



Thin Film Technology Corp.

**Product Family:** 4-Terminal Current Sensing Power Resistor**Part Number Series:** D1FCP Series

	<b>Construction:</b> <ul style="list-style-type: none"> <li>Glass epoxy substrate</li> <li>Cu metal foil resistive element</li> <li>100% matte tin over Ni terminations</li> <li>Halogen Free</li> <li>RoHS compliant and Pb free</li> <li>Inherently Anti-Sulfur</li> </ul>	<b>Features:</b> <ul style="list-style-type: none"> <li>0306, 0508, 0612 English case sizes</li> <li>Power up to 1W</li> <li>Resistances from 0.5mΩ~5mΩ</li> <li>TCR down to ±75ppm/°C</li> <li>Tolerance down to ±1.0%</li> <li>Low profile (0306: 0.45mm max.; 0508: 0.60mm max.; 0612: 0.50mm max. &amp; 0.35mm max.)</li> <li>Moisture Sensitivity Level (MSL) = 1</li> </ul>
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**Description:**

These low resistance, high power chip resistors exhibit excellent performance in resistance, noise performance, surface heat distribution and have a lower surface temperature. They are designed and produced with a face (pattern) down construction and have a very low height profile. They are useful in many current sensing applications.

**Product Construction:**

	<b>Number</b>	<b>Description</b>
	1	Glass epoxy substrate
	2	Adhesive (epoxy resin)
	3	Resistive element (Cu alloy)
	4	Terminal electrodes (Cu, Ni, Sn)
	5	Protective coating (epoxy resin)
	6	Marking*

\*Note: Marking will consist of a black marked top surface with an orientation marker in white or dark gray color.

**Part Numbering:** Ex: D1FCP0306RR005FF-T5

Series Name	English Size (Metric Size)	Temp. Coefficient of Resistance (TCR)	Resistance Value*	Resistance Tolerance	Serial Code	T&R Packaging Quantity
D1FCP	0306 (0816) 0508 (1220) 0612 (1632)	D = ±75ppm/°C R = ±100ppm/°C (refer to electrical table)	Ex. R001 = 0.001Ω 0M50 = 0.0005Ω (4 digits)	F = ±1.0%	F = Face Down	-T5 = 5,000pcs/reel

\*Note: For resistance values of one milliohm or greater, use "R" to specify the decimal point (i.e. R005=0.005Ω). For resistance values less than one milliohm or those with 1/2 milliohm increments, use "M" to specify the decimal point (i.e. 0M50=0.0005Ω and 7M50 = 7.50mΩ).

**Product Dimensions:**

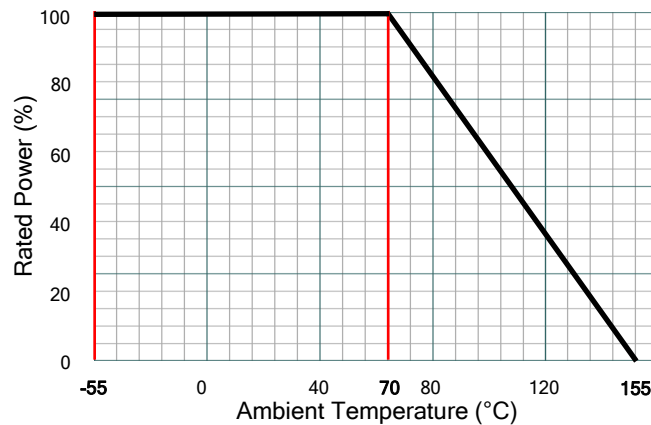
<b>Top</b> 	<b>Side</b> 	<b>Bottom</b> 
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All dimensions shown in inches, mm in parentheses.

