



Features

- 1.7kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching
- Positive Temperature Coefficient on V_F

Benefits

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

Applications

- Switch Mode Power Supplies (SMPS)
- Boost diodes in PFC or DC/DC stages
- Free Wheeling Diodes in Inverter stages
- AC/DC converters
- 1500V Solar Inverter

Part Number	Package
GC5D05170H	TO-247-2

V_{RRM}	=	1700 V
$I_F, T_c < 135^\circ\text{C}$	=	8.8A
Q_c	=	69 nC



Package

TO-247-2



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

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1700	V		
V_R	DC Peak Reverse Voltage	1700	V		
I_F	Continuous Forward Current	18 8.8 5.0	A	$T_c=25^\circ\text{C}$ $T_c=135^\circ\text{C}$ $T_c=160^\circ\text{C}$	Fig. 3
I_{FRM}	Repetitive Peak Forward Surge Current	30 16	A	$T_c=25^\circ\text{C}, t_p=10\text{ ms}$, Half Sine Pulse $T_c=110^\circ\text{C}, t_p=10\text{ ms}$, Half Sine Pulse	
I_{FSM}	Non-Repetitive Forward Surge Current	32 24	A	$T_c=25^\circ\text{C}, t_p=10\text{ ms}$, Half Sine Pulse $T_c=110^\circ\text{C}, t_p=10\text{ ms}$, Half Sine Pulse	
P_{tot}	Power Dissipation	115 50	W	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	Fig. 4
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$		
	TO-247 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.5 2.2	1.8 2.5	V	$I_F = 5\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 5\text{ A}$ $T_J = 175^\circ\text{C}$	Fig. 1
I_R	Reverse Current	20 120	200 300	μA	$V_R = 1700\text{ V}$ $T_J = 25^\circ\text{C}$ $V_R = 1700\text{ V}$ $T_J = 175^\circ\text{C}$	Fig. 2
Q_C	Total Capacitive Charge	69		nC	$V_R = 1700\text{ V}$, $I_F = 5\text{ A}$ $di/dt = 200\text{ A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$	Fig. 5
C	Total Capacitance	425 34 33		pF	$V_R = 0\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 800\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 1700\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$	Fig. 6
E_C	Capacitance Stored Energy	49		μJ	$V_R = 1700\text{ V}$	Fig. 7

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

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1.3	$^\circ\text{C}/\text{W}$	Fig. 8

