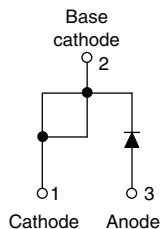


Fast Soft Recovery Rectifier Diode, 20 A



TO-220AC FULL-PAK



FEATURES

- The fully isolated package ($V_{INS} = 2500 V_{RMS}$) is UL E78996 approved 
- Designed and qualified for industrial level



Available
RoHS*
COMPLIANT

APPLICATIONS

- Output rectification and freewheeling in inverters, choppers and converters
- Input rectifications where severe restrictions on conducted EMI should be met

DESCRIPTION

The 20ETF..FPPbF fast soft recovery rectifier series has been optimized for combined short reverse recovery time and low forward voltage drop.

The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions.

PRODUCT SUMMARY

V_F at 20 A	< 1.31 V
I_{FSM}	355 A
V_{RRM}	1000 V to 1200 V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
V_{RRM}		1000 to 1200	V
$I_{F(AV)}$	Sinusoidal waveform	20	A
I_{FSM}		355	
t_{rr}	1 A, 100 A/ μ s	95	ns
V_F	20 A, $T_J = 25^\circ C$	1.31	V
T_J	Range	- 40 to 150	$^\circ C$

VOLTAGE RATINGS

PART NUMBER	V_{RRM} , MAXIMUM PEAK REVERSE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} AT 150 $^\circ C$ mA
20ETF10FPPbF	1000	1100	6
20ETF12FPPbF	1200	1300	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 97^\circ C$, 180° conduction half sine wave	20	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	10 ms sine pulse, rated V_{RRM} applied	300	
		10 ms sine pulse, no voltage reapplied	355	
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied	450	A^2s
		10 ms sine pulse, no voltage reapplied	635	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ ms to 10 ms, no voltage reapplied	6350	$A^2\sqrt{s}$

* Pb containing terminations are not RoHS compliant, exemptions may apply

20ETF10FPPbF, 20ETF12FPPbF Soft Recovery Series

Vishay Semiconductors

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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V_{FM}	20 A, $T_J = 25\text{ }^{\circ}\text{C}$		1.31	V
Forward slope resistance	r_t	$T_J = 150\text{ }^{\circ}\text{C}$		11.88	$m\Omega$
Threshold voltage	$V_{F(TO)}$			0.93	V
Maximum reverse leakage current	I_{RM}	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^{\circ}\text{C}$		6	

RECOVERY CHARACTERISTICS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Reverse recovery time	t_{rr}	I_F at 20 Apk 25 A/ μs 25 $^{\circ}\text{C}$	400	ns	
Reverse recovery current	I_{rr}		6.1	A	
Reverse recovery charge	Q_{rr}		1.7	μC	
Snap factor	S	Typical	0.6		

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range		T _J , T _{Stg}		- 40 to 150	°C
Maximum thermal resistance, junction to case		R _{thJC}	DC operation	1.5	°C/W
Maximum thermal resistance, junction to ambient		R _{thJA}		62	
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth and greased	1.5	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device		Case style TO-220AC FULL-PAK	20ETF10FP		
			20ETF12FP		



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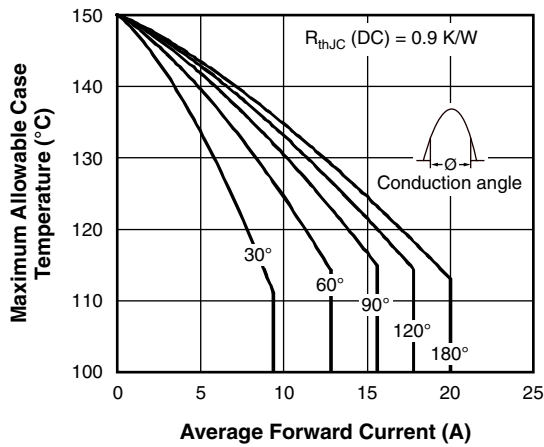


