TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

# T A 8 2 7 7 H

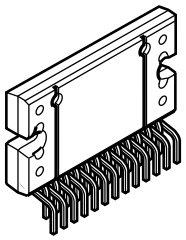
Max Power 43 W BTL × 4 ch Audio Power IC

The TA8277H is 4 ch BTL audio power amplifier for car audio application.

This IC can generate more high power: $P_{OUT}MAX$ = 43 W as it is included the pure complementary PNP and NPN transistor output stage.

It is designed low distortion ratio for 4 ch BTL audio power amplifier, built-in stand-by function and muting function.

Additionally, the AUX amplifier and various kind of protector for car audio use is built-in.



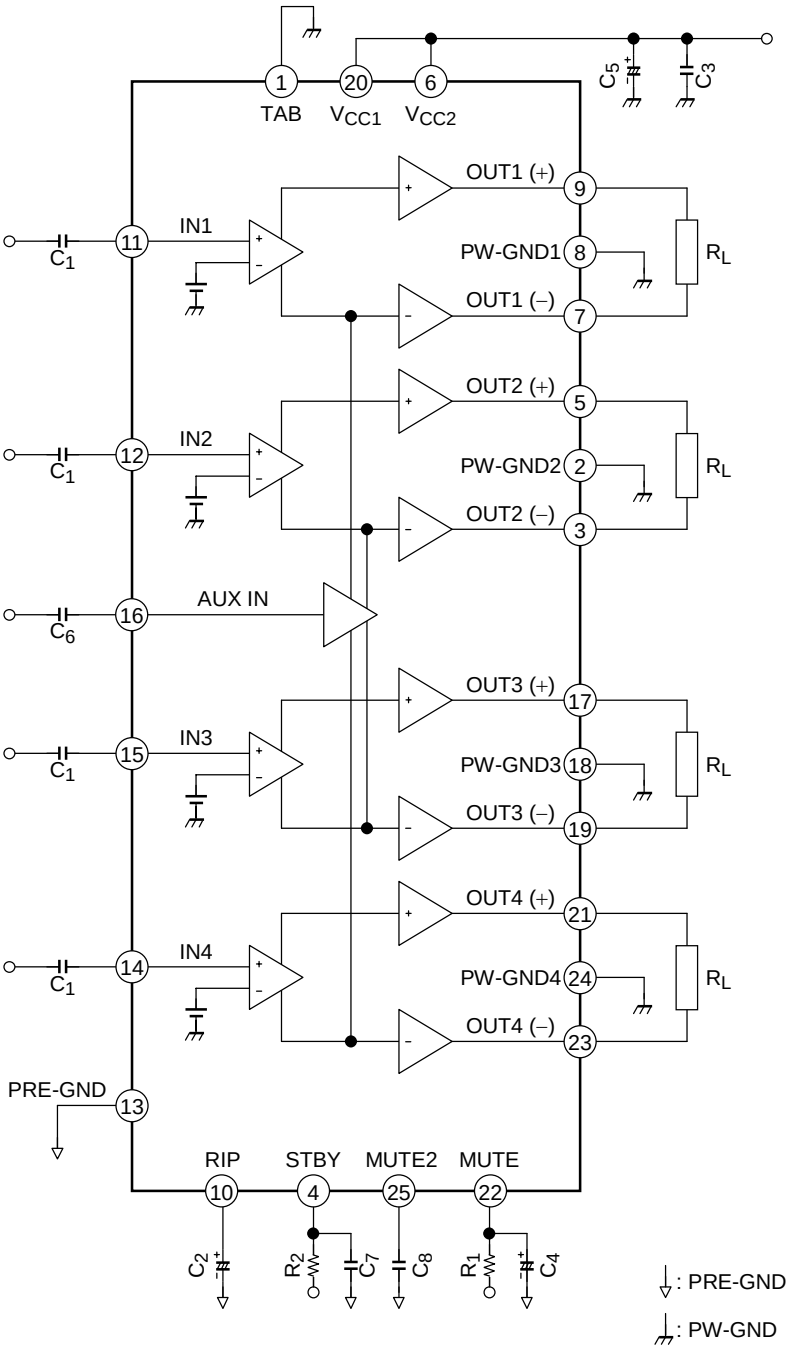
HZIP25-P-1.00F

Weight: 7.7 g (typ.)

