

## 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

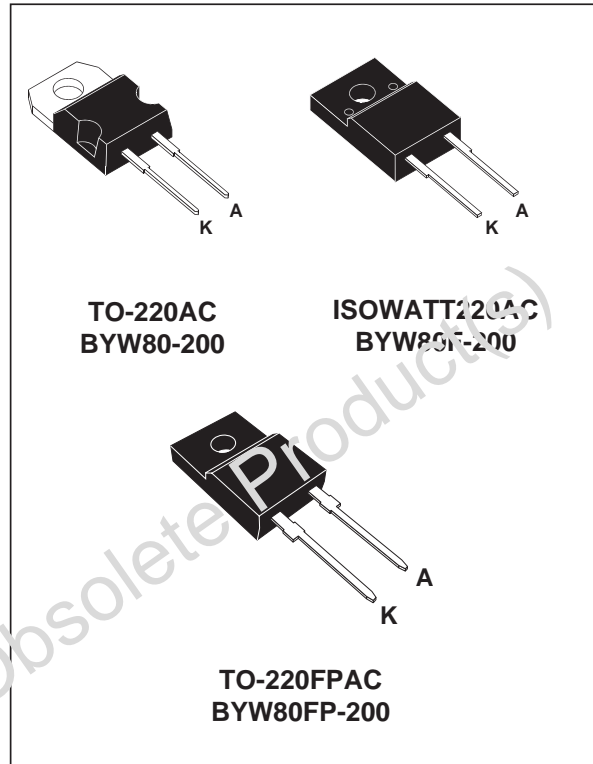
### FEATURES

- 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 <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 %

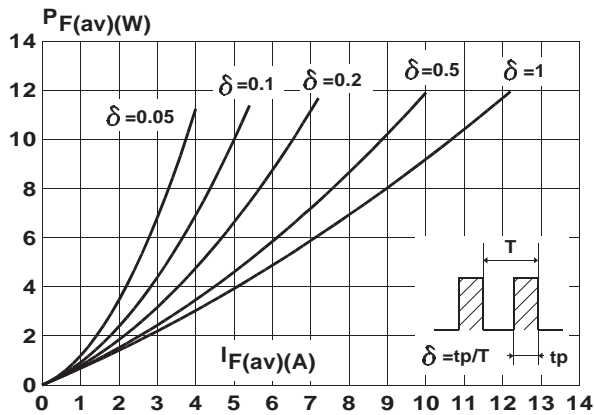
To evaluate the conduction losses use the following equation :

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

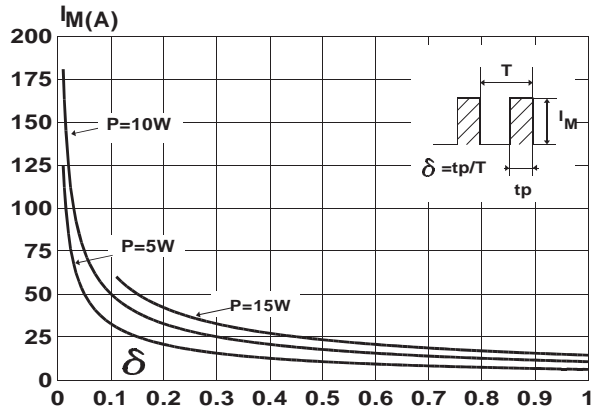
### RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
trr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A I <sub>R</sub> = 1A	I <sub>rr</sub> = 0.25A			25	ns
		I <sub>F</sub> = 1A 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 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

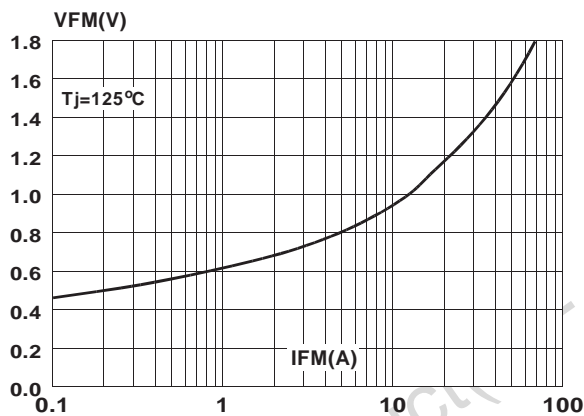
**Fig. 1:** Average forward power dissipation versus average forward current



