

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

Part Number	Package	Marking
GC6D04065A	TO-220-2	GC6D04065

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	18 9 4	A	$T_c=25^\circ\text{C}$ $T_c=125^\circ\text{C}$ $T_c=160^\circ\text{C}$	Fig. 3
I_{FRM}	Repetitive Peak Forward Surge Current	19 12	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	32 28	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	290 200	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	60 26	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	

$$V_{RRM} = 650 \text{ V}$$

$$I_F(T_c=160^\circ\text{C}) = 4 \text{ A}$$

$$Q_c = 16 \text{ nC}$$



TO-220-2

Package



Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.27 1.37	1.50 1.60	V	$I_F = 4\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 4\text{ A}$ $T_J = 175^\circ\text{C}$	Fig. 1
I_R	Reverse Current	2 12	20 80	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	16		nC	$V_R = 400\text{ V}$, $I_F = 4\text{ A}$ $T_J = 25^\circ\text{C}$	Fig. 5
C	Total Capacitance	256 32 27		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	2.6		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	2.5	$^\circ\text{C/W}$	Fig. 9

Typical Performance

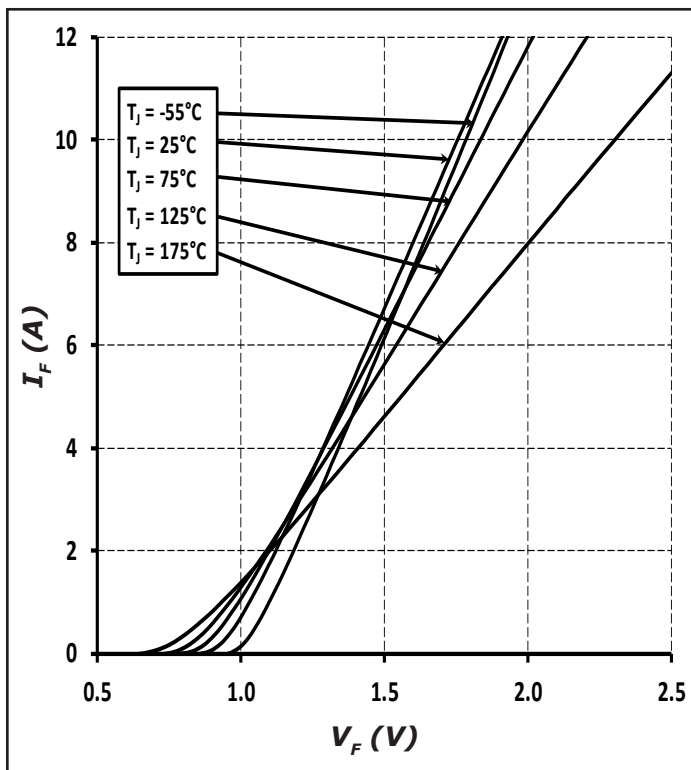


Figure 1. Forward Characteristics

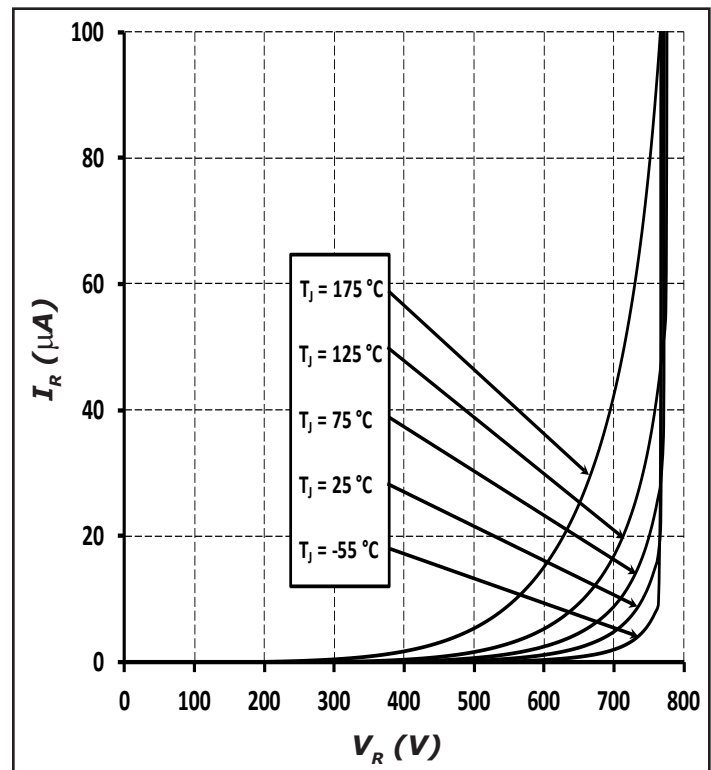


