

## S4D10120A/S4D10120E/S4D10120H/S4D10120F 1200V SiC POWER SCHOTTKY RECTIFIERS

### Description



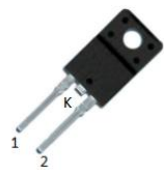


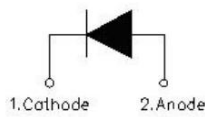
S4D10120A/S4D10120E/S4D10120H/S4D10120F are all single SiC Schottky rectifiers packaged in TO-220AC(TO-220-2)/DPAK(TO-252-2)/TO-247AC(TO-247-2)/ITO-220AC(TO-220-F2). The devices are high voltage Schottky rectifiers that have very low total conduction losses and very stable switching characteristics over temperature extremes. The S4D10120A/S4D10120E/S4D10120H/S4D10120F 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

S4D10120A 	S4D10120E 	S4D10120F 	S4D10120H 
TO-220AC (TO-220-2)	DPAK (TO-252-2)	ITO-220AC (TO-220-F2)	TO-247AC (TO-247-2)
			

### 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)</sub>	50% duty cycle @T <sub>c</sub> =150°C, rectangular wave form	10	A
Peak One Cycle Non-Repetitive Surge Current	I <sub>FSM</sub>	10ms, Half Sine pulse, T <sub>J</sub> =25°C	105	A
Repetitive Peak Forward Surge Current	I <sub>FRM</sub>	10 ms, Half Sine pulse, T <sub>J</sub> =25°C	47	A

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### Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V <sub>F1</sub>	@ 10A, Pulse, T <sub>J</sub> = 25 °C	1.5	1.8	V
	V <sub>F2</sub>	@ 10A, 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	30	200	uA
	I <sub>R2</sub>	@V <sub>R</sub> = rated V <sub>R</sub> T <sub>J</sub> = 175 °C	55	350	uA
Junction Capacitance	C <sub>T</sub>	V <sub>R</sub> =0V, T <sub>J</sub> =25°C, f=1MHz	772	-	pF

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

### Thermal-Mechanical Specifications:

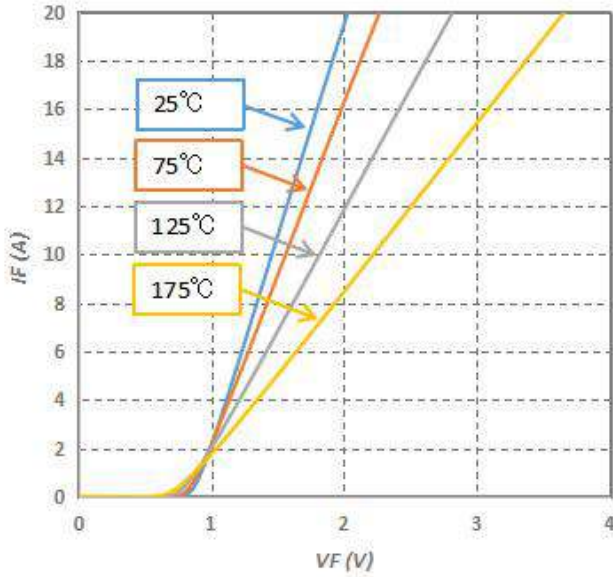
Characteristics	Symbol	S4D10120A	S4D10120E	S4D10120H	S4D10120F	Units
Junction Temperature	T <sub>J</sub>	-55 to +175				°C
Storage Temperature	T <sub>stg</sub>	-55 to +175				°C
Typical Thermal Resistance Junction to Case	R <sub>qJC</sub>	1.7	1.5	0.61	4	°C/W

