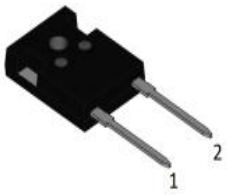
Technical Data
Data Sheet N2580, REV.B

S3D40065H2/S3D40065D1
650V SIC POWER SCHOTTKY RECTIFIERS



TO-247AC

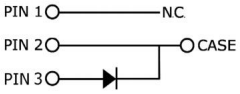
TO-247AD

Description

This 650V 40A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D40065H2/S3D40065D1 is ideal for energy sensitive, high frequency applications in challenging environments.

Circuit Diagram

TO-247AC
(TO-247-2)



TO-247AD
(TO-247-3)

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
- "-A" is an AEC-Q101 qualified device
- 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:

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	128	A
	$I_{F\ (AV)2}$	Tc=135°C	58	A
	$I_{F\ (AV)3}$	Tc=152°C	40	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, T_C =25°C	190	A
	I_{FRM2}	10ms, Half Sine pulse, T_C =110°C	120	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, T_C =25°C	320	A
	I_{FSM2}	10ms, Half Sine pulse, T_C =110°C	270	A
Power Dissipation	P_{tot1}	T_C =25℃	441	W
	P_{tot2}	T_C =110℃	191	W

Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 40A, Pulse, T_J = 25 °C	1.45	1.7	V
	V_{F2}	@ 40A, Pulse, T_J = 175 °C	1.65	2.0	V
Reverse Current*	I_{R1}	@V_R = rated V_R, T_J = 25 °C	3	50	uA
	I_{R2}	@V_R = rated V_R, T_J = 175 °C	30	200	uA
Junction Capacitance	C_T	V_R=0V, T_J=25℃, f=1MHz	3100	-	pF
Reverse Recovery Charge	Q_c	I_F = 40A, di/dt=200A/μs V_R = 400 V, T_J =25°C	193.4	-	nC
Capacitance Stored Energy	E_C	V_R = 400 V, T_J =25°C	47.3	-	μJ

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

Thermal-Mechanical Specifications:

Characteristics	Symbol	S3D40065H2	S3D40065D1	Units
Junction Temperature	T_J	-55 to +175	-55 to +175	°C
Storage Temperature	T_{stg}	-55 to +175	-55 to +175	°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	0.42	0.42	°C/W

Ordering Information

Device	Package	Plating	Shipping
S3D40065H2	TO-247AC(TO-247-2)	Pure Sn	25pcs / tube
S3D40065D1	TO-247AD(TO-247-3)	Pure Sn	25pcs / tube

