



# BYW80F/FP-200

## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### MAIN PRODUCTS CHARACTERISTICS

|                |        |
|----------------|--------|
| $I_{F(AV)}$    | 20 A   |
| $V_{RRM}$      | 200 V  |
| $T_j$ (max)    | 150°C  |
| $V_F$ (max)    | 0.85 V |
| $t_{rr}$ (max) | 35 ns  |

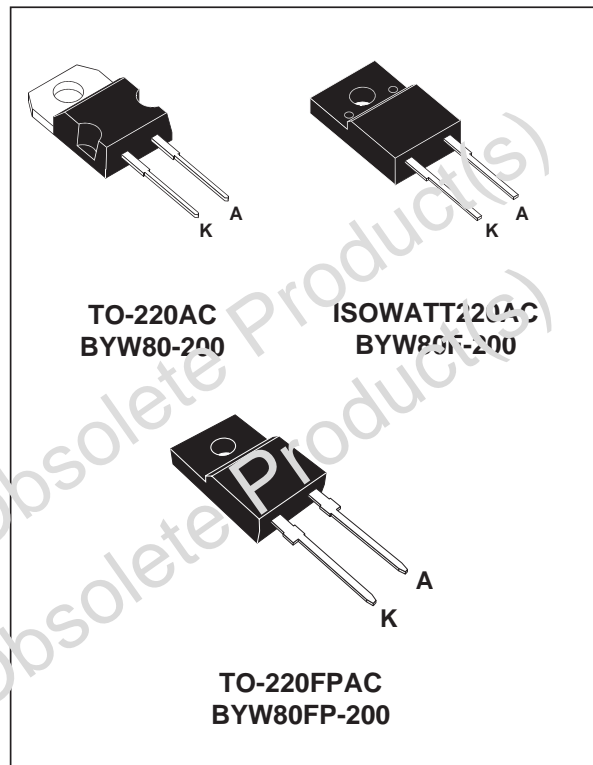
### FEATURES

- Suited for SMPS
- Very low forward losses
- Negligible switching losses
- High surge current capability
- Insulated packages:  
ISOWATT220AC / TO-220FPAC:  
Insulation voltage = 2000 V DC  
Capacitance = 12 pF

### DESCRIPTION

Single chip rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-220AC, ISOWATT220AC and TO-220FPAC this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



### ABSOLUTE MAXIMUM RATINGS

| Symbol       | Parameter                                 |                                   | Value                     | Unit |   |
|--------------|---|-----------------------------------|---------------------------|------|---|
| $V_{RRM}$    | Repetitive peak reverse voltage           |                                   | 200                       | V    |   |
| $I_{F(RMS)}$ | RMS forward current                       |                                   | 20                        | A    |   |
| $I_{F(AV)}$  | Average forward current<br>$\delta = 0.5$ | TO-220AC                          | $T_c = 120^\circ\text{C}$ | 10   | A |
|              |   | ISOWATT220AC<br>TO-220FPAC        | $T_c = 95^\circ\text{C}$  | 10   |   |
| $I_{FSM}$    | Surge non repetitive forward current      | $t_p = 10\text{ms}$<br>sinusoidal | 100                       | A    |   |
| $T_{stg}$    | Storage and junction temperature range    |                                   | - 65 to + 150             | °C   |   |
| $T_j$        | Maximum operating temperature range       |                                   | + 150                     | °C   |   |

**BYW80F/FP-200****THERMAL RESISTANCE**

| Symbol    | Parameter        |                           | Value | Unit |
|-----------|------------------|---------------------------|-------|------|
| Rth (j-c) | Junction to case | TO-220AC                  | 2.5   | °C/W |
|           |                  | ISOWATT220AC / TO-220FPAC | 4.7   |      |

**ELECTRICAL CHARACTERISTICS  
STATIC CHARACTERISTICS**

| Symbol            | Test Conditions        |                                   | Min. | Typ. | Max. | Unit |
|-------------------|------------------------|-----------------------------------|------|------|------|------|
| I <sub>R</sub> *  | T <sub>j</sub> = 25°C  | V <sub>R</sub> = V <sub>RRM</sub> |      |      | 10   | μA   |
|                   | T <sub>j</sub> = 100°C |                                   |      |      | 1    | mA   |
| V <sub>F</sub> ** | T <sub>j</sub> = 125°C | I <sub>F</sub> = 7 A              |      |      | 0.85 | V    |
|                   | T <sub>j</sub> = 125°C | I <sub>F</sub> = 15 A             |      |      | 1.05 |      |
|                   | T <sub>j</sub> = 25°C  | I <sub>F</sub> = 15 A             |      |      | 1.15 |      |

