

TA7630P

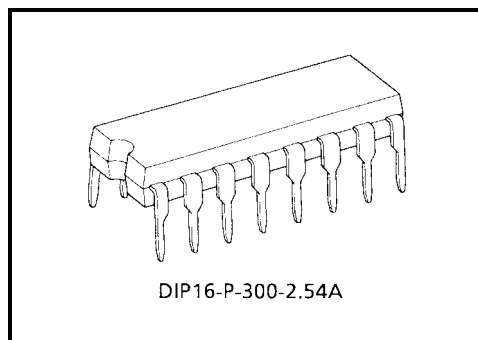
Dual. Volume/Balance/Tone (Bass/Treble) DC Control IC

The TA7630P is DC controlled dual volume, balance, tone (Bass, treble) IC. As these dual channels are constructed on one chip, this IC is excellent in pair characteristic.

It is suitable for automobile stereo, radio cassette, music center, TV multiplex sound receiver and remote controlled applications.

Features

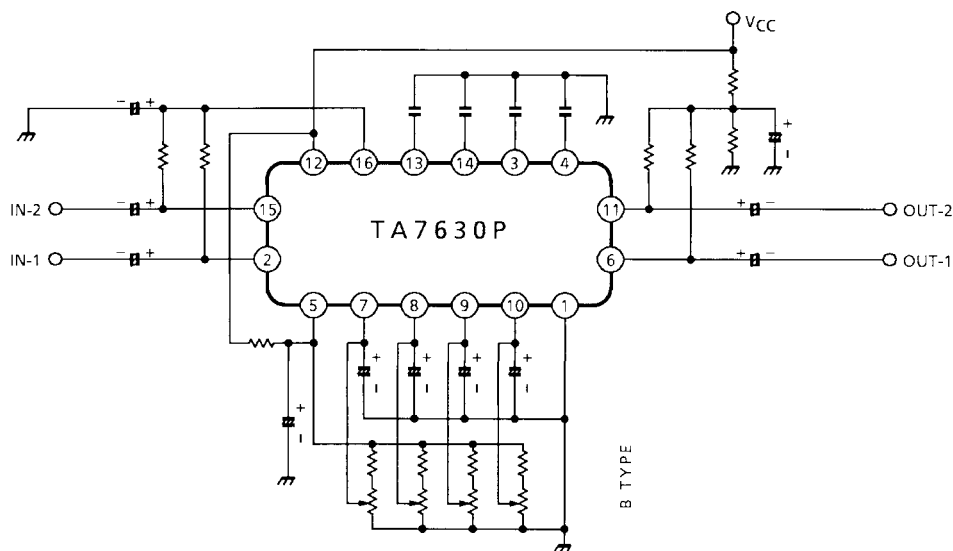
- Wide power supply voltage range:
Single supply $V_{CC} (opr) = 8 \sim 14 \text{ V}$ ($T_a = 25^\circ\text{C}$)
Dual supply $V_{CC} - V_{EE} (opr) = \pm 4 \sim \pm 7 \text{ V}$ ($T_a = 25^\circ\text{C}$)
- Wide volume control range: $V_R = 80\text{dB}$ (typ.)
- Excellent cross talk: C.T. = 70dB (typ.)
- Stable for temperature drift.
- Wide tone control range
Control range:
 $V_B = 10\text{dB}$ (typ.) ($f = 1 \text{ kHz} \rightarrow 100 \text{ Hz}$)
 $V_T = 12\text{dB}$ (typ.) ($f = 1 \text{ kHz} \rightarrow 20 \text{ kHz}$)



DIP16-P-300-2.54A

Weight: 1.00 g (typ.)

