BIPOLAR ANALOG INTEGRATED CIRCUIT

μPC1270H

T-74-05-01

30-50 W POWER AMPLIFIER DRIVER

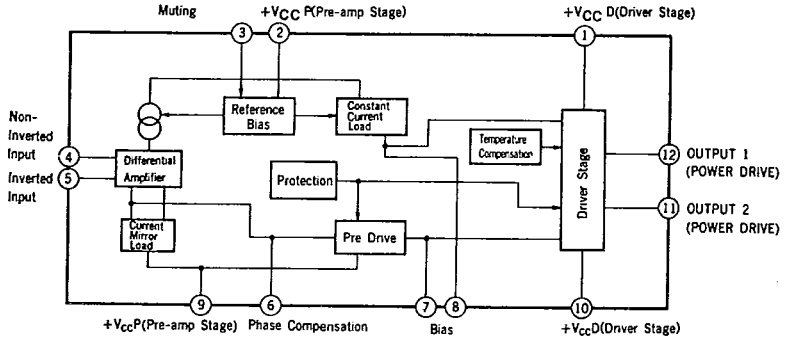
DESCRIPTION

μPC1270H is designed for use with a Hi-Fi power amplifier driver. It is composed of a differential amplifier, a predriver, a driver and protection circuit.
It is in a 12 pin small power SIP. (Single In Line)

FEATURES

- Excellent Low Distortion.
  0.002 % TYP. (V_{CC} = ±36 V, f = 1 kHz, A_v = 30 dB, P_O = 30 W, R_L = 8 Ohms)
  0.006 % TYP. (V_{CC} = ±36 V, f = 20 kHz, A_v = 30 dB, P_O = 30 W, R_L = 8 Ohms)
- Wide Frequency Band.
  900 kHz TYP. (-3 dB)
- Wide Power Band Width.
  90 kHz TYP. (P_O = 25 W, T.H.D. = 0.1 %)
- Excellent Low POP ON/OFF Noise.

BLOCK DIAGRAM



NOTE: The protection circuit is for this IC and cannot protect external Power Transistors. Thus, design a P_O Tr protection circuit besides.

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ABSOLUTE MAXMUM RATINGS (T_a = 25 °C)

Supply Voltage (Quiscent)	V_{CC1}	±50	V
Supply Voltage (Operational)	V_{CC2}	±45	V
Quiscent Circuit Current	$I_{CC\ (peak)}$	200	mA
Allowable Package Dissipation	P_D	4.1	W
Operational Temperature	T_{opt}	−20 to +75	°C
Storage Temperature	T_{stg}	−40 to +150	°C

RECOMMENDED OPERATING CONDITION

Supply Voltage (Operational)	V_{CC} = ±18 to ±36 V at MAX. Power Output
Input Bias Resistance	R_{IN} = 1 to 50 to 100 kohms
Power Transistor h_{FE}	h_{FE} = 50 at MAX. Power Output
Closed Loop Voltage Gain	A_V = 26 to 30 dB

ELECTRICAL CHARACTERISTICS (V_{CC} = ±36 V, A_V = 30 dB, Use Standard Test Circuit, T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Output Offset Voltage	V_{OFF}		±5	±100	mV	SEE TEST CIRCUIT 1
Quiscent Circuit Current	I_{CC}		20	40	mA	V_{IN} = 0
Maximum Output Voltage	V_{OM}	20	23		V	T.H.D. = 0.05 % f = 20 to 20 kHz
Open Loop Voltage Gain	A_{vo}	80	95		dB	V_o = 1.5 V, f = 1 kHz
Output Noise Voltage	V_{NO}		0.07	0.14	mV	R_G = 10 kohms
Power Band Width	P.B.W.		900		kHz	V_o = 1.5 V, −3dB
Supply Voltage Rejection Ratio	S.V.R.	55	70		dB	R_G = 2 kohms, f = 100 Hz
Output Offset Voltage (Mute)	$V_{OFF(Mute)}$			±50	mV	V_{CC}=±50 V, TEST CIRCUIT 7

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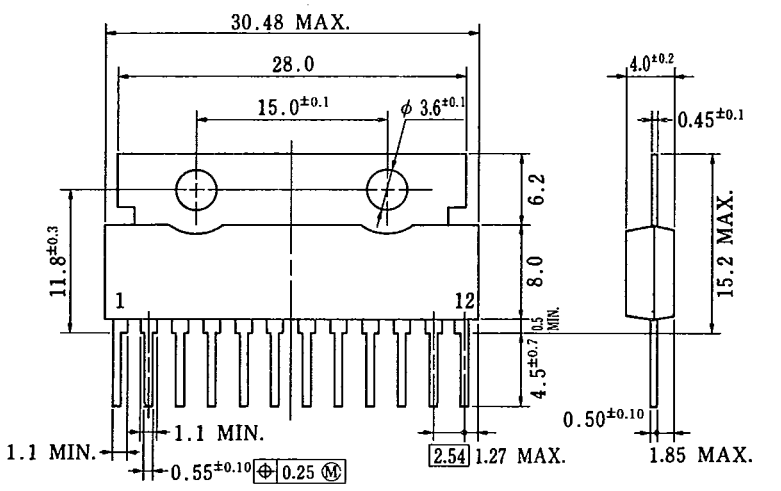
12 PIN SIP (Unit : mm)



