



# STPS10L45CT/CG/CF/CFP

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>2x5 A</b>
<b>V<sub>RRM</sub></b>	<b>45 V</b>
<b>T<sub>j (max)</sub></b>	<b>150°C</b>
<b>V<sub>F (max)</sub></b>	<b>0.46 V</b>

### FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP MEANING VERY SMALL CONDUCTION LOSSES
- LOW SWITCHING LOSSES ALLOWING HIGH FREQUENCY OPERATION
- INSULATED PACKAGE: ISOWATT220AB, TO-220FPAB  
Insulating voltage = 2000V DC  
Capacitance = 12pF
- AVALANCHE CAPABILITY SPECIFIED

### DESCRIPTION

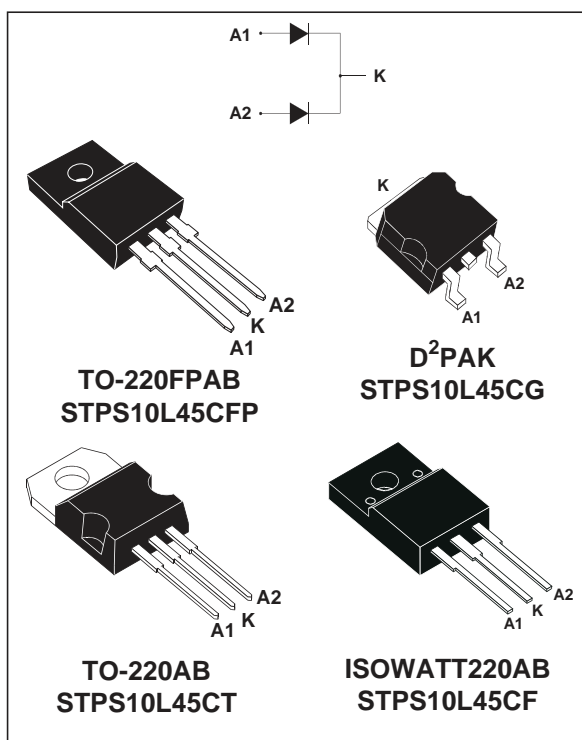
Dual center tap Schottky rectifiers suited for Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-220AB, ISOWATT220AB, TO-220FPAB and D<sup>2</sup>PAK, these devices are 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			20	A	
I <sub>F(AV)</sub>	Average forward current	TO-220AB D <sup>2</sup> PAK	T <sub>c</sub> = 135°C δ = 0.5	Per diode Per device	5 10	A
		ISOWATT220AB TO-220FPAB	T <sub>c</sub> = 115°C δ = 0.5	Per diode Per device	5 10	A
I <sub>FSM</sub>	Surge non repetitive forward current		tp = 10 ms	Sinusoidal	150	A
I <sub>RRM</sub>	Repetitive peak reverse current		tp = 2 μs	square F=1kHz	1	A
I <sub>RSM</sub>	Non repetitive peak reverse current		tp = 100 μs	square	2	A
P <sub>ARM</sub>	Repetitive peak avalanche power		tp = 1 μs	T <sub>j</sub> = 25°C	2700	W
T <sub>stg</sub>	Storage temperature range			- 65 to + 150	°C	
T <sub>j</sub>	Maximum operating junction temperature *			150	°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
$R_{th(j-c)}$	Junction to case	TO-220AB D <sup>2</sup> PAK	Per diode	3
			Total	
$R_{th(c)}$			Coupling	0.35
$R_{th(j-c)}$	Junction to case	ISOWATT220AB TO-220FPAB	Per diode	5
			Total	
$R_{th(c)}$			Coupling	2.5

When the diodes 1 and 2 are used simultaneously :  
 $\Delta T_{j(\text{diode } 1)} = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$

