



# STPS2045CT/CF/CG/CFP/CR

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>2 x 10 A</b>
<b>V<sub>RRM</sub></b>	<b>45 V</b>
<b>T<sub>j</sub> (max)</b>	<b>175 °C</b>
<b>V<sub>F</sub> (max)</b>	<b>0.57 V</b>

### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- INSULATED PACKAGE: ISOWATT220AB, TO-220FPAB  
Insulating voltage = 2000V DC  
Capacitance = 12pF
- AVALANCHE CAPABILITY SPECIFIED

### DESCRIPTION

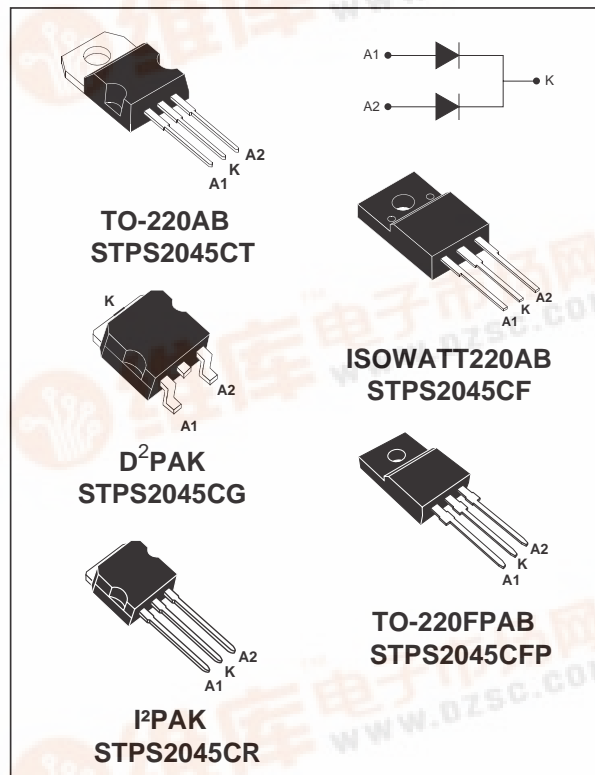
Dual center tap Schottky rectifier suited for SwitchMode Power Supply and high frequency DC to DC converters.

Packaged either in TO-220AB, I<sup>2</sup>PAK, ISOWATT220AB, TO-220FPAB or D<sup>2</sup>PAK, this device is especially intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

### ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit		
V <sub>RRM</sub>	Repetitive peak reverse voltage		45	V		
I <sub>F(RMS)</sub>	RMS forward current		30	A		
I <sub>F(AV)</sub>	Average forward current δ = 0.5	TO-220AB / D <sup>2</sup> PAK / I <sup>2</sup> PAK	T <sub>c</sub> = 155°C	Per diode	10	A
		ISOWATT220AB TO-220FPAB	T <sub>c</sub> = 125°C	Per device	20	
I <sub>FSM</sub>	Surge non repetitive forward current		tp = 10 ms sinusoidal	180	A	
I <sub>R(RM)</sub>	Repetitive peak reverse current		tp = 2 μs square F = 1kHz	1	A	
I <sub>R(SM)</sub>	Non repetitive peak reverse current		tp = 100 ms square	2	A	
P <sub>ARM</sub>	Repetitive peak avalanche power		tp = 1μs T <sub>j</sub> = 25°C	4000	W	
T <sub>stg</sub>	Storage temperature range			-65 to +175	°C	
T <sub>j</sub>	Maximum operating junction temperature *			175	°C	
dV/dt	Critical rate of rise of reverse voltage			10000	V/μs	

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th}(j-a)}$  thermal runaway condition for a diode on its own heatsink



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### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit	
R <sub>th(j-c)</sub>	Junction to case	TO-220AB / D <sup>2</sup> PAK I <sup>2</sup> PAK	Per diode Total	2.2 1.3	°C/W
		ISOWATT220AB TO-220FPAB	Per diode Total	4.5 3.5	
R <sub>th(c)</sub>		TO-220AB / D <sup>2</sup> PAK I <sup>2</sup> PAK	Coupling	0.3	
		ISOWATT220AB TO-220FPAB		2.5	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode 1}) = P (\text{diode1}) \times R_{th(j-c)} (\text{per diode}) + P (\text{diode 2}) \times R_{th(c)}$$

