

■ General

• Scope

This specification is available for Thick Film 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

- Consumer electronics
- Voltage regulator
- Computer & relative products
- Measuring instrument
- Industrial/Power supply
- Battery management system

■ Features

- Wide Terminal
- High precision current sensing
- High power capability
- Halogen free and lead free
- RoHS compliant

■ Standard Electrical Specifications

- Standard Type

Type	EIA Size	Rated Power at 70℃	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/℃)	Resistance Range
						F(1%),G(2%),J(5%)
ECW58	0508	0.75W	200V	400V	±200	1Ω≦R<10Ω
					±100	10Ω≦R≦1MΩ
ECW62	0612	0.75W			±200	1Ω≦R<10Ω
					±100	10Ω≦R≦10MΩ
ECW00	1020	1W			±200	1Ω≦R<10Ω
					±100	10Ω≦R≦10MΩ
ECW28	1218	1W			±200	1Ω≦R<10Ω
					±100	10Ω≦R≦10MΩ
ECW22	1225	2W			±200	1Ω≦R<10Ω
					±100	10Ω≦R≦10MΩ

- For non-standard parts, please contact our sales dept.
- Operating Temperature Range: $-55^\circ\text{C} \sim +155^\circ\text{C}$

Wide Terminal Thick Film Resistor ECW Series



- High Power Electrical Type

Type	EIA Size	Rated Power at 70°C	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/°C)	Resistance Range
						F(1%),G(2%),J(5%)
ECW58	0508	1W	200V	400V	±150	$1\Omega \leq R < 10\Omega$
					±100	$10\Omega \leq R \leq 1M\Omega$
ECW62	0612	1.5W			±100	$1\Omega \leq R < 10\Omega$
					±100	$10\Omega \leq R \leq 10M\Omega$
ECW00	1020	2W			±100	$1\Omega \leq R < 10\Omega$
					±100	$10\Omega \leq R \leq 10M\Omega$
ECW28	1218	2W			±100	$1\Omega \leq R < 10\Omega$
					±100	$10\Omega \leq R \leq 10M\Omega$
ECW22	1225	3W			±100	$1\Omega \leq R < 10\Omega$
					±100	$10\Omega \leq R \leq 10M\Omega$

- Low Ohm Resistor Type

Type	EIA Size	Rated Power at 70°C	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/°C)	Resistance Range
						F(1%),G(2%),J(5%)
ECW62	0612	0.75W	0.087V~0.86V	2.154V	±2000	$10m\Omega \leq R < 50m\Omega$
					±800	$50m\Omega \leq R < 100m\Omega$
					±600	$100m\Omega \leq R < 1\Omega$
ECW00	1020	1W	0.1V~0.99V	2.475V	±2000	$10m\Omega \leq R < 50m\Omega$
					±800	$50m\Omega \leq R < 100m\Omega$
					±600	$100m\Omega \leq R < 1\Omega$
ECW28	1218	1W	0.1V~0.99V	2.475V	±2000	$10m\Omega \leq R < 50m\Omega$
					±800	$50m\Omega \leq R < 100m\Omega$
					±600	$100m\Omega \leq R < 1\Omega$
ECW22	1225	2W	0.14V~1.41V	3.518V	±2000	$10m\Omega \leq R < 50m\Omega$
					±800	$50m\Omega \leq R < 100m\Omega$
					±600	$100m\Omega \leq R < 1\Omega$

- For non-standard parts, please contact our sales dept.
- Operating Temperature Range:-55°C~+155°C

Wide Terminal Thick Film Resistor ECW Series

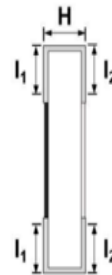
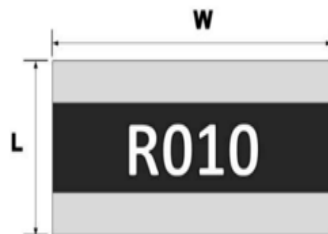


• Jumper Electrical Type

Type	EIA Size	Jumper Resistance Value	Jumper Rated Current	Over Load Current< 1 Second and 1 times (Max.)
ECW62	0612	20mΩ Max	4A	15A
ECW00	1020		6A	22A
ECW28	1218		6A	22A
ECW22	1225		8A	30A

- For non-standard parts, please contact our sales dept.
- Operating Temperature Range:-55℃~+155℃

