STPS16H100CT/CG/CFP/CR

HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

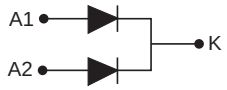
$I_{F(AV)}$	2 x 8 A
V_{RRM}	100 V
Tj (max)	175 °C
V_F (max)	0.64 V

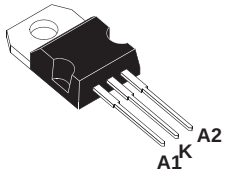
FEATURES AND BENEFITS

- NEGLIGIBLE SWITCHING LOSSES
- HIGH JUNCTION TEMPERATURE CAPABILITY
- LOW LEAKAGE CURRENT
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- AVALANCHE CAPABILITY SPECIFIED

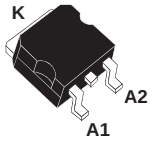
DESCRIPTION

Dual center tap Schottky rectifier designed for high frequency miniature Switch Mode Power Supplies such as adaptators and on board DC/DC converters.

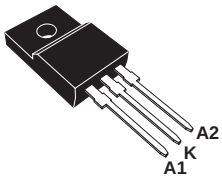




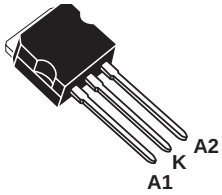
TO-220AB
STPS16H100CT



D²PAK
STPS16H100CG



TO-220FPAB
STPS16H100CFP



I²PAK
STPS16H100CR

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter				Value	Unit
V_{RRM}	Repetitive peak reverse voltage				100	V
$I_{F(RMS)}$	RMS forward current				30	A
$I_{F(AV)}$	Average forward current δ = 0.5	TO-220AB D²PAK / I²PAK	Tc = 165°C	Per diode	8	A
		TO-220FPAB	Tc = 150°C	Per device	16	
I_{FSM}	Surge non repetitive forward current		tp = 10 ms sinusoidal		200	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 Tj = 25°C		8700	W
T_{stg}	Storage temperature range				-65 to +175	°C
Tj	Maximum operating junction temperature *				175	°C
dV/dt	Critical rate of rise of reverse voltage				10000	V/µs

* : $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ thermal runaway condition for a diode on its own heatsink

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th\ (j-c)}$	Junction to ambient	TO-220AB / D^2PAK / I^2PAK	Per diode	1.6	°C/W
		TO-220FPAB		4	
		TO-220AB / D^2PAK / I^2PAK	Total	1.1	°C/W
		TO-220FPAB		3.5	
$R_{th\ (c)}$		TO-220AB / D^2PAK / I^2PAK	Coupling	0.6	°C/W
		TO-220FPAB		3	

When the diodes 1 and 2 are used simultaneously :
Δ Tj(diode 1) = P(diode1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage Current	Tj = 25°C	$V_R = V_{RRM}$			3.6	µA
		Tj = 125°C			1.6	5	mA
V_F**	Forward Voltage drop	Tj = 25°C	I_F = 8 A			0.77	V
		Tj = 125°C	I_F = 8 A		0.59	0.64	
		Tj = 25°C	I_F = 16 A			0.88	
		Tj = 125°C	I_F = 16 A		0.67	0.73	

Pulse test : * tp = 5 ms, δ < 2%
** tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation :
$P = 0.55 \times I_{F(AV)} + 0.011 \times I_{F\ (RMS)}^2$

Fig. 1: Conduction losses versus average current.

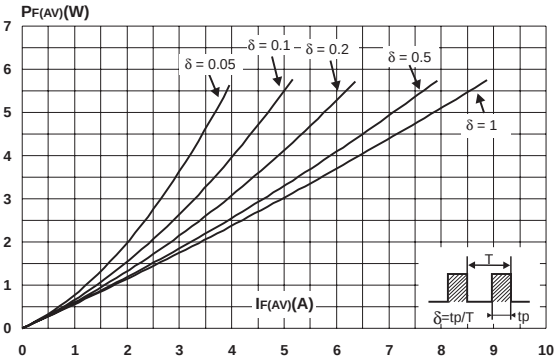


Fig. 2: Average forward current versus ambient temperature (δ=0.5).

