

Chip Magneto Resistors

Type: EZMPL

Type M



Type S



Chip Magneto Resistors change their resistance value in accordance with changes in intensity of the surrounding magnetic field.

This type, EZMPL is a reliable contactless sensor for detecting the number of rotations, rotation angle and direction of rotations.

Features

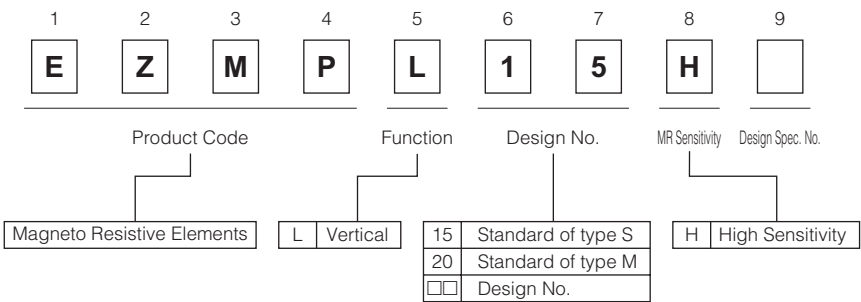
- 1. High sensitivity
- Response to  $4 \times 10^3$  [A / m] magnetic force
- 2. Compact design
- Suitable for thin design (H: 0.7 mm)
- Strong body (Uses alumina substrate)

RoHS compliant

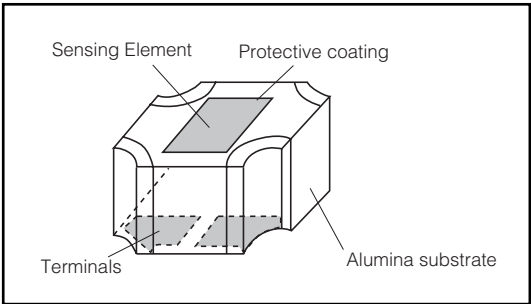
Recommended Applications

- Disc drive actuator (position of rotation)
- Flow meter
- Switch
- Printer (Printing timing)
- Tape counter (Number of rotations)

Explanation of Part Numbers

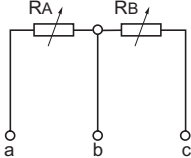


Construction



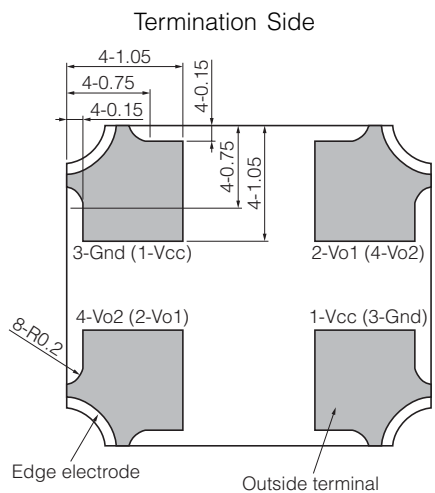
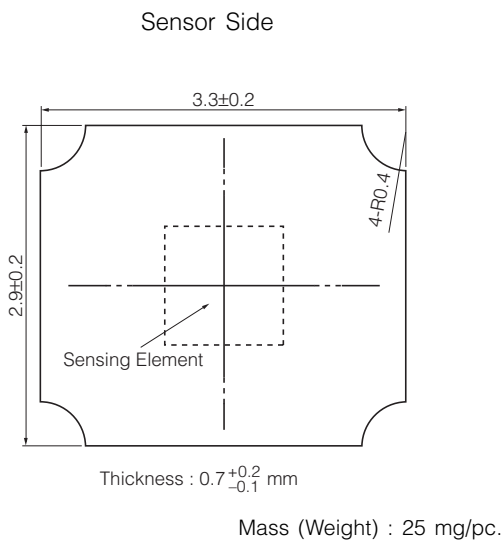
Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