Typical Performance

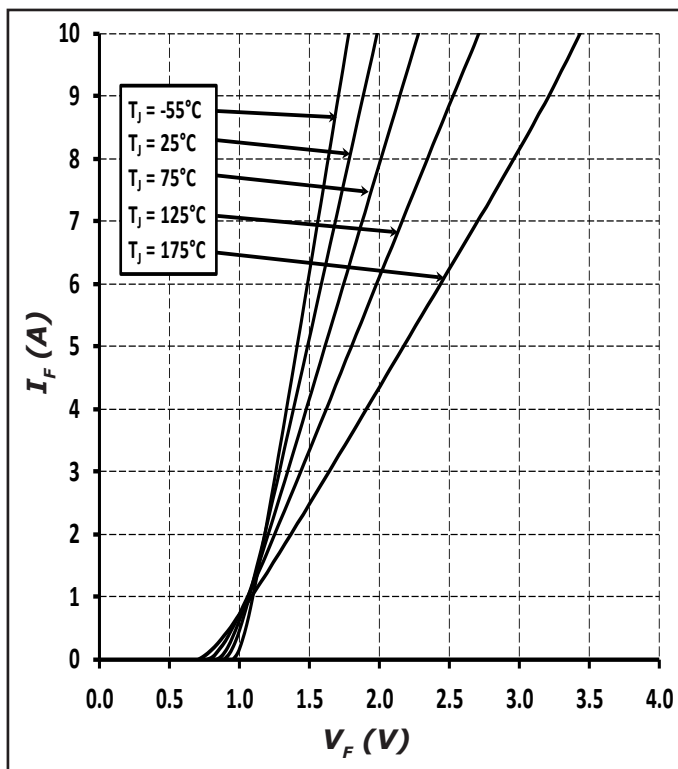


Figure 1. Forward Characteristics

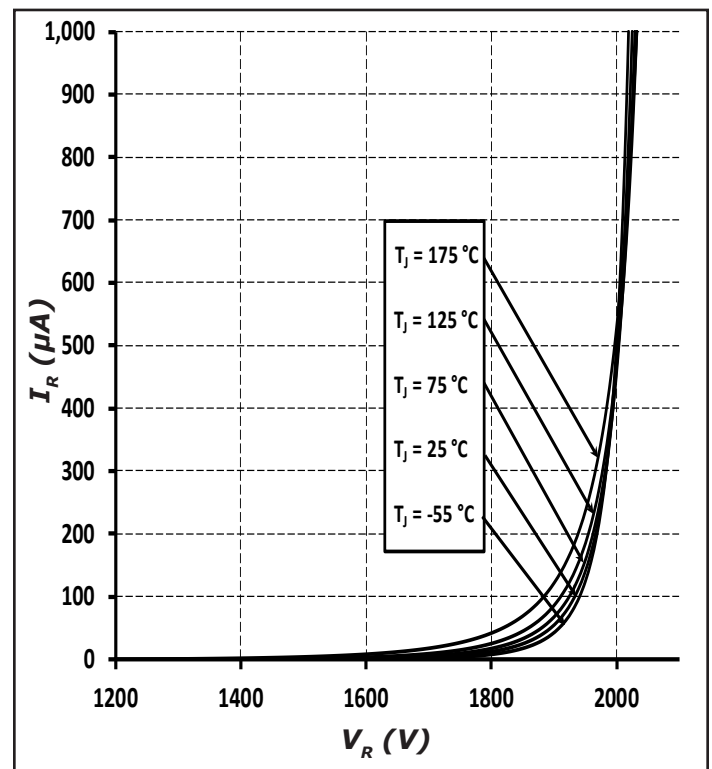


Figure 2. Reverse Characteristics



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Wuxi Gwok Semiconductor Co.,Ltd

