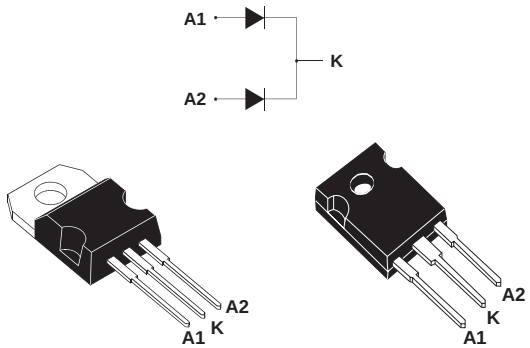
STPS40150CG/CT/CW

HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

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



TO-220AB
STPS40150CT

TO-247
STPS40150CW

D^2PAK
STPS40150CG

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 D^2PAK, 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	Tc = 150°C δ = 0.5	Per diode Per device	20 40	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal		250	A
P_{ARM}	Repetitive peak avalanche power	tp = 1µs Tj = 25°C		14100	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 case	TO-220AB / D^2PAK	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 :
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	$V_R = V_{RRM}$		2	8	µA
		Tj = 125°C			2	11	mA
V_F *	Forward voltage drop	Tj = 25°C	I_F = 20 A			0.92	V
		Tj = 125°C	I_F = 20 A		0.69	0.75	
		Tj = 25°C	I_F = 40 A			1.00	
		Tj = 125°C	I_F = 40 A		0.79	0.86	

Pulse test : * tp = 380 µs, δ < 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).

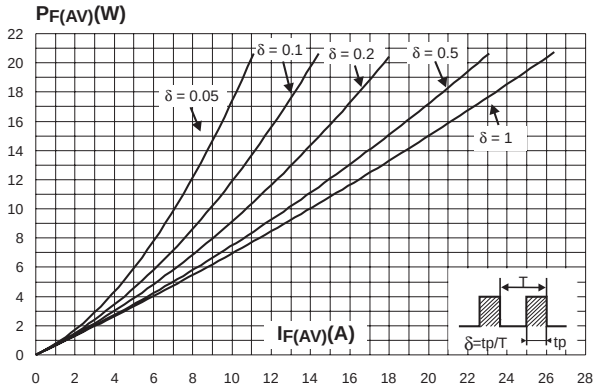


Fig. 2: Normalized avalanche power derating versus pulse duration.

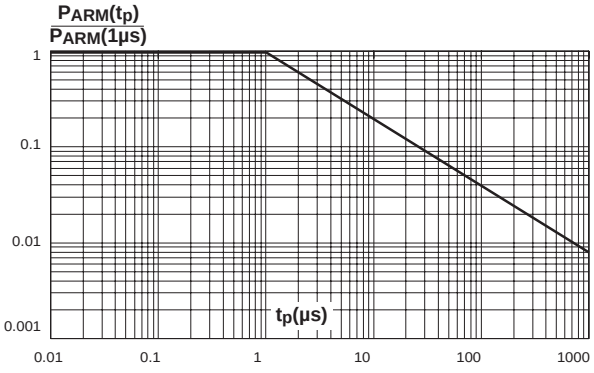


Fig. 3: Normalized avalanche power derating versus junction temperature.

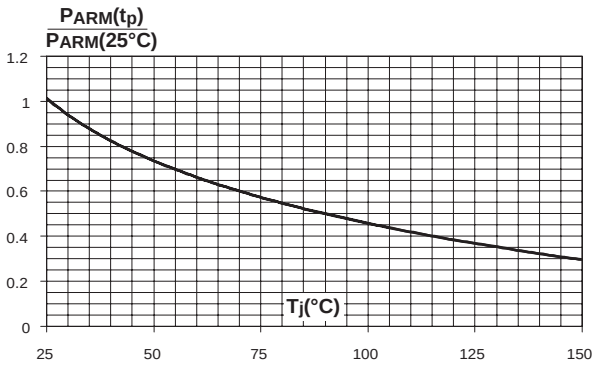


Fig. 4: Average forward current versus ambient temperature (δ=0.5, per diode).

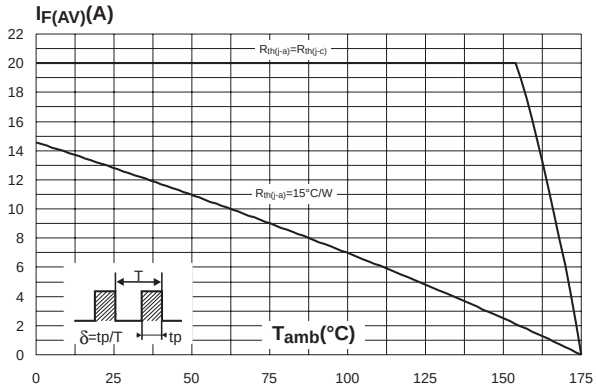


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode).

