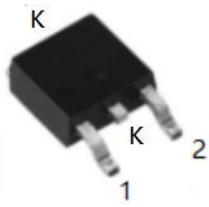


S3D03065E 3A 650V SIC POWER SCHOTTKY RECTIFIERS



DPAK(TO-252-2)

Description

This 650V 3A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D03065E is ideal for energy sensitive, high frequency applications in challenging environments.

Circuit Diagram



Features

- 175°C TJ 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

Maximum Ratings@ $T_A=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage	V_{RRM}	-		
Working Peak Reverse Voltage	V_{RWM}		650	V
DC Blocking Voltage	V_{DC}			
	$I_{F(AV)1}$	$T_c=25^\circ\text{C}$	18	A
	$I_{F(AV)2}$	$T_c=135^\circ\text{C}$	8	A
Average Rectified Forward Current	$I_{F(AV)3}$	$T_c=165^\circ\text{C}$	3	A
	I_{FRM1}	10ms, Half Sine pulse, $T_c=25^\circ\text{C}$	16	A
	I_{FRM2}	10ms, Half Sine pulse, $T_c=110^\circ\text{C}$	14	A
Repetitive Peak Forward Surge Current	I_{FSM1}	10ms, Half Sine pulse, $T_c=25^\circ\text{C}$	27	A
	I_{FSM2}	10ms, Half Sine pulse, $T_c=110^\circ\text{C}$	25	A
Peak One Cycle Non-Repetitive Surge Current	$I_{F,Max1}$	10 μs . Pulse, $T_c=25^\circ\text{C}$	390	A
	$I_{F,Max2}$	10 μs . Pulse, $T_c=110^\circ\text{C}$	265	A
Non-Repetitive Peak Forward Surge Current	P_{tot1}	$T_c=25^\circ\text{C}$	100	W
	P_{tot2}	$T_c=110^\circ\text{C}$	43	W
Power Dissipation				

Electrical Characteristics@ $T_A=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 3A, Pulse, $T_J = 25^\circ\text{C}$	1.4	1.7	V
	V_{F2}	@ 3A, Pulse, $T_J = 175^\circ\text{C}$	1.6	2.0	V
Reverse Current*	I_{R1}	@ $V_R = \text{rated } V_R$ $T_J = 25^\circ\text{C}$	0.03	2	uA
	I_{R2}	@ $V_R = \text{rated } V_R$ $T_J = 175^\circ\text{C}$	0.3	20	uA
Junction Capacitance	C_T	$V_R=0\text{V}$, $T_J=25^\circ\text{C}$, $f=1\text{MHz}$	230	-	pF
Reverse Recovery Charge	Q_c	$I_F = 3\text{A}$, $dI/dt = 200\text{A}/\mu\text{s}$ $VR = 400\text{V}$, $T_J = 25^\circ\text{C}$	14.35	-	nC
Capacitance Stored Energy	EC	$VR = 400\text{V}$, $T_J = 25^\circ\text{C}$	3.51	-	μJ

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

Thermal-Mechanical Specifications@ $T_A=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	S3D03065E	Units
Junction Temperature	T_J	-55 to +175	°C
Storage Temperature	T_{stg}	-55 to +175	°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	1.5	°C/W

Ordering Information

Device	Package	Shipping
S3D03065E	DPAK(TO-252-2)	2500pcs / reel
S3D03065ETR	DPAK(TO-252-2)	2500pcs / 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