Pulse test : \* tp = 5 ms, duty cycle < 2 %

\*\* tp = 380 μs, duty cycle < 2 %

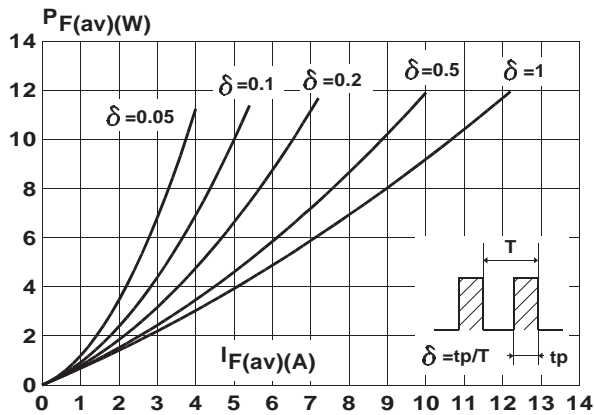
To evaluate the conduction losses use the following equation :

$$P = 0.65 \times I_{F(AV)} + 0.027 \times I_{F(RMS)}^2$$

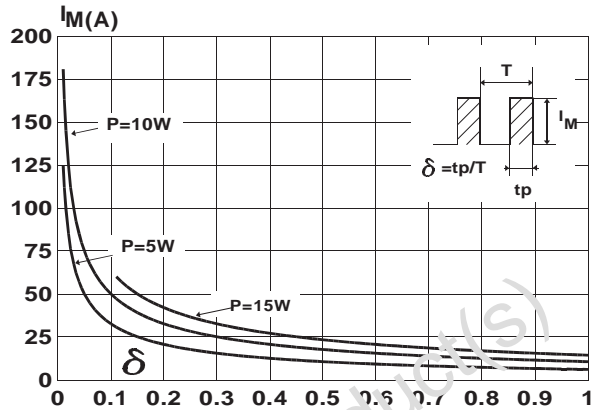
**RECOVERY CHARACTERISTICS**

| Symbol          | Test Conditions       |   |                               | Min. | Typ. | Max. | Unit |
|-----------------|-----------------------|---|-------------------------------|------|------|------|------|
| trr             | T <sub>i</sub> = 25°C | I <sub>F</sub> = 0.5A<br>I <sub>R</sub> = 1A                  | I <sub>rr</sub> = 0.25A       |      |      | 25   | ns   |
|                 |                       | I <sub>F</sub> = 1A<br>V <sub>R</sub> = 30V                   | dI <sub>F</sub> /dt = -50A/μs |      |      | 35   |      |
| tfr             | T <sub>j</sub> = 25°C | I <sub>F</sub> = 1A<br>V <sub>FR</sub> = 1.1 x V <sub>F</sub> | tr = 10 ns                    |      | 15   |      | ns   |
| V <sub>FP</sub> | T <sub>j</sub> = 25°C | I <sub>F</sub> = 1A   | tr = 10 ns                    |      | 2    |      | V    |

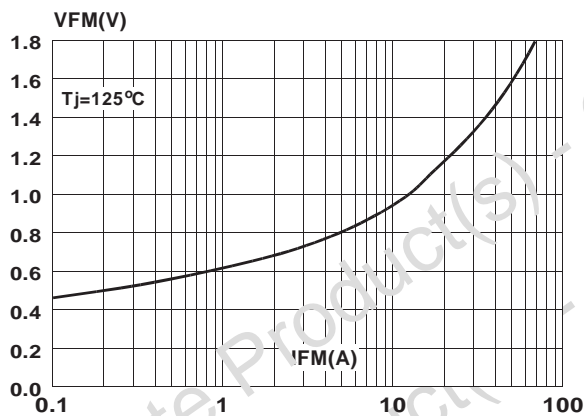
**Fig. 1:** Average forward power dissipation versus average forward current



