



**UMX1089**  
 LOW LOSS MRI PROTECTION DIODES  
 RoHS Compliant

**GENERAL DESCRIPTION**

The UMX1089 diode series was designed to protect MRI receivers from high RF energy fields including long RF pulses and RF spike pulses present in most MRI machines. The UMX1089 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. The UMX1089 process has been optimized for lower loss performance. 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 present) so as not to decrease the receiver’s sensitivity. The UMX1089 diodes are available in two package configurations for flexibility in design.

**KEY FEATURES**

- Available in surface mount package.
- Metallurgical bond
- Passivated chip
- Low magnetic construction
- Non cavity design
- Optimized for low loss performance
- Low capacitance at 0V bias
- Low conductance at 0V bias
- Compatible with automatic insertion equipment
- RoHS Compliant <sup>1</sup>

Note 1: RoHS compliant versions are supplied with a matte Tin finish or Silver finish. RoHS part numbers are:  
 UMX1089B – matte Tin finish  
 UMX1089SM – Silver finish  
 Pb/Sn terminal plating available. Consult factory for details.

**APPLICATION/BENEFITS**

- MRI Receiver Protection
- Body Coil Isolation

**ABSOLUTE MAXIMUM RATINGS @ 25°C**

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	$V_{RRM}$	75	V
Working Peak Reverse Voltage	$V_{RWM}$		
DC Blocking Voltage	$V_R$		
RMS Reverse Voltage	$V_{R(RMS)}$	50	V
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine wave	$I_{FSM}$	2.5	A
Storage Temperature	$T_{STG}$	-65 to +150	°C
Operating Temperature	$T_{OP}$	-65 to +150	°C

For the most current data, consult MICROSEMI's website: [www.MICROSEMI.com](http://www.MICROSEMI.com)  
 Specifications are subject to change, consult the RFIS factory at (978) 442-5600 for the latest information.



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**THERMAL CHARACTERISTICS**

Thermal Resistance @ Lead Length = 3/8 inches		
$R_{OLA}$	100	°C/Watt

**DEVICE ELECTRICAL PARAMETERS AT 25°C**

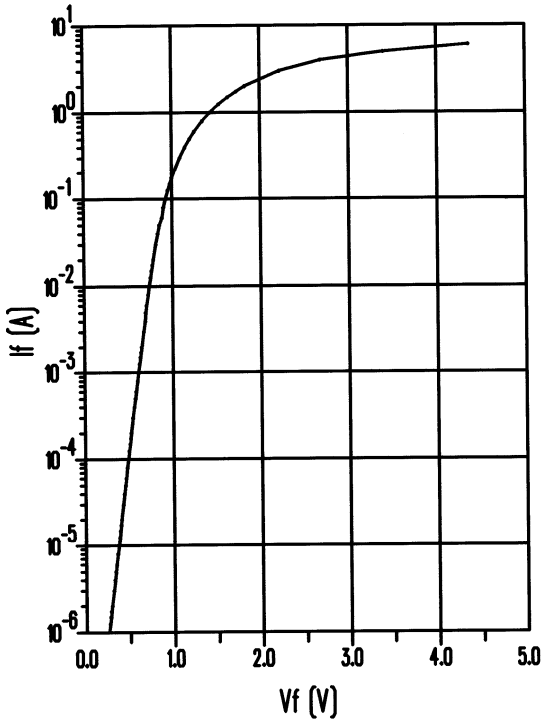
Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Forward Voltage (Note 1)	$V_F$	$I_F = 10 \text{ mA}, T_J = 25 \text{ }^\circ\text{C}$			1.0	V
		$I_F = 100 \text{ mA}, T_J = 25 \text{ }^\circ\text{C}$			1.2	V
Reverse Break Down Voltage	$V_{BR}$	$I_R = 100 \text{ } \mu\text{A}$	75			V
Reverse Current (Note1)	$I_R$	$V_R = 20 \text{ V}, T_J = 25 \text{ }^\circ\text{C}$			50	nA
		$V_R = 50 \text{ V}, T_J = 25 \text{ }^\circ\text{C}$			500	nA
Capacitance	$C_T$	$V_R = 0 \text{ V}, F = 1 \text{ MHz}$		1.5	3	pF
Conductance	G	$V_R = 0 \text{ V}, F = 64 \text{ MHz}$			40	$\mu\text{S}$

Note: 1 Short duration test pulse used to minimize self heating effect.

