

6427525 N E C ELECTRONICS INC 05E 22678 D
BIPOLAR ANALOG INTEGRATED CIRCUIT

μPC1212C

T-74-05-01

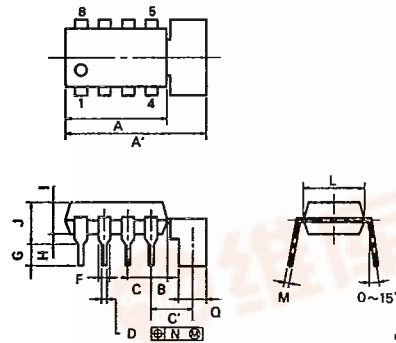
AUDIO POWER AMPLIFIER

DESCRIPTION

The μPC1212C is a silicon monolithic integrated circuit designed for an audio power amplifier used in a portable radio receiver or a portable cassette tape recorder which works at 6-volt power supply.

The μPC1212C is encapsulated in an 8-pin dual in line plastic package with a tab.

8 PIN PLASTIC DIP WITH TAB (300 mil)



PACT-100-3008

ITEM	MILLIMETERS	INCHES
A	12.70 MAX.	0.500 MAX.
A'	14.50 MAX.	0.571 MAX.
B	2.54 MAX.	0.100 MAX.
C	2.54 [T.P.]	0.100 [T.P.]
C'	3.65	0.144
D	0.50 ^{+0.10}	0.020 ^{+0.004}
F	1.1 MIN.	0.043 MIN.
G	3.5 ^{+0.3}	0.138 ^{+0.012}
H	0.51 MIN.	0.020 MIN.
I	4.31 MAX.	0.170 MAX.
J	5.08 MAX.	0.200 MAX.
L	6.4	0.252
M	0.30 ^{+0.08}	0.012 ^{+0.003}
N	0.25	0.01
Q	2.62 ^{+0.60}	0.103 ^{+0.020}

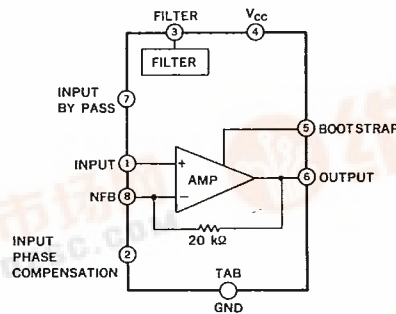
NOTE

1) Each lead centerline is located within 0.25 mm (0.01 inch) of its true position (T.P.) at maximum material condition.

FEATURES

- High output power. $P_o = 1$ W (TYP.) at $V_{CC} = 6$ V, $R_L = 4 \Omega$, T.H.D. = 10 %
- Wide operating voltage range. $V_{CC} = 3.5$ to 6 to 9 V
- High ripple rejection ratio. R.R.R. = 55 dB (TYP.)
- Soft clipping waveform.
- Have a muting circuit so that no shock noise at power supply switch on and off.
- Have a terminal to reject interference noise in strong electric field. (pin 2)

BLOCK DIAGRAM



CONNECTION DIAGRAM

No.	CONNECTION	No.	CONNECTION
1	INPUT	5	BOOTSTRAP
2		6	OUTPUT
3	FILTER	7	FILTER
4	VCC	8	N. F. B.
TAB	GND		



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ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Supply Voltage	V _{CC1}	(No Signal)	11	V
Supply Voltage	V _{CC2}	(Operating)	9	V
Allowable Power Dissipation	P _d		2.4	W
Operating Temperature	T _{opt}		-20 to 70	°C
Storage Temperature	T _{stg}		-40 to 150	°C

* 50 x 50 x 0.035 mm³ copper heat sink on P.C.B.

RECOMMENDED CONDITIONS (T_a = 25 °C)

Supply Voltage	V _{CC} = 3.5 to 6 to 9 V
Load Impedance	R _L = 4 Ω

ELECTRIC CHARACTERISTICS (T_a = 25 °C)

