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Arrays

CA3019

Ultra-Fast Low-Capacitance
Matched DiodesFor Applications In Communications
and Switching Systems

Features:

- Excellent diode match
- Low leakage current
- Low pedestal voltage when gating
- Companion Application Note, ICAN-5299: "Application of the RCA-CA3019 Integrated-Circuit Diode Array"

The RCA-CA3019 consists of six ultra-fast, low capacitance diodes on a common monolithic substrate. Integrated circuit construction assures excellent static and dynamic matching of the diodes, making the array extremely useful for a wide variety of applications in communication and switching systems.

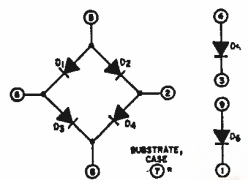
Four of the diodes are internally connected as a "quad" and two are independently accessible. The substrate is internally connected to the 10-lead TO-5-style case.

For applications such as balanced modulators or ring modulators where capacitive balance is important, the substrate

Applications:

- Modulator
- Mixer
- Balanced modulator
- Analog switch
- Diode gate for chopper-modulator applications

should be returned to a DC potential which is significantly more negative (with respect to the active diodes) than the peak signal applied.



* Connect to most negative circuit potential.

Fig. 1 — Schematic Diagram.

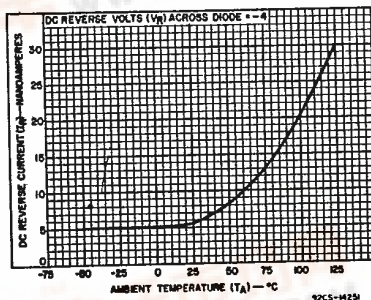


Fig. 3 — Reverse (leakage) current (any diode) as a function of temperature.

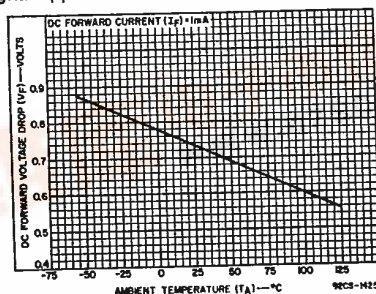


Fig. 2 — DC forward voltage drop (any diode) as a function of temperature.

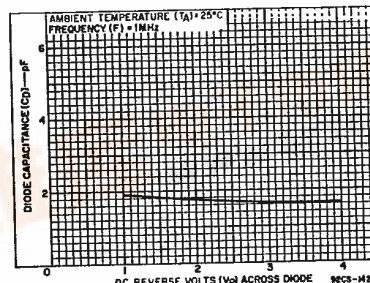


Fig. 4 — Diode capacitance (any diode) as a function of reverse voltage.

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CA3019

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Absolute-Maximum Ratings:

DISSIPATION:	
Any one diode unit	20 max. mW
Total for device	120 max. mW
TEMPERATURE RANGE:	
Storage	-65 to +200 °C
Operating	-55 to +125 °C
DC Forward Current, I_F	25 mA
Peak Recurrent Forward Current, I_{FR}	100 mA
Peak Forward Surge Current, I_{FS} (surge)	100 mA
VOLTAGE: See Table	

Absolute-Maximum Voltage Limits:

TERM.	VOLTAGE LIMITS		CONDITIONS	
	NEG.	POS.	TERM.	VOLT.
1	-3	+12	7	-6
2	-3	+12	7	-6
3	-3	+12	7	-6
4	-3	+12	7	-6
5	-3	+12	7	-6
6	-3	+12	7	-6
7	-18	0	1,2,3,6,8	0
8	-3	+12	7	-6
9	-3	+12	7	-6
10	NO CONNECTION			
CASE	INTERNALLY CONNECTED TO TERMINAL 7 DO NOT GROUND			

ELECTRICAL CHARACTERISTICS, at $T_A = 25^\circ\text{C}$

Characteristics Apply for Each Diode Unit, Unless Otherwise Specified

Characteristics Apply for Each Device

CHARACTERISTICS	SPECIAL TEST CONDITIONS	LIMITS			Units
		TYPE CA3019			
		Min.	Typ.	Max.	
DC Forward Voltage Drop	DC Forward Current (I_F) = 1 mA	—	0.73	0.78	V
DC Reverse Breakdown Voltage	DC Reverse Current (I_R) = -10 μ A	4	6	—	V
DC Reverse Breakdown Voltage Between any Diode Unit and Substrate	DC Reverse Current (I_R) = -10 μ A	25	80	—	V
DC Reverse (Leakage) Current	DC Reverse Voltage (V_R) = -4 V	—	0.0055	10	μ A
DC Reverse (Leakage) Current Between any Diode Unit and Substrate	DC Reverse Voltage (V_R) = -4 V	—	0.010	10	μ A
Magnitude of Diode Offset Voltage (Difference in DC Forward Voltage Drops of any Two Diode Units)	DC Forward Current (I_F) = 1 mA	—	1	5	mV
Single Diode Capacitance	Frequency (f) = 1 MHz DC Reverse Voltage (V_R) = -2V	—	1.8	—	pF
Diode Quad-to-Substrate Capacitance	Frequency (f) = 1 MHz DC Reverse Voltage (V_R) between Terminal 2,5,6, or 8 of Diode Quad and Terminal 7 (Substrate) = -2 V				
	Terminal 2 or 6 to Terminal 7	—	4.4	—	pF
	Terminal 5 or 8 to Terminal 7	—	2.7	—	pF
Series Gate Switching Pedestal Voltage		—	10	—	mV