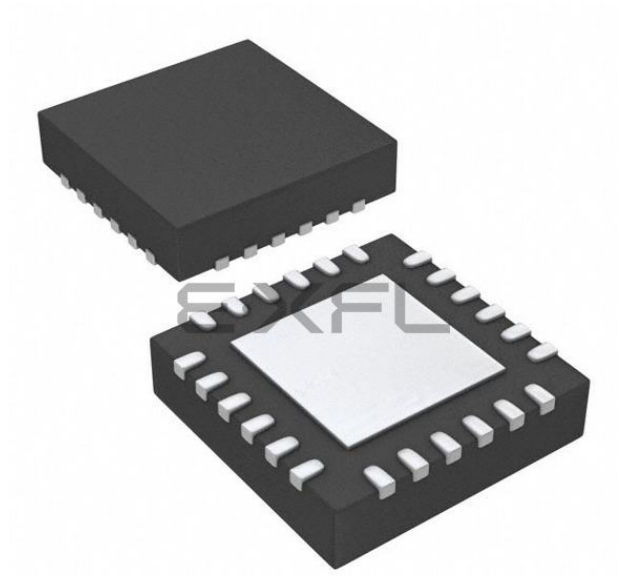

Welcome to E-XFL.COM

Understanding Embedded - DSP (Digital Signal Processors)

Embedded - DSP (Digital Signal Processors) are specialized microprocessors designed to perform complex mathematical computations on digital signals in real-time. Unlike general-purpose processors, DSPs are optimized for high-speed numeric processing tasks, making them ideal for applications that require efficient and precise manipulation of digital data. These processors are fundamental in converting and processing signals in various forms, including audio, video, and communication signals, ensuring that data is accurately interpreted and utilized in embedded systems.

Applications of Embedded - DSP (Digital Signal Processors)

Details	
Product Status	Active
Type	Fixed Point
Interface	I²C, SPI
Clock Rate	80MHz
Non-Volatile Memory	ROM (160kB)
On-Chip RAM	256kB
Voltage - I/O	1.8V, 3.3V
Voltage - Core	1.00V
Operating Temperature	0°C ~ 70°C (TA)
Mounting Type	Surface Mount
Package / Case	24-VFQFN Exposed Pad
Supplier Device Package	24-QFN
Purchase URL	https://www.e-xfl.com/product-detail/cirrus-logic/cs48l10-cnzr

Product Summary

CIRRUS LOGIC®

2012 Cirrus Logic Product Summary

First choice in high-precision analog + digital signal processing components for the audio + energy markets.

Printed in the USA

CIRRUS LOGIC®

A Leader In Innovative Audio ICs

Audio Components

Cirrus Logic is a recognized leader in analog and mixed-signal audio converter ICs and audio processors that enable today's new consumer, professional and automotive entertainment products. Our products include analog-to-digital converters ("ADCs"), digital-to-analog converters ("DACs"), codecs that integrate ADCs and DACs into a single IC, digital interface ICs (eg. "S/PDIF" receivers), Class D digital amplifier controllers and power stages and audio DSPs. Our products are featured in a wide array of consumer applications, including smartphones, tablets, portable media players, soundbars, complete home theater systems, set-top boxes, gaming devices, sound cards and digital TVs. Applications for products within professional markets include digital mixing consoles, multitrack digital recorders and effects processors, and applications for products within automotive markets include amplifiers, satellite radio systems and multispeaker car audio systems.

Audio DSPs
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- CS495314
- CS497014
- NEW CS48Lxx Family

Audio SOCs
- CS470xx Family

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- CobraNet LE Reference Design
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- CS35L03

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- CS4525

Volume Control
- CS3308
- CS3310
- CS3318

Interfaces & Sample-Rate Converters
- CS8406
- CS8416
- CS8420
- CS8421
- CS8422
- CS8427

Clock Generation & Jitter Reduction
- CS2000
- CS2100
- CS2200
- CS2300

Audio DSPs

	Part	Processor	Key Firmwares & Features	DSP Core Speed	Grade†	Package
	CS485xx	Tiny, cost effective, mega-performance PCM processors targeted for: mini-systems, DVD receivers, soundbars, car audio, DTVs				
	CS48520	Single 32-bit	4 channel audio PP1	150 MHz (300 M MAC/Sec)	CQZ	48 QFP
	CS48540	Single 32-bit	8 channel audio PP1	150 MHz (600 M MAC/Sec)	CQZ	48 QFP
				150 MHz (300 M MAC/Sec)	DQZ	
	CS48560	Single 32-bit	8 channel audio PP1	150 MHz (300 M MAC/Sec)	CQZ	48 QFP
				150 MHz (300 M MAC/Sec)	DQZ	
	CS4953xx	Single-chip multistandard surround sound decoder targeted for playback from analog & S/PDIF sources				
	CS495314	Dual 32-bit	(DD, DDEX, DTS, DTSES, DTS96, AAC) + PP2	150 MHz (600 M MAC/Sec)	CVZ	128 LQFP
				131 MHz (600 M MAC/Sec)	DVZ	
	CS4970xx	Single-chip multistandard surround sound decoder targeted for playback from HD DVD™, Blu-ray Disc® players, & all analog, S/PDIF & HDMI® sources				
	CS497014	Dual 32-bit	(DD+, DTHD, DD, DDEX, AAC) + PP2	150 MHz (600 M MAC/Sec)	CVZ	128 LQFP
				131 MHz (600 M MAC/Sec)	DVZ	
	CS48Lxx	Ultra low power voice and Audio DSP subsystem				
NEW	CS48L10	Single 32-bit	MP3, WMA, AAC	1.0 V 80 MHz	CNZ	24 QFN 24 WLSCP
				1.2 V 130 MHz	CWZ	
				1.0 V 80 MHz	DNZ	
				1.2 V 130 MHz	DWZ	
				1.0 V 80 MHz	ENZ	
				1.2 V 130 MHz	EWZ	
NEW	CS48L11	Single 32-bit	MP3, WMA, AAC, AC3, OH, PL2	1.0 V 80 MHz	CNZ	24 QFN
				1.2 V 150 MHz		
				1.0 V 80 MHz	DNZ	
				1.2 V 150 MHz		
				1.0 V 80 MHz	ENZ	
				1.2 V 150 MHz		

