

**650V Silicon Carbide Schottky Diode**

**GENERAL DESCRIPTION**

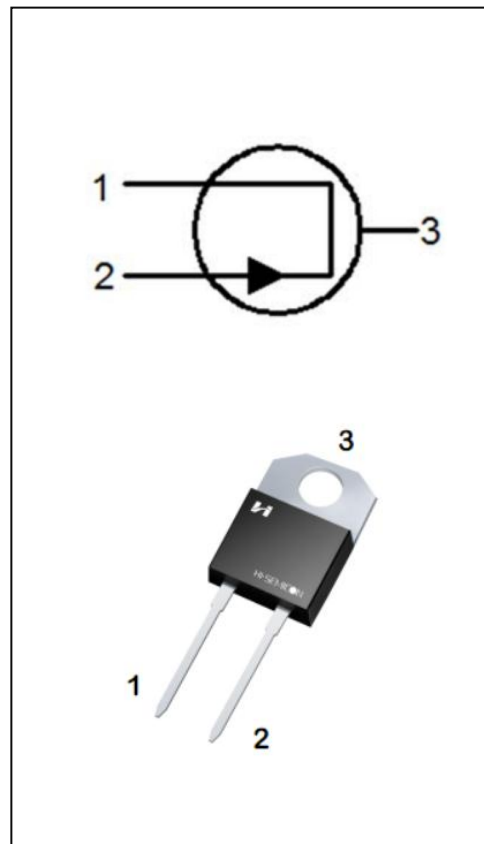
- ◆ 650V Schottky rectifier
- ◆ Zero reverse recovery current/voltage
- ◆ High frequency operation
- ◆ Switching characteristics independent of temperature
- ◆ Positive temperature coefficient of forward voltage( $V_F$ )

**BENEFIT**

- ◆ Replace bipolar with unipolar rectifiers
- ◆ Essentially no switching losses
- ◆ higher efficiency
- ◆ Reduction of heat requirements
- ◆ Parallel devices without thermal runaway

**Applications**

- ◆ Switched mode power supplies (SMPS)
- ◆ Uninterruptible power supply (UPS)
- ◆ Free wheeling diodes in inverter stages
- ◆ LED lighting power
- ◆ AC/DC Converters



**ORDERING INFORMATION**

Part No.	Package	Marking	Material	Packing
SC3D16065I	TO-220A-2L	C3D16065I	Pb free	Tube

## ABSOLUTE MAXIMUM RATINGS (T<sub>J</sub>=25°C unless otherwise noted)

Characteristics	Symbol	Ratings	Unit
Repetitive peak reverse voltage	V <sub>RRM</sub>	650	V
Maximum DC blocking voltage	V <sub>DC</sub>	650	V
Surge peak reverse voltage	V <sub>RSM</sub>	650	V
Continuous forward current	I <sub>F</sub>	16	A
Repetitive peak forward surge current	I <sub>FRM</sub>	T <sub>C</sub> =135°C	103
		tp=10ms T <sub>C</sub> =25°C	
Non-repetitive peak forward surge current	I <sub>FSM</sub>	T <sub>C</sub> =135°C	135
		tp=10ms T <sub>C</sub> =25°C	
Power dissipation	P <sub>tot</sub>	T <sub>C</sub> =25°C	203
		T <sub>C</sub> =110°C	91
Operating junction temperature	T <sub>j</sub>	-55~175	°C
Storage temperature range	T <sub>stg</sub>	-55~175	
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	TL	300	°C

## ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Forward voltage drop	V <sub>F</sub>	I <sub>F</sub> =16A, T <sub>J</sub> =25°C	--	1.47	1.8	V
		I <sub>F</sub> =16A, T <sub>J</sub> =175°C	--	1.75	3.0	
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =650V, T <sub>J</sub> =25°C	--	--	20	uA
		V <sub>R</sub> =650V, T <sub>J</sub> =175°C	--	--	80	
Total capacitance	C	V <sub>R</sub> =0V, f=1MHz	--	853.3	--	pF
		V <sub>R</sub> =200V, f=1MHz	--	82.7	--	
		V <sub>R</sub> =400V, f=1MHz	--	61.5	--	
Total capacitance charge	Q <sub>C</sub>	V <sub>R</sub> =400V, T <sub>J</sub> =25°C	--	42.6	--	nC
Capacitance stored energy	E <sub>C</sub>	V <sub>R</sub> =400V	--	8.5	--	uJ

