

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 10 A
V_{RRM}	25 V
$T_j(\text{max})$	150 °C
$V_F(\text{max})$	0.35 V

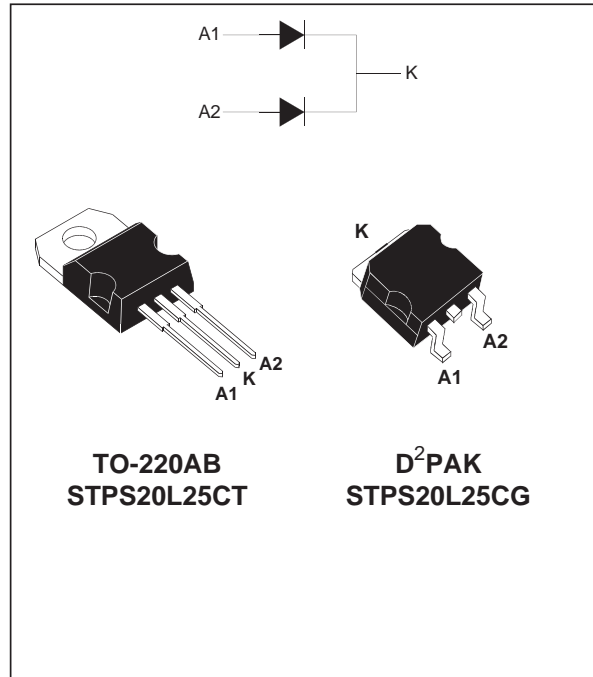
FEATURES AND BENEFITS

- VERY LOW FORWARD VOLTAGE DROP FOR LESS POWER DISSIPATION AND REDUCED HEATSINK
- OPTIMIZED CONDUCTION/REVERSE LOSSES TRADE-OFF WHICH MEANS THE HIGHEST EFFICIENCY IN THE APPLICATIONS
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Dual center tap Schottky rectifier suited to Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-220AB and D²PAK, this device is especially intended for use as a rectifier at the secondary of 3.3V SMPS units.



TO-220AB
STPS20L25CT

D²PAK
STPS20L25CG

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		25	V
$I_{F(RMS)}$	RMS forward current		30	A
$I_{F(AV)}$	Average forward current	$T_c = 145^\circ\text{C}$ $\delta = 0.5$	Per diode: 10 Per device: 20	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ Sinusoidal	220	A
I_{RRM}	Repetitive peak reverse current	$t_p = 2 \mu\text{s}$ square $F = 1\text{kHz}$	1	A
I_{RSM}	Non repetitive peak reverse current	$t_p = 100 \mu\text{s}$ square	3	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1 \mu\text{s}$ $T_j = 25^\circ\text{C}$	5300	W
T_{stg}	Storage temperature range		- 65 to + 150	°C
T_j	Maximum operating junction temperature *		150	°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

STPS20L25CT/CG

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R _{th(j-c)}	Junction to case	Per diode	1.5	°C/W
		Total	0.8	
R _{th(c)}		Coupling	0.1	

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	Tests conditions	Tests conditions	Min.	Typ.	Max.	Unit
I _R *	Reverse leakage current	T _j = 25°C	V _R = V _{RRM}		800	μA
		T _j = 125°C		125	250	mA
V _F *	Forward voltage drop	T _j = 25°C	I _F = 10 A		0.46	V
		T _j = 125°C	I _F = 10 A	0.30	0.35	
		T _j = 25°C	I _F = 20 A		0.56	
		T _j = 125°C	I _F = 20 A	0.41	0.48	

Pulse test: * t_p = 380 μs, δ < 2%

To evaluate the maximum conduction losses use the following equation :
 $P = 0.22 \times I_{F(AV)} + 0.013 I_{F(RMS)}^2$

Fig. 1: Average forward power dissipation versus average forward current.

