



STPS1545CT/CF/CG/CFP/CR

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

I _{F(AV)}	2 x 7.5 A
V _{RRM}	45 V
T _{j(max)}	175 °C
V _{F(max)}	0.57 V

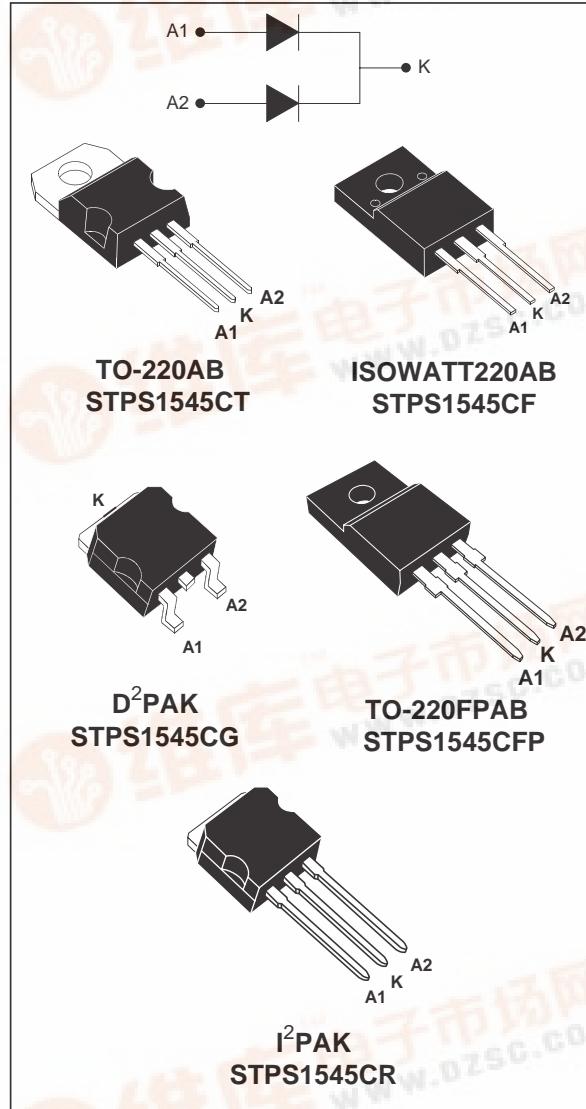
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- INSULATED PACKAGE: ISOWATT220AB, TO-220FPAB
Insulating voltage = 2000V DC
Capacitance = 12pF
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

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

Packaged either in TO-220AB, ISOWATT220AB, TO-220FPAB, D²PAK or I²PAK, 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 _{RRM}	Repetitive peak reverse voltage				45	V		
I _{F(RMS)}	RMS forward current				20	A		
I _{F(AV)}	Average forward current $\delta = 0.5$	TO-220AB / D ² PAK I ² PAK	T _c = 157°C	Per diode	7.5	A		
		ISOWATT220AB TO-220FPAB	T _c = 130°C	Per device	15			
I _{FSM}	Surge non repetitive forward current		tp = 10 ms Sinusoidal		150	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		2	A		
P _{ARM}	Repetitive peak avalanche power		tp = 1μs T _j = 25°C		2700	W		
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 / I ² PAK		Per diode	3.0	°C/W	
		ISOWATT220AB / TO-220FPAB		Total	1.7		
R _{th} (c)		TO-220AB / D ² PAK / I ² PAK		Per diode	5.5		
		ISOWATT220AB / TO-220FPAB		Total	4.2		
		TO-220AB / D ² PAK / I ² PAK		Coupling	0.35		
		ISOWATT220AB / TO-220FPAB			2.9		

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}			100	μA
		T _j = 125°C			5	15	mA
V _F *	Forward voltage drop	T _j = 125°C	I _F = 7.5 A		0.5	0.57	V
		T _j = 25°C	I _F = 15 A			0.84	
		T _j = 125°C	I _F = 15 A		0.65	0.72	

Pulse test : * tp = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.020 I_{F(RMS)}^2$$

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

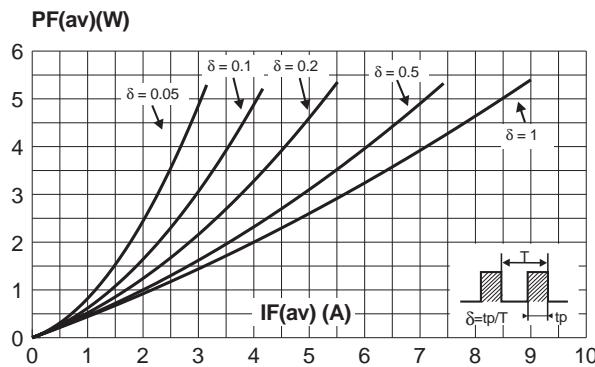


Fig. 2: Average current versus ambient temperature ($\delta = 0.5$, per diode).

