2*30W I²S Input Stereo Class D Amplifier

■ FEATURES

- Power supply: 4.5V - 26V
- Audio Performance
  - Output Power (BTL)
    2×25W (PVDD=16V, R_L=4Ω, THD+N=1%)
    2×30W (PVDD=24V, R_L=8Ω, THD+N=1%)
  - Output Power (PBTL)
    60W (PVDD=24V, R_L=4Ω, THD+N=1%)
    21 W (PVDD=12V, R_L=3Ω, THD+N=1%)
  - THD+N
    0.05% (PVDD=12V, R_L=4Ω, Po=1W)
    0.02% (PVDD=24V, R_L=8Ω, Po=1W)
  - Noise
    75uV (Gain = 25.2dB, A weighted)
  - Efficiency
    91 % (PVDD=12V, R_L=4Ω, Po=10W)
- Audio I/O Configuration
  - Single Stereo I²S Input
  - BTL or PBTL output
  - 32, 44.1, 48, 88.2, 96kHz Sample Rates
- General Operational Features
  - Selectable Hardware or I²C Control mode
  - Integrated Digital Output Clipper and AGC
  - Integrated Thermal Foldback Function
  - Programmable I²C Address (110110x[R/W])
  - Adjustable Switching Frequency for Class D
- Robustness Features
  - Clock Error, DC, and Short-Circuit Protection
  - Overtemperature and Programmable Overcurrent Protection
- Packages
  - Pb-free Packages, QFN36-PP

■ APPLICATIONS

- Bluetooth/Wi-Fi Speakers
- Portable Speakers
- Smart speakers
- LCD TV/Monitor
- Sound Bars, Docking stations, PC Audio

■ DESCRIPTION

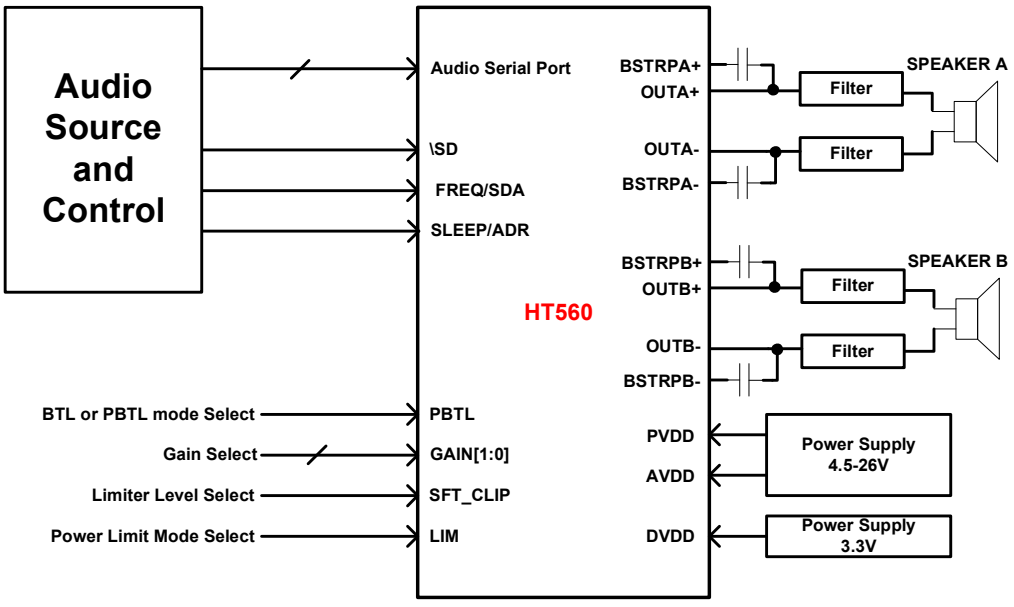
The HT560 is a stereo Class D audio amplifier with an I²S input serial port. It supports a variety of audio clock configurations via two speed modes.

The outputs of the HT560 can be configured to drive two speakers in stereo BTL mode or mono PBTL mode.