Ratings and Characteristics Curves

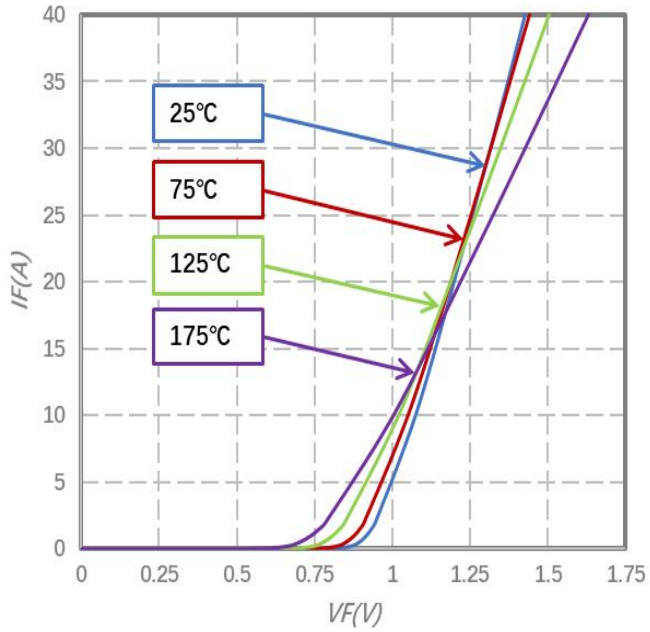


Fig.1-Typical Forward Voltage Characteristics

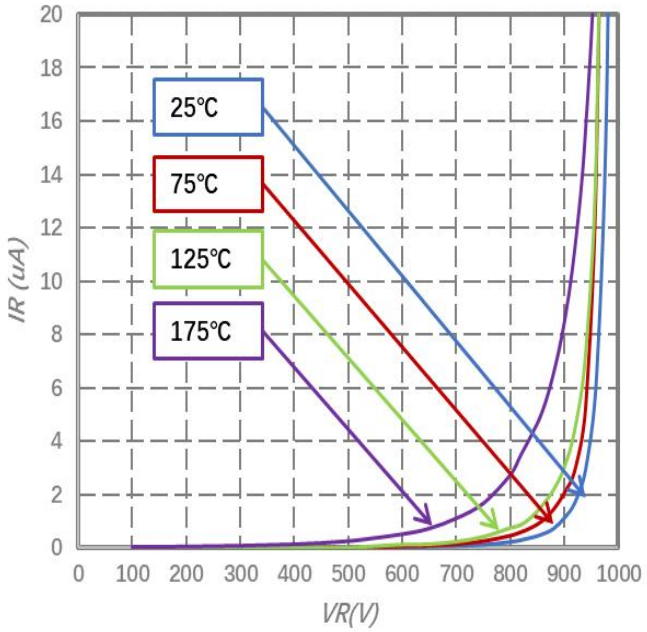


Fig.2-Typical Reverse Characteristics

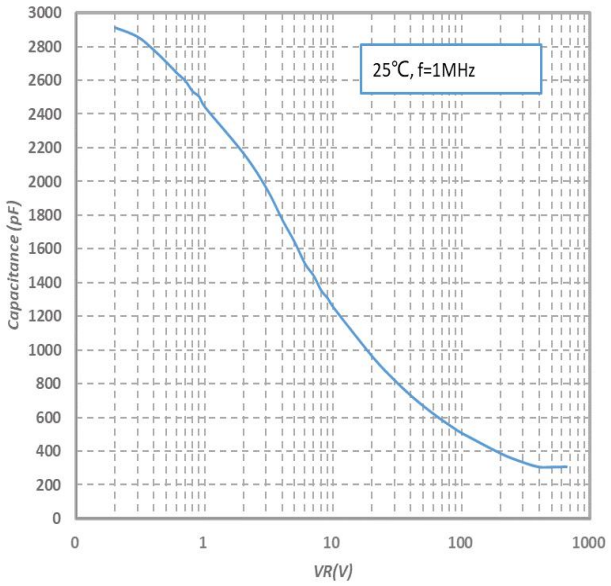


Fig.3-Capacitance vs. Reverse Voltage

