CPW2-0650-S006B

Silicon Carbide Schottky Diode Chip

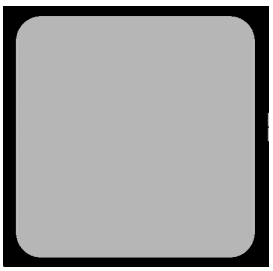
Z-Rec® Rectifier

V_{RRM}	=	650 V
$I_{F(AVG)}$	=	6 A
Q_c	=	15 nC

Features

- 650-Volt Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on V_F

Chip Outline



AEC-Q101 Qualified

Halogen-Free

RoHS

Part Number	Die Size	Anode	Cathode
CPW2-0650-S006B	1.55 x 1.55	Al	Ni/Ag

Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V		
V_{RSM}	Surge Peak Reverse Voltage	650	V		
V_R	DC Peak Blocking Voltage	650	V		
I_F	Continuous Forward Current	19 9 6	A	T_C=25˚C T_C=135˚C T_C=154˚C	1
I_{FRM}	Repetitive Peak Forward Surge Current	30 20	A	T_C=25˚C, t_P = 10 ms, Half Sine Wave T_C=110˚C, t_P = 10 ms, Half Sine Wave	1
I_{FSM}	Non-Repetitive Peak Forward Surge Current	63 49	A	T_C=25˚C, t_p = 10 ms, Half Sine Wave T_C=110˚C, t_p = 10 ms, Half Sine Wave	1
$I_{F,Max}$	Non-Repetitive Peak Forward Surge Current	540 460	A	T_C=25˚C, t_P = 10 µs, Pulse T_C=110˚C, t_P = 10 µs, Pulse	
dV/dt	Diode dV/dt ruggedness	200	V/ns	V_R=0-650V	
$\int i^2dt$	i^2t value	20 12	A^2s	T_C=25˚C, t_P=10 ms T_C=110˚C, t_P=10 ms	1
T_J , T_{stg}	Operating Junction and Storage Temperature	-55 to +175	˚C		
T_{Proc}	Maximum Processing Temperature	325	˚C	10 min. maximum	

1. Assumes $R_{\theta JC}$ Thermal Resistance of 1.7˚C/W or less

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.5 2.0	1.7 2.4	V	I_F = 6 A T_J=25°C I_F = 6 A T_J=175°C	Fig. 1
I_R	Reverse Current	8 15.5	40 160	µA	V_R = 650 V T_J=25°C V_R = 650 V T_J=175°C	Fig. 2
Q_C	Total Capacitive Charge	15		nC	V_R = 400 V, I_F = 6 A di/dt = 500 A/µs T_J = 25°C	Fig. 3
C	Total Capacitance	295 28.5 25.5		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. 4
E_C	Capacitance Stored Energy	2.3		µJ	V_R = 400 V	

Mechanical Parameters

Parameter	Typ.	Unit
Die Size	1.55 x 1.55	mm
Anode Pad Size	1.29 x 1.29	mm
Anode Pad Opening	1.08 x 1.08	mm
Thickness	377 ± 10%	µm
Wafer Size	100	mm
Anode Metalization (Al)	4	µm
Cathode Metalization (Ni/Ag)	1.8	µm
Frontside Passivation	Polyimide	

