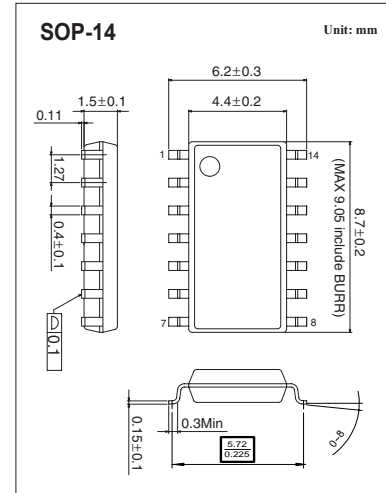
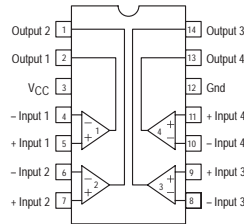




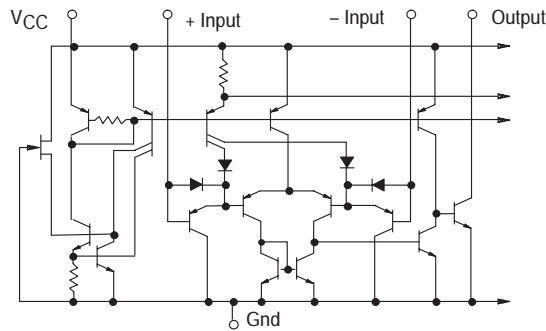
# Quad Single Supply Comparators

## ■ Features

- Single or Split Supply Operation
- Low Input Bias Current: 25 nA (Typ)
- Low Input Offset Current:  $\pm 5.0$  nA (Typ)
- Input Common Mode Voltage Range to Gnd
- Low Output Saturation Voltage: 130 mV (Typ) @ 4.0 mA
- TTL and CMOS Compatible



## ■ Circuit Schematic



## ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Power Supply Voltage	V <sub>CC</sub>	+36 or $\pm 18$	V
Input Differential Voltage Range	V <sub>IDR</sub>	36	V
Input Common Mode Voltage Range	V <sub>ICR</sub>	-0.3 to V <sub>CC</sub>	V
Output Short Circuit-to-Ground *	I <sub>SC</sub>	Continuous	
Power Dissipation @ T <sub>A</sub> = 25°C			
Derate above 25°C	P <sub>D</sub>	8.0	mW/°C
Plastic Package		1.0	W
Operating Ambient Temperature Range	T <sub>A</sub>	0 to 70	°C
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C

\* The maximum output current may be as high as 20 mA, independent of the magnitude of V<sub>CC</sub>, output short circuits to V<sub>CC</sub> can cause excessive heating and eventual destruction.



■ Electrical Characteristics ( $V_{CC} = +5.0\text{ V}$ ,  $T_A = 25^\circ\text{C}$ , unless otherwise noted.)

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Input Offset Voltage *4	$V_{IO}$			$\pm 2.0$	$\pm 5.0$	mV
Input Bias Current *4,5	$I_{IB}$			25	250	nA
Input Offset Current *4	$I_{IO}$			$\pm 5.0$	$\pm 50$	nA
Input Common Mode Voltage Range	$V_{ICMR}$		0		$V_{CC}-1.5$	V
Supply Current	$I_{CC}$	$R_L = \infty$ (For All Comparators)		0.8	2.0	mA
		$R_L = \infty$ , $V_{CC} = 30\text{ V}$		1.0	2.5	
Voltage Gain	$A_{VOL}$	$R_L \geq 15\text{ k}\Omega$ , $V_{CC} = 15\text{ V}$	50	200		V/mV
Large Signal Response Time		$V_I = \text{TTL Logic Swing}$ , $V_{ref} = 1.4\text{ V}$ , $V_{RL} = 5.0\text{ V}$ , $R_L = 5.1\text{ k}\Omega$		300		ns
Response Time *6		$V_{RL} = 5.0\text{ V}$ , $R_L = 5.1\text{ k}\Omega$		1.3		$\mu\text{ s}$
Output Sink Current	$I_{SINK}$	$V_I(-) \geq +1.0\text{ V}$ , $V_I(+)=0$ , $V_O \leq 1.5\text{ V}$	6.0	16		mA
Saturation Voltage	$V_{SAT}$	$V_I(-) \geq +1.0\text{ V}$ , $V_I(+)=0$ , $I_{SINK} \leq 4.0\text{ mA}$		130	400	mV
Output Leakage Current	$I_{OL}$	$V_I(+)\geq +1.0\text{ V}$ , $V_I(-)=0$ , $V_O = +5.0\text{ V}$		0.1		nA

■ Performance Characteristics ( $V_{CC}=+5.0\text{V}$ ,  $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ )

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Input Offset Voltage *4	$V_{IO}$				$\pm 9.0$	mV
Input Bias Current*4,5	$I_{IB}$				400	nA
Input Offset Current *4	$I_{IO}$				$\pm 150$	nA
Input Common Mode Voltage Range	$V_{ICMR}$		0		$V_{CC}-2.0$	V
Saturation Voltage	$V_{SAT}$	$V_I(-) \geq +1.0\text{ V}$ , $V_I(+)=0$ , $I_{SINK} \leq 4.0\text{ mA}$			700	mV
Output Leakage Current	$I_{OL}$	$V_I(+)\geq +1.0\text{ V}$ , $V_I(-)=0$ , $V_O = 30\text{ V}$			1.0	$\mu\text{ A}$
Differential Input Voltage	$V_{ID}$	All $V_I \geq 0\text{ V}$			$V_{CC}$	V

\*4. At the output switch point,  $V \approx 1.4\text{ V}$ ,  $R_s \leq 100\ \Omega$ ,  $5.0\text{ V} \leq V_{CC} \leq 30\text{ V}$ , with the inputs over the full common mode range (0 V to  $V_{CC} - 1.5\text{ V}$ ).

\*5. The bias current flows out of the inputs due to the PNP input stage. This current is virtually constant, independent of the output state.

\*6. The response time specified is for a 100 mV input step with 5.0 mV overdrive. For larger signals, 300 ns is typical.