

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 |

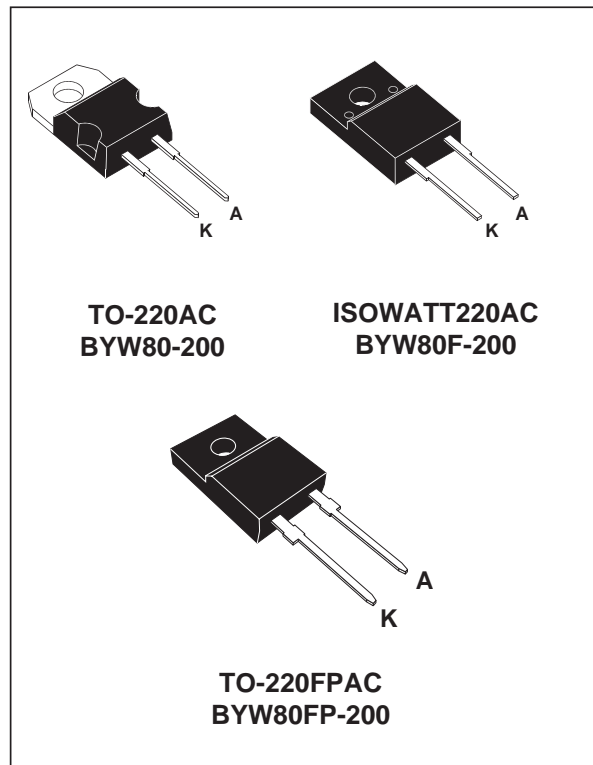
FEATURES

- 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 $\delta = 0.5$ | TO-220AC | $T_c=120^\circ\text{C}$ | 10 | A |
| | | ISOWATT220AC TO-220FPAC | $T_c=95^\circ\text{C}$ | 10 | |
| I_{FSM} | Surge non repetitive forward current | $t_p=10\text{ms}$ 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 _R * | T _j = 25°C | V _R = V _{RRM} | | | 10 | μA |
| | T _j = 100°C | | | | 1 | mA |
| V _F ** | T _j = 125°C | I _F = 7 A | | | 0.85 | V |
| | T _j = 125°C | I _F = 15 A | | | 1.05 | |
| | T _j = 25°C | I _F = 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 _j = 25°C | I _F = 0.5A I _R = 1A | I _{rr} = 0.25A | | | 25 | ns |
| | | I _F = 1A V _R = 30V | dI _F /dt = -50A/μs | | | 35 | |
| tfr | T _j = 25°C | I _F = 1A V _{FR} = 1.1 x V _F | tr = 10 ns | | 15 | | ns |
| V _{FP} | T _j = 25°C | I _F = 1A | tr = 10 ns | | 2 | | V |

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

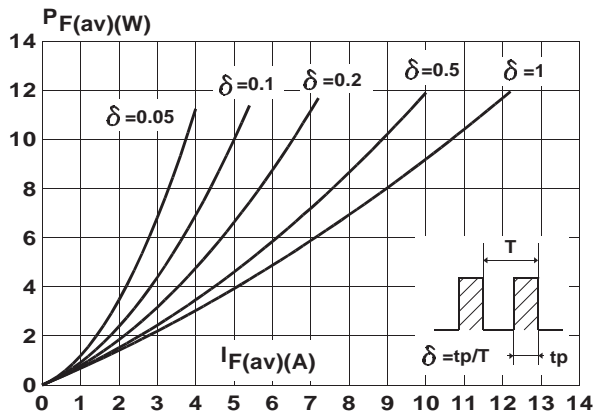


Fig. 2: Peak current versus form factor

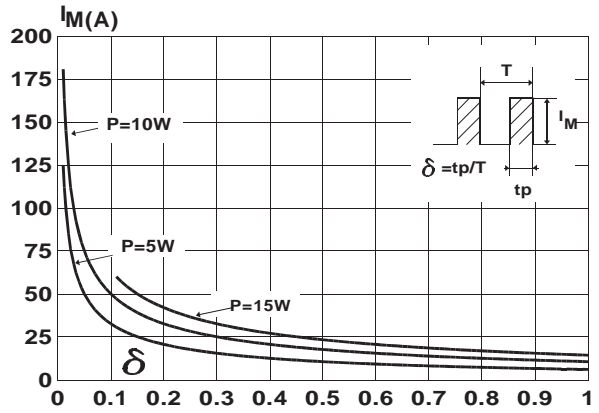


Fig. 3: Forward voltage drop versus forward current (maximum values)

