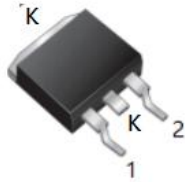


S3D20065G

650V SIC POWER SCHOTTKY RECTIFIERS

**D2PAK(TO-263-2)**

Description

This 650V 20A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D20065G is ideal for energy sensitive, high frequency applications in challenging environments.

Circuit Diagram



Features

- 175°C TJ 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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{DC}	-	650	V
Average Rectified Forward Current	$I_{F(AV)1}$	$T_C=25^{\circ}\text{C}$	66	A
	$I_{F(AV)2}$	$T_C=135^{\circ}\text{C}$	30	A
	$I_{F(AV)3}$	$T_C=150^{\circ}\text{C}$	20	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, $T_C=25^{\circ}\text{C}$	105	A
	I_{FRM2}	10ms, Half Sine pulse, $T_C=110^{\circ}\text{C}$	70	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, $T_C=25^{\circ}\text{C}$	170	A
	I_{FSM2}	10ms, Half Sine pulse, $T_C=110^{\circ}\text{C}$	145	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10 μs . Pulse, $T_C=25^{\circ}\text{C}$	1830	A
	$I_{F,Max2}$	10 μs . Pulse, $T_C=110^{\circ}\text{C}$	1260	A
Power Dissipation	P_{tot1}	$T_C=25^{\circ}\text{C}$	230	W
	P_{tot2}	$T_C=110^{\circ}\text{C}$	100	W

Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 20A, Pulse, $T_J = 25^{\circ}\text{C}$	1.45	1.7	V
	V_{F2}	@ 20A, Pulse, $T_J = 175^{\circ}\text{C}$	1.65	2.0	V
Reverse Current*	I_{R1}	@ V_R = rated V_R , $T_J = 25^{\circ}\text{C}$	1.5	50	μA
	I_{R2}	@ V_R = rated V_R , $T_J = 175^{\circ}\text{C}$	15	200	μA
Junction Capacitance	C_T	$V_R=0\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$	1550	-	pF
Reverse Recovery Charge	Q_c	$I_F = 20\text{A}$, $di/dt=200\text{A}/\mu\text{s}$ $V_R = 400\text{V}$, $T_J = 25^{\circ}\text{C}$	96.7	-	nC
Capacitance Stored Energy	E_c	$V_R = 400\text{V}$, $T_J = 25^{\circ}\text{C}$	23.69	-	μJ

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

Thermal-Mechanical Specifications:

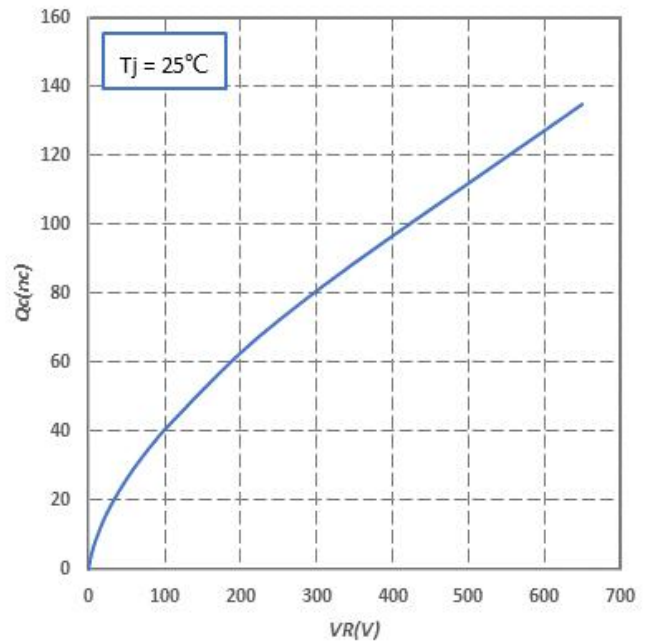
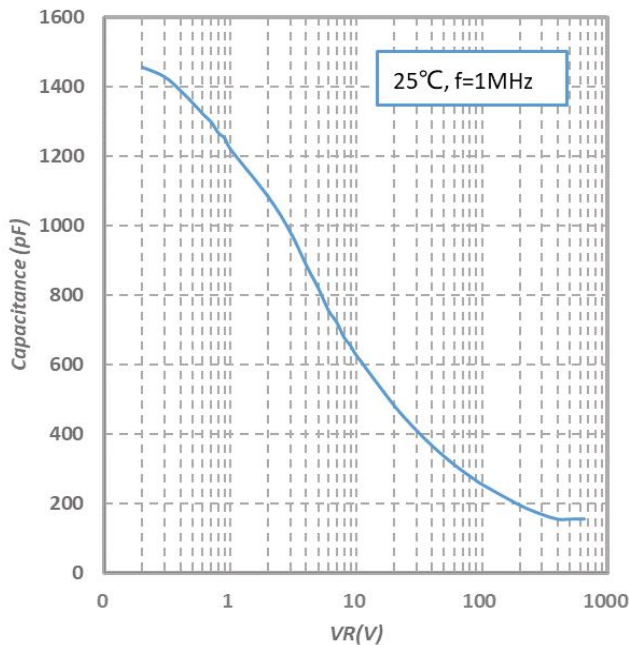
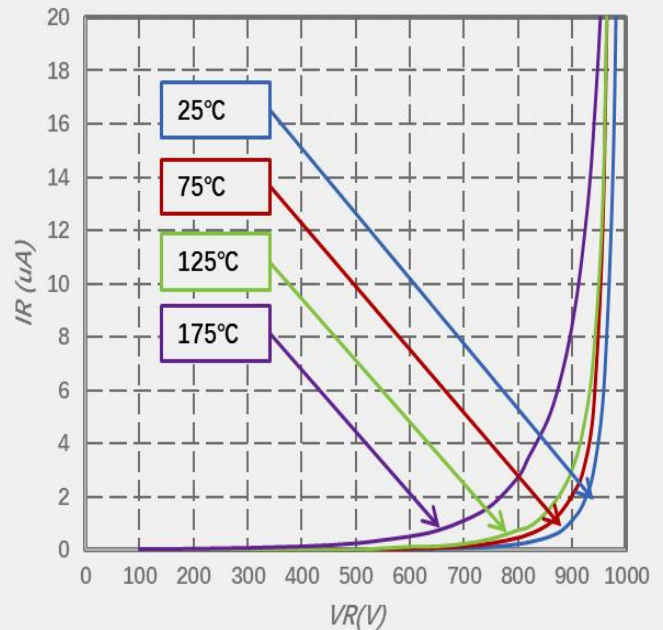
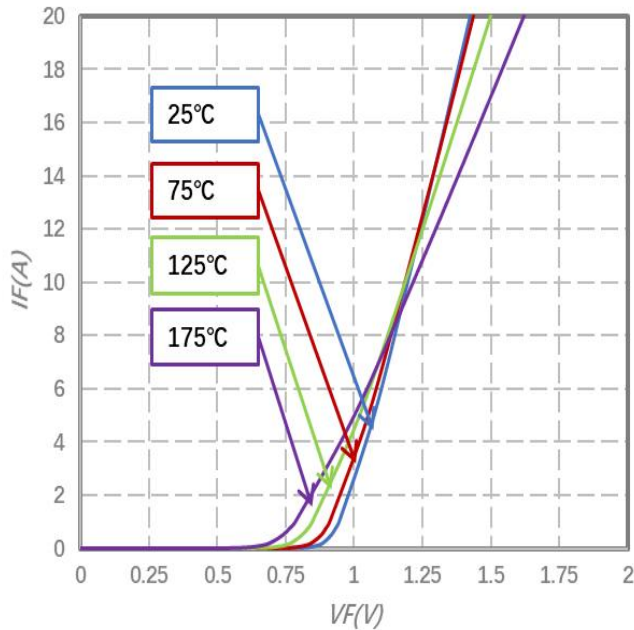
Characteristics	Symbol	Condition	Specification	Units
Junction Temperature	T_J	-	-55 to +175	°C
Storage Temperature	T_{stg}	-	-55 to +175	°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	DC operation	0.65	°C/W