Typical Characteristics

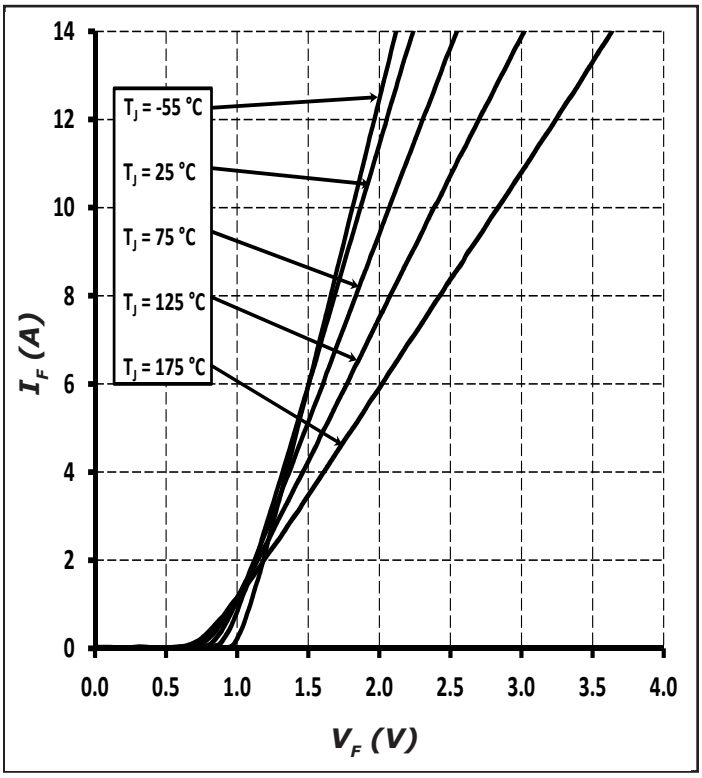


Figure 1. Forward Characteristics

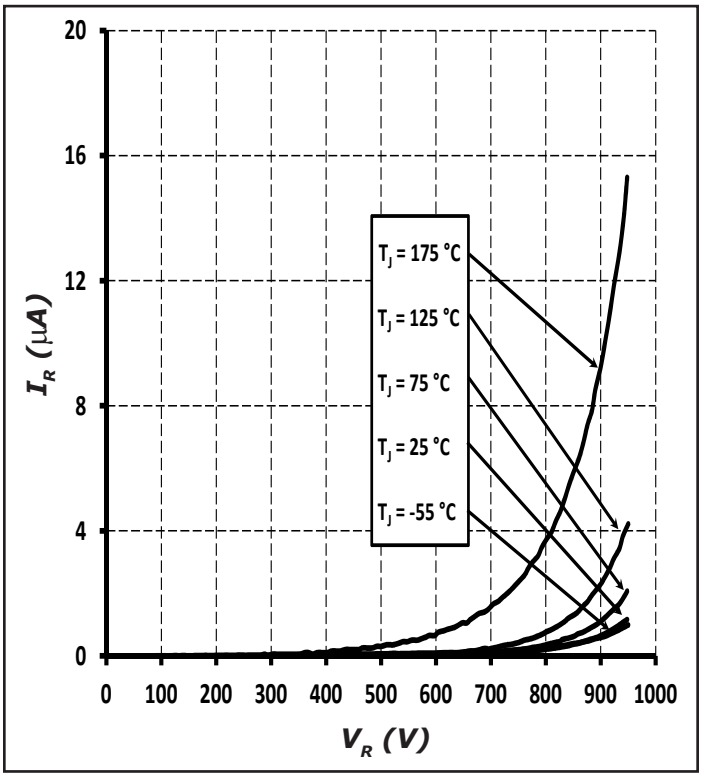


Figure 2. Reverse Characteristics

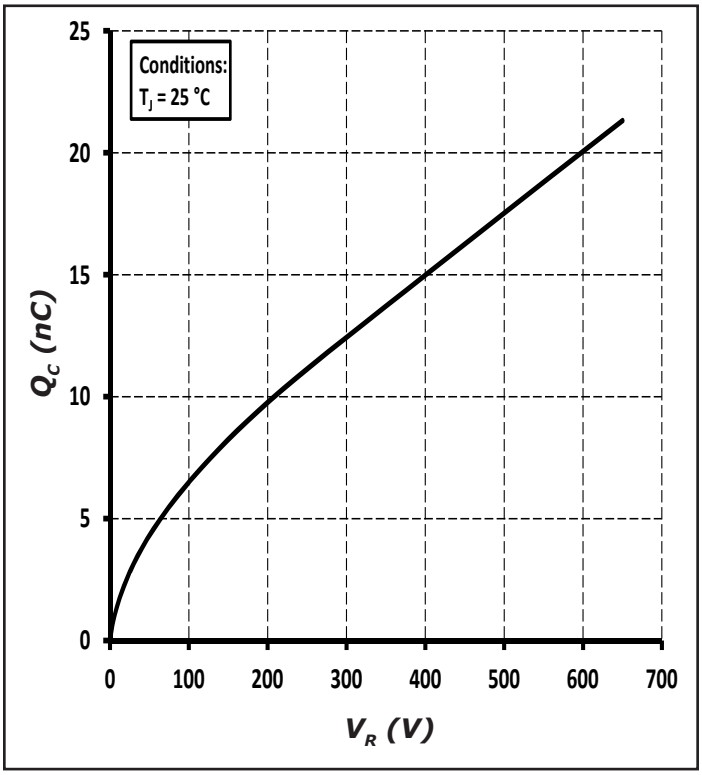


Figure 3. Total Capacitance Charge vs. Reverse Voltage

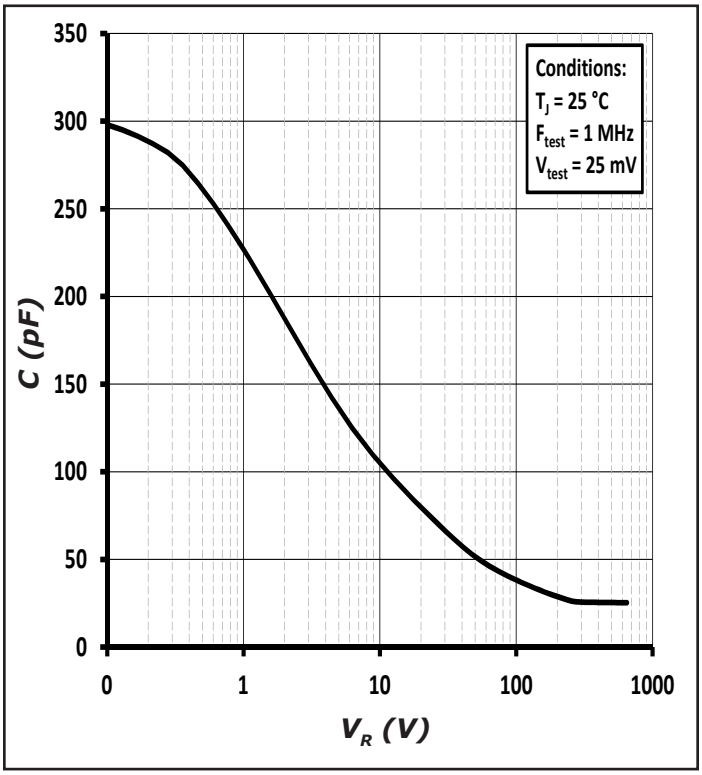
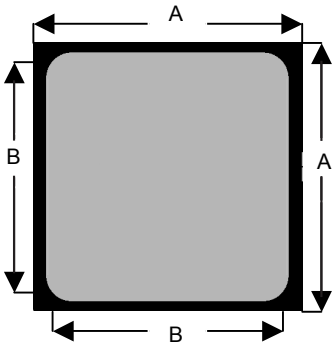


Figure 4. Capacitance vs. Reverse Voltage

Chip Dimensions



symbol	dimension	
	mm	inch
A	1.55	0.061
B	1.29	0.051

Notes

- **RoHS Compliance**
  The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Cree representative or from the Product Documentation sections of www.cree.com.

- **REACh Compliance**
  REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future,please contact a Cree representative to insure you get the most up-to-date REACh SVHC Declaration. REACh banned substance information (REACh Article 67) is also available upon request.

- This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control systems.

Related Links

- Cree SiC Schottky diode portfolio: http://www.wolfspeed.com/Power/Products#SiCSchottkyDiodes
- Schottky diode Spice models: http://www.wolfspeed.com/power/tools-and-support/DIODE-model-request2
- SiC MOSFET and diode reference designs: http://go.pardot.com/l/101562/2015-07-31/349i

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