



# LA4629

Monolithic Linear IC

## 2-channel AF Power Amplifier

### Overview

The LA4629 is a 2-channel power amplifier developed for use in radio/cassette player products. The LA4629 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 SIP12H package.
- $P_O$  : 2.5W×2 ( $V_{CC} = 9V, R_L = 3\Omega$ ), 4.5W×2 ( $V_{CC} = 12V, R_L = 3\Omega$ )  
: 2.0W×2 ( $V_{CC} = 9V, R_L = 4\Omega$ ), 4.0W×2 ( $V_{CC} = 12V, R_L = 4\Omega$ )
- 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	$V_{CC\ max}$	No input	24	V
Allowable power dissipation	$P_d\ max$	With an arbitrarily large heat sink	25	W
Operating temperature	$T_{opr}$		-25 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
Operating voltage range	$V_{CC\ op}$	The range over which the package $P_d$ is not exceeded.	5 to 22	V
Recommended operating load resistance	$R_{Lop}$		2.7 to 8	$\Omega$

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# LA4629

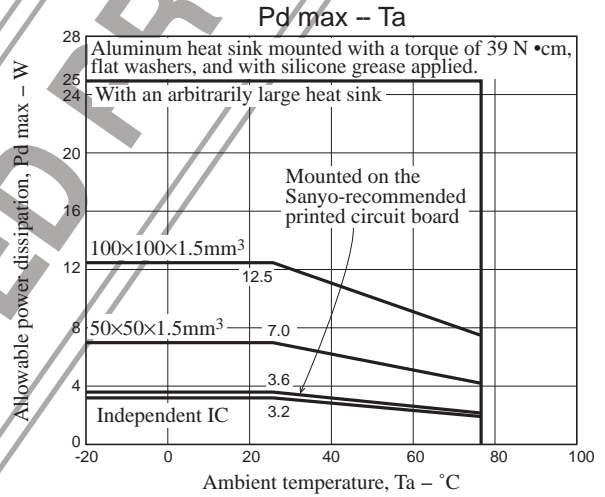
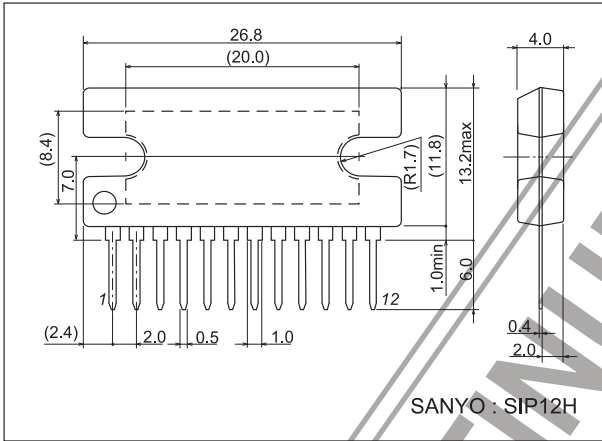
**Electrical Characteristics** at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 12\text{V}$ ,  $R_L = 3\Omega$ ,  $f = 1\text{kHz}$ ,  $R_g = 600\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	$I_{CCO}$	$R_g = 0$	18	35	80	mA
Standby current	$I_{ST}$			1.0	10	$\mu\text{A}$
Voltage gain	$V_G$	$V_O = 0\text{dBm}$	43	45	47	dB
Output power	$P_{O(1)}$	THD = 10%	3.0	4.5		W
	$P_{O(2)}$	$V_{CC} = 12\text{V}$ , $R_L = 4\Omega$ , THD = 10%		4.0		W
	$P_{O(3)}$	$V_{CC} = 9\text{V}$ , $R_L = 3\Omega$ , THD = 10%	2.0	2.5		W
	$P_{O(4)}$	$V_{CC} = 9\text{V}$ , $R_L = 4\Omega$ , THD = 10%		2.0		W
Total harmonic distortion	THD	$P_O = 1\text{W}$		0.2	0.8	%
Output noise voltage	$V_{NO}$	$R_g = 0$ , DIN AUDIO		0.15	0.5	mV
Ripple rejection ratio	SVRR	$R_g = 0$ , $f_R = 100\text{Hz}$ , $V_r = 0\text{dBm}$ , DIN AUDIO	45	55		dB
Channel separation	CHsep	$R_g = 0$ , $V_O = 0\text{dBm}$ , DIN AUDIO	43	50		dB
Input resistance	$R_i$		20	30	40	$\text{k}\Omega$
Standby pin voltage	$V_{ST}$	The pin 6 voltage such that the amplifier is on	1.5	5.0		V

