Technical Data
Data Sheet N2359, REV.D

S3D30065A S3D30065H S3D30065G S3D30065D1
650V SIC POWER SCHOTTKY RECTIFIERS

Description

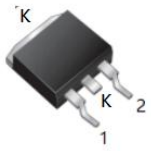
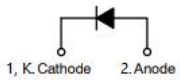
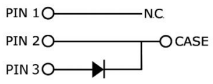
This 650V 30A diode is a high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D30065A/S3D30065H/S3D30065G/S3D30065D1 are ideal for energy sensitive, high frequency applications in challenging environments.

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

S3D30065A	S3D30065G	S3D30065H	S3D30065D1
			
TO-220AC (TO-220-2)	D^2PAK (TO-263-2)	TO-247AC TO-247-2	TO-247AD TO-247-3
			

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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	$I_{F\ (AV)1}$	Tc=25°C	84	A
	$I_{F\ (AV)2}$	Tc=135°C	37	A
	$I_{F\ (AV)3}$	Tc=146°C	30	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, T_C=25°C	125	A
	I_{FRM2}	10ms, Half Sine pulse, T_C=110°C	85	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, T_C=25°C	255	A
	I_{FSM2}	10ms, Half Sine pulse, T_C=110°C	175	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10μs. Pulse, T_C=25℃	2165	A
	$I_{F,Max2}$	10μs. Pulse, T_C=110℃	1490	A
Power Dissipation	P_{tot1}	T_C=25℃	246	W
	P_{tot2}	T_C=110℃	107	W

Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 30A, Pulse, T_J = 25 °C	1.4	1.7	V
	V_{F2}	@ 30A, Pulse, T_J = 175 °C	1.6	2.0	V
Reverse Current at DC condition*	I_{R1}	@V_R = rated V_R, T_J = 25 °C	4	140	uA
Reverse Current *	I_{R2}	@V_R = rated V_R, T_J = 175 °C	40	400	uA
Junction Capacitance	C_T	V_R=0V, T_J=25℃,f=100MHz	2307	-	pF
Reverse Recovery Charge	Q_c	I_F = 30A, di/dt = 200A/μs V_R = 400 V, T_J =25°C	143.9	-	nC
Capacitance Stored Energy	E_C	V_R = 400 V, T_J =25°C	35.3	-	μJ

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

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Thermal-Mechanical Specifications:

Characteristics	Symbol	S3D30065A	S3D30065H	S3D30065G	S3D30065D1	Units
Junction Temperature	T_J	-55 to +175				°C
Storage Temperature	T_{stg}	-55 to +175				°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	1.3	0.61	1.65	0.84(per leg) 0.42(both leg)	°C/W

