

## S4D20120A S4D20120H S4D20120G 1200V SIC POWER SCHOTTKY RECTIFIERS

### Description


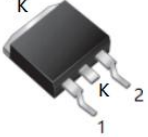


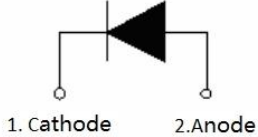
This 1200V 20A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S4D20120A/S4D20120H/S4D20120G are ideal for energy sensitive, high frequency applications in challenging environments.

### 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>S4D20120A</p> 	<p>S4D20120G</p> 	<p>S4D20120H</p> 
<p>TO-220AC (TO-220-2)</p>	<p>D<sup>2</sup>PAK (TO-263-2)</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	$V_{RRM}$ $V_{RWM}$ $V_R$	-	1200	V
Average Rectified Forward Current	$I_{F(AV)1}$	@Tc=25°C	57	A
	$I_{F(AV)2}$	@Tc=150°C	20	A
Repetitive Peak Forward Surge Current	$I_{FRM1}$	10 ms, Half Sine pulse, Tc =25°C	140	A
	$I_{FRM2}$	10 ms, Half Sine pulse, Tc =110°C	110	A
Peak One Cycle Non-Repetitive Surge Current	$I_{FSM1}$	10ms, Half Sine pulse, Tc =25°C	240	A
	$I_{FSM2}$	10ms, Half Sine pulse, Tc =110°C	195	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10µs. Pulse, Tc =25°C	1150	A
	$I_{F,Max2}$	10µs. Pulse, Tc =110°C	950	A
Power Dissipation	$P_{tot1}$	Tc =25°C	245.9	W
	$P_{tot2}$	Tc =110°C	106.6	W

## Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	$V_{F1}$	@ 20A, Pulse, T <sub>J</sub> = 25 °C	1.5	1.8	V
	$V_{F2}$	@ 20A, Pulse, T <sub>J</sub> = 175 °C	2.2	3.0	V
Reverse Current*	$I_{R1}$	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 25 °C	1	25	µA
	$I_{R2}$	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 175 °C	10	150	µA
Junction Capacitance	$C_T$	V <sub>R</sub> =0V, T <sub>J</sub> =25°C, f=1MHz	1620	-	pF
Reverse Recovery Charge	$Q_c$	I <sub>F</sub> = 20A, di/dt = 200A/µs V <sub>R</sub> = 800 V, T <sub>J</sub> =25°C	124.89	-	nC
Capacitance Stored Energy	$E_C$	V <sub>R</sub> = 800 V, T <sub>J</sub> =25°C	64.20	-	µJ

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

## Thermal-Mechanical Specifications:

Characteristics	Symbol	S4D20120A	S4D20120H	S4D20120G	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>	0.6	0.61	0.6	°C/W

## Ordering Information

Device	Package	Shipping
S4D20120A	TO-220AC(TO-220-2)	50pcs / tube
S4D20120H	TO-247AC(TO-247-2)	25pcs / tube
S4D20120G	D2PAK(TO-263-2)	800pcs/reel
S4D20120GTR	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

