BCR16CM-16LH
800V - 16A - Triac
Medium Power Use

Features
- \( I_{\text{T(RMS)}} \): 16 A
- \( V_{\text{DRM}} \): 800 V
- \( I_{\text{FGT}1}, I_{\text{RG}1}, I_{\text{RG}3} \): 50 mA or 35 mA (IGT item:1)
- \( T_j \): 150°C
- Planar Passivation Type
- High Commutation

Outline

Application
Power supply, motor control, heater control and other general purpose AC control applications.

Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Voltage class</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitive peak off-state voltage</td>
<td>( V_{\text{DRM}} )</td>
<td>16</td>
<td>V</td>
</tr>
<tr>
<td>Non-repetitive peak off-state voltage</td>
<td>( V_{\text{DSM}} )</td>
<td>960</td>
<td>V</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Ratings</th>
<th>Unit</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMS on-state current</td>
<td>( I_{\text{T(RMS)}} )</td>
<td>16</td>
<td>A</td>
<td>Commercial frequency, sine full wave 360°conduction, ( T_c = 125^\circ\text{C} )</td>
</tr>
<tr>
<td>Surge on-state current</td>
<td>( I_{\text{TS}} )</td>
<td>160</td>
<td>A</td>
<td>60 Hz sinewave 1 full cycle, peak value, non-repetitive</td>
</tr>
<tr>
<td>( I_t ) for fusion</td>
<td>( I_t )</td>
<td>106.5</td>
<td>A²s</td>
<td>Value corresponding to 1 cycle of half wave 60 Hz, surge on-state current</td>
</tr>
<tr>
<td>Peak gate power dissipation</td>
<td>( P_{\text{GM}} )</td>
<td>5</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>Average gate power dissipation</td>
<td>( P_{\text{G(AV)}} )</td>
<td>0.5</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>Peak gate voltage</td>
<td>( V_{\text{GM}} )</td>
<td>10</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Peak gate current</td>
<td>( I_{\text{GM}} )</td>
<td>2</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>( T_j )</td>
<td>-40 to +150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>( T_{\text{stg}} )</td>
<td>-40 to +150</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>
## Electrical Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>BCR16CM-16LH-1 (I&lt;sub&gt;GT&lt;/sub&gt; item:1)</th>
<th>BCR16CM-16LH</th>
<th>Unit</th>
<th>Test conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitive peak off-state current</td>
<td>I&lt;sub&gt;DRM&lt;/sub&gt;</td>
<td>—</td>
<td>—</td>
<td>5.0</td>
<td>—</td>
</tr>
<tr>
<td>On-state voltage</td>
<td>V&lt;sub&gt;TM&lt;/sub&gt;</td>
<td>—</td>
<td>—</td>
<td>1.5</td>
<td>—</td>
</tr>
<tr>
<td>Gate trigger voltage&lt;sup&gt;Note2&lt;/sup&gt;</td>
<td>I&lt;sub&gt;FGT&lt;/sub&gt;I</td>
<td>—</td>
<td>—</td>
<td>1.5</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;RGTI&lt;/sub&gt;</td>
<td>—</td>
<td>—</td>
<td>1.5</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;RGTH&lt;/sub&gt;</td>
<td>—</td>
<td>—</td>
<td>1.5</td>
<td>—</td>
</tr>
<tr>
<td>Gate trigger current&lt;sup&gt;Note2&lt;/sup&gt;</td>
<td>I&lt;sub&gt;FGT&lt;/sub&gt;I</td>
<td>—</td>
<td>—</td>
<td>35</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;RGTI&lt;/sub&gt;</td>
<td>—</td>
<td>—</td>
<td>35</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;RGTH&lt;/sub&gt;</td>
<td>—</td>
<td>—</td>
<td>35</td>
<td>—</td>
</tr>
<tr>
<td>Gate non-trigger voltage</td>
<td>V&lt;sub&gt;GD&lt;/sub&gt;</td>
<td>0.2</td>
<td>—</td>
<td>—</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1</td>
<td>—</td>
<td>—</td>
<td>0.1</td>
</tr>
<tr>
<td>Thermal resistance</td>
<td>R&lt;sub&gt;th&lt;/sub&gt;(j&lt;sub&gt;-&lt;/sub&gt;c)</td>
<td>—</td>
<td>—</td>
<td>1.4</td>
<td>—</td>
</tr>
<tr>
<td>Critical-rate of fall of on-state</td>
<td>(di/dt)c</td>
<td>9</td>
<td>—</td>
<td>—</td>
<td>15</td>
</tr>
<tr>
<td>commutating current&lt;sup&gt;Note5&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
1. Gate open.
2. Measurement using the gate trigger characteristics measurement circuit.
3. Case temperature is measured at the T<sub>2</sub> tab 1.5 mm away from the molded case.
4. The contact thermal resistance R<sub>th</sub>(c<sub>-f</sub>) in case of greasing is 1.0°C/1W.
5. Test conditions of the critical-rate of fall of on-state commutation current are shown in the table below.

