

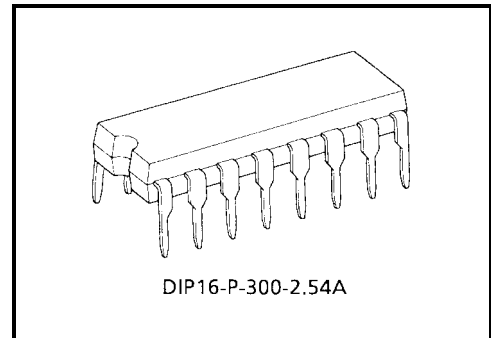
TA7612AP

LED Driver

The TA7612AP is designed for 10 LED level meter driver.

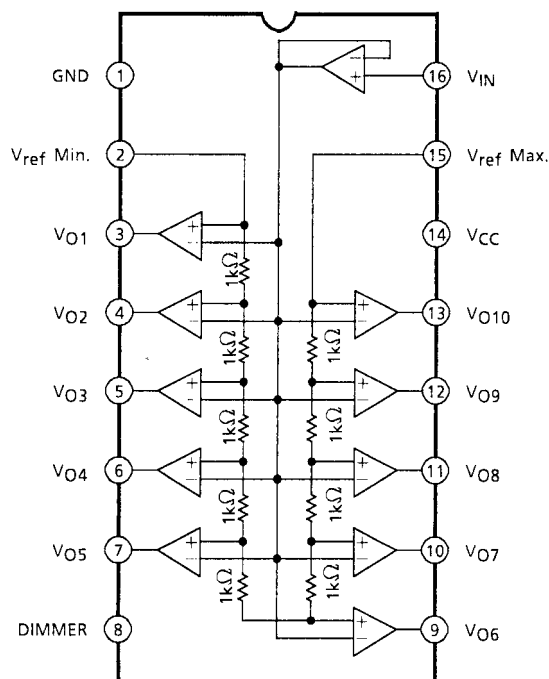
Features

- 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: 1.00 g (typ.)

Block Diagram (Note 1)

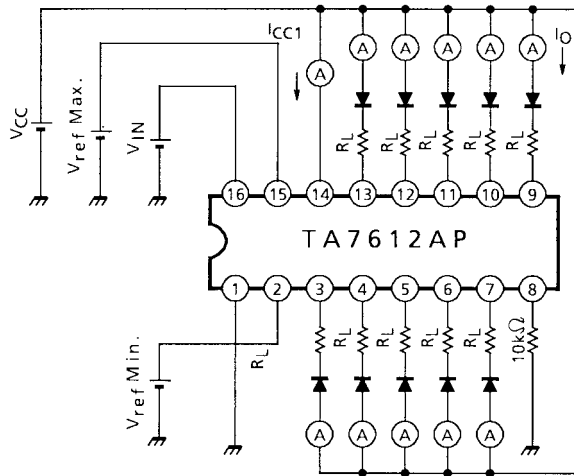


Note 1: ($V_{ref\ max} (= PIN\ 15) = 3.6\ V$)

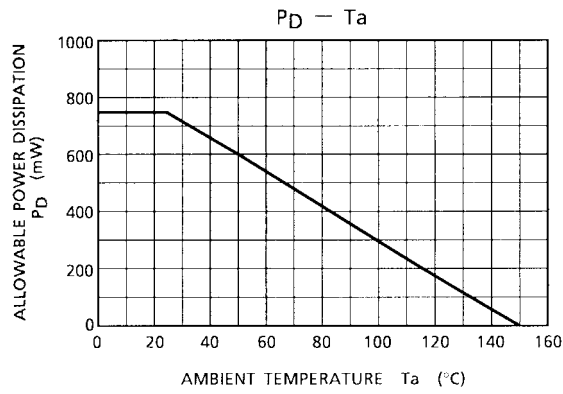
2 Pin Connection	Display	Condition
Terminated ground	Light on No.1 LED	$V_{IN} = 0\sim 0.4\ V$ (typ.)
	Lighted all LED	$V_{IN} \geq 3.6\ V$ (typ.)
Terminated 1 kΩ between ground	Without lighted No.1 LED	$V_{IN} = 0\sim 0.36\ V$ (typ.)
	Light on No.1 LED	$V_{IN} \geq 0.36\ V$ (typ.)

