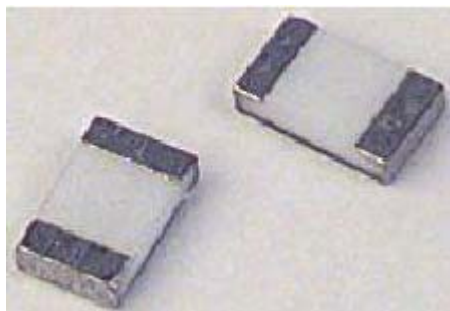
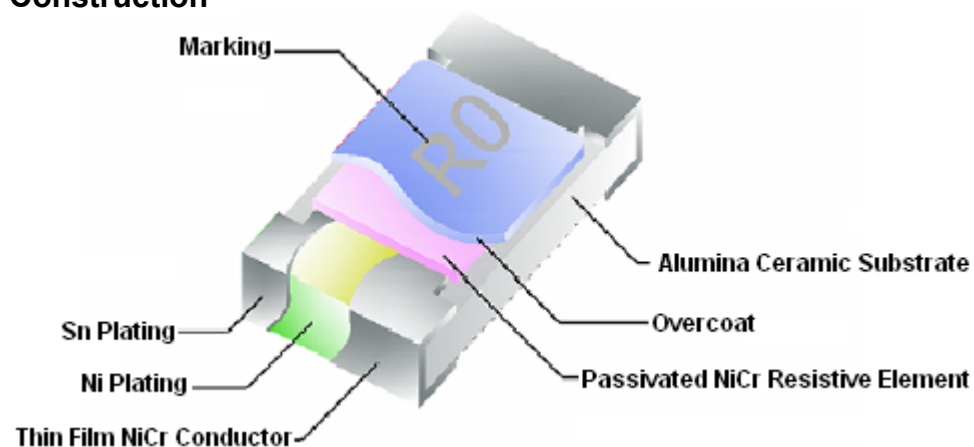


Thick Film Chip Resistors

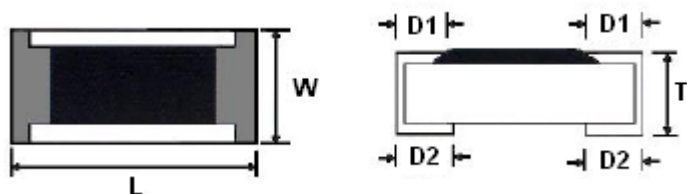
2010 Series



Construction



Power Rating and Dimensions



Dimensions : Millimetres

Dimensions

Type	L ±0.2	W ±0.15	T ±0.15	D1 ±0.3	D2 ±0.25
RMC 2010	5	2.45	0.6	0.6	0.5

Dimensions : Millimetres

Power Rating

Type	Power Rating at 70°C (W)	Tolerance %	Resistance Range (Ω)	TCR (PPM / °C)	Standard Series
RMC 2010	1/2 (0.5)	±1	0.01 to 0.02	±600	E-96
			0.021 to 0.05	±400	
			0.051 to 0.5	±300	
			0.501 to 1	±200	

