



# Silicon Carbide Schottky Diode S1S12030RB1

$V_{RRM}$	=	1200 V
$I_F (T_C=135\text{ }^\circ\text{C})$	=	50 A
$Q_C$	=	154 nC

## Features

- 1200V 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
S1S12030RB1	TO247-2L

料号: 3960240000  
 品名: SiC SBD塑封器件 1200V 30A-T0247-2L(S1S12030RB1)  
 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	1200	V		
$V_R$	DC Peak Reverse Voltage	1200	V		
$I_F$	Continuous Forward Current	105	A	$T_C=25^\circ\text{C}$	Fig. 3
		50		$T_C=135^\circ\text{C}$	
		38		$T_C=150^\circ\text{C}$	
$I_{FRM}$	Repetitive Peak Forward Surge Current	150	A	$T_C=25^\circ\text{C}$ , $t_p=10$ ms, Half Sine Pulse	
		83		$T_C=110^\circ\text{C}$ , $t_p=10$ ms, Half Sine Pulse	
$I_{FSM}$	Non-Repetitive Forward Surge Current	240	A	$T_C=25^\circ\text{C}$ , $t_p=10$ ms, Half Sine Pulse	
		210		$T_C=110^\circ\text{C}$ , $t_p=10$ ms, Half Sine Pulse	
$I_{F,MAX}$	Non-Repetitive Forward Surge Current	1120	A	$T_C=25^\circ\text{C}$ , $t_p=10\mu\text{s}$ , Square Wave Pulse	
		930		$T_C=110^\circ\text{C}$ , $t_p=10\mu\text{s}$ , Square Wave Pulse	
$P_{tot}$	Power Dissipation	577	W	$T_C=25^\circ\text{C}$	Fig. 4
		250		$T_C=110^\circ\text{C}$	
$T_J$	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		1.5	1.8	V	$I_F=30\text{A}$ , $T_J=25^\circ\text{C}$	Fig. 1
			2.0	3		$I_F=30\text{A}$ , $T_J=175^\circ\text{C}$	
$I_R$	Reverse Current		8.4	250	$\mu\text{A}$	$V_R=1200\text{V}$ , $T_J=25^\circ\text{C}$	Fig. 2
			208	450		$V_R=1200\text{V}$ , $T_J=175^\circ\text{C}$	
$Q_C$	Total Capacitive Charge		154		nC	$V_R=800\text{V}$ , $T_J=25^\circ\text{C}$	Fig. 5
C	Total Capacitance		2425		pF	$V_R=0\text{V}$ , $T_J=25^\circ\text{C}$ , $f=1\text{MHz}$	Fig. 6
			138			$V_R=400\text{V}$ , $T_J=25^\circ\text{C}$ , $f=1\text{MHz}$	
			133			$V_R=800\text{V}$ , $T_J=25^\circ\text{C}$ , $f=1\text{MHz}$	
$E_C$	Capacitance Stored Energy		38		$\mu\text{J}$	$V_R=800\text{V}$	Fig. 7

### Thermal Characteristics

Symbol	Parameter	Value	Unit	Note
$R_{\theta JC}$	Thermal Resistance(Junction to Case)	0.26	$^\circ\text{C/W}$	Fig. 8



