



SANYO Semiconductors

DATA SHEET

LA4636

Monolithic Linear IC
 For General Audio Use
 11W 2-Channel BTL AF Power
 Amplifier

Overview

The LA4636 is a BTL power amplifier that is pin-compatible with the LA4635A and LA4635B single-end power amplifier. It represents a new concept in devices of this type by allowing design editing based on common circuit board pin compatibility for products of different power ranks. The LA4636 also incorporates several protection circuits.

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	No signal	24	V
Maximum output current	I_O peak	Per channel	2.5	A
Allowable power dissipation	P_d max	Infinite heat sink	25	W
Operating temperature	T_{opr}		-20 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		12	V
Recommended load resistance	R_L op		4 to 8	Ω
Allowable operating voltage range *1	V_{CC} op	$R_L = 8\Omega$	5.5 to 20	V
		$R_L = 6\Omega$	5.5 to 17	V
		$R_L = 4\Omega$	5.5 to 13	V

Set V_{CC} , R_L , and output level such that P_d max. is not exceeded for the size of heat sink used.

*1: Assuming two-channel output with an I_O peak per channel exceeding 1.0A. If the I_O peak per channel is 1.0A or less, the allowable operating voltage range, is 5.5 to 20V (range not exceeding P_d max.) for all R_L values.

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LA4636

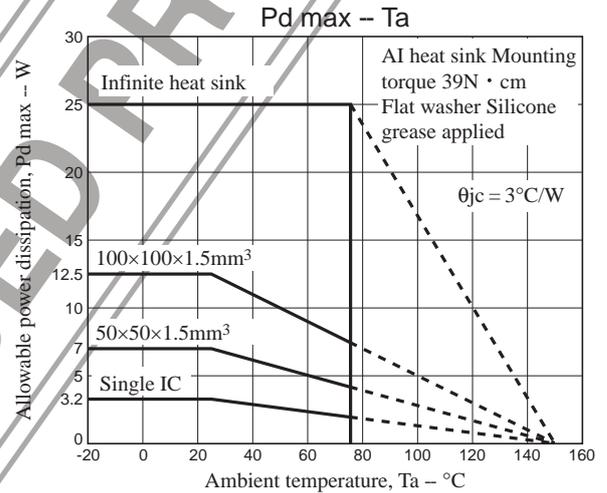
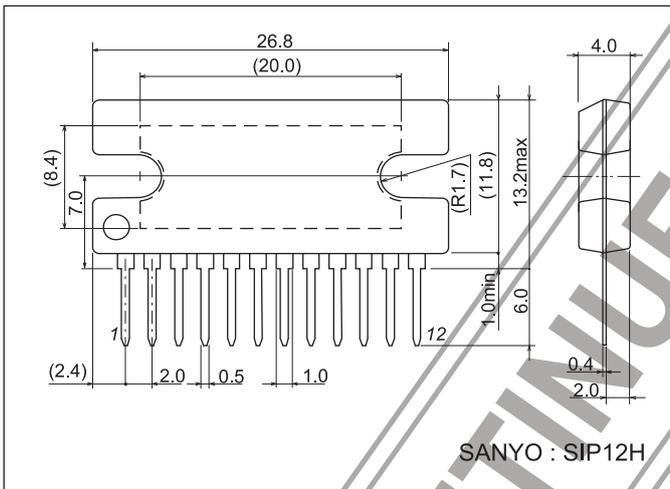
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 12\text{V}$, $R_L = 4\Omega$, $f = 1\text{kHz}$, $R_g = 600\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	$R_g = 0$	40	70	150	mA
Standby current	I_{st}			0	10	μA
Voltage gain	VG	$V_O = 0\text{dBm}$	33	35	37	dB
Total harmonic distortion	THD	$P_O = 1\text{W}$		0.06	0.2	%
Output power	P_{O1}	THD = 10%	8	11		W
	P_{O2}	THD = 10%, $R_L = 6\Omega$		9		W
Output noise voltage	V_{NO}	$R_g = 0$, BPF = 20Hz to 20kHz		0.14	0.3	mV
Ripple rejection	SVRR	$R_g = 0$, $f_R = 100\text{Hz}$, $V_R = 0\text{dBm}$	50	60		dB
Channel separation	CHsep	$R_g = 10\text{k}\Omega$, $V_O = 0\text{dBm}$	50	60		dB
Input resistance	R_i		14	20	26	$\text{k}\Omega$
Output offset voltage	V_N offset	$R_g = 0$	-300		+300	mV
Standby pin voltage	V_{ST}	Amplifier on (pin 5 voltage)	2.5		10	V
Mute pin voltage	V_M	Mute on (pin 6 voltage)	1.5		3	V
Mute attenuation	ATTM	$V_O = 1\text{Vrms}$, BPF = 20Hz to 20kHz	80	90		dB

