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## NTE1576 Integrated Circuit Dual Volume Control/Balance/Tone

**Description:**

The NTE1576 is a DC controlled dual volume, balance and tone (Bass, treble) integrated circuit in 1 16-Lead DIP type package. As these dual channels are constructed on one chip, this IC is excellent in pair characteristics and it is suitable for automobile stereo, radio cassette, music center, TV multiplex sound receiver and remote controlled applications.

**Features:**

- Wide Power Supply Voltage Range:  
     Single Supply  $V_{CC}$  (opr) = 8V to 14V  
     Dual Supply  $V_{CC} - V_{EE}$  (opr) =  $\pm 4V$  to  $\pm 7V$
- Wide Volume Control Range:  $V_R = 80dB$  (Typ.)
- Excellent Cross Talk:  $CT = 70dB$  (Typ)
- Stable for Temperature Drift
- Wide Tone Control Range:  
      $V_B = 10dB$  (Typ) at  $f = 1kHz$  100Hz  
      $V_T = 12dB$  (Typ) at  $f = 1kHz$  20kHz

**Absolute Maximum Ratings:** ( $T_A = +25^\circ C$  unless otherwise specified)

Supply Voltage, $V_{CC}$ .....	14V
Power Dissipation, $P_D$ .....	750mW
Derated above $25^\circ C$ .....	6mW/ $^\circ C$
Operating Temperature Range, $T_{opr}$ .....	$-20^\circ$ to $+75^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ C$

**Electrical Characteristic:** ( $T_A = +25^\circ C$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Current	$I_{CCQ}$	VOL/BAL/BASS SW <sub>1-4</sub> : B	-	11	17	mA
			10	18	25	mA
Maximum Input Voltage	$V_{IN}$	BASS/TRBL/BAL SW <sub>1-3</sub> : B, VOL SW <sub>4</sub> : A, THD = 1%	-	-	1	$V_{rms}$
Maximum Output Voltage	$V_{OUT}$		1	-	-	$V_{rms}$
Voltage Gain	$G_V$	BASS/TRBL/BAL SW <sub>1-3</sub> : B $V_{IN} = 0.1V_{rms}$ , VOL SW <sub>4</sub> : A	-0.5	2.0	4.5	dB

**Electrical Characteristic (Cont'd):** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Channel Balance	CB	BASS/TRBL/BAL SW <sub>1-3</sub> : B V <sub>IN</sub> = 0.1V <sub>rms</sub> , VOL SW <sub>4</sub> : A	-3	0	+3	dB	
		VOL/BAL/BASS/TRBL SW <sub>1-4</sub> : B, V <sub>IN</sub> = 0.1V <sub>rms</sub> , f = 100Hz to 20kHz	-3.5	0	+3.5	dB	
Volume Control Range	V <sub>R</sub>	BASS/TRBL/BAL SW <sub>1-3</sub> : B, VOL SW <sub>4</sub> : A → C, V <sub>IN</sub> = 1V <sub>rms</sub>	70	80	-	dB	
Bass Control Range	V <sub>B</sub> Max	VOL/BAL SW <sub>3,4</sub> : B, V <sub>IN</sub> = 1V <sub>rms</sub> , f = 1kHz → 100Hz	BASS/TRBL SW <sub>1,2</sub> : A	7	11	14	dB
	V <sub>B</sub> Min		BASS/TRBL SW <sub>1,2</sub> : C	-15.0	-11.5	-7.0	dB
Treble Control Range	V <sub>T</sub> Max	VOL/BAL SW <sub>3,4</sub> : B, V <sub>IN</sub> = 1V <sub>rms</sub> , f = 1kHz → 20kHz	BASS/TRBL SW <sub>1,2</sub> : A	7	11	14	dB
	V <sub>T</sub> Min		BASS/TRBL SW <sub>1,2</sub> : C	-20	-14	-10	dB
Tone Error	ΔG <sub>V</sub>	VOL/BAL SW <sub>3,4</sub> : B, V <sub>IN</sub> = 1V <sub>rms</sub> , BASS/TRBL SW <sub>1,2</sub> : C → A	-	6	10	dB	
Total Harmonic Distortion	THD	BASS/TRBL/BAL SW <sub>1-3</sub> : B, VOL SW <sub>4</sub> : A, V <sub>O</sub> = 150mV <sub>rms</sub>	-	0.1	0.35	%	
Output Noise Voltage	V <sub>NO</sub>	BASS/TRBL/BAL SW <sub>1-3</sub> : B, VOL SW <sub>4</sub> : A, BPF = 50Hz to 20kHz, Input Open	-	130	300	μV <sub>rms</sub>	
Crosstalk	CT	BASS/TRBL/BAL SW <sub>1-3</sub> : B, VOL SW <sub>4</sub> : A, V <sub>OUT</sub> = 1V <sub>rms</sub>	-	70	-	dB	
Control Terminal Input Resistance	R <sub>IN</sub>	Pin8, Pin9, Pin10	-	500	-	kΩ	
		Pin7	-	200	-	kΩ	

**Pin Connection Diagram**



