

## S6D16065A/S6D16065F/S6D16065I 16A 650V SIC POWER SCHOTTKY RECTIFIERS

### Description

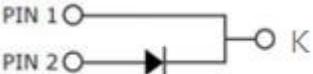
This 650V 16A diode is a high voltage Schottky rectifier that have very low total conduction losses and very stable switching characteristics over temperature extremes. The S6D16065A/S6D16065F/S6D16065I are ideal for energy sensitive, high frequency applications in challenging environments.

### 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

<p>S6D16065A</p> 	<p>S6D16065F</p> 	<p>S6D16065I</p> 
<p>TO-220AC (TO-220-2)</p>	<p>TO-220MF-2L (TO-220-F2)</p>	<p>TO-220-Isolation</p>
		

### 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	$I_{F(AV)1}$	$T_C=25^{\circ}C$	49	A
	$I_{F(AV)2}$	$T_C=135^{\circ}C$	23	A
	$I_{F(AV)3}$	$T_C=153^{\circ}C$	16	A
Repetitive Peak Forward Surge Current	$I_{FRM1}$	10ms, Half Sine pulse, $T_C=25^{\circ}C$	96	A
	$I_{FRM2}$	10ms, Half Sine pulse, $T_C=110^{\circ}C$	50	A
Peak One Cycle Non-Repetitive Surge Current	$I_{FSM1}$	10ms, Half Sine pulse, $T_C=25^{\circ}C$	160	A
	$I_{FSM2}$	10ms, Half Sine pulse, $T_C=110^{\circ}C$	128	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10 $\mu$ s. Pulse, $T_C=25^{\circ}C$	1250	A
	$I_{F,Max2}$	10 $\mu$ s. Pulse, $T_C=110^{\circ}C$	1100	A
Power Dissipation	$P_{tot1}$	$T_C=25^{\circ}C$	214	W
	$P_{tot2}$	$T_C=110^{\circ}C$	93	W

### Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	$V_{F1}$	@ 16A, Pulse, $T_J = 25^{\circ}C$	1.25	1.50	V
	$V_{F2}$	@ 16A, Pulse, $T_J = 175^{\circ}C$	1.4	1.60	V
Reverse Current*	$I_{R1}$	@ $V_R = \text{rated } V_R$ $T_J = 25^{\circ}C$	1.5	80	$\mu$ A
	$I_{R2}$	@ $V_R = \text{rated } V_R$ $T_J = 175^{\circ}C$	14	350	$\mu$ A
Junction Capacitance	$C_T$	$V_R=0V$ , $T_J=25^{\circ}C$ , $f=1MHz$	1560	-	pF
Reverse Recovery Charge	$Q_c$	$I_F = 10A$ , $di/dt = 200A/\mu s$ $V_R = 400V$ , $T_J = 25^{\circ}C$	97.8	-	nC
Capacitance Stored Energy	$E_c$	$V_R = 400V$ , $T_J = 25^{\circ}C$	25.1	-	$\mu$ J

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

### Thermal-Mechanical Specifications:

Characteristics	Symbol	S6D16065A	S6D16065F	S6D16065I	Units
Junction Temperature	$T_J$	-55 to +175			°C
Storage Temperature	$T_{stg}$	-55 to +175			°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	0.7	2	1.7	°C/W

### Ordering Information

Device	Package	Shipping
S6D16065A	TO-220AC(TO-220-2)	50pcs / tube
S6D16065F	TO-220MF-2L(TO-220-F2)	50pcs / tube
S6D16065I	TO-220-Isolation	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**

