

Specifications Per

- IEC 60115-1
- MIL-R-226848

Features

- SMD enabled structure
- Excellent solderability termination
- Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

DIMENSIONS

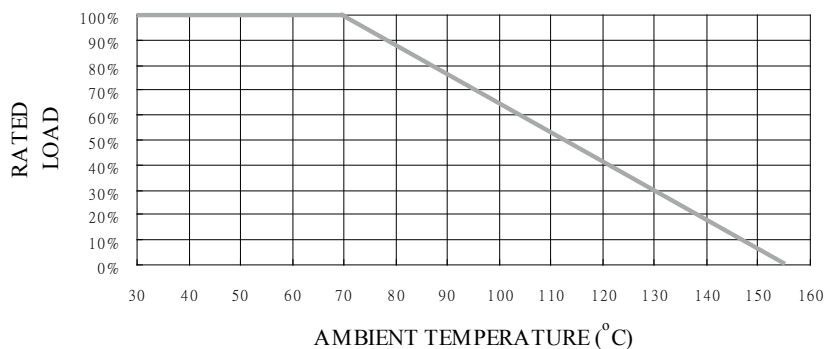
Type	Body Length (L, mm)	Cap Diameter (D1, mm)	Body Diameter (D2, mm)	Soldering Spot (B, mm)	Net Weight Per 1000 pcs
CM204	3.52 ± 0.15	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
CM207	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams
CM52	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams

GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
CM204	1/4W	200V	300V	0, 0.51Ω	1MΩ	±5%	E-24
CM207	1/3W	300V	600V	0, 0.51Ω	10MΩ	±5%	E-24
CM52	1/2W	350V	600V	0, 0.51Ω	10MΩ	±5%	E-24

For 10m~510mΩ please see CSM series.
Special sizes, values, and specifications not listed available on special order.

POWER DERATING CURVE



Quality • Reliability
Cost-Down via Innovation

CM

TECHNICAL SUMMARY

Characteristics	Limits			
Dielectric Withstanding Voltage, VAC or DC	CM204: 200, CM207, CM52: 500			
Temperature Coefficient, PPM / °C	CM204		CM207 & CM52	
	1Ω~33K	±300	1Ω~33K	±300
	33K~330K	- 500	33K~330K	- 500
	330K~470K	- 700	330K~470K	- 700
	470K~910K	-1000	470K-1M	-1000
Over 910K	-1500	Over 1M	-1500	
Operating Temperature Range, °C	-55 ~ +155			
Insulation Resistance, MΩ	>10 ⁴			
Tin Whisker (JESD201 Temperature Cycling & High Temp. /Humidity Storage), μm	<5			

PART NUMBER

Example: CM204J10K0TKZTR3K0

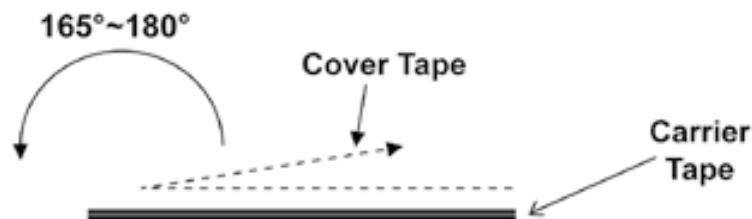
CM204	J	10K0	TKZ	TR3K0
Type	Tolerance	Resistance	TCR	Packaging
	J (5%)	10KΩ 4-character code containing - 3 significant digits 1 letter multiplier <u>OHM MULTIPLIER</u> R = 1 K = 10 ³ M = 10 ⁶ G = 10 ⁹	3-character code TKZ = Default Product Temperature Coefficient. Information of typical product temperature coefficient can be found in the Technical Summary section of the datasheet.	5-character code TR = Tape Reel (pieces per reel) <u>CM204</u> 3K0 = 3,000 6K0 = 6,000* 10K = 10,000* <u>CM207/CM52</u> 2K0 = 2,000 6K0 = 6,000* 10K = 10,000*