†C grade parts have a temperature range between 0ºC and 70ºC, D grade parts have a temperature range between -40ºC and 85ºC, and E grade parts have a temperature range between -40ºC and 105ºC.

Audio SOCs (DSP with Integrated Mixed-Signal)

Part	Processor	Resol. Bits	Dynamic Range (dB)	Convertors	Comments	Speed (MIPS)	Grade†	Package
CS470xx	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.							
CS47024	Single 32-bit	24	105 ADC 108 DAC	2 - ADC 4 - DAC	2 ADC w/ 5:1 MUX, 4 DAC, S/PDIF Rx/Tx, 8 channel HW SRC block	150 MHz	CQZ	100 LQFP
						131 MHz	DQZ	
						113 MHz	EQZ	
CS47028	Single 32-bit	24	105 ADC 108 DAC	2 - ADC 8 - DAC	2 ADC w/ 5:1 MUX on 1 ADC, 8 DAC, S/PDIF Rx/Tx, 8 channel HW SRC	150 MHz	CQZ	100 LQFP
						131 MHz	DQZ	
						113 MHz	EQZ	
CS47048	Single 32-bit	24	105 ADC 108 DAC	4 - ADC 8 - DAC	4 ADC w/ 5:1 MUX, 8 DAC, S/PDIF Rx/Tx, 8 channel HW SRC	150 MHz	CQZ	100 LQFP
						131 MHz	DQZ	
						113 MHz	EQZ	

†C grade parts have a temperature range between 0ºC and 70ºC, D grade parts have a temperature range between -40ºC and 85ºC, and E grade parts have a temperature range between -40ºC and 105ºC.

Recommended Replacements for New Designs

Part Number	Status	Recommended Replacement
CS48AU2B	NRND	CS48520
CS48DV2A	NRND	CS48520
CS48DV2B	NRND	CS48520
CS493253	EOL	CS497014-CVZ
CS493254	EOL	CS497014-CVZ
CS493263	EOL	CS495314-CVZ
CS493264	EOL	CS495314-CVZ
CS493295	EOL	CS495314-CVZ
CS493302	EOL	CS48540-CQZ
CS494xxx (CS494003)	NRND	CS495314-CVZ
CS4950xx (CS495002)	NRND	CS495314-CVZ
CS4951xx (CS495102)	NRND	CS495314-CVZ
CS4952xx (CS495202)	NRND	CS495314-CVZ
CS495303-CVZ	NRND	CS497014-CVZ
CS495303-CQZ	EOL	CS497014-CVZ
CS495304	EOL	CS497014-CVZ
CS495313-CQZ	EOL	CS495314-CVZ
CS495303-CVZ	NRND	CS495314-CVZ

Algorithm & Nomenclature Abbreviations

Decoding Algorithm & Nomenclature Abbreviation Table	
AAC = MPEG-2 AAC Multichannel Low Complexity	DTSLBR = 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	

Post-Processing (PP1) Inclusion & Algorithm Abbreviation Table	
APP = Advanced Post-Processor	DVS = Dolby Virtual Speaker® 2
BXR = Cirrus Band XpandeR™	L7 = Logic7™
CBE = Cirrus Bass Enhancement	LIM = Compressor/Limiter
CBM = Cross-Bar Mixer	NEO = DTS Neo:6™
CSHP = SRS Circle Surround Headphone (includes SRS HP 360º & Circle Surround)	NER = DTS Neural Surround
CVT = Cirrus Virtualization Technology	PEQ = Parametric EQ
DH = Dolby Headphone® 2	PL = Dolby® Pro Logic®
DVL = Cirrus® Dynamic Volume Leveler	PLII = Dolby Pro Logic II
DVOL = Dolby Volume	PLIIx = Dolby Pro Logic® IIx
DVOLMC= Dolby Volume Multichannel	PLZz = Dolby Pro Logic IIz
REEQ = THX Cinema Re-EQ™	TSXT = SRS® TruSurround XT®
SPP = Stand Post-Processory	TUX = THX Select2/Ultra2™ Surround EX
TB = SRS TruBass®	TV = SRS TruVolume®
TC = Tone Control	TVMC = SRS TruVolume Multichannel
TEX = THX Surround EX™	WOW = SRS® WOW™
THX = THX® Cinema	WOWHD = SRS WOW HD™
TSHD = SRS TruSurround® HD/HD4	

