

9097247 TOSHIBA. ELECTRONIC

02E 17491 D

**TA7666P**  
**TA7667P**

T-52-13-07

5 STEP LOGARITHMIC  
DUAL LED DRIVER

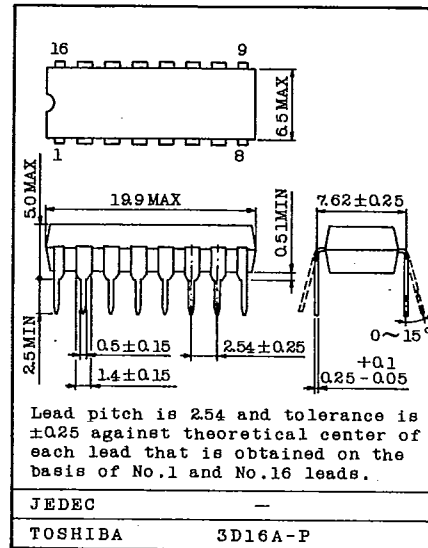
Both of the TA7666P and the TA7667P consist of two inverting amplifiers, ten comparators and a reference voltage network.

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	$T_{opr}$	$-30\sim 75$	$^{\circ}C$
Storage Temperature	$T_{stg}$	$-55\sim 150$	$^{\circ}C$

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  $6mW/^{\circ}C$ .

TOSHIBA

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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	$\mu A$
Voltage Gain	$G_V$		-	-	12.6	-	dB

## TA7666P

Comparator Turn-On Thresholds	LD5		$G_V=12.6dB$	-1	0	1	dB
				189	212	238	mV <sub>rms</sub>
	LD4			-4	-3	-2	dB
				134	150	168	mV <sub>rms</sub>
	LD3			-7.5	-6	-4.5	dB
				89	106	126	mV <sub>rms</sub>
	LD2			-13	-11	-9	dB
				47	60	75	mV <sub>rms</sub>
	LD1		-19	-16	-13	dB	
			24	34	47	mV <sub>rms</sub>	
1st Threshold Difference between R and L Channel	$\Delta LD_1$			-1	0	1	dB

## TA7667P

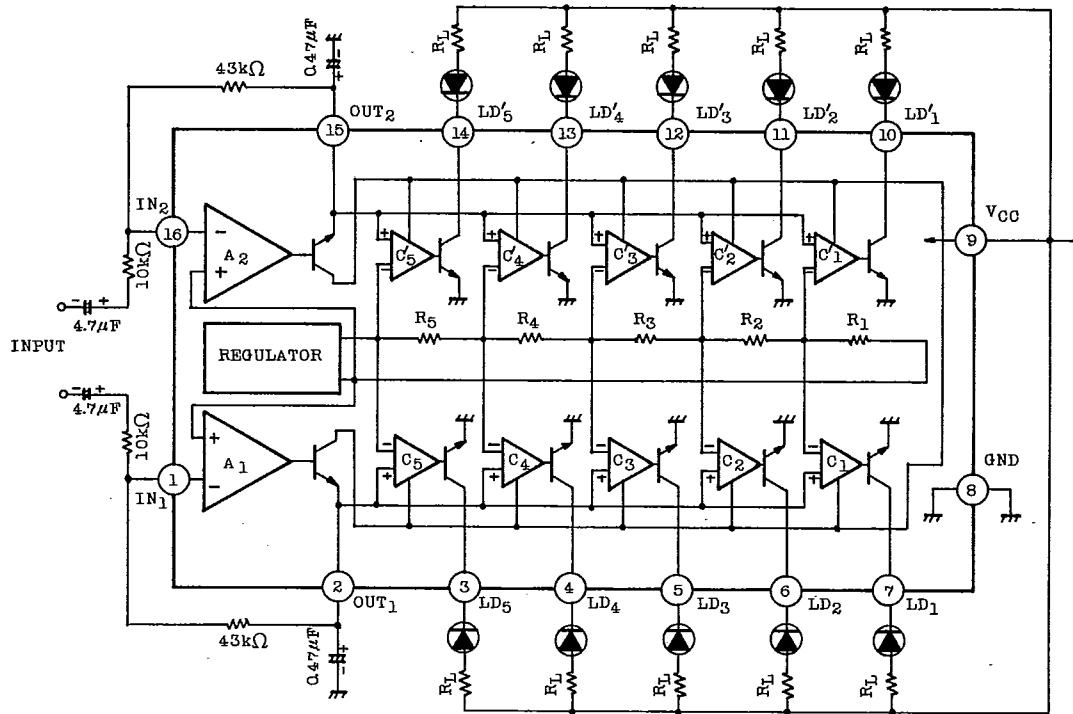
Comparator Turn-On Thresholds	LD5		$G_V=12.6dB$	-1	0	1	dB
				189	212	238	mV <sub>rms</sub>
	LD4			-3	-2	-1	dB
				150	168	189	mV <sub>rms</sub>
	LD3			-5	-4	-3	dB
				119	134	150	mV <sub>rms</sub>
	LD2			-7	-6	-5	dB
				95	106	119	mV <sub>rms</sub>
	LD1		-9	-8	-7	dB	
			75	84	95	mV <sub>rms</sub>	
1st Threshold Difference between R and L Channel	$\Delta LD_1$			-1	0	1	dB

