

NF3D06065AF

Silicon Carbide Schottky Diode

V_{RRM}	=	650 V
$I_F (T_C = 146^\circ\text{C})$	=	6 A
Q_C	=	22 nC

Features

- 650 V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching

Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- High Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

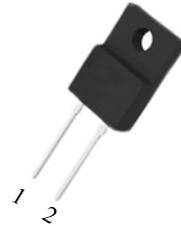
Applications

- Switching Mode Power Supply
- Boost Diodes in PFC
- DC/DC Converters
- AC/DC Converters
- Free Wheeling Diodes in Inverter

Maximum Ratings $(T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V		
V_{RSM}	Surge Peak Reverse Voltage	650	V		
V_R	DC Peak Reverse Voltage	650	V		
I_F	Continuous Forward Current	16.5 8.5 6	A	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ $T_C = 146^\circ\text{C}$	Fig. 3
I_{FSM}	Non-Repetitive Forward Surge Current	66	A	$T_C = 25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Pulse	
P_{tot}	Power Dissipation	55 24	W	$T_C = 25^\circ\text{C}$ $T_C = 110^\circ\text{C}$	Fig. 4
T_J	Operating Junction Range	-55 to +175	$^\circ\text{C}$		
T_{stg}	Storage Temperature Range	-55 to +175	$^\circ\text{C}$		

Package



TO-220F



Part Number	Package	Marking
NF3D06065AF	TO-220F	NF3D06065AF

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.38 1.8	1.65 2.4	V	$I_F = 6\text{ A}, T_J = 25^\circ\text{C}$ $I_F = 6\text{ A}, T_J = 175^\circ\text{C}$	Fig. 1
I_R	Reverse Current	2 15	50 180	μA	$V_R = 650\text{ V}, T_J = 25^\circ\text{C}$ $V_R = 650\text{ V}, T_J = 175^\circ\text{C}$	Fig. 2
Q_C	Total Capacitive Charge	22		nC	$V_R = 400\text{ V}, I_F = 6\text{ A},$ $T_J = 25^\circ\text{C}$	Fig. 6
C	Total Capacitance	398 43 33		pF	$V_R = 0\text{ V}, T_J = 25^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 200\text{ V}, T_J = 25^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 400\text{ V}, T_J = 25^\circ\text{C}, f = 1\text{ MHz}$	Fig. 5
E_C	Capacitance Stored Energy	2.8		μJ	$V_R = 400\text{ V}$	Fig. 7

Note: This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case		2.7		$^\circ\text{C/W}$	Fig.8

