



## TDA8496

### LINEAR INTEGRATED CIRCUIT

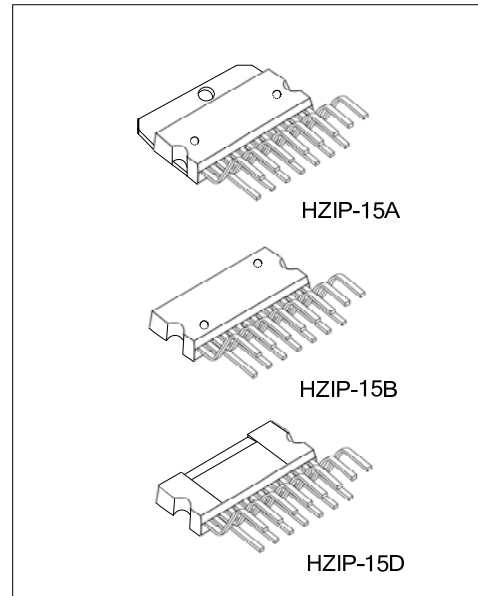
## 5W+5W AMPLIFIER WITH DC VOLUME CONTROL

### DESCRIPTION

The UTC **TDA8496** is a stereo 5+5W class AB power amplifier with mute and dc volume control, assembled in the HZIP-15A/B/D package. It is designed for high quality sound, LCD TV or LCD Monitor applications.

### FEATURES

- \* 5+5w output power @  $V_{CC}=22V$ ;  $R_L=8\Omega$
- \* Low turn-on turn-off pop noise
- \* Low external components
- \* Short circuit & thermal overload protection
- \* Linear volume control by DC voltage
- \* Soft clipping
- \* Internally fixed gain
- \* St-by and mute functions

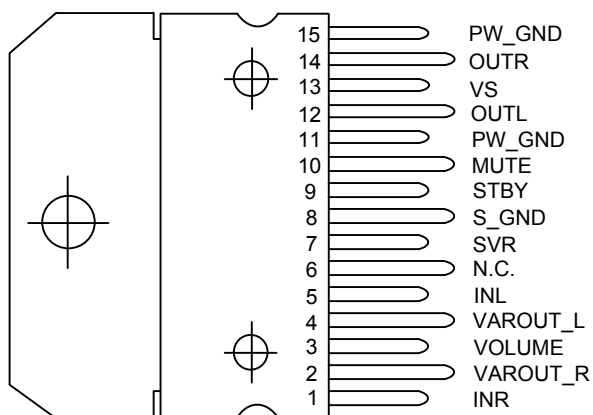


### ORDERING INFORMATION

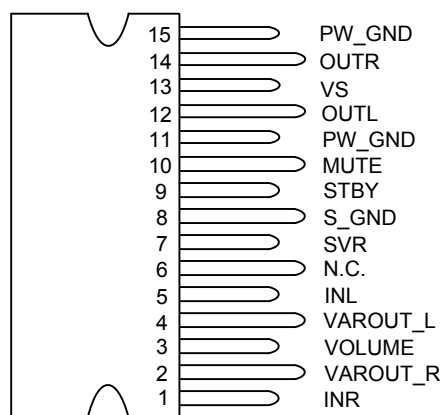
| Ordering Number |                  |                  | Package  | Packing |
|-----------------|------------------|------------------|----------|---------|
| Normal          | Lead Free        | Halogen Free     |          |         |
| TDA8496-J15-A-T | TDA8496L-J15-A-T | TDA8496G-J15-A-T | HZIP-15A | Tube    |
| TDA8496-J15-B-T | TDA8496L-J15-B-T | TDA8496G-J15-B-T | HZIP-15B | Tube    |
| TDA8496-J15-D-T | TDA8496L-J15-D-T | TDA8496G-J15-D-T | HZIP-15D | Tube    |

|                                                                                        |  |                                                                                                                                   |
|----------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------|
| <p>TDA8496L-J15-A-T</p> <p>(1) Packing Type<br/>(2) Package Type<br/>(3) Lead Free</p> |  | <p>(1) T: Tube<br/>(2) J15-A:HZIP-15A, J15-B:HZIP-15B,<br/>J15-D:HZIP-15D<br/>(3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p> |
|----------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------|

