



STPS30L45CG/CR/CT/CW/CFP

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

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

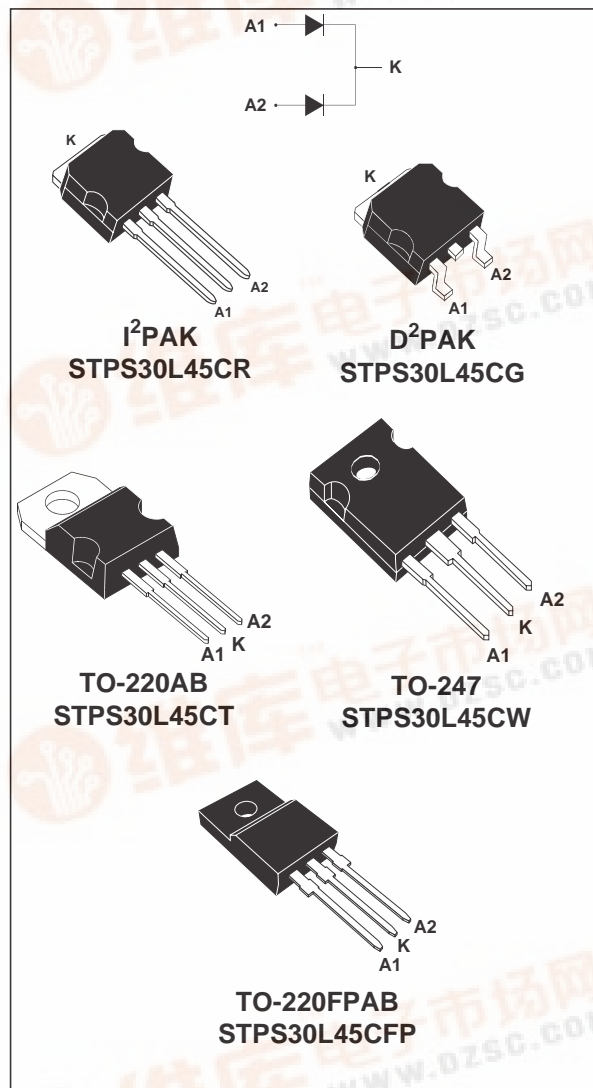
FEATURES AND BENEFITS

- 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, D²PAK and I²PAK these devices are 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			30	A	
I _{F(AV)}	Average forward current	TO-220FPAB	T _c = 110°C δ = 0.5	Per diode Per device	15 30	A
		TO-220AB, TO-247, I ² PAK, D ² PAK	T _c = 135°C δ = 0.5			
I _{FSM}	Surge non repetitive forward current		tp = 10 ms Sinusoidal	220	A	
I _{RRM}	Repetitive peak reverse current		tp = 2 μs square F=1kHz	1	A	
I _{RSM}	Non repetitive peak reverse current		tp = 100 μs square	3	A	
P _{ARM}	Repetitive peak avalanche power		tp = 1 μs T _j = 25°C	6000	W	
T _{stg}	Storage temperature range			- 65 to + 150	°C	
T _j	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 _{th(j-c)}	Junction to case	TO-220FPAB	Per diode Total	4 3.2	°C/W
		TO-220AB, TO-247, I ² PAK, D ² PAK	Per diode Total	1.60 0.85	
R _{th(c)}		TO-220FPAB	Coupling	2.5	°C/W
		TO-220AB, TO-247, I ² PAK, D ² 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 _R *	Reverse leakage current	T _j = 25°C	V _R = V _{RRM}			0.4	mA
		T _j = 125°C			100	200	mA
V _F *	Forward voltage drop	T _j = 25°C	I _F = 15 A			0.55	V
		T _j = 125°C	I _F = 15 A		0.42	0.50	
		T _j = 25°C	I _F = 30 A			0.74	
		T _j = 125°C	I _F = 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).

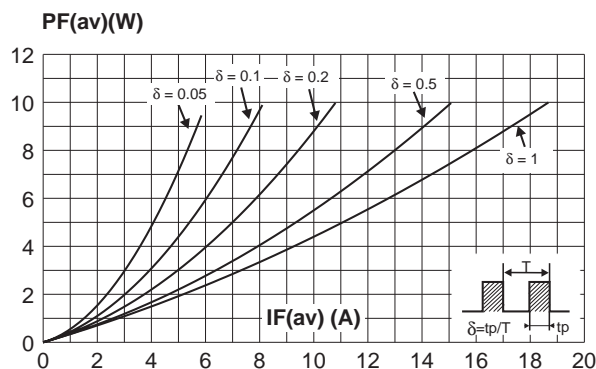


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$, per diode).