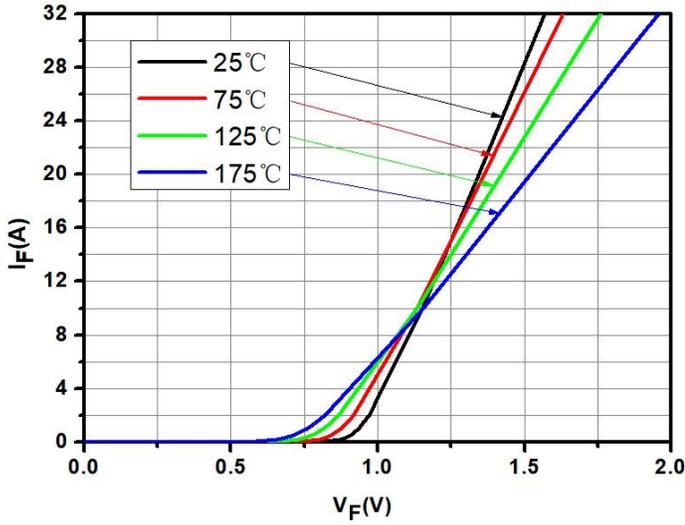


Fig.1-Typical Forward Voltage Characteristics

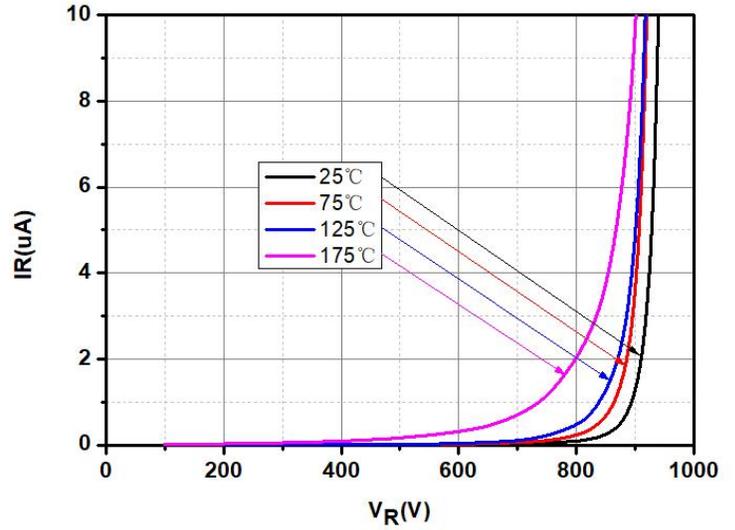


Fig.2-Typical Reverse Characteristics

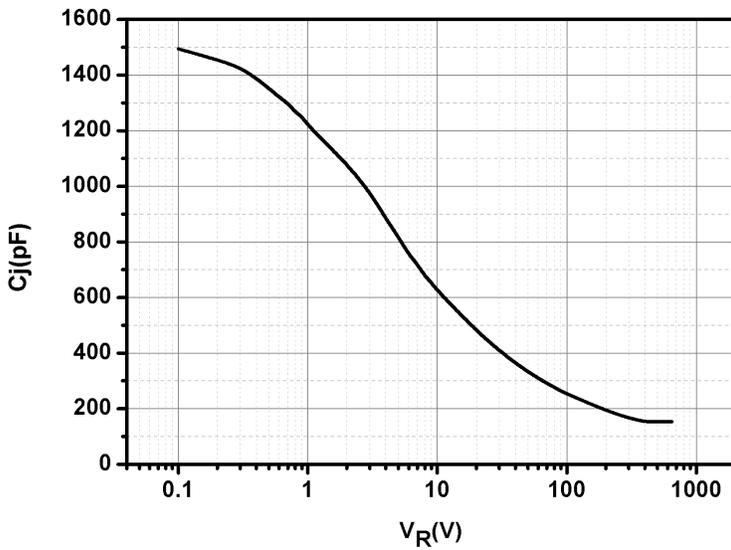


Fig.3-Capacitance vs. Reverse Voltage

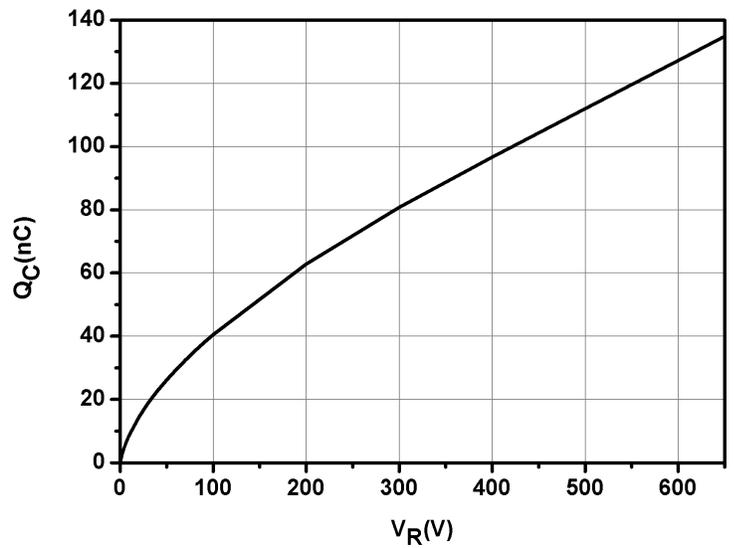


