

9097247 TOSHIBA. ELECTRONIC

02E 17491 D

TA7666P
TA7667P

T-52-13-07

**5 STEP LOGARITHMIC
DUAL LED DRIVER**

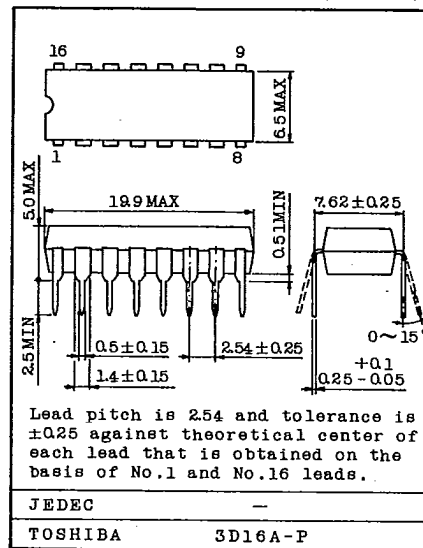
Both of the TA7666P and the TA7667P consist of two inverting amplifiers, ten comparators and a reference voltage network.

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 : $V_{CC}=6\sim 12V$
- . Low Quiescent 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


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

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	$^{\circ}C$
Storage Temperature	T_{stg}	-55 ~ 150	$^{\circ}C$

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

2. Derated above $T_a=25^{\circ}C$ in the proportion of $6mW/^{\circ}C$.

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ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, $V_{CC}=9V$, $f=1kHz$, $T_a=25^{\circ}C$)

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	LD5	$G_V=12.6dB$	-1	0	1	dB
			189	212	238	mV _{rms}
	LD4		-4	-3	-2	dB
			134	150	168	mV _{rms}
	LD3		-7.5	-6	-4.5	dB
			89	106	126	mV _{rms}
	LD2		-13	-11	-9	dB
			47	60	75	mV _{rms}
	LD1		-19	-16	-13	dB
			24	34	47	mV _{rms}
1st Threshold Difference between R and L Channel	$\Delta LD1$		-1	0	1	dB

TA7667P

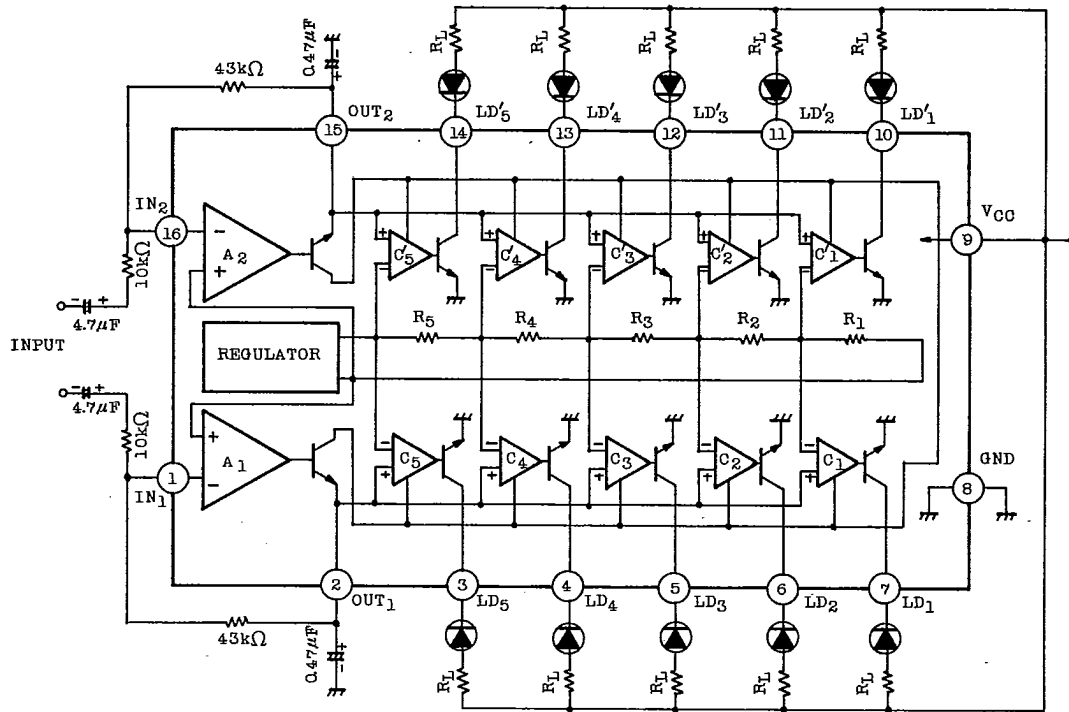
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			189	212	238	mV _{rms}
	LD4		-3	-2	-1	dB
			150	168	189	mV _{rms}
	LD3		-5	-4	-3	dB
			119	134	150	mV _{rms}
	LD2		-7	-6	-5	dB
			95	106	119	mV _{rms}
	LD1		-9	-8	-7	dB
			75	84	95	mV _{rms}
1st Threshold Difference between R and L Channel	$\Delta LD1$		-1	0	1	dB