■ Type Dimensions



Unit: mm

TYPE	EIA Size	L	W	H	l ₁	l ₂
ECW58	0508	1.25±0.10	2.00±0.10	0.55±0.15	0.25±0.15	0.50±0.15
ECW62	0612	1.60±0.15	3.20±0.20	0.55±0.15	0.30±0.20	0.50±0.20
ECW00	1020	2.50±0.15	5.00±0.15	0.55±0.15	0.40±0.20	0.75±0.20
ECW28	1218	3.10±0.15	4.60±0.15	0.55±0.15	0.40±0.20	0.50±0.20
ECW22	1225	3.20±0.20	6.50±0.20	0.55±0.15	0.40±0.25	0.80±0.25
ECW22*H	1225	3.20±0.20	6.50±0.20	0.65±0.15	0.40±0.25	0.80±0.25

Wide Terminal Thick Film Resistor ECW Series



■ PART NUMBER SYSTEM

<u>ECW</u>	<u>25</u>	<u>F</u>	<u>S</u>	<u>10K0</u>	<u>C</u>	<u>D</u>	<u>S</u>
Product Type	Size (Inch)	Resistor Tolerance	Rated Power	Resistor Value	TCR (PPM/°C)	Quantity (Pcs)	Remarks
ECW	58=0508 62=0612 00=1020 28=1218 22=1225	F=±1% G=±2% J=±5%	Q=0.75W T=1W A=1.5W S=2W R=3W	R056=56mΩ R010=10mΩ 10K0=10KΩ 100K=100KΩ	E=±100PPM K=±150PPM F=±200PPM G=±300PPM H=±400PPM J=±600PPM R=±1000PPM T=±1600PPM U=±2000PPM	B=2000 D=4000 E=5000	S=Standard H=High power L=Low Ohm J=Jump

(1): ECW Series

(2): Size Code

(3): Tolerance Code: F=±1%,G=±2%, J=±5%

(4): Power Rated: Q=0.75W,T=1W,S=2W,R=3W

(5): Resistance Code: R056=56mΩ; R010=10mΩ; R100=100mΩ;10K0=10KΩ

(6): TCR(PPM/°C) : E=±100ppm,F=±200ppm,G=±300ppm,H=±400ppm,J=±600ppm,K=±150ppm,

R=±1000ppm, T=±1600ppm,U=±2000ppm

(7): Quantity: B=2000, D=4000,E=5000

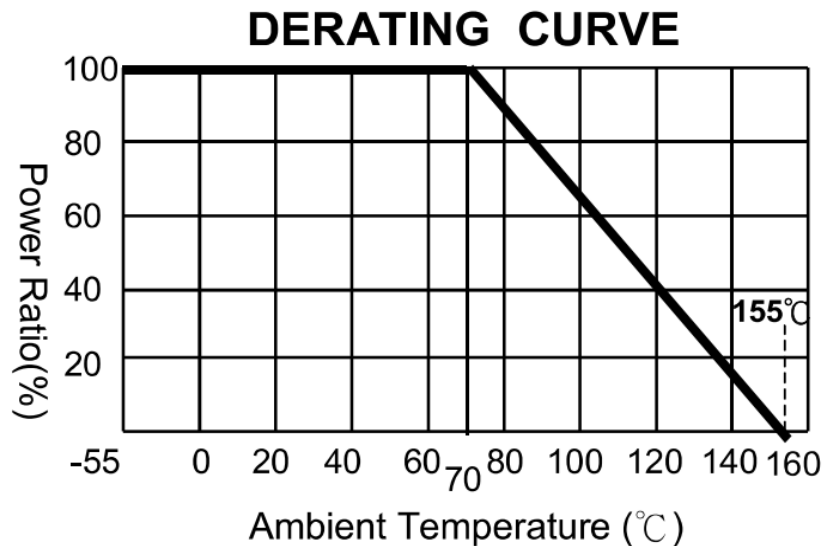
(8): Remarks: S=Standard, H=High power, L=Low Ohm, J=Jump

■ Performance Characteristics

• Power Derating Curve

The Operating Temperature Range:-55°C~+155°C

Power rating or current rating is in the case Based on continuous full-load at ambient temperature of 70°C. For operation at ambient temperature in excess of 70°C, the load should be derated in accordance with figure of derating Curve.



