




Thin Film Technology Corp.

Product Family: Current Sensing Power Resistor

Part Number Series: CPC0306-FF Series (Face Down - Black Marked)



	Construction: <ul style="list-style-type: none"> Manganese alloy resistive element High purity alumina substrate Inherently Anti-Sulfur Pre-tinned (Sn100, matte) terminations over Ni barrier Beryllium free and halogen free RoHS compliant without exemptions 	Features: <ul style="list-style-type: none"> Resistance range of 1mΩ ~50mΩ TCR down to ±50ppm/°C Power of 1/3 Watt Tolerance down to 0.5% High volume production suitable for commercial and special applications MSL = 1 , Mass = 2.91mg
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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. They are useful in many current sensing applications.

Product Dimensions:

All dimensions shown in inches. (mm in parentheses)

Item	L	W	T	A	B	C	D
CPC0306-FF	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)

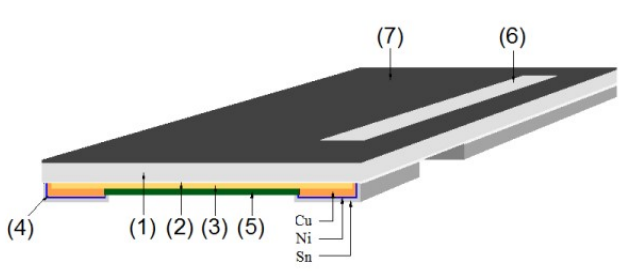
Part Numbering: Ex: CPC0306QR010FF-T50

Product Designator	Ceramic Type	English Size (Metric Size)	Temp. Coefficient of Resistance (TCR)	Resistance Value *	Tolerance	Serial Code	T&R Qty
CP	C = Alumina	0306 (0816)	Q = ±50ppm/°C R = ±100ppm/°C G = ±150ppm/°C (refer to electrical table for offerings)	Ex. R010 = 0.010Ω	F = ±1.0%	F = Face Down	-T50 = 5,000pcs/reel

*Note: For resistance values of one milliohm or greater, use "R" to specify the decimal point (i.e. R010=0.010Ω). 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 Construction:

Layers			
1	Alumina ceramic substrate	5	Protective coating (Flame -retardant epoxy)
2	Adhesive epoxy	6	Marking (Flame -retardant epoxy)
3	Resistive elements (Cu – alloy)	7	Top coating (Flame -retardant epoxy)
4	Terminal Electrode (Sn, Ni, Cu)		



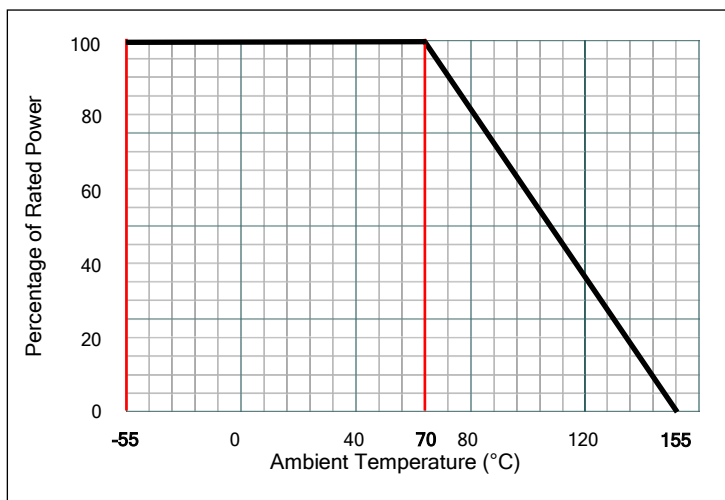
Note: Parts will consist of a black marked top surface with an orientation marker in white or light gray color.

