



STPS1545CT/CF/CG/CFP/CR

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_F(AV)$	2 x 7.5 A
V_{RRM}	45 V
$T_j(max)$	175 °C
$V_F(max)$	0.57 V

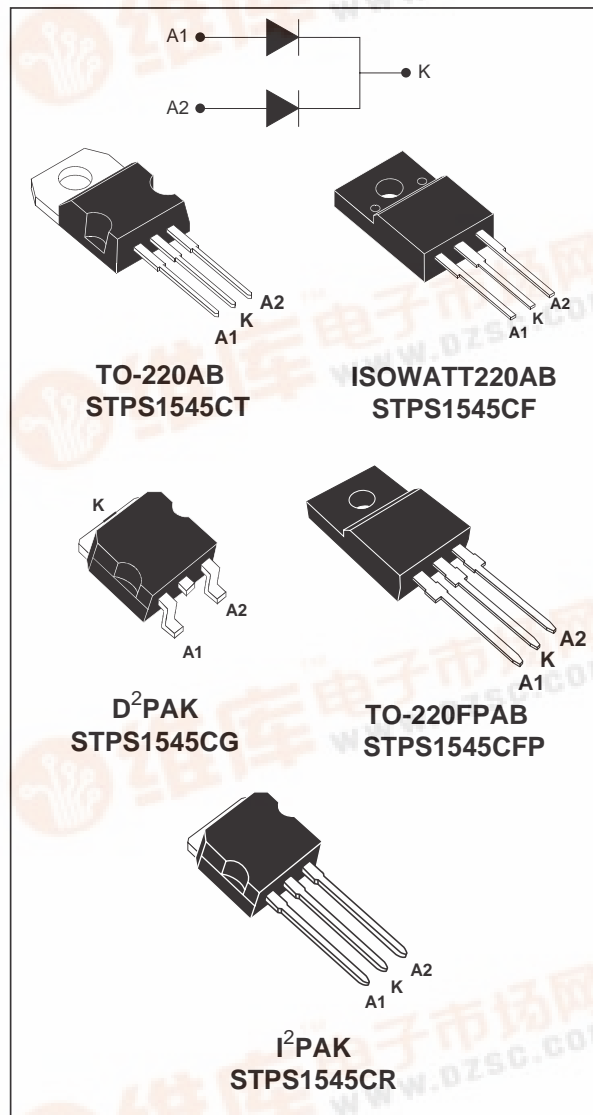
FEATURES AND BENEFITS

- 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, ISOWATT220AB, TO-220FPAB, D²PAK or I²PAK, this device is especially intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



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ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter				Value	Unit
V _{RRM}	Repetitive peak reverse voltage				45	V
I _{F(RMS)}	RMS forward current				20	A
I _{F(AV)}	Average forward current $\delta = 0.5$	TO-220AB / D ² PAK / I ² PAK	T _c = 157°C	Per diode	7.5	A
		ISOWATT220AB / TO-220FPAB	T _c = 130°C	Per device	15	
I _{FSM}	Surge non repetitive forward current		tp = 10 ms Sinusoidal		150	A
I _{RRM}	Repetitive peak reverse current		tp = 2 μ s square F = 1kHz		1	A
I _{RSM}	Non repetitive peak reverse current		tp = 100 μ s square		2	A
P _{ARM}	Repetitive peak avalanche power		tp = 1 μ s T _j = 25°C		2700	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/ μ s

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

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
R _{th(j-c)}	Junction to case	TO-220AB / D ² PAK / I ² PAK	Per diode	3.0	°C/W
			Total	1.7	
	ISOWATT220AB / TO-220FPAB	Per diode	5.5		
		Total	4.2		
R _{th(c)}		TO-220AB / D ² PAK / I ² PAK	Coupling	0.35	
		ISOWATT220AB / TO-220FPAB		2.9	

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°C	V _R = V _{RRM}			100	μ A
		T _j = 125°C			5	15	mA
V _F *	Forward voltage drop	T _j = 125°C	I _F = 7.5 A		0.5	0.57	V
		T _j = 25°C	I _F = 15 A			0.84	
		T _j = 125°C	I _F = 15 A		0.65	0.72	

