

## LOW FREQUENCY POWER AMPLIFIER

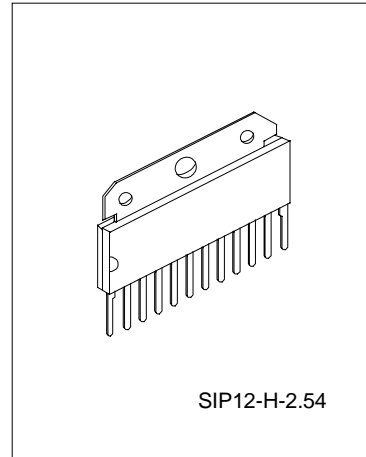
UTC8207 is an audio power IC with built-in two channels developed for portable radio cassette tape recorder with power ON/OFF switch.

Because of the parts reduction and SIPH (single inline package), space merit is remarkable.

Thermal shut down protection circuit is built in.

### FEATURE

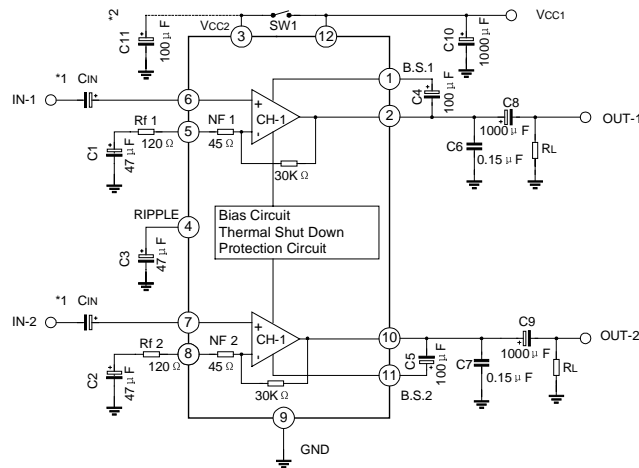
- High Power: POUT=2.5W (Typ.)  
(VCC=9V, RL=4Ω, f=1kHz, THD=10%)  
POUT=4.6W (Typ.)  
(VCC=12V, RL=4Ω, f=1kHz, THD=10%)
- Low popping noise at power ON
- Small quiescent current: ICCQ=21mA (Typ.) (VCC=9V, VIN=0)
- Soft Clip
- Built-in Thermal shut down protection circuit
- Best for supply voltage 9V, 12V
- Operation supply voltage range: VCC=6~15V



### ORDERING INFORMATION

Part No.	Package
UTC8207	SIP12-H-2.54

### BLOCK DIAGRAM



(\*1): This IC can be used without coupling capacitor (CIN). If volume slide noise occurred by input offset voltage is undesirable, it needs to use the capacitor (CIN).

(\*2): The condenser between the ③ pin and the GND (C11) is for reducing pop noise when the power ON / OFF switch (SW1) is set to ON/OFF.

**ABSOLUTE MAXIMUM RATINGS** (TA=25°C)

Characteristics	Symbol	Value	Units
Supply Voltage	VCC	20	V
Output Current (Peak/CH)	IO (peak)	2.5	A
Power Dissipation	PD	12.5	W
Operating Temperature	Topr	-20~75	°C
Storage Temperature	Tstg	-55~150	°C

**ELECTRICAL CHARACTERISTICS**

( Unless otherwise specified, VCC=9V, RL=4Ω, Rg=600Ω, f=1kHz, TA=25°C, Rf=120Ω)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Quiescent Current	ICCQ	VIN=0	--	21	45	mA
Output Power	POUT (1)	THD=10%	2.0	2.5	--	W
	POUT (2)	THD=10%, VCC=12V	--	4.6	--	
Total Harmonic Distortion	THD	POUT=0.4W/ch	--	0.2	1.0	%
Voltage Gain	GV (1)	Rf=120Ω, VOUT=0.775Vrms (0dBm)	43	45	47	dB
	GV (2)	Rf=0, VOUT=0.775Vrms (0dBm)	--	56.5	--	
Input Resistance	RIN	--	--	30	--	kΩ
Output Noise Voltage	VNO	Rg=10kΩ, BW=20Hz~20kHz	--	0.3	1.0	mVrms
Ripple Rejection Ratio	R.R.	Rg=600Ω, fripple=100Hz	--	52	--	dB
Cross Talk	C.T.	Rg=600Ω, AMP. 1↔2, VO=0.775Vrms (0dB), f=1kHz	--	50	--	dB
Input Offset Voltage	V6, V7	--	--	30	60	mV
Stand-by Current	IOFF	SW1→OFF	--	1	--	μA

