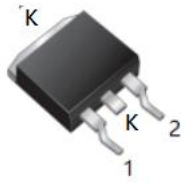
Technical Data
Data Sheet N3097, REV.-

S3D12065G
650V SIC POWER SCHOTTKY RECTIFIERS



D2PAK(TO-263-2)

Description

S3D12065G is SiC Schottky rectifiers packaged in D2PAK(TO-263-2) case. The devices are high voltage Schottky rectifiers that have very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D12065G 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	$I_{F(AV)1}$	@Tc=25°C	48	A
	$I_{F(AV)2}$	@Tc=157°C	12	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, Tc=25°C	60	A
	I_{FRM2}	10ms, Half Sine pulse, Tc=110°C	40	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, Tc=25°C	140	A
	I_{FSM2}	10ms, Half Sine pulse, Tc=110°C	96	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10μs. Pulse, Tc=25°C	1200	A
	$I_{F,Max2}$	10μs. Pulse, Tc=110°C	100	A
Power Dissipation	P_{tot1}	Tc=25°C	144	W
	P_{tot2}	Tc=110°C	63	W

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Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 12A, Pulse, T_J = 25 ˚C	1.5	1.7	V
	V_{F2}	@ 12A, Pulse, T_J = 175 ˚C	1.75	2.2	V
Reverse Current*	I_{R1}	@V_R = rated V_R T_J = 25 ˚C	0.1	6	uA
	I_{R2}	@V_R = rated V_R T_J = 175 ˚C	1.5	50	uA
Junction Capacitance	C_T	V_R=0V, T_J=25˚C, f=1MHz	764	-	pF
Reverse Recovery Charge	Q_c	I_F = 12A, di/dt = 200A/μs VR = 400 V, T_J =25˚C	84.07	-	nC
Capacitance Stored Energy	EC	V_R = 400 V, T_J =25˚C	17.30	-	μJ

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

Thermal-Mechanical Specifications:

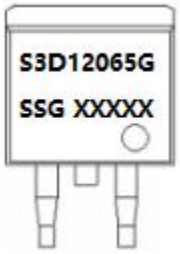
Characteristics	Symbol	Condition	Specification	Units
Junction Temperature	T_J	-	-55 to +175	˚C
Storage Temperature	T_{stg}	-	-55 to +175	˚C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	DC operation	1.01	˚C/W

Ordering Information

Device	Package	Shipping
S3D12065G	D2PAK(TO-263-2)	800pcs /Reel
S3D12065GTR	D2PAK(TO-263-2)	800pcs /Reel

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

Marking Diagram



Where XXXXX is YYWWL

S3D = Device Type
G = Package type
12 = Forward Current (12A)
065 = Reverse Voltage (650V)
SSG = SSG
YY = Year
WW = Week
L = Lot Number