### PIN DESCRIPTION (TOP VIEW)

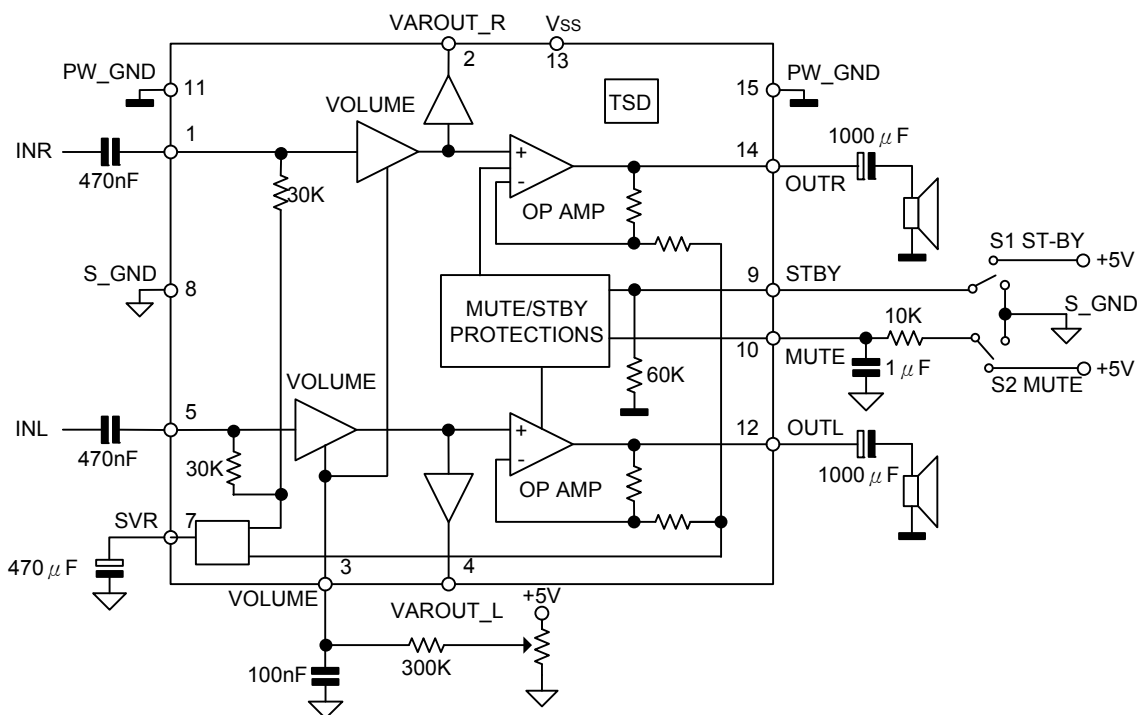


HZIP-15A



HZIP-15B/HZIP-15D

### BLOCK DIAGRAM



## ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER                                    |                   | SYMBOL        | RATINGS    | UNIT             |
|----------------------------------------------|-------------------|---------------|------------|------------------|
| DC Supply voltage                            |                   | $V_{SS}$      | 35         | V                |
| Maximum Input Voltage                        |                   | $V_{IN(MAX)}$ | 8          | $V_{PP}$         |
| Volume Control DC Voltage                    |                   | $V_3$         | 7          | V                |
| Power Dissipation ( $T_A=80^\circ\text{C}$ ) | HZIP-15A/HZIP-15B | $P_D$         | 15         | W                |
|                                              | HZIP-15D          |               | 12.5       |                  |
| Junction Temperature                         |                   | $T_J$         | +150       | $^\circ\text{C}$ |
| Ambient Operating Temperature                |                   | $T_{OPR}$     | 0 ~ +70    | $^\circ\text{C}$ |
| Storage Temperature                          |                   | $T_{STG}$     | -40 ~ +150 | $^\circ\text{C}$ |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ THERMAL DATA

| PARAMETER           |                   | SYMBOL        | RATINGS | UNIT               |
|---------------------|-------------------|---------------|---------|--------------------|
| Junction to Ambient | HZIP-15A/HZIP-15B | $\theta_{JA}$ | 35      | $^\circ\text{C/W}$ |
|                     | HZIP-15D          |               | 46      |                    |
| Junction to Case    | HZIP-15A/HZIP-15B | $\theta_{JC}$ | 4.6     | $^\circ\text{C/W}$ |
|                     | HZIP-15D          |               | 5.0     |                    |

