

Features

- Low Forward Voltage Drop (V_F)
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Low Leakage Current (I_r)
- Temperature-Independent Switching Behavior
- Positive Temperature Coefficient on V_F

Benefits

- Higher System Level Efficiency
- Increase System Power Density
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

- Switch Mode Power Supplies (SMPS)
- Server/Telecom Power Supplies
- Industrial Power Supplies
- Solar
- UPS

V_{RRM}	=	650 V
$I_F(T_c=155^\circ\text{C})$	=	8 A
Q_c	=	29 nC



TO-220-2

Package

Part Number	Package	Marking
GC6D08065A	TO-220-2	GC6D08065



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_{DC}	DC Blocking Voltage	650	V		
I_F	Continuous Forward Current	30 16 8	A	$T_c=25^\circ\text{C}$ $T_c=125^\circ\text{C}$ $T_c=155^\circ\text{C}$	Fig. 3
I_{FRM}	Repetitive Peak Forward Surge Current	37 22	A	$T_c=25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave $T_c=110^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	69 63	A	$T_c=25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave $T_c=110^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave	Fig. 8
I_{FMax}	Non-Repetitive Peak Forward Surge Current	860 790	A	$T_c=25^\circ\text{C}$, $t_p = 10$ μs , Pulse $T_c=110^\circ\text{C}$, $t_p = 10$ μs , Pulse	Fig. 8
P_{tot}	Power Dissipation	92.6 40.1	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-220 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	1.27 1.37	1.50 1.60	V	$I_F = 8\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 8\text{ A}$ $T_J = 175^\circ\text{C}$	Fig. 1
I_R	Reverse Current	2 15	40 160	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	29		nC	$V_R = 400\text{ V}$, $I_F = 8\text{ A}$ $T_J = 25^\circ\text{C}$	Fig. 5
C	Total Capacitance	518 57 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. 6
E_C	Capacitance Stored Energy	4.4		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	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1.62	$^\circ\text{C}/\text{W}$	Fig. 9

