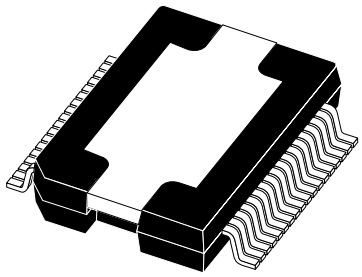
STA516BE

500 W FFX digital amplifier power stage

Datasheet - production data



PowerSO-36 with exposed pad up

Features

- Output Power at 56 V supply voltage
  - 2 x 250 W at 10% THD + N into 6 Ω BTL
  - 2 x 200 W at 10% THD + N into 8 Ω BTL
  - 4 x 130 W at 10% THD + N into 3 Ω SE
  - 4 x 100 W at 10% THD + N into 4 Ω SE
  - 1 x 480 W at 10% THD + N into 3 Ω PBTL
  - 1 x 380 W at 10% THD + N into 2 Ω PBTL
- Output Power at 52 V supply voltage
  - 2 x 200 W at 10% THD + N into 6 Ω BTL
  - 4 x 100 W at 10% THD + N into 3 Ω SE
  - 1 x 400 W at 10% THD + N into 2 Ω PBTL
- < 0.1% THD + N at 1 W
- PSO-36 thermally enhanced package
- Minimum input / output pulse width distortion
- High efficiency power stage (> 90%) with 190 mΩ RdsON
- CMOS compatible logic inputs
- Integrated self protection circuits including overtemperature, undervoltage, overvoltage, overload, short-circuit
- EMI compliant when used with recommended system design
- Automatic recovery mode after fault conditions

Applications

- Home theater
- DVD receiver
- Mini / Micro Audio systems

Description

STA516BE is a monolithic quad half-bridge stage in Multipower BCD Technology. The device can be used as dual bridge or reconfigured, by connecting pin CONFIG to pins VDD, as a single bridge with double-current capability or as a half bridge (binary mode) with half-current capability.

A cost-effective, high fidelity audio system can be designed using ST chipset, including a modulator (e.g. STA309A or STA321) and the STA516BE. This system only requires a simple passive LC demodulation filter to deliver high-quality, high efficiency audio amplification with prove EMI compliance. The efficiency of this digital amplifier is greater than 90% into 8 Ω speakers, enabling the use of smaller power supplies and heatsinks.

The STA516BE has an innovative integrated protection system, safeguarding the device against different fault conditions that could damage the overall system.

Table 1: Device summary

Part number	Temperature range	Package	Packing
STA516BE13TR	0 to 90 °C	PowerSO36 EPU	Tape and reel

2 Pin description

Figure 1: Pin out

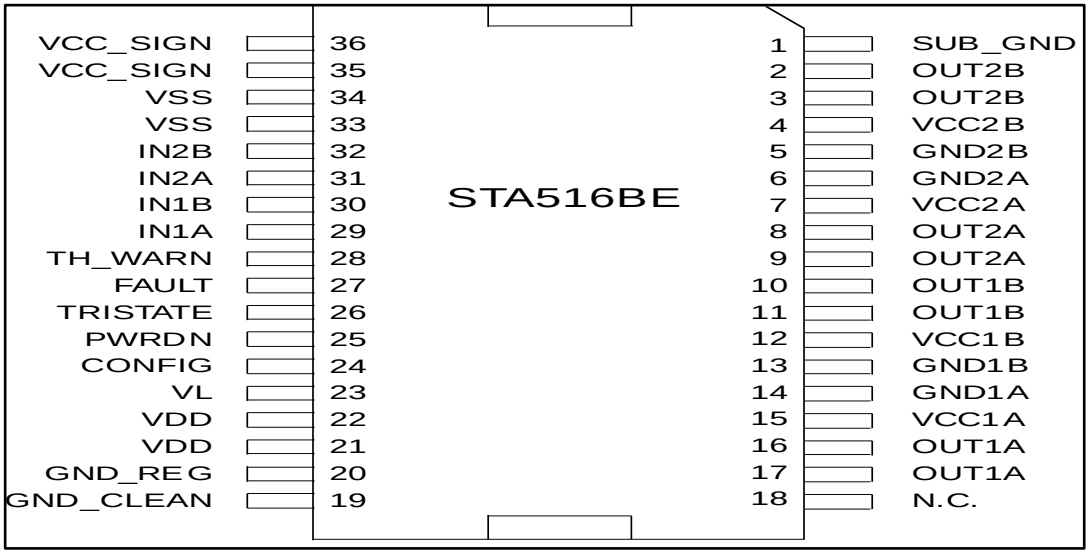


Table 2: Pin function

Pin	Name	Type	Description
1	GND_SUB	PWR	Substrate ground
2, 3	OUT2B	O	Output half bridge 2B
4	VCC2B	PWR	Positive supply
5	GND2B	PWR	Negative supply
6	GND2A	PWR	Negative supply
7	VCC2A	PWR	Positive supply
8, 9	OUT2A	O	Output half bridge 2A
10, 11	OUT1B	O	Output half bridge 1B
12	VCC1B	PWR	Positive supply
13	GND1B	PWR	Negative supply
14	GND1A	PWR	Negative supply
15	VCC1A	PWR	Positive supply
16, 17	OUT1A	O	Output half bridge 1A
18	N.C.	-	No internal connection
19	GND_CLEAN	PWR	Logical ground
20	GND_REG	PWR	Ground for regulator V_{DD}
21, 22	VDD	PWR	5-V regulator referred to ground
23	VL	PWR	High logical state setting voltage, V_L
24	CONFIG	I	Configuration pin: 0: normal operation

Pin	Name	Type	Description
			1: bridges in parallel (OUT1A = OUT1B, OUT2A = OUT2B (If IN1A = IN1B, IN2A = IN2B))
25	PWRDN	I	Standby pin: 0: low-power mode 1: normal operation
26	TRISTATE	I	Hi-Z pin: 0: all power amplifier outputs in high impedance state 1: normal operation
27	FAULT	O	Fault pin advisor (open-drain device, needs pull-up resistor): 0: fault detected (short circuit or thermal, for example) 1: normal operation
28	TH_WARN	O	Thermal warning advisor (open-drain device, needs pull-up resistor): 0: temperature of the IC >130 °C 1: normal operation
29	IN1A	I	Input of half bridge 1A
30	IN1B	I	Input of half bridge 1B
31	IN2A	I	Input of half bridge 2A
32	IN2B	I	Input of half bridge 2B
33, 34	VSS	PWR	5-V regulator referred to $+V_{CC}$
35, 36	VCC_SIGN	PWR	Signal positive supply