

GC3D010065E

Silicon Carbide Schottky Diode

V_{RRM}	=	650	V
$I_{F(Tc=150^{\circ}C)}$	=	10	A
Q_C	=	28	nC

Features

- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Positive Temperature Coefficient on VF

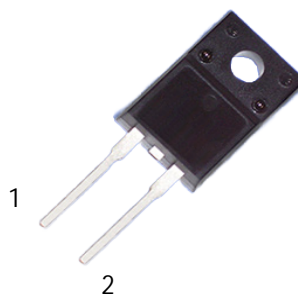
Benefits

- Replace Bipolar with Unipolar Rectifiers
- Higher System Efficiency
- Reduced Cooling Requirements
- Parallel Devices Without Thermal Runaway

Applications

- Switch Mode Power Supplies(SMPS)
- Server/TelecomPowerSupplies
- IndustrialPowerSupplies
- SolarInverters

Package



Part Number	Package
GC3D010065E	TO-220F-2L

Maximum Ratings ($T_c = 25^{\circ}C$ 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_{DC}	DC Blocking Voltage	650	V		
I_F	Continuous Forward Current	10	A	$T_C=150^{\circ}C$	Fig. 7
I_{FRM}	Repetitive Peak Forward Surge Current	80	A	$T_C=25^{\circ}C$, $t_p=10$ ms, Half Sine Wave,	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	105	A	$T_C=25^{\circ}C$, $t_p=10$ ms, Half Sine Wave	
$I_{F,Max}$	Non-Repetitive Peak Forward Surge Current	840	A	$T_C=25^{\circ}C$, $t_p= 10$ μ s, Pulse	
P_{tot}	Power Dissipation	138 60	W	$T_C=25^{\circ}C$ $T_C=110^{\circ}C$	Fig. 6
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	$^{\circ}C$		

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.45 1.75	1.70 2.00	V	$I_F = 10\text{ A } T_J = 25^\circ\text{C}$ $I_F = 10\text{ A } T_J = 175^\circ\text{C}$	Fig. 1
I_R	Reverse Current	2 40	20 200	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	28		nC	$V_R = 400\text{ V}, I_F = 10\text{ A}, T_J = 25^\circ\text{C}$ $Q_C = \int_0^{V_R} C(V) dV$	Fig. 4
C	Total Capacitance	550 53 48		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. 3
E_C	Capacitance Stored Energy	7.0		μJ	$V_R = 400\text{ V}$	Fig. 5

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1.09	$^\circ\text{C/W}$	Fig. 8

