Silicon Carbide Schottky Diode

S1S12020RB1

V_{RRM}	=	1200 V
I_F (T_C=135 ˚C)	=	32 A
Q_C	=	107 nC

Features

- 1200V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching

Package

Halogen-Free

RoHS

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

Part Number	Package
S1S12020RB1	TO247-2L

料号:3960230000
品名:SiC SBD塑封器件 1200V 20A-TO247-2L(S1S12020RB1)
版本:01
编辑:温小花 2025.01.02
审核:王松 2025.01.02

Maximum Rated Values (T_C=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V		
V_R	DC Peak Reverse Voltage	1200	V		
I_F	Continuous Forward Current	67	A	T_C=25˚C	Fig. 3
		32		T_C=135˚C	
		23		Tc=150˚C	
I_{FRM}	Repetitive Peak Forward Surge Current	91	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse	
		77		T_C=110˚C, t_P=10 ms, Half Sine Pulse	
I_{FSM}	Non-Repetitive Forward Surge Current	98	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse	
		84		T_C=110˚C, t_P=10 ms, Half Sine Pulse	
$I_{F,MAX}$	Non-Repetitive Forward Surge Current	872	A	T_C=25˚C, t_P=10μs, Square Wave Pulse	
		753		T_C=110˚C, t_P=10μs, Square Wave Pulse	
P_{tot}	Power Dissipation	319	W	T_C=25˚C	Fig. 4
		138		T_C=110˚C	
T_J	Operating Temperature	-55 to +175	˚C		
T_{stg}	Storage Temperature	-55 to +175	˚C		
	TO-247 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	

Electrical Characteristics (T_J=25℃)

Symbol	Parameter	Value			Unit	Test Conditions	Note
		Min.	Typ.	Max.			
V_F	Forward Voltage		1.4	1.9	V	I_F=20A, T_J=25°C	Fig. 1
			1.9			I_F=20A, T_J=175°C	
I_R	Reverse Current		9.6	200	μA	V_R=1200V, T_J=25°C	Fig. 2
			147			V_R=1200V, T_J=175°C	
Q_C	Total Capacitive Charge		107		nC	V_R=800V,T_J=25°C	Fig. 5
C	Total Capacitance		1615		pF	V_R=0V, T_J=25°C, f=1MHz	Fig. 6
			94			V_R=400V, T_J=25°C, f=1MHz	
			88			V_R=800V, T_J=25°C, f=1MHz	
E_C	Capacitance Stored Energy		27		μJ	V_R=800 V	Fig. 7

Thermal Characteristics

Symbol	Parameter	Value	Unit	Note
$R_{\theta JC}$	Thermal Resistance(Junction to Case)	0.47	°C/W	Fig. 8

