Resistors

Metal Foil on Ceramic Chip Resistors

MFC Series

- Small size down to 0402
- Tolerance to ±0.5%
- TCR to ±50ppm/°C
- High power density
- AEC-Q200 qualified (excluding 0.5% tolerance)

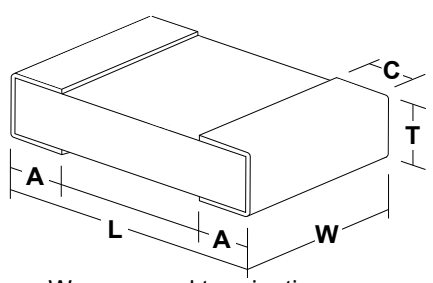
RoHS All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

Electrical Data

		0402	0603	0805		1206		2010		2512	
Power rating @ 70°C	W	0.25	0.5	0.25	0.75	0.5	1	0.75	1	1	2
Overload rating 5s	W	2.25	2.5	2.25	3.75	2.5	5	3.75	5	5	8
Resistance range	mΩ	10- 50	5- 100	30- 100	10- 100	30- 100	3- 100	30- 100	3- 100	30- 100	101- 200	2- 100
AEC-Q200 qualified												
Tolerance	±%	1, 2, 5		0.5	1, 2, 5	0.5	1, 2, 5	0.5	1, 2, 5	0.5	1, 2, 5	
TCR (-55°C to +125°C)	±ppm/°C	100	<R01: 200, ≥R01: 100	<R01: 100, ≥R01: 50						R002: 200, R003 – R009: 100, ≥R01: 50		
Standard values		E24 plus integer milliohm values below R01 preferred										
Operating temperature	°C	-55 to +155										

Physical Data

Dimensions (mm) and weight (mg)							
Size	Value (mΩ)	L	W	C	A	T max	Wt
0402	All	1.05±0.1	0.55±0.1	-	0.27±0.1	0.55	0.9
0603	All	1.6±0.2	0.85±0.25	0.35±0.25	0.35±0.2	0.85	2.9
0805	All	2±0.25	1.3±0.2	0.38±0.28	0.4±0.3	0.85	7- 10
1206	≤4	3.15±0.25	1.6±0.2	0.5±0.3	0.9±0.3	0.9	13- 15
	>4				0.53±0.33		
2010	<4	5±0.2	2.5±0.2	0.6±0.3	1.6±0.3	0.73	33
	4 – 5				1.3±0.3		
	>5				0.85±0.35		
2512	2	6.35±0.25	3.2±0.2	0.75±0.45	2.3±0.3	0.95	54
	3 – 4				1.8±0.4		
	5 – 7				1.15±0.35		
	>7				1.05±0.45		



Wrap-around terminations (3 faces)

Construction

Metal foil resistor material is bonded onto an alumina substrate and connected to wraparound terminations with nickel barrier and 100% Sn finish. Protection and marking are applied and each resistor is measured immediately before packing into tape.

Marking

MFC0402 parts are not marked. Larger MFC sizes are marked with 2, 3 or 4 characters indicating ohmic value. Where "R" is used it indicates the decimal point location for the value in ohms, e.g. "R047" = 47mΩ, "R01" = 10mΩ. Where "R" is omitted, the value is in milliohms e.g. "047" = 47mΩ, "03" = 3mΩ. Reels are marked with type, value, tolerance, date code and quantity.

Solvent Resistance

The body protection and marking are resistant to all normal industrial cleaning solvents suitable for printed circuits.

General Note

TT Electronics reserves the right to make changes in product specification without notice or liability.

