

SHARC Processor Family



The Leader in Floating-Point Performance

The SHARC® processor portfolio currently consists of four generations of products providing code-compatible solutions ranging from entry-level products priced at less than \$10 to the highest performance products offering fixed- and floating-point computational power to 450 MHz/2700 MFLOPS. Irrespective of the specific product choice, all SHARC processors provide a common set of features and functionality usable across many signal processing markets and applications. This baseline functionality enables the SHARC user to leverage legacy code and design experience while transitioning to higher performance and more highly integrated SHARC products.

By integrating on-chip, single-instruction, multiple-data (SIMD) processing elements, coprocessors for filter processing (FIR, IIR, and FFT), high speed DRAM interface, SRAM, and I/O peripherals, SHARC processors deliver breakthrough signal processing performance.

- High performance 32-bit floating-point/fixed-point core for computationally intensive, real-time signal processing applications
- Coprocessors to offload FIR, IIR, and FFT processing in fixed- and floating-point formats
- Ideal choice for home theater, pro-audio, industrial, automotive, and medical applications
- High performance signal processing coupled with integrated system peripherals
- SIMD architecture with integrated application-specific system peripherals
- Link ports for data transport across SHARC processors
- Low power signal processors for portable and temperature-sensitive applications
- Exceptional core and memory performance with outstanding I/O throughput
- Wide range of code-compatible and pin-compatible products
- Supported by easy to use, world-class CROSSCORE® development tools

SHARC Processor Target Applications

ADSP-21488/ADSP-21489: Highest performance 32-bit floating-point processor in a QFP package positioned for automotive audio and industrial/instrumentation applications.

ADSP-21483/ADSP-21486/ADSP-21487: Highest performance SHARC processor for consumer audio solutions.

ADSP-21478/ADSP-21479: Lowest power 32-bit floating-point SHARC processor positioned for automotive audio, portable medical, and instrumentation applications.

ADSP-21469: Highest performance processor positioned for professional audio and industrial/instrumentation applications.

ADSP-21371/ADSP-21375: Value-priced processors positioned for professional audio, industrial/instrumentation, and medical applications.

ADSP-21368/ADSP-21369: Highest performance processors for professional audio and industrial/instrumentation applications.

ADSP-21363/ADSP-21364: High performance processors for general-purpose and professional audio applications.

ADSP-21266/ADSP-21366/ADSP-21367: Highly integrated processors optimized for consumer audio, home theater, and next-generation DVD applications.

ADSP-21262/ADSP-21261: Low cost, floating-point processor created for consumer audio, wireless communication, medical appliances, and professional audio.

ADSP-21161: Optimized for single processor or small multiprocessor systems such as speech recognition, motor control, industrial, and medical applications.

ADSP-21160: For multiprocessing applications such as medical, military, imaging, and communications.

ADSP-21065L: Outstanding price/performance value for a broad base of consumer, communications, automotive, industrial, and computer applications.

