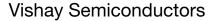
VS-U5FX300FA60



FRED Pt[®] Gen 5 Hyperfast Rectifier Diode, 600 V, 300 A



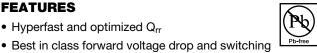
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PRIMARY CHARACTERISTICS							
V _R	600 V						
V _F (typical) at 150 A, per diode	1.6 V						
t _{rr} (typical) at 150 A, per diode	72 ns						
$I_{F(DC)}$ per module at $T_C = 80 \ ^{\circ}C$	300 A						
Туре	Modules - diode, FRED Pt®						
Package	SOT-227						
Circuit configuration	Two separate diodes, parallel pin-out						

FEATURES

losses trade off

Hyperfast and optimized Q_{rr}



- RoHS COMPLIANT
- · Optimized for high speed operation
- 175 °C maximum operating junction temperature
- · Electrically isolated base plate
- Large creepage distance between terminal
- · Simplified mechanical designs, rapid assembly
- Designed and gualified for industrial level
- UL approved file E78996
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

DESCRIPTION / APPLICATIONS

Featuring a unique combination of low conduction and switching losses, the VS-U5FX300FA60 is the right choice for high frequency converters, both soft switched / resonant. The semiconductor in the SOT-227 package is isolated from the copper base plate, allowing for common heatsinks and compact assemblies to be built.

These modules are specifically designed to improve efficiency of PFC and output rectification stages of EV / HEV battery charging stations, booster stage of solar inverters, and UPS applications, these devices are perfectly matched to operate with MOSFETs or high speed IGBTs.

ABSOLUTE MAXIMUM RATINGS							
PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS			
Cathode to anode voltage	V _R		600	V			
Continuous forward current per diode	I _F	$T_{\rm C} = 80 \ ^{\circ}{\rm C}$	150	^			
Single pulse forward current per diode	I _{FSM}	T _J = 25 °C	1035	A			
Maximum power dissipation per module	PD	$T_{\rm C} = 80 \ ^{\circ}{\rm C}$	529	W			
RMS isolation voltage	V _{ISOL}	Any terminal to case, t = 1 min	2500	V			
Operating junction and storage temperature range	T _J , T _{Stg}		-55 to +175	°C			

ELECTRICAL SPECIFICATIONS (T _J = 25 °C unless otherwise specified)								
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS		
Cathode to anode breakdown voltage	V _{BR}	I _R = 200 μA	600	-	-			
Forward voltage	V _{FM}	I _F = 150 A	-	1.6	2.2	V		
		I _F = 150 A, T _J = 150 °C	-	1.31	-			
		V _R = 600 V	-	0.3	100			
Reverse leakage current	I _{RM}	$T_{\rm J}$ = 125 °C, $V_{\rm R}$ = 600 V	-	77	-	μA		
		T _J = 150 °C, V _R = 600 V	-	343	-			

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DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25$ °C unless otherwise specified)									
PARAMETER	SYMBOL	TEST	CONDITIONS	MIN.	TYP.	MAX.	UNITS		
Reverse recovery time	+	$T_J = 25 \ ^\circ C$		-	72	-	ns		
Reverse recovery time	t _{rr}	T _J = 125 °C		-	102	-			
Deal was a second	I _{RRM}	T _J = 25 °C	I _F = 150 A, di _F /dt = 1000 A/μs, V _R = 400 V	-	17	-	A		
Peak recovery current		T _J = 125 °C		-	49	-			
Reverse recovery charge	Q _{rr}	T _J = 25 °C		-	0.4	-			
		T _J = 125 °C		-	2.6	-	μC		
Junction capacitance	CT	V _R = 600 V, f =	= 1 MHz	-	128.2	-	pF		

THERMAL - MECHANICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS	
Thermal resistance junction to case, per diode	_		-	-	0.35		
Thermal resistance junction to case, per module	R _{thJC}		-	-	0.175	°C/W	
Thermal resistance case to heatsink, per module	R _{thCS}	Flat, greased surface	-	0.05	-		
Weight			-	30	-	g	
Mounting torque		Torque per diode	-	-	1.1 (9.7)	Nm (lbf.in)	
		Torque to heatsink	-	-	1.8 (15.9)	Nm (lbf.in)	
Case style				SO	Г-227	•	

