MAVR-000120-1411

MACOM
Partners in RF & Microwave

Solderable GaAs Constant Gamma Flip-Chip Varactor Diode V3

Features

- Usable Past 70GHz
- Constant Gamma for Linear Tuning
- Low Parasitic Capacitance
- High Q
- Silicon Nitride Passivation
- Polyimide Scratch Protection
- Surface Mount Configuration
- Lead Free (RoHs Compliant)
- Available in Pocket Tape and Reel.
- Can withstand 500 Temperature Cycles (-65 Deg.C. to +150 Deg.C), mounted with 96.5Sn/3.5Ag solder without Mechanical Degradation.
- Can be Mounted with Solder or Conductive Epoxy.

Description

M/A-COM Technology Solutions' MAVR-000120-1411 is a gallium arsenide flip chip hyperabrupt varactor diode. This device is fabricated on OMCVD epitaxial wafers using a process designed for high device uniformity and extremely low parasitics. This diode is fully passivated with silicon nitride and has an additional layer of polyimide for scratch protection. The protective coatings prevent damage to the junction during automated or manual handling. The flip chip configuration is suitable for pick and place insertion.

Ordering Information

Part Number	Package
MAVR-000120-14110P	Pocket Tape
MAVR-000120-14110G	Gel Pack

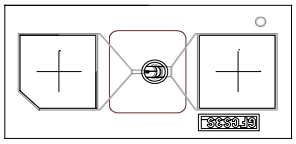
Absolute Maximum Ratings [1,2]

Operating Temperature	-40°C to +125°C
Storage Temperature	-65°C to +150°C
Power Dissipation	100 mW
Mounting Temperature	+260C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. M/A-COM does not recommend sustained operation near these survivability limits.

Chip Layout

Front View (Circuit Side)



Back View (Operator Side)

• **North America** Tel: 800.366.2266 • **Europe** Tel: +353.21.244.6400
• **India** Tel: +91.80.43537383 • **China** Tel: +86.21.2407.1588
Visit www.macomtech.com for additional data sheets and product information.

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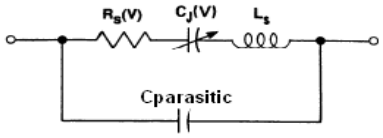
Electrical Specifications @ T_A = +25 °C

Breakdown Voltage @ I_R = 10mA, V_b = 20 V Minimum
Reverse Leakage Current @ V_R =14V, I_R = 100 nA Maximum

Part Number	Ct (pF)			Ct (pF)			Ct (pF)			Q Factor (pF)			Gamma (pF)		
	f=1MHZ, V_R = 0 V			f=1MHZ, V_R = 4 V			f=1MHZ, V_R = 10 V			f=50MHZ, V_R = 4 V			V_R = 2-12V		
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max	Min.	Typ.	Max.	Min.	Typ.	Max.
MAVR-000120-1141		1.1			0.30	0.40		0.14	0.20		3000			0.9	1.1

