

S4D10120A/S4D10120E/S4D10120H/S4D10120F 1200V SIC POWER SCHOTTKY RECTIFIERS

Description

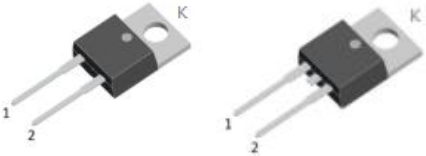
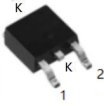
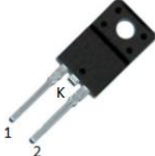


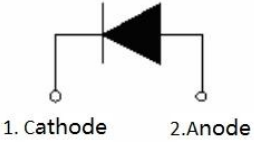
This 1200V 10A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S4D10120A/S4D10120E/S4D10120H/S4D10120F are ideal for energy sensitive, high frequency applications in challenging environments.

Features

- 175°C T_J 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>S4D10120A</p> 	<p>S4D10120E</p> 	<p>S4D10120F</p> 	<p>S4D10120H</p> 
<p>TO-220AC (TO-220-2)</p>	<p>DPAK (TO-252-2)</p>	<p>ITO-220AC (TO-220-F2)</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	$I_{F(AV)1}$	$T_c = 25^\circ\text{C}$	33	A
	$I_{F(AV)2}$	$T_c = 153^\circ\text{C}$	10	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10 ms, Half Sine pulse, $T_c = 25^\circ\text{C}$	46	A
	I_{FRM2}	10 ms, Half Sine pulse, $T_c = 110^\circ\text{C}$	30	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, $T_c = 25^\circ\text{C}$	105	A
	I_{FSM2}	10ms, Half Sine pulse, $T_c = 110^\circ\text{C}$	80	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10 μs . Pulse, $T_c = 25^\circ\text{C}$	750	A
	$I_{F,Max2}$	10 μs . Pulse, $T_c = 110^\circ\text{C}$	620	A
Power Dissipation	P_{tot1}	$T_c = 25^\circ\text{C}$	150.0	W
	P_{tot2}	$T_c = 110^\circ\text{C}$	65.0	W

Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 10A, Pulse, $T_J = 25^\circ\text{C}$	1.5	1.8	V
	V_{F2}	@ 10A, Pulse, $T_J = 175^\circ\text{C}$	2.2	3.0	V
Reverse Current*	I_{R1}	@ $V_R = \text{rated } V_R$ $T_J = 25^\circ\text{C}$	2	30	μA
	I_{R2}	@ $V_R = \text{rated } V_R$ $T_J = 175^\circ\text{C}$	8	40	μA
Junction Capacitance	C_T	$V_R = 0\text{V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{MHz}$	772	-	pF
Reverse Recovery Charge	Q_c	$I_F = 10\text{A}$, $di/dt = 200\text{A}/\mu\text{s}$ $V_R = 800\text{V}$, $T_J = 25^\circ\text{C}$	56.46	-	nC
Capacitance Stored Energy	E_c	$V_R = 800\text{V}$	30.51	-	μJ

* Pulse width < 300 μs , duty cycle < 2

Thermal-Mechanical Specifications:

Characteristics	Symbol	S4D10120A	S4D10120E	S4D10120H	S4D10120F	Units
Junction Temperature	T_J	-55 to +175				$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +175				$^\circ\text{C}$
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	0.9	0.9	0.98	4	$^\circ\text{C}/\text{W}$

