



# STPS30L45CG/CR/CT/CW/CFP

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 15 A
$V_{RRM}$	45 V
$T_j(\text{max})$	150 °C
$V_F(\text{max})$	0.50 V

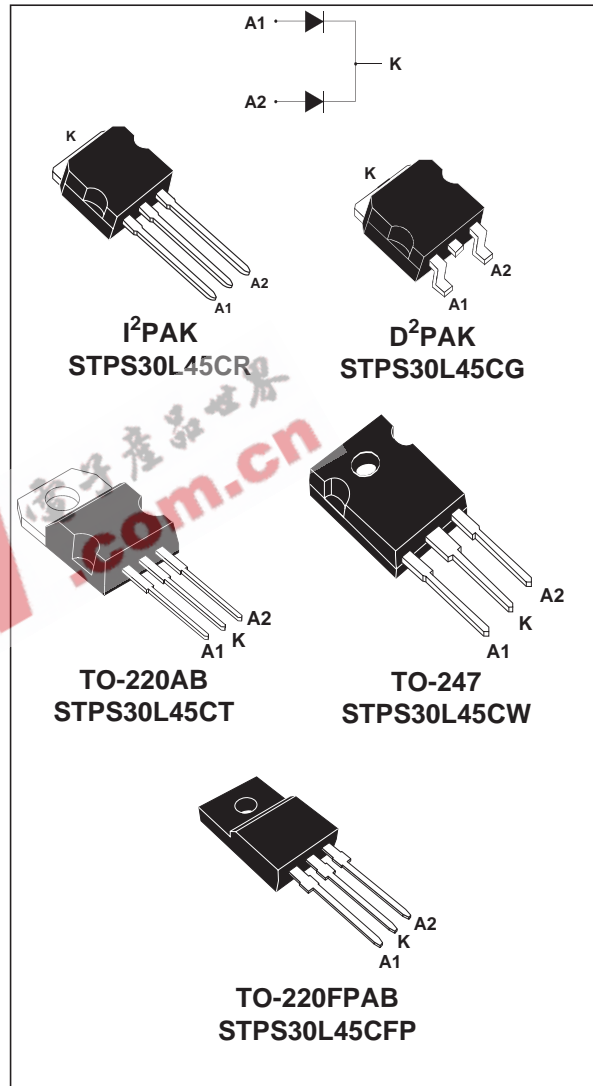
### FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP MEANING VERY SMALL CONDUCTION LOSSES
- LOW SWITCHING LOSSES ALLOWING HIGH FREQUENCY OPERATION
- LOW THERMAL RESISTANCE
- AVALANCHE RATED
- INSULATED PACKAGE: TO-220FPAB  
Insulating voltage: 2000V DC  
Capacitance = 45pF
- 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-247, TO-220AB, TO-220FPAB, D<sup>2</sup>PAK and I<sup>2</sup>PAK these devices are intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection applications.



## STPS30L45CG/CR/CT/CW/CFP

### 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	TO-220FPAB	T <sub>c</sub> = 110°C δ = 0.5	Per diode Per device	15 30	A
		TO-220AB, TO-247, I <sup>2</sup> PAK, D <sup>2</sup> PAK	T <sub>c</sub> = 135°C δ = 0.5			
I <sub>FSM</sub>	Surge non repetitive forward current		tp = 10 ms Sinusoidal	220	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	3	A	
P <sub>ARM</sub>	Repetitive peak avalanche power		tp = 1 μs T <sub>j</sub> = 25°C	6000	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

### THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
R <sub>th(j-c)</sub>	Junction to case	TO-220FPAB	Per diode Total	4 3.2	°C/W
		TO-220AB, TO-247, I <sup>2</sup> PAK, D <sup>2</sup> PAK	Per diode Total	1.60 0.85	
R <sub>th(c)</sub>		TO-220FPAB	Coupling	2.5	°C/W
		TO-220AB, TO-247, I <sup>2</sup> PAK, D <sup>2</sup> PAK		0.10	

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)