### Test conditions

1. Junction temperature
   T<sub>j</sub> = 125°C
2. Peak off-state voltage
   V<sub>D</sub> = 400 V
3. Rate of rise of off-state commutating voltage
   (dv/dt)c < 100 V/μs

### Commuting voltage and current waveforms (inductive load)

![Diagram showing commutation voltage and current waveforms]
Performance Curves

Maximum On-State Characteristics

On-State Voltage (V) vs. On-State Current (A)

On-State Voltage (V)

On-State Current (A)

Rated Surge On-State Current

Surge On-State Current (A) vs. Conduction Time (Cycles at 60Hz)

Gate Characteristics (I, II and III)

Gate Voltage (V) vs. Gate Current (mA)

Gate Voltage (V)

Gate Current (mA)

Gate Trigger Current vs. Junction Temperature

Gate Trigger Current (mA) vs. Junction Temperature (°C)

Gate Trigger Voltage vs. Junction Temperature

Gate Trigger Voltage (V) vs. Junction Temperature (°C)

Gate Trigger Current vs. Gate Current Pulse Width

Gate Trigger Current (mA) vs. Gate Current Pulse Width (μs)
Maximum Transient Thermal Impedance Characteristics (Junction to case)

Conduction Time (Cycles at 60Hz)

Maximum On-State Power Dissipation

360° Conduction
Resistive, inductive loads

RMS On-State Current (A)

Allowable Ambient Temperature vs.
On-State Power Dissipation (W)

Maximum On-State Power Dissipation

RMS On-State Current (A)

Allowable Case Temperature vs.
RMS On-State Current

RMS On-State Current (A)

Allowable Ambient Temperature vs.
RMS On-State Current

All fins are black painted aluminum and greased

RMS On-State Current (A)
Rate of Rise of Off-State Voltage (V/μs)

Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=125°C)

- I Quadrant
- III Quadrant

Typical Example: 
Tj = 125°C

Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=150°C)

- I Quadrant
- III Quadrant

Typical Example: 
Tj = 150°C

Holding Current vs. Junction Temperature

- Holding Current (mA)
- Junction Temperature (°C)

Latching Current vs. Junction Temperature

- Latching Current (mA)
- Junction Temperature (°C)

Typical Example: 
Vd=12V

Typical Example: 
Tj = 125°C

III Quadrant
I Quadrant

III Quadrant
I Quadrant

Typical Example: 
Tj = 150°C
Gate Trigger Characteristics Test Circuits

Commutation Characteristics (Tj=125°C)

Rate of Decay of On-State Commutating Current (A/ms)

Commutation Characteristics (Tj=150°C)

Rate of Decay of On-State Commutating Current (A/ms)

Recommended peripheral components for Triac

Test Procedure I

Test Procedure II

Test Procedure III

C1 = 0.1 to 0.47 μF
R1 = 47 to 100 Ω
C0 = 0.1 μF
R0 = 100 Ω
Package Dimensions

Ordering code: #BH0

<table>
<thead>
<tr>
<th>Package Name</th>
<th>JEDEC Package Code</th>
<th>RENESAS Code</th>
<th>Previous Code</th>
<th>MASS[Typ.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO-220ABA</td>
<td>TO-220AB</td>
<td>PRSS0004AT-A</td>
<td>TO-220ABA</td>
<td>2.1g</td>
</tr>
</tbody>
</table>

Ordering code: #BB0

<table>
<thead>
<tr>
<th>Package Name</th>
<th>JEITA Package Code</th>
<th>RENESAS Code</th>
<th>Previous Code</th>
<th>MASS[Typ.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO-220AB</td>
<td>SC-46</td>
<td>PRSS0004AG-A</td>
<td>TO-220ABS</td>
<td>2.1g</td>
</tr>
</tbody>
</table>

EOL announced
### Ordering Information

<table>
<thead>
<tr>
<th>Orderable Part Number</th>
<th>Package</th>
<th>Quantity</th>
<th>Remark</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCR16CM-16LH#BH0</td>
<td>TO-220ABA</td>
<td>50 pcs./ tube</td>
<td>Straight type</td>
<td>Mass Production</td>
</tr>
<tr>
<td>BCR16CM-16LH-1#BH0</td>
<td>TO-220ABA</td>
<td>50 pcs./ tube</td>
<td>Straight type, I GT item:1</td>
<td></td>
</tr>
<tr>
<td>BCR16CM-16LH#BB0</td>
<td>TO-220ABS</td>
<td>50 pcs./ tube</td>
<td>Straight type</td>
<td>EOL announced</td>
</tr>
<tr>
<td>BCR16CM-16LH-1#BB0</td>
<td>TO-220ABS</td>
<td>50 pcs./ tube</td>
<td>Straight type, I GT item:1</td>
<td></td>
</tr>
<tr>
<td>BCR16CM-16LH□□#BB0</td>
<td>TO-220ABS</td>
<td>50 pcs./ tube</td>
<td>□□: Lead form type</td>
<td></td>
</tr>
</tbody>
</table>

Notes: 6. Please confirm the specification about the shipping in detail.
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