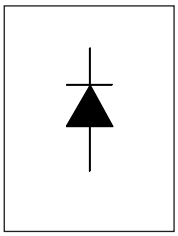
I2149 rev. A 11/99

International
IOR Rectifier

QUIETIR Series
10ETF..S

FAST SOFT RECOVERY RECTIFIER DIODE



V_F < 1.33V @ 10A
t_{rr} = 80ns
V_{RRM} 1000 to 1200V

Description/Features

The 10ETF..S 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.

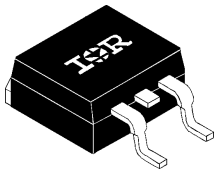
Typical applications are both:

- 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	10ETF..S	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
V_{RRM} range	1000 to 1200	V
I_{FSM}	160	A
V_F @ 10A, T_J = 25°C	1.33	V
t_{rr} @ 1A, 100A/µs	80	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
10ETF10S	1000	1100	4
10ETF12S	1200	1300	

Absolute Maximum Ratings

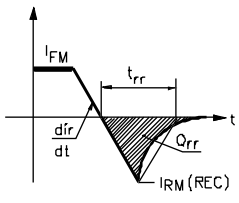
	Parameters	10ETF..S	Units	Conditions
$I_{F(AV)}$	Max. Average Forward Current	10	A	@ T_C = 125° C, 180° conduction half sine wave
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current	160	A	10ms Sine pulse, rated V_{RRM} applied
		185		10ms Sine pulse, no voltage reapplied
I^2t	Max. I^2t for fusing	128	A^2s	10ms Sine pulse, rated V_{RRM} applied
		180		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for fusing	1800	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied

Electrical Specifications

	Parameters	10ETF..S	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	1.33	V	@ 10A, T_J = 25°C	
r_t	Forward slope resistance	22.9	mΩ	T_J = 150°C	
$V_{F(TO)}$	Threshold voltage	0.96	V		
I_{RM}	Max. Reverse Leakage Current	0.1	mA	T_J = 25 °C	V_R = rated V_{RRM}
		4		T_J = 150 °C	

Recovery Characteristics

	Parameters	10ETF..S	Units	Conditions
t_{rr}	Reverse Recovery Time	310	ns	I_F @ 10Apk
I_{rr}	Reverse Recovery Current	4.7	A	@ 25A/ µs
Q_{rr}	Reverse Recovery Charge	1.05	µC	@ 25°C
S	Typical Snap Factor	0.6		



Thermal-Mechanical Specifications

	Parameters	10ETF..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	1.5	°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)		

