

TA7630P

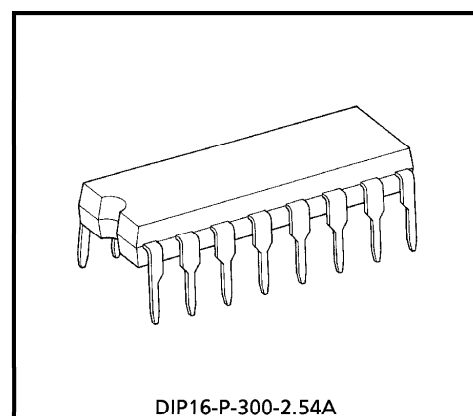
DUAL. VOLUME / BALANCE / TONE (BASS / TREBLE)

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.

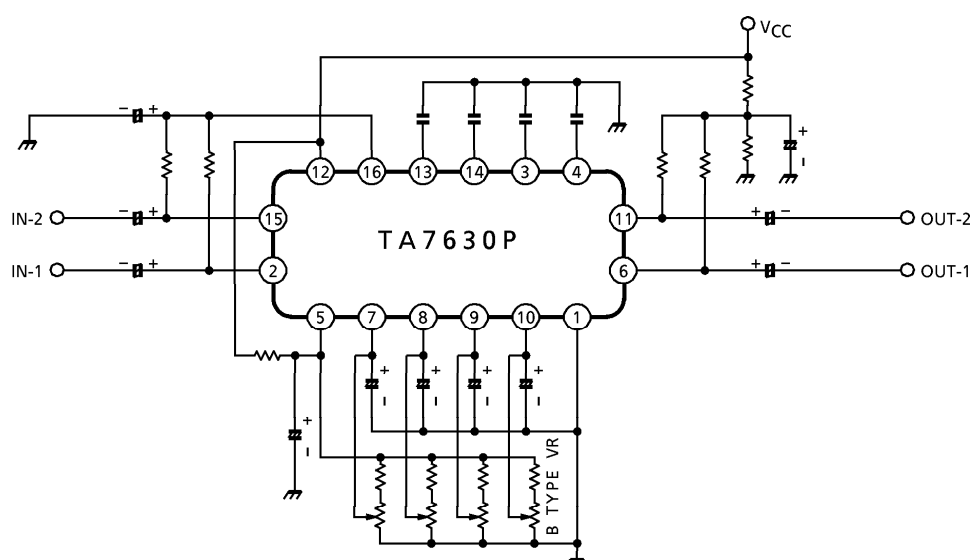
FEATURES

- Wide Power Supply Voltage Range
; Single Supply $V_{CC}(\text{opr}) = 8 \sim 14\text{V}$ ($T_a = 25^\circ\text{C}$)
Dual Supply $V_{CC} - V_{EE}(\text{opr}) = \pm 4 \sim \pm 7\text{V}$ ($T_a = 25^\circ\text{C}$)
- 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.) at $f = 1\text{kHz} \rightarrow 100\text{Hz}$
 $V_T = 12\text{dB}$ (Typ.) at $f = 1\text{kHz} \rightarrow 20\text{kHz}$



Weight : 1.00g (Typ.)

BLOCK DIAGRAM



961001EBA2

● TOSHIBA is continually working to improve the quality and the 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 observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product 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 products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

PIN CONNECTION

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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	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 6mW/°C.

