

Features

- Non- Magnetic Construction
- Passivated Chip
- Surface Mount Package
- Thermally Matched Configuration
- Low Capacitance @ 0 V bias
- Low Conductance @ 0 V bias
- Compatible with Automatic Insertion Equipment
- RoHS* Compliant

Applications

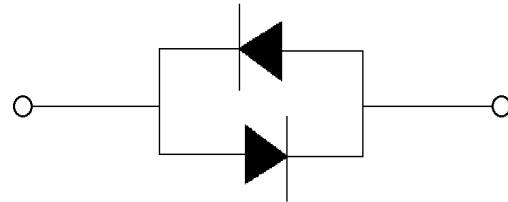
- MRI Receiver Protection
- Body Coil Isolation

Description

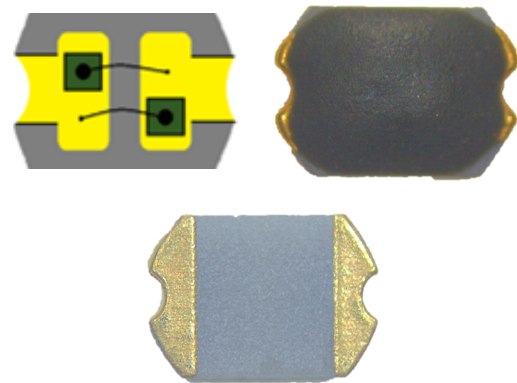
The MADP-010015-1443W0 non-magnetic anti-parallel diode was designed to protect MRI receivers from high RF energy fields including long RF pulses and RF spike pulses present in most MRI machines. This diode acts as a passive protector (limiter) for the MRI receiver. No forward bias voltage is required to turn on the diode. It is self-biased by the RF transmitter pulse power. A switch driver is not needed for this receiver protection application.

Receiver protector diodes appear directly across the input port of the receiver. They are connected in anti-parallel pairs to limit the RF carrier excursion in both polarities. They must, therefore, exhibit extremely low insertion loss, both in the “on” state (high power present) and the “off” state (receiver power). The anti-parallel packaging option eliminates the worry of incorrectly polarized diodes when devices are placed onto the PCB and decreases parasitic capacitance and inductance associated with single packaged diodes.

Functional Schematic



Construction



Ordering Information

Part Number	Package
MADP-010015-1443W0	250 piece reel

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

Electrical Specifications: $T_A = +25^\circ\text{C}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Forward Voltage ¹	$I_F = 10 \mu\text{A}, T_J = 25^\circ\text{C}$ $I_F = 1000 \text{ mA}, T_J = 25^\circ\text{C}$	V	—	—	0.4 1.4
Reverse Breakdown Voltage ²	$I_R = 10 \mu\text{A}$	V	75	—	—
Reverse Current ²	$V_R = 20 \text{ V}, T_J = 25^\circ\text{C}$ $V_R = 50 \text{ V}, T_J = 25^\circ\text{C}$	nA	—	—	50 500
Total Capacitance (Single Diode)	$V_R = 0 \text{ V}, 1 \text{ MHz}$ $V_R = 0 \text{ V}, 64 \text{ MHz}$	pF	—	1.2 1.5	2.5 3.0
Conductance (Single Diode)	$V_R = 0 \text{ V}, 64 \text{ MHz}$	μs	—	—	20

1. Short term duration test pulse used to minimize self heating effect.
2. The reverse breakdown voltage is not measured on Anti-Parallel Pair.

Absolute Maximum Ratings^{3,4}

Parameter	Absolute Maximum
Junction Temperature	175°C
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	75 V
RMS Reverse Voltage	50 V
Forward Current	1000 mA DC
Non-Repetitive Peak Forward Surge Current 8.3 ms Single half sine wave	2.5 A
Operating & Storage Temperature	-65°C to +175°C

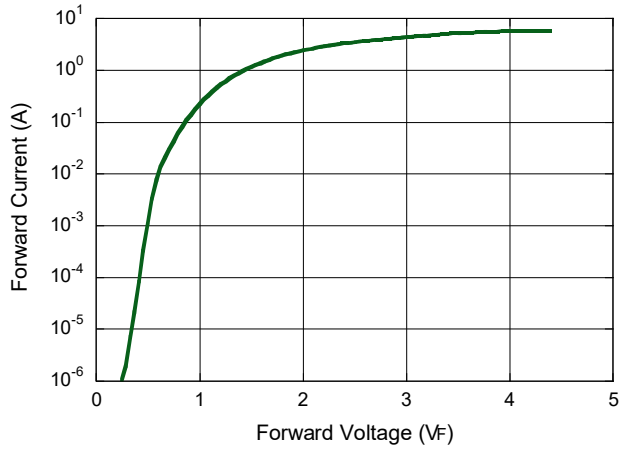
3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. MACOM does not recommend sustained operation near these survivability limits.