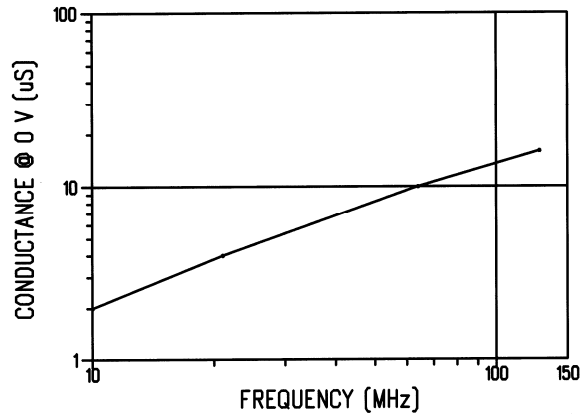


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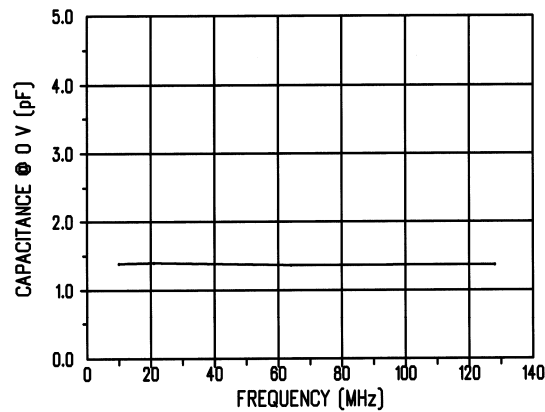
**VF VS IF**



**CONDUCTANCE VS FREQUENCY**



**CAPACITANCE VS FREQUENCY**



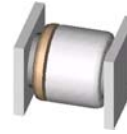
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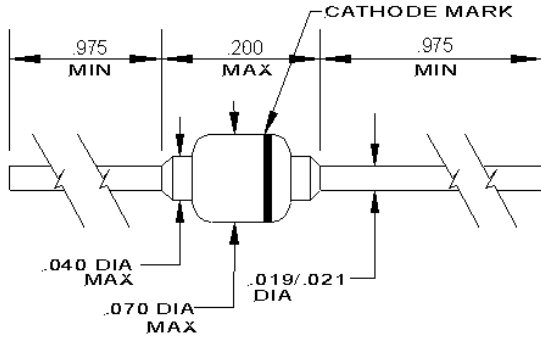
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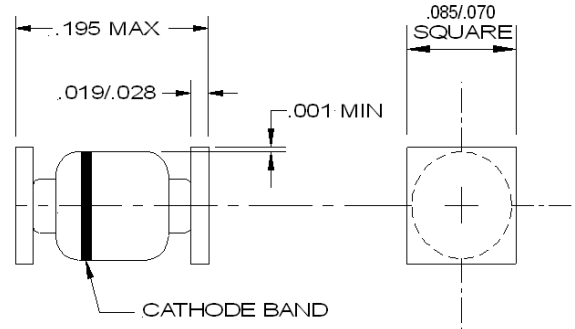
**Style "SM"**

**PACKAGE STYLE**

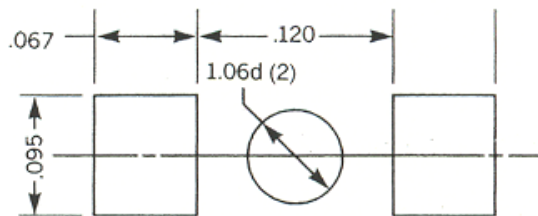
**UMX1089B**



**UMX1089SM**



**SM STYLE SOLDER FOOTPRINT**



**Revision History**

Revision Level / Date	Para. Affected	Description
1 / 23 December 2014	-	Initial Release

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