1W SINGLE AUDIO POWER AMPLIFIER

KIA6278P/S/F are suitable for the audio power amplifier of portable radio cassette.

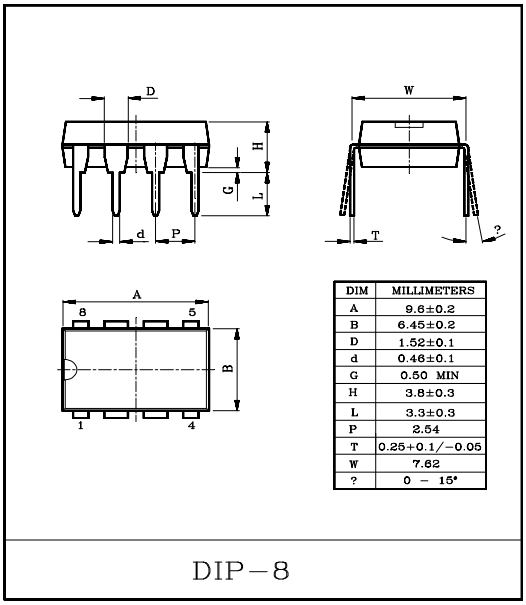
FEATURES

- Very few external parts counts (only three capacitor)
- Low Quiescent Current
  :I_{CCQ}=6.6mA(Typ.) (V_{CC}=6V)
- Wide operationg supply voltage range.
  :V_{CC}=2~10V
- Output Power
  :P_{OUT}=720mW(Typ.) (V_{CC}=6V, R_L=4Ω, THD=10%)
- Voltage Gain : G_V=40dB(Typ.)

MAXIMUM RATINGS (Ta=25℃)

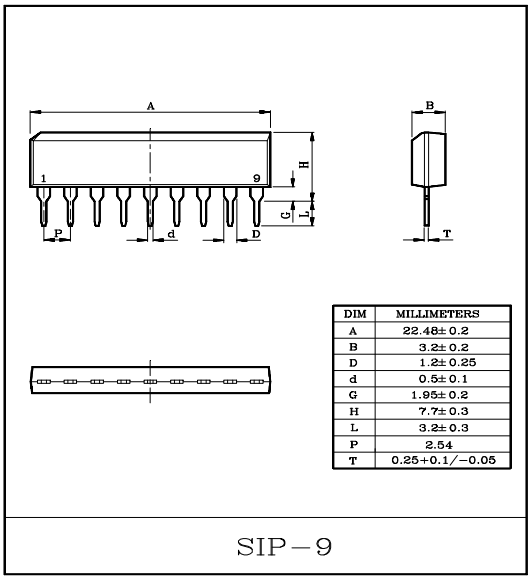
CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	14	V
Power Dissipation (Peakage Limitation) (Note)	KIA6278P	P_D	900	mW
	KIA6278S		950	
	KIA6278F		400	
Operating Temperature		T_{opr}	-25~75	℃
Storage Temperature		T_{stg}	-55~150	℃

Note : Derated above Ta=25℃ in the proportion of 7.2mW/℃.



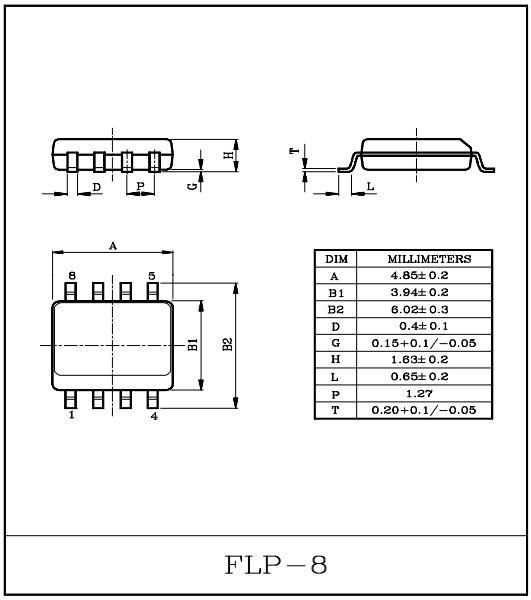
DIM	MILLIMETERS
A	9.6±0.2
B	6.45±0.2
D	1.52±0.1
d	0.46±0.1
G	0.50 MIN
H	3.8±0.3
L	3.3±0.3
P	2.54
T	0.25+0.1/−0.05
W	7.62
?	0 ~ 15°

