

## 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

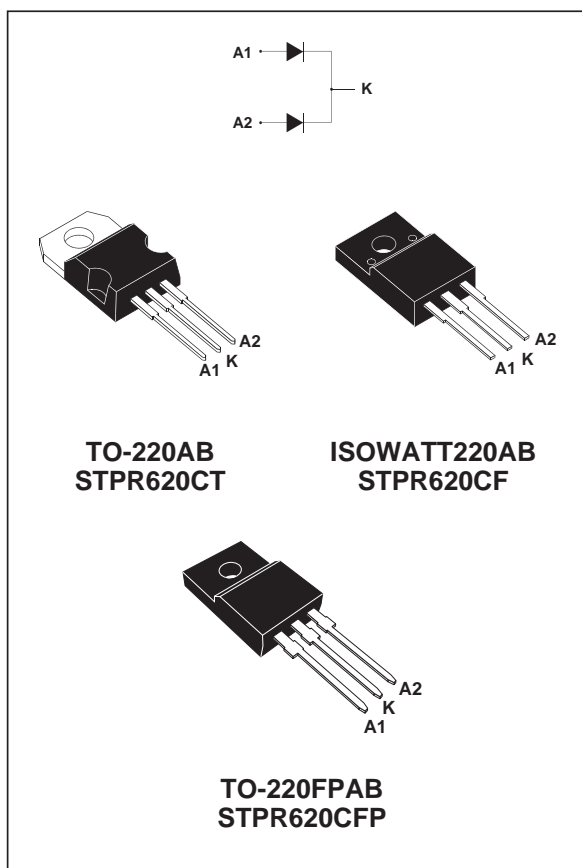
### FEATURES

- 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 <sub>th(j-c)</sub>	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 <sub>R</sub> *	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			50	μA
	T <sub>j</sub> = 100°C				0.6	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 3 A			0.99	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 6 A			1.20	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 6 A			1.25	

Pulse test :

\* t<sub>p</sub> = 5 ms, δ < 2 %

\*\* t<sub>p</sub> = 380 μs, δ < 2 %

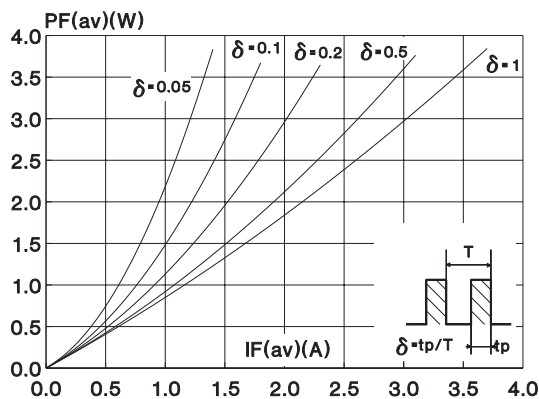
### RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A I <sub>R</sub> = 1A			30	ns
t <sub>fr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A V <sub>FR</sub> = 1.1 x V <sub>F</sub>		20		ns
V <sub>FP</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A		3		V

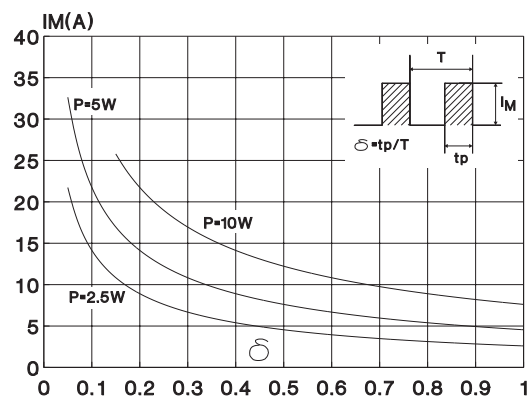
To evaluate the conduction losses use the following equation :

