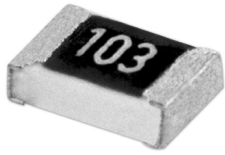


High Power Resistors (HPCR Series)



Features:

- RoHS Compliant (5/6) and Halogen Free
- Available Sizes 0402 to 1210
- Values from 1Ω to 1MΩ, plus 0Ω Jumper
- TCR as low as ±100PPM
- Good power dissipation capabilities
- 100% matte Tin over Nickel with wrap around termination for excellent solderability

Part Number Structure

HPCR Series	1210 Size	- W Power Rating	- 103 Resistance Value	J Tolerance	T Packaging	- □ Optional Reel Identifier
0402	0603	R = 1/8W (0.125W)	3 DIGIT (J TOL.)	F = ± 1%	T = Tape & Reel	Leave blank for standard quantity.
0805	1206	T = 1/4W (0.25W)	4 DIGIT (F TOL.)	J = ± 5%		Add '-13' if 13" Reel is required
1206	1210	U = 1/3W (0.33W)				
		V = 1/2W (0.50W)				
		W = 3/4W (0.75)				

Example P/N: HPCR1210-W-103JT

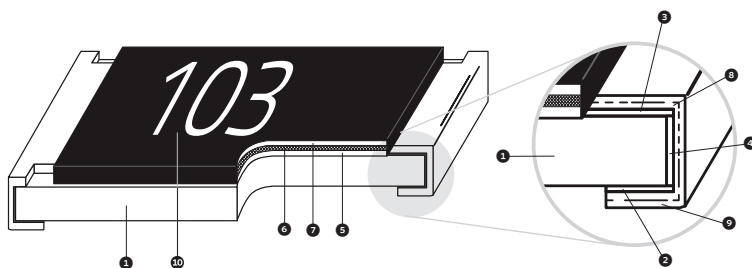
Standard termination finish is 100% matte Tin (Sn) over Nickel.

Dimensions

Size	L	W	T	C ₁	C ₂
0402	0.040 ± 0.002 (1.0 ± 0.05)	0.020 ± 0.002 (0.5 ± 0.05)	0.014 ± 0.002 (0.35 ± .05)	0.008 ± 0.004 (0.2 ± 0.1)	0.008 ± 0.004 (0.2 ± 0.1)
0603	0.063 ± 0.004 (1.6 ± 0.1)	0.031 ± 0.004 (0.8 ± 0.1)	0.018 ± 0.004 (0.45 ± 0.1)	0.012 ± 0.007 (0.30 ± 0.20)	0.012 ± 0.007 (0.30 ± 0.20)
0805	0.079 ± 0.006 (2.0 ± 0.10)	0.050 ± 0.003 (1.25 ± 0.10)	0.019 ± 0.003 (0.50 ± 0.10)	0.014 ± 0.007 (0.35 ± 0.20)	0.015 ± 0.007 (0.40 ± 0.20)
1206	0.122 ± 0.003 (3.10 ± 0.10)	0.061 ± 0.003 (1.55 ± 0.10)	0.021 ± 0.003 (0.55 ± 0.10)	0.020 ± 0.009 (0.50 ± 0.25)	0.020 ± 0.008 (0.50 ± 0.20)
1210	0.122 ± 0.003 (3.10 ± 0.10)	0.10 ± 0.006 (2.60 ± 0.15)	0.021 ± 0.003 (0.55 ± 0.10)	0.020 ± 0.009 (0.50 ± 0.25)	0.020 ± 0.008 (0.50 ± 0.20)

Unit: inches (mm)

Structure



1	Alumina Substrate	6	Primary Coating
2	Backside Electrode	7	Protective Coating
3	Top Electrode	8	Barrier Layer (Ni)
4	Edge Electrode	9	Termination-100% matte Tin
5	Resistive layer	10	Marking

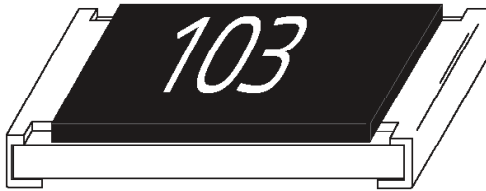
High Power Resistors (HPCR Series)

