

MS2H20065V1 650V Silicon Carbide Diode

Features

- 650-Volt Schottky Rectifier
- Shorter recovery time
- High-speed switching possible
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on VF

Benefits

- Higher safety margin against overvoltage
- Improved efficiency all load conditions
- Increased efficiency compared to Silicon Diode alternatives
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

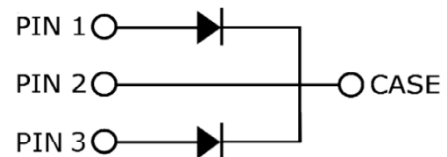
Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives
- HID Lighting

Package



Type : TO-247-3Lead



Absolute Maximum Ratings $T_c = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | MS2H20065V1 | Units |
|----------|---|---------------------------|-------|
| VRRM | Repetitive Peak Reverse Voltage | 650 | V |
| VRSM | Surge Peak Reverse Voltage | 650 | V |
| VDC | DC Blocking Voltage | 650 | V |
| IF | Continuous Forward Current (Per Leg/Device) @Tc=25°C @Tc=135°C @Tc=149°C | 27.5/55 13/26 10/20 | A |
| IFRM | Repetitive Peak Forward Surge Current (Per Leg) @TC=25°C, tP = 10 ms, Half Sine Wave | 70 | A |
| IFSM | Non-Repetitive Peak Forward Surge Current (Per Leg) @TC=25°C, tP = 10 ms, Half Sine Wave | 90 | A |
| Ptot | Power Dissipation (Device) @Tc=25°C @Tc=110°C | 136 59 | W |
| TJ, Tstg | Operating Junction and Storage Temperature | -55 to +175 | °C |

Electrical Characteristics

T_C = 25° C unless otherwise noted

| Symbol | Test Conditions | Test Conditions | Min | Typ | Max | Unit |
|--------|---------------------------|--|-----|-----------------|------------|------|
| VF | Forward Voltage (Per Leg) | IF=10A, TC=25° C IF=10A, TC=175° C | - | 1.5 2.2 | 1.8 3.0 | V |
| IR | Reverse Current | VR=650V, TC=25° C VR=650V, TC=175° C | - | 30 50 | 100 400 | μA |
| QC | Total Capacitive Charge | VR =400V, IF =20A TJ = 25° C $Q_c = \int_0^{V_r} C (V) dv$ | - | 24 | - | nC |
| C | Total Capacitance | VR =0V, TJ = 25° C, f=1MHz VR =200V, TJ = 25° C, f=1MHz VR =400V, TJ = 25° C, f=1MHz | - | 487 50 35 | - | pF |
| EC | Capacitance Stored Energy | VR=400V | - | 4.8 | - | μJ |

Thermal Characteristics

| Symbol | Parameter | Typ | Unit |
|--------|--|-----|------|
| RθJC | Thermal Resistance from Junction to Case | 1.8 | °C/W |

