Technical Data
Data Sheet N2331, REV.H

S3D06065A/S3D06065F/S3D06065E/S3D06065G/S3D06065I
6A 650V SIC POWER SCHOTTKY RECTIFIERS

Description

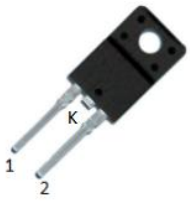
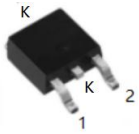
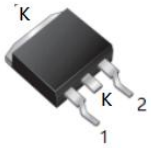
This 650V 6A diode is a high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D06065A/S3D06065F/S3D06065E/ S3D06065G/S3D06065I are ideal for energy sensitive, high frequency applications in challenging environments.

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

S3D06065A	S3D06065F	S3D06065E	S3D06065G	S3D06065I
				
TO-220AC (TO-220-2)	ITO-220AC (TO-220-F2)	DPAK (TO-252-2)	D^2PAK (TO-263-2)	TO-220-Isolation
				

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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	24	A
	$I_{F\ (AV)2}$	Tc=136°C	9	A
	$I_{F\ (AV)3}$	Tc=157°C	6	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, T_C=25°C	30	A
	I_{FRM2}	10ms, Half Sine pulse, T_C=110°C	20	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, T_C=25°C	70	A
	I_{FSM2}	10ms, Half Sine pulse, T_C=110°C	48	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10μs. Pulse, T_C=25℃	600	A
	$I_{F,Max2}$	10μs. Pulse, T_C=110℃	500	A
Power Dissipation	P_{tot1}	T_C=25℃	103	W
	P_{tot2}	T_C=110℃	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}	@ 6A, Pulse, T_J = 25 °C	1.5	1.7	V
	V_{F2}	@ 6A, Pulse, T_J = 175 °C	1.75	2.2	V
Reverse Current*	I_{R1}	@V_R = rated V_R T_J = 25 °C	0.03	3	uA
	I_{R2}	@V_R = rated V_R T_J = 175 °C	0.6	25	uA
Junction Capacitance	C_T	V_R=0V, T_J=25℃, f=1MHz	382	-	pF
Reverse Recovery Charge	Q_c	I_F = 6A, di/dt = 200A/μs V_R = 400 V, T_J =25°C	23.8	-	nC
Capacitance Stored Energy	E_C	V_R = 400 V, T_J =25°C	5.88	-	μJ

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

Thermal-Mechanical Specifications:

Characteristics	Symbol	S3D06065A	S3D06065F	S3D06065E	S3D06065G	S3D06065I	Units
Junction Temperature	T_J	-55 to +175					°C
Storage Temperature	T_{stg}	-55 to +175					°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	1.7	4	1.5	1.65	3.3	°C/W

Ordering Information

Device	Package	Shipping
S3D06065A	TO-220AC(TO-220-2)	50pcs / tube
S3D06065F	ITO-220AC(TO-220-F2)	50pcs / tube
S3D06065E	DPAK(TO-252-2)	2500pcs / reel
S3D06065ETR	DPAK(TO-252-2)	2500pcs / reel
S3D06065G	D2PAK(TO-263-2)	800pcs / reel
S3D06065GTR	D2PAK(TO-263-2)	800pcs / reel
S3D06065I	TO-220-Isolation	50pcs / 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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Ratings and Characteristics Curves