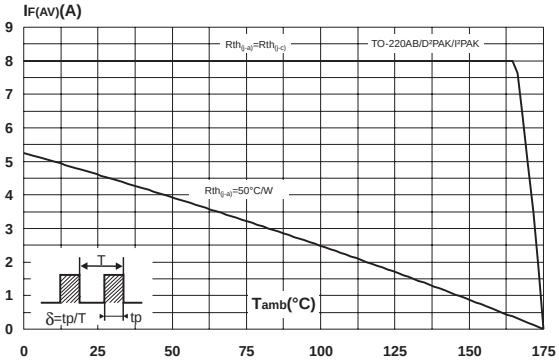


Fig. 3: Normalized avalanche power derating versus pulse duration.

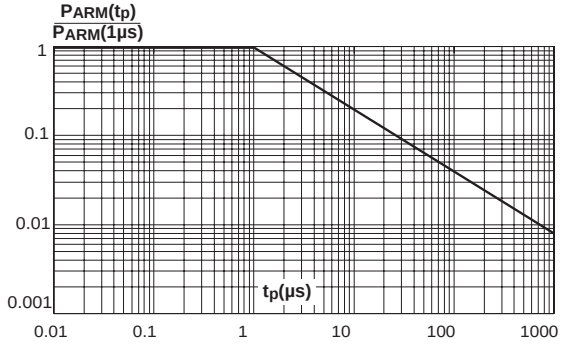


Fig. 4: Normalized avalanche power derating versus junction temperature.

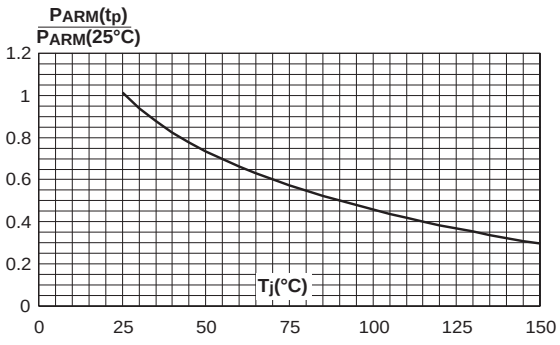


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AB, D²PAK, I²PAK).

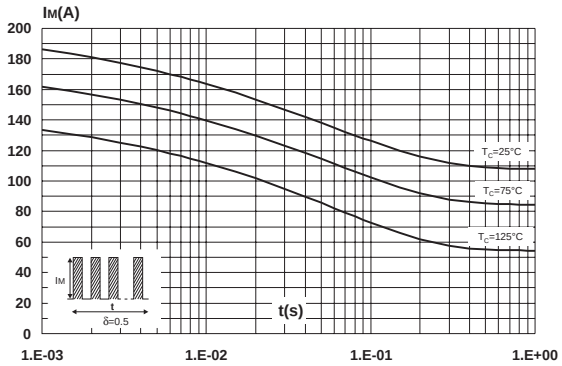


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220FPAB).

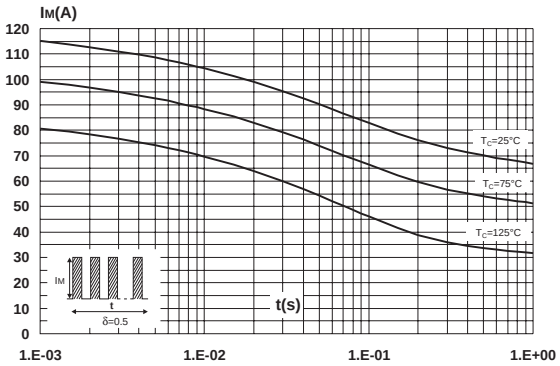


Fig. 6-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB, D²PAK & I²PAK).

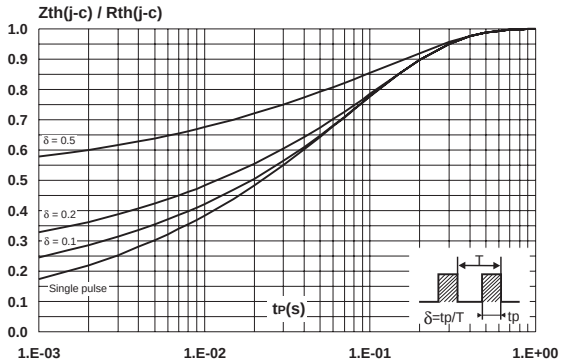


Fig. 6-2: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAB).