■ ELECTRICAL CHARACTERISTICS (refer to the test circuit  $V_{SS}=22\text{V}$ ,  $R_L=8\Omega$ ,  $R_G=50\Omega$ ,  $T_A=25^\circ\text{C}$ )

| PARAMETER                                  | SYMBOL         | TEST CONDITIONS                                                      | MIN                   | TYP | MAX  | UNIT             |
|--------------------------------------------|----------------|----------------------------------------------------------------------|-----------------------|-----|------|------------------|
| Supply Voltage Range                       | $V_{SS}$       |                                                                      | 10                    |     | 32   | V                |
| Output DC Offset Referred to SVR Potential | $V_{OUT(OFF)}$ | No Input Signal                                                      |                       | 200 |      | mV               |
| Quiescent Output Voltage                   | $V_{Q(OUT)}$   |                                                                      |                       | 11  |      | V                |
| Output Power                               | $P_{OUT}$      | THD = 10%, $R_L = 8\Omega$                                           | 5                     | 5.5 |      | W                |
|                                            |                | THD = 1%, $R_L = 8\Omega$                                            |                       | 4   |      |                  |
|                                            |                | THD = 10%, $R_L = 4\Omega$ , $V_{SS} = 12\text{V}$                   |                       | 2.1 |      | W                |
|                                            |                | THD = 1%, $R_L = 4\Omega$ , $V_{SS} = 12\text{V}$                    |                       | 1.0 |      |                  |
| Total Harmonic Distortion                  | THD            | $G_V = 30\text{dB}$ , $P_{OUT} = 1\text{W}$ , $f = 1\text{KHz}$      |                       |     | 0.4  | %                |
| Total Quiescent Current                    | $I_Q$          |                                                                      |                       | 25  | 50   | mA               |
| Output Peak Current                        | $I_{PEAK}$     | (internally limited)                                                 | 1.0                   | 1.3 |      | A                |
| Input Signal                               | $V_{IN}$       |                                                                      |                       |     | 2.8  | Vrms             |
| Closed Loop Gain                           | $G_V$          | $V_{O(L\text{ CTRL})} > 4.5\text{V}$                                 | 28.5                  | 30  | 31.5 | dB               |
| Monitor Out Gain                           | $G_{V(LINE)}$  | $V_{O(L\text{ CTRL})} > 4.5\text{V}$ , $Z_{LOAD} > 30\text{K}\Omega$ | -1.5                  | 0   | 1.5  | dB               |
| Attenuation at Minimum Volume              | $A_{MIN}$      | $V_{O(L\text{ CTRL})} < 0.5\text{V}$                                 | 80                    |     |      | dB               |
| Bandwidth                                  | BW             |                                                                      |                       | 0.6 |      | MHz              |
| Total Output Noise                         | $e_N$          | $f = 20\text{Hz} \sim 22\text{KHz}$                                  | PLAY, Max volume      | 500 | 800  | $\mu\text{V}$    |
|                                            |                |                                                                      | PLAY, Max attenuation | 100 | 250  | $\mu\text{V}$    |
|                                            |                |                                                                      | Mute                  | 60  | 150  | $\mu\text{V}$    |
| Slew Rate                                  | SR             |                                                                      | 5                     | 8   |      | V/ $\mu\text{s}$ |
| Input Resistance                           | $R_{IN}$       |                                                                      | 22.5                  | 30  |      | $\text{K}\Omega$ |
| Variable Output Resistance                 | $R_{VAR(OUT)}$ |                                                                      |                       | 30  | 100  | $\Omega$         |
| Variable Output Load                       | $R_{L(OUT)}$   |                                                                      | 2                     |     |      | $\text{K}\Omega$ |
| Supply Voltage Rejection                   | SVR            | $f=1\text{KHz}$ , $C_{SVR}=470\text{mF}$ , $V_{RIP}=1\text{Vrms}$    | Max volume            | 35  | 39   | dB               |
|                                            |                |                                                                      | Max attenuation       | 55  | 65   | dB               |
| Thermal Muting                             | $T_{MUTE}$     |                                                                      |                       | 150 |      | $^\circ\text{C}$ |
| Thermal Shut-down                          | $T_{SHDN}$     |                                                                      |                       | 160 |      | $^\circ\text{C}$ |