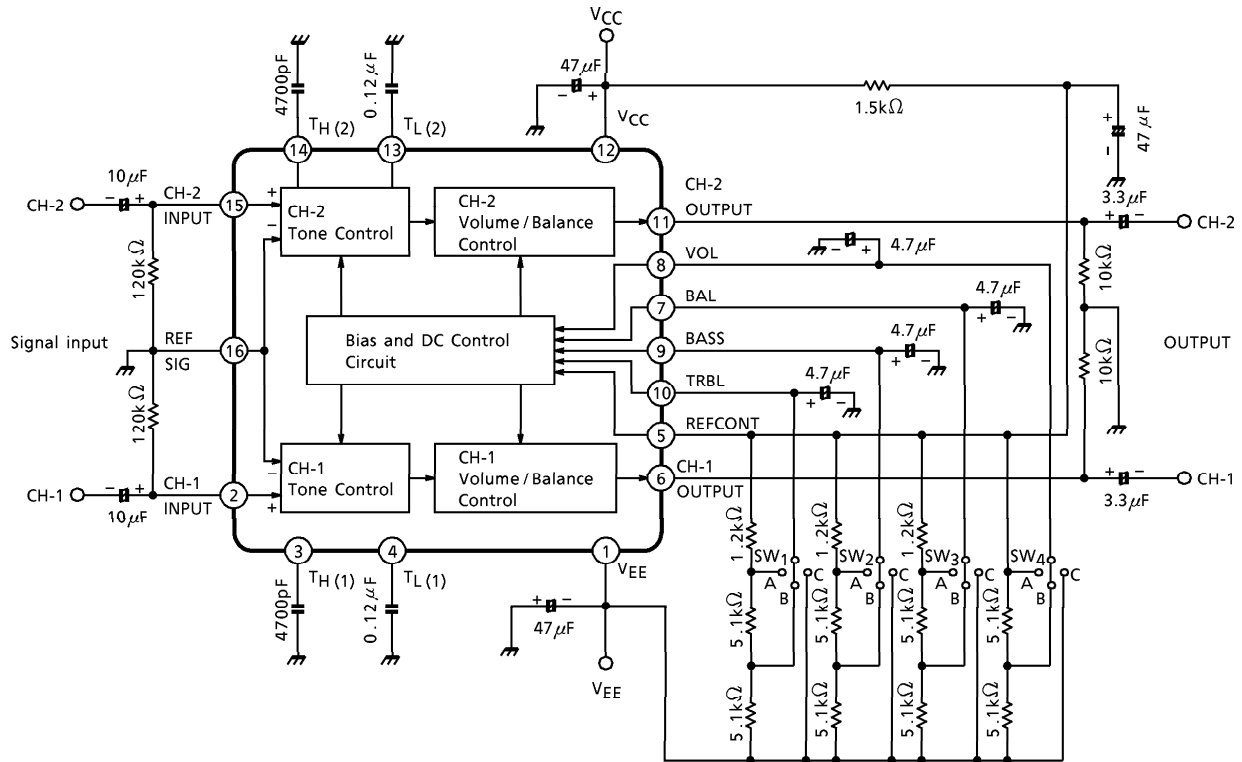
961001EBA2'

