



2005 EDN DSP Directory

DSP devices and cores

Company	Device/family (core)	Target applications	On-chip accelerators	CPU frequency (MHz)	Bus interface (address/data) (bits)	Instruction width (bits)	Core/I/Os operating voltages (V)	Typical power at maximum frequency	Power-down modes and minimum power
Altera www.altera.com	Cyclone II	Consumer, communications, industrial, computer	IP blocks, as many as 150 18x18-bit multipliers	As many as 180			1.2		
	HardCopy II	Video/image processing, wireless, wireline, industrial, test and measurement		350			1.2		
	Nios II (core)	Video/image processing, wireless	256 custom instructions and accelerators	As many as 180	32/32	32			
	Stratix II	Communications, broadcast, industrial, wireless, test and measurement	IP blocks, as many as 384 18x18-bit multipliers	As many as 180			1.2, 1.5, 1.8, 2.5, 3.3	Early power estimator on Web site	Early power estimator on Web site
AMI Semiconductor www.amis.com	BelaSigna 200	Wireless and specialty headsets, ultralow-power audio		2.56 internal, 33 external	16/16	16	1/1, 1.8, 2	800 uW	Manual shutdown: 150 uW
	Orela 4500	Digital hearing aids		As many as 2.56	16/16	16	1/1, 2	900 uW	Power-down: 38 uW
	Toccatto Plus	Digital hearing aids		As many as 2.56	16/16	16	1/1, 2	800 uW	Manual shutdown: 150 uW
Analog Devices www.analog.com	ADSP-BF561	Consumer multimedia		600	32	16, 32, 64	0.8 to 1.2/2.25 to 3.6	650 mW	Full-On, Active, Sleep, Deep Sleep, Hibernate (<50 uW)
	ADSP-BF531/BF532/BF533	Biometric, consumer audio, e-mail terminal, embedded modem, games/learning aid, industrial control		400 to 750	16	16, 32, 64	0.8 to 1.4/2.25 to 3.6	264 mW	Full-on, active, sleep, deep sleep, hibernate (less than 50 uW)
	ADSP-BF534	Automotive safety, body control, driver assistance, entertainment, fleet monitoring, factory automation, industrial control		500	16	16, 32, 64	0.8 to 1.2/2.25 to 3.6		Full-on, active, sleep, deep sleep, hibernate (less than 50 uW)
	ADSP-BF535	Embedded audio, video, communications	Dual MACs	350	32	16, 32, 64	1 to 1.6/3.15 to 3.45	797 mW	Full-on, active, sleep, deep sleep (approximately 1 mW)
	ADSP-BF536 ADSP-BF537	Remote monitoring devices, VOIP, point-of-sale terminals, biometrics, video surveillance, distributed industrial control		400 to 600	16	16, 32, 64	0.8 to 1.2/2.25 to 3.6		Full-on, active, sleep, deep sleep, hibernate (less than 50 uW)
ARC International www.arc.com	ARC 610D (core)	Personal audio and image player, digital still camera, cellular handset, disk/DVD drive	ARC XY DSP subsystem	As many as 260 (130 nm)	32	16, 32	Process dependent	18 mW (core)	Sleep mode via software, clock-gating option
	ARC 625D (core)	Set-top box, personal audio/image player, ink-jet printer, cellular handset, broadband modem, wireless LAN, VOIP terminal/gateway, home gateway	ARC XY DSP subsystem	As many as 240 (130 nm)	32	16, 32	Process dependent	19 mW (core)	Sleep mode via software, clock-gating option
	ARC 710D (core)	Packet processing, data-plane functions, security accelerators, TCP offload engines, disk drives	ARC XY DSP subsystem	As many as 405 (130 nm)	32	16, 32	Process dependent	45 mW (core)	Sleep mode via software