Fig. 1 - Current Rating Characteristics

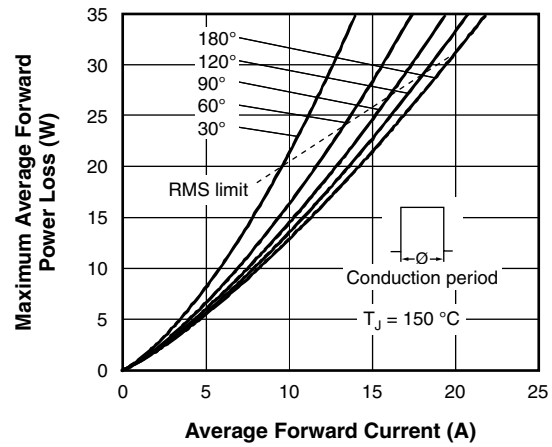


Fig. 4 - Forward Power Loss Characteristics

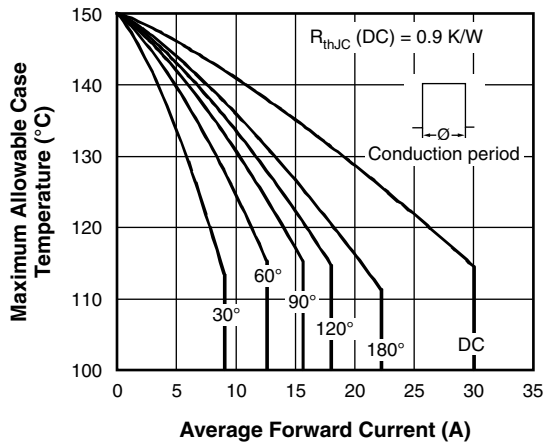


Fig. 2 - Current Rating Characteristics

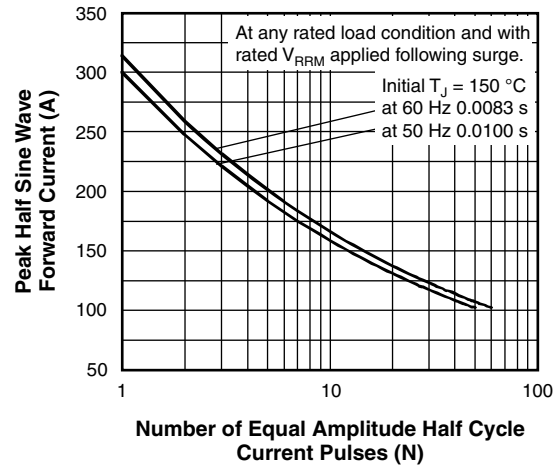


Fig. 5 - Maximum Non-Repetitive Surge Current

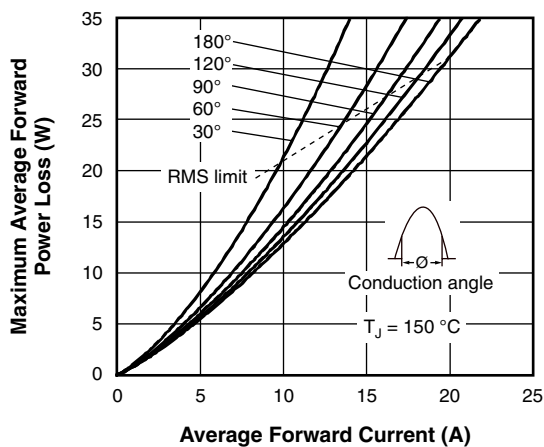


Fig. 3 - Forward Power Loss Characteristics

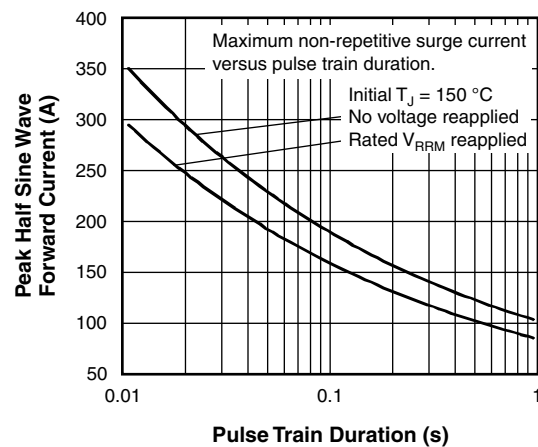


Fig. 6 - Maximum Non-Repetitive Surge Current

20ETF10FPPbF, 20ETF12FPPbF Soft Recovery Series

Vishay Semiconductors

Fast Soft Recovery
Rectifier Diode, 20 A

