

2×24W STEREO/1×40W MONO, DIGITAL INPUT CLASS-D AUDIO AMPLIFIER WITH AUDIO EFFECT TUNING

Description

The PAMS5803 is a fully integrated, high-efficiency, stereo Class-D audio amplifier with digital inputs. The application circuit requires few passive components to operate with 4.5V to 17V PVDD supply, 3.3V or 1.8V DVDD supply. It can drive 2×24W output power into BTL 4Ω and 1×40W into PBTL 2Ω@1% THD+N.

The PAMS5803 features one novel PWM modulation architecture, which adjusts PWM common duty cycle during start-up phase to avoid startup pop click.

Spread spectrum technology provides lower EMI noise. It allows inductor free application with specified output power situation with the PAMS5803.

The advanced audio effect tuning capability inside the PAMS5803 provides one highly integrated solution. It allows turning on/off each block with highly free operations. Both BQs and volume helps a lot to maintain audio headroom.

The PAMS5803 is packaged in TSSOP-28EP (Type TH-1).

Applications

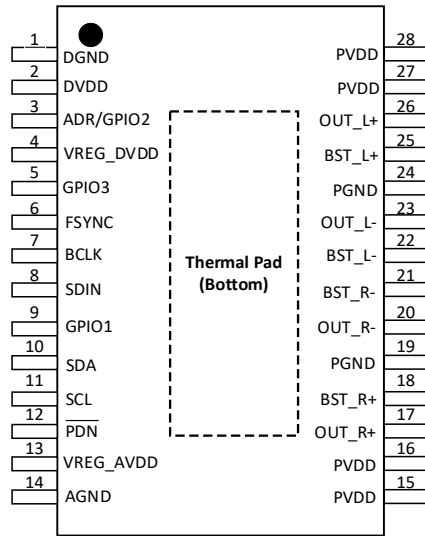
- Portable speakers: bluetooth, smart speakers with voice assistant
- Home audios: TV, sound-bar, STB (set top box), HTiB (home theatre in a box)
- PCs and laptops

Features

- Flexible Power Supply Configurations
 - PVDD: 4.5V to 17V
 - DVDD and I/O: 3.3V or 1.8V
- Various Output Configurations
 - 2×14W, Stereo Mode (4Ω, 12V, THD+N = 1%)
 - 2×24W, Stereo Mode (4Ω, 16V, THD+N = 1%)
- Excellent Audio Performance
 - THD+N ≤ 0.02% at 1W, 1kHz, PVDD = 12V
 - 107 dB A-Weighted Signal-to-Noise Ratio (SNR)
 - Idle Switching A-Weighted Noise 35μV_{RMS}
 - 17mA Low Quiescent Current
 - 90% Efficiency into 6Ω Load at 12V
- Configurable Digital Audio Interface
 - I2C Control with Up to 4 Selectable Addresses
 - I²S, Left-Justified, Right-Justified, TDM Audio Format
 - 3-Wire Digital Audio Interface without MCLK Required
 - 32kHz, 44.1kHz/48kHz Input Sample Rate
 - SDOUT for Acoustic Echo Cancellation – AEC or 1.1/2.1 System Sub-Channel Signal Routing
- Advanced Audio Effect Tuning
 - Flexible Digital and Analog Gain Adjustment
 - High Pass Filter for DC Blocking
 - Input Signal Router for Left and Right Channel
 - 2×10 BQs to Support Enhanced Audio Frequency Tuning
 - Dynamic Range Boost (DRB)
 - Full-Band AGL to Limit Output Power
- Analog Protections
 - FAULT Status Report through GPIO and I2C Registers
 - Overcurrent and Direct Current Protection
 - Overtemperature Protection
 - Undervoltage and Overvoltage Protection
 - Clock Error Protection
- TSSOP-28EP (Type TH-1) Package
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative.**
<https://www.diodes.com/quality/product-definitions/>