DIP-8



DIM	MILLIMETERS
A	22.48±0.2
B	3.2±0.2
D	1.2±0.25
d	0.5±0.1
G	1.95±0.2
H	7.7±0.3
L	3.2±0.3
P	2.54
T	0.25+0.1/−0.05

SIP-9



DIM	MILLIMETERS
A	4.85±0.2
B1	3.94±0.2
B2	6.02±0.3
D	0.4±0.1
G	0.15+0.1/−0.05
H	1.63±0.2
L	0.65±0.2
P	1.27
T	0.20+0.1/−0.05

FLP-8

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, Vcc=6V, f=1kHz, Rg=600Ω, R_L=4Ω, Ta=25℃)

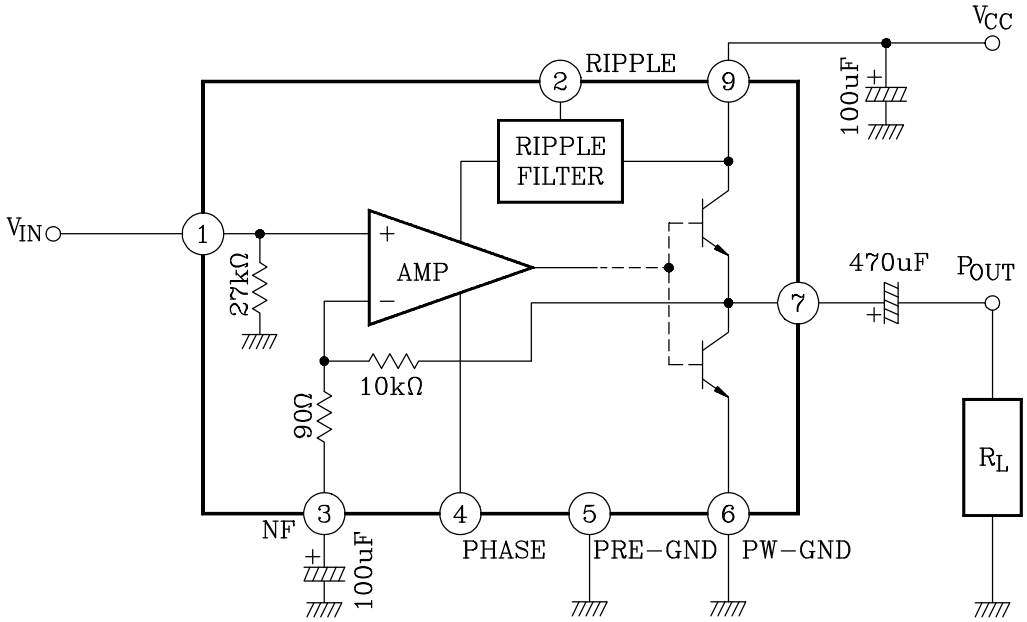
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}	-	V_{CC}=3V, V_{IN}=0V	-	5.5	-	mA
			V_{CC}=6V, V_{IN}=0V	-	6.6	15	
			V_{CC}=9V, V_{IN}=0V	-	7.5	18	
Output Power	P_{OUT}	-	V_{CC}=3V, R_L=4Ω, THD=10%	-	120	-	mW
			V_{CC}=6V, R_L=4Ω, THD=10%	500	720	-	
			V_{CC}=6V, R_L=8Ω, THD=10%	300	450	-	
			V_{CC}=9V, R_L=8Ω, THD=10%	800	1100	-	
			V_{CC}=9V, R_L=16Ω, THD=10%	450	610	-	
Total Harmonic Distortion	THD	-	P_{OUT}=100mW	-	0.3	1.0	%
Voltage Gain	G_V	-	V_{IN}=0.5mV_{rms}	37	40	43	dB
Output Noise Voltage	V_{NO}	-	Rg=10kΩ, BW=20Hz～20kHz	-	0.2	0.5	mV_{rms}
Ripple Rejection Ratio	R.R.	-	f_{RIP}=100Hz, V_{RIP}=0.3V_{rms} Without C_{RIP}	-	25	-	dB
Input Resistance	R_{IN}	-		-	27	-	kΩ

TYPICAL VOLTAGE OF EACH TERMINAL (KIA6278S)

(V_{CC}=6V, Ta=25℃, by test circuit) (unit:V)

TERMINAL NO.	1	2	3	4	5	6	7	8	9
DC Voltage	0	2.40	0.62	0.64	0	0	2.61	NC	6.0

TEST CIRCUIT & BLOCK DIAGRAM



Note : The V_{CC} of KIA6278S is pin ⑨.
The V_{CC} of KIA6278P/F are pin ⑧.