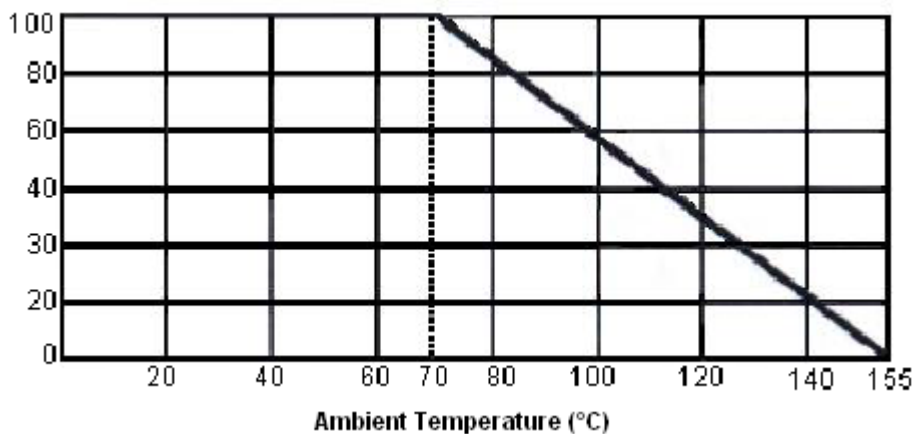
Thick Film Chip Resistors

2010 Series

Power Rating

Resistors shall have a power rating based on continuous load operation at an ambient temperature of 70°C. For temperature in excess of 70°C, the load shall be derate

Derating Curve



Nominal Resistance

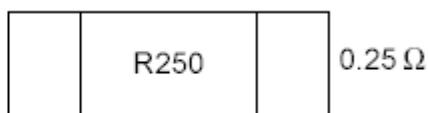
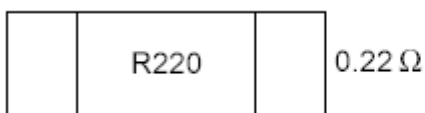
Effective figures of nominal resistance shall be in accordance with E-24, E-96 and E-192 series. E-96 for 1%, E-24 series for 2%, 5%, 10% and E-192 for 0.5%, 0.25%, 0.1%

Specification Table

Type	Power Rating (W)	Temperature Range (°C)	Ambient Temperature (°C)	Resistance Range (Ω)
RMC 2010	0.5 (1/2)	-55° to +155°	70	0.01 to 1

Marking on the Resistors

±1% Tolerance (Low value) : 4 digits, the first is letter "R" is for decimal point denoted number of zeros. The three digits are significant figures of resistance



Thick Film Chip Resistors

2010 Series



Performance Specification

Characteristics	Limits	Test Methods (JIS C 5201-1)
Temperature Coefficient	0.01 Ω to 0.02 Ω ± 600 PPM / $^{\circ}\text{C}$ 0.021 Ω to 0.05 Ω ± 400 PPM / $^{\circ}\text{C}$ 0.051 Ω to 0.5 Ω ± 300 PPM / $^{\circ}\text{C}$ 0.501 Ω to 1 Ω ± 200 PPM / $^{\circ}\text{C}$	Natural resistance change per temperature degree centigrade $R_2 - R_1 / R_1 (t_2 - t_1) \times 10^6$ (PPM / $^{\circ}\text{C}$) R1 : Resistance value at room temperature (t_1) R2 : Resistance value at room temperature plus 100 $^{\circ}\text{C}$ (t_2)
Short Time Overload	Resistance change rate is $\pm (0.5\% + 0.05 \Omega)$	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds
Insulation Resistance	$\geq 1,000 \text{ M}\Omega$	Apply 500 V dc between protective coating and termination for 1 minimum, then measure
Dielectric Withstanding Voltage	No evidence of flashover mechanical damage, arcing or insulation break down	Apply 500 V ac between protective coating and termination for 1 minute
Terminal Bending	$\pm (1\% + 0.05 \Omega)$	Twist of test board : Bending amplitude 3 mm for 10 seconds
Soldering Heat	Resistance change rate is $\pm (0.5\% + 0.05 \Omega)$	Dip the resistor into a solder bath having a temperature of 260 $^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and hold it for 10 ± 1 seconds
Load Life in Humidity	Resistance change rate is $\pm (0.5\% + 0.05 \Omega)$	Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity chamber controlled at 40 $^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 90 to 95% relative humidity
Load Life	Resistance change rate is $\pm (1\% + 0.05 \Omega)$	Permanent resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours "on", 0.5 hour "off") at 70 $^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ambient
Solderability	95% coverage minimum	Test temperature of solder : 245 $\pm 3^{\circ}\text{C}$ Dipping them solder : 2 to 3 seconds

