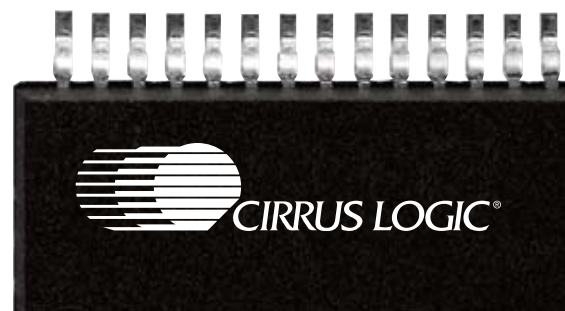


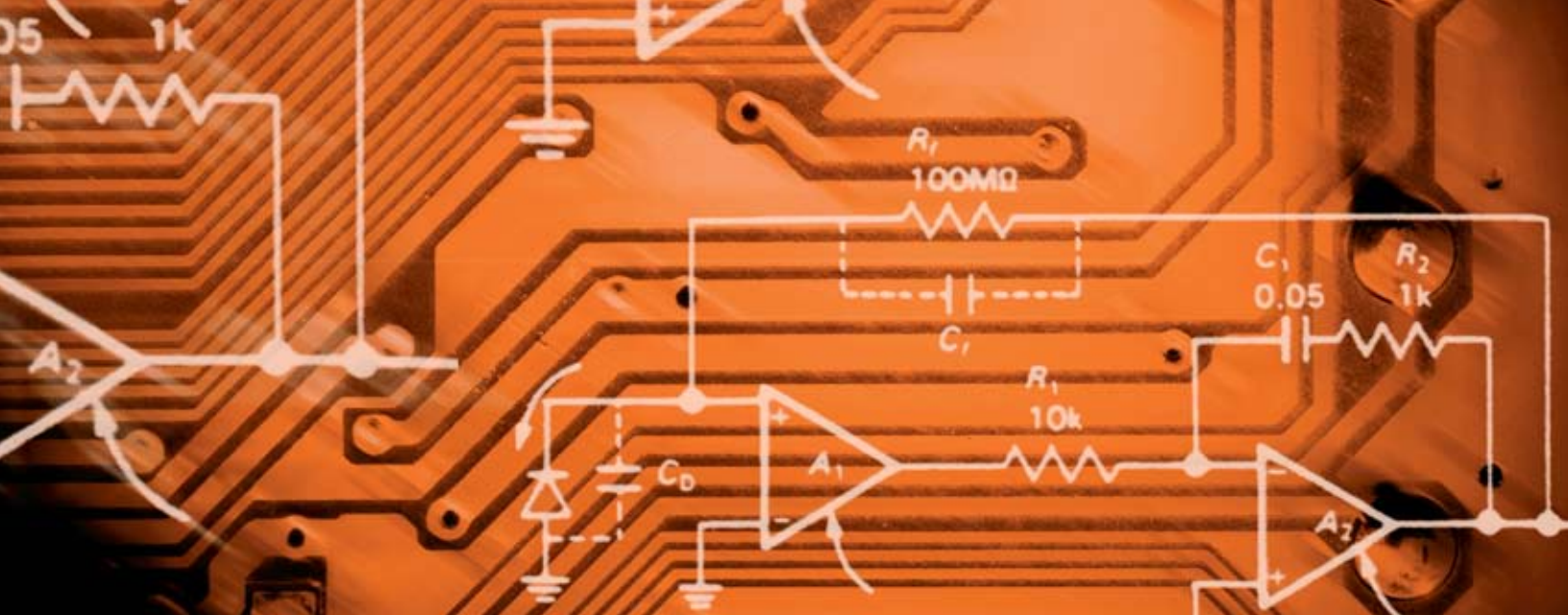
**2010**  
Winter



# Product Summary

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# Audio Components

A LEADER IN INNOVATIVE AUDIO ICs

Cirrus Logic enjoys a long-standing reputation as a leader in innovative audio ICs. Cirrus Logic's portfolio of products includes audio converters such as analog-to-digital converters (ADCs), digital-to-analog converters (DACs), CODECs, S/PDIF interfaces, sample rate converters, and Class-D amplifier solutions. Cirrus Logic also offers a wide range of digital signal processors (DSPs), and Cirrus' CobraNet® technology is the de facto standard for delivering uncompressed digital audio via Ethernet networks.

Our products are used in a wide array of consumer applications, including audio/video receivers, DVD and Blu-ray Disc® players, complete home theater systems, set-top boxes, gaming devices, sound cards, portable products and digital TVs. Applications for products within professional markets include digital mixing consoles, multitrack digital recorders and effects processors. Applications for products within automotive markets include amplifiers, satellite radio systems and multispeaker car audio systems.

LEARN MORE AT

[www.cirrus.com](http://www.cirrus.com)

## AUDIO DSPs

- CS493xxx Family
- CS485xx Family
- CS48AU2x Family
- CS48DV2x Family
- CS4953xx Family
- CS4970xx Family

## AUDIO SOCs

- CS470xx Family

## COBRANET NETWORKED DIGITAL AUDIO

- CM-1
- CM-2
- EV-2
- CobraCom™ Reference Design
- CobraNet LE Reference Design
- CS1810xx Transport Processor ICs
- CS4961xx Audio Network Processor ICs
- DSP Conductor™ Software
- CobraCAD™ Software
- CobraNet Discovery

## AUDIO A/D CONVERTERS

- CS5340
- CS5341
- CS5342
- CS5343/44
- CS5346
- CS5351
- CS5361
- CS5364/66/68
- CS5381

## AUDIO D/A CONVERTERS

- CS4334/35/38/39
- CS4344/45/46/48
- CS4349
- CS4350
- CS4351
- CS4352
- CS4353
- CS4361
- CS4362A/82A
- CS4364/84
- CS4365/85
- CS4391A
- CS4392
- CS4398

