM335	31
	CDCE925	51		TMS320DM355	31
	CDCE949	51		TMS320DM365	31
Integrated PMIC	TPS65023	69	Temperature Sensor	TMP102	65
	TPS65053	69		TMP122	65
Power over Ethernet Controller	TPS2375	66		TMP75	65
	TPS23750	66	Video Amplifier	OPA360	39
	TPS23753	66		OPA361	39
	TPS2376-H	66		THS7315	39
		THS7375		39	
			THS78303	39	

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

Digital Signage

Digital signage (DS) solutions consist of displays used for advertising and communicating information to viewers outside the home. There are three main components in a DS system which include a display screen, a player and a server application called Content Management System (CMS). The

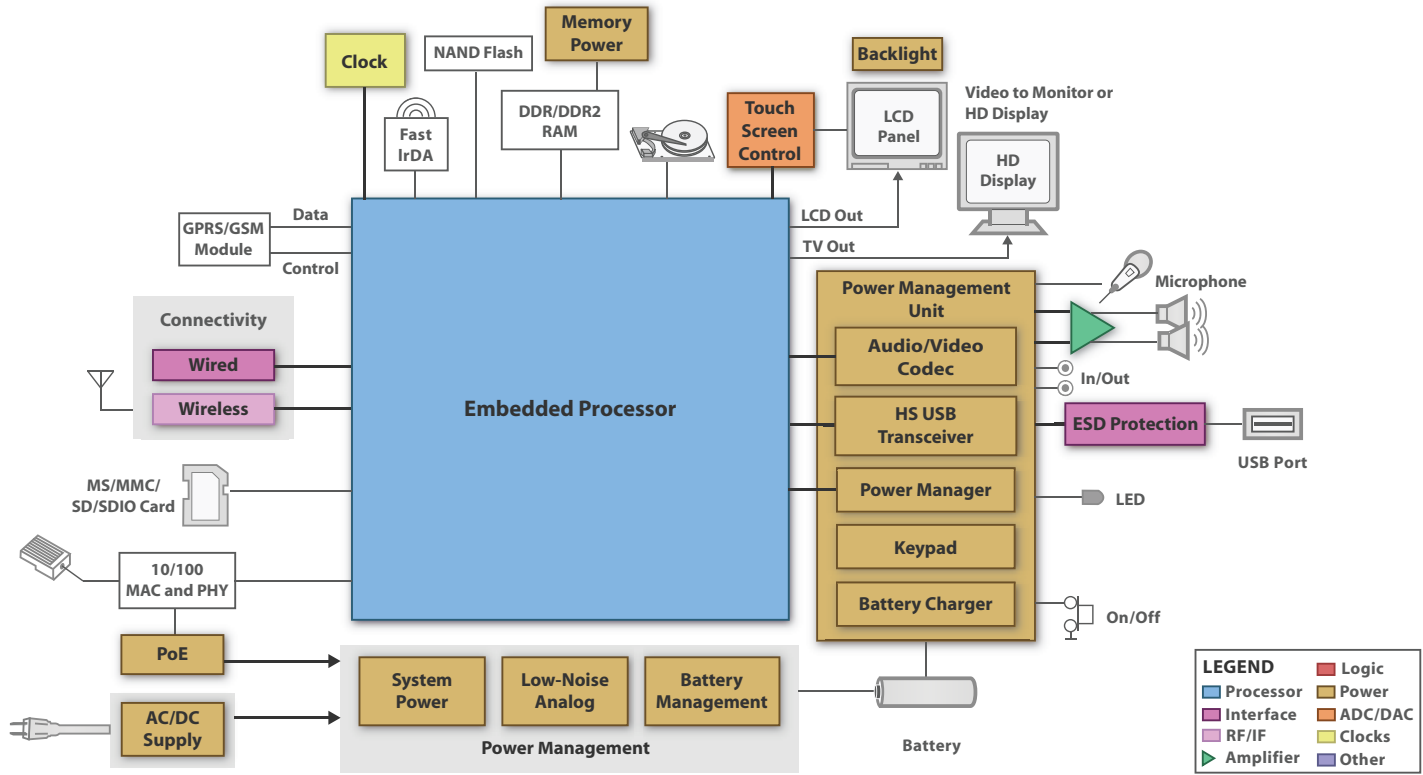
CMS, traditionally controlled by a PC, controls the schedule and content of the information played on the screen.

Because of their superior performance, embedded processors are beginning to displace PCs. Not only do they offer a far more robust system at a lower cost,

they also consume far less power and provide all the audio, video, graphic and connectivity features required in a typical signage system.

For more specific information about digital signage solutions, see www.ti.com/digitalsignage.

Digital Signage System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
Clock	CDCE949	51	Processor	OMAP3530	35
ESD Protection	TPD2E001	57 / 58		TMS320C6472	34
	TPD2E007	57		TMS320C6474	34
	TPD2E009	57		TMS320DM365	31
	TPD4E001	57 / 58	RS-232	TRS3253E	54
	TPD4E002	57	Touch-Screen Control	TSC2006	49
Low-Power RF – Sub-1 GHz	CC1110	46		TSC2000	49
	CC1101	46		TSC2004	49
	CC2500	47		TSC2007	49
Low-Power RF – 2.4 GHz	CC2510	47		TSC2046	49
	TPS51020	67		TSC2200	49
	TPS65023	69			
Power Management Unit	TPS65023	69			
Power over Ethernet Controller	TPS23750	66			
	TPS23753	66			
	TPS2376-H	66			

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

DLP® Front Projection

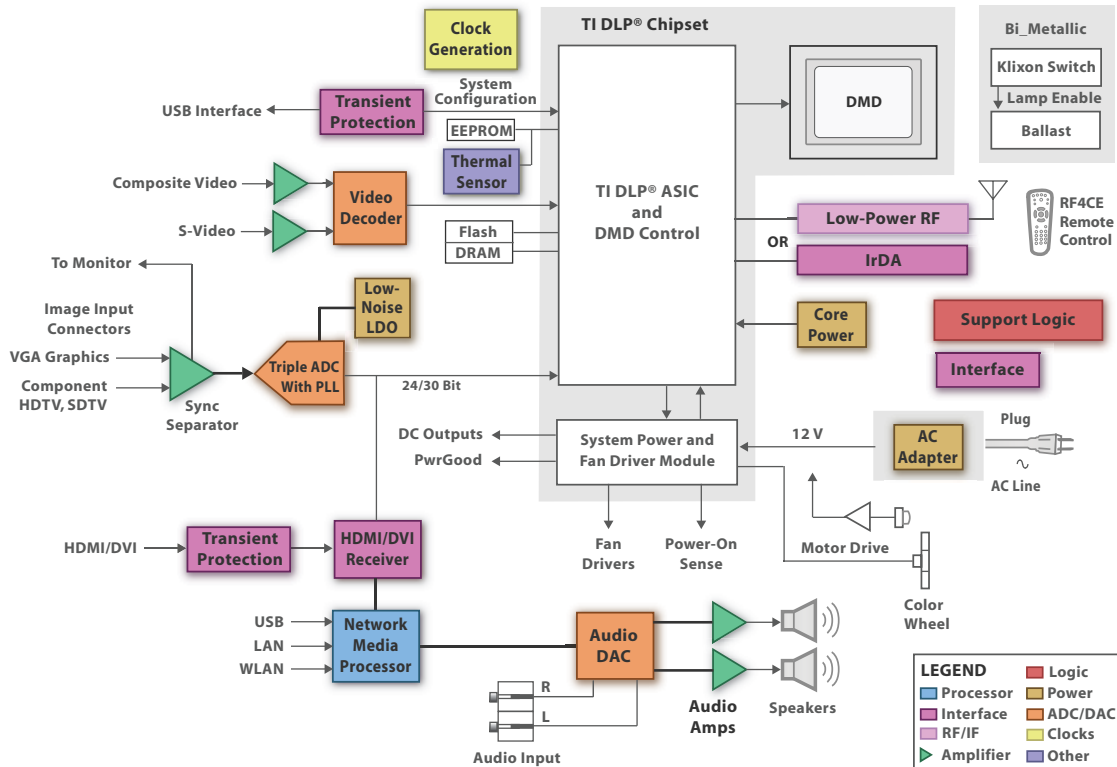
Digital TV (DTV), which can be received in standard-definition or high-definition formats, uses digital modulation data. This data is digitally compressed and requires decoding by a specially designed television set or a standard receiver with a set-top box. DTV's rapid growth in popularity is spurred by high-definition video quality as well as the availability of

a variety of new features and services, including video on demand (VoD), gaming, security, PVR, interactive TV, merchandising and Web browser capabilities.

Texas Instruments has a long history of providing expertise and superior products to the video market. TI's comprehensive solutions cover the entire

video chain – everything from the initial capture of video content to the final viewing experience. TI provides a variety of products for DTV designs including DLP® products, LCD and plasma formats that offer superior image, audio quality and better reception over analog. For the latest information on TI's DTV solutions, see www.ti.com/dlpfrontprojection.

DLP® Front Projection System Block Diagram



Featured Products			Featured Products			
Product	TI Part #	Page	Product	TI Part #	Page	
Audio Amplifier – Class-D	TPA3100D2	43	Processor	TMS320DM365	31	
	TPA3110D2	43		S/PDIF Rx/Tx	DIR9001	45
	TPA3121D2	43		DIT4192	45	
	TPA3123D2	43		DIX4192	45	
Class-D Power Stage	TAS5602	42		Temperature Sensor	TMP102	65
Class-D Speaker Amplifier	TAS5707 / 5708	42	Transient Protection	TPD2E001	57 / 58	
	TAS5709 / 5710	42		TPD3E001	57 / 58	
Clock Generator	CDCD5704	51	TPD8S009	57		
	CDCDL223	51	Triple ADC	TVP7002	36	
DVI RX	TFP503	56		Video Amplifier	THS7327	39
GPIO Expander	TCA9539	53	THS7303		39	
Low-Power RF – 2.4 GHz	CC2530	47	THS7314		39	
PFC Controller	UCC28060	67	OPA360	39		
Power Management	TPS40195	67	Video Decoder	TVP5150	36	
	TPS54350	67		TVP5146 / 47	36	
	TPS54386	67		TVP5160	36	

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

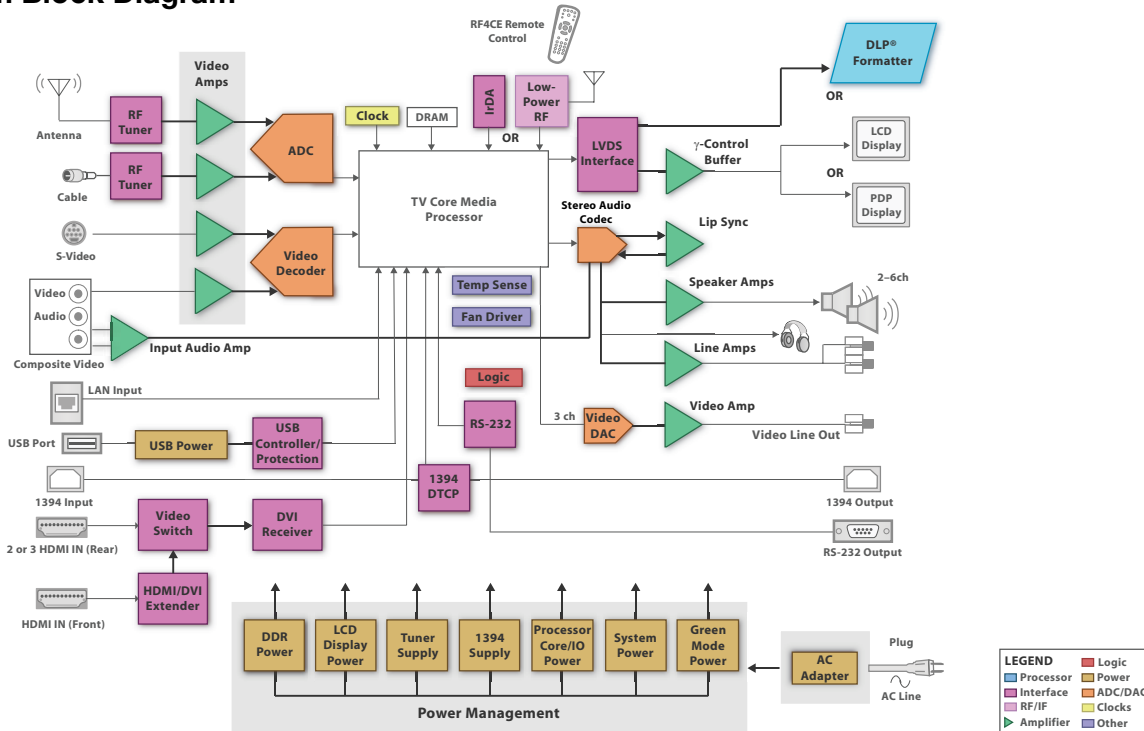
High-Definition (HD) Television

In general, a Digital TV (DTV) can be broken down into the display (and driver), core media engine, audio decoding and processing, video decoding and processing, tuner, interface block and power supply. Many of the devices needed to develop what happens behind the screen are already in TI's product

portfolio. Whether tapping into DLP® technology, DSP-based digital video processors, other core processing solutions, or other high-performance analog components, a high level of integration, flexibility and ease of use are needed for the rapidly evolving DTV market place. Leveraging high

performance audio-video codecs, graphics acceleration, communications and support is essential for the convergent applications designed into and around the home entertainment experience. For the latest information on TI's DTV solutions, see www.ti.com/hdtv.

HDTV System Block Diagram



Featured Products

Product	TI Part #	Page
1394	TSB43DA42A	56
Audio Amplifier – Class-D	TPA3110D2	43
	TPA3123D2	43
Audio ADC	PCM1850	41
Audio DAC	PCM1770	41
Class-D Power Stage	TAS5602	42
Class-D Speaker Amplifier	TAS5707	42
	TAS5710	42
Clock Buffer	CDCR83A	51
Gamma Control	BUF16821	48
	BUF08832	48
HDMI Switch	TMDS351	38
	TS3DV416	38
	TS3DV520E	38
HDMI Repeater	TMDS141	38
Headphone Amp	TPA6111A2 / 6112A2	44
	TPA4411	44
Line Driver	DRV601	38
Low-Power RF – 2.4 GHz	CC2530	47

Product	TI Part #	Page
PFC	UC2853A	67
Power Management	TPS40195	67
	TPS5430	67
	TPS54386	67
S/PDIF Rx/Tx	DIR9001	45
	DIX4192	45
Smart Card and USB Power	TPS2051B	66
Temperature Sensor	TMP75	65
USB Transient Protection	TPD3E001	57 / 58
	TPD2E009	57
Video Amplifier	THS7314 / 16	39
	THS7365	39
	THS7373 / 74	39
Video Buffer/MUX	THS7303	39
Video DAC and ADC	THS8200	36
Video Decoder	TVP5147M1	36
	TVP5160	36
Video Switch	TSSV330 / 40	38

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

STB/Digital Video Recorder/Streaming Media

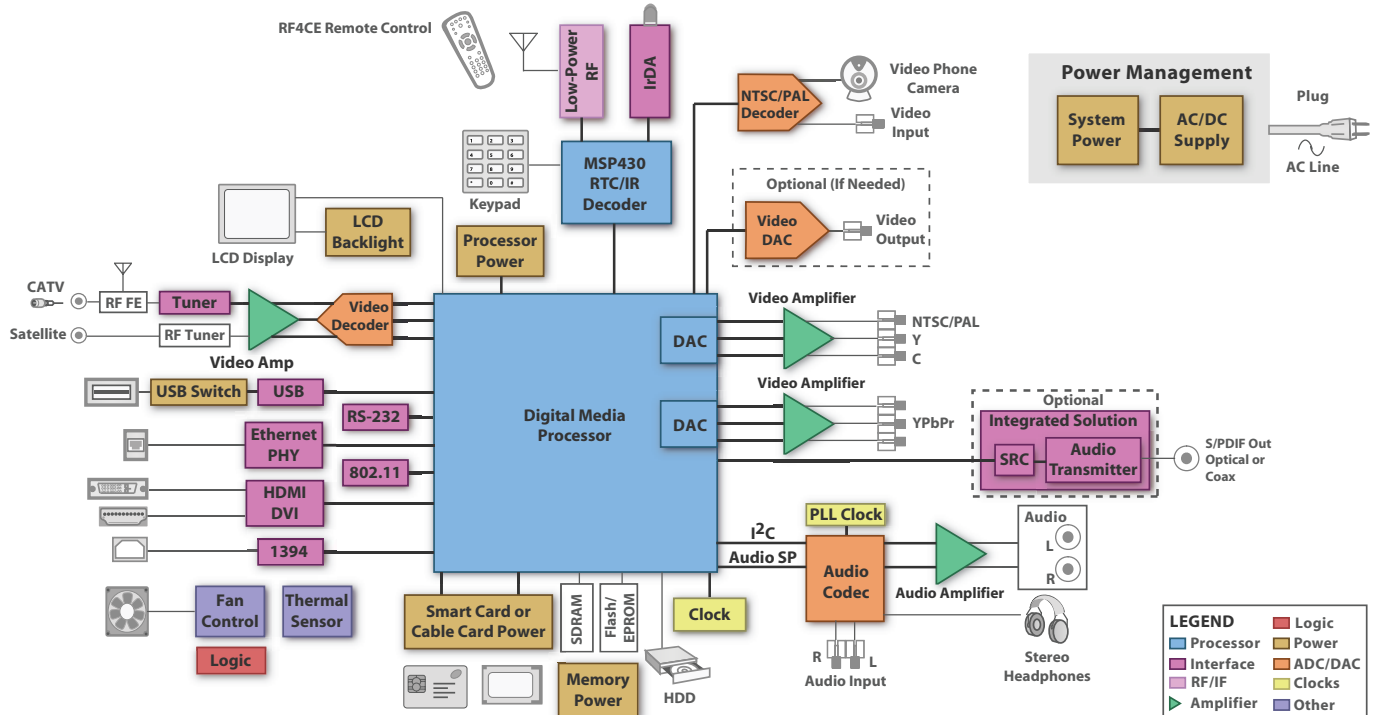


TI offers a complete digital set-top-box (STB) solution which converts signals into content which can then be displayed on a television screen. This solution can be easily used to create standalone streaming media products or digital video recorder (DVR) systems. Additionally, this

solution can also be used as a sub-system to add streaming media capability to various consumer products. With the addition of a hard disk drive (HDD), this platform can be made to support DVR or personal video recorder (PVR) functionality as well. Added system

savings can be achieved by compressing content before storing. For more specific information on STB/digital video recorder and streaming media solutions, see www.ti.com/stb-dvr-streaming.

STB/Digital Video Recorder/Streaming Media System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
1394	TSB43EA42	56	Processor (cont'd)	TMS320DM6446	30
Audio Codec	PCM3060	40		TMS320DM6467	31
Clock and Timer	CDCS502	51	Smart Card	TPS2223	67
	CDCE913	51	Temperature Sensor	TMP75	65
	CDCE949	51	USB	TPD4E002	57
Ethernet	TPD2E009	57		TUSB6020	58
HDMI/DVI	TMDS141	38		TPD2E009	57
	TPD12S521	57	USB Power Switch	TPS2042B	66
	TPD8S009	57	Video Amplifier	THS7365	39
	TFP410	56		THS7374	39
LED Backlight	TPS65120	69		THS7368	39
Line Driver	DRV603	38		THS7373	39
Low-Power RF – 2.4 GHz	CC2530	47		THS7314	39
MSP430 RTC/IR Decoder	MSP430F2132	61		THS7316	39
Processor	TMS320DM6437	30	Video Encoders / Decoder	TVP5146M2	36
	TMS320DM6441	30		TVP5147M1	36
	TMS320DM6443	30		TVP5151	36
				TVP5160	36

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

→ Network Projector Front End

Emerging trends in network projectors/ displays indicate the transition to a scenario where projectors and displays become part of an IP network that seamlessly work with all PCs, phones, calculators and other network appliances. These display screens and projectors are no longer isolated but display content that is located anywhere – the network, PCs, notebooks, netbooks and smart

phones. Networked projectors can be controlled from remote locations, provide instant status updates and even download presentation software files for later viewing.

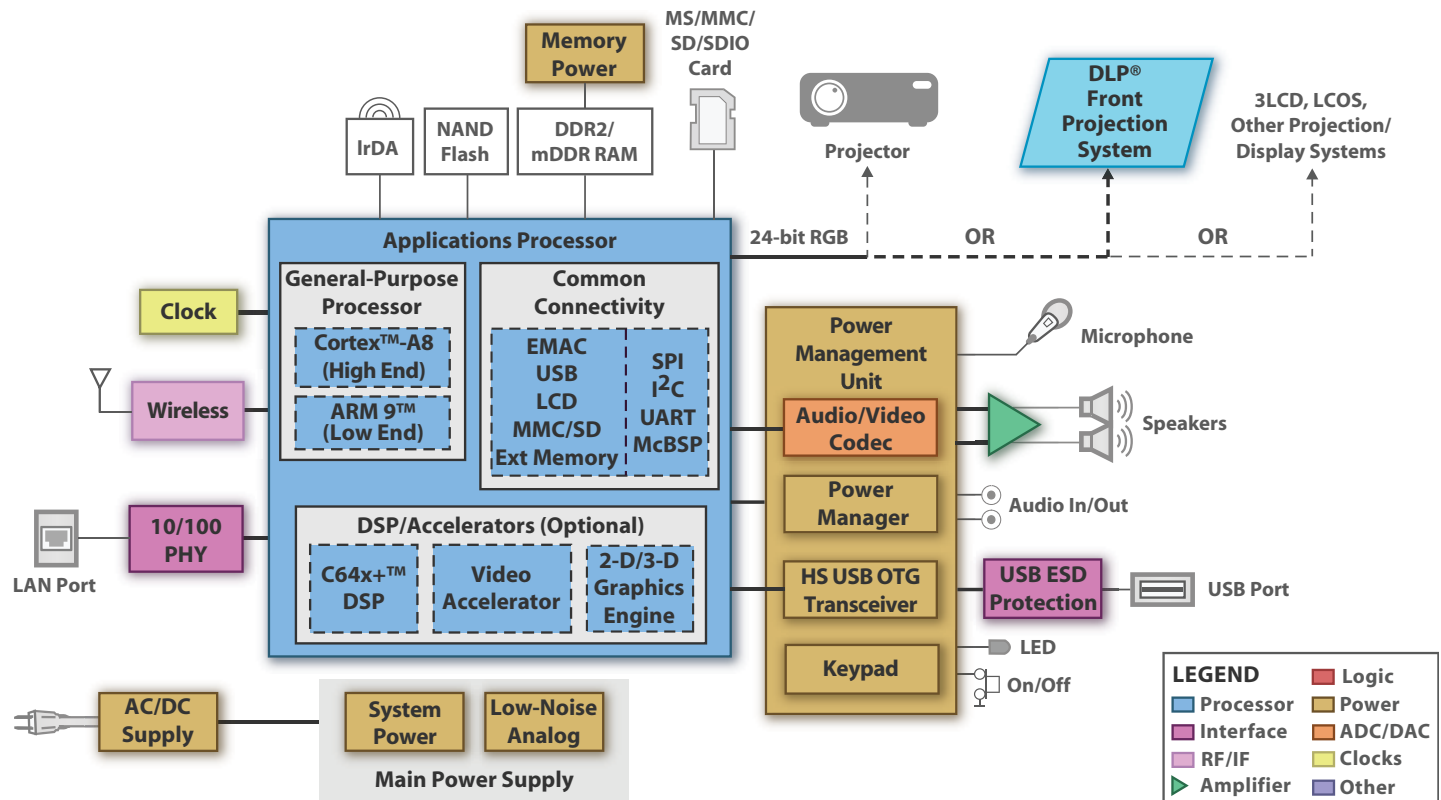
Benefits of networked projectors include:

- Remote PC capabilities, PC-less presentations, mobile uploads or direct USB connection

- Network asset management integrates with centralized control console making projectors easier to manage and control
- Ability to be controlled through the projector's Web page
- The hassle of VGA wire connection and set up will be completely relieved

For information, see www.ti.com/networkprojector.

Network Projector Front-End System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

→ Featured Products

Product	TI Part #	Page	Product	TI Part #	Page
Audio Codec	TLV320AIC3104	40	Processor	TMS320DM365	31
Audio DAC	TLV320DAC23	41		TMS320DM6443	30
Clock	CDCE949	51		OMAP3530	35
Low-Noise Analog Power	TPS71219	68	Speaker Amplifier	TPA3110D2	43
Low-Power RF – 2.4 GHz	CC2530	47		TPA6211A1	44
Memory Power	TPS51200	68 / 69	USB ESD Protection	TPD2E001	57 / 58
				TPD4E002	57
				TPD2E009	57

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

Video Conferencing and Communications Systems

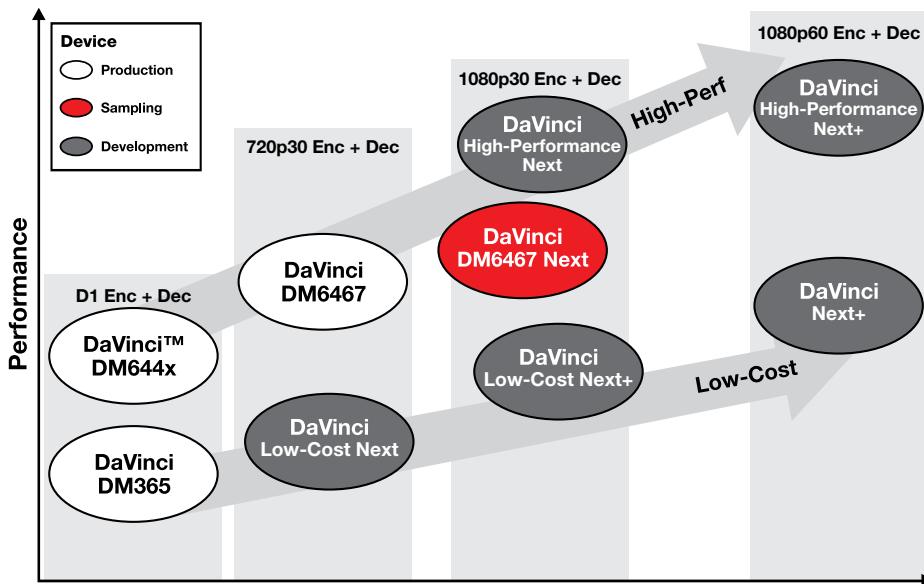


Video conferencing and communications systems have come a long way from the original systems that attempted to pass real-time MJPEG over networks designed to transport best-effort data. In contrast, today's developers have access to a wide range of industry-proven protocols and technologies specifically designed to maximize quality while increasing image resolution and reducing network latency. Video conferencing is no longer for big business, rather, it is rapidly becoming a standard means of communications for many different end equipments.

Enabled by broadband access and growing network penetration, video communications demand continues to increase in both the enterprise and residential markets. For the enterprise market, video communications products range from simple IP video phones to advanced telepresence systems. Residential, or consumer, markets demand a satisfying user experience that allows easy connectivity to family and friends, while still powerful enough to connect with the office. Network bandwidth and compression efficiencies have converged to the point where video

communications is affordable for everyone.

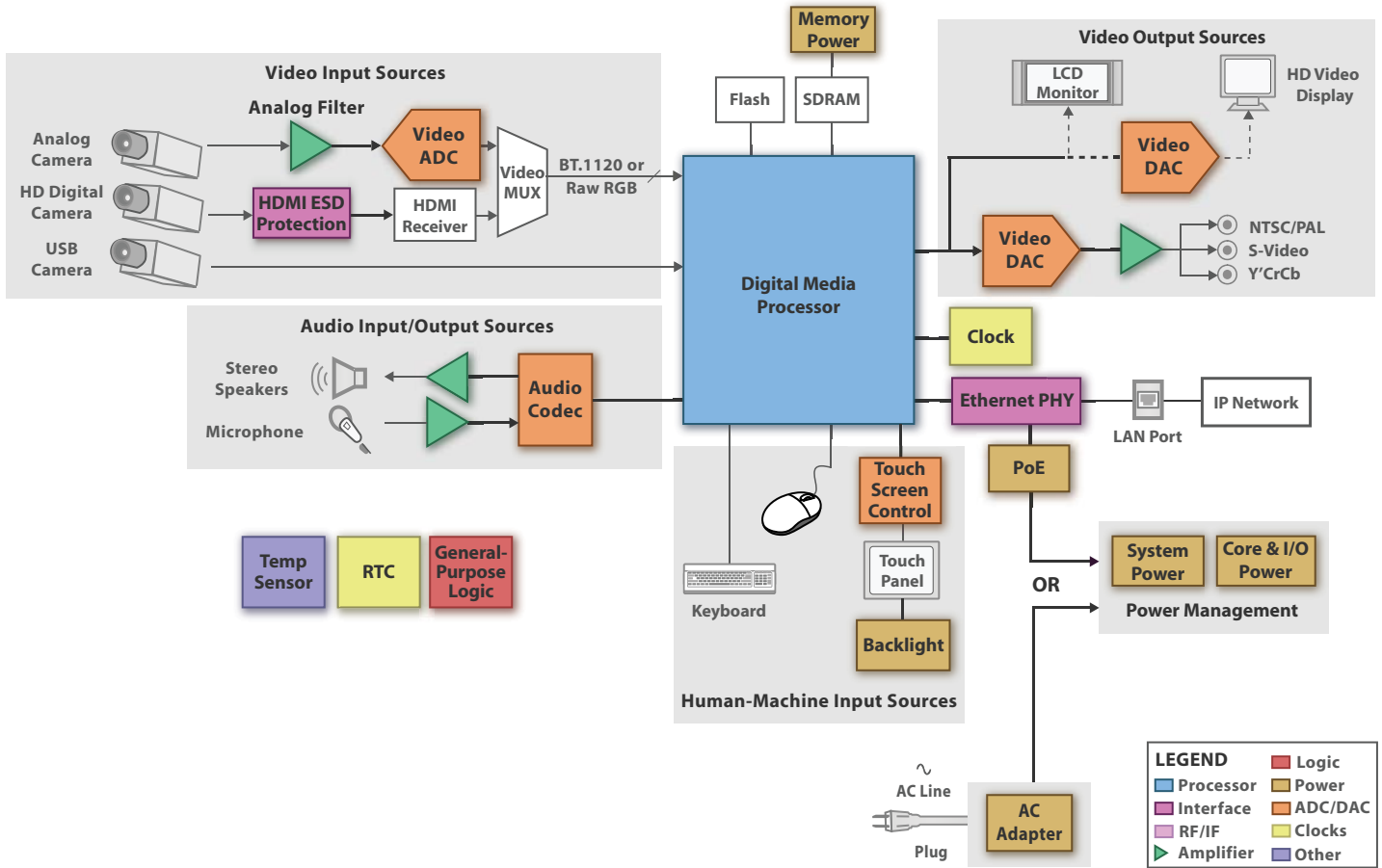
TI has a variety of solutions for this market that provide high media-processing performance, rich peripherals and maximum battery life in a video communication product. Additionally, these solutions enable a number of features including 3-D graphics, real-time audio/video/graphics processing, call control, multi-way video conferencing, OS support, browser support and more. For information about video communications solutions, see www.ti.com/videocommunications.



Digital video processors with DaVinci™ technology are ideal for the video communications market.

Video Conferencing and Communications System

Video Communications System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products				
Product	TI Part #	Page	Product	TI Part #	Page		
Analog Filter	OPA3692	39	Processor (cont'd)	TMS320DM6446	30		
	THS7303	39		TMS320DM6467	31		
	THS7353	39		OMAP3530	35		
Audio Codec	TLV320AIC3104	40		OMAP3525	35		
	TPS61161A	69		Temperature Sensor	TMP411	65	
Backlight	TPS61161A	69			TMP422	65	
Clock	CDCE906	51		Touch-Screen Controller	TSC2117	49	
Ethernet PHY	TPD2E009	57			Video Amplifier	THS7365	39
General-Purpose Logic	SN74AVC4T245	55				THS7303	39
HDMI ESD Protection	TPD8S009	57		THS7373		39	
Microphone Amplifier	PGA2500	45		THS7316		39	
Power over Ethernet Controller	TPS23753	66	THS7314	39			
Processor	TMS320DM365	31	Video DAC	THS8200	36		
	TMS320DM6441	30					

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

Embedded Camera System



End equipment designers that want to add video cameras to their systems for real-time video capture or even video communications have previously been limited to low-cost, low-quality analog cameras or they required expensive high-resolution, high-cost analog cameras. These cameras required video decoders or ADCs to effectively capture the video from these solutions. In addition to this added complexity, the system often required massive changes to be able to compress and packetize the video data.

To address these concerns, TI's digital media processors with DaVinci™ technology have integrated ARM® core, DSP core and/or video/imaging accelerators. TI's solutions allow customers to get to market quickly with low-cost and low-power options. These solutions enable a wide variety of markets including video conferencing, gaming, telemedicine, digital signage, etc.

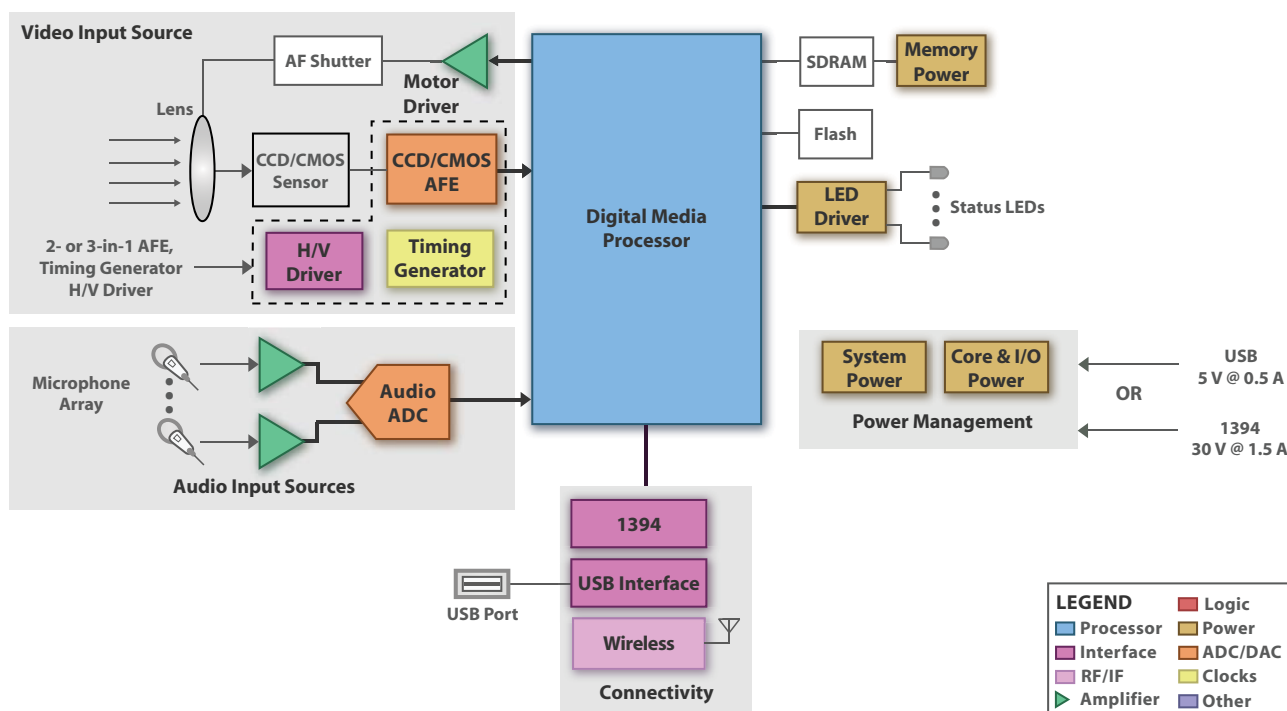
TI has a variety of solutions for this market that provide high media-

processing performance, rich peripherals and maximum battery life in an IP video phone product. Additionally, these solutions enable a number of features including 3-D graphics, real-time audio/video/graphics processing, call control, multi-way video conferencing, OS support, browser support and more.

For information about embedded camera solutions, see

www.ti.com/embeddedcamera.

Embedded Camera System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.



Featured Products

Product	TI Part #	Page	Product	TI Part #	Page
1394	TSB41BA3D	56	Processor	TMS320DM355	31
Audio ADC	PCM4204	41		TMS320DM365	31
	TLV320ADC3101	41		TMS320DM6441	30
Clock	CDCE913	51		TMS320DM6446	30
Imager Power	TPS65130	69		TMS320DM640	32
Low-Power RF – 2.4 GHz	CC2530	47	USB	TPD4E001	57 / 58
Memory Power	TPS51200	68 / 69		TUSB1106	58
Microphone Amplifier	INA217	45		TUSB2551A	58
Motor Driver	OPA567	48		TPD2E009	57

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

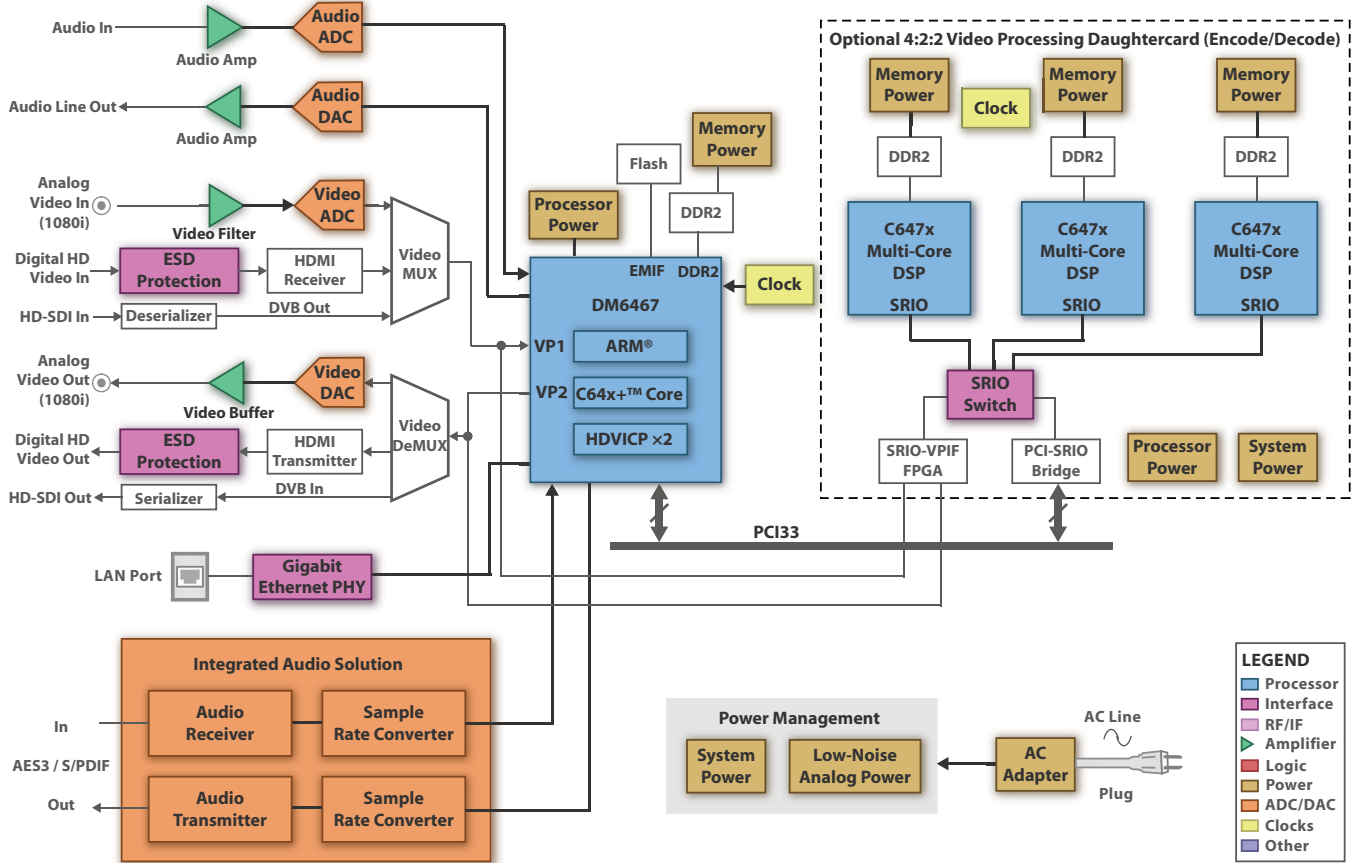
Video Broadcasting and Infrastructure: Scalable Platform

This professional studio-quality video encoding and decoding broadcast scalable platform leverages the processing power of the TMS320C6474 multi-core DSP and the flexibility of the

TMS320DM6467 digital video SoC to render a truly unique system that can be adjusted to suit the capability of the end product. In this system, the C6474 DSP is used as the codec processor for

the 4:2:2 video input. For more specific information about broadcast encoder solutions, see www.ti.com/videobroadcast.

