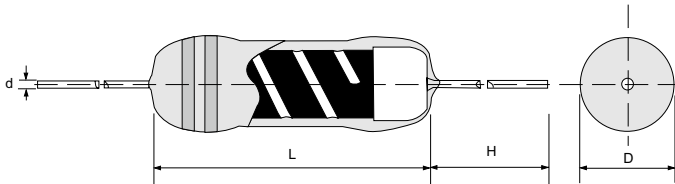


MO Metal Oxide Film Fixed Resistor

Quality • Reliability
Cost-Down via Innovation.

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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
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	30 ± 3.0	0.8 ± 0.03	3700 Grams
MO700	31.5 ± 1.0	8.0 ± 0.5	30 ± 3.0	0.8 ± 0.03	4000 Grams
MO1000	52.5 ± 1.5	8.0 ± 0.5	39 ± 3.0	0.8 ± 0.03	6900 Grams

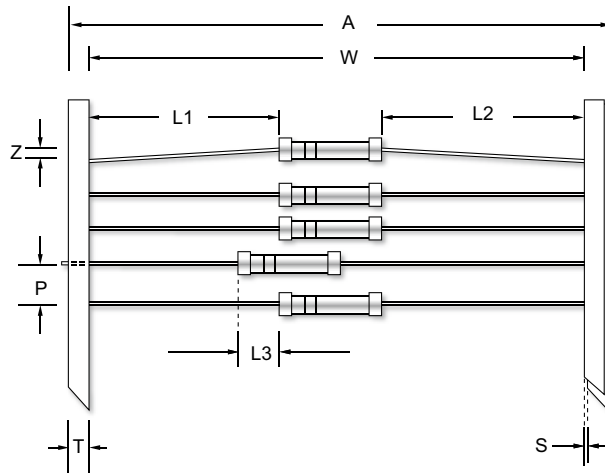
■ GENERAL SPECIFICATIONS

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
MO1000	10W	1000V	2000V	0.33Ω	330KΩ	±5%	E-24

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

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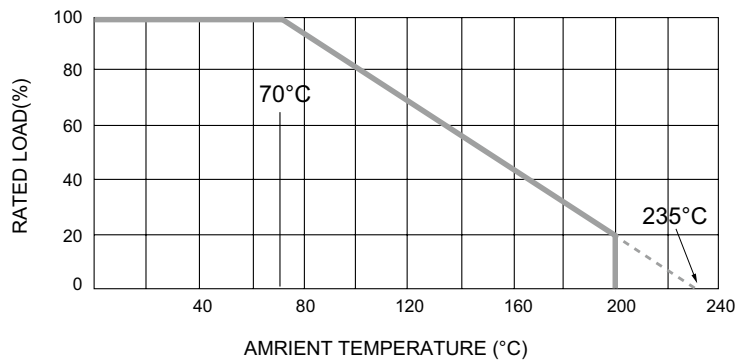
■ TAPING SPECIFICATIONS



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
MO1000	Available only in bulk package.							

■ POWER DERATING CURVE



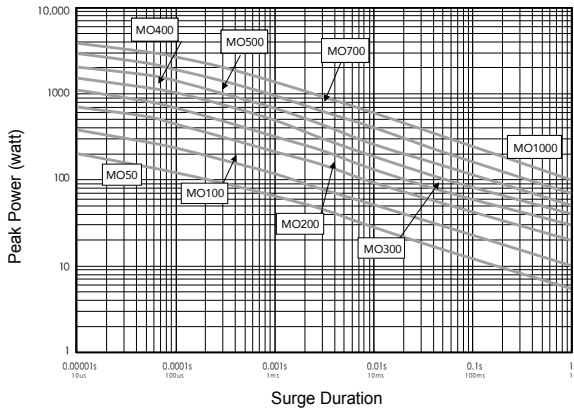
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MO Metal Oxide Film Fixed Resistor

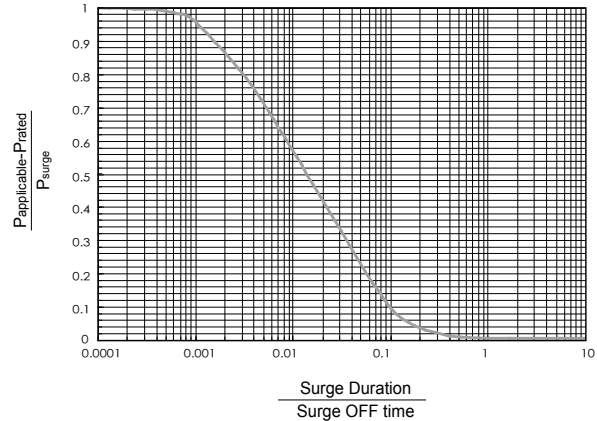
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■ SINGLE SURGE PERFORMANCE



■ 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 <u>OHM MULTIPLIER</u> 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 MO600/700 250 = 250 (Bulk Packaging Only) MO1000 BK250

* 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	MO50: 350 MO100 / MO200: 600 MO300 to MO1000: 1000
Temperature Coefficient, PPM / °C*	Typically ±300
Operating Temperature Range, °C	-55~+200
Insulation Resistance, MΩ	10 ⁴

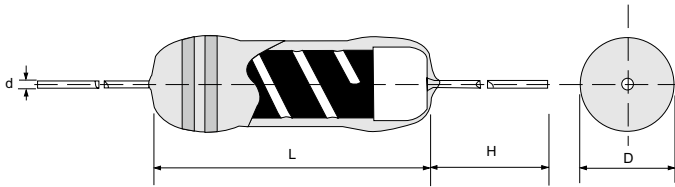
* Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).

