



# STPS3045CT/CG/CR/CP/CPI/CW

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 15 A
$V_{RRM}$	45 V
$T_j(\text{max})$	175 °C
$V_F$	0.57 V

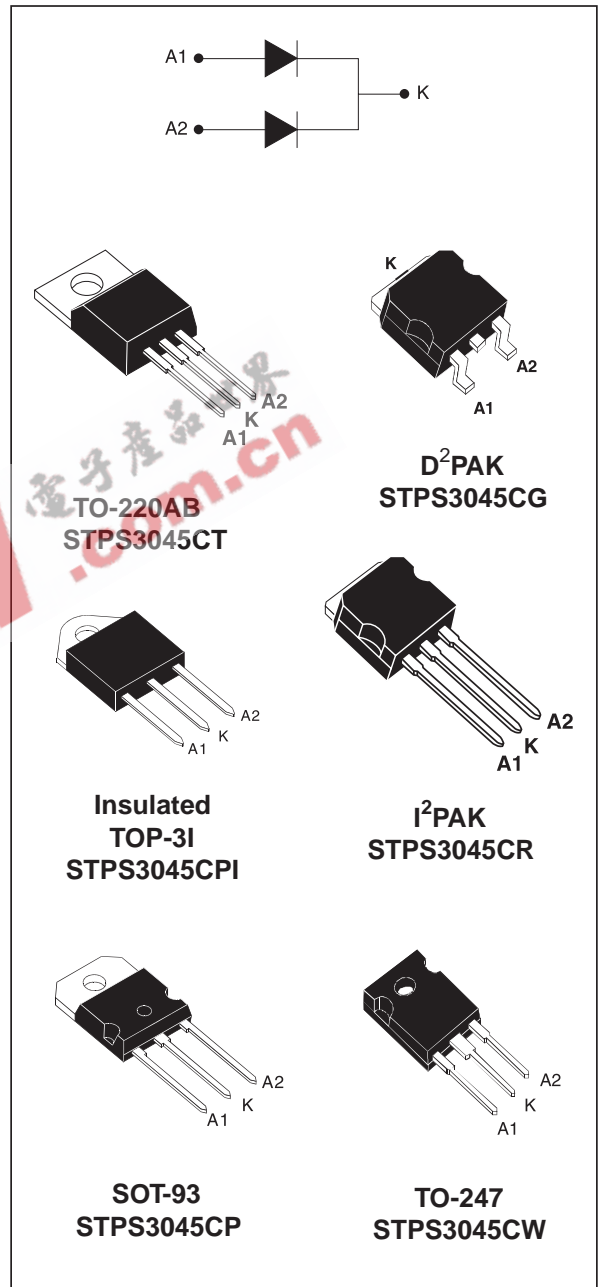
### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW THERMAL RESISTANCE
- INSULATED PACKAGE: TOP-3I  
Insulating voltage = 2500V RMS  
Capacitance = 12pF

### DESCRIPTION

Dual center tap Schottky rectifier suited for SwitchMode Power Supply and high frequency DC to DC converters.

Packaged either in TO-220AB, D<sup>2</sup>PAK, I<sup>2</sup>PAK, TO-247, SOT93 or TOP-3I, 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 <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 δ = 0.5	TO-220AB D <sup>2</sup> PAK / I <sup>2</sup> PAK SOT-93 TO-247	T <sub>c</sub> = 155°C	Per diode Per device	15 30	A
		TOP-3I	T <sub>c</sub> = 150°C			
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	
T <sub>stg</sub>	Storage temperature range			-65 to +175	°C	
T <sub>j</sub>	Maximum operating junction temperature *			175	°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-220AB D <sup>2</sup> PAK / I <sup>2</sup> PAK	Per diode Total	1.60 0.85	°C/W
		SOT-93 TO-247	Per diode Total	1.5 0.8	
		TOP-3I	Per diode Total	2.2 1.6	
R <sub>th(c)</sub>		TO-220AB D <sup>2</sup> PAK / I <sup>2</sup> PAK SOT-93 TO-247	Coupling	0.10	
		TOP-3I	Coupling	1.0	

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)

