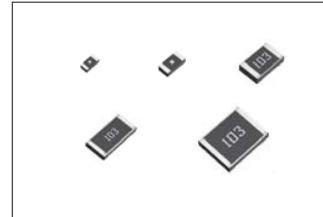


# Anti-surge Chip Resistors

## ESR Series

### ●Features

- 1) Exclusive resistive element pattern and laser trimming technology results in significantly improved surge resistance characteristics.
- 2) 2kV to 5kV electrostatic discharge resistance.
- 3) Superior power ratings.
- 4) ROHM resistors have obtained ISO9001 / ISO / TS16949 certification.
- 5) Corresponds to AEC-Q200.(ESR10/18)



### ●Products List

Part No.	Size		Rated Power (70°C) (W)	Limiting Element Voltage (V)	Maximum Overload Voltage (V)	Temperature Coefficient (ppm / °C)	Resistance Tolerance (%)	Resistance Range	Series	Operating Temperature Range (°C)		
	(mm)	(inch)										
<b>ESR01</b>	1005	0402	0.2	50	100	±200	J(±5%)	10Ω to 1MΩ	E24	-55 to +155		
						±100	F(±1%)					
<b>ESR03</b>	1608	0603	0.25	150	200	±200	J(±5%)	1Ω to 10MΩ				
						±100	F(±1%)					
						±100	D(±0.5%)	10Ω to 1MΩ				
<b>ESR10</b>	2012	0805	0.4	150	200	±200	J(±5%)	1Ω to 10MΩ				
						±100	F(±1%)					
						±100	D(±0.5%)	10Ω to 1MΩ				
<b>ESR18</b>	3216	1206	0.33	200	400	±200	J(±5%)	1Ω to 10MΩ				
						±100	F(±1%)					
						±100	D(±0.5%)	10Ω to 1MΩ				
<b>ESR25</b>	3225	1210	0.5	200	400	±200	J(±5%)	1Ω to 10MΩ				
						±100	F(±1%)					
						±100	D(±0.5%)	10Ω to 1MΩ				

\*Design and specifications are subject to change without notice.

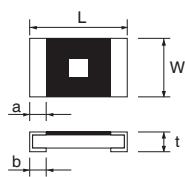
Carefully check the specification sheet supplied with the product before using or ordering it.

### ●Part Number Description

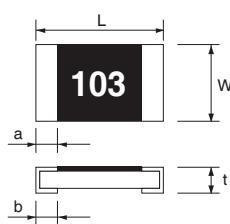
<b>ESR</b>	<b>1 0</b>	<b>E Z P</b>	<b>J</b>	<b>1 0 0</b>
<b>Part No.</b>	<b>Size (mm [inch])</b>	<b>Packaging Specifications Code</b>	<b>Resistance Tolerance</b>	<b>Nominal Resistance</b>
<b>ESR</b> (Anti-surge chip resistors)	01 (1005 [0402]) 03 (1608 [0603]) 10 (2012 [0805]) 18 (3216 [1206]) 25 (3225 [1210])	Part No.    Code    Packaging specifications    Quantity / Reel <b>ESR01</b> MZP    Paper tape (4mm Pitch)    10,000 <b>ESR03</b> EZP    Paper tape (4mm Pitch)    5,000 <b>ESR10</b> EZP    Paper tape (4mm Pitch)    5,000 <b>ESR18</b> EZP    Paper tape (4mm Pitch)    5,000 <b>ESR25</b> JZP    Embossed tape (4mm Pitch)    4,000	D (±0.5%) F (±1%) J (±5%)	Resistance code, 3 or 4 digits. 000 denotes jumper type.  Resistance tolerance    Resistance code D,F : 4 digits J : 3 digits  Ex.) 1Ω = 1R00 (±1%) 1R0 (±5%) 10Ω = 10R0 (±0.5%, ±1%) 100 (±5%) 1MΩ = 1004 (±0.5%, ±1%) 105 (±5%)

## •Chip Resistor Dimensions and Markings

■ ESR01 / 03



■ ESR10 / 18 / 25



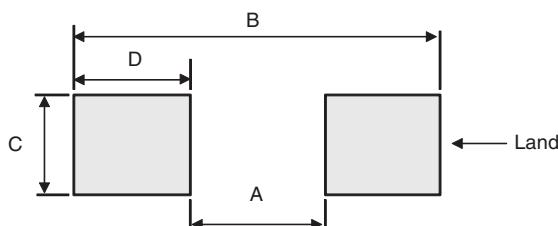
### <Marking method>

There are three or four digits used for the calculation number according to IEC code and "R" is used for the decimal point.

