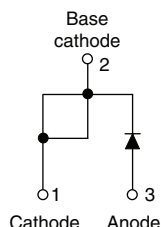


Fast Soft Recovery Rectifier Diode, 20 A



TO-220AC



FEATURES/DESCRIPTION

The 20ETF.. 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.

This product series has been designed and qualified for industrial level.

APPLICATIONS

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

PRODUCT SUMMARY

V_F at 10 A	< 1.2 V
I_{FSM}	300 A
V_{RRM}	200 to 600 V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
V_{RRM}	Range	200 to 600	V
$I_{F(AV)}$	Sinusoidal waveform	20	A
I_{FSM}		300	
t_{rr}	1 A, 100 A/ μ s	60	ns
V_F	10 A, $T_J = 25^\circ\text{C}$	1.2	V
T_J	Range	- 40 to 150	$^\circ\text{C}$

VOLTAGE RATINGS

PART NUMBER	V_{RRM} , MAXIMUM PEAK REVERSE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} AT 150 $^\circ\text{C}$ mA
20ETF02	200	300	5
20ETF04	400	500	
20ETF06	600	700	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 97^\circ\text{C}$, 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	250	
		10 ms sine pulse, no voltage reapplied	300	
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied	316	A^2s
		10 ms sine pulse, no voltage reapplied	442	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied	4420	$\text{A}^2\sqrt{\text{s}}$

20ETF.. Soft Recovery Series

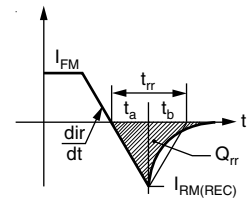
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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V _{FM}	20 A, T _J = 25 °C		1.3	V
Forward slope resistance	r _t	T _J = 150 °C		12.5	mΩ
Threshold voltage	V _{F(TO)}			0.9	V
Maximum reverse leakage current	I _{RM}	T _J = 25 °C	V _R = Rated V _{RRM}	0.1	mA
		T _J = 150 °C		5.0	

RECOVERY CHARACTERISTICS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	t_{rr}	I_F at 20 Apk 100 A/ μs 25 $^{\circ}\text{C}$	160	ns
Reverse recovery current	I_{rr}		10	A
Reverse recovery charge	Q_{rr}		1.25	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	0.9	°C/W
Maximum thermal resistance, junction to ambient		R _{thJA}		62	
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth and greased	0.5	
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	20ETF02		
			20ETF04		
			20ETF06		

