



## TDA8541

Preliminary

LINEAR INTEGRATED CIRCUIT

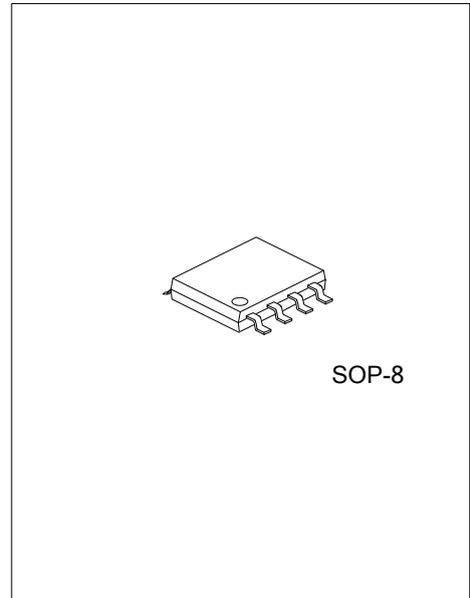
### 1W BTL AUDIO AMPLIFIER

#### 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

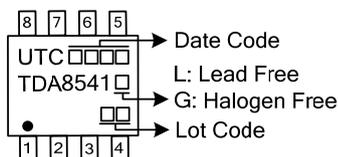


#### ORDERING INFORMATION

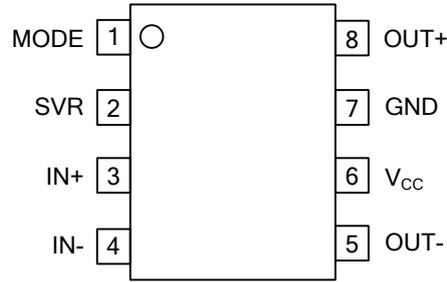
Ordering Number		Package	Packing
Lead Free	Halogen Free		
TDA8541L-S08-R	TDA8541G-S08-R	SOP-8	Tape Reel

<p>TDA8541G-S08-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) S08: SOP-8</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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#### MARKING



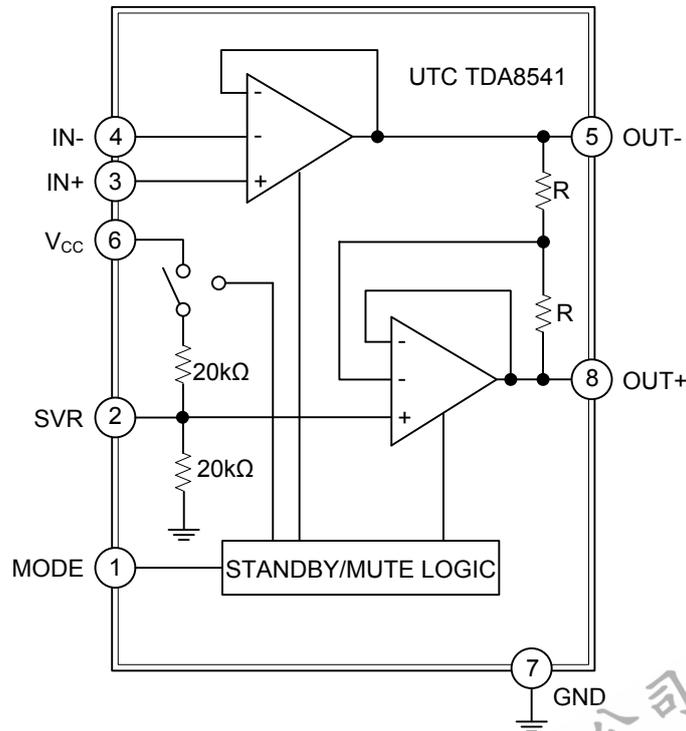
■ PIN CONFIGURATION



■ 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	V <sub>CC</sub>	Supply voltage
7	GND	Ground
8	OUT+	Positive loudspeaker terminal

■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage	Operating	$V_{CC}$	-0.3 ~ +18	V
Input Voltage		$V_I$	-0.3 ~ $V_{CC}+0.3$	V
Repetitive Peak Output Current		$I_{ORM}$	1	A
AC and DC Short-Circuit Safe Voltage		$V_{PSC}$	10	V
Total Power Dissipation		$P_D$	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	$\theta_{JA}$	160	°C/W

