

Data Sheet

Customer:

Product: Metal Film High Frequency MELF Resistor-CSRFB Series

Size: 0102/0204/0207

Issued Date: 15-Feb-22

Edition: REV.A3



Produced by (QC)	Checked (QC)	Approved by (QC)	Prepared by (Sales)	Accepted by (Customer)
15-Feb-22	15-Feb-22	15-Feb-22		
Susan Huang	J.C. Liu	J.C. Liu		

Metal Film High Frequency MELF Resistor

Features

- Suitable for RF applications
- Specialty trimmed technology
- Sn termination on Ni barrier layer
- SMD enabled structure
- Lead-free and RoHS compliant

Applications

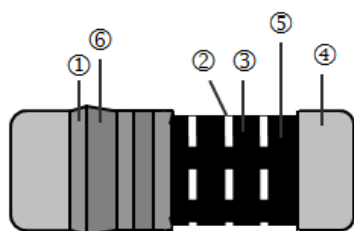
- Industrial
- Telecommunication



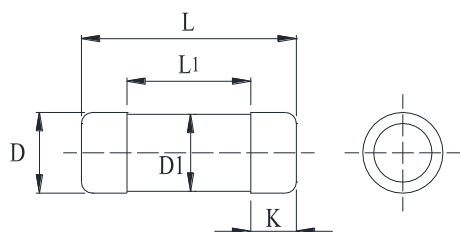
TECHNICAL SPECIFICATIONS

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DESCRIPTION	CSRF0102		CSRF0204		CSRF0207	
Resistance range	6.8Ω-100Ω; 50Ω		1.5Ω-220Ω; 50Ω		6.8Ω-220Ω; 50Ω	
Resistance tolerance	±1%					
Temperature coefficient	±50ppm/°C					
Power rating P ₇₀	1/5W	0.3W	1/4W	2/5W	1/2W	1W
Operating voltage U _{max.}	150V		200V		350V	
Operating temperature range	-55°C~155°C					
Max. resistance change at P70 for resistance range, ΔR/R max., after 1000 h	≤0.5%		≤0.5%		≤0.5%	

Construction & Dimension



①	Insulation Coating	④	Electrode Cap
②	Trimming Line	⑤	Resistor Layer
③	Ceramic Rod	⑥	Marking



Type	L (mm)	L ₁ min. (mm)	ΦD (mm)	ΦD ₁ (mm)	K (mm)	Weight 1,000EA (g)
CSRF0102	2.20±0.10	1.1	1.10±0.10	D +0/-0.15	0.45±0.05	7.7
CSRF0204	3.50±0.2	1.7	1.40±0.15	D +0/-0.2	0.8±0.1	18.7
CSRF0207	5.90±0.2	2.9	2.20±0.20	D +0/-0.2	1.3±0.1	80.9

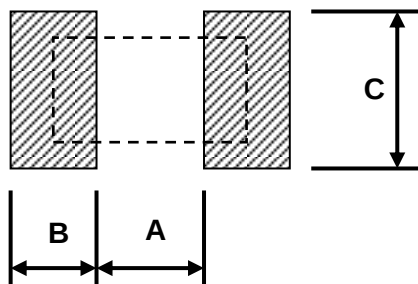
■ Part Numbering

Part Number : CSRF0204FTDV1000

C	S	R	F	0	2	0	4	F	T	D	V	1	0	0	0
Product Type	Dimensions (L×ΦD)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance									
CSRF	0102: 2.2x1.1 0204: 3.5x1.4 0207: 5.9x2.2	F: ±1%	T: 7" Taping Reel S: 7" Taping Reel, Antistatic Tape* W: 13" Taping Reel M: 13" Taping Reel, Antistatic Tape*	D: ±50	T: 1W U: 1/2W V: 1/4W G: 2/5W P: 1/5W L: 0.3W	1R50: 1.5Ω 0100: 10Ω 1000: 100Ω									