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

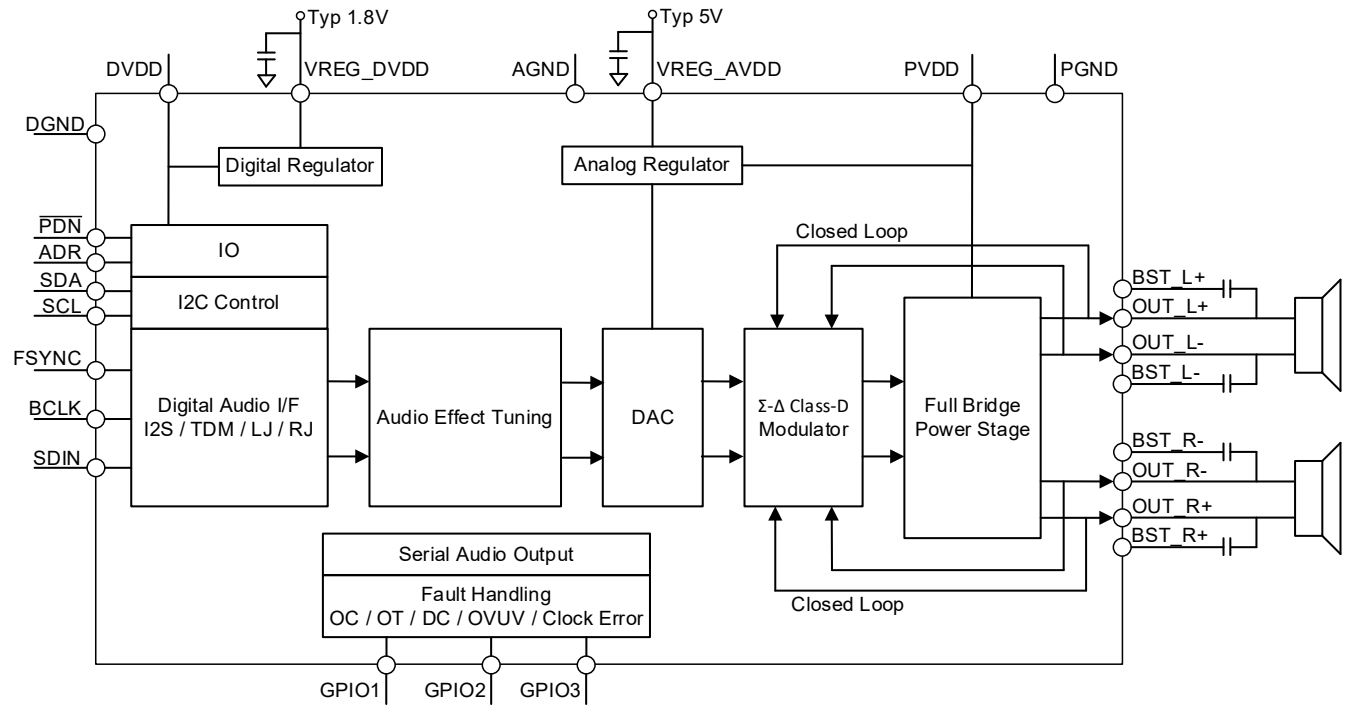
Pin Descriptions



TSSOP-28EP (Type TH-1) Top View

Pin No.	Name	Type	Description
1	DGND	PWR	Digital ground.
2	DVDD	PWR	Digital power supply input: 3.3V or 1.8V.
3	ADR/GPIO2	DIO	I2C address selection/ GPIO2: FAULT/WARNING/SDOUT...
4	VREG_DVDD	AOUT	Digital regulator output.
5	GPIO3	DIO	GPIO3: FAULT/WARNING/SDOUT... Default setting is allowed to directly short to GND.
6	FSYNC	DIN	Word select clock for the digital signal.
7	BCLK	DIN	Bit clock for the digital signal.
8	SDIN	DIN	Serial data input.
9	GPIO1	DIO	GPIO1: FAULT/WARNING/SDOUT...
10	SDA	DIO	I2C serial data.
11	SCL	DIN	I2C clock.
12	PDN	DIN	Shut down, low active.
13	VREG_AVDD	AOUT	Analog regulator output.
14	AGND	PWR	Analog ground.
15	PVDD	PWR	Power stage supply input.
16	PVDD	PWR	Power stage supply input.
17	OUT_R+	AOUT	Right channel positive output of H-bridge.
18	BST_R+	AIN	Bootstrap capacitor for OUT_R+.
19	PGND	PWR	Power stage ground.
20	OUT_R-	AOUT	Right channel negative output of H-bridge.
21	BST_R-	AIN	Bootstrap capacitor for OUT_R-.
22	BST_L-	AIN	Bootstrap capacitor for OUT_L-.
23	OUT_L-	AOUT	Left channel negative output of H-bridge.
24	PGND	PWR	Power stage ground.
25	BST_L+	AIN	Bootstrap capacitor for OUT_L+.
26	OUT_L+	AOUT	Left channel positive output of H-bridge.
27	PVDD	PWR	Power stage supply input.
28	PVDD	PWR	Power stage supply input.