• Rated Current

Resistance Range: <1Ω

Rated Current: The resistor shall have a DC continuous working or a AC(rms) continuous working current at commercial-line frequency and wave form corresponding to the power rating ,as determined formula as following:

$$I = \sqrt{P/R}$$

I=Rated current(A)

P=Rated Power (W)

R=Resistance(Ω)

• Rated Voltage

Resistance Range: ≥1Ω

Rated Voltage: The resistor shall have a DC Continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating ,as determined formula as following:

$$V = \sqrt{P * R}$$

I=Rated voltage(V)

P=Rated Power (W)

R=Nominal Resistance(Ω)

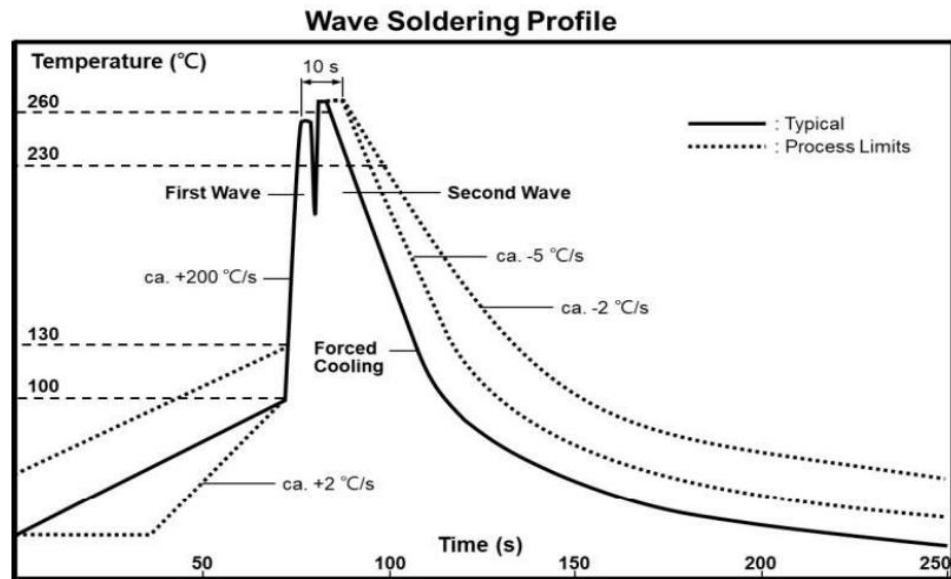
■ Reliability Tests and Requirements

Test Item	Requirements	Procedure	Test Method
Temperature Coefficient of Resistance(T.C.R)	Refer to Standard Electrical Specifications	At 25°C/+125°C,25°C is the reference temperature	JIS-C-5201-1 4.8 IEC-60115-1 4.8
Short Time Overload	$\pm(1.0\%+0.001\Omega)$	Standard power :6.25 times rated power whichever is less for 5 seconds	JIS-C-5201-1 4.13 IEC-60115-1 4.13
		High power (2x/4x) and wide terminal type:5 times rated power whichever is less for 5 seconds	
Insulation Resistance	$\geq 10G\Omega$	Apply 100VDC for 1 Minute.	JIS-C-5201-1 4.6 IEC-60115-1 4.6
Dielectric withstanding Voltage	No short or burned on the appearance.	0805/0508 and above applied 500VAC for 1 minute. 0201 0402 0603 applied 300VAC for 1 minute	JIS-C5201-1 4.7
Core Body Strength	No Broken	Central Part Pressurizing force:10N, 10 seconds	JIS-C5201-1 4.15
Solderability	>95% Coverage No Visual Damage	245 $\pm$ 5°C for 3 seconds.	JIS-C-5201-1 4.17 IEC-60115-1 4.17
Resistance to Soldering heat	$\pm(1.0\%+0.001\Omega)$ No Visual Damage	260 $\pm$ 5°C for 10 seconds.	JIS-C-5201-1 4.18 IEC-60115-1 4.18
Leaching	>95% Coverage No Visual Damage	260 $\pm$ 5°C for 30 seconds.	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1
Rapid Change of Temperature	$\pm(1.0\%+0.001\Omega)$ No Visual Damage	-55°C to+155°C,300 cycles	JIS-C-5201-1 4.19 IEC-60115-1 4.19
Damp Heat with Load	$\pm(1.0\%+0.001\Omega)$	40 $\pm$ 2°C,90-95% R.H. RCWV or Max. working current whichever is less for 1000 Hrs with 1.5 Hrs "ON" and 0.5 Hr "OFF"	JIS-C-5201-1 4.24 IEC-60115-1 4.24
Biased Humidity	$\pm(0.5\%+0.05\Omega)$	1,000 hours; 85°C/85% RH, 10% of operating power. Measurement at 24 $\pm$ 4 hours after test conclusion	MIL-STD-202 Method 103
Load Life (Endurance)	$\pm(1.0\%+0.001\Omega)$	70 $\pm$ 2°C,Rated power ,or Max. working current whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 Hr "OFF"	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1
High Temperature Exposure	$\pm(1.0\%+0.001\Omega)$	At 155 $\pm$ 5°C for 1000 hours.	JIS-C5201-1 4.25 IEC 60068-2-2
Resistance to Solvent	$\pm(1.0\%+0.001\Omega)$ No Visual Damage	The tested resistor be immersed into isopropyl alcohol of 20~25°C for 60 secs. Then the resistor is left in the room for 48 hrs.	JIS-C5201-1 4.29
Terminal Strength	No Broken	Pressurizing force for 10 seconds 0201,0402,0603 :8N; 0805/0508 and above :17.7N	JIS-C5201-1 4.33 AEC Q200-006
Bending Strength	1% and below: $\pm(1.0\%,2\%,5\%+0.05\Omega)$	Bending once for 5 seconds D:0508, 0612, 1020, 1218, 1225=2mm	JIS -C-5201-1 4.33 IEC-60115-1 4.33

