The TA8262H is a 4 ch BTL audio power amplifier for car audio application.
This IC can generate more high power: \( P_{\text{OUT MAX}} = 43 \, \text{W} \) as it includes the pure complementary PNP and NPN transistor output stage.
It is designed with low distortion ratio for 4 ch BTL audio power amplifier, built-in Stand-by Function, Muting Function, Clip detector, and diagnosis circuit.
Additionally, the AUX. amplifier is built-in, it can make the beep signal etc. output to 2 channels (OUT1 and 4).
It contains various kind of protectors for car audio use.

**Features**

- **High power**
  \( P_{\text{OUT MAX}} (1) = 43 \, \text{W (typ.)} \)
  \( (V_{CC} = 14.4 \, \text{V}, \text{JEITA max}, R_L = 4 \, \Omega) \)
  \( P_{\text{OUT MAX}} (2) = 40 \, \text{W (typ.)} \)
  \( (V_{CC} = 13.7 \, \text{V}, \text{JEITA max}, R_L = 4 \, \Omega) \)
  \( P_{\text{OUT}} (1) = 28 \, \text{W (typ.)} \)
  \( (V_{CC} = 14.4 \, \text{V}, f = 1 \, \text{kHz, THD} = 10\%, R_L = 4 \, \Omega) \)
  \( P_{\text{OUT}} (2) = 24 \, \text{W (typ.)} \)
  \( (V_{CC} = 13.2 \, \text{V, f = 1 kHz, THD = 10\%, R_L = 4 \, \Omega}) \)
- **Built-in clip detector & diagnosis circuit. (pin 25)**
- **Low distortion ratio**
  \( \text{THD} = 0.02\% \) (typ.)
  \( (V_{CC} = 13.2 \, \text{V, f = 1 kHz, P_{OUT} = 5 \, W, R_L = 4 \, \Omega}) \)
- **Low noise**
  \( V_{NO} = 0.10 \, \text{mVRms (typ.)} \)
  \( (V_{CC} = 13.2 \, \text{V, R}_{\text{g}} = 0 \, \Omega, G_{V} = 26\text{dB, BW} = 20 \, \text{Hz-20 kHz}) \)
- **Built-in stand-by switch function (pin 2)**
- **Built-in muting function (pin 24)**
- **Built-in AUX. amplifier from single input (pin 16) to 2 channels output : OUT1 and 4**
- **Built-in various protection circuit**
  \( \text{Thermal shut down, over voltage, out to GND, out to VCC, out to out short} \)
- **Operating supply voltage**
  \( V_{CC \text{ (opr)}} = 9-18 \, \text{V} \)
Caution and Application Method (description is made only on the single channel)

1. Voltage gain adjustment

This IC has no NF (negative feedback) terminals. Therefore, the voltage gain can't adjusted, but it makes the device a space and total costs saver.

![Block diagram](image)

**Figure 1  Block diagram**

The voltage gain of Amp. 1 : $G_{V1} = 0\text{dB}$
The voltage gain of Amp. 2A, B : $G_{V2} = 20\text{dB}$
The voltage gain of BTL Connection : $G_{V (BTL)} = 6\text{dB}$

Therefore, the total voltage gain is decided by expression below.

$$G_{V} = G_{V1} + G_{V2} + G_{V (BTL)} = 0 + 20 + 6 = 26\text{dB}$$
2. **Stand-by SW function (pin 2)**

By means of controlling pin 2 (Stand-by terminal) to High and Low, the power supply can be set to ON and OFF.

The threshold voltage of pin 2 is set at about $3 \text{ V}_{\text{BE}}$ (typ.), and the Power Supply current is about 2 $\mu$A (typ.) at the stand-by state.

### Control voltage of pin 2: $V_{(SB)}$

<table>
<thead>
<tr>
<th>Stand-By</th>
<th>Power</th>
<th>$V_{(SB)}$ (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>OFF</td>
<td>0–1.5</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>3–$V_{CC}$</td>
</tr>
</tbody>
</table>

Adjustage of stand-by SW

1. Since $V_{CC}$ can directly be controlled to ON or OFF by the microcomputer, the switching relay can be omitted.
2. Since the control current is microscopic, the switching relay of small current capacity is satisfactory for switching.

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**Figure 2** With pin 2 set to High, power is turned ON

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**Figure 3**
3. Muting function (pin 24)

By means of controlling pin 24 less than 0.5 V, it can make the audio muting condition.
The muting time constant is decided by $R_1$ and $C_4$ and these parts is related the pop noise at power ON/OFF.
The series resistance: $R_1$ must be set up less than 15 kΩ, we recommend 10 kΩ.
The muting function have to be controlled by a transistor, FET and µ-COM port which has $I_{MUTE} \geq 250 \mu A$ ability.
Terminal 24 must not be pulled up and it shall be controlled by OPEN/LOW.

