

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

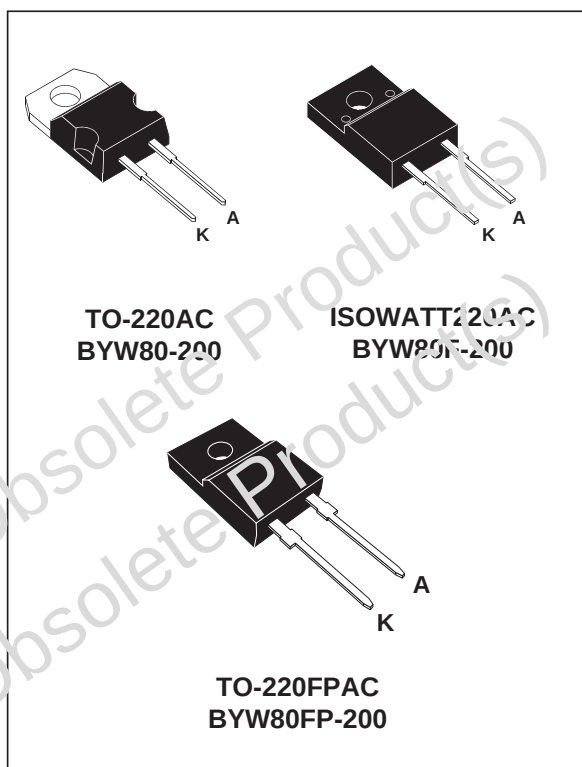
FEATURES

- 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

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 _i = 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

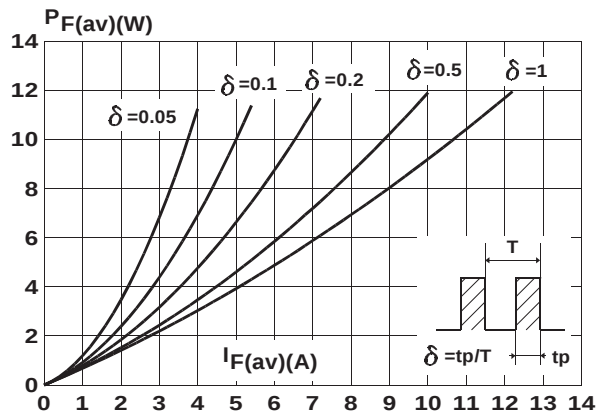


Fig. 2: Peak current versus form factor

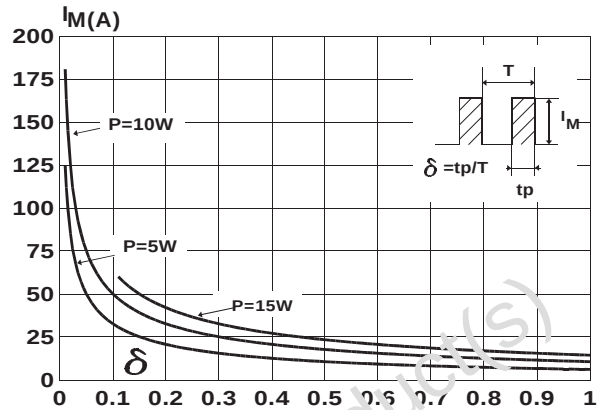


Fig. 3: Forward voltage drop versus forward current (maximum values)

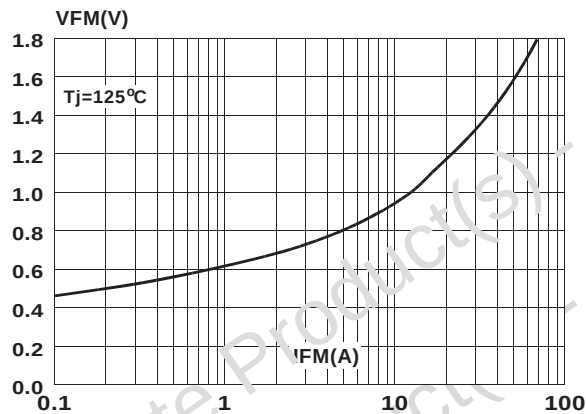


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC)