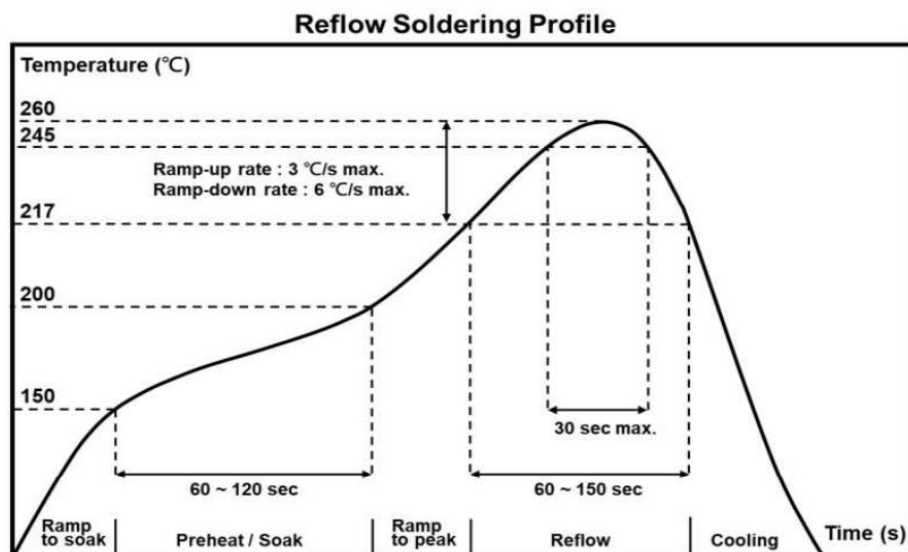
Temperature Coefficient of Resistance test to -55°C is available on request

■ Recommend Customer Soldering Parameters

- Wave solder Temperature condition

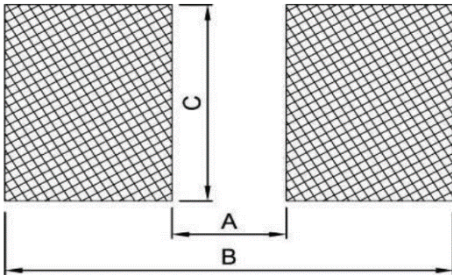


- Solder Reflow Temperature Condition



- Rework temperature (hot air equipment) :350°C, 3-5seconds
 - Recommended reflow methods
IR, vapor phase oven, hot air oven
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

■ Recommend Land Pattern Design



Unit: mm

TYPE	EIA Size	A	B	C
ECW58	0508	0.40	1.80	2.00
ECW62	0612	0.60	2.90	3.20
ECW00	1020	0.8	3.5	5.50
ECW28	1218	2.1	4.3	5.0
ECW22	1225	1.00	3.70	6.50

