



# STPS3045CT/CG/CP/CPI/CW

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

I <sub>F(AV)</sub>	2 x 15 A
V <sub>RMM</sub>	45 V
T <sub>j(max)</sub>	175 °C
V <sub>F</sub>	0.57 V

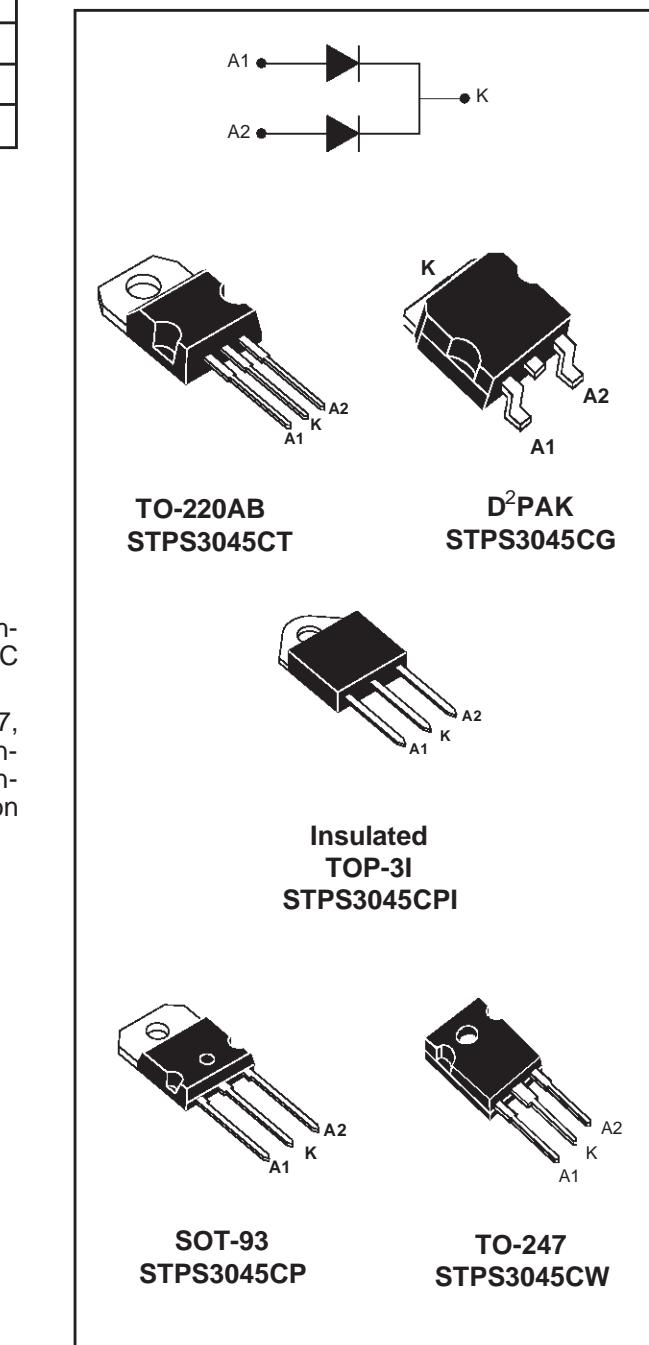
### FEATURES AND BENEFITS

- 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 Switch-Mode Power Supply and high frequency DC to DC converters.

Packaged either in TO-220AB, D<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 $\delta = 0.5$	TO-220AB D <sup>2</sup> PAK SOT-93 TO-247	T <sub>c</sub> = 155°C	Per diode Per device	15	A			
		TOP-3I	T <sub>c</sub> = 150°C		30				
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>RSRM</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	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 SOT-93 TO-247	Coupling	0.10	
		TOP-3I	Coupling	1.0	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode 1}) = P (\text{diode1}) \times R_{th(j-c)} (\text{per diode}) + P (\text{diode 2}) \times R_{th(c)}$$