(Refer to the test circuits V_{CC}=6 V, R_L=4 Ω, 50 X 50 X 0.035 mm³ copper heat sink on P.C.B. unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Quiescent Circuit Current	I _{CC}	8	15	25	mA	No Signal
Open Loop Voltage Gain	A _{VO}	55	65		dB	P _O =0.25 W, f=1 kHz
Voltage Gain (Closed Loop)	A _V	41	45	48	dB	R _f =100 Ω f=1 kHz
			34			R _f =360 Ω f=1 kHz
Output Power	P _O	0.7	2.4		W	T.H.D.=10 % f=1 kHz, R _f =100 Ω
			1.3			V _{CC} =9 V, R _L =4 Ω
			1.0			V _{CC} =9 V, R _L =8 Ω
			0.54			V _{CC} =6 V, R _L =4 Ω
			0.41			V _{CC} =6 V, R _L =8 Ω
			0.22			V _{CC} =4 V, R _L =4 Ω V _{CC} =4 V, R _L =8 Ω
Input Sensitivity	V _{i(rms)}		16.4		mV	P _O =1 W R _L =4 Ω, f=1 kHz
			47.4			R _f =100 Ω (A _V =45 dB) R _f =360 Ω (A _V =34 dB)
Input Sensitivity	V _{i(rms)}		2.5		mV	P _O =50 mW R _L =4 Ω, f=1 kHz
			8.9			R _f =100 Ω (A _V =45 dB) R _f =360 Ω (A _V =34 dB)
Total Harmonic Distortion	T.H.D.		0.4	1.5	%	P _O =0.25 W
Output Noise Voltage	NL		0.2	0.8	mV _{r.m.s.}	R _G =0
Supply Voltage Rejection Ratio	S.V.R.	40	55		dB	R _G =0, f _{ripple} =100 Hz V _{ripple} =0.3 V _{r.m.s.}
Input Impedance	R _i	10	20		kΩ	

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NOTE: In case that only a TYP. value is specified, this specification is for helping to design.

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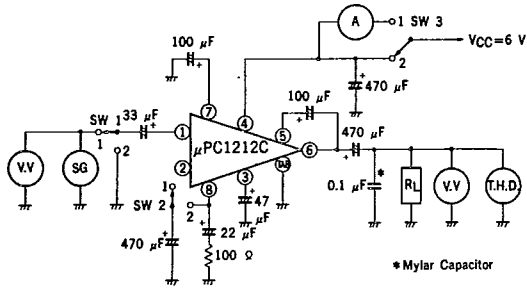
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TEST CIRCUIT

Fig. 1 TEST CIRCUIT

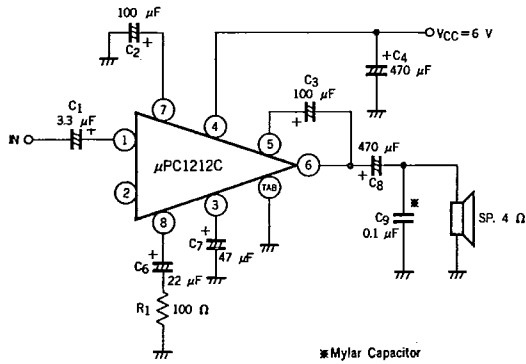


SWITCH POSITION

ITEM	SWITCH	SWITCH		
		SW1	SW2	SW3
Circuit Current	I_{CC}	.2	1	1
Open Loop Voltage Gain	A_{VO}	1	2	2
Voltage Gain	A_V	1	1	2
Output Power	P_O	1	1	2
Total Harmonic Distortion	T.H.D.	1	1	2
Output Noise Voltage	NL	2	1	2

