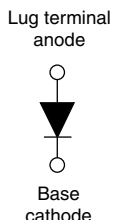


FRED Pt® **Ultrafast Soft Recovery Diode Module, 280 A**


HALF-PAK (D-67)


FEATURES

- 175 °C T_J operation
- Very low Q_{rr} and t_{rr}
- Designed and qualified for industrial level
- UL approved file E222165 
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

BENEFITS

- Reduced RFI and EMI
- Reduced snubbing
- Higher frequency operation

DESCRIPTION / APPLICATIONS

FRED Pt® diodes are optimized to reduce losses and EMI/RFI in high frequency power conditioning systems. The softness of the recovery eliminates the need for a snubber in most applications. These devices are ideally suited for HF welding, power converters, and other applications where switching losses are significant portion of the total losses.

PRIMARY CHARACTERISTICS

I _{F(AV)}	280 A
V _R	200 V
Q _{rr} (typical)	249 nC
t _{rr}	87 ns
Type	Modules - diode, FRED Pt®
Package	HALF-PAK (D-67)
Circuit configuration	Single

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Cathode to anode voltage	V _R		200	V
Continuous forward current	I _{F(DC)}	T _C = 25 °C	640	A
		T _C = 100 °C	400	
		T _C = 130 °C	280	
Maximum average forward current	I _{F(AV)}	T _J = 25 °C	1150	W
Single pulse forward current	I _{FSM}	T _C = 25 °C	789	
Maximum power dissipation	P _D	T _C = 100 °C	394	
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 = 100 µA	200	-	-	V
Maximum forward voltage	V _{FM}	I _F = 200 A	-	0.94	1.0	
		I _F = 400 A	-	1.06	1.14	
		I _F = 200 A, T _J = 125 °C	-	0.8	-	
		I _F = 400 A, T _J = 125 °C	-	0.94	-	
Maximum reverse leakage current	I _{RM}	T _J = 175 °C, V _R = 200 V	-	0.67	1.5	mA
Series inductance	L _S	From top of terminal hole to mounting plane	-	7.0	-	nH

**DYNAMIC RECOVERY CHARACTERISTICS** ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	$I_F = 50\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 200\text{ V}$	-	87	-	ns
		$T_J = 125\text{ }^{\circ}\text{C}$		-	95	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$		-	6	-	A
		$T_J = 125\text{ }^{\circ}\text{C}$		-	10.62	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$		-	249	-	nC
		$T_J = 125\text{ }^{\circ}\text{C}$		-	493	-	

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range		T _J , T _{Stg}		-55 to +175	°C
Maximum thermal resistance, junction to case		R _{thJC}	DC operation	0.19	°C/W
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, flat, smooth and greased	0.05	
Approximate weight				30	g
				1.06	oz.
Mounting torque	minimum			3 (26.5)	N · m (lbf · in)
	maximum			4 (35.4)	
Terminal torque	minimum			3.4 (30)	
	maximum			5 (44.2)	
Case style				HALF-PAK(D-67)	

