

## S5D05170H S5D05170A 1700V SiC POWER SCHOTTKY RECTIFIERS

### Description

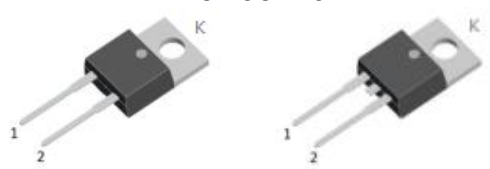

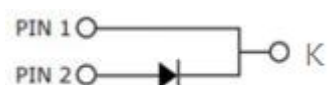
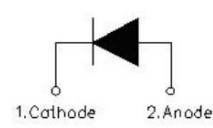
S5D05170H/S5D05170A are SiC Schottky rectifiers packaged in TO-247AC(TO-247-2) and TO-220AC(TO-220-2) case. The device is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S5D05170H/S5D05170A are ideal for 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>S5D05170A</p> 	<p>S5D05170H</p> 
<p>TO-220AC (TO-220-2)</p>	<p>TO-247AC (TO-247-2)</p>
	

### Maximum Ratings

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	-	1700	V
Average Rectified Forward Current	$I_{F(AV)1}$	$T_c=25^{\circ}\text{C}$	22	A
	$I_{F(AV)2}$	$T_c=161^{\circ}\text{C}$	5	A
Peak One Cycle Non-Repetitive Surge Current	$I_{FSM1}$	10ms, Half Sine pulse, $T_c=25^{\circ}\text{C}$	115	A
	$I_{FSM2}$	10ms, Half Sine pulse, $T_c=110^{\circ}\text{C}$	105	A
Repetitive Peak Forward Surge Current	$I_{FRM1}$	10 ms, Half Sine pulse, $T_c=25^{\circ}\text{C}$	69	A
	$I_{FRM2}$	10 ms, Half Sine pulse, $T_c=110^{\circ}\text{C}$	63	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10 $\mu\text{s}$ . Pulse, $T_c=25^{\circ}\text{C}$	200	A
	$I_{F,Max2}$	10 $\mu\text{s}$ . Pulse, $T_c=110^{\circ}\text{C}$	160	A
Power Dissipation	$P_{tot1}$	$T_c=25^{\circ}\text{C}$	166.7	W
	$P_{tot2}$	$T_c=110^{\circ}\text{C}$	72.2	W

### Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	$V_{F1}$	@ 5A, Pulse, $T_J = 25^{\circ}\text{C}$	1.5	1.8	V
	$V_{F2}$	@ 5A, Pulse, $T_J = 175^{\circ}\text{C}$	2.4	2.6	V
Reverse Current*	$I_{R1}$	@ $V_R = \text{rated } V_R, T_J = 25^{\circ}\text{C}$	1	10	$\mu\text{A}$
	$I_{R2}$	@ $V_R = \text{rated } V_R, T_J = 175^{\circ}\text{C}$	10	100	$\mu\text{A}$
Junction Capacitance	$C_{T1}$	$V_R=0\text{V}, f=1\text{MHz}, T_J=25^{\circ}\text{C},$	497	-	pF
	$C_{T2}$	$V_R=1700\text{V}, f=1\text{MHz}, T_J=25^{\circ}\text{C},$	21	-	pF
Reverse Recovery Charge	$Q_c$	$I_F = 5\text{A}, di/dt = 200\text{A}/\mu\text{s}$ $V_R = 1700\text{V}, T_J = 25^{\circ}\text{C}$	61.57	-	nC
Capacitance Stored Energy	$E_C$	$V_R = 1700\text{V}, T_J = 25^{\circ}\text{C}$	66.93	-	$\mu\text{J}$

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

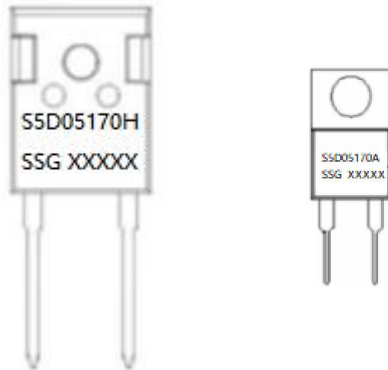
### Thermal-Mechanical Specifications:

Characteristics	Symbol	S5D05170H	S5D05170A	Units
Junction Temperature	$T_J$	--55 to +175		°C
Storage Temperature	$T_{stg}$	--55 to +175		°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	0.8	0.9	°C/W

### Ordering Information

Device	Package	Shipping
S5D05170H	TO-247AC(TO-247-2)	25pcs / tube
S5D05170A	TO-220AC(TO-220-2)	50pcs / tube

