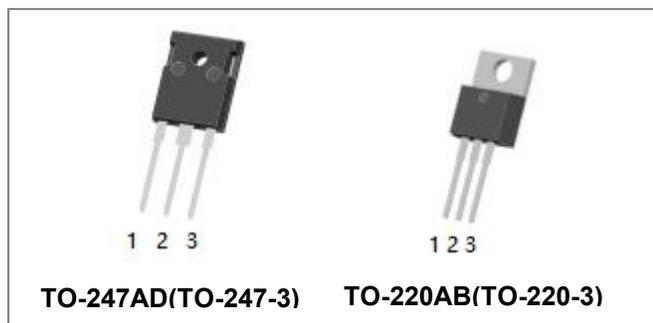


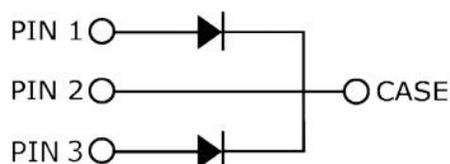
## S3D20065D S3D20065C 650V SiC POWER SCHOTTKY RECTIFIER



### Description

S3D20065D/S3D20065C are SiC Schottky rectifiers packaged in TO-247AD(TO-247-3)/TO-220AB(TO-220-3) case. The devices are high voltage Schottky rectifiers that have very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D20065D/S3D20065C are 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
- 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 <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	-	650	V
Average Rectified Forward Current	I <sub>F(AV)</sub>	50% duty cycle @T <sub>c</sub> =150°C, rectangular wave form	10 (per leg) 20 (per device)	A
Peak One Cycle Non-Repetitive Surge Current(per leg)	I <sub>FSM</sub>	10ms, Half Sine pulse, T <sub>J</sub> =25°C	102 (per leg)	A
Repetitive Peak Forward Surge Current	I <sub>FRM</sub>	10 ms, Half Sine pulse , T <sub>J</sub> =25°C	46(per leg)	A

### Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop(per leg)*	V <sub>F1</sub>	@ 10A, Pulse, T <sub>J</sub> = 25 °C	1.5	1.7	V
	V <sub>F2</sub>	@ 10A, Pulse, T <sub>J</sub> = 175 °C	2.0	2.4	V
Reverse Current(per leg)*	I <sub>R1</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 25 °C	0.005	20	uA
	I <sub>R2</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 175 °C	0.30	30	uA
Junction Capacitance(per leg)	C <sub>T</sub>	VR=0V, T <sub>J</sub> =25°C, f=1MHz	621	-	pF

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

### Thermal-Mechanical Specifications:

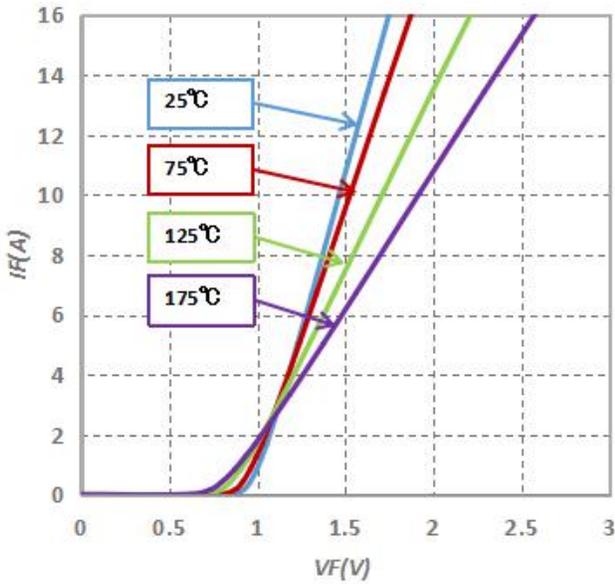
Characteristics	Symbol	S3D20065D	S3D20065C	Units
Junction Temperature	T <sub>J</sub>	-55 to +175		°C
Storage Temperature	T <sub>stg</sub>	-55 to +175		°C
Typical Thermal Resistance Junction to Case	R <sub>θJC</sub>	0.84(per leg) 0.42(both leg)	2.4(per leg) 1.2(both leg)	°C/W

