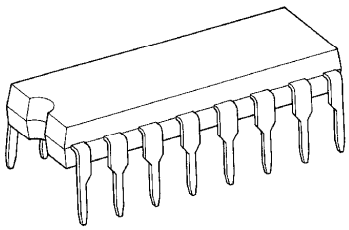
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

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.



DIP16-P-300-2.54A

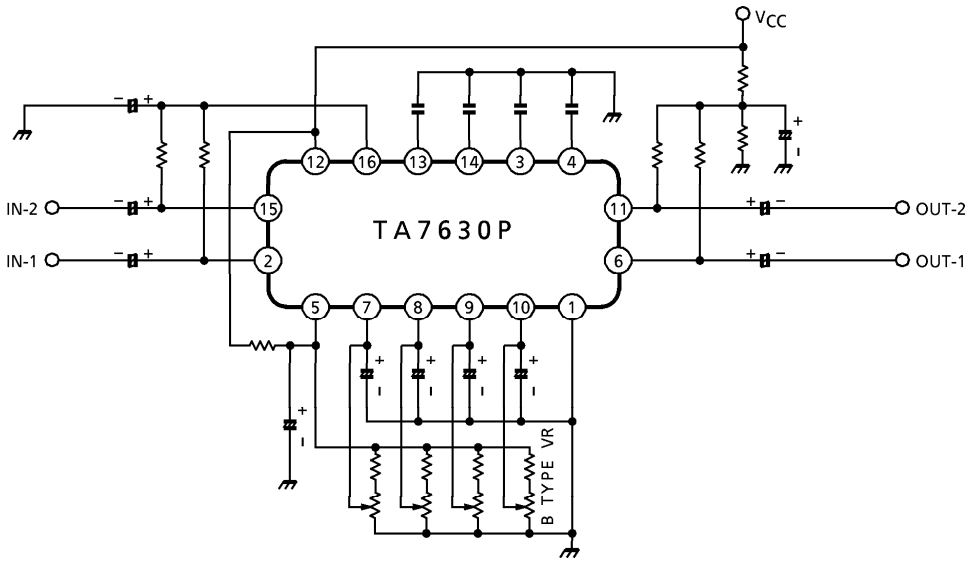
Weight : 1.00g (Typ.)

FEATURES

- Wide Power Supply Voltage Range
  ; Single Supply $V_{CC\,(opr)}$ = 8~14V (Ta = 25°C)
  Dual Supply $V_{CC} - V_{EE\,(opr)}$ = ±4~±7V (Ta = 25°C)
- Wide Volume Control Range ; V_R = 80dB (Typ.)
- Excellent Cross Talk ; C.T. = 70dB (Typ.)
- Stable for Temperature Drift.
- Wide Tone Control Range

  Control Range ; V_B = 10dB (Typ.) at f = 1kHz→100Hz
  V_T = 12dB (Typ.) at f = 1kHz→20kHz

BLOCK DIAGRAM



961001EBA2

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)

