

Dual Voltage Comparator

Description

The AP393 consists of two independent voltage comparators designed to operate from a single power supply over a wide voltage range.

Features

- Single Supply Operation: 2V to 36V
- Dual Supply Operation: $\pm 1V$ to $\pm 18V$.
- Allow Comparison of Voltages Near Ground Potential.
- Low Current Drain 0.8mA Typ.
- Compatible with all Forms of Logic.
- Low Input Bias Current 25nA Typ.
- Low Input Offset Current and offset voltage
- Low Output 250mV at 4mA saturation voltage



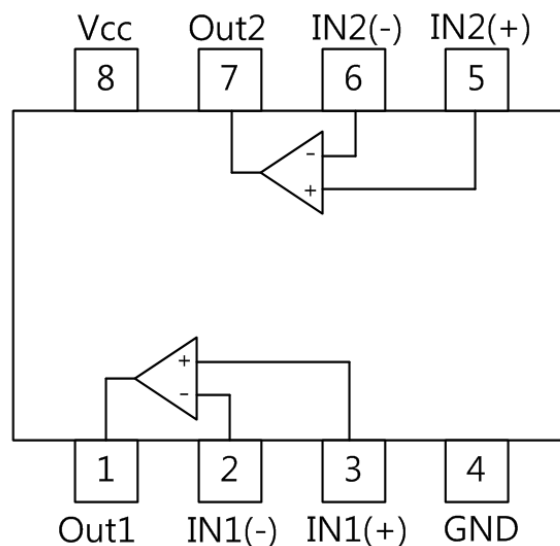
Typical Applications

- A/D Converters
- Wide Range VCO
- MOS Clock Generator
- High Voltage Logic Gate

Ordering Information

Part No	Package	Packing	Finish	Halogen	Packing Unit
AP393	SOP-8	Tape & Reel	Sn	Free	2,500ea

Internal Block Diagram



Pin Diagram

Pin No	Symbol	I/O	Description
1	Out1	O	Commparator1 Output
2	IN1(-)	I	Commparator1's Inverting Input
3	IN1(+)	I	Commparator1's Non-inverting Input
4	GND	GND	GND
5	IN2(+)	I	Commparator2's Non-inverting Input
6	IN2(-)	I	Commparator2's Inverting Input
7	Out2	O	Commparator2 Output
8	Vcc	PWR	Vcc for Dual Comparators



Maximum Ratings Characteristics (TA = 25°C unless otherwise specified)

Parameter	Symbol	Values	Units
Supply Voltage	V _{CC}	36 or ±18	V
Differential input voltage	V _{IND}	36	V
Input voltage	V _{IN}	-0.3 ~ +36	V
Power Dissipation	PD	600	mW
Operating temperature	T _{OPR}	-40 ~ +85	°C
Storage temperature	T _{STG}	-55 ~ +150	°C

Electrical Characteristics (unless otherwise specified. V_{CC} = 5V and -40°C ≤ Ta ≤ +85°C)

Characteristics	Symbol	Test Condition	Min.	Typ.	Max.	Units
Input offset voltage	V _{IOS}	V _O = 1.4V, R _S = 0Ω	-	±2	±5	mV
Input offset current	I _{IOS}	-	-	±5	±50	nA
Input bias current	I _{IB}	-	-	25	250	nA
Input common mode voltage range	V _{ICR}	-	0	-	V _{CC} -1.5	V
Supply current	I _{CC}	V _{CC} = 30V, R _L = ∞, All Channel	-	0.8	2	mA
Large signal voltage gain	G _V	V _{CC} = 15V, R _L = 15kΩ	-	200	-	V/mV
Output voltage (L Level)	V _{SAT}	V _{IN+} = 0V, V _{IN-} = 1V I _{SINK} ≤ 4mA	-	130	400	mV
Respose Time	t _{RES}	V _{RC} = 5V, R _L = 5.1kΩ	-	1.3	-	μs
Output sink current	I _{SINK}	V _O ≤ 1.5V V _{IN+} = 0V, V _{IN-} = 1V	6	16	-	mA
Output Leakage Current	I _{LEAK}	V _O = 5V V _{IN+} = 1 V, V _{IN-} = 0V	-	0.1	-	nA

