

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

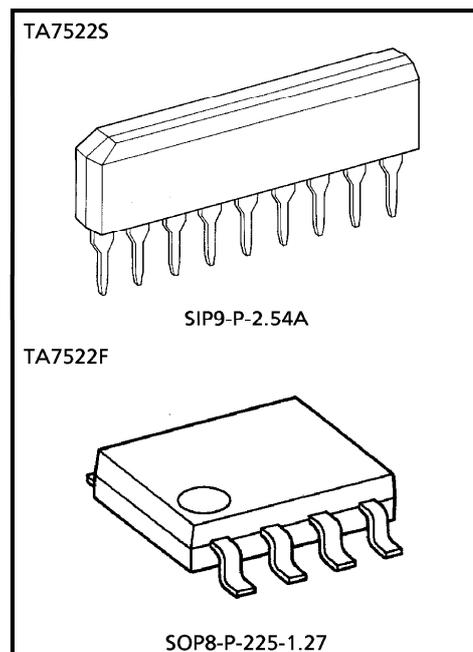
**TA7522S, TA7522F****DUAL VOLTAGE COMPARATOR**

The TA7522S, TA7522F is an easy-to-use small 9-pin single in-line package 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 so wide an operating temperature range that it can be used in wide application fields.

**FEATURES**

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



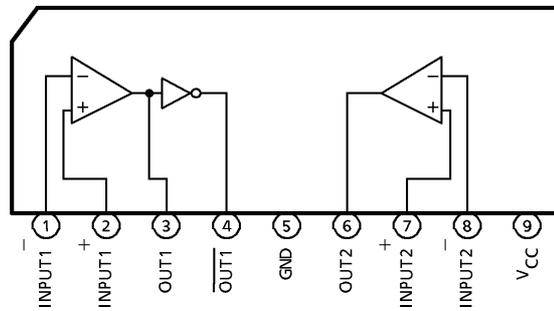
Weight  
 SIP9-P-2.54A : 0.92g (Typ.)  
 SOP8-P-225-1.27 : 0.08g (Typ.)

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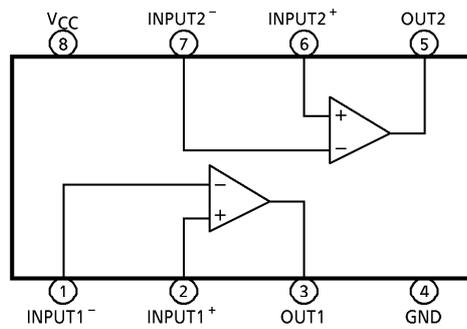
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**BLOCK DIAGRAM AND PIN LAYOUT**

TA7522S



TA7522F



Note : The TA7522S and TA7522F are the same chip, except that they are housed in different packages.

## PIN DESCRIPTION

PIN No.		SYMBOL	DESCRIPTION
TA7522S	TA7522F		
1	1	INPUT1 <sup>-</sup>	Inverted-input pin
2	2	INPUT1 <sup>+</sup>	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 <sup>+</sup>	Non-inverted-input pin
8	7	INPUT2 <sup>-</sup>	Inverted-input pin
9	8	V <sub>CC</sub>	Power supply pin

MAXIMUM RATINGS (T<sub>a</sub> = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	-0.3 to +18	V
Supply Voltage Surge	V <sub>CC SURGE</sub>	+30 (within 1 second)	V
Power Dissipation	P <sub>D</sub>	500 / 440	mW
Differential Input Voltage	DV <sub>IN</sub>	±18	V
Input Voltage	V <sub>IN</sub>	-0.3 to +18	V
Output Current	I <sub>SINK</sub>	30	mA
Operating Temperature	T <sub>opr</sub>	-40 to +85	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