## THERMAL CHARACTERISTICS

Characteristics	Symbol	MAX	Unit
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	2.7	°C/W

Typical Performance Characteristics

Figure.1: Forward characteristics

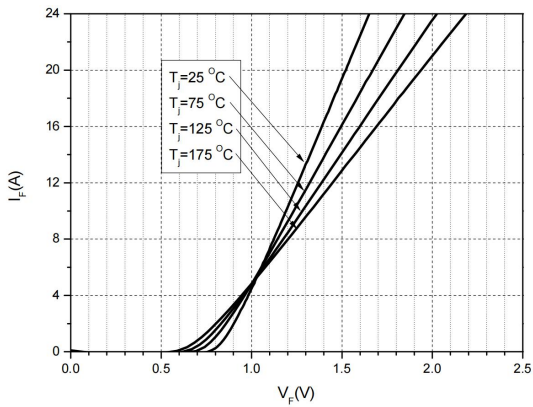


Figure.2: Reverse characteristics

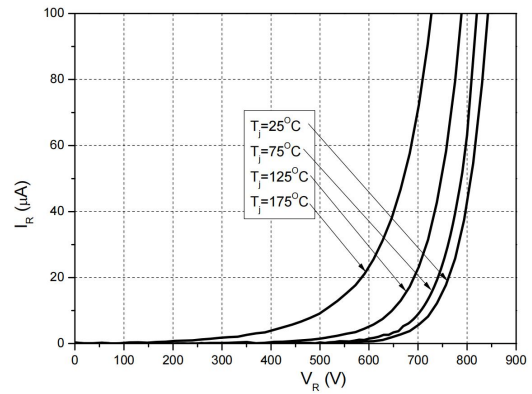


Figure.3: Capacitance vs reverse voltage

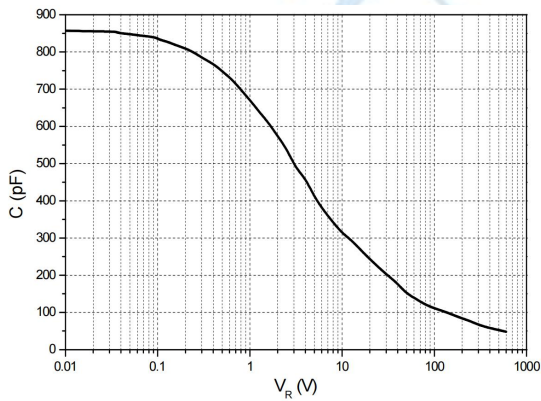


Figure.4: Transient thermal impedance

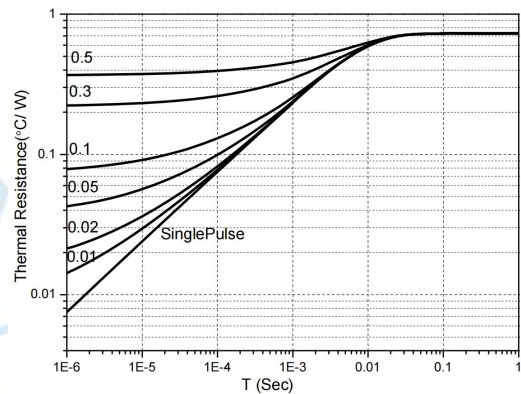


Figure.5: Cap-Charge vs reverse voltage

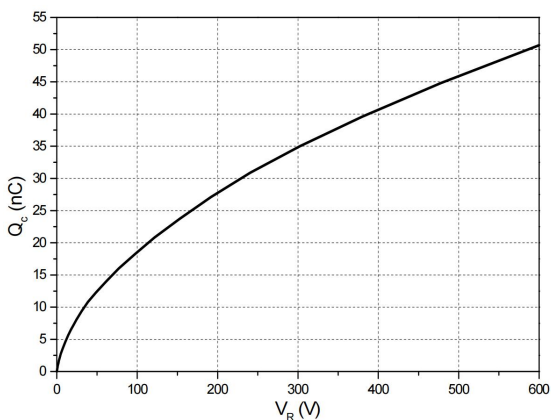
