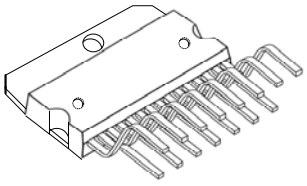
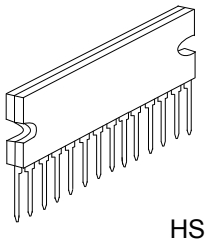
LOW FREQUENCY POWER AMPLIFIER



HZIP-15A



HSIP-14B

*Pb-free plating product number: UA8229L

■ DESCRIPTION

The UTC **UA8229** is a low frequency power amplifier and developed for portable radio cassette tape recorder with power ON/OFF switch.

The audio power IC has built-in two channels and thermal shut down protection circuit.

■ FEATURES

* High Power
  : P_{OUT} (1) = 2.5W (Typ.)
  (V_{CC} = 9V, R_L = 4Ω, f = 1kHz, THD = 10%)
  : P_{OUT}(2) = 4.6W (Typ.)
  (V_{CC} = 12V, R_L = 4Ω, f = 1kHz, THD = 10%)
* Low Popping Noise at Power ON
* Small Quiescent Current
  : I_Q = 21mA (Typ.) (V_{CC} = 15V, V_{IN} = 0)
* Soft Clip
* Thermal Shut Down Protection
* Best for Supply Voltage 9V, 12V
* Operation Supply Voltage Range from 6V to 15V

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Normal	Lead Free Plating		
UA8229-H14-B-T	UA8229L-H14-B-T	HSIP-14B	Tube
UA8229-J15-A-T	UA8229L-J15-A-T	HZIP-15A	Tube

UA8229L-H14-B-T (1)Packing Type (2)Package Type (3)Lead Plating	(1) T: Tube (2) H14-B: HSIP-14B, J15-A: HZIP-15A (3) Lead Free Plating, Blank: Pb/Sn

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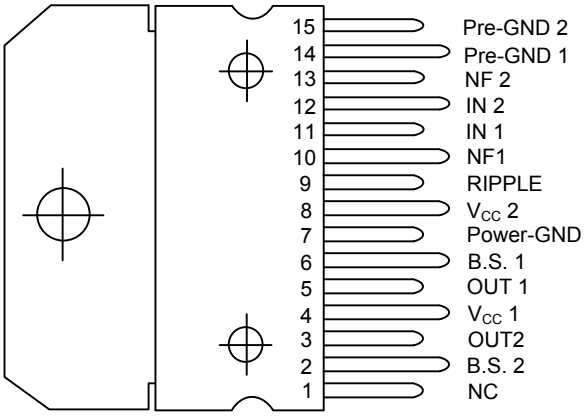
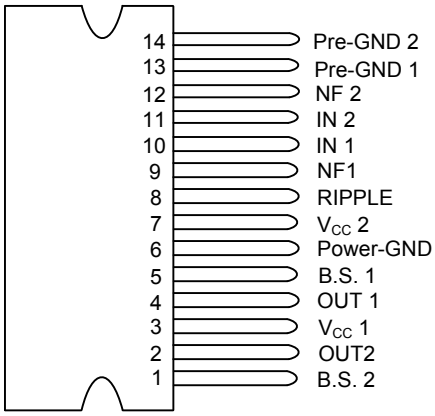
■ PIN CONFIGURATIONS



