Thin Film Technology Corp.

Product Family: 4-Terminal Current Sensing Power Resistor

Part Number Series: D1CPC0306QR003FF-T50

RoHS COMPLIANT 2011/65/EU

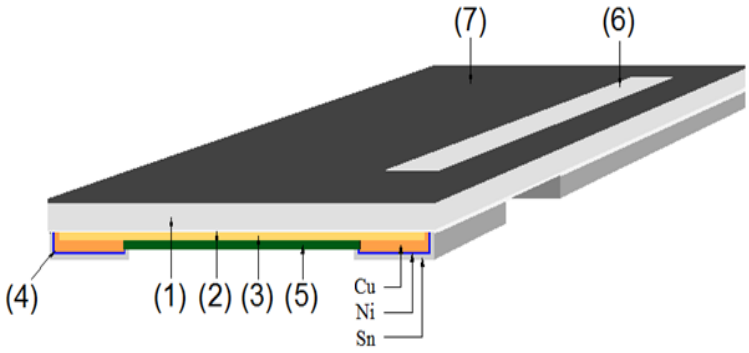
HF HALOGEN-FREE

Construction:
- High purity alumina substrate
- MnCu alloy resistive element
- Epoxy-resin overcoat
- Non-wrapped terminations
- Halogen free
- RoHS compliant and Pb free
- Inherently Anti-Sulfur

Features:
- 0306 English case size
- Power of 1/3 Watt
- Resistance of 3mΩ
- TCR of ±50ppm/°C
- Tolerance of ±1.0%

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. They are useful in many current sensing applications.

Product Construction:

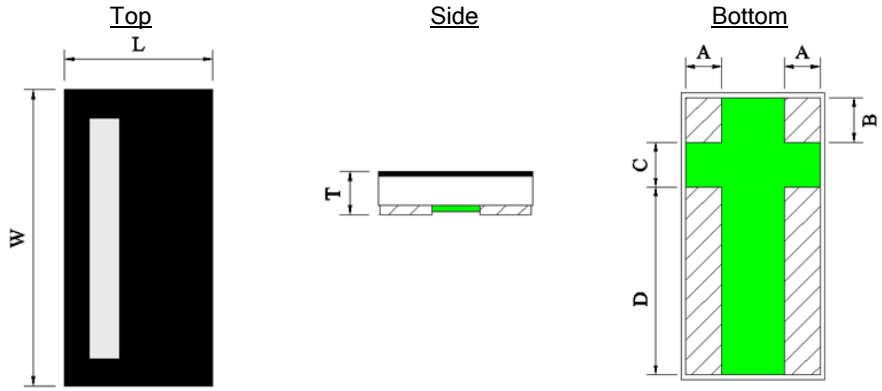


Number	Description
1	Substrate (Alumina ceramic)
2	Adhesive (Epoxy resin)
3	Resistive Element (MnCu alloy)
4	Terminal Electrodes (Sn, Ni, Cu)
5	Protective Coating (Flame retardant epoxy, green)
6	Marking (Flame retardant epoxy, white)
7	Marking Coating (Flame retardant epoxy, black)

Part Numbering: Ex: D1CPC0306QR003FF-T50

Series Name	Ceramic Type	English Size (Metric Size)	Temp. Coefficient of Resistance (TCR)	Resistance Value	Tolerance	Internal Code	T&R Packaging Quantity
D1CP	C = Alumina	0306 (0816)	Q = ±50ppm/°C	For all sizes, use 4 digit code for all values. "R" denotes decimal position as necessary. Ex. R003 = 3mΩ	F = ±1.0%	F = Face Down	-T50 = 5,000pcs/reel

Product Dimensions:



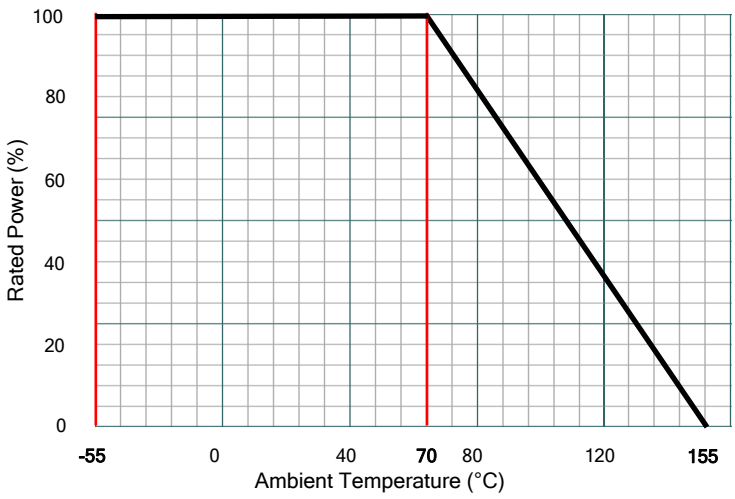
All dimensions shown in inches, mm in parentheses.

Dimension (Metric)	L	W	T	A	B	C	D
D1CPC0306 (0816)	0.031 ±0.006 (0.80 ±0.15)	0.063 ±0.008 (1.60 ±0.20)	0.022 ±0.004 (0.55 ±0.10)	0.007 ±0.004 (0.18 ±0.10)	0.009 ±0.004 (0.23 ±0.10)	0.016 ±0.004 (0.40 ±0.10)	0.037 ±0.008 (0.93 ±0.20)

Electrical Specifications:

Type	D1CPC0306
Metric Size	0816
Power Rating	1/3W (0.33W)
Resistance Range	3mΩ
Resistance Tolerance % (code)	±1.0% (F)
TCR ppm/°C (code)	±50ppm/°C (Q)
Rated Voltage	√(Power x Resistance)
Operating Temperature	-55°C ~ +155°C
Packaging	5,000 pcs/reel (-T50)

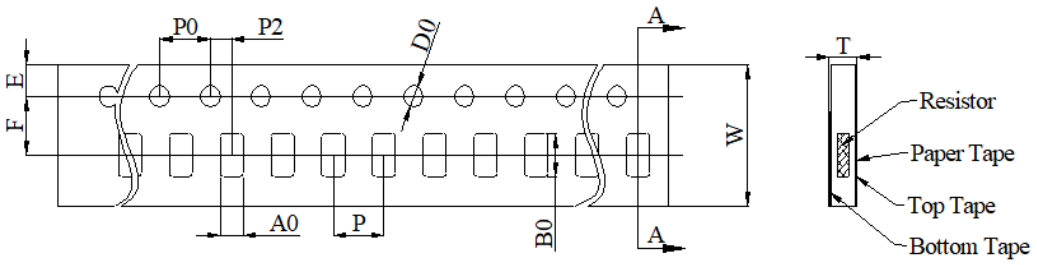
Power Derating Curve:



Reliability Specifications:

Test	Procedure	Specifications
Short Time Over Load IEC60115-1 4.13	P= 2.5Pr; T=25 ±2°C, t= 5sec.	±1.0%
High Temp. Exposure IEC60115-1 4.25	T = +170 ±2°C; t = 1000h	±1.0%
Low Temp. Storage IEC60115-1 4.25	T = -55 ±2°C ; t = 1000h	±1.0%
Moisture Load Life IEC60115-1 4.25	Vtest = Vmax ; T = 60 ±2°C ; RH = 95% ; t = 90min ON , 30min OFF , 1000h	±2.0%
Thermal Shock JESD22-A-104	-55±3°C to 125±3°C with 30 minute dwell at each temperature and 1 min maximum transition time.1000 cycles	±1.0%
Load Life at 70°C IEC60115-1 4.25	Vtest = Vmax ; T=70 ±2°C ; t = 90min ON , 30min OFF,1000h	±1.0%
Solderability IEC60115-1 4.17	Dip into solder at T = 245 ±5°C , t = 3 ±0.5 sec.	The covered area >95%
Resistance to Solder Heat JEDEC J-STD-20	Through Reflow T= 260°C , t =10sec.	Part must meet initial specifications following test
Mechanical Shock IEC60115-1 4.21	a = 100G, t = 11ms, 5 times shock	±1.0%
Substrate Bending IEC60115-1 4.33	Span between fulcrums; 90mm Bend width: 2mm Test board: Glass-epoxy board Thickness: 1.6mm	±1.0%