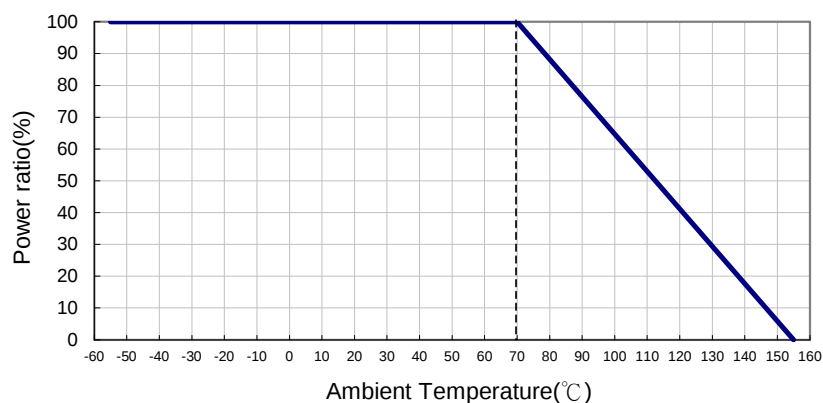
※Packaging Code “S” & “M” only for 0102 & 0204 size products, not include 0207 size product.

Recommend Land Pattern

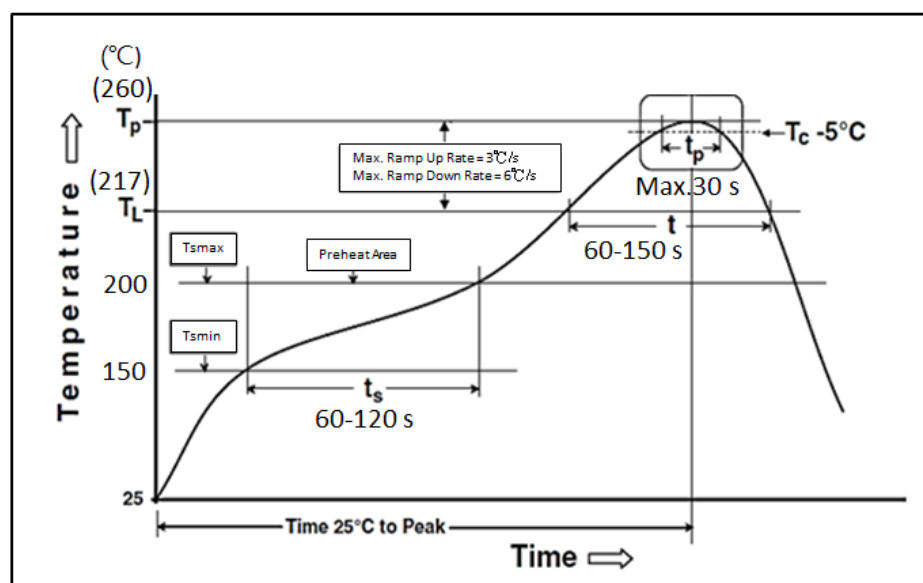


Type	A (mm)	B (mm)	C (mm)
CSRF0102	1.0	0.8	1.5
CSRF0204	1.6	1.2	1.6
CSRF0207	3.0	1.7	2.4

Derating Curve



■ Soldering Condition (IPC/JEDEC J-STD-020)



Standard Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Resistance Range	TCR (PPM/°C)
				±1%(E24)	
0102	0.2W	-55 ~ +155°C	150V	50Ω, 6.8Ω-100Ω	±50
0204	1/4W	-55 ~ +155°C	200V	50Ω, 1.5Ω-220Ω	±50
0207	1/2W	-55 ~ +155°C	300V	50Ω, 6.8Ω-220Ω	±50

High Power Rating Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Resistance Range	TCR (PPM/°C)
				±1%(E24)	
0102	0.3W	-55 ~ +155°C	150V	50Ω, 6.8Ω-100Ω	±50
0204	2/5W	-55 ~ +155°C	200V	50Ω, 1.5Ω-220Ω	±50
0207	1W	-55 ~ +155°C	350V	50Ω, 6.8Ω-220Ω	±50

Operating Voltage= $\sqrt{P \cdot R}$ or Max. Operating Voltage listed above, whichever is lower.

