

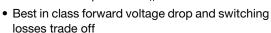
FRED Pt® Gen 5, Ultrafast Rectifier Diode, 600 V, 300 A



PRIMARY CHARACTERISTICS					
I _{F(AV)} at 81 °C (per module)	300 A				
V_{R}	600 V				
Q _{rr} (typical)	620 nC				
t _{rr}	68 ns				
Туре	Modules - diode, FRED Pt®				
Package	TO-244				
Circuit configuration	Two diodes common cathode				

FEATURES

Ultrafast and optimized Q_{rr}



RoHS

- Optimized for high speed operation
- 175 °C maximum operation junction temperature
- UL approved file E222165
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

BENEFITS

- · Reduced RFI and EMI
- Higher frequency operation
- · Reduced snubbing
- · Reduced parts count

DESCRIPTION / APPLICATIONS

Featuring a unique combination of low conduction and switching losses the FRED Pt® Gen 5 is the right choice for soft switched and resonant converters, as well as medium frequency hard switching converters.

These devices are also ideally suited for HF welding, power converters, and other applications where switching losses are significant portion of the total losses.

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS	
Cathode to anode voltage	V _R		600	V	
	I _{F(DC)}	T _C = 25 °C	259		
Continuous forward current per diode		T _C = 85 °C	185		
		T _C = 109 °C	150	Α	
Non-repetitive single pulse forward current per diode	I _{FSM}	T _C = 25 °C	1150		
Maximum power dissipation per diode	P _D	T _C = 25 °C	468	W	
		T _C = 109 °C	206	VV	
Storage temperature range	T _{Stg}		-40 to +150	°C	
Operating junction temperature range	TJ		-40 to +175	°C	

ELECTRICAL SPECIFICATIONS PER LEG (T _J = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS MIN. TY		TYP.	MAX.	UNITS
Breakdown voltage	V_{BR}	I _R = 200 μA	600	-	-	
Forward voltage	V _{FM}	I _F = 150 A	-	1.36	1.70	
		I _F = 300 A	-	1.52	2.20	V
		I _F = 150 A, T _J = 150 °C	-	1.09	-	
		I _F = 300 A, T _J = 150 °C	-	1.31	-	
Reverse leakage current	I _{RM}	$T_J = 150 ^{\circ}\text{C}, V_R = 600 ^{\circ}\text{V}$	-	0.23	0.7	mA
Series inductance	L _S	From top of terminal hole to mounting plane	-	5	-	nH
Maximum junction capacitance per leg	C _T	V _{DC} = 5 V, f = 1 MHz, 25 °C	-	-	1.0	nF

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DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS			TYP.	MAX.	UNITS
Davida da d	T _J = 25 °C		-	68	-		
neverse recovery time	Reverse recovery time t _{rr}	T _J = 125 °C	I _F = 50 A	-	170	-	ns
Peak recovery current I _{RRM}	1	T _J = 25 °C		-	7	-	^
	T _J = 125 °C	dl _F /dt = 200 A/µs, V _B = 300 V	-	22	-	A	
Reverse recovery charge	Q _{rr}	T _J = 25 °C		-	620	-	nC
		T _J = 125 °C		-	3150	-	

THERMAL - MECHANICAL SPECIFICATIONS							
PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNITS	
Thermal resistance,	per leg	Б	-	-	0.32		
junction to case	per module	R_{thJC}	-	-	0.16	°C/W	
Thermal resistance, case	hermal resistance, case to heatsink		-	0.10	-		
Weight			-	68	-	g	
			-	2.4	-	oz.	
Mounting torque Mounting torque center hole			30 (3.4)	-	40 (4.6)		
			12 (1.4)	-	18 (2.1)	lbf ⋅ in (N ⋅ m)	
Terminal torque			30 (3.4)	-	40 (4.6)	(14 - 111)	
Vertical pull			=	- 80			
2" lever pull			=	=	35	- lbf · in	
Case style			TO-244				

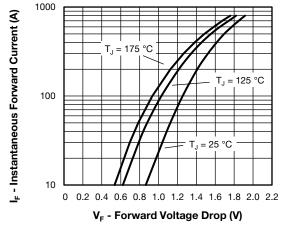
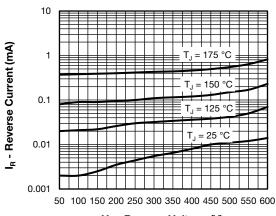


Fig. 1 - Typical Forward Voltage Drop vs. Instantaneous Forward Current (Per Diode)



