美浦森半导体
M s e m i t e k

Halogen Free

RoHS LEAD FREE

# MSD04065G1
# 650V Silicon Carbide Schottky 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

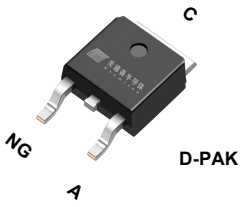
## Benefits

-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
-Essentialy No Switching Losses

## Applications

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

## Package




D-PAK

Type : TO-252(D-PAK)


## Absolute Maximum Ratings

$T_C$ = 25℃ unless otherwise noted

| Symbol | Parameter | MSD04065G1 | 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 @Tc=150℃ | 4.8 | A |
| IFRM | Repetitive Peak Forward Surge Current @TC=25℃<br>tp = 10 ms, Half Sine Wave | 20 | A |
| IFSM | Non-Repetitive Peak Forward Surge Current @TC=25℃<br>tp= 10 ms, Half Sine Wave | 26 | A |
| IF,Max | Non-Repetitive Peak Forward Surge Current<br>@TC=25℃, tp= 10 us，pulse | 200 | A |
| Ptot | Power Dissipation @Tc=25℃<br>@Tc=110℃ | 76.5<br>33.2 | 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 | IF=4A, TC=25° C<br>IF=14A, TC=175° C | - | 1.45<br>1.8 | 1.65<br>2.0 | V |
| IR | Reverse Current | VR=650V, TC=25° C<br>VR=650V, TC=175° C | - | 1<br>12 | 10<br>100 | μA |
| QC | Total Capacitive Charge | VR =400V<br>TJ = 25° C<br>Qc= $\int_0^{Vr} C\ (V)\ \mathrm{dv}$ | - | 9.5 | - | nC |
| C | Total Capacitance | VR =0V, TJ = 25° C, f=1MHz<br>VR =200V, TJ = 25° C, f=1MHz<br>VR =400V, TJ = 25° C, f=1MHz | - | 185<br>19.0<br>16.7 | - | pF |
| EC | Capacitance Stored Energy | VR=400V | - | 2.4 | - | μJ |

## Thermal Characteristics

| Symbol | Parameter | Typ | Unit |
|---|---|---|---|
| RθJC | Thermal Resistance from Junction to Case | 1.96 | ℃/W |