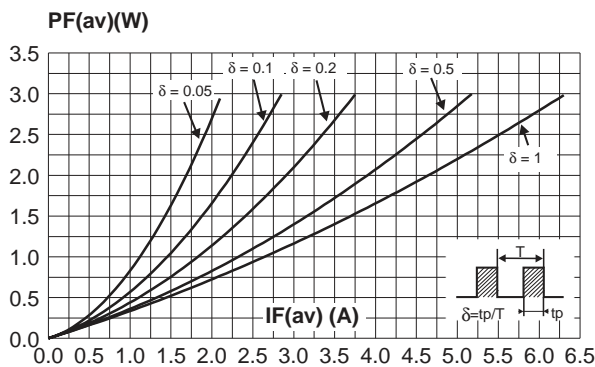
### STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			0.15	mA
		$T_j = 125^\circ\text{C}$			45	90	mA
$V_F^*$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 5\text{ A}$			0.53	V
		$T_j = 125^\circ\text{C}$			0.36	0.46	
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$			0.67	
		$T_j = 125^\circ\text{C}$			0.49	0.59	

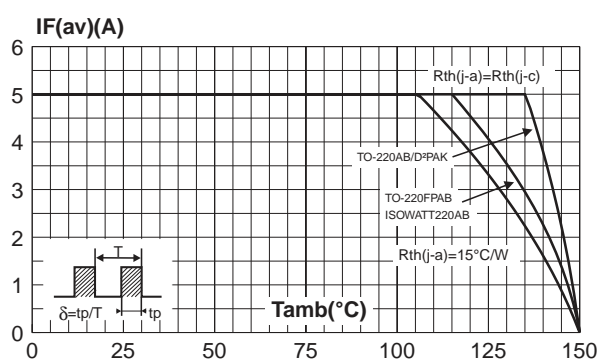
Pulse test : \*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation :  
 $P = 0.33 \times I_{F(AV)} + 0.026 I_F^2(\text{RMS})$

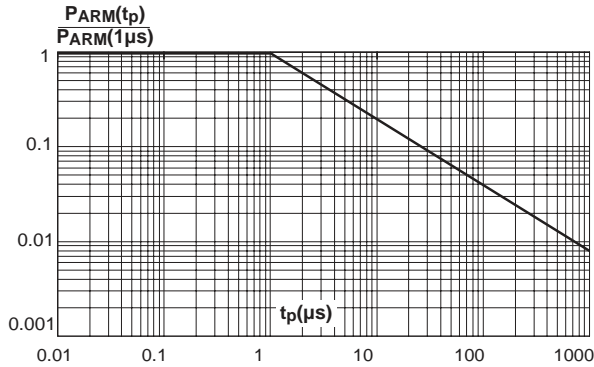
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



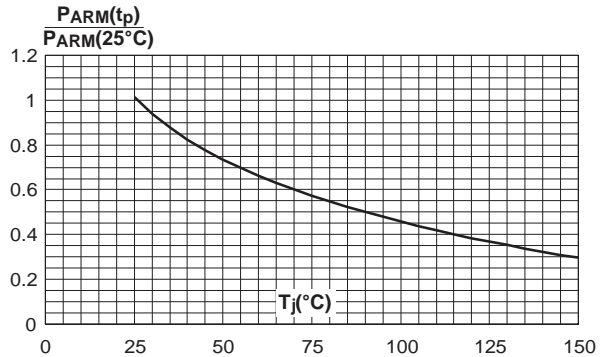
**Fig. 2:** Average forward current versus ambient temperature ( $\delta=0.5$ , per diode).



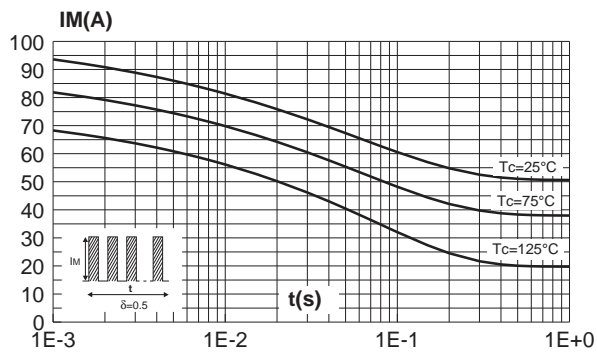
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