Pulse test : * tp = 380 μ s, $\delta < 2\%$

To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.020 I_{F(RMS)}^2$$

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

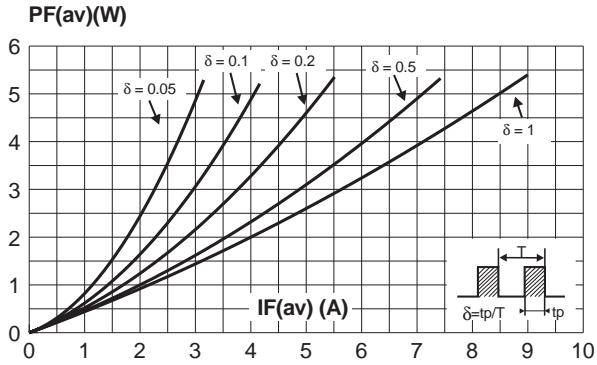


Fig. 2: Average current versus ambient temperature ($\delta = 0.5$, per diode).

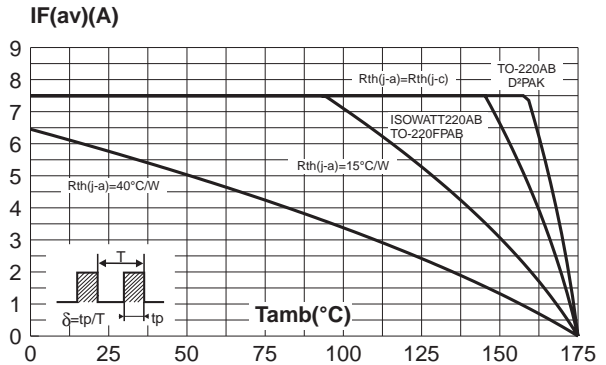


Fig. 3: Normalized avalanche power derating versus pulse duration.

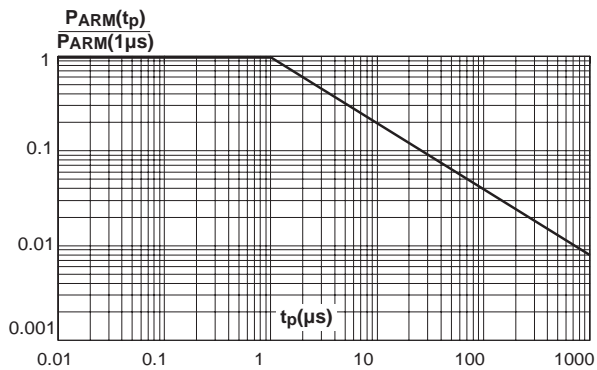


Fig. 4: Normalized avalanche power derating versus junction temperature.

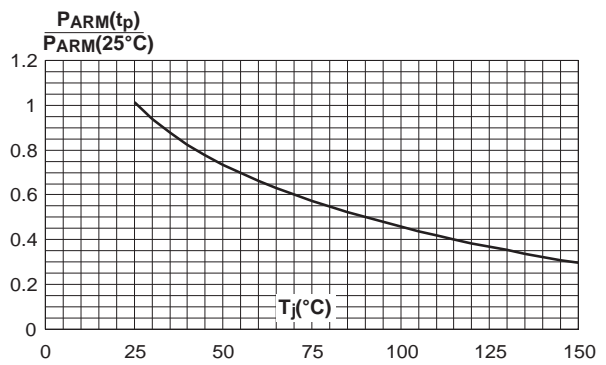


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D²PAK).

