

Features

General Description

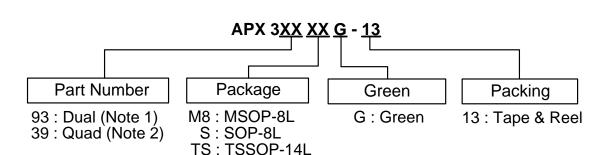
- Guaranteed 2.7V and 5V performance
- Industrial temperature range (-40°C to +85°C)
- Low supply current: 60 μA per Channel
- Input Common Mode Voltage (V-+0.2V to V+ -0.2V)
- Low output saturation voltage @ 200 mV
- Manufactured in standard CMOS process
- MSOP-8L, SOP-8L, and TSSOP-14L available in "Green" Molding Compound (No Br, Sb)
- Lead-free Finish / RoHS Compliant (Note 3)

The APX393/339 are low voltage (2.5V to 5.5V) dual and quad comparators. The APX393 is the dual version available in the 8-pin SOP and MSOP packages. The APX339 is the quad version available in 14-pin TSSOP package. The APX393/339 are designed to efficiently minimize cost, space, and power consumption for portable consumer products. They have open drain output to connect to the logic supply through a pull-up resistor and allow interfacing to a variety of logic families.

Applications

- Mobile communications
- Notebooks and PDA's
- · Battery powered electronics
- General purpose portable device
- General purpose low voltage applications

Ordering Information



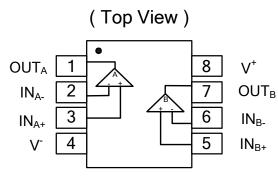
	Device	Package	Packaging	13" Tape and Reel			
	201100	Code	(Note 4)	Quantity	Part Number Suffix		
PD ,	APX393M8G-13	M8	MSOP-8L	2500/Tape & Reel	-13		
PD ,	APX393SG-13	S	SOP-8L	2500/Tape & Reel	-13		
P	APX339TSG-13	TS	TSSOP-14L	2500/Tape & Reel	-13		

Notes:

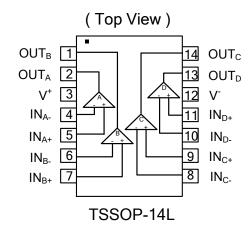
- 1. APX393 is only available for MSOP-8L and SOP-8L.
- 2. APX339 is only available for TSSOP-14L.
- EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html
- Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.



Pin Assignments



MSOP-8L / SOP-8L



Absolute Maximum Ratings (Note 5)

Symbol	Description		Rating	Unit	
ESD HBM	Human Rady Madal	APX393	4000	V	
ESD UDINI	Human Body Model	APX339	3500	V	
ESD MM	Manking Mandal	APX393	400	V	
E2D IAIIAI	Machine Model	APX339	400		
	Differential Input Voltage		±Supply Voltage	V	
	Voltage On Any Pin (Referred to V ⁻ Pin)		5.5	V	
T _{ST}	Storage Temperature		-65 to 150	°C	
TJ	Maximum Junction Temperature		150	°C	

Operating Ratings (Note 5)

Symbol	Description	Rating	Unit
V ⁺ -V ⁻	Supply Voltage	2.5 to 5.5	V
T _A	Operating Temperature Range	-40 to +85	°C

Notes: 5. Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but specific performance is not guaranteed. For guaranteed specifications and the test conditions, see the Electrical Characteristics.



Electrical Characteristics

2.7V DC Electrical Characteristics

Unless otherwise specified, all limits guaranteed for $T_A = 25$ °C, $V^+ = 2.7V$, $V^- = 0V$. Boldface limits apply at the temperature extremes.

Symbol	Parameter	Test Conditions	Min (Note 7)	Typ. (Note 6)	Max (Note 7)	Unit
Vos	Input Offset Voltage			1.7	7	mV
TCVos	Input Offset Voltage Average Drift			5		μV/°C
I _B	Input Bias Current			10	250 400	nA
I _{os}	Input Offset Current			5	50 150	nA
\/	Input Voltage Range			0.2		V
V_{CM}				2.5		V
V_{SAT}	Saturation Voltage	I _{SINK} ≤ 1mA		200		mV
Ιο	Output Sink Current	V ₀ ≤ 1.5V	5	20		mA
	Committee Comment	APX393 Both Comparators		150	180	μA
I _S	Supply Current	APX339 All four Comparators		240	300	μA
•	Output Leakage Current			0.003	1	μΑ

2.7V AC Electrical Characteristics

 $T_A = 25$ °C, $V^+ = 2.7V$, $R_L = 5.1 \text{ k}\Omega$, $V^- = 0V$.

Symbol	Parameter	Test Conditions	Min (Note 7)	Typ. (Note 6)	Max (Note 7)	Unit
_	Propagation Delay (High to Low)	Input Overdrive = 10mV		700		ns
T _{PHL}		Input Overdrive = 100mV		150		ns
T _{PLH}	Propagation Delay (Low to High)	Input Overdrive = 10mV		500		ns
I PLH		Input Overdrive = 100mV		200		ns



Electrical Characteristics (Continued)

5V DC Electrical Characteristics

Unless otherwise specified, all limits guaranteed for $T_A = 25$ °C, $V^+ = 5V$, $V^- = 0V$. **Boldface** limits apply at the temperature extremes.