(Note) P<sub>D</sub> : TA7522S / TA7522F

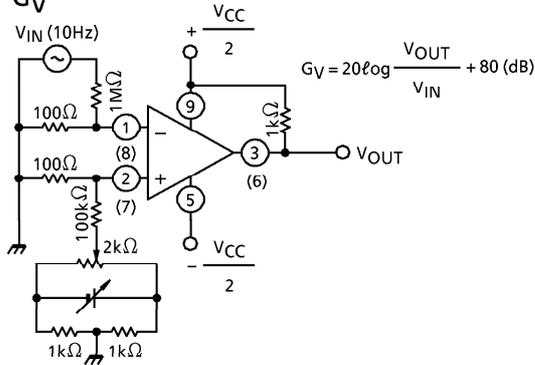
## ELECTRICAL CHARACTERISTICS (Ta = -40 to +85°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	(Note) TYP.	MAX.	UNIT
Voltage Gain	G <sub>V</sub>	1	V <sub>CC</sub> = 6V, R <sub>L</sub> = 1kΩ f = 10Hz, test circuit 1	60	95	—	dB
Input Offset Voltage	V <sub>IO</sub>	2	V <sub>CC</sub> = 6V, R <sub>L</sub> = 1kΩ CMV <sub>IN</sub> = 3V, test circuit 2	—	2	10	mV
Input Bias Current	I <sub>I</sub>	3	V <sub>CC</sub> = 6V, CMV <sub>IN</sub> = 3V test circuit 3	—	-0.2	-2	μA
Input Offset Current	I <sub>IO</sub>	3	Same as above	—	0.02	0.3	μA
Common-mode Input Voltage	CMV <sub>IL</sub>	4	V <sub>CC</sub> = 6.5V, R <sub>L</sub> = 1kΩ V <sub>IO</sub> = 20mV, test circuit 4	—	-0.5	0	V
	CMV <sub>IH</sub>		Same as above	5.0	5.3	—	V
Zero Output Voltage	V <sub>OL</sub>	OUT1 OUT2	V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = 0.1V I <sub>OL</sub> = 10mA, test circuit 5	—	0.18	0.4	V
		$\overline{\text{OUT1}}$	V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = 0.1V, I <sub>OL</sub> = 15mA, V <sub>OL</sub> (out1) ≥ 2V, test circuit 5	—	0.25	0.4	V
Output Leakage Current	I <sub>LEAK</sub>	OUT1 OUT1 OUT2	V <sub>CC</sub> = 6V, V <sub>OUT</sub> = 30V test circuit 6	—	—	10	μA
		OUT1	V <sub>CC</sub> = 6V, V <sub>OUT</sub> = 0.4V test circuit 6	—	-1.5	-10	μA
Current Consumption	I <sub>CC</sub>	7	V <sub>CC</sub> = 6.5V, R <sub>L</sub> = ∞ test circuit 7	—	3	7	mA

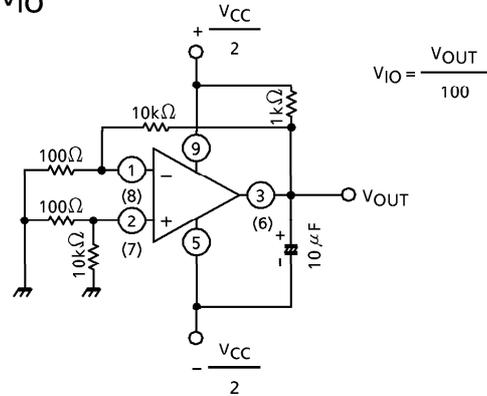
Note : An ambient temperature of 25°C is assumed for the typical values.