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TEST CIRCUIT/BLOCK DIAGRAM



INTERNAL RESISTANCE VALUE

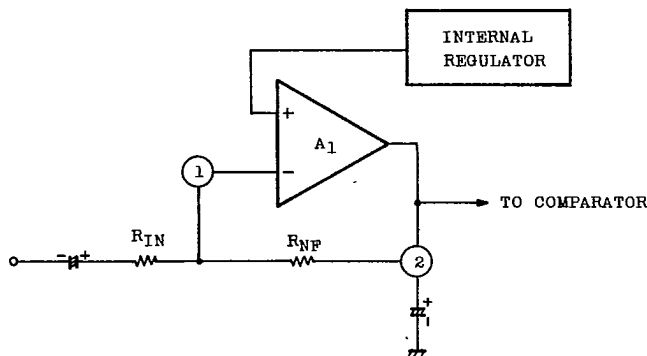
	TA7666P	TA7667P	UNIT
R1	1.36	3.66	kΩ
R2	1.08	0.948	kΩ
R3	1.89	1.19	kΩ
R4	1.78	1.50	kΩ
R5	2.50	1.89	kΩ

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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 $911.6 \text{ mV}_{\text{rms}}$ at $G_v=0\text{dB}$, voltage gain of inverting amplifier is set by the following equation.

$$\text{Voltage Gain} = 20 \log \frac{911.6 \text{ (mV}_{\text{rms}})}{V_{IN}(\text{Input Voltage})} \text{ (dB)}$$

(Example) Case of 5th LED turn-on at $300 \text{ mV}_{\text{rms}}$ input level

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

When R_{IN} is set up to be $10 \text{ k}\Omega$, R_{NF} becomes $30 \text{ k}\Omega$.

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

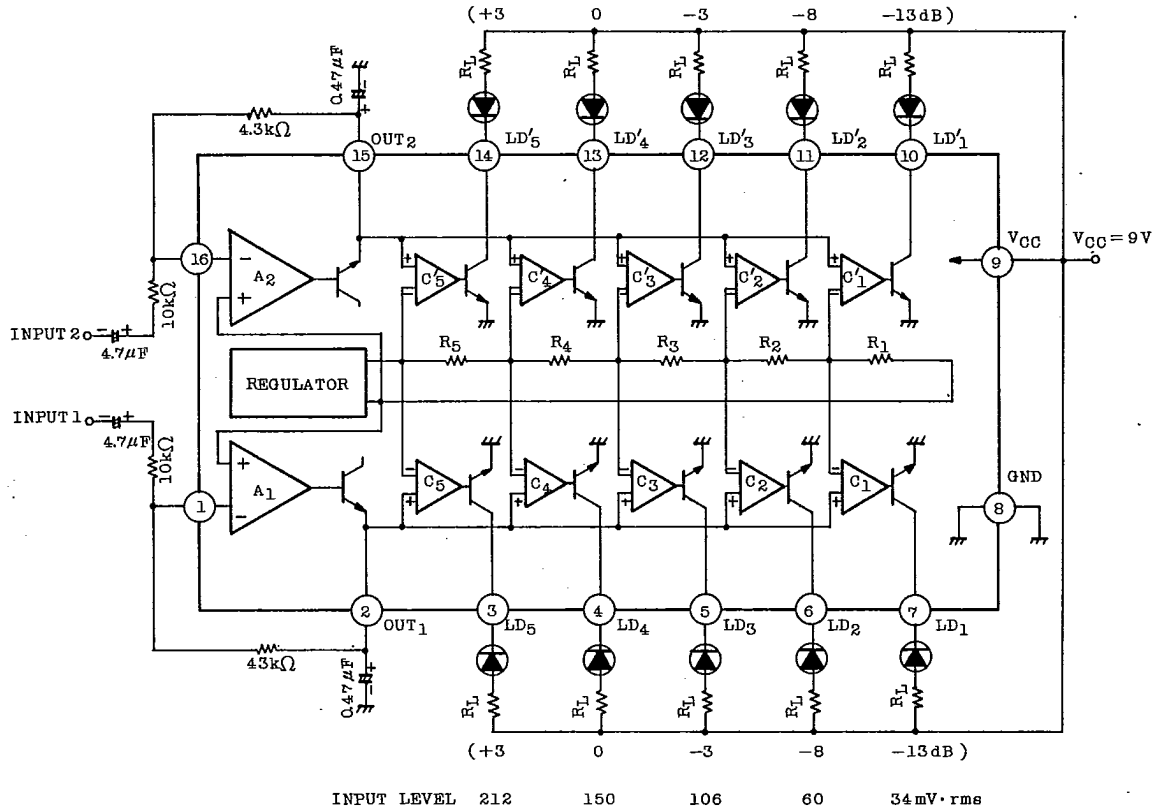
Then each LED turn-on level is as follows.

