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FFSP2065A

Silicon Carbide Schottky Diode
650 V, 20 A

Features

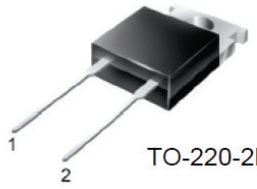
- Max Junction Temperature 175 °C
- Avalanche Rated 95 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery

Applications

- General Purpose
- SMPS, Solar Inverter, UPS
- Power Switching Circuits

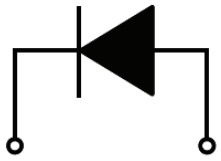
Description

SiC Schottky Diode has no switching loss, provides improved system efficiency against Si diodes by utilizing new semiconductor material - Silicon Carbide, enables higher operating frequency, and helps increasing power density and reduction of system size/cost. Its high reliability ensures robust operation during surge or over-voltage conditions



TO-220-2L

1. Cathode 2. Anode



1. Cathode 2. Anode

Absolute Maximum Ratings T_C = 25°C unless otherwise noted.

Symbol	Parameter		FFSP2065A	Unit
V_{RRM}	Peak Repetitive Reverse Voltage		650	V
E_{AS}	Single Pulse Avalanche Energy (Note 2)		95	mJ
I_F	Continuous Rectified Forward Current @ T_C < 147 °C		20	A
	Continuous Rectified Forward Current @ T_C < 135 °C		25	
$I_{F, Max}$	Non-Repetitive Peak Forward Surge Current	T_C = 25 °C, 10 μs	1225	A
		T_C = 150 °C, 10 μs	1000	A
$I_{F,SM}$	Non-RepetitiveForwardSurgeCurrent	Half-Sine Pulse, t_p = 8.3 ms	105	A
$I_{F,RM}$	Repetitive Forward Surge Current	Half-Sine Pulse, t_p = 8.3 ms	58	A
Ptot	Power Dissipation	T_C = 25 °C	187	W
		T_C = 150 °C	31	W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	°C
	TO247 Mounting Torque, M3 Screw		60	Ncm

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max. (Note 1)	0.8	°C/W

Semiconductor Components Industries, LLC, 2017
Sep, 2017, Rev.1.0

Publication Order Number:
FFSP2065A/D

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFSP2065A	FFSP2065A	TO-220	Tube	N/A	N/A	50 units

Electrical Characteristics T_C = 25 °C unless otherwise noted.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F = 20 A, T_C = 25 °C	-	1.5	1.75	V
		I_F = 20 A, T_C = 125 °C	-	1.6	2.0	
		I_F = 20 A, T_C = 175 °C	-	1.72	2.4	
I_R	Reverse Current	V_R = 650 V, T_C = 25 °C	-	-	200	μA
		V_R = 650 V, T_C = 125 °C	-	-	400	
		V_R = 650 V, T_C = 175 °C	-	-	600	
Q_C	Total Capacitive Charge	V = 400 V	-	64	-	nC
C	Total Capacitance	V_R = 1 V, f = 100 kHz	-	1085	-	pF
		V_R = 200 V, f = 100 kHz	-	117	-	
		V_R = 400 V, f = 100 kHz	-	88	-	

Notes:
1: Pulse: Test Pulse width = 300μs, Duty Cycle = 2%
2: EAS of 95mJ is based on starting T_J = 25 °C, L = 0.5 mH, I_{AS} = 19.5 A, V = 50 V.

Typical Characteristics T_J = 25 °C unless otherwise noted.