SHARC Processors

Part Number	Package	Speed (MHz)	On-Chip Memory SRAM/ROM (Mb)	Temp Range (°C)	Key Peripherals	Price Range @ 1k (\$U.S.)¹			
ADSP-21489BSWZ-2A²	100-lead LQFP E-pad	300	5/4	–40 to +85 ambient	2 timers, 1 UART, 8 SPORTs, 8-channel ASRC, 2 SPIs, 16-bit SDRAM interface, 1 TWI, 4 PCGs, PWM, S/PDIF Rx/Tx	12.86 to 23.81			
ADSP-21489BSWZ-2B	176-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21489KSWZ-2A²	100-lead LQFP E-pad			0 to 70 ambient					
ADSP-21489KSWZ-2B	176-lead LQFP E-pad			0 to 70 ambient					
ADSP-21489BSWZ-3A²	100-lead LQFP E-pad	350		–40 to +85 ambient			Integrated audio decoders (ADSP-21483/ADSP-21486/ ADSP-21487 only)	10.14 to 18.35	
ADSP-21489BSWZ-3B	176-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21489KSWZ-3A²	100-lead LQFP E-pad			0 to 70 ambient					
ADSP-21489KSWZ-3B	176-lead LQFP E-pad			0 to 70 ambient					
ADSP-21489BSWZ-4A²	100-lead LQFP E-pad	400		–40 to +85 ambient					Contact ADI
ADSP-21489BSWZ-4B	176-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21489KSWZ-4A²	100-lead LQFP E-pad			0 to 70 ambient					
ADSP-21489KSWZ-4B	176-lead LQFP E-pad			0 to 70 ambient					
ADSP-21488BSWZ-2A²	100-lead LQFP E-pad	300	3/4	–40 to +85 ambient	Contact ADI				
ADSP-21488BSWZ-2B	176-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21488KSWZ-2A²	100-lead LQFP E-pad			0 to 70 ambient					
ADSP-21488KSWZ-2B	176-lead LQFP E-pad			0 to 70 ambient					
ADSP-21488BSWZ-3A²	100-lead LQFP E-pad	350		–40 to +85 ambient		Contact ADI			
ADSP-21488BSWZ-3B	176-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21488KSWZ-3A²	100-lead LQFP E-pad			0 to 70 ambient					
ADSP-21488KSWZ-3B	176-lead LQFP E-pad			0 to 70 ambient					
ADSP-21488BSWZ-4A²	100-lead LQFP E-pad	400		–40 to +85 ambient			Contact ADI		
ADSP-21488BSWZ-4B	176-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21488KSWZ-4A²	100-lead LQFP E-pad			0 to 70 ambient					
ADSP-21488KSWZ-4B	176-lead LQFP E-pad			0 to 70 ambient					
ADSP-21487KSWZ-3B³	176-lead LQFP E-pad	350	5/4	0 to 70 ambient	Contact ADI				
ADSP-21487KSWZ-4B³	176-lead LQFP E-pad	400		0 to 70 ambient					
ADSP-21486KSWZ-3A³	100-lead LQFP E-pad	350	5/4	0 to 70 ambient	Contact ADI				
ADSP-21486KSWZ-3B³	176-lead LQFP E-pad			0 to 70 ambient					
ADSP-21486KSWZ-4A³	100-lead LQFP E-pad	400	3/4	0 to 70 ambient	Contact ADI				
ADSP-21486KSWZ-4B³	176-lead LQFP E-pad			0 to 70 ambient					
ADSP-21483KSWZ-3B³	176-lead LQFP E-pad	350	3/4	0 to 70 ambient	Contact ADI				
ADSP-21483KSWZ-4B³	176-lead LQFP E-pad	400		0 to 70 ambient					
ADSP-21479BBCZ-1	196-ball CSP_BGA	200	5/4	–40 to +85 ambient	2 timers, 1 UART, 8 SPORTs, 8-channel ASRC, 2 SPIs, 16-bit SDRAM interface, 1 TWI, 4 PCGs, PWM, S/PDIF Rx/Tx, WDT	8.81 to 12.77			
ADSP-21479BSWZ-1²	100-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21479KBCZ-1	196-ball CSP_BGA			0 to 70 ambient					
ADSP-21479KSWZ-1²	100-lead LQFP E-pad			0 to 70 ambient					
ADSP-21479BBCZ-2	196-ball CSP_BGA	266		–40 to +85 ambient					
ADSP-21479BSWZ-2²	100-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21479KBCZ-2	196-ball CSP_BGA			0 to 70 ambient					
ADSP-21479KSWZ-2²	100-lead LQFP E-pad			0 to 70 ambient					
ADSP-21478BBCZ-1	196-ball CSP_BGA	200	3/4	–40 to +85 ambient	RTC (196-ball CSP_BGA only)	7.99 to 11.10			
ADSP-21478BSWZ-1²	100-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21478KBCZ-1	196-ball CSP_BGA			0 to 70 ambient					
ADSP-21478KSWZ-1²	100-lead LQFP E-pad			0 to 70 ambient					
ADSP-21478BBCZ-2	196-ball CSP_BGA	266		–40 to +85 ambient					
ADSP-21478BSWZ-2²	100-lead LQFP E-pad			–40 to +85 ambient					
ADSP-21478KBCZ-2	196-ball CSP_BGA			0 to 70 ambient					
ADSP-21478KSWZ-2²	100-lead LQFP E-pad			0 to 70 ambient					

¹All pricing is budgetary and subject to change.

²Available in automotive grade.

³License agreement required from respective IP holders prior to purchase for all products containing integrated audio decoders or DTCP acceleration hardware.