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

Audio DSP Tools

Features

DSP Composer	DSP Composer™ is a graphical tool supporting drag-and-drop design of custom audio signal flows. Users of this tool can create custom audio processing firmware for any of the DSP IC Families without writing custom DSP code, by combining choices from a large selection of existing audio processing primitive elements. DSP Composer also provides run-time control of firmware parameters, both for custom processing blocks and for Cirrus Logic supplied processing blocks.
CLIDE	The Cirrus Logic Integrated Development Environment (CLIDE™) is an Eclipse-based workbench supporting development of custom code for Cirrus Logic DSPs. CLIDE encapsulates many of the other available programming tools, including: assembler; linker; C compiler; debugger; and simulator. CLIDE also includes a set of wizards to aid in the creation of different forms of DSP projects, such as custom ULDs and custom Composer primitives.
DSP Condenser	DSP Condenser™ is a set of tools and a methodology to support creation of a complex AVR or soundbar application using Cirrus Logic multi-core DSPs. The tool set includes tools for defining the firmware and configuration settings for all DSP firmware to be supported by the application, plus sample microcode (written in C) for controlling the DSP. The DSP Condenser tool set "condenses" the output of multiple DSP Composer projects into a single flash image that is then managed by the DSP operating system (OS).
Micro Condenser	Micro Condenser™ is a set of tools and a methodology to support creation of flash image containing firmware and configuration settings for a single-core or multi-core DSP. The tool set includes sample microcode (written in C) for controlling the DSP.
C Compiler	The Cirrus C Compiler (CCC) is an ISO-compliant C compiler with ISO-recommended enhancements for supporting DSP architectures, including: support for fixed point arithmetic types; and support for separate memory spaces.
CDB-MCU-DEBUG Board	The CDB-MCU-DEBUG Rev B board is a USB based debug interface that enables a customer to debug/tune the end product using the Cirrus Logic tools such as CLIDE and DSP Composer.

CobraNet System Modules

Product	Description	CobraNet® Part Numbers	Audio Channels over Ethernet (full-duplex)	Serial Input/ Output Ports	Ethernet Interface	Integrated DSP (MIPS)	Board Dimensions
CM-1	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"
CM-2	Digital audio network interface module with dual Ethernet ports and audio DSP (available as a reference design)	CPB181012-CM2, CPB181022-CM2, CPB496122-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"
EV-2	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"
CobraCom Reference Design	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"
CobraNet LE Reference Design	Low-cost, 2 channel I/O end-node reference design	Available direct from Attero Tech www.atterotech.com	2	Stereo 1/8" input and output, stereo RCA input and output, I²S 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

Family	Description	CobraNet® Part Numbers	Audio Channels over Ethernet	Serial Input/Serial Output Ports	Ethernet Interface	IC Package
CS1810xx CS4961xx*	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

DSP Conductor	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.
CobraCAD	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.
CobraNet Discovery	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

Part Number	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog Inputs	Power Supply (V)	Comments	Package
CS5343/44	24	98	–92	96	Single-ended	VA = 3.3 or 5	CS5343 – I^2S CS5344 – LJ	10 TSSOP
CS5340	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
CS5341	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
CS5342	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
CS5346	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
CS5351	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
CS5361	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
CS5364/66/68	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
CS5381	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

Part Number	Channels	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog Outputs	Power Supply (V)	Comments	Package
CS4334/35/38/39	2	24	96	–88	96	Single-ended	VA = 5	Entry-level stereo DAC	8 SOIC
CS4344/45/48	2	24	105	–90	192	Single-ended	VA = 3.3 or 5	Upgrade for CS4340 and CS4340A	10 TSSOP
CS4349	2	24	101	–91	192	Single-ended	VA = 3.3 or 5	1 V_{RMS} @ 3.3 V, Volume Control	24 TSSOP
CS4350	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
CS4351	2	24	112	–100	192	Single-ended	VA = 9 or 12 VD = 3.3 VL = 1.8 to 3	Line driver, 2 V_{RMS} output	20 TSSOP
CS4352	2	24	106	–93	192	Single-ended	VA = 9 or 12 VD = 3.3 VL = 1.5 to 5	Line driver, 2 V_{RMS} output	20 TSSOP
CS4353	2	24	106	–93	192	Single-ended	VA = 3.3 VCP = 3.3 VL = 0.9 to 3.3	Ground-centered 2 V_{RMS} line-level outputs	24 QFN
CS4354	2	24	101	-86	192	Single-ended	VA/VD = 5.0 VL = 1.5 to 5.0	2 V_{RMS} line driver	14 SOIC
CS4361	6	24	105	–95	192	Single-ended	VA = 5 VL = 1.8 to 5	Entry-level 6-channel DAC	20 TSSOP
CS4362A/82A	6/8	24	114	–100	192	Differential	VA = 5 VD = 2.5 VL = 1.8 to 5	6-/8-channel DAC, DSD	48 LQFP
CS4364/84	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
CS4365/85	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
NEW CS4385A	8	24	114	–100	192	Differential	VA = 5 VD = 2.5 VL = 1.8 to 5	8-channel DAC, DSD, TDM. Unlike the CS4385, the CS4385A offers access to TDM through hardware mode, and offers a wider range of TDM timings.	48 LQFP
CS4392	2	24	114	–100	192	Differential	VA = 5 VL = 1.8 to 5	DSD, selectable digital filters, pin compatible with CS4391A	20 TSSOP
CS4398	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

Part	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog I/O	Power Supply (V)	Comments	Package
CS4245	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
CS4265	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
CS4270	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
CS4271	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
CS4272	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

