

# **KA319**

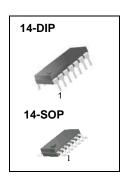
# **Dual Comparator**

#### **Features**

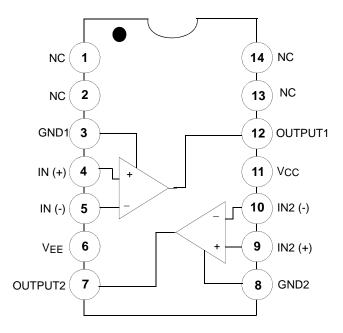
- Operates From a Single 5V Supply
- Typically 80ns Response Time at±15V
- Open Collector Outputs: up to +35V
- High Output Drive Current: 25mA
- Inputs and Outputs can be Isolated From System Ground
- Minimum Fan-out of 2 (Each Side)
- Two Independent Comparators

### **Description**

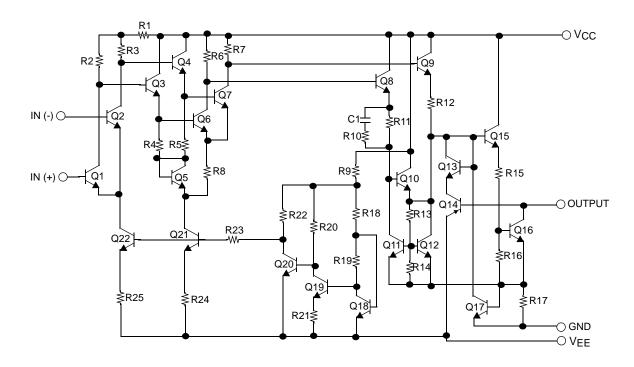
The KA319 is a dual high speed voltage comparator designed to operate from a single +5V supply up to  $\pm15V$  dual supplies. Open collector of the output stage makes the KA319 compatible with RTL, DTL and TTL as well as capable of driving lamps and relays at currents up to 25mA. Typical response time of 80ns with  $\pm15V$  power supplies makes the KA319 ideal for application in fast A/D converts, level shiftiers, oscillators, and multivibrators.



### **Internal Block Diagram**



# **Schematic Diagram**



# **Absolute Maximum Ratings**

Parameter	Symbol	Value	Unit
Supply Voltage	Vcc	36	V
Output to Negative Supply Voltage	Vo - VEE	36	V
Ground to Negative Supply Voltage	VEE	25	V
Ground to Positive Supply Voltage	Vcc	18	V
Differential Input Voltage	VI(DIFF)	5	V
Input Voltage	VI	±15	V
Output Short Circuit Duration	-	10	sec
Power Dissipation	PD	500	mW
Thermal Resistance Junction-Ambient Max.	Rθja	250	°C/W
Operating Temperature Range KA319	TOPR	0 ~ +70	°C
Storage Temperature Range	TSTG	-65 ~ +150	°C

### **Electrical Characteristics**

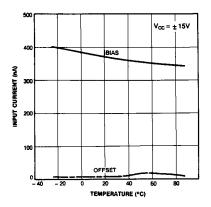
(VCC = +15V, VEE = -15V, TA =  $25^{\circ}$ C, unless otherwise specified)

Parameter	Symbol	Conditions		KA319			Unit
Farameter	Symbol			Min.	Тур.	Max.	Unit
Input Offcot Voltage (Note1)	Vio	Do < Flo		-	2.0	8.0	mV
Input Offset Voltage (Note1)		$RS \leq 5k\Omega$	Note3	-	-	10	1110
Input Offset Current (Note1)	lio	-		-	10	200	nA
			Note3	-	-	300	na l
Input Bias Current	IBIAS	_		-	150	1000	nA
		Note3		-	-	1200	nA
Voltage Gain	G∨	-		8	40	-	V/mV
Response Time (Note2)	T <sub>RES</sub>	Vcc = ±15V		-	80	-	ns
Saturation Voltage	VSAT	$VCC=15V$ , $VEE=-15V$ , $VI \le -5mV$ , $IO=25mA$		-	0.6	1.5	
		$V_{CC} = 4.5V, V_{EE} = 0V$ $V_{I} \le -10$ mV, $I_{O} \le 3.2$ mA	Note3	-	0.3	0.4	V
Output Leakage Current	lo(LKG)	\\\\ > Fm\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		-	-	-	
		$V_I \ge 5mV$ , $VO(P) = 35V$	Note3	-	-	-	μА
		$V_{I} \ge 10 \text{mV}, V_{O(P)} = 35 \text{V}$		-	0.2	10	
Input Voltage Range	VI(R)	Note3	$V_{CC} = \pm 15V$	-	±13	-	V
			VCC = 5V, VEE = 0V	1	-	3	
Differential Input Voltage	VI(DIFF)	-	Note3	-	-	±5	V
Positive Supply Current	ICC1	VCC = 5V, VEE = 0V		-	3.6	-	mA
Positive Supply Current	ICC2	V <sub>C</sub> C = ±15V		-	7.5	12.5	mA
Negative Supply Current	IEE	VCC = ±15V		-	3	5	mA

#### Notes:

- 1. The offset voltage and offset currents given are the maximum values required to drive the output within a volt of either supply with a 1mA load. Thus, these parameters define an error band and take into account the worst case effects of voltage gain and input impedance.
- 2. The response time specified is for a 100mV input step with 5mV overdrive.
- 3. KA319 :  $0 \le T_A \le +70^{\circ}C$

