

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

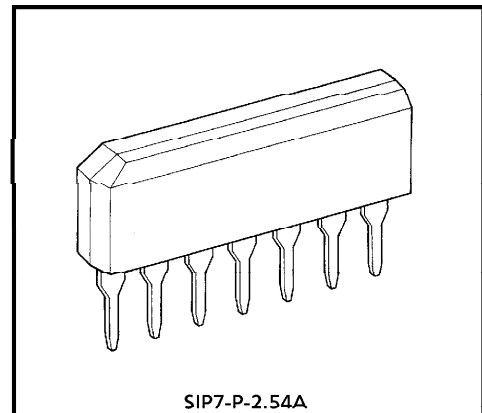
# TA7523S

## SINGLE COMPARATOR

TA7523S is comparator with wide range single or two supply voltage. Output is open collector and wired-OR possible.

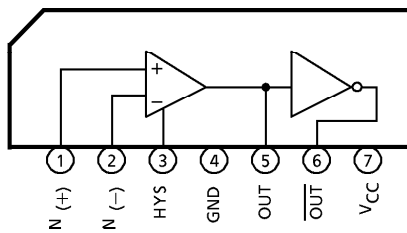
### FEATURES

- Wide Common Mode Input Voltage :  $0V \sim V_{CC} - 1.5V$
- Output is Compatible with TTL and CMOS.
- With Two Output Terminal (OUT,  $\overline{OUT}$ )
- Hysteresis Voltage Width is Variable by External Resistor.
- Wide Supply Voltage Range :  $2V \sim 36V$  or  $\pm 1V \sim \pm 18V$



Weight : 0.7g (Typ.)

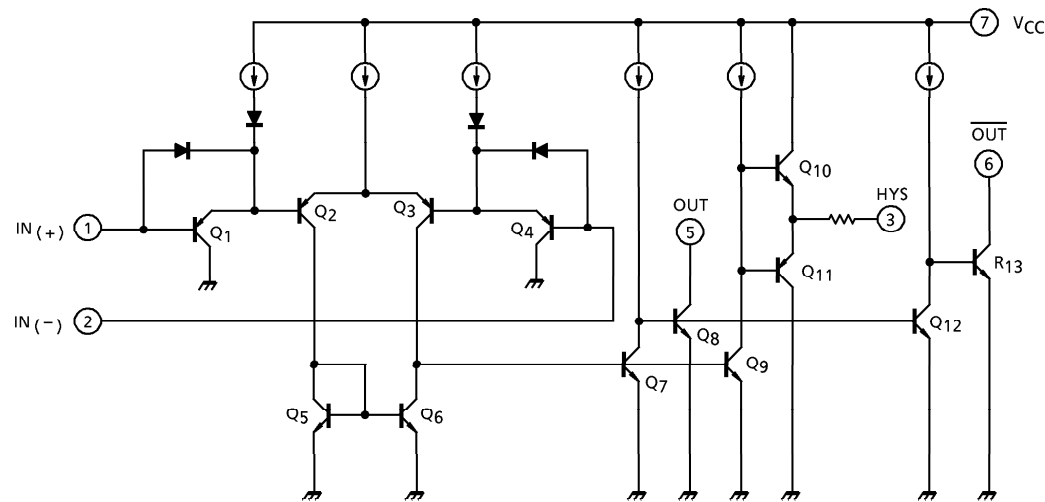
### PIN CONNECTION



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EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

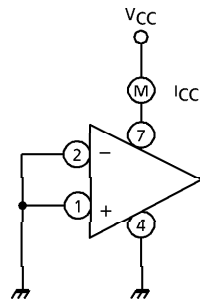
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	± 18 or 36	V
Differential Input Voltage	DV <sub>IN</sub>	± 36	V
Common Mode Input Voltage	CMV <sub>IN</sub>	- 0.3~V <sub>CC</sub>	V
Power Dissipation	P <sub>D</sub>	500	mW
Operating Temperature	T <sub>opr</sub>	- 40~85	°C
Storage Temperature	T <sub>stg</sub>	- 55~125	°C

