

## Low Resistance Value Chip Resistors (Current Sensing Resistors) 2512

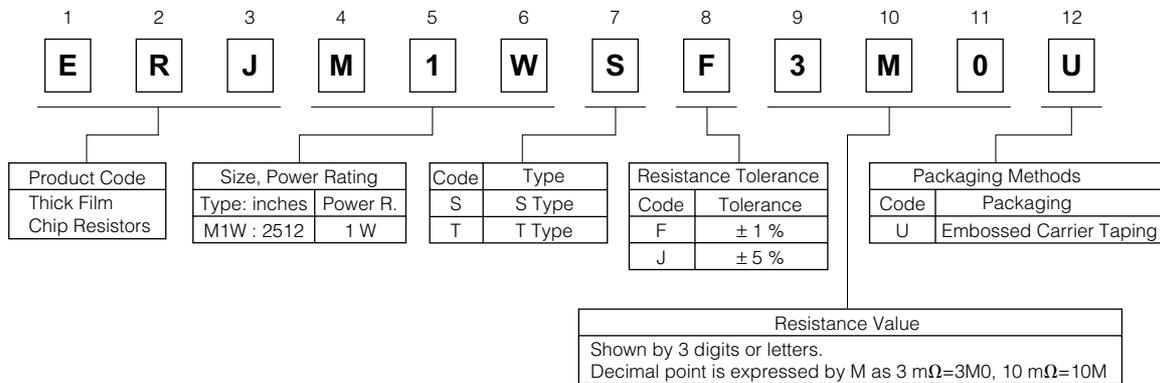
Type: **ERJM1W**



### ■ Features

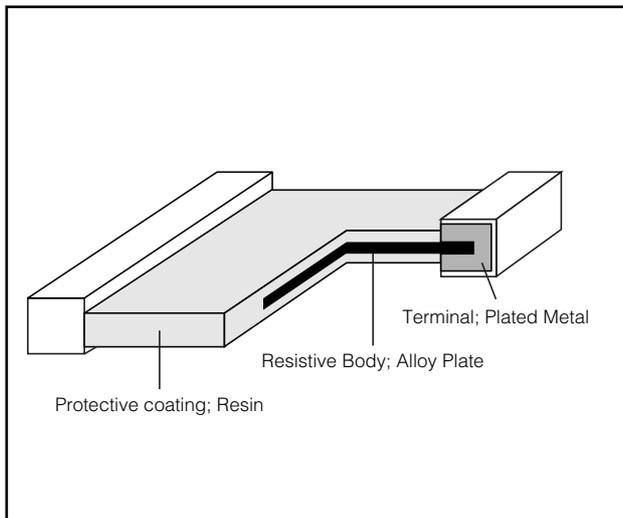
- Low resistance values and high precision (1 mΩ to 20 mΩ)
- Stable resistance not influenced by measurement position
- High heat emission
- Low profile, strong body
- Inductance less than 1.0 nH for the metal plate structure

### ■ Explanation of Part Numbers

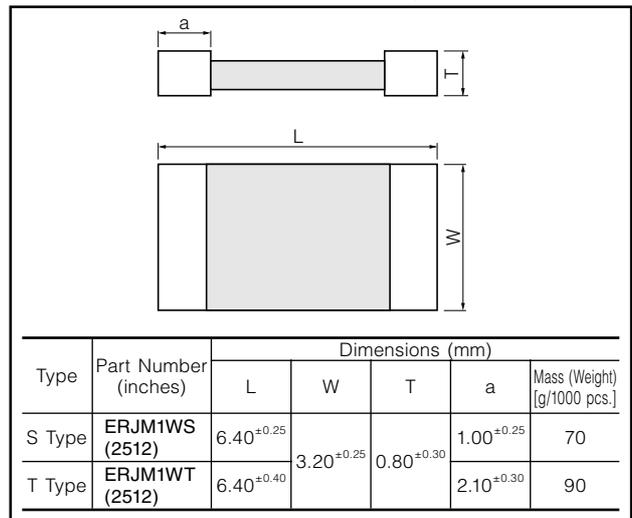


\* When omitted, the rest of the P/N factors shall be moved up respectively.