Typical Performance

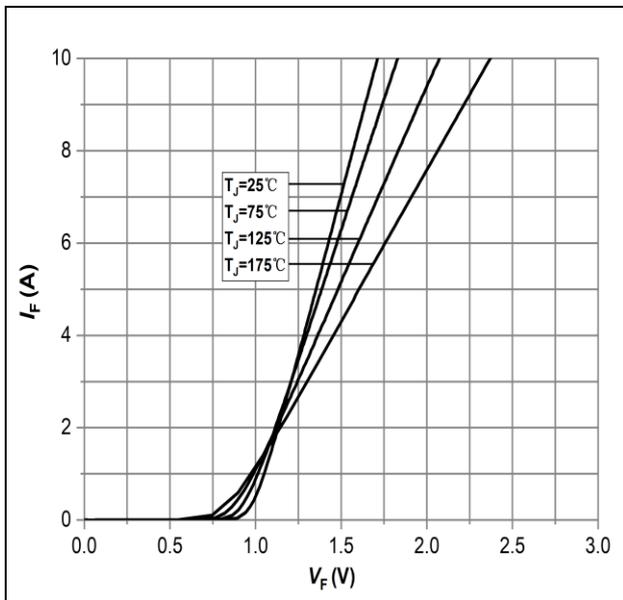


Figure 1: Forward Characteristics

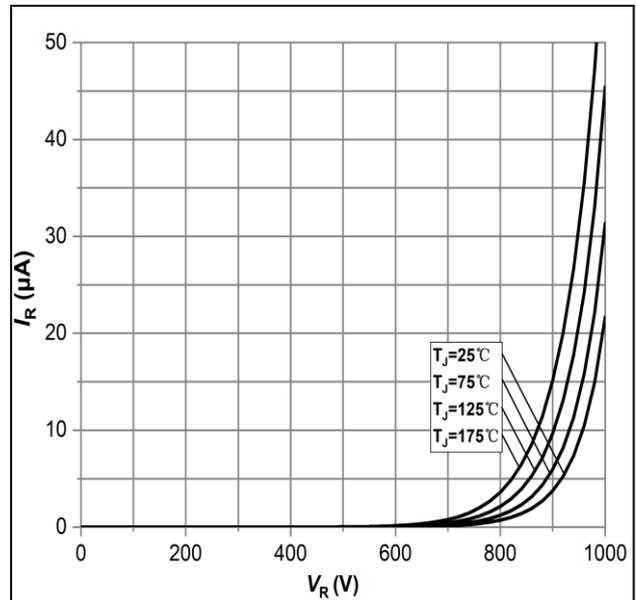


Figure 2: Reverse Characteristics

Typical Performance

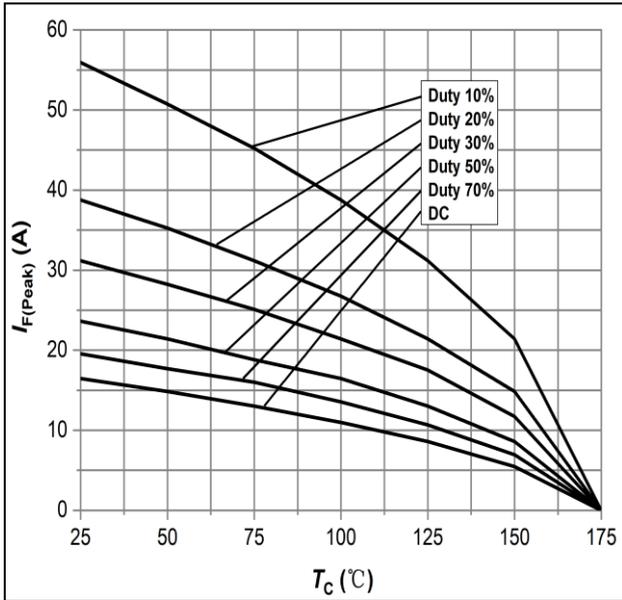


Figure 3: Current Derating

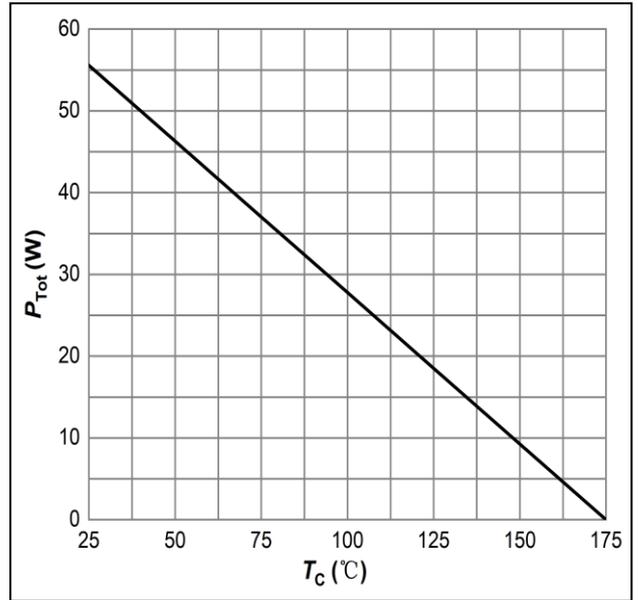


Figure 4: Power Derating

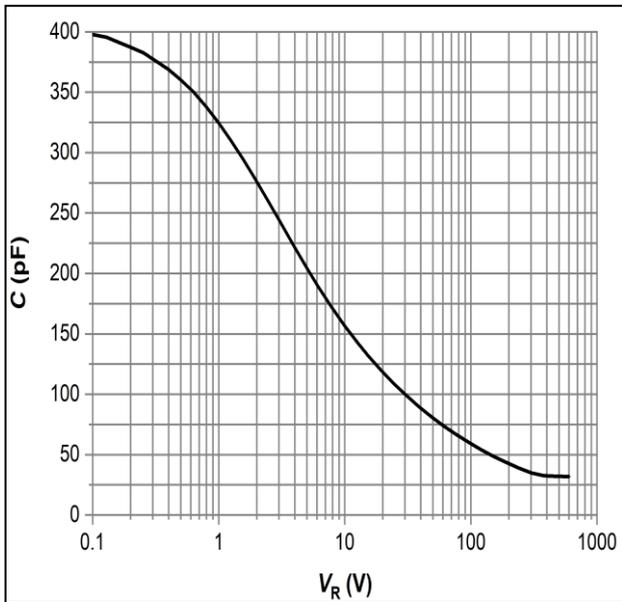


Figure 5: Capacitance vs. Reverse Voltage