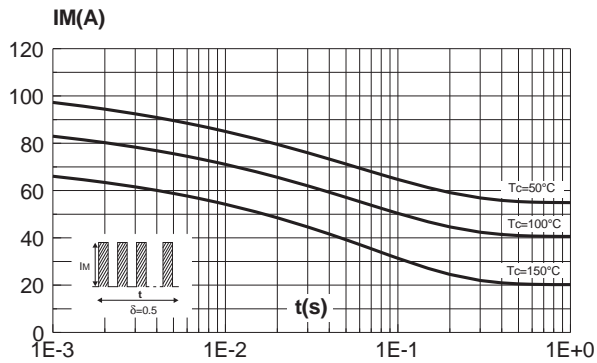
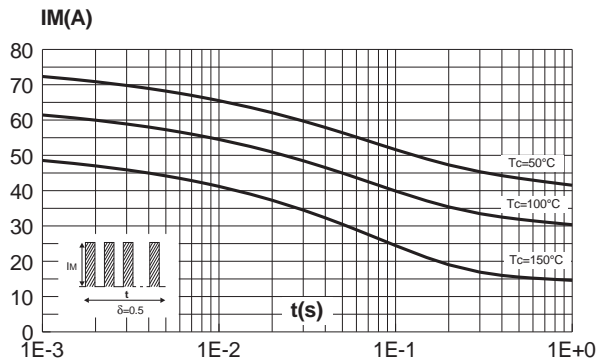


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB, TO-220FPAB).



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Fig. 6-1: Relative variation of thermal transient impedance junction to case versus pulse duration (per diode) (TO-220AB and D²PAK).

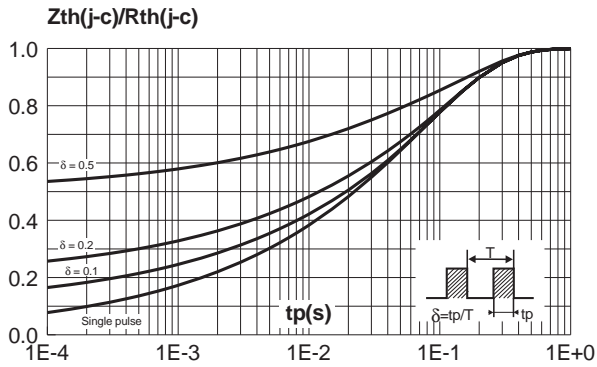


Fig. 6-2: Relative variation of thermal transient impedance junction to case versus pulse duration (per diode) (ISOWATT220AB, TO-220FPAB).

