

SiC Schottky Diode Full Bridge Power Module

Preliminary

 $V_{RRM} = 1,200V$
 $I_F = 25A @ T_C = 135^\circ C$

Features

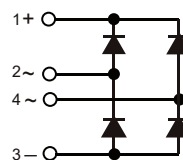
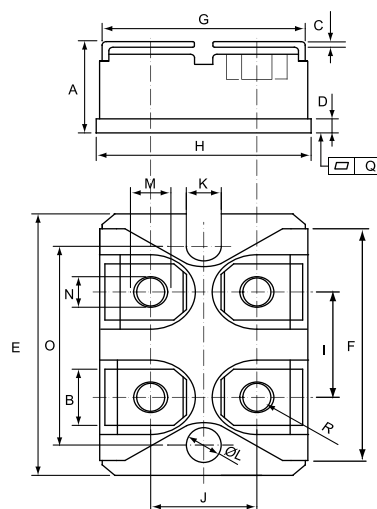
- Zero reverse recovery
- Zero forward recovery
- Temperature-independent switching behavior
- Positive temperature coefficient on VF
- Very low stray inductance
- High level of integration

Benefits

- Outstanding performance at high-frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction-to-case thermal resistance
- RoHS compliant

Applications

- Switch mode power supplies rectifier
- Induction heating
- Welding equipment
- High-speed rectifiers



Maximum Ratings

| Part Number | Maximum Recurrent Peak Reverse Voltage | Maximum DC Blocking Voltage |
|-----------------|--|-----------------------------|
| CSRI4×25-120L1B | 1200V | 1200V |

| Maximum Rating | Symbol | Conditions | Value | Unit |
|---|-----------|--|------------|------------|
| Continuous forward current (per diode) | I_F | $T_C = 25^\circ C$ | 60 | A |
| | | $T_C = 125^\circ C$ | 30 | |
| | | $T_C = 135^\circ C$ | 25 | |
| Non-repetitive peak forward surge current (per diode) | I_{FSM} | $T_C = 25^\circ C$, $t_p = 8.3ms$ half sine wave | 200 | A |
| | | $T_C = 150^\circ C$, $t_p = 8.3ms$ half sine wave | 125 | |
| | | $T_C = 25^\circ C$, $t_p = 10\mu s$ pulse | 800 | |
| Repetitive peak forward surge current (per diode) | I_{FRM} | $T_C = 25^\circ C$, $t_p = 10ms$ half sine wave, $D = 0.1$ | 160 | A |
| | | $T_C = 125^\circ C$, $t_p = 10ms$ half sine wave, $D = 0.1$ | 88 | |
| DC blocking voltage | V_R | $T_j = 25^\circ C$ | 1200 | V |
| Repetitive peak reverse voltage | V_{RRM} | $T_j = 25^\circ C$ | 1200 | V |
| Isolation voltage between All Terminals and Baseplate | V_{iso} | 50/60Hz, RMS $I_{ISOL} \leq 1mA$ | 2500 | V |
| Operating junction and storage temperature | T_j | | 175 | $^\circ C$ |
| | T_{stg} | | -55 to 175 | |
| Mounting torque | | To heatsink | 1.3 | Nm |
| | | To terminal | 1.1 | |

| | DIMENSIONS | | | |
|---|------------|-------|-------|-------|
| | INCHES | | MM | |
| | MIN | MAX | MIN | MAX |
| A | 0.460 | 0.483 | 11.68 | 12.28 |
| B | 0.307 | 0.323 | 7.80 | 8.20 |
| C | 0.030 | 0.033 | 0.75 | 0.85 |
| D | 0.071 | 0.081 | 1.80 | 2.05 |
| E | 1.488 | 1.504 | 37.80 | 38.20 |
| F | 1.248 | 1.260 | 31.70 | 32.00 |
| G | 0.917 | 0.957 | 23.30 | 24.30 |
| H | 0.996 | 1.008 | 25.30 | 25.60 |
| I | 0.579 | 0.602 | 14.70 | 15.30 |
| J | 0.492 | 0.516 | 12.50 | 13.10 |
| K | 0.161 | 0.169 | 4.10 | 4.30 |
| L | 0.161 | 0.169 | 4.10 | 4.30 |
| M | 0.181 | 0.197 | 4.60 | 5.00 |
| N | 0.165 | 0.181 | 4.20 | 4.60 |
| O | 1.181 | 1.197 | 30.00 | 30.40 |
| Q | -0.002 | 0.004 | -0.05 | 0.10 |
| R | M4*8 | | | |

