

## 内置升压18W D类音频功放

### 18W Boosted Class D Amplifier

#### ■ FEATURES

- Anti-Clipping Function (ACF)
- Spread spectrum technology
- Output Power  
18W ( $V_{BAT}=3.7V$ ,  $R_L=4\Omega$ , THD+N=10%,  $f_{IN} = 1kHz$ )  
16W ( $V_{BAT}=3.7V$ ,  $R_L=4\Omega$ , THD+N=1%,  $f_{IN} = 1kHz$ )
- Power Supply  $V_{BAT}$ : 3.0V~12V
- High Efficiency Class H Boost Converter
  - Multiple boost voltages automatically adjust Class D audio amplifier (HT81293A)
  - Extends the playing time in battery supply applications
  - Adjustable switch peak current limit to avoid over-pulling on battery current
- Over Current Protection, Thermal Protection, over voltage protection function included
- Pb-Free Packages, ESOP16
- 防削顶失真功能(防破音, Anti-Clipping Function, ACF)
- 扩频技术
- 输出功率  
18W ( $V_{BAT}=3.7V$ ,  $R_L=4\Omega$ , THD+N=10%,  $f_{IN} = 1kHz$ )  
16W ( $V_{BAT}=3.7V$ ,  $R_L=4\Omega$ , THD+N=1%,  $f_{IN} = 1kHz$ )
- $V_{BAT}$ 供电范围: 3.0V至12V
- 高效H类升压功能
- 自适应功放功率的升压轨, 延长电池播放时间 (HT81293A)
- 可调节最大限流值, 有效防止电池拉死
- 保护功能:过流/过热/过压保护功能
- 无铅封装, ESOP16

#### ■ APPLICATIONS

- Bluetooth/Wi-Fi Speakers
- Portable Speakers
- Smart speakers
- Smart Home
- 蓝牙/ Wi-Fi音箱
- 智能音箱
- 便携式音箱
- 智能家居

## ■ DESCRIPTION

HT81293, integrated with a boost converter, is a mono Class D audio amplifier that drives up to continuous 18W (10% THD+N, 1kHz) into 4ohm speaker from a Li-battery voltage.

HT81293A integrates an adaptive boost converter that generates a Class D amplifier supply rail tracking the audio signal, which will significantly improve the efficiency and extends the playing time in battery supply applications. The output voltage of boost converter in HT81293F is forced into 9V or 12V and it provides to the class D amplifier. Configurable current limit is adopted to avoid accidental large peak current.

HT81293 features Anti-Clipping Function (ACF) which detects output signal clip due to the over input signal and suppresses the output signal clip automatically. Also, the ACF function can adapt the output clip caused by power supply voltage down with battery. It can significantly improve the sound quality, creating a very comfortable musical enjoyment, and to protect the speakers from overload damage. It supplies 2 different ACF mode with different audio experience, and also ACF OFF mode.

HT81293 integrates Spread Spectrum Control technology to achieve advanced EMI suppression. The Gain of HT81293 is 32dB .

As for protection function, over current protection function for speaker output terminals, over temperature protection function and over voltage protection for boost converter output are also prepared.

HT81293是一款内置升压的单声道D类音频功率放大器，由锂电池供电时，THD+N=10%，能连续输出18W功率（4Ω负载）。

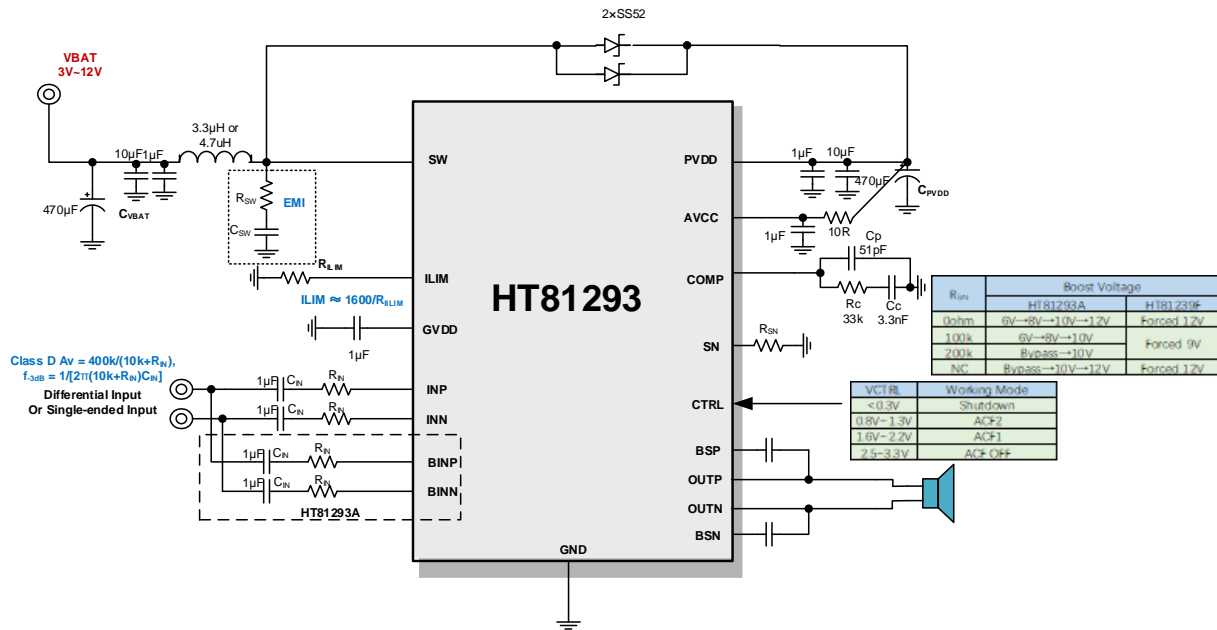
HT81293A内置可动态调节的升压，可以提供适应不同输出功率的电压给D类功放，其可大幅提高系统效率，延长电池续航时间。HT81293F则内置固定升压，提供一个固定9V或12V的升压给D类功放。HT81293可配置升压限流值，以防止过大的电流尖峰。

