

S3D20065A/S3D20065H/S3D20065G 650V SiC POWER SCHOTTKY RECTIFIERS

Description



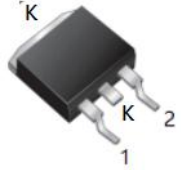
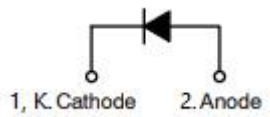
S3D20065A/S3D20065H/S3D20065G are SiC Schottky rectifiers packaged in TO-220AC(TO-220-2)/TO-247AC(TO-247-2)/D2PAK(TO-263-2) case. The devices are high voltage Schottky rectifiers that have very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D20065A/S3D20065H/S3D20065G are ideal for energy sensitive, high frequency applications in challenging

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
- 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	S3D20065H	S3D20065G
		
TO-220AC (TO-220-2)	TO-247AC (TO-247-2)	D2PAK (TO-263-2)
 <p>1, K. 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_{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, $T_J=25^{\circ}C$	105	A
	I_{FRM2}	10ms, Half Sine pulse, $T_J=110^{\circ}C$	70	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, $T_J=25^{\circ}C$	170	A
	I_{FSM2}	10ms, Half Sine pulse, $T_J=110^{\circ}C$	145	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max}$	10 μ s. Pulse, $T_J=25^{\circ}C$	1830	A
	$I_{F,Max}$	10 μ s. Pulse, $T_J=110^{\circ}C$	1260	A
Power Dissipation	P_{tot1}	$T_J=25^{\circ}C$	136	W
	P_{tot1}	$T_J=110^{\circ}C$	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	$I_F = 20A$, $di/dt=200A/\mu s$ $V_R = 400 V$, $T_J = 25^{\circ}C$	96.7	-	nC
Capacitance Stored Energy	E_c	$V_R = 400 V$	23.69	-	μ J

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

Thermal-Mechanical Specifications:

Characteristics	Symbol	S3D20065A	S3D20065H	S3D20065G	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	0.61	1.65	$^{\circ}C/W$

Ordering Information

Device	Package	Plating	Shipping
S3D20065A	TO-220AC(TO-220-2)	Pure Sn	50pcs / tube
S3D20065H	TO-247AC(TO-247-2)	Pure Sn	25pcs / tube
S3D20065G	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

