

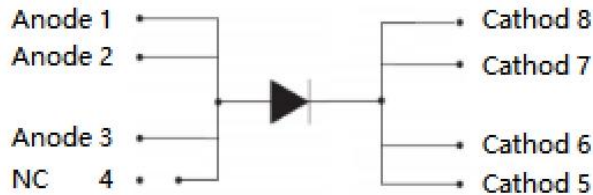
## S3D04065M 650V SiC POWER SCHOTTKY RECTIFIER



### Description

S3D04065M is a SiC Schottky rectifier packaged in PDFNWB5×6-8L case. The device is a high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D04065M 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
- “-A” is an AEC-Q101 qualified device
- 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>	-	650	V
Working Peak Reverse Voltage	V <sub>RWM</sub>			
DC Blocking Voltage	V <sub>DC</sub>			
Average Rectified Forward Current	I <sub>F(AV)1</sub>	T <sub>c</sub> =25°C	16	A
	I <sub>F(AV)2</sub>	T <sub>c</sub> =150°C	4	A
Repetitive Peak Forward Surge Current	I <sub>FRM1</sub>	10ms, Half Sine pulse, T <sub>c</sub> =25°C	23	A
	I <sub>FRM2</sub>	10ms, Half Sine pulse, T <sub>c</sub> =110°C	15	A
Peak One Cycle Non-Repetitive Surge Current	I <sub>FSM1</sub>	10ms, Half Sine pulse, T <sub>c</sub> =25°C	40	A
	I <sub>FSM2</sub>	10ms, Half Sine pulse, T <sub>c</sub> =110°C	23	A
Non-Repetitive Peak Forward Surge Current	I <sub>F,Max1</sub>	10µs. Pulse, T <sub>c</sub> =25°C	390	A
	I <sub>F,Max2</sub>	10µs. Pulse, T <sub>c</sub> =110°C	265	A
Power Dissipation	P <sub>tot1</sub>	T <sub>c</sub> =25°C	83.3	W
	P <sub>tot2</sub>	T <sub>c</sub> =110°C	36.1	W

**Electrical Characteristics:**

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V <sub>F1</sub>	@ 4A, Pulse, T <sub>J</sub> = 25 °C	1.48	1.7	V
	V <sub>F2</sub>	@ 4A, Pulse, T <sub>J</sub> = 175 °C	1.78	2.0	V
Reverse Current*	I <sub>R1</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 25 °C	0.03	2	uA
	I <sub>R2</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 175 °C	0.3	20	uA
Junction Capacitance	C <sub>T</sub>	V <sub>R</sub> =0V, T <sub>J</sub> =25°C, f=1MHz	230	-	pF
Reverse Recovery Charge	Q <sub>c</sub>	I <sub>F</sub> = 4A, di/dt = 200A/μs V <sub>R</sub> = 400 V, T <sub>J</sub> =25°C	14.35	-	nC
Capacitance Stored Energy	E <sub>c</sub>	V <sub>R</sub> = 400 V	3.51	-	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	R <sub>θJC</sub>	DC operation	1.8	°C/W

**Marking Diagram**


Where XXXXX is YYWWL

S3D = Device Type  
M = Package type  
04 = Forward Current (4A)  
065 = Reverse Voltage (650V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

**Cautions:** Molding resin  
Epoxy resin UL:94V-0

**Ordering Information**

Device	Package	Shipping
S3D04065M	PDFNWB5×6-8L	3000/Reel
S3D04065MTR	PDFNWB5×6-8L	3000/Reel

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging Specification.

