



STPS20L40CF/CW/CT/CFP

LOW DROP POWER SCHOTTKY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

I _{F(AV)}	2 x 10 A
V _{RRM}	40 V
T _j (max)	150°C
V _F (max)	0.5 V

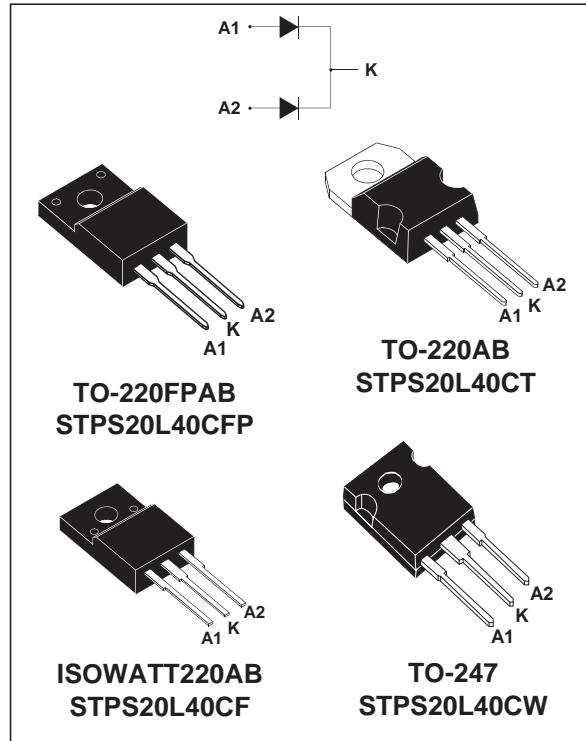
FEATURES AND BENEFITS

- Low forward voltage drop meaning very small conduction losses
- Low dynamic losses as a result of the schottky barrier
- Insulated package: ISOWATT220AB, TO-220FPAB
Insulating voltage = 200V DC
Capacitance = 12pF

DESCRIPTION

Dual center tap Schottky rectifiers designed for high frequency switched mode power supplies and DC to DC converters.

These devices are intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter				Value	Unit
V _{RRM}	Repetitive peak reverse voltage				40	V
I _{F(RMS)}	RMS forward current				30	A
I _{F(AV)}	Average forward current	TO-220AB	T _c = 135°C	Per diode	10	A
		TO-247	δ = 0.5	Per device	20	
I _{FSM}	Surge non repetitive forward current	ISOWATT220AB	T _c = 115°C	Per diode	10	A
		TO-220FPAB	δ = 0.5	Per device	20	
I _{IRRM}	Peak repetitive reverse current	tp = 10 ms Sinusoidal			180	A
I _{IRSM}	Non repetitive peak reverse current	tp = 100 μs square			2	A
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

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THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
R _{th(j-c)}	Junction to case	ISOWATT220AB TO-220FPAB	Per diode Total Coupling	4.5 3.5 2.5	°C/W
R _{th(j-c)}	Junction to case	TO-247	Per diode Total Coupling	2.2 1.20 0.3	°C/W
R _{th(j-c)}	Junction to case	TO-220AB	Per diode Total Coupling	2.2 1.3 0.3	°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°C	V _R = V _{RRM}			0.7	mA
		T _j = 100°C			15	35	mA
V _F *	Forward voltage drop	T _j = 25°C	I _F = 10 A			0.55	V
		T _j = 125°C	I _F = 10 A		0.44	0.5	
		T _j = 25°C	I _F = 20 A			0.73	
		T _j = 125°C	I _F = 20 A		0.62	0.72	

Pulse test : * tp = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation :

$$P = 0.28 \times I_{F(AV)} + 0.022 I_{F}^2(\text{RMS})$$

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

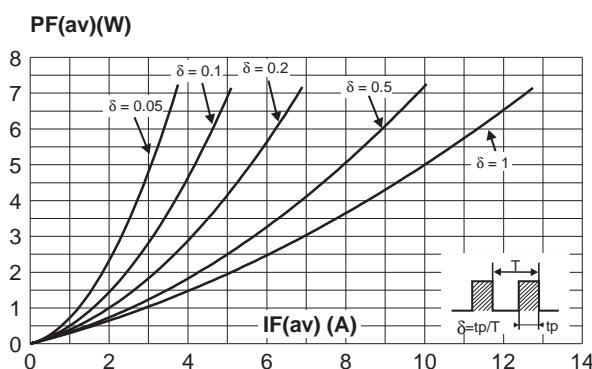


Fig. 2: Average forward current versus ambient temperature (δ = 0.5, per diode).

