

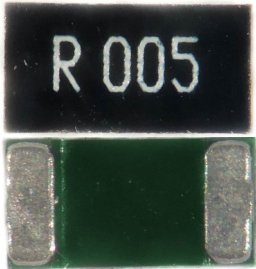


Thin Film Technology Corp.

Product Family: 2-Terminal Current Sensing Power Resistor

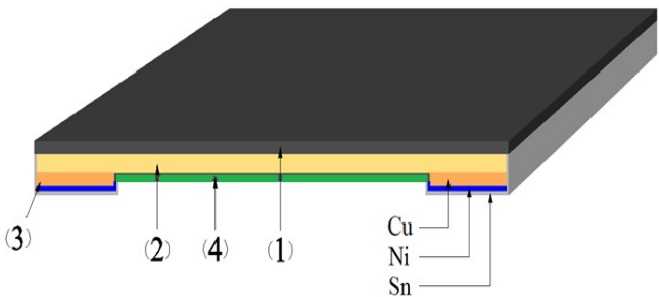
Part Number Series: D1MPC Series



	<p>Construction:</p> <ul style="list-style-type: none"> • Metal foil resistive element • Epoxy-resin overcoat • Non-wrapped electrodes • 100% matte tin over Ni terminations • RoHS compliant and Pb free • Inherently Anti-Sulfur 	<p>Features:</p> <ul style="list-style-type: none"> • 0201, 0402, 0603, 0805 and 1206 English case sizes • Resistances from 1mΩ~50mΩ • TCR down to ±50ppm/°C • Tolerance down to ±0.5% • Power up to 1W • Low profile (0201, 0402: 0.014in max.; ≥0603: 0.024in max.)
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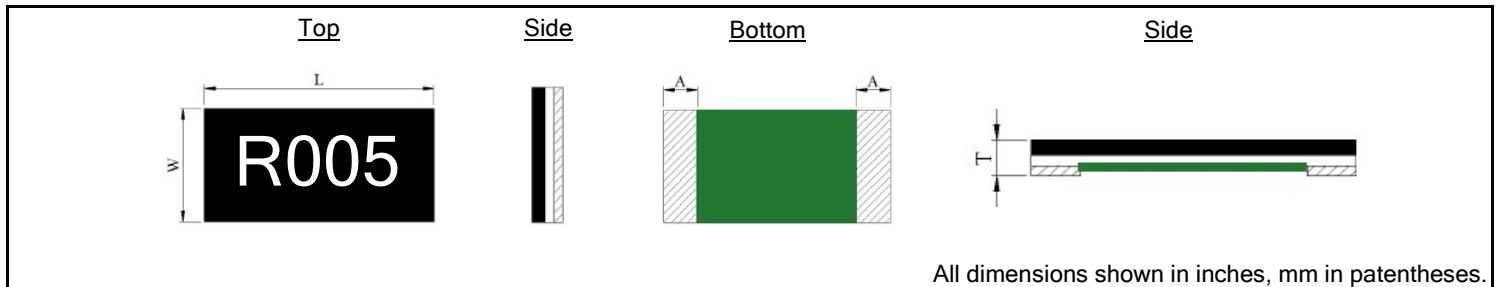
Description:
 These low resistance, metal foil, current sensing chip resistors exhibit excellent performance with a very low height profile. They are useful in many current sensing applications. High volume production suitable for commercial and special applications.

Product Construction:

	<table border="1"> <thead> <tr> <th>Number</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Substrate (Glass epoxy)</td> </tr> <tr> <td>2</td> <td>Resistor Element (Cu alloy foil)</td> </tr> <tr> <td>3</td> <td>Terminals (100% matte Sn)</td> </tr> <tr> <td>4</td> <td>Protection Coating (Epoxy resin)</td> </tr> </tbody> </table>	Number	Description	1	Substrate (Glass epoxy)	2	Resistor Element (Cu alloy foil)	3	Terminals (100% matte Sn)	4	Protection Coating (Epoxy resin)	
Number	Description											
1	Substrate (Glass epoxy)											
2	Resistor Element (Cu alloy foil)											
3	Terminals (100% matte Sn)											
4	Protection Coating (Epoxy resin)											

