



LA4627 — Monolithic Linear IC

2-Channel AF Power Amplifier

Overview

The LA4627 is a 2-channel power amplifier developed for use in radio/cassette player products. The LA4627 reduces the number of required external components by 50% over earlier products (BS/NF capacitors and oscillation prevention RC components) and thus can contribute significantly to space saving in end products.

Features

- Provided in the DIP12F.
- P_O : 2.0W×2 ($V_{CC} = 9V$, $R_L = 4\Omega$)
2.5W×2 ($V_{CC} = 9V$, $R_L = 3\Omega$)
- Standby function built in (supports direct microcontroller control).
- Built-in thermal protection circuit.

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\text{ max}}$	$R_g = 0$	22	V
Allowable power dissipation	$P_d\text{ max}$	When mounted on the Sanyo-recommended PCB	4.0	W
Operating temperature	T_{opr}		-25 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		9	V
Recommended load resistance	R_L		3	Ω
Operating voltage range	$V_{CC\text{ op}}$	Under conditions such that the maximum ratings are not exceeded.	5.0 to 20	V
Recommended operating load resistance	$R_L\text{ op}$		2.7 to 8.0	Ω

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LA4627

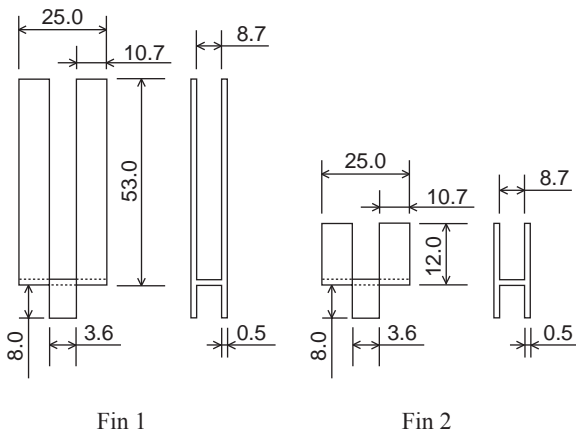
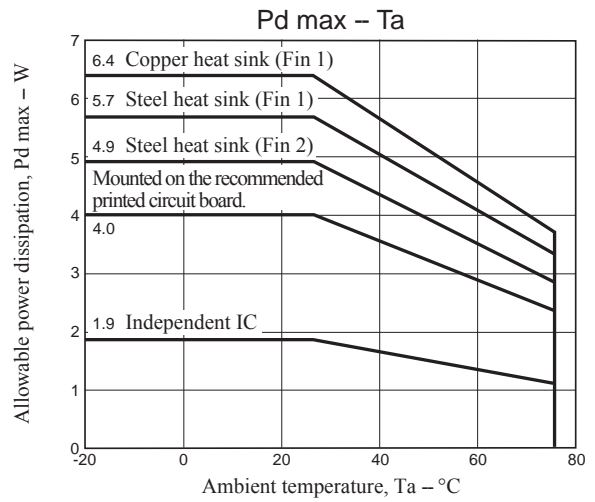
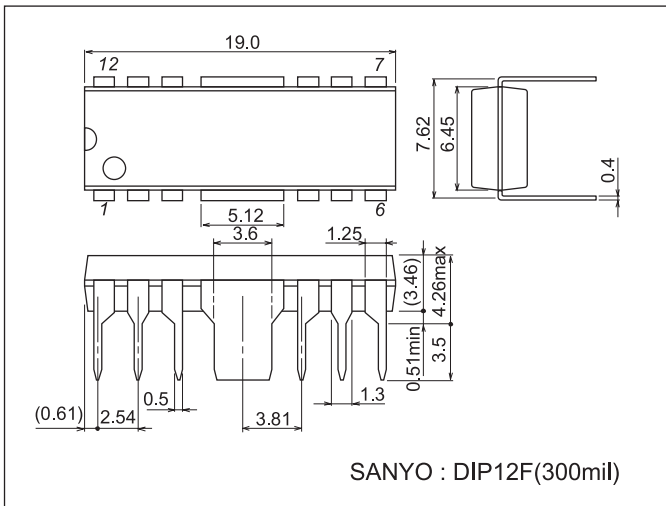
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 9\text{V}$, $R_L = 3\Omega$, $f = 1\text{kHz}$, $R_g = 600\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	$R_g = 0$	17	30	70	mA
Voltage gain	V_G	$V_O = 0\text{dBm}$	43	45	47	dB
Total harmonic distortion	THD	$P_O = 0.33\text{W}$ ($V_O = 1.0\text{V}$)		0.1	0.8	%
Output power	P_{O1}	THD = 10%	2.0	2.5		W
	P_{O2}	THD = 10%, $R_L = 4\Omega$		2.0		W
Output noise voltage	V_{NO}	$R_g = 0$, DIN AUDIO		0.15	0.5	mVrms
Ripple rejection ratio	SVRR	$R_g = 0$, $f_R = 100\text{Hz}$, $V_r = 0\text{dBm}$, DIN AUDIO	45	52		dB
Channel separation	CHsep	$R_g = 0$, $V_O = 0\text{dBm}$, DIN AUDIO	50	60		dB
Standby current	I_{ST}	$R_g = 0$		1.0	10	μA
Input resistance	R_i		20	30	40	$\text{k}\Omega$
Standby pin voltage	V_{ST}	The pin 1 voltage such that the amplifier is on	1.5	5.0		V