**TYPICAL DC VOLTAGE OF EACH TERMINAL** (VCC=9V, TA=25°C)

Terminal NO	1	2	3	4	5	6	7	8	9	10	11	12
DC Voltage	8.7	4.5	VCC	5.0	0.7	0.03	0.03	0.7	GND	4.5	8.7	VCC

**FUNCTION DESCRIPTION**

**1. Adjustment of Voltage Gain**

The voltage gain GV is obtained as follows by R1, R2 and Rf in fig.1.

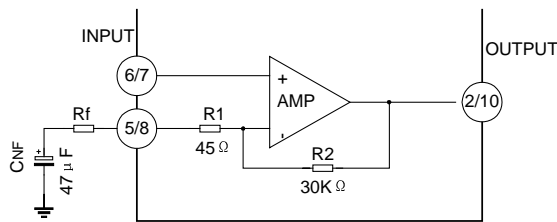
$$GV = 20\log \frac{Rf + R1 + R2}{Rf + R1}$$

When Rf=0, GV=56.5dB (Typ.)

When Rf=120Ω, GV=45dB (Typ.)

By increasing Rf, reduction of GV is possible. However, since the feedback increase is liable to produce oscillation, it is recommended to use this at 40dB or over.

**Fig.1**



**2. Thermal Shut-down Circuit**

The thermal shut-down circuit is built in for the purpose of preventing the destruction of IC due to the abnormal temperature rise when the heat radiation is insufficient.

The operation temperature is set at radiation Fin temperature 175°C (Typ.)

At this temperature or over the bias is interrupted to prevent the destruction of the IC.

**3. Input Stage**

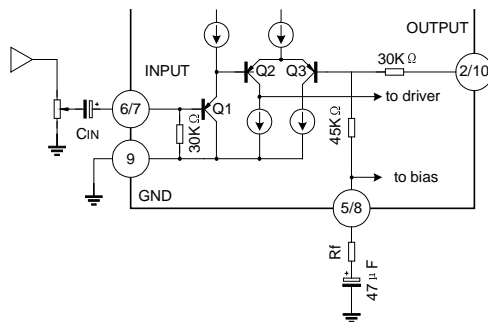
The input circuit of this IC is shown in fig. 2.

PNP Tr: Q1 is provided in the input circuit so as to make its usage possible without the input coupling capacitor. However, at pin 6 and 7, max 60mV offset voltage is produced.

Application after checking volume slide noise is recommended.

For cutting the volume slide noise, insert the input capacitor: CIN in series to interrupt the DC component.

**Fig.2**



**4. Oscillation Preventive Measures**

For oscillation preventive capacitor C6 and C7 between the output terminal and GND, it is recommended to

use polyester film capacitor having good characteristics for temperature and for high frequency.

Since the characteristics of the capacitor is liable to be influenced by the temperature, use this capacitor after the temperature test to check the oscillation allowance.

In addition, as the position of the electrolytic capacitor has remarkable influence on the oscillation, connect C10 to VCC at the nearest possible position form power GND.

At using this application with the voltage gain reduced, oscillation is liable to be produced. Apply the capacitor after checking enough for its capacity, type and mounting position.

**5.Power ON/OFF Switch**

There is power ON/OFF switch at pin3. However, output power is changed by pin3 supply voltage when pin3 supply voltage is not same pin12 voltage, after referring to attached date, select pin3 supply voltage.

