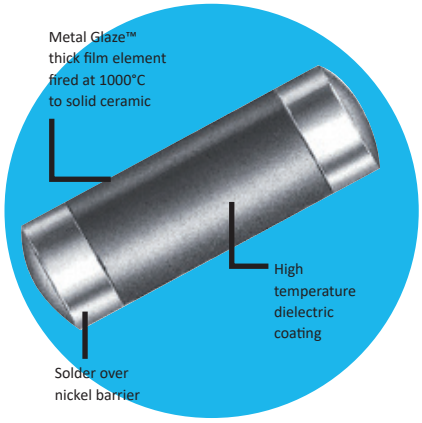
Resistors

Cylindrical High Power Surface Mount Metal Glaze™



CHP Series

- Up to 2 watts
- Up to 1000 volts
- 0.2 ohm to 2.2 megohm range
- RoHS-compliant version available
- 150°C maximum operating temperature
- AEC-Q200

All Pb-free parts comply with EU Directive 2011/65/EU (RoHS2)

Electrical Data

IRC Type	Industry Footprint	Size Code[1]	Maximum Power Rating	Working Voltage[2]	Maximum Voltage	Resistance Range (ohms)[3]	Product Category	Tolerance (±%)[3]	TCR (ppm/°C)[3]
CHP 1/8	1206	B & C	1/4W @ 70°C	200	400	0.1 to 0.99	Low Range	1, 2, 5	100
						1.0 to 1.0 M	Standard	1, 2, 5	50, 100
						20 to 348K	Tight Tolerance	0.25, 0.5	50, 100
CHP 1/2	2010	D & E	1/2W @ 70°C	300	600	0.1 to 0.99	Low Range	1, 2, 5	100
						1.0 to 348K	Standard	1, 2, 5	50, 100
CHP 1	2512	F	1W @ 70°C	350	700	0.1 to 0.99	Low Range	1, 2, 5	100
						1.0 to 2.21M	Standard	1, 2, 5	50, 100
						20 to 348K	Tight Tolerance	0.25, 0.5	50, 100
CHP 2	3610	H	2W @ 25°C 1.33W @ 70°C	500	1000	0.2 to 0.99	Low Range	1, 2, 5	100
						1.0 to 2.21M	Standard	1, 2, 5	50, 100

[1]See pages 2 & 3 for product dimensions, recommended solder pads, and standard packaging. [2]Not to exceed $\sqrt{P \times R}$ [3]Consult factory for tighter TCR, tolerance, or resistance values.

Environmental Data

Characteristics	Maximum Change	Test Method
Thermal Shock	±0.25% +.01 Ω	MIL-PRF-55342H, §4.8.3 (MIL-STD-202, Method 107G: +150°C / -65°C)
Low Temperature Operation	±0.25% +.01 Ω	MIL-PRF-55342H, §4.8.5 (-65°C)
Short Time Overload	±0.5% +.01 Ω ±1% for R>100KΩ	MIL-PRF-55342H, §4.8.6
High Temperature Exposure	±0.5% +.01 Ω	MIL-PRF-55342H, §4.8.7 (150°C x 100 Hours)
Resistance to Bonding Exposure	±0.25% +.01 Ω	MIL-PRF-55342H, §4.8.8.2
Moisture Resistance	±0.5% +.01 Ω	MIL-PRF-55342H, §4.8.8.2 (MIL-STD-202, Method 106G)
Temperature Coefficient	As specified	MIL-PRF-55342H, §4.8.10 (MIL-STD-202, Method 304)
Life Test	±1% +.01 Ω	MIL-PRF-55342H, §4.8.11 (MIL-STD-202, Method 108A: 2000 Hours @ 70°C)
Solderability	95% minimum coverage	MIL-PRF-55342H, §4.8.12 (MIL-STD-202, Method 208H)
Terminal Adhesion Strength (push)	±1% +.01 Ω (no mechanical damage)	IRC – defined 1200 gram push from underside of mounted device for 60 sec
Terminal Adhesion Strength (flex)	±1% +.01 Ω (no mechanical damage)	IRC-defined Device mounted in center of 90mm long board, deflected 1 mm to exert pull on contacts for 5 seconds