Ratings and Characteristics Curves

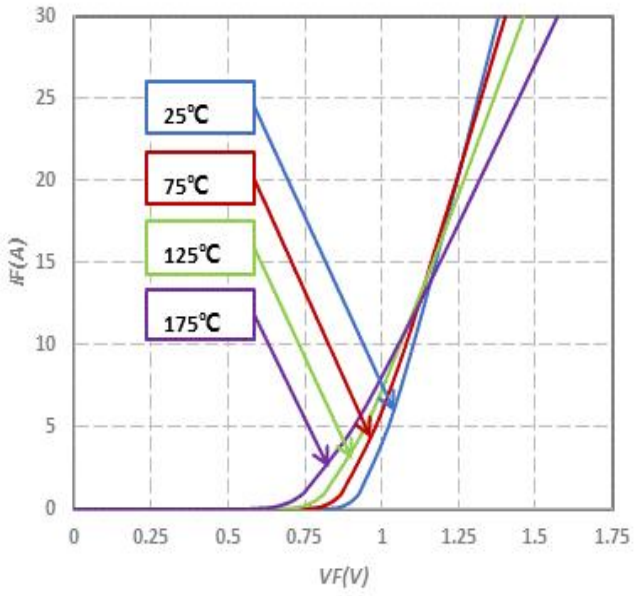

Fig.1-Typical Forward Voltage Characteristics

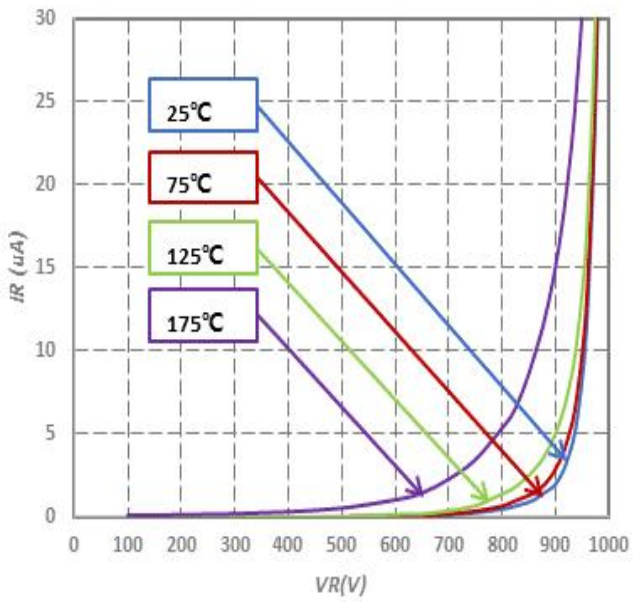

Fig.2-Typical Reverse Characteristics

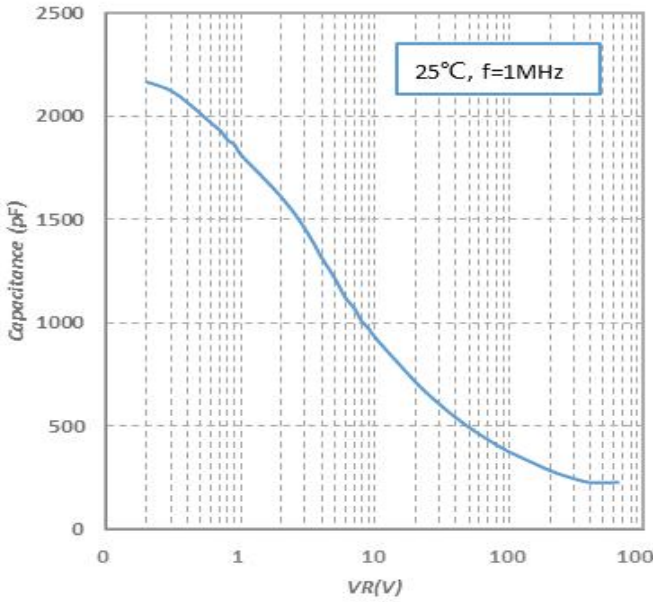

Fig.3-Capacitance vs. Reverse Voltage

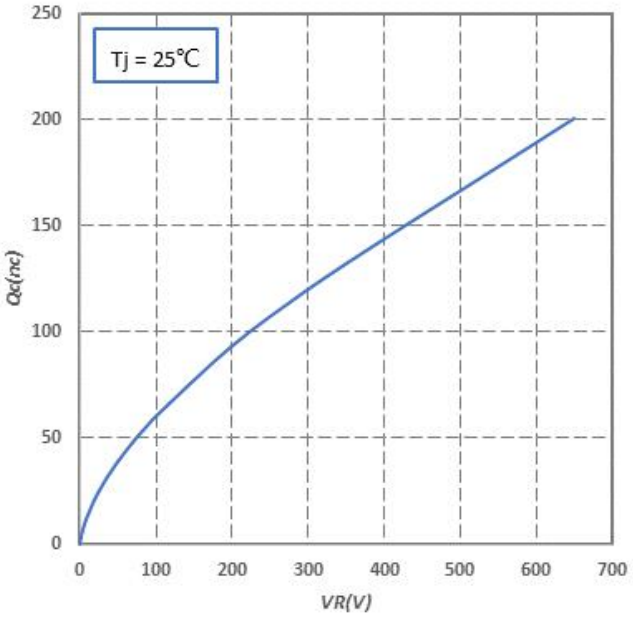

