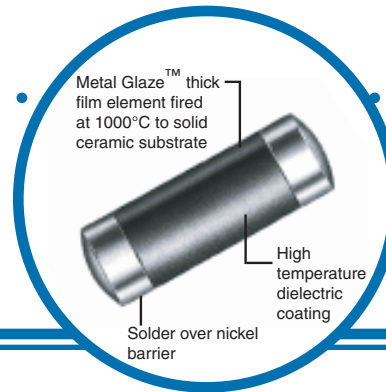


# Metal Glaze™ Cylindrical Surface Mount Power Resistors



## 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 Foot-print | 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 page 8 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                                                                                                 |
|-----------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Temperature Coefficient                 | As specified                           | MIL-R-55342E Par 4.7.9 (-55°C + 125°C)                                                                      |
| Thermal Shock                           | ±0.5% + 0.01 ohm                       | MIL-R-55342E Par 4.7.3 (-65°C + 150°C, 5 cycles)                                                            |
| Low Temperature Operation               | ±0.25% + 0.01 ohm                      | MIL-R-55342E Par 4.7.4 (-65°C @ working voltage)                                                            |
| Short Time Overload                     | ±0.5% + 0.01 ohm<br>±1% for R>100K ohm | MIL-R-55342E Par 4.7.5<br>$2.5 \times \sqrt{\quad}$ for 5 seconds                                           |
| High Temperature Exposure               | ±0.5% + 0.01 ohm                       | MIL-R-55342E Par 4.7.6 (-150°C for 100 hours)                                                               |
| Resistance to Bonding                   | ±0.25% + 0.01 ohm                      | MIL-R-55342E Par 4.7.7 (Reflow soldered to board at 260°C for 10 seconds)                                   |
| Exposure                                | 95% minimum coverage                   | MIL-STD-202, Method 208 (245°C for 5 seconds)                                                               |
| Solderability                           | ±0.5% + 0.01 ohm                       | MIL-R-55342E Par 4.7.8 (10 cycles, total 240 hours)                                                         |
| Moisture Resistance                     | ±0.5% + 0.01 ohm                       | MIL-R-55342E Par 4.7.10 (2000 hours at 70°C intermittent)                                                   |
| Life Test<br>Terminal Adhesion Strength | ±1% + 0.01 ohm<br>no mechanical damage | 1200 gram push from underside of mounted chip for 60 seconds                                                |
|                                         | ±1% + 0.01 ohm<br>no mechanical damage | Chip mounted in center of 90mm long board, deflected 1mm so as to exert pull on chip contacts for 5 seconds |

### General Note

IRC reserves the right to make changes in product specification without notice or liability. All information is subject to IRC's own data and is considered accurate at time of going to print.

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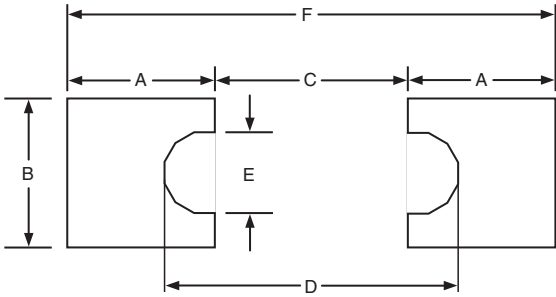
# Metal Glaze™ Cylindrical Surface Mount Power Resistors



## 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 ± 0.006<br>(2.01 ± 0.15) | 0.030 ± 0.010<br>(0.761 ± 0.25) |
| MRC 1    | E         | 2010               |    | 0.200 ± 0.010<br>(5.08 ± 0.25)                                                     | 0.105 ± 0.006<br>(2.67 ± 0.15) | 0.040 ± 0.015<br>(1.02 ± 0.38)  |
| CHP 1    | F         | 2512               |    | 0.251 ± 0.010<br>(6.38 ± 0.25)                                                     | 0.079 ± 0.006<br>(2.01 ± 0.15) | 0.040 ± 0.010<br>(1.02 ± 0.25)  |
| CHP 2    | H         | 3610               |  | 0.367 ± 0.010<br>(9.32 ± 0.25)                                                     | 0.105 ± 0.006<br>(2.67 ± 0.15) | 0.050 ± 0.010<br>(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<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) |

# Metal Glaze™ Cylindrical Surface Mount Power Resistors

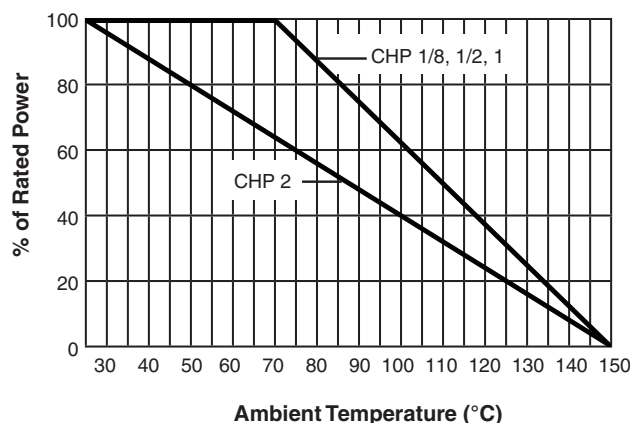


## Standard Reel Packaging per EIA-481:

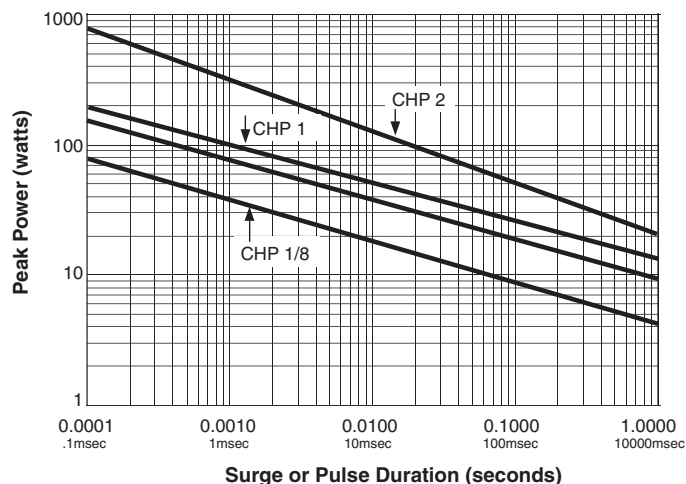
| IRC Type           | Size Code | Industry Footprint | Reel Diameter* | Quantity Per Reel | Carrier Tape Width | Component Pitch |
|--------------------|-----------|--------------------|----------------|-------------------|--------------------|-----------------|
| CHP 1/8<br>MRC 1/2 | B         | 1206               | 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** .....