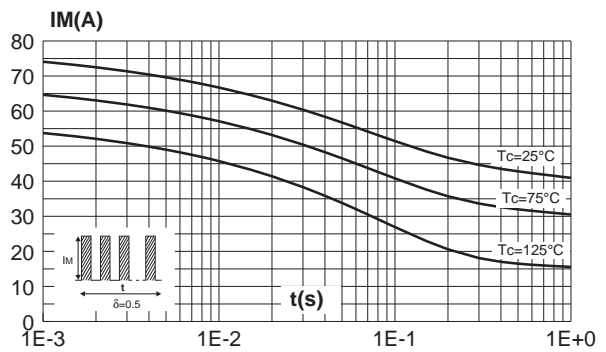
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



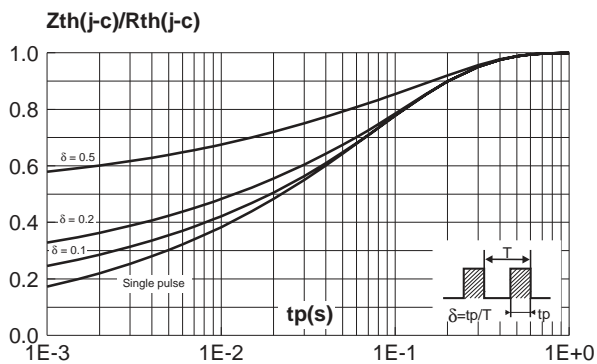
**Fig. 5-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D<sup>2</sup>PAK).



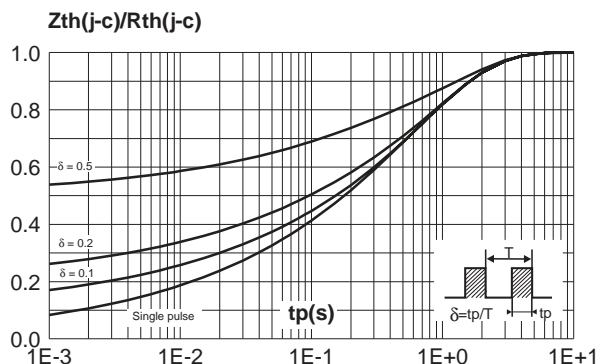
**Fig. 5-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB, TO-220FPAB).



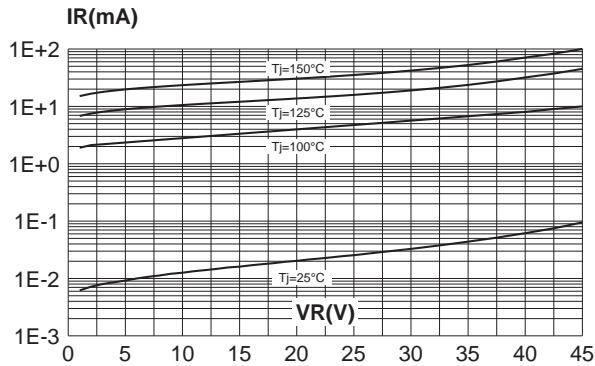
**Fig. 6-1:** Relative variation of thermal impedance junction to case versus pulse duration. (TO-220AB and D<sup>2</sup>PAK).



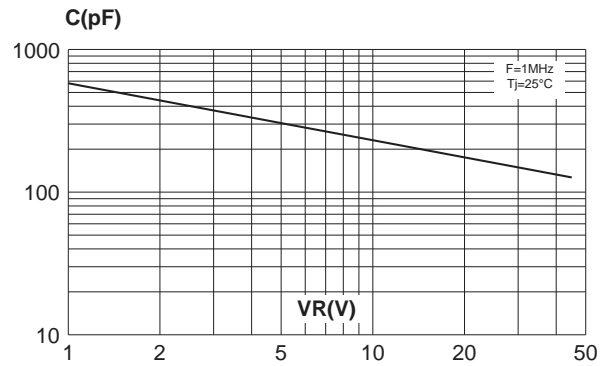
**Fig. 6-2:** Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AB, TO-220FPAB).



