



Technical Data
Data Sheet N2289, REV.E



S3D10065A/S3D10065F/S3D10065E/S3D10065G/S3D10065I/S3D10065D1 10A 650V SIC POWER SCHOTTKY RECTIFIERS

Description

This 650V 10A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D10065A/S3D10065F/S3D10065E/S3D10065G/S3D10065I/S3D10065D1 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

S3D10065A	S3D10065F	S3D10065E	S3D10065G	S3D10065I	S3D10065D1
TO-220AC (TO-220-2)	ITO-220AC (TO-220-F2)	DPAK (TO-252-2)	D ² PAK (TO-263-2)	TO-220- Isolation	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	$I_F (AV)1$	$T_c=25^{\circ}C$	31	A
	$I_F (AV)2$	$T_c=135^{\circ}C$	14	A
	$I_F (AV)3$	$T_c=150^{\circ}C$	10	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, $T_J=25^{\circ}C$	55	A
	I_{FRM2}	10ms, Half Sine pulse, $T_J=110^{\circ}C$	40	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, $T_J=25^{\circ}C$	115	A
	I_{FSM2}	10ms, Half Sine pulse, $T_J=110^{\circ}C$	80	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10 μ s. Pulse, $T_J=25^{\circ}C$	995	A
	$I_{F,Max2}$	10 μ s. Pulse, $T_J=110^{\circ}C$	685	A
Power Dissipation	P_{tot1}	$T_J=25^{\circ}C$	103	W
	P_{tot2}	$T_J=110^{\circ}C$	45	W
TO-220 Mounting Torque		M3 Screw	1	Nm
		6-32 Screw	8.8	bf-in



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Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V _{F1}	@ 10A, Pulse, T _J = 25 °C	1.45	1.7	V
	V _{F2}	@ 10A, Pulse, T _J = 175 °C	1.65	2.0	V
Reverse Current*	I _{R1}	@V _R = rated V _R T _J = 25 °C	0.7	40	μA
	I _{R2}	@V _R = rated V _R T _J = 175 °C	7	160	μA
Junction Capacitance	C _T	V _R =0V, T _J =25°C, f=1MHz	680	-	pF
Reverse Recovery Charge	Q _c	I _F = 10A, di/dt = 200A/μs V _R = 400 V, T _J =25°C	42.4	-	nC
Capacitance Stored Energy	E _c	V _R = 400 V, T _J =25°C	10.4	-	μJ

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

Thermal-Mechanical Specifications:

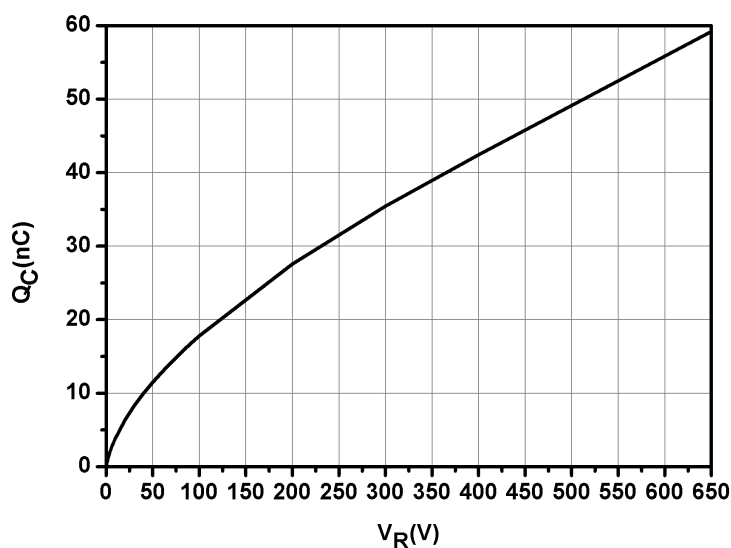
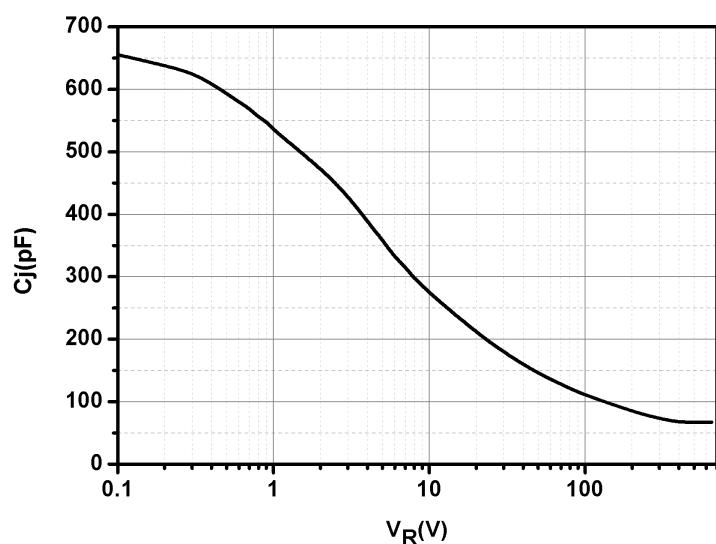
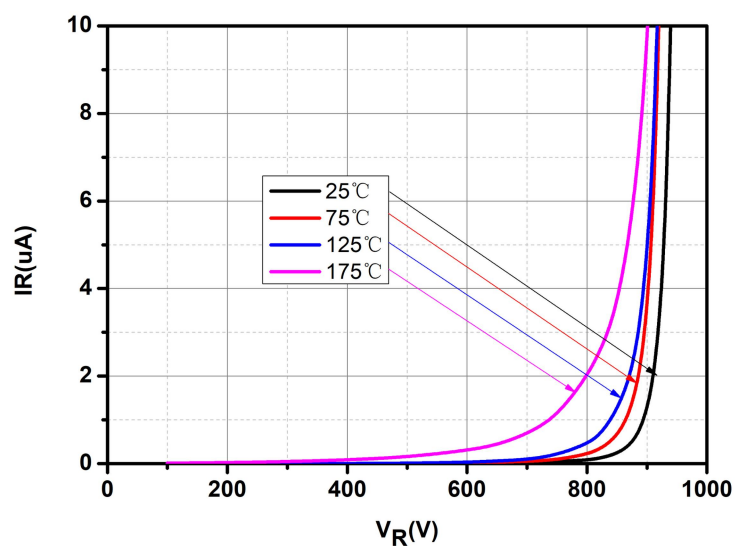
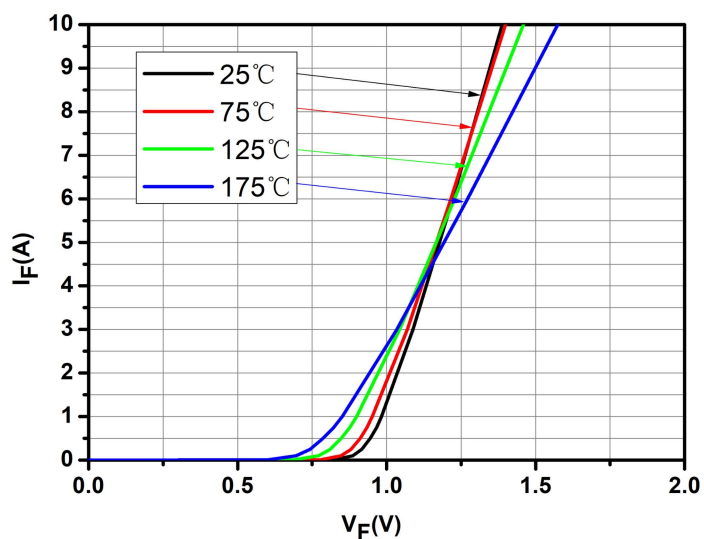
Characteristics	Symbol	S3D10065A	S3D10065F	S3D10065E	S3D10065G	S3D10065I	S3D10065D1	Units
Junction Temperature	T _J	-55 to +175						°C
Storage Temperature	T _{stg}	-55 to +175						°C
Typical Thermal Resistance Junction to Case	R _{θJC}	1.4	4	1.5	1.65	3.3	0.84(per leg) 0.42(both leg)	°C/W

Ordering Information

Device	Package	Shipping
S3D10065A	TO-220AC(TO-220-2)	50pcs / tube
S3D10065F	ITO-220AC(TO-220-F2)	50pcs / tube
S3D10065E	DPAK(TO-252-2)	2500pcs / reel
S3D10065ETR	DPAK(TO-252-2)	2500pcs / reel
S3D10065G	D2PAK(TO-263-2)	800pcs / reel
S3D10065GTR	D2PAK(TO-263-2)	800pcs / reel
S3D10065I	TO-220-Isolation	50pcs / tube
S3D10065D1	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.

