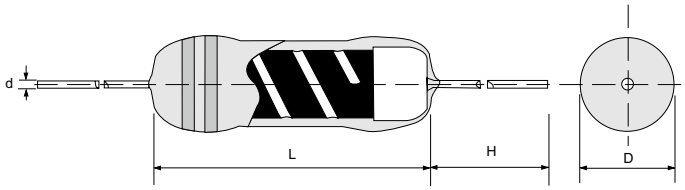
MO
Metal Oxide Film Fixed Resistor

Quality • Reliability
Cost-Down via Innovation



Specifications Per

- IEC 60115-4
- MIL-11804

Features

- Flameproof multi-layer coating equivalent to UL 94 V-0
- Flameproof feature equivalent to overload test UL 1412
- Solvent resistant
- Special tin-plated electrolytic copper lead wire
- Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

DIMENSIONS

Type	Body Length (L, mm)	Body Diameter (D, mm)	Lead Wire Length (H, mm)	Lead Wire Diameter (d, mm)	Net Weight Per 1000Pcs
MO50	9.00 ± 1.0	3.2 ± 0.2	28 ± 3.0	0.6 ± 0.03	340 Grams
MO100	11.0 ± 1.0	4.0 ± 0.5	28 ± 3.0	0.7 ± 0.03	500 Grams
MO200	13.5 ± 1.0	5.0 ± 0.5	30 ± 3.0	0.8 ± 0.03	1050 Grams
MO300	15.5 ± 1.0	5.5 ± 0.5	30 ± 3.0	0.8 ± 0.03	1200 Grams
MO400	19.0 ± 1.0	6.0 ± 0.5	30 ± 3.0	0.8 ± 0.03	1620 Grams
MO500	19.0 ± 1.0	8.0 ± 0.5	30 ± 3.0	0.8 ± 0.03	3100 Grams
MO600	24.0 ± 1.0	8.0 ± 0.5	35 ± 3.0	0.8 ± 0.03	3700 Grams
MO700	31.5 ± 1.0	8.0 ± 0.5	35 ± 3.0	0.8 ± 0.03	4000 Grams

GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
MO50	1/2W	350V	600V	0.1Ω	120KΩ	±5%	E-24
MO100	1W	350V	600V	0.1Ω	120KΩ	±5%	E-24
MO200	2W	350V	700V	0.1Ω	150KΩ	±5%	E-24
MO300	3W	350V	700V	0.1Ω	150KΩ	±5%	E-24
MO400	4W	450V	800V	0.1Ω	180KΩ	±5%	E-24
MO500	5W	500V	1000V	0.1Ω	200KΩ	±5%	E-24
MO600	6W	500V	1000V	0.1Ω	220KΩ	±5%	E-24
MO700	7W	600V	1200V	0.22Ω	220KΩ	±5%	E-24

Special sizes, values, and specifications not listed available on special order.

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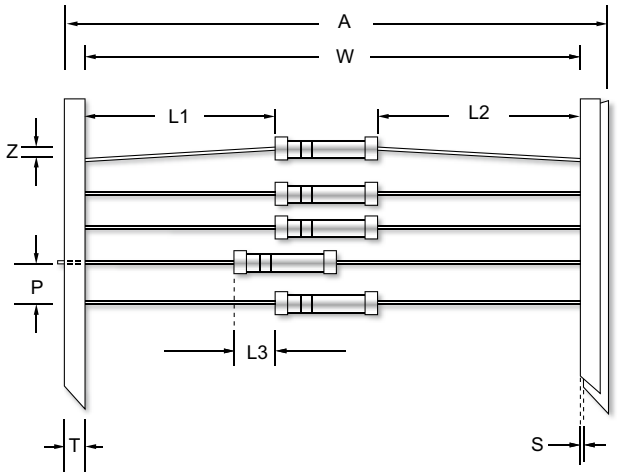
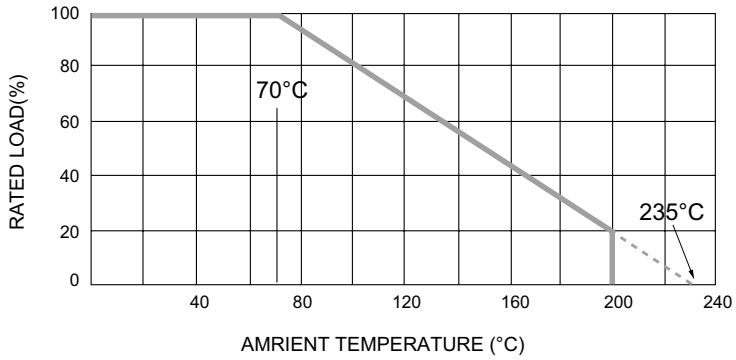
TAPING SPECIFICATIONS