Fig.4-Total Capacitance Charge vs. Reverse Voltage

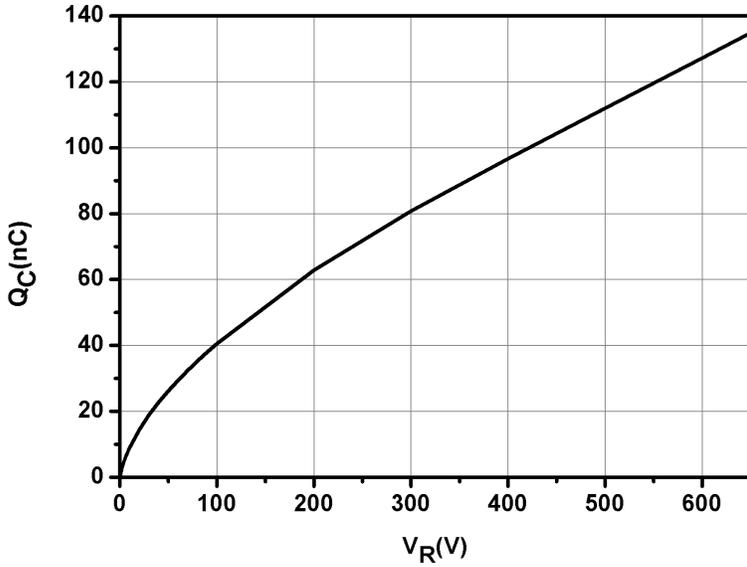


Fig.5-Capacitance Stored Energy

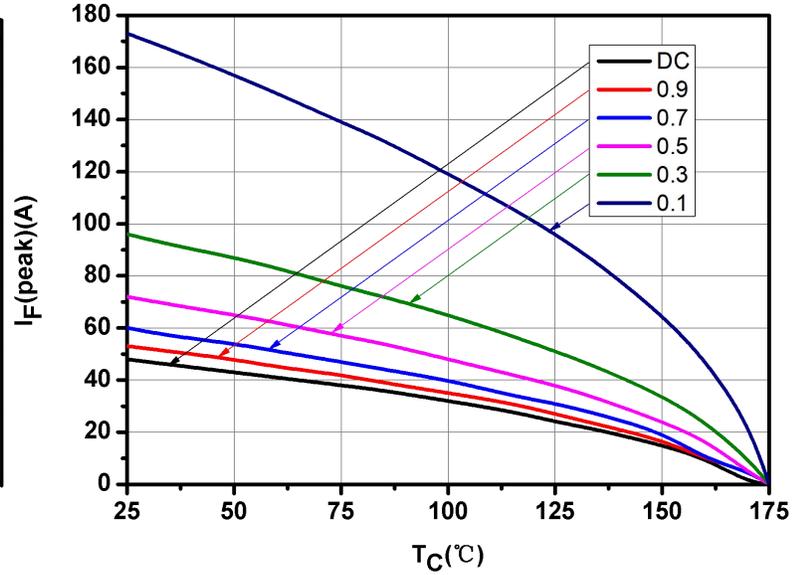


Fig.6-Current Derating

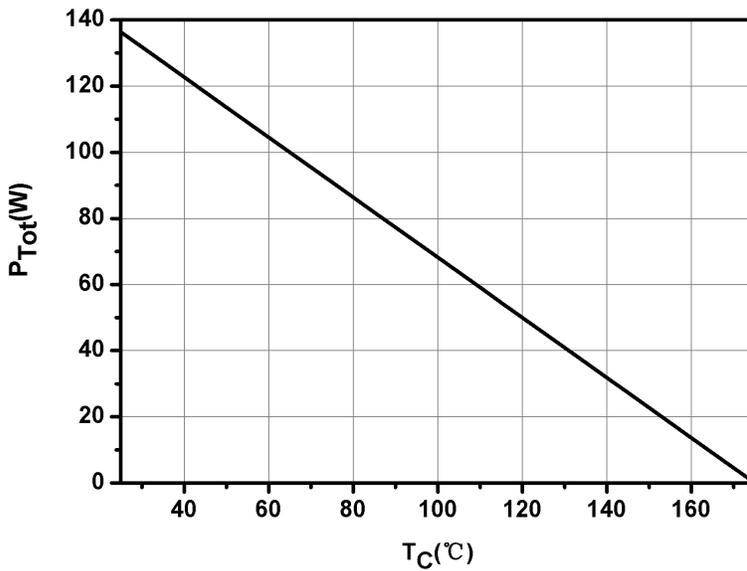
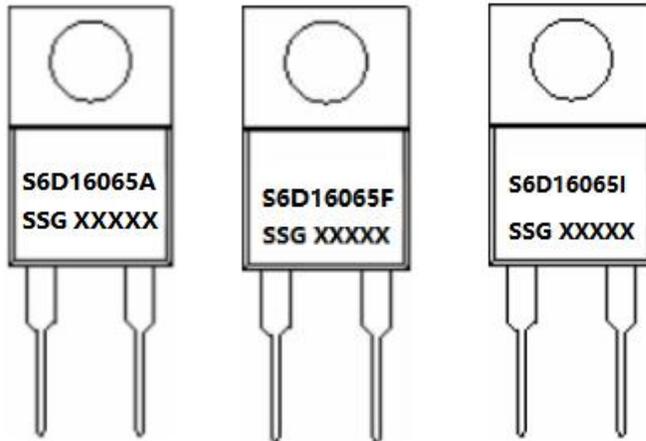


Fig.7-Power Derating

