

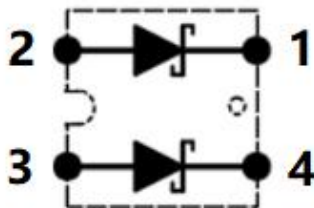
## S4D80120S2 1200V SiC POWER SCHOTTKY RECTIFIER



### Description

S4D80120S2 is a SiC Schottky rectifier packaged in SOT-277 case. The device is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S4D80120S2 is ideal for energy sensitive, high frequency applications in challenging environments.

### Circuit Diagram



### Features

- 175°C T<sub>J</sub> operation
- Ultra-low switching loss
- Switching speeds independent of operating temperature
- Low total conduction losses
- High forward surge current capability
- High package isolation voltage
- Terminals finish: 100% Pure Tin
- Pb – Free Device
- All SMC parts are traceable to the wafer lot
- Additional electrical and life testing can be performed upon request

### Applications

- Alternative energy inverters
- Power Factor Correction (PFC)
- Free-Wheeling diodes
- Switching supply output rectification
- Reverse polarity protection

### Maximum Ratings

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	-	1200	V
Working Peak Reverse Voltage	V <sub>RWM</sub>			
DC Blocking Voltage(per leg)	V <sub>R</sub>			
Average Rectified Forward Current(per leg)	I <sub>F(AV)1</sub>	T <sub>C</sub> =25°C	128	A
	I <sub>F(AV)2</sub>	T <sub>C</sub> =155°C	41	A
Peak One Cycle Non-Repetitive Surge Current(per leg)	I <sub>FSM1</sub>	10ms, Half Sine pulse, T <sub>C</sub> =25°C	340	A
	I <sub>FSM2</sub>	10ms, Half Sine pulse, T <sub>C</sub> =110°C	245	A
Repetitive Peak Forward Surge Current(per leg)	I <sub>FRM1</sub>	10ms, Half Sine pulse, T <sub>C</sub> =25°C	161	A
	I <sub>FRM2</sub>	10ms, Half Sine pulse, T <sub>C</sub> =110°C	91	A
Power Dissipation(per leg)	P <sub>tot1</sub>	T <sub>C</sub> =25°C	667	W
	P <sub>tot2</sub>	T <sub>C</sub> =110°C	289	W
I <sup>2</sup> t Value(per leg)	∫i <sup>2</sup> t1	10ms, T <sub>C</sub> =25°C	305	A <sup>2</sup> s
	∫i <sup>2</sup> t2	10ms, T <sub>C</sub> =25°C	300	A <sup>2</sup> s

- China - Germany - Korea - Singapore - United States •
- <http://www.smc-diodes.com> - [sales@smc-diodes.com](mailto:sales@smc-diodes.com) •

### Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*(per leg)	V <sub>F1</sub>	@ 40A, Pulse, T <sub>J</sub> = 25 °C	1.5	1.8	V
	V <sub>F2</sub>	@ 40A, Pulse, T <sub>J</sub> = 175 °C	2.2	3.0	V
Reverse Current*(per leg)	I <sub>R1</sub>	@V <sub>R</sub> = rated V <sub>R</sub> , T <sub>J</sub> = 25 °C	2	30	uA
	I <sub>R2</sub>	@V <sub>R</sub> = rated V <sub>R</sub> , T <sub>J</sub> = 175 °C	10	300	uA
Junction Capacitance(per leg)	C <sub>T</sub>	V <sub>R</sub> =0V, f=1MHz, T <sub>J</sub> =25°C,	2530	-	pF
Reverse Recovery Charge(per leg)	Q <sub>c</sub>	V <sub>R</sub> = 800 V, T <sub>J</sub> =25°C	195	-	nC
Capacitance Stored Energy(per leg)	E <sub>c</sub>	V <sub>R</sub> = 800 V, T <sub>J</sub> =25°C	100	-	μJ

\* Pulse width < 300 μs, duty cycle < 2%

### Thermal-Mechanical Specifications:

Characteristics	Symbol	Condition	Specification	Units
Junction Temperature	T <sub>J</sub>	-	-55 to +175	°C
Storage Temperature	T <sub>stg</sub>	-	-55 to +175	°C
Typical Thermal Resistance Junction to Case(per leg)	R <sub>θJC</sub>	DC operation, T <sub>J</sub> =25°C	0.66	°C/W

