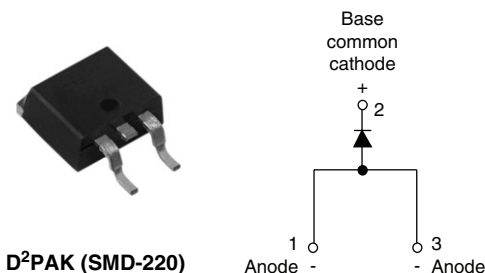


Fast Soft Recovery Rectifier Diode, 10 A



FEATURES/DESCRIPTION

The 10ETF..SPbF 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 and lead (Pb)-free.



RoHS*
COMPLIANT

PRODUCT SUMMARY

V_{RRM}	200 to 600 V
V_F at 10 A	< 1.2 V
t_{rr}	50 ns

APPLICATIONS

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

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
V_{RRM}		200 to 600	V
$I_{F(AV)}$	Sinusoidal waveform	10	A
I_{FSM}		150	
t_{rr}	1 A, 100 A/ μ s	50	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
10ETF02SPbF	200	300	2
10ETF04SPbF	400	500	
10ETF06SPbF	600	700	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 128^\circ\text{C}$, 180° conduction half sine wave	10	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	10 ms sine pulse, rated V_{RRM} applied	150	
		10 ms sine pulse, no voltage reapplied	160	
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied	112.5	A^2s
		10 ms sine pulse, no voltage reapplied	160	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied	1125	$\text{A}^2\sqrt{\text{s}}$

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

10ETF..SPbF Soft Recovery Series

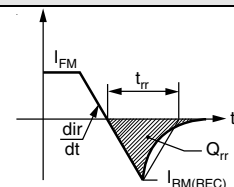
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Fast Soft Recovery
Rectifier Diode, 10 A



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V _{FM}	10 A, T _J = 25 °C		1.2	V
Forward slope resistance	r _t	T _J = 150 °C		12.7	mΩ
Threshold voltage	V _{F(TO)}			1.25	V
Maximum reverse leakage current	I _{RM}	T _J = 25 °C	V _R = Rated V _{RRM}	0.1	mA
		T _J = 150 °C		2.0	

RECOVERY CHARACTERISTICS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time	t_{rr}	I_F at 10 Apk 25 A/ μs 25 $^{\circ}\text{C}$	145	ns
Reverse recovery current	I_{rr}		2.75	A
Reverse recovery charge	Q_{rr}		0.32	μC
Snap factor	S		0.6	



THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		- 40 to 150	$^{\circ}\text{C}$
Maximum thermal resistance junction to case	R_{thJC}	DC operation	1.5	$^{\circ}\text{C}/\text{W}$
Maximum thermal resistance junction to ambient (PCB mount)	$R_{thJA}^{(1)}$		40	
Soldering temperature	T_S		240	$^{\circ}\text{C}$
Approximate weight			2	g
			0.07	oz.
Marking device		Case style D ² PAK (SMD-220)	10ETF02S	
			10ETF04S	
			10ETF06S	

Note

⁽¹⁾ When mounted on 1" square (650 mm²) PCB of FR-4 or G-10 material 4 oz. (140 μm) copper 40 $^{\circ}\text{C}/\text{W}$
For recommended footprint and soldering techniques refer to application note #AN-994



10ETF..SPbF Soft Recovery Series

Fast Soft Recovery
Rectifier Diode, 10 A

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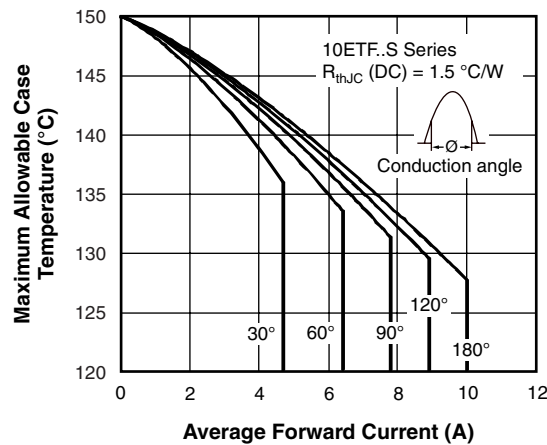


