



Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

KA339/KA339A, KA2901

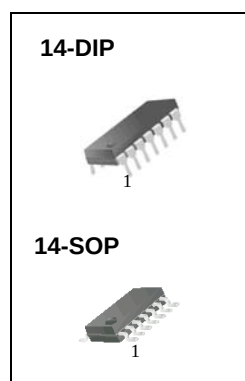
Quad Comparator

Features

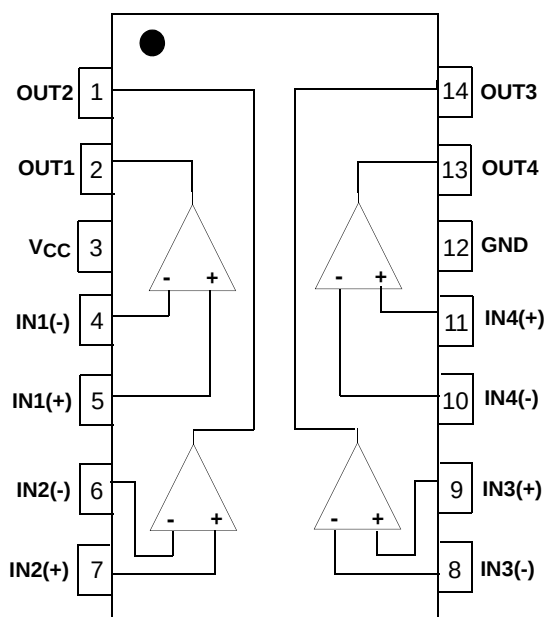
- Single or Dual Supply Operation
- Wide Range of Supply Voltage
KA339/KA339A, KA2901 : $2 \sim 36V$ (or $\pm 1 \sim \pm 18V$)
- Low Supply Current Drain $800\mu A$ Typ.
- Open Collector Outputs for Wired and Connectors
- Low Input Bias Current $25nA$ Typ.
- Low Input Offset Current $\pm 2.3nA$ Typ.
- Low Input Offset Voltage $\pm 1.4mV$ Typ.
- Input Common Mode Voltage Range Includes Ground.
- Low Output Saturation Voltage
- Output Compatible With TTL, DTL and MOS Logic System

Description

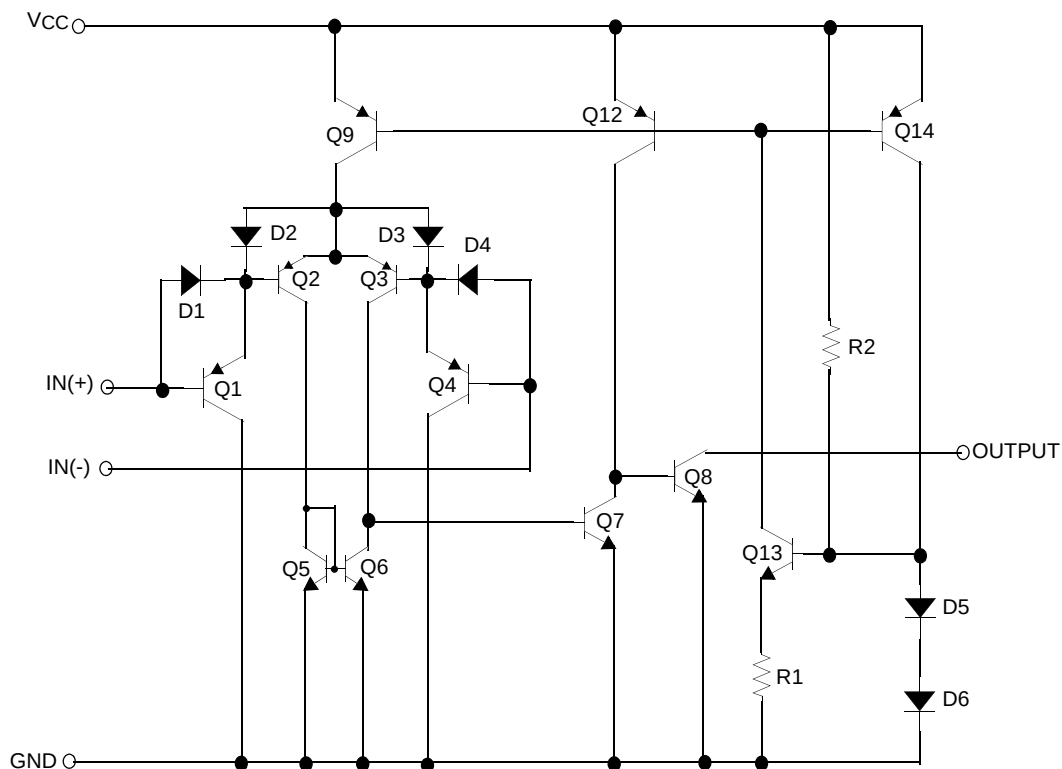
The KA339/KA339A, KA2901 consist of four independent voltage comparators designed to operate from single power supply over a wide voltage range.