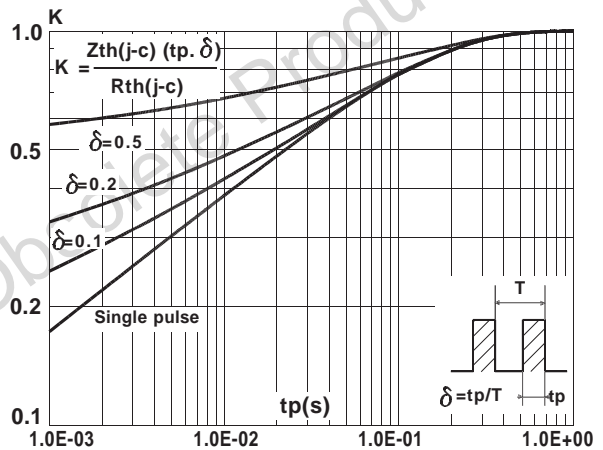
**Fig. 2:** Peak current versus form factor



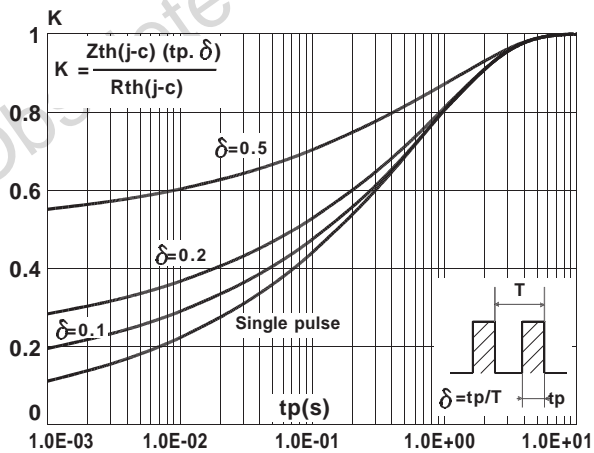
**Fig. 3:** Forward voltage drop versus forward current (maximum values)



**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)

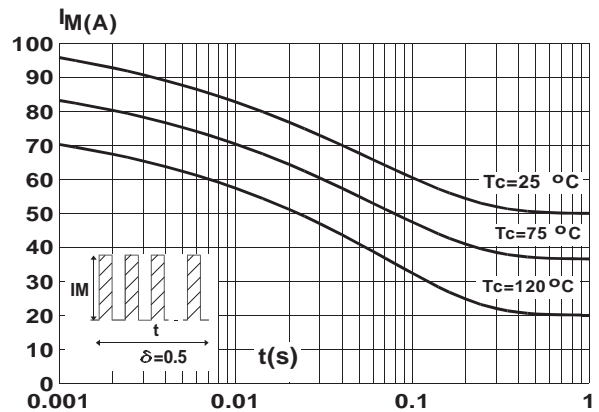


Fig. 7: Non repetitive surge peak forward current versus overload duration (ISOWATT220AC / TO-220FPAC)

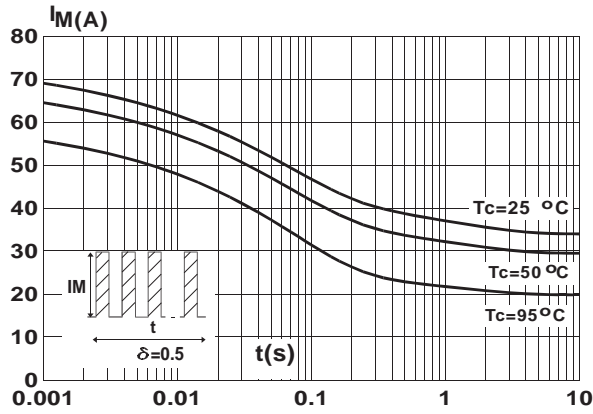


Fig. 8: Average current versus ambient temperature (duty cycle : 0.5) (TO-220AC)

