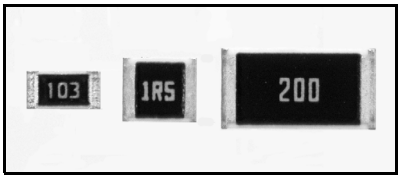
RMC Series — General Purpose Thick Film Chip Resistors

Features

- Nickel barrier terminations standard
- Power derating from 100% at 70°C to zero at +150°C
- Operating temp range from -55°C to +150°C
- Zero ohm available (max resistance 0.05Ω)
- RoHS compliant/ lead-free available



Electrical Specifications

Type	Package Type	Power Rating (Watts) @ 70°C	Maximum Working Voltage*	Maximum Overload Voltage	Max. Current	Resistance Temperature Coefficient	Ohmic Range and Tolerance	
							1%	5%
RMC 1/20	0201	0.05W	25	50	1 Amp	±200 ppm/°C ±300 ppm/°C	100Ω – 1M 10Ω – 97.6Ω	100Ω – 1M 10Ω – 91Ω
RMC 1/16S	0402	0.063W	50	100	1 Amp	±200 ppm/°C ±350 ppm/°C	10Ω – 10M –	10Ω – 10M 1Ω – 9.1Ω
RMC 1/16	0603	0.1W	50	100	1 Amp	500 ppm/°C, ±350 ppm/°C ±350 ppm/°C ±200 ppm/°C ±100 ppm/°C ±350 ppm/°C	1Ω – 2.37Ω 2.43Ω – 9.76Ω 10Ω – 97.6Ω 100Ω – 1M 1.02M – 4.64M	1Ω – 2.2Ω 2.4Ω – 9.1Ω 10Ω – 1M – 1.1M – 22M
RMC 1/10	0805	0.125W	150	300	2 Amp	±250 ppm/°C 500 ppm/°C, ±350 ppm/°C ±350 ppm/°C ±200 ppm/°C ±100 ppm/°C ±350 ppm/°C	0.1Ω – 0.294Ω 0.3Ω – 2.37Ω 2.43Ω – 9.76Ω 10Ω – 97.6Ω 100Ω – 1M 1.02M – 10M	0.1Ω – 9.1Ω 1Ω – 2.2Ω 2.4Ω – 9.1Ω 10Ω – 1M – 1.1M – 22M
RMC 1/8	1206	0.25W	200	400	2 Amp	500 ppm/°C, ±350 ppm/°C ±350 ppm/°C ±200 ppm/°C ±100 ppm/°C ±350 ppm/°C	0.1Ω – 2.37Ω 2.43Ω – 9.76Ω 10Ω – 97.6Ω 100Ω – 1M 1.02M – 10M	0.1Ω – 2.2Ω 2.4Ω – 9.1Ω 10Ω – 1M – 1.1M – 24M
RMC 1/4	1210	0.33W	200	400	3 Amp	500 ppm/°C, ±350 ppm/°C ±350 ppm/°C ±200 ppm/°C ±100 ppm/°C ±350 ppm/°C	0.1Ω – 2.37Ω 2.43Ω – 9.76Ω 10Ω – 97.6Ω 100Ω – 1MΩ 1.02M – 10M	0.15Ω – 2.2Ω 2.4Ω – 9.1Ω 10Ω – 1M – 1.1M – 22M
RMC 1/2	2010	0.75W	200	400	3 Amp	500 ppm/°C, ±350 ppm/°C ±350 ppm/°C ±200 ppm/°C ±100 ppm/°C ±350 ppm/°C	0.1Ω – 2.37Ω 2.43Ω – 9.76Ω 10Ω – 97.6Ω 100Ω – 1M 1.02M – 10M	0.1Ω – 2.2Ω 2.4Ω – 9.1Ω 10Ω – 1M – 1.1M – 22M
RMC 1	2512	1W	200	400	3 Amp	500 ppm/°C, ±350 ppm/°C ±350 ppm/°C ±200 ppm/°C ±100 ppm/°C ±350 ppm/°C	0.1Ω – 2.37Ω 2.43Ω – 9.76Ω 10Ω – 97.6Ω 100Ω – 1M –	0.1Ω – 2.2Ω 2.4Ω – 9.1Ω 10Ω – 1M – 1.1M – 22M

* Lesser of √PR or maximum working voltage.