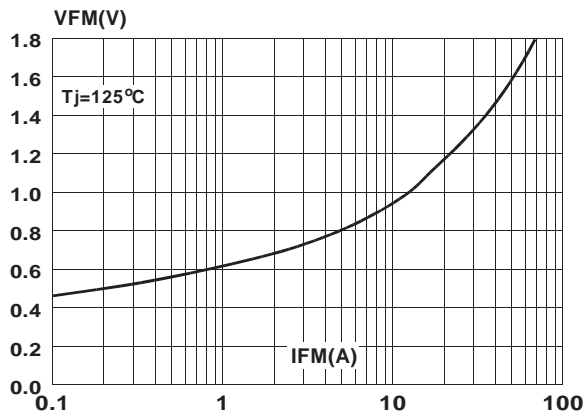


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC)

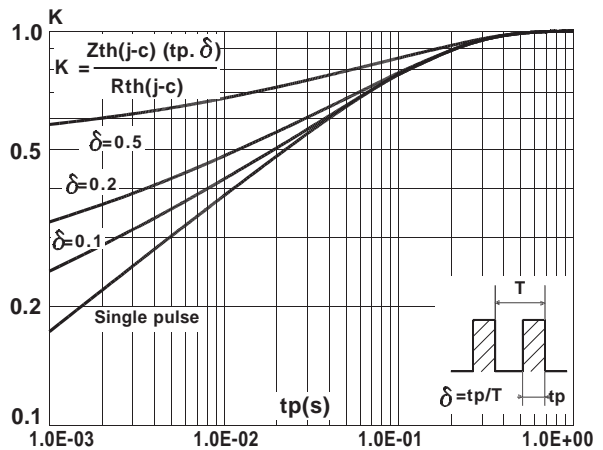


Fig. 5: Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AC / TO-220FPAC)

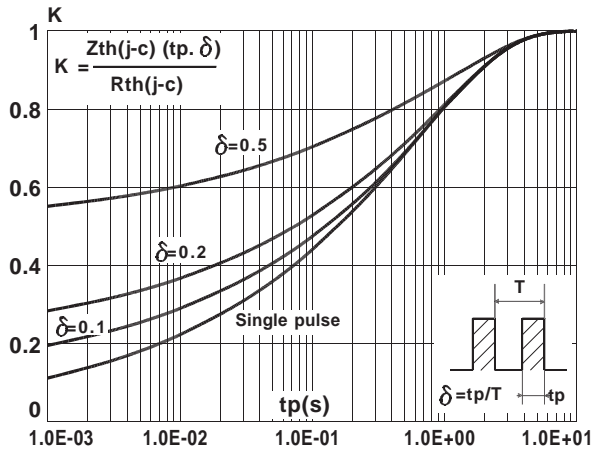


Fig. 6: Non repetitive surge peak forward current versus overload duration (TO-220AC)

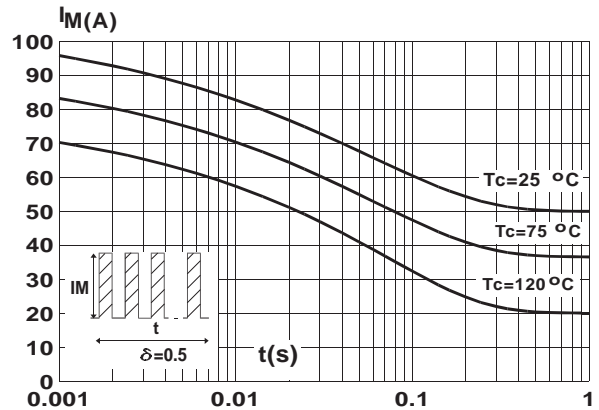


Fig. 7: Non repetitive surge peak forward current versus overload duration (ISOWATT220AC / TO-220FPAC)