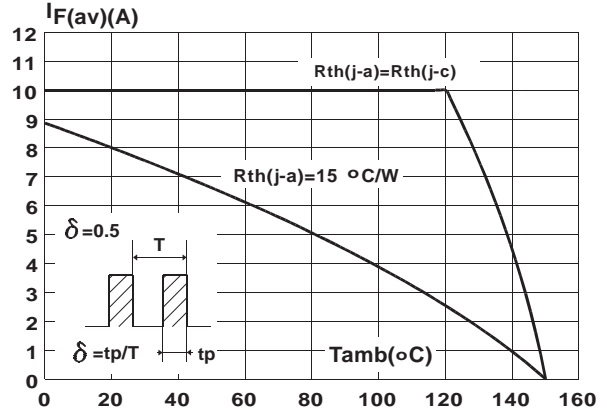


Fig. 9: Average current versus ambient temperature (duty cycle: 0.5) (ISOWATT220AC / TO-220FPAC)

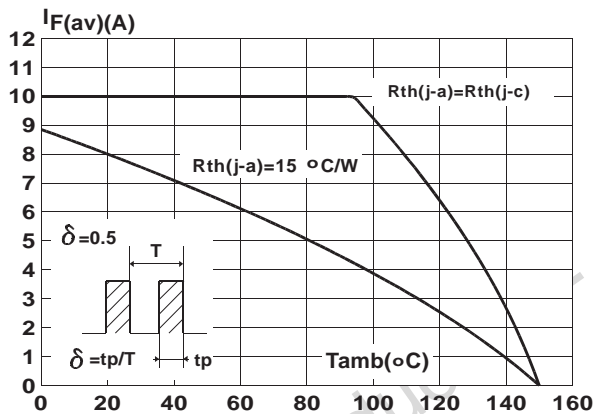


Fig. 10: Junction capacitance versus reverse voltage applied (Typical values)

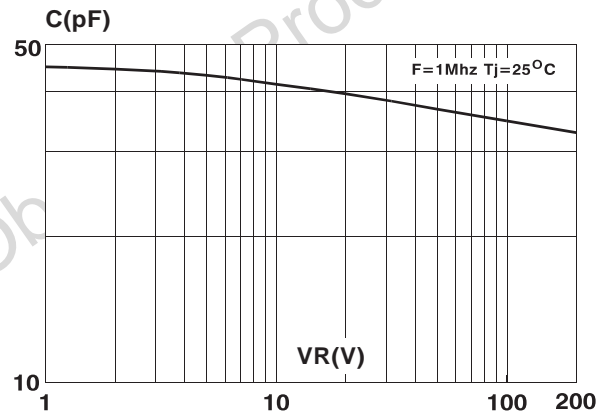


Fig. 11: Recovery charges versus  $dI_F/dt$ .

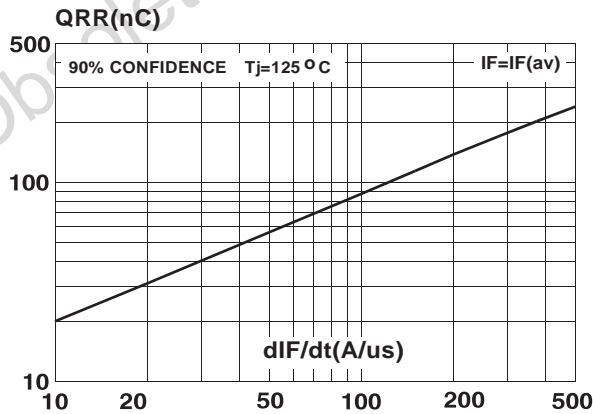


Fig. 12: Peak reverse current versus  $dI_F/dt$ .