### Marking Diagram

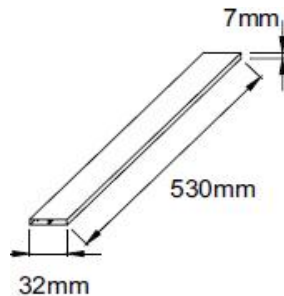


Where XXXXX is YYWWL

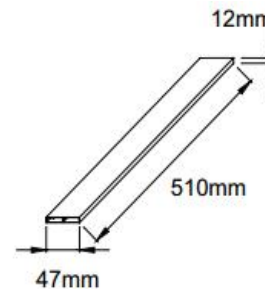
S5D = Device Type  
H/A = Package type  
05 = Forward Current (5A)  
170 = Reverse Voltage (1700V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

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

### Tube Specification



TO-220AC(TO-220-2)



TO-247AC(TO-247-2)

**Ratings and Characteristics Curves**

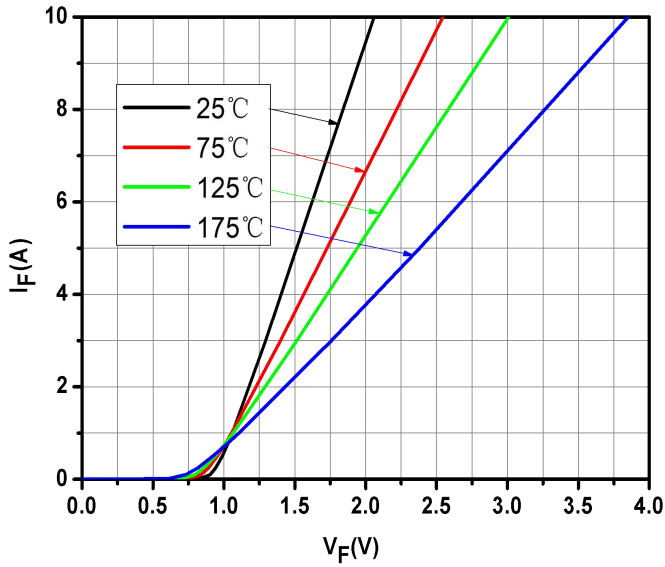