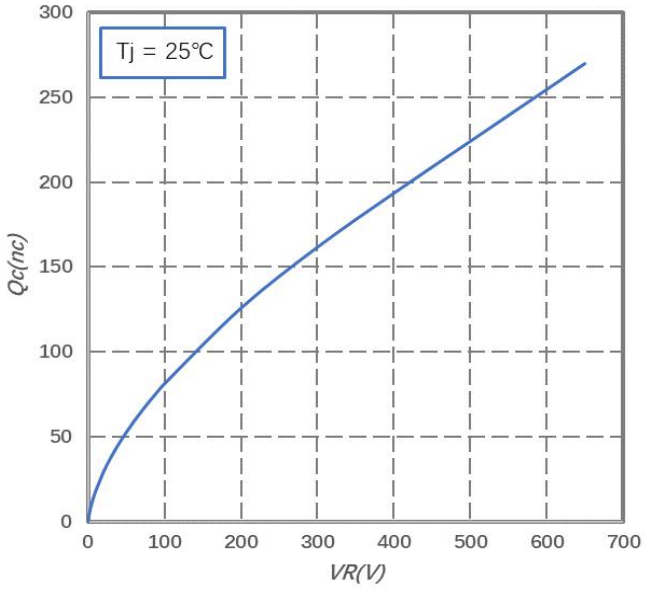


Fig.4-Total Capacitance Charge vs. Reverse Voltage

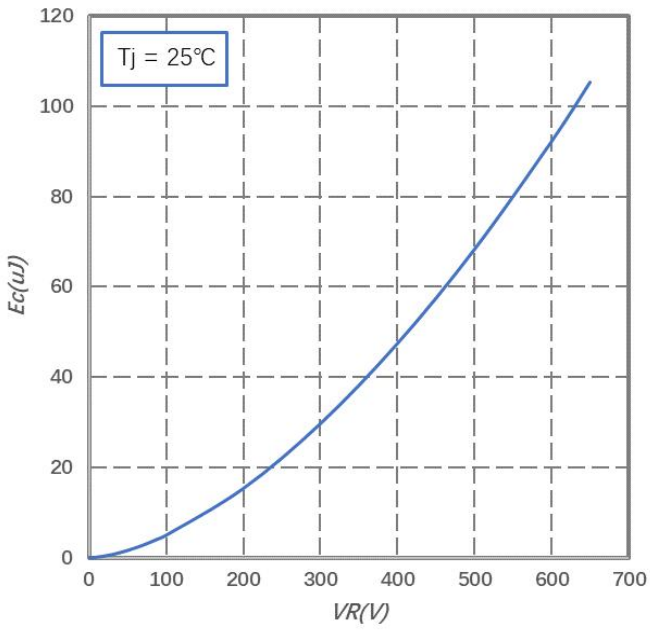


Fig.5-Capacitance Stored Energy

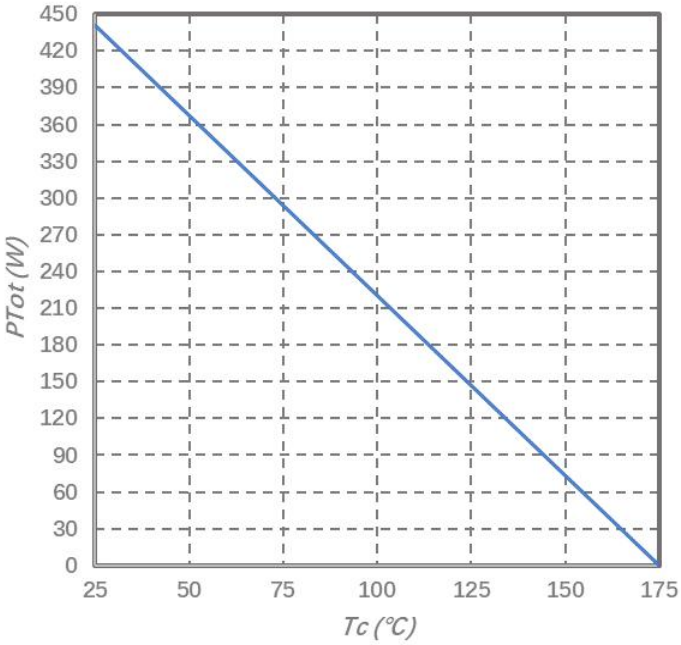


Fig.6-Power Derating

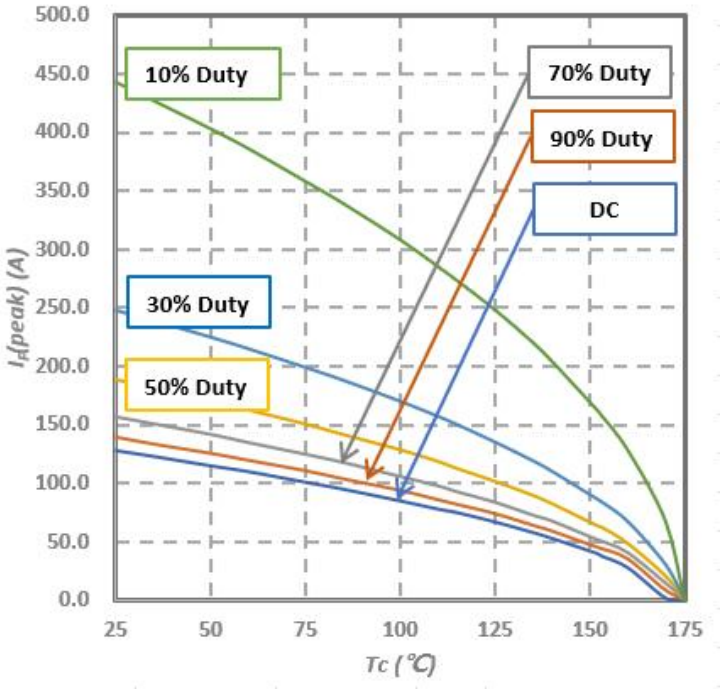
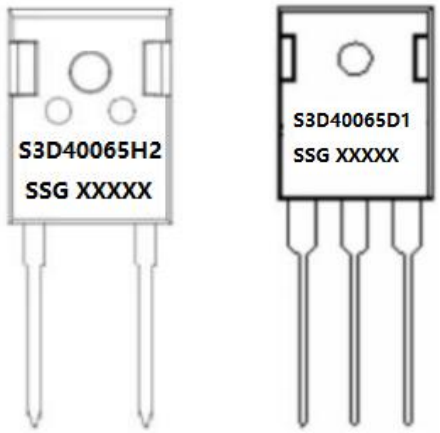