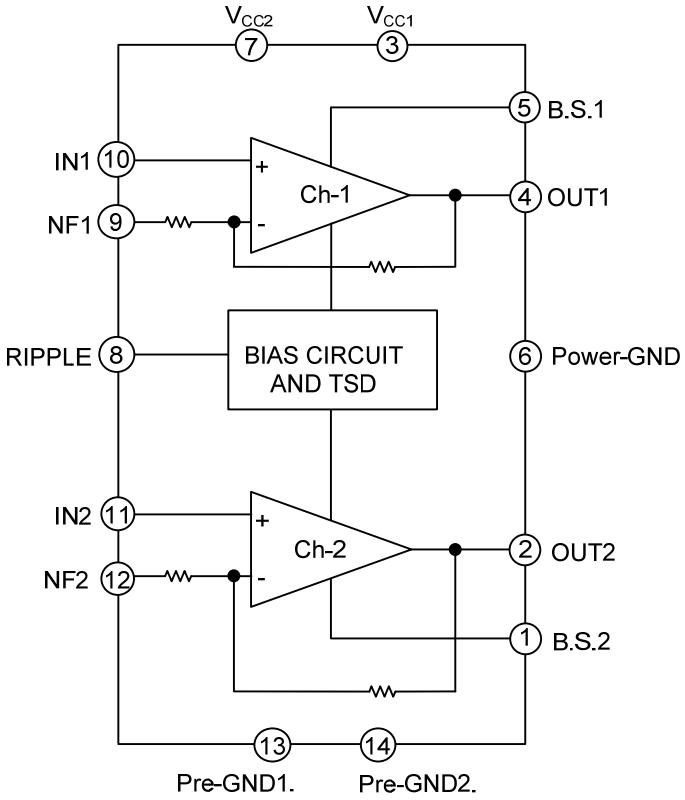
HZIP-15A



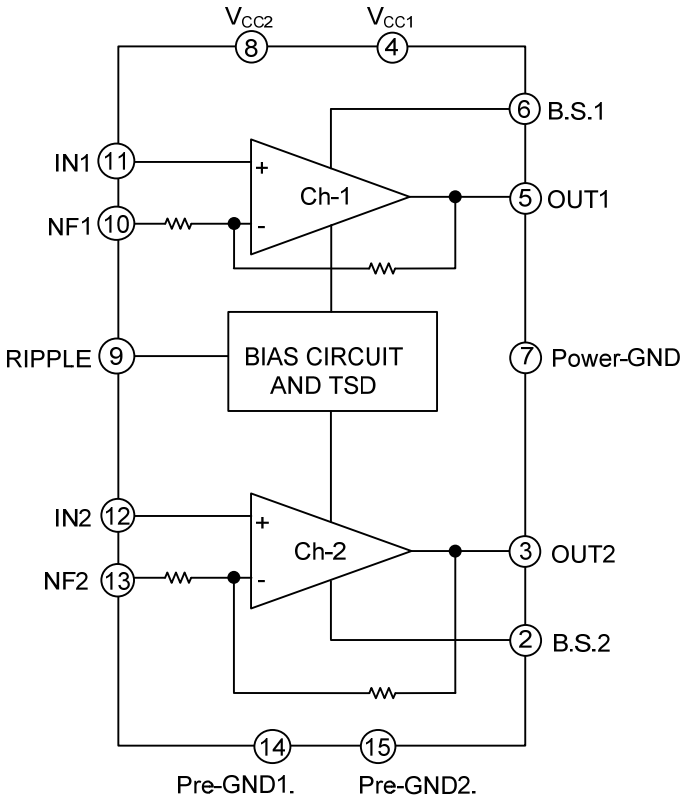
HSIP-14B

■ BLOCK DIAGRAMS

FOR HSIP-14B PACKAGE



FOR HZIP-15A PACKAGE



■ ABSOLUTE MAXIMUM RATINGS (Ta = 25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	20	V
Peak Output Current	$I_{O(PEAK)}$	2.5	A
Power Dissipation Derated above Ta = 25℃	P_D	15 120	W mW/℃
Operating Temperature	T_{OPR}	-20 ~ +85	℃
Storage Temperature	T_{STG}	-40 ~ +150	℃

Note 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The device is guaranteed to meet performance specification within 0℃~ +70℃ operating temperature range and assured by design from -20℃~ +85℃.

