



# STPS20H100CT/CF/CG/CR/CFP

## HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	<b>2 x 10 A</b>
$V_{RRM}$	<b>100 V</b>
$T_j$	<b>175°C</b>
$V_F (max)$	<b>0.64 V</b>

### FEATURES AND BENEFITS

- NEGLIGIBLE SWITCHING LOSSES
- HIGH JUNCTION TEMPERATURE CAPABILITY
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- LOW LEAKAGE CURRENT
- AVALANCHE RATED
- INSULATED PACKAGE: ISOWATT220AB, TO-220FPAB  
Insulating Voltage = 2000V DC  
Capacitance = 45 pF
- AVALANCHE CAPABILITY SPECIFIED

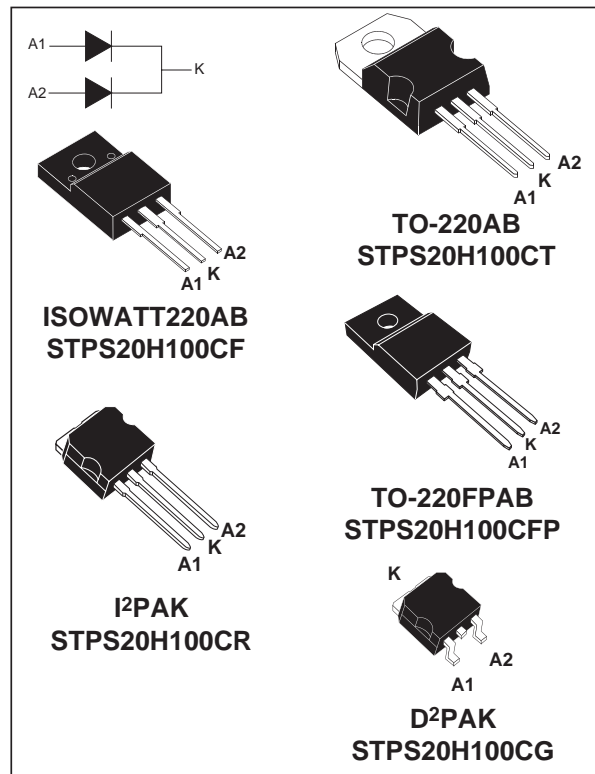
### DESCRIPTION

Dual center tap schottky rectifier designed for high frequency miniature Switched Mode Power Supplies such as adaptators and on board DC/DC converters.

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

Symbol	Parameter			Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage			100	V	
$I_{F(RMS)}$	RMS forward current			30	A	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB D <sup>2</sup> PAK / I <sup>2</sup> PAK	$T_c = 160^\circ\text{C}$	per diode per device	10 20	A
		ISOWATT220AB TO-220FPAB	$T_c = 145^\circ\text{C}$			
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ sinusoidal	250	A	
$I_{RRM}$	Repetitive peak reverse current		$t_p = 2 \mu\text{s}$ square $F = 1 \text{ kHz}$	1	A	
$I_{RSM}$	Non repetitive peak reverse current		$t_p = 100 \mu\text{s}$ square	3	A	
$P_{ARM}$	Repetitive peak avalanche power		$t_p = 1 \mu\text{s}$ $T_j = 25^\circ\text{C}$	10800	W	
$T_{stg}$	Storage temperature range			- 65 to + 175	°C	
$T_j$	Maximum operating junction temperature *			175	°C	
$dV/dt$	Critical rate of rise of reverse voltage			10000	V/ $\mu\text{s}$	

