



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





SANYO Semiconductors

# DATA SHEET

## LA42052 — Monolithic Linear IC Audio Output for TV application 5W × 2ch Power Amplifier

### Overview

LA42052 is 5W 2-channel AF power amplifier intended for televisions.

### Functions

- 5W × 2 channels ( $V_{CC} = 18V$ ,  $R_L = 8\Omega$ )
- Standby function
- Pop noise reduction function
- Ripple filter
- Thermal protection circuit

LA42000 series is power IC which made Pin compatible altogether in 5 to 15W. They consist of four kinds of power ICs (mono, stereo, mono with volume function, stereo with volume function. They realized PCB layout communalization of an audio power block of TV).

Model name	P <sub>O</sub>	Channel		Volume
		Monaural	Stereo	
LA42051	5W	○		
LA42052	5W		○	
LA42351	5W	○		○
LA42352	5W		○	○
LA42071	7W	○		
LA42072	7W		○	
LA42152	15W		○	

■ Any and all SANYO Semiconductor Co.,Ltd. products described or contained herein are, with regard to "standard application", intended for the use as general electronics equipment (home appliances, AV equipment, communication device, office equipment, industrial equipment etc.). The products mentioned herein shall not be intended for use for any "special application" (medical equipment whose purpose is to sustain life, aerospace instrument, nuclear control device, burning appliances, transportation machine, traffic signal system, safety equipment etc.) that shall require extremely high level of reliability and can directly threaten human lives in case of failure or malfunction of the product or may cause harm to human bodies, nor shall they grant any guarantee thereof. If you should intend to use our products for applications outside the standard applications of our customer who is considering such use and/or outside the scope of our intended standard applications, please consult with us prior to the intended use. If there is no consultation or inquiry before the intended use, our customer shall be solely responsible for the use.

■ Specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

**SANYO Semiconductor Co., Ltd.**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

**Specifications**

**Maximum Ratings** at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	unit
Maximum supply voltage	V <sub>CC</sub> max	No signal	24	V
Allowable power dissipation	P <sub>d</sub> max	Infinitely heat sink	15	W
Maximum junction temperature	T <sub>j</sub> max		150	°C
Thermal resistance	θ <sub>jc</sub>		3	°C/W
Operating temperature	T <sub>opr</sub>		-25 to +75	°C
Storage temperature	T <sub>stg</sub>		-40 to +150	°C

**Operating Conditions** at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	unit
Recommended supply voltage	V <sub>CC</sub>		18	V
Recommended load resistance	R <sub>L</sub>		8	Ω
Allowable operating voltage range	V <sub>CC</sub> op		5.5 to 22	V

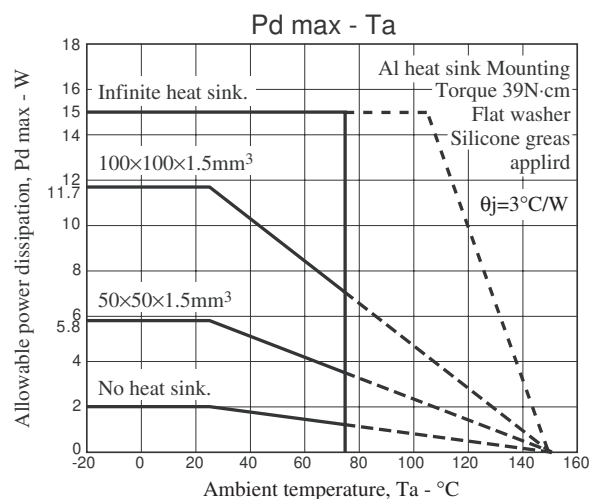
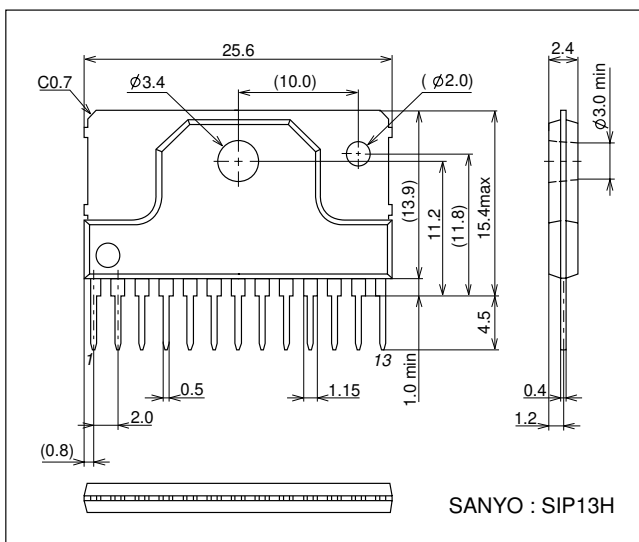
**Electrical Characteristics** at Ta = 25°C, V<sub>CC</sub> = 18V, R<sub>L</sub> = 8Ω, f = 1kHz, R<sub>g</sub>=600Ω