Ratings and Characteristics Curves

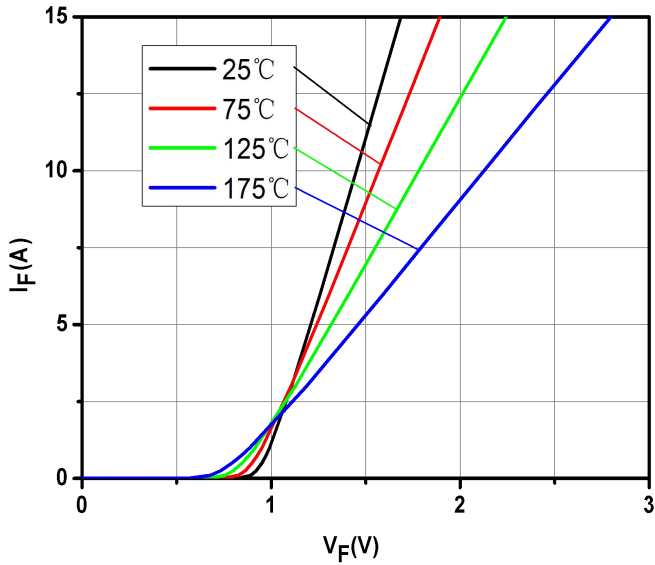


Fig.1-Typical Forward Voltage Characteristics

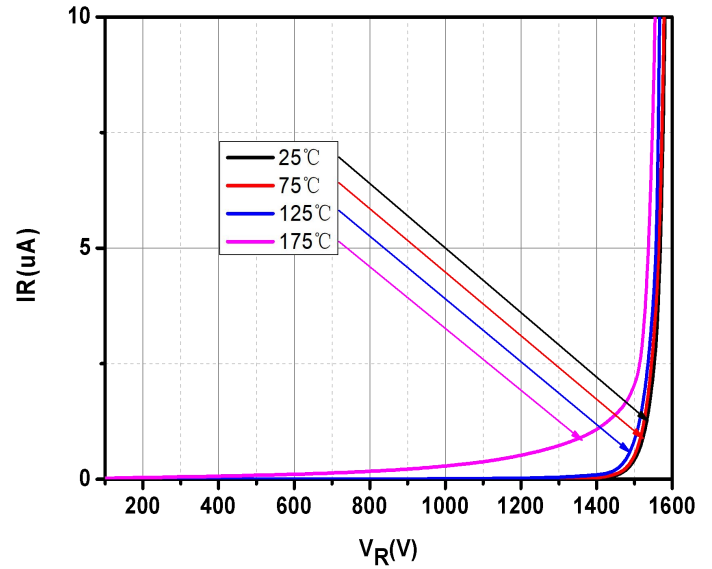


Fig.2-Typical Reverse Characteristics

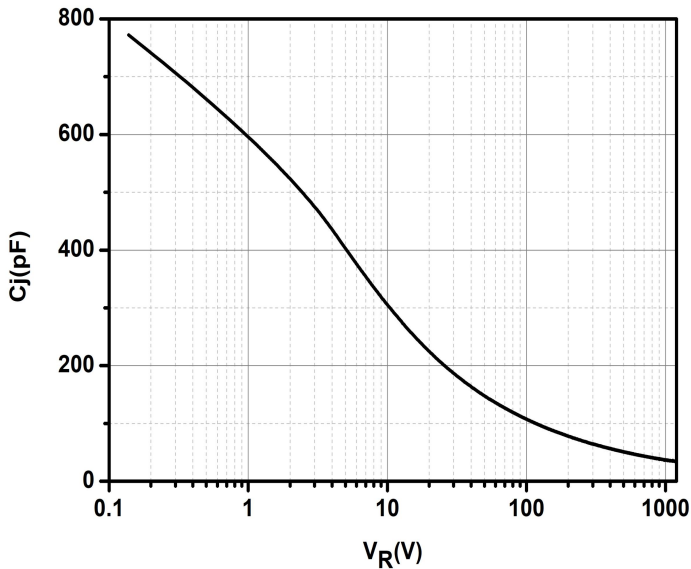


Fig.3-Capacitance vs. Reverse Voltage

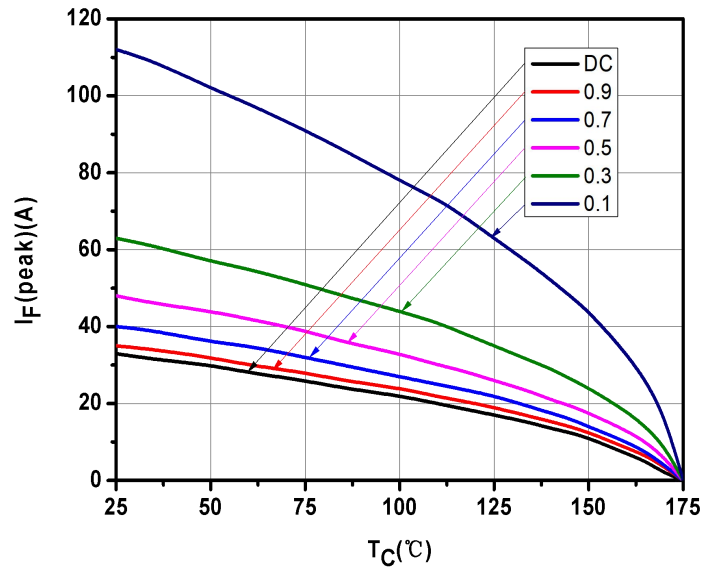


Fig.4-Current Derating

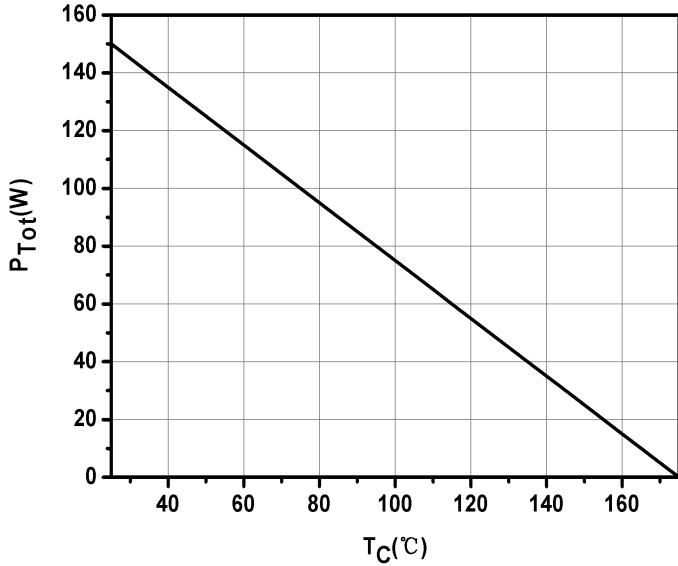


Fig.5-Power Derating

