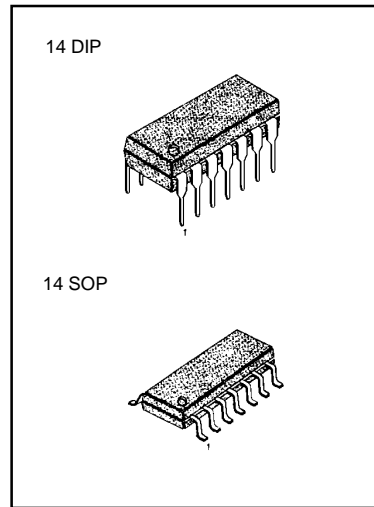


DUAL HIGH SPEED VOLTAGE COMPARATOR

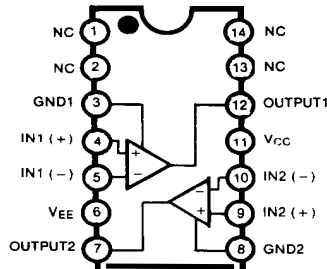
The KA219 is a dual high speed voltage comparator designed to operate from a single +5V Supply up to $\pm 15V$ dual supplies. Open collector of the output stage makes the KA219 compatible with RTL, DTL and TTL as well as capable of driving lamps and relays at currents up to 25mA. Typical response time of 80ns with $\pm 15V$ power supplies makes the KA219 ideal for application in fast A/D converts, level shifters, oscillators, and multivibrators.

FEATURES

- Operates from a single 5V supply
- Typically 80ns response time at $\pm 15V$
- 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



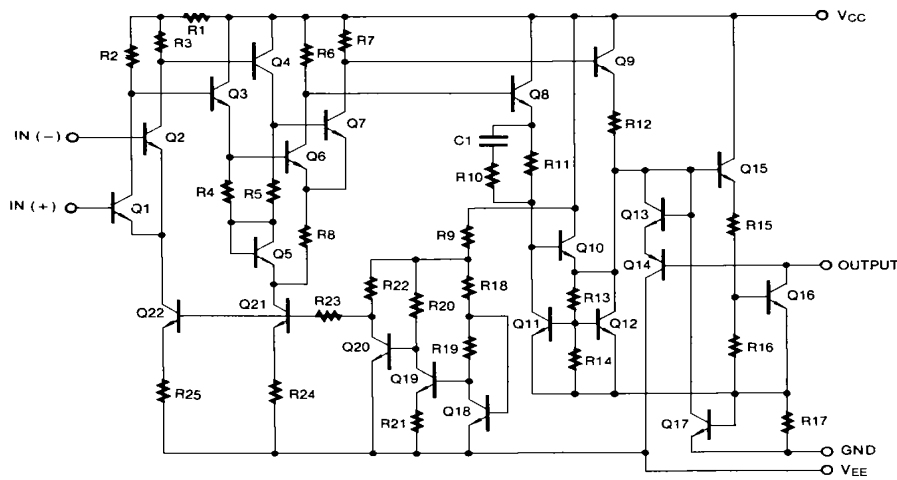
BLOCK DIAGRAM



ORDERING INFORMATION

Device	Package	Operating Temperature
KA319	14 DIP	0 ~ + 70 °C
KA319D	14 SOP	
KA219	14 DIP	-25 ~ + 85 °C
KA219D	14 SOP	

SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	36	V
Output to Negative Supply Voltage	$V_O - V_{EE}$	36	V
Ground to Negative Supply Voltage	V_{EE}	25	V
Ground to Positive Supply Voltage	V_{CC}	18	V
Differential Input Voltage	$V_{I(DIFF)}$	± 5	V
Input Voltage	V_I	± 15	V
Output Short Circuit Duration		10	sec
Power Dissipation	P_D	500	mW
Operating Temperature Range KA219	T_{OPR}	-25 ~ + 85	$^{\circ}C$
KA319		0 ~ + 70	
Storage Temperature Range	T_{STG}	-65 ~ + 150	$^{\circ}C$

ELECTRICAL CHARACTERISTICS

(V_{CC} = + 15V, V_{EE} = - 15V, T_A = 25 $^{\circ}C$, unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA219			KA319			Unit
			Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage (Note 1)	V_{IO}	$R_S \leq 5K\Omega$ Note 3		0.7	4.0		2.0	8.0	mV
Input Offset Current (Note 1)	I_{in}	Note 3		10	75		10	200	nA
Input Bias Current	I_{BIAS}	Note 3		150	500		150	1000	nA
					1000			1200	
Voltage Gain	G_V		10	40		8	40		V/mV
Response Time (Note 2)	t_{RES}	$V_{CC} = \pm 15V$		80			80		ns
Saturation Voltage	V_{SAT}	$V_I \leq -5mV, I_O = 25mA$		0.6	1.5				V
		$V_I \leq -5mV, I_O = 25mA$					0.6	1.5	V
		$V_{CC} = 4.5V, V_{EE} = 0V$ $V_I \leq -6mV, I_{SINK} \leq 3.2mA$		0.23	0.4				V
		$V_I \leq -5mV, I_O = 25mA$					0.3	0.4	V
		$V_I \leq -10mV, I_{SINK} \leq 3.2mA$							
Output Leakage Current	$I_{O(LKG)}$	$V_I = 5mV, V_{O(P)} = 35V$ Note 3		0.2	2				μA
		$V_I = 10mV, V_{O(P)} = 35V$			10				
Input Voltage Range	$V_{I(R)}$	Note 3	$V_{CC} = \pm 15V$		± 13			± 13	
			$V_{CC} = 5V, V_{EE} = 0V$	1		3	1		3

