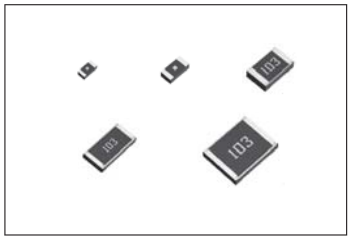
Anti-surge Chip Resistors

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 (mm)	Size (inch)	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)
ESR01	1005	0402	0.2	50	100	±200	J(±5%)	10Ω to 1MΩ	E24	−55 to +155
						±100	F(±1%)			
ESR03	1608	0603	0.25	150	200	±200	J(±5%)	1Ω to 10MΩ		
						±100	F(±1%)			
						±100	D(±0.5%)	10Ω to 1MΩ		
ESR10	2012	0805	0.4	150	200	±200	J(±5%)	1Ω to 10MΩ		
						±100	F(±1%)			
						±100	D(±0.5%)	10Ω to 1MΩ		
ESR18	3216	1206	0.33	200	400	±200	J(±5%)	1Ω to 10MΩ		
						±100	F(±1%)			
						±100	D(±0.5%)	10Ω to 1MΩ		
ESR25	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

E S R — **Part No.**: ESR (Anti-surge chip resistors)

1 0 — **Size** (mm [inch]):
01 (1005 [0402])
03 (1608 [0603])
10 (2012 [0805])
18 (3216 [1206])
25 (3225 [1210])

E Z P — **Packaging Specifications Code**

Part No.	Code	Packaging specifications	Quantity / Reel
ESR01	MZP	Paper tape (4mm Pitch)	10,000
ESR03	EZP	Paper tape (4mm Pitch)	5,000
ESR10	EZP	Paper tape (4mm Pitch)	5,000
ESR18	EZP	Paper tape (4mm Pitch)	5,000
ESR25	JZP	Embossed tape (4mm Pitch)	4,000

J — **Resistance Tolerance**:
D (±0.5%)
F (±1%)
J (±5%)

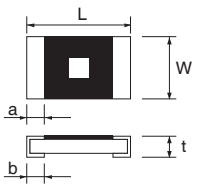
1 0 0 — **Nominal Resistance**
Resistance code, 3 or 4 digits.
000 denotes jumper type.

Resistance tolerance		Resistance code
D,F	:	4 digits
J	:	3 digits

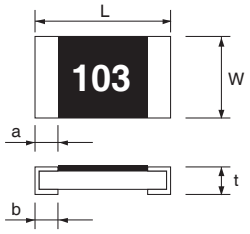
Ex.)
1Ω = 1R00 (±1%)
1R0 (±5%)
10Ω = 10R0 (±0.5%, ±1%)
100 (±5%)
1MΩ = 1004 (±0.5%, ±1%)
105 (±5%)

●Chip Resistor Dimensions and Markings

■ **ESR01 / 03**



■ **ESR10 / 18 / 25**



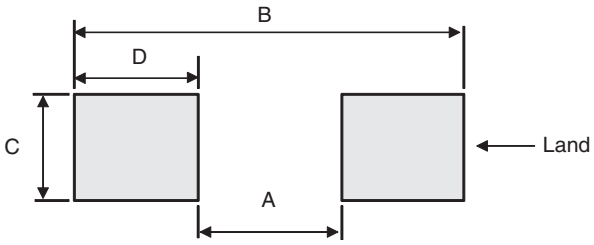
<Marking method>
There are three or four digits used for the calculation number according to IEC code and “R”is used for the decimal point.

