

# Datenblatt für Präzisionswiderstände



SMD Widerstand (Metall-Dünnschicht)

Serie CPH



- Ultrapräziser Chipwiderstand
- Hochentwickelte Dünnschichttechnologie
- Rauscharme Konstruktion
- Widerstandstoleranz bis zu  $\pm 0,01\%$
- Temperaturkoeffizient bis zu  $\pm 1 \text{ ppm}/^\circ\text{C}$

Elektrische Spezifikation					CPH						
Typ	Belastbarkeit bei 70°C	Temperaturbereich	Arbeitsspannung	Spannungsfestigkeit	Widerstandsbereich						TK-Wert (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						$\pm 5$
0805	1/10W	-55~+155°C	100V	200V	24,9Ω...30kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...150kΩ						$\pm 5$
1206	1/8W	-55~+155°C	150V	300V	24,9Ω...49,9kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...300kΩ						$\pm 5$
2010	1/4W	-55~+155°C	150V	300V	24,9Ω...100kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...300kΩ						$\pm 5$

Elektrische Spezifikation					CPHH (High Power)						
Typ	Belastbarkeit bei 70°C	Temperaturbereich	Arbeitsspannung	Spannungsfestigkeit	Widerstandsbereich						TK-Wert (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						$\pm 5$
0805	1/8W	-55~+155°C	150V	300V	24,9Ω...30kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...150kΩ						$\pm 5$
1206	1/4W	-55~+155°C	200V	400V	24,9Ω...49,9kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...300kΩ						$\pm 5$
2010	1/3W	-55~+155°C	200V	400V	24,9Ω...100kΩ			-			$\pm 1, \pm 2, \pm 3$
					24,9Ω...300kΩ						$\pm 5$

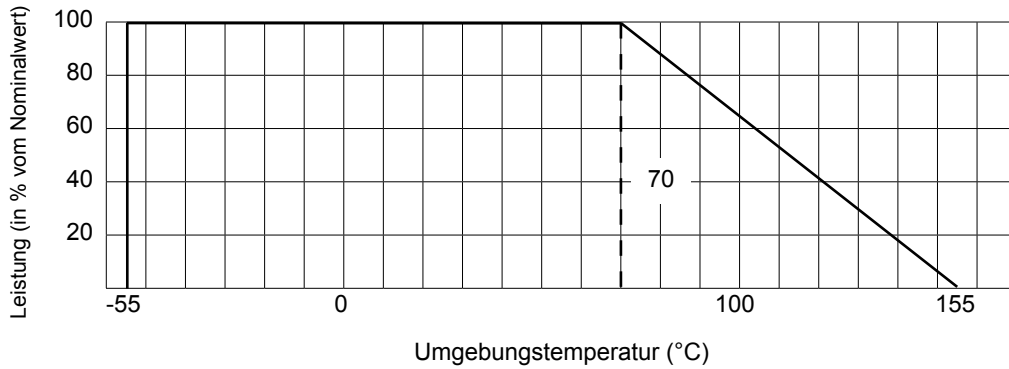
Mechanische Spezifikation	
Widerstandstechnologie / -material	Metall-Dünnschicht / NiCr
Bauform	SMD: 0603, 0805, 1206, 2010
Gehäusematerial	Epoxyschicht ummantelt, anorganische Passivierung
Anschlüsse	Axial verzinkt

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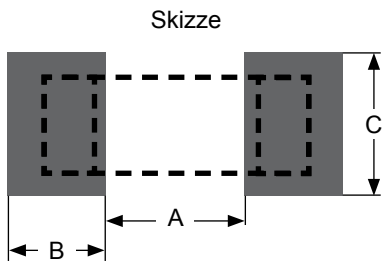
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## Leistungsminderungskurve