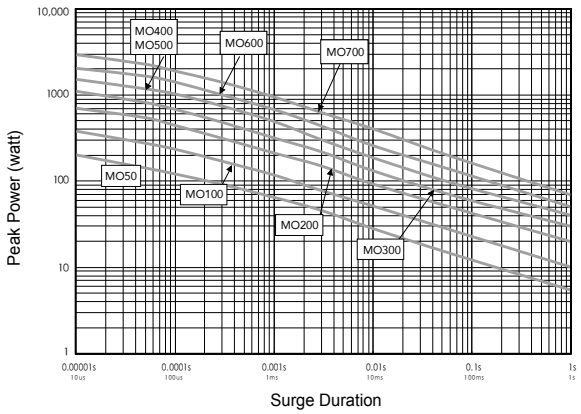
Unit (mm)

Type	A (Max.)	L1-L2 (Max.)	L3 (Max.)	P ±0.5	S (Max.)	T ±0.5	W ±1.5	Z (Max.)
MO50	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
MO100	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
MO200	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
MO300	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
MO400	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
MO500	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
MO600	97	±1.5	1.0	10.0	0.8	6.0	83.0	1.2
MO700	97	±1.5	1.0	10.0	0.8	6.0	83.0	1.2

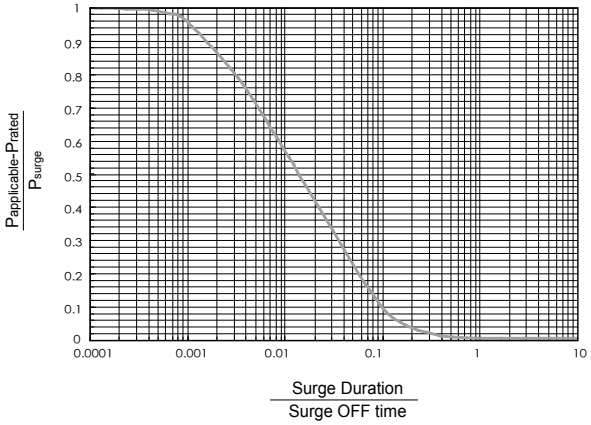
POWER DERATING CURVE



SINGLE SURGE PERFORMANCE



SURGE POWER DERATING CURVE



Notes:

• SINGLE SURGE PERFORMANCE graph is good for NON REPETITIVE applications operating in an ambient temperature of 70°C or less. For temperatures above 70°C, the graph power must be derated further linearly down to zero at 200°C.

• To determine applicable surge power in continuous-surge applications:

1. Identify allowable duration and peak power P_{surge} of single surge;
2. Determine ratio of surge duration/surge OFF time in application;
3. Calculate $P_{applicable}$ backwardly according to Y-axis of SURGE POWER DERATING CURVE.

PART NUMBER

Example: MO200J10K0TKZTB500

MO200	J	10K0	TKZ	TB500
Type	Tolerance	Resistance	TCR	Packaging
	J (5%)	10KΩ **4-character code** containing - 3 significant digits 1 letter multiplier OHM MULTIPLIER R = 1 K = 10^3 M = 10^6 G = 10^9	**3-character code** TKZ = Default Product Temperature Coefficient. Information of typical product temperature coefficient can be found in the Technical Summary section of the datasheet.*	**5-character code** TB = Tape Box (pieces per box) MO50 2K0 = 2,000 MO100 1K0 = 1,000 MO200/300/400 500 = 500 MO500 400 = 400 MO600/700 350 = 350

*** For the availabilities of non-default temperature coefficient, please check with us. Reference for TCR letter codes can be found in section (4) of Part Number Construction in the Appendices.**

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TECHNICAL SUMMARY

Characteristics	Limits
Dielectric Withstanding Voltage, VAC or DC	MO50: 350 MO100 / MO200: 600 MO300 to MO700 : 1000
Temperature Coefficient, PPM / °C*	Typically ±300
Operating Temperature Range, °C	-55~+200
Insulation Resistance, MΩ	10^4

*** Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).**

PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits
Short Time Over Load	**IEC 60115-1 4.13** 5 seconds 2.5x rated voltage (not over max. overload voltage)	±1%
Load Life In Humidity	**IEC 60115-1 4.24** 56 days rated load (not over max. working voltage) at (40±2)°C and (93±3)% relative humidity	±5%
Load Life	**IEC 60115-1 4.25.1** Rated load (not over max. working voltage) 1,000 hours with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	±5%
Resistance To Soldering Heat	**IEC 60115-1 4.18.2** Leads immersed till 3mm from the body in (260±5)°C solder for 10±1 seconds	±1%
Solderability	**IEC 60115-1 4.17.2** Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	95% min.coverage
Vibration	**IEC 60115-1 4.22** Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 1.52mm and 10 to 2,000 Hz.	±0.5%
Thermal Endurance	**IEC 60115-1 4.25.3** 1000 hours at 200°C without load	±1%
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +150°C 30minutes, 5 cycles	±2%

MO MINIATURE SIZE
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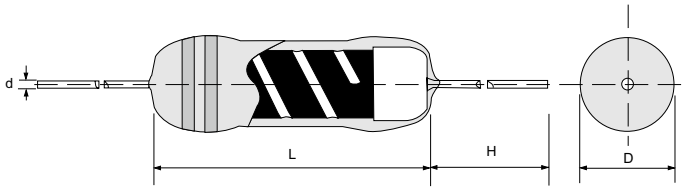

Specifications Per

- IEC 60115-4
- MIL-11804

Features

- Flameproof multi-layer coating equivalent to UL 94 V-0
- Flameproof feature equivalent to overload test UL 1412
- Solvent resistant
- Special tin-plated electrolytic copper lead wire
- Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

DIMENSIONS

Type	Body Length (L, mm)	Body Diameter (D, mm)	Lead Wire Length (H, mm)	Lead Wire Diameter (d, mm)	Net Weight Per 1000Pcs
MO51	6.50 ± 1.0	2.6 ± 0.2	26 ± 3.0	0.6 ± 0.03	300 Grams
MO101	9.00 ± 1.0	3.2 ± 0.5	28 ± 3.0	0.6 ± 0.03	340 Grams
MO201	11.0 ± 1.0	4.0 ± 0.5	28 ± 3.0	0.7 ± 0.03	500 Grams
MO301	13.5 ± 1.0	5.0 ± 0.5	30 ± 3.0	0.8 ± 0.03	1050 Grams
MO401	15.5 ± 1.0	5.5 ± 0.5	30 ± 3.0	0.8 ± 0.03	1200 Grams
MO501	19.0 ± 1.0	6.0 ± 0.5	30 ± 3.0	0.8 ± 0.03	1620 Grams
MO601	19.0 ± 1.0	8.0 ± 0.5	30 ± 3.0	0.8 ± 0.03	3100 Grams

GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
MO51	1/2W	250V	500V	0.1Ω	100KΩ	±5%	E-24
MO101	1W	300V	600V	0.1Ω	120KΩ	±5%	E-24
MO201	2W	350V	600V	0.1Ω	120KΩ	±5%	E-24
MO301	3W	350V	700V	0.1Ω	150KΩ	±5%	E-24
MO401	4W	350V	700V	0.1Ω	150KΩ	±5%	E-24
MO501	5W	450V	800V	0.1Ω	180KΩ	±5%	E-24
MO601	6W	500V	800V	0.1Ω	200KΩ	±5%	E-24

Special sizes, values, and specifications not listed available on special order.

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PART NUMBER

Example: MO301J10K0TKZTB500

MO301	J	10K0	TKZ	TB500
Type	Tolerance	Resistance	TCR	Packaging
	J (5%)	10KΩ **4-character code** containing - 3 significant digits 1 letter multiplier OHM MULTIPLIER R = 1 K = 10^3 M = 10^6 G = 10^9	**3-character code** TKZ = Default Product Temperature Coefficient. Information of typical product temperature coefficient can be found in the Technical Summary section of the datasheet.*	**5-character code** TB = Tape Box (pieces per box) MO51/MO101 2K0 = 2,000 MO201 1K0 = 1,000 MO301/401/501 500 = 500 MO601 400 = 400

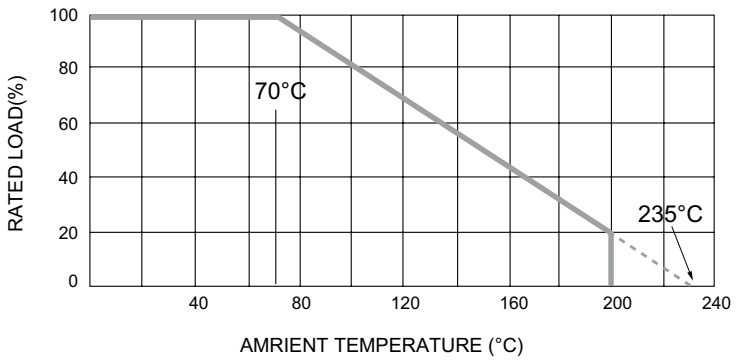
*** For the availabilities of non-default temperature coefficient, please check with us.**
Reference for TCR letter codes can be found in section (4) of Part Number Construction in the Appendices.