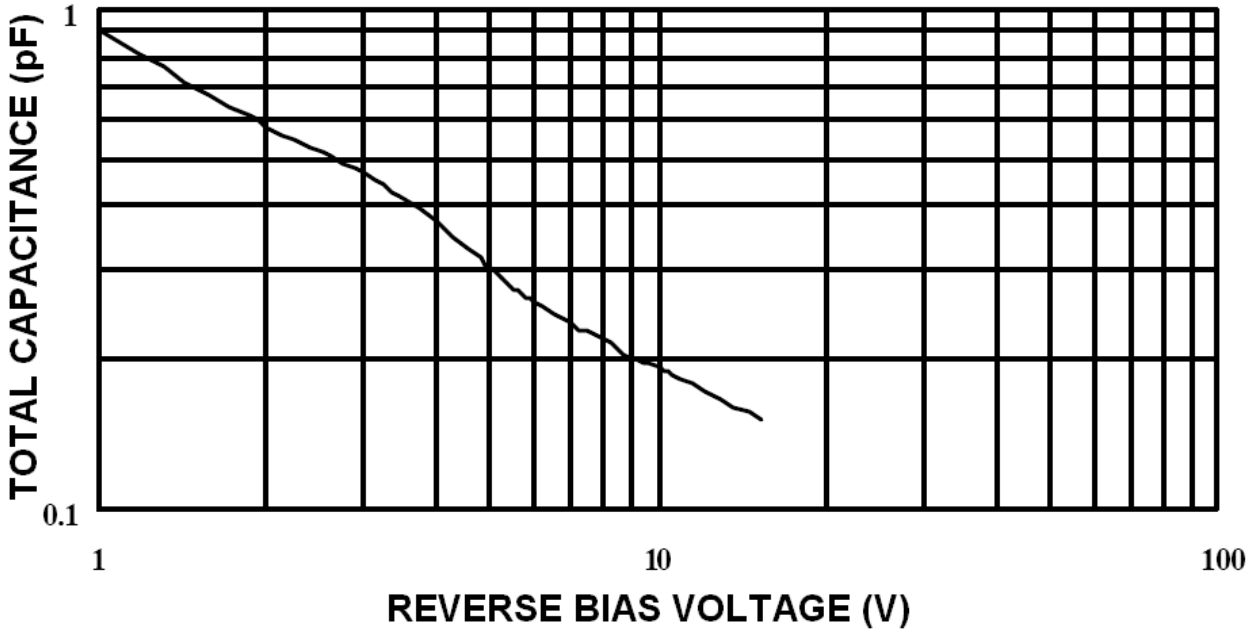
Schematic

FLIPCHIP TUNING VARACTOR EQUIVALENT CIRCUIT



TYPICAL PERFORMANCE CURVE @ +25 °C

CAPACITANCE VS VOLTAGE
GAMMA = 1.00 +/- 10% FROM 2 to 12 Volts



* Specifications are subject to change without prior notification

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Mounting Techniques
Die attach for these devices is made simple through the use of surface mount die attach technology.
This chip was designed to be inserted onto hard or soft substrates with the junction side down. This chip can be mounted with conductive epoxy or with solder.

Solder Die Attach:
This device can be mounted with Sn63/Pb37 or RoHS compliant solder.
Typical reflow profiles are provided on M/A-Com application note M538, " Surface Mounting Instructions" which can be found @ www.macomtech.com

Epoxy Die Attach:
This device can also be attached with conductive epoxy. The assembly can be preheated to 125 - 150°C.
Use a minimum amount of epoxy. Cure epoxy as per manufacturer's instructions.

Handling Procedures
The following precautions should be observed to avoid damaging these chips:

Cleanliness: The chips should be handled in a clean environment. Do not attempt to clean die after installation.

Static Sensitivity: Semiconductor devices are ESD sensitive and can be damaged by static electricity. Proper ESD techniques should be used when handling these devices.

General Handling: The protective polymer coating on the active areas of these die provides scratch protection, particularly for the metal air bridge which contacts the anode. Die can be handled with tweezers or vacuum pickups and are suitable for use with automatic pick-and-place equipment.

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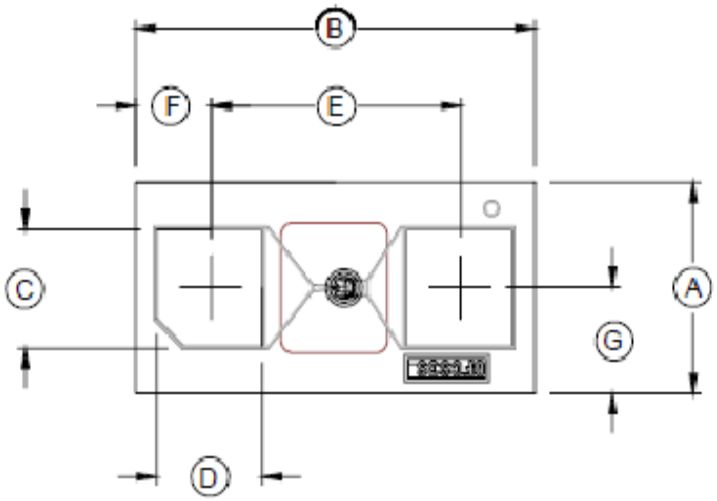
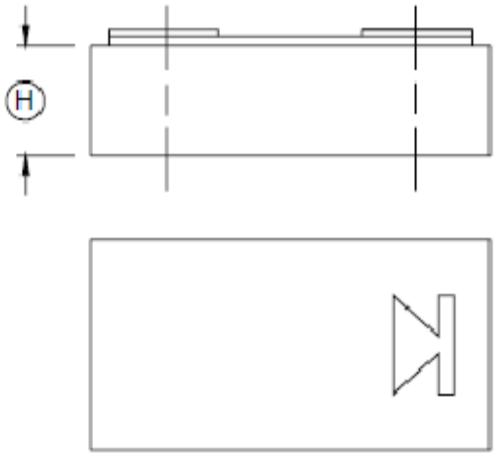
Flip Chip Outline Drawing



Case Style 1500



DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.015	0.017	0.381	0.431
B	0.029	0.031	0.736	0.787
C	0.008	0.009	0.203	0.228
D	0.007	0.008	0.178	0.203
E	0.016	0.017	0.406	0.431
F	0.006	0.007	0.152	0.178
G	0.0075	0.0085	0.190	0.216
H	0.0075	0.0085	0.190	0.216

1. Pad finish is .2 microns of gold over 4 microns of nickel.

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