

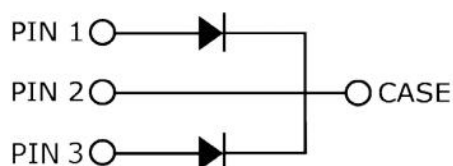
S3D40065D 650V SiC POWER SCHOTTKY RECTIFIER



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
- “-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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{DC}	-	650	V
Average Rectified Forward Current	$I_F (AV)1$	$T_C=25^{\circ}C$	57	A
	$I_F (AV)2$	$T_C=135^{\circ}C$	25	A
	$I_F (AV)3$	$T_C=147^{\circ}C$	20	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, $T_C=25^{\circ}C$	105	A
	I_{FRM2}	10ms, Half Sine pulse, $T_C=110^{\circ}C$	70	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, $T_C=25^{\circ}C$	170	A
	I_{FSM2}	10ms, Half Sine pulse, $T_C=110^{\circ}C$	145	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10 μ s. Pulse, $T_C=25^{\circ}C$	1830	A
	$I_{F,Max2}$	10 μ s. Pulse, $T_C=110^{\circ}C$	1260	A
Power Dissipation	P_{tot1}	$T_C=25^{\circ}C$	136	W
	P_{tot2}	$T_C=110^{\circ}C$	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, $T_J = 25^{\circ}C$	1.45	1.7	V
	V_{F2}	@ 20A, Pulse, $T_J = 175^{\circ}C$	1.65	2.0	V
Reverse Current*	I_{R1}	@ $V_R =$ rated V_R , $T_J = 25^{\circ}C$	1.5	50	μ A
	I_{R2}	@ $V_R =$ rated V_R , $T_J = 175^{\circ}C$	15	200	μ A
Junction Capacitance	C_T	$V_R=0V$, $T_J=25^{\circ}C$, $f=1MHz$	1550	-	pF
Reverse Recovery Charge	Q_C	$I_F = 20A$, $di/dt = 200A/\mu s$ $V_R = 400V$, $T_J=25^{\circ}C$	96.7	-	nC
Capacitance Stored Energy	E_C	$V_R = 400V$, $T_J=25^{\circ}C$	23.69	-	μ J

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

Thermal-Mechanical Specifications

Characteristics	Symbol	Condition	Specification	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	$R_{\theta JC}$	DC operation	0.84(per leg) 0.42(both leg)	$^{\circ}C/W$

Ratings and Characteristics Curves (per leg)