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Standby current	I <sub>STB</sub>	Amplifier off		1	10	μA
Quiescent current	I <sub>CCO</sub>	R <sub>g</sub> = 0	18	50	100	mA
Output power	P <sub>O</sub>	THD = 10%	4	5		W
Total harmonic distortion	THD	P <sub>O</sub> = 1W		0.15	0.4	%
Voltage gain	VG	V <sub>O</sub> = 0dBm	33	35	37	dB
Output noise voltage	V <sub>NO</sub>	R <sub>g</sub> = 0, BPF = 20Hz to 20kHz		0.05	0.25	mVrms
Ripple rejection	SVRR	R <sub>g</sub> = 0, f <sub>R</sub> = 100Hz, V <sub>CCR</sub> = 0dBm	50	60		dB
Channel separation	CH Sep.	R <sub>g</sub> = 10kΩ, V <sub>O</sub> = 0dBm	50	60		dB
Standby control voltage (The Pin 5 voltage)	V <sub>STB-H</sub>	Amplifier on	1.0		5	V
	V <sub>STB-L</sub>	Amplifier off	0		0.5	V
Input resistance	R <sub>i</sub>		21	30	39	kΩ

**Package Dimensions**

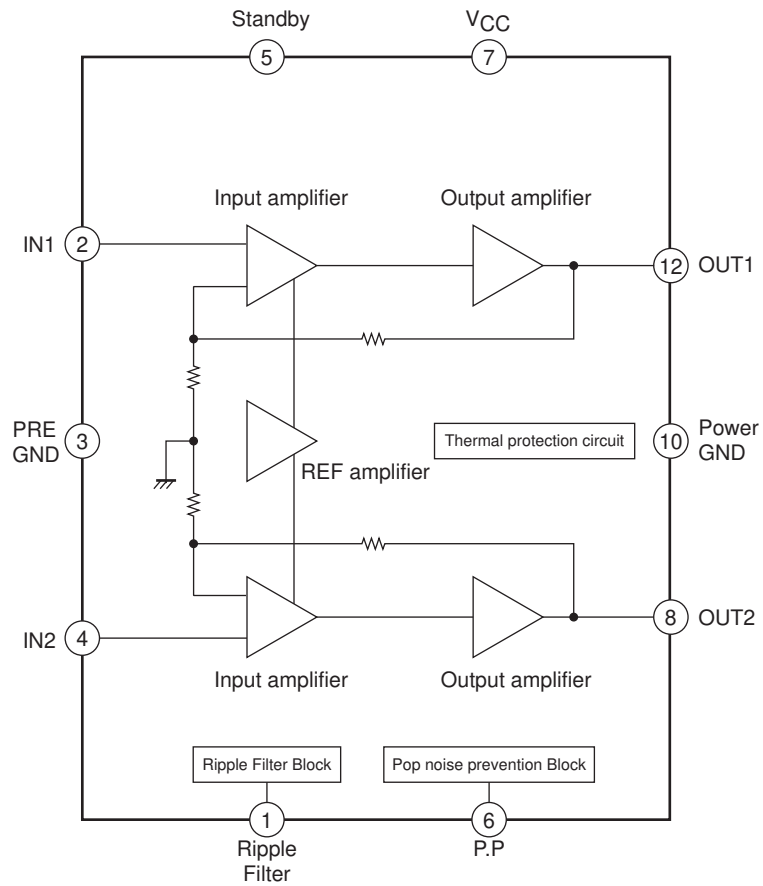
unit : mm

3107B

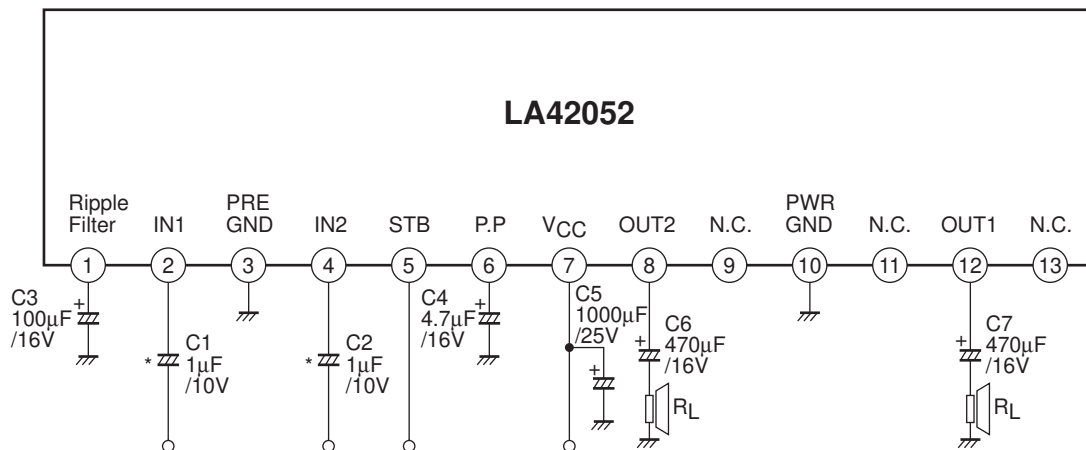


# LA42052

## Block Diagram



## Application Circuit Example



**External Components**

C1, C2 : Input coupling capacitors, which are recommended to be 1.0μF or less.

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

Determine the polarity orientation of these capacitors based on the DC current from the circuit connected to the LA42052 front end.

C3 : The recommended value for the Ripple filter capacitor is 100μF.

C4 : The recommended value for the P.P capacitor 4.7μF. It is a capacitor for there being small Pop sound.

