

S3D20065C

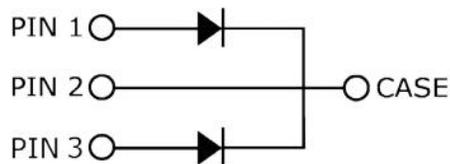
650V SiC POWER SCHOTTKY RECTIFIER



Description

S3D20065C is SiC Schottky rectifiers packaged in TO-220AB(TO-220-3) case. The device is high voltage Schottky rectifiers that have very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D20065C 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
- "-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(per leg)

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage	V_{RRM}	-	650	V
Working Peak Reverse Voltage	V_{RWM}			
DC Blocking Voltage	V_{DC}			
Average Rectified Forward Current	$I_{F(AV)1}$	$T_C=25^{\circ}C$	31	A
	$I_{F(AV)2}$	$T_C=135^{\circ}C$	14	A
	$I_{F(AV)3}$	$T_C=150^{\circ}C$	10	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, $T_C=25^{\circ}C$	55	A
	I_{FRM2}	10ms, Half Sine pulse, $T_C=110^{\circ}C$	40	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, $T_C=25^{\circ}C$	115	A
	I_{FSM2}	10ms, Half Sine pulse, $T_C=110^{\circ}C$	80	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10 μ s. Pulse, $T_C=25^{\circ}C$	995	A
	$I_{F,Max2}$	10 μ s. Pulse, $T_C=110^{\circ}C$	685	A
Power Dissipation	P_{tot1}	$T_C=25^{\circ}C$	103	W
	P_{tot2}	$T_C=110^{\circ}C$	45	W

Electrical Characteristics(per leg)

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 10A, Pulse, $T_J = 25^{\circ}C$	1.45	1.7	V
	V_{F2}	@ 10A, Pulse, $T_J = 175^{\circ}C$	1.65	2.0	V
Reverse Current*	I_{R1}	@ $V_R =$ rated V_R , $T_J = 25^{\circ}C$	0.7	40	μ A
	I_{R2}	@ $V_R =$ rated V_R , $T_J = 175^{\circ}C$	7	160	μ A
Junction Capacitance	C_T	$V_R=0V$, $T_J=25^{\circ}C$, $f=1MHz$	787	-	pF
Reverse Recovery Charge	Q_C	$I_F = 10A$, $di/dt = 200A/\mu s$ $V_R = 400V$, $T_J = 25^{\circ}C$	49.1	-	nC
Capacitance Stored Energy	E_C	$V_R = 400V$, $T_J = 25^{\circ}C$	12.03	-	μ J

* Pulse width < 300 μ s, duty cycle < 2%

Thermal-Mechanical Specifications:

Characteristics	Symbol	S3D20065C	Units
Junction Temperature	T_J	-55 to +175	$^{\circ}C$
Storage Temperature	T_{stg}	-55 to +175	$^{\circ}C$
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	1.4(per leg) 0.7(per device)	$^{\circ}C/W$

Ratings and Characteristics Curves (per leg)