Fig.1-Typical Forward Voltage Characteristics

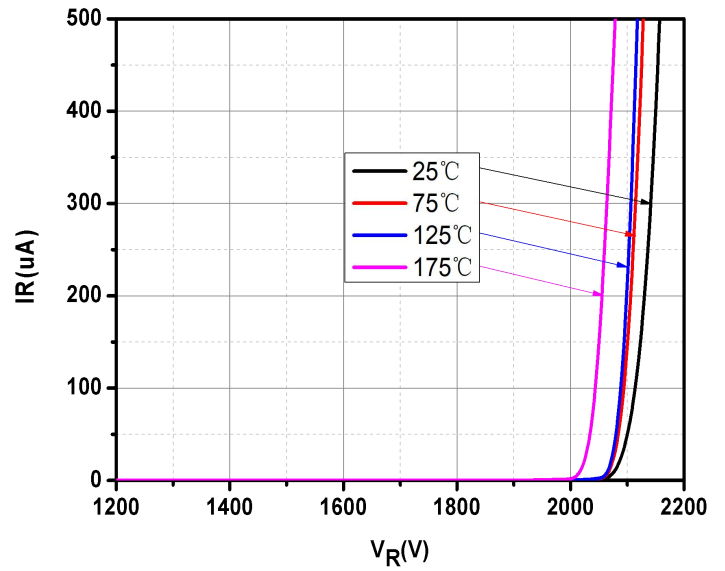


Fig.2-Typical Reverse Characteristics

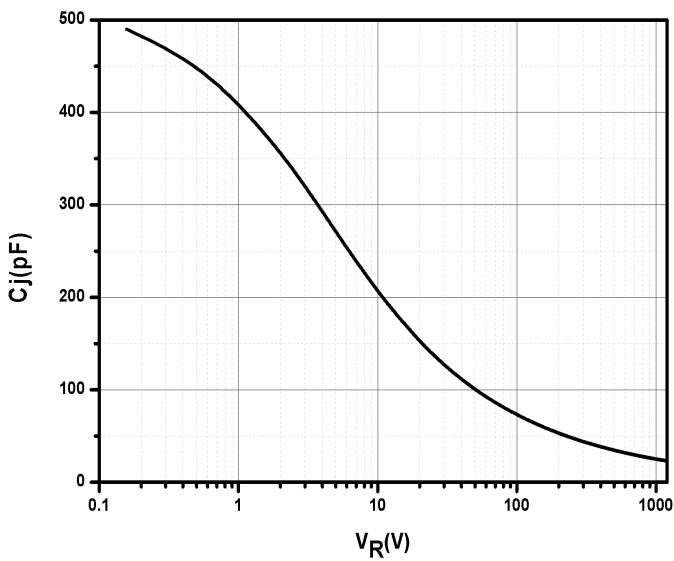


Fig.3-Capacitance vs. Reverse Voltage

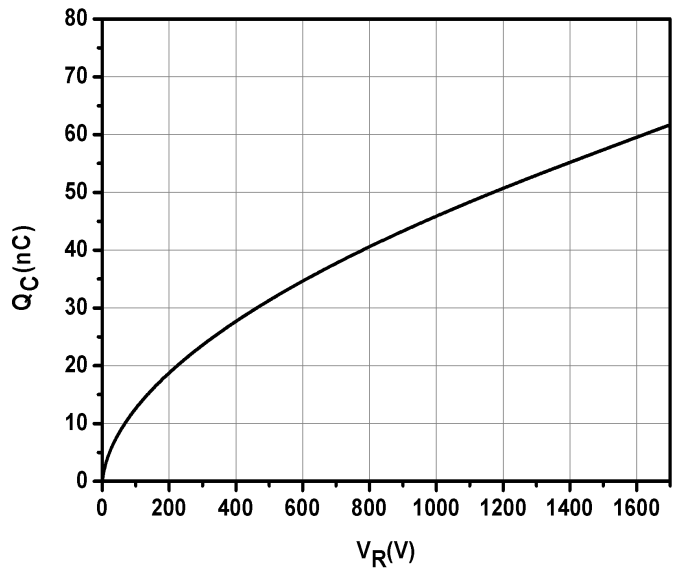


Fig.4-Total Capacitance Charge vs. Reverse Voltage

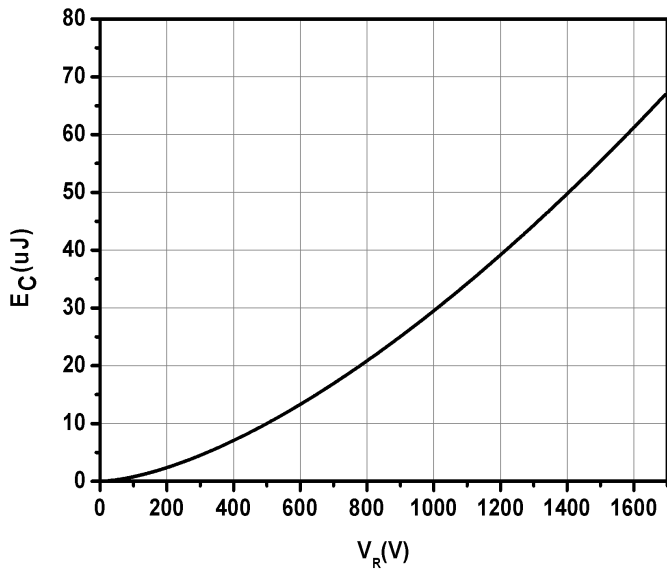


Fig.5-Capacitance Stored Energy

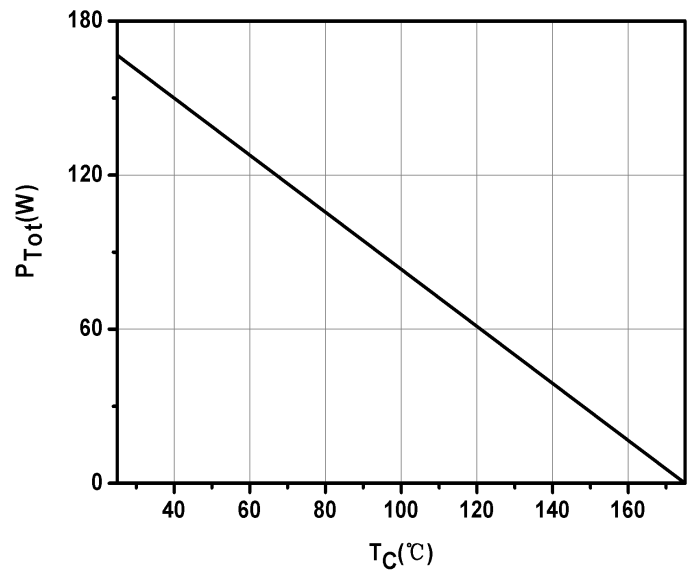


