S1D010065A

TriQSiC™ 650V Silicon Carbide Schottky Diode G1

Features

- 650V schottky Rectifier
- Zero Reverse Recovery Current / Zero forward recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Low forward voltage
- Positive Temperature Coefficient on V_F
- Increased Creepage/Clearance Distance

TO-220-2L

Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- High Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives
- AC/DC converters

Table 1 Key performance and package parameters

Type	V_{RRM}	I_F(T_C = 135℃)	Q_C	Marking	Package
S1D010065A	650V	16A	26nC	S1D010065A	TO-220-2L

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1、Maximum ratings

Table 2 Maximum rating (Tc = 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V	-	
V_{RSM}	Surge Peak Reverse Voltage	700	V	-	
V_R	DC Peak Reverse Voltage	650	V	-	
I_F	Continuous Forward Current	32 16 10	A	Tc = 25°C Tc = 135°C Tc = 155°C	Fig.7
I_{FSM}	Non-Repetitive Peak Forward Surge Current	80	A	Tc = 25℃，tp = 10ms，Half Sine Pulse	
P_{tot}	Power Dissipation	110 48	W	Tc = 25°C Tc = 110°C	Fig.6
$\int i^2dt$	$\int i^2dt$	32	A^2S	Tc = 25℃，tp = 10ms	
T_{stg} ,T_J	Operating Junction Range	-55 to +175	℃	-	

2、Thermal characteristics

Table 3 Thermal characteristics

Symbol	Parameter	Typ.	Unit	Test Conditions	Note
$R_{th(j-c)}$	Thermal resistance from junction to case	1.36	°C/W	-	Fig.8

3、Electrical characteristics

Table 4 Electrical characteristics (Tc = 25°C unless otherwise specified)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.35 1.53	1.6 1.9	V	I_F = 10A，T_J = 25°C I_F = 10A，T_J = 175°C	Fig.1
I_R	Reverse Current	0.5 7	100 200	μA	V_R = 650V，T_J = 25°C V_R = 650V，T_J = 175°C	Fig.2
Q_c	Total Capacitive Charge	26	-	nC	V_R = 400V，I_F = 10A di/dt =200A/μs，T_J = 25°C	Fig.4
C	Total Capacitance	576 47 36	-	pF	V_R = 0V，T_J = 25°C，f = 1MHz V_R = 200V，T_J = 25°C，f = 1MHz V_R = 400V，T_J = 25°C，f = 1MHz	Fig.3
E_C	Capacitance Stored Energy	6.6	-	μJ	V_R = 400V	Fig.5