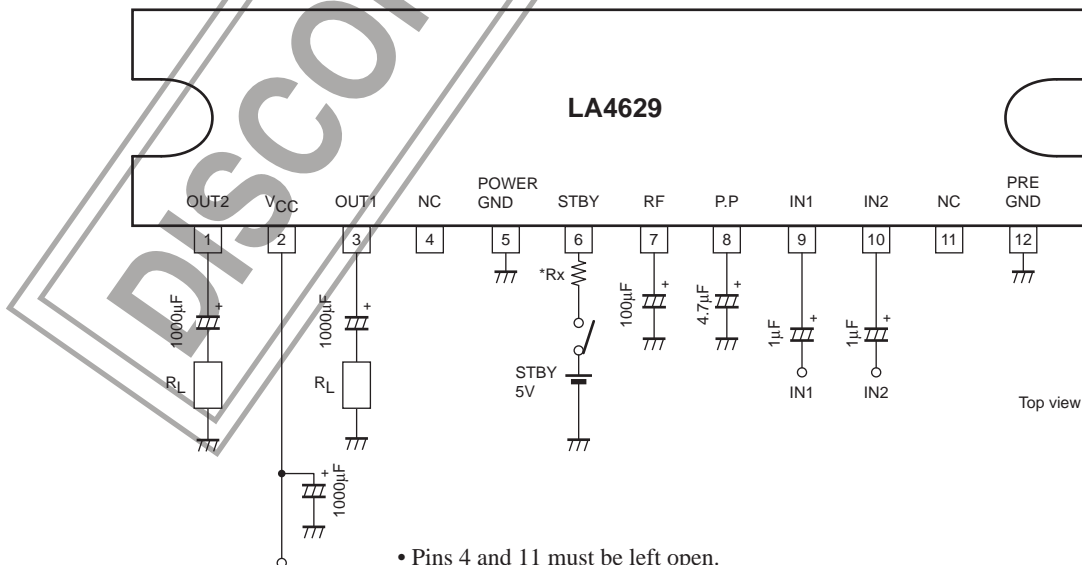
## Package Dimensions

unit : mm (typ)