How to Order

RMC — **1/16** — **4.7K** — **5%** — **R**

SEI Type | Code | Nominal Resistance | Tolerance | Packaging

SEI Type
RMC
RMCF

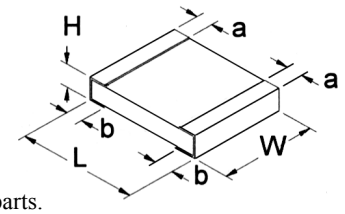
Code	Wattage	Size
1/20	0.05W	0201
1/16S	0.063W	0402
1/16	0.1W	0603
1/10	0.125W	0805
1/8	0.25W	1206
1/4	0.33W	1210
1/2	0.75W	2010
1	1W	2512

Tolerance	Values
1%	E96,E24
5%	E24

Code	Description	Pkg Qty
R	7" reel - Paper	5,000
G	10" reel - Paper	10,000
A	Bulk	1,000

See page 76 for exceptions

RMC Series — General Purpose Thick Film Chip Resistors



Lead free (RMCF) dimensions same as standard parts.

Mechanical Specifications

Type	L Body Length	W Body Width	H Body Height	a Top Termination	b Bottom Termination	Units
RMC 1/20	0.024 ± 0.001 0.60 ± 0.03	0.011 ± 0.001 0.30 ± 0.03	0.009 ± 0.001 0.23 ± 0.03	0.004 ± 0.002 0.10 ± 0.05	0.006 ± 0.002 0.15 ± 0.05	inches mm
RMC 1/16S	0.039 ± 0.002 1.00 ± 0.05	0.020 ± 0.002 0.50 ± 0.05	0.014 ± 0.002 0.35 ± 0.05	0.008 ± 0.004 0.20 ± 0.10	0.010 +0.002, -0.004 0.25 +0.05, -0.10	inches mm
RMC 1/16	0.063 ± 0.004 1.60 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.012 ± 0.008 0.30 ± 0.20	0.012 ± 0.008 0.30 ± 0.20	inches mm
RMC 1/10	0.079 ± 0.004 2.00 ± 0.10	0.049 ± 0.004 1.25 ± 0.10	0.020 ± 0.006 0.50 ± 0.15	0.016 ± 0.008 0.40 ± 0.20	0.016 ± 0.008 0.40 ± 0.20	inches mm
RMC 1/8	0.126 ± 0.006 3.20 ± 0.15	0.063 ± 0.006 1.60 ± 0.15	0.021 ± 0.006 0.55 ± 0.15	0.020 ± 0.010 0.50 ± 0.25	0.020 ± 0.010 0.50 ± 0.25	inches mm
RMC 1/4	0.126 ± 0.006 3.20 ± 0.15	0.098 ± 0.006 2.50 ± 0.15	0.021 ± 0.006 0.55 ± 0.15	0.020 ± 0.010 0.50 ± 0.25	0.020 ± 0.010 0.50 ± 0.25	inches mm
RMC 1/2	0.197 ± 0.006 5.00 ± 0.15	0.098 ± 0.006 2.50 ± 0.15	0.021 ± 0.006 0.55 ± 0.15	0.024 ± 0.010 0.60 ± 0.25	0.024 ± 0.010 0.60 ± 0.25	inches mm
RMC 1	0.248 ± 0.006 6.30 ± 0.15	0.126 ± 0.006 3.20 ± 0.15	0.021 ± 0.006 0.55 ± 0.15	0.024 ± 0.010 0.60 ± 0.25	0.024 ± 0.010 0.60 ± 0.25	inches mm

