



STPS3045CT/CG/CP/CPI/CW

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

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

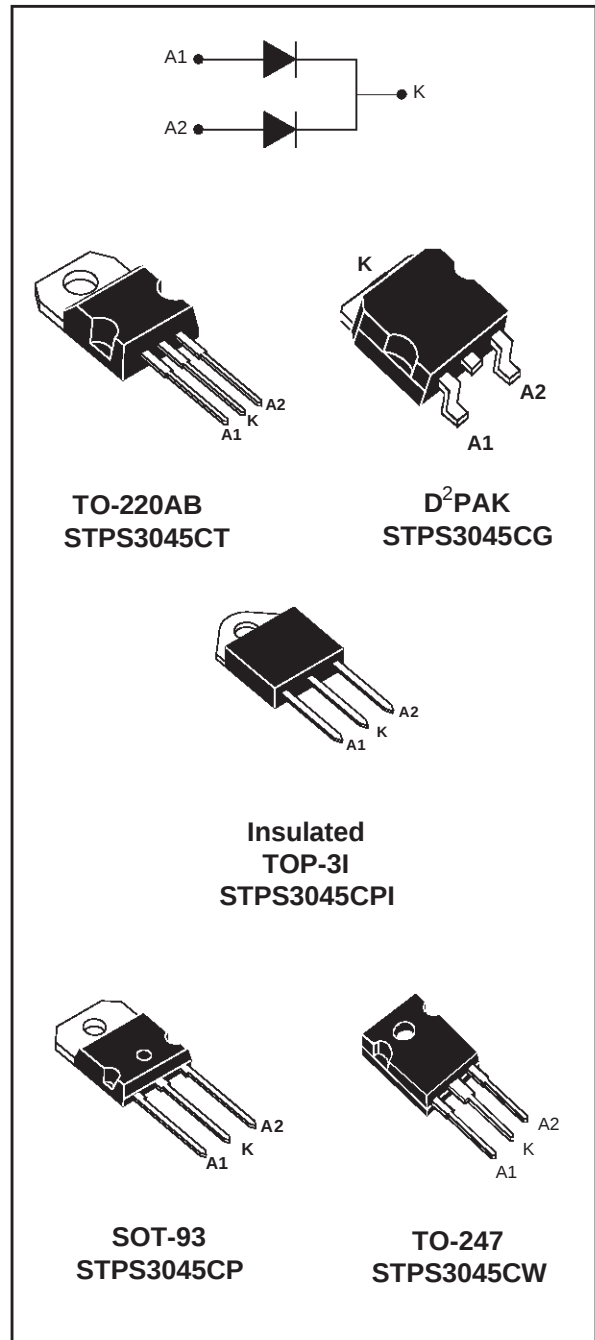
FEATURES AND BENEFITS

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

Packaged either in TO-220AB, D²PAK, 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.



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 δ = 0.5	TO-220AB D ² PAK SOT-93 TO-247	T _c = 155°C	Per diode Per device	15 30	A
		TOP-3I	T _c = 150°C			
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
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/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-220AB D ² 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 _{th(c)}		TO-220AB D ² 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	μA
		$T_j = 125^\circ\text{C}$			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 : * $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation :

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

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

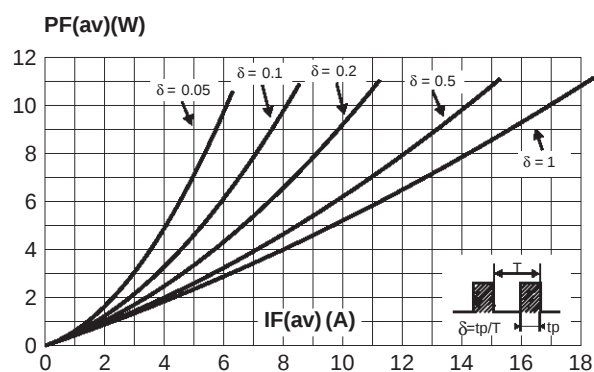


Fig. 2: Average current versus ambient temperature ($\delta = 0.5$, per diode).

