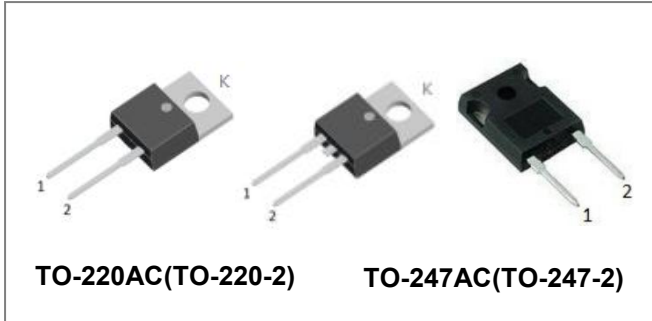


## S4D15120A S4D15120H 1200V SiC POWER SCHOTTKY RECTIFIERS



### Description

S4D15120A/S4D15120H are SiC Schottky rectifiers packaged in TO-220AC(TO-220-2)/TO-247AC(TO-247-2) case. The devices are high voltage Schottky rectifiers that have very low total conduction losses and very stable switching characteristics over temperature extremes. The S4D15120A/S4D15120H 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
- “-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

### Maximum Ratings

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	-	1200	V
Working Peak Reverse Voltage	V <sub>RWM</sub>			
DC Blocking Voltage	V <sub>R</sub>			
Average Rectified Forward Current	I <sub>F(AV)1</sub>	T <sub>c</sub> = 25°C	46 (per leg)	A
	I <sub>F(AV)2</sub>	T <sub>c</sub> = 148°C	92 (per device)	A
15 (per leg)			A	
			30 (per device)	
Peak One Cycle Non-Repetitive Surge Current	I <sub>FSM</sub>	10ms, Half Sine pulse, T <sub>c</sub> = 25 °C	130	A
Repetitive Peak Forward Surge Current	I <sub>FRM</sub>	10ms, Half Sine pulse, T <sub>c</sub> = 25 °C	68	A
Power Dissipation	P <sub>tot1</sub>	T <sub>c</sub> = 25°C	178.6	W
	P <sub>tot2</sub>	T <sub>c</sub> = 110°C	77.4	W

### Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop *	V <sub>F1</sub>	@ 15A, Pulse, T <sub>J</sub> = 25 °C	1.5	1.8	V
	V <sub>F2</sub>	@ 15A, Pulse, T <sub>J</sub> = 175 °C	2.2	3.0	V
Reverse Current *	I <sub>R1</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 25 °C	3	40	uA
	I <sub>R2</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 175 °C	10	50	uA
Junction Capacitance	C <sub>T</sub>	V <sub>R</sub> =0V, T <sub>J</sub> =25°C, f=1MHz	990	-	pF
Reverse Recovery Charge	Q <sub>c</sub>	I <sub>F</sub> = 15A, di/dt = 200A/μs V <sub>R</sub> = 800 V, T <sub>J</sub> =25°C	76.32	-	nC
Capacitance Stored Energy	E <sub>c</sub>	V <sub>R</sub> = 800 V, T <sub>J</sub> =25°C	39.24	-	μJ

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

### Thermal-Mechanical Specifications:

Characteristics	Symbol	S4D15120A	S4D15120H	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>	1.7	0.61	°C/W

