

SANYO Semiconductors DATA SHEET

LA42032 — Audio Output for TV application 5W × 2ch Power Amplifier

Overview

LA42032 is 5W 2-channel AF power amplifier intended for televisions.

Functions

- $3W \times 2$ channels (V_{CC} = 9V, R_L = 8Ω , THD = 10%).
- 5W \times 2 channels (V_{CC} = 11V, R_L = 8 Ω , THD = 10%).
- Standby function.
- Built-in mute function.
- Built-in various protection circuit (short to VCC/short to groumd/load shorting/overheating).

Specifications

Maximum Ratings at $Ta = 25^{\circ}C$

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Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC} max		16	V
Allowable power dissipation	Pd max	Infinitely large heat sink	15	W
Maximum junction temperature	Tj max		150	°C
Thermal resistance	θјс		3	°C/W
Operating temperature	Topr		-25 to +75	°C
Storage temperature	Tstg		-40 to +150	°C

Operating Conditions at $Ta = 25^{\circ}C$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V _{CC}		9	V
Recommended load resistance	RL		8	Ω
Allowable operating supply voltage range	V _{CC} op	Under conditions such that Maximum ratings are not exceeded	5.5 to 15	V

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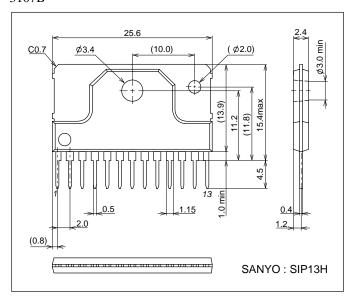
Electrical Characteristics at $Ta=25^{\circ}C,\ V_{CC}=9V,\ R_L=8\Omega,\ f=1kHz,\ Rg=600\Omega$

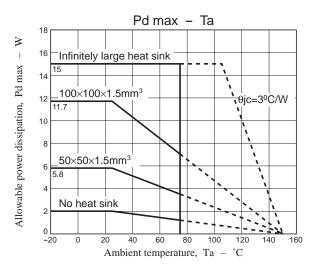
Parameter	Cumph of	Symbol Conditions	Ratings			1.1
	Symbol	Conditions	min	typ	max	Unit
Standby current	Ist	Amplifier OFF		0	10	μΑ
Quiescent current	Icco	Rg = 0, R _L = OPEN	40	70	140	mA
Output power	P _O 1	THD = 10%	2	3		W
	P _O 2	V _{CC} = 11V, THD = 10%		5		W
Total harmonic distortion	THD	P _O = 1W		0.06	0.2	%
Voltage gain	VG	$V_{O} = 0$ dBm	33	35	37	dB
Output noise voltage	V _{NO}	Rg = 0, BPF = 20Hz to 20kHz		0.2	0.4	mVrms
Ripple rejection ratio	SVRR	Rg = 0, fR = 100Hz, V _{CC} R = 0dBm	40	50		dB
Channel separation	CH.Sep	$Rg = 10k\Omega$, $V_O = 0dBm$	50	60		dB
Mute attenuation value	ATT	V _O = 1Vrms, BPF = 20Hz to 20kHz	80	90		dB
Mute control voltage (pin 6)	Vmute	Mute ON *1	1.7		3.0	V
		Mute OFF	0		0.5	V
Standby control voltage (pin 5)	Vst	Amplifier ON *1	2.5		15	V
		Amplifier OFF	0		0.5	V
Input resistance	Ri		21	30	39	kΩ

^{*1 :} Note that the standby pin (pin 5) and MUTE pin (pin 6) incorporate the anti-electrostatic diode allowing the current to flow through the diode when the potential of V_{CC} 7 pin decreases below that of pin 5/6.