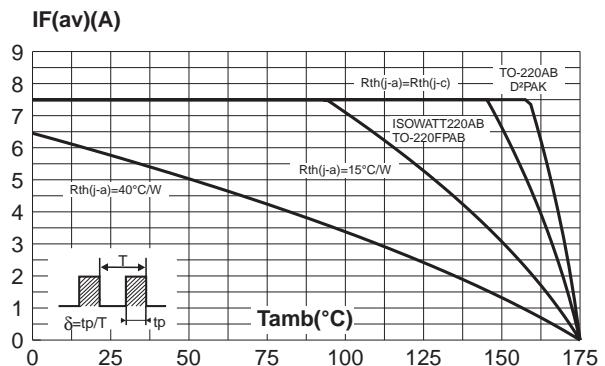


Fig. 3: Normalized avalanche power derating versus pulse duration.

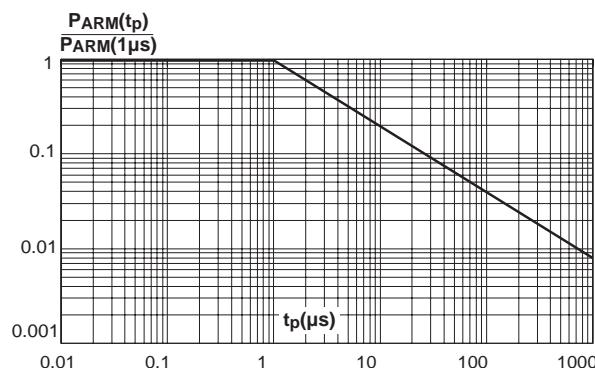


Fig. 4: Normalized avalanche power derating versus junction temperature.

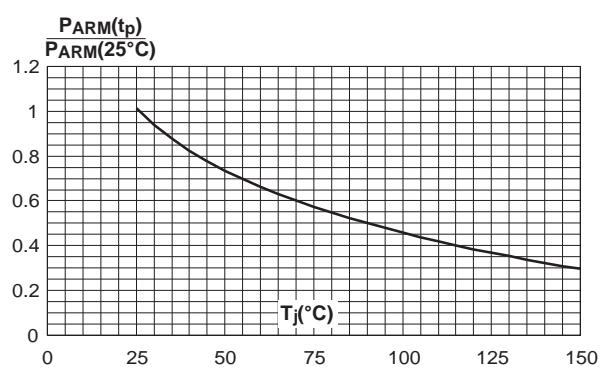


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D²PAK).

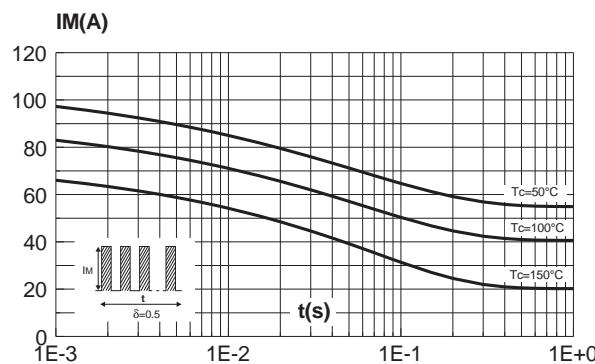
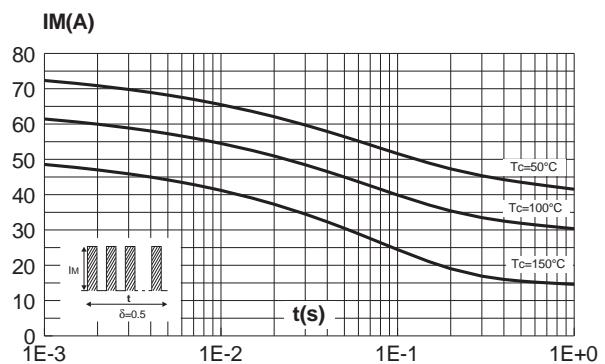


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB, TO-220FPAB).



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Fig. 6-1: Relative variation of thermal transient impedance junction to case versus pulse duration (per diode) (TO-220AB and D²PAK).