Block Diagram



Pin Connection

Pin No.	Symbol	Explanation
1	V _{EE}	Negative power supply
2	INPUT-1	Input channel-1
3	T _H (1)	Treble turning frequency setting.
4	T _L (1)	Bass turning frequency setting.
5	REF CONT	Reference control
6	OUTPUT-1	Output channel-1
7	BAL	Balance control
8	VOL	Volume control
9	BASS	Bass control
10	TRBL	Treble control
11	OUTPUT-2	Output channel-2
12	V _{CC}	Power supply
13	T _L (2)	Bass turning frequency setting
14	T _H (2)	Treble turning frequency setting
15	INPUT-2	Input channel-2
16	REF SIG	Reference signal

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage	V _{CC}	14	V
Power dissipation	P _D (Note)	750	mW
Operating temperature	T _{opr}	-25~75	°C
Storage temperature	T _{stg}	-55~150	°C

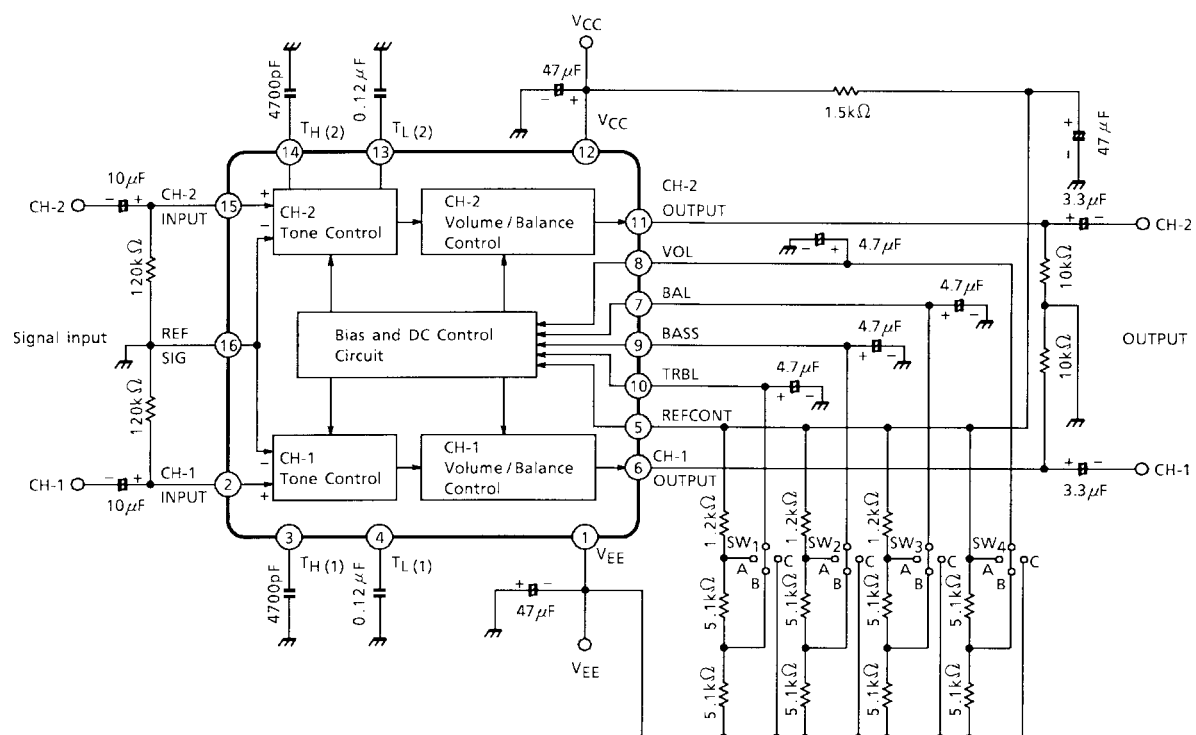
Note: Derated above Ta = 25°C in the proportion of 6 mW/°C.