**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

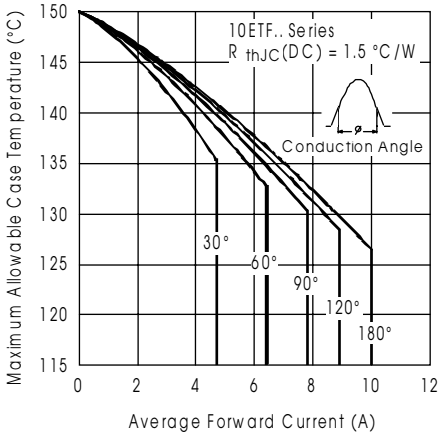


Fig. 1 - Current Rating Characteristics

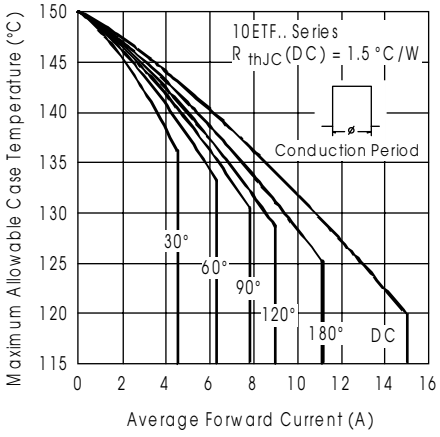


Fig. 2 - Current Rating Characteristics

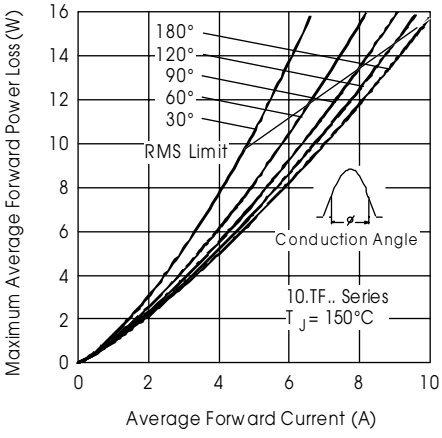


Fig. 3 - Forward Power Loss Characteristics

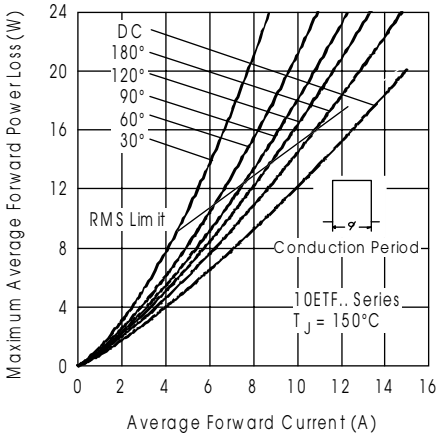


Fig. 4 - Forward Power Loss Characteristics

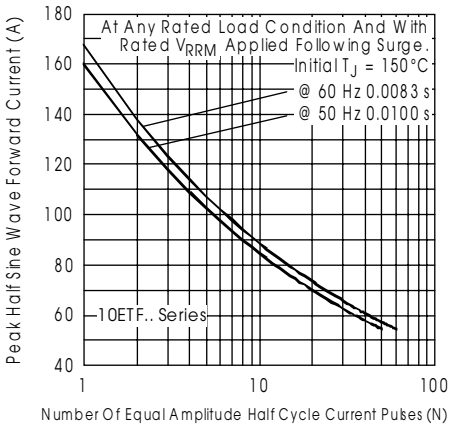


Fig. 5 - Maximum Non-Repetitive Surge Current

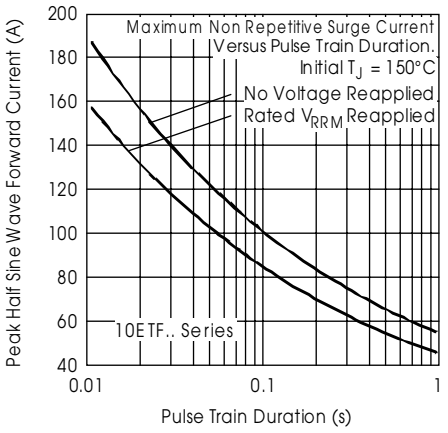


Fig. 6 - Maximum Non-Repetitive Surge Current