Internal Block Diagram



Schematic Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	±18 or 36	V
Differential Input Voltage	V _{I(DIFF)}	36	V
Input Voltage	V _I	-0.3 to +36	V
Output Short Circuit to GND	-	Continuous	-
Power Dissipation	P _D	570	mW
Operating Temperature KA339/KA339A KA2901	T _{OPR}	0 ~ +70 -40 ~ +85	°C
Storage Temperature	T _{STG}	-65 ~ +150	°C

Electrical Characteristics

($V_{CC} = 5V$, $T_A = 25^\circ C$, unless otherwise specified)

Parameter	Symbol	Conditions	KA339A			KA339			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Input Offset Voltage	V_{IO}	$V_{O(P)} = 1.4V$, $R_S = 0\Omega$	-	1	2	-	1.4	5	mV
		Note1	-	-	4.0	-	-	9.0	
Input Offset Current	I_{IO}	$I_{IN(+)} - I_{IN(-)}$, $V_{CM} = 0V$	-	2.3	50	-	2.3	50	nA
		Note1	-	-	150	-	-	150	
Input Bias Current	I_{BIAS}	$V_{CM} = 0V$	-	57	250	-	57	250	nA
		Note1	-	-	400	-	-	400	
Input Common Mode Voltage Range	$V_{I(R)}$	$V_{CC} = 30V$	0	-	$V_{CC}-1.5$	0	-	$V_{CC}-1.5$	V
		Note1	0	-	$V_{CC}-2$	0	-	$V_{CC}-2$	
Supply Current	I_{CC}	$V_{CC} = 5V$, $R_L = \infty$	-	1.1	2.0	-	1.1	2.0	mA
Voltage Gain	G_V	$V_{CC} = 15V$, $R_L \geq 15k\Omega$ (for large swing)	50	200	-	50	200	-	V/mV
Large Signal Response Time	T_{LRES}	$V_I = \text{TTL Logic Swing}$ $V_{REF} = 1.4V$, $V_{RL} = 5V$, $R_L = 5.1k\Omega$ (Note2)	-	300	-	-	300	-	ns
Response Time	T_{RES}	$V_{RL} = 5V$, $R_L = 5.1k\Omega$ (Note2)	-	1.3	-	-	1.3	-	μs
Output Sink Current	I_{SINK}	$V_{I(-)} \geq 1V$, $V_{I(+)} = 0V$, $V_{O(P)} \leq 1.5V$	6	18	-	6	18	-	mA
Output Saturation Voltage	V_{SAT}	$V_{I(-)} \geq 1V$, $V_{I(+)} = 0V$	-	140	400	-	140	400	mV
		$I_{SINK} = 4mA$ Note1	-	-	700	-	-	700	
Output Leakage Current	$I_{O(LKG)}$	$V_{I(-)} = 0V$	-	0.1	-	-	0.1	-	nA
		$V_{I(+)} = 1V$	-	-	1.0	-	-	1.0	μA
Differential Voltage	$V_{I(DIFF)}$	Note1	-	-	36	-	-	36	V

Note:

- KA339 / KA339A: $0 \leq T_A \leq +70^\circ C$
KA2901: $-40 \leq T_A \leq +85^\circ C$
- These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics (Continued)(V_{CC} = 5V, T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions		KA2901			Unit
				Min.	Typ.	Max.	
Input Offset Voltage	V _{IO}	V _{O(P)} = 1.4V, R _S = 0Ω		-	2	7	mV
		Note1		-	9	15	
Input Offset Current	I _{IO}			-	2.3	50	nA
		Note1		-	50	200	
Input Bias Current	I _{BIAS}			-	57	250	nA
		Note1		-	200	500	
Input Common Mode Voltage Range	V _{I(R)}	KA2901, V _{CC} = 30V		0	-	V _{CC} -1.5	V
		Note1		0	-	V _{CC} -2	
Supply Current	I _{CC}	R _L = ∞, V _{CC} = 5V		-	1.1	2.0	mA
		R _L = ∞, V _{CC} = 30V		-	1.6	2.5	
Voltage Gain	G _V	V _{CC} = 15V, R _L ≥ 15kΩ (for large swing)		25	100	-	V/mV
Large Signal Response Time	T _{LRES}	V _I = TTL Logic Swing V _{REF} = 1.4V, V _{RL} = 5V, R _L = 5.1kΩ (Note2)		-	300	-	ns
Response Time	T _{RES}	V _{RL} = 5V, R _L = 5.1kΩ (Note2)		-	1.3	-	μs
Output Sink Current	I _{SINK}	V _{I(-)} ≥ 1V, V _{I(+)} = 0V, V _{O(P)} ≤ 1.5V		6	18	-	mA
Output Saturation Voltage	V _{SAT}	V _{I(-)} ≥ 1V, V _{I(+)} = 0V		-	140	400	mV
		I _{SINK} = 4mA	Note1	-	-	700	
Output Leakage Current	I _{O(LKG)}	V _{I(-)} = 0V V _{I(+)} = 1V	V _{O(P)} = 5V	-	0.1	-	nA
			V _{O(P)} = 30V	-	-	1.0	μA
Differential Voltage	V _{I(DIFF)}	-	Note1	-	-	36	V

Note:

- KA339 / KA339A: 0 ≤ T_A ≤ +70°C
KA2901: -40 ≤ T_A ≤ +85°C
- These parameters, although guaranteed, are not 100% tested in production.

