STPS10L40CT/CG/CF

LOW DROP POWER SCHOTTKY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2x5 A
V_{RRM}	40 V
Tj (max)	150°C
V_F (max)	0.46 V

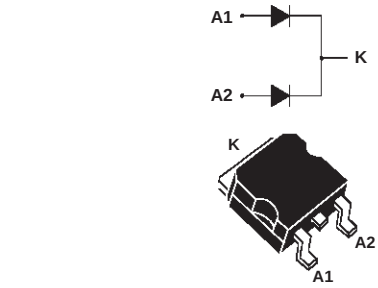
FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP MEANING VERY SMALL CONDUCTION LOSSES
- LOW DYNAMIC LOSSES AS A RESULT OF THE SCHOTTKY BARRIER
- AVALANCHE RATED

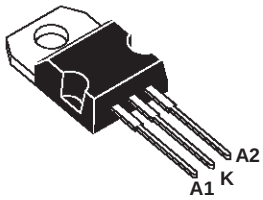
DESCRIPTION

Dual center tap Schottky rectifiers suited for switchmode power supply and high frequency DC to DC converters.

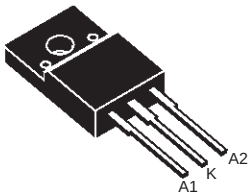
Packaged in TO-220AB, ISOWATT220AB and D^2PAK, these devices are intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection applications.



D^2PAK
STPS10L40CG



TO-220AB
STPS10L40CT



ISOWATT220AB
STPS10L40CF

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			40	V
$I_{F(RMS)}$	RMS forward current			20	A
$I_{F(AV)}$	Average forward current	Tc = 135°C δ = 0.5	Per diode Per device	5 10	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal		150	A
I_{RRM}	Peak repetitive reverse current	tp=2 µs F=1kHz square		1	A
I_{RSM}	Non repetitive peak reverse current	tp = 100 µs square		2	A
T_{stg}	Storage temperature range			- 65 to + 150	°C
Tj	Maximum operating junction temperature *			150	°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	3 1.7	°C/W
$R_{th\ (c)}$			Coupling	0.35	
$R_{th\ (j-c)}$	Junction to case	ISOWATT220AB	Per diode Total	5 3.8	°C/W
$R_{th\ (c)}$			Coupling	2.5	

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	$V_R = V_{RRM}$			0.2	mA
		Tj = 100°C			8	25	mA
V_F *	Forward voltage drop	Tj = 25°C	I_F = 5 A			0.53	V
		Tj = 125°C	I_F = 5 A		0.36	0.46	
		Tj = 25°C	I_F = 10 A			0.67	
		Tj = 125°C	I_F = 10 A		0.49	0.59	

Pulse test : * tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation :
$P = 0.33 \times I_{F(AV)} + 0.026\ I_F{}^2{}_{(RMS)}$

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

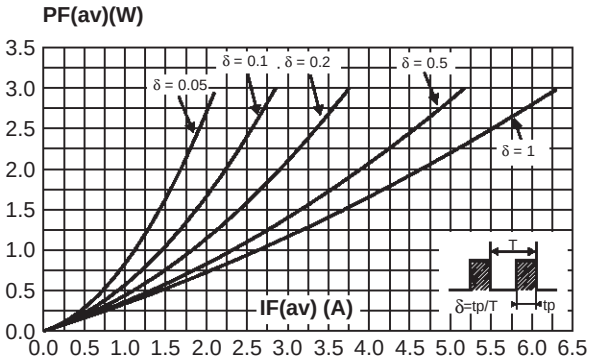


Fig. 2: Average forward current versus ambient temperature (δ=0.5, per diode).

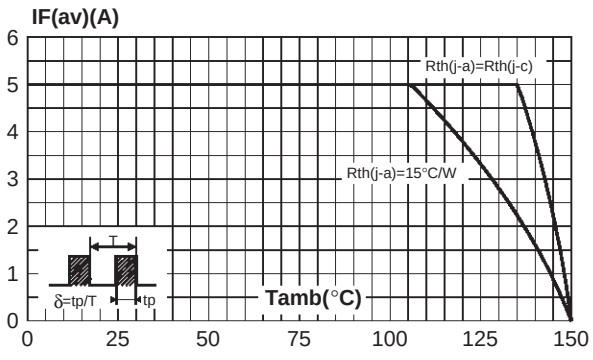


Fig. 3-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D^2PAK).

