

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

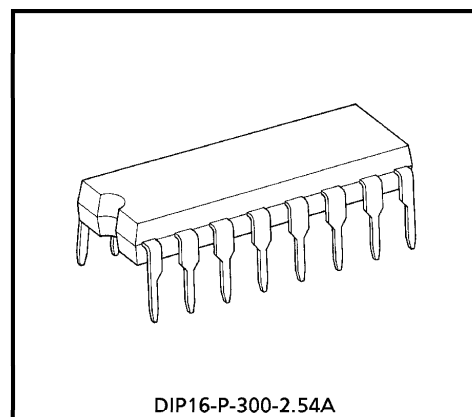
TA7612AP

LED DRIVER

The TA7612AP is designed for 10 LED level meter driver.

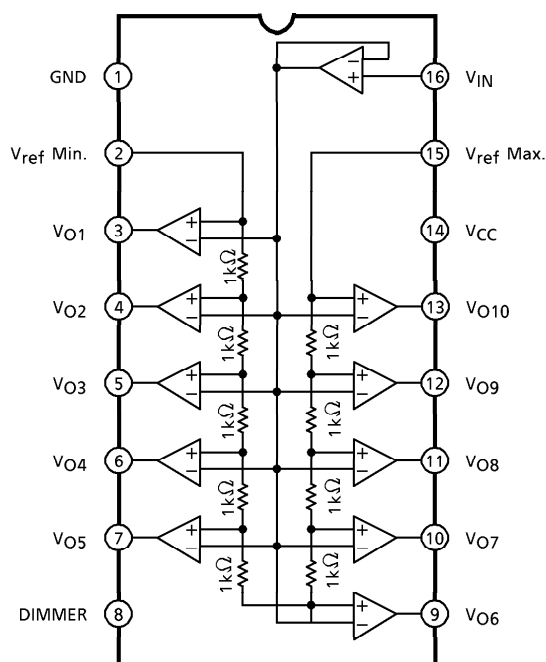
FEATURES

- 10 LED'S Bar Display Driver.
- Linear Scale Display.
- Continuous 10 LED Display.
- By Choosing a Series Connection of IC, Can Display more than 10 LED.



Weight : 1.00g (Typ.)

BLOCK DIAGRAM



961001EBA2

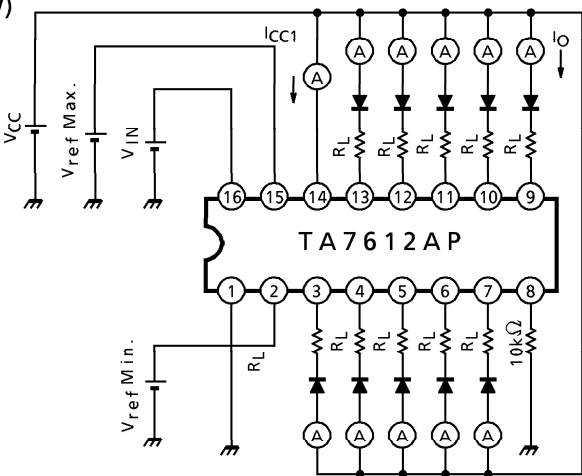
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(Note) (V_{ref} Max. (= ⑮PIN) = 3.6V)

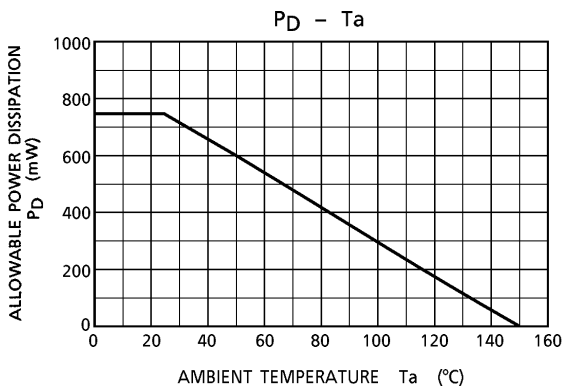
2PIN CONNECTION	DISPLAY	CONDITION
Terminated Ground	Light on No.1 LED	$V_{IN} = 0 \sim 0.4V$ (Typ.)
	Lighted All LED	$V_{IN} \geq 3.6V$ (Typ.)
Terminated $1k\Omega$ Between Ground	Without Lighted No.1 LED	$V_{IN} = 0 \sim 0.36V$ (Typ.)
	Light on No.1 LED	$V_{IN} \geq 0.36V$ (Typ.)