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Caching	On-chip memory and controller interfaces	ADC/DAC	Peripherals and off-chip interfaces	Package selection	Temperature ranges (degrees Celsius)	Additional features/information	Price (10,000)
	Up to 1.1-Mbit memory, SDR, DDR, DDR2, QDR II interfaces.		PCI, PCI-X, 10/100 Ethernet, FPD, Flat Link, RSDS, mini-LVDS, SPI, IEEE394, USB 2.0, I2C, E1, E3, T1, T3, SONET/SDH, POS-PHY Level 2 and 3, UTOPIA Level 2 and 3	144 TQFP, 208 PQFP, 256/484/672/896 FBGA	-40 to 100	Soft 32-bit NIOS II processor	
	SDR, DDR, DDR2, RDRAM II, QDR II, ZBT		Same as Stratix II FPGAs	F484/F672/F780/F1020/F1508	0 to 70	Structured ASIC, nonprogrammable	
Configurable	On-chip FPGA memory interface, SDR/DDR SDRAM, SSRAM interfaces		Selectable DMA, interval timer, interface to user logic, general-purpose I/Os, SPI, serial UART, JTAG, PCI			On-chip debug core, configurable switch fabric, multiprocessor hardware multiplexer	License included with FPGA
	9.3-Mbit memory, DDR2, RDRAM II, QDR II, SDR, DDR, QDR interfaces		LVTTTL, LVCMOS, SSTL CI and CII, HSTL CI and CII, PCI, PCI-X, LVDS, HyperTransport, differential HSTL and SSTL, SPI-4.2, SFI-4, XSBI, RapidIO, NPSI, UTOPIA IV, DDR2, RDRAM II, QDR II, SDR, DDR, QDR, Custom	F484, H484, F672, F780, F1020, F1508	-40 to +100	Soft 32-bit NIOS II processor, ALM adders, PLLs, design security	
	DMA FIFO controller	Six inputs to two ADCs, two DACs	Multiple clock domains (configurable prescalers), battery-voltage monitor, watchdog, 16 general-purpose I/Os, PCM, SPI, two UART, I2C, I2S	QFN	-40 to +85, -55 to +125 (storage)	Multiprocessor mixed-signal system, rapid prototyping modules, mobile headset reference design	
	Integrated off-chip EEPROM, DMA FIFO controller	Four inputs to two ADCs, two DACs	Multiple clock domains (configurable prescalers), battery-voltage monitor, watchdog, debug UART port, I2C, 2 general-purpose I/Os	6.04x3.5x1.6 5 mm, reflowable hybrids	0 to 50, -40 to +85 (storage)	High-power audio output, secure device memories, power-supply management	
	Integrated off-chip EEPROM, DMA FIFO controller	Three inputs to two ADCs, one DAC	Multiple clock domains with configurable prescalers, on-chip battery-voltage monitor, watchdog, two UART, 2 general-purpose I/Os	5.97x3.48x1.65 mm, reflowable hybrids	0 to 50, -55 to +85 (storage)	Multiprocessor mixed-signal system	
Up to 32-kbyte instruction, up to 64-kbyte data	Up to 32-kbyte instruction, up to 64-kbyte data, 8-kbyte scratchpad RAM, 128-byte L2 SRAM, three DMA controllers, SDRAM, SRAM, flash, ROM interfaces		Two ITU-R 656 video interfaces, two dual channel, full duplex synchronous serial port, 12 32-bit timer/counters (with PWM), SPI-compatible UART (supports IrDA), dual watchdog, 48 programmable flags, 1 to 63x PLL	256 mBGA, 297 PBGA	-40 to +85	Dual Blackfin processor cores	\$19.75 to \$85.72
Up to 16-kbyte instruction, up to 32-kbyte data	Up to 64-kbyte instruction, up to 32-kbyte data, 4-kbyte scratchpad RAM, DMA controller, SDRAM, SRAM, flash, ROM interfaces		ITU-R 656 video interface, two dual-channel, full duplex synchronous serial ports, SPI-compatible port, three timer/counters (with PWM)	160 mBGA, 169 PBGA, 176 LQFP			\$4.95 to \$59.95
Up to 16-kbyte instruction, up to 32-kbyte data	Up to 48-kbyte instruction, up to 32-kbyte data, 4-kbyte scratchpad RAM, DMA controllers, SDRAM, SRAM, flash, ROM interfaces		CAN 2.0B interface, ITU-R 656 video interface, two dual channel, full-duplex synchronous serial port, SPI-compatible UARTs (supports IrDA), two-wire interface controller	182 mBGA, 208 Sparse MiniBGA	-40 to +85	Functional extension of the ADSP-BF531/ADSP-BF532/ADSP-BF533 processors	\$9.65 to \$13.10
Up to 16-kbyte instruction, up to 32-kbyte data	Up to 16-kbyte instruction, up to 32-kbyte data, 4-kbyte scratchpad RAM, 256-kbyte L2 SRAM, DMA controller, SDRAM, SRAM, flash, ROM interfaces		32-Bit, 33 MHz, 3.3 V, PCI 2.2 compliant (master and slave), USB 1.1 compliant, two UARTs (IrDA support), two SPI compatible ports, two full-duplex synchronous serial ports, four timer/counters (PWM support), 16 bidirectional Flag I/Os, watchdog, realtime, 1 to 31x PLL	260 PBGA	-40 to +85	Dynamic power management	\$22 to \$31.25
Up to 16-kbyte instruction, up to 32-kbyte data	Up to 48-kbyte instruction, up to 32-kbyte data, 4-kbyte scratchpad RAM, DMA controller (Ethernet support), SDRAM, SRAM, flash, ROM interfaces		IEEE 802.3-compliant 10/100 Ethernet MAC; CAN 2.0B; ITU-R 656 video port; two dual-channel, full-duplex synchronous serial ports; SPI-compatible ports, two UARTs (IrDA support); two-wire interface controller, eight 32-bit timer/counters (PWM support); real time, watchdog, 48 general-purpose I/Os (high current driver support); one to 63 PLLs, debugging/JTAG	182 mBGA, 208 Sparse MiniBGA	-40 to +85	Functional extension of the ADSP-BF531/ADSP-BF532/ADSP-BF533 processors	\$8.05 to \$16.55
	Single-cycle closely coupled memory		BVCI and AMBA-AHB	User dependent	User dependent		License
Up to 32-kbyte instruction/data	Single-cycle closely coupled memory, caches		BVCI and AMBA-AHB	User dependent	User dependent		License
	Single-cycle closely coupled memory		BVCI and AMBA-AHB	User dependent	User dependent		License