■ 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 1,000 hours	IEC 60115-1 4.25.1 Rated load (not over max. working voltage) 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	90% Min.
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.	±1%
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%

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Cost-Down via Innovation.

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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.

Quality • Reliability
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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) <u>MO51/MO101</u> 2K0 = 2,000 <u>MO201</u> 1K0 = 1,000 <u>MO301/401/501</u> 500 = 500 <u>MO601</u> 400 = 400

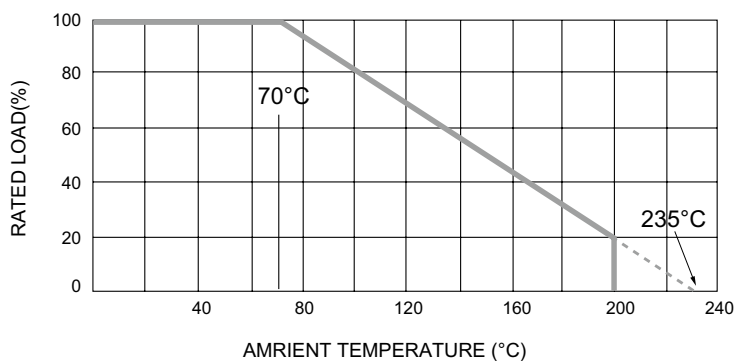
* For the availabilities of non-default temperature coefficient, please check with us.
Reference for TCR letter codes can be found in section (4) of Part Number Construction in the Appendices.

■ 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).

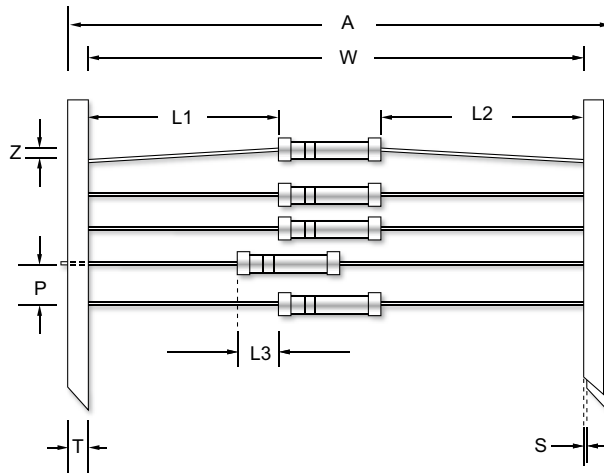
■ POWER DERATING CURVE



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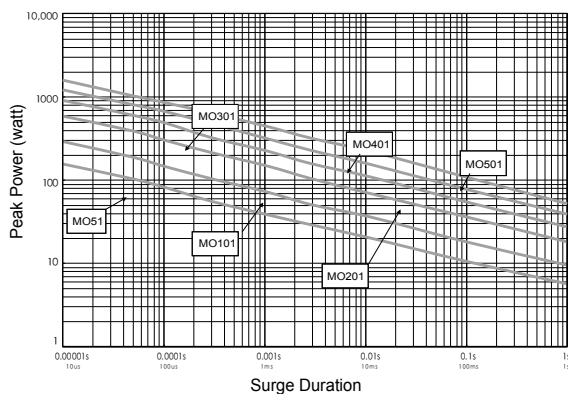
TAPING SPECIFICATIONS



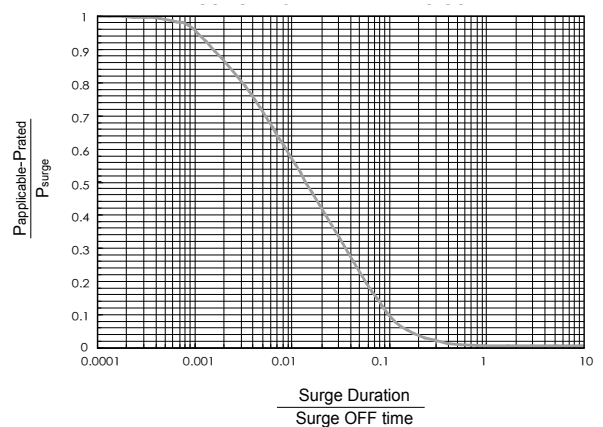
Unit (mm)

Type	A (Max.)	L1-L2 (Max.)	L3 (Max.)	P ±0.5	S (Max.)	T ±0.5	W ±1.5	Z (Max.)
MO51	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
MO101	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
MO201	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
MO301	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
MO401	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
MO501	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2
MO601	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2

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.

Quality • Reliability
Cost-Down via Innovation.

■ 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 1,000 hours	IEC 60115-1 4.25.1 Rated load (not over max. working voltage) 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	90% Min.
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.	±1%
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%

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