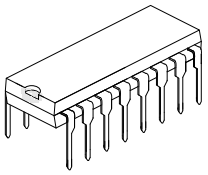
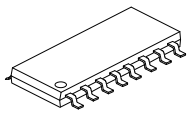
TDA7053A

LINEAR INTEGRATED CIRCUIT

STEREO BTL AUDIO OUTPUT AMPLIFIER WITH DC VOLUME CONTROL



DIP-16



SOP-16

■ DESCRIPTION

The UTC **TDA7053A** is stereo BTL output amplifiers with DC volume control and specially is designed for use in TV and monitors, but are also suitable for battery-fed portable recorders and radios.

Different packages are supplied for different output power, DIP-16 for 2×1W and SOP-16 for 2×0.5W.

■ FEATURES

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

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
TDA7053AL-D16-T	TDA7053AG-D16-T	DIP-16	Tube
TDA7053AL-S16-R	TDA7053AG-S16-R	SOP-16	Tape Reel

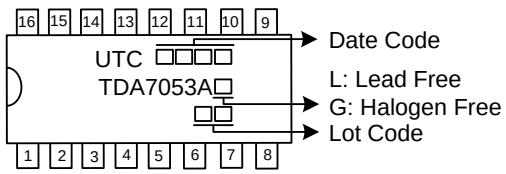
TDA7053AG-D16-T

(1)Packing Type
(2)Package Type
(3)Green Package

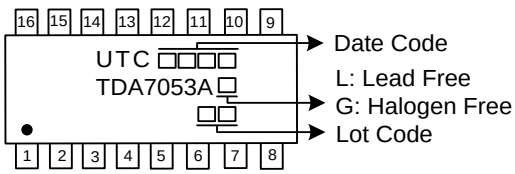
(1) T: Tube, R: Tape Reel
(2) D16: DIP-16, S16: SOP-16
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

