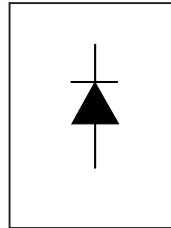


International
IOR Rectifier

QUIETIR Series
 10ETF12SPbF

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



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

Description/ Features

The 10ETF12SPbF 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 | 10 | A |
| V_{RRM} | 1200 | V |
| I_{FSM} | 160 | A |
| $V_F @ 10A, T_J = 25^\circ C$ | 1.33 | V |
| $t_{rr} @ 1A, 100A/\mu s$ | 80 | ns |
| T_J range | -40 to 150 | $^\circ C$ |

Package Outline



10ETF12SPbF *QUIETIR* Series

Bulletin I2205 03/05

International
IR Rectifier

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 |
|-------------|---|--|--------------------------|
| 10ETF12S | 1200 | 1300 | 4 |

Absolute Maximum Ratings

| Parameters | 10ETF..S | Units | Conditions |
|--|----------|---------|--|
| $I_{F(AV)}$ Max. Average Forward Current | 10 | A | @ $T_C = 125^\circ\text{C}$, 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^2vt Max. I^2vt for fusing | 1800 | A^2Vs | $t = 0.1$ to 10ms, no voltage reapplied |

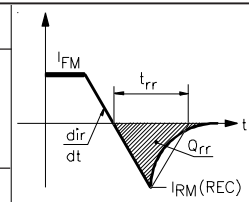
Electrical Specifications

| Parameters | 10ETF..S | Units | Conditions |
|---------------------------------------|----------|-----------|---------------------------------|
| V_{FM} Max. Forward Voltage Drop | 1.33 | V | @ 10A, $T_J = 25^\circ\text{C}$ |
| r_t Forward slope resistance | 22.9 | $m\Omega$ | $T_J = 150^\circ\text{C}$ |
| $V_{F(TO)}$ Threshold voltage | 0.96 | V | |
| I_{RM} Max. Reverse Leakage Current | 0.1 | mA | $T_J = 25^\circ\text{C}$ |
| | 4 | | $T_J = 150^\circ\text{C}$ |

$V_R = \text{rated } V_{RRM}$

Recovery Characteristics

| Parameters | 10ETF..S | Units | Conditions |
|-----------------------------------|----------|---------------|--|
| t_{rr} Reverse Recovery Time | 310 | ns | $I_F @ 10\text{Apk}$ @ 25A/ μs @ 25°C |
| I_{rr} Reverse Recovery Current | 4.7 | A | |
| Q_{rr} Reverse Recovery Charge | 1.05 | μC | |
| 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 ² Pak (SMD-220) | | |
| Marking Device | 10ETF12S | | |