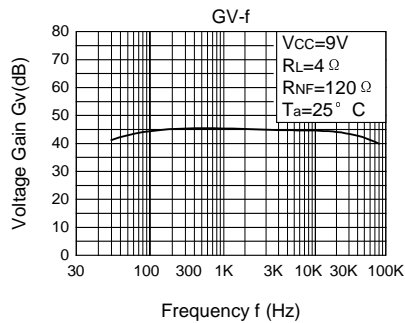
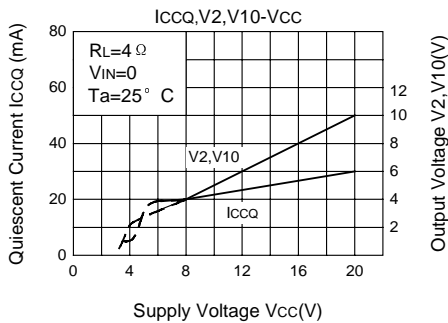
**6.Input Voltage**

When the excessive signal is input, turning-up is produced in the clip waveform. The turning-up point is  $V_{IN}=300mV_{rms}$  (Typ.):  $V_{CC}=9V$ ,  $R_L=4\Omega$ ,  $f=1kHz$ : Enough care must be taken for this phenomenon.

**7. GND Line**

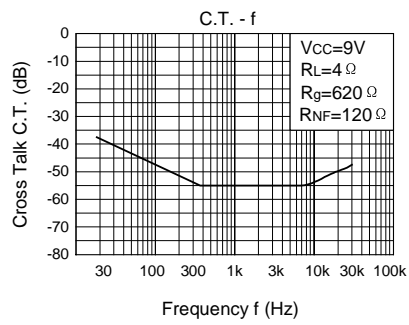
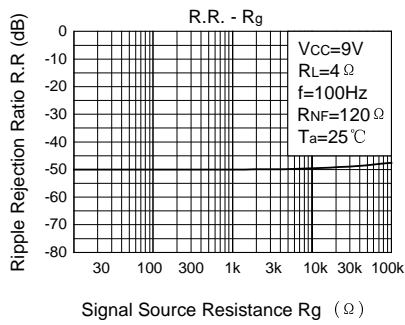
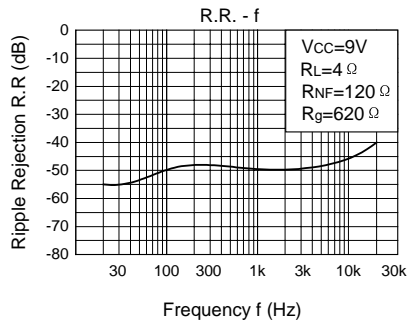
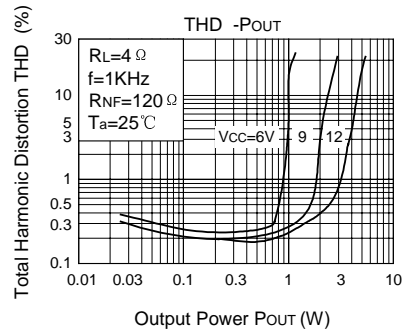
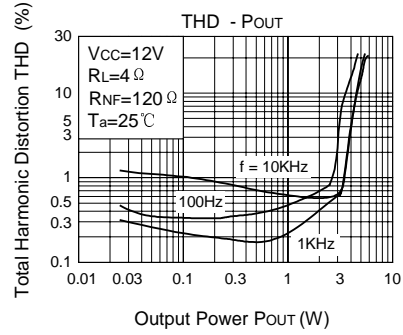
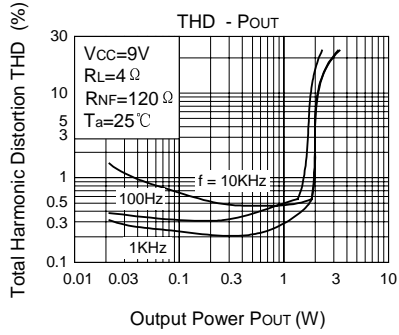
GND pin is not separated for pre-GND and for PW-GND. That is liable to cause distortion and cross talk worse. Before use this IC, please check it.

