

◆ General

● Scope

This specification is available for Alloy Shunt Resistors manufactured by ELLON Electro-Mechanics Co., Ltd.

● Quality

The resistor is manufactured by highly quality-controlled process and guaranteed high reliability, it meets RoHS & Halogen-Free requirement.

● Standard measuring conditions

Temperature $20 \pm 2^\circ\text{C}$, Humidity $65 \pm 5\%$. Being no doubt about the judgment, measurements can be made within the following Temperature $5 \sim 35^\circ\text{C}$, Humidity $45 \sim 85\%$.

◆ Applications

- Current sensor for power hybrid applications
- Vacuum Electron-beam welding craf , pure copper electrode, Ideal solution for current detection applications.
- Bridge-shaped structure, conducive to heat dissipation, high power, superb pulse load capability.
- Frequency converters
- Power modules
- Ultra-low EMF
- Communication system
- Automatic control power supply
- High current applications for the automotive

◆ Specification

- Resistance Value: $1\text{m}\Omega \sim 20\text{m}\Omega$
- Value accuracy: $\pm 1\%(F)$, $\pm 5\%(J)$
- Resistance temperature coefficient : MIN 50PPM/ $^\circ\text{C}$
- Working temperature range: $-55^\circ\text{C} \sim 170^\circ\text{C}$
- Inductors: $< 3\text{n H}$.
- EMV($0 \sim 100^\circ\text{C}$): $< 1\mu\text{V}/^\circ\text{C}$
- Power($P70^\circ\text{C}$): MAX7W
- AEC-Q200 Reliability Testing Passed

◆ Part Number System

<u>ESRC</u>	<u>42</u>	<u>F</u>	<u>7W0</u>	<u>R001</u>	<u>M</u>	<u>02</u>	<u>G</u>
ESRC	42=4320 41=4312	F = $\pm 1\%$ G= $\pm 2\%$ J= $\pm 5\%$	7W0=7Watt 4W0=4Watt 12W=12Watt	R001=1m Ω --- R005=5m Ω	F:FeCrAl M:MnCu K:Karma	01=1000 02=2000	S=standard G=High power

(1): ESR Series

(2): Size Code: 41=4312, 42=4320

(3): Tolerance Code: F = $\pm 1\%$, G= $\pm 2\%$, J= $\pm 5\%$

(4): Power Rating: Ex. 7W0=7Watt; 4W0=4Watt;

(5): Resistance Code: R001=1m Ω , R002=2m Ω ; R005=5m Ω

(6): Materials: F:FeCrAl; M:MnCu; K:Karma

(7): Optional Piece reel quantity: 02=2000PCS; 01=1000PCS; 04=4000PCS;

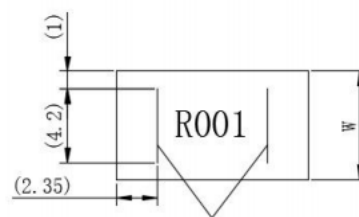
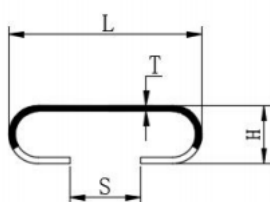
(8): Remarks: Interior code

Standard Electrical Specifications

Type	Item	Rated Power at 70°C	Materials	T.C.R. (PPM/°C)	Resistance Range	T(mm)
					F(±1%) G(+2%)J(±5%)	
ESRC41		4W	M	±100	2mΩ	0.85±0.1
		4W	M	±100	3mΩ	0.60±0.1
		4W	M	±100	5mΩ	0.35±0.1
		4W	K	±50	10mΩ	0.6±0.1
		4W	K	±50	5mΩ	0.3±0.1
ESRC42		12W	M	±100	1mΩ	0.85±0.1
		10W	M	±100	2mΩ	0.43±0.1
		9W	K	±50	5mΩ	0.60±0.1
		9W	K	±50	6mΩ	0.50±0.1
		8W	K	±50	8mΩ	0.38±0.1
		7W	K	±50	10mR	0.30±0.1

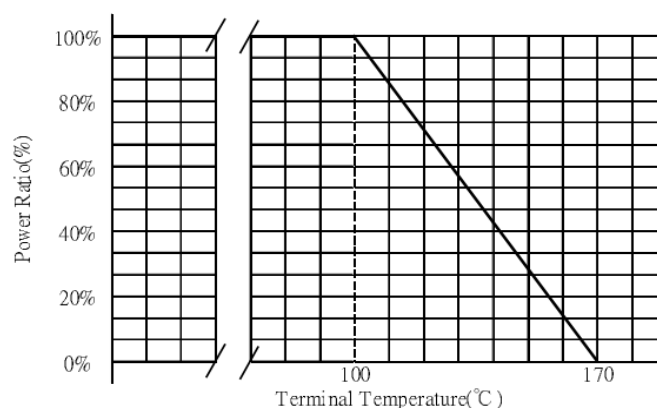
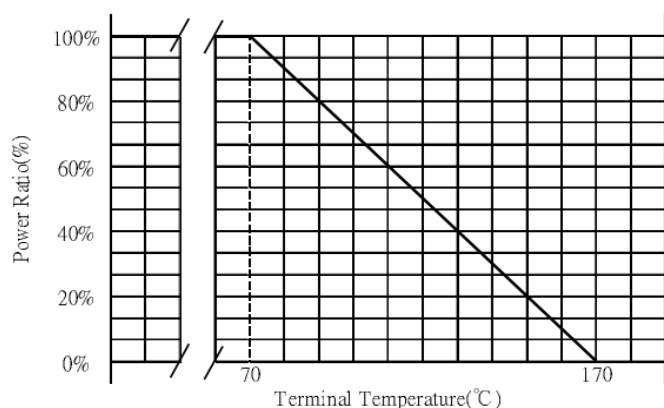
- For non-standard parts, please contact our sales dept.
- Power rating is guaranteed for use an aluminum substrate.
- Operating Temperature Range :-55°C~+170°C