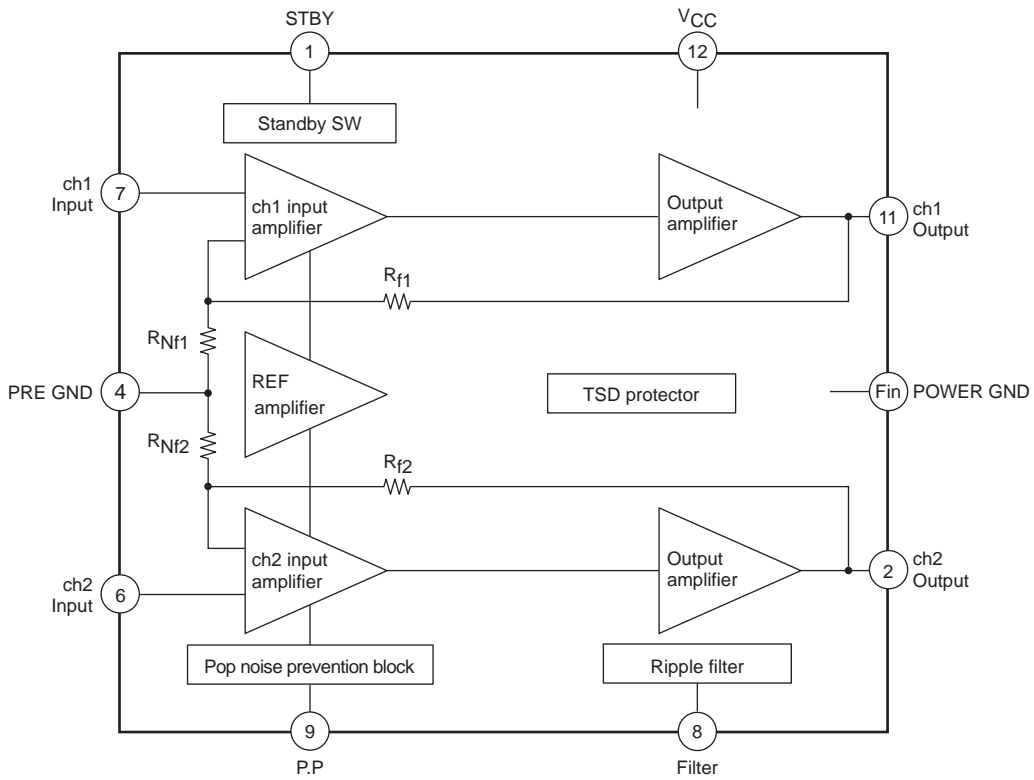
Package Dimensions

unit : mm (typ)

