

Audio Portfolio

Texas Instruments' complete line of audio products feature over 2000 devices within our DAC, ADC, CODEC, AMP, Line driver, Interface, USB Audio, and other product families.

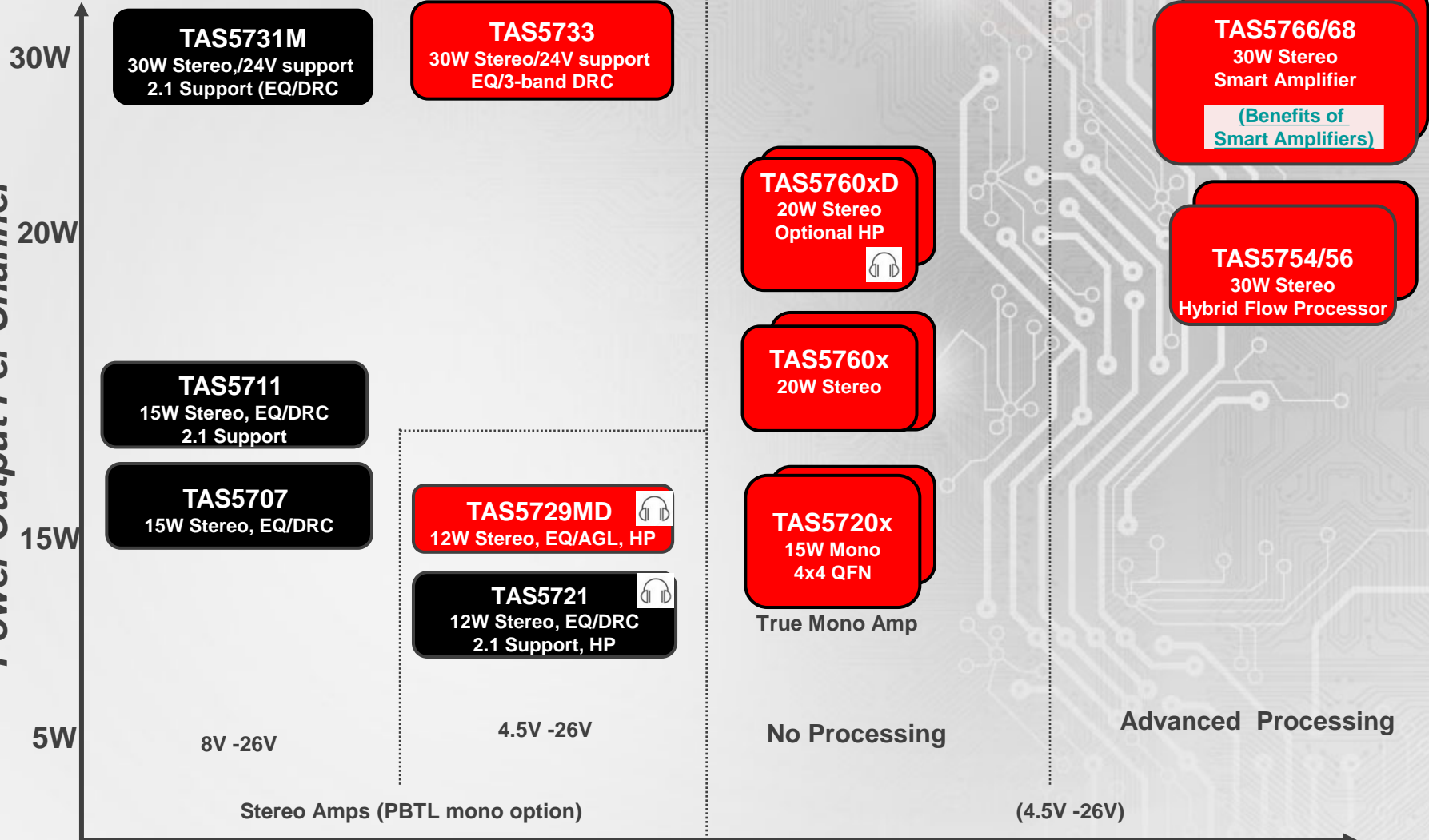
ADC		AMP		CODEC		DAC		Smart AMP	
HW / SW Controlled		Stereo/Mono Class D		Power and Performance Optimized		Current Output, Voltage Output, 2VRMS Output, Delta Sigma Integrated Amplifiers		Low and Mid Power Amplifiers with Smart Speaker Protection	
1.8-3.3-5V Power		Analog/Digital Input		Integrated Amplifiers		DSP integration		Integrated IV Sense, Excursion and Temp sensing options	
Audio PLL		Integrated DSP		Integrated DSP					
Energy Sense									
#ADC	1-4	Inputs	1-6	#ADC/DAC	0-6 / 1-8	#DAC	1-8	Output	7.5 – 50W
SNR	92-123dB	Output Power	0.35-400W	ADC/DAC SNR	72-112dB	SNR	92-127dB	PSRR	75 – 80 dB
PWR	17-600mW			PWR	6.7mw +	THD (%)	0.0004-0.04	Inputs	Analog/Dig.
Packages: 5.3 - 144mm ²		Packages: 2 - 517mm ²		Packages: 7.8 - 170mm ²		Packages: 6.4 - 144mm ²		Packages: 7.5 - 76mm ²	
1K: \$0.80 - \$8.55		1K: \$0.26 - \$10.75		1K: \$1.23 - \$19.25		1K: \$0.89 - \$11.18		1K: \$1.39 - \$3.75	