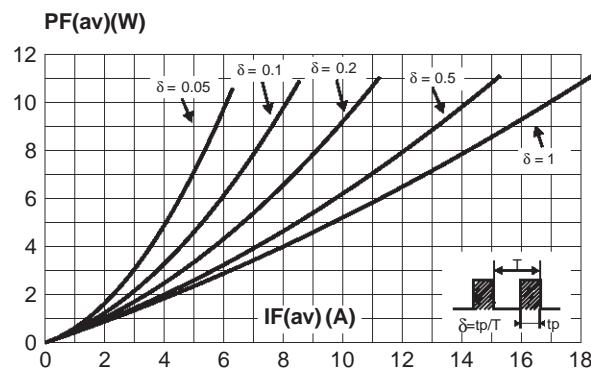
## STATIC ELECTRICAL CHARACTERISTICS (Per diode)

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	

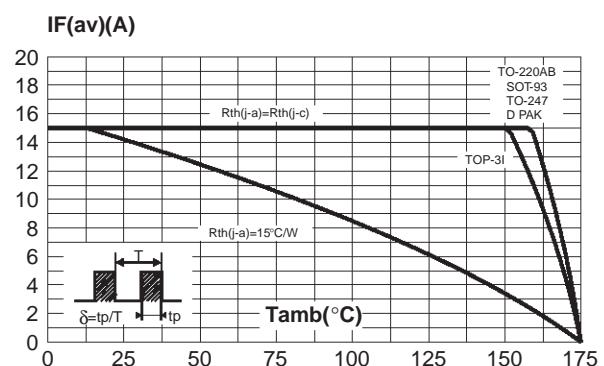
Pulse test : \*  $t_p = 380 \mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation :  
 $P = 0.42 \times I_{F(\text{AV})} + 0.01 I_{F(\text{RMS})}^2$

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

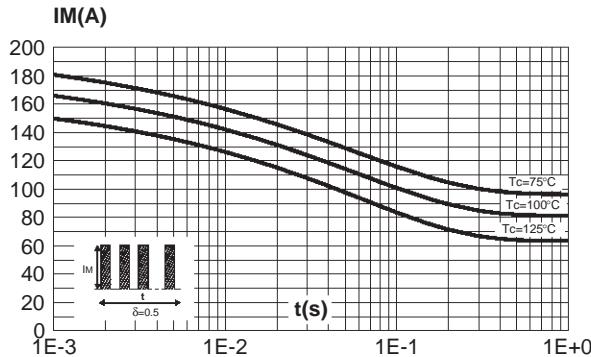


**Fig. 2:** Average current versus ambient temperature ( $\delta = 0.5$ , per diode).

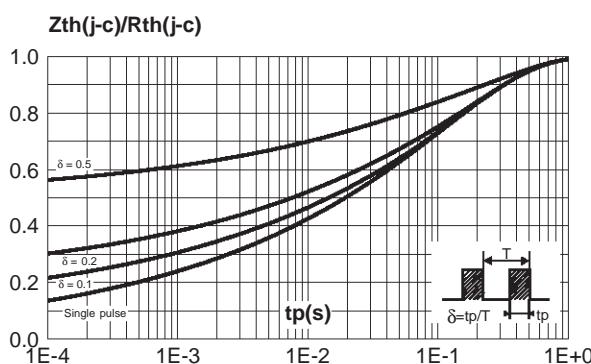


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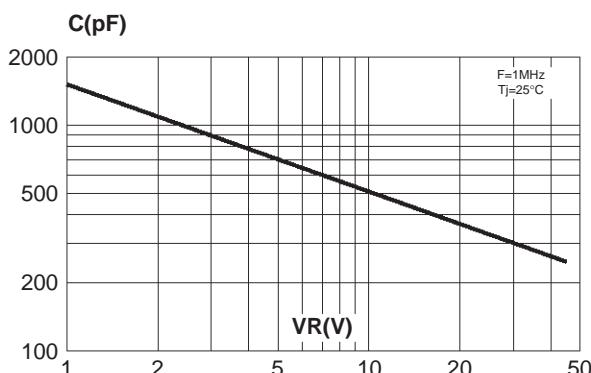
**Fig. 3-1:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB, D<sup>2</sup>PAK, SOT-93 and TO-247).