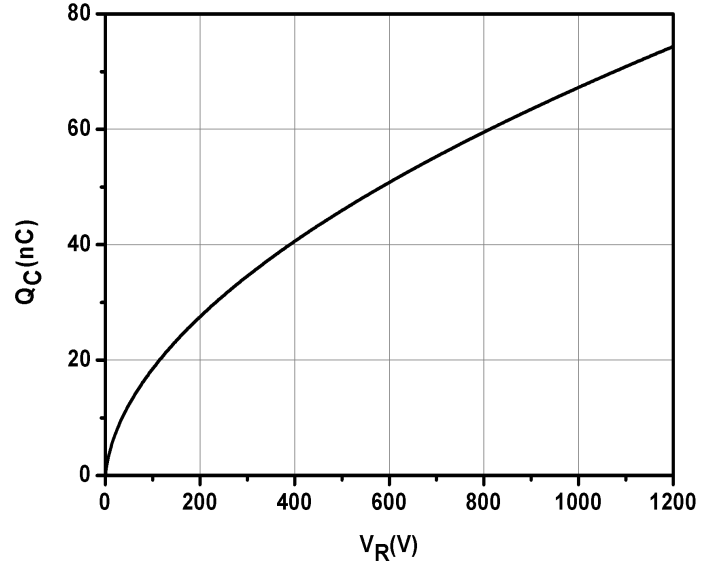


Fig.6-Total Capacitance Charge vs. Reverse Voltage

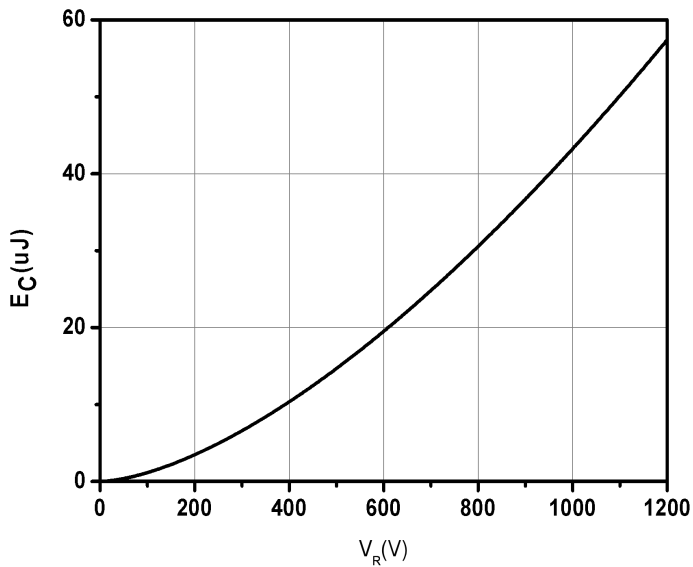


Fig.7-Capacitance Stored Energy

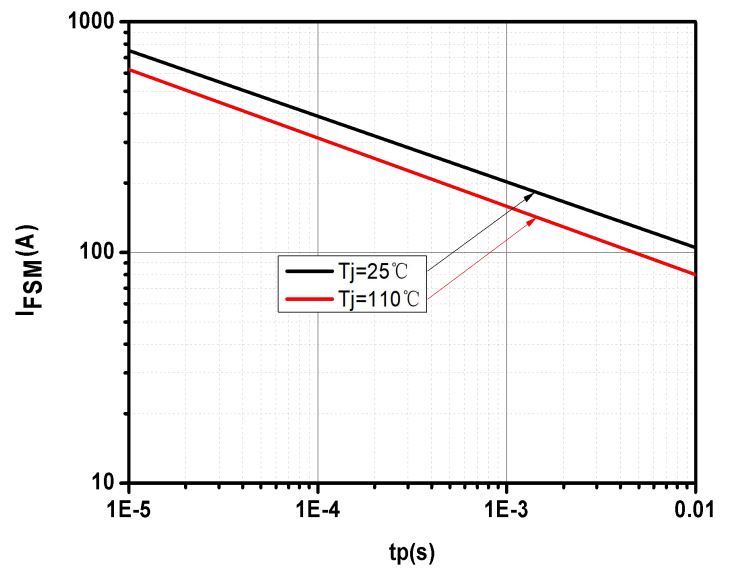
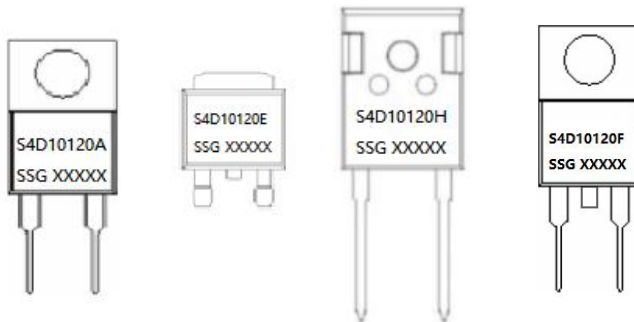


Fig.8-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

Ordering Information

Device	Package	Shipping
S4D10120A	TO-220AC(TO-220-2)	50pcs / tube