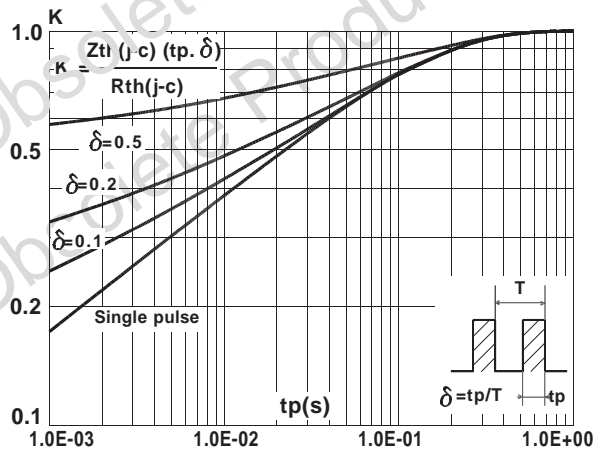
**Fig. 2:** Peak current versus form factor



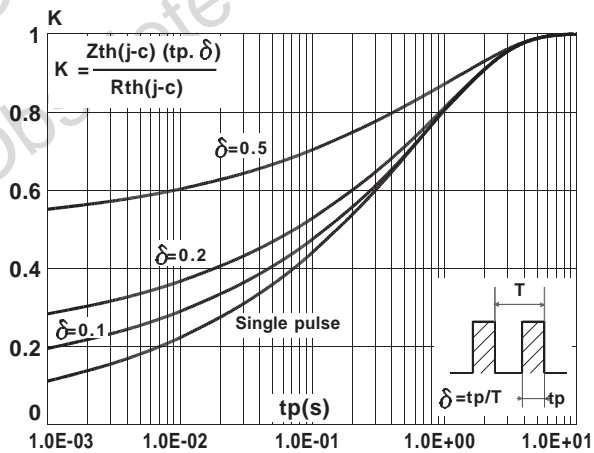
**Fig. 3:** Forward voltage drop versus forward current (maximum values)



**Fig. 4:** Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC)



**Fig. 5:** Relative variation of thermal impedance junction to case versus pulse duration (ISOWATT220AC / TO-220FPAC)



**Fig. 6:** Non repetitive surge peak forward current versus overload duration (TO-220AC)

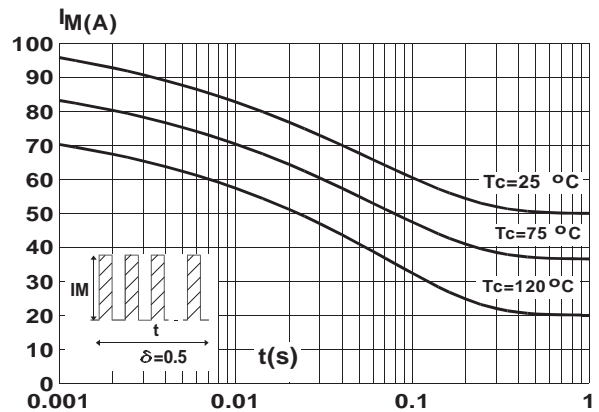


Fig. 7: Non repetitive surge peak forward current versus overload duration (ISOWATT220AC / TO-220FPAC)

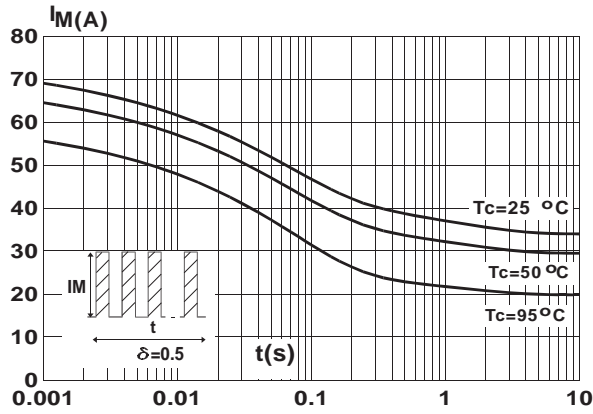


Fig. 8: Average current versus ambient temperature (duty cycle : 0.5) (TO-220AC)

