

## S4D15120A S4D15120F S4D15120H 1200V SIC POWER SCHOTTKY RECTIFIERS

### Description



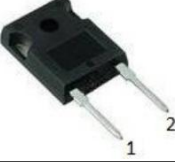

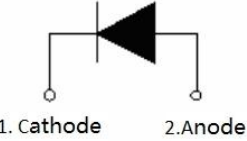
This 1200V 15A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S4D15120A/S4D15120F/S4D15120H are ideal for energy sensitive, high frequency applications in challenging environments.

### 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
- “-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

<p>S4D15120A</p> 	<p>S4D15120F</p> 	<p>S4D15120H</p> 
<p>TO-220AC (TO-220-2)</p>	<p>TO-220MF (TO-220-MF-2L)</p>	<p>TO-247AC (TO-247-2)</p>
	 <p>1. Cathode      2. Anode</p>	

## Maximum Ratings

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	-	1200	V
Average Rectified Forward Current	$I_F (AV)1$	$T_c = 25^\circ\text{C}$	46 (per leg)	A
			92 (per device)	A
	$I_F (AV)2$	$T_c = 148^\circ\text{C}$	15 (per leg)	A
			30 (per device)	A
Peak One Cycle Non-Repetitive Surge Current	$I_{FSM}$	10ms, Half Sine pulse, $T_c = 25^\circ\text{C}$	130	A
Repetitive Peak Forward Surge Current	$I_{FRM}$	10ms, Half Sine pulse, $T_c = 25^\circ\text{C}$	68	A
Power Dissipation	$P_{tot1}$	$T_c = 25^\circ\text{C}$	178.6	W
	$P_{tot2}$	$T_c = 110^\circ\text{C}$	77.4	W

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

## Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop *	$V_{F1}$	@ 15A, Pulse, $T_J = 25^\circ\text{C}$	1.5	1.8	V
	$V_{F2}$	@ 15A, Pulse, $T_J = 175^\circ\text{C}$	2.2	3.0	V
Reverse Current *	$I_{R1}$	@ $V_R = \text{rated } V_R$ $T_J = 25^\circ\text{C}$	3	40	$\mu\text{A}$
	$I_{R2}$	@ $V_R = \text{rated } V_R$ $T_J = 175^\circ\text{C}$	10	50	$\mu\text{A}$
Junction Capacitance	$C_T$	$V_R = 0\text{V}$ , $T_J = 25^\circ\text{C}$ , $f = 1\text{MHz}$	990	-	pF
Reverse Recovery Charge	$Q_c$	$I_F = 15\text{A}$ , $di/dt = 200\text{A}/\mu\text{s}$ $V_R = 800\text{V}$ , $T_J = 25^\circ\text{C}$	76.32	-	nC
Capacitance Stored Energy	$E_C$	$V_R = 800\text{V}$ , $T_J = 25^\circ\text{C}$	39.24	-	$\mu\text{J}$

### Thermal-Mechanical Specifications:

Characteristics	Symbol	S4D15120A	S4D15120F	S4D15120H	Units
Junction Temperature	$T_J$	-55 to +175			°C
Storage Temperature	$T_{stg}$	-55 to +175			°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	1.7	3.8	0.61	°C/W

### Ordering Information

Device	Package	Shipping
S4D15120A	TO-220AC(TO-220-2)	50pcs / tube
S4D15120F	TO-220MF(TO-220MF-2L)	50pcs / tube
S4D15120H	TO-247AC(TO-247-2)	25pcs / tube