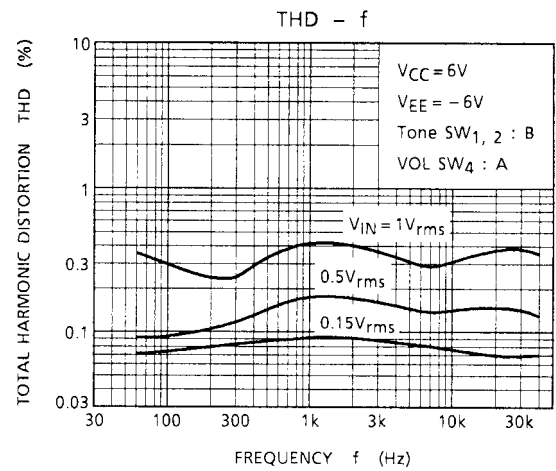
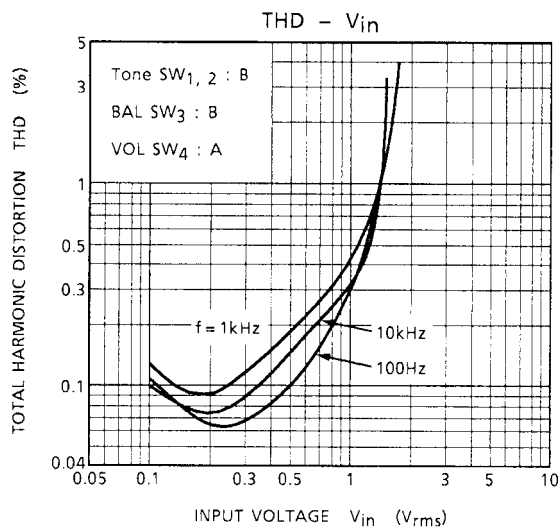
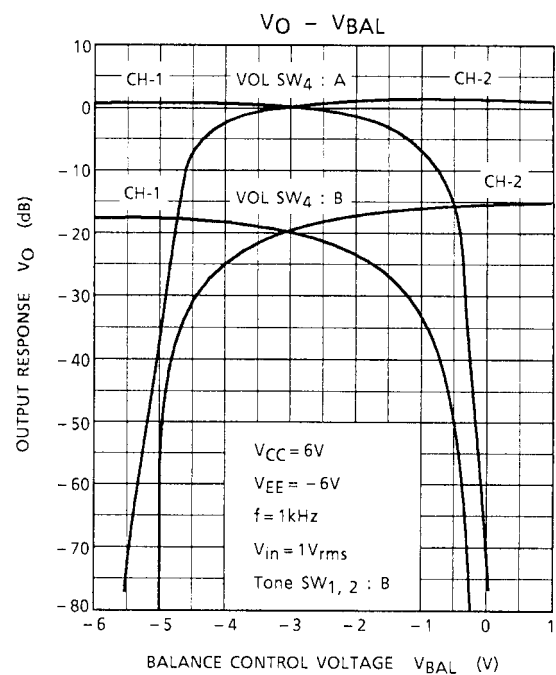
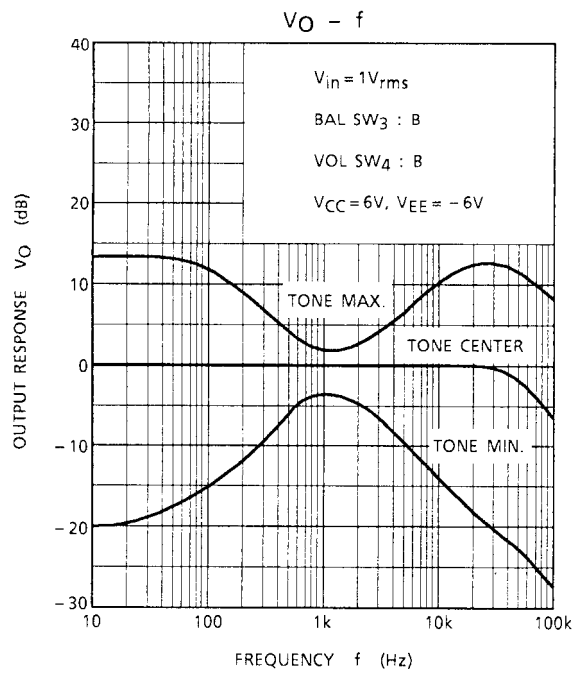
Electrical Characteristics