Electrical Specifications:

Type	CPC0306-FF		
English Size	0306		
Metric Size	0816		
Power	1/3 watt		
Resistance Tolerance	±1.0% (F)		±0.5%(D), ±1.0% (F)
Standard Resistance Values	1mΩ ~ 4mΩ	5mΩ ~ 9mΩ	10mΩ ~ 50mΩ
TCR ppm/°C (code)	100ppm/°C (R)	50ppm/°C (Q) 100ppm/°C (R) 150ppm/°C (G)	50ppm/°C (Q) 100ppm/°C (R) 150ppm/°C (G)
Operating Temperature	-55°C ~ +155°C Derating from 70°C		
Maximum Over Current	$\sqrt{\text{Power} \times \text{Resistance}}$		
Packaging	5,000 pcs/reel		

Power Derating Curve:

CPC0306-FF (1mΩ ~ 50mΩ)

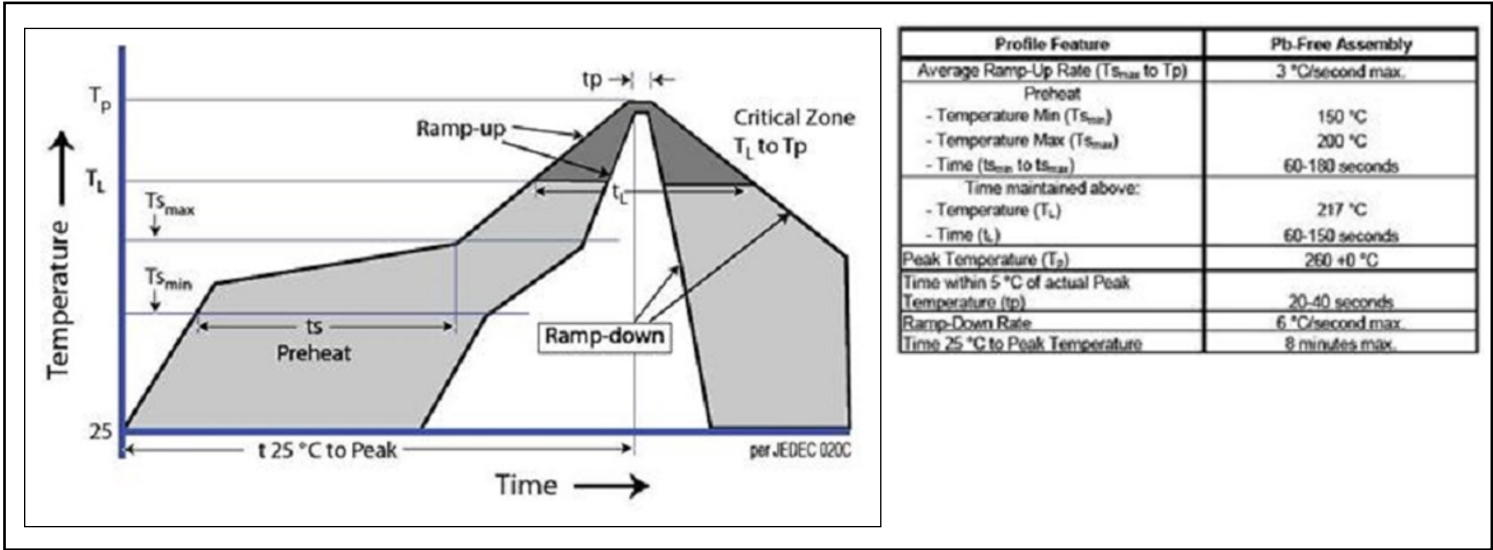


Reliability Specifications:

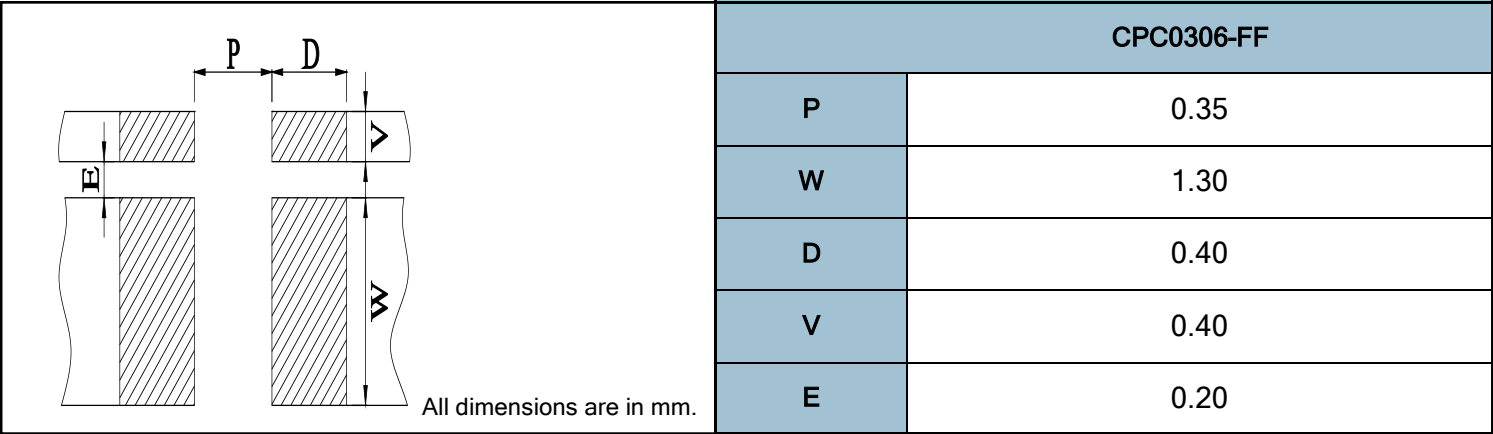
Test	Test Method	Specification
Resistance Data	Resistance data at 25°C	Must meet datasheet requirements
TCR Data	Tested at 25°C and 125°C $TCR = (R_b - R_a) / R_a \times 1 / (T_b - T_a) \times 10^6$	Must meet datasheet requirements
Dimensional Data	Measure all dimensions specified in datasheet	Must meet datasheet requirements
Short Time Overload JIS-C-5201, 4.13	Applied voltage: 2.5X rated voltage. Test duration: 5 seconds	±1.0%
Load Life, Power Cycling (1) JIS-C-5201-1, 4.25	Test Temperature: 70°C Applied voltage: rated power Test period: 1,000 hours with power cycling as follows: 90 min. power ON/30 min. power OFF,	±1.0%
Temperature / Humidity (1) JIS-C-5201-1, 4.24	Test Condition: 60°C / 90-95% RH Test period: 1,000 hours	±1.0%
Temperature Cycle (1) (Thermal Shock) JESD22-A-104	Repeat 1,000 cycles as follows: -55°C (30 min.) / +125°C (30 min.) Transition time of 1 minute maximum	±1.0%
Resistance To Solder Heat #1 J-STD-020	One reflow cycle according to JEDEC J-STD-020, cool down then parts are immersed into a molten solder bath with a temperature of 260°C for a period of 10 ±1 seconds.	Part must meet initial specifications following testing.
Resistance To Solder Heat #2 J-STD-020	Per component MSL classification per J-STD-020 3 reflow cycles	±1.0%
Load Life, Endurance (1) MIL-STD-202, Method 108, Condition D	Test Temperature: 70°C Test period: 1,000 hours Electrical load: rated power	±1.0%
HAST (1) (Highly Accelerated Stress Test - Autoclave)	Test Temperature: 121°C Test Pressure: 30 PSIA Test period: 48 hours No electrical load	±1.0%
Biased Humidity MIL-STD-202, Method 103	Test Temperature: 60°C / 90-95% RH Test period: 1,000 hours Electrical load: 10% of rated power	±1.0%
Terminal Strength AEC-Q200-006	Test Force: 17.7N Duration: 60 ±1 seconds Parts must be soldered onto a PCB to perform test	±0.5%
Flex Strength	Board Flex: Span 90mm, Flex of 2mm Test Duration: 10 seconds	±1.0%
Vibration (1) MIL-STD-202, Method 204, Condition B	Frequency: 10 - 2,000Hz Acceleration: 15G Test Duration: 20 mins / 12 Cycles	±1.0%
Mechanical Shock (1) MIL-STD-202, Method 213, Condition A	Force: 50G Test Duration: 11 ±1 milliseconds	±1.0%
Solderability MIL-STD-202, Method 208H, Category 3	Dipped into molten solder for 3 ±1 seconds at 245°C Flux activity type R0	New solder coverage of 95% minimum
Pre-Conditioning	Per component MSL classification per J-STD-020 3 reflow cycles	N/A

Note: Samples shall be from the pre-conditioned group.