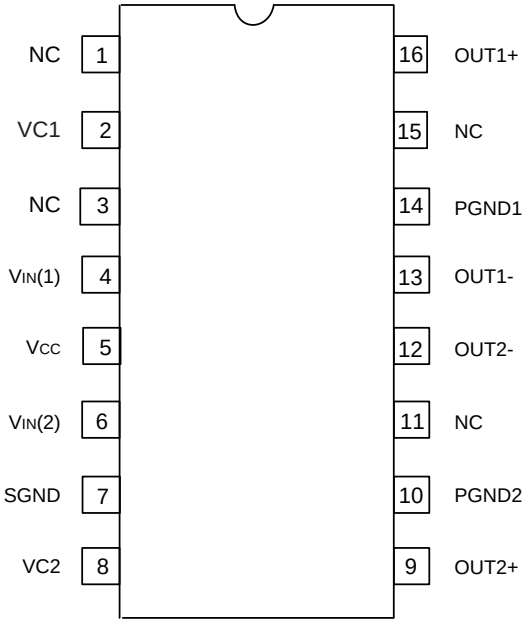
DIP-16



SOP-16



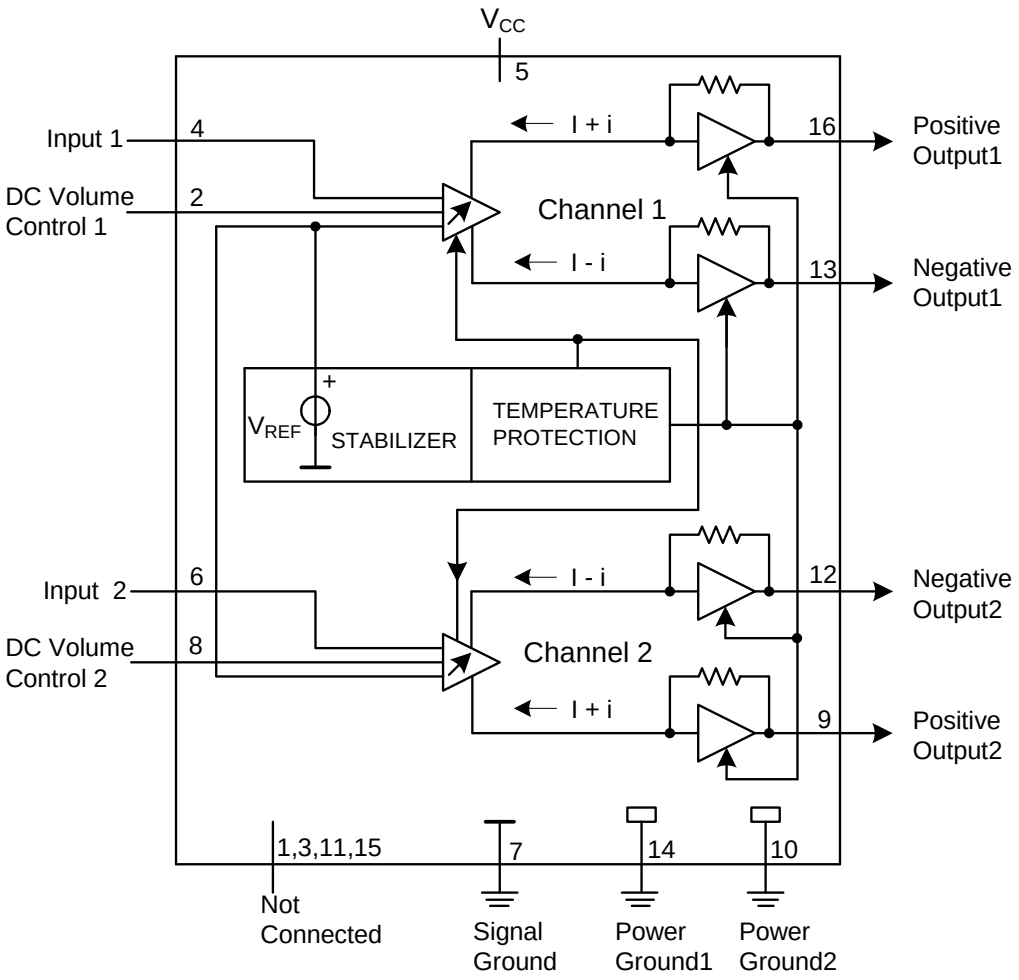
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	SYMBOL	DESCRIPTON
1	NC	No connection
2	VC1	DC volume control 1
3	NC	No connection
4	$V_{IN}(1)$	Voltage input 1
5	V_{CC}	Positive supply voltage
6	$V_{IN}(2)$	Voltage input 2
7	SGND	Signal ground
8	VC2	DC volume control 2
9	OUT2+	Positive output 2
10	PGND2	Power ground 2
11	NC	No connection
12	OUT2-	Negative output 2
13	OUT1-	Negative output 1
14	PGND1	Power ground 1
15	NC	No connection
16	OUT1+	Positive output 1

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	18	V
Repetitive Peak Output Current		I_{ORM}	1.25	A
Non- Repetitive Peak Output Current		I_{OSM}	1.5	A
Total Power Dissipation ($T_A \leqq 25°C$)	DIP-16	P_D	2.5	W
	SOP-16		1.32	W
Short-Circuit Time		T_{SC}	1	hr
Input Voltage Pins 2, 4, 6 and 8		V_{IN}	5	V
Junction Temperature		T_J	+125	°C
Operating Ambient Temperature		T_{OPR}	-20 ~ +85	°C
Storage Temperature		T_{STG}	-40 ~ +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.