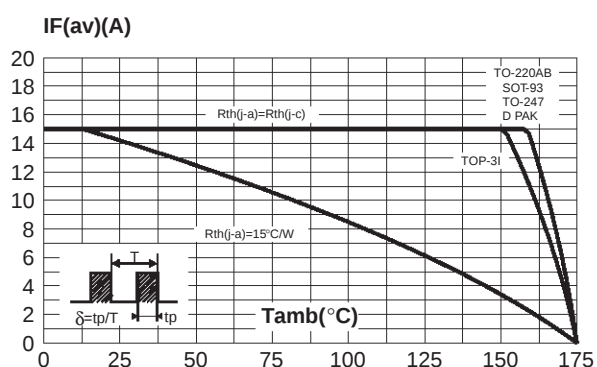


Fig. 3-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB, D²PAK, SOT-93 and TO-247).

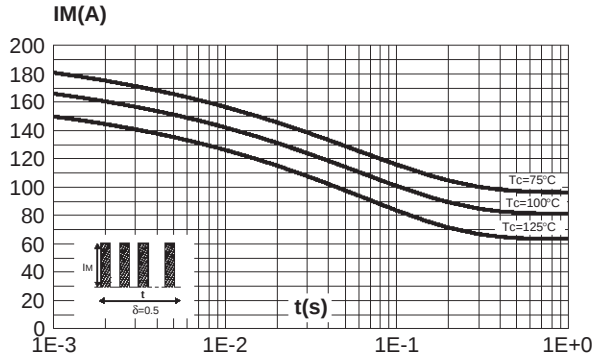


Fig. 4: Relative variation of thermal transient impedance junction to case versus pulse duration.

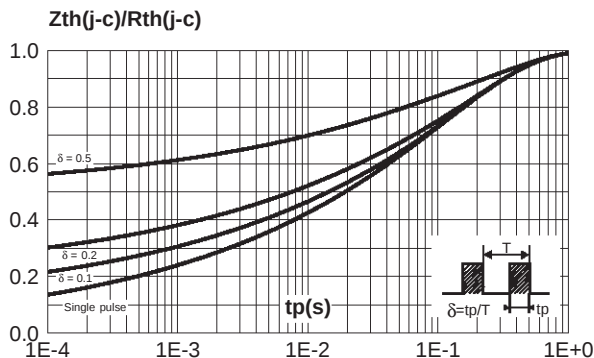


Fig. 6: Junction capacitance versus reverse voltage applied (typical values, per diode).

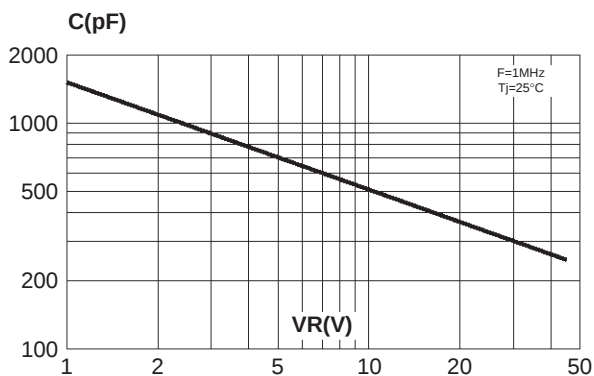


Fig. 3-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TOP-3I).

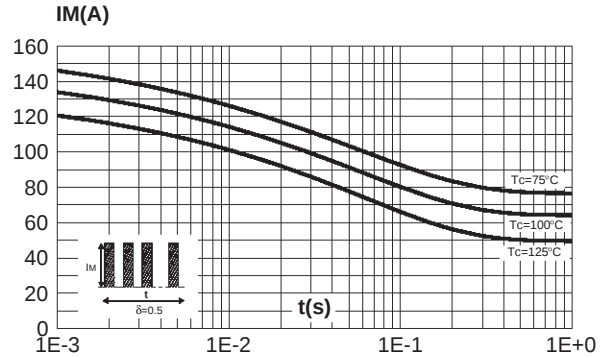


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values, per diode).

