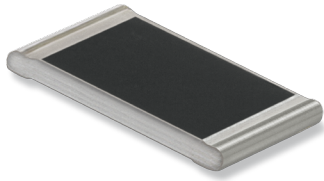


Data Sheet for Precision Resistors

SMD Resistor (metal thin film)

Series CPH



- Ultra-precise chip resistor
- Advanced thin film technology
- Low noise construction
- Resistance tolerance up to $\pm 0.01\%$
- Temperature coefficient up to $\pm 1 \text{ ppm}/^\circ\text{C}$

Electrical Specification					CPH						
Type	Power rating @ 70°C	Temperature range	Working voltage	Dielectric strength	Resistance range						TCR-rate (ppm/°C)
					$\pm 0,01\%$	$\pm 0,05\%$	$\pm 0,10\%$	$\pm 0,25\%$	$\pm 0,5\%$	$\pm 1\%$	
0603	1/16W	-55~+155°C	50V	100V	24,9Ω...15kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...60kΩ						± 5
0805	1/10W	-55~+155°C	100V	200V	24,9Ω...30kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...150kΩ						± 5
1206	1/8W	-55~+155°C	150V	300V	24,9Ω...49,9kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...300kΩ						± 5
2010	1/4W	-55~+155°C	150V	300V	24,9Ω...100kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...300kΩ						± 5

Electrical Specification					CPHH (High Power)						
Type	Power rating @ 70°C	Temperature range	Working voltage	Dielectric strength	Resistance range						TCR-rate (ppm/°C)
					$\pm 0,01\%$	$\pm 0,05\%$	$\pm 0,10\%$	$\pm 0,25\%$	$\pm 0,5\%$	$\pm 1\%$	
0603	1/10W	-55~+155°C	75V	150V	24,9Ω...15kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...60kΩ						± 5
0805	1/8W	-55~+155°C	150V	300V	24,9Ω...30kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...150kΩ						± 5
1206	1/4W	-55~+155°C	200V	400V	24,9Ω...49,9kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...300kΩ						± 5
2010	1/3W	-55~+155°C	200V	400V	24,9Ω...100kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...300kΩ						± 5

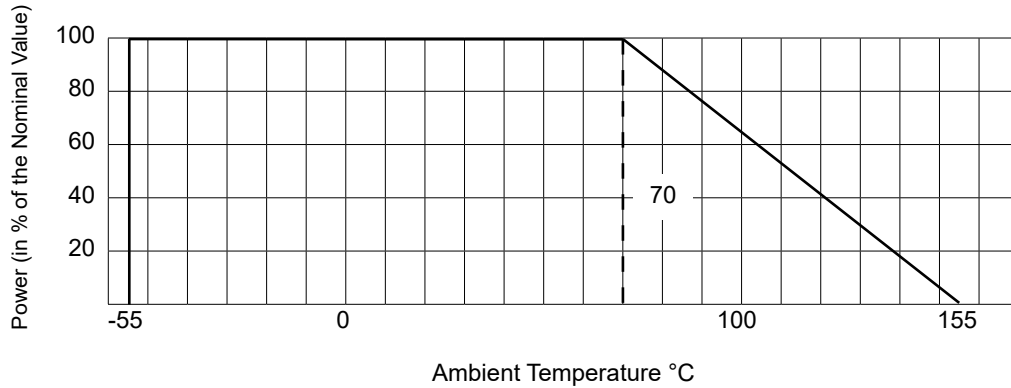
Mechanical Specification	
Resistance technology / material	Metal thin film / NiCr
Design	SMD: 0603, 0805, 1206, 2010
Housing material	Epoxy inorganic passivation layer
Connections	Axial tinned

Data Sheet for Precision Resistors

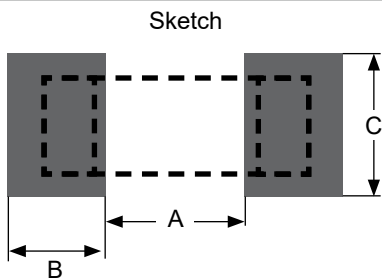
SMD Resistor (metal thin film)