P_D Calculation At 10 LEDs

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

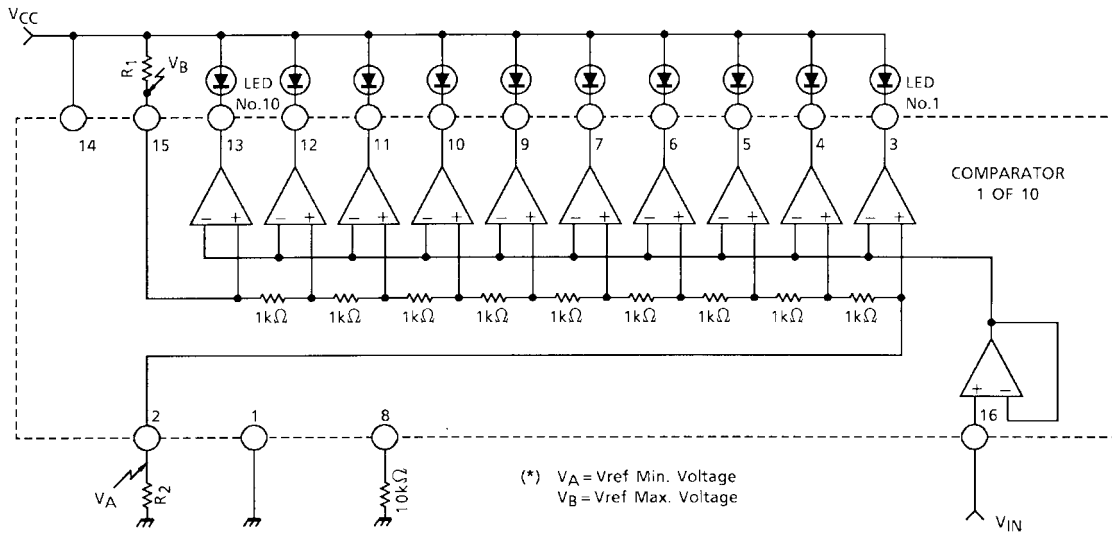


Note: V_{OL} is: $V_{OL} = V_{CC} - V_F \text{ (LED)} - R_L \times I_O$ (When each output is "ON".)



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.

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

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

From (1) and (2)

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

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

How to adjust the dimmer

Toshiba recommends that the value of the resistor at pin 8 be set to 10 kΩ (up to 100 kΩ).
 If the value of the resistor is set lower, the current that flows through each $VO_1 \sim 10$ and the power dissipation will increase. Thus, when setting the value of the resistor, care must be taken with the relationship between the power dissipation (max) and the current that is required to drive LEDs.

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage	V _{CC}	20	V
Power dissipation (Note 2)	P _D	750	mW
Operating temperature	T _{opr}	-30~75	°C
Storage temperature	T _{stg}	-55~125	°C