Symbol	Parameter	Test Conditions	Min (Note 7)	Typ. (Note 6)	Max (Note 7)	Unit
Vos	Input Offset Voltage			1.7	7 9	mV
TCVos	Input Offset Voltage Average Drift			5		μV/°C
I_{B}	Input Bias Current			25	250 400	nA
I _{os}	Input Offset Current			2	50 150	nA
W	Input Voltage Bange			0.2		V
V_{CM}	Input Voltage Range			4.8		V
A_V	Voltage Gain	$R_L = 5.1 \text{ k}\Omega$	20	50		V/mV
V_{SAT}	Saturation Voltage	I _{SINK} ≤ 4mA		200	400 700	mV
I _o (Sink)	Output Sink Current	V ₀ ≤ 1.5V	10	60		mA
	Supply Current	APX393 Both Comparators		150	180 250	μΑ
I _S	Supply Current	APX339 All four Comparators		240	300 350	μΑ
	Output Leakage Current			.003	1	μΑ
	Thermal Resistance Junction-to -Ambient	MSOP-8L (Note 8)		203		°C/W
θ_{JA}		SOP-8L (Note 8)		150		°C/W
	Junction-to -Ambient	TSSOP-14L (Note 8)		100		°C/W

5V AC Electrical Characteristics

 $T_A = 25^{\circ}C$, $V^+ = 5V$, $R_L = 5.1 \text{ k}\Omega$, $V^- = 0V$.

Symbol	Parameter	Test Conditions	Min (Note 7)	Typ. (Note 6)	Max (Note 7)	Unit
T _{PHL}	Propagation Delay (High to Low)	Input Overdrive = 10mV		600		ns
		Input Overdrive = 100mV		200		ns
T _{PLH}	Propagation Delay	Input Overdrive = 10mV		450		ns
	(Low to High)	Input Overdrive = 100mV		300		ns

Notes: 6. 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.

^{7.} All limits are guaranteed by testing or statistical analysis.

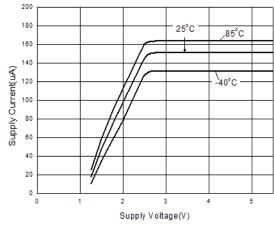
^{8.} All numbers are typical, and apply for packages soldered directly onto a PC board in still air.



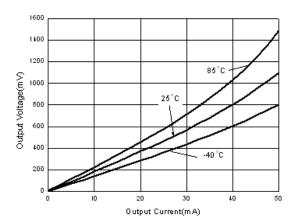
Typical Performance Characteristics

Unless otherwise specified, Vs=+5V, single supply, T_A=25°C

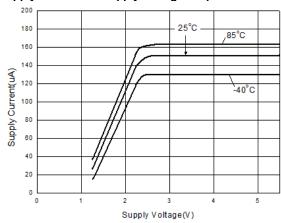
Supply Current vs. Supply Voltage Output High



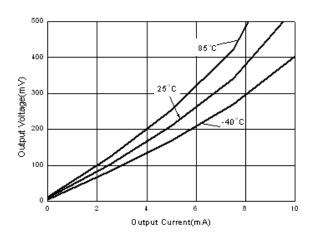
Output Voltage vs. Output Current (5V)



Supply Current vs. Supply Voltage Output Low



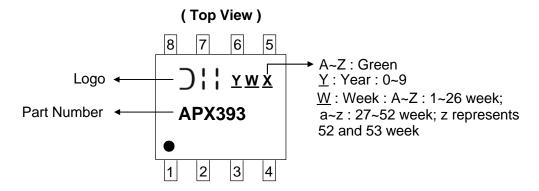
Output Voltage vs. Output Current (2.7V)



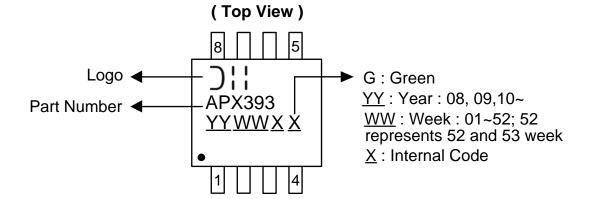


Marking Information

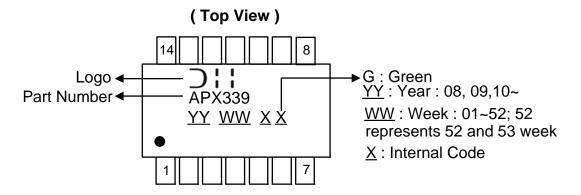
(1) MSOP-8L



(2) SOP-8L



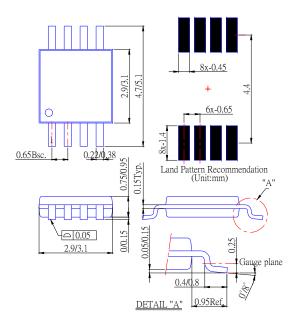
(3) TSSOP-14L



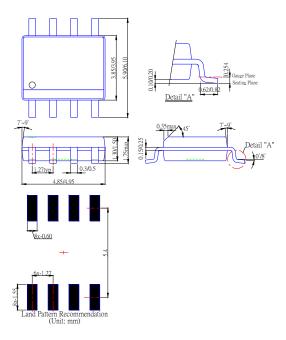


Package Information (All Dimensions in mm)

(1) Package type: MSOP-8L



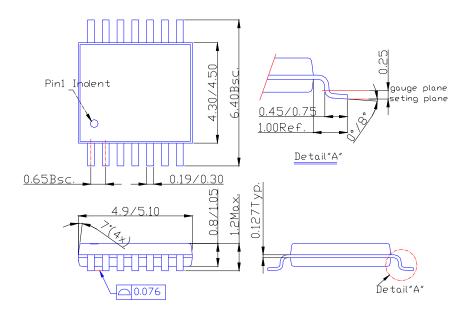
(2) Package type: SOP-8L





Package Information (Continued)

(3) Package type: TSSOP-14L



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