Data Sheet

Customer:	
Product:	Thick Film Chip Resistor (Wide Terminal) – CRW Series
Size:	0508/0612/1020/1225
Issued Date:	15-Jun-22
Edition:	REV.A3

RoHS Compliant

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Thick Film Chip Resistor (Wide Terminal)-CRW Series



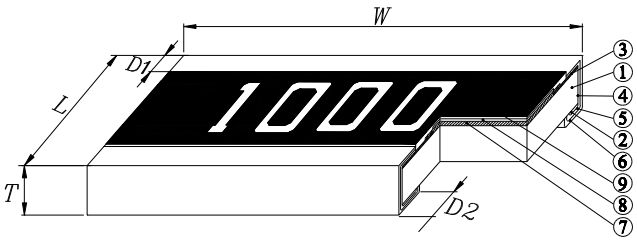
■Scope

－This specification applies to all sizes of rectangular-type fixed chip resistors with Ruthenium-base as material.

■Features

－Highly reliable multilayer electrode construction
－Compatible with all soldering process

■Construction



①	Alumina Substrate	④	Edge Electrode	⑦	Resistor Layer
②	Bottom Electrode	⑤	Barrier Layer	⑧	Primary Overcoat
③	Top Electrode	⑥	External Electrode	⑨	Secondary Overcoat

■Applications

－Telecommunication Equipment
－Radio and Tape Recorders, TV Tuners
－Digital Cameras, Watches, Pocket Calculators
－Computers, Instruments
－Medical Equipment

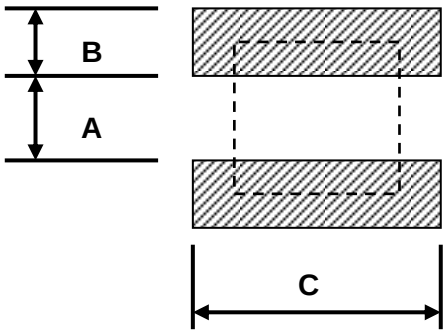
■Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)
CRW08	0508	1.25±0.10	2.00±0.10	0.55±0.10	0.30±0.15	0.30±0.15
CRW08(Jumper)					0.20±0.15	
CRW62	0612	1.55±0.10	3.00±0.15	0.55±0.10	0.25±0.15	0.40±0.15
CRW62(Jumper)						
CRW20	1020	2.45±0.15	5.00±0.10	0.60±0.15	0.35±0.20	0.70±0.20
CRW20(Jumper)					0.45±0.20	
CRW25	1225	3.20±0.20	6.40±0.15	0.65±0.15	0.40±0.20	1.10±0.20
CRW25(Jumper)					0.50±0.20	0.70±0.20

■Part Numbering

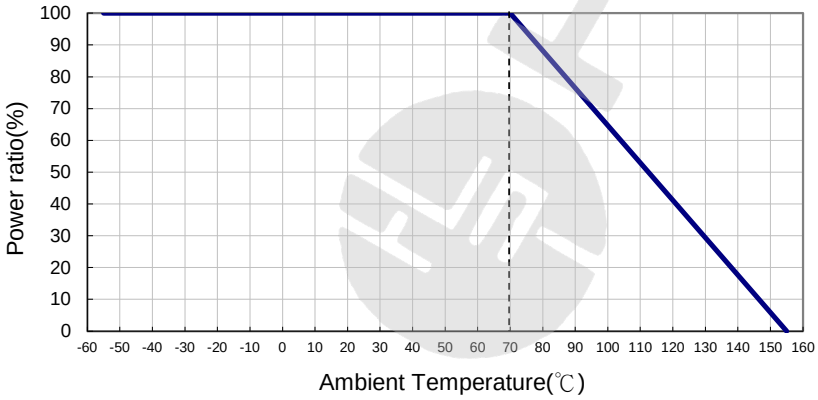
CRW	25	F	L	4	---20R
Product Type	Dimensions	Resistance Tolerance	Function Code	Packaging Code	Resistance
CRW	08: 0508 62: 0612 20: 1020 25: 1225	D: ±0.5% F: ±1% J: ±5%	L:Standard & High Precision P: High Power	4: 7" Reel 4Kpcs 7: 7" Reel 5Kpcs	- - -20R: 20Ω - - - 1R2: 1.2Ω - - - -0R: 0Ω "-" to fill up 6 spaces