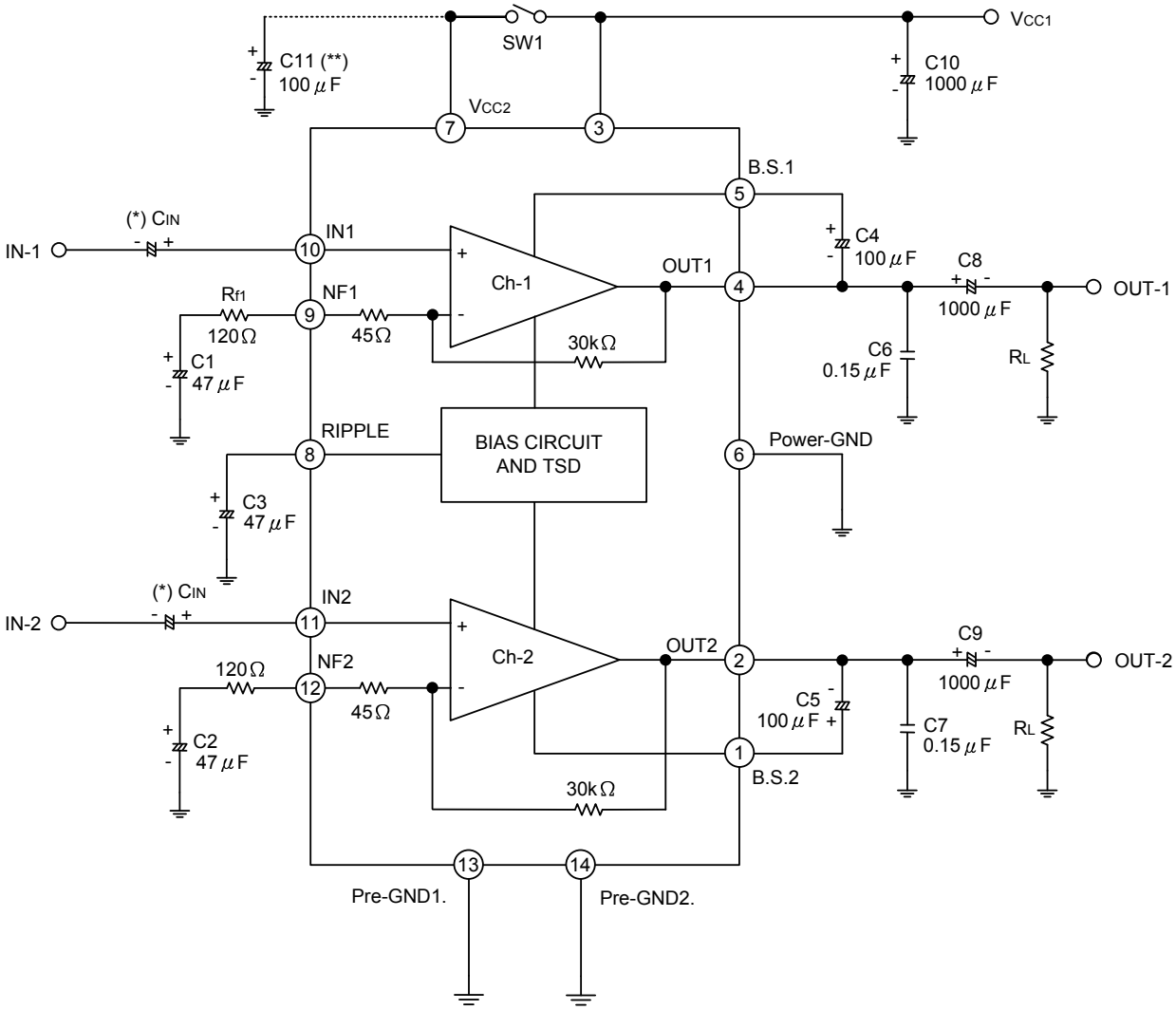
■ ELECTRICAL CHARACTERISTICS

(Ta=25℃, V_{CC}=9V, R_L=4Ω, R_g=600Ω, f=1kHz, R_F=120Ω, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V_{11}, V_{12}			30	60	mV
Stand-by Current	I_{STN-BY}	SW1 ⟶ OFF		1		μA
Quiescent Current	I_D	V_{IN} = 0		25	45	mA
Output Power	$P_{OUT(1)}$	THD = 10%, V_{CC}=9V	2.0	2.5		W
	$P_{OUT(2)}$	THD = 10%, V_{CC} = 12V		4.6		
Total Harmonic Distortion	THD	P_{OUT} = 0.4W/ch		0.2	1.0	%
Voltage Gain	$G_{V(1)}$	R_F= 120Ω, V_{OUT} = 0.775Vrms (0dBm)	43	45	47	dB
	$G_{V(2)}$	R_F= 0, V_{out} = 0.775Vrms (0dBm)		56.5		
Input Resistance	R_{IN}			30		kΩ
Output Noise Voltage	V_{NO}	R_G = 10kΩ, BW = 20Hz ~ 20kHz		0.3	1.0	mVrms
Ripple Rejection Ratio	RR	R_G = 600Ω, f_{RIPPLE} = 100kHz		-52		dB
Cross Talk	C.T.	R_G = 600Ω, amp1⟷ 2 V_{OUT} = 0.775Vrms (0dBm)		-50		dB