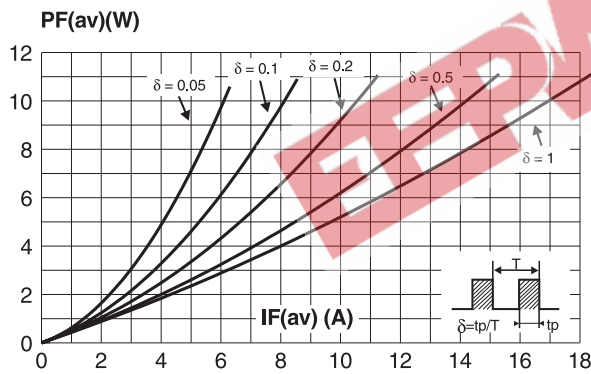
Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			200	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			11	40	mA
$V_F^*$	Forward voltage drop	$T_j = 125^\circ\text{C}$	$I_F = 15\text{ A}$		0.5	0.57	V
		$T_j = 25^\circ\text{C}$	$I_F = 30\text{ A}$			0.84	
		$T_j = 125^\circ\text{C}$	$I_F = 30\text{ A}$		0.65	0.72	

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

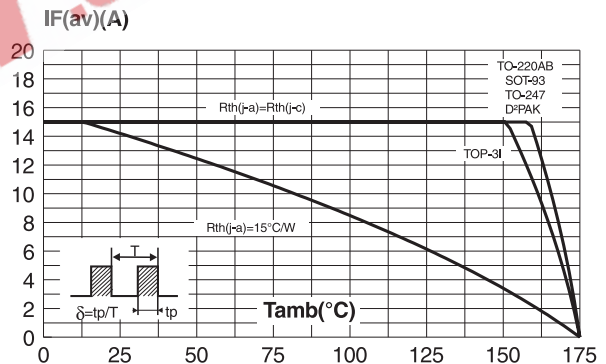
To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.01 \times I_{F(RMS)}^2$$

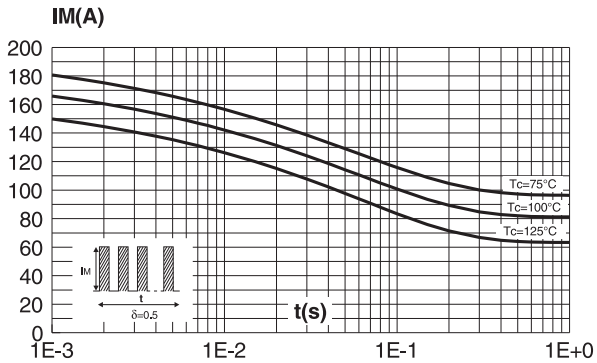
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



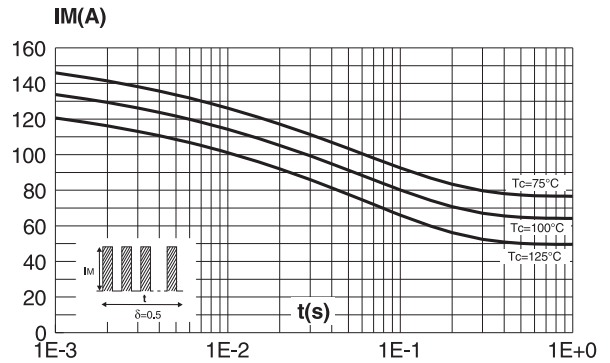
**Fig. 2:** Average current versus ambient temperature ( $\delta = 0.5$ , per diode).



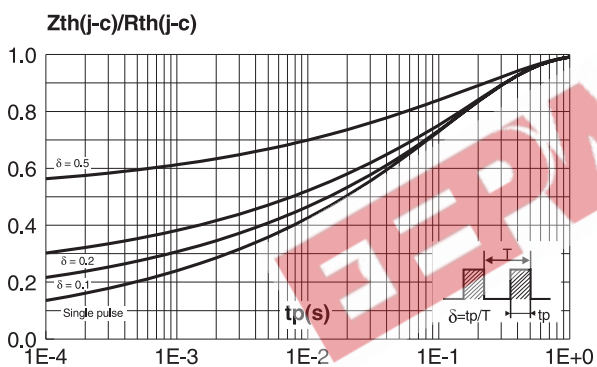
**Fig. 3-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB, D<sup>2</sup>PAK, I<sup>2</sup>PAK, SOT-93 and TO-247).