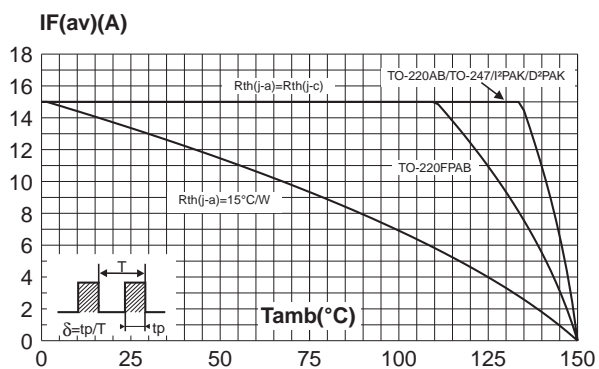


Fig. 3: Normalized avalanche power derating versus pulse duration.

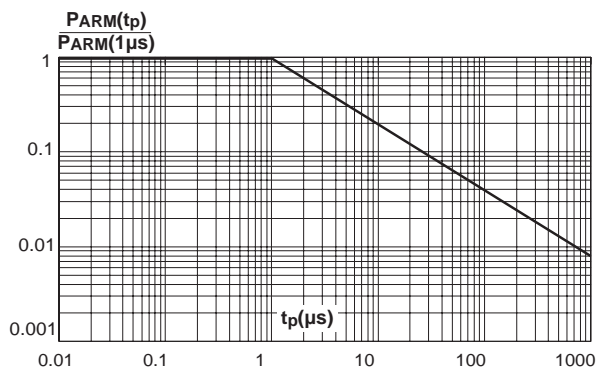


Fig. 4: Normalized avalanche power derating versus junction temperature.

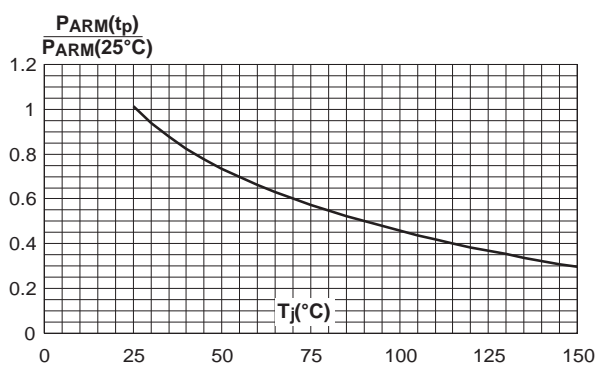


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode).

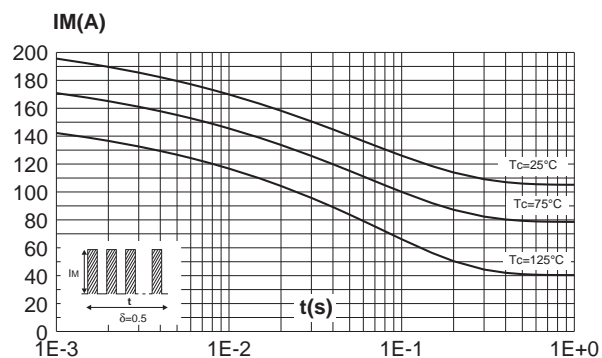
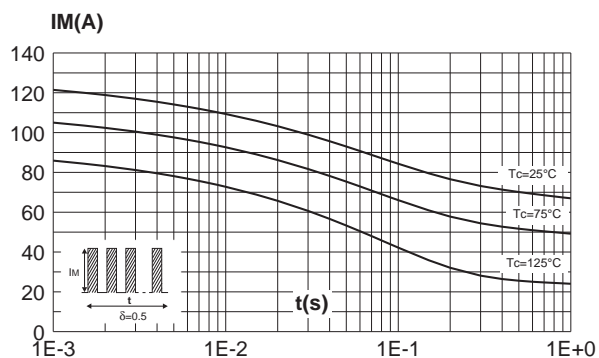


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220FPAB only).