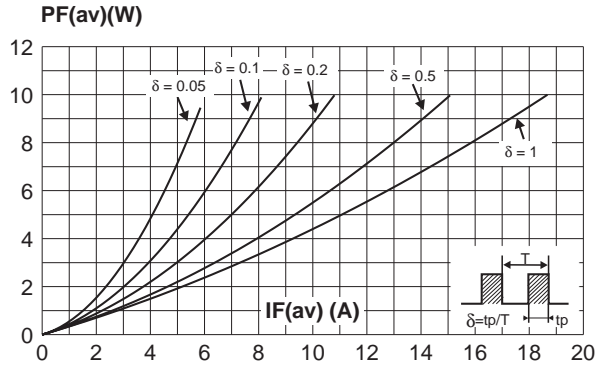
Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			0.4	mA
		T <sub>j</sub> = 125°C			100	200	mA
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 15 A			0.55	V
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 15 A		0.42	0.50	
		T <sub>j</sub> = 25°C	I <sub>F</sub> = 30 A			0.74	
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 30 A		0.59	0.67	

Pulse test : \* tp = 380 μs, δ < 2%

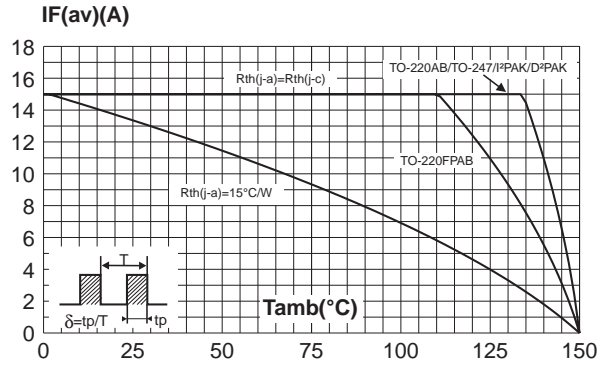
To evaluate the conduction losses use the following equation :

$$P = 0.330 \times I_{F(AV)} + 0.011 I_{F(RMS)}^2$$

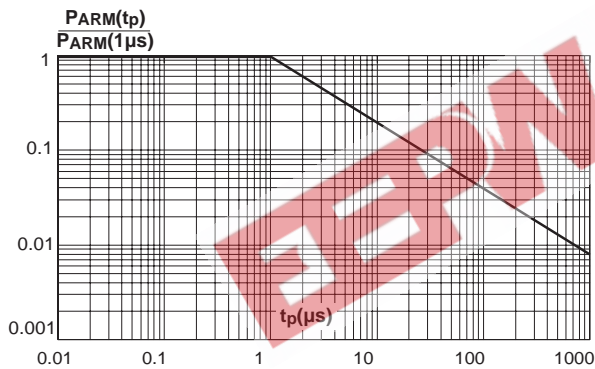
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



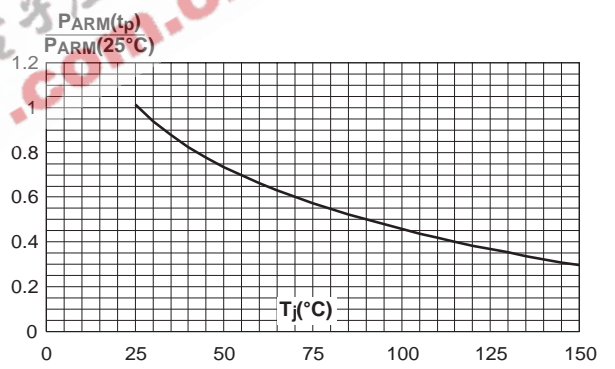
**Fig. 2:** Average forward current versus ambient temperature ( $\delta=0.5$ , per diode).