Typical Performance

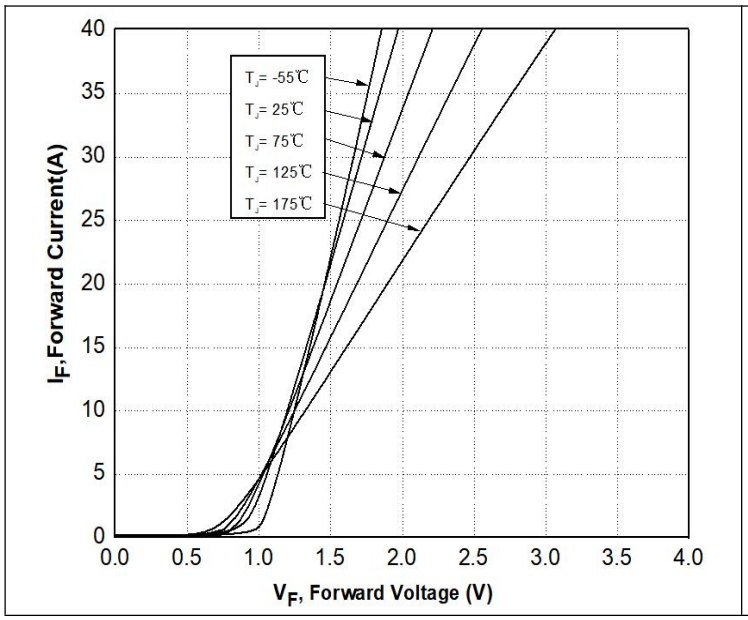


Figure 1. Forward Characteristics

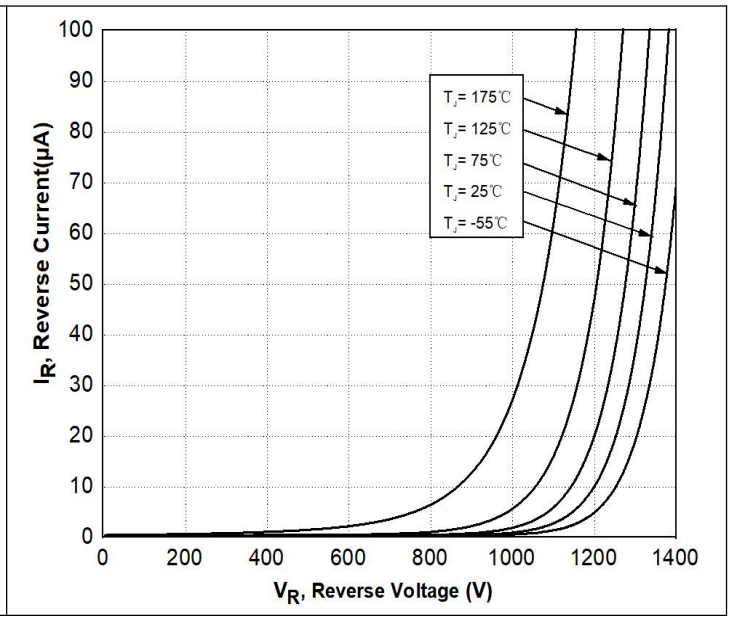


Figure 2. Reverse Characteristics

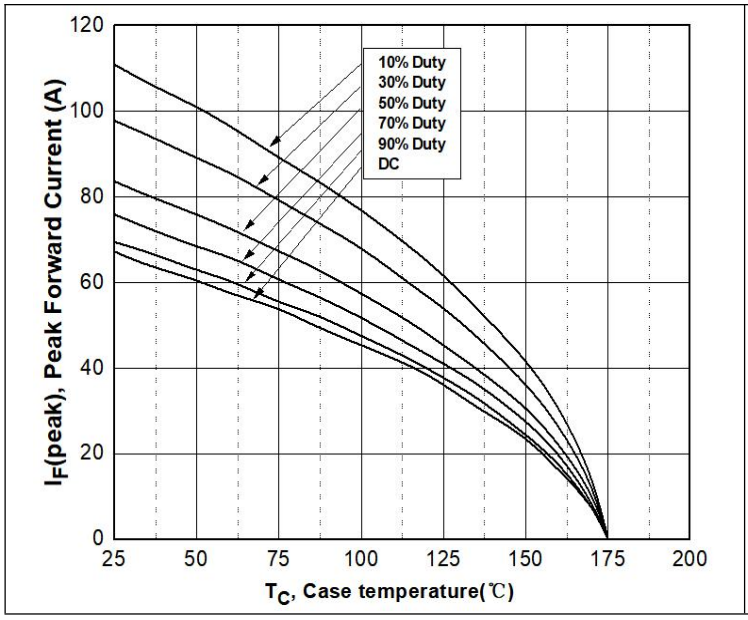


Figure 3. Current Derating

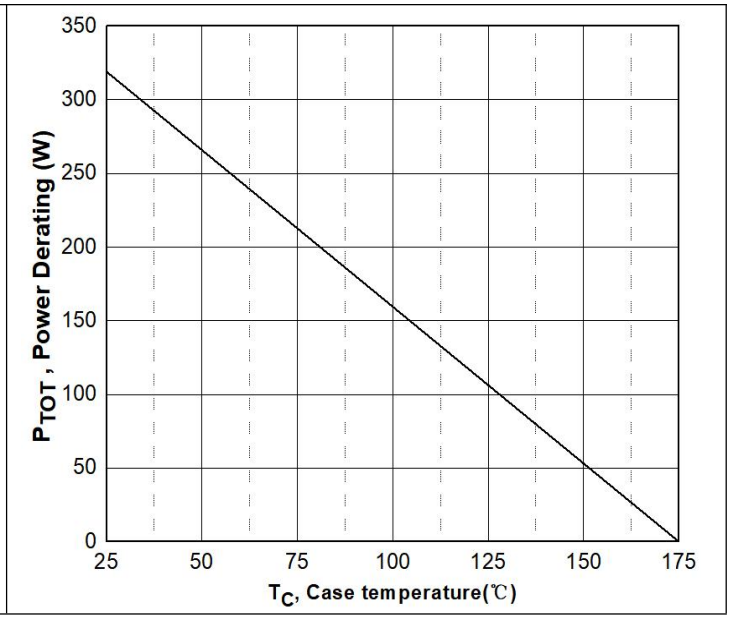


Figure 4. Power Derating