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

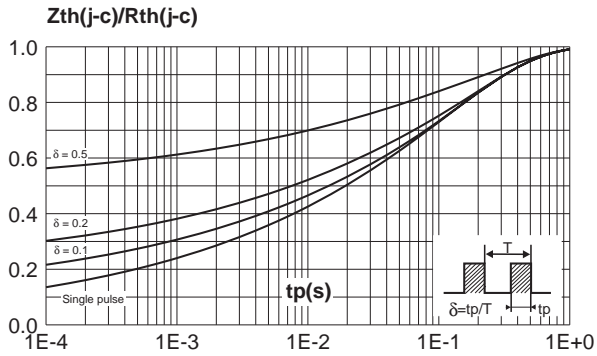


Fig. 6-2: Relative variation of thermal impedance junction to case versus pulse duration. (TO-220FPAB)

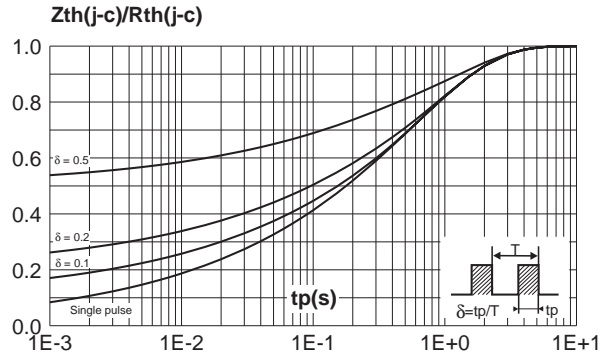


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

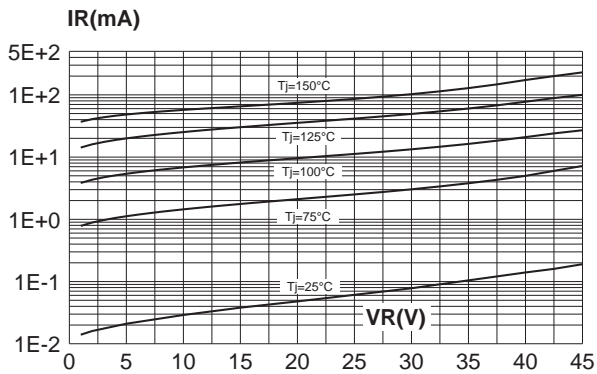


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