■ THERMAL DATA

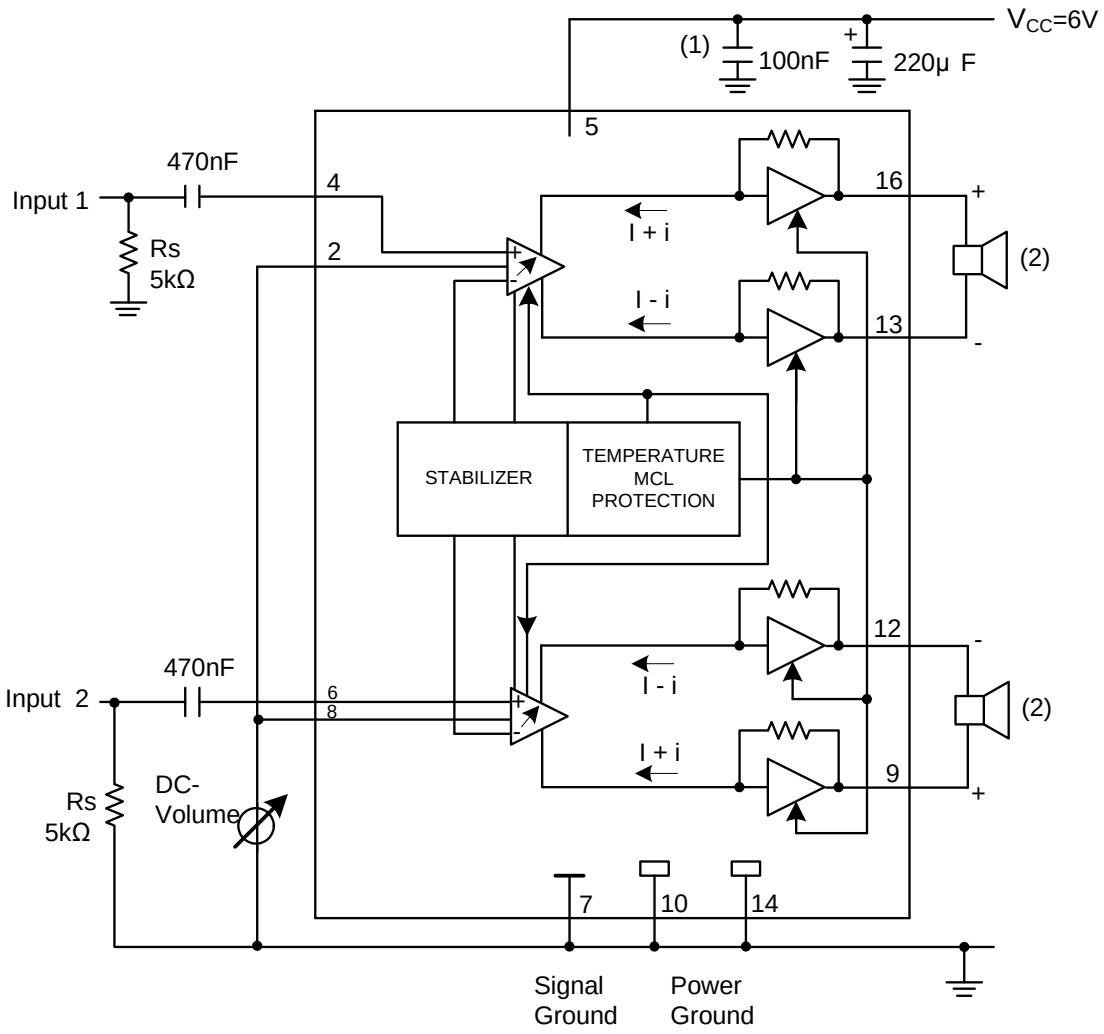
PARAMETER		SYMBOL	RATINGS	UNIT
Thermal Resistance From Junction To Ambient In Free Air	DIP-16	θ_{JA}	50	K/W
	SOP-16		95	K/W

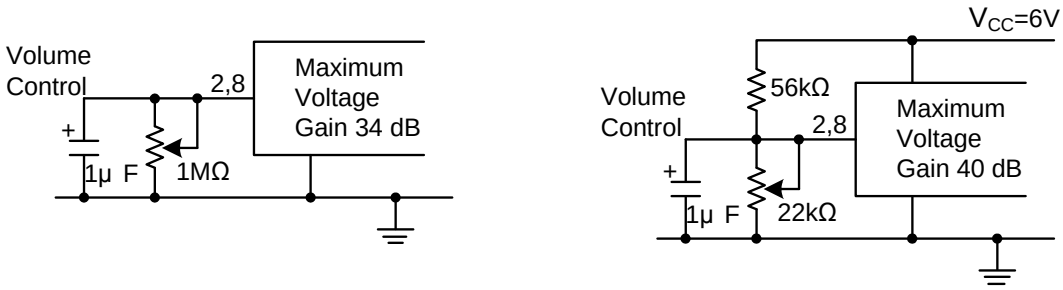
■ ELECTRICAL CHARACTERISTICS (V_{CC}= 6V, T_A= 25°C, f_{IN}=1kHz, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITONS	MIN	TYP	MAX	UNIT
Supply Voltage		V_{CC}		4.5		18	V
Total Quiescent Current (Note)		I_Q	V_{CC}=6V, R_L=∞		22	25	mA
Maximum Gain: V2,8 ≥1.4 V							
Output Power	DIP-16	P_{OUT}	THD=10%, R_L= 8Ω	1.0	1.1		W
	SOP-16		THD=10%, R_L= 16Ω	0.5	0.55		W
Total Harmonic Distortion	DIP-16	THD	P_{OUT}=0.5W		0.3	1	%
	SOP-16		P_{OUT}=0.25W		0.3	1	%
Voltage Gain		G_V		39.5	40.5	41.5	dB
Input Signal Handling (RMS value)		$V_{IN(RMS)}$	Gv=0dB, THD<1%	1			V
Noise Output Voltage		eN	f_{IN}=500kHz, R_S=0Ω, BW=5kHz		210		μV
Bandwidth		BW	At-1dB	20Hz ~ 300kHz(TYP.)			Hz
Supply Voltage Ripple Rejection		RR	$V_{IN(RMS)}$= 200mV, R_S = 0Ω, f_{IN} = 100Hz~10kHz	34	38		dB
DC Output Offset Voltage		$V_{O(OFF)}$	$\lvert V_{16}-V_{13} \rvert$ and $\lvert V_{12}-V_9 \rvert$		0	200	mV
Input Impedance (pins 4 and 6)		Z_{IN}		15	20	25	kΩ
Channel Separation		α_{CS}	R_S=5kΩ	40			dB
Channel Unbalance		$\lvert G_V \rvert$	V_{DC1} = V_{DC2}			1	dB
			G_1=0dB, V_{DC1} = V_{DC2}			1	dB
Mute Position: $V_{2,8}$ = 0.4 V ± 30 mV							
Output Voltage In Mute Position		$V_{O(MUTE)}$	V_{IN}=1.0V, Rs = 5 kΩ		30	40	μV
DC Volume Control							
Gain Control		G_C		68.5	73.5		dB
Volume Control Current		I_{DC}	V_2=V_8=0V	-20	-25	-30	μA