### STATIC ELECTRICAL CHARACTERISTICS (Per diode)

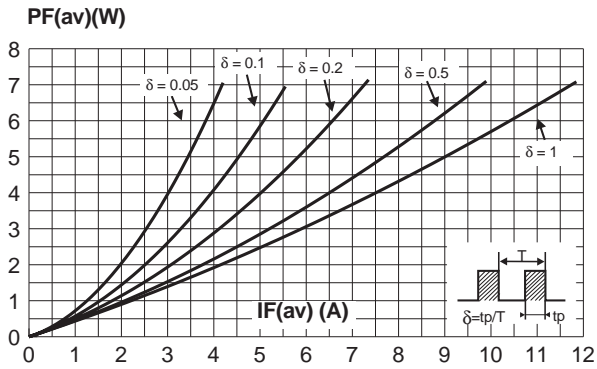
Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			100	μA
		T <sub>j</sub> = 125°C			7	15	mA
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 125°C	I <sub>F</sub> = 10 A		0.5	0.57	V
		T <sub>j</sub> = 25°C	I <sub>F</sub> = 20 A			0.84	
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 20 A		0.65	0.72	

Pulse test : \* tp = 380 μs, δ < 2%

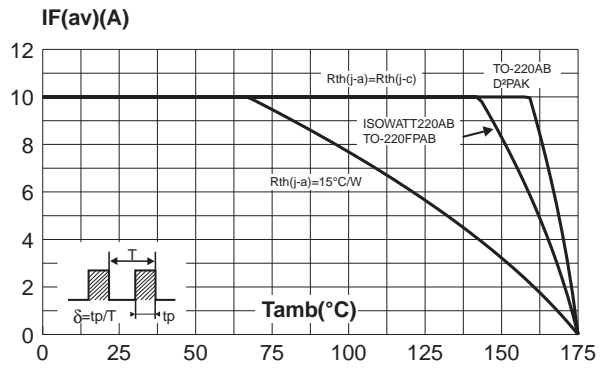
To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.015 I_{F(RMS)}^2$$

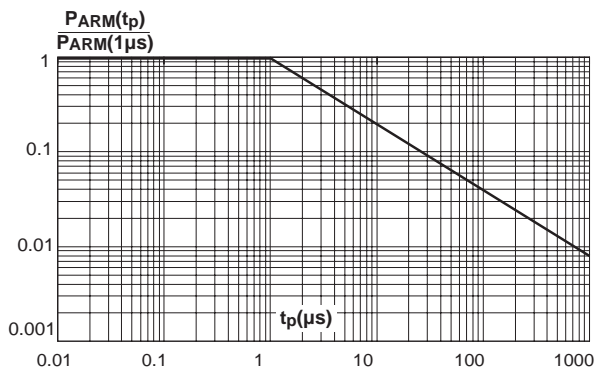
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



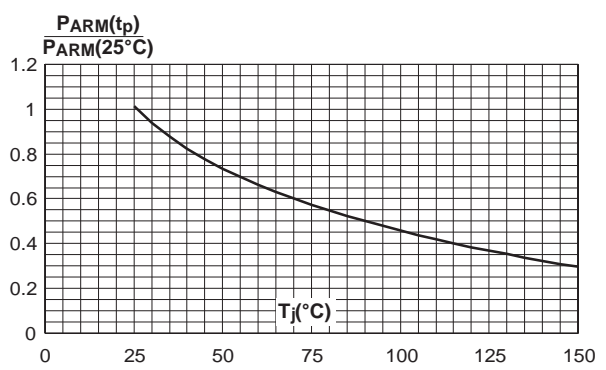
**Fig. 2:** Average current versus ambient temperature ( $\delta=0.5$ , per diode).