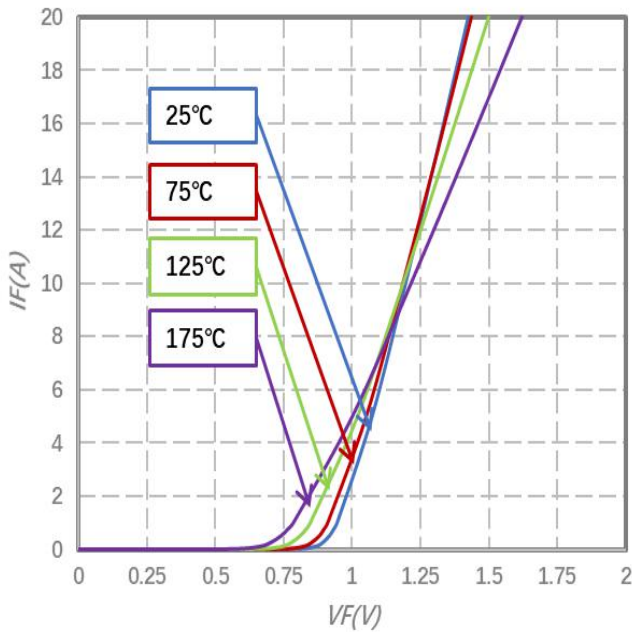


Fig.1-Typical Forward Voltage Characteristics

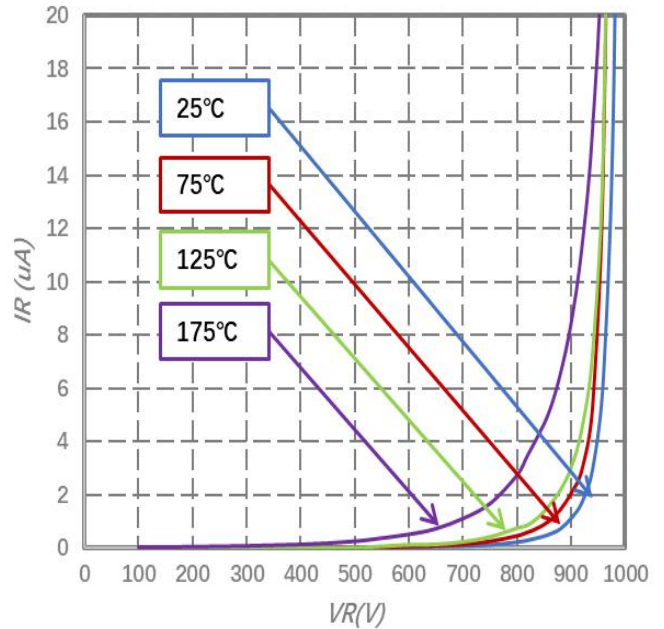


Fig.2-Typical Reverse Characteristics

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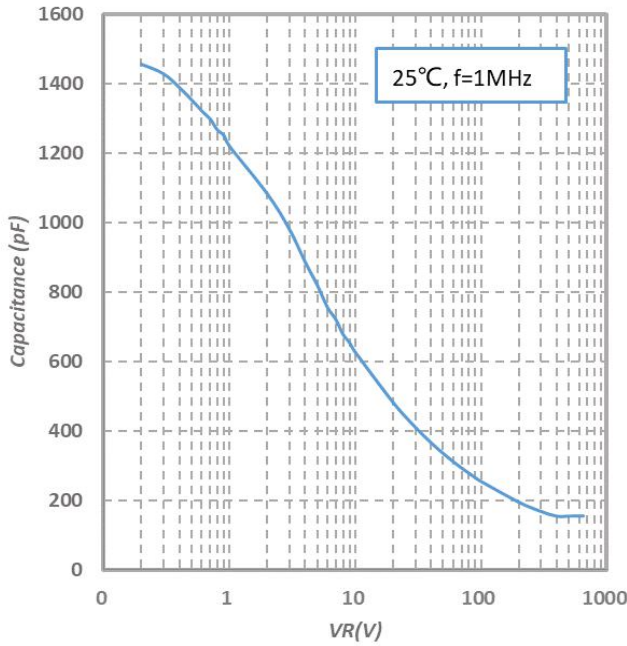


