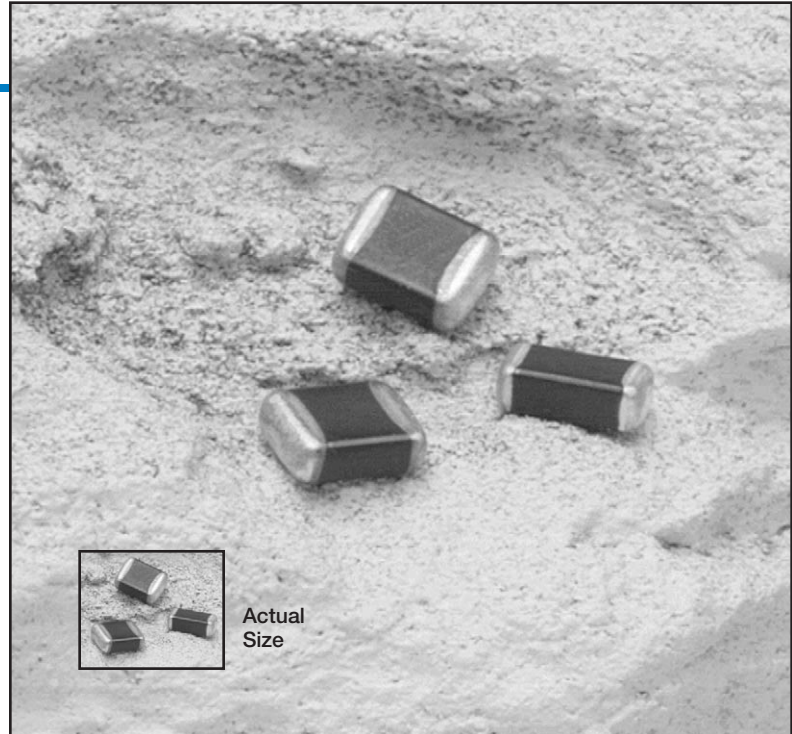


- **Metal Oxide Varistor**
- **Surface Mount**
- **General Purpose**
- **+125°C Maximum Temperature**



The MG series metal oxide varistors are the standard general purpose surface mount varistors from UCC/NCC. These varistors have a wide operating temperature range and are ideal for use in low energy circuit boards where all of the components are surface mounted. The MG series miniature multilayer ceramic design makes them ideal surge protectors for other components where circuit board space is limited.

Refer to the Mini-Glossary at the end of the metal oxide varistors section for additional technical information and specifications.

Summary of Specifications

- **Surface mount terminals.**
- **Operating temperature range: -40°C to $+125^{\circ}\text{C}$.**
- **Maximum voltage range: 6 to 20VAC or 8.5 to 26VDC.**
- **Standard varistor voltage tolerance: $\pm 10\%$**
- **Maximum energy: 1 to 2J depending on case size.**
- **Maximum surge current: 80 to 315A.**
- **Nominal case size (L×W×H): $3.2 \times 1.6 \times 1.0\text{mm}$ and $3.2 \times 2.5 \times 1.0\text{mm}$.**

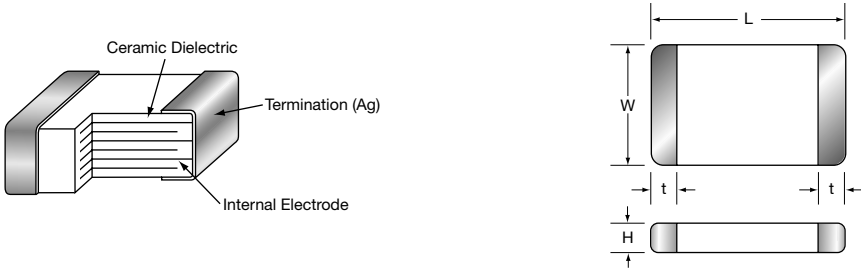
MG Series

MG Specifications

Item	Characteristics
Operating Temperature Range	-40 to +125°C
Storage Temperature Range	-50 to +150°C
Maximum Voltage Range	6 to 20VAC or 8.5 to 26VDC
Varistor Voltage	12 to 33V at 1mA DC
Varistor Voltage Tolerance	±10%
Maximum Energy	1 to 2 Joules at 2ms
Maximum Surge Current	80 to 315A at 8/20µs
Nominal Case Size (L×W×H)	3.2×1.6×1.0mm and 3.2×2.5×1.0mm

Construction and Diagram of Dimensions

Metal Oxide Varistor/Surface Mount Terminals Unit: mm and inches



Case Dimensions (mm)

UCC Case Code	EIA Case Code	L ±0.2	W ±0.2	H ±0.2	t ±0.3
30	1206	3.2	1.6	1.0	0.6
40	1210	3.2	2.5	1.0	0.6

Case Dimensions (inches)

UCC Case Code	EIA Case Code	L ±0.008	W ±0.008	H ±0.008	t ±0.012
30	1206	0.126	0.063	0.039	0.024
40	1210	0.126	0.098	0.039	0.024

Part Numbering System for MG Series

When ordering, always specify complete catalog number for MG Series.

