



INTEGRATED CIRCUIT

TECHNICAL DATA

TA7630P

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT

SILICON MONOLITHIC

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.

• Wide Power Supply Voltage Range;

Single Supply $V_{CC(opr)} = 8 \sim 14V$

Dual Supply $V_{CC-VEE(opr)} = \pm 4 \sim \pm 7V$

• Wide Volume Control Range ; $V_R = 80dB$ (Typ.)

• Excellent Cross Talk ; $CT = 70dB$ (Typ.)

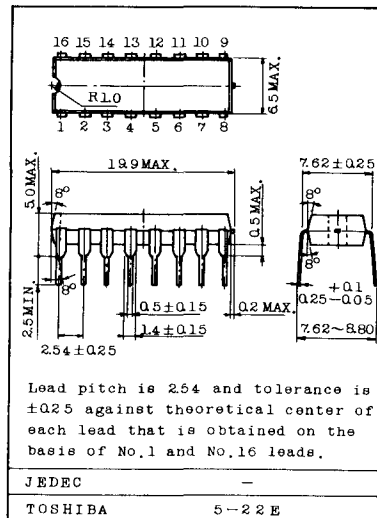
• Stable for Temperature Drift.

• Wide Tone Control Range

Control Range ; $V_B = 10dB$ (Typ.) at $f = 1kHz \rightarrow 100Hz$

$V_T = 12dB$ (Typ.) at $f = 1kHz \rightarrow 20kHz$

Unit in mm



MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	14	V
Power Dissipation (Note)	P_D	750	mW
Operating Temperature	T_{opr}	$-25 \sim 75$	$^\circ C$
Storage Temperature	T_{stg}	$-55 \sim 150$	$^\circ C$

Note: Derated above $T_a = 25^\circ C$ in the proportion of $6mW/^\circ C$.



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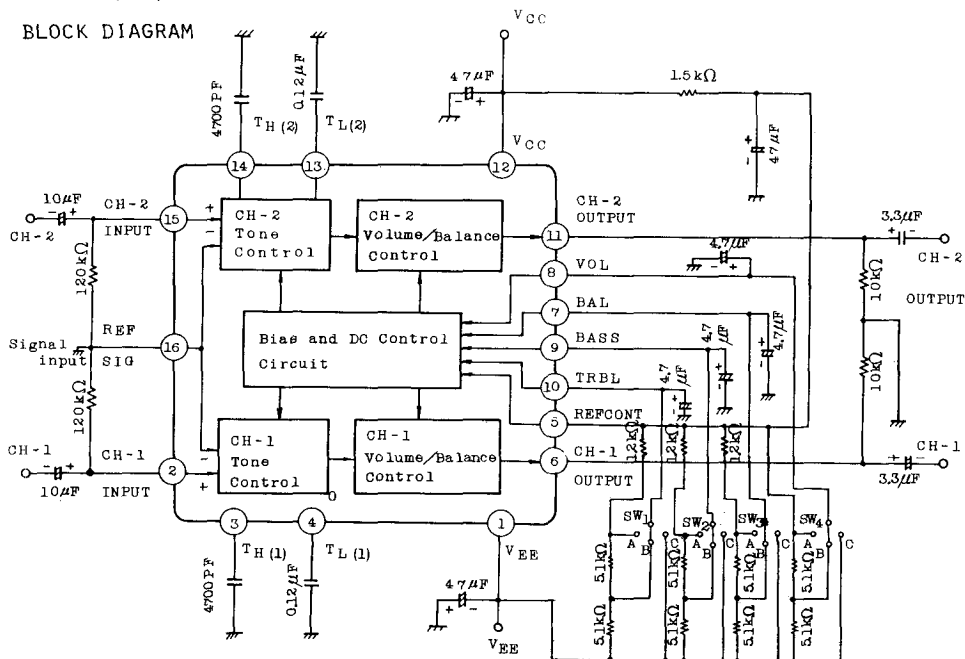
TA7630P