General Note

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BI Technologies IRC Welwyn

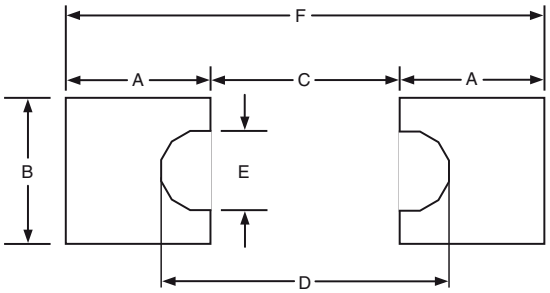
http://www.ttelectronics.com/resistors

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Physical Data

IRC Type	Size Code	Industry Footprint	Actual Size	 Dimensions (Inches and (mm))		
				L	W	C
CHP 1/8	B	1206		0.128 ± 0.007 (3.25 ± 0.18)	0.057 ± 0.006 (1.45 ± 0.15)	0.020 ± 0.010 (0.51 ± 0.25)
CHP 1/2	D	2010		0.200 ± 0.010 (5.08 ± 0.25)	0.079 (nom.) -0.006 / +0.011 (2.01 (nom.) -0.15 / +0.28)	0.030 ± 0.010 (0.761 ± 0.25)
CHP 1	F	2512		0.251 ± 0.010 (6.38 ± 0.25)	0.079 (nom.) -0.006 / +0.011 (2.01 (nom.) -0.15 / +0.28)	0.040 ± 0.010 (1.02 ± 0.25)
CHP 2	H	3610		0.367 ± 0.010 (9.32 ± 0.25)	0.105 (nom.) -0.006 / +0.011 (2.67 (nom.) -0.15 / +0.28)	0.050 ± 0.010 (1.27 ± 0.25)

Recommended Solder Pad Dimensions (Reflow):



Size Code	Industry Footprint	Dimensions (Inches and mm))					
		A	B	C	D	E	F
B & C	1206	0.076 (1.93)	0.093 (2.36)	0.058 (1.47)	0.098 (2.49)	0.032 (0.81)	0.211 (5.36)
D	2010	0.111 (2.82)	0.126 (3.20)	0.096 (2.44)	0.152 (3.86)	0.040 (1.02)	0.318 (8.08)
E	2010	0.170 (4.32)	0.160 (4.06)	0.072 (1.83)	0.132 (3.35)	0.044 (1.12)	0.412 (10.46)
F	2512	0.121 (3.07)	0.126 (3.20)	0.127 (3.23)	0.183 (4.65)	0.040 (1.02)	0.369 (9.37)
H	3610	0.170 (4.32)	0.160 (4.06)	0.213 (5.41)	0.273 (6.93)	0.044 (1.12)	0.553 (14.05)

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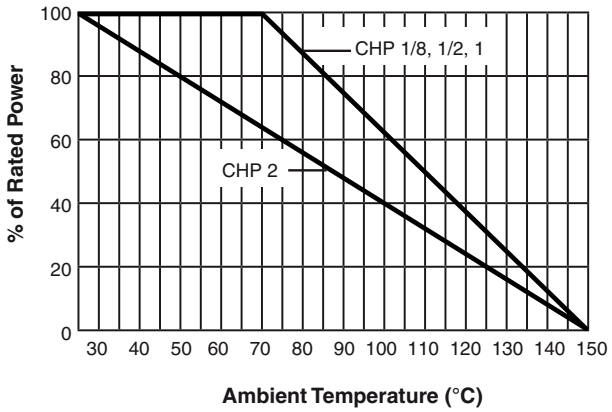
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Standard Reel Packaging per EIA-481:

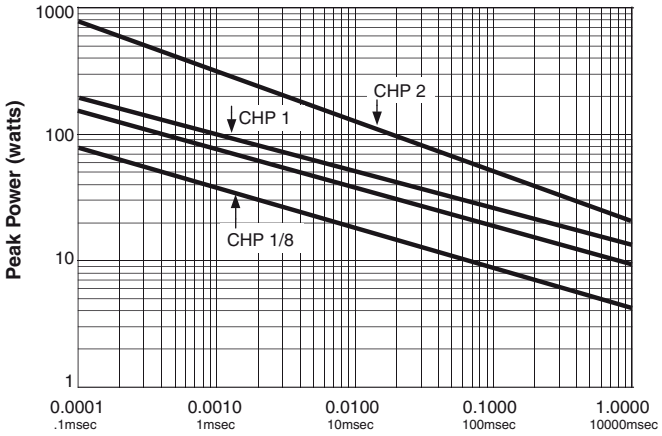
IRC Type	Size Code	Industry Footprint	Reel Diameter*	Quantity Per Reel	Carrier Tape Width	Component Pitch
CHP 1/8 MRC 1/2	B C	1206	7″	2,500 max.	8mm	4mm
			13″	10,000 max.		
CHP 1/2 MRC 1	D E	2010	7″	1,500 max.	12mm	4mm
			13″	5,000 max.		
CHP 1	F	2512	7″	1,500 max.	12mm	4mm
			13″	5,000 max.		
CHP 2	H	3610	13″	1,500 max.	24mm	4mm

*The 13″ reel is considered standard and will be supplied unless otherwise specified.

Power Derating Curve



Repetitive Surge Curve



Note: Use for repetitive pulses where the average power dissipation is not to exceed the component rating at 70°C. Surge handling capacity for low-repetitive surges may be significantly greater than shown above. Contact factory for recommendations.

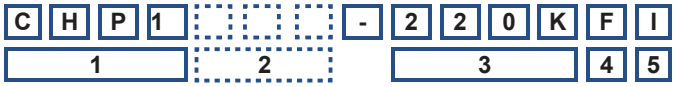
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Ordering Procedure

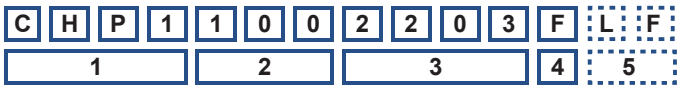
This product has two valid part numbers:

European (Welwyn) Part Number: CHP1-220KFI (CHP1 with TCR ±100ppm/°C at 220 kilohms ±1%, Pb-free)



1 Type	2 TCR (ppm/°C)	3 Value	4 Tolerance	5 Termination & Packing		
CHP1/8	Omit for ±100	E24 = 3/4 characters E96 = 4/5 characters R = ohms K = kilohms M = megohms	C = ±0.25%	I = Pb-free, Tape Pack		
CHP1/2	-50 = ±50		D = ±0.5%	PB = SnPb, Tape Pack		
CHP1			F = ±1%	CHP1/8	Tape	2500/7” reel
CHP2			G = ±2%	CHP1/2, 1		1500/7” reel
			J = ±5%	CHP2		1500/13” reel

USA (IRC) Part Number: CHP11002203FLF (CHP1 with TCR ±100ppm/°C at 220 kilohms ±1%, Pb-free)



1 Type	2 TCR	3 Value	4 Tolerance	5 Termination & Packing	
CHP1/8	50 = ±50	3 digits + multiplier	C = ±0.25%	Omit for SnPb, Standard pack	
CHP1/2	100 = ±100	R = ohms for values <100 ohms	D = ±0.5%	LF = Pb-free, Standard pack	
CHP1			F = ±1%	CHP1/8	2500/7” reel
CHP2			G = ±2%	CHP1/2 & 1	1500/7” reel
			J = ±5%	CHP2	1500/13” reel

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