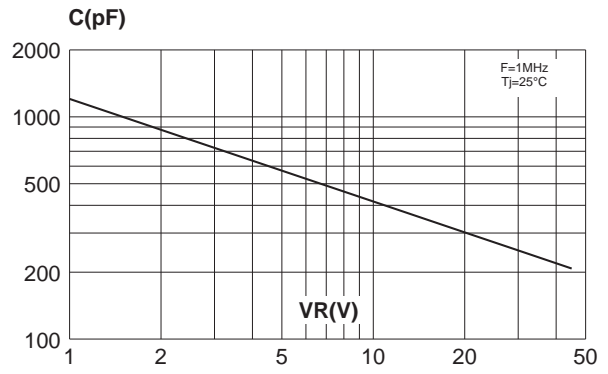


Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

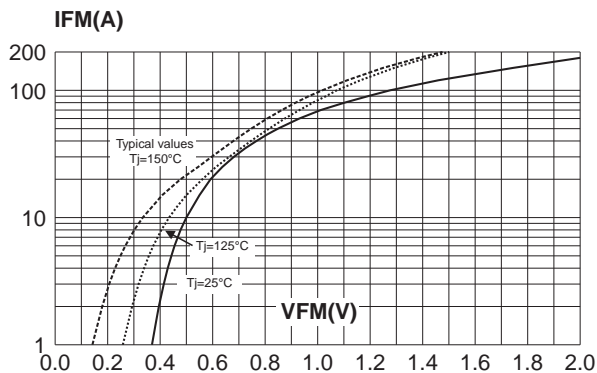
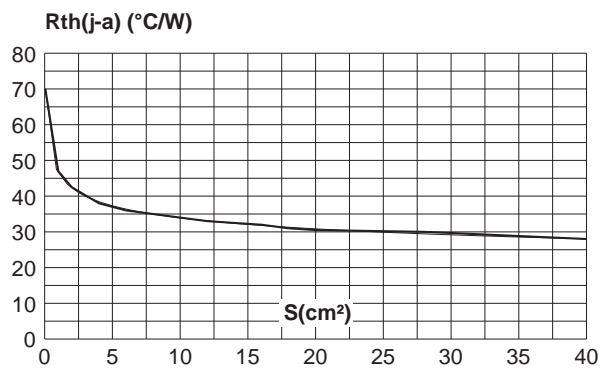
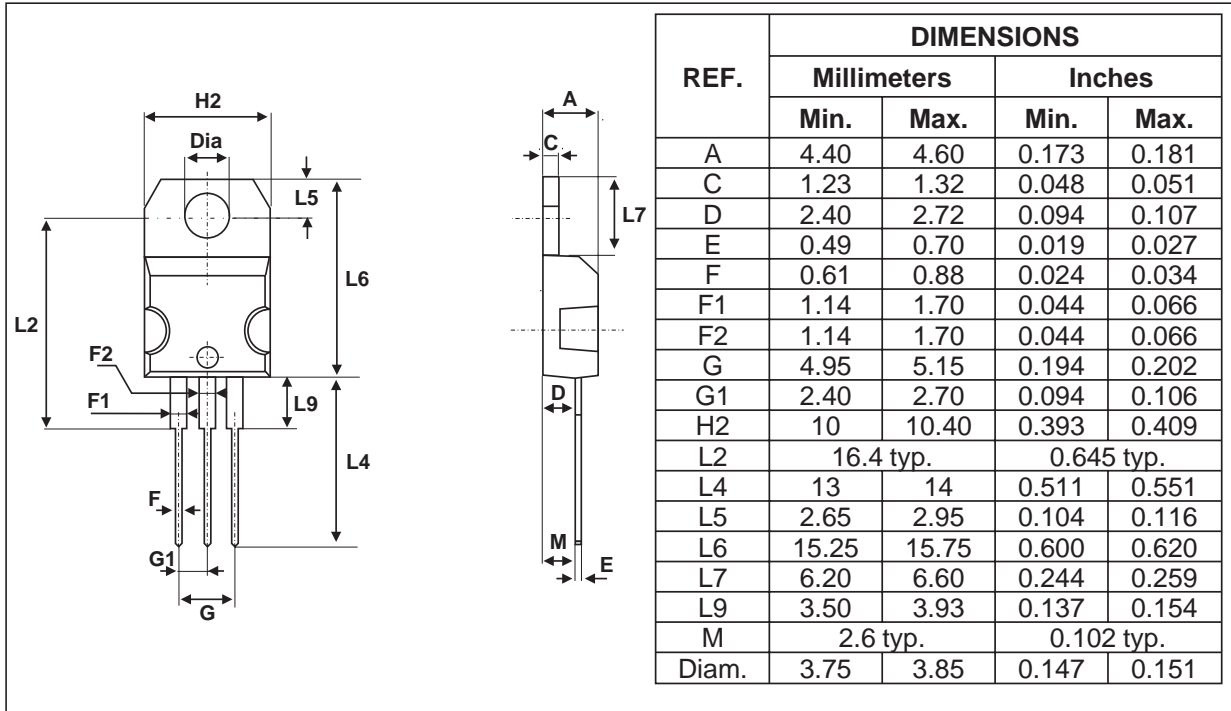


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab for D²PAK (Epoxy printed circuit board FR4, copper thickness: 35µm).

