



STPS40150CG/CT/CW

HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 20 A
V_{RRM}	150 V
T_j (max)	175°C
V_F (max)	0.75 V

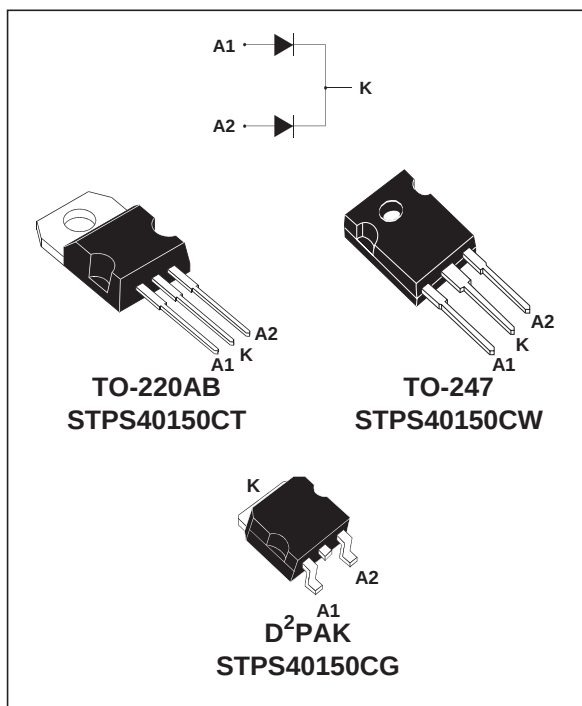
FEATURES AND BENEFITS

- HIGH JUNCTION TEMPERATURE CAPABILITY
- LOW LEAKAGE CURRENT
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- LOW THERMAL RESISTANCE
- HIGH FREQUENCY OPERATION

DESCRIPTION

Dual center tap Schottky rectifiers suited for high frequency switch mode power supply.

Packaged in TO-247, TO-220AB and D²PAK, this devices is intended for use to enhance the reliability of the application.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			150	V
$I_{F(RMS)}$	RMS forward current			60	A
$I_{F(AV)}$	Average forward current	$T_c = 150^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	20 40	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ Sinusoidal		250	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s}$ $T_j = 25^\circ\text{C}$		14100	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

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THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB / D ² PAK	Per diode Total	1.2 0.85	°C/W
$R_{th(j-c)}$	Junction to case	TO-247	Per diode Total	1.2 0.85	°C/W
$R_{th(c)}$	Coupling			0.5	°C/W

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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		2	8	μA
		$T_j = 125^\circ\text{C}$			2	11	mA
V_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 20\text{ A}$			0.92	V
		$T_j = 125^\circ\text{C}$	$I_F = 20\text{ A}$		0.69	0.75	
		$T_j = 25^\circ\text{C}$	$I_F = 40\text{ A}$			1.00	
		$T_j = 125^\circ\text{C}$	$I_F = 40\text{ A}$		0.79	0.86	

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

To evaluate the conduction losses use the following equation :

$$P = 0.64 \times I_F(AV) + 0.0055 I_F^2(RMS)$$

Fig. 1: Conduction losses versus average current (per diode).

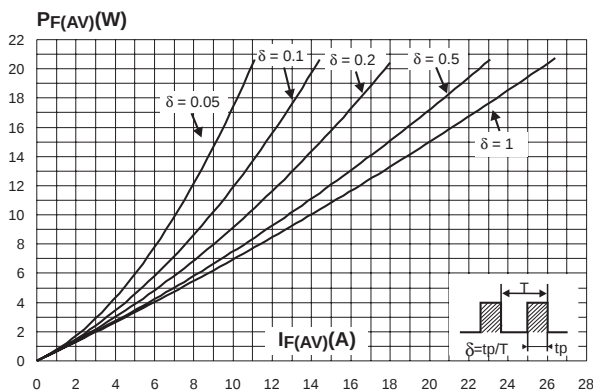


Fig. 2: Normalized avalanche power derating versus pulse duration.

