

6427525 N E C ELECTRONICS INC

05E 22829 D

## BIPOLAR ANALOG INTEGRATED CIRCUIT

 $\mu$ PC1270H

T-74-05-01

## 30-50 W POWER AMPLIFIER DRIVER

## DESCRIPTION

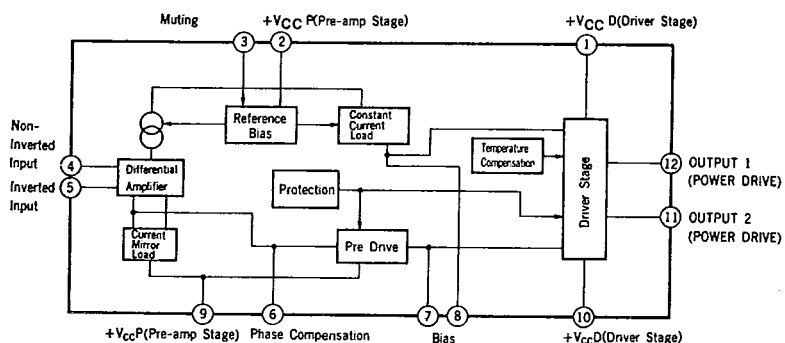
$\mu$ PC1270H is designed for use with a Hi-Fi power amplifier driver. It is composed of a differential amplifier, a predriver, a driver and protection circuit.

It is in a 12 pin small power SIP. (Single In Line)

## FEATURES

- Excellent Low Distortion.  
0.002 % TYP. ( $V_{CC} = \pm 36$  V,  $f = 1$  kHz,  $A_v = 30$  dB,  $P_O = 30$  W,  $R_L = 8$  Ohms)  
0.006 % TYP. ( $V_{CC} = \pm 36$  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.

**$\mu$ PC1270H**

6427525 N E C ELECTRONICS INC

05E 22830 D

*T-74-05-01***ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )**

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

**RECOMMENDED OPERATING CONDITION**

Supply Voltage (Operational)	$V_{CC} = \pm 18$ to $\pm 36$ 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 ( $V_{CC} = \pm 36$  V,  $A_v = 30$  dB, Use Standard Test Circuit,  $T_a = 25^\circ\text{C}$ )**

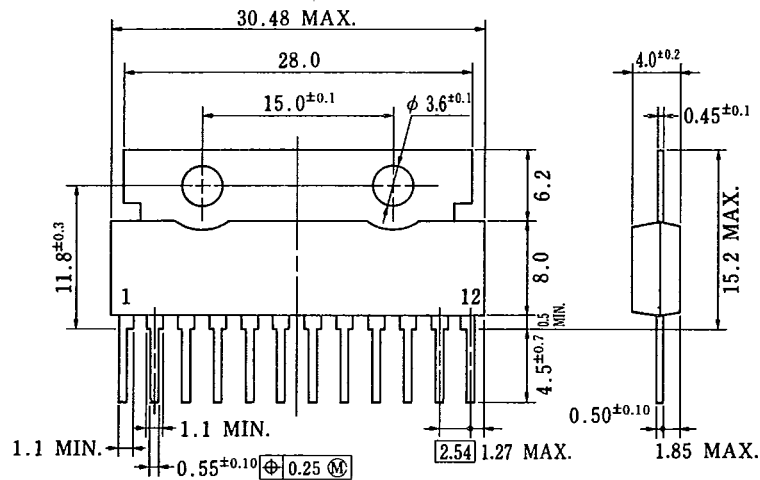
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Output Offset Voltage	$V_{OFF}$		$\pm 5$	$\pm 100$	mV	SEE TEST CIRCUIT 1
Quiescent Circuit Current	$I_{CC}$		20	40	mA	$V_{IN} = 0$
Maximum Output Voltage	$V_{OM}$	20	23		V	T.H.D. = 0.05 % $f = 20$ to $20$ kHz
Open Loop Voltage Gain	$A_{vo}$	80	95		dB	$V_O = 1.5$ 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, $-3$ dB
Supply Voltage Rejection Ratio	S.V.R.	55	70		dB	$R_G = 2$ kohms, $f = 100$ Hz
Output Offset Voltage (Mute)	$V_{OFF}(\text{Mute})$			$\pm 50$	mV	$V_{CC} = \pm 50$ V, TEST CIRCUIT 7