ELECTRICAL CHARACTERISTICS (V<sub>CC</sub> = 5V, Ta = 25°C)

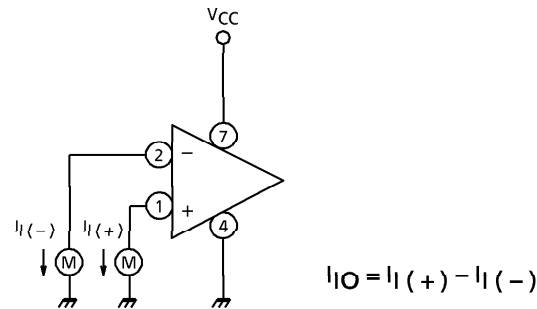
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V <sub>IO</sub>	4	—	—	3	7	mV
Input Bias Current	I <sub>I</sub>	2	—	—	25	250	nA
Input Offset Current	I <sub>IO</sub>	2	—	—	5	50	nA
Common Mode Input Voltage	CMV <sub>IN</sub>	4	—	0	—	V <sub>CC</sub> - 1.5	V
Voltage Gain	G <sub>V</sub>	—	R <sub>L</sub> = 15kΩ	—	200	—	V/mV
Supply Current	I <sub>CC</sub>	1	No Load	—	0.5	3	mA
Sink Current	I <sub>SINK</sub>	5	IN(+) = 0V, IN(-) = 1V, V <sub>OL</sub> = 1.5V	6	16	—	mA
Output Voltage	V <sub>OL</sub>	5	IN(+) = 0V, IN(-) = 1V, I <sub>SINK</sub> = 3mA	—	0.2	0.4	V
Output Leak Current	I <sub>LEAK</sub>	3	IN(+) = 1V, IN(-) = 0V, V <sub>O</sub> = 5V	—	0.1	—	nA
Response Time	t <sub>rsp</sub>	6	R <sub>L</sub> = 5.1kΩ, C <sub>L</sub> = 15pF	—	1.3	—	μs