PRECAUTION FOR USE AND APPLICATION

1) Input Stage

The input stage of power amplifier (Equivalent circuit) is comprised of a PNP differential pair (Q2 and Q3) preceded by a PNP emitter follower (Q1) which allows DC referencing of the source signal to ground.
This eliminates the need for an input coupling capacitor. However, in case the brush noise of volume becomes a problem, provide serially a coupling capacitor to the input side.

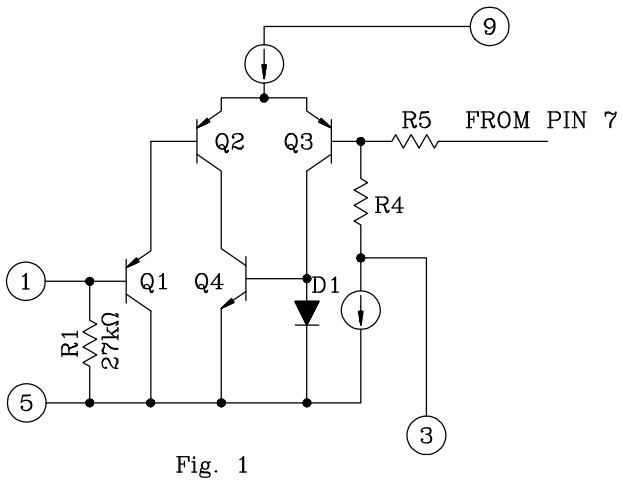


Fig. 1

2) Adjustment of Voltage Gain

The voltage gain is fixed at G_V=40dB by the resistors (R4 and R5) in IC, however, its reduction is possible through adding Rf as shown in Fig 2. In this case, the voltage gain is obtained by the following Equation.

$$G_V = 20 \log \frac{R5 + R4 + Rf}{R4 + Rf}$$

It is recommended to use this IC with the voltage gain of G_V=28dB or over.

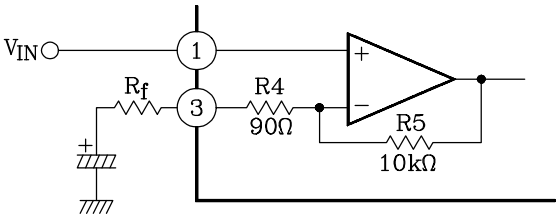


Fig. 2

3) Ripple Rejection Ratio

Adding C_{RIP}, to terminasl 2 as shown Fig 3, the Ripple Rejection ratio is improved from -25dB Typ. to -45dB Typ.. (in case of C_{RIP}=100μF). Refer to R.R. vs. f characteristics.