Part Numbering: Ex: D1MPC1206QR005FF-T5

Series Name	English Size (Metric Size)	Temp. Coefficient of Resistance (TCR)	Resistance Value	Resistance Tolerance	Internal Code	T&R Packaging Quantity
D1MPC	0201 (0603) 0402 (1005) 0603 (1608) 0805 (2012) 1206 (3216)	Q = ±50ppm/°C D = ±75ppm/°C R = ±100ppm/°C G = ±150ppm/°C S = ±200ppm/°C	Ex. R005 = 0.005Ω 2M50 = 0.0025Ω (4 digits)	D = ±0.5% F = ±1.0%	F = Face Down	-T10 = 10,000 -T5 = 5,000

Product Dimensions:

All dimensions shown in inches, mm in parentheses.

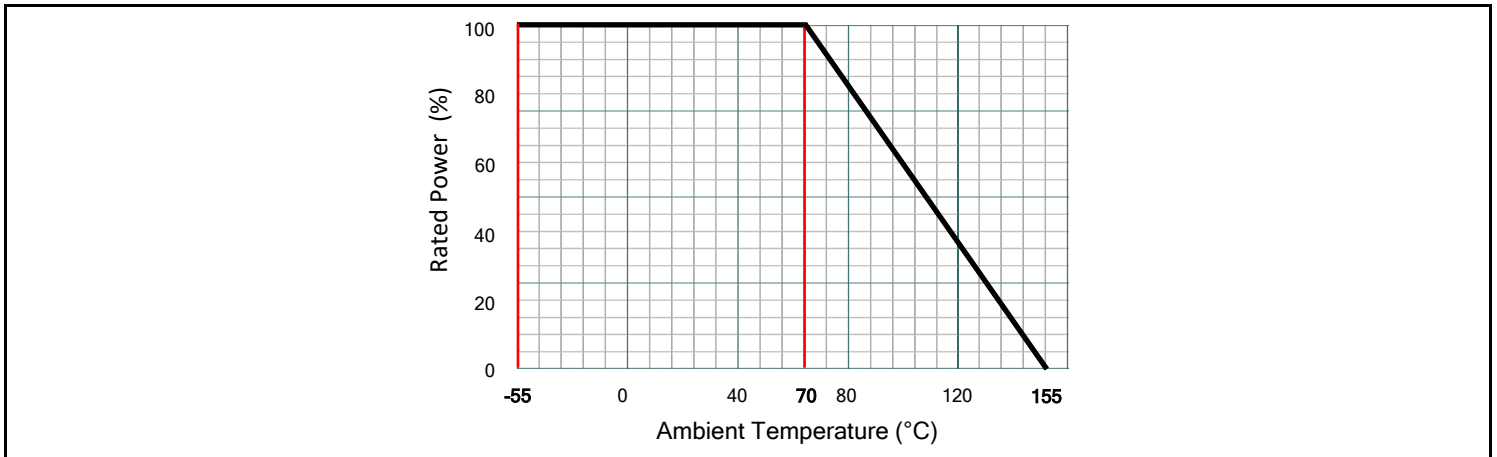
Dimension (Metric)	Resistance Range	L	W	T	A
D1MPC0201 (0603)	10mΩ, 20mΩ	0.024 ±0.004 (0.60 ±0.10)	0.012 ±0.004 (0.30 ±0.10)	0.010 +0.004/-0.002 (0.25+0.10/-0.05)	0.006 ±0.004 (0.15 ±0.10)
D1MPC0402 (1005)	2.5mΩ~3mΩ	0.040 ±0.004 (1.00 ±0.10)	0.022 ±0.004 (0.55 ±0.10)	0.012 ±0.002 (0.30 ±0.05)	0.012 ±0.04 (0.30 ±0.10)
	5mΩ~25mΩ, 40mΩ~50mΩ				0.010 ±0.04 (0.23 ±0.10)
D1MPC0603 (1608)	2mΩ	0.063 ±0.010 (1.60 ±0.25)	0.031 ±0.010 (0.80 ±0.25)	0.016 ±0.08 (0.35 ±0.20)	0.018 ±0.008 (0.45 ±0.20)
	2.5mΩ~3mΩ				0.014 ±0.008 (0.35 ±0.20)
	4mΩ~20mΩ				0.012 ±0.008 (0.30 ±0.20)
D1MPC0805 (2012)	1~1.5mΩ	0.079 ±0.010 (2.00 ±0.25)	0.050 ±0.010 (1.25 ±0.25)	0.016 ±0.08 (0.40 ±0.20)	0.028 ±0.008 (0.70 ±0.20)
	2mΩ~2.5mΩ				0.024 ±0.008 (0.60 ±0.20)
	3mΩ~20mΩ				0.016 ±0.008 (0.40 ±0.20)
D1MPC1206 (3216)	1mΩ~1.5mΩ	0.126 ±0.009 (3.20 ±0.25)	0.062 ±0.009 (1.60 ±0.25)	0.016 ±0.08 (0.40 ±0.20)	0.050 ±0.012 (1.25 ±0.30)
	2mΩ				0.041 ±0.012 (1.05 ±0.30)
	3mΩ				0.031 ±0.012 (0.80 ±0.30)
	4mΩ~20mΩ				0.024 ±0.012 (0.60 ±0.30)

