

<b>SANYO</b>	No. 4608A	<b>STK4044XI</b>
	<b>AF Power Amplifier (Split Power Supply) (100 W min, THD = 0.008 %)</b>	

## Features

- Compact packaging supports slimmer set designs
- Series designed from 50 up to 150 W and pin-compatibility
- Simpler heat sink design facilitates thermal design of slim stereo sets
- Current mirror circuit, cascade circuit and pure-complimentary circuit application reduce distortion to 0.008 %
- Supports addition of electronic circuits for thermal shutdown and load-short protection circuit as well as pop noise muting which occurs when the power supply switch is turned on and off.

## Specifications

Maximum Ratings at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \text{ max}}$		$\pm 74$	V
Thermal resistance	$\theta_{j-c}$		1.2	$^\circ\text{C/W}$
Junction temperature	$T_J$		150	$^\circ\text{C}$
Operating substrate temperature	$T_c$		125	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-30 to +125	$^\circ\text{C}$
Permissible load short time	$t_s^{*1}$	$V_{CC} = \pm 51 \text{ V}, R_L = 8 \Omega, f = 50 \text{ Hz}, P_O = 100 \text{ W}$	1	s

Recommended Operating Conditions at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_{CC}$		$\pm 51$	V
Load resistance	$R_L$		8	$\Omega$

## Operating Characteristics

at  $T_a = 25^\circ\text{C}, V_{CC} = \pm 51 \text{ V}, R_L = 8 \Omega, V_G = 40 \text{ dB}, R_g = 600 \Omega, 100 \text{ kHz LPF ON}, R_L$  (noninductive)

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	$I_{CCO}$	$V_{CC} = \pm 61.5 \text{ V}$	15		120	mA
Output power	$P_O$	THD = 0.008 %, $f = 20 \text{ Hz to } 20 \text{ kHz}$	100			W
Total harmonic distortion	THD	$P_O = 1.0 \text{ W}, f = 1 \text{ kHz}$			0.008	%
Frequency response	$f_L, f_H$	$P_O = 1.0 \text{ W}, +0, -3 \text{ dB}$		20 to 50k		Hz
Input resistance	$r_i$	$P_O = 1.0 \text{ W}, f = 1 \text{ kHz}$		55		k $\Omega$
Output noise voltage	$V_{NO}^{*2}$	$V_{CC} = \pm 61.5 \text{ V}, R_g = 10 \text{ k}\Omega$			1.2	mVrms
Neutral voltage	$V_N$	$V_{CC} = \pm 61.5 \text{ V}$	-70	0	+70	mV

Note: Use rated power supply for test unless otherwise specified.

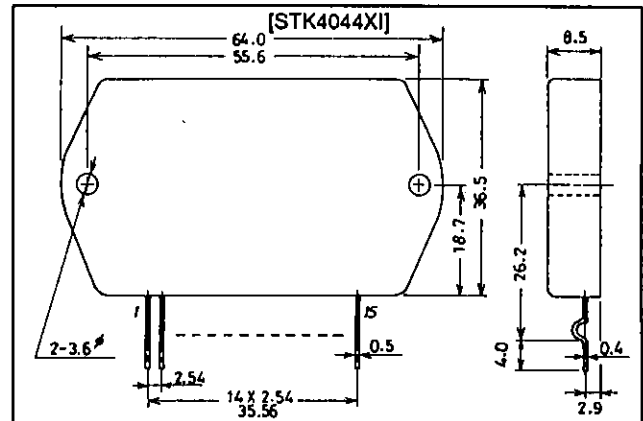
\*1 When measuring permissible load short time and output noise voltage use transformer power supply indicated next page.

\*2 Output noise voltage represents the peak value on the rms scale (VTVM). The noise voltage waveform does not include the pulse noise.