P_D CALCULATION AT 10LEDs

$P_D = V_{CC} \times I_{CC1} + V_{OL} \times I_O \times 10 \quad (W)$

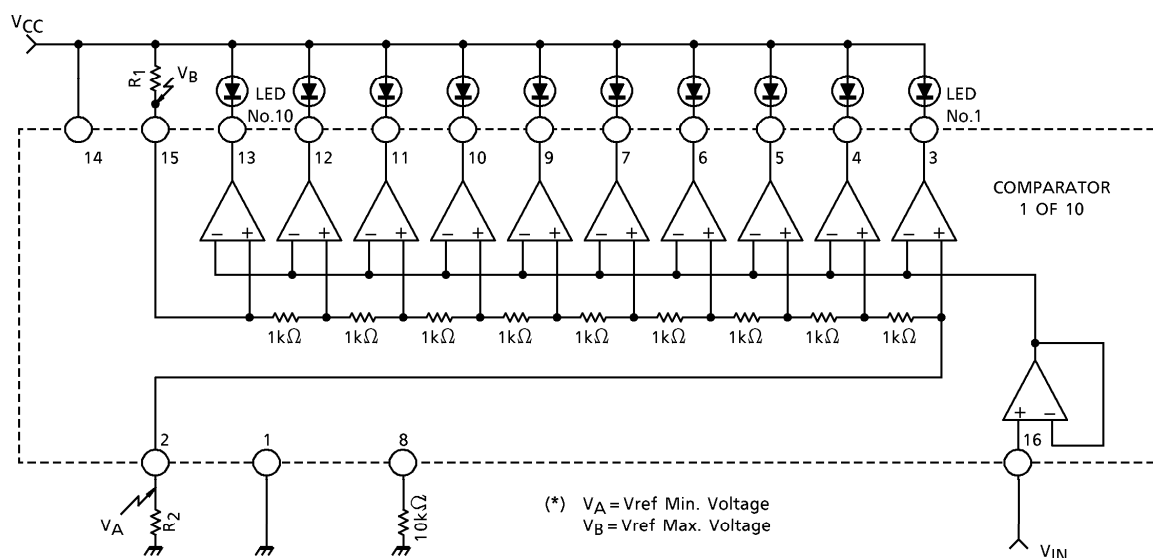


(Note) V_{OL} is : $V_{OL} = V_{CC} - V_F(LED) - R_L \times I_O$ (When each output is "ON".)



FUNCTIONAL DESCRIPTION

BLOCK DIAGRAM



The above simplified TA7612AP Block Diagram is to give the general idea of the circuit's operation.

1. General Operation

If V_{IN} Voltage greater than the first threshold but less than the second threshold is applied "No.1" LED is lighted, if the input voltage is between the second and the third threshold, then 'No.1 and No.2' LED are in operation and so on.

2. Adding R_1 and R_2 Operation

These resistors are to give the reference voltage of 10 comparators.

And then above $V_B - V_A$ is to give the Input Voltage sensitivity of this device.

R_1 and R_2 will be calculated as follows.

$$\frac{R_2}{R_1 + R_2 + 9\Omega} \times V_{CC} = V_A \quad (1)$$

$$\frac{R_2 + 9\Omega}{R_1 + R_2 + 9\Omega} \times V_{CC} = V_B \quad (2)$$

From (1) and (2)

$$R_1 = \frac{9(V_{CC} - V_B)}{V_B - V_A} \text{ (k}\Omega\text{)} \quad (3)$$

$$R_2 = \frac{9V_A}{V_B - V_A} \text{ (k}\Omega\text{)} \quad (4)$$

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	20	V
Power Dissipation (Note)	P_D	750	mW
Operating Temperature	T_{opr}	$-30 \sim 75$	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim 125$	$^\circ\text{C}$