**TEST CIRCUIT** (Shown below is an example for the TA7522S. For the TA7522F, note that the pin numbers are different.)

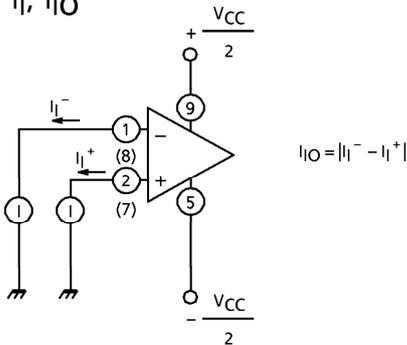
1.  $G_V$



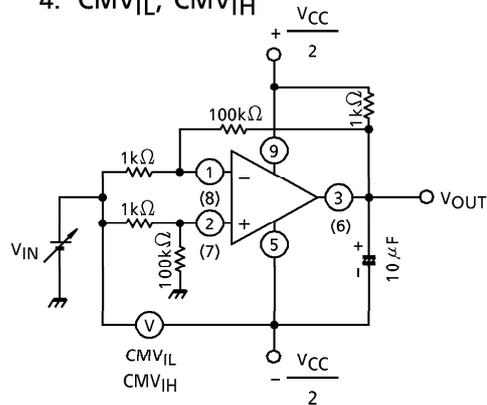
2.  $V_{IO}$



3.  $I_I, I_{IO}$



4.  $CMV_{IL}, CMV_{IH}$

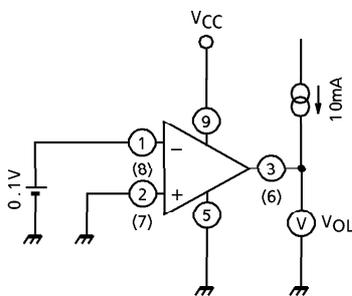


$CMV_{IL}$  : Input voltage relative to pin 5 as it is obtained when  $V_{IN}$  is decreased until output  $V_{OUT}$  becomes  $\pm 2V$ .

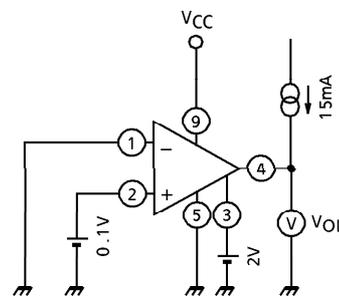
$CMV_{IH}$  : Input voltage relative to pin 5 as it is obtained when  $V_{IN}$  is increased until output  $V_{OUT}$  becomes  $\pm 2V$ .