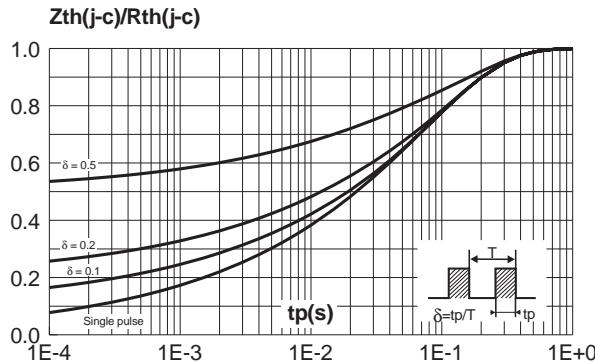


Fig. 6-2: Relative variation of thermal transient impedance junction to case versus pulse duration (per diode) (ISOWATT220AB, TO-220FPAB).

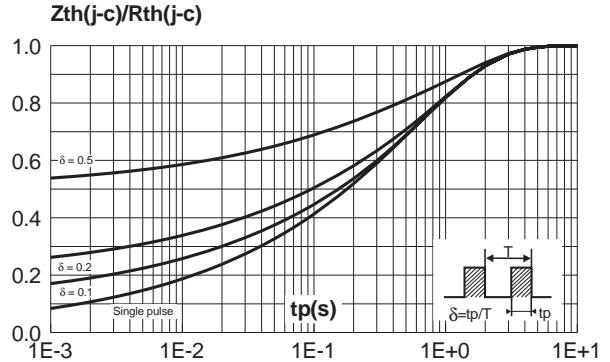


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

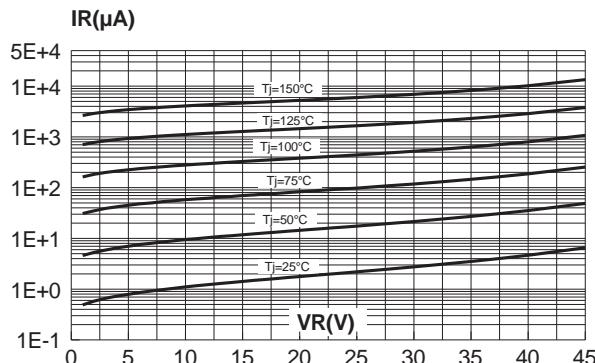


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

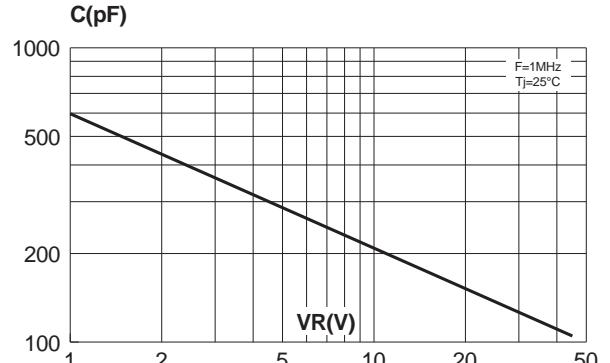


Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

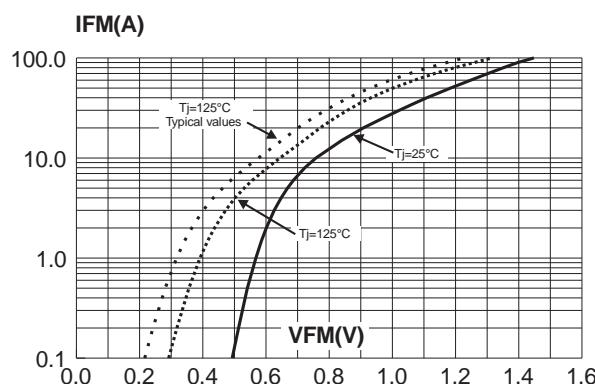
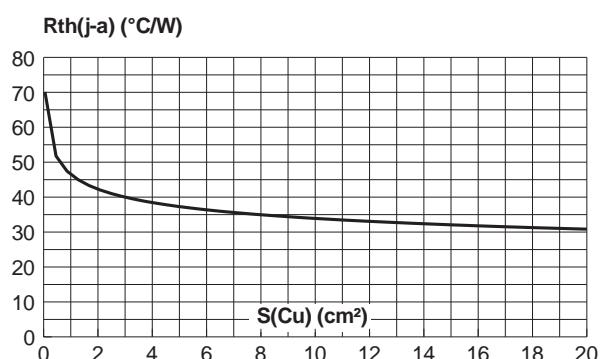
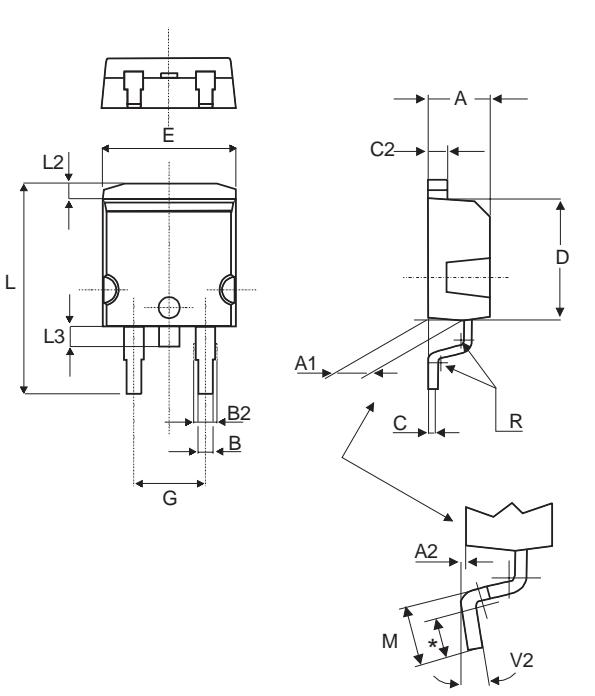