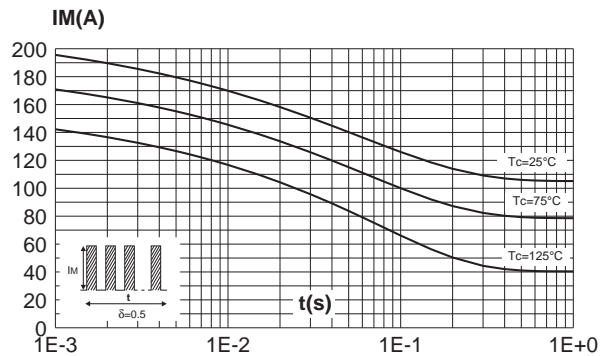
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



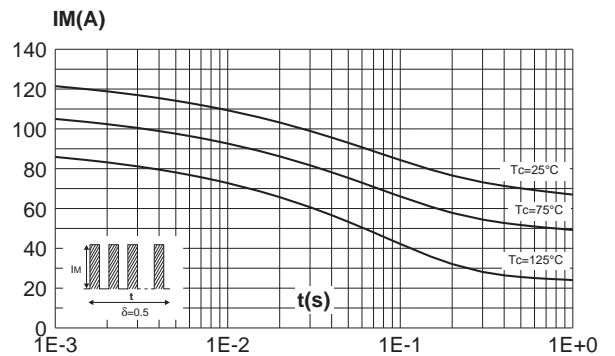
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



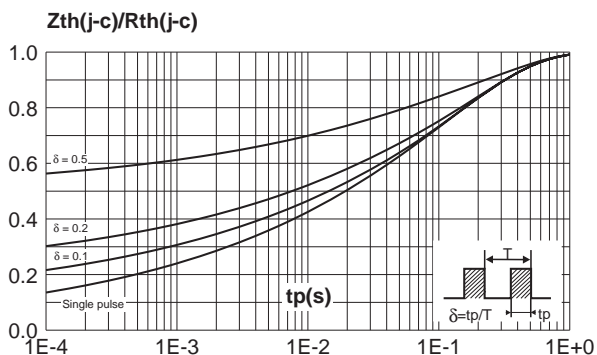
**Fig. 5-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



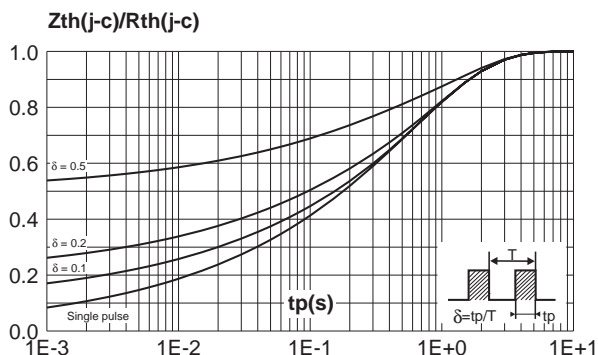
**Fig. 5-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220FPAB only).



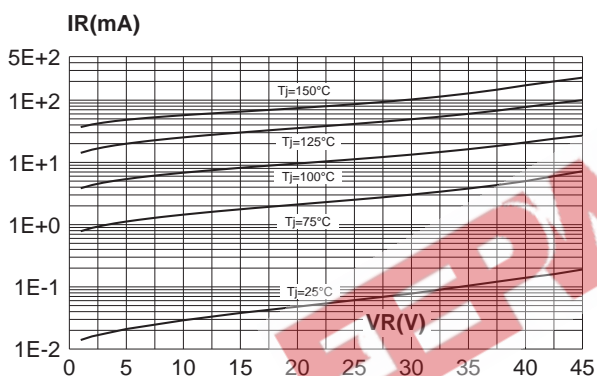
**Fig. 6-1:** Relative variation of thermal impedance junction to case versus pulse duration.