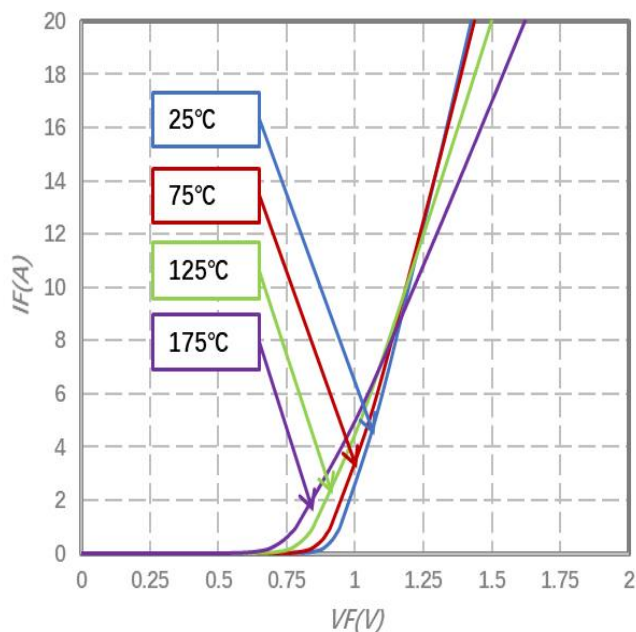


Fig.1-Typical Forward Voltage Characteristics

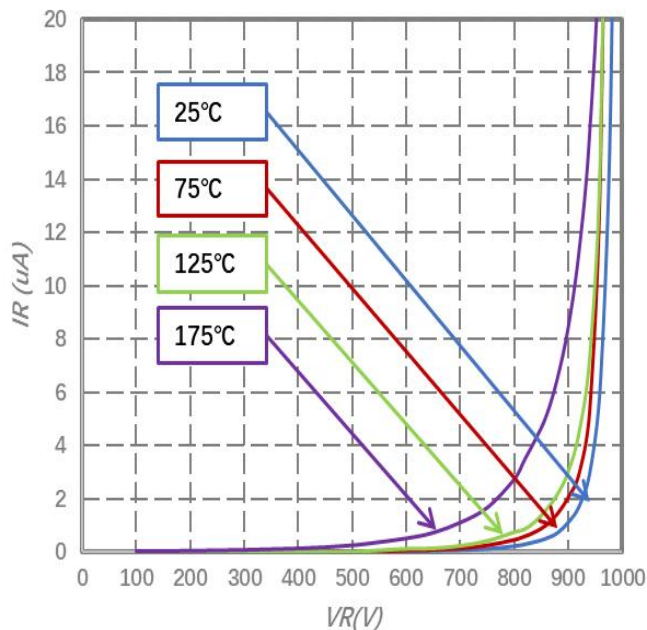


Fig.2-Typical Reverse Characteristics

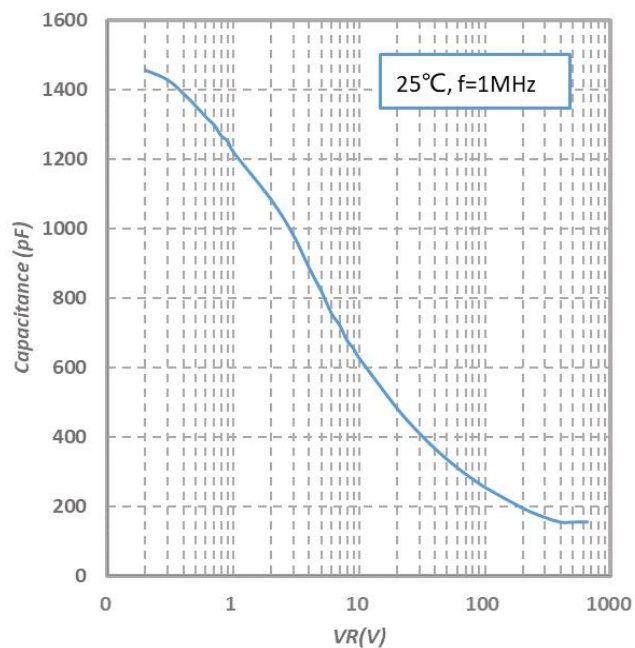


Fig.3-Capacitance vs. Reverse Voltage

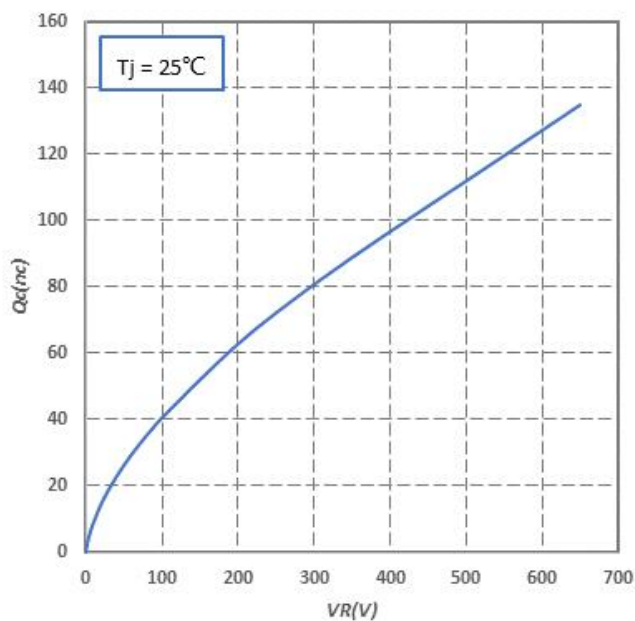


Fig.4-Total Capacitance Charge vs. Reverse Voltage