TYPICAL APPLICATION

Fig. 2 SINGLE OPERATION



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Fig. 3 BTL OPERATION

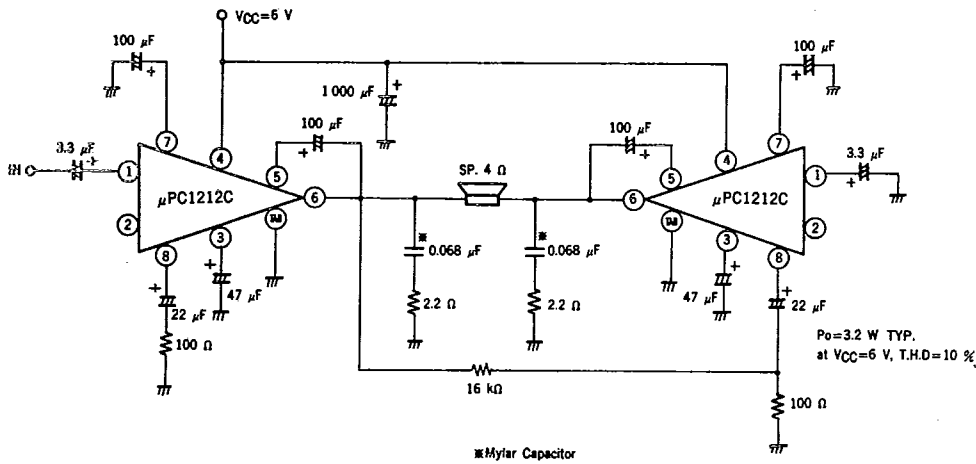
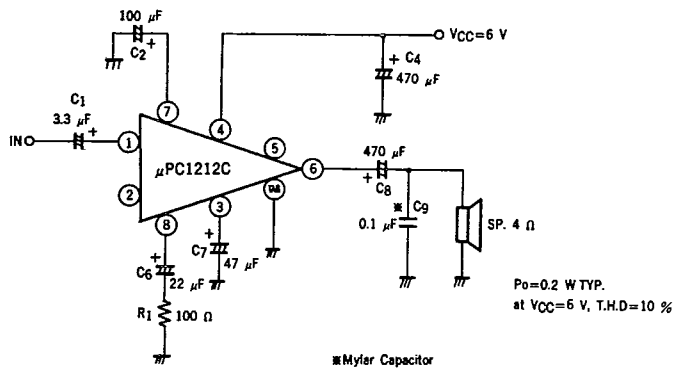


Fig. 4 SINGLE OPERATION WITHOUT BOOTSTRAP



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NOTE FOR USE

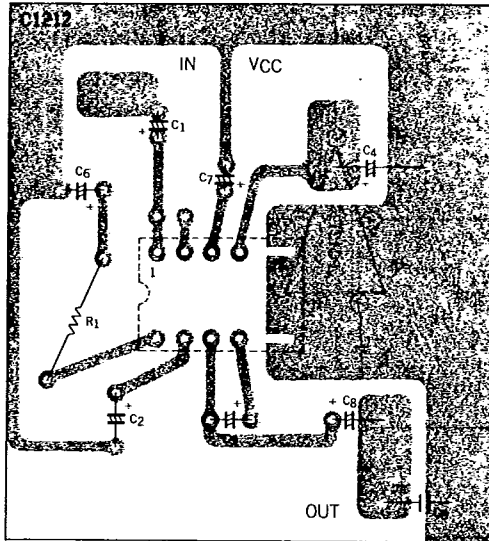
- (1) Capacitor C₉ is for preventing the parasitic oscillation. A mylar capacitor is recommended for this position.
- (2) The ground side of C₄, C₉ and the loud speaker should be attached at the place of the copper foil close to the tab of μ PC1212C.
- (3) Interference noise rejection in a strong electric field can be achieved by adding a capacitor (about 1 000 pF) between pin 1 and pin 2.

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P.C. BOARD PATTERN (COPPER SIDE)

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TYPICAL CHARACTERISTICS (T_a = 25 °C)

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Fig. 6 OUTPUT POWER vs. SUPPLY VOLTAGE

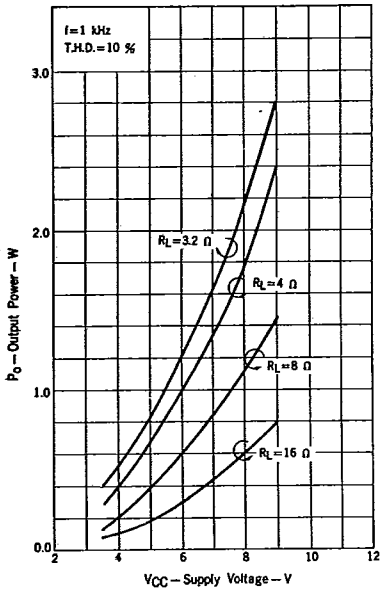


Fig. 7 TOTAL HARMONIC DISTORTION vs. OUTPUT POWER

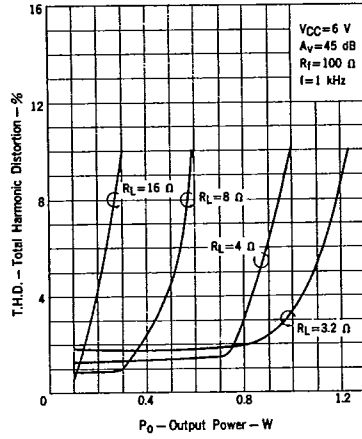
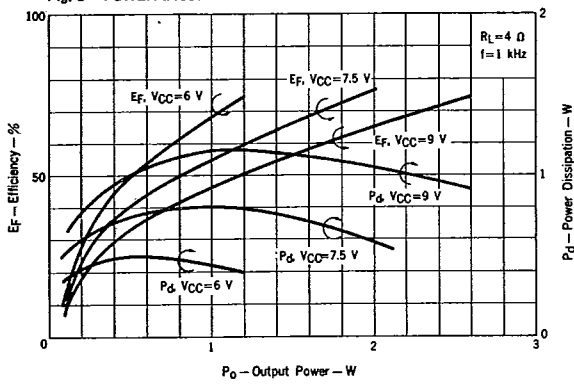