** When mounted on 1" square (650mm²) 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

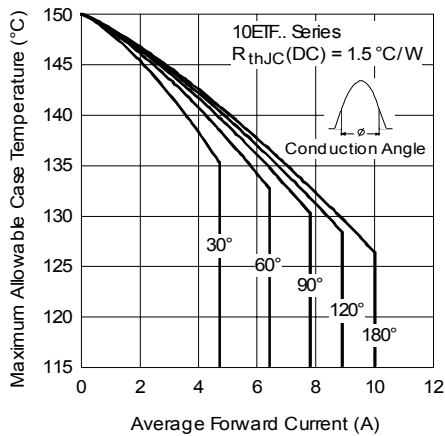


Fig. 1 - Current Rating Characteristics

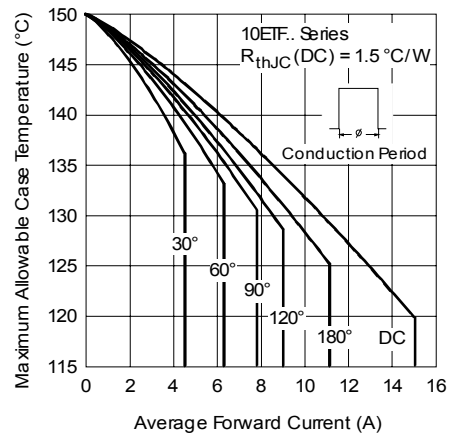


Fig. 2 - Current Rating Characteristics

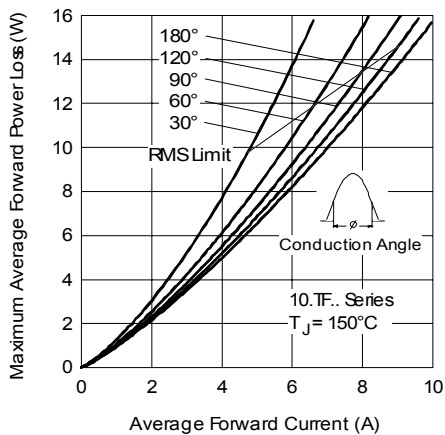


Fig. 3 - Forward Power Loss Characteristics

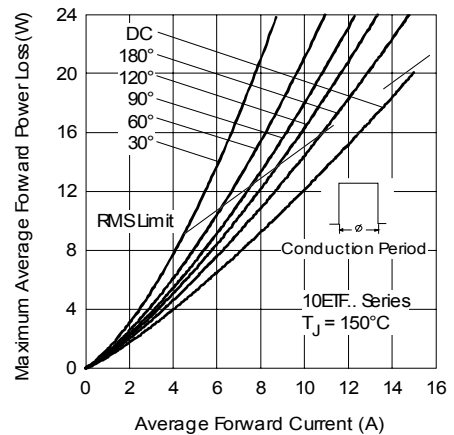


Fig. 4 - Forward Power Loss Characteristics

10ETF12SPbF QUIETIR Series

Bulletin I2205 03/05

International
IR Rectifier