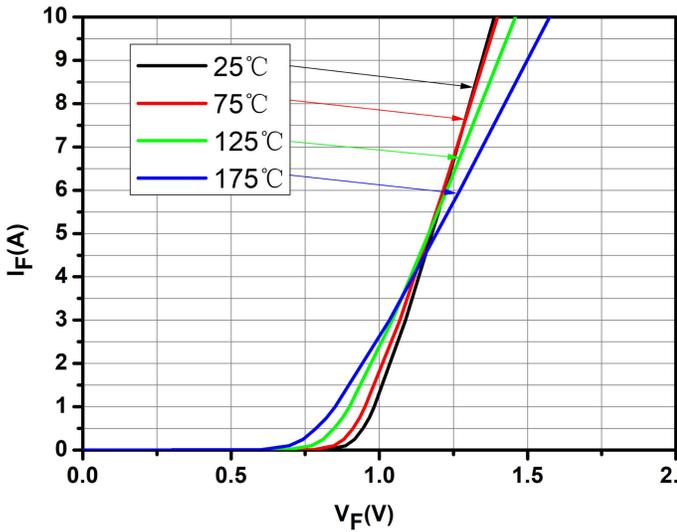


Fig.1-Typical Forward Voltage

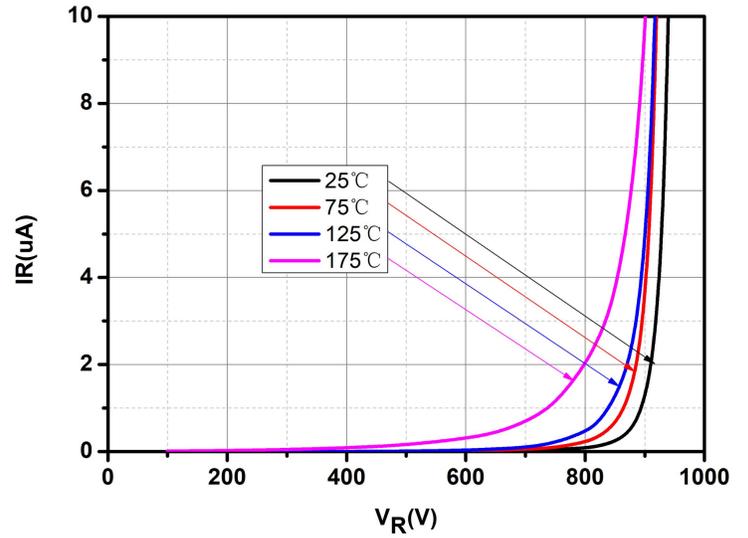


Fig.2-Typical Reverse Characteristics

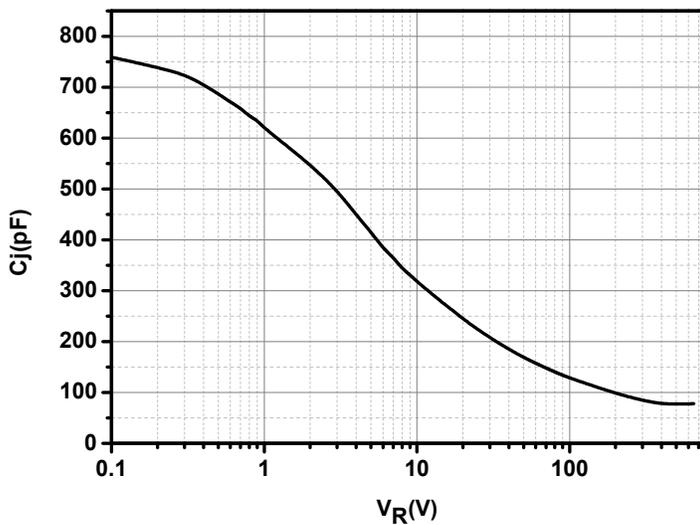


Fig.3-Capacitance vs. Reverse Voltage

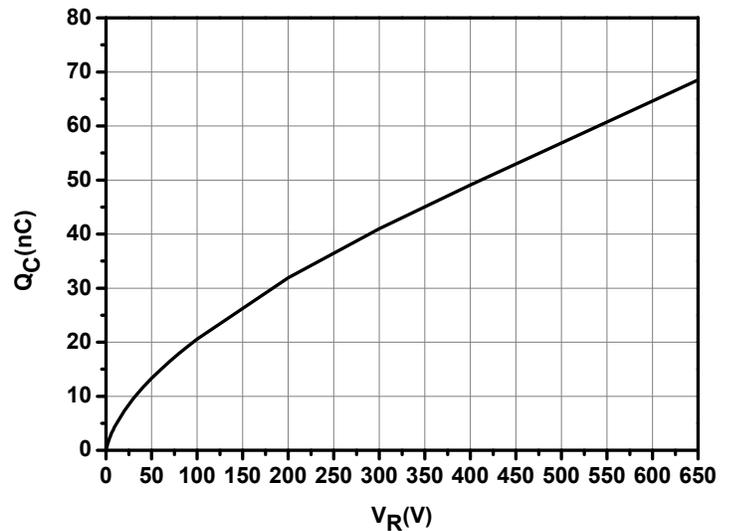


Fig.4-Total Capacitance Charge vs. Reverse Voltage

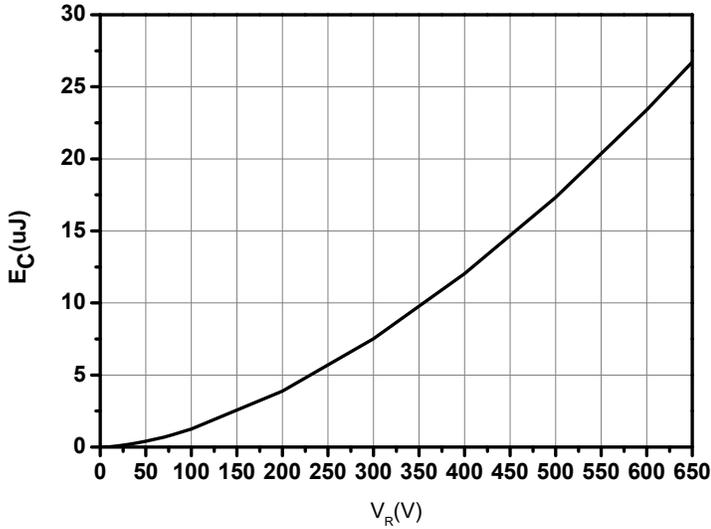


Fig.5-Capacitance Stored Energy

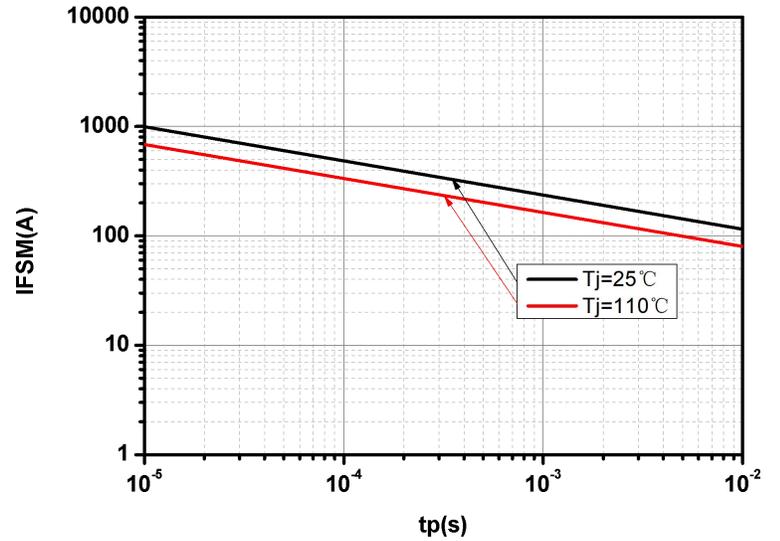


Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