![Muting function](image)

**Figure 4** Muting function

**Figure 5** Mute attenuation–$V_{mute}$ (V)

4. AUX. input (pin 16)

The pin 16 is for input terminal of AUX. amplifier.
The total gain is 0dB by using of AUX. amplifier.
Therefore, the µ-COM can directly drive the AUX. amplifier.
BEEP sound or voice synthesizer signal can be input to pin 16 directly.

![AUX input](image)

**Figure 6** AUX input
5. Diagnosis output (pin 25)

The diagnosis output terminal of pin 25 has open collector output structure on chip as shown in Figure 7. In unusual case that output terminal of Power Amp. is condition of output to VCC or output to GND short and over voltage input mode, it is possible to protect all the system of apparatus as well as power IC protection.

In case of being unused this function, use this IC as open-connection on pin 25.

(Application)

Figure 7
6. Output clip detection function (pin 25)

The output clip detection terminal of pin 25 has the open collector output structure on chip as shown in Figure 8. In case that the output waveform is clipping, the clip detection circuit is operated and NPN Tr. is turned on.

It is possible to improve the audio quality with controlling the volume, tone control circuit through L.P.F. smoothing circuit as shown in Figure 8.

In case of being unused this function, use this IC as open connection on pin 25.

(Appli cation)

![Figure 8](image)

Figure 8

(A) Output (AC waveform)

(B) Clip detector circuit (internal)

(C) Clip DET. terminal (pin 25)

![Figure 9](image)

Figure 9
7. Cross talk

The cross talk characteristics of the IC is not good between OUT1 and 2, OUT3 and 4. So we recommend to use by below method.

<table>
<thead>
<tr>
<th>OUT1, 2</th>
<th>L-ch (or R-ch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUT3, 4</td>
<td>R-ch (or L-ch)</td>
</tr>
</tbody>
</table>

And, please refer to below table in case of applying the AUX. IN because it is out to OUT1 and 4.

ex) in case of the Signal from AUX. IN to front speakers.

<table>
<thead>
<tr>
<th>OUT1</th>
<th>Front</th>
<th>L-ch (or R-ch)</th>
<th>AUX. OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUT2</td>
<td>Rear</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>OUT3</td>
<td>Rear</td>
<td>R-ch (or L-ch)</td>
<td>—</td>
</tr>
<tr>
<td>OUT4</td>
<td>Front</td>
<td></td>
<td>AUX. OUT</td>
</tr>
</tbody>
</table>
### Maximum Ratings (Ta = 25°C)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak supply voltage (0.2 s)</td>
<td>$V_{CC\text{ (surge)}}$</td>
<td>50</td>
<td>V</td>
</tr>
<tr>
<td>DC supply voltage</td>
<td>$V_{CC\text{ (DC)}}$</td>
<td>25</td>
<td>V</td>
</tr>
<tr>
<td>Operating supply voltage</td>
<td>$V_{CC\text{ (opr)}}$</td>
<td>18</td>
<td>V</td>
</tr>
<tr>
<td>Output current (peak)</td>
<td>$I_{O\text{ (peak)}}$</td>
<td>9</td>
<td>A</td>
</tr>
<tr>
<td>Power dissipation</td>
<td>$P_D\text{ (Note 1)}$</td>
<td>250</td>
<td>W</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>$T_{opr}$</td>
<td>−40~−85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>$T_{stg}$</td>
<td>−55~150</td>
<td>°C</td>
</tr>
</tbody>
</table>

Note 1: Package thermal resistance $\theta_{j-T} = 0.5^\circ\text{CW}$ (typ.)
(Ta = 25°C, with infinite heat sink)

### Electrical Characteristics
(unless otherwise specified, $V_{CC} = 13.2\ \text{V}, f = 1\ \text{kHz}, R_L = 4\ \Omega, Ta = 25^\circ\text{C}$)