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  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 / I <sup>2</sup> PAK	Per diode	1.6	°C/W
		ISOWATT220AB / TO-220FPAB	Per diode	4	
		TO-220AB / D <sup>2</sup> PAK / I <sup>2</sup> PAK	Total	0.9	
		ISOWATT220AB / TO-220FPAB	Total	3.2	°C/W
$R_{th(c)}$		TO-220AB / D <sup>2</sup> PAK / I <sup>2</sup> PAK	Coupling	0.15	°C/W
		ISOWATT220AB / TO-220FPAB	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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			4.5	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			2	6	mA
$V_F^{**}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 8\text{ A}$			0.71	V
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$			0.77	
		$T_j = 25^\circ\text{C}$	$I_F = 16\text{ A}$			0.81	
		$T_j = 25^\circ\text{C}$	$I_F = 20\text{ A}$			0.88	
		$T_j = 125^\circ\text{C}$	$I_F = 8\text{ A}$		0.56	0.58	
		$T_j = 125^\circ\text{C}$	$I_F = 10\text{ A}$		0.59	0.64	
		$T_j = 125^\circ\text{C}$	$I_F = 16\text{ A}$		0.65	0.68	
		$T_j = 125^\circ\text{C}$	$I_F = 20\text{ A}$		0.67	0.73	

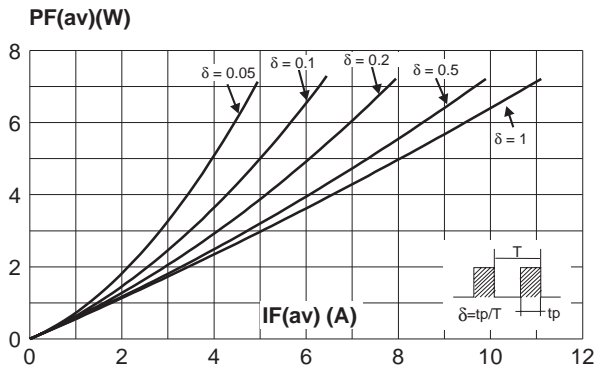
Pulse test : \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

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

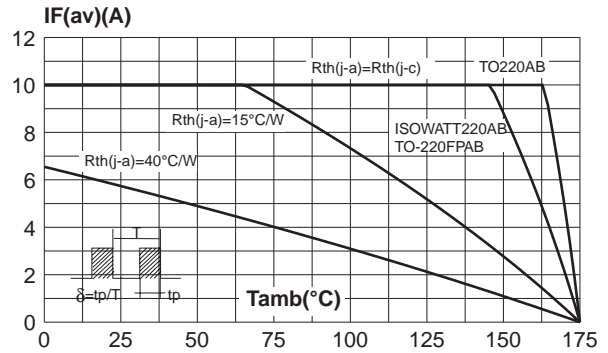
To evaluate the maximum conduction losses use the following equation :

$$P = 0.55 \times I_{F(AV)} + 0.009 \times I_{F(RMS)}^2$$

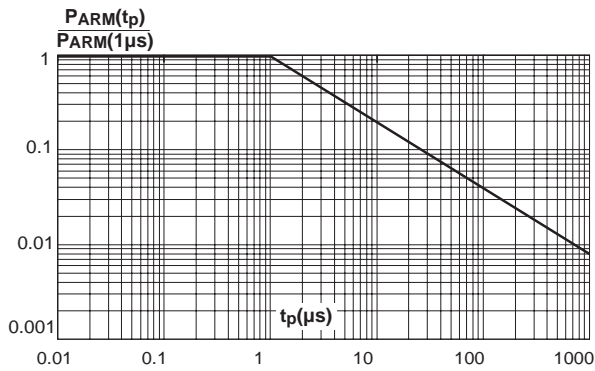
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



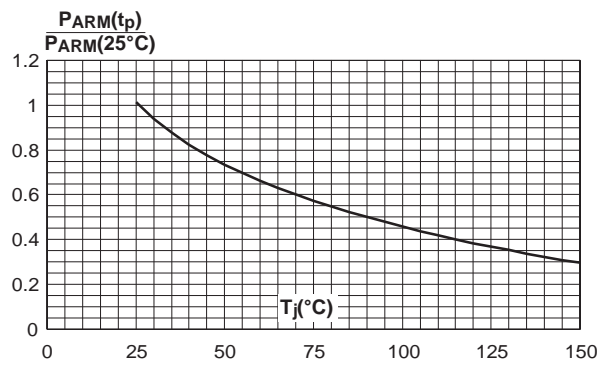
**Fig. 2:** Average forward current versus ambient temperature ( $\delta=0.5$ , per diode).