Figure 2. Reverse Characteristics

Typical Performance

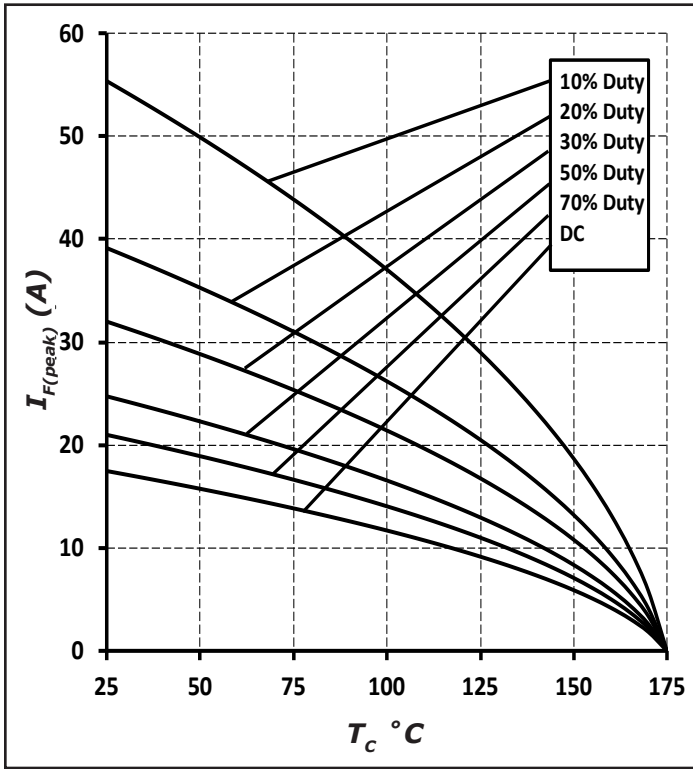


Figure 3. Current Derating

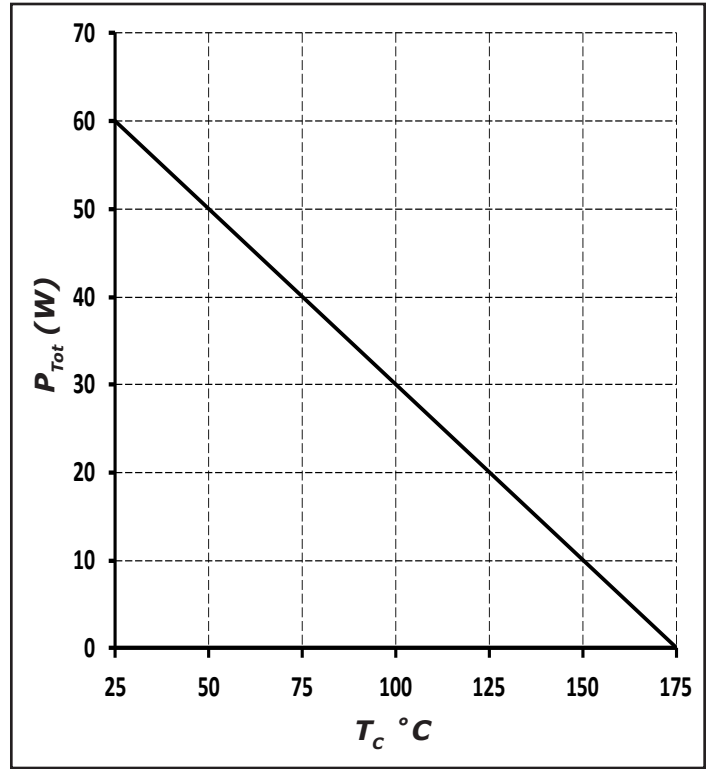


Figure 4. Power Derating

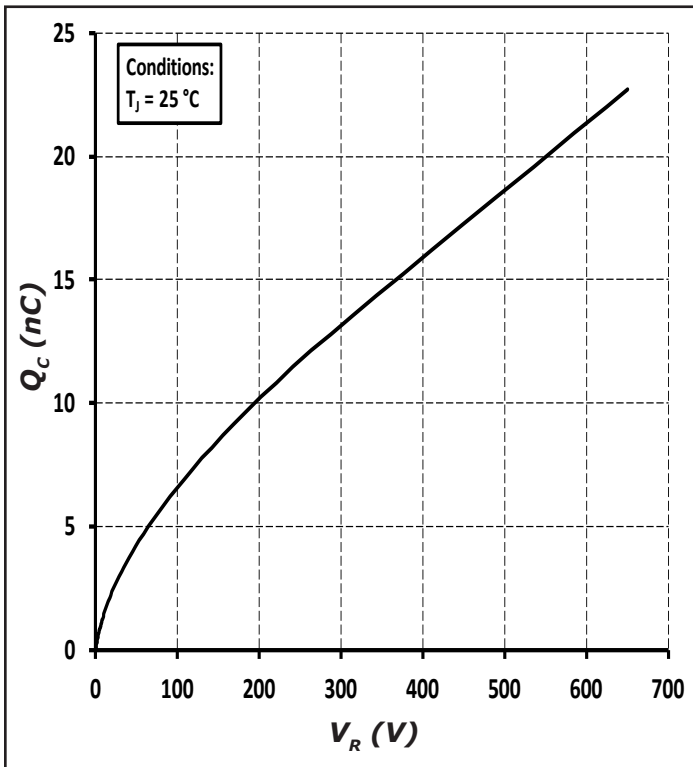


Figure 5. Total Capacitance Charge vs. Reverse Voltage

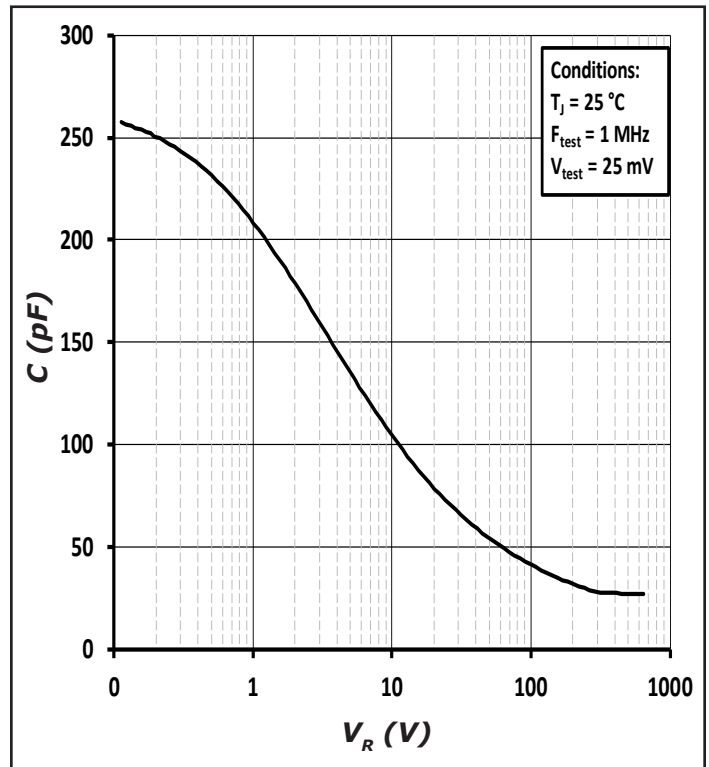


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

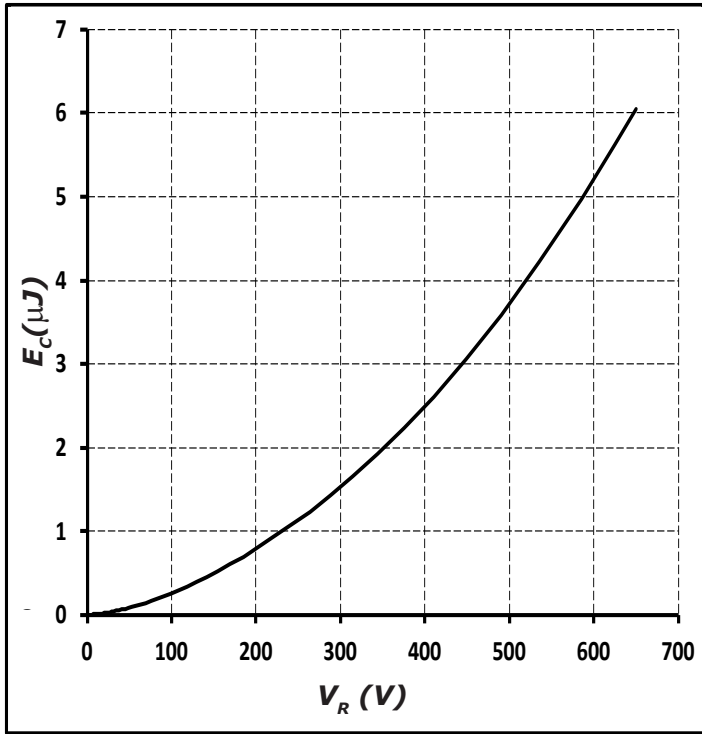


