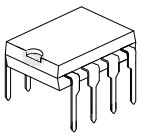
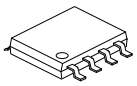
TDA7052A

LINEAR INTEGRATED CIRCUIT

1W BTL MONO AUDIO AMPLIFIER WITH DC VOLUME CONTROL



DIP-8



SOP-8

■ 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)

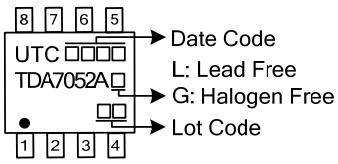
■ ORDERING INFORMATION

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

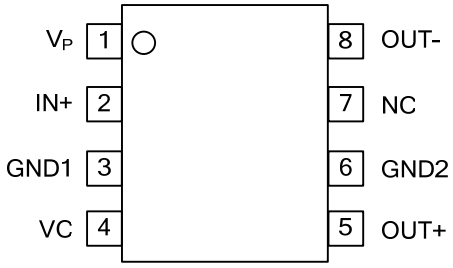
TDA7052AG-D08-T
- (1)Packing Type
- (2)Package Type
- (3)Green Package

(1) T: Tube, R: Tape Reel
(2) D08: DIP-8, S08: SOP-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



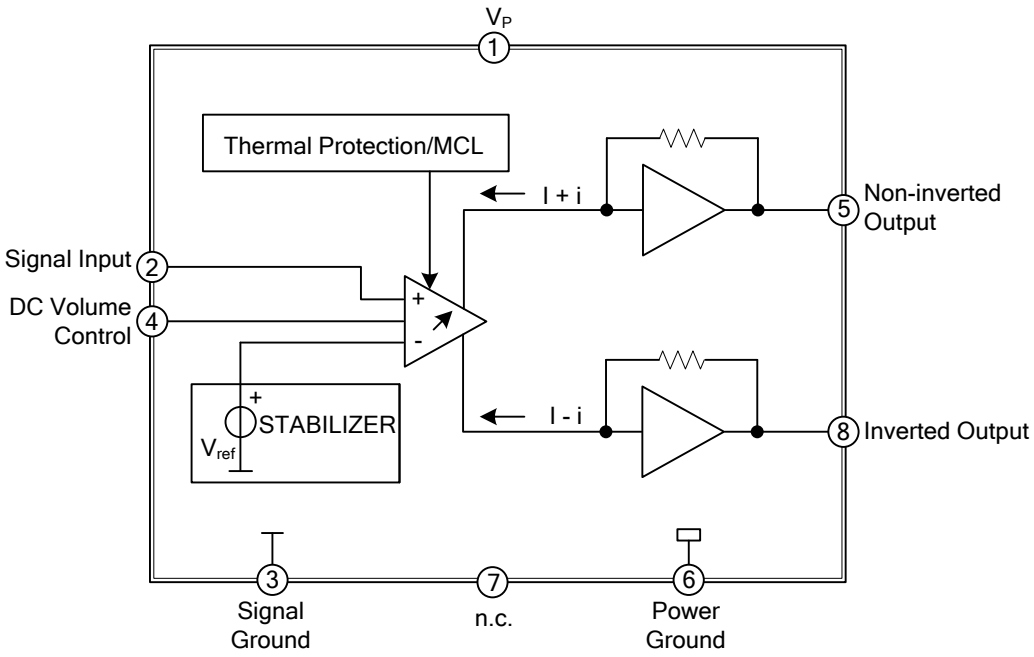
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V_P	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≤25%)	DIP-8	P_D	1.25	W
	SOP-8		0.8	W
Operating Ambient Temperature Range		T_A	-40 ~ +85	°C
Junction Temperature		T_J	+150	°C
Storage Temperature Range		T_{STG}	-55 ~ +150	°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.