P12HP-254B1

PIN CONNECTION DIAGRAM

PIN NO.	PIN CONNECTION
1	$+V_{CCD}$ (for Driver)
2	$+V_{CCP}$ (for Preamp)
3	MUTING
4	INPUT
5	NFB
6	PHASE COMP
7	BIAS
8	BIAS
9	$-V_{CCP}$ (for Preamp)
10	$-V_{CCD}$ (for Driver)
11	LOWER OUTPUT
12	UPPER OUTPUT

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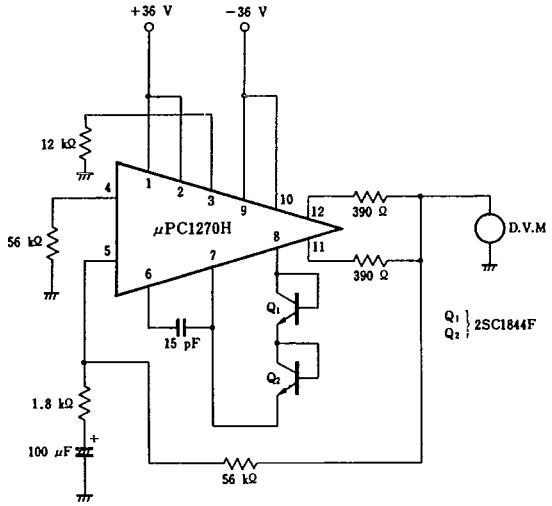
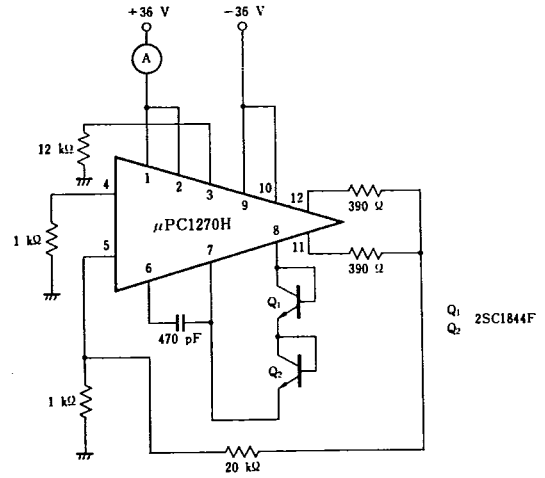
TEST CIRCUIT 1 (V_{OFF})



TEST CIRCUIT 2 (I_{CC})



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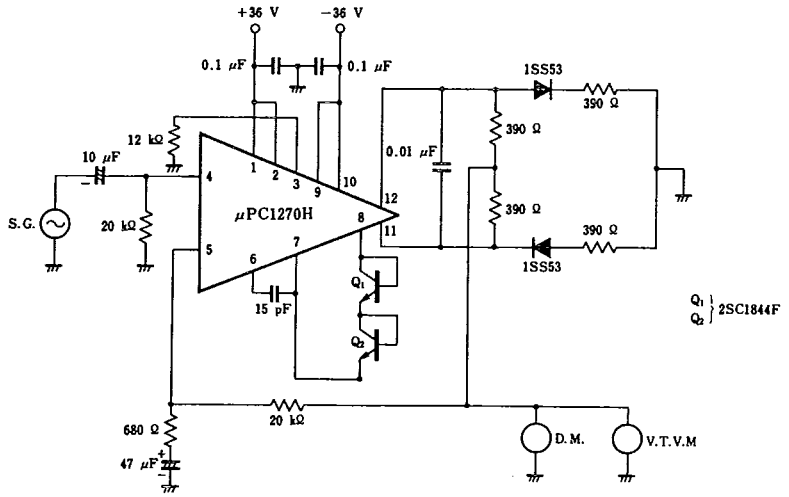
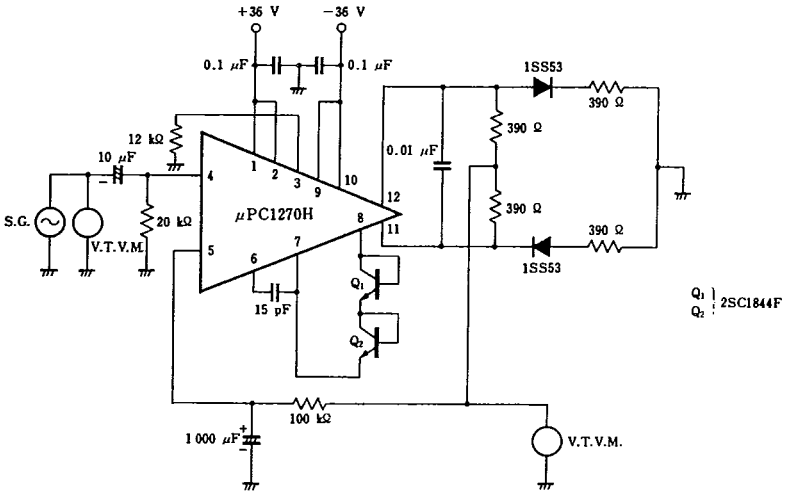
TEST CIRCUIT 3 (V_{OM})