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

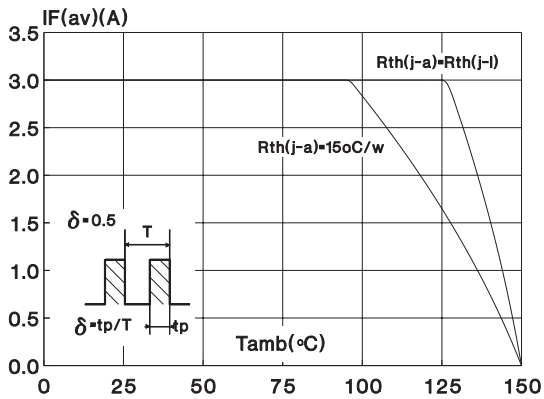
**Fig. 1:** Average forward power dissipation versus average forward current (Per diode).



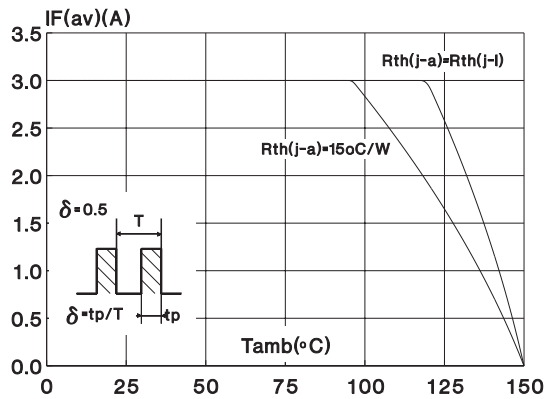
**Fig. 2:** Peak current versus form factor (Per diode).



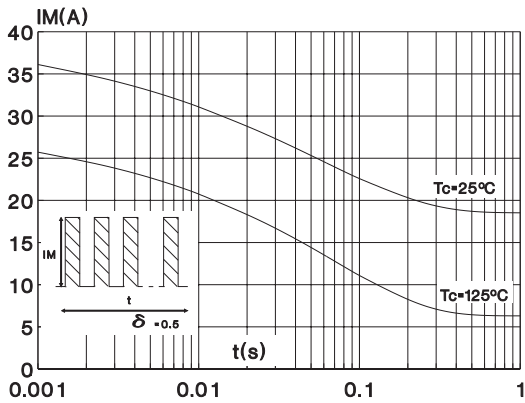
**Fig. 3:** Average current versus ambient temperature. (duty cycle: 0.5) (TO-220AB)



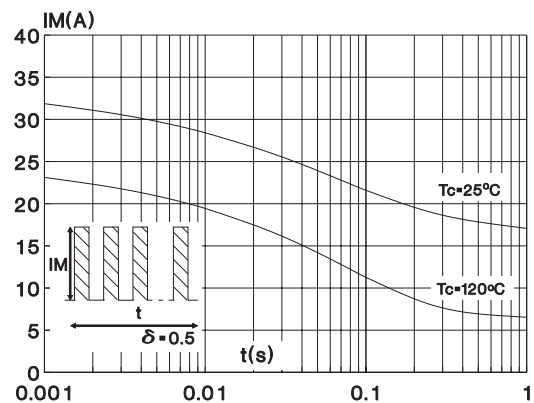
**Fig. 4:** Average current versus ambient temperature. (duty cycle : 0.5) (ISOWATT220AB / TO-220FPAB)



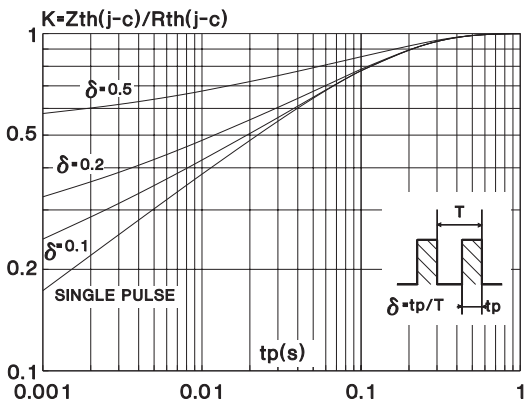
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (Maximum values) (Per diode) (TO-220AB).