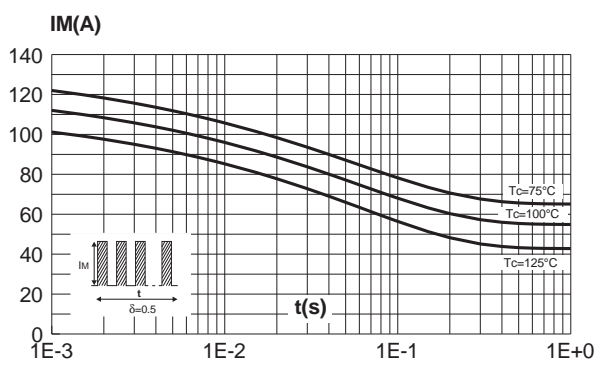
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



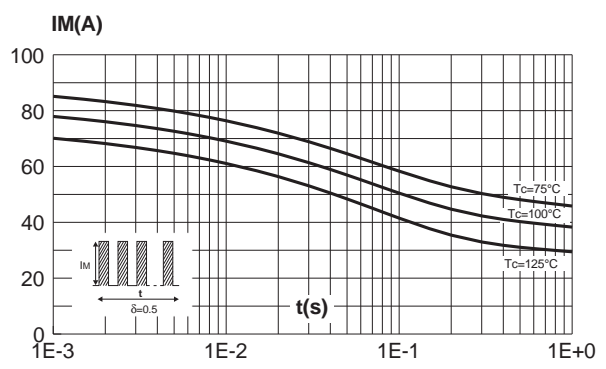
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



**Fig. 5-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB, D<sup>2</sup>PAK and I<sup>2</sup>PAK).

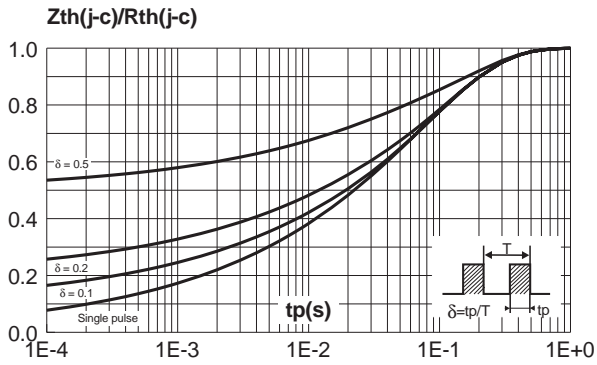


**Fig. 5-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB, TO-220FPAB).

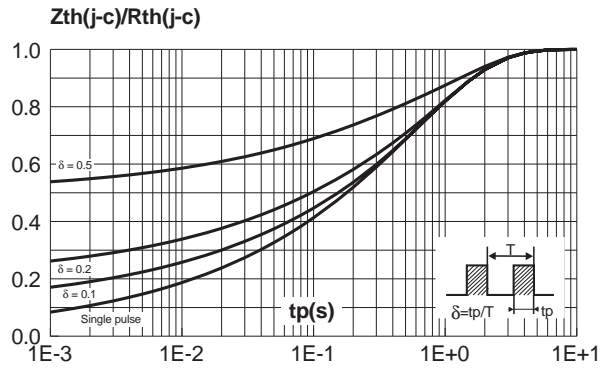


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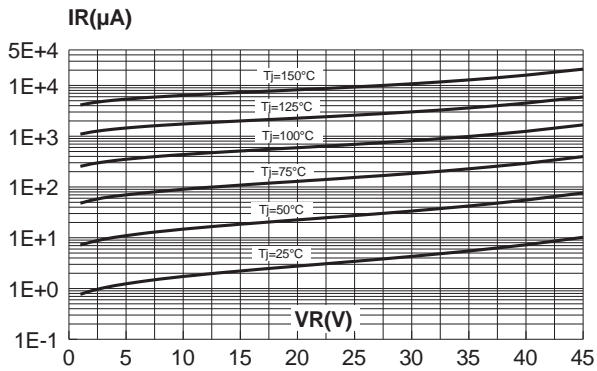
**Fig. 6-1:** Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AB, D<sup>2</sup>PAK and I<sup>2</sup>PAK).