Figure 1. Forward Characteristics

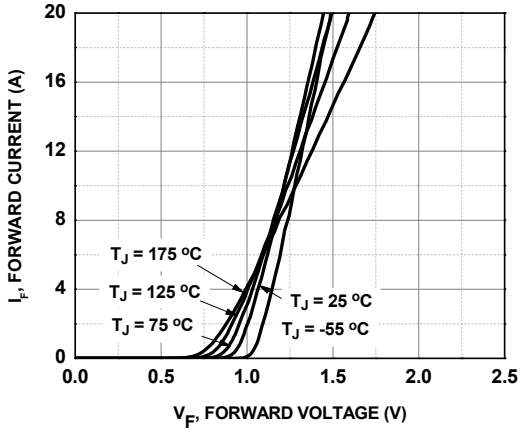


Figure 2. Reverse Characteristics

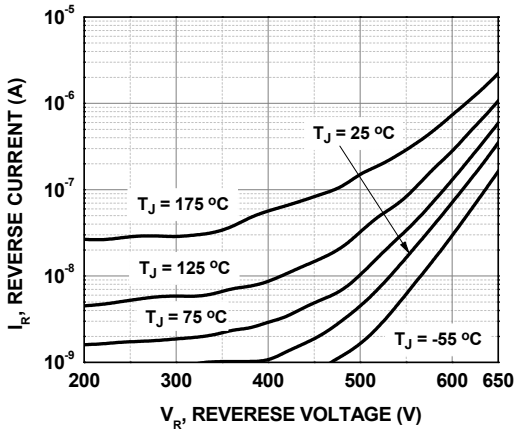


Figure 3. Current Derating

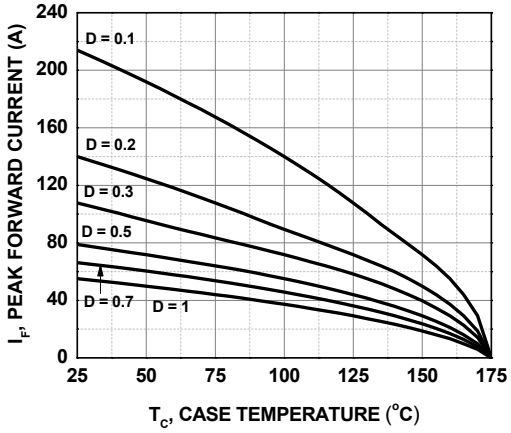
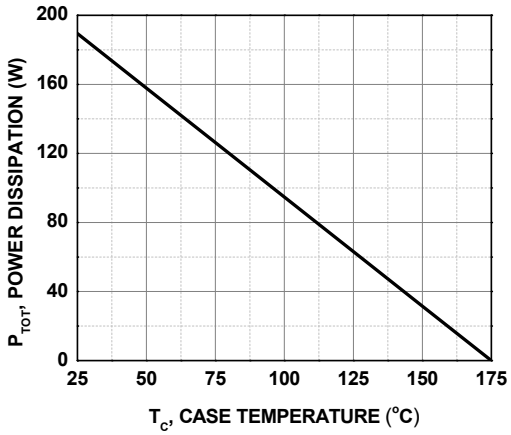


Figure 4. Power Derating



Typical Characteristics T_J = 25 °C unless otherwise noted.