Figure 7. Capacitance Stored Energy

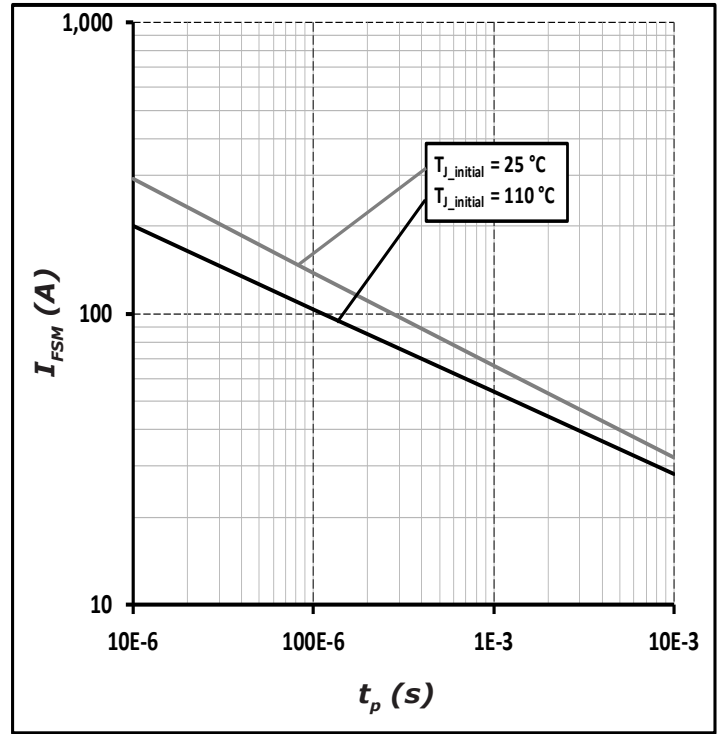


Figure 8. Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

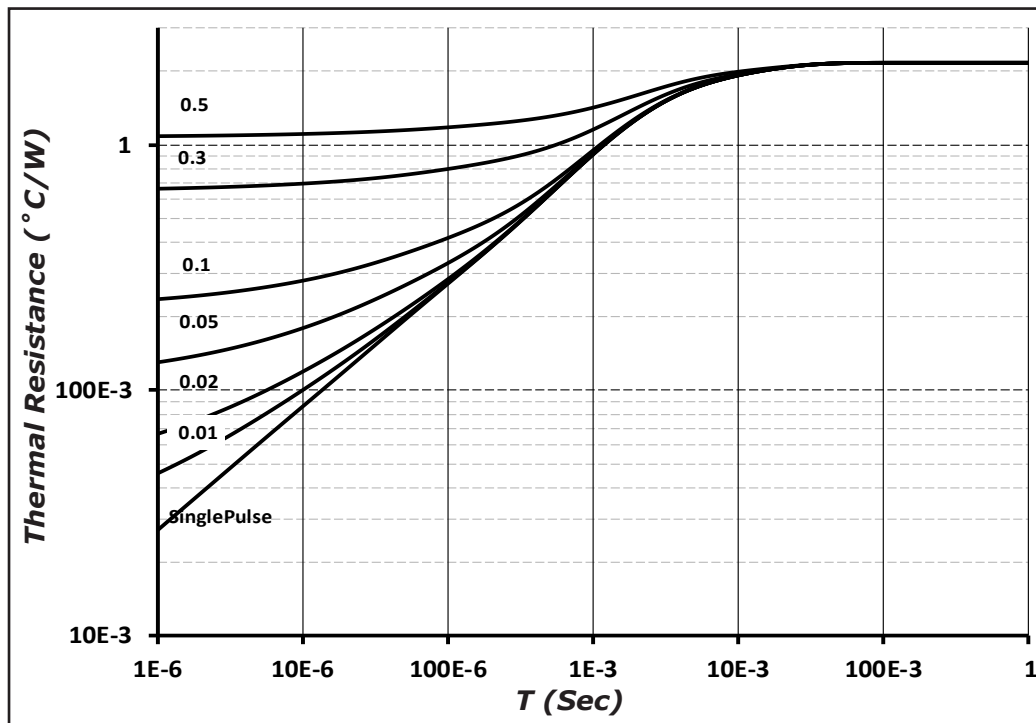
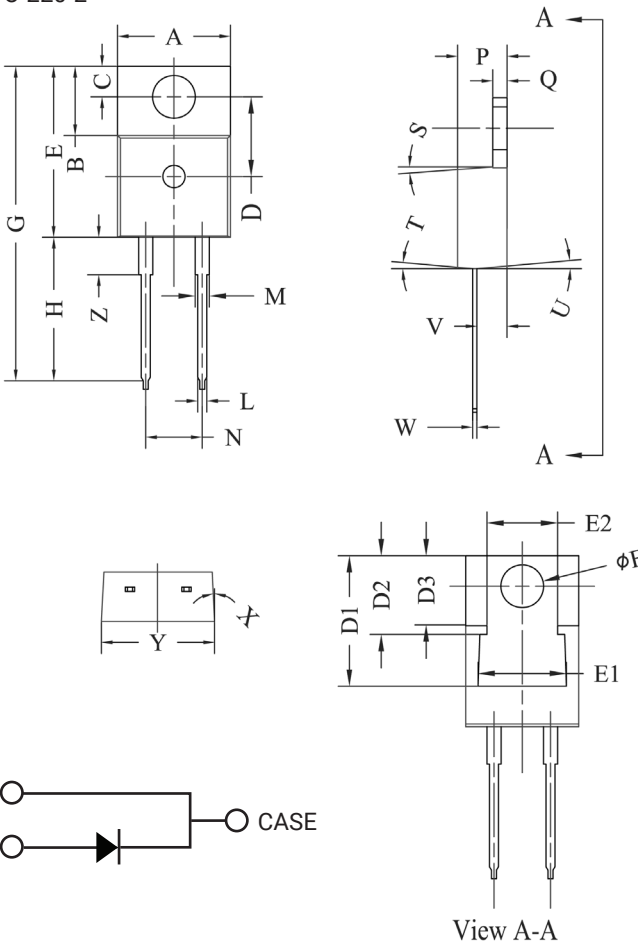


Figure 9. Transient Thermal Impedance

Package Dimensions

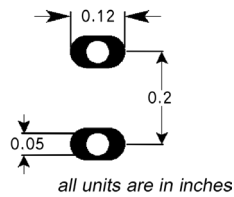
Package TO-220-2



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

Part Number	Package
GC6D04065A	TO-220-2