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	ARC 725D (core)	DVD player/recorder, digital TV, set-top box, personal video recorder, personal audio/video player, digital movie camera, cellular handset, wireless LAN, automotive power-train control, laser printer/copier	ARC XY DSP subsystem	As many as 400 (130 nm)	32	16, 32	Process dependent	48 mW (core)	Sleep mode via software
	ARC 750D (core)	Set-top box, personal video recorder, personal audio/video player, cellular handset, smartphone, PDA, wireless LAN, automotive telematic/navigation/power-train control	ARC XY DSP subsystem	Up to 400 (130 nm)	32	16, 32	Process dependent	52 mW (core)	Sleep mode via software
Atmel www.atmel.com	Diopsis 740 (AT572D740)	Professional audio, speech processing for hands-free phone, radar-based automobile-collision avoidance, acoustic diagnosis of mechanical equipment, software-based ultrasound scanner	Single-cycle butterfly	100	19/16 ARM, 24/80 mAgic	16 ARM, 128 mAgic	1.8/3.3	740 mW	Minimum power: 260 mW
Cambridge Consultants www.CambridgeConsultants.com	APE2 (DSP Generator)	Audio, wireless, consumer, industrial	IP modules	Process dependent	VLIW	VLIW	Process dependent	Design dependent	Can include
Ceva www.ceva-dsp.com	CEVA-Teak (core)	2.5G/3G cellular handset (baseband and application processing), VOIP phone, VOIP gateway, portable audio/video, digital still camera		130 (130 nm)	16/16	16	1.1 to 1.3		Slow mode, stop mode
	Ceva-TeakLite (core)	2G/2.5G wireless communication, disk-drive, portable audio player, speech processing, VOIP phone, hearing aid		170 (130 nm)	16/16	16	1.1 to 1.3		Slow mode, stop mode
	Ceva-TeakLite-II (core)	2G/2.5G cellular handset, portable media player, VOIP phone, hard-disk drive, optical driver, servo control		200 (130 nm)	16/16	16	1.1 to 1.3		Slow mode, stop mode
	Ceva-X1620 (core)	3G cellular handset, smartphone, PDA, VOIP gateway, broadband modem, digital TV, set-top box, HD-DVD		450 (130 nm)	32/64	16, 32	1.1 to 1.3		Slow mode, stop mode
	Ceva-XS1100 (core)	3G cellular handset, VOIP gateway, broadband modem		Half of CEVA-X	32/64	16, 32	1.1 to 1.3		Slow mode, stop mode
	CEVA-XS1200 (core)	3G cellular handset, digital TV, HD-DVD, multimedia application processing, VOIP gateway, broadband modem, set-top box		Half of CEVA-X	32/64	16, 32	1.1 to 1.3		Slow mode, stop mode
	Xpert-Teak (core)	2.5G/3G cellular handset (baseband and application processing), VOIP phone, VOIP gateway, portable audio/video, digital still camera		130 (130 nm)	32/256, 32/64 external	16	1.1 to 1.3		Slow mode, stop mode
ChipWrights www.chipwrights.com	CW4512	Consumer		200	32/32	32	1.5/3.3	450 mW	
	CW4515	Consumer		210	32/32	32	1.5/3.3	700 mW	
	CW5521	Consumer/commercial	Yes	300	32/32	32	1 to 1.2/3.3	950 mW	
Cirrus Logic www.cirruslogic.com	CS493XX	Consumer audio/video receiver, set-top box, digital television		86	24	24	2.5	0.8W	
	CS494xx	Consumer audio/video receiver		86	23/32	24, 32	2.5	1W	
	CS495xx	Consumer audio/video receiver		120	16	32	1.8	0.9W	
	CS4961xx	Professional, commercial, and consumer audio networked applications	CobraNet controller	120	16	32	1.8	0.9W	
Cradle Technologies www.cradle.com	CT3400	Video surveillance		230		20	1.25	3.5W	2W
	CT3600	Video surveillance, imaging, broadcast		230 to 375		20	1 to 1.2	4.8W	1W

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Up to 64-kbyte instruction/data	Single-cycle closely coupled memory, caches		BVCI and AMBA-AHB	User dependent	User dependent		License
Up to 64-kbyte instruction/data	Single-cycle closely coupled memory, caches, MMU		BVCI and AMBA-AHB	User dependent	User dependent		License
	1.9 Mbytes		SPI, USART, timer/counter, ADC/DAC synchronous serial interface, PDC, PIO, watchdog, AIC, EBI, clock generator	352-ball PBGA	0 to +70	Dual core (ARM and 40-bit floating point DSP) supporting native complex arithmetic	26.92
Can add				User dependent	User dependent	Customer configurable	License
							License
							License
							License
32-kbyte instruction	64-kbyte program and data, DMA						License
32-kbyte instruction	2-Mbyte, 16-Mbyte addressable		Power management, timers, interrupt controller, general-purpose I/Os, code-replacement unit, on-chip emulation				License
32-kbyte instruction	2-Mbyte, 16-Mbyte addressable, 3-D 16-channel DMA		Two TDM ports, power management, timers, interrupt controller, general-purpose I/Os, code-replacement unit, on-chip emulation				License
	128-kword program and data		Three-D eight-channel DMA, two TDM ports, HPI, SIO, power management, timers, interrupt controller, general-purpose I/Os, code-replacement unit, on-chip emulation				License
8-kbyte instruction	16/32-bit SDRAM		SDRAM, parallel video, host I/Os, Compactflash, ATA/ATAPI, SPI, Microwire, UART, general-purpose I/Os, JTAG	220-ball BGA	0 to +70		
8-kbyte instruction	16/32-bit SDRAM	Three 10-bit DAC	SDRAM, parallel video, LCD interface, CCD/CMOS sensor input, host I/Os, USB 1.1, IIS Audio codec interface, Compactflash, ATA/ATAPI, PWM, SecureDigital, SPI, Microwire, UART, general-purpose I/Os, JTAG	256-ball BGA	0 to +70		
16-kbyte instruction	32-bit DDR SDRAM	Three 10-bit DACs	DDR SDRAM, parallel video, LCD Interface, CCD/CMOS sensor input, host I/Os, USB 2.0 HS, IIS Audio codec Interface, Compactflash, ATA/ATAPI, SecureDigital, SPI, Microwire, PWM, UART, general-purpose I/Os, JTAG	496-ball BGA	0 to +85		
	84-kbyte RAM, 200-kbyte ROM, parallel, serial		8-bit SRAM, flash	44 PLCC	0 to +70		\$11.48
	172-kbyte RAM, 240-kbyte ROM, parallel, serial		16-bit SDRAM, SRAM, flash	144 LQFP	0 to +70	Intelligent room calibration software, auto-speaker set-up and equalization	13.9
	288-kbyte RAM, 960-kbyte ROM, parallel, serial		SPI, I2C, 16-bit SDRAM, SRAM, flash	144 LQFP	0 to +70, -40 to +85	Intelligent room calibration software, auto-speaker set-up and equalization	\$14.76 to \$20.46
	288-kbyte RAM, 960-kbyte ROM, parallel, serial		SPI, I2C, 16-bit SDRAM, SRAM, flash	144 LQFP	0 to +70, -40 to +85	Networked digital-audio management	\$18 to \$23.26
Two 32-kbyte instruction	140-kbyte, 64-bit SDRAM		128-bit Programmable I/Os SDRAM	FG456	0 to +90	Four RISC processors	\$41
Two 32-kbyte instruction	Up to 340-kbyte, 64-bit DDR SDRAM		144-bit programmable I/Os, PCI 32-bit 66 MHZ	FG676	0 to 90	Four to eight RISC processors	\$40 to \$90