Fig. 1 - Current Rating Characteristics

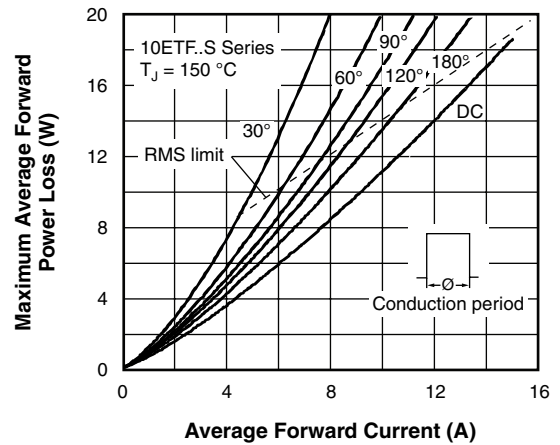


Fig. 4 - Forward Power Loss Characteristics

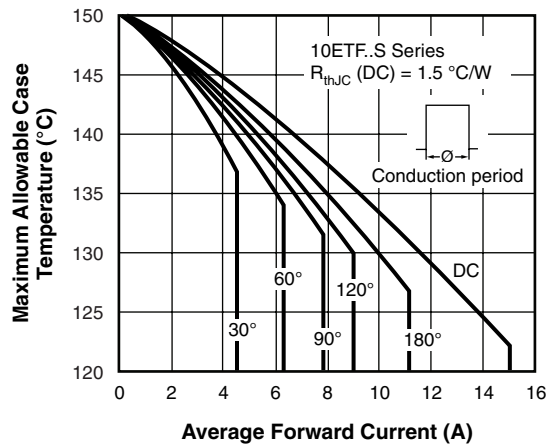


Fig. 2 - Current Rating Characteristics

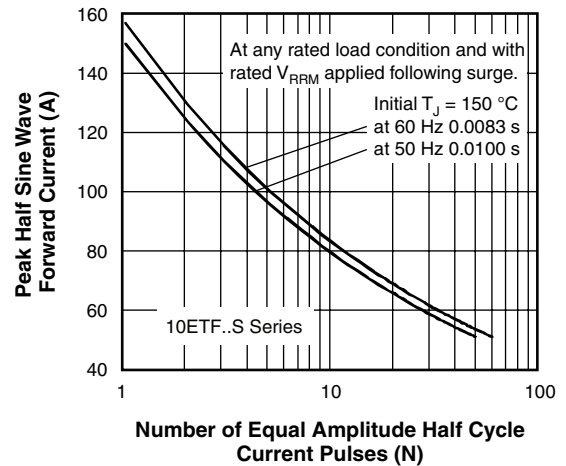


Fig. 5 - Maximum Non-Repetitive Surge Current

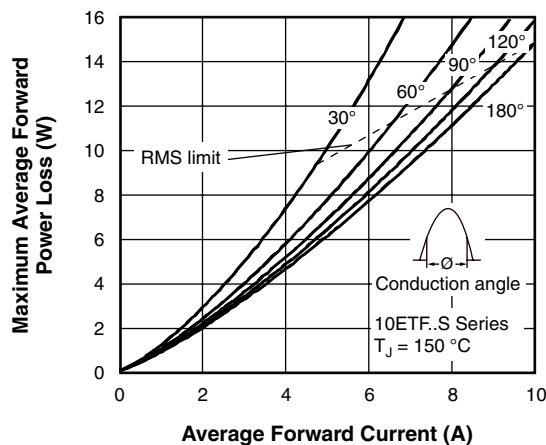


Fig. 3 - Forward Power Loss Characteristics

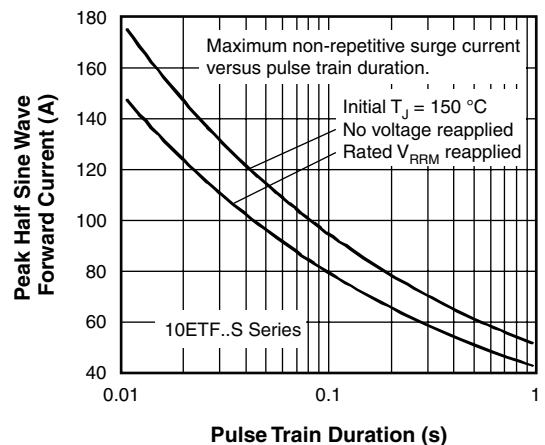


Fig. 6 - Maximum Non-Repetitive Surge Current

10ETF..SPbF Soft Recovery Series

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Fast Soft Recovery
Rectifier Diode, 10 A

