


SANYO Semiconductors

DATA SHEET

LA47501 — Monolithic Linear IC For Car Audio BTL 4ch (50W×4) Power IC

Overview

The LA47501 is a BTL 4ch (50W×4) power IC for car audio.

Functions

- Provided with a terminal against electric mirror noise
- Muting function
- Built-in standby switch
- Full complement of built-in protection circuits, including protection from shorting to V_{CC} , shorting to ground, load shorting, overvoltages, and overheating.
- GND open ground-fault resistance 16V

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\text{ max1}}$	Operating	18	V
	$V_{CC\text{ max2}}$	Quiescent	26	V
Maximum output current	$I_O\text{ peak}$		4.5/ch	A
Allowable power dissipation	$P_d\text{ max}$	With a infinity large heat sink	50	W
Operating temperature	T_{opr}		-40 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +150	$^\circ\text{C}$
Thermal resistance between junction cases	θ_{j-c}		1	$^\circ\text{C/W}$

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		14.4	V
Recommended load resistance	R_L		4	Ω
Operating supply voltage range	$V_{CC\text{ op}}$		9 to 18	V

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LA47501

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 14.4\text{V}$, $f = 1\text{kHz}$, $R_L = 4\Omega$, $R_g = 600\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	$R_L = \infty$, $R_g = 0$		200	350	mA
Standby current	I_{st}	$V_{st} = 0\text{V}$			10	μA
Output offset voltage	V_n offset	$R_g = 0$	-100		+100	mV
Voltage gain	V_G	$V_O = 0\text{dBm}$	25	26	27	dB
Voltage gain difference	ΔV_G		-1		+1	dB
Output power	P_{O1}	THD = 10%	24	29		W
	$P_{O \text{ max1}}$	$V_{CC} = 13.7\text{V}$, $V_{IN} = 5\text{Vrms}$		43		W
	$P_{O \text{ max2}}$	$V_{IN} = 5\text{Vrms}$		48		W
Total harmonic distortion	THD	$P_O = 4\text{W}$		0.05	0.4	%
Channel separation	Chsep	$V_O = 0\text{dBm}$, $R_g = 10\text{k}\Omega$	55	70		dB
Ripple rejection ratio	SVRR	$f_r = 100\text{Hz}$, $V_r = 0\text{dBm}$, $R_g = 0$	50	70		dB
Output noise voltage	V_{NO}	$R_g = 0$, B.P.F. = 20Hz to 20kHz		40	100	μVrms
Muting attenuation	Ma	$V_O = 20\text{dBm}$	70	90		dB

Cautions for use

For a capacitor of pin 1 and pin 25 against electric mirror, use a capacitor about twice in capacitance of the input capacitor.

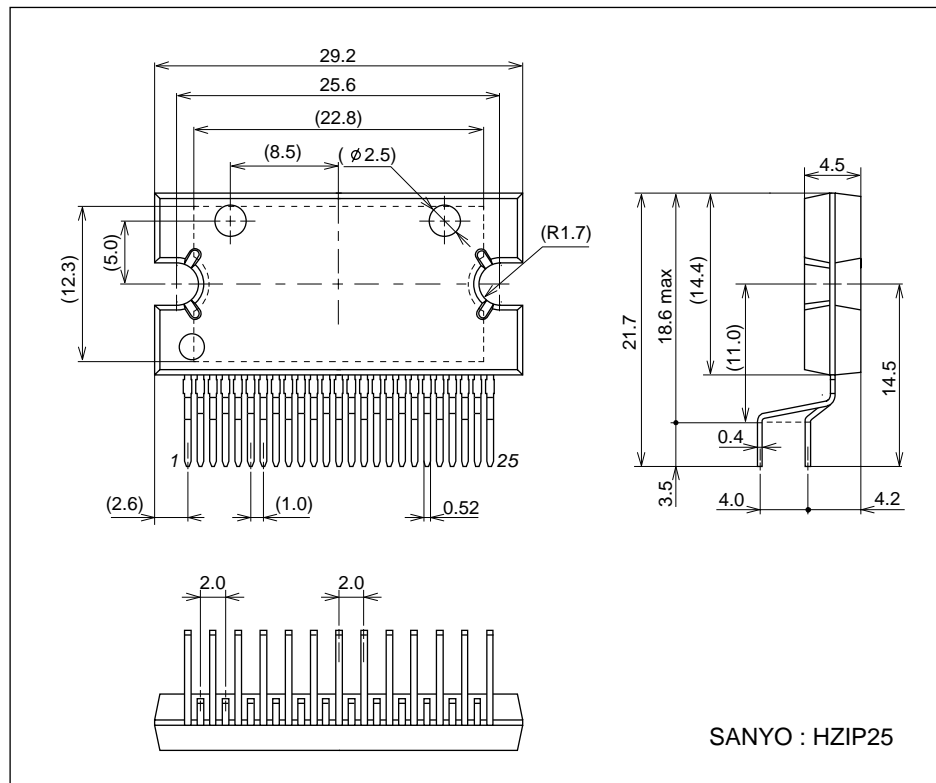
In the sample application circuit, a $0.47\mu\text{F}$ capacitor is used for the input capacitor of $0.22\mu\text{F}$.

