



AOS
SEMICONDUCTOR

产品规格说明书

Product Data Sheet

LM393A

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电源管理IC



通信接口芯片



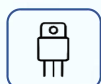
二三极管



LDO稳压器



逻辑器件



MOSFETs



运算放大器



显示驱动



MCU单片机



光电器件

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Operational Amplifier/Comparator >Operational Amplifier

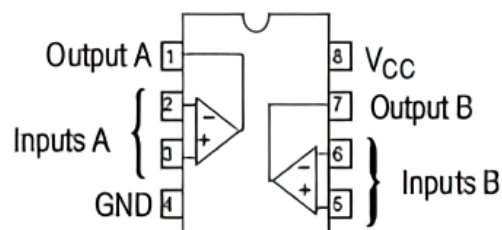
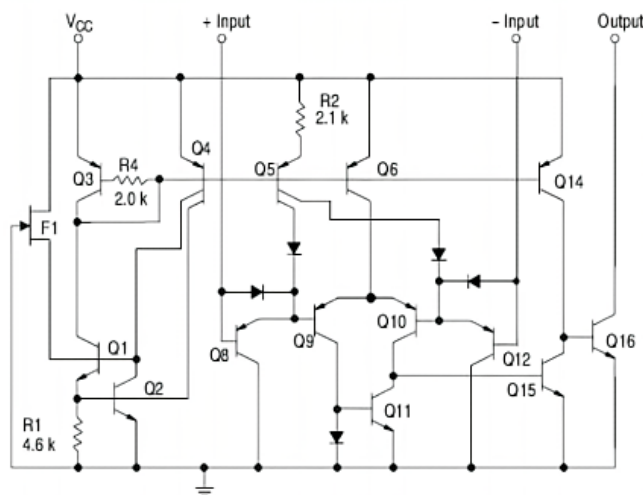
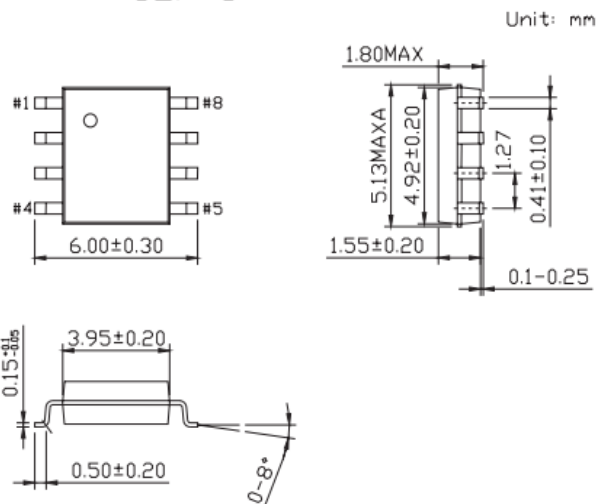
Quadruple Operational Amplifiers

■ Features

- Wide Single-Supply Range:2.0V~36V
- Split-Supply Range: $\pm 1.0\text{V} \sim \pm 18\text{V}$
- Very Low Current Drain Independent of Supply Voltage:0.4mA
- Low Input Bias Current:25nA
- Low Input Offset Current:5.0nA
- Low Input Offset Voltage:5.0mV(max)
- Input Common Mode Range to Ground Level
- Differential input voltage range equal to the power supply voltage

■ Package information

SOP-8



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■ Absolute Maximum Ratings $T_a=25^{\circ}\text{C}$

Parameter	Symbol	Rating	Unit
Power Supply Voltage	V_{CC}	+36 or ± 18	V
Input Differential Voltage Range	V_{IDR}	36	
Input Common Mode Voltage Range	V_{ICR}	-0.3~+36	
Output Short Circuit-to-Ground	I_{SC}	Continuous	mA
Output Sink Current*	I_{Sink}	20	
Power Dissipation@ $T_a=25^{\circ}\text{C}$ Derate above 25°C	P_D $1/R_{\theta JA}$	570 5.7	mW $\text{mW}/^{\circ}\text{C}$
Operating Ambient Temperature Range	T_A	0~70	$^{\circ}\text{C}$
Maximum Operating Junction Range	$T_{J(max)}$	150	
Storage Temperature Range	T_{stg}	-65~+150	
ESD Protection at any Pin -Human Body Model -Machine Model	V_{esd}	2000 200	V

*The maximum output current may be as high as 20mA, independent of the magnitude of V_{CC} , output short circuit to V_{CC} can cause excessive heating and eventual destruction.



