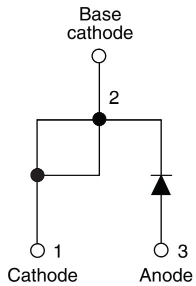
Fast Soft Recovery Rectifier Diode, 10 A

TO-220AC FULL-PAK



PRODUCT SUMMARY

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

FEATURES/DESCRIPTION

Pb Available

RoHS* COMPLIANT

The 10ETF06FPPbF 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.

The fully isolated package (V_{INS} = 2500 V_{RMS}) is UL E78996 approved.

This product series has been designed and qualified for industrial level and lead (Pb)-free.

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/μs	50	ns
V_F	10 A, T_J = 25 °C	1.2	V
T_J		- 40 to 150	°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 °C mA
10ETF02FPPbF	200	300	2
10ETF04FPPbF	400	500	
10ETF06FPPbF	600	700	

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	T_C = 98 °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	1600	$A^2\sqrt{s}$

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

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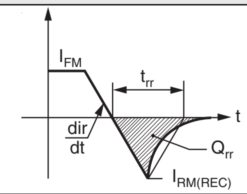
ELECTRICAL SPECIFICATIONS					
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**VALUES**	**UNITS**
Maximum forward voltage drop	V_{FM}	10 A, T_J = 25 °C		1.2	V
Forward slope resistance	r_t	T_J = 150 °C		23.5	mΩ
Threshold voltage	$V_{F(TO)}$			0.85	V
Maximum reverse leakage current	I_{RM}	T_J = 25 °C	V_R = Rated V_{RRM}	0.1	mA
		T_J = 150 °C		3.0	

RECOVERY CHARACTERISTICS				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**VALUES**	**UNITS**
Reverse recovery time	t_{rr}	I_F at 10 Apk 25 A/μs 25 °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	°C
Maximum thermal resistance junction to case		R_{thJC}	DC operation	2.5	°C/W
Maximum thermal resistance junction to ambient		R_{thJA}		62	
Typical thermal resistance, case to heatsink		R_{thCS}	Mounting surface, smooth and greased	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 FULL-PAK (94/V0)	10ETF06FP	

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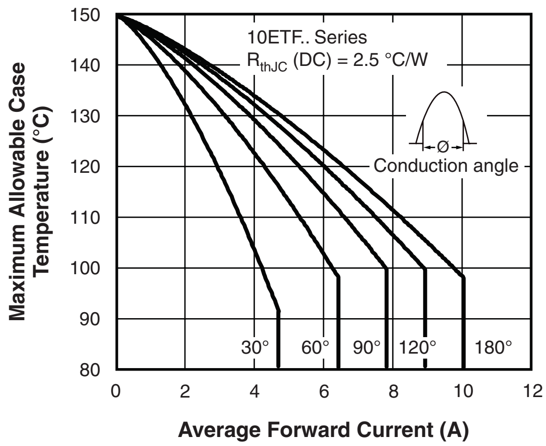