AUDIO LINEAR IC

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TEST CIRCUIT/BLOCK DIAGRAM



INTERNAL RESISTANCE VALUE

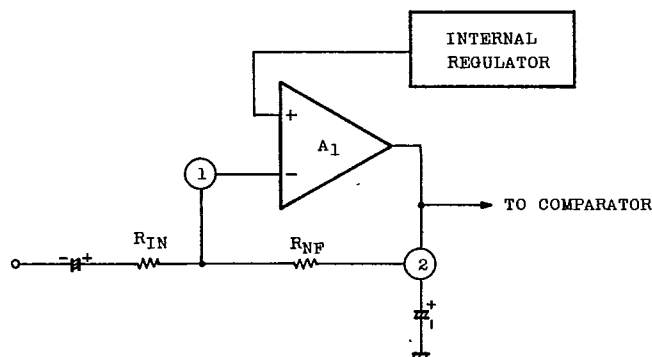
	TA7666P	TA7667P	UNIT
R1	1.36	3.66	kΩ
R2	1.08	0.948	kΩ
R3	1.89	1.19	kΩ
R4	1.78	1.50	kΩ
R5	2.50	1.89	kΩ

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T-52-13-07

## (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  $R_{FF}$  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  $10\text{k}\Omega$ ,  $R_{FF}$  becomes  $30\text{k}\Omega$ .

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

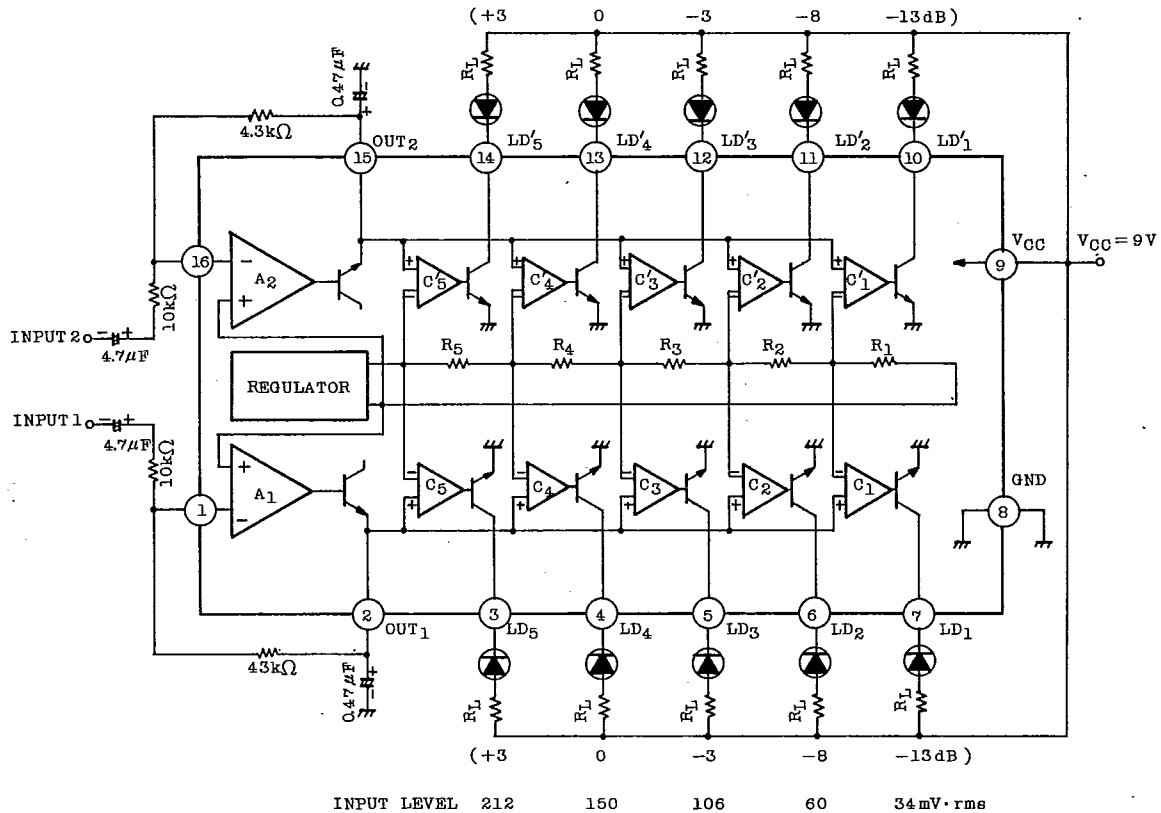
Then each LED turn-on level is as follows.