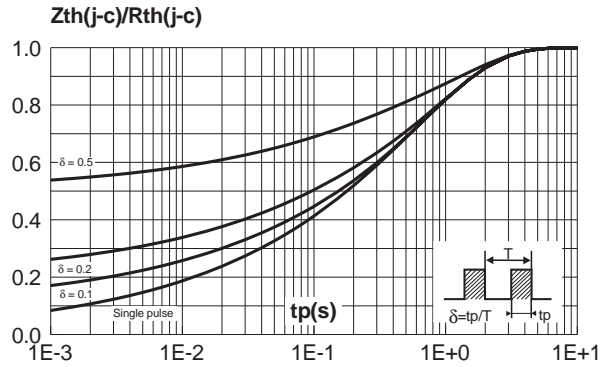


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

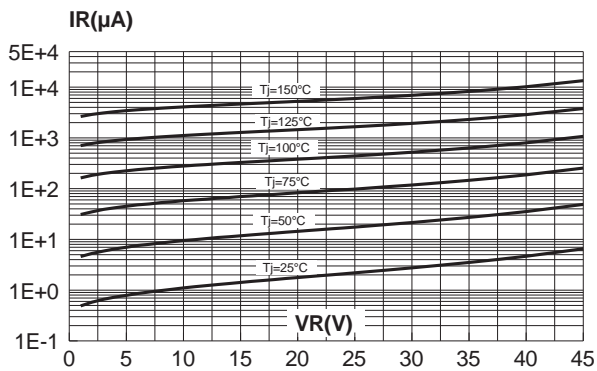


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

