

Dual Differential Comparators



Rev.4 May 2014



VSP MIKRON

LM393M

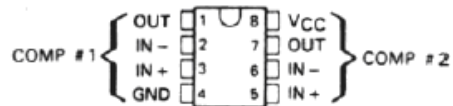
DESCRIPTION

The LM393 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.

FEATURES

- Wide supply voltage range
- 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

PACKAGE INFORMATION



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Maximum Operating Junction Temperature	T _{J(max)}	150	°C
Storage Temperature Range	T _{stg}	-65 to 150	°C

ELECTRICAL CHARACTERISTICS

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

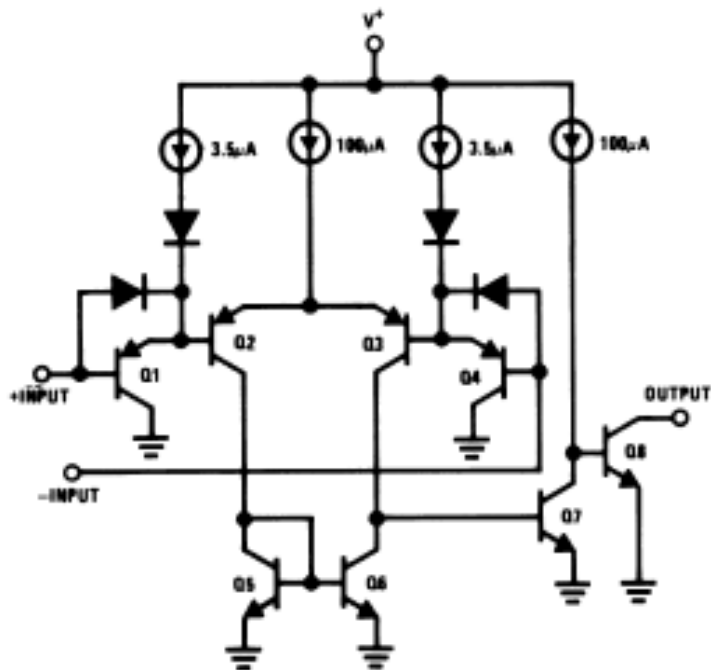
PARAMETER	TEST CONDITIONS*		MIN	TYP	MAX	UNIT
V _{IO} Input offset voltage	V _{CC} = 5V to 30V,	25 °C		2	5	mV
	V _{IC} = V _{ICR} min, V _O =1.4V	Full range			9	
I _{IO} Input offset current	V _O =1.4V	25 °C		5	50	nA
		Full range			150	
I _{IB} Input bias current	V _O =1.4V	25 °C		-25	-250	nA
		Full range			-400	
V _{ICR} Common-mode input voltage range**		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 =1.4V to 11.4 V, R _L ≥ 15 kΩ to V _{CC}	25 °C	50	200		V/mV
I _{OH} High-level output current	V _{OH} =5 V, V _{ID} =1V,	25 °C		0.1	50	nA
	V _{OH} = 30V, V _{ID} =1V	Full range			1	
V _{OL} Low-level output voltage	I _{OL} = 4 mA, V _{ID} =-1V	25 °C		150	400	mV
		Full range			700	
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
		V _{CC} = 30V	Full range		2.5	

* Full range (MIN to MAX), for the LM393 is 0°C to 70 °C. All characteristics are measured with zero common-mode input voltage unless otherwise specified.

** 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, but either or both inputs can go to 30V without damage.



BLOCK DIAGRAM



Dual Differential Comparators

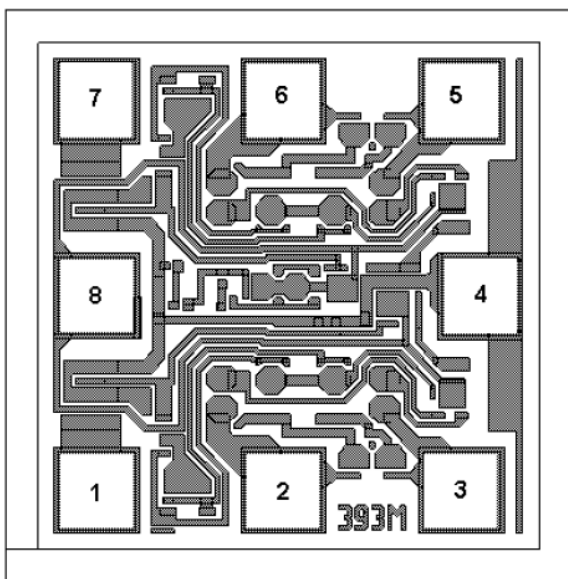


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LM393M

Pad Location

PAD LOCATION LM393M



Chip size 0.70 x 0.70 mm²

Wafer Thickness: 460±30µm (or 350±30µm, 280±30µm)

Top metal: AlSi

Backside metal: - (or Ti-Ni (V)-Ag)

Wafer size: 100 mm

PAD LOCATION COORDINATES

Pad N	Pad Name		Pad size (µm x µm)	Coordinates, µm	
				X	Y
1	#1	OUT	95 x 95	112	112
2	#1	IN-	95 x 95	343	112
3	#1	IN+	95 x 95	564	112
4		GND	95 x 95	587	349
5	#2	IN+	95 x 95	564	588
6	#2	IN-	95 x 95	343	588
7	#2	OUT	95 x 95	112	588
8		Vcc	95 x 95	112	350