C5 : Power supply capacitor.

C6, C7 : The recommended value for the output capacitor is 470μF.

1. Standby Function (Pin 5)

By means of controlling pin 5 to high and low, the power Supply can be set to ON and OFF.

Control Voltage of pin 5

Pin 5 voltage	Amplifier	Standby
0 to 0.5	OFF	ON
1.0 to 5.0	ON	OFF

When the impression voltage of  $V_S$  is high,

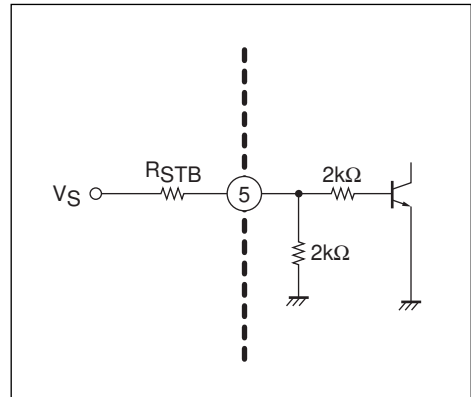
I want to stop 5 pin inflow current.

Restriction resistance ( $R_{STB}$ ) is inserted in a case.

$V_S = 5V, R_{STB} = 5.1k\Omega$

5 pin inflow current = about 750μA

5 pin voltage = about 1.2V



2. Ripple filter and Mute function (Pin 1)

Pin voltage is approx.  $1/2 V_{CC}$

The recommended value for the Ripple filter capacitor is 100μF.

Muting :

The output signal can be controlled by connecting pin 1(Ripple filter) to ground via a resistance of 300 to 500Ω.

If resistance is higher than 750Ω, the suppression ratio will decrease.

3. Input Pin (Pin 2,4)

Voltage at the input pins is approx.  $2V_{BE}$ (about 1.4V)

Determine the polarity orientation of these capacitors based on the DC current from the circuit

Connected to the LA42052 front end.

Input resistance is approx. 30kΩ (typ)

The recommended value for the input capacitor is 1.0μF.

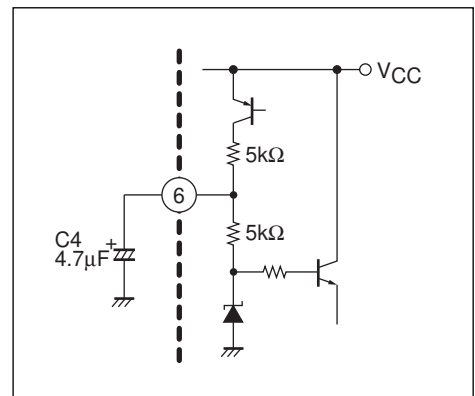
4. P.P (Pin 6)

The Pin 6 is Terminal for there being small pop sound at the time of power supply ON/OFF.