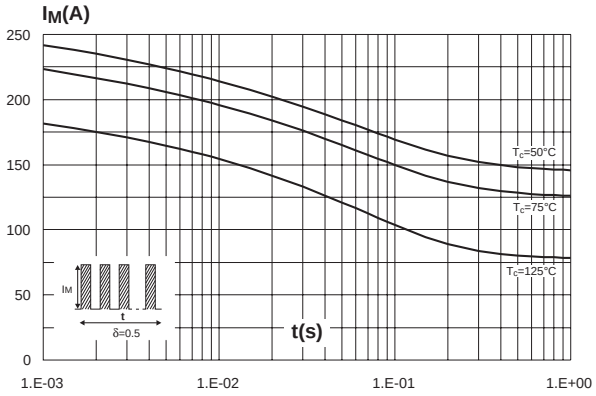


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

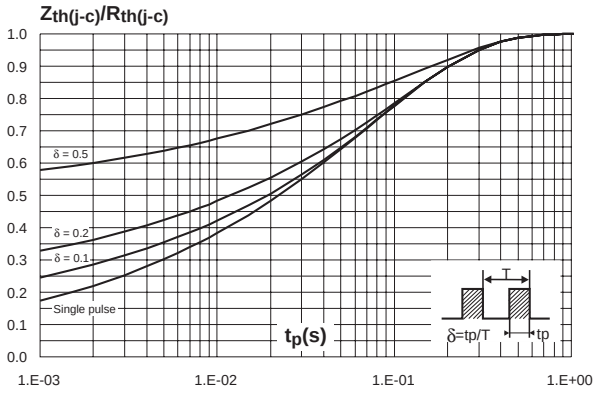


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

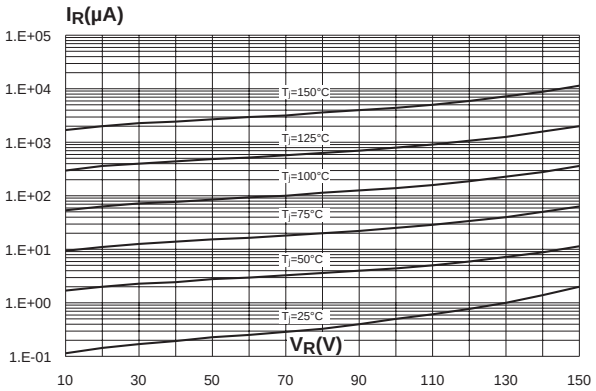


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

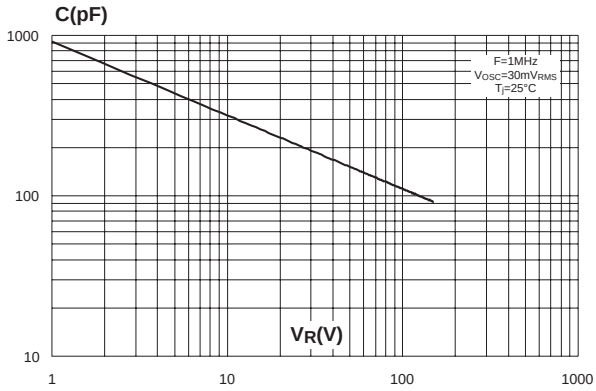


Fig. 9: Forward voltage drop versus forward current (per diode).

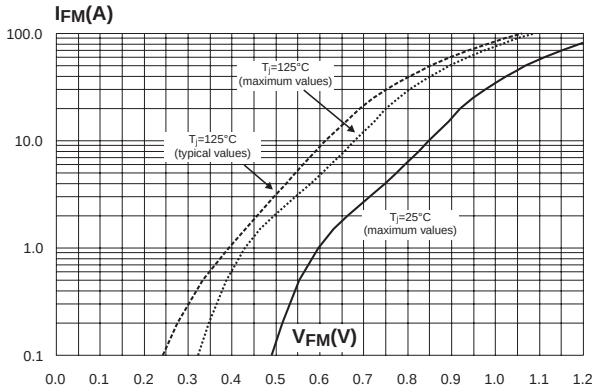
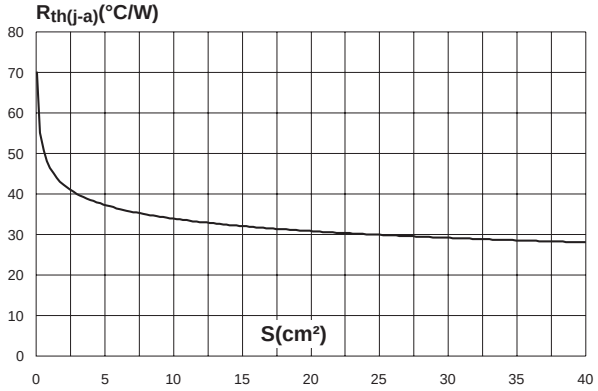
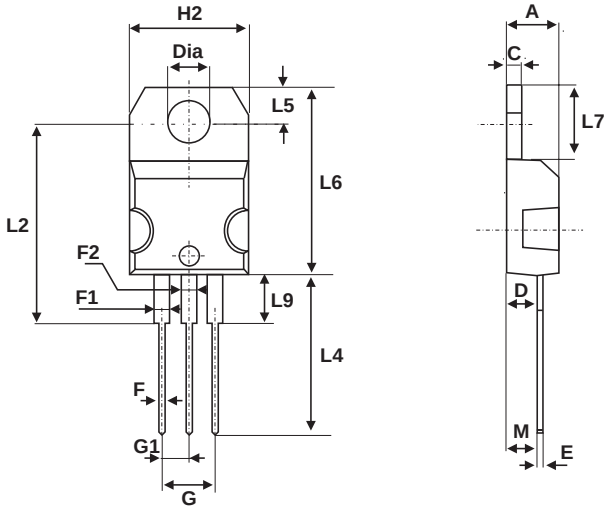


