

S3D20065A/S3D20065F/S3D20065H/S3D20065G/S3D20065D1 650V SIC POWER SCHOTTKY RECTIFIERS

Description


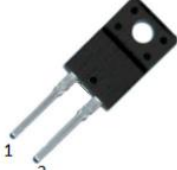

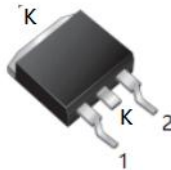


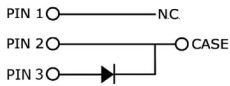
This 650V 20A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D20065A/S3D20065F/S3D20065H/S3D20065G/S3D20065D1 are ideal for energy sensitive, high frequency applications in challenging environments.

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
- “-A” is an AEC-Q101 qualified device
- Terminals finish: Tin Lead-free plated
- 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

S3D20065A	S3D20065F	S3D20065H	S3D20065G	S3D20065D1
				
TO-220AC (TO-220-2)	ITO-220AC (TO-220MF-2L)	TO-247AC (TO-247-2)	D2PAK (TO-263-2)	TO-247AD TO-247-3
				

Maximum Ratings:

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{DC}	-	650	V
Average Rectified Forward Current	$I_{F(AV)1}$	$T_C=25^{\circ}C$	48	A
	$I_{F(AV)2}$	$T_C=135^{\circ}C$	21	A
	$I_{F(AV)3}$	$T_C=140^{\circ}C$	20	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, $T_C=25^{\circ}C$	105	A
	I_{FRM2}	10ms, Half Sine pulse, $T_C=110^{\circ}C$	70	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, $T_C=25^{\circ}C$	170	A
	I_{FSM2}	10ms, Half Sine pulse, $T_C=110^{\circ}C$	145	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10 μ s. Pulse, $T_C=25^{\circ}C$	1830	A
	$I_{F,Max2}$	10 μ s. Pulse, $T_C=110^{\circ}C$	1260	A
Power Dissipation	P_{tot1}	$T_C=25^{\circ}C$	136	W
	P_{tot2}	$T_C=110^{\circ}C$	59	W
TO-220 Mounting Torque		M3 Screw	1	Nm
		6-32 Screw	8.8	bf-in

Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 20A, Pulse, $T_J = 25^{\circ}C$	1.45	1.7	V
	V_{F2}	@ 20A, Pulse, $T_J = 175^{\circ}C$	1.65	2.0	V
Reverse Current*	I_{R1}	@ $V_R = \text{rated } V_R$, $T_J = 25^{\circ}C$	1.5	50	μ A
	I_{R2}	@ $V_R = \text{rated } V_R$, $T_J = 175^{\circ}C$	15	200	μ A
Junction Capacitance	C_T	$V_R=0V$, $T_J=25^{\circ}C$, $f=1MHz$	1550	-	pF
Reverse Recovery Charge	Q_C	$I_F = 20A$, $di/dt=200A/\mu s$ $V_R = 400V$, $T_J = 25^{\circ}C$	96.7	-	nC
Capacitance Stored Energy	E_C	$V_R = 400V$, $T_J = 25^{\circ}C$	23.69	-	μ J

* Pulse width < 300 μ s, duty cycle < 2%

Thermal-Mechanical Specifications:

Characteristics	Symbol	S3D20065A	S3D20065F	S3D20065H	S3D20065G	S3D20065D1	Units
Junction Temperature	T_J	-55 to +175					$^{\circ}C$
Storage Temperature	T_{stg}	-55 to +175					$^{\circ}C$
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	1.1	2.9	0.61	1.65	0.84(per leg) 0.42(both leg)	$^{\circ}C/W$

Ordering Information

Device	Package	Plating	Shipping
S3D20065A	TO-220AC(TO-220-2)	Pure Sn	50pcs / tube
S3D20065F	ITO-220AC(TO-220MF-2L)	Pure Sn	50pcs / tube
S3D20065H	TO-247AC(TO-247-2)	Pure Sn	25pcs / tube
S3D20065D1	TO-247AD(TO-247-3)	Pure Sn	25pcs / tube
S3D20065G	D2PAK(TO-263-2)	Pure Sn	800pcs / reel
S3D20065GTR	D2PAK(TO-263-2)	Pure Sn	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

