


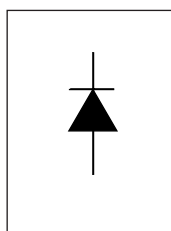
**INPUT RECTIFIER DIODE
TO-220 FULLPAK**

Description/Features

The 20ETS..FP rectifier **SAFEIR** series has been optimized for very low forward voltage drop, with moderate leakage. The glass passivation technology used has reliable operation up to 150°C junction temperature.

Typical applications are in input rectification and these products are designed to be used with International Rectifier Switches and Output Rectifiers which are available in identical package outlines. Fully isolated package ($V_{INS} = 2500 V_{RMS}$).

UL E78996 approved 



| |
|---------------------------------|
| $V_F < 1V @ 10A$ |
| $I_{FSM} = 300A$ |
| $V_{RRM} 800 \text{ to } 1600V$ |

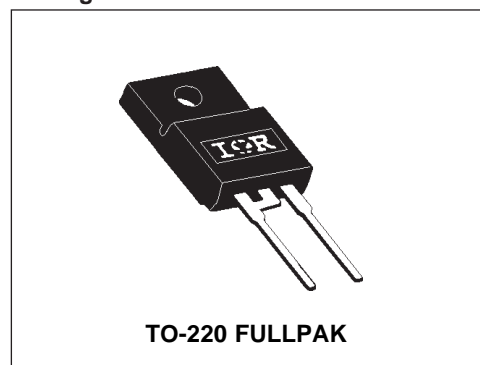
Output Current in Typical Applications

| Applications | Single-phase Bridge | Three-phase Bridge | Units |
|--|---------------------|--------------------|-------|
| Capacitive input filter $T_A = 55^\circ C, T_J = 125^\circ C,$ common heatsink of $1^\circ C/W$ | 18 | 22 | A |

Major Ratings and Characteristics

| Characteristics | 20ETS..FP | Units |
|---------------------------------|-------------|------------|
| $I_{F(AV)}$ Sinusoidal waveform | 20 | A |
| V_{RRM} | 800 to 1600 | V |
| I_{FSM} | 300 | A |
| $V_F @ 10A, T_J = 25^\circ C$ | 1.0 | V |
| T_J | -40 to 150 | $^\circ C$ |

Package Outline



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 |
|-------------|---|--|--------------------------|
| 20ETS08FP | 800 | 900 | 1 |
| 20ETS12FP | 1200 | 1300 | |
| 20ETS16FP | 1600 | 1700 | |

Provide terminal coating for voltages above 1200V

Absolute Maximum Ratings

| Parameters | 20ETS..FP | Units | Conditions |
|--|-----------|---------------|---|
| $I_{F(AV)}$ Max. Average Forward Current | 20 | A | @ $T_C=88^\circ\text{C}$, 180° conduction half sine wave |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current | 250 | A | 10ms Sine pulse, rated V_{RRM} applied |
| | 300 | | 10ms Sine pulse, no voltage reapplied |
| I^2t Max. I^2t for fusing | 316 | A^2s | 10ms Sine pulse, rated V_{RRM} applied |
| | 442 | | 10ms Sine pulse, no voltage reapplied |
| $I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing | 4420 | $A^2\sqrt{s}$ | $t=0.1$ to 10ms, no voltage reapplied |

Electrical Specifications

| Parameters | 20ETS..FP | Units | Conditions |
|---------------------------------------|-----------|-------|---------------------------------|
| V_{FM} Max. Forward Voltage Drop | 1.1 | V | @ 20A, $T_J = 25^\circ\text{C}$ |
| r_t Forward slope resistance | 10.4 | mΩ | $T_J = 150^\circ\text{C}$ |
| $V_{F(TO)}$ Threshold voltage | 0.85 | V | |
| I_{RM} Max. Reverse Leakage Current | 0.1 | mA | $T_J = 25^\circ\text{C}$ |
| | 1.0 | | $T_J = 150^\circ\text{C}$ |