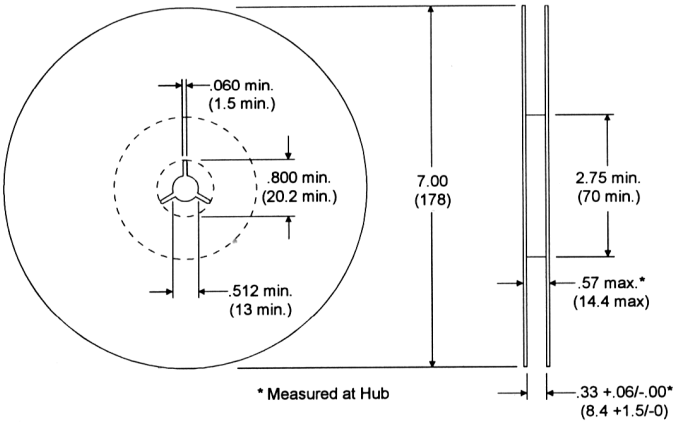
Performance Characteristics

Test	Test Conditions (JIS C 5202)	Test Results
Short Time Overload	2.5x rated voltage for 5 seconds	±(2% +0.1Ω)
Insulation Resistance	100VDC ± 15 volts, 1 minute	>1,000MΩ
Dielectric Withstanding Voltage	100VAC, 1 minute	±(1% +0.05Ω)
Intermittent Overload	3x rated voltage, 1 sec. On, 25 sec. Off, 10,000 cycles	±(2% +0.1Ω)
Vibration	10 to 55 Hz, 3 directions, 2 hours each	±(1% +0.05Ω)
Resistance to Soldering Heat	260°C ±5°C, for 10 sec. ±0.5 sec. (Solder Bath)	±(1% +0.05Ω)
Solderability	235°C ±5°C, for 2 sec. ±0.5 sec. (Colophonium flux)	95% coverage, minimum
Low Temperature	55°C ± 3°C, (1,000 hrs. - 0 hrs. + 48 hrs.)	±(2% +0.1Ω) Jumper (<0.05Ω)
Resistance to Dry Heat	125°C ± 3°C, (1,000 hrs. - 0 hrs. + 48 hrs.)	±(3% +0.1Ω) Jumper (<0.05Ω)
Resistance to Damp Heat	60°C, 90% to 95% RH, No Load (1,000 hrs. - 0 hrs. + 48 hrs.)	±(1% +0.05Ω) Jumper (<0.05Ω)
Temperature Cycle	-55°C: 30 min. 25°C: 2 to 3 min. 125°C: 30 min. 25°C: 2 to 3 min. (5 Cycles)	±(1% +0.05Ω) Jumper (<0.05Ω)
Endurance (Damp load)	40°C ± 2°C, 90% to RH, Rated Load 90 min. On, 30 min. Off, (1,000 hrs. - 0 hrs. + 48 hrs.)	±(3% +0.1Ω) Jumper (<0.05Ω)
Endurance (Rated load)	70°C ± 2°C, 90% to RH, Rated Load 90 min. On, 30 min. Off, (1,000 hrs. - 0 hrs. + 48 hrs.)	±(3% +0.1Ω) Jumper (<0.05Ω)

Packaging — Chip Resistors

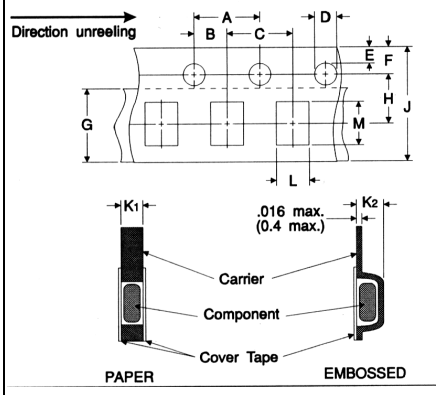
Chip Resistor Reel

Nominal Dimensions
Inches (mm)



Packaging: Chips Per EIA Standard RS-481 — inches / mm

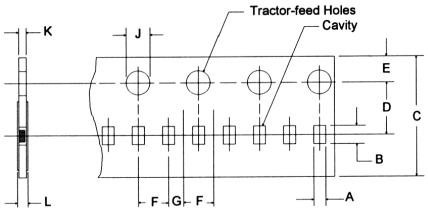
A	B	C	D	E	F	G	H	J[1]
0.16 ± 0.01 4.0 ± 0.1	0.08 ± 0.01 2.0 ± 0.1	0.16 ± 0.01 4.0 ± 0.1	0.06 + 0.01/-0 1.5 + 0.1/-0	0.04 1.0	0.069 1.75	0.20 5.0	0.138 ± 0.002 3.50 ± 0.05	0.32 ± 0.01 8.0 ± 0.1