6427525 N E C ELECTRONICS INC

 $\mu$ PC1270H  
05E 22831 D

12 PIN SIP (Unit : mm)

T-74-05-01



P12HP-254B1

## PIN CONNECTION DIAGRAM

PIN NO.	PIN CONNECTION
1	+V <sub>CCD</sub> (for Driver)
2	+V <sub>CCP</sub> (for Preamp)
3	MUTING
4	INPUT
5	NFB
6	PHASE COMP
7	BIAS
8	BIAS
9	-V <sub>CCP</sub> (for Preamp)
10	-V <sub>CCD</sub> (for Driver)
11	LOWER OUTPUT
12	UPPER OUTPUT

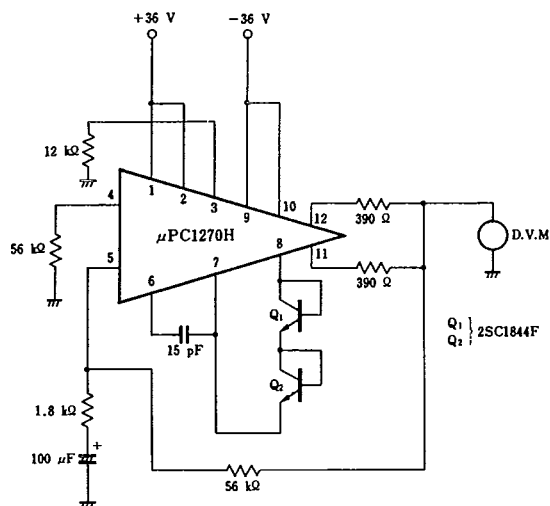
5

$\mu$ PC1270H  
6427525 N E C ELECTRONICS INC

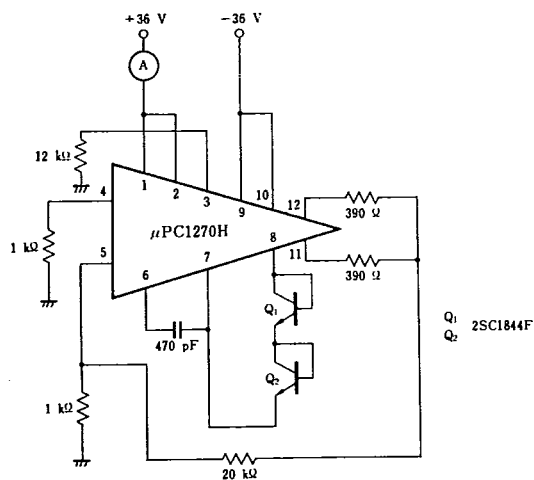
05E 22832 D

T-74-05-01

TEST CIRCUIT 1 ( $V_{OFF}$ )



TEST CIRCUIT 2 ( $I_{CC}$ )



μPC1270H  
05E 22833 D

T-74-05-01



Q<sub>1</sub> : 2SC1844F  
Q<sub>2</sub> :

