

**PRELIMINARY****Low power dual voltage comparator**

■ DESCRIPTION

AA393 includes two independent precision voltage comparators. The maximum offset voltage is as low as 2.0mV. Single power supply provides over a wide range of operating voltages from 2V to 36V or Dual power supply from $\pm 1V$ to $\pm 18V$. The IC is available in **8-pin TSSOP (AA393A)** and **8-pin SOP (AA393S)** package.

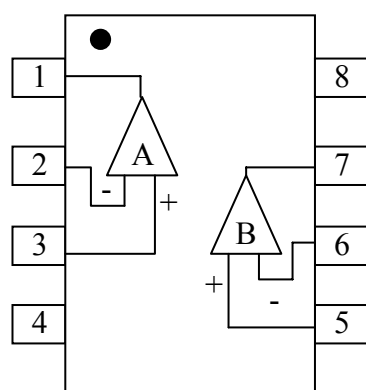
■ FEATURES

1. Wide single operating supply range from 2V to 36V
2. Wide dual operating supply range from $\pm 1V$ to $\pm 18V$
3. Low supply current $I_{CC}=0.8mA$
4. Low input bias current $I_{bias}=25nA$
5. Input common-mode voltage includes ground
6. Differential input voltage range equal to the power supply voltage
7. Open collector outputs for wired and connection
8. Output compatible with TTL ,DTL, and CMOS logic system

■ APPLICATION

- A/D converters
- Wide range VCO
- MOS clock generator
- High voltage logic gate
- Multi-vibrators

■ AA393 BLOCK DIAGRAM



PIN Assignments

1. A OUTPUT
2. A- INPUT
3. A+ INPUT
4. GND
5. B+ INPUT
6. B- INPUT
7. B OUTPUT
8. V+

AA393A
AA393S

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■ **PIN DESCRIPTION**

Symbol	Pin No	Type	Function
AO	1	O	Comparator A Output
A-	2	I	Comparator B Invert Input
A+	3	I	Comparator A Non-Invert Input
GND	4	-	Ground
B+	5	I	Comparator B Non-Invert Input
B-	6	I	Comparator B Invert Input
BO	7	O	Comparator B Output
V+	8	-	Operating Voltage from 2V to 36V or $\pm 1V$ to $\pm 36V$

■ **ABSOLUTE MAXIMUM RATING** $T_a = 25\text{ }^{\circ}\text{C}$

Parameter	Symbol	Rating			UNIT	CONDITION
		MIN	TYP	MAX		
Supply Voltage	V+	--	--	36 (or $\pm 18V$)	V	
V_{IN}	V_{IN}	-0.3		+36	V	
Operating Ambient Temperature	T_a	-40	--	85	$^{\circ}\text{C}$	
Storage Temperature	T_s	-40	--	125	$^{\circ}\text{C}$	

NOTE : Stress above those listed under “Absolute Maximum Rating” may cause device permanent damage to the device. This stress-rating only factor and functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for an extended period of time may affect device reliability of the device.

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■ ELECTRICAL CHARACTERISTICS

