**FEATURES**

* Low noise due to soft and fast recovery diodes.
* High reliability, high durability diodes.
* Isolated heat sink (terminal to base).

---

**CIRCUIT DIAGRAM**

![Circuit Diagram](image)

---

**ABSOLUTE MAXIMUM RATINGS** (TC=25°C)

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Unit</th>
<th>MDM600E45A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitive Peak Reverse Voltage</td>
<td>$V_{RRM}$</td>
<td>V</td>
<td>4,500</td>
</tr>
<tr>
<td>Forward Current DC</td>
<td>$I_F$</td>
<td>A</td>
<td>600</td>
</tr>
<tr>
<td>Forward Current 1ms</td>
<td>$I_{FM}$</td>
<td>A</td>
<td>1,200</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>$T_J$</td>
<td>°C</td>
<td>-40 ~ +125</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{STG}$</td>
<td>°C</td>
<td>-40 ~ +125</td>
</tr>
<tr>
<td>Isolation Test Voltage</td>
<td>$V_{ISO}$</td>
<td>V</td>
<td>6,000 (AC 1 minute)</td>
</tr>
<tr>
<td>Terminal 1-Terminal 2</td>
<td>$V_{ISO, T-T}$</td>
<td>V</td>
<td>6,000 (AC 1 minute)</td>
</tr>
<tr>
<td>Screw Torque Terminals</td>
<td>-</td>
<td>N·m</td>
<td>15 (1)</td>
</tr>
<tr>
<td>Mounting (M6)</td>
<td>-</td>
<td>N·m</td>
<td>6 (2)</td>
</tr>
</tbody>
</table>

Notes: (1) Recommended Value 15$^\circ$/-3N·m (2) Recommended Value 5.5±0.5N·m

---

**ELECTRICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Test Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitive Reverse Current</td>
<td>$I_{RRM}$</td>
<td>mA</td>
<td>-</td>
<td>14</td>
<td>27</td>
<td>VAK=4,500V, $T_J$=125°C</td>
</tr>
<tr>
<td>Forward Voltage Drop</td>
<td>$V_F$</td>
<td>V</td>
<td>3.3</td>
<td>4.5</td>
<td>5.3</td>
<td>$I_F$=600A, $T_J$=125°C</td>
</tr>
<tr>
<td>Reverse Recovery Time</td>
<td>$t_{rr}$</td>
<td>μs</td>
<td>-</td>
<td>0.6</td>
<td>1.0</td>
<td>$V_{CC}$=2,600V, $I_F$=600A, $L$=130nH</td>
</tr>
<tr>
<td>Reverse Recovery Loss</td>
<td>$E_{rr(10%)}$</td>
<td>J/P</td>
<td>-</td>
<td>0.7</td>
<td>1.0</td>
<td>$T_J$=125°C $R_G$=3.3 Ω (3)</td>
</tr>
</tbody>
</table>

---

**PACKAGE CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Test Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Resistance</td>
<td>$R_{CE}$</td>
<td>mΩ</td>
<td>-</td>
<td>0.3</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Terminal Stray Inductance</td>
<td>$L_{SC}$</td>
<td>nH</td>
<td>-</td>
<td>35</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Thermal Impedance</td>
<td>$R_{th(j-c)}$</td>
<td>K/W</td>
<td>-</td>
<td>-</td>
<td>0.026</td>
<td>Junction to case</td>
</tr>
<tr>
<td>Comparative tracking index</td>
<td>$C_{TI}$</td>
<td>-</td>
<td>-</td>
<td>600</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Contact Thermal Impedance</td>
<td>$R_{th(c-f)}$</td>
<td>K/W</td>
<td>-</td>
<td>0.008</td>
<td>-</td>
<td>Case to fin per module</td>
</tr>
</tbody>
</table>

Notes: (3) Counter arm; MBN600E45A $V_{GE}$=±15V

$R_G$ value is the test condition's value for evaluation of the switching times, not recommended value.
Please, determine the suitable $R_G$ value after the measurement of switching waveforms (overshoot voltage, etc.) with appliance mounted.

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* Please contact our representatives at order.
* For improvement, specifications are subject to change without notice.
* For actual application, please confirm this spec sheet is the newest revision.

---

**OUTLINE DRAWING**

![Outline Drawing](image)

**Weight:** 900(g)
Fig. 1 Switching test circuit

Fig. 2 Definition of Ls

Fig. 3 Definition of switching loss
**DUAL DIODE MODULE**

**MDM600E45A**

**Forward Voltage of free-wheeling diode**

- **TYPICAL**

**Recovery Loss vs. Collector Current**

- **TYPICAL**

**Recovery Time vs. Forward current**

- **TYPICAL**

**Recovery Waveform of Diode**

- **TYPICAL**

**Recovery SOA**

- **TYPICAL**

---

**[Condition]**

- $V_{GE}=\pm 15V, R_G=3.3\Omega$
- $V_D=2600V, L=130nH, T_c=125^\circ C$
- Inductive load

**[Condition]**

- $V_{GE}=\pm 15V, R_G=3.3\Omega$
- $V_D=2600V, L=130nH, T_c=125^\circ C$
- Inductive load

**[Condition]**

- $V_{CE}=3000V, T_j=125^\circ C$
- $R_g=3.3\Omega, L_s=130nH$

**Hitachi RRSOA**
Material declaration
Please note the following materials are contained in the product, in order to keep product characteristic and reliability level.

<table>
<thead>
<tr>
<th>Material</th>
<th>Contained part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead (Pb) and its compounds</td>
<td>Solder</td>
</tr>
</tbody>
</table>
HITACHI POWER SEMICONDUCTORS

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