HEWLETT hp PACKARD

COMPONENTS

SCHOTTKY BARRIER DIODE QUADS FOR DOUBLE BALANCED MIXERS

5082-2231/33
5082-2261/63
5082-2271/72
5082-2276/77
5082-2279/80
5082-2291/92
5082-2293/94
5082-2830/31

Features

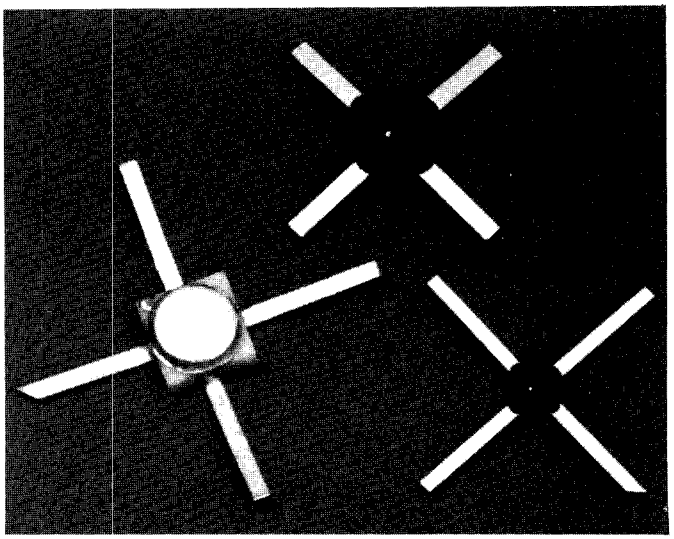
SMALL SIZE
Eases Broad Band Designs

TIGHT MATCH
Improves Mixer Balance

IMPROVED BALANCE OVER TEMPERATURE

RUGGED DESIGN

BOTH MEDIUM AND LOW BARRIER DIODES AVAILABLE



Description / Applications

These matched diode quads use a monolithic array of Schottky diodes interconnected in ring configuration. The relative proximity of the diode junction on the wafer assures uniform electrical characteristics and temperature tracking.

These diodes are designed for use in double balanced mixers, phase detectors, AM modulators, and pulse modulators requiring wideband operation and small size. The low barrier diodes allow for optimum mixer noise figure at lower than conventional local oscillator levels. The wider dynamic range of the medium barrier diodes allows for better distortion performance.

Maximum Ratings at T_{CASE} = 25°C

Junction Operating and Storage Temperature Range:

H-4 Packaged Diodes ..... -65°C to +150°C

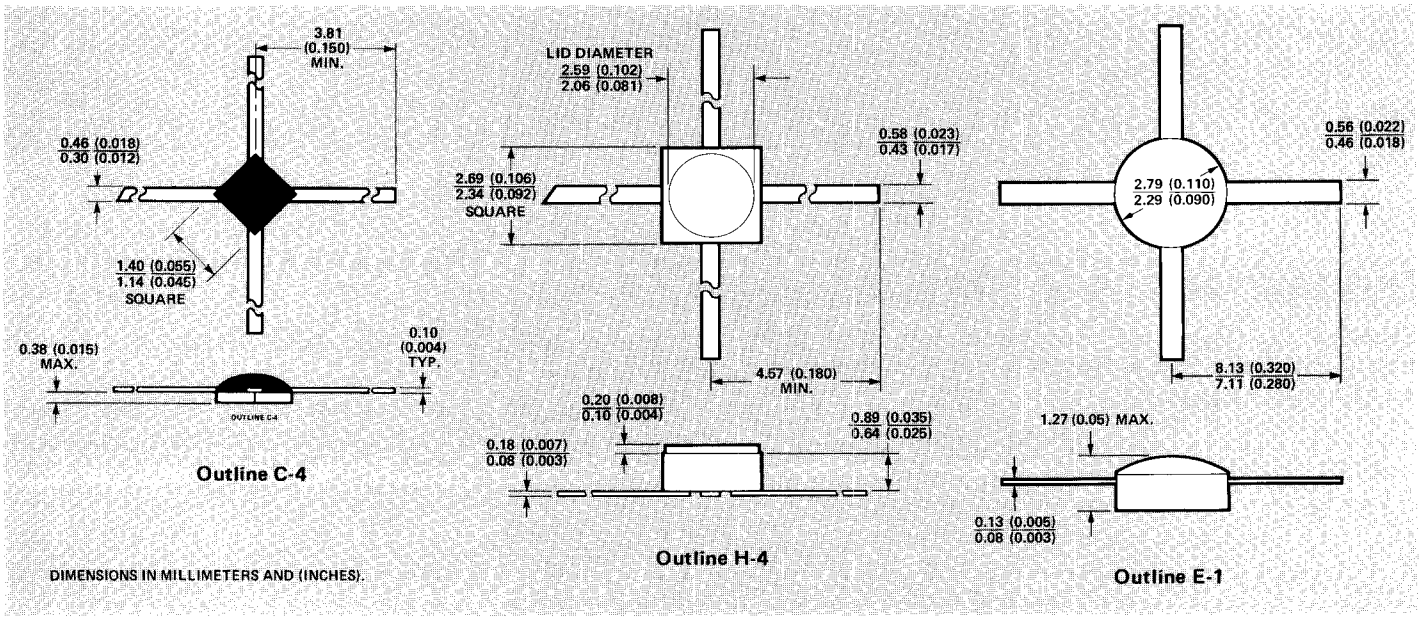
E-1 and C-4 Packaged Diodes ..... -65°C to +125°C