HD Broadcast Encoder Typical System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
Audio ADC	PCM1804	41	Processor	TMS320DM6467	31
	PCM4201	41		TMS320C6472	34
	PCM4204	41	Processor Power	TPS40195	67
	PCM4222	41		TPS62110	67
Audio DAC	PCM1793	41	Sample Rate Converter	SRC4184	45
	PCM1796	41		SRC4194	45
	PCM4104	41	Signal-Conditioning Amplifier	OPA1632	45
Clock	CDCE949	51		OPA2134	45
Digital Audio Receiver	DIR9001	45		NE5532	45
Digital Audio Transmitter	DIT4192	45	Video Amplifier	THS7327	39
Line Drivers / Receiver	DRV134	48		THS7353	39
	DRV135	48		OPA361	39
	DRV601	38		THS7315	39
Memory Power	TPS51200	68		THS7375	39
			Video DAC	THS8200	36

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

Video Broadcasting: IP-Based Multi-Format Transcoder



Transcoding, which is the process of converting from one video format to another, is used quite extensively by video viewers even without their knowledge. An example of this is a typical occurrence of transferring video from a camcorder to a PC for editing and then uploading the information onto a website such as YouTube™. As the video data is being transferred, transcoding is taking place; e.g. camcorder (AVI format) to PC (MPEG-2 for editing; MPEG-4 for

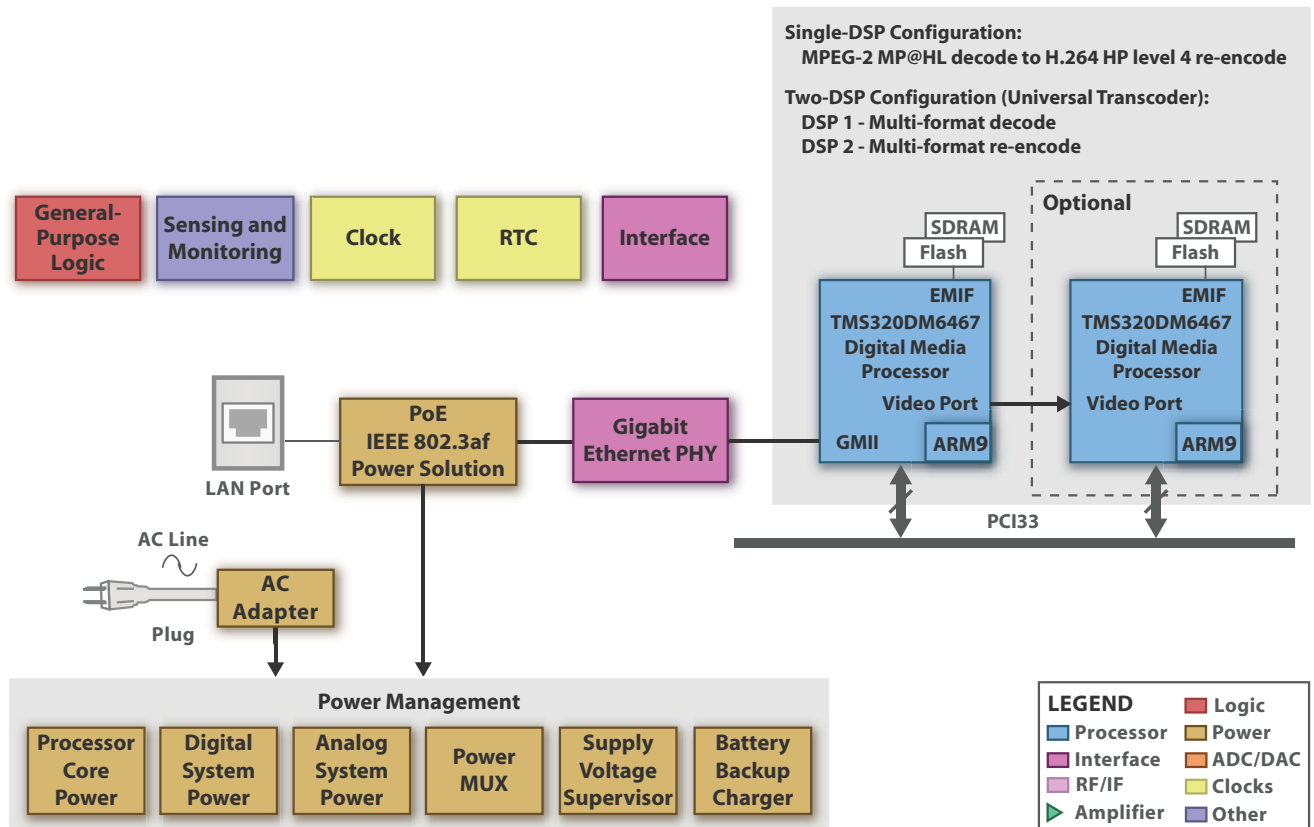
storage) to website (H.263/H.264/Flash/etc.). If the file is viewed on the PC from the website, transcoding is performed yet again to be viewed on RealPlayer™ or Windows™ Media Player, for example. It is this multi-format transcoding that was not achievable in a single SoC until now.

IP-based video infrastructure equipments are today high-performance systems due to the advent of HD video. Because HD video

carries inherently more data than standard video, the processing engine needed to transcode the video signal must: 1) have higher processing power, 2) convert to and from multiple formats, and 3) be capable of doing so in real-time. The new DaVinci™ TMS320DM6467 SoC can do just that.

For more specific information about IP-based, multi-format decoder solutions, see www.ti.com/multiformattranscoder.

Video Broadcasting: IP-Based Multi-Format Transcoder System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
Clock	CDCE949	51	Temperature Sensor	TMP275	65
General Logic	PCA9555	53		TMP411	65
	SN74CB3T16212	50		TMP421	65
Interface	TRSF3238E	54		TMP422	65
Processor	TMS320C6472	34		TMP441	65
	TMS320C6474	34		TMP442	65
	TMS320DM6467	31			

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

➔ Digital Video Recorder/Digital Video Server

A digital video recorder (DVR) and digital video server (DVS) are appliances used in video surveillance. These appliances take the analog video signals from multiple analog surveillance cameras and digitize them. A processing engine encodes the video streams in digital formats such as H.264, motion JPEG, MPEG-4 or proprietary codecs to allow for data storage or transmission.

While the DVR is designed to store and view this video stream locally, the DVS sends the encoded video to the larger security network using the TCP/IP protocol. Higher performance systems also have video analysis (VA) capabilities allowing for the automatic detection of motion, crossing of virtual fences, etc.

DVRs and DVSs are used to upgrade existing security systems, which are based on analog surveillance cameras. Replacing tape-based VCRs, the DVR/DVS automates the storage of surveillance data and enables remote access to surveillance installations via TCP/IP networks. DVRs/DVSs typically have 4-, 8- or 16-input channels. With

further integration, the channel count will increase to 32, 64 and beyond.

With the advent of IP cameras, systems that accept both analog and digital formats are advantageous as the installed analog camera market base still dominates. For this reason, hybrid DVRs are available today. These appliances are versatile video recording devices that also must have the capability to perform storage and VA functions.



For more specific information about digital video recorder solutions, see www.ti.com/dvr.

TI has brought to market a single-platform H.264 reference design based on the TMS320DM365 digital video processor with DaVinci™ technology

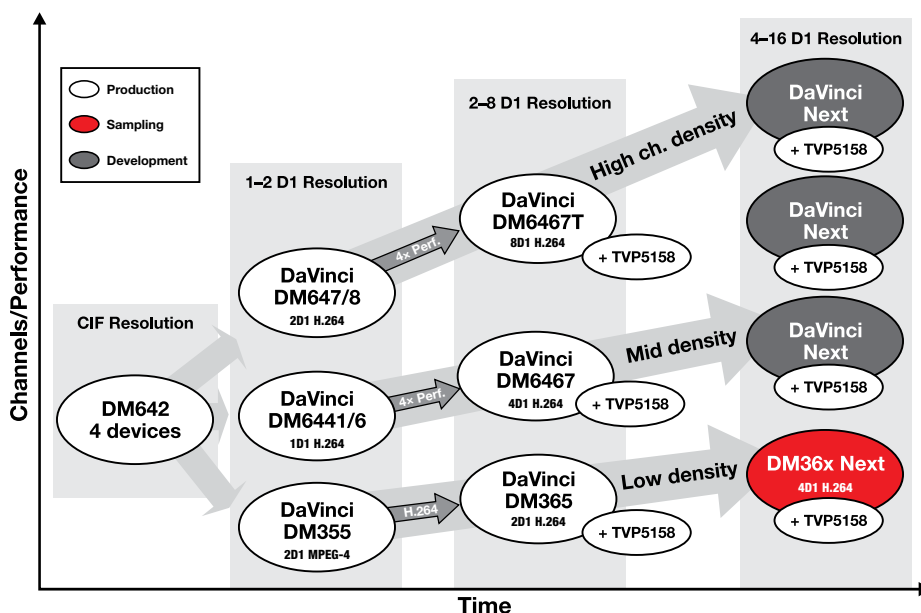
and the TI TVP5158 multi-channel video decoder for faster development at a reduced cost.

Hardware features

- TI TMS320DM365 digital video processor based on DaVinci technology
- TI TVP5158, new multi-channel video decoder with integrated audio
- Storage of compressed input (SATA and USB)
- Streaming of compressed input (Ethernet)
- Local display support up to 800×600 resolution
- Local user interface support
- Pan, tilt and zoom camera support

Software features

- Multi-codec system allows triple streams per channel (H.264, MPEG-4 and MJPEG) for real-time signal processing
- Simultaneous D1 record (65 fps), playback (30 fps), storage, streaming and display
- Audio/video adjustment tools
- Video timestamp support
- Software Development Kit (SDK) provided for easy customization

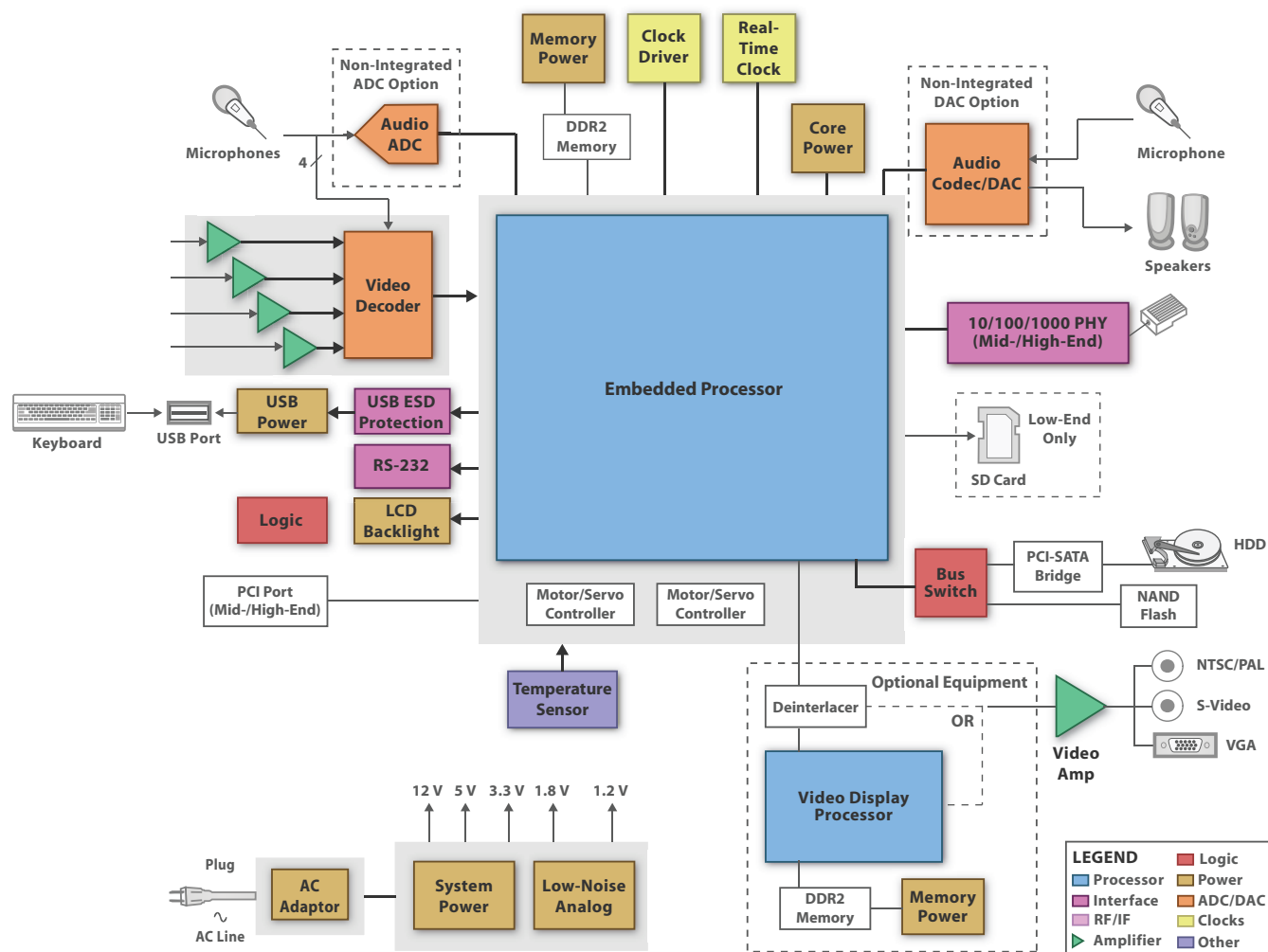


DaVinci multi-channel processor roadmap – Complete video security portfolio

Digital Video Recorder/Digital Video Server



High-End Digital Video Recorder/Digital Video Server/Video Encoder System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.



Featured Products

Product	TI Part #	Page
Core Power	TPS54386	67
	TPS62350	69
	TPS62400	69
	PTH04T240W	68
	TPS65053	69
	TPS75003	67
Clock Driver	CDCE913	51
	CDCE949	51
	CDCS502	51
Logic	SN74AVC8T245	55
Processor	TMS320DM365	31
	TMS320DM6467	31
RS-232	TRS3232E	54
Temperature Sensor	TMP100	65
	TMP302	65
	TMP75	65

Product	TI Part #	Page
USB Power	TPS2061	66
	TPS2065	66
	TPS2066	66
Video Amplifier	OPA3695	39
	OPA360	39
	THS7303	39
	THS7373	39
	THS7365	39
	THS7368	39
Video Decoder	THS7314	39
	THS7316	39
	TVP5154A	36
	TVP5158	36

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

→ IP Camera

The world of video surveillance is moving toward the IP network. An IP network camera can be defined as a camera with networking and video processing combined into one unit. A network camera has its own IP address and the computing functions necessary to handle network communication. It captures and transmits live images over the network, enabling remote viewing and user control from anywhere, anytime.

TI's DSPs are used to compress the image in a variety of standard and nonstandard video formats. Additionally, TI DSPs offer the ability to use intelligent image analysis functions and various types of networking protocol support.

Digital video transmission is fast becoming the standard requirement for security and surveillance systems. Both wired and wireless links are of interest for security and surveillance architects.

For more specific information about IP camera solutions, see www.ti.com/ipcamera.

Multiple IP Camera Solutions Enable Quick Product Development at Low Analog Camera Price Points

Texas Instruments offers multiple highly optimized reference designs based on the TMS320DM3x digital video processors with DaVinci™ technology for the IP camera market to enable developers to speed through the design process as well as reduce overall bill-of-materials (BOM) costs. These reference designs:

- Reduce development time by 98 percent
- Deliver higher quality, wider field-of-view HD images
- Decrease electronic bill of materials
- Empower customers to bring U.S. \$150 HD IP cameras to the market

These solutions reduce development to under four months by including:

- Complete and optimized schematics
- Gerber files
- Free Linux application source code, including:
 - Integrated auto white balance and auto exposure
 - Simple motion detection
 - Dual-stream HD MPEG-4 and MJPEG video codecs to support recording and monitoring needs at full frame rates

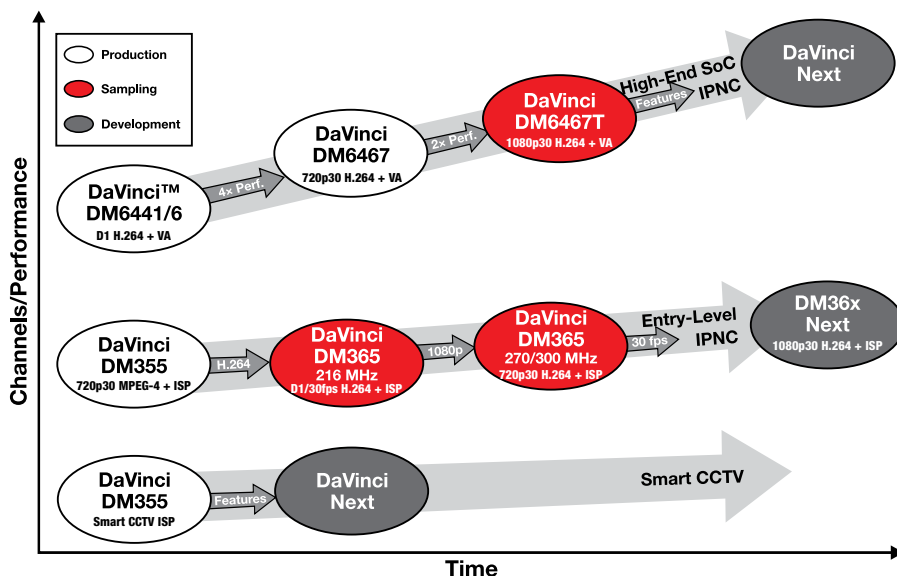
- DaVinci IP camera software framework including I/O application programming interfaces (APIs), media APIs and DaVinci Codec Engine



Multiple Reference Designs Available Based on TI Technology:

TI's DM3x-based IP camera solutions include:

- **New DM36x IP Camera Reference Design (part #: DM368IPNC-MT5):** Single-platform solution provides 1080p at 30 fps
- **DM365 IP Camera Reference Design (part #: DM365IPNC-MT5):** Single-platform solution provides H.264 in HD
- **Video Content Analytics (VA) IP Camera Reference Design (part #: DM355IPNC-VCA1):** includes base version plus VA technology from Object Video
- **DM355 IP Camera Reference Design (part #: DM355IPNC-MT5):** supports high definition (HD) at 1.3 MPixel CMOS sensor technologies from Aptina



DaVinci IP camera processor roadmap – Complete video security portfolio

DM365 IP Camera Reference Design:
H.264 main profile 1080p at 30 fps
DM368IPNC-MT5 @ U.S. \$995

TI's latest reference design provides full HD video with a 30 percent boost in host processing performance, advanced software for image signal processing tuning and encryption.

Hardware features

- TI's TMS320DM36x DaVinci™ video processor includes an ARM926 and H.264 hardware video coprocessor, EMAC, RTC and integrated voice codec for BOM savings



- Aptina 5-MP sensor CMOS imager optimized for low-light performance
- Board size: 65x50-mm, low power (3W)
- Power over Ethernet, audio, SD storage

Software features

- Complete Linux-based IP camera application including free source code
- Encode up to H.264 main profile 1080p at 30 fps or 720p at 60 fps; MPEG-4 up to 720p at 60 fps; MJPEG at 5 Megapixels at 15 fps
- Triple stream per channel (H.264, MPEG-4, MJPEG)
- Integrated auto white balance and auto exposure
- Royalty-free, production-ready codecs included
- Software framework includes input/output and media APIs, codec engine
- Ability to add video analytics with DaVinci™ TMS320DM643x DSP

DM365 IP Camera Reference Design: DM365IPNC-MT5 @ U.S. \$795

TI and Aptina Imaging (a division of Micron) have come together again to bring to market a single platform, H.264 reference design for faster development at a reduced cost.

Hardware features

- TI TMS320DM365 DaVinci video processor includes ARM926 and H.264 hardware video coprocessor, EMAC, RTC and integrated voice codec for BOM savings
- Aptina 5-MP sensor CMOS imager optimized for low-light performance
- Board size 65x50 mm, low-power (3W)
- Power over Ethernet, audio, SD storage

Software features

- Complete Linux-based IP net camera application including free source code

- Encode up to H.264/MPEG-4 HD 1080p at reduced frame rate or 720p full frame rate
- Triple stream per channel (H.264, MPEG-4, MJPEG)
- Integrated auto white balance and auto exposure
- Royalty-free, production-ready codecs included
- Software framework includes input/output and media APIs, codec engine
- Ability to add video analytics with DaVinci TMS320DM643x DSP
- PSIA standard support

Video Analysis (VA) DM355 IP Camera Reference Design:

DM355IPNC-VCA1 @ U.S. \$995

TI and Object Video have brought to market the VA version of the DM355-based IP camera which supports Object Video intelligent video analytics. The analytics software provides simple monitoring and notification of security events through a web browser. This reference design builds on the base solution (DM355IPNC-MT5) with a VA daughter board.

Hardware features

- TMS320DM6435 DaVinci video processor
- DaVinci TMS320DM355 SoC, ARM926 and hardware video coprocessor
- Aptina 5 MP sensor (2x2 binning ~1.3 MP)
- VA daughter board size: 41x40 mm

Software features

- Complete Linux-based IP network camera application including free source code
- Dual-stream capabilities
 - MPEG-4 HD 720p + MPEG-4 CIF + G.711

- Triple-stream capabilities
 - MPEG-4 HD 720p + MJPEG VGA + MJPEG CIF + G.711
- Integrated auto white balance and auto exposure
- Field-proven, robust, royalty-free bundled MPEG-4 and MJPEG video codecs
- DaVinci IP camera software framework including I/O APIs, media APIs and DaVinci Codec Engine

TMS320DM355 IP Camera Reference Design: DM355IPNC-MT5 @ U.S. \$795

TI and Aptina Imaging (a division of Micron) have brought to market the original DM355-based IP camera highly optimized reference design.

Hardware features

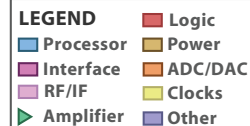
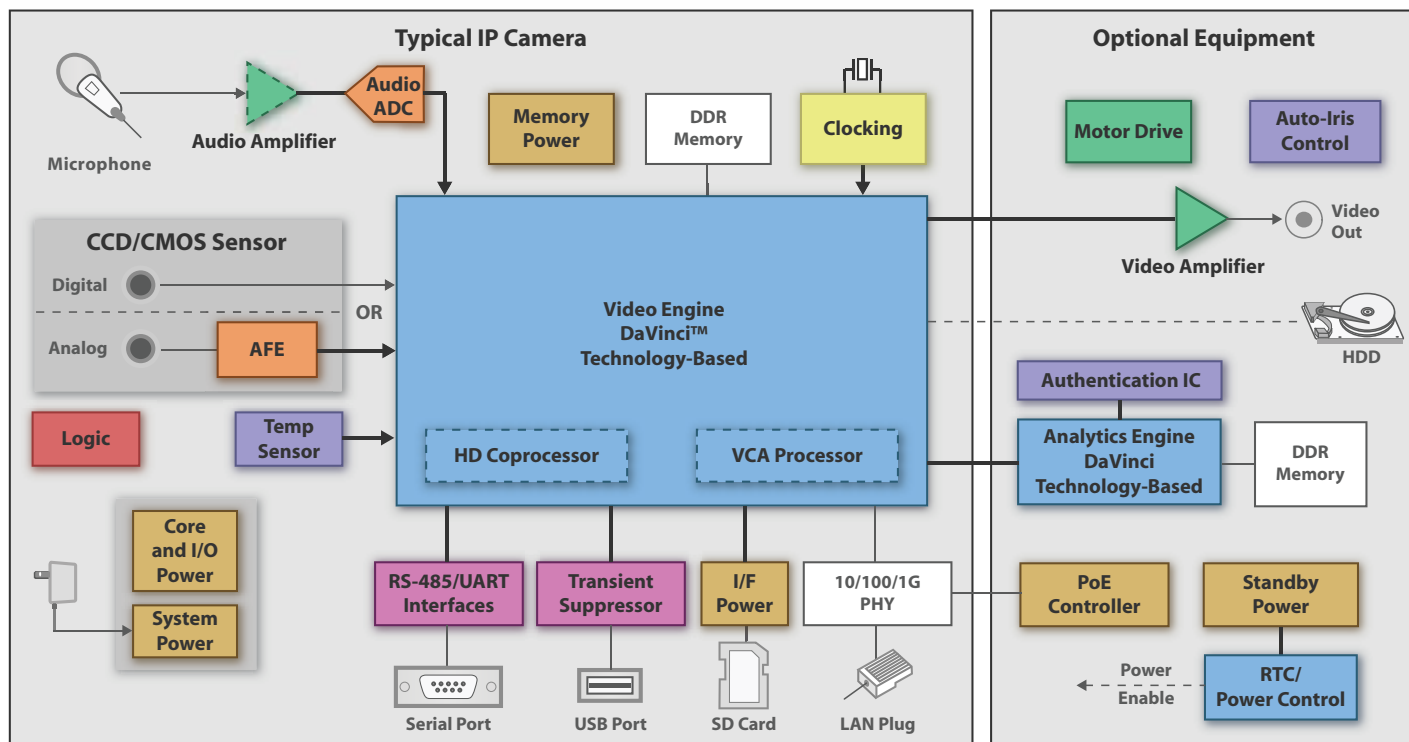
- TMS320DM355 SoC, ARM926 and hardware video coprocessor
- Aptina 5 MP sensor (2x2 binning ~1.3 MP)
- CMOS imager optimized for low-light performance
- Board size 65x50 mm
- Low power (< 3W)

Software features

- Complete Linux-based IP camera application including free source code
- Dual-stream capabilities
 - MPEG-4 HD 720p + MPEG-4 CIF + G.711
 - MPEG-4 HD 720p + MJPEG CIF + G.711
- Integrated auto white balance and auto exposure
- Field-proven, robust, royalty-free bundled MPEG-4 and MJPEG video codecs
- DaVinci IP camera software framework including I/O APIs, media APIs and DaVinci Codec Engine
- Ability to add video analytics with TMS320DM643x DaVinci video processors

→ IP Camera

High-End IP Network Camera System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

→ Featured Products

Product	TI Part #	Page	Product	TI Part #	Page
AFE	VSP01M01	37	Power over Ethernet Controller (cont'd)	TPS23754	66
	VSP2582	37		TPS23757	66
	VSP2590	37	Processor	TMS320DM365	31
Audio ADC	PCM1870A	41		TMS320DM6437	30
	PCM3006	40		TMS320DM6467	31
	TLV320AIC3101	40		TMS320DM355	31
	TLV320AIC3104	40	Temperature Sensor	TMP100	65
Audio Codec	PCM3006	40		TMP175	65
	TLV320AIC3101	40		TMP20	65
	TLV320AIC3104	40		TMP75	65
Auto-Iris Control	OPA2357	39	USB Power Switch	TPS2041B	66
Clocking	CDCE906	51		TPS2052B	66
	TPS2061	66		TPS2553	66
Core and I/O Power	TPS65053	69	Video Amplifier	OPA361	39
	TPS51020	67		THS7315	39
Memory Power	TPS51200	68			
	TPS23750	66			
Power over Ethernet Controller	TPS23750	66			
	TPS23753A	66			

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

Video Analytics Server

Video analytics servers handle multiple camera inputs, digitize, compress and stream digital media content over an IP network such as a LAN, intranet or the Internet, turning an analog video system into a network video system. Users can view live images using Web browsers or application software on any local or remote computer on a network. User configuration and control can also be done remotely.

Video analytics servers allow authorized viewers from different locations to simultaneously access images from the same analog camera(s), as well as network cameras if they are added to the system. These devices can also store video as an option and typically operate as stand-alone units.

Digital video transmission is fast becoming the standard requirement for security and surveillance systems. TI's DSPs provide developers the flexibility to design a wide range of digital surveillance products. By leveraging the DSP programmability, processing performance, video-specific peripherals and support for all major multimedia codecs, developers can design differentiated products with customized features to meet changing market needs.

For more specific information about IP video node, video server and matrix solutions, see

www.ti.com/videoanalyticsserver.

VLIB 2.0: Video Analytics & Vision Library

VLIB 2.0 supports:

- Video analytics
- Automotive vision and advanced driver assistance systems (ADAS)
- Embedded vision
- Game vision
- Machine vision
- Consumer electronics vision

VLIB 2.0 consists of 50+ royalty-free kernels:

- Background modeling and subtraction
- Object feature extraction

- Tracking, recognition
- Low-level pixel processing

New in VLIB 2.0:

- Optimized functions for TMS320C64x™ DaVinci™ DSP core support (example: TMS320DM642 processor)
- Simulink™ blocks to enable MathWorks model-based design
- Bit-exact version for testing on a PC
- Six additional functions including bit mask packing/unpacking, 16-bit IIR filter, L1 distance

VLIB 2.0 function list

- Background subtraction
 - Exponentially and uniformly weighted mean
 - Exponentially and uniformly weighted variance
 - Mixture of Gaussians
- Canny edge detection
 - Non-maxima suppression
- Hough transform for lines
- Integral image
- Image pyramid
- Legendre moments

Getting started with VLIB is as easy as one, two, three . . .

Step 1: A TMS320C64x+™ or C64x™-based development tool is required to view and access the VLIB software. If needed, TI recommends the TMS320DM6437 Digital Video Development Platform (part number TMDSVDP6437, U.S. \$495).

Step 2: Get approval from TI. Visit www.ti.com/vlibrequest to fill out the VLIB Approval Request form.

Step 3: Upon approval, download the VLIB at no cost and receive:

- Library of 50+ kernel library and header files
- Simulink blocks
- PC library
- Documentation: User's Guide
- Demo (for use on TMS320DM6437 DVDP only)
- Test scripts

Advanced software features on TMS320DM3xx processors

The advanced software features on the TMS320DM3xx digital video processors allow customers to differentiate their video surveillance applications by providing better image improvements and added intelligent video processing.

Problems encountered

- Camera shakes due to weather, traffic or vehicle shaking degrades video quality.
- Detect and recognize face for identification, access control, privacy mask ...
- Image noise degrades low-light image quality. Increased sensor gain will increase noise and the use of a larger sensor will increase cost and size.

TI advanced software features solutions

- **TI video stabilization** reduces jitter, improves visual quality and improves video bit rate.
- **TI face detection** detects face in <20 ms (with glasses, partially obscured, blurred, black & white, with night vision ...) and will handle multiple face tracking (>30 faces) at >30 fps.
- **TI video noise filters** include spatial and temporal noise filtering capabilities to:
 - Enhance visual quality, without removing detail with TI KATANA Noise Reduction (2D-NF)
 - Enable low-light imaging
 - Increase video coding efficiency – compression quality can be improved for same bit rate improving total end-to-end video quality
- TI motion compensated de-interlacing algorithm
 - User-selectable threshold value (to be specified in ARM® code)
 - YUV422 interleaved and YUV420 semi-planar support
 - ARM side function call for easy system integration

Video Analytics Server

Get started today

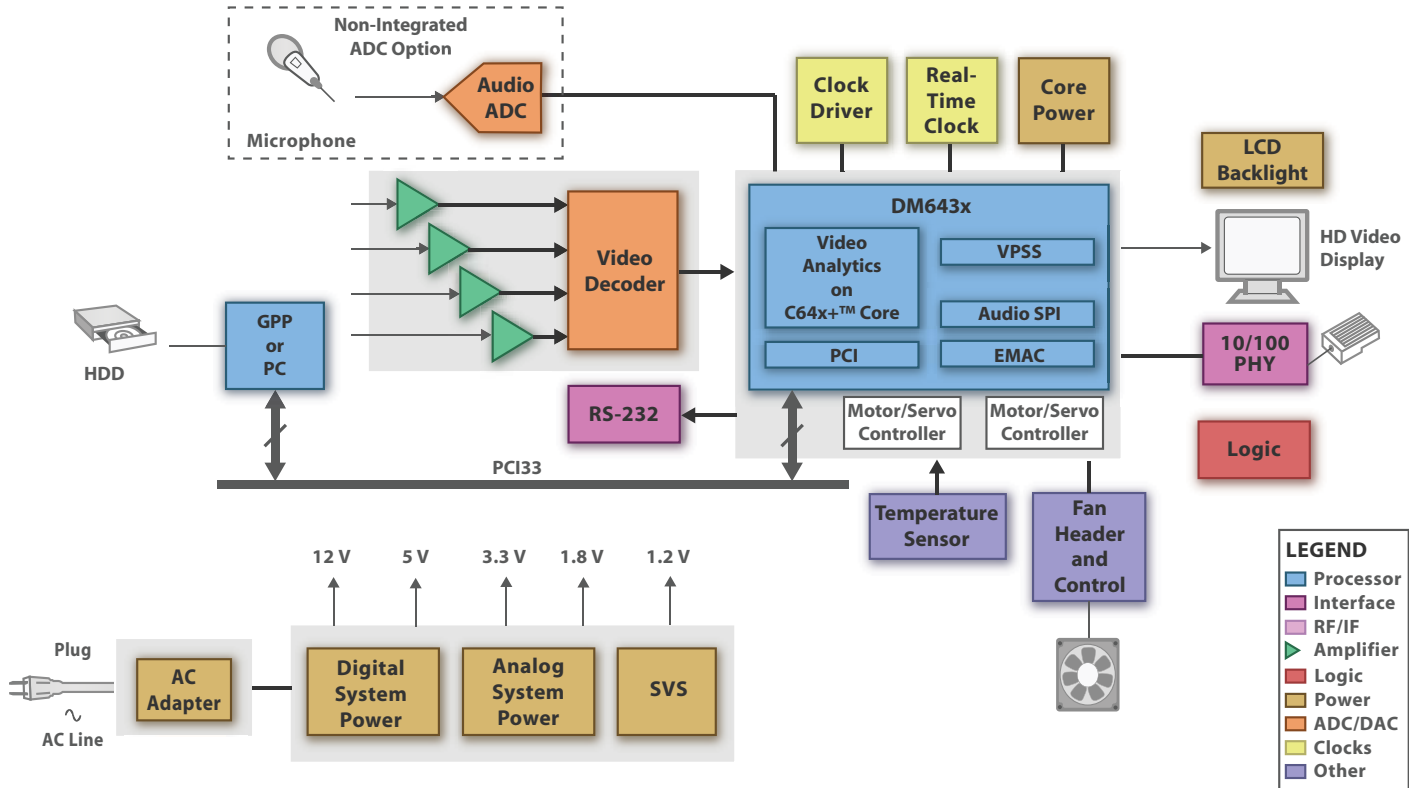
- **Evaluation model** – For demos and evaluation only (cannot be used in practical customer applications)
 - Included in the TI IP Camera

Reference Design v2.1 software release

- Works only for 10 minutes at a time and can be restarted
- Watermark demo video with OSD

- **Working model** – Click-wrap production license agreement with TI to receive complete production library on six pre-defined packages.

Video Analytics Server System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
Clock Driver	CDCE949	51	RS-232	TRS3232E	54
Core Power	TPS40041	67	Temperature Sensor	TMP100	65
	TPS54386	67		TMP124	65
	TPS62400	69		TMP302	65
Processor	TMS320C6472	34		TMP422	65
	TMS320C6474	34		TMP431	65
	TMS320DM6435	30	TMP432	65	
	TMS320DM6437	30	Video Decoder	TVP5154	36
	TMS320DM6433	30		TVP5158	36
TMS320DM6431	30				

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.



Active Safety and Advanced Driver Assistance Systems Overview

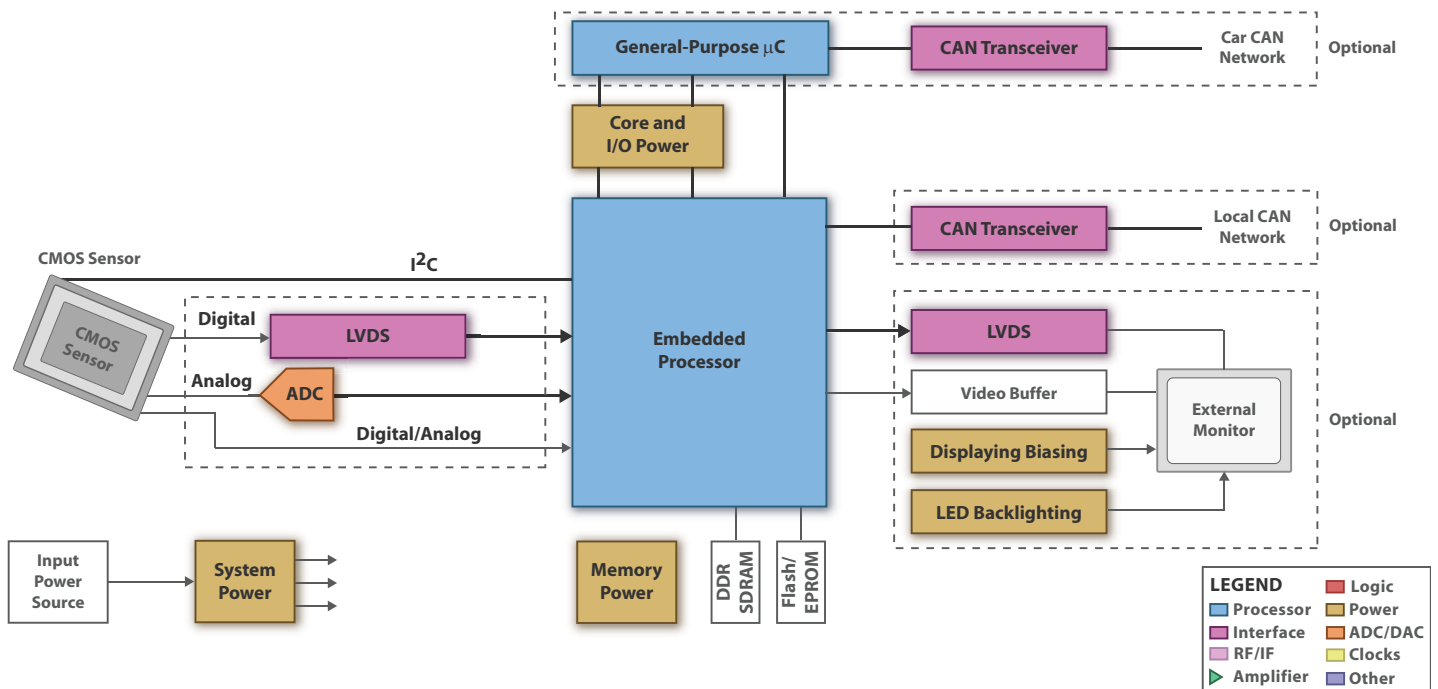
Active safety and advanced driver assistance systems (ADAS) are growing in popularity for automotive designs. These automotive systems are using CMOS, infrared, radar or lidar sensors coupled with powerful processors to create a virtual model of the car's surroundings. Data can either be presented to the driver to avoid collisions or used to take partial or full control of the vehicle, improving driver comfort or mitigating

the severity of a crash. Applications include adaptive cruise control, lane departure warning, pedestrian detection, night vision, parking assist, drowsiness detection and blind spot detection.

These ADAS applications require high levels of real-time processing to remain accurate and relevant. TI has automotive-grade DSPs and system-on-chip (SoC) devices in production, many

of which have already been designed into ADAS applications. DSPs are well positioned to address a majority of ADAS applications, providing high processing power at a relatively low cost, complete programmability, strong development tools and an extensive ecosystem of third parties and complementary products. www.ti.com/automotivevision.

