


**SANYO Semiconductors**

# DATA SHEET

## LA42207 — Monolithic Linear IC Audio Output for TV application 7W × 2ch Power Amplifier

### Overview

The LA42207 is a 7W 2-channel power amplifier IC and optimal for use as the audio output power amplifier in TV application

### Functions

- 7W × 2 channels ( $V_{CC} = 11.5V$ ,  $R_L = 8\Omega$ )
- Built-in standby function.
- Built-in mute function.
- Built-in various protection circuit (short to  $V_{CC}$ /short to ground/load shorting/overheating).

### Specifications

**Maximum Ratings** at  $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\ max}$	No signal	16	V
Allowable power dissipation	$P_d\ max$	Infinitely large heat sink	30	W
Maximum output current	$I_O\ peak$	Per channel	1.0	A
Maximum junction temperature	$T_j\ max$		150	$^\circ C$
Thermal resistance	$\theta_{jc}$		2.5	$^\circ C/W$
Operating temperature	$T_{opr}$		-20 to +75	$^\circ C$
Storage temperature	$T_{stg}$		-40 to +150	$^\circ C$

**Operating Conditions** at  $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_{CC}$		11.5	V
Recommended load resistance	$R_L$		8	$\Omega$
Allowable operating supply voltage range	$V_{CC\ op}$	Under conditions such that maximum ratings are not exceeded	7 to 15	V

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**SANYO Semiconductor Co., Ltd.**

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# LA42207

**Electrical Characteristics** at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 11.5\text{V}$ ,  $R_L = 8\Omega$ ,  $f = 1\text{kHz}$ ,  $R_g = 600\Omega$

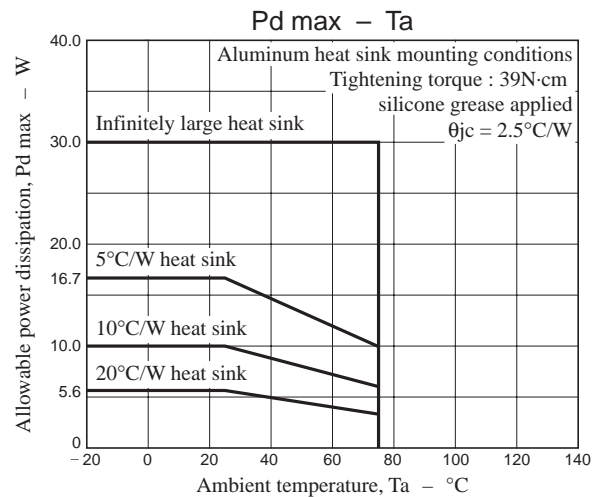
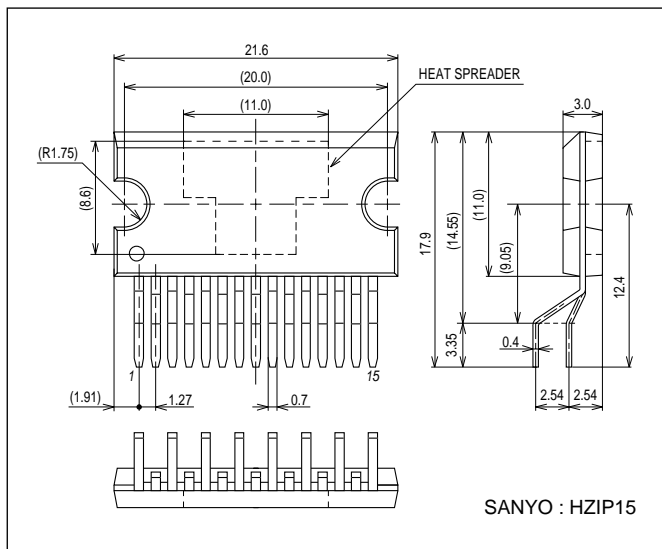
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Standby current	$I_{st}$	Amplifier OFF		0	10	$\mu\text{A}$
Quiescent current	$I_{CCO}$	$R_g = 0$ , $R_L = \text{OPEN}$	35	70	140	mA
Output power	$P_{O1}$	THD = 10%	6	7		W
Total harmonic distortion	THD	$P_O = 1\text{W}$		0.06	0.2	%
Voltage gain	VG	$V_O = 0\text{dBm}$	30	32	34	dB
Output noise voltage	$V_{NO}$	$R_g = 0$ , BPF = 20Hz to 20kHz		0.2	0.4	mVrms
Ripple rejection ratio	SVRR	$R_g = 0$ , $f_R = 100\text{Hz}$ , $V_{CCR} = 0\text{dBm}$	40	50		dB
Channel separation	CH.Sep	$R_g = 10\text{k}\Omega$ , $V_O = 0\text{dBm}$	50	60		dB
Mute attenuation value	ATT	$V_O = 1\text{Vrms}$ , BPF = 20Hz to 20kHz	80	90		dB
Mute control voltage (pin 7)	$V_{mute}$	Mute ON *1	1.5		3.0	V
		Mute OFF	0		0.5	V
Standby control voltage (pin 6)	$V_{st}$	Amplifier ON *1	2.5		$V_{CC}$	V
		Amplifier OFF	0		0.5	V
Input resistance	$R_i$		21	30	39	$\text{k}\Omega$

