Maplesemi

LEAD FREE RoHS COMPLIANT

# MSH20120V1
# 1200V Silicon Carbide Diode

## Features

-1200-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
-Essentialy No Switching Losses

## Applications

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

## Package




**Type : TO-247-2Lead**




## Absolute Maximum Ratings

$T_C$ = 25 ℃ unless otherwise noted

| Symbol | Parameter | MSH20120V1 | Units |
|---|---|---|---|
| VRRM | Repetitive Peak Reverse Voltage | 1200 | V |
| VRSM | Surge Peak Reverse Voltage | 1200 | V |
| VDC | DC Blocking Voltage | 1200 | V |
| IF | Continuous Forward Current @Tc=25℃<br>@Tc=125℃<br>@Tc=137℃ | 53<br>27<br>20 | A |
| IFRM | Repetitive Peak Forward Surge Current<br>@TC=25℃, tP = 10 ms, Half Sine Wave | 100 | A |
| IFSM | Non-Repetitive Peak Forward Surge Current<br>@TC=25℃, tP = 10 ms, Half Sine Wave | 140 | A |
| Ptot | Power Dissipation @Tc=25℃<br>@Tc=110℃ | 258<br>112 | 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 Lag) | IF=10A, TC=25° C<br>IF=10A, TC=175° C | - | 1.5<br>2.2 | 1.8<br>3.0 | V |
| IR | Reverse Current | VR=1200V, TC=25° C<br>VR=1200V, TC=175° C | - | 2<br>20 | 5<br>40 | μA |
| QC | Total Capacitive Charge | VR =600V, IF =10A<br>TJ = 25° C<br>$Qc=\int_0^{Vr} C(V)\,dv$ | - | 95 | - | nC |
| C | Total Capacitance | VR =0V, TJ = 25° C, f=1MHz<br>VR =400V, TJ = 25° C, f=1MHz<br>VR =600V, TJ = 25° C, f=1MHz | - | 2010<br>120<br>97 | - | pF |
| EC | Capacitance Stored Energy | VR=600V | - | 28.6 | - | μJ |

## Thermal Characteristics

| Symbol | Parameter | Typ | Unit |
|---|---|---|---|
| RθJC | Thermal Resistance from Junction to Case | 0.58 | ℃/W |