SHARC Processors (continued)

Part Number	Package	Speed (MHz)	On-Chip Memory SRAM/ROM (Mb)	Temp Range (°C)	Key Peripherals	Price Range @ 1k (\$U.S.)¹								
ADSP-21469BBCZ-3²	324-ball PBGA	400	5/4	–40 to +85 ambient	2 timers, 1 UART, 8 SPORTs, 8-channel ASRC, 2 SPIs, 16-bit DDR2 interface, 1 TWI, 4 PCGs, PWM, S/PDIF Rx/Tx, DAI, DPI, link ports	28.50 to 34.20								
ADSP-21469KBCZ-3²				0 to 70 ambient										
ADSP-21469KBCZ-4²		450												
ADSP-21375BSWZ-2B	208-lead LQFP E-pad	266	0.5/2	–40 to +85 ambient	2 timers, 1 UART, 4 SPORTs, 2 SPIs, 1 TWI, 4 PCGs, PWM, DAI, 16-bit SDRAM interface	9.83 to 11.79								
ADSP-21375KSWZ-2B				0 to 70 ambient										
ADSP-21371BSWZ-2B	208-lead LQFP E-pad	266	1/4	–40 to +85 ambient	2 timers, 1 UART, 8 SPORTs, 2 SPIs, 1 TWI, S/PDIF Rx/Tx, 4 PCGs, PWM, DAI, 32-bit SDRAM interface	13.27 to 15.92								
ADSP-21371KSWZ-2A³				0 to 70 ambient										
ADSP-21371KSWZ-2B														
ADSP-21369BSWZ-1A	208-lead LQFP E-pad	266	2/6	–40 to +85 ambient	3 timers, 2 UARTs, 8 SPORTs, 2 SPIs, 1 TWI, S/PDIF Rx/Tx, 4 PCGs, PWM, 8-channel ASRC, 32-bit SDRAM interface Shared external memory support (ADSP-21368 only) Integrated audio decoders in ROM (ADSP-21367 only)³	19.69 to 37.91								
ADSP-21369KSWZ-1A	208-lead MQFP			0 to 70 ambient										
ADSP-21369BBP-2A	256-ball SBGA	333		–40 to +85 ambient										
ADSP-21369BBPZ-2A														
ADSP-21369BSWZ-2A	208-lead LQFP E-pad			0 to 70 ambient										
ADSP-21369KBP-2A	256-ball SBGA													
ADSP-21369KBPZ-2A														
ADSP-21369KSWZ-2A	208-lead LQFP E-pad													
ADSP-21369KSWZ-4A	350													
ADSP-21369KSWZ-5A	366													
ADSP-21369KBPZ-3A	256-ball SBGA	400		–40 to +85 ambient		31.04 to 47.81								
ADSP-21368BBP-2A	256-ball SBGA	333												
ADSP-21368BBPZ-2A		0 to 70 ambient												
ADSP-21368KBP-2A														
ADSP-21368KBPZ-2A														
ADSP-21368KBPZ-3A							400							
ADSP-21367BSWZ-1A	208-lead LQFP E-pad	266		–40 to +85 ambient		Contact ADI								
ADSP-21367KSWZ-1A	208-lead MQFP			0 to 70 ambient										
ADSP-21367BBP-2A	256-ball SBGA	333		–40 to +85 ambient										
ADSP-21367BBPZ-2A														
ADSP-21367KBP-2A				0 to 70 ambient										
ADSP-21367KBPZ-2A														
ADSP-21367KSWZ-2A														
ADSP-21367KSWZ-4A	208-lead LQFP E-pad	350												
ADSP-21367KSWZ-5A		366												
ADSP-21367KBPZ-3A	256-ball SBGA	400												
ADSP-21366YSWZ-2AA²	144-lead LQFP E-pad	200	3/4	–40 to +105 ambient	3 timers, 6 SPORTs, DAI, 2 SPIs, 2 PCGs, PWM, 8-channel ASRC, S/PDIF Rx/Tx Integrated audio decoders in ROM (ADSP-21366 only)³	Contact ADI								
ADSP-21366BBC-1AA	136-ball CSP_BGA	333		–40 to +85 ambient										
ADSP-21366BBCZ-1AA²														
ADSP-21366BSWZ-1AA²	144-lead LQFP			0 to 70 ambient										
ADSP-21366KSWZ-1AA	144-lead LQFP E-pad													
ADSP-21366KBC-1AA	136-ball CSP_BGA													
ADSP-21366KBCZ-1AA														
ADSP-21364YSWZ-2AA²	144-lead LQFP E-pad	200		–40 to +105 ambient	3 timers, 6 SPORTs, 2 SPIs, S/PDIF Rx/Tx (not on ADSP-21363), 8-channel ASRC (not on ADSP-21363), 2 PCGs, PWM, DAI	29.75 to 42.85								
ADSP-21364BBC-1AA	136-ball CSP_BGA	333		–40 to +85 ambient										
ADSP-21364BBCZ-1AA²														
ADSP-21364BSWZ-1AA²	144-lead LQFP E-pad			0 to 70 ambient										
ADSP-21364KBC-1AA	136-ball CSP_BGA													
ADSP-21364KBCZ-1AA														
ADSP-21364KSWZ-1AA	144-lead LQFP E-pad													