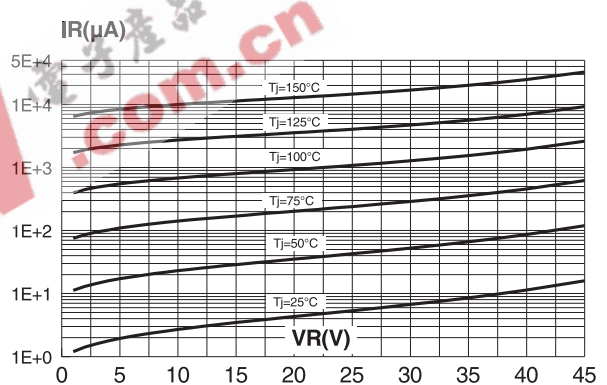
**Fig. 3-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TOP-3I).



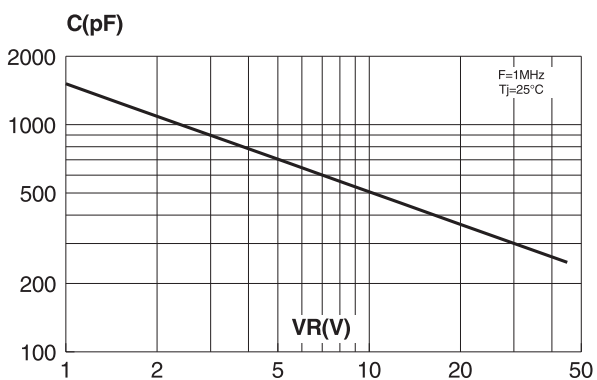
**Fig. 4:** Relative variation of thermal transient impedance junction to case versus pulse duration.



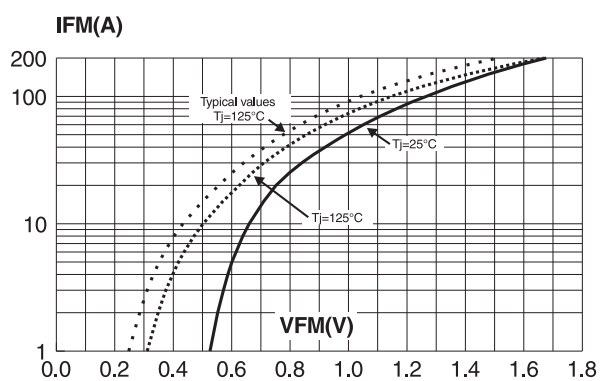
**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



