

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA7522S,TA7522F

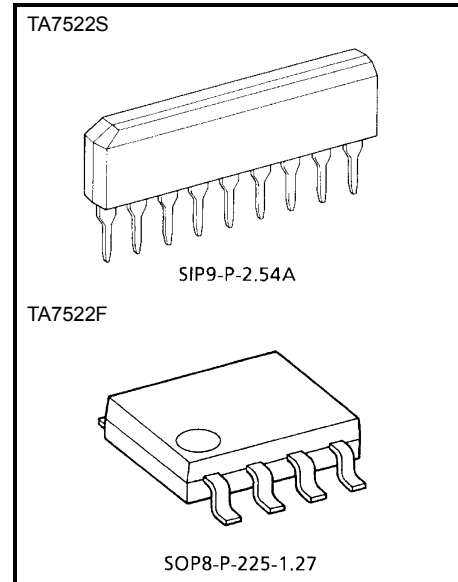
Dual Voltage Comparator

The TA7522S/TA7522F is an easy-to-use IC incorporating two voltage comparator circuits.

Since one channel has an inverted-output buffer, a CR oscillator can be easily built up. In addition, the IC has a wide operating temperature range that allows it to be used in a wide variety of applications.

Features

- Two-circuit package
- High gain
- Single 3 V power supply for operation
- Inverted-output also available
- 0 V input causes action in the IC with a single power supply.
- Wide common-mode input range
- No latch-up
- Operating temperature range: -40 to 85°C
- Open-collector output
- SIP-9 pin (TA7522S)
- SOP-8 pin (TA7522F)



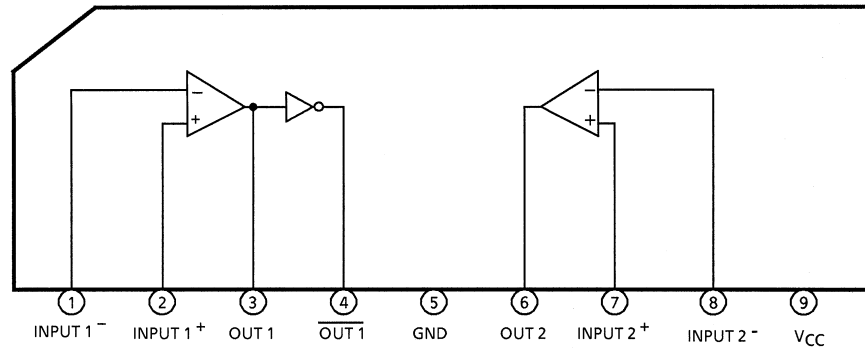
Weight

SIP9-P-2.54A : 0.92 g (typ.)

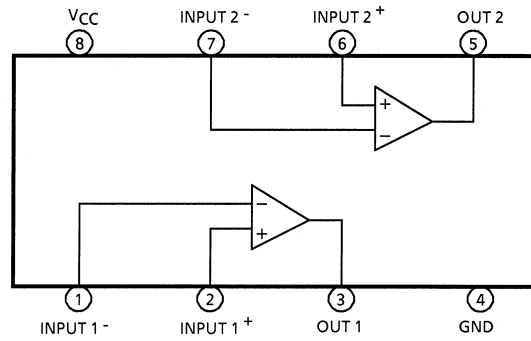
SOP8-P-225-1.27 : 0.08 g (typ.)

Block Diagram and Pin Layout

TA7522S



TA7522F



Note 1: The TA7522S and TA7522F are the same chip housed in different packages.

Note 2: Some functional blocks, circuits, or constants are omitted or simplified in the block diagram to clarify the descriptions of the relevant features.

Pin Description

Pin No.		Symbol	Description
TA7522S	TA7522F		
1	1	INPUT1 ⁻	Inverted-input pin
2	2	INPUT1 ⁺	Non-inverted-input pin
3	3	OUT1	Output pin corresponding to INPUT1
4	—	$\overline{\text{OUT1}}$	Output pin for inversion of OUT1
5	4	GND	Grounded
6	5	OUT2	Output pin corresponding to INPUT2
7	6	INPUT2 ⁺	Non-inverted-input pin
8	7	INPUT2 ⁻	Inverted-input pin
9	8	V _{CC}	Power supply pin

Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Supply voltage	V _{CC}	-0.3 to +18	V
Supply voltage surge	V _{CC SURGE}	+30 (within 1 second)	V
Power dissipation	P _D	500 / 440	mW
Differential input voltage	DV _{IN}	±18	V
Input voltage	V _{IN}	-0.3 to +18	V
Output current	I _{SINK}	30	mA
Operating temperature	T _{opr}	-40 to +85	°C
Storage temperature	T _{stg}	-55 to +150	°C

Note 1: The absolute maximum ratings of a semiconductor device are a set of specified parameter values which must not be exceeded during operation, even for an instant.
 If any of these levels is exceeded during operation, the device's electrical characteristics may be irreparably altered and the reliability and lifetime of the device can no longer be guaranteed, possibly causing damage to any other equipment with which it is used. Applications using the device should be designed such that the maximum ratings will never be exceeded in any operating conditions.
 Ensuring that the parameter values remain within these specified ranges during device operation will help to ensure that the integrity of the device is not compromised.

Note 2: P_D: TA7522S / TA7522F

Electrical Characteristics (Ta = -40 to +85°C)

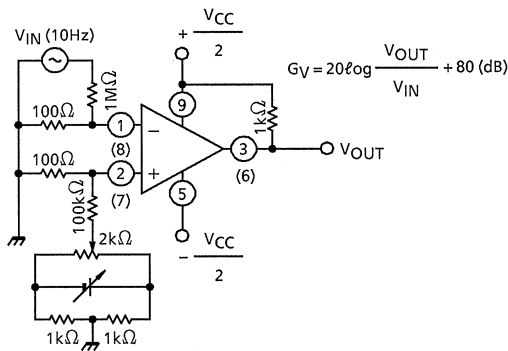
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ. (Note)	Max	Unit	
Voltage gain	G_V	1	$V_{CC} = 6\text{ V}$, $R_L = 1\text{ k}\Omega$ $f = 10\text{ Hz}$, test circuit 1	60	95	—	dB	
Input offset voltage	V_{IO}	2	$V_{CC} = 6\text{ V}$, $R_L = 1\text{ k}\Omega$ $CMV_{IN} = 3\text{ V}$, test circuit 2	—	2	10	mV	
Input bias current	I_I	3	$V_{CC} = 6\text{ V}$, $CMV_{IN} = 3\text{ V}$ test circuit 3	—	-0.2	-2	μA	
Input offset current	I_{IO}	3	Same as above	—	0.02	0.3	μA	
Common-mode input voltage	CMV_{IL}	4	$V_{CC} = 6.5\text{ V}$, $R_L = 1\text{ k}\Omega$ $V_{IO} = 20\text{ mV}$, test circuit 4	—	-0.5	0	V	
	CMV_{IH}		Same as above	5.0	5.3	—	V	
Zero output voltage	V_{OL}	OUT1 OUT2	5	$V_{CC} = 5.5\text{ V}$, $V_{IN} = 0.1\text{ V}$ $I_{OL} = 10\text{ mA}$, test circuit 5	—	0.18	0.4	V
		$\overline{\text{OUT1}}$						
Output leakage current	I_{LEAK}	OUT1 OUT1 OUT2	6	$V_{CC} = 6\text{ V}$, $V_{OUT} = 30\text{ V}$ test circuit 6	—	—	10	μA
		OUT1	6	$V_{CC} = 6\text{ V}$, $V_{OUT} = 0.4\text{ V}$ test circuit 6	—	-1.5	-10	μA
Current consumption	I_{CC}	7	$V_{CC} = 6.5\text{ V}$, $R_L = \infty$ test circuit 7	—	3	7	mA	

Note: An ambient temperature of 25°C is assumed for the typical values.

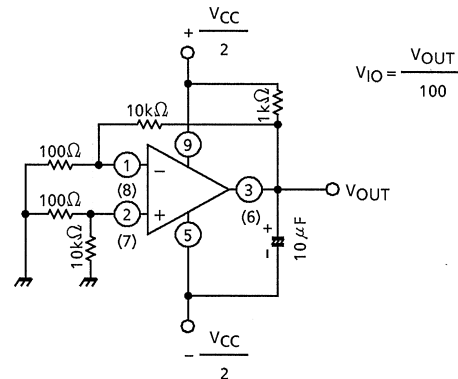
Test Circuit

(Below are examples for the TA7522S. Note that, for the TA7522F, pin numbers are different.)