## STEREO CODECs

- CS4245
- CS4265
- CS4270
- CS4271
- CS4272

## HD AUDIO CODECs

- CS4207

## AC '97 CODECs

- CS4202
- CS4205
- CS4299

## MULTICHANNEL CODECs

- CS42324/25
- CS42416/26
- CS42418/28
- CS42432
- CS42435
- CS42436/38
- CS42448
- CS42516/26
- CS42518/28
- CS42888

## PORTABLE AUDIO CONVERTERS

- CS42L51
- CS42L52
- CS42L55
- CS43L21
- CS43L22
- CS44L11
- CS53L21

## DIGITAL AMPLIFIER POWER STAGES

- CS4412A

## INTEGRATED CLASS-D AUDIO AMPLIFIERS

- CS3511
- CS4525

## INTERFACES & SAMPLE-RATE CONVERTERS

- CS8406
- CS8416
- CS8420
- CS8421
- CS8422
- CS8427

## CLOCK GENERATION & JITTER REDUCTION

- CS2000
- CS2100
- CS2200
- CS2300

## VOLUME CONTROL

- CS3308
- CS3310
- CS3318

# Audio DSPs

## SPECIFICATIONS

Part	Processor	DSP Tools	Key Firmwares & Features	DSP Core Speed/Temp Range	Package
<b>CS493xxx</b>	<b>Supported exclusively with existing firmwares, many functions available for license, ideal for reduced requirements and low-cost opportunities</b>				
<b>CS493253</b>	Dual 24-bit	None	DD + PLII, IEC61937 via I <sup>2</sup> S	86 MHz-70 °C	44 PLCC
<b>CS493254</b>	Dual 24-bit	None	DD + PLII, IEC61937 via I <sup>2</sup> S + DDEX	86 MHz-70 °C	44 PLCC
<b>CS493263</b>	Dual 24-bit	None	DD + PLII, IEC61937 via I <sup>2</sup> S + DTS	86 MHz-70 °C	44 PLCC
<b>CS493264</b>	Dual 24-bit	None	DD + PLII, IEC61937 via I <sup>2</sup> S + DDEX	86 MHz-70 °C	44 PLCC
<b>CS493295</b>	Dual 24-bit	None	also includes support for AAC	86 MHz-70 °C	44 PLCC
<b>CS493302</b>	Dual 24-bit	None	MP3 & PCM Processor for THX® & automotive applications	86 MHz-70 °C & 72 MHz-85 °C	44 PLCC
<b>CS493105</b>	Dual 24-bit	None	Broadcast audio decoder, DD, MPEG, AAC ES/PES streams	86 MHz-70 °C	44 PLCC
<b>CS493115</b>	Dual 24-bit	None	Broadcast audio decoder, DD, MPEG, AAC ES/PES streams	86 MHz-70 °C	44 PLCC
<b>CS493122</b>	Dual 24-bit	None	Broadcast audio decoder, DD, MPEG, AAC ES/PES streams	86 MHz-70 °C	44 PLCC
<b>CS485xx</b>	<b>Tiny, cost effective, mega-performance PCM processors targeted for: mini-systems, DVD receivers, soundbars, car audio, DTVs</b>				
<b>CS48520</b>	Single 32-bit	DSP Composer, ASM, C	4 channel audio PP1	150 MHz-70 °C (300 M MAC/Sec)	48 QFP
<b>CS48540</b>	Single 32-bit	DSP Composer, ASM, C	8 channel audio PP1	150 MHz-70 °C (300 M MAC/Sec)	48 QFP
<b>CS48560</b>	Single 32-bit	DSP Composer, ASM, C	> 8 channel audio PP1	150 MHz-70 °C & 130 MHz-85 °C	48 QFP
<b>CS48AU2x</b>	<b>Audyssey® EQ/Dynamic Volume/Dynamic EQ/ABX/BassXT-enabled device ideally targeted for DTVs, portable audio docking stations, automotive entertainment, I<sup>2</sup>S I/O</b>				
<b>CS48AU2B</b>	Single 32-bit	DSP Composer	2.0 channel Audyssey EQ/Dynamic Volume/Dynamic EQ/ABX/BassXT processor (selected additional functions available through DSP Composer)	150 MHz-70 °C (300 M MAC/Sec)	48 QFP
<b>CS48DV2x</b>	<b>Dolby® Volume-enabled device ideally targeted for DTVs, portable audio docking stations, automotive entertainment, I<sup>2</sup>S I/O</b>				
<b>CS48DV2B</b>	Single 32-bit	DSP Composer	2.1 channel Dolby® Volume processor (selected additional functions available through DSP Composer)	150 MHz-70 °C (300 M MAC/Sec)	48 QFP
<b>CS4953xx</b>	<b>Single-chip multistandard surround sound decoder targeted for playback from analog &amp; S/PDIF sources</b>				
<b>CS495303</b>	Dual 32-bit	DSP Composer	(DD, DDEX, AAC) + PP2	150 MHz-70 °C (600 M MAC/Sec)	128 LQFP
<b>NEW CS495304</b>	Dual 32-bit	DSP Composer DSP Condenser	(DD,DDEX,DTS,DTSES,DTS96,AAC,MPEG)+PP2	150 MHz-70 °C (600 M MAC/Sec)	128 LQFP 144 LQFP
<b>CS495313</b>	Dual 32-bit	DSP Composer	(DD, DDEX, DTS, DTSES, DTS96, AAC) + PP2	150 MHz-70 °C (600 M MAC/Sec)	128 LQFP 144 LQFP
<b>NEW CS495314</b>	Dual 32-bit	DSP Composer	(DD, DDEX, DTS, DTSES, DTS96, AAC) + PP2	150 MHz-70 °C (600 M MAC/Sec)	128 LQFP 144 LQFP

# Audio DSPs (continued)

## SPECIFICATIONS

Part	Processor	DSP Tools	Key Firmwares & Features	DSP Core Speed/Temp Range	Package
<b>CS4970xx</b>	<b>Single-chip multistandard surround sound decoder targeted for playback from HD DVD™, Blu-ray Disc® players, &amp; all analog, S/PDIF &amp; HDMI® sources</b>				
<b>CS497004</b>	Dual 32-bit	DSP Composer, ASM, C	(DD+, DTHD, DTSHRA, DTSMA, DTSLBR, DTSES, DTS96, DD, DDEX, DTS, AAC, MPEG) + PP2	150 MHz-70 °C (600 M MAC/Sec)	144 LQFP
<b>NEW CS497014</b>	Dual 32-bit	DSP Composer, ASM, C	(DD+,DTHD,DD,DDEX,AAC)+PP2	150 MHz-70 °C (600 M MAC/Sec)	144 LQFP
<b>CS497024</b>	Dual 32-bit	DSP Composer, ASM, C	(DD+, DTHD, DTSHRA, DTSMA, DTSLBR, DTSES, DTS96, DD, DDEX, DTS, AAC) + PP2	150 MHz-70 °C (600 M MAC/Sec)	128 LQFP

# Audio SOCs (DSP with Integrated Mixed-Signal)

## SPECIFICATIONS

Part	Processor	Speed (MIPS)	Car Audio DSPs	General Audio DSPs	Resolution (bits)	Dynamic Range (dB)	A/D Channels	D/A Channels	Comments	Package
<b>CS470xx</b>	<b>Tiny, cost effective, mega-performance PCM processors with integrated CODEC targeted for mini-systems, DVD receivers, soundbars, sound projectors, car audio, DTVs. DSP Composer, a graphical DSP programming tool from Cirrus Logic, makes advanced DSP programming of this integrated device family a breeze.</b>									
<b>CS47024</b>	Single 32-bit	150	CS47024B-DQZ	CS47024B-CQZ	24	108 DAC 105 ADC	2	4	2 ADC w/ 5:1 MUX, 4 DAC, S/PDIF Rx/Tx, 2ch HW SRC, SW SRC	100 LQFP
<b>CS47028</b>	Single 32-bit	150	CS47028B-DQZ	CS47028B-CQZ	24	108 DAC 105 ADC	2	8	2 ADC w/ 5:1 MUX on 1 ADC, 8 DAC, S/PDIF Rx/Tx, 8ch HW SRC	100 LQFP
<b>CS47048</b>	Single 32-bit	150	CS47048B-DQZ	CS47048B-CQZ	24	108 DAC 105 ADC	4	8	4 ADC w/ 5:1 MUX, 8 DAC, S/PDIF Rx/Tx, 8ch HW SRC	100 LQFP

# Recommended Replacements for New Designs

Not Recommended for New Design	Recommended Replacement
CS494xxx (CS494003)	CS4953xx
CS4950xx (CS495002)	CS4953xx
CS4951xx (CS495102)	CS4953xx
CS4952xx (CS495202)	CS4953xx
CS4953xx	CS4953xx

# Algorithm & Nomenclature Abbreviations

Decoding Algorithm & Nomenclature Abbreviation Table	
AAC = MPEG-2 AAC Multichannel Low Complexity	DTS_LBR = DTS Express
CBR = Constant Bit Rate	DTSMA = DTS® Master Audio
DD = Dolby Digital®	ES = Elementary Stream
DD+ = Dolby Digital Plus	HE-AAC = MPEG-4 AAC Multichannel Low Complexity
DDCE = Dolby Digital Consumer Encoder (5.1 Channel)	MP3 = MPEG 1, Layer II & III CBR & VBR
DDEX = Dolby Digital EX®	MPEG = MPEG 2, Layer II Stereo & Multichannel
DTHD = Dolby® TrueHD	PES = Packetized Elementary Stream
DTS = DTS Digital Surround™	PP = Post-Processing
DTS96 = 96 kHz/24-bit	PULSE = Dolby Pulse (MPEG-4 AAC Multichannel Low Complexity Decoder with Metadata Support)
DTSENC = DTS Digital Surround Encoder (5.1 Channel)	STCR = Dolby Stereo Creator
DTSES = DTS-ES™ Matrix/Discrete	VBR = Variable Bit Rate
DTSHRA = DTS® High-Resolution Audio	