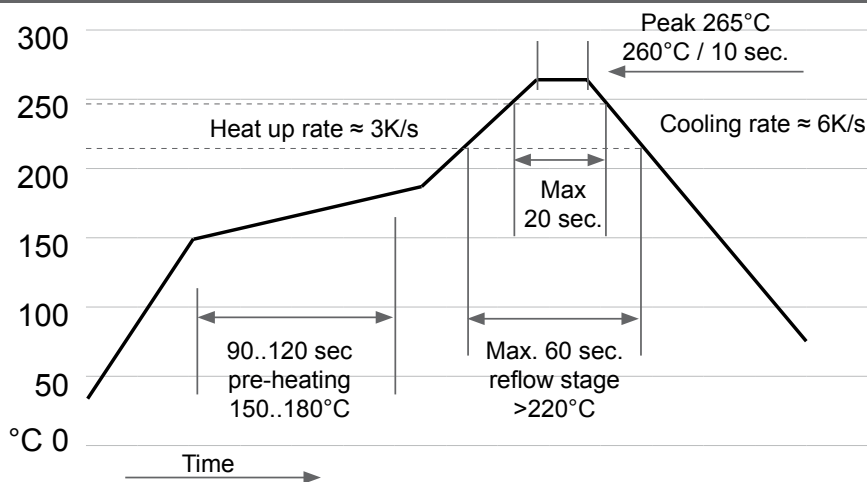


## Empfohlene Lötanschlussfläche



	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

## Empfehlung zum Reflow-Lötprofil

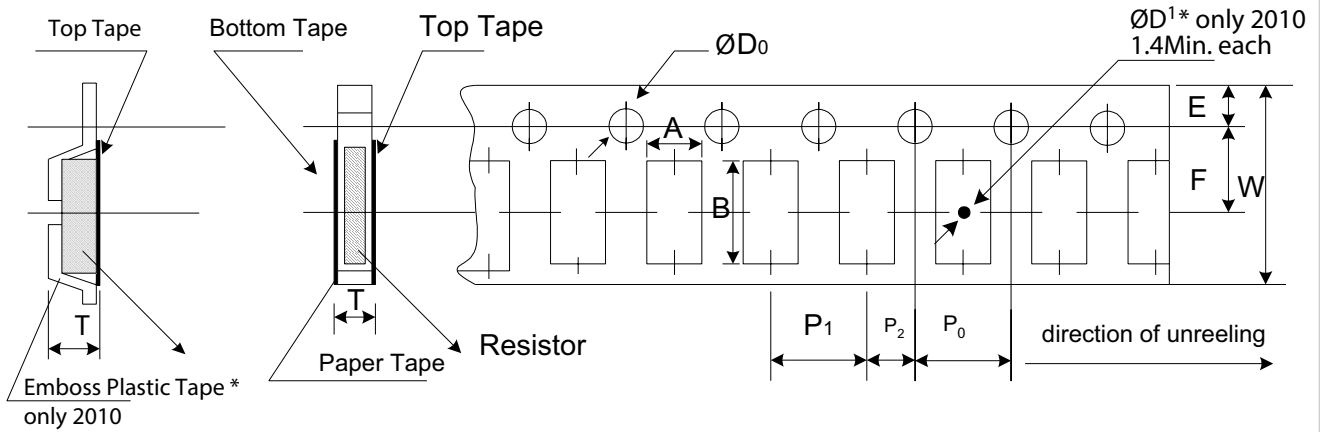


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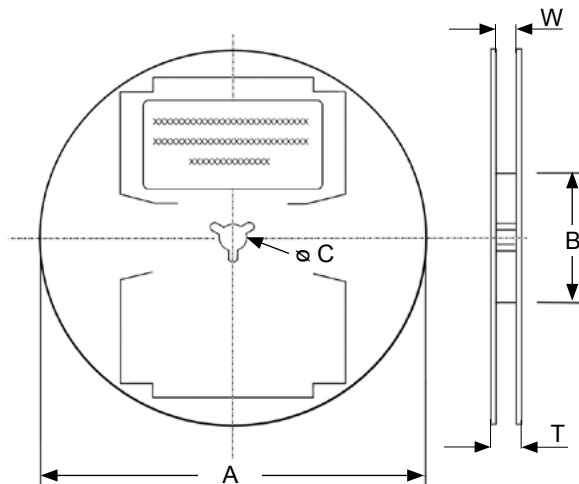
## Abmessungen Blistergurt



Unit: mm

Type	A	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	ØD <sub>0</sub>	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

## Abmessungen Rolle, Menge & Verpackung



Unit :mm

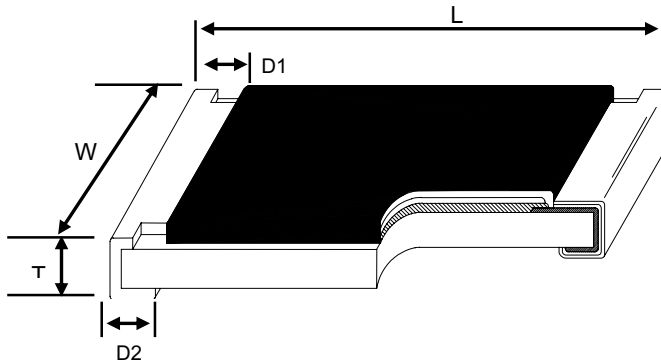
Type	ØA	ØB	ØC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
0603	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
0805	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
1206	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
2010	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000

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## Technische Zeichnung



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

## Bestellschlüssel

Beschreibung	Auswahl: <b>Standard=schwarz/fett</b> , mögliche <i>Optionen=grau/kursiv</i>				
<b>Serie:</b> Basic High power	CPH CPHH				
<b>Bauform / Größe:</b> 0603 (max. 60kΩ) 0805 (max. 150kΩ) 1206 (max. 300kΩ) 2010 (max. 300kΩ)		0603 0805 1206 2010			
<b>Widerstandstoleranz:</b> ±1% ±0,5% ±0,25% ±0,1% ±0,05% ±0,01%			W1% W0,5% W0,25% W0,1% W0,05% W0,01%		
<b>Temperaturkoeffizient:</b> ±5ppm/°C ±3ppm/°C ±2ppm/°C <i>Option ±1ppm/°C</i>				TK5 TK3 TK2 TK1	
<b>Widerstandswert - bitte wählen:</b> Von 24,9Ω bis max. Ω siehe Bauform					xxkxxx

Bestellbeispiel	Serie	Bauform	Widerstandstoleranz	Temperaturkoeffizient	Widerstandswert
Auswahl	CPH	0603	±0,1%	±2ppm/°C	10,1kΩ
Schlüssel	CPH	0603	W0,1%	TK2	10k100

### Test Daten

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