Technical Data
Data Sheet N2382, REV.A

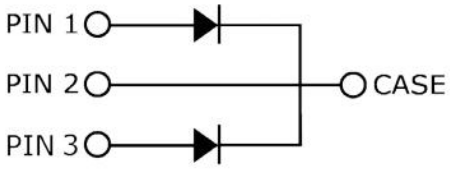
S3D40065D
650V SIC POWER SCHOTTKY RECTIFIER

TO-247AD(TO-247-3)

Description

S3D40065D is a SiC Schottky rectifier packaged in TO-247AD(TO-247-3) 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 S3D40065D 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

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Maximum Ratings(per leg)

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=135°C	21	A
	$I_{F\ (AV)3}$	Tc=140°C	20	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, T_J =25°C	105	A
	I_{FRM2}	10ms, Half Sine pulse, T_J =110°C	70	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, T_J =25°C	170	A
	I_{FSM2}	10ms, Half Sine pulse, T_J =110°C	145	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max}$	10μs. Pulse, T_J =25℃	1830	A
	$I_{F,Max}$	10μs. Pulse, T_J =110℃	1260	A
Power Dissipation	P_{tot1}	T_J =25℃	136	W
	P_{tot1}	T_J =110℃	59	W
TO-247 Mounting Torque		M3 Screw	1	Nm
		6-32 Screw	8.8	bf-in

Electrical Characteristics(per leg)

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 20A, Pulse, T_J = 25 °C	1.45	1.7	V
	V_{F2}	@ 20A, Pulse, T_J = 175 °C	1.65	2.0	V
Reverse Current*	I_{R1}	@V_R = rated V_R, T_J = 25 °C	1.5	50	uA
	I_{R2}	@V_R = rated V_R, T_J = 175 °C	15	200	uA
Junction Capacitance	C_T	V_R=0V, T_J=25℃, f=1MHz	1550	-	pF
Reverse Recovery Charge	Q_c	I_F = 20A, di/dt = 200A/μs V_R = 400 V, T_J =25°C	96.7	-	nC
Capacitance Stored Energy	E_C	V_R = 400 V	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	0.84(per leg) 0.42(both leg)	°C/W

Ratings and Characteristics Curves (per leg)