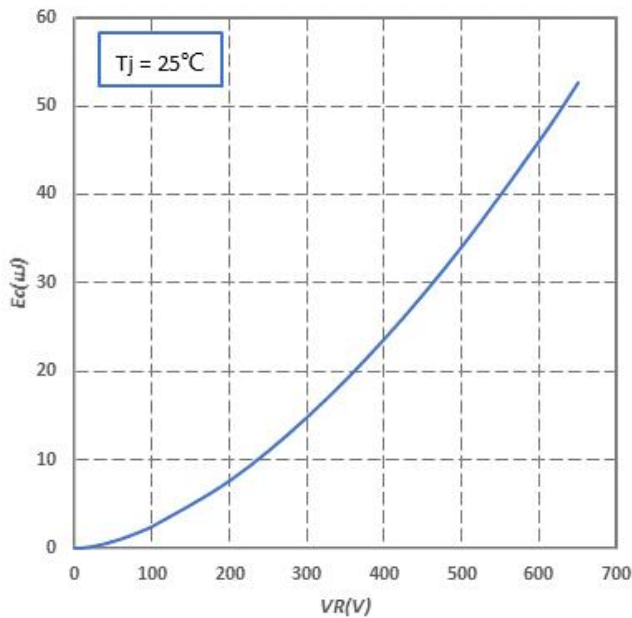


Fig.5-Capacitance Stored Energy

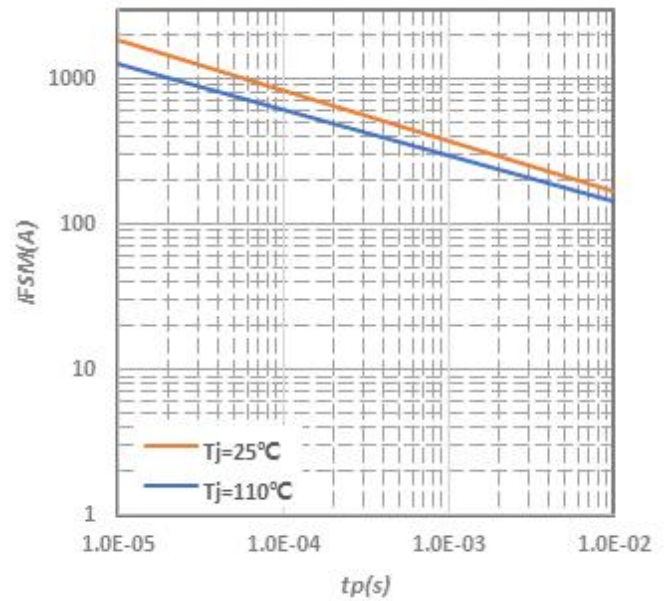


Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

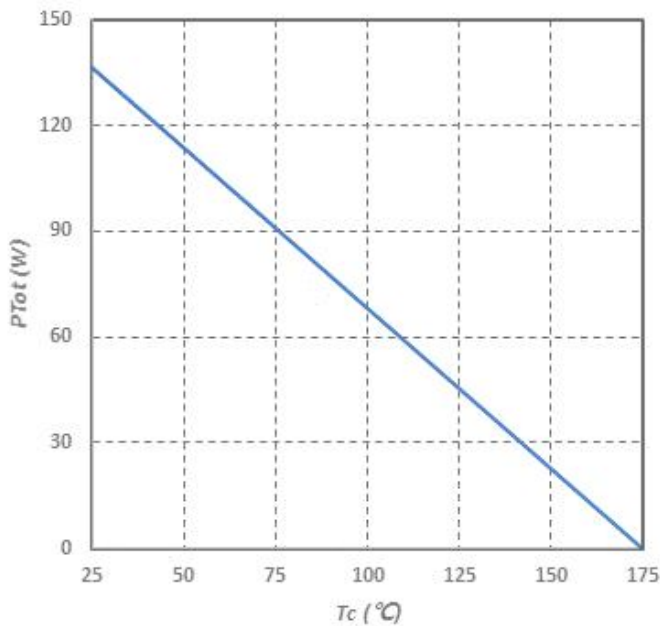


Fig.7-Power Derating

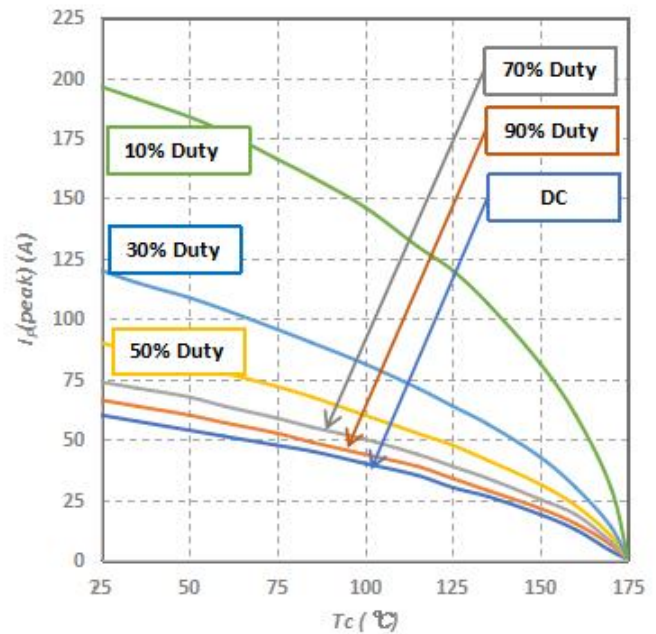
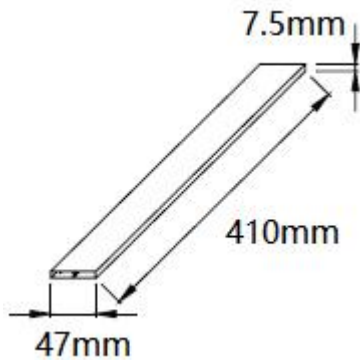


Fig.8-Current Derating