### Ordering Information

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

**Ratings and Characteristics Curves**

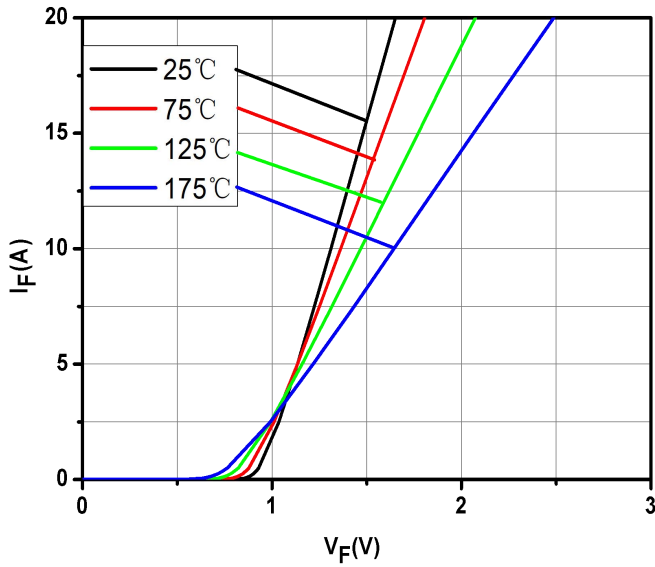


Fig.1-Typical Forward Voltage Characteristics

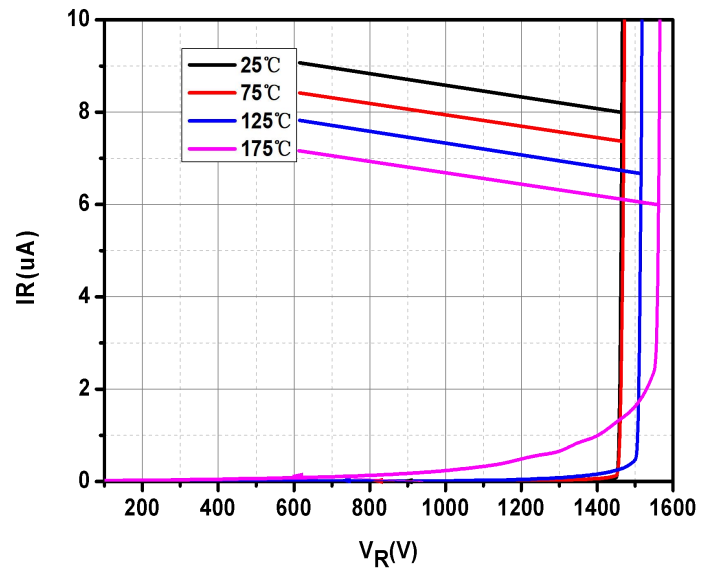


Fig.2-Typical Reverse Characteristics

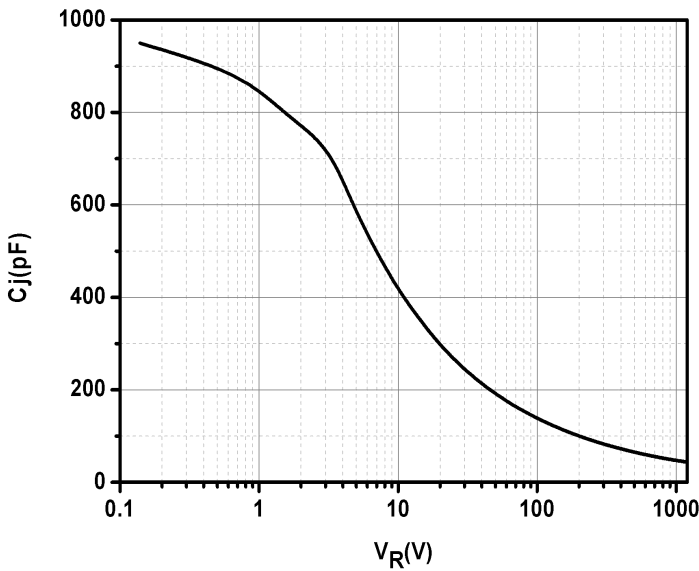