ELECTRICAL CHARACTERISTICS

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

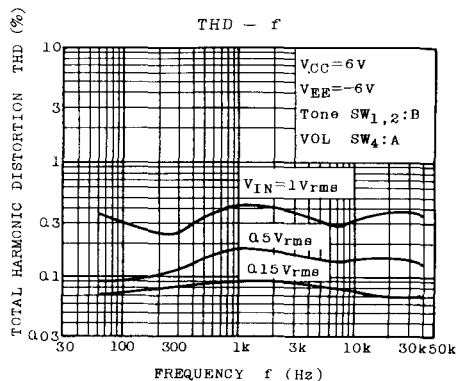
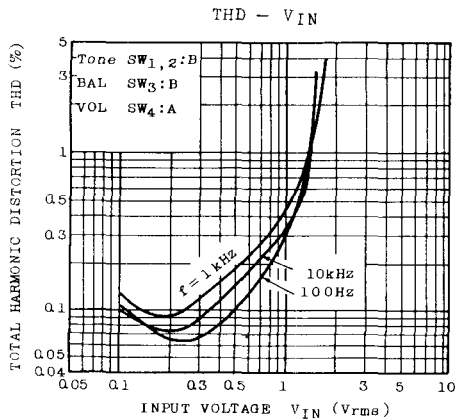
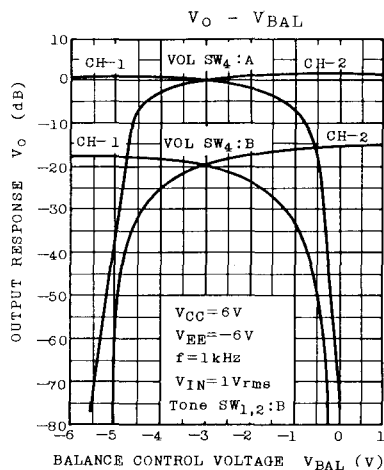
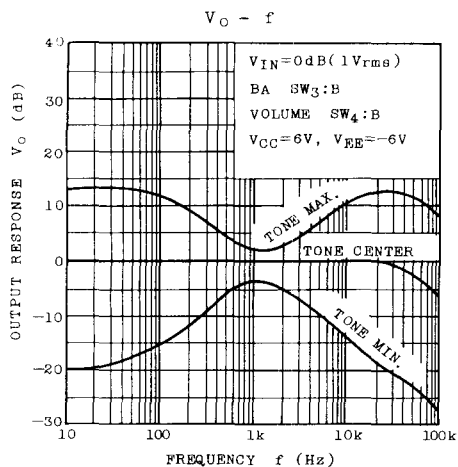
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Quiescent Current	$I_{CCQ}(1)$	-	$V_{OL}/BAL/BASS/SW_{1-4}:B$	$V_{CC}, V_{EE}=+4V$	-	11	17	mA
	$I_{CCQ}(2)$	-			10	18	25	
Maximum Input Voltage	V_{IN}	-	BASS/TRBL/BAL $SW_{1-3}:B$		-	-	1	V_{rms}
Maximum Output Voltage	V_{OUT}	-	VOL $SW_4:A$, THD=1%		1	-	-	V_{rms}
Voltage Gain	G_V	-	BASS/TRBL/BAL $SW_{1-3}:B$		-0.5	2.0	4.5	dB
Channel Balance	C.B-1	-	$V_{IN}=1V_{rms}$, VOL $SW_4:A$		-3	0	3	dB
	C.B-2	-	VOL/BAL/BASS/TRBL $SW_{1-4}:B$ $V_{IN}=0.1V_{rms}$ $f=100Hz \sim 20kHz$		-3.5	0	3.5	
Volume Control Range	V_R	-	BASS/TRBL/BAL $SW_{1-3}:B$ VOL $SW_4:A \rightarrow C$ $V_{IN}=1V_{rms}$		70	80	-	dB
Bass Control Range	V_B MAX	-	VOL/BAL $SW_{3,4}:B$ $V_{IN}=1V_{rms}$ $f=1kHz \rightarrow 100Hz$	BASS/TRBL $SW_{1,2}:A$	7	11	14	dB
	V_B MIN	-		BASS/TRBL $SW_{1,2}:C$	-15	-11.5	-7	
Treble Control Range	V_T MAX	-	VOL/BAL $SW_{3,4}:B$ $V_{IN}=1V_{rms}$ $f=1kHz \rightarrow 20kHz$	BASS/TRBL $SW_{1,2}:A$	7	11	14	dB
	V_T MIN	-		BASS/TRBL $SW_{1,2}:C$	-20	-14	-10	
Tone Error	ΔG_V	-	VOL/BAL $SW_{3,4}:B$, $V_{IN}=1V_{rms}$ BASS/TRBL $SW_{1,2}:C \rightarrow A$		-	6	10	dB
Total Harmonic Distortion	THD	-	BASS/TRBL/BAL $SW_{1-3}:B$ VOL $SW_4:A$, $V_O=150mV_{rms}$		-	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	CT	-	BASS/TRBL/BAL $SW_{1-3}:B$ VOL $SW_4:A$, $V_{OUT}=1V_{rms}$		-	70	-	dB
Control Terminal Input Resistance	R_{IN}	-	8, 9, 10 PIN		-	500	-	k Ω
		-	7 PIN		-	200	-	