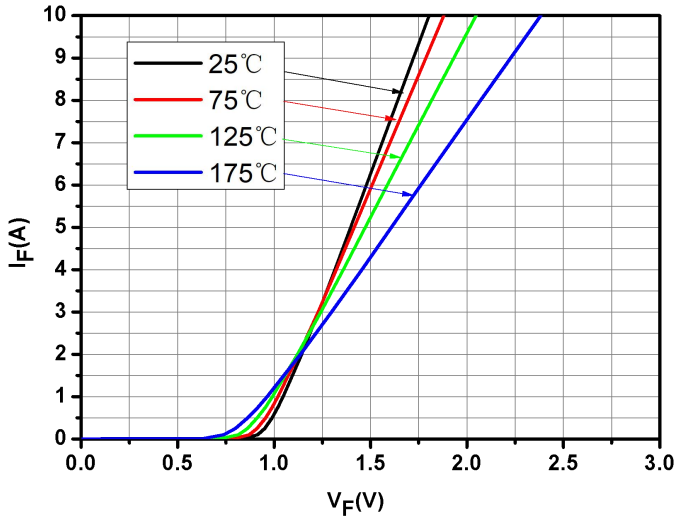

Fig.1-Typical Forward Voltage Characteristics

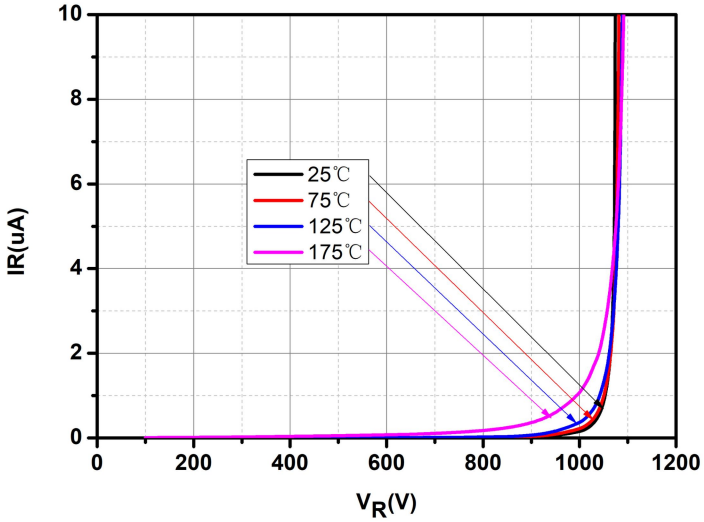

Fig.2-Typical Reverse Characteristics

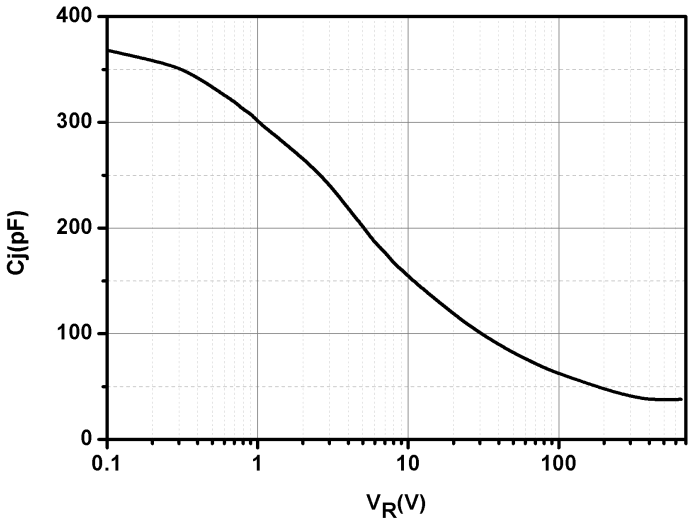

Fig.3-Capacitance vs. Reverse Voltage

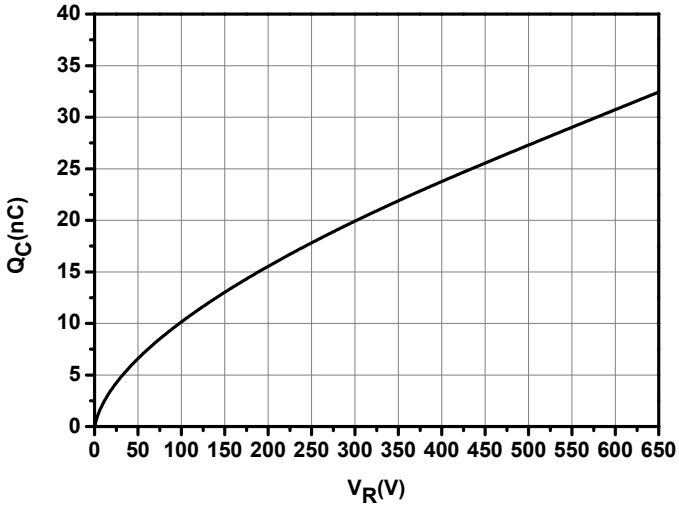

Fig.4-Total Capacitance Charge vs. Reverse Voltage

