

# C6D08065E

## Silicon Carbide Schottky Diode

### Z-REC<sup>®</sup> RECTIFIER

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

### Features

- New 6<sup>th</sup> Generation Technology
- Low Forward Voltage Drop ( $V_F$ )
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Low Leakage Current ( $I_L$ )
- 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

### Package



TO-252-2



Part Number	Package	Marking
C6D08065E	TO-252-2	C6D08065

### 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	29 15 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	34 20	A	$T_c=25^\circ\text{C}, t_p = 10 \text{ ms}, \text{Half Sine Wave}$ $T_c=110^\circ\text{C}, t_p = 10 \text{ ms}, \text{Half Sine Wave}$	
$I_{FSM}$	Non-Repetitive Peak Forward Surge Current	63 57	A	$T_c=25^\circ\text{C}, t_p = 10 \text{ ms}, \text{Half Sine Wave}$ $T_c=110^\circ\text{C}, t_p = 10 \text{ ms}, \text{Half Sine Wave}$	Fig. 8
$I_{F,Max}$	Non-Repetitive Peak Forward Surge Current	781 717	A	$T_c=25^\circ\text{C}, t_p = 10 \mu\text{s}, \text{Pulse}$ $T_c=110^\circ\text{C}, t_p = 10 \mu\text{s}, \text{Pulse}$	Fig. 8
$P_{tot}$	Power Dissipation	85 37	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	$^\circ\text{C}$		

## 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	$\mu\text{A}$	$V_R = 650\text{ V}$ $T_J = 25^\circ\text{C}$ $V_R = 650\text{ V}$ $T_J = 175^\circ\text{C}$	Fig. 2
$Q_C$	Total Capacitive Charge	29		nC	$V_R = 400\text{ V}$ , $T_J = 25^\circ\text{C}$	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		$\mu\text{J}$	$V_R = 400\text{ V}$	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	1.77	$^\circ\text{C}/\text{W}$	Fig. 9