Typical Performance

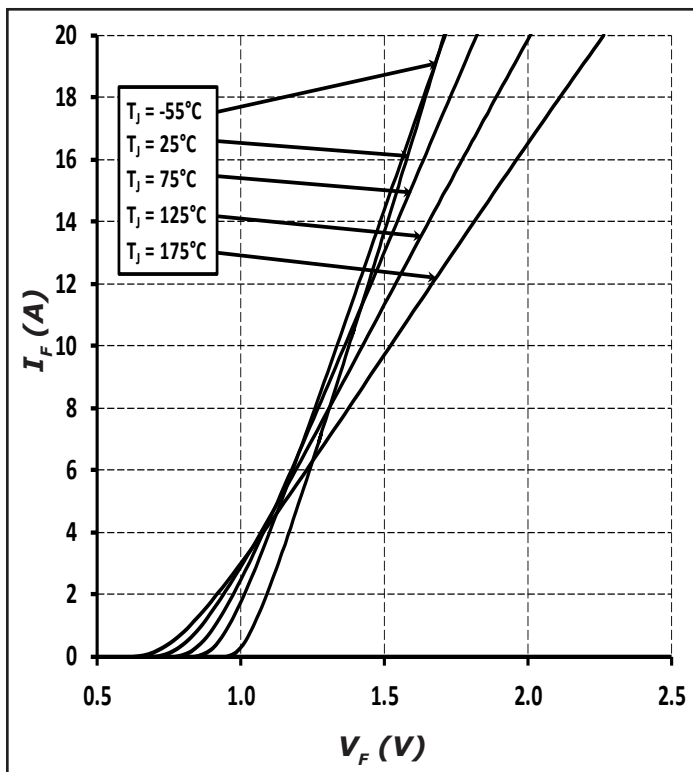


Figure 1. Forward Characteristics

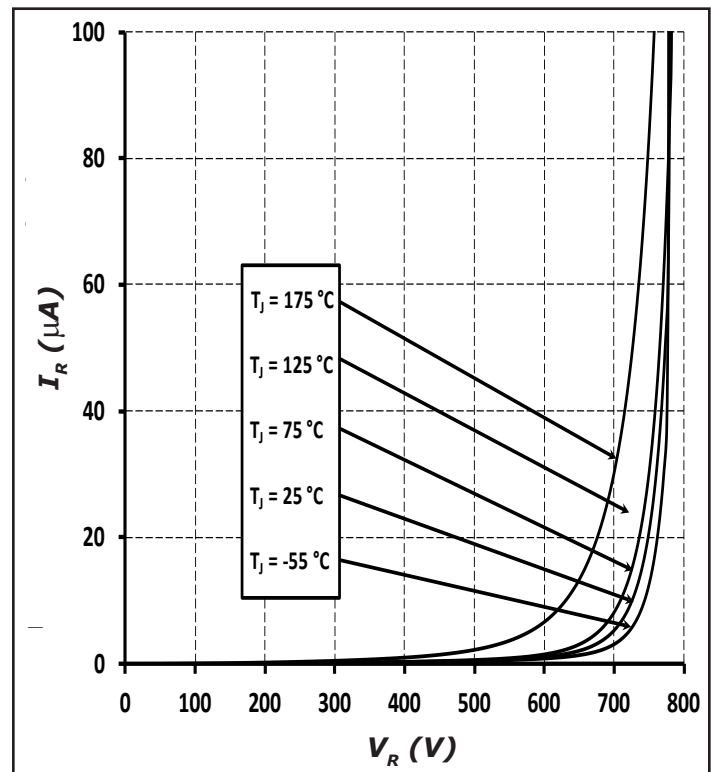


Figure 2. Reverse Characteristics

Typical Performance

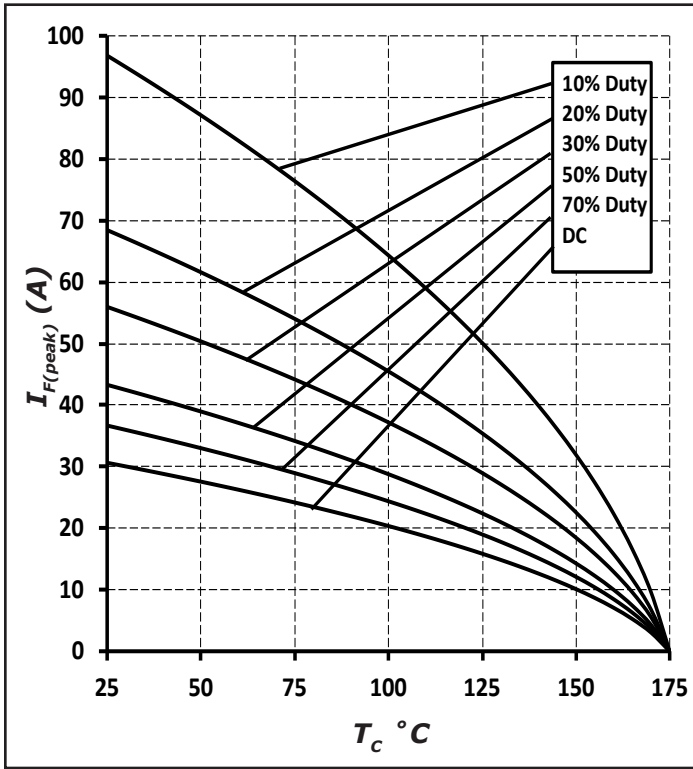


Figure 3. Current Derating

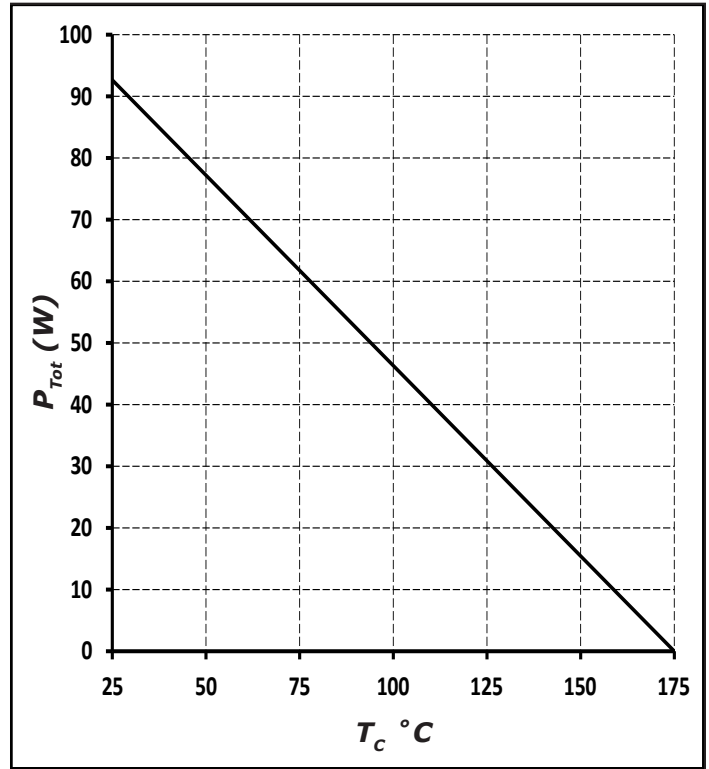


Figure 4. Power Derating

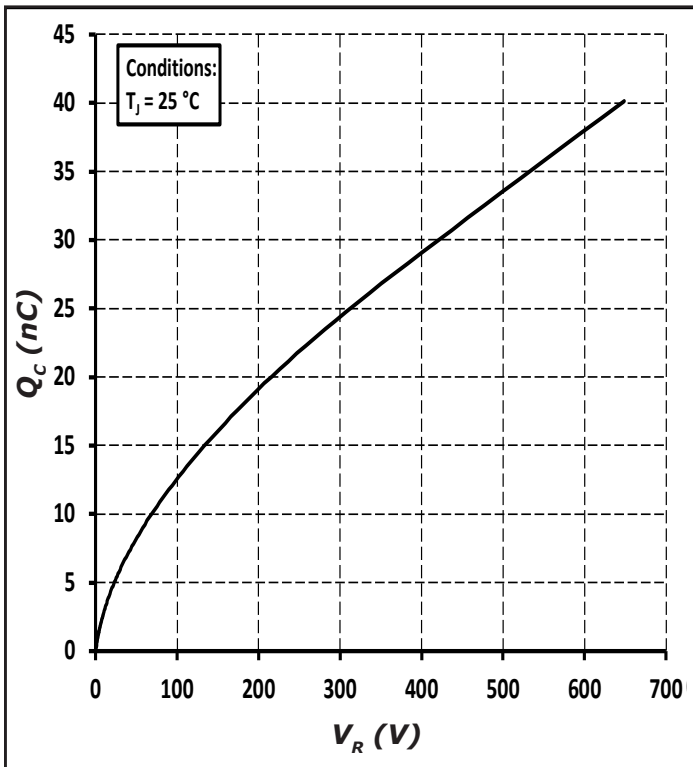


Figure 5. Total Capacitance Charge vs. Reverse Voltage

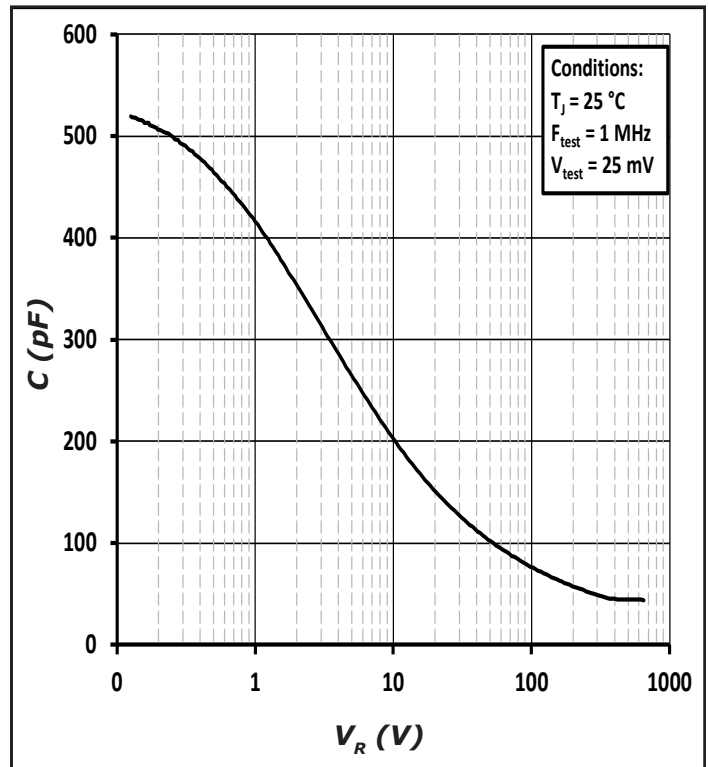


