Technical Data
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RoHS

S3D04065A/S3D04065F/S3D04065E/S3D04065E1
4A 650V SIC POWER SCHOTTKY RECTIFIERS

Description

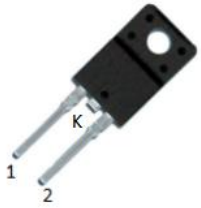
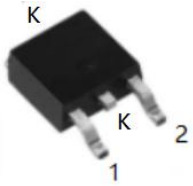
This 650V 4A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D04065A/S3D04065F/S3D04065E/S3D04065E1 are ideal for energy sensitive, high frequency applications in challenging environments.

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

S3D04065A	S3D04065F	S3D04065E	S3D04065E1
			
TO-220AC (TO-220-2)	ITO-220AC (TO-220-F2)	DPAK (TO-252-2)	
			

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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	17	A
	$I_{F\ (AV)2}$	Tc=110°C	8	A
	$I_{F\ (AV)3}$	Tc=150°C	4	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, Tc =25°C	23	A
	I_{FRM2}	10ms, Half Sine pulse, Tc =110°C	15	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, Tc =25°C	32	A
	I_{FSM2}	10ms, Half Sine pulse, Tc =110°C	30	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max}$	10μs. Pulse, Tc =25℃	390	A
	$I_{F,Max}$	10μs. Pulse, Tc =110℃	265	A
Power Dissipation	P_{tot1}	Tc =25℃	89	W
	P_{tot1}	Tc =110℃	39	W

Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 4A, Pulse, T_J = 25 °C	1.5	1.7	V
	V_{F2}	@ 4A, 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	2	uA
	I_{R2}	@V_R = rated V_R T_J = 175 °C	0.3	20	uA
Junction Capacitance	C_T	V_R=0V, T_J=25℃, f=1MHz	230	-	pF
Reverse Recovery Charge	Q_c	I_F = 4A, di/dt = 200A/μs V_R = 400 V, T_J =25°C	14.35	-	nC
Capacitance Stored Energy	E_C	V_R = 400 V	3.51	-	μJ

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

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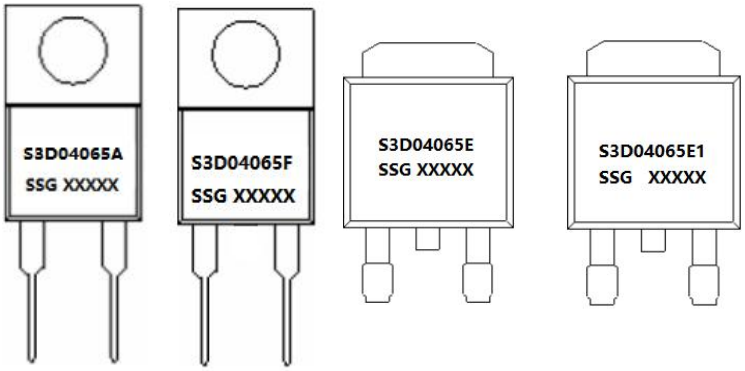
Thermal-Mechanical Specifications:

Characteristics	Symbol	S3D04065A	S3D04065F	S3D04065E	S3D04065E1	Units
Junction Temperature	T_J	-55 to +175				°C
Storage Temperature	Tstg	-55 to +175				°C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	1.7	4	1.5	1.5	°C/W

Marking Diagram



Where XXXXX is YYWWL

S3D = Device Type
A/F/E/E1 = Package type
04 = Forward Current (4A)
065 = Reverse Voltage (650V)
SSG = SSG
YY = Year
WW = Week
L = Lot Number

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

Ordering Information

Device	Package	Shipping
S3D04065A	TO-220AC(TO-220-2)	50pcs / tube
S3D04065F	ITO-220AC(TO-220MF-2L)	50pcs / tube
S3D04065E	DPAK(TO-252-2)	2500pcs / reel
S3D04065E1	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