Typical Characteristics

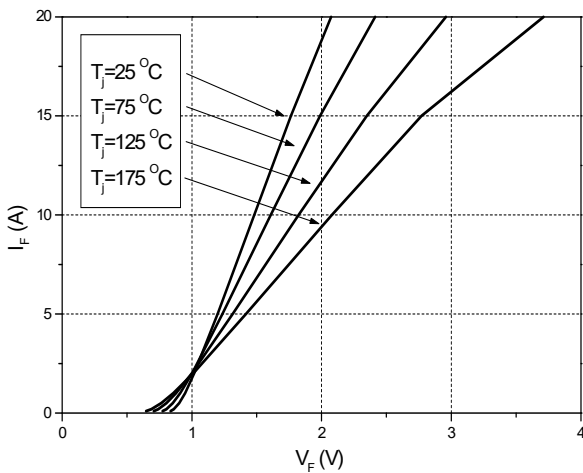


Figure 1. Forward Characteristics

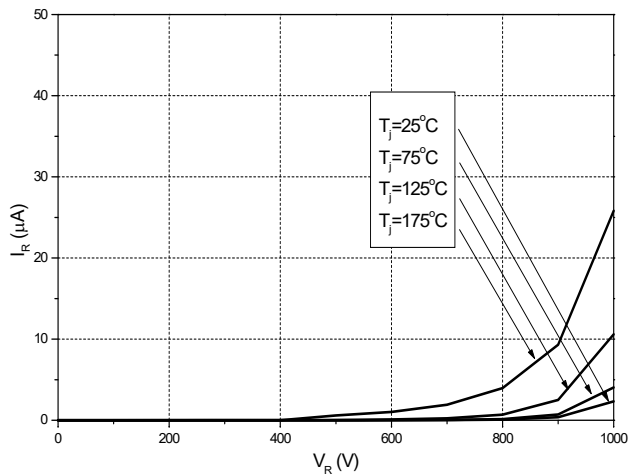


Figure 2. Reverse Characteristics

Typical Characteristics

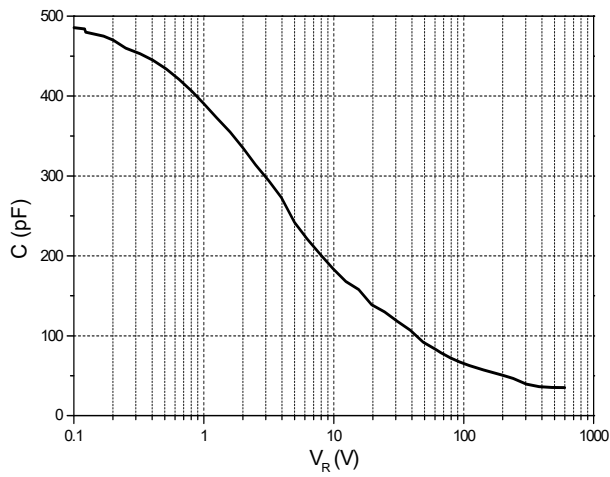


Figure 3. Capacitance vs. Reverse Voltage

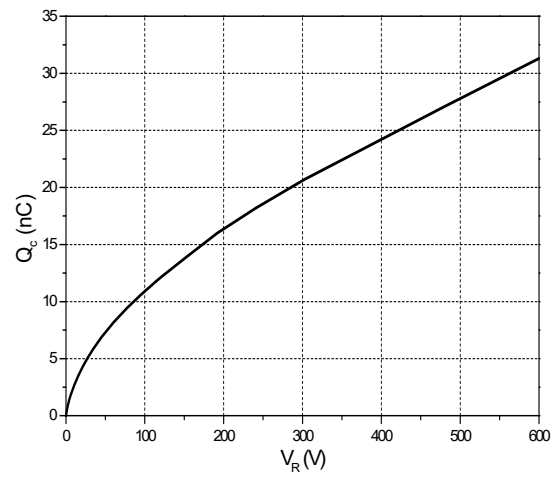


Figure 4. Total Capacitance Charge vs. Reverse Voltage

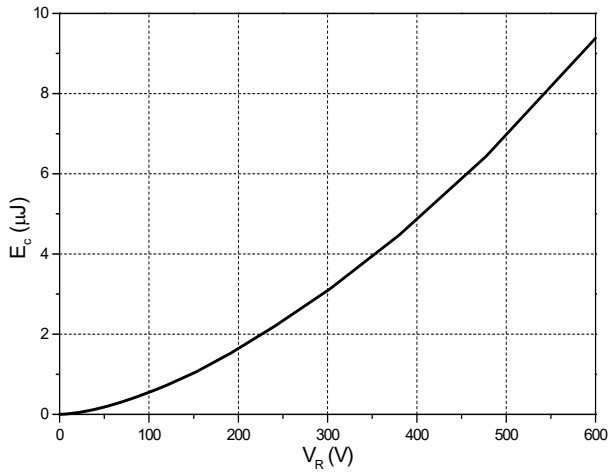
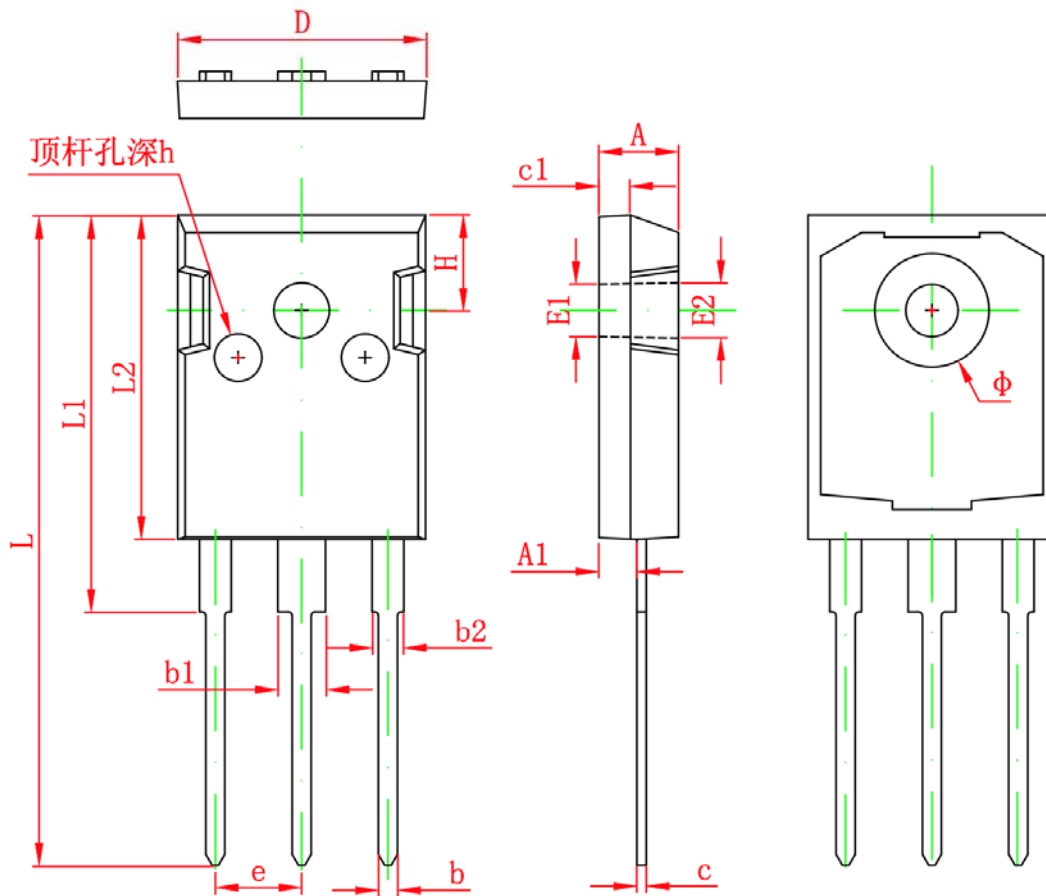


Figure 5. Capacitance Stored Energy

Package Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 4.850 | 5.150 | 0.191 | 0.200 |
| A1 | 2.200 | 2.600 | 0.087 | 0.102 |
| b | 1.000 | 1.400 | 0.039 | 0.055 |
| b1 | 2.800 | 3.200 | 0.110 | 0.126 |
| b2 | 1.800 | 2.200 | 0.071 | 0.087 |
| c | 0.500 | 0.700 | 0.020 | 0.028 |
| c1 | 1.900 | 2.100 | 0.075 | 0.083 |
| D | 15.450 | 15.750 | 0.608 | 0.620 |
| E1 | 3.500 REF | | 0.138 REF | |
| E2 | 3.600 REF | | 0.142 REF | |
| L | 40.900 | 41.300 | 1.610 | 1.626 |
| L1 | 24.800 | 25.100 | 0.976 | 0.988 |
| L2 | 20.300 | 20.600 | 0.799 | 0.811 |
| Φ | 7.100 | 7.300 | 0.280 | 0.287 |
| e | 5.450 TYP | | 0.215 TYP | |
| H | 5.980 REF | | 0.235 REF | |
| h | 0.000 | 0.300 | 0.000 | 0.012 |