S4D10120E	DPAK(TO-252-2)	2500pcs / reel
S4D10120ETR	DPAK(TO-252-2)	2500pcs / reel
S4D10120H	TO-247AC(TO-247-2)	25pcs / tube
S4D10120F	ITO-220AC(TO-220-F2)	50pcs / tube

Marking Diagram

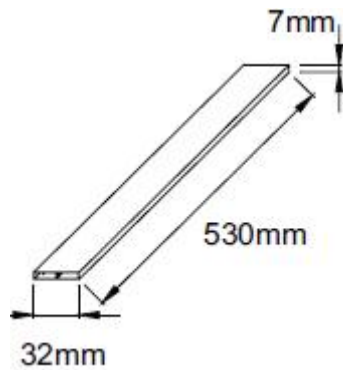


Where XXXXX is YYWWL

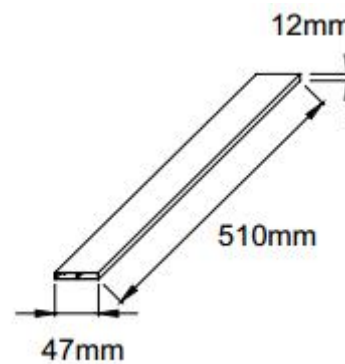
S4D = Device Type
A/E/H/F = Package type
10 = Forward Current (10A)
120 = Reverse Voltage (1200V)
SSG = SSG
YY = Year
WW = Week
L = Lot Number