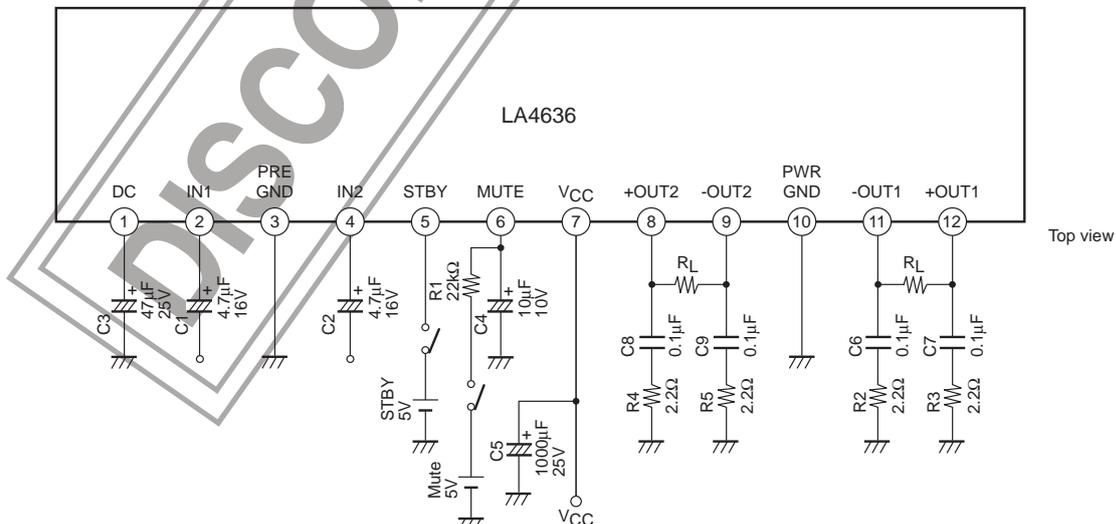
Package Dimensions

unit : mm (typ)

3049B



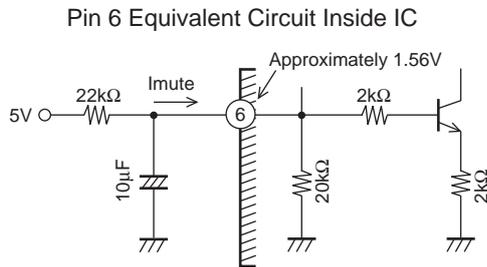
Test Circuit



Note: The LA4636 is basically pin-compatible with the LA4635, but there are partial differences in operation and usage, including with regard to externally connected parts.

Signal Mute Function

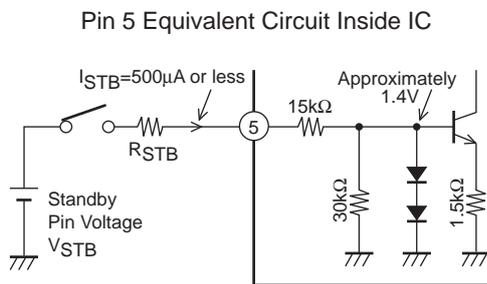
- Connecting a CR of the recommended value (10μF, 22kΩ) to pin 6 of the IC and applying +5V turns signal mute on. This function mutes low-frequency popping noises.
- The CR is for smoothing during attack and recovery. The 10μF capacitor also performs smoothing after the starting time, so it is necessary even if the signal mute function is not used.



If a 22kΩ external resistor is used, the pin 6 inflow current (I_{mute}) will be approximately 160μA when +5V is applied.

It is possible to change the external resistance value if the voltage applied is changed or to match the capacity of the microprocessor, but the popping noise level could rise if the pin 6 inflow current increases too much. It is therefore important to check the inflow current whenever the resistance value is changed.

Standby Function



The IC's pin 5 is the standby pin, and the amplifier turns on when approximately 2V or more is applied to it.

If +5V is applied directly to pin 5 the inflow current of pin 5 is approximately 240μA.

$$I_{STB} = \frac{5V - 1.4V}{15k\Omega} = 240\mu A$$

If the microprocessor is used, an external current limiting resistor (R_{STB}) should be inserted if necessary (to reduce the inflow current).

If a voltage other than that supplied by the microprocessor is applied, the pin 5 inflow current should be limited to 500μA or less using the applied V_{STB} value by calculating R_{STB} using the following equation and inserting a resistor if necessary.

$$R_{STB} = \frac{\text{Applied Voltage } (V_{STB}) - 1.4V}{500\mu A} - 15k\Omega$$

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