May 2016

FFSH40120ADN_F155

Silicon Carbide Schottky Diode

1200 V, 40 A

Features

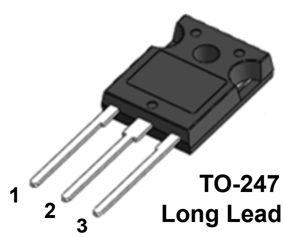
- Max Junction Temperature 175 ^{o}C
- Avalanche Rated 200 mJ
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery / No Forward Recovery

Applications

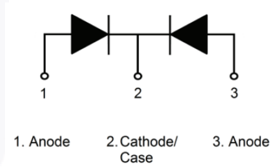
- General Purpose
- SMPS, Solar Inverter, UPS
- Power Switching Circuits

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-247
Long Lead**



Absolute Maximum Ratings T_C = 25^{o}C unless otherwise noted. (per leg)

Symbol	Parameter		FFSH40120ADN_F155	Unit
V_{RRM}	Peak Repetitive Reverse Voltage		1200	V
E_{AS}	Single Pulse Avalanche Energy (Note 1)		200	mJ
I_F	Continuous Rectified Forward Current @ T_C < 148 ^{o}C		20* / 40**	A
$I_{F, Max}$	Non-Repetitive Peak Forward Surge Current	T_C = 25 ^{o}C, 10 μs	1190	A
		T_C = 150 ^{o}C, 10 μs	990	A
$I_{F,SM}$	Non-RepetitiveForwardSurgeCurrent	Half-Sine Pulse, t_p = 8.3 ms	135	A
$I_{F,RM}$	Repetitive Forward Surge Current	Half-Sine Pulse, t_p = 8.3 ms	74	A
Ptot	Power Dissipation	T_C = 25 ^{o}C	220	W
		T_C = 150 ^{o}C	37	W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	^{o}C
	TO247 Mounting Torque, M3 Screw		60	Ncm

Thermal Characteristics

Symbol	Parameter	FFSH40120ADN_F155	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.68* / 0.34**	^{o}C/W

*** Per Leg, ** Per Device**

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FFSH40120ADN_F155	FFSH40120ADN	TO-247 Long Lead	Tube	N/A	N/A	30 units

Electrical Characteristics T_C = 25°C unless otherwise noted. (per leg)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F = 20 A, T_C = 25 °C	-	1.45	1.75	V
		I_F = 20 A, T_C = 125 °C	-	1.7	2	
		I_F = 20 A, T_C = 175 °C	-	2	2.4	
I_R	Reverse Current	VR = 1200 V, T_C = 25 °C	-	-	200	µA
		VR = 1200 V, T_C = 125 °C	-	-	300	
		VR = 1200 V, T_C = 175 °C	-	-	400	
Q_C	Total Capacitive Charge	V = 800 V	-	120	-	nC
C	Total Capacitance	V_R = 1 V, f = 100 kHz	-	1220	-	pF
		V_R = 400 V, f = 100 kHz	-	111	-	
		V_R = 800 V, f = 100 kHz	-	88	-	

Notes:
1: EAS of 200mJ is based on starting T_J = 25 °C, L = 0.5 mH, I_{AS} = 29 A, V = 150 V.

Typical Characteristics T_J = 25 °C unless otherwise noted (per leg).