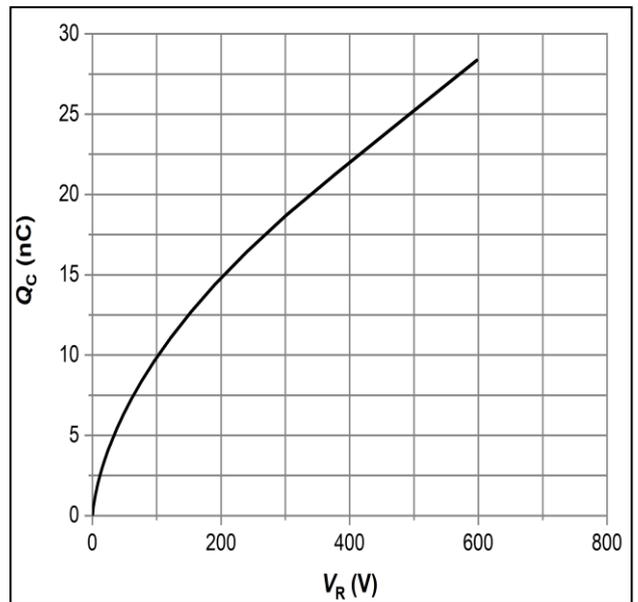


Figure 6: Total Capacitance Charge vs. Reverse Voltage

Typical Performance

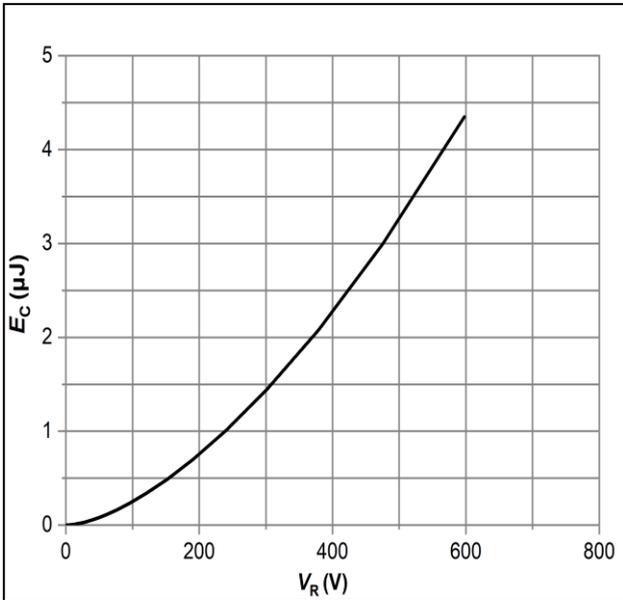


Figure 7: Typical Capacitance Stored Energy

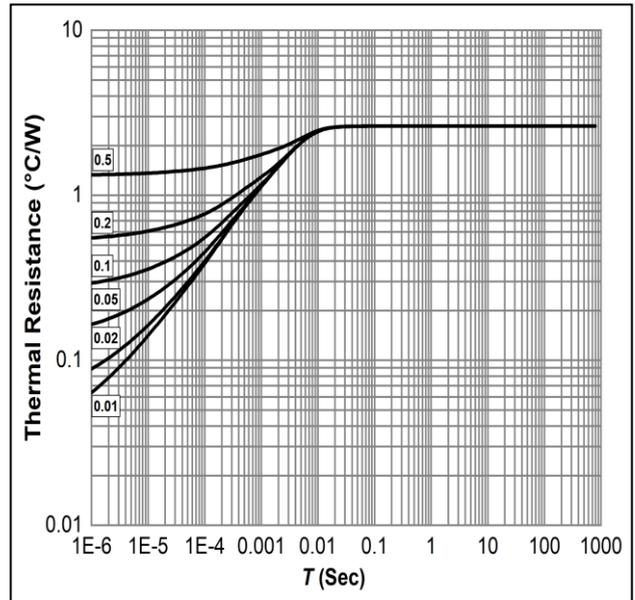
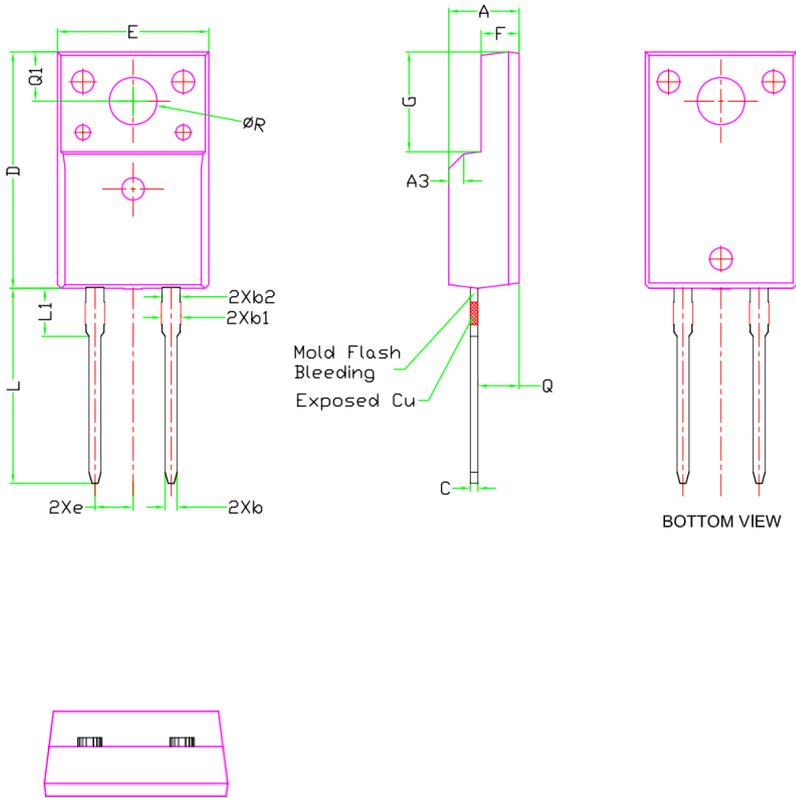


Figure 8: Transient Thermal Impedance

Package Dimensions

Package: TO-220F



SYMBOL	DIMENSIONS		
	Min.	Nom.	Max.
A	4.60	4.70	4.80
b	0.70	0.80	0.91
b1	1.20	1.30	1.47
b2	1.10	1.20	1.30
C	0.45	0.50	0.63
D	15.80	15.87	15.97
e	2.54		
E	10.00	10.10	10.30
F	2.44	2.54	2.64
G	6.50	6.70	6.90
L	12.90	13.10	13.30
L1	3.13	3.23	3.33
Q	2.65	2.75	2.85
Q1	3.20	3.30	3.40
ΦR	3.08	3.18	3.28

Note:

1. All Dimension Are In mm.
2. Package Body Sizes Exclude Mold Flash And Burrs
Mold Flash Should Be Less Than 6 Mil.