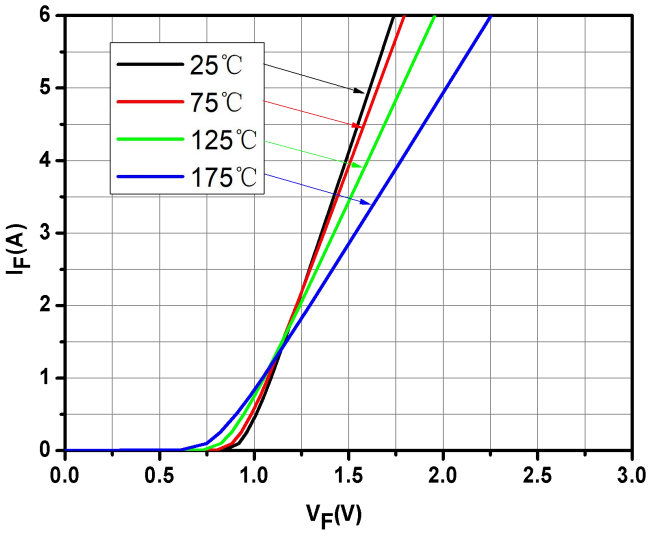


Fig.1-Typical Forward Voltage Characteristics

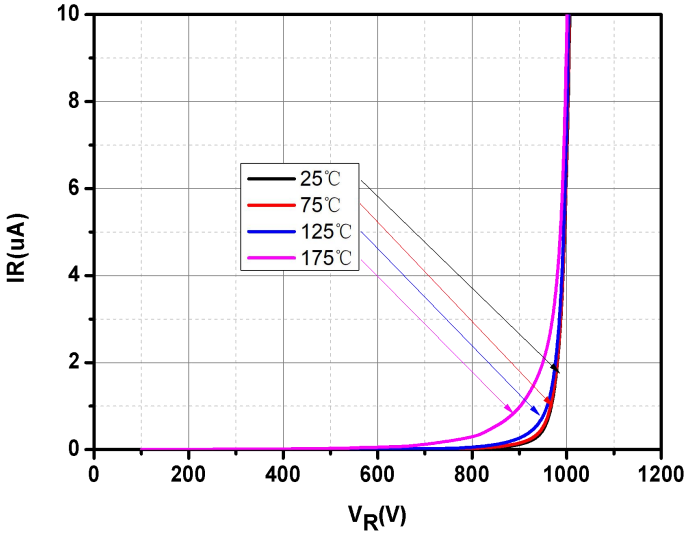


Fig.2-Typical Reverse Characteristics

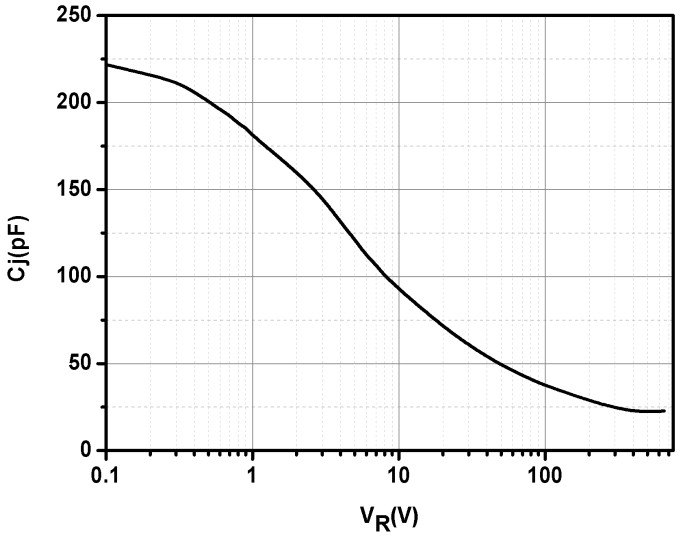


Fig.3-Capacitance vs. Reverse Voltage

