



## TDA7052A

LINEAR INTEGRATED CIRCUIT

### 1W BTL MONO AUDIO AMPLIFIER WITH DC VOLUME CONTROL

#### DESCRIPTION

The UTC TDA7052A is mono BTL output amplifier with DC volume control. It is designed for use in TV and monitors, additionally it is suitable for portable recorders and radios.

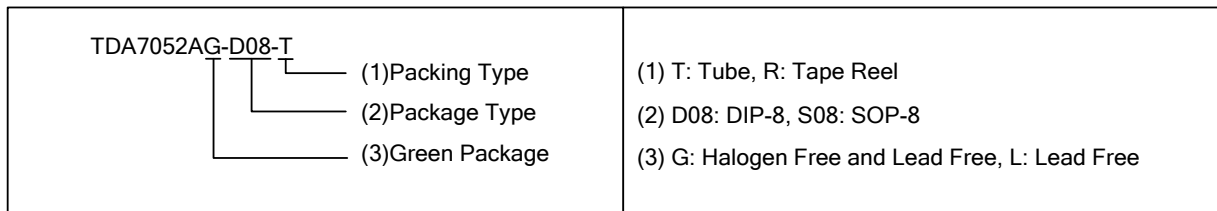
In the IC, a Missing Current Limiter (MCL) is built-in. This function is activated when the difference of current between the OUT+ and OUT- exceed 100mA (typical 300mA). This level of 100mA suit for headphone applications (single-ended).

#### FEATURES

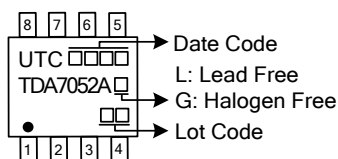
- \* Low power consumption
- \* DC volume control
- \* Mute mode
- \* No switch-on and off clicks
- \* Short-circuit proof
- \* Good overall stability
- \* Low HF radiation
- \* Few external components
- \* Thermal protection
- \* ESD protected on all pins
- \* Missing Current Limiter (MCL)

#### ORDERING INFORMATION

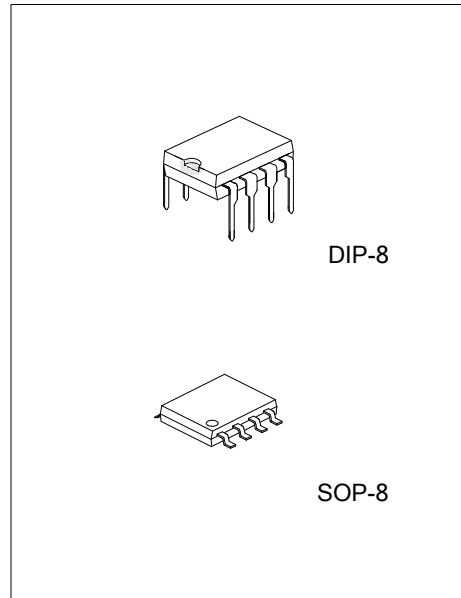
Ordering Number		Package	Packing
Lead Free	Halogen Free		
TDA7052AL-D08-T	TDA7052AG-D08-T	DIP-8	Tube
TDA7052AL-S08-R	TDA7052AG-S08-R	SOP-8	Tape Reel