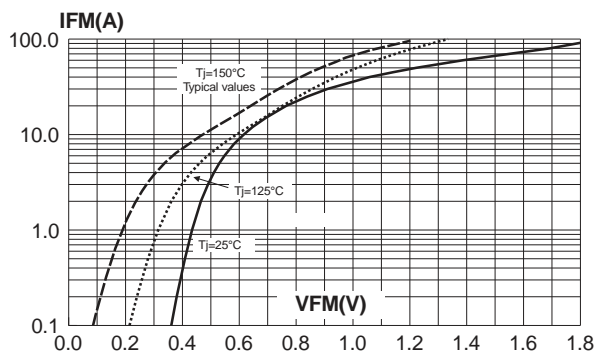
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



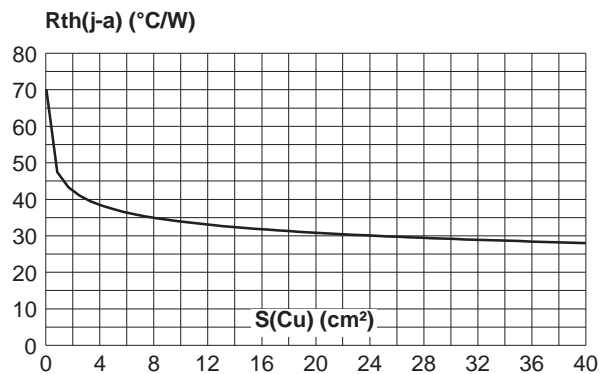
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values, per diode).



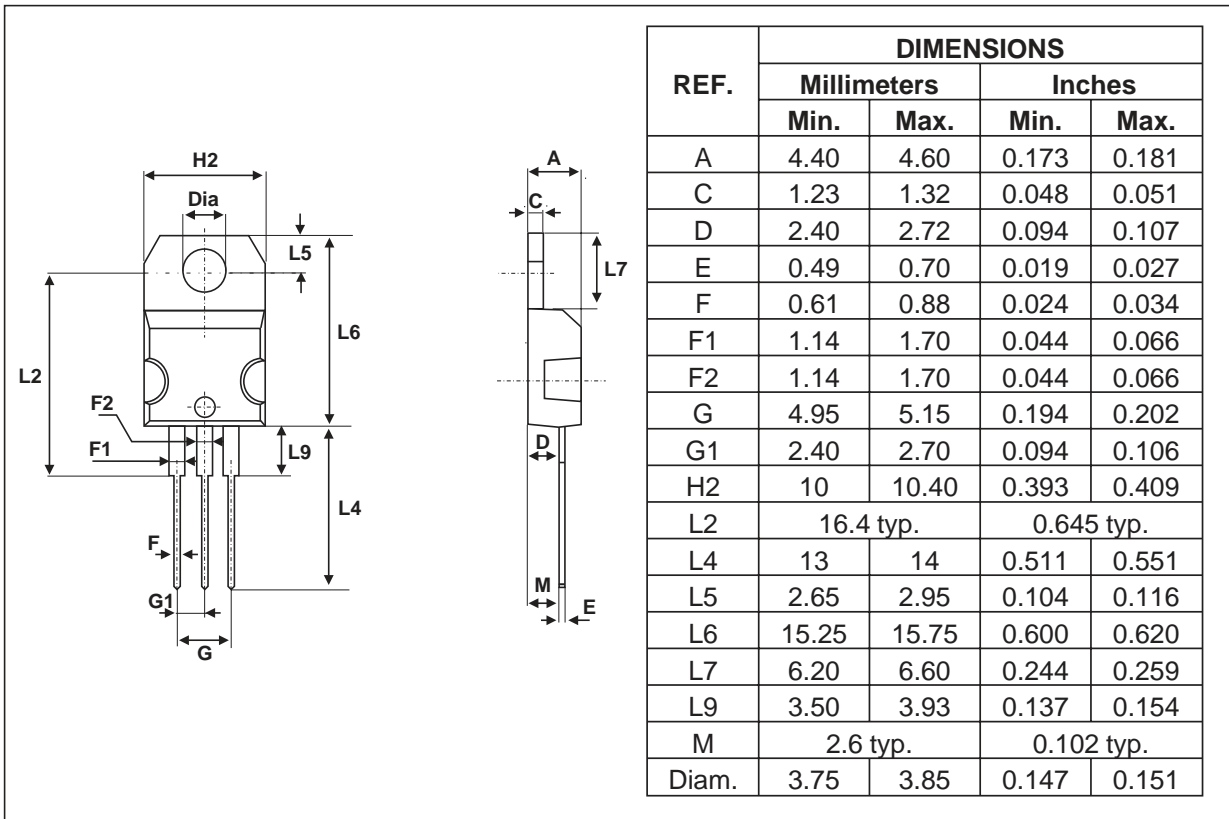
**Fig. 9:** Forward voltage drop versus forward current (maximum values, per diode).