### Ordering Information

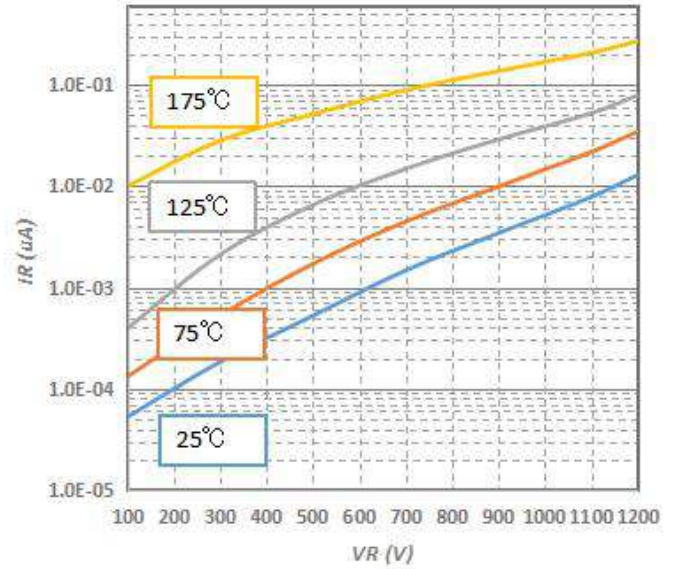
Device	Package	Shipping
S4D10120A	TO-220AC(TO-220-2)	50pcs / tube
S4D10120E	DPAK(TO-252-2)	2500pcs / reel
S4D10120H	TO-247AC(TO-247-2)	25pcs / tube
S4D10120F	ITO-220AC(TO-220-F2)	50pcs / tube

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

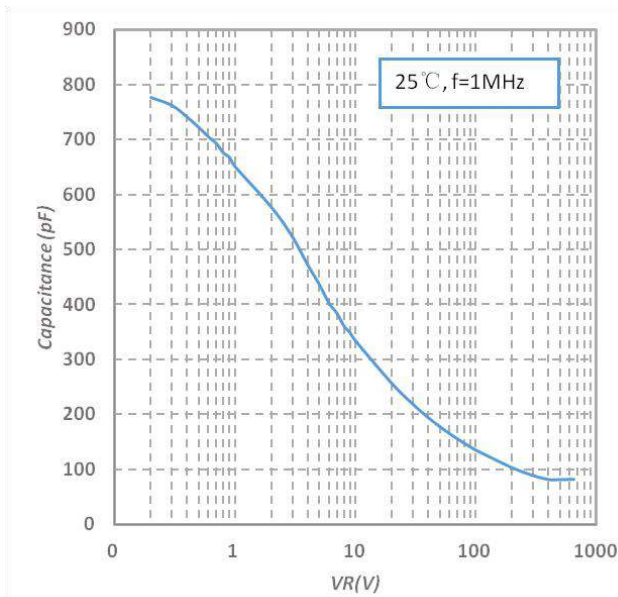
**Ratings and Characteristics Curves**



**Fig.1-Typical Forward Voltage Characteristics**



**Fig.2-Typical Reverse Characteristics**



**Fig.3-Capacitance vs. Reverse Voltage**

## Marking Diagram

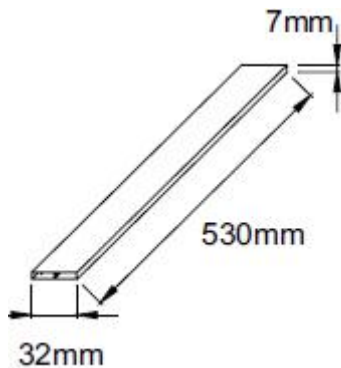


Where XXXXX is YYWWL

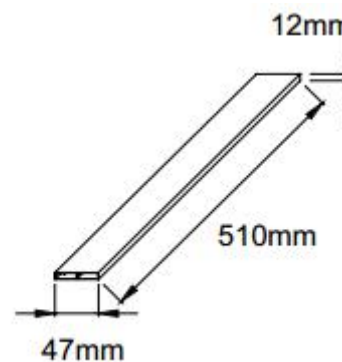
S4D = Device Type  
A/E/H/F = Package type  
10 = Forward Current (10A)  
120 = Reverse Voltage (1200V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

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

## Tube Specification

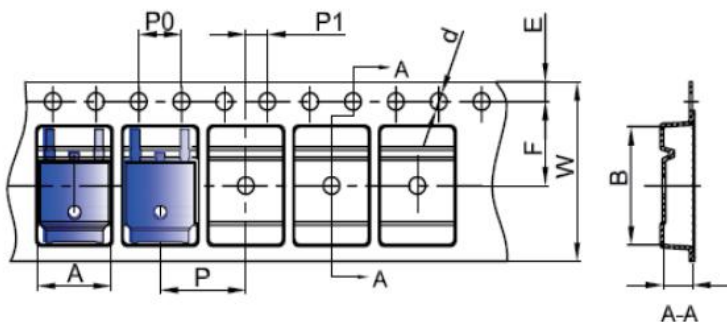


TO-220AC(TO-220-2)  
ITO-220AC(TO-220-F2)



