TOP ONE SEMI CONDUCTOR

LM393

DC/DC CONVERTER CONTROL CIRCUIT

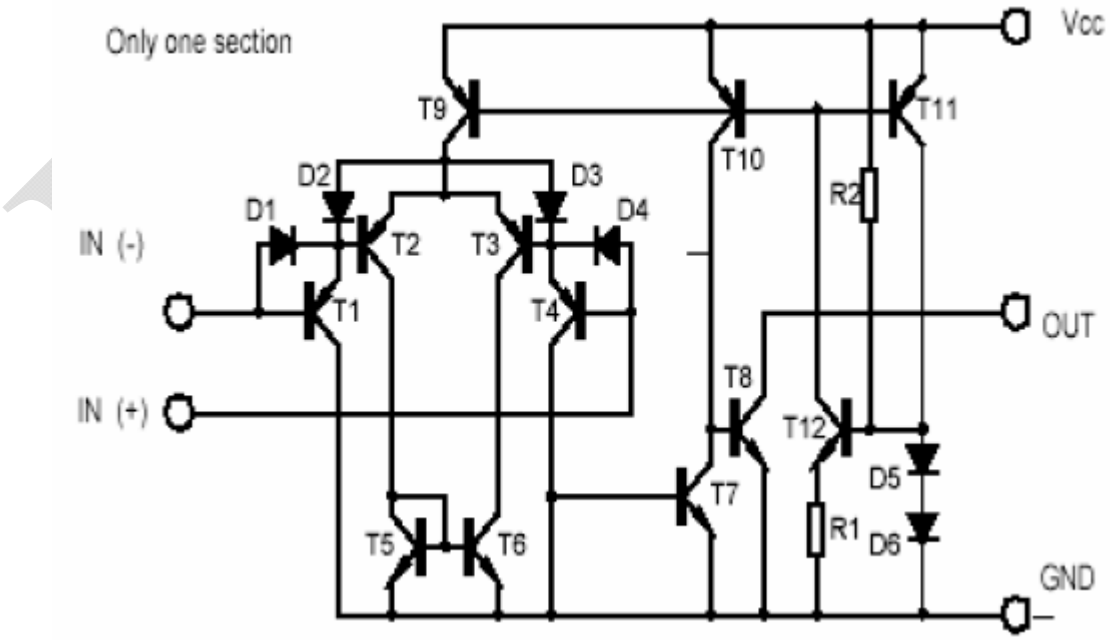
GENERAL DESCRIPTION

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.

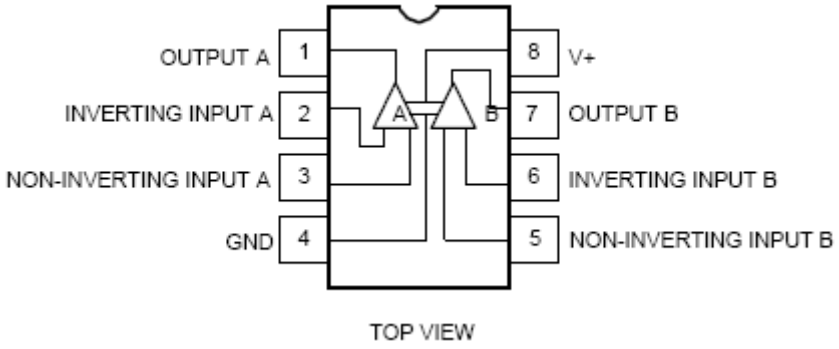
FEATURES

- 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

Block Diagram



Pin Description



TOP VIEW

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
Vcc	Power supply Voltage	30 or±15	V
V_{IDR}	lnput Differential Voltage Range(a)	±30	V
V_{ICR}	lnput Common Mode Voltage Range	-0.3 to 30	V
T_{OPR}	Operating Temperature Range	-40 to 80	℃
Tstg	storage Temperature (TA=+25℃)	-55 to +125	℃
T_L	Lead Temperatur,1mm from Case for 10 Seconds	280	℃

Maximum Ratings are those Values beyond which damage to the device may occur.
Functional operation should be restricted to the Recommended Operating Conditions.
Notes:
a. Split Power Supplies.