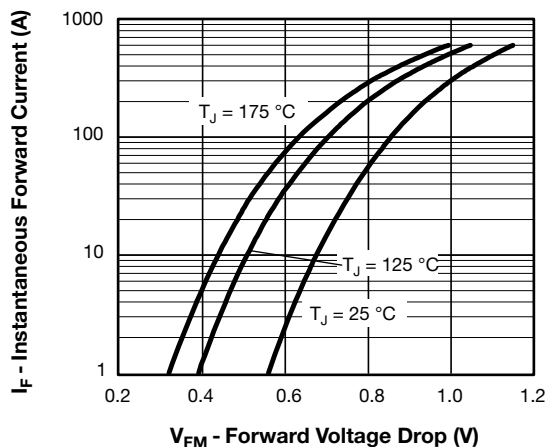


Fig. 1 - Typical Forward Voltage Drop vs. Instantaneous Forward Current

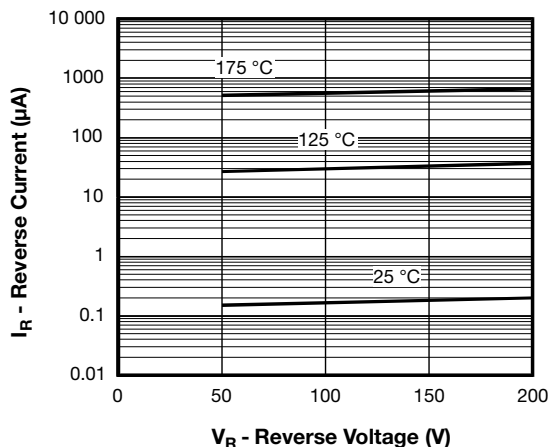


Fig. 2 - Typical Reverse Current vs. Reverse Voltage

