Thin Film Technology Corp.

Product Family: 2-Terminal Current Sensing Power Resistor

Part Number Series: D1MPC Series – Long Side Electrodes

RoHS COMPLIANT 2011/65/EU

HF HALOGEN-FREE

Construction:

- Cu alloy resistive element
- Epoxy-resin overcoat
- Non-wrapped electrodes
- 100% matte tin over Ni terminations
- Halogen Free
- RoHS compliant and Pb free
- Inherently Anti-Sulfur

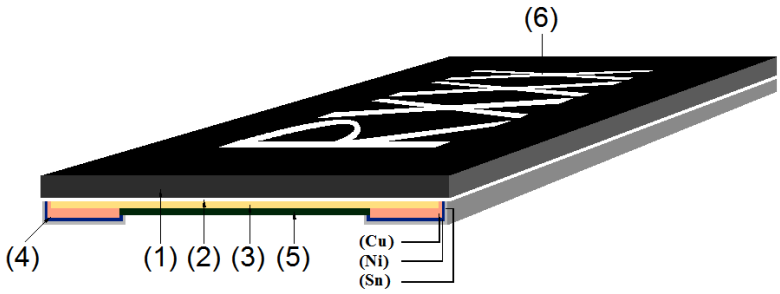
Features:

- 0508 & 0612 English case sizes
- Power of 1W
- Resistance from 1mΩ~5mΩ
- TCR down to ±50ppm/°C
- Tolerance of ±1.0%
- Low profile (0508: 0.55mm max.; 0612: 0.45mm max.)
- Moisture Sensitivity Level (MSL) = 1

Description:

These low-resistance, metal strip, current sensing chip resistors exhibit excellent performance with a low height profile. They are useful in many current sensing applications. High volume production that is suitable for commercial and special applications.

Product Construction:

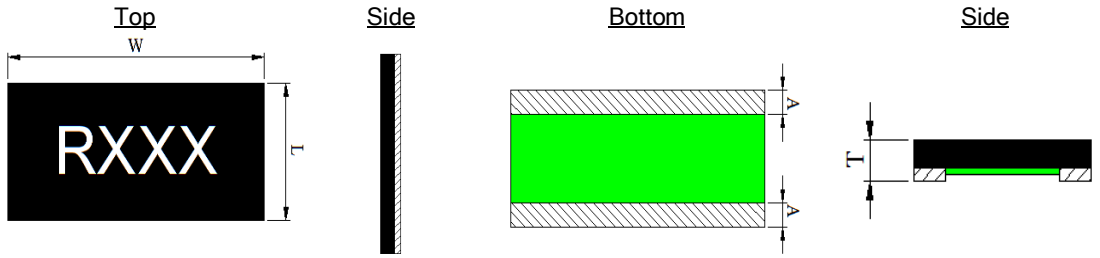


Number	Description
1	Substrate (glass epoxy)
2	Adhesive (epoxy resin)
3	Resistive element (Cu alloy)
4	Terminal Electrodes (Cu, Ni, Sn)
5	Protective coating
6	Marking

Part Numbering: Ex: D1MPC0612QR001FF-T5

Series Name	English Size (Metric Size)	Temp. Coefficient of Resistance (TCR)	Resistance Value	Resistance Tolerance	Internal Code	T&R Packaging Quantity
D1MPC	**0508** (1220) **0612** (1632)	**Q** = ±50ppm/°C **R** = ±100ppm/°C **G** = ±150ppm/°C	Ex. **R001** = 0.001Ω **1M50** = 0.0015Ω (4 digits)	**F** = ±1.0% **G** = ±2.0%	**F** = Face Down	**-T5** = 5,000 pcs/reel

Product Dimensions:



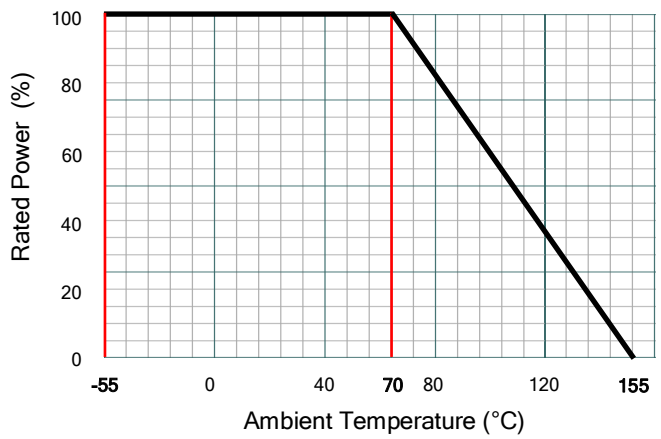
All dimensions shown in inches, mm in parentheses.

Dimension (Metric)	Resistance Range	L	W	T	A
D1MPC0508 (1220)	1mΩ	0.049 ±0.010 (1.25 ±0.25)	0.079 ±0.010 (2.00 ±0.25)	0.016 ±0.006 (0.40 ±0.15)	0.015 ±0.008 (0.38 ±0.20)
	1.5~5mΩ				0.013 ±0.008 (0.32 ±0.20)
D1MPC0612 (1632)	1mΩ	0.063 ±0.010 (1.60 ±0.25)	0.126 ±0.010 (3.20 ±0.25)	Max 0.018 (Max 0.45)	0.014 ±0.006 (0.35 ±0.15)
	1.5~5mΩ			Max 0.016 (Max 0.40)	

Electrical Specifications:

Type	D1MPC0508			D1MPC0612
Metric Size	1220			1632
Electrode Style	"B" - Long side electrode			
Power Rating	1W			
Resistance Range	1mΩ~1.5mΩ	2mΩ	3mΩ~5mΩ	1mΩ~5mΩ
Resistance Tolerance (code)	±1.0%(F)			±1.0%(F), ±2%(G)
TCR ppm/°C (code)	±50(Q)	±150(G)	±100(R)	±50(Q)
Rated Voltage	√(Power x Resistance)			
Operating Temp. Range	-55°C~+155°C			
Packaging (code)	5,000 pcs/reel (-T5)			

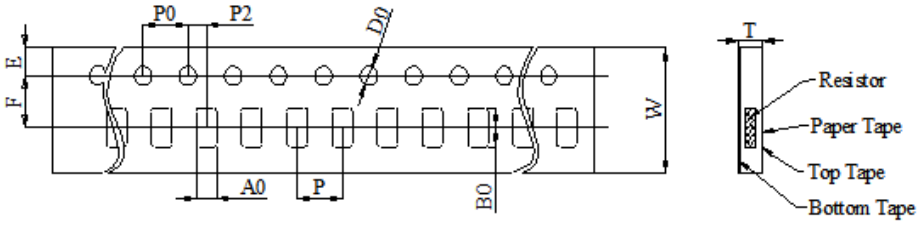
Power Derating Curve



Reliability Specifications:

Test	Procedure	Specifications
Short Time Over Load IEC60115-1 4.13	P = 2.5Pr; T = 25 ±2°C, t = 5sec.	±(1.0% +0.5mΩ)
High Temp. Exposure IEC60115-1 4.25	T = +155 ±2°C; t = 1000h	±(1.0% +0.5mΩ)
Low Temp. Storage IEC60115-1 4.25	T = -55 ±2°C; t = 1000h	±(1.0% +0.5mΩ)
Moisture Load Life IEC60115-1 4.25	$V_{test} = V_{max}$; T = 60 ±2°C; RH = 95%; t = 90min ON, 30min OFF, 1000h	±(2.0% +0.5mΩ)
Thermal Shock IEC60115-1 4.19	-55°C 30min. → R.T. 3min. → +150°C 30min.→ R.T. 3min., 100 Cycles	±(1.0% +0.5mΩ)
Load Life at 70°C IEC60115-1 4.25	$V_{test} = V_{max}$; T = 70 ±2°C; t = 90min ON, 30min OFF, 1000h	±(2.0% +0.5mΩ)
Solderability IEC60115-1 4.17	Dip into solder at T = 245 ±5°C, t = 3 ±0.5sec.	>95% coverage with new solder
Resistance to Solder Heat IEC60115-1 4.18	Through Reflow Parts are subjected to 3 reflow cycles	±(1.0% +0.5mΩ)
Mechanical Shock IEC60115-1 4.21	A = 100G, t = 6ms, 5 times shock	±(1.0% +0.5mΩ)
Substrate Bending IEC60115-1 4.33	Span between fulcrums = 90mm Bend width = 2mm Test board = Glass-epoxy board Thickness = 1.6mm	±(1.0% +0.5mΩ)

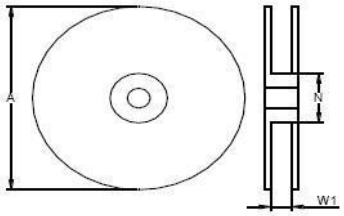
Paper Tape Dimensions:



All dimensions are in mm.

Type	W	P0	P	P2	A0	B0	D0	F	E	T
0508	8.00 ±0.30	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	1.45 ±0.10	2.20 ±0.10	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.60 ±0.10
0612	8.00 ±0.30	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	1.90 ±0.20	3.50 ±0.20	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.60 ±0.10

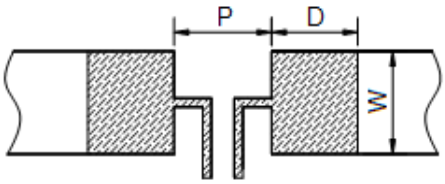
Reel Dimensions:



All dimensions in mm.

Type	A	N	W1
0508	178 ±5.00	60.0 ±2.00	9.00 ±1.00
0612			

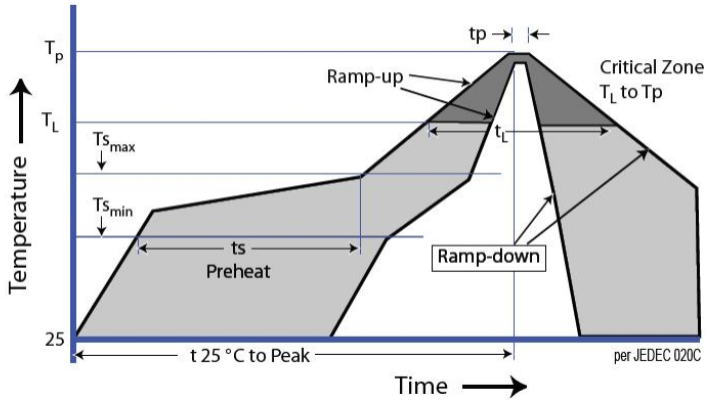
Recommended Land Pattern:



All dimensions in mm.

Type	Resistance Range	P	W	D
0508	1mΩ	0.40	2.30	0.90
	1.5mΩ~5mΩ	0.50		0.85
0612	1.5mΩ~5mΩ	0.60	3.68	1.30

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.

Storage Conditions:

Environment Conditions:

Products should be stored under the following environmental conditions.

- Temperature: +5 to +35°C
- Humidity: 45 to 85% relative humidity
- Do not keep products in environments where they may be subject to particulate contamination or harmful gases such as sulfuric acid or hydrogen chloride as it may cause oxidization on electrodes, resulting in poor solderability.
- Products should be stored in a space that does not expose it to high temperatures, vibration, or direct sunlight.
- Products should be stored in the original airtight packaging until use.