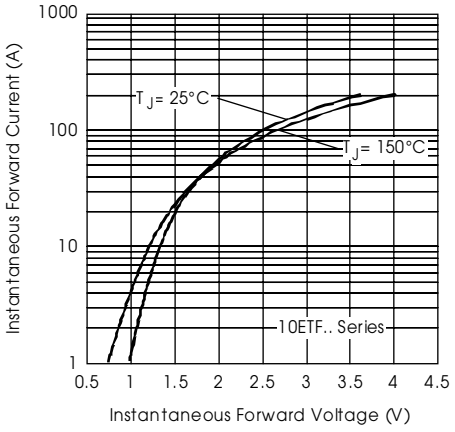


Fig. 7 - Forward Voltage Drop Characteristics

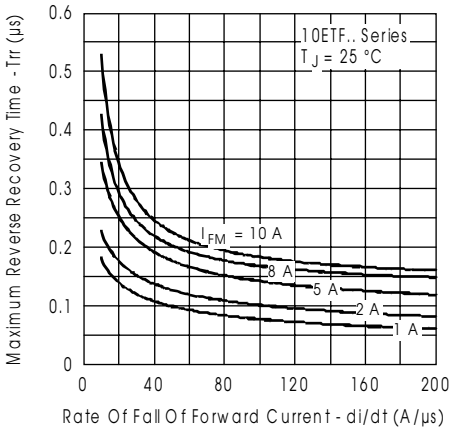


Fig. 8 - Recovery Time Characteristics, T_J = 25°C

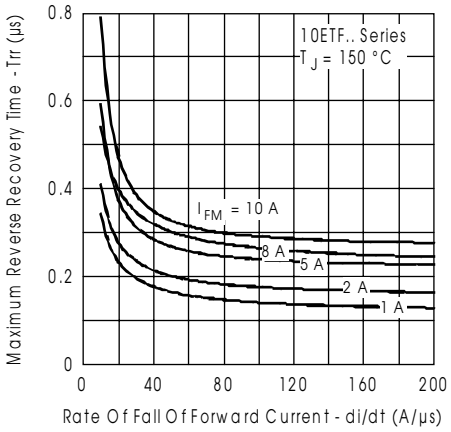


Fig. 9 - Recovery Time Characteristics, T_J = 150°C

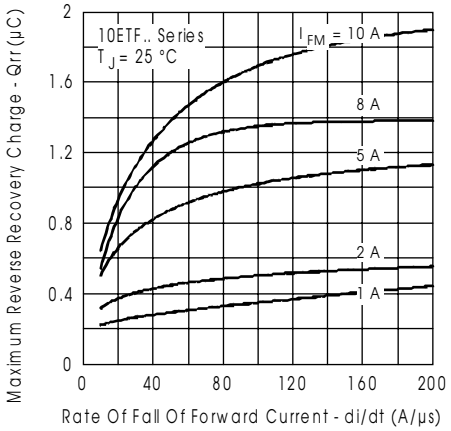


Fig. 10 - Recovery Charge Characteristics, $T_J = 25°C$

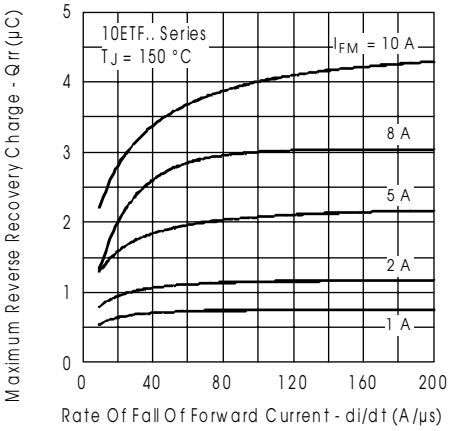


Fig. 11 - Recovery Charge Characteristics, $T_J = 150°C$

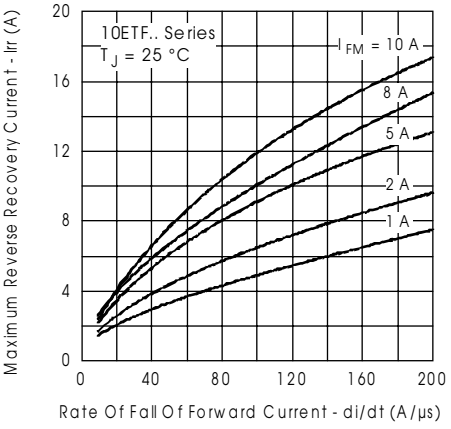


Fig. 12 - Recovery Current Characteristics, $T_J = 25°C$

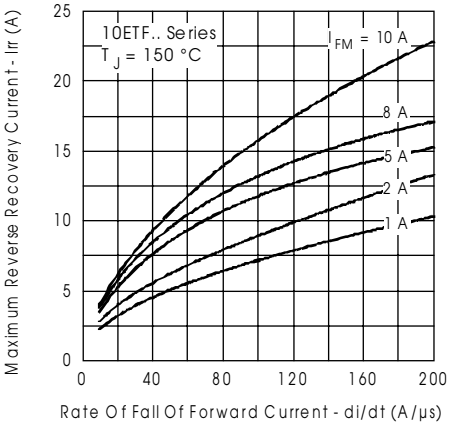


