

HYBRID POWER OPERATIONAL AMPLIFIER SI-1050GS

SPECIFICATIONS

Power: Maximum AC power rating is 50W at 1000Hz with a load of 8 ohms and the recommended heat sink and mounting.

When used as a DC amplifier, continuous output current of 1.6A can be obtained.

Response: Flat within 1/2dB from 20Hz to 100,000Hz at voltage gain 31.5dB and output 1W.

Temperature Compensation: An internal compensating diode is used to provide minimum cross-over distortion and protection from thermal runaway.

Voltage Gain: Desired voltage gain can be obtained by changing external resistors.

Heat Sink: Values shown are minimum for a plain white aluminum sheet, 2mm (approximately 1/16 inch) thick, at a 25°C ambient, with reasonable ventilation. A silicone grease such as GE Insulgrease G-640 should be used to provide good thermal contact from base to heat sink. Insulated base plate allows for direct mounting on a heat sink.

Power Supply: Maximum voltage values are absolute maximum. The amplifier can be operated from a single (66V) or split ($\pm 33V$) power supply. A transformer with 10% regulation is recommended to assure the specified short circuit standing times.

Derating: Idling current remains constant at any output power level. When used as an AC amplifier, internal power loss reaches its maximum when the output is 40% of the rated maximum output. In case of DC applications internal power loss increases as output voltage decreases and output current increases.

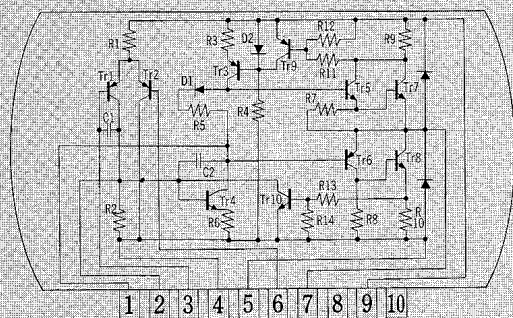
Oscillation: Depending on loads, oscillation may occur.

If oscillation is present, the designated 75V 0.47 μ F capacitor as shown in example circuits should be used.

Current Limiting: Current limiting starts functioning when the load current reaches $7A \pm 0.5A$. When operated with the power supply shown in the exemplified connections and the specified heat sink, the amplifier can withstand repeated output shorts of 10 seconds with AC input and 5 seconds with DC input, provided that the time interval between shorts is sufficient to allow for internal cooling.

Application Considerations: (1) Amplifiers can be damaged by oscillation or overdriving. (2) Do not exceed recommended supply voltage. (3) For transformer-coupling the primary should always be 8 ohms. (4) Amplifier should not be operated without a quick blow fuse or circuit breaker in the power line, especially in +V_{CC} line (5) Both for inverting amplifiers and non-inverting amplifiers, increase capacitance of phase compensating capacitor between terminals 1 and 2 as voltage gain is reduced (6) Provide separate ground connections for input signal and output signal. Use RC network and coil for preventing oscillation as shown in the exemplified circuit because oscillation may occur depending on wiring or when operated with a reactive load. (7) Decrease output or lower supply voltage when the amplifier is operated at frequency over 20,000Hz. (8) With AC input the amplifier must be derated for loads less than 8 ohms. With DC input, use servo motors of less than 15W because of internal power loss of the amplifier and response speed of motors.

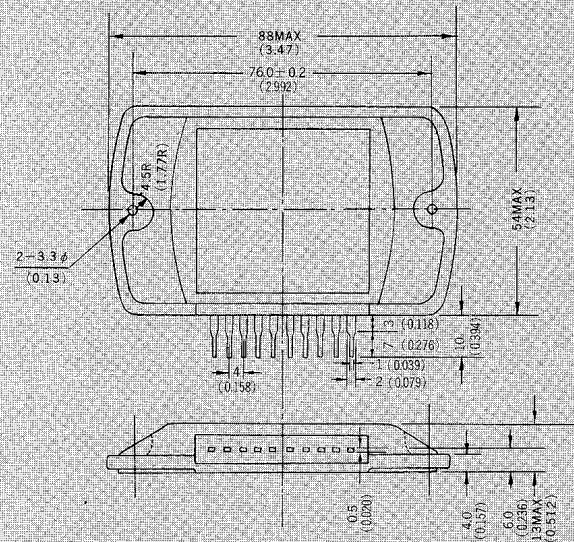
SCHMATIC



TERMINAL ASSIGNMENTS

1. Phase compensation capacitor
2. Phase compensation capacitor
3. Non-inverting input, offset voltage adjustment
4. Power supply (-) or Ground
5. Power supply (-) or Ground
6. Inverting input
7. Output
8. Spare
9. Power supply (+)
10. Spare

OUTLINE DRAWINGS



Dimensions in mm (approx. inch)

ABSOLUTE MAXIMUM RATINGS (Ta : 25°C)

Parameter	Rating	Remarks
Supply Voltage V_{CC}, V_{EE}	$\pm 40V$	
Load Current I_{ODC}	$\pm 7A$	1 sec Max.
Power Dissipation P_{diss}	40W(AC) 30W(DC)	
Differential Mode Input Voltage $DMVin$	$\pm 6V$	
Common Mode Input Voltage $CMVin$	$\pm 32V$	
Operating Temperature T_{op}	$-20^{\circ}C \sim +80^{\circ}C$	
Storage Temperature T_{stg}	$-30^{\circ}C \sim +100^{\circ}C$	

ELECTRICAL CHARACTERISTICS ($V_{CC} : 33V, V_{EE} : -33V, T_a : 25^{\circ}C$)

Parameter	Rating	Remarks
Maximum Output Power P_{omax}	50W	AC input signal
Load Current I_{ODC}	1.64A typ.	
Supply Current I_{CC}	1.64A typ.	
Power Dissipation P_{diss}	28W max.	AC input signal
	20W max.	DC input signal
Input Offset Voltage V_{io}	30mV typ.	
Temperature Coefficient of Input Offset Voltage $\Delta V_{io}/\Delta T$	0.2mV/ $^{\circ}C$ typ.	
Input Offset Current I_{io}	0.5 μA typ.	
Temperature Coefficient of Input Offset Current $\Delta I_{io}/\Delta T$	3nA/ $^{\circ}C$ typ.	
Input Bias Current I_i	3 μA typ.	
Input Impedance Z_{in}	3k Ω typ.	f : 1kHz, Open loop
Common Mode Input Voltage Range $CMVin$	+27V -31V typ.	Voltage follower
Voltage Gain G_v	80dB typ.	f : 1kHz, Open loop
Maximum Output Voltage V_{omax}	$\pm 31V$ typ.	$I_{ODC} : 1.6A$
Output Impedance Z_o	10 Ω typ.	f : 1kHz, Open loop
Common Mode Signal Rejection Ratio $CMRR$	60dB typ.	
Supply Voltage Rejection Ratio $SVRR$	3.0mV/V typ.	$V_{CC}, V_{EE} : \pm 38 \sim \pm 28V$
Slewing Ratio SR	0.2V/ μS typ.	Voltage follower C : 500PF
Idling Current I_d	20mA typ.	
Thermal Resistance θ	1.7 $^{\circ}C/W$	Junction to case