

## MSD02065G1

### 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

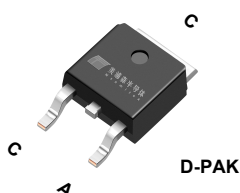
#### Benefits

- 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
- Essentially No Switching Losses

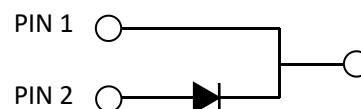
#### Applications

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

#### Package



Type : TO-252(D-PAK)



#### Absolute Maximum Ratings

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

Symbol	Parameter	MSD02065G1	Units
VRRM	Repetitive Peak Reverse Voltage	650	V
VRSM	Surge Peak Reverse Voltage	650	V
$V_{DC}$	DC Blocking Voltage	650	V
IF	Continuous Forward Current @ $T_c=150^\circ\text{C}$	2.1	A
IFRM	Repetitive Peak Forward Surge Current @ $T_c=25^\circ\text{C}$ $t_p = 10$ ms, Half Sine Wave	14	A
IFSM	Non-Repetitive Peak Forward Surge Current @ $T_c=25^\circ\text{C}$ $t_p = 10$ ms, Half Sine Wave	16	A
$I_{F_{Max}}$	Non-Repetitive Peak Forward Surge Current @ $T_c=25^\circ\text{C}$ , $t_p = 10$ us, pulse	80	A
$P_{tot}$	Power Dissipation @ $T_c=25^\circ\text{C}$ @ $T_c=110^\circ\text{C}$	46 20	W
$T_J, T_{stg}$	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$

## Package Marking

Part Number	Top Marking	Package	Packing Method	MOQ	QTY
MSD02065G1	MSD02065G1	D-Pak	Tape & Reel	5000	25000

## Electrical Characteristics

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

Symbol	Test Conditions	Test Conditions	Min	Typ	Max	Unit
VF	Forward Voltage	IF=2 A, TC=25° C IF= 2 A, TC=175° C	-	1.4 1.8	1.8 2.0	V
IR	Reverse Current	VR=650V, TC=25° C VR=650V, TC=175° C	-	2 12	20 100	μA
QC	Total Capacitive Charge	VR =400V, TJ = 25° C $Q_c = \int_0^{V_r} C(V) dv$	-	4.8	-	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	-	93 9.5 8.3	-	pF
EC	Capacitance Stored Energy	VR=400V	-	1.2	-	μJ

## Thermal Characteristics

Symbol	Parameter	Typ	Unit
$R_{\theta JC}$	Thermal Resistance from Junction to Case	3.22	°C/W

