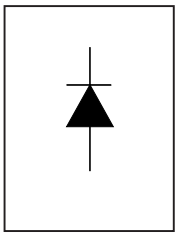
International
IOR Rectifier

QUIETIR Series
20ETF12SPbF

FAST SOFT RECOVERY RECTIFIER DIODE
Lead-Free ("PbF" suffix)



V_F < 1.31V @ 20A
I_{FSM} = 355A
V_{RRM} = 1200V

Description/ Features

The 20ETF12SPbF fast soft recovery *QUIETIR* 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.

- Typical applications are both: output rectification and freewheeling in
- inverters, choppers and converters and input rectifications where severe restrictions on conducted EMI should be met.

Major Ratings and Characteristics

Characteristics		Values	Units
$I_{F(AV)}$	Sinusoidal waveform	20	A
V_{RRM}		1200	V
I_{FSM}		355	A
V_F	@20 A, T_J = 25°C	1.31	V
trr	@ 1A, 100A/µs	95	ns
T_J	range	-40 to 150	°C

Package Outline

D^2 Pak (SMD-220)

Voltage Ratings

Part Number	V_{RRM} , maximum peak reverse voltage V	V_{RSM} , maximum non repetitive peak reverse voltage V	I_{RRM} 150°C mA
20ETF12SPbF	1200	1300	6

Absolute Maximum Ratings

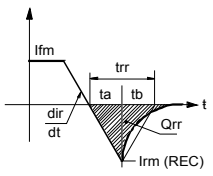
	Parameters	20ETF..S	Units	Conditions
$I_{F(AV)}$	Max. Average Forward Current	20	A	@ T_C = 97° C, 180° conduction half sine wave
I_{FSM}	Max. Peak One Cycle Non-Repetitive	300	A	10ms Sine pulse, rated V_{RRM} applied
	Surge Current	355		10ms Sine pulse, no voltage reapplied
I^2t	Max. I^2t for fusing	450	A^2s	10ms Sine pulse, rated V_{RRM} applied
		635		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for fusing	6350	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied

Electrical Specifications

	Parameters	20ETF..S	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	1.31	V	@ 20A, T_J = 25°C	
r_t	Forward slope resistance	11.88	mΩ	T_J = 150°C	
$V_{F(TO)}$	Threshold voltage	0.93	V		
I_{RM}	Max. Reverse Leakage Current	0.1	mA	T_J = 25 °C	V_R = rated V_{RRM}
		6		T_J = 150 °C	

Recovery Characteristics

	Parameters	20ETF..S	Units	Conditions
t_{rr}	Reverse Recovery Time	400	ns	I_F @ 20Apk
I_{rr}	Reverse Recovery Current	6.1	A	@ 25A/ µs
Q_{rr}	Reverse Recovery Charge	1.7	µC	@ 25°C
S	Snap Factor tb/ta	0.6	typical	



Thermal-Mechanical Specifications

	Parameters	20ETF..S	Units	Conditions
T_J	Max. Junction Temperature Range	-40 to 150	°C	
T_{stg}	Max. Storage Temperature Range	-40 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case	0.9	°C/W	DC operation
R_{thJA}	Max. Thermal Resistance Junction to Ambient (PCB Mount)**	62	°C/W	
T_s	Soldering Temperature	240	°C	
wt	Approximate Weight	2 (0.07)	g (oz.)	
	Case Style	D^2Pak (SMD-220)		
	Device marking	20ETF12S		

** When mounted on 1" square (650mm^2) PCB of FR-4 or G-10 material 4 oz (140µm) copper 40°C/W
For recommended footprint and soldering techniques refer to application note #AN-994