Electrical Specifications:

Type	D1MPC0201		D1MPC0402				D1MPC0603				
Metric Size	0603		1005				1608				
Power Rating	1/4W		1/3W			1/4W	1/3W				
Resistance Range (mΩ)	10	20	2.5~3	5~19	20	21~25	40~50	2	2.5~4	5	6~20
Resistance Tolerance (code)	±1.0% (F)	±0.5% (D) ±1.0% (F)	±1.0% (F)		±0.5% (D)	±1.0% (F)		±1.0% (F)		±0.5% (D)	±1.0% (F)
TCR ppm/°C (code)	±200 (S)	±100 (R)	±150 (G)	±100 (R)			±150 (G)	±100 (R)		±75 (D)	
Rated Voltage	$\sqrt{\text{Power} \times \text{Resistance}}$										
Operating Temp. Range	-55°C~+155°C										
Packaging (code)	10,000 pcs/reel (-T10)						5,000 pcs/reel (-T5)				

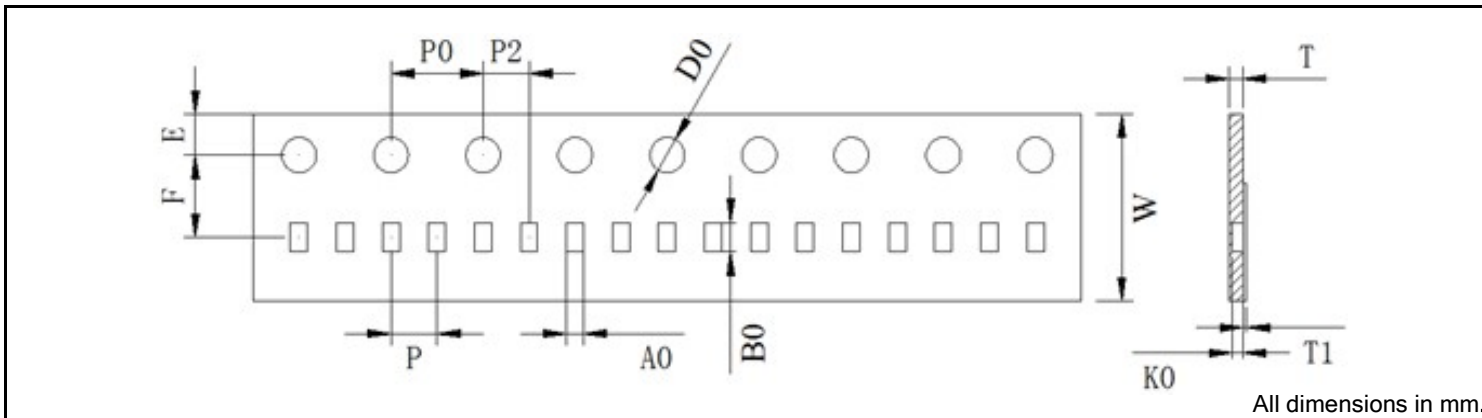
Electrical Specifications (Cont):

