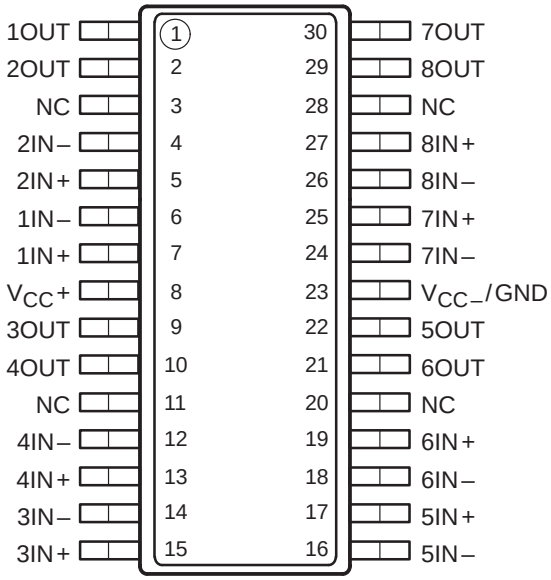
- **Single Supply or Dual Supplies**
- **Wide Range of Supply Voltage 2 V to 36 V**
- **Low Supply-Current Drain Independent of Supply Voltage . . . 1.6 mA Typ**
- **Low Input Bias Current . . . 25 nA Typ**
- **Low Input Offset Current . . . 5 nA Typ**
- **Low Input Offset Voltage . . . 2 mV Typ**
- **Common-Mode Input Voltage Range Includes Ground**
- **Differential Input Voltage Range Equal to Maximum-Rated Supply Voltage . . . ±36 V**
- **Low Output Saturation Voltage**
- **Output Compatible With TTL, MOS, and CMOS**

DB PACKAGE
(TOP VIEW)

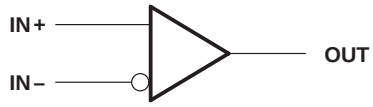


NC – No internal connection

description

The LM339x2 consists of eight independent voltage comparators that are designed to operate from a single power supply over a wide range of voltages. Operation from dual supplies is also possible when the difference between the two supplies is 2 V to 36 V and V_{CC} is at least 1.5 V more positive than the input common-mode voltage. Current drain is independent of the supply voltage. The outputs can be connected to other open-collector outputs to achieve wire-AND relationships.

symbol (each comparator)



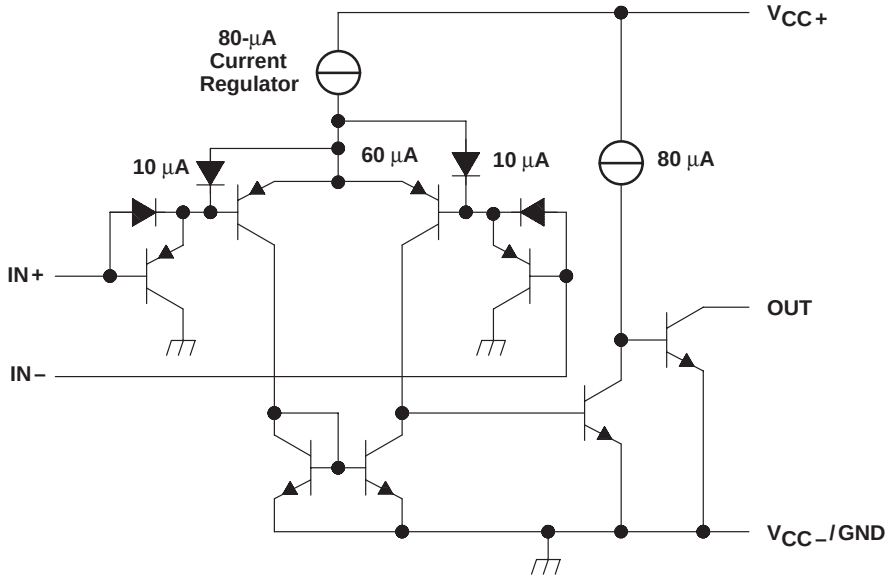
AVAILABLE OPTION

T_A	V_{IO}max AT 25°C	PACKAGE
		SMALL OUTLINE (DB)†
0°C to 70°C	5 mV	LM339x2DBLE

† The DB package is only available left-end taped and reeled.

schematic (each comparator)

ACTUAL DEVICE COMPONENT COUNT	
Transistors	120
Diodes	7
Resistors	4
JFET	2



All component values shown are nominal.

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage, V_{CC} (see Note 1) . . . . . 36 V
Differential input voltage, V_{ID} (see Note 2) . . . . . ±36 V
Input voltage range, V_I (any input) . . . . . –0.3 V to 36 V
Output voltage, V_O . . . . . 36 V
Output current, I_O . . . . . 20 mA
Duration of output short circuit to ground (see Note 3) . . . . . unlimited
Continuous total dissipation . . . . . See Dissipation Rating Table
Operating free-air temperature range, T_A . . . . . 0°C to 70°C
Storage temperature range . . . . . –60°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these conditions beyond those indicated is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. All voltage values, except differential voltages, are with respect to network GND.
2. Differential voltages are at IN+ with respect to IN–.
3. Short circuits from outputs to V_{CC} can cause excessive heating and eventual destruction.

DISSIPATION RATING TABLE

PACKAGE	$T_A \le 25°C$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25°C$	$T_A = 70°C$ POWER RATING
DB	1024 mW	8.2 mW/°C	655 mW

electrical characteristics at specified free-air temperature, V_{CC} = 5 V (unless otherwise noted)

PARAMETER		TEST CONDITIONS	T_A†	MIN	TYP‡	MAX	UNIT
V_{IO}	Input offset voltage	V_{CC} = 5 V to 30 V, $V_{IC} = V_{ICR}$min, V_O = 1.4 V	25°C		2	5	mV
			Full range			9	
I_{IO}	Input offset current	V_O = 1.4 V	25°C		5	50	nA
			Full range			150	

I_{IB}	Input bias current	V_O = 1.4 V		25°C		–25	–250	nA
				Full range			–400	
V_{ICR}	Common-mode input voltage range			25°C	0 to V_{CC}–1.5			V
				Full range	0 to V_{CC}–2			
A_{VD}	Large-signal differential voltage amplification	V_{CC} = 15 V, V_O = 1.4 V to 11.4 V, R_L = ≥ 15 kΩ to V_{CC}		25°C	50	200		V/mV
V_{OL}	Low-level output voltage	V_{ID} = –1 V,	I_{OL} = 4 mA	25°C		150	400	mV
				Full range			700	
I_{OH}	High-level output current	V_{ID} = 1 V	V_{OH} = 5 V	25°C		0.1	50	nA
			V_{OH} = 30 V	Full range			1	µA
I_{OL}	Low-level output current	V_{ID} = –1 V,	V_{OL} = 1.5 V	25°C	6	16		mA
I_{CC}	Supply current (eight comparators)	V_O = 2.5 V,	No load	25°C		1.6	4	mA
		V_{CC} = 30 V,	No load	25°C		2	5	mA

† Full range for LM339 is 0°C to 70°C. All characteristics are measured with zero common-mode input voltage unless otherwise specified.
‡ All typical values are measured at T_A = 25°C.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Response time	R_L connected to 5 V through 5.1 kΩ, C_L = 15 pF§, See Note 4	100-mV input step with 5-mV overdrive		1.3		ns
		TTL 1-level input step		0.3		

§ C_L includes probe and jig capacitance.
NOTE 4: The response time specified is the interval between the input step function and the instant when the output crosses 1.4 V.

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