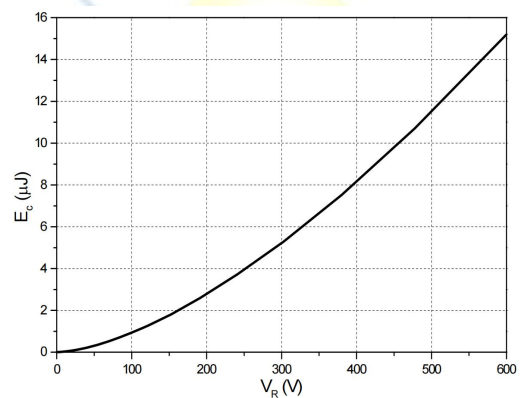
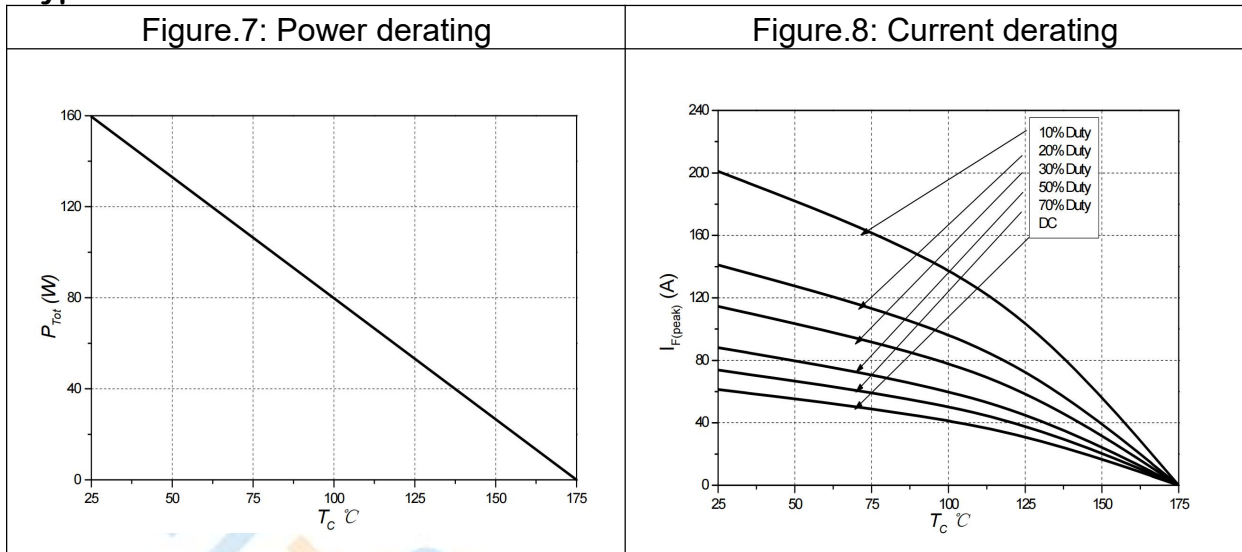


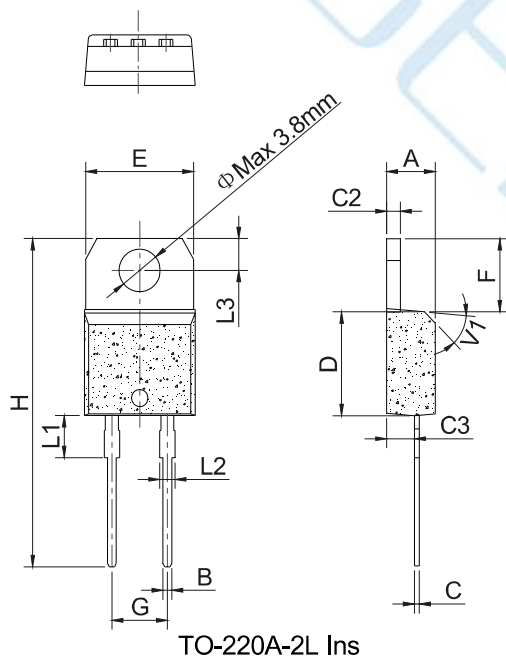
Figure.6: Capacitance stored energy



Typical Performance Characteristics



Package Dimensions of TO-220A-2L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.61		0.88	0.024		0.035
C	0.46		0.70	0.018		0.028
C2	1.21		1.32	0.048		0.052
C3	2.40		2.72	0.094		0.107
D	8.60		9.70	0.339		0.382
E	9.80		10.4	0.386		0.409
F	6.55		6.95	0.258		0.274
G		5.08			0.2	
H	28.0		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	

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