

GC3D020065D

Silicon Carbide Schottky Diode

V_{RRM}	=	650	V
$I_{F(Tc=150^{\circ}C)}$	=	20	A
Q_C	=	33	nC

Features

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

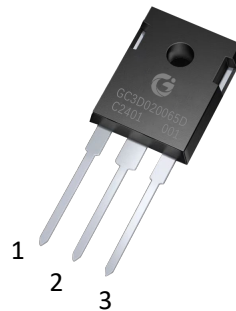
Benefits

- 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
GC3D020065D	TO-247-3L

Maximum Ratings (T_c = 25°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°C	
I_{FRM}	Repetitive Peak Forward Surge Current	70*	A	T _c =25°C, t _p =10 ms, Half Sine Wave	Fig. 7
I_{FSM}	Non-Repetitive Peak Forward Surge Current	90*	A	T _c =25°C, t _p =10ms, Half Sine Wave	
$I_{F,Max}$	Non-Repetitive Peak Forward Surge Current	800*	A	T _c =25°C, t _p = 10 μs, Pulse	
P_{tot}	Power Dissipation	150* 64*	W	T _c =25°C T _c =110°C	Fig. 6
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	°C		

*Per Leg, ** Per Device

Electrical Characteristics (Per Leg)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.5 2.0	1.8 2.5	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	1 10	5 30	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	33		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	514 54 45		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	6.5		μJ	$V_R = 400\text{ V}$	Fig. 5

Thermal Characteristics (Per Leg)

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.99	$^\circ\text{C/W}$	Fig. 8

Typical Performance(Per Leg)