	K1	K2	L	M
RGC 1/16, RMC 1/16, RNC 16, TTF 16, CSR 1/8	0.04 max 1.1 max	-	0.04 ± 0.01 1.1 ± 0.2	0.08 ± 0.01 1.9 ± 0.2
RGC 1/10, RMC 1/10, HMC 1/10, FCR 1/10, TTF 20, RNC 20, CSR 1/4	0.04 max 1.1 max	-	0.65 ± 0.008 1.65 ± 0.20	0.09 ± 0.01 2.4 ± 0.2
RGC 1/8, RMC 1/8, HMC 1/8, FCR 1/8, TTF 32, RNC 32, CSR 1/2	0.04 max 1.1 max	0.09 max 2.4 max	0.08 ± 0.01 2.0 ± 0.1	0.138 ± 0.002 3.50 ± 0.05
RMC 1/4, FCR 1/4	-	0.09 max 2.4 max	0.11 ± 0.01 2.8 ± 0.2	0.14 ± 0.01 3.6 ± 0.2
RMC 1/2, CSR 1	-	0.09 max 2.4 max	0.11 ± 0.01 2.8 ± 0.2	0.21 ± 0.01 5.3 ± 0.2
RMC 1, CSR 2	-	0.09 max 2.4 max	0.15 ± 0.01 3.8 ± 0.2	0.26 ± 0.01 6.6 ± 0.2

Notes:
1. Dimensions are 0.47 ± 0.01 (12.0 ± 0.1) for 1/2 and 1 Watt.
2. 5,000 per (7") reel — 1/16, 1/10, & 1/8 Watt. 4,000 per (7") reel — 1/4, 1/2 & 1 Watt. Available Options — 10,000 piece (13") reels.
3. Embossed taping standard 4,000 per (7") reel on 1/4, 1/2 & 1 Watt.
4. Paper taping available 4,000 per (7") reel on RMC 1/4 Watt.

Packaging: RMC 1/16S, RGC 1/16S, RNC 10, and RMC 1/20 Chips (2mm Pitch) — inches / mm



A	B	C	D	E
0.026 + 0.004/-.002 0.65+0.10/-0.05	0.045 + 0.004/-002 1.15+0.10/-0.05	0.315 ± 0.008 8.00 ± 0.20	0.138 ± 0.002 3.50 ± 0.05	0.69 ± 0.004 1.75 ± 0.10
F	**G**	**J**	**K**	**L**
0.079 ± 0.002 2.00 ± 0.05	0.039 ± 0.002 1.00 ± 0.05	0.059 + 0.004/-.000 1.50 + 0.10/-0.00	0.016 + 0.002/-.000 0.40 + 0.05/0.00	0.020 max 0.50 max

Standard Tape Packaging
2 mm Pitch – 10,000 per reel Reel diameter – 7.0 (178) Reel width – 0.315 (8.0)

Packaging — Chip Resistors

Packaging for Chip Resistors			
Chip Resistors	**Options**	**Description**	**Package Quantity**
RMC 1/20, RMC 1/16S, RGC 1/16S, RNC 10, CSR 1/8S, HVC 0402	R	7" reel - paper taping	10,000
RMC 1/16, RMC 1/10, RMC 1/8 RPC 0805, RPC 1206, HVC 0603,HVC 0805, HVC 1206	R G A	7" reel - paper taping 10" reel - paper taping Bulk	5,000 10,000 1,000
HMC 1/16, HMC 1/10, HMC 1/8, RGC 1/16, RGC 1/10, RGC 1/8, CSR 1/4	R	7" reel - paper taping	5,000
RNC 16, RNC 20, RNC 32, TTF 16, TTF 20, TTF 32, FCR 1/16, FCR 1/10, FCR 1/8, CSR 1/2	R I	7" reel - paper taping 7" reel - paper taping	5,000 1,000
RMC 1/4, RMC 1/2, RMC 1, FCR 1/4, RPC 1210, RPC 2010, RPC 2512, HVC 1210, HVC 2010, HVC 2512	R	7" reel - emboss taping	4,000
CSR 1, CSRN 1, CSR 2, CSRL 2, CSRN 2	R I	7" reel - emboss taping 7" reel - emboss taping	4,000 1,000
CSRF 2	R	7" reel - emboss taping	2,000
Chip Arrays	**Options**	**Description**	**Package Quantity**
RAV 10-2D, RAF 10-2D, RAV 10-4D, RAF 10-4D	R	7" reel - paper taping	10,000
RAV 16-2D, RAV 16-4D, RAC 16-4D, RAV 32-8R, RAV 32-8N	R	7" reel - paper taping	5,000
RAV 32-4D, RAV 64-8N, RAV 64-8R, RAC 32-4D, RAC 40-8M, RAC 64-8N, RAC 64-8R, RAV 16-8D	R	7" reel - emboss taping	4,000
Surface Mount Wirewounds	**Options**	**Description**	**Package Quantity**
SM 1	R B	13" reel - paper taping Bulk	1,500 500
SM 2, SMX 2	R B	13" reel - paper taping Bulk	800 250
SM 2A	R B	13" reel - paper taping Bulk	1,200 250
SM 3 SMX 3	R B	13" reel - paper taping Bulk	750 100

