BIPOLAR ANALOG INTEGRATED CIRCUIT

μPC1277H

4.2 W DUAL AUDIO POWER AMPLIFIER

DESCRIPTION

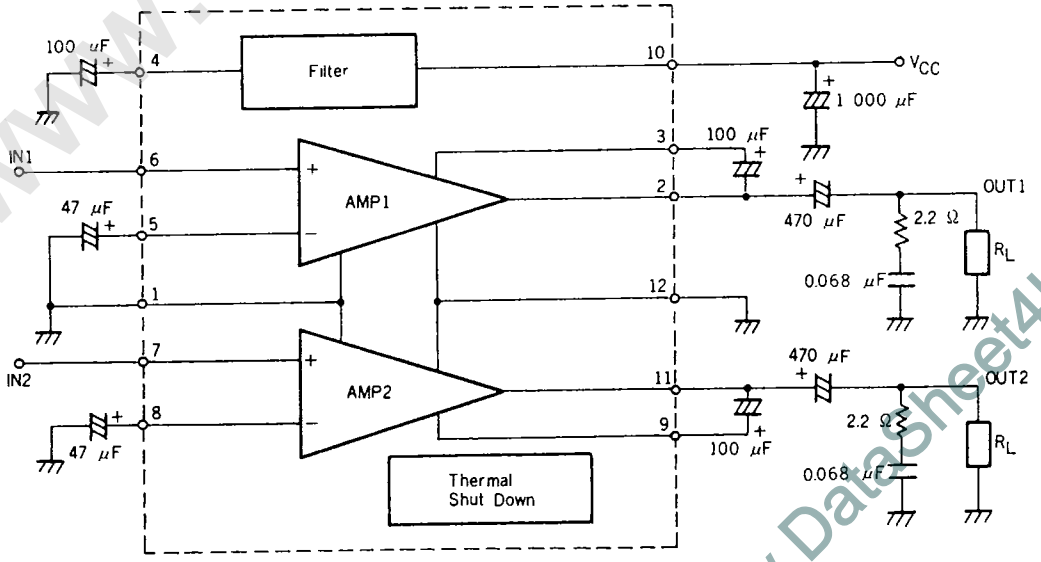
The μPC1277H is a dual audio power amplifier designed for a stereo radio cassette and in a 12-pin power single in line plastic package.

The μPC1277H has two audio power amplifiers and each of the two provides 4.2 W output power at 12 V/4 ohms.

FEATURES

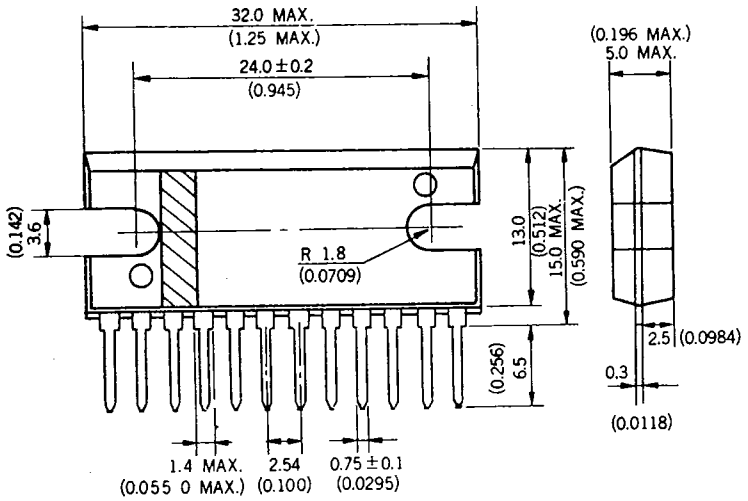
- High output power.
  - 4.2 W/ch (TYP.) V_{CC} = 12 V, R_L = 4 ohms
  - 5 W/ch (TYP.) V_{CC} = 12 V, R_L = 3 ohms
  - 2.2 W/ch (TYP.) V_{CC} = 9 V, R_L = 4 ohms
  - 3 W/ch (TYP.) V_{CC} = 9 V, R_L = 3 ohms
- Wide operating voltage range. V_{CC} = 5 to 16 V
- No shock noise at power supply switch on and off.
- Soft clipping wave form.
- High ripple rejection ratio. R.R.R. = 50 dB (TYP.)
- Few external components. 12 parts
- Thermal shut'down circuit is built in.
- A 12-pin power SIP can easily be mounted on PCB and a external heat sink can easily be attached.