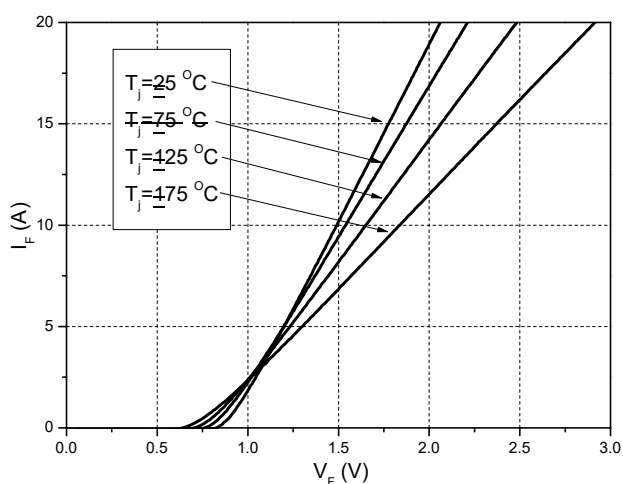


Figure 1. Forward Characteristics

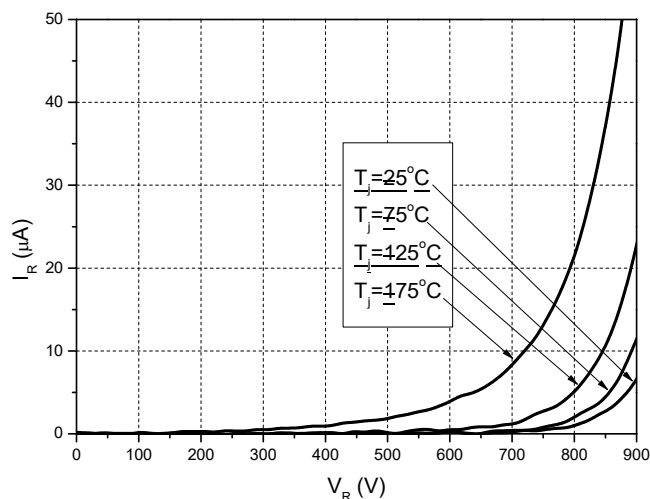


Figure 2. Reverse Characteristics

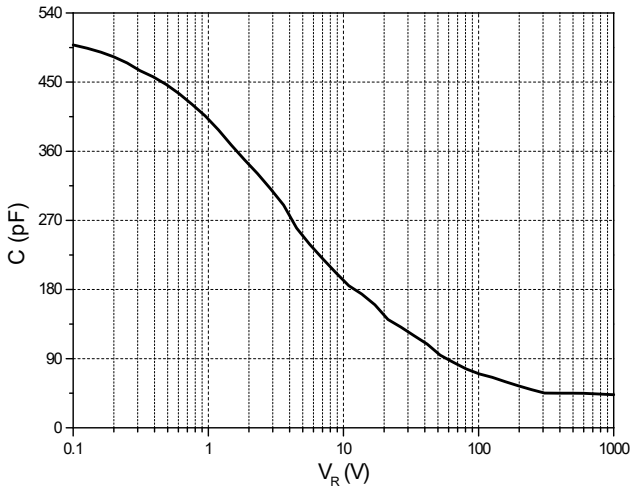


Figure 3. Capacitance vs. Reverse Voltage

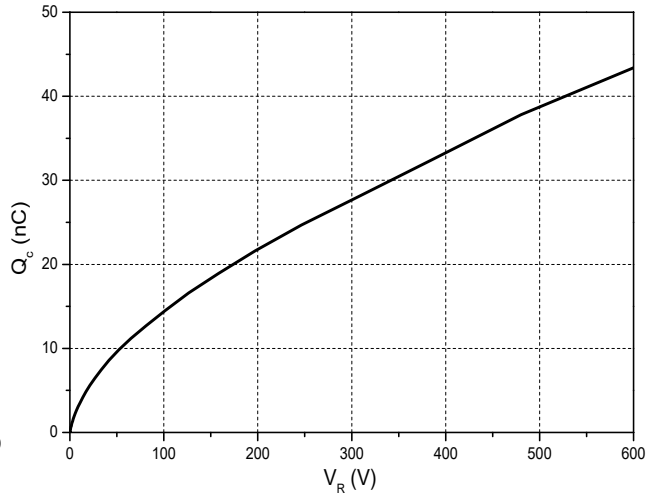


Figure 4. Total Capacitance Charge vs. Reverse Voltage

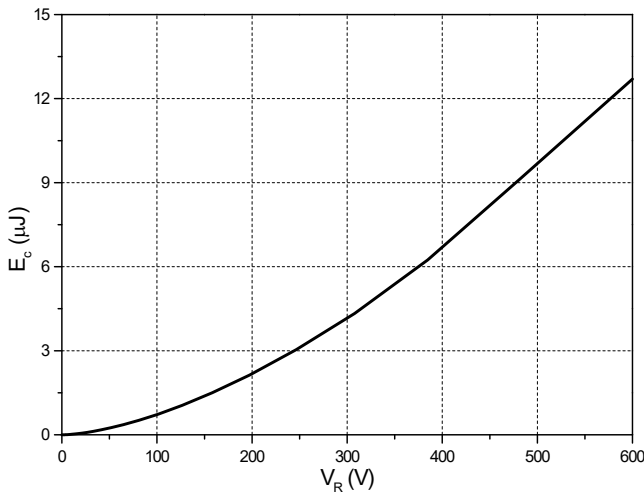


Figure 5. Capacitance Stored Energy

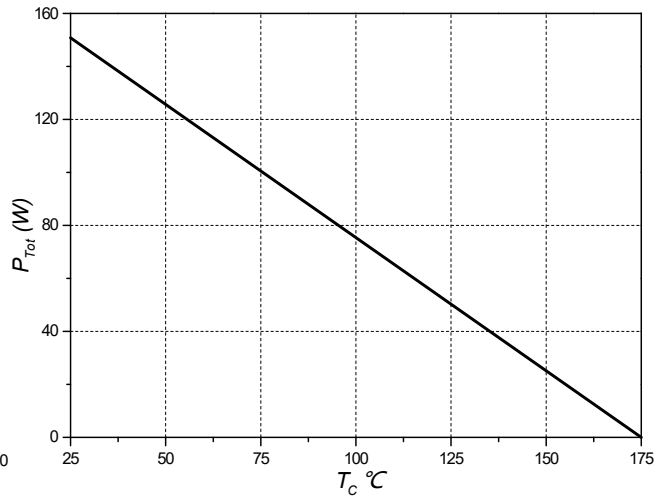


Figure 6. Power Derating

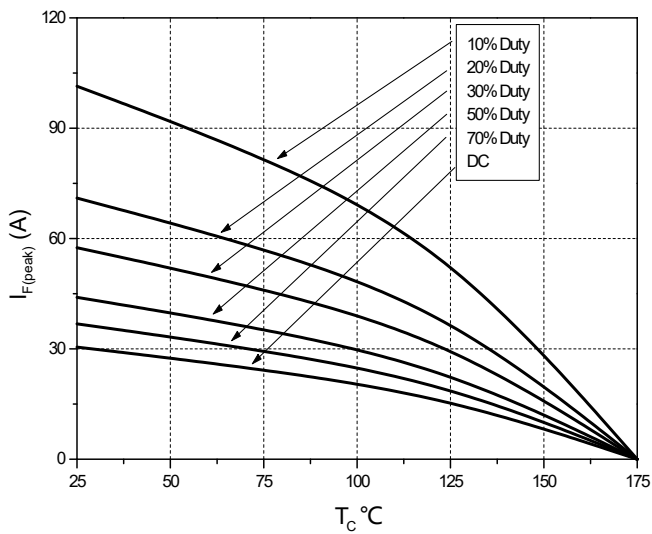


Figure 7. Current Derating

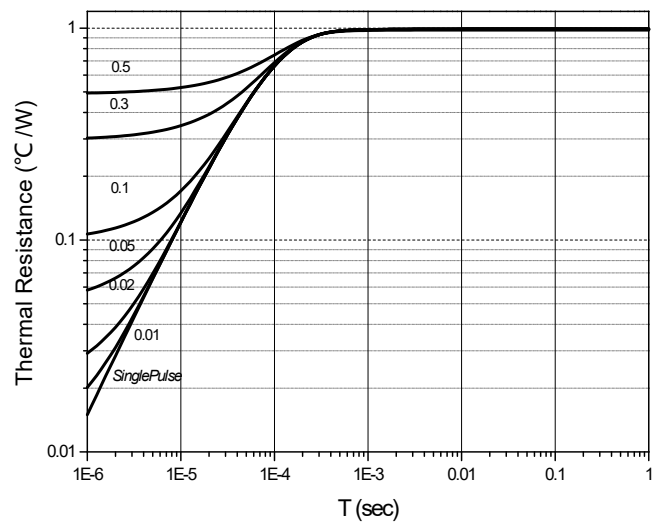
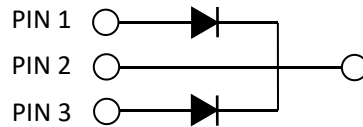
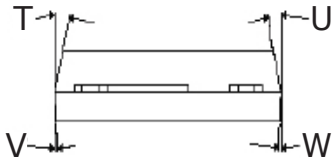