## Package Dimensions

unit: mm

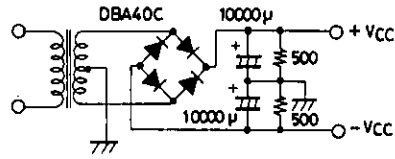
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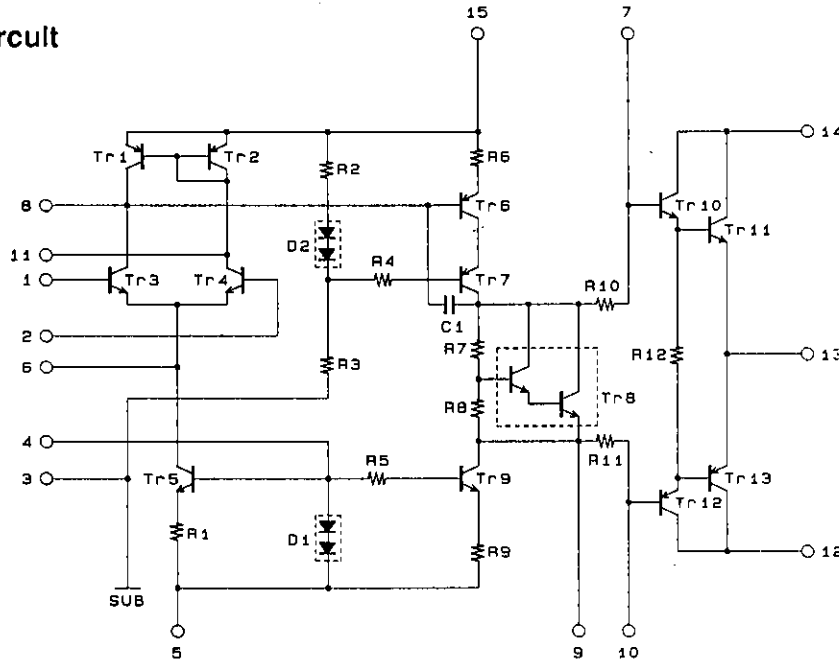
# STK4044XI



Unit (resistance:Ω , capacitance: F)

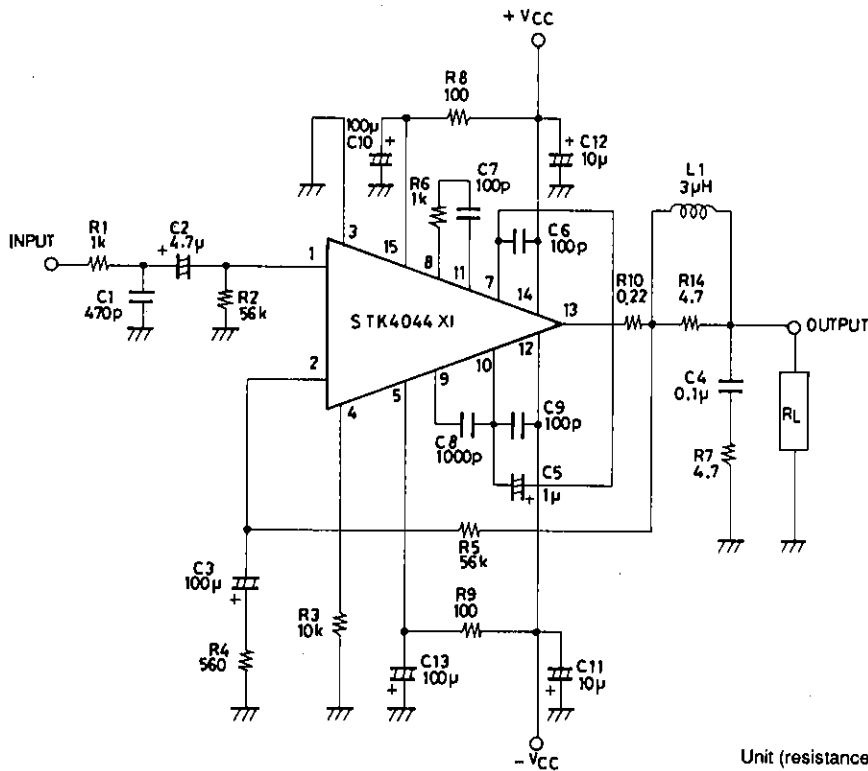
## Specified Transformer Power Supply (MG-200 Equivalent)