4、Electrical characteristic diagrams

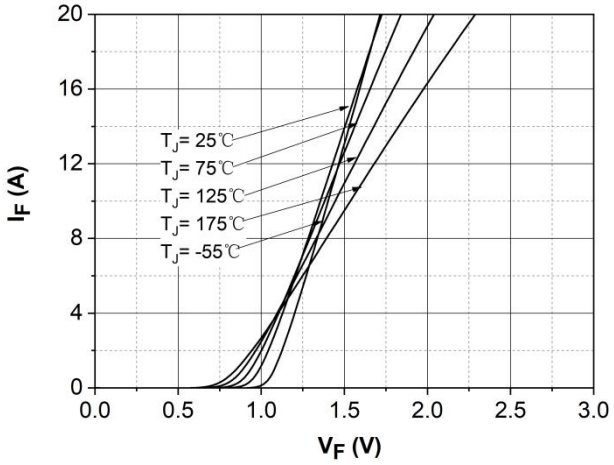


Figure 1. Forward Characteristics

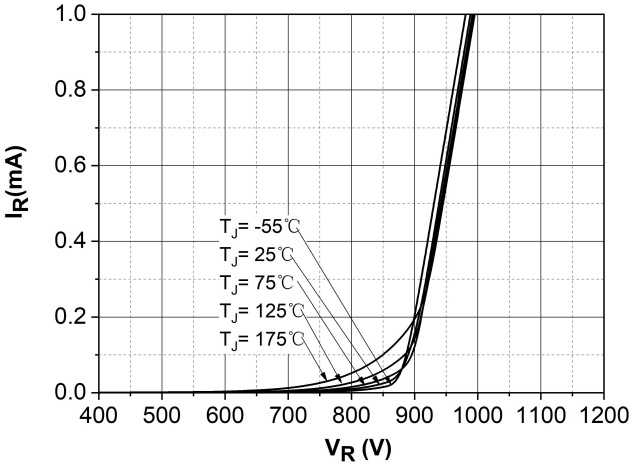


Figure 2. Reverse Characteristics

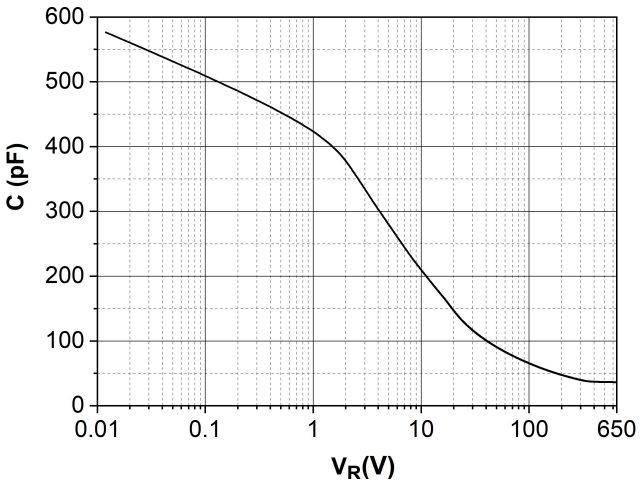


Figure 3. Capacitance vs. Reverse Voltage

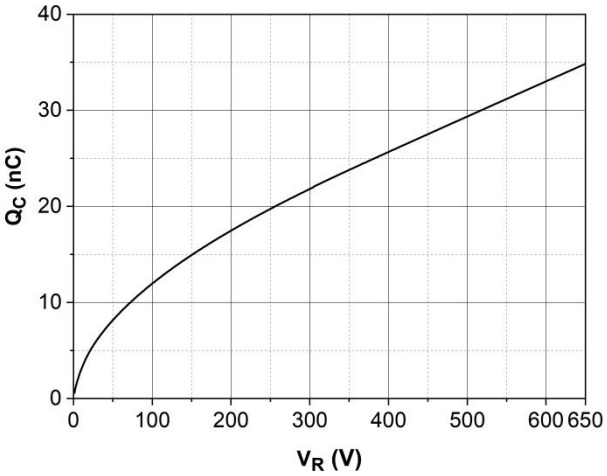


Figure 4. Recovery Charge vs. Reverse Voltage

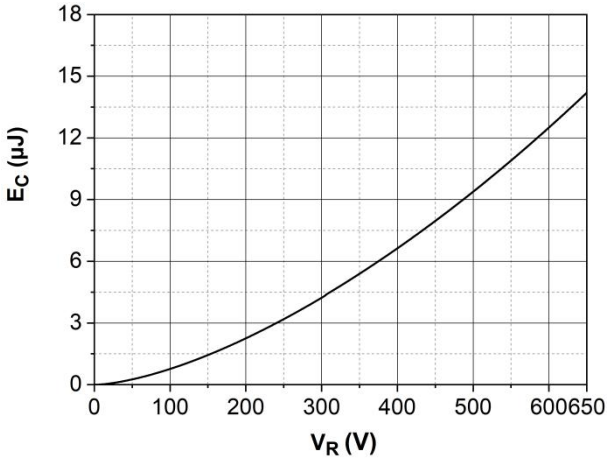


Figure 5. Typical Capacitance Stored Energy

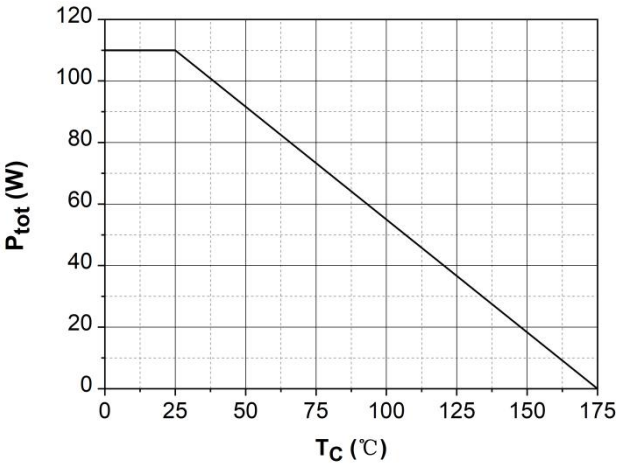


Figure 6. Power Derating

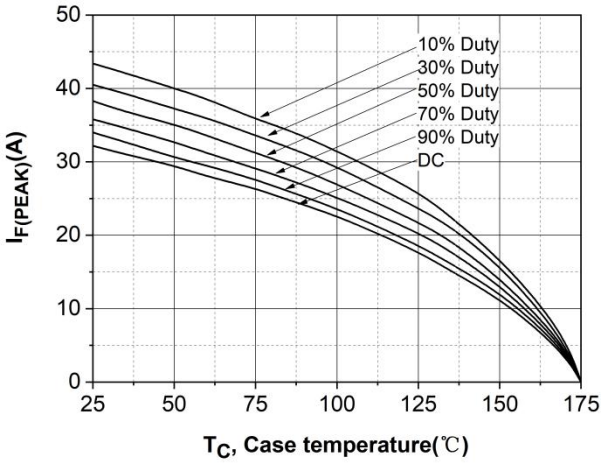


Figure 7. Current Derating

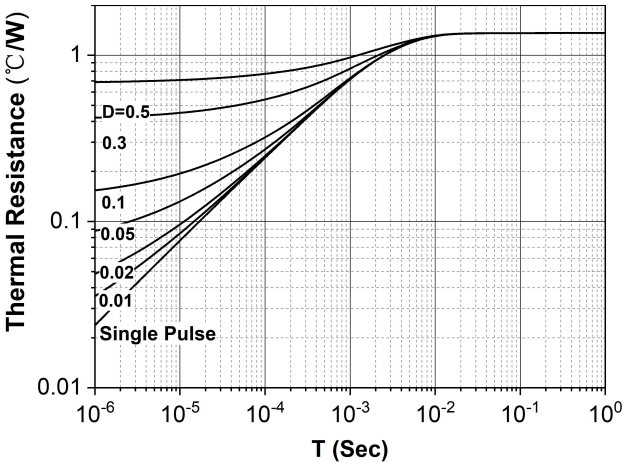
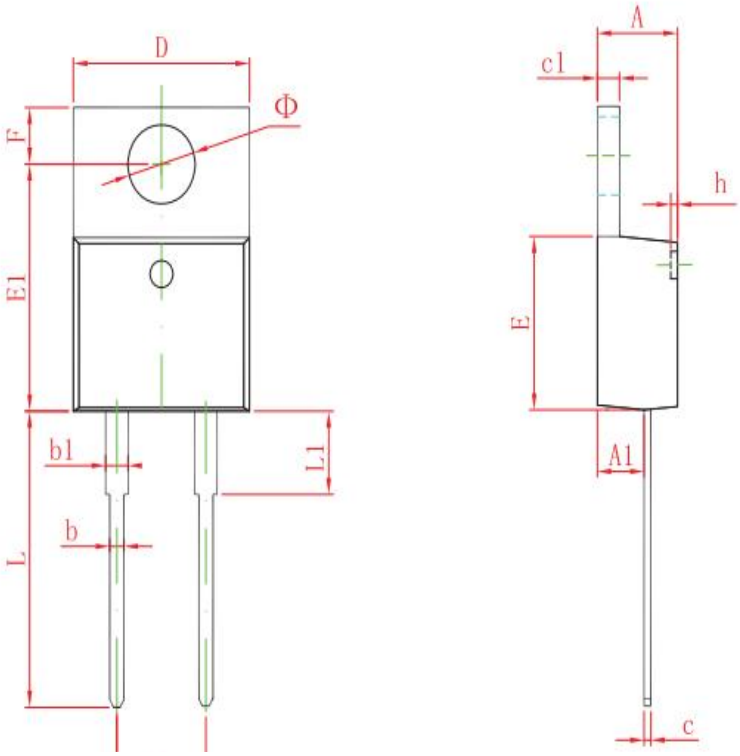


Figure 8. Transient Thermal Impedance

5、Package drawing (TO-220-2L)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.450	4.750	0.175	0.187
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.300	0.500	0.012	0.020
c1	1.170	1.370	0.046	0.054
D	9.830	10.330	0.387	0.407
E	8.500	8.900	0.335	0.350
E1	12.050	12.650	0.474	0.498
e	5.080 TYP		0.200 TYP	
F	2.540	2.940	0.100	0.116
h	0.100 TYP		0.004 TYP	
L	13.300	13.800	0.523	0.543
L1	3.540	3.940	0.139	0.155
Φ	3.735	3.935	0.147	0.155

Revision history

Document version	Date of release	Description of changes
V01_00	2025-04-29	——

Attention

1. **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.

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