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

Tube Specification

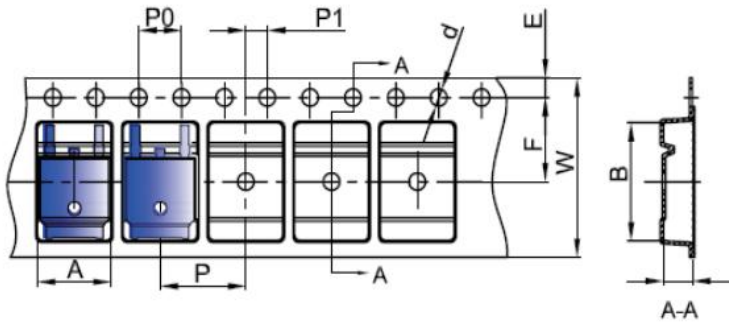


TO-220AC(TO-220-2)
ITO-220AC(TO-220-F2)



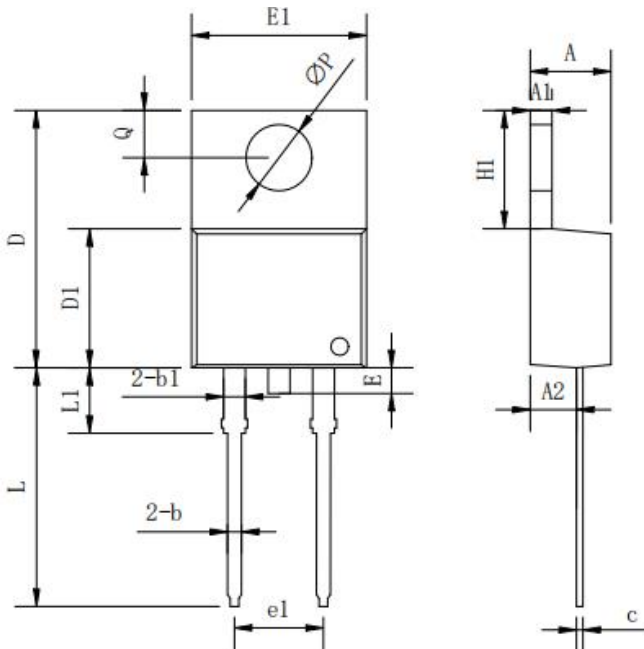
TO-247AC(TO-247-2)

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



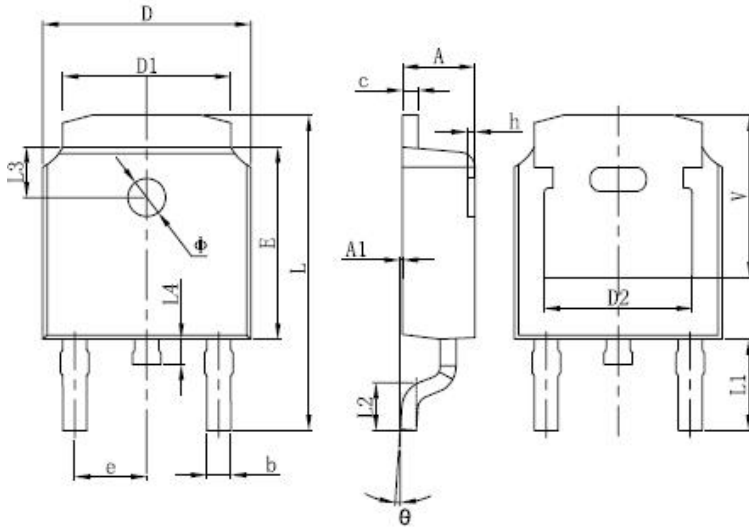
SYMBOL	Millimeters	
	Min.	Max.
A	6.80	7.00
B	10.40	10.60
C	2.60	2.80
d	Φ1.45	Φ1.65
E	1.65	1.85
F	7.40	7.60
P0	3.90	4.10
P	7.90	8.10
P1	1.90	2.10
W	15.90	16.30