### Equivalent Circuit



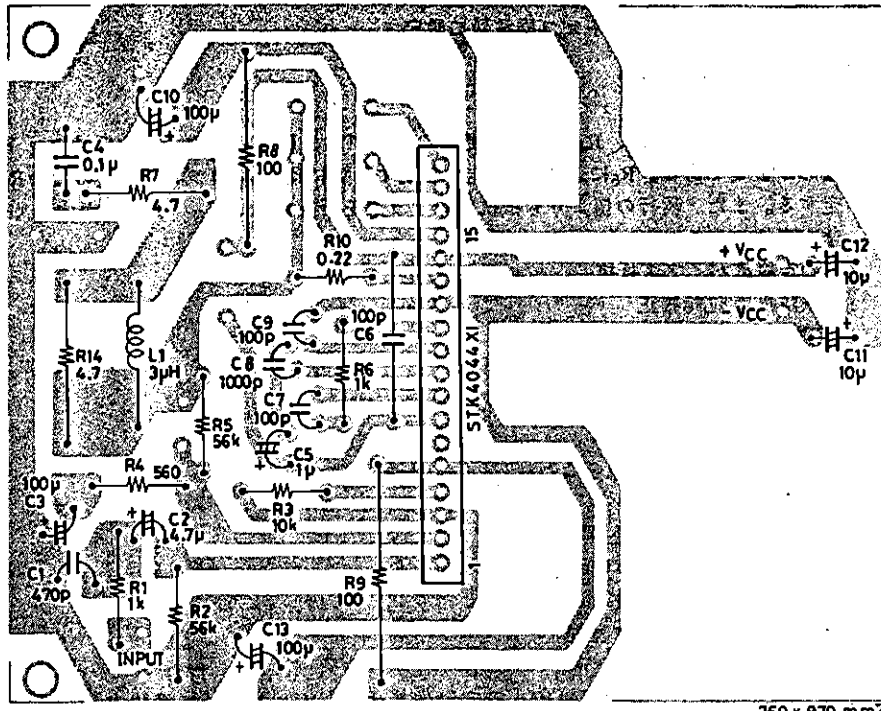
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### Sample Application Circuit: 100W min Single Channel AF Power Amplifier



Unit (resistance:Ω , capacitance: F)

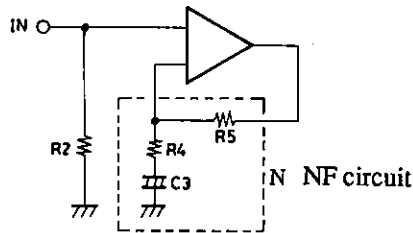
Sample Printed Circuit Pattern for Application Circuit (Copper-foiled side)



Description of External Parts

Unit (resistance:Ω , capacitance: F)

- R<sub>1</sub>, C<sub>1</sub> : Input filter circuit
  - Reduces high-frequency noise.
- C<sub>2</sub> : Input coupling capacitor
  - DC current suppression. A reduction in reactance is effective because of increases in capacitor reactance at low frequencies and 1/f noise dependence on signal source resistance which result in output noise worsening.
- R<sub>2</sub> : Input bias resistor
  - Biases the input pin to zero.
  - Effects V<sub>N</sub> stability (refer to NF circuit).
  - Due to differential input, input resistance is more or less determined by this resistance value.
- R<sub>4</sub>, R<sub>5</sub> : NFB circuit (AC NF circuit). Use of resistor with 1% error is suggested.
- C<sub>3</sub> (R<sub>2</sub>)



- C<sub>3</sub> : AC NF capacitor
- R<sub>4</sub>, R<sub>5</sub> : Used for VG setting.

- VG settings are obtained using  $R_4$  and  $R_5$  according to the following equation:

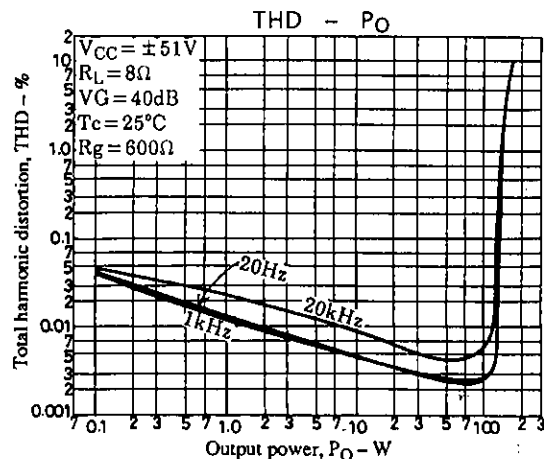
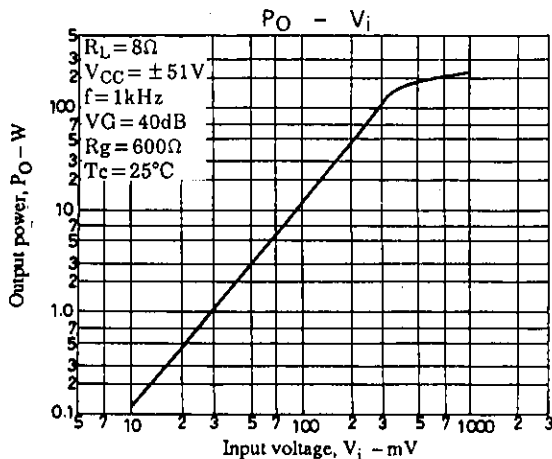
$$\log_{20} \frac{R_5}{R_4} \quad 40 \text{ dB is recommended.}$$