Fig. 1 - Current Rating Characteristics

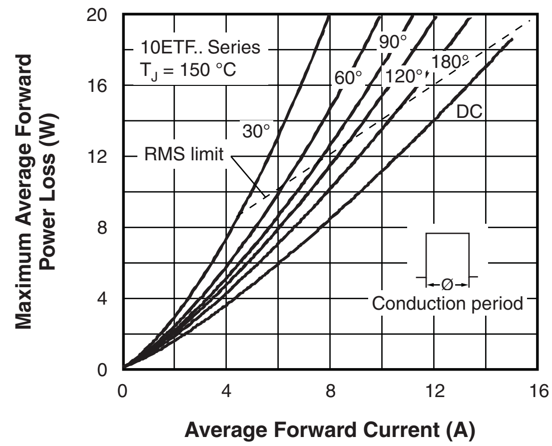

Fig. 4 - Forward Power Loss Characteristics

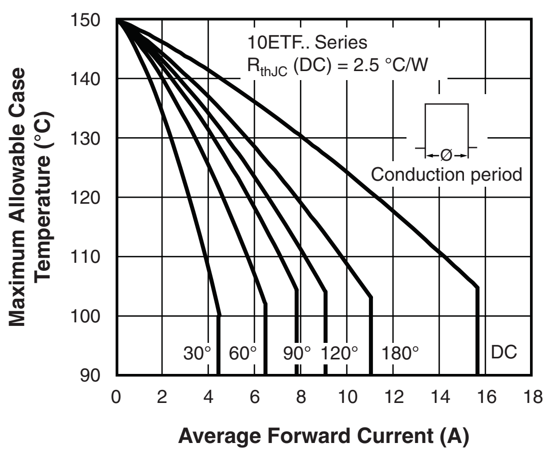

Fig. 2 - Current Rating Characteristics

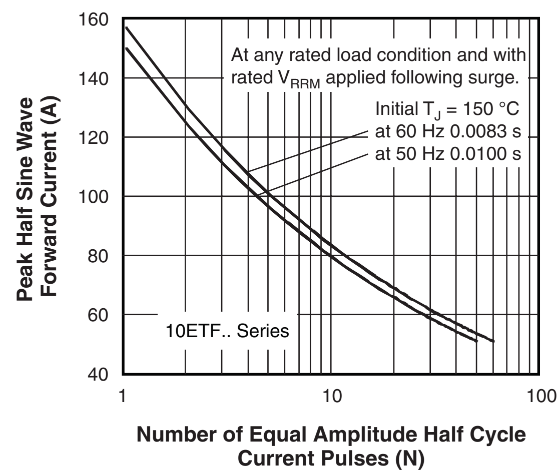

Fig. 5 - Maximum Non-Repetitive Surge Current

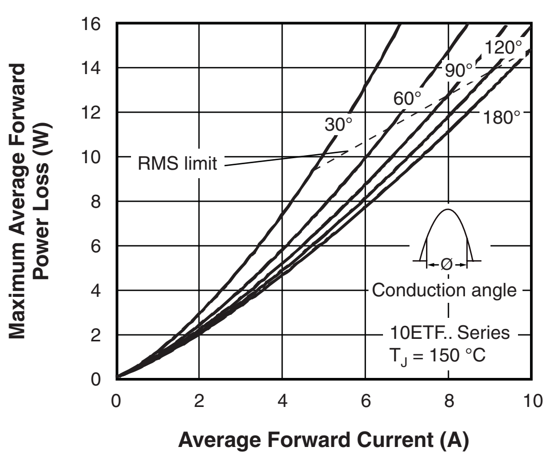

Fig. 3 - Forward Power Loss Characteristics

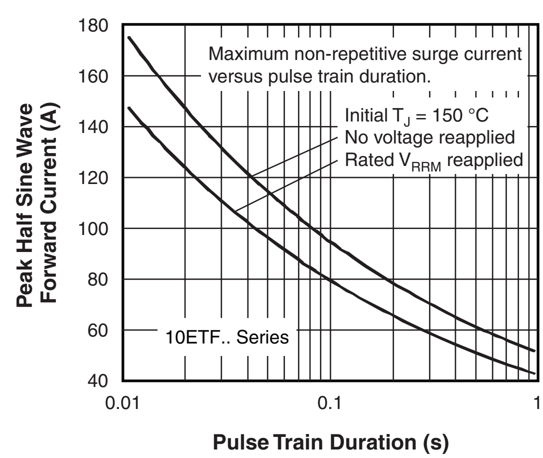

Fig. 6 - Maximum Non-Repetitive Surge Current

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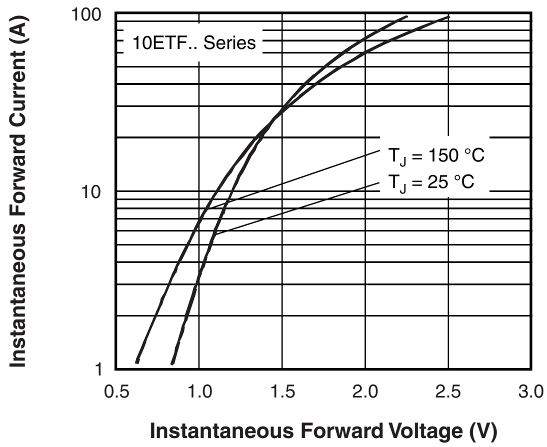