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■ Electrical Characteristics ($V_{CC}=5.0V$, $0^{\circ}C \leq T_A \leq 70^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Input Offset Voltage *1	V_{IO}	$T_A=25^{\circ}C$ $0^{\circ}C \leq T_A \leq 70^{\circ}C$		± 1.0	± 5.0 9.0	mV
Input Offset Current	I_{IO}	$T_A=25^{\circ}C$ $0^{\circ}C \leq T_A \leq 70^{\circ}C$		± 5.0	± 50 ± 150	nA
Input Bias Current*2	I_{IB}	$T_A=25^{\circ}C$ $0^{\circ}C \leq T_A \leq 70^{\circ}C$		25	250 400	nA
Input Common Mode Voltage Range*2	V_{ICR}	$T_A=25^{\circ}C$ $0^{\circ}C \leq T_A \leq 70^{\circ}C$			$V_{CC}-1.5$ $V_{CC}-2.0$	V
Voltage Gain	A_{VOL}	$R_L \geq 15k\Omega$, $V_{CC}=15V$, $T_A=25^{\circ}C$	0 0	200	0	V/mV
Large Signal Response Time		$V_{in}=TTL$ Logic Swing, $V_{ref}=1.4V$, $V_{RL}=5.0V$, $R_L=5.1k\Omega$, $T_A=25^{\circ}C$	50	300		ns
Response Time*4	t_{TLH}	$V_{RL}=5.0V$, $R_L=5.1k\Omega$, $T_A=25^{\circ}C$		1.3		μs
Input Differential Voltage *5	V_{ID}	All $V_{in} \geq GND$ or V -Supply(if used)			V_{CC}	V
Output Sink Current	I_{SINK}	$V_{in} \geq 1.0V$, $V_{in+}=0V$, $V_O \leq 1.5V$, $T_A=25^{\circ}C$	6.0	16		mA
Output Saturation Voltage	V_{OL}	$V_{in} \geq 1.0V$, $V_{in+}=0V$, $I_{SINK} \leq 1.5V$, $T_A=25^{\circ}C$ $0^{\circ}C \leq T_A \leq 70^{\circ}C$		150	400 700	mV
Output Leakage Current	I_{OL}	$V_{in-}=0V$, $V_{in+} \geq 1.0V$, $V_O=5.0V$, $T_A=25^{\circ}C$ $V_{in-}=0V$, $V_{in+} \geq 1.0V$, $V_O=5.0V$, $0^{\circ}C \leq T_A \leq 70^{\circ}C$		0.1	1000	nA
Supply Current	I_{CC}	$R_L=\infty$ Both Comparatores, $T_A=25^{\circ}C$ $R_L=\infty$ Both Comparatores, $V_{CC}=30V$		0.4	1.0 2.5	mA

- *1.At output switch pouint, $V_O=1.4V$, $R_S=0\Omega$ with V_{CC} from $5.0V \sim 30V$, and over the full input common mode range($0V \sim V_{CC}-1.5V$).
- *2.Due to the PNP transistor inputs, bias current will flow out of the inputs. This current is essentially constant, independent of the output state, therefore, no loading changes will exist on the input lines.
- *3.Input common mode of the either input should not be permitted to go more than $0.3V$ negative of ground or minus supply. The upper limit of common mode range is $V_{CC}-1.5V$.
- *4.Respense tiome is specified with a $100mV$ step and $5.0mV$ of overdrive. With large magnitudes of overdrive faster response times are obtainable.
- *5.The comparator will exhibit proper output state if one of the inputs becomes greater than V_{CC} , the other input must remain within the common mode range. The low input state must not be less than $-0.3V$ ground or minus supply.

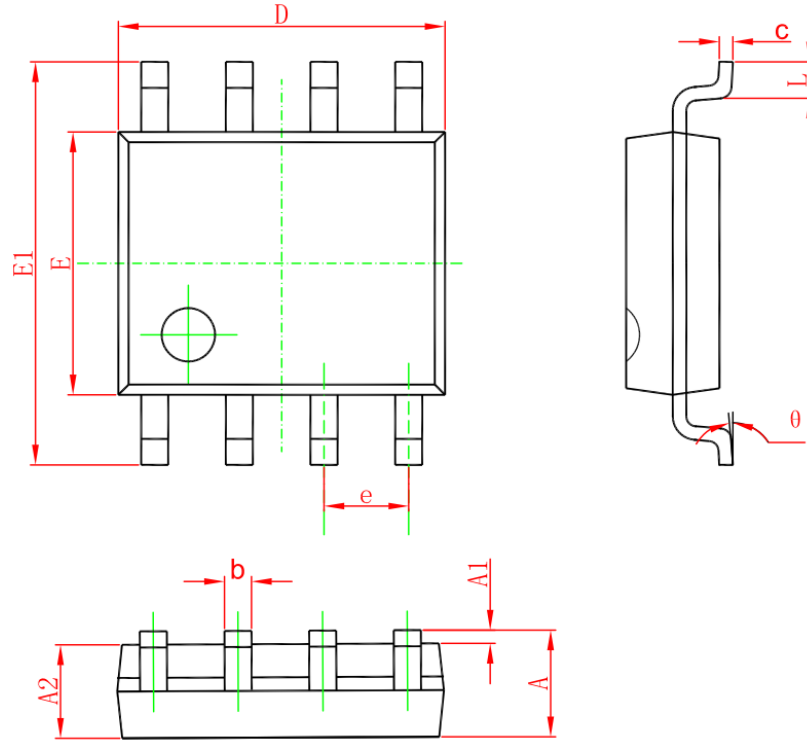


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■ Package Dimension

SOP8



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 °

■ ORDERING INFORMATION

Order code	Package	Base qty	Delivery mode
LM393ADR	SOP-8	2500	Tape and reel

