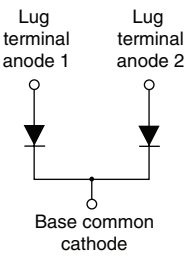
FRED Pt™
Ultrafast Soft Recovery Diode, 400 A

TO-244



FEATURES

- Ultrafast recovery
- Lead (Pb)-free
- Designed for industrial level

Pb-free
RoHS COMPLIANT

BENEFITS

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

PRODUCT SUMMARY	
$I_{F(AV)}$	400 A
V_R	600 V
t_{rr}	90 ns

DESCRIPTION

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.

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MAX.**	**UNITS**
Cathode to anode voltage	V_R		600	V
Continuous forward current per diode	$I_{F(AV)}$	T_C = 25 °C	330	A
		T_C = 85 °C	230	
		T_C = 97 °C	200	
Single pulse forward current per diode	I_{FSM}		1200	
Maximum power dissipation	P_D	T_C = 25 °C	660	W
		T_C = 97 °C	280	
Operating junction and storage temperatures	T_J, T_{Stg}		- 40 to 150	°C

ELECTRICAL SPECIFICATIONS PER LEG (T_J = 25 °C unless otherwise specified)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Breakdown voltage	V_{BR}	I_R = 100 µA	600	-	-	V
Forward voltage	V_{FM}	I_F = 200 A	-	1.45	2.0	
		I_F = 400 A	-	1.67	2.3	
		I_F = 200 A, T_J = 150 °C	-	1.13	1.4	
		I_F = 400 A, T_J = 150 °C	-	1.39	1.8	
Reverse leakage current	I_{RM}	T_J = 150 °C, V_R = V_R rated	-	0.3	1.38	mA
Series inductance	L_S	From top of terminal hole to mounting plane	-	5	-	nH

DYNAMIC RECOVERY CHARACTERISTICS (T_J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	T_J = 25 °C	I_F = 200 A, dI_F/dt = 200 A/µs, V_R = 200 V	-	90	-	ns
		T_J = 150 °C		-	240	-	
Peak recovery current	I_{RRM}	I_F = 200 A, dI_F/dt = 200 A/µs, V_R = 200 V		-	8.3	-	A
		I_F = 200 A, dI_F/dt = 200 A/µs, V_R = 200 V, T_J = 150 °C		-	24	-	
Reverse recovery charge	Q_{rr}	I_F = 200 A, dI_F/dt = 200 A/µs, V_R = 200 V		-	830	-	nC
		I_F = 200 A, dI_F/dt = 200 A/µs, V_R = 200 V, T_J = 150 °C		-	4730	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case	per leg	R_{thJC}	-	-	0.19	°C/W
	per module		-	-	0.095	
Thermal resistance, case to heatsink		R_{thCS}	-	0.10	-	
Weight			-	68	-	g
			-	2.4	-	oz.
Mounting torque			30 (3.4)	-	40 (4.6)	lbf · in (N · m)
Mounting torque center hole			12 (1.4)	-	18 (2.1)	
Terminal torque			30 (3.4)	-	40 (4.6)	
Vertical pull			-	-	80	lbf · in
2" lever pull			-	-	35	