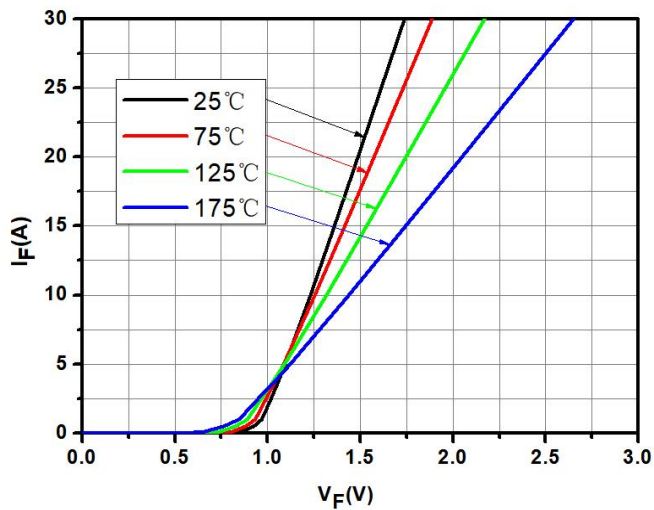


Fig.1-Typical Forward Voltage Characteristics

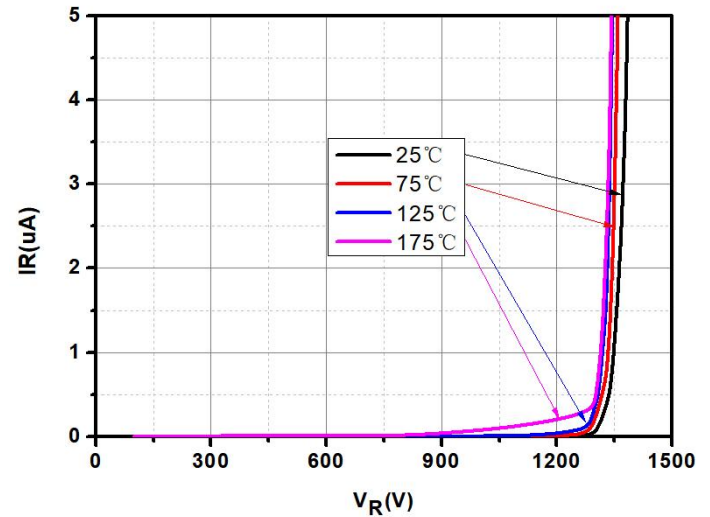


Fig.2-Typical Reverse Characteristics

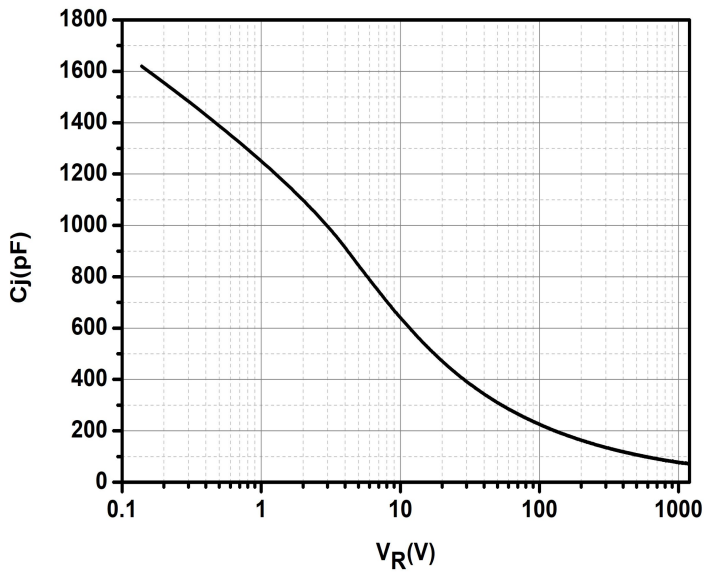


Fig.3-Capacitance vs. Reverse Voltage

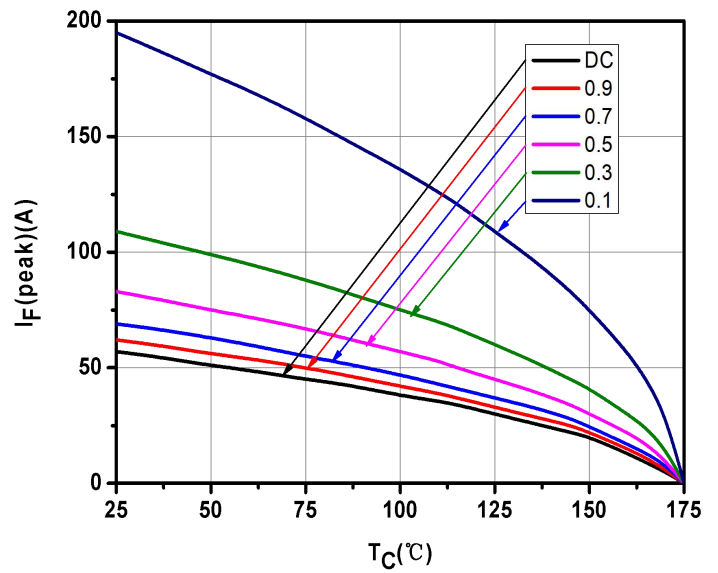


