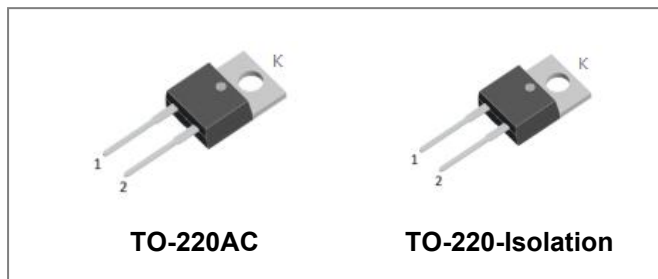


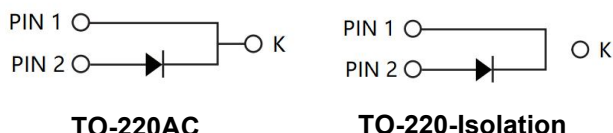
## S3D15065A/S3D15065I 650V SIC POWER SCHOTTKY RECTIFIER



### Description

This 650V 15A device is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D15065A and S3D15065I are ideal for energy sensitive, high frequency applications in challenging environments.

### Circuit Diagram



### Applications

- Alternative energy inverters
- Power Factor Correction (PFC)
- Free-Wheeling diodes
- Switching supply output rectification
- Reverse polarity protection

### 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

### 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>DC</sub>	-	650	V
Average Rectified Forward Current	I <sub>F (AV)1</sub>	T <sub>C</sub> =25°C	42	A
	I <sub>F (AV)2</sub>	T <sub>C</sub> =135°C	18	A
	I <sub>F (AV)3</sub>	T <sub>C</sub> =145°C	15	A
Repetitive Peak Forward Surge Current	I <sub>FRM1</sub>	10ms, Half Sine pulse, T <sub>C</sub> =25°C	50	A
	I <sub>FRM2</sub>	10ms, Half Sine pulse, T <sub>C</sub> =110°C	35	A
Peak One Cycle Non-Repetitive Surge Current	I <sub>FSM1</sub>	10ms, Half Sine pulse, T <sub>C</sub> =25°C	102	A
	I <sub>FSM2</sub>	10ms, Half Sine pulse, T <sub>C</sub> =110°C	65	A
Non-Repetitive Peak Forward Surge Current	I <sub>F,Max1</sub>	10µs. Pulse, T <sub>C</sub> =25°C	865	A
	I <sub>F,Max2</sub>	10µs. Pulse, T <sub>C</sub> =110°C	590	A
Power Dissipation	P <sub>tot1</sub>	T <sub>C</sub> =25°C	116	W
	P <sub>tot2</sub>	T <sub>C</sub> =110°C	50	W
TO-220 Mounting Torque		M3 Screw	1	Nm
		6-32 Screw	8.8	bf-in

### Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V <sub>F1</sub>	@ 15A, Pulse, T <sub>J</sub> = 25 °C	1.4	1.7	V
	V <sub>F2</sub>	@ 15A, Pulse, T <sub>J</sub> = 175 °C	1.6	2.0	V
Reverse Current*	I <sub>R1</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 25 °C	0.3	15	uA
	I <sub>R2</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 175 °C	3	150	uA
Junction Capacitance	C <sub>T</sub>	V <sub>R</sub> =0V, T <sub>J</sub> =25°C, f=1MHz	1243	-	pF
Reverse Recovery Charge	Q <sub>c</sub>	I <sub>F</sub> = 15A, di/dt = 200A/μs V <sub>R</sub> = 400 V, T <sub>J</sub> =25°C	77.5	-	nC
Capacitance Stored Energy	E <sub>c</sub>	V <sub>R</sub> = 400 V, T <sub>J</sub> =25°C	18.99	-	μJ