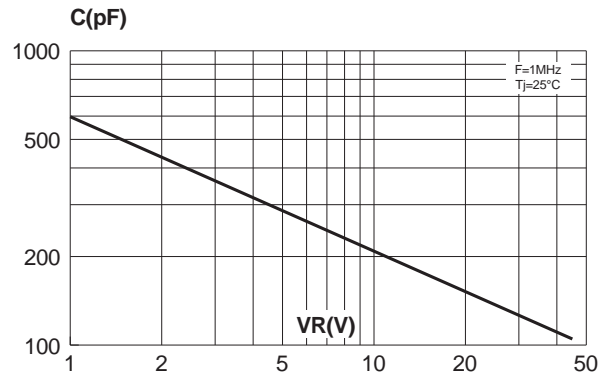


Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

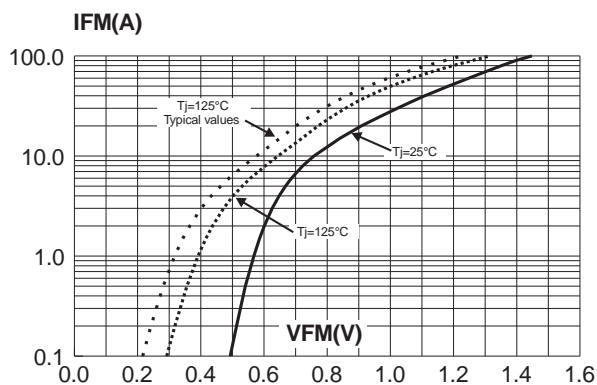
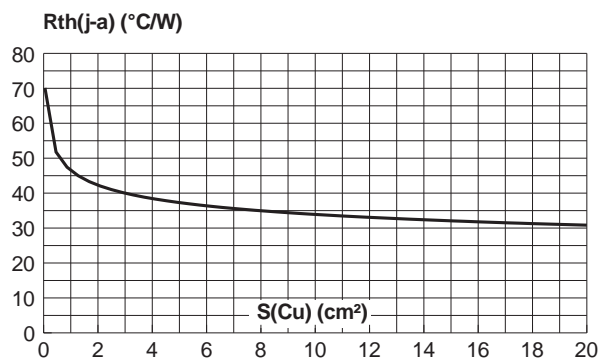
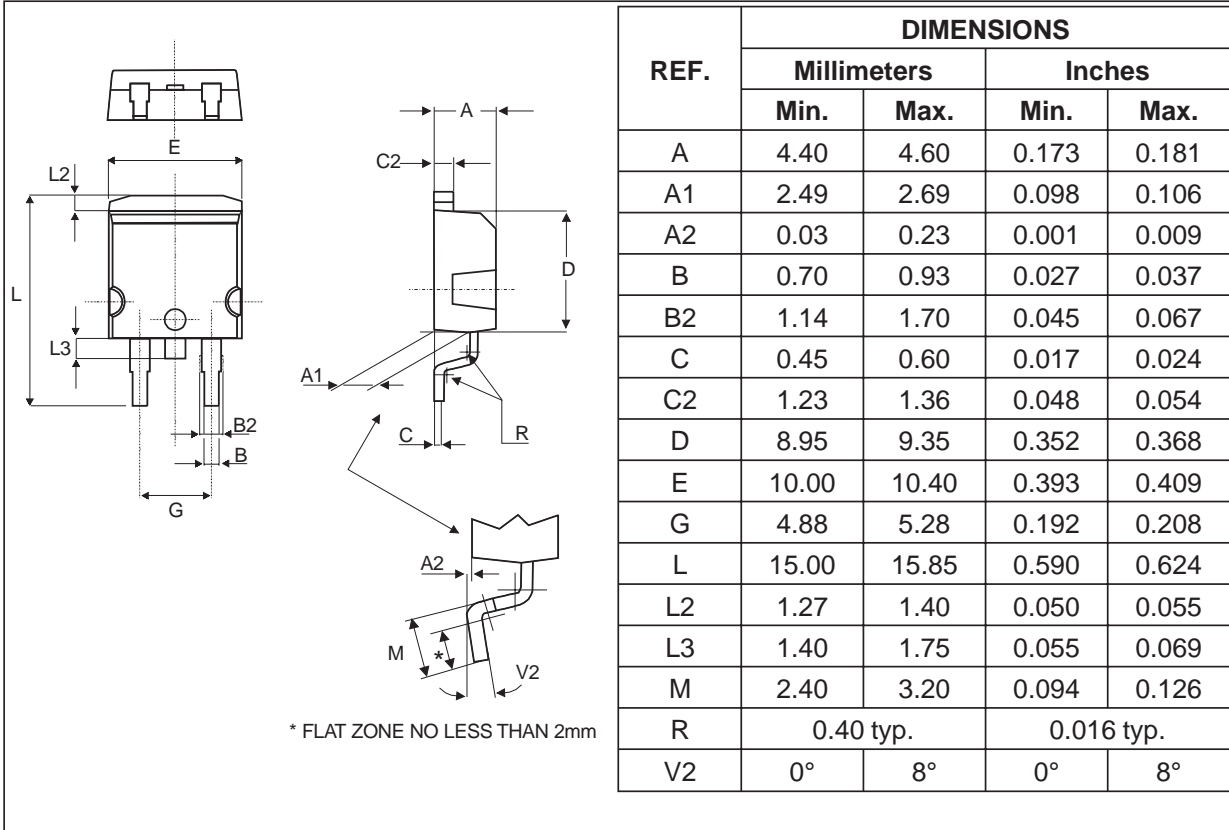