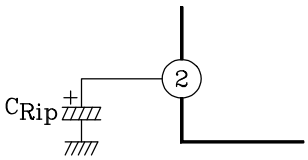
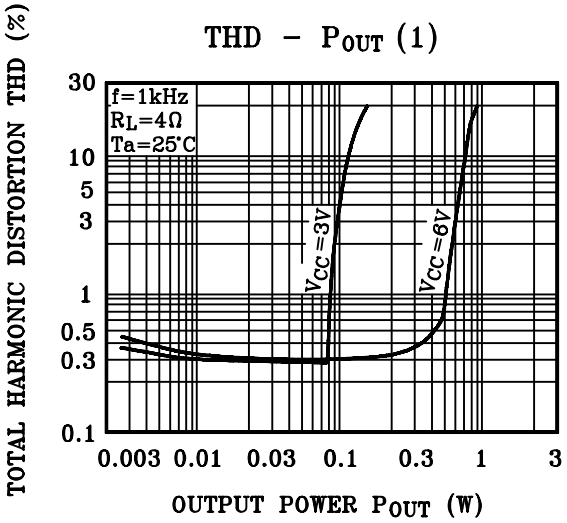
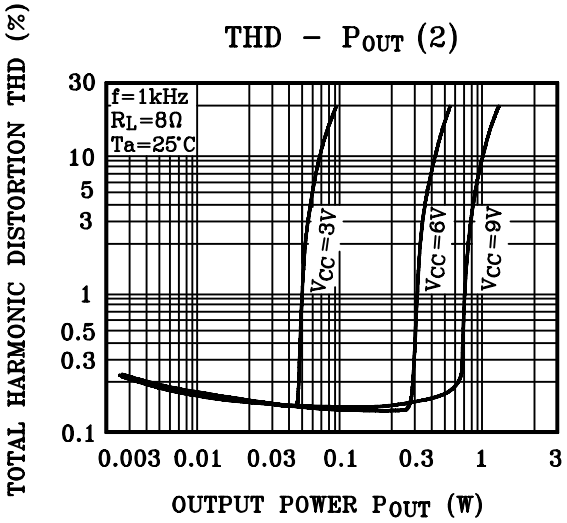


Fig. 3

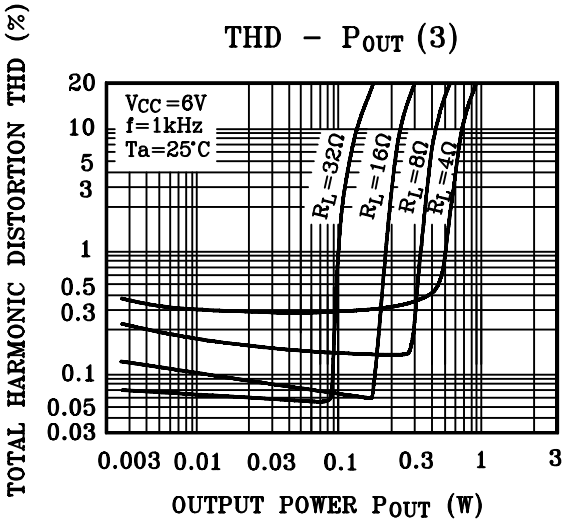
THD – P_{OUT} (1)



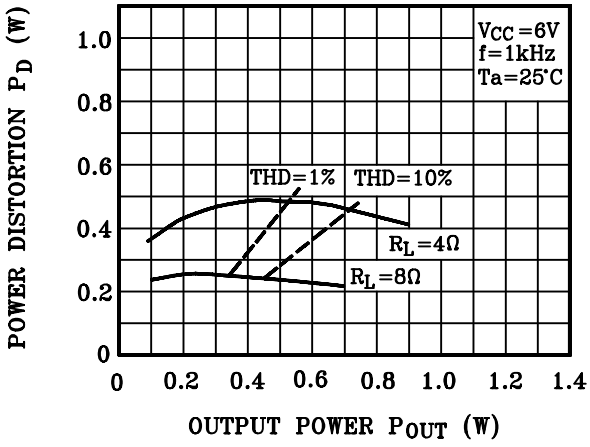
THD – P_{OUT} (2)



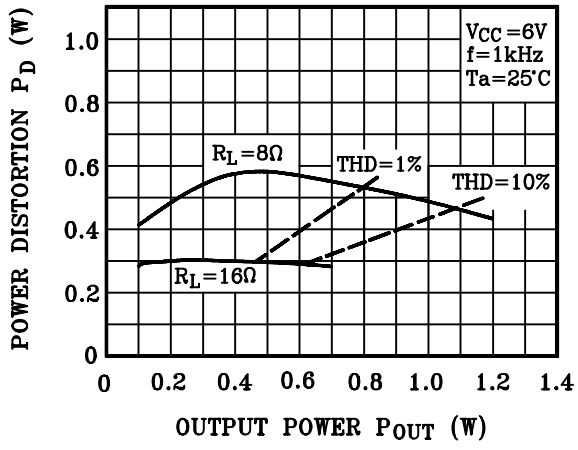
THD – P_{OUT} (3)



P_D – P_{OUT} (1)



P_D – P_{OUT} (2)



P_D MAX – V_{CC}