Fig. 7 - Forward Voltage Drop Characteristics

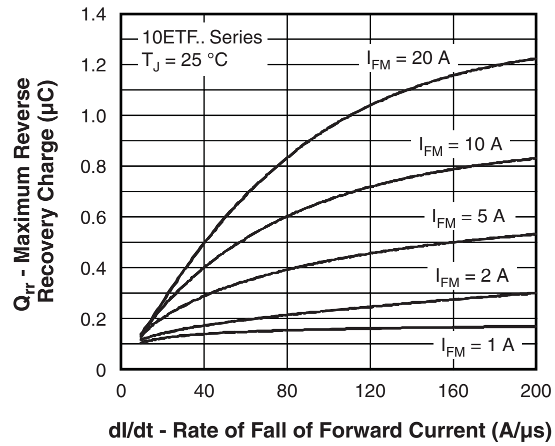

Fig. 10 - Recovery Charge Characteristics, T_J = 25 °C

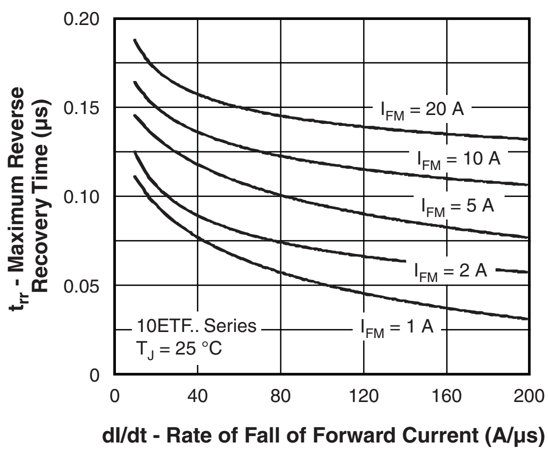

Fig. 8 - Recovery Time Characteristics, T_J = 25 °C

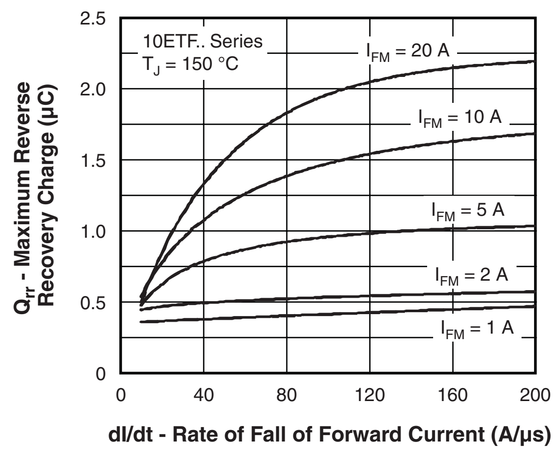

Fig. 11 - Recovery Charge Characteristics, T_J = 150 °C

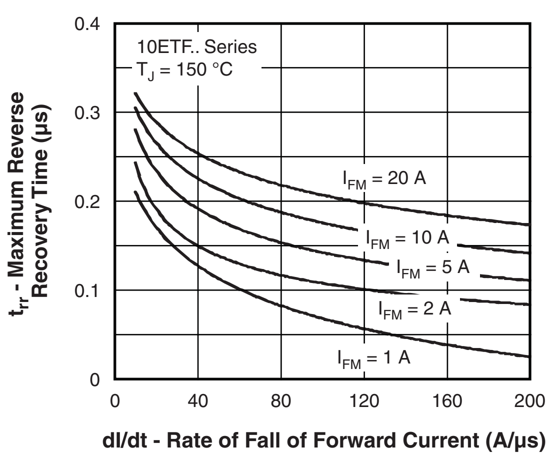

Fig. 9 - Recovery Time Characteristics, T_J = 150 °C

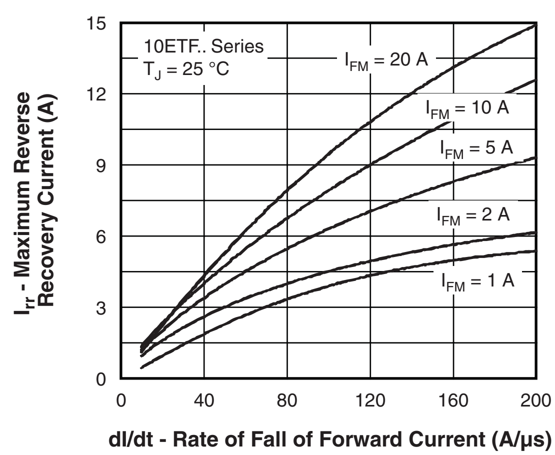

Fig. 12 - Recovery Current Characteristics, T_J = 25 °C

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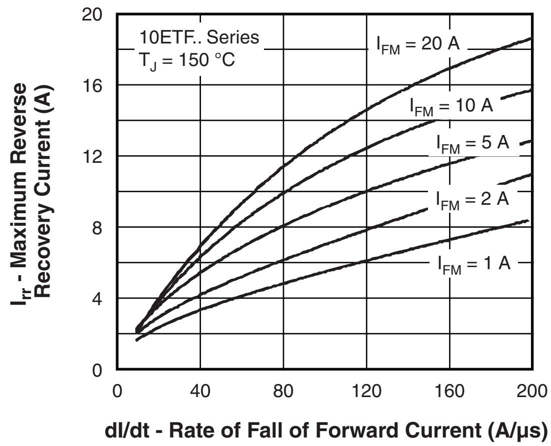

