

UMX502-UMX812 Datasheet
Surface Mount—MELF PIN Diodes





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Revision History

1.1 Revision 1.0

Revision 1.0 was the first publication of this document.

Contents

Revision History.....	3
1.1 Revision 1.0.....	3
2 Product Overview	7
2.1 Applications	7
2.1.1 Key Features	7
2.1.2 Applications and Benefits	7
3 Electrical Specifications.....	8
3.1 Absolute Maximum Ratings	8
3.2 Device Electrical Parameters.....	8
3.3 Typical RS Curves	9
4 Package Outline.....	10

List of Figures

Figure 1 Typical RS Curves	9
Figure 2 UMX502-UMX812 Package Outlines.....	10

List of Tables

Table 1 Absolute Maximum Ratings	8
Table 2 Device Electrical Parameters at 25 °C	8
Table 3 UMX502-UMX812 Package Dimensions	10

2 Product Overview

This line of metal electrode leadless face (MELF) high-power PIN diodes consists of hermetically sealed surface mount packaged devices with full-face bonded chips for low-inductance construction. The MELF ceramic package has square-end terminations, which are ideal for surface mount and pick-and-place operations. The PIN diode chips are coated with a special hard glass passivation, which is required both for high-power applications and to enhance the reliability, resulting in mean time between failures (MTBFs) of greater than one million hours.

These RoHS-compliant products meet the requirements of EU Directive 2002/95/EC.

The standard terminal finish is matte tin unless otherwise specified. Alternative terminal finishes are available. Consult the factory if you have special requirements.

2.1 Applications

The MELF diodes are used as switching, attenuating, and phase-shifting elements from HF through 2 GHz, and have breakdown voltage ratings up to 500 V. Low-magnetic¹ Cer-Met MELFs are also used as switching elements in magnetic resonance imaging (MRI). Conventional magnetic MELF packages are used in cellular applications, beam-steering units (telephone via satellites), surface mount applications, and switch-filter banks for frequency-hopping radios.

1. RoHS versions are supplied with a matte tin finish.

2.1.1 Key Features

- Low-magnetic (ideal for MRI applications)
 - Very low inductance, full-face bonding
 - High-reliability hermetic design
 - Surface mount devices available in tape and reel
 - RoHS Compliant²
 - ESD HMB Class 2
2. RoHS versions are supplied with a matte tin finish.

2.1.2 Applications and Benefits

- Designed for low-loss and low-distortion applications
- Switch-filter bank
- T/R control
- Attenuators
- MRI switching

3 Electrical Specifications

3.1 Absolute Maximum Ratings

The following table shows the absolute maximum ratings at 25 °C unless otherwise specified.

Table 1 Absolute Maximum Ratings

Rating	Symbol	Value	Unit
Maximum leakage current at 80% of minimum rated V_B	I_R	500	nA
Forward current (1 μ S pulse)	I_F	1	A
Operating temperature	T_{OP}	–55 to 150	°C
Storage temperature	T_{STG}	–55 to 150	°C
Maximum solder temperature		260	°C

3.2 Device Electrical Parameters

The following table shows the absolute maximum ratings at 25 °C.