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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T-52-13-07

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



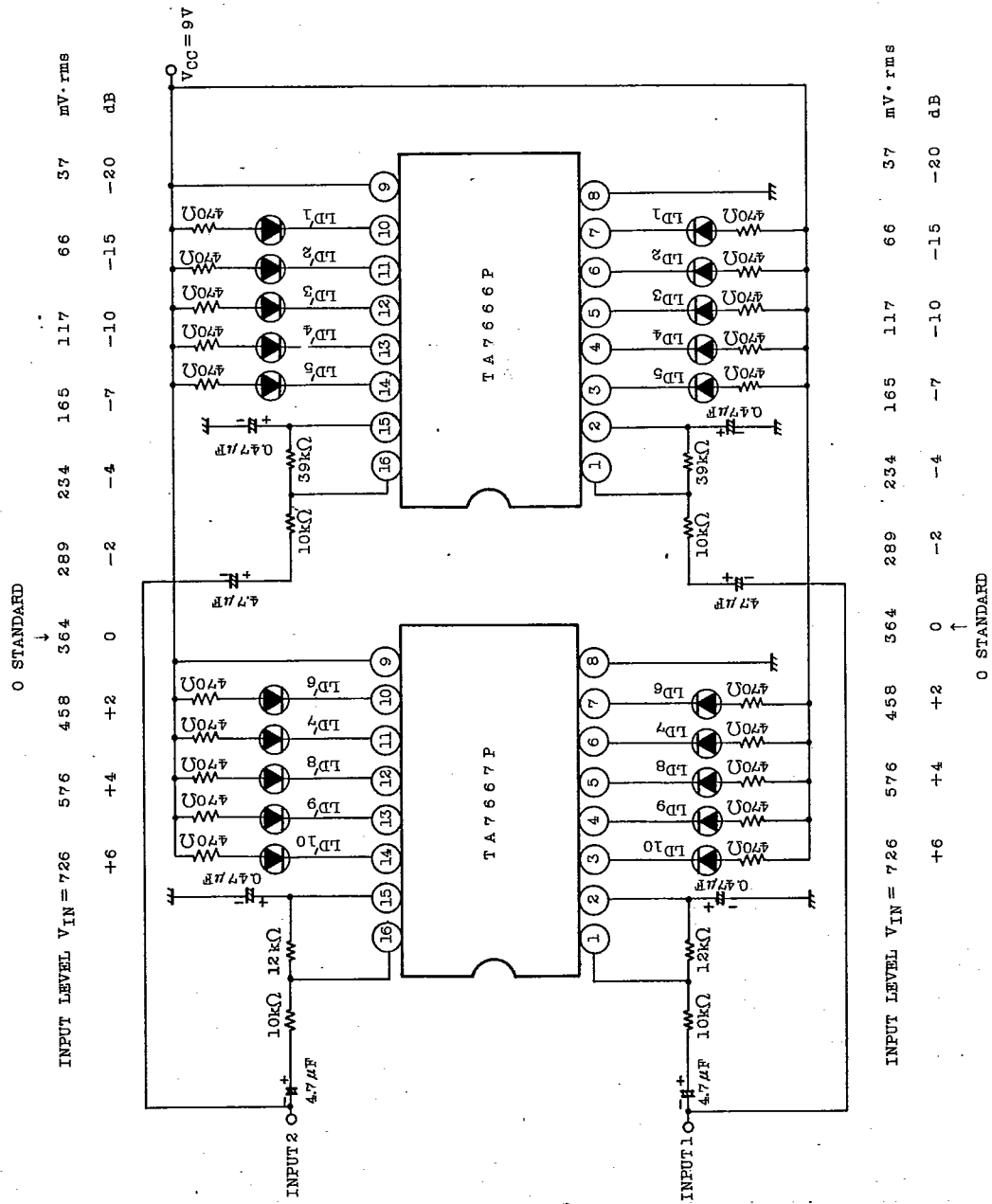
9097247 TOSHIBA. ELECTRONIC

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



AUDIO LINEAR IC