Typical Performance Characteristics

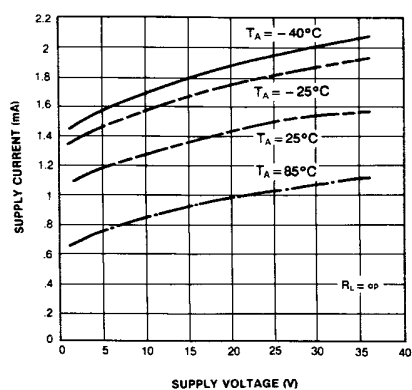


Figure 1. Supply Current vs Supply Voltage

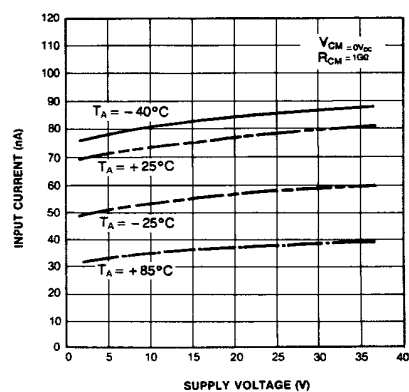


Figure 2. Input Current vs Supply Voltage

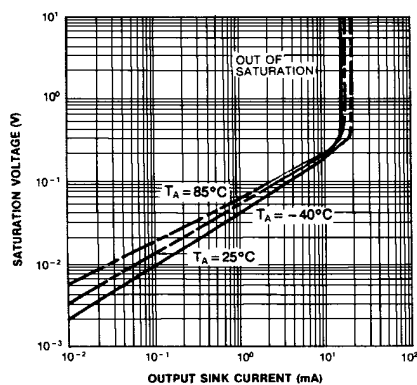


Figure 3. Output Saturation Voltage vs Sink Current

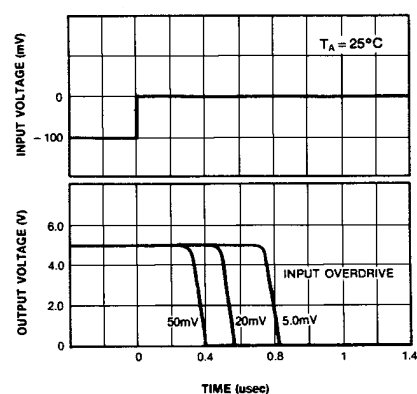


Figure 4. Response Time for Various Input Overdrive-Negative Transition

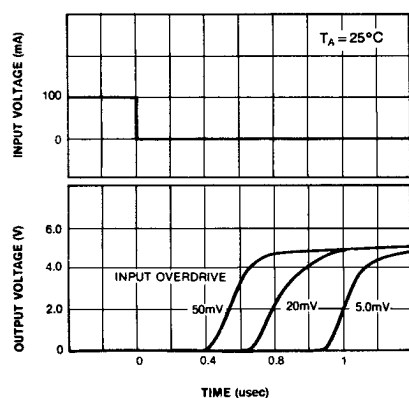


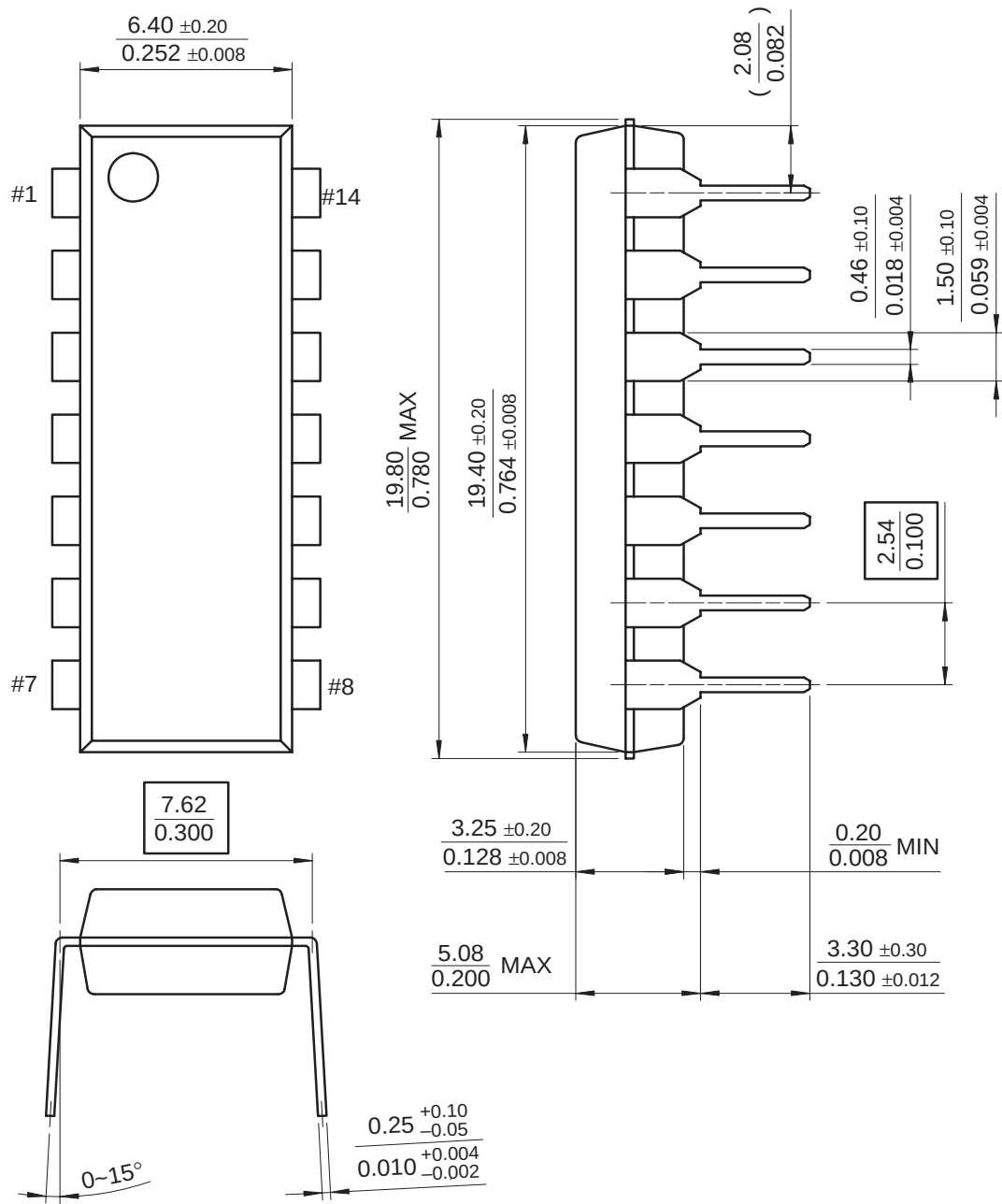
Figure 5. Response Time for Various Input Overdrive-Positive Transition