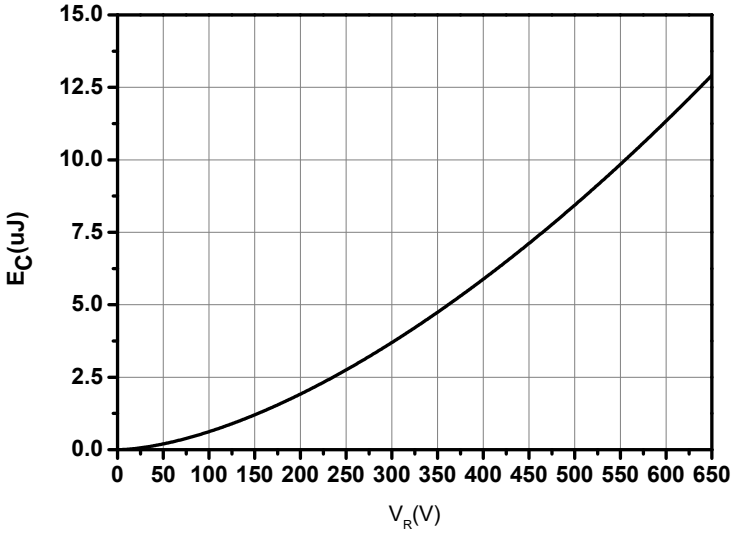

Fig.5-Capacitance Stored Energy

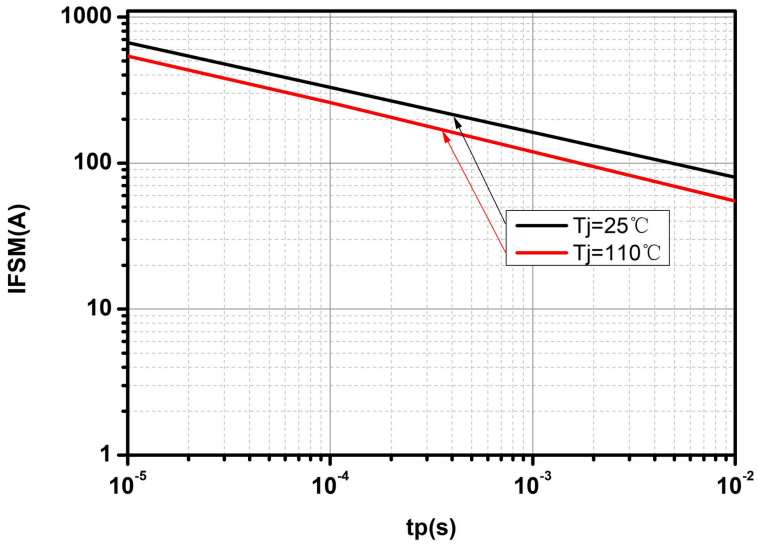

Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

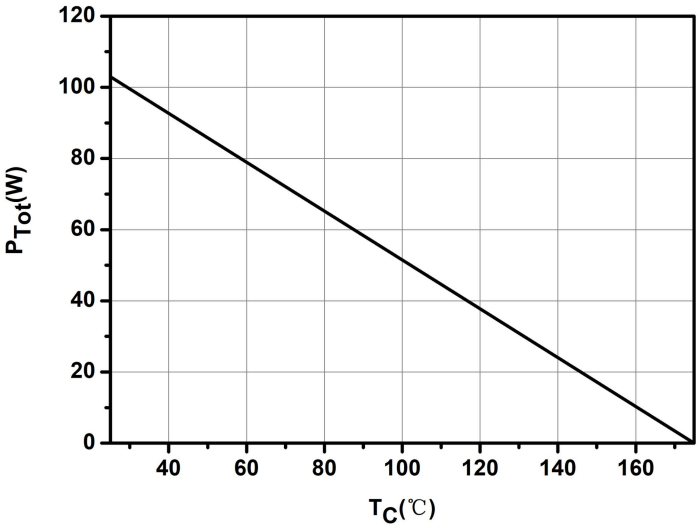

Fig.7-Power Derating

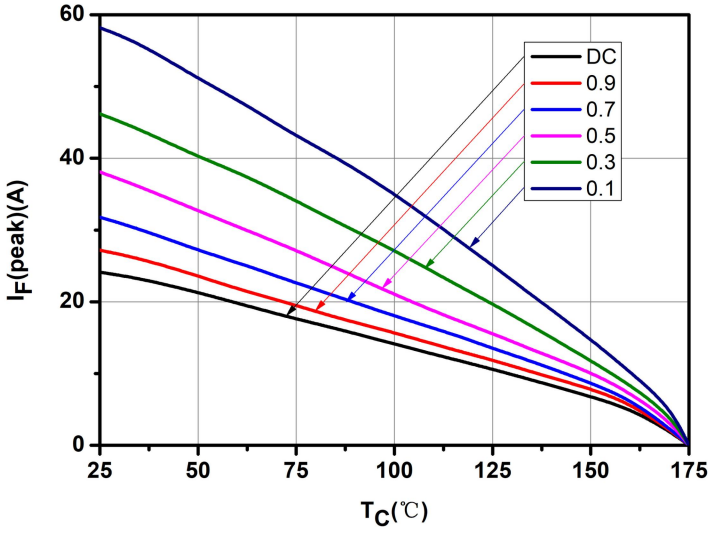

Fig.8-Current Derating