## Ratings and Characteristics Curves

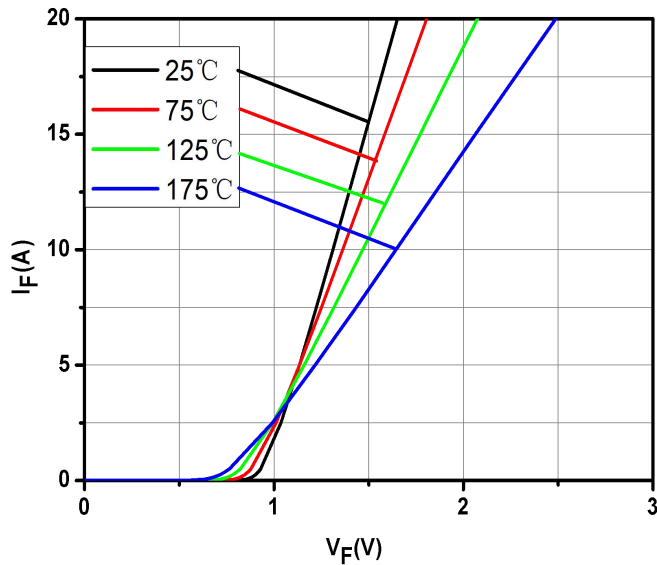


Fig.1-Typical Forward Voltage Characteristics

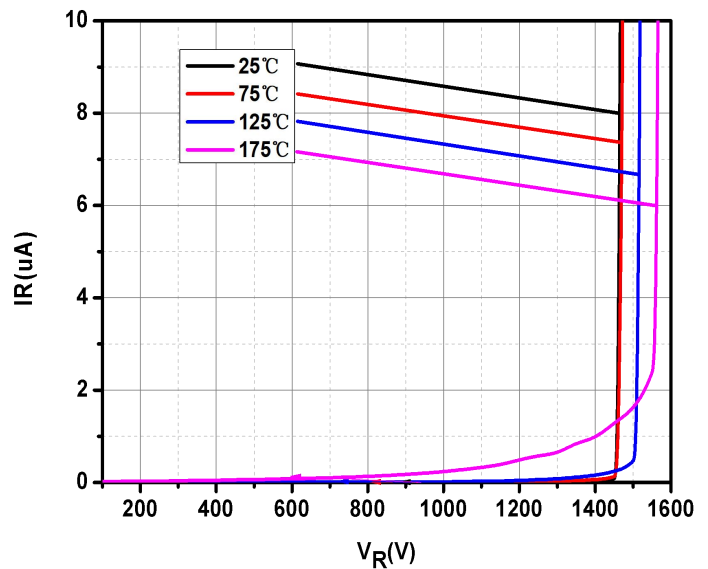


Fig.2-Typical Reverse Characteristics

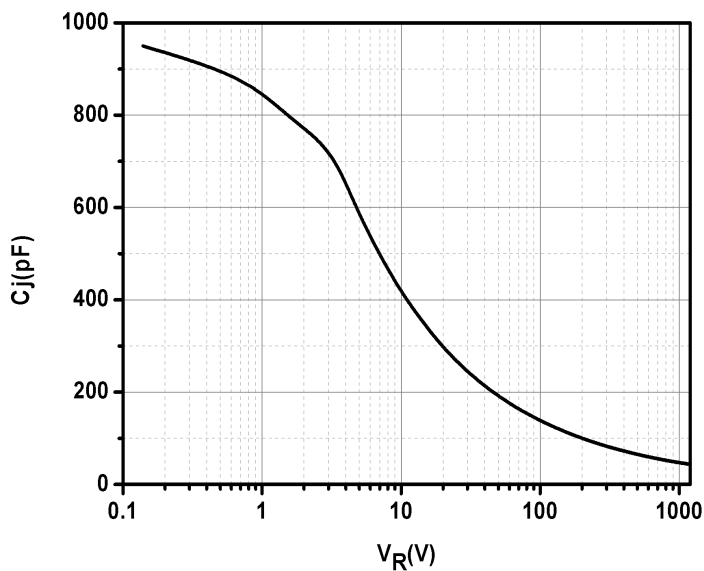


Fig.3-Capacitance vs. Reverse Voltage

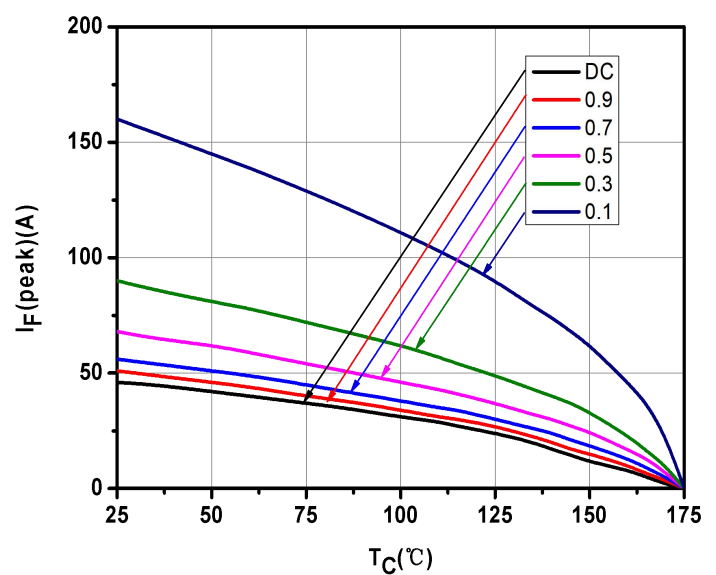


Fig.4-Current Derating