Fig.4-Total Capacitance Charge vs. Reverse Voltage

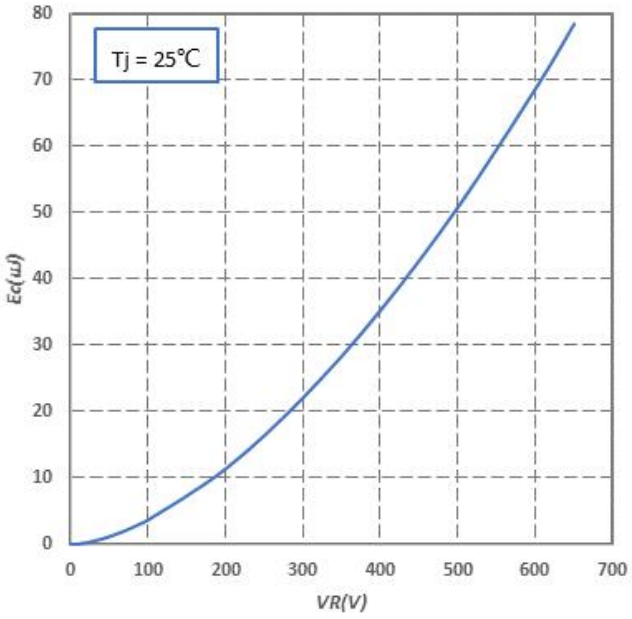

Fig.5-Capacitance Stored Energy

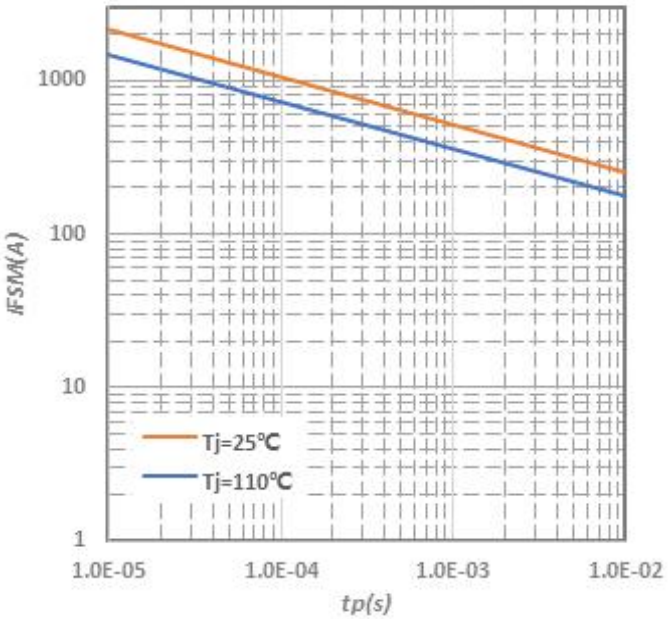

Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

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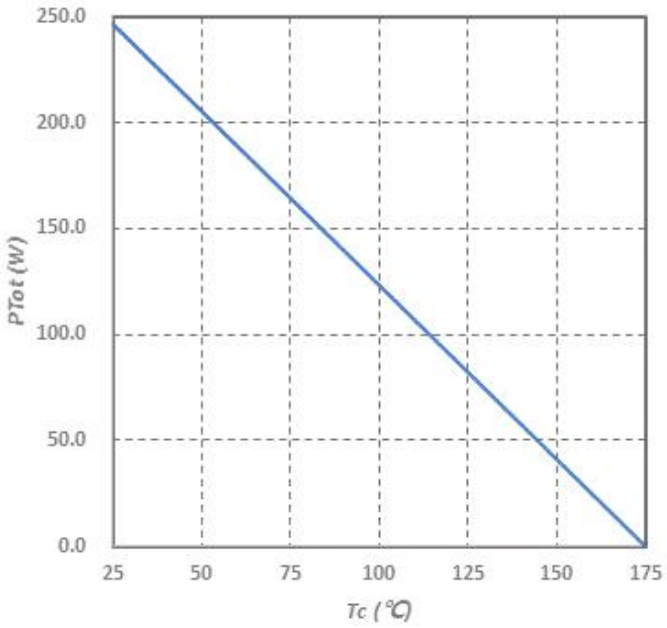


