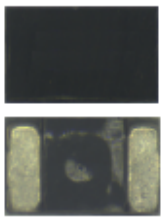
Thin Film Technology Corp.

Product Family: Current Sensing Power Resistor

Part Number Series: MPC Series (Short Side Electrode- Black, 2-Terminal)



Construction:

- Metal Strip Construction
- Epoxy-resin overcoat
- Non-Wrapped Terminations
- Pre-tinned (Sn100, matte) terminations over Ni barrier is standard (RoHS compliant and Pb Free)
- Anti-Sulfur

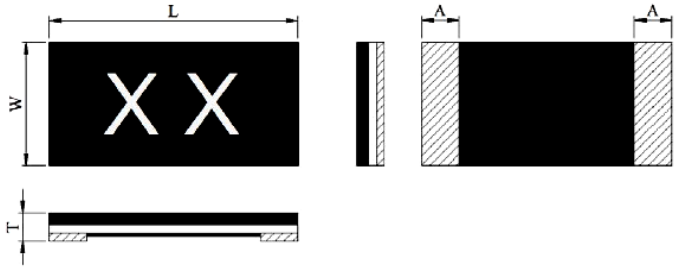
Features:

- Resistances of 2mΩ to 20mΩ
- Power rating of 1 watts
- TCR's down to ±100ppm/°C
- Tolerances down to ±1.0%
- High volume production suitable for commercial and special applications
- AEC-Q200 Automotive Grade

Description:

These low resistance, metal strip, current sensing chip resistors exhibit excellent performance with a very low height profile. They are useful in many current sensing applications.

Product Dimensions:



All dimensions are shown in inches. Metric case sizes are shown in parenthesis.

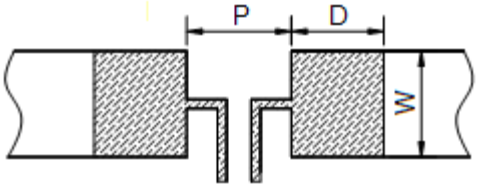
Dimensions Inch (mm)	Resistance Values (mΩ)	L	W	T	A
0603 (1608)	2	0.062±0.009 (1.60±0.25)	0.031±0.009 (0.80±0.25)	0.016±0.009 (0.40±0.25)	0.018±0.008 (0.45±0.20)
	2.5~20				0.014±0.008 (0.35±0.20)
0805 (2012)	2	0.078±0.009 (2.00±0.25)	0.049±0.009 (1.25±0.25)	0.016±0.009 (0.40±0.25)	0.024±0.008 (0.60±0.20)
	3~20				0.016±0.008 (0.40±0.20)
1206 (3216)	2	0.126±0.009 (3.20±0.25)	0.062±0.009 (1.60±0.25)	0.016±0.009 (0.40±0.25)	0.041±0.012 (1.05±0.30)
	3				0.031±0.012 (0.80±0.30)
	4~20				0.024±0.012 (0.60±0.30)

Product Construction:

(refer to callouts in diagram above)

1 = Resistor Plate (Metal Alloy)
2 = Terminals (100% Matte Sn over Nickel)
3 = Protection Coating (Black Epoxy Resin, Meets UL-94-V0 requirements)

Land Pattern:



Dimensions Inch (mm)	Resistance Values (mΩ)	P	W	D	t
0603 (1608)	2	0.50	0.92	1.35	105µ
	2.5~20	0.60		1.30	
0805 (2012)	2	0.50	1.44	1.55	105µ
	3~20	0.80		1.40	
1206 (3216)	2	0.70	1.84	1.75	105µ
	3	1.00		1.90	
	4~20	1.20		1.80	

Part Numbering: MPC0603RR020FF-T5

Product Designator	English Size (Metric Size)	Temp. Coefficient of Resistance (TCR)	Resistance Value	Tolerance	Serial Code	Automotive Code	T&R Qty
MPC	**0603** (1608) **0805** (2012) **1206** (3216)	**Q** = ±50ppm/°C **R** = ±100ppm/°C **G** = ±150ppm/°C	4 digits with the first 3 being significant. The last digit specifies the number of zeros. "R" denotes decimal position as necessary Ex. **R001** = 0.001Ω (4 digits)	**F** = ±1.0% **G** = ±2.0%	**F=**Face Down	A- Automotive AEC-Q200 Leave Blank for Non AEC-Q200	**T5** = 5,000

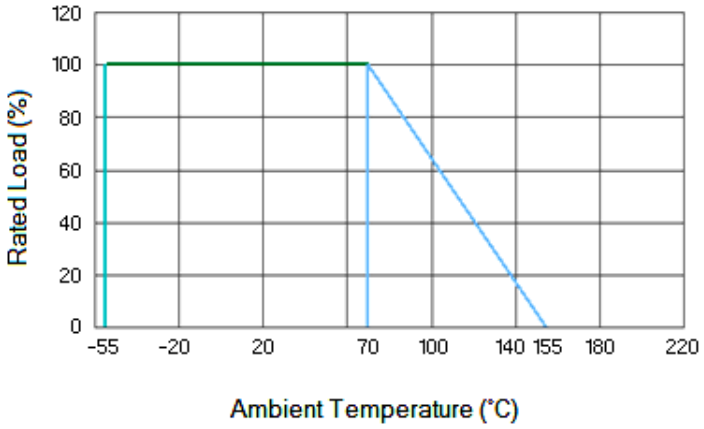
Electrical Specifications:

