

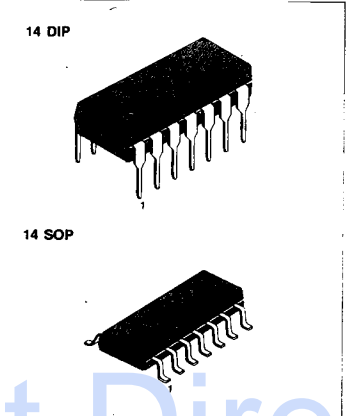
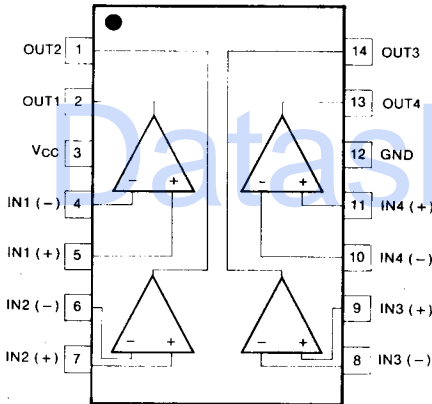
**QUAD DIFFERENTIAL COMPARATOR**

The LM339 consists of four independent voltage comparators designed to operate from single power supply over a wide voltage range.

**FEATURES**

- Single or dual supply operation
- Open collector outputs for wired connectors
- Low input offset current:  $\pm 2.3\text{mA}$  (TYP)
- Low input offset voltage:  $\pm 1.4\text{mV}$  (TYP)

**BLOCK DIAGRAM**

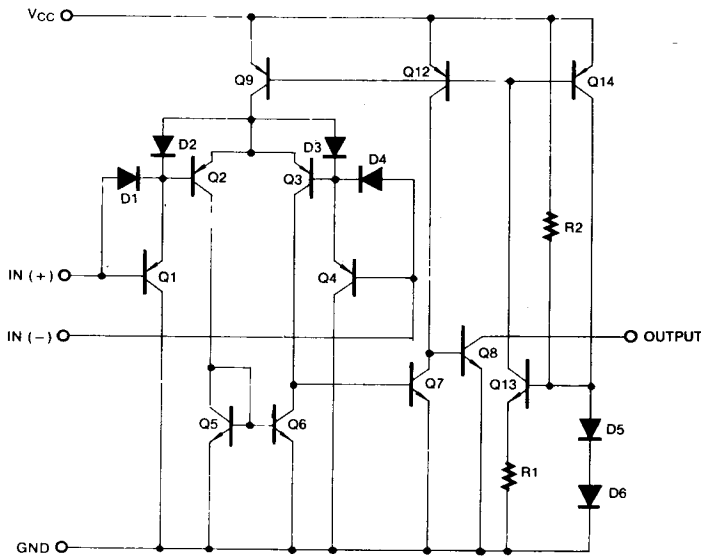


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**ORDERING INFORMATION**

Device	Package	Operating Temperature
LM339N	14 DIP	0 ~ +70°C
LM339D	14 SOP	
LM3302N	14 DIP	-40 ~ +85°C
LM3302D	14 SOP	

**SCHEMATIC DIAGRAM**



## ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Power Supply Voltage	$V_S$	$\pm 18$ or 36	V
Differential Input Voltage	$V_{ID}$	36	V
Input Voltage	$V_I$	-0.3 to +36	V
Output Short Circuit to GND		Continuous	
Power Dissipation	$P_D$	570	mW
Operating Temperature LM339	$T_{opr}$	-25 ~ +85	°C
LM3302		-40 ~ +85	°C
Storage Temperature	$T_{stg}$	-65 ~ +150	°C

## ELECTRICAL CHARACTERISTICS

(V<sub>CC</sub> = 5V, T<sub>a</sub> = 25°C, unless otherwise specified)