Part	Bus	Converters	Feature
CS4207	HD-Audio	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

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

Multichannel Codecs

	Part	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate (kHz)	Analog I/O	Power Supply (V)	Comments	Package
	CS42416/26	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
	CS42418/28	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
	CS42432	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
	CS42435	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
	CS42436/38	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
NEW	CS4244	24	108 DAC 105 ADC	-90 DAC -95 ADC	192	Single-ended or Differential	VA = 3.3 or 5 VL = 1.8 to 5	4 DACs, 4 ADCs, PCM and TDM I/F	40 QFN
NEW	CS4234	24	108 DAC 105 ADC	-90 DAC -95 ADC	192	Single-ended or Differential	VA = 3.3 or 5 VL = 1.8 to 5	5 DACS, 4 ADCs, PCM and TDM I/F	40 QFN
	CS42448	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
	CS42516/26	24	110/114 DAC 114 ADC	–100 DAC –100 ADC	192	Differential	VA = 5 VD = 3.3 or 5	6 DACs, 2 ADCs, S/PDIF Rx, digital volume control	64 LQFP
	CS42518/28	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
	CS42888	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

Part	Resolution (bits)	Dynamic Range (dB)	THD+N (dB)	Sample Rate(kHz)	Analog I/O	Power Supply (V)	Comments	Package
CS42L51	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
CS42L52	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
CS42L55	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
CS42L73	24	91 ADC 97 DAC	-85	48	Pseudo-differential	VA/VCP/VL = 1.66 to 1.94 VP = 3.0 to 5.25 VD = 0.85 to 1.40	2 ADCs, 4 DACs, Class-H HP, Class A/B speaker driver, 3x asynchronous serial ports	60 WLCSP 65 BGA
CS43L21	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
CS43L22	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
CS53L21	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

Low Power Class-D Audio Amplifiers

Part	Power (W)	Dynamic Range (dB)	THD+N %	PSRR (dB)	Channels	Power Supply (V)	Gain	Comments	Package
CS35L00	3	98	0.02	-85	1	2.5 to 5.5	Selectable +6/+12 dB	Hybrid Class-D architecture, < 1 mA quiescent current	10 DFN
CS35L01	3	98	0.02	-85	1	2.5 to 5.5	+6 dB	Hybrid Class-D architecture, < 1 mA quiescent current	9 WLCSP
CS35L03	3	98	0.02	-85	1	2.5 to 5.5	+12 dB	Hybrid Class-D architecture, < 1 mA quiescent current	9 WLCSP

Integrated Class-D Audio Amplifiers

Part	Power (W)	Dynamic Range (dB)	THD+N %	Channels	Power Supply (V)	Comments	Package
CS4525	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

Volume Control

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

Interfaces & Sample-Rate Converters

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
CS8406	192	✓	–	✓	✓	✓	✓	–	28 SOIC 28 TSSOP
CS8416	192	–	✓	✓	✓	✓	✓	–	28 SOIC 28 TSSOP 28 QFN
CS8420	96	✓	✓	✓	✓	✓	✓	✓	28 SOIC
CS8421	192	–	–	–	–	–	–	✓	20 TSSOP 20 QFN
CS8422	192	–	✓	✓	✓	✓	✓	✓	32 QFN
CS8427	96	✓	✓	✓	✓	✓	✓	–	28 SOIC 28 TSSOP

Clock Generation and Jitter Reduction

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
CS2000	CS2000-OTP	✓	✓	3.3	50 Hz to 30 MHz	8 to 75 MHz	6 to 75 MHz	10 MSOP
CS2100	CS2100-OTP	–	✓	3.3	50 Hz to 30 MHz	8 to 75 MHz	6 to 75 MHz	10 MSOP
CS2200	CS2200-OTP	✓	–	3.3	–	8 to 75 MHz	6 to 75 MHz	10 MSOP
CS2300	CS2300-OTP	–	✓	3.3	50 Hz to 30 MHz	Internally generated	6 to 75 MHz	10 MSOP

Energy Measurement and Power Management Products

Energy Solutions

For over a decade, Cirrus Logic has been a proven leader in the energy metering and monitoring market. 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.

Enabled by Cirrus Logic's EXL Core® architecture, the CS1501 and CS1601 series of digital PFC controllers intelligently solve power management challenges, allowing for smaller total solution size and better efficiency and THD across load conditions. Ideal for power supplies up to 300 W, applications include commercial lighting, digital TV, notebook adapters, desktops and servers.

Cirrus Logic has set the standard for seismic ICs — including complete data acquisition system solutions of best-in-class single-sensor and multi-sensor chipsets. Cirrus Logic's products for energy exploration applications include hydrophone and geophone amplifiers, high-fidelity Delta-Sigma modulators, and seismic digital filters plus test DAC.

Solving the challenges in the LED lighting market is the newest conquest in energy products from Cirrus Logic. Through the unique digital algorithms within TruDim™ technology, a new lineup of digital LED controllers has effectively solved the LED lamp's most glaring challenge: dimmer compatibility. Cirrus Logic's 1610 LED controllers have been tested to provide near 100 percent dimming compatibility with a wide variety of dimmers representing the vast majority of the installed base. New LED controller products coming in 2012 will also help LED manufacturers improve LED color temperature quality and focus on system cost reduction.