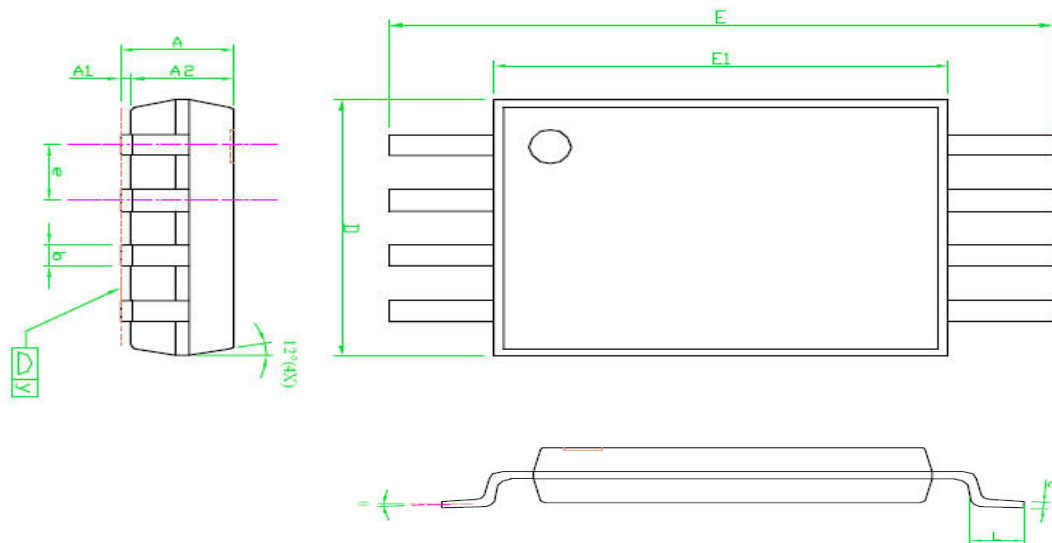
 $T_a = 25^\circ\text{C}$

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Input offset voltage	V_{OS}	--	± 2.0	± 5.0	mV	
Input common-mode voltage range	V_{CM}	0	--	$V^+ - 1.5$	V	
Differential input voltage	V_{IDR}	--	--	V^+	V	
Input bias current	I_{BIAS}	--	25	250	nA	$I_{IN(+)}$ or $I_{IN(-)}$ with output in linear range
Input offset current	I_{OS}		± 5.0	± 50	nA	$I_{IN(+)} - I_{IN(-)}$
Output sink current	I_{OL}	6.0	16.0	--	mA	$I_{IN(-)} \geq 1V_{DC}$, $I_{IN(+)} = 0$ $V_O \leq 1.5V_{DC}$
Output leakage current		--	0.1	1.0	μA	$I_{IN(+)} \geq 1V_{DC}$, $I_{IN(-)} = 0$ $V_O = 30V_{DC}$
Supply current	I_{CC}	--	0.8	1	mA	$R_L = \infty$
Voltage gain	A_V	50	200	--	V/mV	$R_L \geq 15K\Omega$, $V^+ = 15V_{DC}$
Saturation voltage	V_{OL}	--	250	400	mV	$V_{IN(-)} \geq 1V_{DC}$, $V_{IN(+)} = 0$ $I_{SINK} \leq 4\text{mA}$
Large signal response time	t_{LSR}	--	300	--	ns	$V_{IN} = \text{TTL logic swing}$, $V_{REF} = 1.4V_{DC}$, $V_{RL} = 5V_{DC}$ $R_L = 5.1K\Omega$
Response time	t_R	--	1.3	--	μs	$V_{RL} = 5V_{DC}$, $R_L = 5.1K\Omega$

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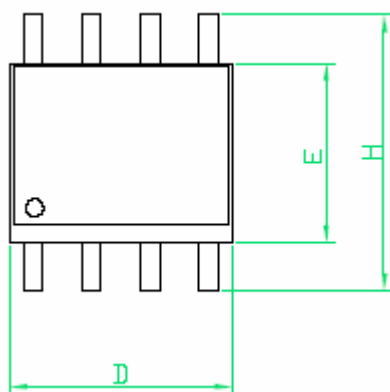
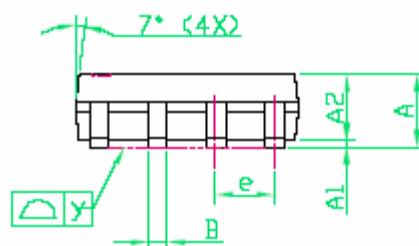
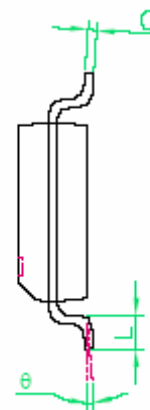
■ TSSOP-8 – AA393A – PACKAGE DIMENSION



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.20	---	---	0.048
A1	0.05	---	0.15	0.002	---	0.006
A2	0.80	1.00	1.05	0.031	0.039	0.041
b	0.19	---	0.30	0.007	---	0.012
C	0.09	---	0.20	0.004	---	0.008
D	2.90	3.00	3.10	0.114	0.118	0.122
E	6.20	6.40	6.60	0.244	0.252	0.260
E1	4.30	4.40	4.50	0.169	0.173	0.177
e	---	0.65	---	---	0.026	---
L	0.45	0.60	0.75	0.018	0.024	0.030
y	---	---	0.10	---	---	0.004
θ	0°	---	8°	0°	---	8°

NOTES:

1. Package body sizes exclude mold flash protrusions or gate burrs.
2. Tolerance $\pm 0.1 \text{ mm}$ (4 mil) unless otherwise specified
3. Coplanarity: 0.1 mm
4. Controlling dimension is millimeter converted inch dimensions are not necessarily exact.
5. Followed from JEDEC MO-153.

**PRELIMINARY****Low power dual voltage comparator****■ SOP-8 – AA393S – PACKAGE DIMENSION**

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35	1.60	1.75	0.053	0.063	0.069
A1	0.10	---	0.25	0.004	---	0.010
A2	---	1.45	---	---	0.057	---
b	0.33	---	0.51	0.013	---	0.020
C	0.19	---	0.25	0.007	---	0.010
D	4.80	---	5.00	0.189	---	0.197
E	3.80	---	4.00	0.150	---	0.157
e	---	1.27	---	---	0.050	---
H	5.80	---	6.20	0.228	---	0.244
L	0.40	---	1.27	0.016	---	0.050
y	---	---	0.10	---	---	0.004
θ	0°	---	8°	0°	---	8°

NOTES:

1. Package body sizes exclude moldflash protrusions or gate burns.
2. Tolerance $\pm 0.1 \text{ mm}$ (4 mil) unless otherwise specified
3. Coplanarity: 0.1 mm
4. Controlling dimension is millimeter converted inch dimensions are not necessarily exact
5. Followed from JEDEC MS-012