Fig. 13 - Recovery Current Characteristics, T_J = 150 °C

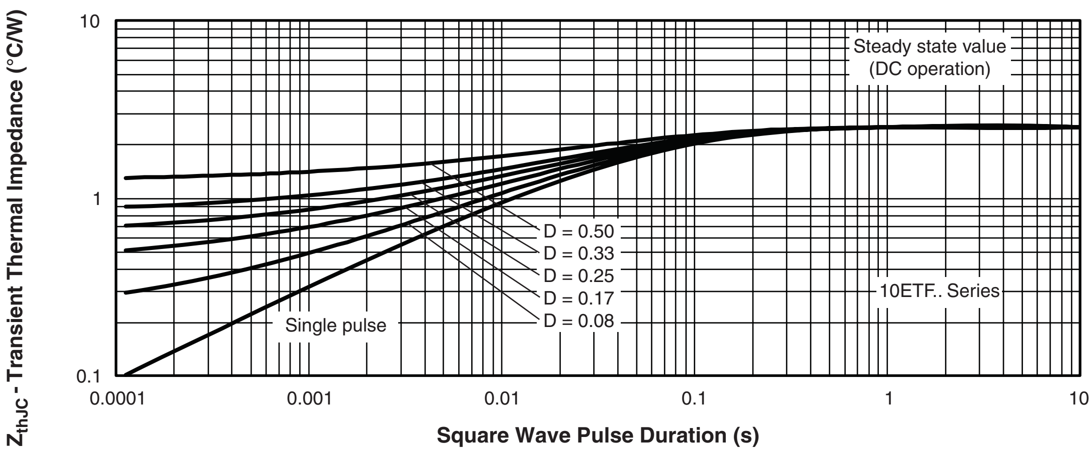

Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

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ORDERING INFORMATION TABLE

Device code	10	E	T	F	06	FP	PbF
	1	2	3	4	5	6	7

1 - Current rating (10 = 10 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 - FULL-PAK

7 -
• None = Standard production
• PbF = Lead (Pb)-free

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

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