

Ultrafast Soft Recovery Diode, 150 A FRED Pt®



PowerTab®



FEATURES

- Ultrafast recovery time
- 175 °C max. operating junction temperature
- Screw mounting only
- AEC-Q101 qualified
- PowerTab® package
- 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
- Reduced parts count

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 not significant portion of the total losses.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	150 A
V_R	200 V
V_F at I_F	0.77 V
t_{rr} (typ.)	See recovery table
T_J max.	175 °C
Package	PowerTab®
Circuit configuration	Single

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Cathode to anode voltage	V_R		200	V
Continuous forward current	$I_{F(AV)}$	$T_C = 116\text{ °C}$	150	A
Single pulse forward current	I_{FSM}	$T_C = 25\text{ °C}$	1600	
Maximum repetitive forward current	I_{FRM}	Square wave, 20 kHz	380	
Operating junction and storage temperatures	T_J, T_{Stg}		-55 to +175	°C

ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ °C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR}, V_R	$I_R = 100\text{ }\mu\text{A}$	200	-	-	V
Forward voltage	V_F	$I_F = 150\text{ A}$	-	0.94	1.10	
		$I_F = 150\text{ A}, T_J = 175\text{ °C}$	-	0.77	0.88	
Reverse leakage current	I_R	$V_R = V_R$ rated	-	-	50	μA
		$T_J = 150\text{ °C}, V_R = V_R$ rated	-	-	2	mA
Junction capacitance	C_T	$V_R = 200\text{ V}$	-	180	-	pF
Series inductance	L_S	Measured lead to lead 5 mm from package body	-	3.5	-	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}	$T_J = 25\text{ }^{\circ}\text{C}$	-	48	-	ns
		$T_J = 125\text{ }^{\circ}\text{C}$	-	88	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$	-	5	-	A
		$T_J = 125\text{ }^{\circ}\text{C}$	-	12	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	120	-	nC
		$T_J = 125\text{ }^{\circ}\text{C}$	-	520	-	

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case	R_{thJC}		-	-	0.35	K/W
Thermal resistance, case to heatsink	R_{thCS}	Mounting surface, flat, smooth and greased	-	0.2	-	
Weight			-	-	5.02	g
			-	0.18	-	oz.
Mounting torque			1.2 (10)	-	2.4 (20)	N · m (lbf · in)
Marking device		Case style PowerTab®	150EBU02H			