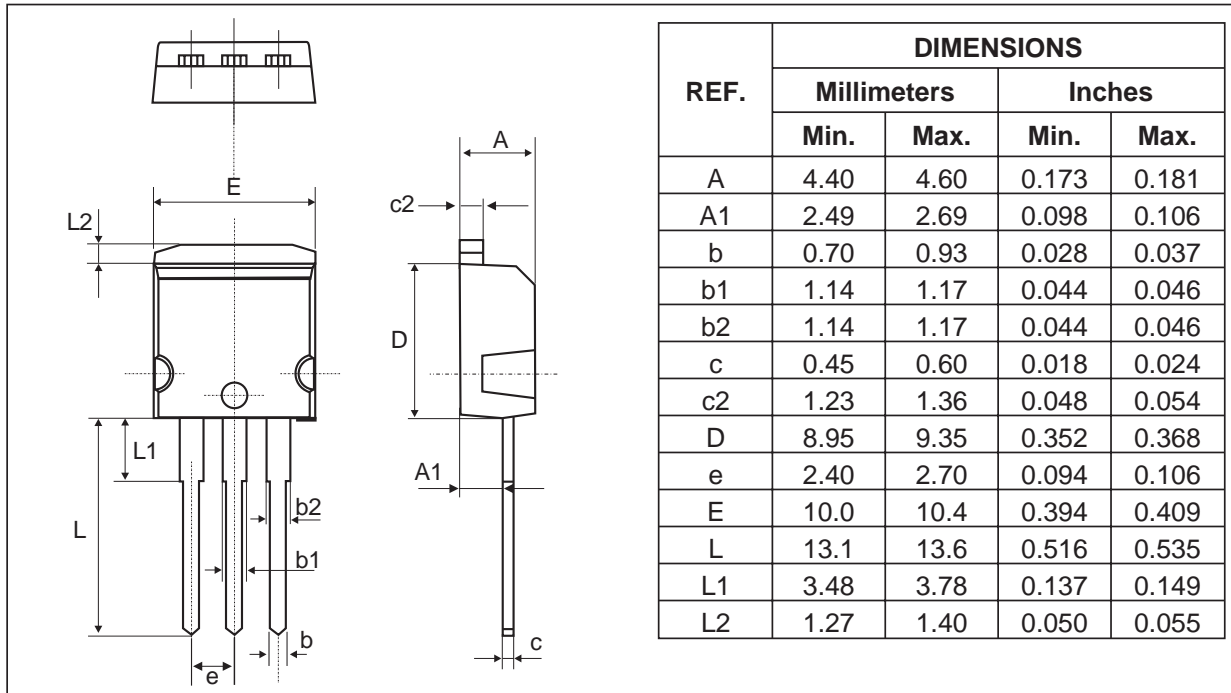


PACKAGE MECHANICAL DATA
TO-220AB



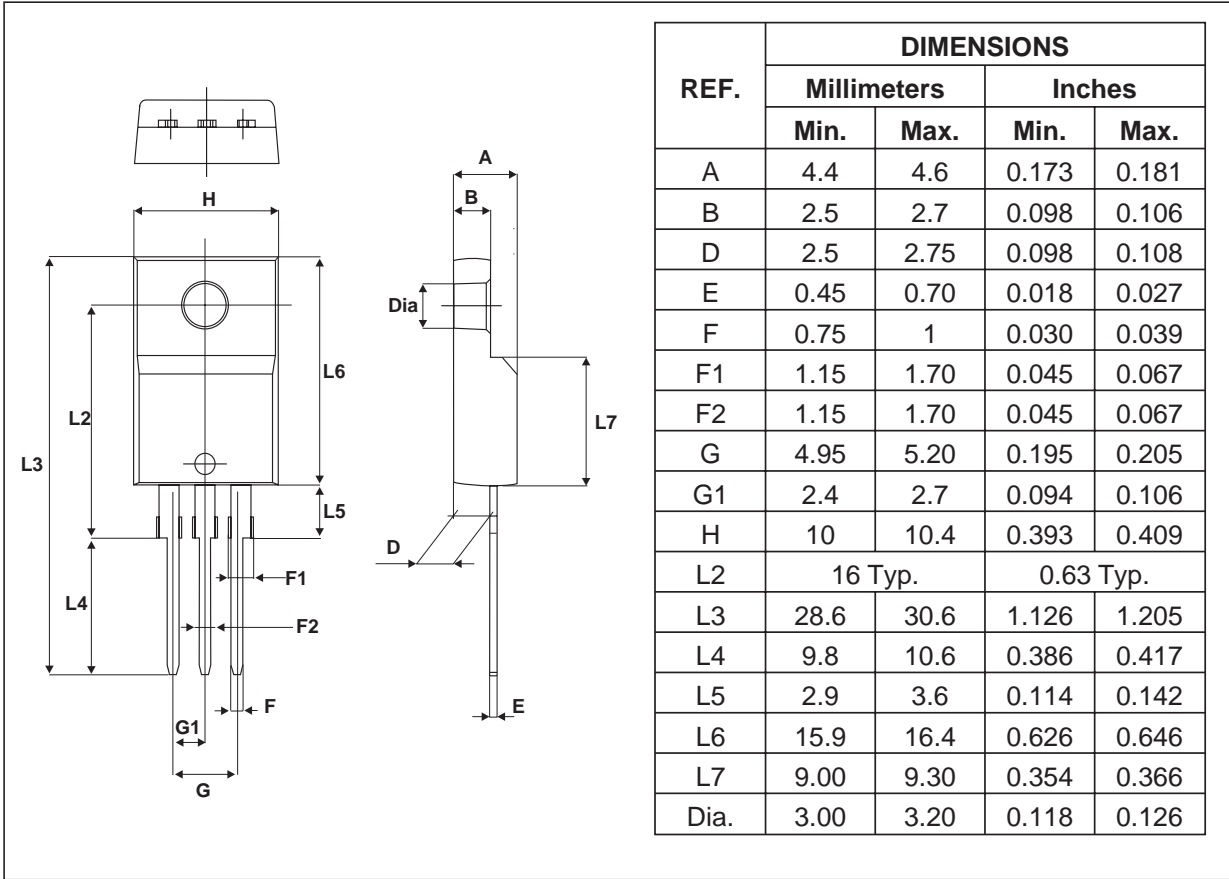
- Cooling method : C
- Recommended torque value : 0.55 m.N
- Maximum torque value : 0.70 m.N