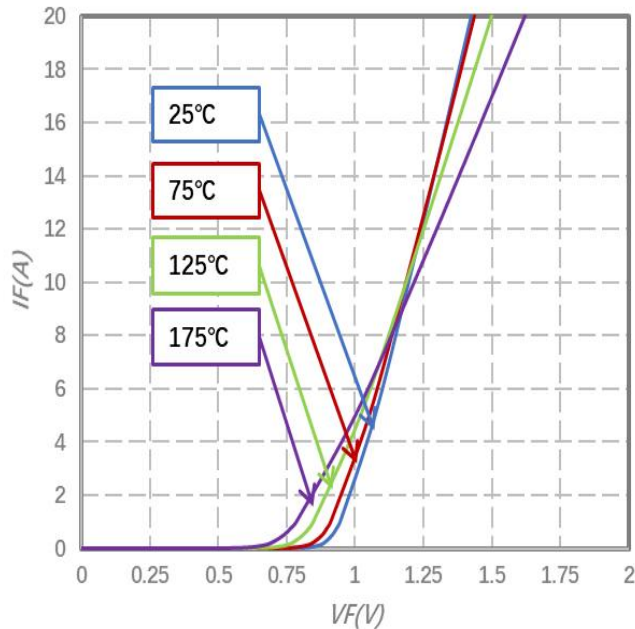


Fig.1-Typical Forward Voltage Characteristics

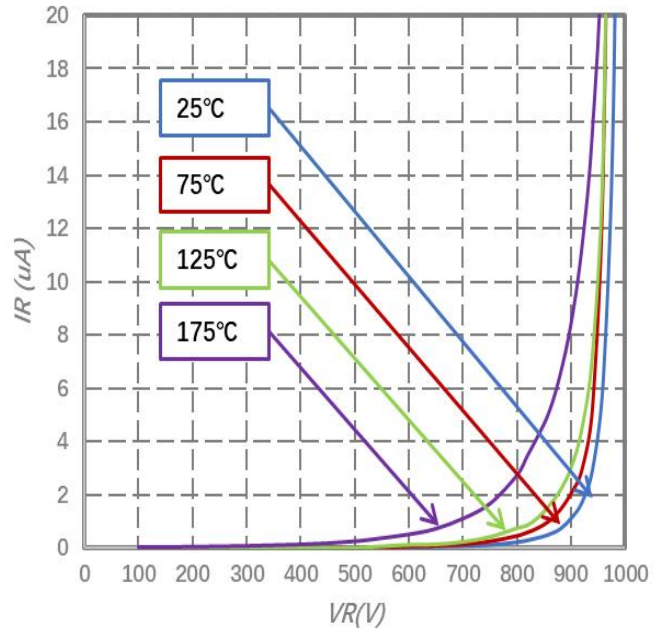


Fig.2-Typical Reverse Characteristics

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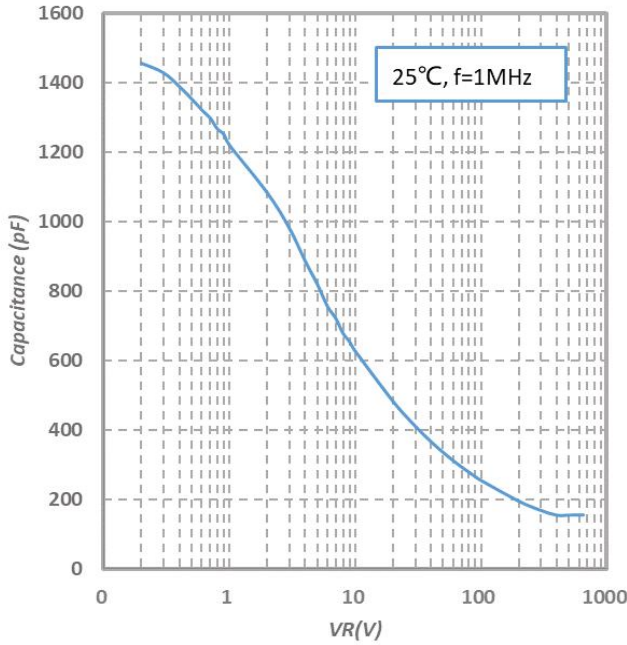