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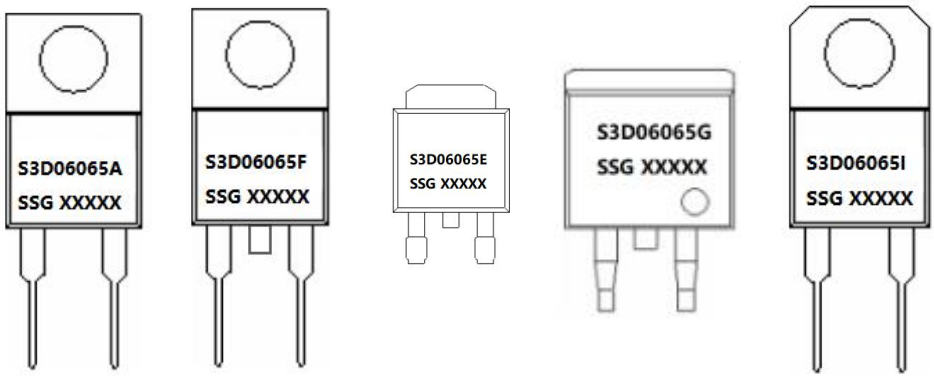
Marking Diagram

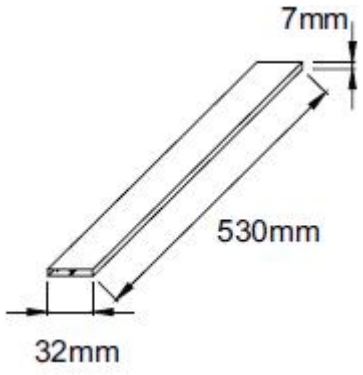


Where XXXXX is YYWWL

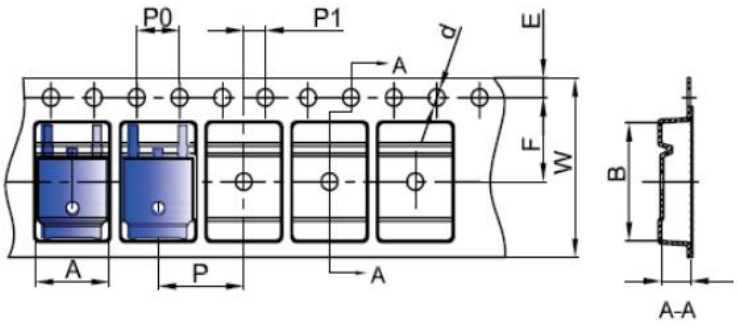
S3D	= Device Type
A/F/E/G/I	= Package type
06	= Forward Current (6A)
065	= Reverse Voltage (650V)
SSG	= SSG
YY	= Year
WW	= Week
L	= Lot Number