Fig.4-Current Derating

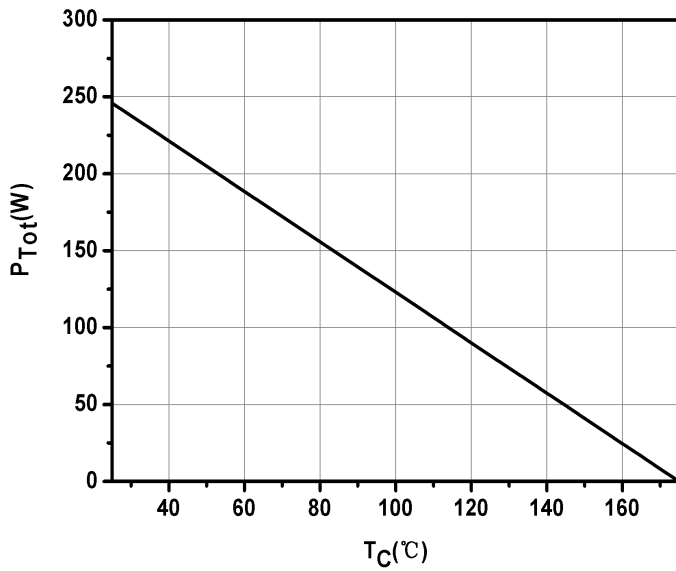


Fig.5-Power Derating

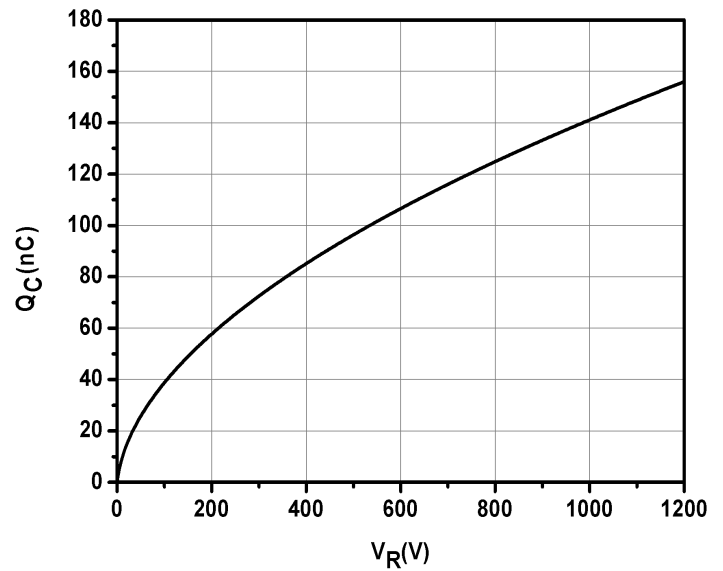


Fig.6-Total Capacitance Charge vs. Reverse Voltage

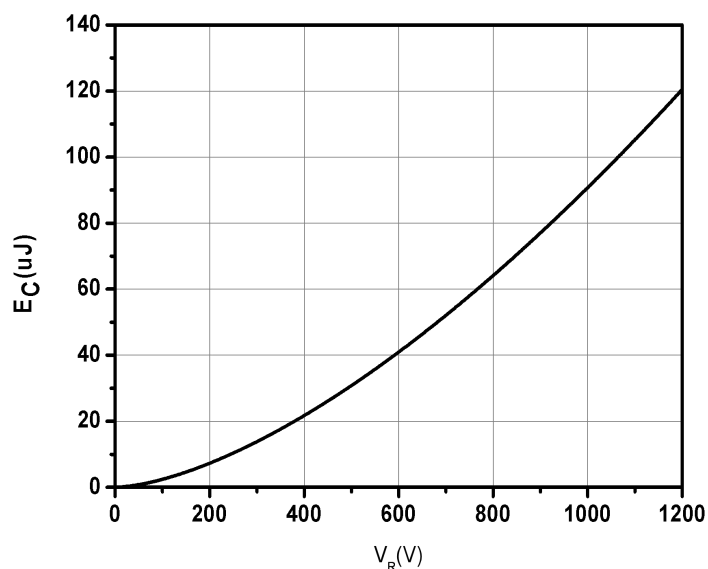
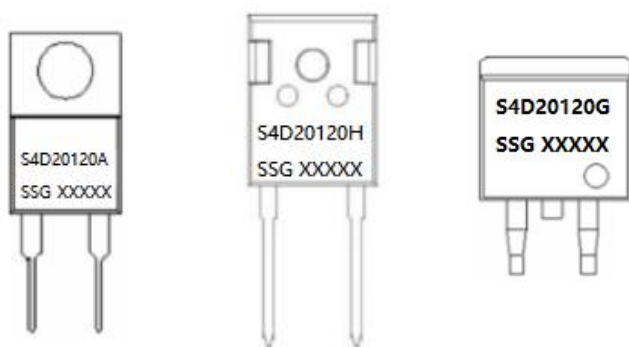