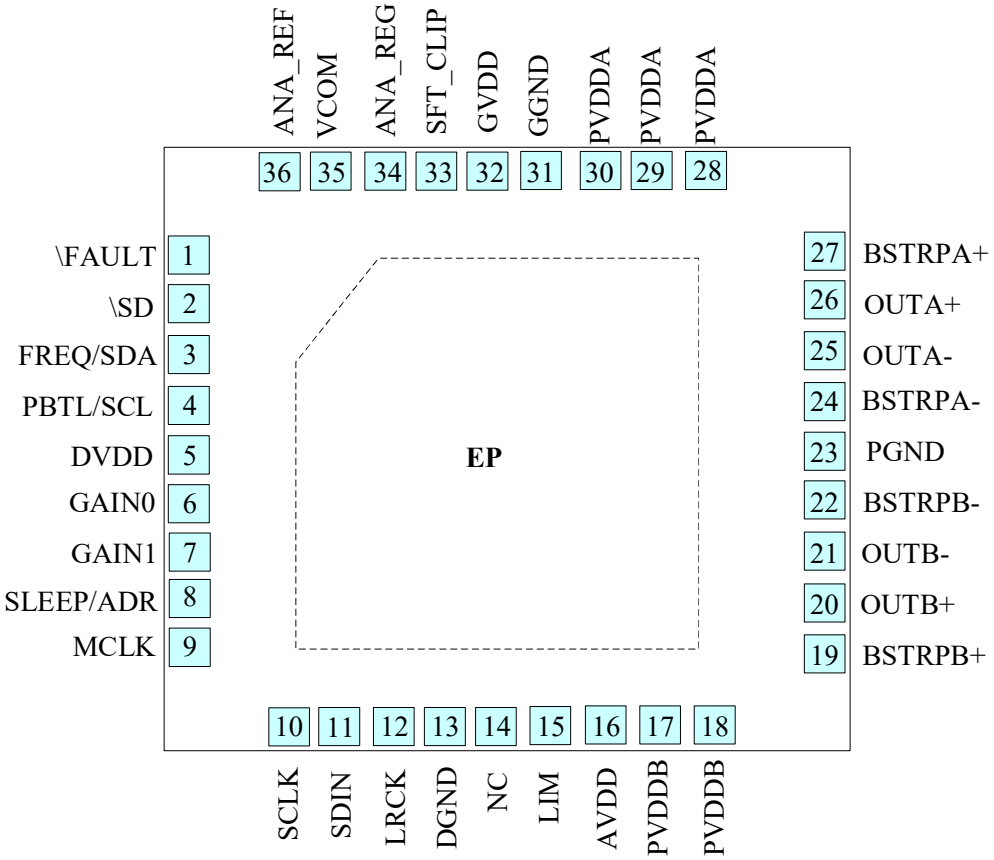
The HT560 also includes hardware and I²C control modes, integrated digital clipper, AGC, several gain options, and a wide power supply operating range to enable use in a multitude of applications.

An optimal mix of thermal performance and device cost is provided in the 110-mΩ $R_{DS(ON)}$ of the output MOSFETs. Additionally, a thermally enhanced 36-Pin QFN provides excellent operation in the elevated ambient temperatures found in modern consumer electronic devices.

■ TYPICAL APPLICATION



■ TERMINAL CONFIGURATION



Top View

■ TERMINAL FUNCTION

Terminal No.	Name	I/O*1	Description
1	\FAULT	O	Speaker amplifier fault terminal, which is pulled LOW when an internal fault occurs
2	\SD	I	Places the speaker amplifier in shutdown mode while pulled down.
3	FREQ/SDA	I	Dual function pin that functions as an I²C data input pin in I²C Control Mode or as a Frequency Select terminal when in Hardware Control Mode.
4	PBTL/SCL	I	Dual function pin that functions as an I²C clock input terminal in I²C Control Mode or configures the device to operate in pre-filter Parallel Bridge Tied Load (PBTL) mode when in Hardware Control Mode.
5	DVDD	P	Power supply for the internal digital circuitry
6	GAIN0	I	Adjusts the LSB of the multi-bit gain of the speaker amplifier
7	GAIN1	I	Adjusts the MSB of the multi-bit gain of the speaker amplifier
8	SLLEP/ADR	I	In Hardware Control Mode, places the speaker amplifier in sleep mode. In I²C Control Mode, is used to determine the I²C Address of the device
9	MCLK	I	Master Clock used for internal clock tree, sub-circuit/state machine, and Serial Audio Port clocking
10	SCLK	I	Bit clock for the digital signal that is active on the serial data port's input data line
11	SDIN	I	Data line to the serial data port