\*1 : Note that the standby pin (pin 6) and MUTE pin (pin 7) incorporate the anti-electrostatic diode allowing the current to flow through the diode when the potential of  $V_{CC}$  (pin 9) decreases below that of pin 6 or 7.

## Package Dimensions

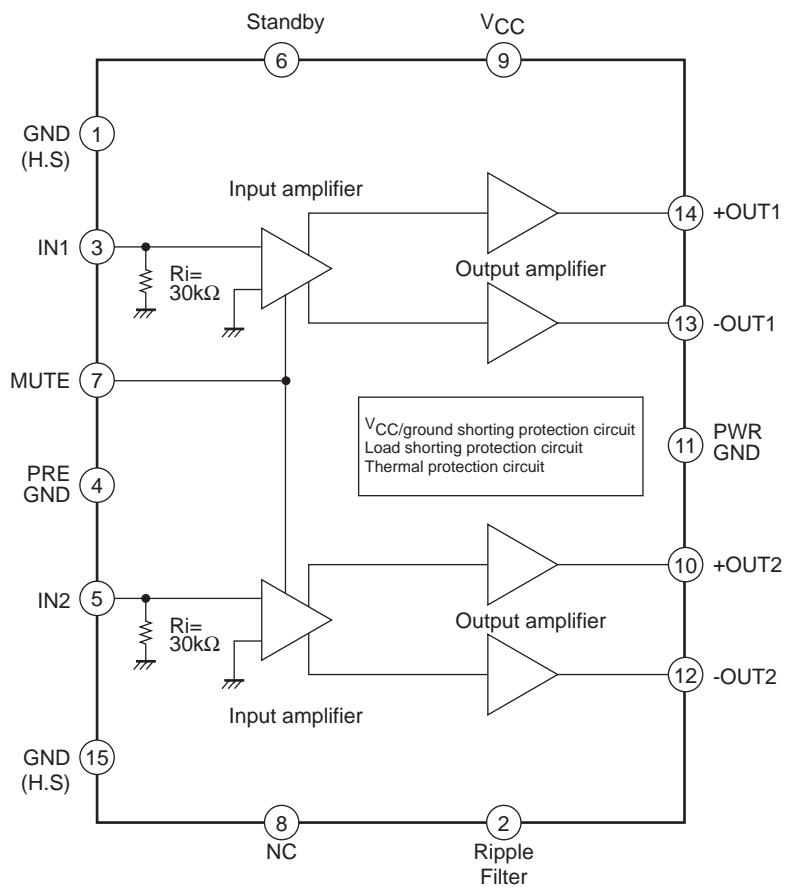
unit : mm (typ)