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

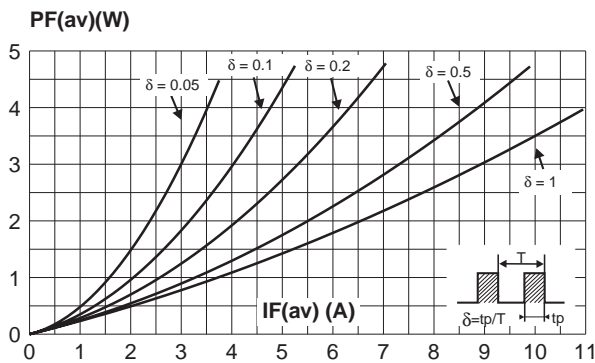


Fig. 3: Normalized avalanche power derating versus pulse duration.

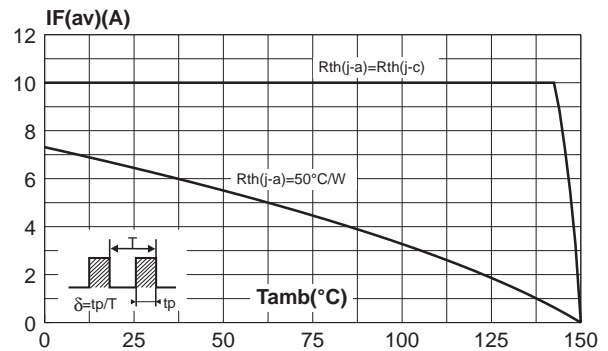


Fig. 4: Normalized avalanche power derating versus junction temperature.

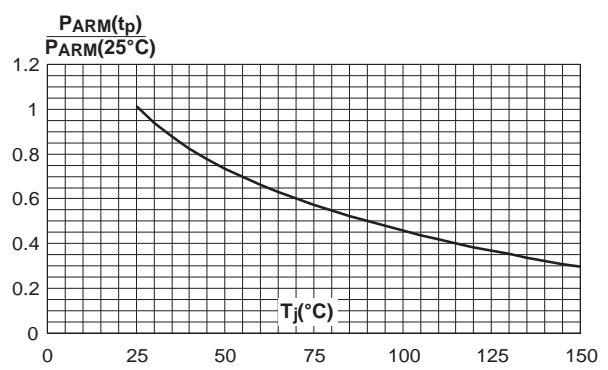
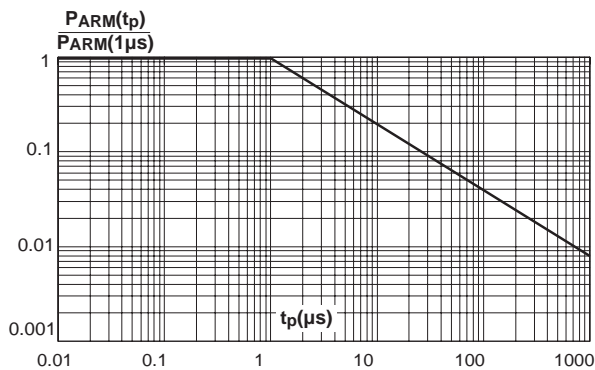