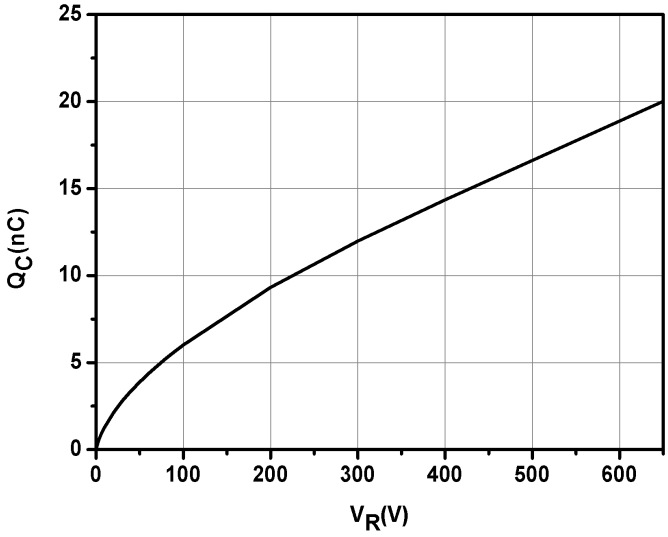


Fig.4-Total Capacitance Charge vs. Reverse Voltage

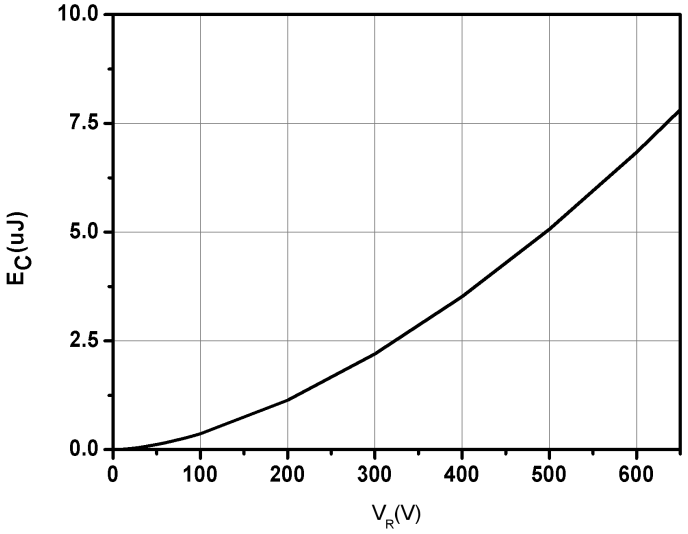


Fig.5-Capacitance Stored Energy

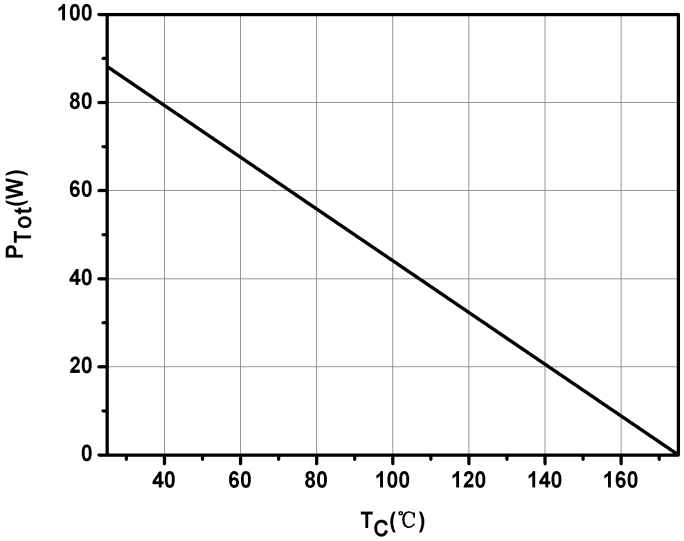


Fig.6-Power Derating

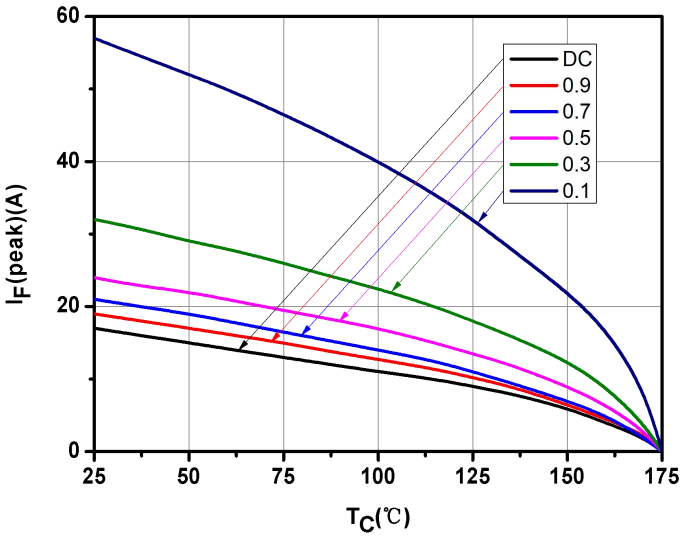
