

ULTRA FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 3 A
V_{RRM}	200 V
$T_{j(max)}$	150°C
$V_{F(max)}$	0.99 V
$t_{rr(max)}$	30 ns

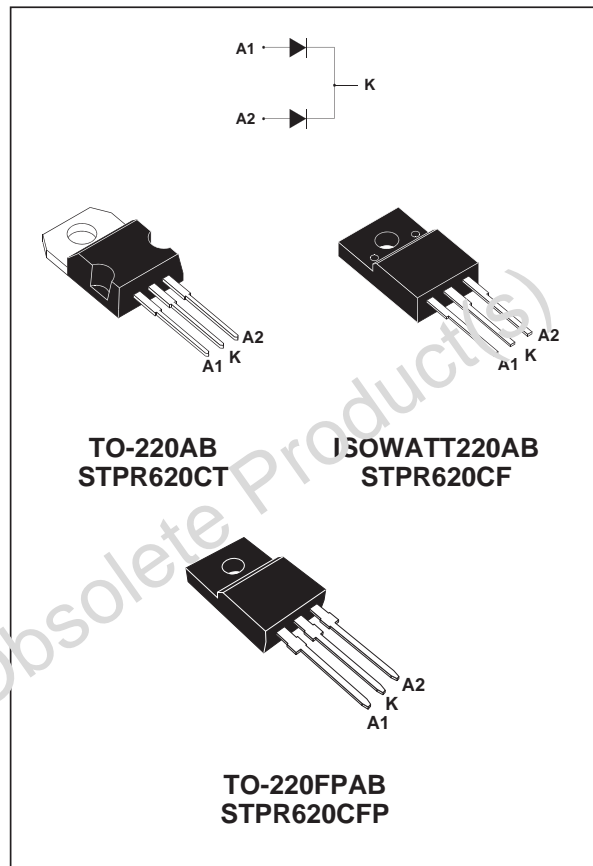
FEATURES

- Suited for SMPS
- Low losses
- Low forward and reverse recovery time
- High surge current capability
- Insulated packages:
ISOWATT220AB / TO-220FPAB
Insulation voltage = 2000V DC
Capacitance = 12pF

DESCRIPTION

Low cost dual center tap rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-220AB, TO-220FPAB and ISOWATT220AB, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE MAXIMUM (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			200	V
$I_{F(RMS)}$	RMS forward current		Per diode	10	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB	$T_c = 125^\circ\text{C}$	Per diode	3
		ISOWATT220AB TO-220FPAB	$T_c = 120^\circ\text{C}$	Per device	6
I_{FSM}	Surge non repetitive forward current		$t_p = 10\text{ms}$ sinusoidal	30	A
T_{stg}	Storage temperature range			- 65 to + 150	°C
T_j	Maximum junction temperature			150	°C

STPR620CT/CF/CFP

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit	
R _{th(j-c)}	Junction to case	TO-220AB	Per diode	6.5	°C/W
		ISOWATT220AB TO-220FPAB	Per diode	8.5	

When the diodes 1 and 2 are used simultaneously :

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)} (\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I _R *	T _j = 25°C	V _R = V _{RRM}			50	μA
	T _j = 100°C				0.6	mA
V _F **	T _j = 125°C	I _F = 3 A			0.99	V
	T _j = 125°C	I _F = 6 A			1.20	
	T _j = 25°C	I _F = 6 A			1.25	

Pulse test :

* tp = 5 ms, δ < 2 %

** tp = 380 μs, δ < 2 %

RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t _{rr}	T _j = 25°C	I _F = 0.5A I _R = 1A			30	ns
t _{fr}	T _j = 25°C	I _F = 1A V _{FR} = 1.1 x V _F		20		ns
V _{FP}	T _j = 25°C	I _F = 1A		3		V

To evaluate the conduction losses use the following equation :

$$P = 0.78 \times I_{F(AV)} + 0.070 \times I_{F(RMS)}^2$$

Fig. 1: Average forward power dissipation versus average forward current (Per diode).

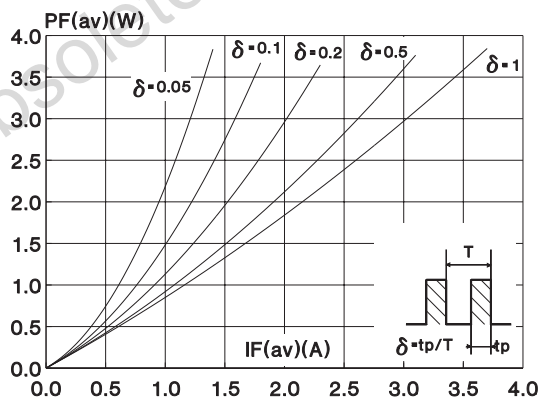


Fig. 2: Peak current versus form factor (Per diode).

