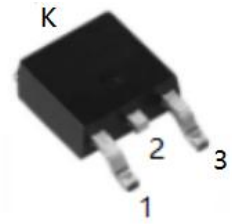
Technical Data
Data Sheet N2389, REV.A

S3D10065E2
650V SIC POWER SCHOTTKY RECTIFIER

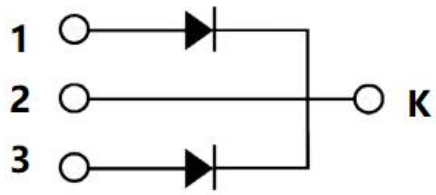


DPAK(TO-252-2)

Description

S3D10065E2 is a SiC Schottky rectifier packaged in DPAK(TO-252-2) 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 S3D10065E2 is ideal for energy sensitive, high frequency applications in challenging environments.

Circuit Diagram



Features

- **175°C T_J 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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	-	650	V
Average Rectified Forward Current	$I_{F\ (AV)}$	50% duty cycle @Tc=150°C, rectangular wave form	5 (per leg) 10 (per device)	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM}	10ms, Half Sine pulse, Tc=25°C	70(per leg)	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max}$	10μs. Pulse, Tc =25℃	700(per leg)	A
Power Dissipation	P_{tot}	Tc =25℃	103(per leg)	W

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Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 5A, Pulse, T_J = 25 °C	1.4	1.7	V
	V_{F2}	@ 5A, Pulse, T_J = 175 °C	1.6	2.4	V
Reverse Current*	I_{R1}	@V_R = rated V_R T_J = 25 °C	0.002	8	uA
	I_{R2}	@V_R = rated V_R T_J = 175 °C	0.06	25	uA
Junction Capacitance	C_T	V_R=0V, T_J=25℃, f=1MHz	382	-	pF
Reverse Recovery Charge	Q_c	I_F = 6A, di/dt = 500A/μs V_R = 400 V, T_J =25°C	23.8	-	nC
Capacitance Stored Energy	E_C	V_R = 400 V	5.88	-	μJ

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

Thermal-Mechanical Specifications:

Characteristics	Symbol	Condition	Specification	Units
Junction Temperature	T_J	-	-55 to +175	°C
Storage Temperature	T_{stg}	-	-55 to +175	°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	DC operation	3.0(per leg) 1.5(both leg)	°C/W

Marking Diagram

Where XXXXX is YYWWL

S3D = Device Type
E2 = Package type
10 = Forward Current (10A)
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
S3D10065E2	DPAK(TO-252-2)	2500pcs / reel

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

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Ratings and Characteristics Curves (per leg)

