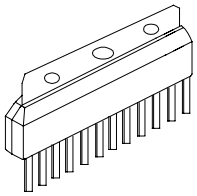
UTC TA8207K LINEAR INTEGRATED CIRCUIT

LOW FREQUENCY POWER AMPLIFIER



FSIP-12H

DESCRIPTION

The UTC TA8207K 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 SIP (Single inline package), space merit is remarkable.
Thermal shut down protection circuit is built in.

FEATURES

*High Power : P_{OUT}=2.5W / CH (Typ.)
(Vcc=9V, RL=4Ω, f=1KHz, THD=10%)
: P_{OUT}=4.6W / CH (Typ.)
(Vcc=12V, RL=4Ω, f=1KHz, THD=10%)
*Low Popping Noise at Power ON
*Small Quiescent Current: I_{CCQ}=21mA (Typ.)
(Vcc=9V, VIN=0)
*Soft Clip
*Built-in Thermal Shut Down Protection Circuit
*Bast for Supply Voltage 9V, 12V
*Operation Supply Voltage Range: Vcc=6-15V

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	Vcc	20	V
Output Current (Peak / CH)	Io(peak)	2.5	A
Power Dissipation	PD	12.5	W
Operating Temperature	Topr	-20 to + 75	°C
Storage Temperature	Tstg	-55 to + 150	°C

ELECTRICAL CHARACTERISTICS

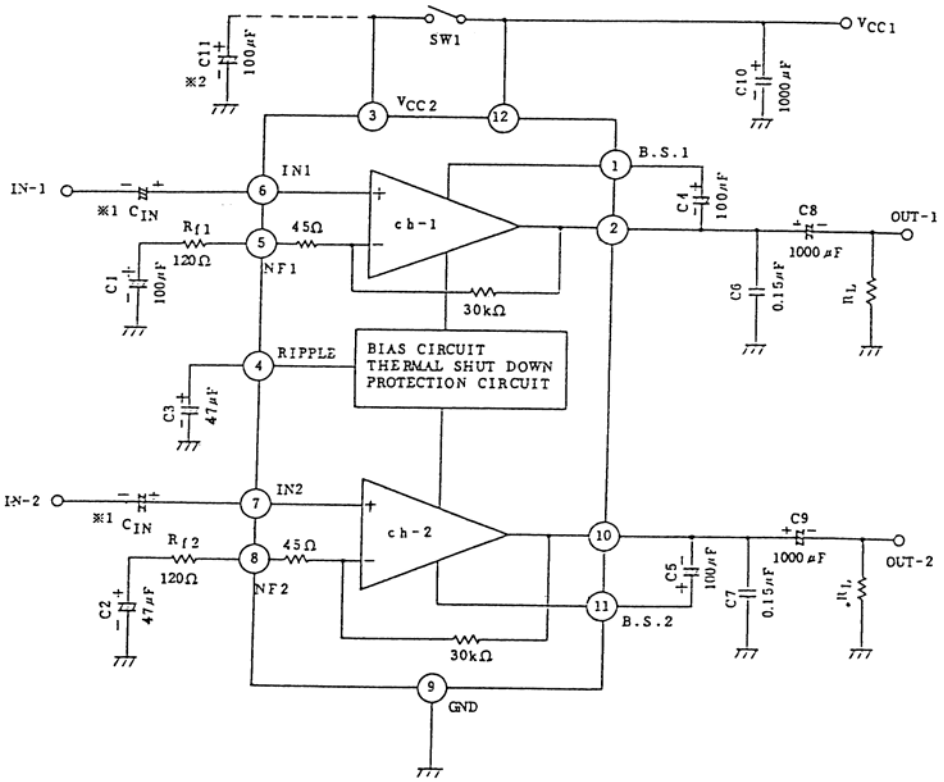
(Vcc=9V, R_L=4Ω, Rg=600Ω, f=1kHz, Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Current	I_{CCQ}	Vin=0		21	45	mA
Output Power	$P_{OUT(1)}$	THD=10%	2.0	2.5		W
	$P_{OUT(2)}$	Vcc=12V,THD=10%		4.6		W
Total Harmonic Distortion	THD	POUT=0.4W / ch		0.2	1.0	%
Voltage Gain	GV(1)	Rf=120Ω V_{OUT}=0.775Vrms	43	45	47	dB
	GV(2)	Rf=0, V_{OUT}=0.775Vrms		56.5		dB
Input Resistance	R_{IN}			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, Amp1<->2 VOUT=0dBm, f=1kHz		50		dB
Input Offset Voltage	V6,V7			30	60	mV
Stand-by Current		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