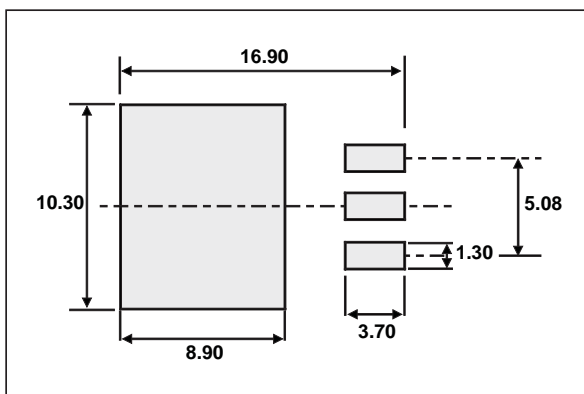
Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: 35μm).



PACKAGE MECHANICAL DATA
D²PAK

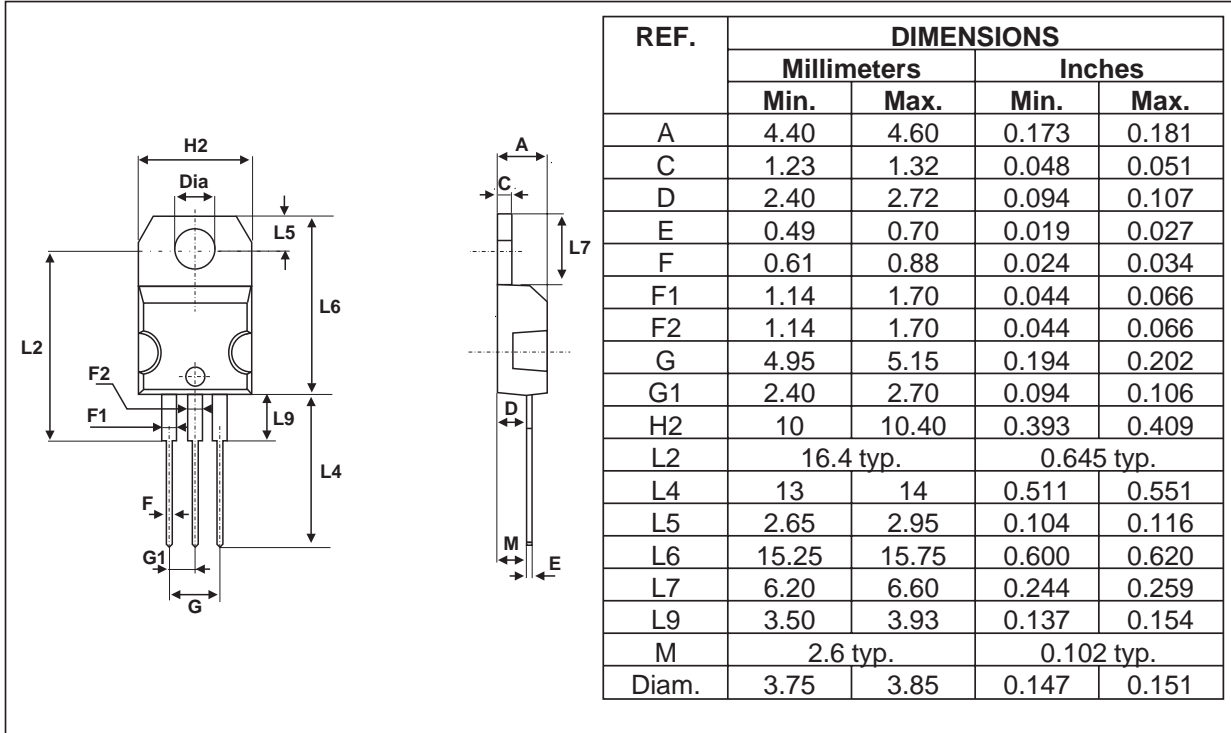


FOOTPRINT DIMENSIONS (in millimeters)

