

UNISONIC TECHNOLOGIES CO., LTD

TDA8541

Preliminary

LINEAR INTEGRATED CIRCUIT

1W BTL AUDIO AMPLIFIER

DESCRIPTION

The UTC **TDA8541**(T) is a 1W BTL audio amplifier ,which has a complementary PNP-NPN output stage and standby/mute logic, it uses UTC's advanced technology to provide customers with low saturation voltage of output stage, low standby current and high SVRR, etc.

FEATURES

- * Low saturation voltage of output stage
- * External resistors could fix Gain
- * Low standby current
- * No switch-on/switch-off plops
- * High SVRR
- * Protected against outputs short-circuit to ground, V_{CC} and across the load
- * Thermal shut-down protection

ORDERING INFORMATION

| Ordering Number | | Deskere | Deaking | |
|-----------------|----------------|---------|-----------|--|
| Lead Free | Halogen Free | Раскаде | Packing | |
| TDA8541L-S08-R | TDA8541G-S08-R | SOP-8 | Tape Reel | |



MARKING





Preliminary

PIN CONFIGURATION



■ PIN DESCRIPTION

| PIN NO. | PIN NAME | DESCRIPTION |
|---------|----------|--|
| 1 | MODE | Operating mode select (standby, mute, operating) |
| 2 | SVR | Half supply voltage, decoupling ripple rejection |
| 3 | IN+ | Positive input |
| 4 | IN- | Negative input |
| 5 | OUT- | Negative loudspeaker terminal |
| 6 | Vcc | Supply voltage |
| 7 | GND | Ground |
| 8 | OUT+ | Positive loudspeaker terminal |

BLOCK DIAGRAM





■ ABSOLUTE MAXIMUM RATING

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|--------------------------------------|---------------|------------------|-----------------------------|------|
| Supply Voltage | Operating | Vcc | -0.3 ~ +18 | V |
| Input Voltage | | VI | -0.3 ~ V _{CC} +0.3 | V |
| Repetitive Peak Output Current | | IORM | 1 | А |
| AC and DC Short-Circuit Safe Voltage | | V _{PSC} | 10 | V |
| Total Power Dissipation | | PD | 0.8 | W |
| Storage Temperature | Non-Operating | T _{STG} | -55 ~ +150 | °C |
| Operating Ambient Temperature | | T _A | -40 ~ +85 | °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 | θ」Α | 160 | °C/W |

DC ELECTRICAL CHARACTERISTICS

(V_{CC}=5V, T_A=25°C, R_L=8Ω, V_{MODE}=0V, measured in test circuit Figure 1, unless otherwise specified.)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------------------------|-------------------------------------|--|---------|-----|---------|------|
| Supply Voltage | Vcc | Operating | 2.3 | 5 | 18 | V |
| Quiescent Current | lq | R _L =∞ (Note 1) | | 8 | 12 | mA |
| Standby Current | I _{stb} | V _{MODE} =V _{CC} | | | 10 | μA |
| DC Output Voltage | Vo | (Note 2) | | 2.4 | | V |
| Differential Output Voltage Offset | Vout+-Vout- | | | | 80 | mV |
| Input Bias Current | I _{IN+} , I _{IN-} | | | | 500 | nA |
| Input Voltage Mode Select | V _{MODE} | Operating | 0 | | 0.5 | V |
| | | Mute | 1.5 | | Vcc-1.5 | V |
| | | Standby | Vcc-0.5 | | Vcc | V |
| Input Current Mode Select | IMODE | 0 <v<sub>MODE<v<sub>CC</v<sub></v<sub> | | | 20 | μA |

Notes: 1. With a load connected at the outputs the quiescent current will increase, the maximum of this increase being equal to the DC output offset voltage divided by R_L.

2. The DC output voltage with respect to ground is approximately $0.5 \times V_{CC}$.



■ AC ELECTRICAL CHARACTERISTICS

| (VCC-3V, Tamb-23 C, NL-622, I-TKTZ, VMODE-0V, The asuled in test circuit Figure 1, diffess otherwise specified.) | | | | | | |
|--|-----------------|-----------------|-----|------|-----|------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
| Output Douron | Po | THD=10% | 1 | 1.2 | | W |
| Output Power | | THD=0.5% | 0.6 | 0.9 | | W |
| Total Harmonic Distortion | THD | P₀=0.5W | | 0.15 | 0.3 | % |
| Closed Loop Voltage Gain | Gv | (Note 1) | 6 | | 30 | dB |
| Differential Input Impedance | Zi | | | 100 | | kΩ |
| Noise Output Voltage | V _{no} | (Note 2) | | | 100 | μV |
| Supply Voltage Ripple Rejection | SVRR | (Note 3) | 50 | | | dB |
| | | (Note 4) | 40 | | | dB |
| Output Voltage In Mute Condition | Vo | (Note 5) | | | 200 | μV |

(V_{CC}=5V, T_{amb}=25°C, R_L=8Ω, f=1kHz, V_{MODE}=0V, measured in test circuit Figure 1, unless otherwise specified.)

Notes: 1. Gain of the amplifier is 2×R2/R1 in test circuit of Figure 1.

2. The noise output voltage is measured at the output in a frequency range from 20Hz to 20kHz (unweighted), with a source impedance of $R_s=0\Omega$ at the input.

3. Supply voltage ripple rejection is measured at the output, with a source impedance of $R_S=0\Omega$ at the input. The ripple voltage is a sine wave with a frequency of 1kHz and an amplitude of 100mV (RMS), which is applied to the positive supply rail.

4. Supply voltage ripple rejection is measured at the output, with a source impedance of $R_s=0\Omega$ at the input. The ripple voltage is a sine wave with a frequency between 100Hz and 20kHz and an amplitude of 100mV (RMS), which is applied to the positive supply rail.

5. Output voltage in mute position is measured with an input voltage of 1V (RMS) in a bandwidth of 20kHz, so including noise.



TYPICAL APPLICATION CIRCUIT



Figure 1. BTL Application.







TYPICAL CHARACTERISTICS











Preliminary

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