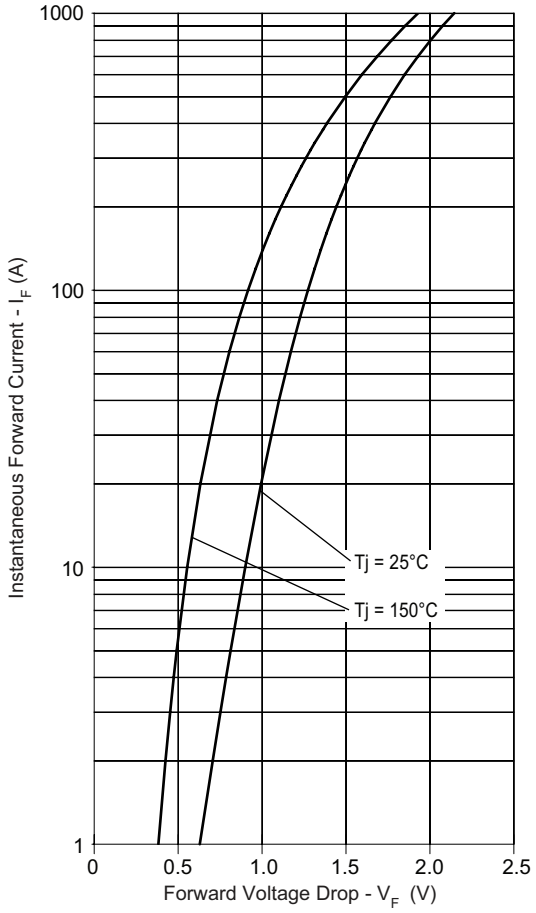


Fig. 1 - Typical Forward Voltage Drop vs. Instantaneous Forward Current (Per Leg)

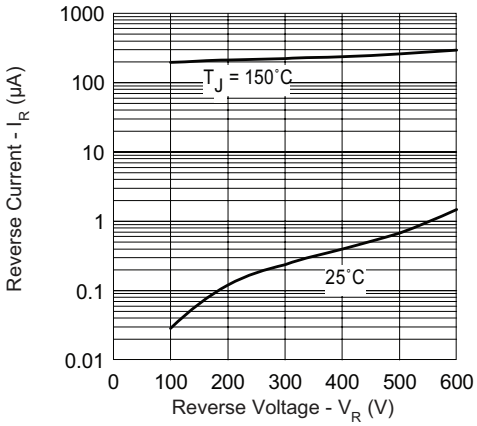


Fig. 2 - Typical Reverse Current vs. Reverse Voltage (Per Leg)

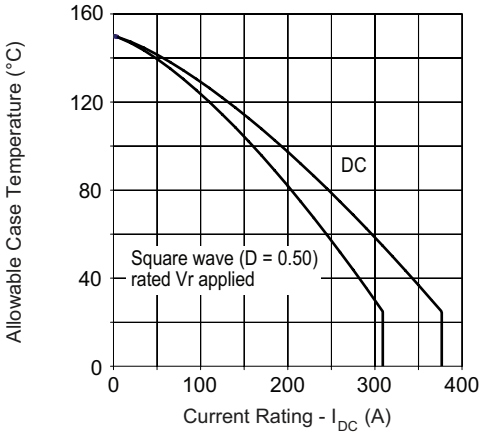


Fig. 3 - Maximum Current Rating Capability (Per Leg)

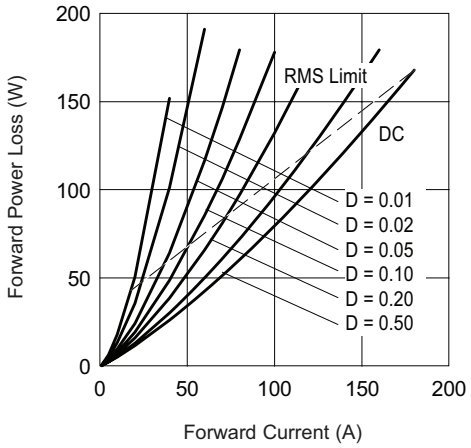


Fig. 4 - Forward Power Loss Characteristics

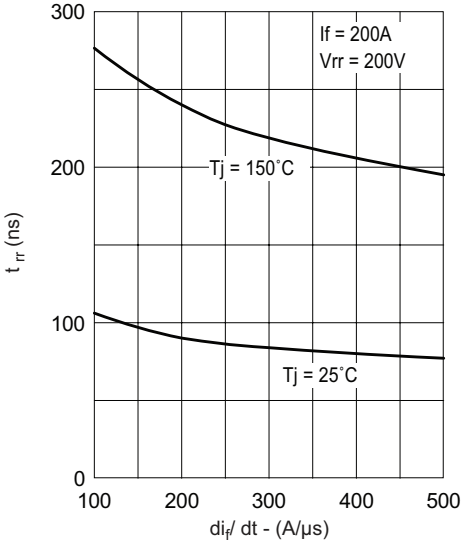


Fig. 5 - Typical Reverse Recovery Time vs. dI_F/dt (Per Leg)