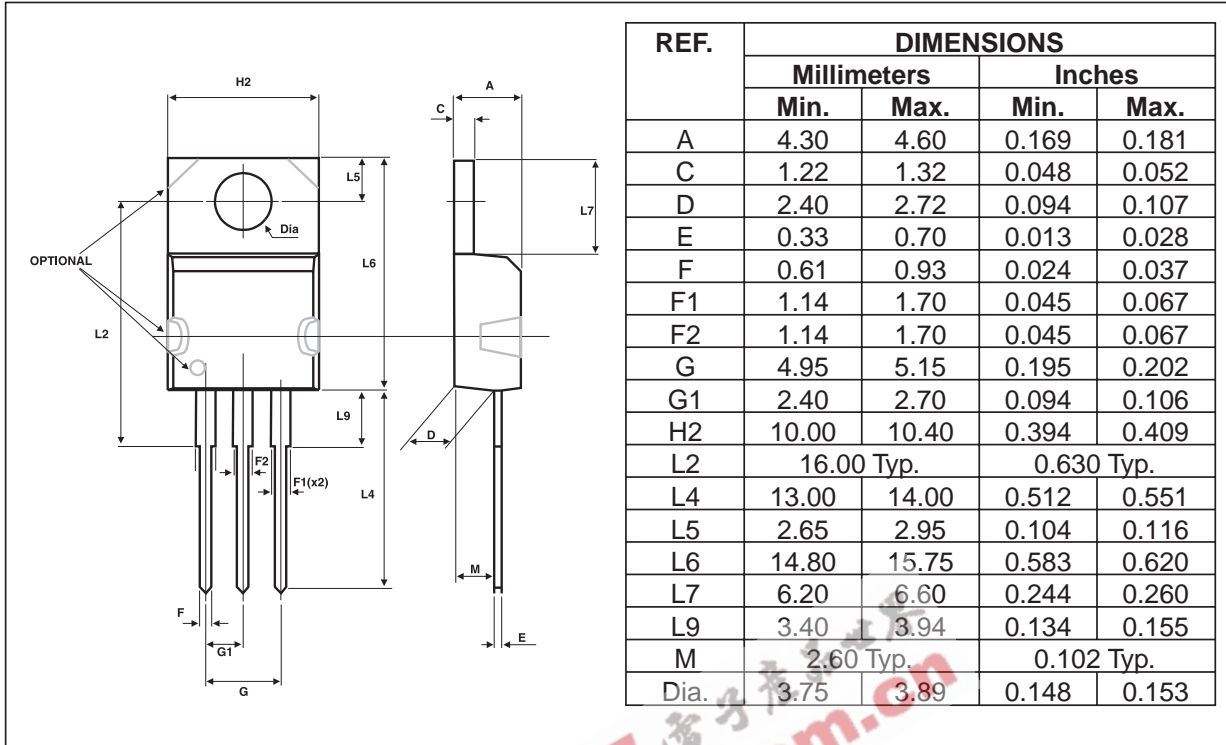
**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values, per diode).



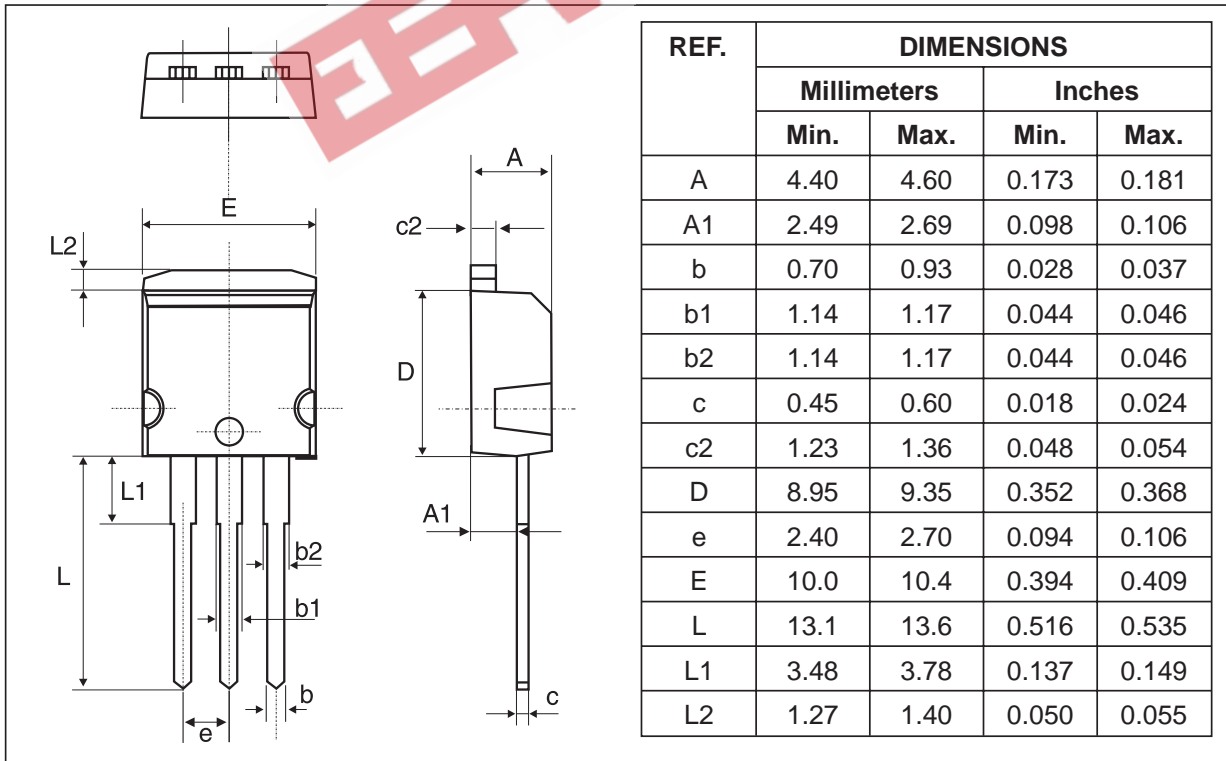
**Fig. 7:** Forward voltage drop versus forward current (maximum values, per diode).