HT81293的最大特点是防削顶失真（ACF）输出控制功能，可检测并抑制由于输入音乐、语音信号幅度过大所引起的输出信号削顶失真（破音），也能自适应地防止在BOOST升压电压下降所造成的输出削顶，显著提高音质，创造非常舒适的听音享受，并保护扬声器免受过载损坏。HT81293提供两种不同音乐体验的ACF模式，以及ACF-Off模式。

HT81293具有先进的扩频功能来抑制EMI。HT81293的增益为32dB。

此外，HT81293集成了输出端过流保护、片内过温保护、升压过压保护等功能。

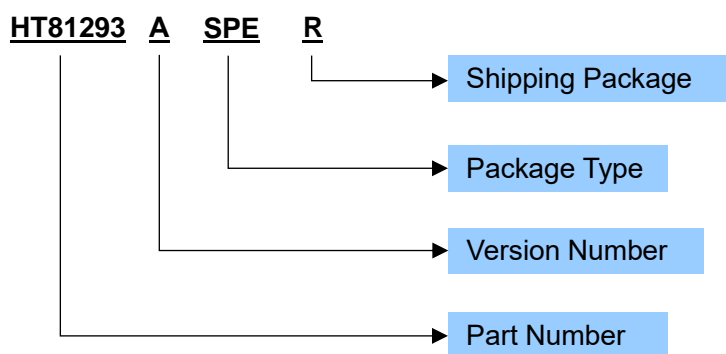
### TYPICAL APPLICATION



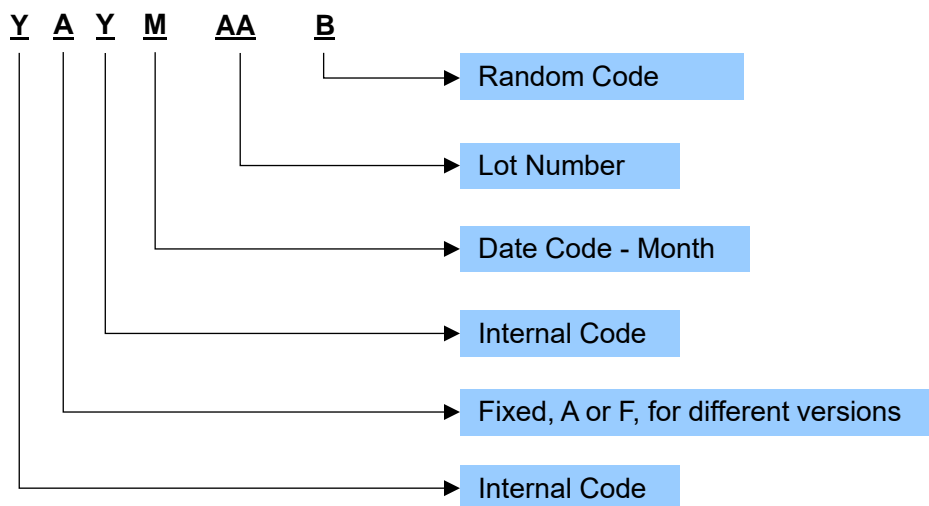
**ORDERING INFORMATION**

Ordering Number	Package Type	Marking	Operating Temperature Range	Shipping Package / MOQ
HT81293ASPER	ESOP16 (SPE)	HT81293 YYYMAAB <sup>1</sup>	-40℃~85℃	Tape and Reel (R) / 2500pcs
HT81293ASPET	ESOP16 (SPE)	HT81293 YYYMAAB	-40℃~85℃	Tube (T) / 50pcs
HT81293FSPER	ESOP16 (SPE)	HT81293 YYYMAAB	-40℃~85℃	Tape and Reel (R) / 2500pcs
HT81293FSPET	ESOP16 (SPE)	HT81293 YYYMAAB	-40℃~85℃	Tube (T) / 50pcs