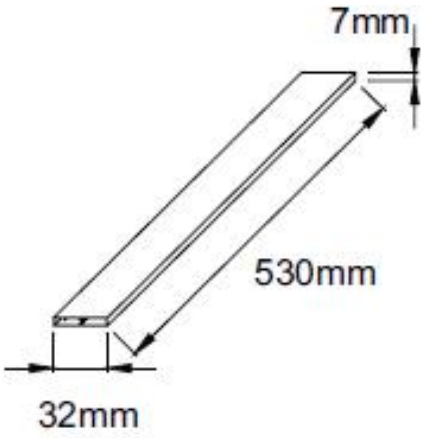
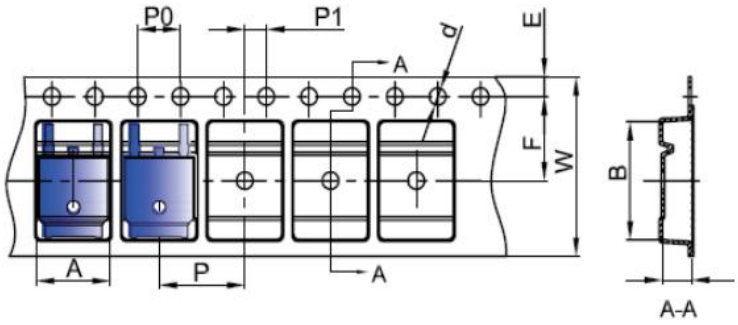


Fig.7-Current Derating

Tube Specification(TO-220-2/TO-220MF-2L)

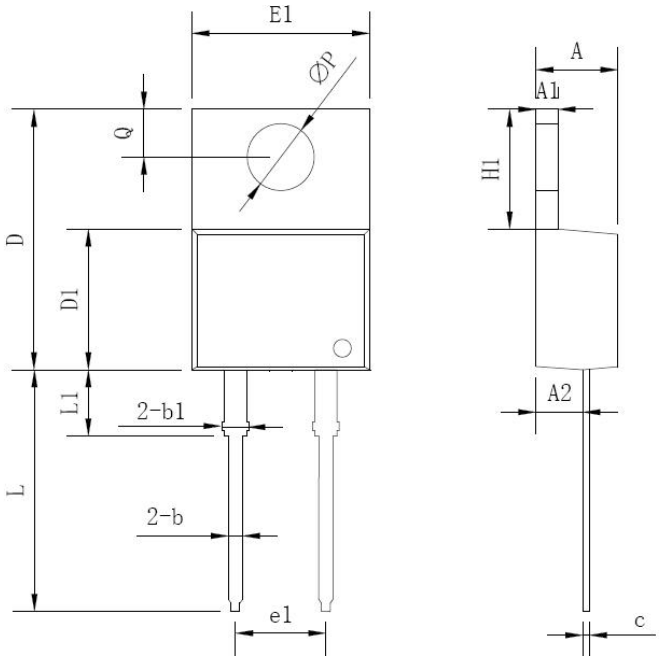


Carrier Tape & Reel Specification DPAK(TO-252-2)