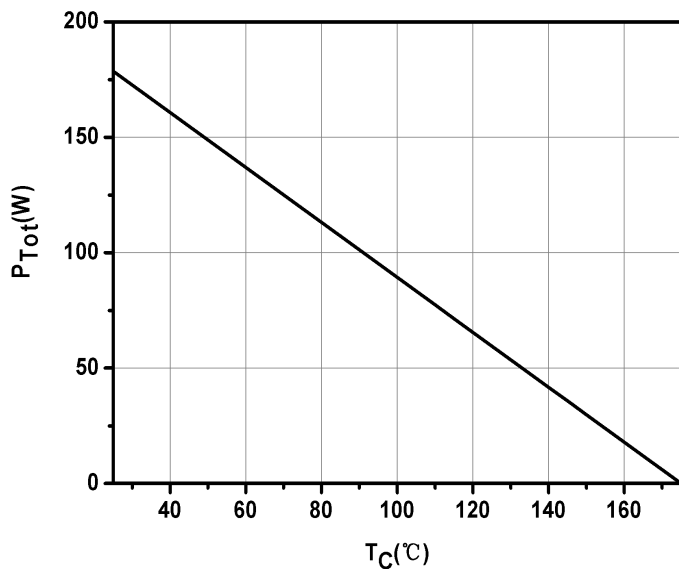


Fig.5-Power Derating

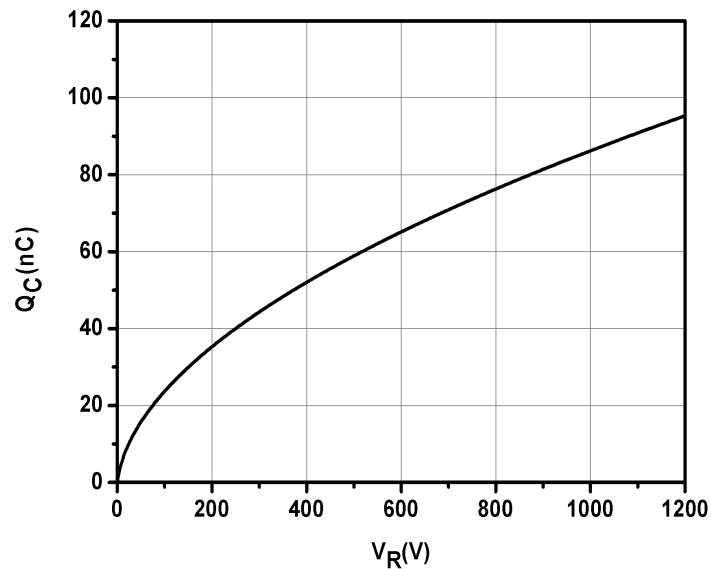


Fig.6-Total Capacitance Charge vs. Reverse Voltage

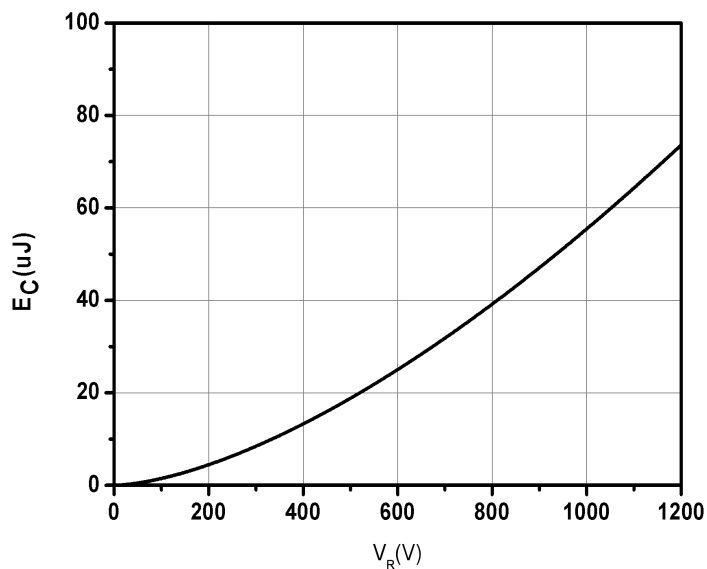
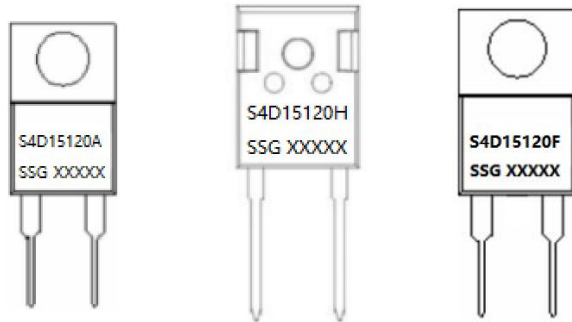


Fig.7-Capacitance Stored Energy

## Marking Diagram

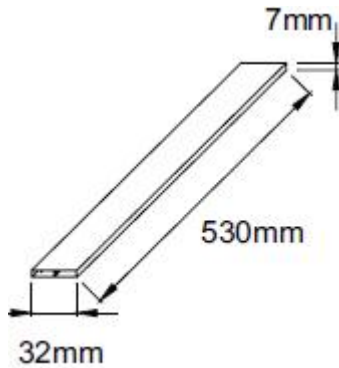


Where XXXXX is YYWWL