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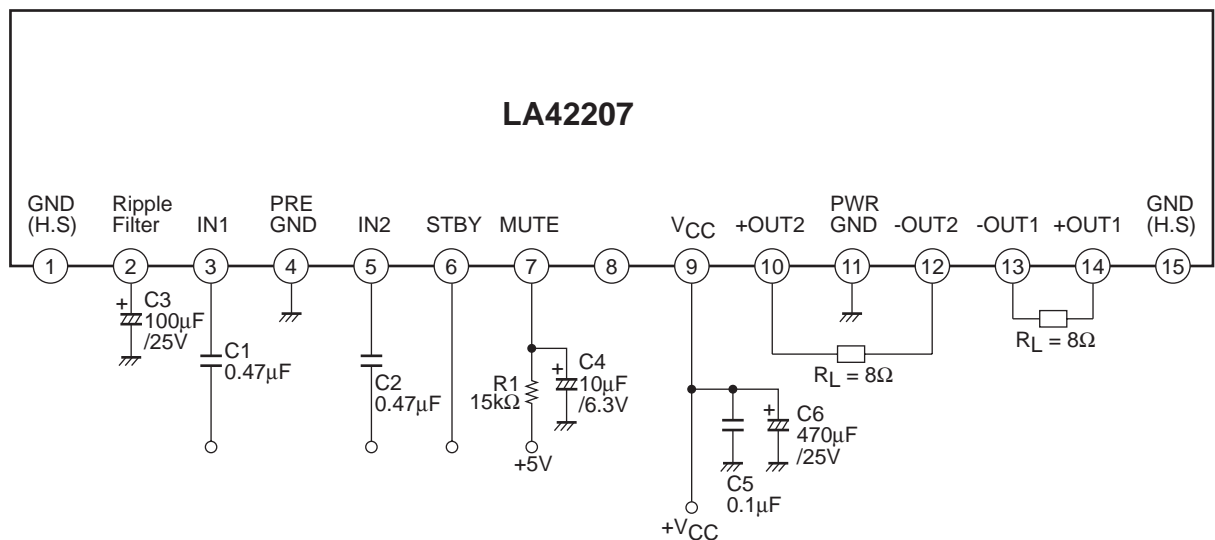


LA42207

Block Diagram



Test Circuit



- \* Pin 8 : NC. This pin must be left open.
- \* Pins 1 and 15 are connected to the heat sink. They must be connected to power and ground.

Pin Voltage

Conditions : VCC = 11.5V, STBY = 5V

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Pin	GND (H.S)	Ripple Filter	IN1	Pre GND	IN2	STBY	Mute	N.C.	VCC	+OUT2	Power GND	-OUT2	-OUT1	+OUT1	GND (H.S)
Pin voltage (V)	0	11.2	0.7	0	0.7	5	0	-	11.5	5.8	0	5.8	5.8	5.8	0

## External Components

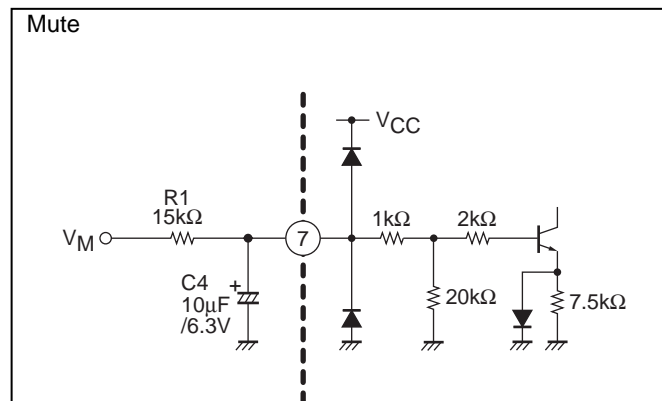
- C1, C2 : Input coupling capacitors, whose capacity is recommended to be  $0.47\mu\text{F}$ . The input pin potential is about  $0.7\text{V}$ .  
 C3 : Capacitor for ripple filter and amplifier starting time, whose capacity is recommended to be  $100\mu\text{F}$ .  
 C4, R1 : Capacitor and resistor for muting. C4 is necessary even when the MUTE function is not used.  
 C5 : Capacitor to enhance the tolerance of oscillation, whose capacity is recommended to be  $0.1\mu\text{F}$ .  
 C6 : Power supply capacitor.

### 1. Muting function (pin 7)

MUTE ON when the pin 7 voltage is  $1.5\text{V}$  (minimum) or more.

Set the  $V_M$  application voltage so that the pin 7 voltage becomes  $1.5\text{V}$  or more.

In the MUTE mode, the constant is determined from CR. Since this may cause pop sound at MUTE ON/OFF, determine the constant with due consideration. C4 is also related to pop sound when the amplifier is turned ON, so that this is necessary even when the MUTE function is not to be used.



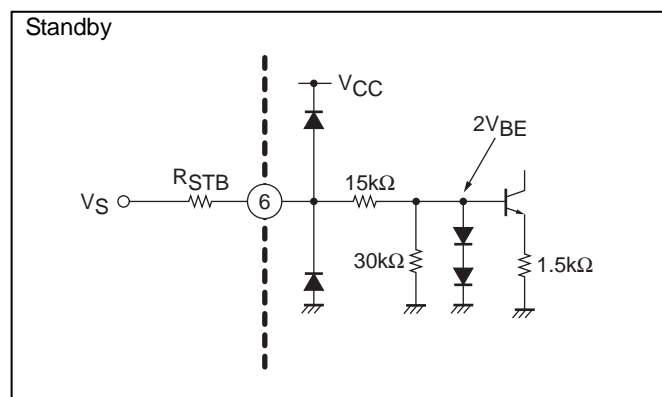
### 2. Standby function (pin 6)

By means of controlling pin 6 to high and low, the power Supply can be set to ON and OFF.