## ■ ELECTRICAL CHARACTERISTICS(Cont.)

| PARAMETER                                            | SYMBOL            | TEST CONDITIONS                              | MIN | TYP | MAX | UNIT    |
|------------------------------------------------------|-------------------|----------------------------------------------|-----|-----|-----|---------|
| <b>MUTE STAND-BY &amp; INPUT SELECTION FUNCTIONS</b> |                   |                                              |     |     |     |         |
| Stand-by ON Threshold                                | $V_{THD(SON)}$    |                                              | 3.5 |     |     | V       |
| Stand-by OFF Threshold                               | $V_{THD(SOFF)}$   |                                              |     |     | 1.5 | V       |
| Mute ON threshold                                    | $V_{THD(MON)}$    |                                              | 3.5 |     |     | V       |
| Mute OFF threshold                                   | $V_{THD(MOFF)}$   |                                              |     |     | 1.5 | V       |
| Mute Attenuation                                     | $A_{MUTE}$        |                                              | 50  | 65  |     | dB      |
| Quiescent Current @ Stand-by                         | $I_{Q(ST-BY)}$    |                                              |     | 0.6 | 1   | mA      |
| Stand-by Bias Current                                | $I_{ST-BY(BIAS)}$ | Stand by ON: $V_{ST-BY} = 5V, V_{MUTE} = 5V$ |     | 80  |     | $\mu A$ |
|                                                      |                   | Play or Mute                                 | -20 | -5  |     | $\mu A$ |
| Mute Bias Current                                    | $I_{MUTE(BIAS)}$  | Mute                                         |     | 1   | 5   | $\mu A$ |

### MUTE STAND-BY TRUTH TABLE

| MUTE STAND-BY TROUBLE TABLE |          |                     |
|-----------------------------|----------|---------------------|
| MUTE                        | STAND-BY | OPERATING CONDITION |
| H                           | H        | STAND-BY            |
| L                           | H        | STAND-BY            |
| H                           | L        | MUTE                |
| L                           | L        | PLAY                |

■ TYPICAL APPLICATION CIRCUIT(Cont.)