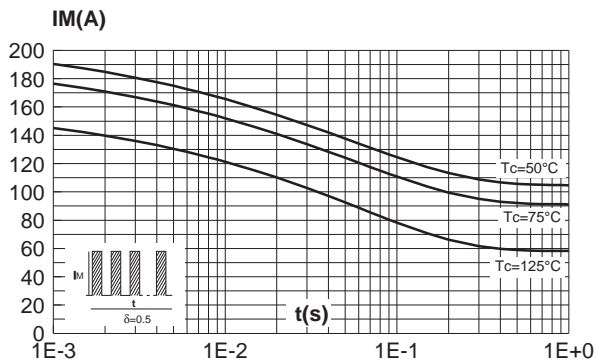
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



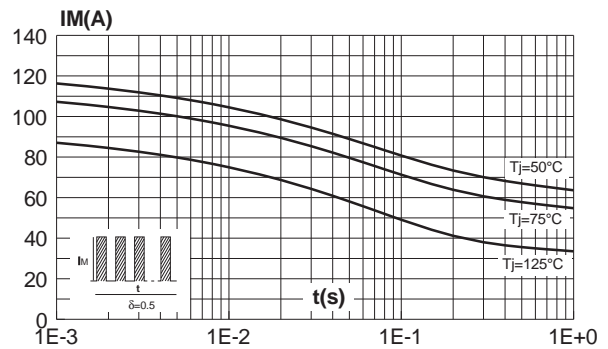
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



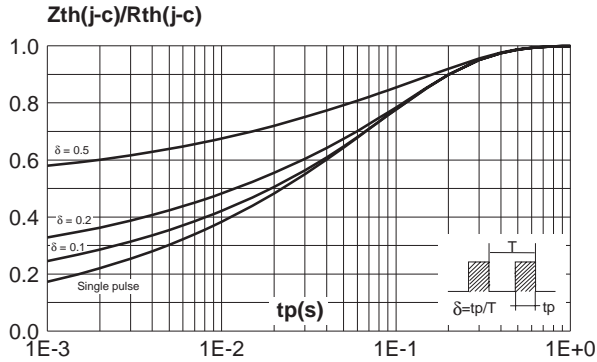
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB, D<sup>2</sup>PAK, I<sup>2</sup>PAK)



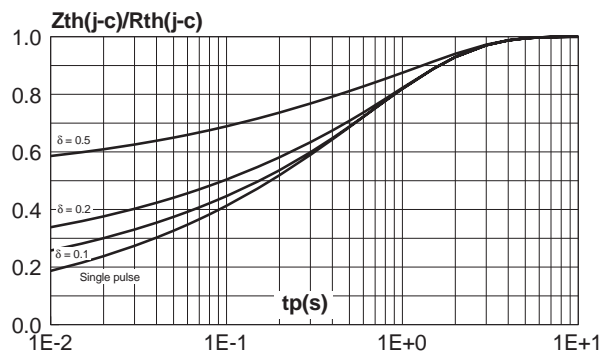
**Fig. 6:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB, TO-220FPAB).



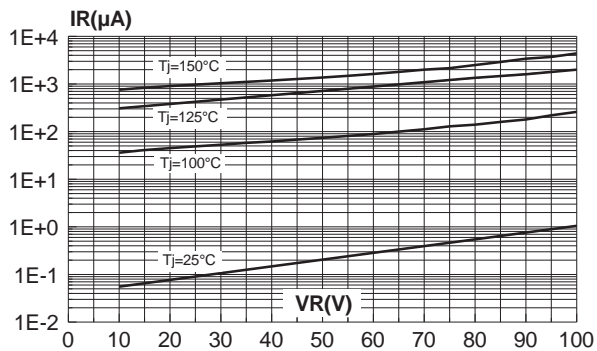
**Fig. 7-1:** Relative variation of thermal impedance junction to case versus pulse duration (per diode) (TO-220AB, D<sup>2</sup>PAK, I<sup>2</sup>PAK).