3049B

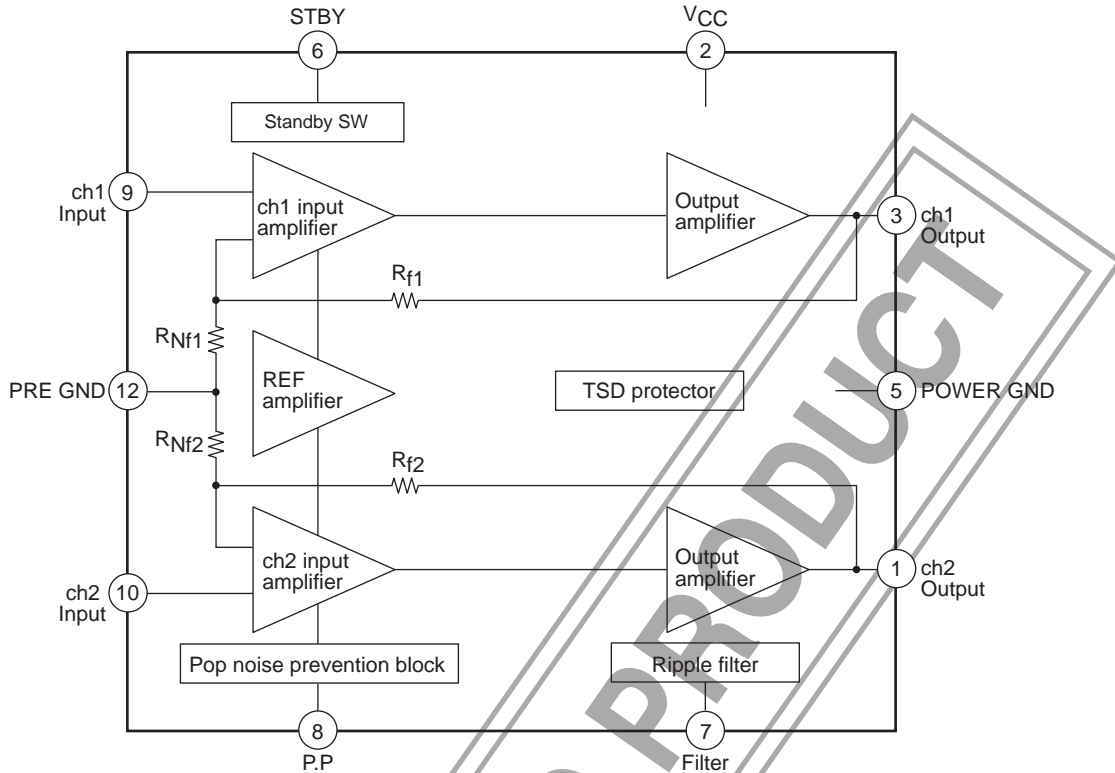


## Pin Assignment and Application Circuit Example



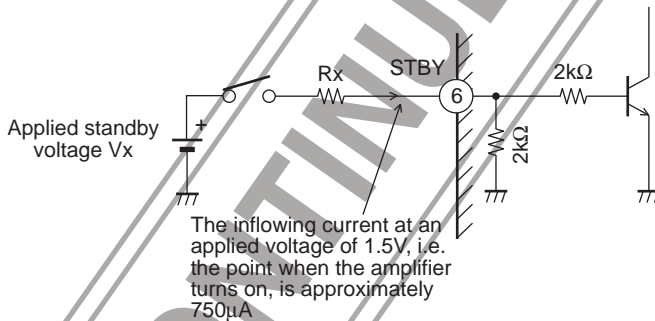
- Pins 4 and 11 must be left open.
- \* • Rx : If the STBY pin (pin 6) is used, observe the following :  
Insert the resistor Rx in series to limit the inflowing current.  
(The amplifier will be on when a voltage is applied to pin 6.)

Block Diagram



Pin Functions

1. Standby switch function (pin 6)



STBY pin applied voltage: 5V

To hold the pin 6 inflow current to about 750μA insert a resistor (Rx) of 4.7kΩ

STBY pin applied voltage: 12V

To hold the pin 6 inflow current to about 750μA insert a resistor (Rx) of 14kΩ (12kΩ).

STBY pin applied voltage: Other value (Vx)

To hold the pin 6 inflow current to about 750μA insert a resistor (Rx) of (Vx - 1.5V)/750μA.

- 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 9 and 10)

The input pin voltage is about 2V<sub>BE</sub> (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.)

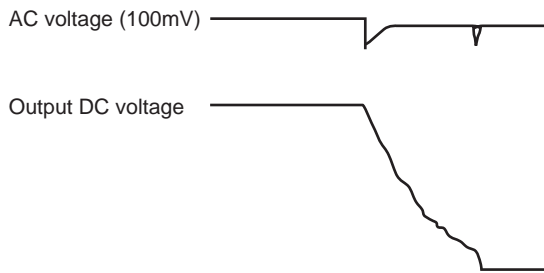
Input capacitor	1.0μF	2.2μF	3.3μF	4.7μF	10μF
Starting time (t <sub>s</sub> )	0.2s	0.3s	0.5s	0.65s	1.5s

3. FILTER (decoupling) pin (pin 7)

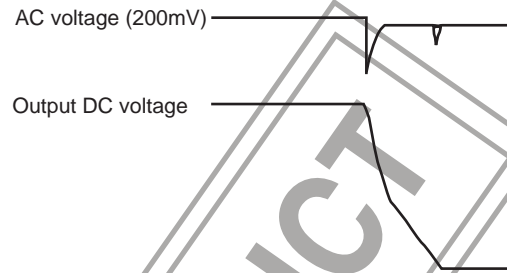
The pin voltage is about  $1/2V_{CC}$ .

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 =  $47\mu\text{F}$

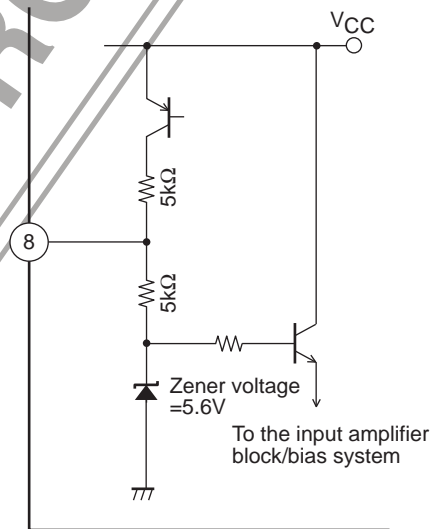
4. P.P (pulse noise) pin (pin 8)

$$\text{Pin 8 pin voltage} \approx \frac{V_{CC} - V_{CE} (\text{about } 0.3\text{V}) - 5.6\text{V}}{2\text{k}\Omega} + 5.6\text{V}$$