Fig. 13 - Recovery Current Characteristics, $T_J = 150°C$

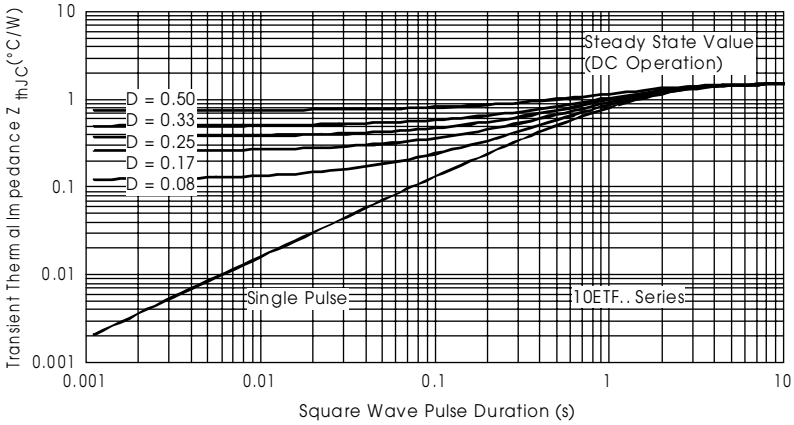
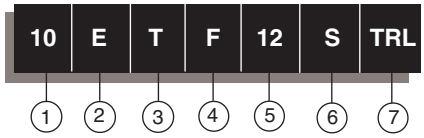


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

Ordering Information Table

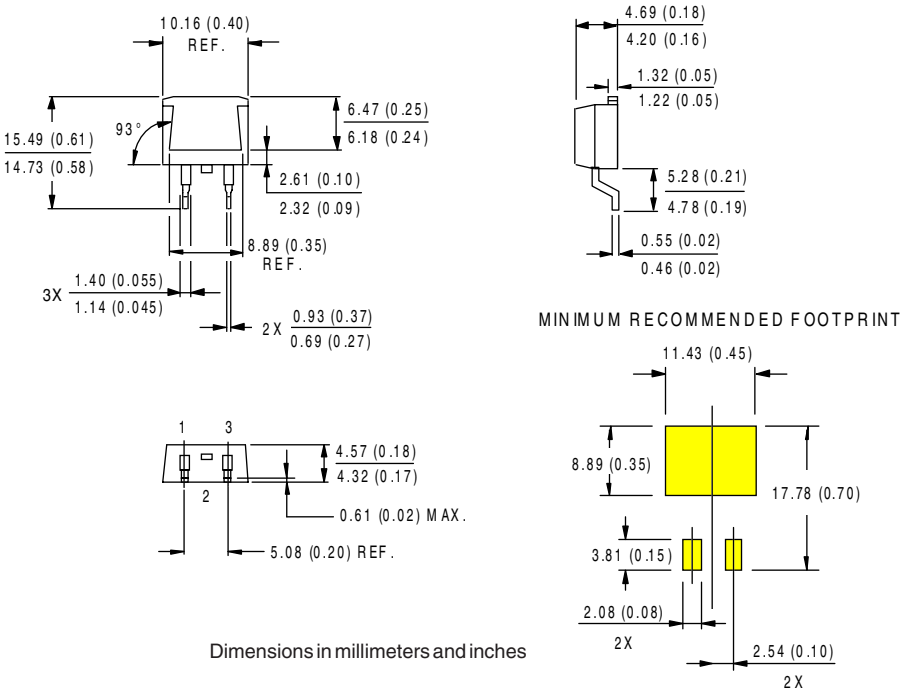
Device Code



1	-	Current Rating
2	-	Circuit Configuration: E = Single Diode
3	-	Package: T = TO-220AC
4	-	Type of Silicon: F = Fast Soft Recovery Rectifier
5	-	Voltage code: Code x 100 = V_{RRM}
6	-	S = TO-220 D^2Pak (SMD-220) Version
7	-	Tape and Reel Option
		TRL = Left Reel
		TRR = Right Orientation Reel