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

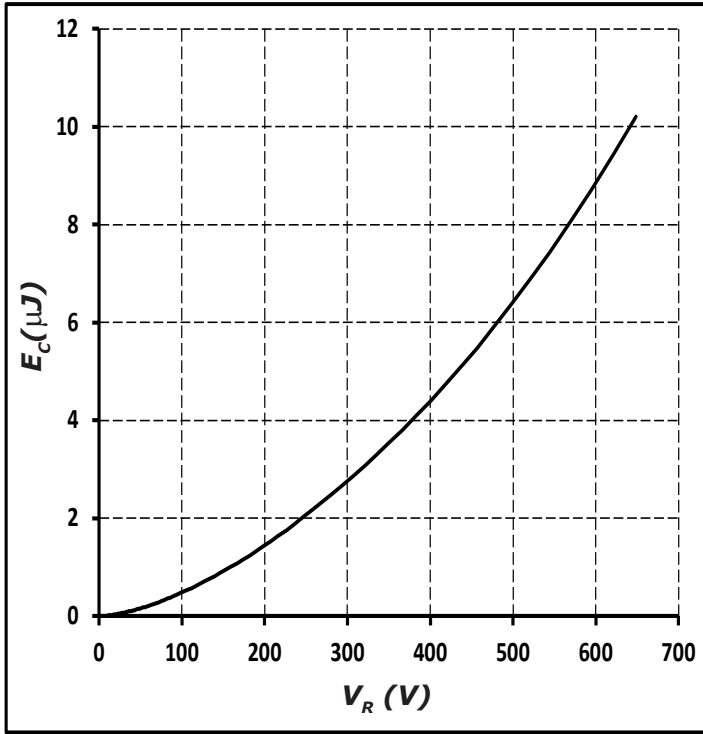


Figure 7. Capacitance Stored Energy

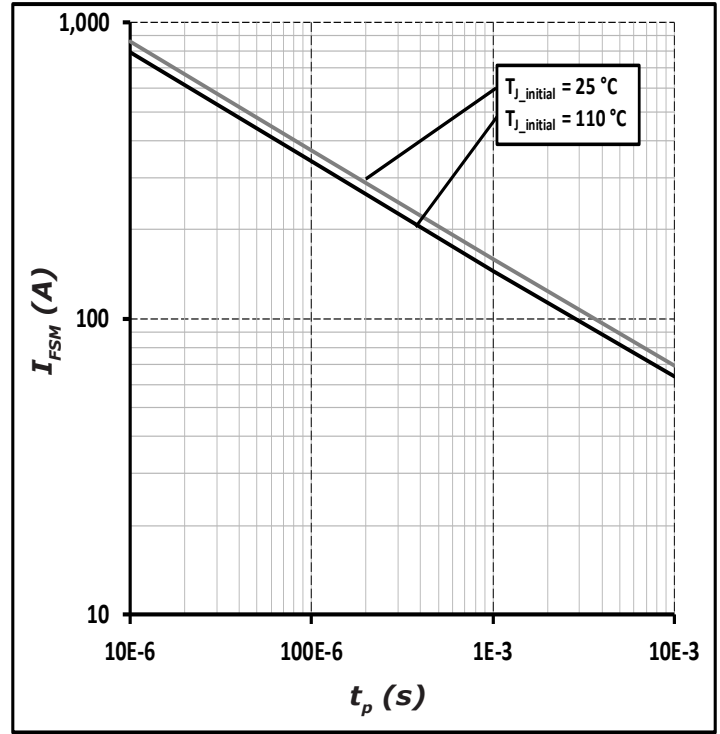


Figure 8. Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

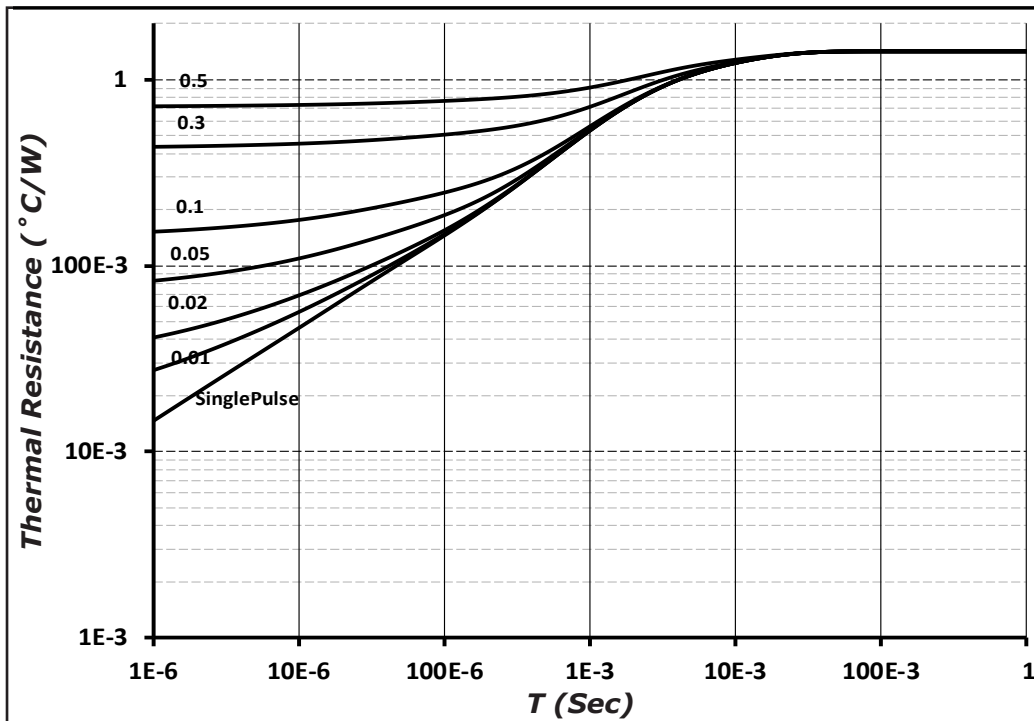
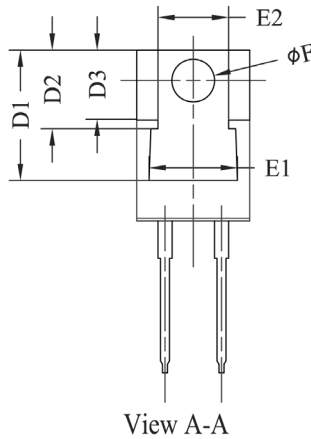
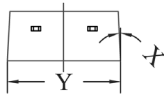
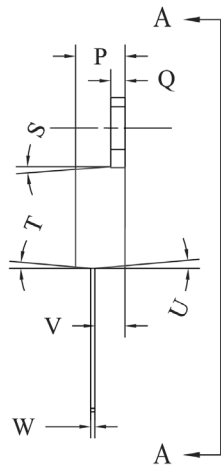
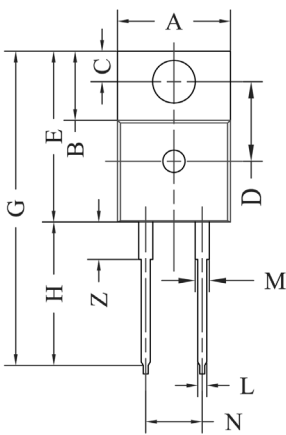