## Algorithm & Nomenclature Abbreviations (continued)

Post-Processing (PP1) Inclusion & Algorithm Abbreviation Table	
APP = ADVANCED POST-PROCESSOR	PLII = Dolby Pro Logic II
BXR = CIRRUS BAND XPANDER™	PLIIx = Dolby Pro Logic® IIx
CBE = CIRRUS BASS ENHANCEMENT	PLZZ = DOLBY PROLOGIC IIZ
CBM = Cross-Bar Mixer	REEQ = THX Cinema Re-EQ™
CSHP = SRS CIRCLE SURROUND HEADPHONE (INCLUDES SRS HP 360° & CIRCLE SURROUND)	SPP = STAND POST-PROCESSORY
CVT = CIRRUS VIRTUALIZATION TECHNOLOGY	TB = SRS TruBass®
DH = Dolby Headphone® 2	TC = Tone Control
DVL = Cirrus® Dynamic Volume Leveler	TEX = THX Surround EX™
DVOL = DOLBY VOLUME	THX = THX® Cinema
DVOLMC= DOLBY VOLUME MULTICHANNEL	TSHD = SRS TruSurround® HD/HD4
DVS = Dolby Virtual Speaker® 2	TSXT = SRS® TruSurround XT®
L7 = Logic7™	TUX = THX Select2/Ultra2™ Surround EX
LIM = Compressor/Limiter	TV = SRS TruVolume®
NEO = DTS Neo:6™	TVMC = SRS TRUVOLUME MULTICHANNEL
NER = DTS NeuralSurround	WOW = SRS® WOW™
PEQ = PARAMETRIC EQ	WOWHD = SRS WOW HD™
PL = Dolby® Pro Logic®	
Post-Processing (PP2 includes all of the above +) Inclusion & Algorithm Abbreviation Table	
AUD = Audistry®	DYNVOL = Audyssey Dynamic Volume® / Dynamic EQ®
AUDY = Audyssey® MultEQ XT™	TUX+ = THX Select2/Ultra2™ Surround EX™ with Loudness Plus

# CobraNet System Modules

## SPECIFICATIONS

Product	Description	CobraNet® Part Numbers	Audio Channels over Ethernet (full-duplex)	Serial Input/Output Ports	Ethernet Interface	Integrated DSP (MIPS)	Board Dimensions
<b>CM-1</b>	Digital audio network interface module with dual Ethernet ports	See your Cirrus Logic sales representative for available models.	32	Quad synchronous, up to 32 channels at 48 and/or up to 96 kHz sample rates	100BASE-Tx, 100 Mbps, full duplex Ethernet, fully compliant with IEEE 802.3u	—	3.5" X 3.5"
<b>CM-2</b>	Digital audio network interface module with dual Ethernet ports and audio DSP (available as a reference design)	CPB181012-CM2, CPB181022-CM2, CS496122-CM2 (all available with female-bottom or male-top headers)	16	Quad synchronous, capable of supplying up to 16 full-duplex channels at 48 kHz sample rate or up to 8 full-duplex channels at 96 kHz sample rate	100BASE-Tx, 100 Mbps, full duplex Ethernet, fully compliant with IEEE 802.3u	32-bit DSP, 120 MIPS	3.5" X 3.5"
<b>EV-2</b>	CobraNet development platform for use with the CM-1 and CM-2 modules	CDB-496122-EV2	16	One digital AES3 input stream (two channels) or one digital AES3 output stream (two channels). Two analog audio input channels, two analog audio output channels	100BASE-Tx, 100 Mbps, full duplex Ethernet, fully compliant with IEEE 802.3u	32-bit DSP, 120 MIPS	8" X 7"
<b>CobraCom Reference Design</b>	CobraNet microphone and network-powered loudspeaker reference design	CRD-CobraCom Reference Design	16	Using the CS4961xx series provides up to 16 audio channels with audio DSP capability	100BASE-Tx, 100 Mbps, full duplex Ethernet, fully compliant with IEEE 802.3u and 802.3af Power-over-Ethernet	32-bit DSP, 120 MIPS	5.4" X 4"
<b>CobraNet LE Reference Design</b>	Low-cost, 2 channel I/O end-node reference design	Available direct from Attero Tech <a href="http://www.atterotech.com">www.atterotech.com</a>	2	Stereo 1/8" input and output, stereo RCA input and output, I <sup>2</sup> S digital audio outputs	100Base-Tx, 10 Mbps, full duplex Ethernet, fully compliant with IEEE 802.3u and 802.3af Power-over-Ethernet	—	5" x 3"

# CobraNet Transport and Audio Network Processor ICs

## SPECIFICATIONS

Family	Description	CobraNet® Part Numbers	Audio Channels over Ethernet	Serial Input/Serial Output Ports	Ethernet Interface	IC Package
<b>CS1810xx CS4961xx*</b>	The CS1810xx Family contains CobraNet networked digital audio interface ICs. The CS4961xx Family provides digital audio signal processing along with the network interface function.	CS181002 CS496102*	2	One synchronous, capable of supplying up to 2 full-duplex channels at 48 and/or up to 96 kHz sample rates.	Supports 100BASE-Tx, 100 Mbps, full duplex Ethernet, fully compliant with IEEE 802.3u.	144 LQFP
		CS181012 CS496112*	8	Quad synchronous, capable of supplying up to 8 full-duplex channels at 48 and/or up to 96 kHz sample rates.		
		CS181022 CS496122*	16	Quad synchronous, capable of supplying up to 16 full-duplex channels at 48 kHz, or up to 8 channels at 96 kHz sample rates.		

\*The CS4961xx series includes a 32-bit, 120 MIPS digital signal processor for audio processing of any or all channels.

# CobraNet Software Tools

## FEATURES

<b>DSP Conductor</b>	DSP Conductor software is a powerful, graphical tool for rapid, drag-and-drop audio signal processing firmware development on CS4961xx-based platforms, such as the CM-2 module or an OEM's custom hardware. Drawing upon a comprehensive library of DSP functions, an OEM can design the audio processing of a product, then lock the DSP firmware down into the CS4961xx-based CobraNet product. These audio functions can be controlled either by the product's user interface or through remote SNMP commands over the CobraNet Ethernet LAN. Further, any CS4961xx node can be re-programmed in real-time from a PC on the network, enabling multi-purpose products to serve different audio processing functions for different applications at the push of a button.
<b>CobraCAD</b>	CobraCAD software is a graphical, drag-and-drop design and verification tool for modeling a network of CobraNet-enabled gear and standard Ethernet switches. A library of commercially available, CobraNet-enabled products is the place to start for designing a virtual CobraNet network, then making sure it will perform as required. CobraCad™ software is ideal for consultants and integrators preparing a bid for a client and for installers and expert end users who need to visualize the network before or after deployment.
<b>CobraNet Discovery</b>	CobraNet Discovery is a CobraNet network maintenance utility that automatically discovers CobraNet devices on the network, configures them and queries and reports the working state of a CobraNet network and its devices. Discovery also provides a CobraNet firmware update function.

# Audio A/D Converters

## SPECIFICATIONS

Part Number	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog Inputs	Power Supply (V)	Comments	Package
<b>CS5340</b>	24	101	-94	192	Single-ended	VA = 3.3 or 5, VD = 3.3 or 5, VL = 1.8 to 5	Pin compatible with CS5341	16 TSSOP
<b>CS5341</b>	24	105	-98	192	Single-ended	VA = 3.3 or 5, VD = 3.3 or 5, VL = 1.8 to 5	Pin compatible with CS5340	16 TSSOP
<b>CS5342</b>	24	105	-98	192	Single-ended	VA = 3.3 or 5, VD = 3.3 or 5, VL = 2.5 to 5	384*Fs MCLK	16 TSSOP
<b>CS5343/44</b>	24	98	-92	96	Single-ended	VA = 3.3 or 5	CS5343-I <sup>2</sup> S CS5344-LJ	10 TSSOP
<b>CS5346</b>	24	103	-95	192	Single-ended	VA = 5, VD = 3.3, VL = 3.3 to 5	6:1 input MUX, PGA, MIC pre-amp, high input impedance	48 LQFP
<b>CS5351</b>	24	108	-98	192	Single-ended	VA = 5, VD = 3.3 or 5, VL = 2.5 to 5	Functionally compatible with CS5361	24 SOIC 24 TSSOP
<b>CS5361</b>	24	114	-105	192	Differential	VA = 5, VD = 3.3 or 5, VL = 2.5 to 5	Pin compatible with CS5381	24 SOIC 24 TSSOP
<b>CS5364/66/68</b>	24	114	-105	192	Differential	VA = 5, VD = 3.3 or 5, VLS/VLC = 1.8 to 5	4-/6-/8-channel ADC, TDM, on-chip oscillator	48 LQFP
<b>CS5381</b>	24	120	-110	192	Differential	VA = 5, VD = 3.3 or 5, VL = 2.5 to 5	Flagship performance	24 SOIC 24 TSSOP