### Ordering Information

Device	Package	Shipping
S4D80120S2	SOT-277	36pcs / BULK

**Ratings and Characteristics Curves(per leg)**

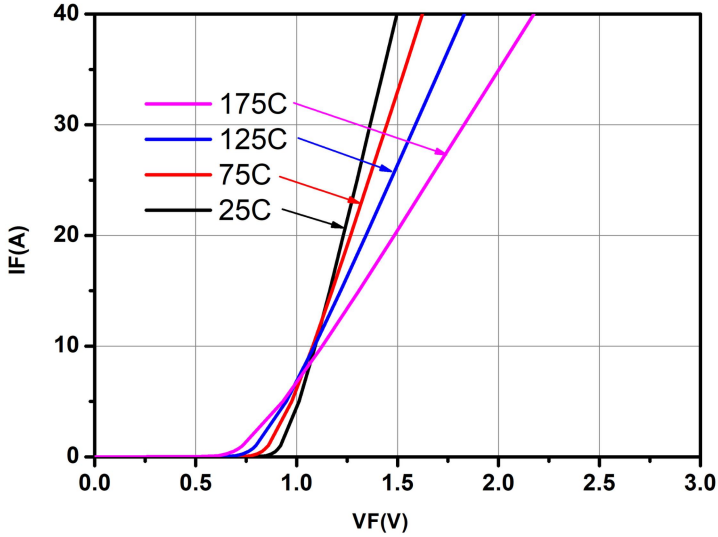


Fig.1-Typical Forward Voltage Characteristics

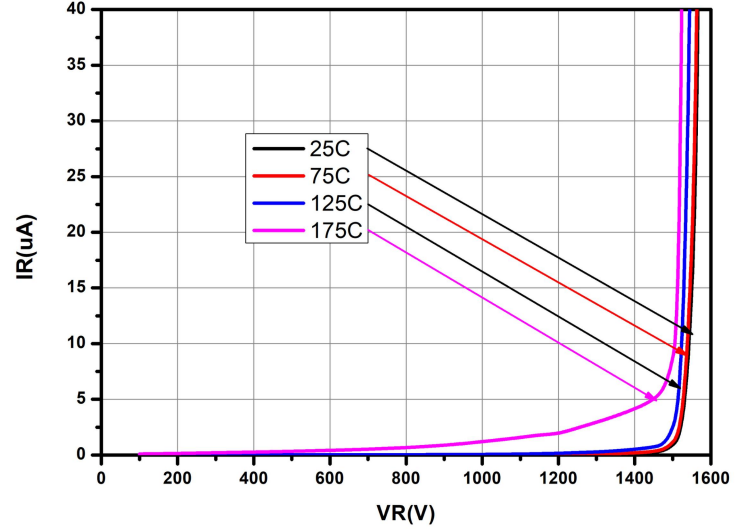


Fig.2-Typical Reverse Characteristics

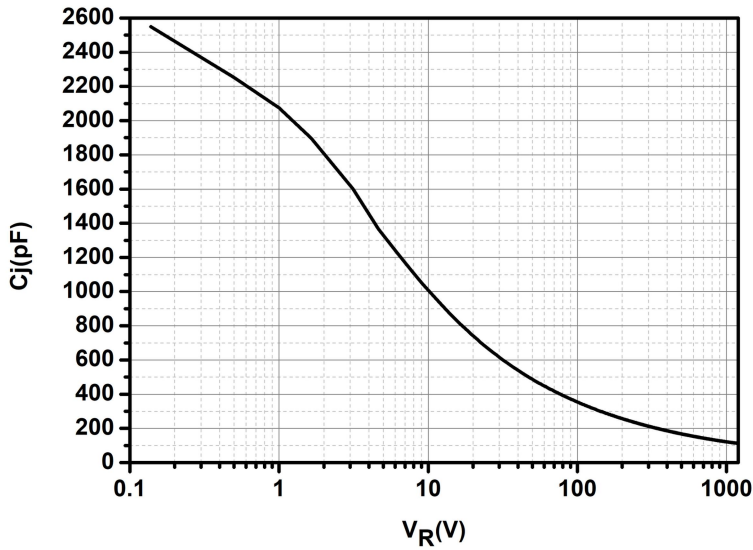


Fig.3-Capacitance vs. Reverse Voltage

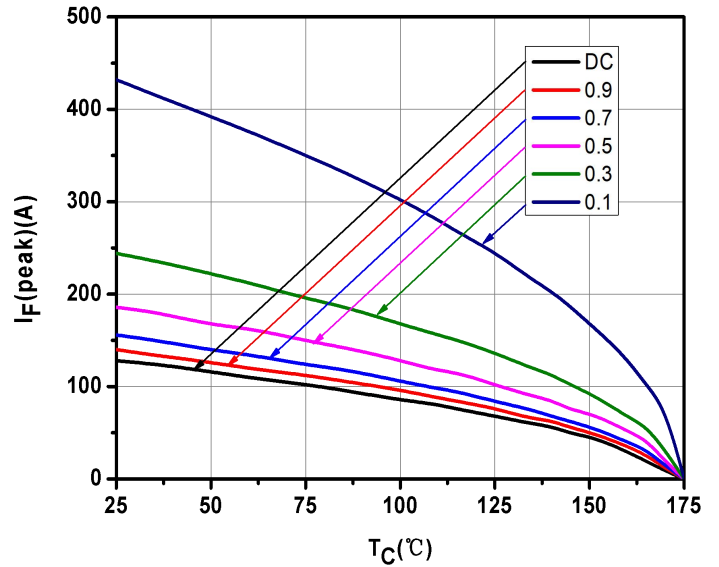