Notes: 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 divided by R_L.

■ TEST AND APPLICATION DIAGRAM CIRCUITS

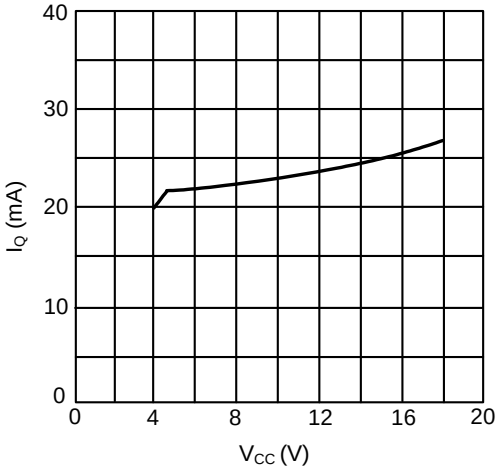




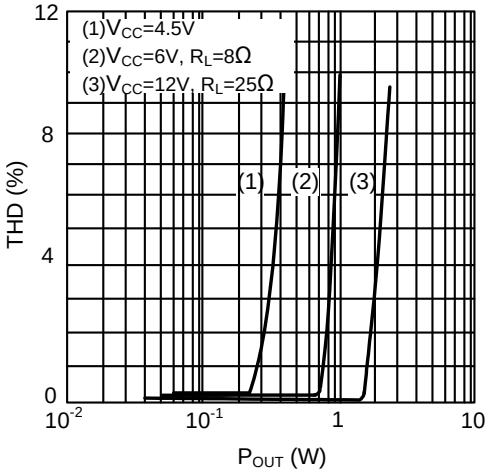
(1) This capacitor can be omitted if the 220µ F electrolytic capacitor is connected close to pin 5.
(2) R_L= 8Ω

■ TYPICAL CHARACTERISTICS

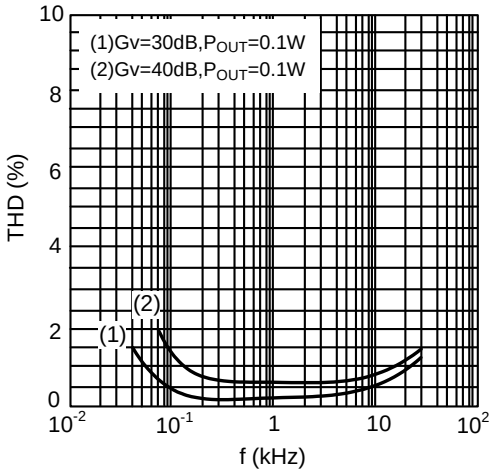
Quiescent Current as a Function of Voltage