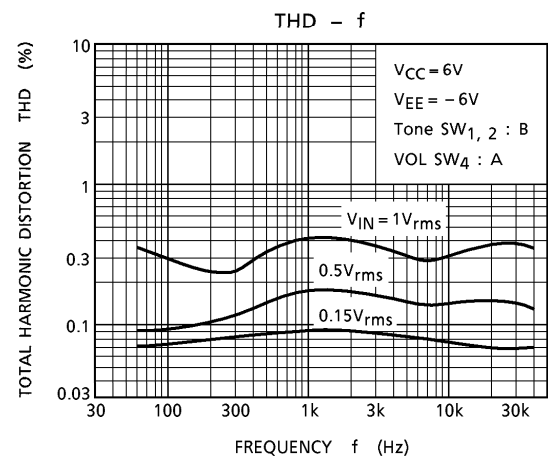
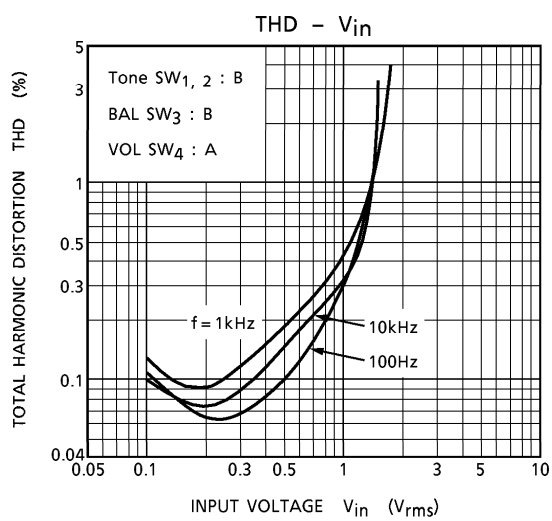
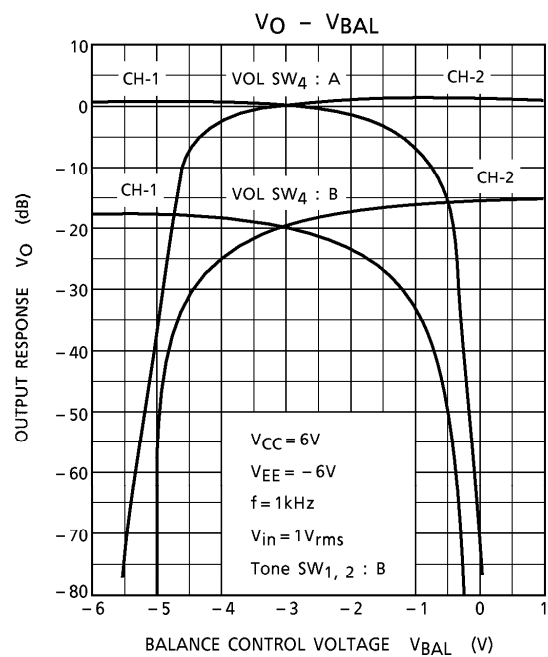
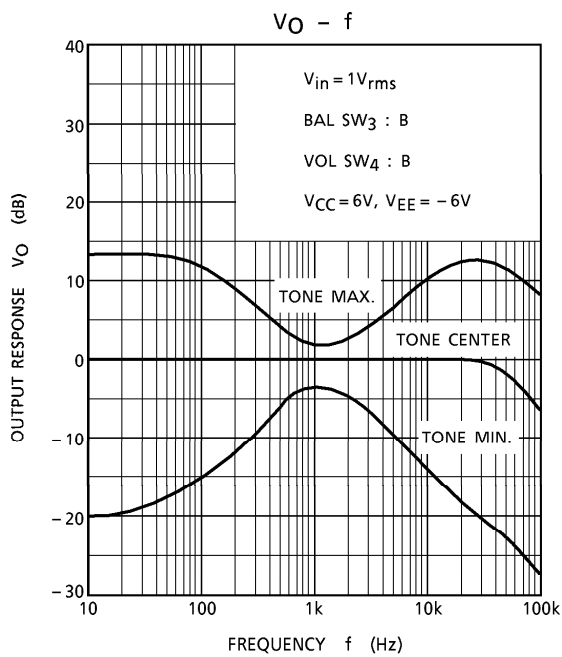
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property 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.