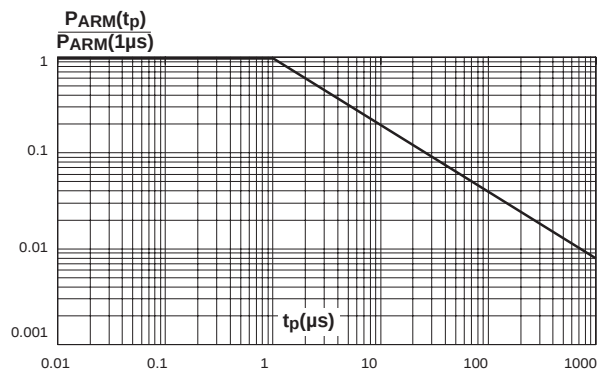


Fig. 3: Normalized avalanche power derating versus junction temperature.

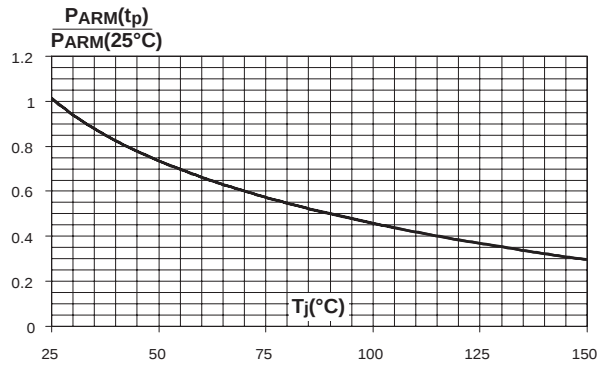


Fig. 4: Average forward current versus ambient temperature ($\delta=0.5$, per diode).

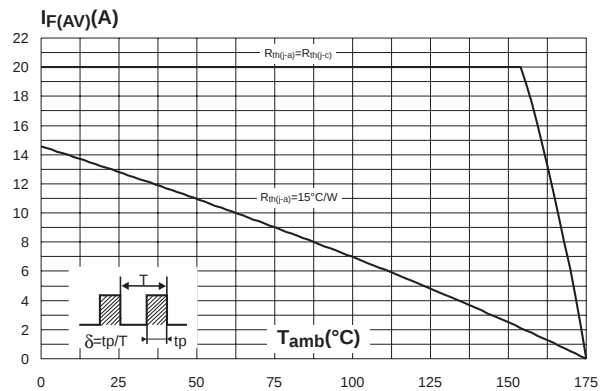


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode).