V_R - Reverse Voltage (V)

Fig. 2 - Typical Reverse Current vs. Reverse Voltage (Per Diode)

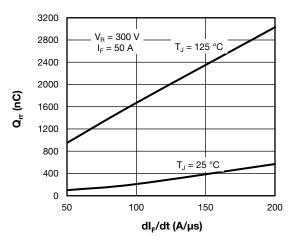


Fig. 3 - Typical Reverse Recovery Charge vs dl_F/dt (Per Diode)

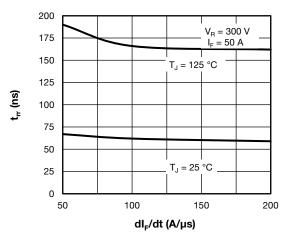


Fig. 4 - Typical Reverse Recovery Time vs dl_F/dt (Per Diode)

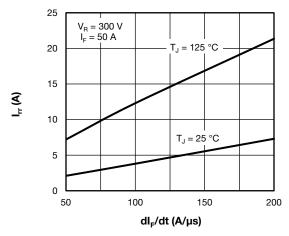


Fig. 5 - Typical Reverse Recovery Current vs dl_F/dt (Per Diode)

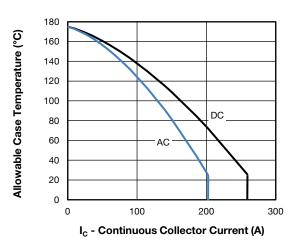


Fig. 6 - Maximum Continuous Forward Current vs.

Case Temperature

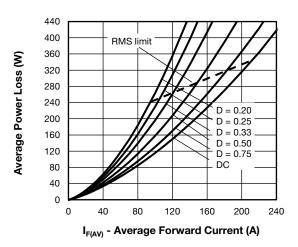


Fig. 7 - Average Power Loss vs. Average Forward Current (Forward Power Loss Characteristics)

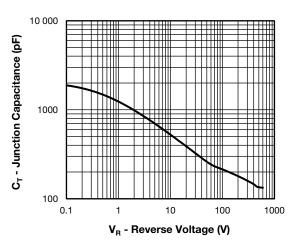


Fig. 8 - Typical Junction Capacitance vs. Reverse Voltage

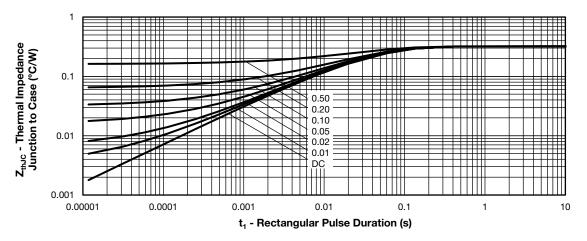
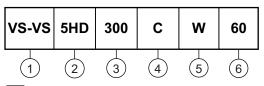


Fig. 9 - Z_{thJC} Maximum Thermal Impedance Junction to Case vs. t₁ Rectangular Pulse Duration

ORDERING INFORMATION TABLE

Device code



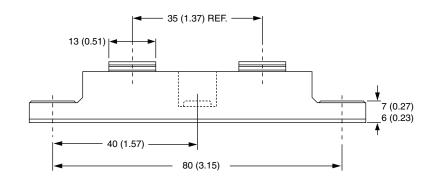
- 1 Vishay Semiconductors product
- 2 5HD = high speed FRED Pt® Gen 5
- 3 Current rating (300 = 300 A)
- 4 Circuit configuration:
 - C = two diodes common cathode
- 5 W = TO-244 wire bondable not isolated
- 6 Voltage rating (60 = 600 V)

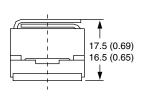
CIRCUIT CONFIGURATION				
CIRCUIT	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING		
Two diodes common cathode	С	Lug Lug terminal terminal anode 1 anode 2 Base common cathode		

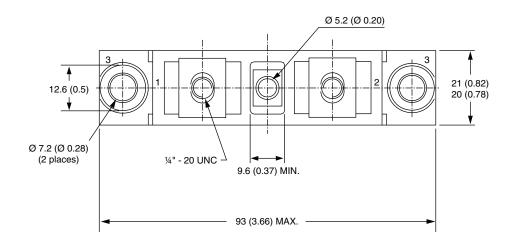
LINKS TO RELATED DOCUMENTS				
Dimensions	www.vishay.com/doc?95021			



DIMENSIONS in millimeters (inches)









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