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

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



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

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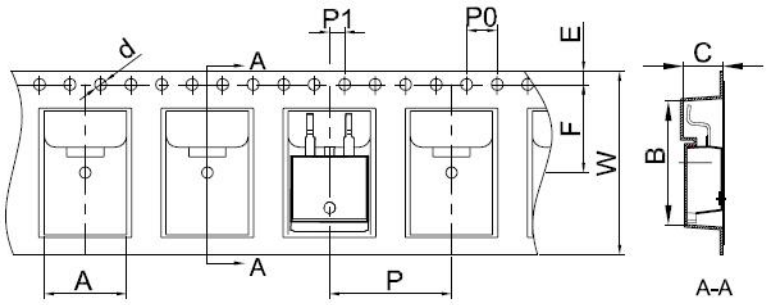
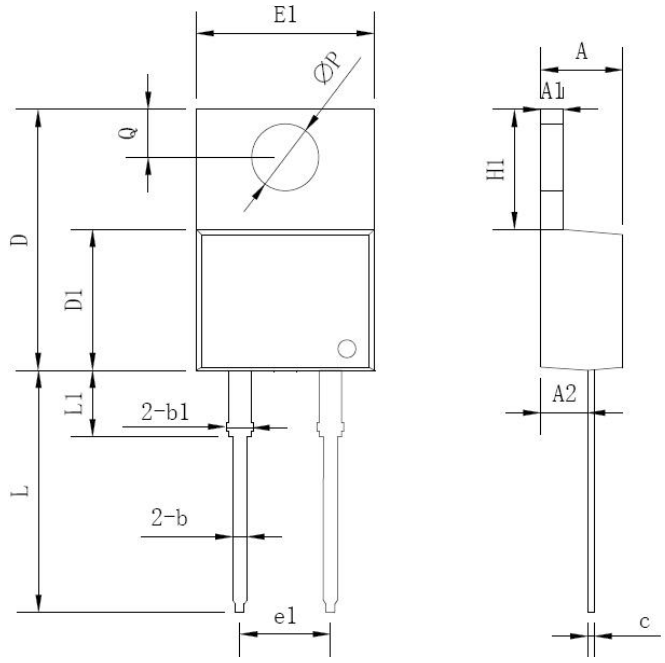
Carrier Tape & Reel Specification D2PAK(TO-263-2)



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

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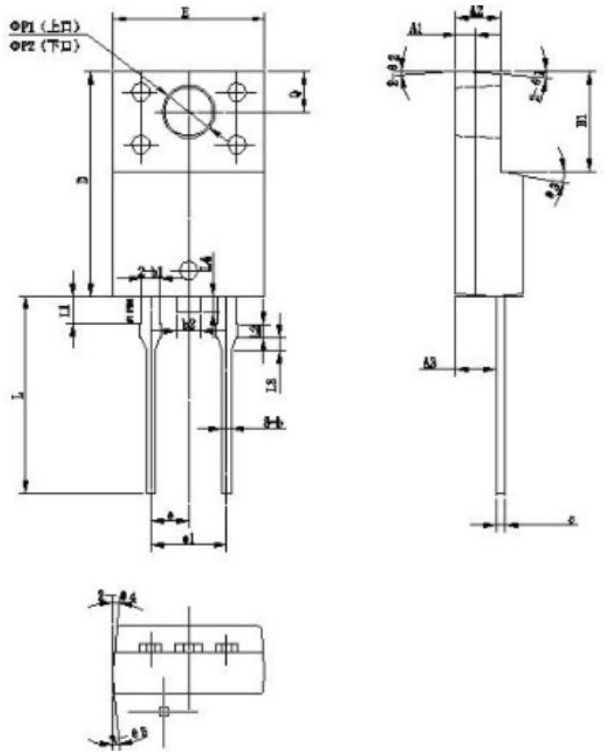
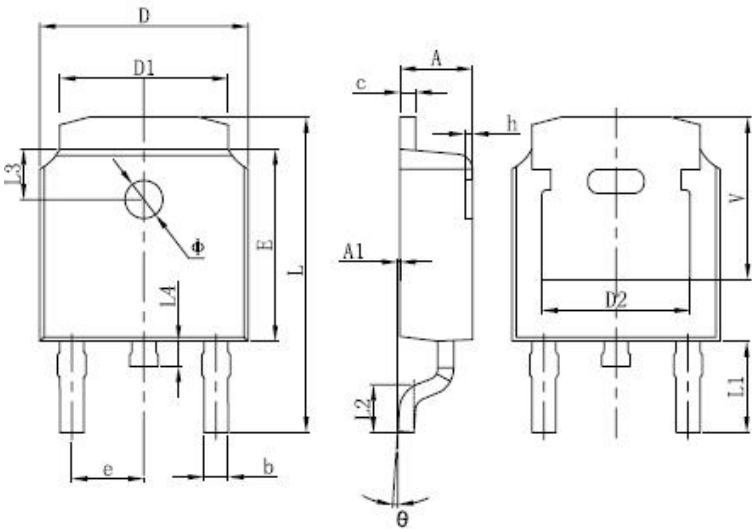
Mechanical Dimensions ITO-220AC(TO-220-2F)