### Ordering Information

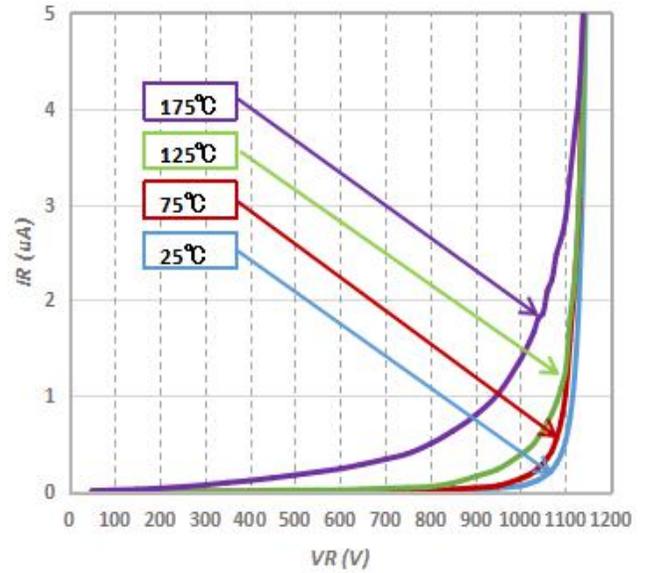
Device	Package	Shipping
S3D20065D	TO-247AD(TO-247-3)	25pcs /tube
S3D20065C	TO-220AB(TO-220-3)	50pcs /tube

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

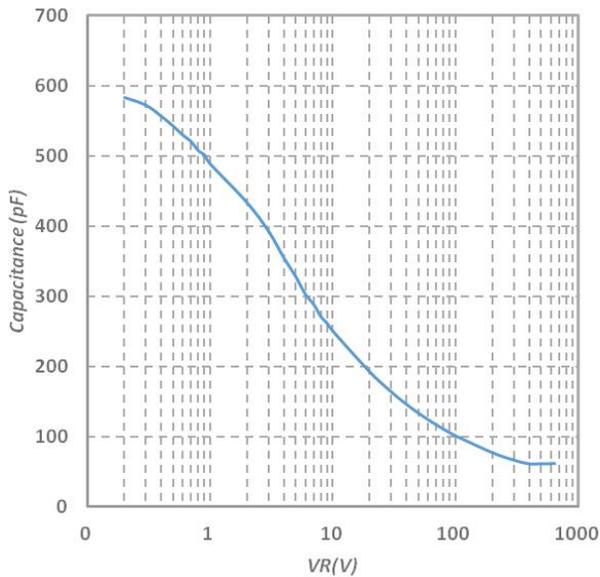
**Ratings and Characteristics Curves (per leg)**



**Fig.1-Typical Forward Voltage Characteristics**

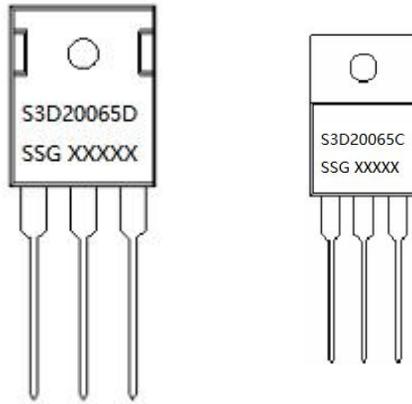


**Fig.2-Typical Reverse Characteristics**



**Fig.3-Capacitance vs. Reverse Voltage**

## Marking Diagram

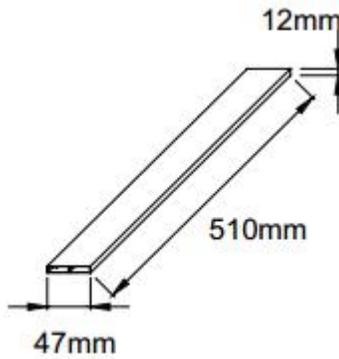


Where XXXXX is YYWWL

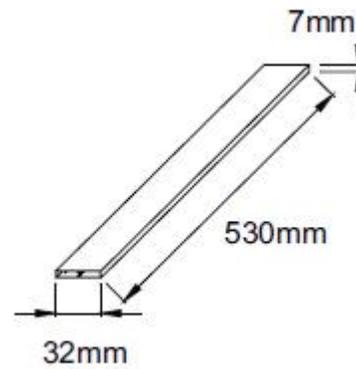
S3D = Device Type  
D/C = Package type  
20 = Forward Current (20A)  
065 = Reverse Voltage (650V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