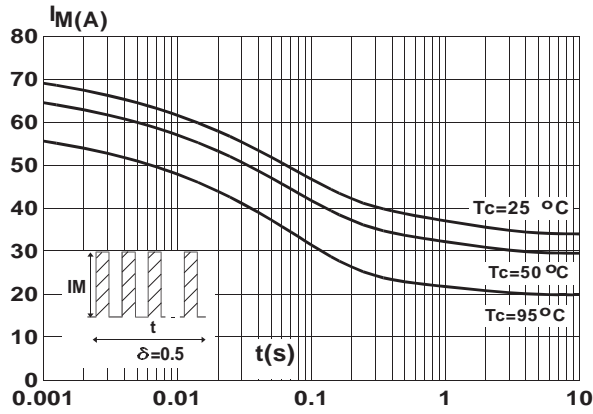


Fig. 8: Average current versus ambient temperature (duty cycle : 0.5) (TO-220AC)

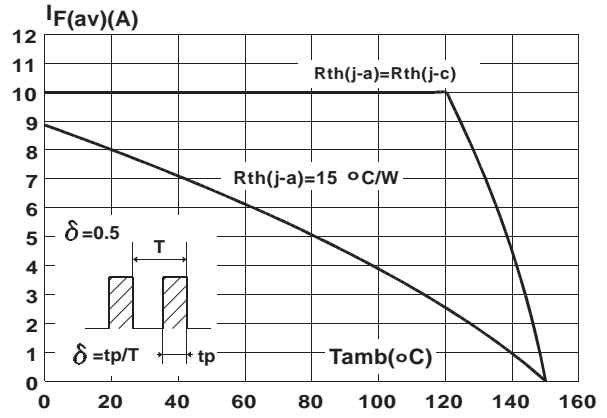


Fig. 9: Average current versus ambient temperature (duty cycle: 0.5) (ISOWATT220AC / TO-220FPAC)

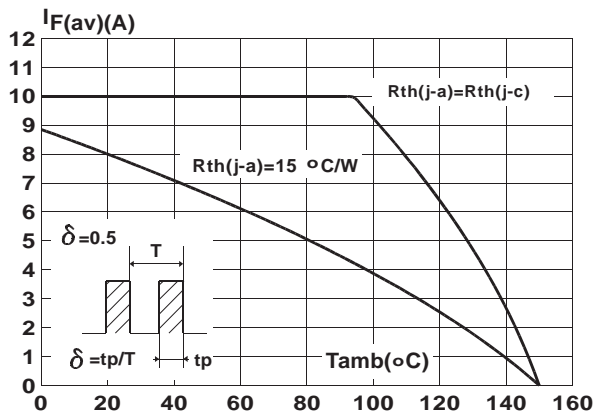


Fig. 10: Junction capacitance versus reverse voltage applied (Typical values)

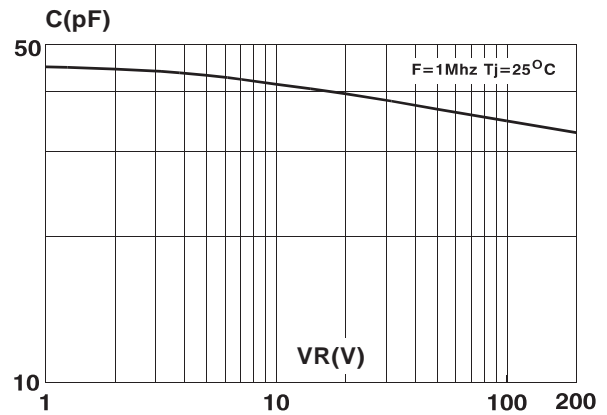


Fig. 11: Recovery charges versus dI_F/dt .

