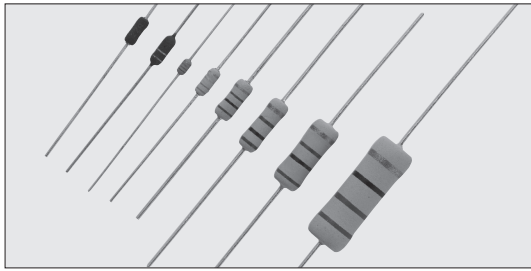


CW Coat-Insulated Miniature Wirewound Resistors



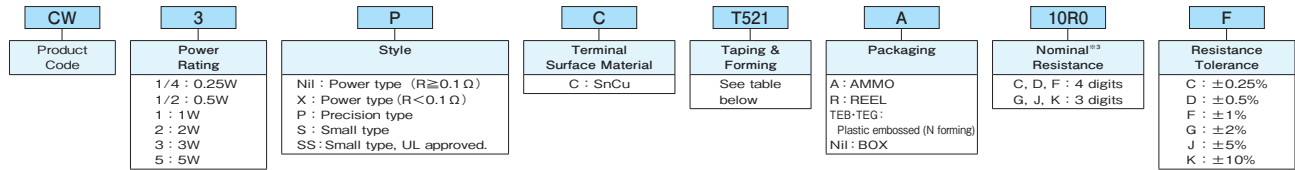
Coating color : Green (CW1/4) , Blue (CW, CW□X, CW□P)
 Black (CW1S, CW1SS)
 Marking : Color code (CW, CW□X, CW1SS*)
 Alphanumeric (CW□P, CW1S)
 *1 Two silver lines for CW1SS.

Features

- Products meet EU-RoHS requirements.
- CW1SS has UL1412 approval. (File No. E320246)
- Automatic mounting machine is applicable by surface mounted device style lead forming.
- Flame retardant coating (Equivalent to UL94 V-0)

Type Designation

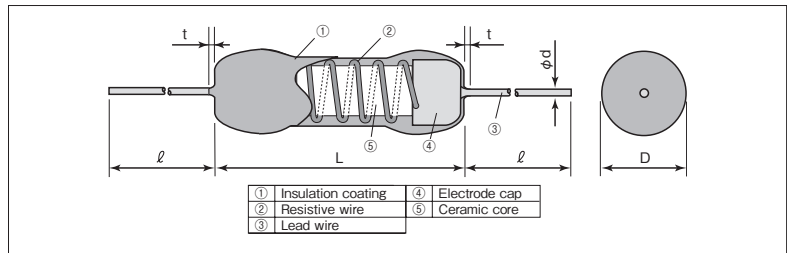
Example



Resistance Value (Ω)	3 digits	Resistance Value (Ω)	4 digits
10m~91m	10L~91L	0.1~0.976	R100~R976
0.1~0.91	R10~R91	1~9.76	1R00~9R76
1~9.1	1R0~9R1		

Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.
 For further information on taping and forming, please refer to APPENDIX C on the back pages.

Construction



Dimensions

Type	Dimensions (mm)					Weight (g) (1000pcs)
	L	D	$\ell \pm 3.0^{※2}$	d(Nominal)	t Max.	
CW1/4	3.3 \pm 0.3	1.9 \pm 0.3	30	0.45	0.5	140
CW1/2	6.5 \pm 1.0	2.5 \pm 1.0		0.6	1	250
CW1	9.0 \pm 1.0	3.5 \pm 1.0		0.8	3	650
CW1X		3.5 \pm 1.0				
CW1P		3.5 \pm 1.0				
CW2	12 \pm 1.0	4.0 \pm 1.0			3	950
CW2X		4.0 \pm 1.0				
CW2P		4.0 \pm 1.0				
CW3	15 \pm 1.0	6.0 \pm 1.0			3	1780
CW3X		6.0 \pm 1.0				
CW3P		6.0 \pm 1.0				
CW5	24 \pm 1.5	9.0 \pm 1.5	38		3	4400
CW1S	6.5 \pm 1.0	2.5 \pm 1.0	30	0.6	1	250
CW1SS						

※2 Lead length changes depending on taping and forming type.