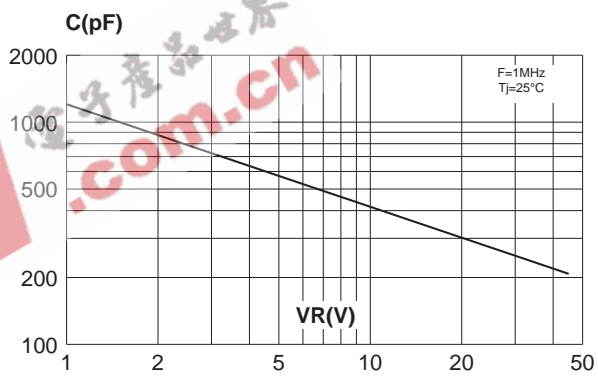
**Fig. 6-2:** Relative variation of thermal impedance junction to case versus pulse duration. (TO-220FPAB)



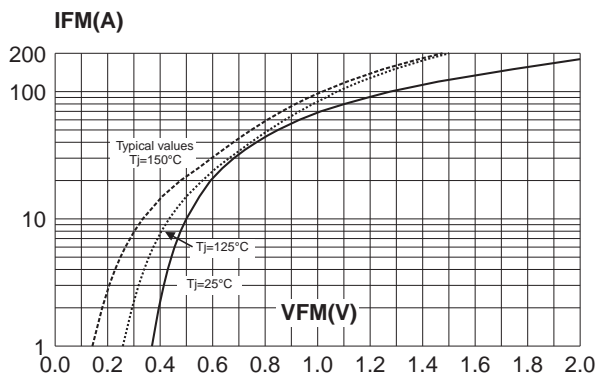
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



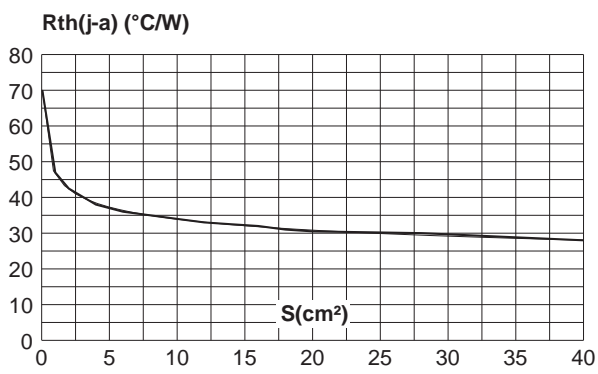
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values, per diode).



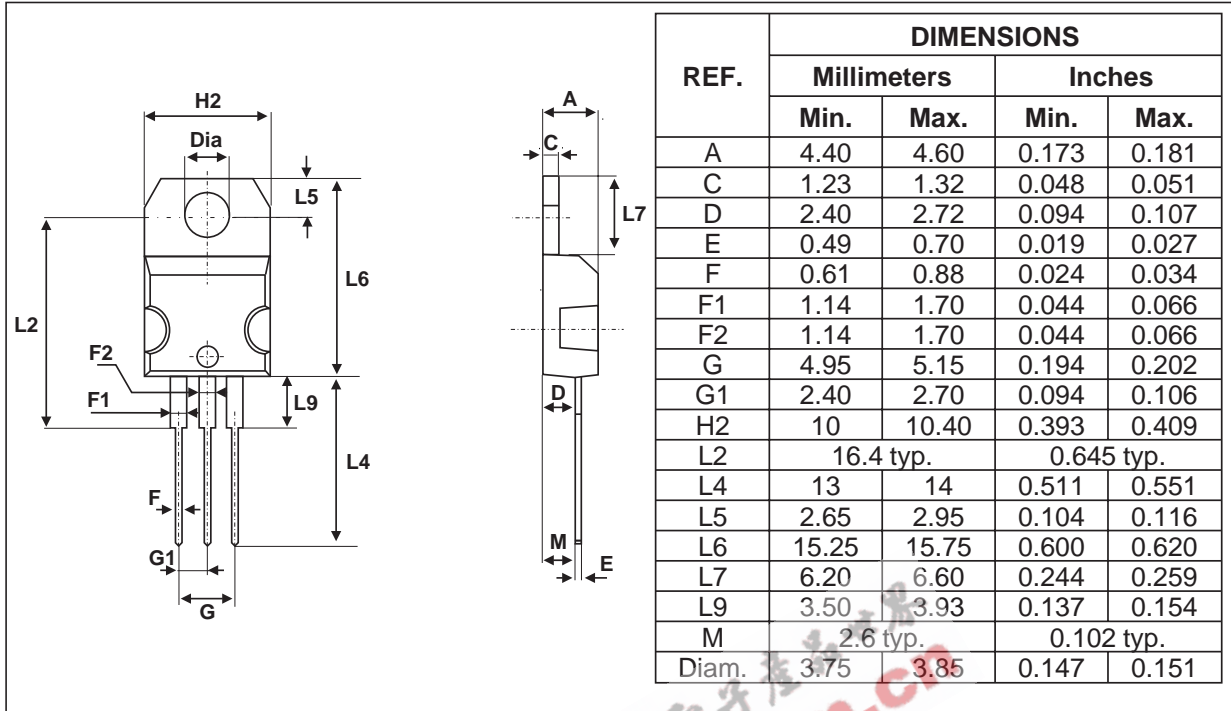
**Fig. 9:** Forward voltage drop versus forward current (maximum values, per diode).



