C6D04065E

Silicon Carbide Schottky Diode

Z-Rec® Rectifier

V_{RRM}	=	650 V
I_F (T_C=155˚C)	=	4 A
Q_c	=	16 nC

Features

- New 6th Generation Technology
- 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

Package

TO-252-2

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
C6D04065E	TO-252-2	C6D04065

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_{DC}	DC Blocking Voltage	650	V		
I_F	Continuous Forward Current	16 8 4	A	T_C=25˚C T_C=125˚C T_C=155˚C	Fig. 3
I_{FRM}	Repetitive Peak Forward Surge Current	17 11	A	T_C=25˚C, t_P = 10 ms, Half Sine Wave T_C=110˚C, t_P = 10 ms, Half Sine Wave	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	29 25	A	T_C=25˚C, t_P = 10 ms, Half Sine Wave T_C=110˚C, t_P = 10 ms, Half Sine Wave	Fig. 8
$I_{F,Max}$	Non-Repetitive Peak Forward Surge Current	261 180	A	T_C=25˚C, t_P = 10 µs, Pulse T_C=110˚C, t_P = 10 µs, Pulse	Fig. 8
P_{tot}	Power Dissipation	52 22	W	T_C=25˚C T_C=110˚C	Fig. 4
T_J , T_{stg}	Operating Junction and Storage Temperature	-55 to +175	˚C		

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 A T_J=25°C I_F = 4 A T_J=175°C	Fig. 1
I_R	Reverse Current	2 12	20 80	µA	V_R = 650 V T_J=25°C V_R = 650 V T_J=175°C	Fig. 2
Q_C	Total Capacitive Charge	16		nC	V_R = 400 V, T_J = 25°C	Fig. 5
C	Total Capacitance	256 32 27		pF	V_R = 0 V, T_J = 25°C, f = 1 MHz V_R = 200 V, T_J = 25°C, f = 1 MHz V_R = 400 V, T_J = 25°C, f = 1 MHz	Fig. 6
E_C	Capacitance Stored Energy	2.6		µJ	V_R = 400 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	2.89	°C/W	Fig. 9