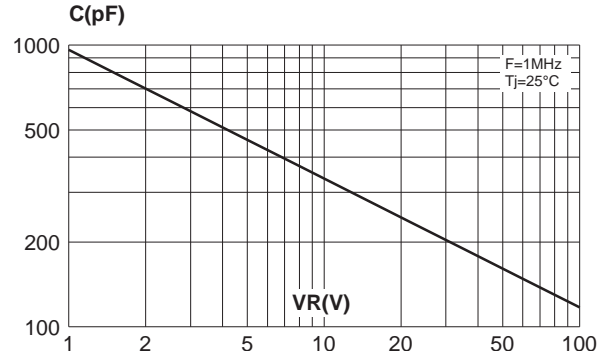
**Fig. 7-2:** Relative variation of thermal impedance junction to case versus pulse duration (per diode) (ISOWATT220AB, TO-220FPAB).



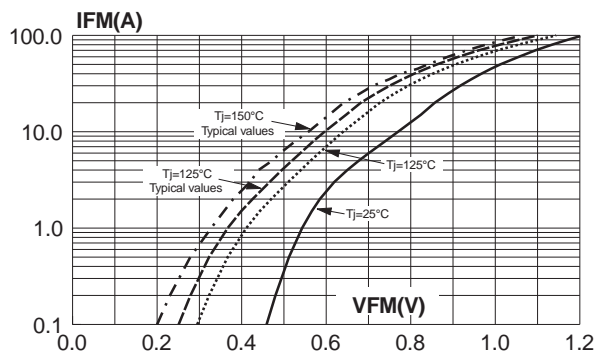
**Fig. 8:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



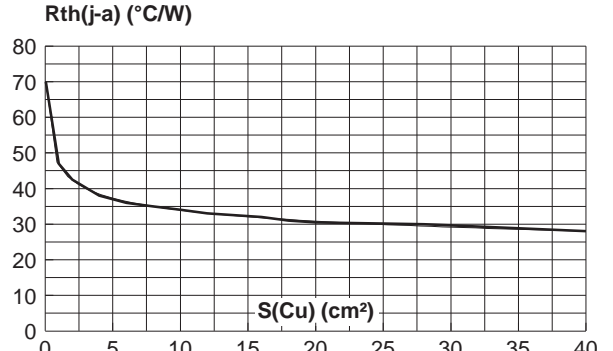
**Fig. 9:** Junction capacitance versus reverse voltage applied (typical values, per diode).