I2S Input Mid Power Amplifiers



Power Output Per Channel



Open Loop Amplifiers

Closed Loop Amplifiers
(Benefits of Closed Loop Amplifiers)



I2S Mid Power Amplifier Parameter

Device	PVDD	Output Power			Algorithm	Control	Package
		Mono	Stereo	2.1			
TAS5707	8 to 26V	30Wx1	15Wx2	N/A	EQ.DRC	S/W	7x7mm (48- HTQFP)
TAS5711	8 to 26V	30Wx1	15Wx2	10Wx2 + 15W	EQ.DRC	S/W	7x7mm 48- HTQFP
TAS5721	4.5 to 26V	30Wx1	12Wx2	8Wx2 + 15W	EQ/DRC	S/W	12x6mm 48- HTSSOP
TAS5729	4.5 to 26V	30Wx1	12Wx2	N/A	EQ/AGL	S/W	12x6mm 48- HTSSOP
TAS5731M	8 to 26V	60Wx1	30Wx2	15Wx2 + 30W	EQ/DRC	S/W	7x7mm 48- HTQFP
TAS5733	8 to 26V	60Wx1	30Wx2	N/A	EQ/ 3-band AGL	S/W	7x7mm 48- HTQFP
TAS5720M	4.5 to 26V	15Wx1	.N/A	N/A	EQ/DRC	H/W & S/W	4x4mm32- HQFN
TAS5720L	4.5 to 16V	15Wx1	.N/A	N/A	EQ/DRC	H/W & S/W	4x4mm32- HQFN
TAS5760LDCA	4.5 to 16V	30Wx1	15Wx2	N/A	None	H/W & S/W	12x 6mm 48- HTSSOP
TAS5760LDAP	4.5 to 16V	30Wx1	15Wx2	N/A	None	H/W & S/W	12x 6mm 48- HTSSOP
TAS5760MDCA	4.5 to 26V	40Wx1	20Wx2	N/A	None	H/W & S/W	12x 6mm 48- HTSSOP
TAS5760MDAP	4.5 to 26V	40Wx1	20Wx2	N/A	None	H/W & S/W	12x 6mm 48- HTSSOP
TAS5766	4.5 to 26V	60Wx1	30Wx2	N/A	Smart amp	S/W	12x 6mm 48- HTSSOP
TAS5768	4.5 to 26V	60Wx1	30Wx2	N/A	Smart amp	S/W	5 x 7mm 48- QFN
TAS5756	4.5 to 26V	60Wx1	30Wx2	N/A	Hybrid Flow	S/W BD Modulation	12x 6m 48- HTSSOP
TAS5754	4.5 to 26V	60Wx1	30Wx2	N/A	Hybrid Flow	SW/SPWM Modulation	12x6mm 48- HTSSOP