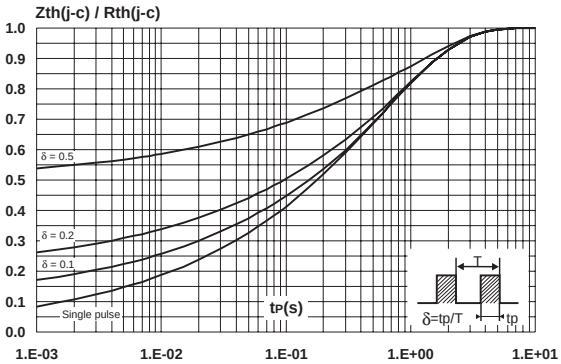


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

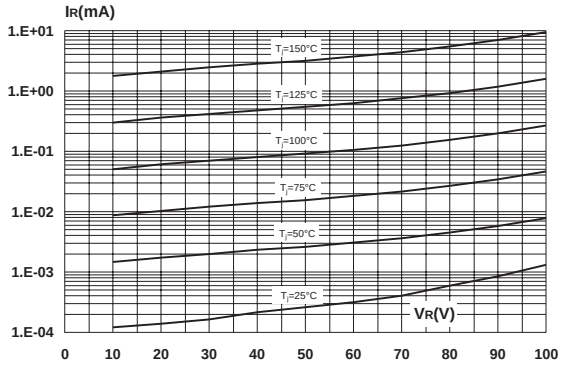


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

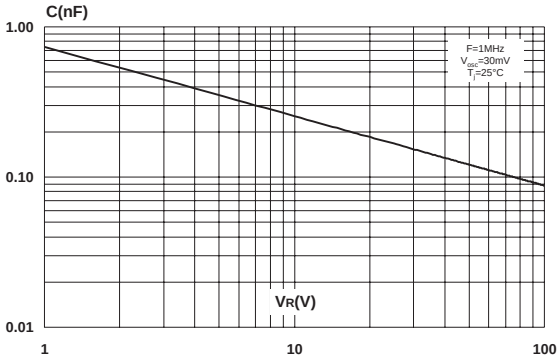


Fig. 9: Forward voltage drop versus forward current.

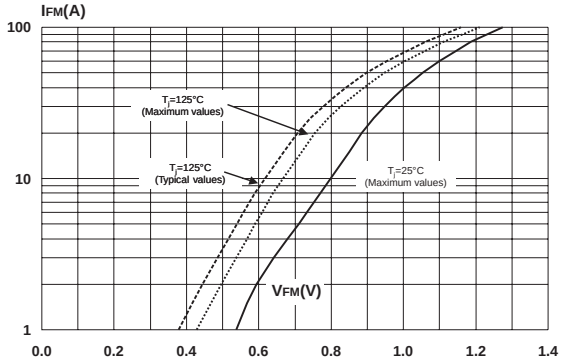
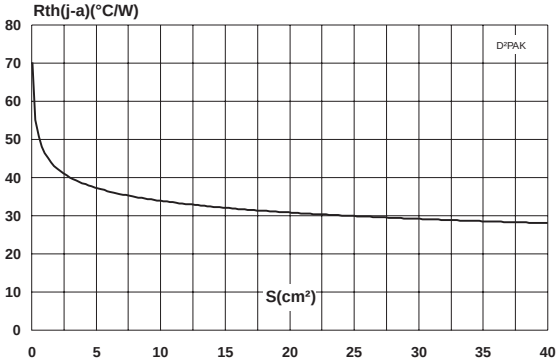
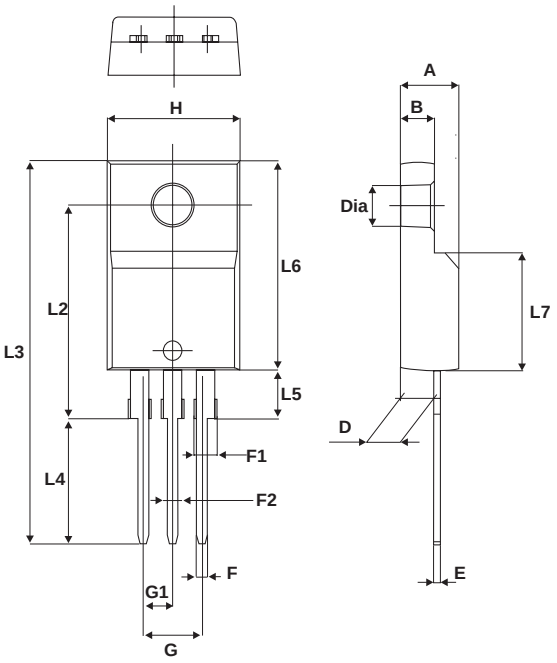


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35µm).