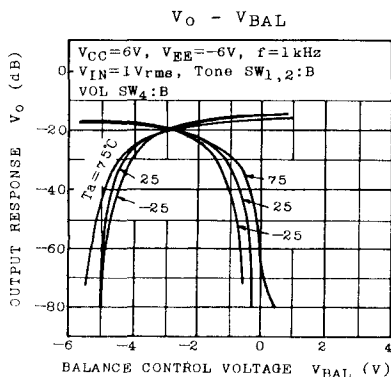
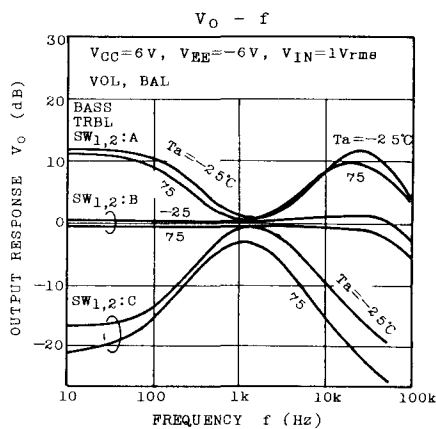
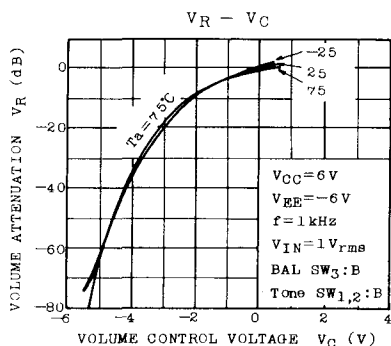
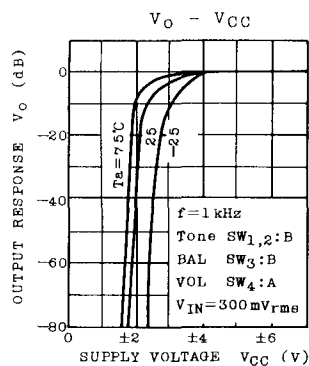
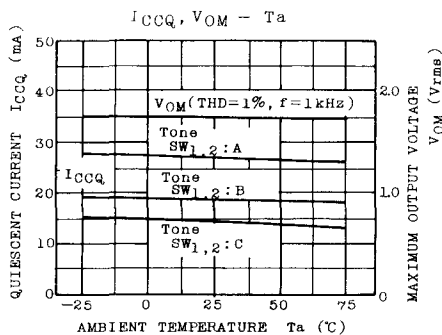
TEST CIRCUIT/ BLOCK DIAGRAM



PIN CONNECTION

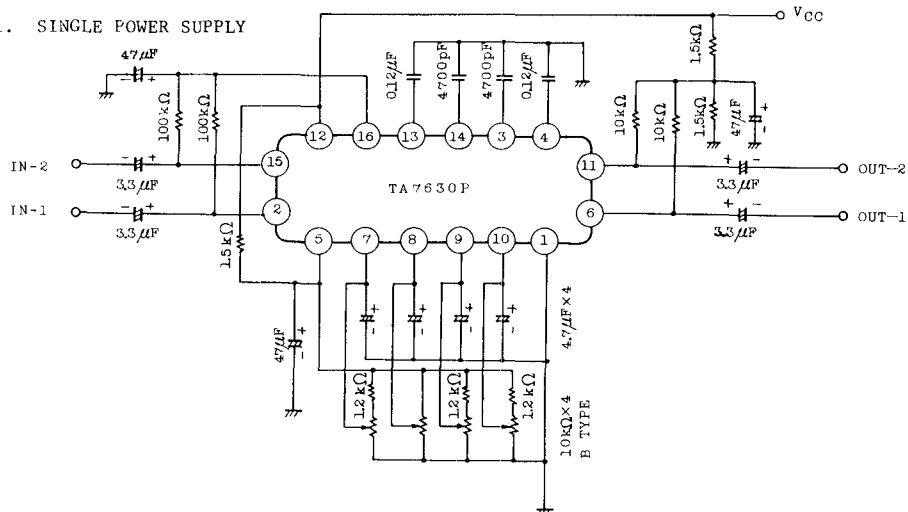
PIN NO.	SYMBOL	EXPLANATION	PIN NO.	SYMBOL	EXPLANATION
1	V _{EE}	Negative Power Supply	9	BASS	Bass Control
2	INPUT-1	Input channel-1	10	TRBL	Treble control
3	TH(1)	Treble turning frequency setting.	11	OUTPUT-2	Output channel-2
4	TL(1)	Bass turning frequency setting.	12	V _{CC}	Power supply
5	REF CONT	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



