



Silicon Carbide Schottky Diode S1S65020RC1

V_{RRM}	=	650 V
$I_F (T_c=135\text{ }^\circ\text{C})$	=	27 A
Q_c	=	90 nC

Features

- 650V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching

Benefits

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

Applications

- Switch Mode Power Supplies (SMPS)
- Power Factor Correction
- Motor Drives

Package



Part Number	Package
S1S65020RC1	TO220-2L

料号: 3960170000
 品名: Si C SBD塑封器件 650V 20A-T0220-2L(S1S65020RC1)
 版本: 01
 编辑: 温小花 2025.01.02
 审核: 王松 2025.01.02



Maximum Rated Values ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V		
V_R	DC Peak Reverse Voltage	650	V		
I_F	Continuous Forward Current	62	A	$T_C=25^{\circ}\text{C}$	Fig. 3
		27		$T_C=135^{\circ}\text{C}$	
		20		$T_C=150^{\circ}\text{C}$	
I_{FRM}	Repetitive Peak Forward Surge Current	79	A	$T_C=25^{\circ}\text{C}$, $t_p=10$ ms, Half Sine Pulse	
		69		$T_C=110^{\circ}\text{C}$, $t_p=10$ ms, Half Sine Pulse	
I_{FSM}	Non-Repetitive Forward Surge Current	99	A	$T_C=25^{\circ}\text{C}$, $t_p=10$ ms, Half Sine Pulse	
		86		$T_C=110^{\circ}\text{C}$, $t_p=10$ ms, Half Sine Pulse	
$I_{F,MAX}$	Non-Repetitive Forward Surge Current	557	A	$T_C=25^{\circ}\text{C}$, $t_p=10\mu\text{s}$, Square Wave Pulse	
		422		$T_C=110^{\circ}\text{C}$, $t_p=10\mu\text{s}$, Square Wave Pulse	
P_{tot}	Power Dissipation	192	W	$T_C=25^{\circ}\text{C}$	Fig. 4
		83		$T_C=110^{\circ}\text{C}$	
T_J	Operating Temperature	-55 to +175	$^{\circ}\text{C}$		
T_{stg}	Storage Temperature	-55 to +175	$^{\circ}\text{C}$		
	TO-247 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	

Electrical Characteristics ($T_J=25^{\circ}\text{C}$)

Symbol	Parameter	Value			Unit	Test Conditions	Note
		Min.	Typ.	Max.			
V_F	Forward Voltage		1.4	2.0	V	$I_F=20\text{A}$, $T_J=25^{\circ}\text{C}$	Fig. 1
			1.6	2.2		$I_F=20\text{A}$, $T_J=175^{\circ}\text{C}$	
I_R	Reverse Current		0.8	100	μA	$V_R=650\text{V}$, $T_J=25^{\circ}\text{C}$	Fig. 2
			10			$V_R=650\text{V}$, $T_J=175^{\circ}\text{C}$	
Q_C	Total Capacitive Charge		90		nC	$V_R=650\text{V}$, $T_J=25^{\circ}\text{C}$	Fig. 5
C	Total Capacitance		1349		pF	$V_R=0\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$	Fig. 6
			110			$V_R=400\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$	
			108			$V_R=650\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$	
E_C	Capacitance Stored Energy		17		μJ	$V_R=650\text{V}$	Fig. 7

Thermal Characteristics

Symbol	Parameter	Value	Unit	Note
$R_{\theta JC}$	Thermal Resistance(Junction to Case)	0.78	$^{\circ}\text{C/W}$	Fig. 8