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

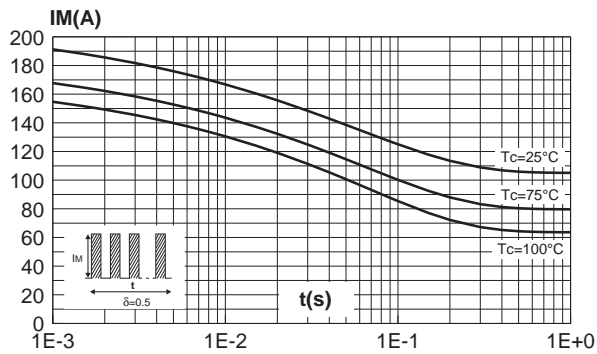


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

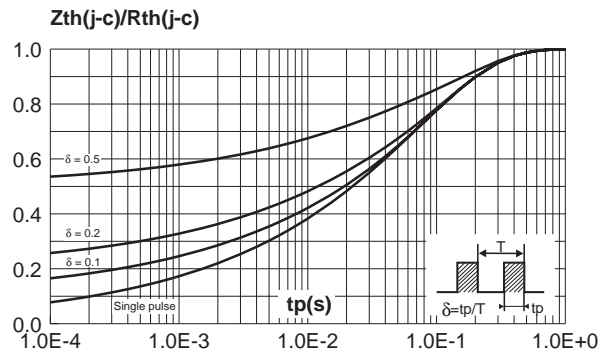


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

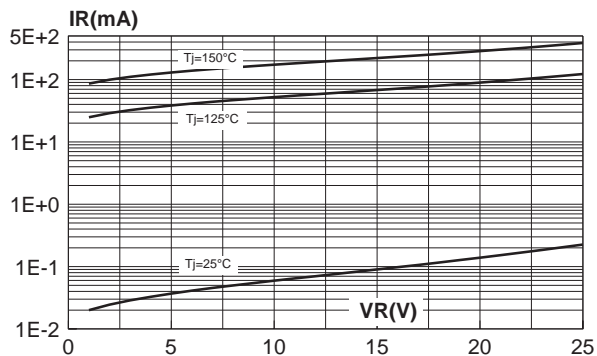


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

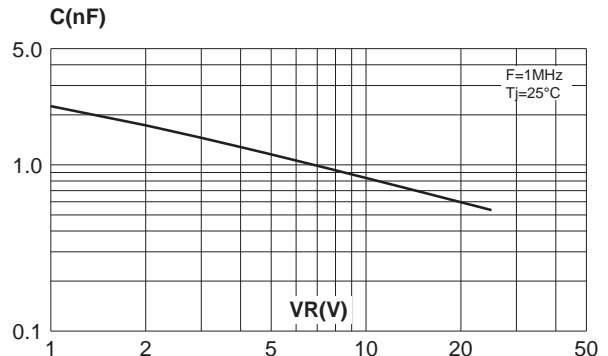


Fig. 9: Forward voltage drop versus forward current (maximum values).