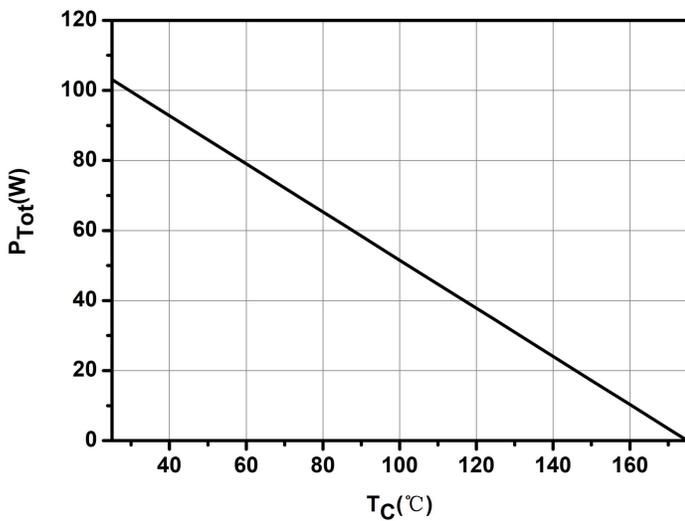


Fig.7-Power Derating

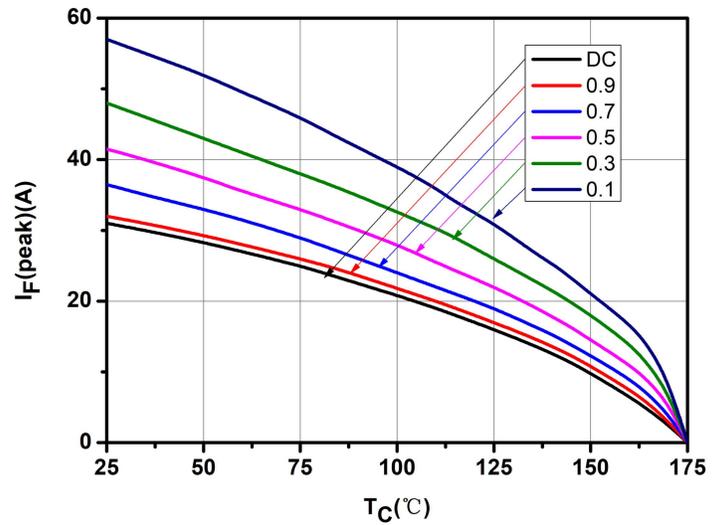
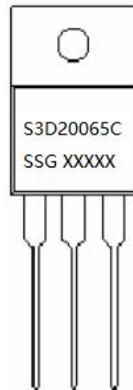


Fig.8-Current Derating

Ordering Information

Device	Package	Shipping
S3D20065C	TO-220AB(TO-220-3)	50pcs /tube

Marking Diagram

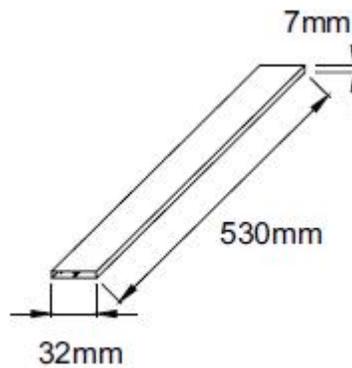


Where XXXXX is YYWWL

S3D = Device Type
 C = Package type
 20 = Forward Current (20A)
 065 = Reverse Voltage (650V)
 SSG = SSG
 YY = Year
 WW = Week