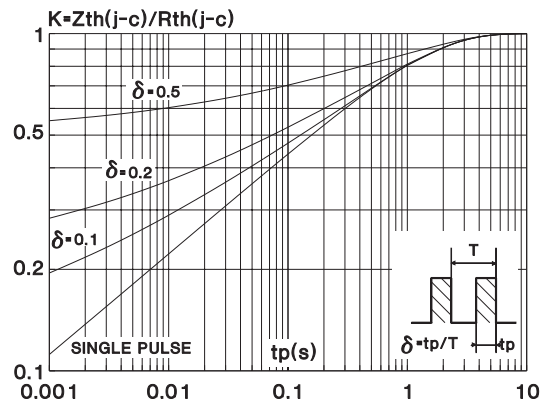
**Fig. 6:** Non repetitive surge peak forward current versus overload duration (Maximum values) (Per diode) (ISOWATT220AB / TO-220FPAB).



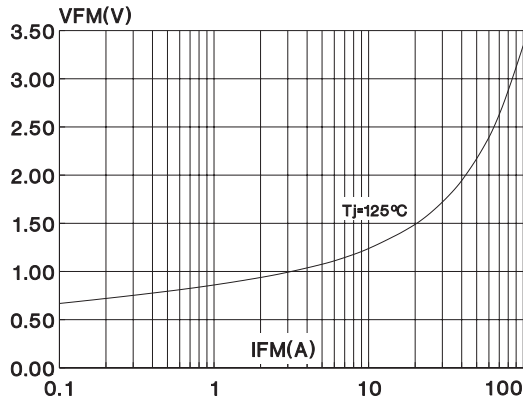
**Fig. 7:** Relative variation of thermal transient impedance junction to case versus pulse duration (Per diode) (TO-220AB).



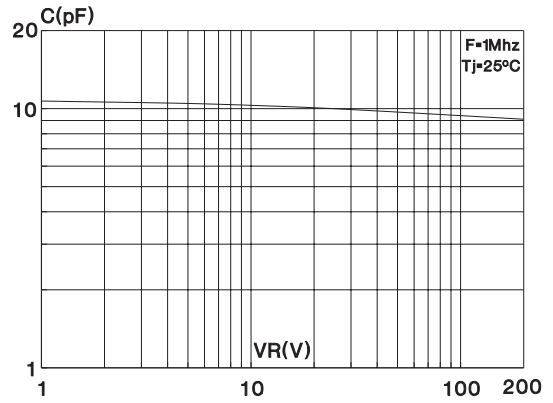
**Fig. 8:** Relative variation of thermal transient impedance junction to case versus pulse duration (Per diode) (ISOWATT220AB / TO-220FPAB).



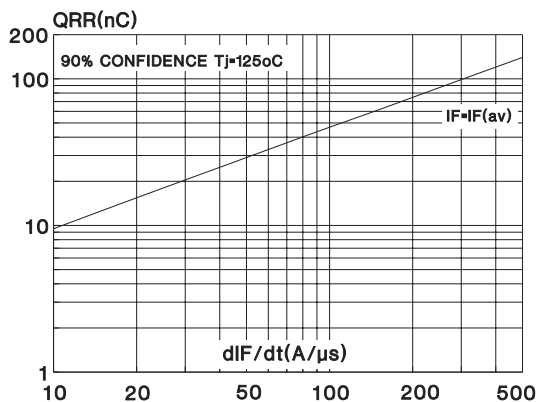
**Fig. 9:** Forward voltage drop versus forward current. (Maximum values) (Per diode).



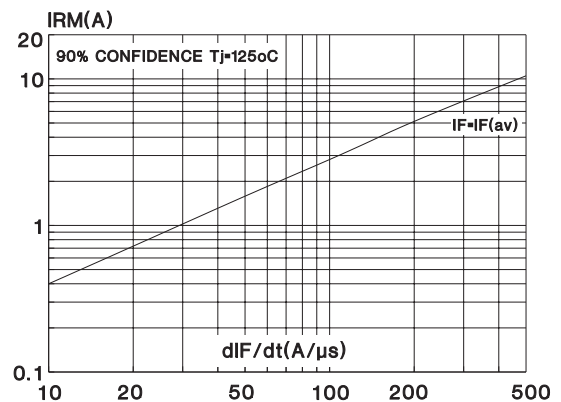
**Fig. 10:** Junction capacitance versus reverse voltage applied (Typical values) (Per diode).