Fig.7-Power Derating

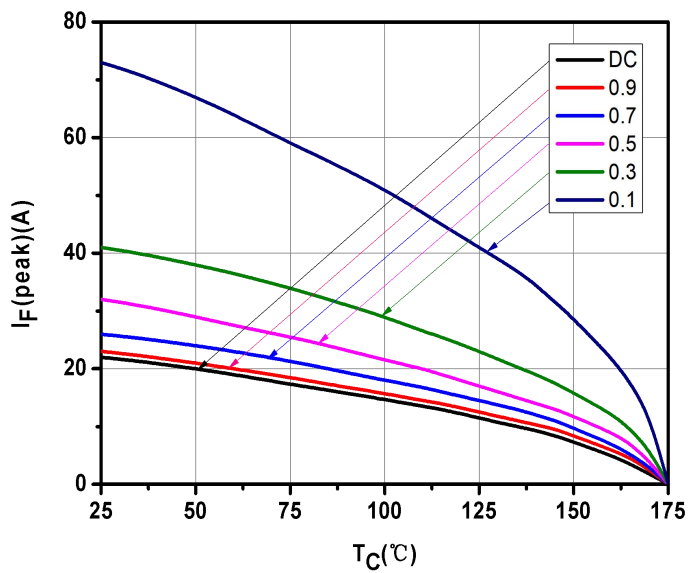
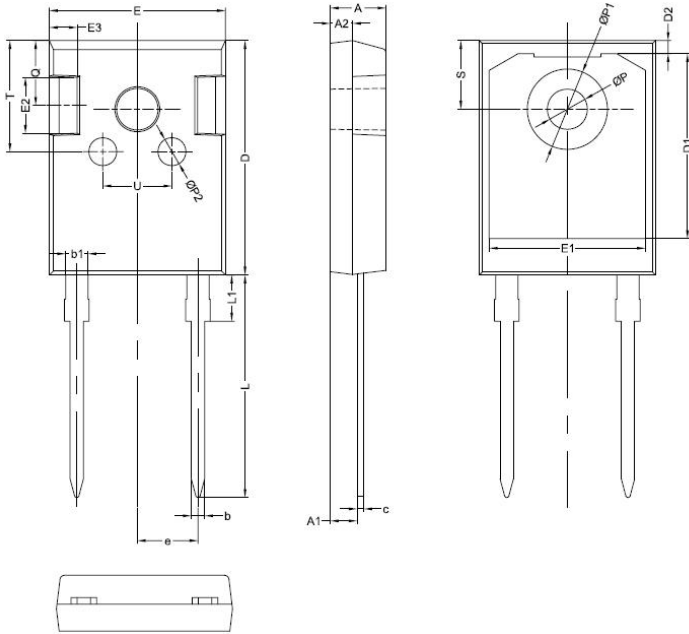


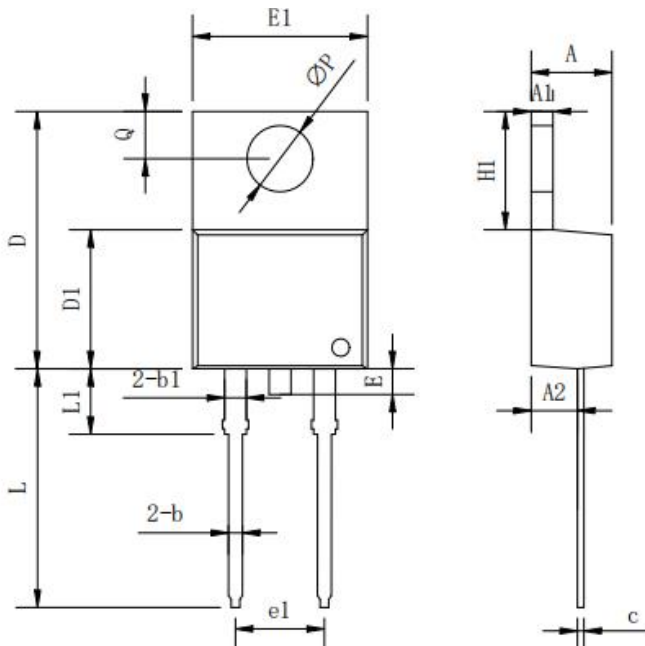
Fig.8-Current Derating

**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-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
E	-	-	1.78
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	-



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S5D05170H  
S5D05170A

Technical Data  
Data Sheet N2462, REV.-

