TA7666P
TA7667P

T-52-13-07

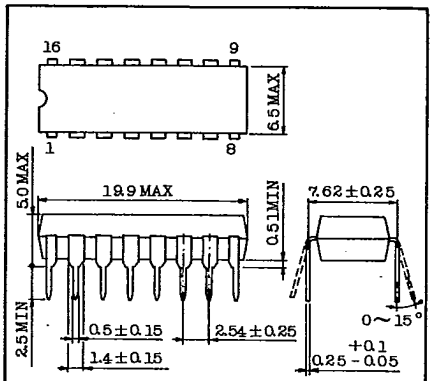
5 STEP LOGARITHMIC
DUAL LED DRIVER

Both of the TA7666P and the TA7667P consist of two inverting amplifiers, ten comparators and a reference voltage network.

Turn-on level intervals are 5dB, 5dB, 3dB, 3dB, in TA7666P, and are 2dB, 2dB, 2dB, 2dB in TA7667P. It is suitable for stereo radio cassette applications because of dual type.

- Suitable for Stereo LED Driver
- Wide Supply Voltage Range : V_{CC}=6～12V
- Low Quiscent Current : I_{CCQ}=4mA(Typ.) at V_{CC}=9V
- Variable Voltage Gain Because of Inverting Amplifier
- Easy Arrangement for Dual 10 LED's Driver by Series Connection of TA7666P and TA7667P

Unit in mm



Lead pitch is 2.54 and tolerance is ±0.25 against theoretical center of each lead that is obtained on the basis of No.1 and No.16 leads.

JEDEC	—
TOSHIBA	3D16A-P

MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	14	V
Output Current	I_O	30	mA
LED Drive Terminal Voltage (Note 1)	V_L	15	V
Power Dissipation (Note 2)	P_D	750	mW
Operating Temperature	T_{opr}	-30～75	°C
Storage Temperature	T_{stg}	-55～150	°C

Note 1. LED drive terminal voltage is maximum voltage at terminals from 3 to 7 and from 10 to 14.

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

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ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, V_{CC}=9V, f=1kHz, Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}		V_{IN}=0	-	4	6	mA
Output Current	I_O		V_{CE}=2V	15	20	30	mA
Output Leak Current	$I_{O(OFF)}$		V_{IN}=0	-	-	50	μA
Voltage Gain	G_V		-	-	12.6	-	dB

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Comparator Turn-On Thresholds	LD_5		G_V=12.6dB	-1	0	1	dB
				189	212	238	mV_{rms}
	LD_4			-4	-3	-2	dB
				134	150	168	mV_{rms}
	LD_3			-7.5	-6	-4.5	dB
				89	106	126	mV_{rms}
	LD_2			-13	-11	-9	dB
				47	60	75	mV_{rms}
	LD_1			-19	-16	-13	dB
				24	34	47	mV_{rms}
1st Threshold Difference between R and L Channel	ΔLD_1			-1	0	1	dB

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				189	212	238	mV_{rms}
	LD_4			-3	-2	-1	dB
				150	168	189	mV_{rms}
	LD_3			-5	-4	-3	dB
				119	134	150	mV_{rms}
	LD_2			-7	-6	-5	dB
				95	106	119	mV_{rms}
	LD_1			-9	-8	-7	dB
				75	84	95	mV_{rms}
1st Threshold Difference between R and L Channel	ΔLD_1			-1	0	1	dB

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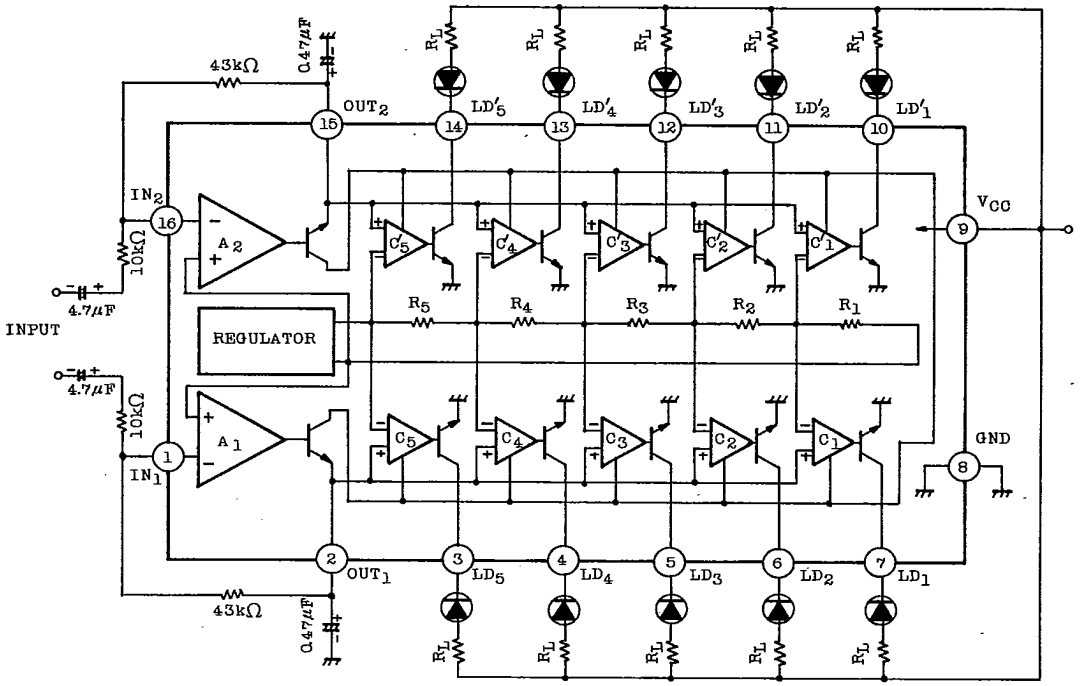
TEST CIRCUIT/BLOCK DIAGRAM