Typical Performance

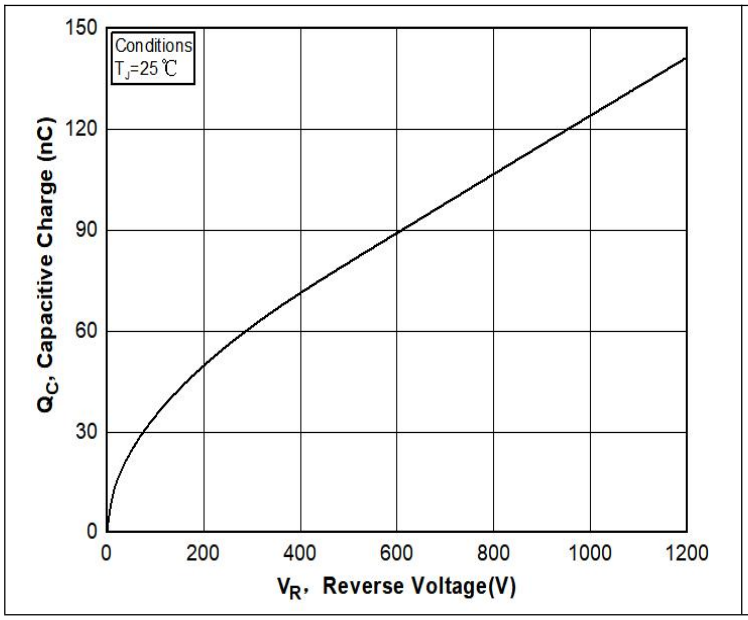


Figure 5. Capacitance Charge Vs. Reverse Voltage

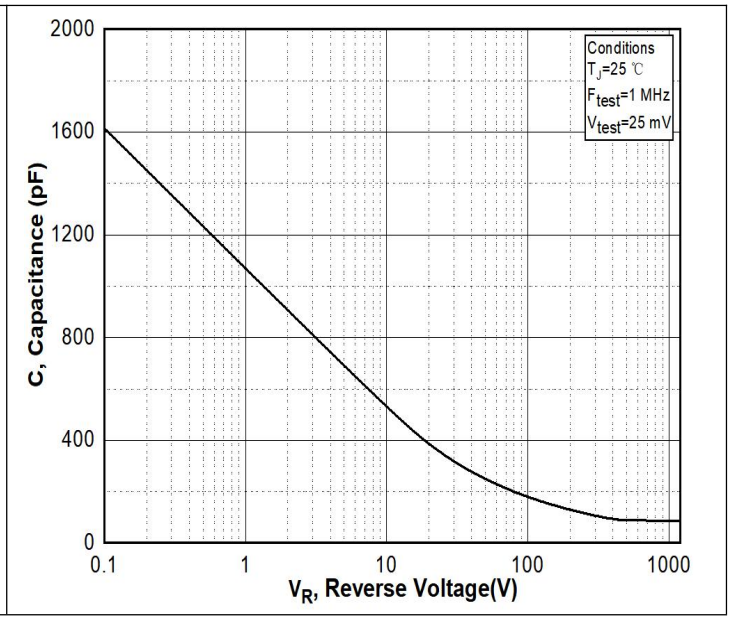


Figure 6. Capacitance Vs. Reverse Voltage

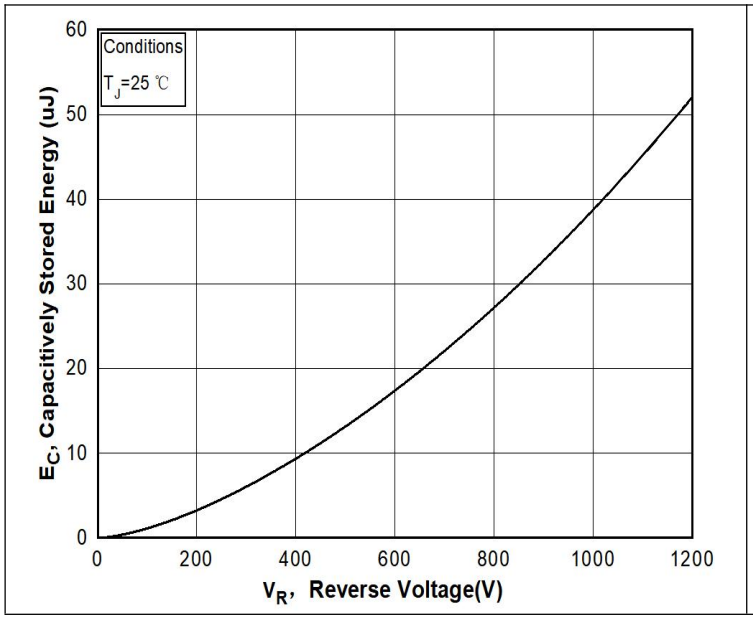


Figure 7. Capacitance Stored Energy

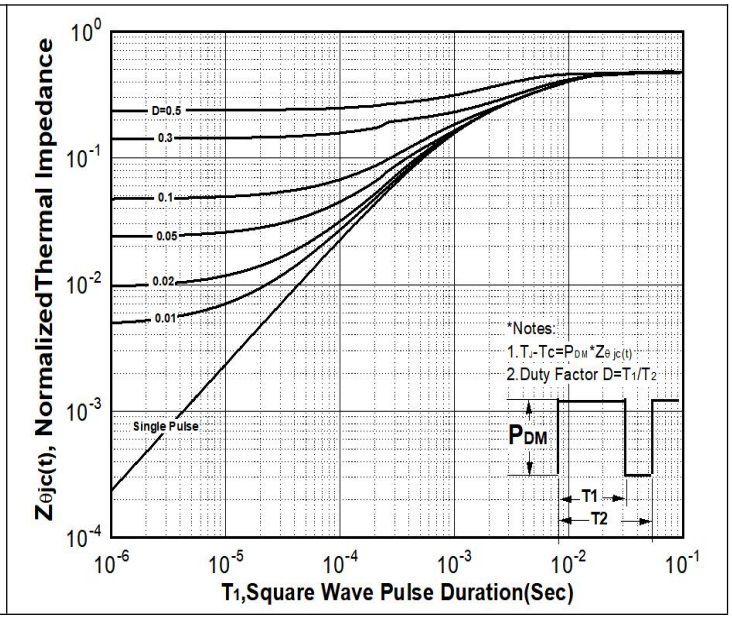