(Unit : mm)

Part No.	(mm)	(inch)	L	W	t	a	b	Marking existence
ESR01	1005	0402	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	$0.25^{+0.05}_{-0.1}$	No ∗
ESR03	1608	0603	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2	No ∗
ESR10	2012	0805	2.0±0.1	1.25±0.1	0.55±0.1	0.3±0.2	0.4±0.2	Yes
ESR18	3216	1206	3.2±0.15	1.6±0.15	0.55±0.1	0.3±0.25	0.5±0.25	Yes
ESR25	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



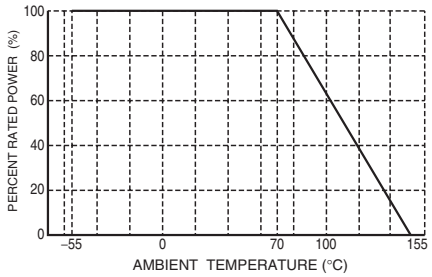
(Unit : mm)

Dimensions / Part No.	A	B	C	D
ESR01	0.5	1.3	0.5	0.4
ESR03	1.0	2.0	0.8	0.5
ESR10	1.2	2.6	1.15	0.7
ESR18	2.2	4.0	1.5	0.9
ESR25	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 Resistor Type	Test Conditions
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

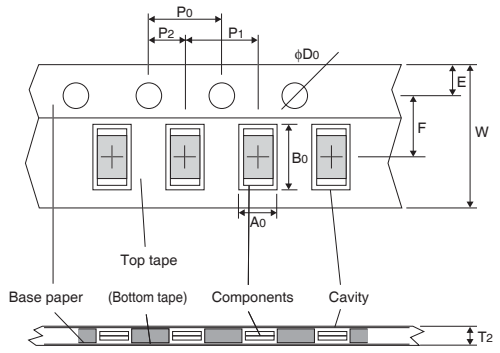
Compliance Standard(s) : IEC60115–8
JISC 5201–8

●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

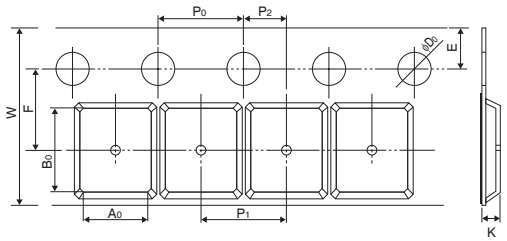


(Unit : mm)

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

Part No.	D0	P0	P1	P2	T2
ESR01	$\phi1.5^{+0.1}_{0}$	4.0±0.1	2.0±0.05	2.0±0.05	Max 1.1
ESR03	$\phi1.5^{+0.1}_{0}$	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1
ESR10	$\phi1.5^{+0.1}_{0}$	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1
ESR18	$\phi1.5^{+0.1}_{0}$	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1

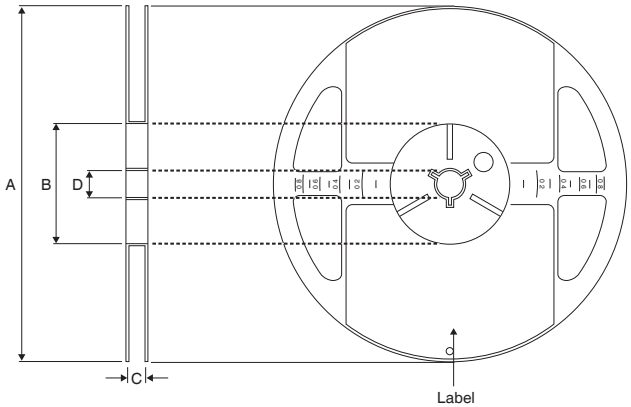
■ Embossed Tape



(Unit : mm)

Part No.	W	F	E	A0	B0
ESR25	8.0±0.3	3.5±0.05	1.75±0.1	3.0±0.1	3.5±0.1
	D0	P0	P1	P2	K
	$\phi1.5^{+0.1}_{0}$	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1

●Reel Dimensions



ACCORDING TO EIAJ ET-7200B

(Unit : mm)

Part No.	A	B	C	D
ESR01	$\phi180^{0}_{-1.5}$	$\phi60^{+1.0}_{0}$	$9^{+1.0}_{0}$	φ13±0.2
ESR03				
ESR10				
ESR18				
ESR25				

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