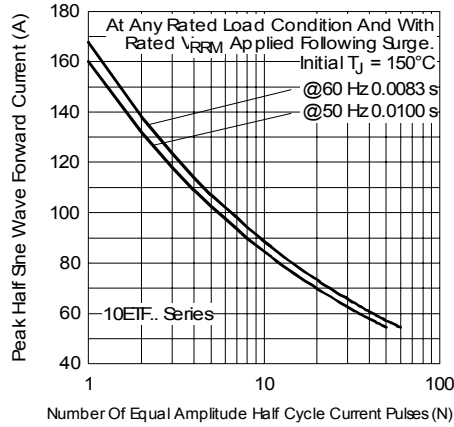


Fig. 5 - Maximum Non-Repetitive Surge Current

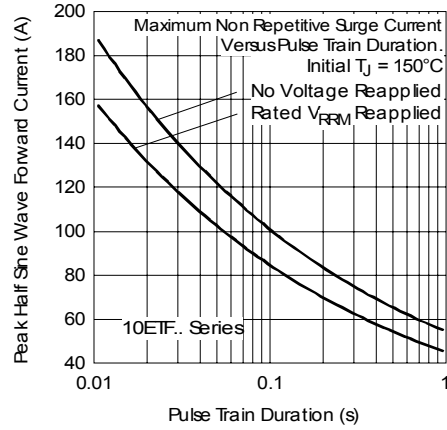


Fig. 6 - Maximum Non-Repetitive Surge Current

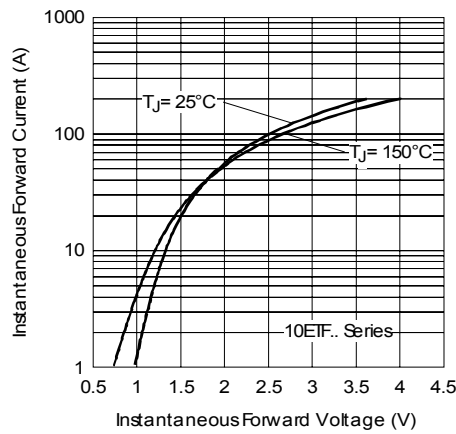


Fig. 7 - Forward Voltage Drop Characteristics

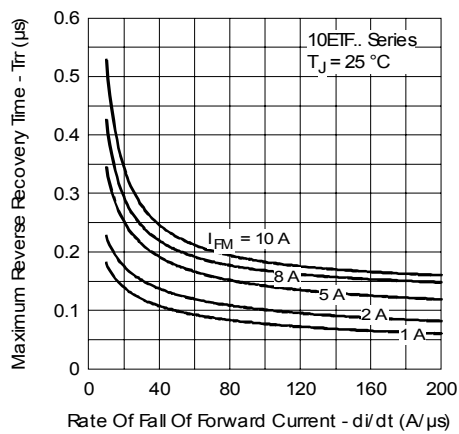


Fig. 8 - Recovery Time Characteristics, $T_J = 25^\circ\text{C}$

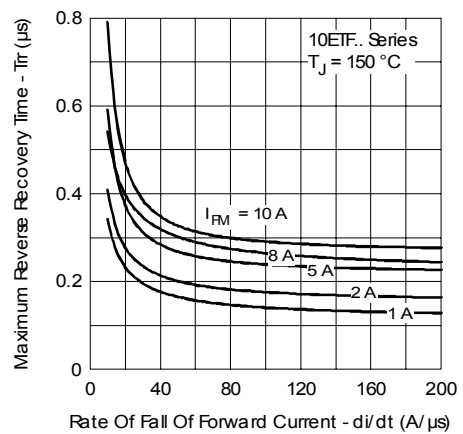


Fig. 9 - Recovery Time Characteristics, $T_J = 150^\circ\text{C}$

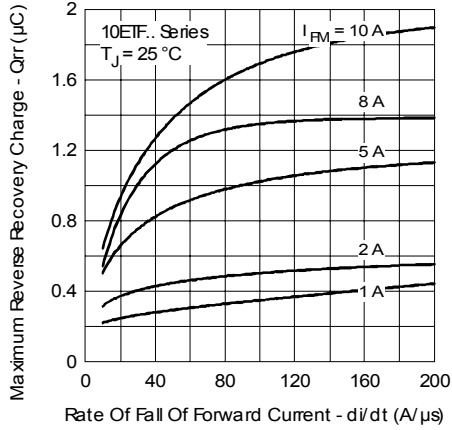