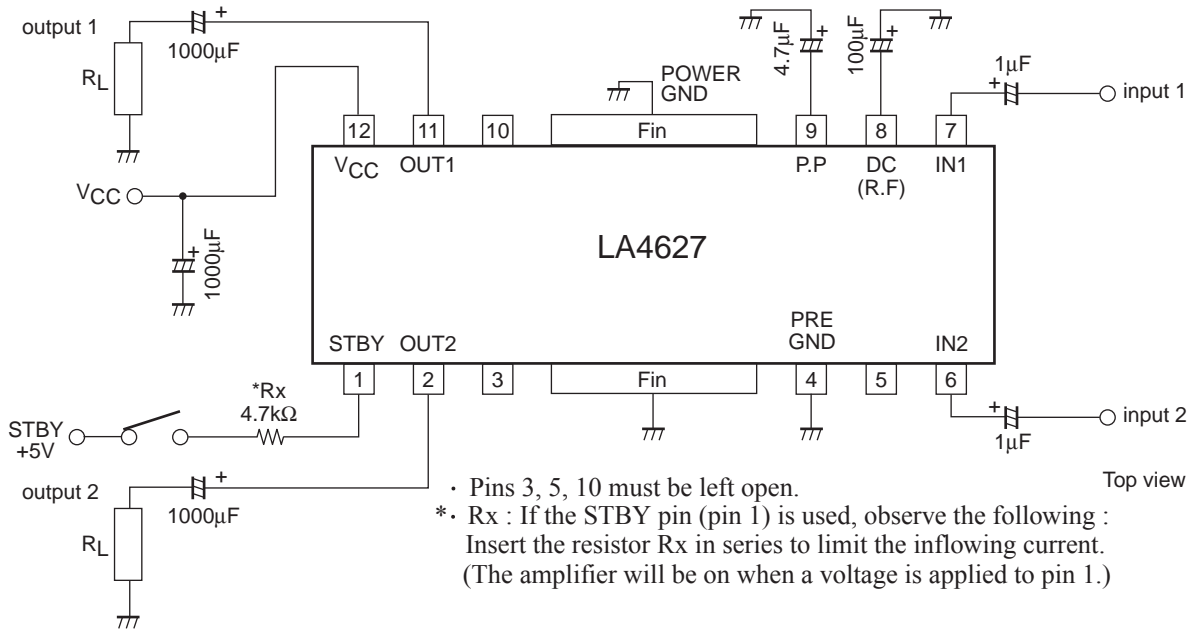
3022B



Block Diagram

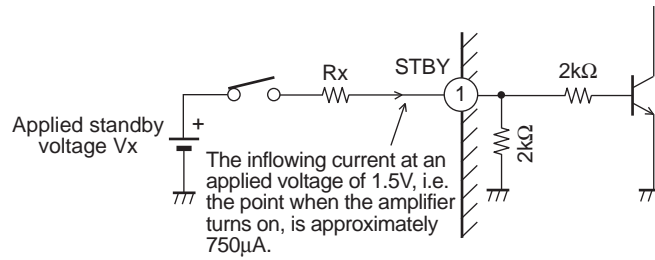


Application Circuit Example



Pin Functions

1. Standby switch function (pin 1)



STBY pin applied voltage : 5V

To hold the pin 1 inflow current to about 750μA insert a resistor (Rx) of 4.7kΩ

STBY pin applied voltage : 12V

To hold the pin 1 inflow current to about 750μA insert a resistor (Rx) of 14kΩ (12kΩ).

STBY pin applied voltage : Other value (Vx)

To hold the pin 1 inflow current to about 750μA insert a resistor (Rx) of $(Vx - 1.5V)/750\mu A$.

- If a microcontroller output signal is applied directly, insert a resistor in series and adjust the current to a level optimal for the drive capability of the microcontroller.

2. Input pins (pins 6 and 7)

The input pin voltage is about $2V_{BE}$ (1.4V).

The input pin impedance is about 30kΩ.

- Although the recommended value for the input capacitor is 0.22μF, the starting time can be modified by changing the value of this capacitor. (The time from the point a voltage is applied to the standby pin to the point sound is emitted.)