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DSP Architectures www.dsparchitectures.com	DSP24 (device and core)	Communication, navigation, imaging		65	20/48	16	3.3	4W	
	MILDSP24 (device and core)	Communication, navigation, radar		75	20/48	16	3.3	3W	
	MILtMMU24 (device and core)	Communication, navigation, radar		75	20/48	16	3.3	Less than 1W	
	MMU24 (device and core)	Communication, navigation, imaging		65	20/48	16	3.3	Less than 1W	
	RHDSP24 (device and core)	Space and avionics		75	20/48	16	3.3	3W	
	RHtMMU24 (device and core)	Space and avionics		75	20/48	16	3.3	Less than 1W	
Equator Technologies www.equator.com	BSP-15	Set-top box, digital home consumer electronics, video conferencing, security, surveillance, imaging	Video scaler, DES engine, variable length encoder / decoder, DMA engine	300, 350, 400	32	Variable	1.2/1.27/1.35	3W	Variable clock speed
	BSP-16	Set-top box, digital home consumer electronics, video conferencing, security, surveillance, imaging	Video scaler, DES engine, variable length encoder / decoder, DMA engine	350, 400, 500	32	Variable	1/1.2	1.7W	Variable clock speed
Freescale Semiconductor www.freescale.com	56F8100	Industrial and consumer		40	32		2.5		
	56F8300	Motor control		60			2.5		
	DSP563xx	Wireless and wireline infrastructure, packet telephony, communication, audio, medical, industrial control	Enhanced filter coprocessor	80, 100, 150, 220, 240, 275	24	24	1.6, 1.8, 3.3/3.3		
	MSC71xx	Low-density VOIP/SOHO/ROBO, IAD, security, instrumentation, control, automation, general purpose		200, 300	14/8, 16, 32	16	1.2/2.5 to 3.3		
	MSC8103	Wireless and wireline infrastructure, packet telephony, communication equipment			32/64	16	1.6/3.3		
	MSC8122	Packet telephony media gateway, multi-channel modem, 3G wireless transcoding, video transcoding, image processing, military	Four DSP cores	300, 400, 500	32/64	16	1.1, 1.2/3.3		
	MSC8126	3G wireless basestations, video security, wireless and video transcoding, image processing, military, packet telephony	Turbo and Viterbi, Four DSP cores	400 and 500	32/64	16	1.1, 1.2/3.3		
	XC56309	Wireless and wireline infrastructure, packet telephony, communication equipment, professional audio, test and measurement, medical, industrial control		100	24	24	3.3/3.3		
	XC56L307	Wireless and wireline infrastructure, packet telephony, communication equipment, professional audio, test and measurement, medical, industrial control	EFCOP	160	24	24	1.8/3.3		
	Hyperstone www.hyperstone.com	E1-16XSR (device and core)	Signal processing		125	22/16	16, 32, 48	1.8/3.3	40 mA
E1-32XSR (device and core)		Signal processing		125	26/32	16, 32, 48	1.8/3.3	40 mA	Power-down sleep
HyNet32S		Networking, industrial control, real-time Ethernet	DCT	220	32/32	16, 32, 48	1.8/3.3		Power-down Sleep

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	Optional MMU		SRAM, SSRAM	432 (plastic) SBGA	0 to 70	Cascadable to scale performance	\$1,500
	Optional MMU		SRAM, SSRAM	472 (ceramic) DBGA	-55 to +125	Cascadable to scale performance	30
	Compatible with DSP26		SSRAM	255 (ceramic) CGA	-55 to +125	Three MMU24 cores in single package	\$39,000
	Compatible with DSP24		SSRAM	80 TQFP, 68 PLCC	0 to 70		300
	Optional MMU		SRAM, SSRAM	472 (ceramic) DBGA	-55 to +125	Cascadable to scale performance	\$9,900
	Compatible with DSP25		SSRAM	255 (ceramic) CGA	-55 to +125	Three MMU24 cores in single package	5000
32-kbyte instruction/data	Glueless to SDRAM	Analog RGB output	PCI, IIC, flash ROM controller, S/PDIF, IIS, BT.656, digital RGB output	352 BGA	0 to 85	Programmable display refresh controller, fully programmable 64-channel DMA controller	\$30 to \$80
32-kbyte instruction/data	Glueless to DDR-SDRAM		IDE, PCI, 802.3, IIC, UART, NAND flash controller, IIS, S/PDIF, BT.656, BT.1120, SPI, GPD, general purpose I/Os, digital RGB output	484 PGBA	0 to 85	Programmable display refresh controller, fully programmable 64 channel DMA controller	\$20 to \$70
	Four	12-bit ADC	On-chip emulation; on-chip PLL		-40 to +150	Watchdog	\$6.19 to \$16.86
	Four	ADC	On-chip emulation; on-chip PLL		-40 to +150	Watchdog quad decoder	\$7.23 to \$15.87
1-kbyte instruction	24, 384, 576-kbyte configurable, DMA		32-bit PCI, 8-bit host interface, two four channel synchronous serial, serial communication, triple timer module, 34 general-purpose I/Os	196/252/400 MAPBGA, 144/205 TQFP	-40 to +105		\$14.90 to \$39.84
16-kbyte, 16-way instruction	8-kbyte boot ROM, 64-, 192-, 224-kbyte M1, up to 224-kbyte M2		HDI-16 host port, DDR controller, as many as three TDM (128-channel/port), 10/100 Ethernet MAC, UART, I2C, general-purpose I/Os, timers and event port	400-ball MAPBGA	-40 to +105	fieldBIST hardware diagnostics	\$12.65 to \$34.53
	512-kbyte		Communications processor module with: dual 10/100 (MII) Ethernet, 256 DSOs TDM/ HDLC, 155Mb/s ATM, Utopia. 64-bit 60x System bus, External memory controller.	332 FC-PBGA	0 to 90		\$76.46
16-kbyte, 16-way instruction (each core)	1.436-Mbyte unified program and data, 32-channel DMA		16 ALUs, system-integration unit, 32/64-bit direct slave interface, 1024 channel TDM interface, UART, 32 timers, 32 general-purpose I/Os, I2C, Ethernet support for MII, RMII, and SMII	431-ball FCPBGA	0 to 90, -40 to +105		127.74
16-kbyte, 16-way instruction (each core)	1.436-Mbyte unified program and data, 32 channel DMA		16 ALUs, system integration unit, 32/64-bit direct slave interface, 1024 channel TDM interface, UART, 32 timers, 32 general-purpose I/Os, I2C, Ethernet support for MII, RMII, and SMII	431-ball FCPBGA	0 to 90, -40 to +105		\$163
1-kbyte instruction	102-kbyte programmable, DMA		Enhanced filter coprocessor, 8-bit host interface, four-channel enhanced synchronous serial interfaces, serial communication interface, triple timer module, 34 general-purpose I/Os	196-ball MAPBGA, 144 TQFP	-40 to +105		23.75
1-kbyte instruction	192-kbyte configurable, DMA		Enhanced filter coprocessor, 8-bit Host interface, four channel enhanced synchronous serial interfaces, serial communication interface, triple timer module, 34 general-purpose I/Os	196-ball MAPBGA	-40 to +105		\$23.77
128-byte instruction	16-byte SRAM, SDRAM, SRAM, flash		3 general-purpose I/Os, address/data bus	100 LQFP	0 to 85		From \$6.50
128-byte instruction	16-byte SRAM, SDRAM, SRAM, flash		3 general-purpose I/Os, address/data bus	144 TQFP, 144 TFBGA	0 to 85		From \$6.50
Two 2-kbyte instruction/data	16-kbyte RAM, shared SRAM, 64-kbyte SRAM, boot ROM, six channel DMA		10/100 Ethernet MAC, Core YUV, PCI, MPI, I2C, RS232, synchronous interfaces	256 LBGA	0 to 85	IEEE 1588 Clock Sync, realtime clock, watchdog, interrupt controller, reset and clock manager	9