# Audio D/A Converters

## SPECIFICATIONS

Part Number	Channels	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog Outputs	Power Supply (V)	Comments	Package
<b>CS4334/35/38/39</b>	2	24	96	-88	96	Single-ended	VA = 5	Entry-level stereo DAC	8 SOIC
<b>CS4344/45/46/48</b>	2	24	105	-90	192	Single-ended	VA = 3.3 or 5	Upgrade for CS4340 and CS4340A	10 TSSOP
<b>CS4349</b>	2	24	101	-91	192	Single-ended	VA = 3.3 or 5	1 V <sub>RMS</sub> @ 3.3 V, Volume Control	24 TSSOP
<b>CS4350</b>	2	24	109	-91	192	Single-ended or Differential	VA = 3.3 or 5 VLC = 3.3 to 5 VLS = 1.5 to 5	Integrated PLL, TDM	24 TSSOP
<b>CS4351</b>	2	24	112	-100	192	Single-ended	VA = 9 or 12 VD = 3.3 VL = 1.8 to 3	Line driver, 2 V <sub>RMS</sub> output	20 TSSOP
<b>CS4352</b>	2	24	106	-93	192	Single-ended	VA = 9 or 12 VD = 3.3 VL = 1.5 to 5	Line driver, 2 V <sub>RMS</sub> output	20 TSSOP
<b>CS4353</b>	2	24	106	-93	192	Single-ended	VA = 3.3 VCP = 3.3 VL = 0.9 to 3.3	Ground-centered 2 V <sub>RMS</sub> line-level outputs	24 QFN
<b>CS4361</b>	6	24	105	-95	192	Single-ended	VA = 5 VL = 1.8 to 5	Entry-level 6-channel DAC	20 TSSOP
<b>CS4362A/82A</b>	6/8	24	114	-100	192	Differential	VA = 5 VD = 2.5 VL = 1.8 to 5	6-/8-channel DAC, DSD	48 LQFP
<b>CS4364/84</b>	6/8	24	103	-88	192	Single-ended	VA = 5 VD = 2.5 VL = 1.8 to 5	6-/8-channel DAC, DSD, footprint compatible with CS4365/85	48 LQFP
<b>CS4365/85</b>	6/8	24	114	-100	192	Differential	VA = 5 VD = 2.5 VL = 1.8 to 5	6-/8-channel DAC, DSD, TDM	48 LQFP
<b>CS4391A</b>	2	24	108	-94	192	Differential	VA = 5 VL = 1.8 to 5	DSD, pin compatible with CS4392	20 TSSOP
<b>CS4392</b>	2	24	114	-100	192	Differential	VA = 5 VL = 1.8 to 5	DSD, selectable digital filters, pin compatible with CS4391A	20 TSSOP
<b>CS4398</b>	2	24	120	-107	192	Differential	VA = 5 VD = 3.3 or 5 VL = 1.8 to 5	Flagship DAC, DSD processor, selectable D-filter	28 TSSOP

# Stereo CODECs

## SPECIFICATIONS

Part	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog I/O	Power Supply (V)	Comments	Package
<b>CS4245</b>	24	104 ADC 104 DAC	-95 ADC -90 DAC	192	Single-ended	VA = 3.3 or 5 VD = 3.3 or 5 VL = 1.8 to 5	6:1 input MUX, MIC pre-amp, PGA	48 LQFP
<b>CS4265</b>	24	104 ADC 104 DAC	-95 ADC -90 DAC	192	Single-ended	VA = 3.3 or 5 VD = 3.3 or 5 VL = 1.8 to 5	2:1 input MUX, MIC pre-amp, PGA, S/PDIF out	32 QFN
<b>CS4270</b>	24	105 ADC 105 DAC	-95 ADC -95 DAC	192	Single-ended	VA = 3.3 or 5 VD = 3.3 or 5 VL = 1.8 to 5	Volume control, passive filters, 3.3 V operation	24 TSSOP
<b>CS4271</b>	24	108 ADC 114 DAC	-98 ADC -100 DAC	192	Single-ended ADC Differential DAC	VA = 5 VD = 3.3 or 5 VL = 2.5 to 5	Stereo CODEC, volume control, compatible with CS4272	28 TSSOP
<b>CS4272</b>	24	114 ADC 114 DAC	-100 ADC -100 DAC	192	Differential ADC Differential DAC	VA = 5 VD = 3.3 or 5 VL = 2.5 to 5	Stereo CODEC, volume control, on-chip oscillator	28 TSSOP

# HD Audio CODECs

## SPECIFICATIONS

Part	Bus	Converters	Feature
<b>NEW CS4207</b>	HD	Six 192 kHz DACs; Four 96 kHz ADCs	S/PDIF receiver with sample-rate converter, 2 S/PDIF transmitters, MIC pre-amp, ground centered HP driver, 2 digital MIC inputs

# AC '97 CODECS

## SPECIFICATIONS

Part	Bus	Converters	Feature	Package
<b>CS4202</b>	AC '97	20-bit stereo DAC; 18-bit stereo ADC	S/PDIF transmitter	48 TQFP/LQFP
<b>CS4205</b>	AC '97	20-bit stereo DAC; 18-bit stereo ADC	Sample-rate converter	48 TQFP/LQFP
<b>CS4299</b>	AC '97	20-bit stereo DAC; 18-bit stereo ADC	Sample-rate converter	48 TQFP/LQFP

# Multichannel CODECs

## SPECIFICATIONS

Part	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog I/O	Power Supply (V)	Comments	Package
<b>CS42324/25</b>	24	100 DAC 95 ADC	-90 DAC -88 ADC	96	Single-ended	VA = 9 or 12 VD = 3.3 VL = 1.8 or 3.3	4 DACs, 2 ADCs, 2 V <sub>RMS</sub> I/O, I/O MUX, HP Driver (CS42325 only)	48 LQFP
<b>CS42416/26</b>	24	110/114 DAC 114 ADC	-100 DAC -100 ADC	192	Differential DACs Single-ended or Differential ADCs	VA = 5 VD = 3.3 or 5 VL = 1.8 to 5	6 DACs, 2 ADCs, digital volume control	64 LQFP
<b>CS42418/28</b>	24	110/114 DAC 114 ADC	-100 DAC -100 ADC	192	Differential	VA = 5 VD = 3.3 or 5 VL = 1.8 to 5	8 DACs, 2 ADCs, PLL, digital volume control	64 LQFP
<b>CS42432</b>	24	108 DAC 105 ADC	-98 DAC -98 ADC	192	Single-ended or Differential	VA = 3.3 or 5 VD = 3.3 VL = 1.8 to 5	6 DACs, 4 ADCs TDM I/F	52 MQFP
<b>CS42435</b>	24	108 DAC 105 ADC	-98 DAC -98 ADC	192	Single-ended or Differential	VA = 3.3 or 5 VD = 3.3 VL = 1.8 to 5	8 DACs, 6 ADCs TDM I/F	52 MQFP
<b>CS42436/38</b>	24	105/108 DAC 102/105 ADC	-95/-98 DAC -95/-98 ADC	192	Single-ended or Differential	VA = 3.3 or 5 VD = 3.3 VL = 1.8 to 5	6/8 DACs, 6 ADCs TDM I/F	52 MQFP
<b>CS42448</b>	24	108 DAC 105 ADC	-98 DAC -98 ADC	192	Single-ended or Differential	VA = 3.3 or 5 VD = 3.3 to 5 VL = 1.8 to 5	8 DACs, 6 ADCs TDM and PCM I/F	64 LQFP

# Multichannel CODECs (continued)

## SPECIFICATIONS

Part	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog I/O	Power Supply (V)	Comments	Package
<b>CS42516/26</b>	24	110/114 DAC 114 ADC	-100 DAC -100 ADC	192	Differential	VA = 5 VD = 3.3 or 5 VL = 1.8 to 5	6 DACs, 2 ADCs, S/PDIF Rx, digital volume control	64 LQFP
<b>CS42518/28</b>	24	110/114 DAC 114 ADC	-100 DAC -100 ADC	192	Differential	VA = 5 VD = 3.3 or 5 VL = 1.8 to 5	8 DACs, 2 ADCs, S/PDIF Rx, digital volume control	64 LQFP
<b>CS42888</b>	24	108 DAC 105 ADC	-98 DAC -98 ADC	192	Single-ended or Differential	VA = 3.3 or 5 VD = 3.3 or 5 VL = 1.8 to 5	8 DACs, 4 ADCs, PCM and TDM I/F	64 LQFP