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

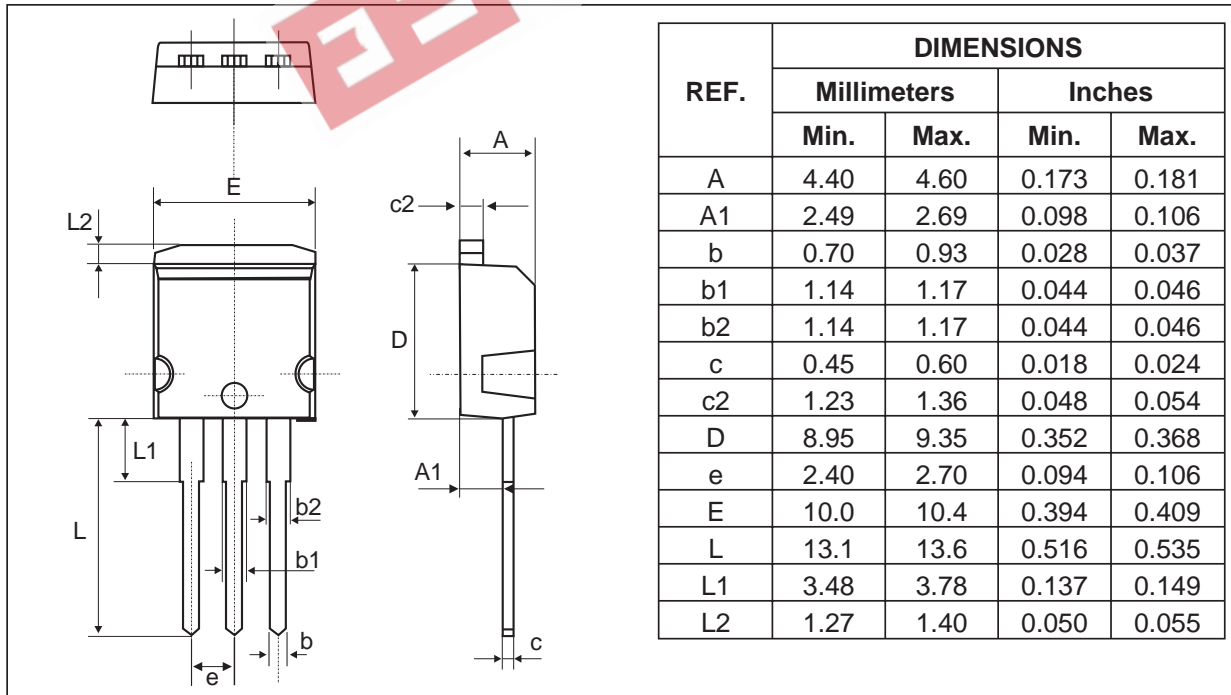


**PACKAGE MECHANICAL DATA**  
TO-220AB

