LM393S8

Low Power Dual Voltage Comparators

Features

- Wide Supply Voltage Range
- Single Supply: 2.0V to 36V
- Dual Supplies: ±1.0V to ± 18V
- Very Low Supply Current Drain: 0.8mA
- Independent of Supply Voltage
- Low Input Bias Current: 25nA (Typ)
- Low Input Offset Current: ±5nA (Typ)
- Low Input Offset Voltage: ±5mV (Typ)
- Differential input voltage range equal to the supply voltage
- TTL, DTL, ECL, MOS, CMOS compatible outputs

Applications

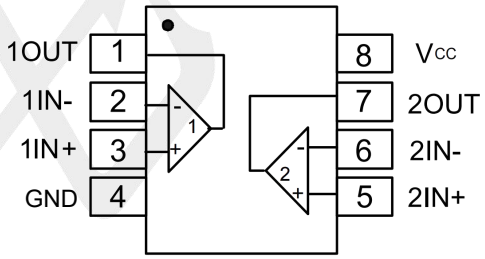
- Alarm and Monitoring Circuits
- Peak and Zero-crossing Detectors
- Logic Level Shifting or Translation
- Window Comparators
- IR Receivers
- Portable Systems

General Description

The series consists of two independent preci-sion voltage comparators with an offset voltage speci-fication as low as 2mV. It can operate from a single supply or dual supply, and its current is not affected by the magnitude of the supply voltage.
These comparators also have a unique characteristic in that the input common-mode voltage range includes ground even though operated from a single power supply voltage.

Pin Assignments

(Top View)



SOP8

Pin Configurations

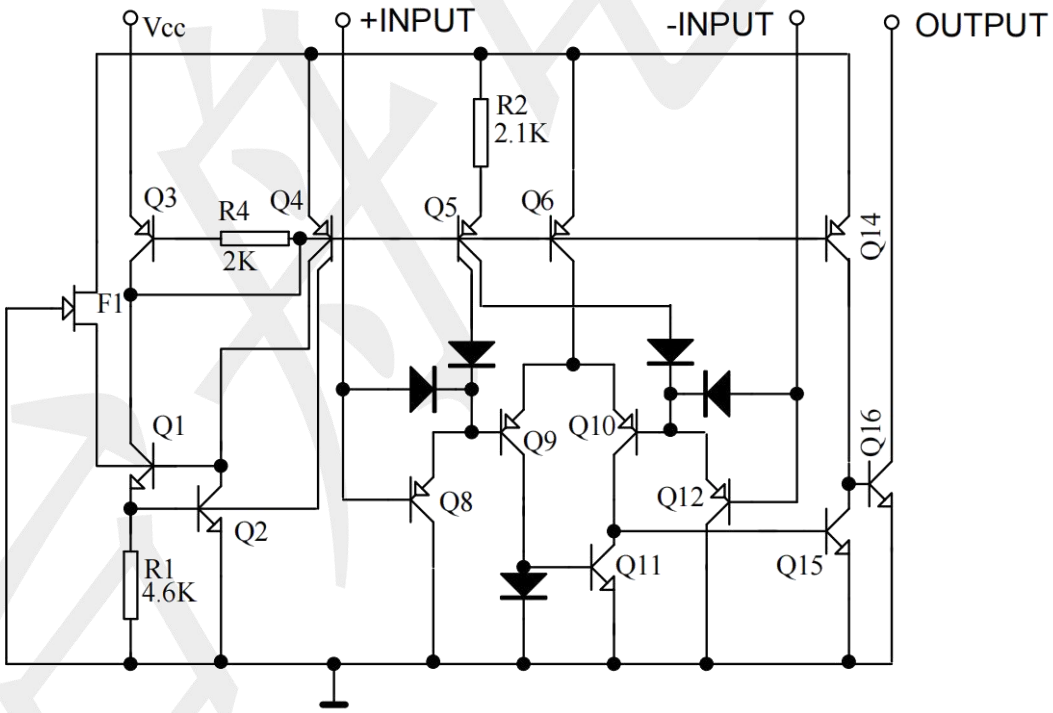
Pin Number	Pin Name	Pin Function
1	1OUT	Channel 1 Output
2	1IN-	Channel 1 Inverting Input
3	1IN+	Channel 1 Non-inverting Input
4	GND	Chip Supply Voltage(Negative)/GND
5	2IN+	Channel 2 Non-inverting Input
6	2IN-	Channel 2 Inverting Input
7	2OUT	Channel 2 Output
8	VCC	Chip Supply Voltage(Positive)

Absolute Maximum Ratings

(@TA = +25°C, unless otherwise specified.)