Figure 5. Capacitive Charge vs. Reverse Voltage

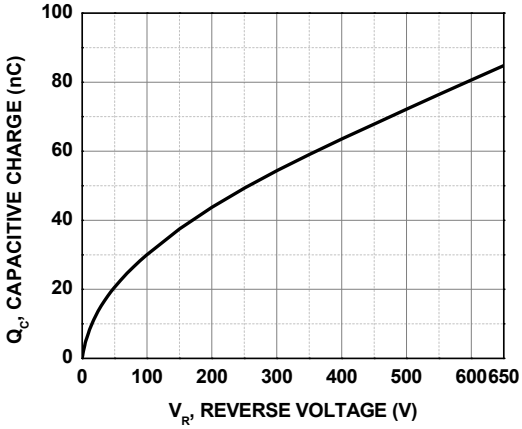


Figure 6. Capacitance vs. Reverse Voltage

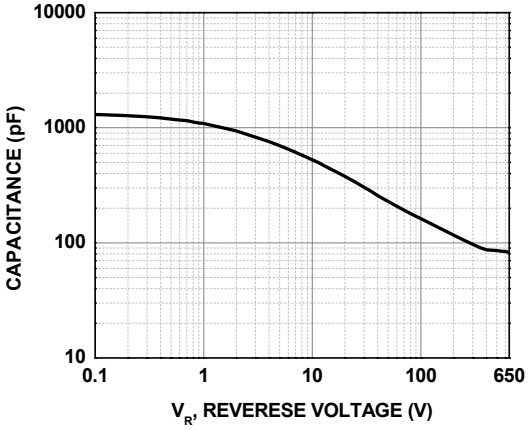


Figure 7. Capacitance Stored Energy

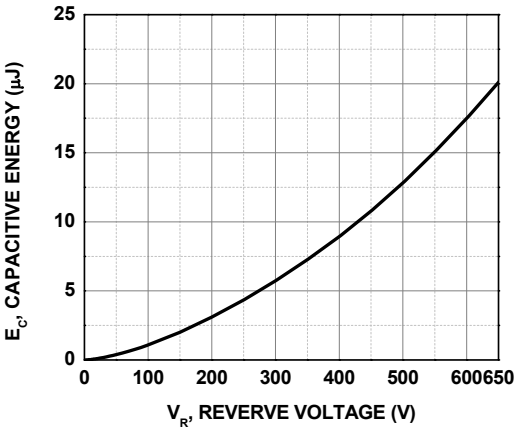
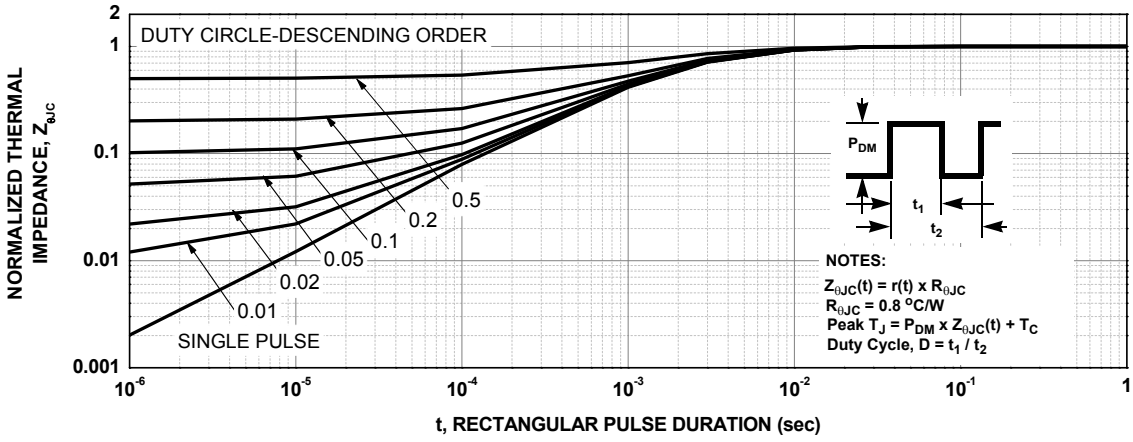
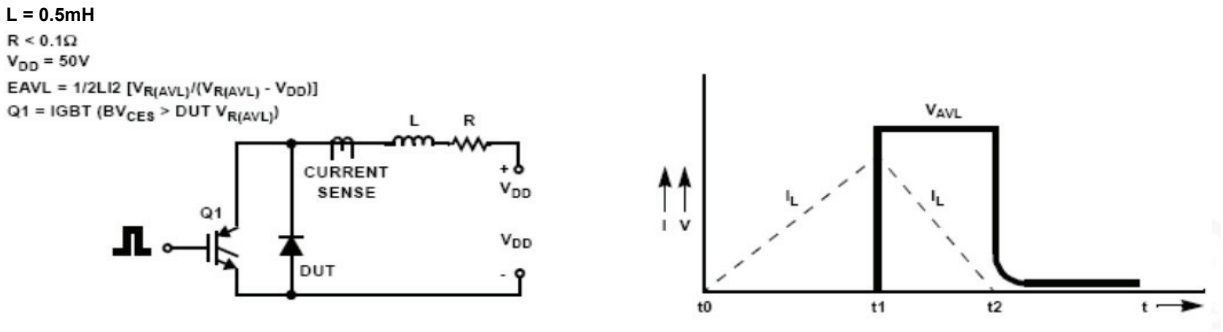