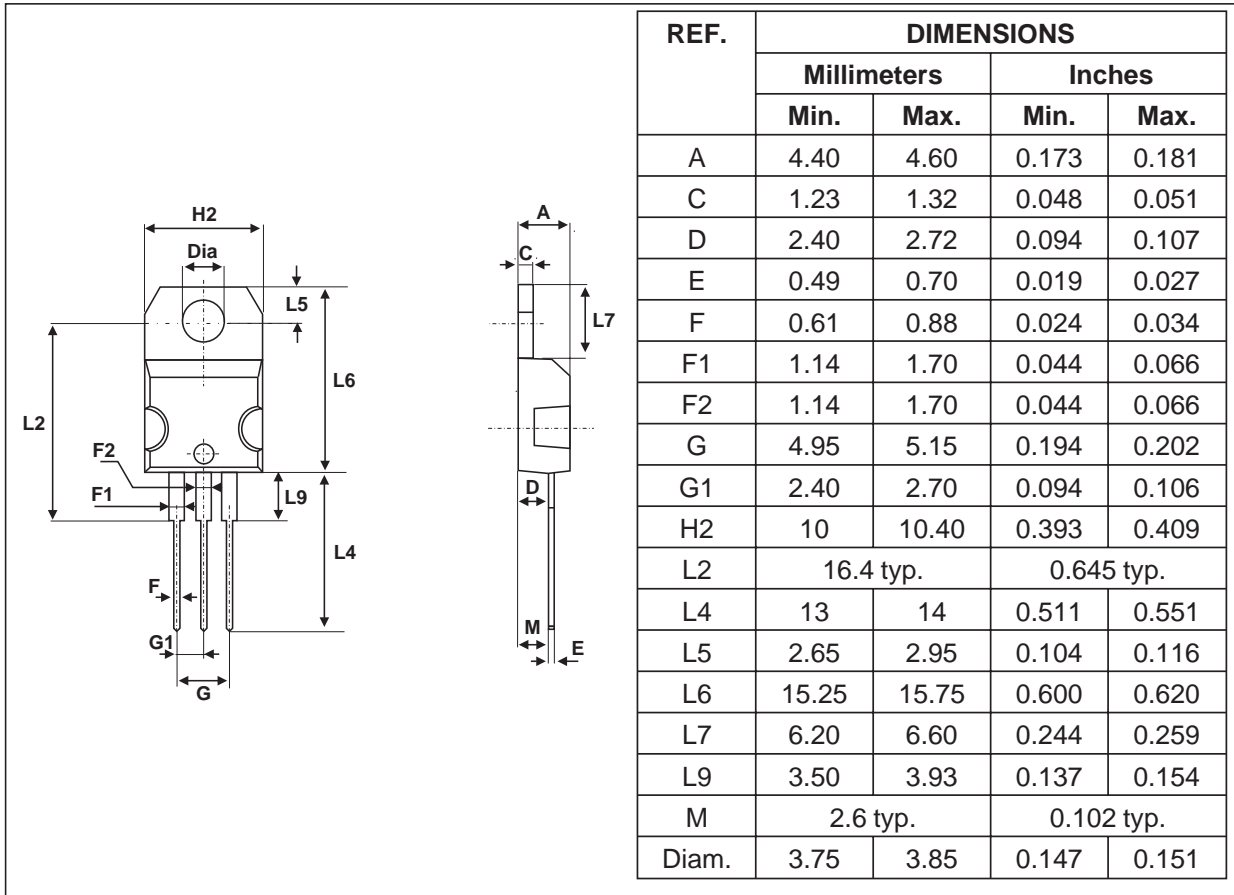
**Fig. 10:** Forward voltage drop versus forward current (maximum values, per diode).