Open Loop

Closed Loop

Home



Up



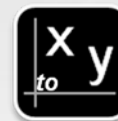
Last Slide



Roadmaps



Feedback



TAS5760: 20W Stereo Closed Loop I2S Amplifier With Integrated Headphone Amp

Feature

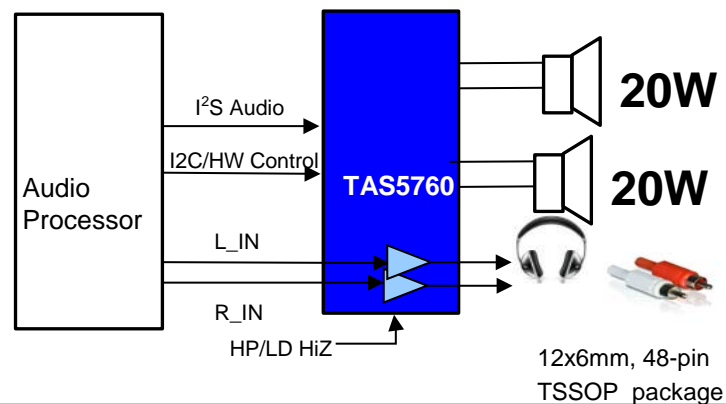
- 10Wx2 @12V/8ohm , 20W @16V/8ohm
- Supports 32kHz to 96kHz sample rates
- Closed loop amplifier with flexible switching frequencies
- Integrated HP amplifier/ 2Vrms Line Drive
- Selectable Hardware or Software (I2C) control
- Power Limiter with soft/hard clipping
- Volume Control :Mute to +24 dB in 0.5db steps
- High performance for THD+N, idle noise, X-talk

Benefit

- Fits majority of mid-power home applications
- Flexibility to accept multiple sources
- Improved EMI, reduced filtering requirements and low BOM count
- Integrated solution reduces board space
- Flexibility in the control of the device
- Protects speaker & set rated power for TV models
- Helps with volume changes and control sequences
- Meet high performance requirements for end system

Applications

- TV
- Bluetooth Dock/Speakers
- Sound Bar



Home



Last Slide



Roadmaps



Feedback



TEXAS INSTRUMENTS

TAS5754/56M

40W Class-D Amplifier with Hybrid Flow Processing

Features

- **Hybrid Flow Processor with 8K to 192K sampling rates**
- **Multiple pre-configured signal Hybrid Flow signal shaping algorithms**
- 40W/8Ω/24V or 75W mono @10% THD+N
- Wide 4.5V to 26V supply voltage operation
- SDOOUT available in some Hybrid Flows
- Ternary Switching Mode (only in TAS5754)