Electrical Characteristics

at specified free-air temperature, Vcc= 5V (unless otherwise noted)

Symbol	Parameter	Test conditions*			LM393			Unit
					Min	Typ	Max	
Vio	Input Offset voltage	Vcc=5V to MAX, V_{IC}=VICR Min, Vo=1.4V		25℃		2	5	mV
				Full range			9	
Iio	Input offset current	Vo=1.4V		25℃		5	50	nA
				Full range			150	
I_{IB}	Input bias Current	Vo=1.4V		25℃		-25	-250	nA
				Full range			-400	
V_{ICR}	Common-mode input voltage range			25℃	0 to Vcc-1.5			V
				Full range	0 to Vcc-2			
A_{VD}	Large-signal differential voltage amplification	Vcc=15V, Vo=1.4V to 11.4V, RL≥15KΩ to Vcc		25℃	50	200		V/mV
I_{OH}	High-level output current	V_{OH}=5V V_{ID}=1V,		25℃	50	80		dB
		V_{OH}=30V V_{ID}=1V,		Full range		0.1	50	nA
V_{OL}	Low-level output voltage	I_{OL}=4mA, V_{ID}=-1V		25℃		150	400	mV
				Full range			700	
I_{OL}	Low-level output current	V_{OL}=1.5V, V_{ID}=-1V		25℃	6			mA
Icc	supply current	RL=00	Vcc=5V	25℃		0.8	1	mA
			Vcc=30V	Full range			2.5	

℃ to 70 ℃.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 Vcc-1.5V,but either or both inputs can go to 30V without damage.

Absolute Maximum Ratings

Vcc=5V, TA=25℃

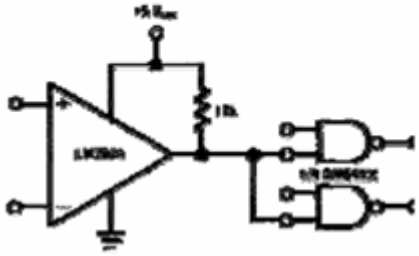
Parameter	Test conditions		Min	Typ	Max	Units
Response time	RL connected to 5V through 5.1 KΩ , CL=15pF*(See Note 1)	100-mV input step with 5-mV overdrive		1.3		μs
		TTL-level input step		0.3		

* CL includes probe and jig capacitance.

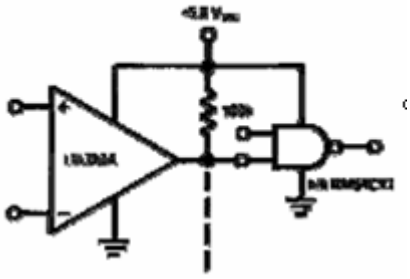
Note 1:The response time specified is the interval between the input step function and the instant when the output crosses 1.4V