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

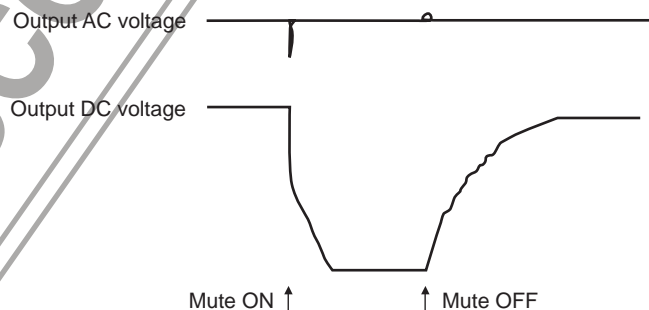
The pulse noise that occurs when the standby pin is set low (power off) will be degraded if a value under  $2.2\mu\text{F}$  is used.

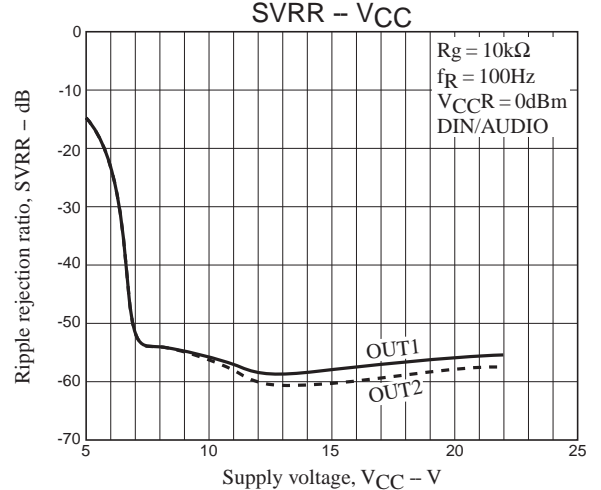
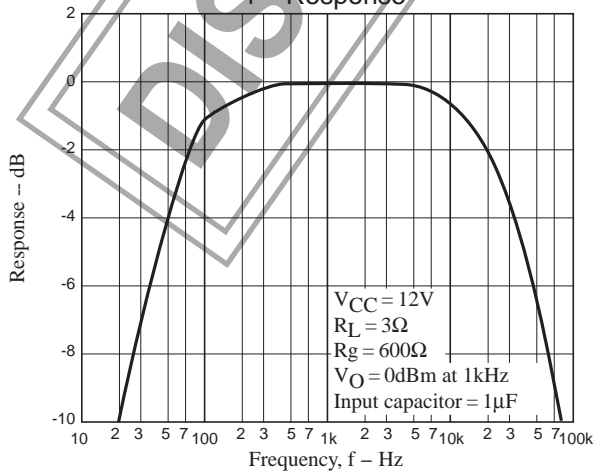
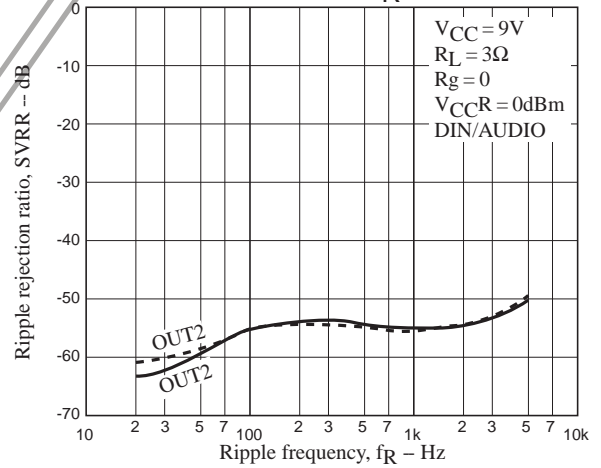