## Typical Performance

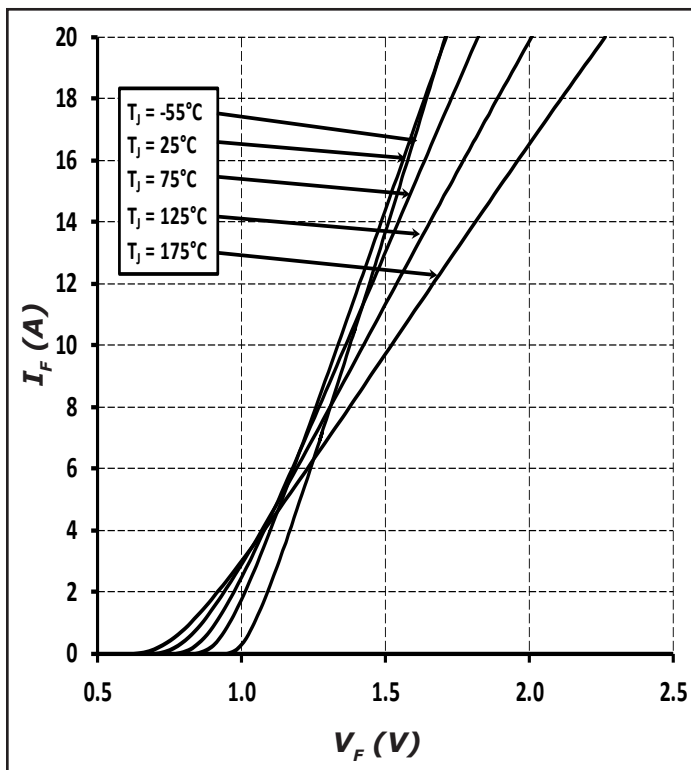


Figure 1. Forward Characteristics

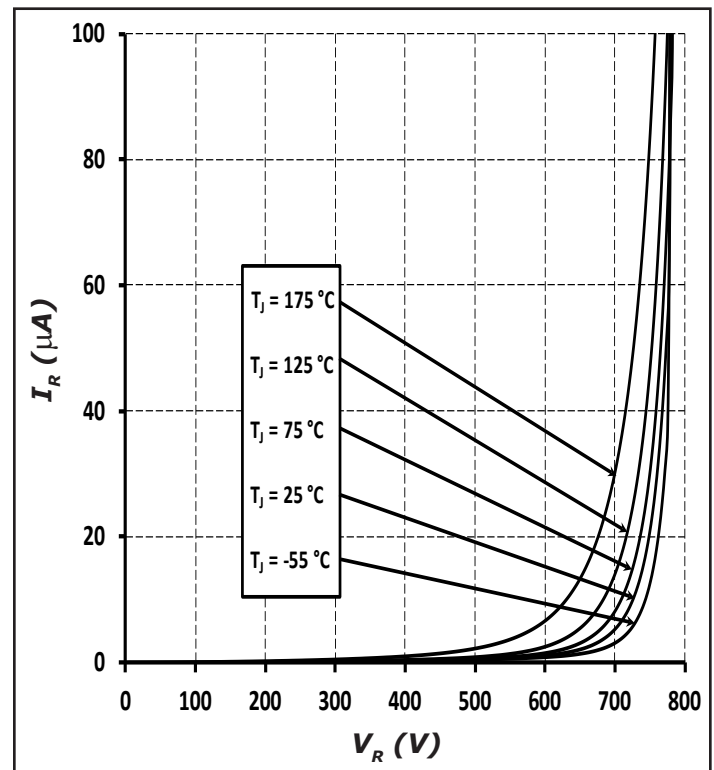


Figure 2. Reverse Characteristics

## Typical Performance

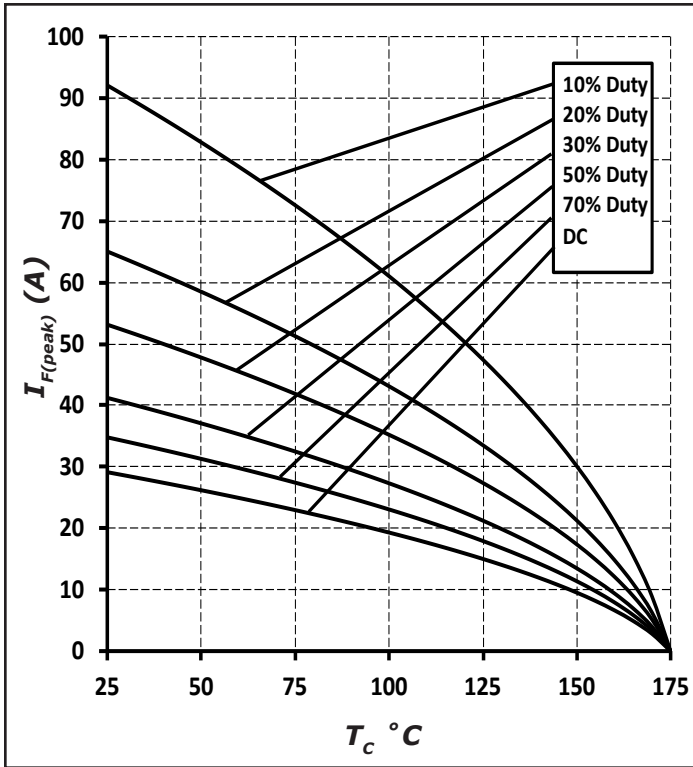