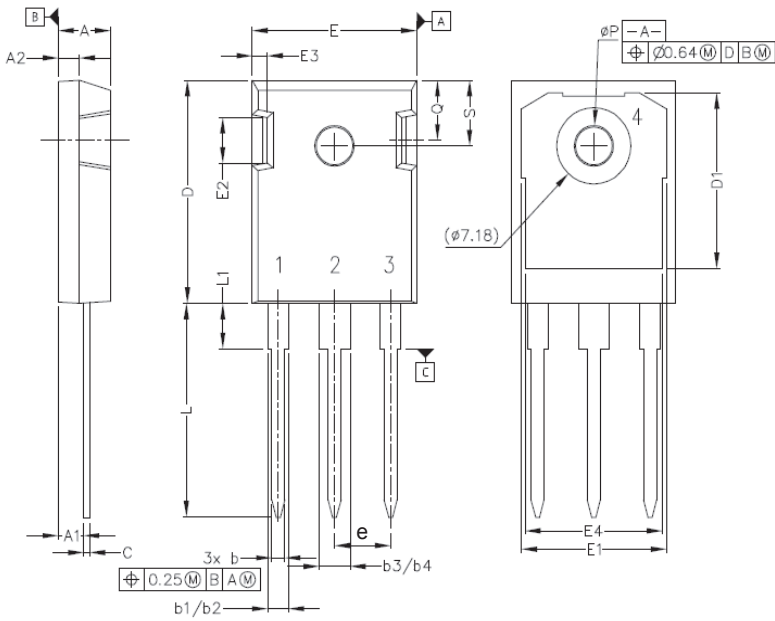


Figure 8. Transient Thermal Impedance

Package Dimensions: TO-247-3L



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.042	.052	1.07	1.33
b1	.075	.095	1.91	2.41
b2	.075	.085	1.91	2.16
b3	.113	.133	2.87	3.38
b4	.113	.123	2.87	3.13
c	.022	.027	0.55	0.68
D	.819	.831	20.80	21.10
D1	.640	.695	16.25	17.65
D2	.037	.049	0.95	1.25
E	.620	.635	15.75	16.13
E1	.516	.557	13.10	14.15
E2	.145	.201	3.68	5.10
E3	.039	.075	1.00	1.90
E4	.487	.529	12.38	13.43
e	.214 BSC		5.44 BSC	
N	3		3	
L	.780	.800	19.81	20.32
L1	.161	.173	4.10	4.40
ØP	.138	.144	3.51	3.65
Q	.216	.236	5.49	6.00
S	.238	.248	6.04	6.30
T	9°	11°	9°	11°
U	9°	11°	9°	11°
V	2°	8°	2°	8°
W	2°	8°	2°	8°