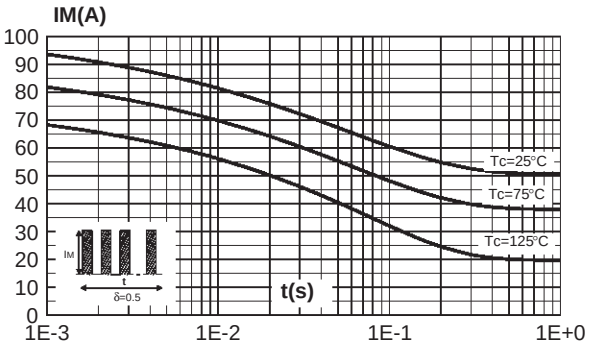


Fig. 3-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB).

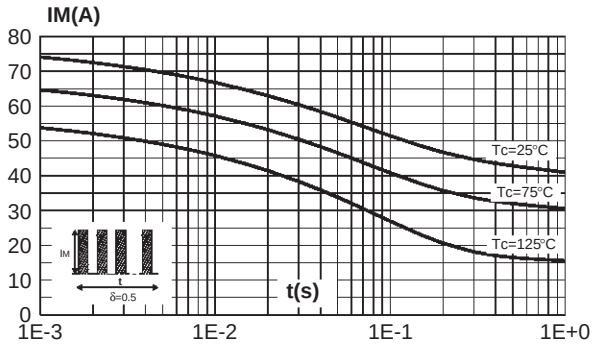


Fig. 4-1: Relative variation of thermal impedance junction to case versus pulse duration. (TO-220AB and D^2PAK).

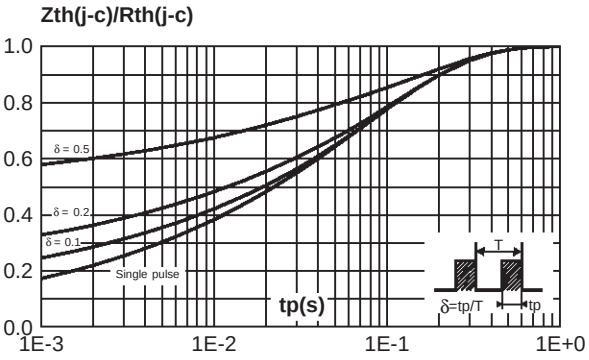


Fig. 4-2: Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AB).

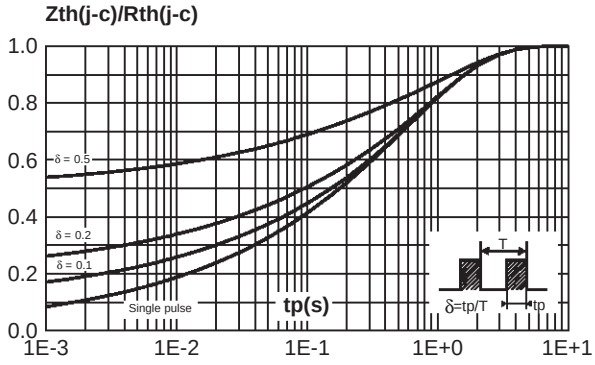


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values, per diode).

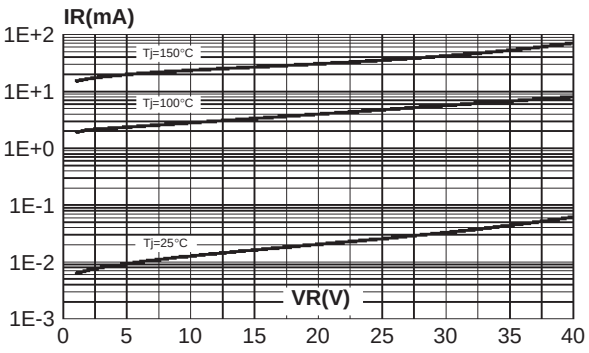


Fig. 6: Junction capacitance versus reverse voltage applied (typical values, per diode).