TEST CIRCUIT

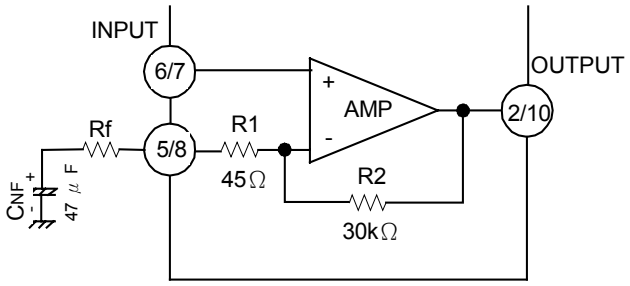


REMARK 1 : This IC can be used without coupling capacitor (CIN). If volume slide noise occurred by input offset voltage is undesirable, it needs to use the capacitor (CIN).

REMARK 2 : The condenser between the pin3 and the GND (C11) is for reducing pop noise when the power ON/OFF switch (SW1) is set to ON/OFF.

APPLICATION INFORMATION AND APPLICATION METHOD

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=0Ω Gv=56.5dB(typ.)

When Rf=120Ω Gv=45dB(typ.)

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

2.Thermal shut-down circuit

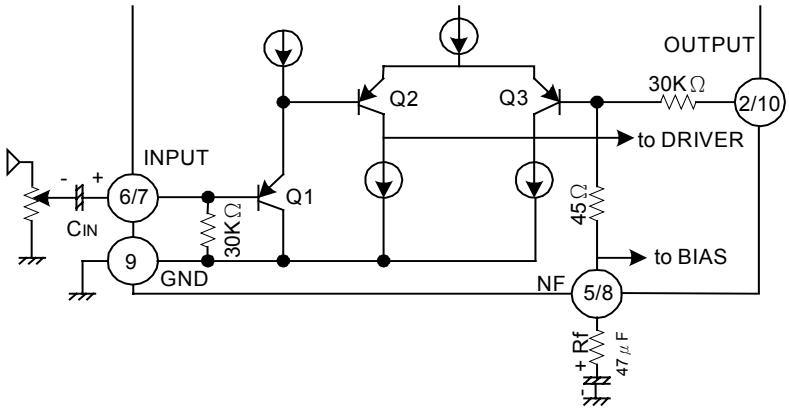
The thermal shut-down circuit is built is built in for the purpose of preventing the destruction of IC due to the abnormal temperature rise when the heat radiation is insufficient.

The operation temperature is set at radiation fin temperature 175℃

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

3.Input stage

The input circuit of this IC is as 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.

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

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 rmarkable influence on the oscillation,connect C10 to Vcc at the nearest possible position from powerGND.

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

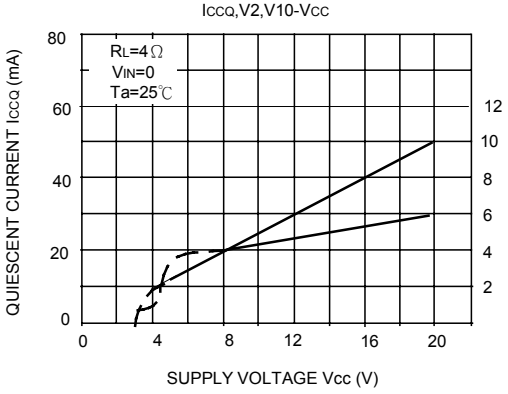
There is power on/off switch at (3) pin.However,output power is changed by(3) pin supply voltage when(3) pin supply voltage I not same(12) pin supply voltage,after referring to attached date,select(3) pin supply voltage.