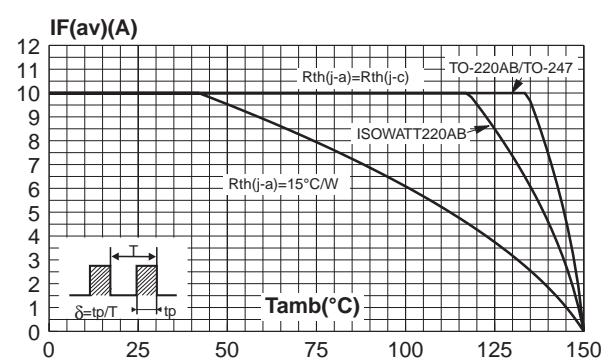


Fig. 3-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode, TO-220AB / TO-247).

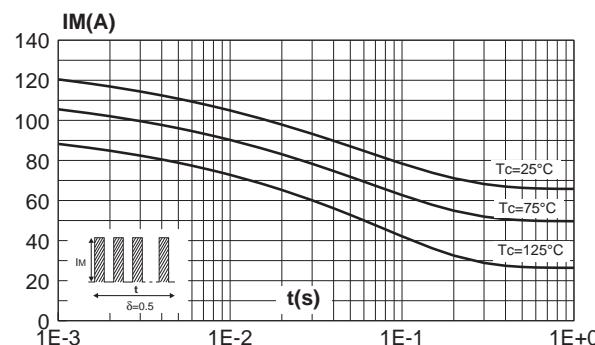


Fig. 4-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB / TO-247).

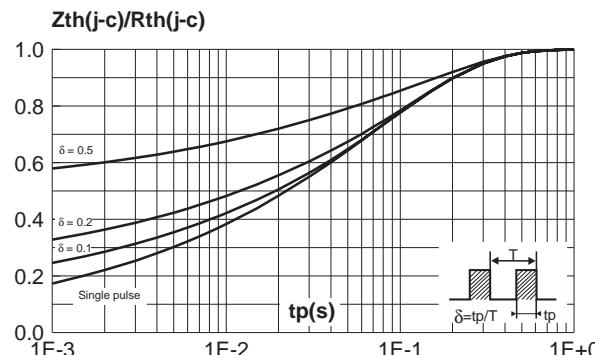


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values, per diode).

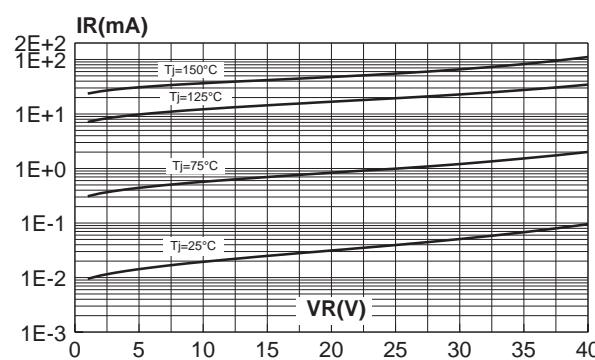


Fig. 3-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode, ISOWATT220AB, TO-220FPAB).

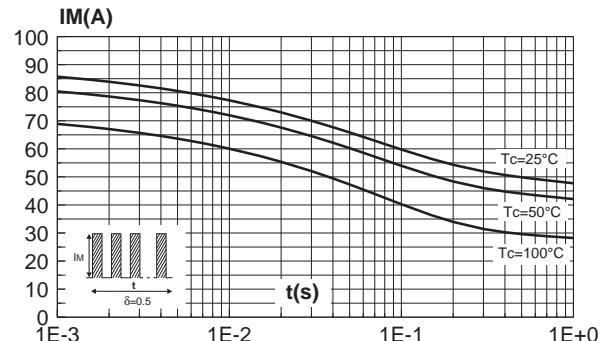


Fig. 4-2: Relative variation of thermal impedance junction to case versus pulse duration (ISOWATT220AB, TO-220FPAB).