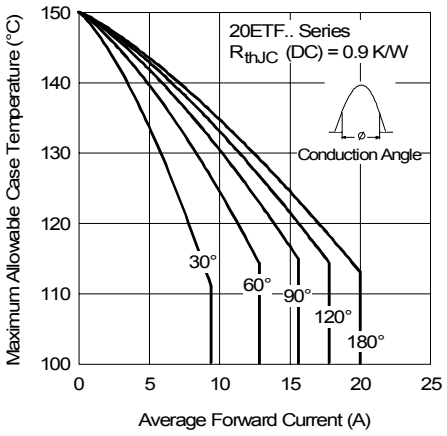


Fig. 1 - Current Rating Characteristics

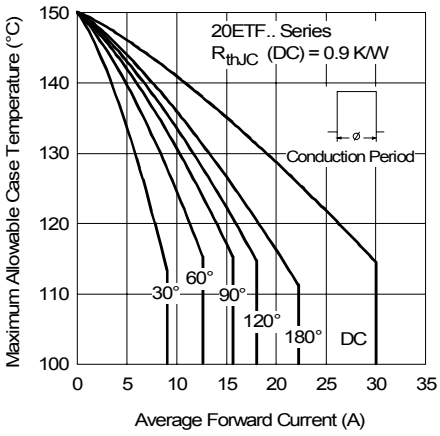


Fig. 2 - Current Rating Characteristics

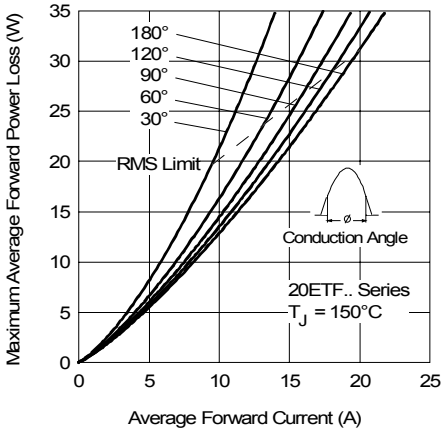


Fig. 3 - Forward Power Loss Characteristics

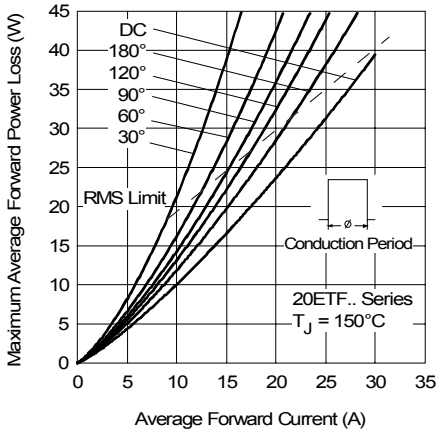


Fig. 4 - Forward Power Loss Characteristics

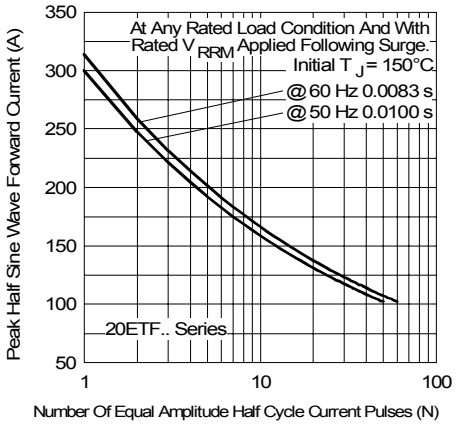


Fig. 5 - Maximum Non-Repetitive Surge Current