C4 recommends 4.7μF.

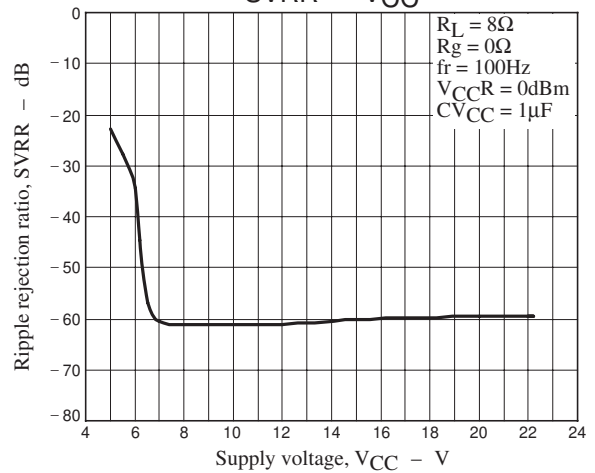
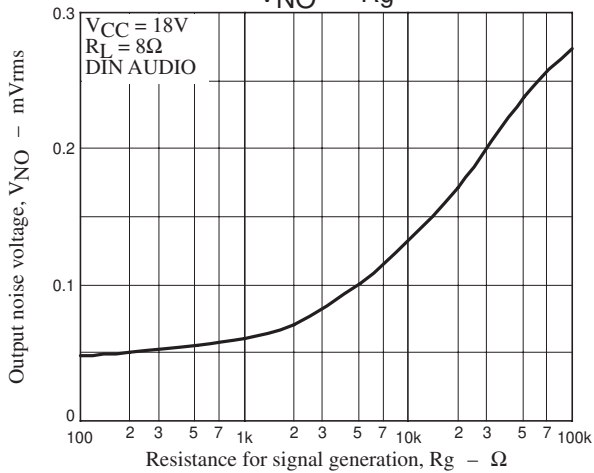
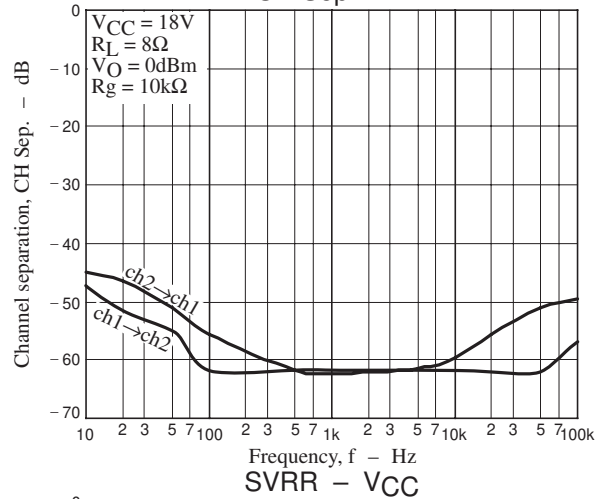
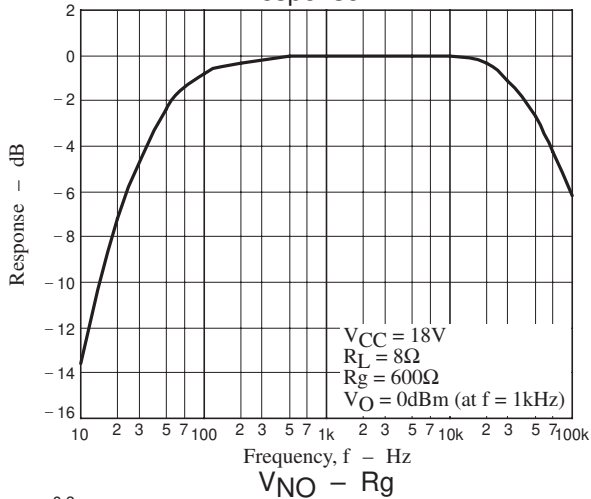
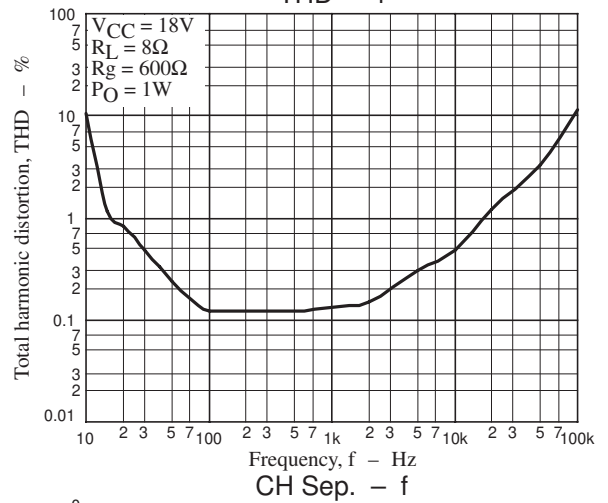