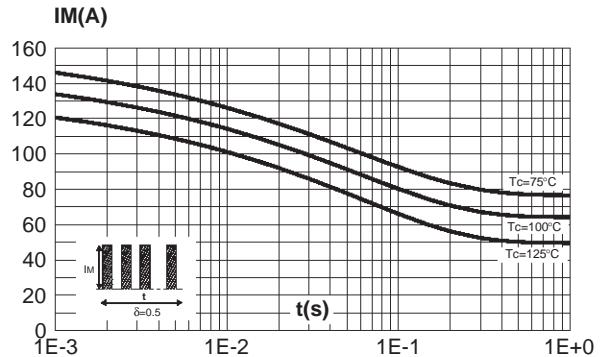
**Fig. 4:** Relative variation of thermal transient impedance junction to case versus pulse duration.



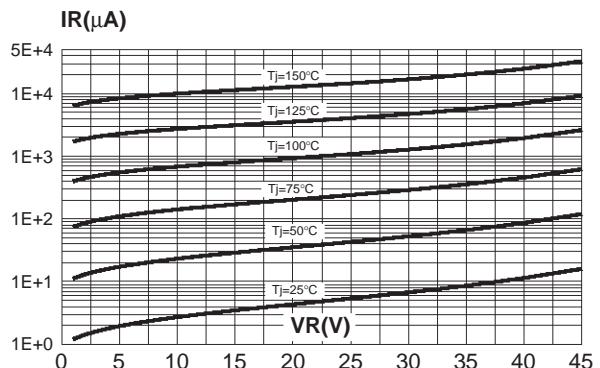
**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values, per diode).



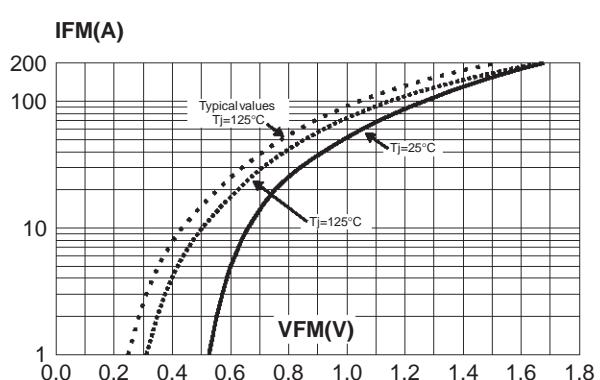
**Fig. 3-2:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TOP-3I).



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

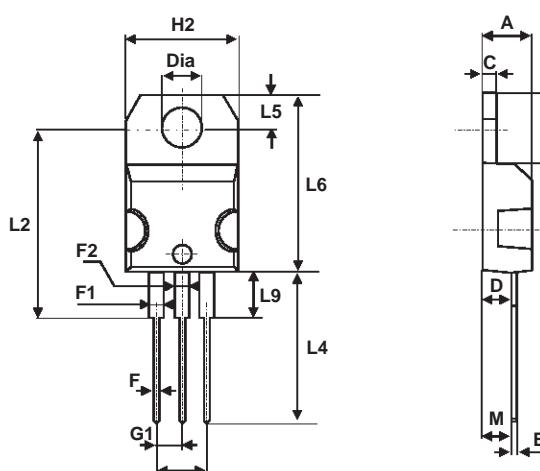


**Fig. 7:** Forward voltage drop versus forward current (maximum values, per diode).



**PACKAGE MECHANICAL DATA**  
TO-220AB

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
L2	16.4 typ.		0.645 typ.	
L4	13	14	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam.	3.75	3.85	0.147	0.151



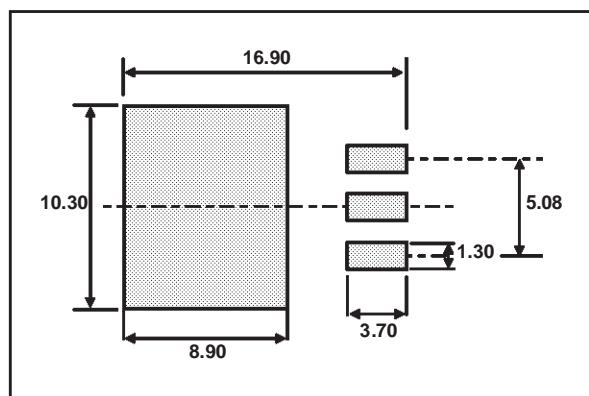
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### PACKAGE MECHANICAL DATA D<sup>2</sup>PAK