12	LRCK	I	Word select clock for the digital signal that is active on the serial port's input data line
13	DGND	G	Ground for digital circuitry (NOTE: This pin should be connected to the system ground)
14	NC	-	Not connected inside the device (all "no connect" pins should be connected to ground for best thermal performance, however they can be used as routing channels if required.)
15	LIM	I	Selects mode of Digital Output Clipper or AGC
16	AVDD	P	Power supply for internal analog circuitry
17	PVDDB	P	Power Supply for internal power circuitry of Channel B
18	PVDDB	P	
19	BSB+	BST	Connection point for the OUTB+ bootstrap capacitor, which is used to create a power supply for the high-side gate drive for OUTB+
20	OUTB+	O	Positive pin for differential speaker amplifier output B
21	OUTB-	O	Negative pin for differential speaker amplifier output B
22	BSB-	BST	Connection point for the OUTB- bootstrap capacitor, which is used to create a power supply for the high-side gate drive for OUTB-
23	PGND	G	Ground for power device circuitry (NOTE: This terminal should be connected to the system ground)
24	BSA-	BST	Connection point for the OUTA- bootstrap capacitor, which is used to create a power supply for the high-side gate drive for OUTA-
25	OUTA-	O	Negative pin for differential speaker amplifier output A
26	OUTA+	O	Positive pin for differential speaker amplifier output A
27	BSA+	BST	Connection point for the OUTA+ bootstrap capacitor, which is used to create a power supply for the high-side gate drive for OUTA
28	PVDDA	P	Power Supply for internal power circuitry of Channel A
29	PVDDA	P	
30	PVDDA	P	
31	GGND	G	Ground for gate drive circuitry (this terminal should be connected to the system ground)
32	GVDD	O	Voltage regulator derived from PVDD supply (NOTE: This pin is provided as a connection point for filtering capacitors for this supply and must not be used to power any external circuitry)
33	SFT_CLIP	I	Sets the maximum output voltage before clipping (Limiter Level)
34	ANA_REG	P	Voltage regulator derived from AVDD supply (NOTE: This terminal is provided as a connection point for filtering capacitors for this supply and must not be used to power any external circuitry)
35	VCOM	P	Bias voltage for internal PWM conversion block
36	ANA_REF	P	Connection point for internal reference used by ANA_REG and VCOM filter capacitors. And connect to system GND net.
/	EP	G	Provides both electrical and thermal connection from the device to the board. A matching ground pad must be provided on the PCB and the device connected to it via solder. For proper electrical operation, this ground pad must be connected to the system ground.

*1: I: Input; O: Output; G: Ground; P: Power; BST: BOOT Strap

■ ORDERING INFORMATION

H T 5 6 0 XX

Package type

Part Number	Package Type	Marking	Operating Temperature Range	MOQ/Shipping Package
HT560SQ	QFN36-PP	HT560SQ UVWXYZ *1	-25℃～85℃	Tape and Reel 3000PCS

*1：WXYZ/UVWXYZ is production track code.

IMPORTANT NOTICE
注意

Jiaxing Heroic Electronic Technology Co., Ltd (HT) reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any products or services. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete.

嘉兴禾润电子科技有限公司（以下简称HT）保留对产品、服务、文档的任何修改、更正、提高、改善和其他改变，或停止提供任何产品和服务的权利。客户在下单和生产前应确保所得到的信息是最新、最完整的。

HT assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using HT components.

HT对相关应用的说明和协助以及客户产品的板级设计不承担任何责任。

HT products are not authorized for use in safety-critical applications (such as life support devices or systems) where a failure of the HT product would reasonably be expected to affect the safety or effectiveness of that devices or systems.

HT的产品并未授权用于诸如生命维持设备等安全性极高的应用中。

The information included herein is believed to be accurate and reliable. However, HT assumes no responsibility for its use; nor for any infringement of patents or other rights of third parties which may result from its use.

本文中的相关信息是精确和可靠的，但HT并不对其负责，也不对任何可能的专利和第三方权利的侵害负责。

Following are URLs and contacts where you can obtain information or supports on any HT products and application solutions:

下面是可以联系到我公司的相关链接和联系方式：

嘉兴禾润电子科技有限公司
Jiaxing Heroic Electronic Technology Co., Ltd.
地址: 浙江省嘉兴市凌公塘路3339号JRC大厦A座三层
Add: A 3rd floor, JRC Building, No. 3339, LingGongTang Road, Jiaxing, Zhejiang Province
Sales: 0573-82585539, sales@heroic.com.cn
Support: 0573-82586151, support@heroic.com.cn
Fax: 0573-82585078
Website: www.heroic.com.cn; wap.heroic.com.cn
Wechat MP: HEROIC_JX
请及时关注禾润官方微信公众号，随时获取最新产品信息和技术资料！