Control voltage of pin 6

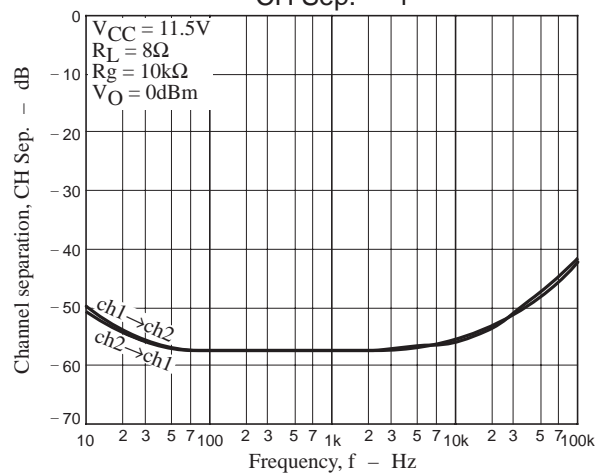
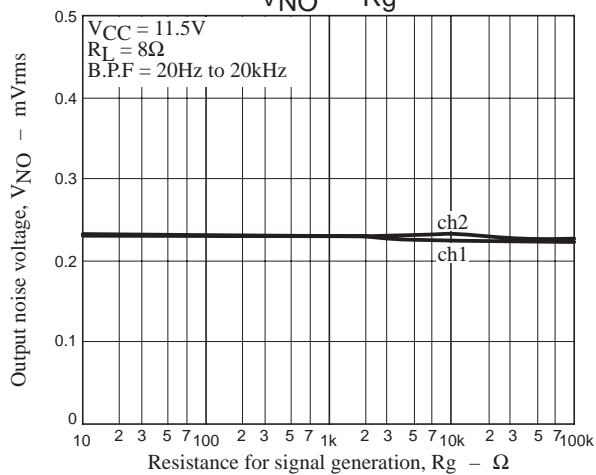
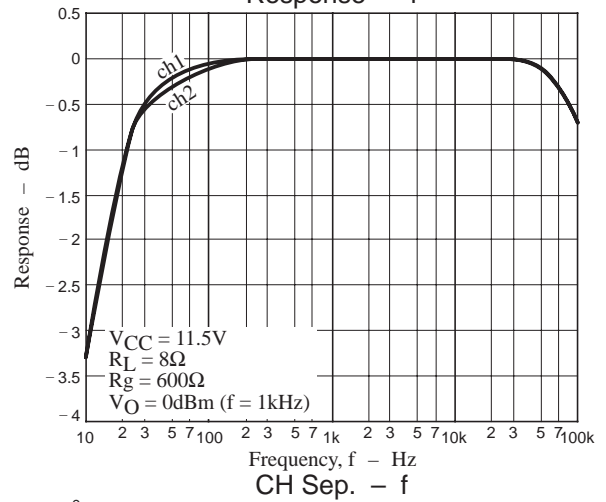
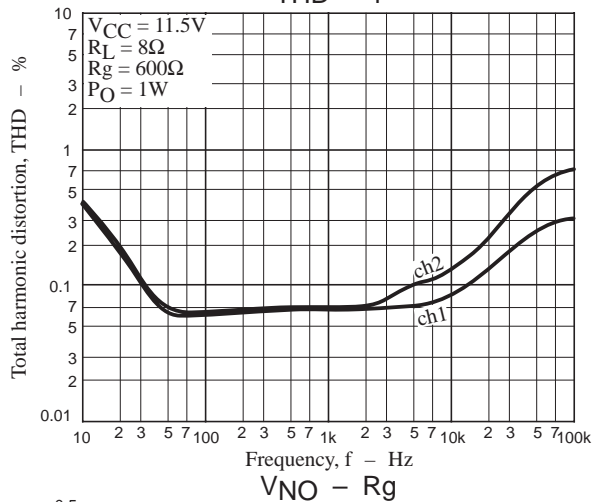
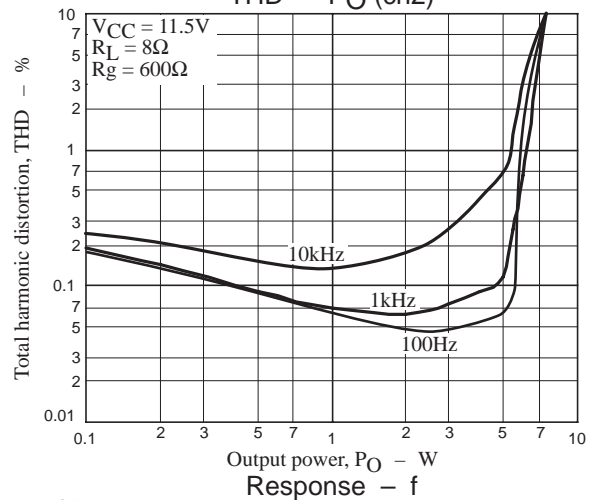