Part No.	(mm)	(inch)	L	W	t	a	b	(Unit : mm)
								Marking existence
<b>ESR01</b>	1005	0402	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	0.25 <sup>+0.05</sup> <sub>-0.1</sub>	No *
<b>ESR03</b>	1608	0603	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2	No *
<b>ESR10</b>	2012	0805	2.0±0.1	1.25±0.1	0.55±0.1	0.3±0.2	0.4±0.2	Yes
<b>ESR18</b>	3216	1206	3.2±0.15	1.6±0.15	0.55±0.1	0.3±0.25	0.5±0.25	Yes
<b>ESR25</b>	3225	1210	3.2±0.15	2.5±0.15	0.55±0.1	0.3±0.25	0.5±0.25	Yes

\*Only with square mark

## •Land pattern Example

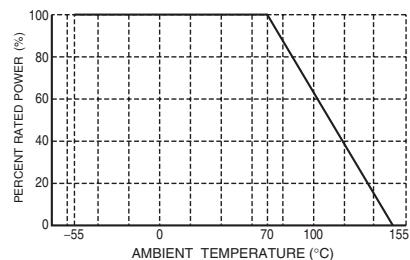


Dimensions Part No.	A	B	C	D
<b>ESR01</b>	0.5	1.3	0.5	0.4
<b>ESR03</b>	1.0	2.0	0.8	0.5
<b>ESR10</b>	1.2	2.6	1.15	0.7
<b>ESR18</b>	2.2	4.0	1.5	0.9
<b>ESR25</b>	2.2	4.0	2.3	0.9

### ●Derating Curve

When the ambient temperature exceeds 70°C, power dissipation must be adjusted according to the derating curves below.

■ ESR01 / 03 / 10 / 18 / 25



### ●Characteristics

Test Items	Guaranteed Value	Test Conditions
	Resistor Type	
Resistance	See P.1	20°C
Variation of resistance with temperature	See P.1	Measurement : +20 / -55 / +20 / +125°C
Overload	± (2.0%+0.1Ω)	Rated voltage (current) ×2.0, 2s (ESR01) Rated voltage (current) ×2.5, 2s (ESR03 / 10 / 18 / 25) Maximum overload voltage
Solderability	A new uniform coating of minimum of 95% of the surface being immersed and no soldering damage.	Rosin-Ethanol : 25% (Weight) Soldering condition : 235±5°C Duration of immersion : 2.0±0.5s
Resistance to soldering heat	± (1.0%+0.05Ω) No remarkable abnormality on the appearance.	Soldering condition : 260±5°C Duration of immersion : 10±1s
Rapid change of temperature	± (1.0%+0.05Ω)	Test temp. : -55°C to +125°C 5cycle
Damp heat, steady state	± (3.0%+0.1Ω)	40°C, 93%RH (Relative Humidity) Test time : 1,000h to 1,048h
Endurance at 70°C	± (3.0%+0.1Ω)	70°C Rated voltage (current) 1.5h : ON – 0.5h : OFF Test time : 1,000h to 1,048h
Endurance	± (3.0%+0.1Ω)	155°C Test time : 1,000h to 1,048h
Resistance to solvent	± (1.0%+0.05Ω)	23±5°C, Immersion cleaning, 5±0.5min Solvent : 2-propanol
Bend strength of the end face plating	± (1.0%+0.05Ω) Without mechanical damage such as breaks.	–
Static electric characteristics	± (5.0%+0.05Ω)	EIAJ ED-4701 / 300 TEST METHOD304 Voltage : 2kV (ESR01) 3kV (ESR03 / 10 / 18) 5kV (ESR25) C : 100pF R : 1.5kΩ Apply cycle : 1time

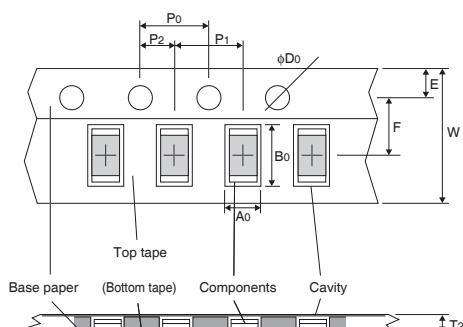
Compliance Standard(s) : IEC60115-8  
JISC 5201-8