TEST CIRCUIT 4 (A_{VO})



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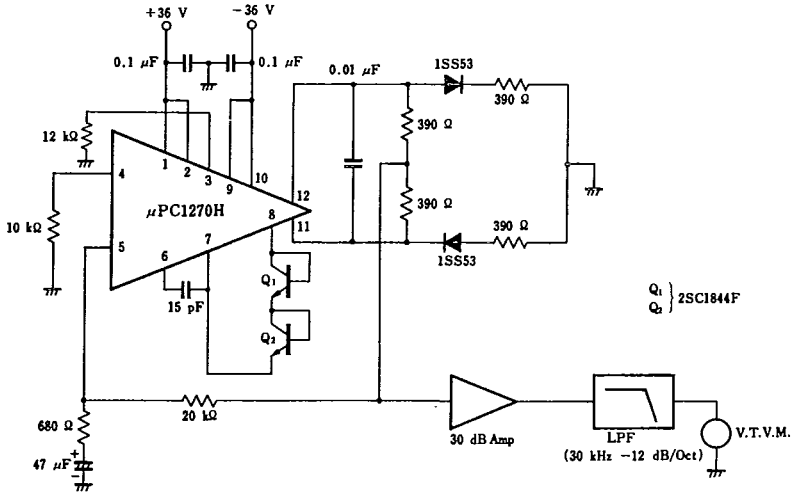
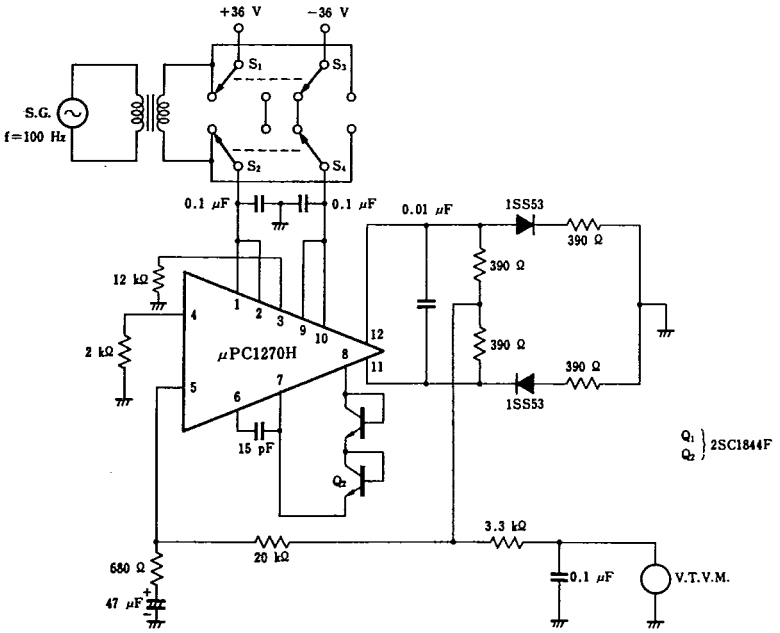
TEST CIRCUIT 5 (V_{NO})



TEST CIRCUIT 6 (S.V.R.)



TEST CIRCUIT 7 ($V_{OFF(MUTE)}$)

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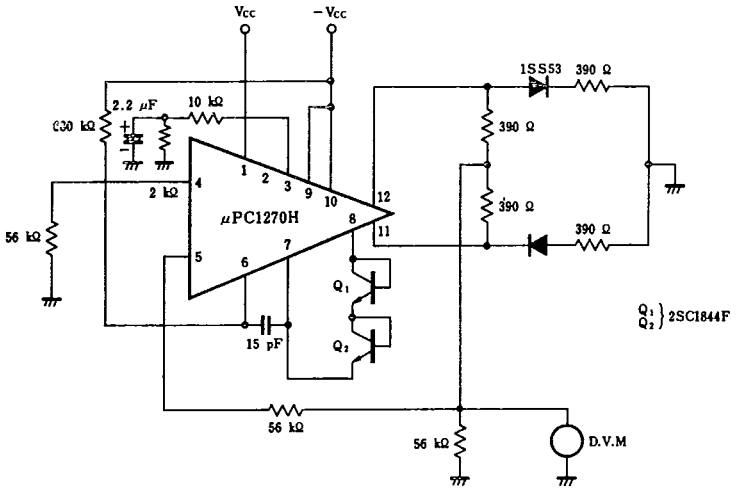