Dimension (Metric)	Resistance Range	L	W	T	A	B	C	D
D1FCP0306 (0816)	2.5mΩ~5mΩ	0.031 ±0.006 (0.80 ±0.15)	0.063 ±0.008 (1.60 ±0.20)	0.014 ±0.004 (0.35 ±0.10)	0.008 ±0.004 (0.20 ±0.10)	0.010 ±0.004 (0.25 ±0.10)	0.016 ±0.004 (0.40 ±0.10)	0.037 ±0.008 (0.95 ±0.20)
D1FCP0508 (1220)	1mΩ~2mΩ	0.049 ±0.008 (1.25 ±0.20)	0.079 ±0.008 (2.00 ±0.20)	0.016 ±0.008 (0.40 ±0.20)	0.014 ±0.006 (0.35 ±0.15)	0.012 ±0.006 (0.30 ±0.15)	0.012 ±0.006 (0.30 ±0.15)	0.055 ±0.008 (1.40 ±0.20)
D1FCP0612 (1632)	0.5mΩ~2mΩ	0.063 ±0.008 (1.60 ±0.20)	0.126 ±0.008 (3.20 ±0.20)	0.014 ±0.006 (0.35 ±0.15)	0.018 ±0.008 (0.45 ±0.20)	0.020 ±0.008 (0.50 ±0.20)	0.024 ±0.008 (0.60 ±0.20)	0.083 ±0.008 (2.10 ±0.20)
	2.5mΩ~5mΩ	0.063 ±0.008 (1.60 ±0.20)	0.126 ±0.008 (3.20 ±0.20)	0.010 ±0.004 (0.25 ±0.10)	0.018 ±0.008 (0.45 ±0.20)	0.020 ±0.008 (0.50 ±0.20)	0.024 ±0.008 (0.60 ±0.20)	0.083 ±0.008 (2.10 ±0.20)

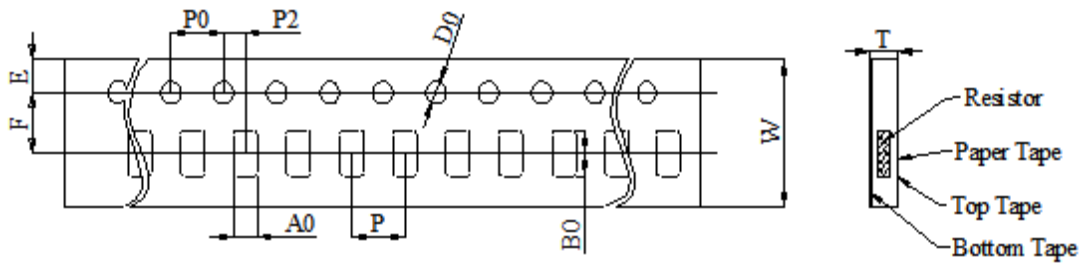
**Electrical Specifications:**

Type	D1FCP0306	D1FCP0508	D1FCP0612	
Metric Size	0816	1220	1632	
Power Rating	1/2W (0.5W)	1/2W (0.5W)	1W	
Resistance Range	2.5mΩ~5mΩ	1mΩ~2mΩ	0.5mΩ	1mΩ~5mΩ
Resistance Tolerance (code)	±1.0%(F)	±1.0%(F)	±1.0%(F)	
TCR ppm/°C (code)	±100(R)	±100(R)	±100(R)	±75(D)
Rated Voltage	$\sqrt{(\text{Power} \times \text{Resistance})}$			
Operating Temp. Range	-55°C~+155°C			
Packaging (code)	5,000 pcs/reel (-T5)			