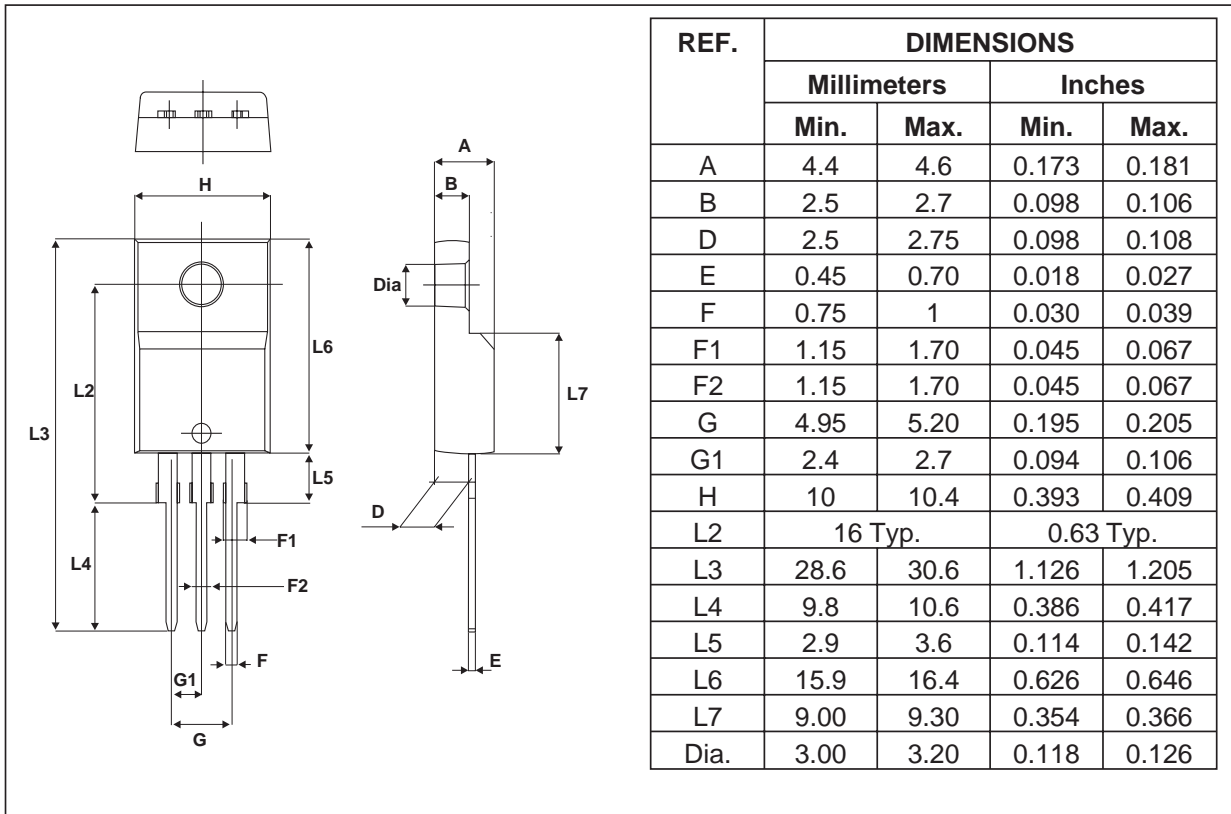


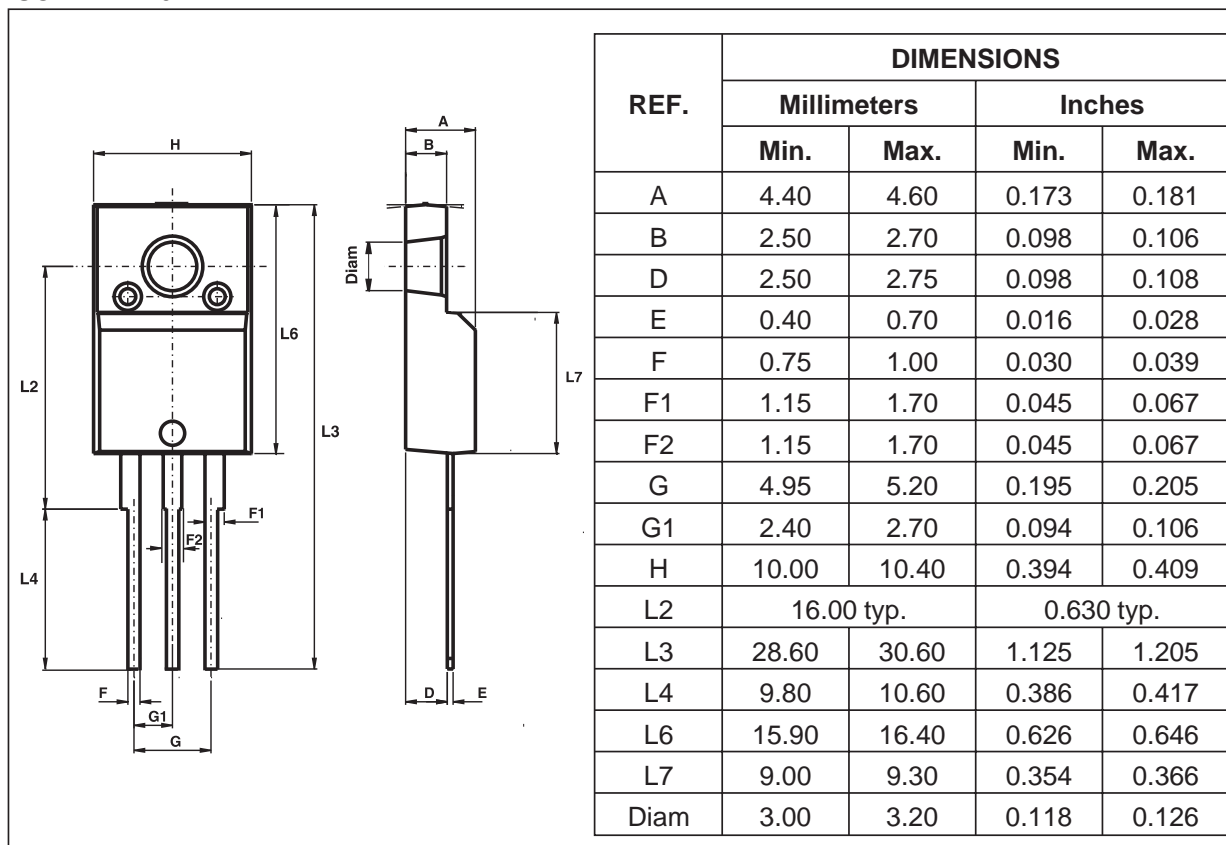
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PACKAGE MECHANICAL DATA
TO-220AB