Automotive Vision/Blind Spot/Lane Departure Warning System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
Backlight	TPS40200-Q1	67	Processor, Memory and System Power	TPS40200-Q1	67
		TPS61040/41-Q1		69	TPS5420-Q1
Processor	TMS320DM6431	30		TPS5430-Q1	67
	TMS320DM6435	30		TPS65023-Q1	69
	TMS320DM6437	30		TPS76950-Q1	68
	TMS320DM642	32		TPS73733-Q1	68
	TMS320DM648	32		TPS76801-Q1	68
				TPS77601-Q1	68
				TPS79850-Q1	68

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

→ Intelligent Occupancy Sensing

TI Intelligent Occupancy Sensing (IOS) is a new vision-based method of detecting and counting the number of people in a given area. This technology couples vision-based imagers with video analytics to count the presence of people in designated areas. The occupancy rate can be used by intelligent building systems to adjust HVAC (heating, ventilation and air conditioning) and

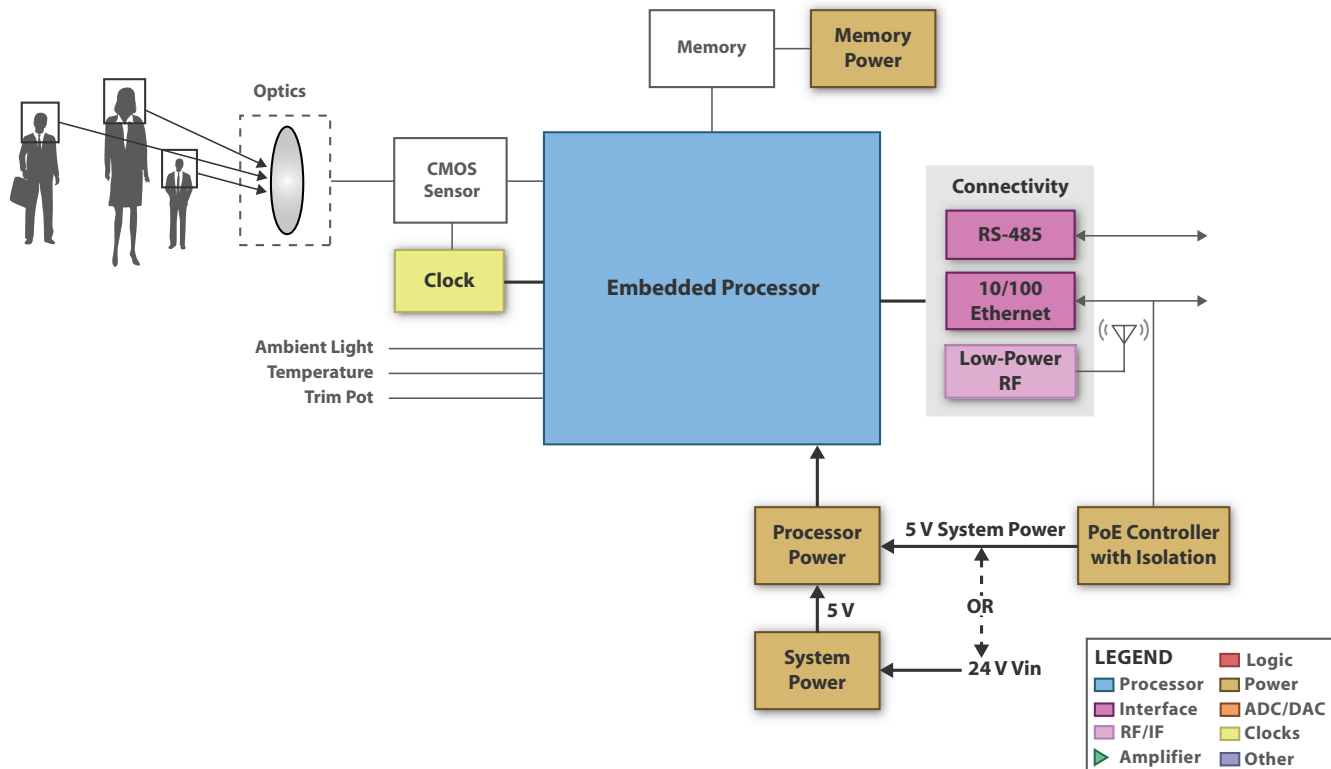
lighting to the most energy-efficient levels. This technology also has application in business intelligence gathering or other applications where it is desirable to know how many people are in a defined space.

Appropriate applications include offices, classrooms, copy rooms, restrooms, storage areas, conference rooms,

warehouses, break rooms, corridors, parking garage, etc. IOS technology provides an accurate assessment of resource requirements for building management systems.

For more specific information about IOS solutions, see www.ti.com/ios.

Intelligent Occupancy Sensing System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

→ Featured Products

Product	TI Part #	Page	Product	TI Part #	Page
Clock	CDCE913	51	Processor	TMS320DM6431	30
	CDCE925	51		TMS320C6746	33
Low-Power RF	CC1110	46		TMS320C6748	33
	CC2530	47		TMS320DM6435	30
Memory Power	TPS51020	67	Processor Power	TPS73018	68
	TPS51200	68		TPS62110	67
Power over Ethernet Controller	TPS23750	66			
	TPS23753A	66			
	TPS23757	66			

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

Machine Vision: Camera

Machine vision refers to both industrial and non-industrial applications where operational guidance is provided to equipment for the execution of functions based on the capture and processing of images. Basically, this is providing “sight” or “vision” to

otherwise “blind” equipment. This greatly enhances the capabilities of the equipment, resulting in improved product quality, increased productivity and decreased costs. TI’s comprehensive solutions cover the entire vision chain – everything from

the initial capture of vision content to the final viewing experience.

For more specific information about machine vision solutions, see www.ti.com/machinevision.

Vision Software Solutions

VLIB 2.0: Video Analytics & Vision Library

VLIB 2.0 supports:

- Video analytics
- Automotive vision and advanced driver assistance systems (ADAS)
- Embedded vision
- Game vision
- Machine vision
- Consumer electronics vision

VLIB 2.0 consists of 50+ royalty-free kernels:

- Background modeling and subtraction
- Object feature extraction
- Tracking, recognition
- Low-level pixel processing

New in VLIB 2.0:

- Optimized functions for TMS320C64x™ DaVinci™ DSP core support (example: TMS320DM642 processor)
- Simulink™ blocks to enable MathWorks model-based design

- Bit-exact version for testing on a PC
- Six additional functions including bit mask packing/unpacking, 16-bit IIR filter, L1 distance

VLIB 2.0 function list

- Background subtraction
 - Exponentially and uniformly weighted mean
 - Exponentially and uniformly weighted variance
 - Mixture of Gaussians
- Canny edge detection
 - Non-maxima suppression
- Hough transform for lines
- Integral image
- Image pyramid
- Legendre moments

Getting started with VLIB is as easy as one, two, three . . .

Step 1: A TMS320C64x+™ or C64x™-based development tool is required to view and access the VLIB software. If needed, TI recommends

the TMS320DM6437 Digital Video Development Platform (part number TMDSDVP6437, U.S. \$495).

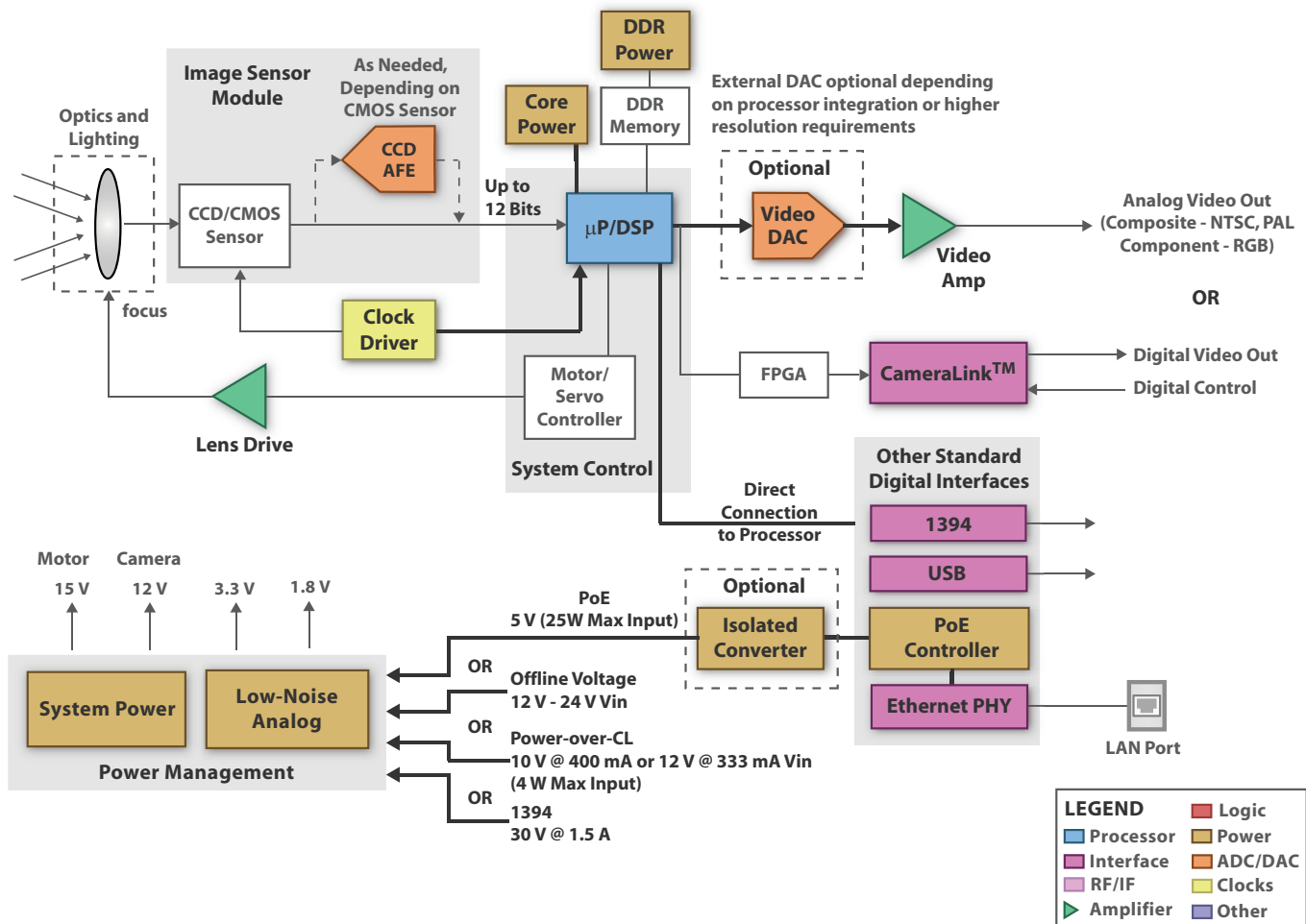
Step 2: Get approval from TI. Visit www.ti.com/vlibrequest to fill out the VLIB Approval Request form.

Step 3: Upon approval, download the VLIB at no cost and receive:

- Library of 50+ kernel library and header files
- Simulink blocks
- PC library
- Documentation: User’s Guide
- Demo (for use on TMS320DM6437 DVDP only)
- Test scripts

Machine Vision: Camera

Machine Vision Camera System Block Diagram



Visit page 67 or power.ti.com for information on TI's power management products.

Featured Products

Product	TI Part #	Page
1394	TSB41BA3D	56
Clock Driver	CDCE949	51
Core Power	TPS54317	67
	TPS62110	67
Power over Ethernet Controller	TPS23753	66
	TPS23754	66
	TPS23754-1	66
	TPS2376-H	66
Processor	TMS320C6748	33
	TMS320DM6437	30
	TMS320DM6435	30
	TMS320DM6431	30
	TMS320DM642	32
	TMS320DM648	32

Product	TI Part #	Page
USB	TPD2E001	57
	TPD4E004	57
	TUSB2551A	58
	TPD2E009	57
Video Amplifier	OPA3692	39
	OPA360	39
	THS7303	39
	THS7314	39
	THS7316	39
	THS7365	39
	THS7373	39
	THS7374	39

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.

Machine Vision: Frame Grabber



Machine vision refers to both industrial and non-industrial applications where operational guidance is provided to equipment for the execution of functions based on the capture and processing of images. Basically, this is providing “sight” or “vision” to otherwise “blind”

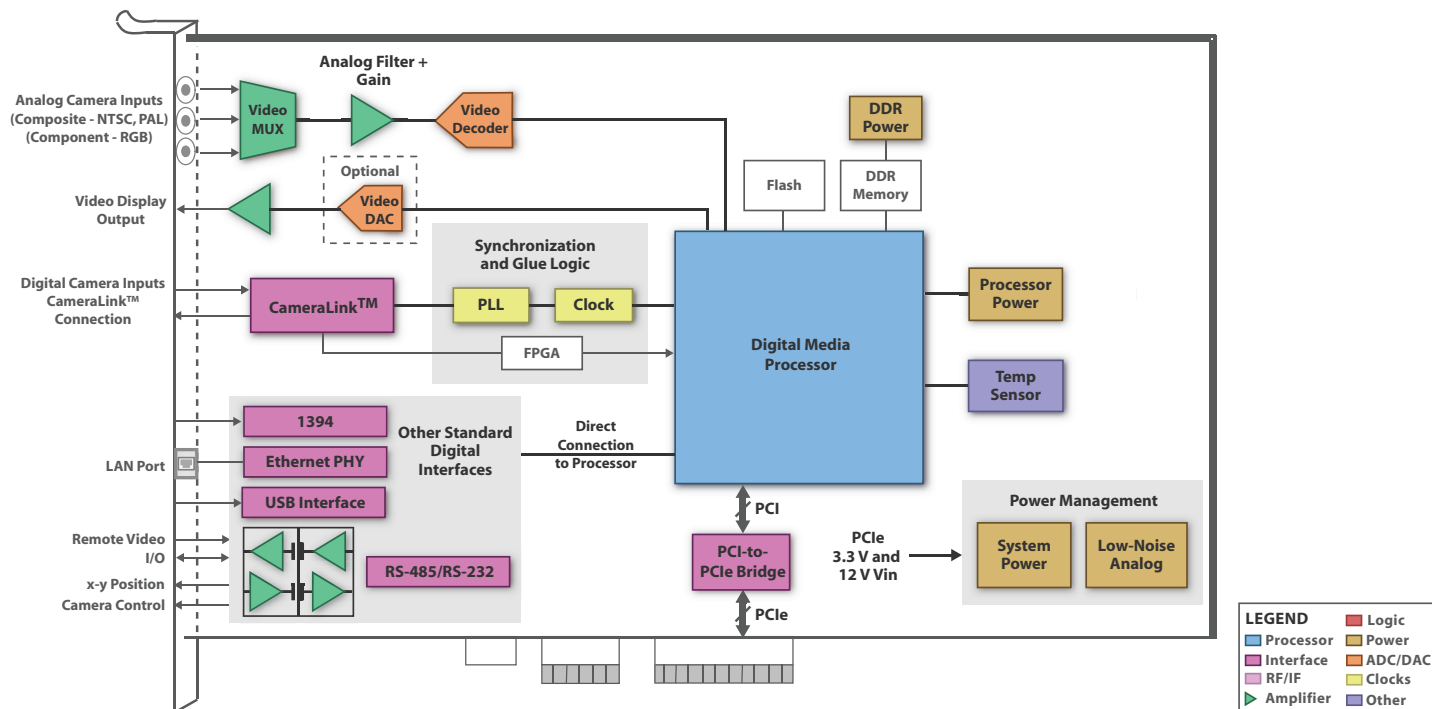
equipment. This greatly enhances the capabilities of the equipment, resulting in improved product quality, increased productivity and decreased costs.

TI’s comprehensive solutions cover the entire vision chain – everything from the

initial capture of vision content to the final viewing experience.

For more specific information about machine vision solutions, see www.ti.com/framegrabber.

Machine Vision/Frame Grabber System Block Diagram



Visit page 67 or power.ti.com for information on TI’s power management products.

Featured Products			Featured Products		
Product	TI Part #	Page	Product	TI Part #	Page
1394	TSB43AB21A	56	Processor (cont'd)	TMS320C6748	33
	TSB43AB22A	56		TMS320DM6437	30
	TSB43AB23	56		TMS320DM6435	30
	TSB83AA22C	56		TMS320DM6431	30
	TSB83AA23	56		TMS320DM642	32
	XIO2213B	56		TMS320DM648	32
Analog Filter + Gain	OPA3692	39	RS-485/RS-232	TRS3232E	54
	OPA360	39	Temperature Sensor	TMP102	65
	THS7316	39		TMP122	65
	THS7327	39	USB Interface	TPD4E004	57
Clock	CDCE913	51		TUSB2551A	58
DDR Power	TPS51200	68		TPD2E009	57
PCI-to-PCIe Bridge	XIO2000A	59	Video Decoder	TVP5147M1	36
	XIO2001	59	Video MUX	THS7303	39
Processor	TMS320C6455	33		THS7353	39
	TMS320C6457	33		OPA3875	38
	TMS320C6472	34		OPA4872	38
	TMS320C6474	34			

Device specifications can be found in the Selection Guide section of this document, pages 30–69. For additional information on each product, please visit www.ti.com and search by TI part number.



Digital Media Processors

DaVinci™ Video Processors

Device	CPU	Frequency (MHz)	L1/ SRAM (Bytes)	L2/ SRAM (Bytes)	ROM (Bytes)	External Memory I/F	EDMA	Video Ports (Configurable)	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, I ² C, 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, I ² C, 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, I ² C, 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, I ² C, 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
TMS320DM6431ZWT3	C64x+, DaVinci Video	300	64 K	64 K	64 K	1 8-Bit EMIFA, 1 16-Bit DDR2	64 Ch	1 Input	McASP, I ² C, 1 UART, 1 McBSP, 1 HECC	10/100 EMAC	Async SRAM, DDR2 SDRAM, NAND Flash	1.2	1.8/3.3	361 PBGA 16 × 16 mm, 376 BGA 23 × 23 mm	11.25
TMS320DM6431ZWTQ3 ²															12.38
TMS320DM6431ZDU3															11.25
TMS320DM6431ZDUQ3 ²															12.38
TMS320DM6433ZWT4	C64x+, DaVinci Video	400	112 K	128 K	64 K	1 8-Bit EMIFA, 1 16-/32-Bit DDR2	64 Ch	1 Output	McASP, I ² C, 1 McBSP, I ² C, 1 UART	32-Bit PCI, VLYNQ, 10/100 EMAC, 16-bit HPI	Async SRAM, DDR2 SDRAM, NAND Flash	1.05/1.2	1.8/3.3	361 PBGA 16 × 16 mm, 376 BGA 23 × 23 mm	15.28
TMS320DM6433ZWT5		500													16.20
TMS320DM6433ZWTQ5 ²		500													18.03
TMS320DM6433ZWT6		600													18.03
TMS320DM6433ZWTQ6²		660													21.70
TMS320DM6433ZWT7		700													21.70
TMS320DM6433ZWTL		600													21.70
TMS320DM6433ZDU4		400													15.28
TMS320DM6433ZDU5		500													16.20
TMS320DM6433ZDUQ5 ²		500													18.03
TMS320DM6433ZDU6		600													18.03
TMS320DM6433ZDUQ6²		660													21.70
TMS320DM6433ZDU7		700													21.70
TMS320DM6433ZDUL		600													21.70
TMS320DM6435ZWT4	C64x+, DaVinci Video	400	112 K	128 K	64 K	1 8-Bit EMIFA 1 16-/32-Bit DDR2	64 Ch	1 Input	McASP, I ² C, 1 McBSP, 2 UARTs, 1 HECC	VLYNQ, 10/100 EMAC, 16-bit HPI	Async SRAM, DDR2 SDRAM, NAND Flash	1.05/1.2	1.8/3.3	361 PBGA 16 × 16 mm, 376 BGA 23 × 23 mm	15.81
TMS320DM6435ZWTQ4 ²		400													16.76
TMS320DM6435ZWT5		500													16.76
TMS320DM6435ZWTQ5 ²		500													18.66
TMS320DM6435ZWT6		600													18.66
TMS320DM6435ZWTQ6²		660													22.45
TMS320DM6435ZWT7		700													22.45
TMS320DM6435ZWTL		600													22.45
TMS320DM6435ZDU4		400													15.81
TMS320DM6435ZDUQ4 ²		400													16.76
TMS320DM6435ZDU5		500													16.76
TMS320DM6435ZDUQ5 ²		500													18.66
TMS320DM6435ZDU6		600													18.66
TMS320DM6435ZDUQ6²		660													22.45
TMS320DM6435ZDU7	700	22.45													
TMS320DM6435ZDUL	600	22.45													
TMS320DM6437ZWT4	C64x+, DaVinci Video	400	112 K	128 K	64 K	1 8-Bit EMIFA, 1 16-/32-Bit DDR2	64 Ch	1 Input, 1 Output	McASP, I ² C, 1 HECC 2 McBSPs ³ , 2 UARTs	32-Bit PCI, VLYNQ, 10/100 EMAC, 16-bit HPI	Async SRAM, DDR2 SDRAM, NAND Flash	1.05/1.2	1.8/3.3	361 PBGA 16 × 16 mm, 376 BGA 23 × 23 mm	20.35
TMS320DM6437ZWTQ4 ²		400													24.00
TMS320DM6437ZWT5		500													21.55
TMS320DM6437ZWTQ5 ²		500													26.50
TMS320DM6437ZWT6		600													24.00
TMS320DM6437ZWTQ6²		660													31.90
TMS320DM6437ZWT7		700													24.00
TMS320DM6437ZWTL		600													28.85
TMS320DM6437ZDU4		400													20.35
TMS320DM6437ZDUQ4 ²		400													21.55
TMS320DM6437ZDU5		500													21.55
TMS320DM6437ZDUQ5 ²		500													24.00
TMS320DM6437ZDU6		600													24.00
TMS320DM6437ZDUQ6²		660													28.85
TMS320DM6437ZDU7	700	28.85													
TMS320DM6437ZDUL	600	28.85													

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.

² Q designates Q100 automotive reliability.

³ McBSP can be configured as an SPI peripheral.

Digital Media Processors



DaVinci™ Video Processors

Device	CPU	Frequency (MHz)	L1/ SRAM (Bytes)	L2/ SRAM (Bytes)	ROM (Bytes)	External Memory I/F	EDMA (Ch)	Video Ports (Configurable)	Serial I/F	Connectivity I/F	Program/Data Storage	Voltage			1-KU Price ¹
												Core	I/O	Packaging	
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, I ² C, 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, I ² C, 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, I ² C, 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, I ² C, 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, I ² C, 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, I ² C, 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, I ² C	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, I ² C	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
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, I ² C	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

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.

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.



Digital Media Processors

TMS320DM64x™ Video Processors

Device	CPU	Frequency (MHz)	L1/ SRAM (Bytes)	L2/ SRAM (Bytes)	ROM (Bytes)	External Memory I/F	EDMA (Ch)	Video Ports (Configurable)	Serial I/F	Connectivity I/F ²	Program/Data Storage	Voltage		Packaging	1-KU Price ¹		
												Core	I/O				
TMS320DM647ZUT7	C64x+™, DaVinci Video	720	32 K/ 32 K	256 K	64 K	1 16-/8-Bit EMIFA ³ , 1 32-/16-Bit DDR2	64	5 video ports (each configurable as dual capture, single capture, display, TSI capture)	1 I ² C, 1 SPI, 1 UART, 1 McASP	PCI/HPI, VLYNQ™, 10/100/1000 3-pt Ethernet Switch Subsys w/ 1 SGMII Port	Async SRAM, DDR2 SDRAM, NAND Flash, NOR Flash	1.2/	1.8/	529 nFBGA, 19 × 19 mm	37.05		
TMS320DM647ZUT9		900										1.2	3.3			44.46	
TMS320DM647ZUTD7		720										1.2	3.3				53.72
TMS320DM647ZUTD9		900										1.2	3.3				
TMS320DM647ZUTA8	800	1.2	3.3	46.31													
TMS320DM648ZUT7	C64x+, DaVinci Video	720	32 K/ 32 K	512 K	64 K	1 16-/8-Bit EMIFA ³ , 1 32-/16-Bit DDR2	64	5 video ports (each configurable as dual capture, single capture, display, TSI capture)	2 I ² C, 1 SPI, 1 UART, 1 McASP, 2 TSIP	PCI/HPI, VLYNQ, 10/100/1000 3-pt Ethernet Switch Subsys w/ 2 SGMII Ports	Async SRAM, DDR2 SDRAM, NAND Flash, NOR Flash	1.2/	1.8/	529 nFBGA, 19 × 19 mm	46.35		
TMS320DM648ZUT9		900										1.2	3.3			55.62	
TMS320DM648ZUTD7		720										1.2	3.3				67.21
TMS320DM648ZUTD9		900										1.2	3.3				
TMS320DM648ZUTA8	800	1.2	3.3	57.94													
TMS320DM640AGDK4	C64x™, Video	400	16 K/ 16 K	128 K	–	1 32-Bit	64	1 8-bit	2 McBSP	EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.2	3.3	548 BGA, 23 × 23 mm	21.88		
TMS320DM640AGNZ4	C64x, Video	400	16 K/ 16 K	128 K	–	1 32-Bit	64	1 8-bit	2 McBSP	EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.2	3.3	548 BGA, 27 × 27 mm	21.88		
TMS320DM641AGDK5	C64x, Video	500	16 K/ 16 K	128 K	–	1 32-Bit	64	2 8-bit	2 McBSP	HPI/16/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.2	3.3	548 BGA, 23 × 23 mm	25.61		
TMS320DM641AGDK6	C64x, Video	600	16 K/ 16 K	128 K	–	1 32-Bit	64	2 8-bit	2 McBSP	HPI/16/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.4	3.3	548 BGA, 23 × 23 mm	28.17		
TMS320DM641AGNZ6	C64x, Video	600	16 K/ 16 K	128 K	–	1 32-Bit	64	2 8-bit	2 McBSP	HPI/16/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.4	3.3	548 BGA, 27 × 27 mm	28.17		
TMS320DM643AGDK5	C64x, Video	500	16 K/ 16 K	256 K	–	1 64-Bit	64	2 20-bit	1 McBSP	HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.2	3.3	548 BGA, 23 × 23 mm	28.42		
TMS320DM643AGNZ5	C64x, Video	500	16 K/ 16 K	256 K	–	1 64-Bit	64	2 20-bit	1 McBSP	HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.2	3.3	548 BGA, 27 × 27 mm	28.42		
TMS320DM643AGDK6	C64x, Video	600	16 K/ 16 K	256 K	–	1 64-Bit	64	2 20-bit	1 McBSP	HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.4	3.3	548 BGA, 23 × 23 mm	30.98		
TMS320DM643AGNZ6	C64x, Video	600	16 K/ 16 K	256 K	–	1 64-Bit	64	2 20-bit	1 McBSP	HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.4	3.3	548 BGA, 27 × 27 mm	30.98		
TMS320DM642AGDK5	C64x, Video	500	16 K/ 16 K	256 K	–	1 64-Bit	64	3 20-bit	2 ⁴ McBSP	PCI/HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.2	3.3	548 BGA, 23 × 23 mm	33.80		
TMS320DM642AGNZ5	C64x, Video	500	16 K/ 16 K	256 K	–	1 64-Bit	64	3 20-bit	2 ⁴ McBSP	PCI/HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.2	3.3	548 BGA, 27 × 27 mm	33.80		
TMS320DM642AGDK6	C64x, Video	600	16 K/ 16 K	256 K	–	1 64-Bit	64	3 20-bit	2 ⁴ McBSP	PCI/HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.4	3.3	548 BGA, 23 × 23 mm	37.18		
TMS320DM642AGNZ6	C64x, Video	600	16 K/ 16 K	256 K	–	1 64-Bit	64	3 20-bit	2 ⁴ McBSP	PCI/HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.4	3.3	548 BGA, 27 × 27 mm	37.18		
TMS320DM642AGDK7	C64x, Video	720	16 K/ 16 K	256 K	–	1 64-Bit	64	3 20-bit	2 ⁴ McBSP	PCI/HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.4	3.3	548 BGA, 23 × 23 mm	52.23		
TMS320DM642AGNZ7	C64x, Video	720	16 K/ 16 K	256 K	–	1 64-Bit	64	3 20-bit	2 ⁴ McBSP	PCI/HPI 32/EMAC ⁵	SDRAM, SBSRAM, Async SRAM	1.4	3.3	548 BGA, 27 × 27 mm	52.23		

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.

² HPI is selectable, 32-bit or 16-bit.

³ EMIFA does not support SDRAM.

⁴ The DM642 can be configured to have up to three serial ports in various video/McASP/McBSP combinations.

⁵ The DM640 has an Ethernet MAC. The DM641 can be configured to have either a 16-bit HPI or Ethernet MAC. The DM643 can be configured to have either a 32-bit HPI or a 16-bit HPI and Ethernet MAC. The DM642 can be configured to have either a 32-bit PCI or 32-bit HPI or a 16-bit HPI and Ethernet MAC.

Note: Check www.ti.com for extended temperature and packaging options.

New devices are listed in bold red.

TMS320C645x DSP Generation – Highest Performance Fixed-Point DSPs

Part Number	Cores	Internal RAM (Bytes) L1 Program Cache/ L1 Data Cache/ L2 Unified RAM/Cache	McASP	McBSP	TSIP	Enhanced DMA (Channels)	COM ³	Timers	MHz	MIPS	Power (W) ²		Voltage (V)		Packaging	1-KU Price ¹
											Internal Logic	Total	Core	I/O		
TMS320C6457CMH	1	32 K/32 K/2 M	–	2+Utopia ⁴	–	64	Serial RapidIO [®] /HPI/ Gigabit EMAC	2 ⁵	1000	8000	1.85	2.33	1.1	3.3, 1.8, 1.1	688 BGA, 23 mm	111.85
TMS320C6457CMH2	1	32 K/32 K/2 M	–	2+Utopia ⁴	–	64	Serial RapidIO/HPI/ Gigabit EMAC	2 ⁵	1200	9600	2.79	3.27	1.2	3.3, 1.8, 1.2	688 BGA, 23 mm	145.41
TMS320C6455BZT2	1	32 K/32 K/2 M	–	2+Utopia ⁴	–	64	Serial RapidIO/HPI/ PCI/Gigabit EMAC	2 ⁵	1200	9600 ⁶	1.76	2.30	1.25	3.3, 1.8, 1.5, 1.25	697 BGA, 24 mm	215.72
TMS320C6455BZTZ	1	32 K/32 K/2 M	–	2+Utopia ⁴	–	64	Serial RapidIO/HPI/ PCI/Gigabit EMAC	2 ⁵	1000	8000 ⁶	1.66	2.19	1.25	3.3, 1.8, 1.5, 1.25	697 BGA, 24 mm	171.36
TMS320C6455BZT8	1	32 K/32 K/2 M	–	2+Utopia ⁴	–	64	Serial RapidIO/HPI/ PCI/Gigabit EMAC	2 ⁵	850	6800 ⁶	1.41	1.94	1.2	3.3, 1.8, 1.5, 1.2	697 BGA, 24 mm	148.86
TMS320C6455BZT7	1	32 K/32 K/2 M	–	2+Utopia ⁴	–	64	Serial RapidIO/HPI/ PCI/Gigabit EMAC	2 ⁵	720	5760 ⁶	1.29	1.81	1.2	3.3, 1.8, 1.5, 1.2	697 BGA, 24 mm	126.15
TMS320C6454BZT2	1	32 K/32 K/1 M	–	2	–	64	HPI/PCI/ Gigabit EMAC	2 ⁵	1200	9600	1.76	2.30	1.25	3.3, 1.8, 1.5, 1.25	687 BGA, 24 mm	175.07
TMS320C6454BZTZ	1	32 K/32 K/1 M	–	2	–	64	HPI/PCI/ Gigabit EMAC	2 ⁵	1000	8000	1.66	2.19	1.25	3.3, 1.8, 1.5, 1.25	687 BGA, 24 mm	134.13
TMS320C6454BZT8	1	32 K/32 K/1 M	–	2	–	64	HPI/PCI/ Gigabit EMAC	2 ⁵	850	6800	1.41	1.94	1.2	3.3, 1.8, 1.5, 1.2	687 BGA, 24 mm	106.26
TMS320C6454BZT7	1	32 K/32 K/1 M	–	2	–	64	HPI/PCI/ Gigabit EMAC	2 ⁵	720	5760	1.29	1.81	1.2	3.3, 1.8, 1.5, 1.2	687 BGA, 24 mm	87.10
TMS320C6452ZU9	1	32 K/32 K/1.4 M	1	–	2	64	2×SGMII/Gigabit EMAC Switch/UHPI/ PCI/VLYNQ™	4 ⁵	900	7200	2.173	3.373	1.2	3.3, 1.8	529 BGA, 19 mm	91.31
TMS320C6452ZU7	1	32 K/32 K/1.4 M	1	–	2	64	2×SGMII/Gigabit EMAC Switch/UHPI/ PCI/VLYNQ	4 ⁵	720	5760	1.92	3.116	1.2	3.3, 1.8	529 BGA, 19 mm	80.10

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² Assumes the following conditions: 60% CPU utilization; DDR2 at 50% utilization (250 MHz), 50% writes, 32 bits, 50% bit switching; two 2-MHz McBSPs at 100% utilization, 50% switching; two 75-MHz timers at 100% utilization; device configured for HPI32 mode with pull-up resistors on HPI pins; room temperature (25°C). See SPRAAE8 for TMS320C6455 and TMS320C6454 DSPs. See SPRAAR5 for TMS320C6452 DSPs.

³ HPI is selectable, 32 bit or 16 bit.

⁴ UTOPIA pins muxed with a second McBSP.

⁵ 64-bit configurable timers.

⁶ Plus on-chip Turbo (TCP) and Viterbi (VCP) coprocessors.

Note: Check www.ti.com for extended temperature and packaging options.

TMS320C674x DSP Generation – Floating-Point DSPs

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)		Total Power (mW)	Packaging	1-KU Price ¹
												Core	I/O			
TMS320C6748ZCE	C674x	300	32 K	32 K	256 K	128 K	DDR2/mDDR SDRAM NAND NOR	64	3 GP, 1 GP/WD	USB 2.0 HS OTG, USB 1.1, SATA 1 McASP, 2 McBSP, 2 SPI, 2 I ² C, 3 UART	10/100 Ethernet MAC, 2 MMC/SD, 2 PWMs, LCD controller, uHPI, 3 eCAP, Video I/O	1.2/ 1.1/ 1.0	1.8/ 3.3	442 ²	0.65-mm 361-pin 13×13-mm BGA	15.20 ³
TMS320C6748ZWT	C674x	300	32 K	32 K	256 K	128 K	DDR2/mDDR SDRAM NAND NOR	64	3 GP, 1 GP/WD	USB 2.0 HS OTG, USB 1.1, SATA 1 McASP, 2 McBSP, 2 SPI, 2 I ² C, 3 UART	10/100 Ethernet MAC, 2 MMC/SD, 2 PWMs, LCD controller, uHPI, 3 eCAP, Video I/O	1.2/ 1.1/ 1.0	1.8/ 3.3	442 ²	0.8-mm 361-pin 16×16-mm BGA	15.20 ³
TMS320C6746ZCE	C674x	300	32 K	32 K	256 K		DDR2/mDDR SDRAM NAND NOR	64	3 GP, 1 GP/WD	USB 2.0 HS OTG, 1 McASP, 2 McBSP, 2 SPI, 2 I ² C, 3 UART	10/100 Ethernet MAC, 2 MMC/SD, 2 PWMs, 3 eCAP, uHPI, Video I/O	1.2/ 1.1/ 1.0	1.8/ 3.3	442 ²	0.65-mm 361-pin 13×13-mm BGA	13.50 ³
TMS320C6746ZWT	C674x	300	32 K	32 K	256 K		DDR2/mDDR SDRAM NAND NOR	64	3 GP, 1 GP/WD	USB 2.0 HS OTG, 1 McASP, 2 McBSP, 2 SPI, 2 I ² C, 3 UART	10/100 Ethernet MAC, 2 MMC/SD, 2 PWMs, 3 eCAP, uHPI, Video I/O	1.2/ 1.1/ 1.0	1.8/ 3.3	442 ²	0.8-mm 361-pin 16×16-mm BGA	13.50 ³

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 prior to placing orders. TI may verify final pricing prior to accepting any order. *New devices are listed in bold red.*

² 70% DSP load (300 MHz), 50% DDR2 EMIF (133 MHz), 50% McBSP (25 MHz), Timer at 100%, CV_{DD} = 1.2 V, @ 25°C.

³ TMS pricing will come into effect when the device is fully qualified in 1Q10. TMX pricing will be applied until that time.

Note: Check www.ti.com for extended temperature and packaging options.



Digital Signal Processors

TMS320C647x DSP Generation – Multi-Core Highest-Performance Fixed-Point DSP

Part Number	Cores	Internal RAM (Bytes) L1 Program Cache/ L1 Data Cache/ L2 Unified RAM/Cache	McASP	McBSP	TSIP	Enhanced DMA (Channels)	COM ³	Timers	MHz	MIPS	Power (W) ²		Voltage (V)		Packaging	1-KU Price ¹
											Internal Logic	Total	Core	I/O		
TMS320C6474ZUN	3	96 K/96 K/3.072 M	–	2	–	64	Serial RapidIO®/ SGMII/Gigabit EMAC	6 ⁴	1000	24000	5.04	5.43	0.9 to 1.2 Smart- Reflex™	1.8, 1.1	561 BGA, 23 mm	224.81
TMX320C6472CZTZ	6	192 K/192 K/4.8 M	–	–	3	64	Serial RapidIO/ RGMII/Gigabit EMAC	12	500	24000	2.44	2.823	1.0	1.2, 1.8, 3.3	737 BGA	140.00
TMX320C6472CZTZ6	6	192 K/192 K/4.8 M	–	–	3	64	Serial RapidIO/ RGMII/Gigabit EMAC	12	625	30000	3.62	4.0	1.1	1.2, 1.8, 3.3	737 BGA	175.00
TMX320C6472CZTZ7	6	192 K/192 K/4.8 M	–	–	3	64	Serial RapidIO/ RGMII/Gigabit EMAC	12	700	33600	5.06	5.44	1.2	1.2, 1.8, 3.3	737 BGA	210.00

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 prior to placing orders. TI may verify final pricing prior to accepting any order.

New devices are listed in bold red.

² Assumes the following conditions: 60% CPU utilization; DDR2 at 50% utilization (250 MHz), 50% writes, 32 bits, 50% bit switching; two 2-MHz McBSPs at 100% utilization, 50% switching; two 75-MHz timers at 100% utilization; room temperature (25°C). See SPRAAX3 for TMS320C6474 DSPs.

³ HPI is selectable, 32 bit or 16 bit.

⁴ 64-bit configurable timers.

Note: Check www.ti.com for extended temperature and packaging options. Additional information on enhanced plastic and HiRel DSP versions is available on page 103 of the Embedded Processing Guide.

TMS320C55x™ DSP Generation – Fixed-Point DSPs

Part Number	RAM (Bytes)	ROM (Bytes)	I-Cache (Bytes)	EMIF (Bits)	DMA (Ch)	DAT/Pro (ADDR) (Words)	USB ²	ADC ³	UART	I ² C	RTC	McBSP ⁴	MMC/ SD	Voltage (V)		COM	Timers ⁵	MHz	MIPs	Packaging	1-KU Price ¹
														Core	I/O						
TMS320VC5509AGHH ⁶	256 K	64 K	–	16	6	8 M	Y1	Y1	–	Y	Y	3	2	1.2/1.35/ 1.6	2.7– 3.6	HPI16	2 ⁷	108/144/ 200	400 (max)	179 BGA	14.40
TMS320VC5509AGHHR ⁶	256 K	64 K	–	16	6	8 M	Y1	Y1	–	Y	Y	3	2	1.2/1.35/ 1.6	2.7– 3.6	HPI16	2 ⁷	108/144/ 200	400 (max)	179 BGA	14.83
TMS320VC5509APGE ⁶	256 K	64 K	–	16	6	8 M	Y1	Y2	–	Y	Y	3	2	1.2/1.35/ 1.6	2.7– 3.6	HPI16	2 ⁷	108/144/ 200	400 (max)	144 LQFP	14.40
TMS320VC5509AZHH ⁶	256 K	64 K	–	16	6	8 M	Y1	Y1	–	Y	Y	3	2	1.2/1.35/ 1.6	2.7– 3.6	HPI16	2 ⁷	108/144/ 200	400 (max)	179 BGA ⁸	14.40
TMS320VC5509AZHHR ⁶	256 K	64 K	–	16	6	8 M	Y1	Y1	–	Y	Y	3	2	1.2/1.35/ 1.6	2.7– 3.6	HPI16	2 ⁷	108/144/ 200	400 (max)	179 BGA ⁸	14.83

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 prior to placing orders. TI may verify final pricing prior to accepting any order.

² 1 = Full speed 2.0; 2 = High speed 2.0

³ 1 = 4-ch 10-bit ADC; 2 = 2-ch 10-bit ADC

⁴ Multi-channel buffered serial port (McBSP).

⁵ 3 = Two general-purpose timers and one 32-bit DSP/BIOS™ kernel counter, 2 = Two general-purpose timers.

Note: All devices include software PLL.

⁶ Extended temperature device, –40 to 85°C case temperature operation.

⁷ Plus 1 additional programmable watchdog timer.

⁸ MicroStar BGA™ package.

Note: Enhanced plastic and HiRel DSP versions are available for selected DSPs.

TMS320C54x™ DSP Generation – Fixed-Point DSPs

Part Number	RAM (Bytes)	ROM (Bytes)	DAT/Pro (ADDR) (Bytes)	EMIF (Bits)	UART	McBSP	Voltage (V)		COM	Timers	DMA	MHz	MIPs	Packaging	1-KU Price ¹
							Core	I/O							
TMS320UC5402PGE80	32 K	8 K	128 K/2 M	16	–	2	1.8	1.8–3.6	HPI 8	2	6	80	80	144 LQFP	5.50
TMS320UC5402GGU80	32 K	8 K	128 K/2 M	16	–	2	1.8	1.8–3.6	HPI 8	2	6	80	80	144 BGA ²	5.50
TMS320UC5402ZGU80	32 K	8 K	128 K/2 M	16	–	2	1.8	1.8–3.6	HPI 8	2	6	80	80	144 BGA ²	5.50
TMS320VC5402GGU100	32 K	8 K	128 K/2 M	16	–	2	1.8	3.3	HPI 8	2	6	100	100	144 BGA	5.50
TMS320VC5402GGUR10	32 K	8 K	128 K/2 M	16	–	2	1.8	3.3	HPI 8	2	6	100	100	144 BGA	5.90
TMS320VC5402PGE100	32 K	8 K	128 K/2 M	16	–	2	1.8	3.3	HPI 8	2	6	100	100	144 LQFP	5.50
TMS320VC5402PGER10	32 K	8 K	128 K/2 M	16	–	2	1.8	3.3	HPI 8	2	6	100	100	144 LQFP	5.90
TMS320VC5402ZGU100	32 K	8 K	128 K/2 M	16	–	2	1.8	3.3	HPI 8	2	6	100	100	144 BGA	5.50
TMS320VC5402ZGUR10	32 K	8 K	128 K/2 M	16	–	2	1.8	3.3	HPI 8	2	6	100	100	144 BGA	5.90
TMS320VC5402APGE16	32 K	32 K	128 K/16 M	16	–	3	1.6	3.3	HPI 8	1	6	160	160	144 LQFP	10.86
TMS320VC5402AGGU16	32 K	32 K	128 K/16 M	16	–	3	1.6	3.3	HPI 8	1	6	160	160	144 BGA ²	10.86
TMS320VC5402AZGU16	32 K	32 K	128 K/16 M	16	–	3	1.6	3.3	HPI 8/16	1	6	160	160	144 BGA	10.86

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 prior to placing orders. TI may verify final pricing prior to accepting any order.