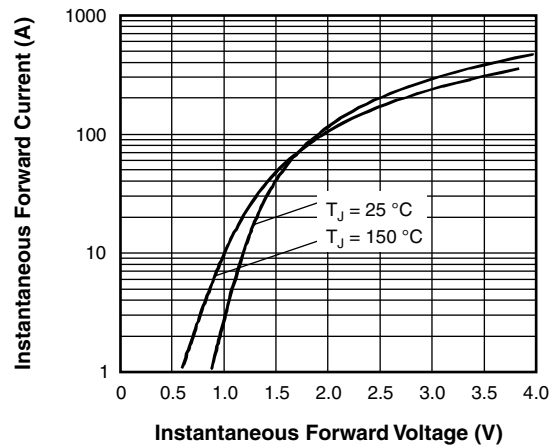


Fig. 7 - Forward Voltage Drop Characteristics

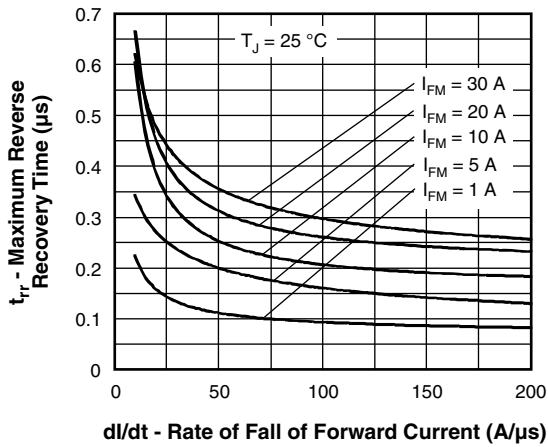


Fig. 8 - Recovery Time Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

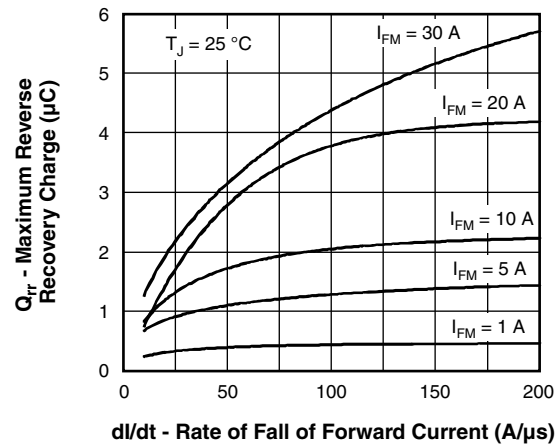


Fig. 10 - Recovery Charge Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

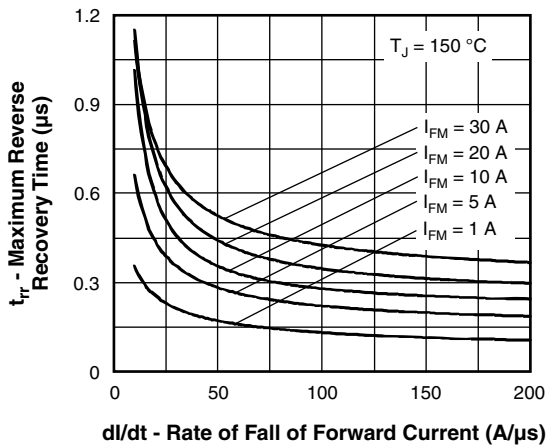


Fig. 9 - Recovery Time Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

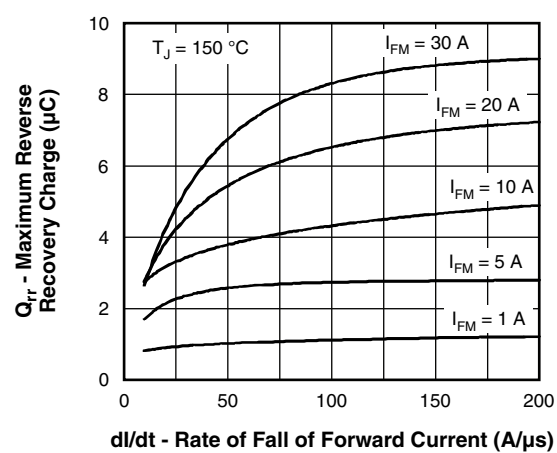


Fig. 11 - Recovery Charge Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$