¹All pricing is budgetary and subject to change.

²Available in automotive grade.

³License agreement required from respective IP holders prior to purchase for all products containing integrated audio decoders or DTCP acceleration hardware.

SHARC Processors (continued)

Part Number	Package	Speed (MHz)	On-Chip Memory SRAM/ROM (Mb)	Temp Range (°C)	Key Peripherals	Price Range @ 1k (\$U.S.) ¹	
ADSP-21363YSWZ-2AA ²	144-lead LQFP E-pad	200	3/4	−40 to +105 ambient	3 timers, 6 SPORTs, 2 SPIs, S/PDIF Rx/Tx (not on ADSP-21363), 8-channel ASRC (not on ADSP-21363), 2 PCGs, PWM, DAI	20.22 to 29.13	
ADSP-21363BBC-1AA	136-ball CSP_BGA	333		−40 to +85 ambient			
ADSP-21363BBCZ-1AA ²							
ADSP-21363BSWZ-1AA ²	144-lead LQFP E-pad						
ADSP-21363KBC-1AA	136-ball CSP_BGA			0 to 70 ambient			
ADSP-21363KBCZ-1AA							
ADSP-21363KSWZ-1AA	144-lead LQFP E-pad						
ADSP-21266SKSTZ-1B	144-lead LQFP		150	2/4	0 to 70 ambient	3 timers, 6 SPORTs, 1 SPI, integrated audio decoders in ROM (ADSP-21266 only), ³ 2 PCGs, DAI	Contact ADI
ADSP-21266SKSTZ-1C							
ADSP-21266SKSTZ-1D							
ADSP-21266SKBCZ-2B	136-ball CSP_BGA	200					
ADSP-21266SKBCZ-2C							
ADSP-21266SKBCZ-2D							
ADSP-21266SKSTZ-2B	144-lead LQFP						
ADSP-21266SKSTZ-2C							
ADSP-21266SKSTZ-2D							
ADSP-21262SBBC-150	136-ball CSP_BGA		150		−40 to +85 ambient	3 timers, 6 SPORTs, 1 SPI, 2 PCGs, DAI	17.15 to 25.35
ADSP-21262SBBCZ150 ²			200		0 to 70 ambient		
ADSP-21262SKBC-200							
ADSP-21262SKBCZ200							
ADSP-21262SKSTZ200	144-lead LQFP						
ADSP-21261SKBC-150	136-ball CSP_BGA	150	1/3	0 to 70 ambient	3 timers, 4 SPORTs, 1 SPI, 2 PCGs, DAI, 4 SPORTs, 2 link ports, 1 SPI, DMA controller	6.64 to 7.68	
ADSP-21261SKBCZ150							
ADSP-21261SKSTZ150	144-lead LQFP						
ADSP-21161NCCA-100	225-ball CSP_BGA	100	1/—	−40 to +85 ambient		26.17 to 36.27	
ADSP-21161NCCAZ100							
ADSP-21161NKCA-100							
ADSP-21161NKCAZ100							
ADSP-21160MKB-80	225-ball CSP_BGA	80	4/—	0 to 85 case	2 SPORTs, 4 link ports, DMA controller	169.49 to 209.25	
ADSP-21160MKBZ-80							
ADSP-21160NCB-100		100		−40 to +100 case			
ADSP-21160NCBZ-100							
ADSP-21160NKB-100							0 to 85 case
ADSP-21160NKBZ-100							
ADSP-21065LCCA-240	196-ball CSP_BGA	60	0.5/—	−40 to +100 case	2 SPORTs, DMA controller, 2 timers	22.85 to 69.96	
ADSP-21065LCCAZ240	208-lead MQFP						
ADSP-21065LCSZ-240							
ADSP-21065LKCA-240				196-ball CSP_BGA			
ADSP-21065LKCAZ240							
ADSP-21065LKSZ-240	208-lead MQFP						
ADSP-21065LKCA-264				196-ball CSP_BGA			
ADSP-21065LKCAZ264							
ADSP-21065LKSZ-264	208-lead MQFP						

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Development Tools

Analog Devices CROSSCORE development tools offer easy and robust methods for engineers to develop and optimize systems by shortening product development cycles, reducing time to market.