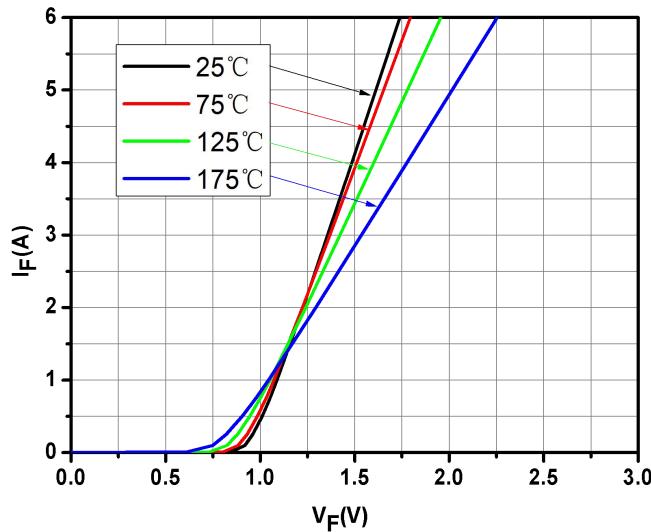


Fig.1-Typical Forward Voltage Characteristics

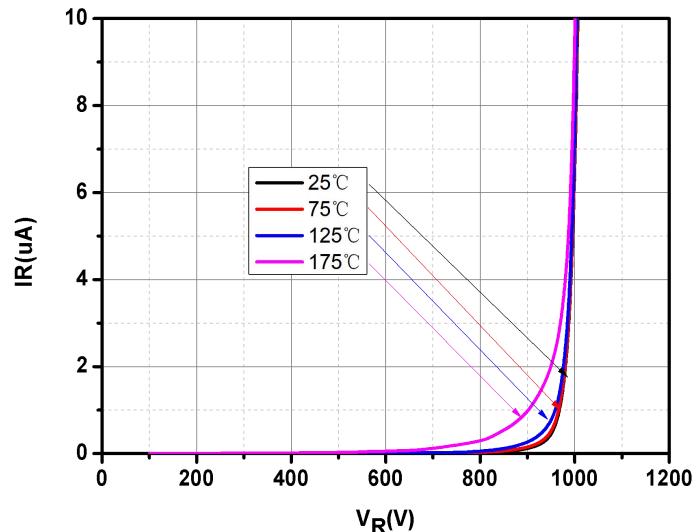


Fig.2-Typical Reverse Characteristics

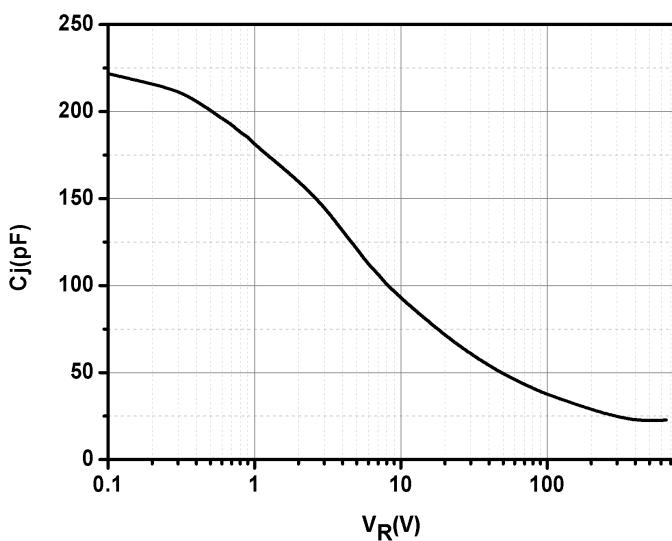


Fig.3-Capacitance vs. Reverse Voltage

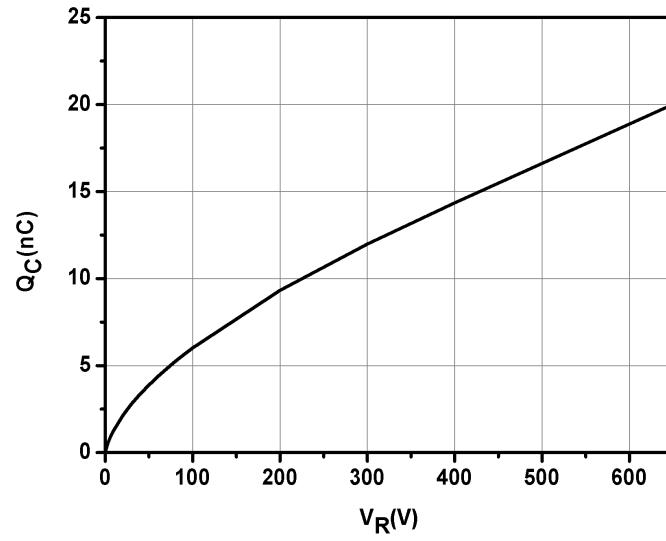


Fig.4-Total Capacitance Charge vs. Reverse Voltage

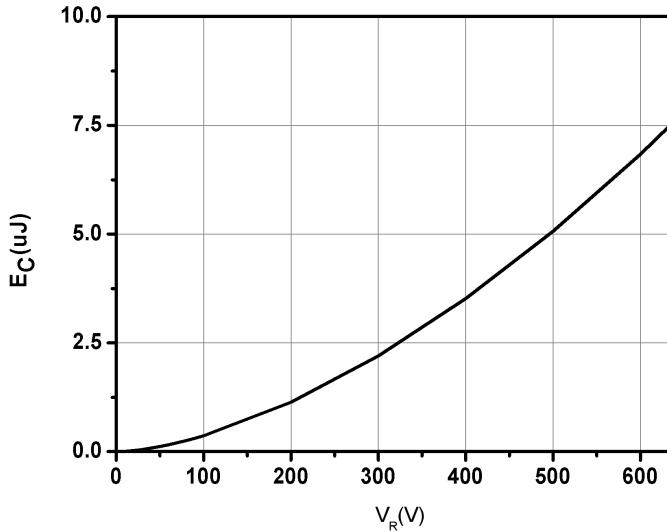