**PACKAGE MECHANICAL DATA**  
TO-220AB

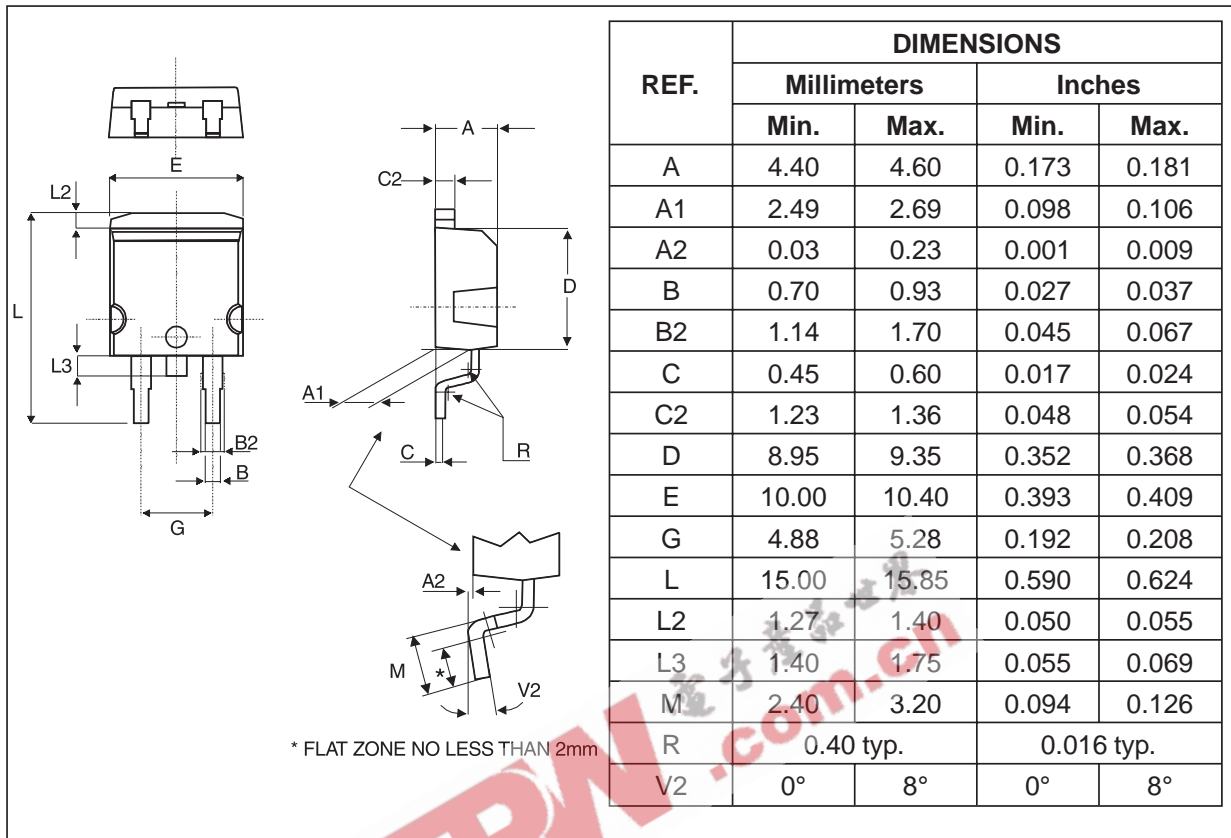


**PACKAGE MECHANICAL DATA**  
I<sup>2</sup>PAK

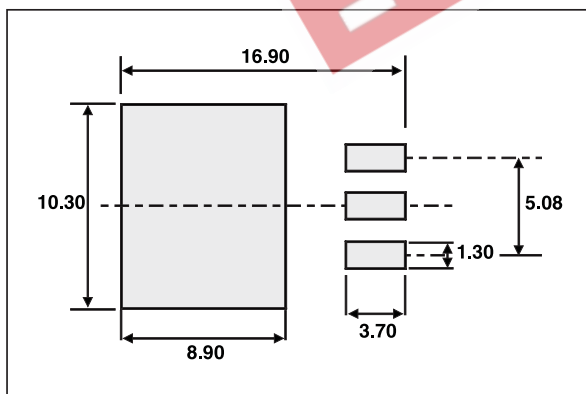