<table>
<thead>
<tr>
<th>Characteristics</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>$I_{CCQ}$</td>
<td>—</td>
<td>$V_{IN} = 0$</td>
<td>—</td>
<td>200</td>
<td>400</td>
<td>mA</td>
</tr>
<tr>
<td>Output power</td>
<td>$P_{OUT\text{ MAX (1)}}$</td>
<td>—</td>
<td>$V_{CC} = 14.4\ \text{V, MAX power}$</td>
<td>—</td>
<td>43</td>
<td>—</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>$P_{OUT\text{ MAX (2)}}$</td>
<td>—</td>
<td>$V_{CC} = 13.7\ \text{V, MAX power}$</td>
<td>—</td>
<td>40</td>
<td>—</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>$P_{OUT\text{ (1)}}$</td>
<td>—</td>
<td>$V_{CC} = 14.4\ \text{V, THD = 10%}$</td>
<td>—</td>
<td>28</td>
<td>—</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>$P_{OUT\text{ (2)}}$</td>
<td>—</td>
<td>THD = 10%</td>
<td>22</td>
<td>24</td>
<td>—</td>
<td>W</td>
</tr>
<tr>
<td>Total harmonic distortion</td>
<td>THD</td>
<td>—</td>
<td>$P_{OUT} = 5\ \text{W}$</td>
<td>—</td>
<td>0.02</td>
<td>0.2</td>
<td>%</td>
</tr>
<tr>
<td>Voltage gain</td>
<td>$G_V$</td>
<td>—</td>
<td>$V_{OUT} = 0.775\ \text{Vrms (0dBm)}$</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>dB</td>
</tr>
<tr>
<td>Voltage gain ratio</td>
<td>$\Delta G_V$</td>
<td>—</td>
<td>$V_{OUT} = 0.775\ \text{Vrms (0dBm)}$</td>
<td>−1.0</td>
<td>0</td>
<td>1.0</td>
<td>dB</td>
</tr>
<tr>
<td>Output noise voltage</td>
<td>$V_{NO\text{ (1)}}$</td>
<td>—</td>
<td>$R_g = 0\ \Omega, \text{DIN45405}$</td>
<td>—</td>
<td>0.12</td>
<td>—</td>
<td>mVrms</td>
</tr>
<tr>
<td></td>
<td>$V_{NO\text{ (2)}}$</td>
<td>—</td>
<td>$R_g = 0\ \Omega, \text{BW = 20 Hz~20 kHz}$</td>
<td>—</td>
<td>0.10</td>
<td>0.35</td>
<td>mVrms</td>
</tr>
<tr>
<td>Ripple rejection ratio</td>
<td>R.R.</td>
<td>—</td>
<td>$f_{rip} = 100\ \text{Hz}, R_g = 620\ \Omega, V_{rip} = 0.775\ \text{Vrms (0dBm)}$</td>
<td>40</td>
<td>50</td>
<td>—</td>
<td>dB</td>
</tr>
<tr>
<td>Cross talk</td>
<td>C.T.</td>
<td>—</td>
<td>$R_g = 620\ \Omega, V_{OUT} = 0.775\ \text{Vrms (0dBm)}$</td>
<td>—</td>
<td>65</td>
<td>—</td>
<td>dB</td>
</tr>
<tr>
<td>Output offset voltage</td>
<td>$V_{OFFSET}$</td>
<td>—</td>
<td>—</td>
<td>−100</td>
<td>0</td>
<td>100</td>
<td>mV</td>
</tr>
<tr>
<td>Input resistance</td>
<td>$R_{IN}$</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>90</td>
<td>—</td>
<td>kΩ</td>
</tr>
<tr>
<td>Stand-by current</td>
<td>$I_{SB}$</td>
<td>—</td>
<td>Stand-by condition</td>
<td>—</td>
<td>2</td>
<td>10</td>
<td>µA</td>
</tr>
<tr>
<td>Stand-by control voltage</td>
<td>$V_{SB\text{ H}}$</td>
<td>—</td>
<td>Power: on</td>
<td>3.0</td>
<td>—</td>
<td>$V_{CC}$</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>$V_{SB\text{ L}}$</td>
<td>—</td>
<td>Power: off</td>
<td>0</td>
<td>—</td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td>Mute control voltage (Note 2)</td>
<td>$V_{M\text{ H}}$</td>
<td>—</td>
<td>Mute: off</td>
<td>—</td>
<td>OPEN</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>$V_{M\text{ L}}$</td>
<td>—</td>
<td>Mute: on, $R_1 = 10\ \text{kΩ}$</td>
<td>—</td>
<td>0</td>
<td>—</td>
<td>0.5</td>
</tr>
<tr>
<td>Mute attenuation</td>
<td>ATT M</td>
<td>—</td>
<td>Mute: on, $V_{OUT} = 7.75\ \text{Vrms (20dBm)}$ at Mute: off.</td>
<td>80</td>
<td>90</td>
<td>—</td>
<td>dB</td>
</tr>
</tbody>
</table>

Note 2: Muting function have to be controlled by open and Low Logic, which Logic is a transistor, FET and µ-COM port of $I_{MUTE} \geq 250\ \mu\text{A}$ ability.
This means that the Mute control terminal: pin 24 must not be pulled-up.
Test Circuit
Package Dimensions

HZIP25-P-1.27E

Unit: mm

Weight: 9.8 g (typ.)
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