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	HyNet32XS	Networking, industrial control, real-time Ethernet	Galios Factory Co processor	220	32/32	16, 32, 48	1.8/3.3	1.7W	Power-down sleep
LSI Logic www.lsilogic.com	LSI402ZX	Eight- to 16-channel VOIP	Two ALU, two MAC	200	16/32	16	1.8/3.3	750 mW	Idle, sleep, halt (0.22 mW/MHz)
	LSI403KGD	One- to four-channel VOIP	Two ALU, two MAC	120	16/32	16	1.2/3.3	40 mW	Idle, sleep, halt (0.22 mW/MHz)
	LSI403LC	One- to four-channel VOIP	Two ALU, two MAC	120	16/32	16	1.2/3.3	40 mW	Idle, sleep, halt (0.22 mW/MHz)
	LSI403LP	One- to eight-channel VOIP	Two ALU, two MAC	150	16/32	16	1.2/3.3	50 mW	Idle, sleep, halt (0.02 mW/MHz)
	ZSP200 (core)	Servo, voice		225 (130 nm)	16/16	16	Process dependent	0.05 mW/MHz	Yes
	ZSP400 (core)	Voice, audio		225 (130 nm)	16/16	16	Process dependent	0.1 mW/MHz	Yes
	ZSP500 (core)	Voice, wireless	Can add	300 (130 nm)	24/32	16, 32	Process dependent	0.2 mW/MHz	Yes
	ZSP540 (core)	Wireless handset	Can add	300 (130 nm)	24/32	16, 32	Process dependent	0.3 mW/MHz	Yes
	ZSP600 (core)	Wireless infrastructure	Can add	300 (130 nm)	24/32	16, 32	Process dependent	0.35 mW/MHz	Yes
Microchip Technology www.microchip.com	dsPIC30F20xx	Motor control, power conversion, space-constrained sensor		30	24/16	24	2.5 to 5.5	500 mW	Idle Sleep 15 µW
	dsPIC30F30xx	Motor control, power conversion, space-constrained sensor		30	24/16	24	2.5 to 5.5	600 mW	Idle, sleep, 15 µW
	dsPIC30F40xx	Motor control, power conversion, general purpose, speech processing		30	24/16	24	2.5 to 5.5	700 mW	Idle, sleep, 15 µW
	dsPIC30F50xx	General purpose, speech processing		30	24/16	24	2.5 to 5.5	800 mW	Idle, sleep, 15 µW
	dsPIC30F60xx	Motor control, power conversion, general purpose, speech processing		30	24/16	24	2.5 to 5.5	1000 mW	Idle, sleep, 25 µW
Morpho Technologies	MS1 (core)	Mobile and infrastructure	Complex correlator unit	250, 400	256	32	1/3.3	75 to 120 mW	Yes
Philips Semiconductors www.semiconductors.philips.com	Adelante RD16024 (core)	3G, GSM, GPRS/EDGE, digital cordless, answering device, image processing, digital servo	Application-specific extension units, bit-manipulation unit, linear-feedback shift support	200 (90 nm)	20, 21/16	16, 32	1.2	22 mW (90 nm)	Less than 1 µW (90 nm)
	Adelante RD24121 (core)	High-end audio processing requiring a large dynamic range	As many as 15 application-specific extension units	204 (130 nm)	20/48	16, 32	1.2	20.1 mW (130 nm)	Less than 1 µW (130 nm)
	Device PNX5220	Multimedia mobile phone, full software EDGE receiver up to Class 43, single-antenna interference cancellation	Viterbi and Ciphering accelerators	130	20, 21/16	16, 32	1.2/1.8 to 3.3		As many as three levels, variable voltage and clock