Temperature Coefficient Codes

SEI TC Code	MIL TC Code	Industry Std TC Code	Temperature Coefficient	Temperature Span
T0	N/A	T0	±200ppm/°C	-55°C to + 150°C
T1	D	T1	±100ppm/°C	-55°C to + 165°C
T2	C	T2	±50ppm/°C	-55°C to + 175°C
T9	E	T9	±25ppm/°C	-55°C to + 175°C
TD	N/A	T10	±15ppm/°C	-55°C to + 150°C
TB	N/A	T13	±10ppm/°C	-55°C to + 150°C
TA	N/A	T16	±5ppm/°C	-55°C to + 150°C

Tolerance Codes

SEI/MIL Reference	Tolerance
K	±10%
J	±5%
G	±2%
F	±1%
D	±0.5%
C	±0.25%
B	±0.1%

Resistance Values

SEI Standard for Nominal Values & Tolerances	
Series	**Tolerance**
E12	±10%
E24	±5%, ±2%
E96	±1%
E192	±0.5%, ±0.25%, ±0.1%

Note: Non-standard R values are available. Consult factory for minimum order quantities.

Component Flammability

SEI Electronics Product Type	Polymer Type	IEC 695-2-2	UL94V Rating	Total Polymer Mass	Oxygen Index
Carbon Films					
CF 1/8 (CFM 1/4)	Epoxy	*	N/A	3 mg	N/A
CF 1/4 (CFM 1/2)	Epoxy	*	N/A	15 mg	N/A
CF 1/2	Epoxy	*	N/A	30 mg	N/A
Metal Films					
RN 1/8 (RNM 1/4)	Epoxy	*	N/A	3 mg	N/A
RN 1/4 (RNM 1/2)	Epoxy	*	N/A	15 mg	N/A
RN 1/2	Epoxy	*	N/A	30 mg	N/A
Metal Oxides					
RSM 1/2	Silicone	*	94V-0	20 mg	46 – 48%
RSM 1 (RS 1/2)	Silicone	*	94V-0	30 mg	46 – 48%
RSM 2 (RS 1)	Silicone	*	94V-0	50 mg	46 – 48%
RSM 3 (RS 2)	Silicone	*	94V-0	130 mg	46 – 48%
RSM 5 (RS 3)	Silicone	*	94V-0	500 mg	46 – 48%
RS 5	Silicone		94V-0	400 mg	46 – 48%
Chip Resistors					
RMC Series	Boro-Silicated Acid Lead Glass	*	94V-0	N/A	N/A
Resistor Networks					
LC5X	Epoxy	*	94V-0	70 mg	N/A
LC6X	Epoxy	*	94V-0	80 mg	N/A
LC7X	Epoxy	*	94V-0	90 mg	N/A
LC8X	Epoxy	*	94V-0	110 mg	N/A
LC9X	Epoxy	*	94V-0	120 mg	N/A
LC0X	Epoxy	*	94V-0	140 mg	N/A
Chip Networks					
RAC Series	Boro-Silicated Acid Lead Glass	*	94V-0	N/A	N/A
RAV Series	Boro-Silicated Acid Lead Glass	*	94V-0	N/A	N/A

* Meets specification