² MicroStar BGA™ package.

Note: All devices include software PLL.

Note: Enhanced plastic and HiRel DSP versions are available for selected DSPs.

OMAP™ Applications Processors



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	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 I ² C, 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
			430	32 K	32 K + 48 K SRAM	64 K + 32 K SRAM	64 K	16 K	64								
OMAP3525	ARM Cortex-A8, C64x+	—	600	32 K	16 K	256 K	64 K	112 K	LPDDR, NOR, NAND, OneNAND, SRAM	32	12 GP, 2 WDT	5 McBSP, 4 McSPI, 3 I ² C, 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
			430	32 K	32 K + 48 K SRAM	64 K + 32 K SRAM	64 K	16 K	64								
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 I ² C, 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 I ² C, 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

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New devices are listed in bold red.

[†] MMC1 is 3.0 V.

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	16 K	16 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 I ² C, 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	16 K	16 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 I ² C, 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.

New devices are listed in bold red.

➔ Video Data Converters and Encoders/Decoders

Video ADCs

Part Number	Description	Resolution (Bits)	(MSPS)	Supply (V)	Analog Voltage Range (V)	Analog Inputs	Power (typ) (mW)	DNL (Max) (\pm LSB)	INL (Max) (\pm LSB)	Digital Clamp	Flexible IP Range	Int/Ext Ref	PGA	PLL	Power Down	SE/DIF	Video Formatter	Pins/Package	Price ¹
TVP7002	Triple 8-/10-bit, 165/110-MSPS video ADC	10, 8	110/165	1.9, 3.3	0.5 to 2	3	1112	1	4	Yes	Yes	Yes	Yes	Yes	Yes	–	Yes	100 HTQFP	3.00

Video DACs

Part Number	Input Format	Output Format	Resolution (Bits)	Sample Rate (MSPS)	Supply Voltage (Analog/Digital) (V)	Number of DACs	Output Standards	SMPTE-Compliant Tri-Level Sync Gen	Multiplexed YPbPr/GBR Input Mode	Pin/Package	Approx. Price ¹	Description
THS8134B	1,2,3×8-bit 4:2:2 YCbCr/RGB	Analog RGB/YPbPr	8	80	5/3 to 5	3	YPbPr SDTV/HDTV (I/P), VESA (to XGA @ 75 Hz)			48 HTQFP	3.00	8-bit, 80-MSPS triple DAC with tri-level sync generation (HDTV compliant)
THS8135	3×10 bit 4:4:4, 2×10 bit 4:2:2 or 1×10 bit 4:2:2 (ITU-R.BT656) multiplexed YCbCr/GBR	Analog RGB/YPbPr, generic DAC	10	240	3.3/1.8	3	YPbPr or RGB SDTV/HDTV (I/P) with embedded composite bi- or tri-level sync. VESA PC graphics up to 1920×1440 @ 60 Hz	Yes	Yes	48 HTQFP	3.00	Triple 10-bit 240-MSPS video DAC with tri-level sync & video (ITU-R. BT.601)-compliant full-scale range
THS8200	1, 2×8-/10-bit 4:2:2, 3×8-/10-bit 4:4:4 YCbCr/RGB, 15-/16-bit RGB	Analog RGB/YPbPr	10	205	3.3/1.8	3	YPbPr SDTV/HDTV (I/P), VESA (to UXGA @ 75 Hz), ITU-R BT.656			80 HTQFP	3.50	Triple 10-bit all format video DAC

Video Encoders/Decoders

Part Number	Supply Voltage (V)	Input Format	Output Format	Analog Inputs	Input Standard(s)	ADC	ADC Resolution (Bits)	Output Standards	Pin/Package	Approx. Price ¹	Description
TVP5150AM1	3.3	CVBS, S-Video	8-bit 4:2:2 ITU656	2	NTSC/PAL/SECAM	9-bit 30 MHz	9	NTSC/PAL/SECAM	32 TQFP, 48 BGA MicroStar Junior™ BGA	2.70	Ultra-low power NTSC/PAL/SECAM video decoder w/robust sync detector
TVP5151	1.8 to 3.3	CVBS, S-Video	8-bit 4:2:2 ITU656	2	NTSC/PAL/SECAM	9-bit 30 MHz	9	NTSC/PAL/SECAM	32 TQFP, 48 BGA MicroStar Junior BGA	2.65	Ultra-low power NTSC/PAL/SECAM video decoder w/robust sync detector
TVP5147M1	1.8, 3.3	CVBS, S-Video, YPbPr	20-bit 4:2:2 YCbCr, 10-bit ITU-R BT.656 4:2:2 YCbCr, 10-bit 4:2:2 YCbCr	10	NTSC/PAL/SECAM	2×10-bit 30 MHz	10	ITU 601, ITU656	80 HTQFP	2.95	10-bit high-quality single-chip digital video decoder that digitizes and decodes NTSC/PAL/SECAM
TVP5160	1.8, 3.3	CVBS, S-Video, SCART, YPbPr	10-bit ITU-R BT.656 4:2:2 YCbCr	12	NTSC/PAL/SECAM	2×54 MHz	10		128 HTQFP	5.20	NTSC/PAL/SECAM/component 10-bit digital video decoder with Macrovision detection, 3-D-YC/5-line com
TVP5146M2	1.8, 3.3	CVBS, RGB, S-Video, YPbPr	10-bit ITU-R BT.656 4:2:2 YCbCr, 20-bit 4:2:2 YCbCr	10	NTSC/PAL/SECAM	4×10-bit 30 MHz	10	ITU 601, ITU656	80 HTQFP	3.30	10-bit high-quality single-chip digital video decoder that digitizes and decodes NTSC/PAL/SECAM
TVP5154A	1.8, 3.3	CVBS, S-Video	8-bit 4:2:2 ITU656	8	NTSC/PAL/SECAM	27 MHz	9	ITU656	128 HTQFP	5.75	4-channel low-power PAL/NTSC/SECAM video decoder with independent scalars
TVP5158	1.1, 1.8, 3.3	CVBS	8-bit 4:2:2 or 16-bit 4:2:2 YCbCr with embedded syncs	4	NTSC/PAL	10-bit, 27 MHz	10	ITU656	128 HTQFP	8.25	4-channel NTSC/PAL video decoder with independent scalars, noise reduction, auto contrast

¹Suggested resale price in U.S. dollars in quantities of 1,000.

AFE and Support Chips and Vertical Drivers



Analog Front End (AFE) and Support Chips

Device	Description	AFE	TG	VD	SNR (dB)	Bits Out	MSPS (MHz)	Pd (mW)	VS (V)	DNL (±LSB)	INL (±LSB)	Gain (dB)	Pin/Package	Price ¹
Single-Channel AFEs														
VSP2582	CDS	✓	—	—	78	12	36	85	2.7 to 3.3	0.5	2	−9 to 35	36-QFN	2.25
VSP2562	CDS with two 8-bit on-chip DAC	✓	—	—	78	12	36	86	2.7 to 3.3	0.5	2	−9 to 44	48-QFP	2.50
VSP2566	CDS with two 8-bit on-chip DAC	✓	—	—	78	16	36	86	2.7 to 3.3	2	32	−9 to 44	48-QFP	2.80
VSP6244	CDS with TG (11 × 3-level, 7 × 2-level 6 × 2-level small)	✓	✓	✓	80	14	50	140	2.7 to 3.3	0.5	12	0 to 51	98-pin BGA 6 × 9 mm	*
VSP6822	CDS with VDr (22 ch)	✓	—	✓	79	12	45	120	2.7 to 3.3	0.5	8	−9 to 44	98-pin BGA 6 × 9 mm	*
VSP01M01	CDS with TG and VD (5 × 3-level, 3 × 2-level)	✓	✓	✓	80	10	36	139	2.7 to 3.6	1	2	−9 to 44	98-pin BGA 6 × 9 mm	*
VSP02M21A	CDS with TG and VD (10 × 3-level, 6 × 2-level, 6 × 2-level small)	✓	✓	✓	81	16	36	230	2.7 to 3.6	1	32	−12 to 38	159-pin BGA 8 × 8 mm 0.5-mm pitch	*
VSP8801A	CDS with TG and VD (10 × 3-level, 6 × 2-level, 6 × 2-level small)	✓	✓	✓	82	14	45	175	2.7 to 3.6	8	0.5	0 to 51	143-pin BGA 8 × 8 mm 0.65-mm pitch	*
Multi-Channel AFEs														
VSP2254	2-ch CDS	✓	—	—	75	14	36	210	3.0 to 3.3	2	8	0	96-pin BGA Monostar	15.75 ²
VSP2590	2-ch CDS	✓	—	—	75	16	41.5	290	2.7 to 3.3	0.8	32	−3 to 5	159-pin BGA	9.25
AFE for Line Sensor														
VSP5010	2-ch CDS	✓	—	—	78	12	30	290	3 to 3.6	0.5	2	0 to 24	64 LOFP 64 SOIC	7.40
VSP5100	6-ch CDS with LVDS outputs	✓	—	—	77	10	30	960	2.7 to 3.3	1	32	−3 to 33	TCCP128	**
VSP7502	4-ch SH with LVDS output	✓	—	—	78	16	54	400	1.8 to 3	1	32	0 to 40	159 BGA 8 × 8 mm	8.00/10 KU

Vertical Drivers

Device	Description	Drive Channels	Voltage Levels	E- Shutter Control	Price ²
VSP1900	CCD vertical clock driver	3 Level drivers ×5, 2 Level drivers ×3	V _L = −5 to −9 V, V _H = 11 to 15 V	✓	6.55

¹Suggested resale price in U.S. dollars in quantities of 1,000.

²Suggested resale price in U.S. dollars in quantities of 100.

HPA Imaging (VSP) Technical Support: vsp_help@list.ti.com (vsp_help)

Preview devices are listed in **bold gray**.

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

* 10K/month minimum. Contact TI for product pricing.

** Contact TI for product pricing.



HDMI, Video Switches/MUXes, Audio Codecs, Digital Audio, Line Drivers

HDMI Switches and Repeaters

Device	Description	No. of Inputs	No. of Outputs	Intra-Pair Skew (max) (ps)	Inter-Pair Skew (max) (ps)	I _{CC} (max) (mA)	ESD HBM (kV)	Pin/Package	Price ¹
TMDS141	HDMI híder	1	1	50	100	150	5	40 QFN	1.75
TMDS351	3-to-1 DVI/HDMI switch	3	1	40	65	200	8	64 TQFP	1.90
TMDS442	4-to-2 DVI/HDMI switch	4	2	50	100	550	5	128 TQFP	3.45

Video Switches

Device	V _{CC}	Signal Type	Configuration	R _{ON} (max) (Ohms)	Bandwidth	XTALK
TS3DV416	3.3 V	Digital video (DVI, HDMI)	4-channel differential SPDT	8	800 MHz (1.8 Gbps)	-41 dB
TS3DV520E	3.0/3.6 V	Digital video (DVI, HDMI)	5-channel differential SPDT	8	1.2 GHz (2.4 Gbps)	-41 dB
TS3DV421	3.0/3.6 V	Digital video (DVI, HDMI)	4-channel differential 8:24 multiplexer switch	12.5	1.9 GHz (3.8 Gbps)	-50 dB
TS3V330	3.3 V	Analog composite, component video	4-channel SPDT	10	300 MHz	-80 dB
TS3V340	3.3 V	Analog composite, component video	4-channel SPDT	6	500 MHz	-80 dB
TS5V330	5 V	Analog composite, component video	4-channel SPDT	10	300 MHz	-63 dB
TL52055	5 V	Analog composite, component video	3-channel SPDT buffered	Push-pull type output	40 MHz	-75 dB

Voiceband Codecs

Device	Description	Sample Rate (kHz)	Number of Input Channel(s)	SNR DAC (dB)	SNR ADC (dB)	Interface	Analog Supply (V)	Logic Supply (V)	Power Supply (mW) (typ)	Package(s)	Price ¹
AIC111	Lowest power, 20-bit	40	1	87	87	SPI, DSP	1.1 to 1.5	+1.1 to +3.3	0.46	QFN-32, FlipChip	5.20
TLV320AIC12K	Low-power, mono codec, 16-bit, 26-kbps voiceband codec with 8W driver	26	1	90	92/84	I ² C, S ² C, DSP	1.65 to 1.95/2.7 to 3.6	+1.1 to +3.6	10	TSSOP-30	1.60
TLV320AIC14K	Low-power, mono codec, 16-bit, 26-kbps voiceband codec	26	1	90	92/84	I ² C, S ² C, DSP	1.65 to 1.95/2.7 to 3.6	+1.1 to +3.6	10	TSSOP-30	1.35
TLV320AIC20K	Low-power, stereo codec, 16-bit, 26-kbps voiceband codec with 8W driver	26	2	90	92/84	I ² C, S ² C, DSP	1.65 to 1.95/2.7 to 3.6	+1.1 to +3.6	20	TQFP-48	2.70
TLV320AIC24K	Low-power, stereo codec, 16-bit, 26-kbps voiceband codec	26	2	90	92/84	I ² C, S ² C, DSP	1.65 to 1.95/2.7 to 3.6	+1.1 to +3.6	20	TQFP-48	2.45

Digital Audio Processors

Device	Description	Digital I/O	Input FS (kHz)	Processing Bits/Accumulator	I/O Max Resolution (Bits)	Package	Price ¹
TAS3103A	Configurable volume, bass, treble, loudness, DRC, mixing, delay, 3-D effects, bi-quad filters	4/3	8-96	48/76	32	PSOP-32	4.15
TAS3108	Fully-programmable, 135-MHz, 48-bit, 8-channel processor	8/8	16-192	48/76	24	TSSOP-38	5.10
TAS3108IA	Fully-programmable, 135-MHz, 48-bit, 8-channel processor (automotive qualified)	8/8	16-192	48/76	24	TSSOP-38	5.75

Video Multiplexers

Device	Description	Ch	SHDN	Supply Voltage (V)	-3 dB at G=+2 Bandwidth (MHz)	0.1-dB Gain Flatness (MHz)	Diff Gain (%)	Diff Phase (°)	Slew Rate (V/μs)	Offset Voltage (mV) (max)	I _o per Ch. (mA) (Typ)	Input Range (V)	RRO	Package(s)	Price ¹
OPA4872	4:1 MUX	1	Y	±3.5, ±6	500	120	0.035	0.005	2300	5	10.6	±2.8	N	SOIC	2.15
OPAy875	2:1 MUX	1, 3	Y	±3, ±6	700	200	0.025	0.025	3100	7	11	±2.8	N	MSOP, SOIC	1.20

DirectPath™ 2-V_{RMS} Line Drivers

Device	Description	Gain (V/V)	Power Supply (V)	Slew Rate (V/μs)	Drive Capability	Price ¹
DRV600	Fixed-gain, single-supply, ground-biased output 2-V _{RMS} line driver	1.5	±1.8 to ±4.5	2.2	2 V _{RMS} 600-Ω Load	0.95
DRV601	Variable-gain, single-supply, ground-biased output 2-V _{RMS} line driver	Variable	±1.8 to ±4.5	2.2	2 V _{RMS} 600-Ω Load	0.75
DRV602	Differential input, variable gain 2-V _{RMS} line driver	Variable	±1.8 to ±4.5	2.2	2 V _{RMS} into 2500 Ω	0.70
DRV603	Differential input, variable gain 2-V _{RMS} with Powersense Technology	Variable	±1.8 to ±5.5	2.2	2 V _{RMS} into 2500 Ω	0.85

¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in bold red.



Video Amplifiers

Device	Description	Ch	SHDN	Supply Voltage (V)	-3 dB at G=+2 Bandwidth (MHz)	0.1-dB Gain Flatness (MHz)	Diff Gain (%)	Diff Phase (°)	Slew Rate (V/μs)	Offset Voltage (mV) (max)	I _q per Ch. (mA) (Typ)	Input Range (V)	RRO	Package(s)	Price ¹
THS7313	I ² C, SD 5 th -order LPF	3	Y	2.7 to 5.5	8	4	0.07	0.12	35	35	6	0 to 2.4	Y	TSSOP	1.20
THS7314	SDTV, 5 th -order Butterworth	3	Y	2.85 to 5.5	8.5	4.2	0.1	0.1	36	390	5.3	0 to 2.4	Y	SOIC	0.40
THS7315	SDTV, 5 th -order Butterworth, 5.2-V/V gain	3	N	2.85 to 5.5	8.5	—	0.2	0.3	37	420	5.2	0 to 0.56	Y	SOIC	0.50
THS7374	SDTV, 6 th -order Butterworth, 6-dB gain	4	Y	2.85 to 5	9.5	—	0.1	0.3	150	380	2.5	-0.1 to 1.46	Y	TSSOP	0.55
THS7375	SDTV, 6 th -order Butterworth, 5.6-V/V gain	4	Y	2.85 to 5.5	9.5	—	0.5	0.5	150	365	3.5	-0.1 to 0.9	Y	TSSOP	0.70
OPA360	G = 2, DC-coupled, LPF, Use with DM270/275/320	1	Y	2.7 to 3.3	9-MHz 2-Pole Filter	5	0.5	1	55	80	6	GND to (V+) -1.5	Y	SC70	0.49
OPA361	G = 5.2, DC-coupled, LPF, TV detect	1	Y	2.5 to 3.3	9-MHz 2-Pole Filter	5	0.5	1	55	55	5.3	GND to 0.55	Y	SC70	0.49
THS7319	EDTV/SDTV, very low power, μCSP	3	Y	2.6 to 5	20	11	0.05	0.03	80	250	1.13	-0.1 to 1.5	Y	μCSP	0.85
THS7365	3-SD, 3-HD, 6 th -order filter, 6-dB gain	6	Y	2.7 to 5	9.5, 36	—	0.2	0.3	500	400	3.45	-0.1 to 1.46	Y	TSSOP-20	0.65
THS7373	1-SD, 3-HD, 6 th -order filter, 6-dB gain	4	Y	2.7 to 5	9.5, 36	—	0.2	0.3	475	400	4.05	-0.1 to 1.46	Y	TSSOP-14	TBD
THS7316	HDTV, 5 th order	3	N	2.85 to 5.5	36	—	0.1	0.1	—	390	5.8	0 to 2.3	Y	SOIC	0.55
THS4281	Low power, high speed, RRIO	1	N	+2.7, ±5, +15	40	20	0.05	0.08	35	12.5	750	30	Y	SOT, MSOP	0.95
OPA358	Small package, low cost	1	Y	2.7 to 3.3	40	12	0.3	0.7	55	6	5.2	GND -0.1 to (V+) -1	Y	SC70	0.45
OPAy832	VFB, fixed gain	1, 2, 3	N	+2.8, ±5	80	—	0.1	0.16	350	7	4.25	-0.5 to 1.5	Y	SOT-23, SOIC	0.70
OPAy354	VFB, low cost	1, 2, 4	N	2.5 to 5.5	100	40	0.02	0.09	150	8	4.9	-0.1 to 5.4	Y	SOT-23, SOIC, MSOP, TSSOP	0.67
OPAy357	VFB, low cost, SHDN	1, 2	Y	2.5 to 5.5	100	40	0.02	0.09	150	8	4.9	-0.1 to 5.4	Y	SOT-23, SOIC, MSOP	0.67
OPAy830	VFB	1, 2, 4	N	+2.8, ±5.5	110	—	0.07	0.17	600	7	4.25	-0.45 to 1.2	Y	SO, SOT-23	0.75
OPA842	VFB	1	N	±5	150	56	0.003	0.008	400	1.2	20.2	±3.2	N	SOT-23, SOIC	1.55
OPAy683	CFB	1, 2	Y	±5, +5	150	37	0.06	0.03	540	1.5	0.9	±3.75	N	SOT-23, SOIC	1.20
THS7353	I ² C, selectable SD/ED/HD/bypass 5 th -order LPF, 0-dB gain	3	Y	2.7 to 5.5	9/16/35/150	5/9/20/25	0.15	0.3	40/70/150/300	20	5.9	0 to 3.4	Y	TSSOP	1.65
OPAy684	CFB	1, 2, 3, 4	Y	±5, +5	160	19	0.04	0.02	820	3.5	1.7	±3.75	N	SOT-23, SOIC	1.35
VCA822	Wideband, variable gain, linear in V/V	1	Y	±5	168	28	—	—	1700	17	36	-2.1 to +1.6	N	MSOP, SOIC	4.35
THS7303	I ² C, selectable SD/ED/HD/bypass 5 th -order LPF, 6 dB	3	Y	2.7 to 5.5	9/16/35/190	5/9.5/22/125	0.13	0.55	40/75/155/320	35	6	0 to 2.4	Y	TSSOP	1.65
OPAy355	VFB, low cost, SHDN	1, 2, 3	Y	2.5 to 5.5	200	75	0.02	0.05	300	9	8.3	-0.1 to 3	Y	SOT-23, SOIC, MSOP, TSSOP	0.69
OPAy356	VFB, low cost	1, 2	N	2.5 to 5.5	200	75	0.02	0.05	300	9	8.3	-0.1 to 3	Y	SOT-23, SOIC, MSOP	0.69
OPA656	VFB, JFET input	1	N	±5	200	30	0.02	0.05	290	1.8	14	-4/+2.5	N	SOT-23, SOIC	3.35
OPAy690	VFB	1, 2, 3	Y	±5, +5	220	30	0.06	0.03	1800	4	5.5	±3.5	N	SOT-23, SOIC	1.35
OPAy691	CFB	1, 2, 3	Y	±5, +5	225	90	0.07	0.02	2100	2.5	5.1	±3.5	N	SOT-23, SOIC	1.45
OPAy820	VFB	1, 4	N	±5, +5	230	—	0.01	0.03	240	0.75	5.6	0.9 to 4.5	N	SOT-23, SOIC	0.90
OPAy692	CFB1, fixed gain	1, 3	Y	±5, +5	240	120	0.07	0.02	2000	2.5	5.1	±3.5	N	SOT-23, SOIC	1.15
THS7368	3-SD, 3-SD/ED/HD/full HD filters, 6-dB gain	6	Y	2.7 to 5	9.5/18/35/70/330	—	0.2	0.3	550	400	3.9	-0.1 to 1.46	Y	TSSOP-20	TBD
THS7327	RGBHV buffer, I ² C, 2:1 MUX	3	Y	2.7 to 5.5	9/16/35/75/500	4/7/15/38/56	0.3	0.45	1300	65	33	0 to 2.4	Y	TQFP	3.35
THS7347	RGBHV buffer, I ² C, 2:1 MUX	3	Y	2.7 to 5.5	500	350	0.05	0.1	1300	15	26.8	0 to 2.4	Y	TQFP	2.75
OPAy694	CFB	2	N	±5	690	—	0.03	0.015	1700	4.1	5	±2.5	N	SOT-23, SOIC	1.25
OPAy693	CFB, fixed gain	1, 3	Y	±5, +5	700	200	0.03	0.01	2500	2	13	±3.4	N	SOT-23, SOIC	1.30
VCA824	Ultra wideband, variable gain, linear in V/V	1	Y	±5	710	135	—	—	2500	17	36	-2.1 to +1.6	N	MSOP, SOIC	5.20
OPAy695	CFB	1, 2, 3	Y	±5, +5	1400	320	0.04	0.007	4300	3	12.9	±3.3	N	SOT-23, SOIC	1.35
BUF602	Closed-loop buffer AV = ±1, 1.4 GHz	1	N	±5, 3.3	N/A	240	0.15	0.04	8000	30	5.8	±4.0	N	SOT-23, SOIC	0.85
OPA615	DC restoration	1	N	±5	N/A	N/A	N/A	N/A	2500	N/A	13	± 3.5	N	SO, MSOP	4.25
OPA861	Transconductance	1	N	±5	N/A	N/A	—	—	900	12	5.4	±4.2	N	SOT-23, SOIC	0.95

¹Suggested resale price in U.S. dollars in quantities of 1,000.

Preview devices are listed in **bold gray**.

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



Audio Codecs

Audio Codecs

Device	Description	Portable Focus	SNR ADC (dB)	Dynamic Range (dB)	Sampling Rate (max) (kHz)	Audio Data Format	Power Supply (V)	Package(s)	Price ¹
PCM3168A	High-performance, 6 inputs, 8 outputs audio codec	—	107	112	96	Normal, I ² S, DSP, TDM	3.3 to 5	HTQFP-64	4.60
PCM3052A	Stereo codec with integrated mic preamp and S/PDIF output	—	101	105	96	Left Justified	+3.3, +5	VQFN-32	3.00
PCM3060	Asynchronous stereo codec	—	99	104	192	I ² S, L, R	+3.3, +5	TSSOP-28	2.10
TLV320AIC3107	Low-power stereo codec, integrated PLL, 10 inputs (mic/line), 7 outputs (line, headphone, mono integrated Class-D Amp)	✓	92	102	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	QFN	2.55
TLV320AIC3106	Low-power stereo codec, integrated PLL, 10 inputs (mic/line), 7 outputs (line, headphone), notch filtering, low-power analog bypass	✓	92	102	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	QFN-32, BGA-80	2.25
TLV320AIC3254	Low-power stereo codec, integrated PLL, integrated LDO, PowerTune™ Technology, 6 SE/3 differential inputs, 4 outputs (stereo line out and stereo HP), integrated miniDSP for enhanced custom audio processing	✓	—	100	192	I ² S, L, R, DSP, TDM	+1.5 to +3.6	QFN-32	3.95
TLV320AIC3204	Low-power stereo codec, integrated PLL, integrated LDO, PowerTune Technology, 6 SE/3 differential inputs, 4 outputs (stereo line out and stereo HP), effects processing	✓	—	100	192	I ² S, L, R, DSP, TDM	+1.5 to +3.6	QFN-32	2.25
PCM3000	Stereo audio codec 18-bits, serial interface, software controlled	✓	—	98	48	Normal, I ² S, DSP	+4.5 to +5.5	SSOP-28	3.45
PCM3001	Stereo audio codec 18-bits, serial interface, hardware controlled	✓	—	98	48	Normal, I ² S, DSP	+4.5 to +5.5	SSOP-28	3.45
PCM3006	Low-power, 3-V supply, stereo codec, hardware controlled	✓	—	93	48	Normal	+2.7 to +3.6	SSOP-24	3.45
PCM3794A	Ultra-low-power stereo codec, 6 inputs (mic/line), 5 outputs (line/HP)	✓	—	93	48	Normal, I ² S, DSP	+2.4 to +3.6	QFN-32	4.55
PCM3793A	Ultra-low-power stereo codec, 6 inputs (mic/line), 3 outputs (line/HP/Class-D speaker)	✓	—	93	48	Normal, I ² S, DSP	+2.4 to +3.6	QFN-32	4.85
PCM3008	Low-power, 2.4-V single supply, stereo codec, low cost, hardware controlled	✓	—	88	48	Normal, I ² S	+2.1 to +3.6	TSSOP-16	3.10
TLV320AIC3105	Low-power stereo codec, integrated PLL, 6 SE inputs (mic/line), 6 outputs (line, headphone), notch filtering, low-power analog bypass	✓	—	102	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	QFN-32	1.95
TLV320AIC3104	Low-power stereo codec, integrated PLL, 6 inputs (mic/line), 6 outputs (line, headphone), notch filtering, low-power analog bypass	✓	—	102	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	QFN-32	1.95
TLV320AIC3101	Low-power stereo codec, integrated PLL, 6 inputs (mic/line), 6 outputs (line, headphone/speaker), notch filtering, low-power analog bypass	✓	—	102	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	QFN-32	2.10
TLV320AIC34	Low-power quad stereo (4-channel) codec, 12 inputs (mic/line), 14 outputs (line, headphone/speaker), 2 PLLs and audio serial buses allow fully asynchronous simultaneous codec operation	✓	—	102	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	BGA-87	3.95
TLV320AIC33	Low-power stereo codec, integrated PLL, 6 inputs, 3 line out and speaker/HP outputs	✓	—	102	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	QFN-48, BGA-80	3.45
TLV320AIC31/32	Low-power stereo codec, integrated PLL, 6 inputs (AIC32 – 6 single-ended, AIC31 – 2 differential and 2 single-ended) 2 line out and speaker/HP outputs	✓	—	100	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	QFN-32	3.25
TLV320AIC36	Low-power stereo audio codec, integrated PLL, 5 inputs (3 mics + 2 line), 6 outputs (stereo HP, stereo line, stereo receiver), digital mic support, advanced programmable filter engines, low-power bypass	✓	—	100	96	I ² S, L, R, DSP, TDM	+2.5 to +3.3	BGA-80	4.25
TLV320AIC23B	Low-power, lower-cost, stereo codec with headphone amps	✓	—	100	96	I ² S, L, R	+2.7 to +3.3	VFBGA-80, TSSOP-28, QFN-28	3.35
TLV320AIC3111	Low-power stereo audio codec, integrated PLL, 6 inputs, 6 outputs, digital mic support, integrated stereo headphone amplifier and stereo Class-D speaker amplifier and integrated miniDSP	✓	—	95	96	I ² S, L, R, DSP, TDM	+2.7 to +3.3	QFN-32	2.95
TLV320AIC3007	Low-power stereo codec, integrated Class-D amp, 7 inputs, 6 outputs	✓	—	93	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	QFN-40	2.35

¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in bold red.



Audio ADCs and DACs

Device	Description	Portable Focus	Dynamic Range (dB)	No. of Inputs/No. of Outputs	Sampling Rate (max) (kHz)	Audio Data Format	Power Supply (V)	Package(s)	Price ¹
Audio ADCs									
PCM4222	2-channel, high-performance $\Delta\Sigma$ ADC	—	124	2/0	216	6-bit modulator, DSD, normal, I ² S, TDM	+3.3, +4	TQFP-48	14.95
PCM4220	2-channel, high-performance $\Delta\Sigma$ ADC	—	123	2/0	216	Normal, I ² S, TDM	+3.3, +4	TQFP-48	9.95
PCM4204	4-channel, high-perf. $\Delta\Sigma$ ADC, PCM or DSD, high-pass filter	—	118	4/0	216	Normal, I ² S, DSD, TDM	+3.3, +5	TQFP-64	7.95
PCM4202	Stereo, high-perf. $\Delta\Sigma$ ADC, PCM or DSD, high-pass filter	—	118	2/0	216	Normal, I ² S, DSD	+3.3, +5	SSOP-28	4.95
PCM4201	Mono, high-performance $\Delta\Sigma$ ADC, PCM or DSD, high-pass filter, wide digital supply range, low power dissipation	—	112	1/0	108	Normal, DSP	+3.3, +5	TSSOP-16	2.50
PCM1804	Stereo ADC, fully differential, high-pass filter	—	112	2/0	192	Normal, I ² S, DSD	+3.3, +5	SSOP-28	3.95
PCM1802	Stereo ADC, SE input	—	105	2/0	96	Normal, I ² S	+3.3, +5	SSOP-20	3.35
PCM1803A	Stereo ADC, SE input, high-pass filter	—	103	2/0	96	Normal, I ² S	+3.5, +5	SSOP-20	1.10
PCM1850A/1A	Stereo ADC w/ 2 × 6 input MUX and PGA, SPI (1850) and I ² C (1851) control	—	101	2/0	96	Normal, I ² S	+3.3, +5	TQFP-32	4.80
PCM1807A/8A	Stereo ADC, SE input, mute w/ fade, SPI control, software (1807) hardware (1808) controlled	—	101	2/0	96	I ² S, L	+3.5, +5	TSSOP-14	1.00
TLV320ADC3101	Low-power stereo audio ADC with internal PLL and highly flexible digital filtering; 6 inputs	✓	92	6/0	96	I ² S, L, R, DSP and TDM	+2.7, +3.6	QFN-24	1.55
TLV320ADC3001	Low-power stereo audio ADC with internal PLL and highly flexible digital filtering; 3 inputs	✓	92	3/0	96	I ² S, L, R, DSP and TDM	+2.7, +3.6	WCSP-16	1.45
PCM1870A	Stereo ADC, SE input, digital filter, very low power consump.	✓	90	2/0	50	Normal, I ² S, DSP	+2.4, +3.6	QFN-24	1.70
Audio DACs									
PCM1792A	Stereo, optional DSD format, external filter and DSP interface, SPI/I ² C, differential output current: 7.8 mA _{p-p}	—	132	0/2	192	Standard, I ² S, L	+3.3, +5	SSOP-28	10.65
PCM1796/8	Stereo advanced segment, 123-dB dynamic range, TDMCA serial interface (1798)	—	123	0/2	192	Standard, I ² S, L	+3.5, +5	SSOP-28	2.95
PCM4104	4-channel, high performance, sampling rate up to 216kHz, hardware or software controlled	—	118	0/4	216	Normal, I ² S, TDM	+3.3, +5	TQFP-48	4.95
PCM1791A	Stereo advanced segment DAC, optional DSD format, external filter and DSP interface, SPI/I ² C differential output current: 3.2 mV _{p-p}	—	113	0/2	192	Normal, I ² S, TDMCA	+3.3, +5	SSOP-28	2.25
PCM1793	Stereo advanced segment DAC, balanced voltage outputs, improved clock jitter	—	113	0/2	192	Normal, I ² S, left justified	+3.3, +5	SSOP-28	2.25
PCM1789	Stereo, differential output DAC, SPI/I ² C or hardware control	—	113	0/2	192	I ² S, left, right justified	+3.3, +5	TSSOP-24	1.90
PCM1780/81/82	Stereo with volume control, software (1780/82) and hardware (1781), open-drain output zero flag (1782), improved jitter performance	—	106	0/2	192	Normal, I ² S	+5	SSOP-16	1.10
TLV320DAC23	I ² C and SPI control with headphone amp, P _{diss} = 23 mW	✓	100	0/2	96	Normal, I ² S, DSP	+1.5 to +3.3	VFBGA-80	2.00
PCM1770/1	Stereo with integrated headphone driver, software (1770) and hardware (1771) controlled	✓	98	0/2	48	Normal, I ² S	+1.6 to +3.6	TSSOP-28, QFN-28, TSSOP-16, QFN-20	1.35
PCM1772/3	Stereo with integrated line out, software (1772) and hardware (1773) controlled	✓	98	0/2	48	Normal, I ² S	+1.6 to +3.6	TSSOP-16, QFN-20	1.35
TLV320DAC26	Integrated PLL, SPI control, speaker/headphone amp, P _{diss} = 11 mW	✓	97	2/2	53	Normal, I ² S, DSP	+2.7 to +3.6	QFN-32	2.45
TLV320DAC32	Low-power stereo DAC with PLL and stereo HP/speaker amplifiers	✓	95	2/4	96	Normal, I ² S, DSP, TDM	+2.7 to +3.6	QFN-32	1.35
PCM1774	Low-power stereo DAC with HP amplifier, sound effect	✓	93	0/2	50	LJ, RJ, I ² S, DSP	+3.3	QFN-20	1.50
PCM1690	Octal DAC, single-ended outputs, SPI/I ² C or hardware control differential outputs	—	113	0/8	192	I ² S TDM, left, right justified	+3.3, +5	HTSSOP-48	2.60
PCM1691	Octal DAC, single-ended outputs, SPI/I ² C or hardware control	—	111	0/8	192	I ² S TDM, left, right justified	+3.3, +5	HTSSOP-48	2.50
DSD1608	8-channel, enhanced multiformat $\Delta\Sigma$ DAC, supports DSD with TDMCA	—	108	0/8	192	Normal, I ² S, DSD	+3.3, +5	TQFP-52	6.40
PCM1680	8-channel, low-cost DAC, improved jitter performance, pin compatible with PCM1780	—	103	0/8	192	Normal, I ² S	+5	SSOP-24	1.50
PCM1606	6-channel, low-cost CMOS, multilevel	—	103	0/6	192	Normal, I ² S	+5	SSOP-20	2.00

¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in bold red.



Speaker Amps, PWM Processors and PWM-Input Class-D Power Stages

Digital-Input Class-D Speaker Amplifiers (PurePath™)

Device	Description	Output Power (W)	2.1 Support	Closed Loop	Power Supply (PVDD)		Half Power THD+N at 1 kHz (%)	SNR (dB)	On-Chip DRC/EQ	I ² C	Price ¹
					(min)	(max)					
TAS5701	20 W, stereo, hardware control	20	Yes (w/ext amp)	No	0	21	< 0.1	101	No	No	2.45
TAS5704	20 W, stereo with feedback, hardware control	20	Yes	Yes	10	26	< 0.1	99	No	No	3.00
TAS5705	20 W, stereo with speaker EQ and DRC	20	Yes (w/ext amp)	No	8	23	< 0.1	105	Yes	Yes	2.45
TAS5706A	20 W, stereo with feedback, speaker EQ and DRC	20	Yes (w/ext amp)	Yes	10	26	< 0.1	99	Yes	Yes	3.00
TAS5706B	20 W, stereo with feedback, speaker EQ, DRC and 2.1 support	20	Yes	Yes	10	26	< 0.1	99	Yes	Yes	3.00
TAS5707	20 W, stereo with speaker EQ and DRC	20	No	No	8	26	< 0.1	106	Yes	Yes	2.55
TAS5708	20 W, stereo with feedback, speaker EQ and DRC	20	No	Yes	10	26	< 0.1	100	Yes	Yes	2.55
TAS5709	20 W, stereo with speaker EQ, 2-band DRC and 3D	20	No	No	8	26	< 0.1	106	Yes	Yes	2.40
TAS5710	20 W, stereo with feedback, speaker EQ, 2-band DRC and 3D	20	No	Yes	10	26	< 0.1	100	Yes	Yes	2.65
TAS5711	20 W, stereo with speaker EQ, 2-band DRC, 3D and 2.1 support	20	Yes	No	8	26	< 0.1	106	Yes	Yes	2.75
TAS5713	25 W, stereo with speaker EQ and 2-band DRC	25	No	No	8	26	< 0.1	106	Yes	Yes	TBD
TAS5716	20 W, stereo with feedback, speaker EQ, DRC, 3D and 2.1 support	20	Yes	Yes	10	26	< 0.1	99	Yes	Yes	3.15

PWM Processors (PurePath)

Device	Description	Frequency (kHz)	Dynamic Range (dB)	Half Power THD+N at 1 kHz (%)	Resolution (Bits)	Package	Price ¹
TAS5010	Stereo modulator only	32 to 192	>93	< 0.08	16, 20, 24	TQFP-48	3.75
TAS5012	Stereo modulator only with higher dynamic range	32 to 192	>102	< 0.06	16, 20, 24	TQFP-48	5.95
TAS55001	Stereo modulator only	32 to 192	>96	< 0.08	16, 20, 24	TQFP-48	3.50
TAS5028A	8-channel, volume control and channel mapping	32 to 192	>102	< 0.1	16, 20, 24	TQFP-64	6.15
TAS5504A	4-channel, EQ, bass management, dynamic range and volume control, HP output	32 to 192	>102	< 0.1	16, 20, 24	TQFP-64	3.00
TAS5508B	8-channel, EQ, bass management, dynamic range and volume control, HP output	32 to 192	>102	< 0.1	16, 20, 24	TQFP-64	5.00
TAS5086	6-channel, bass management, tone and volume control	32 to 192	>105	< 0.1	16, 20, 24	TSSOP-38	1.75
TAS5518C	8-channel, highest dynamic range, record line and HP outputs, DSVIC adds 24-dB dynamic range, EQ, bass management, dynamic range and volume control	32 to 192	>110	< 0.1	16, 20, 24	TQFP-64	7.95

PWM-Input Class-D Power Stages (PurePath)

Device	Description	PBTL Power ²	BTL Power ²	SE Power ²	Package(s)	Price ¹
TAS5182	Controller only, for use with external FETs	—	—	—	HTSSOP-56	6.60
TAS5186A	Highest integration power	—	—	5×30 W + 1×60 W	HTSSOP-44	5.50
TAS5103	15 W, stereo, supports 2 to 4 channels, pad down package	—	15	7.5	HTSSOP-32	1.80
TAS5602	20 W, stereo with feedback, supports 2 to 4 channels, Hi-Z pin	—	20	10	HTSSOP-56	2.00
TAS5102	20 W, stereo, supports 2 to 4 channels, pad up package	—	20	10	HTSSOP-32	1.80
TAS5132	Stereo, low power	—	25	12	HTSSOP-44	2.10
TAS5122	Stereo, low power	—	30	—	HTSSOP-56	3.25
TAS5112A	Stereo, medium power	—	50	—	HTSSOP-56	4.05
TAS5111A	Mono, medium power	—	70	—	HTSSOP-32	2.40
TAS5121	Mono, high power	—	100	—	SSOP-36	3.25
TAS5142	High power, pin compatible with TAS5152	200	100	40	SSOP-36, HTSSOP-44	3.35
TAS5342LA	100 W, stereo, digital power	214	113	42	HTSSOP-44	2.75
TAS5342A	100 W, stereo, digital power	220	117	41	HTSSOP-44	2.95
TAS5152	High power, pin compatible with TAS5142	240	125	45	SSOP-36	4.60
TAS5612	125-W stereo PWM-input closed-loop amplifier	250	125	50	QFP-64, PSSOP-44	4.30
TAS5352A	125-W stereo, digital power	268	138	48	HTSSOP-44	3.10
TAS5614	150-W stereo PWM-input closed-loop amplifier	300	150	75	QFP-64, PSSOP-44	4.45
TAS5616	150-W stereo PWM-input closed-loop amplifier	300	150	75	QFP-64, PSSOP-44	4.45
TAS5261	Mono, high power	—	210	—	SSOP-36	5.25
TAS5162	Stereo, high power	331	210	99	SSOP-36, HTSSOP-44	4.95
TAS5631	300-W stereo PWM-input closed-loop amplifier	600	300	150	QFP-64, PSSOP-44	5.45
TAS5176	6-channel, medium power	—	2×30 W + 1×40 W	5×15 W + 1×25 W	HTSSOP-44	4.30

¹ Suggested resale price in U.S. dollars in quantities of 1,000.