# Portable Audio Converters

## SPECIFICATIONS

Part	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog I/O	Power Supply (V)	Comments	Package
<b>CS42L51</b>	24	98 ADC 98 DAC	-88 ADC -86 DAC	96	Single-ended	VA = 1.8 to 2.5 VD = 1.8 to 2.5 VL = 1.8 to 3.3	CODEC, 3:1 MUX, PGA, MIC pre-amp, HP amp	32 QFN
<b>CS42L52</b>	24	98 ADC 98 DAC	-88 ADC -86 DAC	96	Single-ended	VA/VD = 1.65 to 2.83 VP = 2.37 to 5.35 VL = 1.8 to 3.3	CODEC, 4:1 MUX, PGA, MIC pre-amp, HP/speaker amps	40 QFN
<b>CS42L55</b>	24	95 ADC 99 DAC	-87 ADC -86 DAC	48	Pseudo-differential	VA/VD = 1.65 to 2.71 VCP = 1.65 to 2.73 VL = 1.65 to 3.47	CODEC, Class-H HP amp, 2:1 MUX, PGA	36 QFN
<b>CS43L21</b>	24	98	-86	96	Single-ended	VA = 1.8 to 2.5 VD = 1.8 to 2.5 VL = 1.8 to 3.3	DAC with HP amp and volume control	32 QFN
<b>CS43L22</b>	24	98	-88	96	Single-ended	VA = 1.65 to 2.83 VD = 1.65 to 2.83 VP = 2.37 to 5.35 VL = 1.8 to 3.3	DAC with HP and Class-D speaker amps	40 QFN
<b>CS44L11</b>	24	95	-64	96	Single-ended	VA = 1.8 to 2.4 VD = 1.8 to 2.4	Digital headphone amp	16 TSSOP
<b>CS53L21</b>	24	98	-88	96	Single-ended	VA = 1.8 to 2.5 VD = 1.8 to 2.5 VL = 1.8 to 3.3	ADC, 3:1 MUX, PGA, MIC pre-amp	32 QFN

# Power Stage

## SPECIFICATIONS

Part	Power (W)	Dynamic Range (dB)	THD+N %	Channels	Power Supply (V)	Comments	Package
<b>CS4412A</b>	30	102	0.1	4	VP = 8 to 18 VD = 2.5 or 5	Quad power stage IC thermally enhanced	48 QFN

# Integrated Class-D Audio Amplifiers

## SPECIFICATIONS

Part	Power (W)	Dynamic Range (dB)	THD+N %	Channels	Power Supply (V)	Comments	Package
<b>NEW CS3511</b>	2 x 10	98	0.03	2.0	VP = 9 to 12	Integrated digital audio amp w/ feedback and differential input	32 QFN
<b>CS4525</b>	2 x 15	102	0.1	2.1	VP = 8 to 18 VD = 2.5 or 5	Integrated digital audio amp w/ ADC, SRC and signal processor	48 QFN

# Interfaces & Sample-Rate Converters

## SPECIFICATIONS

Part	Sample Rate (kHz)	S/PDIF, IEC-60958 Transmitter	S/PDIF, IEC-60958 Receiver	AES/EBU	EIAJ CP1201	Host Interface	Channel Status Buffer Memory	SRC	Package
<b>CS8406</b>	192	✓	—	✓	✓	✓	✓	—	28 SOIC 28 TSSOP 28 QFN
<b>CS8416</b>	192	—	✓	✓	✓	✓	✓	—	28 SOIC 28 TSSOP 28 QFN
<b>CS8420</b>	96	✓	✓	✓	✓	✓	✓	✓	28 SOIC
<b>CS8421</b>	192	—	—	—	—	—	—	✓	20 TSSOP 20 QFN
<b>CS8422</b>	192	—	✓	✓	✓	✓	✓	✓	32 QFN
<b>CS8427</b>	96	✓	✓	✓	✓	✓	✓	—	28 SOIC 28 TSSOP

# Clock Generation and Jitter Reduction

## SPECIFICATIONS

Part Number	One-Time Programmable	Frequency Synth/Clock Generator	Clock Multiplier/Jitter Remover	Power Supply (V)	Input Frequency Range	Reference Frequency Range	Output Frequency Range	Package
<b>CS2000</b>	CS2000-OTP	✓	✓	3.3	50 Hz to 30 MHz	8 to 75 MHz	6 to 75 MHz	10 MSOP
<b>CS2100</b>	CS2100-OTP	—	✓	3.3	50 Hz to 30 MHz	8 to 75 MHz	6 to 75 MHz	10 MSOP
<b>CS2200</b>	CS2200-OTP	✓	—	3.3	—	8 to 75 MHz	6 to 75 MHz	10 MSOP
<b>CS2300</b>	CS2300-OTP	—	✓	3.3	50 Hz to 30 MHz	Internally generated	6 to 75 MHz	10 MSOP

# Volume Control

## SPECIFICATIONS

Part	Channel	Dynamic Range (dB)	THD+N (dB)	Analog I/O	Power Supply (V)	Comments	Package
<b>CS3308</b>	8	123	-112	Single-ended	VA = ±5 VD = 3.3	+22 dB gain/-96 dB attenuation, 0.25 dB step	48 LQFP
<b>CS3310</b>	2	116	-100	Single-ended	VA = ±5 VD = 5	+31.5 dB gain/-95.5 dB attenuation, 0.5 dB step	16 SOIC
<b>CS3318</b>	8	127	-112	Single-ended	VA = ±8 to ±9 VD = 3.3	+22 dB gain/-96 dB attenuation, 0.25 dB step	48 LQFP

# Industrial Components

## HIGH-PRECISION ANALOG & MIXED-SIGNAL ICs & PROCESSORS

Cirrus Logic high-precision analog and mixed-signal ICs for industrial measurement applications—such as industrial process control, analytical instruments, consumer utility – are based on proprietary advanced Delta-Sigma technology.

Cirrus Logic provides many proprietary products, including analog-to-digital converters, digital-to-analog converters, and a wide variety of ARM9-based system-on-chip processors.

### AMPLIFIERS

- CS3001
- CS3002
- CS3003
- CS3004
- CS3011
- CS3012
- CS3013
- CS3014

### EMBEDDED PROCESSORS

#### ARM 9 Embedded Processors

- EP9301
- EP9302
- EP9307
- EP9312
- EP9315

#### Networked Attached Storage (NAS) Reference Design

- NAS ARM 9

### DELTA-SIGMA A/D CONVERTERS

- CS5505
- CS5506
- CS5507
- CS5508
- CS5509
- CS5510
- CS5511
- CS5512
- CS5513
- CS5529

### DELTA-SIGMA A/D CONVERTERS WITH INTEGRATED AMPLIFIERS

- CS5521
- CS5522
- CS5523
- CS5524
- CS5525
- CS5526
- CS5528
- CS5530
- CS5531
- CS5532
- CS5533
- CS5534
- CS5550

### HIGH-THROUGHPUT DELTA-SIGMA A/D CONVERTERS

- CS5560
- CS5566
- CS5571
- CS5581

# Amplifiers

## SPECIFICATIONS

Part Number	Device	Supply Voltage (V)	Supply Current (mA)	V <sub>os</sub> (µV) Max	V <sub>os</sub> Drift (µV/°C)	e <sub>noise</sub> (nV/√Hz)	A <sub>ol</sub> min (dB)	Package
<b>CS3001</b>	Single	2.7 to 6.7	2.1	10	0.05	6	200	8 SOIC
<b>CS3002</b>	Dual	2.7 to 6.7	3.6	10	0.05	6	200	8 SOIC
<b>CS3003</b>	Single	2.7 to 5.25	1.0	10	0.05	17	150	8 SOIC
<b>CS3004</b>	Dual	2.7 to 5.25	2.0	10	0.05	17	150	8 SOIC
<b>CS3011</b>	Single	2.7 to 6.7	0.9	10	0.05	12	200	8 SOIC
<b>CS3012</b>	Dual	2.7 to 6.7	1.7	10	0.05	12	200	8 SOIC
<b>CS3013</b>	Single	2.7 to 5.25	0.5	10	0.05	22	135	8 SOIC
<b>CS3014</b>	Dual	2.7 to 5.25	1.0	10	0.05	22	135	8 SOIC

# ARM 9 Embedded Processors

## SPECIFICATIONS

Part	Processor Speed (MHz)	Cache Data/Code (K)	Ethernet MAC	PCMCIA Device	IDE/IF	USB Hosts	Display I/F	Graphics Engine	Math Crunch Engine	Touch/ADC	Package
<b>EP9301</b>	166	16/16	✓	—	—	2	—	—	—	5 ADC	208 TQFP
<b>EP9302</b>	200	16/16	✓	—	—	2	—	—	✓	5 ADC	208 LQFP
<b>EP9307</b>	200	16/16	✓	—	—	3	✓	✓	✓	8-wire	272 TFBGA
<b>EP9312</b>	200	16/16	✓	—	2	3	✓	—	✓	8-wire	352 PBGA
<b>EP9315</b>	200	16/16	✓	✓	2	3	✓	✓	✓	8-wire	352 PBGA

