ATC WBR Series
Wire Bond Resistors
(Top Contact/Bottom Isolated)

Features:
- Resistance Range: 5 Ω to 1 MΩ*
- Outline Size: 20 x 20 mils (0.51 x 0.51 mm)
- Passivated SiCr or TaN Resistor Material
- Gold Wire Bondable**
- Ultra-High Stability
- Extremely Low TCR available (±25 ppm/°C)
- Laser Trim for Tight Tolerances
- Top Contact / Bottom Isolated
- Unique A-Face Value Marking
- Ideal for Hybrid Circuit Applications

Please contact factory for the following:
* Custom designs up to 10 MΩ are available
** Aluminum bond pads are available

American Technical Ceramics offers the WBR Series precision Wire Bondable Resistors. These resistors are designed specifically for applications that require stable thermo-compression, ultrasonic or epoxy die attachment. This device is built in an 0202 chip outline and is ideal for but not limited to hybrid circuit applications.

The WBR Series utilizes our proprietary thin film resistor material sets. This results in extremely tight tolerances and superior Temperature Coefficient of Resistance (TCR). Tolerance of ±0.1%, with absolute TCR of ±25 ppm/°C is available. The WBR offers excellent stability and reliability and is suitable for the most demanding applications.

Applications:
- Hybrid Chip on Board Circuits
- Multi Chip Module (MCM)
- Bias Networks
- Test and Measurement Equipment
- Aerospace
- Medical
- Automotive

WBR Series Power Derating

<table>
<thead>
<tr>
<th>% Power Applied</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-65</td>
</tr>
<tr>
<td>20</td>
<td>-45</td>
</tr>
<tr>
<td>40</td>
<td>-25</td>
</tr>
<tr>
<td>60</td>
<td>-5</td>
</tr>
<tr>
<td>80</td>
<td>15</td>
</tr>
<tr>
<td>100</td>
<td>35</td>
</tr>
<tr>
<td>120</td>
<td>55</td>
</tr>
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<td></td>
<td>75</td>
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<tr>
<td></td>
<td>95</td>
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<tr>
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<tr>
<td></td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>175</td>
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</tbody>
</table>

250 mW (70°C, derated to 0 at 150°C) on alumina

ATC WBR Life Test Data

<table>
<thead>
<tr>
<th>% Res Change</th>
<th>Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>0</td>
</tr>
<tr>
<td>-0.010</td>
<td>200</td>
</tr>
<tr>
<td>-0.020</td>
<td>400</td>
</tr>
<tr>
<td>-0.030</td>
<td>600</td>
</tr>
<tr>
<td>-0.040</td>
<td>800</td>
</tr>
<tr>
<td>-0.050</td>
<td>1000</td>
</tr>
<tr>
<td>-0.060</td>
<td>1200</td>
</tr>
</tbody>
</table>

American Technical Ceramics
ATC // AVX Thin Film Technologies
tfsales@atceramics.com
ATC North America
sales@atceramics.com
THE ENGINEERS’ CHOICE®
www.atceramics.com

ATC # 001-1109
Rev C, 6/17
Resistor Materials

- **Substrate Material**: Oxidized Silicon
- **Resistor Material**: Silicon Chrome (SiCr)
- **Backing**: None, Lapped Silicon
- **Bonding Pad Material**: Gold

Mechanical Configurations  

<table>
<thead>
<tr>
<th>Size</th>
<th>Length (L)</th>
<th>Width (W)</th>
<th>Thickness (T)</th>
<th>Bond Pad</th>
</tr>
</thead>
<tbody>
<tr>
<td>0202</td>
<td>0.020 ±0.004 (0.51 ±0.10)</td>
<td>0.020 ±0.004 (0.51 ±0.10)</td>
<td>0.010 ±0.002 (0.25 ±0.05)</td>
<td>0.0038 x 0.0038 (0.09 x 0.09)</td>
</tr>
</tbody>
</table>

General Specifications

- **Resistor**
  - Package Outline: 0202
  - Resistance Range: 5 Ω to 1 MO *
  - Power Rating: 250 mW (70°C, derated to 0 at 150°C) on alumina
  - Termination: Gold Wire Bond
  - Tolerances: 0.1, 0.5, 1%
  - Operating Temperature: -55°C +125°C
  - Temperature Coefficient of Resistance: ±25, ±50, ±100 ppm/°C
  - Maximum Rated Voltage: 125 volts
  - Insulation Resistance: 10⁶ MΩ

*Custom Designs up to 10 MΩ available

Environmental Tests

- **Test**
  - **Limit**
  - **Condition**
  - Life Test: ±0.25% max
  - 1000 hrs., 125°C @ 50 mW
  - Thermal Shock: ±0.25% max.
  - IAW MIL-STD-202, condition B
  - High Temperature Exposure: ±0.25% max.
  - 100 hrs. @ 150°C
  - Moisture Resistance: ±0.25% max.
  - IAW MIL-PRF-55342
  - Wire Bond Test: 4 grams min. (1.25 mil wire)
  - IAW MIL-PRF-55342
  - Short-Time Overload: ±0.25% max.
  - IAW MIL-PRF-55342

ATC Part Number Code

```
ATC WBR 1 470 1 F G E W
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Packaging: Waffle Pack, 400 pc. qty.

Temperature Coefficient of Resistance (TCR - ppm/°C)
- C = ±25, D = ±50, E = ±100 (Std.)

Termination
- G = Gold Wire Bond

Tolerance

<table>
<thead>
<tr>
<th>Multiplier</th>
<th>RESISTOR TOLERANCE</th>
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</thead>
<tbody>
<tr>
<td>D</td>
<td>B</td>
</tr>
<tr>
<td>F</td>
<td>±0.1%</td>
</tr>
<tr>
<td>G</td>
<td>±0.5%</td>
</tr>
<tr>
<td>H</td>
<td>±1%</td>
</tr>
</tbody>
</table>

For additional information and catalogs contact your ATC representative or call direct at +1-631-822-4700.

Consult factory for additional performance data.

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