Fig.3-Capacitance vs. Reverse Voltage

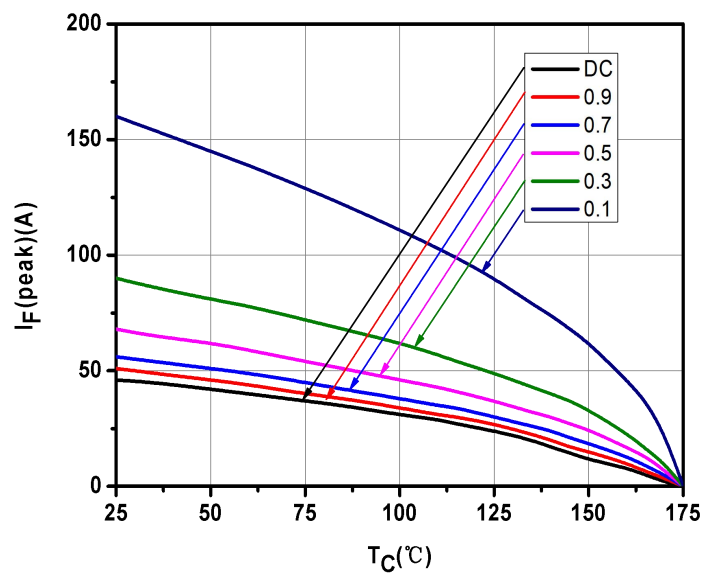


Fig.4-Current Derating

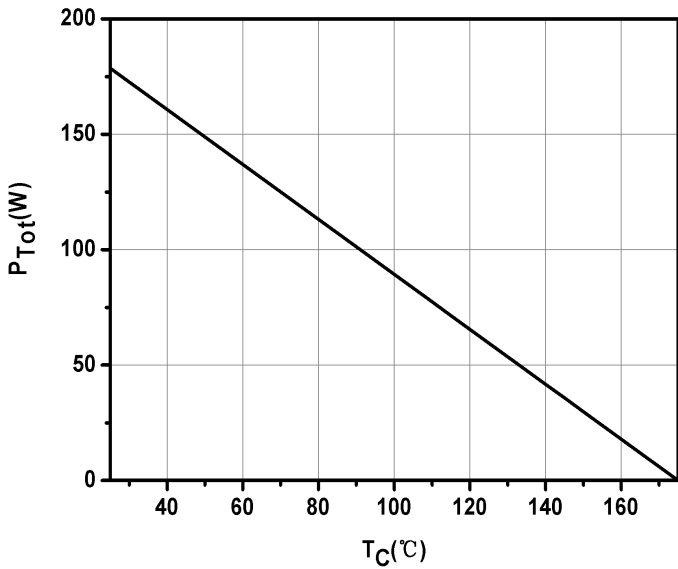


Fig.5-Power Derating

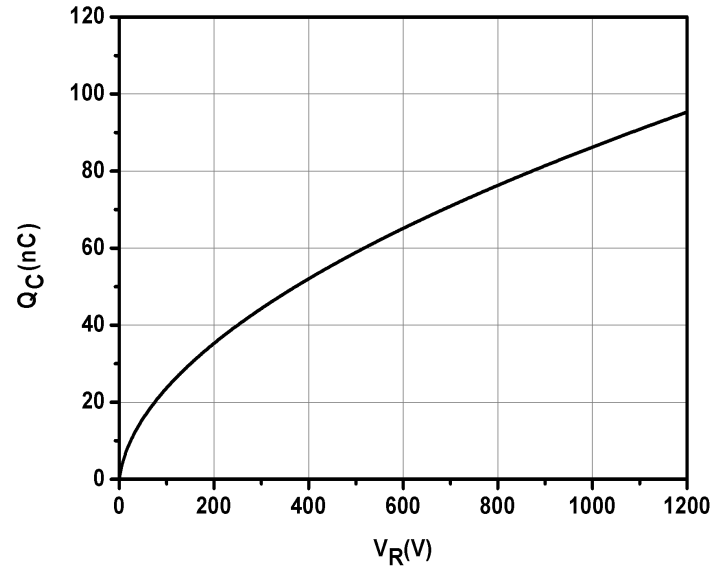


Fig.6-Total Capacitance Charge vs. Reverse Voltage

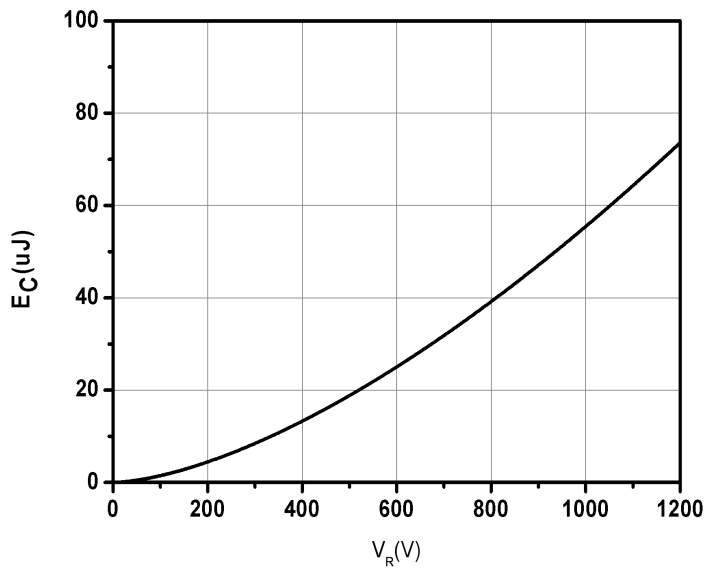
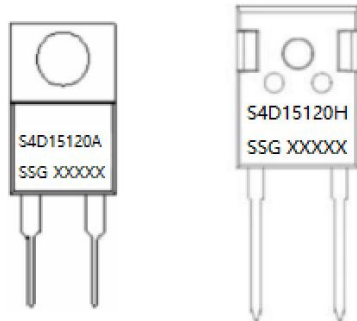


