UMX5601™

ULTRA LOW MAGNETIC MOMENT PIN DIODE FOR MRI APPLICATIONS

RoHS compliant

DESCRIPTION

The UMX5601 PIN diode series was designed to provide ultra low magnetic PIN diodes for in bore surface coil applications associated with higher field strength (3T and greater) MR scanners. These PIN diodes produce the minimum artifacts (magnetic field distortions) available in the industry, today. The diodes have been tested in magnetic fields of ±7 Tesla. **The UMX5601 PIN diodes have a magnetic moment at 7 T of 4E-8 (J/T).**

The diodes are offered in axial or surface mount packages. The SM package utilizes a round end cap to mark the anode. The cathode is square. The fully passivated PIN diode chip is full face metallurgically bonded to shortened high conductive pins for lower thermal and electrical resistances. The PIN diodes feature low forward bias resistance and high zero bias impedance. The UMX5601 PIN diodes are characterized at 64, 128, and 300 MHz.

The UMX5601B and the UMX5601SM are RoHS compliant.

IMPORTANT: For the most current data, consult *MICROSEMI*'s website: **http://www.microsemi.com**

KEY FEATURES

- Ultra low magnetic construction
- SOGO passivated chip
- Thermally matched configuration
- RoHS compliant
- Low capacitance at 0 V bias
- Low conductance at 0 V bias
- Metallurgical bond
- Fused-in-glass construction
- Non cavity design
- Available in surface mount package.
- Compatible with automatic insertion equipment

ABSOLUTE MAXIMUM RATINGS AT 25° C (UNLESS OTHERWISE SPECIFIED)

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	100 100 100	V
RMS Reverse Voltage	$V_{R\ (RMS)}$	75	V
Storage Temperature	T stg	-65 to +175	ºC
Operating Temperature Non-Repetitive Peak	T op	-65 to +150	ºC

APPLICATIONS/BENEFITS

- High B Field (3T+) in bore APPLICATIONS:
- Active or semi-active (not passive)
- MR blocking circuits
- MR detuning circuits
- MR disable circuits
- MR receiver protector circuits

THERMAL CHARACTERISTICS (UNLESS OTHERWISE SPECIFIED)