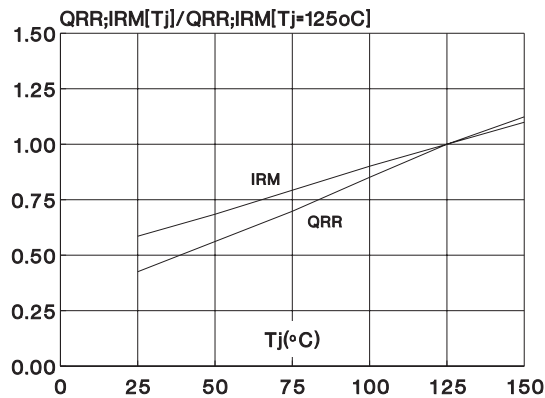
**Fig. 11:** Recovery charges versus  $dI_F/dt$  (Per diode).



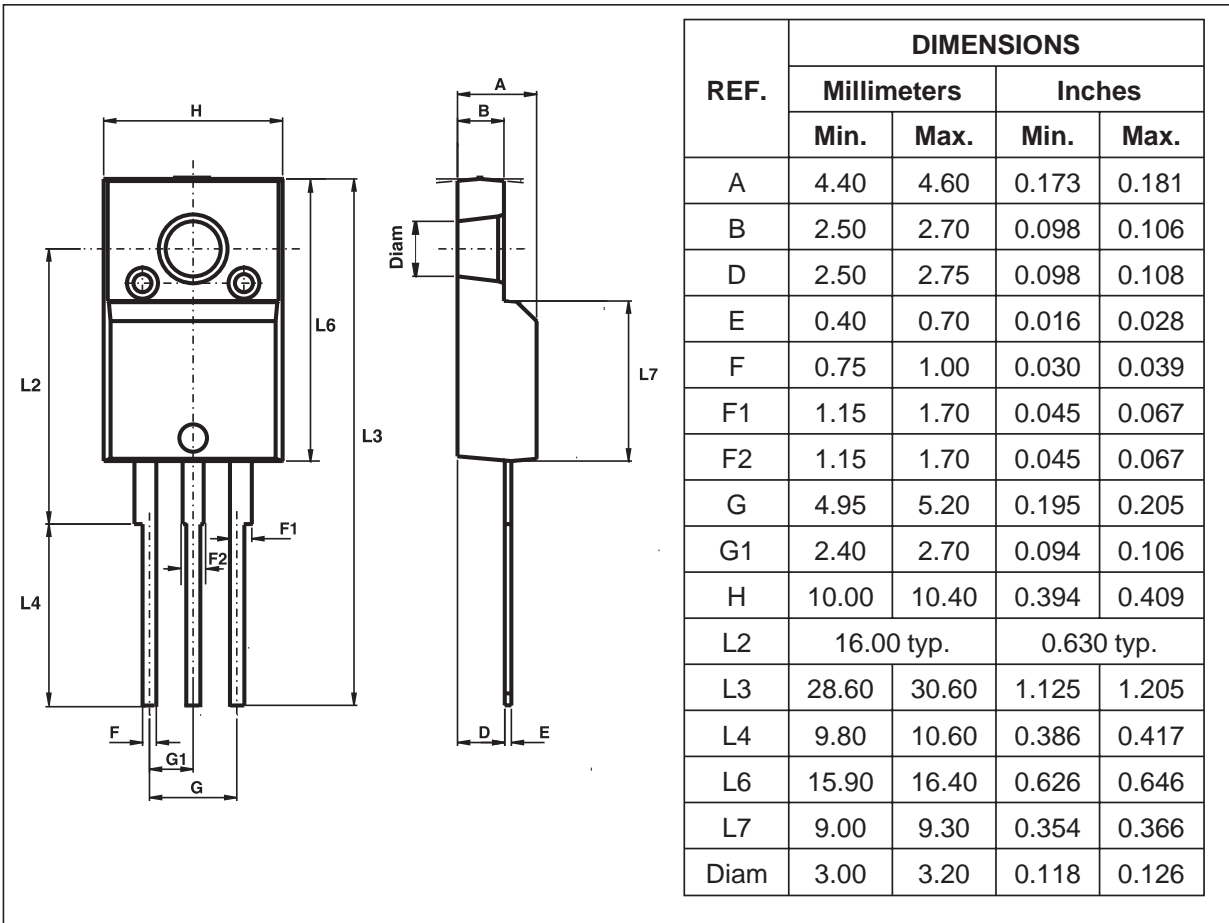
**Fig. 12:** Peak reverse current versus  $dI_F/dt$  (Per diode).