Energy Measurement

- CS5451A
- CS5463
- CS5464
- CS5467
- NEW CS5480
- NEW CS5484
- NEW CS5490

Digital Power Factor Correction

- CS1501
- CS1601
- CS1601H

Geophysical/Seismic

- CS3301A
- CS3302A
- CS4373A
- CS5374
- CS5371A
- CS5372A
- CS5373A
- CS5376A
- CS5378

NEW LED Controllers

- CS1610
- CS1611
- CS1612
- CS1613

Energy Measurement

	Part	ADC Converters	Current Sensor Options	Active Energy Accuracy	Reactive Energy Accuracy	I_{RMS} Accuracy	SNR (dB)	Serial Comm	Digital Outputs	V_{REF} Drift (ppm/°C)	Input Voltage (V)	Power Cons. (mW)	Package
NEW	CS5480	3	Shunt / CT / Rogowski	0.1% over 4000:1 dynamic range	0.1% over 4000:1 dynamic range	0.1% over 1000:1 dynamic range	80	UART	3x Configurable Outputs	25	3.3	13	24 QFN
NEW	CS5484	4	Shunt / CT / Rogowski	0.1% over 4000:1 dynamic range	0.1% over 4000:1 dynamic range	0.1% over 1000:1 dynamic range	80	SPI / UART	4x Configurable Outputs	25	3.3	13	28 QFN
NEW	CS5490	2	Shunt / CT / Rogowski	0.1% over 4000:1 dynamic range	0.1% over 4000:1 dynamic range	0.1% over 1000:1 dynamic range	80	SPI / UART	Single Configurable Output	25	3.3	13	16 SOIC
	CS5451A	6	Shunt / CT	—	—	—	77	SPI	—	25	3 Analog; 3 Digital	23	28 SSOP
	CS5463	2	Shunt / CT	0.1% over 1000:1 dynamic range	0.2% over 1000:1 dynamic range	0.2% over 1000:1 dynamic range	78	SPI	Energy Pulses	40	5 Analog; 3.3 / 5 Digital	21	24 SSOP
	CS5464	3	Shunt / CT	0.1% over 1000:1 dynamic range	0.2% over 1000:1 dynamic range	0.2% over 1000:1 dynamic range	78	SPI	Energy Pulses	40	5 Analog; 3.3 / 5 Digital	25	28 SSOP
	CS5467	4	Shunt / CT	0.1% over 1000:1 dynamic range	0.2% over 1000:1 dynamic range	0.2% over 1000:1 dynamic range	78	SPI	Energy Pulses	40	5 Analog; 3.3 / 5 Digital	25	28 SSOP

Digital Power Factor Correction

Part	Max f_{sw} [kHz]	Valley Switching	Over-current Protection	IC Supply Current [mA]	Input Voltage Range (Vac)	Target Applications	Package
CS1501	70	✓	✓	1.5	90 to 265	DTV, Consumer Electronics, Server/Telecom	SOIC-8
CS1601	70	✓	✓	1.5	90 to 265 or 108 to 305	LED, HID, Fluorescent Lighting Ballasts	SOIC-8
CS1601H	100	✓	✓	1.7	90 to 265 or 108 to 305	DTV, LED/HID/Fluorescent Lighting Ballasts, Consumer Electronics	SOIC-8

Geophysical/Seismic

Single Channel

Part	Description	Resolution (bits)	Dynamic Range (dB)	THD (dB)	Power Consumption Per Channel (mW)	Signal Range (V)	Package
CS3301A	Geophone amplifier	—	—	–121	27.5	5 V_{p-p} diff	24 SSOP
CS3302A	Hydrophone amplifier	—	—	–118	25	5 V_{p-p} diff	24 SSOP
CS5373A	DS modulator	24	124	–118	25	5 V_{p-p} diff	28 SSOP
	D/A converter	24	114	–116	40	5 V_{p-p} diff	
CS5378	Filter with PLL	—	—	—	16	—	28 SSOP

Multichannel

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

NEW LED Controllers

Part	TRIAC Dimmable	Output Stage Topology	Input Voltage Range	Maximum Output Power	LED Output Channels	Power Factor	Output Current Reg.	Min. Dimming Level	External Over Temp Protect	Package
CS1610	✓	Flyback; Buck-boost	100 – 120 V	< 25 W	1	> 0.9	< 5%	0%	✓	16eSOIC
CS1611	✓	Flyback; Buck-boost	220 – 240 V	< 25 W	1	> 0.9	< 5%	0%	✓	16eSOIC
CS1612	✓	Buck; Tapped-buck	100 – 120 V	< 25 W	1	> 0.9	< 5%	0%	✓	16eSOIC
CS1613	✓	Buck; Tapped-buck	220 – 240 V	< 25 W	1	> 0.9	< 5%	0%	✓	16eSOIC

High-Precision Analog & Mixed-Signal ICs & Processors

Industrial Components

Cirrus Logic high-precision analog and mixed-signal ICs for industrial measurement applications — such as industrial process control, analytical instruments and 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, modulator and amplifier ICs, and ARM9-based system-on-chip processors.