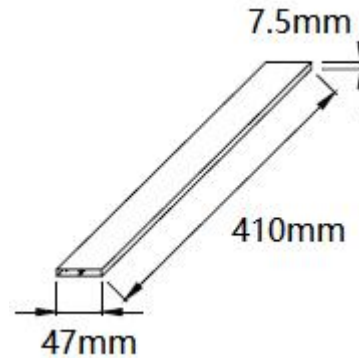
S4D = Device Type  
A/H/F = Package type  
15 = Forward Current (15A)  
120 = Reverse Voltage (1200V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

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

## Tube Specification

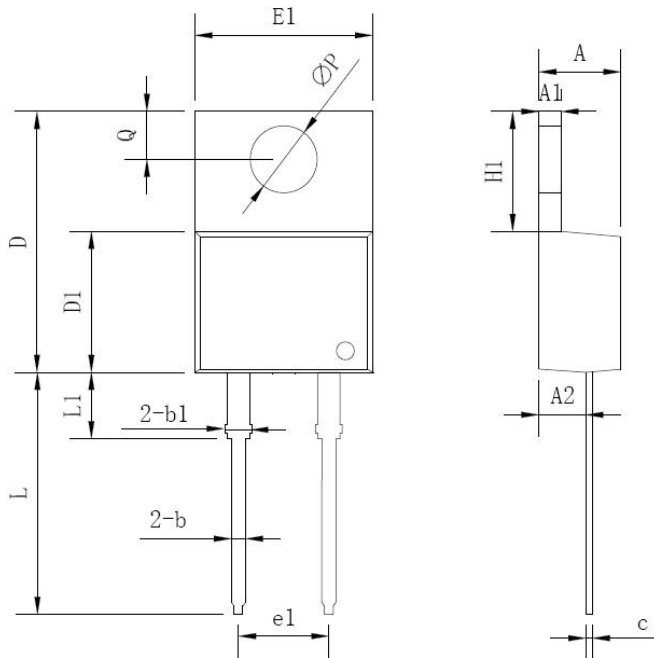


TO-220AC(TO-220-2)  
TO-220MF(TO-220MF-2L)