Functional Block Diagram

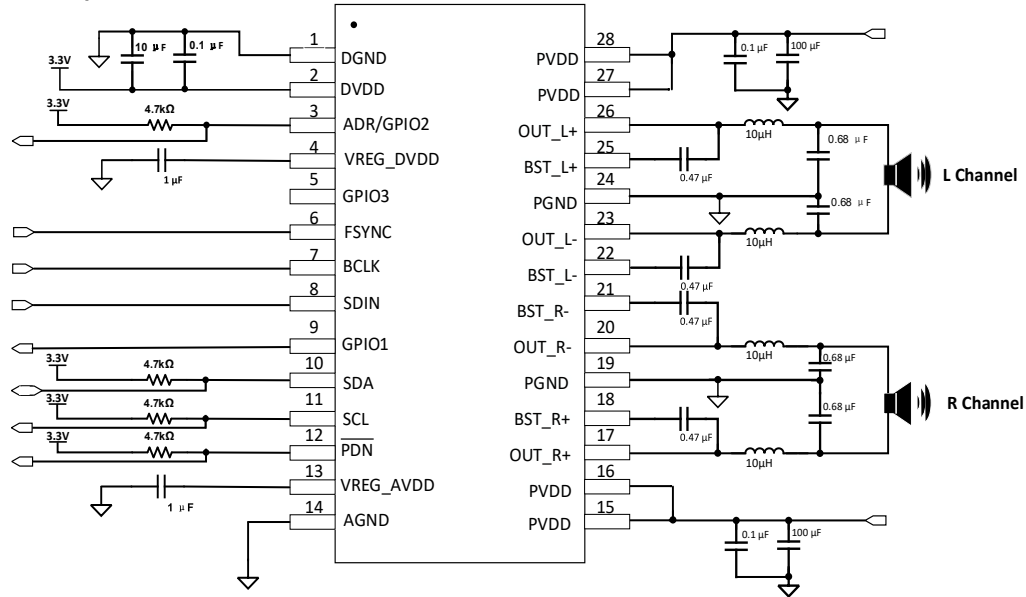


Device Family Comparison

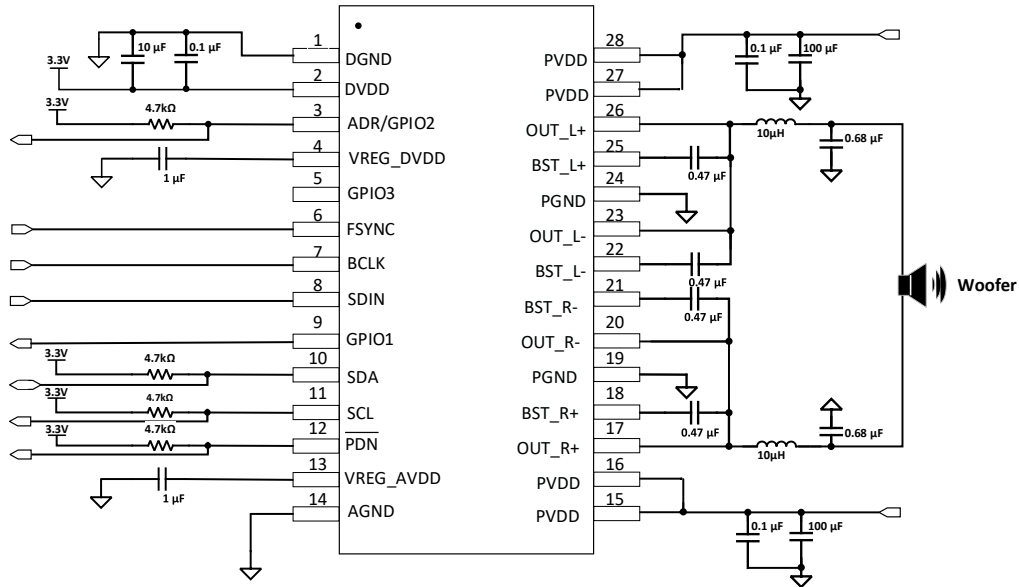
Device Name	R _{DS(on)}	PVDD	Output Power
PAMS5803	110mΩ	4.5V to 17V	Stereo 2×24W (4Ω, 16V, THD+N = 1%)
PAMS5804	135mΩ	4.5V to 26.4V	Stereo 2×33W (6Ω, 22V, THD+N = 1%)
PAMS5825	75mΩ	4.5V to 21V	Stereo 2×33W (6Ω, 21V, THD+N = 1%)
PAMS5826	95mΩ	4.5V to 26.4V	Stereo 2×40W (6Ω, 24V, THD+N = 1%)
PAMS5827	75mΩ	4.5V to 26.4V	Stereo 2×41W (6Ω, 24V, THD+N = 1%)

