

# MSF16065G1

## 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

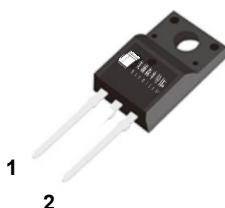
### Benefits

- 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-220F -2lead

1、Cathode 2、Anode



### Absolute Maximum Ratings

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

Symbol	Parameter	MSF16065G1	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 @ $T_c=150^\circ\text{C}$	16	A
IFRM	Repetitive Peak Forward Surge Current @ $T_c=25^\circ\text{C}$ $t_p = 10\text{ ms}$ , Half Sine Wave	105	A
IFSM	Non-Repetitive Peak Forward Surge Current @ $T_c=25^\circ\text{C}$ $t_p = 10\text{ ms}$ , Half Sine Wave	135	A
IF,Max	Non-Repetitive Peak Forward Surge Current @ $T_c=25^\circ\text{C}$ , $t_p = 10\text{ us}$	1200	A
Ptot	Power Dissipation @ $T_c=25^\circ\text{C}$ @ $T_c=110^\circ\text{C}$	205 89	W
TJ , Tstg	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$

## Electrical Characteristics

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

Symbol	Test Conditions	Test Conditions	Min	Typ	Max	Unit
VF	Forward Voltage	IF=16A, TC=25° C IF=16A, TC=175° C	-	1.45 1.75	1.8 3.0	V
IR	Reverse Current	VR=650V, TC=25° C VR=650V, TC=175° C	-	4 40	20 200	μA
QC	Total Capacitive Charge	VR =400V, IF =16A TJ = 25° C $Q_c = \int_0^{t_r} C (V) dv$	-	41	-	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	-	860 85 60	-	pF
EC	Capacitance Stored Energy	VR=400V	-	8.2	-	μJ

## Thermal Characteristics

Symbol	Parameter	Typ	Unit
RθJC	Thermal Resistance from Junction to Case	0.73	°C/W

