Ordering number: ENN6985

Monolithic Linear IC

LA4636

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

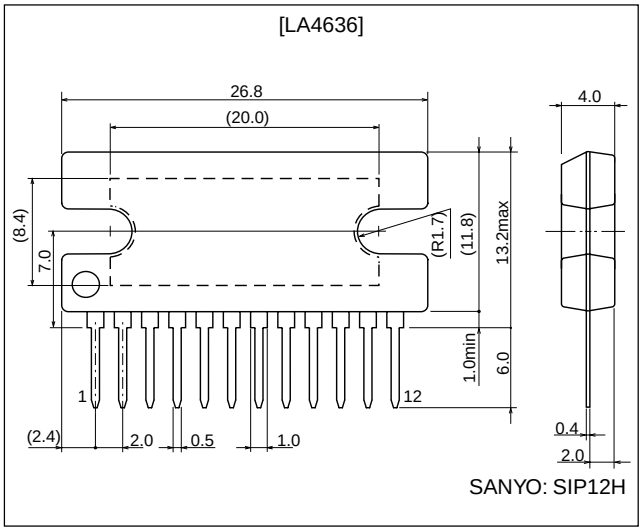
Overview

The LA4636 is a BTL power IC that is pin-compatible with the LA4635A and LA4635B single-end power ICs. 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.

Package Dimensions

unit: mm

3049B-SIP12H



Specifications

Maximum Ratings at Ta = 25°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	Pd max	Infinite heat sink	25	W
Operating temperature	Topr		–20 to +75	°C
Storage temperature	Tstg		–40 to +150	°C

Operating Conditions at Ta = 25°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 Ω	5.5 to 20	V
		R_L = 6 Ω	5.5 to 17	V
		R_L = 4 Ω	5.5 to 13	V

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

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

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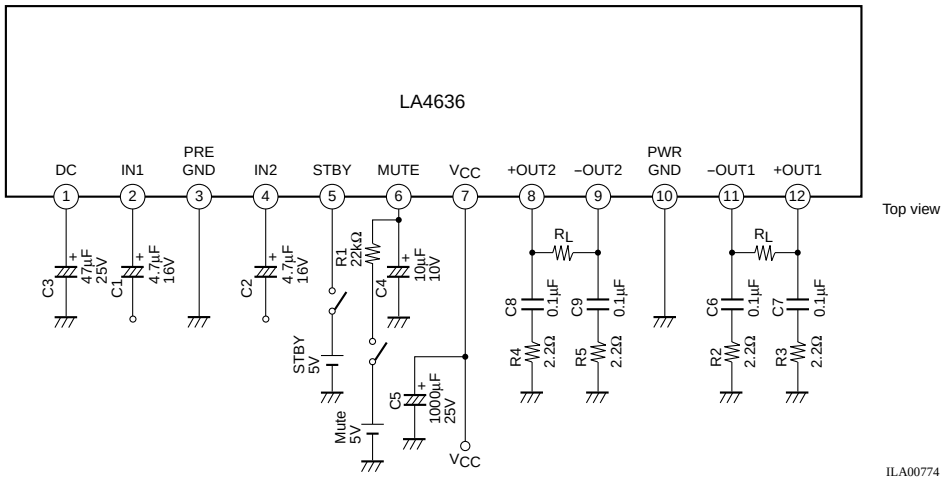
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Operating Characteristics at Ta = 25°C, V_{CC} = 12 V, R_L = 4 Ω, f = 1 kHz, Rg = 600 Ω

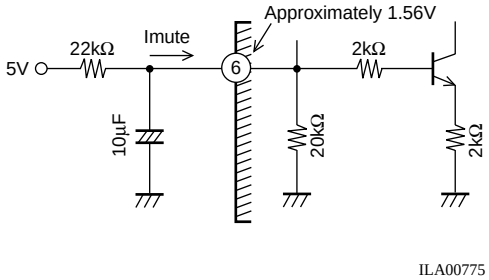
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	Rg = 0	40	70	150	mA
Standby current	Ist			0	10	μA
Voltage gain	VG	V_O = 0 dBm	33	35	37	dB
Total harmonic distortion	THD	P_O = 1 W		0.06	0.2	%
Output power	P_O1 P_O2	THD = 10% THD = 10%, R_L = 6 Ω	8	11 9		W W
Output noise voltage	V_{NO}	Rg = 0, BPF = 20 Hz to 20 kHz		0.14	0.3	mV
Ripple rejection	SVRR	Rg = 0, f_R = 100 Hz, V_R= 0 dBm	50	60		dB
Channel separation	CH Sep	Rg = 10 kΩ, V_O = 0 dBm	50	60		dB
Input resistance	Ri		14	20	26	kΩ
Output offset voltage	V_N offset	Rg = 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 = 1Vrms, BPF = 20 Hz to 20 kHz	80	90		dB

Measurement Circuit Diagram



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.

Pin 6 Equivalent Circuit Inside IC

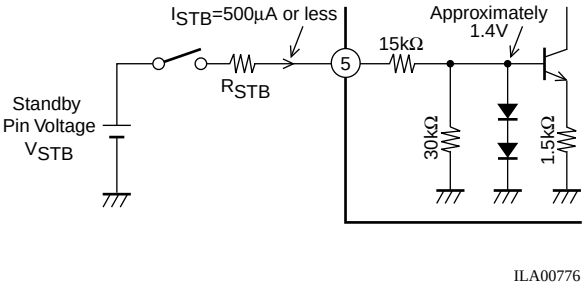


Signal Mute Function

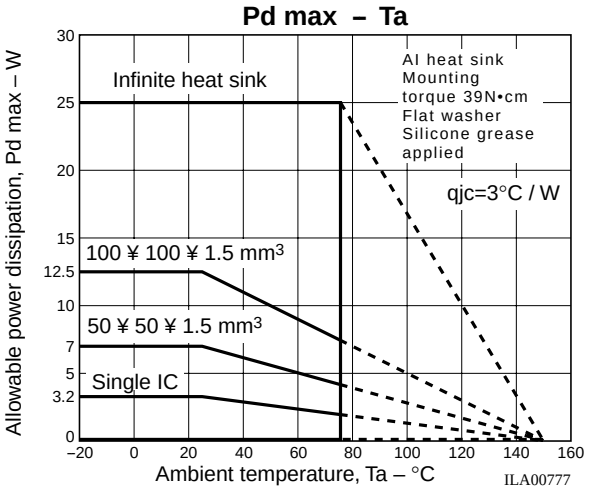
- Connecting a CR of the recommended value (10 μF, 22 kΩ) to pin 6 of the IC and applying +5 V turns signal mute on. This function mutes low-frequency popping noises.
- The CR is for smoothing during attack and recovery. The 10 μF capacitor also performs smoothing after the starting time, so it is necessary even if the signal mute function is not used.
  If a 22 kΩ external resistor is used, the pin 6 inflow current (Imute) will be approximately 160 μA when +5 V 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

Pin 5 Equivalent Circuit Inside IC



ILA00776



ILA00777

The IC's pin 5 is the standby pin, and the amplifier turns on when approximately 2 V or more is applied to it.
If +5 V is applied directly to pin 5 the inflow current of pin 5 is approximately 240 µA.

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

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 500 µA or less using the applied V_{STB} value by calculating R_{STB} using the following equation and inserting a resistor if necessary.

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

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