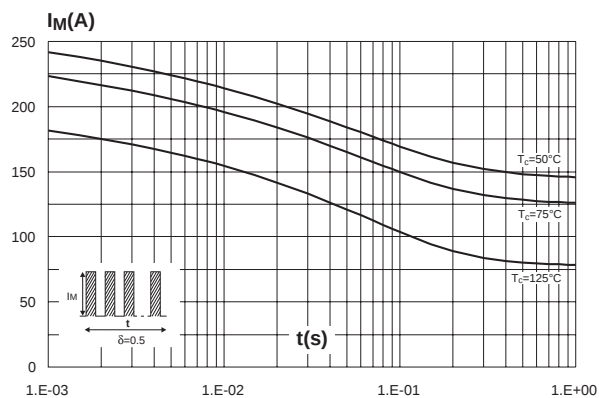


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

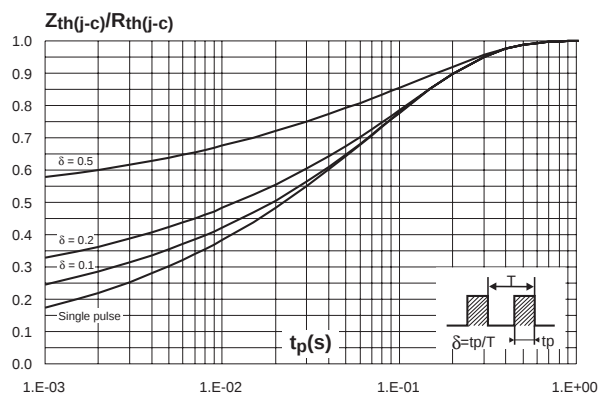


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

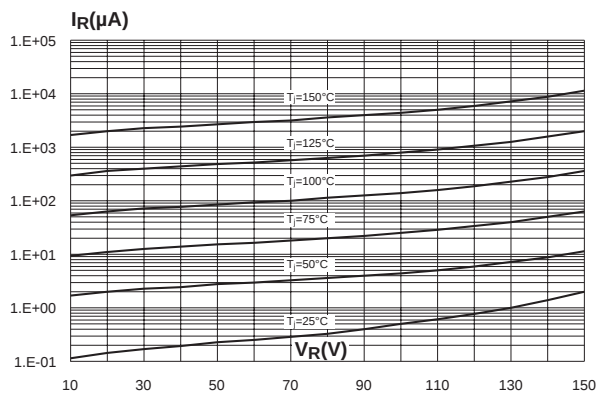


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

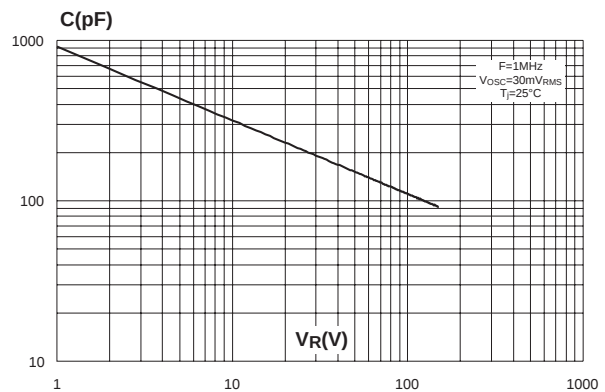


Fig. 9: Forward voltage drop versus forward current (per diode).

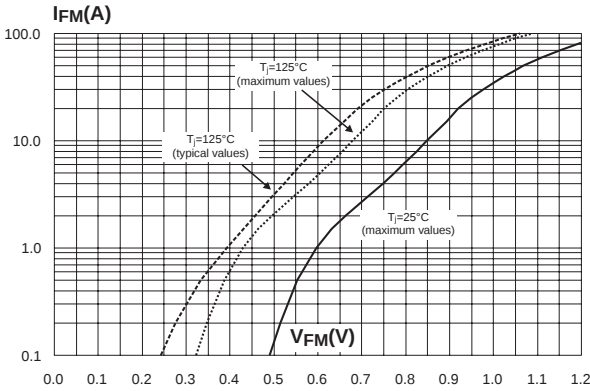
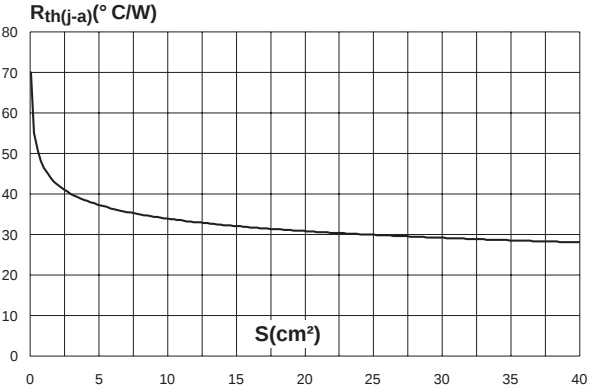
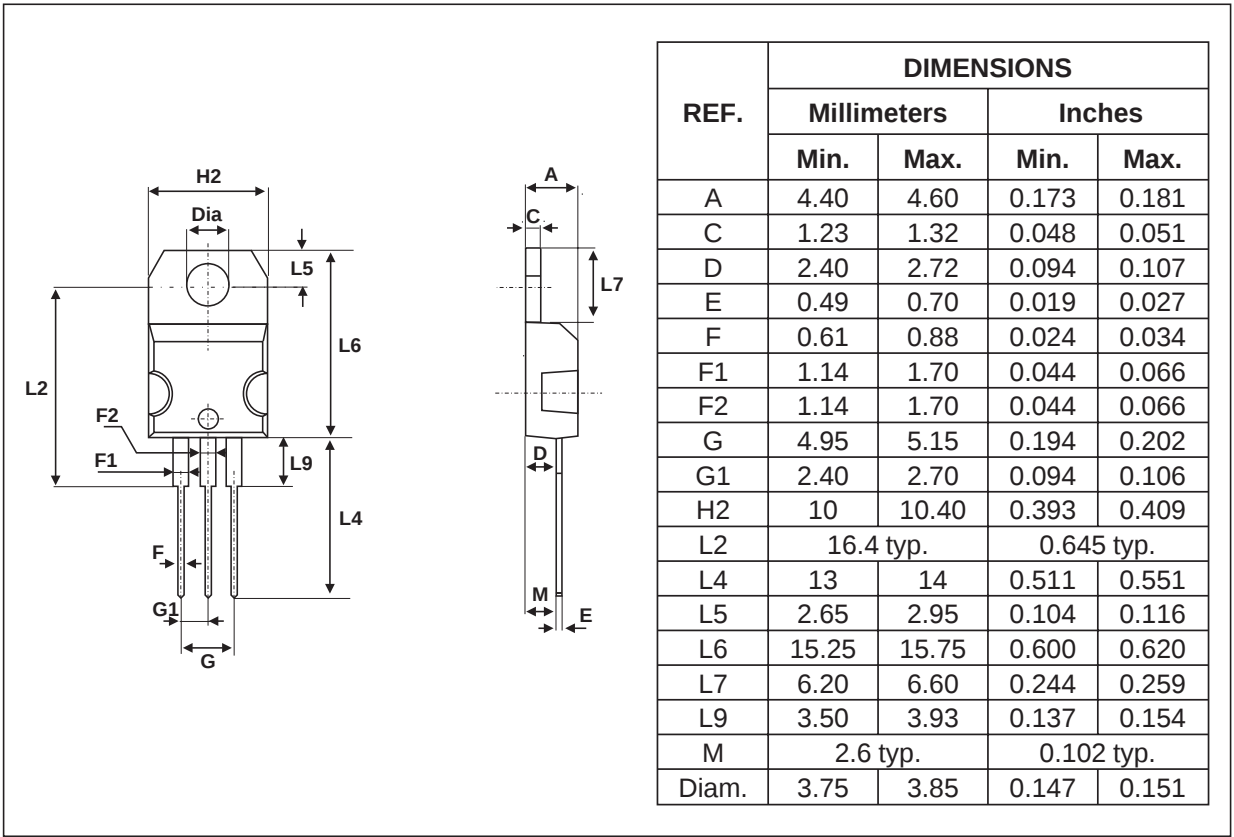