Figure 8. Junction-to-Case Transient Thermal Response Curve



Test Circuit and Waveforms

Figure 9. Unclamped Inductive Switching Test Circuit & Waveform



Mechanical Dimensions

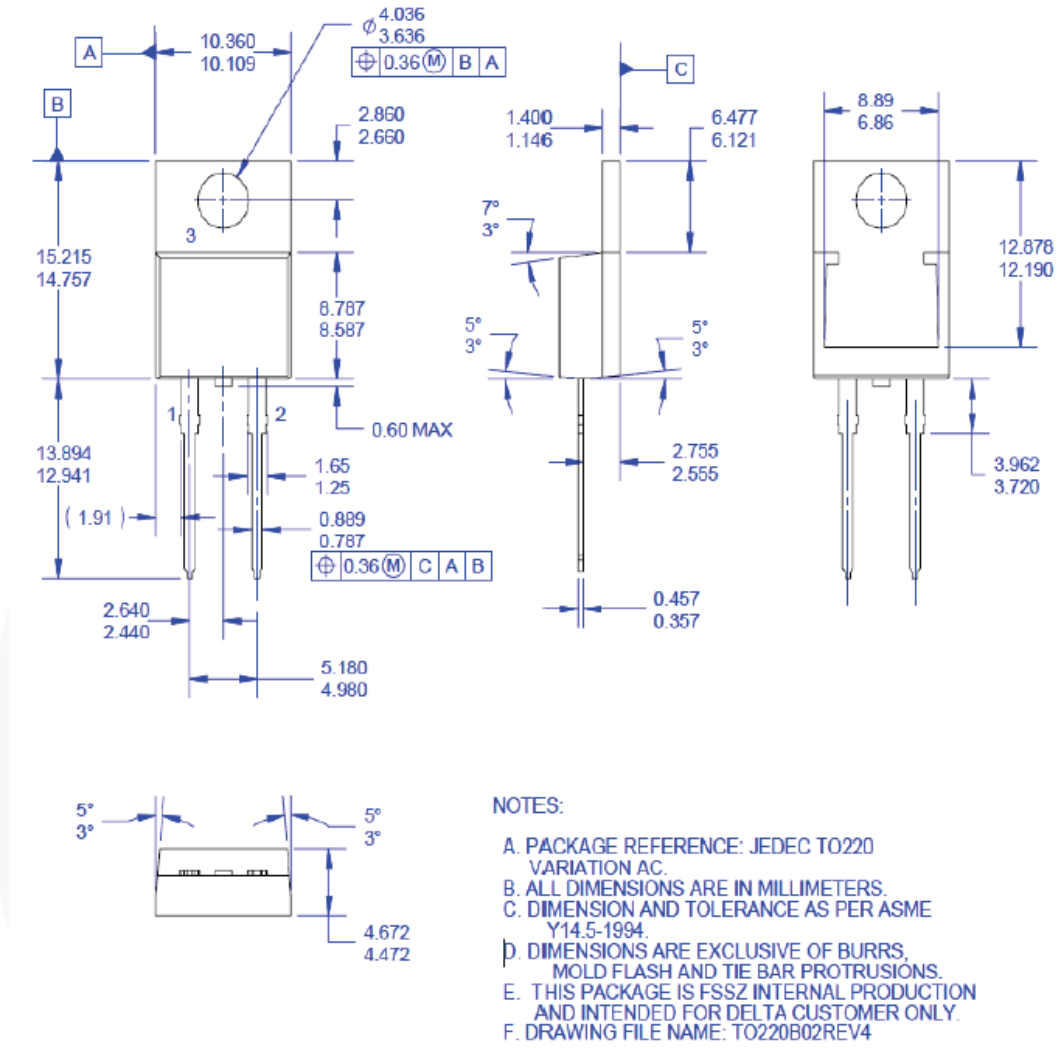


Figure 10. TO-220 2L - TO-220, MOLDED, 2LD