Characteristic	Symbol	Test Conditions	LM339			LM3302			Unit
			Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage	$V_{IO}$	$V_{ICM} = 0V$ to $V_{CC} - 1.5V$		1.4	5		2	20	mV
		$V_O = 1.4V$ , $R_S = 0$	NOTE 1		9.0			40	
Input Offset Current	$I_{IO}$			2.3	50		3	100	nA
		NOTE 1			150			300	
Input Bias Current	$I_B$			80	250		57	250	nA
		NOTE 1			400			1000	
Input Common Mode Voltage Range	$V_{ICR}$				3.5	0		$V_{CC} - 1.5$	V
		NOTE 1	0		3.0	0		$V_{CC} - 2$	
Supply Current	$I_{CC}$	$R_L = \infty$		1.1	2.0		1.1	2.0	mA
Voltage Gain	$A_{VOL}$	$V_{CC} = 15V$ , $R_L \geq 15K\Omega$ (for large swing)	50	500		2	30		V/mV
Large Signal Response Time	$t_{RES}$	$V_{IN} =$ TTL Logic Swing $V_{ref} = 1.4V$ , $V_{RL} = 5V$ , $R_L = 5.1K\Omega$		350			350		ns
Response Time	$t_{RES}$	$V_{RL} = 5V$ , $R_L = 5.1K\Omega$		1.4			1.4		$\mu S$
Output Sink Current	$I_{sink}$	$V_{IN-} \geq 1V$ , $V_{IN+} = 0V$ , $V_O \leq 1.5V$	6	18		6	18		mA
Output Saturation Voltage	$V_{sat}$	$V_{IN-} \geq 1V$ , $V_{IN+} = 0V$		160	400		160	400	mV
		$I_{sink} = 4mA$	NOTE 1		700			700	
Output Leakage Current	$I_{leak}$	$V_{IN-} = 0$		0.1			0.1		nA
		$V_{IN+} = 1V$	$V_O = 30V$			1.0		1.0	$\mu A$
Differential Voltage	$V_{ID}$	NOTE 1			40			40	V

NOTE 1

LM339:  $0 \leq T_a \leq +70^\circ C$ LM3302:  $-40 \leq T_a \leq +85^\circ C$

TYPICAL PERFORMANCE CHARACTERISTICS

Fig. 1 SUPPLY CURRENT

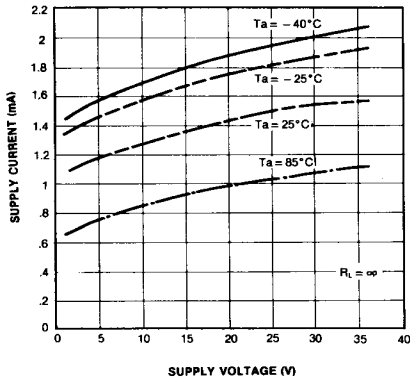


Fig. 2 INPUT CURRENT

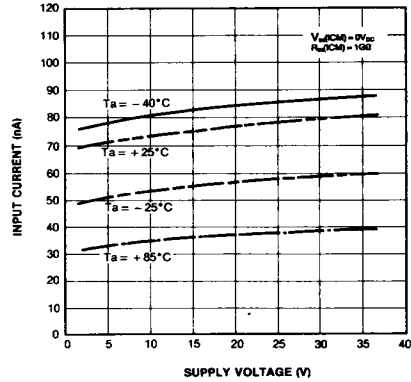


Fig. 3 OUTPUT SATURATION VOLTAGE

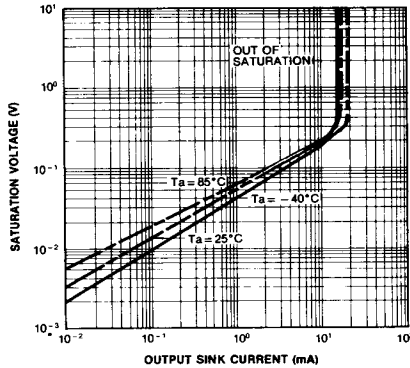


Fig. 4 RESPONSE TIME FOR VARIOUS INPUT OVERDRIVE-NEGATIVE TRANSITION

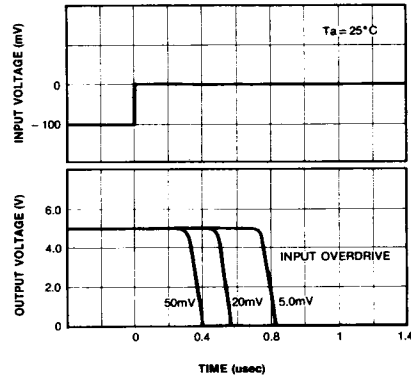


Fig. 5 RESPONSE TIME FOR VARIOUS INPUT OVERDRIVE-POSITIVE TRANSITION