BLOCK DIAGRAM



μPC1277H

PACKAGE DIMENSIONS in millimeters (inches)



CONNECTION DIAGRAM

Pin No.	Connection
1	GND (Input)
2	Output 1
3	Boot Strap 1
4	Filter
5	NFB 1
6	Input 1
7	Input 2
8	NFB 2
9	Boot Strap 2
10	V_{CC}
11	Output 2
12	GND (Output)

ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C)

Supply Voltage (No Signal)	V_{CC1}	20	V
Supply Voltage (Operating)	V_{CC2}	16	V
Allowable Power Dissipation	P_D	13*	W
Operating Temperature	T_{opt}	−20 to +75	°C
Storage Temperature	T_{stg}	−40 to +150	°C

* 100 x 100 x 2 mm³ Al heat sink

RECOMMENDED OPERATING CONDITIONS (Ta = 25 °C)

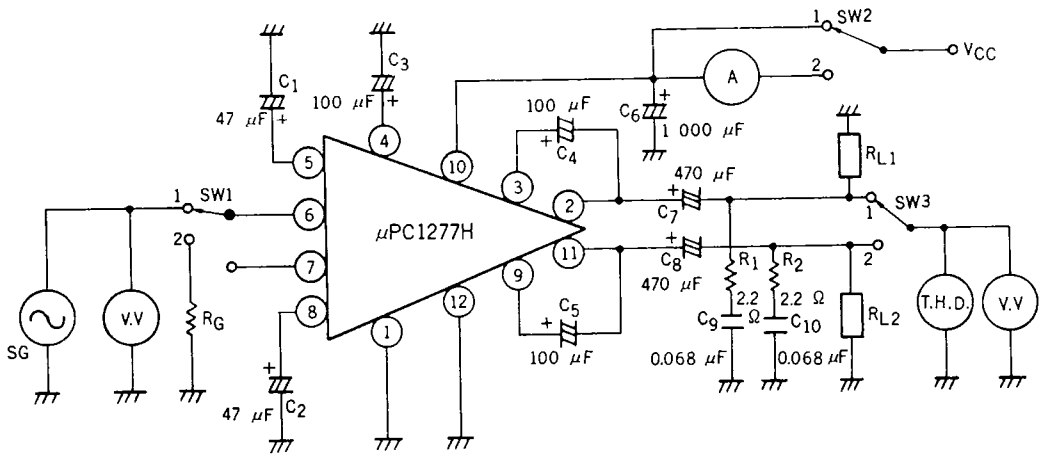
Supply Voltage	V_{CC}	5 to 12 to 16	V
Load Impedance	R_L	3 to 4 to 8	ohms

ELECTRICAL CHARACTERISTICS

(V_{CC} = 12 V, R_L = 4 ohm, f = 1 kHz, Ta = 25 °C, 100 x 100 x 2 mm Al Panel Heat Sink)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Circuit Current	I_{CC}	20	45	90	mA	No Signal
Voltage Gain	A_V	42	45	48	dB	P_o = 1 W
Output Power	P_{o1}	1.8	2.2		W	T.H.D. = 10 % V_{CC} = 9 V, R_L = 4 ohm
	P_{o2}	2.5	3		W	T.H.D. = 10 % V_{CC} = 9 V, R_L = 3 ohm
	P_{o3}	3.2	4.2		W	T.H.D. = 10 % V_{CC} = 12 V, R_L = 4 ohm
	P_{o4}	4	5		W	T.H.D. = 10 % V_{CC} = 12 V, R_L = 3 ohm
Total Harmonic Distortion	T.H.D.		0.2	1	%	P_o = 1 W
Output Noise Voltage	NL		0.6	2	mVr.m.s.	R_G = 10 kohm
Cross Talk	C.T.	45	55		dB	P_o = 1 W other ch. R_G = 10 kohm
Channel Balance	Ch. B.	−2	0	+2	dB	P_o = 1 W
Ripple Rejection	R.R.	40	50		dB	R_G = 0, f = 100 Hz v = 0.3 Vr.m.s.
Input Impedance	Z_{in}	30	50		kohm	