■ TEST CIRCUITS

FOR HSIP-14B PACKAGE

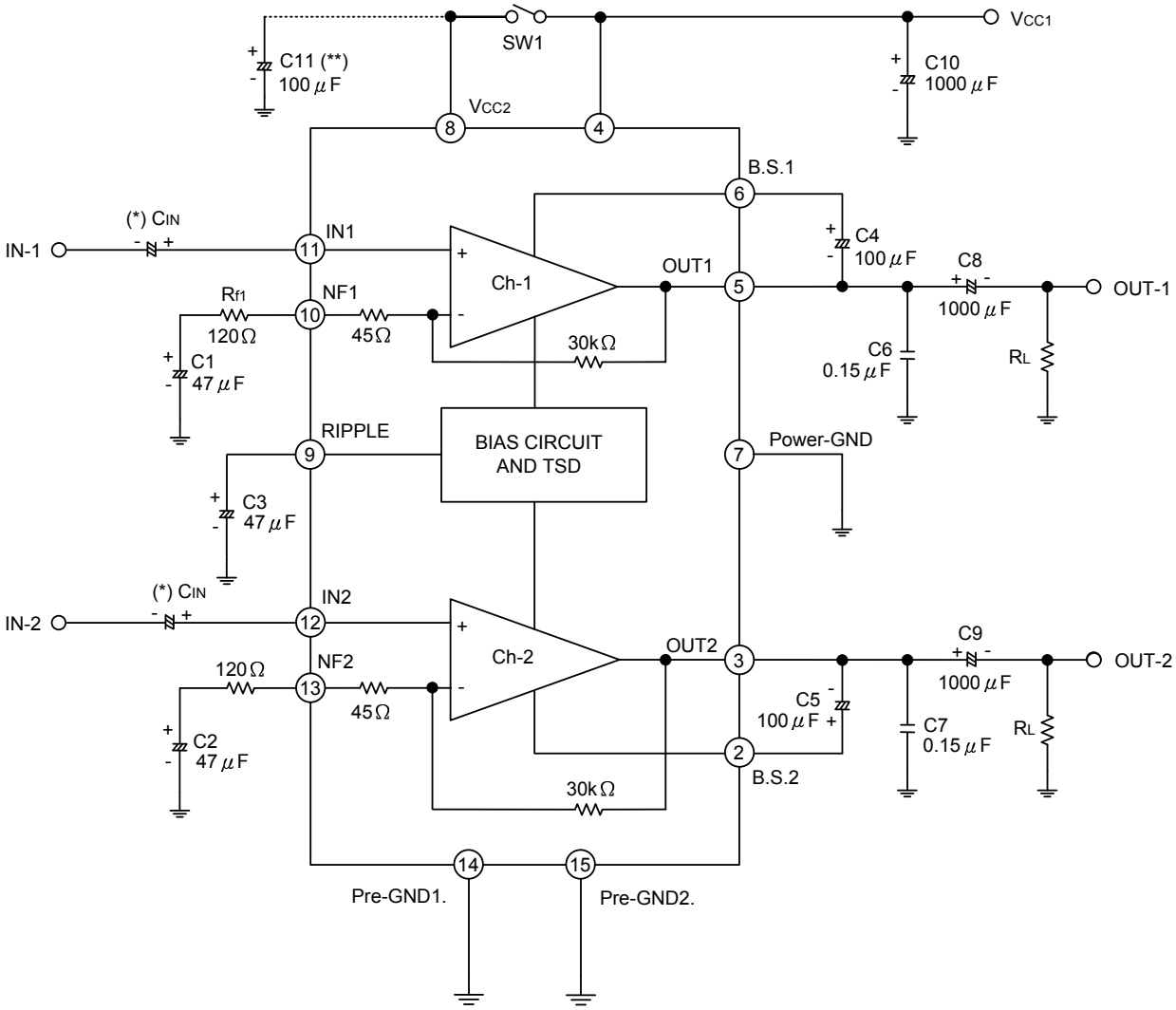


(*) This IC can be used without coupling capacitor (C_{IN}).
If volume slide noise occurred by input offset voltage is undesirable, it needs to use the capacitor (C_{IN}).

(**) The condenser between the pin 8 and the GND (C11) is for reducing POP noise when the power ON/OFF switch (SW1) is set to ON/OFF.

■ TEST CIRCUITS(Cont.)