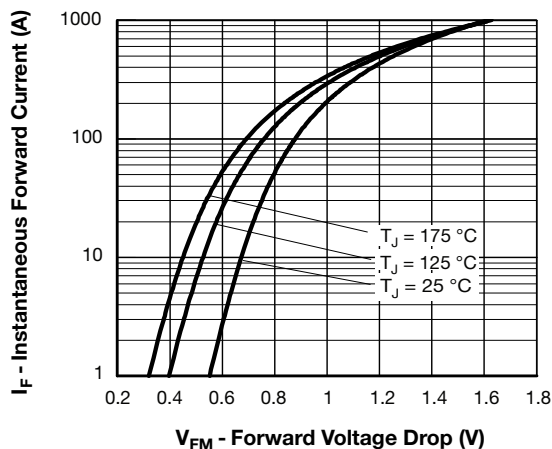


Fig. 1 - Maximum Forward Voltage Drop Characteristics

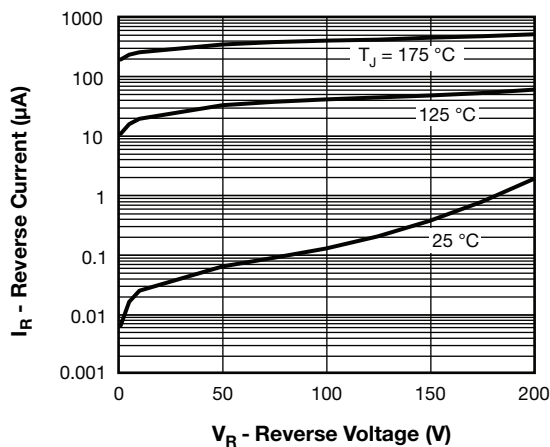


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

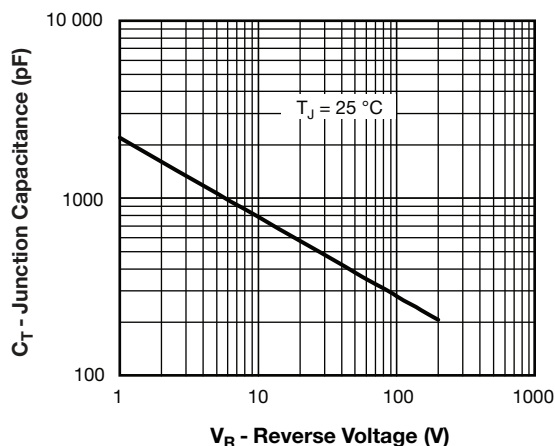


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

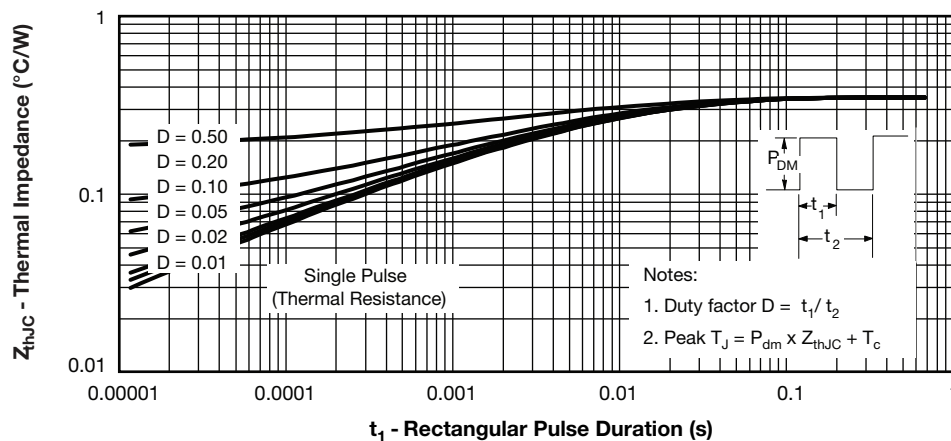


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

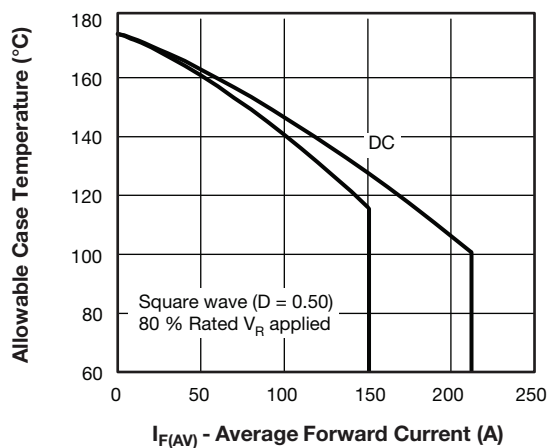


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

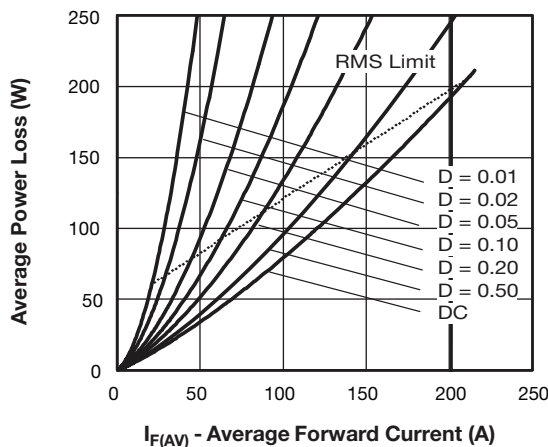


Fig. 6 - Forward Power Loss Characteristics

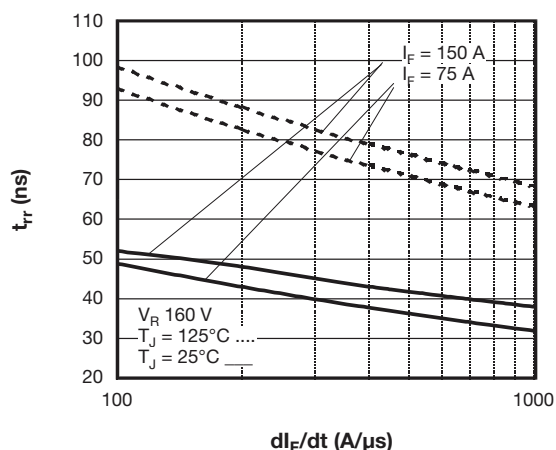