² These power indications should be considered a guide, as final power output capability will rely heavily on external factors such as heat dissipation techniques, power supply ripple and speaker load impedance.

New products are listed in bold red.



High-Power Analog-Input Class-D Speaker Amplifiers

Device	Description	Output Power (W)	Min Load Impedance (Ω)	Power Supply (V)		Half Power THD+N at 1 kHz (%)	PSRR (dB)	Package(s)	Price ¹
				(min)	(max)				
TAS5630	300-W stereo analog-input closed-loop amplifier	300	4	25	50	0.03	80	QFP-64, PSSOP-44	5.45
TAS5615	150-W stereo analog-input closed-loop amplifier	150	8	25	50	0.03	80	QFP-64, PSSOP-44	4.45
TAS5613	150-W stereo analog-input closed-loop amplifier	150	4	18	36	0.025	80	QFP-64, PSSOP-44	4.45
TAS5611	125-W stereo analog-input closed-loop amplifier	125	4	18	36	0.025	80	QFP-64, PSSOP-44	4.30
TAS5412	Stereo, automotive, single-ended analog inputs	100	2	6	24	0.04	75	HTQFP-64	5.30
TAS5422	Stereo, automotive, differential analog inputs	100	2	6	24	0.04	75	HTQFP-64	5.80
TAS5414A	Quad, automotive, single-ended analog inputs	45	2	8	22	0.04	75	SSOP-36, HTQFP-64	8.80
TAS5424A	Quad, automotive, differential analog inputs	45	2	8	22	0.04	75	SSOP-44	10.75
TPA3106D1	40-W mono amp with sync pin	40	4	10	26	0.2	70	HLQFP-32	2.25
TPA3112D1	25-W filter-free mono amp with SpeakerGuard™ Technology	25	4	8	26	0.07	70	TSSOP-28	0.85
TPA3123D2	25-W stereo single-ended amp	25	4	10	30	0.08	60	HTSSOP-24	1.75
TPA3100D2	20-W stereo amp with sync pin	20	4	10	26	0.1	80	HTQFP-48, QFN-48	3.50
TPA3110D2	15-W filter-free stereo amp with SpeakerGuard Technology	15	4	8	26	0.07	70	TSSOP-28	1.45
TPA3122D2	15-W stereo single-ended amp in DIP package	15	4	10	30	< 0.15	60	PDIP-20	0.99
TPA3124D2	15-W stereo single-ended amp with fast mute	15	4	10	26	0.04	60	TSSOP-24	1.45
TPA3121D2	15-W stereo single-ended amp	15	4	10	26	0.04	60	TSSOP-24	1.45
TPA3004D2	12-W stereo amp with DC volume control	12	4	8.5	18	0.1	80	HTQFP-48	3.25
TPA3125D2	10-W stereo single-ended amp in DIP package	10	4	10	26	0.15	60	PDIP-20	0.85
TPA3101D2	10-W stereo amp with sync pin	10	4	10	26	0.1	80	HTQFP-48, QFN-48	3.10
TPA3111D1	10-W filter-free mono amp with SpeakerGuard Technology	10	4	8	26	0.07	70	TSSOP-28	0.90
TPA3002D2	9-W stereo amp with DC volume control	9	8	8.5	14	0.06	80	HTQFP-48	3.30
TPA3113D2	6-W filter-free stereo amp with SpeakerGuard Technology	6	4	8	26	0.07	70	TSSOP-28	0.85
TPA3003D2	3-W stereo amp with DC volume control	3	8	8.5	14	0.2	80	TQFP-48	3.00
TPA2008D2	Stereo, med. power, volume control, ideal for docking stations	3	3	4.5	5.5	0.05	70	TSSOP	1.80

Low-Power Analog-Input Class-D Speaker Amplifiers

Device	Description	Stereo/Mono	Output Power (W)	Min Load Impedance (Ω)	Power Supply (V)		Half Power THD+N at 1 kHz (%)	PSRR (dB)	Package(s)	Price ¹
					(min)	(max)				
TPA2017D2	Stereo, dynamic range compression, SmartGain™ AGC/DRC, GPIO interface	Stereo	2.8	4	2.5	5.5	0.2	80	QFN	1.40
TPA2000D2	Medium power, ideal for docking stations	Stereo	2.5	3	4.5	5.5	0.05	77	TSSOP	1.55
TPA2000D4	Headphone amp, medium power, ideal for docking stations	Stereo	2.5	4	3.7	5.5	0.1	70	TSSOP	2.10
TPA2012D2	Smallest stereo amp in 2mm × 2mm WCSP package	Stereo	2.1	4	2.5	5.5	0.2	75	WCSP, QFN	0.70
TPA2016D2	Dynamic range compression, SmartGain AGC/DRC, I ² C interface	Stereo	1.7	8	2.5	5.5	0.2	80	WCSP	1.30
TPA2001D2	Lower power, ideal for docking stations	Stereo	1.25	8	4.5	5.5	0.08	77	TSSOP	1.65
TPA2100P1	Piezo electric speaker driver	Mono	19 Vpp	1.5 μ F Piezo	2.5	5.5	0.2	90	WCSP	1.30
TPA2011D1	External gain with integrated DAC noise filter	Mono	3.2	4	2.5	5.5	0.03	86	WCSP (0.4-mm pitch)	0.65
TPA2037/39D1	Fixed gain with integrated DAC noise filter 2V/V, 4 V/V	Mono	3.2	4	2.5	5.5	0.03	86	WCSP (0.4-mm pitch)	0.65
TPA2035D1	Fully differential, high power, fixed gain, with auto recovery	Mono	2.75	4	2.5	5.5	0.2	75	WCSP	0.65
TPA2032/3/4D1	Smallest solution size, fully differential, internal gain 2 V/V, 3 V/V, 4 V/V	Mono	2.75	4	2.5	5.5	0.2	75	WCSP	0.45
TPA2013D1	Integrated boost converter, high and constant output power	Mono	2.7	4	1.8	5.5	0.2	95	QFN, WCSP	1.05
TPA2036D1	Similar to TPA2010D1 with short-circuit auto recovery	Mono	2.5	4	2.5	5.5	0.2	75	WCSP	0.35
TPA2015D1	Integrated boost converter with battery monitor for constant output power	Mono	1.4	8	2.3	5.5	0.06	82	WCSP	TBD
TPA2031D1	Similar to TPA2010D1 with slower start-up	Mono	2.5	4	2.5	5.5	0.2	75	WCSP	0.60
TPA2010D1	Fully differential, 1.45mm × 1.45mm WCSP package, high power	Mono	2.5	4	2.5	5.5	0.2	75	WCSP	0.55
TPA2018D1	Dynamic range compression, SmartGain AGC/DRC, I ² C interface	Mono	1.7	8	2.5	5.5	0.2	80	WCSP	0.90
TPA2014D1	Integrated boost converter, medium and constant power	Mono	1.5	8	2.5	5.5	0.1	91	QFN, WCSP	0.90
TPA2006D1	Fully differential, 1.8-V compatible shutdown voltage	Mono	1.45	8	2.5	5.5	0.2	75	QFN	0.49
TPA2005D1	Fully differential, most package options	Mono	1.4	8	2.5	5.5	0.2	75	BGA, QFN, MSOP	0.49

¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in bold red. Preview products are listed in bold gray.

→ Audio Amplifiers

Class-G Amplifiers, Class-AB Headphone Amplifiers

Device	Description	Output Power (W)	Min Load Impedance (Ω)	Power Supply (V)		Half Power THD+N at 1 kHz (%)	PSRR (dB)	Package(s)	Price ¹
				(min)	(max)				
Class-G Amplifiers									
TPA6140A2	DirectPath™, high-efficiency Class-G, I ² C volume control, Hi-Z mode	0.025	16	2.5	5.5	0.0025	109	WCSP	0.95
TPA6141A2	DirectPath, high-efficiency Class-G, Hi-Z mode	0.025	16	2.5	5.5	0.0025	109	WCSP	0.85
Class-AB Headphone Amplifiers									
TPA6136A2	DirectPath, fixed gain, Hi-Z mode	0.025	16	2.5	5.5	0.0025	109	WCSP	0.70
TPA6135A2	DirectPath, fixed gain, Hi-Z mode	0.025	16	2.5	5.5	0.0025	109	QFN	0.55
TPA6132A2	DirectPath, fixed gain	0.025	16	2.5	5.5	0.0025	109	QFN	0.55
TPA6130A2	DirectPath with I ² C volume control	0.138	16	2.5	5.5	0.0025	109	QFN, WCSP	0.90
TPA6120A2	Hi-Fi, current feedback, 80 mW into 600 Ω from a \pm 12-V supply at 0.00014% THD+N	1.5	32	10	30	0.0005	75	SO-20	2.05
TPA6112A2	Differential inputs, 10- μ A ISD	0.15	8	2.5	5.5	0.25	83	MSOP-10	0.39
TPA6111A2	Low cost, headphone, SOIC package, 1- μ A ISD	0.15	8	2.5	5.5	0.25	83	SOIC-8, MSOP-8	0.33
TPA6110A2	Headphone, 10- μ A ISD	0.15	8	2.5	5.5	0.25	83	MSOP-8	0.39
TPA6102A2	Ultra-low voltage, fixed gain (14 dB)	0.05	16	1.6	3.6	0.1	72	SOIC-8, MSOP-8	0.50
TPA6101A2	Ultra-low voltage, fixed gain (2 dB)	0.05	16	1.6	3.6	0.1	72	SOIC-8, MSOP-8	0.35
TPA6100A2	Ultra-low voltage, external resistors	0.05	16	1.6	3.6	0.1	72	SOIC-8, MSOP-8	0.45
TPA4411	DirectPath, internal gain	0.08	16	1.8	4.5	0.08	80	DSBGA-16, QFN-20	0.85
TPA152	Hi-Fi, mute	0.075	32	4.5	5.5	0.007	81	SOIC-8	0.70

Class-AB Speaker Amplifiers

Device	Description	Stereo/Mono	Output Power (W)	Min Load Impedance (Ω)	Power Supply (V)		Half Power THD+N at 1 kHz (%)	PSRR (dB)	Package(s)	Price ¹
					(min)	(max)				
TPA1517	Mute, medium power, low cost, DIP package, single ended	Stereo	6	4	9.5	18	0.15	65	PDIP-20, SO-20	1.05
TPA6030A4	Stereo with stereo HP, wide supply voltage, low power, volume control, fully differential	Stereo	3	16	7	15	0.06	60	HTSSOP-28	1.40
TPA6013A4	Stereo audio power amplifier with advanced DC-volume control and input MUX	Stereo	3	3	4.5	5.5	< 0.8	82	PowerPAD™	0.50
TPA6012A4	Stereo audio power amplifier with advanced DC-volume control	Stereo	3	3	4.5	5.5	< 0.8	82	PowerPAD	1.20
TPA6011A4	Stereo with stereo HP, volume control, fully differential	Stereo	3	3	4	5.5	0.06	70	HTSSOP-24	1.20
TPA6020A2	Fully differential, low voltage, smallest package	Stereo	2.8	3	2.5	5.5	0.05	85	QFN-20	0.60
TPA6017A2	Cost effective, internal gain, fully differential	Stereo	2.6	3	4.5	5.5	0.1	77	HTSSOP-20	0.99
TPA6010A4	Stereo with stereo HP, volume control and bass boost, fully differential	Stereo	2.6	3	4.5	5.5	0.06	67	HTSSOP-28	2.25
TPA0212	Stereo with stereo headphone, internal gain, low-cost computing solution	Stereo	2.6	3	4.5	5.5	0.15	77	TSSOP	1.10
TPA6021A4	Stereo with stereo HP, volume control, fully differential	Stereo	2	4	4	5.5	0.19	70	PDIP-20	1.00
TPA0172	Stereo with stereo headphone, mute function, I ² C volume control	Stereo	2	4	4.5	5.5	0.08	75	TSSOP	2.60
TPA6211A1	Fully differential, highest power	Mono	3.1	3	2.5	5.5	0.05	85	MSOP, QFN	0.55
TPA0233	Mono with stereo headphone, summed inputs	Mono	2.7	4	2.5	5.5	0.06	75	MSOP	1.05
TPA6204A1	Fully differential, high power	Mono	1.7	8	2.5	5.5	0.05	85	QFN	0.35
TPA6205A1	Fully differential, 1.8-V compatible shutdown voltage	Mono	1.25	8	2.5	5.5	0.06	90	MSOP, QFN, BGA	0.32
TPA6203A1	Fully differential, lower cost solution	Mono	1.25	8	2.5	5.5	0.06	90	BGA	0.45
TPA751	Differential inputs, active low	Mono	0.9	8	2.5	5.5	0.15	78	SOIC, MSOP	0.35
TPA731	Differential inputs, active high	Mono	0.9	8	2.5	5.5	0.15	78	SOIC, MSOP	0.35
TPA721	Single-ended inputs, active high	Mono	0.9	8	2.5	5.5	0.15	85	SOIC, MSOP	0.35
TPA711	Single-ended inputs, active high, mono headphone	Mono	0.9	8	2.5	5.5	0.15	85	SOIC, MSOP	0.35

¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in bold red.

Amplifiers, Sample Rate Converters and Transceivers



Microphone Preamplifiers

Device	Description	Gain Range (dB)	Noise (E_{IN} , $G = 30$ dB)	Half Power THD+N at 1 kHz (%)	Power Supply (V)	Package(s)	Price ¹
PGA2500	Digitally controlled, fully differential, high performance, low noise, wide dynamic range, on-chip DC servo loop	0 dB, and 10 dB to 65 dB in 1-dB steps	-128 dBu	0.0004	±5	SSOP-28	7.95
PGA2505	Digitally controlled, fully differential, high performance, low noise, wide dynamic range, on-chip DC servo loop	0 dB, and 10 dB to 60 dB in 3-dB steps	50	0.03	80	QFP-64, PSSOP-44	4.95

Device	Description	Slew Rate (V/μs)	GBW (MHz)	Half Power THD+N at 1 kHz (%)	Power Supply (V)	Package(s)	Price*
INA163	Mono, low noise, low distortion, current feedback, wide bandwidth, wide range of gain	15	8	0.0003	±4.5 to ±18	SO-14	2.90
INA217	Mono, low noise, low distortion, current feedback, wide bandwidth, wide range of gain	15	8	0.004	±4.5 to ±18	PDIP-8, SOIC-16	2.50

Device	Gain (dB)	SNR (dB)	THD at 1 kHz (%)	PSRR (dB)	Output Noise (dBV)	Power Supply (V)	Package	Price ¹
TLV1012	15.6	60	0.013	—	-89	2.2V to 5V	WCSP	0.50
TLV1018-15	15	61	0.13	70	70	1.7V to 5V	WCSP	0.65
TLV1018-25	25	61	0.20	65	65	1.7V to 5V	WCSP	0.65

High-Performance Audio Operational Amplifiers

Device	Description	Supply Voltage (V)	THD+N (%)	Slew Rate (V/μs)	GBW (MHz)	Single, Dual, Quad	Package	Price ¹
OPA604, OPA2604	FET, audio op amp	±4.5 to ±24	0.0003	25	20	S, D	DIP, SO	1.05
OPA134, OPA2134, OPA4134	FET, audio op amp	±2.5 to ±18	0.00008	20	8	S, D, Q	DIP, SO	1.00
OPA1611, OPA1612	Bipolar-input audio op amp	±2.25 to ±18	0.000015	27	80	S, D	SO	1.75
OPA1632	Diff. output ADC driver	±2.5 to ±16	0.00003	50	170	S	SO, MSOP	1.75
NE5532	Dual, low noise op amp	±3 to ±20	—	9	10	D	DIP, SO	0.36
TL072	Dual, low noise, JFET op amp	±7	0.003	13	3	D	DIP, SO	0.29

Integrated Sample Rate Converters and S/PDIF – AES/EBU Transceivers

Device	Description	# SRC Channel(s)	THD+N (dB)	Sample Rate (max) (kHz)	Digital Audio Interface	Control Interface	Dynamic Range (dB)	AES Receive	AES Transmit	Power Supply (V)	Package	Price ¹
SRC4392	High-end combo sample rate converter	2	-140	216	AES/EBU, S/PDIF, I ² S, R, L	I ² C, SPI	144	Yes	Yes	1.8, 3.3	TQFP-48	8.50
SRC4382	Combo sample rate converter	2	-125	216	AES/EBU, S/PDIF, I ² S, R, L	I ² C, SPI	128	Yes	Yes	1.8, 3.3	TQFP-48	6.50

Stand-Alone Sample Rate Converters

SRC4184	4-channel, asynchronous sample rate converter	4	-125	212	I ² S, R, L, TDM	SPI	128	—	—	1.8, 3.3	TQFP-64	5.95
SRC4190	192-kHz stereo asynchronous sample rate converter	2	-125	212	I ² S, R, L, TDM	H/W	128	—	—	3.3	SSOP-28	3.50
SRC4192	High-end sample rate converter	2	-140	212	I ² S, R, L, TDM	H/W	144	—	—	3.3	SSOP-28	5.95
SRC4193	High-end sample rate converter	2	-140	212	I ² S, R, L, TDM	SPI	144	—	—	3.3	SSOP-28	5.95
SRC4194	4-channel, asynchronous sample rate converter	4	-140	212	I ² S, R, L, TDM	SPI	144	—	—	1.8, 3.3	TQFP-64	9.95

Stand-Alone S/PDIF and AES/EBU Interfaces

DIX4192	Digital audio interface transceiver	0	—	216	AES/EBU, S/PDIF, I ² S, R, L, TDM	I ² C, SPI	—	Yes	Yes	1.8, 3.3	TQFP-48	4.95
DIX9210	216-kHz digital audio transceiver	0	—	216	AES/EBU, S/PDIF, I ² S, R, L	I ² S, SPI, H/W	—	Yes	Yes	3.3, 5	LQFP-48	TBD
PCM9210	216-kHz digital audio transceiver with 101-dB stereo ADC	0	-93 (ADC)	216	AES/EBU, S/PDIF, I ² S, R, L	I ² S, SPI, H/W	101 (ADC)	Yes	Yes	3.3, 5	LQFP-48	TBD
DIT4192	192-kHz digital audio transmitter	0	—	192	AES/EBU, S/PDIF, I ² S, R, L	H/W, SPI	—	No	Yes	3.3, 5	TSSOP-28	1.95
DIT4096	96-kHz digital audio transmitter	0	—	96	AES/EBU, S/PDIF, I ² S, R, L	H/W, SPI	—	No	Yes	3.3, 5	TSSOP-28	1.65
DIR9001	96-kHz digital audio receiver	0	—	96	AES/EBU, S/PDIF, I ² S, R, L	H/W	—	Yes	No	3.3	TSSOP-28	2.10

¹Suggested resale price in U.S. dollars in quantities of 1,000.

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



Low-Power RF

Product Comparison Guide Sub-1 GHz

Features/Product	CC1020	CC1021	CC1101	CC1050	CC1110	CC1111	CC1100E
Product type	Transceiver	Transceiver	Transceiver	Transmitter	SoC	SoC	SoC
Programmable frequency, MHz	402–470 804–960	402–470 804–960	300–348 387–464 779–928	300–1000	300–348 391–464 782–928	300–348 391–464 782–928	300–348 391–464 782–928
Supply voltage	2.3 – 3.6 V	2.1 – 3.6 V	1.8 – 3.6 V	2.1 – 3.6 V	2.0 – 3.6 V	3.0 – 3.6 V	3.0 – 3.6 V
Current consumption (RX) 0 dBm (TX)	19.9/19.9 mA 16.2/20.5 mA	19.9/19.9 mA 16.2/20.5 mA	15.0 mA 14.7 mA	NA 9.1 mA	17 mA 31 mA	17 mA 31 mA	17 mA 31 mA
FSK data rate (max)	153.6 kbps	153.6 kbps	500 kbps	76.8 kbps	500 kbps	500 kbps	500 kbps
Modulation format	FSK/OOK/ GFSK	FSK/GFSK/ OOK	FSK/GFSK/ MSK/ OOK/ASK	FSK/OOK	FSK/GFSK/ MSK/ OOK/ASK	FSK/GFSK/ MSK/ OOK/ASK	FSK/GFSK/ MSK/ OOK/ASK
Receiver sensitivity (FSK)	–118 dBm	–109 dBm	–111 dBm	—	–111 dBm	–111 dBm	–110 dBm
Programmable output power ranging from	–20 to 10 dBm	–20 to 10 dBm	–30 to 12 dBm	–20 to 12 dBm	–30 to 12 dBm	–30 to 12 dBm	–30 to 10 dBm
Multi-channel systems/ Frequency hopping protocols	•	•	•	•	•	•	•
RSSI output	Digital	Digital	Digital	—	Digital	Digital	Digital
Integrated bit synchronizer	•	•	•	—	•	•	•
Internal RF switch/IF filter	•	•	•	—	•	•	•
Antenna connection	Single-ended	Single-ended	Differential	Single-ended	Differential	Differential	Differential
Package type	QFN-32	QFN-32	QLP-20	TSSOP-24	QLP-36	QLP-36	QLP-36
Complies with EN 300 220 and FCC CFR 47, part 15	•	•	•	•	•	•	•
Narrow band (12.5/25 kHz)	•	—	—	—	—	—	—
Integrated MCU	—	—	—	—	•	•	•
USB	—	—	—	—	—	•	•
AES encryption/ authentication	—	—	—	—	•	•	•
Program memory	—	—	—	—	8-/16-/32-kB Flash	8-/16-/32-kB Flash	8-/16-/32-kB Flash
Data memory	—	—	—	—	124-kB SRAM	124-kB SRAM	124-kB SRAM



Product Comparison Guide 2.4 GHz

Features/Product	CC2400	CC2520	CC2430	CC2431	CC2550	CC2500	CC2510	CC2511	CC2590 CC2591	CC2480	CC253x
Product type	Transceiver	Transceiver	SoC	SoC	Transmitter	Transceiver	SoC	SoC	RF front end	ZigBee® processor	SoC
Programmable frequency, MHz	2400–2483	2394–2507	2400–2483	2400–2483	2400–2483	2400–2483	2400–2483	2400–2483	2400–2483.5	2400–2483.5	2400–2483
Frequency resolution	1 MHz	1 MHz	1 MHz	1 MHz	427 Hz	427 Hz	427 Hz	427 Hz	—	5 MHz	5 MHz
Operating supply voltage	1.6–2.0 V	1.8–3.8 V	2.0–3.6 V	2.0–3.6 V	1.8–3.6 V	1.8–3.6 V	2.0–3.6 V	3.0–3.6 V	2.0–3.6 V	2.0–3.6 V	2.0–3.6 V
Current consumption (RX) 0 dBm (TX)	24.0 mA 19 mA	18.5 mA 25.8 mA	27 mA 27 mA	27 mA 24.7 mA	N/A 22.8 mA	12.8 mA 21.6 mA	19.8 mA 23 mA	22 mA 23 mA	1.8 mA 3.4 mA	27 mA 27 mA	20.5 mA 29 mA
Data rate (max)	1.0 Mbps	250 Kbps	250 Kbps	250 Kbps	500 Kbps	500 Kbps	500 Kbps	500 Kbps	—	250 kbps	250 kbps
Receiver sensitivity	–101 dBm at 10 Kbps BER = 10 ⁻³ 85 dBm at 1 Mbps	–98 dBm	–94 dBm at PER < 1%	–94 dBm at PER < 1%	N/A	–89 dBm at 250 Kbps 1% PER –99 dBm at 10 Kbps	–88 dBm at 250 Kbps 1% PER –99 dBm at 10 Kbps	–88 dBm at 250 Kbps 1% PER –99 dBm at 10 Kbps	—	–92 dBm at PER < 1%	–97 dBm at PER < 1%
Programmable output power range	–25 to 0 Mbps	–20 to 5 dBm	–25 to 0 dBm	–24 to 0 dBm	–20 to 1 dBm	–20 to 1 dBm	–30 to 1 dBm	–30 to 1 dBm	—	0 dBm	–28 to +4.5 dBm
Multi-channel systems/FHSS	FHSS	DSSS	DSSS	DSSS	FHSS	FHSS	FHSS	FHSS	—	DSSS	DSSS
RSSI output	Digital	Digital	Digital	Digital	—	Digital	Digital	Digital	—	Digital	Digital
Integrated bit synchronizer	•	•	•	•	—	•	•	•	—	•	•
Integrated packet handling	•	•	•	•	•	•	•	•	—	•	•
Data buffering	32 Bytes FIFO	128 Bytes TX 128 Bytes RX	128 Bytes TX 128 Bytes RX DMA	128 Bytes TX 128 Bytes RX DMA	64 Bytes	64 Bytes TX 64 Bytes RX	128 Bytes TX 128 Bytes RX DMA	128 Bytes TX 128 Bytes RX DMA	—	•	128 Bytes TX 128 Bytes RX DMA
Internal RF switch/ IF filter	•	•	•	•	—	•	•	•	—	•	—
RF chip interface	Differential	Differential	Differential	Differential	Differential	Differential	Differential	Differential	—	Differential	Differential
Package type	QFN-48 7×7 mm	QLP-48 7×7 mm	QLP-48 7×7 mm	QLP-48 7×7 mm	QLP-16 4×4 mm	QLP-20 4×4 mm	QLP-36 6×6 mm	QLP-36 6×6 mm	QFN-16 QFN-48	QFN-48	QFN-40 6×6 mm
Complies with EN 300 220, FCC CFR 47, part 15 and ARIB STD-T66	•	•	•	•	•	•	•	•	—	•	•
Integrated MCU	—	—	•	•	—	—	•	•	—	—	•
IEEE 802.15.4 compliant	—	•	•	•	—	—	—	—	—	•	•
USB	—	—	—	—	—	—	—	•	—	—	CC2531
AES encryption/ authentication	—	•	•	•	—	—	•	•	—	•	•
Program memory	—	—	32-/64-/ 128-kB Flash	128-kB Flash	—	—	32-kB Flash	32-kB Flash	—	•	32-/64-/ 128-/256-kB Flash
Data memory	—	768 Bytes	4-kB + 4-kB SRAM	4-kB + 4-kB SRAM	—	—	4-kB SRAM	4-kB SRAM	—	—	8-kB SRAM

→ Audio Amps, Volume Control, LCD Gamma Correction

Power Amplifiers

Device	I_{OUT} (A)	V_S (V)	Bandwidth (MHz)	Slew Rate (V/ μ s)	I_O (mA) (max)	V_{OS} (mV) (max)	V_{OS} Drift (μ V/ $^{\circ}$ C) (max)	I_B (nA) (max)	Package(s)	Price ¹
OPA564	1.5	7 to 26	17	20	50	20	10	0.1	HSOP-20 PowerPAD™	2.75
OPA567	2.4	2.7 to 5.5	1.2	1.2	6	2	1.3	0.01	QFN-12	1.85
OPA569	2.2	2.7 to 5.5	1.2	1.2	6	2	1.3	0.01	SO-20 PowerPAD	3.10

Line Drivers and Receivers

Device	Description	Power Supply (V)	Half Power THD+N at 1 kHz (%)	Slew Rate (V/ μ s)	GBW (MHz)	Package(s)	Price ¹
Line Drivers							
DRV134	Balanced output, DIP pkg., companion to INA134 and INA137	± 4.5 to ± 18	0.0005	12	1.5	SOIC-16, PDIP-8	1.95
DRV135	Balanced output, small pkg., companion to INA134 and INA137	± 4.5 to ± 18	0.0005	12	1.5	SOIC-8	1.95
Line Receivers							
INAY134 ²	Differential, fixed gain, 0 dB (G=1) 1 V/V	± 4 to ± 18	0.0005	14	3.1	PDIP-8/14, SOIC-8/14	1.05
INAY137 ²	Differential, ± 6 dB (G=1/2 or 2)	± 4 to ± 18	0.0005	14	4	PDIP-8/14, SOIC-8/14	TBD

Volume Controls

Device	Description	Dynamic Range (dB)	Half Power THD+N at 1 kHz (%)	Crosstalk at 1 kHz (dBFS)	Power Supply (V)	Voltage Swing (V_{PP})	Package(s)	Price ¹
PGA2320	± 15 V, improved THD, pin compatible with PGA2310, voltage swing of 28 V_{PP}	120	0.0003	-126	± 15	27	SOL-16	7.95
PGA2310	± 15 V, DIP package, pin compatible with PGA2311, voltage swing of 27 V_{PP}	120	0.0004	-126	± 15	27	SOL-16, DIP-16	9.95
PGA2311U ²	2-channel, ± 5 V, low inter-channel crosstalk, voltage swing of 7.5 V_{PP}	120	0.0002	-130	± 5	7.5	SOL-16, DIP-16	3.95
PGA4311U ²	4-channel, ± 5 V, low inter-channel crosstalk, voltage swing of 7.5 V_{PP}	120	0.0002	-130	± 5	7.5	SOP-28	7.45

²U indicates U-Grade devices.

Reference Voltage Generator for LCD Gamma Correction

Device	Description	Resolution (Bits)	Supply Current (μ A/ch)	Analog Voltage (V)	Digital Supply (V)	Interface	Non-Volatile Memory	Package	Price ¹
BUF16821	16-channel programmable gamma correction and 2-channel programmable Vcom	10	670	9 to 20	2.0 to 5.5	2-wire	Y	TSSOP-28	2.15
BUF08821	8-channel programmable gamma correction and 1-channel programmable Vcom	10	500	9 to 20	2.0 to 5.5	2-wire	Y	TSSOP-20	1.90
BUF08832	8-channel programmable gamma correction and 1-channel high slew-rate Vcom	10	500	9 to 20	2.0 to 5.5	2-Wire	Y	TSSOP-20	1.90

Low-Power Audio Amplifier Sub-Systems

Device	Description	Speaker Output Power (W)	Headphone Output Power (W)	Half Power THD+N at 1 kHz (%)	PSRR (dB)	Power Supply (V)		Package(s)	Price ¹
						(min)	(max)		
TPA6040A4	Stereo Class-AB and DirectPath™ headphones and 4.75-V LDO	2.3	0.2	0.1	80	4.5	5.5	5×5 QFN-32	0.99
TPA6041A4	Stereo Class-AB and DirectPath headphones and 3.3-V LDO	2.6	0.2	0.1	80	4.5	5.5	5×5 QFN-32	1.15
TPA6045A4C	Stereo Class-AB and DirectPath headphones and 3.3-V LDO	2.3	0.2	0.1	80	4.5	5.5	5×5 QFN-32	1.15
TPA6047A4	Stereo Class-AB and DirectPath headphones and 3.3-V LDO	2.6	0.06	0.1	65	4.5	5.5	5×5 QFN-32	1.15
TPA2050D4	Stereo Class-D and DirectPath headphones (2 inputs)	2.4	4	2.5	5.5	0.1	75	WCSP	1.25
TPA2051D3	Mono Class-D sub-system with DirectPath headphone amplifier and SpeakerGuard™ (3 inputs)	2.9	4	2.5	5.5	0.1	75	WCSP	0.75
TPA2054D4	Stereo Class-D and DirectPath headphones (3 inputs)	2.4	4	2.5	5.5	0.1	75	WCSP	1.30

¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in bold red.



Audio Converters with Integrated Touch-Screen Controller

Device	Description	Resolution (Bits) (max)	Dynamic Range DAC (dB)	Dynamic Range ADC (dB)	Sampling Rate (max) (kHz)	Configuration	Audio Data Format	Power Supply (V)	Package(s)	Price ¹
TSC2100	4-wire touch-screen interface, low power, lower cost, stereo DAC, mono ADC, integrated PLL, speaker/HP amp	24	97	88	53	Mono/Stereo	Normal, I ² S, DSP	+2.7 to +3.6	QFN-32, TSSOP-32	3.05
TSC2111	4-wire touch-screen interface, low power, stereo DAC, mono ADC, integrated PLL, speaker/HP amp, additional inputs and outputs (TSC2111 – differential)	24	95	88	53	Mono/Stereo	Normal, I ² S, DSP	+2.7 to +3.6	QFN-48	3.75
TSC2102	4-wire touch-screen interface, low power, stereo DAC, integrated PLL, speaker/HP amp, low cost	24	97	—	53	Stereo	Normal, I ² S, DSP	+2.7 to +3.6	TSSOP-32	2.50
TSC2117	4-wire touch-screen interface, low power, integrated PLL, HP amp, stereo Class-D speaker amplifier, MiniDSP	32	95	91	192	Mono/Stereo	I ² S, L, R, DSP, TDM	+2.7 to +3.6	QFN-48	4.45
TSC2300	4-wire touch-screen interface, low power, stereo DAC, mono ADC, integrated PLL	20	98	88	48	Mono/Stereo	Normal, I ² S	+2.7 to +3.6	TQFP-64	4.45
TSC2301	4-wire touch-screen interface, low power, stereo DAC, stereo ADC, integrated PLL, HP amp, 4 × 4 keypad interface	20	98	88	48	Stereo/Stereo	Normal, I ² S	+2.7 to +3.6	TQFP-64, BGA-120	4.65
TSC2302	4-wire touch-screen interface, low power, stereo DAC, stereo ADC, integrated PLL, HP amp	20	98	88	48	Stereo/Stereo	Normal, I ² S	+2.7 to +3.6	QFN-48	4.55

Non-Audio Touch-Screen Controllers

Device	Touch Panel	Res. (Bits)	Interface	Features	ESD ²	VREF	Supply Voltage (V)	Power Consumption (mW)	Package(s)	Price ¹
Touch Screen for Video										
ADS7845	5-Wire	12(8)	Serial, SPI	X, Y, AUX	2 kV	Ext	2.7 to 5.25	1.8	SSOP-16	4.20
TSC2000	4-Wire	8, 10, 12	Serial, SPI	Processor, X, Y, pressure, V _{BAT} , temp, AUX, DAC	2 kV	Int	2.7 to 3.6	6.2	TSSOP-16, QFN-16, BGA-48	2.35
TSC2003	4-Wire	12(8)	Serial, I ² C	X, Y, pressure, V _{BAT} , temp, AUX	2 kV A 2 kV C	Int	2.7 to 5.25	1.8	TSSOP-16	2.25
TSC2004	4-Wire	12	Serial, I ² C	Processor, X, Y, pressure, temp, AUX	18 kV A 15 kV C	Ext	Analog: 1.6 to 3.6 V/I/O: 1.2 to 3.6	0.075 typ Std 0.6 typ enhanced	2.5×2.5 WCSP-18, QFN-20	2.00
TSC2005	4-Wire	12	Serial, SPI	Processor, X, Y, pressure, temp, AUX	18 kV A 15 kV C	Ext	Analog: 1.6 to 3.6 V/I/O: 1.2 to 3.6	0.075 typ Std 0.6 typ enhanced	2.5×3.0 WCSP-18	2.20
TSC2006	4-Wire	12	Serial, SPI	Processor, X, Y, pressure, temp, AUX	18 kV A 15 kV C	Ext	Analog: 1.6 to 3.6 V/I/O: 1.2 to 3.6	0.075 typ Std 0.6 typ enhanced	QFN-20	1.50
TSC2007	4-Wire	12	Serial, I ² C	Processor, X, Y, pressure, temp, AUX	20 kV A 12 kV C	V _{DD} = V _{REF}	1.2 to 3.6	0.04 typ	1.5×2.0 WCSP-12, TSSOP-16	1.75
TSC2046	4-Wire	12(8)	Serial, SPI	X, Y, pressure, V _{BAT} , temp, AUX	2 kV A 2 kV C	Int	Analog: 2.2 to 5.25 V/I/O: 1.5 to 5.25	1.8	TSSOP-16, QFN-16, BGA-48	1.80
TSC2046E	4-Wire	12(8)	Serial, SPI	X, Y, pressure, V _{BAT} , temp, AUX	15 kV C	Int	Analog: 2.2 to 5.25 V/I/O: 1.5 to 5.25	1.8	TSSOP-16, QFN-16, BGA-48	2.05
TSC2200	4-Wire	8, 10, 12	Serial, SPI	Processor, X, Y, pressure, V _{BAT} , temp, KP, AUX, DAC	2 kV	Int	2.7 to 3.6	6.2	TSSOP-16, QFN-16, BGA-48	2.40

¹Suggested resale price in U.S. dollars in quantities of 1,000.

