

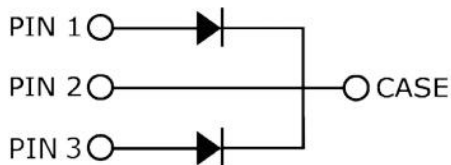
## S3D16065D 650V SiC POWER SCHOTTKY RECTIFIER



### Description

S3D16065D 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 S3D16065D is ideal for energy sensitive, high frequency applications in challenging environments.

### Circuit Diagram



### Features

- 175°C T<sub>J</sub> 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 (per leg)	$I_{F(AV)1}$	50% duty cycle @ $T_c=25^{\circ}C$ , rectangular wave form	23	A
	$I_{F(AV)2}$	50% duty cycle @ $T_c=136^{\circ}C$ , rectangular wave form	11	A
	$I_{F(AV)3}$	50% duty cycle @ $T_c=157^{\circ}C$ , rectangular wave form	8	A
Repetitive Peak Forward Surge Current (per leg)	$I_{FRM1}$	10ms, Half Sine pulse, $T_J=25^{\circ}C$	37.5	A
	$I_{FRM2}$	10ms, Half Sine pulse, $T_J=110^{\circ}C$	25.5	A
Peak One Cycle Non-Repetitive Surge Current (per leg)	$I_{FSM1}$	10ms, Half Sine pulse, $T_J=25^{\circ}C$	71	A
	$I_{FSM2}$	10ms, Half Sine pulse, $T_J=110^{\circ}C$	60	A
Non-Repetitive Peak Forward Surge Current (per leg)	$I_{F,Max}$	10 $\mu$ s. Pulse, $T_J=25^{\circ}C$	650	A
	$I_{F,Max}$	10 $\mu$ s. Pulse, $T_J=110^{\circ}C$	530	A
Power Dissipation (per leg)	$P_{tot1}$	$T_J=25^{\circ}C$	100	W
	$P_{tot1}$	$T_J=110^{\circ}C$	43.5	W

### Electrical Characteristics:

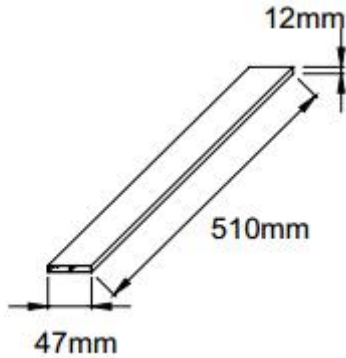
Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop(per leg)*	$V_{F1}$	@ 8A, Pulse, $T_J = 25^{\circ}C$	1.5	1.8	V
	$V_{F2}$	@ 8A, Pulse, $T_J = 175^{\circ}C$	2.1	2.4	V
Reverse Current(per leg)*	$I_{R1}$	@ $V_R = \text{rated } V_R$ $T_J = 25^{\circ}C$	10	51	$\mu$ A
	$I_{R2}$	@ $V_R = \text{rated } V_R$ $T_J = 175^{\circ}C$	12	204	$\mu$ A
Junction Capacitance (per leg)	$C_T$	$V_R=0V$ , $T_J=25^{\circ}C$ , $f=1MHz$	395	-	pF
Reverse Recovery Charge (per leg)	$Q_c$	$I_F = 8A$ , $di/dt = 500A/\mu s$ $V_R = 400V$ , $T_J = 25^{\circ}C$	20	-	nC
Capacitance Stored Energy (per leg)	$E_c$	$V_R = 400V$	3.0	-	$\mu$ J

\* Pulse width < 300  $\mu$ s, duty cycle < 2%

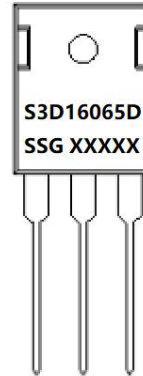
### Thermal-Mechanical Specifications:

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	1.5(per leg) 0.75(both leg)	$^{\circ}C/W$

### Tube Specification



### Marking Diagram



Where XXXXX is YYWWL

S3D = Device Type  
D = Package type  
16 = Forward Current (16A)  
065 = Reverse Voltage (650V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

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

### Ordering Information

Device	Package	Shipping
S3D16065D	TO-247AD(TO-247-3)	25pcs /tube
S3D16065D-A	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.