## Features

- High power : $P_{OUT}MAX$ (1) = 43 W (typ.)
  ($V_{CC}$ = 14.4 V, f = 1 kHz, EIAJ max, $R_L$ = 4 Ω)
  : $P_{OUT}MAX$ (2) = 40 W (typ.)
  ($V_{CC}$ = 13.7 V, f = 1 kHz, EIAJ max, $R_L$ = 4 Ω)
  : $P_{OUT}$ (1) = 28 W (typ.)
  ($V_{CC}$ = 14.4 V, f = 1 kHz, THD = 10%, $R_L$ = 4 Ω)
  : $P_{OUT}$ (2) = 24 W (typ.)
  ($V_{CC}$ = 13.2 V, f = 1 kHz, THD = 10%, $R_L$ = 4 Ω)
- Low distortion ratio: THD = 0.02% (typ.)
  ($V_{CC}$ = 13.2 V, f = 1 kHz, $P_{OUT}$ = 5 W, $R_L$ = 4 Ω)
- Low noise: $V_{NO}$ = 0.10 $mV_{rms}$ (typ.)
  ($V_{CC}$ = 13.2 V, $R_g$ = 0 Ω, $G_V$ = 26dB, BW = 20 Hz~20 kHz)
- Built-in stand-by switch function (pin 4)
- Built-in muting function (pin 22)
- Built-in AUX amplifier from single input to 4 channels output (pin 16)
- Built-in various protection circuit
  : Thermal shut down, over voltage, out to GND, out to $V_{CC}$, out to out short
- Operating supply voltage: $V_{CC\ (opr)}$ = 9~18 V

## Block Diagram



## Maximum Ratings (Ta = 25°C)

| Characteristics | Symbol | Rating | Unit |
|---|---|---|---|
| Peak supply voltage (0.2 s) | $V_{CC\ (surge)}$ | 50 | V |
| DC supply voltage | $V_{CC\ (DC)}$ | 25 | V |
| Operation supply voltage | $V_{CC\ (opr)}$ | 18 | V |
| Output current (peak) | $I_{O\ (peak)}$ | 9 | A |
| Power dissipation | $P_D$ (Note1) | 125 | W |
| Operation temperature | $T_{opr}$ | −40~85 | °C |
| Storage temperature | $T_{stg}$ | −55~150 | °C |

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

## Electrical Characteristics
## (unless otherwise specified, $V_{CC}$ = 13.2 V, f = 1 kHz, $R_L$ = 4 Ω, Ta = 25°C)

| Characteristics | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Quiescent current | $I_{CCQ}$ | — | $V_{IN}$ = 0 | — | 200 | 400 | mA |
| Output power | $P_{OUT}$ MAX (1) | — | $V_{CC}$ = 14.4 V, max Power | — | 43 | — | W |
| | $P_{OUT}$ MAX (2) | — | $V_{CC}$ = 13.7 V, max Power | — | 40 | — | |
| | $P_{OUT}$ (1) | — | $V_{CC}$ = 14.4 V, THD = 10% | — | 28 | — | |
| | $P_{OUT}$ (2) | — | THD = 10% | 22 | 24 | — | |
| Total harmonic distortion | THD | — | $P_{OUT}$ = 5 W | — | 0.02 | 0.2 | % |
| Voltage gain | $G_V$ | — | $V_{OUT}$ = 0.775 Vrms (0dBm) | 24 | 26 | 28 | dB |
| Voltage gain ratio | $\Delta G_V$ | — | $V_{OUT}$ = 0.775 Vrms (0dBm) | −1.0 | 0 | 1.0 | |
| Output noise voltage | $V_{NO}$ (1) | — | Rg = 0 Ω, DIN45405 | — | 0.12 | — | mVrms |
| | $V_{NO}$ (2) | — | Rg = 0 Ω, BW = 20 Hz~20 kHz | — | 0.10 | 0.35 | |
| Ripple rejection ratio | R.R. | — | $f_{rip}$ = 100 Hz, Rg = 620 Ω<br>$V_{rip}$ = 0.775 Vrms (0dBm) | 40 | 50 | — | dB |
| Cross talk | C.T. | — | Rg = 620 Ω<br>$V_{OUT}$ = 0.775 Vrms (0dBm) | — | 65 | — | dB |
| Output offset voltage | $V_{OFFSET}$ | — | — | −150 | 0 | +150 | mV |
| Input resistance | $R_{IN}$ | — | — | — | 90 | — | kΩ |
| Stand-by current | $I_{SB}$ | — | Stand-by condition | — | 2 | 10 | μA |
| Stand-by control voltage | $V_{SB}$ H | — | Power: ON | 3.0 | — | $V_{CC}$ | V |
| | $V_{SB}$ L | — | Power: OFF | 0 | — | 1.5 | |
| Mute control voltage (Note2) | $V_M$ H | — | Mute: OFF | Open | | | — |
| | $V_M$ L | — | Mute: ON, $R_1$ = 10 kΩ | 0 | — | 0.5 | V |
| Mute attenuation | ATT M | — | Mute: ON,<br>$V_{OUT}$ = 7.75 Vrms (20dBm) at Mute: OFF. | 80 | 90 | — | dB |

Note 2: Muting function have to be controlled by open and low logic, which logic is a transistor, FET and μ-COM port of $I_{MUTE}$ > 50 μA ability.
This means than the mute control terminal : pin 22 must not be pulled-up.

**Test Circuit**