## Typical Performance

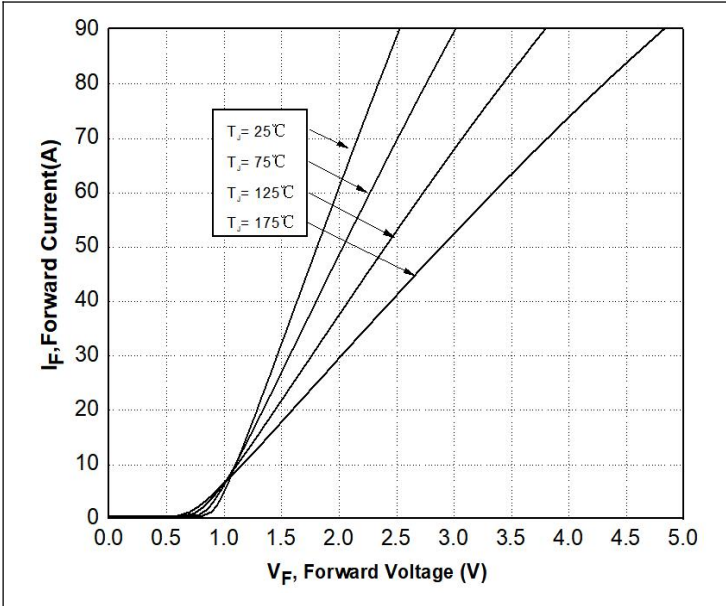


Figure 1. Forward Characteristics

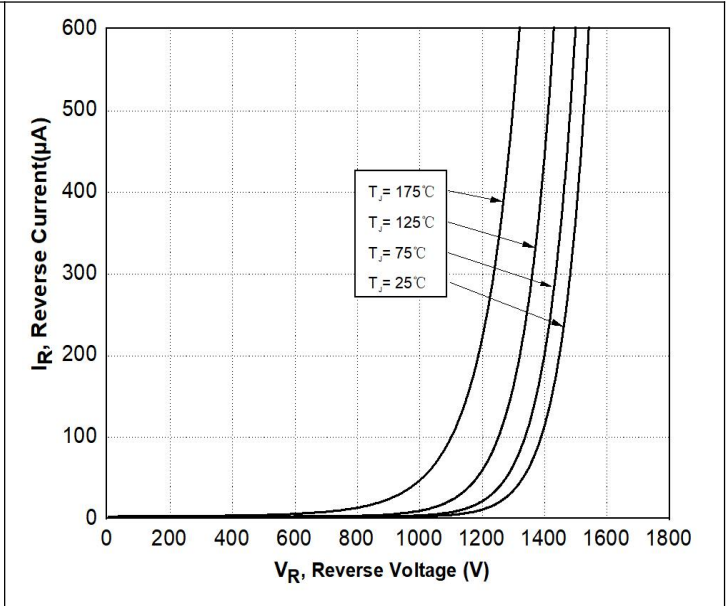


Figure 2. Reverse Characteristics

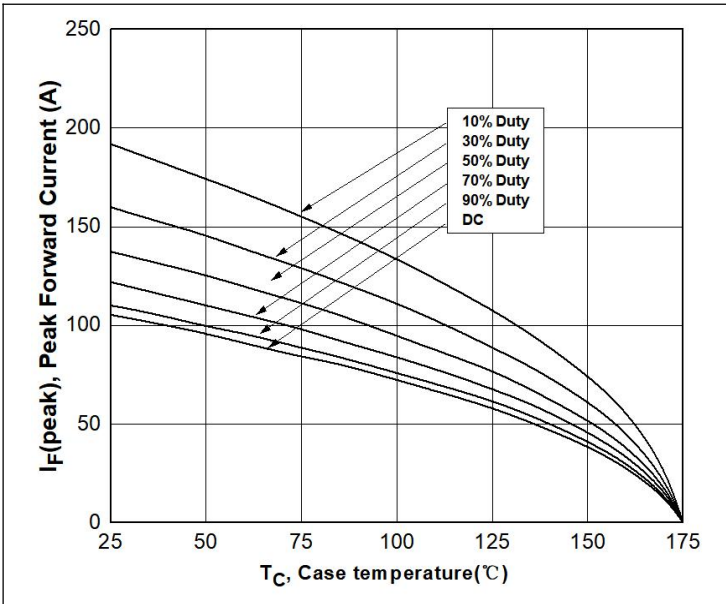


Figure 3. Current Derating

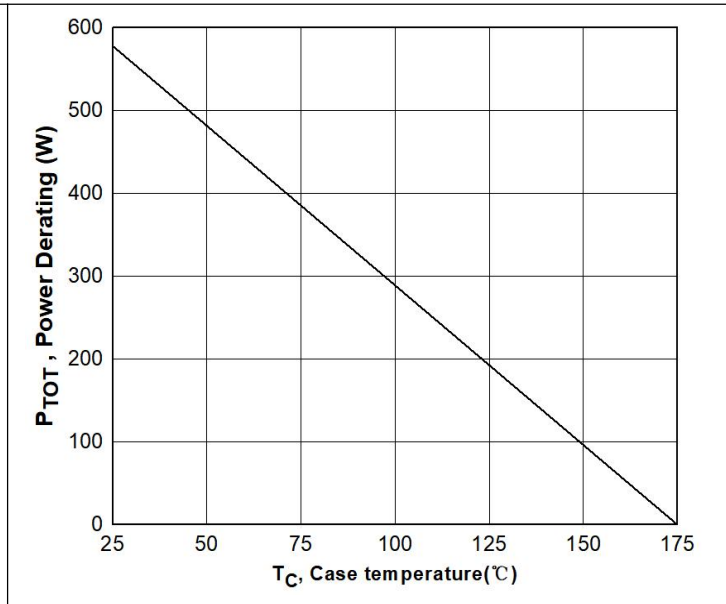


Figure 4. Power Derating