Amplifiers
- CS3002
- CS3003
- CS3004
- 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

Part Number	Device	Supply Voltage (V)	Supply Current (mA)	V_{OS} (RV) Max	V_{OS} Drift (RV/ºC)	e_{NOISE} (nV/ Hz)	A_{OL} min (dB)	Package
CS3002	Dual	2.7 to 6.7	3.6	10	0.05	6	200	8 SOIC
CS3003	Single	2.7 to 5.25	1.0	10	0.05	17	150	8 SOIC
CS3004	Dual	2.7 to 5.25	2.0	10	0.05	17	150	8 SOIC
CS3012	Dual	2.7 to 6.7	1.7	10	0.05	12	200	8 SOIC
CS3013	Single	2.7 to 5.25	0.5	10	0.05	22	135	8 SOIC
CS3014	Dual	2.7 to 5.25	1.0	10	0.05	22	135	8 SOIC

ARM 9 Embedded Processors

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
EP9301	166	16/16	✓	–	–	2	–	–	–	5 ADC	208 TQFP
EP9302	200	16/16	✓	–	–	2	–	–	✓	5 ADC	208 LQFP
EP9307	200	16/16	✓	–	–	3	✓	✓	✓	8-wire	272 TFBGA
EP9312	200	16/16	✓	–	2	3	✓	–	✓	8-wire	352 PBGA
EP9315	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
NAS ARM 9	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

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

Delta-Sigma A/D Converters with Integrated Amplifiers

Part	Resolution (bits)	Throughput (Sps)	Integral Linearity (%FS)	Differential Linearity (fLSB)	Number of Channels	Power Consumption (mW)	Package
CS5521	16	1 – 400	0.0015%	NMC	2	6	20 SSOP
CS5522	24	1 – 606	7.0E-4%	NMC	2	9	20 SSOP
CS5523	16	1 – 400	0.0015%	NMC	4	6	24 SSOP
CS5524	24	1 – 606	7.0E-4%	NMC	4	9	24 SSOP
CS5525	16	3 – 606	0.0015%	NMC	1	9.4	20 SSOP
CS5526	20	3 – 606	7.0E-4%	NMC	1	9.4	20 SSOP
CS5528	24	1 – 606	7.0E-4%	NMC	8	9	24 SSOP
CS5530	24	7 – 3840	f0.0015%	NMC	1	35	20 SSOP
CS5531	16	7 – 3840	f0.0015%	NMC	2	35	20 SSOP
CS5532	24	7 – 3840	f0.0015%	NMC	2	35	20 SSOP
CS5533	16	7 – 3840	f0.0015%	NMC	4	35	24 SSOP
CS5534	24	7 – 3840	f0.0015%	NMC	4	35	24 SSOP
CS5550	24	2440 – 4000	0.01%	NMC	2	21	24 SSOP

High-Throughput Delta-Sigma A/D Converters

Part	Resolution (bits)	Throughput (kSPS)	Integral Linearity (%FS)	Differential Linearity (fLSB)	Number of Channels	Power Consumption (mW)	Package
CS5560	24	50	f5 ppm	0.1	1, Differential	90	24 SSOP
CS5566	24	5	f5 ppm	0.1	1, Differential	20	24 SSOP
CS5571	16	100	f8 ppm	0.1	1, Single-ended	85	24 SSOP
CS5581	16	200	f8 ppm	0.1	1, Single-ended	85	24 SSOP

Power Analog ICs, Modules And Hybrids

Apex Precision Power® Products

Apex Precision Power is the technology inside Cirrus Logic's high performance power analog family of products. This technology drives the design innovation for Cirrus Logic's linear power operational amplifiers, pulse width modulation (PWM) amplifiers, and precision voltage references (VRE). Product form factors include monolithic ICs, board-level "open frame" modules, and traditional hybrid designs that can deliver up to 50 A of continuous output current and voltage supply operation ranging from 8.5 V to 1200 V. Target applications focus on the high power precision control of current, voltage and speed for the industrial, test and measurement, aerospace-defense, and medical markets.

High-Current Linear Amplifiers

MP38CL
MP38CLA
MP39CL
MP39CLA
MP103FC
MP108FD
MP108FDA
MP111FD
PA01
PA02
PA03
PA04
PA05
PA07
PA09
PA09M
PA10
PA107DP
PA119CE
PA12
PA12A
PA12H
PA13
PA13A
PA16
PA162DK
PA50
PA51
PA52
PA61
PA73
PA74
PA74A
PA75
PA76
PA76A
PA92
PA93
PA96
PB50
PB51
PB58
NEW PB63

High-Current PWM Amplifiers

MSA240KC
MSA260KC
SA01
SA03
SA09
SA12
SA303HU-FH
SA306AHU-FH
SA50CE
SA53HU-FH
SA57AHU-FH
SA60

High-Speed Linear Amplifiers

MP103FC
MP108FD
MP108FDA
MP111FD
MP400FC
PA05
PA09
PA107DP
PA119CE
PA78DK
PA79DK
PA84
PA85
PA90
PA91
PA94
PA96
PA98
PB50
PB51
PB58
NEW PB63

High-Voltage Linear Amplifiers

MP38CL
MP38CLA
MP39CL
MP39CLA
MP103FC
MP108FD
MP111FD
PA03
PA04
PA05
PA07
PA08
PA107DP
PA15
PA78DK
PA79DK
PA81J
PA82J
PA83
PA84
PA85
PA88
PA89
PA90
PA91
PA92
PA93
PA94
PA95
PA96
PA97
PA98
NEW PA340CC
NEW PA341CE
PA341DF
PA341DW
NEW PA343DF
PB50
PB51
PB58