Fig.3-Capacitance vs. Reverse Voltage

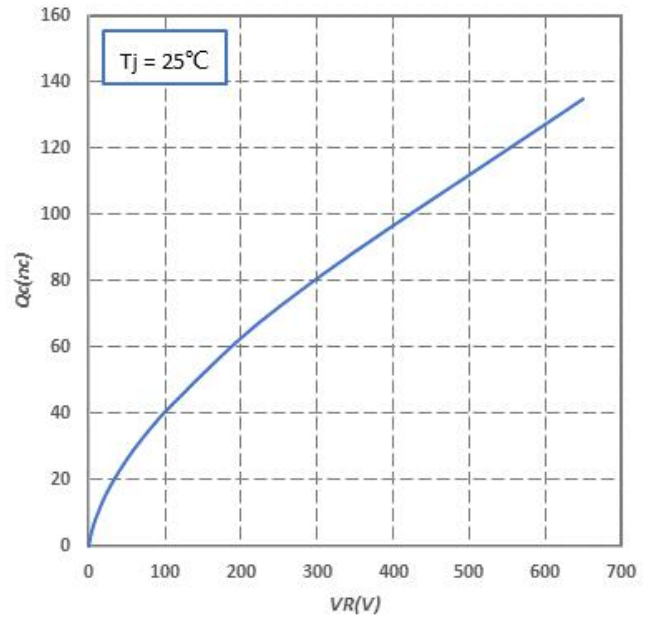


Fig.4-Total Capacitance Charge vs. Reverse Voltage

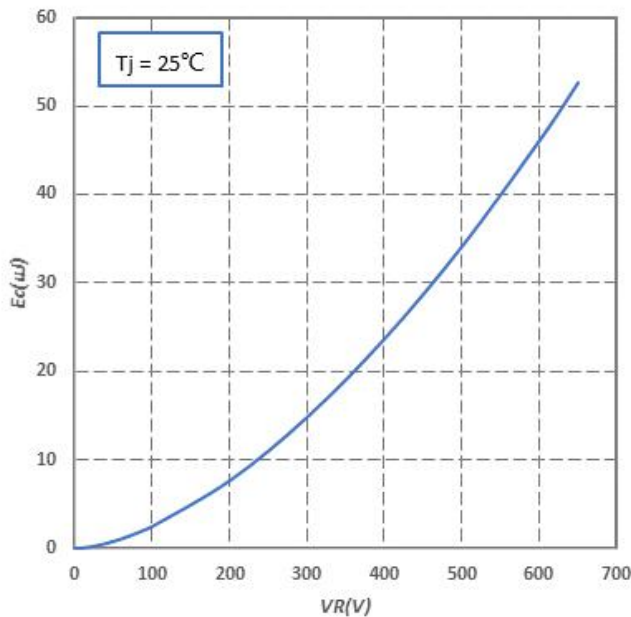


Fig.5-Capacitance Stored Energy

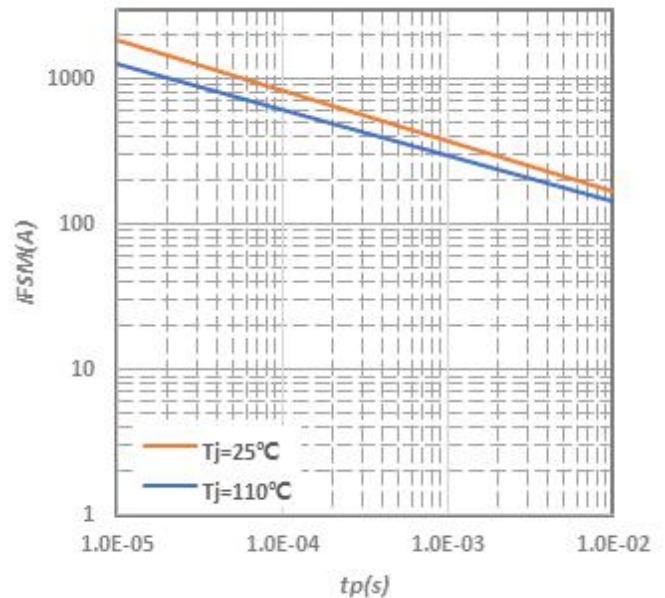


Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

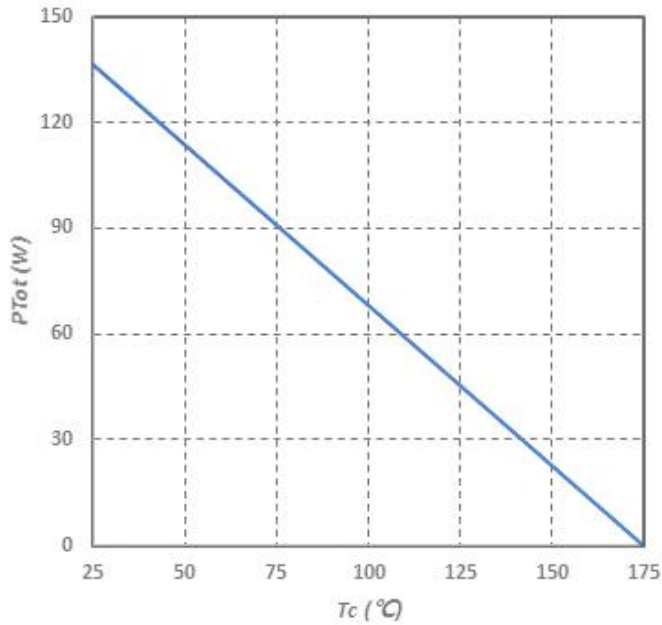


Fig.7-Power Derating