Figure 3. Current Derating

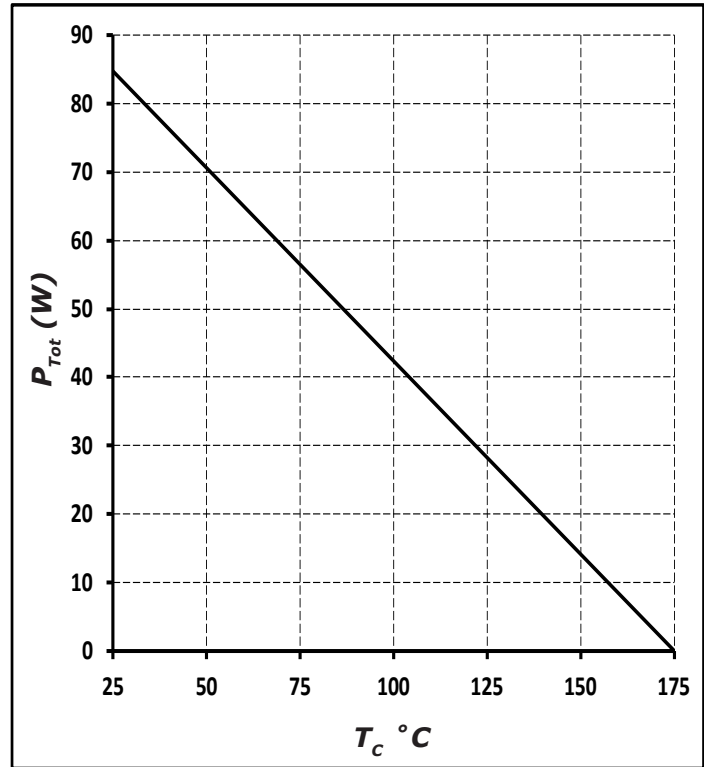


Figure 4. Power Derating

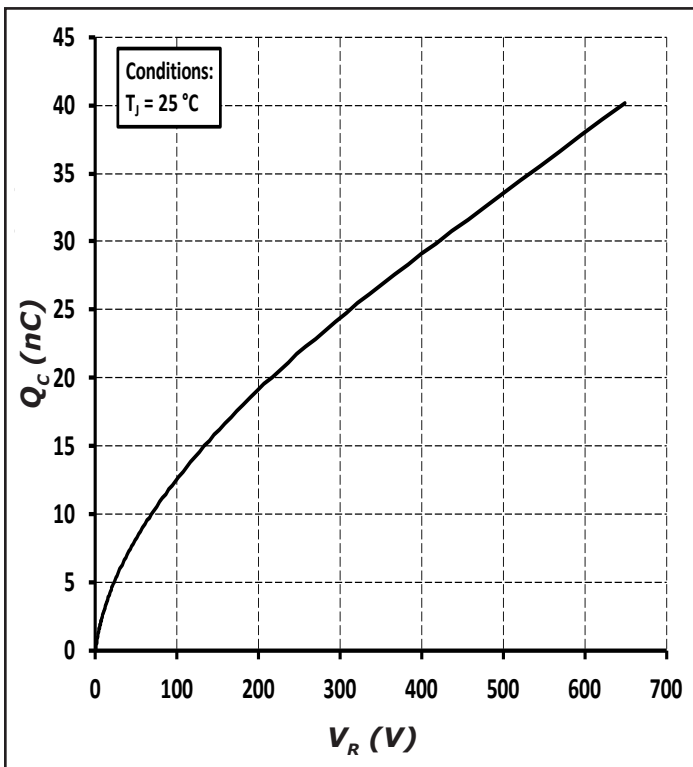


Figure 5. Total Capacitance Charge vs. Reverse Voltage

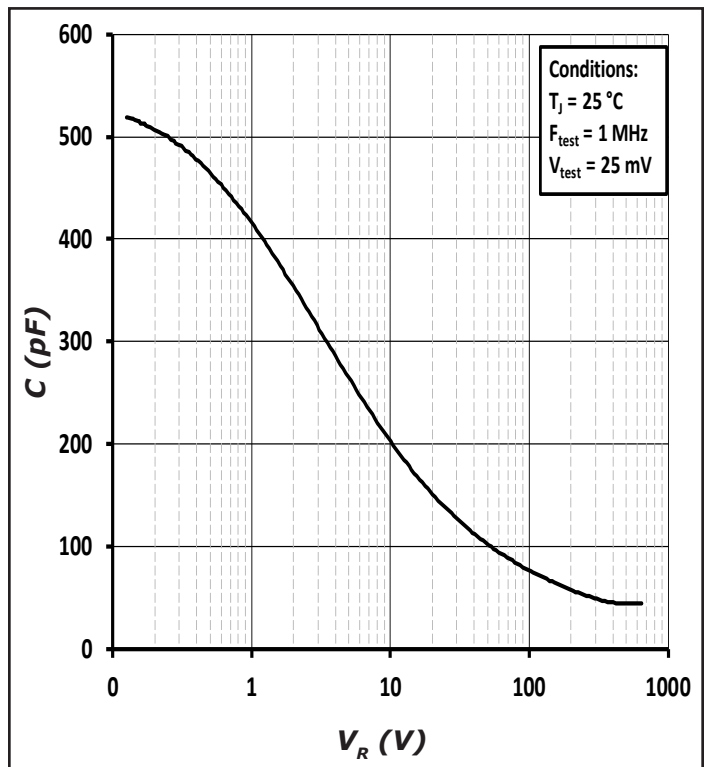


Figure 6. Capacitance vs. Reverse Voltage