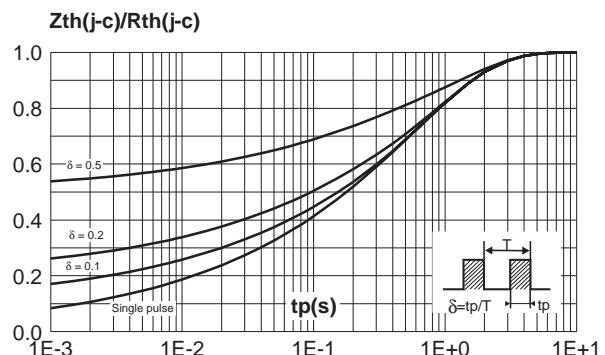
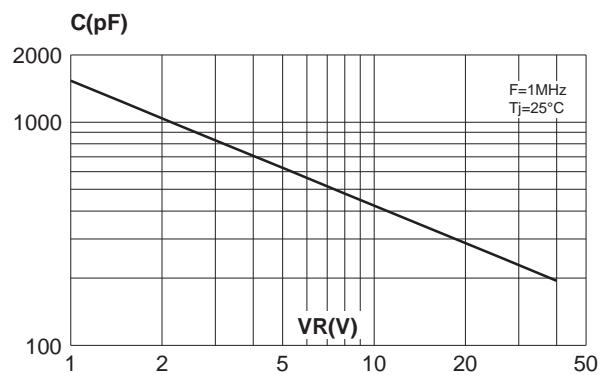
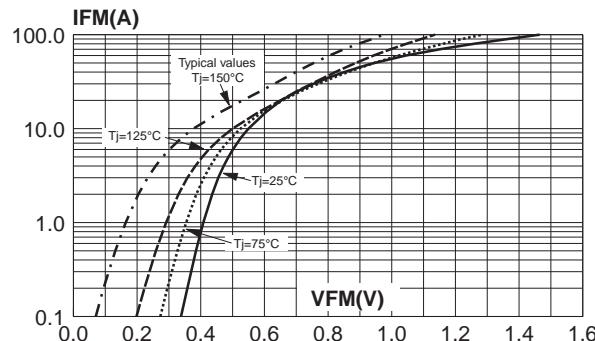


Fig. 6: Junction capacitance versus reverse voltage applied (typical values, per diode).



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

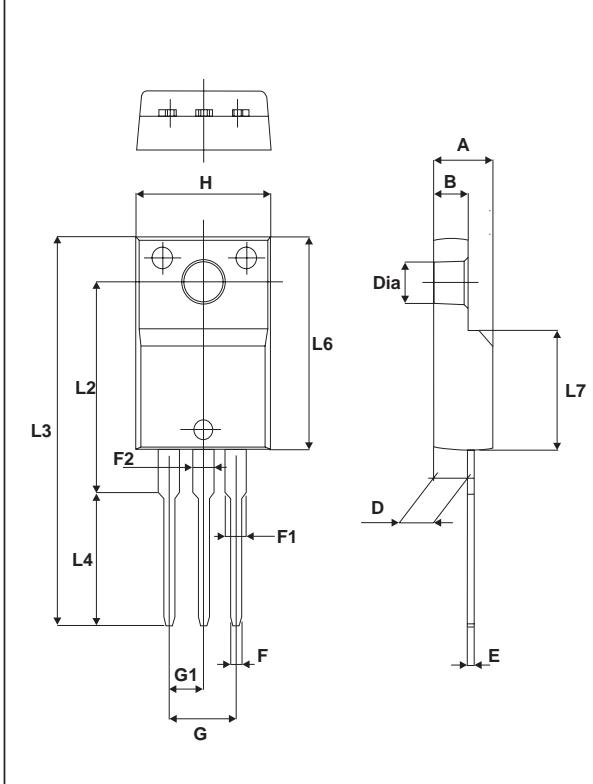


PACKAGE MECHANICAL DATA ISOWATT220AB

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	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 typ.		0.630 typ.	
L3	28.60	30.60	1.125	1.205
L4	9.80	10.60	0.386	0.417
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Diam	3.00	3.20	0.118	0.126

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

PACKAGE MECHANICAL DATA
TO-220FPAB



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.9	0.173	0.193
B	2.5	2.9	0.098	0.114
D	2.45	2.75	0.096	0.108
E	0.4	0.70	0.016	0.027
F	0.60	1	0.024	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	0.204
G1	2.40	2.70	0.094	0.106
H	10	10.7	0.393	0.421
L2	16 Typ.		0.63 Typ.	
L3	28.6	30.6	1.126	1.204
L4	9.8	10.7	0.385	0.421
L6	15.8	16.4	0.621	0.645
L7	9.00	9.90	0.354	0.389
Dia.	2.9	3.50	0.114	0.18

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

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

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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
STPS20L40CF	STPS20L40CF	ISOWATT220AB	2.1g	50	Tube
STPS20L40CFP	STPS20L40CFP	TO-220FPAB	2g	50	Tube
STPS20L40CT	STPS20L40CT	TO-220AB	2g	50	Tube
STPS20L40CW	STPS20L40CW	TO-247	4.4g	30	Tube

- Epoxy meets UL94,V0

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