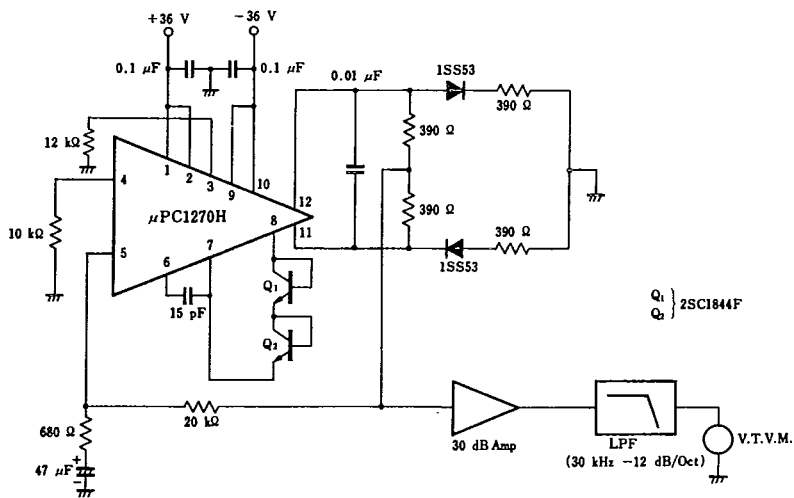
$\mu$ PC1270H

6427525 N E C ELECTRONICS INC

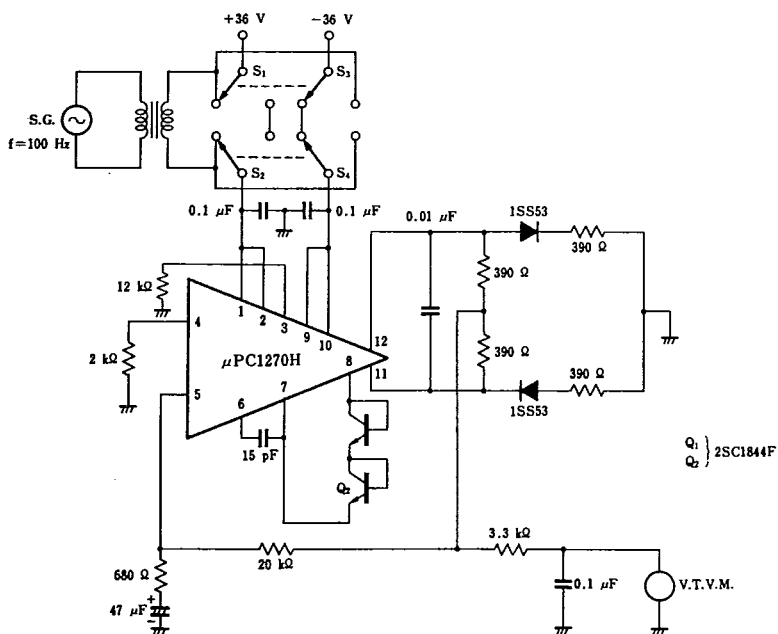
05E 22834 D

TEST CIRCUIT 5 (V<sub>NO</sub>)

T-74-05-01



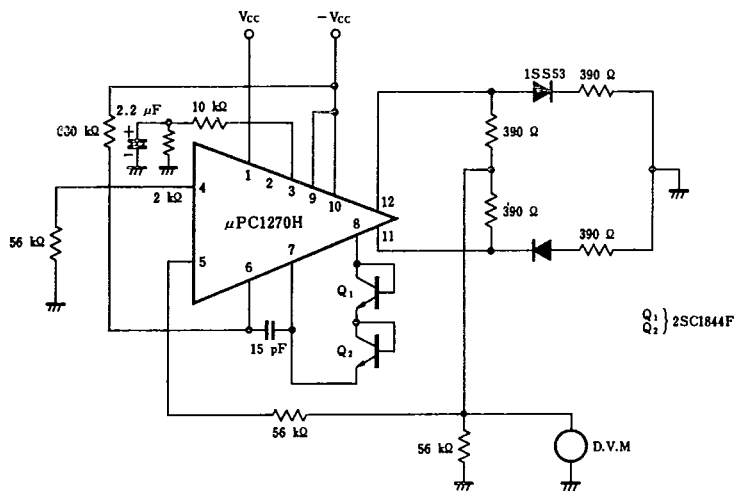
TEST CIRCUIT 6 (S.V.R.)



6427525 N E C ELECTRONICS INC

 $\mu$ PC1270H  
05E 22835 DTEST CIRCUIT 7 (V<sub>OFF</sub>(MUTE))

T-74-05-01

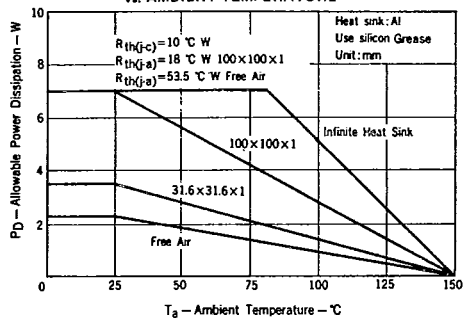


$\mu$ PC1270H

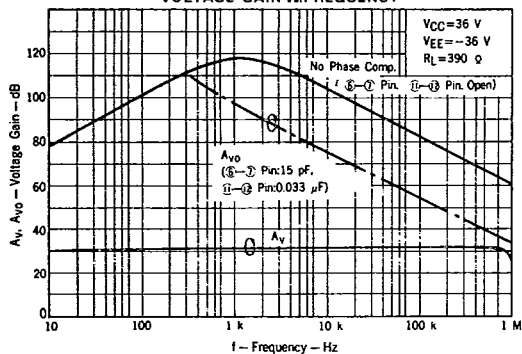
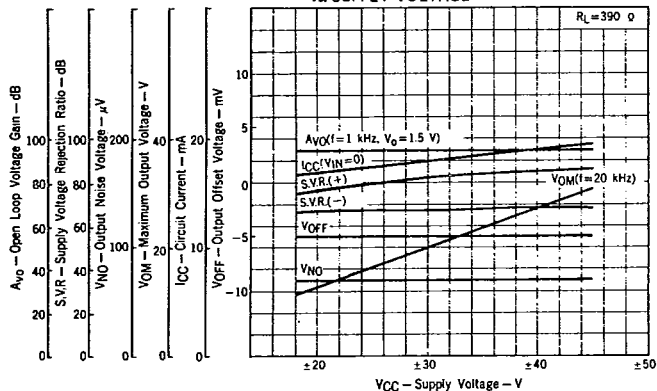
6427525 N E C ELECTRONICS INC

