

Metal Film Thermosensitive Chip Resistors

0603, 0805

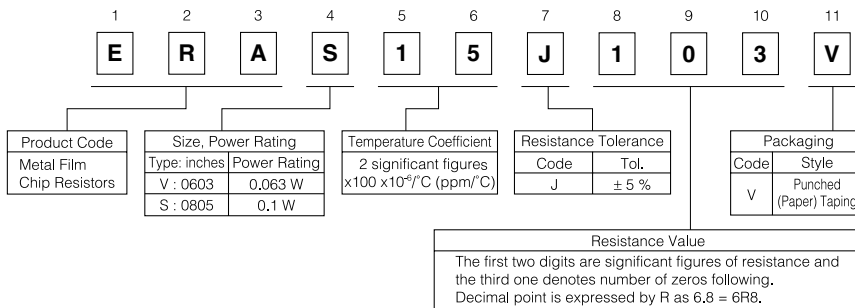
Type: ERAV, S



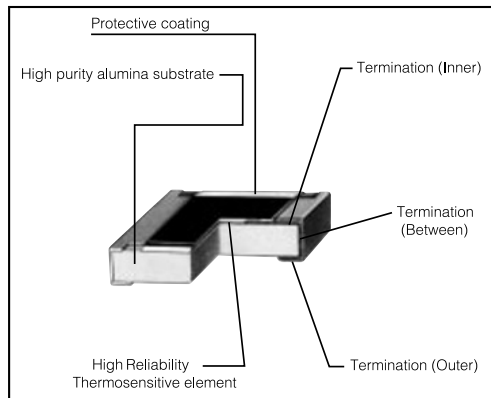
■ Features

- Most Suitable for Temperature correction circuits
- Wide Lineup
 - Temperature coefficient value $1000 \times 10^{-6}/^{\circ}\text{C}(\text{ppm}/^{\circ}\text{C})$ to $4700 \times 10^{-6}/^{\circ}\text{C}(\text{ppm}/^{\circ}\text{C})$
- High performance
 - Quick response to temperature change
- Linearity
 - Excellent linear resistance value change in wide temperature range (-40°C to $+125^{\circ}\text{C}$)
- High reliability, High density placing
- Small size and light weight or PCB size reduction and lightweight products
- Matching with placement machines
 - Taping packaging for automatic placement machine
- Solderability
 - suitable for both reflow soldering and soldering
- Approved under the ISO 9001 system

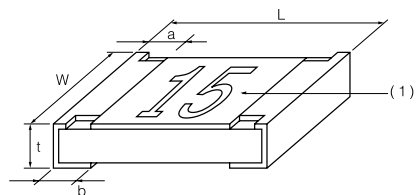
■ Explanation of Part Numbers



■ Construction



■ Dimensions in mm (not to scale)



Type	Dimensions (mm)					Net Weight (1000 pcs.)
	L	W	a	b	t	
NEW ERAV (0603)	1.60 ^{+0.20}	0.80 ^{+0.20}	0.30 ^{+0.20}	0.30 ^{+0.20}	0.45 ^{+0.10}	2g
ERAS (0805)	2.00 ^{+0.20}	1.25 ^{+0.10}	0.40 ^{+0.25}	0.40 ^{+0.25}	0.50 ^{+0.10}	4g

1) Marking Temperature Coefficient value :
2 significant figures $\times 100 \times 10^{-6}/^{\circ}\text{C}$ (ppm/ $^{\circ}\text{C}$)

■ Ratings

Type (inched)	Power Rating at 70 °C (W)	Standard Specification ⁽¹⁾		T.C.R. Tolerance	Standard Resistance Value	Resistance Tolerance (%)
		T.C.R. ×10 ⁻⁶ /°C (ppm/°C) ⁽²⁾	Resistance Range(Ω)			
ERAV (0603)	0.063	1500	1 k to 10 k	±200 ×10 ⁻⁶ /°C(ppm/°C)	E12	±5
		2700	1 k to 3.3 k	± 10 %		
		3900	5.6 to 390			
ERAS (0805)	0.1	1500	1 k to 10 k	±200 ×10 ⁻⁶ /°C(ppm/°C)	E12	±5
		2700	1 k to 4.7 k	± 10 %		
		3900	5.6 to 470			

(1) Table below shows the range of resistance values and T.C.R. which can be supplied (Please ask us when resistors other than standard specifications shown in the table above are needed).

T.C.R. ×10 ⁻⁶ /°C (ppm/°C)	Resistance Range (Ω)	
	ERAV type	ERAS Type
1000	10 to 10 k	10 to 10 k
1500	10 to 10 k	10 to 10 k
2700	43 to 3.3 k	43 to 5.1 k

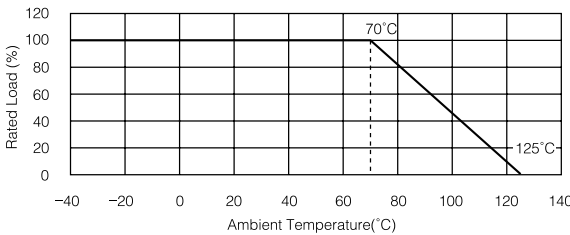
T.C.R. ×10 ⁻⁶ /°C (ppm/°C)	Resistance Range (Ω)	
	ERAV type	ERAS Type
3300	22 to 1.2 k	22 to 1.8 k
3900	5.6 to 390	5.6 to 470
4700	0.56 to 12	0.56 to 15

(2) $T.C.R.=\left(\frac{R_{75}-R_{25}}{R_{25}}\times\frac{1}{75-25}\times10^6\right)\times10^{-6}/^{\circ}C\text{ (ppm}/^{\circ}C\text{)}$ R_{25} : Resistance value at reference temperature 25 °C
 R_{75} : Resistance value at temperature 75 °C

