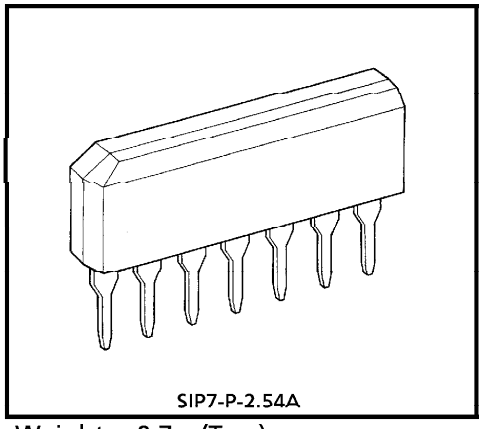
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7523S

SINGLE COMPARATOR

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



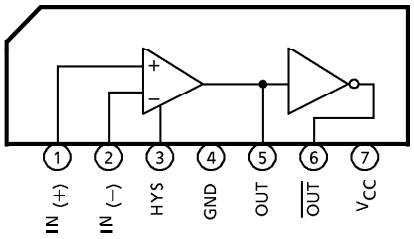
SIP7-P-2.54A

Weight : 0.7g (Typ.)

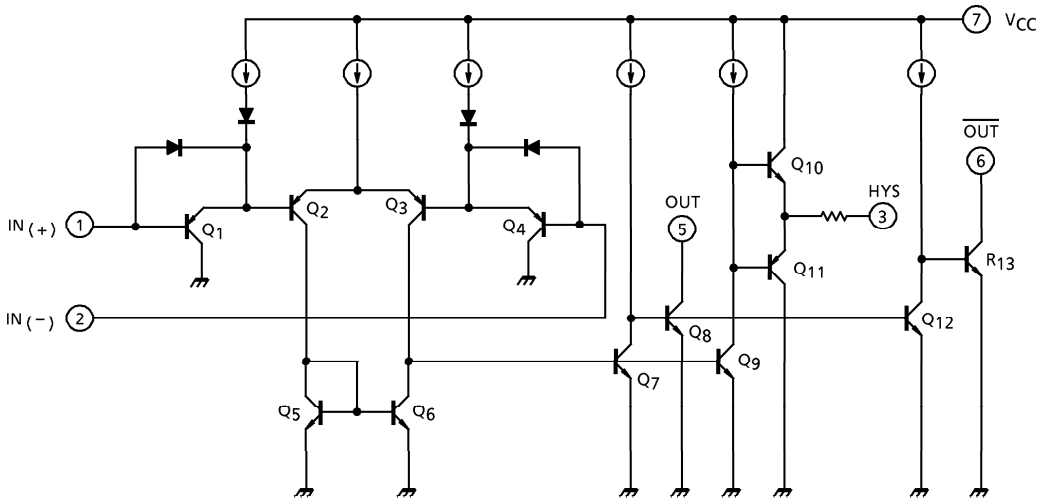
FEATURES

- Wide Common Mode Input Voltage : 0V~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~36V or ±1V~±18V

PIN CONNECTION



EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

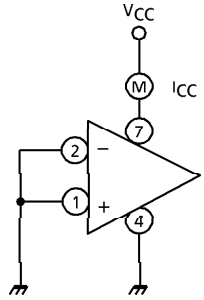
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	± 18 or 36	V
Differential Input Voltage	DV_{IN}	± 36	V
Common Mode Input Voltage	CMV_{IN}	− 0.3~V_{CC}	V
Power Dissipation	P_D	500	mW
Operating Temperature	T_{opr}	− 40~85	°C
Storage Temperature	T_{stg}	− 55~125	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = 5V, Ta = 25°C)

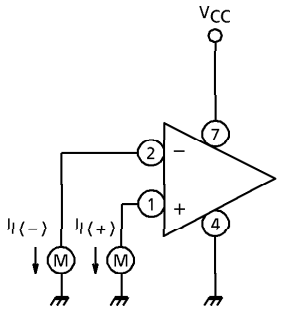
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	4	—	—	3	7	mV
Input Bias Current	I_I	2	—	—	25	250	nA
Input Offset Current	I_{IO}	2	—	—	5	50	nA
Common Mode Input Voltage	CMV_{IN}	4	—	0	—	V_{CC} − 1.5	V
Voltage Gain	G_V	—	R_L = 15kΩ	—	200	—	V / mV
Supply Current	I_{CC}	1	No Load	—	0.5	3	mA
Sink Current	I_{SINK}	5	IN (+) = 0V, IN (−) = 1V, V_{OL} = 1.5V	6	16	—	mA
Output Voltage	V_{OL}	5	IN (+) = 0V, IN (−) = 1V, I_{SINK} = 3mA	—	0.2	0.4	V
Output Leak Current	I_{LEAK}	3	IN (+) = 1V, IN (−) = 0V, V_O = 5V	—	0.1	—	nA
Response Time	t_{rsp}	6	R_L = 5.1kΩ, C_L = 15pF	—	1.3	—	μs