### Typical Performance

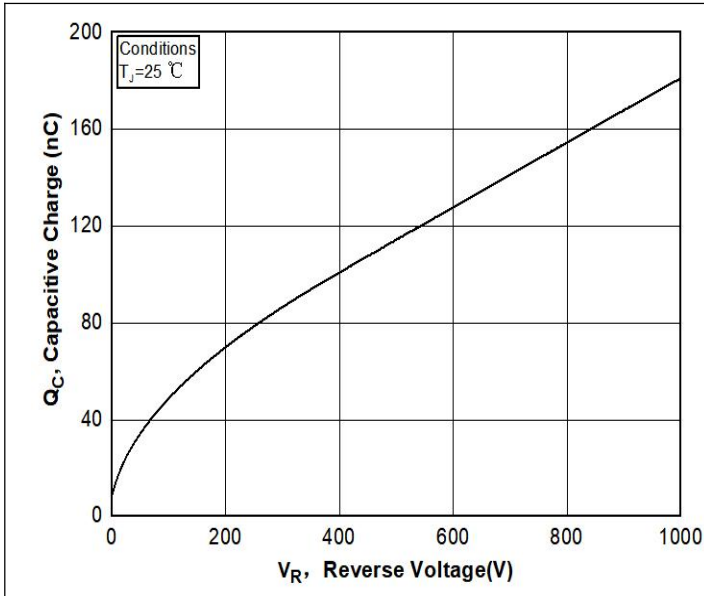


Figure 5. Capacitance Charge Vs. Reverse Voltage

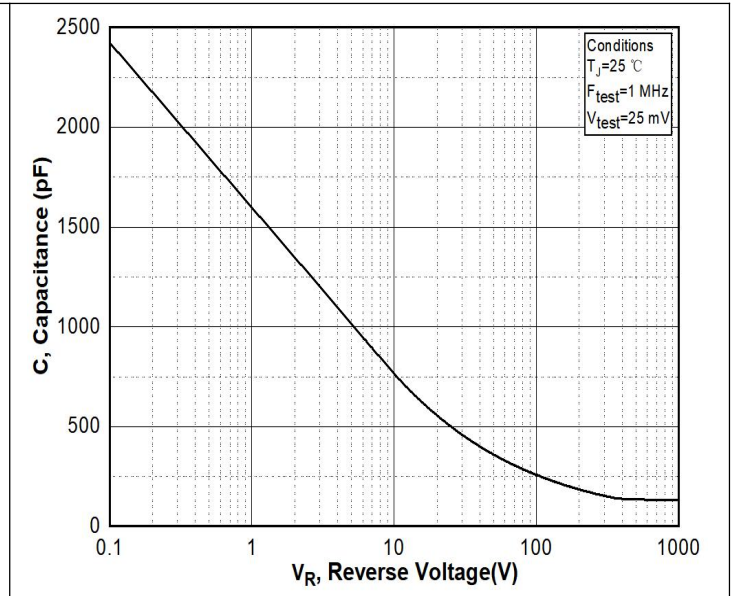


Figure 6. Capacitance Vs. Reverse Voltage

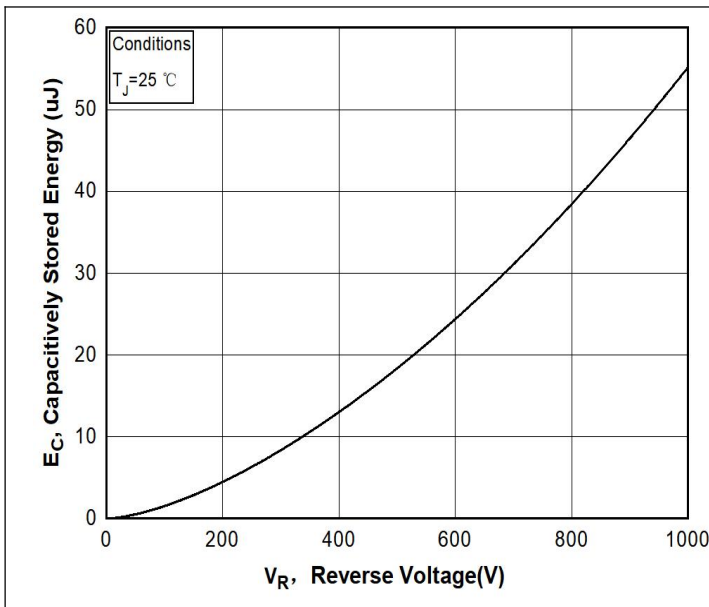


Figure 7. Capacitance Stored Energy

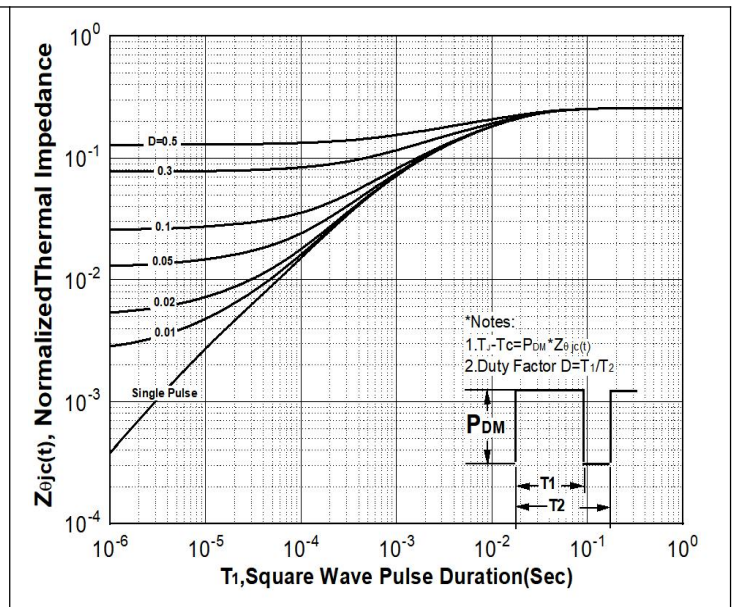
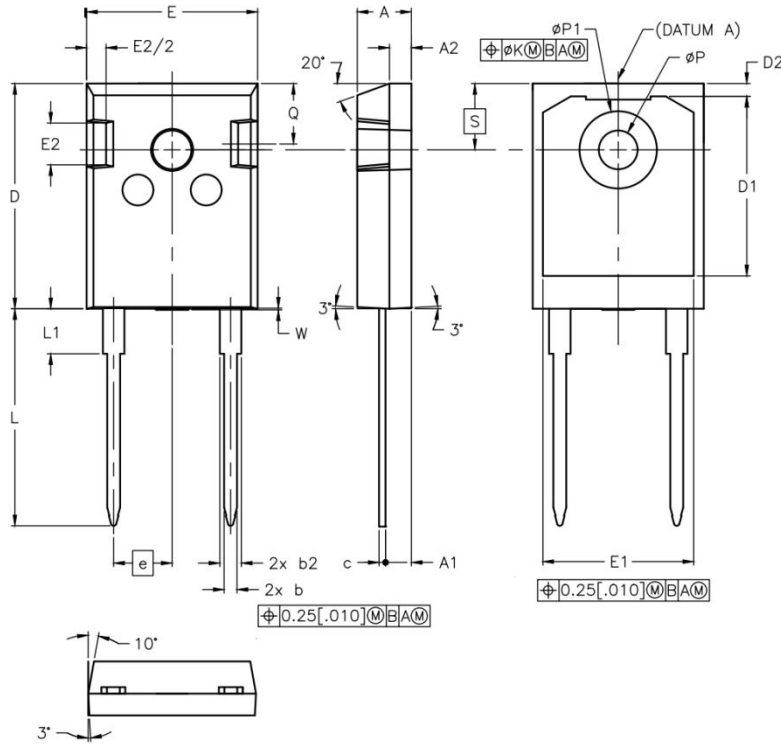


Figure 8. Transient Thermal Response Curve(Junction-to-Case)



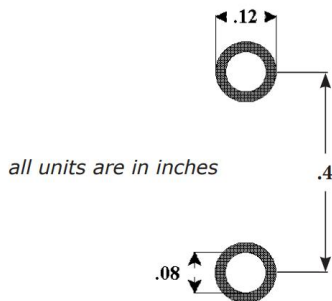
### Package Dimensions

#### 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



TO-247-2L

Part Number	Package
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## Statement:

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