### ■ Construction



### ■ Dimensions in mm (not to scale)



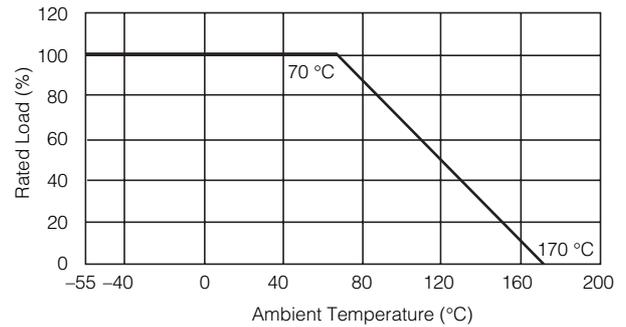
### ■ Ratings

Type (inches)	Power Rating (W)	Standard Resistance (mΩ)	Resistance Tolerance (%)	T.C.R. [ $\times 10^{-6}/^{\circ}\text{C}(\text{ppm}/^{\circ}\text{C})$ ]	Category Temperature Range (Operating Temperature Range)( $^{\circ}\text{C}$ )	Circuit board of use
ERJM1WS (2512)	1	3, 4	F: $\pm 1$ , J: $\pm 5$	$\pm 350$	-55 to +170	You should use the aluminum substrate when the added wattage exceeds 0.5 W.
		5, 6, 10, 15, 20		$\pm 100$		
ERJM1WT (2512)		1, 1.5		$350 \pm 100$		
		2		$100 \pm 50$		
		3, 4				

\* Please contact the factory for other values and the range

### Power Derating Curve

For resistors operated in ambient temperatures above 70  $^{\circ}\text{C}$ , power rating shall be derated in accordance with the figure on the right.

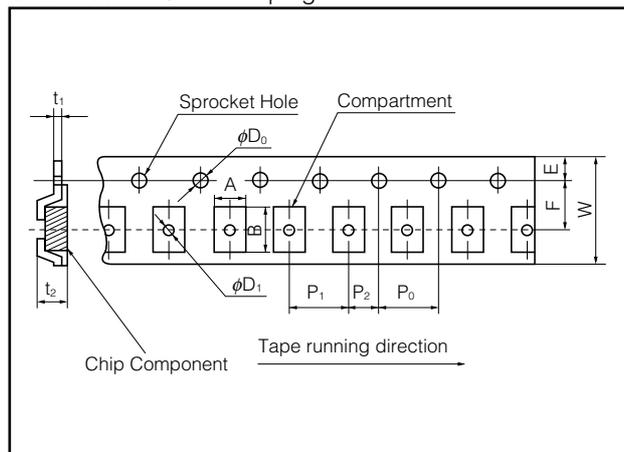


### ■ Packaging Method (Taping)

- Standard Quantity

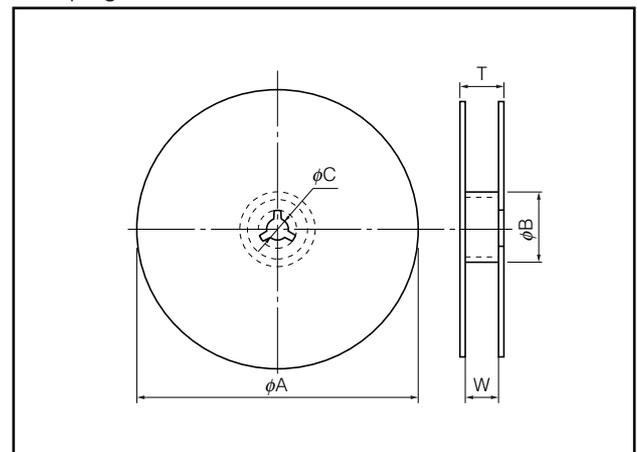
Type	Kind of Taping	Pitch ( $P_1$ )	Quantity
ERJM1WS	Embossed Carrier Taping	4 mm	3000 pcs./reel
ERJM1WT			

