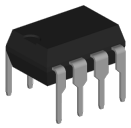
Dual Differential Comparators LM393G

FEATURES

- Wide range of supply voltages
- Low supply current drain independent of supply voltage
- Low input biasing current
- Low input offset current
- Low input offset voltage
- Input common-mode voltage range includes GND
- Differential input voltage range equal to the power supply voltage
- Low output saturation voltage
- Output voltage compatible with TTL, MOS and CMOS logic



DIP-8

ORDERING INFORMATION

Device	Package
LM393GN	DIP-8

DESCRIPTION

The LM393G consists of two independent voltage comparators. These were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. The outputs can be connected to other open-collector outputs to achieve wired-AND relationships.

ABSOLUTE MAXIMUM RATINGS (Note 1)

CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	V_{CC}	-	36 or ±18	V
Differential Input Voltage	V_{ID}	-	36	V
Input Voltage Range (either input)	V_{IC}	−0.3	36	V
Output Voltage	V_O	-	36	V
Junction Temperature Range	T_J	−40	125	°C
Storage Temperature Range	T_{STG}	−65	150	°C

Note 1. 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 or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS (Note 2)

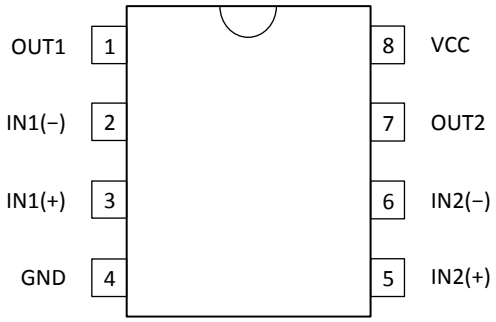
CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
Supply Voltage	V_{CC}	2.0	30	V
Operating Ambient Temperature Range	T_{OPR}	−40	125	°C

Note 2. The device is not guaranteed to function outside its operating ratings.

ORDERING INFORMATION

Package	Order No.	Description	Supplied As	Status
DIP-8	LM393GN	Dual Differential Comparators	Tube	Active

PIN CONFIGURATION



DIP-8

PIN DESCRIPTION

Pin No.	Pin Name	Pin Function
1	OUT1	Output of the Comparator 1
2	IN1(−)	Negative Input of the Comparator 1
3	IN1(+)	Positive Input of the Comparator 1
4	GND	Ground
5	IN2(+)	Positive Input of the Comparator 2
6	IN2(−)	Negative Input of the Comparator 2
7	OUT2	Output of the Comparator 2
8	VCC	Power Supply

ELECTRICAL CHARACTERISTICS

At specified free-air temperature and V_{CC} = 5V unless otherwise specified

SYMBOL	PARAMETER	TEST CONDITIONS	T_A	MIN	TYP	MAX	UNIT
V_{IO}	Input Offset Voltage	V_{CC} = 5V to 30V, $V_{IC} = V_{ICR}$ min, V_O = 1.4V	25°C	-	2	5	mV
			Full range	-	-	9	
I_{IO}	Input Offset Current	V_O = 1.4V	25°C	-	5	50	nA
			Full range	-	-	150	
I_{IB}	Input Bias Current	V_O = 1.4V	25°C	-	−25	−250	nA
			Full range	-	-	−400	
V_{ICR}	Common-mode Input Voltage Range (Note 5)		25°C	0	-	V_{CC} – 1.5	V
			Full range	0	-	V_{CC} – 2.0	
V_{OL}	Low-Level Output Voltage	I_{OL} = 4mA, V_{ID} = −1V	25°C	-	150	400	mV
			Full range	-	-	700	
A_{VD}	Large-Signal Differential Voltage Amplification	V_{CC} = 15V, V_O = 1.4V to 11.4V, R_L ≥ 15kΩ to V_{CC}	25°C	50	200	-	V/mV
I_{OH}	High-Level Output Current	V_{OH} = 5V, V_{ID} = 1V	25°C	-	0.1	50	nA
		V_{OH} = 30V, V_{ID} = 1V	Full range	-	-	1	μA
I_{OL}	Low-Level Output Current	V_{OL} = 1.5V, V_{ID} = −1V	25°C	6	-	-	mA
I_{CC}	Supply Current	R_L = ∞, V_{CC} = 5V	25°C	-	0.8	1	mA
		R_L = ∞, V_{CC} = 30V	Full range	-	-	2.5	

Note 3. All characteristics are measured with zero common-mode input voltage, unless otherwise specified.
Note 4. Temperature full range is −40°C to 125°C.
Note 5. The Voltage at either input or common-mode should not be allowed to go negative by more than 0.3V. The upper end of the common-mode voltage range is V_{CC} − 1.5V.

SWITCHING CHARACTERISTICS

V_{CC} = 5V, T_A = 25°C

PARAMETER	TEST CONDITIONS		TYP	UNIT
Response Time	R_L connected to 5V through 5.1kΩ, C_L = 15pF (Note 6, 7)	100mV input step with 5mV overdrive	1.3	μs
		TTL-Level Input Step	0.3	

Note 6. C_L includes probe and jig capacitance.
Note 7. The response time specified is the interval between the input step function and the instant when the output crosses 1.4V.

TYPICAL OPERATING CHARACTERISTICS

T.B.D.

REVISION NOTICE

The description in this datasheet is subject to change without any notice to describe its electrical characteristics properly.