Series CPH

Power Derating Curve

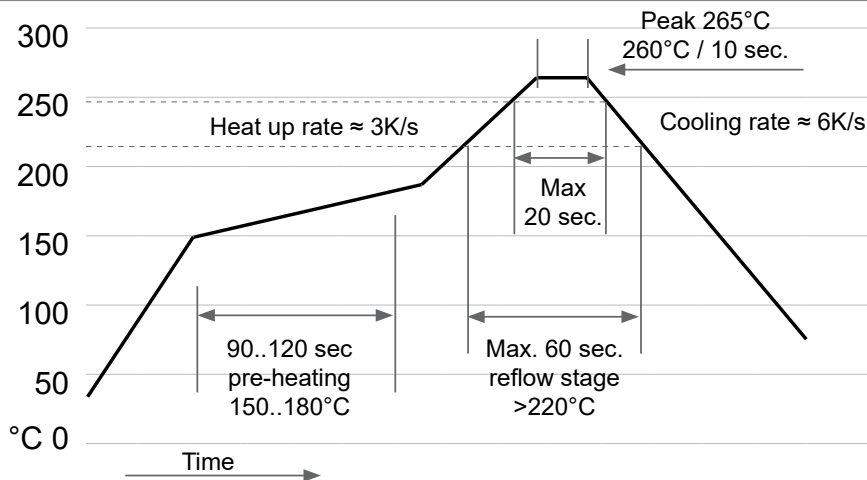


Recommended Foot Prints



CPH	A	B	C
0603	0,8 mm	1,0 mm	0,9 mm ±0,2
0805	1,0 mm	1,0 mm	1,35 mm ±0,2
1206	2,0 mm	1,15 mm	1,7 mm ±0,2
2010	3,6 mm	1,4 mm	2,5 mm ±0,2

Recommendation for Reflow Soldering Profile

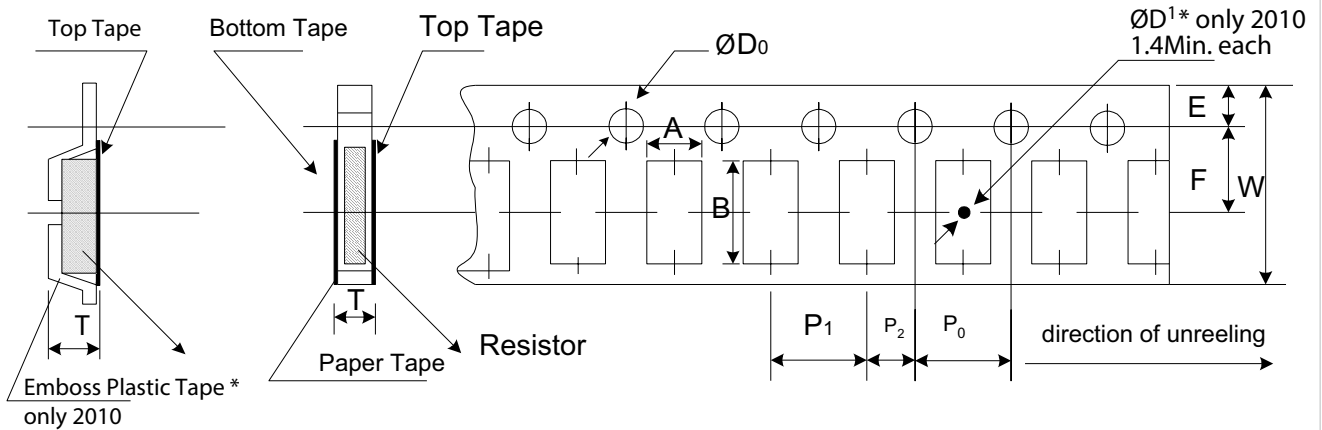


Data Sheet for Precision Resistors

SMD Resistor (metal thin film)

Series CPH

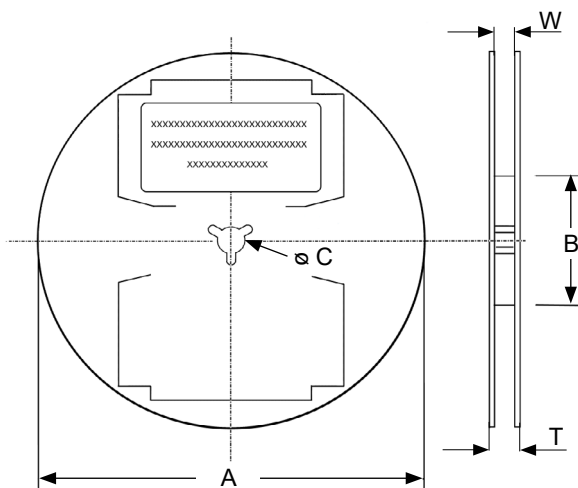
Blister Tape Dimensions



Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ØD ₀	T
0603	1.10±0.05	1.90±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.60±0.03
0805	1.60±0.05	2.37±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
1206	2.00±0.05	3.55±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
2010 *	2.85±0.10	5.45±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	1.00±0.20