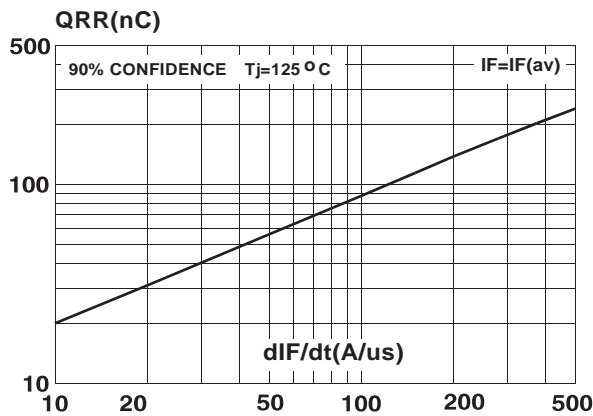


Fig. 12: Peak reverse current versus dI_F/dt .

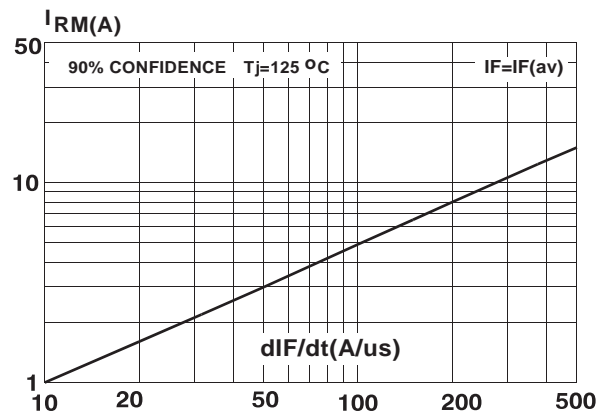
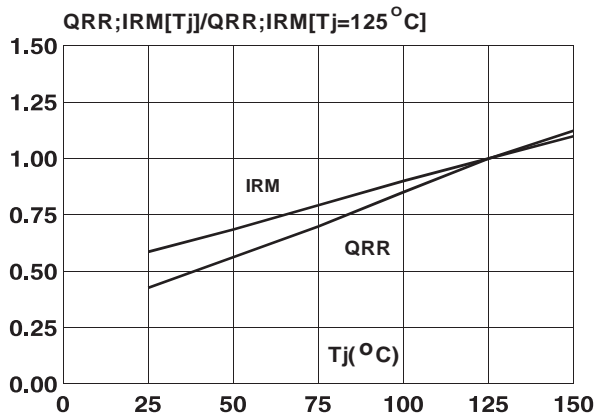
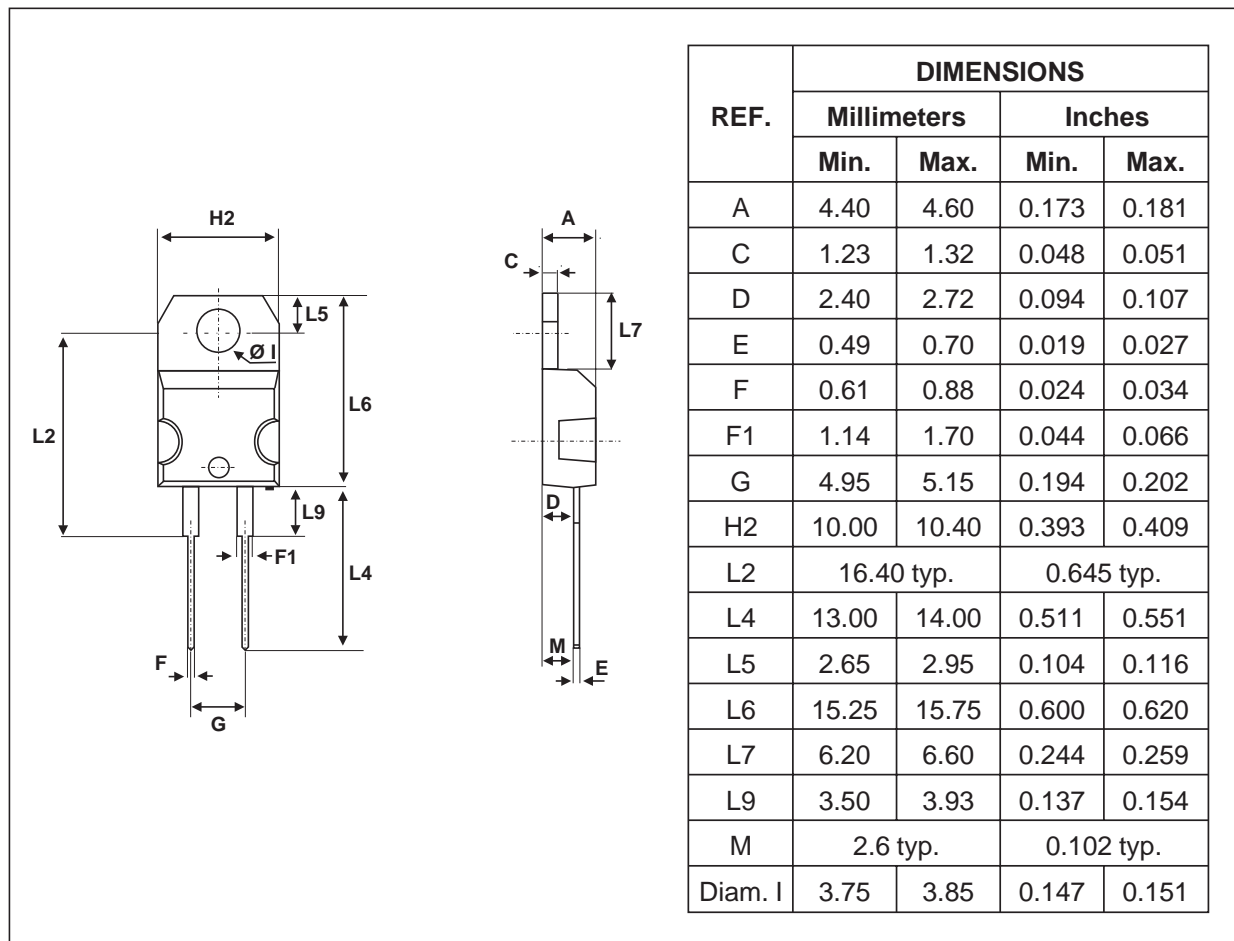