Fig.4-Current Derating

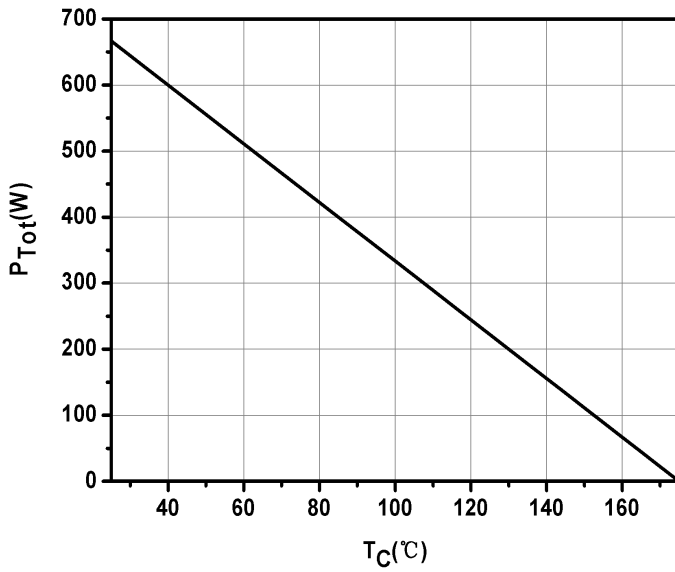


Fig.5-Power Derating

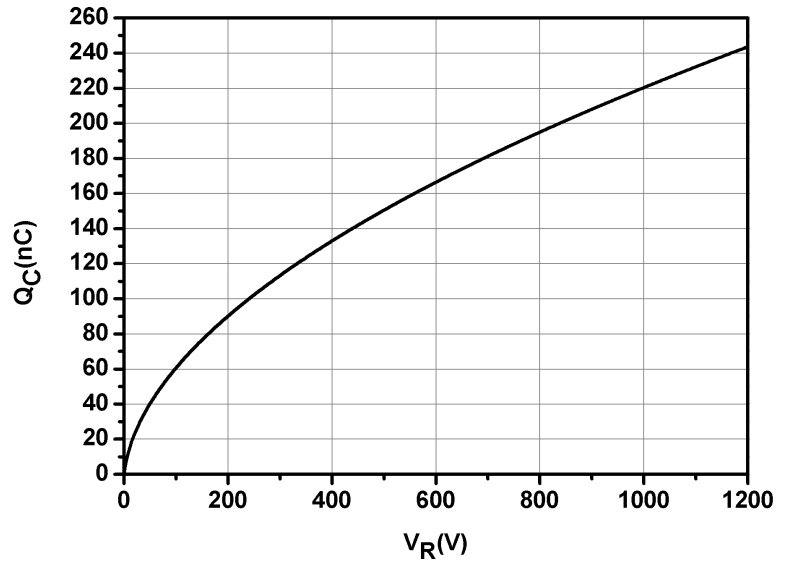


Fig.6-Total Capacitance Charge vs. Reverse Voltage

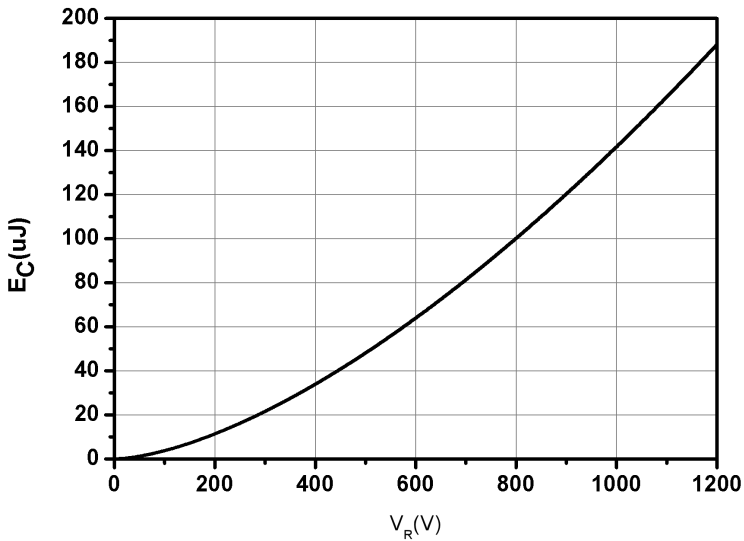
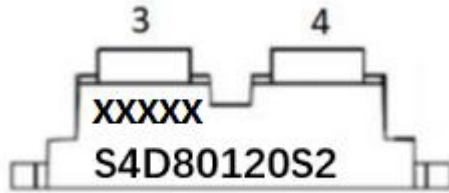


Fig.7-Capacitance Stored Energy

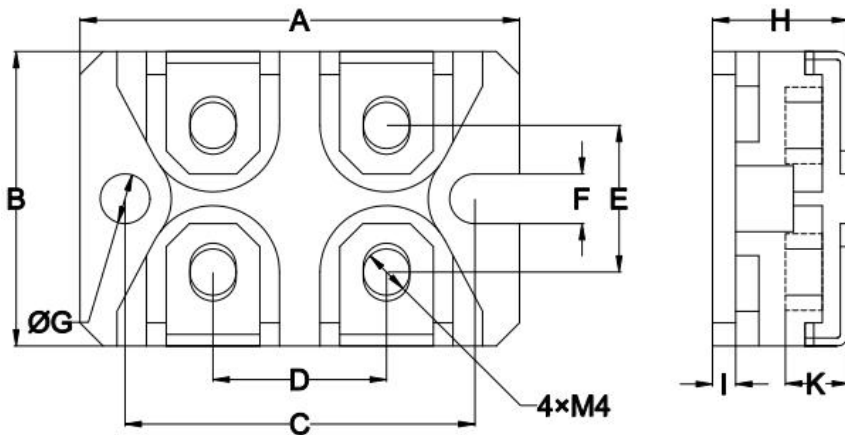
**Marking Diagram**



Where XXXXX is YYWWL

S4D = Device Type  
S2 = Package type  
80 = Forward Current (80A)  
120 = Reverse Voltage (1200V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

**Mechanical Dimensions SOT-277**



SYMBOL	Dimensions in millimeters	
	Min.	Max.
A	37.8	38.2
B	24.8	25.2
C	29.9	30.5
D	14.5	15.5
E	12.2	13.2
F	4.1	4.31
G	φ4.1	φ4.31
H	11	12.5
I	1.9	2.1
K	4.3	6.5

**Technical Data**  
**Data Sheet N2544, REV.-**



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