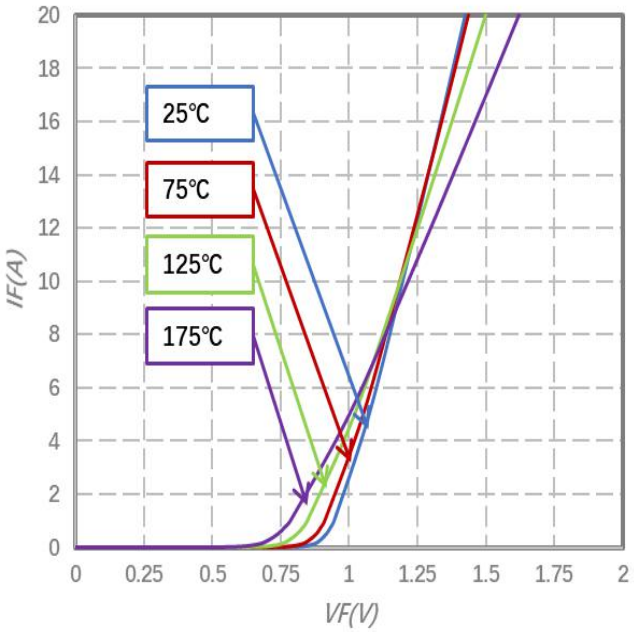

Fig.1-Typical Forward Voltage Characteristics

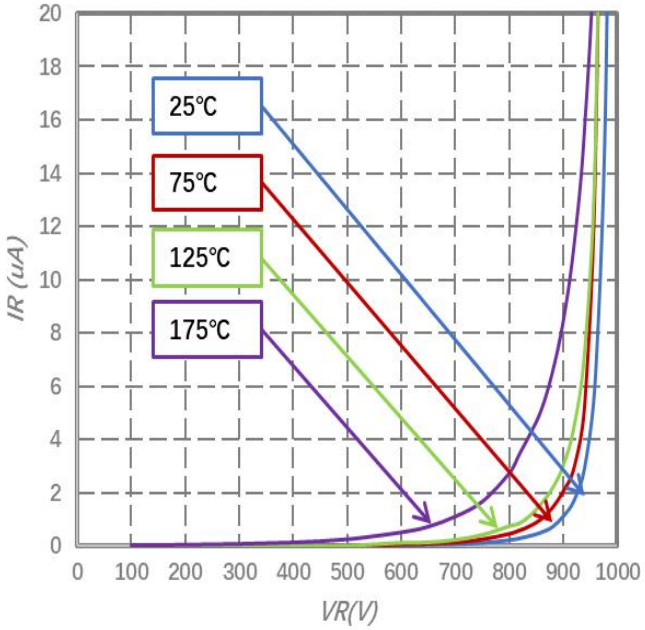

Fig.2-Typical Reverse Characteristics

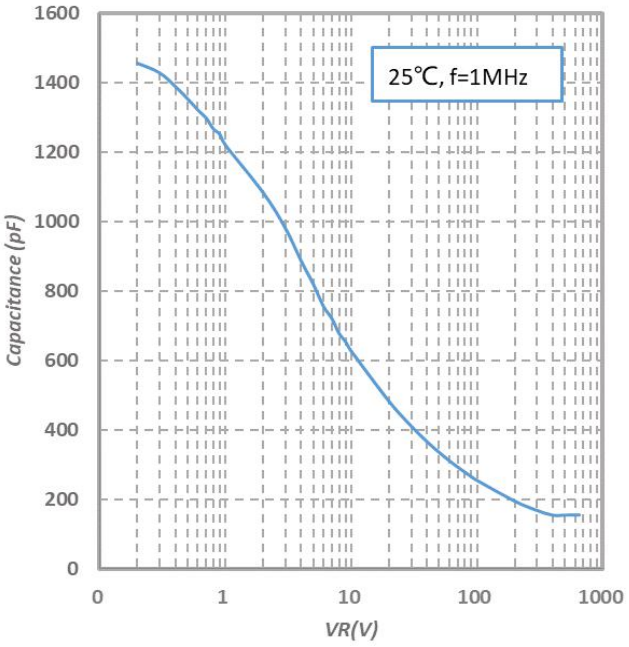

Fig.3-Capacitance vs. Reverse Voltage

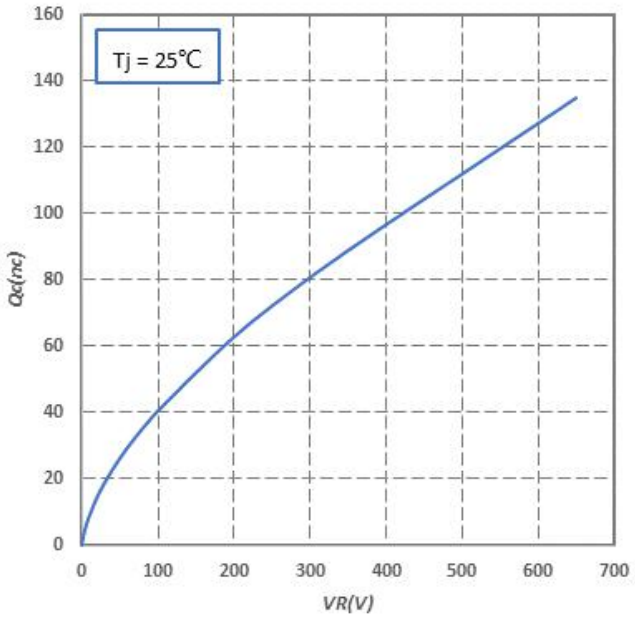

Fig.4-Total Capacitance Charge vs. Reverse Voltage

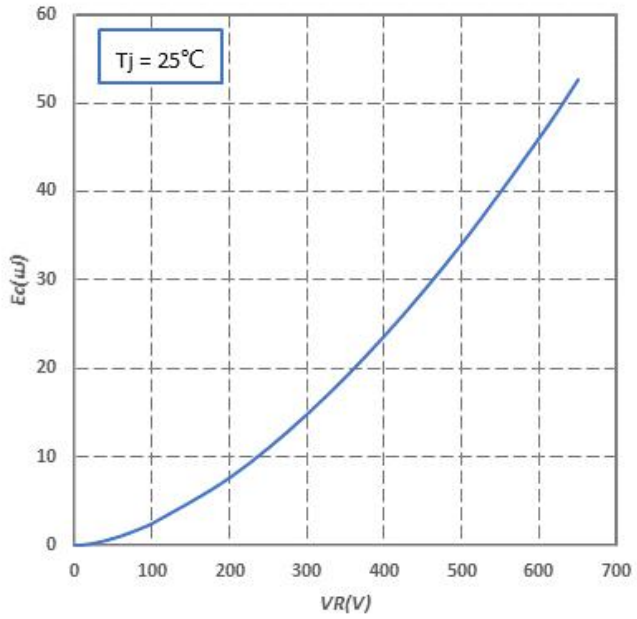

Fig.5-Capacitance Stored Energy

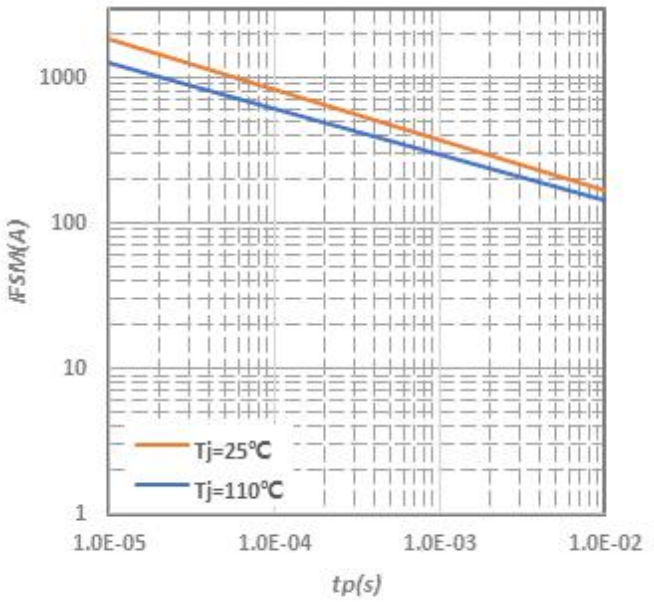

Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

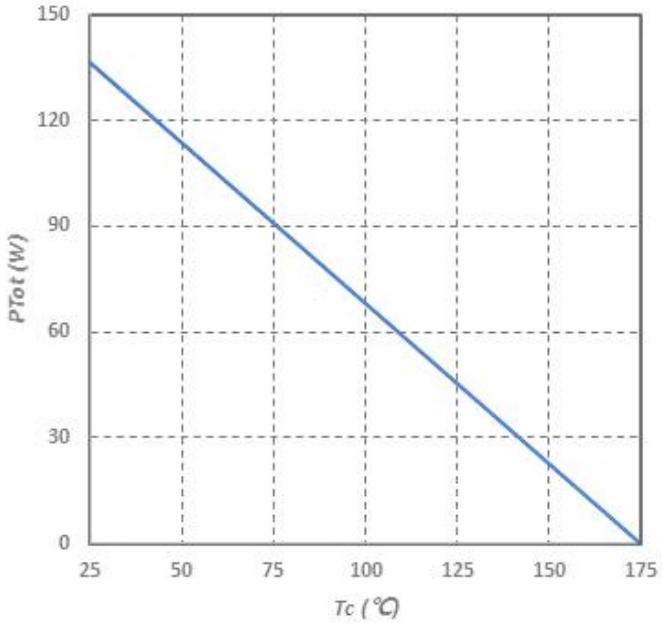