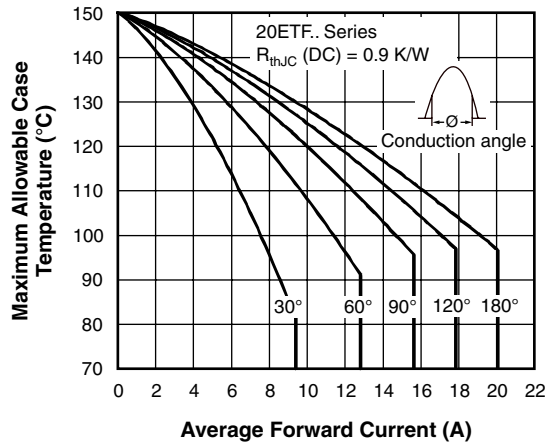


Fig. 1 - Current Rating Characteristics

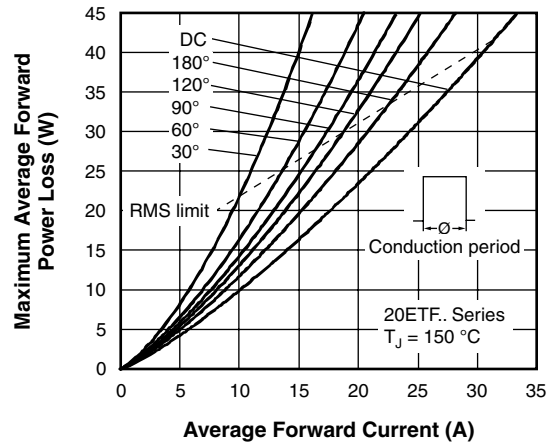


Fig. 4 - Forward Power Loss Characteristics

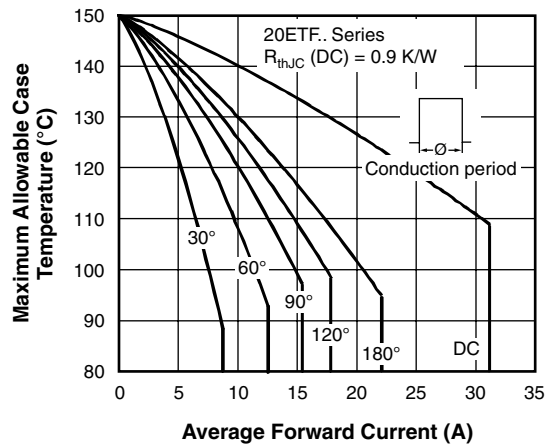


Fig. 2 - Current Rating Characteristics

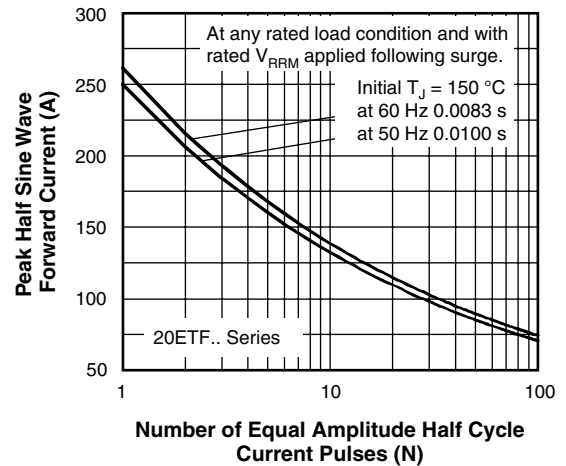


Fig. 5 - Maximum Non-Repetitive Surge Current

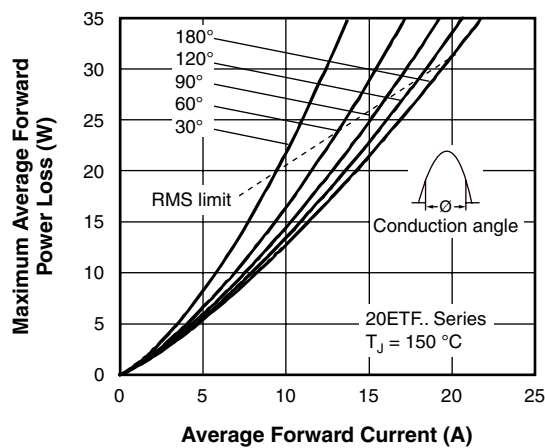


Fig. 3 - Forward Power Loss Characteristics

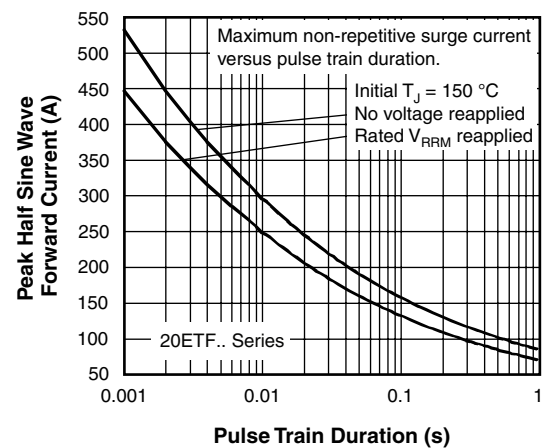


Fig. 6 - Maximum Non-Repetitive Surge Current

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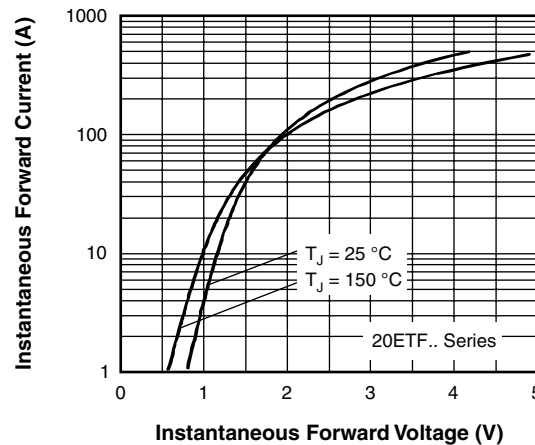