Figure 1. Forward Characteristics

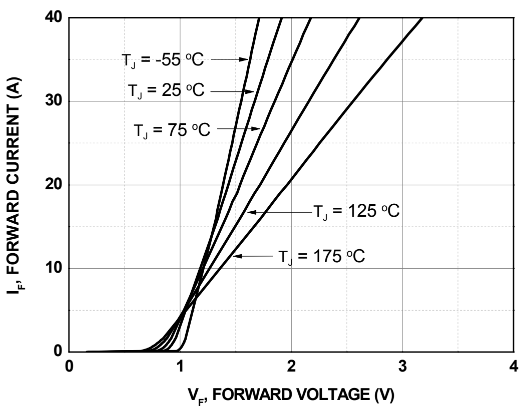


Figure 2. Reverse Characteristics

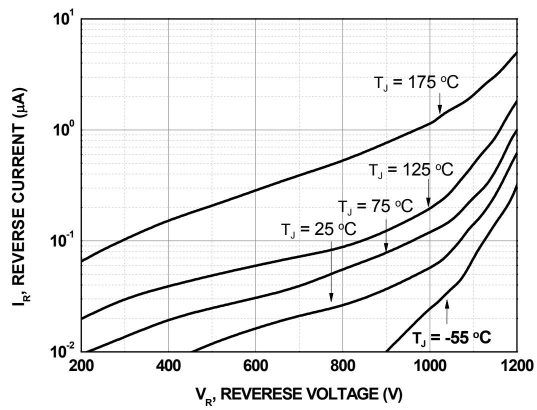


Figure 3. Reverse Characteristics

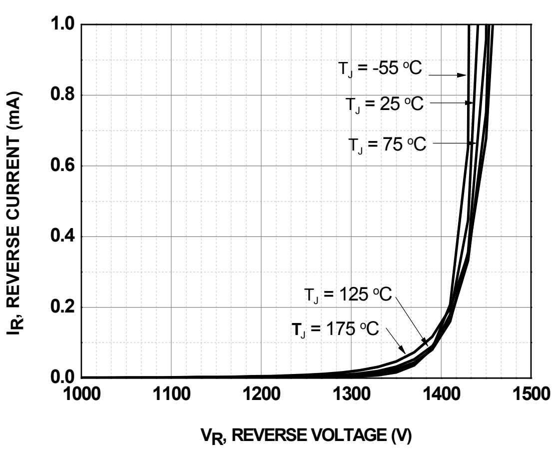
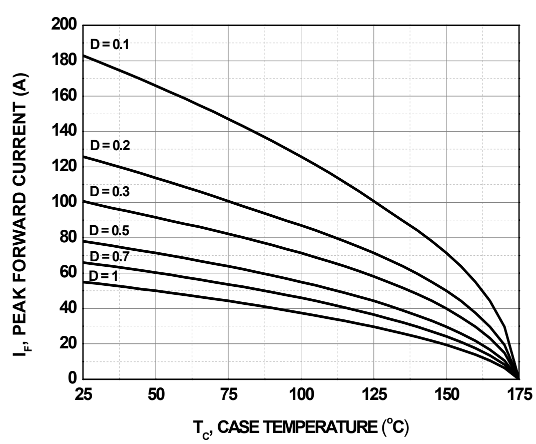


Figure 4. Current Derating



Typical Characteristics T_J = 25 °C unless otherwise noted (per leg, continue).