### ●Technical data

Parameter	Unit	ESR01	ESR03	ESR10	ESR18	ESR25
Failure rate	Fit	–	0.4113	0.0453	0.0944	0.6655
Weight	mg/pc	0.63	2.18	5.13	9.62	16.47

## ● Tape Dimensions

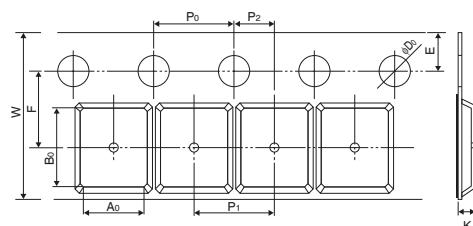
### ■ Paper Tape



Part No.	W	F	E	A0	B0
<b>ESR01</b>	$8.0 \pm 0.3$	$3.5 \pm 0.05$	$1.75 \pm 0.1$	$0.7 \pm 0.1$	$1.2 \pm 0.1$
<b>ESR03</b>	$8.0 \pm 0.3$	$3.5 \pm 0.05$	$1.75 \pm 0.1$	$1.1 \pm 0.1$	$1.9 \pm 0.1$
<b>ESR10</b>	$8.0 \pm 0.3$	$3.5 \pm 0.05$	$1.75 \pm 0.1$	$1.65^{+0.2}_{-0.1}$	$2.4^{+0.2}_{-0.1}$
<b>ESR18</b>	$8.0 \pm 0.3$	$3.5 \pm 0.05$	$1.75 \pm 0.1$	$1.95^{+0.1}_{-0.05}$	$3.5^{+0.15}_{-0.05}$

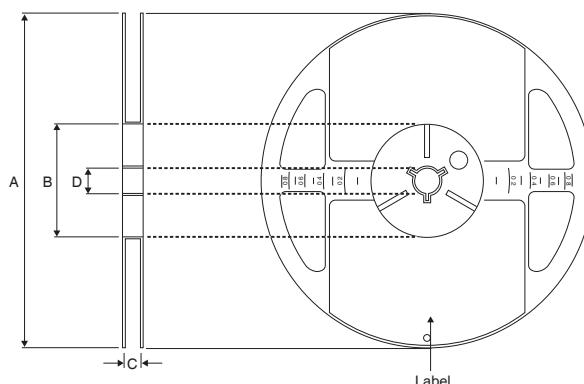
Part No.	D0	P0	P1	P2	T2
<b>ESR01</b>	$\phi 1.5^{+0.1}_{-0}$	$4.0 \pm 0.1$	$2.0 \pm 0.05$	$2.0 \pm 0.05$	Max 1.1
<b>ESR03</b>	$\phi 1.5^{+0.1}_{-0}$	$4.0 \pm 0.1$	$4.0 \pm 0.1$	$2.0 \pm 0.05$	Max 1.1
<b>ESR10</b>	$\phi 1.5^{+0.1}_{-0}$	$4.0 \pm 0.1$	$4.0 \pm 0.1$	$2.0 \pm 0.05$	Max 1.1
<b>ESR18</b>	$\phi 1.5^{+0.1}_{-0}$	$4.0 \pm 0.1$	$4.0 \pm 0.1$	$2.0 \pm 0.05$	Max 1.1

### ■ Embossed Tape



Part No.	W	F	E	A0	B0
<b>ESR25</b>	$8.0 \pm 0.3$	$3.5 \pm 0.05$	$1.75 \pm 0.1$	$3.0 \pm 0.1$	$3.5 \pm 0.1$
	$D_0$	$P_0$	$P_1$	$P_2$	$K$
	$\phi 1.5^{+0.1}_{-0}$	$4.0 \pm 0.1$	$4.0 \pm 0.1$	$2.0 \pm 0.05$	Max 1.1

## ● Reel Dimensions



ACCORDING TO EIAJ ET-7200B

Part No.	A	B	C	D
<b>ESR01</b>				
<b>ESR03</b>				
<b>ESR10</b>	$\phi 180^{+0}_{-1.5}$	$\phi 60^{+1.0}_{-0}$	$9^{+1.0}_{-0}$	$\phi 13 \pm 0.2$
<b>ESR18</b>				
<b>ESR25</b>				

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