TEST CIRCUIT

(1) I_{CC}

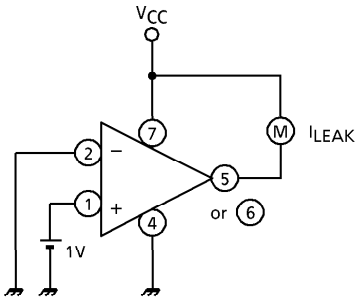


(2) I_I, I_{IO}

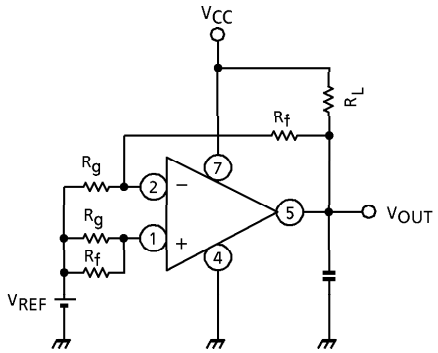


$I_{IO} = I_I(+) - I_I(-)$

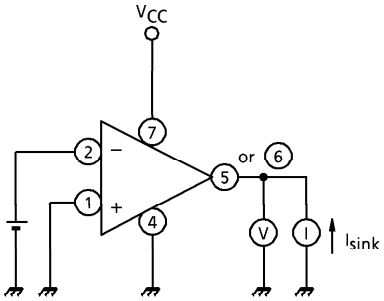
(3) I_{LEAK}



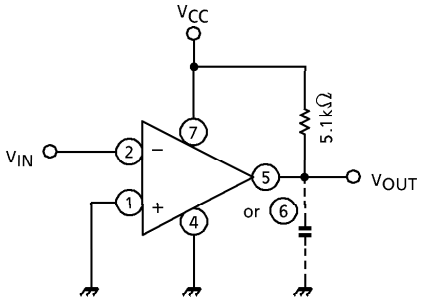
(4) V_{IO}, CMV_{IN}



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

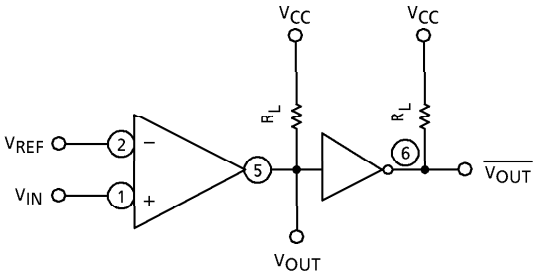


(6) t_{rsp}

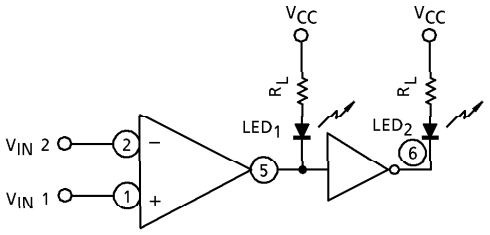


APPLICATION CIRCUIT

1. GENERAL COMPARATOR

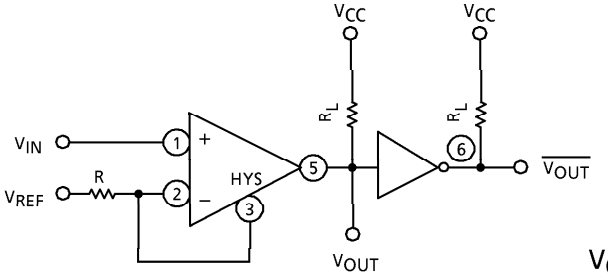


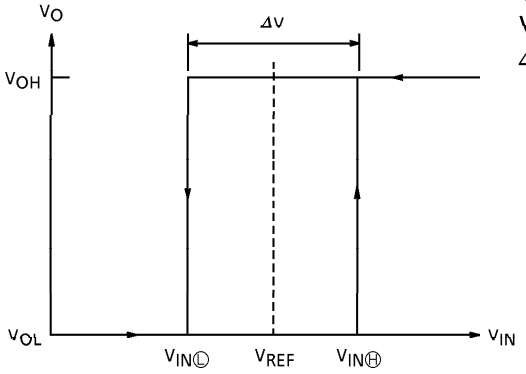
2. COMPARE WITH INPUT VOLTAGE