Type	D1MPC0805				D1MPC1206	
Metric Size	2012				3216	
Power Rating	1/2W				1W	
Resistance Range (mΩ)	1	1.5	2~5	6~20	1~4	5~20
Resistance Tolerance (code)	1.0% (F)					
TCR ppm/°C (code)	±150 (G)	±100 (R)	±75 (D)	±50 (Q)	±75 (D)	±50 (Q)
Rated Voltage	$\sqrt{\text{Power} \times \text{Resistance}}$					
Operating Temperature	-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	Vtest = Vmax ; T = 60 ±2°C ; RH = 95% ; t = 90min ON , 30min OFF , 1000h	±(2.0% +0.5mΩ)
Thermal Shock IEC60115-1 4.19	0201: -55°C 30min. → R.T. 1min. → +155°C 30min. → R.T. 1min., 1000 cycles 0402-1206: -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	Vtest = Vmax ; T=70 ±2°C ; t = 90min ON , 30min OFF,1000h	0201: ±(1.0% +0.5mΩ) 0402-1206: ±(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 T= 275 ±5°C , t=20 ±1sec.	±(1.0% +0.5mΩ)
Mechanical Shock IEC60115-1 4.21	0201: F = 50 ±5G, t = 11 ±1ms. 0402-1206: a = 100G, t = 11ms, 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 Duration = 10 sec.	±(1.0% +0.5mΩ)

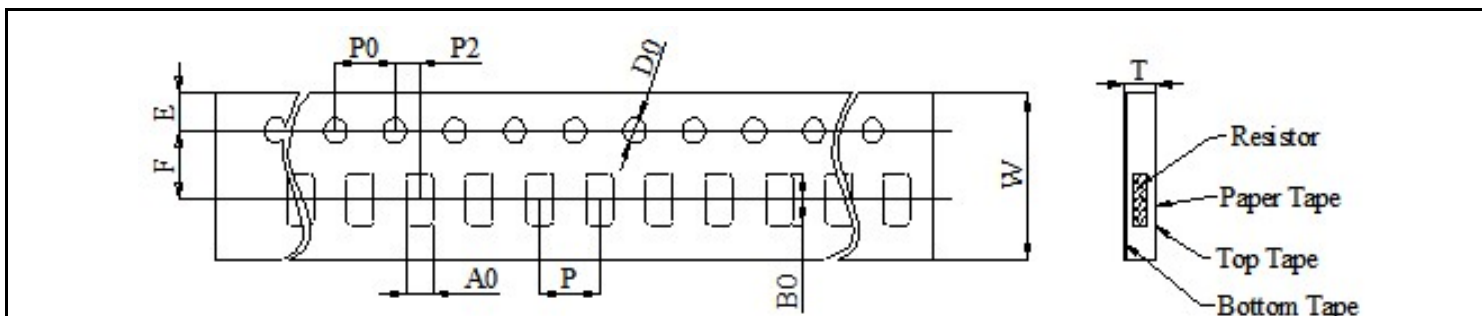
Plastic Tape Dimensions:



All dimensions in mm.

Size	W	P0	P1	P2	A0	B0	D0	F	E	T	T1	K0
0201	8.00 ±0.20	4.00 ±0.10	2.00 ±0.10	2.00 ±0.10	0.38 ±0.10	0.68 ±0.10	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.45 ±0.05	Max. 0.1	0.30 ±0.05

Paper Tape Dimensions:



All dimensions in mm.