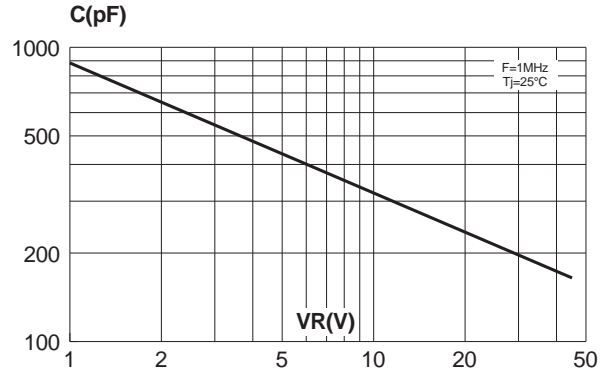
**Fig. 6-2:** Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AB, TO-220FPAB).



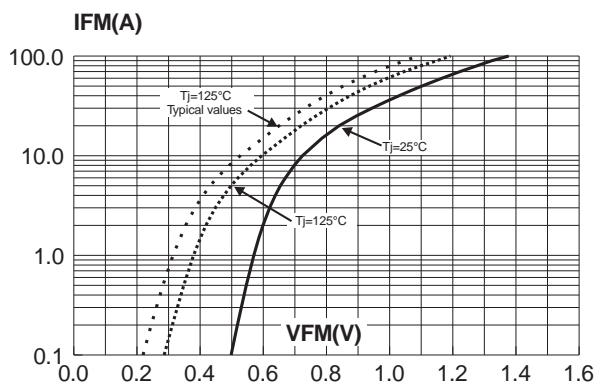
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



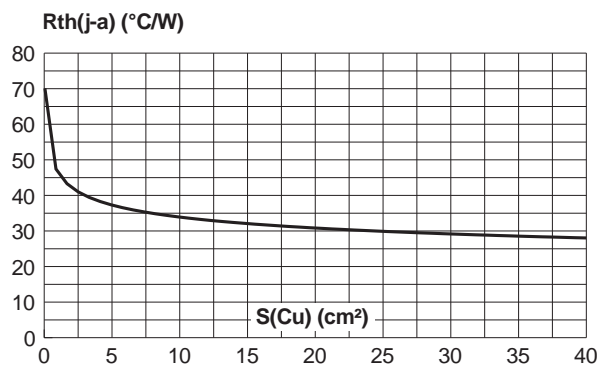
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values, per diode).



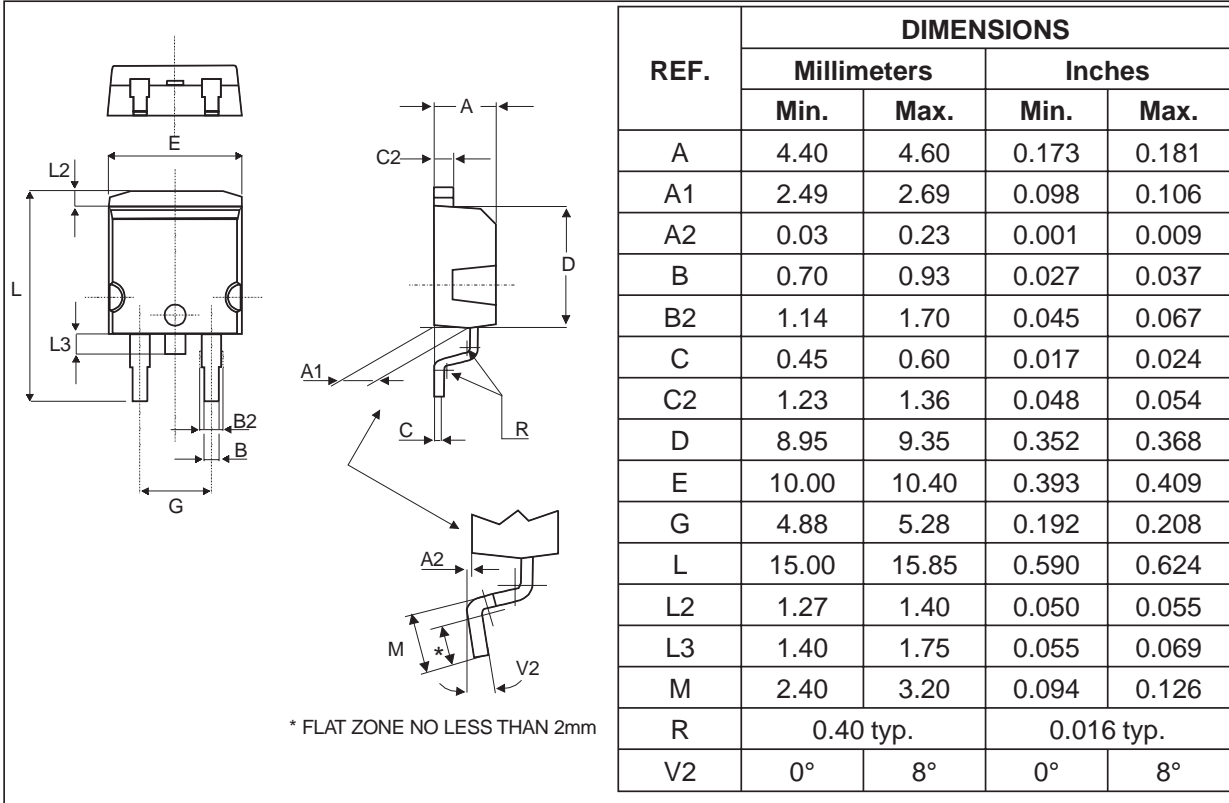
**Fig. 9:** Forward voltage drop versus forward current (maximum values, per diode).