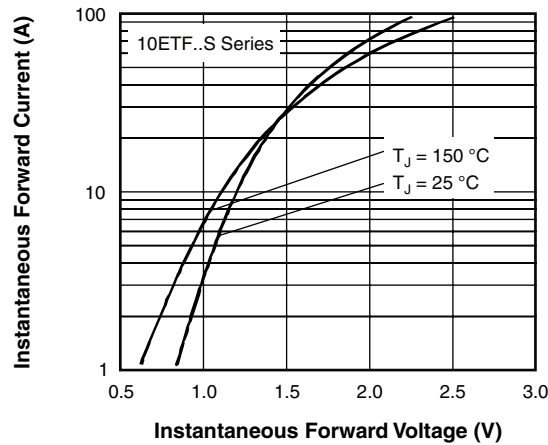


Fig. 7 - Forward Voltage Drop Characteristics

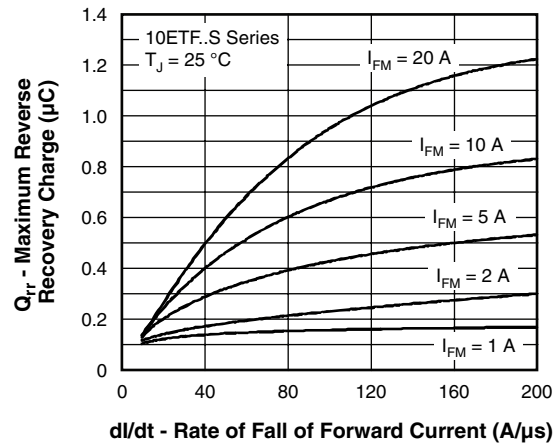


Fig. 10 - Recovery Charge Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

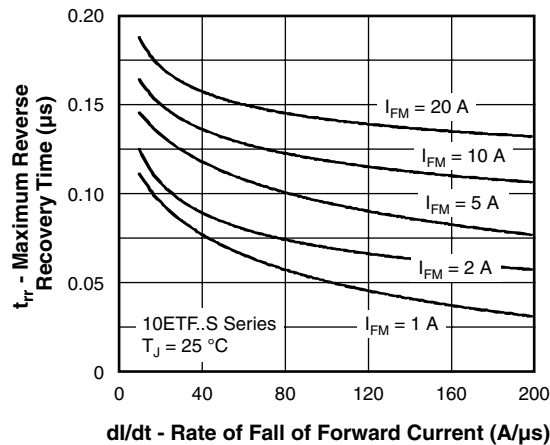


Fig. 8 - Recovery Time Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$

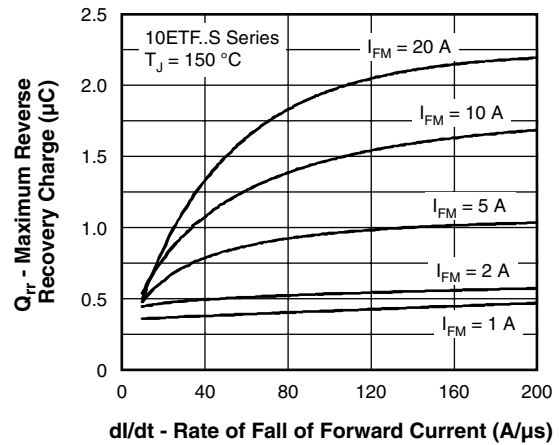


Fig. 11 - Recovery Charge Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

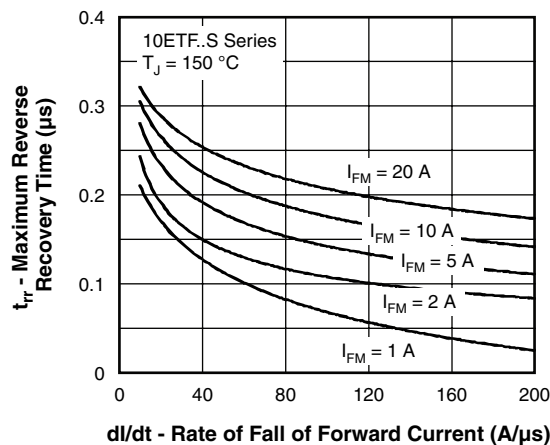


Fig. 9 - Recovery Time Characteristics, $T_J = 150\text{ }^{\circ}\text{C}$

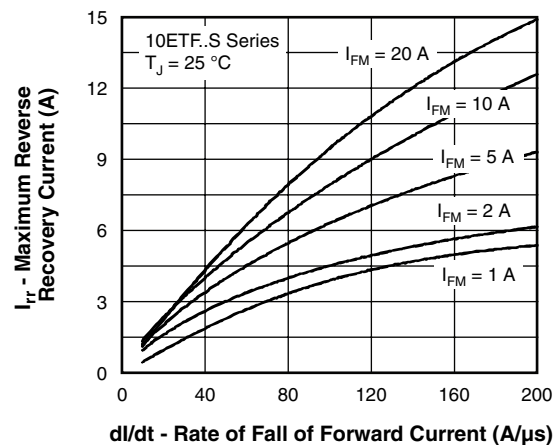


Fig. 12 - Recovery Current Characteristics, $T_J = 25\text{ }^{\circ}\text{C}$



10ETF..SPbF Soft Recovery Series

Fast Soft Recovery
Rectifier Diode, 10 A

Vishay High Power Products

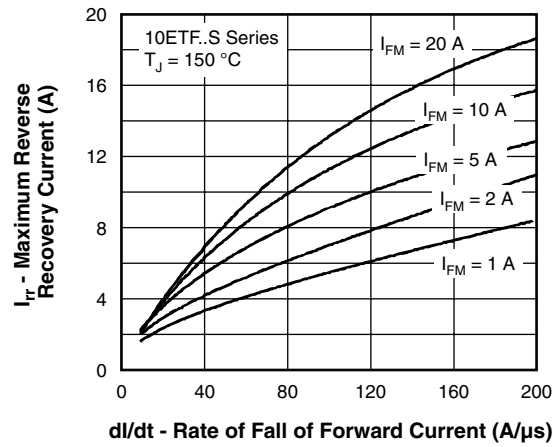


Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ C$

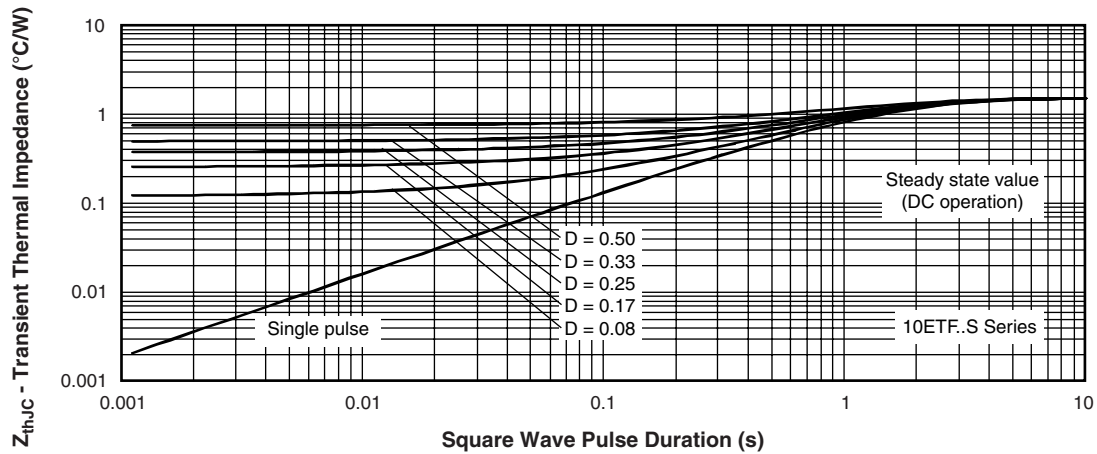


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

10ETF..SPbF Soft Recovery Series

Vishay High Power Products

Fast Soft Recovery
Rectifier Diode, 10 A



ORDERING INFORMATION TABLE

Device code	10	E	T	F	06	S	TRL	PbF
	①	②	③	④	⑤	⑥	⑦	⑧

- | | | | |
|----------|---|--|------------|
| 1 | - | Current rating (10 = 10 A) | |
| 2 | - | Circuit configuration: | |
| | | E = Single diode | |
| 3 | - | Package: | |
| | | T = D ² PAK (TO-220AC) | |
| 4 | - | Type of silicon: | |
| | | F = Fast soft recovery rectifier | |
| 5 | - | Voltage code x 100 = V _{RRM} | 02 = 200 V |
| 6 | - | S = Surface mountable | 04 = 400 V |
| | | | 06 = 600 V |
| 7 | - | • None = Tube | |
| | | • TRR = Tape and reel (right oriented) | |
| | | • TRL = Tape and reel (left oriented) | |
| 8 | - | • None = Standard production | |
| | | • PbF = Lead (Pb)-free | |

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95046
Part marking information	http://www.vishay.com/doc?95054
Packaging information	http://www.vishay.com/doc?95032



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