**Fig. 11:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35μm) (D<sup>2</sup>PAK).

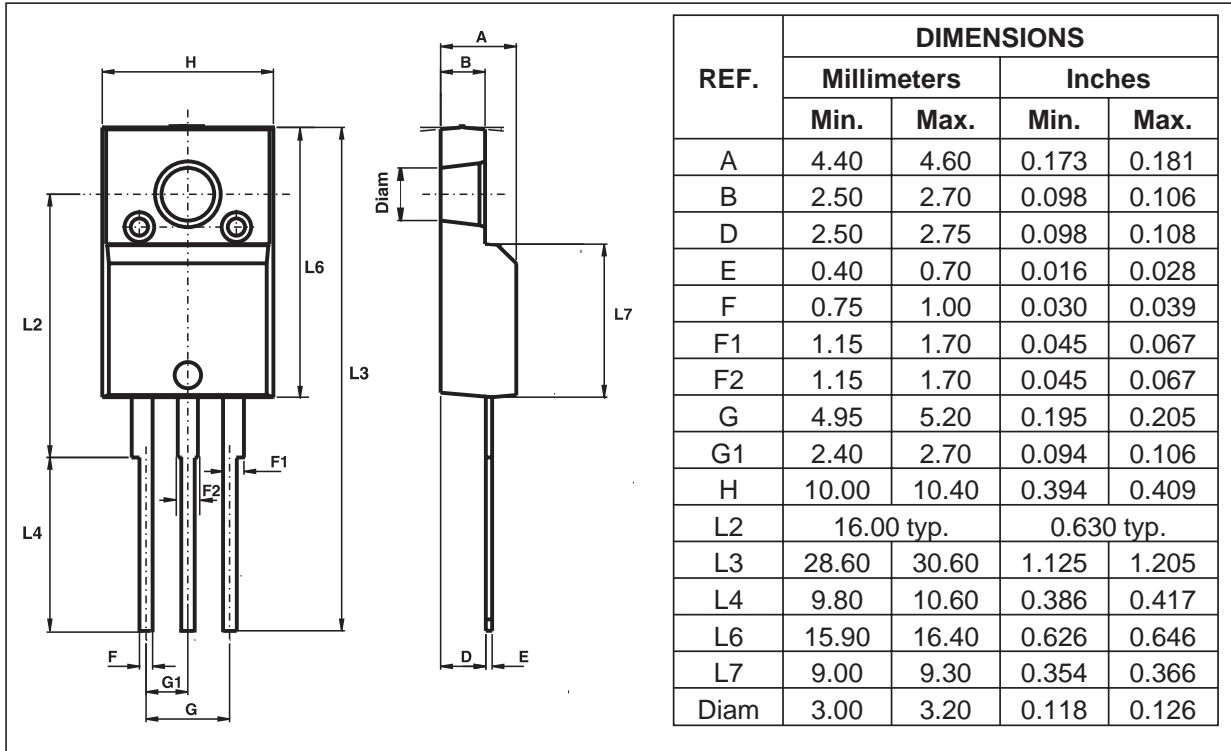


**PACKAGE MECHANICAL DATA**  
TO-220AB