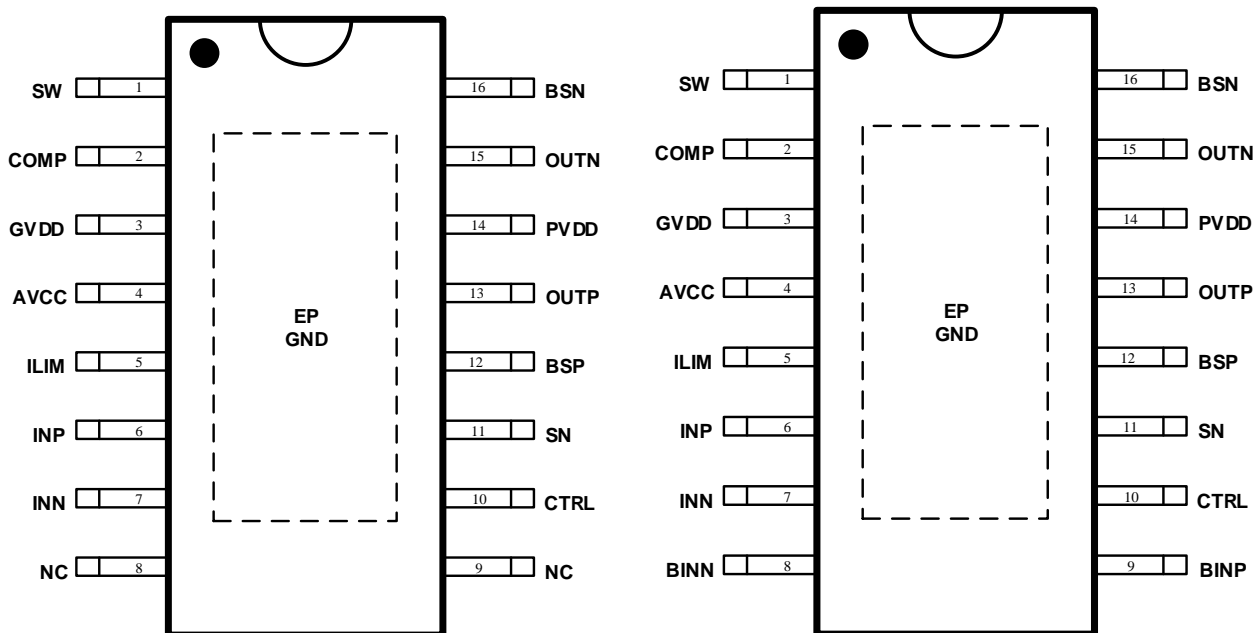
**Ordering Number**



**Production Tracking Code**



<sup>1</sup> YYYMAAB is production tracking code

**■ TERMINAL CONFIGURATION**

**HT81293F Top View**
**HT81293A Top View**
**■ TERMINAL FUNCTION**

Terminal No.		Name	I/O <sup>1</sup>	Description
HT81293F	HT81293A			
1		SW	I	Boost and rectifying switch input. 升压整流开关输入端
2		COMP	O	Output of the internal error amplifier, the loop compensation network should be connected between this pin and the GND pin. 环路补偿脚, 接补偿电路到GND。
3		GVDD	O	Voltage regulator, connect 1uF to GND. 电压调节器, 接1uF到地。
4		AVCC	P	Analog power supply. 模拟供电
5		ILIM	I	Adjustable switch peak current limit. An external resistor should be connected between this pin and GND. 最大限流值设置端, 外部接电阻到地。
6		INP	I	Positive input (differential+) for audio amplifier. 功放输入正端
7		INN	I	Negative input (differential-) for audio amplifier. 功放输入负端
8, 9	/	NC	I	No connection. 内部无连接
/	8	BINN	I	Audio negative input (differential-) for adaptive boost converter. 自适应升压的音频输入负端
/	9	BINP	I	Audio positive input (differential+) for adaptive boost converter. 自适应升压的音频输入正端
10		CTRL	I	Mode Control Terminal. 模式控制脚
11		SN	I	Boost converter output voltage selection. 升压电压选择
12		BSP	BST	Connection point for the OUTP bootstrap capacitor, which is used to create a power supply for the high-side gate drive for OUTP. OUTP自举电容位
13		OUTP	O	Positive pin for differential speaker amplifier output. 输出正端
14		PVDD	P	Power Supply for internal power circuitry. 功率电源
15		OUTN	O	Negative pin for differential speaker amplifier. 输出负端
16		BSN	BST	Connection point for the OUTN bootstrap capacitor, which is used to create a power supply for the high-side gate drive for OUTN. OUTN自举电容位
EP		GND	G	Provides both <b>electrical and thermal connection</b> from the device to the board. <b>A matching ground pad must be provided on the PCB and the device connected to it via solder.</b> For proper electrical operation, this ground pad must be connected to the system ground. 既是地, 又是散热PAD

<sup>1</sup> I: Input; O: Output; G: Ground; P: Power; BST: BOOT Strap;

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