Typical Performance

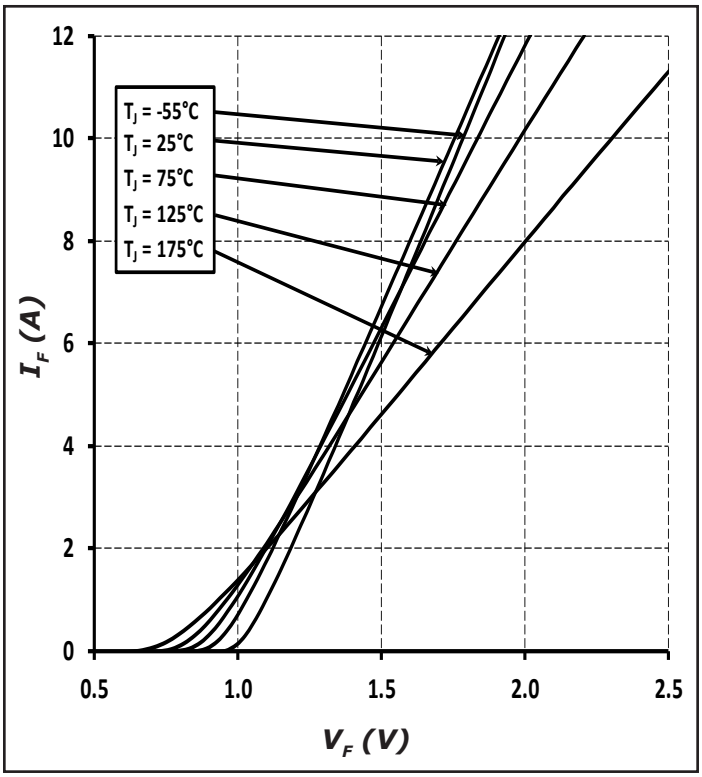


Figure 1. Forward Characteristics

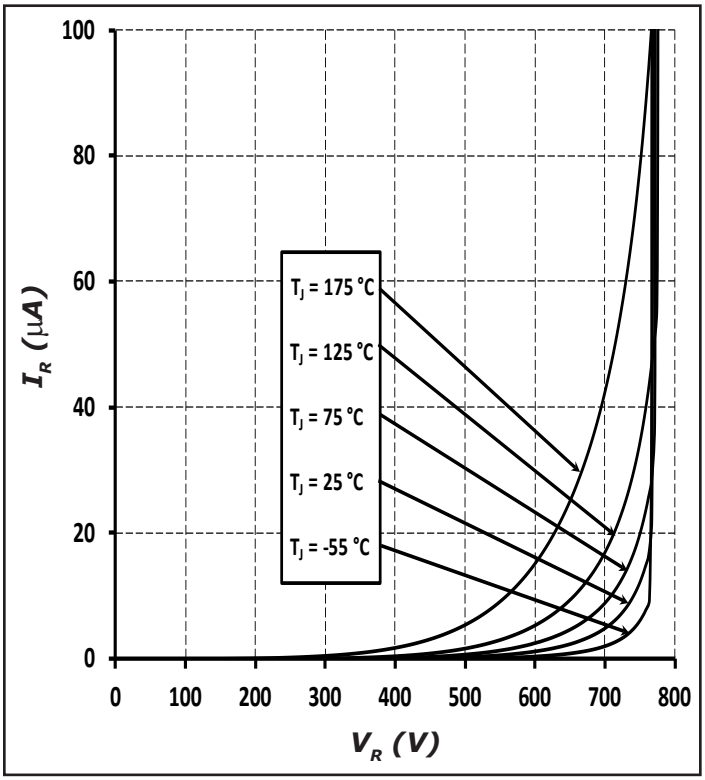


Figure 2. Reverse Characteristics

Typical Performance

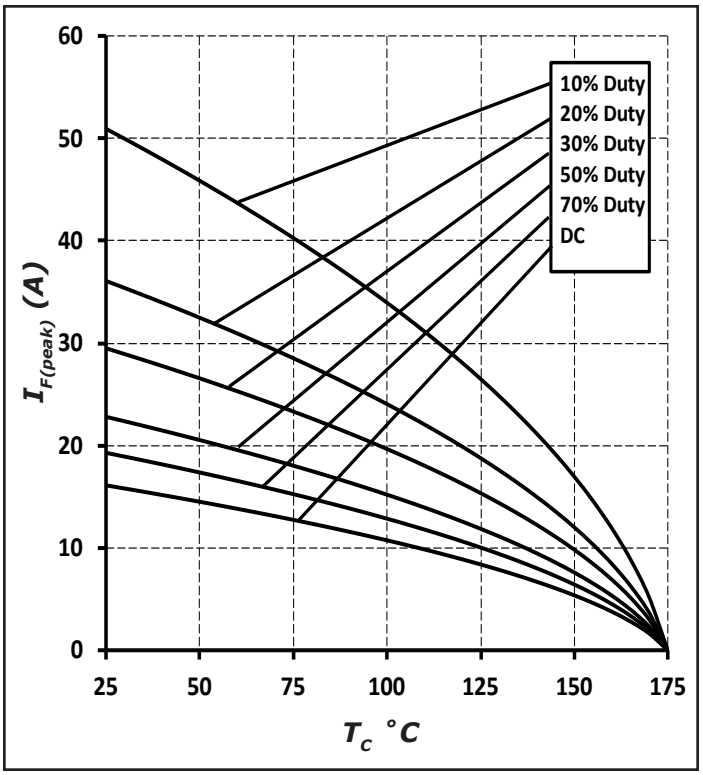