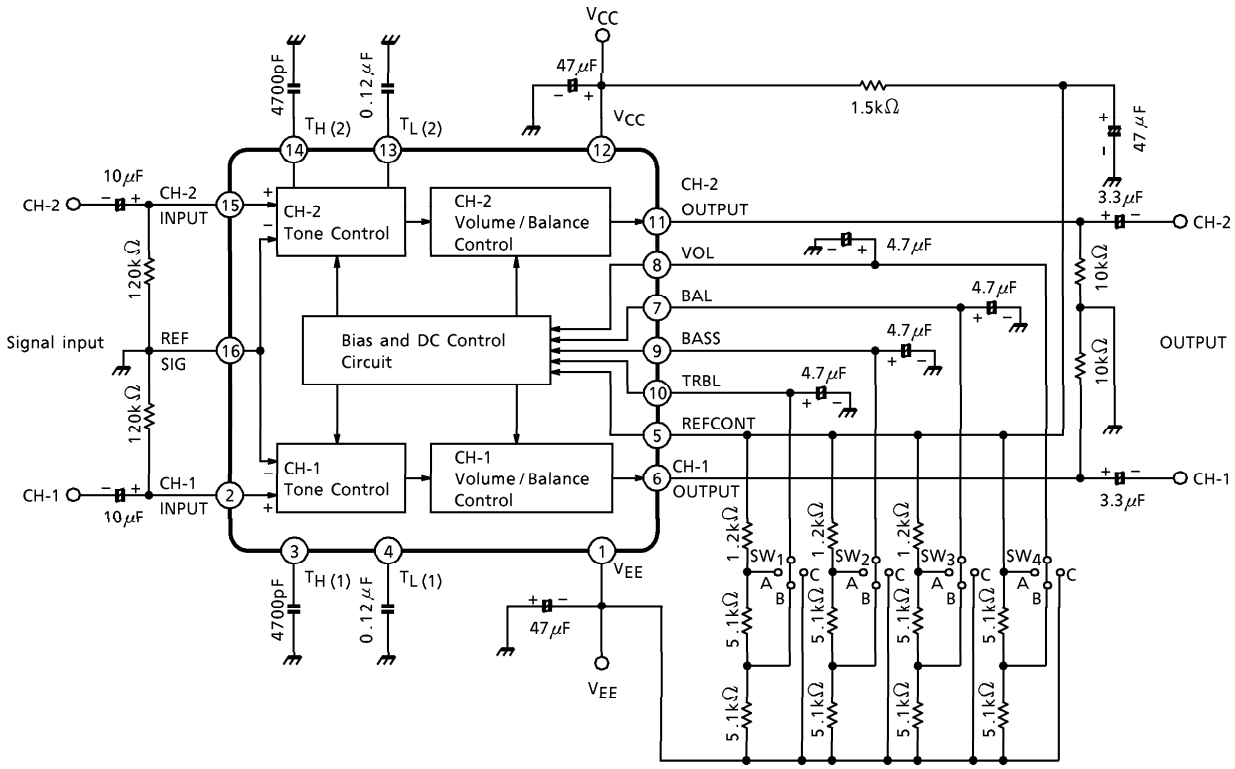
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	14	V
Power Dissipation	P_{D} (Note)	750	mW
Operating Temperature	T_{opr}	− 25~75	°C
Storage Temperature	T_{stg}	− 55~150	°C

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

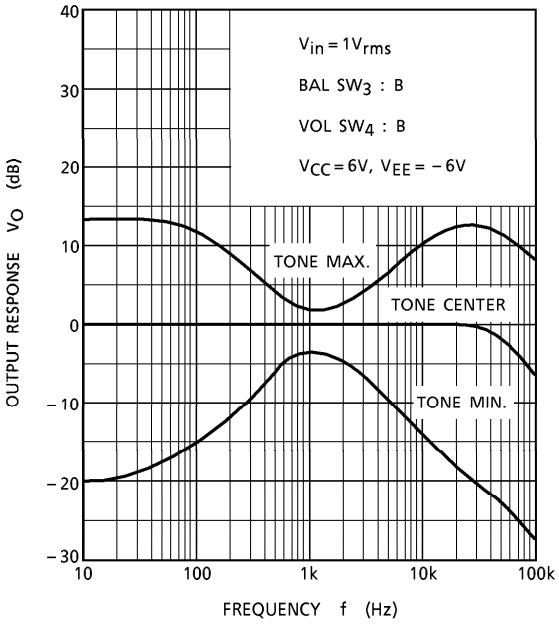
ELECTRICAL CHARACTERISTICS (Unless otherwise specified, V_{CC} = 6V, V_{EE} = − 6V, f = 1kHz, Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ} (1)	—	V_{CC}, V_{EE} = ± 4V	—	11	17	mA
	I_{CCQ} (2)	—	VOL / BAL / BASS / TRBL SW$_{1\sim4}$: B	10	18	25	
Maximum Input Voltage	V_{in}	—	BASS / TRBL / BAL SW$_{1\sim4}$: B VOL SW$_4$: A, THD = 1%	—	—	1	V_{rms}
Maximum Output Voltage	V_{out}	—	BASS / TRBL / BAL SW$_1$, SW$_2$, SW$_3$: B VOL SW$_4$: A, THD = 1%	1	—	—	V_{rms}
Voltage Gain	G_V	—	V_{in} = 1V_{rms} BASS / TRBL / BAL SW$_{1\sim3}$: B VOL SW$_4$: A	− 0.5	2.0	4.5	dB
Channel Balance	C.B. -1	—	BASS / TRBL / BAL SW$_{1\sim3}$: B VOL SW$_4$: A, V_{in} = 1V_{rms}	− 3	0	3	dB
	C.B. -2	—	VOL / BASS / TRBL / BAL SW$_{1\sim4}$: B f = 100Hz~20kHz, V_{in} = 0.1V_{rms}	− 3.5	0	3.5	
Volume Control Range	V_R	—	BASS / TRBL / BAL SW$_{1\sim3}$: B, V_{in} = 1V_{rms} VOL SW$_4$: A→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→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→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→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→20kHz	− 20	− 14	− 10	
Tone Error	ΔG_V	—	VOL / BAL SW$_{3,\ 4}$: B BASS / TRBL SW$_{1,\ 2}$: C→A V_{in} = 1V_{rms}	—	6	10	dB
Total Harmonic Distortion	THD	—	BASS / TRBL / BAL SW$_{1\sim3}$: B VOL SW$_4$: A, V_{out} = 150mV_{rms}	—	0.1	0.35	%
Output Noise Voltage	V_{no}	—	BASS / TRBL / BAL SW$_{1\sim3}$: B VOL SW$_4$: A BPF = 50Hz~20kHz, input open	—	130	300	μV_{rms}
Cross Talk	SEP	—	BASS / TRBL / BAL SW$_{1\sim3}$: B VOL SW$_4$: A, V_{out} = 1V_{rms}	—	− 70	—	dB
Control Terminal Input Resistance	R_{IN}	—	pin⑧, ⑨, ⑩	—	500	—	kΩ
			pin⑦	—	200	—	