Ordering Information

Device	Package	Plating	Shipping
S3D20065G	D2PAK(TO-263-2)	Pure Sn	800pcs / reel
S3D20065GTR	D2PAK(TO-263-2)	Pure Sn	800pcs / reel

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

Ratings and Characteristics Curves



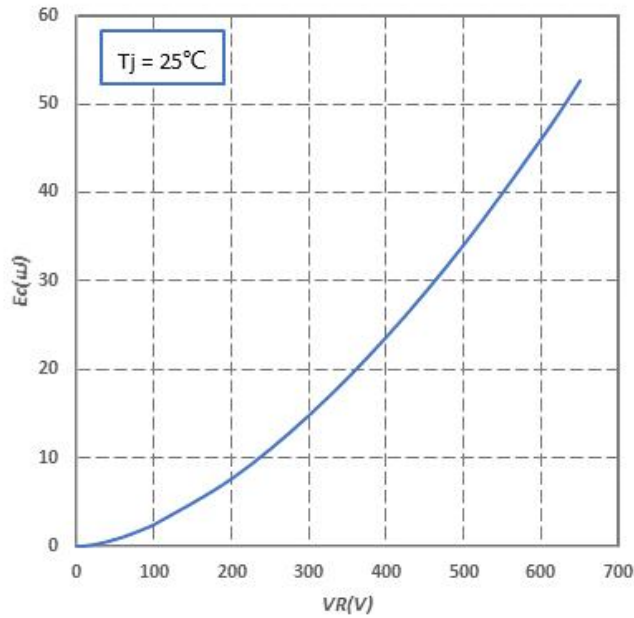


Fig.5-Capacitance Stored Energy

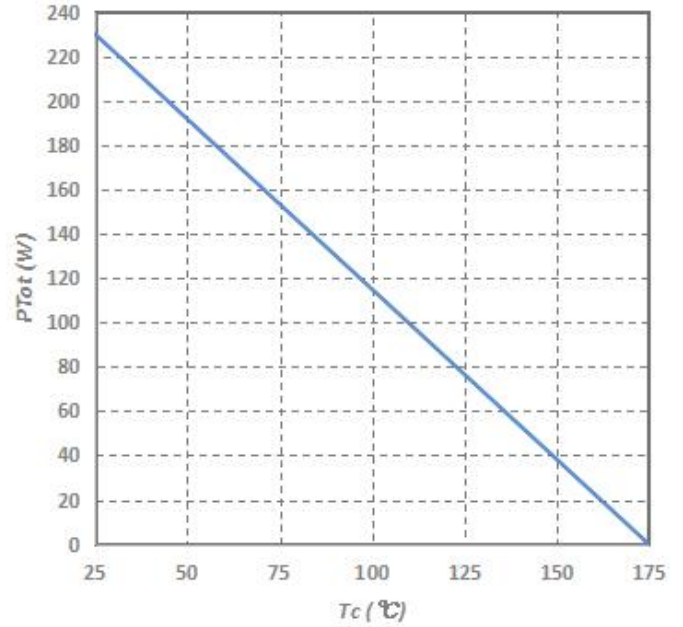


Fig.6-Power Derating

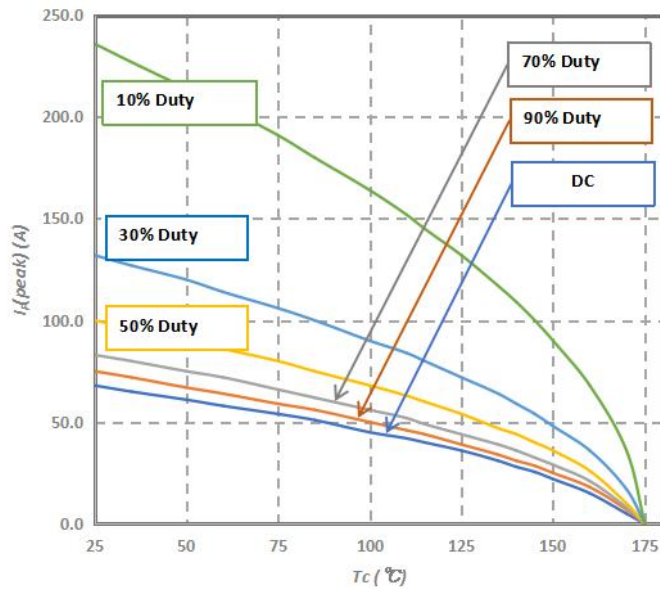
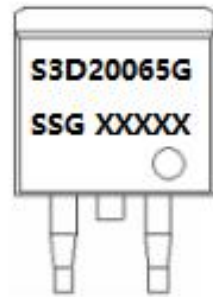