TEST CIRCUIT

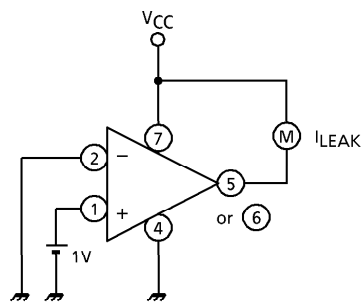
(1)  $I_{CC}$



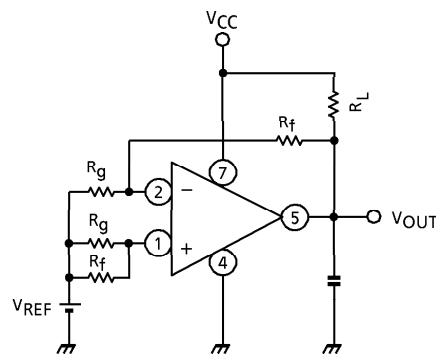
(2)  $I_I, I_{IO}$



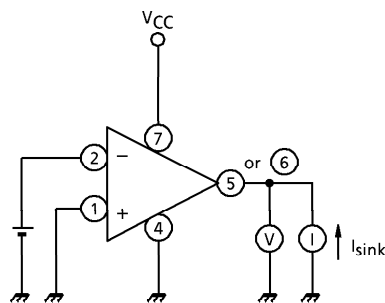
(3)  $I_{LEAK}$



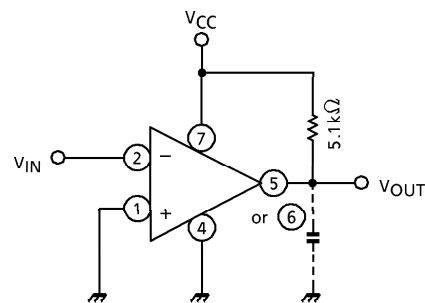
(4)  $V_{IO}, CMV_{IN}$



(5)  $I_{sink}, V_{OL}$

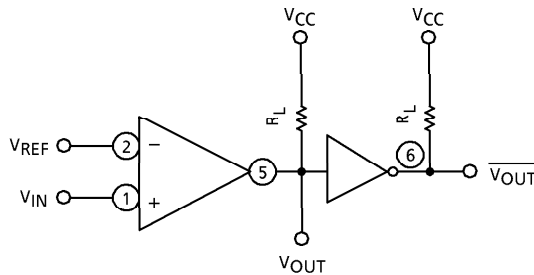


(6)  $t_{rsp}$

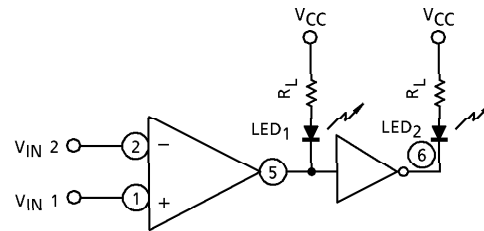


## APPLICATION CIRCUIT

## 1. GENERAL COMPARATOR

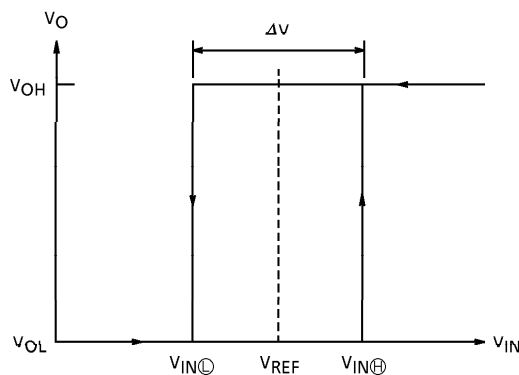
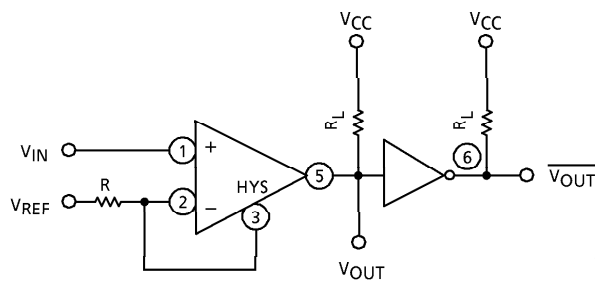


## 2. COMPARE WITH INPUT VOLTAGE



LED<sub>2</sub> IS LIGHTED AT  $V_{IN\ 1} > V_{IN\ 2}$   
 LED<sub>1</sub> IS LIGHTED AT  $V_{IN\ 1} < V_{IN\ 2}$