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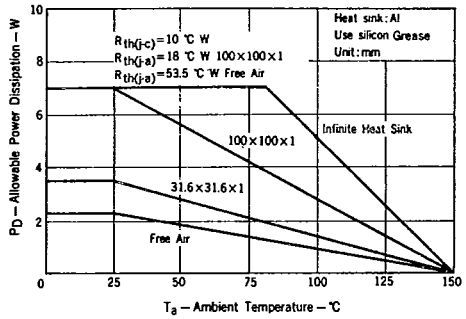
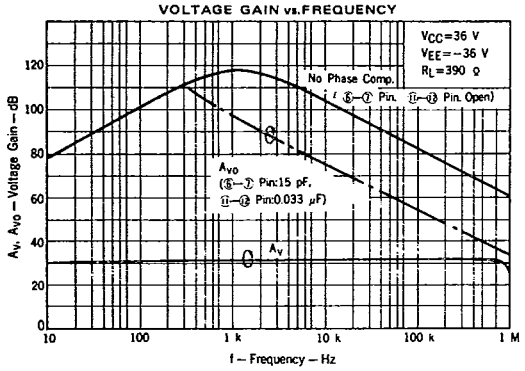
TYPICAL CHARACTERISTICS (Ta = 25°C)

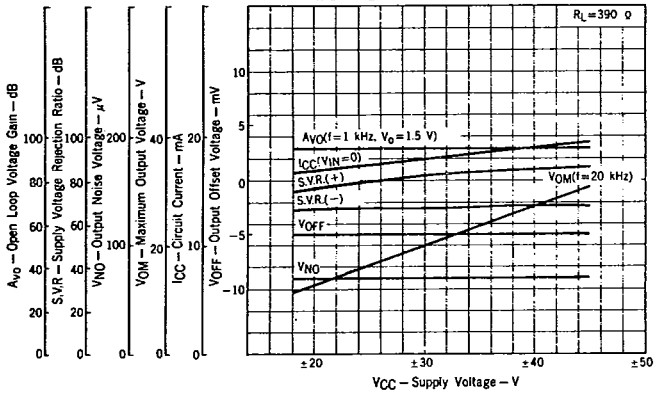
ALLOWABLE POWER DISSIPATION vs. AMBIENT TEMPERATURE



VOLTAGE GAIN vs. FREQUENCY



OPEN LOOP VOLTAGE GAIN
SUPPLY VOLTAGE REJECTION RATIO
OUTPUT NOISE VOLTAGE
CIRCUIT CURRENT
OUTPUT OFFSET VOLTAGE
vs. SUPPLY VOLTAGE



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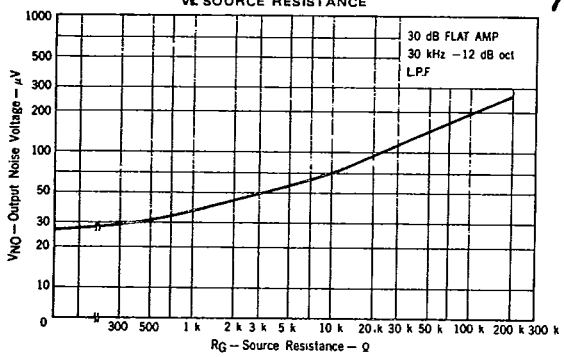
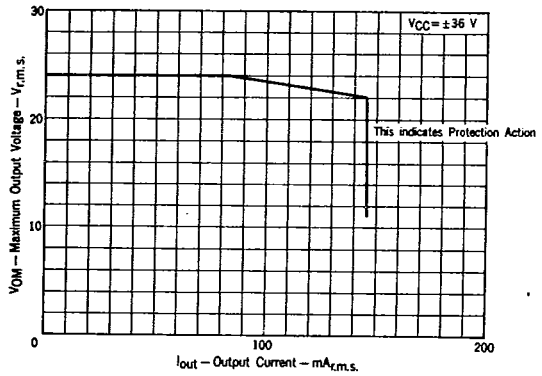
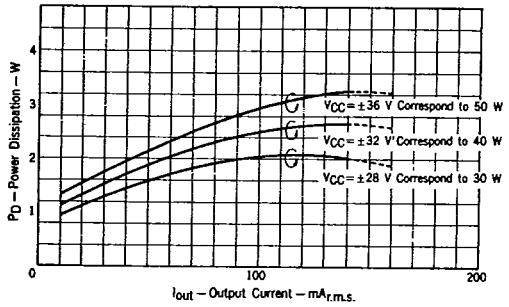
OUTPUT NOISE VOLTAGE vs. SOURCE RESISTANCE