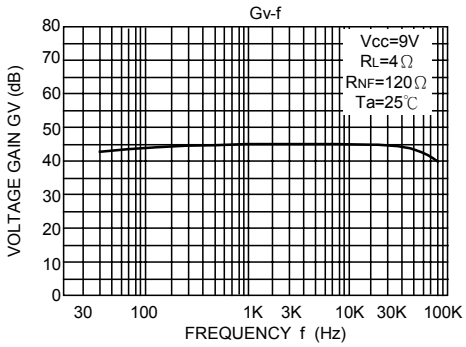
6.Input voltage

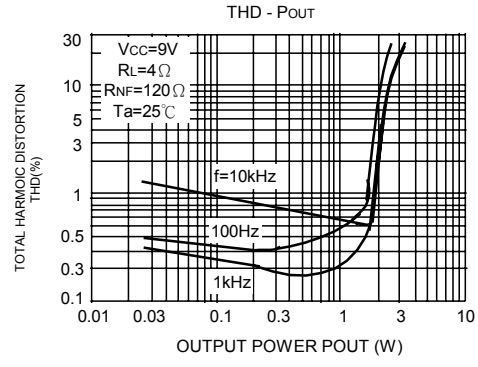
When the excessive signal is input,turning-up is produced in the clip aveform.The turning-up point is VIN=300mVrms(typ.):Vcc=9V,RL=4Ω,f=1kHz:Enough care must be taken for this phenomenon.

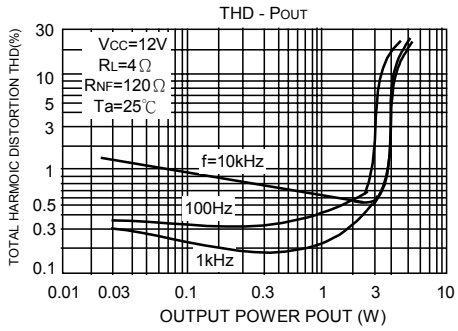
7. GND line

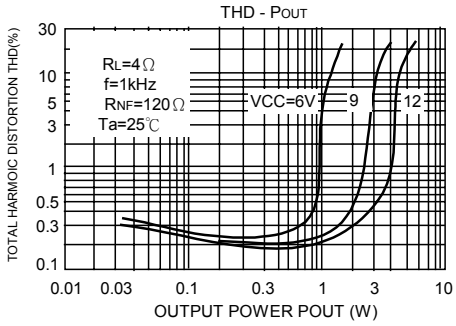
GND pin is not separated for pre-GND and for PW-GND.That is liable to cause distortion and cross talk worse.Before use this IC,please check it.

