WS4A006065A

Silicon Carbide Schottky Diode

Features

- New Thin Wafer Technology
- Low Forward Voltage Drop (V_F)
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on V_F
- Temperature-independent Switching

Package





Benefits

- Replace Bipolar with Unipolar Device
- Reduction of Heat Sink Size
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

Applications

- Switch Mode Power Supplies
- Uninterruptible Power Supplies
- Server/Telecom Power Supplies
- Industrial Power Supplies

Maximum Ratings

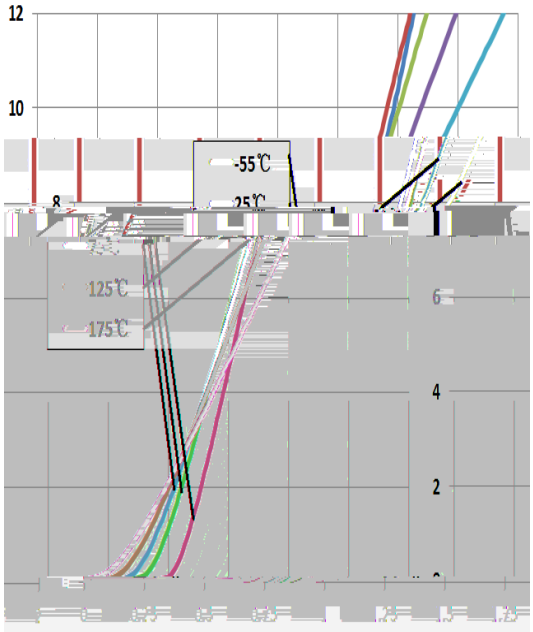
Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V	T_C = 25	
V_{RSM}	Surge Peak Reverse Voltage	650	V	T_C = 25	

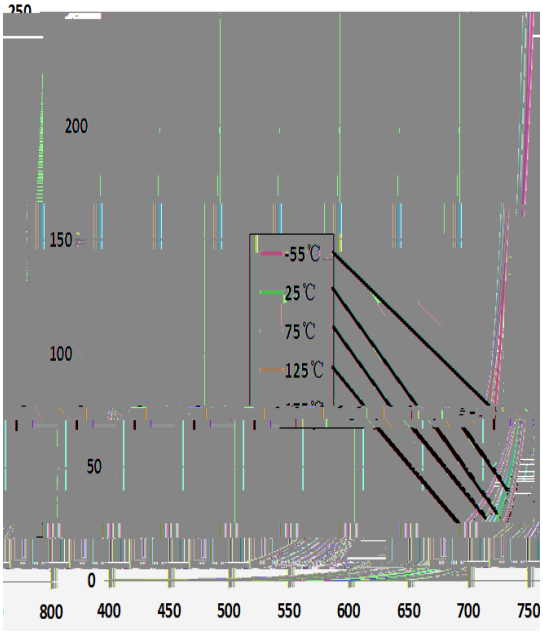
Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.27 1.38	1.5 1.6	V	I_F = 6A, T_J = 25 I_F = 6A, T_J = 175	Fig.1
I_R	Reverse Current	4 20	50 200	μA	V_R = 650V, T_J = 25 V_R = 650V, T_J = 175	Fig.2
C	Total Capacitance	380 39 28	/	pF	V_R = 0V, T_J = 25 , f = 1MHz V_R = 200V, T_J = 25 , f = 1MHz V_R = 400V, T_J = 25 , f = 1MHz	Fig.5
Q_C	Total Capacitive Charge	17	/	nC	V_R = 400V, I_F = 6A di/dt = 200A/μs, T_J = 25	Fig.4

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
R	Thermal Resistance from Junction to Case	1.8		