Fig. 10 - Recovery Charge Characteristics, $T_J = 25^\circ\text{C}$

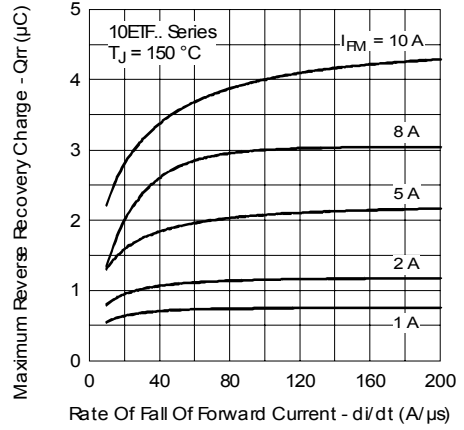


Fig. 11 - Recovery Charge Characteristics, $T_J = 150^\circ\text{C}$

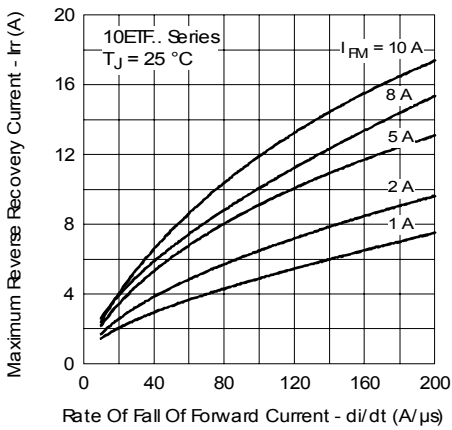


Fig. 12 - Recovery Current Characteristics, $T_J = 25^\circ\text{C}$

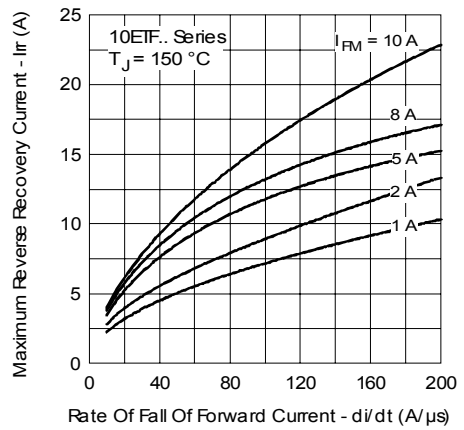


Fig. 13 - Recovery Current Characteristics, $T_J = 150^\circ\text{C}$

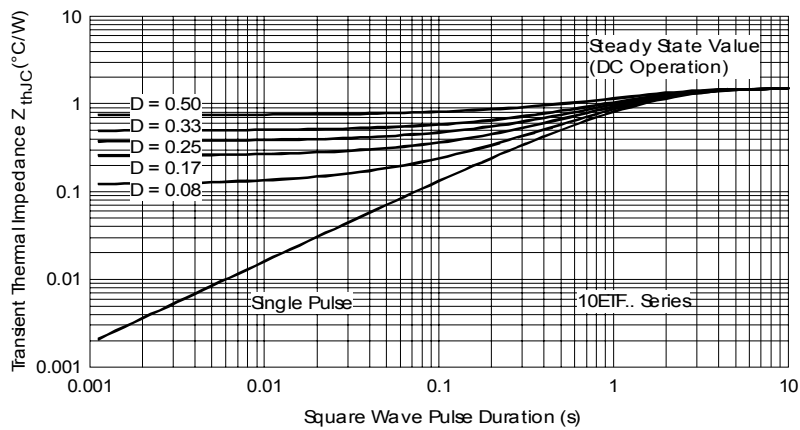
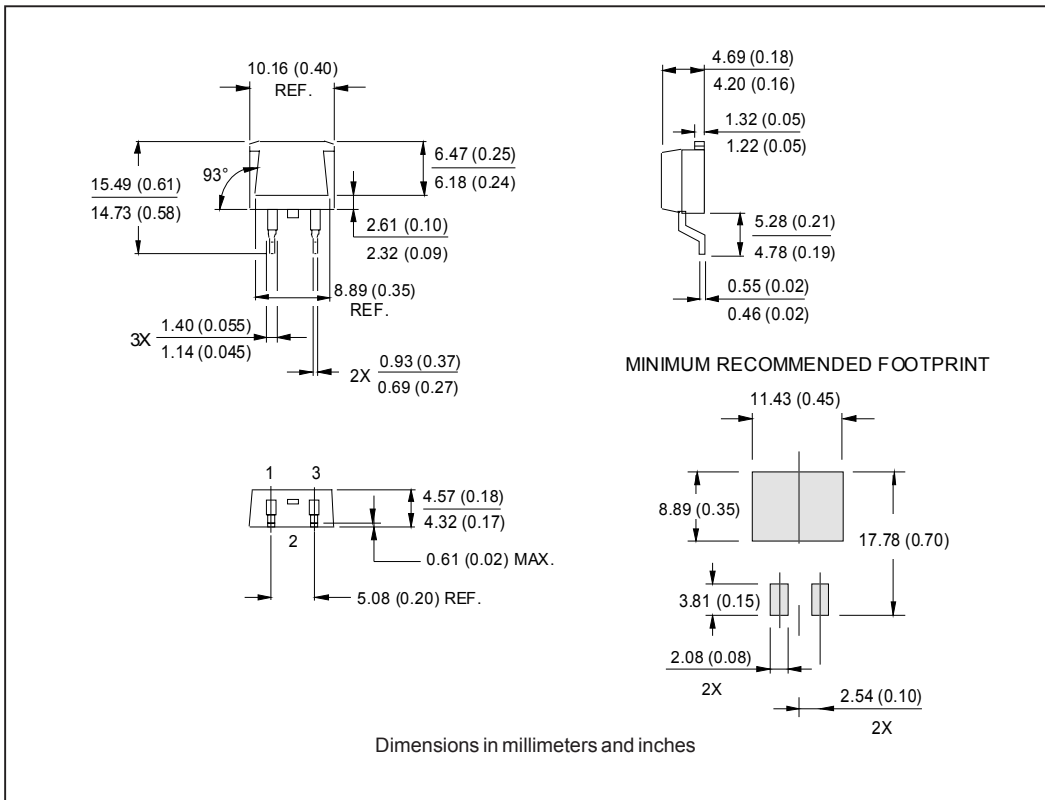
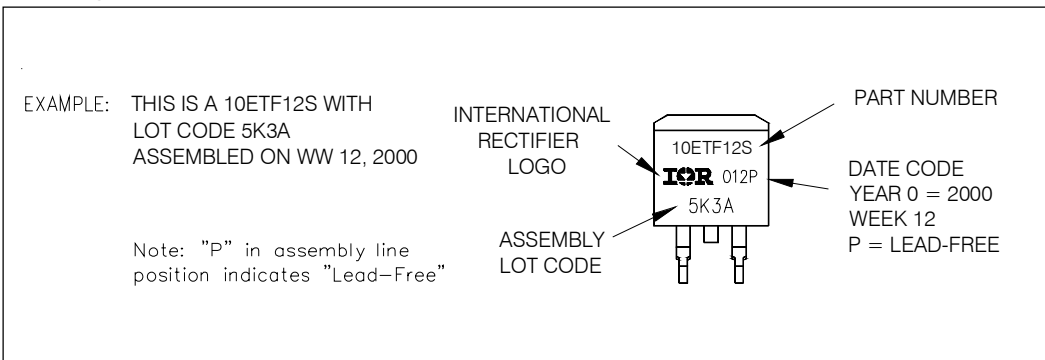