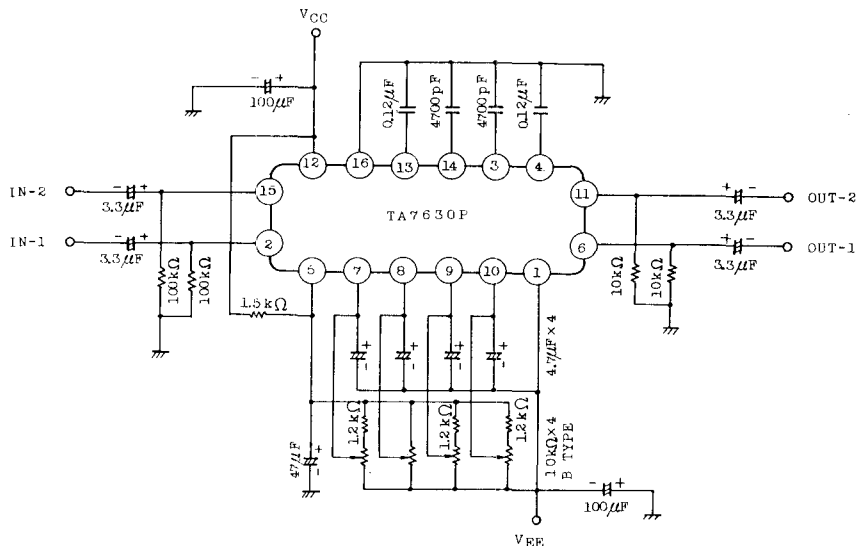


APPLICATION CIRCUITS

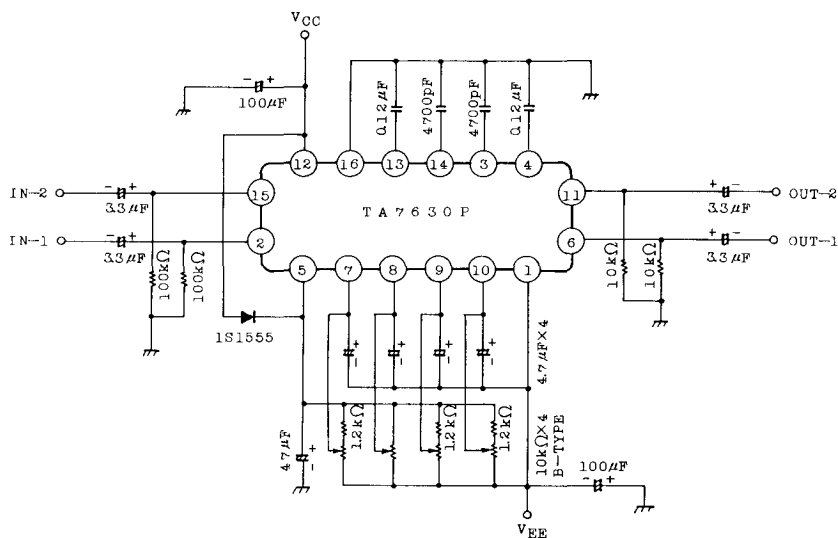
1. SINGLE POWER SUPPLY



2. DUAL POWER SUPPLY



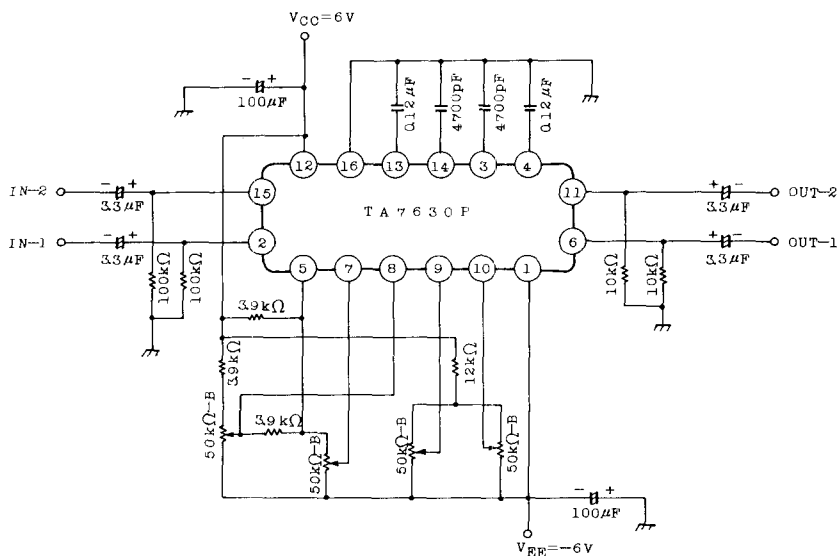
3. APPLICATION CIRCUIT USING DIODE AT REFERENCE TERMINAL



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



OUTPUT - f