Fig.5-Capacitance Stored Energy

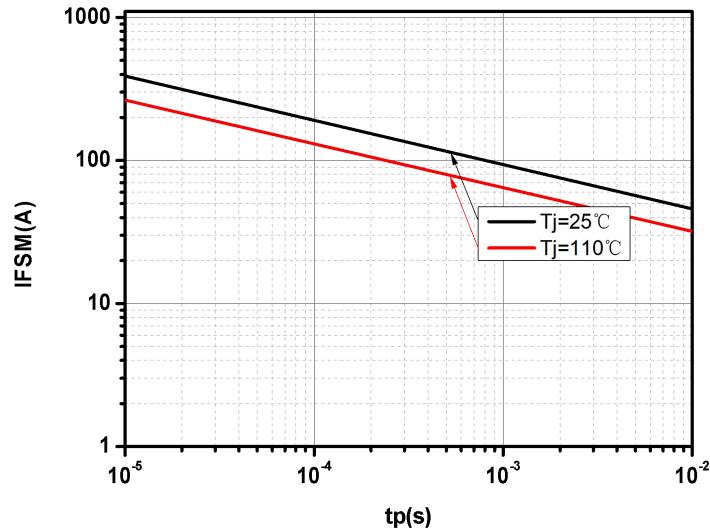


Fig.6-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

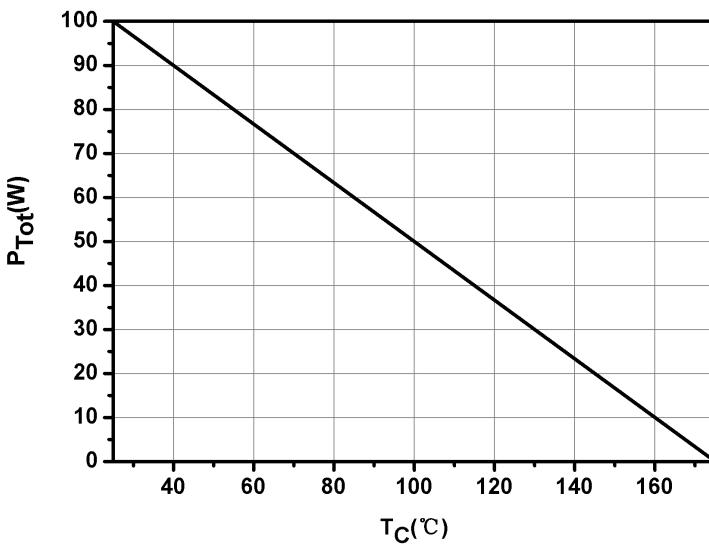


Fig.7-Power Derating

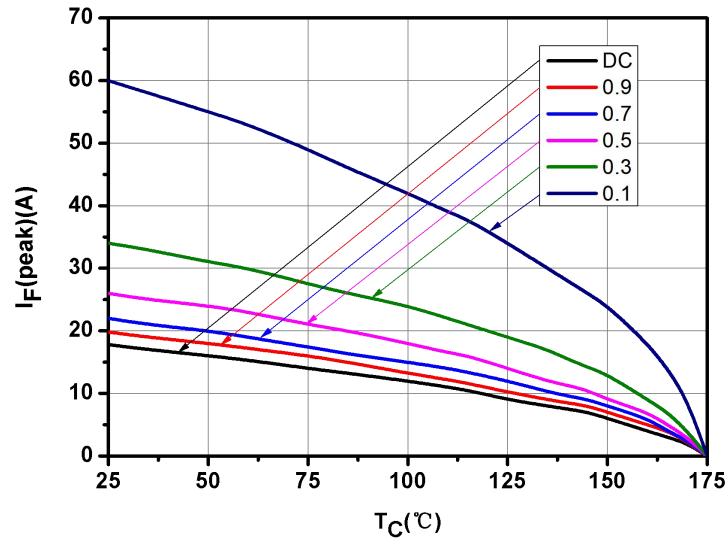


Fig.8-Current Derating

Marking Diagram

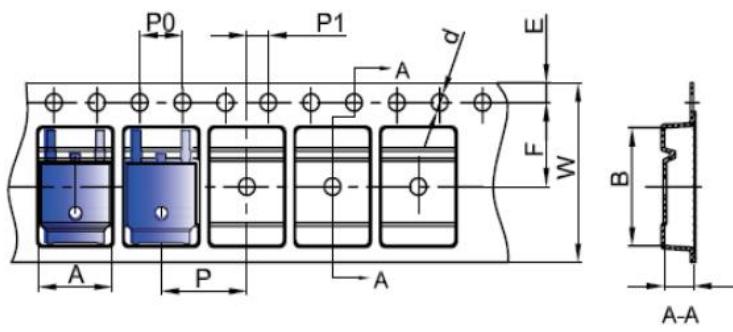


Where XXXXX is YYYYY

