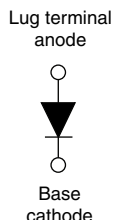


FRED Pt® **Ultrafast Soft Recovery Diode Module, 200 A**


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
- Higher frequency operation
- Reduced snubbing

DESCRIPTION / APPLICATIONS

These 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)}	200 A
V _R	400 V
Q _{rr} (typical)	243 nC
t _{rr}	74 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		400	V
Continuous forward current	I _{F(DC)}	T _C = 25 °C	510	A
		T _C = 100 °C	340	
Maximum average forward current	I _{F(AV)}	T _C = 130 °C	200	
Single pulse forward current	I _{FSM}	T _J = 25 °C	1440	
Maximum power dissipation	P _D	T _C = 25 °C	789	W
		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	400	-	-	V
Maximum forward voltage	V _{FM}	I _F = 200 A	-	1.1	1.19	
		I _F = 400 A	-	1.26	1.36	
		I _F = 200 A, T _J = 125 °C	-	0.9	-	
		I _F = 400 A, T _J = 125 °C	-	1.18	-	
Maximum reverse leakage current	I _{RM}	T _J = 175 °C, V _R = 200 V	-	0.26	1.28	mA
Series inductance	L _S	From top of terminal hole to mounting plane	-	5	-	nH

Note

- Pulse width 500 µs



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}	$I_F = 180\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 200\text{ V}$	-	74	-	ns
		$I_F = 180\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$, $T_J = 150\text{ }^{\circ}\text{C}$	-	171	-	
Peak recovery current	I_{RRM}	$I_F = 180\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 200\text{ V}$	-	6.6	-	A
		$I_F = 180\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$, $T_J = 150\text{ }^{\circ}\text{C}$	-	15.2	-	
Reverse recovery charge	Q_{rr}	$I_F = 180\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 200\text{ V}$	-	243	-	nC
		$I_F = 180\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$, $T_J = 150\text{ }^{\circ}\text{C}$	-	1295	-	

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, 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)		