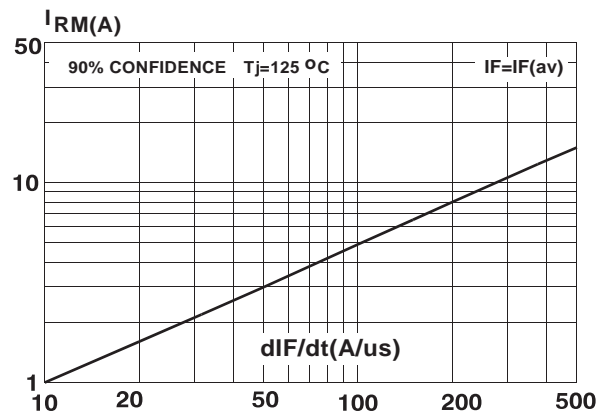
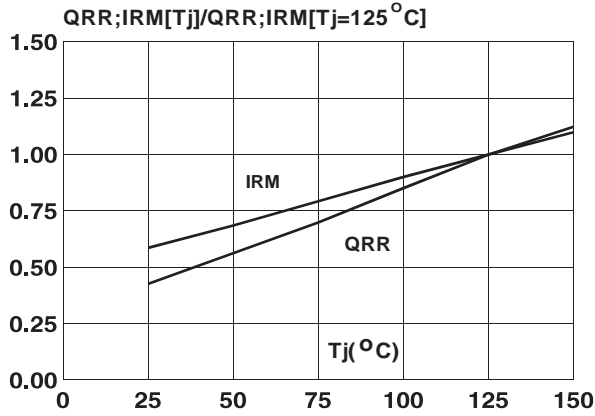
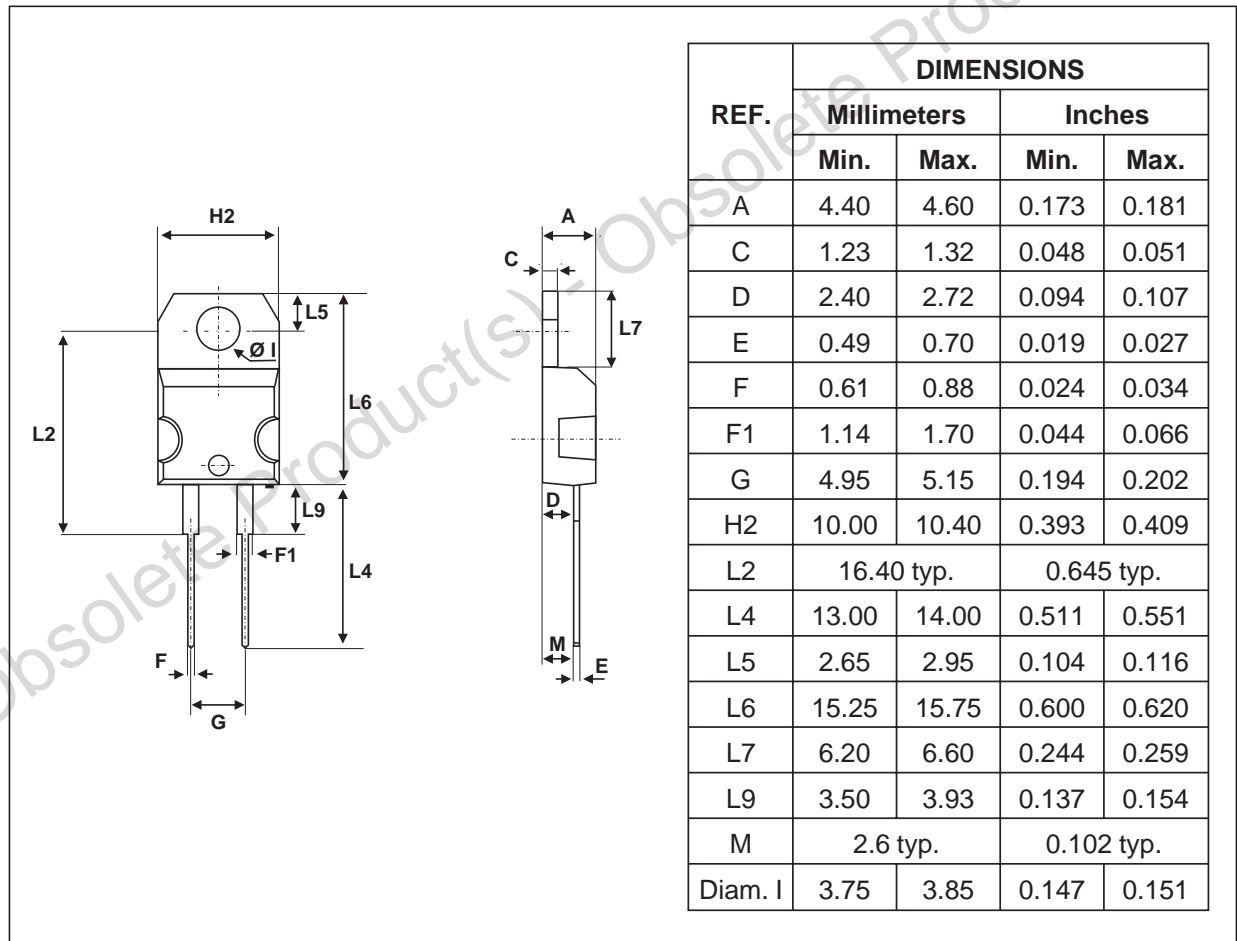