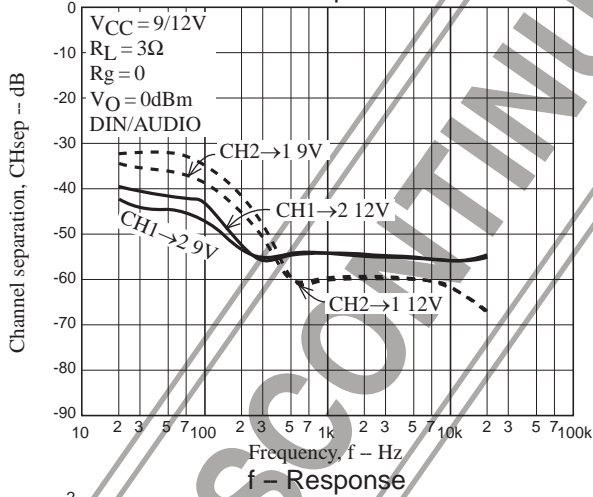
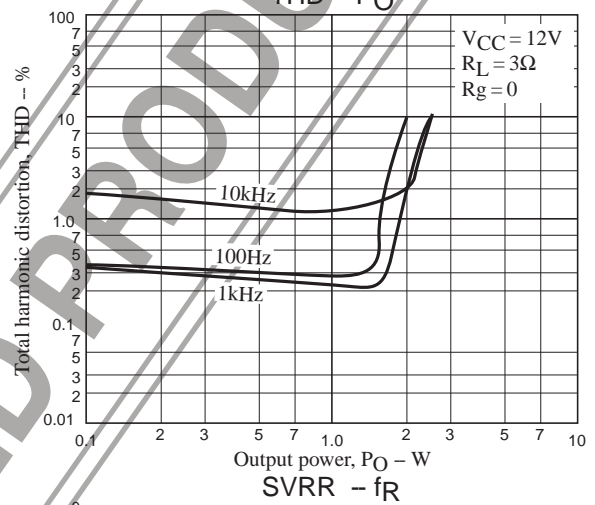
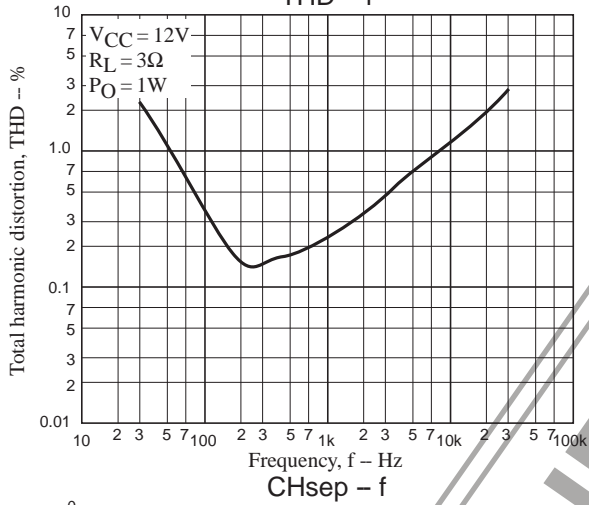
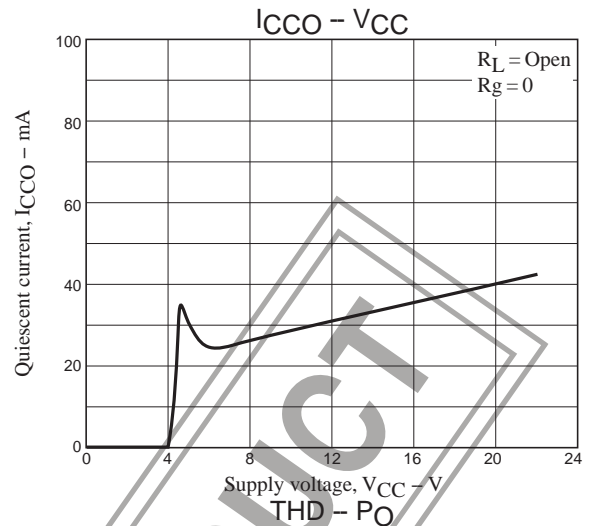
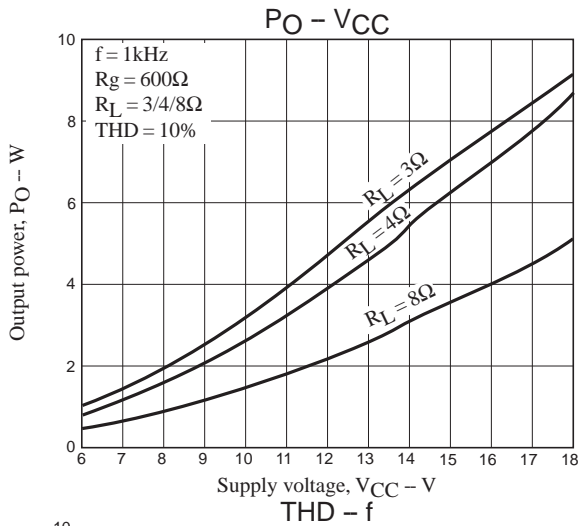
Furthermore, if a value over  $10\mu\text{F}$  is used, the signal may not be cut off and sound may remain audible when the standby pin is set low (power off).