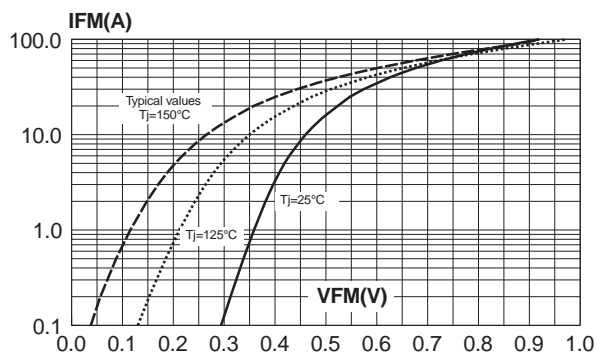
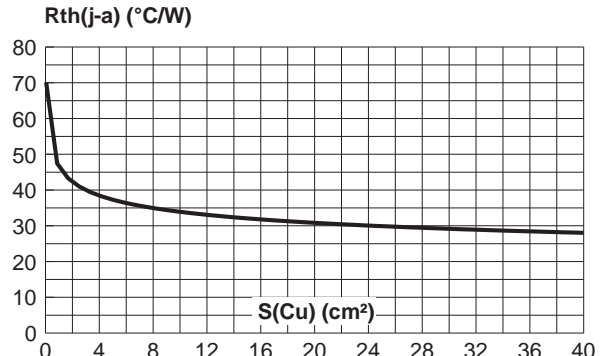
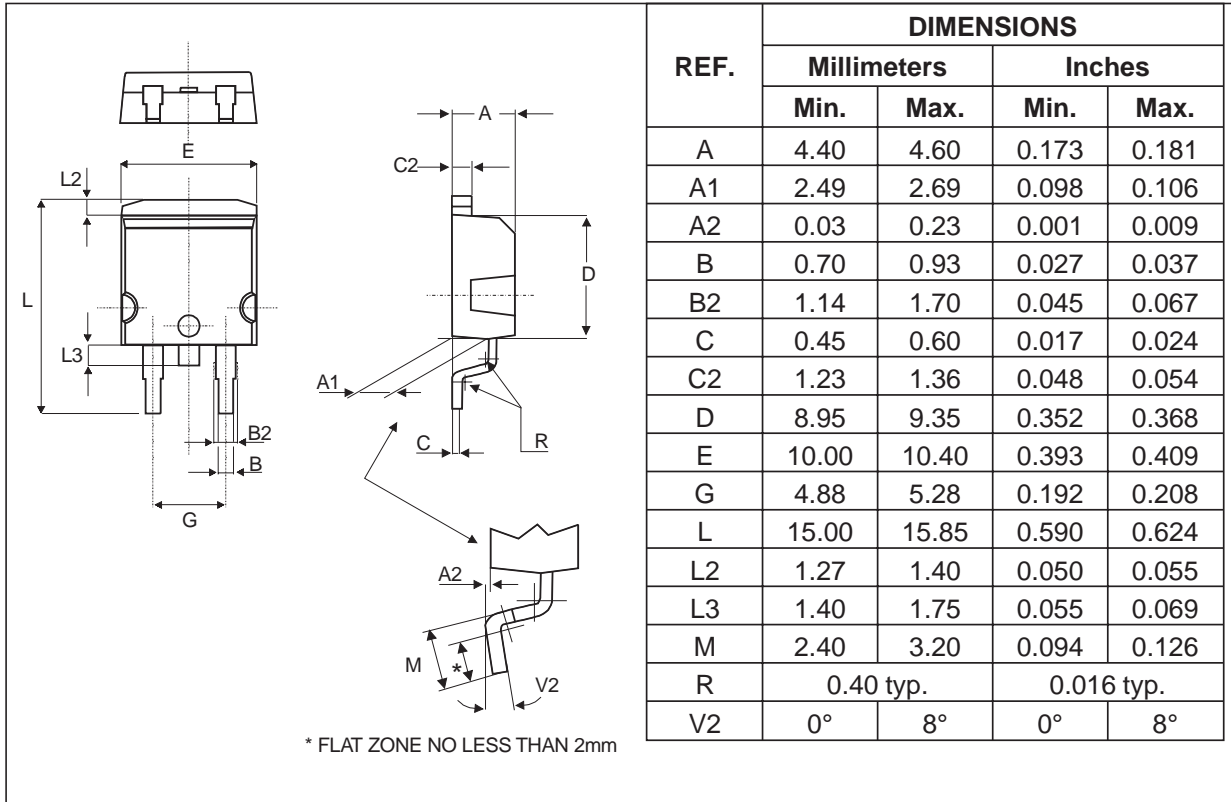


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness : 35 μm). (STPS20L25G only)