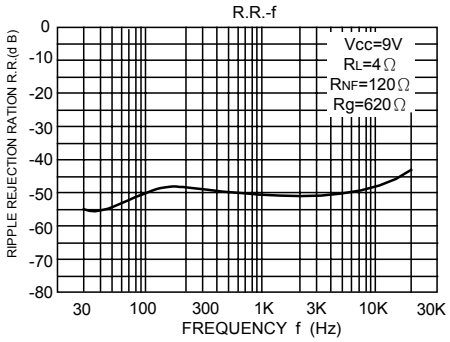


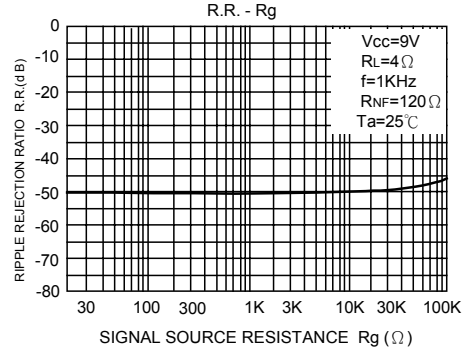


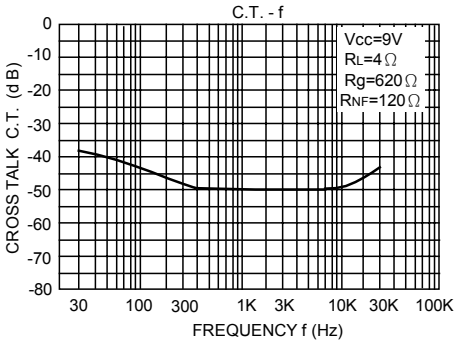


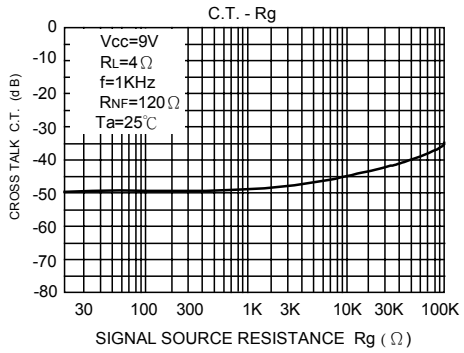


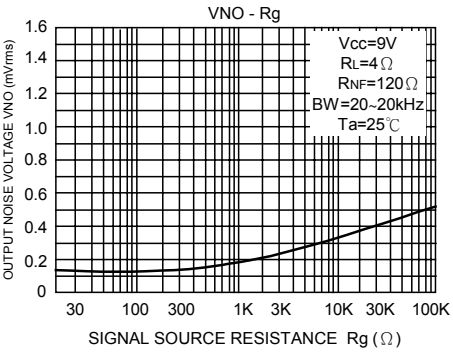

THD - POUT
TOTAL HARMOIC DISTORTION THD(%)
RL=4Ω
f=1kHz
RNF=120Ω
Ta=25℃
VCC=6V
9
12
OUTPUT POWER POUT (W)

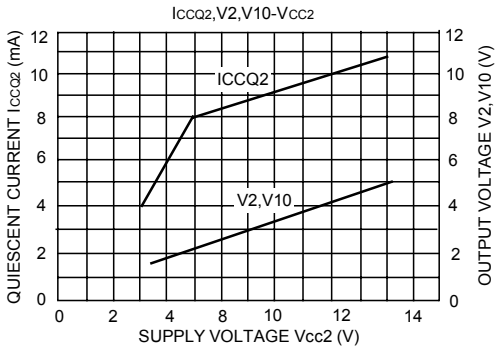

R.R.-f
RIPPLE REJECTION RATION R.R.(d B)
Vcc=9V
RL=4Ω
RNF=120Ω
Rg=620Ω
FREQUENCY f (Hz)

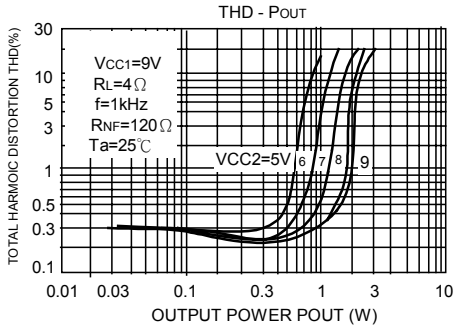

R.R. - Rg
RIPPLE REJECTION RATIO R.R.(d B)
Vcc=9V
RL=4Ω
f=1KHz
RNF=120Ω
Ta=25℃
SIGNAL SOURCE RESISTANCE Rg (Ω)

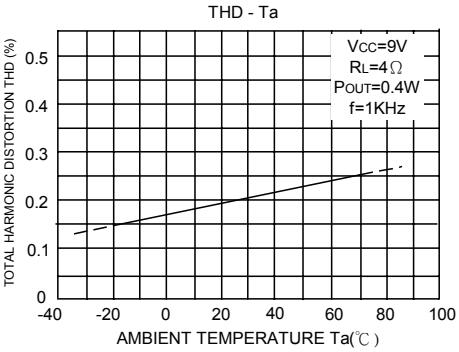

C.T. - f
CROSS TALK C.T. (d B)
Vcc=9V
RL=4Ω
Rg=620Ω
RNF=120Ω
FREQUENCY f (Hz)