ELECTRICAL CHARACTERISTICS(V_{CC} = +15V, V_{EE} = -15V, T_A=25°C, unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA219			KA319			Unit
			Min	Typ	Max	Min	Typ	Max	
Differential Input Voltage	V _{I(DIFF)}		±5			±5			V
Positive Supply Current	I _{CC1}	V _{CC} = 5V, V _{EE} = 0V		3.6			3.6		mA
Positive Supply Current	I _{CC2}	V _{CC} = ±15V		7.5	11.5		7.5	12.5	mA
Negative Supply Current	I _{EE}	V _{CC} = ±15V		3	4.5		3	5	mA

Note 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.

- The response time specified is for a 100mV input step with 5mV overdrive.
- KA319 : $0 \leq T_A \leq +70^\circ\text{C}$
KA219 : $-25 \leq T_A \leq +85^\circ\text{C}$

TYPICAL PERFORMANCE CHARACTERISTICS

Fig. 1 INPUT CURRENT

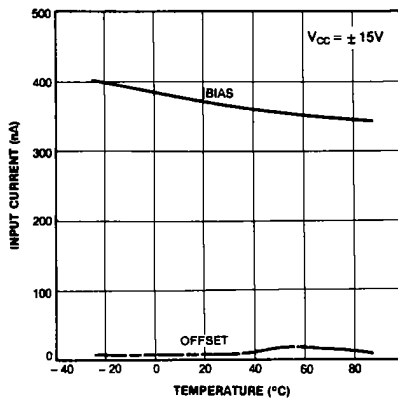


Fig. 2 OUTPUT SATURATION VOLTAGE

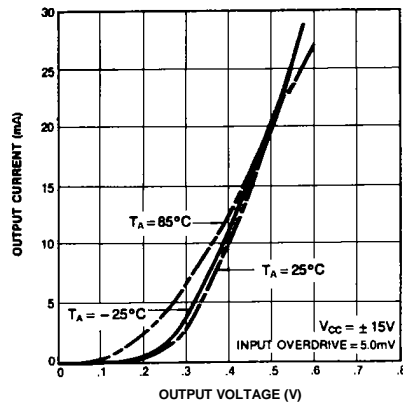


Fig. 3 TRANSFER FUNCTION

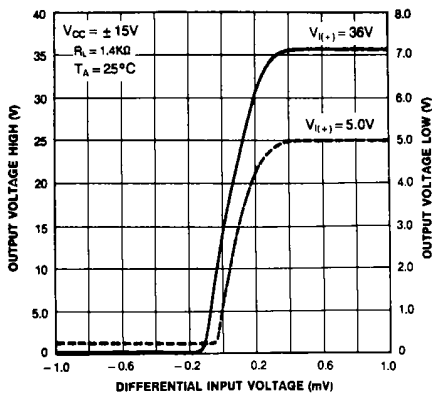


Fig. 4 RESPONSE TIME FOR VARIOUS INPUT OVERDRIVER

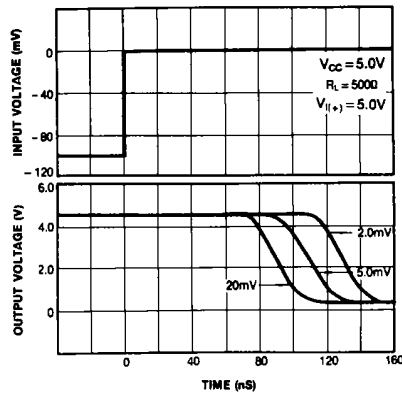


Fig. 5 RESPONSE TIME FOR VARIOUS INPUT OVERDRIVER

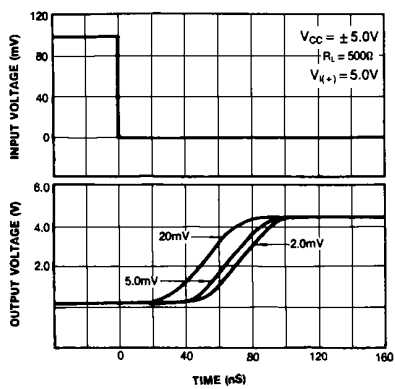


Fig. 6 INPUT CHARACTERISTICS