RCWV(Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower.

■ Viking is capable of manufacturing the optional spec based on customer's requirement.

■ Environmental Characteristics

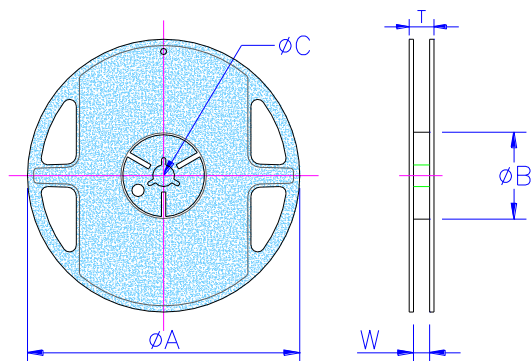
Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec	JIS-C-5201-1 4.8 IEC-60115-1 4.8 At 25°C/-55°C and 25°C/+125°C, 25°C is the reference temperature
Short Time Overload	$\pm(0.15\%+0.01\Omega)$	JIS-C-5201-1 4.13 IEC-60115-1 4.13 RCWV*2.5 for 5 seconds
Endurance	$\pm(0.5\%+0.05\Omega)$	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	$\pm(0.5\%+0.05\Omega)$	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	$\pm(1.0\%+0.05\Omega)$	JIS-C-5201-1 4.23 IEC-60115-1 4.23.2 at +155°C for 1000 hrs
Solderability	95% min. coverage	JIS-C-5201-1 4.17 IEC-60115-1 4.17 J-STD-002 245±5°C for 3 seconds
Resistance to Soldering Heat	$\pm(0.5\%+0.05\Omega)$	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 $\leq 5\%$ Total leaching area $\leq 10\%$	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1 260±5°C for 30 seconds
Rapid Change of Temperature	$\pm(0.25\%+0.05\Omega)$	JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55°C to +155°C, 5 cycles
ESD	$\pm(0.5\%+0.01\Omega)$	AEC-Q200-002 Human body, 0102:800V; 0204:1000V; 0207:2000V
Resistance to Solvents	No visible damage on appearance and marking.	MIL-STD-202 Method 215 Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.
Terminal Strength	No broken	AEC-Q200-006 Force of 1.8kg for 60 seconds.
Flammability	No ignition of the tissue paper or scorching or the pinewood board	UL-94 V-0 or V-1 are acceptable. Electrical test not required.

RCWV(Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower.

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

■ Shelf Life: 2 years from production date.