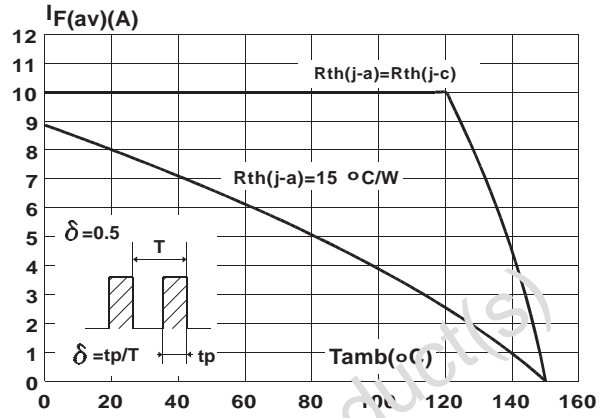


Fig. 9: Average current versus ambient temperature (duty cycle: 0.5) (ISOWATT220AC / TO-220FPAC)

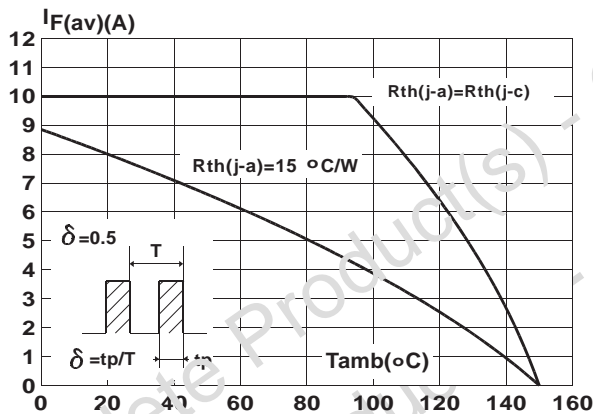


Fig. 10: Junction capacitance versus reverse voltage applied (Typical values)

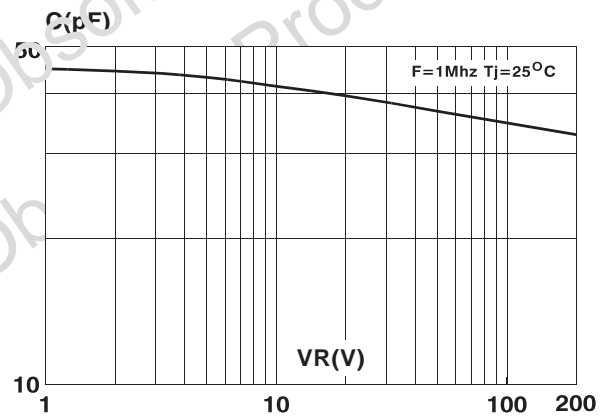


Fig. 11: Recovery charges versus  $dI_F/dt$ .

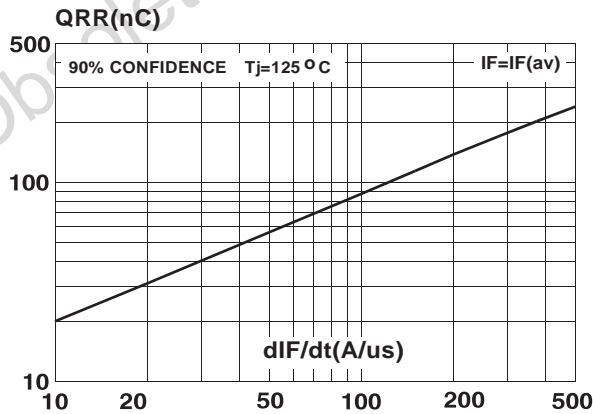


Fig. 12: Peak reverse current versus  $dI_F/dt$ .