²ESD: A = Air, C = Contact

→ Analog Switches and Digital Bus Switches

Analog Switches

Device	Ron (max)	Ron Flatness (max)	Ron Mismatch (max)	V+ (V) (min)	V+ (V) (max)	On Time (ns) (max)	Off Time (ns) (max)	Pins/Packages
SPST								
TS5A3166	0.9	0.15	–	1.65	5.5	7	11.5	5/SC70, SOT-23, WCSP
TS5A3167	0.9	0.15	–	1.65	5.5	7	11.5	5/SC70, SOT-23, WCSP
TS5A4594	8	1.5	–	2.7	5.5	17	14	5/SC70, SOT-23
TS5A4595	8	1.5	–	2.7	5.5	17	14	5/SC70, SOT-23
TS5A4596	8	1.5	–	2.7	5.5	17	14	5/SC70, SOT-23
TS5A4597	8	1.5	–	2.7	5.5	17	14	5/SC70, SOT-23
TS5A1066	10	5	–	1.65	5.5	5.5	4.5	5/SC70, SOT-23, WCSP
SPST x 2								
TS5A23166	0.9	0.25	0.1	1.65	5.5	7.5	11	8/US8, WCSP
TS5A23167	0.9	0.25	0.1	1.65	5.5	7.5	11	8/US8, WCSP
TS3A4741	0.9	0.4	0.05	1.65	3.6	14	9	8/MSOP, SOT-23
TS3A4742	0.9	0.4	0.05	1.65	3.6	14	9	8/MSOP, SOT-23
TS5A2066	10	5	1	1.65	5.5	5.8	3.6	8/SM8, US8, WCSP
SPST x 4								
TS3A4751	0.9	0.4	0.05	1.65	3.6	14	9	14/TSSOP
SPDT								
TS5A6542	0.75	0.25	0.25	2.25	5.5	25	20	8/WCSP
TS5A4624	0.9	0.25	0.1	1.65	5.5	22	8	6/SC70
TS5A3153	0.9	0.15	0.1	1.65	5.5	16	15	8/US8, WCSP
TS5A3154	0.9	0.15	0.1	1.65	5.5	8	12.5	8/US8, WCSP
TS5A3159A	0.9	0.25	0.1	1.65	5.5	30	20	6/SC70, SOT-23, WCSP
TS5A3159	1.1	0.15	0.1	1.65	5.5	35	20	6/SC70, SOT-23
TS5A3160	0.9	0.25	0.1	1.65	5.5	6	13	6/SC70, SOT-23
TS5A3157	10	5	0.2	1.65	5.5	8.5	6.5	6/SC70, SOT-23, WCSP
TS5A63157	10	2	0.14	1.65	5.5	5	3.4	6/SC70, SOT-23
TS5A2053	13.8	4.5	4.5	1.65	5.5	6.8	4.1	8/SM8, US8
SPDT x 2								
TS5A23159	0.9	0.25	0.1	1.65	5.5	13	8	10/MSOP, QFN
TS5A23160	0.9	0.25	0.1	1.65	5.5	5.5	10	10/MSOP
TS5A23157	10	4 (typ)	0.15 (typ)	1.65	5.5	5.7	3.8	10/MSOP, QFN
TS5A623157	10	2	0.14	1.65	5.5	5	3.4	10/MSOP
TS5A26542	0.75	0.25	0.1	1.65	5.5	25	20	12/WCSP
TS3A24157	0.3	0.04	0.07	1.65	3.6	35	25	10/MSOP, QFN
TS3A24159	0.3	0.04	0.05	1.65	3.6	35	25	10/MSOP, SON, WCSP
TS5A22364	0.94	0.46	0.11	2.3	5.5	80	70	10/MSOP
SPDT x 4								
TS3A5018	10	7	0.8	1.65	3.6	8	6.5	16/SOIC, SSOP (QSOP), TSSOP, TVSOP, QFN
TS3A44159	0.45	0.1	0.07	1.65	4.3	23	32	16/TSSOP, QFN
SP3T								
TS5A3359	0.9	0.25	0.1	1.65	5.5	21	10.5	8/US8
TS5A3357	15	6.5 (typ)	0.1 (typ)	1.65	5.5	6.5	3.7	8/SM8, US8
SP4T x 2								
TS3A5017	12	9	2	2.3	3.6	9.5	3.5	16/SOIC, SSOP (QSOP), TSSOP, TVSOP, QFN

Digital Bus Switches

Part Number	I _{CC} (μA)	No. of Bits	Ron (max) (ohms)	t _{pd} Max (ns)	V _{CC} Range (V)	Voltage Nodes (V)	V _{CC} Min (V)	V _{CC} Max (V)	Technology Family	Pin/Package	Description
SN74CB3T16212	70	24	8.5	0.25	2.3 to 3.6	2.5, 3.3	2.3	3.6	CB3T	56 BGA MicroStar Junior™, 56 TSSOP, 56 TVSOP	24-bit FET bus-exchange 2.5-V/3.3-V low-voltage bus switch with 5-V-tolerant level shifter
SN74CB3Q3253	2000	2	11	0.18	2.3 to 3.6	2.5, 3.3	2.3	3.6	CB3Q	16 QFN, 16 SSOP/QSOP, 16 TSSOP, 16 TVSOP	Dual 1-of-4 FET multiplexer/demultiplexer 2.5-V/3.3-V low-voltage high-bandwidth bus switch

Clocks by Application



Digital Media Systems

Device	Description	Input Level	Output Level	Frequency (MHz)	V _{CC} (V)	Jitter (Peak-to-Peak) [P-P] or Cycle-to-Cycle [C-C]	Output Skew (max) (ps)	Pins/Packages	Price ¹
Audio/Video/IPTV/IP-STB/Streaming Media									
CDCE906	Programmable 3-PLL clock generator w/ EEPROM	Xtal/single-ended/differential	2.5- to 3.3-V LVTTTL	<167	3.3	60 ps (typ)	200	20/TSSOP	2.20
CDC5806	3-PLL-based clock generator for digital TV apps	LVTTTL	LVTTTL	12 to 74	3.3	P-P: 150 ps	—	20TSSOP	2.70
CDCVF2505	1:5 PLL clock driver for general purpose, SSC	LVTTTL	LVTTTL	24 to 200	3.3	C-C: 70 ps (typ)	150	8/TSSOP/SOIC	0.85
CDCR83A	400-MHz Direct Rambus clock generator, SSC	CMOS	RSL6	267 to 400	3.3	C-C: 50 ps (400 MHz)	—	24/SSOP	1.85
CDCFR83A	533-MHz Direct Rambus clock generator, SSC	CMOS	RSL6	267 to 533	3.3	C-C: 40 ps (533 MHz)	—	24/SSOP	2.15
CDCE949	Programmable 4-PLL clock generator w/ VCXO input	Xtal/VCXO/single-ended	LVTTTL	<200	1.8	60 ps (typ)	150	24/TSSOP	2.35
CDCDLP223	Clock synthesizer for DLP® technology	Xtal	LVTTTL/HCLK	20 to 400	3.3	Period jitter: ±75 ps	—	20/TSSOP	2.90
CDCE5704	XDR clock generator	HCLK	XDR RSL	300 to 667	2.5	C-C: 40 ps (300 to 635 MHz)	—	28/TSSOP	2.95
CDCS502	Crystal oscillator/clock generator with optional SSC	Xtal	LVC MOS	8 to 108	3.3	100 ps (typ)	—	8/TSSOP	0.95
DSP and DaVinci™ Clocks									
CDCV304	1:4 fanout for PCI-X and general applications	LVTTTL	LVC MOS	0 to 140	3.3	—	100	8/TSSOP	1.10
CDCVF2505	1:5 PLL clock driver for general purpose, SSC	LVTTTL	LVTTTL	24 to 200	3.3	C-C: 70 ps (typ)	150	8/TSSOP/SOIC	0.85
CDCVF2310	1:10 clock with 2 banks with series resistors	LVTTTL/LVC MOS	LVTTTL/LVC MOS	0 to 200	2.5/3.3	—	100	24/TSSOP	2.05
CDCE706	Programmable 3-PLL clock generator with EEPROM	Xtal/single-ended/differential	2.5- to 3.3-V LVTTTL	<300	3.3	60 ps (typ)	200	20/TSSOP	3.60
CDCE906	Programmable 3-PLL clock generator with EEPROM	Xtal/single-ended/differential	2.5- to 3.3-V LVTTTL	<167	3.3	60 ps (typ)	200	20/TSSOP	2.20
CDCE913	1.8-V programmable 1-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	3.3-V LVTTTL	<200	1.8	60 ps (typ)	150	14/TSSOP	1.60
CDCEL913	1.8-V programmable 1-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	1.8-V LVTTTL	<200	1.8	60 ps (typ)	150	14/TSSOP	1.60
CDCE925	1.8-V programmable 2-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	3.3-V LVTTTL	<200	1.8	60 ps (typ)	150	16/TSSOP	1.95
CDCEL925	1.8-V programmable 2-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	1.8-V LVTTTL	<200	1.8	60 ps (typ)	150	16/TSSOP	1.95
CDCE937	1.8-V programmable 3-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	3.3-V LVTTTL	<200	1.8	60 ps (typ)	150	20/TSSOP	2.15
CDCEL937	1.8-V programmable 3-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	1.8-V LVTTTL	<200	1.8	60 ps (typ)	150	20/TSSOP	2.15
CDCE949	1.8-V programmable 4-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	3.3-V LVTTTL	<200	1.8	60 ps (typ)	150	24/TSSOP	2.35
CDCEL949	1.8-V programmable 4-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	1.8-V LVTTTL	<200	1.8	60 ps (typ)	150	24/TSSOP	2.35
Gaming Console									
CDCR83A	400-MHz Direct Rambus clock generator, SSC	CMOS	RSL6	267 to 400	3.3	C-C: 50 ps (400 MHz)	—	24/SSOP	1.85
CDCFR83A	533-MHz Direct Rambus clock generator, SSC	CMOS	RSL6	267 to 533	3.3	C-C: 40 ps (533 MHz)	—	24/SSOP	2.15
CDCE5704	XDR clock generator	HCLK	XDR RSL	300 to 667	2.5	C-C: 40 ps (300 to 635 MHz)	—	28/TSSOP	2.95
Office Automation									
CDCE706	Programmable 3-PLL clock generator w/ EEPROM	Xtal/single-ended/differential	2.5- to 3.3-V LVTTTL	<300	3.3	60 ps (typ)	200	20/TSSOP	3.60
CDCE906	Programmable 3-PLL clock generator w/ EEPROM	Xtal/single-ended/differential	2.5- to 3.3-V LVTTTL	<167	3.3	60 ps (typ)	200	20/TSSOP	2.20
CDCE913	1.8-V programmable 1-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	3.3-V LVTTTL	<200	1.8	60 ps (typ)	150	14/TSSOP	1.60
CDCE925	1.8-V programmable 2-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	3.3-V LVTTTL	<200	1.8	60 ps (typ)	150	16/TSSOP	1.95
CDCE937	1.8-V programmable 3-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	3.3-V LVTTTL	<200	1.8	60 ps (typ)	150	20/TSSOP	2.15
CDCE949	1.8-V programmable 4-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	3.3-V LVTTTL	<200	1.8	60 ps (typ)	150	24/TSSOP	2.35
CDCVF2505	1:5 PLL clock driver for general purpose, SSC	LVTTTL	LVTTTL	24 to 200	3.3	C-C: 70 ps (typ)	150	8/TSSOP/SOIC	0.85
CDCM61001	1:1 ultra-low jitter crystal-in clock generator	Xtal/LVC MOS	LVPECL/LVDS/LVC MOS	44 to 683	3.3	—	—	32/QFN	4.20
CDCM61002	1:2 ultra-low jitter crystal-in clock generator	Xtal/LVC MOS	LVPECL/LVDS/LVC MOS	44 to 683	3.3	—	—	32/QFN	5.00
CDCM61004	1:4 ultra-low jitter crystal-in clock generator	Xtal/LVC MOS	LVPECL/LVDS/LVC MOS	44 to 683	3.3	—	—	32/QFN	6.50
Portable									
CDCEL913	1.8-V programmable 1-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	1.8-V LVTTTL	<200	1.8	60 ps (typ)	150	14/TSSOP	1.60
CDCEL925	1.8-V programmable 2-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	1.8-V LVTTTL	<200	1.8	60 ps (typ)	150	16/TSSOP	1.95
CDCEL937	1.8-V programmable 3-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	1.8-V LVTTTL	<200	1.8	60 ps (typ)	150	20/TSSOP	2.15
CDCEL949	1.8-V programmable 4-PLL VCXO clock synthesizer	Xtal/VCXO/single-ended	1.8-V LVTTTL	<200	1.8	60 ps (typ)	150	24/TSSOP	2.35
CDC3S04	Quad sine-wave clock buffer with LDO	SINE	SINE	<52	1.8	—	50	20/DSBGA	1.80

¹Suggested resale price in U.S. dollars in quantities of 1,000.

➔ Logic

Little Logic: Single-, Dual- and Triple-Gate Logic Devices

Get samples, data sheets and application reports at www.ti.com/littlelogic

Little Logic offers voltage-range operating levels from 5.5 V all the way down to sub 1-V V_{CC} and can be utilized with AHC/T (5-V), LVC (3.3-V), AUP (3.3-V) and AUC (1.8-V) product families. Designs that require signal switching can take advantage of TI's

CBT Little Logic families. The CBT devices provide bus switch solutions in a variety of options, including CBTD for 5-V to 3.3-V translation and CBTLV for low-voltage operation. Little Logic provides packaging options in 5-, 6- and 8-pin packages, including the

NanoStar™ integrated circuit package, that are 70 percent smaller than the 5-pin SC-70 and 13 percent smaller than any other logic package available today.

Key Features

- 1.8-V to 5.5-V optimized performance
- Sub 1-V operation with AUC and AUP Little Logic
- World's smallest logic package NanoStar integrated circuit (IC) package
- YZV = 4-bump NanoStar IC package (0.9 mm × 0.9 mm)
- YZP = 5-, 6- and 8-bump (see diagram below)
- Low-voltage bus switching (CBTLV)
- Pb-free offering
- Packaging: See below

Applications

- Portable media devices
- PDAs/pocket PCs
- Cellular phones
- Computing

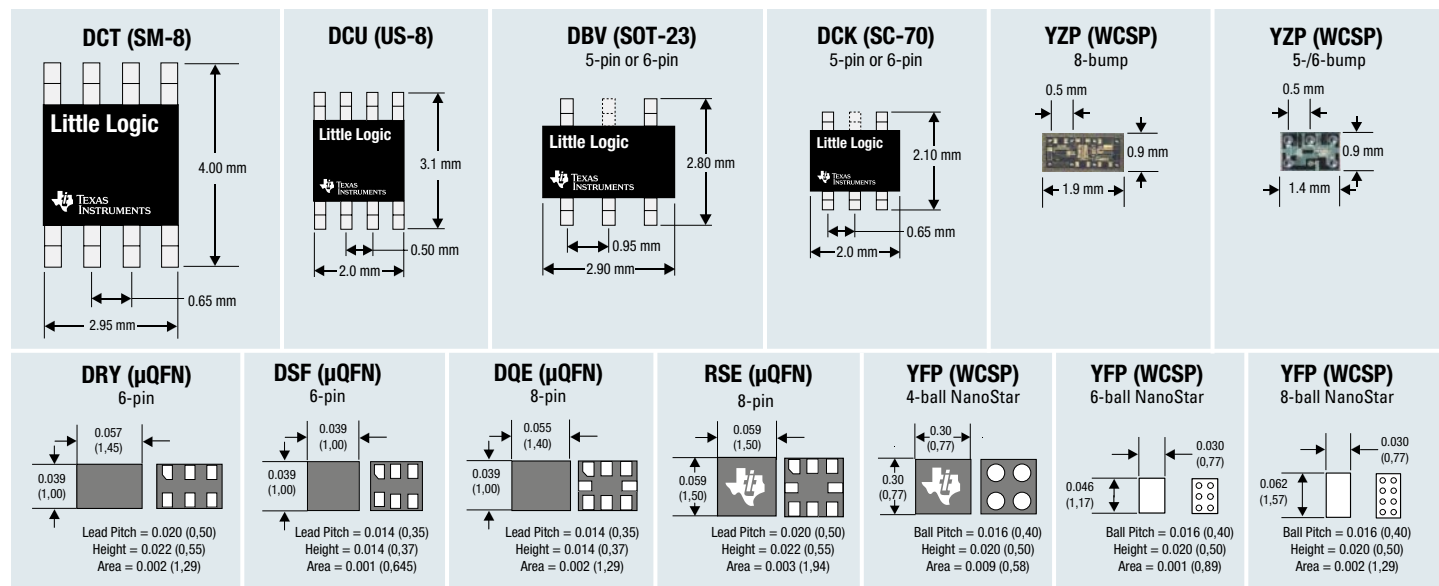
Little Logic Performance Comparisons

Family	Operating Voltage Range (V)	Optimized Voltage (V)	Propagation Delay, tpd (typ) (ns)	Output Drive (mA)	Input Tolerance (V)	IOFF Protection
AUC	0.8 to 2.7	1.8	2.0	8	3.6	Yes
AUP	0.8 to 3.6	3.3	3.5	4	3.6	Yes
LVC	1.65 to 5.5	3.3	3.5	24	5.5	Yes
AHC	2.0 to 5.5	5.0	5.0	8	5.5	No
AHCT	4.5 to 5.5	5.0	5.0	8	5.5	No
CBT	4.5 to 5.5	5.0	0.25 ¹	– ²	5.5	Yes
CBTD	4.5 to 5.5	5.0	0.25 ¹	– ²	5.5	Yes
CBTLV	2.3 to 3.6	3.3	0.25 ¹	– ²	3.6	Yes

¹The propagation delay is the calculated RC time constant of the typical on-state resistance of the switch and the specified load capacitance, when driven by an ideal voltage source (zero output impedance). The value listed is a maximum.

²The FET switch has no output drive. The drive current at the output terminal is determined by the drive current of the device connected at the input terminal of the FET switch.

Space-Saving Little Logic Packages



I²C

Part Number	Max Frequency (kHz)	I ² C Address	V _{CC} Range (V)	No. of I/Os	Additional Features					I/O Type		
					Low Power	Interrupt	Reset	Configuration Registers	5-V-Tolerant I/Os	Push-Pull	Open Drain	
Low-Voltage I/O Expanders												
TCA6408A	400	0100 00x	1.65 to 5.5	8	✓	✓	✓	✓	✓	✓		
TCA6416A	400	0100 00x	1.65 to 5.5	16	✓	✓	✓	✓	✓	✓		
TCA6424	400	0100 00x	1.65 to 5.5	24	✓	✓	✓	✓	✓	✓		
TCA9535	400	0100 xxx	1.65 to 5.5	16	✓	✓		✓	✓	✓		
TCA9539	400	1110 1xx	1.65 to 5.5	16	✓	✓	✓	✓	✓	✓		
TCA9555	400	0100 xxx	1.65 to 5.5	16		✓		✓	✓	✓		
I/O Expanders												
PCA6107	400	0011 xxx	2.3 to 5.5	8	✓	✓	✓	✓	✓	✓	✓	
PCA9534	400	0100 xxx	2.3 to 5.5	8	✓	✓		✓	✓	✓		
PCA9534A	400	0111 xxx	2.3 to 5.5	8	✓	✓		✓	✓	✓		
PCA9535	400	0100 xxx	2.3 to 5.5	16	✓	✓		✓	✓	✓		
PCA9536	400	1000 001	2.3 to 5.5	4				✓	✓	✓		
PCA9538	400	1110 0xx	2.3 to 5.5	8	✓	✓	✓	✓	✓	✓		
PCA9539	400	1110 1xx	2.3 to 5.5	16	✓	✓	✓	✓	✓	✓		
PCA9554	400	0100 xxx	2.3 to 5.5	8		✓		✓	✓	✓		
PCA9554A	400	0111 xxx	2.3 to 5.5	8		✓		✓	✓	✓		
PCA9555	400	0100 xxx	2.3 to 5.5	16		✓		✓	✓	✓		
PCA9557	400	0011 xxx	2.3 to 5.5	8	✓		✓	✓	✓	✓	✓	
PCF8574	100	0100 xxx	2.5 to 6.0	8		✓				✓		
PCF8574A	100	0111 xxx	2.5 to 6.0	8		✓				✓		
PCF8575	400	0100 xxx	2.5 to 5.5	16		✓				✓		
PCF8575C	400	0100 xxx	4.5 to 5.5	16		✓					✓	

I²C Special Functions

Device	Max Frequency (kHz)	I ² C Address	V _{CC} Range (V)	Function	Additional Features			I/O Type	
					Enable Pin	Low Voltage	5-V Tolerant I/Os	Push-Pull	Open Drain
TCA6507	400	1000 101	1.65 to 3.6	LED driver	✓	✓	✓		✓
TCA8418	1000	110100	1.65 to 3.6	Keypad scan		✓		✓	
PCA9306	400		0 to 5.5	Voltage translator	✓		✓		✓

I²C Multiplexers and Switches

Part Number	Max Frequency (kHz)	I ² C Address	V _{CC} Range (V)	Channel Width	Additional Features				Open Drain I/O
					Interrupt	Reset	Simultaneously Active Channels	5-V Tolerant I/Os	
PCA9543A	400	1110 0xx	2.3 to 5.5	2	✓	✓	1 to 2	✓	✓
PCA9544A	400	1110 xxx	2.3 to 5.5	4	✓		1	✓	✓
PCA9545A	400	1110 0xx	2.3 to 5.5	4	✓	✓	1 to 4	✓	✓
PCA9546A	400	1110 xxx	2.3 to 5.5	4		✓	1 to 4	✓	✓
PCA9548A	400	1110 xxx	2.3 to 5.5	8		✓	1 to 8	✓	✓

I²C Hubs, Buffers and Repeaters

Device	Max Frequency (kHz)	V _{CC} Range (V)	Channel Width	Additional Features				Master Side Bus Cap.	Slave Side Bus Cap.	Open Drain I/O
				Enable Pin	EXP Pin	Hot Swap	5-V Tolerant I/Os			
TCA4311	400	2.7 to 5.5	2	✓		✓	✓	400	400	✓
PCA9515A	400	2.3 to 5.5	2	✓			✓	400	400	✓
PCA9517	400	0.9 to 5.5	2	✓			✓	400	400	✓
PCA9518	400	3.0 to 3.6	5	✓	✓		✓	400	400	✓
P82B715	400	3.0 to 12.0	2				✓	400	400	✓
P82B96	400	2.0 to 15.0	2				✓	400	400	✓



Interface

RS-232

Device	Data Rate (kbps)	# of Tx	# of Rx	Supply Voltage (V)	ESD HBM (kV)	I _{CC} (max) (mA)	Single Analog Supply	IEC-61000-4-2 Support	1.8-V Support
TRS202E	120	2	2	5.0	±15	15	✓	✓	
TRS232E	250	2	2	5.0	±15	10	✓	✓	
TRS3221E	250	1	1	3.3 or 5.0	±15	1	✓	✓	
TRS3222E	500	2	2	3.3 or 5.0	±15	1	✓	✓	
TRS3223E	500	2	2	3.3 or 5.0	±15	1	✓	✓	
TRS3227E	1000	1	1	3.3 or 5.0	±15	2	✓	✓	
TRS3232E	250	2	2	3.3 or 5.0	±15	1	✓	✓	
TRS3237E	1000	5	3	3.3 or 5.0	±15	2	✓	✓	
TRS3238E	400	5	3	3.3 or 5.0	±15	2	✓	✓	
TRS3243E	500	3	5	3.3 or 5.0	±15	1	✓	✓	
TRS3253E	1000	3	5	3.3 or 5.0 & 1.8	±15	1		✓	✓
TRS3318E	460	2	2	2.25 to 3.0	±15	2	✓	✓	
TRS3386E	250	3	2	3.3 or 5.0 & 1.8	±15	1		✓	✓
TRSF3221E	1000	1	1	3.3 or 5.0	±15	1	✓	✓	
TRSF3222E	1000	2	2	3.3 or 5.0	±15	1	✓	✓	
TRSF3223E	1000	2	2	3.3 or 5.0	±15	1	✓	✓	
TRSF3232E	1000	2	2	3.3 or 5.0	±15	1	✓	✓	
TRSF3238E	1000	5	3	3.3 or 5.0	±15	2	✓	✓	



Level Translation

Device	Bit Width	V _{CC} Min to Max (V)		V _{CCA} (V)								V _{CCB} (V)								Smallest Package
		V _{CCA}	V _{CCB}	1.2	1.5	1.8	2.5	2.7	3.3	5	1.2	1.5	1.8	2.5	2.7	3.3	5			
1-Bit																				
SN74AVC1T45 ¹	1	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6-ball NanoStar™/NanoFree™		
SN74LVC1T45	1	1.65 to 5.5	1.65 to 5.5			✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	6-ball NanoStar/NanoFree		
TXB0101	1	1.2 to 3.6	1.65 to 5.5	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	6-ball NanoFree		
TXS0101	1	1.65 to 3.6	2.3 to 5.5			✓	✓	✓	✓					✓	✓	✓	✓	6-ball NanoFree		
2-Bit																				
SN74AVC2T245	2	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	10-pin QFN		
SN74AVC2T45 ¹	2	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	8-ball NanoStar/NanoFree		
SN74LVC2T45	2	1.65 to 5.5	1.65 to 5.5	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	8-ball NanoStar/NanoFree		
TXB0102	2	1.2 to 3.6	1.65 to 5.5			✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	8-ball NanoFree		
TXS0102	2	1.65 to 3.6	2.3 to 5.5			✓	✓	✓	✓					✓	✓	✓	✓	8-ball NanoFree		
4-Bit																				
SN74AVC4T245 ¹	4	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	16-pin QFN		
SN74AVC4T774	4	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	16-pin QFN		
TXB0104	4	1.2 to 3.6	1.65 to 5.5	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	12-ball VFBGA		
TXS0104E	4	1.65 to 3.6	2.3 to 5.5			✓	✓	✓	✓					✓	✓	✓	✓	12-ball VFBGA		
6-Bit																				
TXB0106	6	1.2 to 3.6	1.65 to 5.5	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	16-pin QFN		
8-Bit																				
SN74AVC8T245 ¹	8	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	24-pin QFN		
SN74LVC8T245 ¹	8	1.65 to 5.5	1.65 to 5.5			✓	✓	✓	✓	✓				✓	✓	✓	✓	24-pin QFN		
TXB0108	8	1.2 to 3.6	1.65 to 5.5	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	20-ball VFBGA		
TXS0108E	8	1.65 to 3.6	2.3 to 5.5			✓	✓	✓	✓					✓	✓	✓	✓	20-ball VFBGA		
16-Bit																				
SN74AVC16T245 ¹	16	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	56-ball VFBGA		
SN74LVC16T245 ¹	16	1.65 to 5.5	1.65 to 5.5			✓	✓	✓	✓	✓				✓	✓	✓	✓	56-ball VFBGA		
20-Bit																				
SN74AVC20T245 ¹	20	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	56-ball VFBGA		
24-Bit																				
SN74AVC24T245 ¹	24	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	83-ball LFBGA		
32-Bit																				
SN74AVC32T245 ¹	32	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	96-ball LFBGA		
Application Specific																				
CF4320H	—	1.65 to V _{CCB}	3 to 5.5			✓	✓	✓	✓	✓						✓	✓	114-ball LFBGA		
SN74AVCA406E	—	1.2 to 3.6	1.2 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	20-ball VFBGA		
SN74AVC2T872	2	1.1 to 3.6	1.1 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	12-ball WCSP		
TXS02612	—	1.1 to 3.6	1.1 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	24-ball VFBGA		
TXS0206	—	1.1 to 3.6	1.1 to 3.6	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	20-ball WCSP		
TXS0206-29	—	1.1 to 3.6	2.9	✓	✓	✓	✓		✓									20-ball WCSP		
TWL1200	19	1.1 to 3.6	1.1 to 3.6				✓		✓					✓		✓		48-ball VFBGA		

¹ Bus-hold option available.



Interface

PanelBus™ Signal Processing Circuits (DVI) Transmitters and Receivers

Device	Voltage (V)	Recvr./Trans. Channels	Parallel Outputs	Data Speed (Mbps)	I _{CC} (mA)	Package	Description	Price ¹
TFP401	3.3	3	48	495	400	100 HTQFP	DVI receiver, 165 MHz	5.00
TFP401A	3.3	3	48	495	400	100 HTQFP	DVI receiver, 165 MHz, HSYNC jitter immunity	5.00
TFP403	3.3	3	48	495	400	100 HTQFP	DVI receiver	6.83
TFP410	3.3	3	6	495	250	64 HTQFP	DVI transmitter, 165 MHz	3.50
TFP501	3.3	3	48	495	400	100 HTQFP	DVI receiver, 165 MHz plus HDCP	Call
TFP503	3.3	3	48	495	400	100 HTQFP	DVI receiver, 165 MHz plus HDCP and embedded HDCP keys	Call
TFP510	3.3	3	6	495	250	64 HTQFP	DVI transmitter, 165 MHz plus HDCP	Call
TFP513	3.3	3	6	495	250	64 HTQFP	DVI transmitter, 165 MHz plus HDCP and embedded HDCP keys	Call

1394 Integrated Devices

Device	Family Name	Voltage (V)	Data Rate (Mbps)	FIFOs	Package	Description	Price ¹
TSB43DA42A	—	3.3/1.5	up to 400	21	196	Integrated 1394a link/2-port PHY for consumer applications, supports DTCP (5C) content protection	8.25
TSB43EA42	—	3.3/1.5	up to 400	21	196	Integrated 1394a link/2-port PHY for consumer applications, supports DTCP (5C) content protection	8.25
XI02213B	—	3.3, 1.95, 1.5	800	8	167 NFBGA, 168 BGA	PCI Express-to-1394b OHCI with three-port PHY	6.75
TSB43AB21A	—	3.3	400	9	128 TQFP	OHCI 1.1, 1394a link layer controller integrated with 1394a, 400 Mbps, one-port physical layer (PHY)	4.45
TSB43AB22A	—	3.3	400	9	128 TQFP	OHCI 1.1, 1394a link layer controller integrated with 1394a, 400 Mbps, two-port physical layer	3.80
TSB43AB23	—	3.3	400	9	128 TSFP, 144 LQFP	OHCI 1.1, 1394a link layer controller integrated with 1394a, 400 Mbps, three-port physical layer	4.25
TSB83AA22C	—	3.3	800	11	168 BGA	IEEE Std. 1394b-2002 PHY and OHCI link device	8.50
TSB83AA23	—	3.3	800	11	167 NFBGA	Integrated IEEE-1394b OHCI link and three-port S800 PHY	9.00

1394 Physical Layer Controllers

Device	Ports	Voltage (V)	Data Rate (Mbps)	Package	Description	Price ¹
TSB41AB1	1	3.3	up to 400	48 HTQFP, 64 HTQFP	IEEE 1394a 1-port cable transceiver/arbiter	1.50
TSB41AB2	2	3.3	up to 400	64 HTQFP	IEEE 1394a 2-port cable transceiver/arbiter	1.85
TSB41AB3	3	3.3	up to 400	80 HTQFP	IEEE 1394a 3-port cable transceiver/arbiter	3.00
TSB41BA3D	3	3.3	up to 400	80 TQFP	1394b-2002 3-port physical layer device	6.50
TSB41LV04A	4	3.3	up to 400	80 HTQFP	IEEE 1394a 4-port cable transceiver/arbiter	6.50
TSB41LV06A	6	3.3	up to 400	100 HTQFP	IEEE 1394a 6-port cable transceiver/arbiter	6.40
TSB81BA3E	3	1.8, 3.3	up to 800	80 HTQFP	High-performance 1394b s800 3-port cable transceiver/arbiter	7.80

FlatLink™ LVDS Transmitter/Receiver 3G Selection Guide

Device	Description	Number of Parallel Outputs	Number of Parallel Inputs	Data Throughput (Mbps)	PLL Frequency (MHz)	Serial Data Receiver Channels	Serial Data Transmitter Channels	Price ¹
SN65LVDS301	QVGA-XGA serializer transmitter	—	27	1755	4-65	—	3	1.90
SN65LVDS302	QVGA-XGA deserializer receiver	27	—	1755	4-65	3	—	1.90
SN65LVDS303	QVGA-VGA serializer transmitter	—	27	810	4-30	—	2	1.70
SN65LVDS304	QVGA-VGA deserializer receiver	27	—	810	4-30	2	—	1.70
SN65LVDS305	QVGA-HVGA serializer transmitter	—	27	405	4-15	—	1	1.55
SN65LVDS306	QVGA-HVGA deserializer receiver	27	—	405	4-15	1	—	1.55

¹Suggested resale price in U.S. dollars in quantities of 1,000.



ESD Protection Solution

Part Number	# of Channels	Supply Voltage (Max)	I/O Level	I/O Capacitance (pF)	V _{BR} (Min)	Pin/Package
TPD12S015	12	VBAT = 2.3 V–5.5 V	0 V to 5.5 V	1.1	9	28-DSBGA (YFP)
TPD12S520	12	0 V to 6 V	0 V to 5.5 V	0.9	8	38-TSSOP (DBT)
TPD12S521	12	0 V to 6 V	0 V to 5.5 V	0.9	8	38-TSSOP (DBT)
TPD2E001	2	0.9 V to 5.5 V	–0.3 V to V _{CC} +0.3 V	1.5	11	4-SOP (DZD), 5-SOT (DRL), 6-SON (DRY, DRS)
TPD2E007	2	NA	–13.5 V to 13.5 V	15	14	4-DSLGA (YFM), SC70 (3-DCK)
TPD2E009	2	NA	0 V to 6 V	0.7	9	3-SOP (DBZ), 3-SOT (DRT)
TPD3E001	3	0.9 V to 5.5 V	–0.3 V to V _{CC} +0.3 V	1.5	11	5-SOT (DRL), 6-SON (DRY, DRS)
TPD4E001	4	0.9 V to 5.5 V	–0.3 V to V _{CC} +0.3 V	1.5	11	6-SON (DRS), 6-SOT (DRL)
TPD4E002	4	NA	NA	11	6	5-SOT (DLR)
TPD4E004	4	–0.03 V to 5.5 V	–0.3 V to V _{CC} +0.3 V	1.6	6	6-SON (DRY)
TPD4S009	4	–0.3 V to 6 V	0–V _{CC}	0.8	9	10-MSOP (DGS), 6-SC-70 (DCK), 6-SON (DRY), 6-SOT-23 (DBV)
TPD4S010	4	NA	NA	0.8	9	6-SON (DQA)
TPD4S012	4	VBUS = –0.3 V to 20 V	–0.3 V to 6 V	0.8	D+, D-, ID = 9 V, VBUS = 20 V	6-SON (DRY)
TPD6E001	6	0.9 V to 5.5 V	–0.3 V to V _{CC} +0.3 V	1.5	11	10-QFN (RSE), 12-QFN (RSF)
TPD6E004	6	–0.03 V to 5.5 V	–0.3 V to V _{CC} +0.3 V	1.6	6	8-QFN (RSE)
TPD8S009	8	–0.3 V to 6 V	0–V _{CC}	0.8	9	15-SON (DSM)

EMI Protection Solution

Part Number	# of Channels	Breakdown Voltage (Min) (V)	–3 dB Bandwidth	C _{total} (typ) (pF)	R _{line} (typ) (Ohms)	Pin/Package
TPD6F002	6	6	100 MHz	34	100	SON (12-RSV)
TPD4F003	4	6	200 MHz	17	100	WSON (8-DQD)
TPD6F003	6	6	200 MHz	17	100	WSON (12-DQD)
TPD8F003	8	6	200 MHz	17	100	WSON (16-DQD)

IrDA

Part Number	Description	Data Rate (max) (kbps)	Pin/Package
TIR1000	Standalone IrDA encoder and decoder	115	8 SO, 8 TSSOP

→ Interface

USB

USB Hub Controllers

Device	Speed	Ports	I ² C	Voltage (V)	Package	Description	Price ¹
TUSB2036	Full (1.1)	2/3	No	3.3	32 LQFP	2-/3-port hub for USB with optional serial EEPROM interface	1.45
TUSB2046B	Full (1.1)	4	No	3.3	32 LQFP	4-port hub for USB with optional serial EEPROM interface	1.50
TUSB2077A	Full (1.1)	7	No	3.3	48 LQFP	7-port USB hub with optional serial EEPROM interface	2.45
TUSB2136	Full (1.1)	1/2	Yes	3.3	64 LQFP	2-port hub with integrated general-purpose function controller	4.10

USB Peripherals

Device	Speed	Voltage (V)	Remote Wakeup	Package	Description	Price ¹
TUSB3210	Full	3.3	Yes	64 LQFP	USB full-speed general-purpose device controller	3.15
TUSB3410	Full	3.3	Yes	32 LQFP	USB-to-serial converter (RS-232, RS-485)	2.85
TUSB6250	Full, High	3.3	Yes	80 TQFP	USB 2.0 high-speed, low-power ATA/ATAPI bridge solution	3.50
TUSB9260	Super	3.3, 1.8, 1.1	Yes	100 BGA	SuperSpeed USB-to-SATA 3-Gig bridge solution	Call

USB On-The-Go (OTG) Devices

Device	Speed	Voltage (V)	Integrated Circuit Package	Single-Ended Input	Description	Price ¹
TUSB6010B	High	1.5, 1.8 & 3.3	80 MicroStar BGA™	16-bit MUXed NOR	USB 2.0 high-speed OTG to local bus interface controller	Call
TUSB6020	High	1.5, 1.8 & 3.3	80 MicroStar BGA	VLYNQ™	USB 2.0 high-speed OTG local bus interface bridge controller	Call

USB Transceivers

Device	Speed	Voltage (V)	Package	Single-Ended Input	Description	Price ¹
TUSB1105	Full, Low	1.6, 3.6	16 RTZ, 16 RGT	Yes	USB transceivers	0.55
TUSB1106	Full, Low	1.6, 3.6	16 RTZ, 16 PW	No	USB transceivers	0.55
TUSB2551A	Full, Low	1.6, 3.6	14 PW, 16 RGT	No	USB transceivers	0.55
TUSB1210	High	3.3, 1.8, 1.1	32 QFN	N/A	ULPI USB 2.0 transceiver	Call
TUSB1211	High	3.3, 1.8, 1.1	36 BGA	N/A	ULPI USB 2.0 transceiver	Call
TUSB1310	Super	3.3, 1.8, 1.1	167 BGA	N/A	SuperSpeed USB transceiver	Call

USB Port Protection *Transient voltage suppressor protects USB 1.1 devices from ESD and electrical noise transients.*

USB Transient Suppressors

Device	No. of Channels	Application	I/O Capacitance	V _{BR} (Min)	Package	Price ¹
TPD2E001	Dual-bit/single channel	USB HS, USB FS	1.5 pF	11 V	DRL, DRY, DZD	Web
TPD3E001	Three-bit/single-channel USB OTG ESD	USB HS OTG, USB FS OTG	1.5 pF	11 V	DRL, DRY	Web
TPD4E001	Four-bit/two channel	USB HS, USB FS	1.5 pF	11 V	DRL, DRS	Web
TPD4S012	Four-bit/single-channel ESD with VBUS clamp	USB HS with VBUS clamp	1.5 pF	11 V	RSE, RSF	Web
TPD4E004	Four-bit/two channel	USB HS, USB FS	1 pF	6 V	DRY	Web
SN65220, SN75220	Dual-bit/single channel	USB FS	35 pF	6 V	DBV, YZP	Web
SN65240	Four-bit/two channel	USB FS	35 pF	6 V	PW, P	Web

¹Suggested resale price in U.S. dollars in quantities of 1,000.

Preview devices are listed in **bold gray**.

Resources For a complete list of resources (evaluation modules, data sheets and application notes), visit interface.ti.com.

Literature Number	Description
Application Notes	
SLLU043	TUSB3410 UART Evaluation Board
SLLA170B	USB/Serial Applications Using TUSB3410/5052 and the VCP Software
SLLAA276	MSP430 USB Connectivity Using TUSB3410

PCI Express PHY

Device	Supply Voltage (V)	PCIe	Parallel Bus Width	Speed (Max) (Gbps)	MicroStar BGA™ Packaging	Package	Description	Price ¹ (1 KU)
XIO1100	3.3, 1.8, 1.5	×1	8, 16	2.5	Yes	100 BGA	×1 PCI Express PHY, compliant with the PCI Express base specification revision 1.1	7.00

PCI Express Bridge

Device	Supply Voltage (V)	PCIe	PCI Bus Masters	Wake/Beacon Support	MicroStar BGA Packaging	Package	Description	Price ¹ (1 KU)
XIO2000A	3.3, 1.5	×1	6	Yes	Yes	175 BGA 201 BGA	×1 PCI Express-to-PCI bus translation bridge	9.00
XIO2001	3.3, 1.5	×1	6	Yes	Yes	144 BGA 169 BGA	×1 PCI Express-to-PCI bus translation bridge	5.50

PCI Express Endpoints

Device	Supply Voltage (V)	PCIe	FIFO (KB)	Speed (Max) (Mbps)	MicroStar BGA Packaging	Package	Description	Price ¹ (1 KU)
XIO2213B	3.3, 1.95, 1.5	×1	8	800	No	167 NFBGA, 168 BGA	PCI Express-to-1394b OHCI with three-port PHY	6.75

PCI Express Packet Switch

Device	Supply Voltage (V)	PCIe	Downstream PCIe Ports	Wake/Beacon Support	MicroStar BGA Packaging	Package	Description	Price ¹ (1 KU)
XIO3130	3.3, 1.5	×1	3	Yes	Yes	196 BGA	×1 PCI Express 4-port fanout packet switch	8.75

PCI Express Signal Switch

Device	Supply Voltage (V)	ron (Typ) (Ohms)	tpd (Typ) (ns)	MicroStar BGA Packaging	Package	Description	Price ¹ (1 KU)
TS2PCIE2212	1.7–1.9	10	0.25	No	48 NFBGA	4-channel PCIe 2:1 Multiplexer/demultiplexer passive FET switch	1.65
TS2PCIE412	1.5–2.1	12.5	0.25	No	42 QFN	4-channel PCIe 8:16 Multiplexer/demultiplexer passive FET switch	0.95

¹Suggested resale price in U.S. dollars in quantities of 1,000.