Operation of these devices within the above temperature ratings will assure a device Mean Time Between Failure (MTBF) of approximately 1 x 10^7 hours.

DC Power Dissipation ..... 75 mW per Junction
Derate linearly to zero at maximum rated temperature. (Measured in infinite heat sink.)

Soldering Temperature ..... 220°C for 10 s.

Package Dimensions



Selection Guide

Package Outline \ Frequency	Barrier	To 2 GHz	2-4 GHz	4-8 GHz	8-12 GHz	12-18 GHz
E-1	Medium	5082-2830	5082-2276	5082-2277		
Low Cost	Low	5082-2831				
H-4	Medium	5082-2261	5082-2261	5082-2263		
Hermetic	Low	5082-2231	5082-2231	5082-2233		
C-4	Medium	5082-2291	5082-2291	5082-2292	5082-2293	5082-2294
Broadband	Low	5082-2271	5082-2271	5082-2272	5082-2279	5082-2280

Electrical Characteristics at T_A=25°C

Typical Parameters

Part Number 5082-	Package	Barrier	Maximum Capacitance C_T (pF)	Maximum Capacitance Difference ΔC_T (pF)	Forward Voltage V_F (V)[2]	Dynamic Resistance R_D (Ω)
2231	H-4	Low	0.60	0.10	0.25	11
2233			0.50	0.05	0.30	13
2261		Medium	0.60	0.10	0.35	13
2263			0.45	0.05	0.45	13
2830	E-1		0.5 (Typ.)	0.20	0.35	10
2831		Low	0.5 (Typ.)	0.20	0.25	10
2276		Medium	0.60	0.10	0.35	13
2277			0.50	0.10	0.35	16
2271	C-4	Low	0.60	0.10	0.25	11
2272			0.45	0.10	0.25	13
2279			0.25	0.05	0.30	15
2280			0.20	0.05	0.30	15
2291		Medium	0.60	0.10	0.35	11
2292			0.40	0.10	0.35	13
2293			0.25	0.05	0.45	15
2294			0.20	0.05	0.45	15
Test Conditions			V_R=0 f=1 MHz[1]		I_F=1mA Measured between Adjacent Leads	I_F=5mA between Adjacent Leads

Notes: 1. Measured between diagonal leads.
2. Maximum ΔV_F = 20 mV at I_F = 5mA measured between adjacent leads.

Dynamic and Series Resistance

Schottky diode resistance may be expressed as series resistance, R_S, or as dynamic resistance, R_D. The two terms are related by the equation

$$R_D = R_S + R_j$$

where R_j is the resistance of the junction. Junction resistance of a diode with DC bias is quite accurately calculated by

$$R_j = 26/I_B \quad \text{where}$$

I_B is the bias current in milliamperes. The series resistance is independent of current.

The dynamic resistance is more easily measured. If series resistance is specified it is usually obtained by subtracting the calculated junction resistance from the measured dynamic resistance.