Fig. 13: Dynamic parameters versus junction temperature

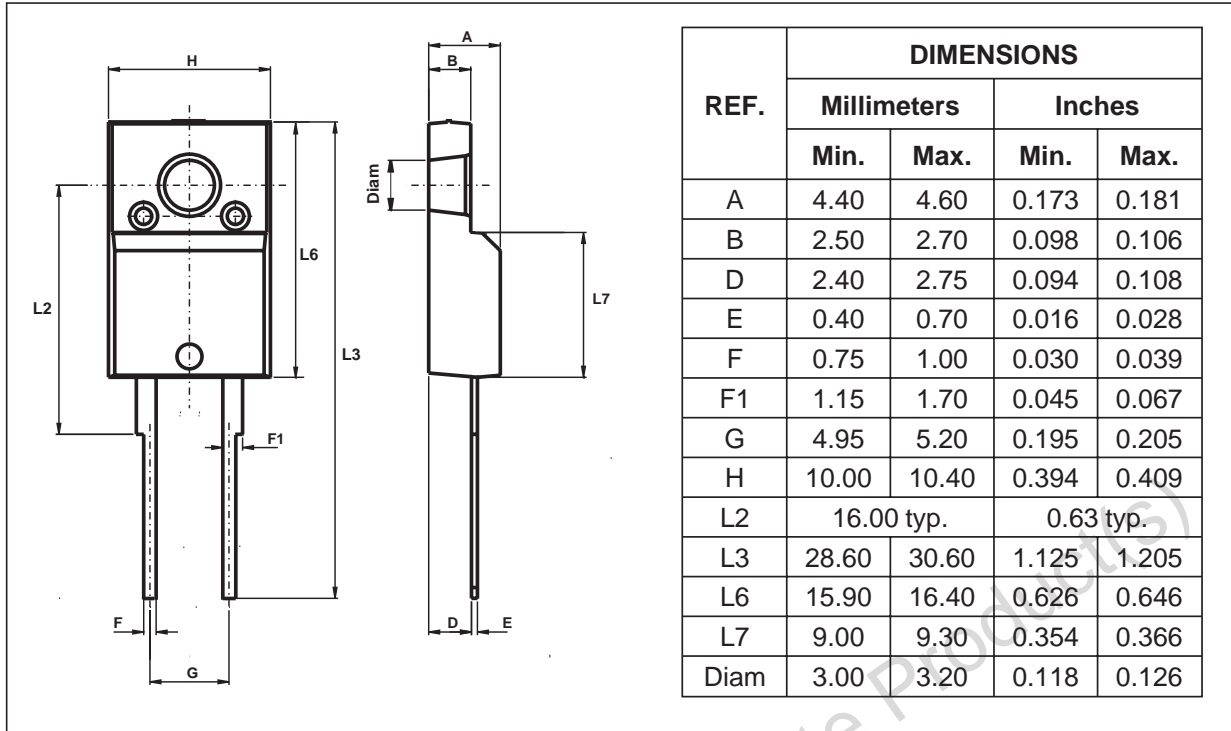


**PACKAGE MECHANICAL DATA**  
TO-220AC (JEDEC outline)