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

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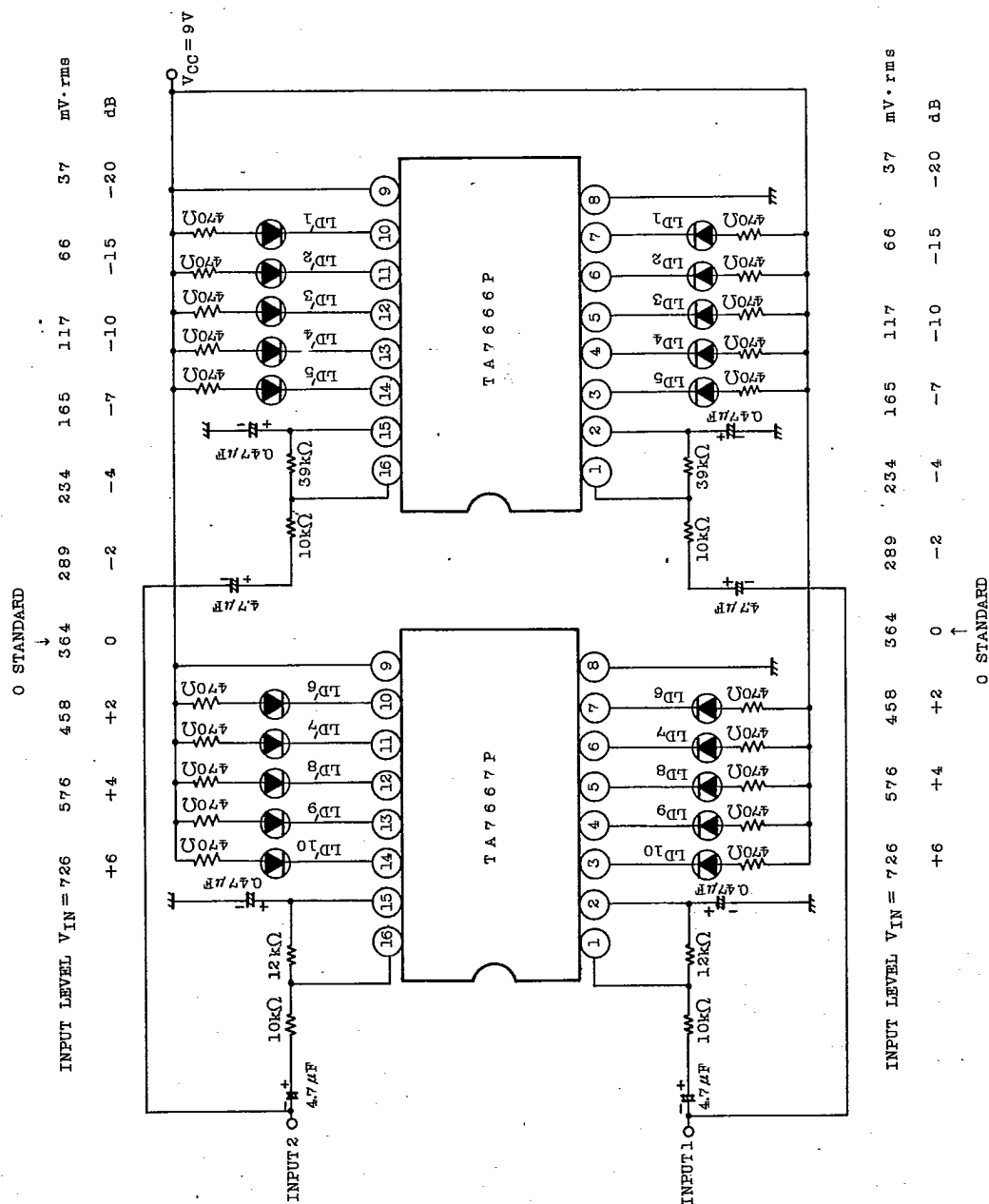
(2) 5 LED×2 APPLICATION CIRCUIT (TA7666P)



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



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