GC5D05170H
Silicon Carbide Schottky Diode

Typical Performance

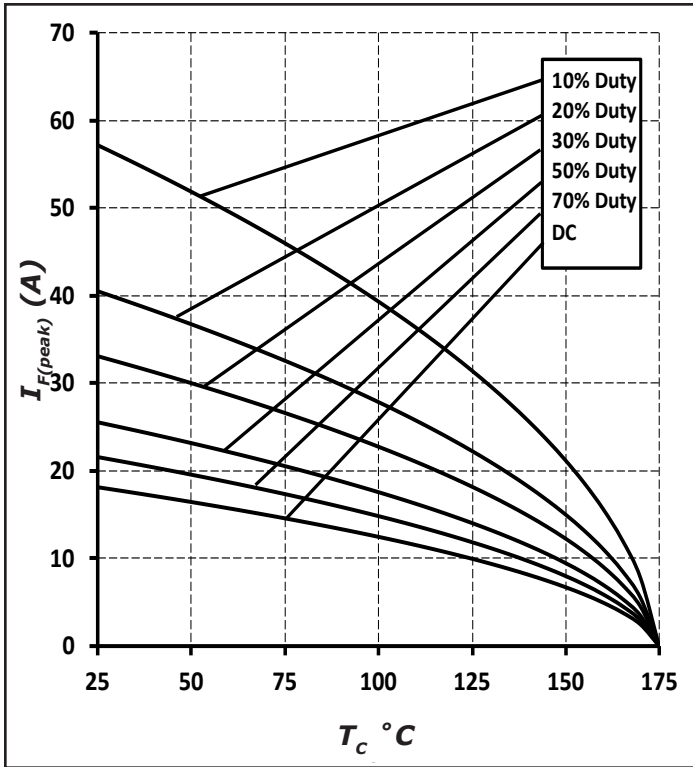


Figure 3. Current Derating

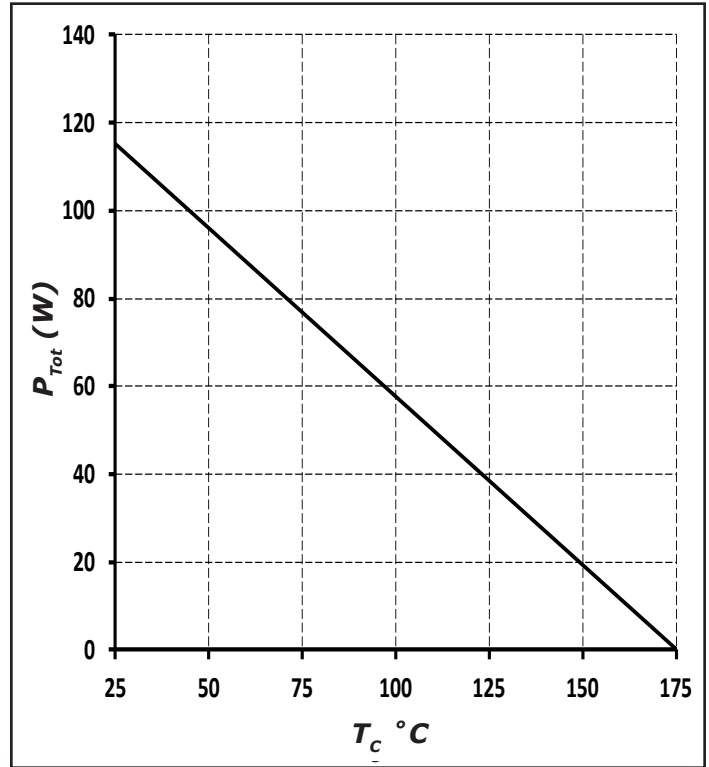


Figure 4. Power Derating

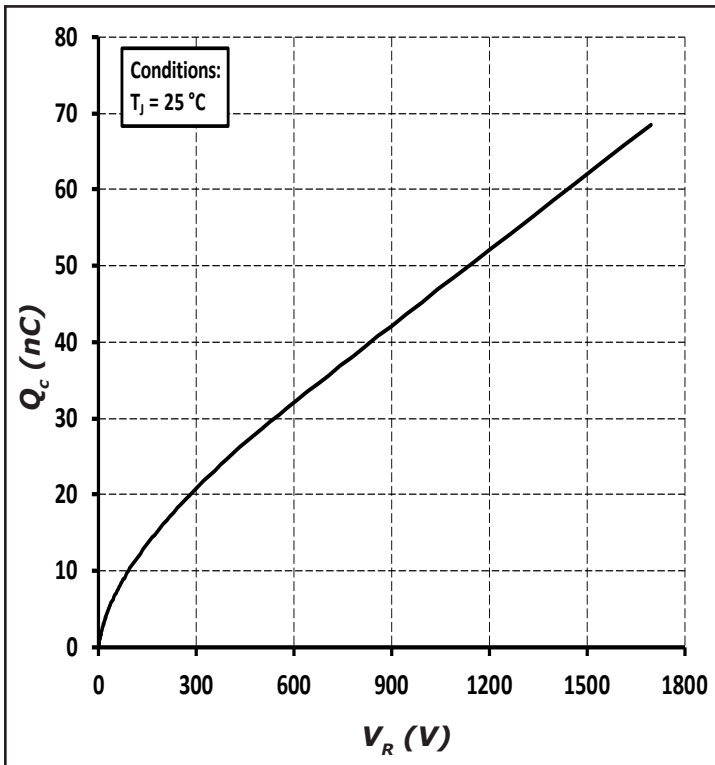


Figure 5. Recovery Charge vs. Reverse Voltage