10	= 1000V
12	= 1200V

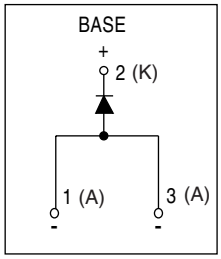
Outline Table

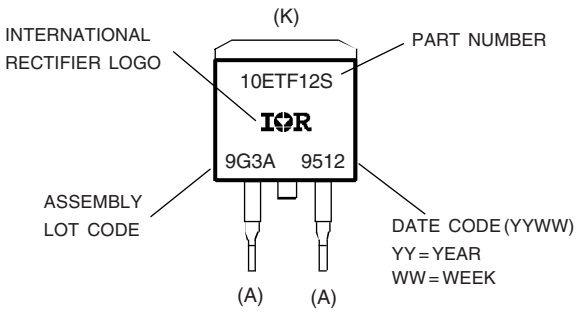


Dimensions in millimeters and inches

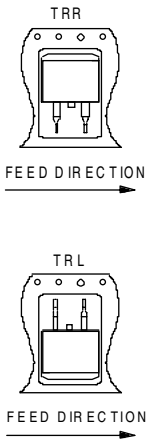
Marking Information

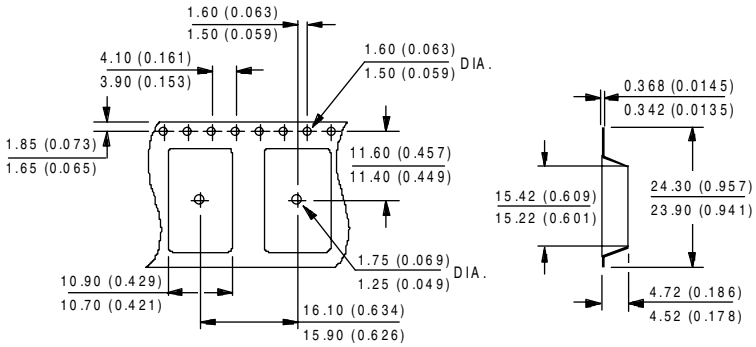
EXAMPLE: THIS IS AN 10ETF12S



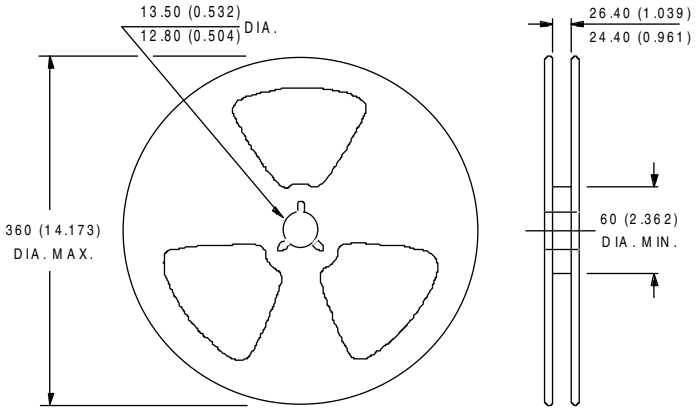


Tape & Reel Information





Dimensions in millimeters and inches



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.

International
IOR Rectifier
WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245 U.S.A. Tel: (310) 322 3331. Fax: (310) 322 3332.
EUROPEAN HEADQUARTERS: Hurst Green, Oxted, Surrey RH8 9BB, U.K. Tel: ++ 44 1883 732020. Fax: ++ 44 1883 733408.
IR CANADA: 15 Lincoln Court, Brampton, Markham, Ontario L6T3Z2. Tel: (905) 453 2200. Fax: (905) 475 8801.
IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.
IR ITALY: Via Liguria 49, 10071 Borgaro, Torino. Tel: ++ 39 11 4510111. Fax: ++ 39 11 4510220.
IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.
IR SOUTHEAST ASIA: 1 Kim Seng Promenade, Great World City West Tower,13-11, Singapore 237994. Tel: ++ 65 838 4630.
IR TAIWAN: 16 Fl. Suite D.207, Sec. 2, Tun Haw South Road, Taipei, 10673, Taiwan. Tel: 886 2 2377 9936.