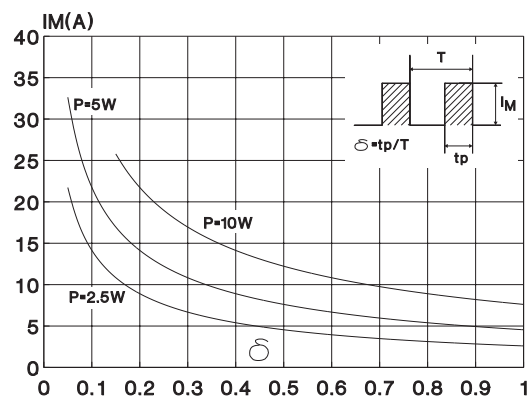


Fig. 3: Average current versus ambient temperature. (duty cycle: 0.5) (TO-220AB)

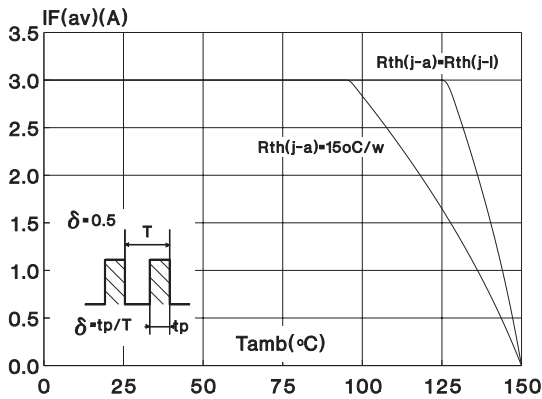


Fig. 4: Average current versus ambient temperature. (duty cycle : 0.5) (ISOWATT220AB / TO-220FPAB)

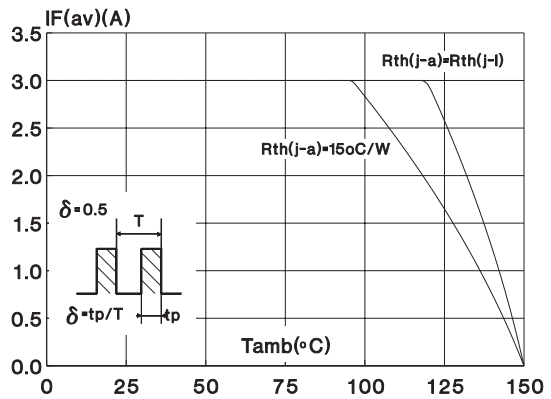


Fig. 5: Non repetitive surge peak forward current versus overload duration (Maximum values) (Per diode) (TO-220AB).

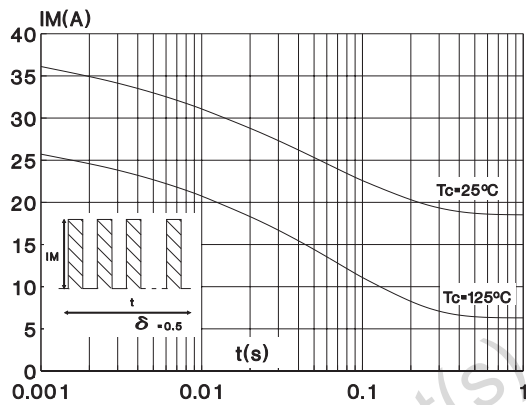


Fig. 6: Non repetitive surge peak forward current versus overload duration (Maximum values) (Per diode) (ISOWATT220AB / TO-220FPAB).

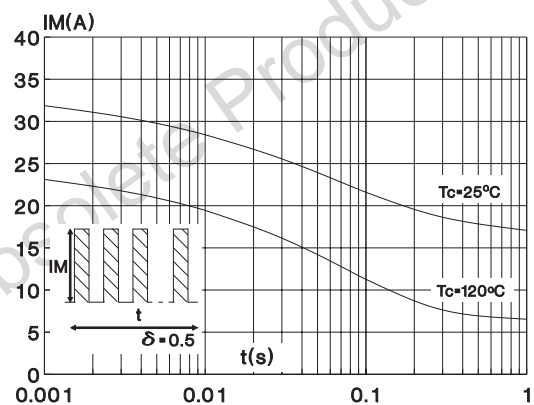


Fig. 7: Relative variation of thermal transient impedance junction to case versus pulse duration (Per diode) (TO-220AB).