Electrical Specifications and Range

	Size	0402	0603	0805	1206	1210
	Power Rating at 70°C (W)	0.125W (1/8W)	0.25W (1/4W)	0.33W (1/3W)	0.50W (1/2W)	0.75W (3/4W)
	Max. Working Voltage	$\sqrt{P \cdot R}$ or 50V whichever is less	$\sqrt{P \cdot R}$ or 75V whichever is less	$\sqrt{P \cdot R}$ or 150V whichever is less	$\sqrt{P \cdot R}$ or 200V whichever is less	$\sqrt{P \cdot R}$ or 200V whichever is less
	Operating Temp. Range	-55°C to +155°C	-55°C to +155°C	-55°C to +155°C	-55°C to +155°C	-55°C to +155°C
Zero Ohm (Jumper)	Current Rating	1.5A	2A	2.5A	3.5A	4.5A
Tolerance	TCR	Resistance Range	Resistance Range	Resistance Range	Resistance Range	Resistance Range
±1 (F)	±100ppm	10Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ
	±200ppm	1Ω - 9.76Ω	1Ω - 9.76Ω	1Ω - 9.76Ω	1Ω - 9.76Ω	1Ω - 9.76Ω
±5% (J)	±100ppm	10Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ
	±200ppm	1Ω - 9.76Ω	1Ω - 9.76Ω	1Ω - 9.76Ω	1Ω - 9.76Ω	1Ω - 9.76Ω

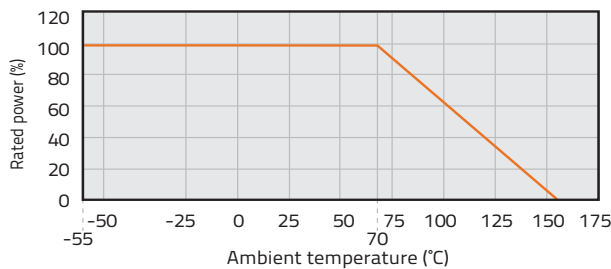
NOTE: Overload Voltage = $2.5 \cdot \sqrt{P \cdot R}$.

Marking Code



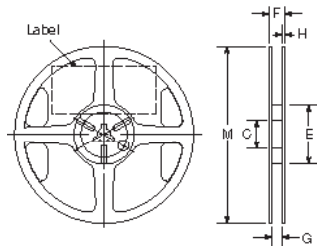
- 1% E-24 values for 0603 size and larger are typically marked with the standard 3 digit marking code.
- 1% E-96 values for 0805 size and larger, will be marked with standard 4 digit marking code.
- 5% E-24 values for 0603 size and larger, will be marked with standard 3 digit marking code.
- 0603 - 1% E-96 values will be marked with a standard 3 digit alpha numeric code (Please see alpha numeric marking codes for resistors).
- 0402 size cannot be marked

Derating Curve



High Power Thin Film Resistors (HPTF Series)

Reel Specifications

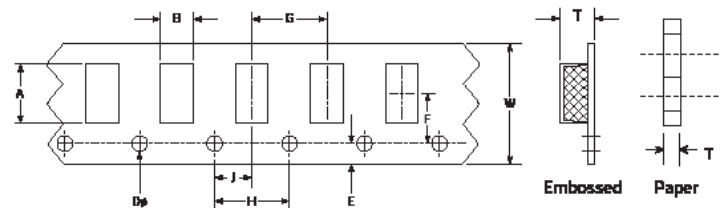


Unit: mm (inch)

C	E	F	G	H	M
13.0 ± 0.2 (0.51 ± 0.008)	60.0 ± 1.0 (2.36 ± 0.03)	11.4 ± 1.0 (0.45 ± 0.04)	9.0 ± .3 (0.35 ± 0.012)	1.5 ± .3 (0.06 ± 0.012)	180 ± 2.0 (7.09 ± 0.08)

Minimum of 30 empty pockets at the beginning of reel, 65 minimum empty pockets at the end.