Figure 5. Power Derating

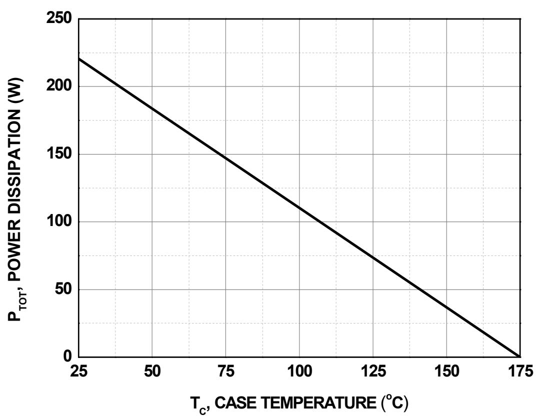


Figure 6. Capacitive Charge vs. Reverse Voltage

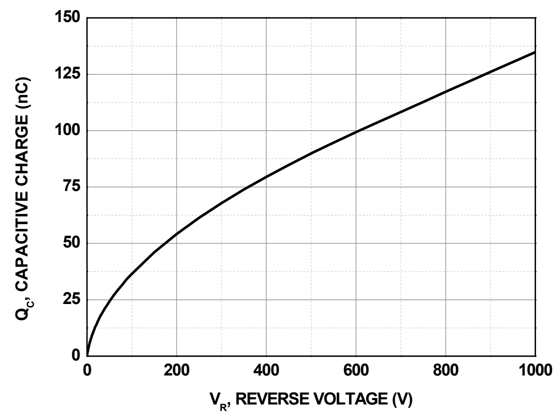


Figure 7. Capacitance vs. Reverse Voltage

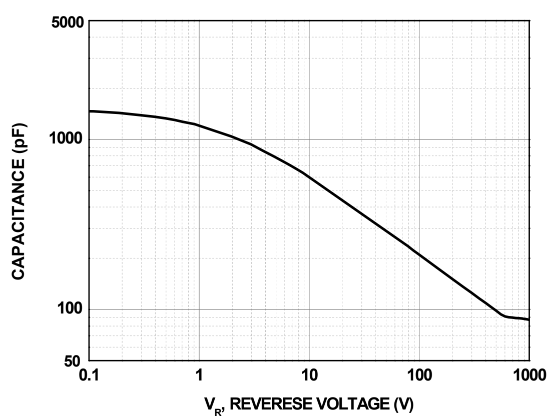


Figure 8. Capacitance Stored Energy

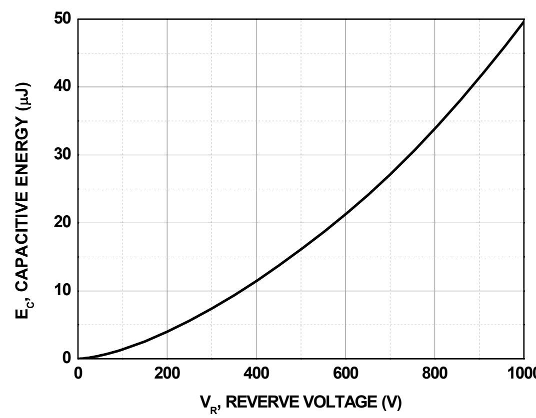
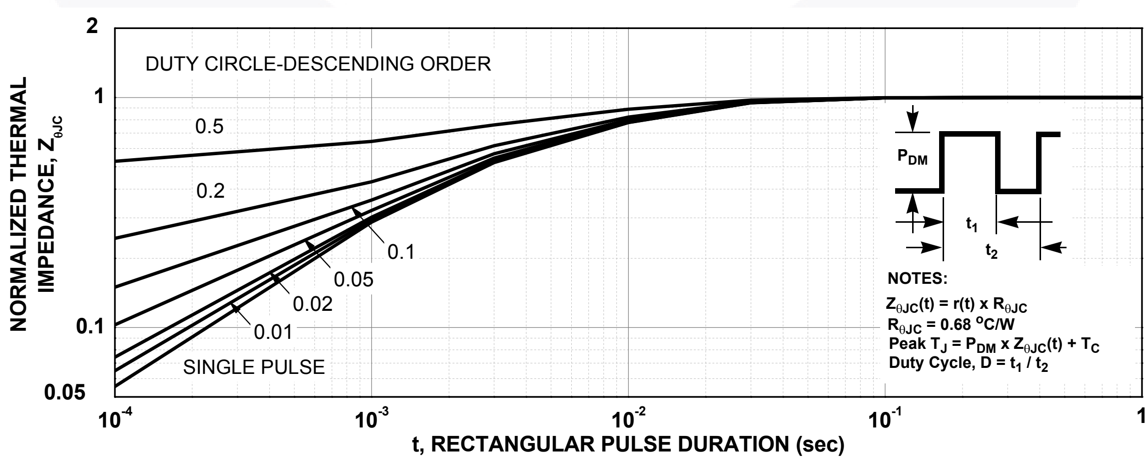
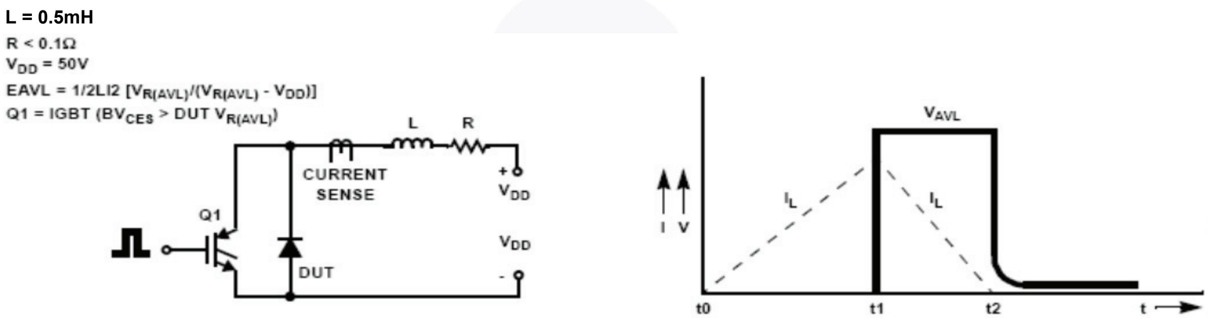