5.  $V_{OL}$

5.1 OUT1, OUT2

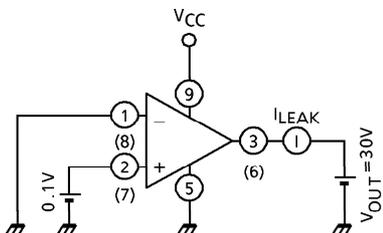


5.2  $\overline{OUT1}$

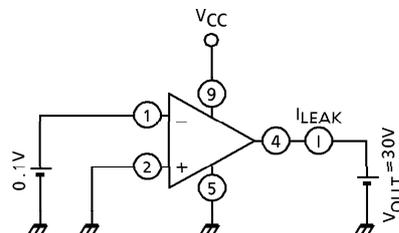


6.  $I_{LEAK}$

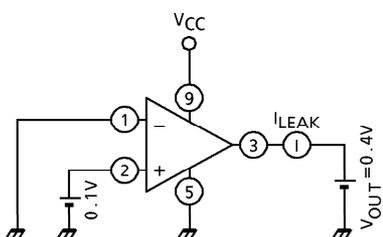
6.1 OUT1, OUT2



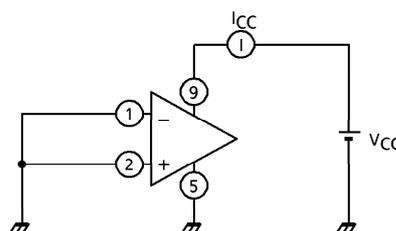
6.2  $\overline{OUT1}$



6.3 OUT1

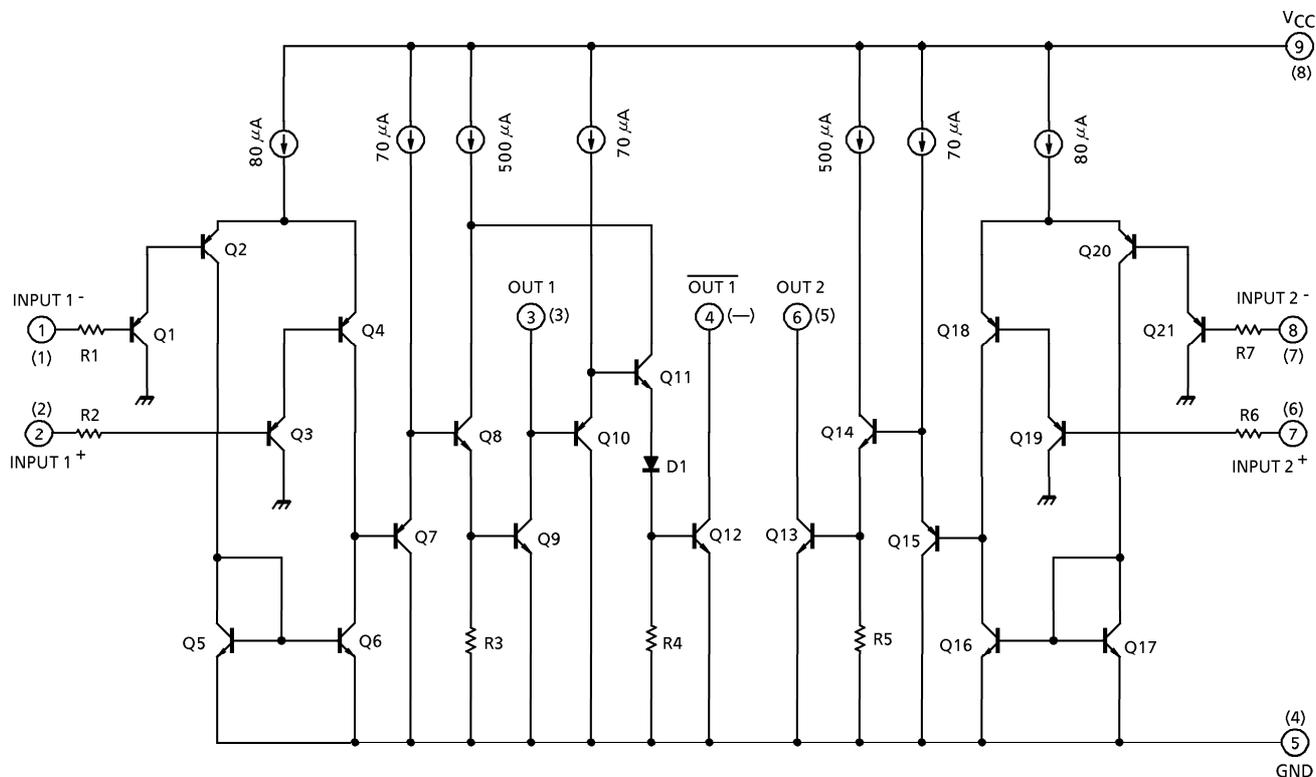


7.  $I_{CC}$



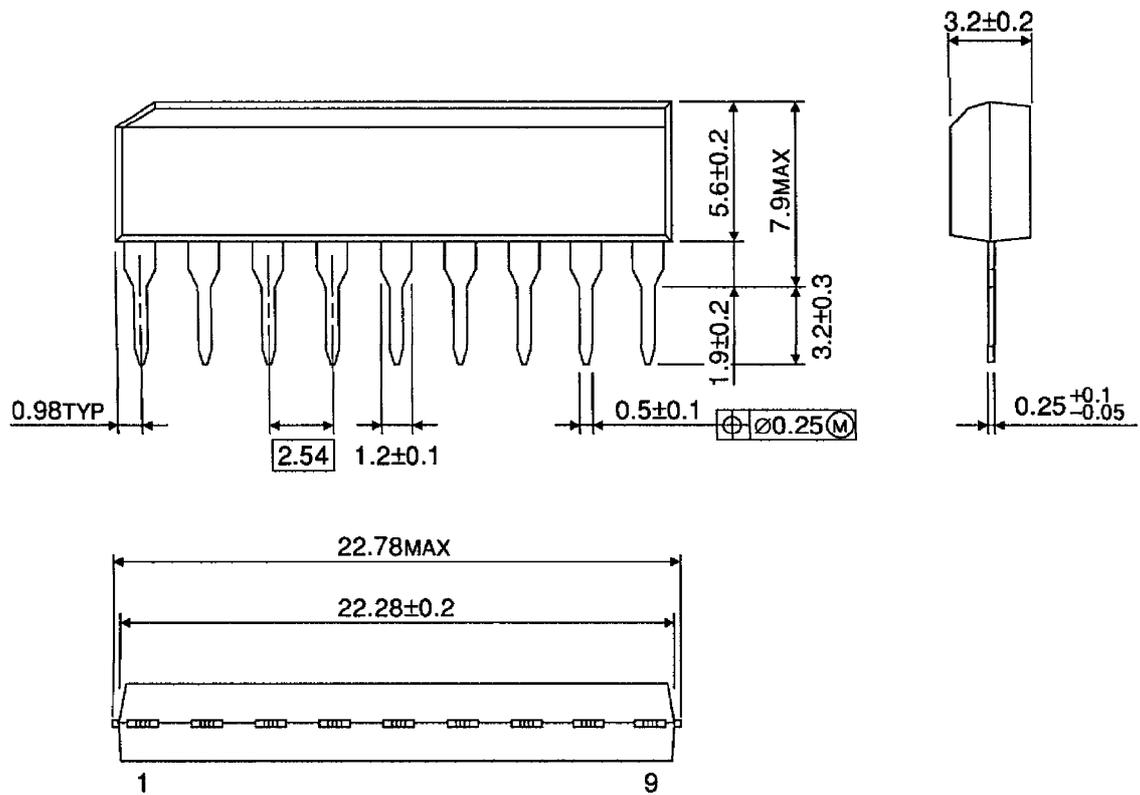
All inputs are grounded.