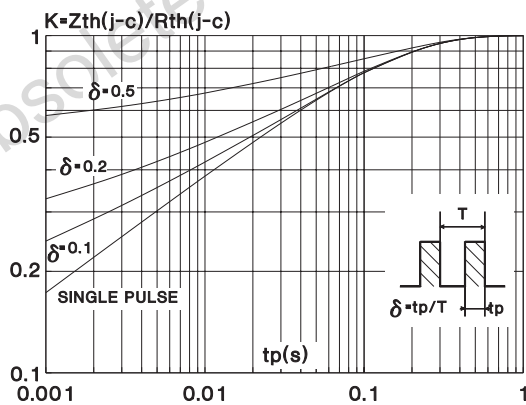


Fig. 8: Relative variation of thermal transient impedance junction to case versus pulse duration (Per diode) (ISOWATT220AB / TO-220FPAB).

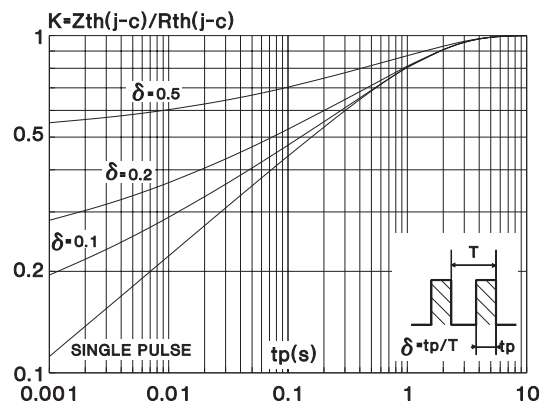


Fig. 9: Forward voltage drop versus forward current. (Maximum values) (Per diode).

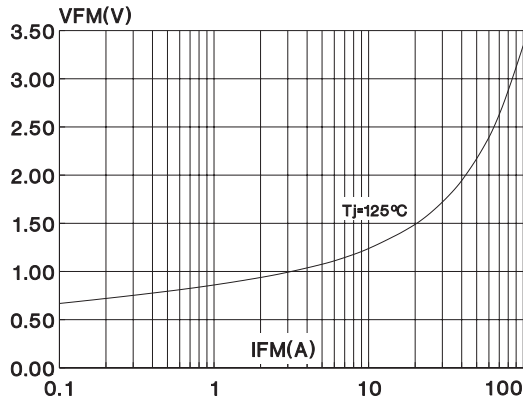


Fig. 10: Junction capacitance versus reverse voltage applied (Typical values) (Per diode).

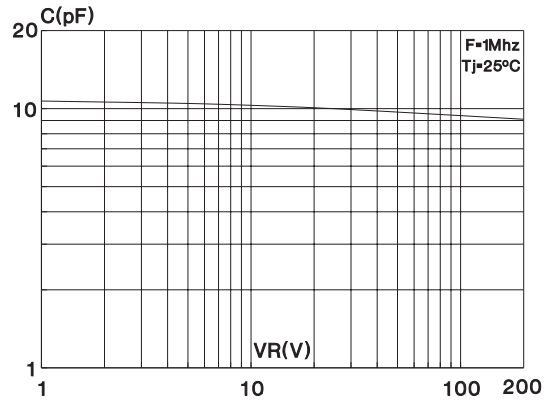


Fig. 11: Recovery charges versus dI_F/dt (Per diode).

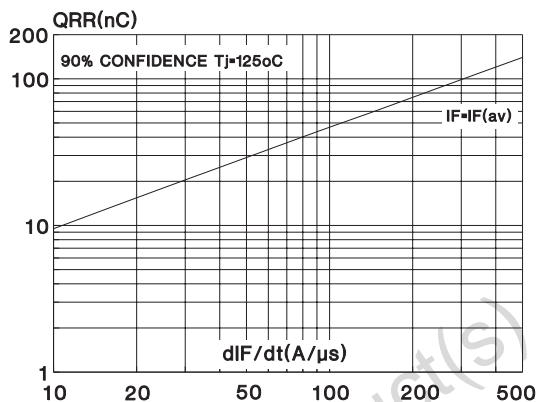


Fig. 12: Peak reverse current versus dI_F/dt (Per diode).

