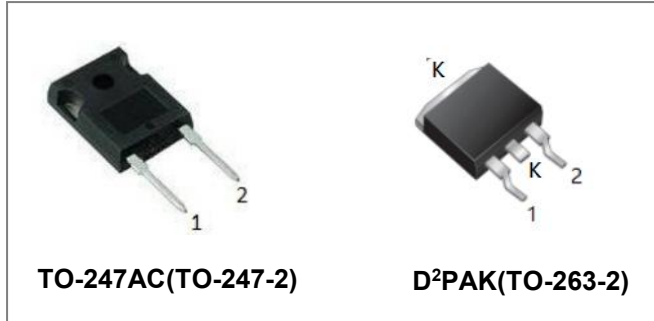


## S4D30120H S4D30120G 1200V SIC POWER SCHOTTKY RECTIFIERS



### Description

This 1200V 30A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S4D30120H/S4D30120G is ideal for energy sensitive, high frequency applications in challenging environments.

### Circuit Diagram



TO-247AC(TO-247-2)

D²PAK(TO-263-2)

### 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
- 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	94	A
	I <sub>F(AV)2</sub>	T <sub>C</sub> = 155°C	30	A
Peak One Cycle Non-Repetitive Surge Current	I <sub>FSM1</sub>	10ms, Half Sine pulse, T <sub>C</sub> = 25°C	300	A
	I <sub>FSM2</sub>	10ms, Half Sine pulse, T <sub>C</sub> = 110°C	246	A
Repetitive Peak Forward Surge Current	I <sub>FRM1</sub>	10ms, Half Sine pulse, T <sub>C</sub> = 25°C	121	A
	I <sub>FRM2</sub>	10ms, Half Sine pulse, T <sub>C</sub> = 110°C	68	A
Power Dissipation	P <sub>tot1</sub>	T <sub>C</sub> = 25°C	441	W
	P <sub>tot1</sub>	T <sub>C</sub> = 110°C	191	W
I <sup>2</sup> t Value	∫i <sup>2</sup> t1	10ms, T <sub>C</sub> = 25°C	271	A <sup>2</sup> s
	∫i <sup>2</sup> t2	10ms, T <sub>C</sub> = 25°C	218	A <sup>2</sup> s

### Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V <sub>F1</sub>	@ 30A, Pulse, T <sub>J</sub> = 25 °C	1.5	1.8	V
	V <sub>F2</sub>	@ 30A, 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	1	20	uA
	I <sub>R2</sub>	@V <sub>R</sub> = rated V <sub>R</sub> , T <sub>J</sub> = 175 °C	5	200	uA
Junction Capacitance	C <sub>T</sub>	V <sub>R</sub> =1V, f=1MHz, T <sub>J</sub> =25°C,	2581	-	pF
Reverse Recovery Charge	Q <sub>c</sub>	V <sub>R</sub> = 800 V, T <sub>J</sub> = 25°C	152	-	nC
Capacitance Stored Energy	E <sub>c</sub>	V <sub>R</sub> = 800 V, T <sub>J</sub> = 25°C	44	-	μJ

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

### Thermal-Mechanical Specifications:

Characteristics	Symbol	Condition	S4D30120H	S4D30120G	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>	DC operation, T <sub>J</sub> =25°C	0.34	0.34	°C/W

### Electrostatic Discharge (ESD) Classifications:

Parameter	Symbol	Value
Human Body Model	HBM	Class 3B (≥ 8000 V)
Charge Device Model	CDM	Class C3 (≥ 1000 V)

### Ordering Information

Device	Package	Shipping
S4D30120H	TO-247AC(TO-247-2)	25pcs / tube
S4D30120G	D2PAK (TO-263-2)	800pcs / Reel