Ratings and Characteristics Curves



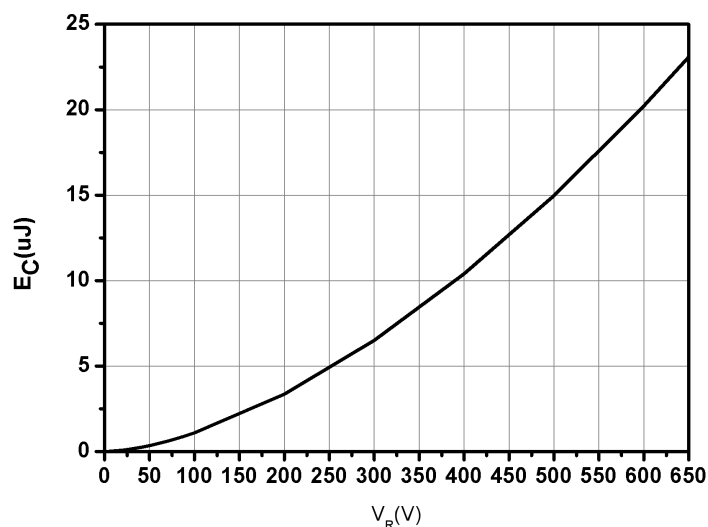


Fig.5-Capacitance Stored Energy

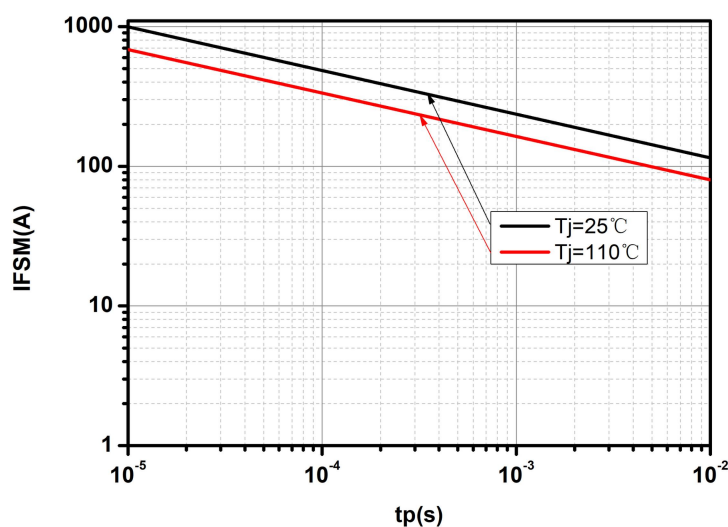


Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

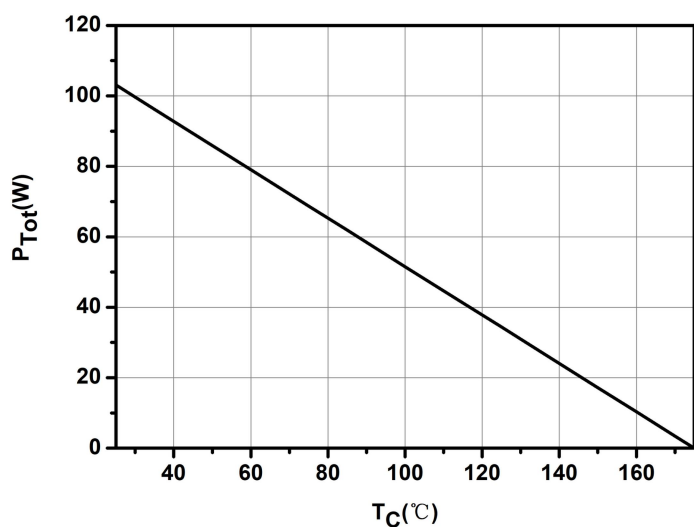


Fig.7-Power Derating

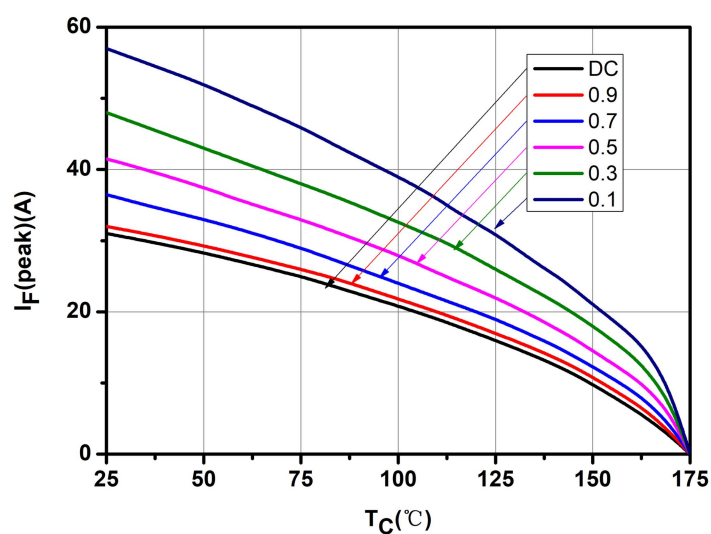


Fig.8-Current Derating

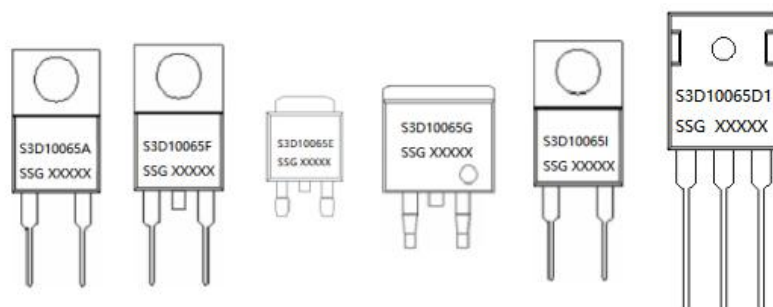
S3D10065A
S3D10065F
S3D10065E
S3D10065G
S3D10065I
S3D10065D1