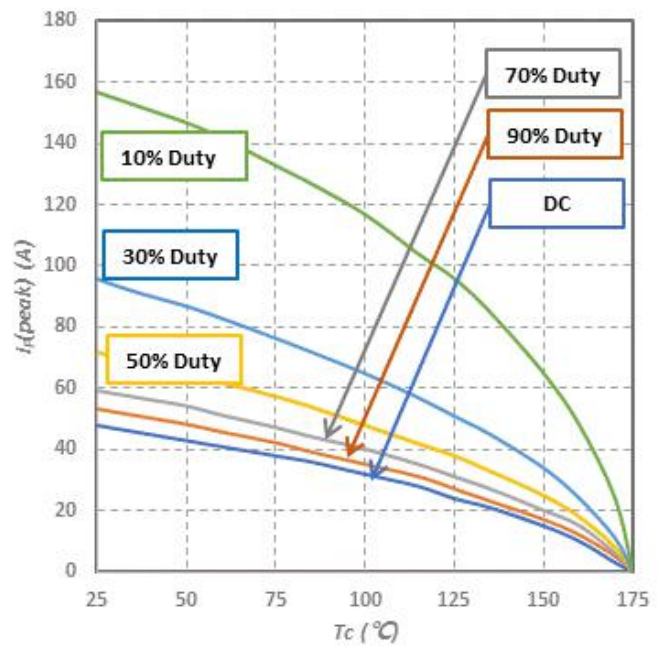
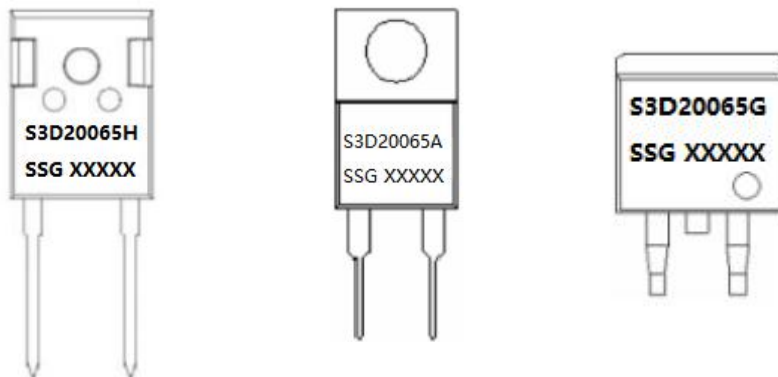


Fig.8-Current Derating

Marking Diagram

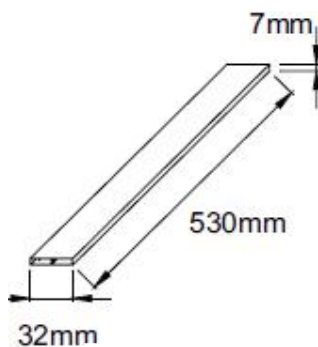


Where XXXXX is YYWWL

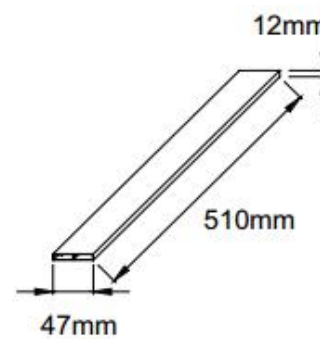
S3D = Device Type
A/H/G = Package type
20 = Forward Current (20A)
065 = Reverse Voltage (650V)
SSG = SSG
YY = Year
WW = Week
L = Lot Number

