2x20W Stereo / 1x 40W Mono Digital Audio Amplifier With 20 Bands EQ Functions and PWM out

Features

- 16/18/20/24-bits input with I^2S, Left-alignment and Right-alignment data format
- PSNR & DR(A-weighting)
  Loudspeaker: 97dB (PSNR), 107dB (DR) @24V
- Multiple sampling frequencies (Fs)
  32kHz / 44.1kHz / 48kHz and
  64kHz / 88.2kHz / 96kHz and
  128kHz / 176.4kHz / 192kHz
- System clock = 64x, 128x, 192x, 256x, 384x, 512x, 576x, 768x, 1024x Fs
  64x~1024x Fs for 32kHz / 44.1kHz / 48kHz
  64x~512x Fs for 64kHz / 88.2kHz / 96kHz
  64x~256x Fs for 128kHz / 176.4kHz / 192kHz
- Supply voltage
  3.3V for digital circuit
  10V~26V for loudspeaker driver
- Loudspeaker output power for at 24V
  10W x 2CH into 8Ω @0.17% THD+N for stereo
  20W x 2CH into 8Ω @0.27% THD+N for stereo
  20W x 1CH into 4Ω @0.14% THD+N for mono
  40W x 1CH into 4Ω @0.21% THD+N for mono
- Sound processing including：
  20 bands parametric speaker EQ
  Volume control (+24dB~-103dB, 0.125dB/step),
  Dynamic range control (DRC)
  Dual band dynamic range control
  Power clipping
  3D surround sound
  Channel mixing
  Noise gate with hysteresis window
  Bass/Treble tone control
  Bass management crossover filter
  DC-blocking high-pass filter
- Anti-pop design
- Short circuit and over-temperature protection
- I^2C control interface with selectable device address
- Support hardware and software reset
- Internal PLL
- LV Under-voltage shutdown and HV Under-voltage detection
- Power saving mode

Applications

- TV audio
- Boom-box, CD and DVD receiver, docking system
- Powered speaker
- Wireless audio

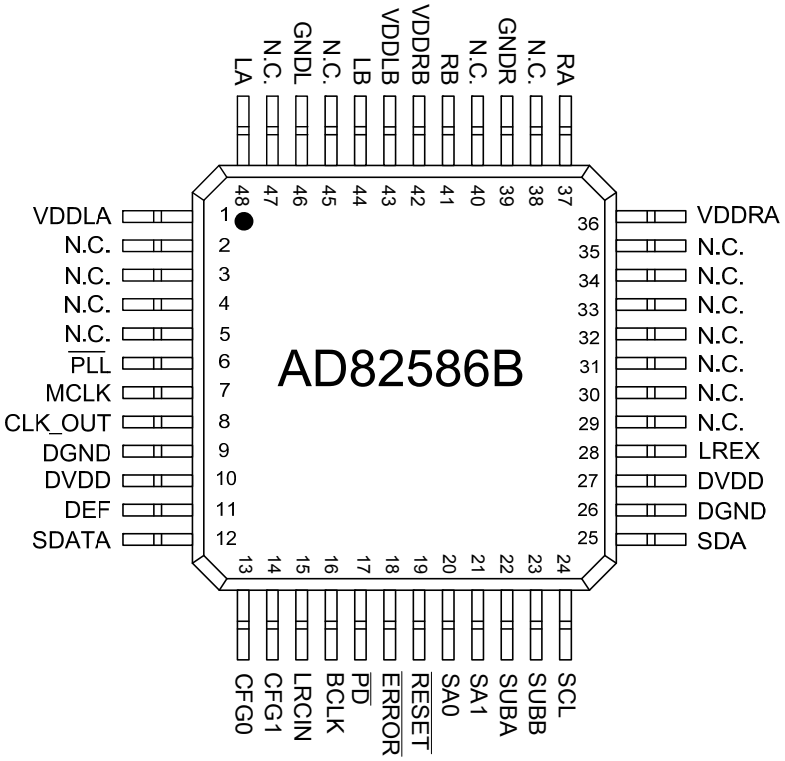
Description

AD82586B is a digital audio amplifier capable of driving a pair of 8Ω, 20W or a single 4Ω, 40W operating at 24V supply without external heat-sink or fan requirement. Higher output wattage can be delivered with cooling method.

