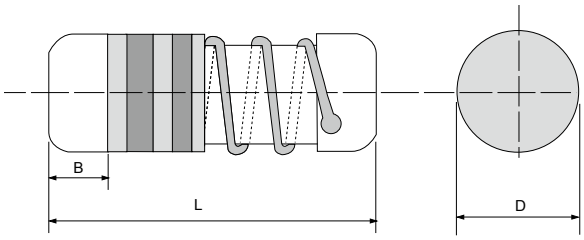
SWMT – Anti-Surge Wire Wound Fast-Fuse MELF Resistors (Preliminary)

Quality • Reliability
Cost-Down via Innovation



[*Patent approval]
Taiwan patent number: I637420
United States patent number: US10170266B2
China patent number: ZL201780088781.6
Japan patent number: 6836669

Applications

- Lighting devices
- Motor start-up protection
- Power supplies & Power adapters
- High rush current protection for power capacitor

Specifications Per

- IEC 60115-1, 60115-4

Features

- Worldwide patent pending
- Enhanced welded spot is reliable against surge
- Fast-acting fuse device for high-power applications
- Advanced combined anti- surge & fast-fuse structure
- Excellent in heat dissipation than chip resistor
- Stronger mechanical structure to endure vibration and thermal shock
- Flameproof multi-layer coating equivalent to UL 94 V-0
- Flameproof feature equivalent to overload test UL 1412
- Thermal fuse to protect against over-heating in electronic products
- SMD enabled structure
- RoHS / REACH Compliant

DIMENSIONS

Type	Body Length (L, mm)	Body Diameter (D, mm)	Soldering Spot (B, mm)
SWMT100	8.50 ± 0.5	3.0 ± 0.2	1.3 Min.
SWMT200	10.5 ± 0.5	4.0 ± 0.5	1.6 Min.
SWMT300	12.6 ± 0.6	4.6 ± 0.5	1.8 Min.
SWMT400	14.6 ± 0.6	5.1 ± 0.5	2.0 Min.

GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage*	Maximum Overload Voltage**	Maximum Permissible Surge Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
SWMT100	1W	$\sqrt{PxR}$	$2.5x\sqrt{PxR}$	7.5KV	1 Ω	470Ω	± 5%	E-24
SWMT200	2W	$\sqrt{PxR}$	$2.5x\sqrt{PxR}$	8.5KV	1 Ω	470Ω	± 5%	E-24
SWMT300	3W	$\sqrt{PxR}$	$2.5x\sqrt{PxR}$	9KV	1 Ω	470Ω	± 5%	E-24
SWMT400	4W	$\sqrt{PxR}$	$2.5x\sqrt{PxR}$	11KV	1 Ω	470Ω	± 5%	E-24

*** Rated Continuous Maximum Working Voltage (RCWV) should be determined from RCWV = $\sqrt{\text{Power Rating x Resistance Values}}$**
**** Short-time Overload (STOL) test should be determined from STOL=2.5 × RCWV**

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PART NUMBER

Example: SWMT200J2R80TKZBK2K0

SWMT200	J	2R80	TKZ	BK2K0
Type	Tolerance	Resistance	TCR	Packaging
	J (5%)	2.8Ω **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** TR= Tape Reel (pieces per reel) SWMT100 2K5=2,500 SWMT200 2K0=2,000 BK = Bulk SWMT100/SWMT200 SWMT300/SWMT400 BK + Quantity

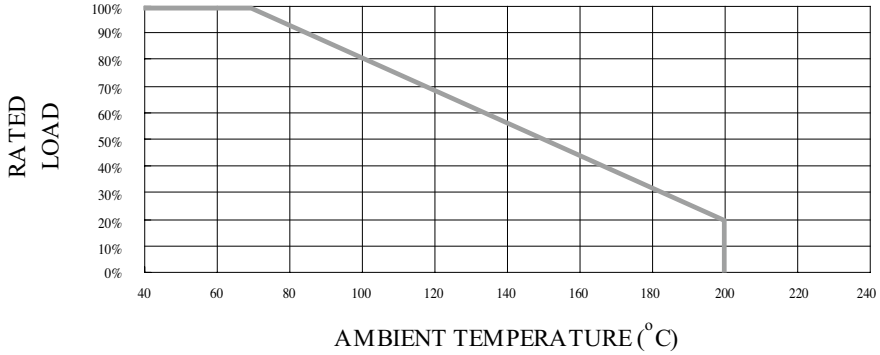
*** For the availabilities of non-default temperature coefficient, please check with us.**