FOR HZIP-15A PACKAGE



(*) This IC can be used without coupling capacitor (C_{IN}).
If volume slide noise occurred by input offset voltage is undesirable, it needs to use the capacitor (C_{IN}).

(**) The condenser between the pin 9 and the GND (C11) is for reducing POP noise when the power ON/OFF switch (SW1) is set to ON/OFF.

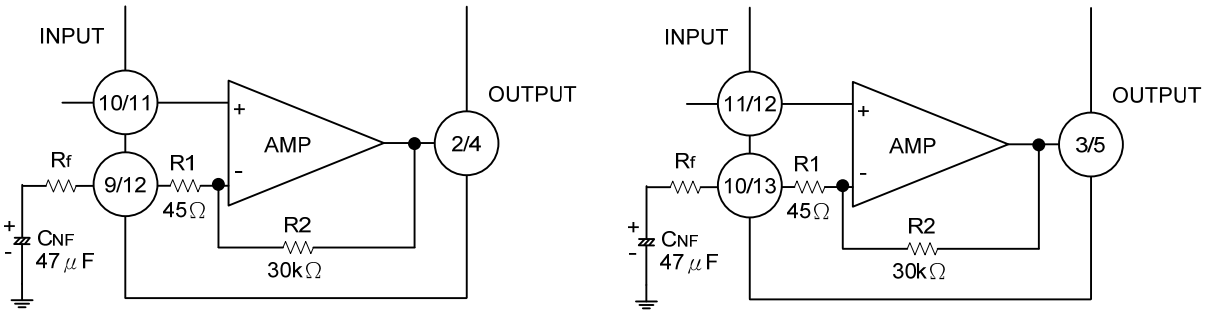
■ APPLICATION INFORMATION

1. Adjustment of voltage gain

The voltage gain G_V is obtained by R1, R2 and R_F as below. By increasing R_F, reduction of G_V is possible. 40dB or over in use is recommended.

$$G_V = 20 \log \frac{R_F + R1 + R2}{R_F + R1}$$

Sine oscillation is probable as a result of feedback in crease.



FOR HSIP-14B PACKAGE FOR HZIP-15A PACKAGE

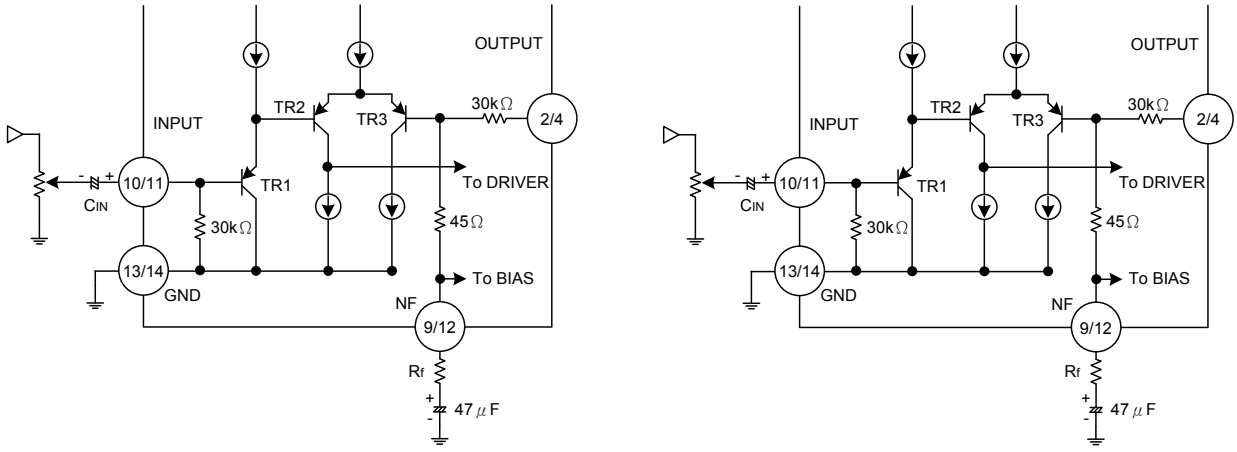
Fig.1

2. Input stage

The input circuit of this IC is as shown as below.

PNP TR: TR1 is provided in the input circuit so as to make its usage possible without the input coupling capacitor. However, at Pin 10 and Pin 11 max 60 mV offset voltage is produced.