Fig.7-Power Derating

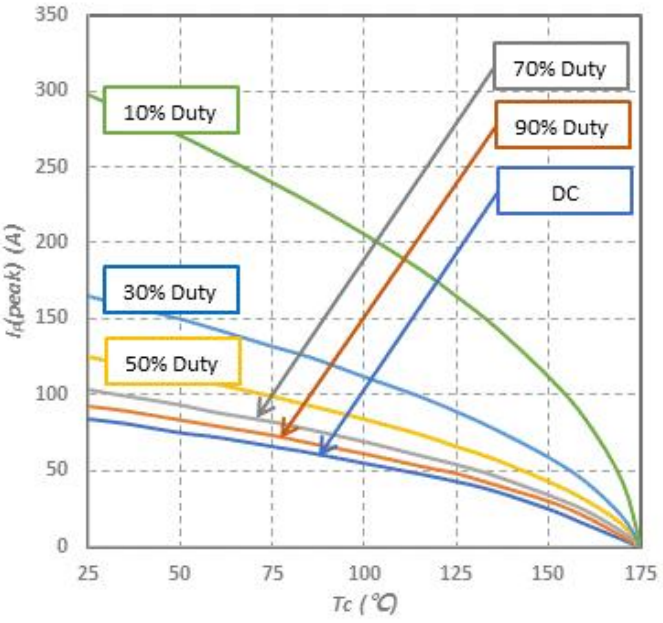
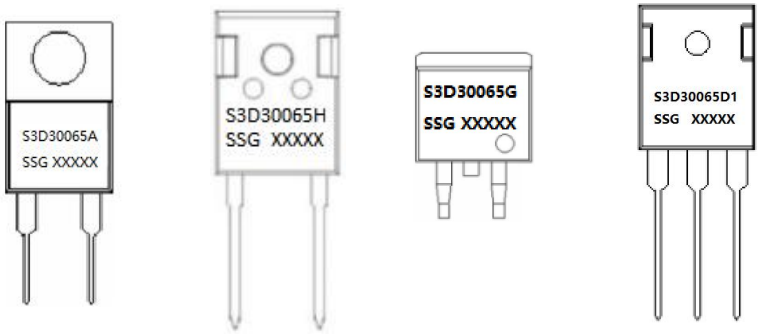


Fig.8-Current Derating

Marking Diagram



Where XXXXX is YYWWL

S3D = Device Type
30 = Forward Current (30A)
065 = Reverse Voltage (650V)
A/H/G/D1 = Package type
SSG = SSG
YY = Year
WW = Week
L = Lot Number

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

Ordering Information

Device	Package	Shipping
S3D30065A	TO-220AC(TO-220-2)	50pcs / tube
S3D30065H	TO-247AC(TO-247-2)	25pcs / tube
S3D30065G	D^2PAK(TO-263-2)	800pcs / reel
S3D30065GTR	D^2PAK(TO-263-2)	800pcs / reel
S3D30065D1	TO-247AD(TO-247-3)	25pcs / tube

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

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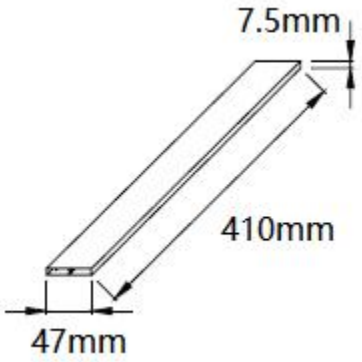
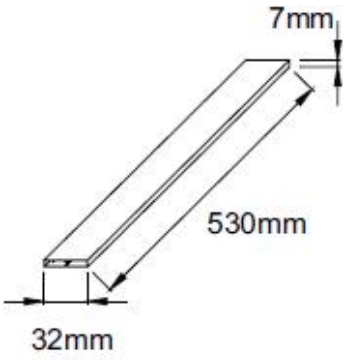
Tube Specification