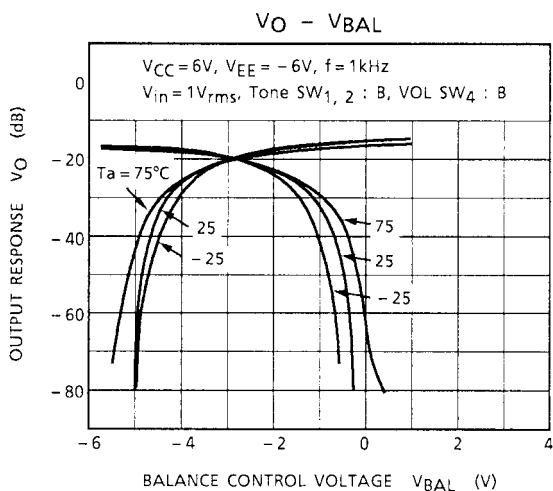
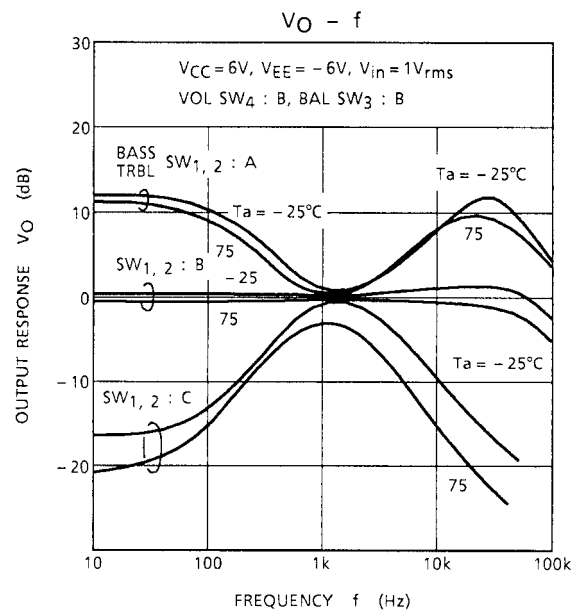
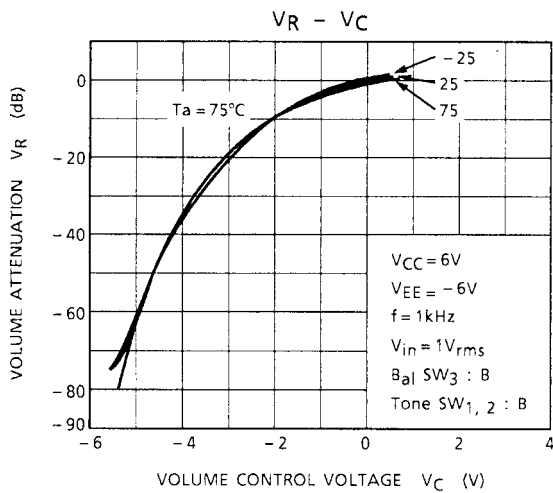
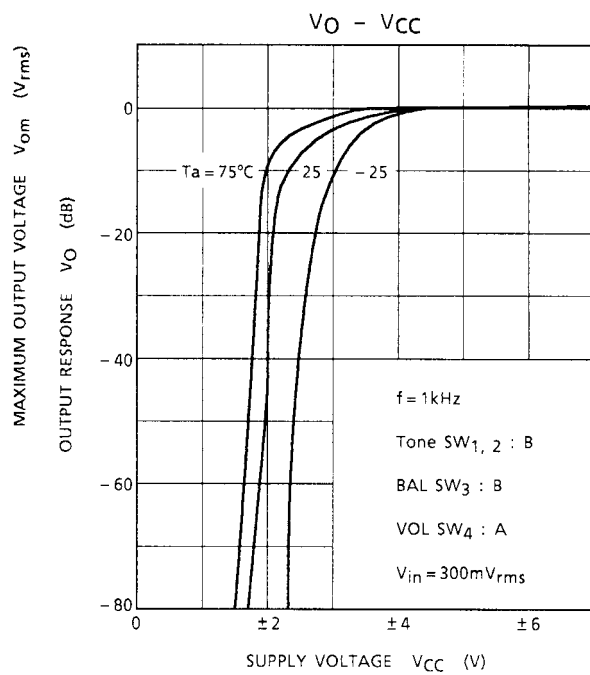
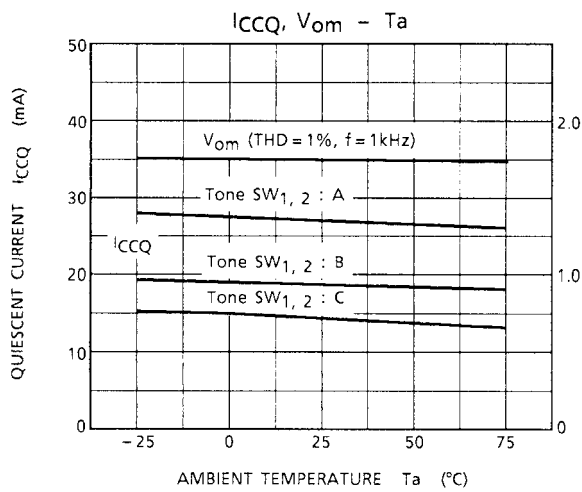
 (unless otherwise specified, $V_{CC} = 6\text{ V}$, $V_{EE} = -6\text{ V}$, $f = 1\text{ kHz}$, $T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Quiescent current	$I_{CCQ(1)}$	—	$V_{CC}, V_{EE} = \pm 4\text{ V}$ VOL/BAL/BASS/TRBL SW _{1~4} : B	—	11	17	mA
	$I_{CCQ(2)}$	—	VOL/BAL/BASS/TRBL SW _{1~4} : B	10	18	25	
Maximum input voltage	V_{in}	—	VOL/BAL/BASS/TRBL SW _{1~4} : B VOL SW ₄ : A, THD = 1%	—	—	1	Vrms
Maximum output voltage	V_{out}	—	BASS/TRBL/BAL SW ₁ , SW ₂ , SW ₃ : B VOL SW ₄ : A, THD = 1%	1	—	—	Vrms
Voltage gain	G_v	—	$V_{in} = 1\text{ Vrms}$ BASS/TRBL/BAL SW _{1~3} : B VOL SW ₄ : A	-0.5	2.0	4.5	dB
Channel balance	C.B. -1	—	BASS/TRBL/BAL SW _{1~3} : B VOL SW ₄ : A, $V_{in} = 1\text{ Vrms}$	-3	0	3	dB
	C.B. -2	—	VOL/BAL/BASS/TRBL SW _{1~4} : B $f = 100\text{ Hz} \sim 20\text{ kHz}$, $V_{in} = 0.1\text{ Vrms}$	-3.5	0	3.5	
Volume control range	V_R	—	BASS/TRBL/BAL SW _{1~3} : B, $V_{in} = 1\text{ Vrms}$ VOL SW ₄ : A $\rightarrow$ C	70	80	—	dB