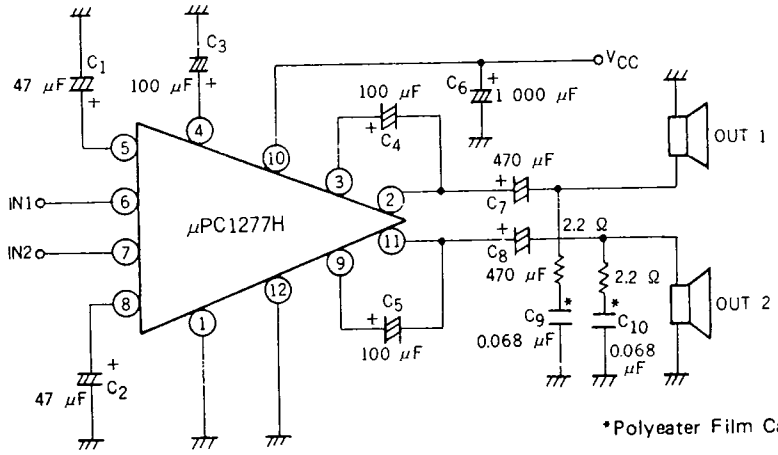
TEST CIRCUIT



SWITCH POSITION (AMP 1 : TEST)

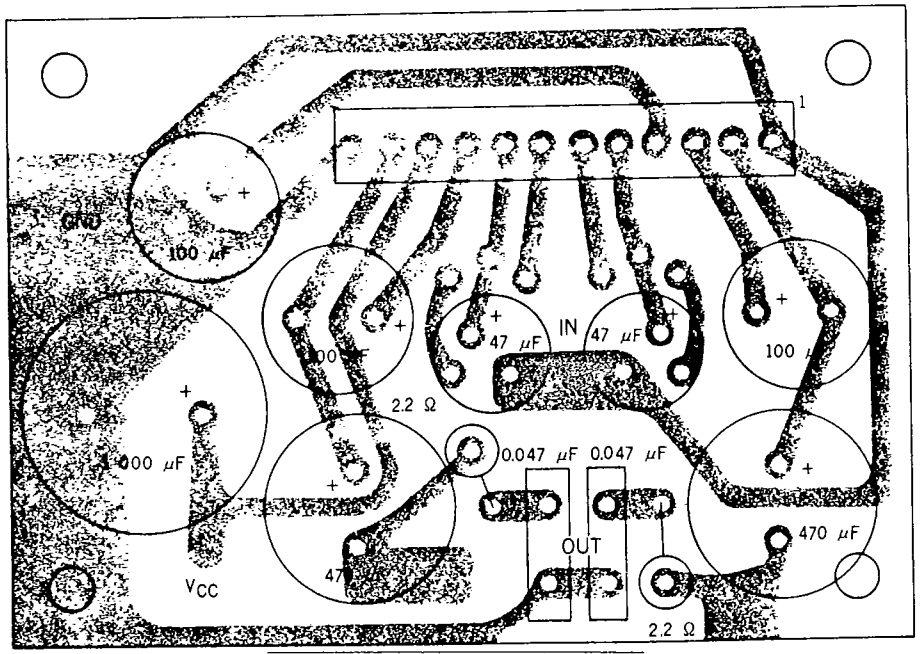
ITEM	SYMBOL	SW 1	SW 2	SW 3
Circuit Current	I_{CC}	2	2	1
Voltage Gain	A_V	1	1	1
Output Power	P_O	1	1	1
Total Harmonic Distortion	T.H.D.	1	1	1
Output Noise Voltage	NL	2	1	1

