NEC®

MM WAVE GaAs VARACTOR DIODE

ND3139-5S ND3139-5M ND3139-5N

FEATURES

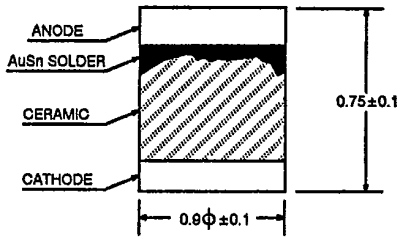
- **LOW CONVERSION LOSS:** Lc = 7.5 dB TYP at f = 20 GHz to 40 GHz, P_{IN} = +16 dBm
- **HIGH CUTOFF FREQUENCY:** fc = 300 GHz TYP
- **LOW THERMAL RESISTANCE:** $R_{TH(J-C)}$ = 500°C/W MAX
- **SMALL SIZE**
- **HIGH RELIABILITY**

DESCRIPTION

These GaAs Varactor Diodes are especially designed for millimeter wave multiplier applications such as a doubler from 20 GHz to 40 GHz. These diodes feature low conversion loss, high cutoff frequency, low thermal resistance, small size and high reliability. They are available in three package types: 5S, 5M and 5N.

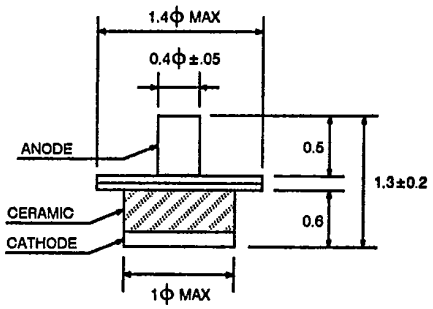
OUTLINE DIMENSIONS (Units in mm)

OUTLINE 5S



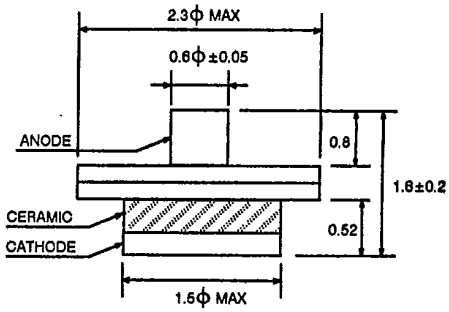
Cp = 0.12 pF

OUTLINE 5M



Cp = 0.12 pF

OUTLINE 5N



Cp = 0.25 pF

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_R	Reverse Voltage	V	15
P_D	Power Dissipation	mW	200
T_{OP}	Operating Temperature	°C	-65 to +125
T_{STG}	Storage Temperature	°C	-65 to +125
T_{SDR}	Soldering Temperature	°C	+230*

*One time within 10 seconds.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V_R	Reverse Voltage at I_R = 10 µA	V	15		
I_R	Reverse Current at V_R = +11 V	nA			10
V_F	Forward Voltage at I_F = 10 mA	V			1.3
C_{J0}	Junction Capacitance at V_R = 0 V, f = 1 MHz	pF	0.15	0.20	0.25
$R_{TH\ (J-C)}$	Thermal Resistance: Small Signal Method I_{OP} = 5 mA f (high) = 5 MHz, f (low) = 30 Hz	°C/W			500
f_{C0}	Cutoff Frequency* at V_R = 0 V, f = 20 GHz	GHz	90	110	
f_{C-4}	Cutoff Frequency* at V_R = 4 V, f = 20 GHz	GHz	260	300	
L_C	Conversion Loss as a doubler, f_{IN} = 20 GHz, at P_{IN} = +16 dBm	dB		7.5	

*Sampling basis of LTPD 10% (n = 22, accept; 0 reject; 1)

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