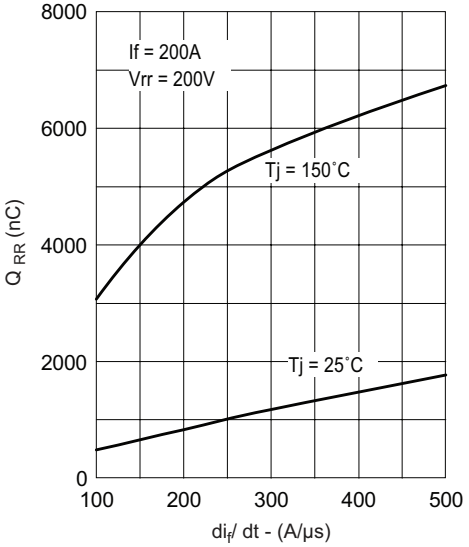


Fig. 6 - Typical Reverse Recovery Charge vs. dI_F/dt (Per Leg)

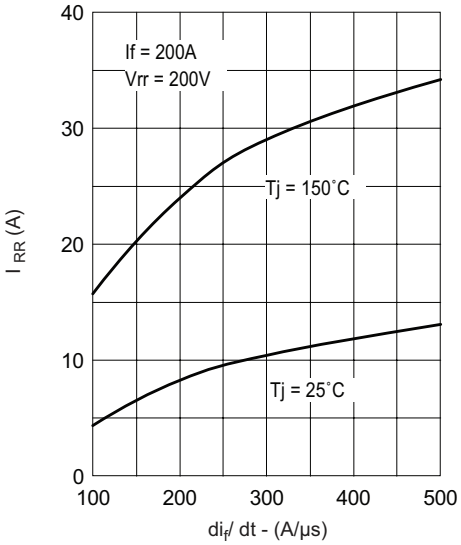


Fig. 7 - Typical Reverse Recovery Current vs. dI_F/dt (Per Leg)

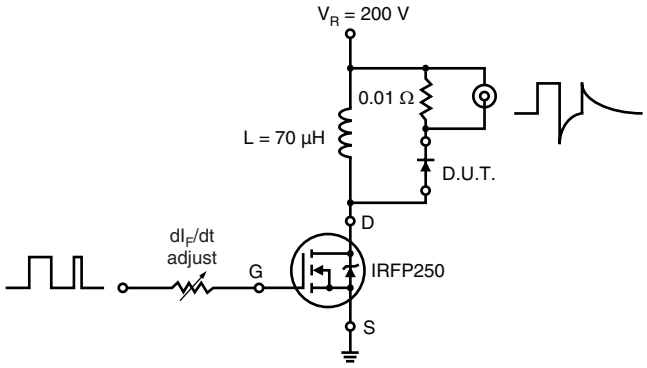
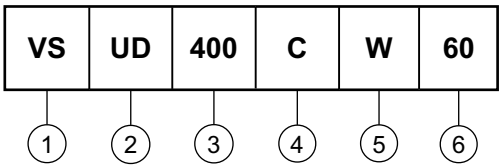