Characteristics Curves

Fig. 1 V_{CC} - I_{CC}

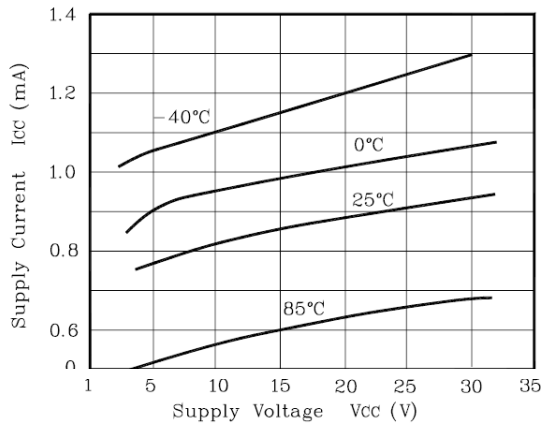


Fig. 2 V_{CC} - I_{IB}

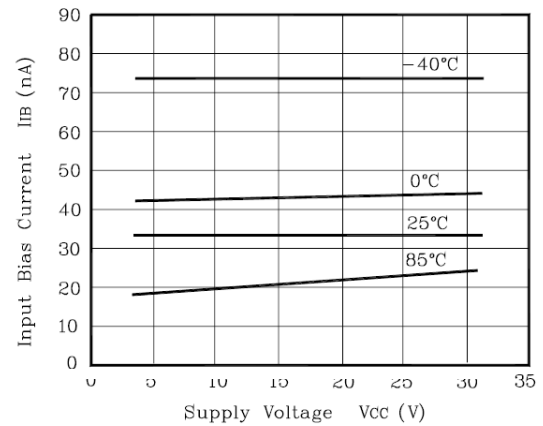


Fig. 3 V_{OL} - I_{SINK}

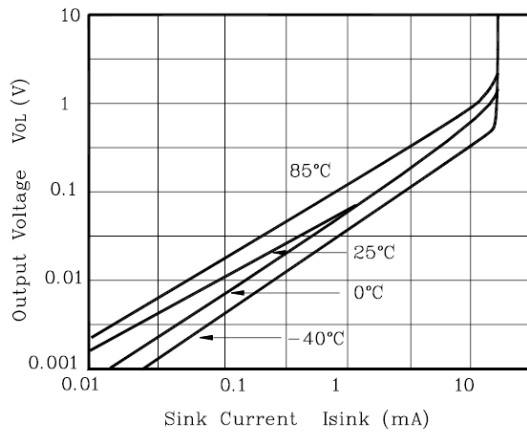