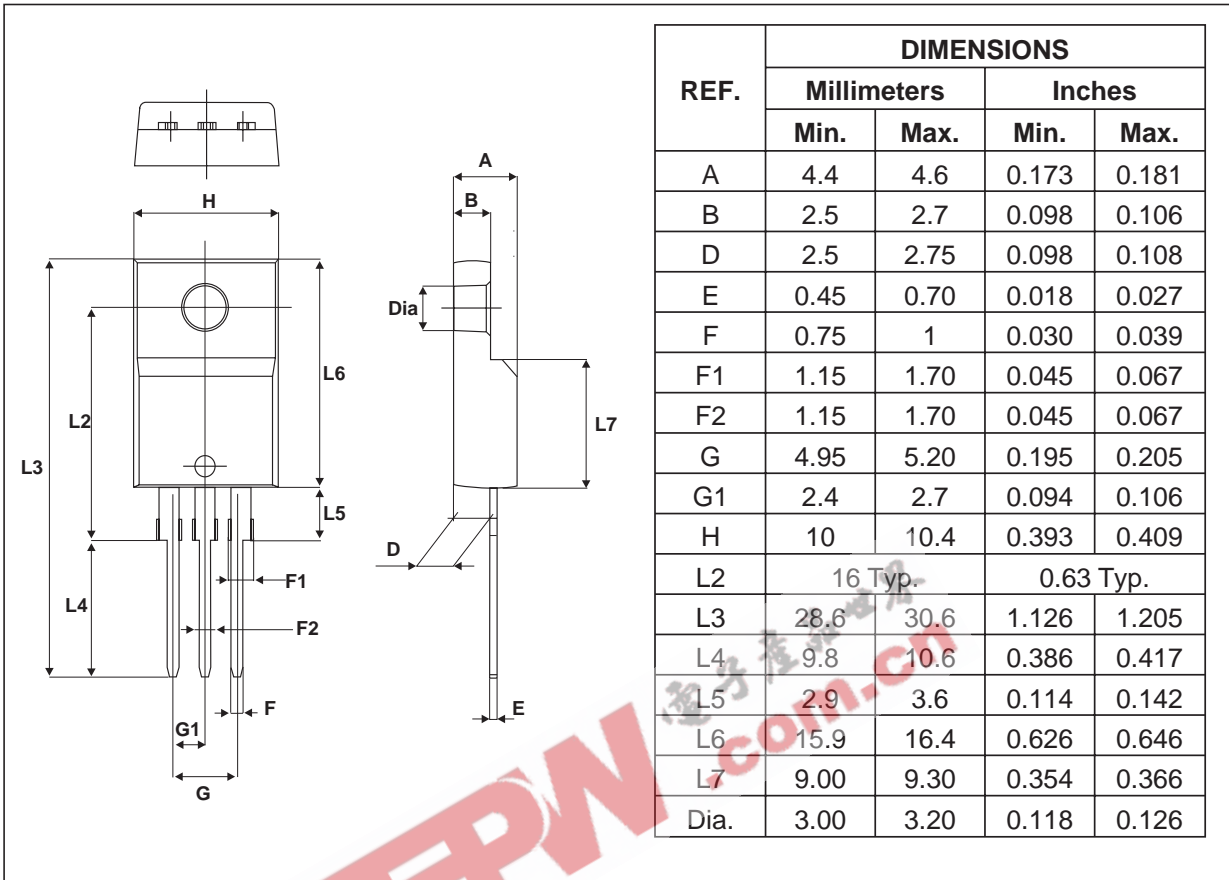


- Cooling method : C
- Recommended torque value : 0.55 m.N
- Maximum torque value : 0.70 m.N