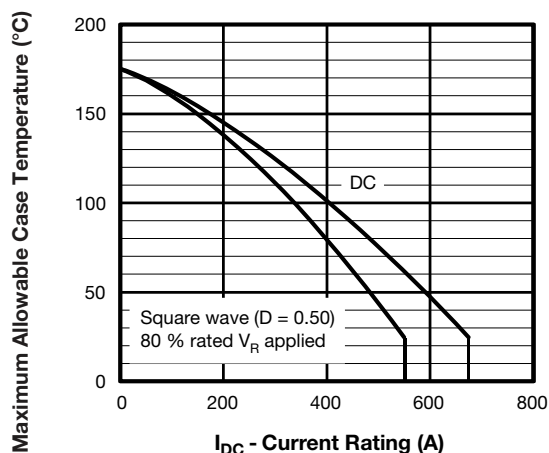
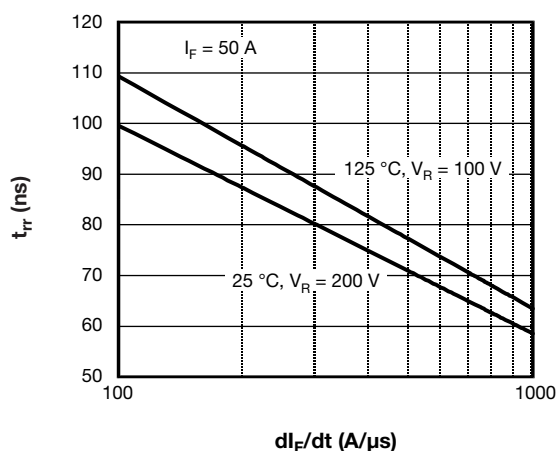
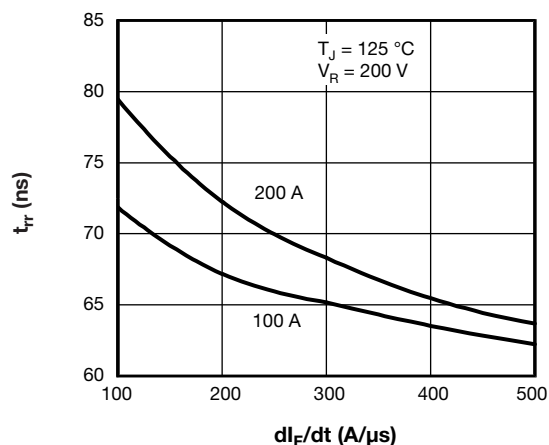
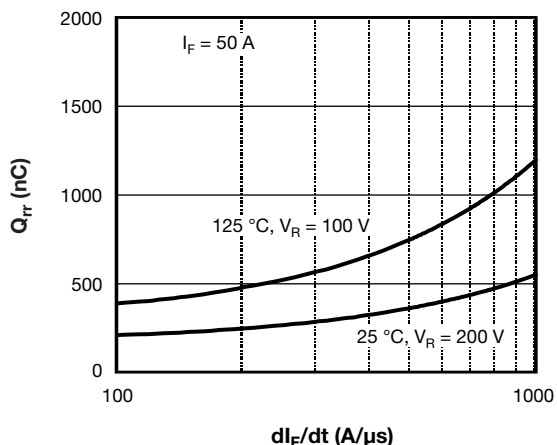
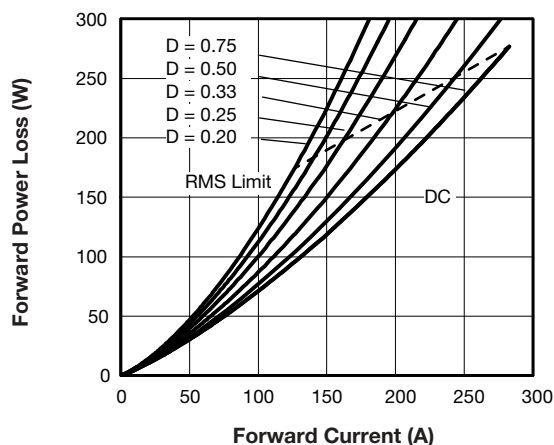
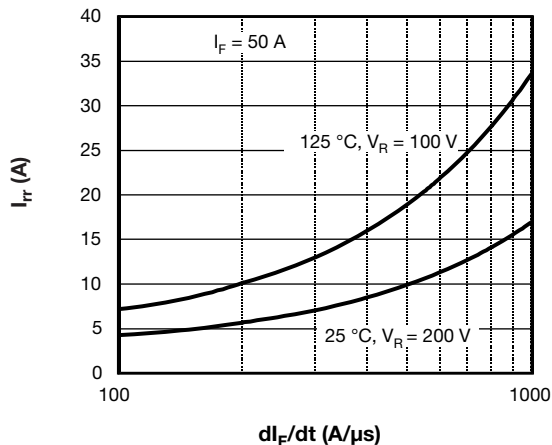