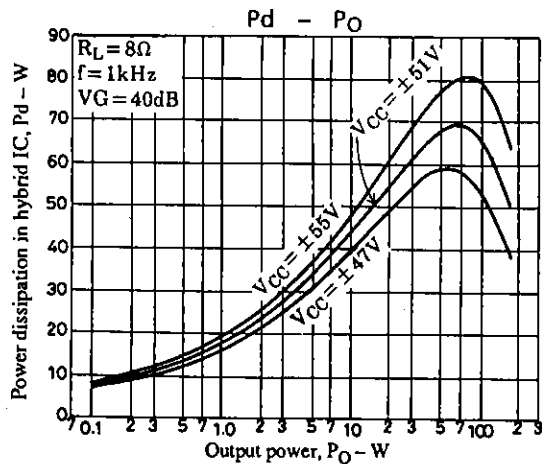
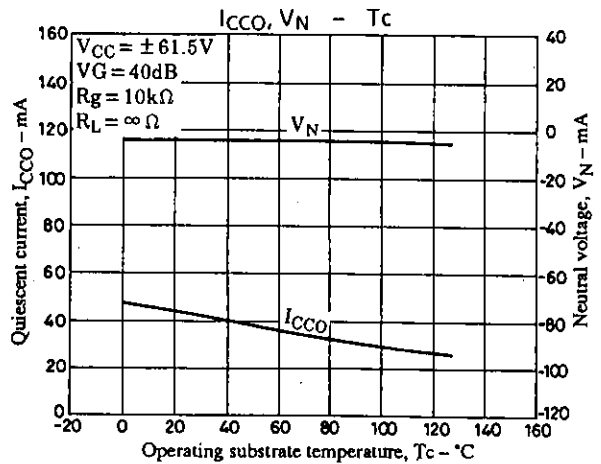
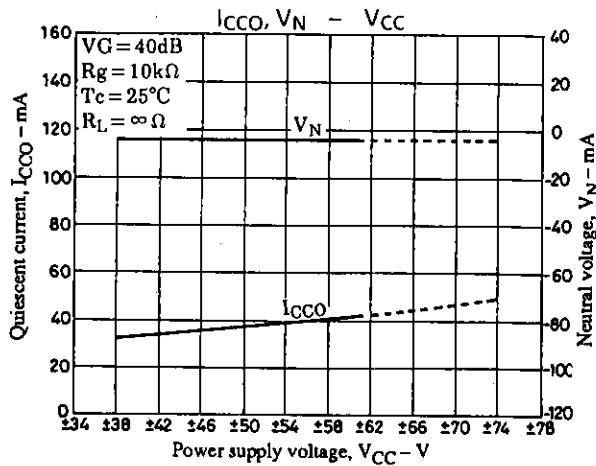
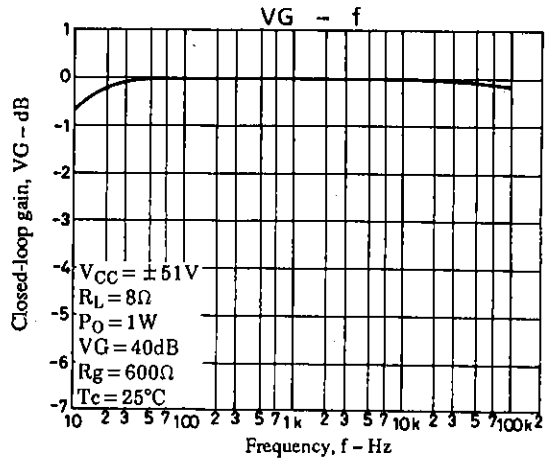
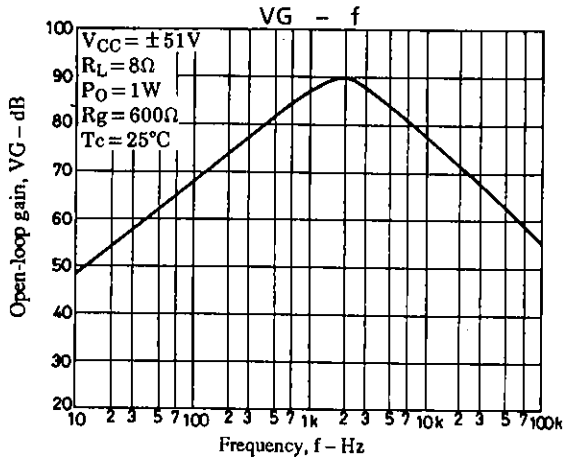
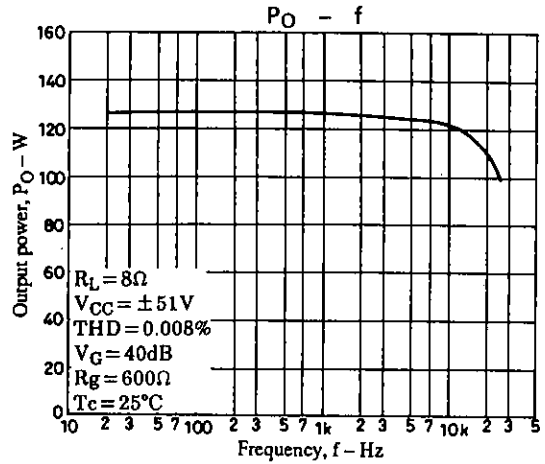
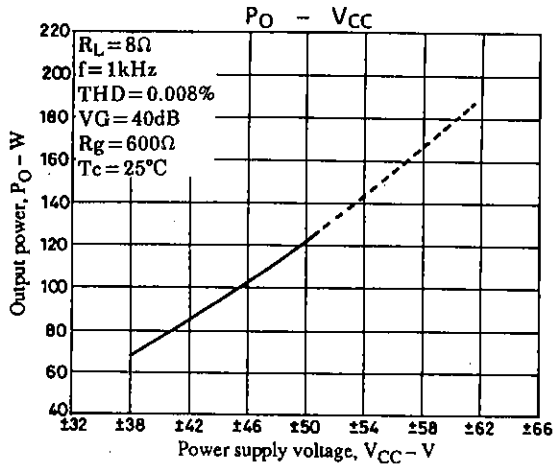
- Low-frequency cutoff frequency settings are obtained using  $R_4$  and  $C_3$  according to the following equation:

$$f_L = \frac{1}{2\pi \cdot R_4 \cdot C_3} \quad [\text{Hz}]$$

When changing the VG setting, you should change  $R_4$  which requires a recheck of the low cutoff frequency setting. When the VG setting is changed using  $R_5$ , the setting should ensure  $R_2$  equals  $R_5$  so that  $V_N$  balance stability is maintained. If the resistor value is increased more than the existing value,  $V_N$  balance may be disturbed and result in deterioration of  $V_N$  temperature characteristics.

- $R_3$  : Differential constant-current bias resistor
- $R_6, R_7$  : For oscillation suppression and phase compensation applications  
(For use with differential stage applications)
- $R_7, C_4$  : For oscillation suppression and phase compensation applications  
(A Mylar capacitor is recommended for  $C_4$  for use with output stage applications)
- $C_6, C_9$  : For oscillation suppression and phase compensation applications  
Power stage (Must be connected near the pin)  $C_6$ : Positive (+) power  $C_9$ : Negative (-) power
- $C_8$  : For oscillation suppression and phase compensation applications  
(Oscillation suppression before power step clip)
- $C_5$  : For oscillation suppression and distortion improvement applications
- $R_8, C_{10}$  : Ripple filter circuit on positive (+) side.
- $R_9, C_{13}$  : Ripple filter circuit on negative (-) side.
- $C_{11}, C_{12}$  : For oscillation suppression applications
  - Used for reducing power supply impedance to stable IC operation and should be connected near the IC pin. We recommend that you use an electrolytic capacitor.
- $R_{10}$  : Output resistor  
Increases load shorting endurance capacity during times of high output.
- $R_{14}, L_1$  : For oscillation suppression applications  
Increases oscillation stability against capacitance loads.





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