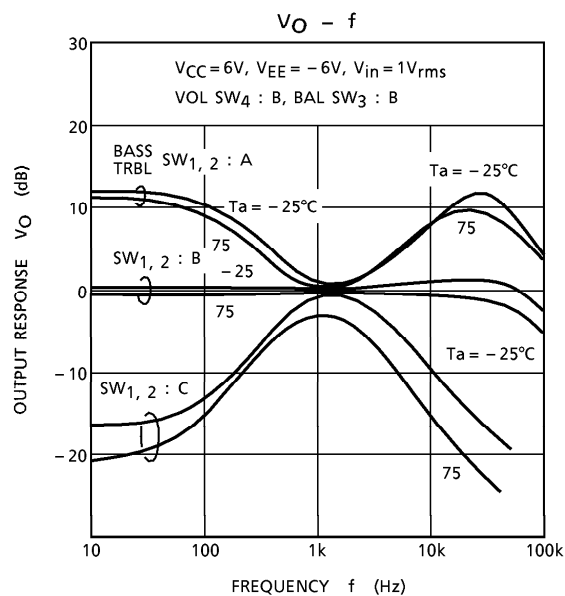
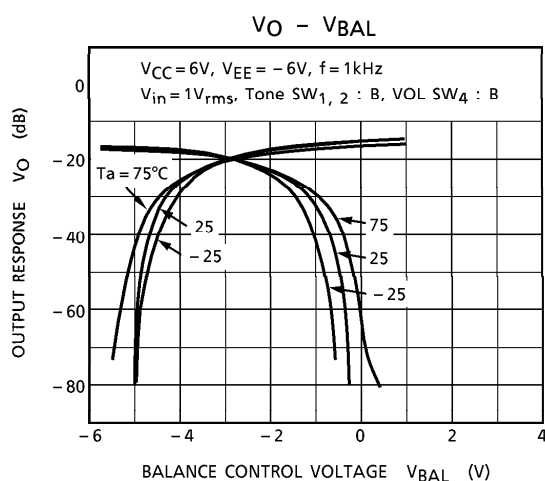
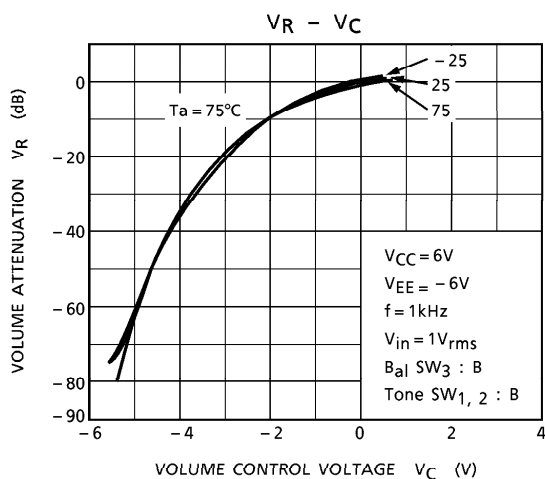
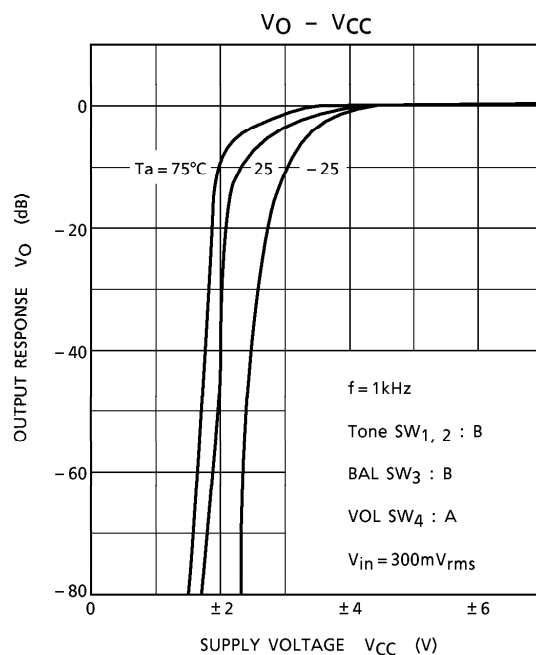
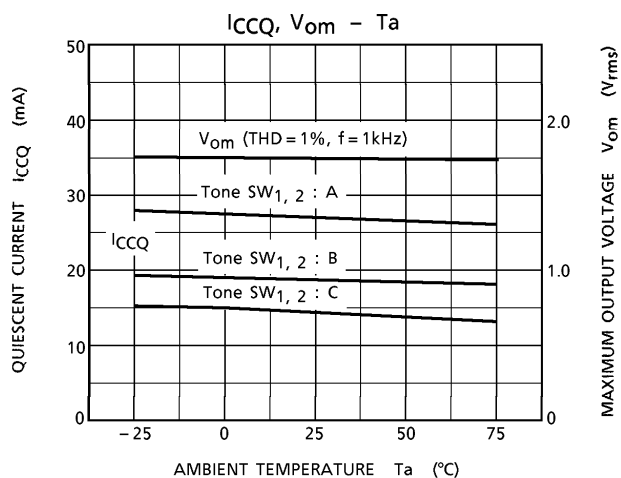
ELECTRICAL CHARACTERISTICS (Unless otherwise specified, $V_{CC} = 6V$, $V_{EE} = -6V$, $f = 1kHz$, $T_a = 25^\circ C$)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	$I_{CCQ(1)}$	—	$V_{CC}, V_{EE} = \pm 4V$	—	11	17	mA
	$I_{CCQ(2)}$	—	VOL/BAL/BASS/TRBL SW _{1~4} : B	10	18	25	
Maximum Input Voltage	V_{in}	—	BASS/TRBL/BAL SW _{1~4} : B VOL SW ₄ : A, THD = 1%	—	—	1	V_{rms}
Maximum Output Voltage	V_{out}	—	BASS/TRBL/BAL SW _{1, 2, 3} : B VOL SW ₄ : A, THD = 1%	1	—	—	V_{rms}
Voltage Gain	G_V	—	$V_{in} = 1V_{rms}$ 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, $V_{in} = 1V_{rms}$	-3	0	3	dB
	C.B. -2	—	VOL/BASS/TRBL/BAL SW _{1~4} : B $f = 100Hz \sim 20kHz$, $V_{in} = 0.1V_{rms}$	-3.5	0	3.5	
Volume Control Range	V_R	—	BASS/TRBL/BAL SW _{1~3} : B, $V_{in} = 1V_{rms}$ VOL SW ₄ : A $\rightarrow$ C	70	80	—	dB