Fig.7-Capacitance Stored Energy

## Marking Diagram

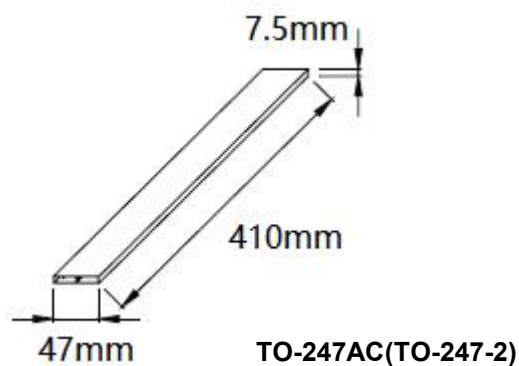
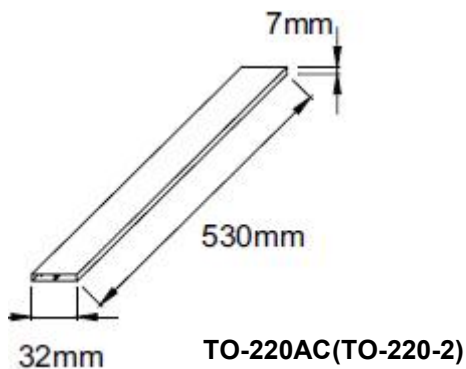


Where XXXXX is YYWWL

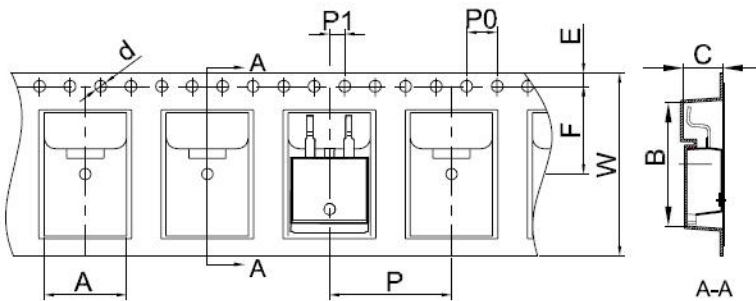
S4D = Device Type  
A/H/G = Package type  
20 = Forward Current (20A)  
120 = Reverse Voltage (1200V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