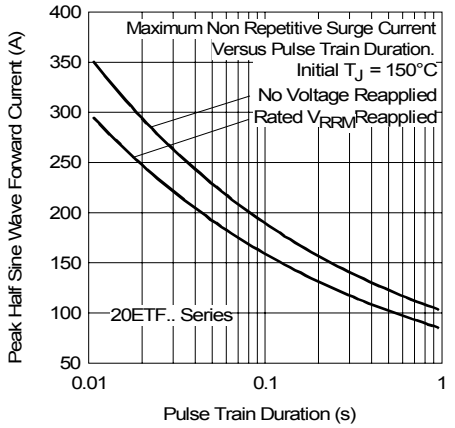


Fig. 6 - Maximum Non-Repetitive Surge Current

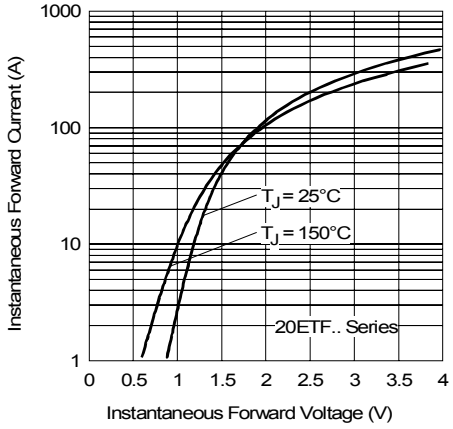


Fig. 7 - Forward Voltage Drop Characteristics

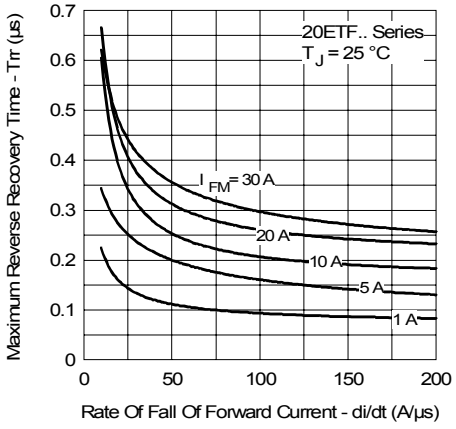


Fig. 8 - Recovery Time Characteristics, T_J = 25°C

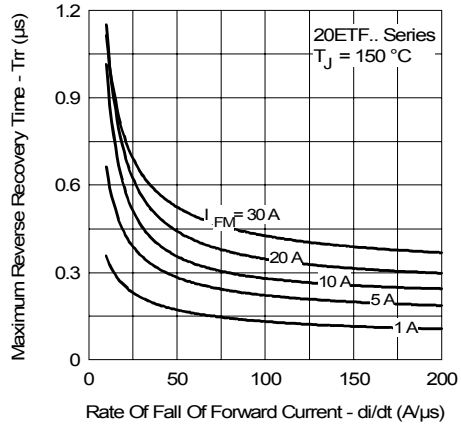


Fig. 9 - Recovery Time Characteristics, T_J = 150°C

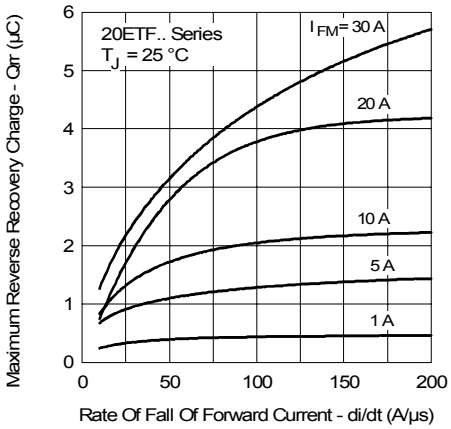