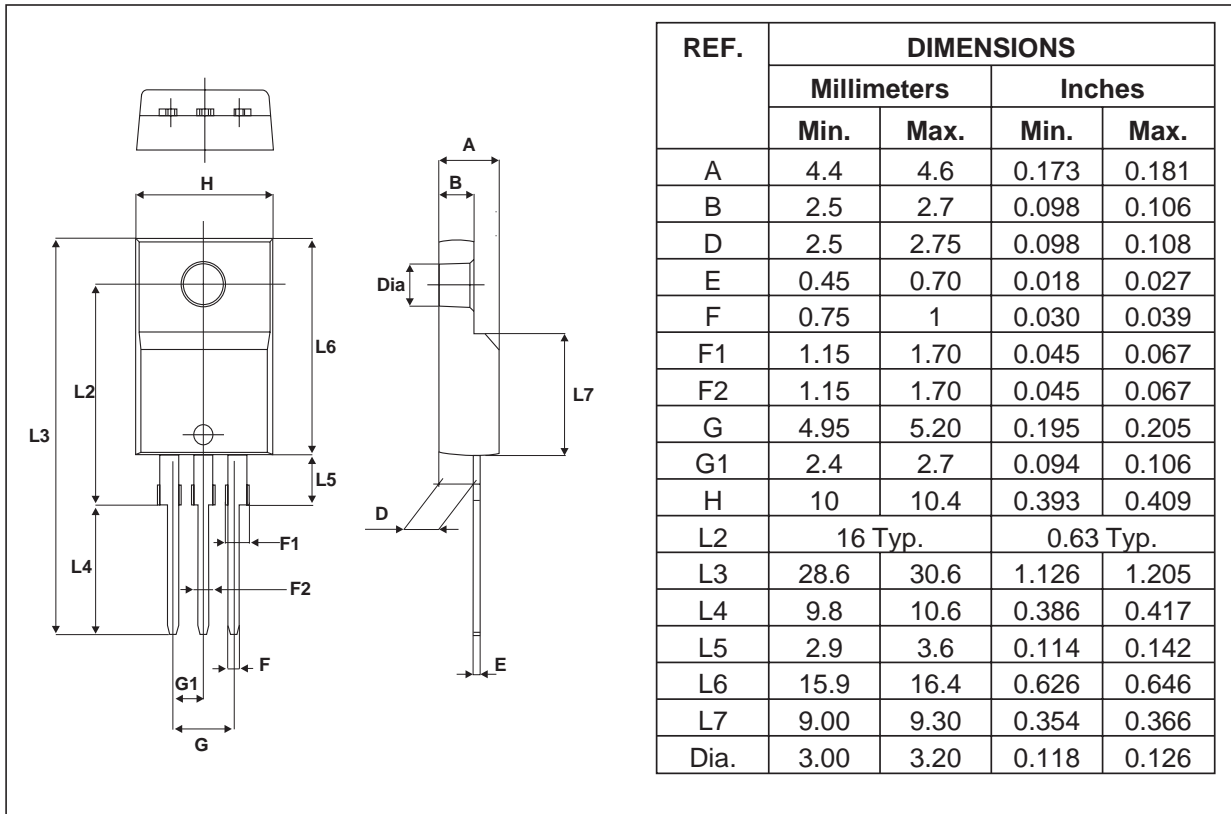


**STPS20H100CT/CF/CG/CR/CFP**

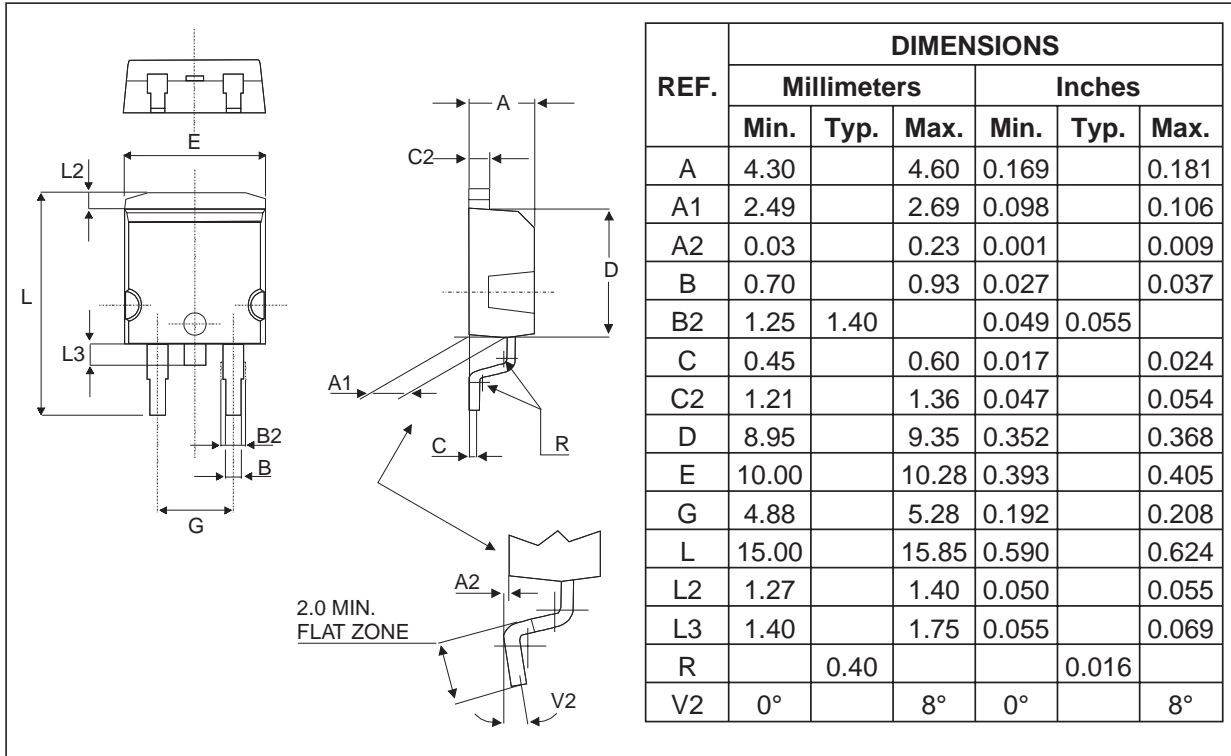
**PACKAGE MECHANICAL DATA**  
ISOWATT220AB