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

## Tube Specification

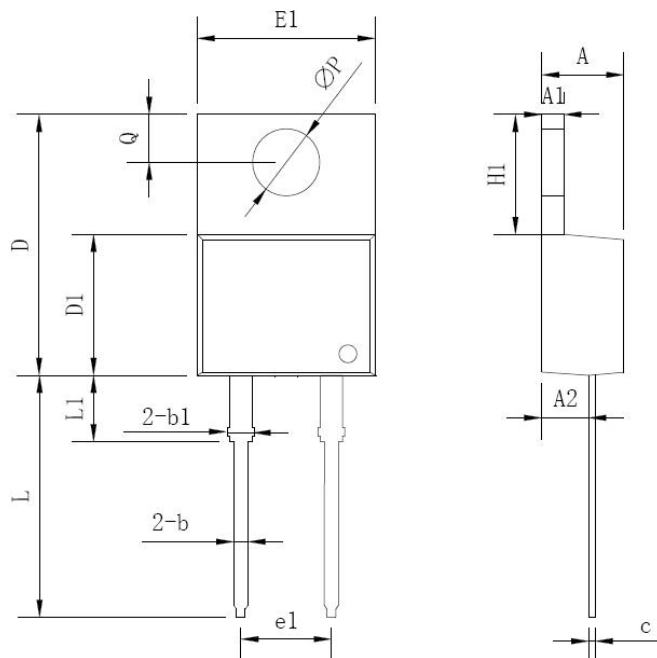


**Carrier Tape & Reel Specification D2PAK(TO-263-2)**



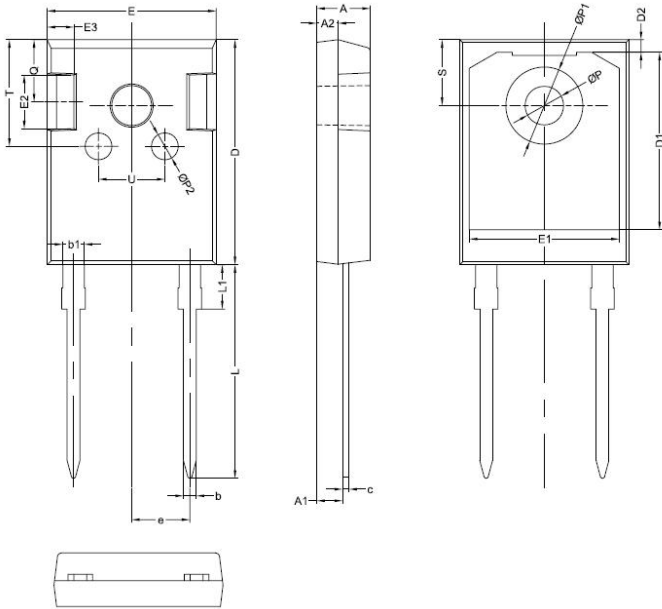
SYMBOL	Millimeters	
	Min.	Max.
A	10.70	10.90
B	16.03	16.23
C	5.11	5.31
d	1.45	1.65
E	1.65	1.85
F	11.40	11.60
P0	3.90	4.10
P	15.90	16.10
P1	1.90	2.10
W	23.90	24.30

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



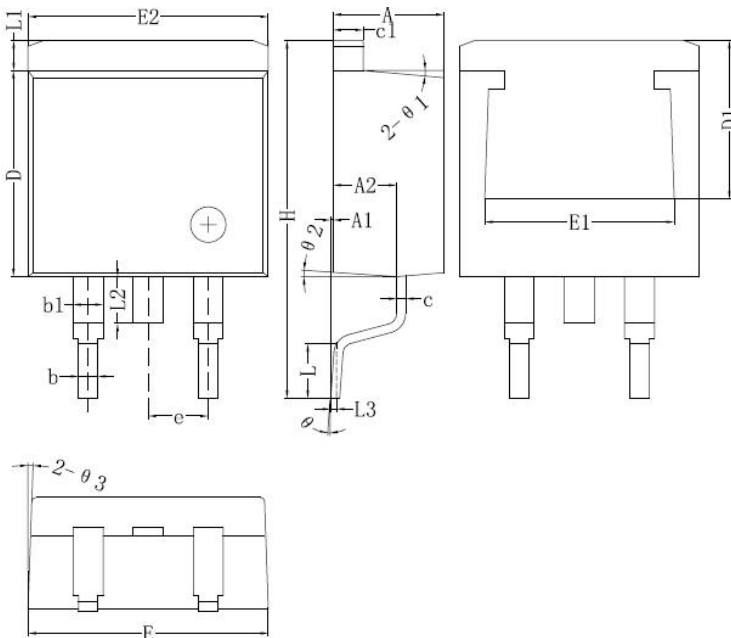
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E1	9.65	10.16	10.67
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
ΦP	-	3.56	-
Q	2.54	-	3.43

**Mechanical Dimensions TO-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	
$\theta$	0	8°

**Technical Data**  
**Data Sheet N2367, REV.H**



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