\* FLAT ZONE NO LESS THAN 2mm

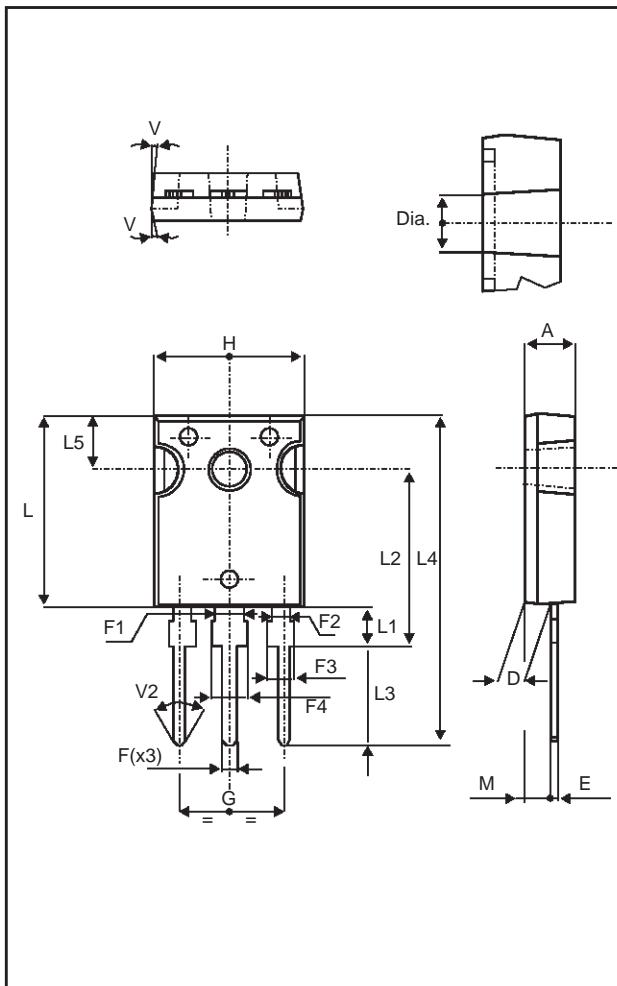
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

### FOOTPRINT DIMENSIONS (in millimeters)



**PACKAGE MECHANICAL DATA**  
TO-247

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143



The technical drawing illustrates the physical dimensions of the TO-247 package. Key features include a central body with two mounting holes (H), a lead frame with four lead tips (F1-F4), and a base with a central cavity (G). Various dimensions are labeled: L (total height), L1-L5 (heights of different sections), F1-F4 (lead tip widths), D (lead pitch), E (lead thickness), F (lead height), G (cavity depth), H (mounting hole diameter), and V (lead angle). The drawing also shows lead extraction points (V) and lead spread (V2).

## STPS3045CT/CG/CP/CPI/CW

### PACKAGE MECHANICAL DATA SOT-93

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.70		4.90	0.185		0.193
C	1.90		2.10	0.075		0.083
D		2.50			0.098	
D1		2.00			0.078	
E	0.50		0.78	0.020		0.031
F	1.10		1.30	0.043		0.051
F3		1.75			0.069	
F4		2.10			0.083	
G	10.80		11.10	0.425		0.437
H	14.70		15.20	0.279		0.598
L			12.20			0.480
L2			16.20			0.638
L3		18.0			0.709	
L5	3.95		4.15	0.156		0.163
L6		31.00			1.220	
O	4.00		4.10	0.157		0.161

## PACKAGE MECHANICAL DATA

TOP-3I (isolated)

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4			4.6	0.173	
B	1.45			1.55	0.057	
C	14.35			15.60	0.565	
D	0.5			0.7	0.020	
E	2.7			2.9	0.106	
F	15.8			16.5	0.622	
G	20.4			21.1	0.815	
H	15.1			15.5	0.594	
J	5.4			5.65	0.213	
K	3.4			3.65	0.134	
L	4.08			4.17	0.161	
P	1.20			1.40	0.047	
R		4.60			0.181	

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
STPS3045CP	STPS3045CP	SOT-93	3.97 g.	30	Tube
STPS3045CPI	STPS3045CPI	TOP-3I	4.46 g.	30	Tube
STPS3045CW	STPS3045CW	TO-247	4.36 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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