 L = Lot Number

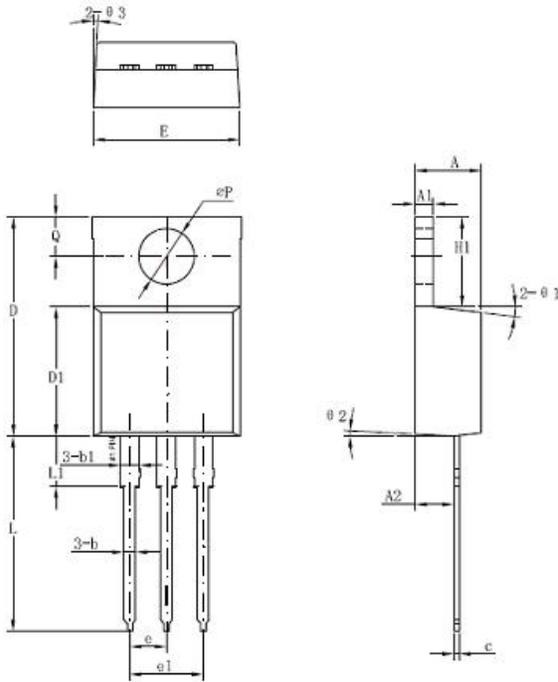
Cautions: Molding resin
 Epoxy resin UL:94V-0

Tube Specification



TO-220AB(TO-220-3)

Mechanical Dimensions TO-220AB



Symbol	Dimensions in millimeters		
	Min	Typical	Max
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E	9.65	-	10.67
e	-	2.54	-
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
φP	-	3.56	-
Q	2.54	-	3.43

Technical Data

Data Sheet N3076, REV.-

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