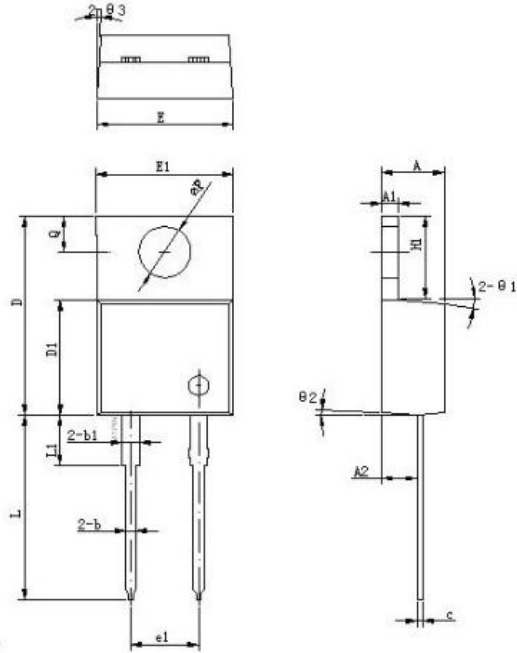
TO-247AC(TO-247-2)

## Carrier Tape & Reel Specification DPAK(TO-252-2)



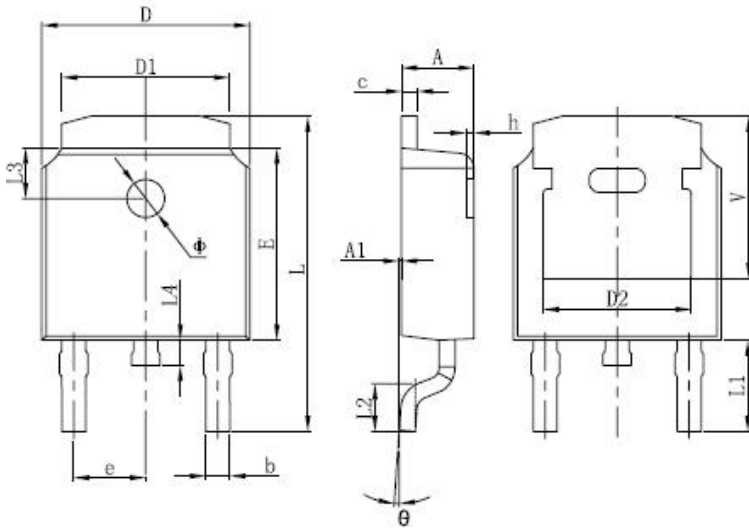
SYMBOL	Millimeters	
	Min.	Max.
A	6.80	7.00
B	10.40	10.60
C	2.60	2.80
d	Φ1.45	Φ1.65
E	1.65	1.85
F	7.40	7.60
P0	3.90	4.10
P	7.90	8.10
P1	1.90	2.10
W	15.90	16.30

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



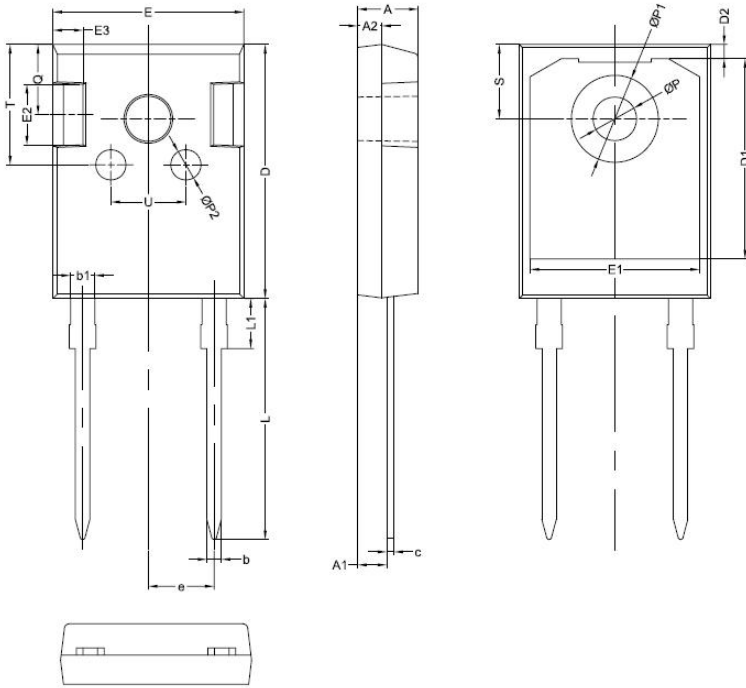
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	4.55	4.70	4.85
A1	1.17	1.27	1.37
A2	2.59	2.69	2.89
b	0.71	0.81	0.96
b1		1.27	
c	0.36	0.38	0.61
D	14.64	14.94	15.24
D1	8.55	8.70	8.90
E	10.01	10.16	10.31
E1	9.98	10.18	10.38
e1		5.08	
H1	6.04	6.24	6.44
L	13.00	13.86	14.08
L1		3.80	
ΦP	3.74	3.84	4.04
Q	2.54	2.74	2.94
Θ1		5°	
Θ2		4°	
Θ3		4°	