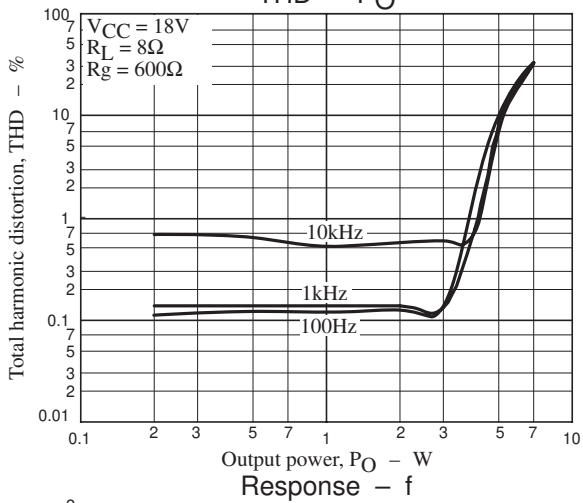
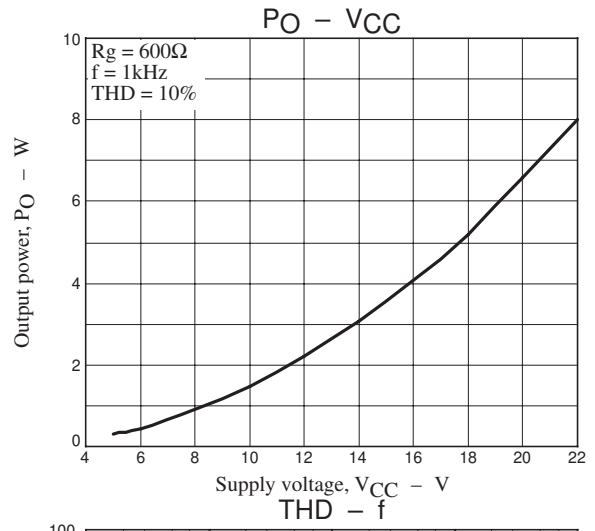
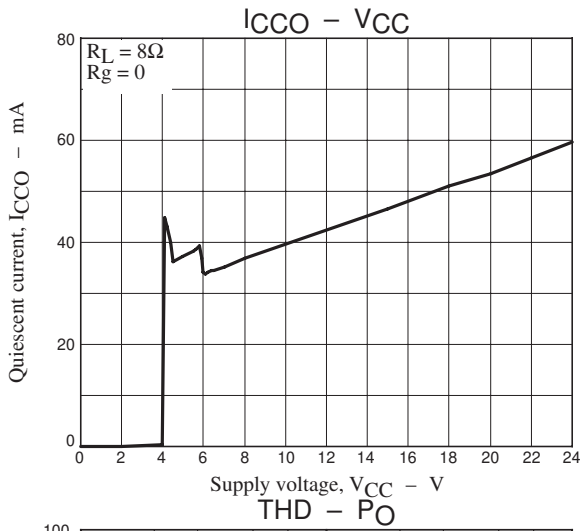
When capacitance is higher 10μF, the sound will not be cut off when setting the power supply OFF.