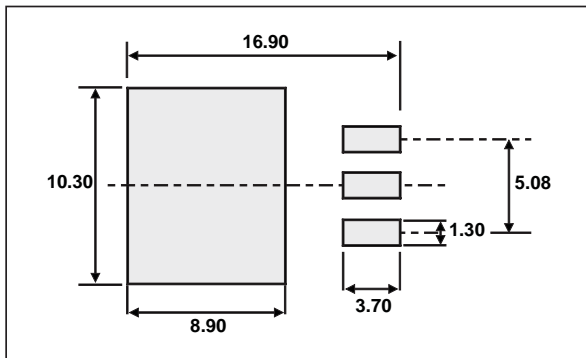


STPS20L25CT/CG

PACKAGE MECHANICAL DATA
D²PAK

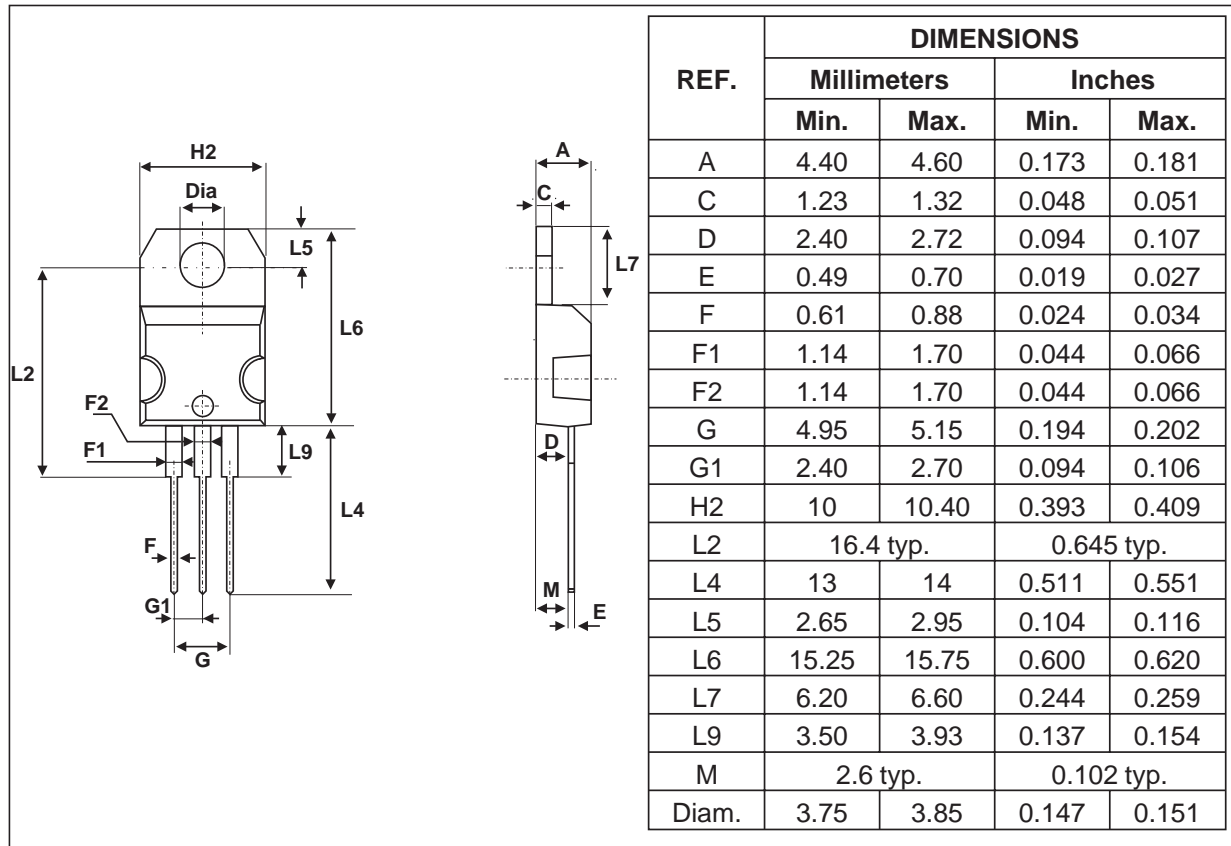


FOOTPRINT DIMENSIONS (in millimeters)



- COOLING METHOD: BY CONDUCTION (METHOD C)

PACKAGE MECHANICAL DATA
TO-220AB



- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.55 M.N
- MAXIMUM TORQUE VALUE : 0.70 M.N

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS20L25CT	STPS20L25CT	TO-220AB	2.23g	50	Tube
STPS20L25CG	STPS20L25CG	D ² PAK	1.48g	50	Tube
STPS20L25CG-TR	STPS20L25CG	D ² PAK	1.48g	1000	Tape & reel

- EPOXY MEETS UL94,V0

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