## Typical Performance

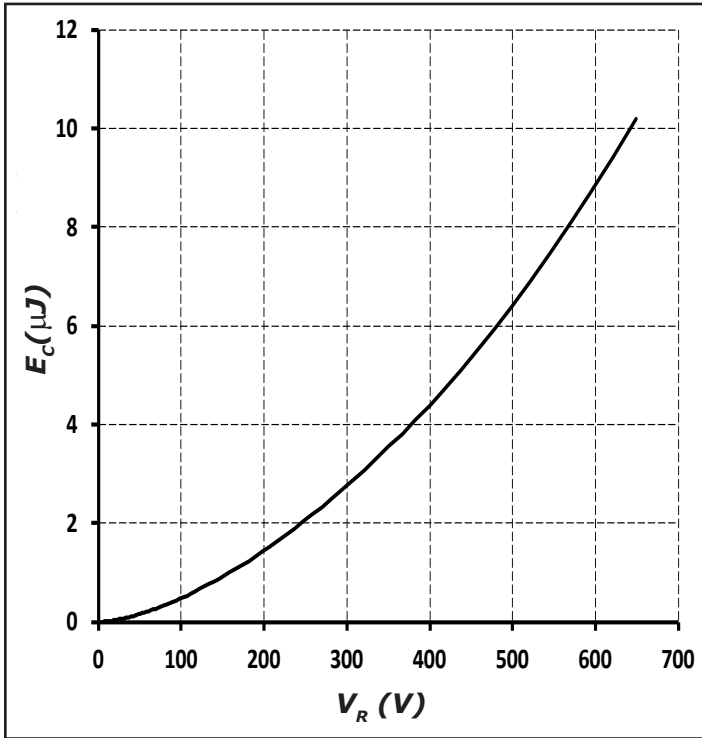


Figure 7. Capacitance Stored Energy

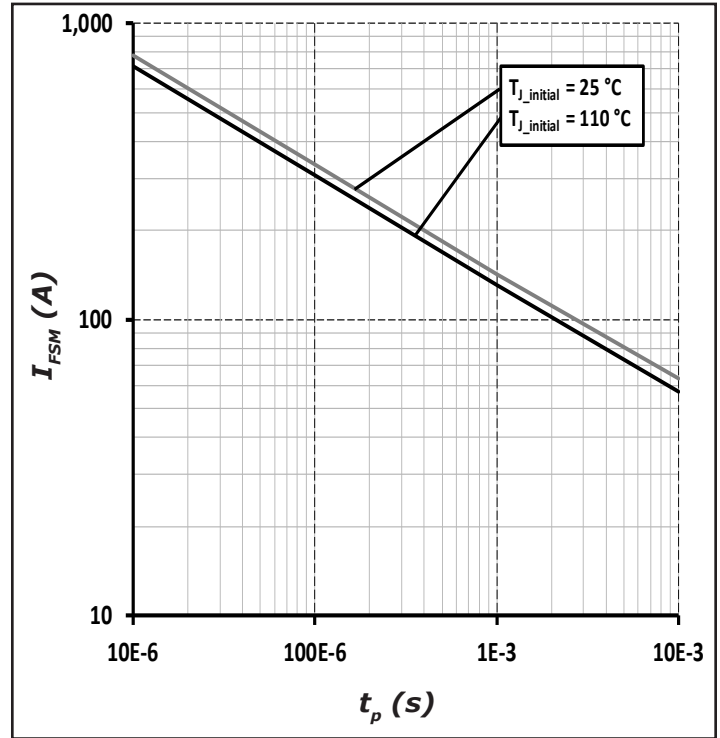


Figure 8. Non-repetitive peak forward surge current versus pulse duration (Sinusoidal Waveform)