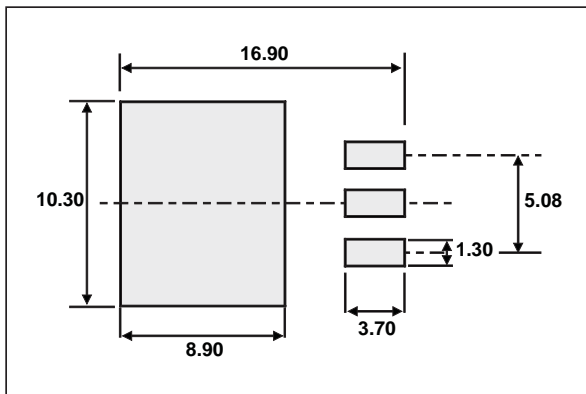
**Fig. 10:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: 35μm).



**PACKAGE MECHANICAL DATA**  
D<sup>2</sup>PAK

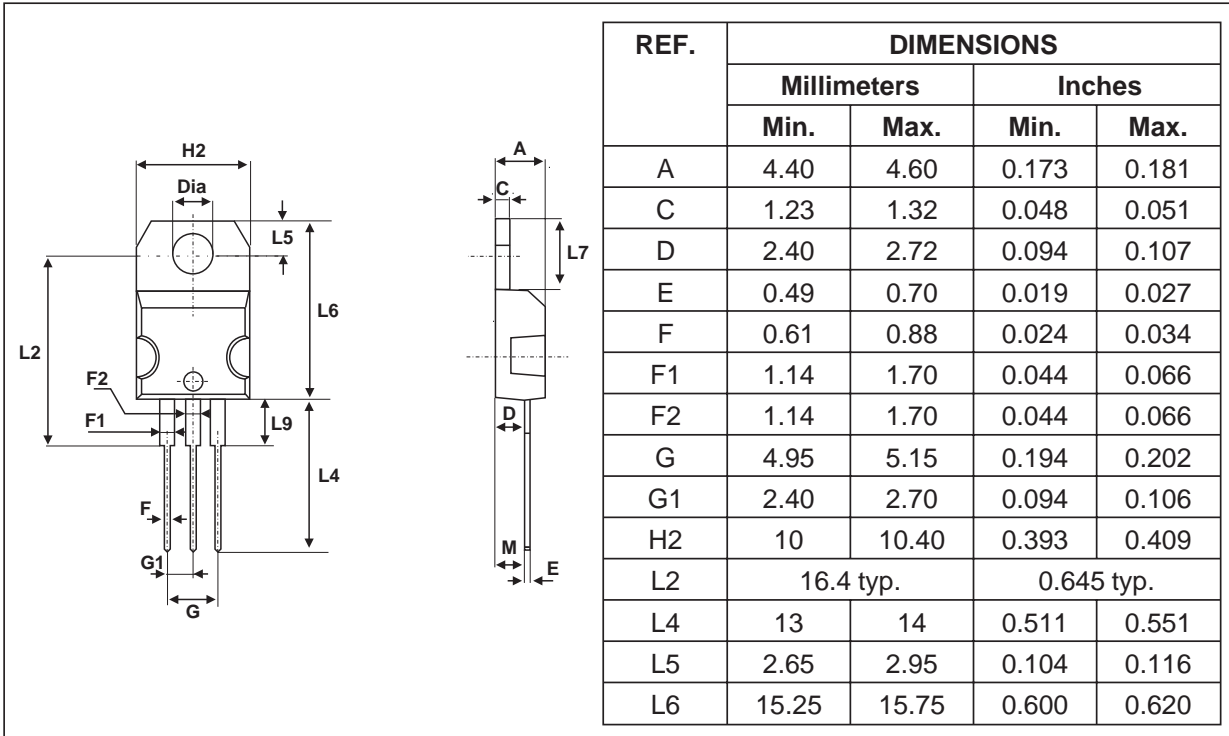


**FOOTPRINT DIMENSIONS** (in millimeters)

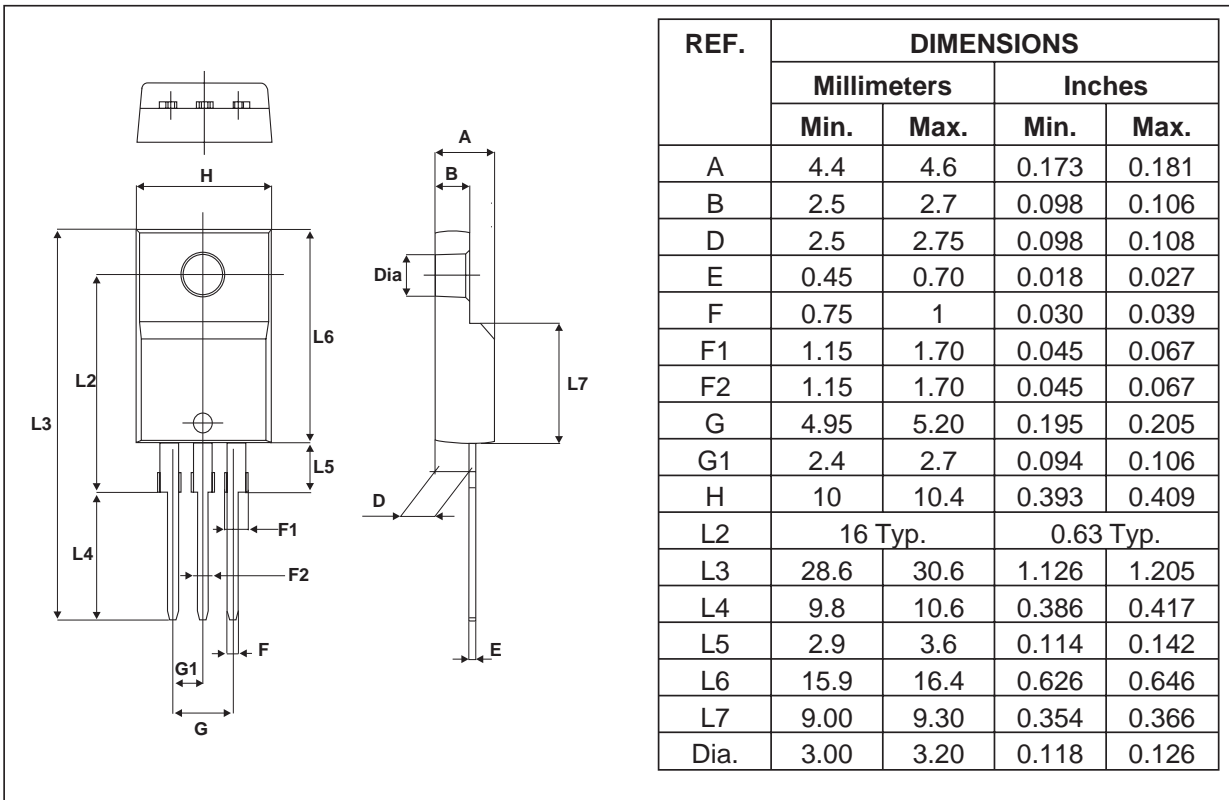