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

Tube Specification

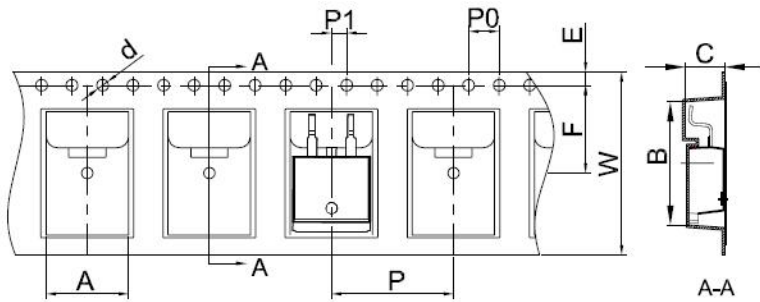


TO-220AC(TO-220-2)



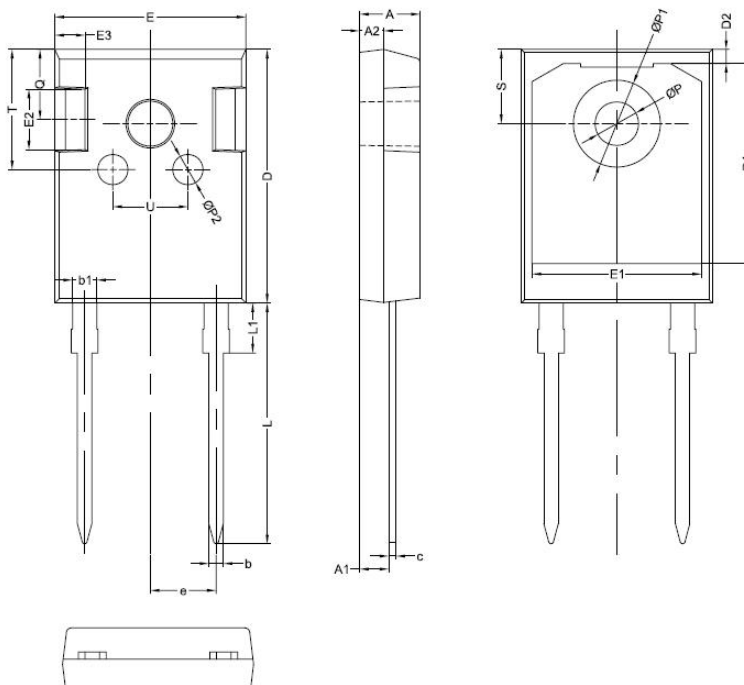
TO-247AC(TO-247-2)

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



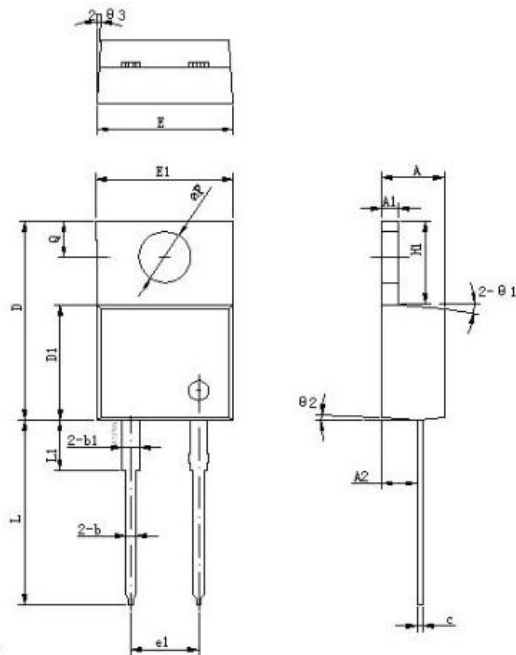
SYMBOL	Millimeters	
	Min.	Max.
A	10.70	10.90
B	16.03	16.23
C	5.11	5.31
d	1.45	1.65
E	1.65	1.85
F	11.40	11.60
P0	3.90	4.10
P	15.90	16.10
P1	1.90	2.10
W	23.90	24.30