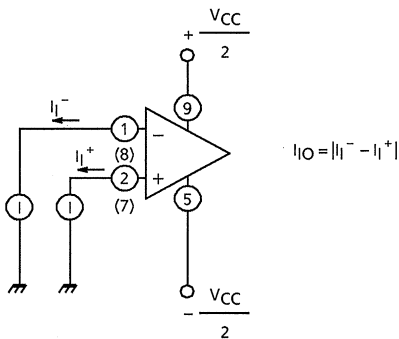
1. G_V



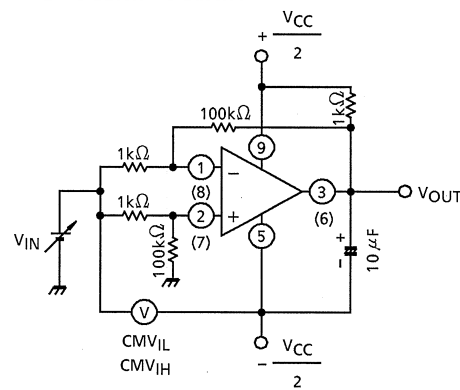
2. V_{IO}



3. I_I, I_{IO}



4. CMV_{IL}, CMV_{IH}

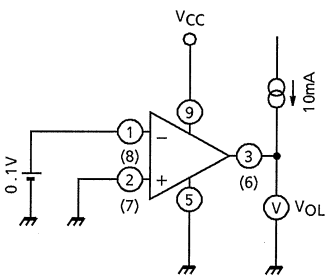


CMV_{IL} : Input voltage relative to pin 5 as it is obtained when V_{IN} is decreased until output V_{OUT} becomes ± 2 V.

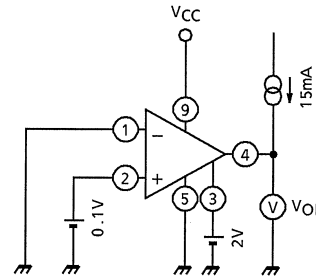
CMV_{IH} : Input voltage relative to pin 5 as it is obtained when V_{IN} is increased until output V_{OUT} becomes ± 2 V.