Typical Performance

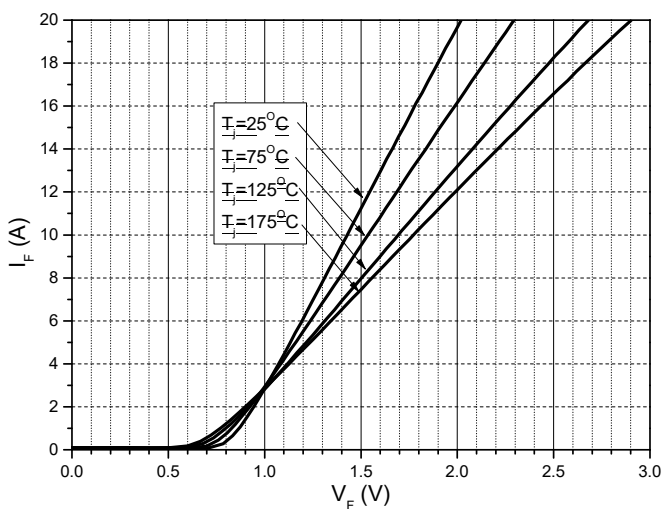


Figure 1. Forward Characteristics

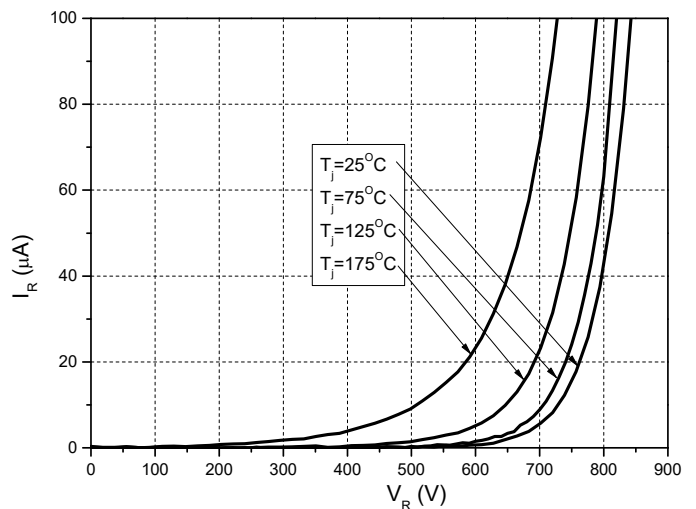


Figure 2. Reverse Characteristics

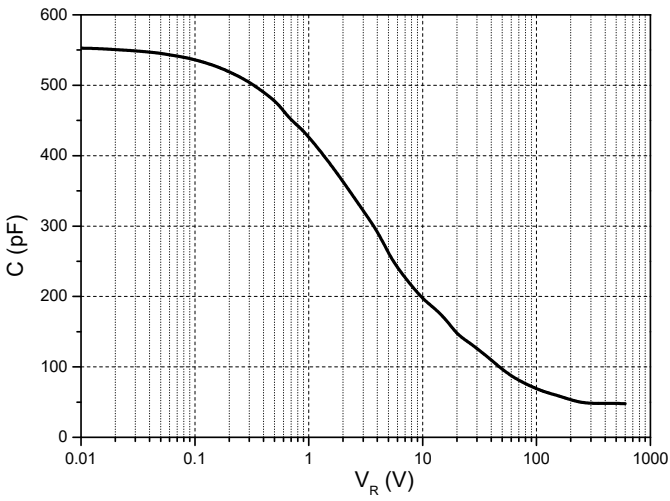


Figure 3. Capacitance vs. Reverse Voltage

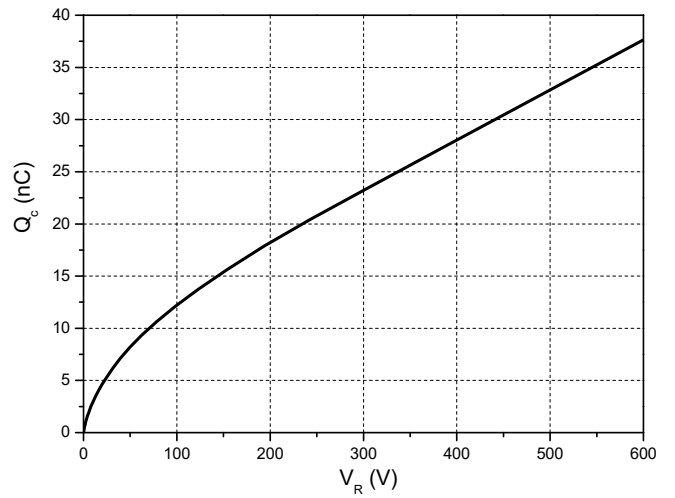


Figure 4. Total Capacitance Charge vs. Reverse Voltage

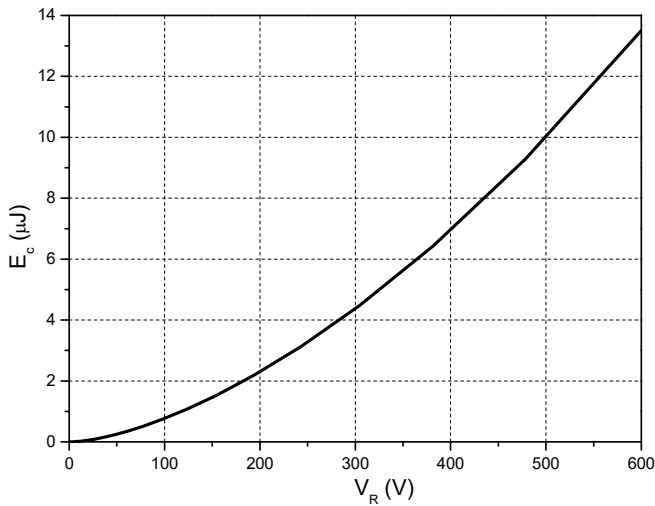


Figure 5. Capacitance Stored Energy

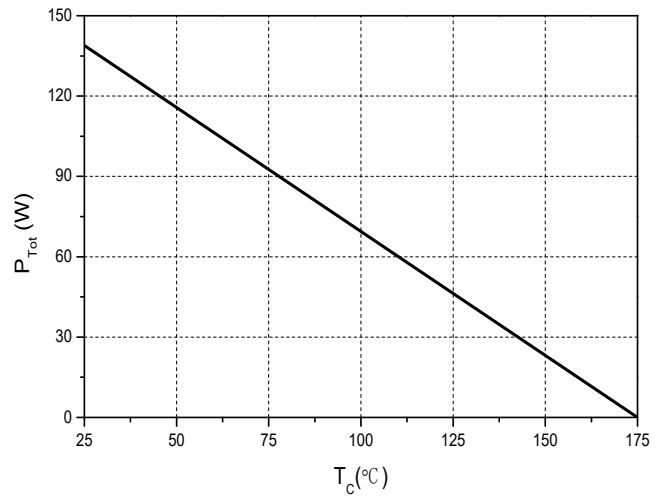


Figure 6. Power Derating

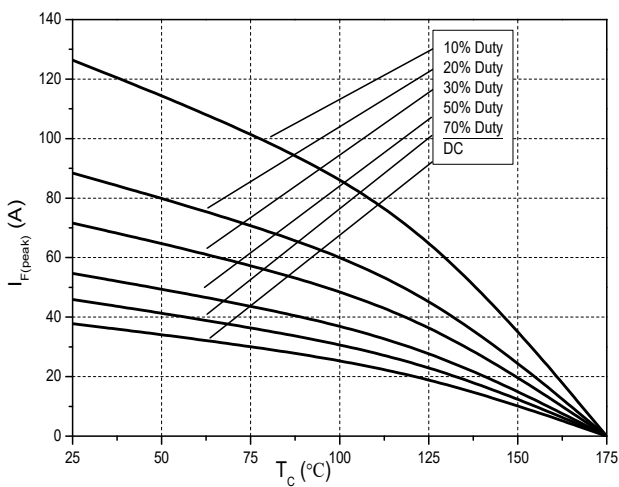