MAXIMUM OUTPUT VOLTAGE vs. OUTPUT CURRENT



POWER DISSIPATION vs. OUTPUT CURRENT



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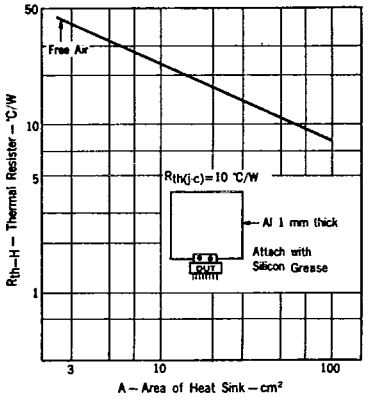
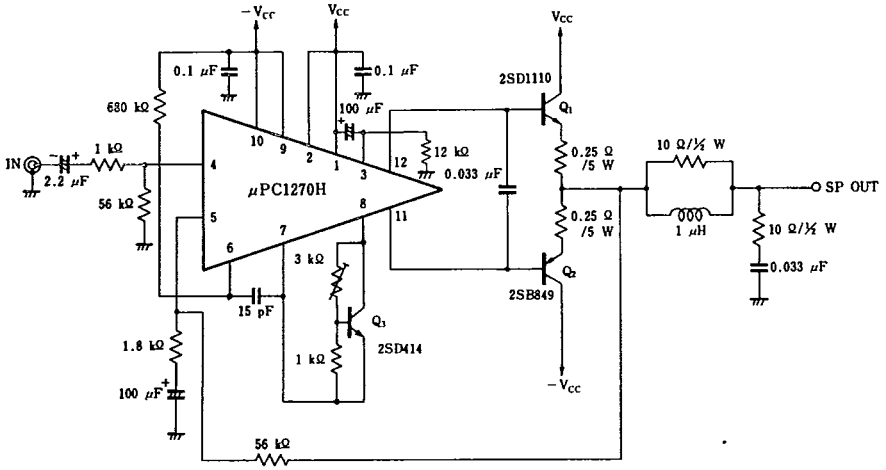
THERMAL RESISTER vs. AREA OF HEAT SINK



APPLICATION CIRCUIT-1



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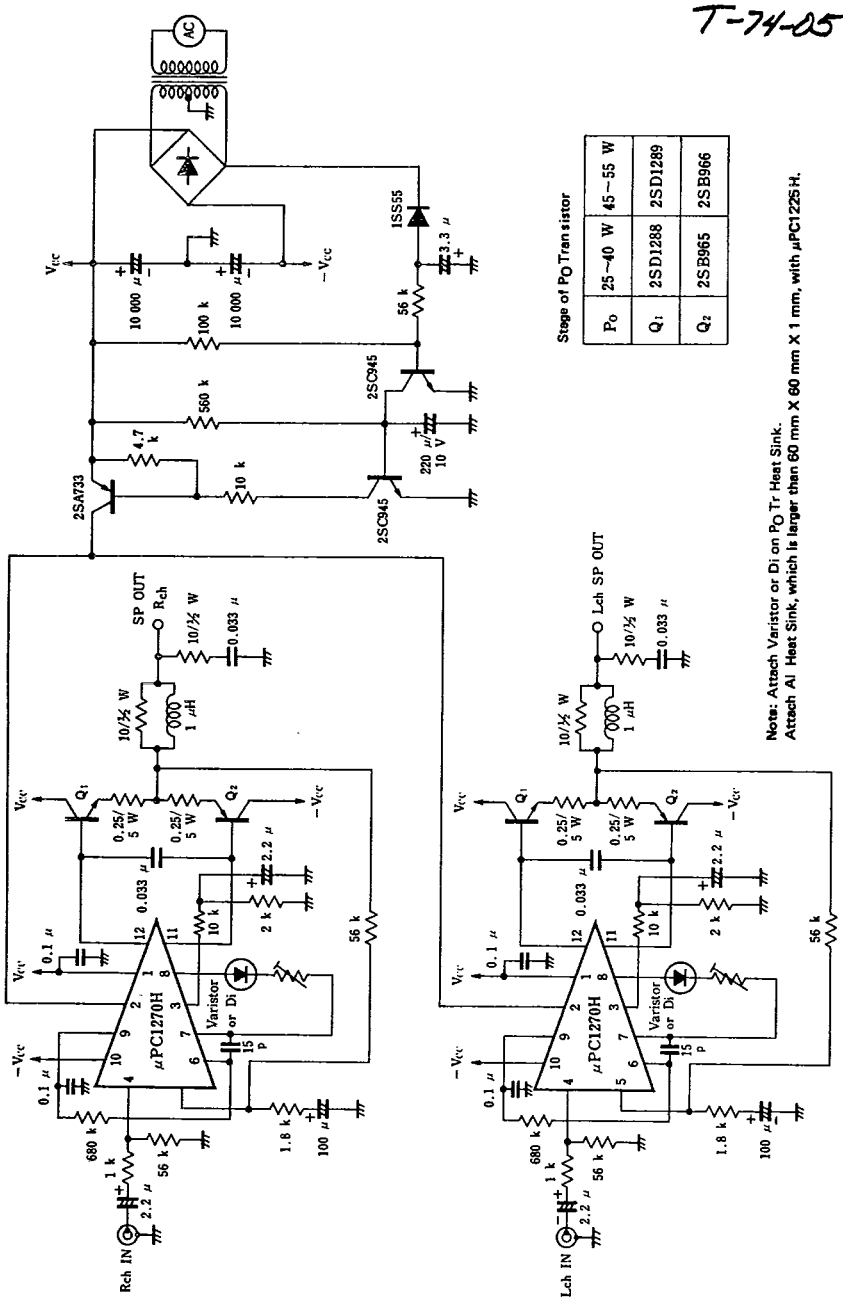
μPC1270H APPLICATION CIRCUIT-2 (no Relay)