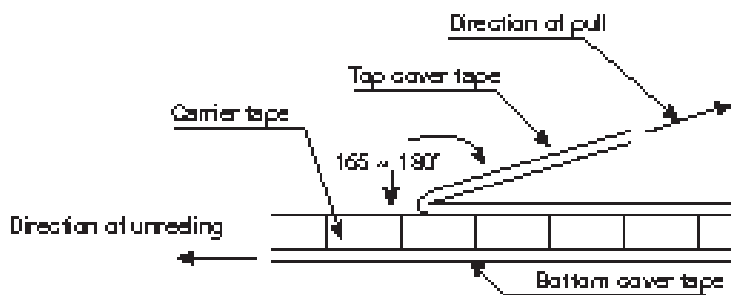
Tape Specifications



All dimensions in mm.

Tape	Size (inches)	A	B	W	E	F	T	G	H	J	Dø
Paper	0402	1.15 ± 0.10	0.65 ± 0.10	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	0.45 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	2.00 ± 0.05	1.50 ± 0.10
	0603	1.90 ± 0.10	1.10 ± 0.10	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	0.70 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 ± 0.10
	0805	2.40 ± 0.10	1.65 ± 0.10	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	0.85 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 ± 0.10
	1206	3.50 ± 0.10	1.90 ± 0.10	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	0.85 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 ± 0.10
	1210	3.50 ± 0.10	2.80 ± 0.10	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	0.85 ± 0.10	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10

Peel Back Force and Direction Diagram



Peel back force and direction of peel back angle should follow EIA481-1-A. Peel back force should be between 0.1N – 1.3N and peel back angle of 165° – 180°.

Alpha Numeric Code for Resistors

0603, 1% Resistors and Thin Film Resistors

A Two-Digit Number Code is assigned to each standard Resistance Value per E96 guidelines. See chart below. The two-digit code is followed by a letter multiplier. Each letter, from "A" — "Y", represents a specific multiplier.

Decade Value	Two-Digit Code	Decade Value	Two-Digit Code	Decade Value	Two-Digit Code	Decade Value	Two-Digit Code	Decade Value	Two-Digit Code	Decade Value	Two-Digit Code
10.0	01	14.7	17	21.5	33	31.6	49	46.4	65	68.1	81
10.2	02	15.0	18	22.1	34	32.4	50	47.5	66	69.8	82
10.5	03	15.4	19	22.6	35	33.2	51	48.7	67	71.5	83
10.7	04	15.8	20	23.2	36	34.0	52	49.9	68	73.2	84
11.0	05	16.2	21	23.7	37	34.8	53	51.1	69	75.0	85
11.3	06	16.5	22	24.3	38	35.7	54	52.3	70	76.8	86
11.5	07	16.9	23	24.9	39	36.5	55	53.6	71	78.7	87
11.8	08	17.4	24	25.5	40	37.4	56	54.9	72	80.6	88
12.1	09	17.8	25	26.1	41	38.3	57	56.2	73	82.5	89
12.4	10	18.2	26	26.7	42	39.2	58	57.6	74	84.5	90
12.7	11	18.7	27	27.4	43	40.2	59	59.0	75	86.6	91
13.0	12	19.1	28	28.0	44	41.2	60	60.4	76	88.7	92
13.3	13	19.6	29	28.7	45	42.2	61	61.9	77	90.9	93
13.7	14	20.0	30	29.4	46	43.2	62	63.4	78	93.1	94
14.0	15	20.5	31	30.1	47	44.2	63	64.9	79	95.3	95
14.3	16	21.0	32	30.9	48	45.3	64	66.5	80	97.6	96

Letter Multiplier Cross Reference

- A – 10
- B – 100
- C – 1,000
- D – 10,000
- E – 100,000
- F – 1,000,000
- X – 1
- Y – 0.1

(Letter multipliers may also come in lower case.)

By combining a specific two-digit code and a letter multiplier, you have a series of Numeric/Alpha digits that give you the complete E96 Resistance Value that determines the resistance value.

0603, ±1%
Marking
01B
25C
93D

Example:

Explanation

01 means 10.0 and B = 100

25 means 17.8 and C = 1,000

93 means 90.9 and D = 10,000

Value:

10.0 x 100 = 1K Ohm

17.8 x 1,000 = 17.8K Ohm

90.9 x 10,000 = 909K Ohm