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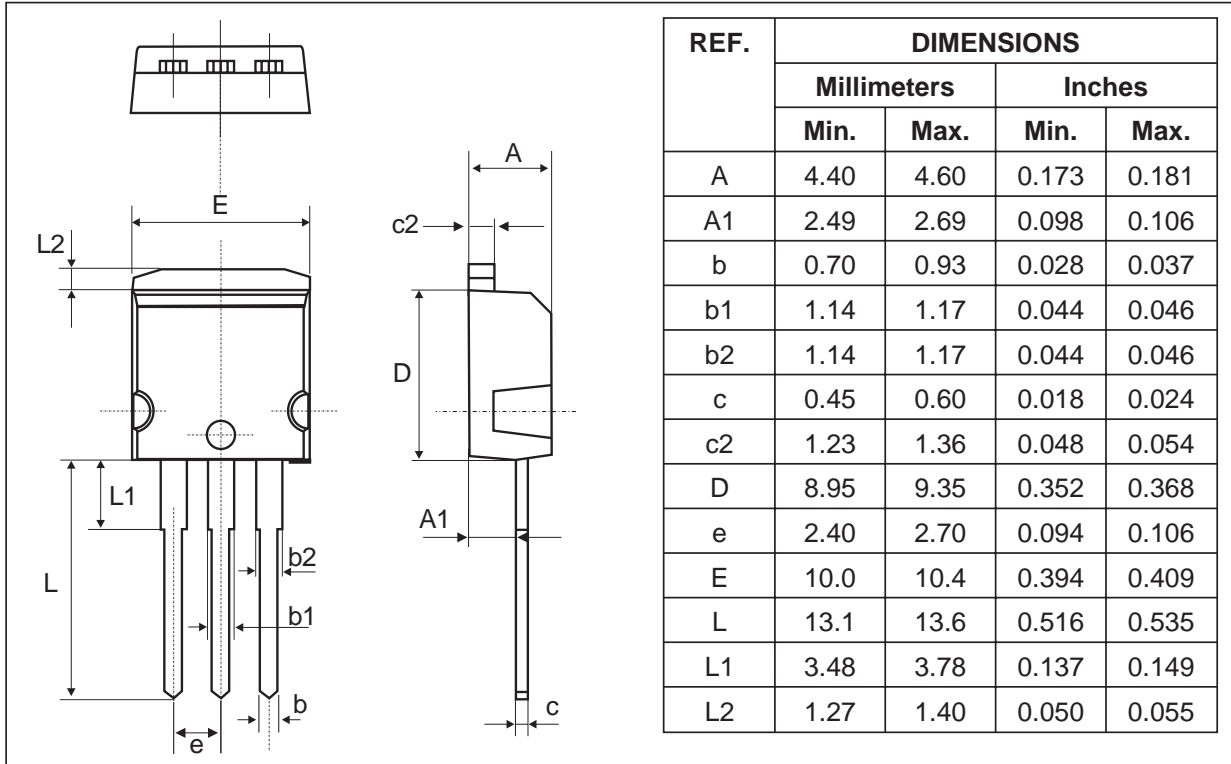
**PACKAGE MECHANICAL DATA**  
TO-220AB