Application-Specific Translators

Memory Card Interface

Part Number	Description	V _{CC (A)}	V _{CC (B)}	Smallest Package
SN74AVCA406	MMC, SD, Memory Stick, Smart Media, and xD-Picture Card voltage translation transceiver	1.4 to 3.6	1.4 to 3.6	48-ball VFBGA
SN74AVCA406L	MMC, SD Card, Memory Stick voltage translation transceiver	1.2 to 3.6	1.2 to 3.6	20-ball VFBGA
TXS0206	MMC, SD Card, Memory Stick voltage translation transceiver with ESD protection and EMI filtering	1.1 to 3.6	1.1 to 3.6	20-ball DSBGA
CF4320H	CompactFlash™ bus-interface chip	1.65 to 3.3	3.3 to 5	114-ball LFBGA

→ MSP430 Ultra Low-Power Microcontrollers

Flash/ROM-Based x1xx MCU Family Offering 1.8–3.6 V Operation, Up to 60 kB, 8 MIPS* and a Wide Range of Peripherals

(C) ROM (F) Flash	Program (KB)	SRAM (B)	I/O	16-Bit Timers ²		Watchdog	BOR	SVS	USART: (UART/SPI)	DMA	MPY (16x16)	Comp_A	Temp Sensor	ADC Ch/Res	Additional Features	Packages	1-KU Price ¹
				A	B												
x11x																	
MSP430F1101A	1	128	14	3	—	✓	—	—	—	—	—	✓	—	slope	—	20 DGV, DW, PW, 24 RGE	0.99
MSP430C1101	1	128	14	3	—	✓	—	—	—	—	—	✓	—	slope	—	20 DW, PW, 24 RGE	0.60
MSP430F1111A	2	128	14	3	—	✓	—	—	—	—	—	✓	—	slope	—	20 DGV, DW, PW, 24 RGE	1.35
MSP430C1111	2	128	14	3	—	✓	—	—	—	—	—	✓	—	slope	—	20 DW, PW, 24 RGE	1.10
MSP430F1121A	4	256	14	3	—	✓	—	—	—	—	—	✓	—	slope	—	20 DGV, DW, PW, 24 RGE	1.70
MSP430C1121	4	256	14	3	—	✓	—	—	—	—	—	✓	—	slope	—	20 DW, PW, 24 RGE	2.11
F11x2																	
MSP430F1122	4	256	14	3	—	✓	✓	—	—	—	—	—	✓	5 ch, ADC10	—	20 DW, PW, 32 RHB	2.00
MSP430F1132	8	256	14	3	—	✓	✓	—	—	—	—	—	✓	5 ch, ADC10	—	20 DW, PW, 32 RHB	2.25
F12x																	
MSP430F122	4	256	22	3	—	✓	—	—	1	—	—	✓	—	slope	—	28 DW, PW, 32 RHB	2.15
MSP430F123	8	256	22	3	—	✓	—	—	1	—	—	✓	—	slope	—	28 DW, PW, 32 RHB	2.30
F12x2																	
MSP430F1222	4	256	22	3	—	✓	✓	—	1	—	—	—	✓	8 ch, ADC10	—	28 DW, PW, 32 RHB	2.40
MSP430F1232	8	256	22	3	—	✓	✓	—	1	—	—	—	✓	8 ch, ADC10	—	28 DW, PW, 32 RHB	2.50
F13x																	
MSP430F133	8	256	48	3	3	✓	—	—	1	—	—	✓	✓	8 ch, ADC12	—	64 PM, PAG, RTD	3.00
MSP430F135	16	512	48	3	3	✓	—	—	1	—	—	✓	✓	8 ch, ADC12	—	64 PM, PAG, RTD	3.60
C13x1																	
MSP430C1331	8	256	48	3	3	✓	—	—	1	—	—	✓	—	slope	—	64 PM, RTD	2.00
MSP430C1351	16	512	48	3	3	✓	—	—	1	—	—	✓	—	slope	—	64 PM, RTD	2.30
F14x																	
MSP430F147	32	1024	48	3	7	✓	—	—	2	—	✓	✓	✓	8 ch, ADC12	—	64 PM, PAG, RTD	5.05
MSP430F148	48	2048	48	3	7	✓	—	—	2	—	✓	✓	✓	8 ch, ADC12	—	64 PM, PAG, RTD	5.75
MSP430F149	60	2048	48	3	7	✓	—	—	2	—	✓	✓	✓	8 ch, ADC12	—	64 PM, PAG, RTD	6.05
F14x1																	
MSP430F1471	32	1024	48	3	7	✓	—	—	2	—	✓	✓	—	slope	—	64 PM, RTD	4.60
MSP430F1481	48	2048	48	3	7	✓	—	—	2	—	✓	✓	—	slope	—	64 PM, RTD	5.30
MSP430F1491	60	2048	48	3	7	✓	—	—	2	—	✓	✓	—	slope	—	64 PM, RTD	5.60
F15x																	
MSP430F155	16	512	48	3	3	✓	✓	✓	1 with I ² C	✓	—	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, RTD	4.95
MSP430F156	24	1024	48	3	3	✓	✓	✓	1 with I ² C	✓	—	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, RTD	5.55
MSP430F157	32	1024	48	3	3	✓	✓	✓	1 with I ² C	✓	—	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, RTD	5.85
F16x1																	
MSP430F167	32	1024	48	3	7	✓	✓	✓	2 with I ² C	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, RTD	6.75
MSP430F168	48	2048	48	3	7	✓	✓	✓	2 with I ² C	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, RTD	7.45
MSP430F169	60	2048	48	3	7	✓	✓	✓	2 with I ² C	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, RTD	7.95
MSP430F1610	32	5120	48	3	7	✓	✓	✓	2 with I ² C	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, RTD	8.25
MSP430F1611	48	10240	48	3	7	✓	✓	✓	2 with I ² C	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, RTD	8.65
MSP430F1612	55	5120	48	3	7	✓	✓	✓	2 with I ² C	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, RTD	8.95

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.

² Represents number of capture/compare registers and PWM output generators per timer.

*See www.ti.com/msp430 for additional information.

MSP430 Ultra Low-Power Microcontrollers



Flash-Based F2xx MCU Family Featuring Lower Power and Up to 16 MIPS* with 1.8–3.6V Operation – Enhancements Include ±1% On-Chip Very-Low-Power Oscillator, Internal Pull-Up/Pull-Down Resistors and Low Pin-Count Options

(F) Flash	Program (KB)	SRAM (B)	I/O	16-Bit Timers ²		Watch-dog	BOR	SVS	USI ⁴ : I ² C/SPI	USCI ³		DMA (16x16)	MPY	Comp_A+	Temp Sensor	ADC Ch/Res	Additional Features	Packages	1-KU Price ¹
				A	B					Ch. A UART/LIN/IrDA/SPI	Ch. B I ² C/SPI								
F20xx																			
MSP430F2001	1	128	10	2	–	✓	✓	–	–	–	–	–	–	✓	–	slope	–	14 PW, N, 16 RSA	0.55
MSP430F2011	2	128	10	2	–	✓	✓	–	–	–	–	–	–	✓	–	slope	–	14 PW, N, 16 RSA	0.65
MSP430F2002	1	128	10	2	–	✓	✓	–	✓	–	–	–	–	–	✓	8 ch, ADC10	–	14 PW, N, 16 RSA	0.80
MSP430F2012	2	128	10	2	–	✓	✓	–	✓	–	–	–	–	–	✓	8 ch, ADC10	–	14 PW, N, 16 RSA	0.95
MSP430F2003	1	128	10	2	–	✓	✓	–	✓	–	–	–	–	–	✓	5 ch, SD16_A	–	14 PW, N, 16 RSA	1.20
MSP430F2013	2	128	10	2	–	✓	✓	–	✓	–	–	–	–	–	✓	5 ch, SD16_A	–	14 PW, N, 16 RSA	1.35
F21xx																			
MSP430F2101	1	128	16	3	–	✓	✓	–	–	–	–	–	–	✓	–	slope	–	20 DGV, DW, PW, 24 RGE	0.75
MSP430F2111	2	128	16	3	–	✓	✓	–	–	–	–	–	–	✓	–	slope	–	20 DGV, DW, PW, 24 RGE	0.80
MSP430F2121	4	256	16	3	–	✓	✓	–	–	–	–	–	–	✓	–	slope	–	20 DGV, DW, PW, 24 RGE	1.10
MSP430F2131	8	256	16	3	–	✓	✓	–	–	–	–	–	–	✓	–	slope	–	20 DGV, DW, PW, 24 RGE	1.40
MSP430F2112	2	256	22	3, 2	–	✓	✓	–	–	1	1	–	–	✓	✓	8 ch, ADC10	–	28 PW, 32 RHB	1.55
MSP430F2122	4	512	22	3, 2	–	✓	✓	–	–	1	1	–	–	✓	✓	8 ch, ADC10	–	28 PW, 32 RHB	1.65
MSP430F2132	8	512	22	3, 2	–	✓	✓	–	–	1	1	–	–	✓	✓	8 ch, ADC10	–	28 PW, 32 RHB	1.75
F22x2																			
MSP430F2232	8	512	32	3	3	✓	✓	–	–	1	1	–	–	–	✓	12 ch, ADC10	–	38 DA, 40 RHA	1.95
MSP430F2252	16	512	32	3	3	✓	✓	–	–	1	1	–	–	–	✓	12 ch, ADC10	–	38 DA, 40 RHA	2.20
MSP430F2272	32	1024	32	3	3	✓	✓	–	–	1	1	–	–	–	✓	12 ch, ADC10	–	38 DA, 40 RHA	2.50
F22x4																			
MSP430F2234	8	512	32	3	3	✓	✓	–	–	1	1	–	–	–	✓	12 ch, ADC10	(2) OPAMP	38 DA, 40 RHA	2.15
MSP430F2254	16	512	32	3	3	✓	✓	–	–	1	1	–	–	–	✓	12 ch, ADC10	(2) OPAMP	38 DA, 40 RHA	2.40
MSP430F2274	32	1024	32	3	3	✓	✓	–	–	1	1	–	–	–	✓	12 ch, ADC10	(2) OPAMP	38 DA, 40 RHA	2.70
F23x0																			
MSP430F2330	8	1024	32	3	3	✓	✓	–	–	1	1	–	✓	✓	–	slope	–	40 RHA	1.85
MSP430F2350	16	2048	32	3	3	✓	✓	–	–	1	1	–	✓	✓	–	slope	–	40 RHA	2.15
MSP430F2370	32	2048	32	3	3	✓	✓	–	–	1	1	–	✓	✓	–	slope	–	40 RHA, 49 YFF	2.55
F23x																			
MSP430F233	8	1024	48	3	3	✓	✓	✓	–	1	1	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 64 RGC	2.40
MSP430F235	16	2048	48	3	3	✓	✓	✓	–	1	1	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 64 RGC	2.90
F24x/2410																			
MSP430F247	32	4096	48	3	7	✓	✓	✓	–	2	2	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 64 RGC	4.05
MSP430F248	48	4096	48	3	7	✓	✓	✓	–	2	2	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 64 RGC	4.60
MSP430F249	60	2048	48	3	7	✓	✓	✓	–	2	2	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 64 RGC	4.75
MSP430F2410	56	4096	48	3	7	✓	✓	✓	–	2	2	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 64 RGC	4.85
F24x1																			
MSP430F2471	32	4096	48	3	7	✓	✓	✓	–	2	2	–	✓	✓	–	slope	–	64 PM, 64 RGC	3.70
MSP430F2481	48	4096	48	3	7	✓	✓	✓	–	2	2	–	✓	✓	–	slope	–	64 PM, 64 RGC	4.25
MSP430F2491	60	2048	48	3	7	✓	✓	✓	–	2	2	–	✓	✓	–	slope	–	64 PM, 64 RGC	4.40
F241x																			
MSP430F2416	92	4096	48/64	3	7	✓	✓	✓	–	2	2	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 80 PN, 113 ZQW	5.60
MSP430F2417	92	8192	48/64	3	7	✓	✓	✓	–	2	2	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 80 PN, 113 ZQW	6.10
MSP430F2418	116	8192	48/64	3	7	✓	✓	✓	–	2	2	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 80 PN, 113 ZQW	6.40
MSP430F2419	120	4096	48/64	3	7	✓	✓	✓	–	2	2	–	✓	✓	✓	8 ch, ADC12	–	64 PM, 80 PN, 113 ZQW	6.10
F261x																			
MSP430F2616	92	4096	48/64	3	7	✓	✓	✓	–	2	2	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, 80 PN, 113 ZQW	7.10
MSP430F2617	92	8192	48/64	3	7	✓	✓	✓	–	2	2	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, 80 PN, 113 ZQW	7.60
MSP430F2618	116	8192	48/64	3	7	✓	✓	✓	–	2	2	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, 80 PN, 113 ZQW	7.90
MSP430F2619	120	4096	48/64	3	7	✓	✓	✓	–	2	2	✓	✓	✓	✓	8 ch, ADC12	(2) DAC12	64 PM, 80 PN, 113 ZQW	7.60

¹ Prices are quoted in U.S. dollars and represent year 2008 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.

² Represents number of capture/compare registers and PWM output generators per timer.

³ USCI channel 1 supports UART/LIN, IrDA and SPI; USCI channel 2 supports I²C and SPI.

⁴ USI supports I²C or SPI.

*See www.ti.com/msp430 for additional information.

→ MSP430 Ultra Low-Power Microcontrollers

Flash/ROM-Based x4xx MCU Family Offering 1.8–3.6V Operation, Up to 120 kB Flash/ROM, 8 MIPS with FLL + SVS and Integrated LCD Controller*

(C) ROM (F) Flash	Pro-gram (KB)	SRAM (B)	16-Bit Timers ²		Watchdog and Basic Timer	BOR	SVS	USART (UART/ SPI)	USCI		LCD Segments	DMA	MPY (16x16)	Temp Sensor	ADC Ch/Res	Additional Features	Packages	1-KU Price ¹		
			A	B					Ch. A: UART/LIN/ IrDA/SPRI	Ch. B I ² C/ SPI										
x41x																				
MSP430F412	4	256	48	3	–	✓	✓	–	–	–	96	–	–	✓	–	slope	–	64 PM, RTD	2.60	
MSP430C412	4	256	48	3	–	✓	✓	–	–	–	96	–	–	✓	–	slope	–	64 PM, RTD	1.90	
MSP430F413	8	256	48	3	–	✓	✓	–	–	–	96	–	–	✓	–	slope	–	64 PM, RTD	2.95	
MSP430C413	8	256	48	3	–	✓	✓	–	–	–	96	–	–	✓	–	slope	–	64 PM, RTD	2.10	
MSP430F415	16	512	48	3,5	–	✓	✓	–	–	–	96	–	–	✓	–	slope	–	64 PM, RTD	3.40	
MSP430F417	32	1024	48	3,5	–	✓	✓	–	–	–	96	–	–	✓	–	slope	–	64 PM, RTD	3.90	
F41x2																				
MSP430F4132	8	512	56	3,5	–	✓	✓	–	1	1	144	–	–	✓	✓	8ch, ADC10	–	64 PM, 48 RGZ	1.90	
MSP430F4152	16	512	56	3,5	–	✓	✓	–	1	1	144	–	–	✓	✓	8ch, ADC10	–	64 PM, 48 RGZ	1.70	
F42x																				
MSP430F423A	8	256	14	3	–	✓	✓	✓	1	–	–	–	✓	–	✓	(3) SD16	–	64 PM	3.55	
MSP430F425A	16	512	14	3	–	✓	✓	✓	1	–	–	–	✓	–	✓	(3) SD16	–	64 PM	4.05	
MSP430F427A	32	1024	14	3	–	✓	✓	✓	1	–	–	–	✓	–	✓	(3) SD16	–	64 PM	4.45	
FW42x																				
MSP430FW423	8	256	48	3,5	–	✓	✓	–	–	–	96	–	–	✓	–	slope	Scan I/F	64 PM	3.75	
MSP430FW425	16	512	48	3,5	–	✓	✓	–	–	–	96	–	–	✓	–	slope	Scan I/F	64 PM	4.05	
MSP430FW427	32	1024	48	3,5	–	✓	✓	–	–	–	96	–	–	✓	–	slope	Scan I/F	64 PM	4.45	
FE42xx																				
MSP430FE423A	8	256	14	3	–	✓	✓	✓	1	–	–	–	✓	–	✓	(3) SD16	ESP430	64 PM	3.90	
MSP430FE425A	16	512	14	3	–	✓	✓	✓	1	–	–	–	✓	–	✓	(3) SD16	ESP430	64 PM	4.40	
MSP430FE427A	32	1024	14	3	–	✓	✓	✓	1	–	–	–	✓	–	✓	(3) SD16	ESP430	64 PM	4.95	
MSP430FE4232	8	256	14	3	–	✓	✓	✓	1	–	–	–	✓	–	✓	(2) SD16	ESP430	64 PM	3.50	
MSP430FE4242	12	512	14	3	–	✓	✓	✓	1	–	–	–	✓	–	✓	(2) SD16	ESP430	64 PM	3.70	
F42x0																				
MSP430F4250	16	256	32	3	–	✓	✓	–	–	–	56	–	–	–	✓	5 ch, SD16_A	DAC12	48 DL, RGZ	3.10	
MSP430F4260	24	256	32	3	–	✓	✓	–	–	–	56	–	–	–	✓	5 ch, SD16_A	DAC12	48 DL, RGZ	3.45	
MSP430F4270	32	256	32	3	–	✓	✓	–	–	–	56	–	–	–	✓	5 ch, SD16_A	DAC12	48 DL, RGZ	3.80	
FG42x0																				
MSP430FG4250	16	256	32	3	–	✓	✓	–	–	–	56	–	–	–	✓	5 ch, SD16_A	DAC12, (2) OPAMP	48 DL, RGZ	3.35	
MSP430FG4260	24	256	32	3	–	✓	✓	–	–	–	56	–	–	–	✓	5 ch, SD16_A	DAC12, (2) OPAMP	48 DL, RGZ	3.70	
MSP430FG4270	32	256	32	3	–	✓	✓	–	–	–	56	–	–	–	✓	5 ch, SD16_A	DAC12, (2) OPAMP	48 DL, RGZ	4.05	
F43x																				
MSP430F435	16	512	48	3	3	✓	✓	✓	1	–	–	128/160	–	–	✓	✓	8 ch, ADC12	–	80 PN, 100 PZ	4.45
MSP430F436	24	1024	48	3	3	✓	✓	✓	1	–	–	128/160	–	–	✓	✓	8 ch, ADC12	–	80 PN, 100 PZ	4.70
MSP430F437	32	1024	48	3	3	✓	✓	✓	1	–	–	128/160	–	–	✓	✓	8 ch, ADC12	–	80 PN, 100 PZ	4.90
F43x1																				
MSP430F4351	16	512	48	3	3	✓	✓	✓	1	–	–	128/160	–	–	✓	–	slope	–	80 PN, 100 PZ	4.05
MSP430F4361	24	1024	48	3	3	✓	✓	✓	1	–	–	128/160	–	–	✓	–	slope	–	80 PN, 100 PZ	4.30
MSP430F4371	32	1024	48	3	3	✓	✓	✓	1	–	–	128/160	–	–	✓	–	slope	–	80 PN, 100 PZ	4.50
FG43x																				
MSP430FG437	32	1024	48	3	3	✓	✓	✓	1	–	–	128	✓	–	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	80 PN	6.50
MSP430FG438	48	2048	48	3	3	✓	✓	✓	1	–	–	128	✓	–	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	80 PN	7.35
MSP430FG439	60	2048	48	3	3	✓	✓	✓	1	–	–	128	✓	–	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	80 PN	7.95
F44x																				
MSP430F447	32	1024	48	3	7	✓	✓	✓	2	–	–	160	–	✓	✓	✓	8 ch, ADC12	–	100 PZ	5.75
MSP430F448	48	2048	48	3	7	✓	✓	✓	2	–	–	160	–	✓	✓	✓	8 ch, ADC12	–	100 PZ	6.50
MSP430F449	60	2048	48	3	7	✓	✓	✓	2	–	–	160	–	✓	✓	✓	8 ch, ADC12	–	100 PZ	7.05

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² Represents number of capture/compare registers and PWM output generators per timer.

*See www.ti.com/msp430 for additional information.

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

Continued on following page.

MSP430 Ultra Low-Power Microcontrollers



Flash/ROM-Based x4xx MCU Family Offering 1.8–3.6V Operation, Up to 120 kB Flash/ROM, 8 MIPS with FLL + SVS and Integrated LCD Controller* (Continued)

(C) ROM (F) Flash	Pro-gram (KB)	SRAM (B)	I/O	16-Bit Timers ²		Watchdog and Basic Timer	BOR	SVS	USART (UART/ SPI)	USCI		LCD Segments	DMA	MPY (16×16)	Comp_A	Temp Sensor	ADC Ch/Res	Additional Features	Packages	1-KU Price ¹
				Ch. A: UART/LIN/ IrDA/SPI	Ch. B I ² C/ SPI															
xG461x																				
MSP430FG4616	92	4096	80	3	7	✓	✓	✓	1	1	1	160	✓	✓	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	100 PZ, 113 ZQW	9.45
MSP430FG4617	92	8192	80	3	7	✓	✓	✓	1	1	1	160	✓	✓	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	100 PZ, 113 ZQW	9.95
MSP430FG4618	116	8192	80	3	7	✓	✓	✓	1	1	1	160	✓	✓	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	100 PZ, 113 ZQW	10.35
MSP430FG4619	120	4096	80	3	7	✓	✓	✓	1	1	1	160	✓	✓	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	100 PZ, 113 ZQW	9.95
MSP430CG4616	92	4096	80	3	7	✓	✓	✓	1	1	1	160	✓	✓	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	100 PZ	7.65
MSP430CG4617	92	8192	80	3	7	✓	✓	✓	1	1	1	160	✓	✓	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	100 PZ	8.05
MSP430CG4618	116	8192	80	3	7	✓	✓	✓	1	1	1	160	✓	✓	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	100 PZ	8.40
MSP430CG4619	120	4096	80	3	7	✓	✓	✓	1	1	1	160	✓	✓	✓	✓	12 ch, ADC12	(2) DAC12, (3) OPAMP	100 PZ	8.05
F47xx																				
MSP430F4783 ³	48	2480	72	3	3	WDT+	✓	✓	–	2	2	160	–	32×32	✓	✓	(3) SD16_A	–	100 PZ	7.50
MSP430F4793 ³	60	2560	72	3	3	WDT+	✓	✓	–	2	2	160	–	32×32	✓	✓	(3) SD16_A	–	100 PZ	8.05
MSP430F4784 ³	48	2048	72	3	3	WDT+	✓	✓	–	2	2	160	–	32×32	✓	✓	(4) SD16_A	–	100 PZ	8.00
MSP430F4794 ³	60	2560	72	3	3	WDT+	✓	✓	–	2	2	160	–	32×32	✓	✓	(4) SD16_A	–	100 PZ	8.55
F471xx																				
MSP430F47166³	92	4096	72	3	3	✓	✓	✓	–	2	2	160	✓	32×32	✓	✓	(6) SD16_A	RTC	100 PZ	5.75
MSP430F47176³	92	8192	72	3	3	✓	✓	✓	–	2	2	160	✓	32×32	✓	✓	(6) SD16_A	RTC	100 PZ	5.95
MSP430F47186³	116	8192	72	3	3	✓	✓	✓	–	2	2	160	✓	32×32	✓	✓	(6) SD16_A	RTC	100 PZ	7.45
MSP430F47196³	120	4096	72	3	3	✓	✓	✓	–	2	2	160	✓	32×32	✓	✓	(6) SD16_A	RTC	100 PZ	7.75
MSP430F47167³	92	4096	72	3	3	✓	✓	✓	–	2	2	160	✓	32×32	✓	✓	(7) SD16_A	RTC	100 PZ	5.90
MSP430F47177³	92	8192	72	3	3	✓	✓	✓	–	2	2	160	✓	32×32	✓	✓	(7) SD16_A	RTC	100 PZ	6.10
MSP430F47187³	116	8192	72	3	3	✓	✓	✓	–	2	2	160	✓	32×32	✓	✓	(7) SD16_A	RTC	100 PZ	7.60
MSP430F47197³	120	4096	72	3	3	✓	✓	✓	–	2	2	160	✓	32×32	✓	✓	(7) SD16_A	RTC	100 PZ	7.95
FG47x																				
MSP430FG477	32	2048	48	3	3	✓	✓	✓	–	1	1	128	–	–	✓	✓	(5) SD16_A	DAC12, (2) OPAMP	80 PN, 113 ZQW	5.50
MSP430FG478	48	2048	48	3	3	✓	✓	✓	–	1	1	128	–	–	✓	✓	(5) SD16_A	DAC12, (2) OPAMP	80 PN, 113 ZQW	5.65
MSP430FG479	60	2048	48	3	3	✓	✓	✓	–	1	1	128	–	–	✓	✓	(5) SD16_A	DAC12, (2) OPAMP	80 PN, 113 ZQW	6.25
F47x																				
MSP430F477	32	2048	48	3	3	✓	✓	✓	–	1	1	128	–	–	✓	✓	(5) SD16_A	DAC12	80 PN, 113 ZQW	4.70
MSP430F478	48	2048	48	3	3	✓	✓	✓	–	1	1	128	–	–	✓	✓	(5) SD16_A	DAC12	80 PN, 113 ZQW	5.20
MSP430F479	60	2048	48	3	3	✓	✓	✓	–	1	1	128	–	–	✓	✓	(5) SD16_A	DAC12	80 PN, 113 ZQW	5.75

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.

² Represents number of capture/compare registers and PWM output generators per timer.

³ Up to 16 MIPS.

*See www.ti.com/msp430 for additional information.

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

→ MSP430 Ultra Low-Power Microcontrollers

Flash-Based F5xx MCU Family Features Lowest Power Consumption, Up to 25 MIPS* with 1.8–3.6V Operation Starting at 12 MIPS

(F) Flash	Program (KB)	SRAM (B)	I/O	16-Bit Timers ²		Watchdog and RTC	PMM (BOR, SVS, SVM, LDO)	USCI		DMA	MPY (32x32)	Comp_B	Temp Sensor	ADC Ch/Res	Additional Features	Package(s)	1-KU Price ¹
				A ²	B ²			Ch. A: UART/LIN/IrDA/SPI	Ch. B I ² C/SPI								
F55xx																	
MSP430F5500	8	4 + 2 ³	31	5,3,3	7	✓	✓	1	1	3 ch	✓	✓	–	–	USB	48 RGZ	1.45
MSP430F5501	16	4 + 2 ³	31	5,3,3	7	✓	✓	1	1	3 ch	✓	✓	–	–	USB	48 RGZ	1.50
MSP430F5502	24	4 + 2 ³	31	5,3,3	7	✓	✓	1	1	3 ch	✓	✓	–	–	USB	48 RGZ	1.55
MSP430F5503	32	4 + 2 ³	31	5,3,3	7	✓	✓	1	1	3 ch	✓	✓	–	–	USB	48 RGZ	1.70
MSP430F5504	8	4 + 2 ³	31	5,3,3	7	✓	✓	1	1	3 ch	✓	–	✓	8 ch ADC10A	USB	48 RGZ, 48 PT	1.60
MSP430F5505	16	4 + 2 ³	31	5,3,3	7	✓	✓	1	1	3 ch	✓	–	✓	8 ch ADC10A	USB	48 RGZ	1.65
MSP430F5506	24	4 + 2 ³	31	5,3,3	7	✓	✓	1	1	3 ch	✓	–	✓	8 ch ADC10A	USB	48 RGZ	1.80
MSP430F5507	32	4 + 2 ³	31	5,3,3	7	✓	✓	1	1	3 ch	✓	–	✓	8 ch ADC10A	USB	48 RGZ	1.90
MSP430F5508	16	4 + 2 ³	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12 ch ADC10A	USB	48 RGZ, 64 RGC, 48 PT	1.75
MSP430F5509	24	4 + 2 ³	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12 ch ADC10A	USB	48 RGZ, 64 RGC, 48 PT	1.85
MSP430F5510	32	4 + 2 ³	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12 ch ADC10A	USB	48 RGZ, 64 RGC, 48 PT	1.95
MSP430F5513	32	4 + 2 ³	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	USB	64 RGC, 80 ZQE	3.25
MSP430F5514	64	4 + 2 ³	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	USB	64 RGC, 80 ZQE	3.55
MSP430F5515	64	4 + 2 ³	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	USB	80 PN	3.65
MSP430F5517	96	6 + 2 ³	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	USB	80 PN	3.75
MSP430F5519	128	8 + 2 ³	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	–	–	USB	80 PN	3.90
MSP430F5521	32	6 + 2 ³	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16 ch ADC12A	USB	80 PN	3.35
MSP430F5522	32	8 + 2 ³	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12 ch ADC12A	USB	64 RGC, 80 ZQE	3.40
MSP430F5524	64	4 + 2 ³	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12 ch ADC12A	USB	64 RGC, 80 ZQE	3.55
MSP430F5525	64	4 + 2 ³	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16 ch ADC12A	USB	80 PN	3.70
MSP430F5526	96	6 + 2 ³	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12 ch ADC12A	USB	64 RGC, 80 ZQE	3.80
MSP430F5527	96	6 + 2 ³	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16 ch ADC12A	USB	80 PN	3.90
MSP430F5528	128	8 + 2 ³	47	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	12 ch ADC12A	USB	64 RGC, 80 ZQE	3.95
MSP430F5529	128	8 + 2 ³	63	5,3,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16 ch ADC12A	USB	80 PN	4.00
F54xx																	
MSP430F5418 ⁴	128	16	64	5,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16 ch ADC12A	18 MIPS	80 PN	3.30
MSP430F5419 ⁴	128	16	83	5,3	7	✓	✓	4	4	3 ch	✓	✓	✓	16 ch ADC12A	18 MIPS	100 PZ, 113 ZQW ⁵	3.65
MSP430F5435 ⁴	192	16	64	5,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16 ch ADC12A	18 MIPS	80 PN	3.90
MSP430F5436 ⁴	192	16	83	5,3	7	✓	✓	4	4	3 ch	✓	✓	✓	16 ch ADC12A	18 MIPS	100 PZ, 113 ZQW ⁵	4.30
MSP430F5437 ⁴	256	16	64	5,3	7	✓	✓	2	2	3 ch	✓	✓	✓	16 ch ADC12A	18 MIPS	80 PN	4.40
MSP430F5438 ⁴	256	16	83	5,3	7	✓	✓	4	4	3 ch	✓	✓	✓	16 ch ADC12A	18 MIPS	100 PZ, 113 ZQW ⁵	4.85

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.

Preview products are listed in **bold gray**.

² Represents number of capture/compare registers and PWM output generators per timer.

³ Additional SRAM available if USB is disabled.

⁴ Revision A with 25 MIPS available in 4Q09.

⁵ Available on Revision A only.

*See www.ti.com/msp430 for additional information.

Digital Temperature Sensors and Switches



Digital Temperature Sensors

Device	Supply Voltage (V)	Accuracy -25 to +85 (°C max)	Accuracy -40 to +125 (°C max)	Operating Temperature Range (°C)	Quiescent Current (µA typ)	Resolution (Bits)	Programmable Temp Alert	Package(s)	Price ¹
I²C/SMBus Interface									
TMP102	1.4 to 3.6	2	3 ²	-55 to +125	10	12	✓	SOT-563	0.80
TMP106	2.7 to 5.5	2	3	-55 to +127	50	9 to 12	✓	1 mm × 1.5 mm WCSP	0.85
TMP275	2.7 to 5.5	0.5 ³	1	-55 to +127	50	9 to 12	✓	MSOP, SOIC	1.25
TMP175	2.7 to 5.5	1.5	2	-55 to +127	50	9 to 12	✓	MSOP, SOIC	0.85
TMP75	2.7 to 5.5	2		-55 to +127	50	9 to 12	✓	MSOP, SOIC	0.70
TMP100	2.7 to 5.5	2	3	-55 to +125	45	9 to 12	✓	SOT-23	0.75
SPI Interface									
TMP122	2.7 to 5.5	1.5	2	-55 to +150	50	9 to 12	✓	SOT-23	0.99
TMP124	2.7 to 5.5	1.5	2	-55 to +150	50	9 to 12	✓	SOIC	0.70
Single-Wire, SensorPath Interface									
TMP141	2.7 to 5.5	2	3	-55 to +127	110	10	✓	SOT-23, MSOP	0.65

Temperature Switches

Device	Trip Points	Supply Voltage (V)	Quiescent Current (max µA)	Trip Point Accuracy (°C)	Specified Temperature Range (°C)	Operating Temperature Range (°C)	Package	Price ¹
TMP302A	50, 55, 60, 65	1.4 to 3.6	15	0.2	-40 to 125	-55 to 130	SOT563	0.30
TMP302B	70, 75, 80, 85	1.4 to 3.6	15	0.2	-40 to 125	-55 to 130	SOT563	0.30
TMP302C	90, 95, 100, 105	1.4 to 3.6	15	0.2	-40 to 125	-55 to 130	SOT563	0.30
TMP302D	110, 115, 120, 125	1.4 to 3.6	15	0.2	-40 to 125	-55 to 130	SOT563	0.30

Remote + Local Temperature Sensors

Device	Description	Remote Sensor Accuracy Over Temperature Range (°C) (max)	Local Sensor Accuracy Over Temperature Range (°C) (max)	Specified Ambient Temperature Range (°C)	Remote Sensor Temperature Range (°C)	Supply Voltage (V)	IQ (µA) (typ)	Package(s)	Price ¹
TMP411	Remote and local temp sensor with programmable non-ideality factor	1	3	-40 to +125	-40 to 150	2.7 to 5.5	350	MSOP, SOIC	1.75
TMP421	Remote and local temp sensor in SOT23-8	1	1.5	-40 to +125	-40 to 150	2.7 to 5.5	32	SOT23	0.99
TMP422	2× remote and local temp sensor in SOT23-8	1	1.5	-40 to +125	-40 to 150	2.7 to 5.5	32	SOT23	1.10
TMP423	3× remote and local temp sensor in SOT23-8	1	1.5	-40 to +125	-40 to 150	2.7 to 5.5	32	SOT23	1.20
TMP441	Remote and local temp sensor with beta correction in SOT23-8	1	1.5	-40 to +125	-40 to 150	2.7 to 5.5	32	SOT23	1.10
TMP442	2× remote and local temp sensor with beta correction in SOT23-8	1	1.5	-40 to +125	-40 to 150	2.7 to 5.5	32	SOT23	1.25
TMP431	Remote and local temp sensor with beta correction and dedicated alerts	1	1	-40 to +125	-40 to 150	2.7 to 5.5	35	MSOP-8	0.99
TMP432	2× remote and local temp sensor with beta correction and dedicated alerts	1	1	-40 to +125	-40 to 150	2.7 to 5.5	35	MSOP-10	1.10

Analog Output Temperature Sensors

Device	Accuracy (°C)	Specified Temperature Range (°C)	Supply Voltage (V)	Quiescent Current (max µA)	Output (mv/°C)	Packages	Price ¹
TMP20	2.5	-55 to 130	1.8 to 5.5	4	-11.77	SOT563, SC-70	0.30

¹Suggested resale price in U.S. dollars in quantities of 1,000.

²Temperature range -55°C to +125°C

³Temperature range +10°C to +85°C

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

→ USB and PoE Power Devices, Load Switches

USB Power Distribution Switches

Device	Number of FETs	I _{OS} (min) (A)	r _{DS(on)} (mΩ)	V _{IN} Range (V)	Supply Current (μA)	OC Logic Output	OT Logic Output	Enable	Predecessor	Price ¹
TPS2041B/51B	1	0.7	70	2.7 to 5.5	43	Yes	Yes	L/H	TPS2041/51/41A/51A	0.50
TPS2042B/52B	2	0.7 ea	70	2.7 to 5.5	50	Yes	Yes	L/H	TPS2042/52/42A/52A	0.60
TPS2550/51	1	0.1 to 1.1	85	2.5 to 6.5	130	Yes	Yes	L/H	—	0.65
TPS2552/53	1	0.75 to 1.3	85	2.5 to 6.5	120	Yes	Yes	L/H	—	0.70
TPS2556/57	1	0.5 to 5	24	2.5 to 6.5	130	Yes	Yes	L/H	—	0.90
TPS2560/61	2	0.25 to 2.5	48	2.5 to 6.5	130	Yes	Yes	L/H	—	0.90
TPS2590	1	1 to 5	28	3 to 20	35	Yes	No	L	—	1.05
TPS2061/5	1	1.1	70	2.7 to 5.5	43	Yes	Yes	L/H	—	0.60
TPS2062A/6	2	1.1 ea	70	2.7 to 5.5	50	Yes	Yes	L/H	TPS2062	0.75

Power-over-Ethernet (PoE) Powered Device (PD) Controllers with Integrated DC/DC Controllers

Device	Description	Abs Max V _{IN} (V)	Operating Temp (°C)	Full Inrush Current Limiting	Current Limit (mA)	Second Gate Driver for Maximum Efficiency?	Package(s)	Price ¹
TPS23750	Integrated PD with PWM controller	100	−40 to 85	Fixed	405	No	TSSOP-20 PowerPAD	1.50
TPS23753A	PD+controller with AUX ORing	100	−40 to 125	Fixed	405	No	TSSOP-14	1.45
TPS23754	High-power PD + high-efficiency controller	100	−40 to 125	Fixed	850	Yes	TSSOP-20 PowerPAD	1.90
TPS23756	High-power PD + high-efficiency controller (12-V startup)	100	−40 to 125	Fixed	850	Yes	TSSOP-20 PowerPAD	1.90
TPS23757	PD + high-efficiency controller	100	−40 to 125	Fixed	405	Yes	TSSOP-20	1.65
TPS23770	Integrated PD with PWM controller	100	−40 to 85	Fixed	405	No	TSSOP-20 PowerPAD	1.50
PTB48540	5-V, 10-W PoE power module	100	−40 to 85	Fixed	405	N/A	13-DIP module	18.00

Power-over-Ethernet (PoE) Powered Device (PD) Interface Front-End Controllers

Device	Description	Detection	Classification	Abs Max V _{IN} (V)	Operating Temp (°C)	Full Inrush Current Limiting	Current Limit (mA)	Auto Retry or Latch Off in Fault	UVLO	DC/DC Interface	Package(s)	Price ¹
TPS2375	Powered device controller	4	Yes, Class 0–4	100	−40 to 85	Programmable	450	Latch Off	802.3af (30.6/39.4 V)	PG	SOIC-8, TSSOP-8	1.25
TPS2375-1	Powered device controller	4	Yes, Class 0–4	100	−40 to 85	Programmable	450	Auto Retry	802.3af (30.6/39.4 V)	PG	TSSOP-8	1.00
TPS2376	Powered device controller	4	Yes, Class 0–4	100	−40 to 85	Programmable	450	Latch Off	Adjustable	PG	SOIC-8, TSSOP-8	1.25
TPS2376-H	High-power powered device cont.	4	Yes, Class 0–4	100	−40 to 85	Programmable	600	Auto Retry	Adjustable	PG	SOIC-8	1.25
TPS2377	Powered device controller	4	Yes, Class 0–4	100	−40 to 85	Programmable	450	Latch Off	Legacy (30.5/35.0 V)	PG	SOIC-8, TSSOP-8	1.25
TPS2377-1	Powered device controller	4	Yes, Class 0–4	100	−40 to 85	Programmable	450	Auto Retry	Legacy (30.5/35.0 V)	PG	SOIC-8	1.00

¹Suggested resale price in U.S. dollars in quantities of 1,000.

For additional resources on PoE, including reference designs and evaluation modules, please see: power.ti.com/poe

Load Switches

Device	Input Voltage (V)	# of Channels	r _{ON} at 3.6V	Output Rise Time	Quick Output Discharge	Min. Current Limit	Max. Output Current	Enable	Package Size
TPS22902	1.0 to 3.6	1	78 mΩ	40 μs	Yes	No	500 mA	Active high	CSP, 0.8 mm × 0.8 mm
TPS22921	0.9 to 3.6	1	14 mΩ	30 μs	No	No	2 A	Active high	CSP, 0.8 mm × 1.2 mm or 0.9 mm × 1.4 mm
TPS22906	1.0 to 3.6	1	90 mΩ	220 μs	Yes	No	500 mA	Active high	CSP, 0.8 mm × 0.8 mm
TPS22960	1.62 to 5.5	2	435 mΩ	75 μs or 660 μs	Yes	No	500 mA	Active high	SOT23-8, 3 mm × 3 mm or μQFN, 1.5 mm × 1.5 mm



We suggest the following devices for video and imaging applications. For a complete device listing, see power.ti.com or download/request the latest "Power Management Selection Guide."