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

Thermal-Mechanical Specifications

| Parameters | 20ETS..FP | Units | Conditions |
|--|---------------|--------------------|--------------------------------------|
| T_J Max. Junction Temperature Range | -40 to 150 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -40 to 150 | $^\circ\text{C}$ | |
| R_{thJC} Max. Thermal Resistance Junction to Case | 1.5 | $^\circ\text{C/W}$ | DC operation |
| R_{thJA} Max. Thermal Resistance Junction to Ambient | 62 | $^\circ\text{C/W}$ | |
| R_{thCS} Typ. Thermal Resistance Case to Heatsink | 1.5 | $^\circ\text{C/W}$ | Mounting surface, smooth and greased |
| wt Approximate Weight | 2 (0.07) | g (oz.) | |
| T Mounting Torque | Min. 6 (5) | Kg-cm (lbf-in) | |
| | Max. 12 (10) | | |
| Case Style | TO-220FULLPAK | | (94/V0) |

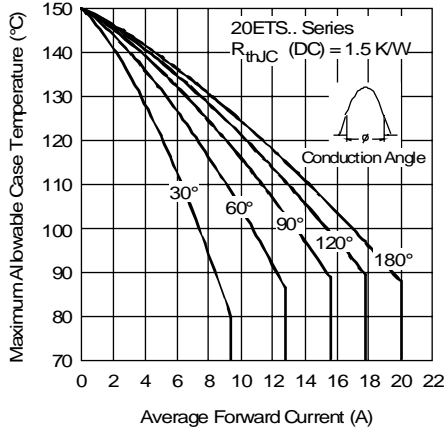


Fig. 1 - Current Rating Characteristics

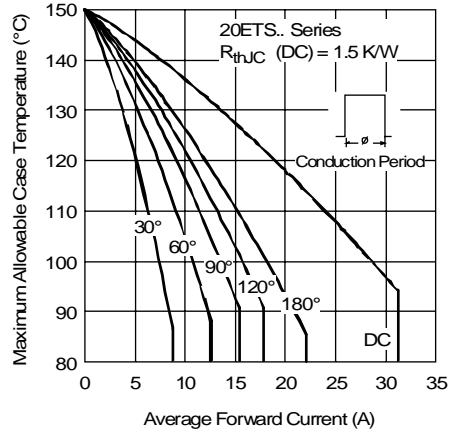


Fig. 2 - Current Rating Characteristics

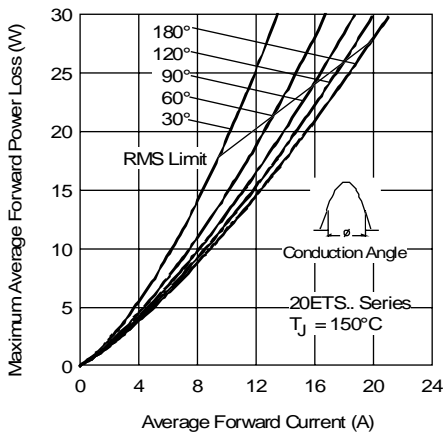


Fig. 3 - Forward Power Loss Characteristics

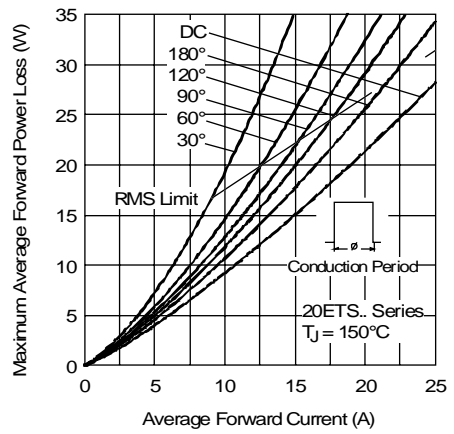