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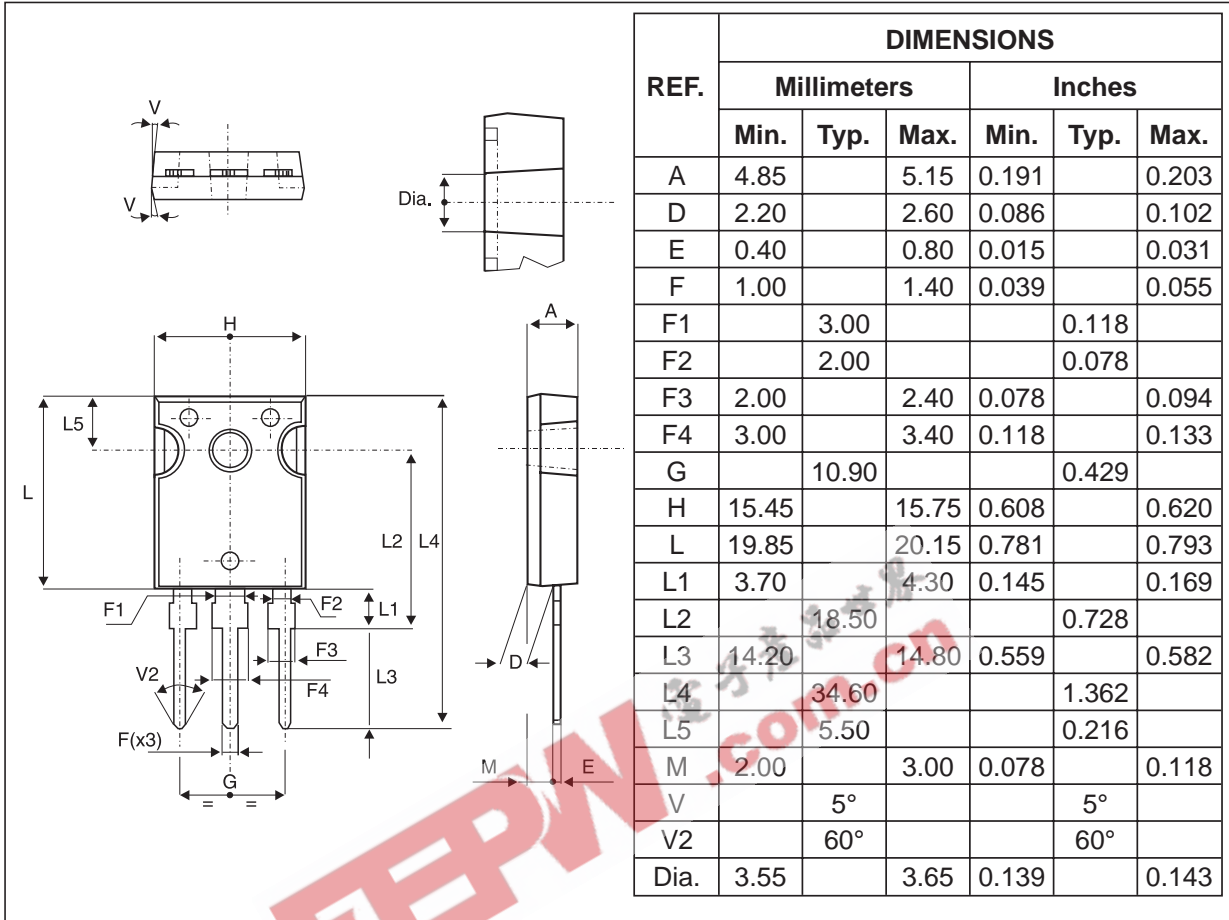
PACKAGE MECHANICAL DATA  
D<sup>2</sup>PAK