Fig. 10 - Recovery Charge Characteristics, T_J = 25°C

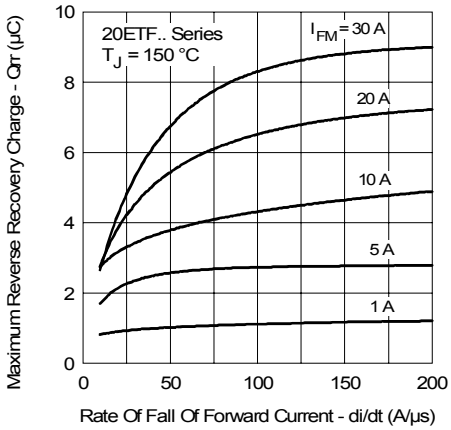


Fig. 11 - Recovery Charge Characteristics, T_J = 150°C

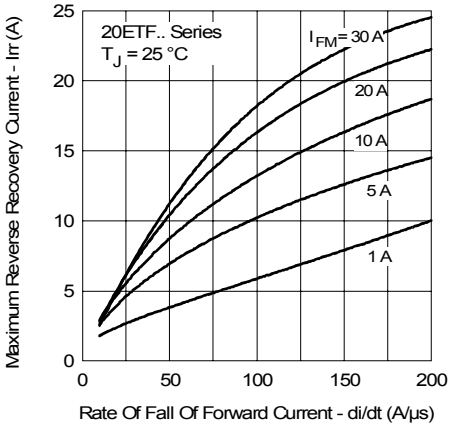


Fig. 12 - Recovery Current Characteristics, T_J = 25°C

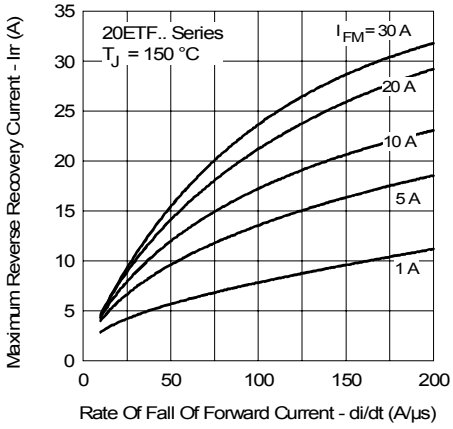


Fig. 13 - Recovery Current Characteristics, T_J = 150°C

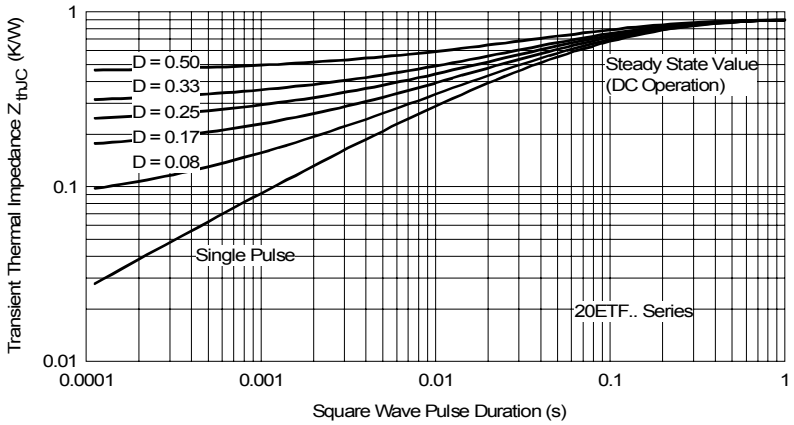
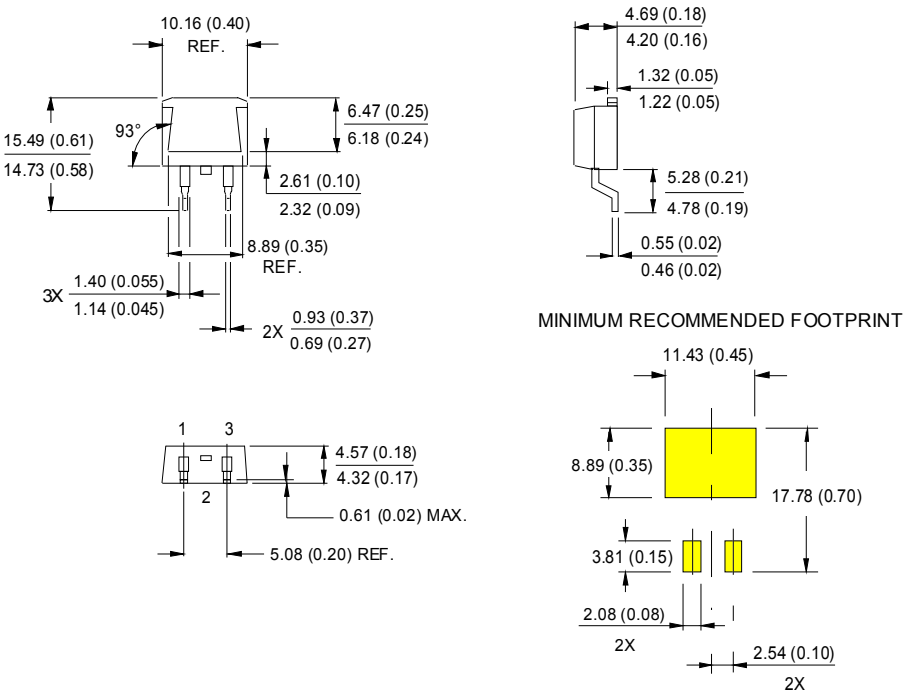