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Caching	On-chip memory and controller interfaces	ADC/DAC	Peripherals and off-chip interfaces	Package selection	Temperature ranges (degrees Celsius)	Additional features/information	Price (10,000)
Two 2-kbyte instruction/data	16-kbyte RAM, 32-kbyte shared SRAM, 128-kbyte SRAM, boot ROM, six-channel DMA		Two 10/100 Ethernet MACs, 10/100 Ethernet PHY, USB 1.1 Host, CAN, YUV, MPI, PCM, Utopia Level 2, up to 58 bits general-purpose I/Os, configurable 16 pin serial controller	256 TFBGA	0 to 85	Ethernet Hub, IEEE1588 clock sync, realtime clock, watchdog, JTAG, interrupt controller, reset and clock manager	\$15
	256 kbytes		HPI16/2-SPI	208 mBGA	0 to 115		4
	96 kbytes		HPI8/2-SPI	eWLP	0 to 125		\$4
	96 kbytes		HPI8/SPI	128 PQFP	0 to 125		4
	96 kbytes		HPI8/2-SPI	208 PQFP, 208 LBGA	0 to 125		6
Available	Memory-subsystem supplier	Configurable	Configurable	User dependent	User dependent	1 MMAC/MHz, 2 MIP/MHz	License
Available	Memory-subsystem supplier	Configurable	Configurable	User dependent	User dependent	2 MMAC/MHz, 4 MIP/MHz	License
Available	Memory-subsystem supplier	Configurable	Configurable	User dependent	User dependent	2 MMAC/MHz, 4 MIP/MHz	License
Available	Memory-subsystem supplier	Configurable	Configurable	User dependent	User dependent	4 MMAC/MHz, 4 MIP/MHz	License
Available	Memory-subsystem supplier	Configurable	Configurable	User dependent	User dependent	4 MMAC/MHz, 6 MIP/MHz	License
	12-kbyte flash, 512-byte to 1-kbyte RAM, up to 1-kbyte EEPROM	Six-channel, 10-bit or eight-channel, 12-bit ADC	UART, SPI, I2C, four-input capture, two-output compare, PWM, watchdog, quadrature encoder interface	28 SPDIP/QFN, 18 PDIP, 18/28 SO	-40 to +85, -40 to +125	Dual 40-bit accumulators, brownout detection, software stack, 25-mA I/Os	\$4.18 to \$5.07
	24-kbyte flash, 1 to 2-kbyte RAM, 1-kbyte EEPROM	10- or 12-bit ADC, one or four sample and hold, six to 18 inputs	UART, SPI, I2C, two/four-input capture, two/four-output compare, PWM, watchdog, quadrature encoder interface	28 SPDIP, 18/40 PDIP, 18/28 SO, 44 TQFP/QFN	-40 to +85, -40 to +125	Dual 40-bit accumulators, brownout detection, software stack, 25-mA I/Os	\$4.38 to \$6.24
	48-kbyte flash, 2-kbyte RAM, 1-kbyte EEPROM	10- or 12-bit ADC, one or four sample and hold, six to 13 inputs	UART, SPI, I2C, two/four-input capture, two/four-output compare, PWM, watchdog, quadrature encoder interface	28 SPDIP/SO, 40 PDIP/TQFP/QFN	-40 to +85, -40 to +125	Dual 40-bit accumulators, brownout detection, software stack, 25-mA I/Os	\$6.62 to \$7.46
	66-kbyte flash, 4-kbyte RAM, 1-kbyte EEPROM	12-bit ADC, one sample and hold, 16 inputs	UART, SPI, I2C, eight-input capture, eight-output compare, PWM, watchdog, codec interface	64/80 TQFP	-40 to +85, -40 to +125	Dual 40-bit accumulators, brownout detection, low-voltage detect, software stack, 25-mA I/Os	\$9.23 to \$9.96
	132 or 144-kbyte flash, 6 or 8-kbyte RAM, 2 or 4-kbyte EEPROM	10- or 12-bit ADC, as many as four sample and hold, as many as 16 inputs	UART, SPI, I2C, eight-input capture, eight-output compare, PWM, watchdog, quadrature encoder and codec interface	64/80 TQFP	-40 to +85, -40 to +125	Dual 40-bit accumulators, brownout detection, low-voltage detection, software stack, 25 mA I/Os	\$12.03 to \$14.55
Yes	Yes						
	P, x, and y master for on- and off-chip memories, system-bus slave, DMA channels for peripherals					VLIW, three-stage pipeline with write back buffering, 256 application specific instructions grant full control over the DSP resources	License
Yes	P, x, and y master for on- and off-chip memories, system-bus slave, DMA channels for peripherals					VLIW, eight-stage pipeline, 8192 application specific instructions grant full control over the DSP resources	License
	All memory on-chip	Yes	I2S and IOM2 for audio, proprietary serial interfaces for tracing, sophisticated timing and control signal generator, message passing system between DSPs and between DSP and ARM	336 FBGA	-25 to +85		\$12

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DSP devices and cores

Company	Device/family (core)	Target applications	On-chip accelerators	CPU frequency (MHz)	Bus interface (address/data) (bits)	Instruction width (bits)	Core/I/Os operating voltages (V)	Typical power at maximum frequency	Power-down modes and minimum power
	Nexperia PNX1700 (core)	Connected multimedia, IP set-top box, digital-media adapter, personal video recorder, videophone	Video I/Os processor/scaler and deinterlacer/composition processor, variable-length decoder, DVD descramble	500	32	16, 32	1.2/2.5(DDR)/3.3 (5 tolerant)	Less than 2.5W	Configurable frequency and core voltage
RC Module www.module.ru	1879BM3	Communication, radar, sonar	Programmable amplification of input signals, programmable doppler shift for output signal	150	23/64	128	2.5/3.3	2.8W	Power-down: 300 mW
	Neuro-Matrix NM6403	Video-image processing, GPS, radar, neural-network	1- to 64- bit vector coprocessor	40	32/64	32, 64	3.3/3.3	1.2W	Power-down: 10 mW
	Neuro-Matrix NMC (core)	Video-image processing, GPS, radar, neural-network	1- to 64- bit vector coprocessor	100 (worst case)	32/64	32, 64	1.5 to 2.5	300 mW	
Sensory www.sensoryinc.com	RSC-4128	Speech recognition, speech/music playback/control	digital filter and vector math	14.3	20/8	8	2.4 to 3.6	10 mA	Sleep: 1 uA, idle: 4 uA
	SC-6x Family	Speech/music playback/control		12.32	22/8	17	3 to 5.2	15 mA	Standby: 0.05 uA, sleep: 40 uA
StarCore www.starcore-dsp.com	SC1200 (core)	2.5/2.75G cellular handset, broadband wireless modem, VOIP, media player	Mapped accelerator interface for user acceleration units	Up to 400	32/128, two 32/64 buses	16 to 128 VLES (four issue)	Process and cell library dependent	User dependent	Wait, stop
	SC1400 (core)	2.75/3G cellular handset, broadband wireless modem, multi-channel VOIP, modem pool	Mapped accelerator interface for user acceleration units	Up to 400	32/128, two 32/64 buses	16 to 128 VLES (six issue)	Process and cell library dependent	User dependent	Wait, stop
	SC2200 (core)	2.75/3G cellular handset, video, portable multimedia, VOIP, digital camera	Mapped accelerator interface for user acceleration units	Up to 500	32/128, two 32/64 buses	16 to 128 VLES (four issue)	Process and cell library dependent	User dependent	Wait, stop
	SC2400 (core)	2.75/3G+ cellular handset, portable and home multimedia, multichannel VOIP, smart phone, graphics, convergence product	Mapped accelerator interface for user acceleration units	Up to 500	32/128, two 32/64 buses	16 to 128 VLES (six issue)	Process and cell library dependent	User dependent	Wait, stop
STMicroelectronics www.st.com	ST140 DSP (core)	Cellular and telecom infrastructure	Coprocessor interface	600	32	128	1.2 (130 nm)	108 mW (core)	Down to 1-µW static power
Tensilica www.tensilica.com	Xtensa LX (core)	Consumer, communication	Vectra DSP Engine	350 (130 nm)	32 to 128	16, 24, 32, 64		0.05 mW/MHz (130 nm)	
Texas Instruments www.ti.com	TMS320C62x	Multi-channel, multi-function applications		150 to 300	24/32	32	1.5 to 1.8/3.3	0.8 to 1.3W	Three modes
	TMS320C64x	Wireless/telecom infrastructure, digital video and imaging	Viterbi and Turbo decoder	400 to 1000	32/64, 32/32	32	1.2 to 1.4/3.3	0.4 to 1.7W	Four modes