TNR	30	MG	A	12	
					<p>Nominal Varistor Voltage: Expressed in volts. (e.g. 12 = 12VDC).</p> <p>Surge Current Capability: A = High; B = Low.</p> <p>Series Name: Indicates Basic Varistor Style.</p> <p>UCC Case Code: 30 and 40 (EIA Case Code 1206 and 1210).</p> <p>TNR: Alpha Prefix for Varistors.</p>

MG Series

Varistor Standard Ratings - Surface Mount

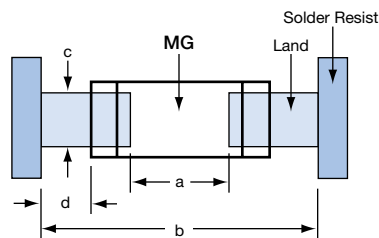
Case Code	Catalog Part Number	Maximum Applied Voltage (Continuous)		Maximum Peak Current (8/20 μ sec.) (A)	Maximum Energy (2msec.) (J)	Maximum Clamping Voltage		Capacitance (typical) at 1kHz (pF)	Varistor Voltage at 1mA DC (V \pm 10%)
		VAC _{rms}	VDC			(A)	(V)		
30 (1206)	TNR30MGA12	6.0	8.5	160	1.0	2	22	1,811	12
	TNR30MGA15	7.8	11.0	160	1.0	2	28	1,449	15
	TNR30MGA18	9.1	12.8	160	1.0	2	32	1,208	18
	TNR30MGA20	10.6	15.0	160	1.0	2	35	1,087	20
	TNR30MGA22	12.0	16.5	160	1.0	2	40	988	22
	TNR30MGA24	14.0	18.0	160	1.0	2	42	906	24
	TNR30MGA27	17.0	22.0	160	1.0	2	50	805	27
	TNR30MGA33	20.0	26.0	160	1.0	2	60	659	33
	TNR30MGB12	6.0	8.5	80	1.0	1	22	776	12
	TNR30MGB15	7.8	11.0	80	1.0	1	28	621	15
	TNR30MGB18	9.1	12.8	80	1.0	1	32	518	18
	TNR30MGB20	10.6	15.0	80	1.0	1	35	466	20
	TNR30MGB22	12.0	16.5	80	1.0	1	40	423	22
	TNR30MGB24	14.0	18.0	80	1.0	1	42	388	24
TNR30MGB27	17.0	22.0	80	1.0	1	50	345	27	
TNR30MGB33	20.0	26.0	80	1.0	1	60	282	33	

40 (1210)	TNR40MGA12	6.0	8.5	315	2.0	5	22	3,623	12
	TNR40MGA15	7.8	11.0	315	2.0	5	28	2,898	15
	TNR40MGA18	9.1	12.8	315	2.0	5	32	2,415	18
	TNR40MGA20	10.6	15.0	315	2.0	5	35	2,174	20
	TNR40MGA22	12.0	16.5	315	2.0	5	40	1,976	22
	TNR40MGA24	14.0	18.0	315	2.0	5	42	1,811	24
	TNR40MGA27	17.0	22.0	315	2.0	5	50	1,610	27
	TNR40MGA33	20.0	26.0	315	2.0	5	60	1,317	33
	TNR40MGB12	6.0	8.5	160	2.0	2	22	1,553	12
	TNR40MGB15	7.8	11.0	160	2.0	2	28	1,242	15
	TNR40MGB18	9.1	12.8	160	2.0	2	32	1,035	18
	TNR40MGB20	10.6	15.0	160	2.0	2	35	932	20
	TNR40MGB22	12.0	16.5	160	2.0	2	40	847	22
	TNR40MGB24	14.0	18.0	160	2.0	2	42	776	24
TNR40MGB27	17.0	22.0	160	2.0	2	50	690	27	
TNR40MGB33	20.0	26.0	160	2.0	2	60	565	33	

Soldering Specifications

Recommended Soldering Land Design

Unit: mm and inches



Soldering Land Dimensions (mm)

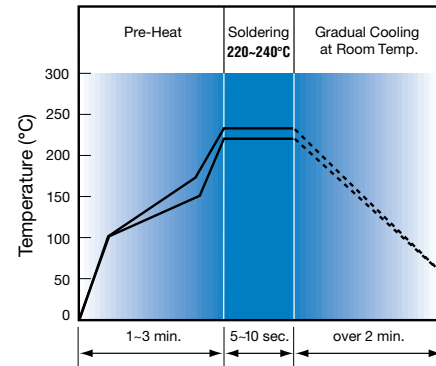
UCC Case Code	EIA Case Code	a	b	c	d
30	1206	1.8-2.5	4.2-5.8	1.2-1.6	0.4-0.8
40	1210	1.8-2.5	4.2-5.8	1.8-2.5	0.5-1.0

