



ECG907

DIODE ARRAY

Diode Array

Six Matched Diodes on a Common Substrate
Monolithic Silicon

The ECG907 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.

Five of the diodes are independently accessible, the sixth shares a common terminal with the substrate.

For applications such as balanced modulators or ring modulators where capacitive balance is important, the substrate should be returned to a DC potential which is significantly more negative (with respect to the active diodes) than the peak signal applied.

APPLICATIONS

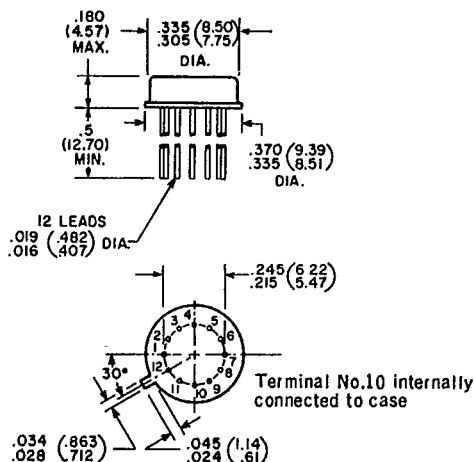
- Balanced modulators or demodulators
- Ring modulators
- High speed diode gates
- Analog switches

FEATURES

- Excellent reverse recovery time - 1 ns typ.
- Matched monolithic construction - V_f matched within 5 mV
- Low diode capacitance - $C_D = 0.65 \text{ pF}$ typical at $V_R = -2 \text{ V}$

ULTRA-FAST LOW-CAPACITANCE MATCHED DIODES

For Applications in
Communications and
Switching Systems



Dimensions in parentheses are in millimeters and are derived from the basic inch dimensions as indicated.

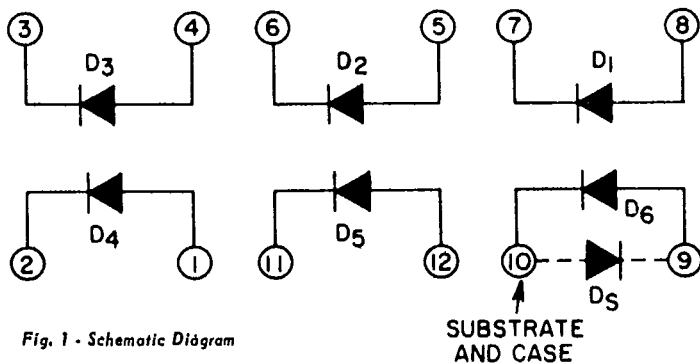


Fig. 1 - Schematic Diagram

ABSOLUTE MAXIMUM RATINGS at T_A = 25 °C

Dissipation:
 Any one diode unit, 100 mW
 Total for device 600 mW
 For T_A > 55 °C derate linearly 5.7 mW/°C

Temperature Range:
 Operating, -55 to +125 °C
 Storage -65 to +200 °C

Peak Inverse Voltage, PIV for: D₁-D₅ 5 V
 D₆ 0.5 V
Peak Diode-to-Substrate Voltage, V_{DI}
 for D₁-D₅ (term. 1,4,5,8 or 12 to term. 10) +20, -1 V
DC Forward Current, I_F 25 mA
Peak Recurrent Forward Current, I_F 100 mA
Peak Forward Surge Current, I_F (surge) 100 mA

ELECTRICAL CHARACTERISTICS, at T_A = 25 °C

Characteristics apply for each diode unit, unless otherwise specified.

CHARACTERISTICS	SYMBOLS	SPECIAL TEST CONDITIONS	LIMITS			UNITS	CHARACTERISTIC CURVES FIG.
			MIN.	TYP.	MAX.		
DC Forward Voltage Drop	V _F	I _F = 50 μA	-	0.65	0.69	V	2
		1 mA	-	0.73	0.78	V	
		3 mA	-	0.76	0.80	V	
		10 mA	-	0.81	0.90	V	
DC Reverse Breakdown Voltage	V _{(BR)R}	I _R = -10 μA	5	7	-	V	-
DC Reverse Breakdown Voltage Between any Diode Unit and Substrate	V _{(BR)R}	I _R = -10 μA	20	-	-	V	-
DC Reverse (Leakage) Current	I _R	V _R = -4 V	-	0.016	100	nA	3
DC Reverse (Leakage) Current Between any Diode Unit and Substrate	I _R	V _R = -10 V	-	0.022	100	nA	4
Magnitude of Diode Offset Voltage (Difference in DC Forward Voltage Drops of any Two Diode Units)	V _{F1} - V _{F2}	I _F = 1 mA	-	0.5	5	mV	2
Temperature Coefficient of V _{F1} - V _{F2}	$\frac{\Delta V_{F1} - V_{F2} }{\Delta T}$	I _F = 1 mA	-	1	-	μV/°C	5
Temperature Coefficient of Forward Drop	$\frac{\Delta V_F}{\Delta T}$	I _F = 1 mA	-	-1.9	-	mV/°C	6
DC Forward Voltage Drop for Anode-to-Substrate Diode (D ₅)	V _F	I _F = 1 mA	-	0.65	-	V	-
Reverse Recovery Time	t _{rr}	I _F = 10 mA, I _R = 10 mA	-	1	-	ns	-
Diode Resistance	R _D	f = 1 kHz, I _F = 1 mA	25	30	45	Ω	7
Diode Capacitance	C _D	V _R = -2 V, I _F = 0	-	0.65	-	pF	8
Diode-to-Substrate Capacitance	C _{DI}	V _{DI} = +4 V, I _F = 0	-	3.2	-	pF	9