			Rating	UNIT
VCC	Supply Voltage	Single power	±18	V
		Dual power	36	V
VIDR	Differential Input Voltage		36	V
VICR	Input Common Mode Voltage		-0.3 to 36	V
LT	Lead Temperature (Soldering, 10 sec.)		260	℃
IOG	Output short circuit current to ground		20	mA
PD	Power Dissipation (TA=25℃)		570	mW
TJ	Operating Junction Temperature		125	℃
TSTG	Storage Temperature Range		-65 to 150	℃
TA	Operating Temperature Range		0 to 70	℃

BLOCK DIAGRAM



Electrical Characteristics

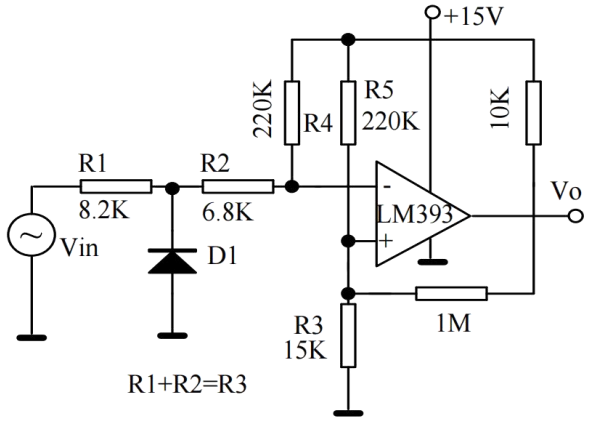
(At VS = +5V, VCM = 0V, CL = 15pF, and TA = +25℃, unless otherwise noted.)

PARAMETER	TEST Conditions	MIN	TYP	MAX	UNIT
Input Offset Voltage	Ta=25℃	--	±1.0	±5.0	mV
	0℃≤Ta≤70℃	--	--	±5.0	mV
Input Bias Current	Ta=25℃	--	25	250	nA
	0℃≤Ta≤70℃	--	--	400	nA
Input Offset Current	Ta=25℃	--	±5.0	±50	nA
	0℃≤Ta≤70℃	--	--	±150	nA
Input Common Mode Voltage Range	Ta=25℃	0	--	VCC-1.5	V
	0℃≤Ta≤70℃	0	--	VCC-2.0	V
Supply Current	RL=∞, VCC=5.0V	--	0.4	1.0	mA
	RL=∞, VCC=30V	--	--	2.5	mA
Voltage Gain	RL≥15kΩ, VCC=15V	50	200	--	V/mV
Large Signal Response Time	VIN=TTL logic swing, VREF=1.4V, VRL=5V, RL=5.1kΩ	--	300	--	ns
Response Time	VRL=5V, RL=5.1kΩ	--	1.3	--	us
Differential Input Voltage		--	--	VCC	V
Output Sink Current	VIN-≥1V, VIN+=0, VO≤1.5V	6.0	16	--	mA
Saturation Voltage	VIN-≥1V, VIN+=0, ISINK ≤4mA	--	150	400	mV
	VIN-≥1V, VIN+=0, ISINK ≤4mA 0℃≤Ta≤70℃	--	--	700	mV
Output Leakage Current	VIN-≥0, VIN+=1V, VO=5V	--	0.1	--	nA
	VIN-≥0, VIN+=1V, VO=5V 0℃≤Ta≤70℃	--	--	1000	nA

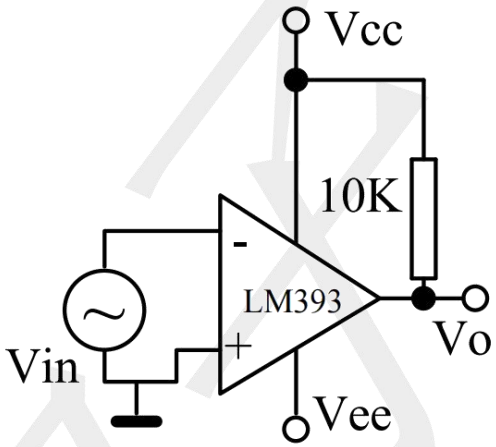
Notes:

1. Typical values represent the most likely parametric norm as determined at the time of characterization. Actual typical values may vary over time and will also depend on the application and configuration. The typical values are not tested and are not guaranteed on shipped production material.
2. All limits are guaranteed by testing or statistical analysis.