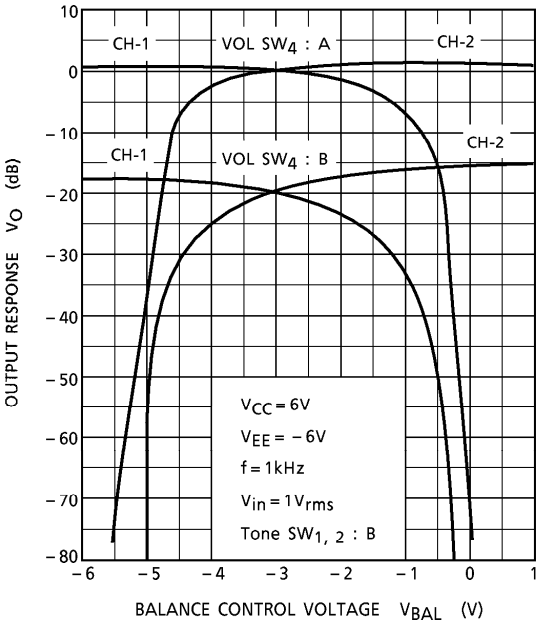
TEST CIRCUIT



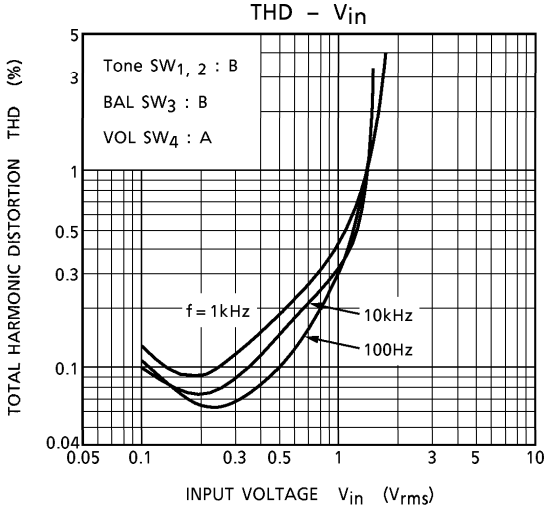
V_O – f



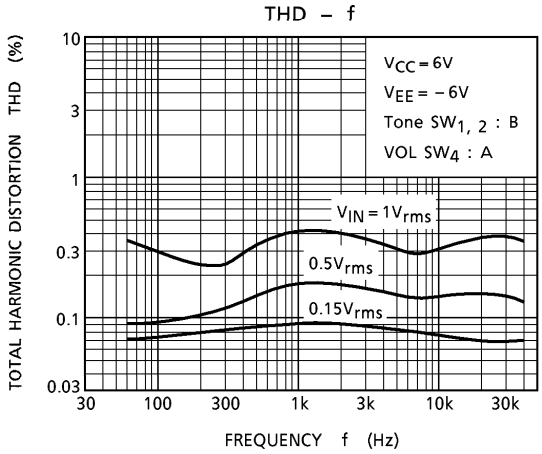
V_O – V_{BAL}



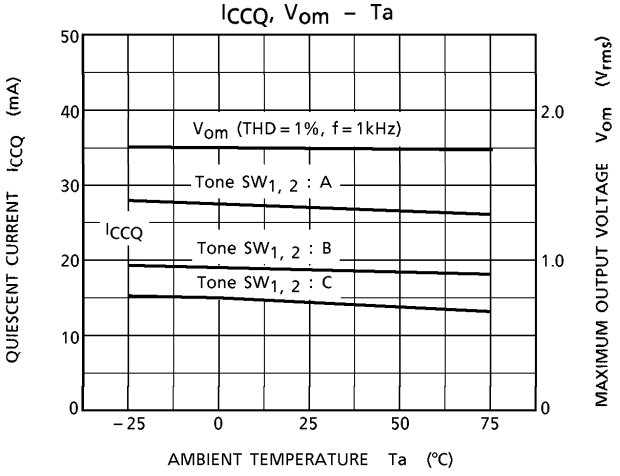