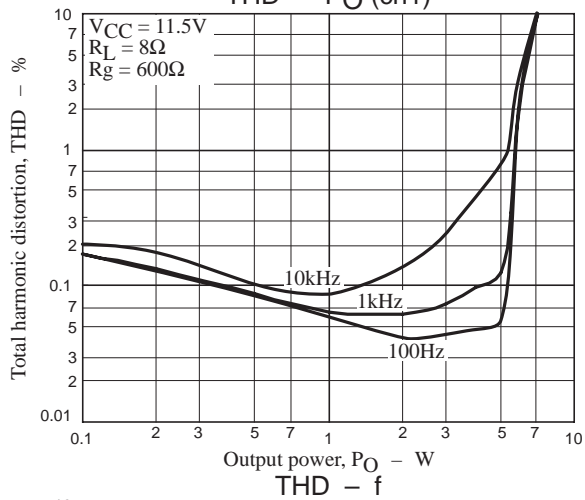
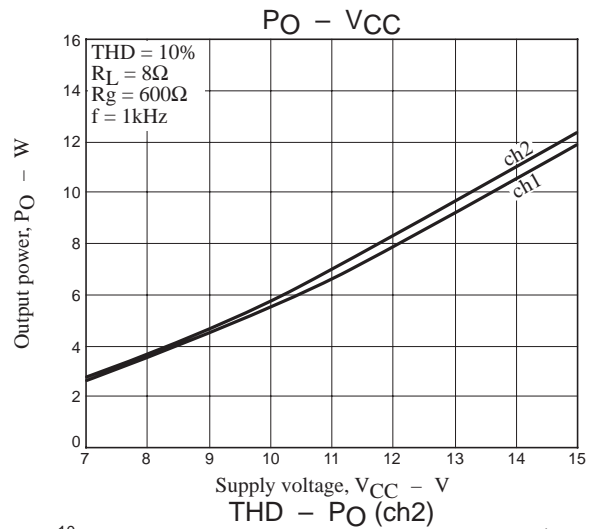
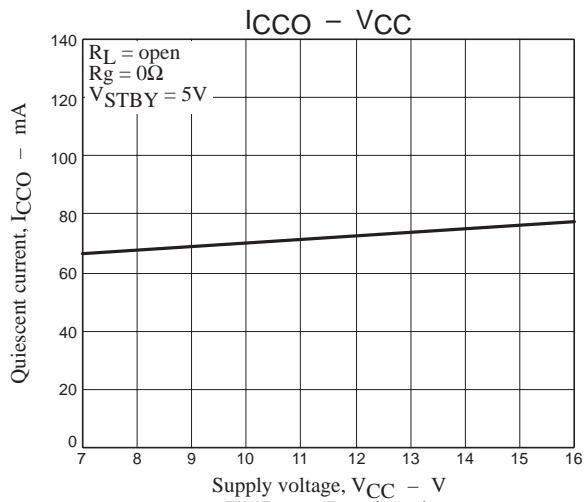
Pin 6 voltage	Amplifier	Standby
0 to 0.5	Off	On
2.5 to $V_{CC}$	On	Off