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**

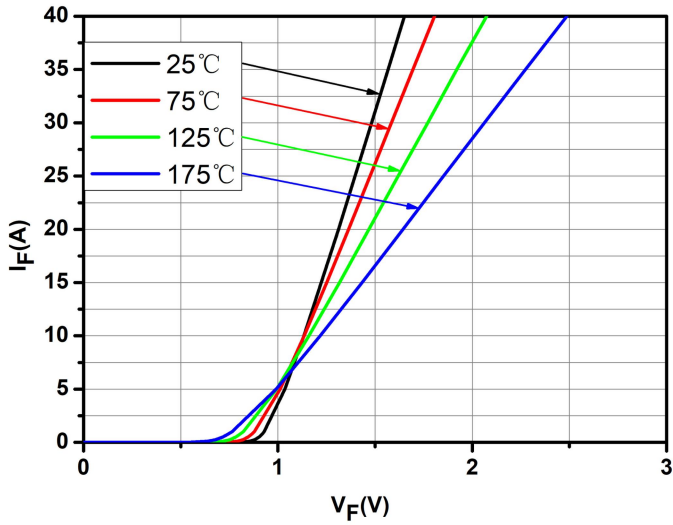


Fig.1-Typical Forward Voltage Characteristics

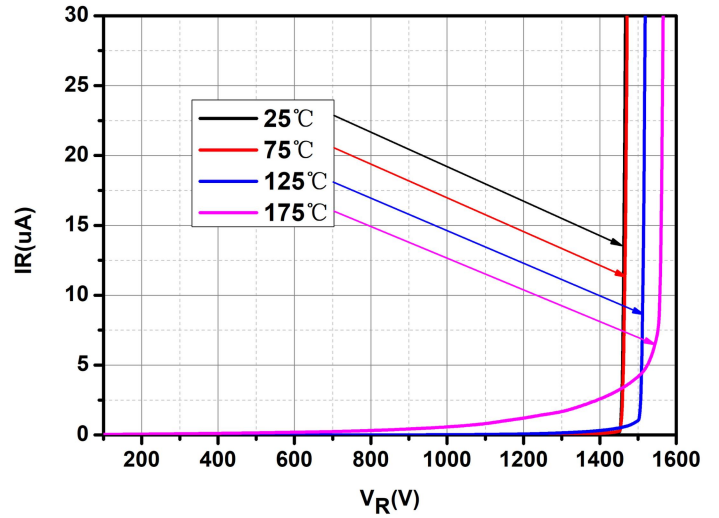


Fig.2-Typical Reverse Characteristics

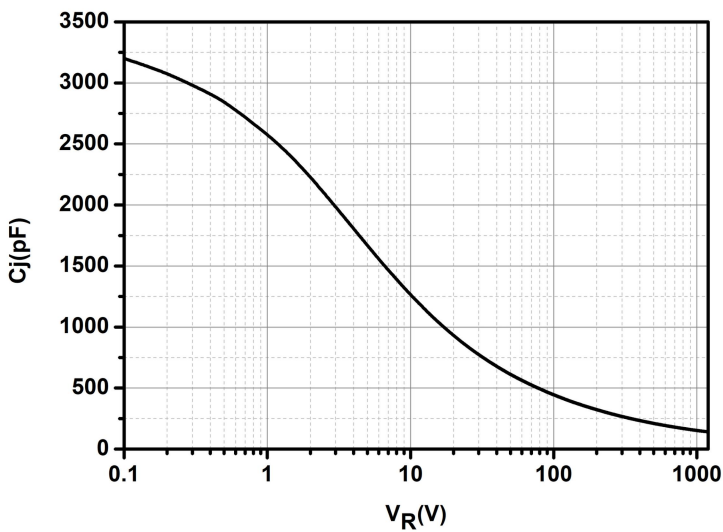


Fig.3-Capacitance vs. Reverse Voltage