Electrical Characteristics, at $T_J=25\text{ }^\circ\text{C}$, unless otherwise specified. (per diode)

| Static Characteristics | Symbol | Conditions | Values | | | Unit |
|------------------------|----------|---|--------|------|------|---------------|
| | | | min. | typ. | max. | |
| DC blocking voltage | V_{DC} | | 1,200 | - | - | V |
| Diode forward voltage | V_F | $I_F=25\text{A}$, $T_J=25\text{ }^\circ\text{C}$ | - | 1.5 | 1.7 | V |
| | | $I_F=25\text{A}$, $T_J=175\text{ }^\circ\text{C}$ | - | 2.3 | 2.8 | |
| Reverse current | I_R | $V_R=1,200\text{V}$, $T_J=25\text{ }^\circ\text{C}$ | - | 5 | 25 | μA |
| | | $V_R=1,200\text{V}$, $T_J=175\text{ }^\circ\text{C}$ | - | 50 | 200 | |

AC Characteristics (per diode)

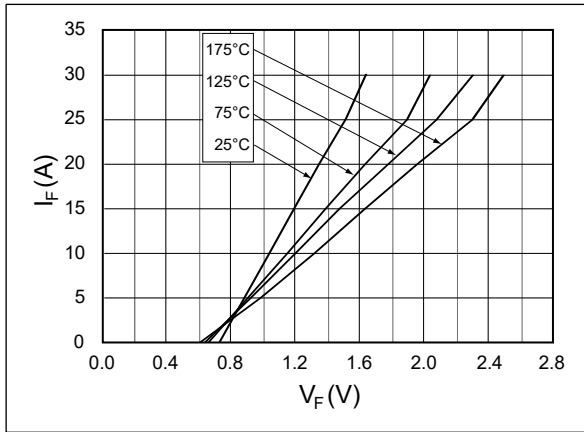
| Static Characteristics | Symbol | Conditions | Values | | | Unit |
|-------------------------|----------|--|--------|------|------|------|
| | | | min. | typ. | max. | |
| Total capacitive charge | Q_{rr} | $V_R=400\text{V}$, $T_J=25\text{ }^\circ\text{C}$ | - | 90 | - | nC |
| Total capacitance | C | $V_R=0\text{V}$, $f=1\text{ MHz}$ $T_J=25\text{ }^\circ\text{C}$ | - | 1500 | - | pF |
| | | $V_R=400\text{V}$, $f=1\text{ MHz}$ $T_J=25\text{ }^\circ\text{C}$ | - | 178 | - | |
| | | $V_R=800\text{V}$, $f=1\text{ MHz}$ $T_J=25\text{ }^\circ\text{C}$ | - | 138 | - | |

Thermal Characteristics (per diode)

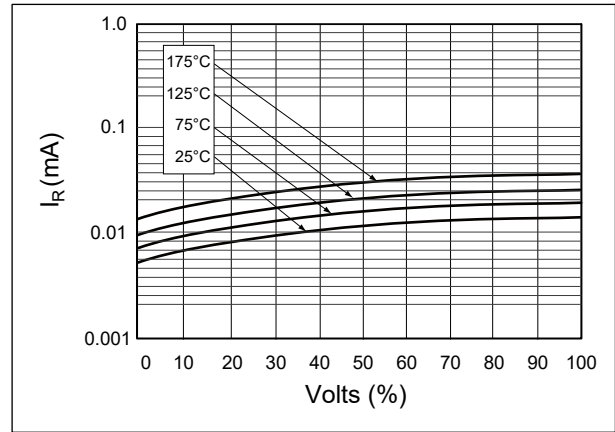
| Static Characteristics | Symbol | Values | Unit |
|--|-----------------|--------|--------------------|
| | | typ. | |
| Thermal resistance from junction to case | $R_{\theta JC}$ | 0.56 | $^\circ\text{C/W}$ |