Figure 3. Current Derating

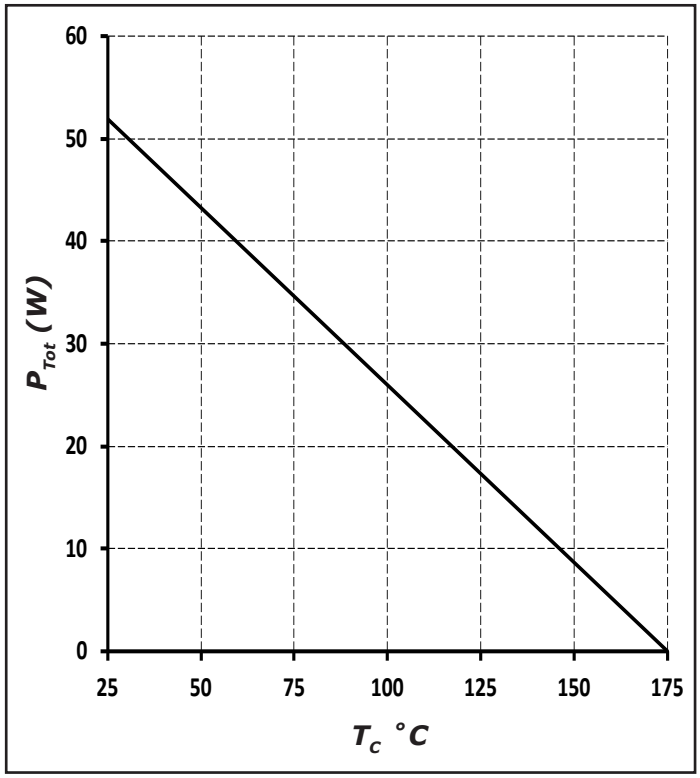


Figure 4. Power Derating

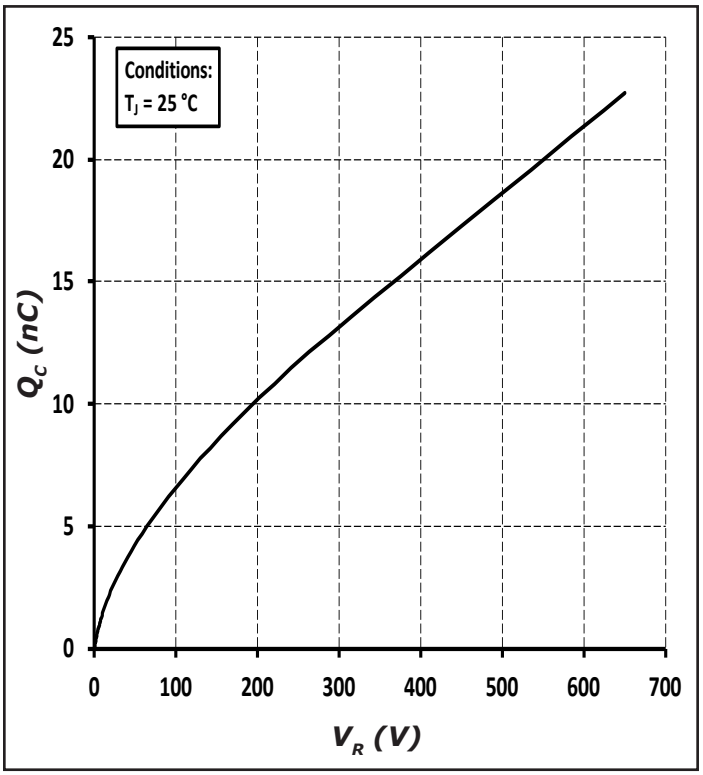


Figure 5. Total Capacitance Charge vs. Reverse Voltage

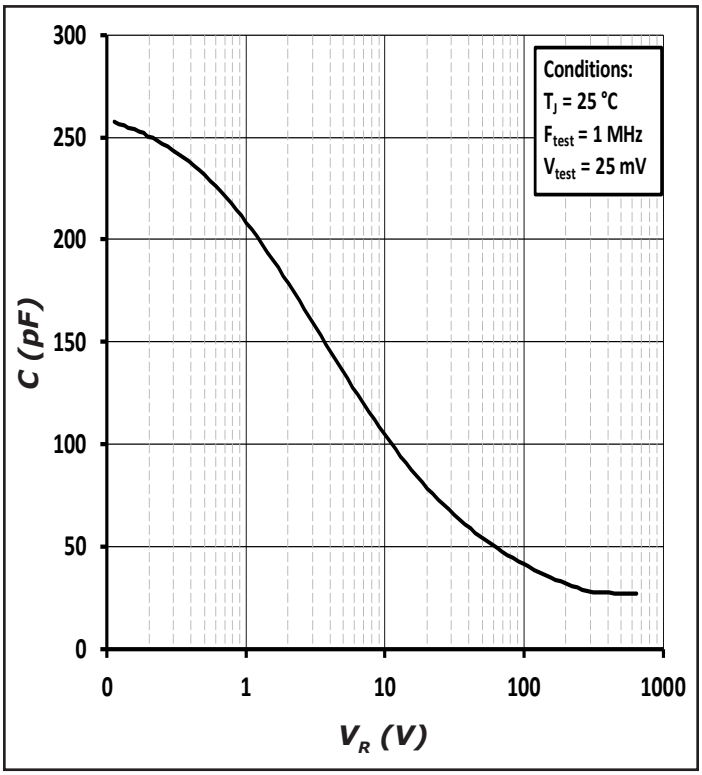