Fig.3-Capacitance vs. Reverse Voltage

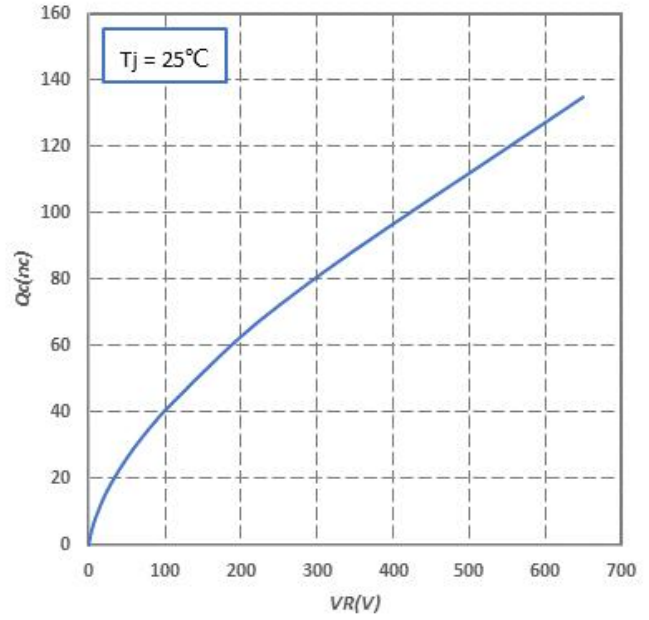


Fig.4-Total Capacitance Charge vs. Reverse Voltage

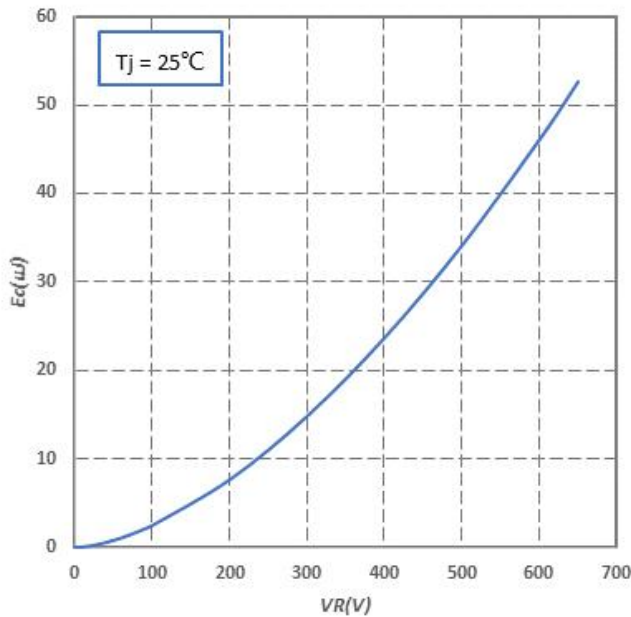


Fig.5-Capacitance Stored Energy