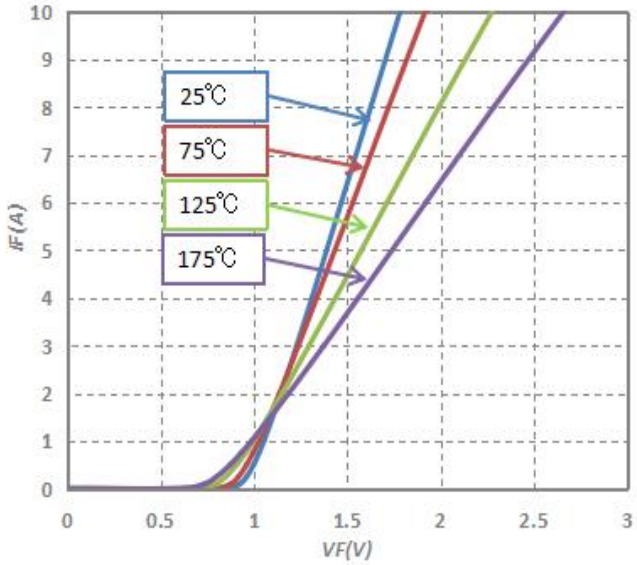


Fig.1-Typical Forward Voltage Characteristics

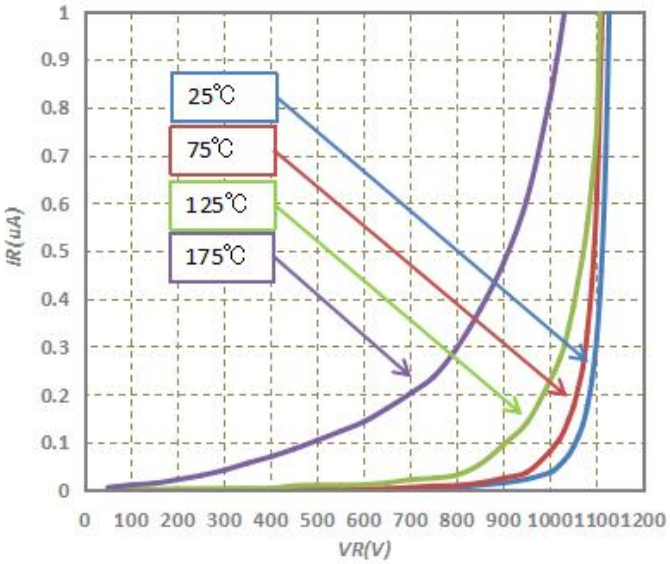


Fig.2-Typical Reverse Characteristics

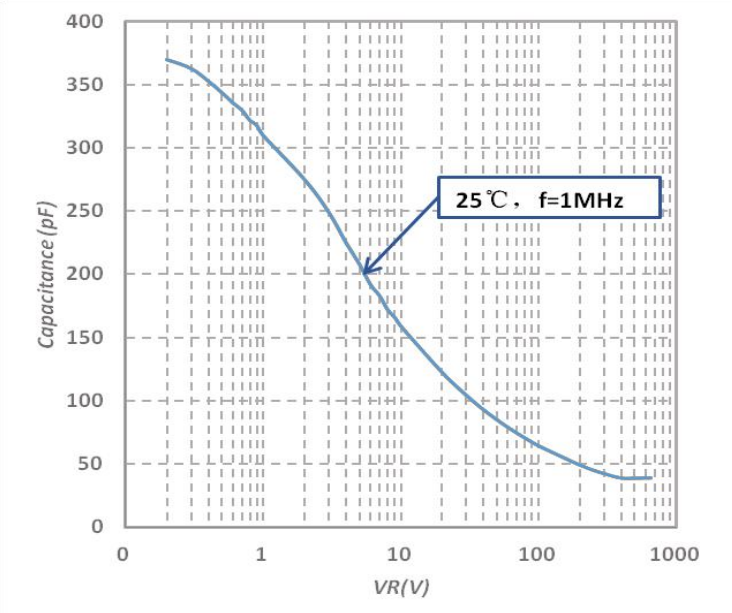


Fig.3-Capacitance vs. Reverse Voltage

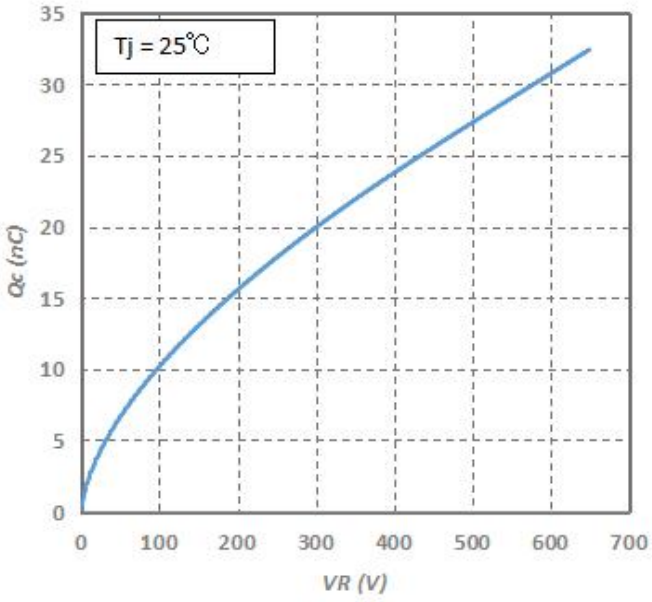


Fig.4-Total Capacitance Charge vs. Reverse Voltage

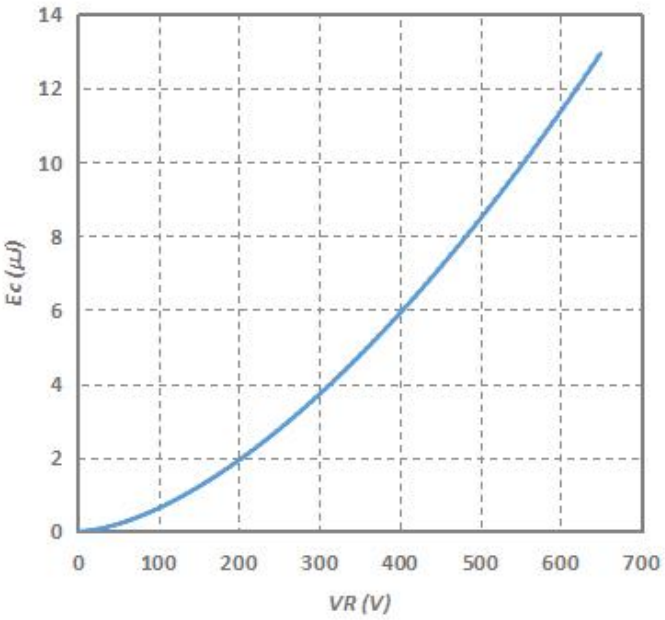


Fig.5-Capacitance Stored Energy