Soldering Land Dimensions (inches)

UCC Case Code	EIA Case Code	a	b	c	d
30	1206	.071-.098	.165-.228	.047-.063	.016-.031
40	1210	.071-.098	.165-.228	.071-.098	.020-.039

Recommended Soldering Temperature Profile

Reflow Method



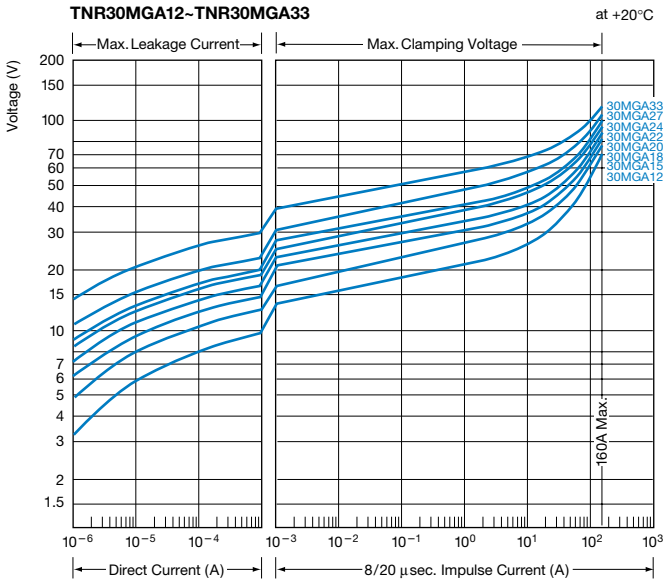
Soldering Guidelines

1. The MG series varistors are designed for reflow soldering only. Do not use flow soldering.
2. Use Sn/Pb/Ag (62/36/2) or equivalent solder.
3. Use inactive rosin flux (Cl content 0.2% max.).
4. Follow the recommended soldering conditions to avoid varistor damage.

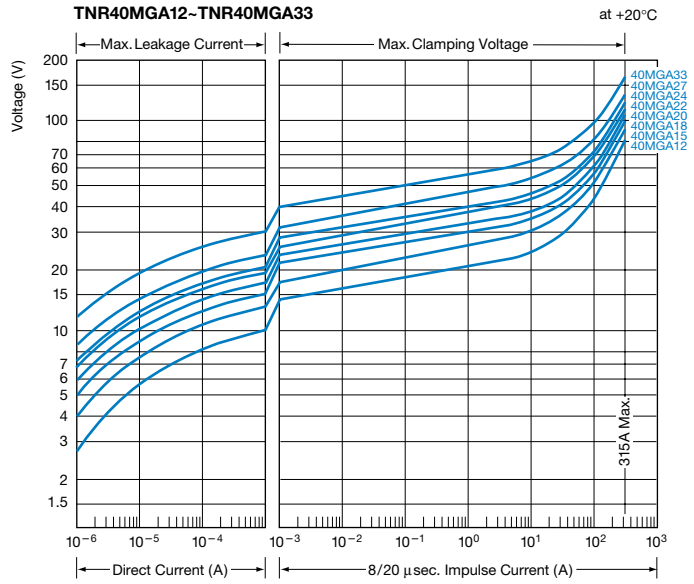
MG Series

Varistor Volt-Ampere Characteristics

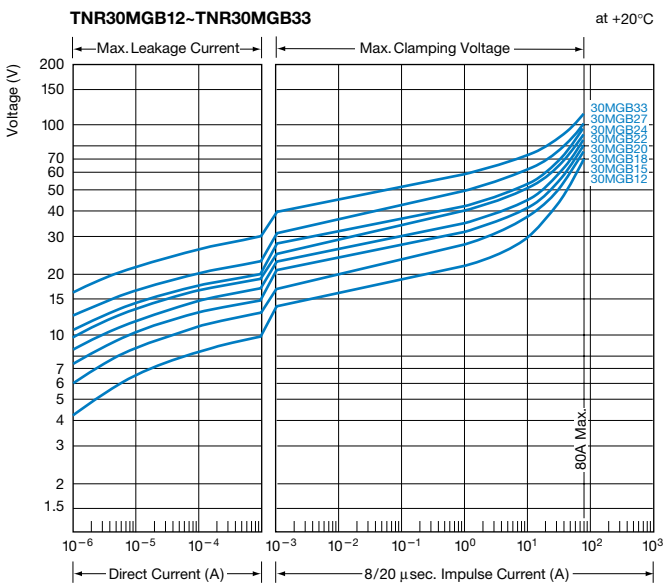
V-I Curve-30A Case Code



V-I Curve-40A Case Code



V-I Curve-30B Case Code



V-I Curve-40B Case Code

