

Data Sheet

Customer: _____

Product: Carbon Film MELF Resistor - CM / CML Series _____

Size : 0204/0207/0309 _____

Issued Date: 01-Sep.-2023 _____

Edition: Ver. 2 _____

Record of change

Date	Ver.	Description	Page
17-Jul.-2017	1		
01-Sep.-2023	2	Revise CM204 Voltage / Add TCR & Resistance Tol. $\pm 2\%$	2

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Prepared by	Checked by	Approved by	Accepted by (customer)
01-Sep.-2023	01-Sep.-2023	01-Sep.-2023	
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Carbon Film MELF Resistor

CM / CML Series

■ Features

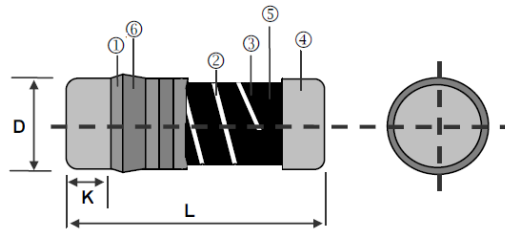
- *SMD style carbon resistor
- *High solder ability due to specially plated electrodes
- *Free direction for mounting due to cylindrical design
- *Electrodes strength is higher than flat chip resistors
- *Lower current noise than thick film flat chip resistors
- *Suitable for reflow, flow and iron soldering



■ Applications

- *Telecommunication
- *Medical Equipment
- *Consumer Products

■ Construction and Dimension



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

Series	Body Length	Body Diameter	Soldering spot
	(L)	(D)	(K)
CM204	3.5±0.2	1.4±0.15	0.5mm Min.
CML204	3.5±0.2	1.4±0.15	0.5mm Min.
CM207	5.9±0.2	2.2±0.20	0.5mm Min.
CML207	5.9±0.2	2.2±0.20	0.5mm Min.
CM309	8.5±0.2	3.2±0.20	0.5mm Min.

(Unit:mm)

■ Part Numbering

CM204	J	-	10KR
Series	Tolerance		Resistance Value
CM204	G = ±2%		10R=10Ω
CM207	J = ±5%		120R=120Ω
CML207			1K2R=1.2KΩ
CM309			10KR=10KΩ
CML309			1MR=1MΩ

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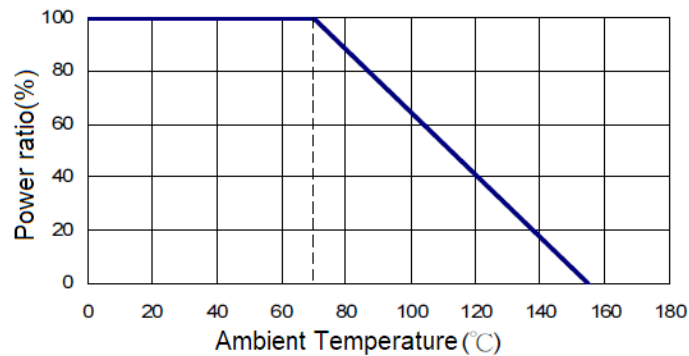
■ General Specification

Series	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range	
					±2%	±5%
CM204	1/4W	-55°C ~ +155°C	200V	400V	1Ω ~ 1MΩ	
CM207	1/2W		300V	600V	1Ω ~ 1MΩ	
CML207	1W		350V	700V	1Ω ~ 1MΩ	
CM309	1W		350V	700V	1Ω ~ 1MΩ	
CML309	2W		350V	700V	1Ω ~ 1MΩ	