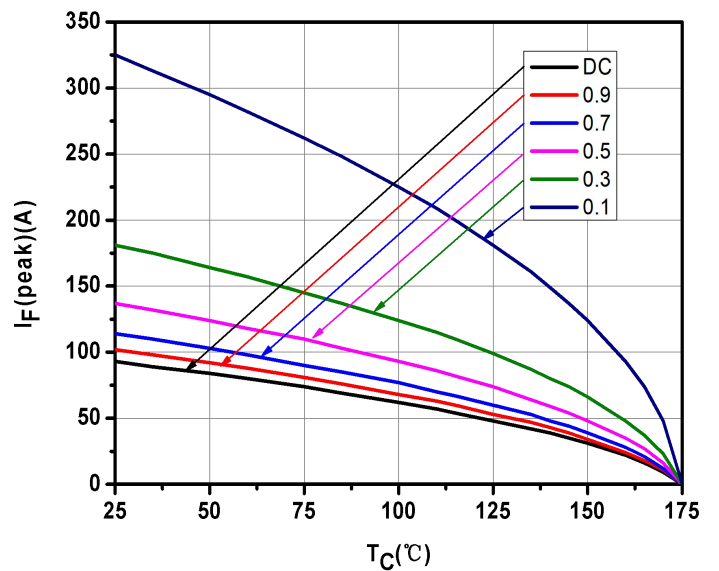


Fig.4-Current Derating

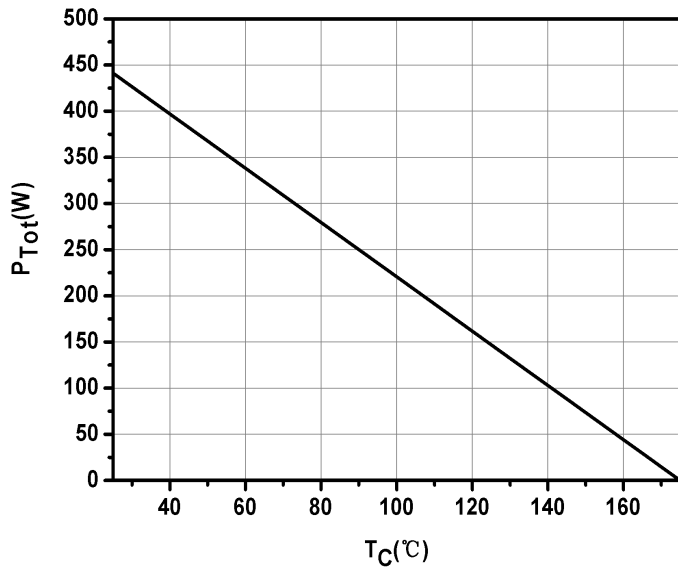


Fig.5-Power Derating

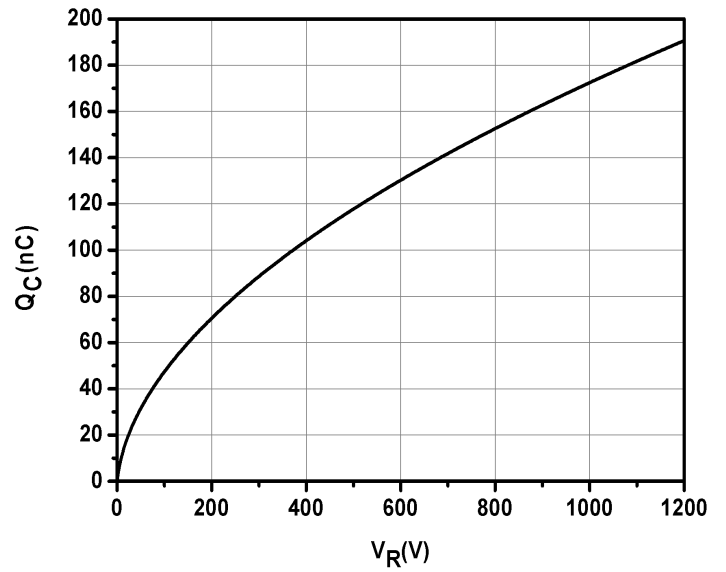


Fig.6-Total Capacitance Charge vs. Reverse Voltage

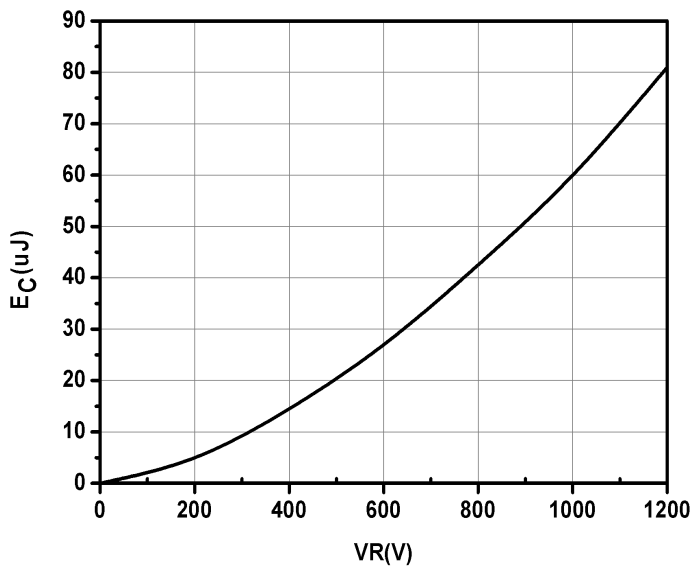
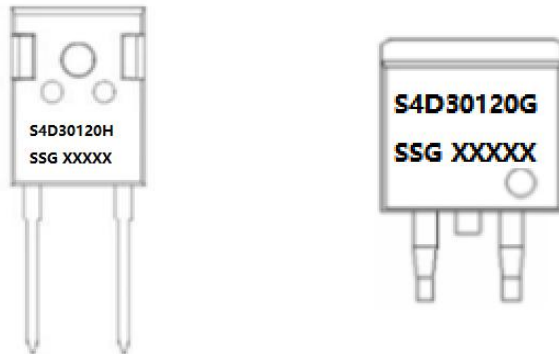