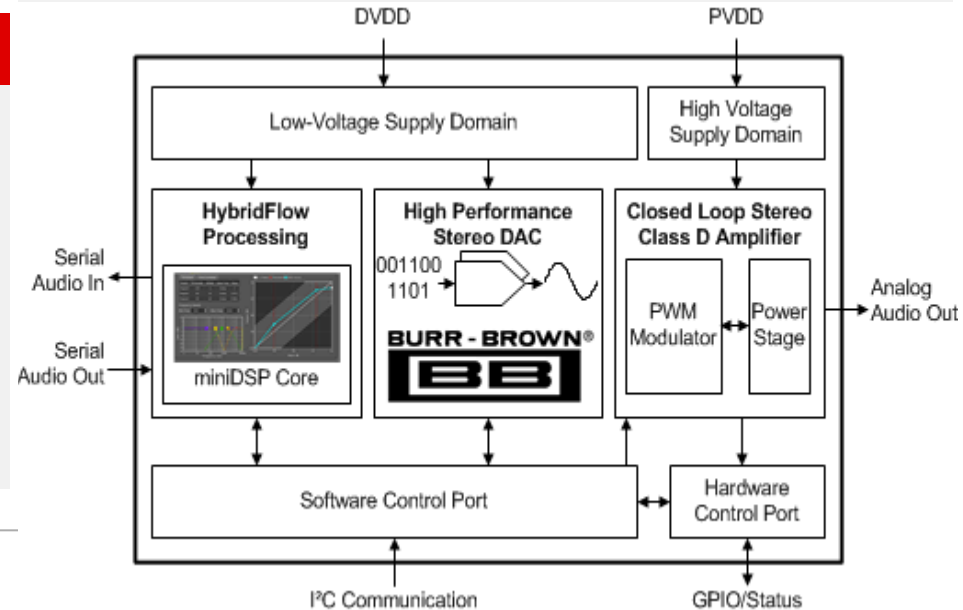
Benefits

- Highly flexible device, with several input sample rates and audio processing configurations
- Makes the small speakers in today's popular audio electronics sound great
- Power to deliver room-filling loudness
- Works in 12V, 24V and 2S battery systems
- Simplifies connection of Sub-Woofer channel
- Simplifies EMI design efforts

Applications

Low Power, Small Footprint

- Wired and Bluetooth Audio Docks
- Sound Bars
- Sub-Woofer
- Active Speakers
- Digital TVs



Home



Last Slide



Roadmaps



Feedback

TAS5754/56M HybridFlow Options

Feature								
Typical Target Application	Mid-level DTVs & General Audio	Mid-level DTVs & General Audio	Bi-Amped Active Speakers	Bluetooth Speakers & Wireless Subs	Hi-End Digital TVs	Docking Stations, All-in-One PC & General Audio	Mid-Level DTVs, Soundbars & General Audio	General Audio (Fast Audio Playback)
Supported Sample Rate	8 – 48 kHz	8 – 48 kHz	8 – 48 kHz	8 – 48 kHz	8 – 192 kHz	8 – 48 kHz	8 – 96 kHz	8 – 48 kHz
Psychoacoustic Bass Enhancer (PBE)	✓	x	✓	✓	x	x	x	X
Output Configuration (Stereo/Mono)	Stereo	Stereo	1.1	Mono	Stereo	Stereo	Stereo	Stereo
DRC Type	3-Band Compander	3-Band Compander	Advanced 3-Band Compander	3-Band Compander	DRC-Lite	3-Band Compander	2-Band Compressor	3-Band Compander
BiQuad Equalizers (In Full-Range Path)	2 x 12	2 x 12	1x10 + 1x5	1 x 15	2x3	2 x 10	2 x 5	2x10
PurePath™ SmoothClip	✓	✓	✓	✓	✓	✓	✓	x
Sound Field Spatializer (SFS)	x	x	x	x	x	✓	x	x
Dynamic Dialog Enhancer (DDE)	x	✓	x	x	x	x	x	x
Dynamic Bass Enhancer (DBE)	✓	✓	x	✓	x	✓	x	x
Serial Audio Data Out (Subwoofer, Full-Range)	FR	SW or FR	SW or FR	FR	FR	FR	FR	SW



TAS5766M/68M

20W Class-D Stereo PurePath™ Smart Amp

Features

- **PurePath™ Console Feed Forward Protection Algorithms**
- **Smart Amp characterization and tuning tools**
- 20W/4Ω/12V continuous and 50W/4Ω/24V peak (10% THD+N)
- Wide 4.5V to 26V supply voltage operation
- Available in two 12.5x6 TSSOP and 5x7mm QFN packages
- Ternary Switching Mode