## 3. COMPARATOR WITH HYSTERESIS

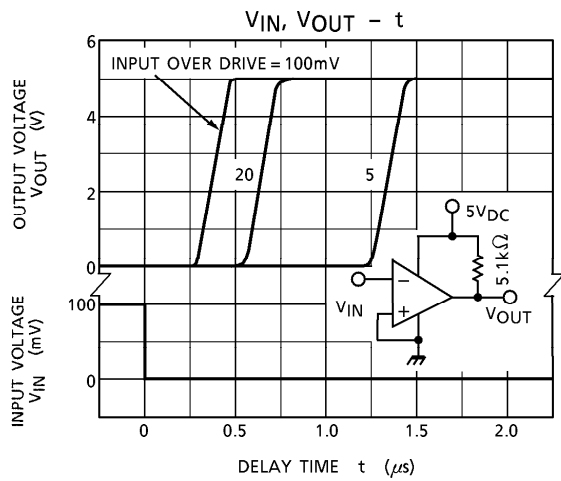
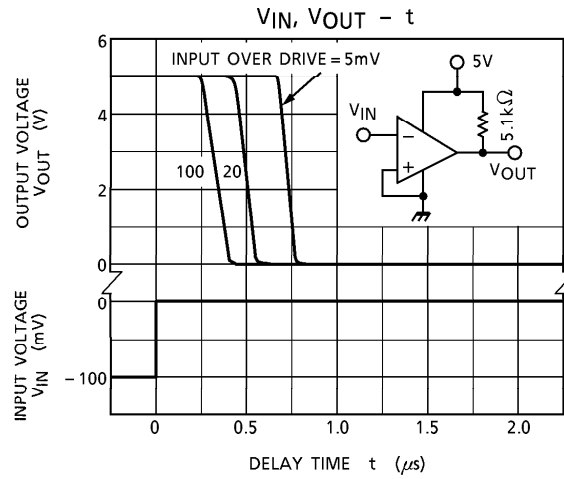
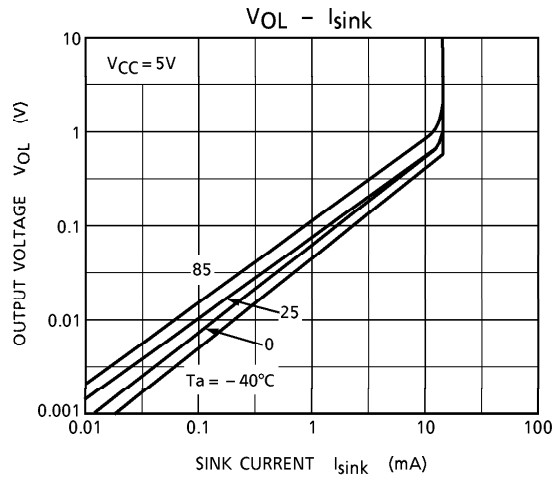
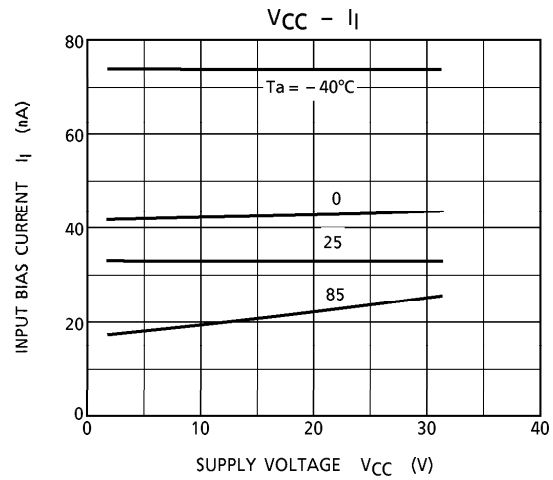
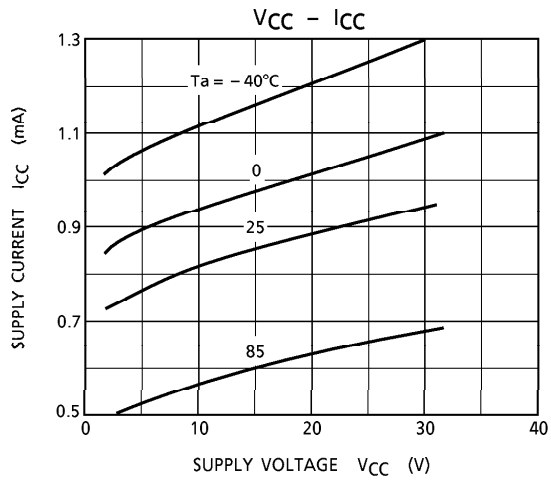