### ● Embossed Carrier Taping



Dimensions (mm)	A	B	W	F	E	$P_0$
	$3.60^{+0.25}$	$6.90^{+0.20}$	$12.00^{+0.30}$	$5.50^{+0.20}$	$1.75^{+0.20}$	$4.00^{+0.10}$
Dimensions (mm)	$P_1$	$P_2$	$\phi D_0$	$t_1$	$t_2$	$\phi D_1$
	$4.00^{+0.10}$	$2.00^{+0.05}$	$1.50^{+0.10}_{-0}$	$0.35^{+0.05}$	$1.50^{+0.20}$	$1.50^{+0.20}_{-0}$

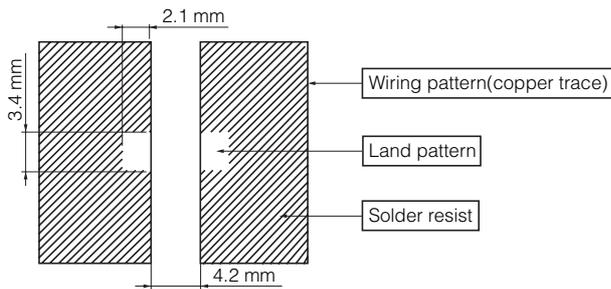
### ● Taping Reel



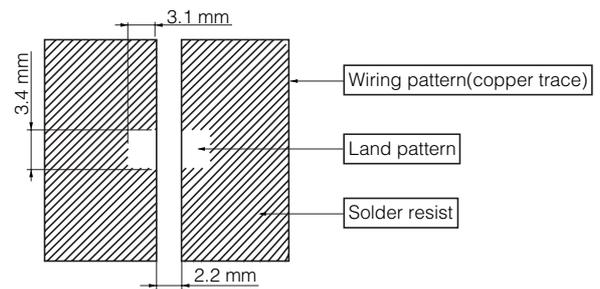
Dimensions (mm)	$\phi A$	$\phi B$	$\phi C$
	$18.0^{+0}_{-3.0}$	60 min.	$13.0^{+1.0}$
Dimensions (mm)	W	T	
	$13.0^{+1.0}$	$15.4^{+2.0}$	

### Recommended land pattern

<ERJM1WS>



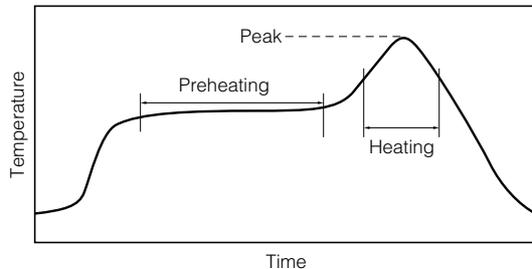
<ERJM1WT>



### Recommended Soldering Conditions

Recommendations and precautions are described below.

- Recommended soldering conditions for reflow
  - Reflow soldering shall be performed a maximum of two times.
  - Please contact us for additional information when used in conditions other than those specified.
  - Please measure the temperature of the terminals and study every kind of solder and printed circuit board for solderability before actual use.



For soldering (Example : Sn/Pb)

	Temperature	Time
Preheating	140 °C to 160 °C	60 s to 120 s
Main heating	Above 200 °C	30 s to 40 s
Peak	235 ± 5 °C	max. 10 s

For lead-free soldering (Example : Sn/Ag/Cu)

	Temperature	Time
Preheating	150 °C to 180 °C	60 s to 120 s
Main heating	Above 230 °C	30 s to 40 s
Peak	max. 260 °C	max. 10 s

- Recommended soldering conditions for flow

	For soldering		For lead-free soldering	
	Temperature	Time	Temperature	Time
Preheating	140 °C to 180 °C	60 s to 120 s	150 °C to 180 °C	60 s to 120 s
Soldering	245 ± 5 °C	20 s to 30 s	max. 260 °C	max. 10 s

### ⚠ Safety Precautions

The following are precautions for individual products. Please also refer to the precautions common to Fixed Resistors shown on page ER3 of this catalog.