Stage of P_O Transistor

P_O	25~40 W	45~55 W	
Q_1	2SD1288	2SD1289	
Q_2	2SB965	2SB966	

Note: Attach Varistor or Di on P_O Tr Heat Sink.
Attach Al Heat Sink, which is larger than 60 mm X 60 mm X 1 mm, with μPC1225H.

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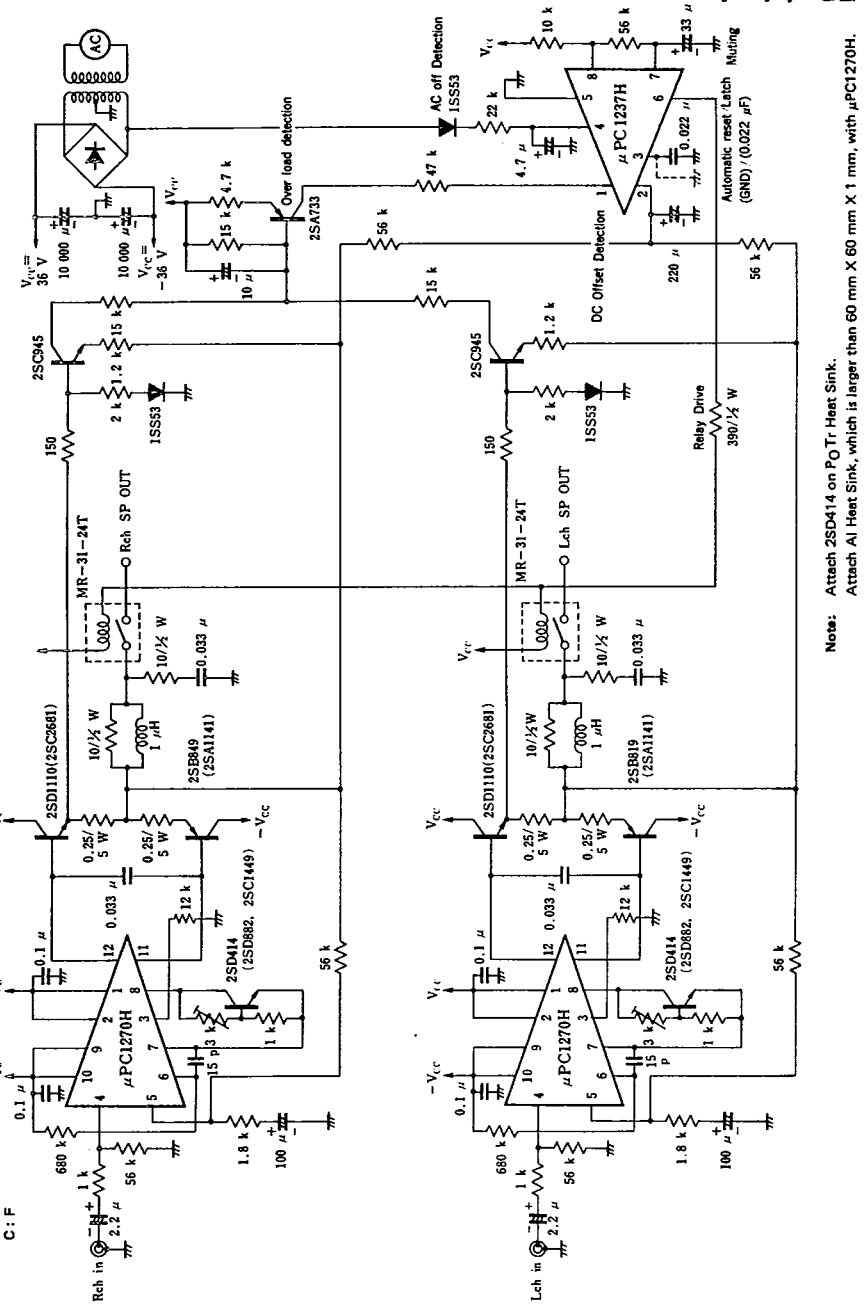


μPC1270H/μPC1237H/MP-80 EVALUATION CIRCUIT

Unit : R : Ω
C : F

Note:

#1 These terminals are for 3-terminals regulators (μPC7818H, μPC7918H) as a μPC1224H power supply.