05E 22836 D

T-74-05-01

TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )ALLOWABLE POWER DISSIPATION  
vs. AMBIENT TEMPERATURE

VOLTAGE GAIN vs. FREQUENCY

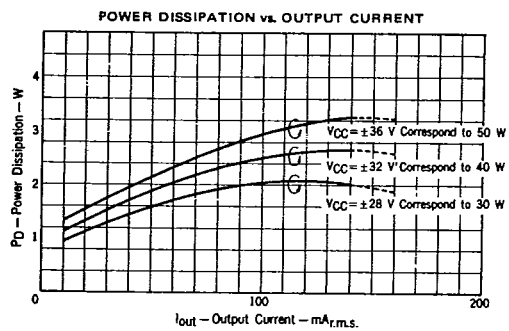
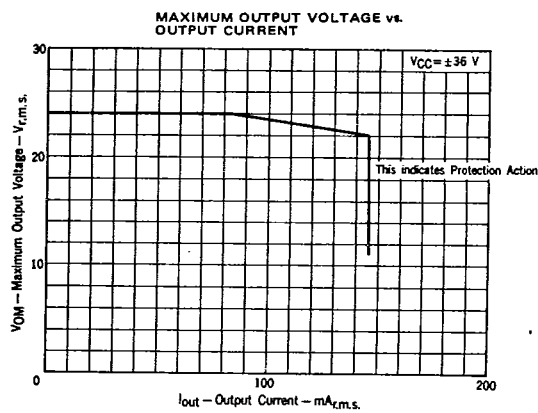
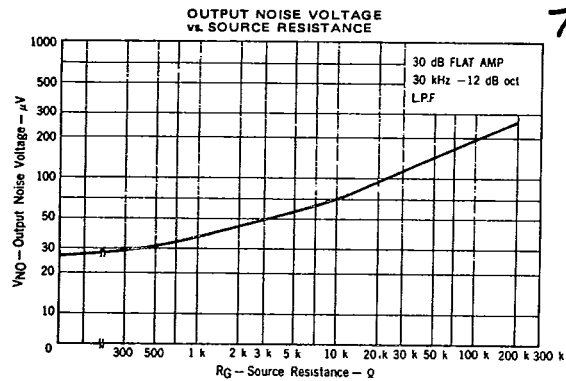
OPEN LOOP VOLTAGE GAIN  
SUPPLY VOLTAGE REJECTION RATIO  
OUTPUT NOISE VOLTAGE  
CIRCUIT CURRENT  
OUTPUT OFFSET VOLTAGE  
vs. SUPPLY VOLTAGE