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

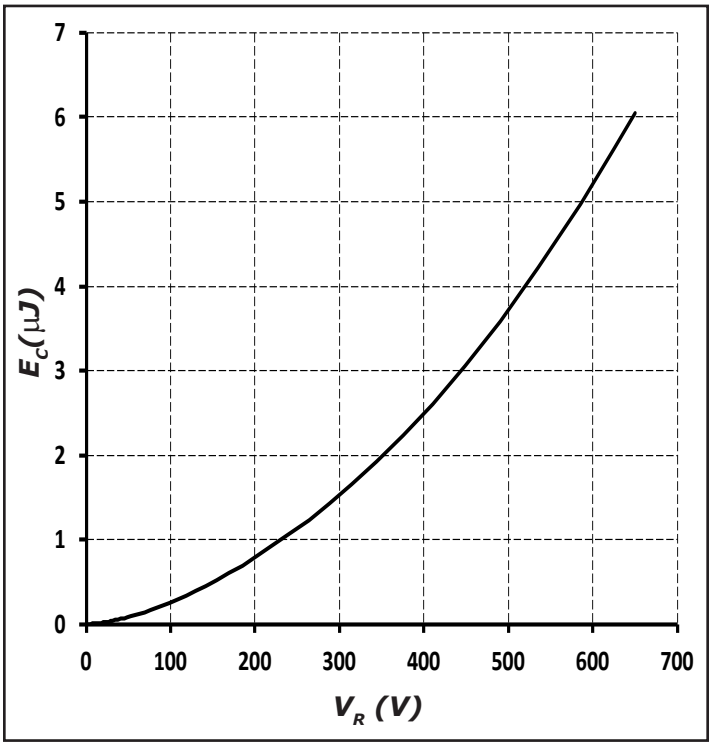


Figure 7. Capacitance Stored Energy

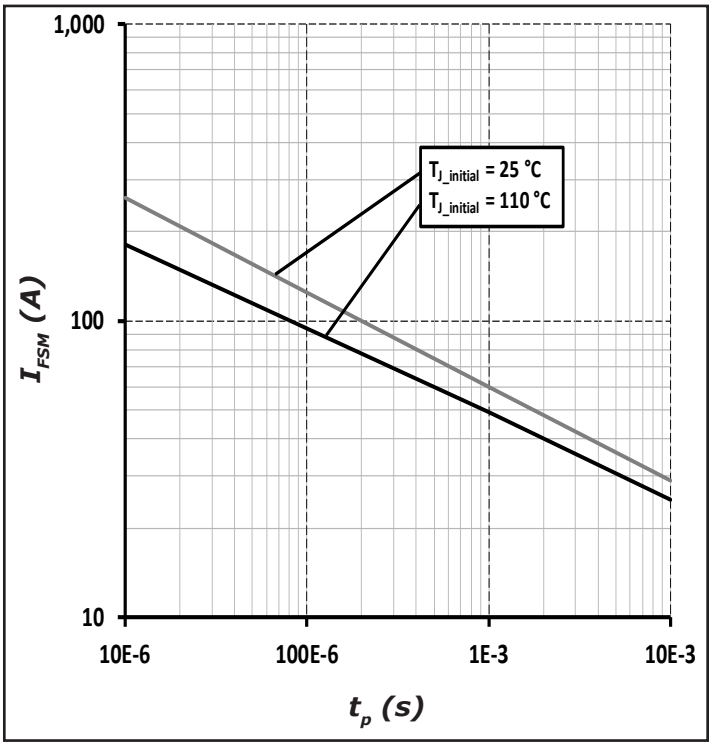


Figure 8. Non-repetitive peak forward surge current versus pulse duration (Sinusoidal Waveform)