Figure 7. Current Derating

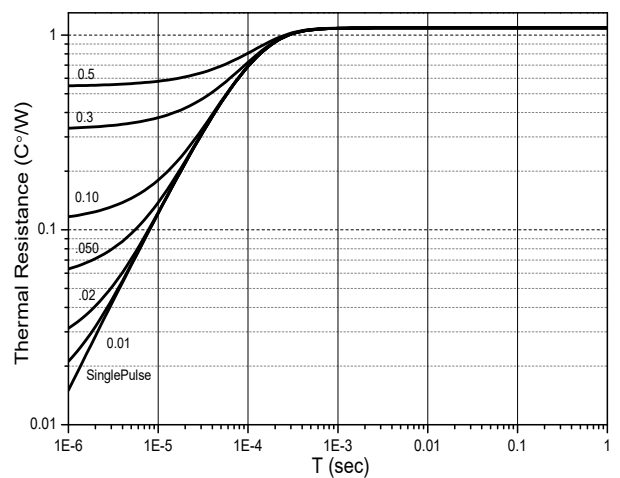
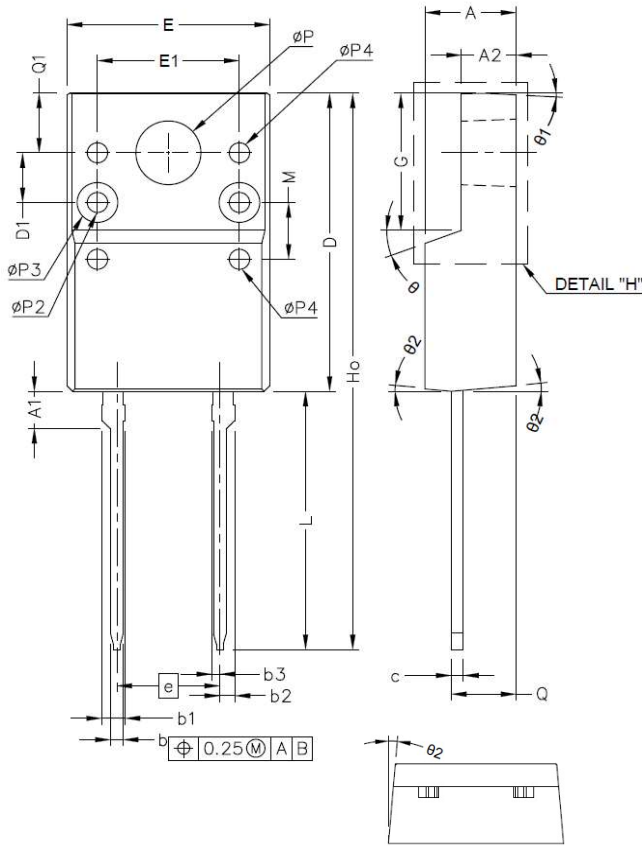


Figure 8. Transient Thermal Impedance

Package Dimensions: TO-220F-2L



SYMBOL	MIN (mm)	MAX (mm)
A	4.30	4.93
A1	1.80	3.90
A2	2.34	2.90
b	0.40	0.91
b1	1.00	1.40
b2	0.56	0.93
b3	0.24	0.55
C	0.40	0.80
D	14.70	16.07
D1	2.50 TYP	
D2	2.66 TYP	
e	4.83	5.33
E	9.70	10.36
E1	7.00 TYP	
G	6.50	7.10
Ho	28 TYP	
L	12.10	13.50
L1	0.50	
M	2.86 TYP	
ØP	2.98	3.40
Q	3.10	3.30
Q1	2.70	3.50
Ø	20° TYP	
Ø1	3° TYP	
Ø2	5° TYP	