EQUIVALENT CIRCUIT (The pin numbers are explained in order of the TA7522S and the TA7522F.)



OUTLINE DRAWING  
SIP9-P-2.54A

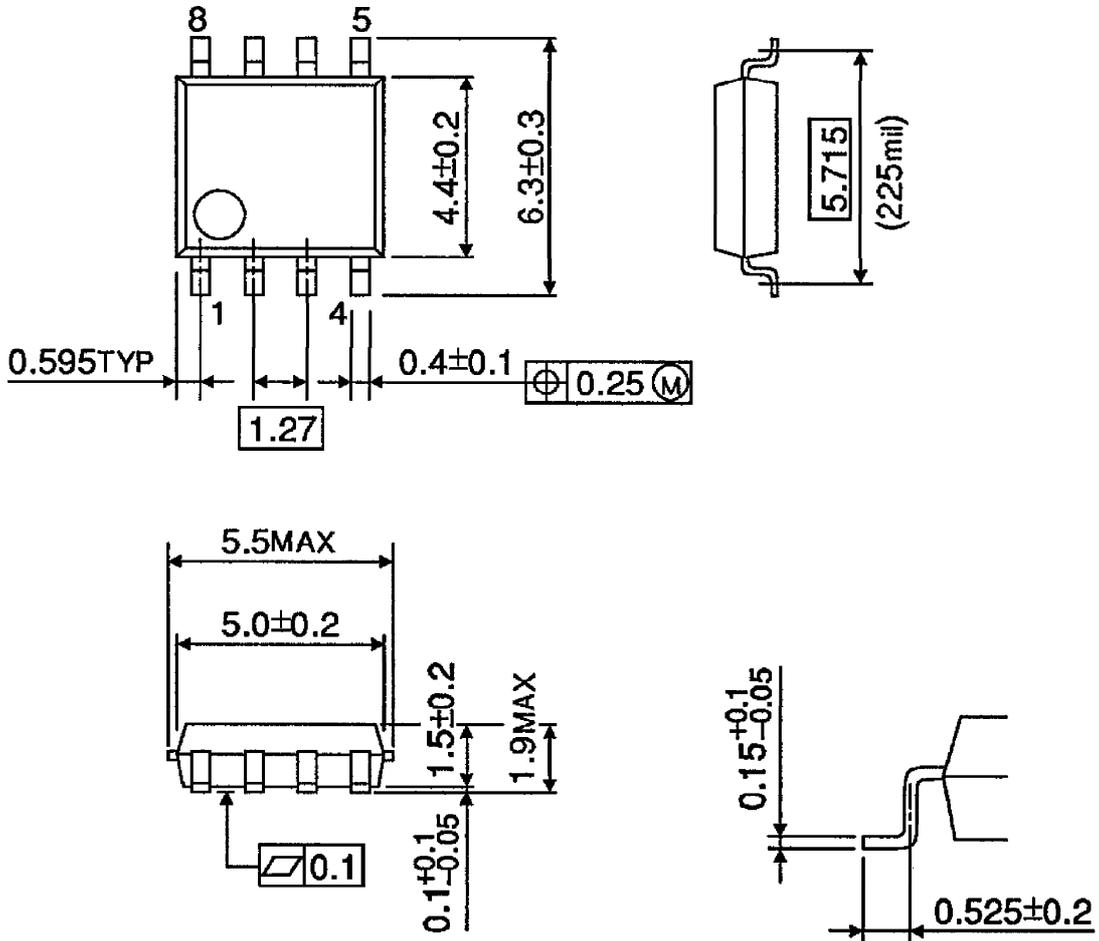
Unit : mm



Weight : 0.92g (Typ.)

OUTLINE DRAWING  
SOP8-P-225-1.27

Unit : mm



Weight : 0.08g (Typ.)