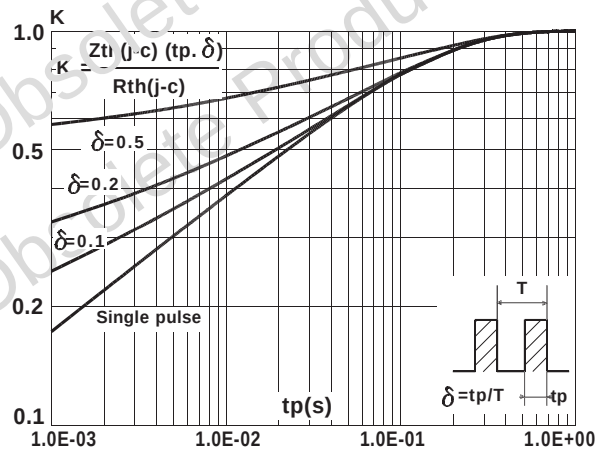


Fig. 5: Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AC / TO-220FPAC)

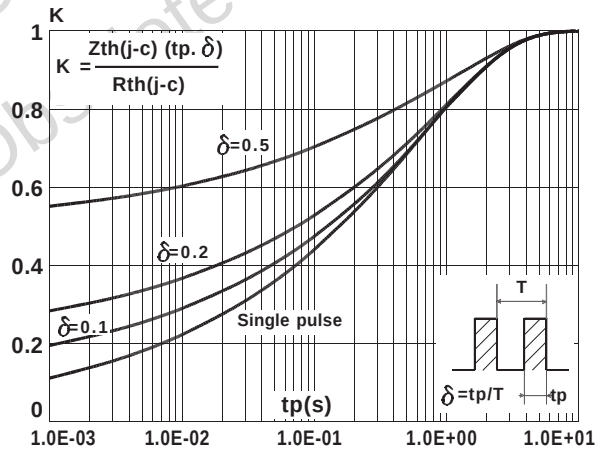


Fig. 6: Non repetitive surge peak forward current versus overload duration (TO-220AC)

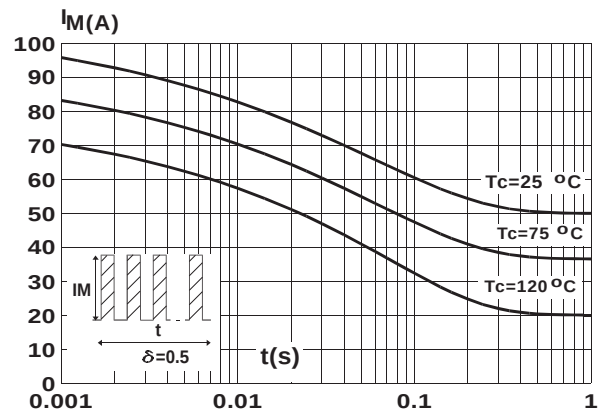


Fig. 7: Non repetitive surge peak forward current versus overload duration (ISOWATT220AC / TO-220FPAC)

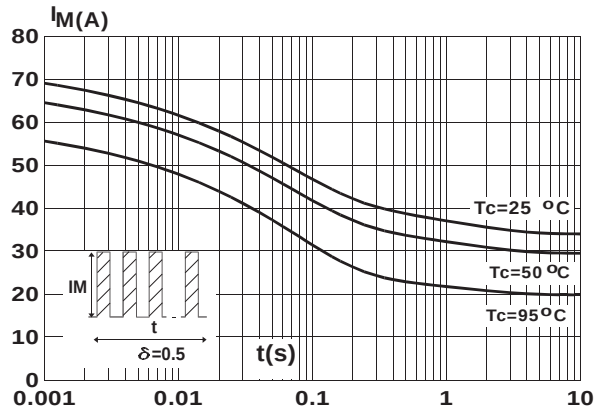


Fig. 8: Average current versus ambient temperature (duty cycle : 0.5) (TO-220AC)