Fig. 8 - Reverse Recovery Parameter Test Circuit

ORDERING INFORMATION TABLE

Device code

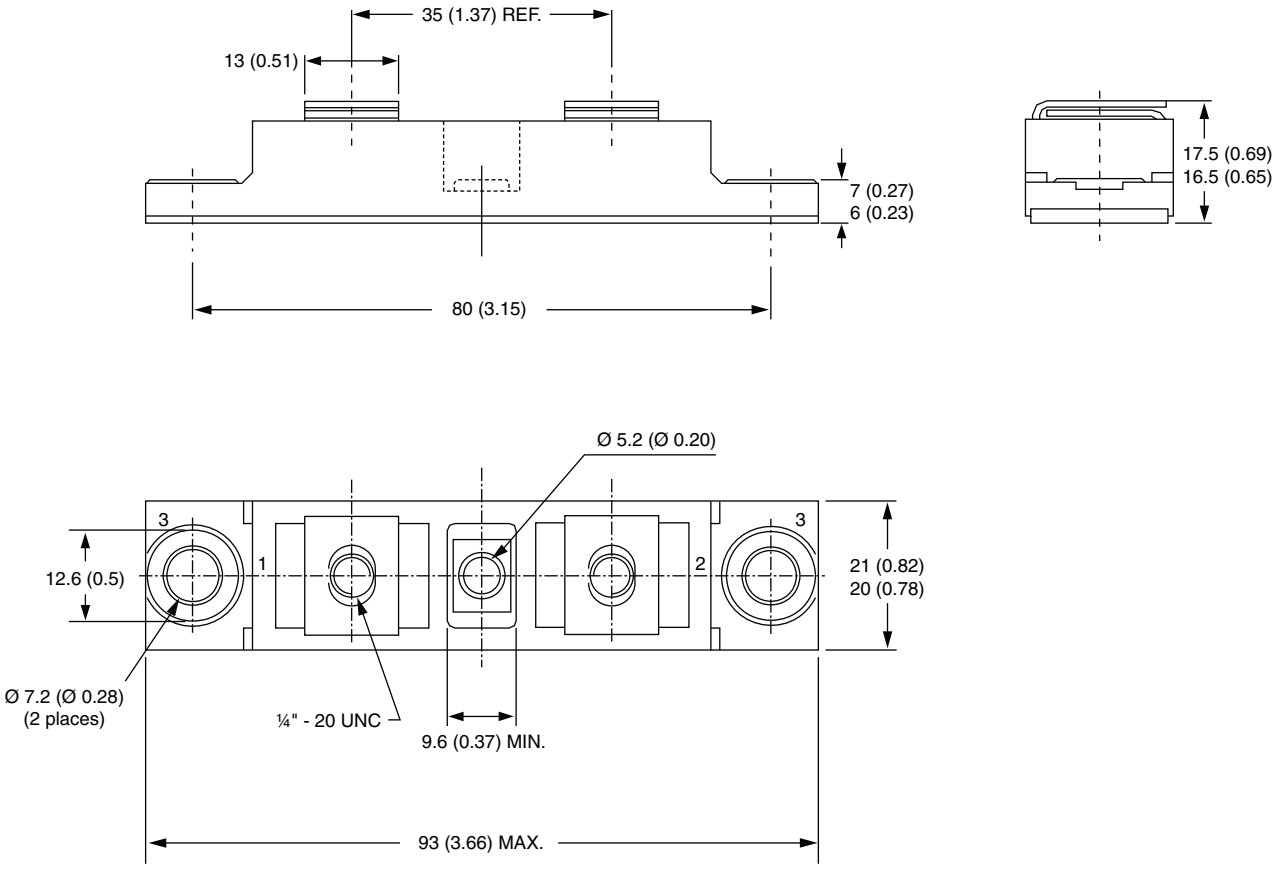


- 1 - Vishay HPP
- 2 - UD = FRED Pt™
- 3 - Current rating (400 = 400 A)
- 4 - Circuit configuration:
  C = Common cathode
- 5 - W = TO-244 wire bondable not isolated
- 6 - Voltage rating (60 = 600 V)

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

TO-244

DIMENSIONS in millimeters (inches)



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