Bass control range	$V_B\text{ MAX}$	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : A, $V_{in} = 1\text{ Vrms}$, $f = 1\text{ kHz} \rightarrow 100\text{ Hz}$	7	11	14	dB
	$V_B\text{ MIN}$	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : C, $V_{in} = 1\text{ Vrms}$, $f = 1\text{ kHz} \rightarrow 100\text{ Hz}$	-15	-11.5	-7	
Treble control range	$V_T\text{ MAX}$	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : A, $V_{in} = 1\text{ Vrms}$, $f = 1\text{ kHz} \sim 20\text{ kHz}$	7	11	14	dB
	$V_T\text{ MIN}$	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : C, $V_{in} = 1\text{ Vrms}$, $f = 1\text{ kHz} \sim 20\text{ kHz}$	-20	-14	-10	
Tone error	ΔG_v	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : C $\rightarrow$ A $V_{in} = 1\text{ Vrms}$	—	6	10	dB
Total harmonic distortion	THD	—	BASS/TRBL/BAL SW _{1~3} : B VOL SW ₄ : A, $V_{out} = 150\text{ mVrms}$	—	0.1	0.35	%
Output noise voltage	V_{no}	—	BASS/TRBL/BAL SW _{1~3} : B VOL SW ₄ : A BPF = 50 Hz $\sim$ 20 kHz, input open	—	130	300	μVrms
Cross talk	SEP	—	BASS/TRBL/BAL SW _{1~3} : B VOL SW ₄ : A, $V_{out} = 1\text{ Vrms}$	—	-70	—	dB
Control terminal input resistance	R_{IN}	—	pin 8, 9, 10	—	500	—	k Ω
		—	pin 7	—	200	—	