Fig.7-Current Derating

Marking Diagram



Where XXXXX is YYWWL

S3D	= Device Type
H2/D1	= 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

Technical Data
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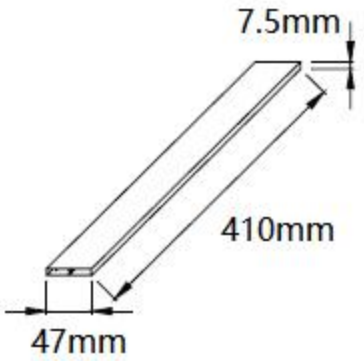
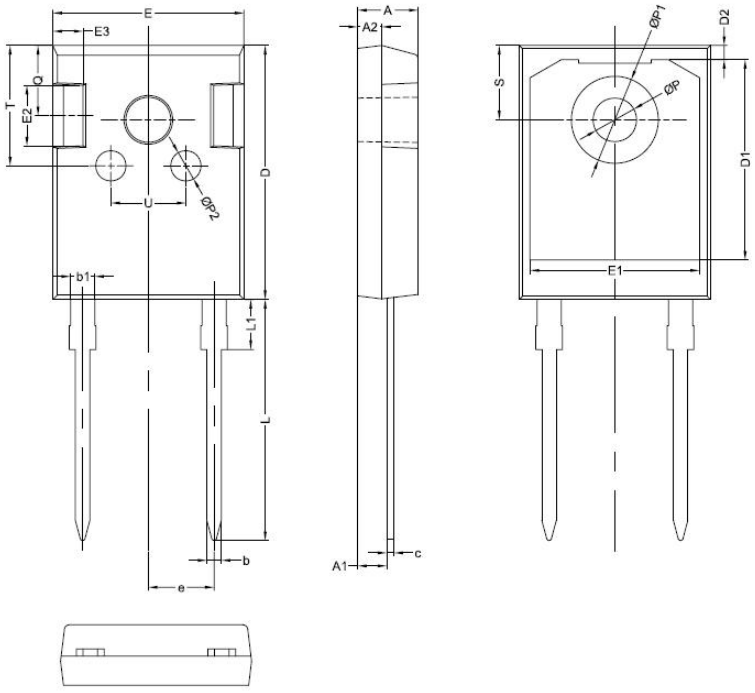
RoHS Pb

Tube Specification



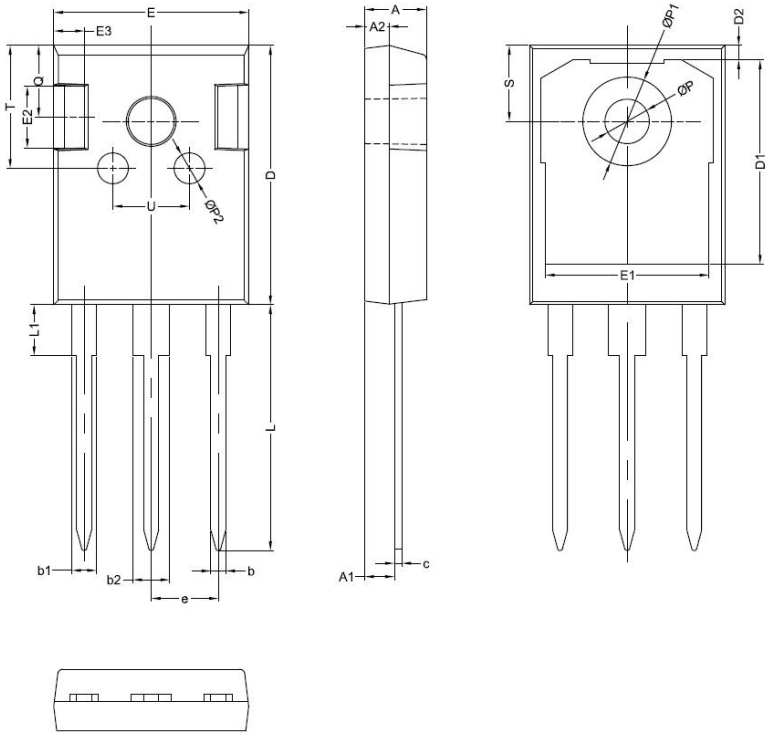
(TO-247-2/TO-247-3)

Mechanical Dimensions TO-247AC(TO-247-2)



SYMBOL	Millimeters		
	MIN.	TYP.	MAX.
A	4.80	5.00	5.20
A1	2.20	2.41	2.61
A2	1.90	2.00	2.10
b	1.10	1.20	1.35
b1	1.80	2.00	2.20
c	0.50	0.60	0.75
D	20.30	21.00	21.20
D1		16.58	
D2		1.17	
E	15.60	15.80	16.00
E1		14.02	
E2		5.00	
E3		2.50	
e		5.44	
L	19.42	19.92	20.42
L1		4.13	
P	3.50	3.60	3.70
P1	7.1	7.19	7.40
P2		2.50	
Q		5.80	
S	6.05	6.15	6.25
T		10.00	
U		6.20	

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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