** 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.

■ Derating Curve



■ Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	1Ω~100KΩ : ±350ppm 101KΩ ~500KΩ : ±700ppm 501KΩ~1MΩ : ±1000ppm	JIS-C-5201-1 4.8 -55°C~+125°C, 25°C is the reference temperature
Short Time Overload	±(0.5%+0.05Ω)	JIS-C-5201-1 5.5 RCWV*2.5 or Max. Overload voltage whichever is lower for 5 seconds
Endurance	±(3%+0.05Ω)	JIS-C-5201-1 7.10 Standard : 70±2°C, for 24 hrs High Power : 70±2°C, for 1000 hrs with DC 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	±(5%+0.05Ω)	JIS-C-5201-C 7.9 Standard : Room temperature +100°C, 90%~95% R.H., Dipping time: 0.5 hrs High Power : 40±2°C, 90%~95% R.H., for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Solderability	95% min. coverage	JIS-C-5201-1 6.5 235±5°C for 3 seconds
Resistance to Soldering Heat	±(1%+0.05Ω)	JIS-C-5201-1 6.4 260±5°C for 10 seconds
Resistance to Solvent	Epoxy Insulation coating can not be peeled	There are 3 cycles, each circle takes 1 min

** RCWV(Rated continuous working voltage = $\sqrt{P * R}$) or Max. operating voltage whichever is lower.

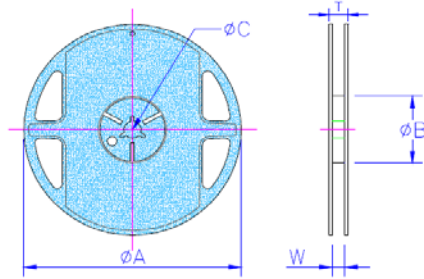
■ Storage Temperature : 15~28°C ; Humidity < 80% RH

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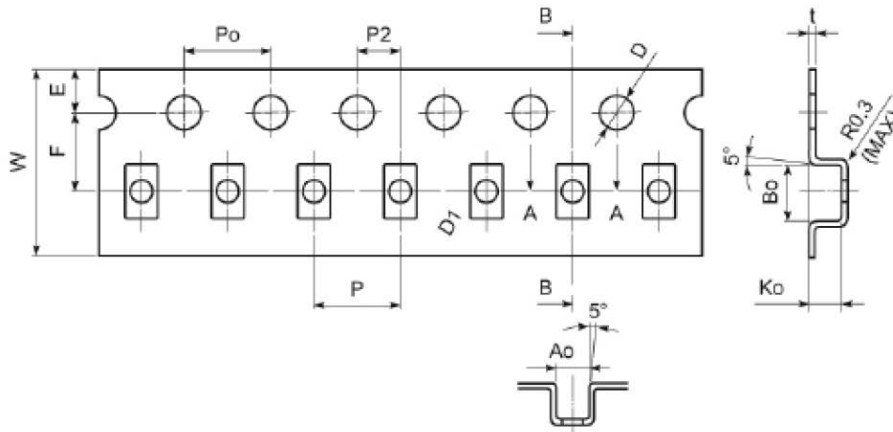
■ Packaging

Packaging Quantity & Reel Specifications



Series	Reel Diameter	ØA (mm)	ØB (mm)	ØC (mm)	W (mm)	T (mm)	Emboss Plastic Tape (EA)
CM204	7 inch	178.0±1.0	60.0±0.5	13.0±0.5	9.0±0.5	12.0±0.15	3,000
CM/CML207	7 inch	178.0±1.0	60.0±0.5	13.0±0.5	13.2±0.5	16.0±0.20	2,000
CM/CML309	13 inch	330.0±1.0	100.0±1.0	13.0±0.5	17.0±0.5	21.5±0.20	2,500

Emboss Plastic Tape Specifications



Series	A0 (mm)	B0 (mm)	W (mm)	E (mm)	F (mm)	P (mm)	P0 (mm)	P2 (mm)	D (mm)	D1 (mm)	K0 (mm)	T (mm)
CM204	1.60±0.10	3.70±0.10	8.0±0.10	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.10	1.50±0.10	1.00±0.10	1.65±0.10	0.22±0.05
CM/CML207	2.40±0.10	6.05±0.10	12.0±0.10	1.75±0.10	5.50±0.05	4.00±0.10	4.00±0.10	2.00±0.10	1.50±0.10	1.50±0.10	2.50±0.10	0.30±0.05
CM/CML309	3.50±0.10	8.85±0.10	16.0±0.10	1.75±0.10	7.50±0.10	8.00±0.10	4.00±0.10	2.00±0.10	1.50±0.10	1.50±0.10	3.50±0.10	0.35±0.05