Fig. 4 P_D - T_a

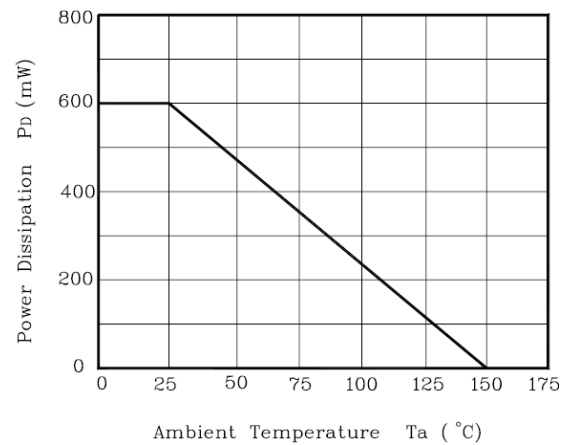


Fig. 5 V_{IN} , V_{OUT} - t_{rsp}

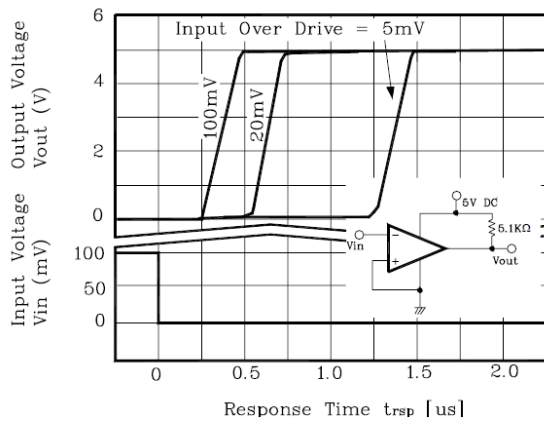
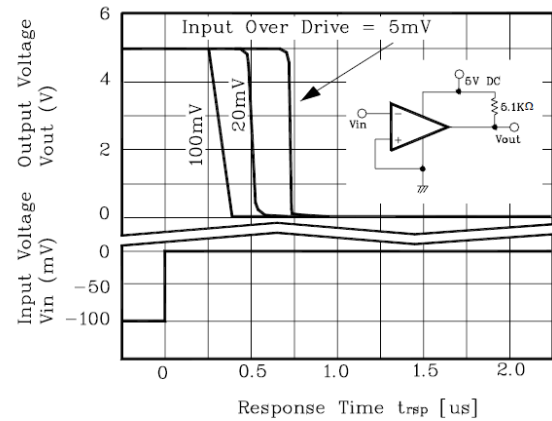
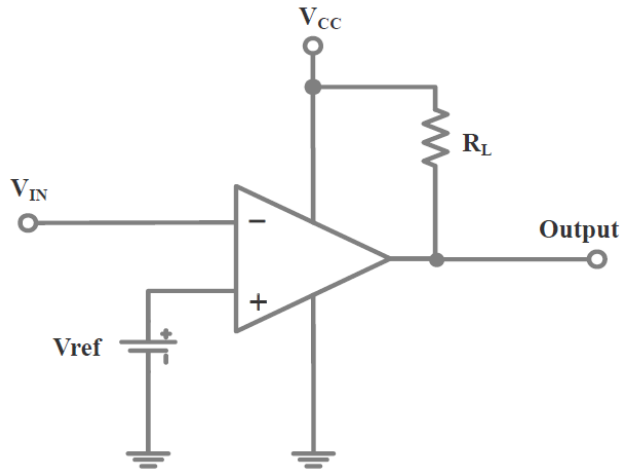