PWM Controllers for Off-Line Supply

Device	Description	Function	Features	Package
UCC28610	Green mode quasi-resonant PWM controller	< 150-W flyback	Lower system cost from Cascode design with 2x max over current, many safety features	8 SOIC
UCC2894	Current mode active clamp PWM controller	100–600 W forward	2-A drivers, zero voltage transition, low EMI, up to 1 MHz	16 SOIC/TSSOP
UCC3581	Fixed frequency green mode controller with adj. minimum duty cycle	< 100-W flyback	1-A driver, low 1q, up to 100 kHz	14 SOIC
UCC3809	High-performance, low-cost PWM	Flyback	100-µA startup current and accessible 5-V regulator	8 SOIC/PDIP/TSSOP/MSOP
UCC3813	Low-power economy BiCMOS current-mode PWM	< 200-W flyback/forward	1-A driver, up to 1 MHz, leading-edge blanking	8 SOIC/PDIP/TSSOP
UCC3861	Resonant mode half bridge PWM controller	> 200-W resonant	1-A driver, up to 1 MHz, true zero current switching, 1% ref.	16 SOIC/PDIP

Power Factor Correction ICs

UC2853A	High-performance ACM PFC	> 80W	Precision multiplier/divider circuit	8 SOIC/PDIP
UCC28019	Advanced 8-pin CCM PFC	> 80W	Superior transient response	8 SOIC/PDIP
UCC28060	Two-phase interleaved transition mode PFC controller	> 200 W PFC	Ripple current cancellation for lower system costs, high efficiency with phase management	16 SOIC
UCC28070	Two-phase interleaved continuous current mode PFC	> 600W PFC	High performance meets high density with quiet operation, with fast transient response	20-pin TSSOP
UCC2817A/18A	Industry-standard continuous conduction mode PFC	> 100 W PFC	1.2-A driver, improved noise immunity, up to 400 kHz	16 SOIC/PDIP/TSSOP

Step-Down DC/DC Converters (Integrated FETs)¹

TPS5410 / 20 / 30 / 50	5.5-V to 36-V input, 1.22-V minimum V_{OUT} , 1/2/3/5 A	Non-synchronous	Internal compensation, enable fixed 500 kHz	8 SOIC
TPS54317	3-V to 6-V input, 0.9-V minimum V_{OUT} , 3 A	Synchronous	PG, enable, sync pin, adj. frequency (up to 1.6 MHz), adj. softstart	24 QFN
TPS54350	4.5-V to 20-V input, 0.9-V minimum V_{OUT} , 3 A	Sync or non-sync	PG, enable, sync pin, adj. frequency (to 700 kHz), 180° out-of-phase, low side gate driver	16 HTSSOP
TPS54386	4.5-V to 28-V input, 0.8-V minimum, 3 A	Non-synchronous	Dual 600-kHz current mode DC/DC converter with softstart and sequencing	14 HTSSOP
TPS62110	3.1-V to 17-V input, 1.2-V minimum V_{OUT} , 1.5 A	Synchronous	PG, enable, sync pin, adj. frequency (to 1.4 MHz), power-save mode	16 QFN
TPS62290	2.3-V to 6.0-V input, 0.6-V minimum V_{OUT} , 1 A	Synchronous	Internal compensation, enable, fixed 2.25 MHz, light load efficiency	6 SON
TPS62510	1.6-V to 3.8-V input, 0.6-V minimum V_{OUT} , 1.5 A	Synchronous	PG, enable, sync pin, adj. freq. (to 1.5 MHz), pwr-save mode	10 SON (package)

Step-Down/Step-Up Inverting Converters

MC34063A	3-V to 40-V input, 40-V maximum V_{OUT} , 750 mA	Non-synchronous	Up to 100 kHz, 1.5-A peak, buck/boost/inverting circuit	8 SOIC, 8 PDIP
TPS63000	1.8-V to 5.5-V input, 1.2-V minimum V_{OUT} , 800 mA	Synchronous	Up to 1.5 MHz, 1.2 A	10 SON
TPS5430	5.5-V to 36-V input, 2 A, configurable as negative V_{OUT}	Non-synchronous	Inverting buck/boost circuit shown in note SLVA257A, enable, internal compensation, 500 kHz	8 HSOIC
TPS63700	2.7-V to 5.5-V input, -15-V minimum V_{OUT} , 360 mA	Non-synchronous	Up to 1.4 MHz, 360-mA peak, inverting circuit	10 SON

Step-Down DC/DC Converters (External FETs)¹

TPS40007/9	2.25-V to 5.5-V input, 0.7-V minimum V_{OUT}	< 15 A synchronous	Adjustable soft start and current limit, fixed 300/600 kHz	10 MSOP
TPS40041	2.25-V to 5.5-V input, 0.7-V minimum	< 12 A synchronous	Enable, 600 kHz, supports pre-bias, selectable short circuit protection	8 SON
TPS40055	8-V to 40-V input, 0.7-V minimum V_{OUT}	< 15 A synchronous	Prog. I-limit, adj. frequency (to 1 MHz), synchronizable	16 HTSSOP
TPS40190	4.5-V to 15- V_{IN} input, 0.6-V minimum V_{OUT}	< 12 A synchronous	Selectable current limit, 300-kHz fixed	10 SON
TPS40195	4.5-V to 28-V input, 0.9-V minimum V_{OUT} dual	< 15 A each synchronous	180° out-of-phase, up to 500 kHz, sequencing enable, suitable for DDR memory	30 SSOP
TPS40200	4.5-V to 52-V input, 0.6-V minimum V_{OUT}	< 3 A non-synchronous	Prog. I-limit, adj. frequency (35–500 kHz)	8 SOIC
TPS51020	4.5-V to 28-V input, 0.9-V minimum V_{OUT} dual	< 15 A each synchronous	180° out-of-phase, up to 500 kHz, sequencing enable, suitable for DDR memory	30 SSOP
TPS60400	1.6-V to 5.5-V input, -1.6-V minimum V_{OUT} , 60 mA	Non-synchronous	Up to 450 kHz, 60-mA peak, unregulated charge pump inverter	23 SSOT
TPS64200	1.8-V to 5.5-V input, 1.2-V minimum V_{OUT}	< 3 A non-synchronous	Enable, minimum on/off time	6 SOT23
TPS75003	2.2-V to 6.5-V input, 1.2-V minimum V_{OUT} T	< 3 A switchers and 300-mA LDO	3 channels, independent enable/softstart, Xilinx Spartan-3 FPGA	20 QFN
UCD9111	Single-output, single-phase digital POL	Synchronous	Single digital PWM, up to 1-MHz switching	32 QFN
UCD9112	Single-output, dual-phase digital POL	Synchronous	Dual digital PWMs, up to 2-MHz switching for sync switch of 2 ph	32 QFN
UCD9240	Quad-output, up to 8-phase digital POL	Synchronous	8 digital PWMs, up to 2-MHz switching for sync switch of 8 ph	40-, 64- and 80-pin QFN

Power Interface Products

TPS2223	Dual-slot carbus interface switches	PCMCIA	Thermal and short circuit protection, make before break switching	24 SSOP/HTSSOP
TPS2231	ExpressCard power interface switch	PCMCIA	Meets ExpressCard standard	20 QFN, 20 TSSOP, 24 HTSSOP

¹ Software tool available at power.ti.com

New devices are listed in bold red.



Power Management Solutions

Linear Regulators

Device	I _{out} (mA)	Description	Handset	WLAN	RF (High PSRR + Low Noise)	Portable Industrial/Consumer	Reverse Leakage Protection	MSP430 Processor	OMAP™ Processor	DSP and FPGA	DDR Termination	High Voltage	Low Profile (<1.2 mm)	Low Cost	Price ¹
TPS797xx	10	1.2-μA I _q , power good for brown-out protection, ceramic cap, SC-70	✓			✓		✓					✓		0.30
TPS715xx	50	3.4-μA I _q , 24-V _{IN} max, ceramic cap, SC-70	✓			✓		✓				✓	✓		0.34
TPS715Axx	80	Higher power version of TPS715xx in thermally enhanced QFN	✓			✓		✓				✓	✓		0.44
TPS769xx	100	17-μA I _q , low-cost option for <100-mA apps, SOT-23				✓								✓	0.29
LP2981	100	16-V _{in} max, fast transient response, SOT-23										✓		✓	0.36
TPS731xx	150	Cap-free, 1% acc, 1.7- to 5.5-V V _{IN} , custom V _{OUT} available, SOT-23				✓	✓			✓					0.45
LP2985	150	16-V _{in} , low-cost option for 150-mA apps, SOT-23										✓		✓	0.36
TPS717xx	150	High-bandwidth PSRR, low noise, SC-70/SON	✓	✓	✓	✓									0.45
TPS780xx	150	DVS with I _Q =500 nA				✓		✓					✓		0.65
TPS730xx	200	Low-cost alternative to TPS793xx, SOT-23/WCSP												✓	0.20
TPS793xx	200	LP2985 cross, RF, ceramic cap, SOT-23/WCSP	✓	✓	✓	✓			✓	✓			✓		0.23
TPS799xx	200	LP3985 cross with 40-μA I _q in TSOT-23/WCSP/SON	✓	✓	✓	✓			✓	✓			✓		0.30
TPS718xx	200/200	Dual output, high PSRR ceramic cap, SON/WCSP	✓	✓	✓	✓									0.70
TPS794xx	250	RF, ceramic cap, thermally enhanced PowerPAD™ IC package MSOP-8			✓	✓			✓	✓			✓		0.65
TPS732xx	250	Cap-free, 1% acc, 1.7- to 5.5-V V _{IN} , custom V _{OUT} available, SOT-23/QFN				✓			✓	✓			✓		0.65
TPS766xx	250	35-μA I _q , power good, low-cost option for 250-mA apps, SOIC-8				✓			✓	✓				✓	0.40
TPS712xx	250/250	Dual-RF LDO in QFN package, ceramic cap	✓	✓	✓	✓			✓	✓			✓		0.80
TPS736xx	400	Cap-free, 1% acc, 1.7- to 5.5-V V _{IN} , custom V _{OUT} avail., SOT-23/QFN/SOT-223				✓	✓			✓			✓		0.85
TPS776xx	500	Low-cost option for 500-mA apps, SOIC and PowerPAD TSSOP (PWP) package								✓			✓	✓	0.70
TPS795xx	500	RF performance, ceramic cap, SOT-223			✓					✓					1.05
TPS747xx	500	V _{bias} , soft start, PG, ceramic cap, in SON								✓					1.10
TPS725xx	1000	Low input voltage (down to 1.8 V), any cap LDO, SOT-223/TO-263/SOIC								✓					1.10
TPS796xx	1000	RF performance, ceramic cap, SOT-223/TO-263/QFN			✓					✓					1.10
TPS768xx	1000	Low-cost option for 1-A apps, SOIC and PowerPAD TSSOP (PWP) package								✓				✓	0.90
TPS737xx	1000	Ultra-low dropout, ceramic cap, reverse protection, SON				✓	✓			✓					0.60
TPS786xx	1500	RF performance, ceramic cap, SOT-223/TO-263			✓					✓					1.35
TPS748xx	1500	V _{bias} , soft start, ceramic cap, SON/QFN							✓	✓					1.25
TPS749xx	3000	V _{bias} , soft start, ceramic cap, QFN/DDPAK							✓	✓					2.50
TPS51200	3000	Sink/source DDR termination regulator, 10-SON									✓				0.90
UC385-x	5000	Separate V _{bias} allows regulation from as low as 1.7 V _{IN} , TO-220/TO-263								✓					3.15

Plug-In Power Modules

Device ²	Input Voltage	Description	I _{out}	V _{out}	V _{out} Adjustable	Auto-Track™ Sequencing	Pola™ DC/DC Power Modules	Price ¹
PTH05T210W	5 V	5-V input, 30-A T2 2nd gen PTH POL with TurboTrans	30 A	0.7 to 3.6	✓	✓	✓	18.00
PTH08T210W	12 V	5.5- to 14-V input, 30-A T2 2nd gen PTH POL with TurboTrans	30 A	0.7 to 3.6	✓	✓	✓	18.00
PTH08T220W	5 V/12 V	4.5- to 14-V input, 16-A T2 2nd gen PTH POL with TurboTrans	16 A	0.7 to 5.5	✓	✓	✓	12.60
PTH08T240W	5 V/12 V	4.5- to 14-V input, 10-A T2 2nd gen PTH POL with TurboTrans	10 A	0.7 to 5.5	✓	✓	✓	10.80
PTH04T220W	3.3 V/5 V	2.2 to 2.5 V input, 16-A T2 2nd gen PTH POL with TurboTrans	16 A	0.7 to 3.6	✓	✓	✓	12.60
PTH04T240W	3.3 V/5 V	2.2 to 2.5 V input, 10-A T2 2nd gen PTH POL with TurboTrans	10 A	0.7 to 3.6	✓	✓	✓	10.80

¹Suggested resale price in U.S. dollars in quantities of 1,000.

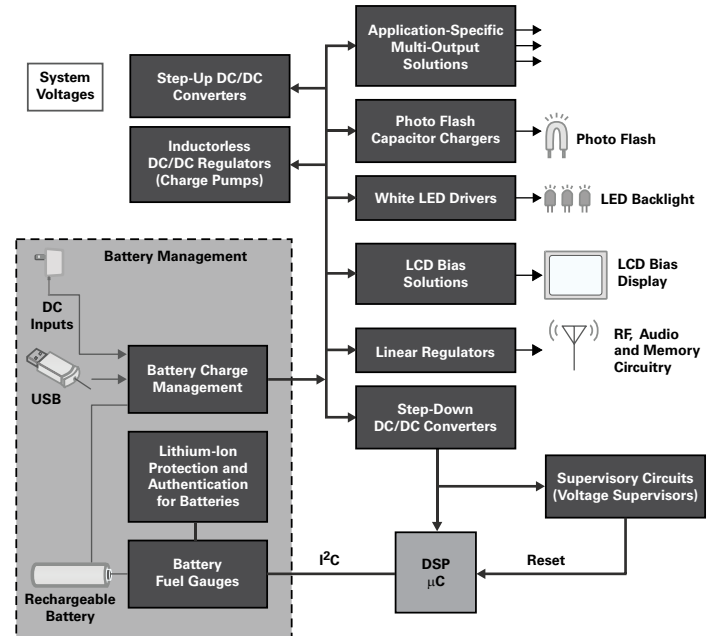
²See power.ti.com for a complete product offering.

Power Management Solutions



Complete Portable Power Solutions

Device	Description
Linear Regulators (LDO)	
TPS79718	10 mA, 1.2- μ A micro-power LDO in SC-70
TPS71533	50 mA, 3.2- μ A micro-power LDO in SC-70
TPS71701	150 mA, high-bandwidth PSRR, low noise, SC-70/SON
TPS72118	150 mA, low-noise, low- V_{IN} LDO in SOT-23
TPS79301	200 mA, low-noise, high PSRR LDO in SOT-23 and WCSP
TPS79901	200 mA, ultra-low noise, high PSRR LDO in WCSP
TPS718xx	200-mA dual-output, high PSRR ceramic cap, SON/WCSP
TPS73601	400 mA, cap-free, reverse-leakage protection LDO in SOT-23 and QFN
TPS79501	500 mA, low-noise, high PSRR LDO in SOT-223
TPS79601	1 A, low-noise, high PSRR LDO in SOT-223
TPS51200	Sink/source DDR termination regulator, 10 SON
LED Backlight and Camera Flash Solutions	
TPS60250	7-channel, current-regulated white LED charge pump in QFN
TPS61041	250-mA switch boost converter, up to 28 V in SOT-23
TPS61050	2-A switch current boost converter for flashlight LEDs with I^2C in CSP
TPS61060	375-mA switch, current-regulated, synchronous boost converter in QFN and WCSP
TPS61161	2.7 to 18 V_{in} , 700-mA boost converter with digital dimming in 6 SON
TPS61150	Dual 27-V, 700-mA switch, 1.2-MHz boost converter
TPS65562	Integrated photo flash charger and IGBT driver
TPS75105	Low dropout, two-bank LED driver with PWM brightness control in CSP
DC/DC Boost (Step-Up) Solutions	
TPS61020	1.5-A switch boost converter in QFN
TPS61030	4-A switch boost converter in QFN
TPS61070	600-mA switch boost converter in thin SOT-23 for 1- and 2-cell alkaline applications
TPS61170	38-V, 1.2-A switch, 1.2-MHz boost converter
TPS63000	96% efficient, 1.2-A buck/boost converter with 1.8 to 5.5- V_{IN}
OLED and Display Power Supply (Small to Medium Screen)	
TPS61045	375-mA switch boost converter, up to 28 V in QFN
TPS65120	4-channel small form-factor TFT display power supply in QFN
TPS65130	2-channel, positive/negative power supply for OLED displays in QFN
TPS61081	28 V, 500-mA switch, 1.2-MHz boost converter
Supply Voltage Supervisors (Quick-Reference Card)	
TPS3836E18	250-nA, supply voltage supervisor in SOT-23
TPS3808G01	2.4- μ A, programmable delay supply voltage supervisor in SOT-23
TPS3801-01	9- μ A, ultra-small supply voltage supervisor in SC-70
TPS3110E12	1.2- μ A, dual-supply voltage supervisor in SOT-23
TPS3806I33	3- μ A, dual-supply voltage supervisor in SOT-23
TPS3860x0	Quad supply voltage supervisors with programmable delay and watchdog timer in small QFN package
Multi-Channel Power Management ICs (PMIC)	
TPS65820	Li-ion charger, 2 DC/DC step-down converters with LED driver, 7 LDO, I^2C interface, A/D
TPS65010	Li-ion charger, 1.2-A and 400-mA step-down converter, 2 LDO with I^2C
TPS65023	6-channel PMU with 3 DC/DCs, 3 LDOs, I^2C interface and DVS, optimized for OMAP35x and DaVinci™ processors
TPS65052	6-channel PMU with 2 DC/DCs, 4 LDOs with very high PSRR
TPS65053	5-channel PMU with 2 DC/DCs and 3 LDOs



Complete Portable Power Solutions (Continued)

Device	Description
Battery Chargers	
bq2002	NiMH/NiCd charger for current-limited power supplies
bq243xx	Charger front-end protection IC with 30 V max V_{IN}
bq24100	1- to 3-cell Li-ion fully integrated switch-mode charger in QFN
bq24020	1-cell Li-ion fully integrated charger for AC/DC adapter and USB in QFN
bq24030	1-cell Li-ion charger for AC/DC adapter and USB with dynamic power path management in QFN
bq25010	Single-chip Li-ion charger with adjustable DC/DC converter in QFN
bq24060	Linear 1-cell Li-ion charger with thermal regulation
Battery Fuel Gauges	
BQ27500	System-side Impedance Track™ integrated circuits fuel gauge
bq26220	1- to 2-cell Li-ion battery monitor with HDQ interface
bq27000	1- to 2-cell Li-ion battery fuel gauge with HDQ in QFN and WCSP
bq27200	1- to 2-cell Li-ion battery fuel gauge with I^2C in QFN and WCSP
Battery Authentication and Protection	
bq26150	CRC-based battery authentication IC
Single DC/DC Buck (Step-Down) Solutions	
TPS62020	600-mA step-down converter, synchronous, high efficiency and small package, 3x3 QFN
TPS62040	1.2-A, 1.25-MHz step-down converter with 18- μ A quiescent current in QFN-10
TPS62110	1.5-A, 17-V V_{IN} step-down converter in QFN
TPS62220	400-mA step-down converter, synchronous, high efficiency and small package
TPS62260	600-mA, 2.25-MHz step-down converter in 2x2 mm SON/TSOT-23 package
TPS62300	500-mA, 3-MHz high-accuracy step-down converter with 1- μ H inductor in WCSP and QFN
TPS62350	800-mA, 3-MHz buck converter with I^2C interface in chip-scale package
TPS62355	1-A, 3-MHz buck converter with I^2C for dynamic voltage scaling in WCSP and QFN
TPS62400	Dual, adjustable, 400-mA and 600-mA, 2.25-MHz step-down converter
TPS64200	3-A controller in SOT-23, non-synchronous, small package, low V_{IN} , low V_{OUT}

→ DaVinci™ Technology Support

DaVinci Technology Overview

DaVinci technology is a signal processing-based solution tailored for digital video applications that provides video equipment manufacturers with integrated processors, software, tools and support to simplify the design process and accelerate innovation.

The portfolio of DaVinci digital video processors consists of scalable, programmable signal processing system-on-chips (SoCs), accelerators and peripherals optimized to match the price, performance and feature requirements for a broad spectrum of video end equipment.

DaVinci technology webcasts

View the archive of TI on-demand DaVinci webcasts to learn how to accelerate and simplify your video system design. Designed for 24/7 access, these webcasts typically last one hour.

Visit www.ti.com/davinciwebcasts.

DaVinci video casts: Engineering in front of the camera

Whether you have two minutes or two hours, a variety of DaVinci technology videos are available for on-demand viewing. These short videos provide engineers the technical meat on the TMS320DM355 and TMS320DM6467 DaVinci processor products, tools and software. Check out the line-up at www.ti.com/dm355videocasts or www.ti.com/dm6467videocasts.

DaVinci technology training

Get hands-on experience on DaVinci technology through online training, one-day and multi-day workshops. Check www.ti.com/davincitraining for the next workshop near you, as well as 24/7 online training and webcasts.

- Introduction to DaVinci Technology Online Training – www.ti.com/davincioit.
- DM6467 DaVinci Processor for HD Transcoding – www.ti.com/dm6467olt.
- DaVinci Technical Seminar – www.ti.com/davinciseminar.
- TMS320DM6437 One-Day Workshop – www.ti.com/dm6437odw.
- TMS320DM644x Multi-Day Workshop – www.ti.com/dm644xmdw.

DaVinci white papers and articles

Download the variety of DaVinci white papers and articles to see the possibilities for designing and developing digital video and audio end equipment devices and applications using DaVinci technology. Visit www.ti.com/davinciwhitepaper.

DaVinci technology FAQs

Have questions about DaVinci technology? Browse the DaVinci questions and answers to find out everything you need to know about DaVinci processors, development tools, applications frameworks, training and support at www.ti.com/davincifaq.

Delve into digital video with Video360 podcasts

The Video360 podcasts feature industry news, technology updates and practical tips regarding the latest innovations in digital video. Check out the archive at www.ti.com/davincipodcast.

Additional web links and community resources

- gstreamer.ti.com – Here engineers can find open source files related to DaVinci and join the DaVinci Linux Open Source mailing list for discussions.
- www.ti.com/davinciwikidsg – The Embedded Processors Wiki provides a collaborative environment for digital media engineers using Texas Instruments processors to share technical tips and open source code. The Wiki is designed to get you to market faster by shortening the design knowledge ramp, assist other developers innovate and foster a growth of technology knowledge on hardware and software.
- www.ti.com/dspdesignsupport – DSP Design Support provides quick access to all technical documentation, tools and software details – all from one page.



OMAP Platform

OMAP processors turn everyday products into new ways to work, socialize and entertain

Targeting applications such as portable navigation devices, Internet appliances, portable media players and personal medical equipment, TI's OMAP platform offers six distinct single-chip processors with a variety of combinations of the ARM9™ or Cortex™-A8 core, multimedia rich peripherals, POWERVR SGX™ graphics accelerator and DaVinci™ technology for video applications.

OMAP35x processors: Laptop-like performance at handheld power levels

The OMAP35x applications processors are pin-for-pin compatible to make it easy for OEMs to efficiently create a complete product portfolio based on the single platform. Supporting development, TI offers a modular and extensible OMAP35x Evaluation Module (EVM). This EVM includes a complementary, integrated power management and analog solution specifically for OMAP.

- OMAP35x Evaluation Module (EVM) available today
- Hardware:
 - OMAP35x processor
 - 128-MB LPDDR
 - 128-MB NAND Flash
 - Touch-screen LCD display with landscape/portrait modes
 - Expansion connector provides flexible interface capability
- Emulator support: TI XDS560™
- Software
- OMAP35x Linux BSP:
 - Peripheral drivers
 - U-boot for boot loading
 - Busybox-based root file system
- Open source development tools
- Reference schematics
- Connectivity
- Daughter card connectivity

- Ethernet, USB 2.0, SDIO, I²C, JTAG, keypad
- SD/MMC and DDR
- S-Video output via NTSC/PAL and YPbPr/RGB

The Windows® Embedded CE BSP is available for download from TI and open source software is also available for the OMAP platform.

Developer network support

Additional applications expertise and support is available from members of the OMAP Developer Network to help customers take their designs from concept to production as quickly as possible.

Online training

Get an inside technical look at the new OMAP35x processor hardware and software. Gain an internal perspective of the possibilities suited for this uniquely compelling generation of OMAP processors.

For more information on OMAP35x applications processors, visit www.ti.com/omap35x.

OMAP-L1x applications processors: Connectivity, portability and general-purpose processing made easy

Enabling developers to integrate feature-rich GUIs into their portable designs, the OMAPL1x generation of applications processors includes a variety of scalable ARM9 and ARM9-plus-DSP architectures. With pricing starting under U.S. \$7 in 1-KU quantities and pin-for-pin compatibility with select devices in the TMS320C674x DSP generation, designers are easily able to choose the right processor to fit their application needs.

Combining industry-leading, cutting-edge 65-nm process technology with low-leakage transistor technology, OMAP-L1x processors offer high performance and scalability with power consumption as low as 7 mW in deep sleep mode. Designers also have the ability to manipulate the individual peripherals to further optimize power consumption.

Chip-level integration includes, but is not limited to:

- 10/100 EMAC
- USB 1.1 Host/2.0 Host/Device/OTG
- MMC/SD controllers
- Universal parallel port (uPP) for interfacing with FPGAs, high-speed data converters
- Universal Host Port Interface (UHPI) for interfacing with other processors
- LCD controller
- Serial ATA interface (OMAP-L1x8 only)
- 448-KB on-chip memory
- Video port interface (OMAP-L1x8 only)

Get started quickly

To get started quickly, designers can purchase OMAP-L1x evaluation modules. Development kits vary in price and capability depending on the customer needs. Most include built-in emulation and Code Composer Studio™ Integrated Development Environment support. All kits contain Linux board-support packages, Codec Engine, DSP/BIOS™ kernel and device driver and the associated debugging environment. For more information on OMAP-L1x processors, visit www.ti.com/omapl1x.

OMAP-L1x videos

Learn more about both the hardware and software that supports this platform here: www.ti.com/omapl1x_comm.

➔ Digital Signal Processing Development Tools

Video and Imaging Hardware and Software Development Tools

Description	Part Number	Price ¹
Hardware Development Tools		
TMS320DM642 Digital Media Development Kit (DM642 DMDK)	TMDSDMK642 (U.S. part number) TMDSDMK642-0E (European part number)	6,495
Evaluation Modules (EVMs)		
TMS320DM644x Digital Video Evaluation Module (DVEVM)	TMDSEVM6446	2,495
OMAP35x Evaluation Module	TMDSEVM3503	1,499
OMAP-L138 Evaluation Module	TMDXOSKL138BET	849
OMAP-L137/TMS320C6747 Floating-Point Starter Kit	TMDXOSKL137BET	395
TMS320DM642 Evaluation Module (EVM)	TMDSEVM642	1,995
TMS320DM6437 Digital Video Development Platform (DVDP)	TMDSDVP6437	495
TMS320DM648 Digital Video Development Platform (DVDP)	TMDSDVP648	1,295
TMS320DM355 Digital Video Evaluation Module (DVEVM)	TMDXEVM355	495
TMS320DM365 Digital Video Evaluation Module (DVEVM)	TMDXEVM365	595
TMS320DM6467 Digital Video Evaluation Module (DVEVM)	TMDSEVM6467	1,995
JTAG Emulators		
Spectrum Digital XDS510PP-Plus Emulator	TMDSEMUPP (U.S. part number)	1,095
Spectrum Digital XDS510PP-Plus Emulator with European Cords	TMDSEMUPP-0E (European part number)	1,095
Spectrum Digital XDS510™ USB Scan-Based Emulator PCB	TMDSEMUUSB	1,495
Blackhawk XDS560™ JTAG PCI Scan-Based Emulator PCB	TMDSEMU560PCI	2,995
Blackhawk XDS560 USB High-Performance JTAG Scan-Based Emulator PCB	TMDSEMU560U	2,999
XDS560 USB Trace Emulator ²	TMDSEMU560T	9,995
Software Development Tools		
VICP Signal Processing Library (DM6446, DM6441, DM647 and DM648 processors)	SPRC831	Free
Code Composer Studio IDE Platinum v4 Development Tools Bundled with Annual Software Subscription Supports C6000™, C5000™ and C2000™ DSPs and DaVinci™ and OMAP™ processor platforms	See eStore at www.ti.com/estore	See eStore
C6000, C5000, C2000 DSPs and DaVinci and OMAP processor Code Composer Studio IDE Development Tools Annual Software Subscription for Version 3.10 and Higher	TMDSSUBALL	600
Code Composer Studio IDE Free Evaluation Tools Includes C6000 DSP and DaVinci platform Code Composer Studio IDE 120-Day Free Evaluation Tools ³	SPRC119 (www.ti.com/freetools)	Free
Video Analytics & Vision Library (VLIB)	www.ti.com/vlib	Free
TMS320C64x™ DSP Image Library	SPRC093	Free
TMS320C64x™ DSP Image Library	SPRC094	Free

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 tools are listed in bold red.

² The XDS560 Trace is designed for use with trace-enabled digital signal processors. Currently the following processors are fully supported by trace: TMS320DM648, TMS320DM647, TMS320DM643, TMS320DM642, TMS320DM641 and TMS320DM640 processors.

³ Includes full-featured Code Composer Studio IDE development tools, code generation tools (C/C++ compiler/assembler/linker) and simulator all limited to 120 days.

Digital Signal Processing Development Tools



Video and Imaging Development Solutions

For more information on TI's video and imaging solutions, go to www.ti.com/videoevms.

TMS320DM365 Digital Video Evaluation Module (DM365 DVEVM) – The TMS320DM365 Digital Video Evaluation Module (DVEVM) includes both hardware and software enabling developers to start immediate evaluation of the DM365 processor and begin building digital video applications such as IP security cameras, digital photo frames, digital signage, video doorbells and portable digital video products that have yet to be invented.

DVEVMs come complete with a demo version of MontaVista Linux Pro 5.0, drivers, evaluation codecs and an evaluation board. Registered DVEVM users may download TI's HD H.264, MPEG-4, JPEG, MP3 and G.711 production codecs free of charge from the DaVinci software updates site.

The DVEVM allows developers to write production-ready application code for the ARM® and provides access to the HMJCP coprocessor core using DaVinci APIs to begin immediate application development for DM365 digital video processors. The Digital Video Software Production



TMS320DM365 Digital Video Evaluation Module

Bundle (DVSPB) MontaVista Linux companion product is recommended for production.

For more information, contact your authorized TI distributor or visit www.ti.com/dm365dvevmdsg.

TMS320DM6467 Digital Video Evaluation Module (DM6467 DVEVM) – The TMS320DM6467 DVEVM includes both hardware and software enabling developers to start immediate evaluation of the DM6467 processor. DVEVMs come complete with a demo version of MontaVista



TMS320DM6467 Digital Video Evaluation Module

Linux Pro 4.0, drivers, Codec Engine, evaluation codecs and an evaluation board. The DVEVM can be used for the development of digital video applications such as surveillance digital video servers/recorders, media gateways, multi-point control units digital media adapters, set-top boxes and many other high-definition video applications.

The DM6467 DVEVM allows developers to write production-ready application code for the ARM® and provides access to the TMS320C64x+™ DSP and HD-Video/Imaging Coprocessor core using DaVinci APIs to begin immediate application development for the DM6467 digital video processor.

The Digital Video Software Production Bundle (DVSPB) MontaVista Linux companion product is recommended for production.

For more information, contact your authorized TI distributor or visit www.ti.com/dm6467dvevmdsg.

➔ Digital Signal Processing Development Tools

TMS320DM355 Digital Video Evaluation Module (DM355 DVEVM) – The TMS320DM355 Digital Video Evaluation Module (DVEVM) includes both hardware and software enabling developers to start immediate evaluation of the DM355 processor. DVEVMs come complete with a demo version of MontaVista Linux Pro 4.0, drivers, Codec Engine, evaluation codecs and an evaluation board. Registered DVEVM users may download TI's JPEG and HD MPEG-4 SP production codecs and G.711 codec free of charge from the DaVinci™ software updates site. The DVEVM can be used for the development of digital video applications such as IP security cameras, digital photo frames, digital cameras, video doorbells, portable medical and portable digital video products that have yet to be invented.

The DVEVM allows developers to write production-ready application code for the ARM® and provides access to the MPEG/JPEG coprocessor core using DaVinci APIs to begin immediate application development for DM355 digital video processors.

The Digital Video Software Production Bundle (DVSPB) MontaVista Linux companion product is recommended for production.



TMS320DM355 Digital Video Evaluation Module

For more information, contact your authorized TI distributor or visit www.ti.com/dm355dvevmdsg.



TMS320DM6437 Digital Video Development Platform (DVDP)

TMS320DM6437 Digital Video Development Platform (DVDP) – Rapidly accelerate the development time of your low-cost digital video application with the new DaVinci TMS320DM6437 digital video development platform.

Available today for U.S. \$495, the DVDP includes both hardware and software and enables immediate evaluation of DM6437 digital video processors. For more information about the DM6437 DVDP, see www.ti.com/dvdp.

Digital Signal Processing Development Tools



TMS320DM6446 Digital Video Evaluation Module

TMS320DM6446 Digital Video Evaluation Module (DVEVM) – The DM6446 DVEVM enables developers to start immediate evaluation of DaVinci processors and begin building digital video applications such as video phones, automotive infotainment, digital still cameras, streaming media, IP set-top boxes, video security systems and digital video products that have yet to be invented. The DM6446 DVEVM allows developers to write production-ready application code for the ARM® and provides access to the DSP core using DaVinci technology-based APIs. For more information about the DM6446 DVEVM, see www.ti.com/dvevm, or test the DM6446 DVEVM for free at www.ti.com/dvevmvirtualab.

DaVinci™ Technology-Based TMS320DM648 Digital Video Development Platform (DVDP) – The DM648 DVDP simplifies development of digital video applications. It provides developers with a comprehensive hardware and software platform that can be used throughout the entire design process to accelerate the development of a wide range of applications such as multi-channel video security and infrastructure applications, including digital video recorders (DVRs), IP video servers, machine vision systems and high-performance imaging applications. For additional information about the DM648 DVDP, see www.ti.com/dm648dvdp.



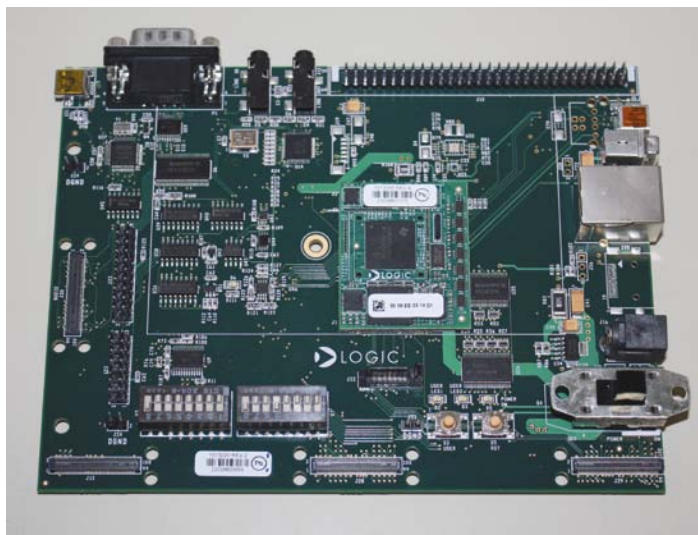
TMS320DM648 Digital Video Development Platform (DVDP)

➔ Digital Signal Processing Development Tools

OMAP35x Evaluation Module (EVM) – Developed with Mistral Solutions, the OMAP35x evaluation module (EVM) enables developers to start immediate evaluation of OMAP processors and begin building low-power applications such as digital TVs, navigation devices, games, data terminals, point of sale/service devices, software-defined radio, medical devices, media controllers and numerous other low-power, high-performance products that have yet to be invented. For more information, see www.ti.com/omap35x.



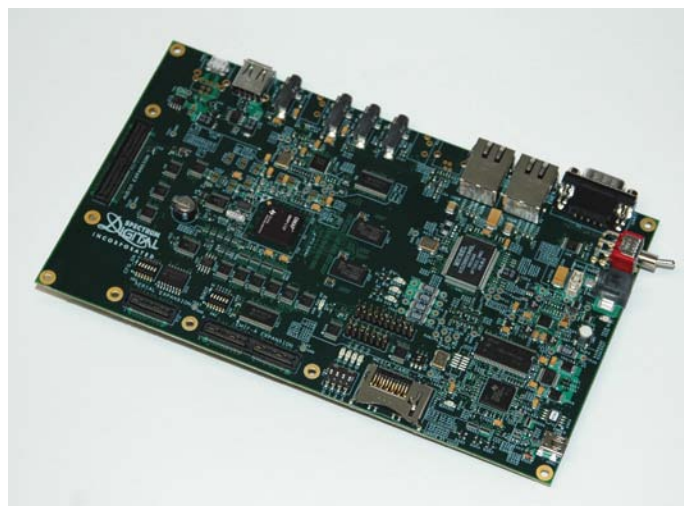
OMAP35x Evaluation Module



OMAP-L138 Evaluation Module

OMAP-L138 Evaluation Module (EVM) – Begin development on your industrial, communications, medical diagnostics and audio applications with the OMAP-L138/C6748 evaluation module. Developed in conjunction with Logic Product Development, the EVM consists of an OMAP-L138 system-on-module (SOM), C6748 SOM, 128-MB mDDR, open source Linux, DSP/BIOS™ kernel drivers and full support for connectivity peripherals. The EVM supports development on four processors, including the TMS320C6742, TMS320C6746, TMS320C6748 DSPs and OMAP-L138 applications processor, which offer unmatched connectivity options and fixed- and floating-point capabilities that are also the industry's lowest power floating-point DSPs. For more information, contact your authorized TI distributor or visit www.ti.com/omap-l138evm.

OMAP-L137/TMS320C6747 Floating-Point Starter Kit – The OMAP-L137/TMS320C6747 Floating-Point Starter Kit, developed jointly with Spectrum Digital Inc., is a low-cost development platform designed to speed the development of high-precision applications based on TI's OMAP-L13x applications processors and TMS320C674x fixed-/floating-point DSPs (TMS320C6747, TMS320C6745 and TMS320C6743). The kit 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-L137/TMS320C6747 Floating-Point Starter Kit

For more information, contact your authorized TI distributor or visit www.ti.com/omap-l137kit.

DLP® Technology Development Tools



DLP® Pico™ Projector Development Kit, DLP1PICOKIT

DLP® Pico™ Projector Development Kit – The DLP Pico Projector Development Kit is a new and affordable way of enabling developers to integrate digital projection into their own innovative applications. The kit utilizes the DLP 0.17-inch HVGA chipset in the projection device with a light engine containing three solid-state color LEDs as a low-power light source. The kit also includes a power supply and a video cable that supports a DVI-D signal as well as I²C commands. Furthermore, the development kit can interface to evaluation modules, such as the BeagleBoard, to offer users more flexibility and expedite development. The DLP Pico Projector Development Kit is a fully integrated projection solution that enables a vast array of new and portable industrial, medical and consumer products.

For more information, visit www.dlpdiscovery.com.

DLP® Discovery™ Developer Kit – The DLP® Discovery Developer Kit is designed to enable non-traditional display and non-display applications of Texas Instruments' DLP chip – the same technology used in DLP HDTVs and projectors. The DLP Discovery products contain an optical semiconductor module that allows developers to manipulate light for high-performance and high-resolution application development. When a DLP Discovery platform is integrated with a light source and optics, it creates binary light patterns with speed, precision and efficiency far surpassing other spatial light modulators. Unlike TI DLP chip controllers optimized for projection display, these platforms support a wide variety of DLP product applications by delivering maximum flexibility in formatting and sequencing data light patterns.

For more information, contact TI at 1-888-DLP-BYTI, or see www.dlpdiscovery.com.



DLP® Discovery Developer Kit, DLPD4X00KIT

→ eXpressDSP™ Software and Development Tools

eXpressDSP Software and Development Tools

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Tools and standards to simplify application development, reduce system cost, enhance product robustness and innovation and accelerate time to market

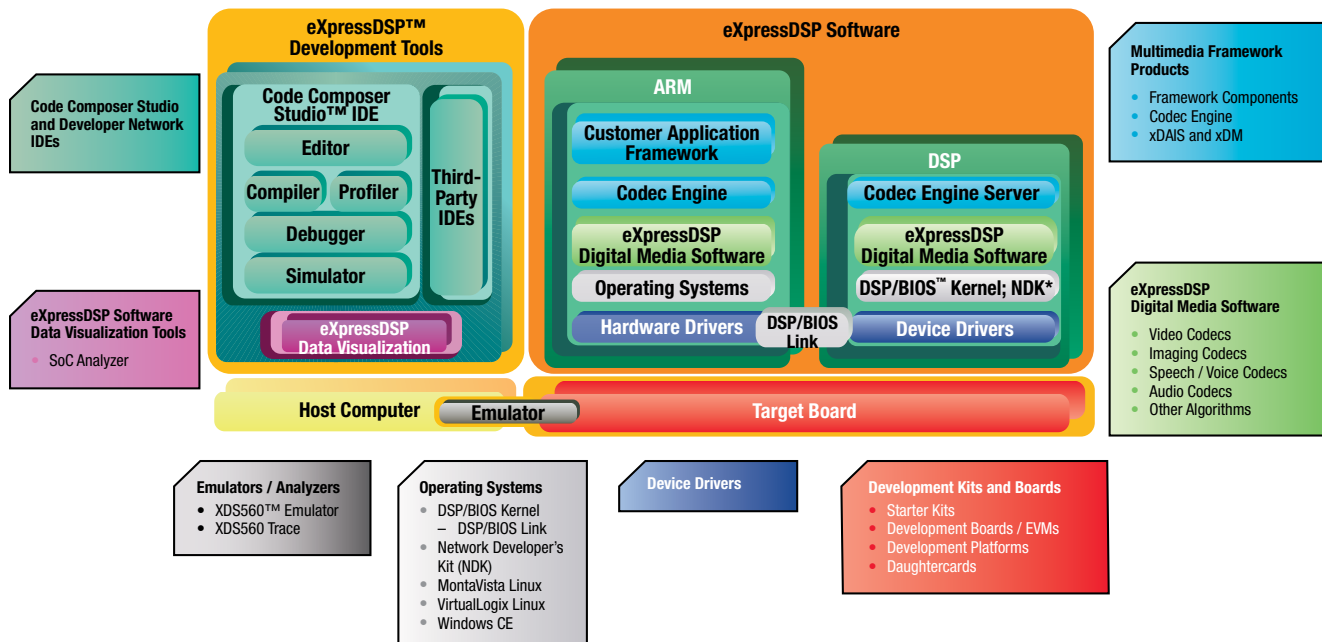
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SoC (ARM® + DSP)



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