■ Performance Specifications, Summary

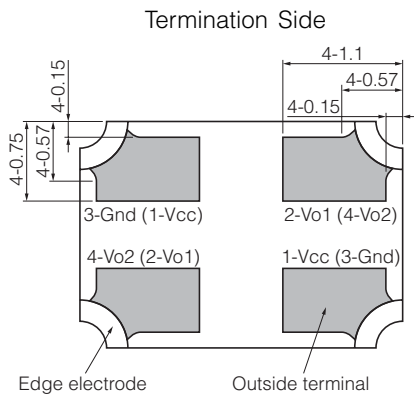
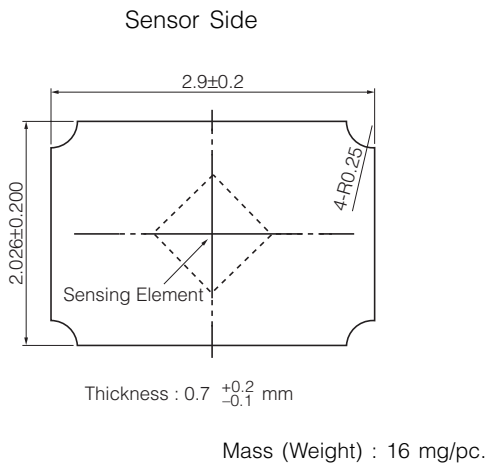
Item	Characteristics
Resistance Value	1.5 kΩ (standard) ±30 % : Type S 10 kΩ (standard) ±30 % : Type M
Sensing Range	1600 A/m to 16000 A/m
Category Temperature Range	−30 °C to +70 °C
Applied Voltage	5 V (standard)
Resistance Change by Magnetic Force	P: 2 % min. (at ±16000A/m)
Resistance Pair-Matching	<div><math display="block">\frac{R_B}{R_A + R_B} = (50 \pm 1) \%</math><div>Circuit Diagram</div></div>

■ Dimensions in mm (not to scale)

● Type M



● Type S

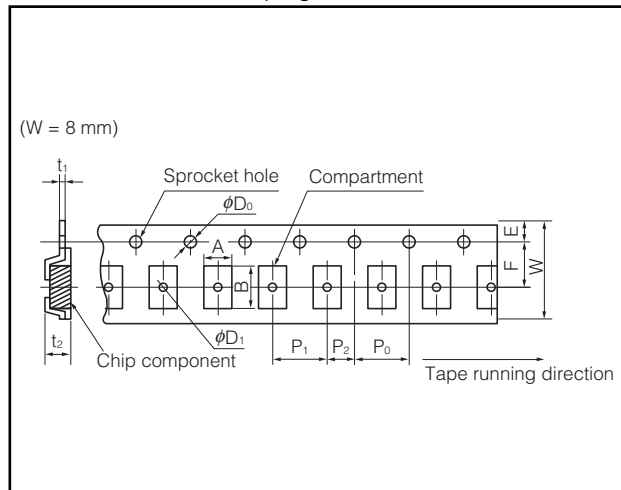


### ■ Packaging Methods (Taping)

#### ● Standard Quantity

Type	Kind of Taping	Pitch (P <sub>1</sub> )	Quantity
M Type EZMPL□□□□	Embossed Carrier Taping	4 mm	4000 pcs./reel
S Type EZMPL□□□□			

#### ● Embossed Carrier Taping

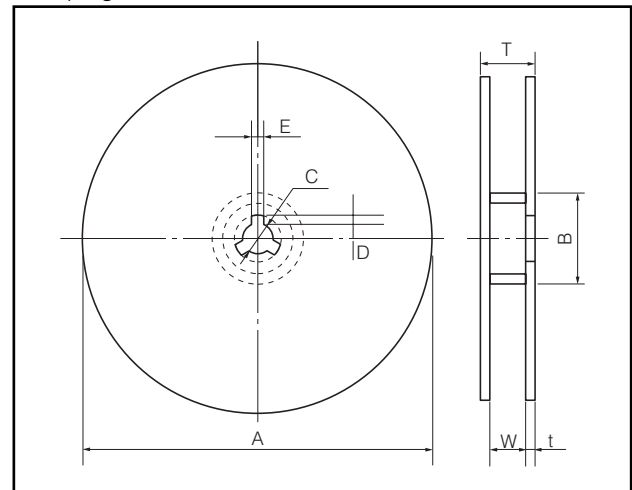


		A	B	W	F	E	P <sub>0</sub>
Dimensions (mm)	M Type	3.40 <sup>+0.35</sup>	3.80 <sup>+0.35</sup>	8.0 <sup>+0.3</sup>	3.5 <sup>+0.1</sup>	1.75 <sup>+0.15</sup>	4.0 <sup>+0.1</sup>
	S Type	2.50 <sup>+0.35</sup>	3.40 <sup>+0.35</sup>	8.0 <sup>+0.3</sup>	3.5 <sup>+0.1</sup>	1.75 <sup>+0.15</sup>	4.0 <sup>+0.1</sup>

		P <sub>1</sub>	P <sub>2</sub>	φD <sub>0</sub>	t <sub>1</sub>	t <sub>2</sub>	φD <sub>1</sub>
Dimensions (mm)	M Type	4.0 <sup>+0.1</sup>	2.0 <sup>+0.1</sup>	1.5 <sup>+0.1</sup>	0.2 <sup>+0.05</sup>	1.20 <sup>+0.25</sup>	1.50 <sup>+0.15</sup>
	S Type	4.0 <sup>+0.1</sup>	2.0 <sup>+0.1</sup>	1.5 <sup>+0.1</sup>	0.2 <sup>+0.05</sup>	1.20 <sup>+0.25</sup>	1.50 <sup>+0.15</sup>