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

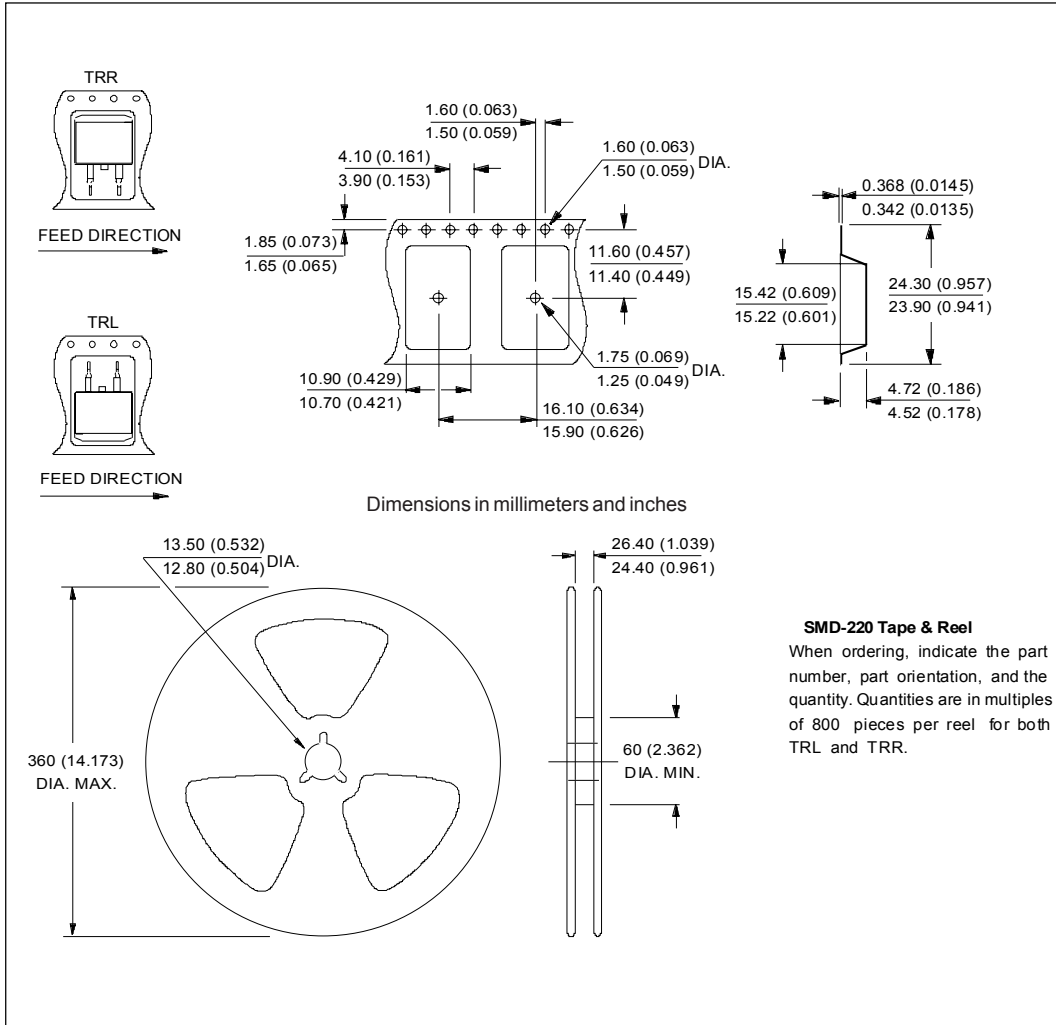
Outline Table



Marking Information



Tape & Reel Information



Ordering Information Table

| Device Code | |
|-------------|-----|
| 10 | E |
| T | F |
| 12 | S |
| TRL | PbF |
| ① | ② |
| ③ | ④ |
| ⑤ | ⑥ |
| ⑦ | ⑧ |

| | | |
|----------|---|--|
| 1 | - | Current Rating (10 = 10A) |
| 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 Rating (12 = 1200V) |
| 6 | - | S = Surface Mountable |
| 7 | - | <ul style="list-style-type: none"> • none = Tape • TRR = Tape & Reel (Right Oriented) • TRL = Tape & Reel (Left Oriented) |
| 8 | - | <ul style="list-style-type: none"> • 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.



Notice

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