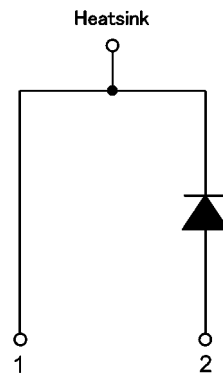


Features

- 1) Shorter recovery time
- 2) Reduced temperature dependence
- 3) High-speed switching possible
- 4) Temperature independent switching behavior

Applications

- PFC Boost Topology
- Secondary Side Rectification
- Data Center
- PV Power Conditioners
- DC/DC Converter
- EV Charger



Package

TO-220-2

- 1: Cathode
- 2: Anode

Part Number	Marking	Package	V_{RRM}	$I_F, T_c < 135^\circ C$	Q_c
GC3D04065A	GC3D04065	T0220-2	650 V	6 A	10 nC

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

Symbol	Parameter	Value	Unit	Test Conditions
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	13.5 6 4	A	$T_c = 25^\circ C$ $T_c = 135^\circ C$ $T_c = 155^\circ C$
I_{FRM}	Repetitive Peak Forward Surge Current	17 12	A	$T_c = 25^\circ C, t_p = 10$ ms, Half Sine Wave $T_c = 110^\circ C, t_p = 10$ ms, Half Sine Wave
I_{FSM}	Non-Repetitive Peak Forward Surge Current	30.5 20	A	$T_c = 25^\circ C, t_p = 10$ ms, Half Sine Wave $T_c = 110^\circ C, t_p = 10$ ms, Half Sine Wave
I_{FMax}	Non-Repetitive Peak Forward Surge Current	220 160	A	$T_c = 25^\circ C, t_p = 10$ μ s, Pulse $T_c = 110^\circ C, t_p = 10$ μ s, Pulse
P_{tot}	Power Dissipation	52 22.5	W	$T_c = 25^\circ C$ $T_c = 110^\circ C$
dV/dt	Diode dV/dt ruggedness	200	V/ns	$V_R = 0-650V$
$\int i^2 dt$	$i^2 t$ value (Per Leg)	4.7 2	A ² s	$T_c = 25^\circ C, t_p = 10$ ms $T_c = 110^\circ C, t_p = 10$ ms
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	$^\circ C$	
	TO-220 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions
V_F	Forward Voltage	1.4 1.7	1.7 2.4	V	$I_F = 4\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 4\text{ A}$ $T_J = 175^\circ\text{C}$
I_R	Reverse Current	6 12	30 120	μA	$V_R = 650\text{ V}$ $T_J = 25^\circ\text{C}$ $V_R = 650\text{ V}$ $T_J = 175^\circ\text{C}$
Q_C	Total Capacitive Charge	10		nC	$V_R = 400\text{ V}$, $I_F = 4\text{ A}$ $di/dt = 500\text{ A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$
C	Total Capacitance	231 18.5 15		pF	$V_R = 0\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 200\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 400\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$
E_C	Capacitance Stored Energy	1.4		μJ	$V_R = 400\text{ V}$

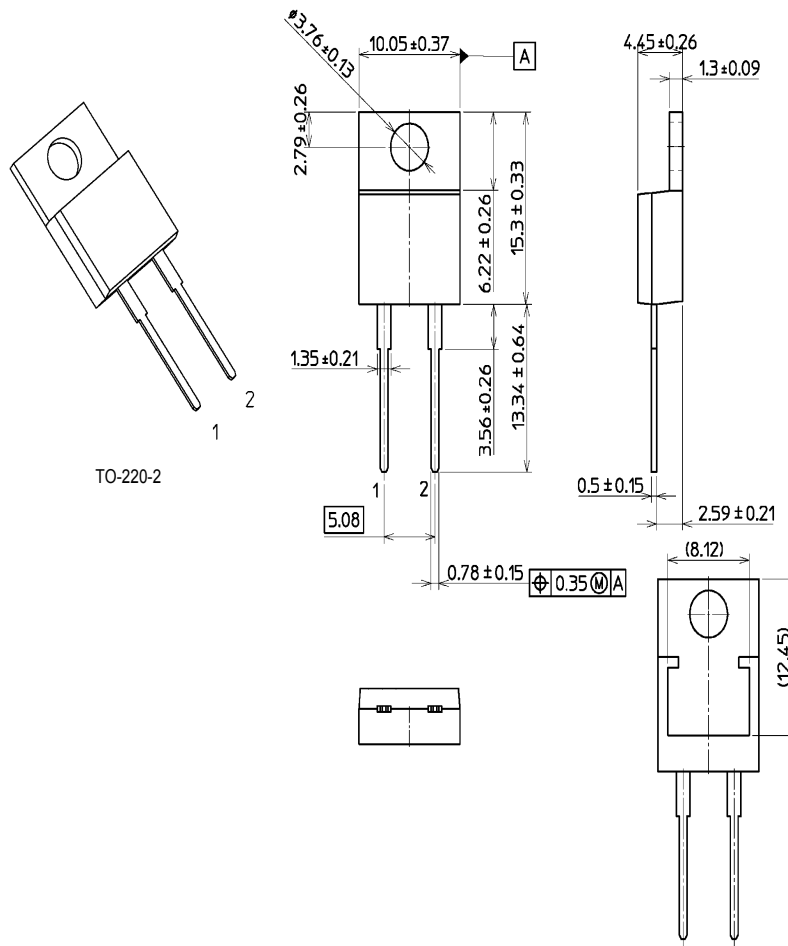
Note: This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

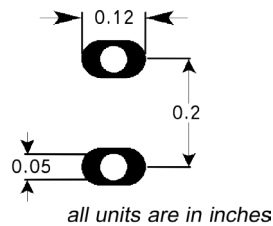
Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	2.9	$^\circ\text{C}/\text{W}$	Fig. 9

Package Dimensions

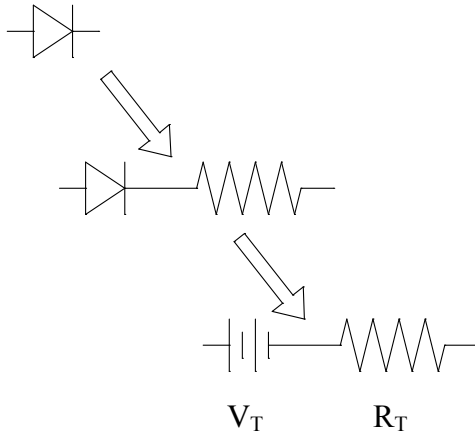
Unit: mm



Recommended Solder Pad Layout



Diode Model



$$V_{f_T} = V_T + I_f * R_T$$

$$V_T = 1.00 + (T_J * -1.1 * 10^{-3})$$

$$R_T = 0.069 + (T_J * 8.3 * 10^{-4})$$

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