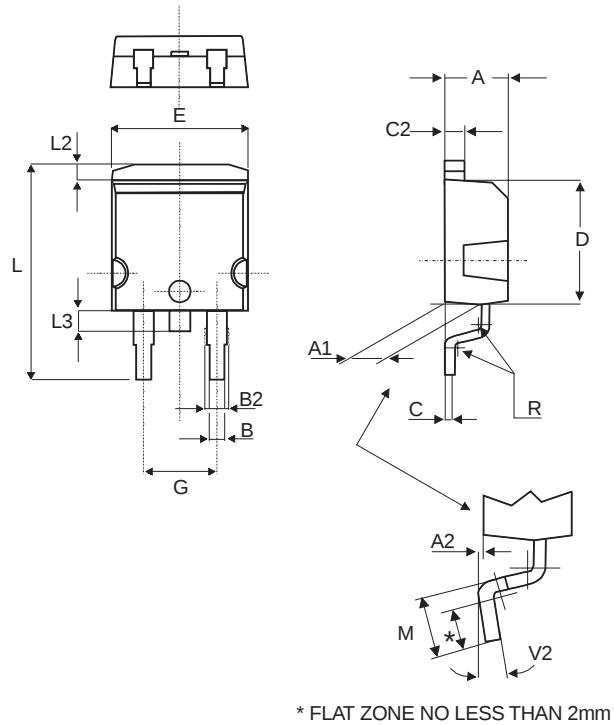
Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu=35μm) (D²PAK).



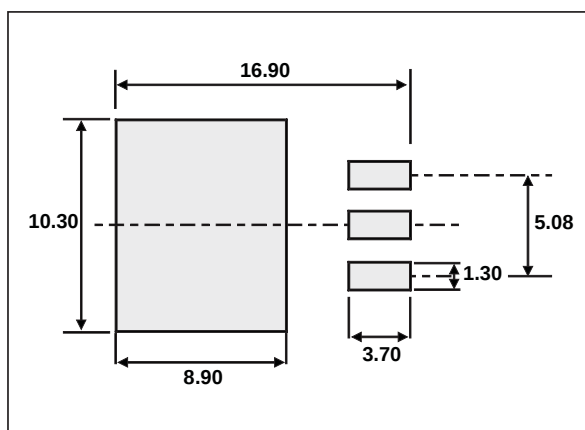
PACKAGE MECHANICAL DATA
TO-220AB



- Cooling method : C
- Recommended torque value : 0.55 m.N
- Maximum torque value : 0.70 m.N