Test Circuit

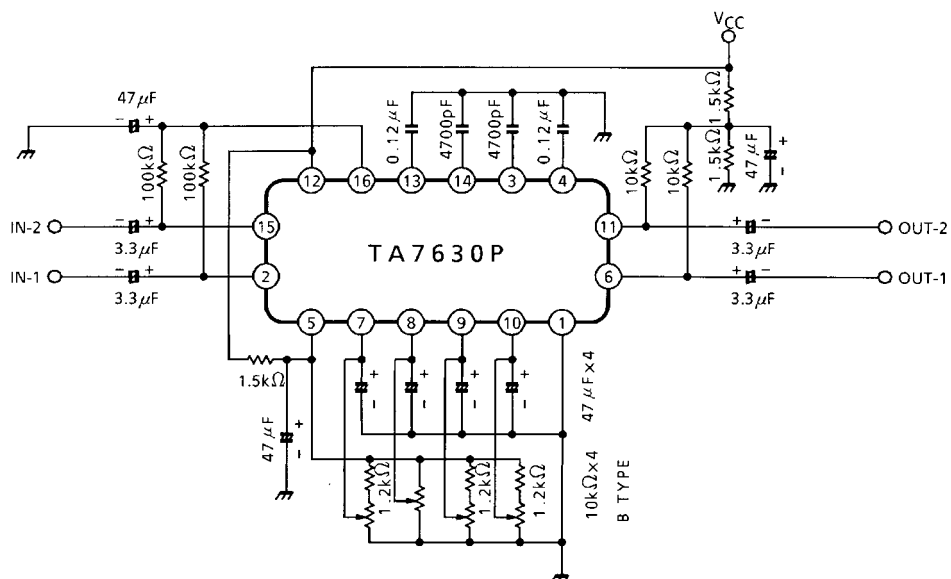




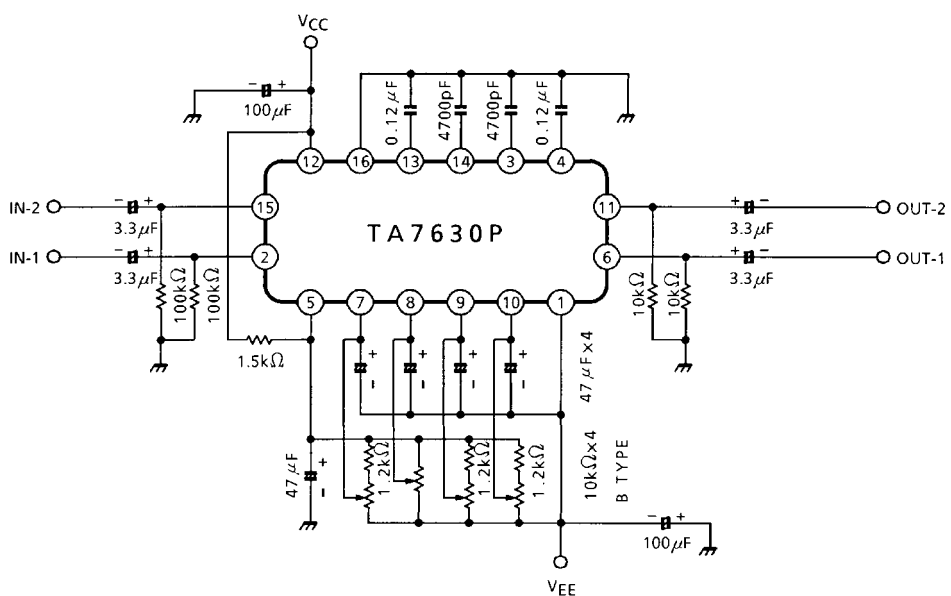


Application Circuits

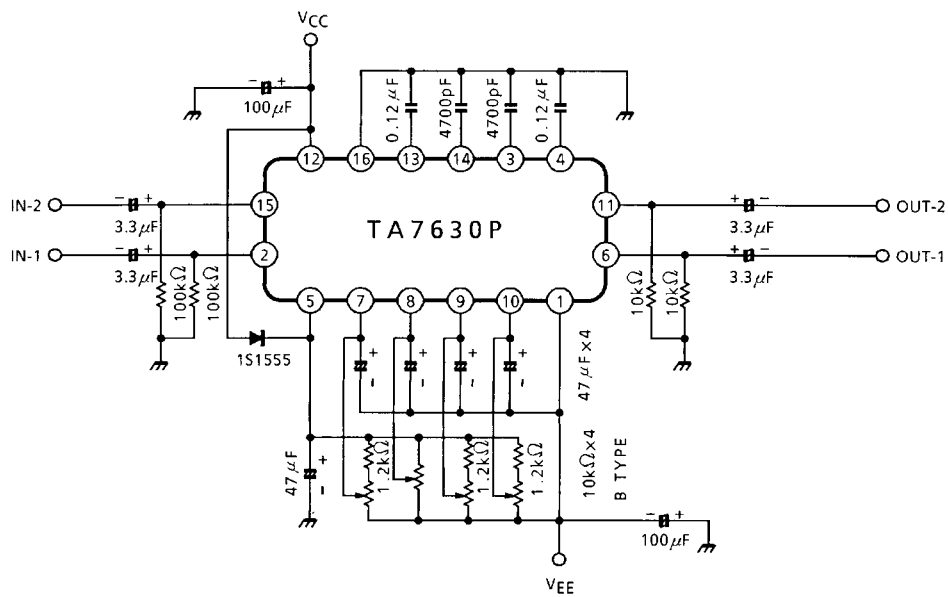
1. Single power supply



2. Dual power supply