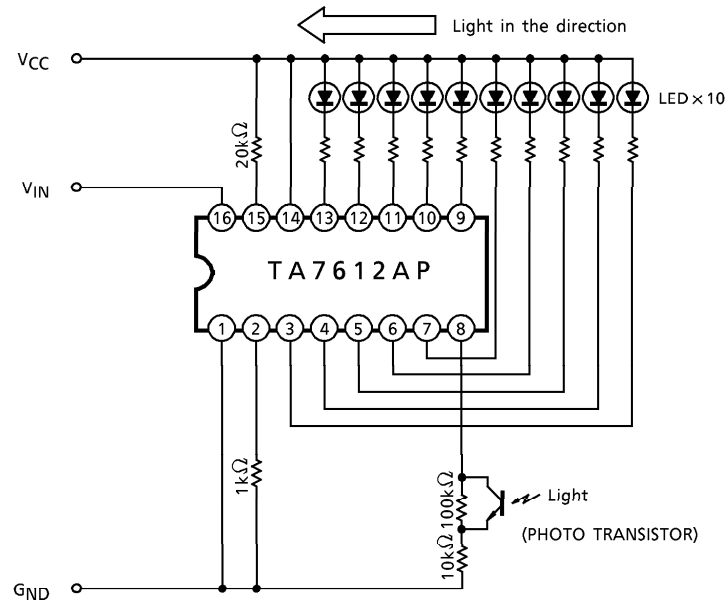
(Note) Derated above $T_a = 25^\circ\text{C}$ in the proportion of $6\text{mW}/^\circ\text{C}$.

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{CC} = 12\text{V}$)

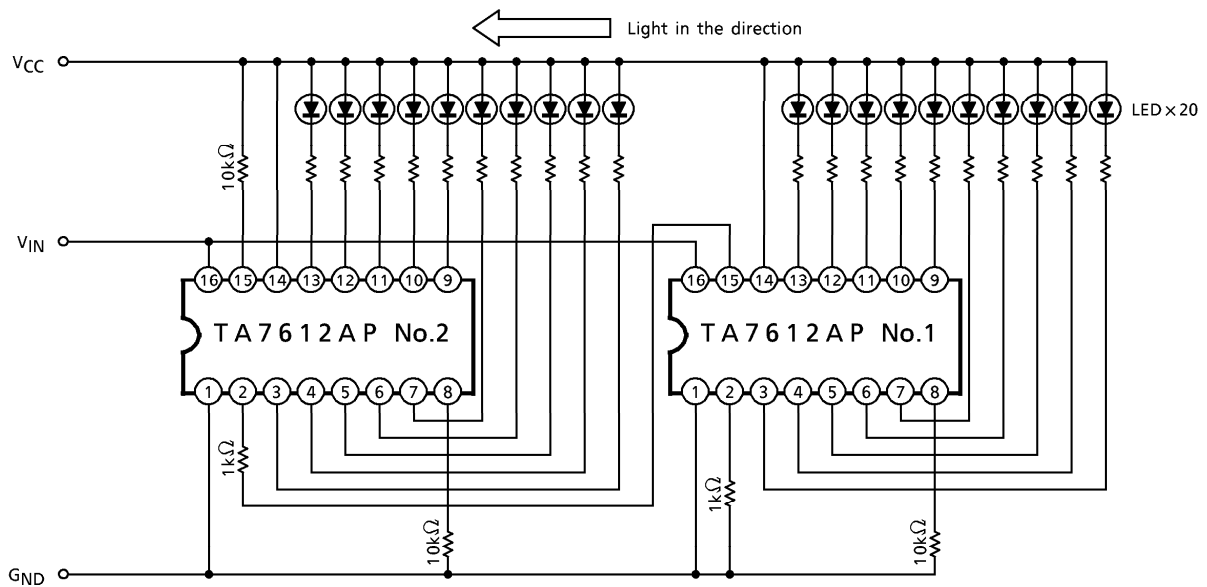
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	—	6	12	15	V
Supply Current (1)	I_{CC1}	—	$V_{ref} = 4\text{V}$, $V_{IN} = 0\text{V}$	—	15	20	mA
Supply Current (2)	I_{CC2}	—	$V_{ref} = 4\text{V}$, $V_{IN} = 4.1\text{V}$ $I_O = 10\text{mA} \times 10$	—	150	160	mA
Input Bias Current	R_{TOT}	—	—	7	9	11	$\text{k}\Omega$
Internal Resistance	I_{IN}	—	$V_{IN} = \text{GND}$	—	-0.25	-1	μA
Input Voltage Range	V_{IN}	—	—	0	—	8	V
Output Offset Voltage	V_{OFF}	—	$V_{ref} = 4\text{V}$	-40	—	40	mV
Output Voltage (High Level)	V_{OH}	—	$V_{ref} = 4\text{V}$, $V_{IN} = \text{GND}$ $R_L = 1.5\text{k}\Omega$	11.9	11.93	—	V
Output Voltage (Low Level)	V_{OL}	—	$V_{ref} = 4\text{V}$, $V_{IN} = 4.10\text{V}$ $R_L = 1.5\text{k}\Omega$	—	0.6	1.0	V
Output Current	I_O	—	$V_{ref} = 4\text{V}$, $V_{IN} = 4.10\text{V}$	—	7	12	mA
Leak Current	I_{IL}	—	$V_{IN} = 4\text{V}$ $V_{ref \text{ Max}} = 0\text{V}$, $V_{ref \text{ Min}} = 0\text{V}$	—	—	15	μA