## Typical Characteristics

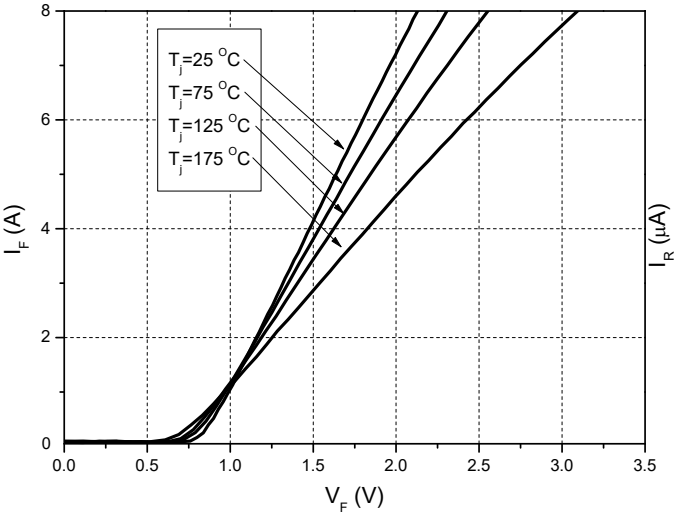



Figure 1.Forward Characteristics

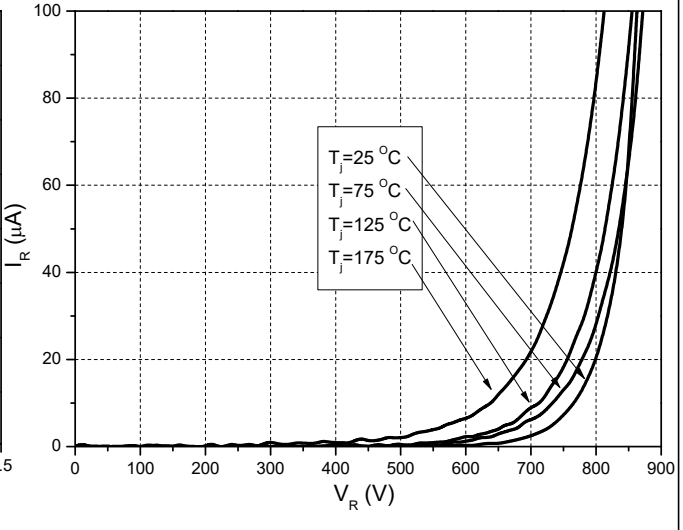



Figure2. Reverse Characteristics

## Typical Characteristics

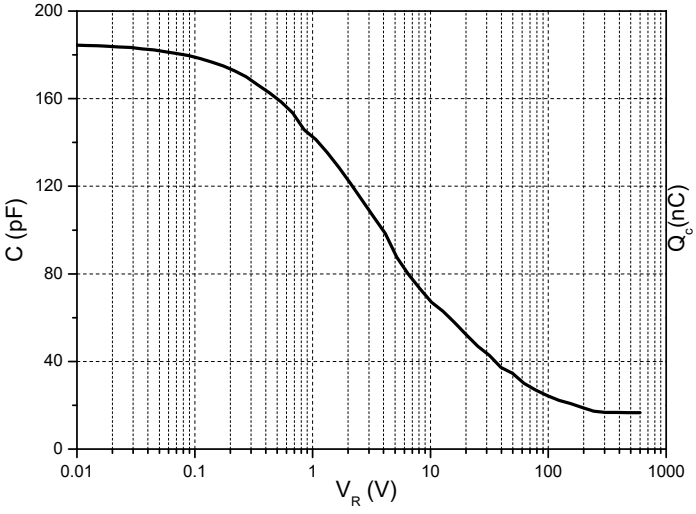



Figure 3. Capacitance vs. Reverse Voltage

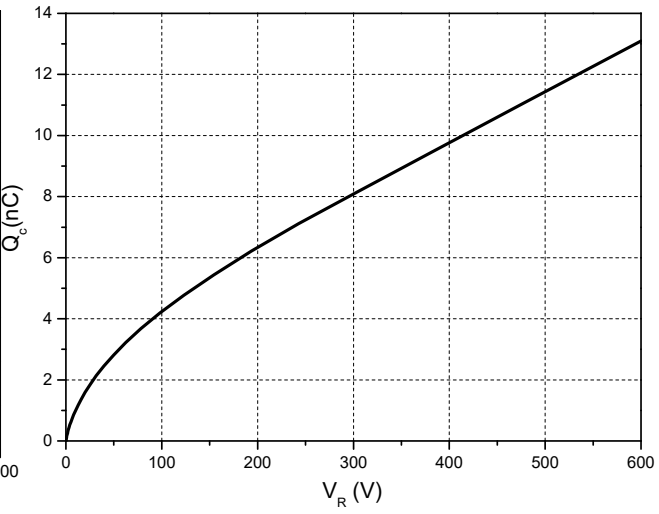