Bass Control Range	V_B MAX	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : A, $V_{in} = 1V_{rms}$ $f = 1kHz \rightarrow 100Hz$	7	11	14	dB
	V_B MIN	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : C, $V_{in} = 1V_{rms}$ $f = 1kHz \rightarrow 100Hz$	-15	-11.5	-7	
Treble Control Range	V_T MAX	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : A, $V_{in} = 1V_{rms}$ $f = 1kHz \rightarrow 20kHz$	7	11	14	dB
	V_T MIN	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : C, $V_{in} = 1V_{rms}$ $f = 1kHz \rightarrow 20kHz$	-20	-14	-10	
Tone Error	ΔG_V	—	VOL/BAL SW _{3, 4} : B BASS/TRBL SW _{1, 2} : C $\rightarrow$ A $V_{in} = 1V_{rms}$	—	6	10	dB
Total Harmonic Distortion	THD	—	BASS/TRBL/BAL SW _{1~3} : B VOL SW ₄ : A, $V_{out} = 150mV_{rms}$	—	0.1	0.35	%
Output Noise Voltage	V_{no}	—	BASS/TRBL/BAL SW _{1~3} : B VOL SW ₄ : A BPF = 50Hz $\sim$ 20kHz, input open	—	130	300	μV_{rms}
Cross Talk	SEP	—	BASS/TRBL/BAL SW _{1~3} : B VOL SW ₄ : A, $V_{out} = 1V_{rms}$	—	-70	—	dB
Control Terminal Input Resistance	R_{IN}	—	pin⑧, ⑨, ⑩	—	500	—	k Ω
		—	pin⑦	—	200	—	