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

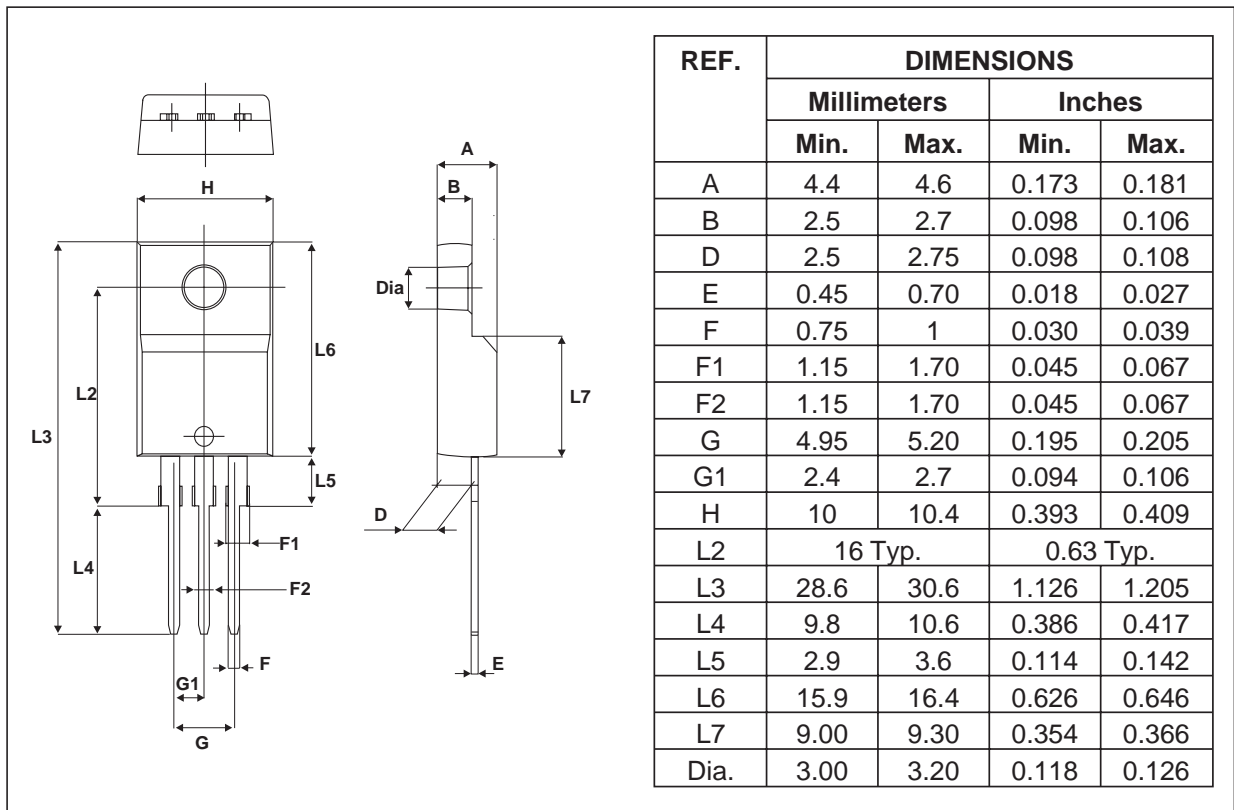


**PACKAGE MECHANICAL DATA**  
ISOWATT220AB (JEDEC outline)