High-Voltage PWM Amplifiers

MSA240KC
MSA260KC
SA01
SA03
SA12
SA50CE
SA60

Precision Voltage References

VRE102
VRE104
VRE107
VRE204
VRE205
VRE210
VRE302
VRE304
VRE305
VRE306
VRE310
VRE410
VRE3025
VRE3041
VRE3050

Sine Wave References

SWR200

High-Current Linear Amplifiers

Model	Output Current MAX (A)	Supply Voltage MAX (V)	Slew Rate TYP (V/µs)	Standby Current MAX (mA)	Power Dissipation MAX (W)
PA50	40	100	50	36	400
PA52	40	200	50	36	400
PA03	30	150	8	300	500
PA05	30	100	100	120	250
PA04	20	200	50	90	200
MP103FC	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
PA107DP	5	200	3000	35	60
PA16	5	38	20	40	62.5
PA73	5	60	2.6	5	67
PA162DK	4 x 1	40	1.4	20	45
PA119CE	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
NEW PB63	2	150	1000	20	35
PA09	2	80	200	85	78
PB50	2	200	100	25	35
PA75	2 x 1.5	40	1.4	10	19/28
PA96	1.5	300	250	18	83

High-Current Linear Amplifiers (Continued)

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

High-Current PWM Amplifiers

Mode	Output Current MAX (A)	Supply Voltage MAX (V)	Switching Frequency MAX (kHz)	Power Delivery MAX (KW)	Power Dissipation MAX (W)
SA03	30	100	22.5	3	300
SA01	20	100	42	2	185
MSA260KC	20	450	50	9	250
MSA240KC	20	100	50	2	250
SA12	15	200	200	3	250
SA306AHU-FH	17	60	100	1	100
SA57AHU-FH	17	60	100	1	100
SA303HU-FH	10	60	100	0.6	100
SA53HU-FH	10	60	100	0.6	100
SA60	10	80	250	0.8	140
SA09	7.5	60	500	0.45	80
SA50CE	5	80	45	0.5	120

High-Speed Linear Amplifiers

	Model	Slew Rate TYP (V/µs)	Supply Voltage MAX (V)	Output Current MAX (A)	Standby Current MAX (mA)	Power Dissipation MAX (W)
	PA107DP	3000	200	5	35	60
	PA98	1000	450	0.2	25	30
	PA85	1000	450	0.2	25	30
NEW	PB63	1000	150	2	20	35
	PA119CE	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
	MP400FC	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

High-Speed Linear Amplifiers (Continued)

Model	Slew Rate TYP (V/µs)	Supply Voltage MAX (V)	Output Current MAX (A)	Standby Current MAX (mA)	Power Dissipation MAX (W)
PA96	250	300	1.5	18	83
PA09	200	80	2	85	78
MP103FC	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

	Model	Supply Voltage MAX (V)	Output Current MAX (A)	Slew Rate TYP (V/µs)	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
NEW	PA340CC	350	0.12	30	2.2	14
NEW	PA341CE	350	0.12	30	2.2	12
NEW	PA343DF	350	0.12x2	30	2.2	12
	PA78DK	350	0.15	350	2.5	23
	PA79DK	350	0.15	350	2.5	26
	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
	MP103FC	200	15	180	26	54

High-Voltage Linear Amplifiers (Continued)

Model	Supply Voltage MAX (V)	Output Current MAX (A)	Slew Rate TYP (V/µs)	Standby Current MAX (mA)	Power Dissipation MAX (W)
MP108FD	200	10	170	65	100
PA04	200	20	50	90	200
PA107DP	200	5	3000	35	60
PB50	200	2	100	25	35
MP38CL	200	7	63	24	125
MP38CLA	200	8	63	24	125
PA03	150	30	8	300	500
PA81J	150	0.03	20	8.5	11.5
MP111FD	100	15	130	157	170
PA05	100	30	100	120	250
PA07	100	5	4	30	67
MP39CL	100	10	10	24	125
MP39CLA	100	11	10	24	125

High-Voltage PWM Amplifiers

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
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
SA50CE	80	5	45	120	140
SA60	80	10	250	140	80

Precision Voltage References

Model	Output(V)	Initial Error (±mV)	TempCo (ppm/°C)	Noise (µVpp)	Package	Feature
VRE102	±10	1.2, 1.0, 1.7, 1.5	1.09	6	DIP14	High Rel Military
VRE104	4.5	0.8, 0.9	1.48	3	DIP14	High Rel Military
VRE107	±5	0.8, 0.9	1.33	3	DIP14	High Rel Military
VRE204	4.5	0.8, 0.9	1.48	3	LCC20	Small Pkg, High Rel Military
VRE205	5	0.8 , 0.9	1.33	3	LCC20	Small Pkg, High Rel Military
VRE210	10	0.5, 0.7, 0.8, 1.0	1.09	6	LCC20	Small Pkg, High Rel Military
VRE302	2.5	0.4, 0.6	1.0	1.5	DIP8, SMT8	Low Cost
VRE304	4.5	0.45, 0.9	0.6	3	SMT8	Low Cost
VRE305	5	0.5, 0.8, 1.0	0.6, 1.0, 2.0	3	DIP8, SMT8	Low Cost
VRE306	6	0.6, 1.2	0.6, 2.0	3	SMT8	Low Cost
VRE310	10	1.0, 1.6, 2.0	0.6, 1.0, 2.0	6	DIP8, SMT8	Low Cost
VRE410	±10	1.6, 2.0, 2.2	1.0, 2.0, 2.2	6	SMT14	Dual, Low Cost
VRE3025	2.5	0.5	0.6, 1.0, 2.0	1.5	DIP8, SMT8	+10V Supply
VRE3041	4.0	2.0	1.0	3	SMT8	Low Cost + 10V Supply
VRE3050	5	0.25, 0.375, 0.5, 0.8, 1.0	0.6, 1.0, 2.0	3	SMT8	+10V Supply