## Typical Characteristics

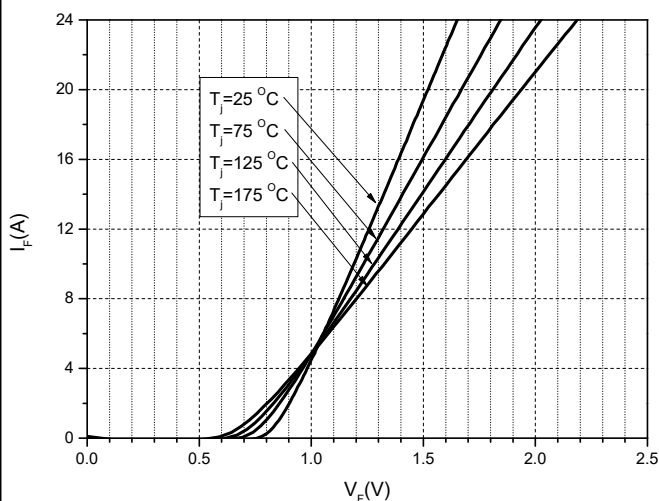


Figure 1. Forward Characteristics

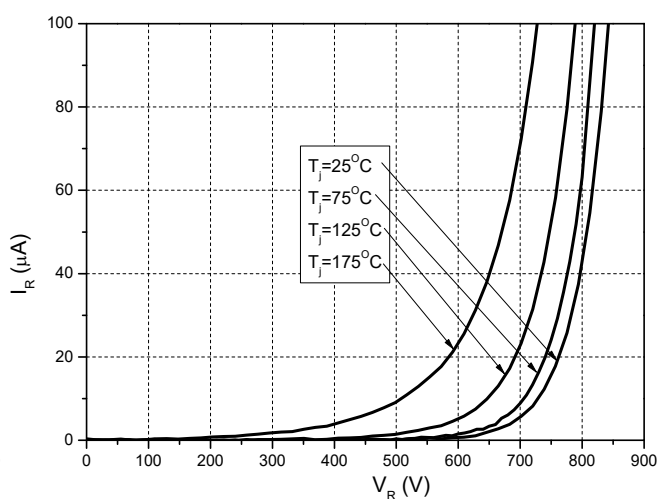


Figure 2. Reverse Characteristics

# Typical Characteristics

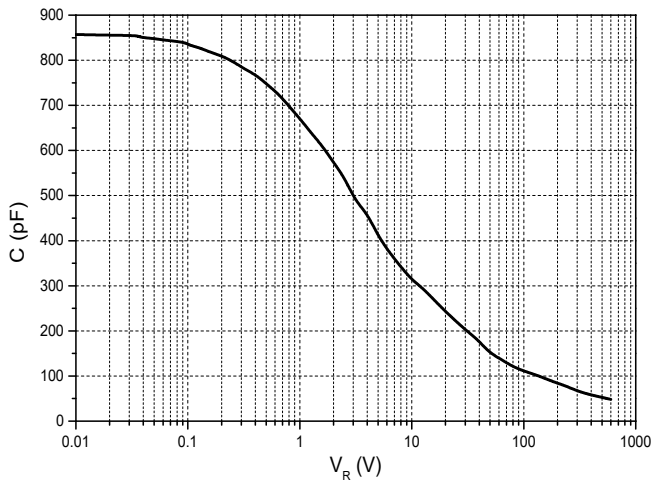


Figure 3. Capacitance vs. Reverse Voltage

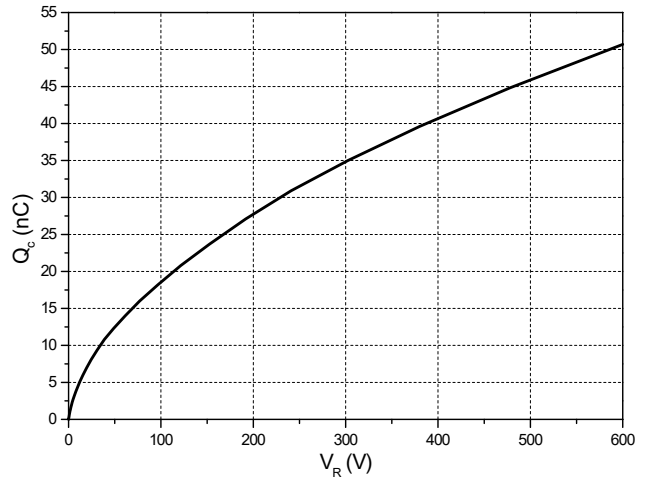


Figure 4. Total Capacitance Charge vs. Reverse Voltage

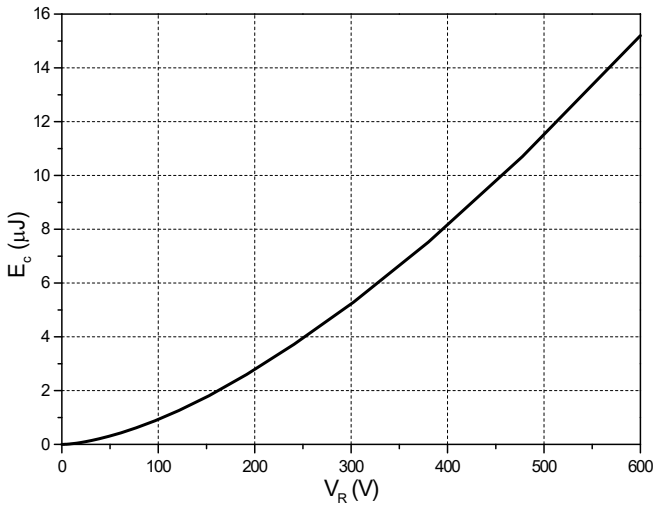


Figure 5. Capacitance Stored Energy

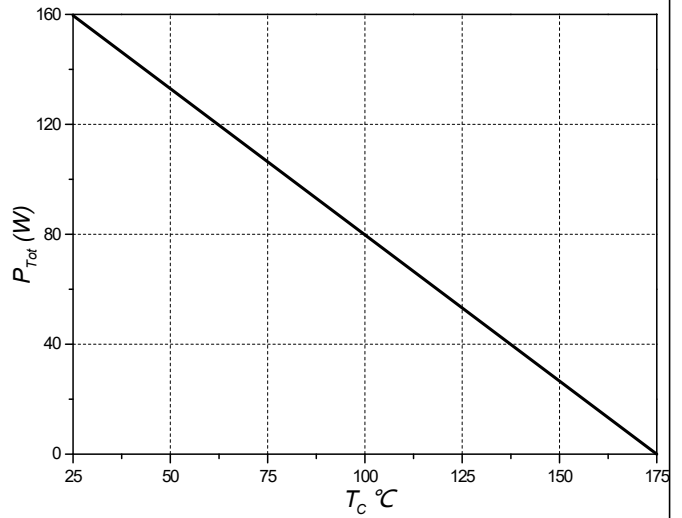


Figure 6. Power Derating

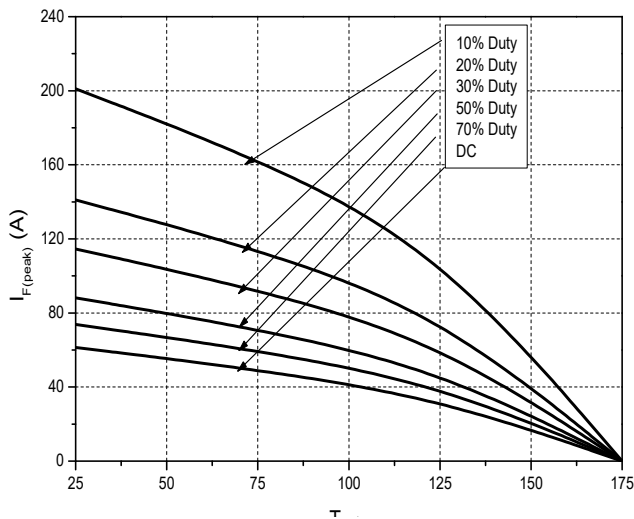


Figure 7. Current Derating