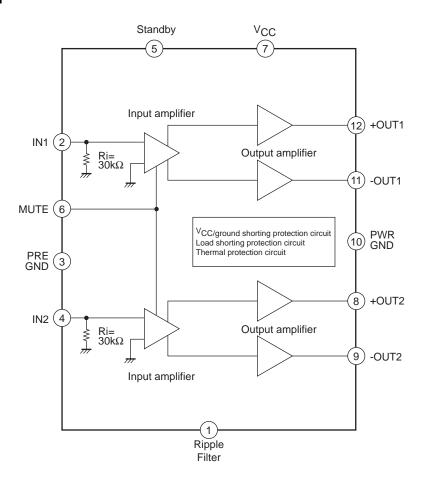
Package Dimensions

unit : mm (typ) 3107B

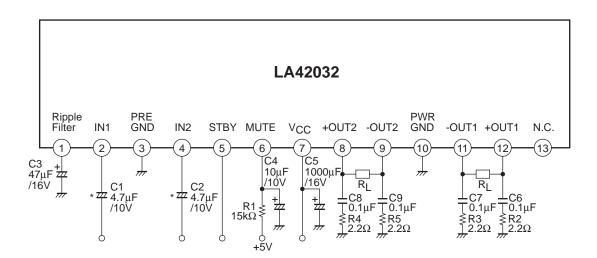




Block Diagram



Test Circuit



* LA42032 employs the zero-bias type input circuit, with the input pin potential being nearly zero (about 0.01V). Accordingly, the polarity must be determined according to the DC potential of a circuit connected to the previous stage of LA42032.

External Components

C1, C2 : Input coupling capacitors, for which 4.7μF or less is recommended. LA42032 employs the zero-bias type input circuit, with the input pin potential being nearly zero. Accordingly, the polarity must be determined according to the DC potential of a circuit connected to the previous stage of LA42032.

: Capacitor for starting time of the ripple filter and amplifier, for which 47μF is recommended.

C4, R1 : Capacitor and resistor for mute. C4 is necessary even when the mute function is not used.

C5 : Power capacitor.

C3

 $C6\ to\ C9\ : Capacitor\ and\ resistor\ for\ oscillation\ prevention.\ For\ C6\ to\ C9,\ the\ polyester\ film\ capacitor\ with\ superior$

R2 to R5 temperature characteristics (Mylar capacitor) is recommended. Use R2 to R5 of 2.2Ω along with the capacitor.

1. Mute function (pin 6)

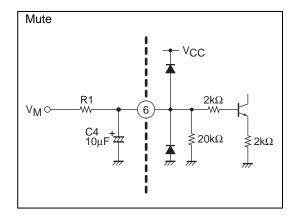
With the pin 6 voltage of 1.7V (minimum) or more, the mute function is turned ON.

Set the V_M application voltage so that the pin 6 voltage becomes. 1.7V or more.

The mute time constant is determined by R1 and C4. Determine the constant after careful review because it is related to the pop sound at mute ON/OFF.

C4 is necessary even when the mute function is not used because it is related to the pop sound when the amplifier is turned ON.

Note that the MUTE pin (pin 6) incorporates the anti-electrostatic diode, allowing the current to flow through the diode when the potential of V_{CC} 7 pin decreases below that of pin 6.



2. Standby function (pin 5)

The amplifier is turned ON when the voltage of 2.5V (minimum) or more is applied to pin 5.

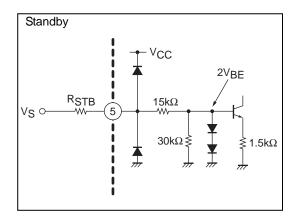
Pin 5 control voltage

Pin 5 voltage	Amplifier	Standby
0 to 0.5	OFF	ON
2.5 to V _{CC}	ON	OFF

To suppress the inrush current to pin 5 when the V_{STB} application voltage is high, insert the control resistor (R_{STB}).