TECHNICAL SPECIFICATIONS

Characteristics		Limits
Temperature Coefficient, PPM / °C*		±100, ±200
Operating Temperature Range, °C		-55~+200
Insulation Resistance, MΩ		10^4
Fusing Characteristics** (Preliminary)	constant voltage	Interrupts in max. 15 seconds at 40 times rated power
	thermal fuse	Interrupts in max. 5 minutes at 3.5 times rated amp at 265°C (special request)

*** Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).**
*** * Recommended to install a fuse holder if fusing function is required**

POWER DERATING CURVE



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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)	±3%
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** Dip the resistor into a solder bath measured (260±5)°C and hold it for a 10±1 seconds	±3%
Solderability	**IEC 60115-1 4.17.2** Solder area covered after (230±3)°C/(2±0.2) seconds with flux applied	95% min. coverage
Vibration	**IEC 60115 4.22** Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 0.75mm and 10 to 500 Hz.	±0.25%
Thermal Endurance	**IEC 60115-1 4.25.3** 1000 hours at 125°C without load	±5%
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +155°C 30minutes, 5 cycles	±5%
Surge Test	**Proprietary test speci ication FRC-TR-010113 =** $\sqrt{(8{,}000\ PR)}$ **DC** P is power rating, R is resistance value. Surge spec = 1.2/50μs Period = 60 sec Number of surges = 10	±5%

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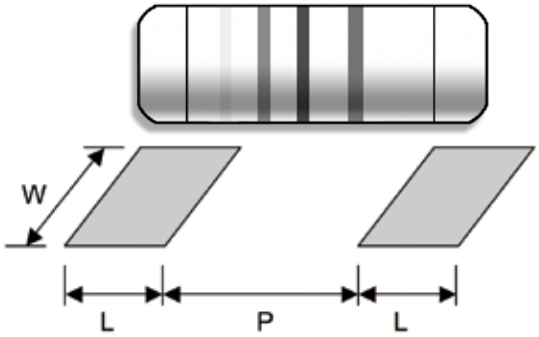
SUGGESTED PAD LAYOUT



Type	Soldering Mode*	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
SWMT100	Reflow (Solder thickness recommended)	3.0	4.9 ± 0.3	3.7
	Wave	3.5	4.8 ± 0.3	4.0
SWMT200	Reflow (Solder thickness recommended)	4.0	6.2 ± 0.4	5.0
	Wave	4.5	6.0 ± 0.4	5.0
SWMT300	Reflow (Solder thickness recommended)	4.5	8.0 ± 0.4	5.5
	Wave	5.0	7.7 ± 0.4	5.5
SWMT400	Reflow (Solder thickness recommended)	5.0	9.3 ± 0.4	6.5
	Wave	5.0	9.0 ± 0.4	6.0

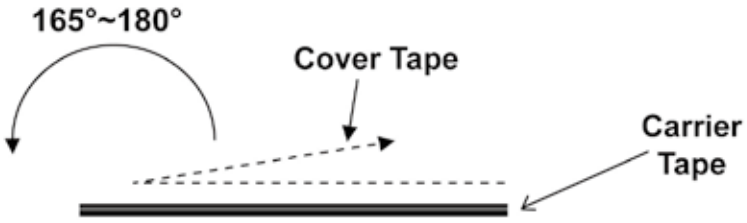
For better heat dissipation / lower heat resistance, increase W & L.
***Wave soldering is highly recommended for all SWMT types.**

COVER TAPE PEELING SPECIFICATION

Recommended peeling force:

SWMT100, SWMT200: 70±10gf

SWMT300, SWMT400: 80±10gf



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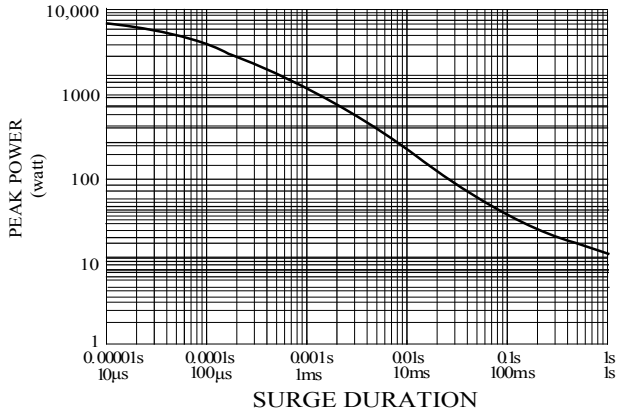
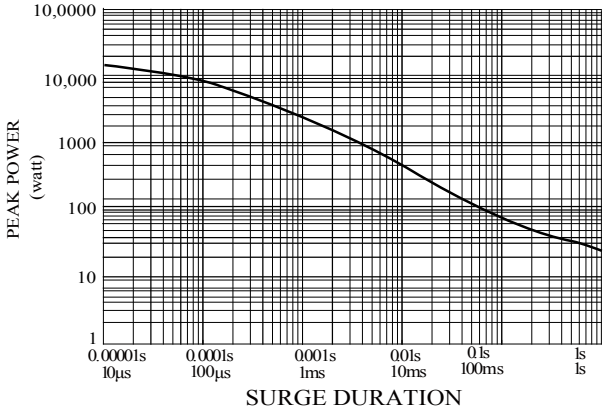
SINGLE SURGE PERFORMANCE

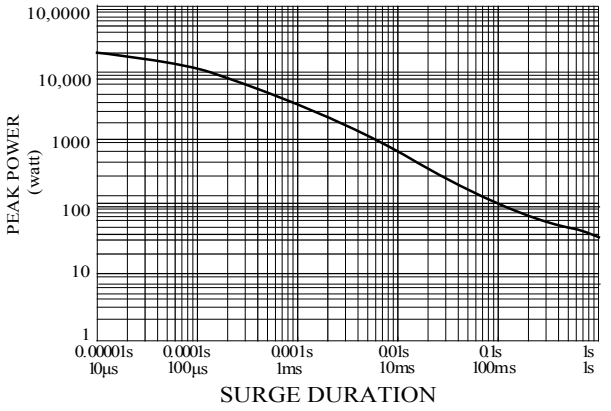
SWMT100



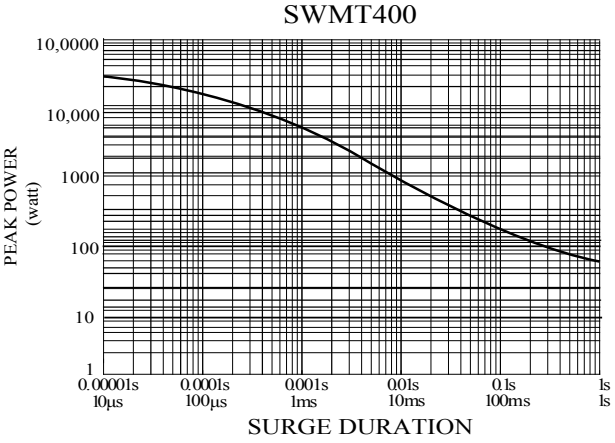
SWMT200



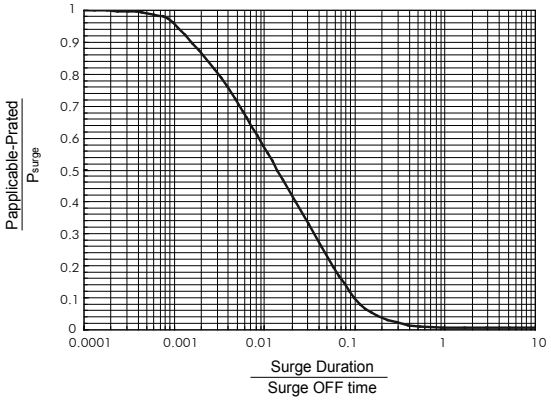
SWMT300



SWMT400



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 150 °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.