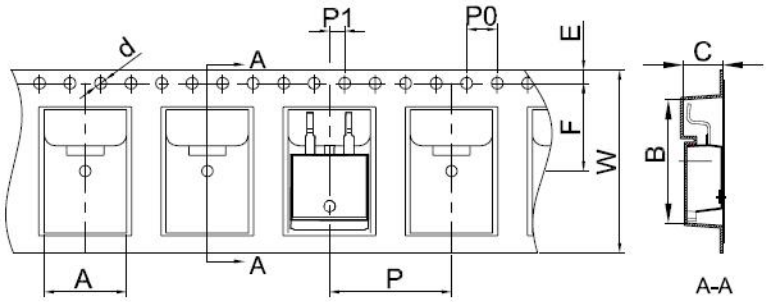


TO-247AC(TO-247-2)/TO-247AD(TO-247-3)



TO-220AC(TO-220-2)

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

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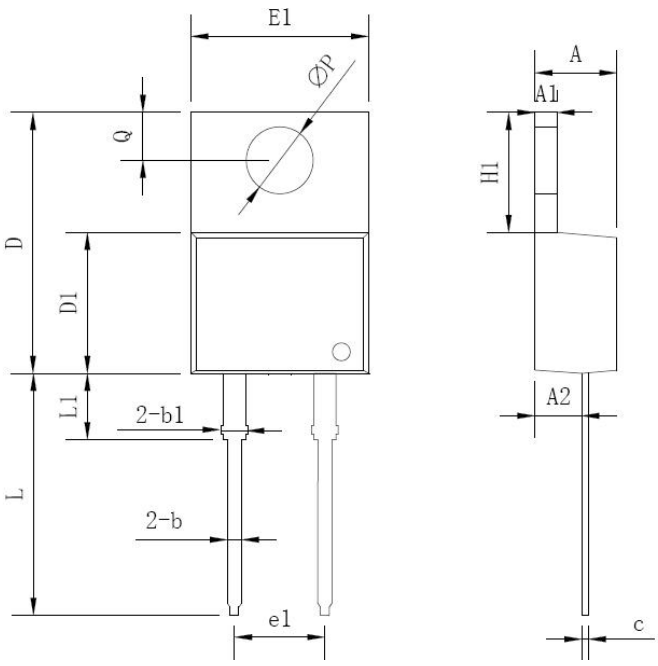
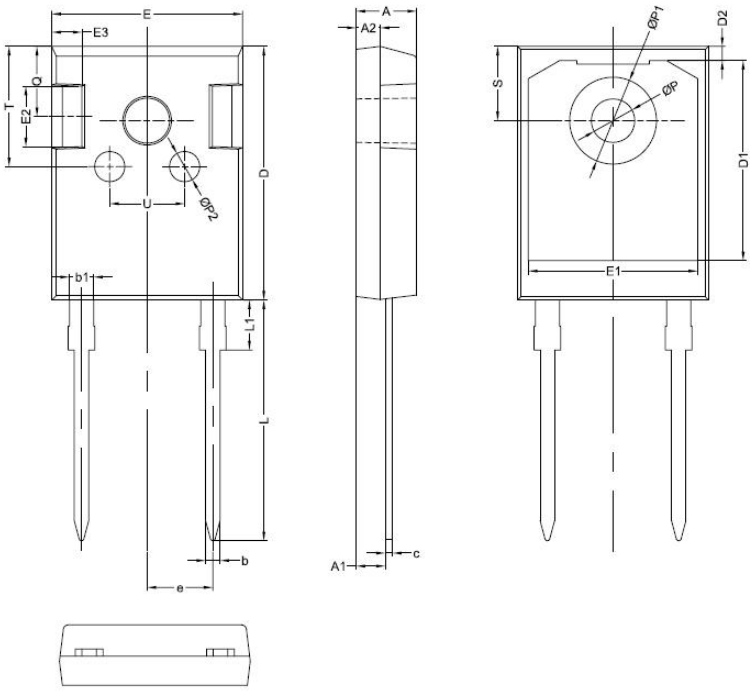
Mechanical Dimensions TO-220AC(TO-220-2)