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
e		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
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	-	-

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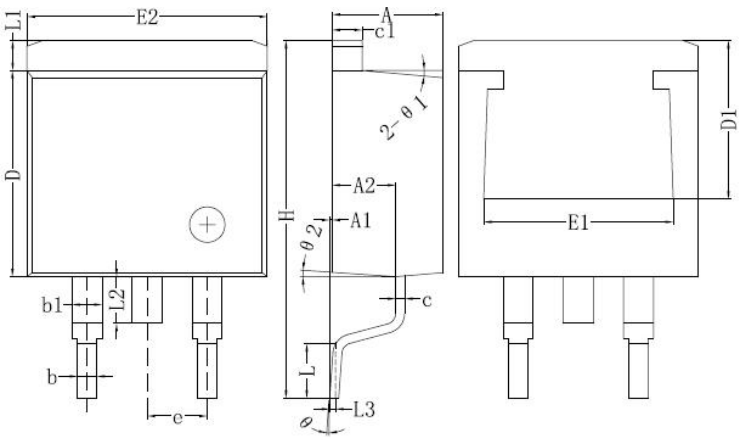
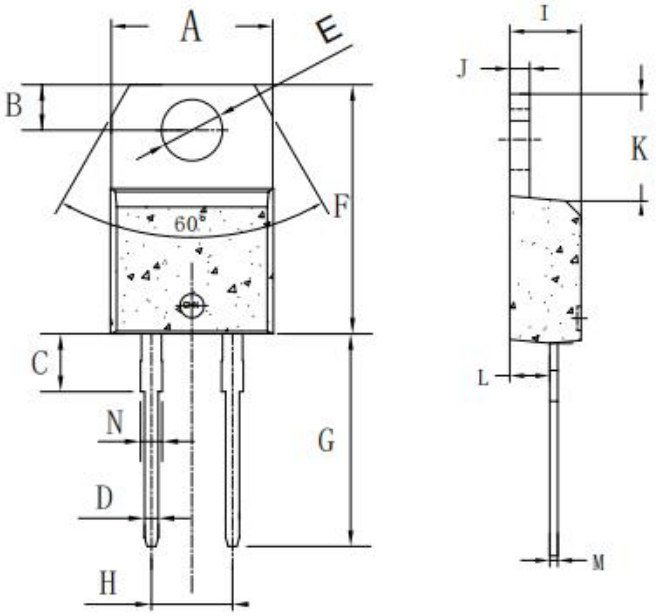
Mechanical Dimensions D²PAK(TO-263-2)



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	9.65
D1	6.40	
E1	6.22	
E2	9.65	10.67
e	2.54BSC	
H	14.6	15.88
L	1.78	2.8
L1	-	1.68
L2	-	2.2
L3	0.255BSC	
Θ	0	8°

Mechanical Dimensions TO-220-Isolation



Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	9.7	-	10.4
B	2.65	-	3.1
C	2.8	-	4.2
D	0.7	-	0.92
E	3.75	-	3.95
F	14.8	-	16.1
G	13.05	-	13.6
H	4.9	-	5.3
I	4.38	-	4.61
J	1.15	-	1.36
K	5.85	-	6.82
L	2.35	-	2.75
M	0.35	-	0.65
N	1.18	-	1.42

Notes: New Mechanical Dimensions is performed from date code 25041.

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