THD – V_{in}



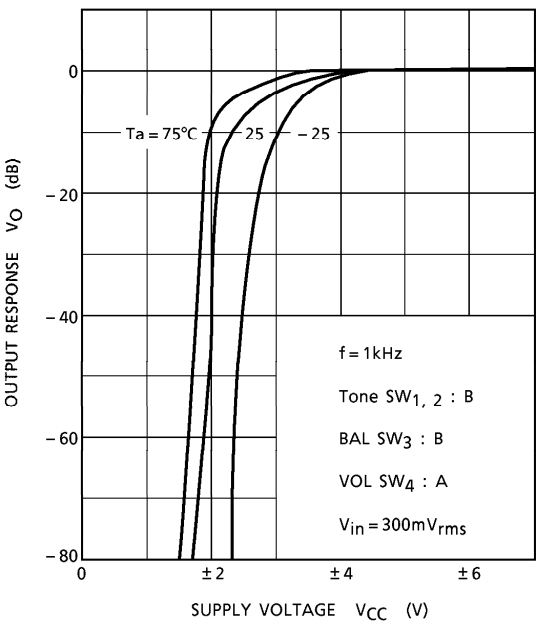
THD – f



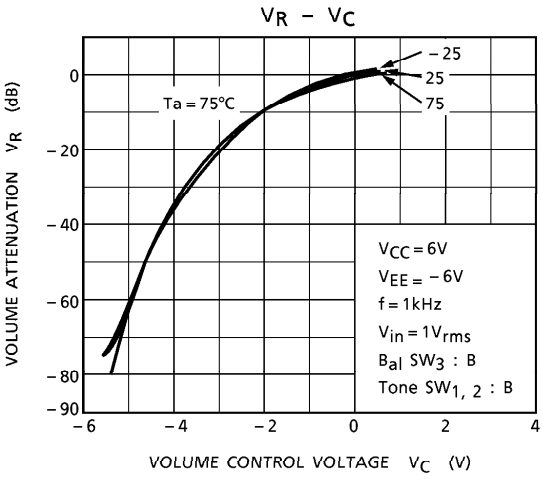
I_{CCQ}, V_{om} – Ta



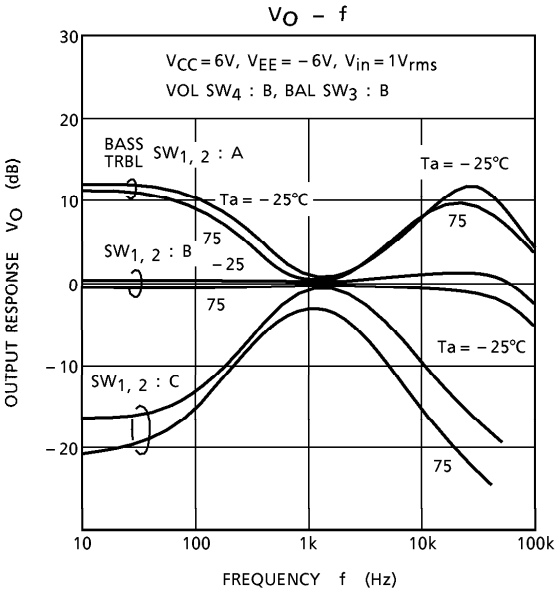