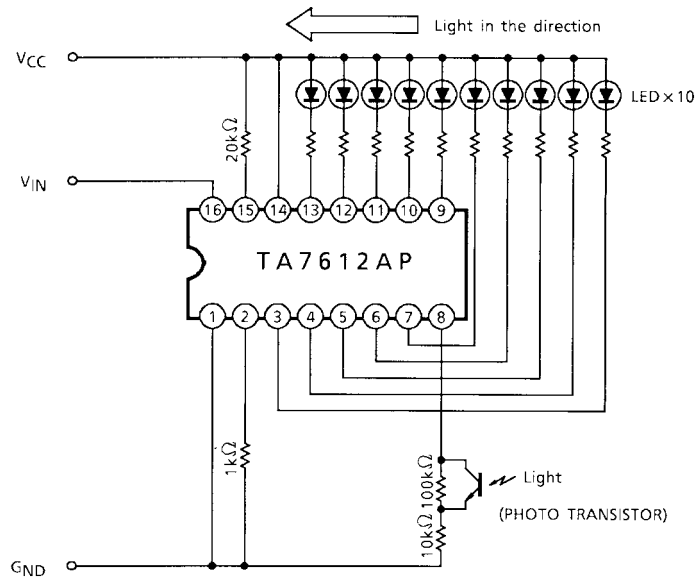
Note 2: Derated above Ta = 25°C in the proportion of 6 mW/°C.

Electrical Characteristics (Ta = 25°C, V_{CC} = 12 V)

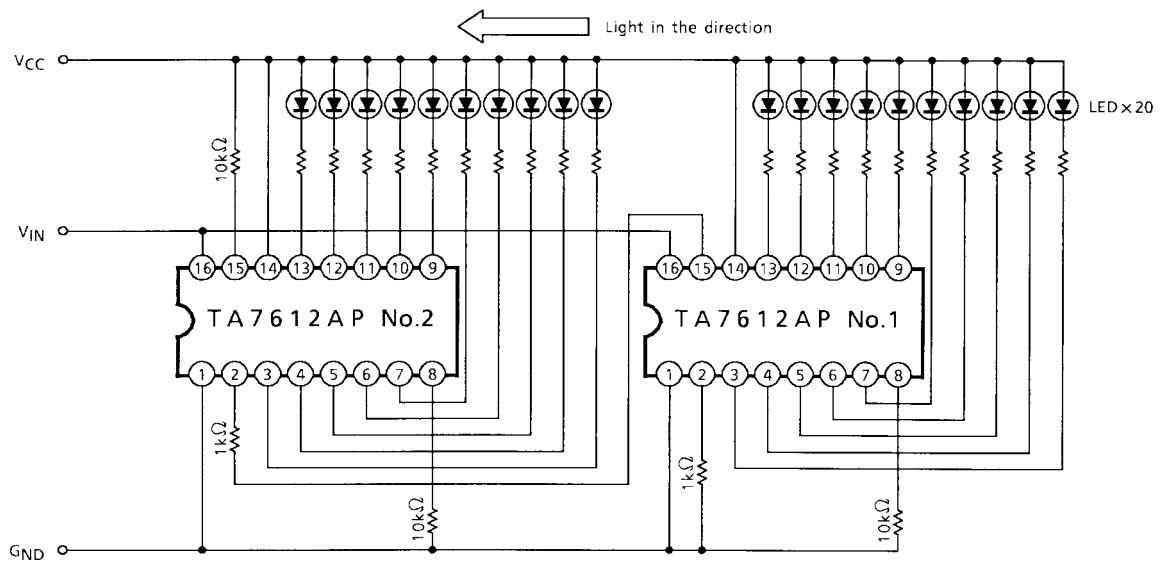
Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Supply voltage	V _{CC}	—	—	6	12	15	V
Supply current (1)	I _{CC1}	—	V _{ref} = 4 V, V _{IN} = 0 V	—	15	20	mA
Supply current (2)	I _{CC2}	—	V _{ref} = 4 V, V _{IN} = 4.1 V I _O = 10 mA × 10	—	150	160	mA
Input bias current	R _{TOT}	—	—	7	9	11	kΩ
Internal resistance	I _{IN}	—	V _{IN} = GND	—	-0.25	-1	μA
Input voltage range	V _{IN}	—	—	0	—	8	V
Output offset voltage	V _{OFF}	—	V _{ref} = 4 V	-40	—	40	mV
Output voltage (high level)	V _{OH}	—	V _{ref} = 4 V, V _{IN} = GND R _L = 1.5 kΩ	11.9	11.93	—	V
Output voltage (low level)	V _{OL}	—	V _{ref} = 4 V, V _{IN} = 4.10 V R _L = 1.5 kΩ	—	0.6	1.0	V
Output current	I _O	—	V _{ref} = 4 V, V _{IN} = 4.10 V	—	7	12	mA
Leak current	I _{IL}	—	V _{IN} = 4 V V _{ref Max} = 0 V, V _{ref Min} = 0 V	—	—	15	μA