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

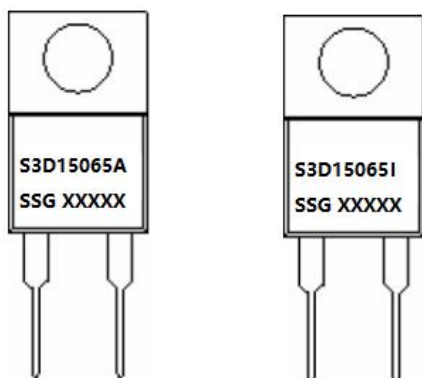
### Thermal-Mechanical Specifications:

Characteristics	Symbol	S3D15065A	S3D15065I	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>	1.3	3.2	°C/W

### Ordering Information

Device	Package	Shipping
S3D15065A	TO-220AC(TO-220-2)	50pcs / tube
S3D15065I	TO-220-Isolation	50pcs / tube

### Marking Diagram



Where XXXXX is YYWWL

S3D = Device Type  
 A/I = Package type  
 15 = Forward Current (15A)  
 065 = Reverse Voltage (650V)  
 SSG = SSG  
 YY = Year  
 WW = Week  
 L = Lot Number

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

## Ratings and Characteristics Curves

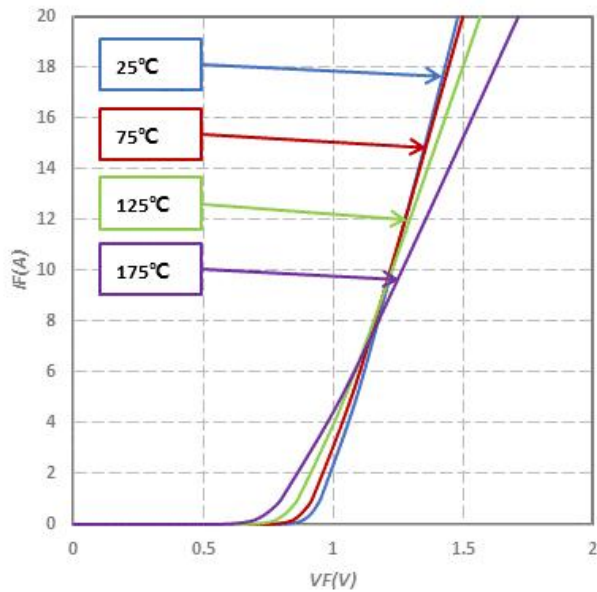


Fig.1-Typical Forward Voltage Characteristics

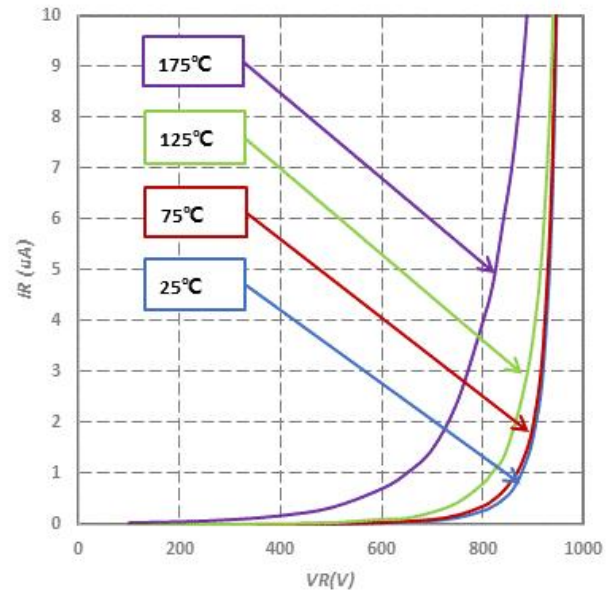


Fig.2-Typical Reverse Characteristics

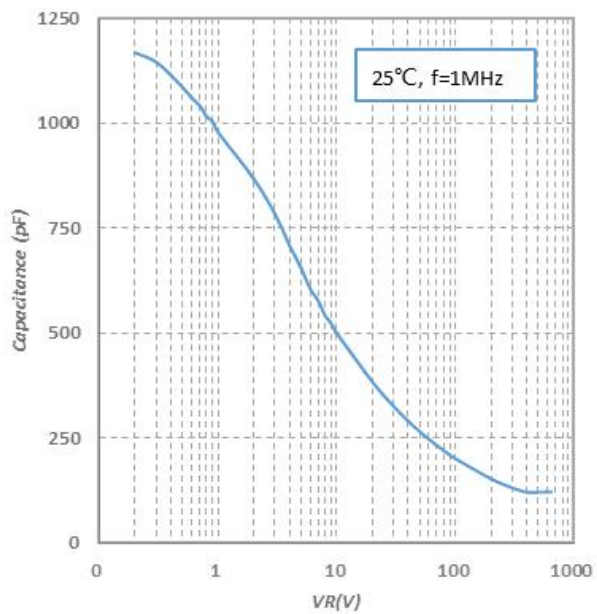


Fig.3-Capacitance vs. Reverse Voltage

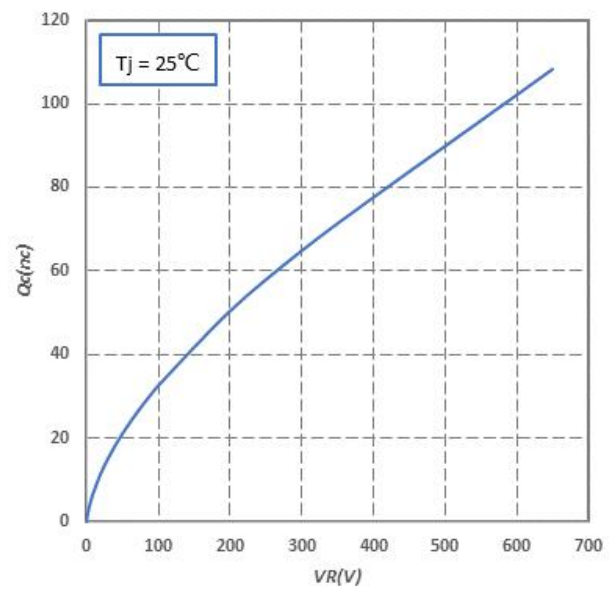


Fig.4-Total Capacitance Charge vs. Reverse Voltage

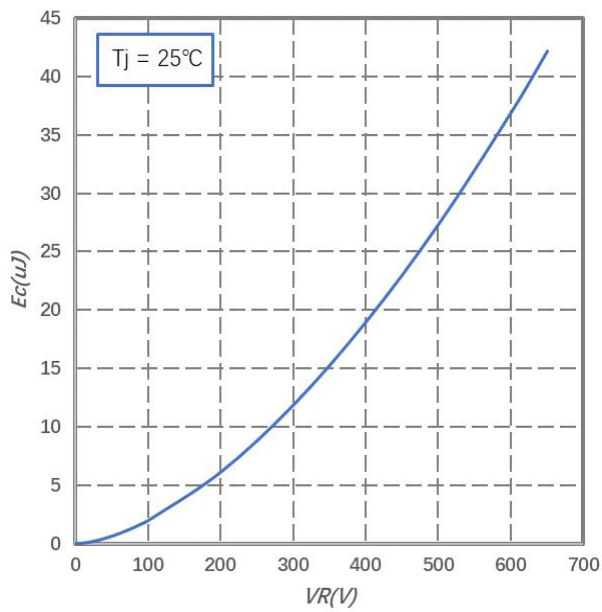


Fig.5-Capacitance Stored Energy

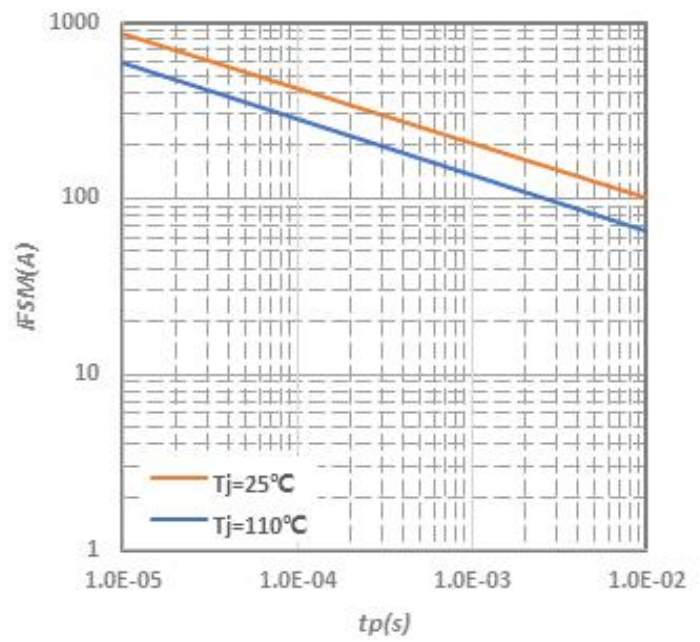


Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

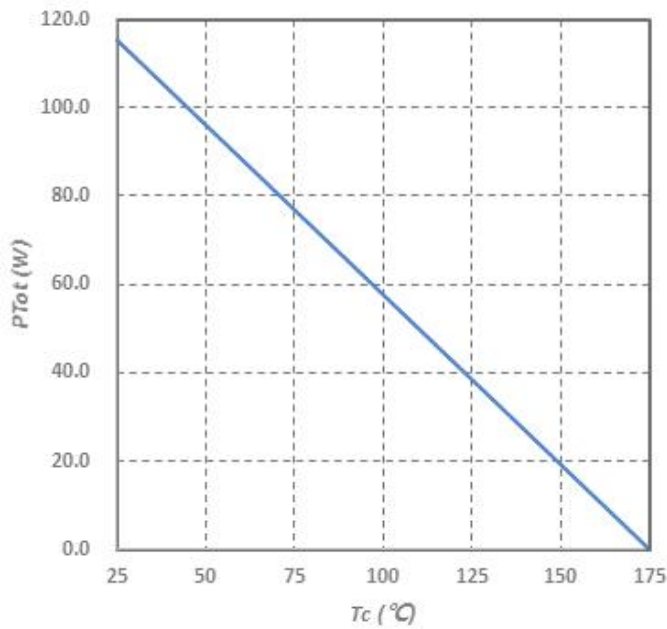


Fig.7-Power Derating

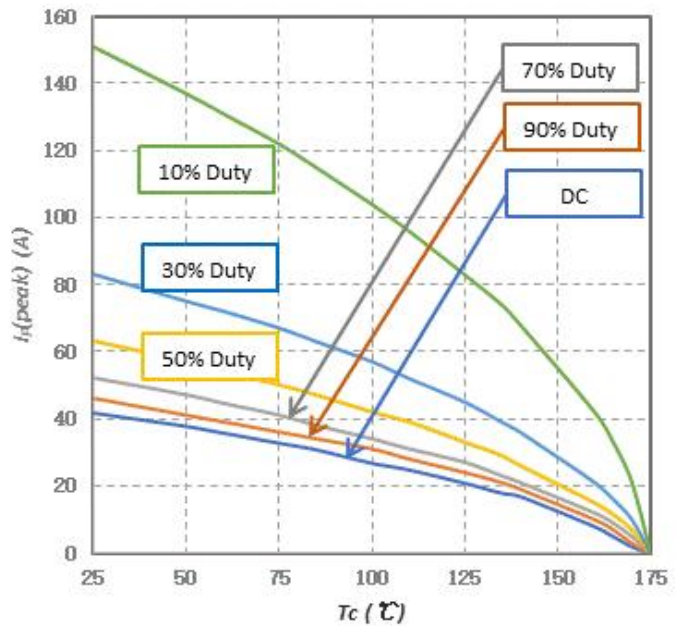
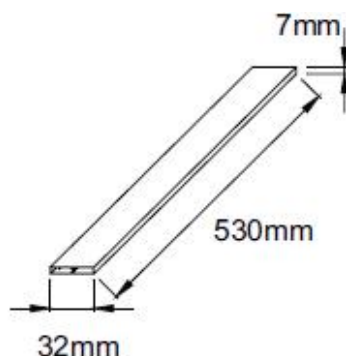
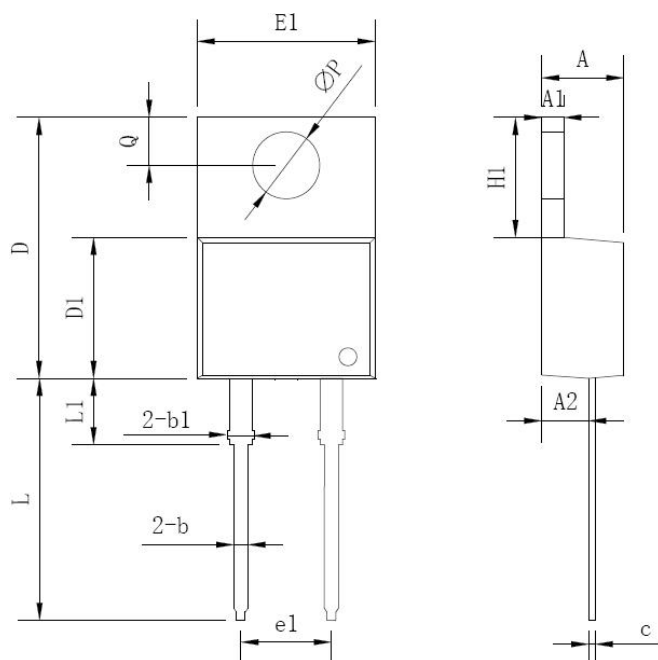


Fig.8-Current Derating

## Tube Specification(TO-220-2/ TO-220-Isolation)

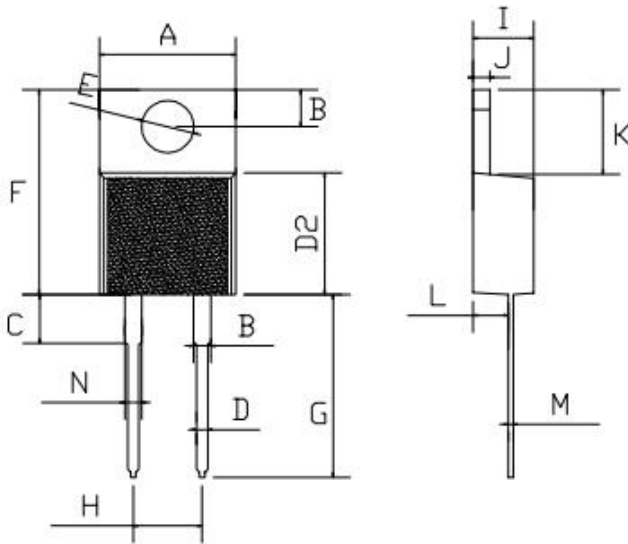


## Mechanical Dimensions TO-220AC(TO-220-2)



Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E1	9.65	10.16	10.67
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
$\Phi P$	-	3.56	-
Q	2.54	-	3.43

## Mechanical Dimensions TO-220-Isolation



SYMBOL	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	9.7	10.4	0.381	0.409
B	2.5	3.0	0.098	0.118
C	3.5	3.9	0.137	0.153
D	0.7	0.92	0.027	0.036
E	3.72	3.95	0.146	0.155
F	14.51	15.55	0.571	0.612
G	12.95	13.9	0.509	0.547
H	4.95	5.19	0.194	0.204
I	4.38	4.65	0.172	0.183
J	1.15	1.36	0.045	0.053
K	5.86	6.38	0.230	0.251
L	2.35	2.85	0.092	0.112
M	0.32	0.58	0.012	0.022
N	1.18	1.42	0.046	0.055

**Technical Data**  
**Data Sheet N2401, REV.C**



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