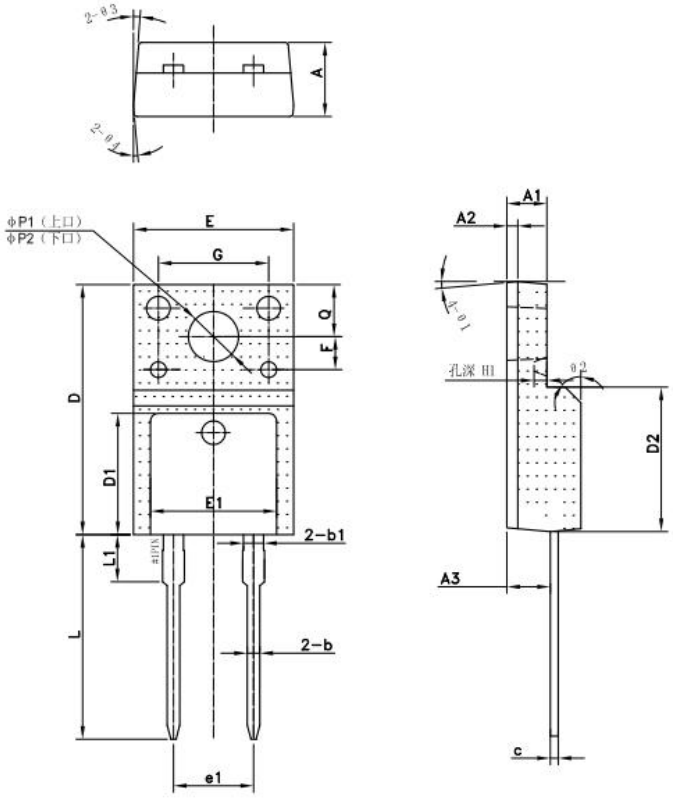
SYMBOL	Millimeters	
	Min.	Max.
A	6.80	7.00
B	10.40	10.60
C	2.60	2.80
d	Φ1.45	Φ1.65
E	1.65	1.85
F	7.40	7.60
P0	3.90	4.10
P	7.90	8.10
P1	1.90	2.10
W	15.90	16.30

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



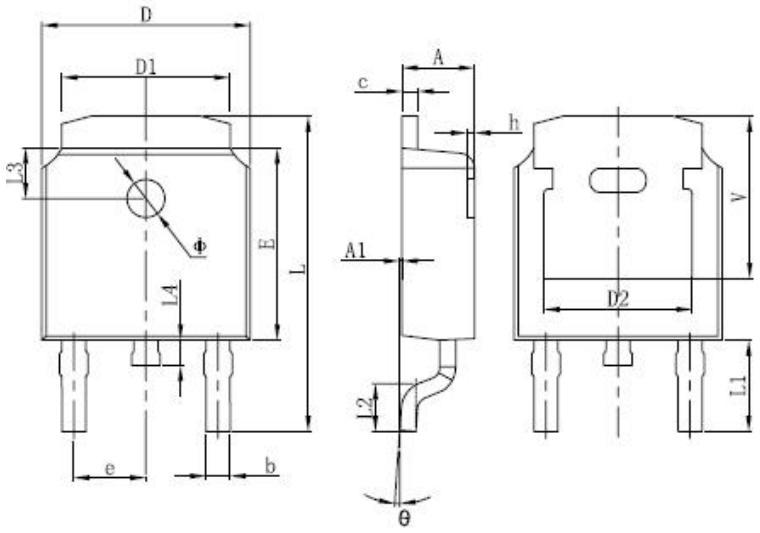
Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E1	9.65	10.16	10.67
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
ΦP	-	3.56	-
Q	2.54	-	3.43

Mechanical Dimensions ITO-220AC(TO-220MF-2L)



Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2		0.70	
A3	2.56	2.76	2.96
b	0.70	0.80	0.95
b1		1.28	
c	0.45	0.50	0.65
D	15.67	15.87	16.07
D1		7.70	
D2		9.12	
E	9.96	10.16	10.36
E1		8.00	
e1		5.08	
F		2.1	
G		7	
H1		0.81	
L	12.48	12.98	13.20
L1		2.93	
4>P1 （上口）	2.98	3.18	3.38
4>P2 （下口）	3.20	3.40	3.60
Q	3.10	3.30	3.50
e 1		5°	
02		45°	
03		5°	
e 4		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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