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Operating Characteristics at Ta = 25°C, VCC=13.2V, Rg=600Ω, with 100×100×1.5mm³
Al heat sink, See specified Test Circuit.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiescent current</td>
<td>Ic0</td>
<td></td>
<td>min</td>
<td>75</td>
</tr>
<tr>
<td>Voltage gain</td>
<td>VG</td>
<td></td>
<td>typ</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>max</td>
<td>mA</td>
</tr>
<tr>
<td>Output power</td>
<td>P0</td>
<td>THD=10%, 2 channels</td>
<td>49.5</td>
<td>51.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>53.5</td>
<td>dB</td>
</tr>
<tr>
<td>Total harmonic distortion</td>
<td>THD</td>
<td></td>
<td>5.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Input resistance</td>
<td>r1</td>
<td></td>
<td>0.15</td>
<td>1.0</td>
</tr>
<tr>
<td>Output noise voltage</td>
<td>VNO</td>
<td></td>
<td>30</td>
<td>kΩ</td>
</tr>
<tr>
<td>Rg=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rg=10kΩ</td>
<td></td>
<td></td>
<td>0.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Ripple rejection</td>
<td>Rr</td>
<td></td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Channel separation</td>
<td>Ch sep</td>
<td>Rg=10kΩ, Vg=0dBm</td>
<td>48</td>
<td>dB</td>
</tr>
</tbody>
</table>

Equivalent Circuit Block Diagram

Sample Application Circuit
Proper Cares in Mounting Radiator Fin

1. The mounting torque is in the range of 39 to 59 N·cm.

2. The distance between screw holes of the radiator fin must coincide with the distance between screw holes of the IC. With case outline dimensions L and R referred to, the screws must be tightened with the distance between them as close to each other as possible.

3. The screw to be used must have a head equivalent to the one of truss machine screw or binder machine screw defined by JIS. Washers must be also used to protect the IC case.

4. No foreign matter such as cutting particles shall exist between heat sink and radiator fin. When applying grease on the junction surface, it must be applied uniformly on the whole surface.

5. IC lead pins are soldered to the printed circuit board after the radiator fin is mounted on the IC.
**Description of External Parts**

- C1 (C2) : Feedback capacitor
  
  Low cutoff frequency $f_L$ depends on this feedback capacitor. Increasing the capacitor value makes the starting time later.

- C3 (C4) : Bootstrap capacitor
  
  If the capacitor value is decreased, the output at low frequencies goes lower.
  
  (Recommended value : 47μF min.)

- C5 (C6) : Oscillation blocking capacitor
  
  Polyester film capacitor, being excellent in temperature characteristic, frequency characteristic, is recommended. The capacitor value can be reduced to 0.047μF depending on the stability of the board.

- C7 (C8) : Output capacitor
  
  The low cutoff frequency depends on this output capacitor. In bridge connection applications the output capacitor must be normally connected.

- C9 : Decoupling capacitor
  
  Used for the ripple filter. Since the rejection effect is saturated at a certain capacitor value, it is meaningless to increase the capacitor value more than needed. This capacitor, being also used for the time constant of the pop noise preventer, affects the starting time. Too small a capacitor value makes the pop noise level higher.

- C10 : Power source capacitor.

- R1 (R2) : Oscillation blocking filter resistor.

**IC Application**

1. V.G. can be reduced by connecting $R_{NF'}$ to the N.F. pin (pins 1, 6)

   V.G. is calculated by the following formula.

   $$ V_G = 20\log \left( \frac{R_f}{R_{NF}+R_{NF'}} \right) $$

   where $R_f=20k\Omega$, $R_{NF}=50\Omega$

   The usable lower limit of $V_G$ is 36dB or thereabouts. When setting $V_G$, oscillation and high cutoff frequency $f_H$ must be considered.

2. External audio muting method

   ![Diagram](image)

**Proper Cares in Using IC**

- If the IC is used in the vicinity of the maximum rating, even a slight variation in conditions may cause the maximum rating to be exceeded, thereby leading to breakdown. Allow an ample margin of variation for supply voltage, etc. and use the IC in the range where the maximum ratings is not exceeded.

- Printed circuit board

  When making the board, refer to the sample printed circuit pattern. No feedback loop must be formed between input and output. Both Pins GND and Power GND must be shorted at the root of IC pin so that the common impedance can be reduced.

- Others

  The radiator fin on the package must be normally connected to GND.

  Some plug jacks to be used for connecting to the external speaker are such that both poles are shorted once when connecting. In this case, the load is shorted, which may break down the IC.
Sample Application Circuit: Bridge connection application
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