LED_2 IS LIGHTED AT $V_{IN}\ 1 > V_{IN}\ 2$
LED_1 IS LIGHTED AT $V_{IN}\ 1 < V_{IN}\ 2$

3. COMPARATOR WITH HYSTERESIS





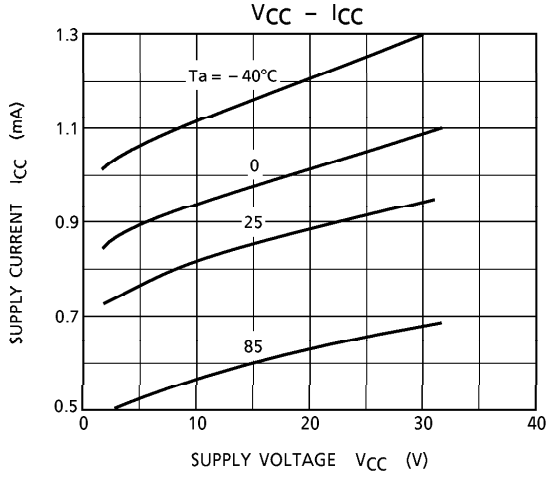
V_{OH} : OUTPUT VOLTAGE ("H" LEVEL)
V_{OL} : OUTPUT VOLTAGE ("L" LEVEL)
V_{IN}Ⓗ : TURNOVER INPUT VOLTAGE ("H" LEVEL)
V_{IN}Ⓛ : TURNOVER INPUT VOLTAGE ("L" LEVEL)
V_{REF} : REFERENCE VOLTAGE
ΔV : HYSTERESIS WIDTH

Calculate the Hysteresis width using the following equation

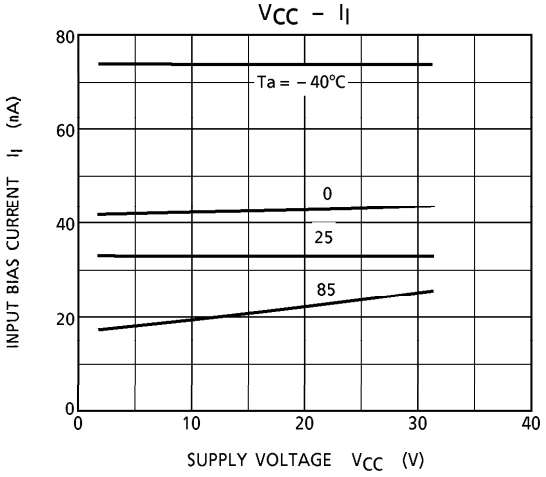
$$\Delta V \fallingdotseq (V_{CC} - 2)\frac{R}{R + 10} \qquad V_{CC}\ (V) \quad R\ (k\Omega)$$