20ETF10FPPbF, 20ETF12FPPbF Soft Recovery Series

Fast Soft Recovery
Rectifier Diode, 20 A

Vishay Semiconductors

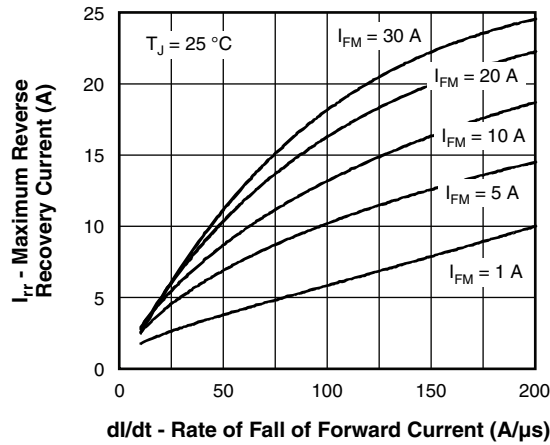


Fig. 12 - Recovery Current Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

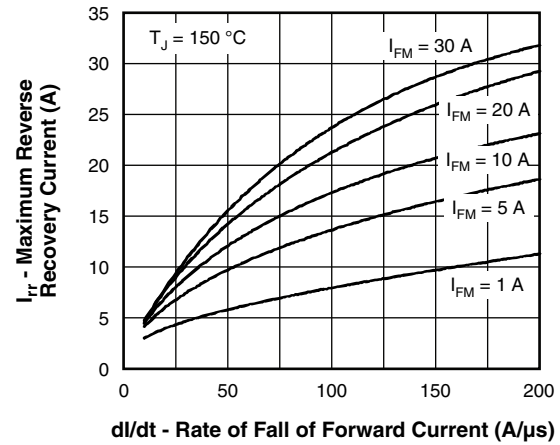


Fig. 13 - Recovery Current Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

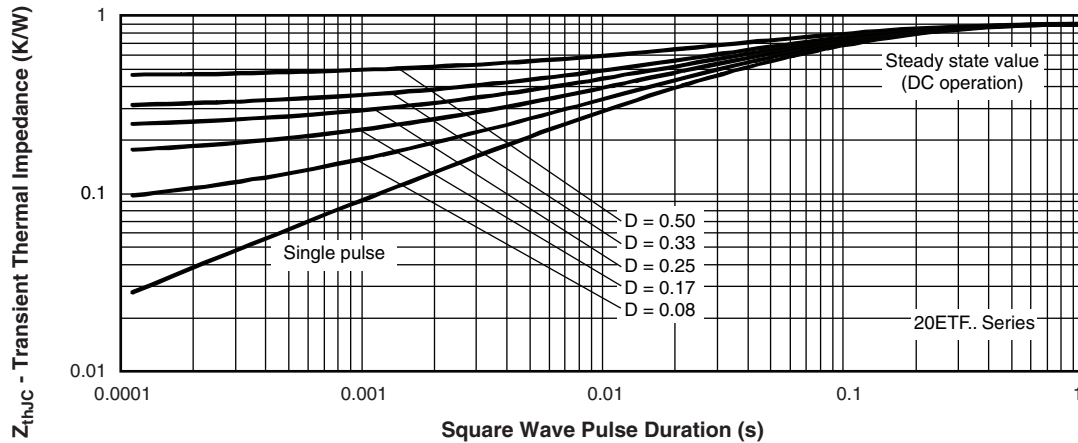


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

20ETF10FPPbF, 20ETF12FPPbF Soft Recovery Series

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Fast Soft Recovery
Rectifier Diode, 20 A