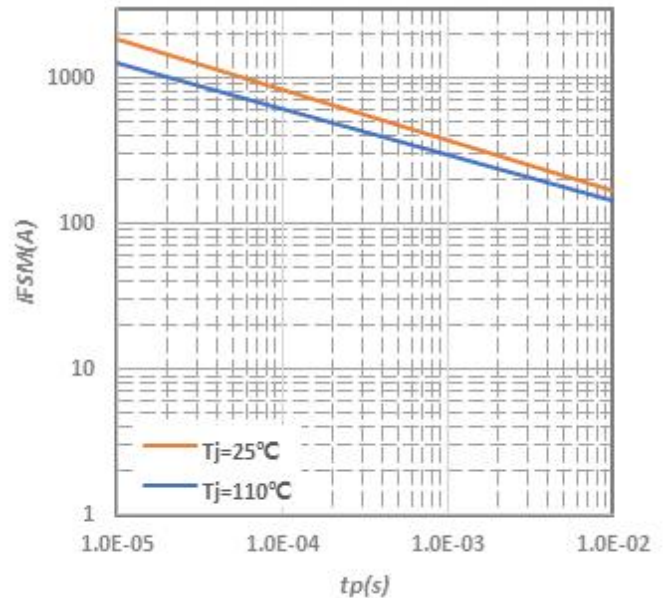


Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

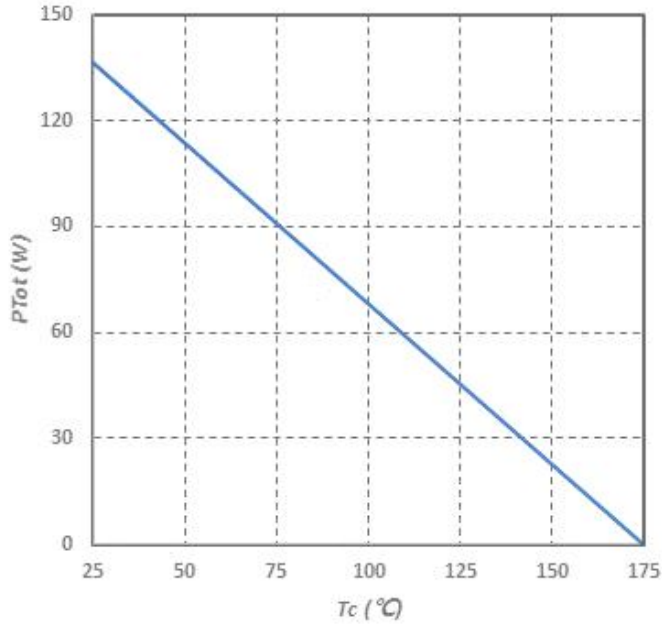


Fig.7-Power Derating

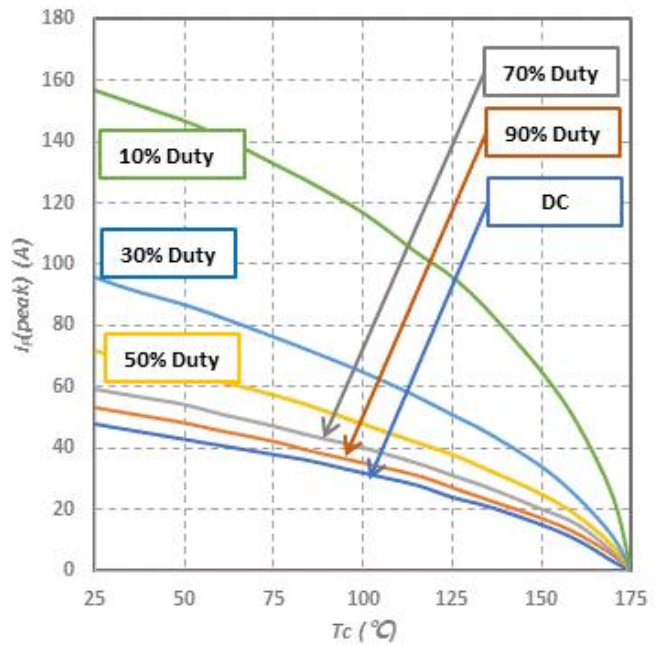
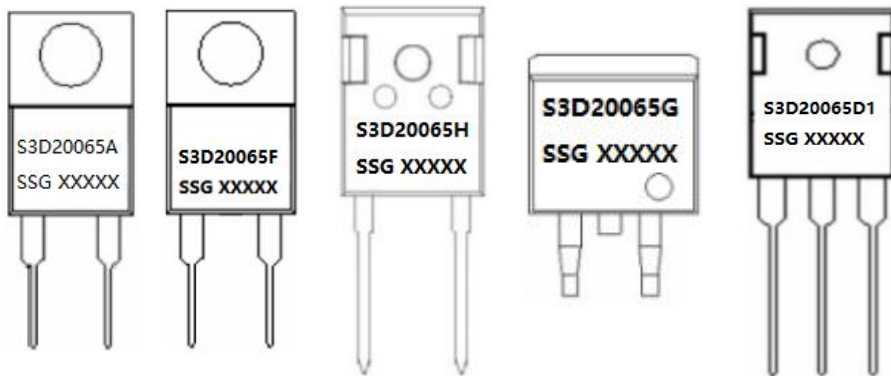