Typical Performance

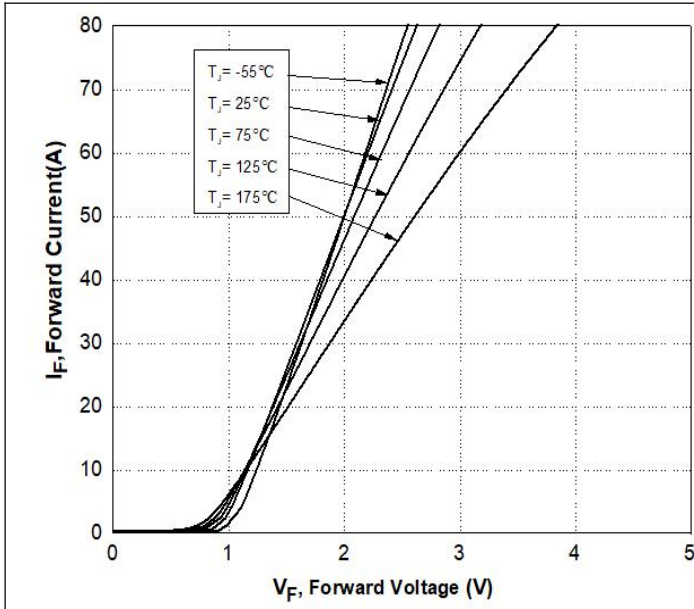


Figure 1. Forward Characteristics

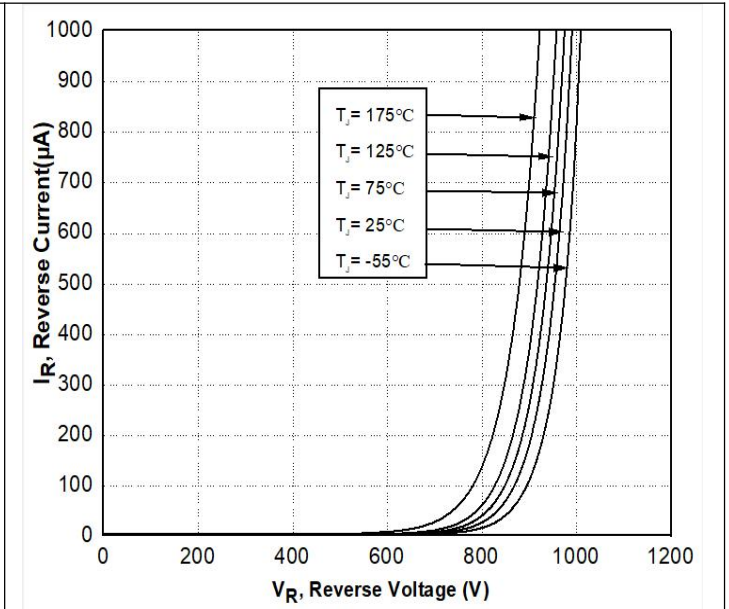


Figure 2. Reverse Characteristics

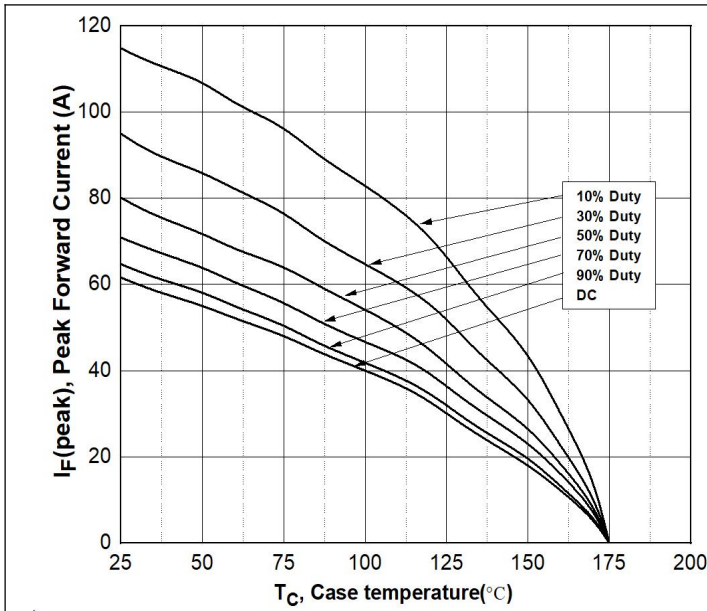


Figure 3. Current Derating

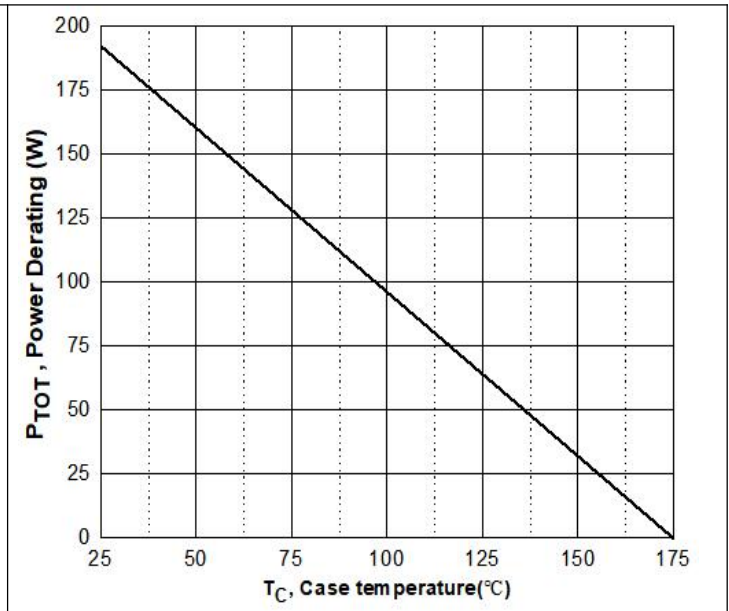


Figure 4. Power Derating



Typical Performance

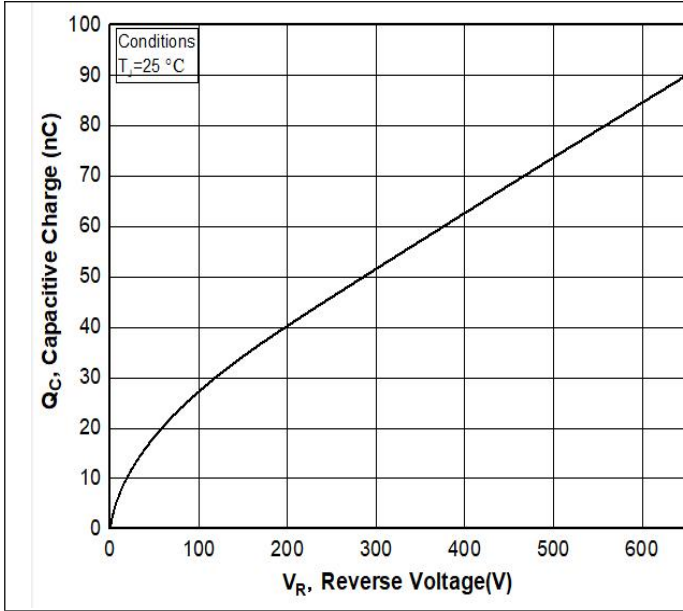


Figure 5. Capacitance Charge Vs. Reverse Voltage

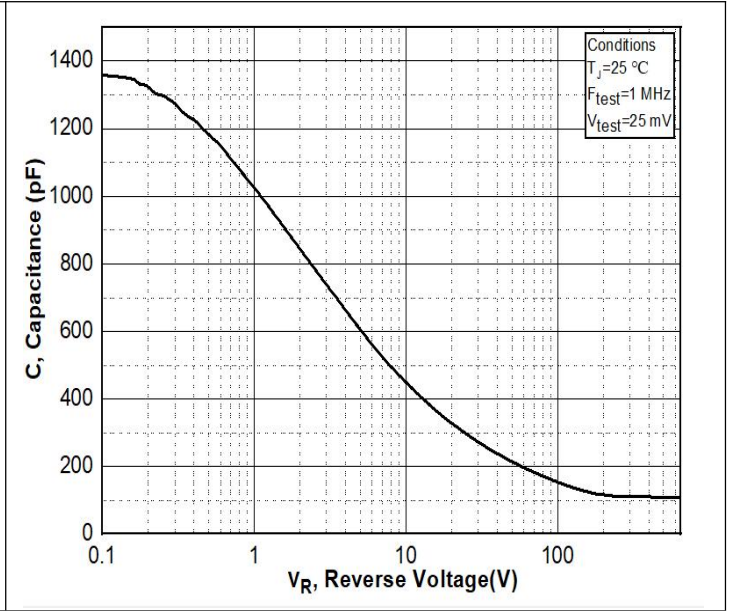