#2 These terminals are for JP– lines to a temperature Compensation transistor (2SD414 or others).

#3 Use 0.02 μF capacitance in case of using μPC1237H at latching function, while connect each other at automatic resetting.

#4 This capacitance is for preventing POP ON/OFF noise. Thus, neglect it in case of using a relay.

#5 These terminals are for JP–lines in case of using the same power supply (μPC1237H and Power Amplifier)

#6 These terminals are for JP– lines in case of using the same power supply (μPC1270H and Power Tr)

#7 This terminal is for AC-OFF Detection. Thus, use 8.2 k ohms instead of 22 k ohms, neglect 1SS53 and connect these 1SS53's terminals and neglect 4.7 μF in case of using DC power supply.

#8 These capacitances are for preventing a parasitic oscillation. Use a 0.1 μF.

#9 These trimmers are for adjusting an idling current. Recommend Neo-Pot PS61 Series.

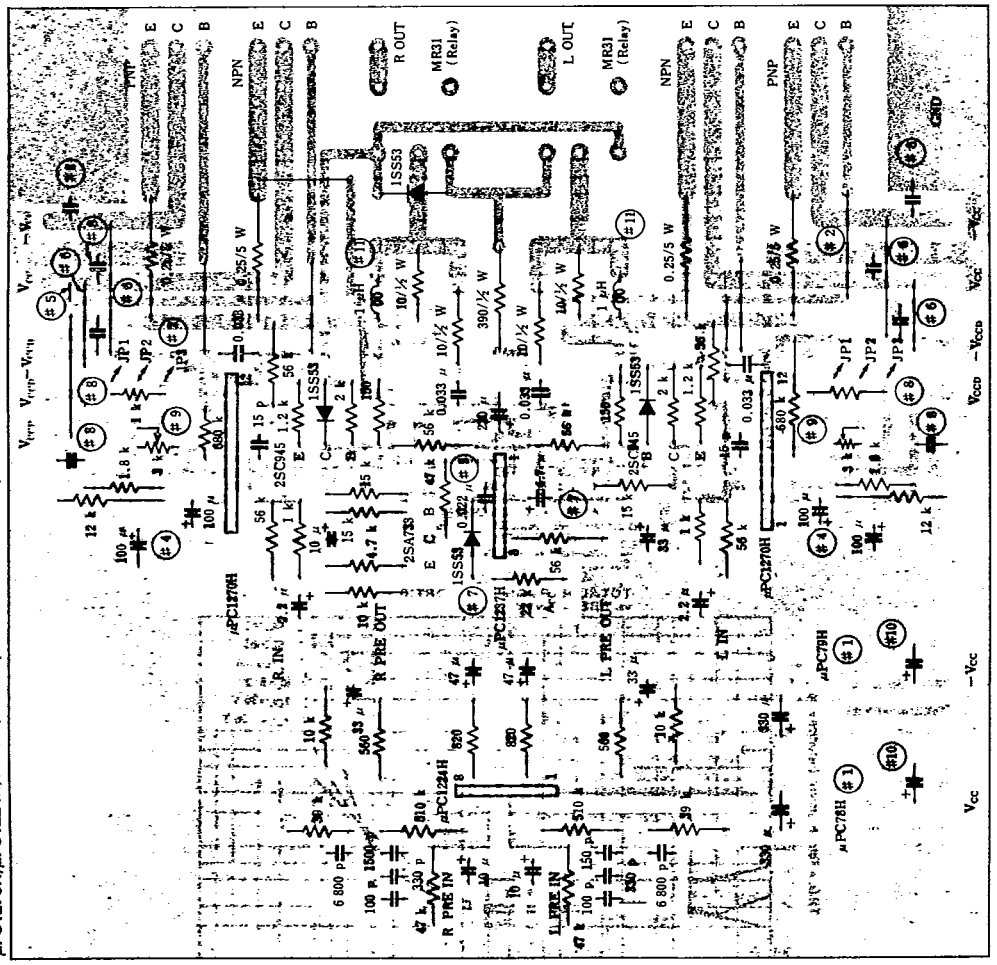
#10 These capacitance are for the 3-terminals regulator input.

#11 Design of 1 μH (example)

#12 This indicates a copper board pattern

This is the evaluation circuit. Thus, it is not for a mass production considered about component deviation and the temperature characteristic.