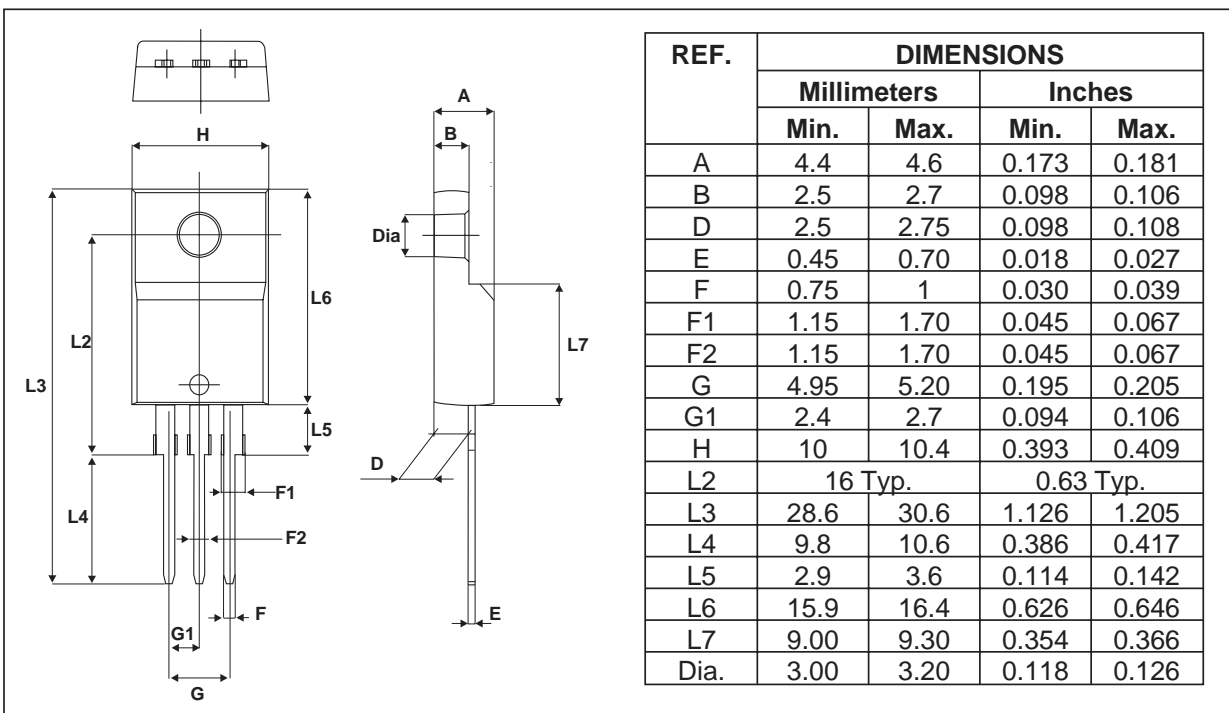
**Fig. 10:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm)( D<sup>2</sup>PAK).