Figure 6. Capacitance Vs. Reverse Voltage

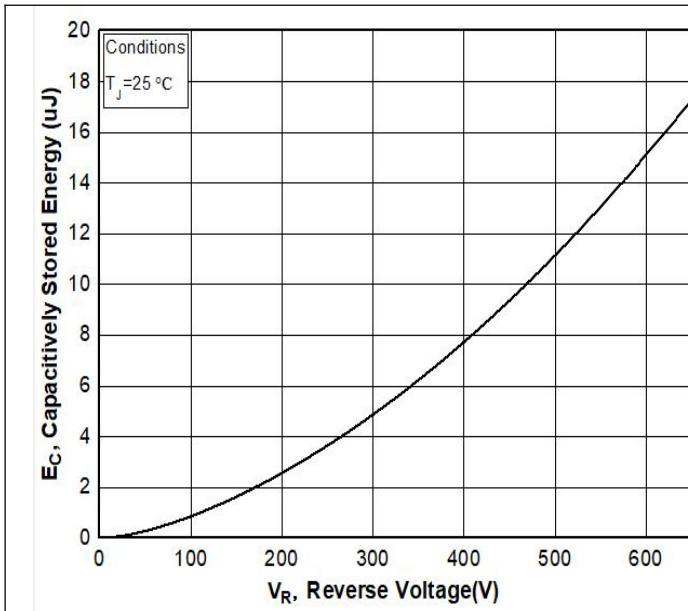


Figure 7. Capacitance Stored Energy

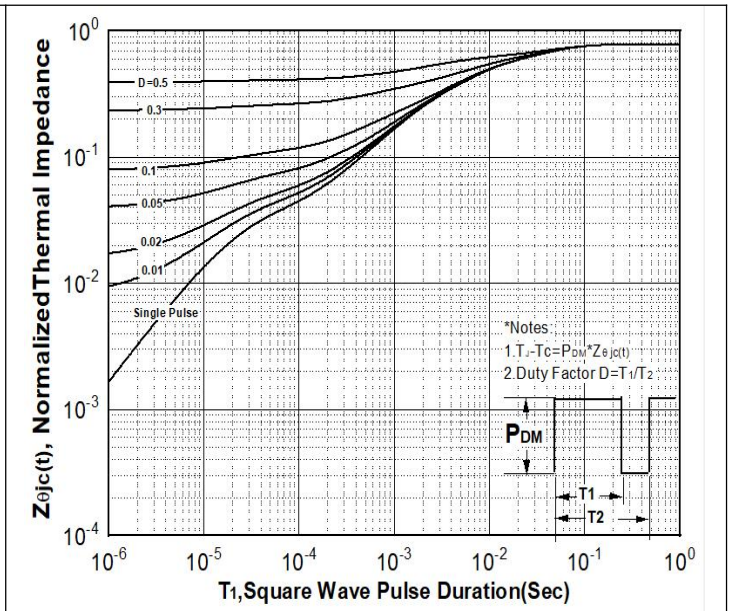
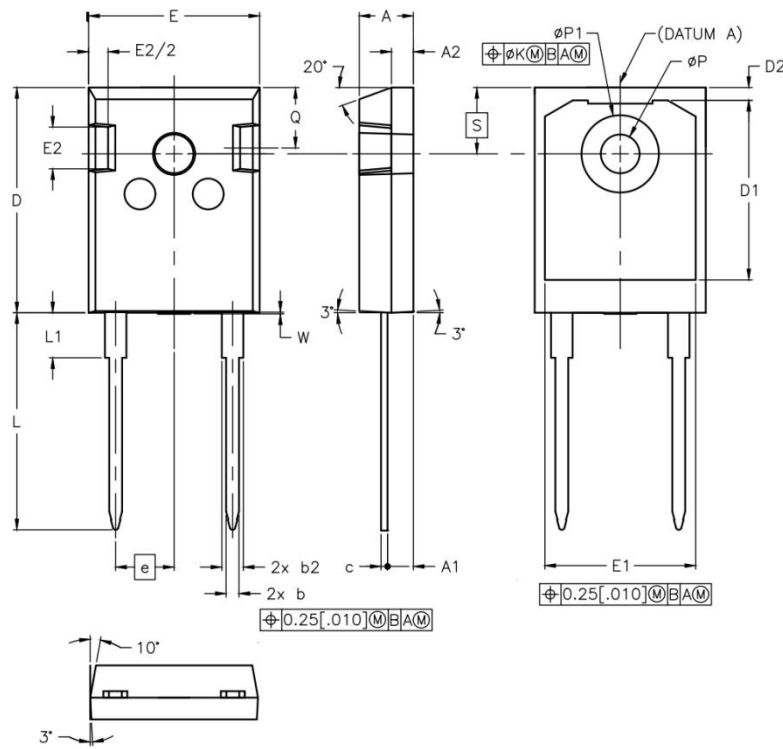


Figure 8. Transient Thermal Response Curve(Junction-to-Case)



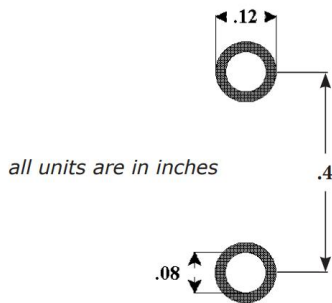
Package Dimensions

Package TO-247-2L



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.70	5.31
A1	.087	.102	2.21	2.59
A2	.059	.098	1.50	2.49
b	.039	.055	0.99	1.40
b2	.065	.094	1.65	2.39
c	.015	.035	0.38	0.89
D	.819	.845	20.80	21.46
D1	.515	-	13.08	-
D2	.020	.053	0.51	1.35
E	.620	.640	15.49	16.26
E1	.530	-	13.46	-
E2	.135	.157	3.43	3.99
e	.214		5.44	
ØK	.010		0.25	
L	.780	.800	19.81	20.32
L1	-	.177	-	4.50
ØP	.140	.144	3.56	3.66
ØP1	.278	.291	7.06	7.39
Q	.212	.244	5.38	6.20
S	.243		6.17	
W	-	.006	-	0.15

Recommended Solder Pad Layout



TO247-2L

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