TECHNICAL SUMMARY

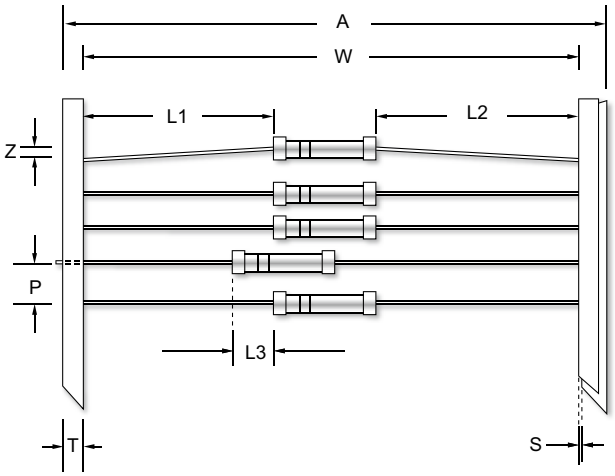
Characteristics	Limits	
Dielectric Withstanding Voltage, VAC or DC	MO51 MO101 MO201 to MO401 MO501 MO601	250V 300V 350V 450V 500V
Temperature Coefficient, PPM/°C*	Typically ±300	
Operating Temperature Range, °C	-55 ~ +200	
Insulation Resistance, MΩ	10^4	

*** Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).**

POWER DERATING CURVE



TAPING SPECIFICATIONS



Unit (mm)

Type	A (Max.)	L1-L2 (Max.)	L3 (Max.)	P ±0.5	S (Max.)	T ±0.5	W ±1.5	Z (Max.)
MO51	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
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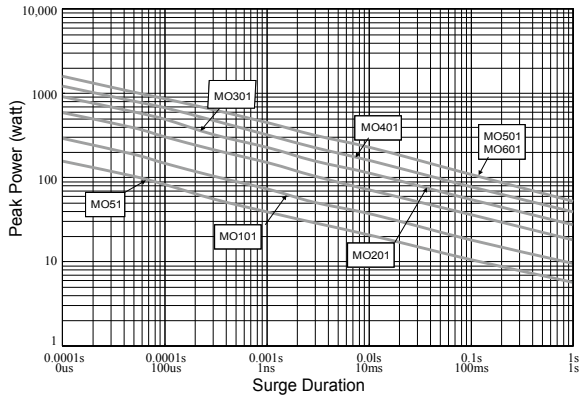
SINGLE SURGE PERFORMANCE



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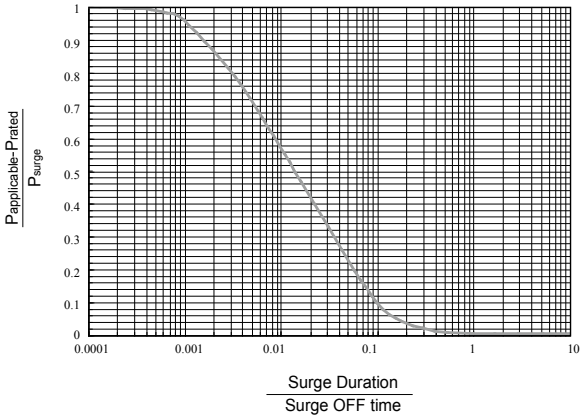

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Load Life	**IEC 60115-1 4.25.1** Rated load (not over max. working voltage) 1,000 hours with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	±5%
Resistance To Soldering Heat	**IEC 60115-1 4.18.2** Leads immersed till 3mm from the body in (260±5)°C solder for 10±1 seconds	±1%
Solderability	**MIL-STD-202 Method 208** Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	95% min.coverage
Vibration	**MIL-STD-202 Method 204** Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 1.52mm and 10 to 2,000 Hz.	±0.5%
Thermal Endurance	**IEC 60115-1 4.25.3** 1000 hours at 200°C without load	±1%
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +150°C 30minutes, 5 cycles	±1%