#### ● Taping Reel

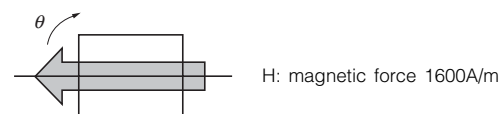
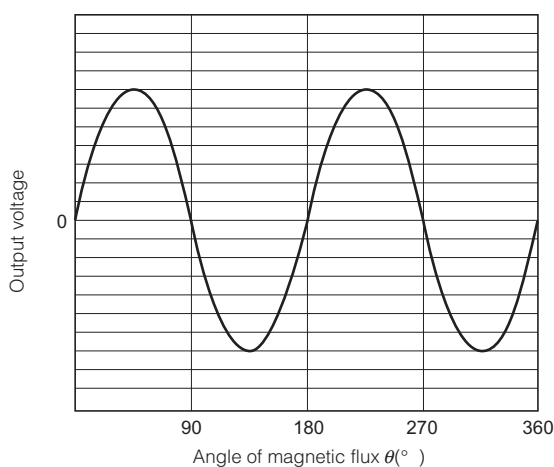


	φA	φB	φC	φD
Dimensions (mm)	178 <sup>±2</sup>	60 <sup>±1</sup>	13.0 <sup>±0.5</sup>	21.0 <sup>±0.8</sup>

	E	W	T	t
Dimensions (mm)	2.0 <sup>±0.5</sup>	9.0 <sup>±0.3</sup>	11.4 <sup>±0.1</sup>	1.35 <sup>±0.20</sup>

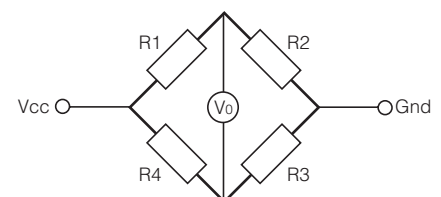
### ■ Direction of Magnetic Field and Typical Output Voltage (EZMPL15H)



- With rotation of magnetic field (flux)
- R1 to R4: Resistance value change

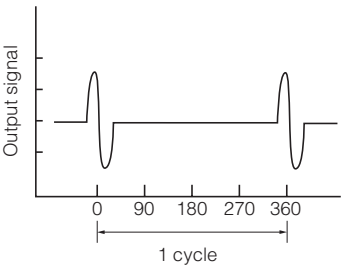
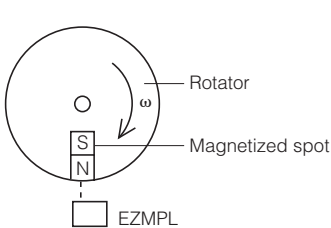
at  $\theta=45^\circ$

- R1•R3: Resistance Value minimize
- R2•R4: Resistance Value maximize

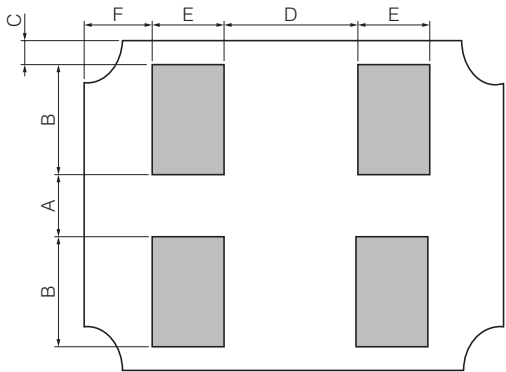


■ Application Examples

- Position Detection  
EZMPL detects the magnetized area on a rotator.



■ Recommended land patterns



	Unit : mm					
	A	B	C	D	E	F
M Type	0.7	1.0	0.25	1.1	0.6	0.5
S Type	0.525	0.7	0.05	0.7	0.7	0.4

⚠ Safety Precautions

The following are precautions for individual products. Please also refer to the common precautions shown on page 4 of this catalog.

1. Conduct reflow soldering at 240 °C max. for up to 30 seconds (time during which 220 °C is exceeded).
2. Do not rework the soldered joints.
3. Do not apply any excessive shocks to Chip Magneto Resistors (hereafter called the MR Elements).
4. Do not use the MR Elements once they've been dropped on the floor.

## Safety Precautions (Common precautions for Fixed Resistors, Noise Suppression Device, ESD Suppressor, fuses, and MR Sensors)

- 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 (except ESD Suppressors)  
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 (except Thermal Cutoffs).
- 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 (except Thermal Cutoffs).
- 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 %.

The performance of EMI Filters is guaranteed for 6 months or a year after our delivery, provided that they are stored at a temperature of -5 °C to +40 °C and a relative humidity of 40 % to 60 %. Check the guarantee period in the specifications. The performance of Thermal Cutoffs is guaranteed for a year after our delivery, provided that they are stored at a temperature of -10 °C to +40 °C and a relative humidity of 30 % to 75 %.

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.