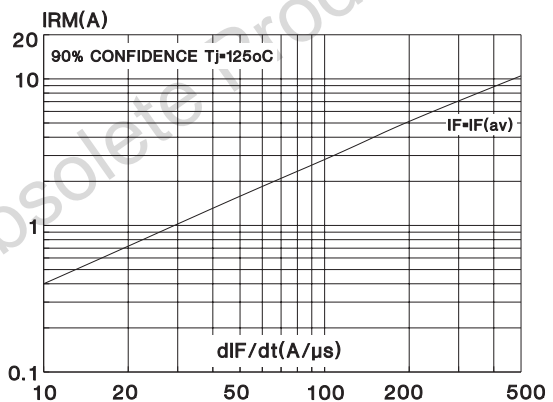
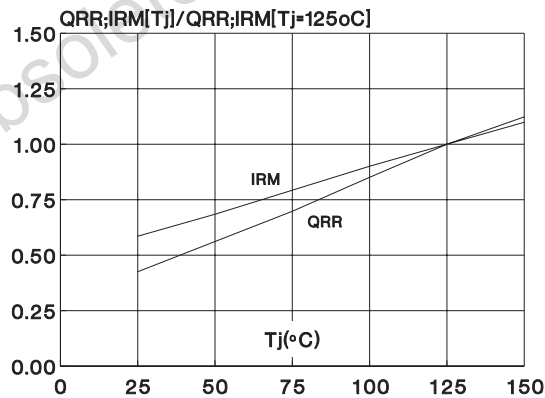
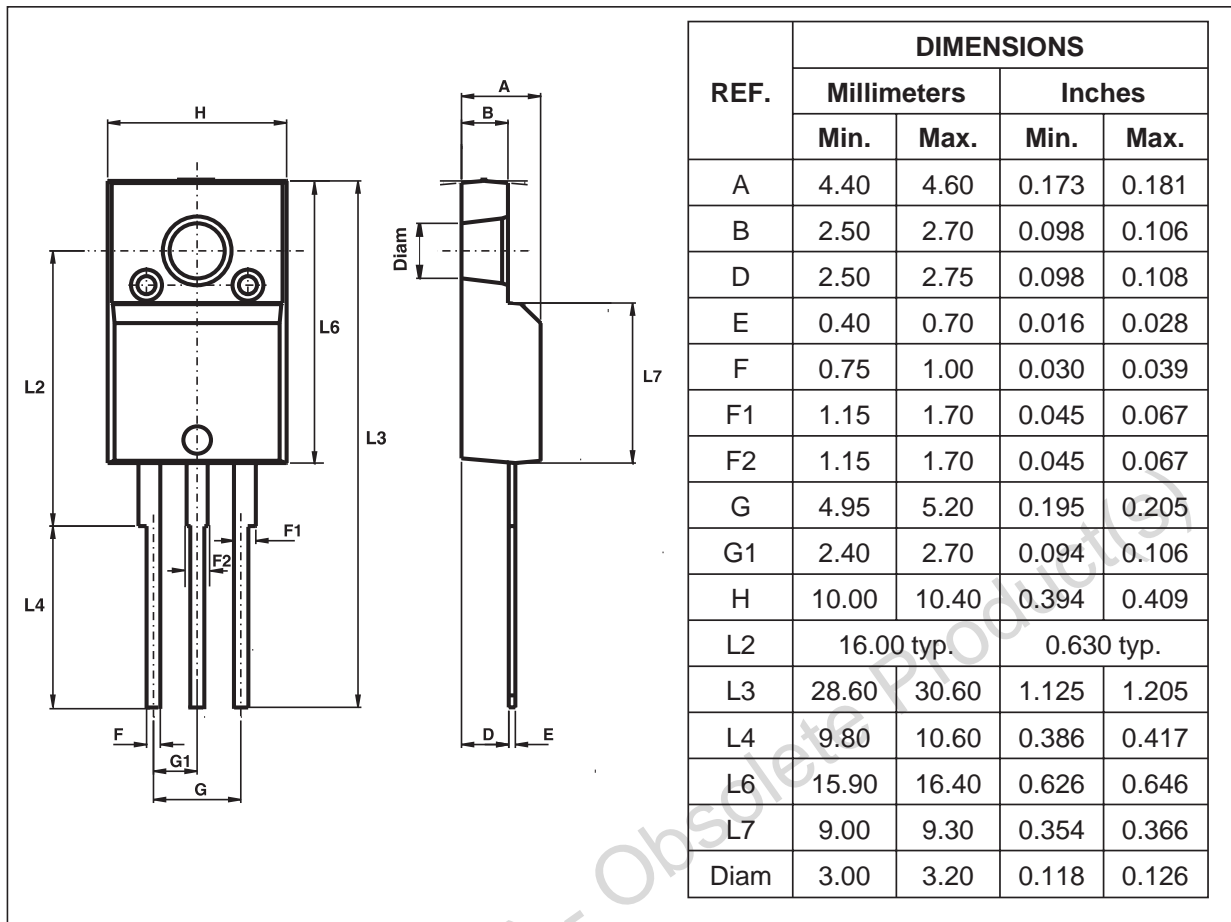