*upon request

COVER TAPE PEELING SPECIFICATION

Recommended peeling force:

CM204, CM207, CM52: 50±5gf



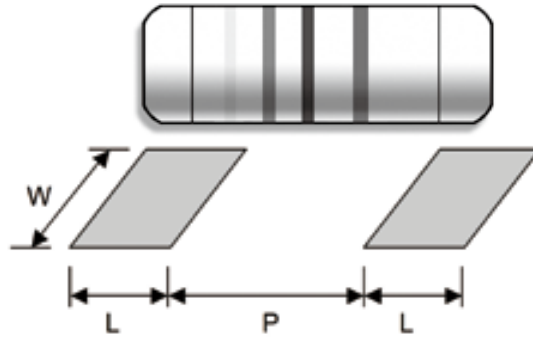
■ PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits
Short Time Overload	IEC 60115-1 4.13 5 seconds 2.5x rated voltage (not over max. overload voltage)	± 1%
Load Life In Humidity	IEC 60115-1 4.24 56 days rated load (not over max. working voltage) at (40±2)°C and (93±3)% relative humidity	± 5%
Load Life	IEC 60115-1 4.25.1 Rated load (not over max. working voltage) 1,000 hours with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	± 3%
Periodic Electric Overload	IEC 60115-1 4.39 3.9x rated voltage (not over max. overload voltage) with 0.1s ON, 2.5s OFF for 1,000 cycles	± 2%
Resistance To Soldering Heat	IEC 60115-1 4.18.2 Dip the resistor into a solder bath measured (260±5)°C and hold it for 10±1 seconds	± 1%
Solderability	IEC 60115-1 4.17.2 Solder area covered after (230±3)°C/(2±0.2) seconds with flux applied	95% min. coverage
Vibration	IEC 60115-1 4.22 Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 1.52mm and 10 to 2,000 Hz.	± 1%
Thermal Endurance	IEC 60115-1 4.25.3 1000 hours at 155°C without load	± 1%
Thermal Shock	IEC 60115-1 4.19 -55°C 30minutes, +155°C 30minutes, 5 cycles	± 1%
Single pulse high voltage overload	IEC 60115-1 4.27 10 pulses of 10/700µs at 10x rated voltage (not over max. overload voltage) with interval of 60 sec.	± 2%
Electrostatic discharge (Human body model)	IEC 60115-1 4.38 3 positive & 3 negative discharges with 2KV for CM16, CM204 or 4KV for CM207, CM52 (For continuous surge application please see Surge Performance paragraph)	± 5%
Climatic test	IEC 60115-1 4.23 4.23.2 - dry heat: 16 hours 155°C 4.23.3 - damp heat: 24 hours 55°C with 95% relative humidity 4.23.4 - cold: 2 hours -55°C 4.23.5 - negative air pressure: 2 hour 8.5KPa at (25±10)°C 4.23.6 - damp heat cyclic: 5 days 55°C with 95% relative humidity 4.23.7 - DC load: rated voltage at -55°C and 155°C each 1 Min.	± 2%
Bending test	IEC 60115-1 4.33 Pressing depth 2mm, 3 times	± 0.25%
Flammability	IEC 60115-1 4.35 Needle flame test 10s	No burning after 30s

CM Carbon Film MELF Resistor

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■ SUGGESTED PAD LAYOUT



CM

Type	Soldering Mode	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
CM204	Reflow	1.3	1.6 ± 0.1	1.6
	Wave	1.5	1.5 ± 0.1	1.8
CM207	Reflow	2.0	3.0 ± 0.1	3.0
	Wave	2.5	3.0 ± 0.1	3.0
CM52	Reflow	2.0	3.0 ± 0.1	3.0
	Wave	2.5	3.0 ± 0.1	3.0

For better heat dissipation / lower heat resistance, increase W & L.