CHARACTERISTICS

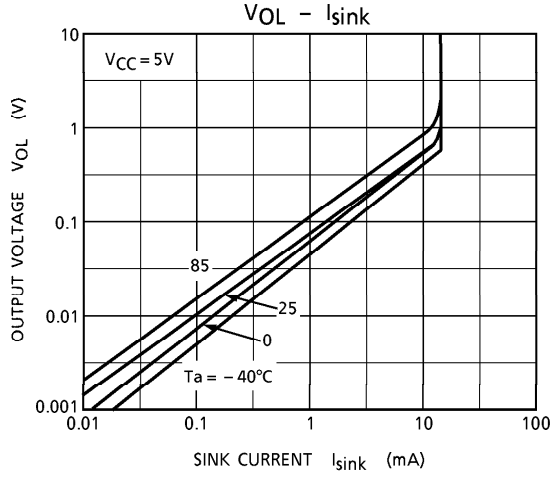
V_{CC} – I_{CC}



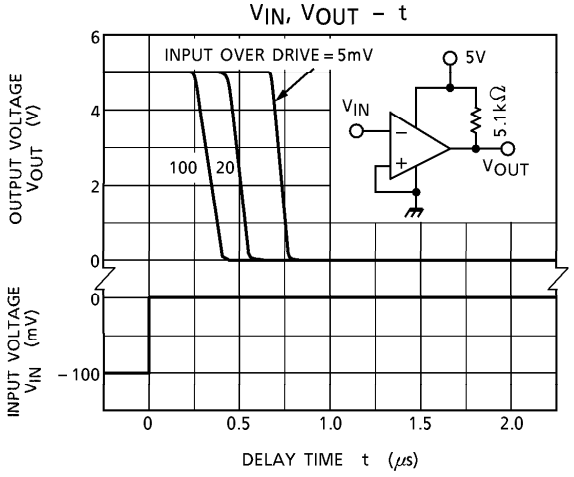
V_{CC} – I_I



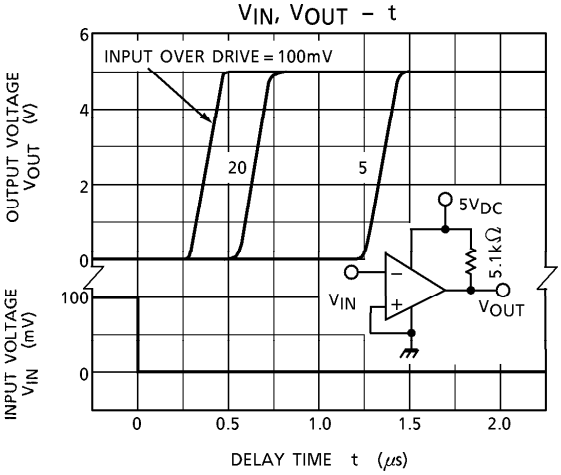
V_{OL} – I_{sink}



V_{IN}, V_{OUT} – t



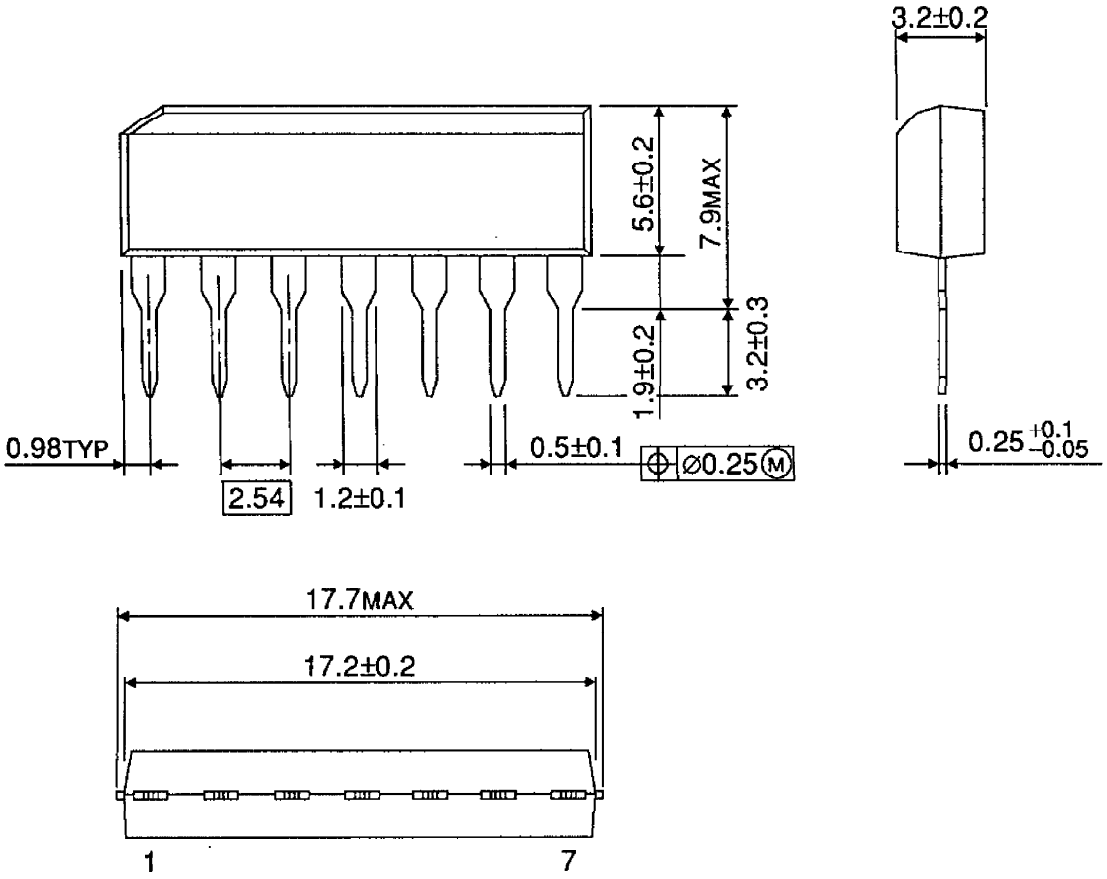
V_{IN}, V_{OUT} – t



OUTLINE DRAWING

SIP7-P-2.54A

Unit : mm



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