◆ Type Dimension

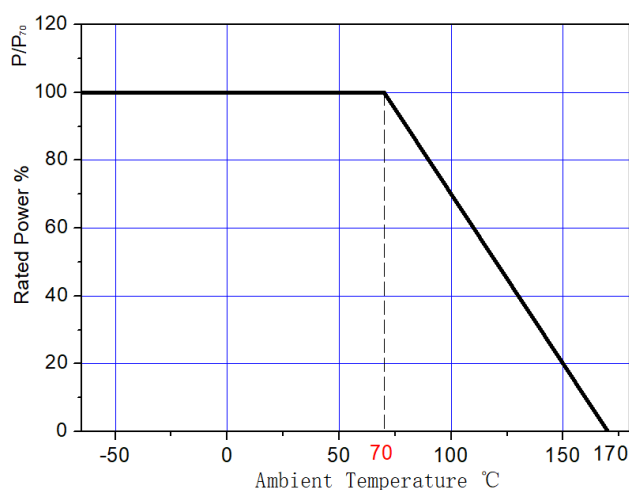


Type	Resistance	L(mm)	w(mm)	S(mm)	H(mm)
ESRC41	2mΩ~20mΩ	11±0.3	3.15±0.3	4.0±0.3	3.3.0±0.25
ESRC42	1mΩ~20mΩ	11±0.3	6.2±0.3	4.0±0.3	3.3.0±0.25

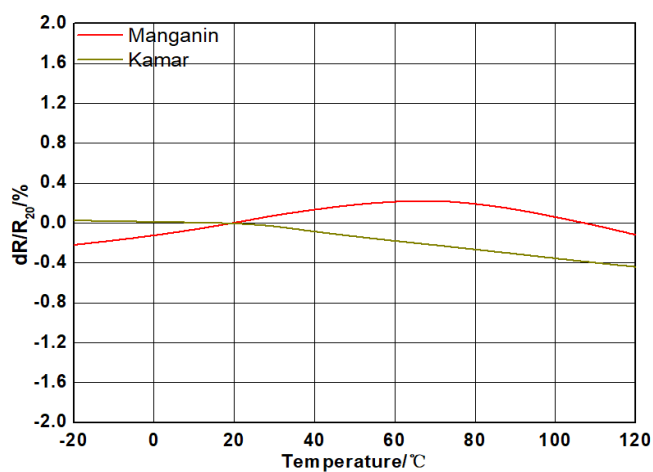
◆ Power Derating Curve



◆ Power Derating



◆ TCR Derating



◆ Rated Voltage:

The rated voltage is calculated by the following formula:

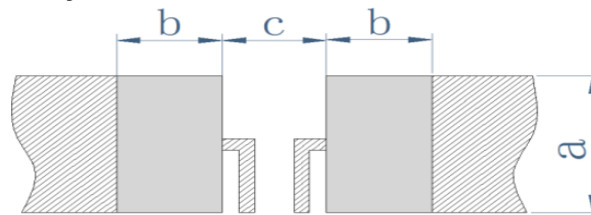
$$E(RCWV) = \sqrt{P * R}$$

E=Rated Voltage(V)

P=Rated Power(W)

R=Resistance Value(R)

◆ Recommended Solder Pad Layout



Unit: mm

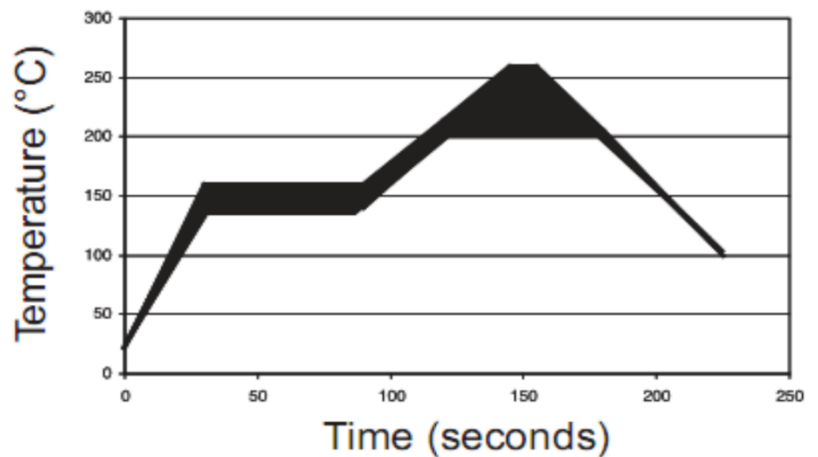
TYPE	Resistance	a	b	c
ESRC41	2mΩ~20mΩ	4.2	5	2
ESRC42	1mΩ~10mΩ	7.2	5	2

◆ Recommend Soldering Conditions:

Peaks reflow temperatures and durations

- Reflow Peak = 260 max for 10 sec
- Not suitable for wave soldering

Recommended IR Reflow Profile



◆ Storage Temperature

Temperature 20~30℃, Humidity 40~80%

◆ Packaging

Size EIA	ESRC41	ESRC42
Standard Packing Quantity (pcs /reel)	2000	1000