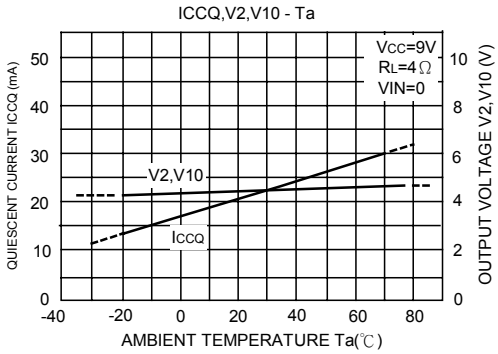

C.T. - Rg
CROSS TALK C.T. (d B)
Vcc=9V
RL=4Ω
f=1KHz
RNF=120Ω
Ta=25℃
SIGNAL SOURCE RESISTANCE Rg (Ω)

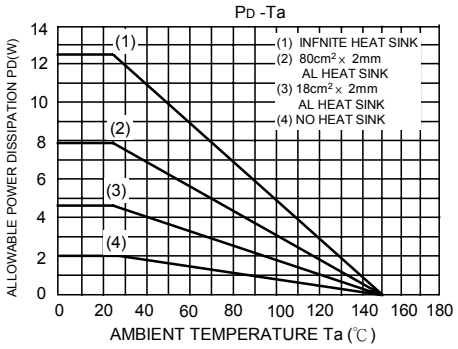

VNO - Rg
OUTPUT NOISE VOLTAGE VNO (mVrms)
Vcc=9V
RL=4Ω
RNF=120Ω
BW=20~20kHz
Ta=25℃
SIGNAL SOURCE RESISTANCE Rg (Ω)

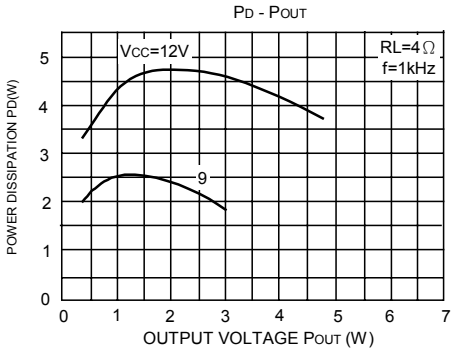

ICCQ2,V2,V10-VCC2
QUIESCENT CURRENT ICCQ2 (mA)
OUTPUT VOLTAGE V2,V10 (V)
ICCQ2
V2,V10
SUPPLY VOLTAGE Vcc2 (V)


THD - POUT
TOTAL HARMOIC DISTORTION THD(%)
VCC1=9V
RL=4Ω
f=1kHz
RNF=120Ω
Ta=25℃
VCC2=5V 6 7 8 9
OUTPUT POWER POUT (W)


THD - Ta
TOTAL HARMONIC DISTORTION THD (%)
VCC=9V
RL=4Ω
POUT=0.4W
f=1KHz
AMBIENT TEMPERATURE Ta(℃)


ICCQ,V2,V10 - Ta
QUIESCENT CURRENT ICCQ (mA)
OUTPUT VOLTAGE V2,V10 (V)
VCC=9V
RL=4Ω
VIN=0
V2,V10
ICCQ
AMBIENT TEMPERATURE Ta(℃)


PD -Ta
ALLOWABLE POWER DISSIPATION PD(W)
(1) INFNITE HEAT SINK
(2) 80cm2× 2mm AL HEAT SINK
(3) 18cm2× 2mm AL HEAT SINK
(4) NO HEAT SINK
AMBIENT TEMPERATURE Ta (℃)


PD - POUT
POWER DISSIPATION PD(W)
VCC=12V
RL=4Ω
f=1kHz
9
OUTPUT VOLTAGE POUT (W)