## Typical Characteristics

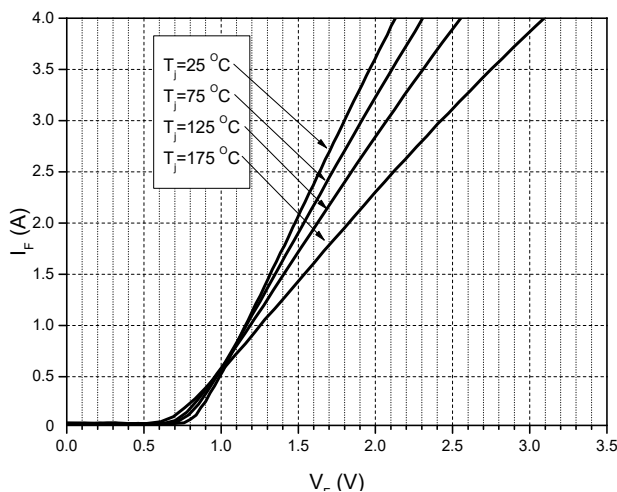


Figure 1. Forward Characteristics

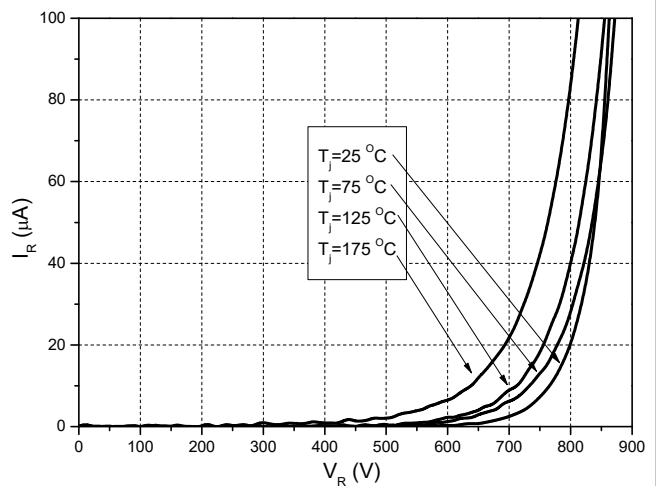


Figure 2. Reverse Characteristics

# Typical Characteristics

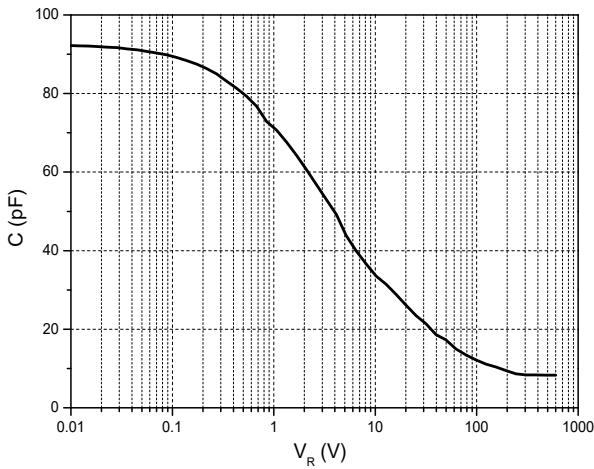


Figure 3. Capacitance vs. Reverse Voltage

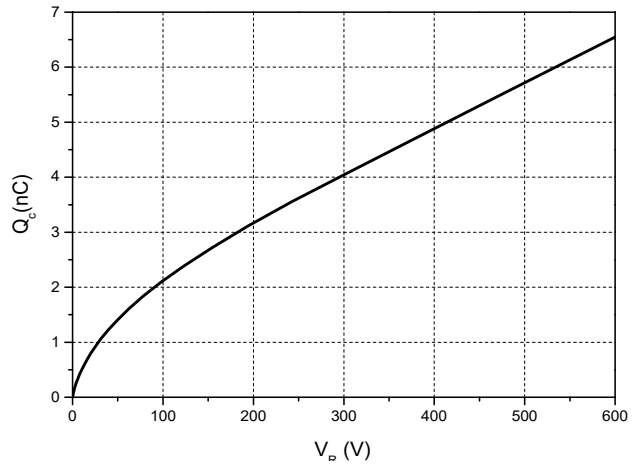


Figure 4. Total Capacitance Charge vs. Reverse Voltage

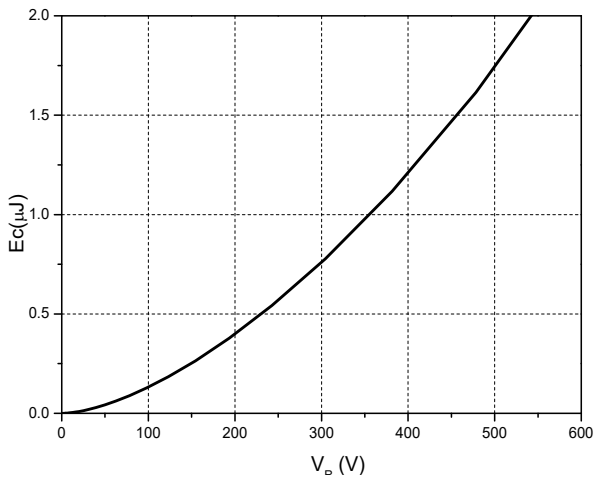


Figure 5. Capacitance Stored Energy