Thermal Characteristics

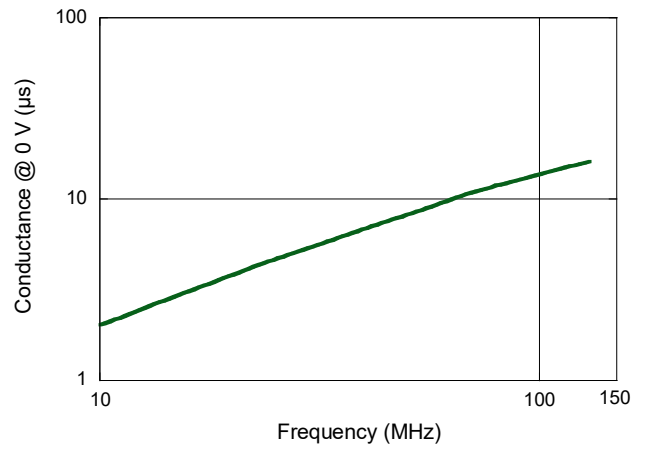
Parameter	Test Conditions	Units
Thermal Resistance	Stripline Surface Mount (US) $R_{\theta\text{JEC}}$	20°C/W

Typical Performance Curves

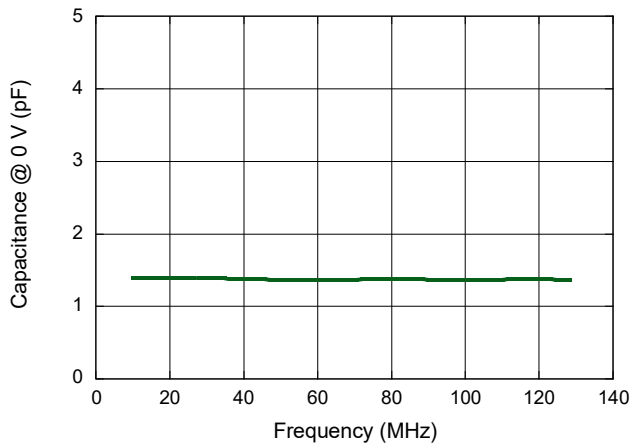
If vs. VF



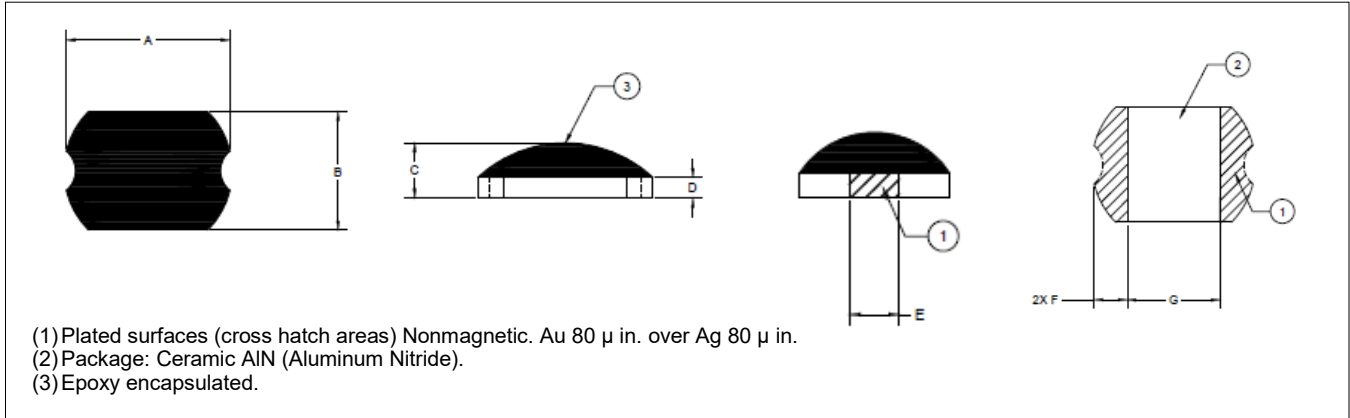
Conductance vs. Frequency



Capacitance vs. Frequency

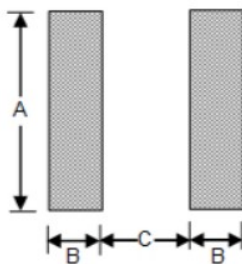


Outline Drawing: Case Style 1443



Dimensions	Min.	Max.
A	0.162	0.178
B	0.112	0.128
C	—	0.055
D	0.017	0.023
E	0.035	0.045
F	Typ.	0.034
G	0.096	0.108

Solder Pad Dimensions



Dimension	Inches	mm
A	0.135	3.43
B	0.045	1.14
C	0.102	2.59

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