■Recommend Land Pattern

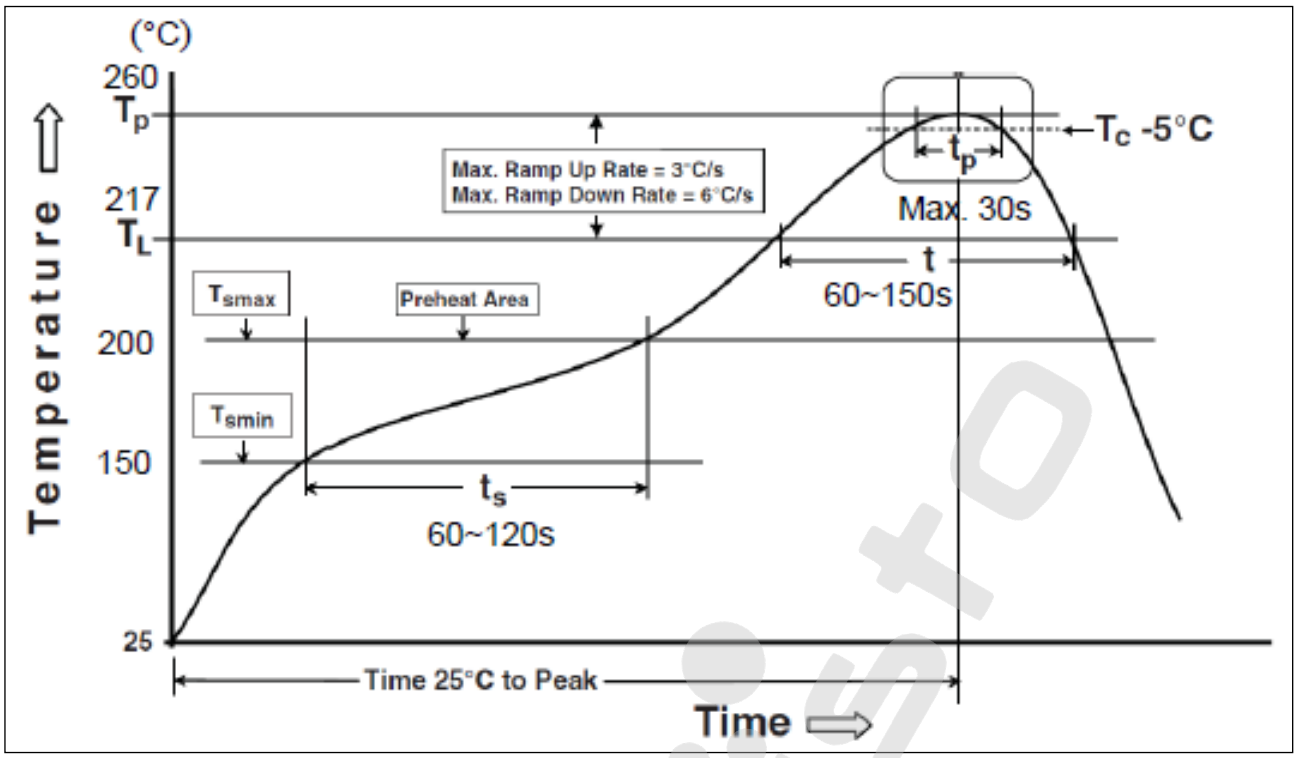


Type	A (mm)	B (mm)	C (mm)
CRW08	0.55	0.90	2.00
CRW62	0.70	0.80	3.20
CRW20	1.00	1.20	5.00
CRW25	1.00	2.00	7.00

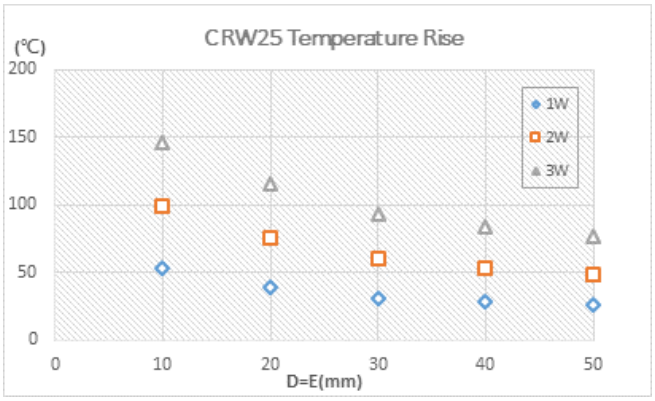
■Derating Curve

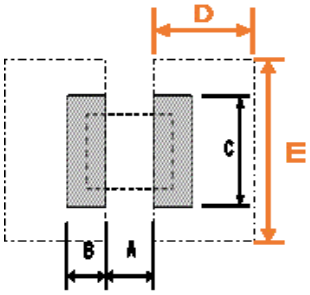


■Soldering Condition (Ref. IPC/JEDEC J-STD-020 & J-STD-002)



Reflow Profiles	
Profile Feature	**Pb-Free Assembly**
Preheat Min. Temperature (Tsmin) Max Temperature (Tsmax) Preheating time (ts) from (Tsmin to Tsmax)	 150 °C 200 °C 60-120 seconds
Ramp-up rate (T_L to Tp)	3 °C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	217 °C 60-150 seconds
Min. Peak temperature (Tp min)	235°C
Max. Peak temperature (Tp max)	260°C
Time (tp) within 5 °C of the specified classification temperature (Tc)	30 seconds max.
Ramp-down rate (Tp to T_L)	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.