ORDERING INFORMATION TABLE

Device code	20	E	T	F	12	FP	PbF
	1	2	3	4	5	6	7

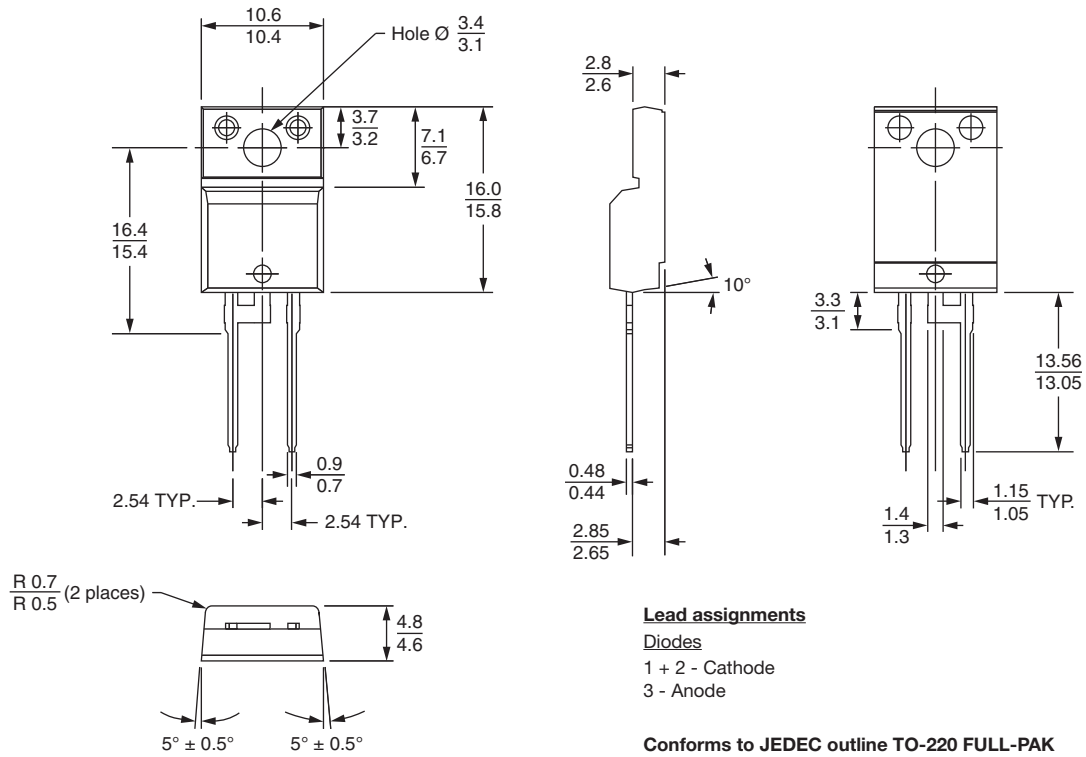
1	-	Current rating (20 = 20 A)
2	-	Circuit configuration: E = Single diode
3	-	Package: T = TO-220AC
4	-	Type of silicon: F = Fast soft recovery rectifier
5	-	Voltage ratings
6	-	FULL-PAK
7	-	• None = Standard production • PbF = Lead (Pb)-free

10 = 1000 V
12 = 1200 V

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95005
Part marking information	www.vishay.com/doc?95009

TO-220AC FULL-PAK

DIMENSIONS in millimeters





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