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Marking Diagram

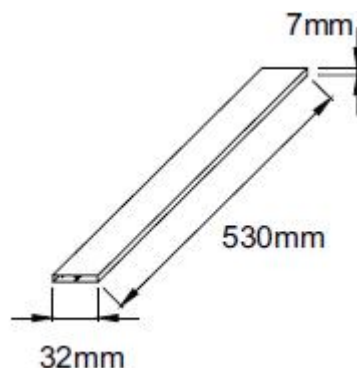


Where XXXXX is YYWWL

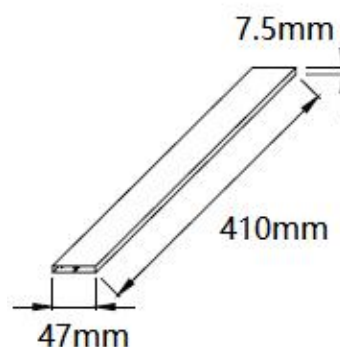
S3D = Device Type
A/F/E/G/I/D1 = Package type
10 = Forward Current (10A)
065 = Reverse Voltage (650V)
SSG = SSG
YY = Year
WW = Week
L = Lot Number

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

Tube Specification

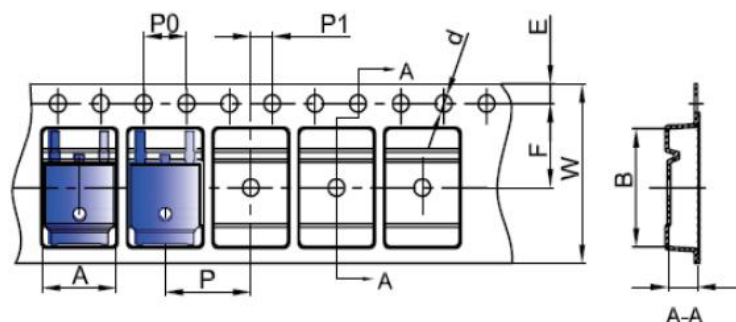


(TO-220-2/TO-220-F2/TO-220-Isolation)