1. Keep the rated power and ambient temperature within the specified derating curve.  
Some circuit boards, wiring patterns, temperatures of heat generated by adjacent components, or ambient temperatures can become factors in the rise of the temperature of Low Resistive Value Chip Resistors (hereafter called the resistors), regardless of the level of power applied. Therefore, check the conditions before use and optimize them so as not to damage the boards and peripheral components.  
Make sure to contact us before using the resistors under special conditions.
2. If a transient load (heavy load in a short time) like a pulse is expected to be applied, check and evaluate the operations of the resistors when installed in your products before use.  
Never exceed the rated power. Otherwise, the performance and/or reliability of the resistors may be impaired.
3. Before using halogen-based or other high-activity flux, check the possible effects of the flux residues on the performance and reliability of the resistors.
4. When soldering with a soldering iron, never touch the resistors' bodies with the tip of the soldering iron. When using a soldering iron with a high temperature tip, finish soldering as quickly as possible (within three seconds at 350 °C max.).
5. Do not apply shock to the resistors or pinch them with a hard tool (e.g. pliers and tweezers). Otherwise, the resistors' protective coatings and bodies may be chipped, affecting their performance.
6. Do not immerse the resistors in solvent for a long time. Before using solvent, carefully check the effects of immersion.

## ⚠ Safety Precautions (Common precautions for Fixed Resistors)

- When using our products, no matter what sort of equipment they might be used for, be sure to make a written agreement on the specifications with us in advance. The design and specifications in this catalog are subject to change without prior notice.
- Do not use the products beyond the specifications described in this catalog.
- This catalog explains the quality and performance of the products as individual components. Before use, check and evaluate their operations when installed in your products.
- Install the following systems for a failsafe design to ensure safety if these products are to be used in equipment where a defect in these products may cause the loss of human life or other significant damage, such as damage to vehicles (automobile, train, vessel), traffic lights, medical equipment, aerospace equipment, electric heating appliances, combustion/gas equipment, rotating equipment, and disaster/crime prevention equipment.
- \* Systems equipped with a protection circuit and a protection device
- \* Systems equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault

### (1) Precautions for use

- These products are designed and manufactured for general and standard use in general electronic equipment (e.g. AV equipment, home electric appliances, office equipment, information and communication equipment)
- These products are not intended for use in the following special conditions. Before using the products, carefully check the effects on their quality and performance, and determine whether or not they can be used.
  1. In liquid, such as water, oil, chemicals, or organic solvent
  2. In direct sunlight, outdoors, or in dust
  3. In salty air or air with a high concentration of corrosive gas, such as Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, or NO<sub>2</sub>
  4. Electric Static Discharge (ESD) Environment
    - These components are sensitive to static electricity and can be damaged under static shock (ESD). Please take measures to avoid any of these environments.
    - Smaller components are more sensitive to ESD environment.
  5. Electromagnetic Environment
    - Avoid any environment where strong electromagnetic waves exist.
  6. In an environment where these products cause dew condensation
  7. Sealing or coating of these products or a printed circuit board on which these products are mounted, with resin or other materials
- These products generate Joule heat when energized. Carefully position these products so that their heat will not affect the other components.
- Carefully position these products so that their temperatures will not exceed the category temperature range due to the effects of neighboring heat-generating components. Do not mount or place heat-generating components or inflammables, such as vinyl-coated wires, near these products .
- Note that non-cleaning solder, halogen-based highly active flux, or water-soluble flux may deteriorate the performance or reliability of the products.
- Carefully select a flux cleaning agent for use after soldering. An unsuitable agent may deteriorate the performance or reliability. In particular, when using water or a water-soluble cleaning agent, be careful not to leave water residues. Otherwise, the insulation performance may be deteriorated.

### (2) Precautions for storage

The performance of these products, including the solderability, is guaranteed for a year from the date of arrival at your company, provided that they remain packed as they were when delivered and stored at a temperature of 5 °C to 35 °C and a relative humidity of 45 % to 85 %.

Even within the above guarantee periods, do not store these products in the following conditions. Otherwise, their electrical performance and/or solderability may be deteriorated, and the packaging materials (e.g. taping materials) may be deformed or deteriorated, resulting in mounting failures.

1. In salty air or in air with a high concentration of corrosive gas, such as Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, or NO<sub>2</sub>
2. In direct sunlight

### <Package markings>

Package markings include the product number, quantity, and country of origin. In principle, the country of origin should be indicated in English.