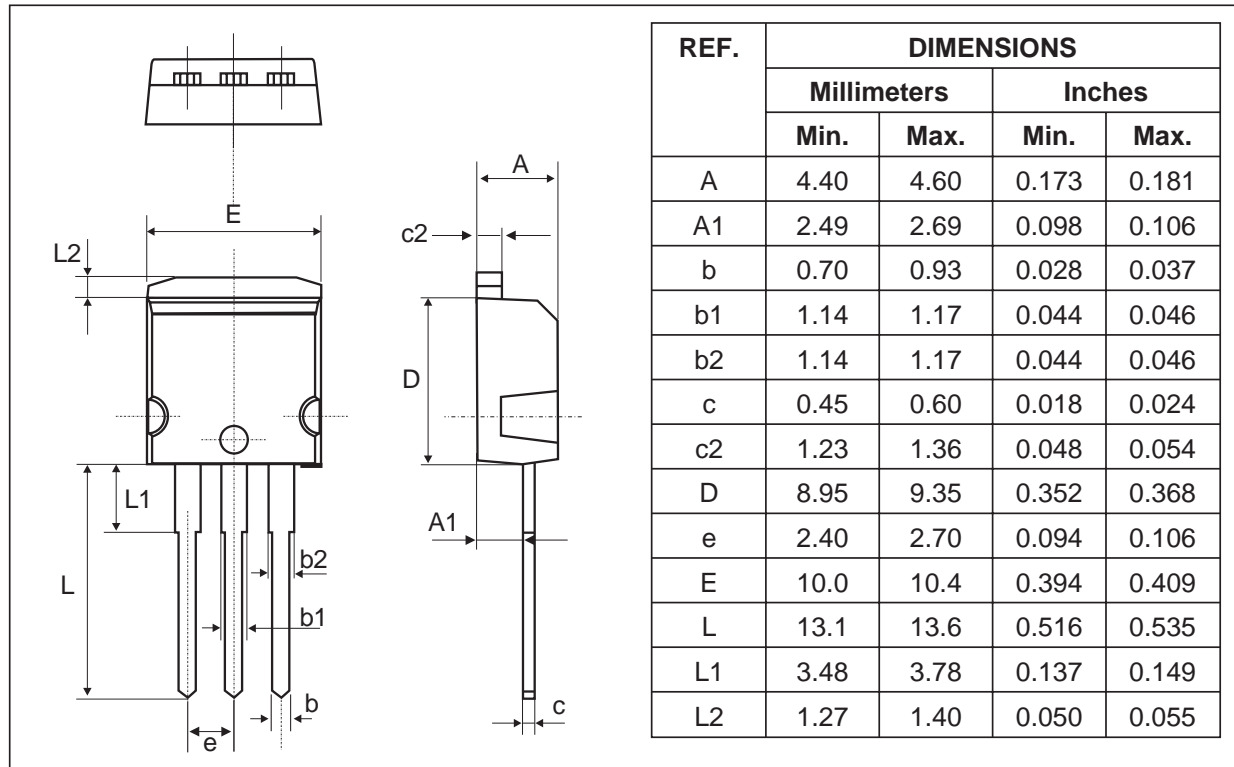
PACKAGE MECHANICAL DATA
TO-220FPAB



PACKAGE MECHANICAL DATA
 ISOWATT220AB


STPS1545CT/CF/CG/CFP/CR

PACKAGE MECHANICAL DATA
I²PAK



Type	Marking	Package	Weight	Base qty	Delivery mode
STPS1545CT	STPS1545CT	TO-220AB	2.23 g.	50	Tube
STPS1545CF	STPS1545CF	ISOWATT220AB	2.08 g.	50	Tube
STPS1545CFP	STPS1545CFP	TO-220FPAB	2.0 g	50	Tube
STPS1545CG	STPS1545CG	D ² PAK	1.48 g.	50	Tube
STPS1545CG-TR	STPS1545CG	D ² PAK	1.48 g.	1000	Tape & reel
STPS1545CR	STPS1545CR	I ² PAK	1.49 g	50	Tube

- Cooling method: by conduction (C)
- Epoxy meets UL94,V0

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