High-Precision Analog & Mixed-Signal ICs & Processors

Communication Components

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

SHORT-HAUL MULTI-PORT LINE INTERFACE UNITS
- CS61584A
- CS61880
- CS61884

Infrared & Echo Canceller
- CS6422

Ethernet
- CS8900A
- CS8952

Short-Haul Single-Port Line Interface Units

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

Short-Haul Multi-Port Line Interface Units

Part	Power Supply (V)	Control Modes	Line Coders	Number of Channels	TBR-12 Compliant	Impedance Matching Line Driver	Arbitrary Waveform Option	Package
CS61584A	3.3 or 5	Host & H/W	AMI, B8ZS & HDB3	2	3	3	3	64 TQFP
CS61880	3.3	Host & H/W	AMI & HDB3	8	3	3	3	144 LQFP 160 BGA
CS61884	3.3	Host & H/W	AMI, HDB3 & B8ZS	8	3	3	3	144 LQFP

Infrared & Echo Canceller

Part	Media Supported	Digital Interface	Number of Channels	Power Supply (V)	Package
CS6422	Analog audio (MIC and telephone)	Acoustic interface and network interface (both ANALOG)	2 – Full Duplex	5	20 SOIC

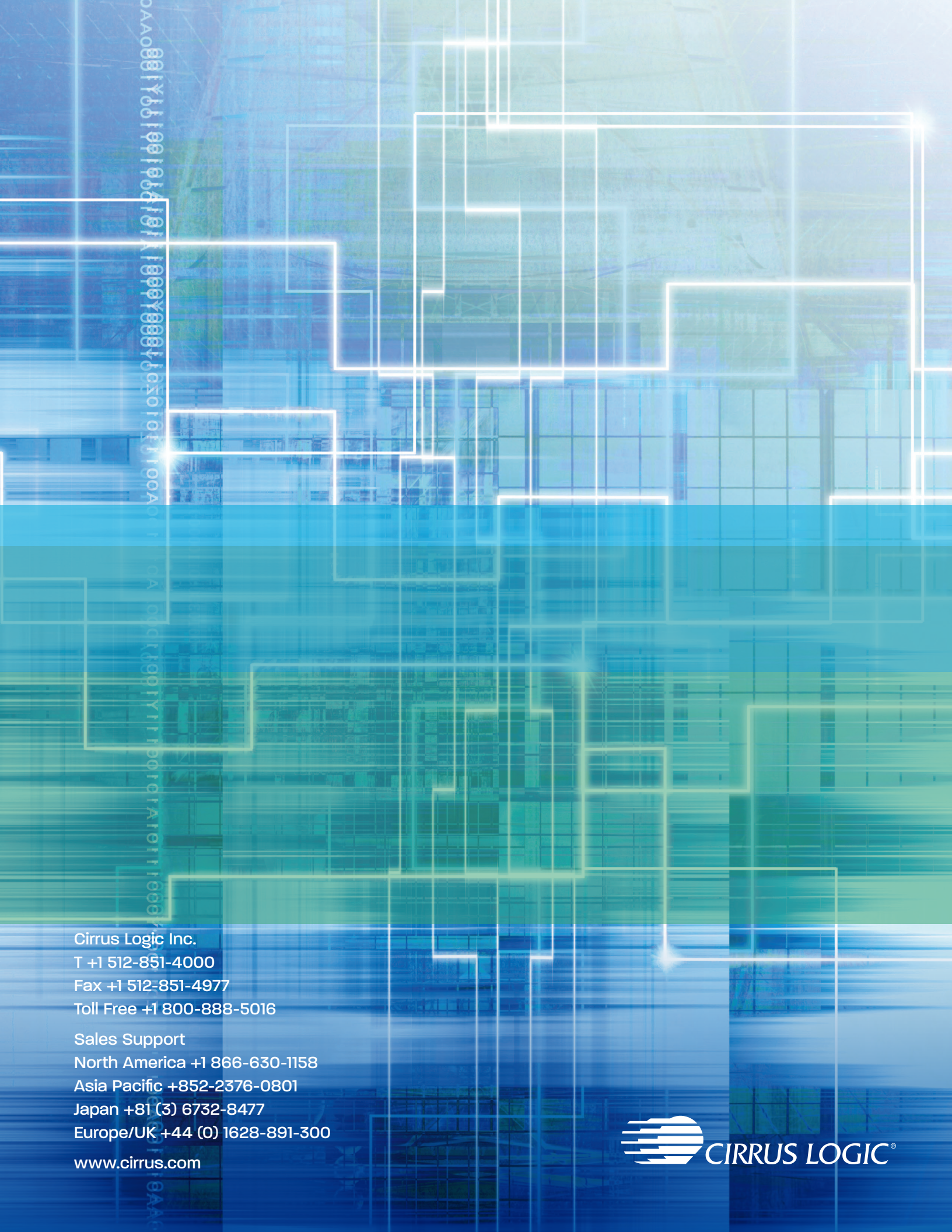
Ethernet

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

Product Number Index

Product Number Index (Continued)

Notes



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