PACKAGE MECHANICAL DATA
I²PAK

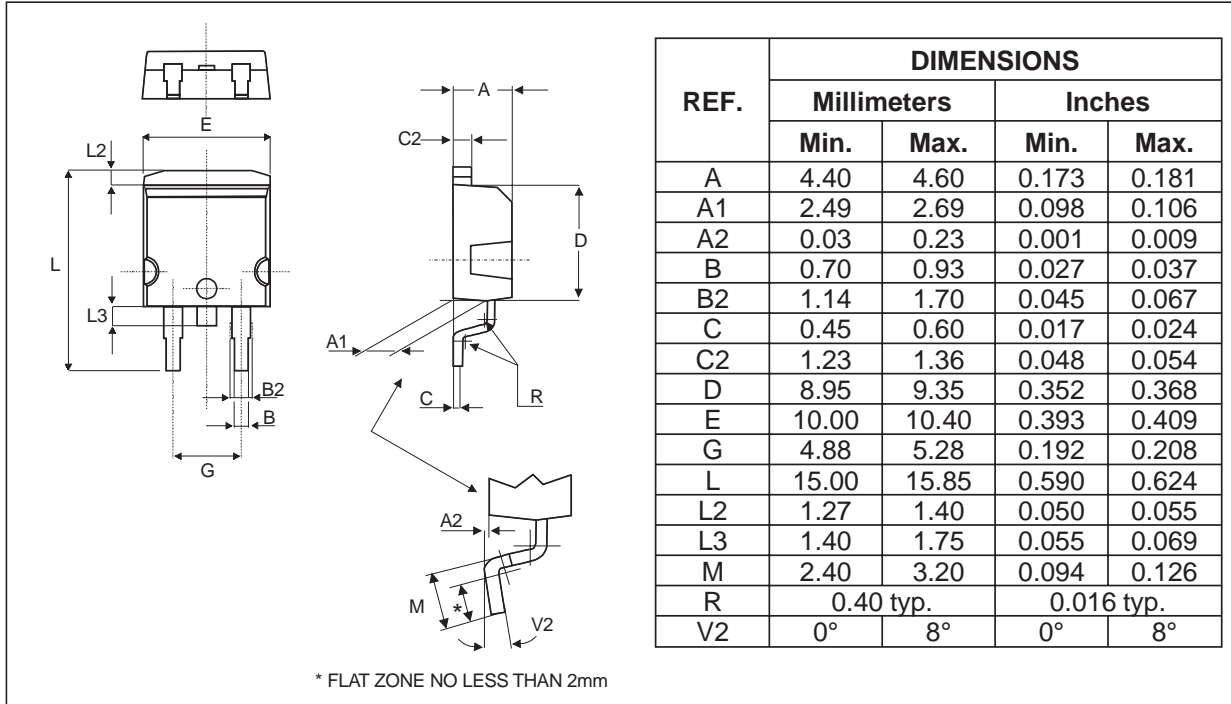


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PACKAGE MECHANICAL DATA
TO-220FPAB