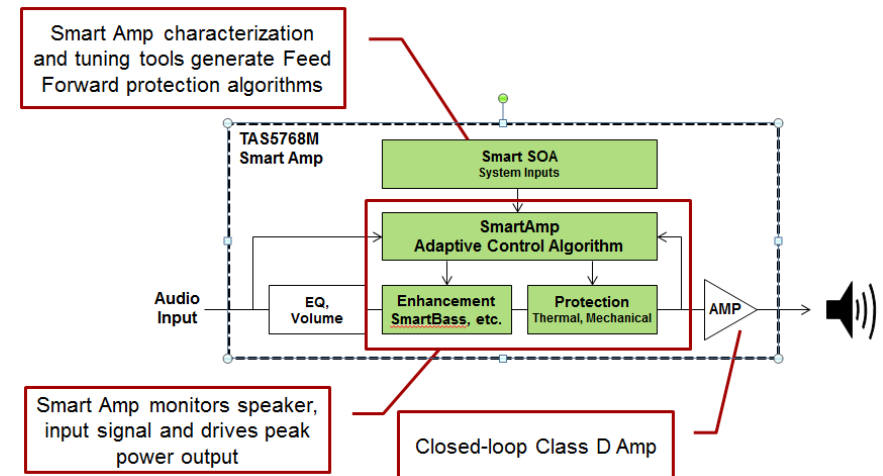
Benefits

- **10-15dB increase of sound pressure level while protects speakers**
- **Fast speaker modeling to improve performance**
- High peak power to delivers clarity and loudness
- Works in 12V, 24V and 2S battery systems
- TSSOP for maximum thermal performance, QFN for systems with minimal board space
- Simplifies EMI design efforts

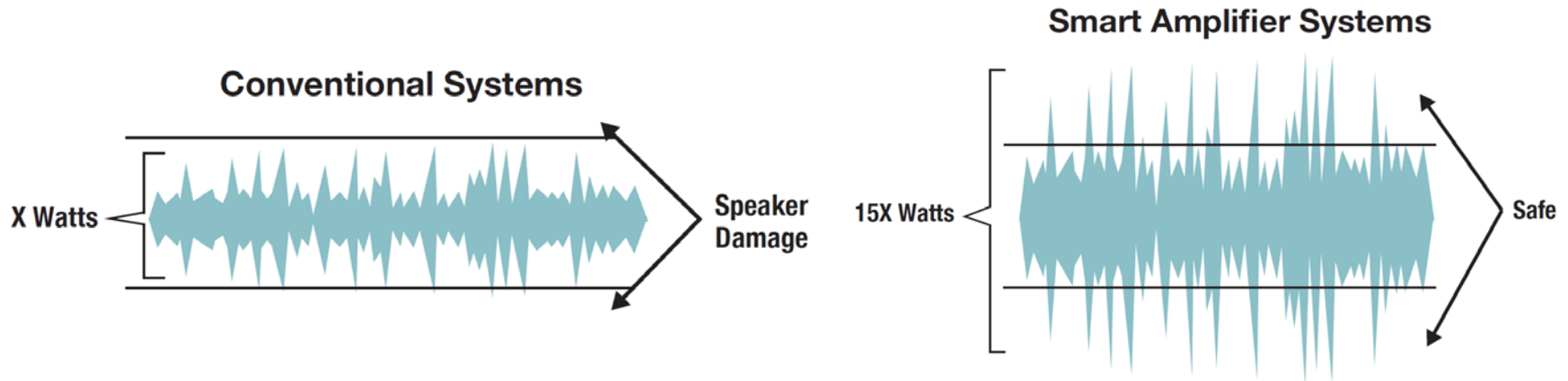
Applications

Low Power, Small Footprint

- Wired and Bluetooth Audio Docks
- Sound Bars
- PCs: Notebooks and All in One Computers
- Digital TVs



Amplifier Design Methodology



- Limits are set for worst case.
- Does not perform continuous speaker modeling.
- Compressors reduce dynamic range.
- Results may be too conservative since loudspeaker excursion and thermal are not monitored.
- Smart Amp continuous speaker modeling keeps excursion and temperature under control.
- Output power and excursion constantly optimized for maximum power and reliability.
- Allows extending the bass.
- Improvement as much as physics allows.