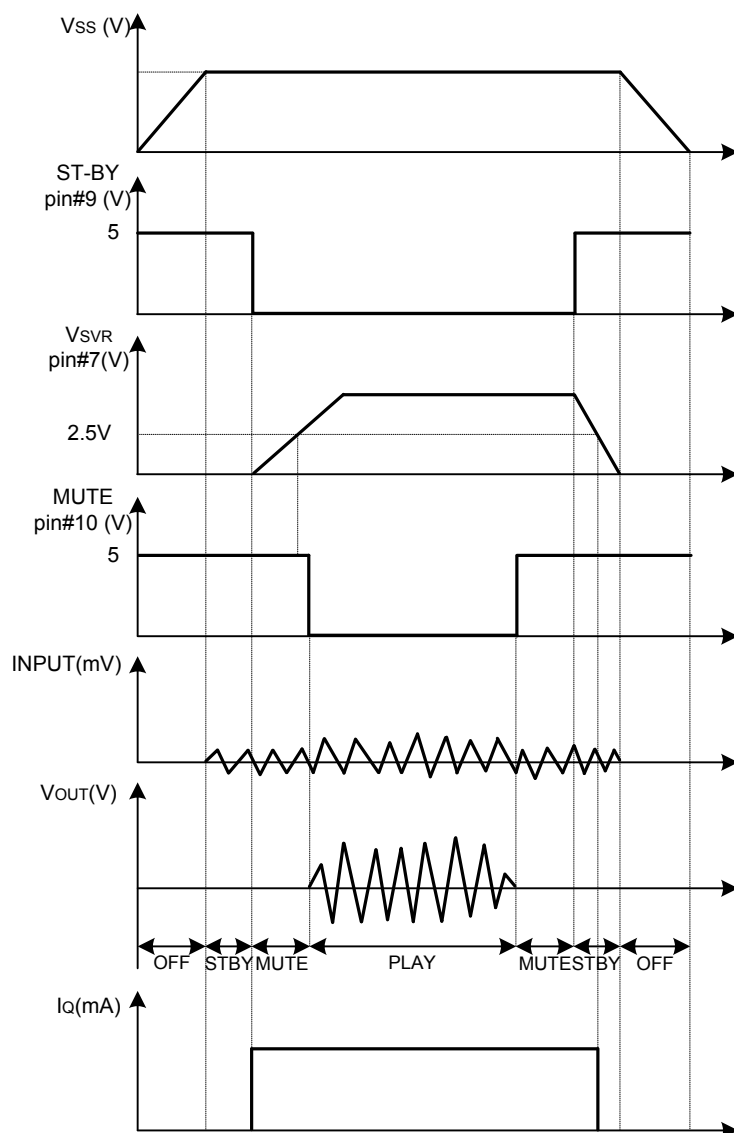
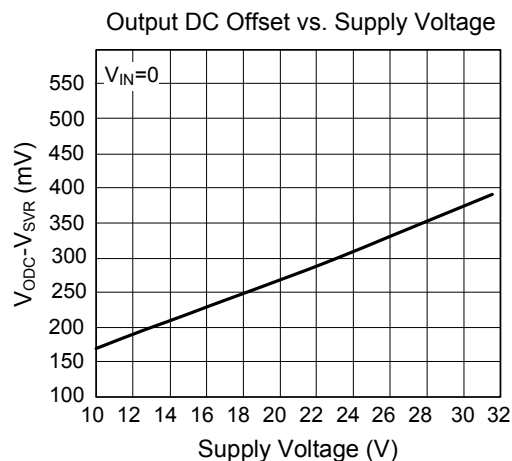
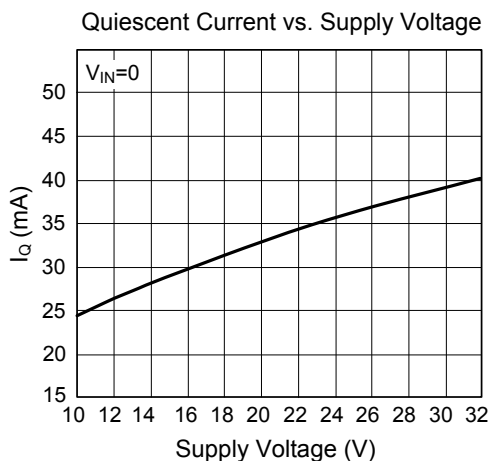
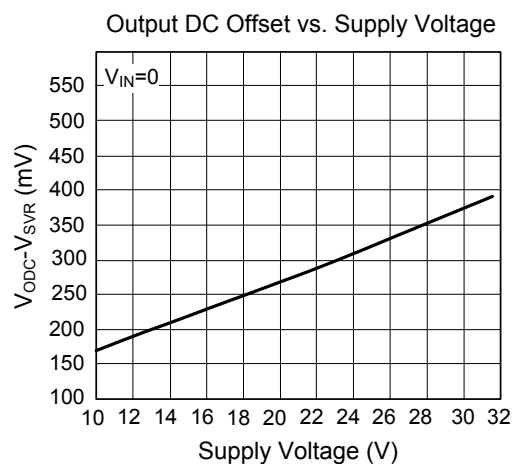
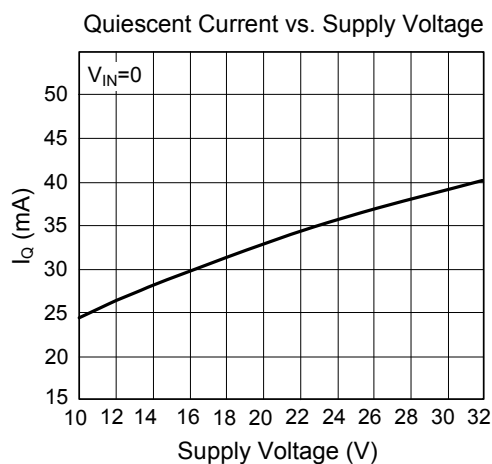


Fig. 2 Turn ON/OFF Sequences (use only the MUTE function)

# TYPICAL CHARACTERISTICS



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