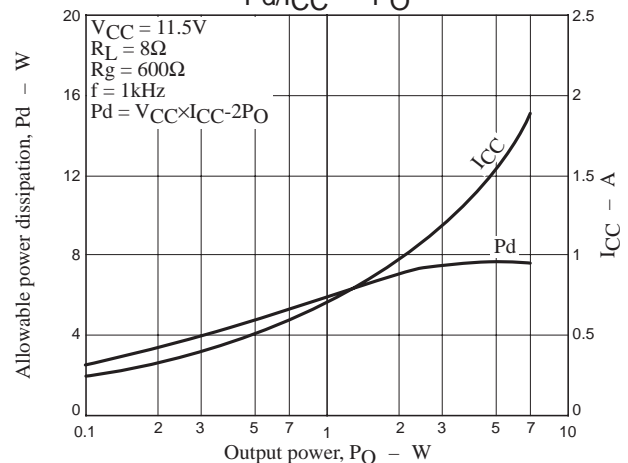
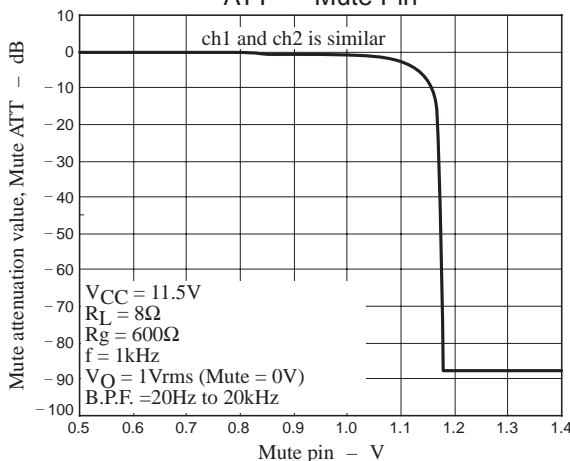
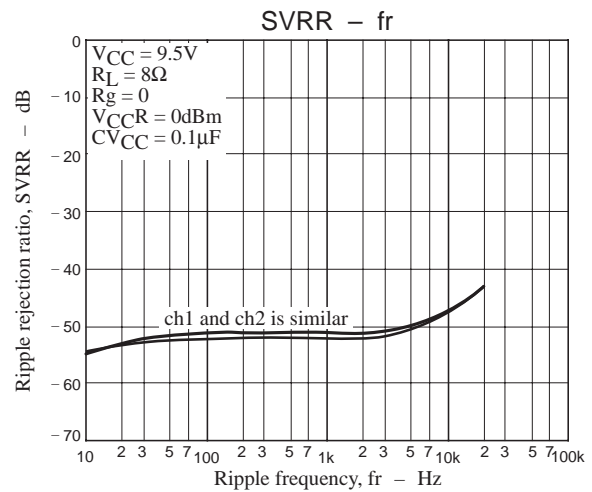
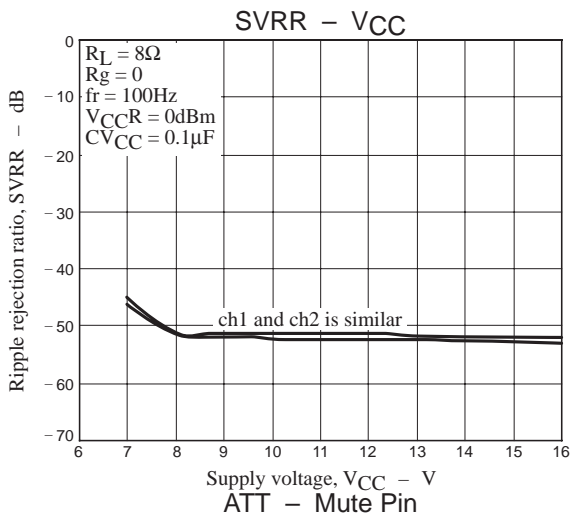
When the impression voltage of  $V_S$  is high, I want to stop pin6 inflow current. Restriction resistance ( $R_{STB}$ ) is inserted in a case.



### Cautions for use

1. This product incorporates lightning (power supply – output short-circuit), ground-fault (GND – output short-circuit) and load short-circuit protective circuits, which are activated in case of abnormal connection.  
These circuits are active while abnormal connection continues, and automatically reset when the abnormal state is removed.  
Depending on the operation conditions, the protective circuits may remain locked even when the abnormal state is canceled, keeping the protective circuits active. In such an event, enter the standby state or turn OFF power supply once to reset.
2. This product incorporates the thermal protective circuit, which is activated when the junction temperature ( $T_j$ ) rises to about 160°C or more. In this case, the output is controlled gradually to the attenuated state.
3. When this is used near the maximum rating, even the smallest change in the conditions may cause the operation to exceed the maximum ratings, possibly leading to the breakdown. Take sufficient margin for the supply voltage to ensure that the product is operated within the maximum ratings.





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