Fig.2 illustrate the input circuit of UTC UA8229. A offset voltage of 60mV max is possible. TR1 is featured to eliminate the usage of coupling capacitor.



FOR HSIP-14B PACKAGE FOR HSIP-15A PACKAGE

Fig. 2

■ APPLICATION INFORMATION(Cont.)

3. Input voltage
When the excessive signal is input, turning-up is produced in the clip waveform.

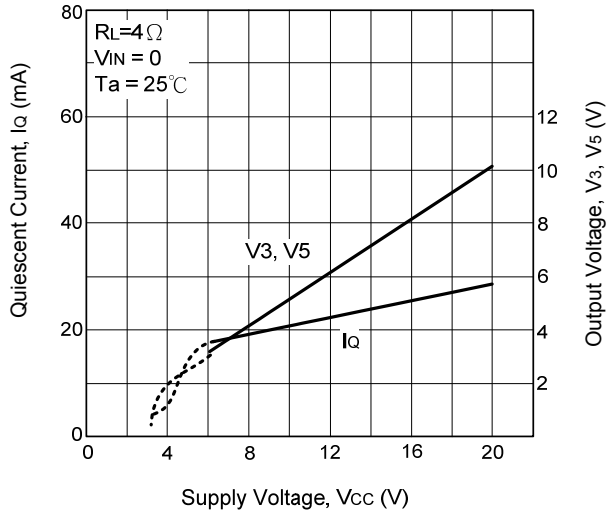
4. Oscillation preventive measures
Mylar capacitor in use is strongly recommended to fulfill well handled of oscillation temperature and high frequency.

5. Power ON/OFF switch
There is power ON/OFF switch at Pin 7(HZIP-15A's Pin 8). However, output power is changed by Pin 7(HZIP-15A's Pin8) supply voltage when Pin 7(HZIP-15A's Pin 8) supply voltage is not same Pin 3(HZIP-15A's Pin 4) supply voltage, after referring to attached date, select Pin 7 (HZIP-15A's Pin 8)supply voltage.

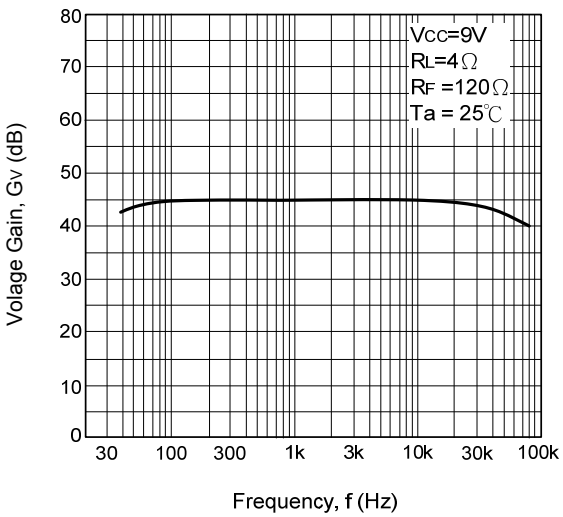
6. Thermal shut-down Protection
The thermal shut-down circuit is built-in to dodge IC damage that result from the abnormal temperature rise during operating.

■ TYPICAL CHARACTERISTICS

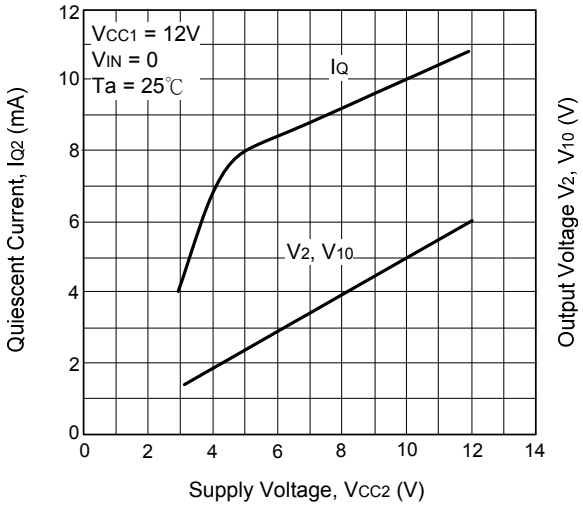
Quiescent Current vs. Supply Voltage



Voltage Gain vs. Frequency



Quiescent Current vs. Supply Voltage



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