Fig. 7 - Forward Voltage Drop Characteristics

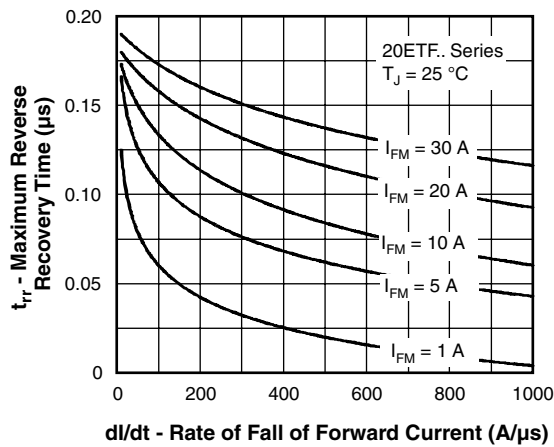


Fig. 8 - Recovery Time Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

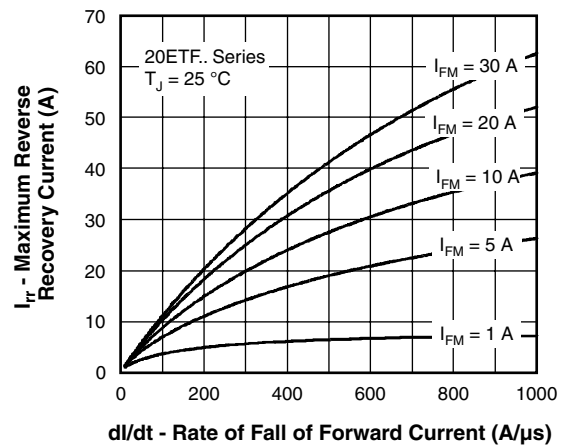


Fig. 10 - Recovery Charge Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

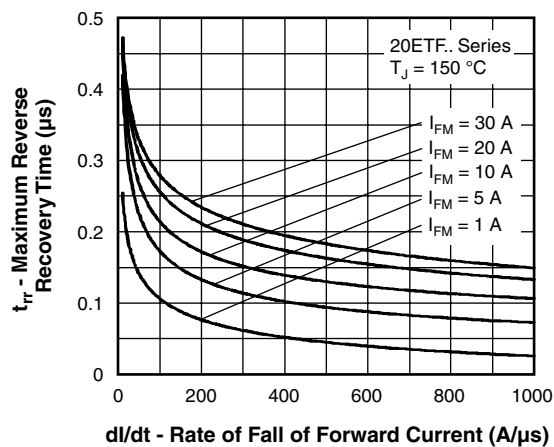


Fig. 9 - Recovery Time Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

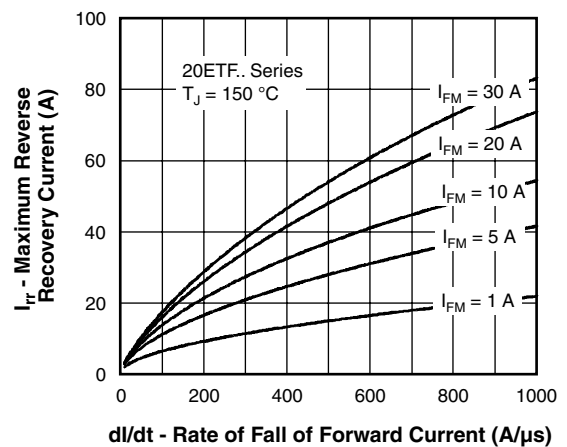


Fig. 11 - Recovery Charge Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

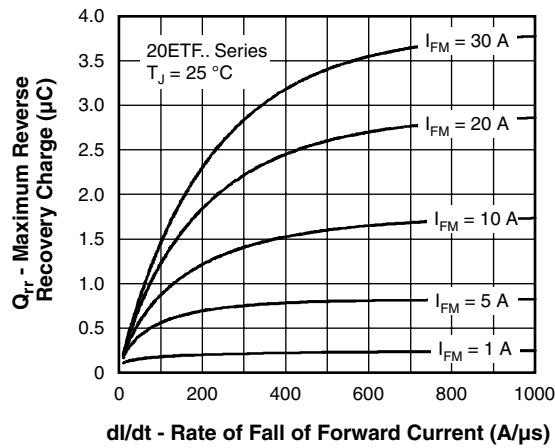


Fig. 12 - Recovery Current Characteristics, $T_J = 25\text{ °C}$

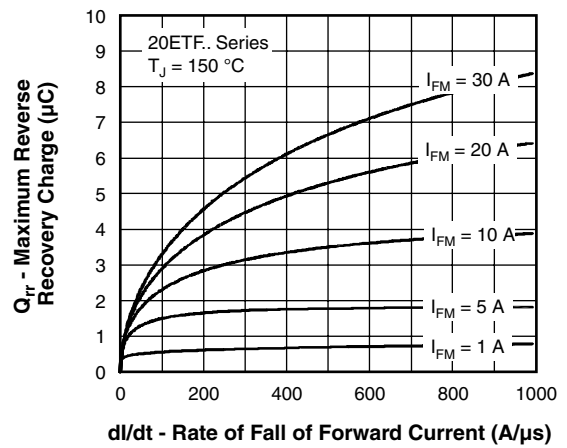