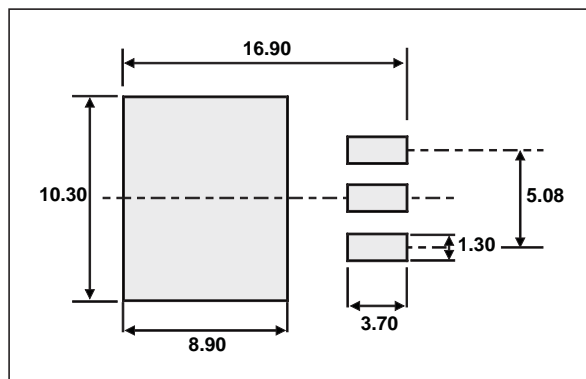


PACKAGE MECHANICAL DATA
D²PAK



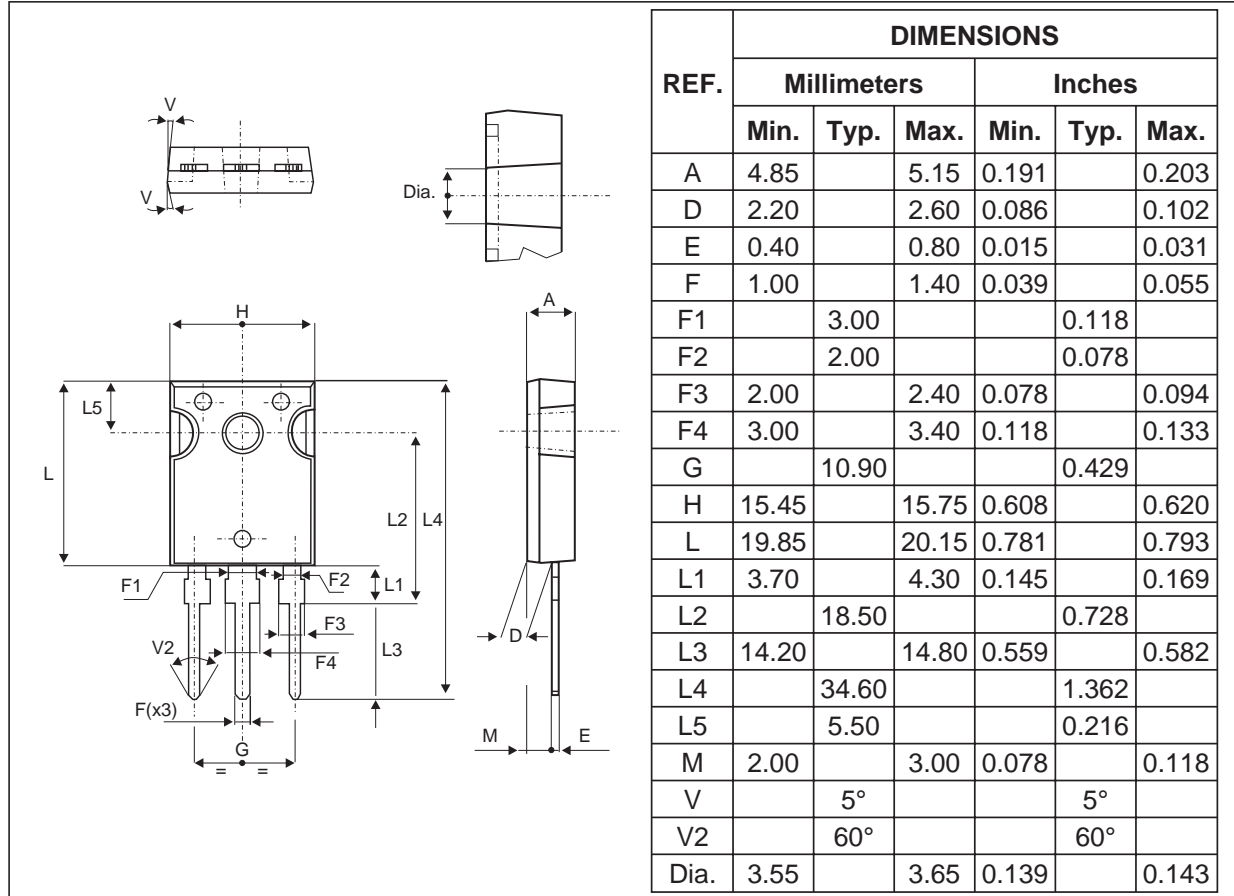
- Cooling method : by conduction (method C)

FOOT PRINT (in millimeters)
D²PAK



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 ² PAK	1.8g	50	Tube
STPS30L45CG-TR	STPS30L45CG	D ² PAK	1.8g	500	Tape & reel
STPS30L45CW	STPS30L45CW	TO-247	4.4g	30	Tube
STPS30L45CR	STPS30L45CR	I ² PAK	1.4g	50	Tube
STPS30L45CFP	STPS30L45CFP	TO-220FPAB	1.9 g	50	Tube

- Epoxy meets UL94,V0

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