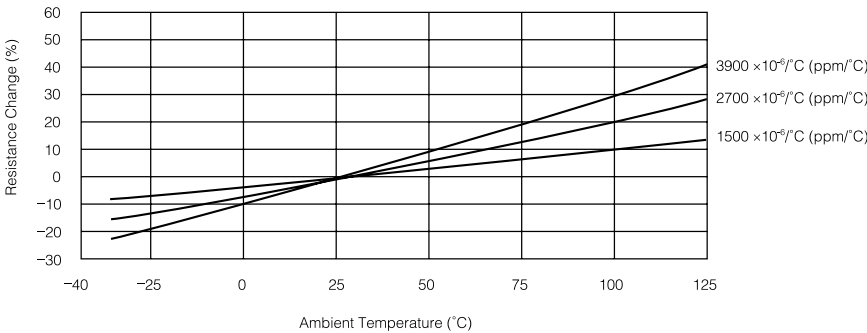
Power Derating Curve

For resistors operated in ambient temperatures above 70°C, the power rating should be derated in accordance with the figure on the right.

Category Temperature Range
(Operating Temperature Range)
-40 °C to +125 °C



■ Typical Linearity of Resistance Change

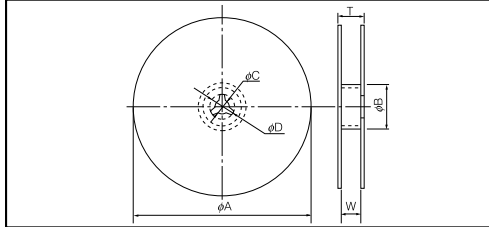


■ Packaging Methods

● Standard Quantity

Type (inches)	Thickness (mm)	Punched (Paper) Taping
ERAV (0603)	0.45	5000 pcs./reel
ERAS (0805)	0.5	5000 pcs./reel

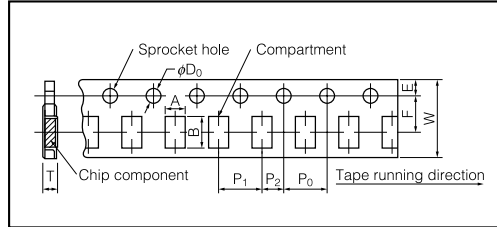
● Taping Reel



Dimensions (mm)	Type	ϕA	ϕB	ϕC	ϕD
	ERAV	180.0 ⁰ _{-3.0}	60 min.	13.0 ^{+1.0}	33.0 ^{+5.0}
	ERAS				

Dimensions (mm)	Type	W	T
	ERAV	9.0 ^{+1.0}	11.4 ^{+2.0}
	ERAS		

● Punched (Paper) Taping



Dimensions (mm)	Type	A	B	W	F	E
	ERAV	1.10 ^{+0.10}	1.90 ^{+0.10}	8.00 ^{+0.20}	3.50 ^{+0.05}	1.75 ^{+0.10}
	ERAS	1.65 ^{+0.15}	2.50 ^{+0.20}			

Dimensions (mm)	Type	P ₁	P ₂	P ₀	ϕD ₀	T
	ERAV	4.00 ^{+0.10}	2.00 ^{+0.05}	4.00 ^{+0.10}	1.50 ^{+0.1}	0.64 ^{+0.05}
	ERAS					0.84 ^{+0.05}

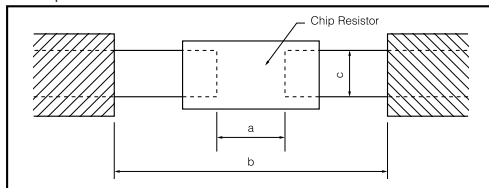
■ Attention

The ERS has high temperature coefficient. When measuring resistance value, it changes by Joule Heat. Measuring current should be very small in order not to let the resistance value change. (For example, when the resistor is used at RCWV, temperature of the resistor rises about 15°C and the resistance value rises a few percent.) Resistance value also changes by ambient temperature. Resistance value is measured at 25°C.

⚠ Safety Precautions

In the case of flow soldering, the land width must be smaller than the Chip Resistor width to control the solder amount properly. Generally, the land width should be 0.7 to 0.8 times the width of chip resistor. In the case of reflow soldering, solder amount can be adjusted, therefore the land width should be set to 1.0 to 1.3 times chip resistor width (W).

Example



Type (inches)	Dimensions (mm)		
	a	b	c
ERAV (0603)	0.7 to 0.9	2 to 2.2	0.8 to 1
ERAS (0805)	1 to 1.4	3.2 to 3.8	0.9 to 1.4

1. Rated Power and Ambient Temperature

Keep the rated power and ambient temperature within the specified derating curve.

*Place and fit resistors and other heating components on board, taking into consideration the temperature rise due to proximity of these components to each other.

2. External Shock

Mechanical shock during automatic mounting or handling of board after chip being mounted may cause break, flaw or fall-off of protective coating of resistor that may impair initial characteristics. Avoid nipping resistor with hard tool (a pair of pliers or tweezers) as it may damage protective film or electrode of resistor and may affect resistor's performance.

3. Application of Pulse

When pulse is applied to a resistor, the peak value of the pulse should be within rated value.

4. The resistor is neither non-combustible nor flameretardant.

5. When soldering with soldering iron, never touch the body of the chip resistor with the tip of the soldering iron. When using a soldering iron with a tip at high temperature, solder as fast as possible (three seconds or less up to 350°C).

6. Avoid immersing chip resistor in solvent for a long time. When using solvent, confirm the effect of immersion.

7. Do not use the product in dewy atmospheres.