Fig.7-Capacitance Stored Energy

**Marking Diagram**

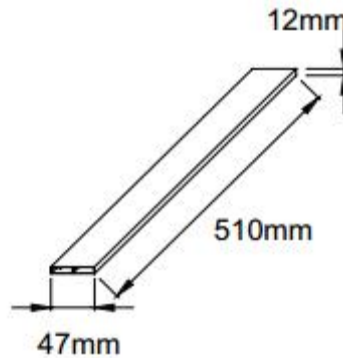


Where XXXXX is YYWWL

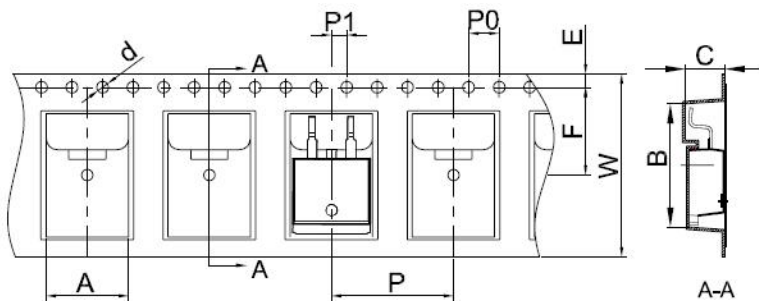
S4D = Device Type  
H/G = Package type  
30 = Forward Current (30A)  
120 = Reverse Voltage (1200V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

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

**Tube Specification TO-247AC(TO-247-2)**

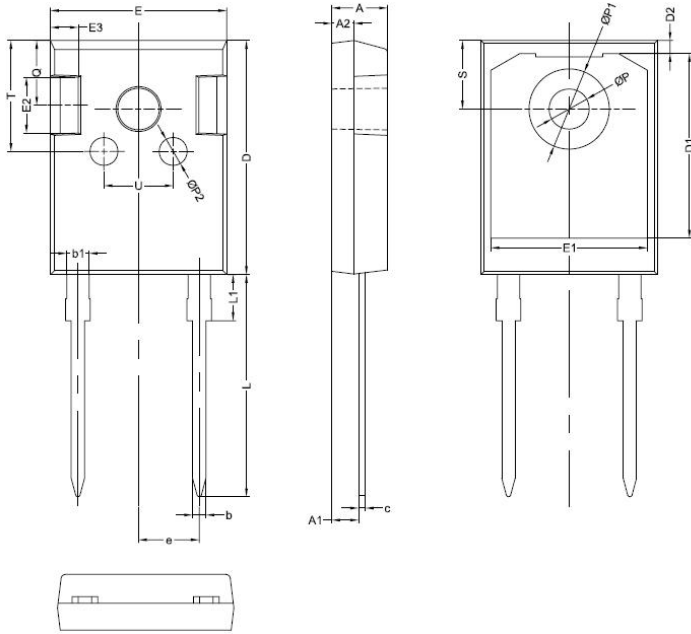


**Carrier Tape & Reel Specification D2PAK(TO-263-2)**



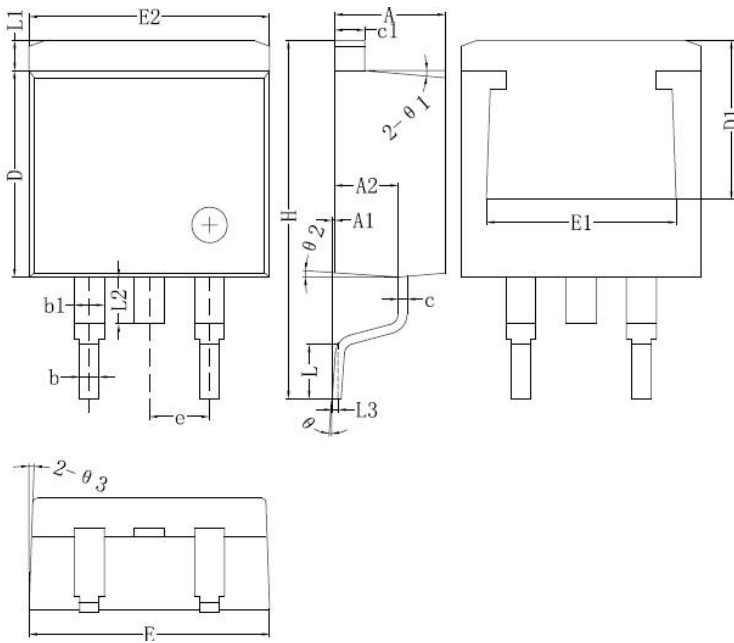
SYMBOL	Millimeters	
	Min.	Max.
A	10.70	10.90
B	16.03	16.23
C	5.11	5.31
d	1.45	1.65
E	1.65	1.85
F	11.40	11.60
P0	3.90	4.10
P	15.90	16.10
P1	1.90	2.10
W	23.90	24.30

**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 D<sup>2</sup>PAK(TO-263-2)**



Symbol	Dimensions in millimeters	
	Min.	Max.
A	4.06	4.83
A1	0	0.26
b	0.51	0.99
b1	1.14	1.78
c	0.31	0.74
c1	1.14	1.65
D	8.38	9.65
D1	6.4	
E1	6.22	
E2	9.65	10.67
e	2.54BSC	
H	14.6	15.88
L	1.78	2.8
L1	-	1.68
L2	-	2.2
L3	0.255BSC	
θ	0	8°

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