Reel Dimensions, quantity & packaging



Unit :mm

Type	ØA	ØB	ØC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
0603	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
0805	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
1206	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
2010	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000

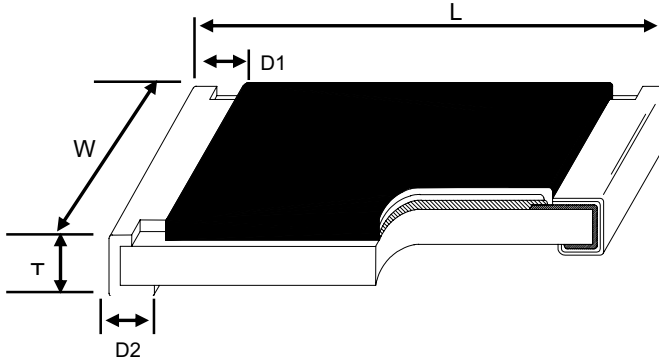
Data Sheet for Precision Resistors



SMD Resistor (metal thin film)

Series CPH

Drawing



Unit: mm

Size	L	W	T	D1	D2
0603	1.55±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
0805	2.00±0.15	1.25±0.15	0.55±0.10	0.30±0.20	0.40±0.20
1206	3.05±0.15	1.55±0.15	0.55±0.10	0.42±0.20	0.35±0.25
2010	4.90±0.15	2.40±0.15	0.55±0.10	0.60±0.30	0.50±0.25

Order code

Description

Selection: standard=black/bold, possible options=grey/cursive

Series:

Basic
High power

CPH
CPHH

Type / size:

0603 (max. 60kΩ)
0805 (max. 150kΩ)
1206 (max. 300kΩ)
2010 (max. 300kΩ)

0603
0805
1206
2010

Resistance tolerance:

±1%
±0,5%
±0,25%
±0,1%
±0,05%
±0,01%

W1%
W0,5%
W0,25%
W0,1%
W0,05%
W0,01%

Temperature coefficient:

±5ppm/°C
±3ppm/°C
±2ppm/°C
Option ±1ppm/°C

TK5
TK3
TK2
TK1

Resistance value - please choose:
From 24,9Ω to ≤ Ω see type

xxkxxx

Order Example	Series	Type	Resistance tolerance	Temperature coefficient	Resistance value
Choice	CPH	0603	±0,1%	2ppm/°C	10,1kΩ
Code	CPH	0603	W0,1%	TK2	10k100

Data Sheet for Precision Resistors



SMD Resistor (metal thin film)

Series CPH

Test Data

Item	Requirement		Test Method
	Tol. ≤ 0.05%	Tol. > 0.05%	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		MIL-STD-202 Method 304 +25/-55/+25/+125/+25°C
Short Time Overload	ΔR±0.05%	ΔR±0.2%	JIS-C-5201-1 4.13 RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds
	ΔR±0.2% for high power rating		
Insulation Resistance	>9999 MΩ		MIL-STD-202 Method 302 Apply 100V _{DC} for 1 minute
Endurance	ΔR±0.05%	ΔR±0.2%	MIL-STD-202 Method 108A 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	ΔR±0.5% for high power rating		
	0201: >7kΩ ... ΔR±0.5% ≤ 7kΩ ... ΔR±0.2%		
Damp Heat with Load	ΔR±0.05%	ΔR±0.3%	MIL-STD-202 Method 103B 40±2°C, 90~95% R.H. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	ΔR±0.5% for high power rating		
Bending Strength	ΔR±0.05%	ΔR±0.1%	JIS-C-5201-1 4.33 Bending amplitude 3 mm for 10 seconds 2010 2512 sizes: 2 mm Other sizes: 3 mm
Solderability	95% min. coverage		MIL-STD-202 Method 208H 245±5°C for 3 seconds
Resistance to Soldering Heat	ΔR±0.05%	ΔR±0.1%	MIL-STD-202 Method 210E 260±5°C for 10 seconds
Dielectric Withstand Voltage	By Type		MIL-STD-202 Method 301 Max. overload voltage for 1 minute
Low Temperature Operation	ΔR±0.05%	ΔR±0.2%	JIS-C-5201-1 4.36 1 hour, -65°C, followed by 45 minutes of RCWV
	ΔR±0.5% for high power rating		
High Temperature Exposure	ΔR±0.5%		MIL-STD-202 Method 108 at +155°C for 1000 hrs

RCWV(Rated continuous working voltage)= $\sqrt{P \cdot R}$ or Max. Operating voltage whichever is lower

■ Storage Temperature: 15~28°C; Humidity < 80%RH