Fig. 8 POWER DISSIPATION AND EFFICIENCY vs. OUTPUT POWER



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Fig. 9 INPUT SENSITIVITY vs. R_f

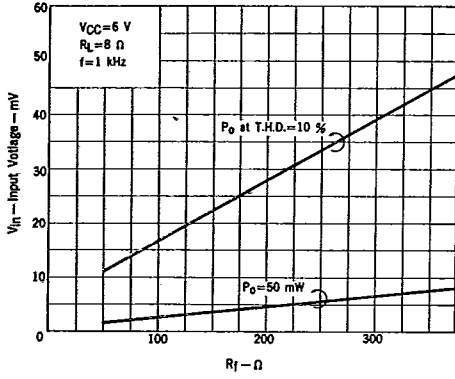


Fig. 10 VOLTAGE GAIN (CLOSED LOOP) vs. R_f

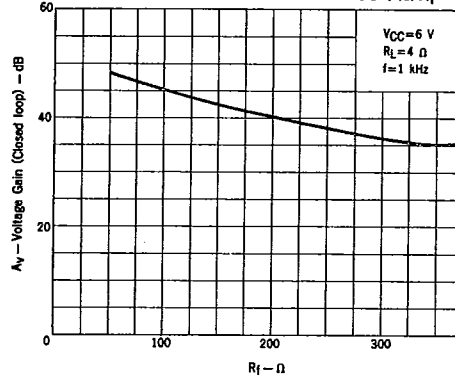


Fig. 11 QUIESCENT OUTPUT VOLTAGE AT PIN 6 vs. SUPPLY VOLTAGE

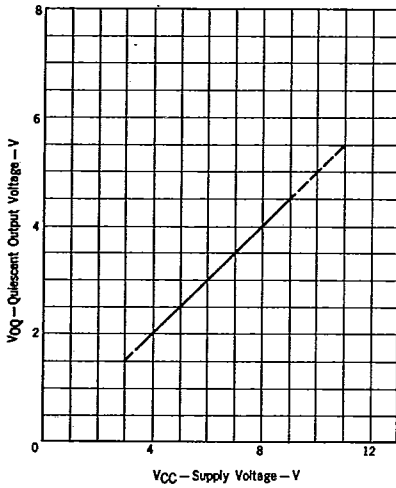
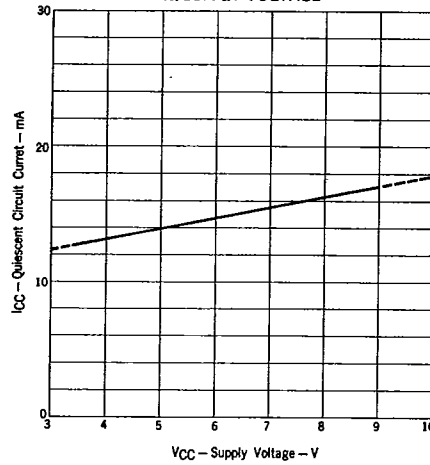


Fig. 12 QUIESCENT CIRCUIT CURRENT vs. SUPPLY VOLTAGE



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Fig. 13 OPEN LOOP VOLTAGE GAIN, VOLTAGE GAIN vs. FREQUENCY