Typical Applications Circuit

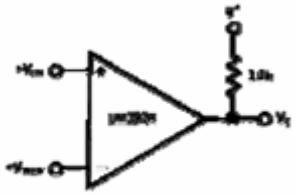
Driving TTL



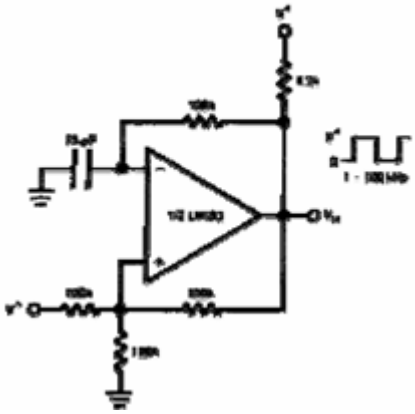
Driving CMOS



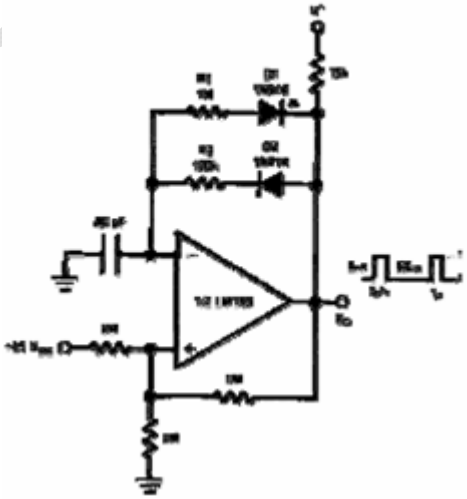
Basic Comparator



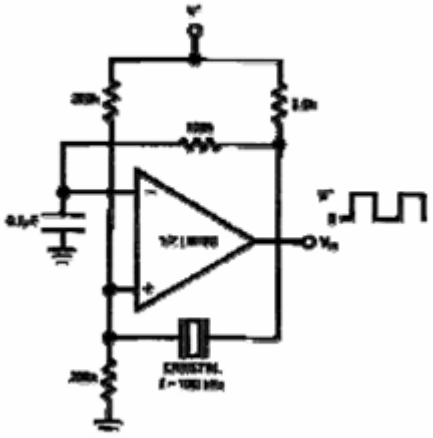
Squarewave Oscillator



Pulse Generator

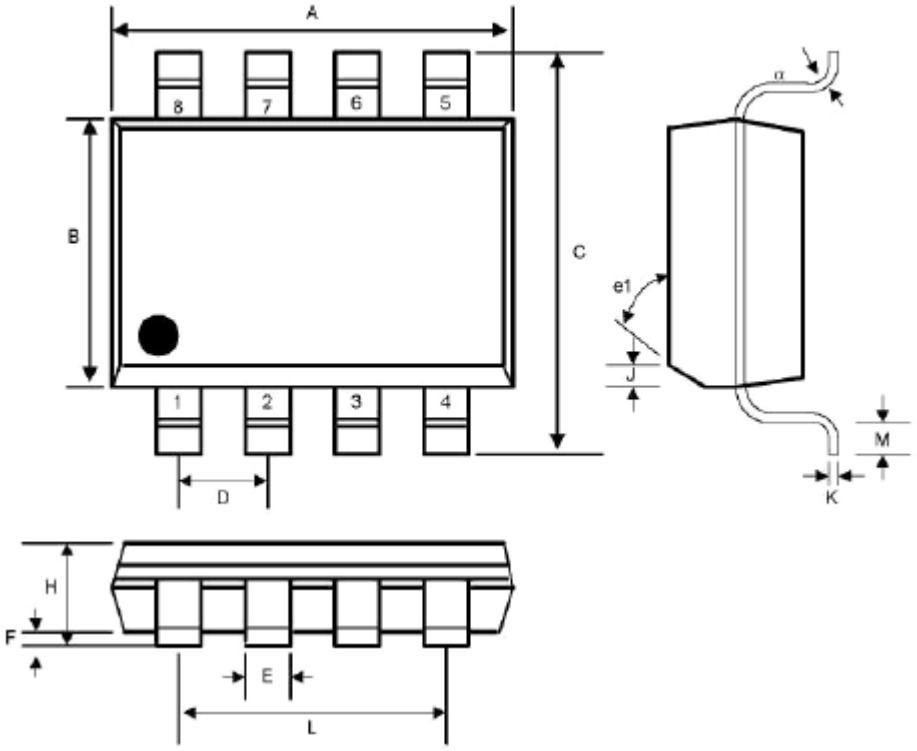


Crystal Controlled Oscillator



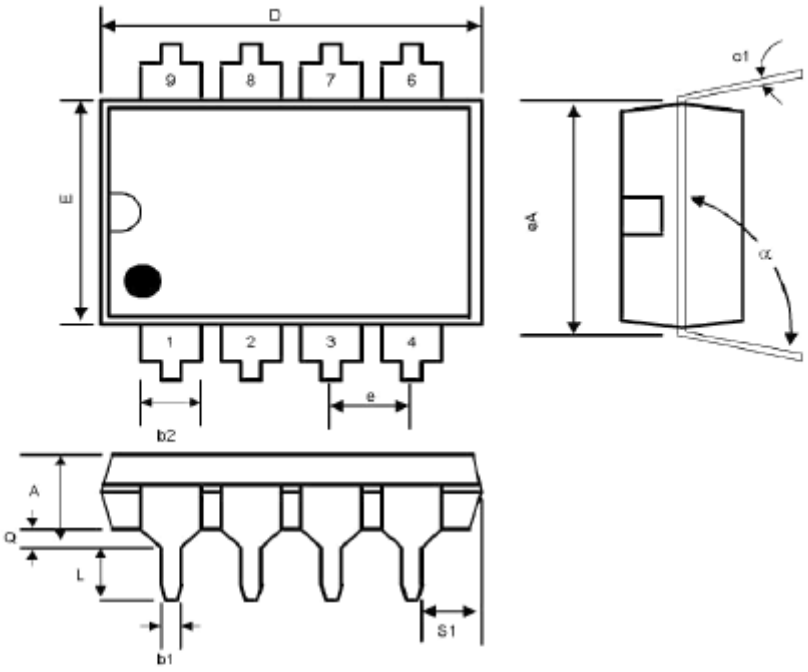
Package Description

SOP8 PACKAGE OUTLINE DIMENSIONS



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.188	0.197	4.80	5.00	-
B	0.149	0.158	3.80	4.00	-
C	0.228	0.244	5.80	6.20	-
D	0.050 BSC		1.27 BSC		-
E	0.013	0.020	0.33	0.51	-
F	0.004	0.010	0.10	0.25	-
H	0.053	0.069	1.35	1.75	-
J	0.011	0.019	0.28	0.48	
K	0.007	0.010	0.19	0.25	-
M	0.016	0.050	0.40	1.27	
L	0.150 REF		3.81 REF		-
e1	45^0		45^0		-
a	0^0	8^0	0^0	8^0	-

DIP8 PACKAGE OUTLINE DIMENSIONS



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b1	0.014	0.023	0.36	0.58	-
b2	0.045	0.065	1.14	1.65	-
c1	0.008	0.015	0.20	0.38	-
D	0.355	0.400	9.02	10.16	-
E	0.220	0.310	5.59	7.87	-
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	-
s1	0.005	-	0.13	-	-
α	90^0	105^0	90^0	105^0	-

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