Application Circuit

10 LEDs applications



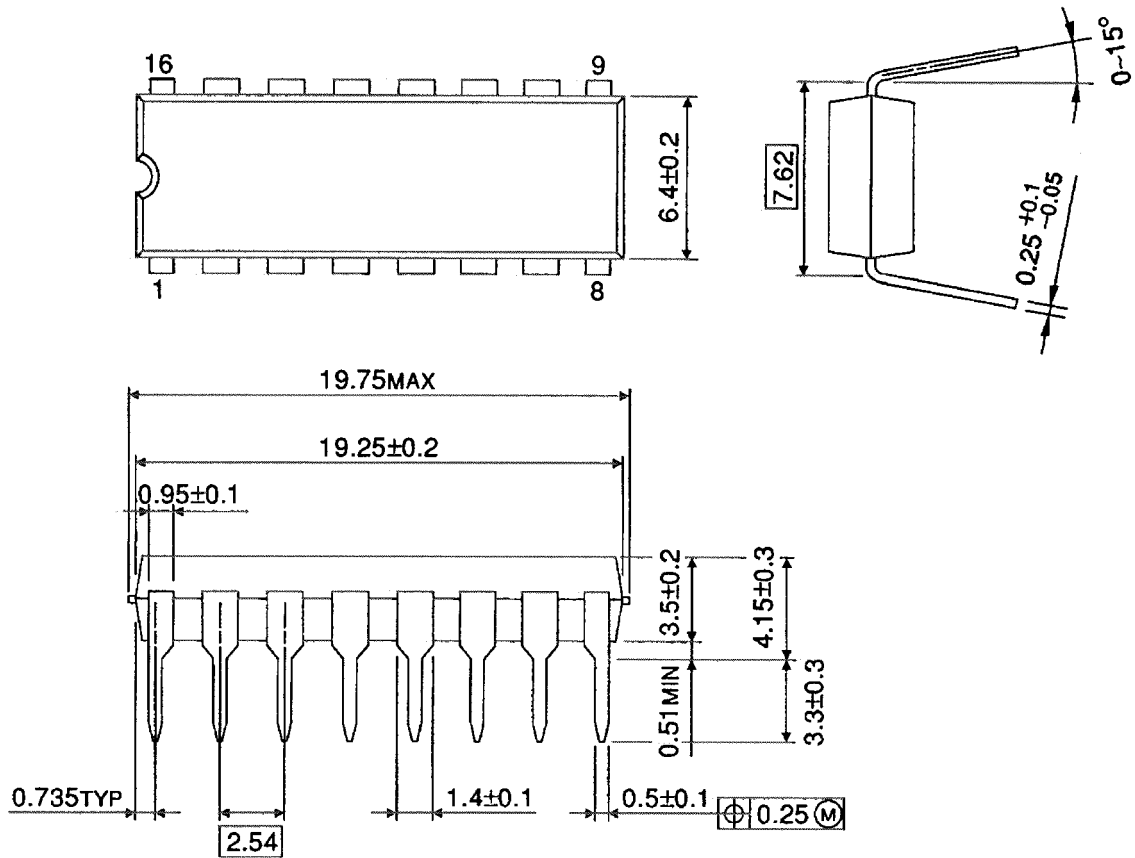
20 LEDs applications



Package Dimensions

DIP16-P-300-2.54A

Unit : mm



Weight: 1.00 g (typ.)

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