## Marking Diagram

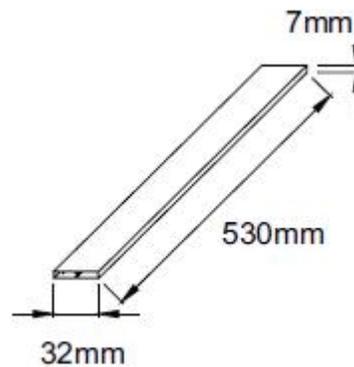


Where XXXXX is YYWWL

S6D = Device Type  
A/F/I = Package type  
16 = Forward Current (16A)  
065 = Reverse Voltage (650V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

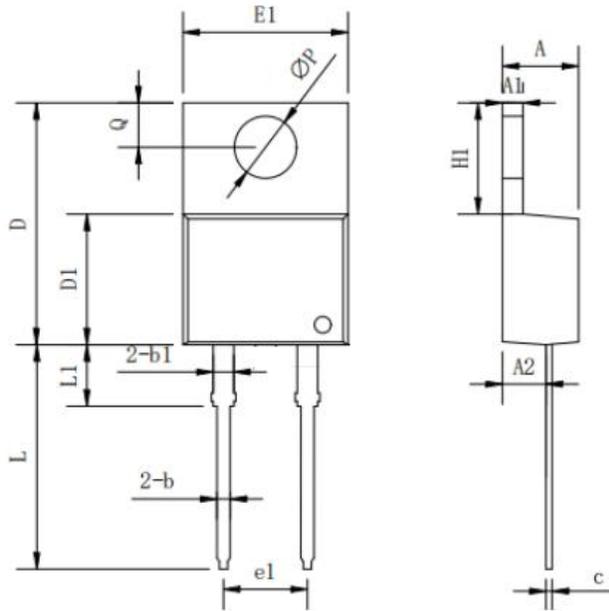
**Cautions:** Molding resin  
Epoxy resin UL:94V-0