■ Plating Thickness

Ni: $\geq 3\mu\text{m}$

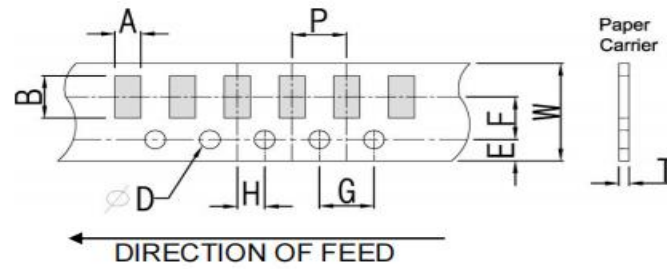
Sn(Tin): $\geq 3\mu\text{m}$

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Wide Terminal Thick Film Resistor ECW Series

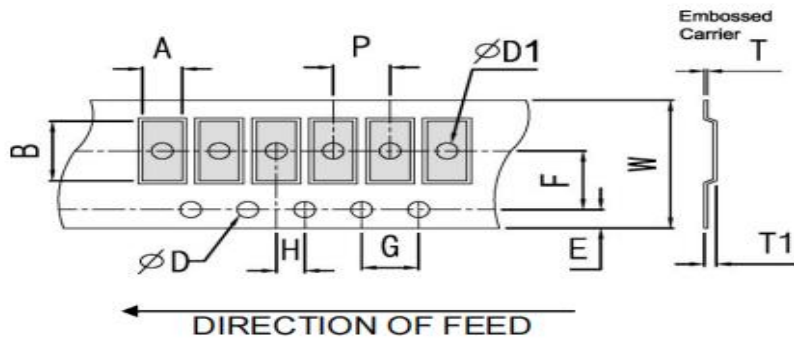


■ Paper Type DIMENSIONS (mm)



Type	EIA Size	A	B	W	E	F	G	H	T	DØ	P
ECW58	0508	1.50±0.15	2.25±0.15	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1	1.5±0.1	4.0±0.1
ECW62	0612	1.90±0.15	3.50±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1	1.5±0.1	4.0±0.1

■ Embossed Type DIMENSIONS (mm)



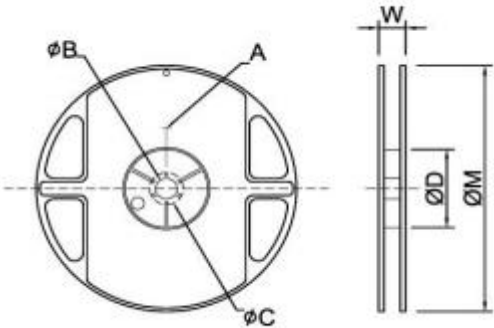
Type	EIA Size	A	B	W	E	F	G	H	T	ØD	ØD1	T1	P
ECW00	1020	2.80±0.2	5.6±0.2	12±0.1	1.7±0.2	5.5±0.1	4.0±0.1	2.0±0.1	2.3±0.1	1.5±0.1	1.5±0.1	0.85±0.2	4.0±0.1
ECW28	1218	3.30±0.2	6.7±0.2	12±0.1	1.7±0.2	5.5±0.1	4.0±0.1	2.0±0.1	2.3±0.1	1.5±0.1	1.5±0.1	0.85±0.2	4.0±0.1
ECW22	1225	3.40±0.2	6.7±0.2	12±0.1	1.7±0.2	5.5±0.1	4.0±0.1	2.0±0.1	2.3±0.1	1.5±0.1	1.5±0.1	1.0±0.2	4.0±0.1

■ TAPING SPECIFICATIONS

Availability

Type	EIA Size	Carrier Tape		Qty per Reel (pcs)
		Material	Width (mm)	
ECW58	0508	Paper	11.5	5000
ECW62	0612			
ECW00	1020	Embossed	16	4000
ECW28	1218			
ECW22	1225			

- Reel DIMENSIONS (mm)
- LAND PATTERN DIMENSIONS (mm)



Type	EIA Size	A	ØB	ØC	ØD	W	ØM
ECW58	0508	2.00±0.5	13.5±1.0	21.0±1.0	60.0±1.0	11.5±2.0	178±2.0
ECW62	0612	2.00±0.5	13.5±1.0	21.0±1.0	60.0±1.0	11.5±2.0	178±2.0
ECW00	1020	2.00±0.5	13.5±1.0	21.0±1.0	60.0±1.0	16.0±2.0	178±2.0
ECW28	1218	2.00±0.5	13.5±1.0	21.0±1.0	60.0±1.0	16.0±2.0	178±2.0
ECW22	1225	2.00±0.5	13.5±1.0	21.0±1.0	60.0±1.0	16.0±2.0	178±2.0