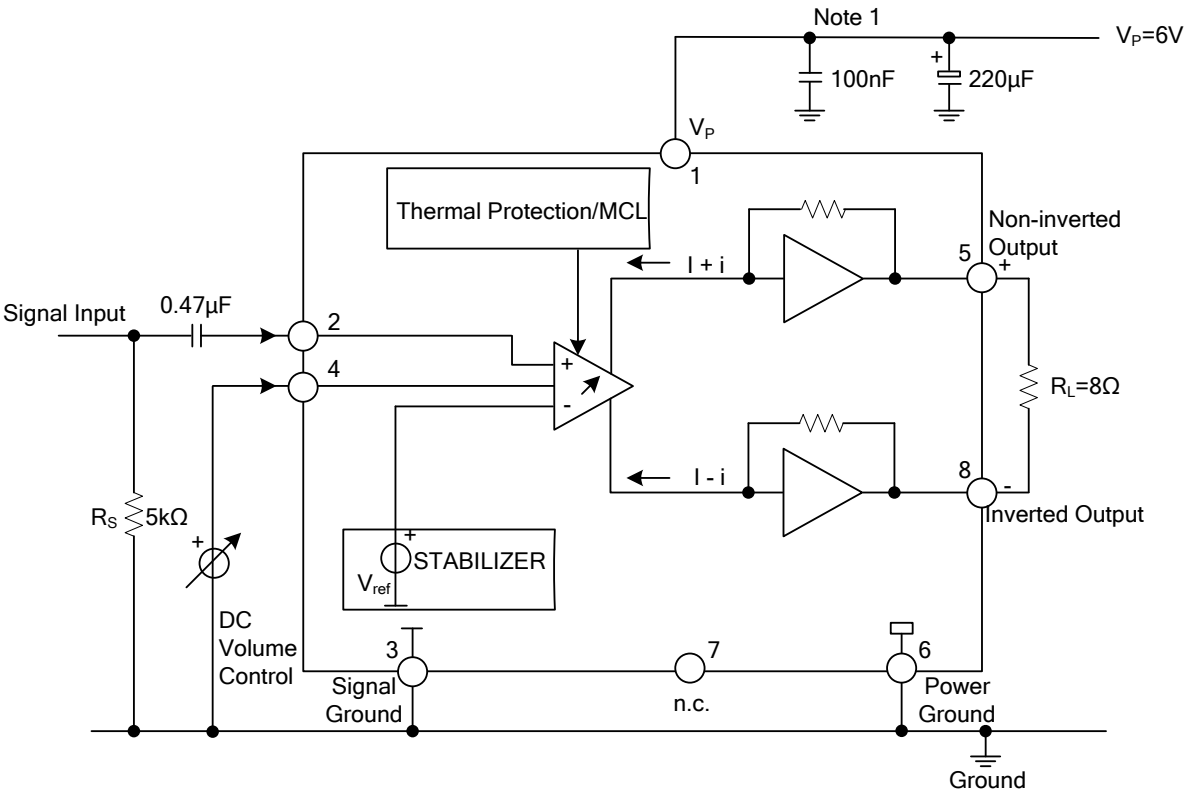
■ ELECTRICAL CHARACTERISTICS

V_P=6V, T_{amb}=25°C, f=1kHz; R_L=8Ω, unless otherwise specified.

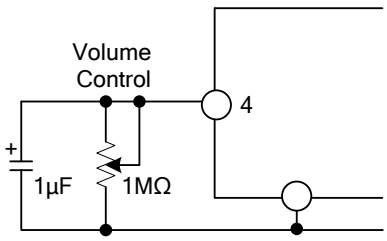
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Supply Voltage Range	V_P		4.5		18	V
Total Quiescent Current	I_P	V_P=6V, R_L=∞, Note 1		7	12	mA
DC Volume Control						
Gain Control Range	φ		75	80		dB
Control Current	I_4	V_4=0.4V		70	80	μA
Characteristics In Mute Position						
Output Voltage In Mute Position	V_O	V_4≤0.3V, V_I=600mV			30	μV
Characteristics In Minimum Gain, V_4=0.5V						
Voltage Gain	G_V			-44		dB
Noise Output Voltage (RMS value)	$V_{NO(RMS)}$	Note 2		20	30	μV
Characteristics In Maximum Gain, V_4=1.4V						
Output Power	P_O	THD=10%	1.0	1.1		W
Total Harmonic Distortion	THD	P_O=0.5W		0.3	1	%
Voltage Gain	G_V		34.5	35.5	36.5	dB
Input Signal Handling	V_I	V_4=0.8V, THD<1%	0.5	0.65		V
Noise Output Voltage (RMS value)	$V_{NO(RMS)}$	f=500kHz, Note 3		210		μV
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	kΩ

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=5kΩ unweighted.
3. The noise output voltage (RMS value) at f=500kHz is measured with R_S=0Ω and bandwidth=5kHz.
4. The ripple rejection is measured with R_S=0Ω and f=100Hz~10kHz. The ripple voltage of 200mV, (RMS value) is applied to the positive supply rail.

■ TYPICAL APPLICATION CIRCUIT



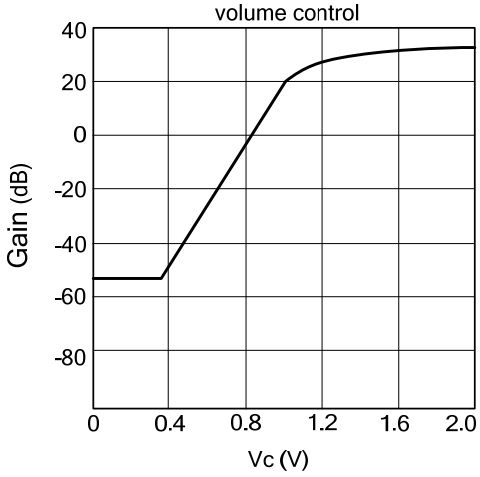
Note 1. This capacitor can be omitted if the 220µF electrolytic capacitor is connected close to pin 1.



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

■ TYPICAL CHARACTERISTICS

Gain control as a function of DC volume control



Control current as a function of DC volume control