Fig. 13: Dynamic parameters versus junction temperature

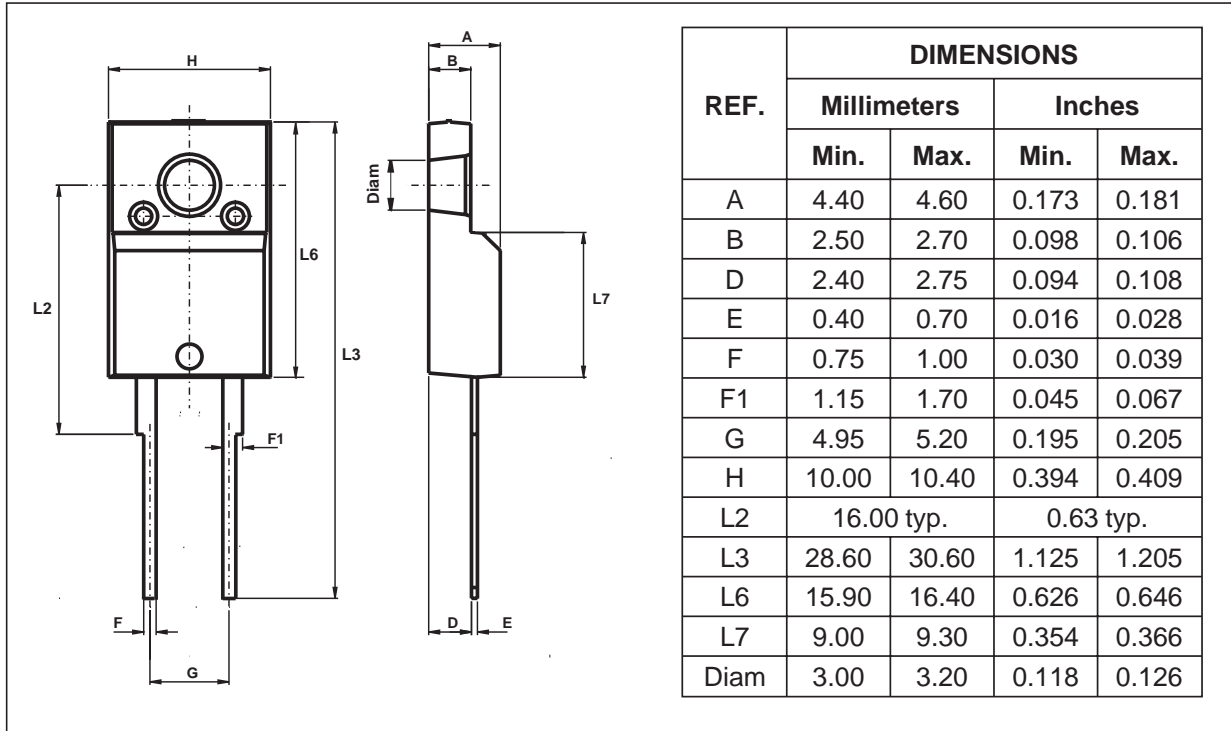


PACKAGE MECHANICAL DATA
TO-220AC (JEDEC outline)

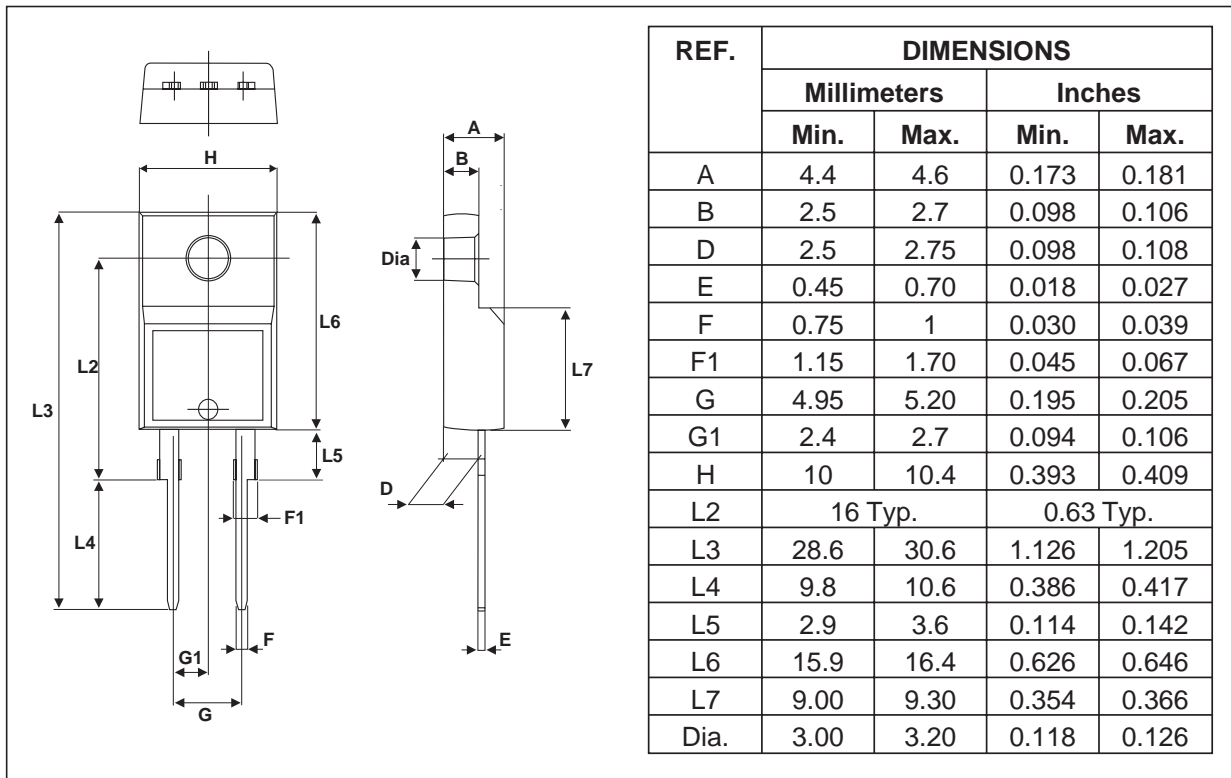


BYW80F/FP-200

PACKAGE MECHANICAL DATA
ISOWATT220AC (JEDEC outline)



PACKAGE MECHANICAL DATA
TO-220FPAC



BYW80F/FP-200

| 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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