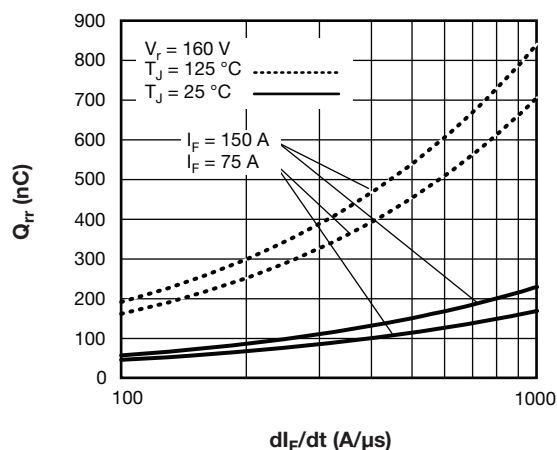
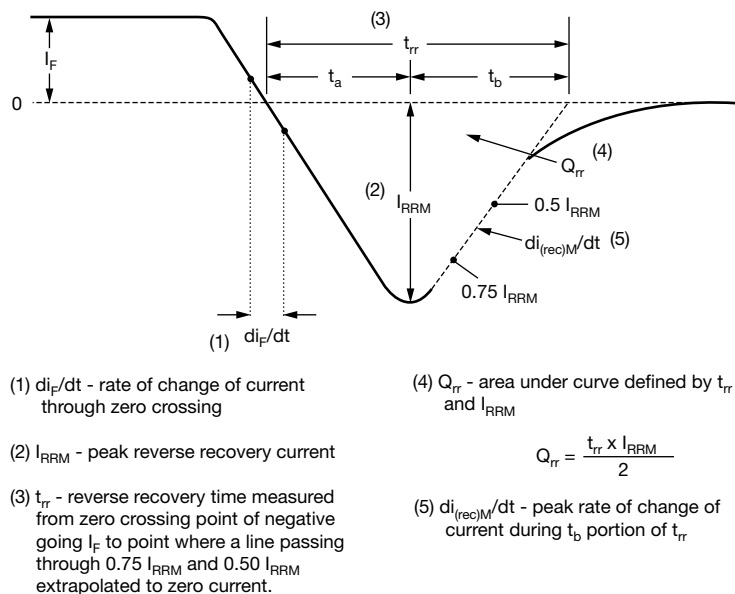

Fig. 7 - Typical Reverse Recovery Time vs. di_F/dt

Fig. 8 - Typical Stored Charge vs. di_F/dt


Fig. 9 - Reverse Recovery Waveform and Definitions

**ORDERING INFORMATION TABLE**

Device code	VS-	150	E	B	U	02	H	F4
	1	2	3	4	5	6	7	8
	1	-	Vishay Semiconductors product					
	2	-	Current rating (150 = 150 A)					
	3	-	Single diode					
	4	-	PowerTab®					
	5	-	Ultrafast recovery					
	6	-	Voltage rating (02 = 200 V)					
	7	-	H = AEC-Q101 qualified					
	8	-	F4 = RoHS-compliant and totally lead (Pb)-free					