V_O – V_{CC}



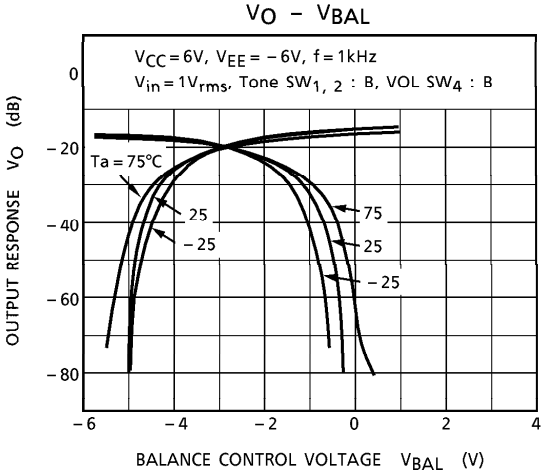
V_R – V_C



V_O – f

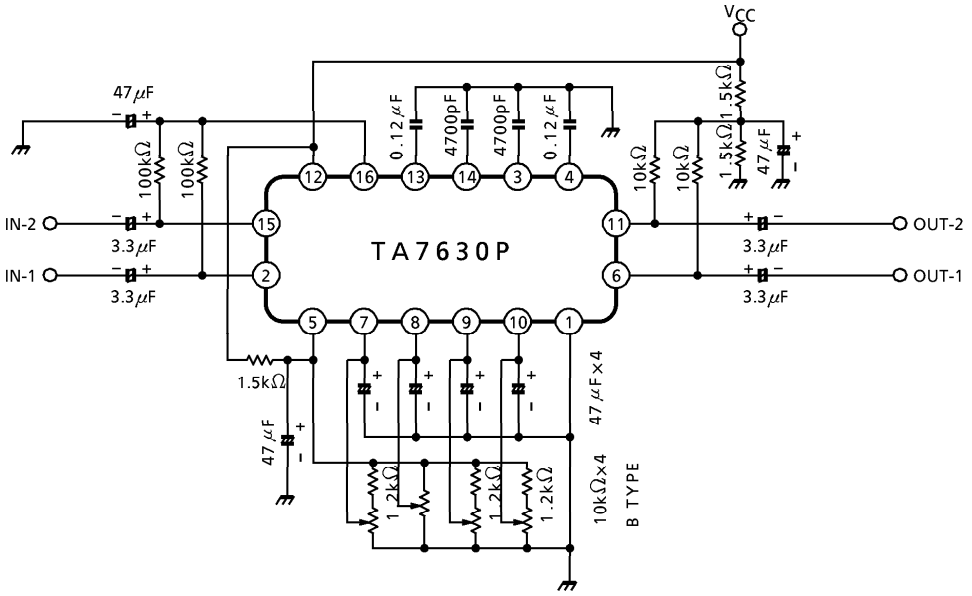


V_O – V_{BAL}

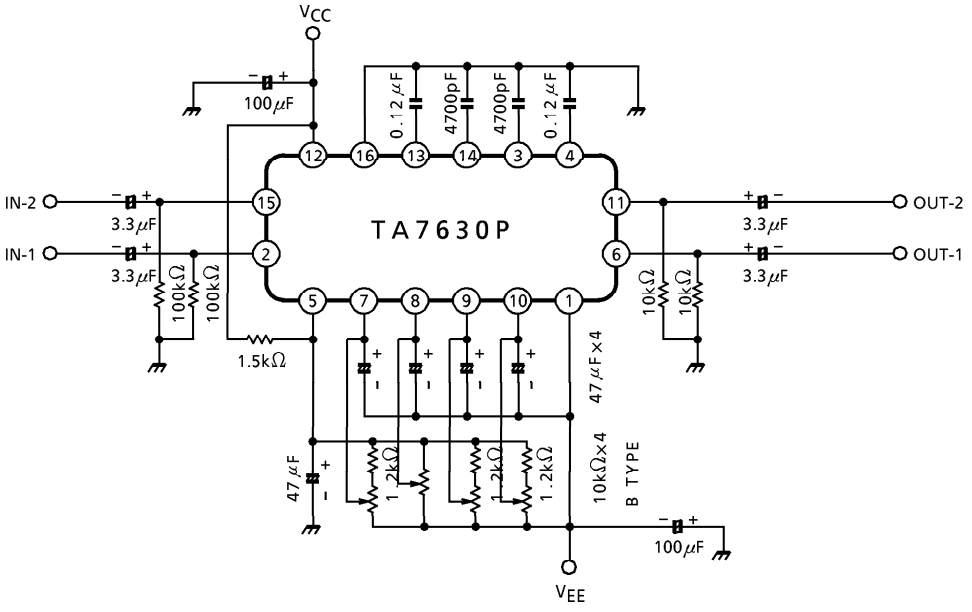


APPLICATION CIRCUITS