### Ratings and Characteristics Curves (per leg)

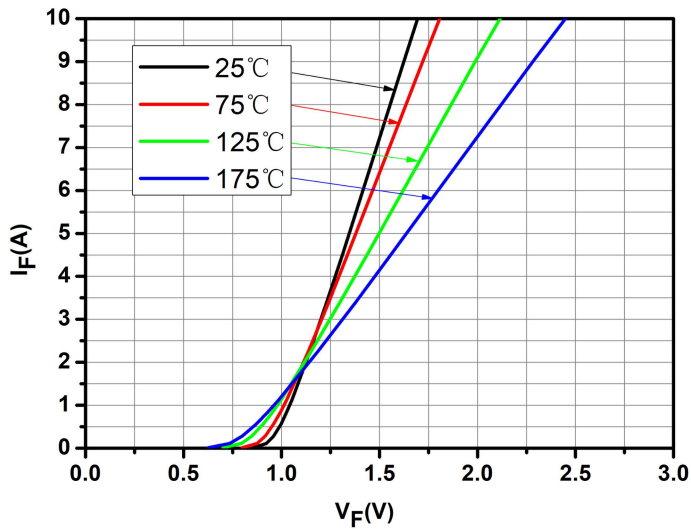


Fig.1-Typical Forward Voltage Characteristics

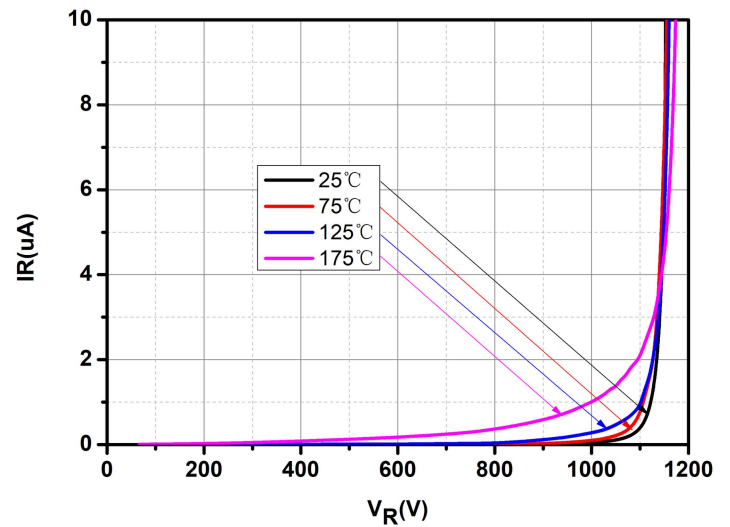


Fig.2-Typical Reverse Characteristics

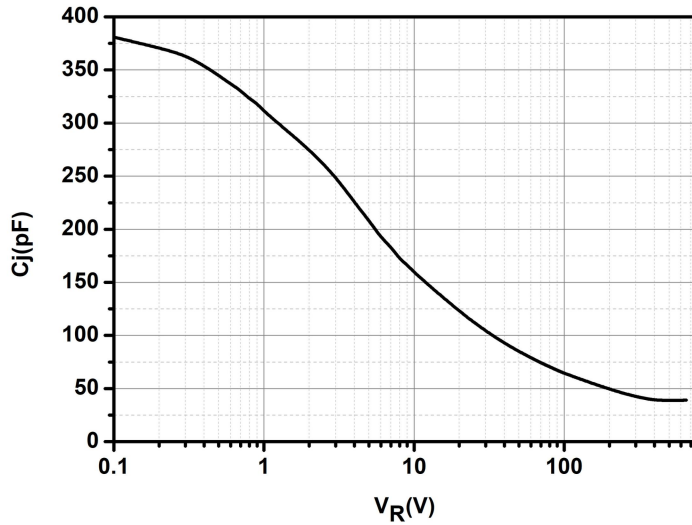
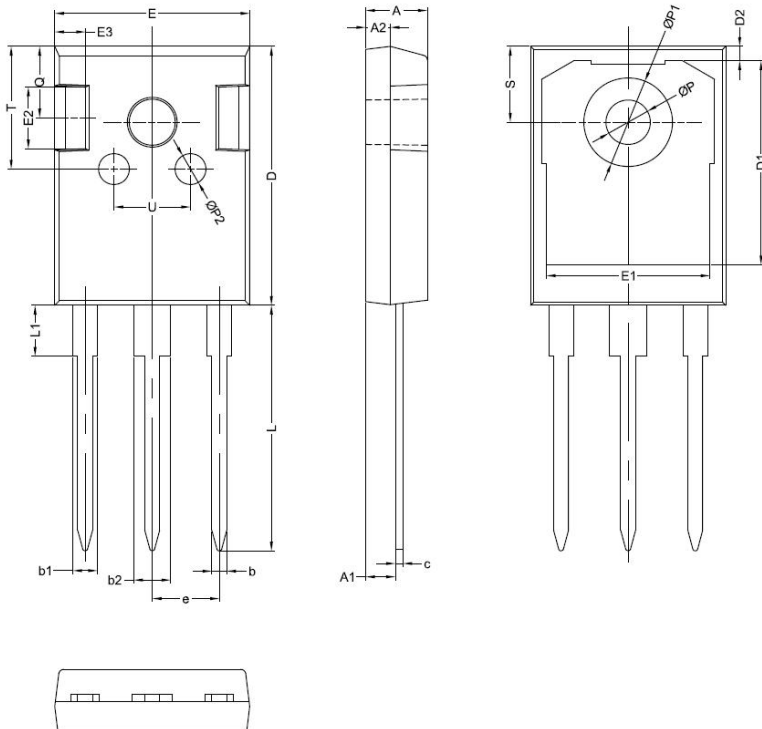


Fig.3-Capacitance vs. Reverse Voltage

**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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