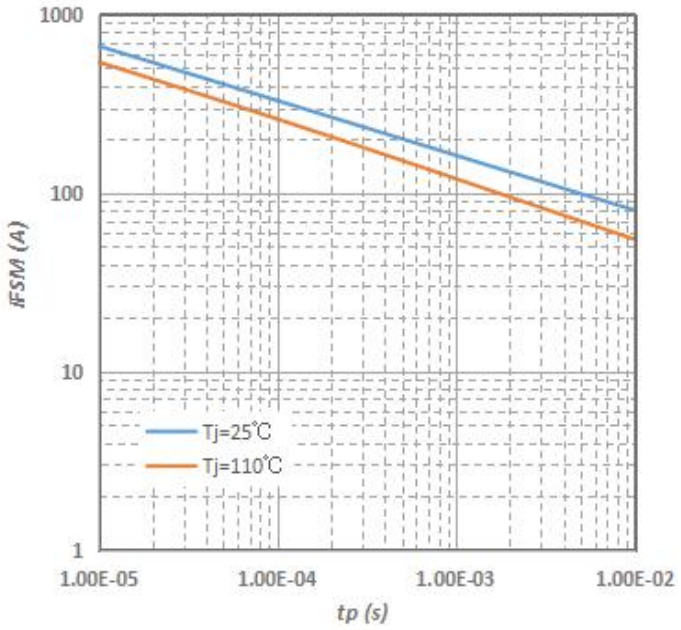


Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

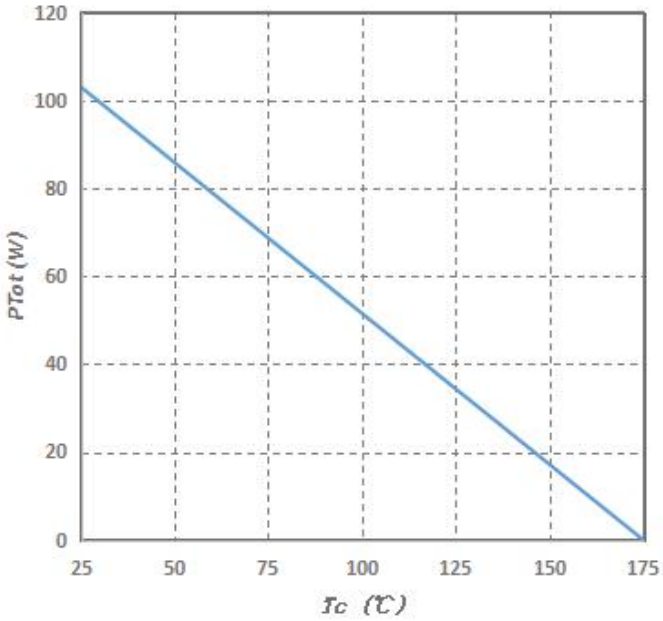


Fig.7-Power Derating

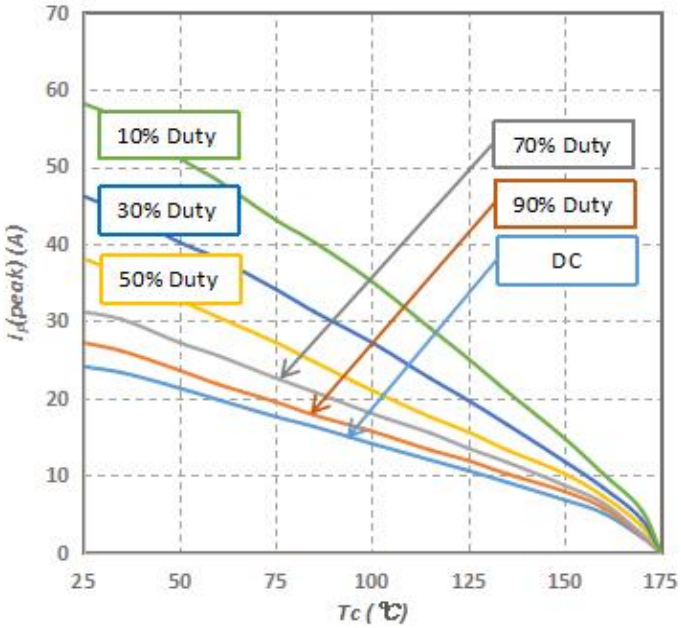
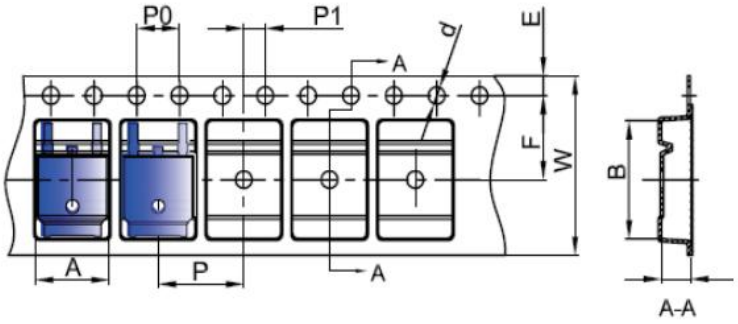


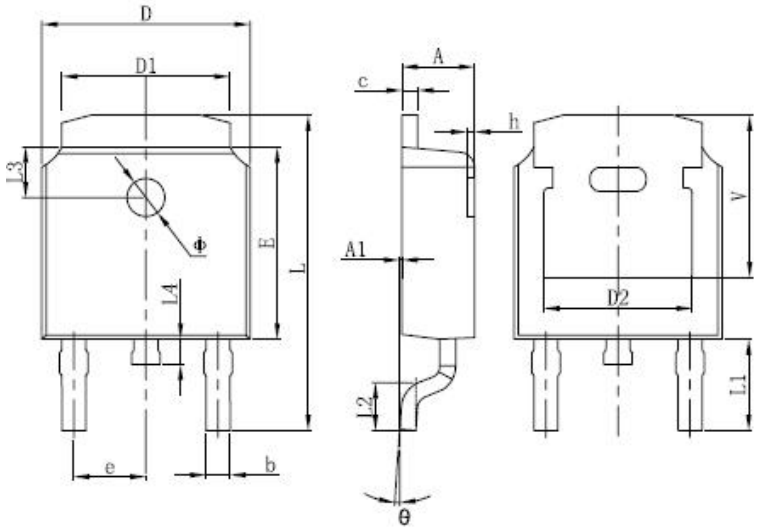
Fig.8-Current Derating

Carrier Tape & Reel Specification DPAK(TO-252-2)



SYMBOL	Millimeters	
	Min.	Max.
A	6.80	7.00
B	10.40	10.60
C	2.60	2.80
d	Φ1.45	Φ1.65
E	1.65	1.85
F	7.40	7.60
P0	3.90	4.10
P	7.90	8.10
P1	1.90	2.10
W	15.90	16.30

Mechanical Dimensions DPAK(TO-252-2)



SYMBOL	Millimeters		
	MIN.	Typ	MAX.
A	2.18	-	2.39
A1	-	-	0.13
b	0.64	-	0.89
c	0.46	-	0.89
D	6.35	-	6.73
D1	4.95	-	5.46
D2	4.32	-	-
E	5.97	6.1	6.22
e	2.29BSC		
L	9.4	-	10.41
L1	2.90 REF.		
L2	1.4	1.52	1.78
L3	1.60 REF.		
L4	-	-	1.02
Φ	1.1	-	1.3
Θ	0°	-	10°
V	5.21	-	-

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