**Power Derating Curve:****Reliability Specifications:**

Test	Procedure	Specification
<b>Short Time Overload</b> IEC60115-1 4.13	$P = 2.5P_r$ ; $T = 25 \pm 2^\circ\text{C}$ ; $t = 5\text{sec}$	$\pm(1.0\% + 0.5\text{m}\Omega)$
<b>High Temp. Exposure</b> IEC60115-1 4.25	$T = +155 \pm 2^\circ\text{C}$ ; $t = 1000\text{h}$	$\pm(1.0\% + 0.5\text{m}\Omega)$
<b>Low Temp. Storage</b> IEC60115-1 4.25	$T = -55 \pm 2^\circ\text{C}$ ; $t = 1000\text{h}$	$\pm(1.0\% + 0.5\text{m}\Omega)$
<b>Moisture Load Life (60°C, 95% RH)</b> IEC60115-1 4.25	$V_{\text{test}} = V_{\text{max}}$ ; $T = 60 \pm 2^\circ\text{C}$ ; RH=95%; $t = 90\text{min ON, } 30\text{min OFF, } 1000\text{h}$	$\pm(2.0\% + 0.5\text{m}\Omega)$
<b>Thermal Shock</b> IEC60115-1 4.19	$[-55^\circ\text{C } 30\text{min.} \rightarrow \text{R.T. } 3\text{min.} \rightarrow +155^\circ\text{C } 30\text{min.} \rightarrow \text{R.T. } 3\text{min.}]$ , 100 Cycles	$\pm(1.0\% + 0.5\text{m}\Omega)$
<b>Load Life at 70°C</b> IEC60115-1 4.25	$V_{\text{test}} = V_{\text{max}}$ ; $T = 70 \pm 2^\circ\text{C}$ ; $t = 90\text{min ON, } 30\text{min OFF, } 1000\text{h}$	$\pm(2.0\% + 0.5\text{m}\Omega)$
<b>Solderability</b> IEC60115-1 4.17	Dip into solder at $T = 245 \pm 5^\circ\text{C}$ , $t = 3 \pm 1\text{sec}$	The covered area >95%
<b>Resistance to Solder Heat</b> IEC60115-1 4.18	Through Reflow Parts are subjected to 3 reflow cycles.	$\pm(1.0\% + 0.5\text{m}\Omega)$
<b>Mechanical Shock</b> IEC60115-1 4.21	$a = 100\text{G}$ , $t = 6\text{ms}$	$\pm(1.0\% + 0.5\text{m}\Omega)$
<b>Substrate Bending</b> IEC60115-1 4.33	Span between fulcrums: 90mm; Bend Width: 2mm; Test board: Glass-Epoxy Board; Thickness = 1.6mm	$\pm(1.0\% + 0.5\text{m}\Omega)$

## Paper Tape Dimensions:



All dimensions in mm.

Type	W	P0	P	P2	A0	B0	D0	F	E	T
0306	8.00 ±0.30	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	0.98 ±0.20	1.85 ±0.20	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.60 ±0.10
0508	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
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	0.50 ±0.15

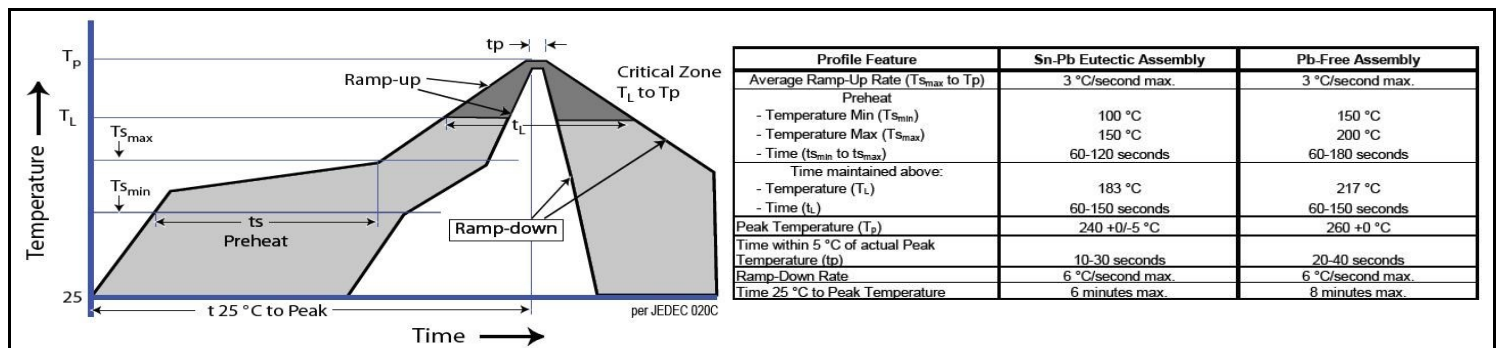
## Reel Dimensions:

Type	A	N	W1
0306	178 ±5.00	60.0 ±2.00	9.00 ±1.00
0508			
0612			

## Recommended Land Pattern:

Type	P	W	D	V	E
0306	0.35	1.30	0.40	0.40	0.20
0508	0.50	1.60	0.70	0.45	0.25
0612	0.76	2.29	1.01	0.76	0.38

## 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.