SiC Schottky Barrier Diodes

Dramatically lower switching loss

Ultra-short reverse recovery time (impossible to achieve with silicon) enables high-speed switching. This minimizes the reverse recovery charge (Qrr), reducing switching loss significantly, contributing to end-product miniaturization.

In addition, SiC devices maintain a constant trr regardless of temperature, unlike conventional silicon fast recovery diodes where the trr increases with temperature. This enables high-temperature driving without increasing switching loss.

SiC wafer supplier SiCrystal has joined the ROHM Group. This makes it possible to perform manufacturing completely in-house, from ingot formation to power device fabrication, resulting in cutting-edge products with superior reliability and quality.

Specifications

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Package</th>
<th>Vsm (V)</th>
<th>Vre (V)</th>
<th>Io (A)</th>
<th>Issu (A)</th>
<th>Tj (˚C)</th>
<th>Tstg (˚C)</th>
<th>Vr (V) typ.</th>
<th>Isq (A) typ.</th>
<th>trr (nsec) typ.</th>
<th>Conditions</th>
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</thead>
<tbody>
<tr>
<td>SCS110AX</td>
<td>3-pin</td>
<td>600</td>
<td>600</td>
<td>10</td>
<td>40</td>
<td>150</td>
<td>-55 to +150</td>
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<td>10</td>
<td>2</td>
<td>600</td>
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<td>SCS110AG</td>
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</table>

In addition, SiC Schottky barrier diodes have are now available for high voltage resistance, large current circuits. High-speed switching characteristics minimize switching loss, improving device operating frequency.

Applications

- Switching circuits
- Motor drive circuits
- PFC (Power Factor Correction) circuits and others

Circuit Example

PFC Circuit: Boost voltage + DC

Main Circuit: SW Power Supply

SiC diodes exhibit stabler temperature characteristics (i.e. forward voltage) compared with silicon-based devices, simplifying parallel connection(s) and preventing thermal runaway - unlike Si FRDs.

Stable temperature characteristics

SiC SBD: Forward Characteristics

- SiC is largely temp.-independent
- Infr difference decreases with temperature
- SiC is largely temp.-independent

TRR Temperature Characteristics

- SiC is largely temp.-independent
- Infr difference decreases with temperature
- SiC is largely temp.-independent

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The content specified in this document is correct as of 23th Apr. 2010.