Fig. 3 - Maximum Current Rating Capability


Fig. 6 - Typical Reverse Recovery Time vs. di_F/dt

Fig. 4 - Typical Reverse Recovery vs. di_F/dt

Fig. 7 - Typical Reverse Recovery Charge vs. di_F/dt

Fig. 5 - Typical Recovery Current vs. di_F/dt

Fig. 8 - Typical Reverse Recovery Current vs. di_F/dt

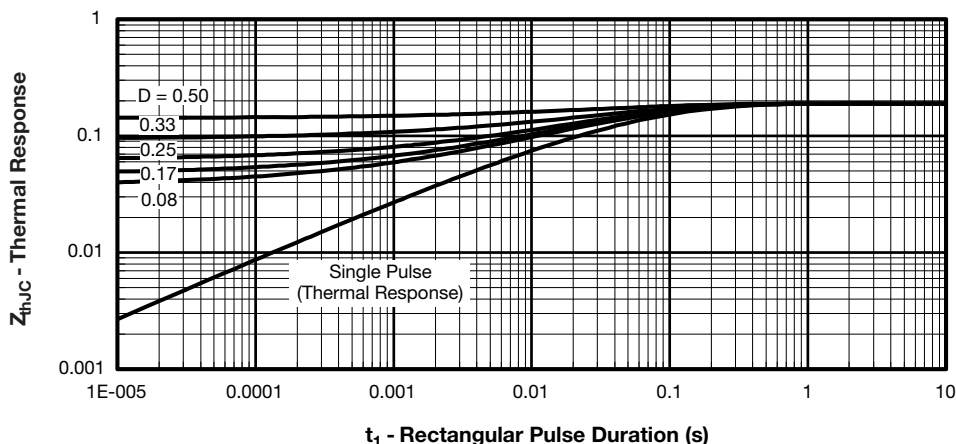


Fig. 9 - Maximum Thermal Impedance Z_{thJC} Characteristics

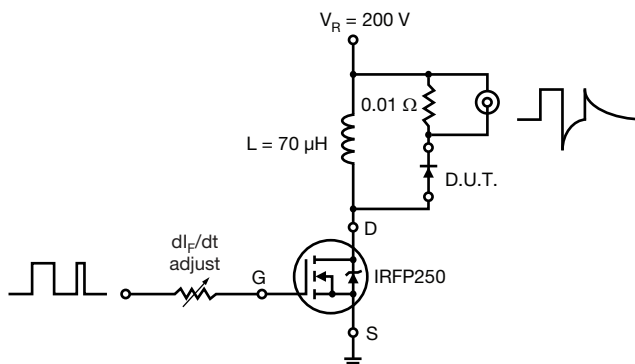


Fig. 10 - Reverse Recovery Parameter Test Circuit

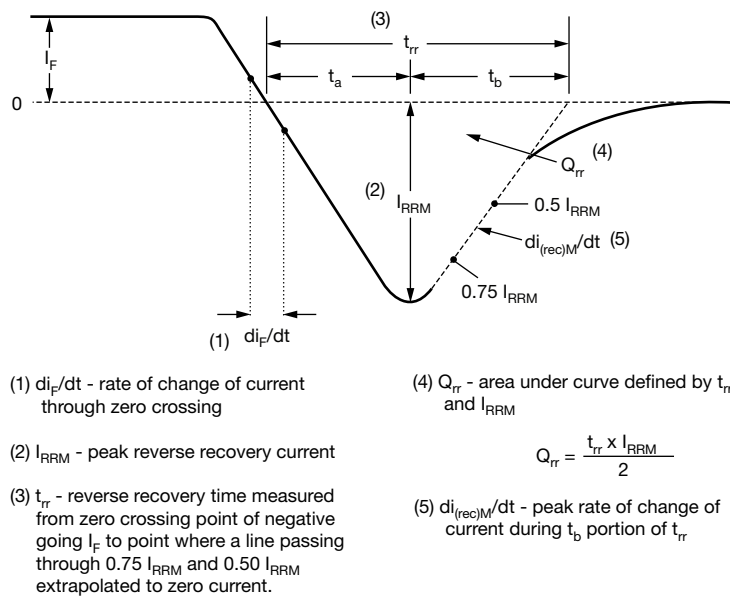


Fig. 11 - Reverse Recovery Waveform and Definitions

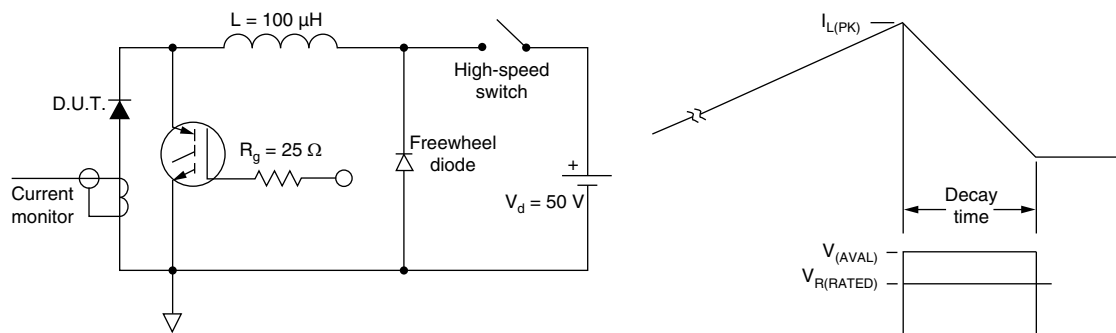