5. V_{OL}

5.1 OUT1, OUT2

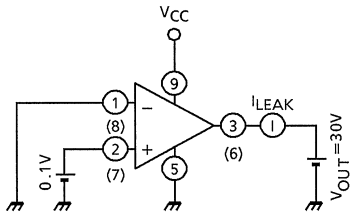


5.2 $\overline{OUT1}$

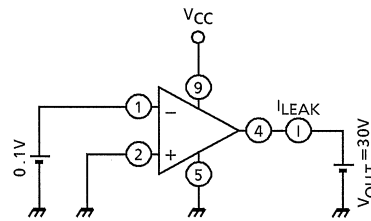


6. I_{LEAK}

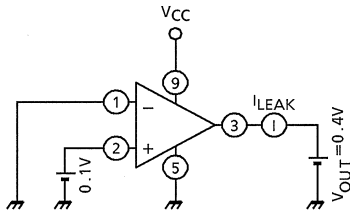
6.1 OUT1, OUT2



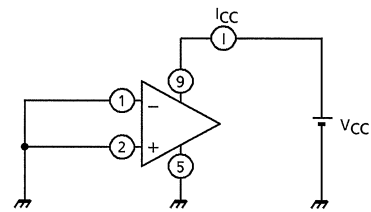
6.2 OUT1



6.3 OUT1



7. I_{CC} OUT1

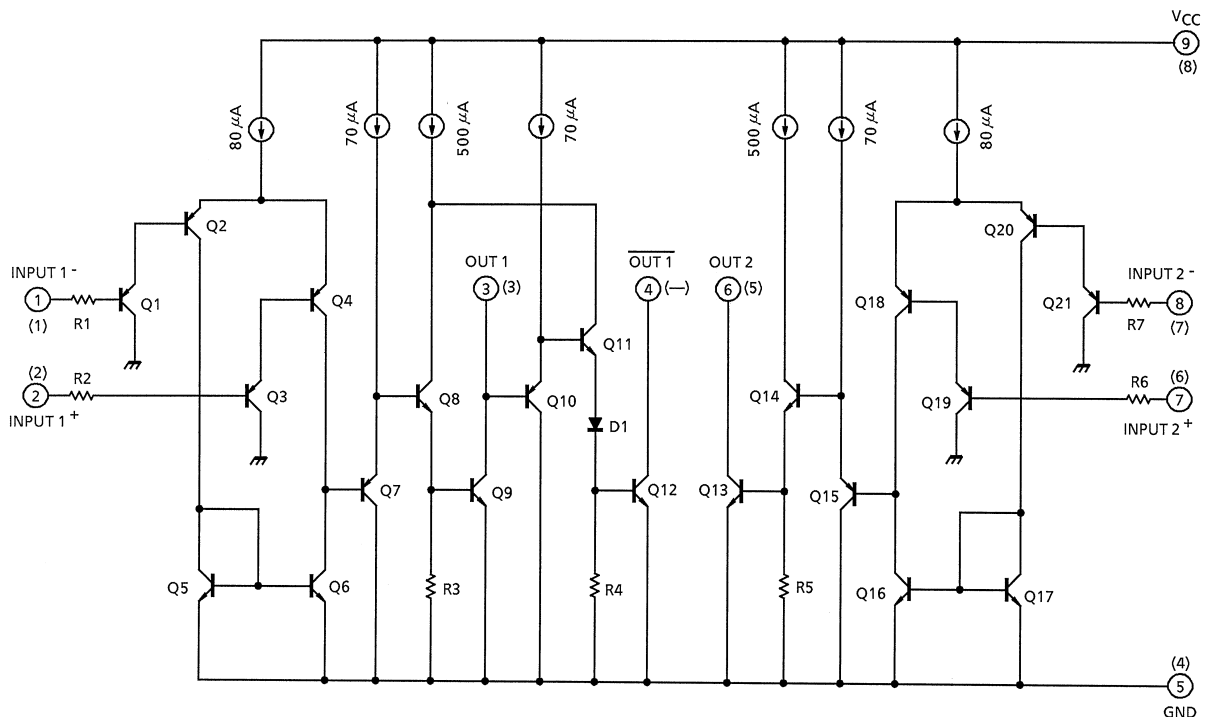


All inputs are grounded.

Note: The application circuit shown above is not intended to guarantee mass production. A thorough evaluation is required when designing an application circuit for mass production.

Equivalent Circuit

(Pin numbers are explained in the order first of the TA7522S and then of the TA7522F.)

