DUAL AUDIO POWER AMPLIFIER

The KIA8200AH is dual audio power amplifier for consumer applications.

This IC provides an output power of 13 watts per channel (at VCC=28V, f=1kHz, THD=10%, RL=8Ω.)

It is suitable for power amplifier of TV and home stereo.

FEATURES

- High Output Power
  : POUT=13W/channel(Typ.)
  : (Vcc=28V, RL=8Ω, f=1kHz, THD=10%)

- Low Noise
  : VNO=0.14mVrms(Typ.)
  : (Vcc=28V, RL=8Ω, G=34dB, RG=10kΩ, BW=20Hz~20kHz)

- Very Few External Parts.
- Built-in Audio Muting Circuit.
- Built-in Thermal Shut Down Protector Circuit.
- Operating Supply Voltage. : VCC(opr)=10~37V(Ta=25°C)

MAXIMUM RATINGS (Ta=25°C)

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>SYMBOL</th>
<th>RATING</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>VCC</td>
<td>37</td>
<td>V</td>
</tr>
<tr>
<td>Output Current (Peak/Ch)</td>
<td>I0 (peak)</td>
<td>2.5</td>
<td>A</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>PD</td>
<td>25</td>
<td>W</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>TOSR</td>
<td>-20~75</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>TSS</td>
<td>-55~150</td>
<td>°C</td>
</tr>
</tbody>
</table>

*: Derated above Ta=25°C in the proportion of 200mW/°C for KIA8200AH

BLOCK DIAGRAM
**ELECTRICAL CHARACTERISTICS**

(Unless otherwise specified, Vcc=28V, RL=8Ω, f=1kHz, Ta=25℃)

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>SYMBOL</th>
<th>TEST CIRCUIT</th>
<th>TEST CONDITION</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiescent Current</td>
<td>IccQ</td>
<td></td>
<td>VRL=0</td>
<td>–</td>
<td>50</td>
<td>105</td>
<td>mA</td>
</tr>
<tr>
<td>Output Power</td>
<td>POUT(1)</td>
<td></td>
<td>THD=10%</td>
<td>10</td>
<td>13</td>
<td>–</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>POUT(2)</td>
<td></td>
<td>THD=1%</td>
<td>–</td>
<td>10</td>
<td>–</td>
<td>W</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>THD</td>
<td></td>
<td>POUT=2W</td>
<td>–</td>
<td>0.04</td>
<td>0.2</td>
<td>%</td>
</tr>
<tr>
<td>Voltage Gain</td>
<td>GV</td>
<td></td>
<td>VOUT=0.775Vrms (0dBm)</td>
<td>32.5</td>
<td>34.0</td>
<td>35.5</td>
<td>dB</td>
</tr>
<tr>
<td>Input Resistance</td>
<td>RIN</td>
<td></td>
<td>–</td>
<td>–</td>
<td>30</td>
<td>–</td>
<td>kΩ</td>
</tr>
<tr>
<td>Ripple Rejection Ratio</td>
<td>RR</td>
<td></td>
<td>Rg=0, Rx=100Ω, Vmax=0.775Vrms (0dBm)</td>
<td>–40</td>
<td>–50</td>
<td>–</td>
<td>dB</td>
</tr>
<tr>
<td>Output Noise Voltage</td>
<td>VNO</td>
<td></td>
<td>Rg=10Ω, BW=20Hz~20kHz</td>
<td>–</td>
<td>0.14</td>
<td>0.3</td>
<td>mV rms</td>
</tr>
<tr>
<td>Cross Talk.</td>
<td>C.T</td>
<td></td>
<td>Rg=7.775Vrms (0dBm)</td>
<td>–</td>
<td>–70</td>
<td>–</td>
<td>dB</td>
</tr>
<tr>
<td>Muting Threshold Voltage</td>
<td>VTH</td>
<td></td>
<td>–</td>
<td>2.6</td>
<td>2.8</td>
<td>–</td>
<td>V</td>
</tr>
</tbody>
</table>

**TYP. DC VOLTAGE OF EACH TERMINAL** (Vcc=28V, Ta=25℃)

<table>
<thead>
<tr>
<th>TERMINAL No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Voltage(V)</td>
<td>1.6</td>
<td>20m</td>
<td>GND</td>
<td>20m</td>
<td>1.6</td>
<td>9.4</td>
<td>13.0</td>
<td>5.0</td>
<td>Vcc</td>
<td>GND</td>
<td>2.8</td>
<td>13.0</td>
</tr>
</tbody>
</table>

**TEST CIRCUIT**

(*1) Mute on at #1 pin low
VTH=2.8V(Typ.), VCC=28V, Ta=25℃
(*2) The capacitor for reducing POP noise at mute ON.
APPLICATION INFORMATION

(1) Voltage Gain
The closed loop voltage gain is determined by $R_1$, $R_2$

$$G_V = 20 \log \frac{R_1 + R_2}{R_2} \text{ (dB)}$$
$$= 20 \log \frac{20k\Omega + 400\Omega}{400\Omega} = 34\text{dB}$$

(2) Amplifier with gain<34dB

$$G_V = 20 \log \frac{R_1 + R_2 + R_3}{R_2 + R_3} \text{ (dB)}$$

When $R_2=220\Omega$

$G_V \approx 30\text{dB}$

is given.
Muting

(1) Audio muting

This IC is possible to make audio muting operation by using 8pin muting terminal.
In Fig.3, the equivalent circuit in the muting circuit section is shown.
By means of reducing the voltage of 8pin down to 2.8V or less in Fig.3, Q1 is turned ON
and the base voltage of Q2 in the differential circuit fabricated with Q3 and Q4.
Therefore, with the voltage reduction of 8pin, the input circuits of dummy of input terminal
and that in the dotted line operate and cut-off the input signal.
After muting, the bias circuit continues ist operation and the power supply current of quiescent
time.
8pin, the capacitor terminal for reducing the pop noise can reduce the pop noise through making
the time constant longer by means of inserting the capacitor externary.
In the case this terminal is not used, short 8pin with 8pin.
The voltage of 8pin set up to 4V or more.

(2) IC internal muting at VCC OFF

When VCC=8V or less at VCC off, the detection circuit at VCC off is operated. And the base
voltage of Q1 is reduced and the muting operation is mode.

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Fig. 3
(3) Standard PCB KIA8200AH

(BOTTOM VIEW)