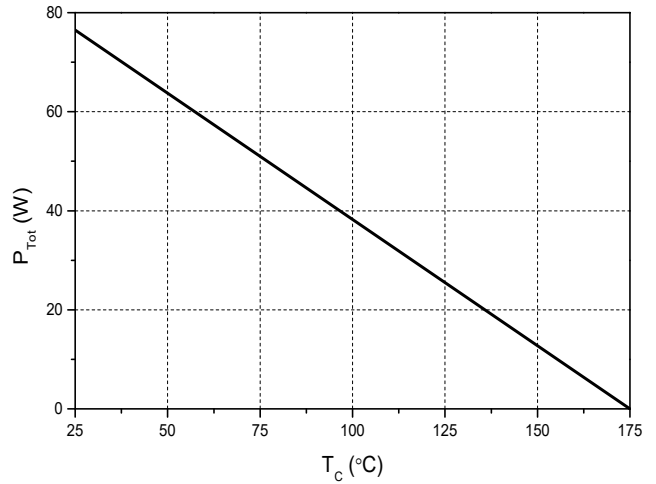


Figure 6. Power Derating

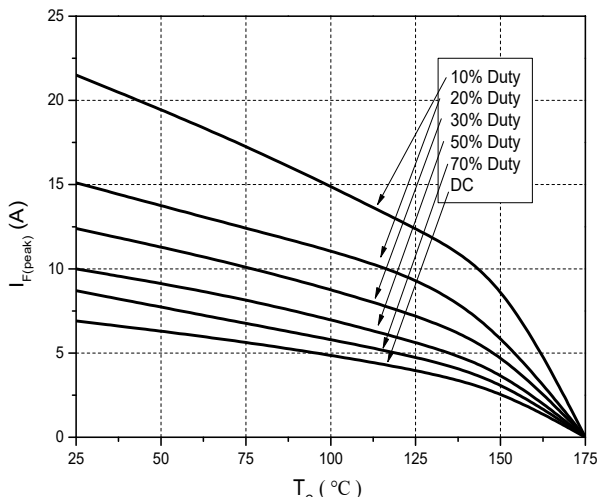


Figure 7. Current Derating

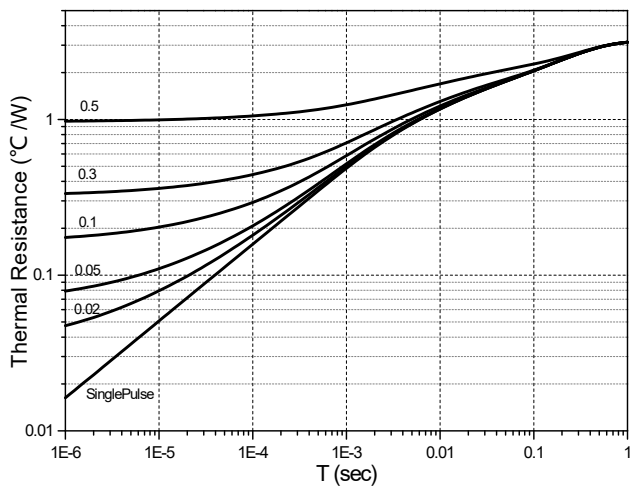
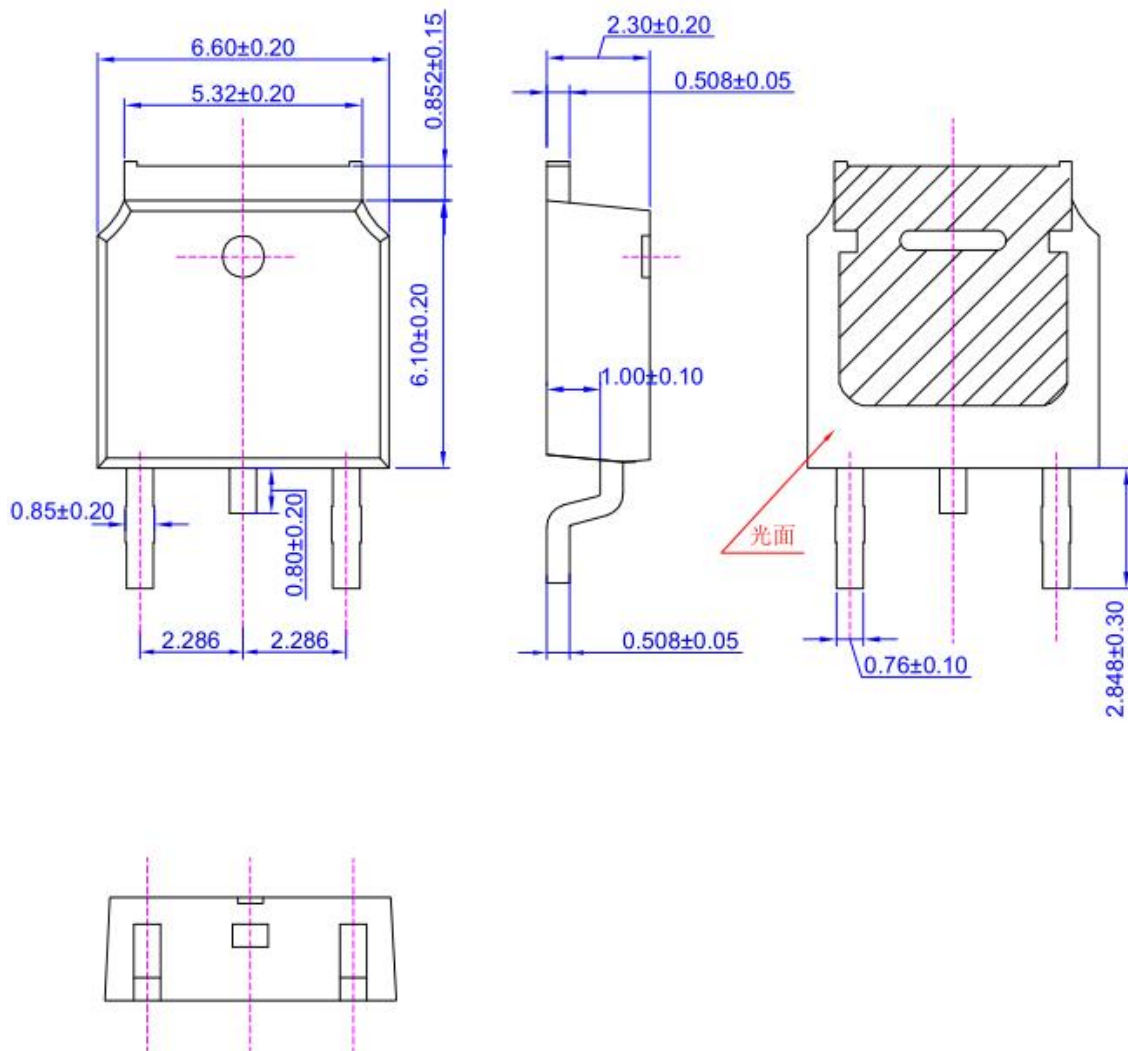


Figure 8. Transient Thermal Impedance

## TO-252 OUTLINE



## NOTE:

- 1The plastic package is not marked as smooth surface  $Ra=0.1$ ; Subglossy surface  $Ra=0.8$
- 2.Undeclared tolerance  $\pm 0.25$ , Unmarked fillet  $R_{max}=0.25$

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