Taping & Forming Matrix

Type	Axial Taping				Stand-off axial taping L52	Radial Taping		L Forming						N Forming		
	T26	T52	T521	T631		VTP	GT	L10A	L12.5A	L15A	L20A	L25A	L30A	L35A	N17	N20
CW1/4	○	○														
CW1/2		○			○	○	○									
CW1		○			○	○ ^{※3}		○								
CW2		○	○				○		○						○	
CW3			○	○			○		○		○					○
CW5												○	○			
CW1X		○			○											
CW2X			○			○										
CW3X			○	○							○	○				
CW1S		○			○			○								
CW1SS		○														
CW1P		○			○		○ ^{※3}			○						
CW2P		○			○			○		○		○				
CW3P			○	○				○		○		○				

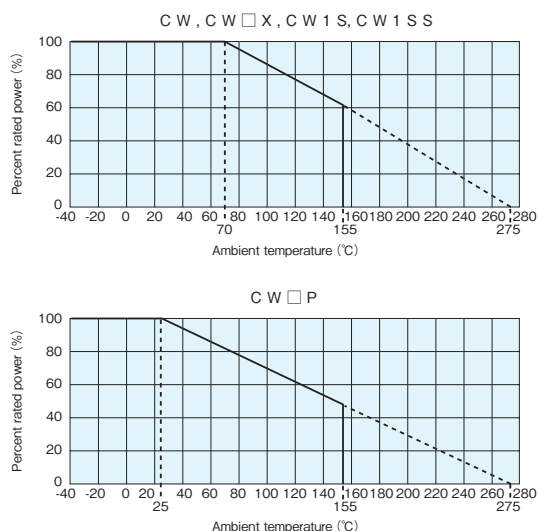
※3 Applicable to 0.47 Ω or over.

Ratings

Type	Power Rating	Rated Ambient Temp.	Resistance Range (Ω)						T.C.R. ($\times 10^{-6}/K$)	Operating Temp. Range	Taping & Q'ty/AMMO (pcs)					
			C : \pm 0.25% E24 · E96	D : \pm 0.5% E24 · E96	F : \pm 1% E24 · E96	G : \pm 2% E24	J : \pm 5% E24	K : \pm 10% E24			T26A	T52A	T521A	T631A		
CW1/4	0.25W	+70°C	—	—	—	—	0.47~15	0.47~15	\pm 250	-40°C ~+155°C	2,000	3,000	—	—		
CW1/2	0.5W		—	—	—	—	0.1~100	0.1~100			—	2,000	—	—		
CW1	1W		—	—	—	—	0.1~390	0.1~390			—	—	1,000	—	—	
CW2	2W		—	—	—	—	0.1~390	0.1~390			—	—	1,000	1,000	—	
CW3	3W		—	—	—	—	0.1~390	0.1~390			—	—	—	500	500	
CW5	5W		—	—	—	—	0.1~390	0.1~390			—	—	—	—	—	
CW1X	1W		—	—	—	—	0.01~0.091	0.01~0.091			\pm 500	—	—	1,000	—	—
CW2X	2W		—	—	—	—	0.01~0.091	0.01~0.091				—	—	—	1,000	—
CW3X	3W		—	—	—	—	0.01~0.091	0.01~0.091				—	—	—	500	500
CW1S	1W		+25°C	—	—	—	—	0.1~100			0.1~100	\pm 250	-40°C ~+155°C	—	2,000	—
CW1SS	1W	—		—	—	—	10	—	\pm 100	—	2,000			—	—	
CW1P	1W	1~100		0.47~220	0.1~430	—	—	—	\pm 90 : R \geq 10 Ω \pm 50 : R<10 Ω	—	1,000			—	—	
CW2P	2W	1~390		0.47~390	0.1~390	—	—	—	—	—	1,000			1,000	—	
CW3P	3W	1~390		0.47~390	0.1~390	—	—	—	—	—	—			500	500	