AD82586B can provide advanced audio processing capabilities, such as volume control, 20 bands speaker EQ, audio mixing, 3D surround and Dynamic Range Control (DRC). These functions are fully programmable via a simple I^2C control interface. Robust protection circuits are provided to protect AD82586B from damage due to accidental erroneous operating condition. AD82586B is more tolerant to noise and PVT (Process, Voltage, and Temperature) variation than the analog Class-AB or Class-D audio amplifier counterpart implemented by analog circuit design. AD82586B is pop free during instantaneous power switch because of its built-in, robust anti-pop circuit.

The output stage is flexibly configurable for stereo or mono applications. In addition, AD82586B provides a sub-woofer PWM output port for the increasingly popular 2.1 channel applications. The programmable audio bass content of this subwoofer PWM output port can drive an external, low cost digital amplifier power stage, e.g., ESMT's AD92580. Furthermore, use three pieces of AD82586B can realize 5.1 channels for home theater applications.

Pin Assignment



Pin Description

PIN	NAME	TYPE	DESCRIPTION	CHARACTERISTICS
1	VDDLA	P	Left channel supply A	
2	N.C.			
3	N.C.			
4	N.C.			
5	N.C.			
6	$\overline{PLL}$	I	PLL enable, low active	Schmitt trigger TTL input buffer
7	MCLK	I	Master clock input	Schmitt trigger TTL input buffer
8	CLK_OUT	O	Clock output from PLL	TTL output buffer
9	DGND	P	Digital Ground	
10	DVDD	P	Digital Power	
11	DEF	I	Default volume setting (1:Un-Mute ; 0:Mute)	Schmitt trigger TTL input buffer
12	SDATA	I	Serial audio data input	Schmitt trigger TTL input buffer
13	CFG0	I	Stereo/Mono/2.1CH configuration pin	Schmitt trigger TTL input buffer
14	CFG1	I	Stereo/Mono/2.1CH configuration pin	Schmitt trigger TTL input buffer
15	LRCIN	I	Left/Right clock input (Fs)	Schmitt trigger TTL input buffer
16	BCLK	I	Bit clock input (64Fs)	Schmitt trigger TTL input buffer
17	$\overline{PD}$	I	Power down, low active	Schmitt trigger TTL input buffer

18	$\overline{\text{ERROR}}$	O	Error status, low active	Open-drain output
19	$\overline{\text{RESET}}$	I	Reset, low active	Schmitt trigger TTL input buffer
20	SA0	I	I^2C select address 0	Schmitt trigger TTL input buffer
21	SA1	I	I^2C select address 1	Schmitt trigger TTL input buffer
22	SUBA	O	Sub-Woofer PWM output A	
23	SUBB	O	Sub-Woofer PWM output A	
24	SCL	I	I^2C serial clock input	Schmitt trigger TTL input buffer
25	SDA	I/O	I^2C bi-directional serial data	Schmitt trigger TTL input buffer
26	DGND	P	Digital Ground	
27	DVDD	P	Digital Power	
28	LREX	I	Left/Right channel exchange	Schmitt trigger TTL input buffer
29	N.C.			
30	N.C.			
31	N.C.			
32	N.C.			
33	N.C.			
34	N.C.			
35	N.C			
36	VDDRA	P	Right channel supply A	
37	RA	O	Right channel output A	
38	N.C.			
39	GNDR	P	Right channel ground	
40	N.C.			
41	RB	O	Right channel output B	
42	VDDRB	P	Right channel supply B	
43	VDDLB	P	Left channel supply B	
44	LB	O	Left channel output B	
45	N.C.			
46	GNDL	P	Left channel ground	
47	N.C.			
48	LA	O	Left channel output A	