APPLICATION CIRCUIT

● 10 LEDs Applications

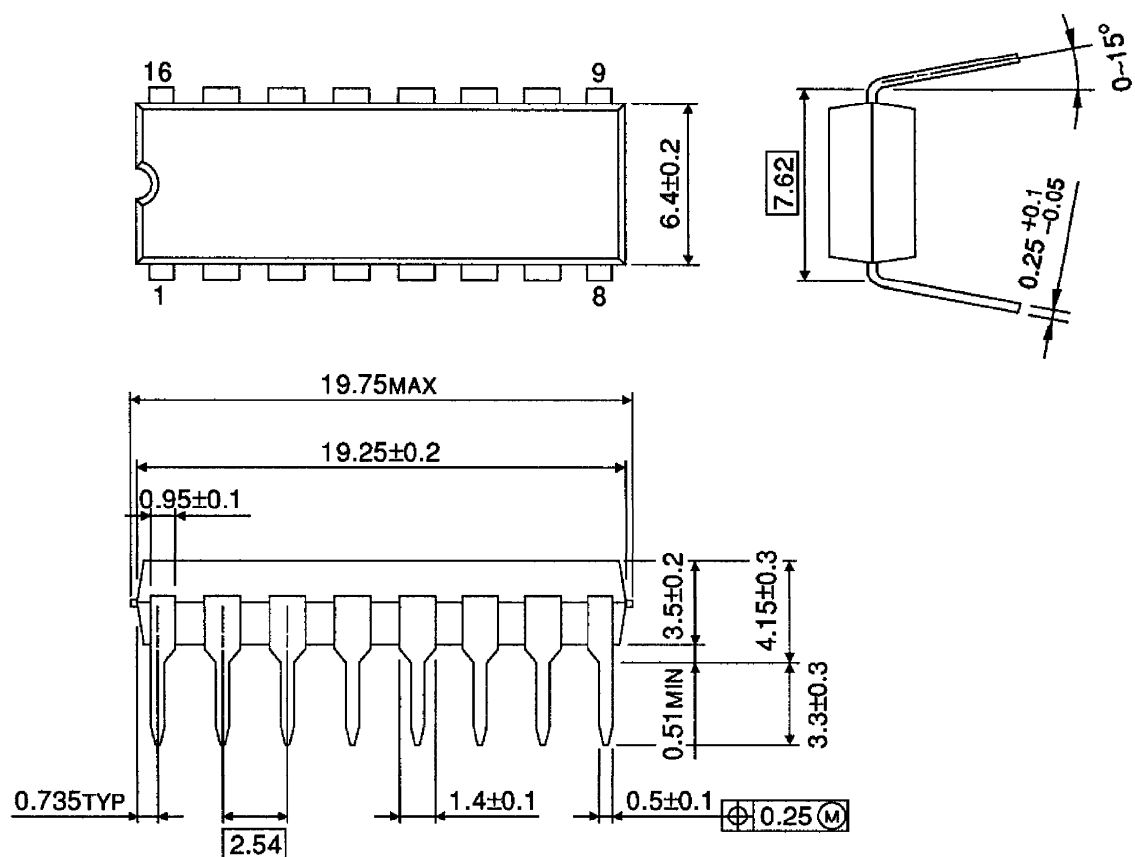


● 20 LEDs Applications



OUTLINE DRAWING
DIP16-P-300-2.54A

Unit : mm



Weight : 1.00g (Typ.)