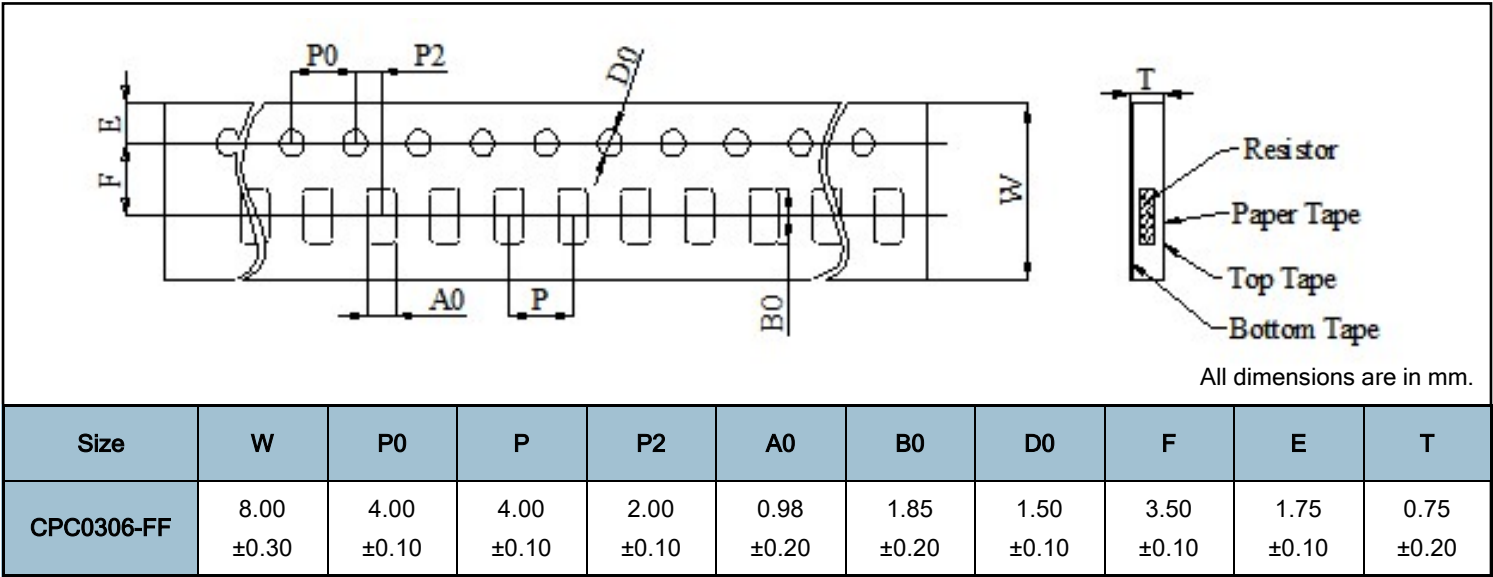
Recommended Soldering Profile:



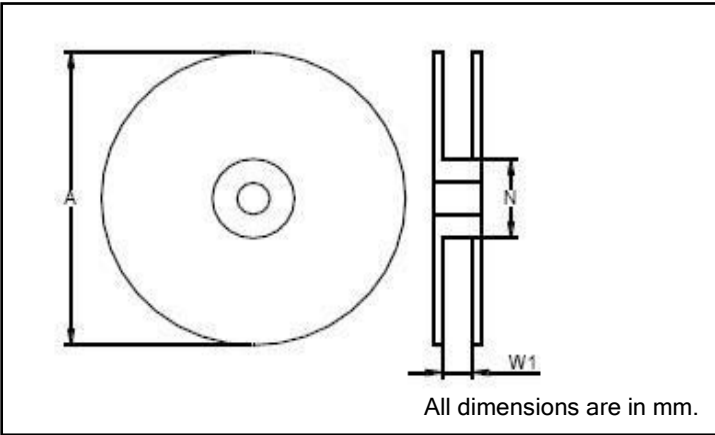
Recommended Land Pattern for Current Sensing:



Tape Dimensions:



Reel Dimensions & Labeling Position:

 <p>All dimensions are in mm.</p>	CPC0306-FF	
	A	178 ±5
	N	60 ±2
	W1	9 ±1

Storage Conditions:

Environment Conditions:

Products should be stored under the following environmental conditions.

- Temperature: +10 to +35°C.
- Humidity: 45 to 75% 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