## Typical Characteristics

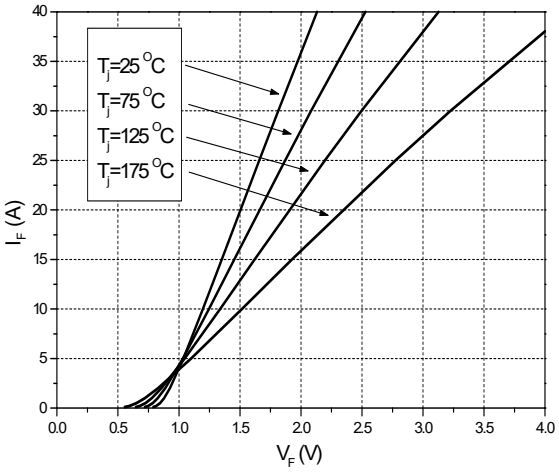



Figure 1.Forward Characteristics

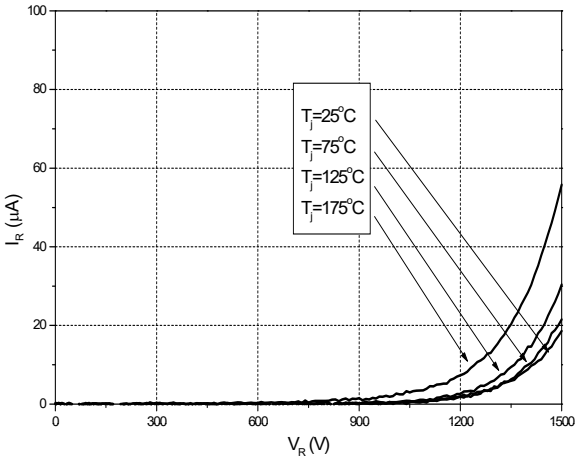



Figure 2. Reverse Characteristics

## Typical Characteristics

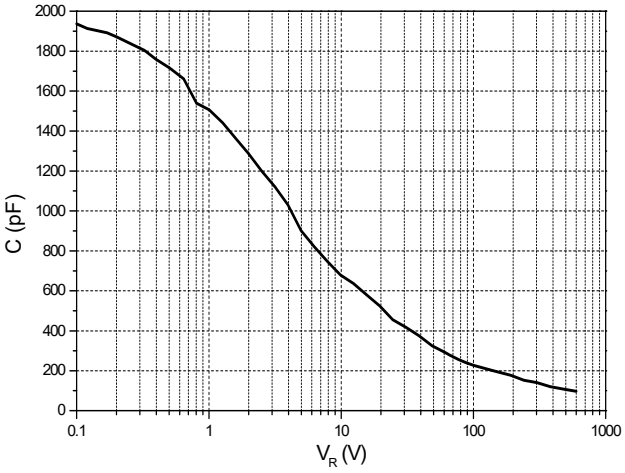



Figure 3.Capacitance vs. Reverse Voltage

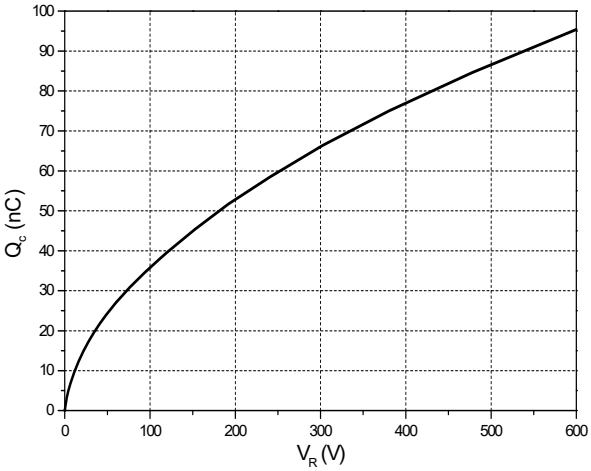



Figure 4. Total Capacitance Charge vs. Reverse Voltage

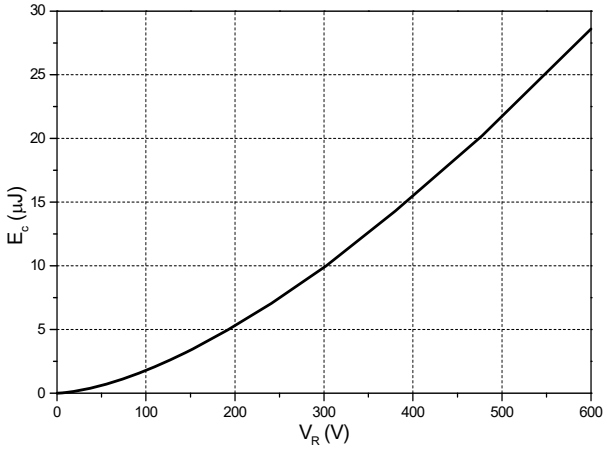



Figure 5. Capacitance Stored Energy

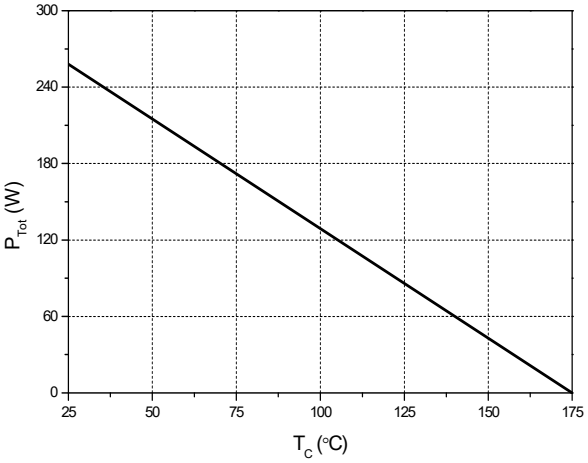



Figure 6. Power Derating

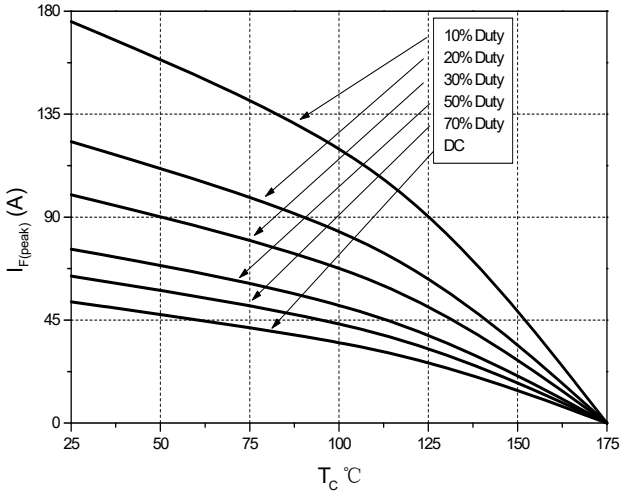



Figure 7. Current Derating