Fig.7-Capacitance Stored Energy

## Marking Diagram

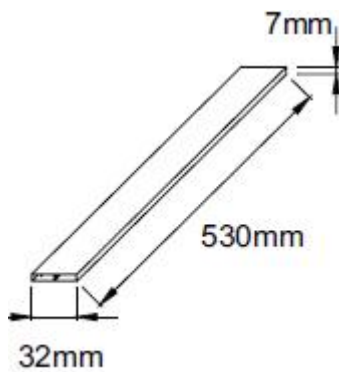


Where XXXXX is YYWWL

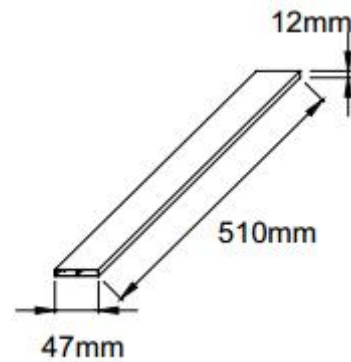
S4D = Device Type  
A/H = Package type  
15 = Forward Current (15A)  
120 = Reverse Voltage (1200V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

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

## Tube Specification

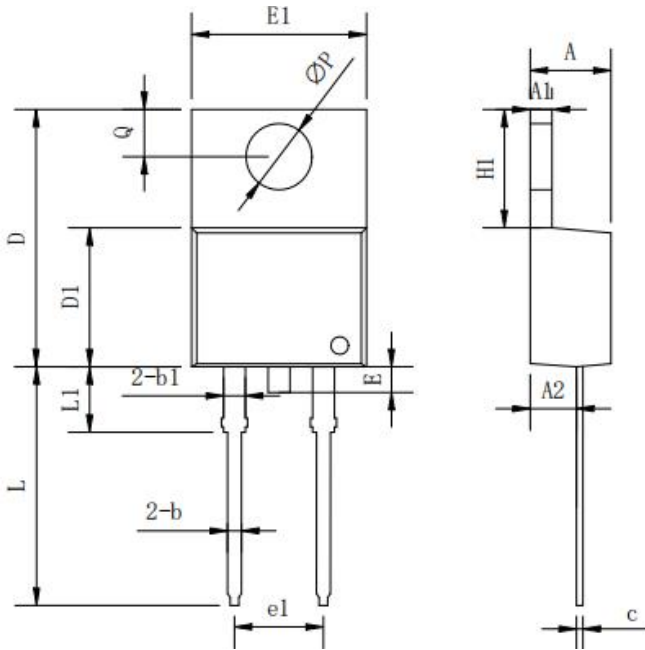


TO-220AC(TO-220-2)



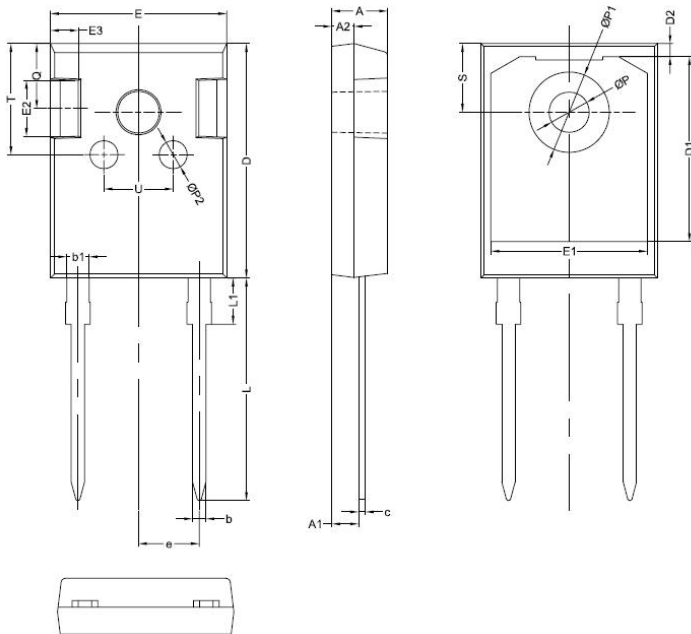
TO-247AC(TO-247-2)

**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
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	-

**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	



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