VisualDSP++ Integrated Development Environment

VisualDSP++[®] software is an easy to install, easy to use, integrated development and debugging environment (IDDE). For more information and to download a free 90-day test drive, visit www.analog.com/testdrive.

EZ-KIT Lite Evaluation Kit

EZ-KIT Lite[®] systems consist of a standalone evaluation board and VisualDSP++ evaluation suite to facilitate architecture evaluations via a PC-hosted tool set. Users can evaluate ADI's processors and learn about digital signal processing applications, as well as simulate, debug, and prototype applications.

EZ-Extender Daughter Boards

EZ-Extender[®] daughter boards give developers access to and the ability to connect to various peripherals from Analog Devices and third parties via the expansion interface of the EZ-KIT Lite evaluation kits.

EZ-Board Evaluation Board

The EZ-Board[™] evaluation board provides developers with a low cost platform for initial evaluation of the processors via an external emulator or μ Clinux[™]. The EZ-Board evaluation board has an expansion interface that allows for modularity with different EZ-Extender boards.

Standalone Debug Agent Board

The Standalone Debug Agent is intended to provide a modular low cost emulation solution for EZ-Board evaluation boards, as well as those designed by third parties. The Standalone Debug Agent is very similar to the Debug Agent that is on existing EZ-KIT Lite evaluation kits but will have the flexibility to move from one board to another board.

Universal Serial Bus-Based Emulators

Analog Devices' cost-effective USB-based emulator and high performance (HP) USB-based emulators provide an easy, portable, nonintrusive, target-based debugging solution for Analog Devices JTAG processors and DSPs. These powerful USB-based emulators perform a wide range of emulation functions, including single-step and full speed execution with predefined breakpoints and viewing and/or altering of register and memory contents.

Software Modules

Analog Devices has a wide range of tested and optimized software modules available, including decoders, encoders, codecs, and other algorithms that provide multimedia functions for the Blackfin[®] and SHARC processor families. The software modules allow engineers to quickly and easily incorporate these functions, providing a faster development path to the end product. In addition, the highly optimized software modules feature a consistent API and framework to ensure rapid development of multiple functions.