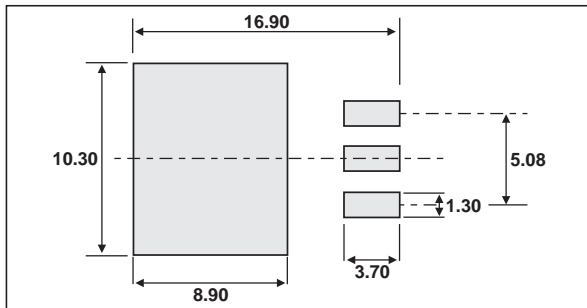
**PACKAGE MECHANICAL DATA**  
TO-220FPAB



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

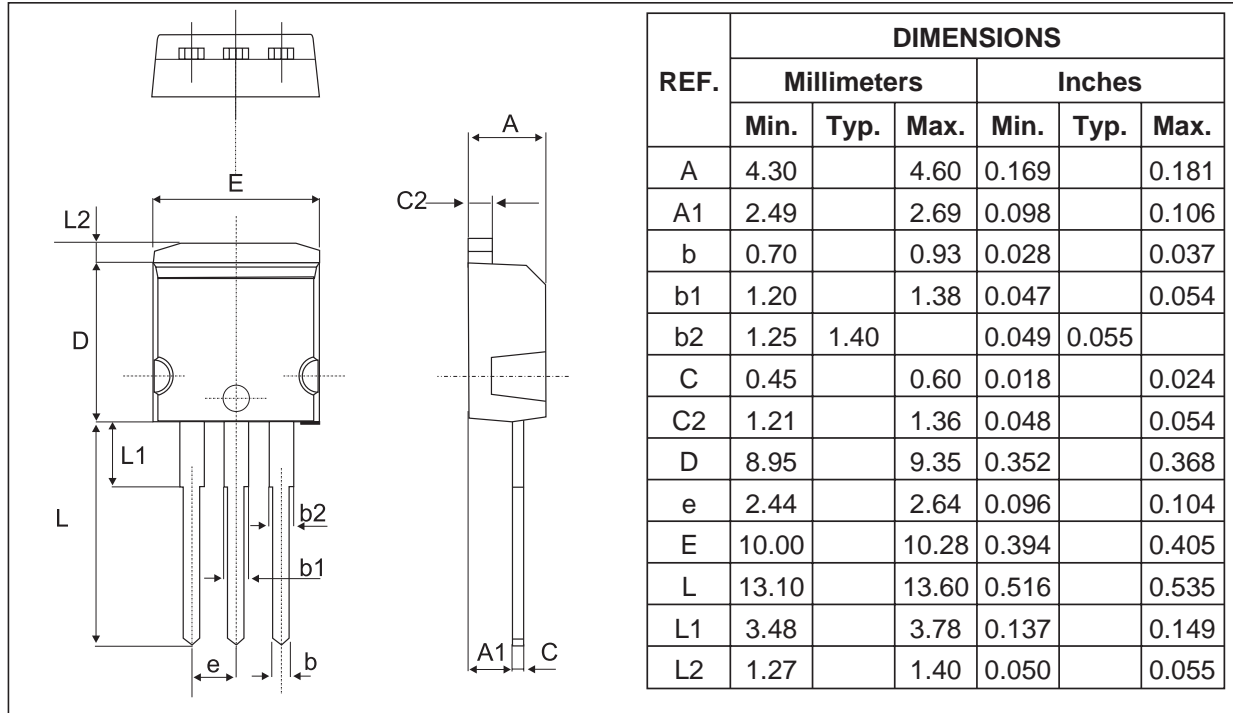


**FOOT PRINT DIMENSIONS (in millimeters)**



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



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS20H100CT	STPS20H100CT	TO-220AB	2.20g	50	Tube
STPS20H100CF	STPS20H100CF	ISOWATT220AB	2.08g	50	Tube
STPS20H100CFP	STPS20H100CFP	TO-220FPAB	2.0 g	50	Tube
STPS20H100CR	STPS20H100CR	I <sup>2</sup> PAK	1.49g	50	Tube
STPS20H100CG	STPS20H100CG	D <sup>2</sup> PAK	1.48g	50	Tube
STPS20H100CG-TR	STPS20H100CG	D <sup>2</sup> PAK	1.48g	1000	Tape & reel

- Epoxy meets UL94,V0

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