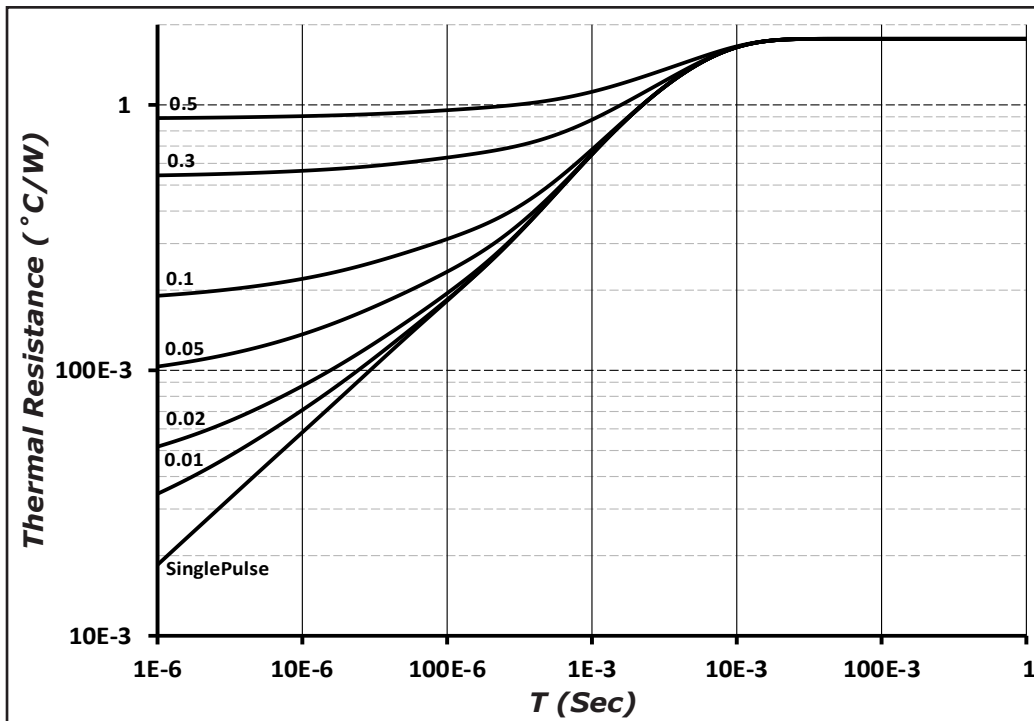
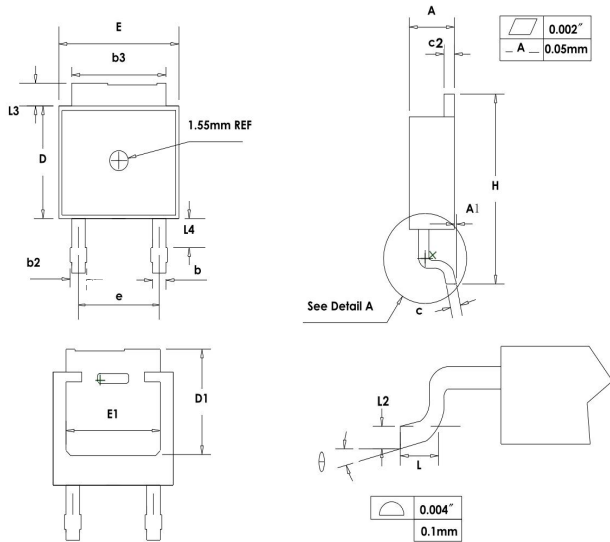


Figure 9. Transient Thermal Impedance

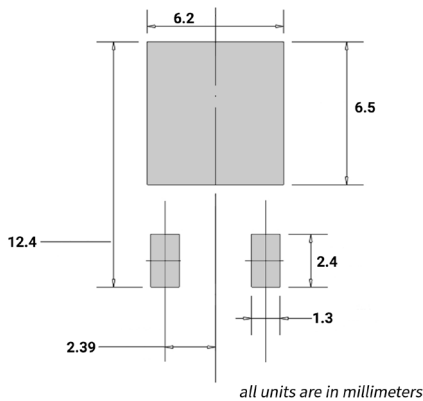
## Package Dimensions

### Package TO-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

Part Number	Package	Marking
C6D08065E	TO-252-2	C6D08065

**Note: Recommended soldering profiles can be found in the applications note here:**  
[http://www.wolfspeed.com/power\\_app\\_notes/soldering](http://www.wolfspeed.com/power_app_notes/soldering)