# **Typical Performance Characteristics**



**Figure 1. Input Current** 

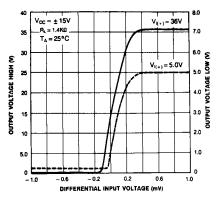


Figure 3. Transfer Function

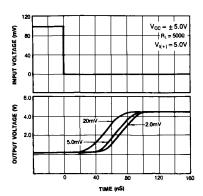


Figure 5. Response Time Various Input Overdriver

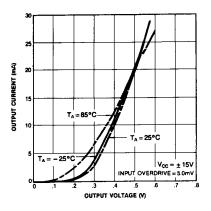


Figure 2. Output Saturation Voltage

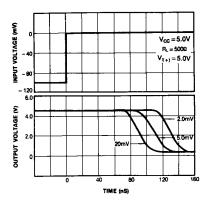


Figure 4. Response Time for Various Input Overdriver

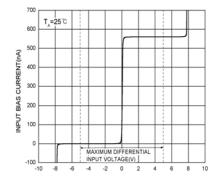
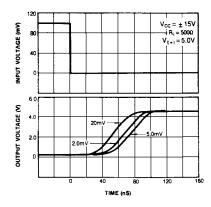


Figure 6. Input Characteristics

# **Typical Performance Characteristics** (Continued)



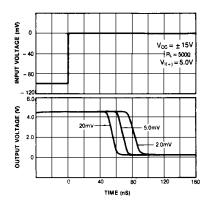


Figure 7. Response Time for Various Input Over driver

Figure 8. Response Time for Various Input Over driver

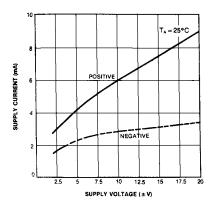


Figure 9. Supply Current

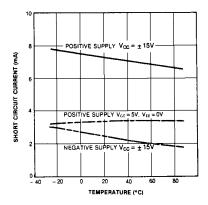


Figure 10. Supply Current

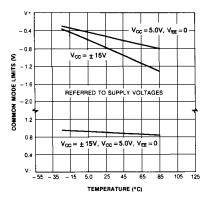


Figure 11. Common Mode Limits

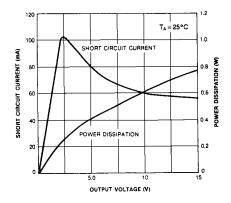
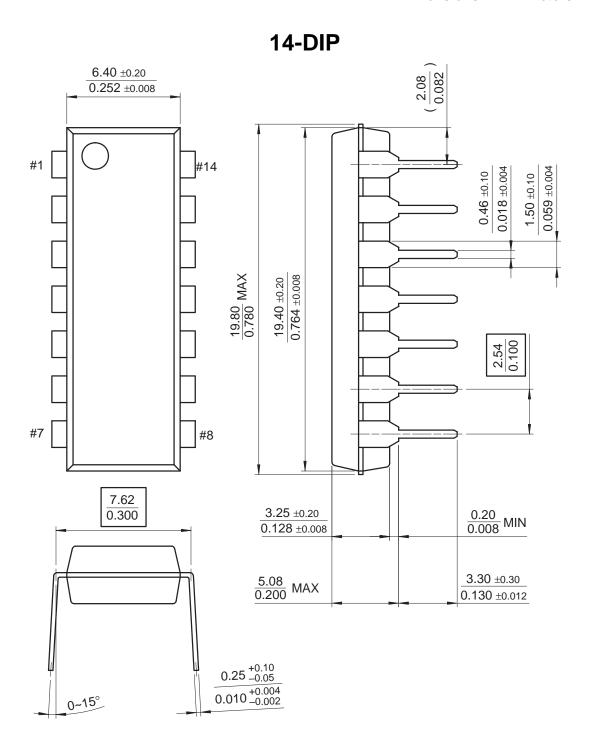


Figure 12. Output Limiting Characteristics

## **Mechanical Dimensions**

### **Package**

#### **Dimensions in millimeters**



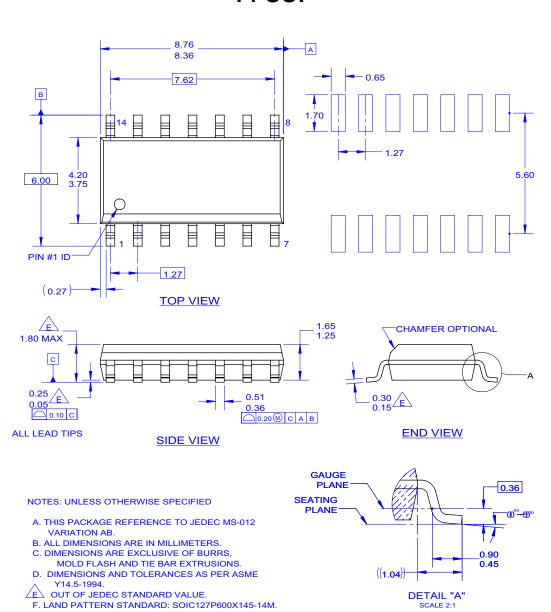
# **Mechanical Dimensions** (Continued)

F. LAND PATTERN STANDARD: SOIC127P600X145-14M. G. FILE NAME: MKT-M14C REV2

### **Package**

#### **Dimensions in millimeters**

# 14-SOP



### **Ordering Information**

Product Number	Package	Operating Temperature	
KA319	14-DIP	0 ~ +70°C	
KA319D	14-SOP	0~+700	

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