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



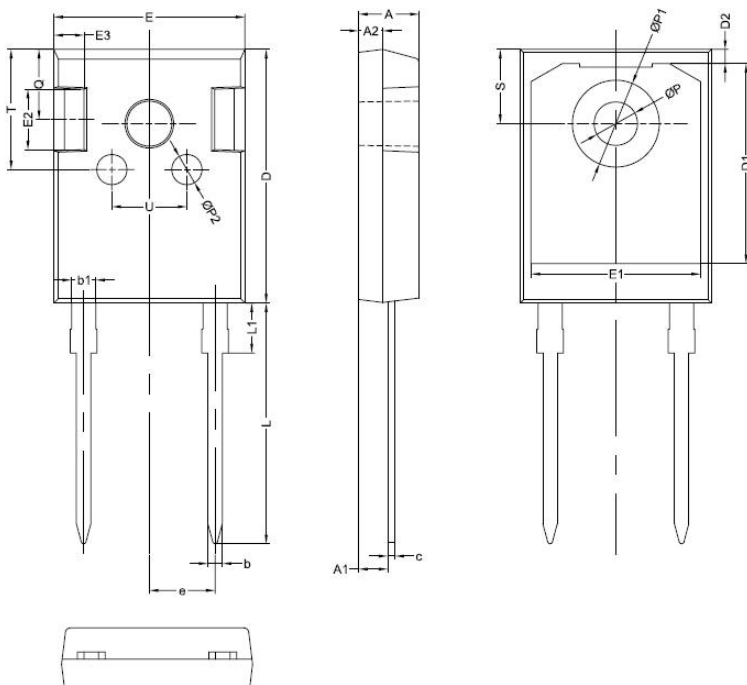
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E	-	-	1.78
E1	9.65	10.16	10.67
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
ΦP	-	3.56	-

Mechanical Dimensions DPAK(TO-252-2)



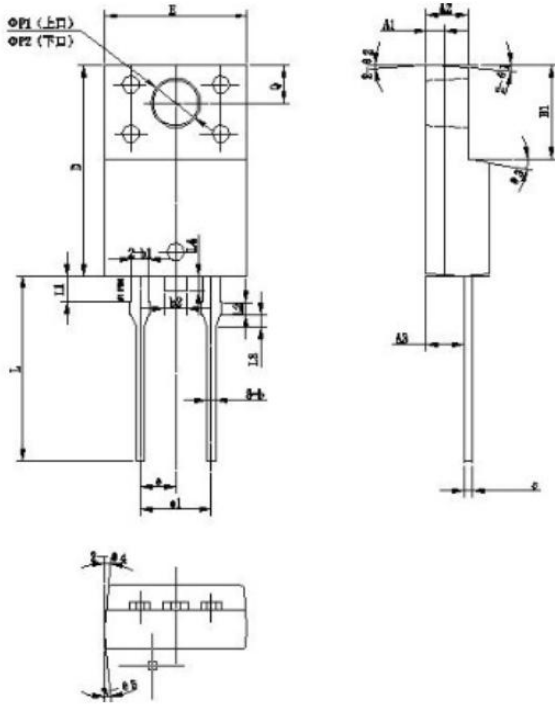
SYMBOL	Dimensions in millimeters		
	Min.	Typ.	Max.
A	2.18	-	2.39
A1	-	-	0.13
b	0.64	-	0.89
c	0.46	-	0.89
D	6.35	-	6.73
D1	4.95	-	5.46
D2	4.32	-	-
E	5.97	6.1	6.22
e	2.29BSC		
L	9.4	-	10.41
L1	2.90 REF.		
L2	1.4	1.52	1.78
L3	1.60 REF.		
L4	-	-	1.02
Φ	1.1	-	1.3
Θ	0°	-	10°
V	5.21	-	-

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.G



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