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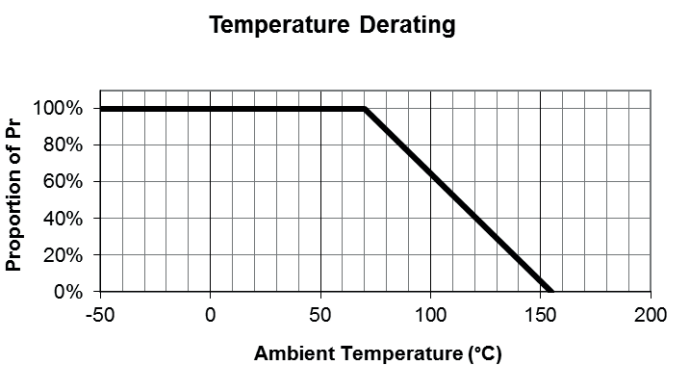
Performance Data

Test				Maximum
Operational Life	MIL-STD-202 Method 108	1000 hours, steady state, T_A=125°C at de-rated power	±ΔR%	1
Short Term Overload	IEC-60115-1 4.13	Pr<2W; 5 x Pr for 5 seconds Pr=2W; 4 x Pr for 5 seconds	±ΔR%	1
Biased Humidity	MIL-STD-202 Method 103	1000 hours, 85°C, 85%RH, 10% of Pr	±ΔR%	1
High Temperature Exposure	MIL-STD-202 Method 108	1000 hours, 155°C	±ΔR%	0.5
Operation at Low Temperature	IEC-60115-1 4.36	-55°C, 45 mins Pr, 15 mins no load	±ΔR%	1
Temperature Rapid Change	IEC-60115-1 4.19	-55°C to +155°C, 5 cycles	±ΔR%	1
Voltage Proof	IEC-60115-1 4.7	1.42 x max operating voltage for 1 minute	±ΔR%	No breakdown or flashover
Board Flex	JIS-C-521-1 4.33	3mm deflection for 5 seconds	±ΔR%	1
Solderability	IEC-60115-1 4.17	245±5°C for 3 seconds		>95% coverage
Resistance to Solder Heat	MIL-STD-202 Method 210	260±5°C for 10 seconds	±ΔR%	1
Leaching	JIS-S-5201-1 4.18 IEC-60068-2-58 8.2.1	260±5°C for 30 seconds	±ΔR%	>90% coverage
Resistance to Solvents	MIL-STD-202 Method 215	Aqueous wash OKEM or equivalent. No banned solvents.		No damage

Thermal Performance Data



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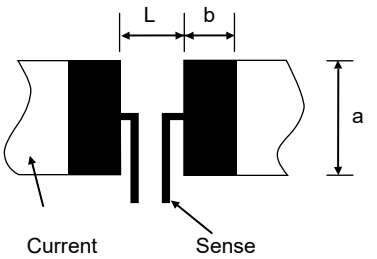
Mounting Recommendations

Size	Resistance Value	L	a	b
0402	10- 50	0.5	0.6	0.5
0603	5- 9	0.6	1	1.1
	10- 100	0.5	0.9	1
0805	10- 100	0.8	1.3	1.3
1206	3- 4	0.8	1.8	1.8
	5- 9	1.8		1.3
	10- 100	1.5	1.7	1.4
2010	3- 9	1.6	2.9	2.4
	10- 100	2.7		1.8
2512	2- 4	1	3.4	3.5
	5- 200	3.8		2.1



Packaging

MFC0402 is packed on 8mm paper tape at 2mm component pitch. MFC0603, 0805 & 1206 are packed on 8mm paper tape at 4mm component pitch. MFC2010 & 2512 are packed on 12mm plastic tape at 4mm component pitch. All sizes are on 178mm diameter reels.

Ordering Procedure

Example: MFC0603-R005FT5 (0603, 5 milliohms ±1%, Pb-free)

M	F	C	0	6	0	3	-	R	0	0	5	F	T	5	
1			2					3				4	5		

1 Type	2 Size	3 Value	4 Tolerance	5 Packing		
MFC	0402	E24 3/4 characters R = ohms	D = ±0.5%	T10	0402	10,000/reel
	0603		F = ±1%	T5	0603 to 1206	5000/reel
	0805		G = ±2%	T4	2010, 2512	4000/reel
	1206		J = ±5%			
	2010					
	2512					

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