Fig. 13: Dynamic parameters versus junction temperature (Per diode).

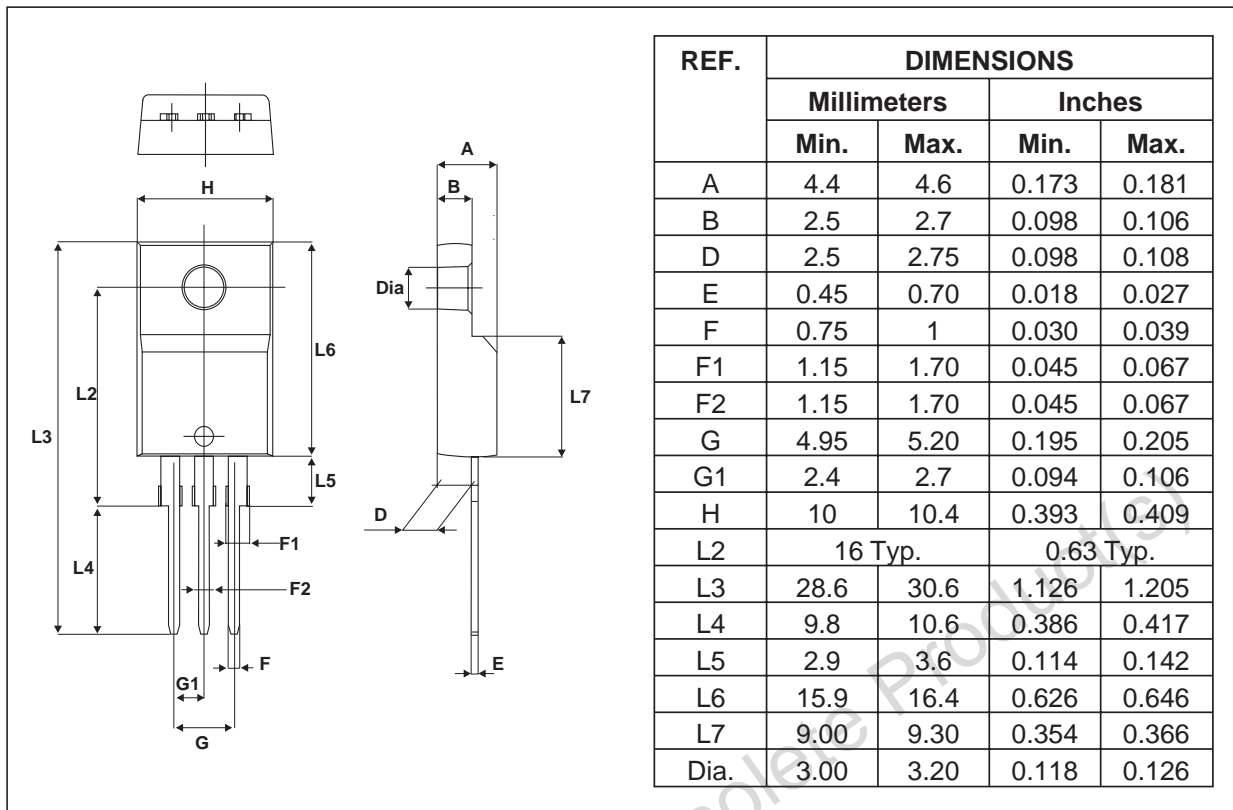


PACKAGE MECHANICAL DATA
ISOWATT220AB (JEDEC outline)