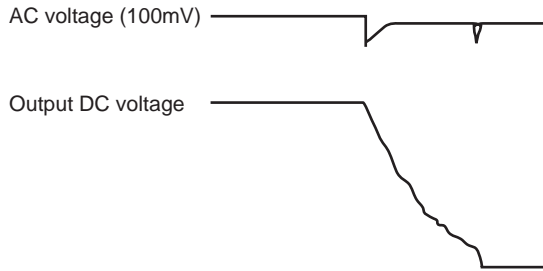
Input capacitor	1.0μF	2.2μF	3.3μF	4.7μF	10μF
Starting time (t _s)	0.2s	0.3s	0.5s	0.65s	1.5s

3. FILTER (decoupling) pin (pin 8)

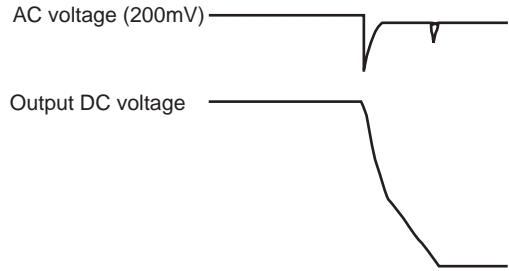
The pin voltage is about $1/2V_{CC}$.

The recommended value for the filter capacitor is $100\mu\text{F}$.

The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under $100\mu\text{F}$ is used.



Filter capacitor = $100\mu\text{F}$



Filter capacitor = $47\mu\text{F}$

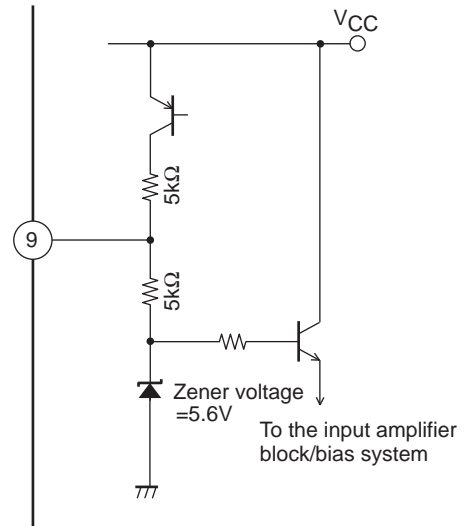
4. P.P (pulse noise) pin (pin 9)

$$\text{Pin 9 pin voltage} \approx \frac{V_{CC} - V_{CE} (\text{about } 0.3\text{V}) - 5.6\text{V}}{2\text{k}\Omega} + 5.6\text{V}$$

- The recommended value for the P.P capacitor is $4.7\mu\text{F}$.

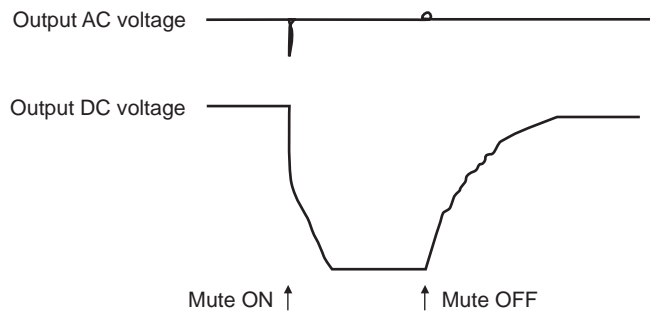
The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under $2.2\mu\text{F}$ is used.