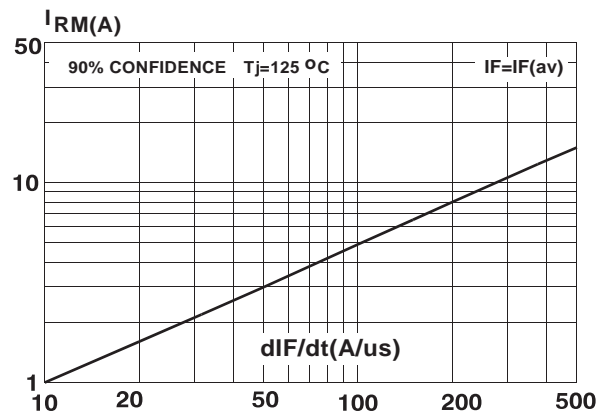
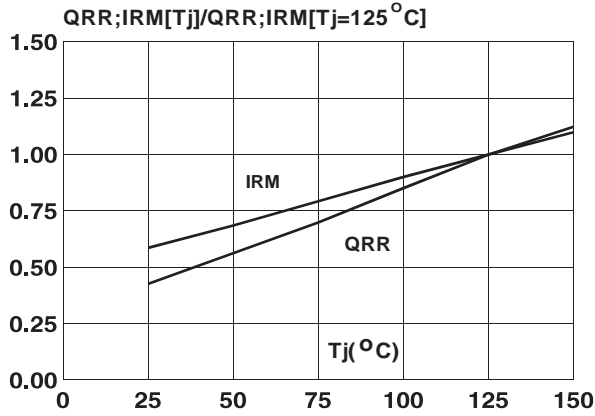
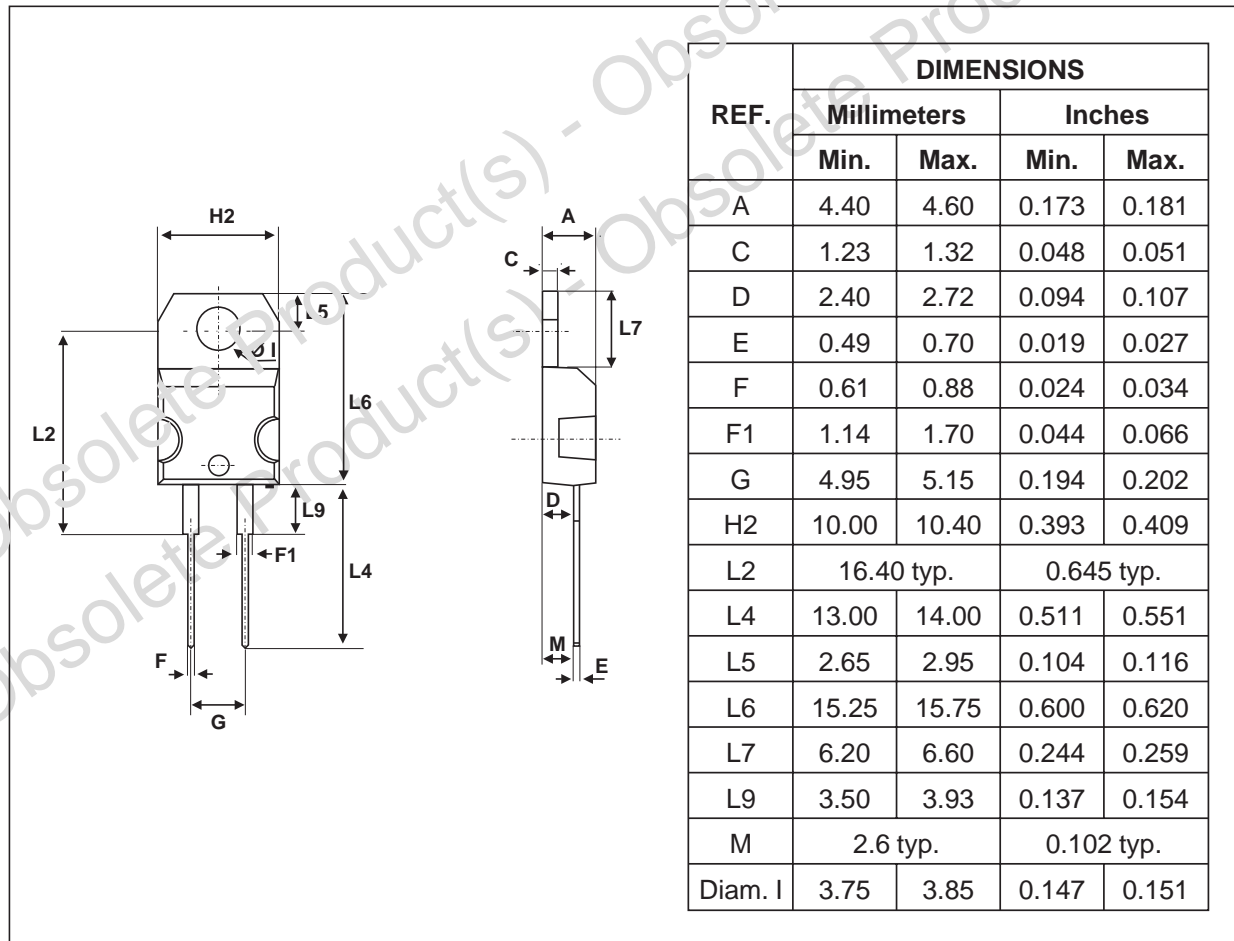