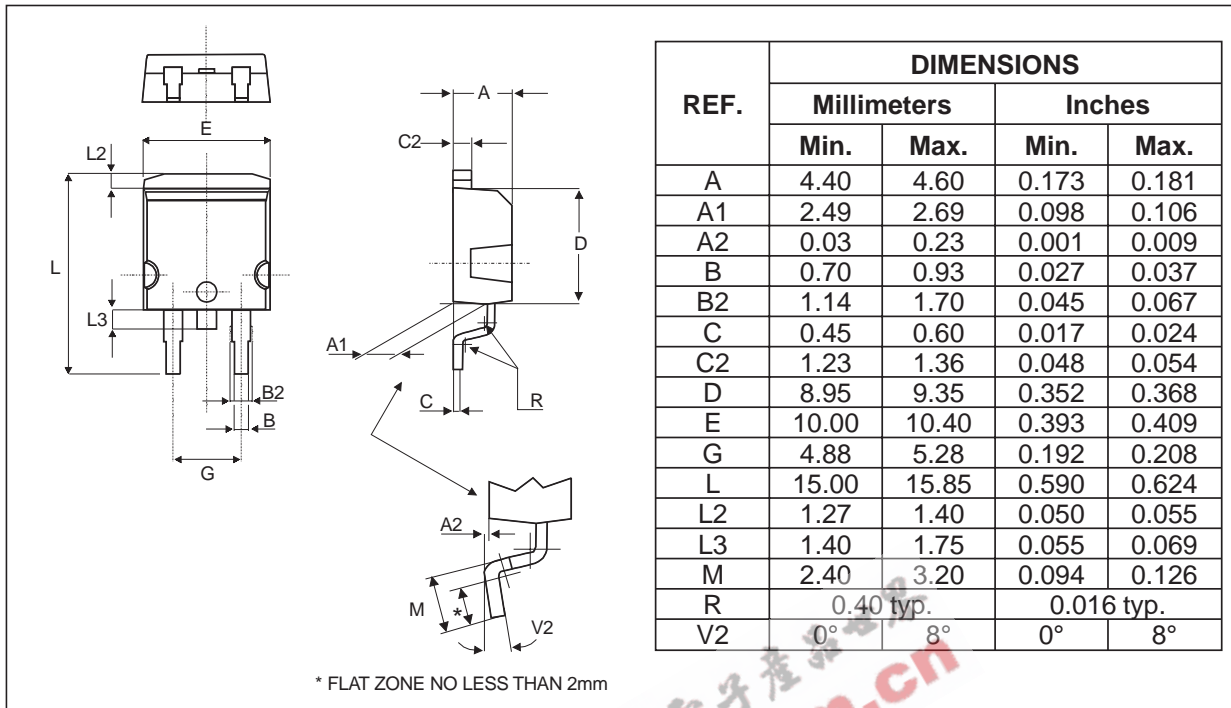
**PACKAGE MECHANICAL DATA**  
I<sup>2</sup>PAK