Fig.8-Current Derating

Marking Diagram

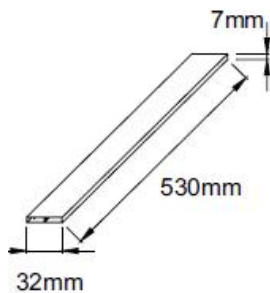


Where XXXXX is YYWWL

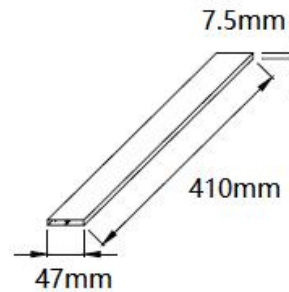
S3D = Device Type
A/F/H/G/D1 = Package type
20 = Forward Current (20A)
065 = Reverse Voltage (650V)
SSG = SSG
YY = Year
WW = Week
L = Lot Number

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

Tube Specification

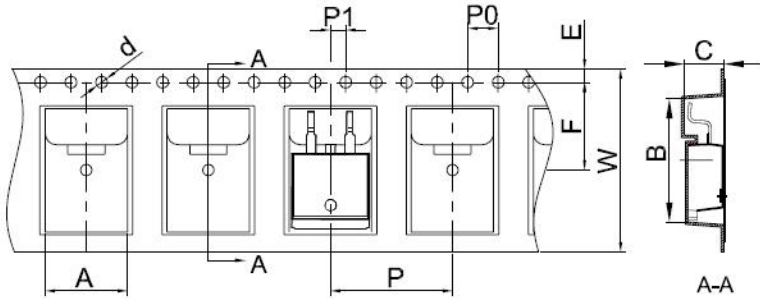


(TO-220-2/TO-220-F2)



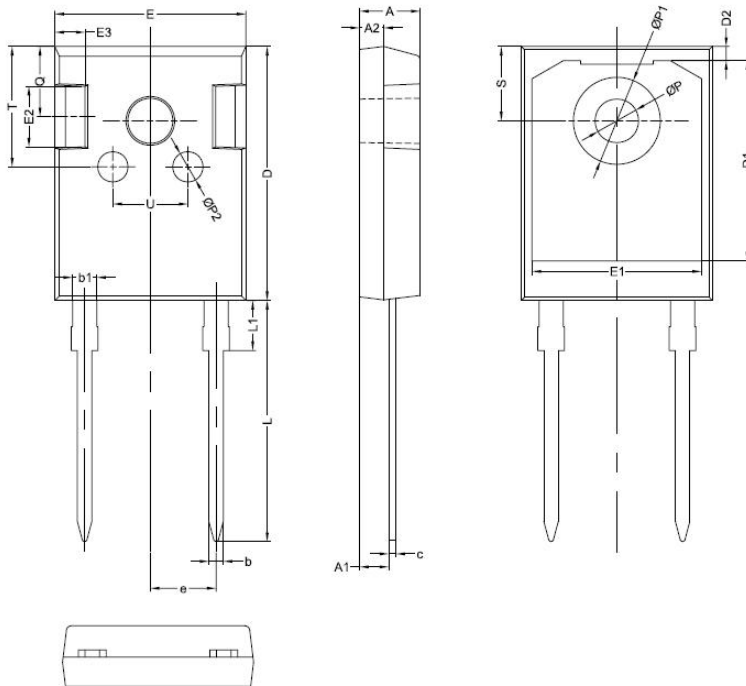
(TO-247-2/TO-247-3)

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



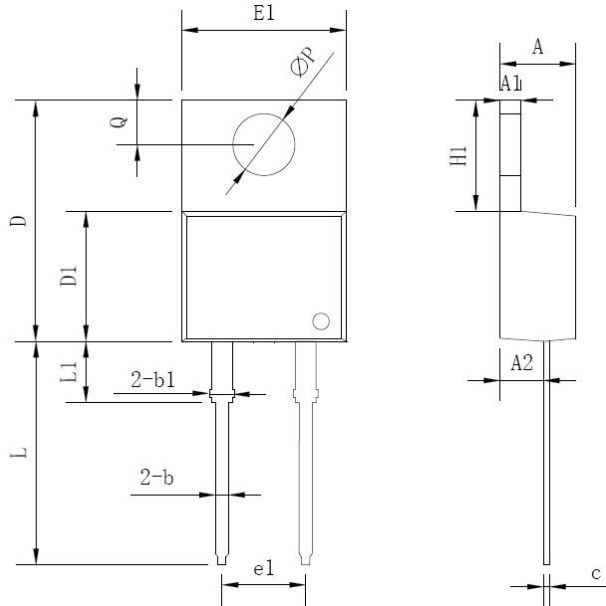
SYMBOL	Millimeters	
	Min.	Max.
A	10.70	10.90
B	16.03	16.23
C	5.11	5.31
d	1.45	1.65
E	1.65	1.85
F	11.40	11.60
P0	3.90	4.10
P	15.90	16.10
P1	1.90	2.10
W	23.90	24.30