(TO-247-3)

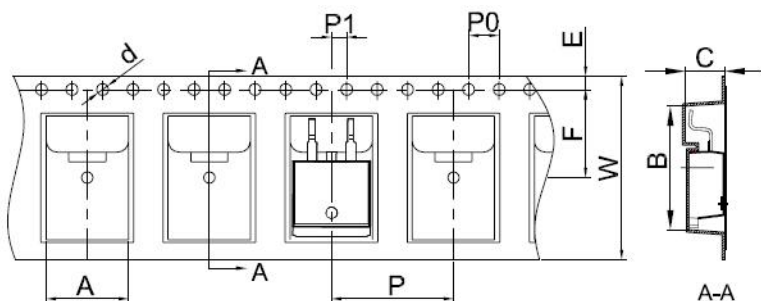
Carrier Tape & Reel Specification DPAK(TO-252-2)



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

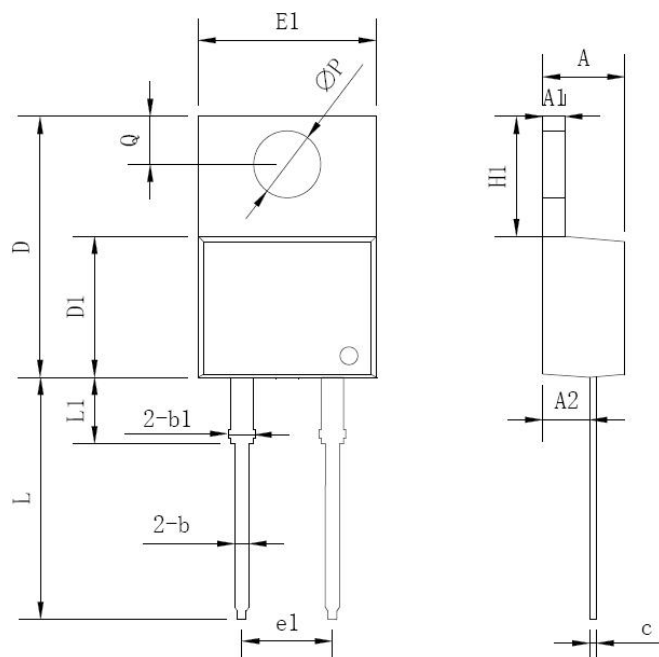
- China - Germany - Korea - Singapore - United States •
- <http://www.smc-diodes.com> - sales@smc-diodes.com •

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



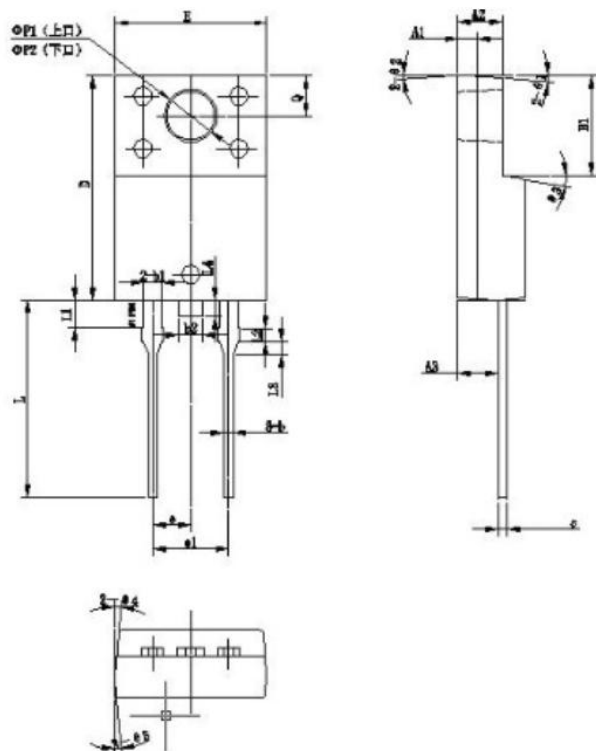
SYMBOL	Millimeters	
	Min.	Max.
A	10.70	10.90
B	16.03	16.23
C	5.11	5.31
d	1.45	1.65
E	1.65	1.85
F	11.40	11.60
P0	3.90	4.10
P	15.90	16.10
P1	1.90	2.10
W	23.90	24.30

