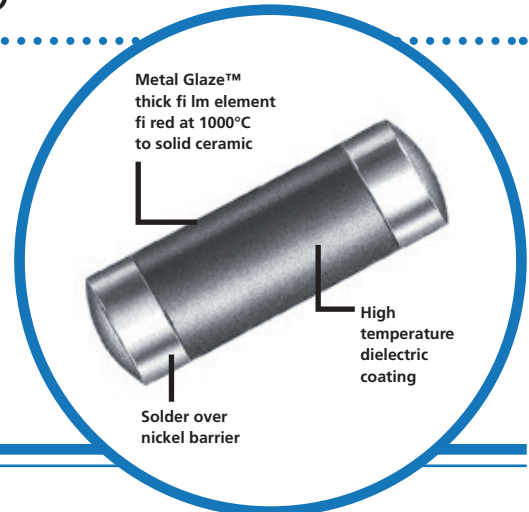


# Cylindrical High Power Surface Mount Metal Glaze™

## 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



## Electrical Data

| IRC Type | Industry Footprint | Size Code <sup>1</sup> | Maximum Power Rating      | Working Voltage <sup>2</sup> | Maximum Voltage | Resistance Range (ohms) <sup>3</sup> | Product Category | Tolerance (±%) <sup>3</sup> | TCR (ppm/°C) <sup>3</sup> |
|----------|--------------------|------------------------|---------------------------|------------------------------|-----------------|--------------------------------------|------------------|-----------------------------|---------------------------|
| 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<br>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                   |

<sup>1</sup>See pages 2 & 3 for product dimensions, recommended solder pads, and standard packaging.    <sup>2</sup>Not to exceed  $\sqrt{P \times R}$     <sup>3</sup>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<br>±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<br>1200 gram push from underside of mounted device for 60 sec  |
| Terminal Adhesion Strength (flex) | ±1% +.01 Ω (no mechanical damage) | IRC-defined<br>Device mounted in center of 90mm long board, deflected 1 mm to exert pull on contacts for 5 seconds |

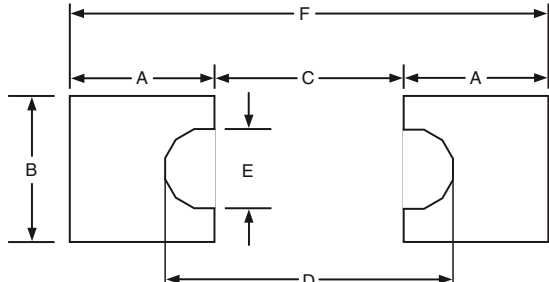
### General Note

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## 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<br>(3.25 ± 0.18)   | 0.057 ± 0.006<br>(1.45 ± 0.15)                              | 0.020 ± 0.010<br>(0.51 ± 0.25)  |
| MRC 1/2  | C         | 1206               |  | 0.128 ± 0.007<br>(3.25 ± 0.18)   | 0.063 ± 0.010<br>(1.60 ± 0.25)                              | 0.020 ± 0.010<br>(0.51 ± 0.25)  |
| CHP 1/2  | D         | 2010               |  | 0.200 ± 0.010<br>(5.08 ± 0.25)   | 0.079 (nom.) -0.006 / +0.011<br>(2.01 (nom.) -0.15 / +0.28) | 0.030 ± 0.010<br>(0.761 ± 0.25) |
| CHP 1    | F         | 2512               |  | 0.251 ± 0.010<br>(6.38 ± 0.25)   | 0.079 (nom.) -0.006 / +0.011<br>(2.01 (nom.) -0.15 / +0.28) | 0.040 ± 0.010<br>(1.02 ± 0.25)  |
| CHP 2    | H         | 3610               |  | 0.367 ± 0.010<br>(9.32 ± 0.25)   | 0.105 (nom.) -0.006 / +0.011<br>(2.67 (nom.) -0.15 / +0.28) | 0.050 ± 0.010<br>(1.27 ± 0.25)  |

## Recommended Solder Pad Dimensions (Reflow):

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

### General Note

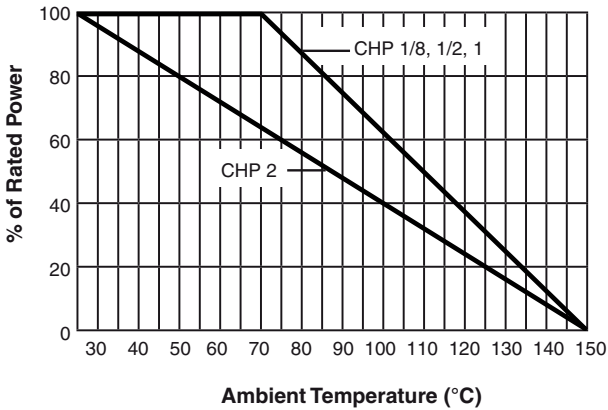
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### Standard Reel Packaging per EIA-481:

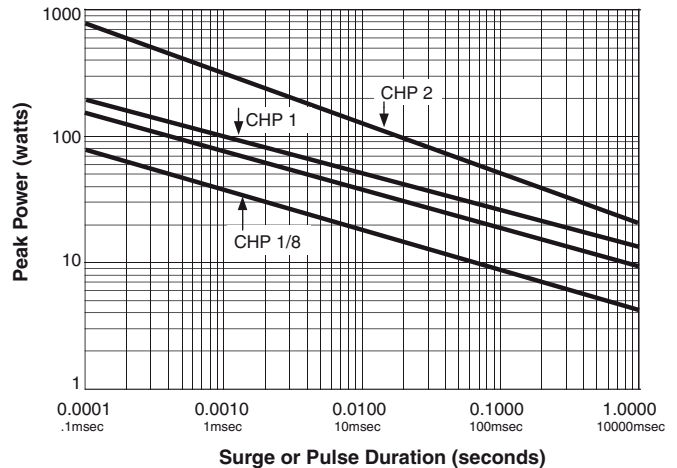
| IRC Type           | Size Code | Industry Footprint | Reel Diameter* | Quantity Per Reel | Carrier Tape Width | Component Pitch |
|--------------------|-----------|--------------------|----------------|-------------------|--------------------|-----------------|
| CHP 1/8<br>MRC 1/2 | B         | 1206               | 7"             | 2,500 max.        | 8mm                | 4mm             |
|                    | C         |                    | 13"            | 10,000 max.       |                    |                 |
| CHP 1/2<br>MRC 1   | D         | 2010               | 7"             | 1,500 max.        | 12mm               | 4mm             |
|                    | E         |                    | 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.

### Ordering Data

Sample Part No. .... **CHP 1** - **100** **2203** **F** **13** **LF**

**IRC Type** .....  
(CHP 1/8, CHP 1/2, CHP 1, or CHP 2)

**Temperature Coefficient** .....  
(50 ppm, 100 ppm)

**Resistance Value** .....  
(100 ohms and greater - First 3 significant digits plus 4th digit multiplier)  
Example: 100 ohms = 1000, 1000 ohms = 1001, 150,000 ohms = 1503  
(Less than 100 ohms - "R" is used to designate decimal)  
Example: 51 ohms = 51R0, 1 ohm = 1R00, 0.25 ohms = R250

**Tolerance** .....  
(C = 0.25%, D = 0.5%, F = 1.0%; G = 2.0%; J = 5.0%)

**Packaging Code\*** .....  
(BLK = Bulk, 7 = 7" Reel, 13 = 13" Reel)

**Lead Free Construction** .....

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