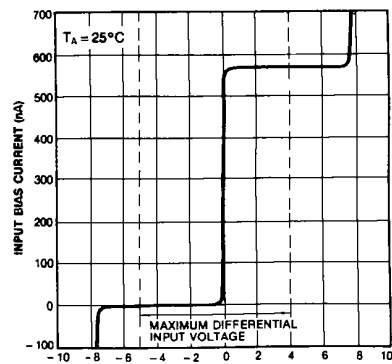


Fig. 7 RESPONSE TIME FOR VARIOUS INPUT OVERDRIVER

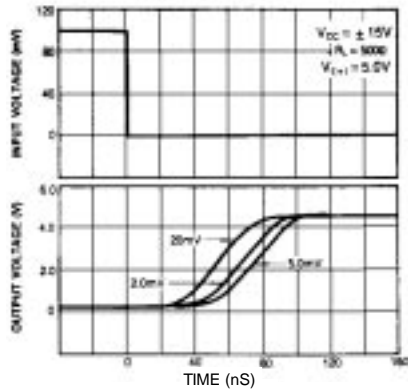


Fig. 8 RESPONSE TIME FOR VARIOUS INPUT OVERDRIVER

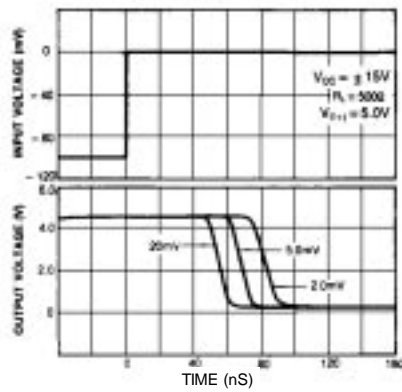


Fig. 9 SUPPLY CURRENT

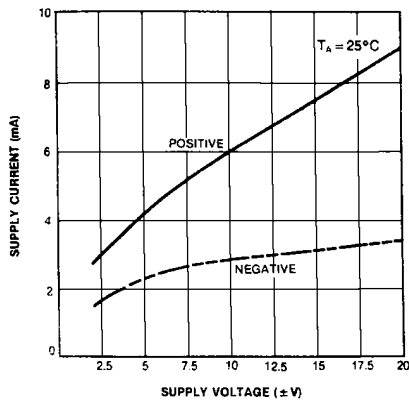


Fig. 10 SUPPLY CURRENT

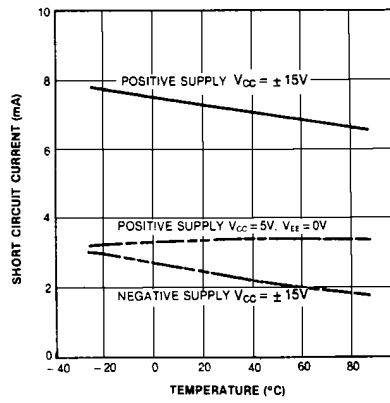


Fig. 11 COMMON MODE LIMITS

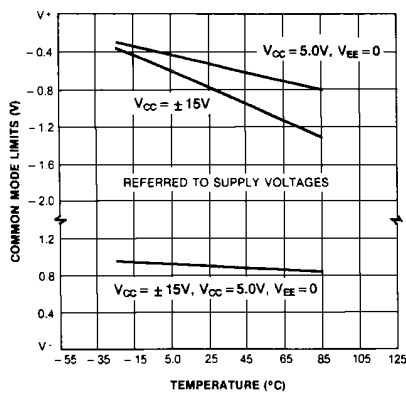
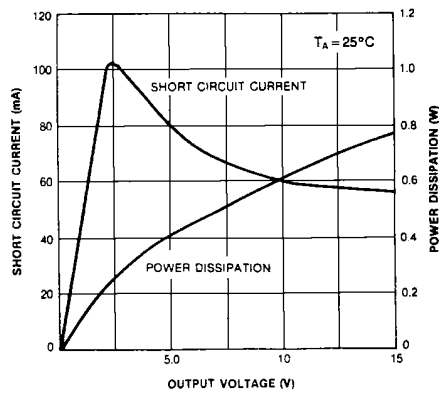


Fig. 12 OUTPUT LIMITING CHARACTERISTICS



TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACEx™	ISOPLANAR™	UHC™
CoolFET™	MICROWIRE™	VCX™
CROSSVOLT™	POP™	
E ² CMOS™	PowerTrench™	
FACT™	QST™	
FACT Quiet Series™	Quiet Series™	
FAST®	SuperSOT™-3	
FASTr™	SuperSOT™-6	
GTO™	SuperSOT™-8	
HiSeC™	TinyLogic™	

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 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, or (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 significant injury to the user.
2. A critical component is 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.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.