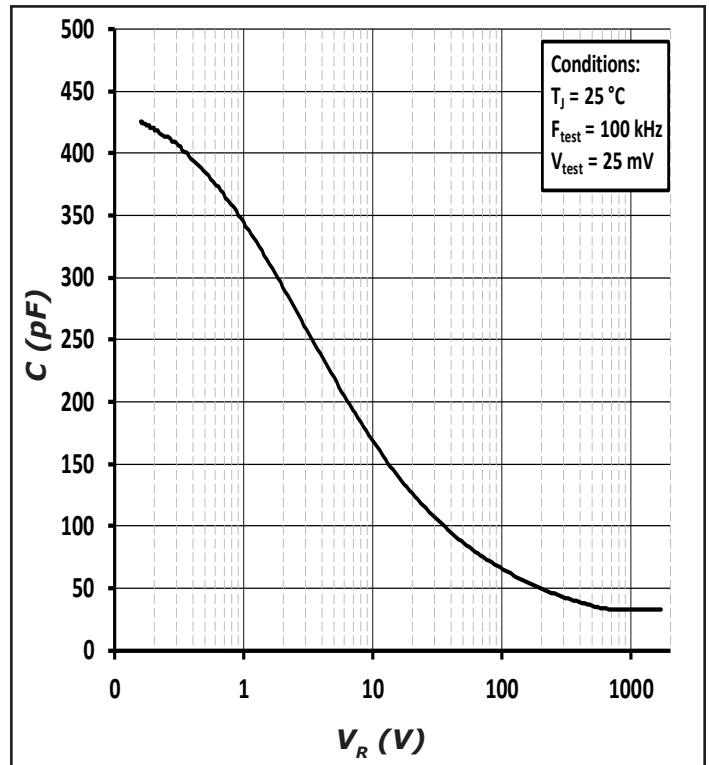


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

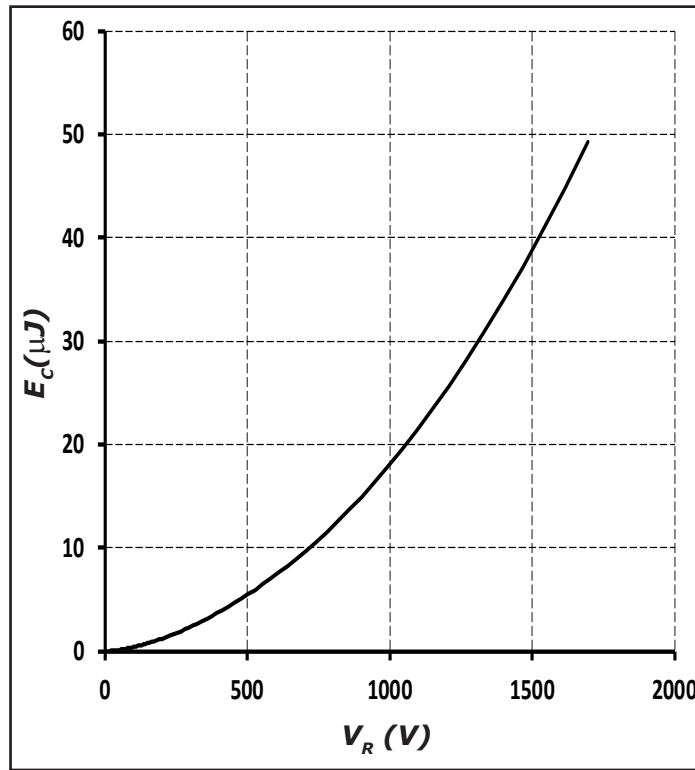


Figure 7. Typical Capacitance Stored Energy

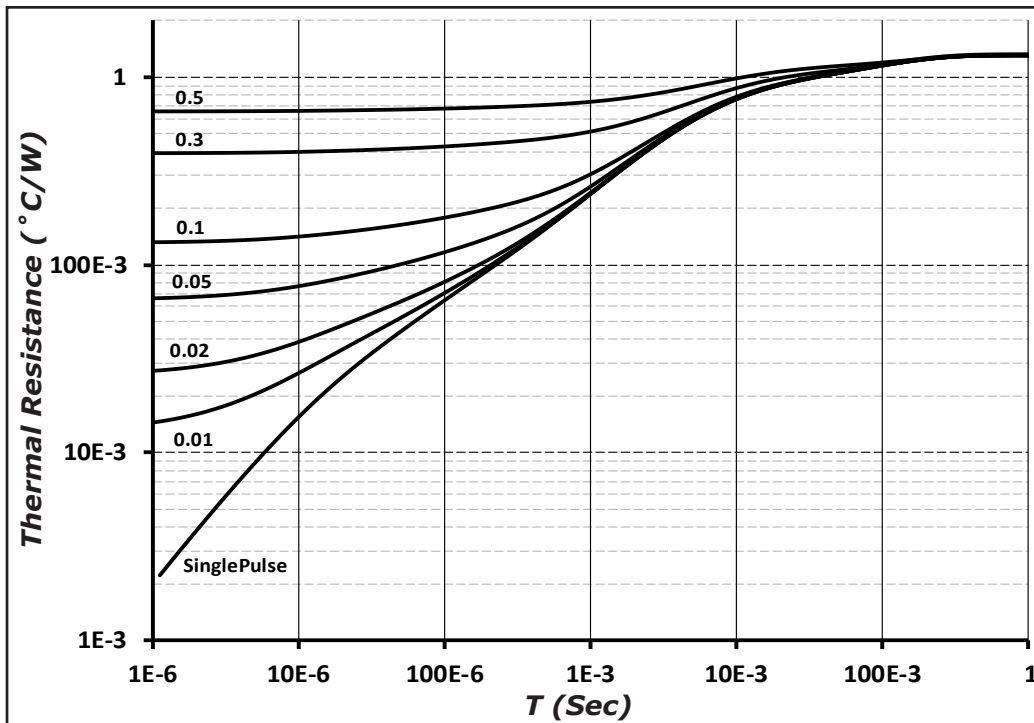
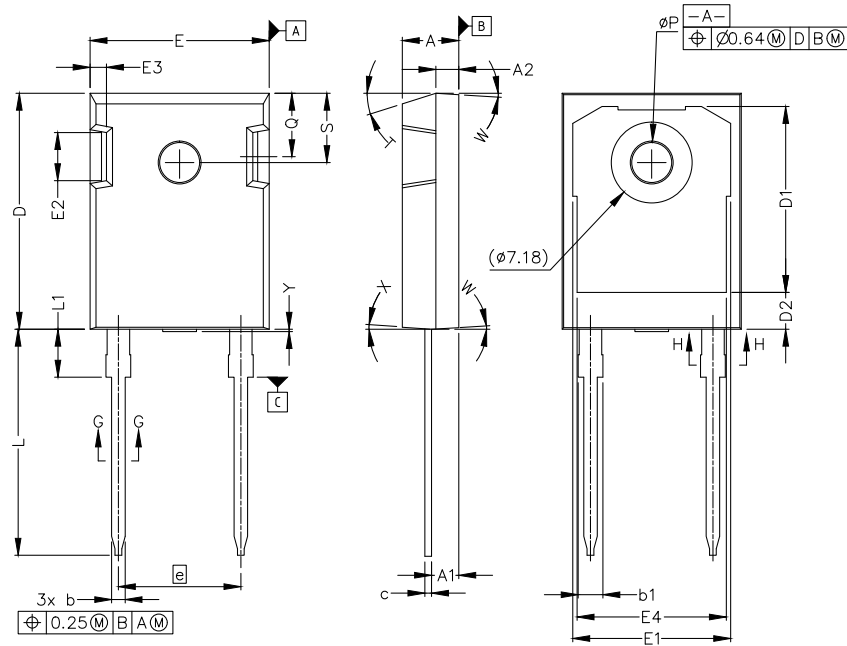