TEST CIRCUIT

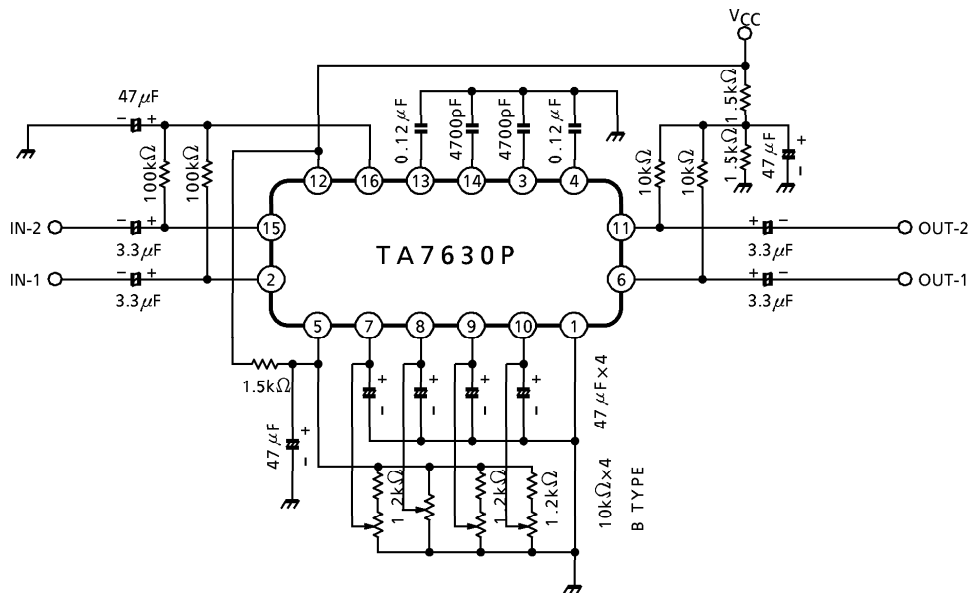




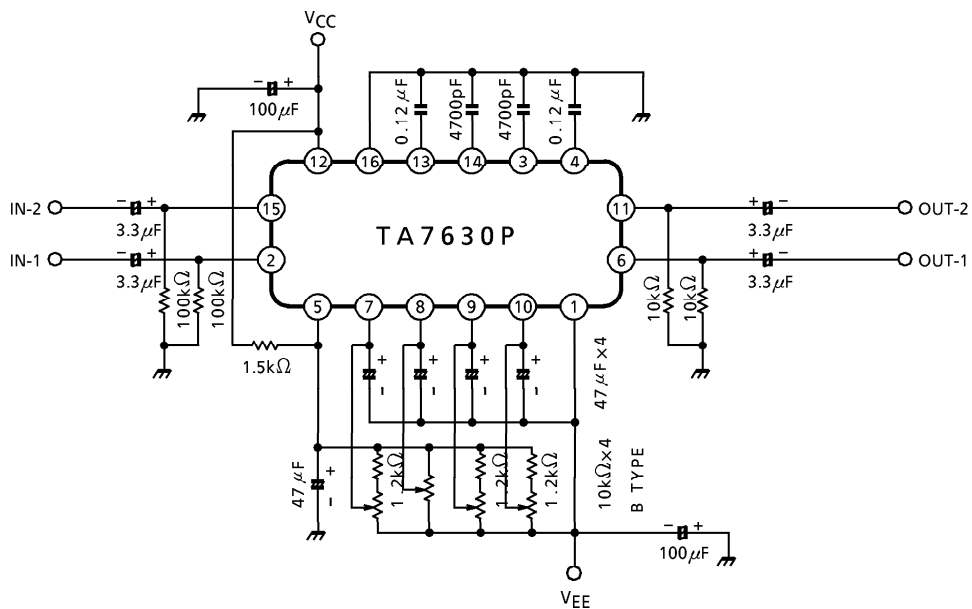


APPLICATION CIRCUITS

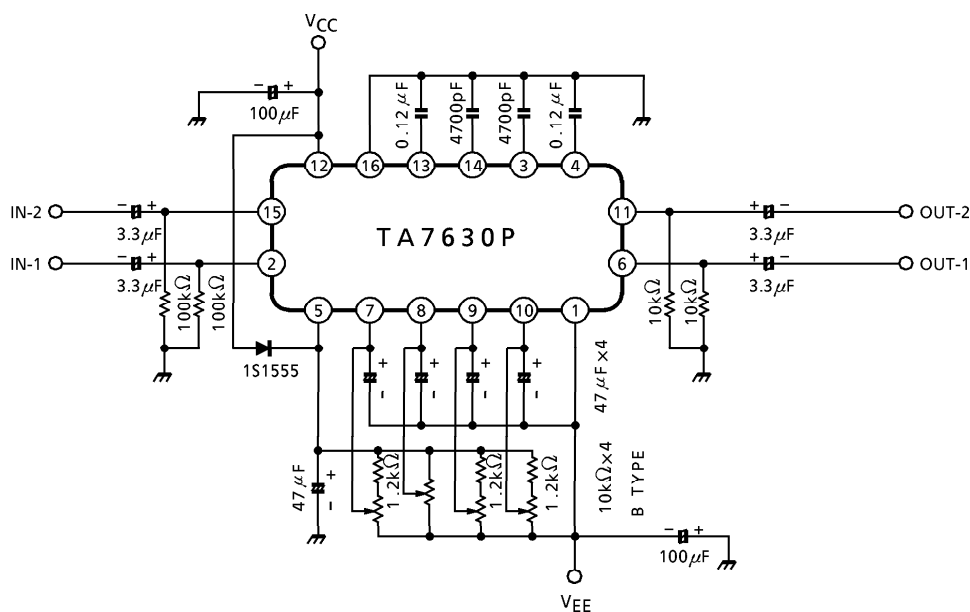
1. Single power supply



2. Dual power supply