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	

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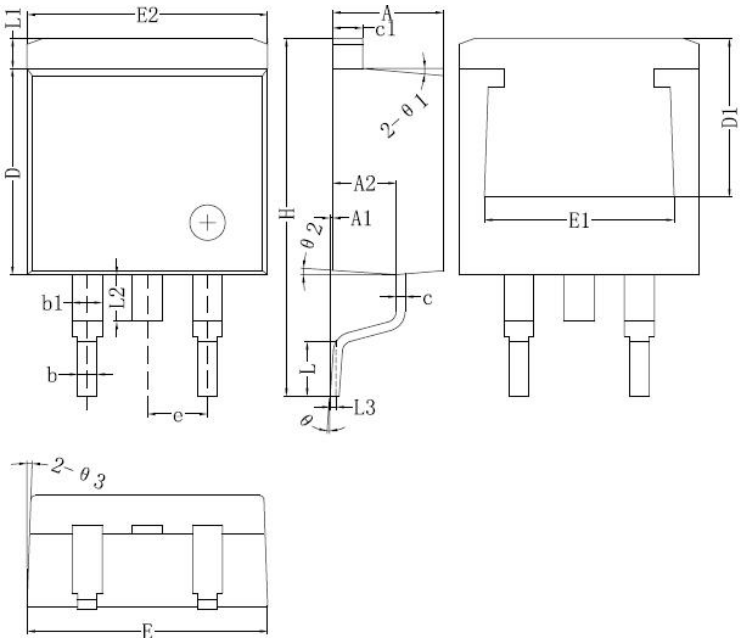
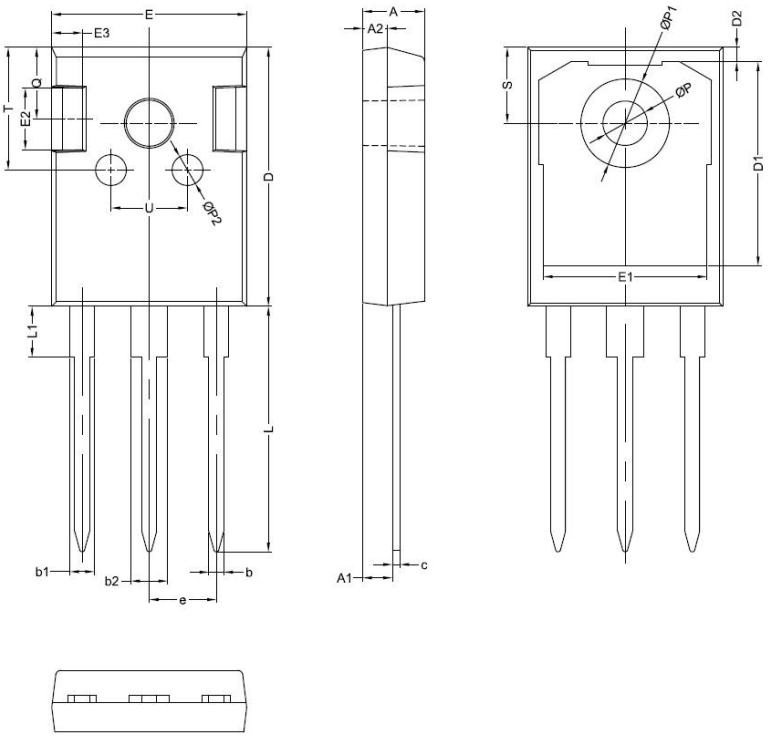
Mechanical Dimensions D²PAK(TO-263-2)



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	-	2.2
L3	0.255BSC	
Θ	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	

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