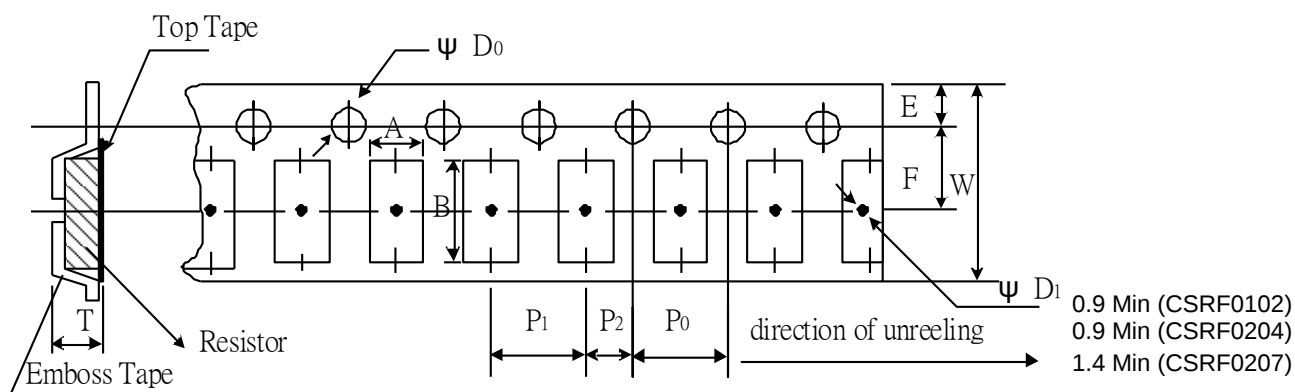
■ Packaging



Packaging Quantity & Reel Specifications

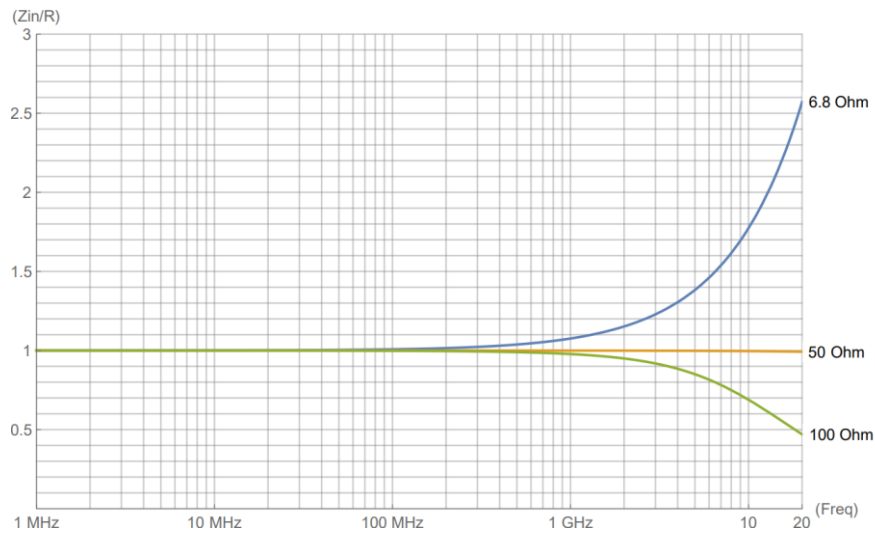
Type	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)	Emboss Plastic Tape (EA)
CSRF0102	7 inch	178.5±1.5	60.0±1.0	13.0±0.2	9.0±0.5	12.5±0.5	3,000
	13 inch	330±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5	10,000
CSRF0204	7 inch	178.5±1.5	60.0±1.0	13.0±0.2	9.0±0.5	12.5±0.5	3,000
	13 inch	330±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5	10,000
CSRF0207	7 inch	178.5±1.5	60.0±1.0	13.0±0.5	13.0±0.5	15.5±0.5	2,000
	13 inch	330±1.0	99±0.5	13.5±0.5	13.4±1	17.8±1	6,000