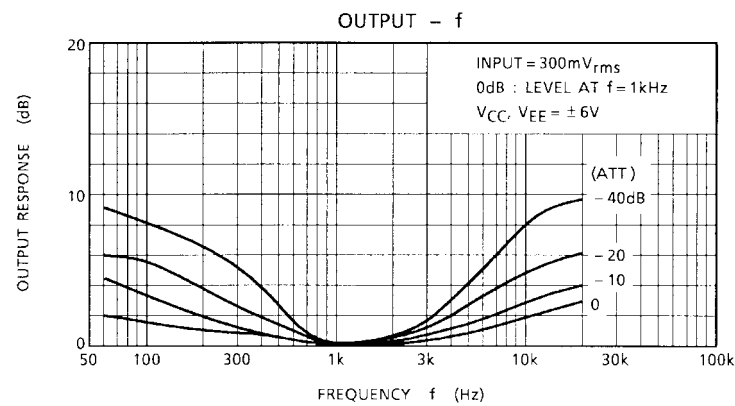
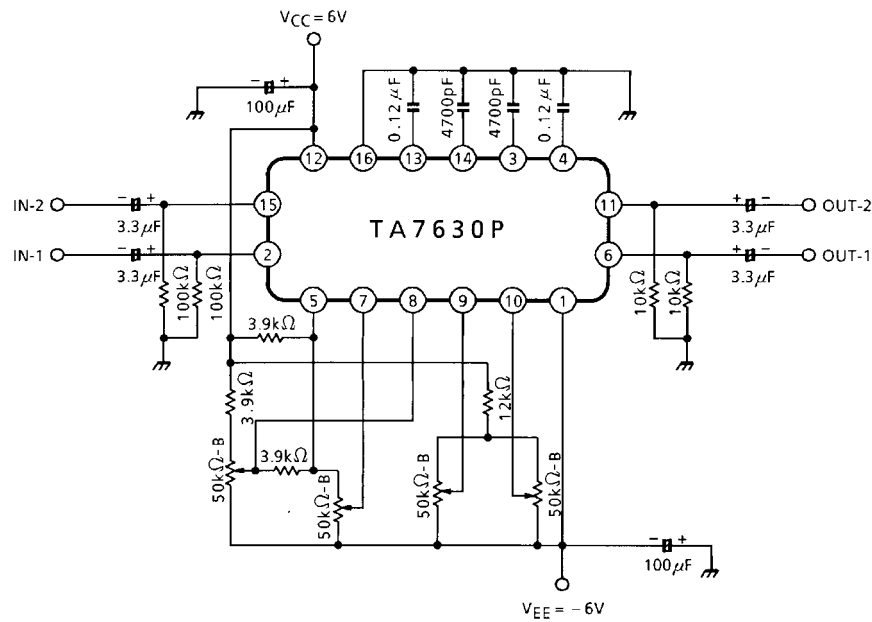
3. Application circuit using diode at reference terminal



The application circuit using diode between Pin 5 and Pin 12 has the following merits.

