

LM339x2 OCTAL DIFFERENTIAL COMPARATOR

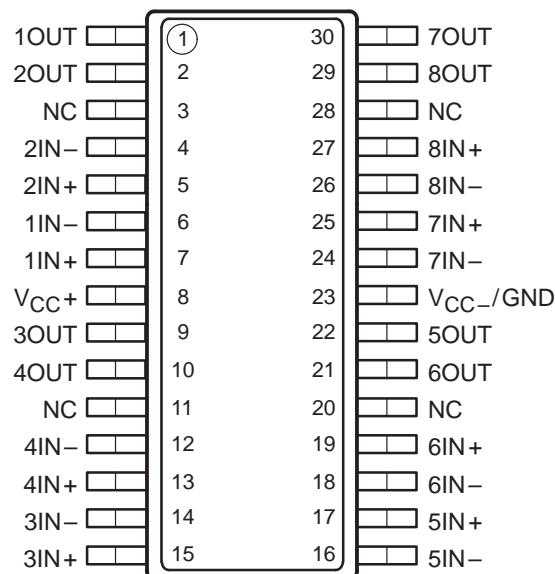
SLCS122A – APRIL 1996 – REVISED SEPTEMBER 1996

- 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

description

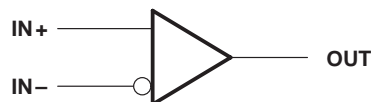
The LM339x2 consists of eight independent voltage comparators that are designed to operate from a single power supply over a wide range of voltages. Operation from dual supplies is also possible when the difference between the two supplies is 2 V to 36 V and V_{CC} is at least 1.5 V more positive than 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.

DB PACKAGE
(TOP VIEW)



NC – No internal connection

symbol (each comparator)



AVAILABLE OPTION

T_A	V_{IOmax} 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.



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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

**TEXAS
INSTRUMENTS**

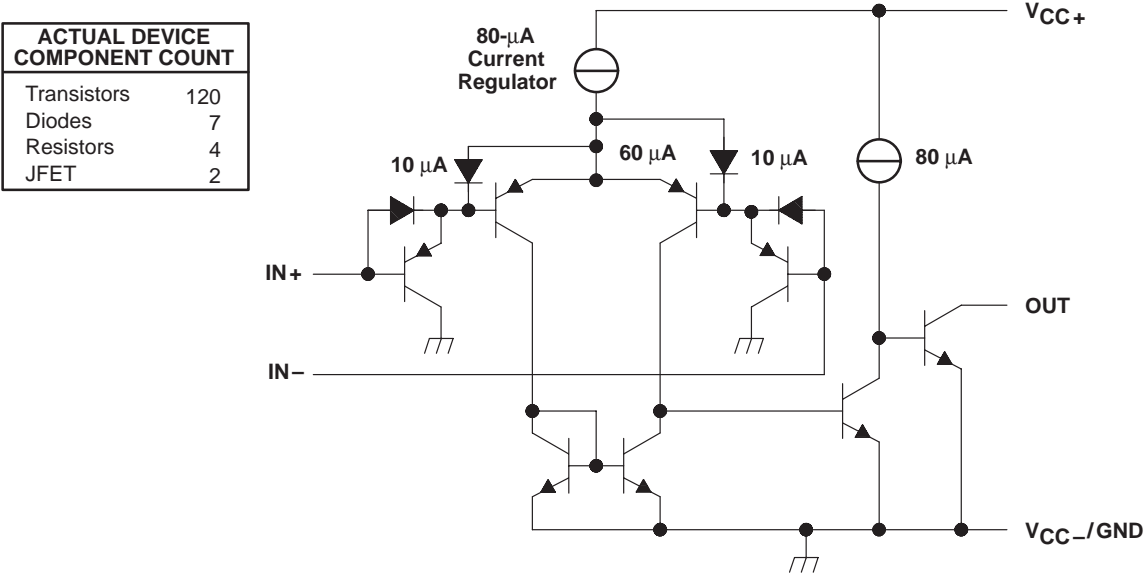
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schematic (each comparator)



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	$T_A \leq 25^{\circ}\text{C}$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25^{\circ}\text{C}$	$T_A = 70^{\circ}\text{C}$ POWER RATING
DB	1024 mW	8.2 mW/ $^{\circ}\text{C}$	655 mW

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

PARAMETER	TEST CONDITIONS	T_A^{\dagger}	MIN	TYP [‡]	MAX	UNIT
V_{IO} Input offset voltage	$V_{CC} = 5$ V to 30 V, $V_{IC} = V_{ICRmin}$, $V_O = 1.4$ 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	

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I_{IB} Input bias current	$V_O = 1.4\text{ V}$	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	$V_{CC} = 15\text{ V}$, $V_O = 1.4\text{ V to } 11.4\text{ V}$, $R_L \geq 15\text{ k}\Omega\text{ to } V_{CC}$	25°C	50 200	V/mV
V_{OL} Low-level output voltage	$V_{ID} = -1\text{ V}$, $I_{OL} = 4\text{ mA}$	25°C	150 400	mV
		Full range	700	
I_{OH} High-level output current	$V_{ID} = 1\text{ V}$	$V_{OH} = 5\text{ V}$	25°C 0.1 50	nA
		$V_{OH} = 30\text{ V}$	Full range 1	μA
I_{OL} Low-level output current	$V_{ID} = -1\text{ V}$, $V_{OL} = 1.5\text{ V}$	25°C	6 16	mA
I_{CC} Supply current (eight comparators)	$V_O = 2.5\text{ V}$, No load	25°C	1.6 4	mA
	$V_{CC} = 30\text{ V}$, 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 $T_A = 25^\circ\text{C}$.

switching characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Response time	R_L connected to 5 V through 5.1 k Ω , $C_L = 15\text{ pF}$ §, 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.



PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
LM339X2DBLE	OBSOLETE	SSOP	DB	30		TBD	Call TI	Call TI

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

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⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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