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Caching	On-chip memory and controller interfaces	ADC/DAC	Peripherals and off-chip interfaces	Package selection	Temperature ranges (degrees Celsius)	Additional features/information	Price (10,000)
64-kbyte instruction, 16/128-kbyte L1/L2 data	Up to 256-Mbyte DDR SDRAM, glueless to DDR main memory		I2C, 10/100 Ethernet MAC, PCI/XIO, JTAG, FPGI, FPGO, IR receiver/transmitter, V2F (Philips Power Management), Video In, Video Out, Audio In (8 Channel I2S in and out), S/PDIF in and Out, SSI	456 BGA	0 to 85	Can decode WMV9 (720p), MPEG-2 HD (1080p) and DivX-HD, simultaneously encode/decode all MPEG-4 formats.	
	32-kbyte 64-bit RAM, 64-bit SRAM, SSRAM, SDRAM, eight DMA channels	Two 6-bit, 600M-sample/sec ADCs, four 8-bit, 300M-sample/sec DACs	24-bit real time counter; eight 18-bit delay counters; eight 12-bit event counters; general purpose IO - 16 inputs and 20 outputs	576 BGA	-40 to +85	Signal accumulation and processing	\$230
	Three 32-kbyte 64-bit RAM blocks, two 64-bit SRAM/ROM/DRAM controllers, two DMA channels		Two 32-bit timers; two I/Os com. ports up to 20 MB/sec. throughput each	256 BGA	-40 to +85	32-bit RISC, 64-bit vector dual-core, VLIW/SIMD architecture	35
	Optional		Optional		-40 to +85	Synthesizable 32/1-64-bit RISC/DSP core at 0.25um CMOS technology	License
	128-kbyte ROM, 4.8-kbyte RAM, interrupts, DMA	16 bit ADC with preamplifier, 10-bit DAC	3 timers, 24 general-purpose I/Os, 4 comparators, audio wakeup, watchdog timer, PWM speaker drive	100 LQFP, waffle-packed	0 to 70	RTC oscillator PLL	7
	ROM, RAM, interrupts	10-bit DAC	2 timers, 32 general-purpose I/Os, 1 comparator	100 LQFP, waffle-packed	0 to 70	variety of ROM sizes	2.5
8/16/32/64-kbyte instruction/data	128-bit SRAM and ROM, 128-bit DMA		Interface to on-chip TAP-controller (JTAG) of the OCE (On Chip Emulation Unit)			System simulator available, scalable, fully synthesizable, supported by popular IDEs	License
			Interface to on-chip test-access-point controller (JTAG) of the OCE (on-chip emulation unit)			System simulator available, scalable, fully synthesizable, supported by popular IDEs	License
8/16/32/64-kbyte instruction/data	AHB Light interface to secondary memory level		Interface to the on-chip test-access-point controller (JTAG) of the OCE (on-chip emulation unit)			System simulator available, scalable, fully synthesizable, supported by popular IDEs	License
			Interface to the on-chip test-access-point controller (JTAG) of the OCE (on-chip emulation unit)			System simulator available, scalable, fully synthesizable, supported by popular IDEs	License
Yes / Configurable for P and D	Configurable		Configurable bus-switches to ARM AMBA bus, comes with ST libraries of peripherals, memories, and interfaces		-40 to +125		
data cache 0-32K, instruction cache 0-32K	Yes					Configurable in many ways	License starts at \$550,000
64 to 384-kbyte instruction, 4 to 512-kbyte data	Four-channel DMA to 16-channel EDMA		EMIF, HPI, PCI, DMA, McBSPs, timers/counters	BGA	0 to 90, -40 to +105		\$8.55 to \$101.97
16-byte instruction/data, 128-kbyte to 1-Mbyte L2 instruction/data	64-channel EDMA		EMIF, HPI, PCI, EMAC, McBSPs, Utopia 2, Viterbi decoder, Turbo decoder, timers/counter, general-purpose I/Os	BGA	0 to 90, -40 to +105	90-nm process node, 100% object code compatibility within platform	\$17.95 to \$218.90