Fig. 4 - Forward Power Loss Characteristics

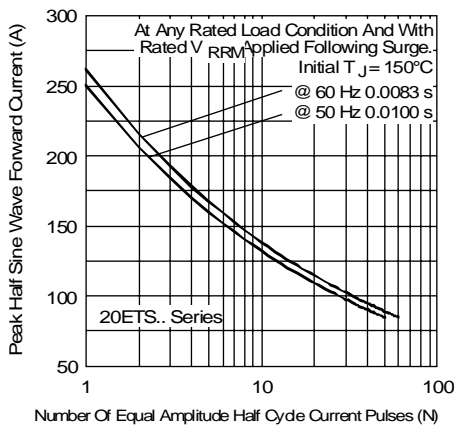


Fig. 5 - Maximum Non-Repetitive Surge Current

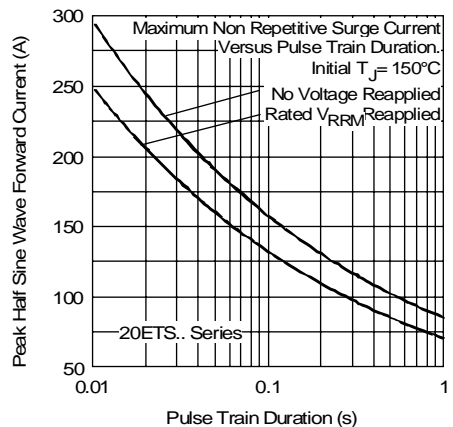


Fig. 6 - Maximum Non-Repetitive Surge Current

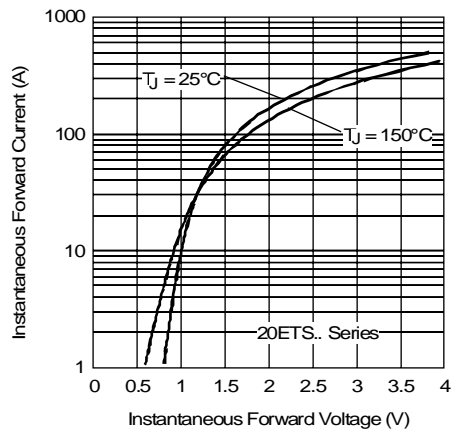


Fig.7-Forward Voltage Drop Characteristics

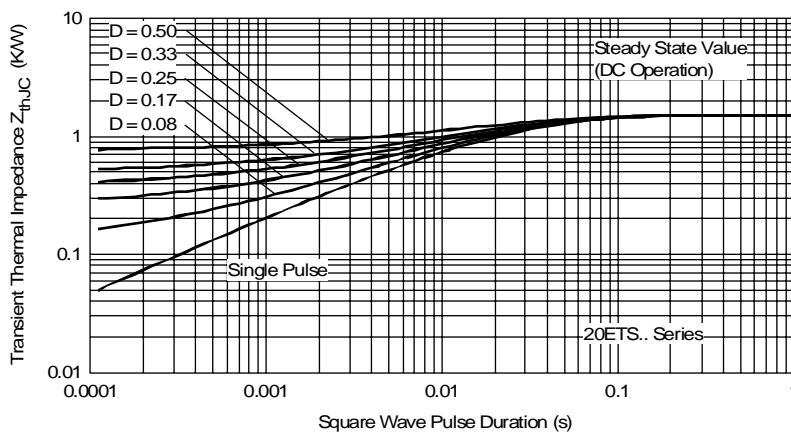
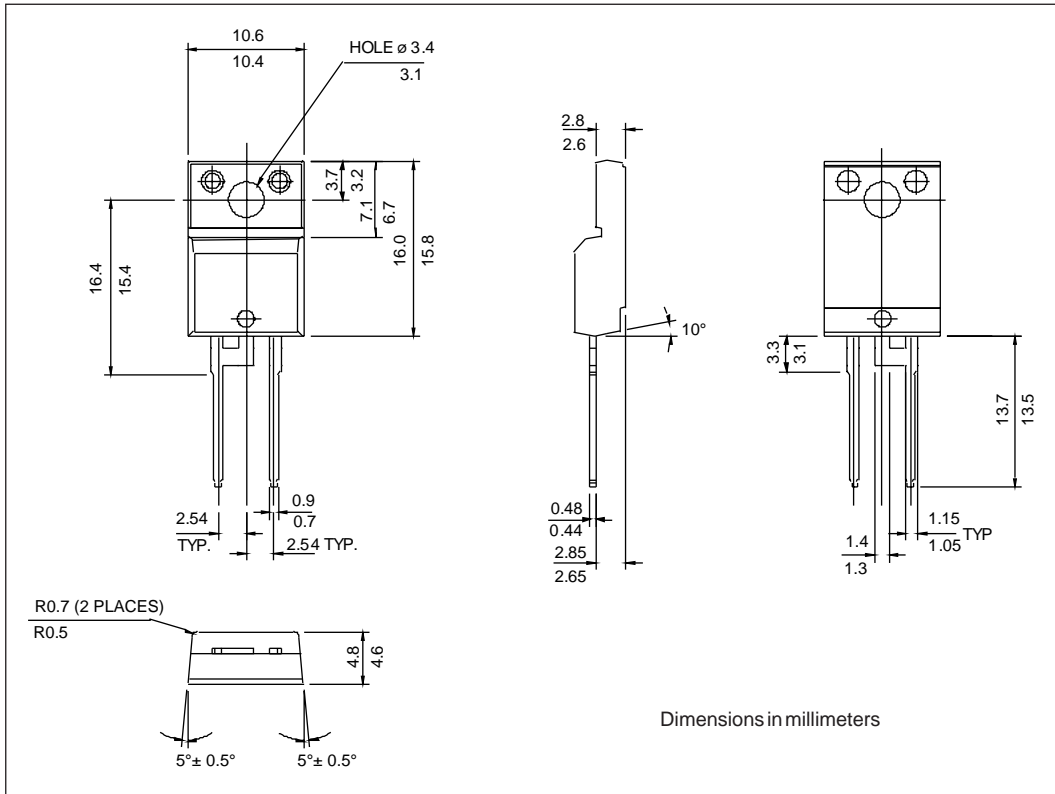
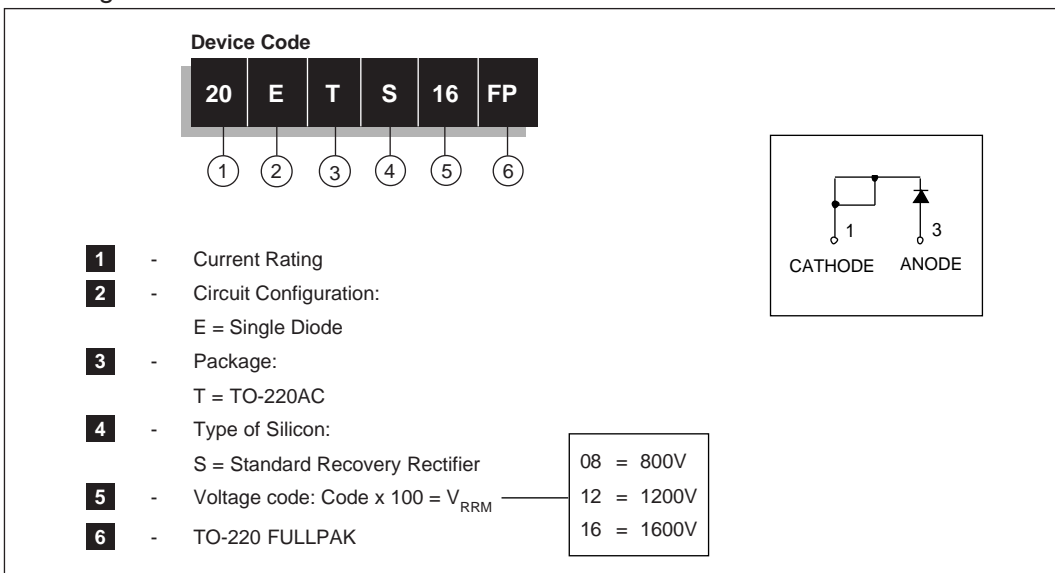


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

Outline Table



Ordering Information Table



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