TYPICAL APPLICATION



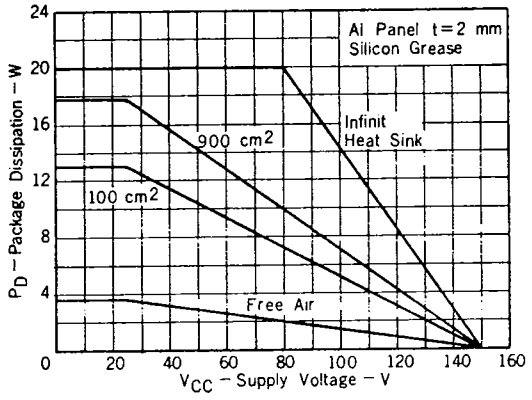
*Polyeater Film Capacitor

TYPICAL PCB (COPPER SIDE)

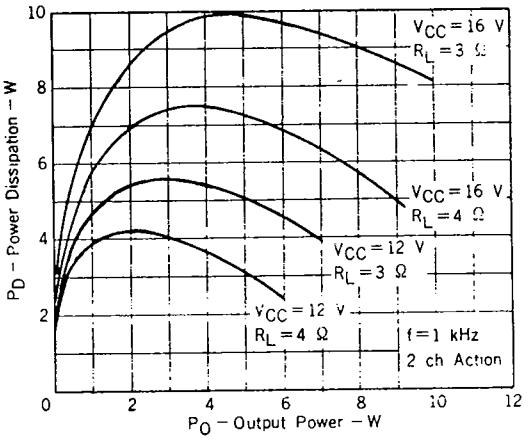


TYPICAL CHARACTERISTICS (Ta = 25 °C)

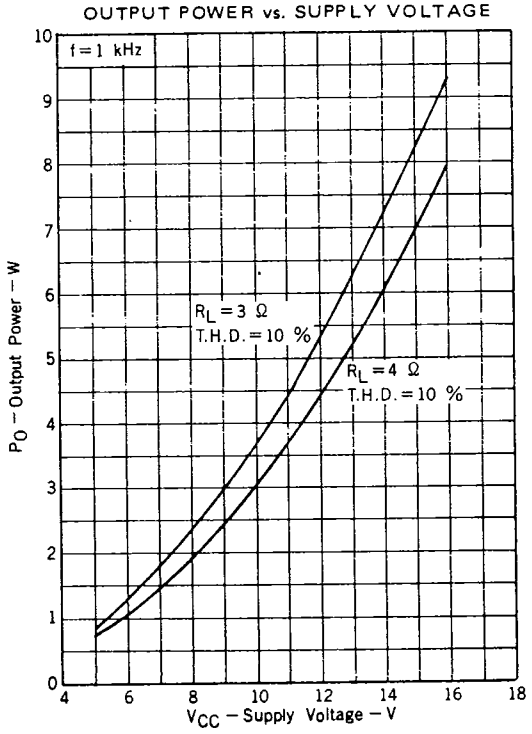
PACKAGE DISSIPATION vs. AMBIENT TEMPERATURE