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

**Ratings and Characteristics Curves**

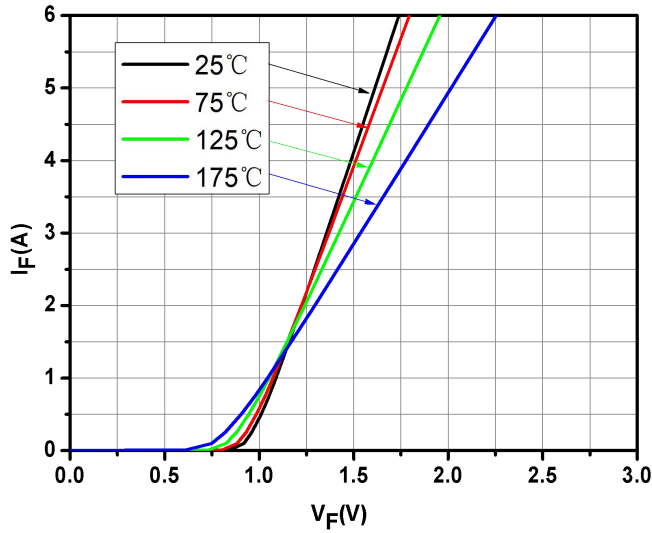


Fig.1-Typical Forward Voltage Characteristics

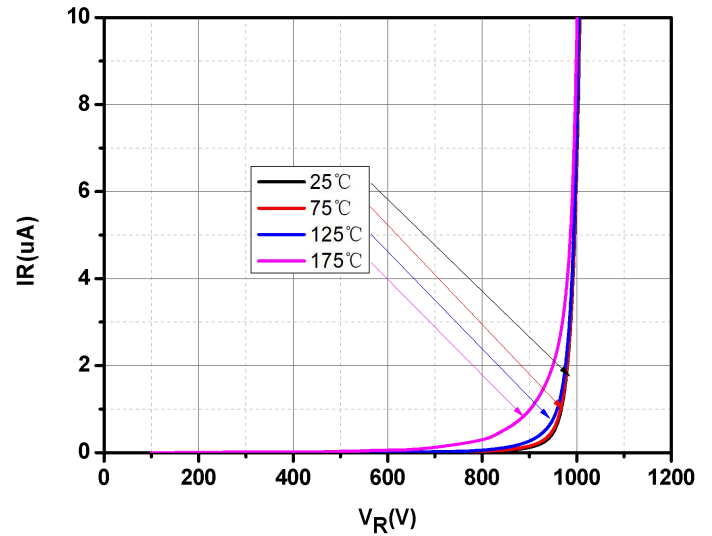


Fig.2-Typical Reverse Characteristics

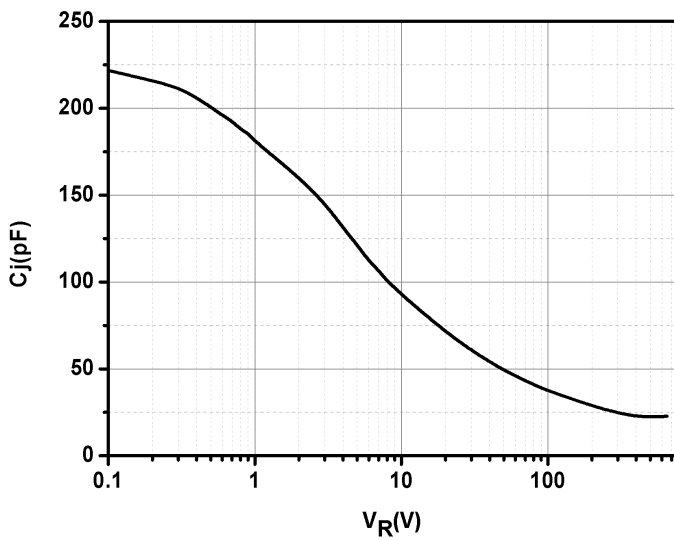


Fig.3-Capacitance vs. Reverse Voltage

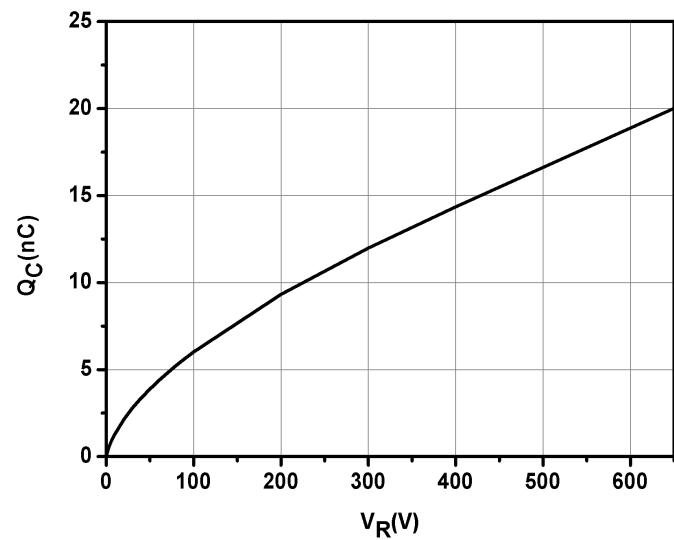