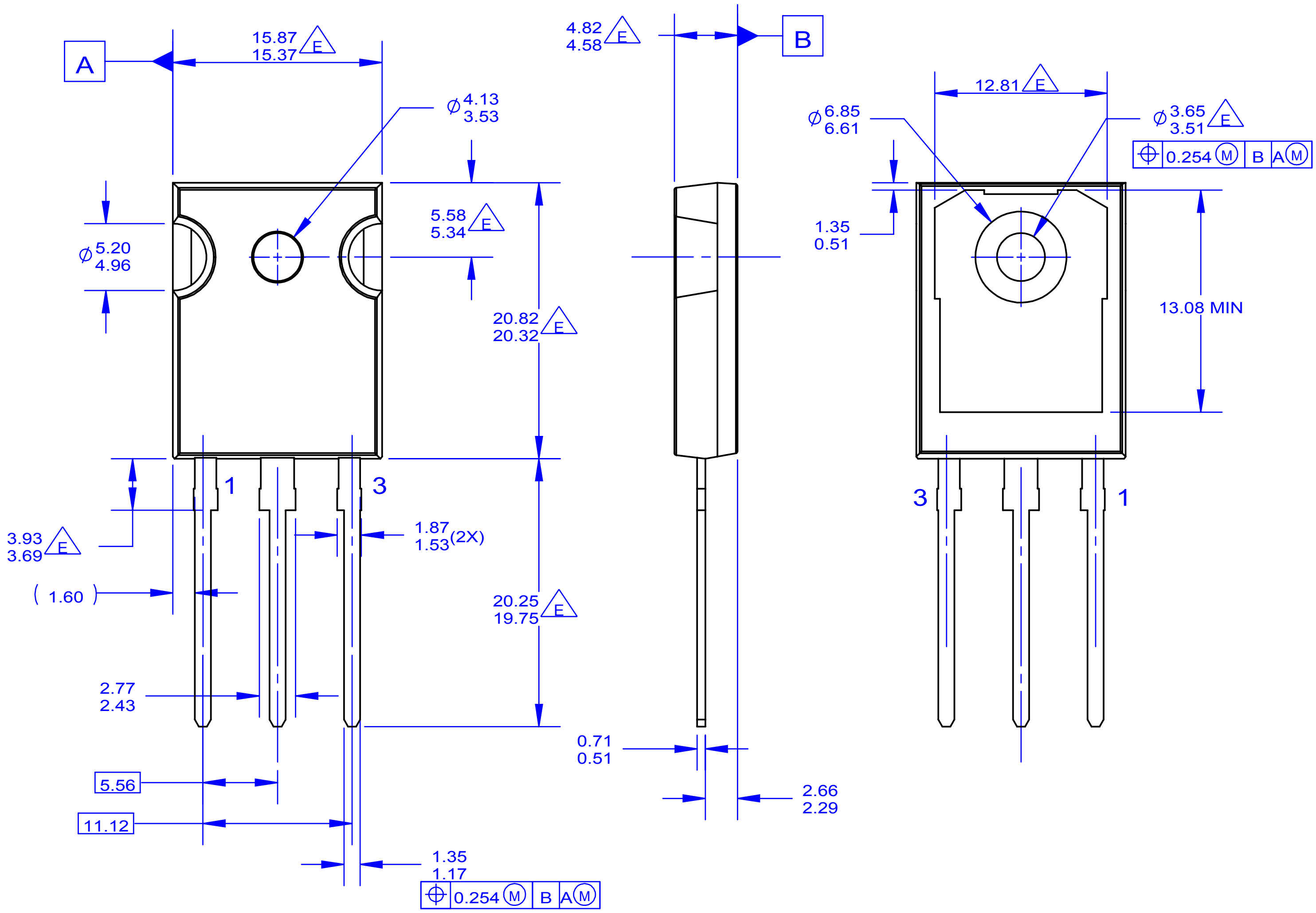
Figure 9. Junction-to-Case Transient Thermal Response Curve



Test Circuit and Waveforms

Figure 10. Unclamped Inductive Switching Test Circuit & Waveform





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