Fig. 6 V_{IN} , V_{OUT} - t_{rsp}

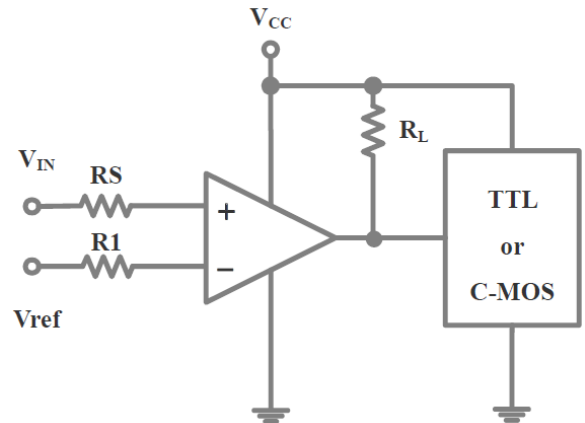


Typical Applications

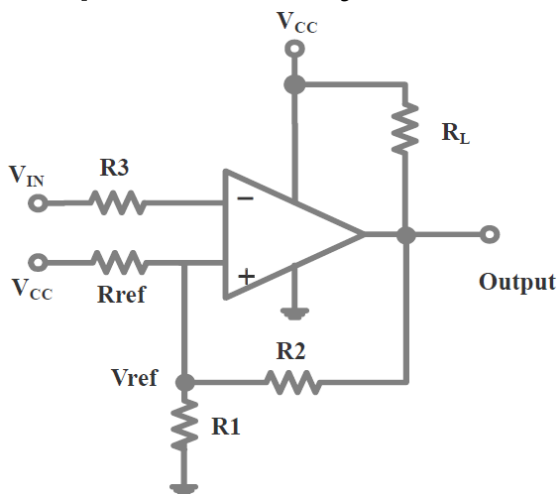
Basic Comparator



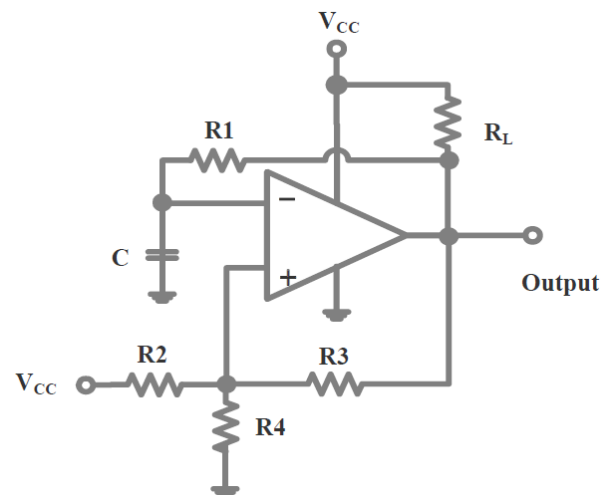
Driving Logic or C-MOS



Comparator with Hysteresis Circuit

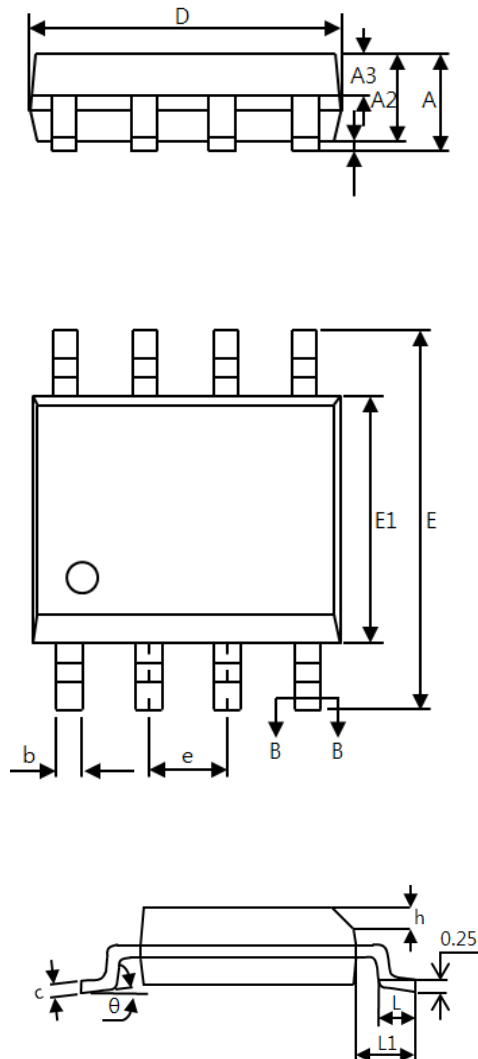


Square-wave Oscillator

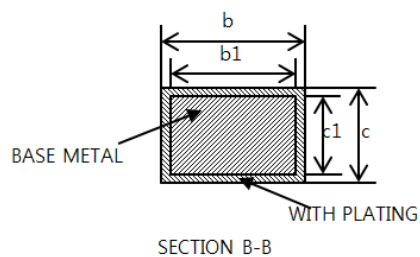


Package Dimensions

SOP-8



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.75
A1	0.10	—	0.225
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.39	—	0.48
b1	0.38	0.41	0.43
c	0.21	—	0.26
c1	0.19	0.20	0.21
D	4.70	4.90	5.10
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
h	0.25	—	0.50
L	0.50	—	0.80
L1	1.05BSC		
θ	0	—	8°
L/F	80*80	90*90	95*130



Revision History

No	Date	Contents
0	2018-04-03	Initial Brief Datasheet Release

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