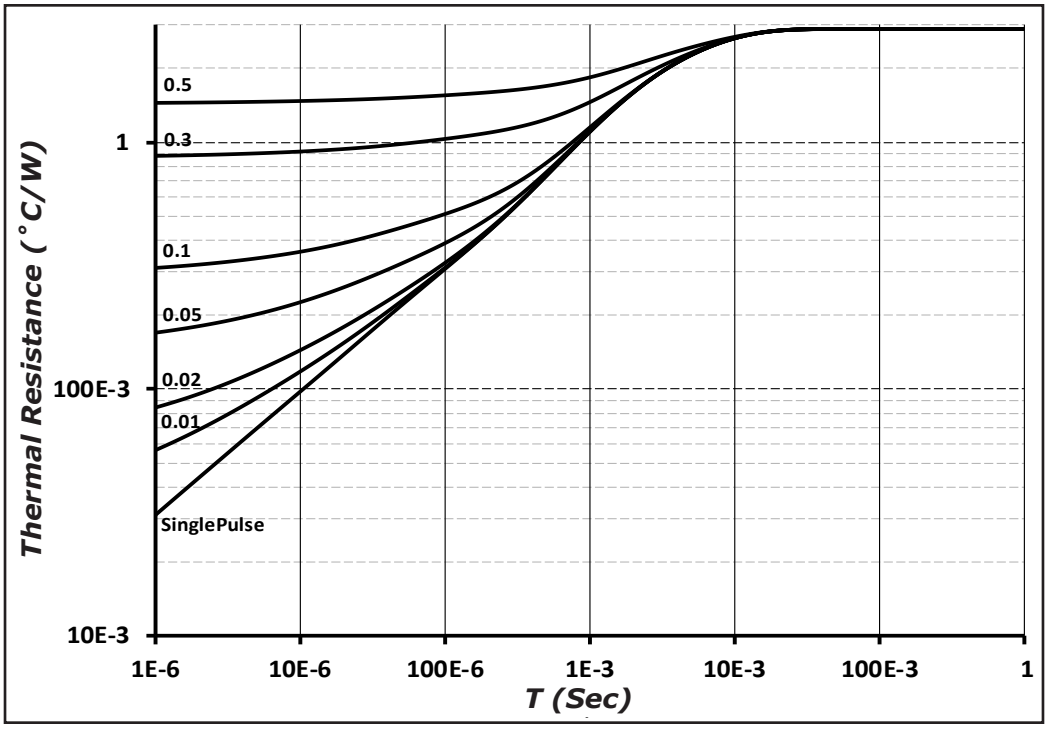
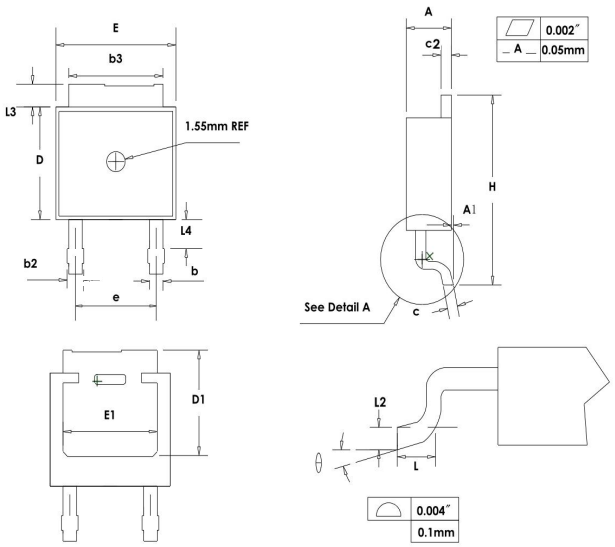


Figure 9. Transient Thermal Impedance

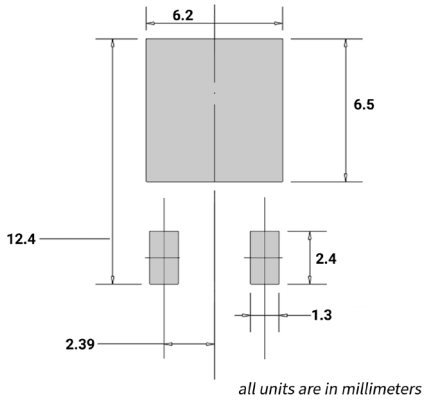
Package Dimensions

Package TO-252-2



SYMBOL	MILLIMETERS	
	MIN	MAX
A	2.159	2.413
A1	0	0.13
b	0.64	0.89
b2	0.653	1.143
b3	5.004	5.6
c	0.457	0.61
c2	0.457	0.864
D	5.867	6.248
D1	5.21	-
E	6.35	6.73
E1	4.32	-
e	4.58 BSC	
H	9.65	10.414
L	1.106	1.78
L2	0.51 BSC	
L3	0.889	1.27
L4	0.64	1.01
Θ	0°	8°

Recommended Solder Pad Layout



TO-252-2

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Note: Recommended soldering profiles can be found in the applications note here:
http://www.wolfspeed.com/power_app_notes/soldering