Fig. 13 - Recovery Current Characteristics, $T_J = 150\text{ °C}$

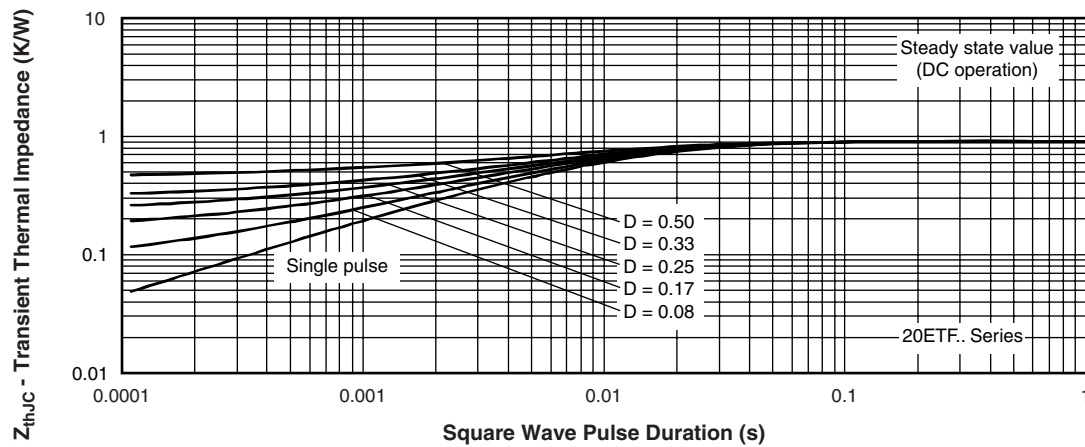


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

20ETF.. Soft Recovery Series



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ORDERING INFORMATION TABLE

Device code	20	E	T	F	06	-
	1	2	3	4	5	6
	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 code x 100 = V_{RRM}			02 = 200 V 04 = 400 V 06 = 600 V
	6	-	• None = Standard production			
			• PbF = Lead (Pb)-free			

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95221
Part marking information	http://www.vishay.com/doc?95224



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