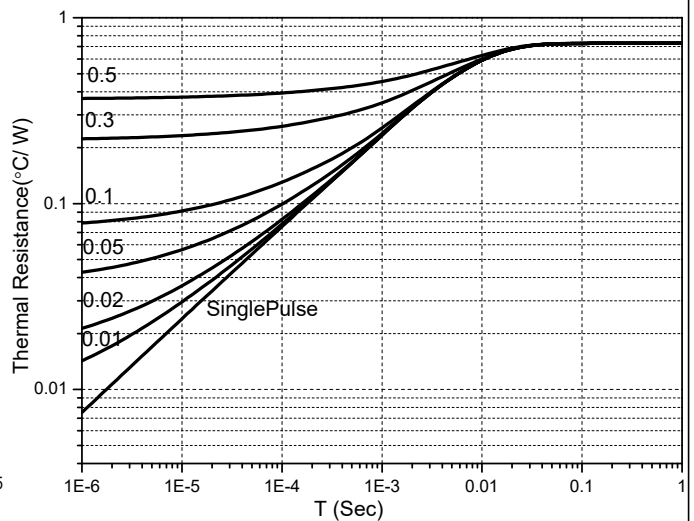
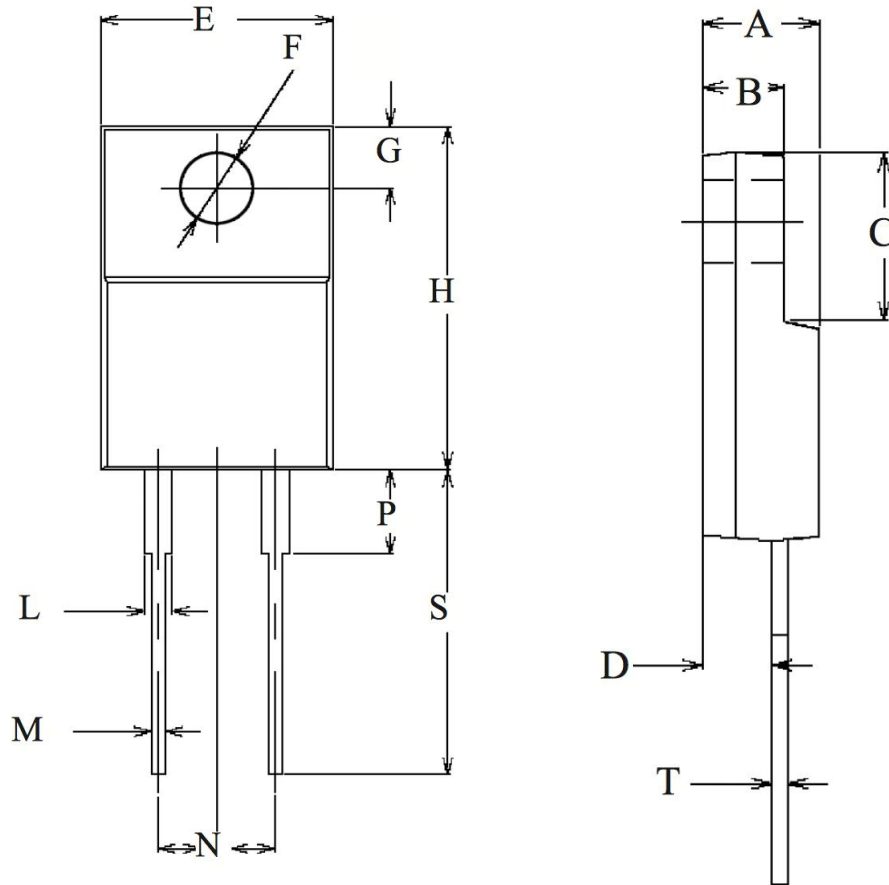


Figure 8. Transient Thermal Impedance

# Package Dimensions TO-220F-2Lead



Symbol	Dimensions In Millimeters		Dimensions In Inches		Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	4.5	4.93	0.177	0.194	H	15.67	16.07	0.617	0.633
B	2.34	2.74	0.092	0.108	L	1	1.4	0.039	0.055
C	6.5	6.9	0.256	0.272	M	0.4	0.91	0.016	0.036
D	2.5	2.96	0.098	0.117	N	5.08 TYP		0.200 TYP	
E	9.9	10.36	0.39	0.408	P	1.9	3.9	0.114	0.154
F	2.98	3.4	0.117	0.134	S	12.1	13.18	0.476	0.519
G	3.1	3.5	0.122	0.138	T	0.4	0.8	0.016	0.031

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