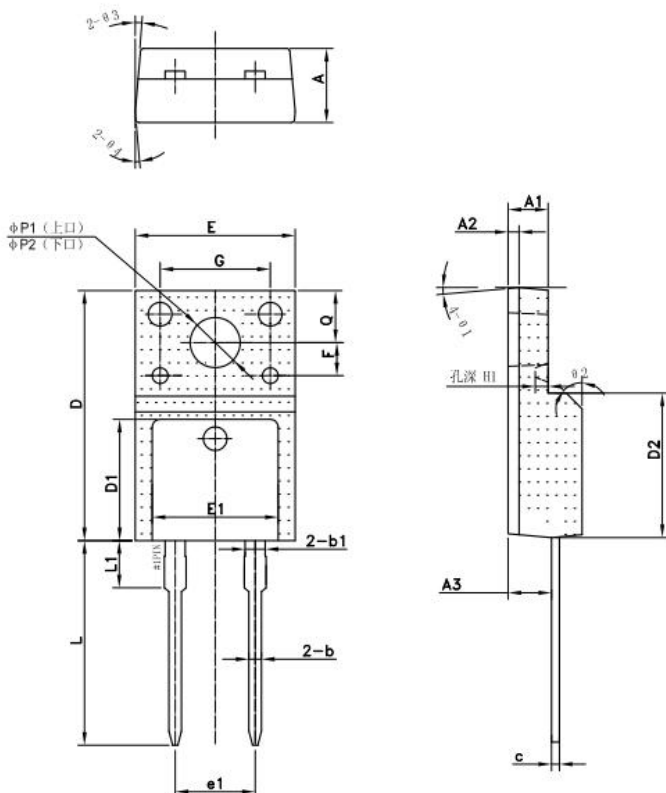
TO-247AC(TO-247-2)

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



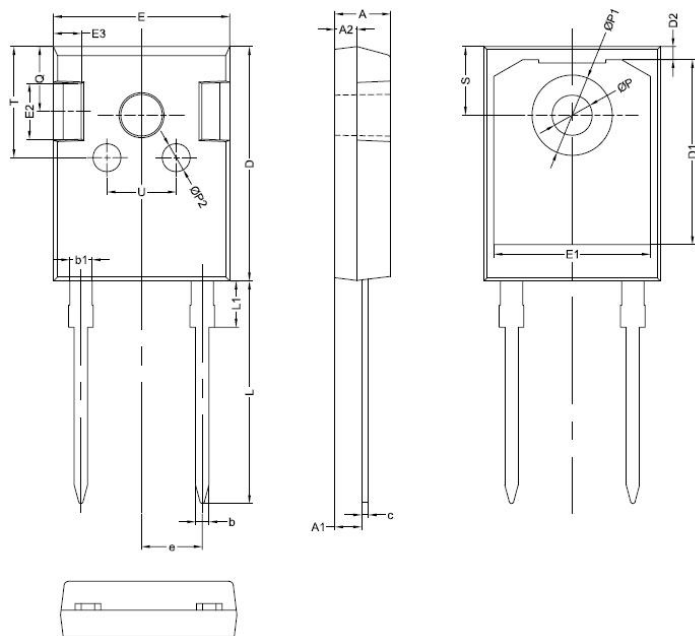
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E1	9.65	10.16	10.67
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
ΦP	-	3.56	-
Q	2.54	-	3.43

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



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-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	



**Technical Data**  
**Data Sheet N2378, REV. D**



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