

# CS47024/28/48 Audio SoC

## HIGH PERFORMANCE MULTICHANNEL CODEC + 32-BIT DSP

### CS470xx TARGET MARKETS



AUTOMOTIVE HEAD-END UNITS



AUTOMOTIVE OUTBOARD AMPLIFIERS



HOME THEATER IN A BOX

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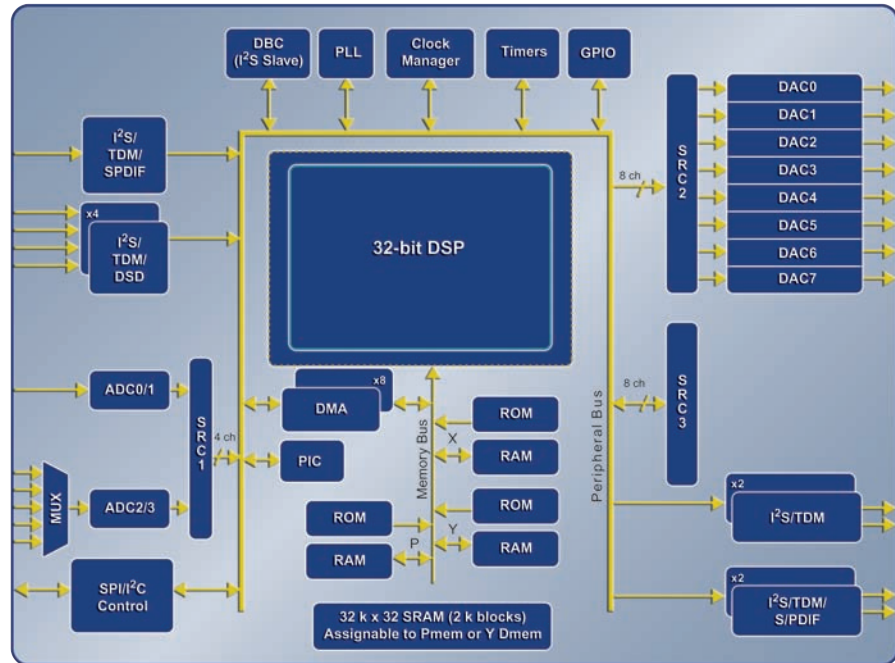
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### LEARN MORE AT

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



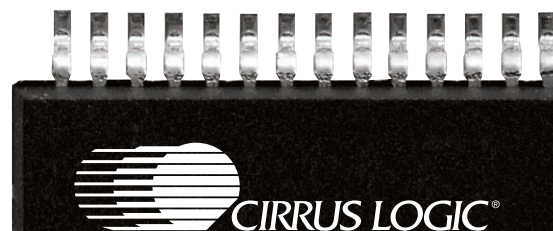
### CS470xx FAMILY FEATURES

- Multichannel 32-bit audio processing at 150 MHz with dual MACs & 72-bit accumulator
- Advanced Delta-Sigma converter architecture
- Single-ended or differential analog I/O
- Up to 4-channel 24-bit, 105 dB ADC
- Stereo 5:1 analog input MUX
- Up to 8-channel 24-bit, 105 dB DAC
- Integrated 192 kHz S/PDIF Rx and Tx
- Integrated multichannel, reassignable SRCs
- Supports both TDM (Time-division Multiplexed) and standard serial audio formats
- SPI™/I2C® serial control port
- Low-power standby: 350 µW
- 32 Kx32 RAM which is reassignable
- DSP Composer GUI simplifies programming and generation of custom signal processing using extensive library of primitives
- Licensed third party audio processing algorithms in ROM, plus extensive library of Cirrus proprietary downloadable and customizable firmware — see back for partial list of algorithms

The CS470xx Family audio SoC gives OEMs a cost-effective and simple-to-design audio processing solution with integrated high-performance mixed-signal that provides an extensive selection of enhanced audio features to maximize the end user's listening experience within the automotive entertainment space.