6427525 N E C ELECTRONICS INC

 $\mu$ PC1270H  
05E 22837 D

T-74-05-01



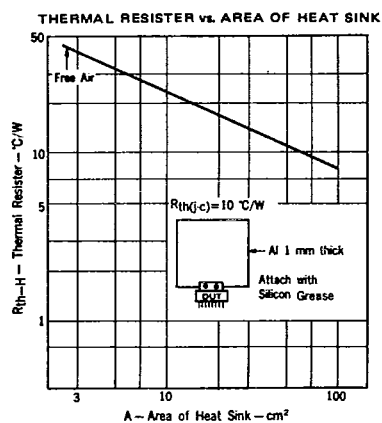
5

$\mu$ PC1270H

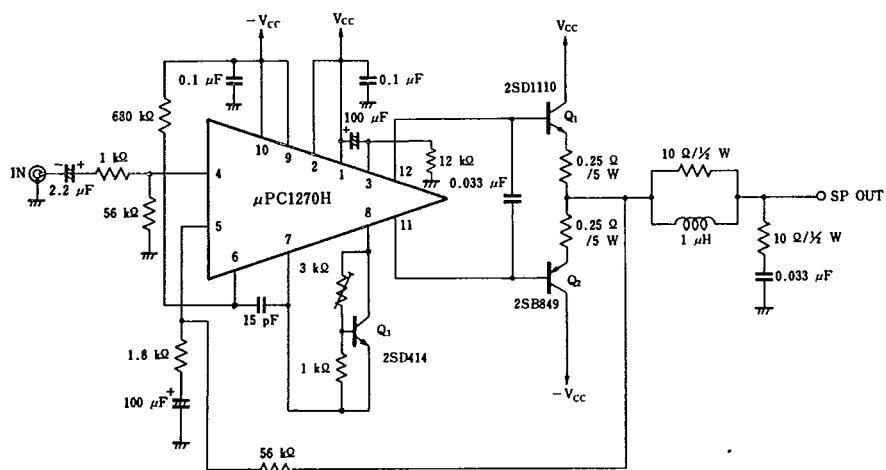
6427525 N E C ELECTRONICS INC

05E 22838 D

T-74-05-01

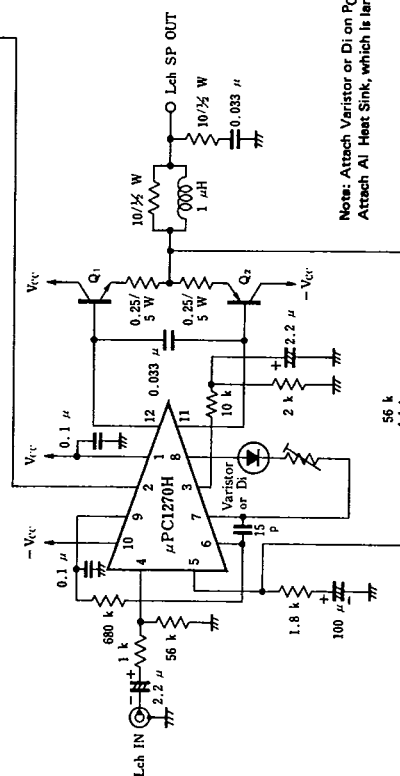
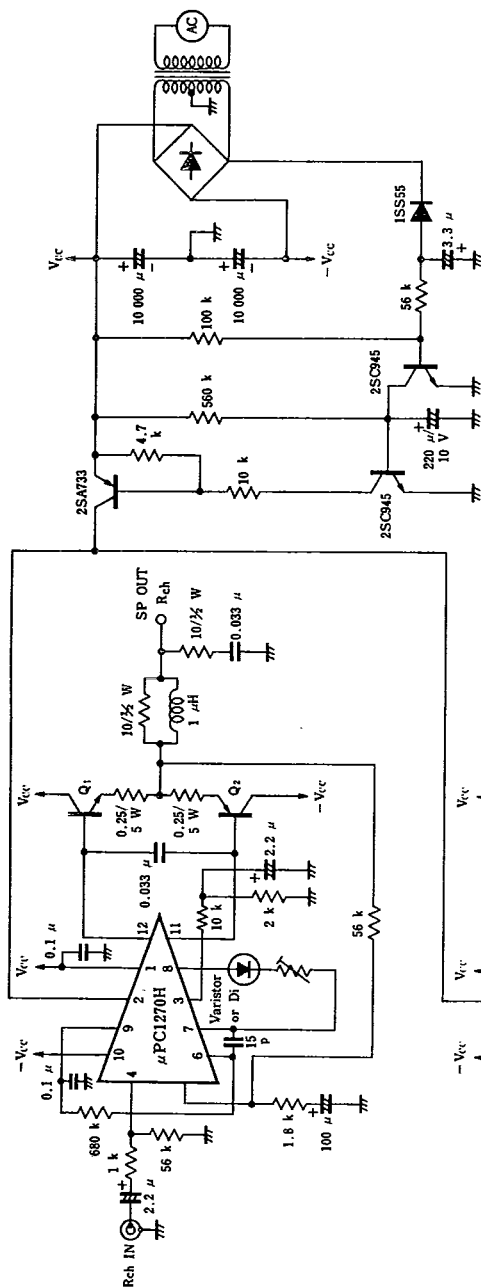