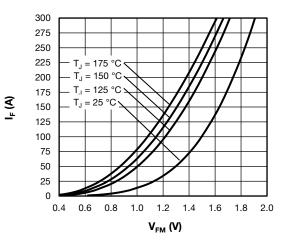


Fig. 1 - Typical Forward Voltage Drop Characteristics

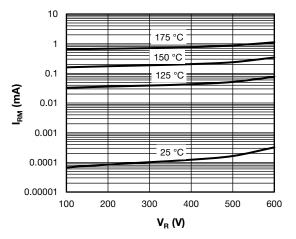


Fig. 2 - Typical Values of Reverse Current



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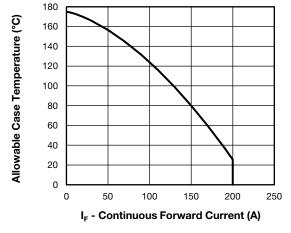


Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Diode)

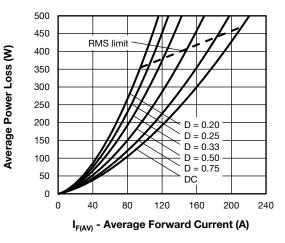


Fig. 4 - Average Power Loss vs. Average Forward Current

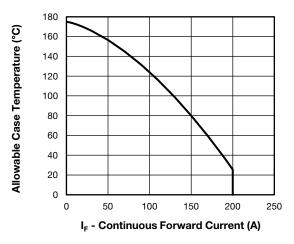


Fig. 5 - Typical Junction Capacitance vs. Reverse Voltage

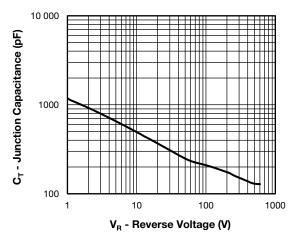


Fig. 6 - Diode Reverse Recovery Time vs. dl_Fdt

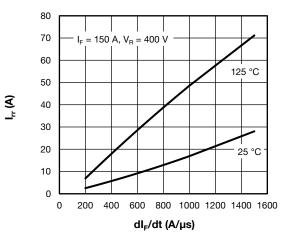


Fig. 7 - Diode Reverse Recovery Current vs. dl_Fdt

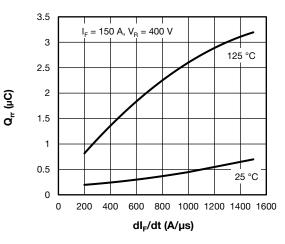


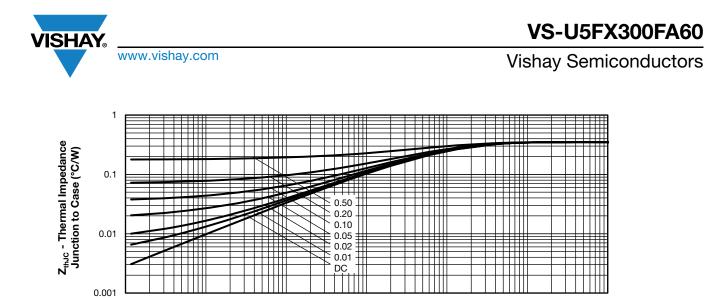
Fig. 8 - Diode Reverse Recovery Charge vs. dl_Fdt

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0.001

0.01 t₁ - Rectangular Pulse Duration (s)

Fig. 9 - Maximum Thermal Impedance Junction to Case

0.1

1

10

ORDERING INFORMATION TABLE

0.0001

0.00001

Device code	VS-	U5F	х	300	F	Α	60	
	1	2	3	4	5	6	7	
	1 - 2 - 3 - 4 - 5 - 6 - 7 -	- U5F - X = - Cur - F = - Pac	= Gen Hyperfa rent rati circuit c kage in	0	Pt [®] far D Pt [®] di nodule ation (tw (SOT-22	nily ode (300 = 3 vo sepa 27 stanc	rate dio	ides, parallel pin-outj ulated base)

CIRCUIT CONFIGURATION							
CIRCUIT	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING					
Two separate diodes, parallel pin-out	F	Lead Assignment 4 1 1 1 1 1 1 1 1 1 1 1 1 1					

LINKS TO RELATED DOCUMENTS					
Dimensions	<u>ww</u>	vw.vishay.com/doc?95423			
Packaging information	WW	vw.vishay.com/doc?95425			
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SOT-227 Generation 2

DIMENSIONS in millimeters (inches)



Note

• Controlling dimension: millimeter



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