Mechanical Dimensions TO-247AC(TO-247-2)



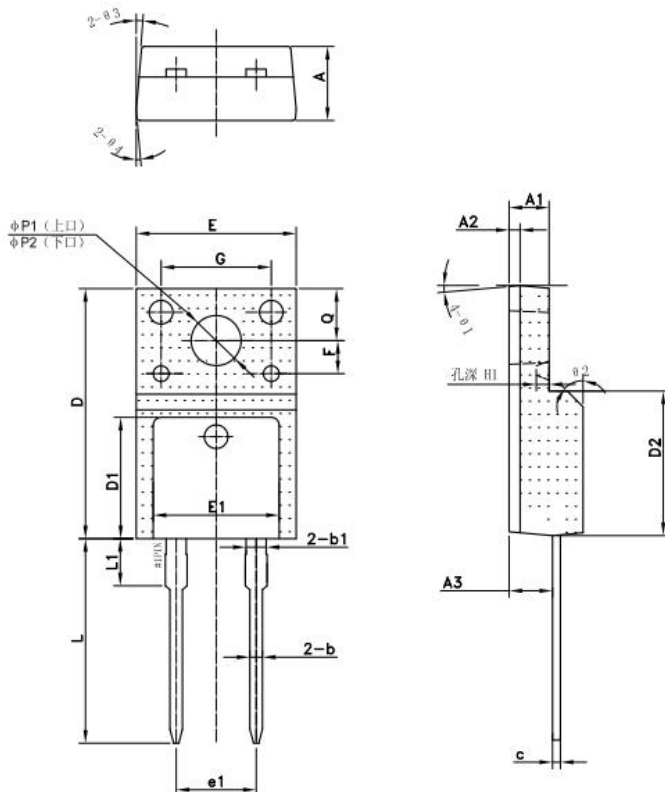
SYMBOL	Millimeters		
	MIN.	TYP.	MAX.
A	4.80	5.00	5.20
A1	2.20	2.41	2.61
A2	1.90	2.00	2.10
b	1.10	1.20	1.35
b1	1.80	2.00	2.20
c	0.50	0.60	0.75
D	20.30	21.00	21.20
D1		16.58	
D2		1.17	
E	15.60	15.80	16.00
E1		14.02	
E2		5.00	
E3		2.50	
e		5.44	
L	19.42	19.92	20.42
L1		4.13	
P	3.50	3.60	3.70
P1	7.1	7.19	7.40
P2		2.50	
Q		5.80	
S	6.05	6.15	6.25
T		10.00	
U		6.20	

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



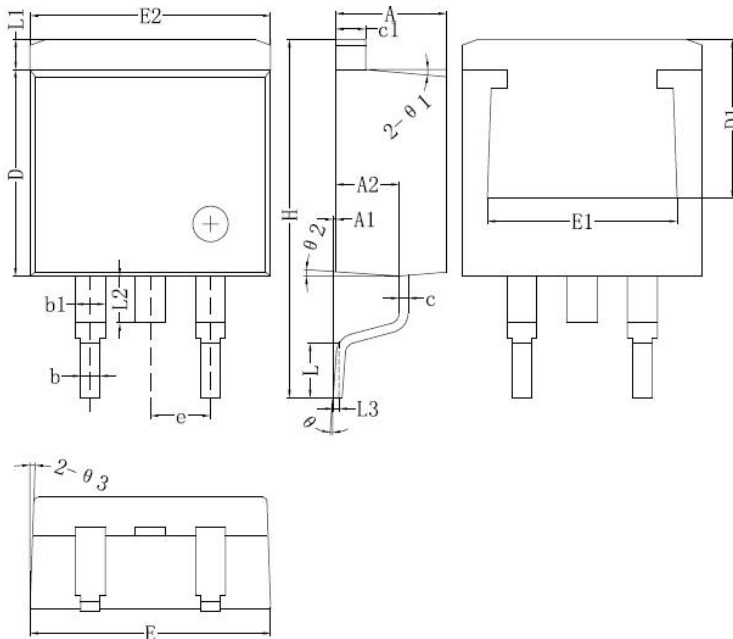
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E1	9.65	10.16	10.67
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
ΦP	-	3.56	-
Q	2.54	-	3.43