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

Outline Table

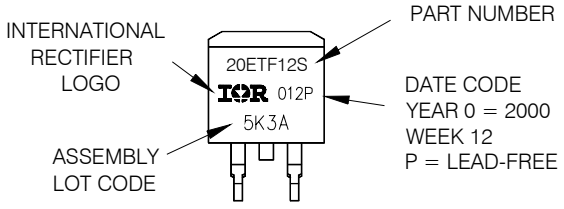


Dimensions in millimeters and inches

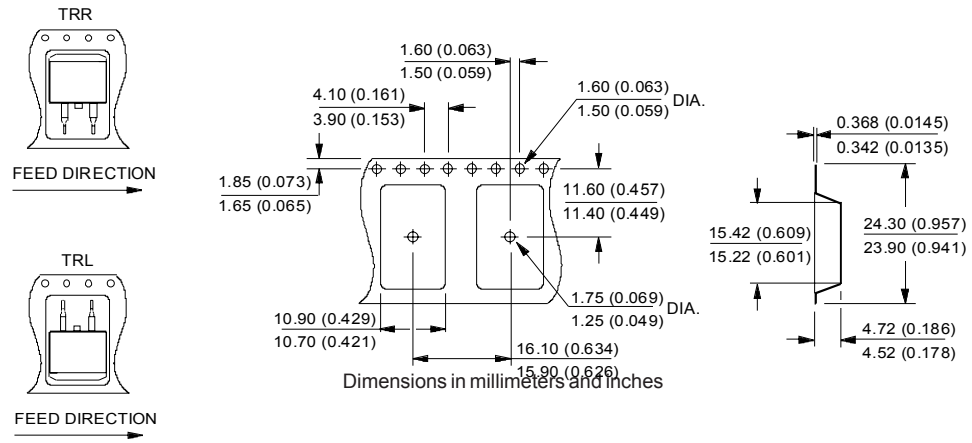
Marking Information

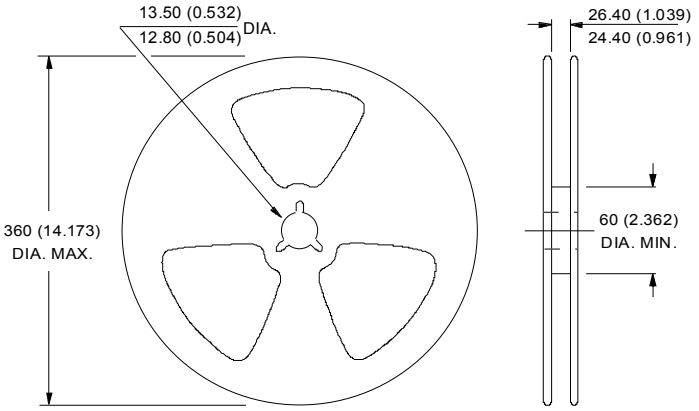
EXAMPLE: THIS IS A 20ETF12S WITH
LOT CODE 5K3A
ASSEMBLED ON WW 12, 2000

Note: "P" in assembly line
position indicates "Lead-Free"



Tape & Reel Information



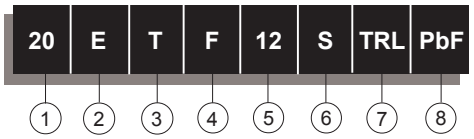


SMD-220 Tape & Reel

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 800 pieces per reel for both TRL and TRR.

Ordering Information Table

Device Code



1 - Current Rating (20 = 20A)

2 - Circuit Configuration:
E = Single Diode

3 - Package:
T = D^2Pak (TO-220AC)

4 - Type of Silicon:
F = Fast Soft Recovery Rectifier

5 - Voltage Rating (12 = 1200V)

6 - S = Surface Mountable

7 - • none = Tape
• TRR = Tape & Reel (Right Oriented)
• TRL = Tape & Reel (Left Oriented)

8 - • none = Standard Production
• PbF = Lead-Free

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on IR's Web site.

International
IOR Rectifier

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