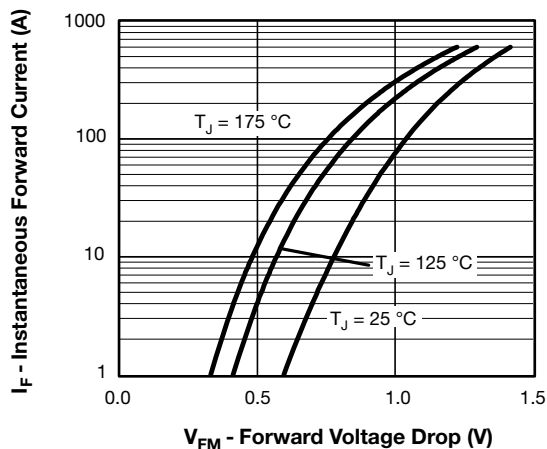


Fig. 1 - Maximum Forward Voltage Drop vs. Instantaneous Forward Current

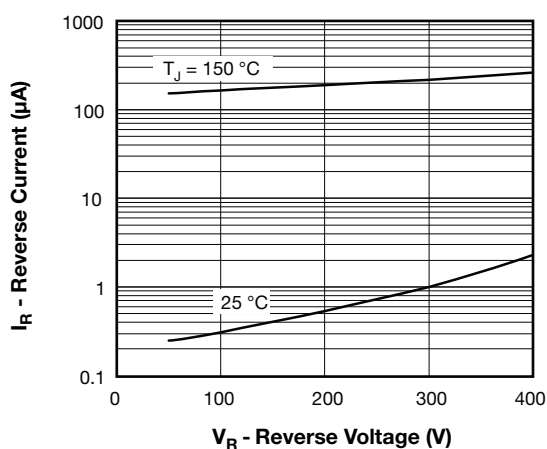


Fig. 2 - Typical Reverse Current vs. Reverse Voltage

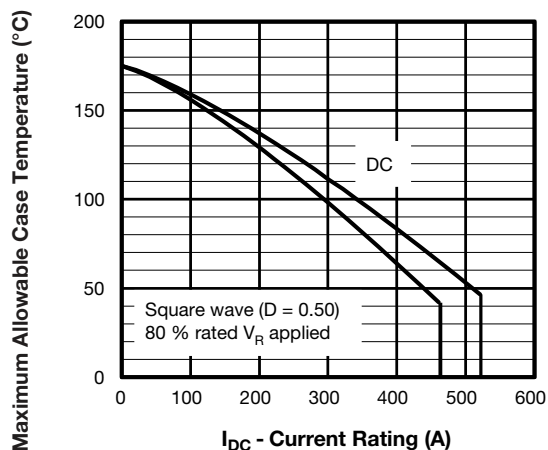


Fig. 3 - Maximum Current Rating Capability

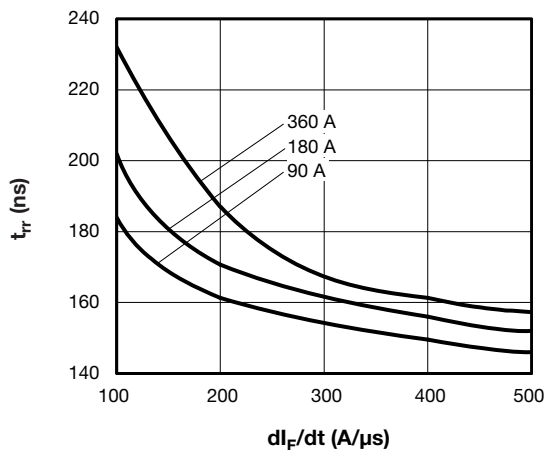
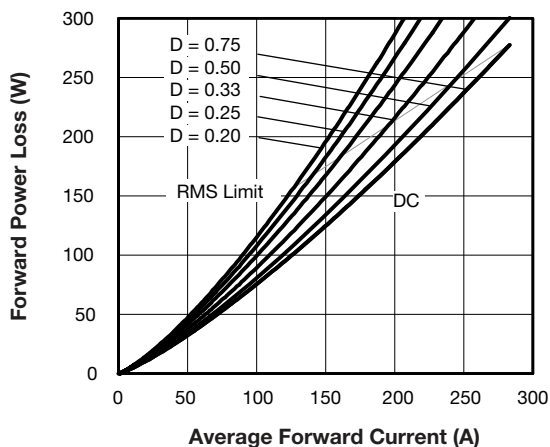
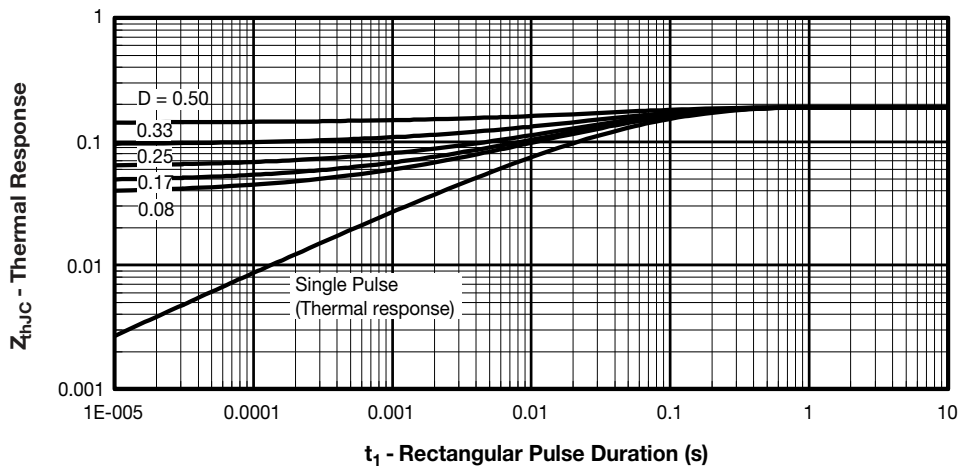

Fig. 4 - Typical Reverse Recovery Time vs. dI_F/dt


Fig. 5 - Forward Power Loss Characteristics


Fig. 6 - Maximum Thermal Impedance Z_{thJC} Characteristics

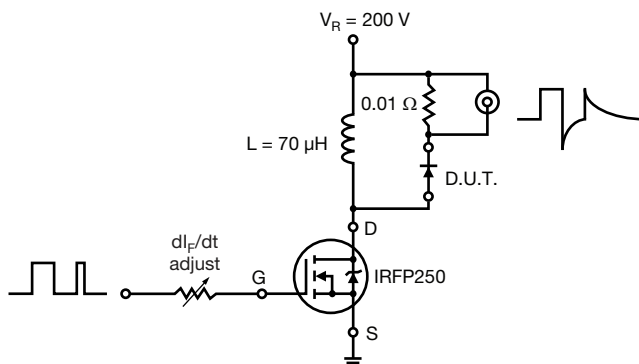
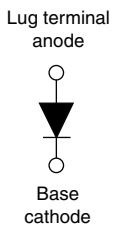


Fig. 7 - Reverse Recovery Parameter Test Circuit
(All recovery characteristics have been determined using shown test circuit)

ORDERING INFORMATION TABLE

Device code	VS-VS	UD	200	C	H	40	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 (40 = 400 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



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