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

## Tube Specification

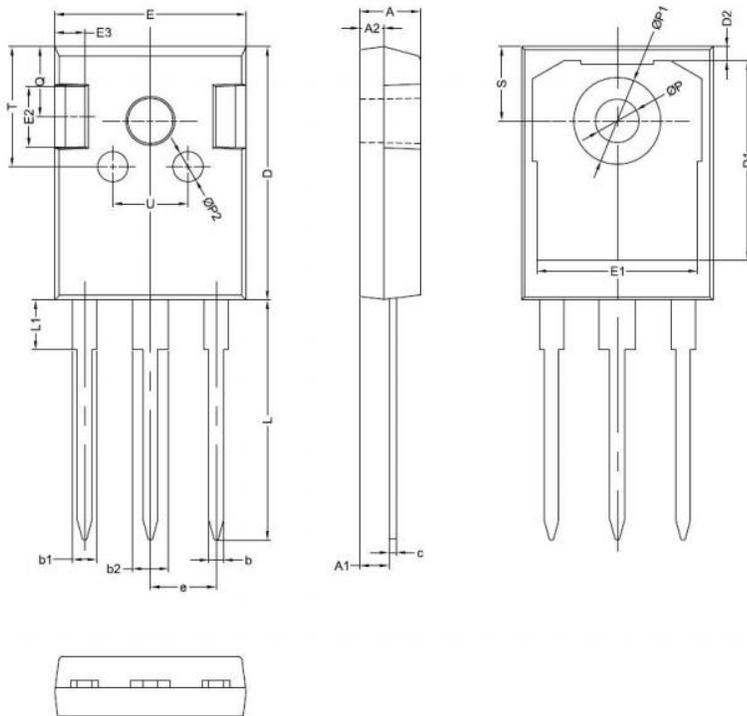


TO-247AD(TO-247-3)



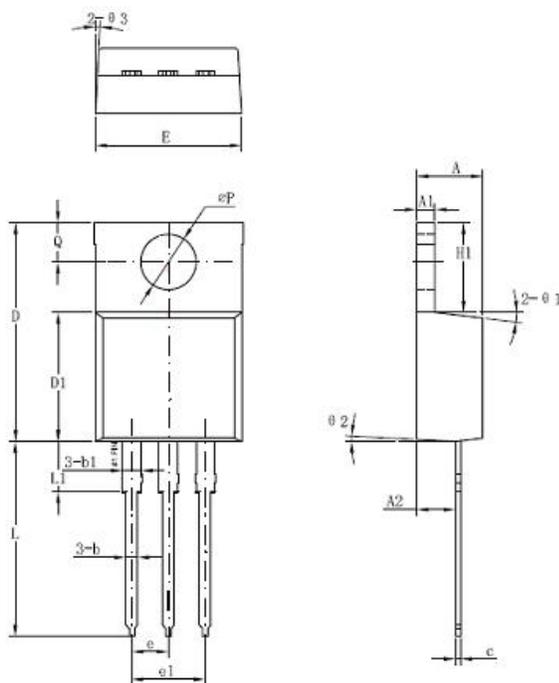
TO-220AB(TO-220-3)

**Mechanical Dimensions TO-247AD**



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	1.40
b1	1.80	2.00	2.20
b2	2.80	3.00	3.20
c	0.50	0.60	0.75
D	20.30	21.00	21.20
D1		16.55	
D2		1.20	
E	15.45	15.80	16.00
E1		13.30	
E2		5.00	
E3		2.50	
e		5.44	
L	19.42	19.92	20.70
L1		4.13	
P	3.50	3.60	3.70
P1	7.1		7.40
P2		2.50	
Q		5.80	
S	6.05	6.15	6.25
T		10.00	
U		6.20	

**Mechanical Dimensions TO-220AB**



Symbol	Dimensions in millimeters		
	Min	Typical	Max
A	4.42	4.57	4.72
A1	1.17	1.27	1.37
A2	2.52	2.69	2.89
b	0.71	0.81	0.96
b1	1.17	1.27	1.37
c	0.31	0.38	0.61
D	14.94	15.24	15.54
D1	8.85	9.00	9.15
E	10.01	10.16	10.31
e		2.54	
e1	4.98	5.06	5.18
H1	6.04	6.24	6.44
L	12.7	13.56	13.80
L1	3.56	3.5	3.96
ΦP	3.74	3.84	4.04
Q	2.54	2.74	2.94
θ1		7°	
θ2		3°	
θ3		4°	



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