FOOTPRINT DIMENSIONS (in millimeters)

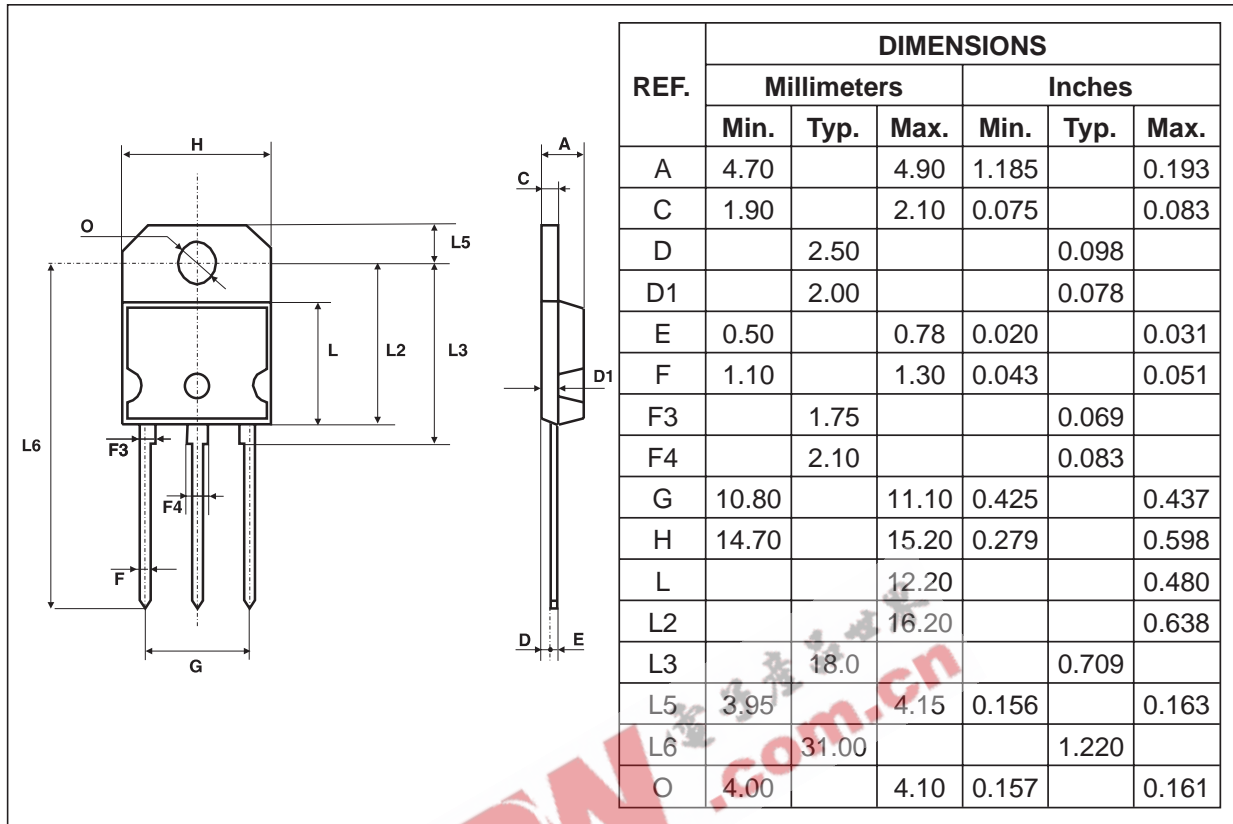


PACKAGE MECHANICAL DATA  
TO-247

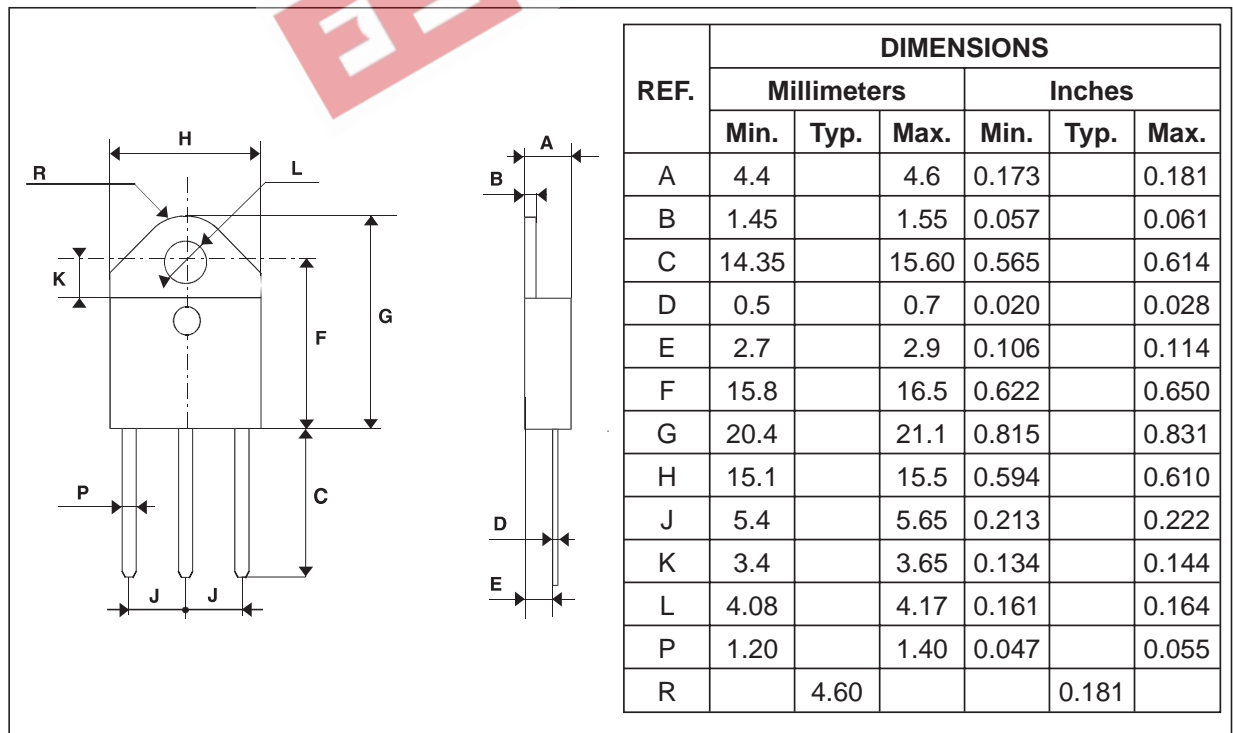


# STPS3045CT/CG/CR/CP/CPI/CW

## PACKAGE MECHANICAL DATA SOT-93



## PACKAGE MECHANICAL DATA TOP-3I (isolated)





Type	Marking	Package	Weight	Base qty	Delivery mode
STPS3045CT	STPS3045CT	TO-220AB	2.23 g.	50	Tube
STPS3045CG	STPS3045CG	D <sup>2</sup> PAK	1.48 g.	50	Tube
STPS3045CG-TR	STPS3045CG	D <sup>2</sup> PAK	1.48 g.	1000	Tape & reel
STPS3045CR	STPS3045CR	I <sup>2</sup> PAK	1.48 g	50	Tube
STPS3045CP	STPS3045CP	SOT-93	3.97 g.	30	Tube
STPS3045CPI	STPS3045CPI	TOP-3I	4.46 g.	120	Bulk
STPS3045CW	STPS3045CW	TO-247	4.46 g.	30	Tube

- Cooling method: by conduction (C)
- Recommended torque value (SOT-93, TOP-3I, TO-247): 0.8 N.m.
- Recommended torque value (TO-220AB): 0.55 N.m.
- Maximum torque value (SOT-93, TOP-3I, TO-247): 1.0 N.m.
- Maximum torque value (TO-220AB): 0.7 N.m.
- Epoxy meets UL94,V0


  
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