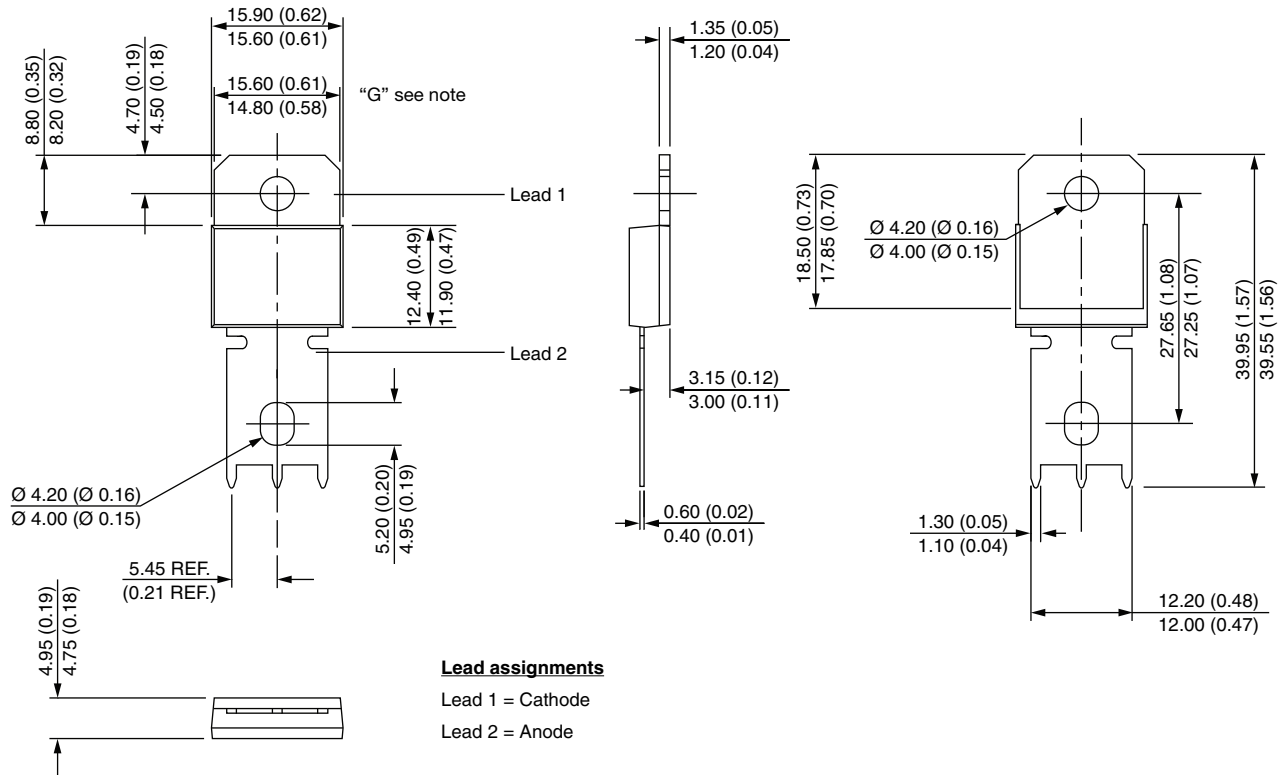
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-150EBU02HF4	25	375	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95240
Part marking information	www.vishay.com/doc?95467
Application note	www.vishay.com/doc?95179
SPICE model	www.vishay.com/doc?96503



PowerTab®

DIMENSIONS in millimeters (inches)



Note:

Outline conform to JEDEC® TO-275, except for dimension "G" only



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