Mechanical Dimensions

Package

Dimensions in millimeters

14-DIP

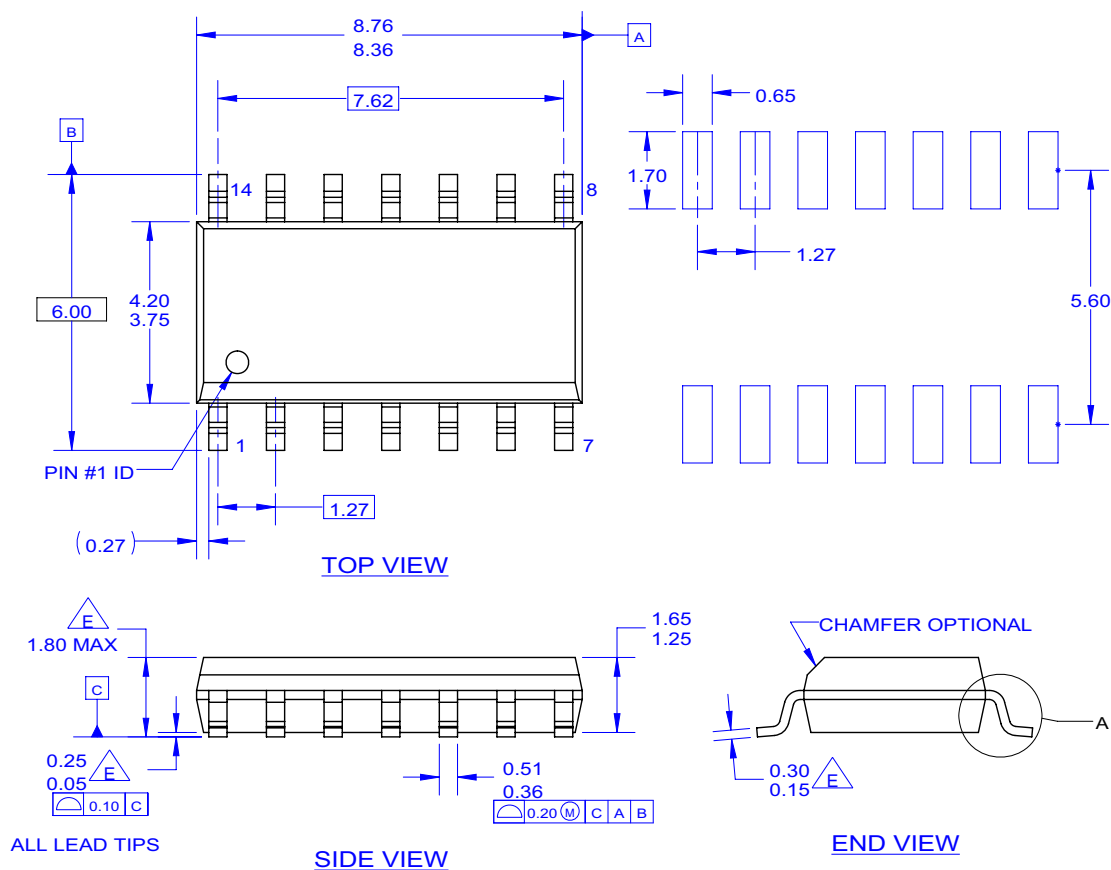


Mechanical Dimensions (Continued)

Package

Dimensions in millimeters

14-SOP



NOTES: UNLESS OTHERWISE SPECIFIED

A. THIS PACKAGE REFERENCE TO JEDEC MS-012 VARIATION AB.

B. ALL DIMENSIONS ARE IN MILLIMETERS.

C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.

D. DIMENSIONS AND TOLERANCES AS PER ASME Y14.5-1994.

E. OUT OF JEDEC STANDARD VALUE.

F. LAND PATTERN STANDARD: SOIC127P600X145-14M.

G. FILE NAME: MKT-M14C REV2

Ordering Information

Product Number	Package	Operating Temperature
KA339	14-DIP	0 ~ +70°C
KA339A		
KA339D	14-SOP	
KA339AD		
KA2901D	14-SOP	-40 ~ +85°C

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Fairchild Semiconductor:

[KA339ADTF](#) [KA339A](#)