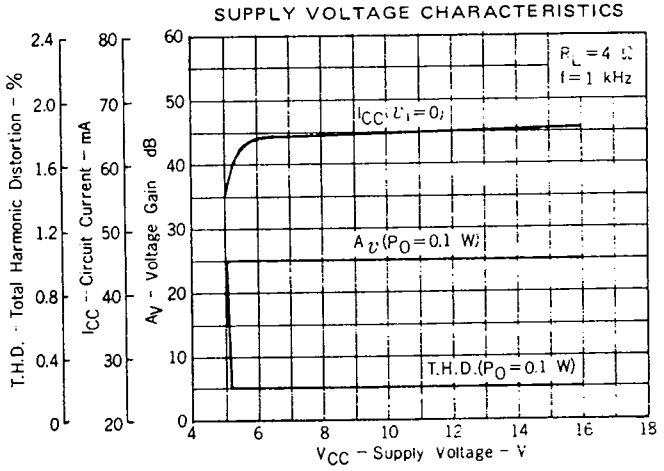
POWER DISSIPATION vs. OUTPUT POWER



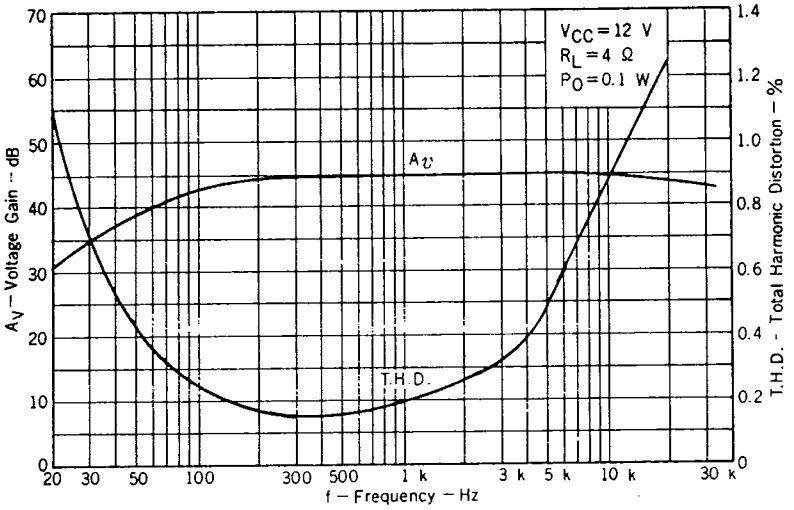
OUTPUT POWER vs. SUPPLY VOLTAGE



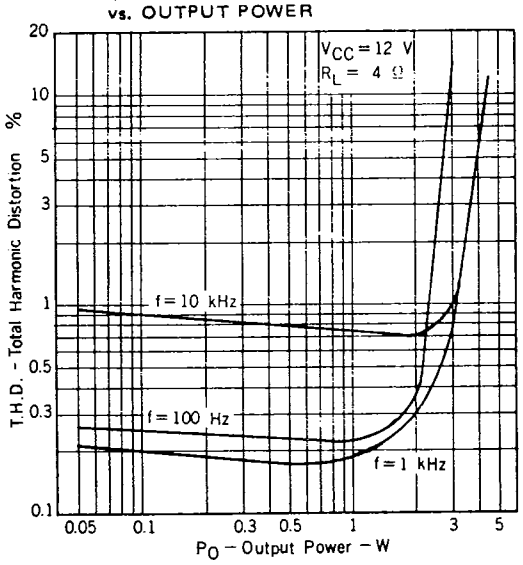
SUPPLY VOLTAGE CHARACTERISTICS



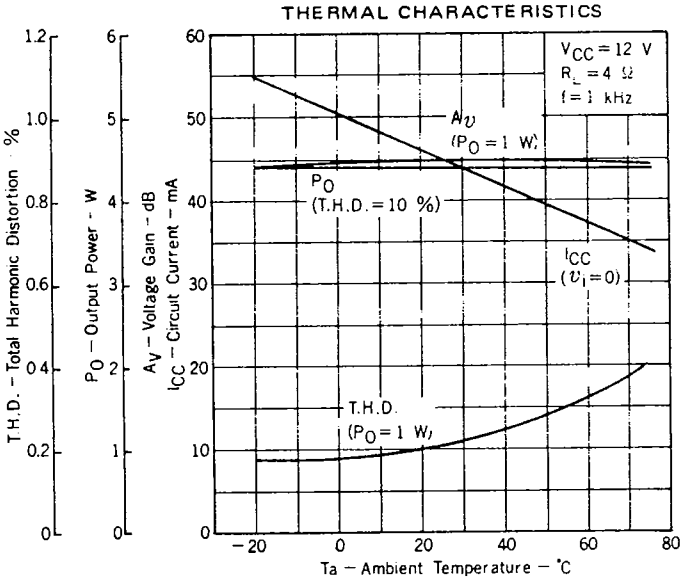
VOLTAGE GAIN, TOTAL HARMONIC DISTORTION vs. FREQUENCY



TOTAL HARMONIC DISTORTION vs. OUTPUT POWER



THERMAL CHARACTERISTICS



Note 1) An inverse connection of the supply voltage pin and the GND pin or a connection of the output pin and either the supply voltage line or GND sometimes causes μPC1277H to break down immediately. Handle it with care.

Note 2) GND pins #1 (input side GND) and #12 (output side GND) are separated inside of the IC, therefore connect them on a PCB. Make the input and output common impedance least when designing a PCB.

Note 3) Recommend a polyeater Film capacitor as a phase compasated capacitance (0.068 μF). Choose larger capacity in case that a long power supply line on a PCB causes the IC a parasitic oscillation.