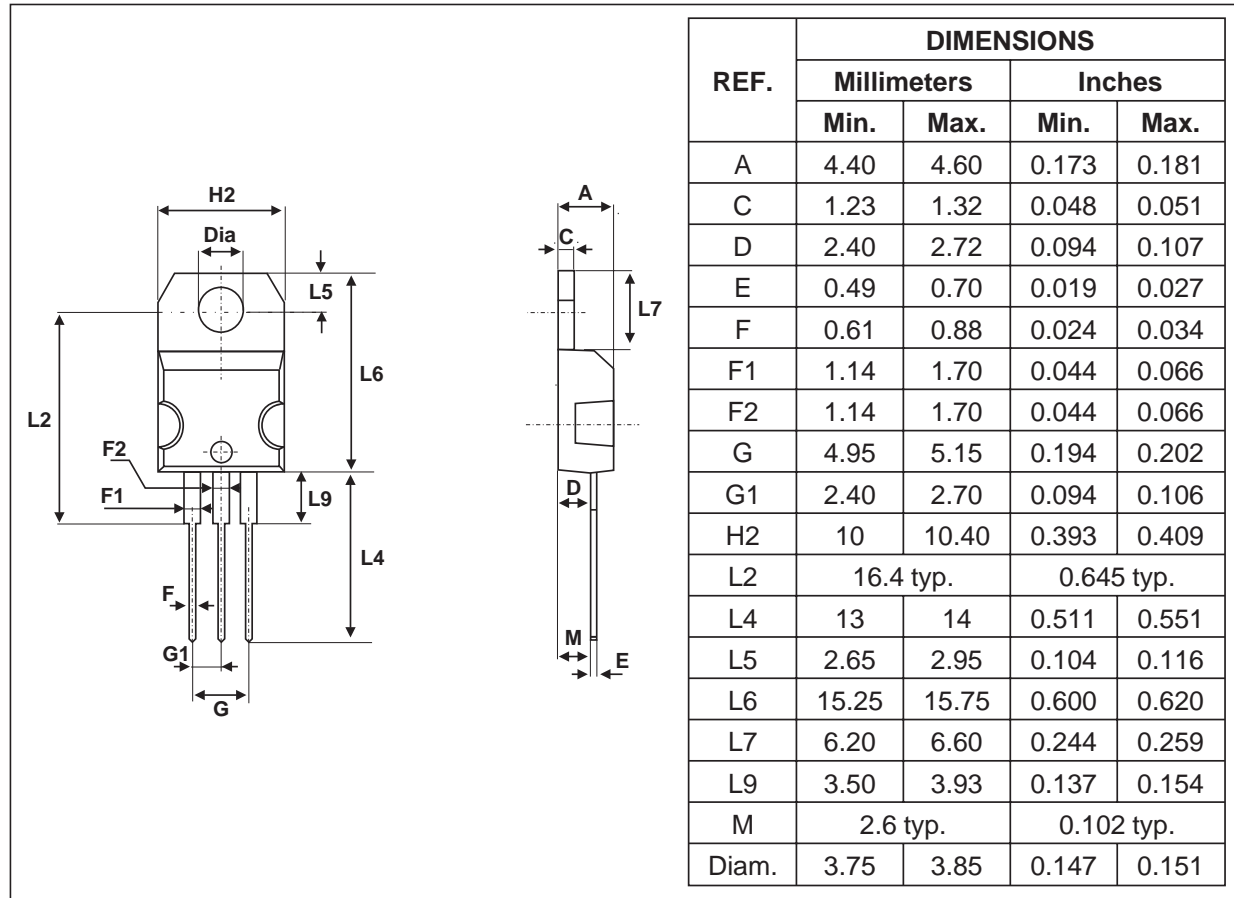
# STPR620CT/CF/CFP

## 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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