Example: Tosuppress the pin 5 inrush current to 500µA or less

$$R_{STB} = \frac{Applied \ voltage \ (V_{STB}) \ -2V_{BE} \ (About \ 1.4V)}{500 uA} -15 k\Omega$$

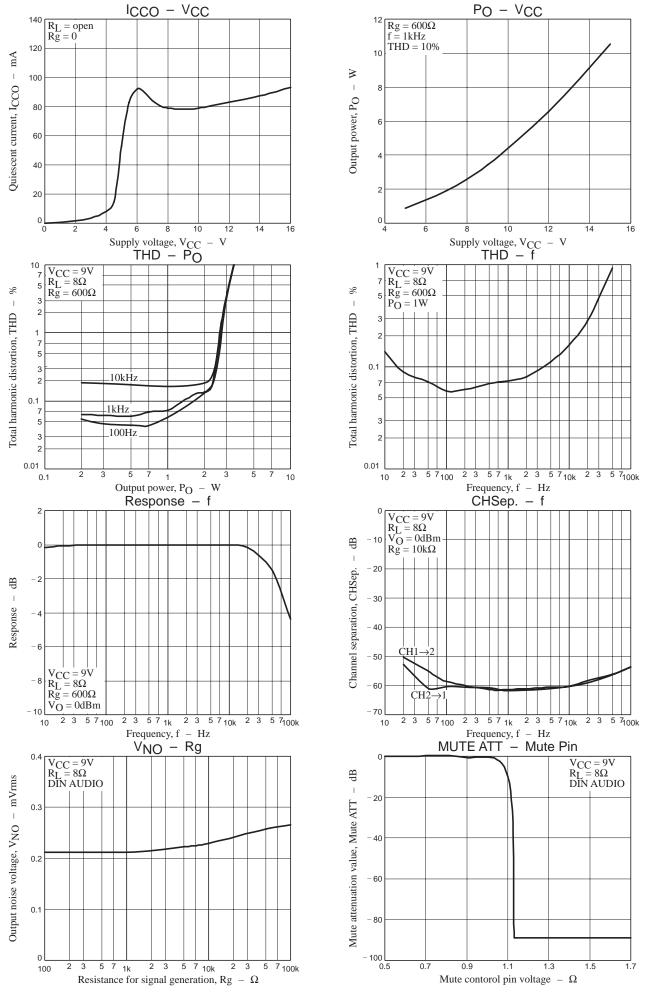


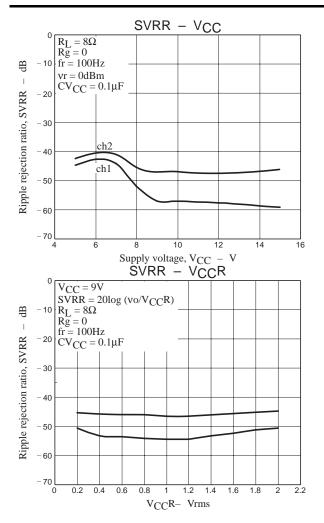
Note that the standby pin (pin 5) incorporates the anti-electrostatic diode, allowing the cu orrent to flow through the diode when the potential of V_{CC} pin 7 decreases below that of pin 5.

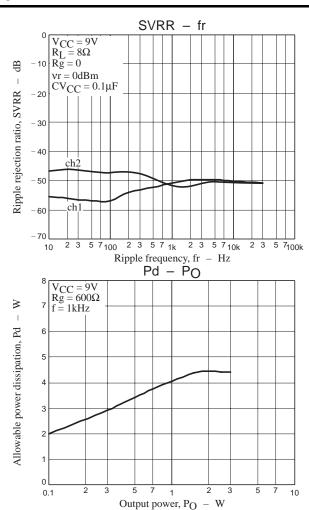
LA42032

Cautions for us

- 1. Short-circuit (power-output short-circuit), ground fault (GND-output short-circuit), and load short-circuit protective circuits are incorporated. They are activated in case of abnormal connection.
 - These circuits remain active while such abnormal connection continues and is reset automatically when the abnormality is removed.
 - In certain conditions, the protective circuits may be locked and continue to be active even when the abnormality is removed. In this case, either enter the standby mode or turn OFF the power supply.
- 2. The thermal protection circuit is incorporated and is activated when the junction temperature (Tj) rises to about 160°C or more. The output is controlled to return gradually to the attenuated state.
- 3. When the product is used near the maximum rating, even the slightest change in the condition may cause exceeding of the maximum rating, resulting possibly in breakdown. Take the sufficient margin for the supply voltage, etc. and always use the product within a range never exceeding the maximum rating.







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