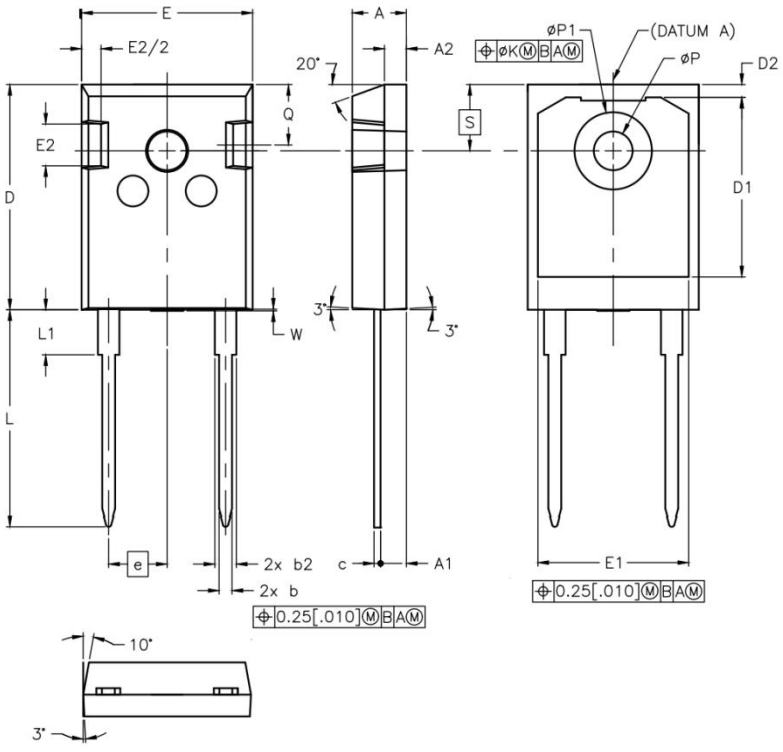


Figure 8. Transient Thermal Response Curve(Junction-to-Case)

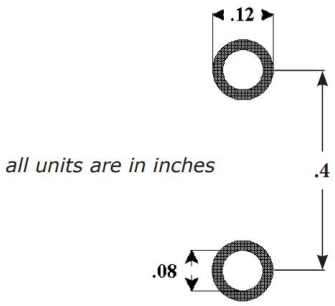
Package Dimensions

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



TO-247-2L

Part Number	Package
S1S12020RB1	TO247-2L

Statement:

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