### CS470xx FAMILY KEY BENEFITS

- Excellent development tools to simplify system design and provide faster time to market
- Easy to design — most standard processing features and some third party algorithms in ROM
- Best in class analog performance and sound quality
- High level of integration enables small PCB footprint and lower system cost
- No external memory needed



## DSP GUI PROGRAMMING ENVIRONMENT WITH CS470xx DEVELOPMENT PLATFORM

### CS470xx ORDERING INFORMATION

#### Device(s)

CS47048-DQZ (Automotive)  
CS47048-CQZ (Commercial)  
CS47028-DQZ (Automotive)  
CS47028-CQZ (Commercial)  
CS47024-DQZ (Automotive)  
CS47024-CQZ (Commercial)

#### Package

100-Pin LQFP

#### Evaluation Board

CDB470XS-DC48/-DC28/-DC24  
(Single-ended)  
CDB470XD-DC48/-DC28/-DC24  
(Differential)

#### Documentation

CS470xx Data Sheet  
CS470xx System Designer's Guide

#### Tools

DSP Composer™  
GUI Software Tool  
MicroCondenser™

#### Standard Processing

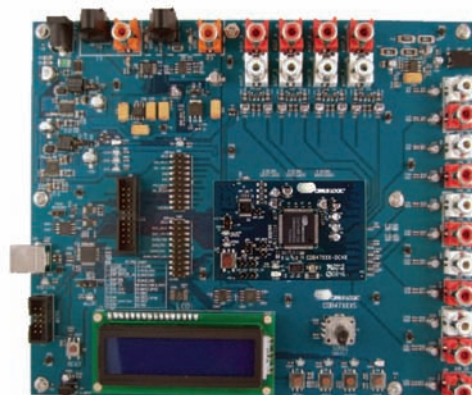
Advanced Bass Management  
Compressor/Limiter  
Crossbar Mixer  
Independent Channel Delay  
Matrix Mixer  
Multiband Parametric/Graphic EQ  
Multichannel Tone Control  
And many more...

#### Cirrus Proprietary Algorithm Support

Cirrus BandXpander™  
Cirrus Bass Enhancement (CBE)  
Cirrus Original Multichannel  
Surround™/II (COMS2) for  
Hall, Theater, etc. DSP effects  
Cirrus Dynamic Volume Leveler™  
Cirrus Intelligent Room Correction™/  
II (IRC/IRC2)  
Cirrus® Virtualizer Technology  
(CVT)—Headphone and  
Speaker modes

#### Extensive Third Party Algorithm Support/Capability

Audistry® by Dolby®  
Audysey Dynamic EQ®  
Audysey Dynamic Volume®  
Cirrus® Virtualizer Technology  
(CVT)—Headphone and  
Speaker modes  
Dolby® Pro Logic® II, IIx, IIz  
Dolby Headphone®  
EmbracingSound® Technologies  
Neural-THX® Surround  
SRS® Automotive™  
SRS® CircleSurround® II  
SRS® TruSurround® XT™/  
HD™/HD4™  
SRS® TruVolume  
SRS® WOW/WOW HD™  
Waves™ MaxxBass®



The CS470xx Family is programmed using Cirrus Logic's proprietary GUI software development tool called DSP Composer.™ An audio processing chain is designed using a drag and drop interface. The tool then configures the CS470xx device through the SPI™/I²C® serial port. The firmware may be loaded from the ROM within the CS470xx device or it may be downloaded through the serial control port.

## CS470xx FAMILY DEVICES & FEATURES

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, speakerbars, car audio, DTVs</b>									
<b>NEW</b> CS47024	Single 32-bit	150	CS47024C-DQZ	CS47024C-CQZ	24	108 DAC 105 ADC	2	4	2 Ch ADC w/ 5:1 MUX, 4 Ch DAC, S/PDIF Tx, SRC (2 Ch)	100 LQFP
<b>NEW</b> CS47028	Single 32-bit	150	CS47028C-DQZ	CS47028C-CQZ	24	108 DAC 105 ADC	2	8	2 Ch ADC w/ 5:1 MUX, 8 Ch DAC, S/PDIF Rx/Tx, SRC (8 Ch)	100 LQFP
<b>NEW</b> CS47048	Single 32-bit	150	CS47048C-DQZ	CS47048C-CQZ	24	108 DAC 105 ADC	4	8	4 Ch ADC w/ 5:1 MUX on one 2 Ch ADC, 8 Ch DAC, S/PDIF Rx/Tx, SRC (8 Ch)	100 LQFP