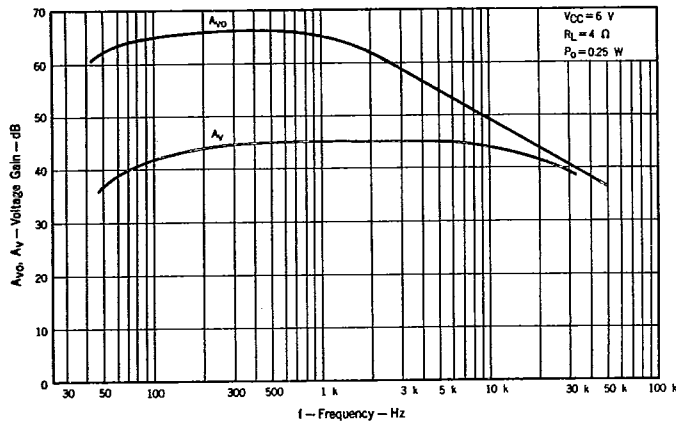


Fig. 14 TOTAL HARMONIC DISTORTION vs. FREQUENCY

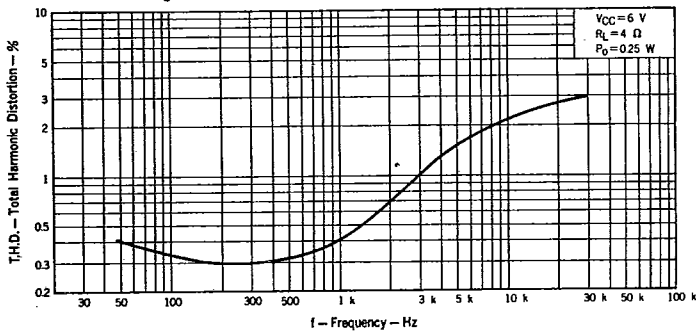
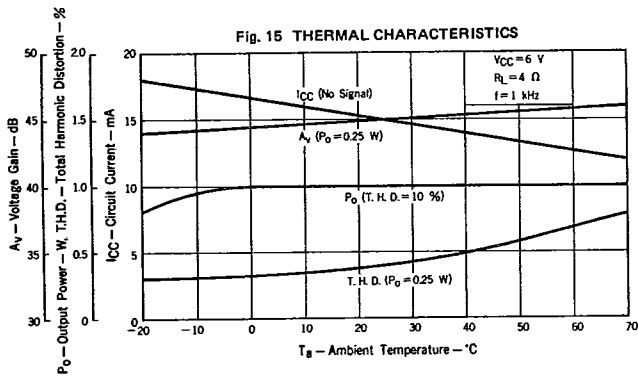


Fig. 15 THERMAL CHARACTERISTICS



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Fig. 16 OPEN LOOP VOLTAGE GAIN, VOLTAGE GAIN vs. SUPPLY VOLTAGE

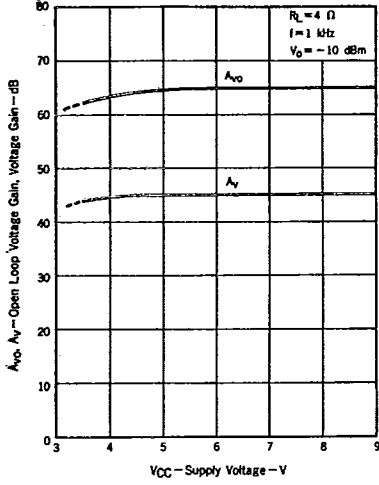


Fig. 17 TOTAL HARMONIC DISTORTION vs. SUPPLY VOLTAGE

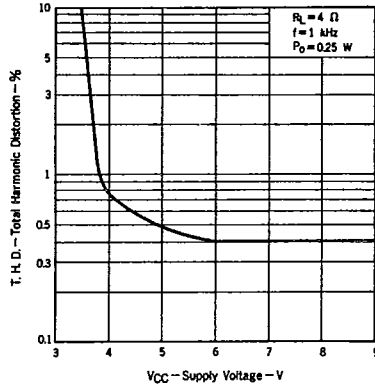
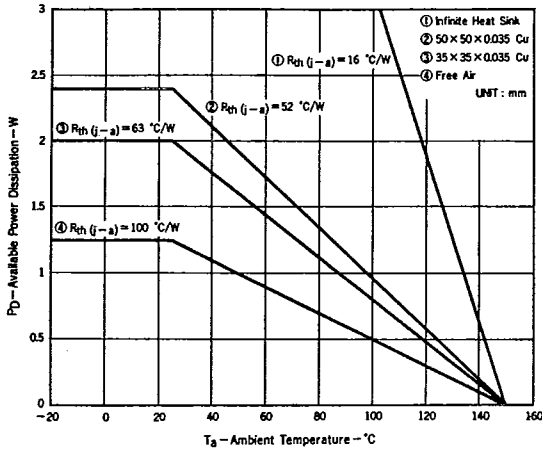


Fig. 18 AVAILABLE POWER DISSIPATION vs. AMBIENT TEMPERATURE



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