Fig.7-Power Derating

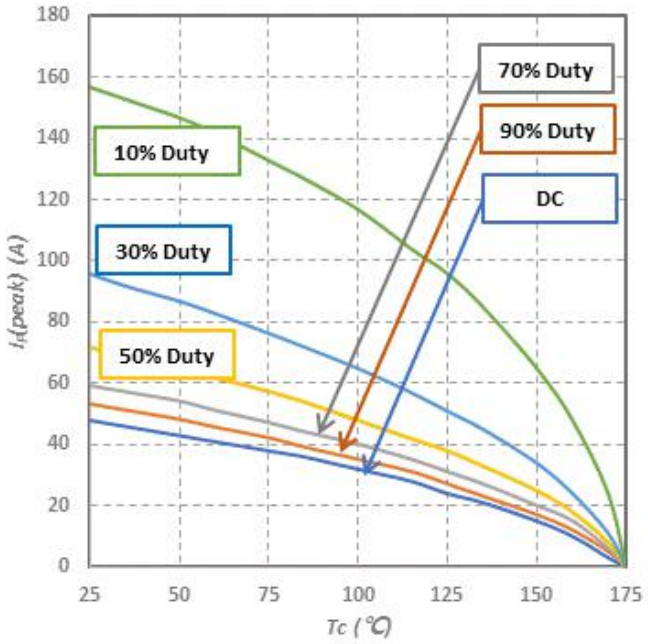

Fig.8-Current Derating

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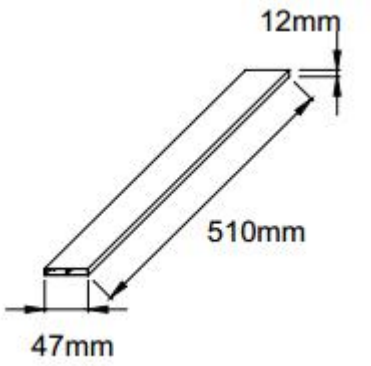
Ordering Information

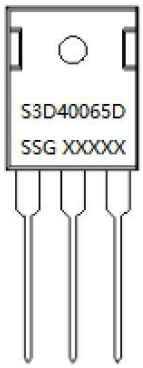
Device	Package	Shipping
S3D40065D	TO-247AD(TO-247-3)	25pcs /tube

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

Tube Specification



Marking Diagram

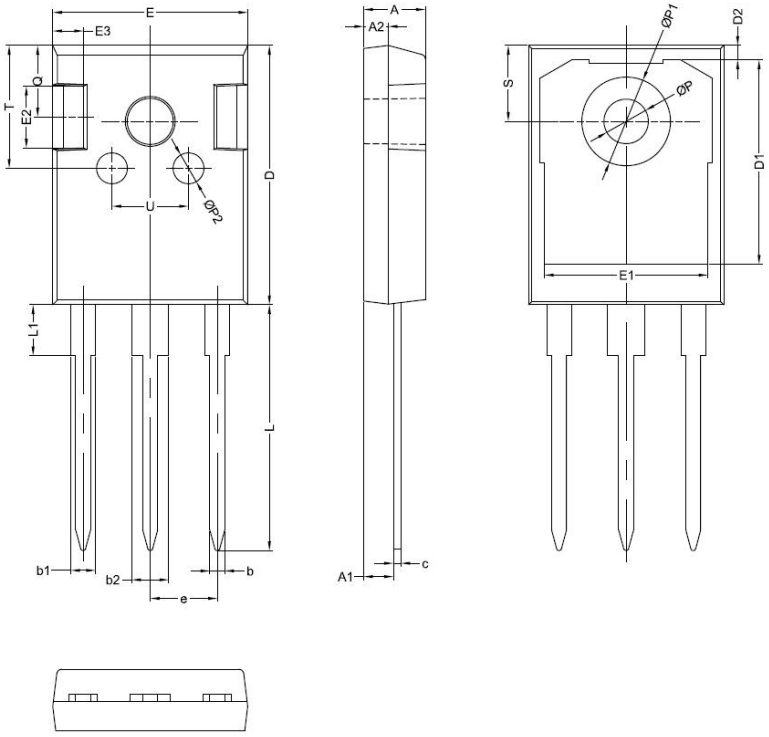


Where XXXXX is YYWWL

S3D	= Device Type
D	= Package type
40	= Forward Current (40A)
065	= Reverse Voltage (650V)
SSG	= SSG
YY	= Year
WW	= Week
L	= Lot Number

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

Mechanical Dimensions TO-247AD



SYMBOL	Millimeters		
	MIN.	TYP.	MAX.
A	4.80		5.20
A1	2.00		2.75
A2	1.90		2.10
b	1.00		1.40
b1	1.80		2.40
b2	2.80		3.40
c	0.40		0.75
D	19.80		21.20
D1		16.55	
D2		1.20	
E	15.20		16.00
E1		13.30	
E2		5.00	
E3		2.50	
e	5.20		5.70
L	13.90		20.70
L1	3.70		4.30
P	3.50		3.70
P1	7.1		7.40
P2		2.50	
Q		5.80	
S	6.05		6.25
T		10.00	
U		6.20	

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