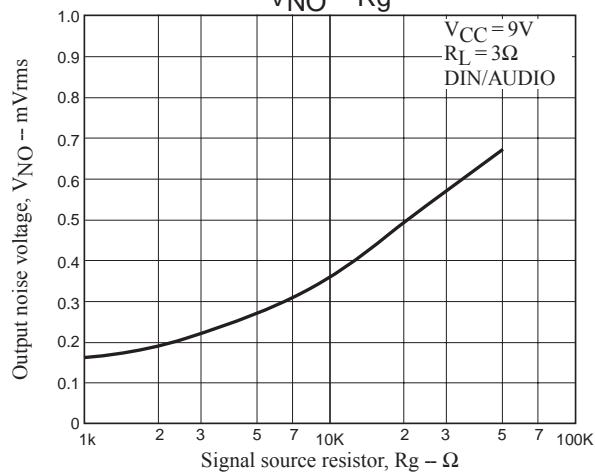
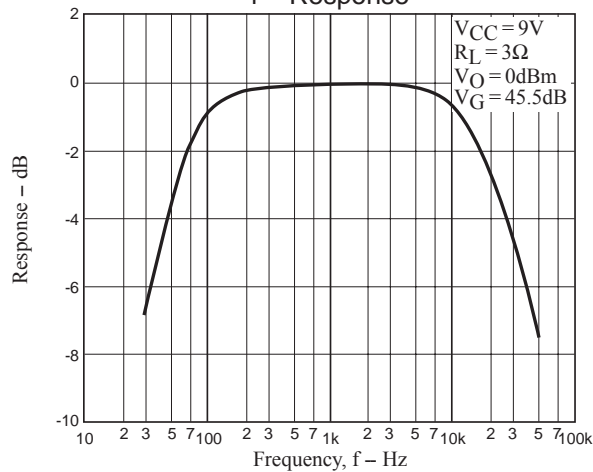
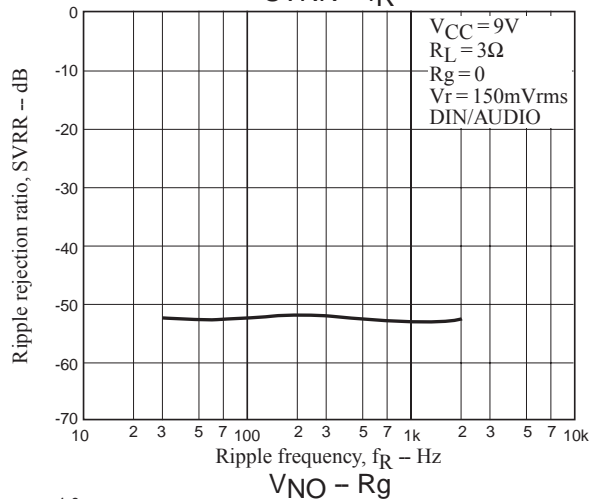
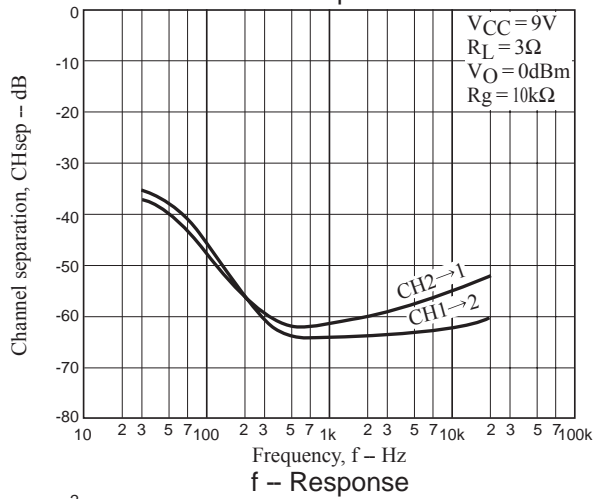
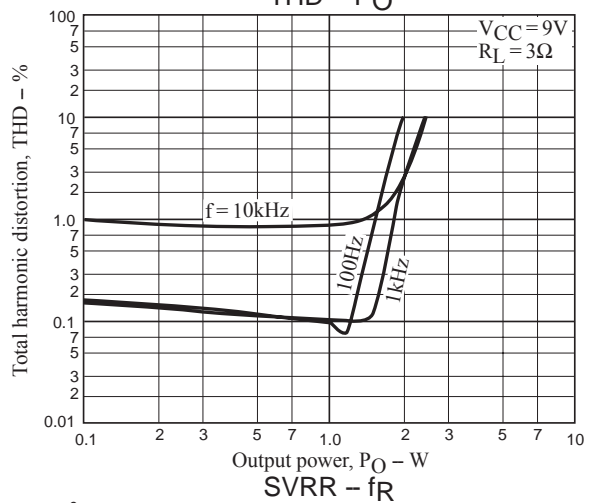
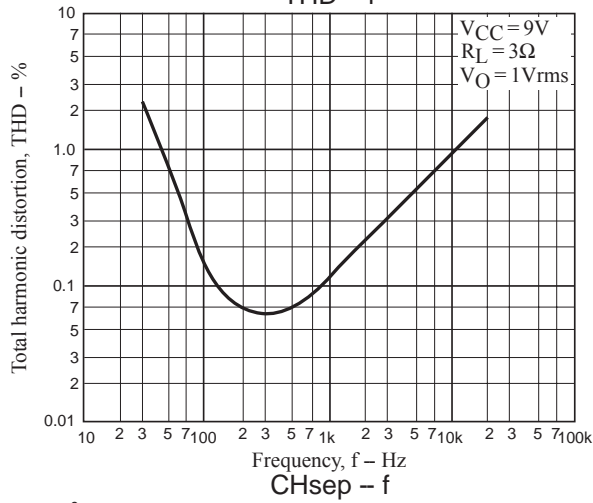
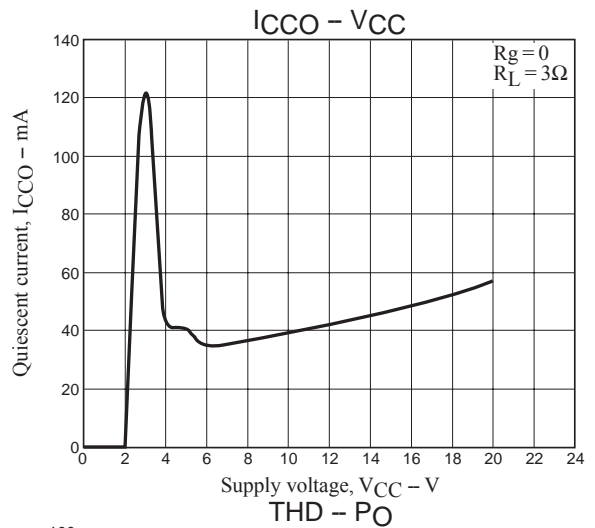
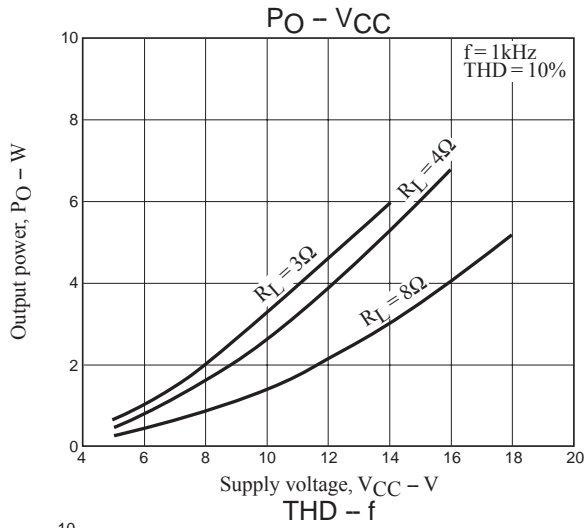
Furthermore, if a value over $10\mu\text{F}$ is used, the signal may not be cut off and sound may remain audible when the standby pin is set low (power off).

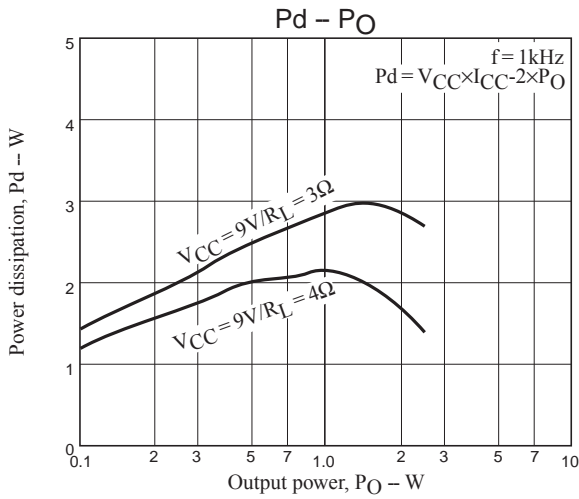


5. MUTE (Muting)

The output signal can be controlled by shifting the pin 8 (FILTER) level towards ground with a 300 to 500Ω resistor. However, note that the degree of suppression is reduced if a value of 750Ω or more is used.







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