Connect a capacitor of each pin of 1 and 25 to Pre GND similarly to the case of input capacitor.

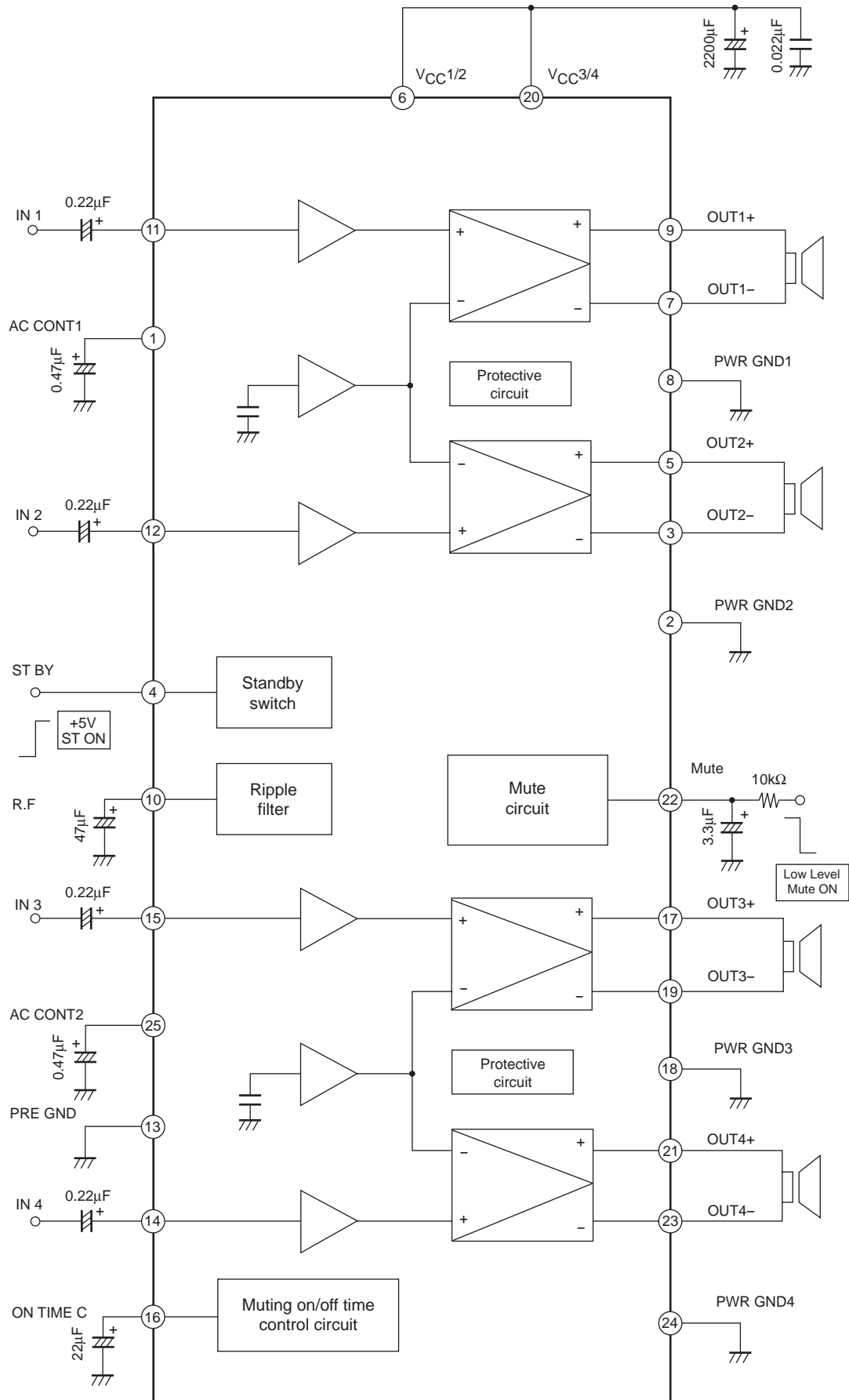
Package Dimensions

unit : mm (typ)

3236A



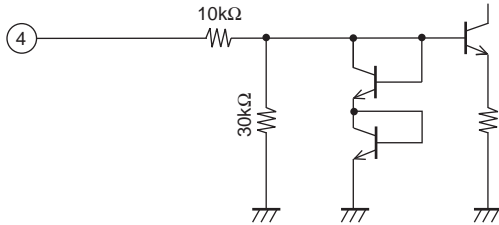
Block Diagram



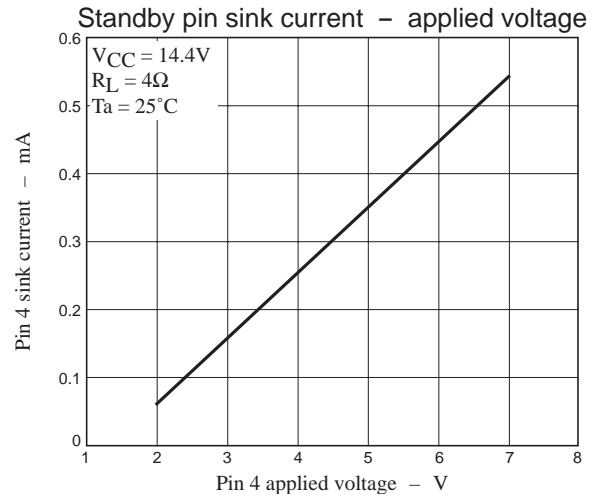
* Package : HZIP25

Standby switch and muting switch usage methods (for reference purposes)

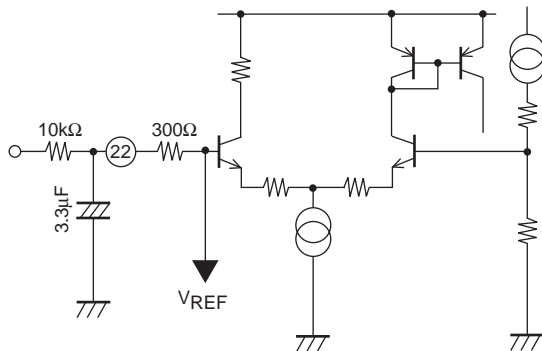
- (1) The amplifier will be on when the standby switch (pin 4) has a voltage of 2V or higher applied, and will be off when that pin is at the ground level.