SHARC Processor Development Tools

Processor	Hardware	Emulator	Software	Additional Software Available
ADSP-21261 ADSP-21262 ADSP-21266	ADZS-21262-EZLITE <i>Key Features</i> • ADSP-21262 SHARC processor • 1M × 8-bit flash memory • 512k × 8-bit SRAM • 512k bit SPI flash memory • AD1835 stereo, 96 kHz, 24-bit S-D codec • 4 × 2 RCA jack for 4 channels of stereo audio output • 1 × 2 RCA jack for 1 channel of stereo audio input • Headphone jack (connected to 1 of the stereo outputs) • 2M bit SPI flash memory • USB-based debugger interface ADDS-21262-1-EZEXT ADSZ-SHRCUSB-EZEXT			
ADSP-21363 ADSP-21364 ADSP-21366	ADZS-21364-EZLITE <i>Key Features</i> • ADSP-21364 SHARC processor • 1M × 8-bit flash memory • 512k × 8-bit SRAM • 2M bit SPI flash memory • AD1835 stereo, 96 kHz, 24-bit codec • USB-based debugger interface ADSZ-SHRCUSB-EZEXT			
ADSP-21367 ADSP-21368 ADSP-21369	ADZS-21369-EZLITE <i>Key Features</i> • ADSP-21369 SHARC processor • AD1835 stereo, 96 kHz, 24-bit codec • 1M × 8-bit flash memory • 1M × 32-bit × 4 banks SDRAM • 512k × 8-bit SRAM • 2M bit SPI flash memory • ADM3202 RS-232 driver/receiver • USB-based debugger interface ADSZ-SHRCUSB-EZEXT			MathWorks™
ADSP-21371 ADSP-21375	ADZS-21371-EZLITE <i>Key Features</i> • ADSP-21371 SHARC processor • 1M × 8-bit flash memory • 128 MB (1M × 32-bit × 4 banks) SDRAM • 2 MB SPI flash memory • AD1835 stereo, 96 kHz, 24-bit codec • USB-based debugger interface ADZS-21375-EZLITE <i>Key Features</i> • ADSP-21375 SHARC processor • 1M × 8-bit flash memory • 8M × 16-bit SDRAM • 2M bit SPI flash memory • AD1835 stereo, 96 kHz, 24-bit codec • USB-based debugger interface ADZS-SHRCUSB-EZEXT	ADZS-USB-ICE ADZS-HPUSB-ICE	VDSP-SHARC-PC-TEST VDSP-SHARC-PC-FULL VDSP-SHARC-PCFLOAT VDSP-SHARC-PCFLT-5	
ADSP-21469	ADZS-21469-EZBRD <i>Key Features</i> • ADSP-21469: 324-pin PBGA package, 25 MHz CLKIN oscillator • Flash memory: 4M × 8-bit, Numonyx M29W320EB • DDR2 memory: 64M × 16-bit, Micron MT47H64M16HR-3 • SPI flash: 16 Mb • Audio codec: AD1939 codec • S/PDIF: RCA phono jacks connected to DAI pin for input/output • Temperature sensor: ADM1032 2-wire sensor • UART: ADM3202 RS-232 line driver/receiver 5 V • Power supply: 5 V @ 3.6 A • LEDs: 11 LEDs: 1 power (green), 1 board reset (red), 8 general-purpose (amber), 1 temperature limit (amber) • Push buttons: 5 push buttons: 1 reset, 2 connected to DAI, 2 IRQ/flag • Expansion interface: EBIU, flags/IQs, DAI, DPI, PWR_IN (5 V), 3.3 V, GND ADZS-21469-EZLITE ADZS-DBAGENT-BRD ADZS-SHAUDIO-EZEXT ADZS-BFUSB-EZEXT			

SHARC Processor Development Tools

Processor	Hardware	Emulator	Software	Additional Software Available
ADSP-21478 ADSP-21479	ADZS-21479-EZBRD <i>Key Features</i> • ADSP-21479: 196-pin CSP_BGA package, 16.625 MHz CLKIN oscillator • Flash memory: 4M × 8-bit, Numonyx M29W320EB • SDRAM memory: 16 Mb × 16-bit, Micron MT48LC16M16A2P • Asynch SRAM: 1M × 16-bit, ISSI IS61WV102416BLL-10TLI • SPI memory: 16 Mb • Analog audio: AD1939 codec • S/PDIF: RCA phone jacks • UART: ADM3202 RS-232 line driver/receiver • Power supply: 5 V @ 3.6 A • LEDs: 10 LEDs: 1 power (green), 1 board reset (red), and 8 general-purpose (amber) • Push buttons: 5 push buttons: 1 reset, 2 connected to DAI, 2 IRQ/flag • SHARC expansion interface II: AMI, flags/IRQs, DAI, DPI, PWR_IN, 3.3 V, GND ADZS-BFSHUSB-EZEXT ADZS-21479-EZLITE ADZS-DBAGENT-BRD			
ADSP-21483 ADSP-21486 ADSP-21487 ADSP-21488 ADSP-21489	ADZS-21489-EZBRD <i>Key Features</i> • ADSP-21489: 176-pin LQFP package, 25 MHz CLKIN oscillator • Flash memory: 4M × 8-bit, Numonyx M29W320EB • SDRAM memory: 16 Mb × 16-bit, Micron MT48LC16M16A2P-6A • Asynch SRAM: 1M × 16-bit, ISSI IS61WV102416BLL-10TLI • SPI memory: 16 MB • Analog audio: AD1939 codec • S/PDIF: RCA phone jacks • Temperature sensor: ADM1032 2-wire sensor • UART: ADM3202 RS-232 line driver/receiver • Power supply: 5 V @ 3.6 A • LEDs: 11 LEDs: 1 power (green), 1 board reset (red), 1 temperature limit (amber), and 8 general-purpose (amber) • Push buttons: 5 push buttons: 1 reset, 2 connected to DAI, 2 IRQ/flag • SHARC expansion interface II: AMI, flags/IRQs, DAI, DPI, PWR_IN, 3.3 V, GND ADZS-BFSHUSB-EZEXT ADZS-21489-EZLITE ADZS-DBAGENT-BRD	ADZS-USB-ICE ADZS-HPUSB-ICE	VDSP-SHARC-PC-TEST VDSP-SHARC-PC-FULL VDSP-SHARC-PCFLOAT VDSP-SHARC-PCFLT-5	