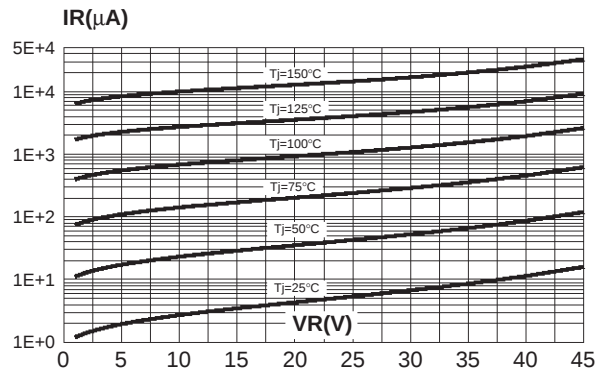
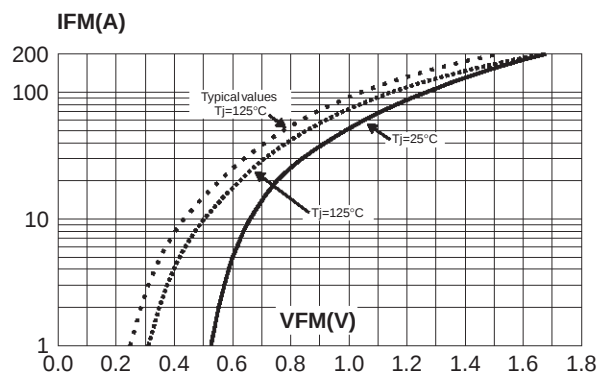


Fig. 7: Forward voltage drop versus forward current (maximum values, per diode).

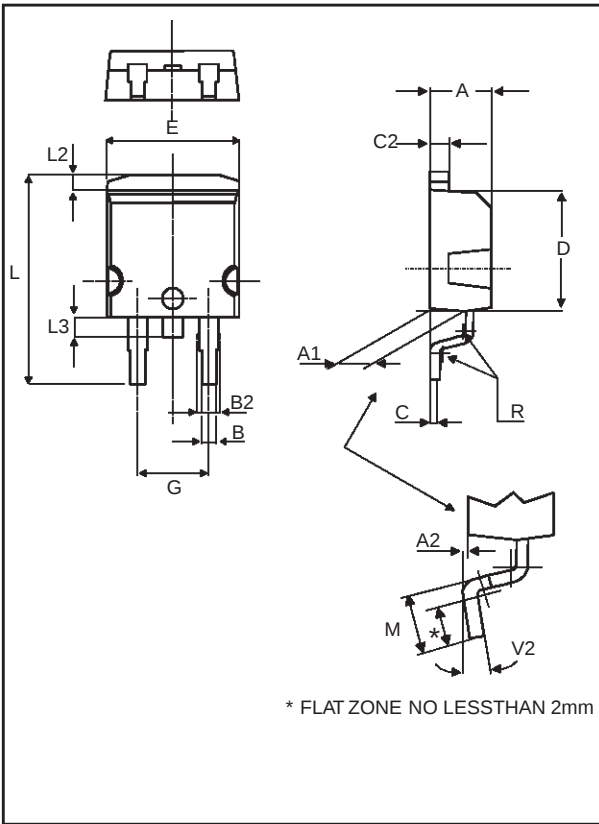


PACKAGE MECHANICAL DATA
TO-220AB

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

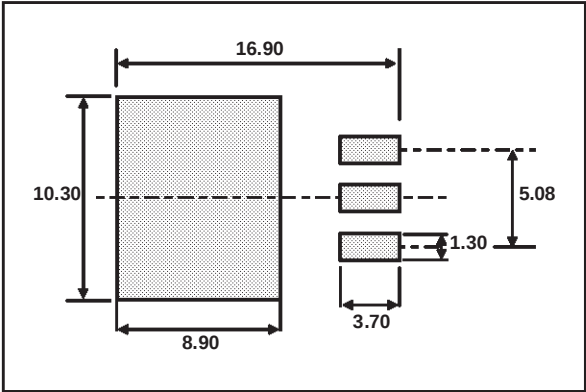
The image shows two views of a TO-220AB package. The top view (left) shows a rectangular body with a central circular feature. Dimensions include H2 (width), Dia (hole diameter), L5 (height from top to base), L6 (height from base to mounting tab), L9 (height from mounting tab to lead), L4 (height from lead to bottom), F2 (width of mounting tab), F1 (width of lead), F (width of lead), G1 (width of lead), and G (width of lead). The side view (right) shows the profile of the package with dimensions A (height), C (width), L7 (height from top to base), D (width), M (width), and E (width).