**ELECTRICAL CHARACTERISTICS CURVE**



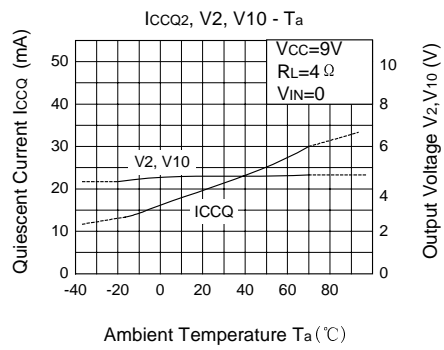
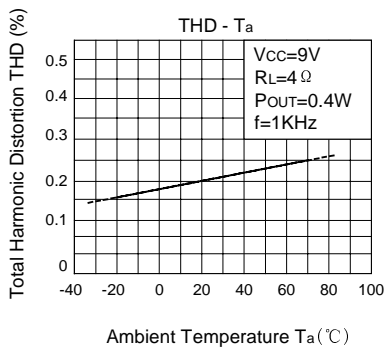
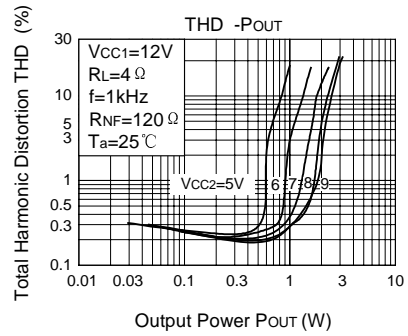
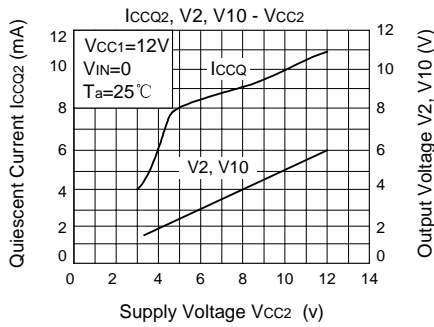
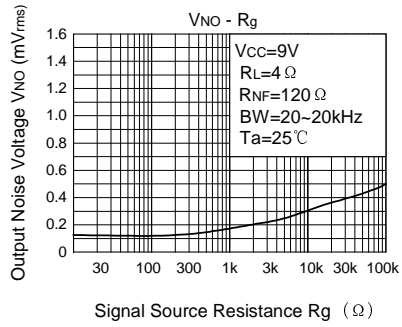
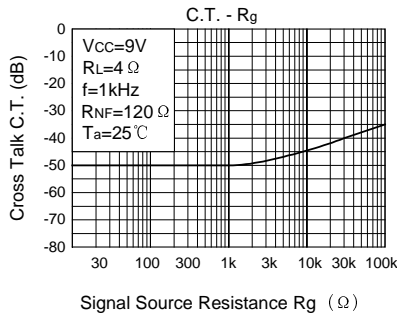
(To be continued)

(Continued)



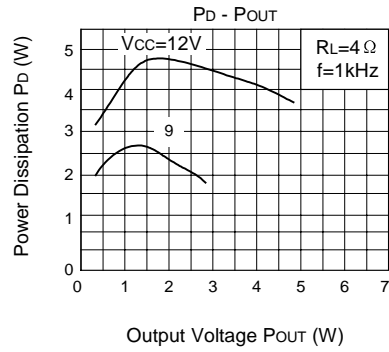
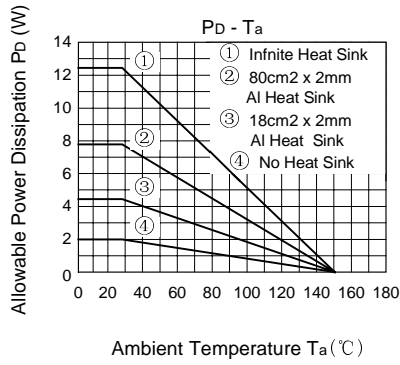
(To be continued)

(Continued)



(To be continued)

(Continued)



**PACKAGE OUTLINE**