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

Ratings and Characteristics Curves

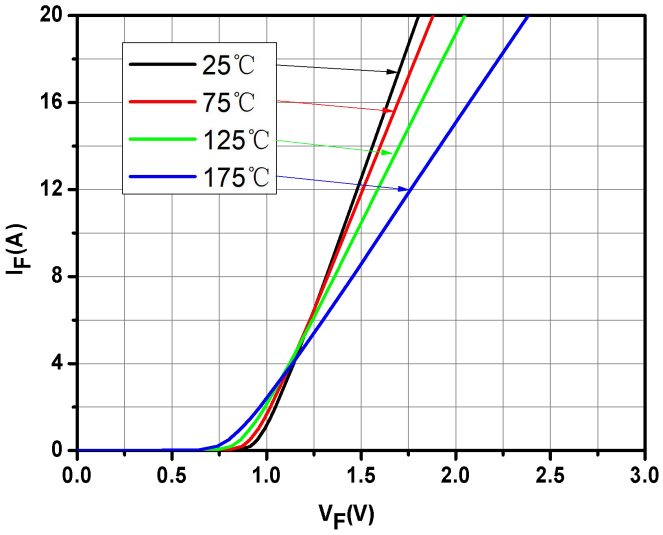


Fig.1-Typical Forward Voltage Characteristics

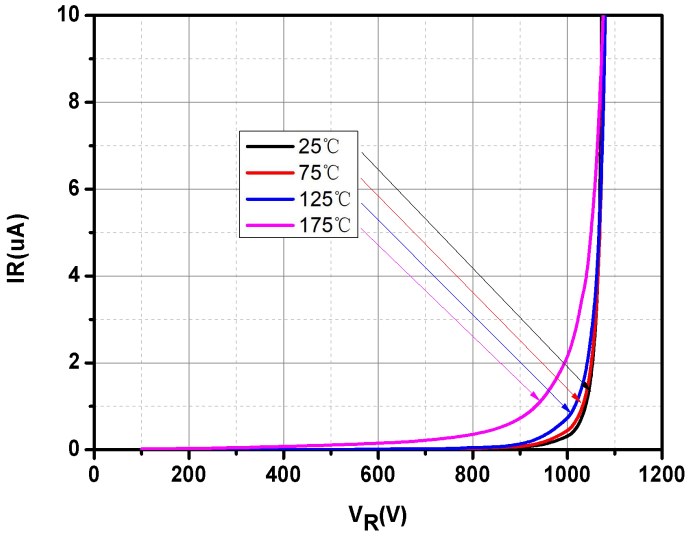


Fig.2-Typical Reverse Characteristics

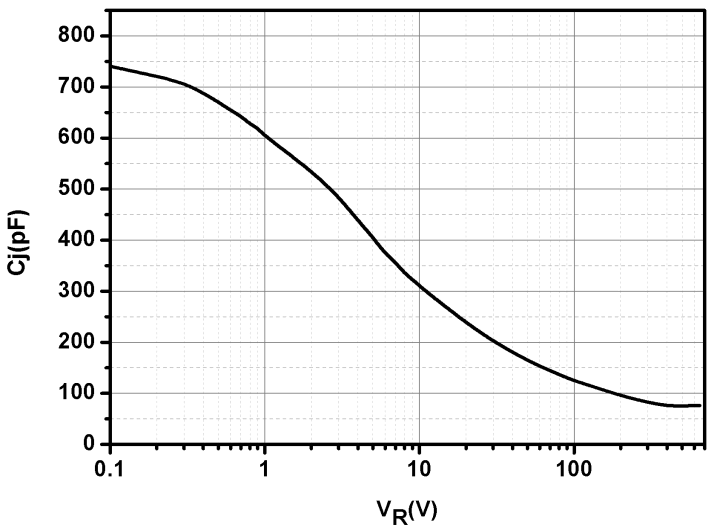


Fig.3-Capacitance vs. Reverse Voltage

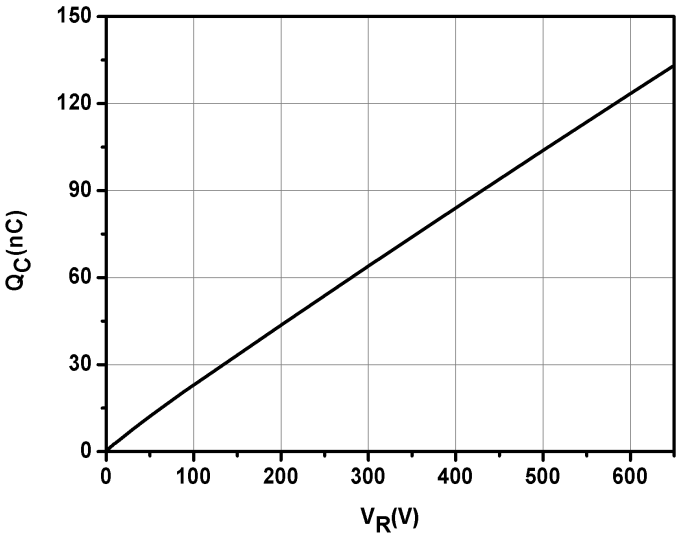


Fig.4-Total Capacitance Charge vs. Reverse Voltage

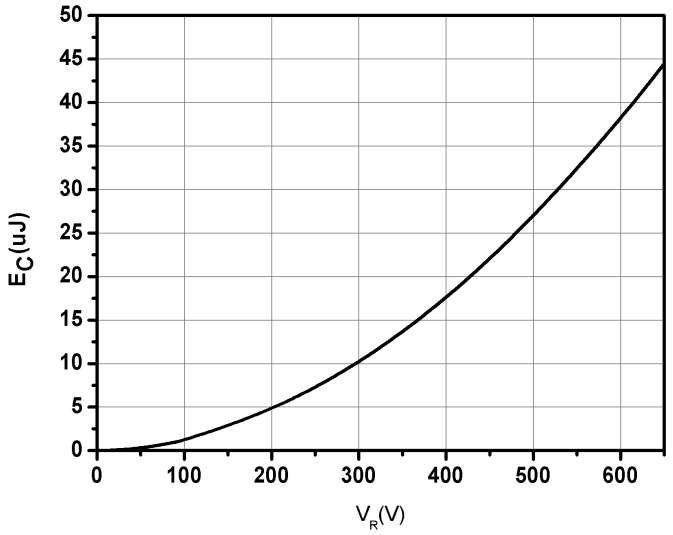