Fig.7-Current Derating

Marking Diagram

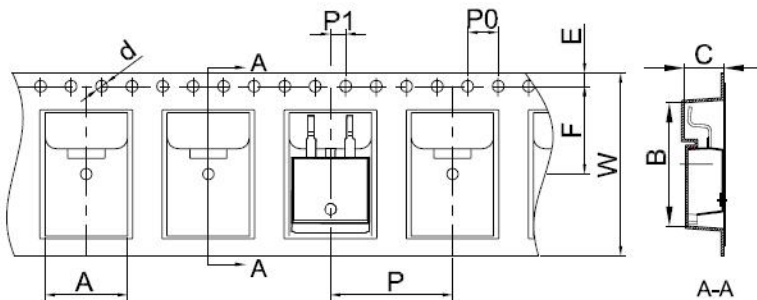


Where XXXXX is YYWWL

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

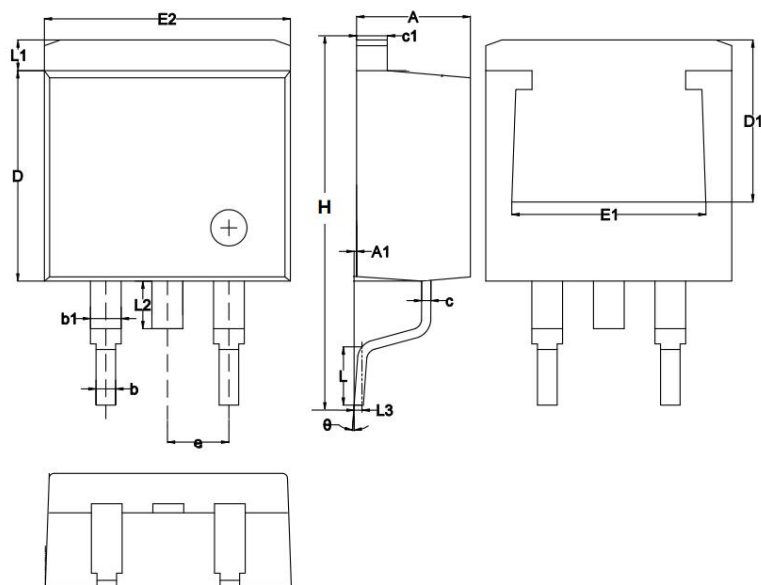
Cautions: Molding resin
Epoxy resin UL:94V-0

Carrier Tape & Reel Specification



SYMBOL	Millimeters	
	Min.	Max.
A	10.70	10.90
B	16.03	16.23
C	5.11	5.31
d	1.45	1.65
E	1.65	1.85
F	11.40	11.60
P0	3.90	4.10
P	15.90	16.10
P1	1.90	2.10
W	23.90	24.30

Mechanical Dimensions



Symbol	Dimensions in millimeters	
	Min.	Max.
A	4.06	4.83
A1	0	0.26
b	0.51	0.99
b1	1.14	1.78
c	0.31	0.74
c1	1.14	1.65
D	8.38	8.65
D1	6.40	
E1	6.22	
E2	9.65	10.67
e	2.54BSC	
H	14.60	15.88
L	1.78	2.80
L1	-	1.68
L2	-	2.2
L3	0.255BSC	
θ	0	8°

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