S3D = Device Type
E = Package type
03 = Forward Current (3A)
065 = Reverse Voltage (650V)
SSG = SSG
YY = Year
WW = Week
L = Lot Number

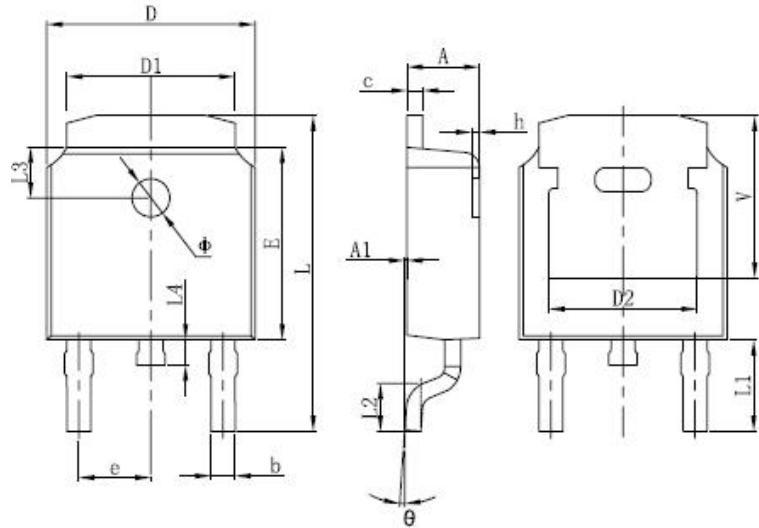
Cautions: Molding resin
Epoxy resin UL:94V-0

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

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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