## APPLICATION CIRCUIT-1



05E  $\mu$ PC1270H 22839 D

T-74-05-01



### Stage of PQ Transistor

$P_0$	25~40 W	45~55 W
$Q_1$	2SD1288	2SD1289
$Q_2$	2SB965	2SB966

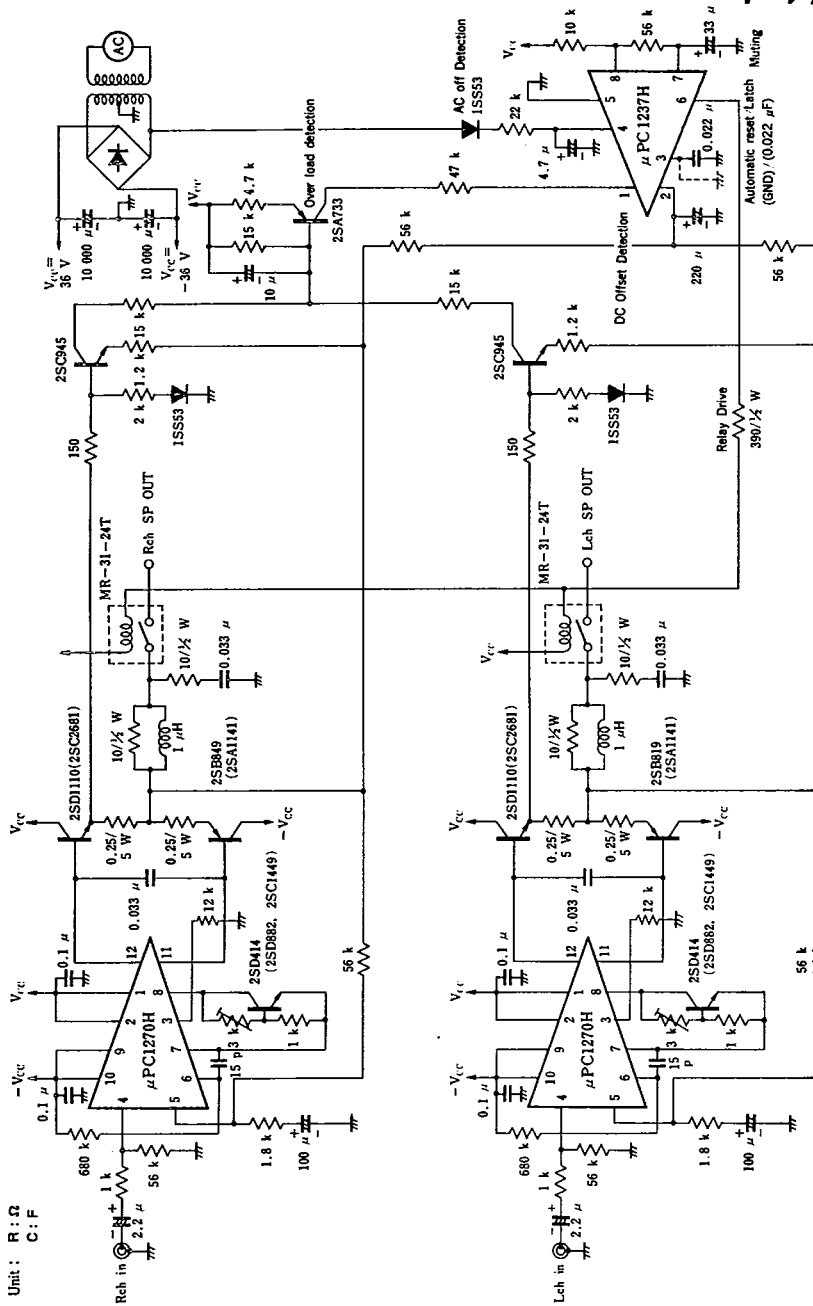
**Note:** Attach Varistor or Di on P<sub>O</sub> Tr Heat Sink.  
Attach Al Heat Sink, which is larger than 60 mm X 60 mm X 1 mm, with  $\mu$ PC1225-H.

$\mu$ PC1270H

6427525 N E C ELECTRONICS INC

05E 22840 D

T-74-05-01

 $\mu$ PC1270H/ $\mu$ PC1237H/MP-80 EVALUATION CIRCUITUnit: R:  $\Omega$   
C: F

Note: Attach 2SD414 on Po Tr Heat Sink.  
Attach A1 Heat Sink, which is larger than 60 mm X 60 mm X 1 mm, with  $\mu$ PC1270H.