Typical Performance

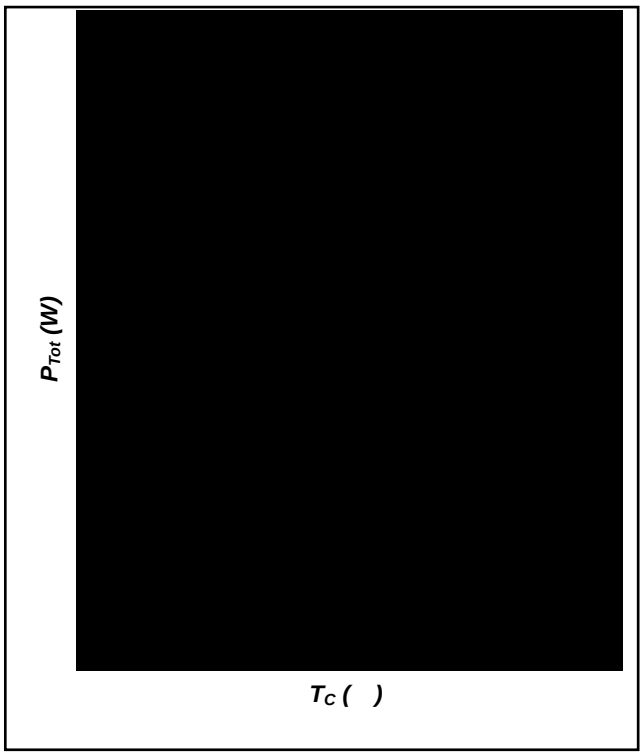


Figure 3. Power Derating

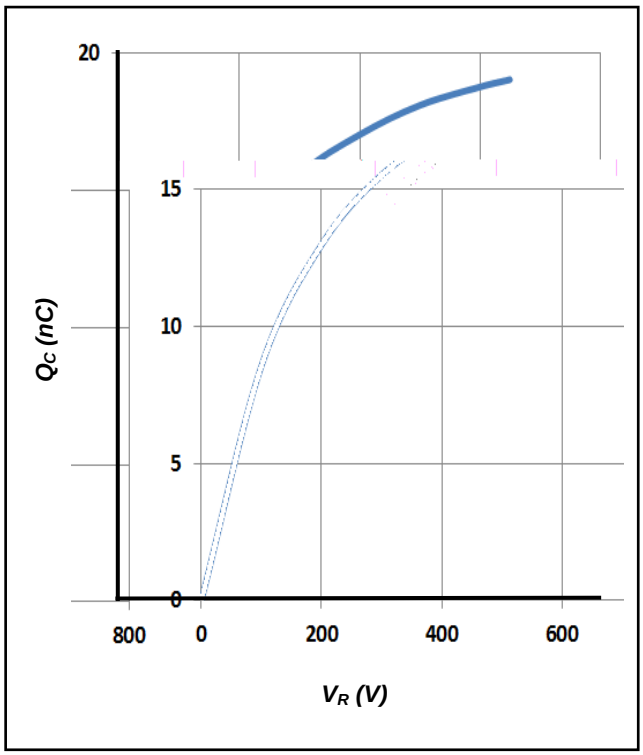


Figure 4. Total Capacitive Charge vs. Reverse Voltage

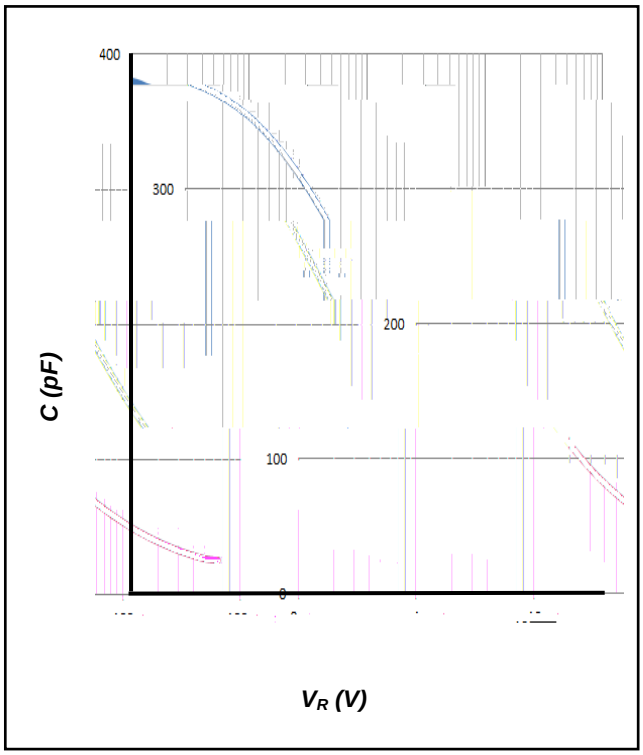


Figure 5. Total Capacitance vs. Reverse Voltage

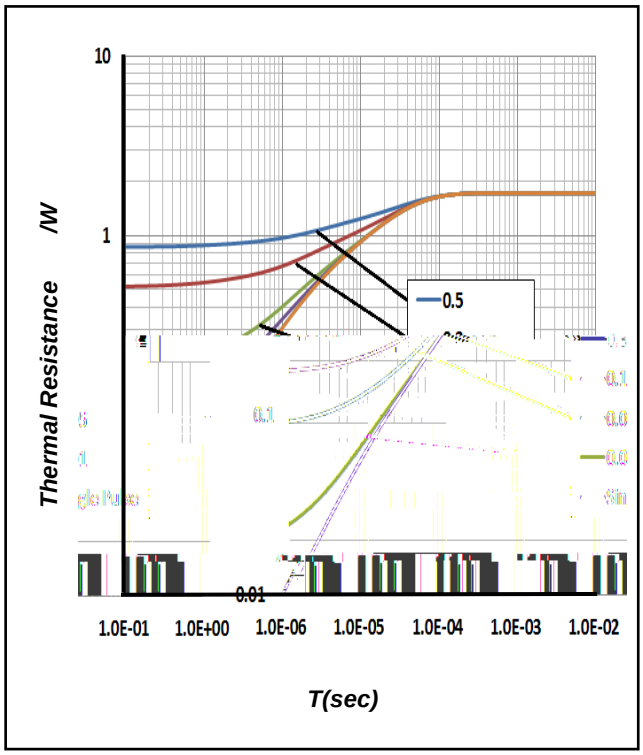
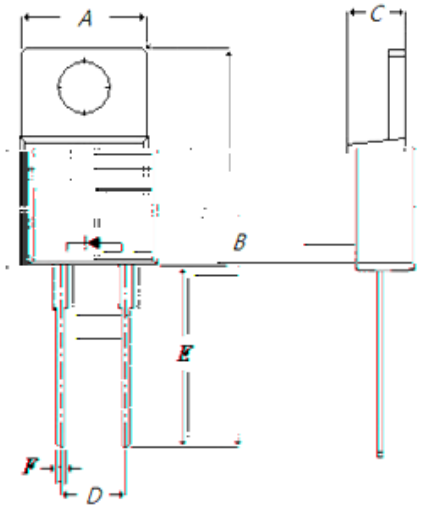


Figure 6. Transient Thermal Impedance

Package Dimensions

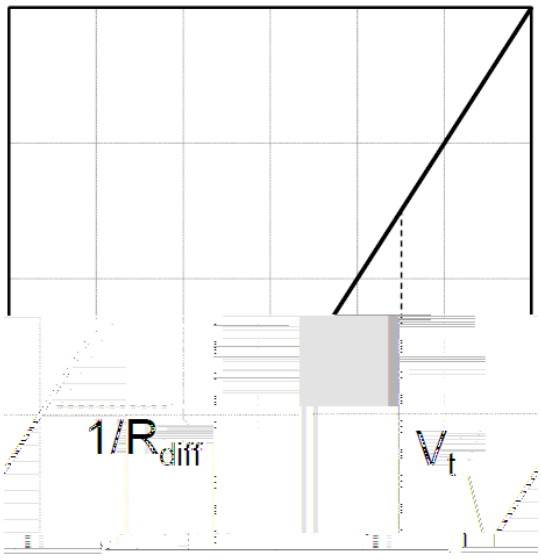
Package TO-220-2



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	9.17		

Simplified Diode Model

Equivalent IV Curve for Model



Mathematical Equation

$$V_F = V_t + I_F \times R_{diff}$$

$V_t = -0.001 \times T_j + 0.99$ [V]

$R_{diff} = 1.2 \times 10^{-6} \times T_j^2 + 7.2 \times 10^{-5} \times T_j + 0.46$

Note:

Tj = Diode Junction Temperature In Degrees Celsius, valid from 25°C to 175°C

I_F= Forward Current

Less than 12A

ADD: No.166 Zhengfang Middle Road, Jiangning District, Nanjing, Jiangsu Province
Contact Person: YONG YANG, NAN WANG
TEL 025-68005861, 13770574989

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