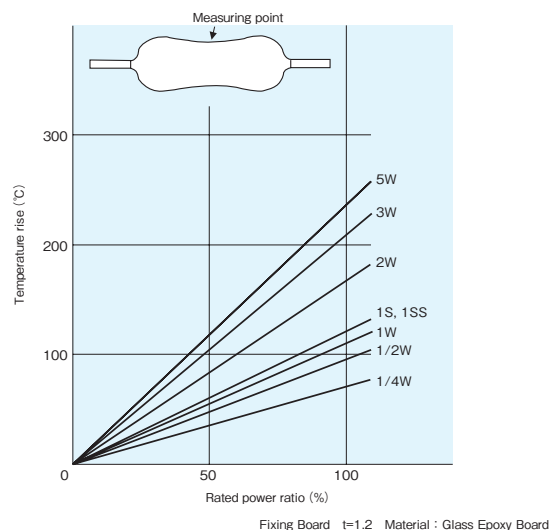
Rated voltage = $\sqrt{\text{Power Rating} \times \text{Resistance value}}$.

Derating Curve



For resistors operated at an ambient temperature or higher, the power shall be derated in accordance with the above derating curve.

Temperature Rise (Ref.)



Performance

Test Items	Performance Requirements		Test Methods
	Limit	Typical	
Resistance	Performance Requirements $\Delta R \pm (\% + 0.05 \Omega)$: CW, CW1S, CW1SS, CW□P $\Delta R \pm (\% + 0.005 \Omega)$: CW□X		25°C
T.C.R.	Within specified T.C.R.		CW, CW□X, CW1S, CW1SS : +25°C/+125°C CW□P : +25°C/-40°C and +25°C/+155°C
Overload (Short time)	1 : CW, CW□X 2 : CW1S, CW1SS 0.5 : CW□P 0.2 : CW□P (R<10Ω) *4	0.8 : CW, CW□X 1.8 : CW1S, CW1SS 0.4 : CW□P 0.18 : CW□P (R<10Ω)	Power rating×10, 5s (CW, CW□X, CW1S, CW1SS) Power rating×6.25, 5s (CW□P) Power rating×5, 5s (CW□P : R<10Ω) *4
Resistance to soldering heat	1 : CW, CW1S, CW1SS, CW□X 0.5 : CW□P 0.2 : CW□P (R<10Ω) *4	0.8 : CW, CW1S, CW1SS, CW□X 0.4 : CW□P 0.18 : CW□P (R<10Ω)	350°C±10°C, 3.5s or 260°C±5°C, 10s
Moisture resistance	5 : CW, CW1S, CW1SS, CW□X 2 : CW□P 0.5 : CW□P (R<10Ω) *4	4 : CW, CW1S, CW□X 1.6 : CW□P 0.45 : CW□P (R<10Ω)	Power rating×1/10, 40°C, 90%~95%RH, 1000h 1.5h ON/0.5h OFF cycle
Endurance at 25°C or 70°C	5 : CW, CW1S, CW1SS, CW□X 2 : CW□P 0.5 : CW□P (R<10Ω) *4	4 : CW, CW1S, CW□X 1.6 : CW□P, CW1SS 0.45 : CW□P (R<10Ω)	70°C, 1000h (CW, CW□X, CW1S, CW1SS) 25°C, 1000h (CW□P) 1.5h ON/0.5h OFF cycle
Resistance to solvent	No abnormality in appearance such as disappearance of marking, etc.	—	On immersing the sample in IPA for 3 minutes, the resistor surface should be lightly wiped with a dry cloth (velvet or gauze).
Thunder surge	3 : CW1SS	—	Combination wave +1.5kV 20sec 3cycles

*4 Refer to MIL-PRF-26G standard.

Precautions for Use

- Be careful to handle these resistors because outer coatings are comparatively weak to outer shock due to flameproof special coats. Please wash them to a minimum. No external force is given to the coating films until they are well dried because the coating films become weaker right after washing. The original strength will be returned after they are dried, so please pay attention not to apply any external force onto the coating film of resistors for 20 minutes after drying. Especially no PC boards shall be piled up.
- In case of using them for an AC circuit, abnormal phenomena like oscillation etc. occasionally happen as they have an inductance or a parasitic capacitance because of their wiring structures. Use them by taking the dispersion of constants of other components into the consideration.