Mechanical Dimensions ITO-220AC(TO-220MF-2L)



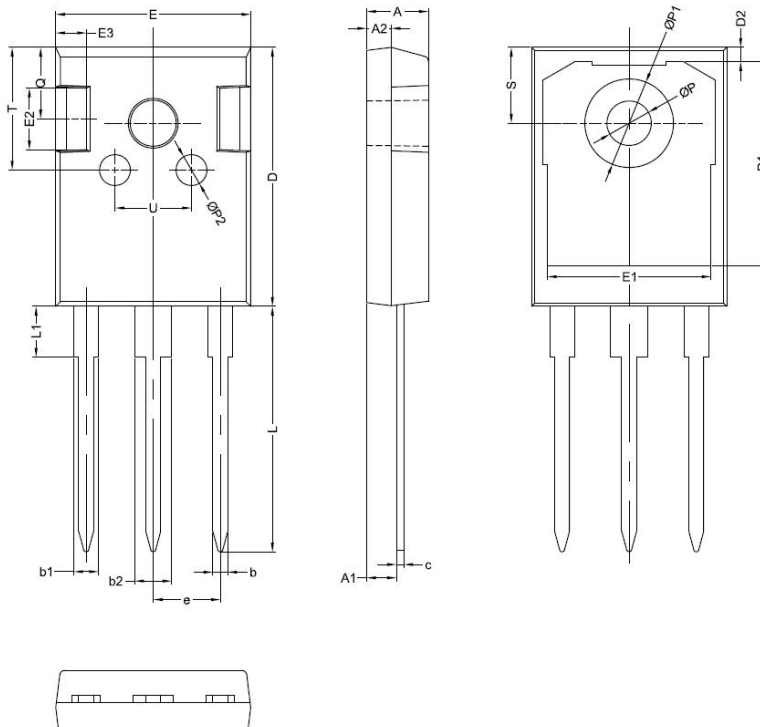
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2		0.70	
A3	2.56	2.76	2.96
b	0.70	0.80	0.95
b1		1.28	
c	0.45	0.50	0.65
D	15.67	15.87	16.07
D1		7.70	
D2		9.12	
E	9.96	10.16	10.36
E1		8.00	
e1		5.08	
F		2.1	
G		7	
H1		0.81	
L	12.48	12.98	13.20
L1		2.93	
4>P1 (上口)	2.98	3.18	3.38
4>P2 (下口)	3.20	3.40	3.60
Q	3.10	3.30	3.50
e 1		5°	
02		45°	
03		5°	
e 4		5°	

Mechanical Dimensions D²PAK(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	8.65
D1	6.40	
E1	6.22	
E2	9.65	10.67
e	2.54BSC	
H	14.60	15.88
L	1.78	2.80
L1	-	1.68
L2	-	1.78
L3	0.255BSC	
Ø	0	8°

Mechanical Dimensions TO-247AD(TO-247-3)



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	1.40
b1	1.80	2.00	2.20
b2	2.80	3.00	3.20
c	0.50	0.60	0.75
D	20.30	21.00	21.20
D1		16.55	
D2		1.20	
E	15.45	15.80	16.00
E1		13.30	
E2		5.00	
E3		2.50	
e		5.44	
L	19.42	19.92	20.70
L1		4.13	
P	3.50	3.60	3.70
P1	7.1		7.40
P2		2.50	
Q		5.80	
S	6.05	6.15	6.25
T		10.00	
U		6.20	



Technical Data
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