# Networked Attached Storage (NAS) Reference Design

Reference Design	Target Device	Development Platform	Operating System	Key Software Features
<b>NAS ARM 9</b>	EP9312 and EP9315	EDB9315A	Linux®	Auto-detect for easy customer set-up, network file server, print server, group and user level security and customizable user interface

# Delta-Sigma A/D Converters

## SPECIFICATIONS

Part Number	Resolution (bits)	Throughput (Sps)	Integral Linearity (%FS)	Differential Linearity ( $\pm$ LSB)	Number of Channels	Power Consumption (mW)	Package
<b>CS5505</b>	16	20 – 100	0.0015%	0.25	4	3.2	24 SOIC
<b>CS5506</b>	20	20 – 100	7.0E-4%	NMC	4	3.2	24 SOIC
<b>CS5507</b>	16	20 – 100	0.0015%	0.25	1	3.2	20 SOIC
<b>CS5508</b>	20	20 – 100	7.0E-4%	NMC	1	3.2	20 SOIC
<b>CS5509</b>	16	20 – 200	0.0015%	0.25	1	1.7	16 SOIC
<b>CS5510</b>	16	53 – 212	0.0015%	NMC	1	1.4	8 SOIC
<b>CS5511</b>	16	100 (typical)	0.0015%	NMC	1	1.5	8 SOIC
<b>CS5512</b>	20	53 – 326	7.0E-4%	NMC	1	1.8	8 SOIC
<b>CS5513</b>	20	100 (typical)	7.0E-4%	NMC	1	1.9	8 SOIC
<b>CS5529</b>	16	1 – 303	0.0015%	NMC	1	2.6	20 SOIC

# Delta-Sigma A/D Converters with Integrated Amplifiers

## SPECIFICATIONS

Part	Resolution (bits)	Throughput (Sps)	Integral Linearity (%FS)	Differential Linearity ( $\pm$ LSB)	Number of Channels	Power Consumption (mW)	Package
<b>CS5521</b>	16	1 – 400	0.0015%	NMC	2	6	20 SSOP
<b>CS5522</b>	24	1 – 606	7.0E-4%	NMC	2	9	20 SSOP
<b>CS5523</b>	16	1 – 400	0.0015%	NMC	4	6	24 SSOP
<b>CS5524</b>	24	1 – 606	7.0E-4%	NMC	4	9	24 SSOP
<b>CS5525</b>	16	3 – 606	0.0015%	NMC	1	9.4	20 SSOP
<b>CS5526</b>	20	3 – 606	7.0E-4%	NMC	1	9.4	20 SSOP
<b>CS5528</b>	24	1 – 606	7.0E-4%	NMC	8	9	24 SSOP
<b>CS5530</b>	24	7 – 3840	$\pm$ 0.0015%	NMC	1	35	20 SSOP
<b>CS5531</b>	16	7 – 3840	$\pm$ 0.0015%	NMC	2	35	20 SSOP
<b>CS5532</b>	24	7 – 3840	$\pm$ 0.0015%	NMC	2	35	20 SSOP
<b>CS5533</b>	16	7 – 3840	$\pm$ 0.0015%	NMC	4	35	24 SSOP
<b>CS5534</b>	24	7 – 3840	$\pm$ 0.0015%	NMC	4	35	24 SSOP
<b>CS5550</b>	24	2440 – 4000	0.01%	NMC	2	21	24 SSOP

# High-Throughput Delta-Sigma A/D Converters

## SPECIFICATIONS

Part	Resolution (bits)	Throughput (kSPS)	Integral Linearity (%FS)	Differential Linearity ( $\pm$ LSB)	Number of Channels	Power Consumption (mW)	Package
<b>CS5560</b>	24	50	$\pm$ 5 ppm	0.1	1, Differential	90	24 SSOP
<b>CS5566</b>	24	5	$\pm$ 5 ppm	0.1	1, Differential	20	24 SSOP
<b>CS5571</b>	16	100	$\pm$ 8 ppm	0.1	1, Single-ended	85	24 SSOP
<b>CS5581</b>	16	200	$\pm$ 8 ppm	0.1	1, Single-ended	85	24 SSOP

# Apex Precision Power™ Products

## POWER ANALOG ICs, MODULES AND HYBRIDS

Apex Precision Power is the brand name for Cirrus Logic's high performance precision power analog family of products.

Apex Precision Power products drive innovation in the design and manufacturing of power operational amplifiers (linear) and pulse width modulation amplifiers (PWM/switching). A mix of IC, board-level module and hybrid product designs is used to deliver up to 50 A of output current while operating on voltage supplies ranging from 8.5 V up to 1200 V. Target applications focus on the high power precision control of current, voltage and speed applications in the industrial, test and measurement, aerospace and medical markets.

### HIGH-CURRENT LINEAR AMPLIFIERS

- MP103
- MP108FD
- MP108FDA
- MP111FD
- MP230FC
- MP240FC
- MP38CL
- MP38CLA
- MP39CL
- MP39CLA
- PA01
- PA02
- PA03
- PA04
- PA05
- PA07
- PA09
- PA09M
- PA10
- PA107
- PA119
- PA12
- PA12A
- PA12H
- PA13
- PA13A
- PA16
- PA162
- PA50
- PA51
- PA52
- PA60EU
- PA61
- PA73
- PA74
- PA74A
- PA75CC
- PA76
- PA76A
- PA92
- PA93
- PA96
- PB50
- PB51
- PB58

### HIGH-CURRENT PWM AMPLIFIERS

- MSA240KC
- MSA260KC
- SA01
- SA03
- SA08
- SA09
- SA12
- SA303
- SA306
- SA50
- SA53
- SA57
- SA60

### HIGH-SPEED LINEAR AMPLIFIERS

- MP103
- MP108FD
- MP108FDA
- MP111FD
- MP400
- PA05
- PA09
- PA107
- PA119
- PA69EU
- PA78DK
- PA79DK
- PA84
- PA85
- PA86EU
- PA90
- PA91
- PA94
- PA96
- PA98
- PB50
- PB51
- PB58

### HIGH-VOLTAGE LINEAR AMPLIFIERS

- MP103
- MP108FD
- MP111FD
- MP230FC
- MP240FC
- MP38CL
- MP39CL
- PA03
- PA04
- PA05
- PA07
- PA08
- PA107
- PA15
- PA240CC
- PA241CE
- PA243DF
- PA50
- PA52
- PA69EU
- PA78DK
- PA79DK
- PA81J
- PA82J
- PA83
- PA84
- PA85
- PA86EU
- PA88
- PA89
- PA90
- PA91
- PA92
- PA93
- PA94
- PA95
- PA96
- PA97
- PA98
- PB50
- PB51
- PB58

### HIGH-VOLTAGE PWM AMPLIFIERS

- MSA240KC
- MSA260KC
- SA01
- SA03
- SA08
- SA12
- SA50
- SA60

# High-Current Linear Amplifiers

## SPECIFICATIONS

Model	Output Current MAX (A)	Supply Voltage MAX (V)	Slew Rate TYP (V/ $\mu$ s)	Standby Current MAX (mA)	Power Dissipation MAX (W)
PA50	40	100	50	36	400
PA52	40	200	50	36	400
MP230FC	30	100	15	35	210
PA03	30	150	8	300	500
PA05	30	100	100	120	250
MP240FC	20	200	14	25	170
PA04	20	200	50	90	200
NEW MP103	15	200	180	26	54
MP111FD	15	100	130	157	170
PA12A	15	100	4	50	125
PA13A	15	90	4	50	135
MP108FDA	11	200	170	65	100
MP39CLA	11	100	10	24	125
MP108FD	10	200	170	65	100
MP39CL	10	100	10	24	125
PA12	10	90	4	50	125
PA13	10	90	4	50	135
PA51	10	72	2.6	10	97
PA61	10	90	2.8	10	97
MP38CLA	8	200	63	24	125
PA93	8	400	50	14	125
MP38CL	7	200	63	24	125
PA01	5	56	2.6	50	67
PA02	5	38	20	40	48
PA07	5	100	4	30	67
PA10	5	90	3	30	67
NEW PA107	5	200	3000	35	60
PA16	5	38	20	40	62.5
PA73	5	60	2.6	5	67
PA162	4 x 1	40	1.4	20	45
PA119	4	80	900	120	78
PA92	4	400	50	14	80
PA09M	3	80	200	85	78
PA74A	2 x 3	40	1.4	40	36/60
PA76A	2 x 3	40	1.4	40	36/60
PA74	2 x 2.5	40	1.4	40	36/60
PA76	2 x 2.5	40	1.4	40	36/60
PA09	2	80	200	85	78
PB50	2	200	100	25	35
PA60EU	2 x 1.5	40	1.4	10	16/31
PA75CC	2 x 1.5	40	1.4	10	19/28