SHARC Processor Product Portfolio

	Higher Performance →									
	 ADSP-21261 ADSP-21262	 ADSP-21266	 ADSP-21362 ¹ ADSP-21363 ^{1,2} ADSP-21364 ^{1,2}	 ADSP-21371 ¹ ADSP-21375 ¹	 ADSP-21368 ADSP-21369 ¹	 ADSP-21365 ¹ ADSP-21366 ^{1,2} ADSP-21367	 ADSP-21478 ¹ ADSP-21479 ¹	 ADSP-21483 ADSP-21486 ADSP-21487 ADSP-21488 ¹ ADSP-21489 ¹	 ADSP-21469 ¹	 Future ¹
Performance > 2 GFLOPS					•	•		•	•	•
Application-Specific Peripherals			•	•	•	•	•	•	•	•
Configurable Applications I/O interface			•	•	•	•	•	•	•	
Low Cost	•			•			•	•		
Audio Decoders in ROM		•				•				
Hardware Accelerators			•		•	•	•	•	•	•
High Speed Interprocessor Communication (Link Ports)									•	
Low Power							•			

¹Automotive grade available.

²ADSP-21363, ADSP-21364, and ADSP-21366 do not have hardware accelerators.

Third-Party Developers

Many third parties provide software, hardware, and consulting services to support SHARC processors. For more information, visit www.analog.com/processors/collaborative.

Hardware

- Companion chip/chipsets
- Development boards
- Development systems
- Emulators
- Evaluation/starter boards
- Reference designs
- COTS DSP boards
- Daughter boards

Software

- Audio (MP3, AAC/AAC+, WMA9, Dolby®, DTS®, etc.)
- Algorithms
- Code generation
- Tool suites
- Filter programs
- Graphical software programs
- Post analysis tools
- System integration
- System prototyping/simulation

Complimentary Support Resources

EngineerZone Online Support Community

EZ.analog.com

SHARC Visual Learning and Development

www.analog.com/vld

Analog Devices Sales and Distributors

www.analog.com/salesdir

Worldwide Processor and Development Tools Technical Support

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Companion Power Selection Guide for SHARC Processors

ADI power management products provide optimized power for SHARC products—whether it's a single processor or multiple processors, in handheld or high power applications, ADI has a solution to meet your needs.

How to Use This Guide

Determine the peak current requirement for each rail of your processor by referring to the relevant data sheets and engineer-to-engineer notes. Then, use this companion guide to select a power solution that offers the required V_{OUT} for that rail. The ADIsimPower™ design tool offers a complete set of features to create a complete BOM for all of these solutions. Visit www.analog.com/ADIsimPower.