Fig. 13: Dynamic parameters versus junction temperature

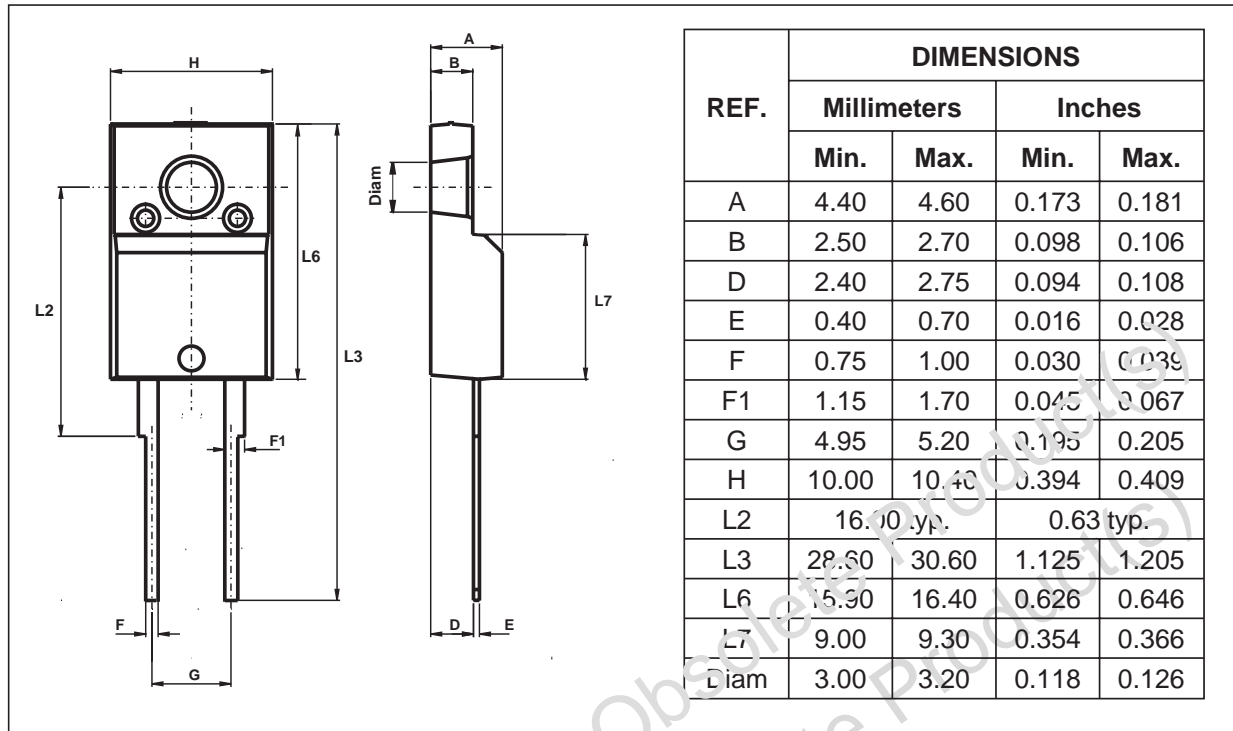


**PACKAGE MECHANICAL DATA**  
TO-220AC (JEDEC outline)

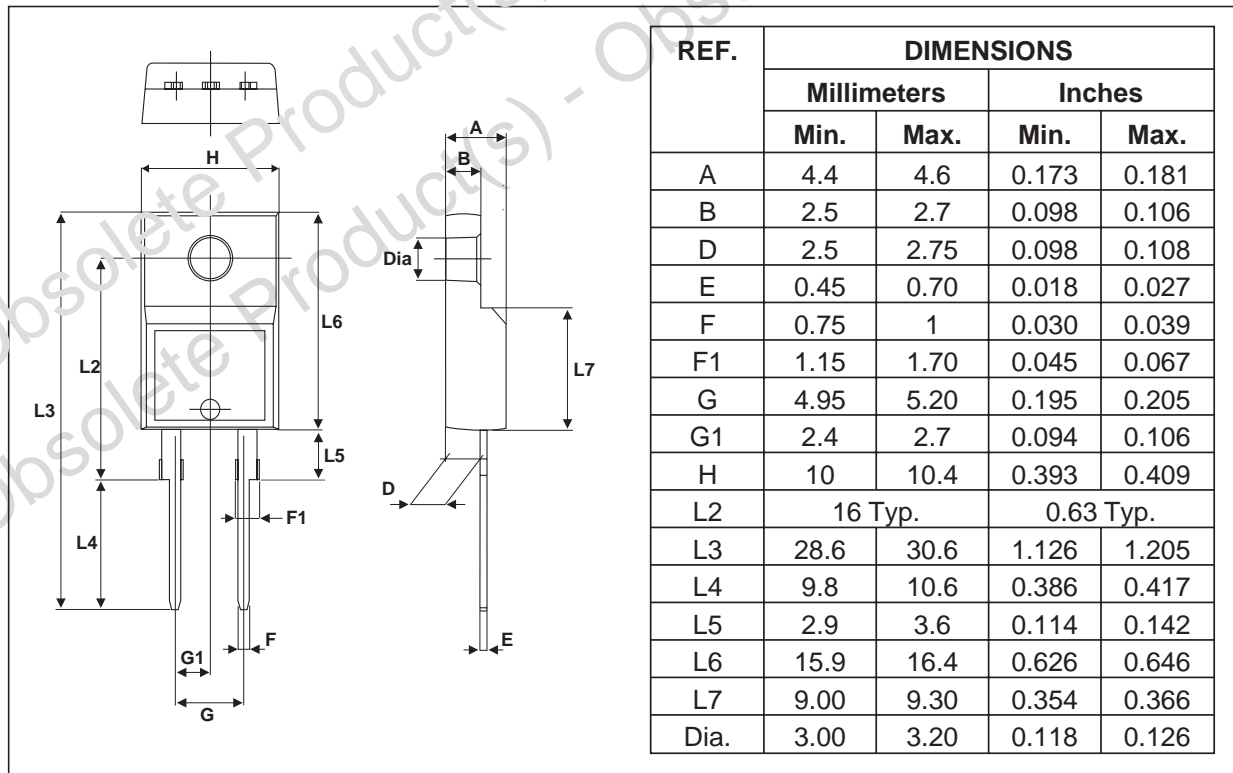


**BYW80F/FP-200**

**PACKAGE MECHANICAL DATA**  
ISOWATT220AC (JEDEC outline)



**PACKAGE MECHANICAL DATA**  
TO-220FPAC



## BYW80F/FP-200

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| Type        | Marking     | Package      | Weight | Base Qty | Delivery mode |
|-------------|-------------|--------------|--------|----------|---------------|
| BYW80-200   | BYW80-200   | TO-220AC     | 2.3 g  | 50       | Tube          |
| BYW80F-200  | BYW80F-200  | ISOWATT220AC | 2 g    | 50       | Tube          |
| BYW80FP-200 | BYW80FP-200 | TO-220FPAC   | 1.8 g  | 50       | Tube          |

- Cooling method: by conduction (C)
- Recommended torque value (ISOWATT220AC, TO-220FPAC): 0.55 Nm
- Maximum torque value (ISOWATT220AC, TO-220FPAC): 0.7 Nm
- Recommended torque value (TO-220AC): 0.8 Nm
- Maximum torque value (TO-220AC): 1.0 Nm
- Epoxy meets UL94, V0

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