TYPICAL CHARACTERISTICS

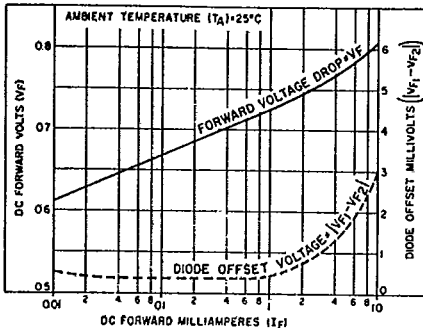


Fig. 2 - DC forward voltage drop (any diode) and diode offset voltage vs DC forward current

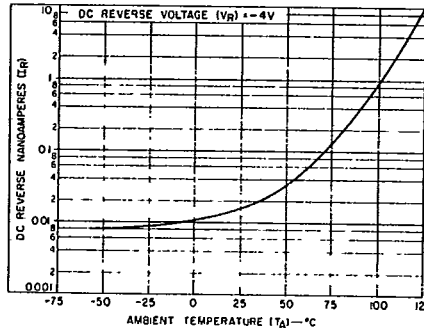


Fig. 3 - DC reverse (leakage) current (diodes 1,2,3,4,5) vs temperature

TYPICAL CHARACTERISTICS

T-43-24

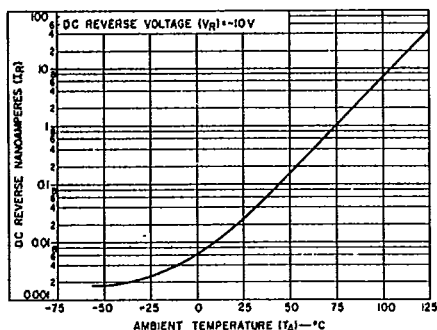


Fig. 4 - DC reverse (leakage) current between diodes (1,2,3,4,5) and substrate vs temperature

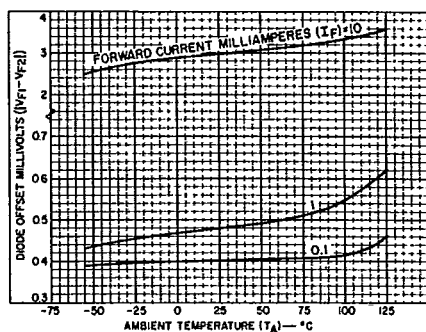


Fig. 5 - Diode offset voltage (any diode) vs temperature

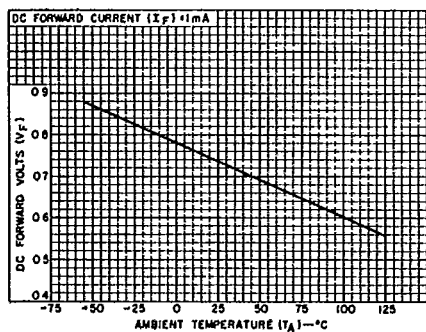


Fig. 6 - DC forward voltage drop (any diode) vs temperature

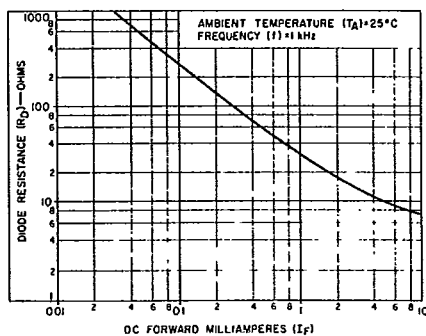


Fig. 7 - Diode resistance (any diode) vs DC forward current

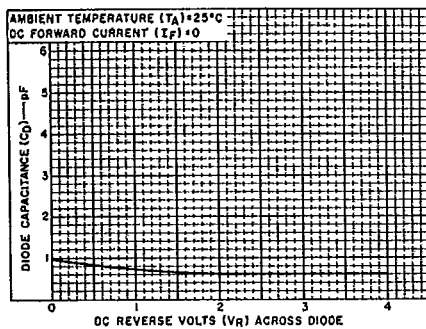


Fig. 8 - Diode capacitance (diodes 1,2,3,4,5) vs reverse voltage

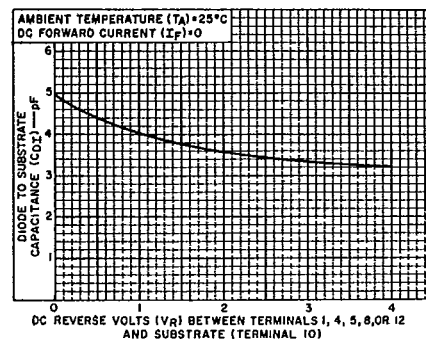


Fig. 9 - Diode-to-substrate capacitance vs reverse voltage