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



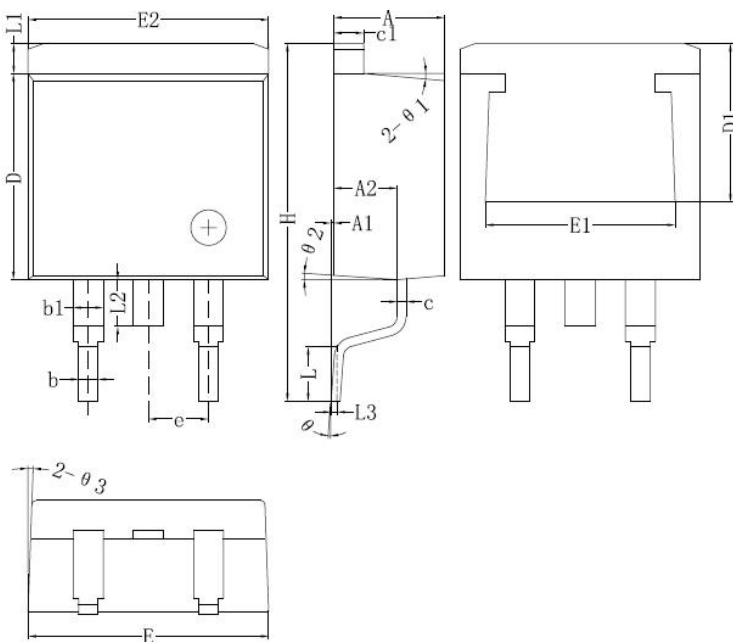
SYMBOL	Millimeters		
	MIN.	TYP.	MAX.
A	4.80	5.00	5.20
A1	2.20	2.41	2.61
A2	1.90	2.00	2.10
b	1.10	1.20	1.35
b1	1.80	2.00	2.20
c	0.50	0.60	0.75
D	20.30	21.00	21.20
D1		16.58	
D2		1.17	
E	15.60	15.80	16.00
E1		14.02	
E2		5.00	
E3		2.50	
e		5.44	
L	19.42	19.92	20.42
L1		4.13	
P	3.50	3.60	3.70
P1	7.1	7.19	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	4.55	4.70	4.85
A1	1.17	1.27	1.37
A2	2.59	2.69	2.89
b	0.71	0.81	0.96
b1		1.27	
c	0.36	0.38	0.61
D	14.64	14.94	15.24
D1	8.55	8.70	8.90
E	10.01	10.16	10.31
E1	9.98	10.18	10.38
e1		5.08	
H1	6.04	6.24	6.44
L	13.00	13.86	14.08
L1		3.80	
ΦP	3.74	3.84	4.04
Q	2.54	2.74	2.94
Θ1		5°	
Θ2		4°	
Θ3		4°	

Mechanical Dimensions D²PAK(TO-263-2)



Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	4.55	4.70	4.85
A1	0	0.10	0.25
A2	2.59	2.69	2.89
b	0.71	0.81	0.96
b1		1.27	
c	0.36	0.38	0.61
c1	1.17	1.27	1.37
D	8.55	8.70	8.85
D1	6.40		
E	10.01	10.16	10.31
E1	7.6		
E2	9.98	10.08	10.18
e		2.54	
H	14.6	15.1	15.6
L	2.00	2.30	2.70
L1	1.17	1.27	1.40
L2			2.20
L3		0.25BSC	
Θ	0	-	8°
Θ1		5°	
Θ2		4°	
Θ3		4°	

Technical Data
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