＊FR4 copper board, 35μm of copper pad thickness

■Standard Electrical Specifications

Item / Type	Power Rating at 70℃	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range			TCR (PPM/℃)
					±0.5% (E24,E96)	±1% (E24,E96)	±5% (E24)	
CRW08 (0508)	0.75W	-55 ~ +155°C	200V	400V	1Ω – 9.76Ω			±150
					10Ω – 1MΩ			±100
CRW62 (0612)	1W	-55 ~ +155°C	200V	400V	1Ω – 1MΩ			±100
CRW20 (1020)	1.5W	-55 ~ +155°C	200V	400V	1Ω – 9.76Ω			±150
					10Ω – 1MΩ			±100
CRW25 (1225)	2W	-55 ~ +155°C	200V	400V	1Ω – 29.4Ω			±200
					30Ω – 1MΩ			±100

■High Power Rating Electrical Specifications

Item / Type	Power Rating at 70℃ Jumper Rated Current	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range			TCR (PPM/℃)
					±0.5% (E24,E96)	±1% (E24,E96)	±5% (E24)	
CRW08 (0508)	1W	-55 ~ +155°C	200V	400V	1Ω – 9.76Ω			±150
					10Ω – 1MΩ			±100
	Jumper: 5A				-		0Ω(<10mΩ)	-
CRW62 (0612)	1.5W	-55 ~ +155°C	200V	400V	1Ω – 1MΩ			±100
	Jumper: 6A				-		0Ω(<10mΩ)	-
CRW20 (1020)	2W	-55 ~ +155°C	200V	400V	1Ω – 9.76Ω			±150
					10Ω – 1MΩ			±100
	Jumper: 10A				-		0Ω(<10mΩ)	-
CRW25 (1225)	3W	-55 ~ +155°C	200V	400V	1Ω – 29.4Ω			±200
					30Ω – 1MΩ			±100
	Jumper: 12A				-		0Ω(<10mΩ)	-

Operating Voltage=$\sqrt{}$(P*R) or Max. Operating Voltage listed above, whichever is lower.
Overload Voltage=2.5*$\sqrt{}$(P*R) or Max. Overload Voltage listed above, whichever is lower.
■ Viking is capable of manufacturing the optional spec based on customer's requirement.

■Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	**JIS-C-5201-1 4.8** **IEC-60115-1 4.8** At 25°C/-55°C and 25°C/+125°C, 25°C is the reference temperature
Short Time Overload	±(1.0%+0.05Ω)	**JIS-C-5201-1 4.13** **IEC-60115-1 4.13** RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds
Insulation Resistance	≥10G	**JIS-C-5201-1 4.6** **IEC-60115-1 4.6** Max. Overload Voltage for 1 minute
Endurance	±(1.0%+0.10Ω)	**JIS-C-5201-1 4.25** **IEC-60115-1 4.25.1** 70±2°C, RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hr “OFF”
Damp Heat with Load	±(1.0%+0.10Ω)	**JIS-C-5201-1 4.24** **IEC-60115-1 4.24** 40±2°C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hr “OFF”
Dry Heat	±(1.0%+0.05Ω)	**JIS-C-5201-1 4.23** **IEC-60115-1 4.23.2** at +155°C for 1000 hrs
Bending Strength	±(1.0%+0.05Ω)	**JIS-C-5201-1 4.33** **IEC-60115-1 4.33** Bending once for 60 seconds with 3mm
Solderability	95% min. coverage	**JIS-C-5201-1 4.17** **IEC-60115-1 4.17** 245±5°C for 3 seconds
Resistance to Soldering Heat	±(0.5%+0.05Ω)	**JIS-C-5201-1 4.18** **IEC-60115-1 4.18** 260±5°C for 10 seconds
Voltage Proof	No breakdown or flashover	**JIS-C-5201-1 4.7** **IEC-60115-1 4.7** 1.42 times Max. Operating Voltage for 1 minute
Leaching	Individual leaching area ≦5% Total leaching area ≦ 10%	**JIS-C-5201-1 4.18** **IEC-60068-2-58 8.2.1** 260±5°C for 30 seconds
Rapid Change of Temperature	±(0.5%+0.05Ω)	**JIS-C-5201-1 4.19** **IEC-60115-1 4.19** -55°C to +155°C, 5 cycles

RCWV(Rated Continuous Working Voltage)=√(P*R) or Max. Operating Voltage whichever is lower.