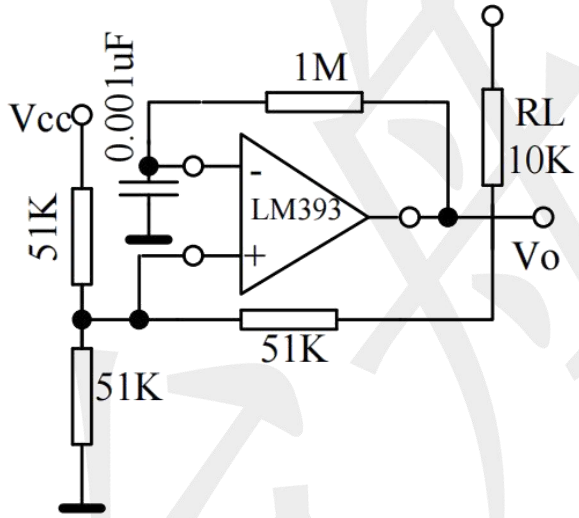
Typical Application Circuit



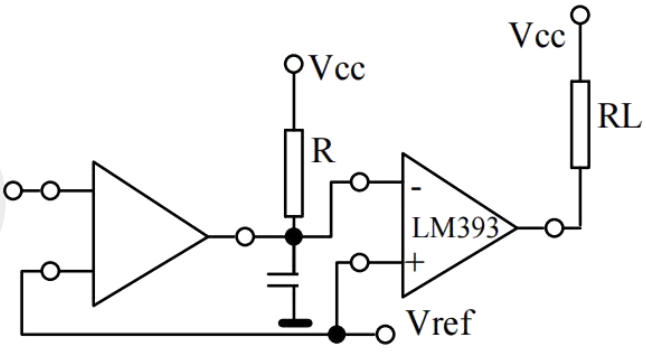
Zero crossing detector
(single power supply)



Zero crossing detector
(dual power supply)



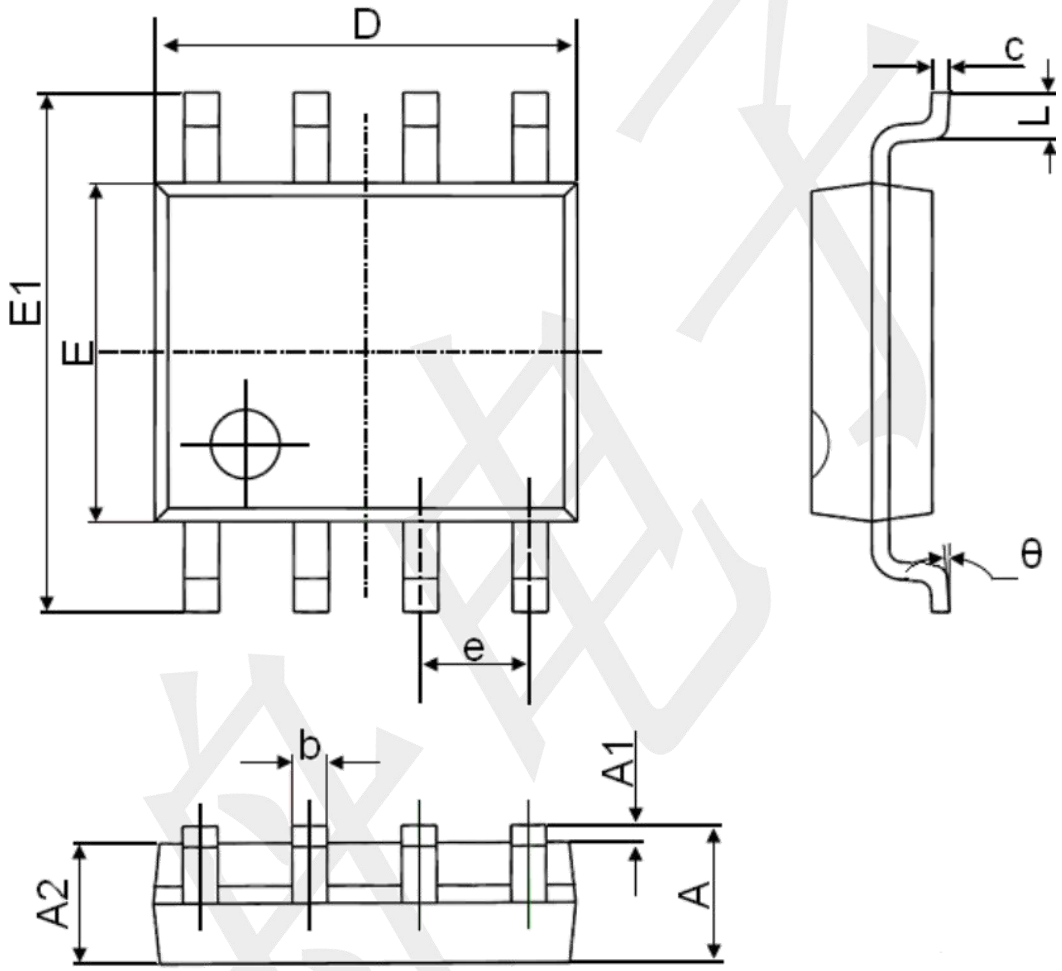
Squarewave oscillator



Delay generator

Package informantion

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Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°