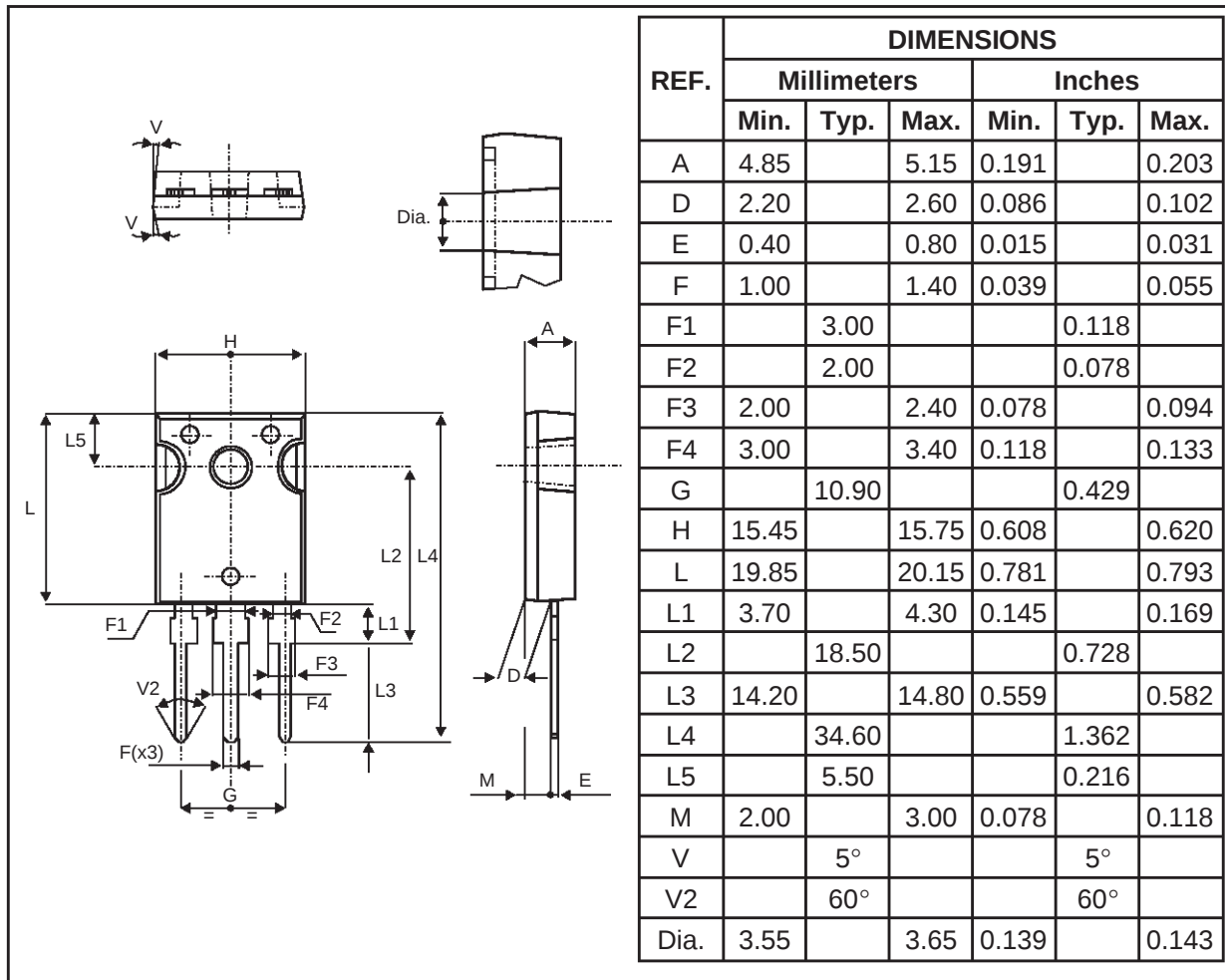
PACKAGE MECHANICAL DATA
D²PAK



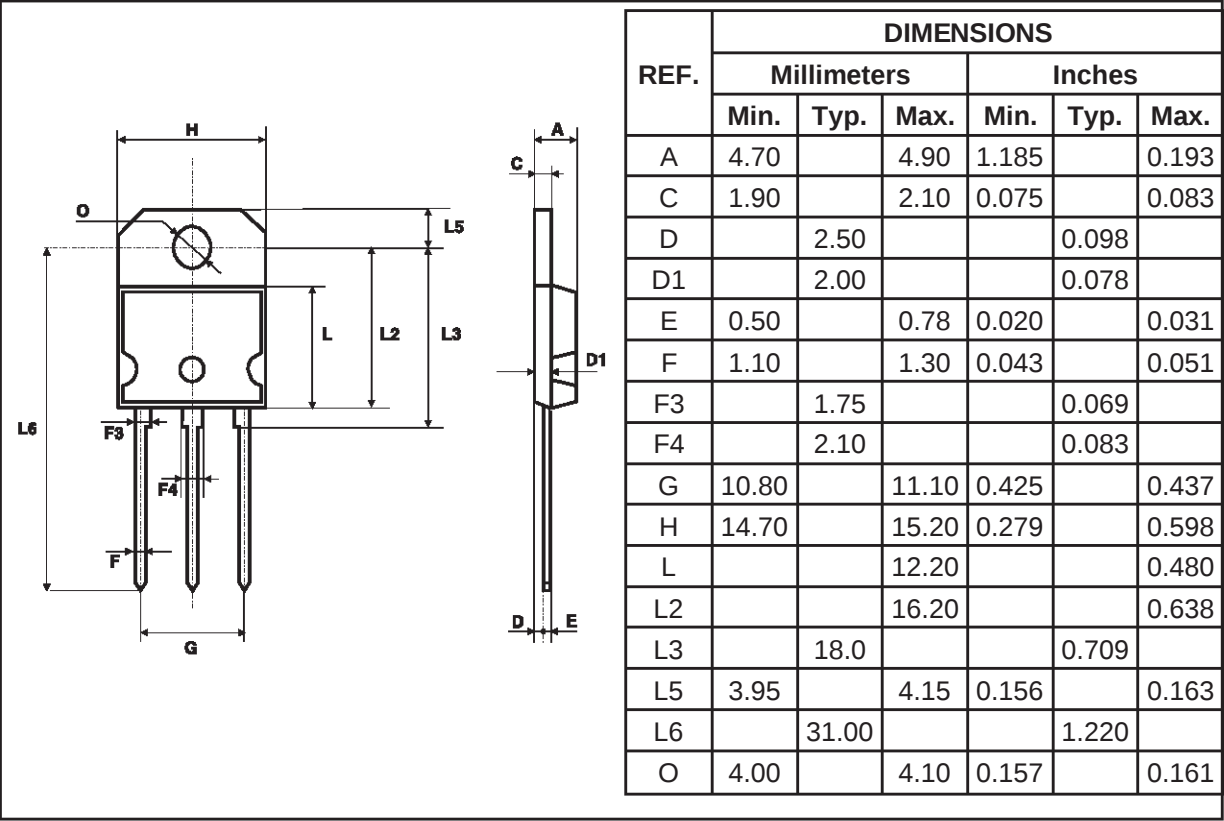
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	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


PACKAGE MECHANICAL DATA
SOT-93



PACKAGE MECHANICAL DATA

TOP-3I (isolated)

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4		4.6	0.173		0.181
B	1.45		1.55	0.057		0.061
C	14.35		15.60	0.565		0.614
D	0.5		0.7	0.020		0.028
E	2.7		2.9	0.106		0.114
F	15.8		16.5	0.622		0.650
G	20.4		21.1	0.815		0.831
H	15.1		15.5	0.594		0.610
J	5.4		5.65	0.213		0.222
K	3.4		3.65	0.134		0.144
L	4.08		4.17	0.161		0.164
P	1.20		1.40	0.047		0.055
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 ² PAK	1.48 g.	50	Tube
STPS3045CG-TR	STPS3045CG	D ² 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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