Part Number	Input Voltage Range (V)	Output Voltage Range (V)	Maximum Output Current (A)	LDO Regulators*										Switching Regulators and Controllers*																		
				ADP1720	ADP220	ADP170	ADP123	ADP125	ADP1752	ADP1753	ADP1708	ADP1754	ADP1755	ADP1740	ADP1741	ADP2102	ADP2140	ADP2108	ADP5020	ADP5022	ADP2120	ADP2300	ADP2301	ADP2106	ADP2119	ADP2302	ADP2303	ADP2118	ADP2114	ADP2116	ADP1871	ADP1877
50 mA	4.0 to 28	1.23 to 5.0	Dual 200 mA																													
	2.5 to 5.5	0.8 to 2.8																														
300 mA	1.6 to 3.6	0.8 to 3.0	300 mA																													
	2.3 to 5.5	0.8 to 5.0																														
500 mA	2.3 to 5.5	0.8 to 5.0	800 mA																													
	1.6 to 3.6	0.75 to 3.0																														
1.0	2.5 to 5.5	0.8 to 5.0	1.2																													
	1.6 to 3.6	0.75 to 3.0																														
2.0	1.6 to 3.6	0.75 to 3.0	600 mA																													
	2.7 to 5.5	0.8 to 1.87																														
Buck and LDO 600 mA, 300 mA	2.3 to 5.5	0.8 to 3.3	600 mA																													
	2.3 to 5.5	1.0 to 3.3																														
Dual buck and LDO 0.6 + 0.25, 0.15	2.4 to 5.5	1.1 to 3.3 See data sheet	Dual buck and LDO 0.6 + 0.6, 0.15																													
	2.4 to 5.5	1.2 to 3.3 See data sheet																														
1.2	2.3 to 5.5	0.6 to 5.0	1.2																													
	3.0 to 20	0.8 to 12																														
1.5	2.7 to 5.5	0.8 to 5.0	2.0																													
	2.3 to 5.5	0.6 to 5.0																														
2.0	2.3 to 5.5	0.6 to 5.0	2.0, 3.0																													
	3.0 to 20	0.8 to 12																														
3.0	2.3 to 5.5	0.6 to 5.0	Dual buck 4.0 or 2.0 + 2.0																													
	2.7 to 5.5	0.8 to 3.3																														
Dual buck 6.0 or 3.0 + 3.0	2.75 to 5.5	0.8 to 5.0	Controller 25																													
	2.95 to 20	0.6 to 12																														
Dual controller 25 + 25	2.75 to 14.5	0.6 to 5.0	Dual controller 25 + 25																													

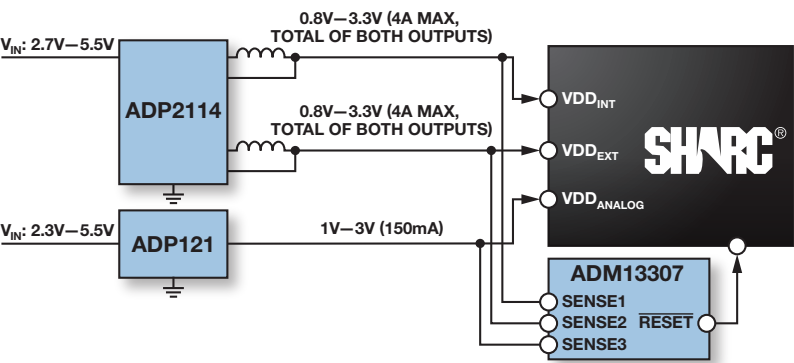
SHARC Processors		Speed (MHz)	Min Voltage (V)	Max Voltage (V)	Typical IDD _{INT} (mA)	Max IDD _{INT} (mA)																									
VDD _{INT} Domain	ADSP-21261/ADSP-21262/ADSP-21266	150	1.14	1.26	<500	1260																									
		200	1.14	1.26	500	1260																									
	ADSP-21362/ADSP-21363/ADSP-21364/ADSP-21365/ADSP-21366	200	0.95	1.05	<800	1150																									
		333	1.14	1.26	<800	1150																									
	ADSP-21367/ADSP-21368/ADSP-21369	266	1.14	1.26	700	1600																									
		333	1.14	1.35	900	3025																									
		350	1.14	1.365	1050	1900																									
		400	1.14	1.35	1100	3100																									
	ADSP-21371/ADSP-21375	266	1.14	1.26	600	1200																									
	ADSP-21469	400	1.00	1.10	850	1300																									
		450	1.05	1.15	900	1500																									
	ADSP-2148x**	300	1.05	1.15	750	1350																									
		350	1.05	1.15	800	1400																									
		400	1.05	1.15	850	1500																									
Other Domains†		Nominal Voltages (V)			Max Current (mA)																										
	VDD _{EXT}	3.3			—																										
	VDD_PLL/ANALOG	1.2			10			•		•	•	•	•	•	•																

*The regulators checked correspond to the exact operating frequency of the DSP indicated in the table. In other words, if an ADSP-21469 is run at a frequency of 300 MHz, it is possible that other regulators in addition to the ones checked may also be used since the current consumption will be different. In such cases, customers are encouraged to perform a power analysis before selecting a regulator.

** Note that these are preliminary numbers and subject to change.

† Refer to the relevant data sheet and engineer-to-engineer note to determine the exact "other domain" requirements of each individual processor.

Example* Power Solution for SHARC Processors



* Numerous variables affect the power requirements of an embedded system. Ambient temperature, core and system frequency, supply voltages, pin capacitances, power modes, application code, and peripheral utilization all contribute to the average power requirements; therefore, this is just one suggested solution.

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