Typical Applications Circuits (Notes 4 & 5)

Application Circuit Example of Stereo

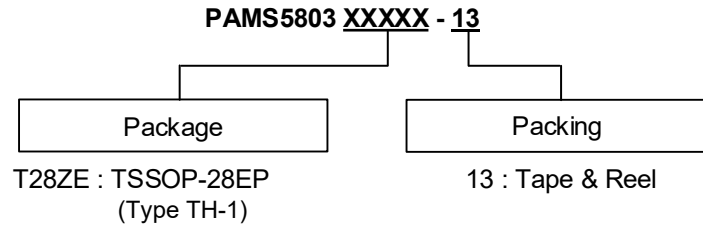


Application Circuit Example of Mono



- Notes:
- Both 0.47μF or 0.22μF are suitable for BST caps.
 - GPIO3 default setting is allowed to directly short to GND.

Ordering Information

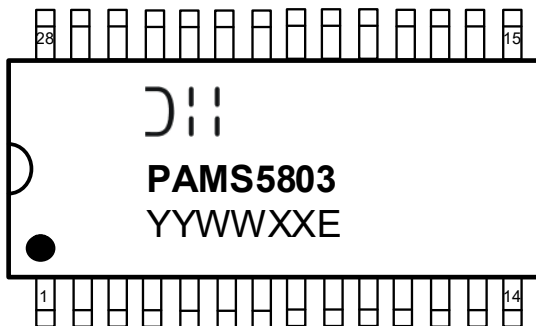


Orderable Part Number	Identification Code	Package Code	Package	Packing	
				Qty.	Carrier
PAMS5803T28ZE-13	PAMS5803	T28ZE	TSSOP-28EP (Type TH-1)	3000	13" Tape and Reel

9. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

(Top View)



Logo :

Marking : PAMS5803

YY: Year: 25, 26, 27~

WW: Week: 01 to 52; 52
Represents 52 and 53 Week

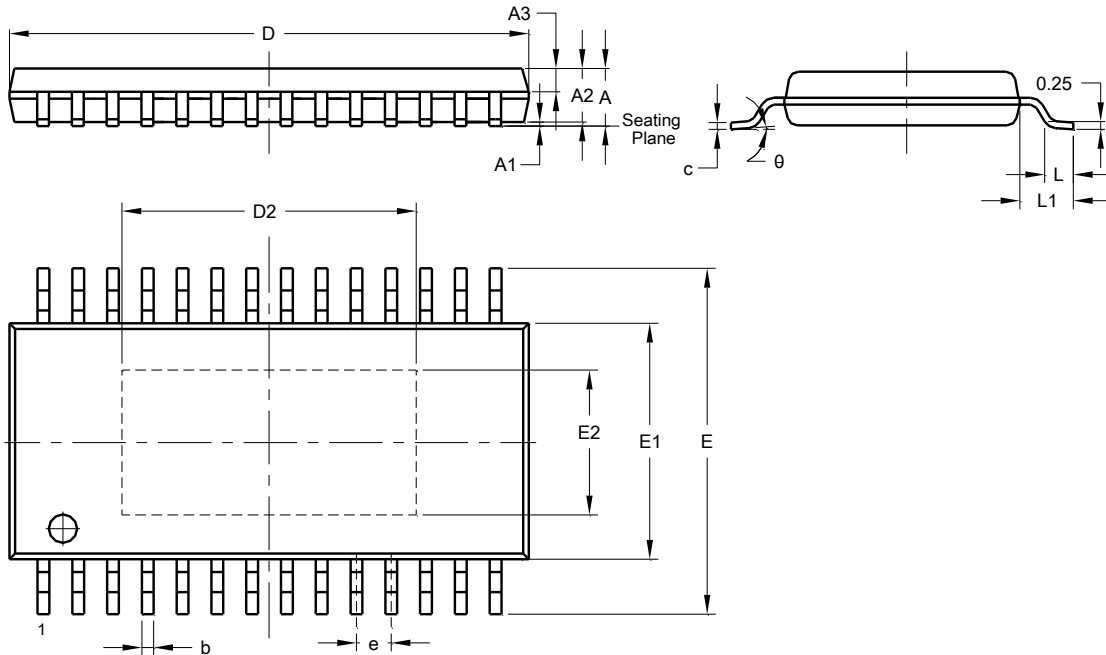
XX: Internal Code

E: Exposed Pad

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

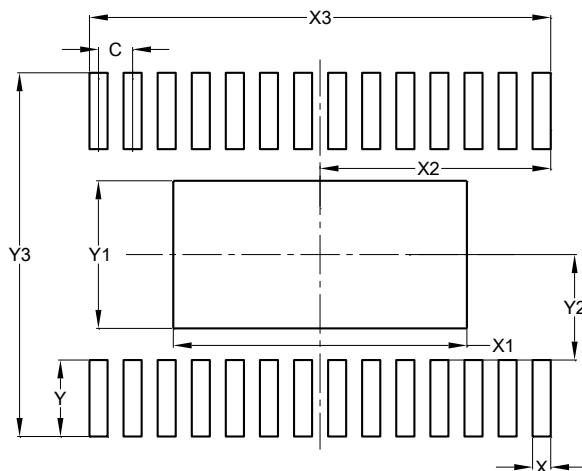
TSSOP-28EP (Type TH-1)



Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TSSOP-28EP (Type TH-1)



Mechanical Data

- Moisture Sensitivity: Level 3 per J-STD-020
- Terminals: Finish – Sn, Solderable per J-STD-002, Test B1 (e1)
- Weight: 0.15 grams (Approximate)

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