- (1) When each control terminal is driven by high impedance, the electrolytic capacitor between terminal 5 and GND operates as the back up capacitor, so that the rise time is short at the ON-OFF repetition of supply voltage.
- (2) When the current drain into the each control terminal varies by control voltage, the voltage of terminal 5 scarcely varies.
It means a stable reference voltage.

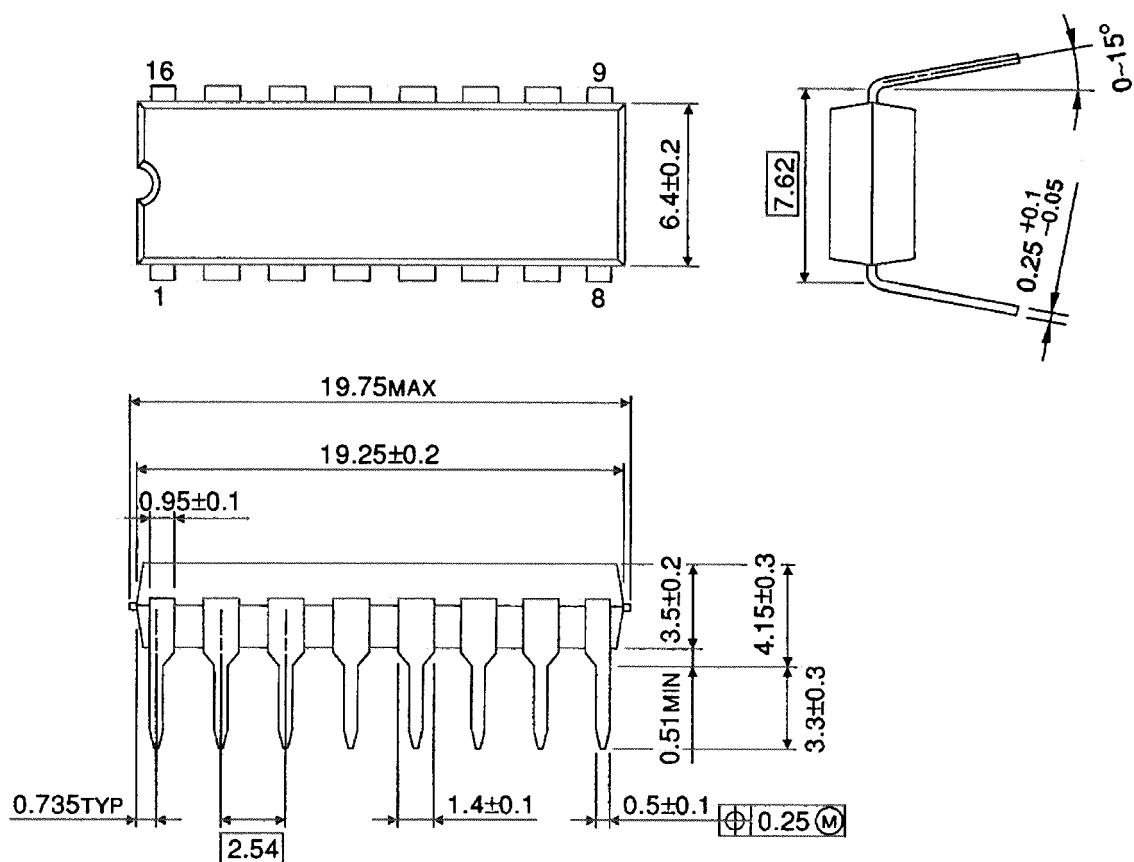
4. Quasi-loudness circuit



Package Dimensions

DIP16-P-300-2.54A

Unit : mm



Weight: 1.00 g (typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.