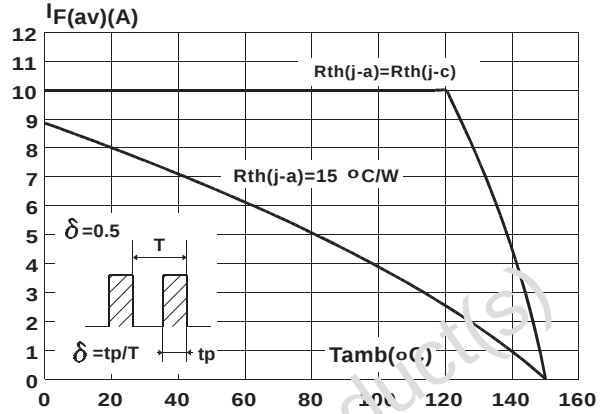


Fig. 9: Average current versus ambient temperature (duty cycle: 0.5) (ISOWATT220AC / TO-220FPAC)

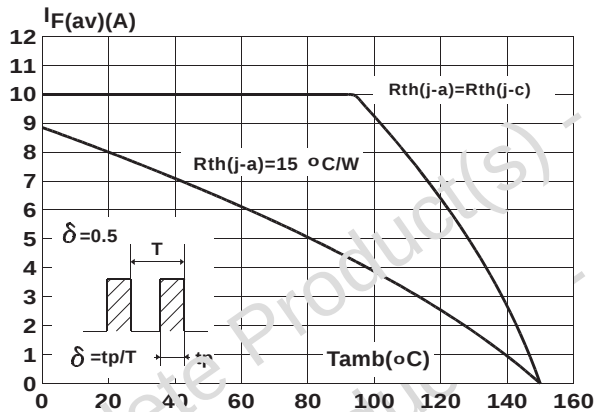


Fig. 10: Junction capacitance versus reverse voltage applied (Typical values)

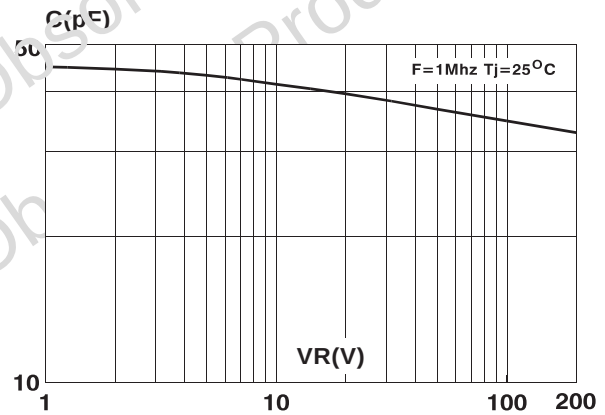


Fig. 11: Recovery charges versus dI_F/dt .

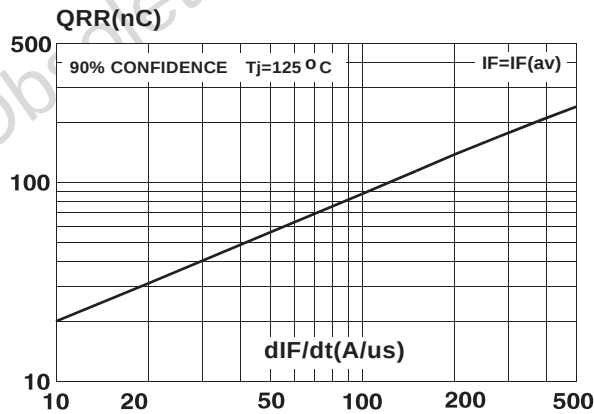


Fig. 12: Peak reverse current versus dI_F/dt .