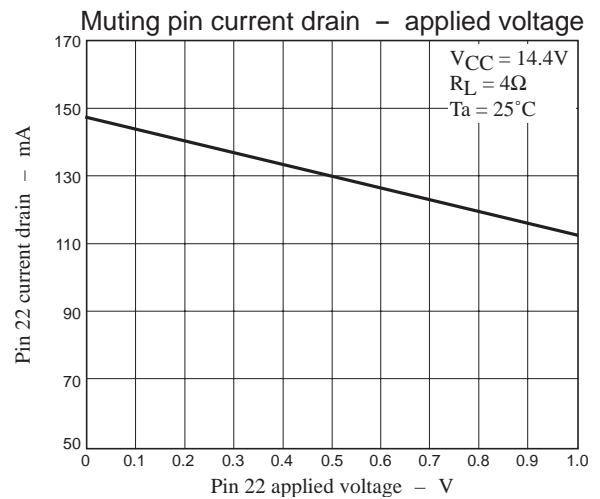
Standby pin internal equivalent circuit diagram



- (2) Muting will be on when muting switch (pin 22) has a voltage of 1V or lower applied, and will be off when that pin is open



Muting pin internal equivalent circuit



Muting on/off times for the recommended external component values

Muting on time : 50ms

Muting off time : 20ms

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