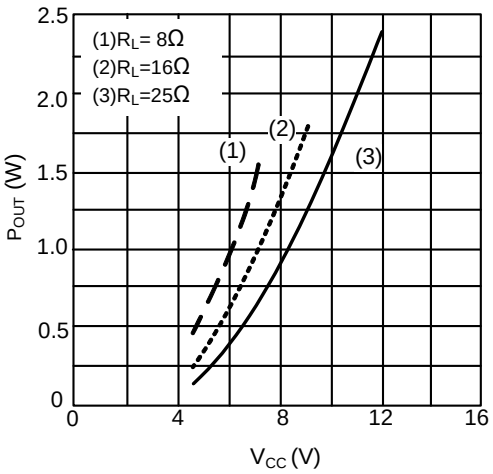
THD as a Function of Output Power



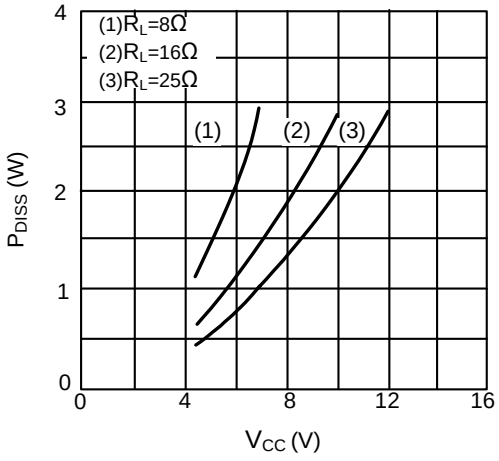
THD as a Function of Frequency



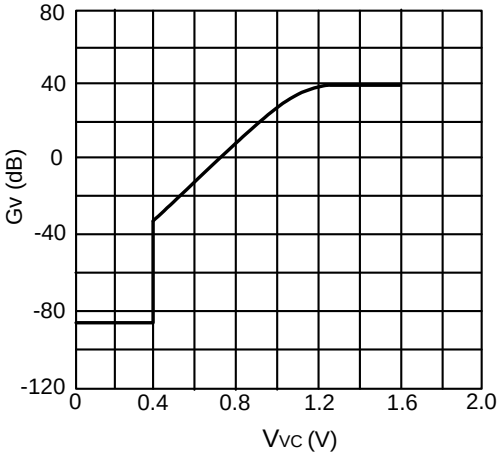
Output Power as a Function of Supply Voltage



Total Worst Wase Power Dissipation as a Function of Supply Voltage

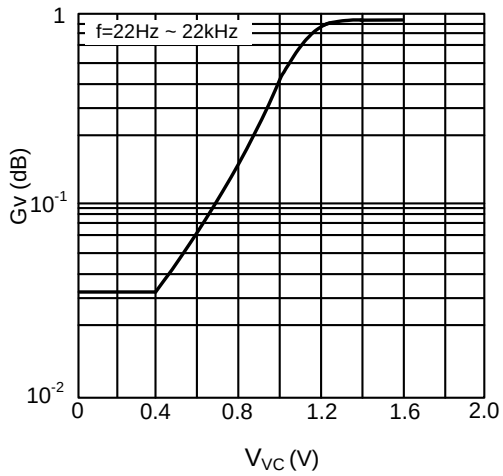


Voltage Gain as a Function of Volume Control Voltage

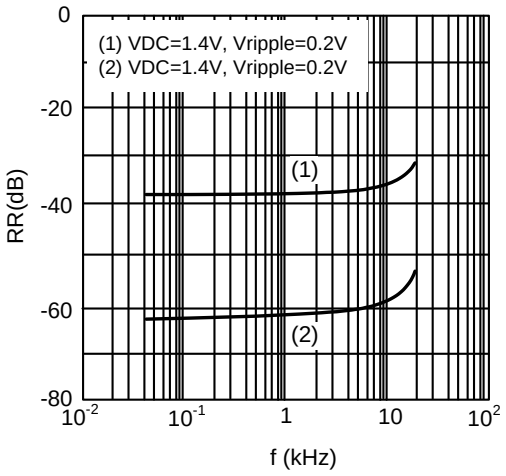


■ TYPICAL CHARACTERISTICS (Cont.)

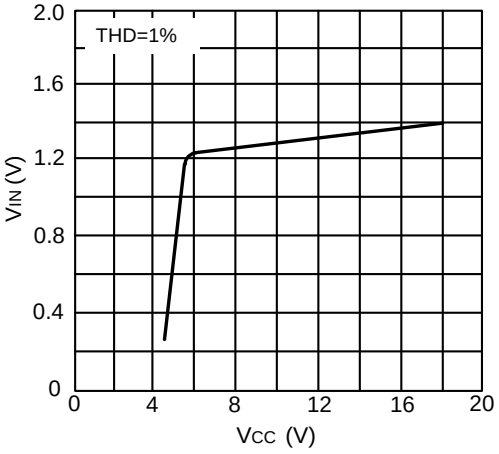
Noise Voltage as a Function of Volume Control Voltage



RR as a Function of Frequency



Input Signal Handling



Volume Control Current as a Function of Volume Control Voltage