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



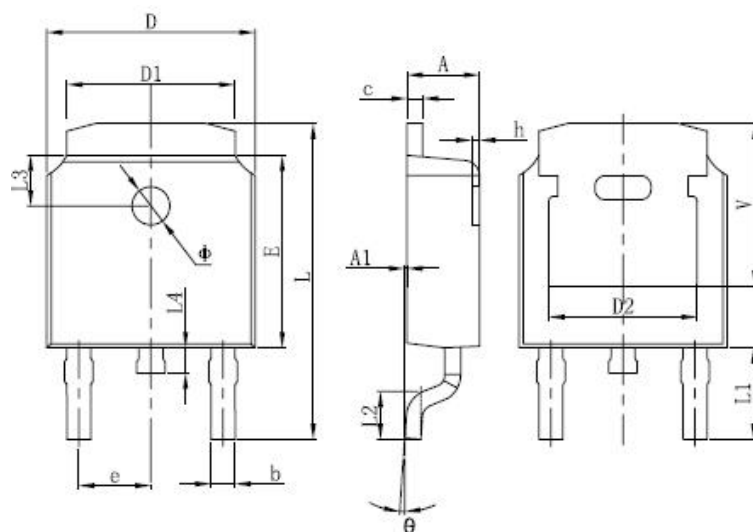
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E1	9.65	10.16	10.67
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
ΦP	-	3.56	-
Q	2.54	-	3.43

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



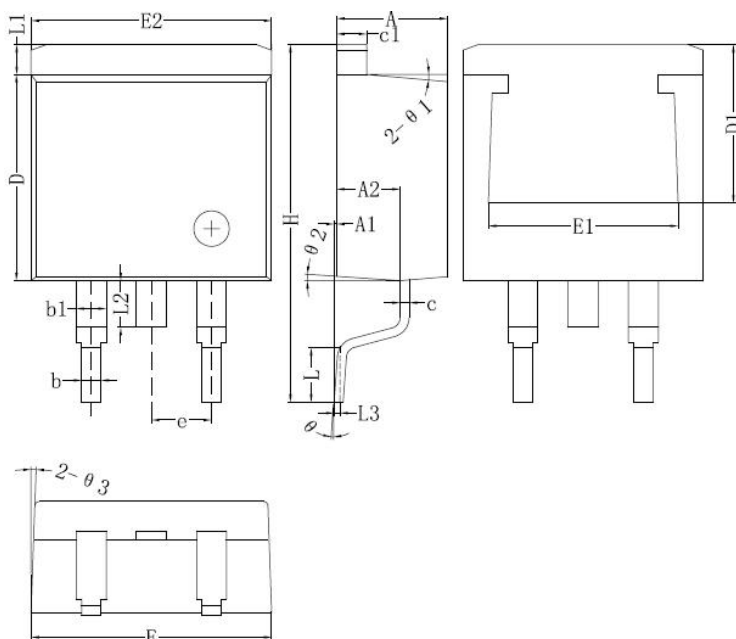
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	4.30	4.0	4.70
A1		1.30	
A2	2.80	3.00	3.20
A3	2.50	2.70	2.90
b	0.5	0.6	0.75
b1		1.20	
b2		1.60	
e	0.55	0.6	0.75
D	14.80	15.00	15.20
E	8.96	10.14	10.36
e1		2.55	
e1		5.10	
H1	8.50	8.70	8.90
L	17.70	18.20	18.70
L1		1.80	
L2		1.00	
L3		0.80	
L4		1.10	
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°	

Mechanical Dimensions DPAK(TO-252-2)