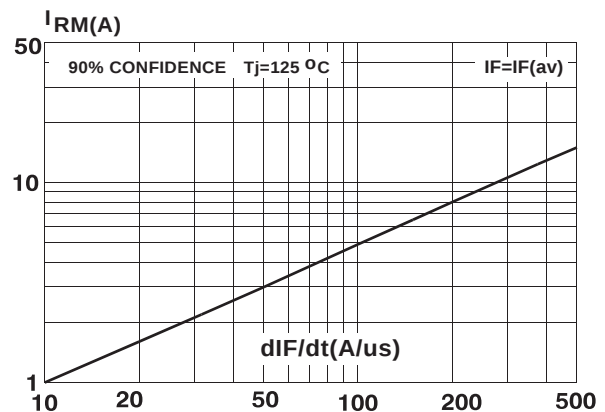
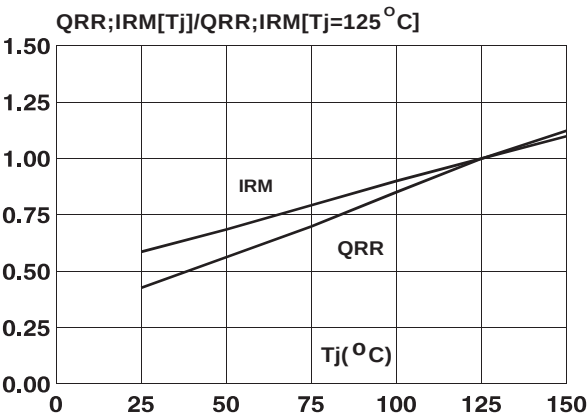
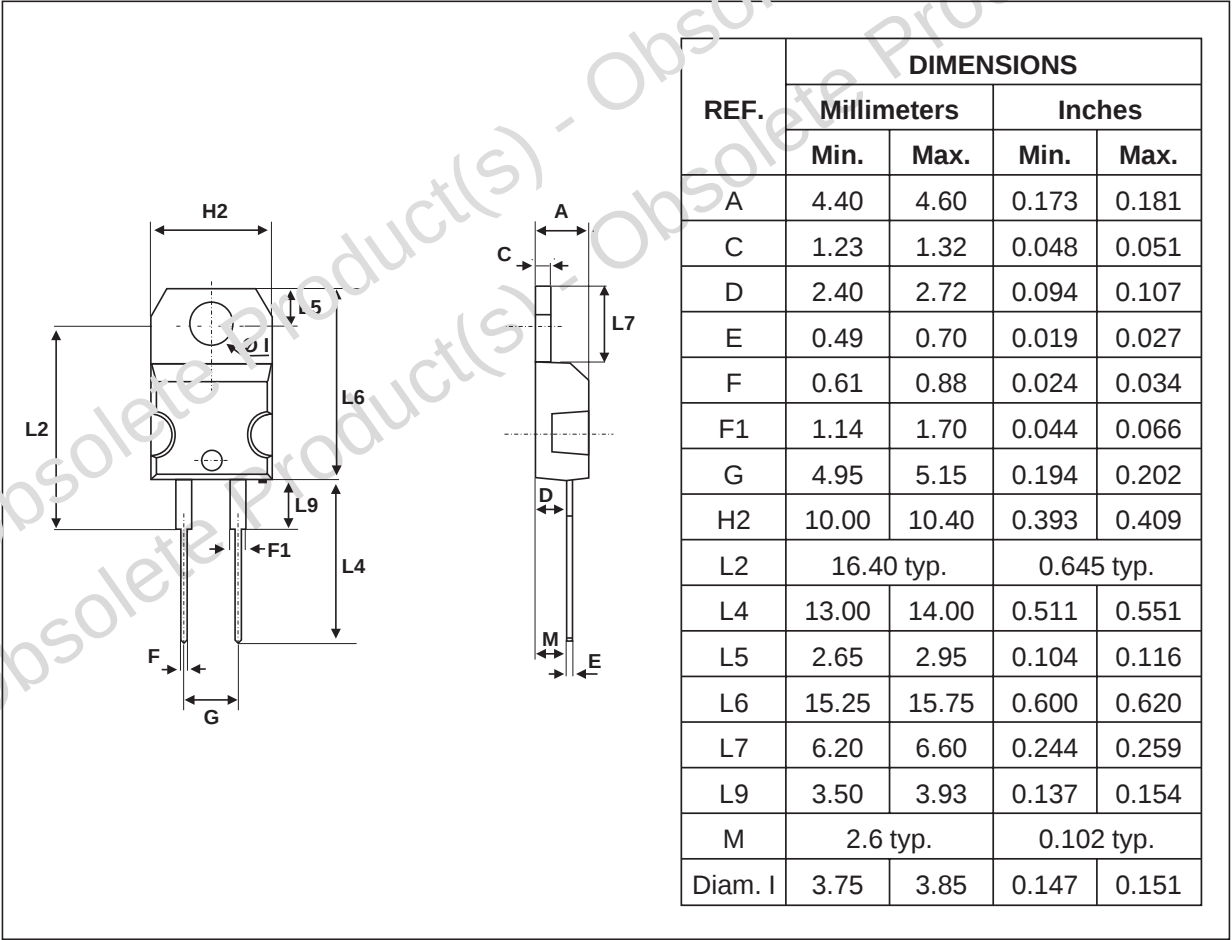