Figure 9. Transient Thermal Impedance

Package Dimensions

Package TO-220-2

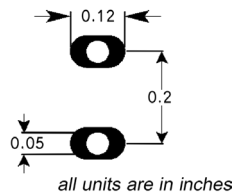


POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.381	.410	9.677	10.414
B	.235	.255	5.969	6.477
C	.100	.120	2.540	3.048
D	.223	.337	5.664	8.560
D1	.457-.490		11.60-12.45 typ	
D2	.277-.303 typ		7.04-7.70 typ	
D3	.244-.252 typ		6.22-6.4 typ	
E	.590	.615	14.986	15.621
E1	.302	.326	7.68	8.28
E2	.227	.251	5.77	6.37
F	.143	.153	3.632	3.886
G	1.105	1.147	28.067	29.134
H	.500	.550	12.700	13.970
L	.025	.036	.635	.914
M	.045	.055	1.143	1.550
N	.195	.205	4.953	5.207
P	.165	.185	4.191	4.699
Q	.048	.054	1.219	1.372
S	3°	6°	3°	6°
T	3°	6°	3°	6°
U	3°	6°	3°	6°
V	.094	.110	2.388	2.794
W	.014	.025	.356	.635
X	3°	5.5°	3°	5.5°
Y	.385	.410	9.779	10.414
Z	.130	.150	3.302	3.810

NOTE:

1. Dimension L, M, W apply for Solder Dip Finish

Recommended Solder Pad Layout



TO-220-2

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GC6D08065A	TO-220-2