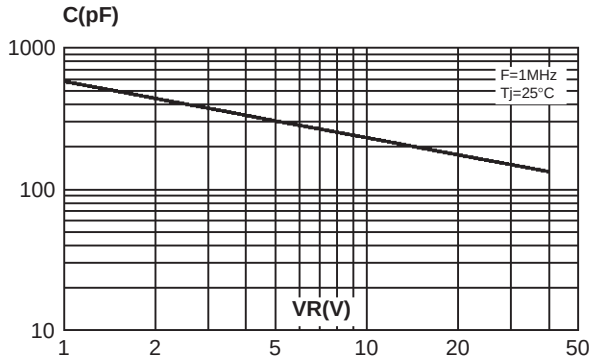


Fig. 7: Forward voltage drop versus forward current (maximum values, per diode).

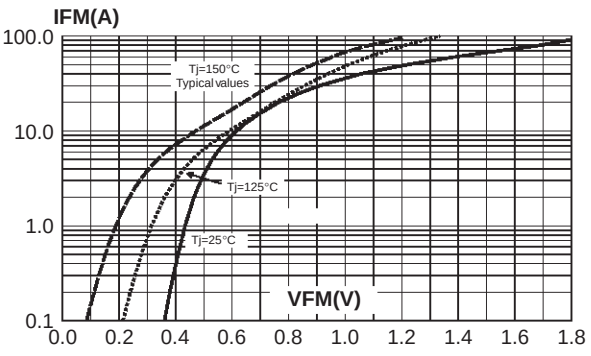
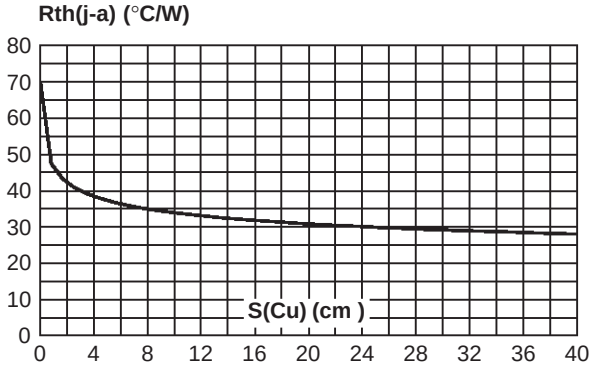
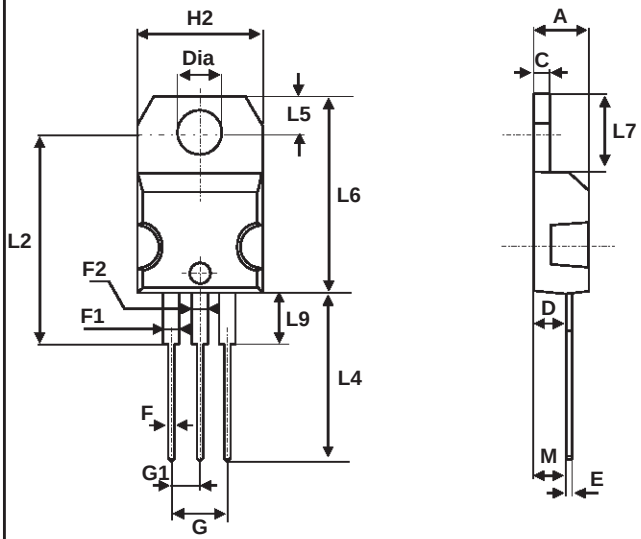


Fig. 8: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm)(D^2PAK).