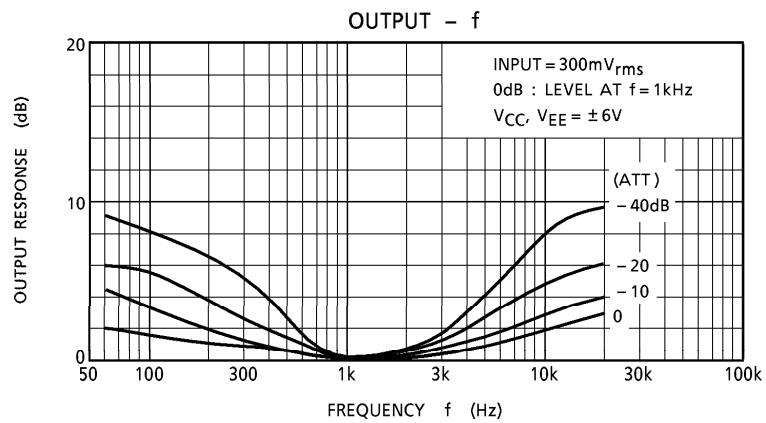
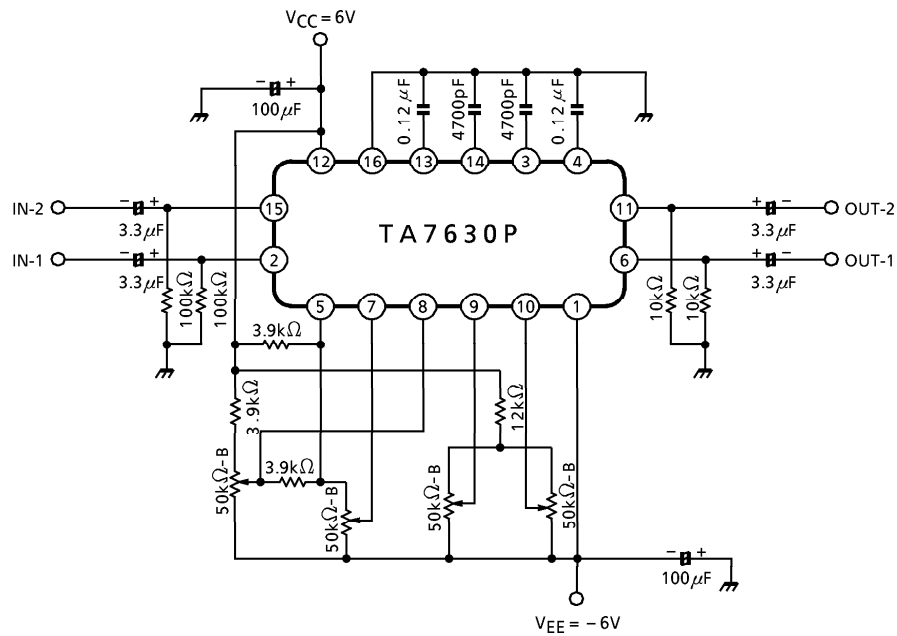
3. Application circuit using diode at reference terminal



The application circuit using diode between Pin⑤ and Pin⑫ has the following merits.