Fig.5-Capacitance Stored Energy

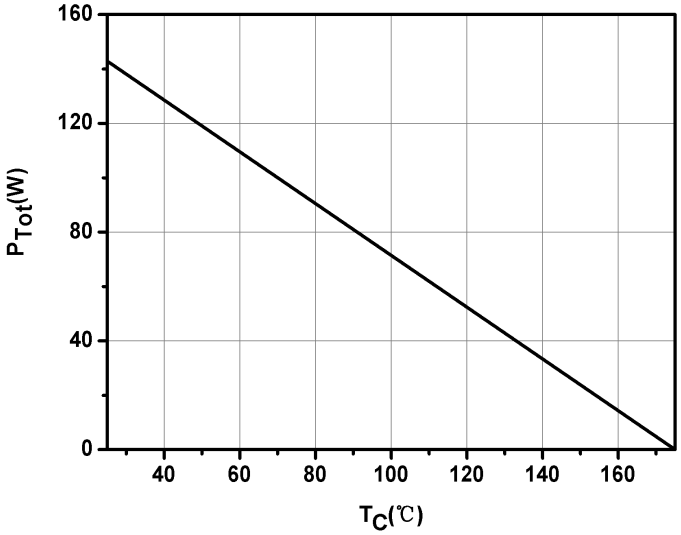


Fig.6-Power Derating

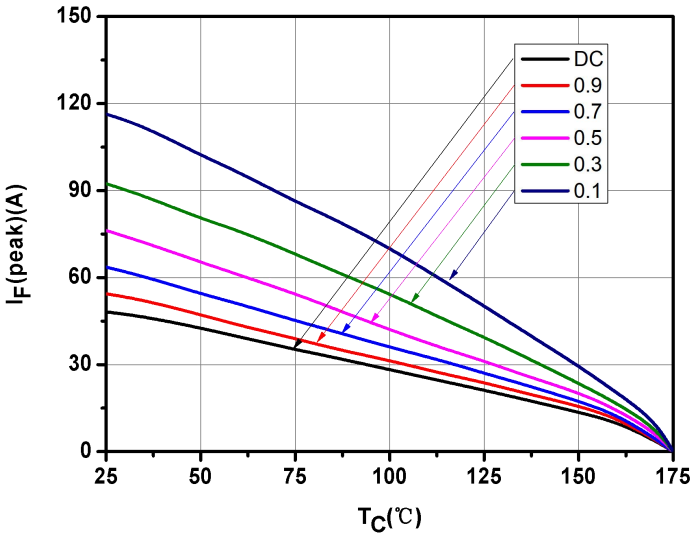


Fig.7-Current Derating

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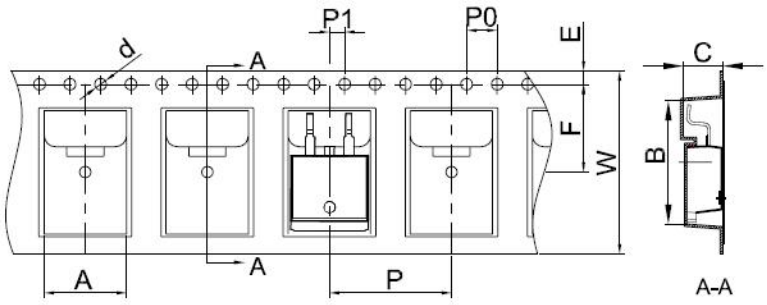
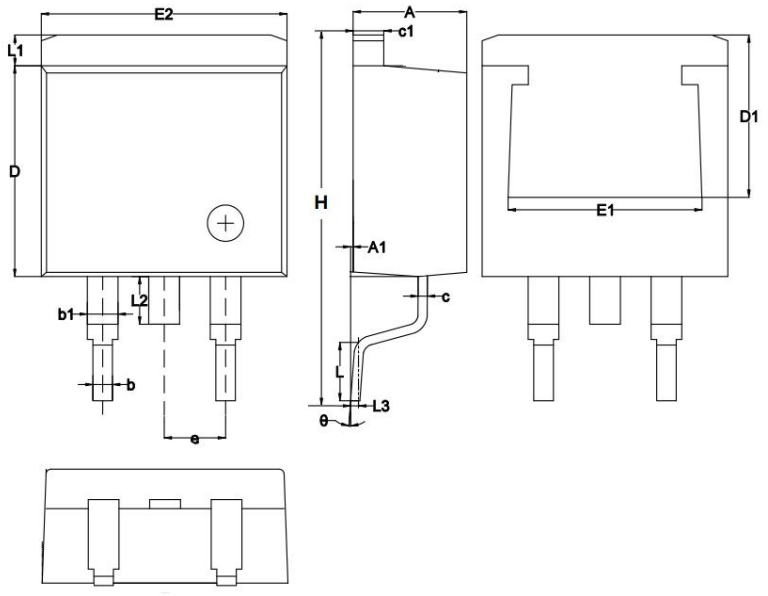
Carrier Tape & Reel Specification



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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