TAS5733

25W Stereo (BTL) Digital Input Audio Amplifier with speaker EQ and 3-band DRC

Feature

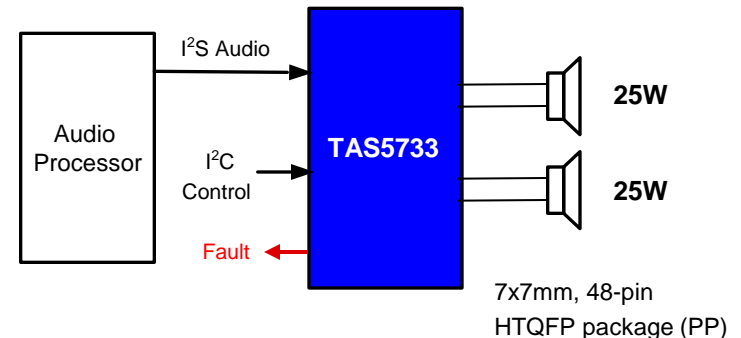
- 2-ch I²S input; 8kHz-48kHz Fs
- 25W stereo, 8Ω/20V (THD+N=10%) (70mΩ FETS)
- Wide 8- 26V supply range; 3.3V dig. supply
- Single filter PBTL support (50W mono)
- I²C address select via terminal pin
- Ternary Modulation
- Selectable switching frequency (288, 336, & 384kHz)
- Speaker EQ: Up to 9-biquads per channel w. 3-band DRC
- Volume control: -103db to +48dB w/ 0.125dB steps

Benefit

- Wide freq range and no-MCLKI support
- Lower RDSON improves system thermal performance
- Wide range supports multiple applications
- Higher Power application support
- Multi device support
- Allows small Inductor filters
- Supports AM mode
- Advanced Audio processing
- Enhanced volume function

Applications

- DLP-TV, LCD-TV and Plasma Displays
- Docking stations & Consumer Audio Applications



TAS5729:

15W Stereo I2S Amplifier With Integrated Headphone Amp

Features

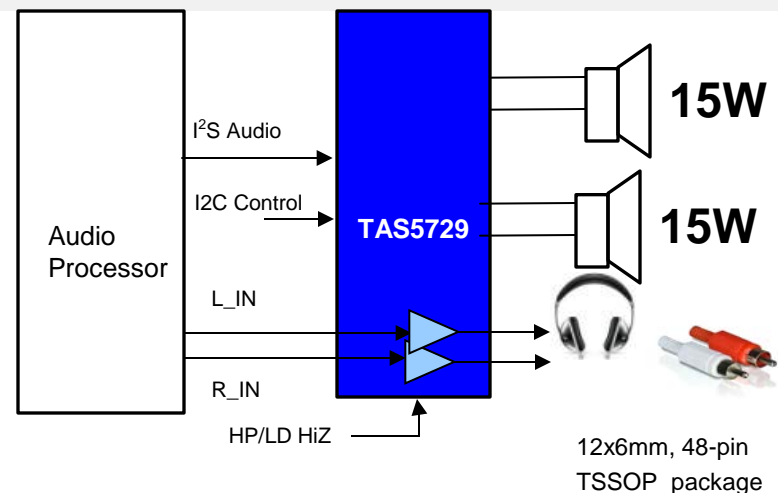
- 10Wx2 into 8Ω/13V
- Supports 8kHz to 48kHz sample
- 2-band AGL for advanced DRC
- Integrated HP amplifier/ 2V RMS Line Driver
- Integrated DSP for 10-band EQ, AGL
- Wide 4.5 V to 26V supply range

Applications

- TV
- Ipod DOCK
- Bluetooth Speakers

Benefits

- Fits majority of mid power home applications
- Flexibility to accept multiple sources
- AGL helps to avoid rattle sound for small spkrs
- Integrated solution helps board space and BOM
- Audio Processing needed in TV
- Support for battery powered applications



TAS5721:

15W Stereo I2S Amplifier with 2.1 Support and Headphone amp

Features

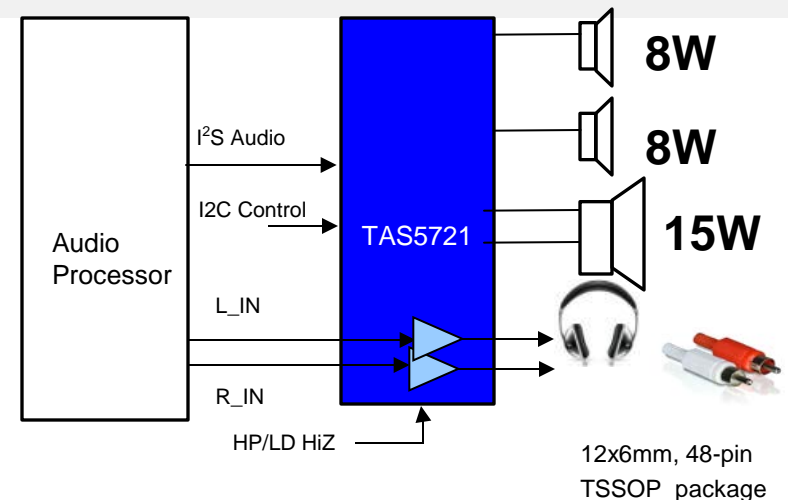
- 10 2.1 Support 8W X2 + 15W
- Supports 8kHz to 48kHz sample
- Two DRCs
- Integrated HP amplifier/ 2V RMS Line Driver
- Total 18 BQs over 4 channels, DRC

Applications

- TV
- Ipod DOCK
- Bluetooth Speakers

Benefits

- Fits majority of mid power home applications
- Flexibility to accept multiple sources
- Separate DRC for satellite and sub channels
- Integrated solution helps board space and BOM
- Audio Processing needed in TV



TAS5731M:

25W Stereo I2S Audio Amplifier with Audio Processing and 2.1 Support

Features

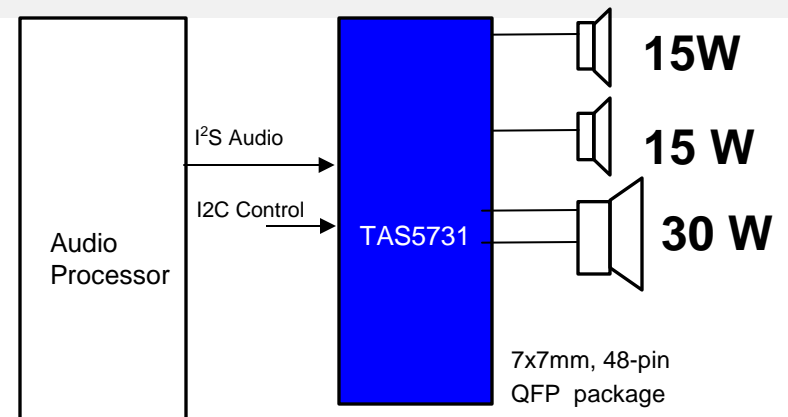
- 2-ch I²S input; 8kHz-48kHz Fs
- 20W stereo, 8Ω/18V (THD+N=10%)
- 70 mΩ R_{dson} efficient FETs
- Up to 90% efficient operation
- Wide 8–21V Supply Range; 3.3V Dig. Supply
- Single Ended 2.1 Support (2x SE + 1x BTL)
- Single Filter PBTL Support
- Speaker EQ, Improved 2-Band DRC, Bass Boost & 3D
- P2P compatible with the TAS5707, 5709 & 5713
- I2C address select via terminal pin

Applications

- TV
- Ipod DOCK
- Bluetooth Speakers

Benefits

- Direct connect to digital processor
 - High output power from standard supply
 - Eliminates need for heat sink
 - Only 2 supplies required for operation
 - Single board design supports both stereo and 2.1
 - Reduced cost / Board space
- Improved audio performance
- Advanced processing improves audio experience
 - Single board design supports multiple models
 - Support for multiple devices per board



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