Typical Performance

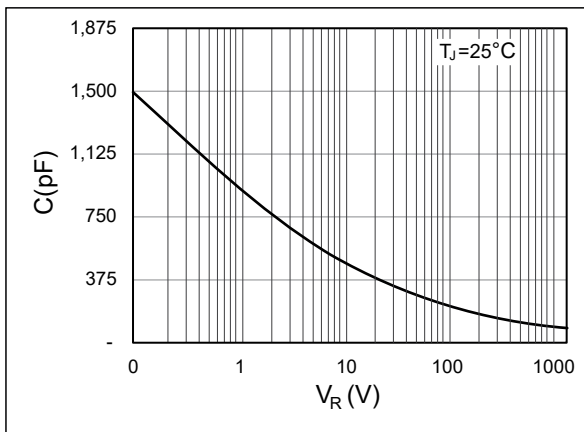
Forward Characteristics (parameterized on T_J)



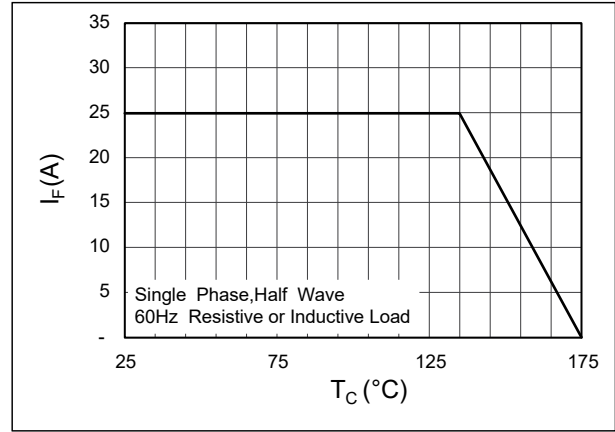
Reverse Characteristics (parameterized on T_J)



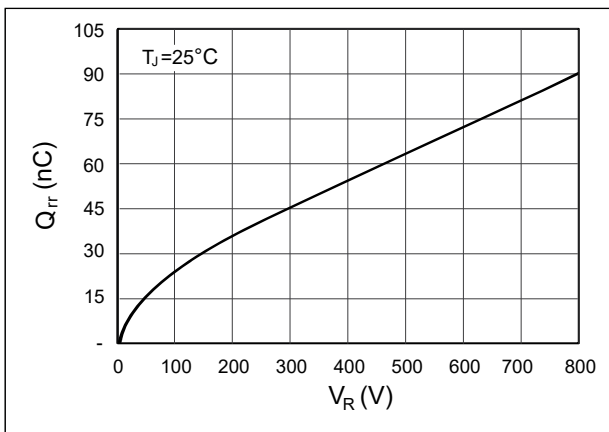
Capacitance



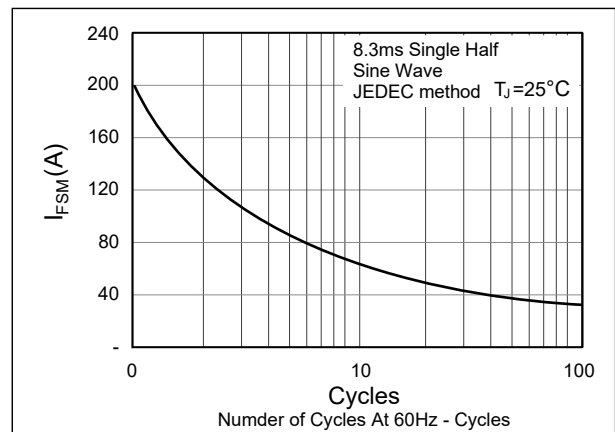
Current Derating



Recovery Charge



Forward Surge Current



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