Thermal Resistance			
UMX5601SM	θ	2	ºC/Watt

UMX5601™

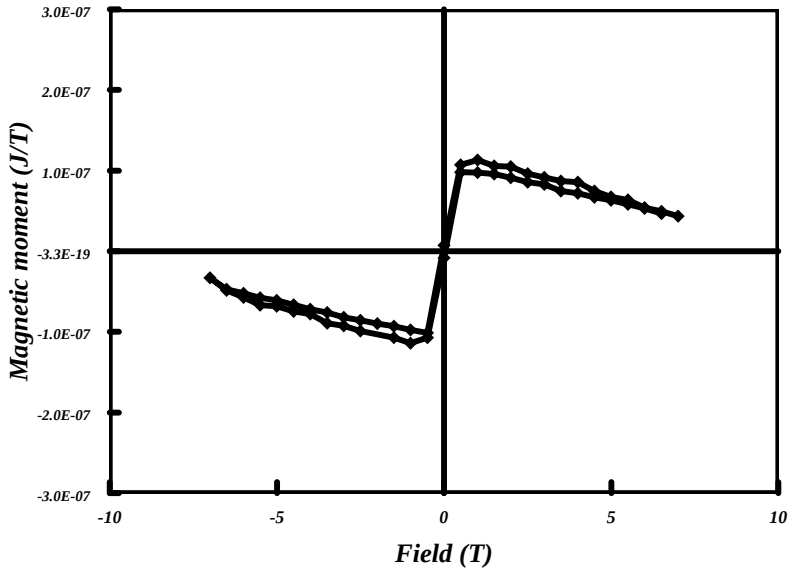
ULTRA LOW MAGNETIC MOMENT PIN DIODE FOR MRI APPLICATIONS

RoHS compliant

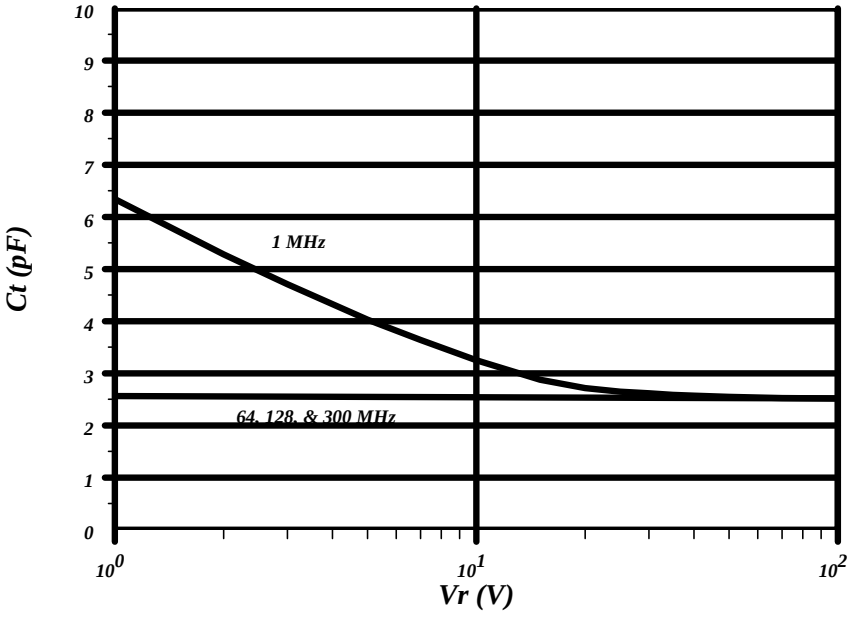
ELECTRICAL PARAMETERS @ 25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Forward Voltage (Note 1)	V_F	I_F = 100 mA		0.75	1.0	V
Reverse Break Down Voltage	V_{BR}	I_R = 10 uA	100			V
Reverse Current	I_R	V_R = 100 V			10	uA
Inductance	Ls			900		pH
Magnetic moment	**m**	**@ 7T** **@ 1T**		**4E-8** **1E-7**		**J/T** **J/T**
Mass Susceptibility	**χ_ρ**	**@ 7T** **@ 1T**		**-3.3E-11** **6.5E-10**		**m^3/kg** **m^3/kg**
Volume Susceptibility	**χ**	**>1T to 7T** **<1 T**		**-3.1E-7** **5.9E-6**		**SI** **SI**
Capacitance Parallel Resistance	C_T Rp	V_R = 0V, F = 1 MH_Z V_R = 50V, F = 1 MHz V_R = 0 V, F = 64 MHz V_R = 30 V, F = 64 MHz	 5 100	9 2.6 9 250	10.0 3.0	pF pF kOhms kOhms
Series Resistance	Rs	If = 100mA F = 64 MHz		0.3	0.5	Ohms
Lifetime	τ	If = 10 mA	5	10		us