PACKAGE MECHANICAL DATA

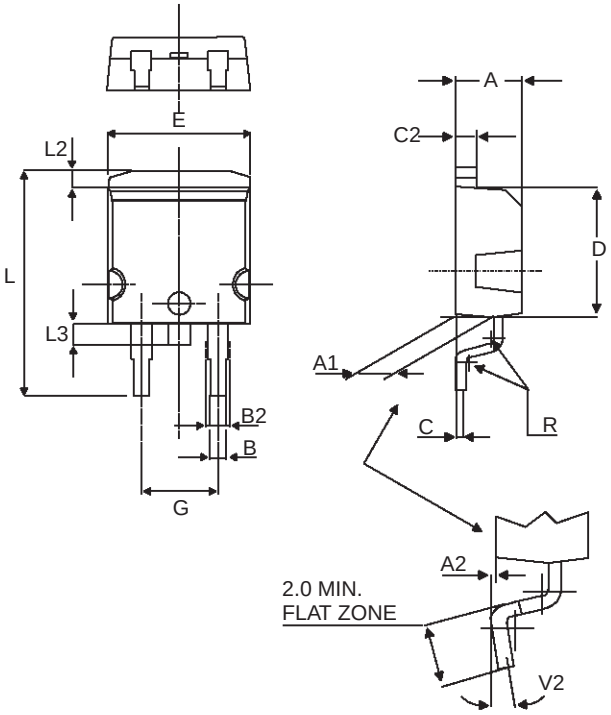
TO-220AB



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

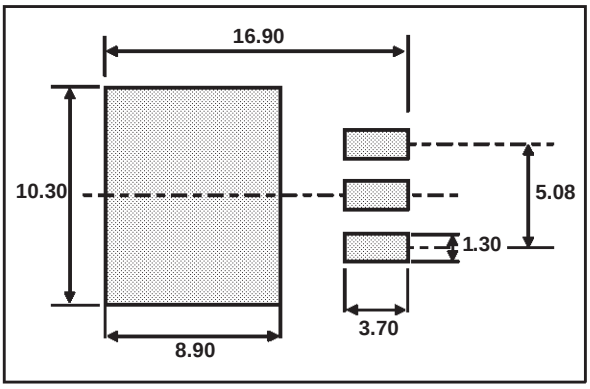
- Cooling method : C
- Recommended torque value : 0.55 m.N
- Maximum torque value : 0.70 m.N

PACKAGE MECHANICAL DATA
D^2PAK



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.169		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	1.25	1.40		0.049	0.055	
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	8.95		9.35	0.352		0.368
E	10.00		10.28	0.393		0.405
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

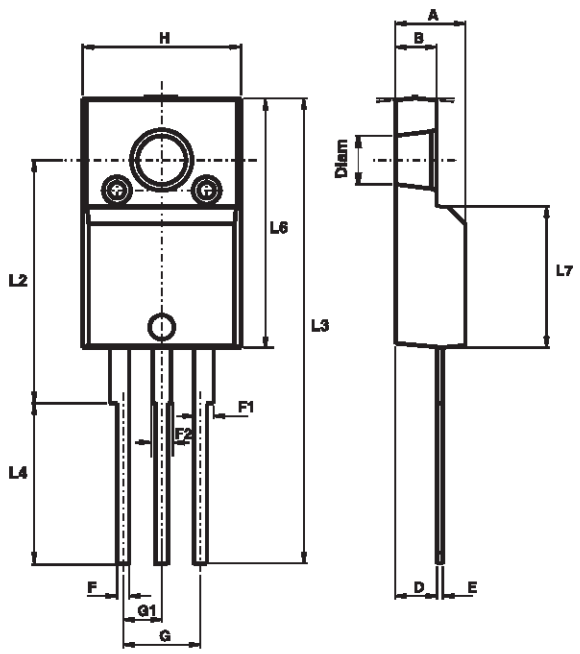
FOOT PRINT DIMENSIONS (in millimeters)



- Cooling method: by conduction (method C)

PACKAGE MECHANICAL DATA

ISOWATT220AB



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	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			0.630	
L3	28.60		30.60	1.125		1.205

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

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS10L40CT	STPS10L40CT	TO-220AB	2.23g	50	Tube
STPS10L40CG	STPS10L40CG	D^2PAK	1.48g	50	Tube
STPS10L40CG-TR	STPS10L40CG	D^2PAK	1.48g	500	Tape & reel
STPS10L40CF	STPS10L40CF	ISOWATT220AB	2.08g	50	Tube