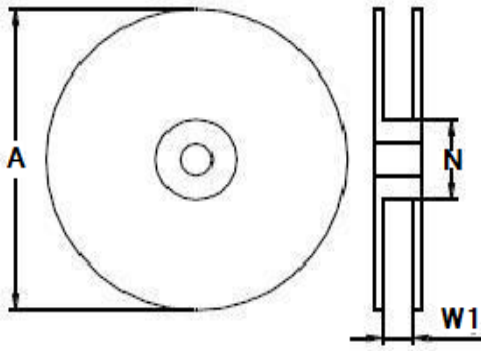
Paper Tape Dimensions:



All dimensions in mm.

Size	W	P0	P	P2	A0	B0	D0	F	E	T
D1CPC0306	8.00 ±0.30	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	1.18 ±0.20	1.98 ±0.20	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.75 ±0.20

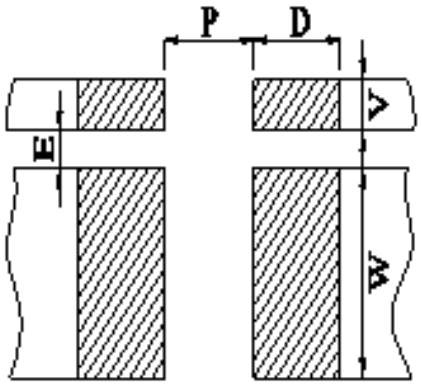
Reel Dimensions:



All dimensions in mm.

Type	A	N	W1
D1CPC0306	178 ±5.00	60.0 ±2.00	9.00 ±1.00

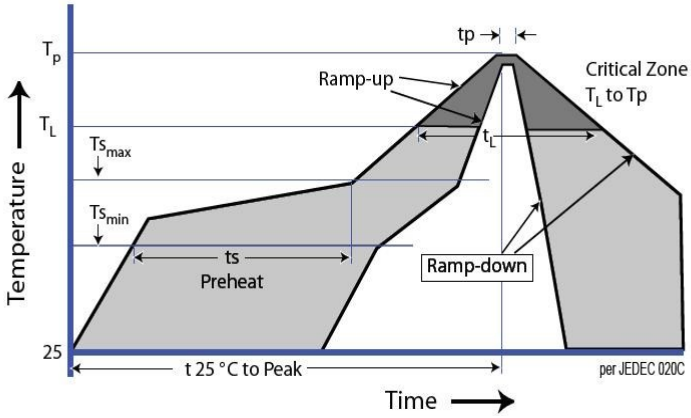
Recommended Land Pattern and Dimensions:



All dimensions in mm.

Type	P	W	D	V	E
D1CPC0306	0.35	1.30	0.40	0.40	0.20

Soldering Profile:



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-Up Rate (Ts_{max} to Tp)	3 °C/second max.	3 °C/second max.
Preheat		
- Temperature Min (Ts_{min})	100 °C	150 °C
- Temperature Max (Ts_{max})	150 °C	200 °C
- Time (ts_{min} to ts_{max})	60-120 seconds	60-180 seconds
Time maintained above:		
- Temperature (T_L)	183 °C	217 °C
- Time (t_L)	60-150 seconds	60-150 seconds
Peak Temperature (T_p)	240 +0/-5 °C	260 +0 °C
Time within 5 °C of actual Peak Temperature (tp)	10-30 seconds	20-40 seconds
Ramp-Down Rate	6 °C/second max.	6 °C/second max.
Time 25 °C to Peak Temperature	6 minutes max.	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.