Figure 4. Total Capacitance Charge vs. Reverse Voltage

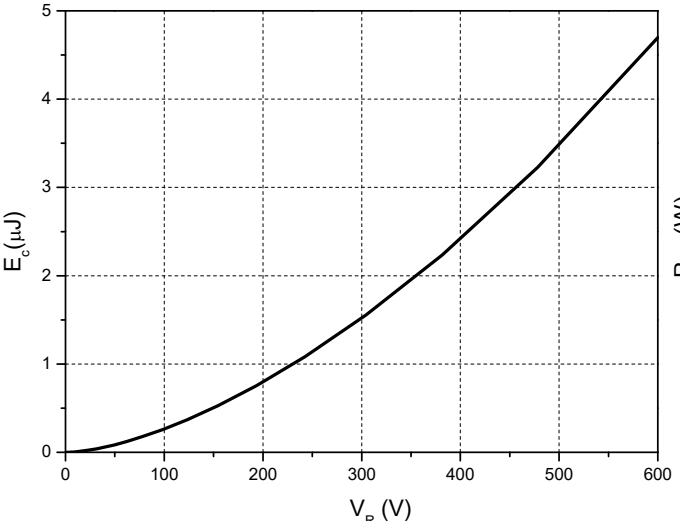



Figure 5. Capacitance Stored Energy

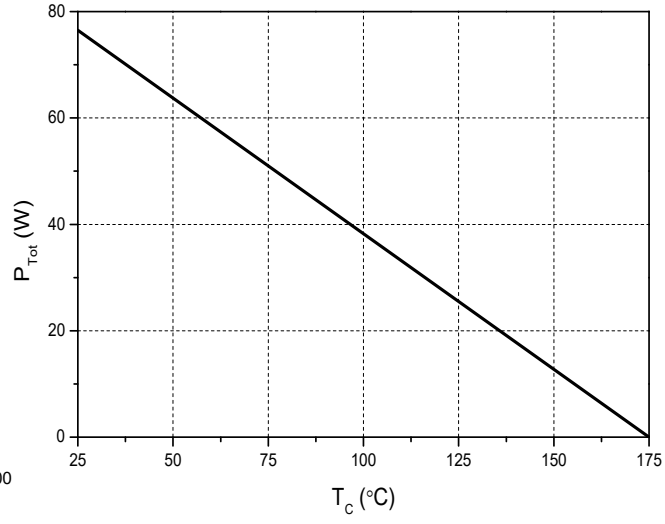



Figure 6. Power Derating

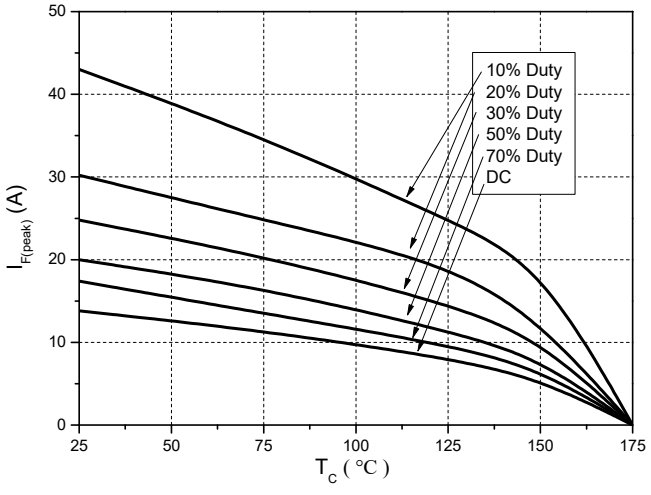



Figure 7.Current Derating

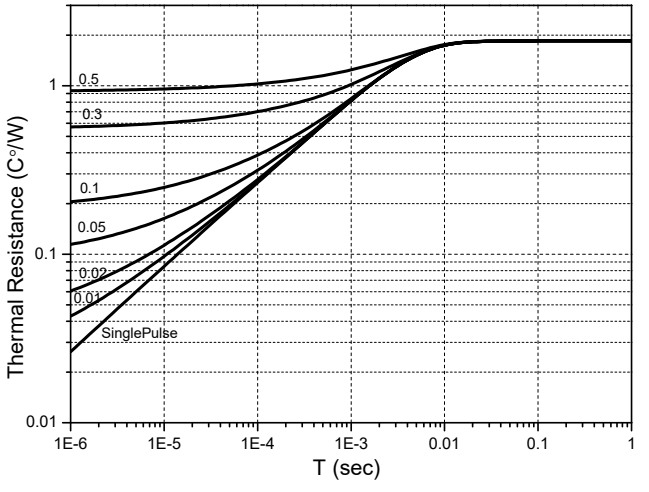