**Mechanical Dimensions DPAK(TO-252-2)**



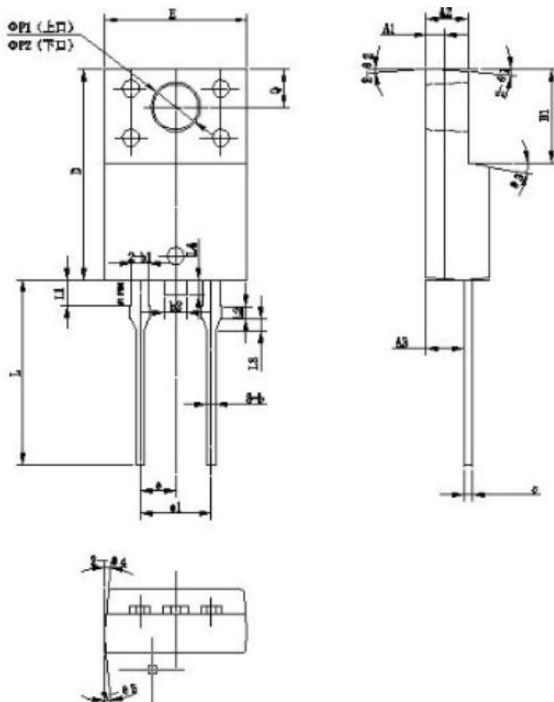
SYMBOL	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0	0.13	0	0.005
b	0.635	0.889	0.025	0.035
c	0.460	0.889	0.018	0.035
D	6.50	6.70	0.250	0.265
D1	4.95	5.46	0.195	0.215
D2	4.32 REF.		0.170 REF.	
E	6.00	6.20	0.235	0.245
e	2.286 BSC		0.090 BSC	
L	9.398	10.414	0.370	0.410
L1	1.778 REF.		0.108 REF.	
L2	1.40	1.78	0.055	0.07
L3	1.60 REF.		0.063 REF.	
L4	0.60	1.02	0.024	0.040
Φ	1.10	1.30	0.043	0.051
Θ	0°	10°	0°	10°
h	0	0.30	0	0.012
V	5.21 REF.		0.205 REF.	

**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 ITO-220AC(TO-220-2F)**



Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	4.30	4.0	4.70
A1		1.30	
A2	2.80	3.00	3.20
A3	2.50	2.70	2.90
b	0.5	0.6	0.75
b1		1.20	
b2		1.60	
e	0.55	0.6	0.75
D	14.80	15.00	15.20
E	8.96	10.14	10.36
e1		2.55	
e1		5.10	
H1	8.50	8.70	8.90
L	17.70	18.20	18.70
L1		1.80	
L2		1.00	
L3		0.80	
L4		1.10	
ΦP1(上口)	3.30	3.50	3.70
ΦP1(下口)	2.99	3.19	3.39
Q	2.50	2.70	2.90
Θ1		5°	
Θ2		4°	
Θ3		10°	
Θ4		5°	
Θ5		5°	



S4D10120A  
S4D10120E  
S4D10120H  
S4D10120F

**Technical Data**  
**Data Sheet N2321, REV.C**



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