Emboss Plastic Tape Specifications

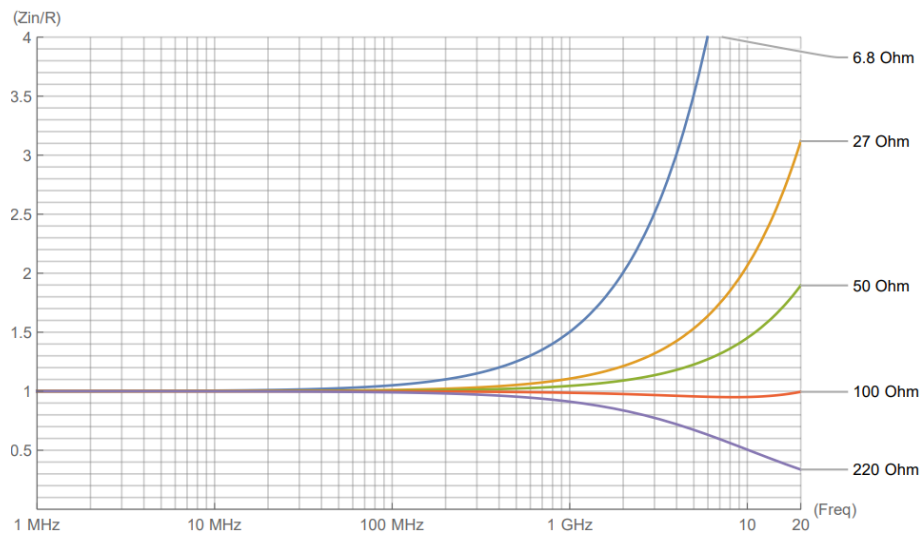


Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P ₀ (mm)	P ₁ (mm)	P ₂ (mm)	ΦD ₀ (mm)	T (mm)
CSRF0102	1.30±0.20	2.40±0.20	8.0±0.10	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	1.50±0.10
CSRF0204	1.55±0.20	3.65±0.20	8.0±0.10	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	1.80±0.10
CSRF0207	2.40±0.10	6.15±0.10	12.0±0.10	1.75±0.10	5.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	2.70±0.10

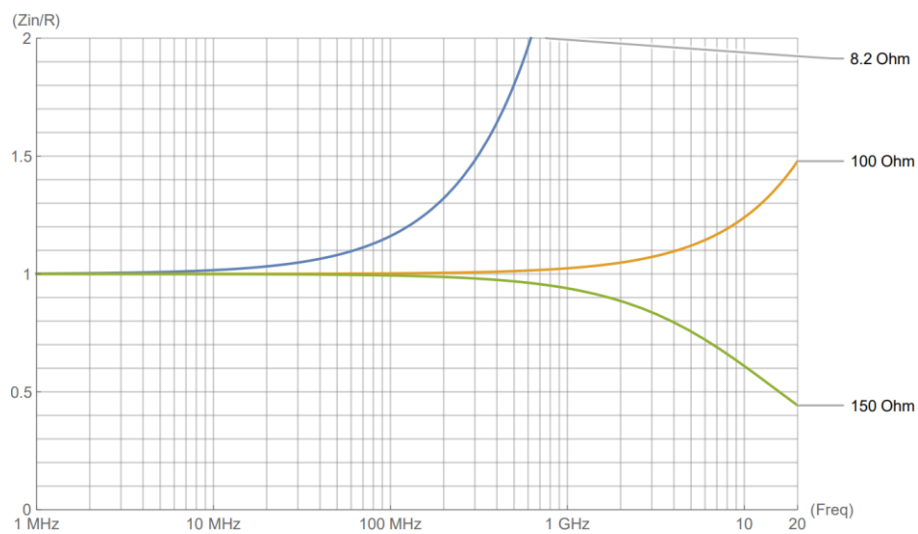
■ Frequency behavior



CSRF0102

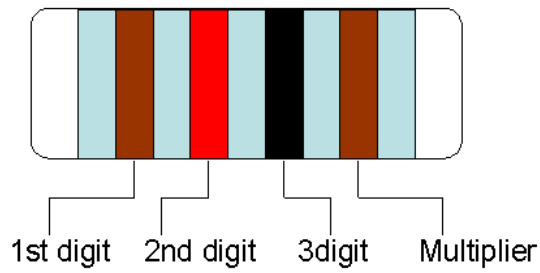


CSRF0204



CSRF0207

■ Marking & Resistance Tolerance



E-24	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91
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Color	Digit	Multiplier
Silver	-	10^{-2}
Gold	-	10^{-1}
Black	0	10^0
Brown	1	10^1
Red	2	10^2
Orange	3	10^3
Yellow	4	10^4
Green	5	10^5
Blue	6	10^6
Violet	7	10^7
Grey	8	10^8
White	9	10^9

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A	Mar 10, 2021	-	- New product release
Version A1	Sep 28, 2021	-	- Add in Shelf Life: 2 years from production date.
Version A2	Jan 05, 2022	-	- Newly added antistatic tape packaging for packaging methods.
Version A3	Feb 15, 2022	-	- Derating Curve changes the temperature range