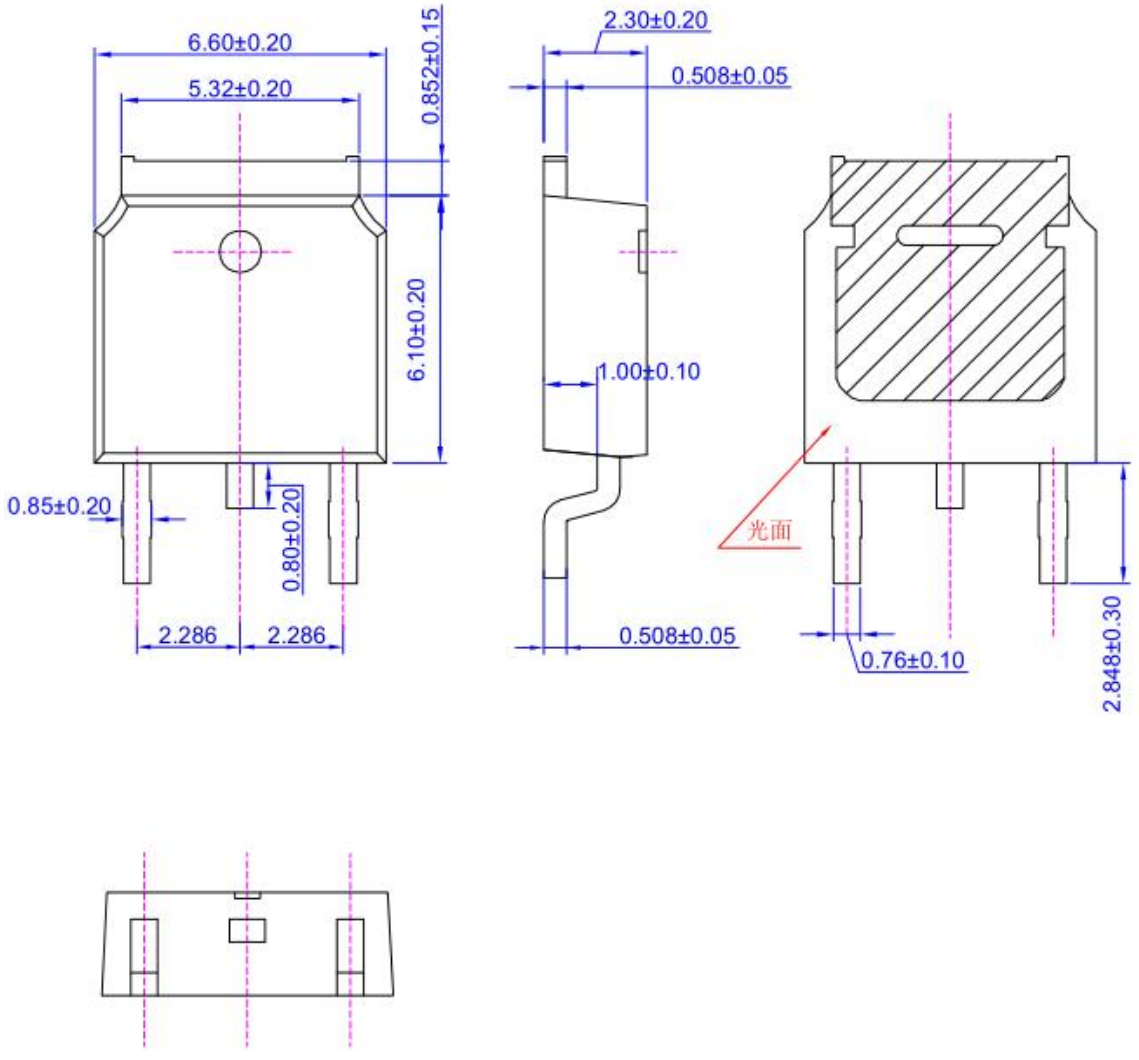



Figure 8. Transient Thermal Impedance

# TO-252 OUTLINE




NOTE：

1The plastic package is not marked as smooth surfaceRa=0.1;Subglossy surfaceRa=0.8

2.Undeclared tolerance±0.25,Unmarked filletRmax=0.25

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