6427525 N E C ELECTRONICS INC

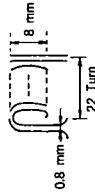
 $\mu$ PC1270H

05E 22841 D

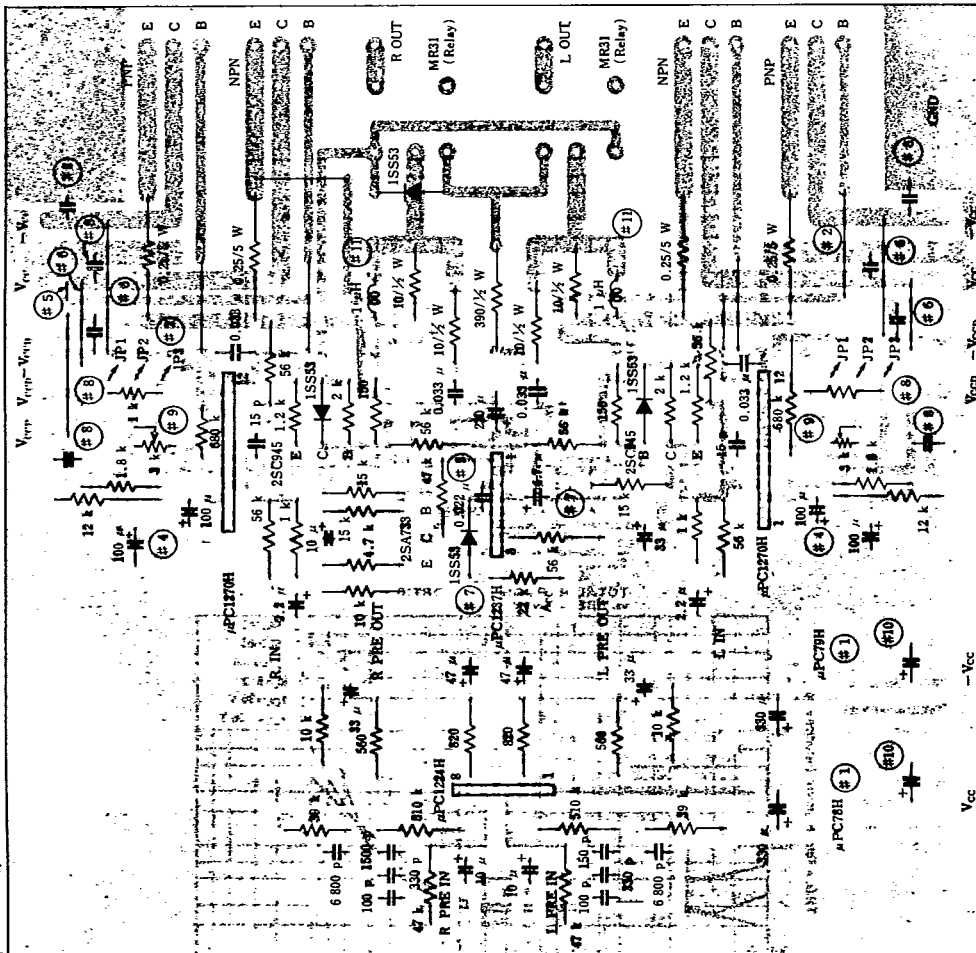
T-74-05-01

## Note:

- #1 These terminals are for 3-terminals regulators ( $\mu$ PC7818H,  $\mu$ PC7918H) as a  $\mu$ PC1224H power supply.
- #2 These terminals are for JP—lines to a temperature Compensation transistor (2SD414 or others).
- #3 Use 0.02  $\mu$ F capacitance in case of using  $\mu$ PC1237H at latching function, while connect each other at automatic resetting.
- #4 This capacitance is for preventing POP ON/OFF noise.
- #5 Thus, neglect it in case of using a relay.
- #6 These terminals are for JP—lines in case of using the same power supply ( $\mu$ PC1237H and Power Amplifier).
- #7 These terminals are for JP—lines in case of using the same power supply ( $\mu$ PC1270H and Power Tr).
- #8 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  $\mu$ F in case of using DC power supply.
- #9 These capacitances are for preventing a parasitic oscillation. Use a 0.1  $\mu$ F. These trimmers are for adjusting an idling current. Recommend Neo-Pot PSS1 Series.
- #10 These capacitances are for the 3-terminals regulator input.
- #11 Design of 1  $\mu$ H (example)
- #12 This indicates a copper board pattern