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: 35μm).



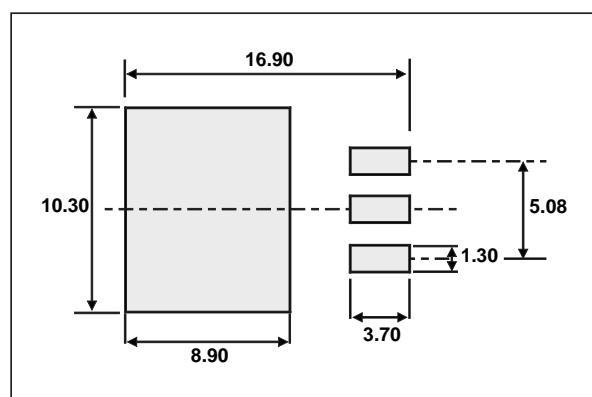
PACKAGE MECHANICAL DATA
D²PAK



* FLAT ZONE NO LESS THAN 2mm

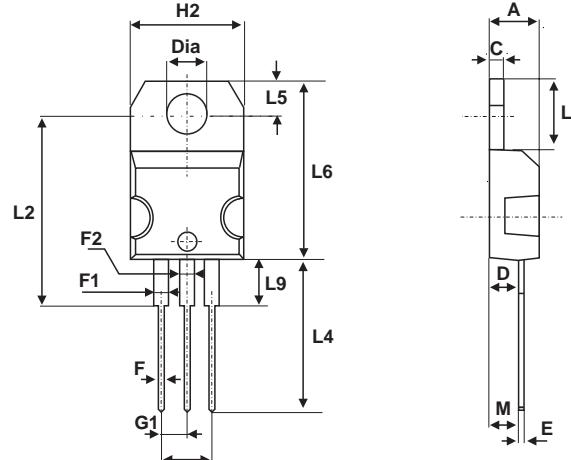
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192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



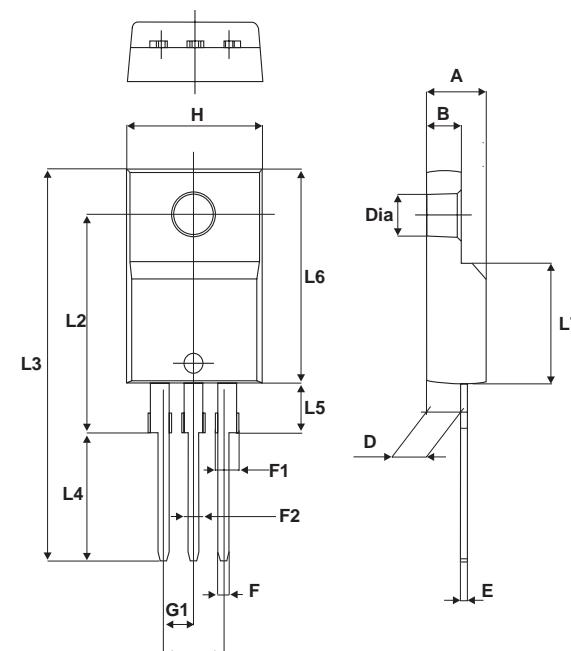
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PACKAGE MECHANICAL DATA TO-220AB