### ■ DC ELECTRICAL CHARACTERISTICS

( $V_{CC}=5V$ ,  $T_A=25^\circ C$ ,  $R_L=8\Omega$ ,  $V_{MODE}=0V$ , measured in test circuit Figure 1, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$	Operating	2.3	5	18	V
Quiescent Current	$I_q$	$R_L=\infty$ (Note 1)		8	12	mA
Standby Current	$I_{stb}$	$V_{MODE}=V_{CC}$			10	$\mu A$
DC Output Voltage	$V_O$	(Note 2)		2.4		V
Differential Output Voltage Offset	$ V_{OUT+}-V_{OUT-} $				50	mV
Input Bias Current	$I_{IN+}, I_{IN-}$				500	nA
Input Voltage Mode Select	$V_{MODE}$	Operating	0		0.5	V
		Mute	1.5		$V_{CC}-1.5$	V
		Standby	$V_{CC}-0.5$		$V_{CC}$	V
Input Current Mode Select	$I_{MODE}$	$0 < V_{MODE} < V_{CC}$			20	$\mu A$

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

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Power	$P_o$	THD=10%	1	1.2		W
		THD=0.5%	0.6	0.9		W
Total Harmonic Distortion	THD	$P_o=0.5W$		0.15	0.3	%
Closed Loop Voltage Gain	$G_v$	(Note 1)	6		30	dB
Differential Input Impedance	$Z_i$			100		k $\Omega$
Noise Output Voltage	$V_{no}$	(Note 2)			100	$\mu V$
Supply Voltage Ripple Rejection	SVRR	(Note 3)	50			dB
		(Note 4)	40			dB
Output Voltage In Mute Condition	$V_o$	(Note 5)			200	$\mu V$

Notes: 1. Gain of the amplifier is  $2 \times R_2/R_1$  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

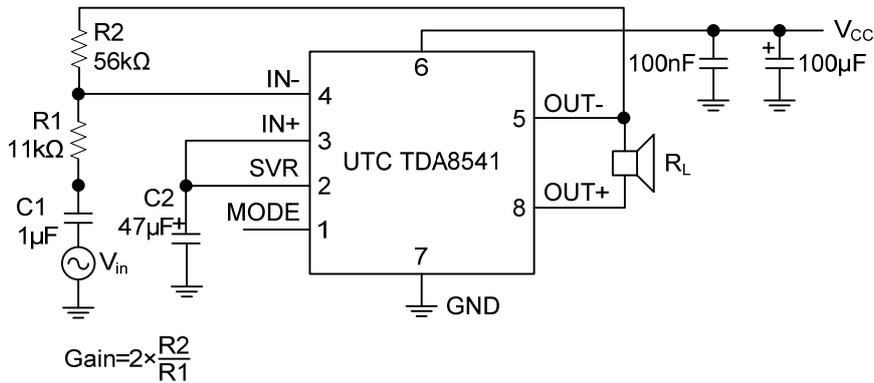


Figure 1. BTL Application.

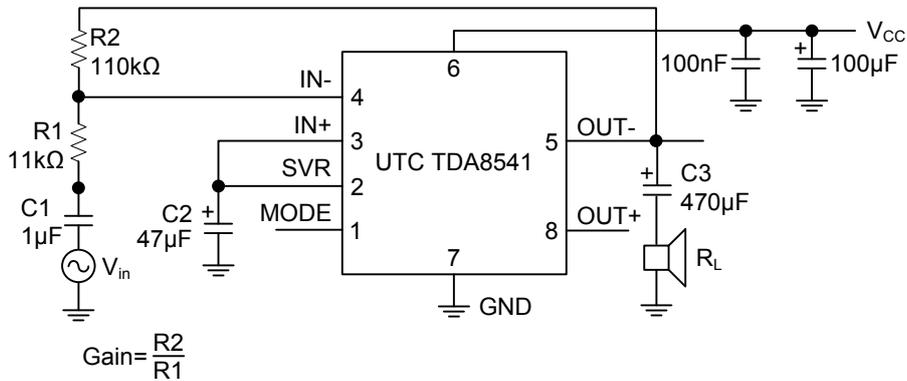


Figure 2. SE Application.

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