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DSP devices and cores

Company	Device/family (core)	Target applications	On-chip accelerators	CPU frequency (MHz)	Bus interface (address/data) (bits)	Instruction width (bits)	Core/I/Os operating voltages (V)	Typical power at maximum frequency	Power-down modes and minimum power
	TMS320C67x	Home audio, industrial automation, voice and speech recognition, high-end graphics and imaging		120 to 300	24/32	32	1.2 to 1.9/3.3	0.7 to 1.4W	
	TMS320DM64x	set-top box, video surveillance, video telephony, high definition and video infrastructure		400 to 720	32/64, 32/32	32	1.2 to 1.4/3.3	0.4 to 1.7W	Four modes
	TMS320F28xx	Automotive/industrial motor control, automation, electronic power steering, starter alternator, brushless motors/pumps, sensing and measurement, digital power supply		100		16, 32	1.8/3.3		Four modes, each peripheral independently
	TMS320LC24xx	White goods, appliances, drive motors, water pump, HVAC, hand-held tools, power supply, optical networking, AC induction, BLDC, switched reluctance, and stepper motor control		40		16	3.3	280 mW	66 to 165 uW, three modes, each peripheral independently
	TMS320LF24xx	White goods, appliances, drive motors, water pump, HVAC, hand-held tools, power supply, optical networking, AC induction, BLDC, switched reluctance, and stepper motor control		40		16	3.3	300 mW	66 to 165 uW, three modes, each peripheral independently
	TMS320R28xx	Industrial and automotive motor control, automation, electronic power steering, starter alternator, brushless motor/pump, sensing and measurement, digital power supply		150	19/16	16, 32	1.9/3.3	525 mW	153 uW, four modes, each peripheral independently
3DSP www.3dsp.com	SP3 (core)	Digital audio, MPEG4 video, VOIP, multimedia		150	32	32	1.8	150 mW	1 mW
	SP5 (core)	Digital audio, MPEG4 video, VOIP, multimedia		150	32	32	1.8	250 mW	5 mW
	UniPHY (core)	Wireless broadband	Yes	160	32	32	1.8	600 mW	10 mW
Xilinx www.xilinx.com	Spartan-3	Consumer	104 18x18-bit multipliers	185	Configurable	Configurable	1.1 to 3.3/1.14 to 3.45		
	Virtex-4 FX	Wireless, video, imaging	192 18x18+48-bit MACs	500	Configurable	Configurable	1.2/1.5 to 3.3	11.5 mW/DSP slice	
	Virtex-4 LX	Wireless, video, imaging	96 18x18+48-bit MACs	500	Configurable	Configurable	1.2/1.5 to 3.3	11.5 mW/DSP slice	
	Virtex-4 SX	Wireless, video, imaging	512 18x18+48-bit MACs	500	Configurable	Configurable	1.2/1.5 to 3.3	11.5 mW/DSP slice	

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Caching	On-chip memory and controller interfaces	ADC/DAC	Peripherals and off-chip interfaces	Package selection	Temperature ranges (degrees Celsius)	Additional features/information	Price (10,000)
4-kbyte instruction/data, 64 to 256-kbyte L2 instruction/data	Four-channel DMA to 16-channel EDMA		Varies per device: EMIF, HPI, DMA, up to 2 McBSPs, zero to two McASPs, zero to two timers/counters, general-purpose I/Os, IIC	BGA, TQFP	0 to 90, -40 to +105	Compiler and assembly optimizer	\$13.50 to \$104.80
16-kbyte instruction/data, 128 to 256-kbyte L2 instruction/data	64-channel EDMA		Varies per device: EMIF, PCI, HPI, EMAC, DMA, as many as three video ports, zero to two McBSPs, one McASP, general-purpose I/Os, as many as three timers/counters	BGA	0 to 90, -40 to +105		\$19.95 to \$59.99
	6-- to 18-kbyte RAM, 16- to 128-kbyte flash	16-channel, 12-bit DAC	SPI, SCI, CAN, I2C, 16 and 32-bit timers, 16-bit PWM, capture unit, quadrature encoder pulse, watchdog, 32 general-purpose I/Os	100/128/176 LQFP, 100/179 BGA	-40 to +85, -40 to +125	0.18-micron, five-layer aluminum	\$4.95 to \$14.11
	1- to 2.5-kbyte RAM, 8- to 32-kbyte flash	Five- to 16-channel, 10-bit ADC	SCI, 16-bit timers/PWM, capture unit, quadrature encoder pulse, watchdog, 13 to 41 general-purpose I/Os	32 TQFP, 100 TQFP, 64 P/LQFP	-40 to +85, -40 to +125	0.25-micron, four-layer aluminum	\$1.95 to \$7.51
	1- to 2.5-kbyte RAM, 8- to 32-kbyte flash	Five- to 16-channel, 10-bit ADC	SCI, 16-bit timers/PWM, capture unit, quadrature encoder pulse, watchdog, 13 to 41 general-purpose I/Os	32 LQFP, 64 PQFP, 100/144 TQFP	-40 to +85, -40 to +125	0.25-micron, four-layer aluminum	\$2.99 to \$7.96
	20 kbytes	16-channel, 12-bit DAC	SPI, SCI, CAN, McBSP, 16-bit timers/PWM, capture unit, watchdog, 56 general-purpose I/Os	128 LQFP, 179 BGA, 176 LQFP	-40 to +85, -40 to +125	0.18-micron, five-layer aluminum	\$8.22 to \$9.59
Yes	DMA						
Yes	DMA						
Yes	DMA	10-bit, 40-MHz ADC, DAC					
	DDR SDRAM, DDR2 SDRAM	External	Microprocessor (UART, timers), DSP (FFT, FEC), and connectivity (PCI) cores available	VQFP, TQFP, PQFP, FTBGA, FBGA	Commercial, industrial, automotive	Soft 32-bit Microblaze processor	
	DDR SDRAM, DDR2 SDRAM, QDRII SRAM, RLDRAII, FCRAMII	External	Microprocessor (UART, timers), DSP (FFT, FEC), and connectivity (RapidIO, PCI) cores available	SF, FF	Commercial, industrial, military, space	One or two embedded PowerPC405	
	DDR SDRAM, DDR2 SDRAM, QDRII SRAM, RLDRAII, FCRAMII	External	Microprocessor (UART, timers), DSP (FFT, FEC), and connectivity (RapidIO, PCI) cores available	SF, FF	Commercial, industrial, military, space	Soft 32-bit Microblaze processor	
	DDR SDRAM, DDR2 SDRAM, QDRII SRAM, RLDRAII, FCRAMII	External	Microprocessor (UART, timers), DSP (FFT, FEC), and connectivity (RapidIO, PCI) cores available	SF, FF	Commercial, industrial, military, space	Soft 32-bit Microblaze processor	