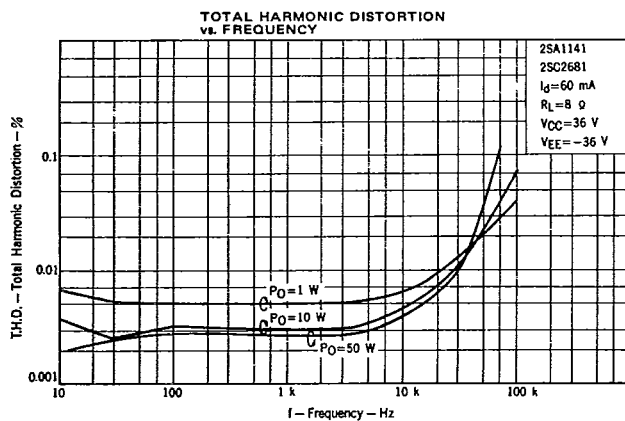
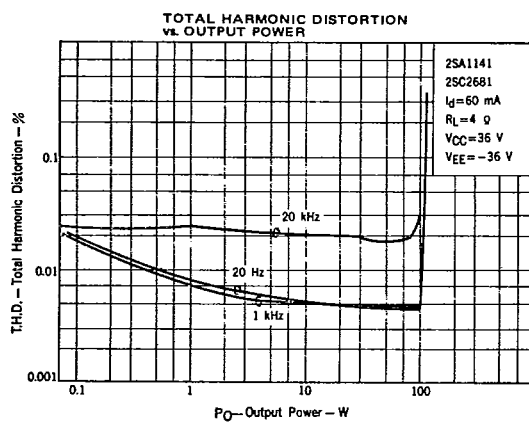
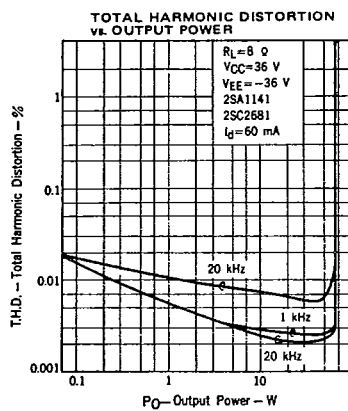
This is the evaluation circuit. Thus, it is not for a mass production considered about component deviation and the temperature characteristic.

 $\mu$ PC1270H/ $\mu$ PC1224H/MF-80 (2SC849, 2SD1110 or 2SA2681, 2SC1141) Evaluation Circuit Board Component Arrangement

$\mu$ PC1270H  
6427525 N E C ELECTRONICS INC

05E 22842 D

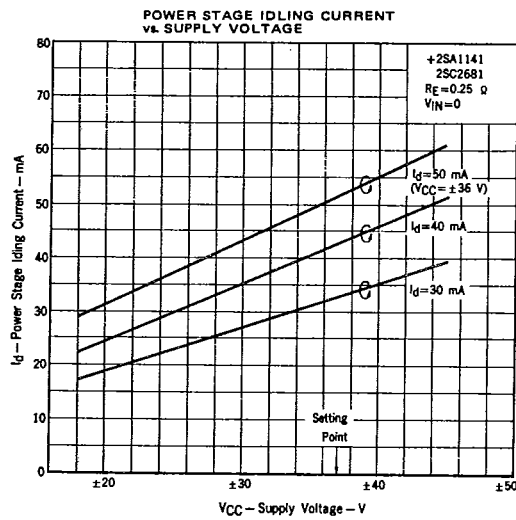
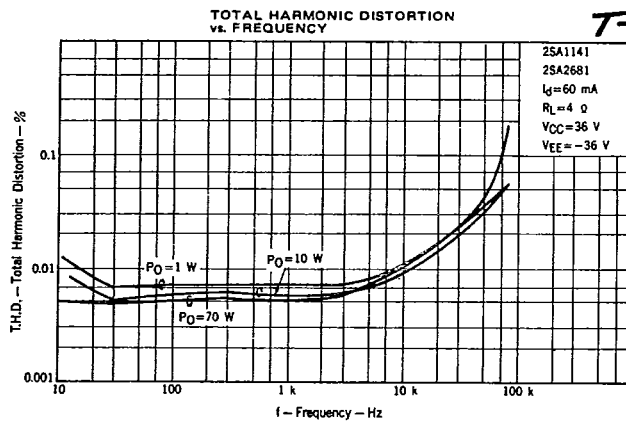
T-74-05-01



6427525 N E C ELECTRONICS INC

 $\mu$ PC1270H  
05E 22843 D

T-74-05-01



5

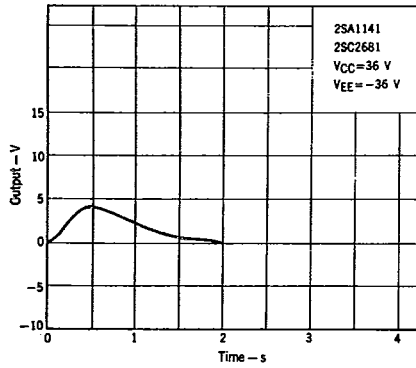
$\mu$ PC1270H

6427525 N E C ELECTRONICS INC

05E 22844 D

T-74-05-01

POP NOISE (Sw on)



POP NOISE (Sw off)