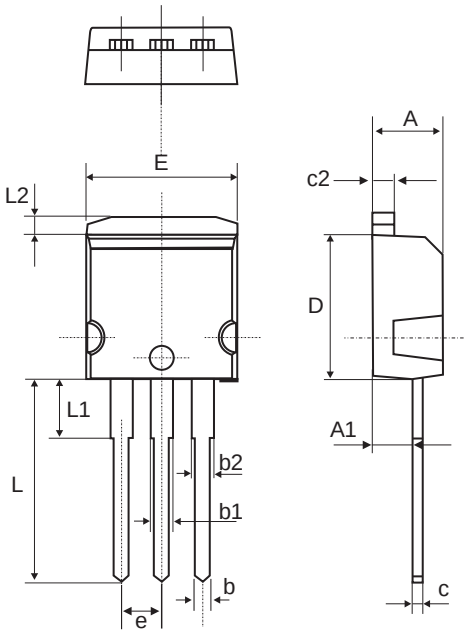


PACKAGE MECHANICAL DATA
TO-220FPAB



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

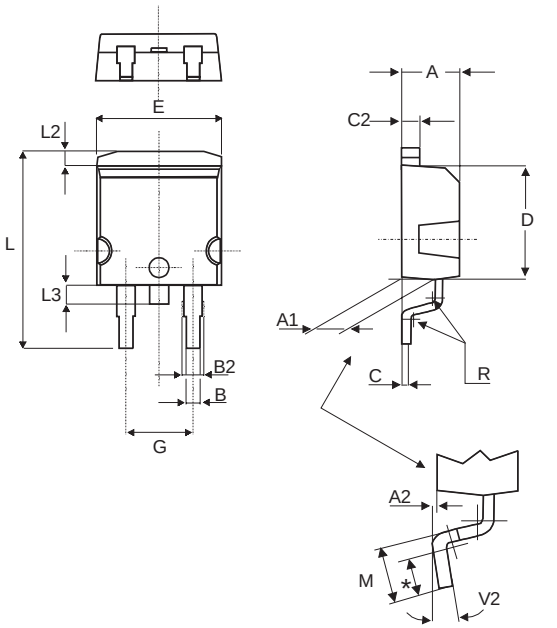
PACKAGE MECHANICAL DATA
I^2PAK



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

PACKAGE MECHANICAL DATA

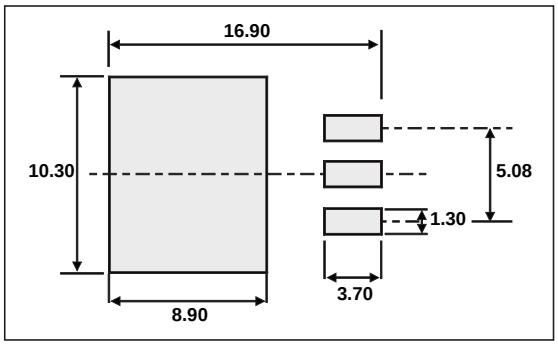
D^2PAK



* FLAT ZONE NO LESS THAN 2mm

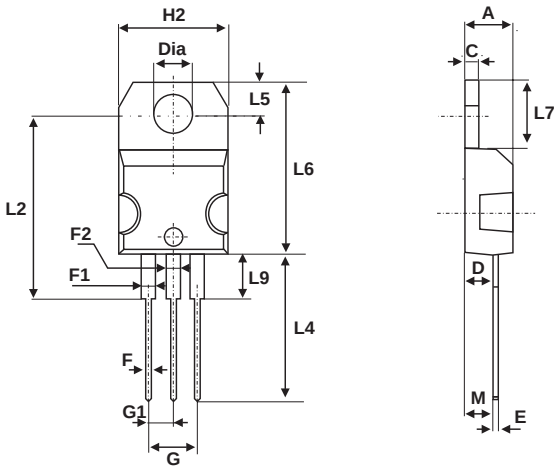
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192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



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

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS16H100CT	STPS16H100CT	TO-220AB	2.20 g	50	Tube
STPS16H100CFP	STPS16H100CFP	TO-220FPAB	2.0 g	50	Tube
STPS16H100CG	STPS16H100CG	D^2PAK	1.48 g	50	Tube
STPS16H100CG-TR	STPS16H100CG	D^2PAK	1.48 g	1000	Tape & reel
STPS16H100CR	STPS16H100CR	I^2PAK	1.9 g	50	Tube

- EPOXY MEETS UL94,V0