VOH : OUTPUT VOLTAGE ("H" LEVEL)  
 VOL : OUTPUT VOLTAGE ("L" LEVEL)  
 VIN<sup>⊕</sup> : TURNOVER INPUT VOLTAGE ("H" LEVEL)  
 VIN<sup>⊖</sup> : TURNOVER INPUT VOLTAGE ("L" LEVEL)  
 VREF : REFERENCE VOLTAGE  
 ΔV : HYSTERESIS WIDTH

Calculate the Hysteresis width using the following equation

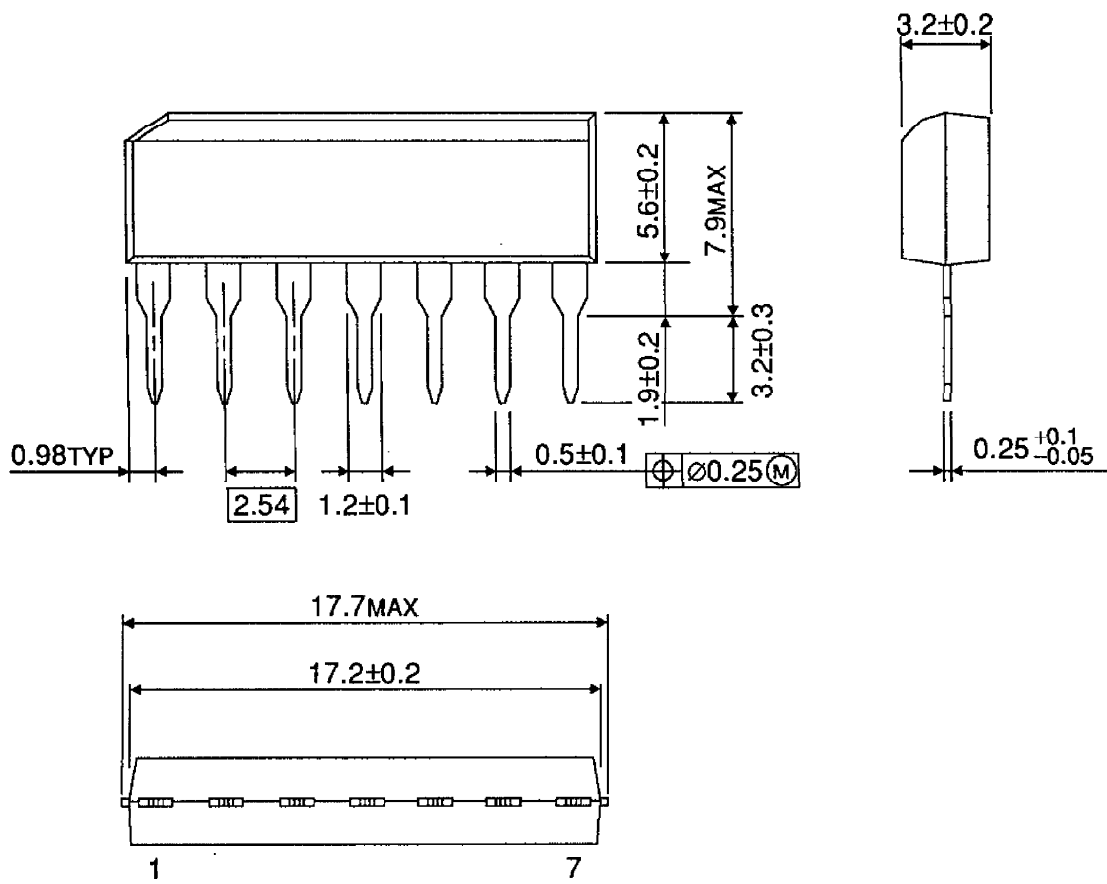
$$\Delta V \cong (V_{CC} - 2) \frac{R}{R + 10} \quad V_{CC} (V) \quad R (k\Omega)$$

CHARACTERISTICS



OUTLINE DRAWING  
SIP7-P-2.54A

Unit : mm



Weight : 0.7g (Typ.)