TDA8946J

2 x 15 W stereo Bridge Tied Load (BTL) audio amplifier

Rev. 02 — 14 March 2000 **Product specification**

1. General description

The TDA8946J is a dual-channel audio power amplifier with an output power of 2×15 W at an 8 Ω load and a 18 V supply. The circuit contains two Bridge Tied Load (BTL) amplifiers with an all-NPN output stage and standby/mute logic. The TDA8946J comes in a 17-pin DIL-bent-SIL (DBS) power package. The TDA8946J is printed-circuit board (PCB) compatible with all other types in the TDA894x family. One PCB footprint accommodates both the mono and the stereo products.

2. Features

- Few external components
- Fixed gain
- Standby and mute mode
- No on/off switching plops
- Low standby current
- High supply voltage ripple rejection
- Outputs short-circuit protected to ground, supply and across the load
- Thermally protected
- Printed-circuit board compatible.

3. Applications

- Mains fed applications (e.g. TV sound)
- PC audio
- Portable audio.

4. Quick reference data

Table 1: Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CC}	supply voltage		6	18	25	V
I_q	quiescent supply current	V_{CC} = 18 V; $R_L = \infty$	-	28	42	mA
I_{stb}	standby supply current		-	-	10	µA

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Table 1: Quick reference data...*continued*

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
P_o	output power	THD = 10%; R_L = 8 Ω; V_{CC} = 18 V	13	15	-	W
THD	total harmonic distortion	P_o = 1 W	-	0.03	0.1	%
G_v	voltage gain		31	32	33	dB
SVRR	supply voltage ripple rejection		50	65	-	dB

5. Ordering information

Table 2: Ordering information

Type number	Package		
	Name	Description	Version
TDA8946J	DBS17P	plastic DIL-bent-SIL power package; 17 leads (lead length 12 mm)	SOT243-1

6. Block diagram

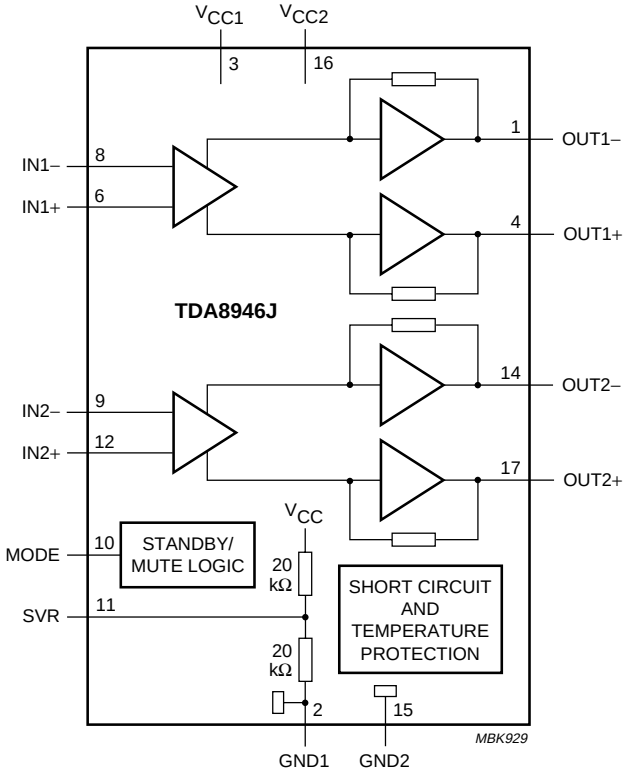

Fig 1. Block diagram.

7. Pinning information

7.1 Pinning

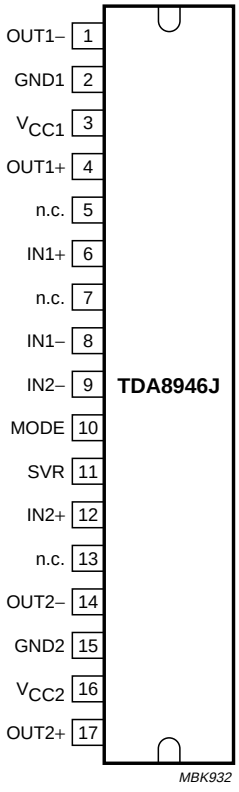

Fig 2. Pin configuration.

7.2 Pin description

Table 3: Pin description

Symbol	Pin	Description
OUT1–	1	negative loudspeaker terminal 1
GND1	2	ground channel 1
V_{CC1}	3	supply voltage channel 1
OUT1+	4	positive loudspeaker terminal 1
n.c.	5	not connected
IN1+	6	positive input 1
n.c.	7	not connected
IN1–	8	negative input 1
IN2–	9	negative input 2
MODE	10	mode selection input (standby, mute, operating)
SVR	11	half supply voltage decoupling (ripple rejection)
IN2+	12	positive input 2

Table 3: Pin description...*continued*

Symbol	Pin	Description
n.c.	13	not connected
OUT2–	14	negative loudspeaker terminal 2
GND2	15	ground channel 2
V_{CC2}	16	supply voltage channel 2
OUT2+	17	positive loudspeaker terminal 2

8. Functional description

The TDA8946J is a stereo BTL audio power amplifier capable of delivering 2 × 15 W output power to an 8 Ω load at THD = 10%, using a 18 V power supply and an external heatsink. The voltage gain is fixed at 32 dB.

With the three-level MODE input the device can be switched from ‘standby’ to ‘mute’ and to ‘operating’ mode.

The TDA8946J outputs are protected by an internal thermal shutdown protection mechanism and a short-circuit protection.

8.1 Input configuration

The TDA8946J inputs can be driven symmetrical (floating) as well as asymmetrical. In the asymmetrical mode one input pin is connected via a capacitor to the signal ground which should be as close as possible to the SVR (electrolytic) capacitor ground. Note that the DC level of the input pins is half of the supply voltage V_{CC}, so coupling capacitors for both pins are necessary.

The input cut-off frequency is:

$$f_{i(cut-off)} = \frac{1}{2\pi(R_i \times C_i)} \quad (1)$$

For R_i = 45 kΩ and C_i = 220 nF:

$$f_{i(cut-off)} = \frac{1}{2\pi(45 \times 10^{3} \times 220 \times 10^{-9})} = 16\ \text{Hz} \quad (2)$$

As shown in Equation 1 and 2, large capacitor values for the inputs are not necessary; so the switch-on delay during charging of the input capacitors, can be minimized. This results in a good low frequency response and good switch-on behaviour.

Remark: To prevent HF oscillations do not leave the inputs open, connect a capacitor of at least 1.5 nF across the input pins close to the device.