Figure 8. Transient Thermal Impedance

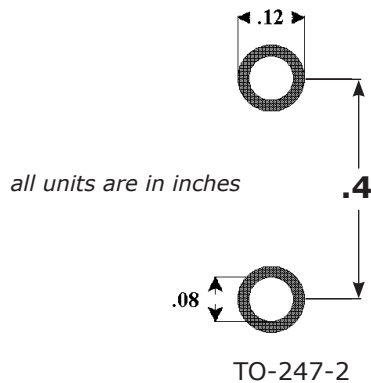
Package Dimensions

Package TO-247-2



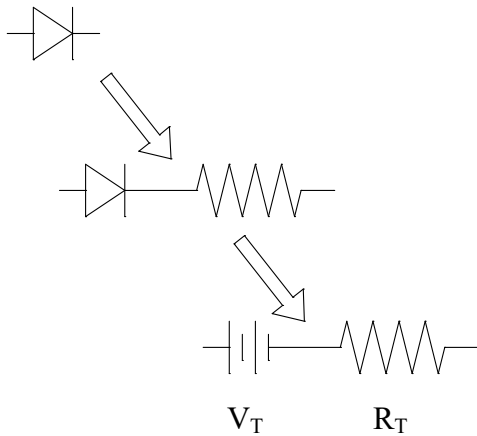
POS	Inches		Millimeters	
	Min	Max	Min	Max
A	0.190	0.205	4.70	5.31
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
b	0.039	0.055	0.99	1.40
b1	0.065	0.095	1.65	2.41
c	0.015	0.035	0.38	0.89
D	0.819	0.845	20.80	21.46
D1	0.640	0.683	16.25	17.35
D2	0.112	0.124	2.86	3.16
E	0.620	0.640	15.49	16.26
E1	0.516	0.557	13.10	14.15
E2	0.135	0.201	3.43	5.10
E3	0.039	0.075	1.00	1.90
E4	0.487	0.529	12.38	13.43
e	0.428 BSC		10.88 BSC	
L	0.78	0.80	19.81	20.32
L1	-	0.177	-	4.50
ϕP	0.138	0.144	3.51	3.66
Q	0.212	0.244	5.38	6.20
S	0.238	0.248	6.04	6.3
T	17.5° REF.			
W	3.5° REF.			
X	4° REF.			
Y	0	0.5	0	0.02

Recommended Solder Pad Layout



TO-247-2

Diode Model



$$V_{fT} = V_T + I_f \cdot R_T$$

$$V_T = 0.94 + (T_J \cdot -1.0 \cdot 10^{-3})$$

$$R_T = 0.027 + (T_J \cdot 2.8 \cdot 10^{-4})$$

Note: T_J = Diode Junction Temperature In Degrees Celsius,
valid from 25°C to 175°C

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