## Tube Specification



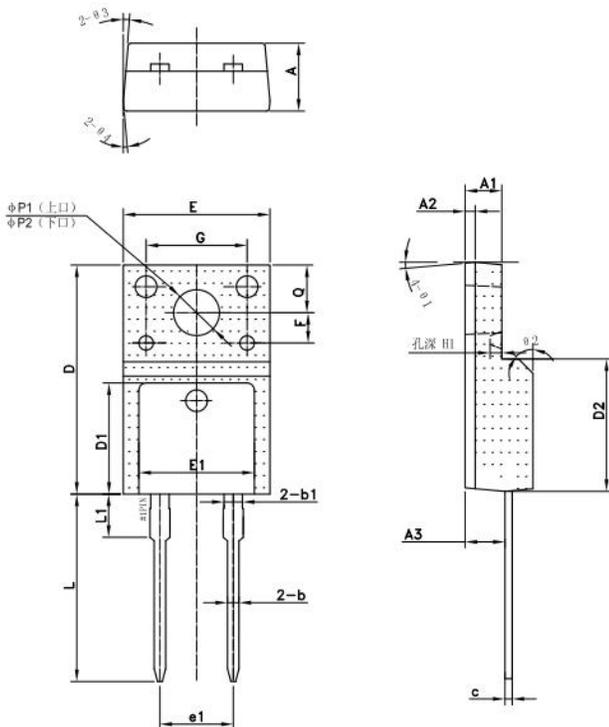
(TO-220-2/TO-220-F2/TO-220-Isolation)

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



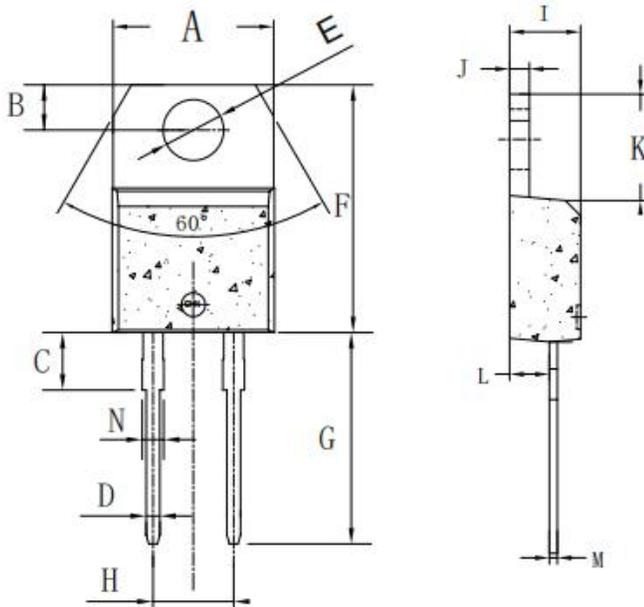
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E1	9.65	10.16	10.67
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
ΦP	-	3.56	-
Q	2.54	-	3.43

**Mechanical Dimensions TO-220MF(TO-220-2F)**



Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2		0.70	
A3	2.56	2.76	2.96
b	0.70	0.80	0.95
b1		1.28	
c	0.45	0.50	0.65
D	15.67	15.87	16.07
D1		7.70	
D2		9.12	
E	9.96	10.16	10.36
E1		8.00	
e1		5.08	
F		2.1	
G		7	
H1		0.81	
L	12.48	12.98	13.20
L1		2.93	
4>P1 (上口)	2.98	3.18	3.38
4>P2 (下口)	3.20	3.40	3.60
Q	3.10	3.30	3.50
e 1		5°	
02		45°	
03		5°	
e 4		5°	

**Mechanical Dimensions TO-220-Isolation**



Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	9.7	-	10.4
B	2.65	-	3.1
C	2.8	-	4.2
D	0.7	-	0.92
E	3.75	-	3.95
F	14.8	-	16.1
G	13.05	-	13.6
H	4.9	-	5.3
I	4.38	-	4.61
J	1.15	-	1.36
K	5.85	-	6.82
L	2.35	-	2.75
M	0.35	-	0.65
N	1.18	-	1.42



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