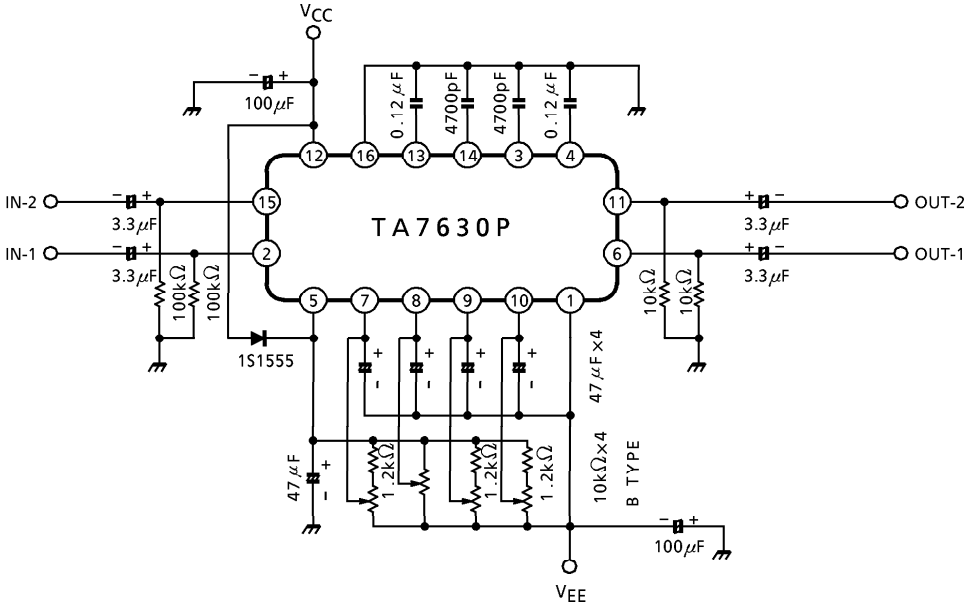
1. Single power supply



2. Dual power supply



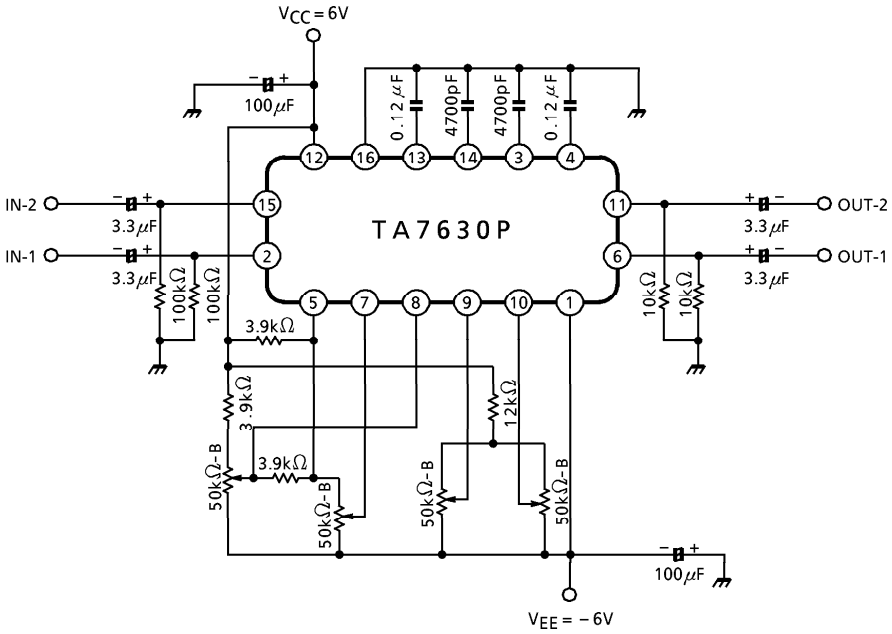
3. Application circuit using diode at reference terminal