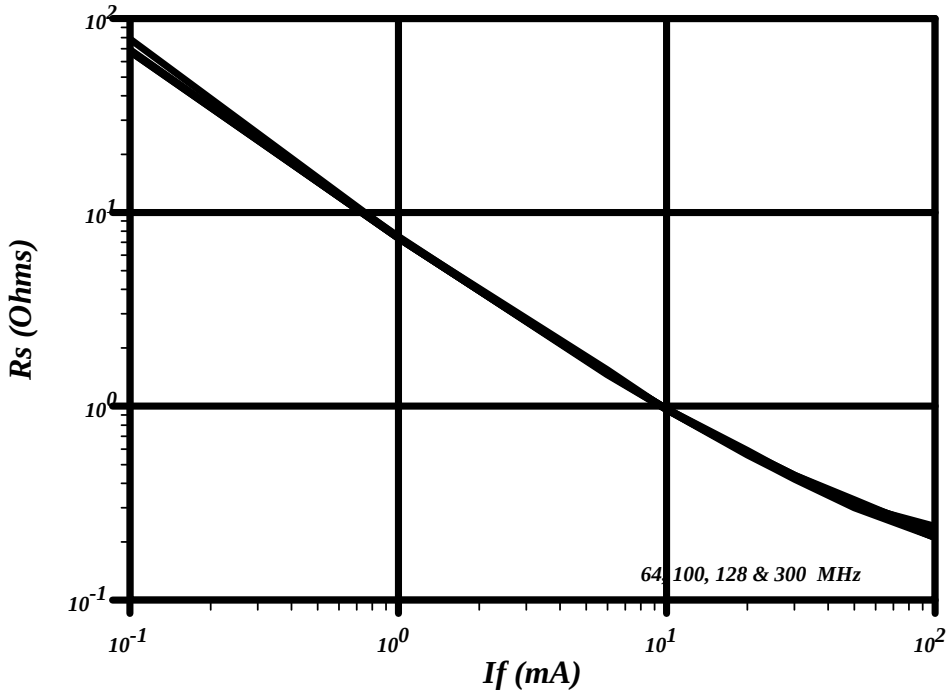
UMX5601SM



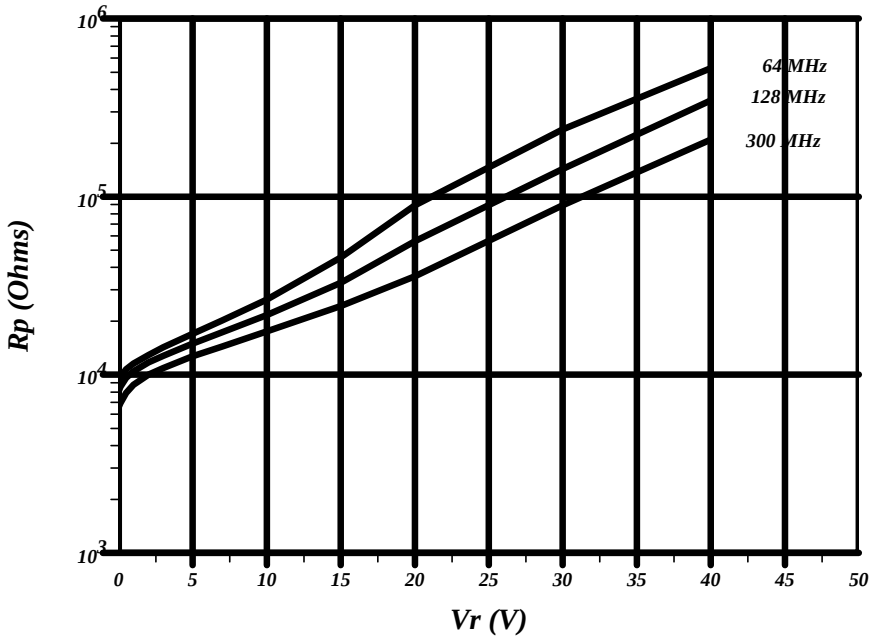
UMX5601
TYPICAL

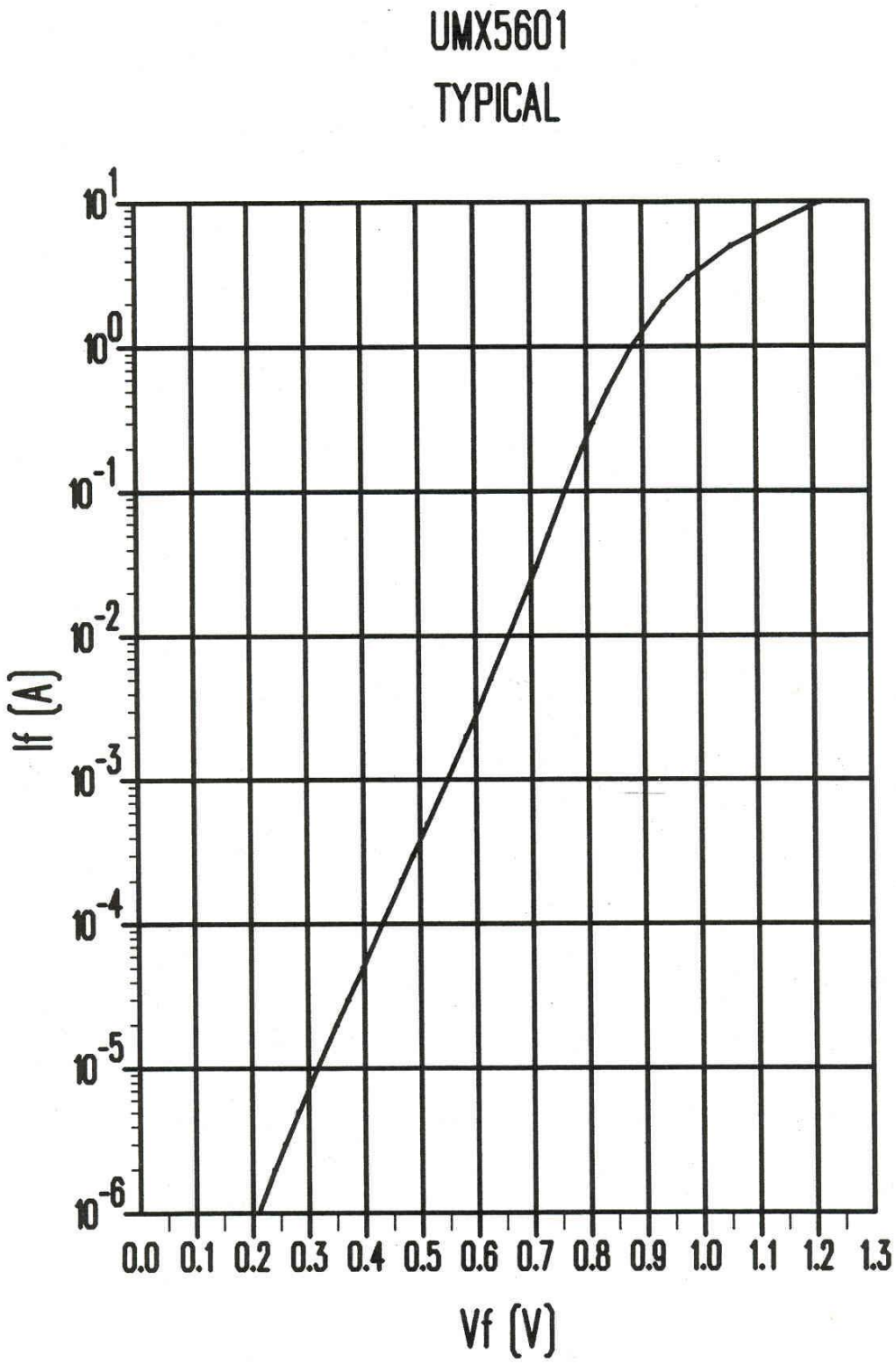


UMX5601
TYPICAL

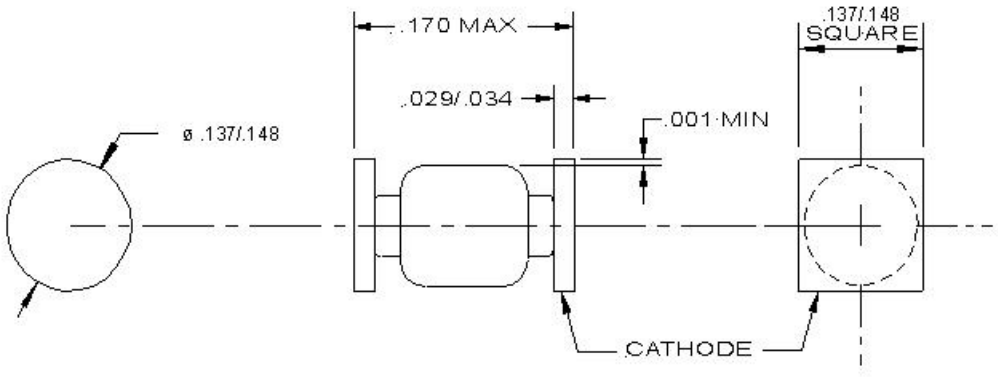


UMX5601
TYPICAL

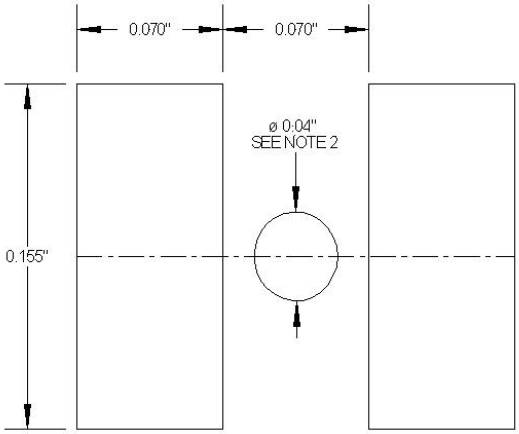




STYLE "SM"