# High-Current Linear Amplifiers (continued)

## SPECIFICATIONS

Model	Output Current MAX (A)	Supply Voltage MAX (V)	Slew Rate TYP (V/ $\mu$ s)	Standby Current MAX (mA)	Power Dissipation MAX (W)
PA96	1.5	300	250	18	83
PB51	1.5	300	100	18	83
PB58	1.5	300	250	35	70
PA12H	1	90	4	100	6

# High-Current PWM Amplifiers

## SPECIFICATIONS

Model	Output Current MAX (A)	Supply Voltage MAX (V)	Switching Frequency (kHz)	Power Delivery MAX (KW)	Power Dissipation MAX (W)
SA03	30	100	22.5	3	300
SA08	20	450	22.5	9	250
SA01	20	100	42	2	185
MSA260KC	20	450	50	9	250
MSA240KC	20	100	50	2	250
SA12	15	200	200	3	250
SA306	17	60	100	1	100
SA57	17	60	100	1	100
<b>NEW</b> SA303	10	60	100	0.6	100
<b>NEW</b> SA53	10	60	100	0.6	100
SA60	10	80	250	0.8	140
<b>NEW</b> SA09	7.5	60	500	0.45	80
SA50	5	80	45	0.5	120

# High-Speed Linear Amplifiers

## SPECIFICATIONS

Model	Slew Rate TYP (V/ $\mu$ s)	Supply Voltage MAX (V)	Output Current MAX (A)	Standby Current MAX (mA)	Power Dissipation MAX (W)
<b>NEW</b> PA107	3000	200	5	35	60
PA98	1000	450	0.2	25	30
PA85	1000	450	0.2	25	30
PA119	900	80	4	120	78
PA94	700	900	0.1	24	30
PA79DK	350	350	0.15	2.5	26
PA78DK	350	350	0.15	2.5	23

# High-Speed Linear Amplifiers (continued)

## SPECIFICATIONS

Model	Slew Rate TYP (V/ $\mu$ s)	Supply Voltage MAX (V)	Output Current MAX (A)	Standby Current MAX (mA)	Power Dissipation MAX (W)
PA86EU	350	200	0.15	2.5	23
MP400	350	50	0.2	2.5	14.2
PA91	300	450	0.2	14	30
PA90	300	400	0.2	14	30
PB58	250	300	1.5	35	70
PA96	250	300	1.5	18	83
PA69EU	200	200	0.05	2.5	23
PA09	200	80	2	85	78
<b>NEW</b> MP103	180	200	15	26	54
PA84	180	300	0.04	7.5	17.5
MP108FDA	170	200	11	65	100
MP108FD	170	200	10	65	100
MP111FD	130	100	15	157	170
PB51	100	300	1.5	18	83
PB50	100	200	2	25	35
PA05	100	100	30	120	250

# High-Voltage Linear Amplifiers

## SPECIFICATIONS

Model	Supply Voltage MAX (V)	Output Current MAX (A)	Slew Rate TYP (V/ $\mu$ s)	Standby Current MAX (mA)	Power Dissipation MAX (W)
PA89	1200	0.075	30	6	40
PA94	900	0.1	700	24	30
PA95	900	0.1	30	2.2	30
PA97	900	0.01	8	1	5
PA15	450	0.2	20	3	30
PA85	450	0.2	1000	25	30
PA88	450	0.1	30	2	15
PA91	450	0.2	300	14	30
PA98	450	0.2	1000	25	30
PA90	400	0.2	300	14	30
PA92	400	4	50	14	80
PA93	400	8	50	14	125
PA240CC	350	0.06	40	2.5	14
PA241CE	350	0.06	40	2.5	12
PA243DF	350	0.06	40	5	11/20
PA78DK	350	0.15	350	2.5	23
PA79DK	350	0.15	350	2.5	26

# High-Voltage Linear Amplifiers (continued)

## SPECIFICATIONS

Model	Supply Voltage MAX (V)	Output Current MAX (A)	Slew Rate TYP (V/ $\mu$ s)	Standby Current MAX (mA)	Power Dissipation MAX (W)
PA08	300	0.15	30	8.5	17.5
PA82J	300	0.015	20	8.5	11.5
PA83	300	0.075	30	8.5	17.5
PA84	300	0.04	180	7.5	17.5
PA96	300	1.5	250	18	83
PB51	300	1.5	100	18	83
PB58	300	1.5	250	35	70
<b>NEW</b> MP103	200	15	180	26	54
MP108FD	200	10	170	65	100
MP240FC	200	20	14	25	170
MP38CL	200	7	63	24	125
PA04	200	20	50	90	200
<b>NEW</b> PA107	200	5	3000	35	60
PA52	200	40	50	36	400
PA69EU	200	0.05	200	2.5	23
PA86EU	200	0.15	350	2.5	23
PB50	200	2	100	25	35
PA03	150	30	8	300	500
PA81J	150	0.03	20	8.5	11.5
MP111FD	100	15	130	157	170
MP230FC	100	30	15	35	210
MP39CL	100	10	10	24	125
PA05	100	30	100	120	250
PA07	100	5	4	30	67
PA50	100	40	50	36	400

# High-Voltage PWM Amplifiers

## SPECIFICATIONS

Model	Supply Voltage MAX (V)	Output Current MAX (A)	Switching Frequency (kHz)	Power Delivery MAX (W)	Int. Power MAX (W)
MSA260KC	450	20	50	250	300
SA08	450	20	22.5	250	250
SA12	200	15	200	250	185
MSA240KC	100	20	50	250	250
SA01	100	20	42	185	250
SA03	100	30	22.5	300	250
SA50	80	5	45	120	140
SA60	80	10	250	140	80

# Geophysical Products

## COMPLETE SEISMIC MEASUREMENT SOLUTIONS

Cirrus Logic has set the standard in seismic IC solutions for over 15 years, offering complete measurement channel chipsets with best in class performance and integration. This product

line includes application specific amplifiers, modulators, decimation filters, and test DACs for in circuit self testing.

Cirrus Logic system solutions include Single-S,<sup>™</sup> Total-S,<sup>™</sup> and Extreme-S.<sup>™</sup> Single-S<sup>™</sup> for single-sensor or traditional 1C systems.

Total-S<sup>™</sup> for multi-component 3C/4C systems or multi channel 1C systems. Extreme-S<sup>™</sup> for high-temperature downhole systems.