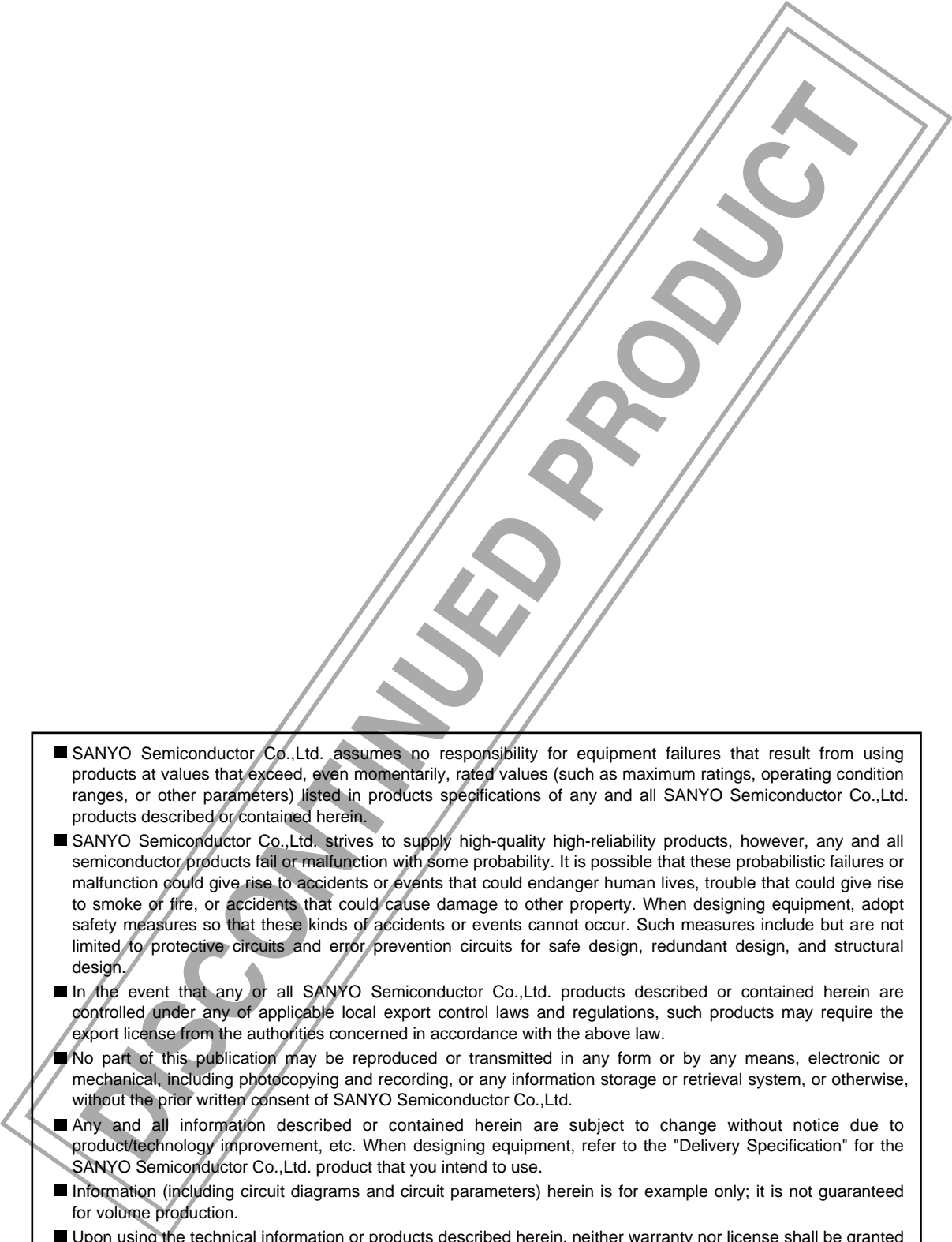


5. MUTE (Muting)

The output signal can be controlled by shifting the pin 7 (FILTER) level towards ground with a  $300$  to  $500\Omega$  resistor. However, note that the degree of suppression is reduced if a value of  $750\Omega$  or more is used.





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