Fig.4-Total Capacitance Charge vs. Reverse Voltage

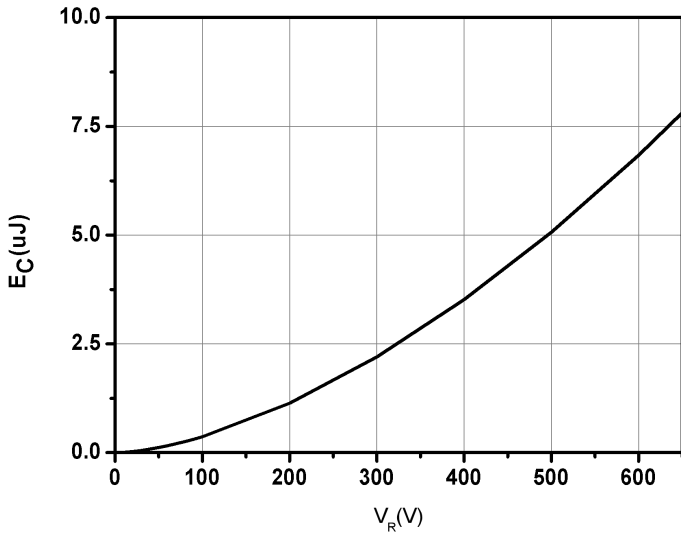


Fig.5-Capacitance Stored Energy

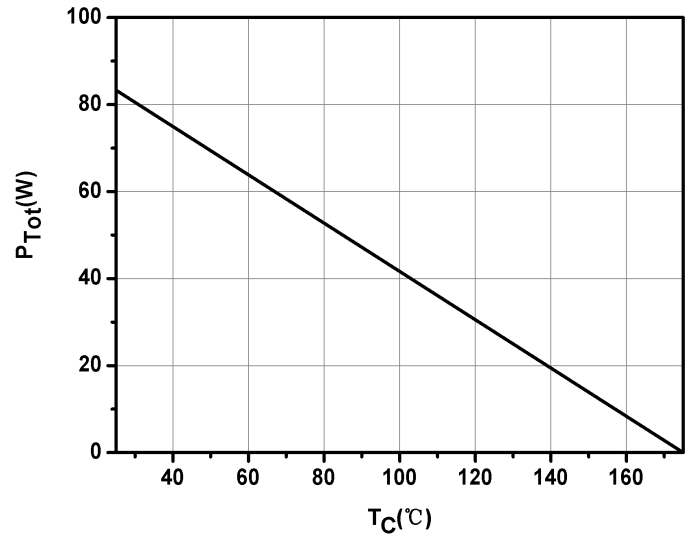


Fig.6-Power Derating

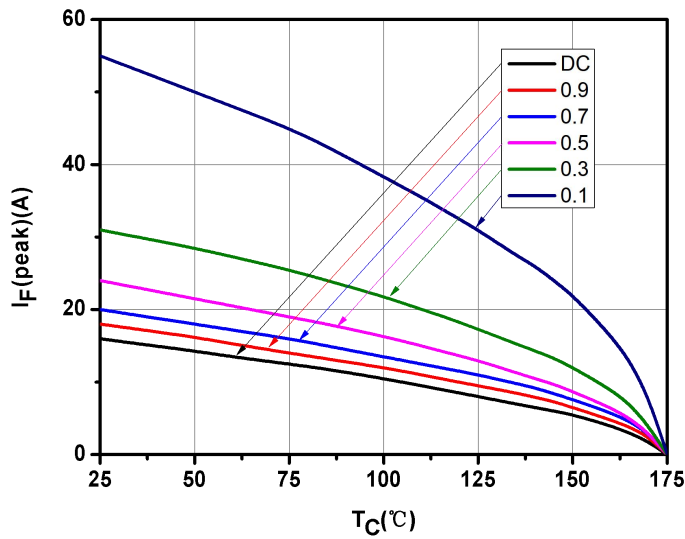
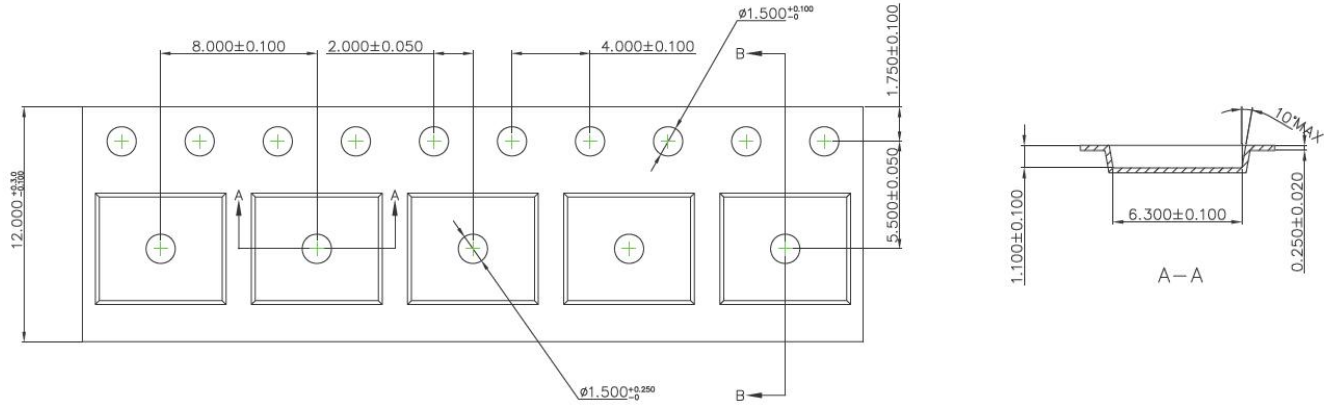
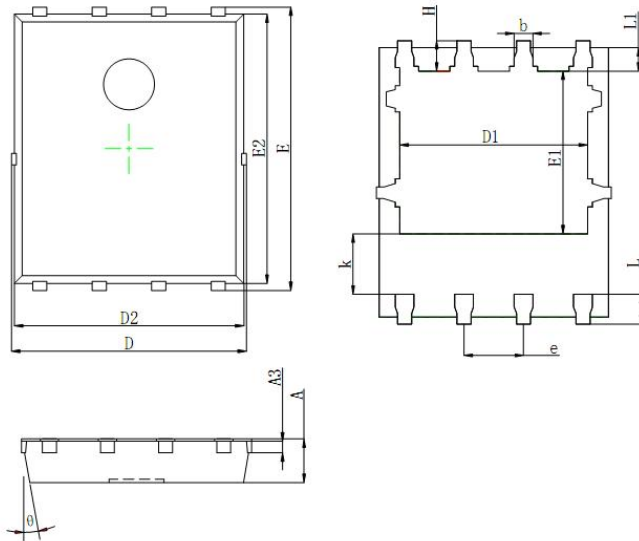


Fig.7-Current Derating

**Carrier Tape & Reel Specification PDFNWB5×6-8L**



**Mechanical Dimensions PDFNWB5×6-8L**



SYMBOL	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254 REF.		0.010 REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270 TYP.		0.050 TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
$\Theta$	10°	12°	10°	12°



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