### SINGLE-S<sup>™</sup>

- CS3301A
- CS3302A
- CS5373A
- CS5378

### TOTAL-S<sup>™</sup>

- CS3301A
- CS3302A
- CS4373A
- CS5371A
- CS5372A
- CS5374
- CS5376A

### EXTREME-S<sup>™</sup>

- CS5201
- CS5203A
- CS5204
- CS5205
- CS5207

# Single-S

## SPECIFICATIONS

Part	Description	Resolution (bits)	Dynamic Range (dB)	THD (dB)	Power Consumption Per Channel (mW)	Signal Range (V)	Package
<b>CS3301A</b>	Geophone amplifier	—	—	-121	27.5	5 V <sub>p-p</sub> diff	24 SSOP
<b>CS3302A</b>	Hydrophone amplifier	—	—	-118	25	5 V <sub>p-p</sub> diff	24 SSOP
<b>CS5373A</b>	DS modulator	24	124	-118	25	5 V <sub>p-p</sub> diff	28 SSOP
	D/A converter	24	114	-116	40	5 V <sub>p-p</sub> diff	
<b>CS5378</b>	Filter with PLL	—	—	—	20	—	28 SSOP

# Total-S

## SPECIFICATIONS

Part	Description	Resolution (bits)	Dynamic Range (dB)	THD (dB)	Power Consumption Per Channel (mW)	Signal Range (V)	Package
<b>CS3301A</b>	Geophone amplifier	—	—	-121	27.5	5 V <sub>p-p</sub> diff	24 SSOP
<b>CS3302A</b>	Hydrophone amplifier	—	—	-118	25	5 V <sub>p-p</sub> diff	24 SSOP
<b>CS4373A</b>	D/A converter	24	114	-116	10	5 V <sub>p-p</sub> diff	28 SSOP
<b>CS5371A</b>	Single DS modulator	24	124	-118	25	5 V <sub>p-p</sub> diff	24 SSOP
<b>CS5372A</b>	Dual DS modulator	24	124	-118	25	5 V <sub>p-p</sub> diff	24 SSOP
<b>CS5374</b>	Dual high performance amplifier & DS modulator	24	124	-118	32.5	5 V <sub>p-p</sub> diff	48 QFN
<b>CS5376A</b>	Quad filter	—	—	—	<10	—	64 TQFP

# Extreme-S

## SPECIFICATIONS

Part	Description	Resolution (bits)	Dynamic Range (dB)	THD (dB)	Power Consumption Per Channel (mW)	Signal Range (V)	Package
<b>CS5201</b>	High-temperature D/A converter	24	114	-116	10	5 V <sub>p-p</sub> diff	28 SOIC ceramic
<b>CS5203A</b>	High-temperature amplifier	—	—	-121	28	5 V <sub>p-p</sub> diff	24 SOIC ceramic
<b>CS5204</b>	High-temperature quad filter	—	—	—	<10	—	64 ceramic
<b>CS5205</b>	High-temperature DS modulator	24	122	-117	32.5	5 V <sub>p-p</sub> diff	24 SOIC ceramic
<b>CS5207</b>	High-temperature DS modulator	24	122	-117	32.5	5 V <sub>p-p</sub> diff	24 SOIC ceramic

# Energy Measurement Products

## POWER METERING AND MONITORING APPLICATIONS

Cirrus Logic is a proven leader in the power metering and monitoring market with over 35Mu shipped during the past decade. Combining advanced Delta-Sigma technology with expert Digital Signal Processing, Cirrus Logic offers a broad product family with superior performance to support a wide variety of application requirements. Easy to use design in and development tools enable quick time to market. Standardize on Cirrus Logic for industry leading performance at competitive prices.

### ENERGY MEASUREMENT

- CS5451A
- CS5460A
- CS5461A
- CS5462
- CS5463
- CS5464
- CS5466
- CS5467

# Energy Measurement

## SPECIFICATIONS

Part	Channels	Energy Data Linearity – 1000:1 Range	Energy Pulse Outputs	Instantaneous I and V	Real (Active) Power	$I_{RMS}$ , $V_{RMS}$	Apparent Power (S)	Reactive Power (Q)	Temp Sensor	Package
<b>CS5451A</b>	6	—	—	✓	—	—	—	—	—	28 SSOP
<b>CS5460A</b>	2	0.1% of reading	✓	✓	✓	✓	—	—	—	24 SSOP
<b>CS5461A</b>	2	0.1% of reading	✓	✓	✓	✓	✓	—	✓	24 SSOP
<b>CS5462</b>	2	0.1% of reading	✓	—	✓	—	—	—	—	24 SSOP
<b>CS5463</b>	2	0.1% of reading	✓	✓	✓	✓	✓	✓	✓	24 SSOP
<b>CS5464</b>	3	0.1% of reading	✓	✓	✓	✓	✓	✓	✓	28 SSOP
<b>CS5466</b>	2	0.1% of reading	✓	—	✓	—	—	—	—	24 SSOP
<b>CS5467</b>	4	0.1% of reading	✓	✓	✓	✓	✓	✓	✓	28 SSOP

# Communication Components

WIDE VARIETY OF INTERFACE, TI, ETHERNET,  
INFRARED AND ECHO CANCELLER ICs

Cirrus Logic, a pioneer in the development of world-class telecommunication ICs, continues to provide cost-effective solutions.

## T1/E1/J1 LIUs

### Short-Haul Single-Port Line Interface Units

- CS61535A
- CS61574A
- CS61575
- CS61577

### Short-Haul Multi-Port Line Interface Units

- CS61584A
- CS61880
- CS61884

## INFRARED & ECHO CANCELLER

- CS6422
- CS8130

## ETHERNET

- CS8900A
- CS8952

# Short-Haul Single-Port Line Interface Units

## SPECIFICATIONS

Part	Power Supply (V)	Control Modes	Line Coders	Number of Channels	TBR-12 Compliant	Impedance Matching Line Driver	Package
<b>CS61535A</b>	5	Host, H/W & Extended H/W	AMI, B8ZS & HDB3	1	✓	✓	28 PLCC
<b>CS61574A</b>	5	Host, H/W & Extended H/W	AMI, B8ZS & HDB3	1	✓	✓	28 PLCC
<b>CS61575</b>	5	Host, H/W & Extended H/W	AMI, B8ZS & HDB3	1	✓	✓	28 PLCC
<b>CS61577</b>	5	Host, H/W & Extended H/W	AMI, B8ZS & HDB3	1	✓	—	28 PLCC

# Short-Haul Multi-Port Line Interface Units

## SPECIFICATIONS

Part	Power Supply (V)	Control Modes	Line Coders	Number of Channels	TBR-12 Compliant	Impedance Matching Line Driver	Arbitrary Waveform Option	Package
<b>CS61584A</b>	3.3 or 5	Host & H/W	AMI, B8ZS & HDB3	2	✓	✓	✓	64 TQFP
<b>CS61880</b>	3.3	Host & H/W	AMI & HDB3	8	✓	✓	✓	144 LQFP 160 BGA
<b>CS61884</b>	3.3	Host & H/W	AMI, HDB3 & B8ZS	8	✓	✓	✓	144 LQFP

# Infrared & Echo Cancellor

## SPECIFICATIONS

Part	Media Supported	Digital Interface	Number of Channels	Power Supply (V)	Package
<b>CS6422</b>	Analog audio (MIC and telephone)	Acoustic interface and network interface (both ANALOG)	2 – Full Duplex	5	20 SOIC
<b>CS8130</b>	IR	IrDA, HPSIR, ASK (CW) and TV remote compatible	1	2 to 5	20 SSOP (5x7 mm)

# Ethernet

## SPECIFICATIONS

Part	Media Supported	Digital Interface	Number of Channels	Power Supply	Package
<b>CS8900A</b>	10Base-T	ISA and general purpose parallel	1	5 V, 3.3 V	100 LQFP
<b>CS8952</b>	10Base-T, 100Base-X and NRZ (optical)	MII	1	5 V with support of 3.3 V digital I/O	100 TQFP

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MP240FC	19, 22	PA88	21		
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## CONTACT US

For technical assistance in North America, please call:  
**1-800-625-4084.**

For International technical assistance, please contact the Cirrus Logic office in your region.

For a complete list of Cirrus Logic's sales representatives and distributors, please visit the Contacts area at [www.cirrus.com](http://www.cirrus.com).



### NORTH AMERICA

#### CORPORATE HEADQUARTERS

2901 Via Fortuna  
Austin, Texas 78746  
United States  
T +1-512-851-4000  
Toll-Free +1-800-888-5016

#### CIRRUS LOGIC TUCSON

5980 N. Shannon Road  
Tucson, Arizona 85741  
United States  
T +1-520-690-8600  
Toll-Free +1-800-888-5016

### ASIA PACIFIC

#### CIRRUS LOGIC INTERNATIONAL LTD.

Suite 1427  
Ocean Centre  
Harbour City  
5 Canton Road  
Tsimshatsui  
Kowloon, Hong Kong  
China  
T +852-2376-0801  
[www.cirrus.com/cn](http://www.cirrus.com/cn)

### JAPAN

#### CIRRUS LOGIC K.K.

Aioi Sonpo, Building 6F  
5-6 Niban-cho  
Chiyoda-ku  
Tokyo, Japan 102-0084  
T +81-3-5226-7757  
[www.cirrus.com/jp](http://www.cirrus.com/jp)

### EUROPE

#### CIRRUS LOGIC (U.K.) LTD.

Ground Floor Offices  
James House, Mere Park  
Dedmere Road  
Marlow, Buckinghamshire SL7 1FJ  
United Kingdom  
T +44-0-1628-891-300