**PACKAGE MECHANICAL DATA**  
TO-220AB

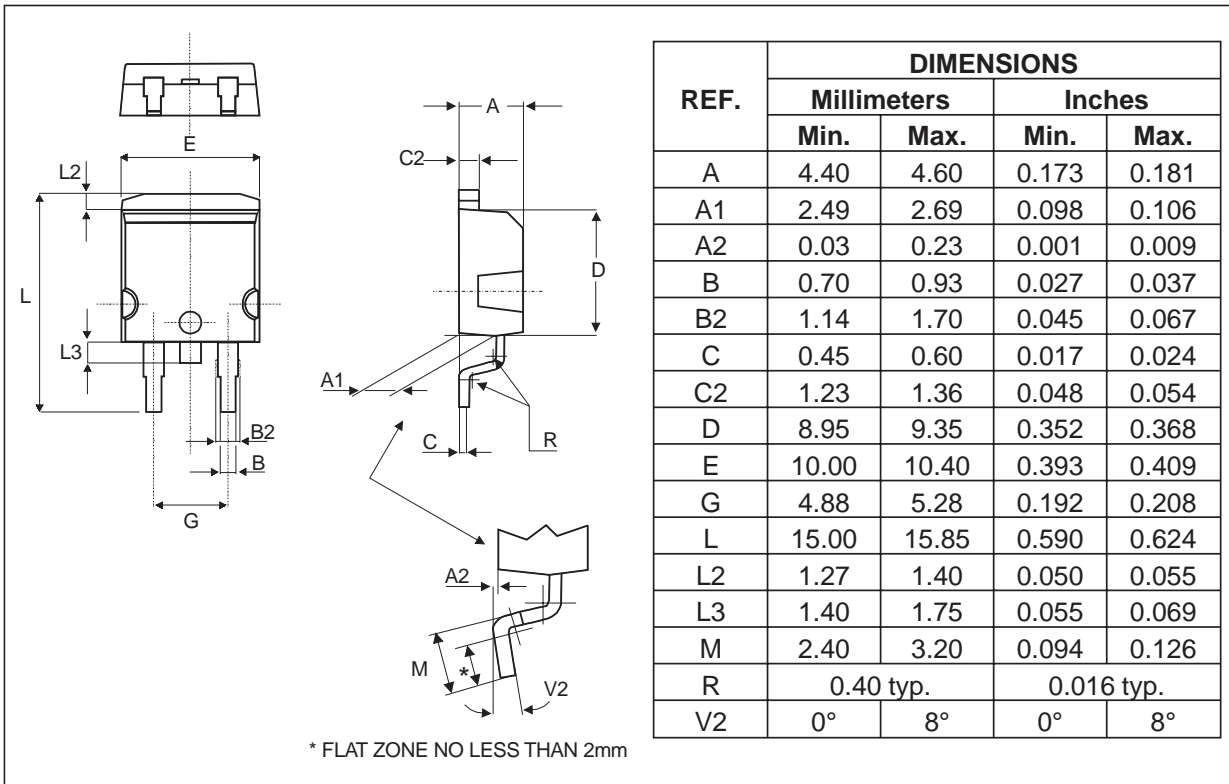


**PACKAGE MECHANICAL DATA**  
TO-220FPAB

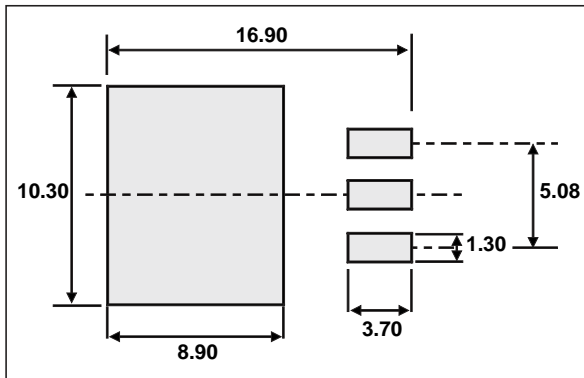


**STPS10L45CT/CG/CF/CFP**

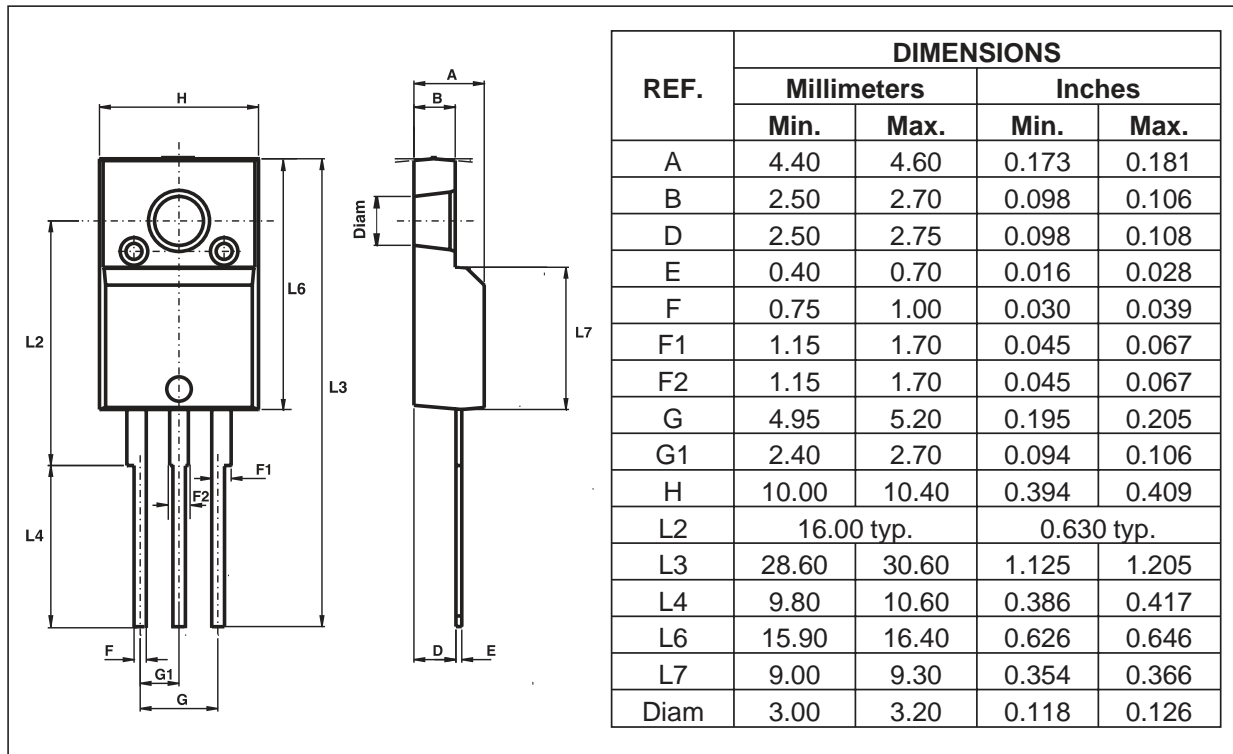
**PACKAGE MECHANICAL DATA**  
D<sup>2</sup>PAK



**FOOT PRINT DIMENSIONS (in millimeters)**



**PACKAGE MECHANICAL DATA**  
ISOWATT220AB



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS10L45CT	STPS10L45CT	TO-220AB	2.23g	50	Tube
STPS10L45CFP	STPS10L45CFP	TO-220FPAB	2 g	50	Tube
STPS10L45CG	STPS10L45CG	D <sup>2</sup> PAK	1.48g	50	Tube
STPS10L45CG-TR	STPS10L45CG	D <sup>2</sup> PAK	1.48g	1000	Tape & reel
STPS10L45CF	STPS10L45CF	ISOWATT220AB	2.08g	50	Tube

- Cooling method : by conduction (C)
- Recommended torque value : 0.55 N.m.
- Maximum torque value : 0.70 N.m.
- Epoxy meets UL94,V0

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