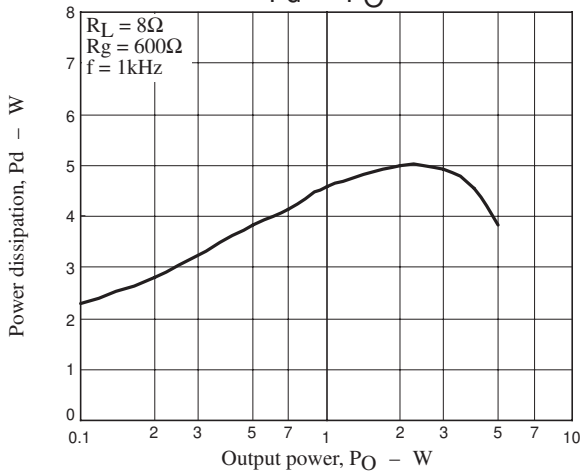
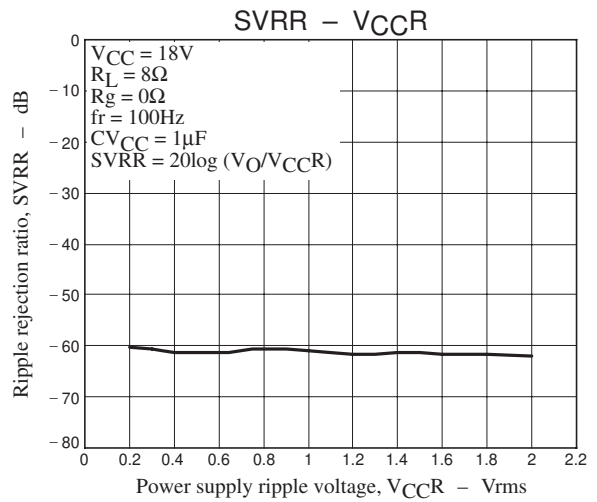
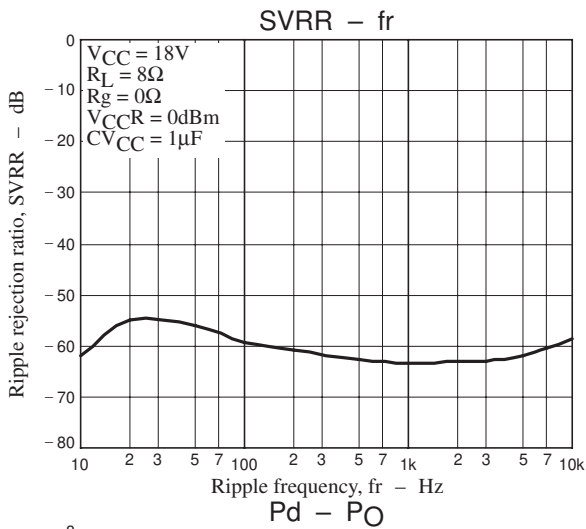
$$\text{Pin 6 voltage} = \frac{V_{CC} - V_{CE} \text{ (about 0.3V)} - 5.6V}{2} + 5.6V$$



## Usage Notes

1. Lightning (power supply - output short-circuit) and ground fault (GND - output short-circuit) protective circuits are not incorporated. Due care must be taken during handling of the product.
2. The thermal protective circuit is incorporated and activated when the junction temperature ( $T_j$ ) rises above about  $160^{\circ}\text{C}$ .  
This circuit controls the output gradually to the attenuated condition.
3. Always ensure the sufficient margin for the supply voltage, etc. to operate the product within the area where the maximum rating will never be exceeded. Namely, the maximum rating may be exceeded due to the slight change in conditions, resulting in damage, if the product is used around the maximum rating.





- SANYO Semiconductor Co.,Ltd. assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein.
- SANYO Semiconductor Co.,Ltd. strives to supply high-quality high-reliability products, however, any and all semiconductor products fail or malfunction with some probability. It is possible that these probabilistic failures or malfunction could give rise to accidents or events that could endanger human lives, trouble that could give rise to smoke or fire, or accidents that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO Semiconductor Co.,Ltd. products described or contained herein are controlled under any of applicable local export control laws and regulations, such products may require the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written consent of SANYO Semiconductor Co.,Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO Semiconductor Co.,Ltd. product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production.
- Upon using the technical information or products described herein, neither warranty nor license shall be granted with regard to intellectual property rights or any other rights of SANYO Semiconductor Co.,Ltd. or any third party. SANYO Semiconductor Co.,Ltd. shall not be liable for any claim or suits with regard to a third party's intellectual property rights which has resulted from the use of the technical information and products mentioned above.

This catalog provides information as of May, 2008. Specifications and information herein are subject to change without notice.