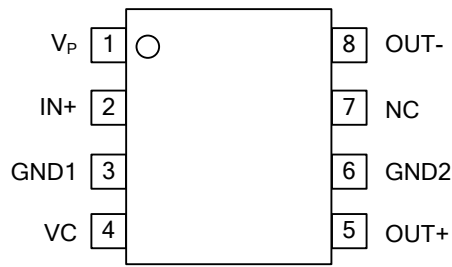


#### MARKING



#### PIN CONFIGURATION

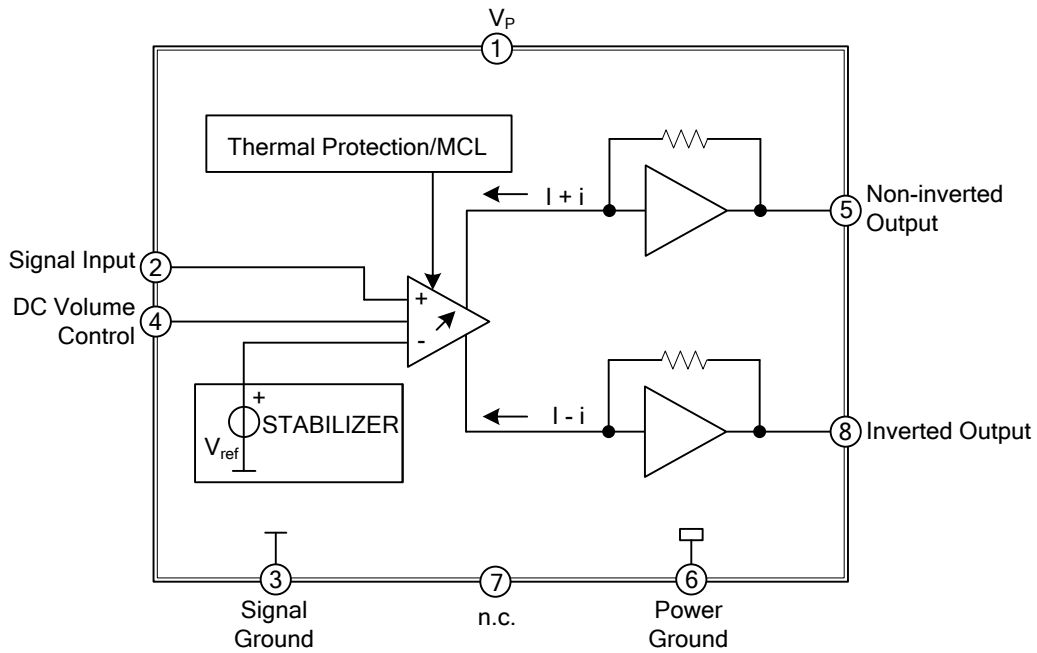




### PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V <sub>P</sub>	Power Supply
2	IN+	Signal Input Terminal
3	GND1	Signal Ground
4	VC	DC Volume Control Terminal
5	OUT+	Non-inverted Output Terminal
6	GND2	Power Ground
7	NC	Not Connected
8	OUT-	Inverted Output Terminal

### BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Range	$V_P$	18	V
Input Voltage Pin 2	$V_2$	8	V
Input Voltage Pin 4	$V_4$	8	V
Repetitive Peak Output Current	$I_{ORM}$	1.25	A
Non-Repetitive Peak Output Current	$I_{OSM}$	1.5	A
Short-Circuit Time	$T_{SC}$	1	hr
Total Power Dissipation ( $T_A \leq 25^\circ\text{C}$ )	DIP-8	1.25	W
	SOP-8	0.8	W
Operating Ambient Temperature Range	$T_A$	-40 ~ +85	$^\circ\text{C}$
Junction Temperature	$T_J$	+150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 ~ +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.

### ■ ELECTRICAL CHARACTERISTICS

$V_P=6\text{V}$ ,  $T_{amb}=25^\circ\text{C}$ ,  $f=1\text{kHz}$ ;  $R_L=8\Omega$ , unless otherwise specified.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Supply Voltage Range	$V_P$		4.5		18	V
Total Quiescent Current	$I_P$	$V_P=6\text{V}$ , $R_L=\infty$ , Note 1		7	12	mA
<b>DC Volume Control</b>						
Gain Control Range	$\phi$		75	80		dB
Control Current	$I_4$	$V_4=0.4\text{V}$		70	80	$\mu\text{A}$
<b>Characteristics In Mute Position</b>						
Output Voltage In Mute Position	$V_O$	$V_4 \leq 0.3\text{V}$ , $V_I=600\text{mV}$			30	$\mu\text{V}$
<b>Characteristics In Minimum Gain, <math>V_4=0.5\text{V}</math></b>						
Voltage Gain	$G_V$			-44		dB
Noise Output Voltage (RMS value)	$V_{NO(RMS)}$	Note 2		20	30	$\mu\text{V}$
<b>Characteristics In Maximum Gain, <math>V_4=1.4\text{V}</math></b>						
Output Power	$P_O$	THD=10%	1.0	1.1		W
Total Harmonic Distortion	THD	$P_O=0.5\text{W}$		0.3	1	%
Voltage Gain	$G_V$		34.5	35.5	36.5	dB
Input Signal Handling	$V_I$	$V_4=0.8\text{V}$ , THD<1%	0.5	0.65		V
Noise Output Voltage (RMS value)	$V_{NO(RMS)}$	$f=500\text{kHz}$ , Note 3		210		$\mu\text{V}$
Bandwidth	B	-1dB		0.02-300		kHz
Supply Voltage Ripple Rejection	SVRR	Note 4	38	46		dB
DC Output Offset Voltage	$ V_{OFF} $			0	150	mV
Input Impedance (Pin 2)	$Z_I$		15	20	25	k $\Omega$