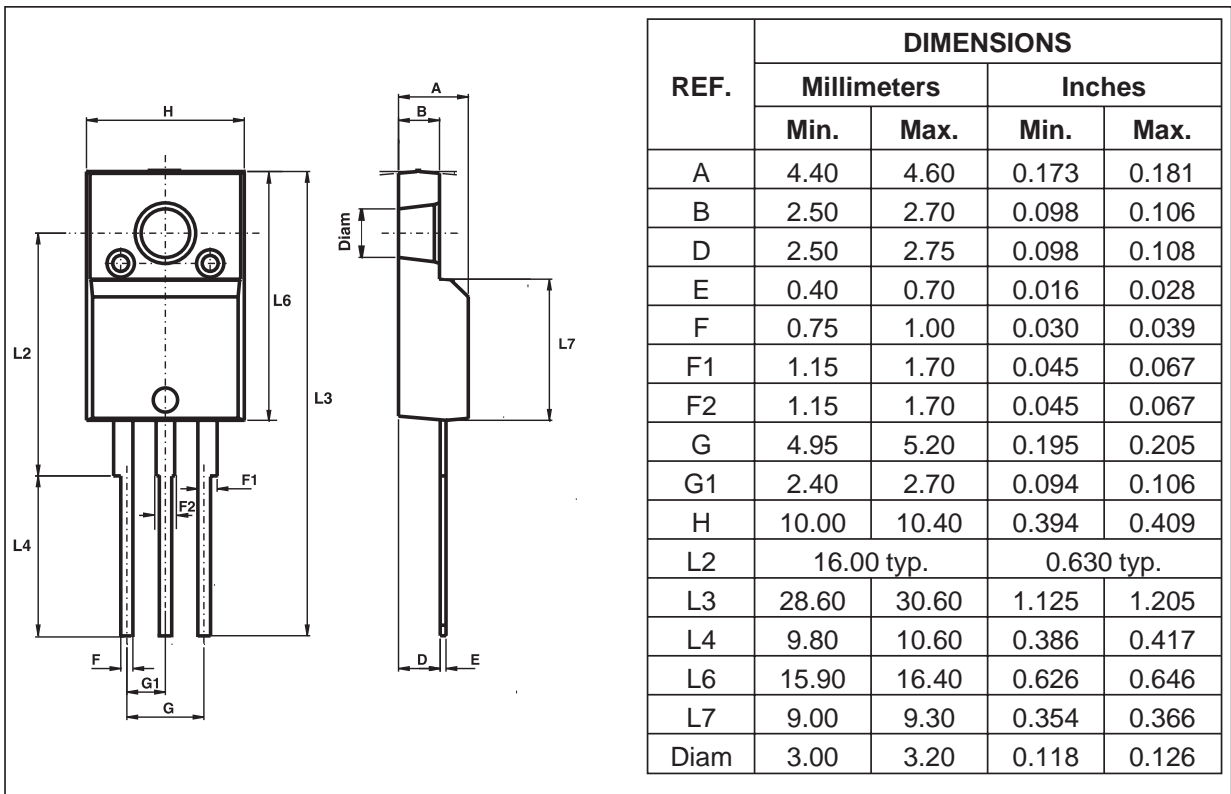
**PACKAGE MECHANICAL DATA**  
TO-220FPAB



**PACKAGE MECHANICAL DATA**  
I<sup>2</sup>PAK



**PACKAGE MECHANICAL DATA**  
ISOWATT220AB



## STPS2045CT/CF/CG/CFP/CR

Type	Marking	Package	Weight	Base qty	Delivery mode
STPS2045CT	STPS2045CT	TO-220AB	2.25 g.	50	Tube
STPS2045CF	STPS2045CF	ISOWATT220AB	2.08 g.	50	Tube
STPS2045CFP	STPS2045CFP	TO-220FPAB	2.0 g.	50	Tube
STPS2045CG	STPS2045CG	D <sup>2</sup> PAK	1.48 g.	50	Tube
STPS2045CG-TR	STPS2045CG	D <sup>2</sup> PAK	1.48 g.	1000	Tape & reel
STPS2045CR	STPS2045CR	I <sup>2</sup> PAK	1.49 g.	50	Tube

- Cooling method: by conduction (C)
- Recommended torque value: 0.55 N.m.
- Maximum torque value: 0.7 N.m.
- Epoxy meets UL94,V0

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