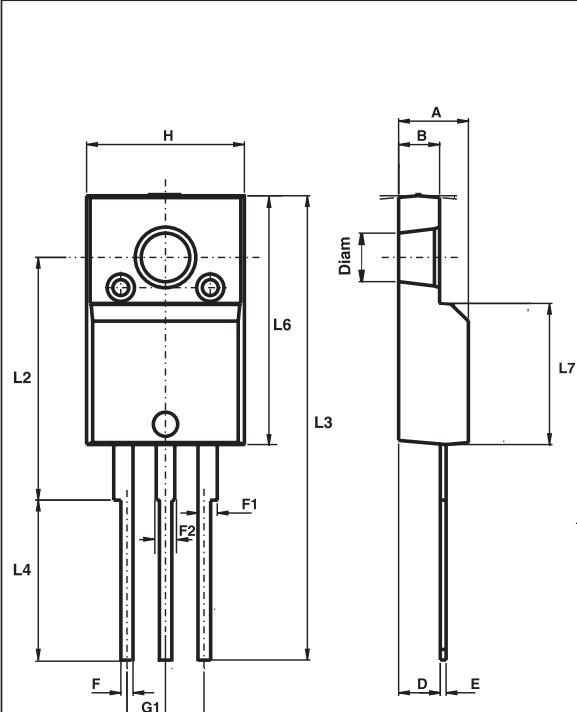
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
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

PACKAGE MECHANICAL DATA TO-220FPAB



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.4	0.393	0.409
L2	16 Typ.		0.63 Typ.	
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126

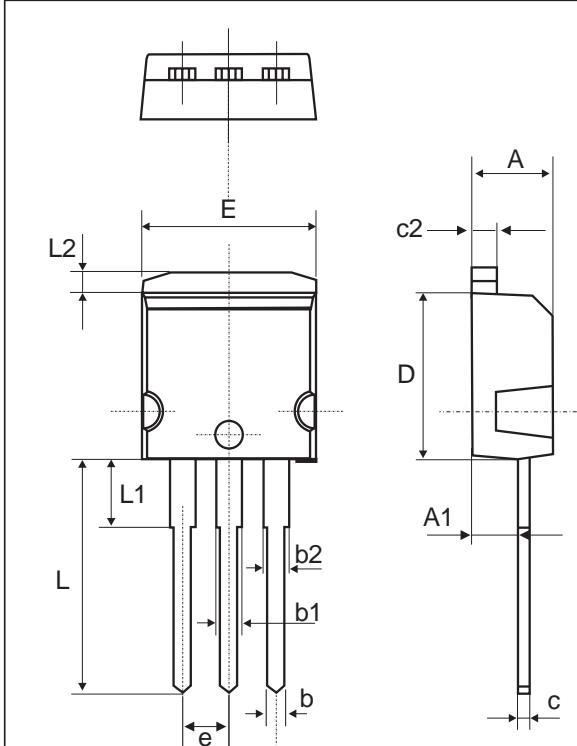
PACKAGE MECHANICAL DATA
ISOWATT220AB



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	2.50	2.70	0.098	0.106
D	2.50	2.75	0.098	0.108
E	0.40	0.70	0.016	0.028
F	0.75	1.00	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.40	2.70	0.094	0.106
H	10.00	10.40	0.394	0.409
L2	16.00 typ.		0.630 typ.	
L3	28.60	30.60	1.125	1.205
L4	9.80	10.60	0.386	0.417
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Diam	3.00	3.20	0.118	0.126

STPS1545CT/CF/CG/CFP/CR

PACKAGE MECHANICAL DATA I²PAK



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
b	0.70	0.93	0.028	0.037
b1	1.14	1.17	0.044	0.046
b2	1.14	1.17	0.044	0.046
c	0.45	0.60	0.018	0.024
c2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
e	2.40	2.70	0.094	0.106
E	10.0	10.4	0.394	0.409
L	13.1	13.6	0.516	0.535
L1	3.48	3.78	0.137	0.149
L2	1.27	1.40	0.050	0.055

Type	Marking	Package	Weight	Base qty	Delivery mode
STPS1545CT	STPS1545CT	TO-220AB	2.23 g.	50	Tube
STPS1545CF	STPS1545CF	ISOWATT220AB	2.08 g.	50	Tube
STPS1545CFP	STPS1545CFP	TO-220FPAB	2.0 g	50	Tube
STPS1545CG	STPS1545CG	D ² PAK	1.48 g.	50	Tube
STPS1545CG-TR	STPS1545CG	D ² PAK	1.48 g.	1000	Tape & reel
STPS1545CR	STPS1545CR	I ² PAK	1.49 g	50	Tube

- Cooling method: by conduction (C)
- Expoxy meets UL94,V0

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