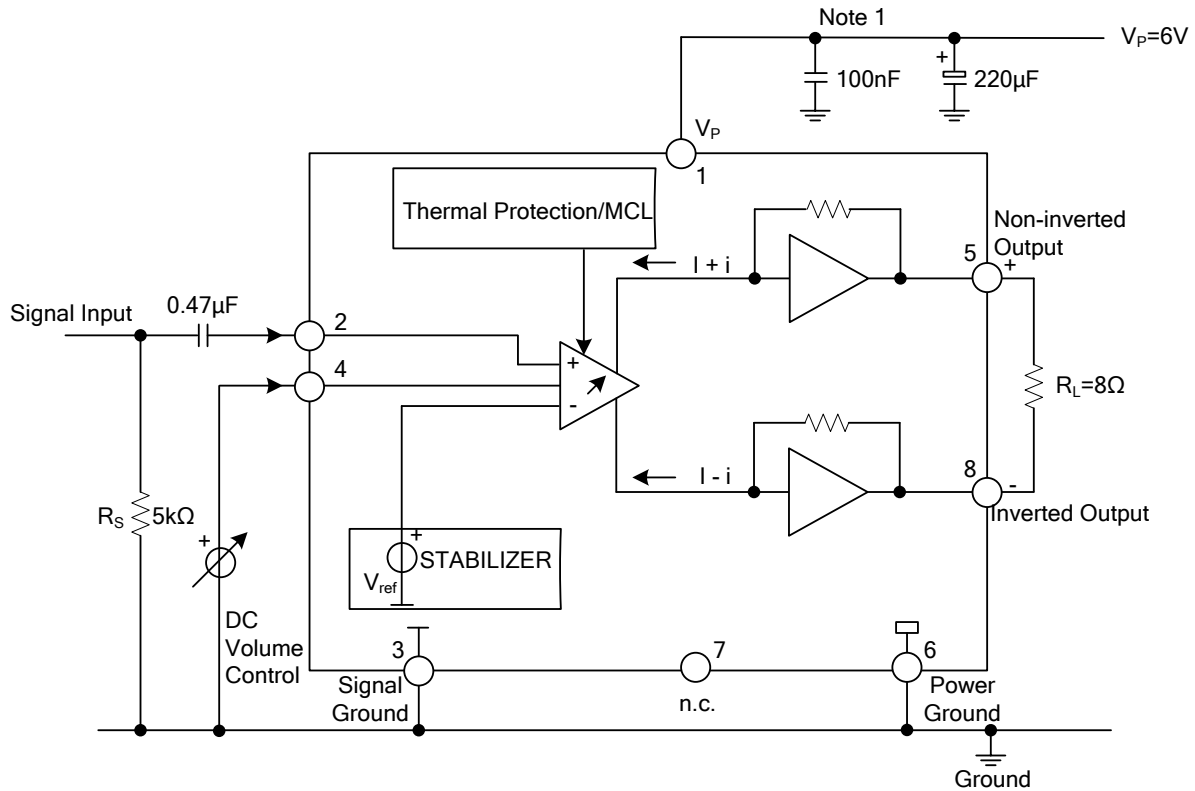
Notes: 1. With a load connected to the outputs the quiescent current will increase, the maximum value of this increase being equal to the DC output offset voltage dividend by  $R_L$ .

2. The noise output voltage (RMS value) is measured with  $R_S=5\text{k}\Omega$  unweighted.

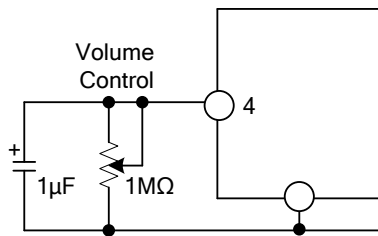
3. The noise output voltage (RMS value) at  $f=500\text{kHz}$  is measured with  $R_S=0\Omega$  and bandwidth=5kHz.

4. The ripple rejection is measured with  $R_S=0\Omega$  and  $f=100\text{Hz}\sim 10\text{kHz}$ . The ripple voltage of 200mV, (RMS value) is applied to the positive supply rail.

## ■ TYPICAL APPLICATION CIRCUIT

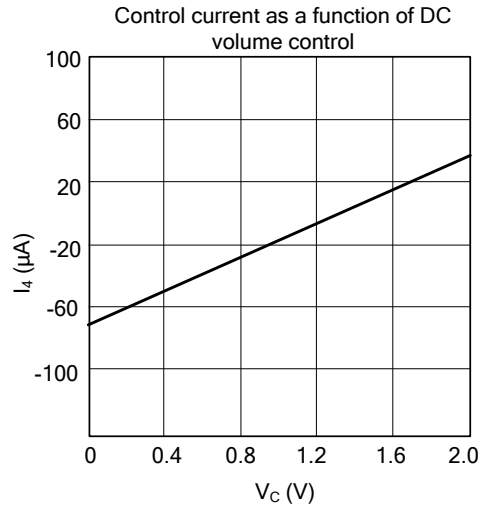
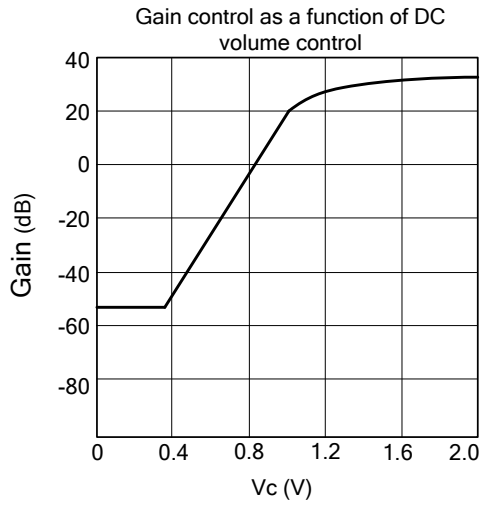


Note 1. This capacitor can be omitted if the 220μF electrolytic capacitor is connected close to pin 1.



Application with potentiometer as volume control; maximum gain=30dB

### ■ TYPICAL CHARACTERISTICS



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