Size	W	P0	P	P2	A0	B0	D0	F	E	T
0402	8.00 ±0.30	4.00 ±0.10	2.00 ±0.10	2.00 ±0.10	0.65 ±0.10	1.10 ±0.10	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.42 ±0.05
0603	8.00 ±0.30	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	0.98 ±0.10	1.85 ±0.10	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.60 ±0.05
0805	8.00 ±0.30	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	1.55 ±0.10	2.30 ±0.10	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.75 ±0.10
1206	8.00 ±0.30	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	2.05 ±0.20	3.65 ±0.20	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.75 ±0.10

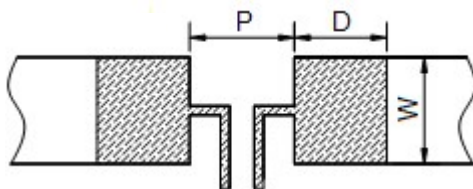
Reel Dimensions:

Size	0201	0402	0603	0805	1206
A	178 ±5.00	178 ±5.00	178 ±5.00	178 ±5.00	178 ±5.00
N	60.0 ±2.00	60.0 ±2.00	60.0 ±2.00	60.0 ±2.00	60.0 ±2.00
W1	9.00 ±1.00	9.00 ±1.00	9.00 ±1.00	9.00 ±1.00	9.00 ±1.00

The diagram shows a top view of a reel with dimensions A and W1, and a side view with dimension N.

All dimensions in mm.

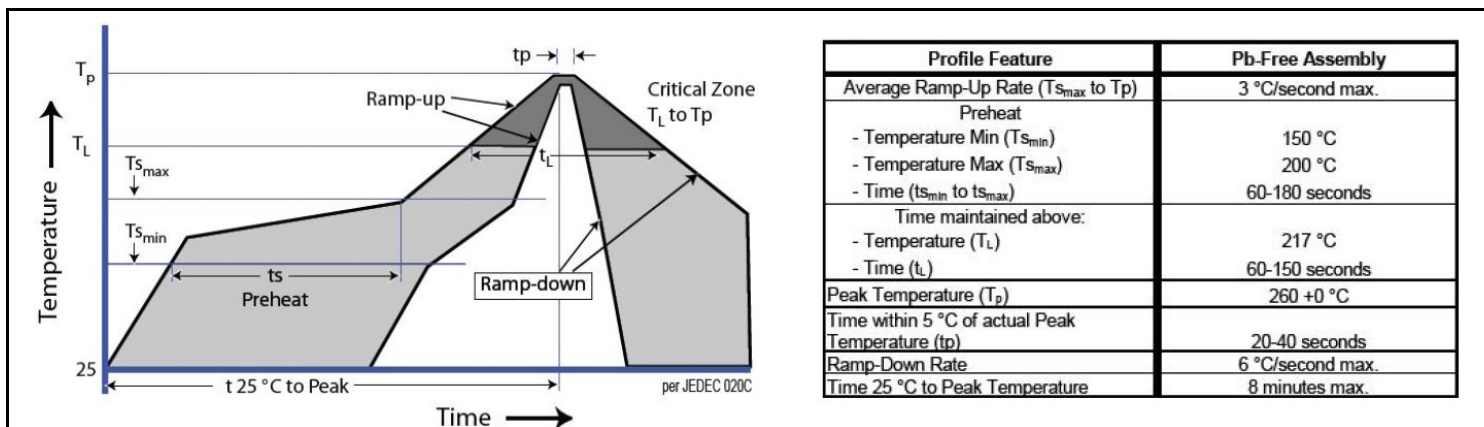
Recommended Land Pattern:



All dimensions in mm.

Size	Resistance Range	P	D	W
0201	10mΩ, 20mΩ	0.25	0.20	0.33
0402	2.5mΩ~3mΩ	0.35	0.60	0.60
	5mΩ~25mΩ	0.40	0.60	
	50mΩ	0.40	0.60	
0603	2mΩ	0.38	1.41	0.92
	2.5mΩ~3mΩ	0.50	1.35	
	4mΩ~20mΩ	0.60	1.30	
0805	1mΩ	0.40	1.60	1.44
	1.5mΩ	0.50	1.55	
	2mΩ	0.50	1.55	
	3mΩ~20mΩ	0.80	1.40	
1206	1mΩ~1.5mΩ	0.50	2.15	1.84
	2mΩ	0.60	2.10	
	3mΩ~20mΩ	1.20	1.80	

Soldering Profile:



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.