Thick Film Chip Resistors

2010 Series



Resistance Preferred Value Range

E6	E12	E24	E96	E6	E12	E24	E96	E6	E12	E24	E96
10	10	10	10				21.5				46.4
			10.2	22	22	22	22.1	47	47	47	47.5
			10.5				22.6				48.7
			10.7				23.2				49.9
		11	11				23.7			51	51.1
			11.3			24	24.3				52.3
			11.5				24.9				53.6
			11.8				25.5				54.9
	12	12	12.1				26.1	56	56	56	56.2
			12.4				27.7				57.6
			12.7	27	27	27	27.4				12.7
		13	13				28				59
			13.3				28.7				60.4
			13.7				29.4			62	61.9
			14			30	30.1				63.4
			14.3				30.9				64.9
			14.7				31.6				66.5
			15				32.4	68	68	68	68.1
15	15	15	15	33	33	33	33.2				69.8
			15.4				34				71.5
			15.8				34.8			75	75
	16	16	16.2				35.7				76.8
			16.5				36.5				78.7
			16.9			36	36.5				80.6
			17.4				37.4				82.5
			17.8				38.3	82	82	82	82.5
	18	18	18.2			39	39.2				84.5
			18.7				40.2				86.6
			19.1				41.2				88.7
			19.6				42.2			91	90.9
		20	20				43.2				93.1
			20.5				44.2				95.3
			21				45.3				97.6

Above values in accordance with IEC Publication 63 (1963) and BS2488

Part Number Table

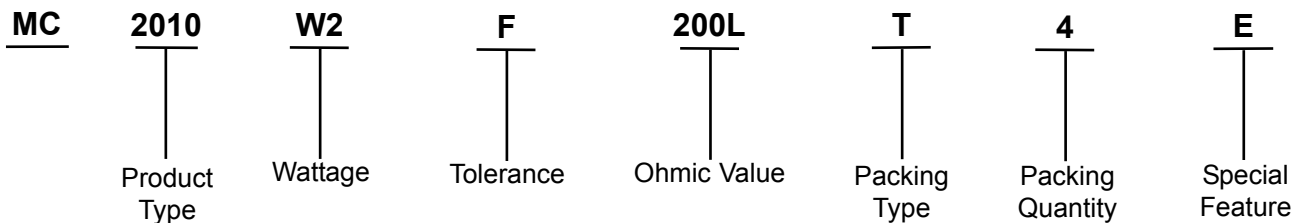
Description	Part Number
Resistor, 0R2, 0.5 W, 2010, 1%	MC2010W2F200LT4E
Resistor, 0R03, 0.5 W, 2010, 1%	MC2010W2F300MT4E
Resistor, 0R33, 0.5 W, 2010, 1%	MC2010W2F330LT4E
Resistor, 0R022, 0.5 W, 2010, 1%	MC2010W2F220MT4E
Resistor, 0R01, 0.5 W, 2010, 1%	MC2010W2F100MT4E
Resistor, 0R015, 0.5 W, 2010, 1%	MC2010W2F150MT4E
Resistor, 0R033, 0.5 W, 2010, 1%	MC2010W2F330MT4E

Thick Film Chip Resistors



2010 Series

Part Number Explanation:



- Wattage** : W2 = 1/2 W
Tolerance : F = $\pm 1\%$
Ohmic Value : Where R = Ohms = Ω
K = Kilo ohms = $K\Omega$
M = Mega ohms = $M\Omega$
And replaces the decimal point
eg: 1R5 = 1.5 Ω , 4K7 = 4.7 $K\Omega$, 6M8 = 6.8 $M\Omega$
- Packing Type** : T = T / R packing
Packing Quantity : 4 = 4,000 pieces
Special Feature : E = Lead free

Stocked Values

Tolerance	Wattage (W)	Preferred Value Range	Range Value
1%	0.063	E96	1R5 - 1M
1%	0.1	E24	1R5 - 1M
1%	0.125	E24	10R - 1M

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