INTERNAL RESISTANCE VALUE

	TA7666P	TA7667P	UNIT
R_1	1.36	3.66	kΩ
R_2	1.08	0.948	kΩ
R_3	1.89	1.19	kΩ
R_4	1.78	1.50	kΩ
R_5	2.50	1.89	kΩ

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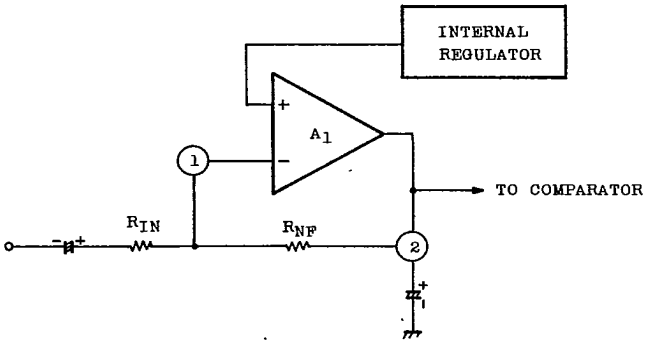
(1) SETUP OF TURNING-ON LEVEL



As voltage gain of inverting amplifier depends on signal source resistance R_g, output resistance of prestage amplifier should be smaller than $10 \times R_{IN}$.
(Output resistance $\leq 10\ R_{IN}$)
It is better to change R_{NF} for voltage gain adjustment, As 5th LED turn-on input level is 911.6 mV_{rms} at G_V=0dB, voltage gain of inverting amplifier is set by the following equation.

$$\text{Voltage Gain} = 20\ \ell og \frac{911.6\ (mV_{rms})}{V_{IN}(\text{Input Voltage})}\ \ (dB)$$

(Example) Case of 5th LED turn-on at 300mVrms input level

$$\text{Voltage Gain} = \frac{911.6}{300} \fallingdotseq 3\ (9.6dB)$$

When R_{IN} is set up to be 10kΩ, R_{NF} becomes 30kΩ.

$R_{NF}=3 \times R_{IN}=30k\Omega$

Then each LED turn-on level is as follows.

IC	1st LED	2nd LED	3rd LED	4th LED	5th LED
TA7666P	48 -16dB	86 -11dB	152 -6dB	215 -3dB	304mV_{rms} 0dB
TA7667P	121 -8dB	152 -6dB	192 -4dB	241 -2dB	304mV_{rms} 0dB

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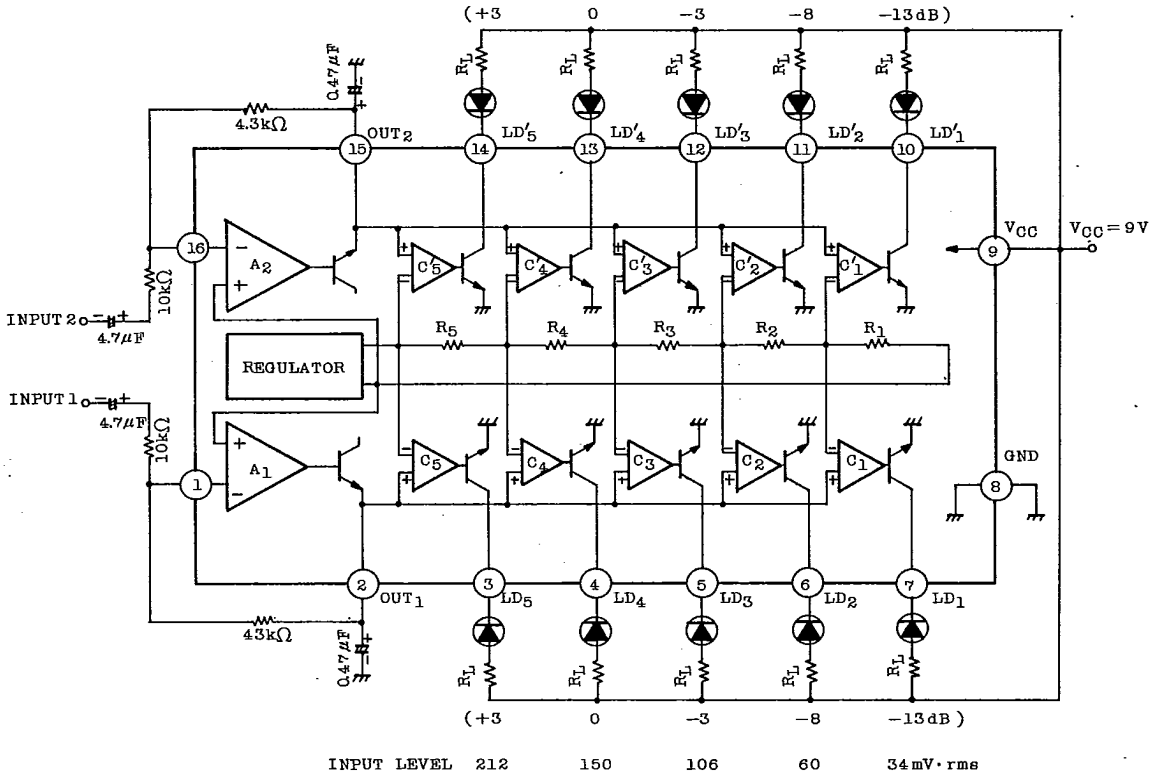
(2) 5 LED×2 APPLICATION CIRCUIT (TA7666P)



INPUT LEVEL 212 150 106 60 34mV·rms

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(3) 10 LED×2 APPLICATION CIRCUIT (TA7666P+TA7667P)