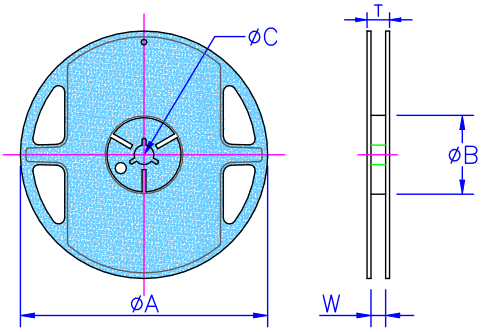
* not include Jumper(0Ω)

■ **Storage Temperature: 15~28°C; Humidity < 80%RH**

■ **Shelf Life: 2 years from production date.**

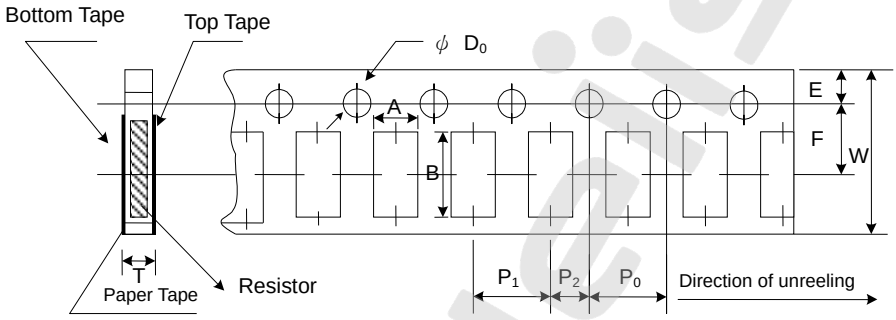
■Packaging

Reel Specifications & Packaging Quantity



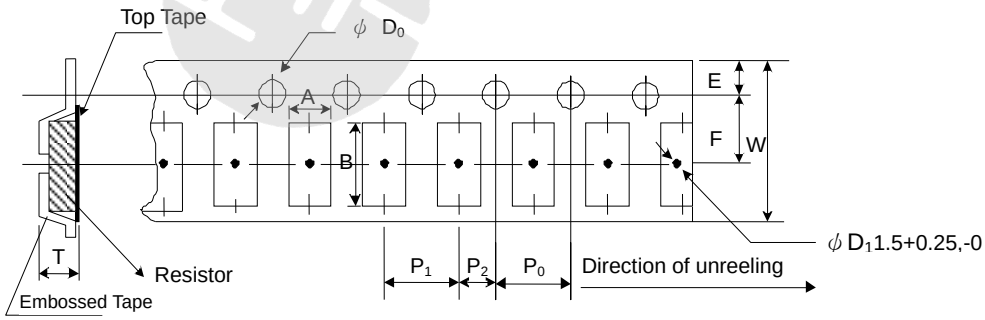
Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
CRW08 CRW62	Paper	5K	8mm	7 inch	178.5±1.5	$60^{+1/-0}$	13.0±0.2	9.0±0.5	12.5±0.5
CRW20 CRW25	Embossed	4K	12mm	7 inch	178.5±1.5	$60^{+1/-0}$	13.0±0.5	13.0±0.5	15.5±0.5

Paper Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P_0 (mm)	P_1 (mm)	P_2 (mm)	ΦD_0 (mm)	T (mm)
CRW08	1.60±0.10	2.40±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10
CRW62	1.90±0.10	3.50±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10

Embossed Plastic Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P_0 (mm)	P_1 (mm)	P_2 (mm)	ΦD_0 (mm)	T (mm)
CRW20	2.80±0.15	5.40±0.20	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.55+0.10	1.00±0.20
CRW25	3.50±0.10	6.70±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.55+0.10	1.00±0.20

■Marking

1% for 0508/0612/1020/1225: 4 digits marking

Example:

Resistance	20Ω	100Ω	1KΩ
Marking	20R0	1000	1001

5% for 0508/0612/1020/1225: 3 digits marking in E24

Example: 101=100Ω 102=1KΩ (1st and 2nd are E24 code and 3rd code is multiplier)

E24 code	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A	Apr 26, 2021	-	- New product release
Version A1	Nov 15, 2021	-	- Increase the shelf life description
Version A2	Feb 15, 2022	-	- Derating Curve changes the temperature range
Version A3	Jun 15, 2022	-	- Modify Soldering Condition