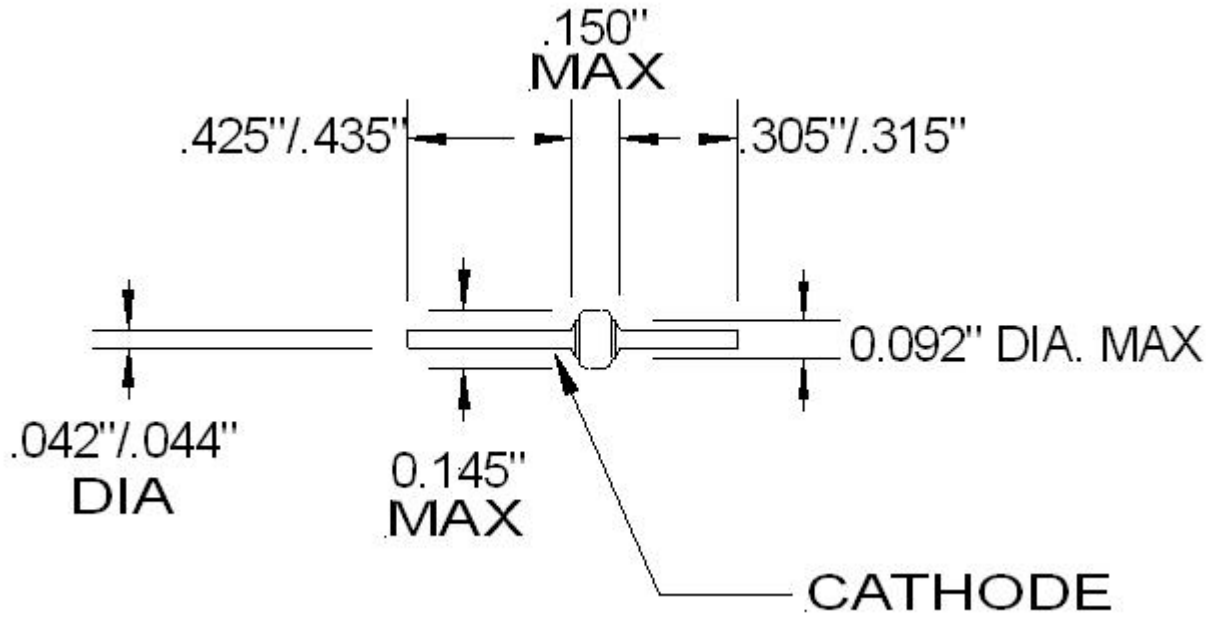
STYLE "SM" FOOTPRINT



NOTES:

1. These dimensions will match the terminals and provide for additional solder fillets at the outboard ends at least as wide as the terminals themselves, assuming accuracy of device placement within .005 inches.
2. If the mounting method chosen requires use of an adhesive separate from the solder compound, a round (or square) spot of cement as shown should be centrally located.
3. Dimensions shown are in inches.

STYLE "B"



Note:

Changing the lead lengths will alter the magnetic properties of the device.

NOTES:

NOTES