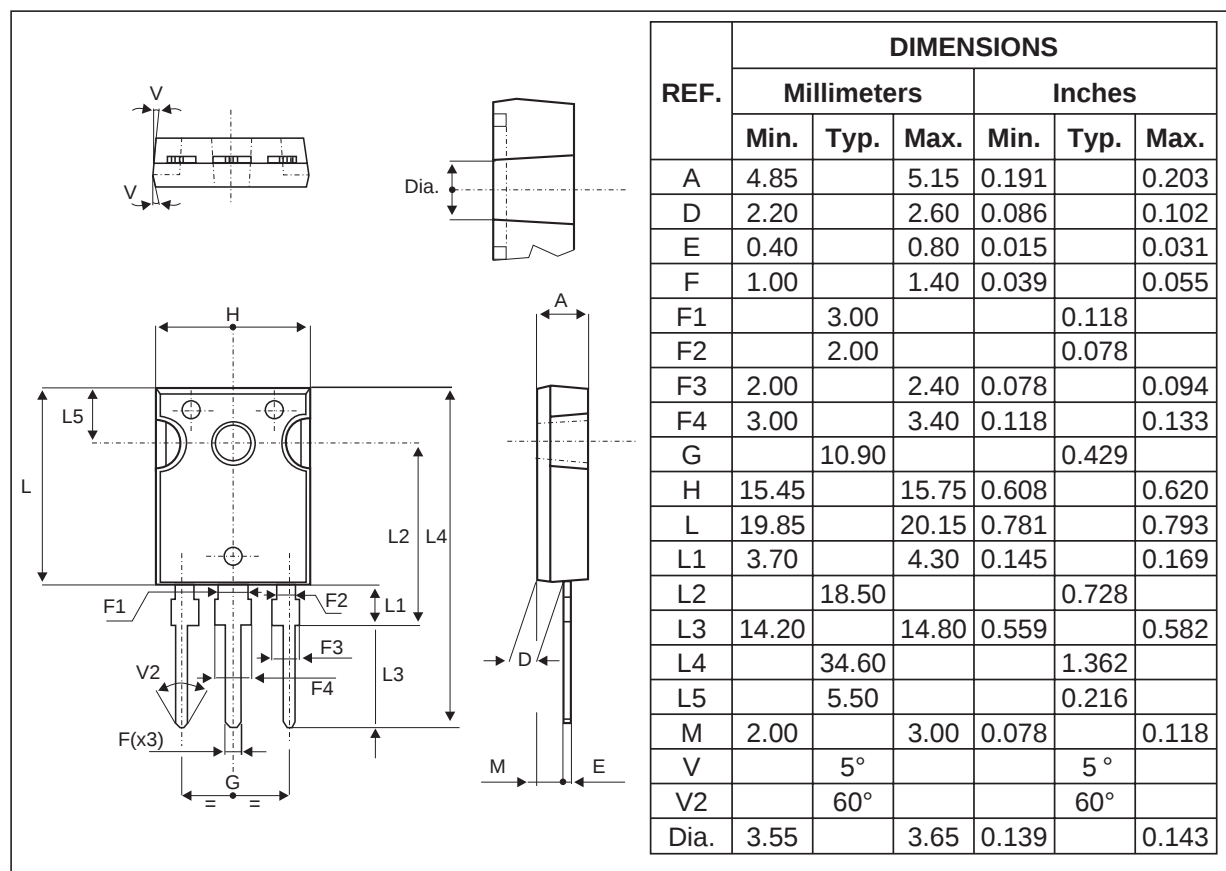
PACKAGE MECHANICAL DATA
D²PAK


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°

FOOT PRINT DIMENSIONS (in millimeters)


STPS40150CT/CW/CG**PACKAGE MECHANICAL DATA**

TO-247



- Cooling method : C
- Recommended torque value : 0.8m.N
- Maximum torque value : 1.0m.N

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS40150CT	STPS40150CT	TO-220AB	2g	50	Tube
STPS40150CW	STPS40150CW	TO-247	4.4g	30	Tube
STPS40150CG	STPS40150CG	D ² PAK	1.48g	50	Tube
STPS40150CG-TR	STPS40150CG-TR	D ² PAK	1.48g	1000	Tape & reel

- Epoxy meets UL94,V0

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