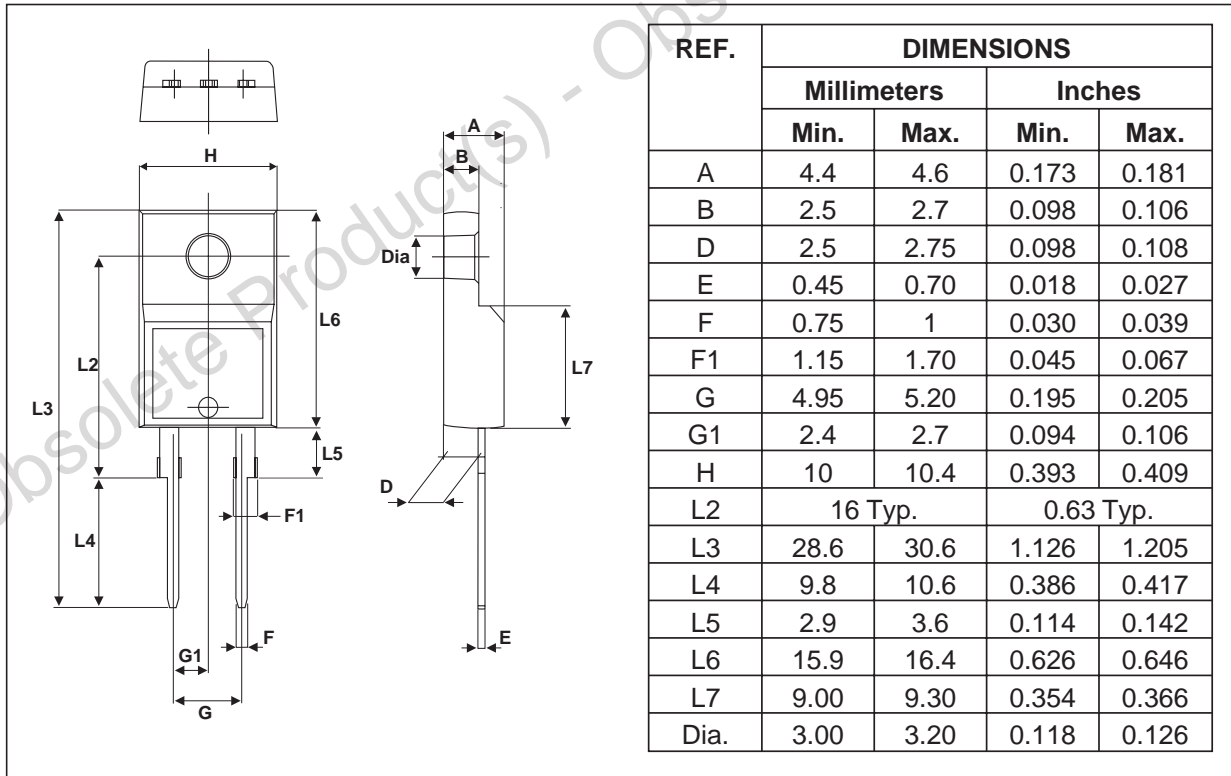


**BYW80F/FP-200**

**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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