μPC1270H/μPC1224H/MP-80 (2SC849, 2SD1110 or 2SA2681, 2SC1141) Evaluation Circuit Board Component Arrangement



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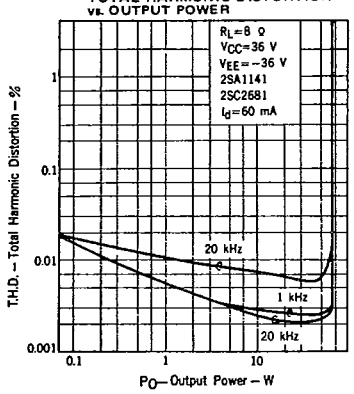
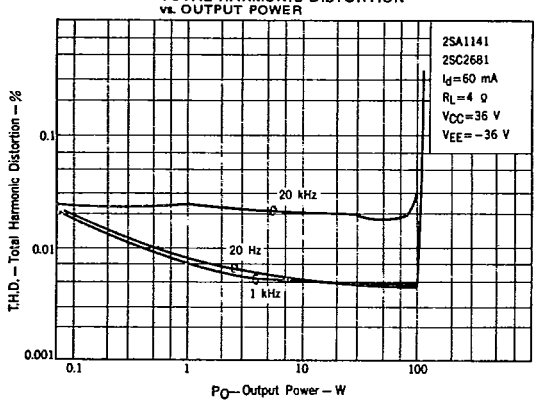
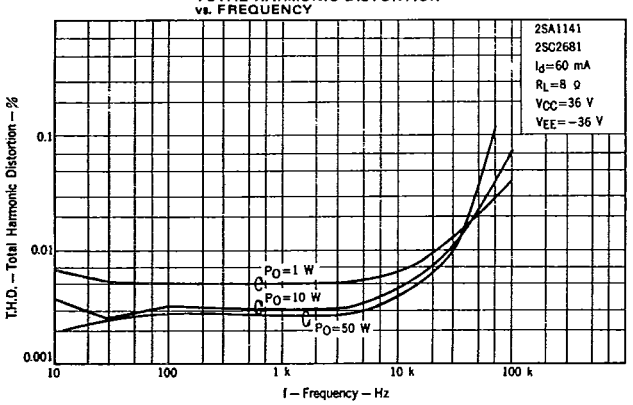
TOTAL HARMONIC DISTORTION
vs. OUTPUT POWER



TOTAL HARMONIC DISTORTION
vs. OUTPUT POWER



TOTAL HARMONIC DISTORTION
vs. FREQUENCY



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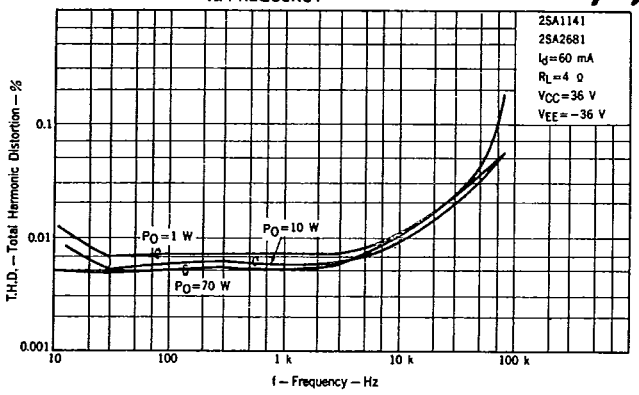
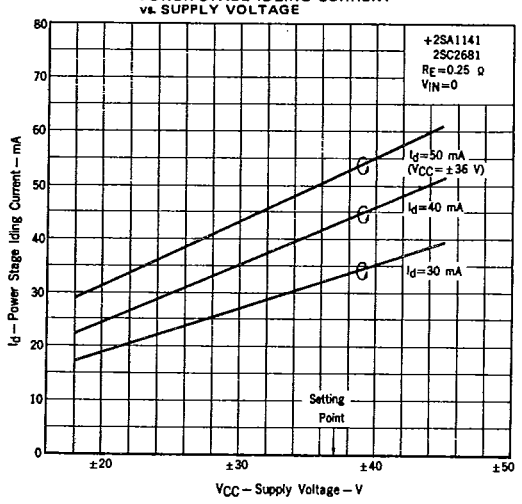
TOTAL HARMONIC DISTORTION
vs. FREQUENCY



POWER STAGE IDLING CURRENT
vs. SUPPLY VOLTAGE



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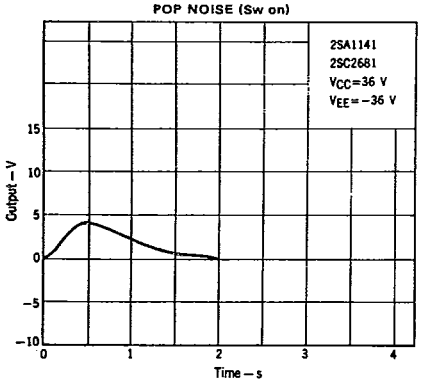
POP NOISE (Sw on)



POP NOISE (Sw off)