Fig. 12 - Avalanche Test Circuit and Waveforms

ORDERING INFORMATION TABLE

Device code	VS-VS	UD	200	C	H	20	PbF
	1	2	3	4	5	6	7

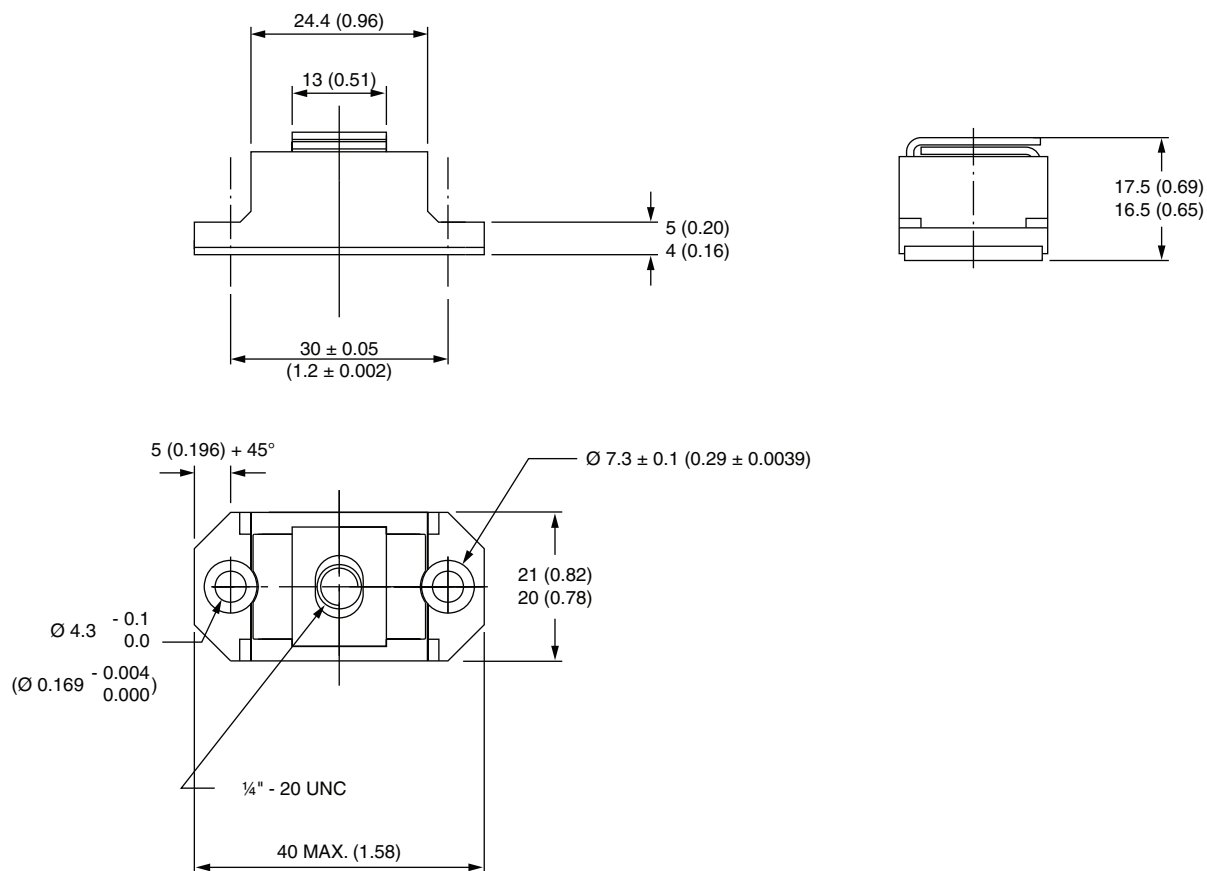
- 1 - Vishay Semiconductors product
- 2 - Ultrafast diode
- 3 - Current rating
- 4 - Circuit configuration:
C = Not isolated
- 5 - Type of device:
H = HALF-PAK (D-67)
- 6 - Voltage rating (20 = 200 V)
- 7 - Lead (Pb)-free

Circuit Configuration		
Circuit	Circuit Configuration Code	Circuit Drawing
Single diode	C	

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95020



DIMENSIONS in millimeters (inches) **D-67 HALF-PAK**





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