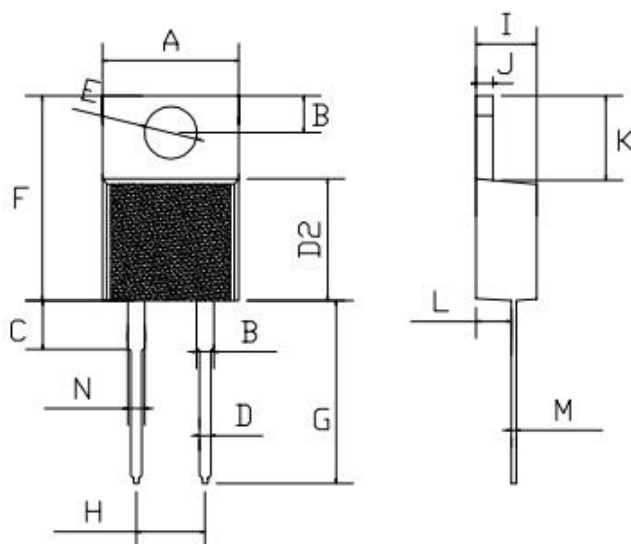
SYMBOL	Dimensions in millimeters		
	Min.	Typ.	Max.
A	2.18	-	2.39
A1	-	-	0.13
b	0.64	-	0.89
c	0.46	-	0.89
D	6.35	-	6.73
D2	4.32	-	-
E	5.97	6.10	6.22
e	2.29BSC		
L	9.40	-	10.41
L2	1.40	1.52	1.78
L4	-	-	1.02
Θ	0°	-	10°
V	5.21	-	-

Mechanical Dimensions D²PAK(TO-263-2)



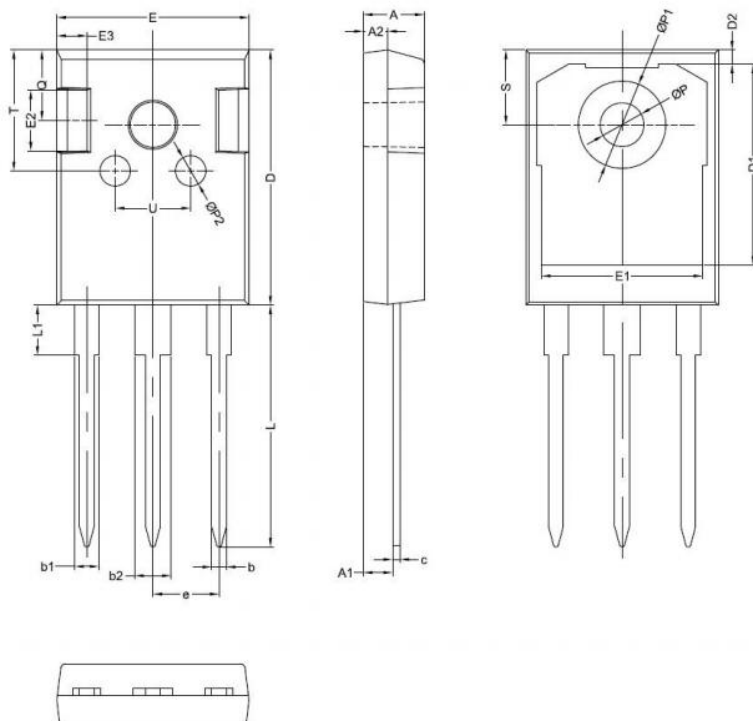
Symbol	Dimensions in millimeters	
	Min.	Max.
A	4.06	4.83
A1	0	0.26
b	0.51	0.99
b1	1.14	1.78
c	0.31	0.74
c1	1.14	1.65
D	8.38	8.65
D1	6.40	
E1	6.22	
E2	9.65	10.67
e	2.54BSC	
H	14.60	15.88
L	1.78	2.80
L1	-	1.68
L2	-	2.2
L3	0.255BSC	
Θ	0	8°

Mechanical Dimensions TO-220-Isolation



SYMBOL	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	9.7	10.4	0.381	0.409
B	2.5	3.0	0.098	0.118
C	3.5	3.9	0.137	0.153
D	0.7	0.92	0.027	0.036
E	3.72	3.95	0.146	0.155
F	14.51	15.55	0.571	0.612
G	12.95	13.9	0.509	0.547
H	4.95	5.19	0.194	0.204
I	4.38	4.65	0.172	0.183
J	1.15	1.36	0.045	0.053
K	5.86	6.38	0.230	0.251
L	2.35	2.85	0.092	0.112
M	0.32	0.58	0.012	0.022
N	1.18	1.42	0.046	0.055

Mechanical Dimensions TO-247AD



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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