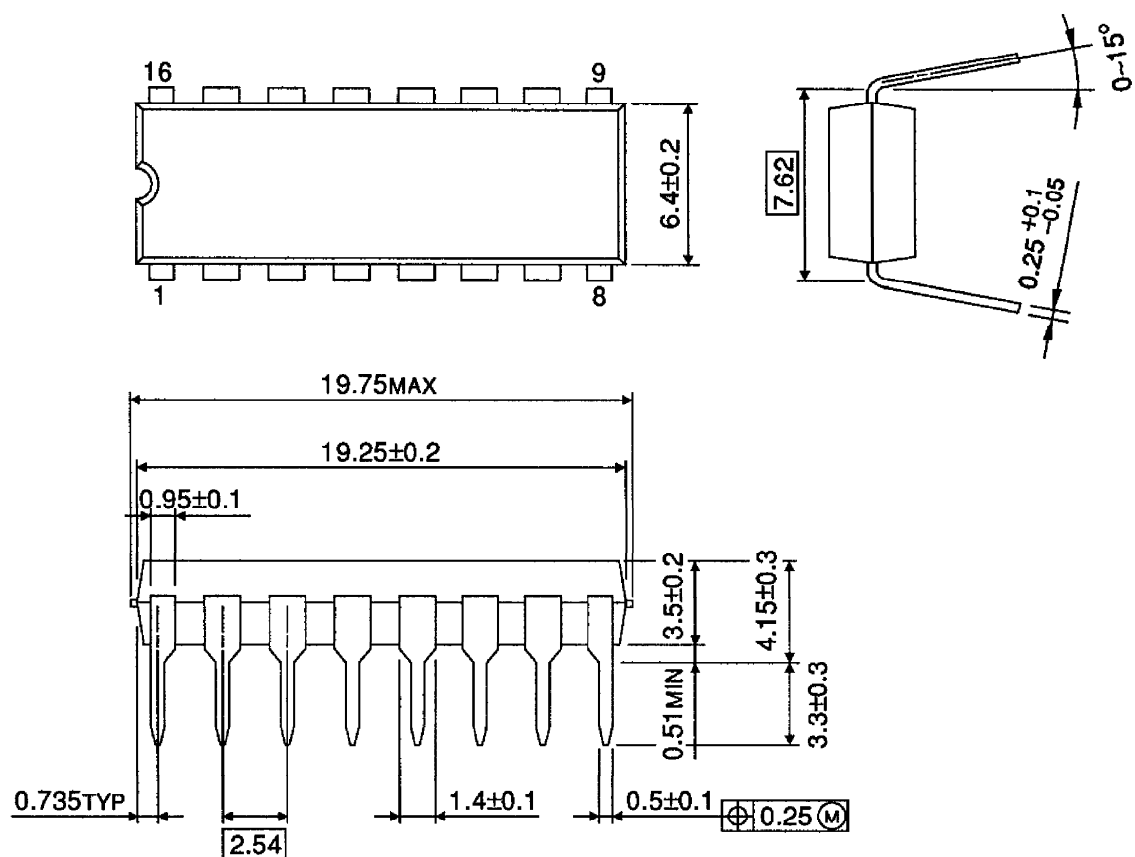
1. When each control terminal is driven by high impedance, the electrolytic capacitor between terminal ⑤ and GND operates as the back up capacitor, so that the rise time is short at the ON-OFF repetition of supply voltage.
2. When the current drain into the each control terminal varies by control voltage,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

4. Quasi-loudness circuit



OUTLINE DRAWING
DIP16-P-300-2.54A

Unit : mm



Weight : 1.00g (Typ.)