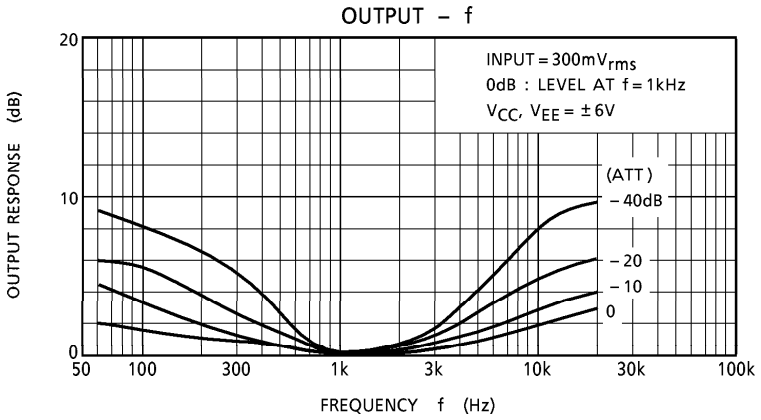


The application circuit using diode between Pin⑤ and Pin⑫ has the following merits.

1. When each control terminal is drived 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 repetation 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

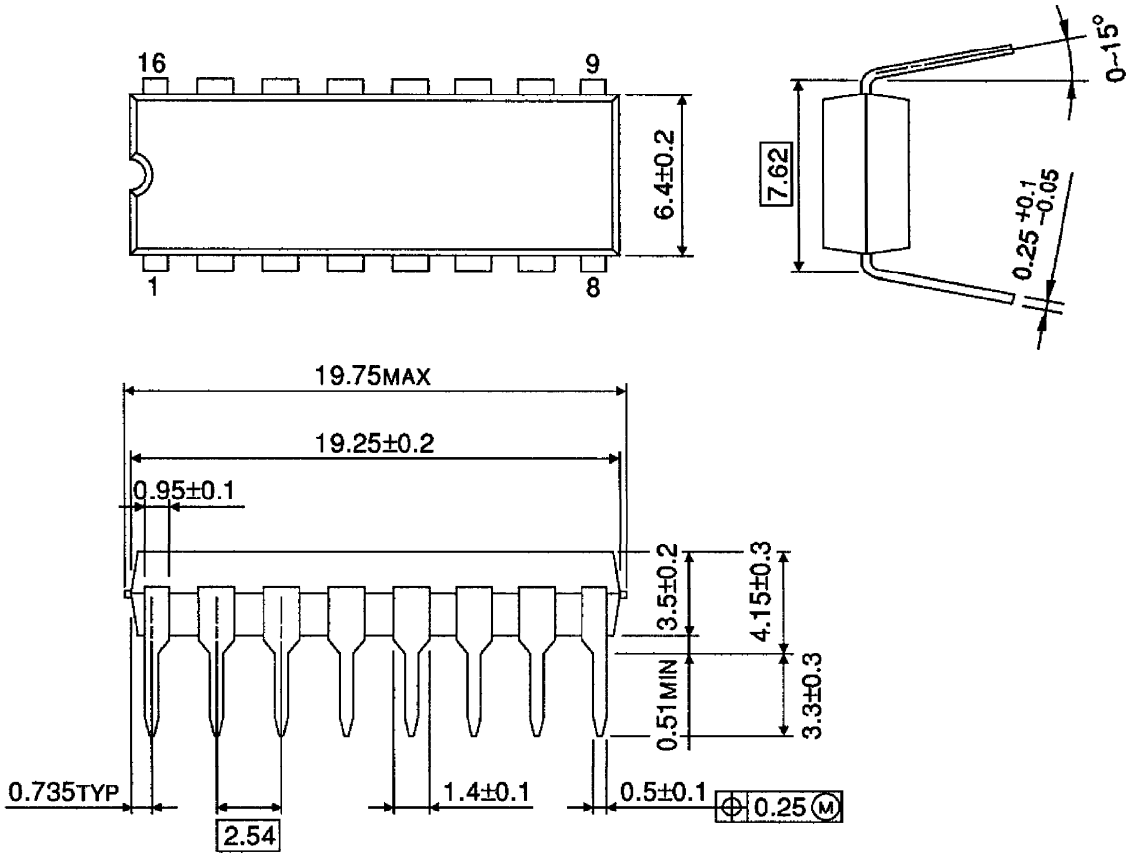




OUTLINE DRAWING

DIP16-P-300-2.54A

Unit : mm



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