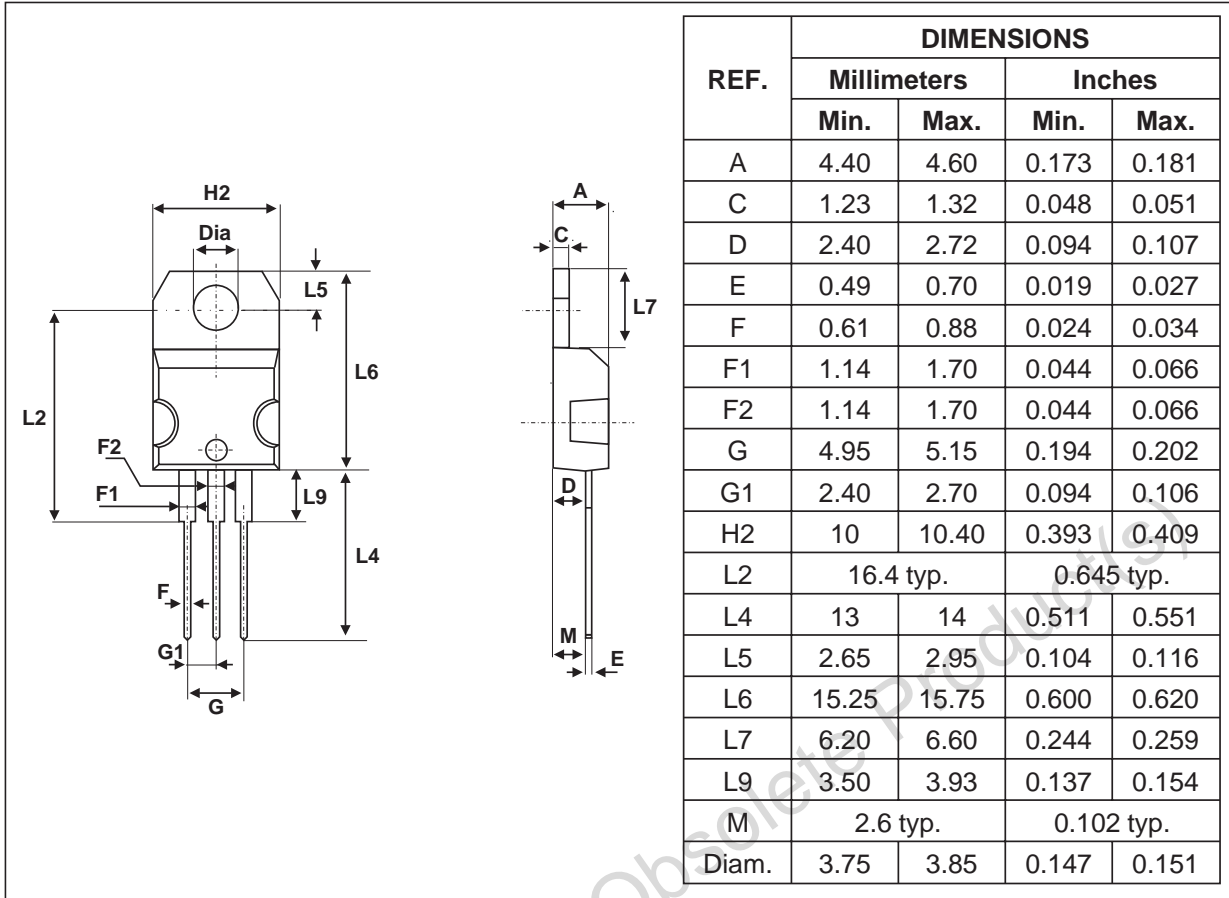
STPR620CT/CF/CFP

PACKAGE MECHANICAL DATA
TO-220FPAB



- Cooling method : by conduction (C)
- Recommended torque value (ISOWATT220AB, TO-220FPAB): 0.55 Nm
- Maximum torque value (ISOWATT220AB, TO-220FPAB): 0.7 Nm
- Recommended torque value (TO-220AB): 0.8 Nm
- Maximum torque value (TO-220AB): 1.0 Nm
- Epoxy meets UL94, V0

PACKAGE MECHANICAL DATA
TO-220AB (JEDEC outline)



Type	Marking	Package	Weight	Base Qty	Delivery mode
STPR620CT	STPR620CT	TO-220AB	2.23 g	50	Tube
STPR620CF	STPR620CF	ISOWATT220AB	2.2 g	50	Tube
STPR620CFP	STPR620CFP	TO-220FPAB	2 g	50	Tube

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