PACKAGE MECHANICAL DATA  
TO-220FPAB

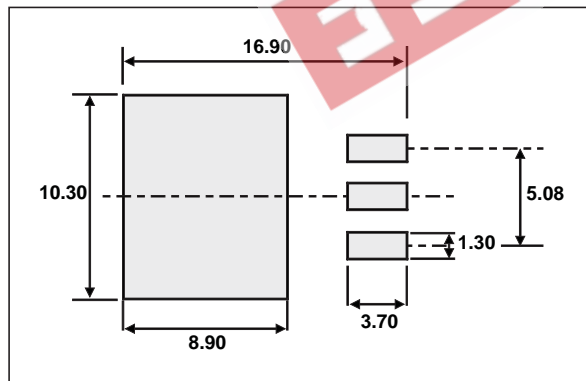


**PACKAGE MECHANICAL DATA**  
D<sup>2</sup>PAK



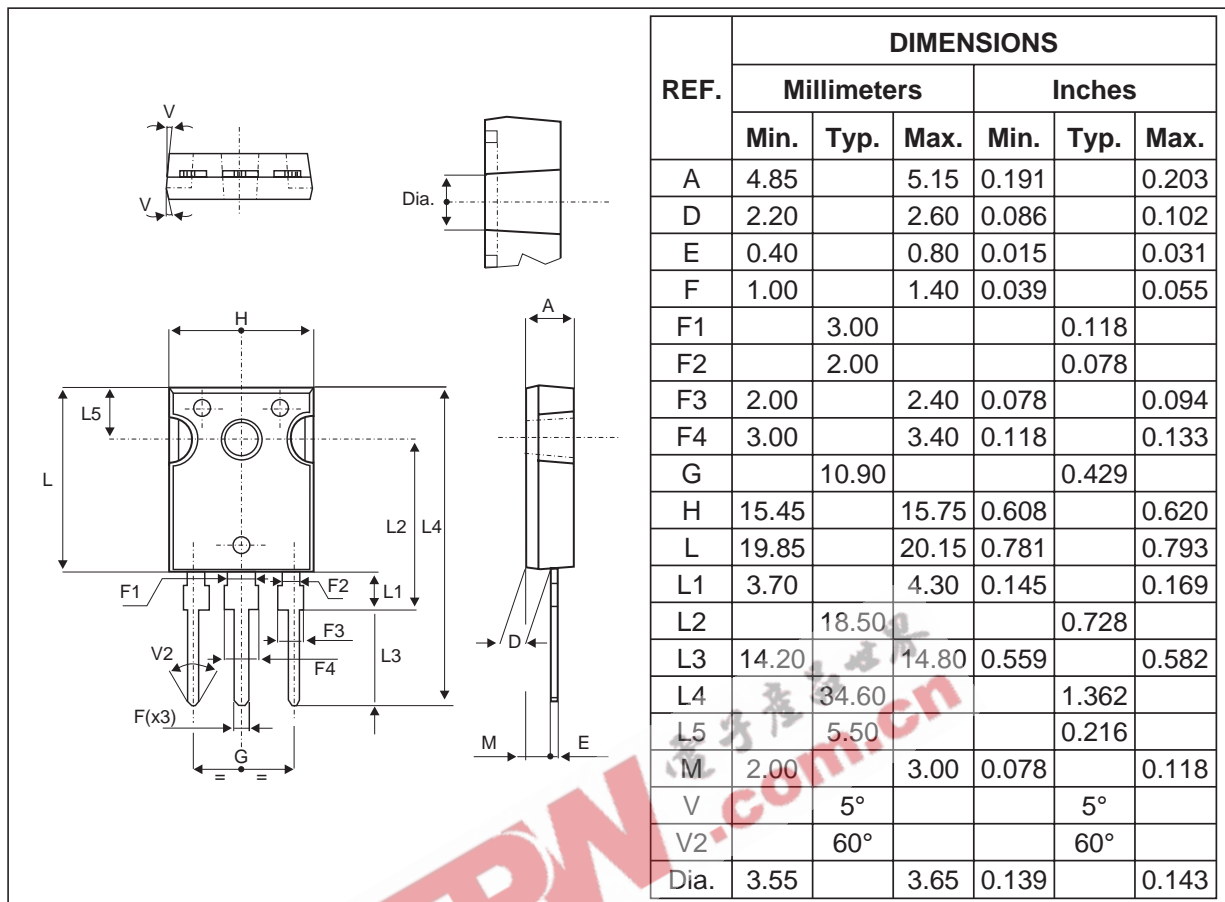
- Cooling method : by conduction (method C)

**FOOT PRINT (in millimeters)**  
D<sup>2</sup>PAK



**STPS30L45CG/CR/CT/CW/CFP**

**PACKAGE MECHANICAL DATA**  
TO-247



- Cooling method : C
- Recommended torque value : 0.8m.N
- Maximum torque value : 1.0m.N

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS30L45CT	STPS30L45CT	TO-220AB	2g	50	Tube
STPS30L45CG	STPS30L45CG	D <sup>2</sup> PAK	1.8g	50	Tube
STPS30L45CG-TR	STPS30L45CG	D <sup>2</sup> PAK	1.8g	500	Tape & reel
STPS30L45CW	STPS30L45CW	TO-247	4.4g	30	Tube
STPS30L45CR	STPS30L45CR	I <sup>2</sup> PAK	1.4g	50	Tube
STPS30L45CFP	STPS30L45CFP	TO-220FPAB	1.9 g	50	Tube

- Epoxy meets UL94,V0

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