Table 2 Device Electrical Parameters at 25 °C

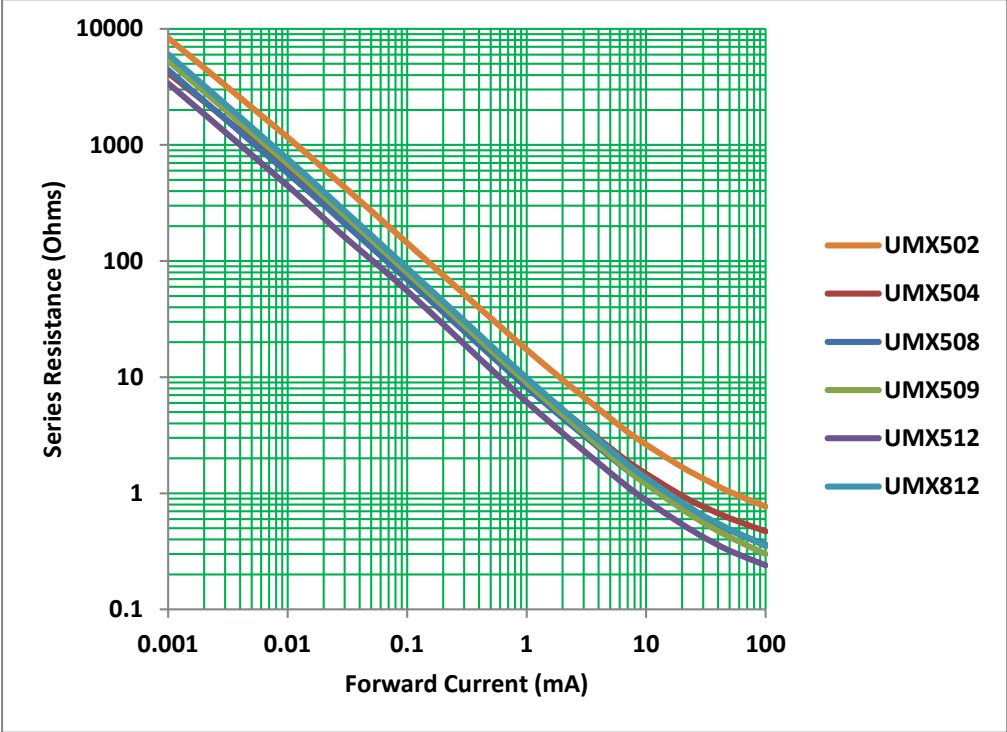
Model Number	$V_B(V)$ $I_R = 10 \mu A$	$C_T(pF)^3$ @50 V	$R_S(\Omega)^4$ @100 mA	$R_S(\Omega)^4$ @200 mA	$T_L(\mu S)$	$\theta_P (^{\circ}C/W)$ Thermal Resistance
	(Min)	(Max)	(Max)	(Typ)	(Typ)	(Max)
UMX502 – F	500	0.5	0.85	0.55	1.5	35
UMX504 – F	500	0.6	0.65	0.45	3.0	20
UMX508 – F	500	0.9	0.45	0.25	5.0	15
UMX509 – F	500	1.2	0.40	0.2	5.5	15
UMX512 – F	500	1.5	0.30	0.12	4.0	15
UMX812 – F	500	1.3	0.45	0.25	5.5	15

- Capacitance (C_T) is measured at $f = 1$ MHz.
- Series resistance (R_S) is measured at $f = 100$ MHz.

3.3 Typical RS Curves

The following illustration shows the typical RS curves.

Figure 1 Typical RS Curves



4 Package Outline

The UMX502-UMX812 devices have the following package outline specifications.

Figure 2 UMX502-UMX812 Package Outlines

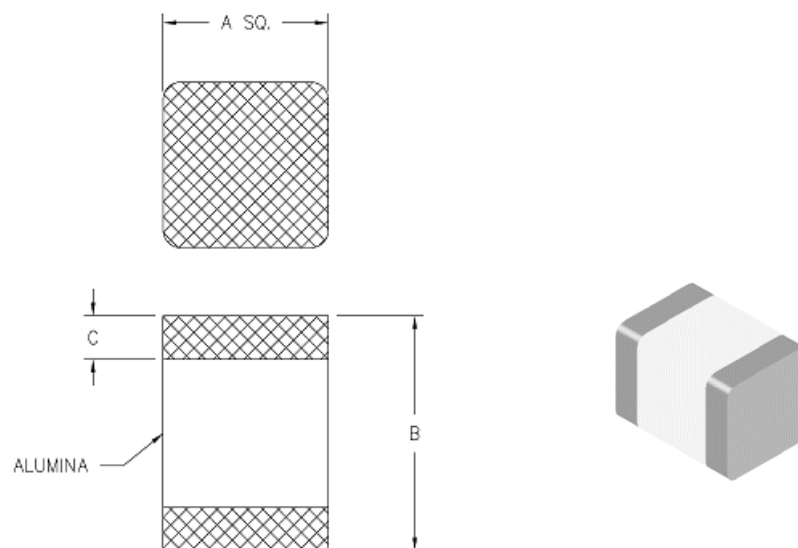


Table 3 UMX502-UMX812 Package Dimensions

DIM	Inches			Millimeters		
	Min	Typ	Max	Min	Typ	Max
A	0.080		0.095	2.032		2.413
B	0.115		0.135	2.921		3.429
C	0.008		0.030	0.203		0.762