

Arrays

T-43-24

CA3019

Ultra-Fast Low-Capacitance Matched Diodes

For 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.

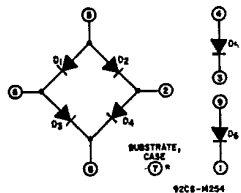
Four of the diodes are internally connected as a "quad" and two are independently accessible. The substrate is internally connected to the 10-lead TO-5-style case.

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.

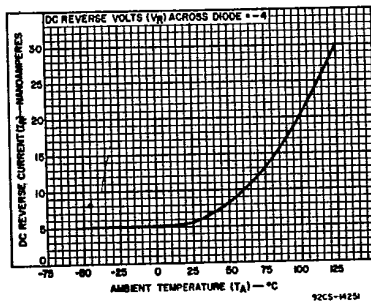


Fig. 3 — Reverse (leakage) current (any diode) as a function of temperature.

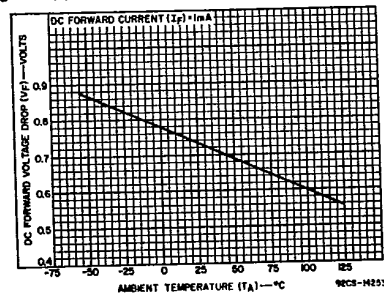


Fig. 2 — DC forward voltage drop (any diode) as a function of temperature.

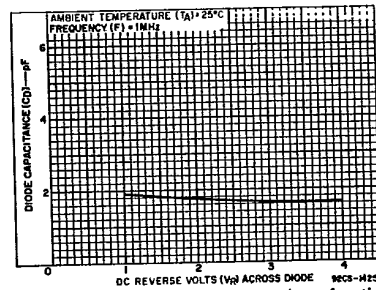


Fig. 4 — Diode capacitance (any diode) as a function of reverse voltage.

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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_{FSM} (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	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 μA	4	6	-	V
DC Reverse Breakdown Voltage Between any Diode Unit and Substrate	DC Reverse Current (I_R) = -10 μA	25	80	-	V
DC Reverse (Leakage) Current	DC Reverse Voltage (V_R) = -4 V	-	0.0055	10	μA
DC Reverse (Leakage) Current Between any Diode Unit and Substrate	DC Reverse Voltage (V_R) = -4 V	-	0.010	10	μA
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