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu=35µm) (D^2PAK).



PACKAGE MECHANICAL DATA

TO-220AB

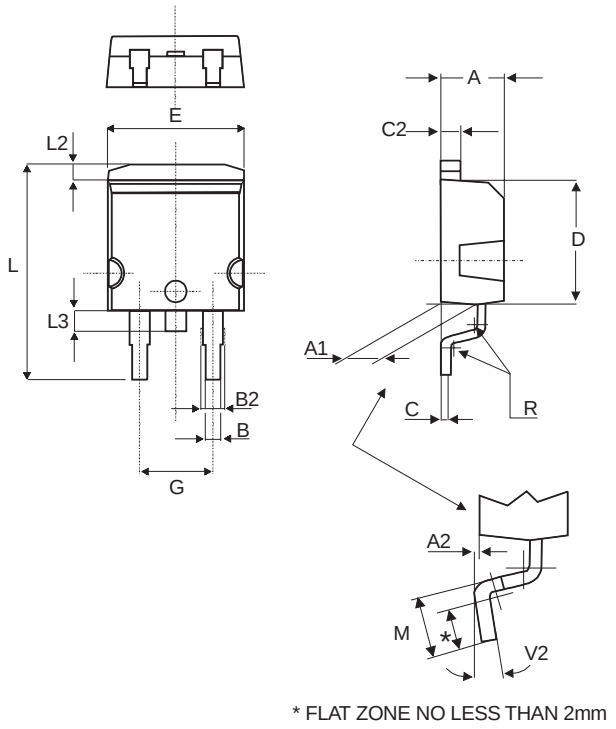


REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409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

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

PACKAGE MECHANICAL DATA

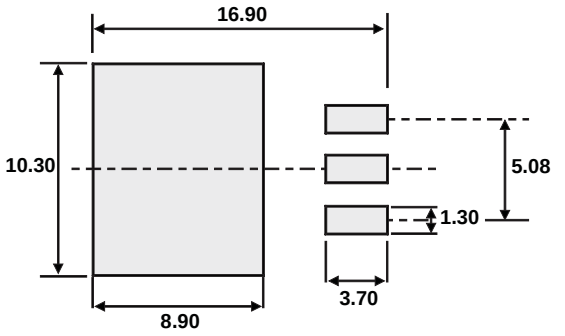
D^2PAK



* FLAT ZONE NO LESS THAN 2mm

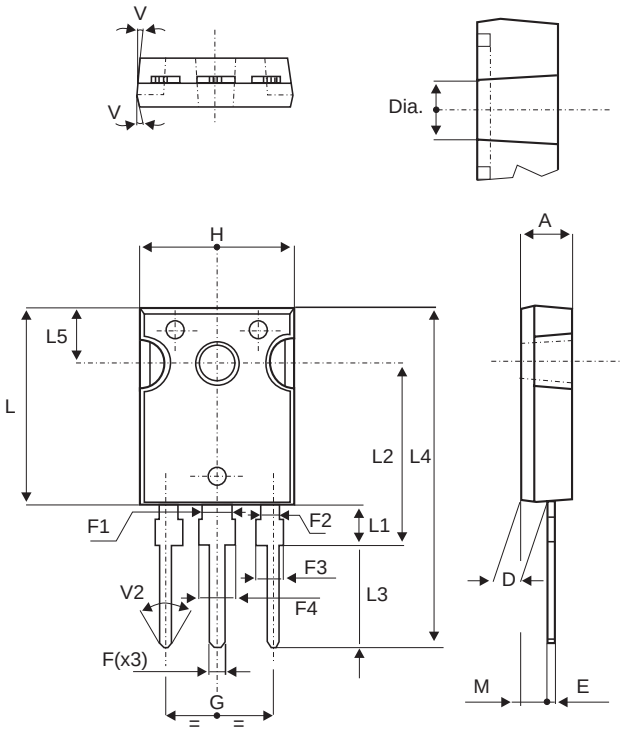
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192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

FOOT PRINT DIMENSIONS (in millimeters)



PACKAGE MECHANICAL DATA

TO-247



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

- 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^2PAK	1.48g	50	Tube
STPS40150CG-TR	STPS40150CG-TR	D^2PAK	1.48g	1000	Tape & reel

- Epoxy meets UL94,V0