Fig. 13: Dynamic parameters versus junction temperature

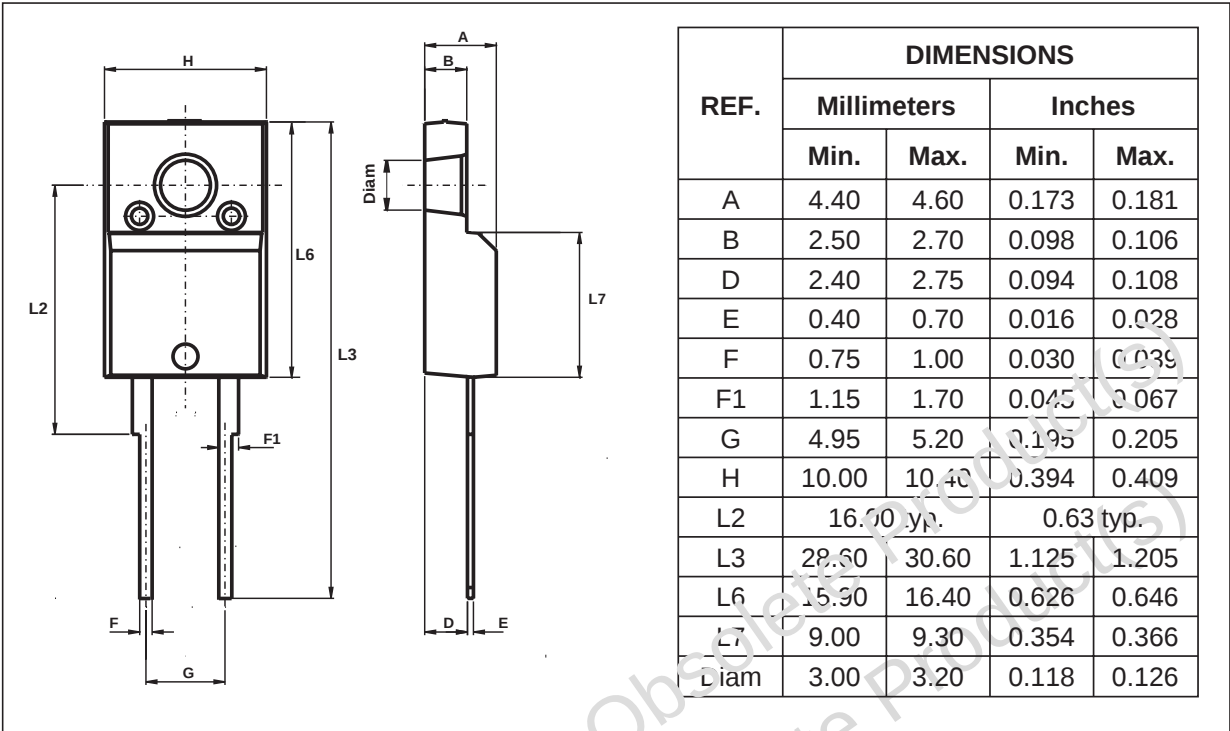


PACKAGE MECHANICAL DATA
TO-220AC (JEDEC outline)