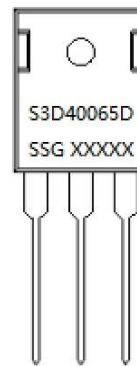
Ordering Information

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

Tube Specification



Marking Diagram

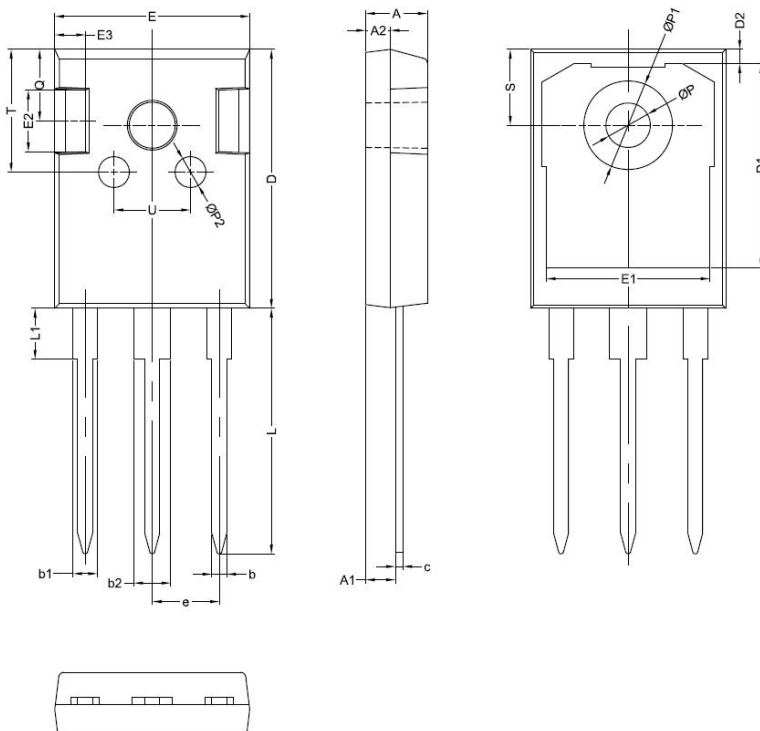


Where XXXXX is YYWWL

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	

Technical Data
Data Sheet N2382, REV.C



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