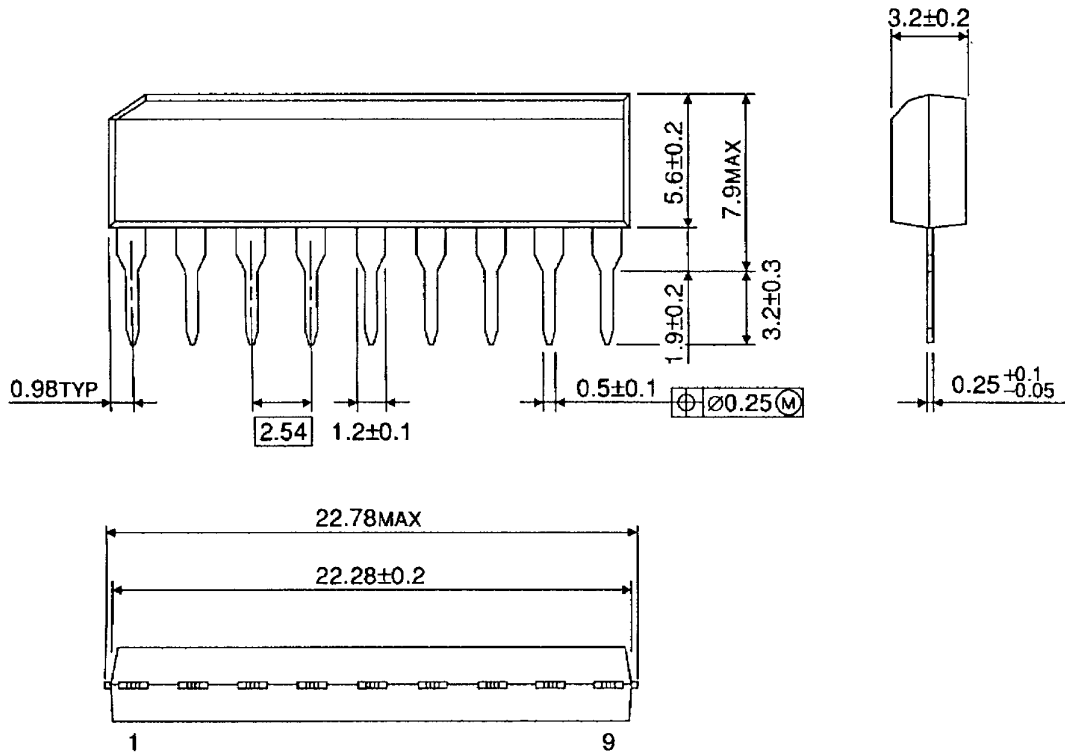


Note: The equivalent circuit diagrams may be simplified or some parts of them may be omitted for explanatory purposes.

Package Dimensions

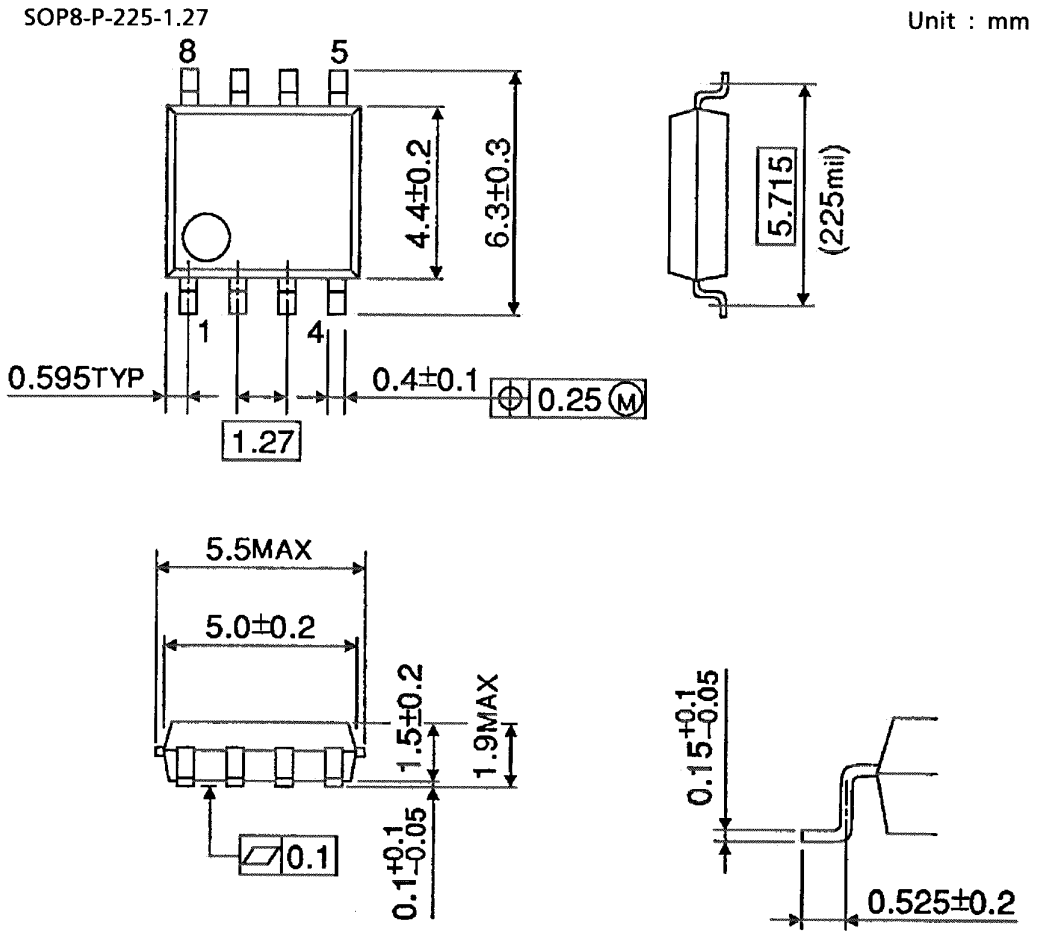
SIP9-P-2.54A

Unit : mm



Weight: 0.92 g (typ.)

Package Dimensions



Weight: 0.08 g (typ.)

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