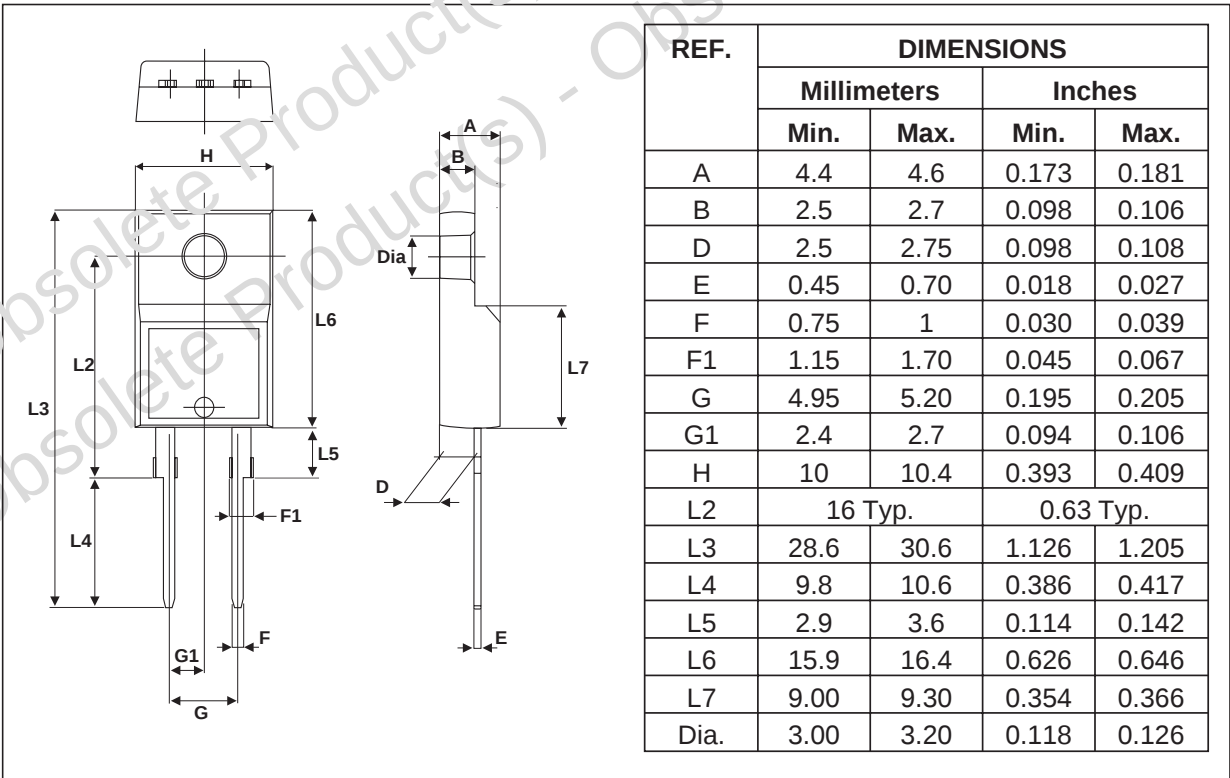


BYW80F/FP-200

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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