Type	MPC0603			MPC0805			MPC1206		
English Size	0603			0805			1206		
Metric Size	1608			2012			3216		
Power	3/10 Watt			1/2 Watt			1.0 Watt		
Rated Voltage	√Power x Resistance								
Resistance Tolerance	±2.5 (G)	±1.0% (F)		±2% (G) ±1% (F)	±1.0% (F)		±2% (G) ±1% (F)	±1.0% (F)	
Standard Resistance Values	2mΩ~3mΩ	4mΩ~5mΩ	6mΩ~20mΩ	2mΩ~3mΩ	4mΩ~5mΩ	6mΩ~20mΩ	2mΩ~3mΩ	4mΩ~5mΩ	6mΩ~20mΩ
TCR ppm/°C (code)	±150 (G)		±100 (R)	±150 (G)		±100 (R)	±50 (Q)		±50 (Q)
Operating Temperature	-55°C ~ +155°C								
Packaging (code)	5,000 pcs/reel (-T5)								

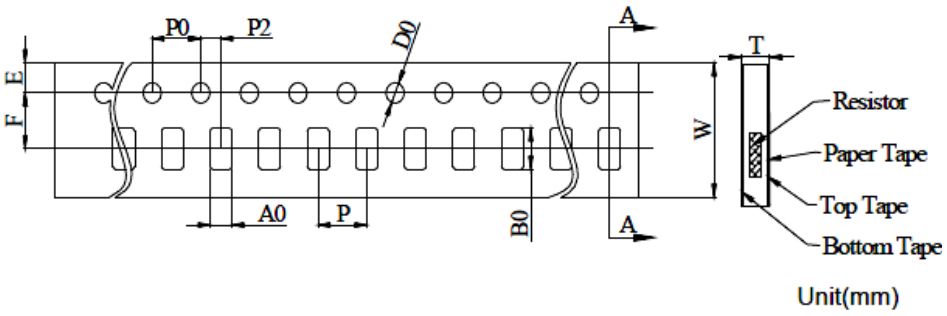
Reliability Specifications:

Parameter	Conditions	Requirements
Short Time Over Load	P= 2.5Pr; T=25±2°C, t= 5sec.	±(1.0%+0.5mΩ) IEC60115-1 4.13
High Temp. Exposure	T = +170±2°C ; t = 1000h	±(1.0%+0.5mΩ) IEC60115-1 4.25
Low Temp. Storage	T = -55±2°C ; t = 1000h	±(1.0%+0.5mΩ) IEC60115-1 4.25
Moisture Load Life	Vtest = Vmax ; T=60±2°C ; RH=95% ; t= 90min ON , 30min OFF , 1000h	±(2.0%+0.5mΩ) IEC60115-1 4.25
Thermal Shock	[-55°C 30min. → R.T. 3min. → +150°C 30min. → R.T. 3min], 100 Cycles	±(1.0%+0.5mΩ) IEC60115-1 4.19
Load Life at 70°C	Vtest = Vmax ; T=70±2°C ;t= 90min ON , 30min OFF,1000h	±(2%+0.5mΩ) IEC60115-1 4.25
Solderability	Dip into solder at T = 245±5°C , t = 3±0.5sec.	>95% coverage with new solder IEC60115-1 4.17
Resistance to Solder Heat	Through Reflow T= 275±5°C , t =20±1sec.	±(1.0%+0.5mΩ) IEC60115-1 4.18
Mechanical Shock	a=100G , t =11ms, 5 times shock	±(1.0%+0.5mΩ) IEC60115-1 4.21
Substrate Bending	Span between fulcrums = 90mm Bend Width = 2mm Test board = Glass-Epoxy Board Thickness =1.6mm	±(1.0%+0.5mΩ) IEC60115-1 4.33

Derating Curve:



Taping Diagrams:



Symbol	MPC0603	MPC0805	MPC1206
W	8.00±0.30	8.00±0.30	8.00±0.30
A0	1.18±0.20	1.68±0.20	2.05±0.20
E	1.75±0.10	1.75±0.10	1.75±0.10
P0	4.00±0.10	4.00±0.10	4.00±0.10
B0	1.98±0.20	2.38±0.20	3.65±0.20
T	0.58±0.10	0.58±0.20	0.58±0.20
P	4.00±0.10	4.00±0.10	4.00±0.10
D0	1.50±0.10	1.50±0.10	1.50±0.10
P2	2.00±0.10	2.00±0.10	2.00±0.10
F	3.50±0.10	3.50±0.10	3.50±0.10

Recommended Soldering Profile:

SOLDERING PROFILE

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Ts_{max} to Tp)	3 °C/second max.
Preheat - Temperature Min (Ts_{min}) - Temperature Max (Ts_{max}) - Time (ts_{min} to ts_{max})	 150 °C 200 °C 60-180 seconds
Time maintained above: - Temperature (T_L) - Time (t_L)	 217 °C 60-150 seconds
Peak Temperature (T_p)	260 +0 °C
Time within 5 °C of actual Peak Temperature (tp)	20-40 seconds
Ramp-Down Rate	6 °C/second max.
Time 25 °C to Peak Temperature	8 minutes max.