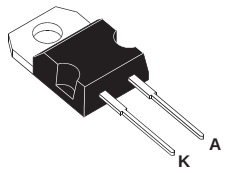
STPR1520D/F

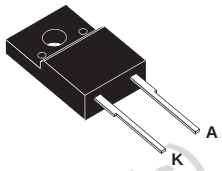
ULTRA-FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	15 A
V_{RRM}	200 V
Tj (max)	150°C
V_F (max)	0.99 V
trr (max)	30 ns



TO-220AC
STPR1520D



ISOWATT220AC
STPR1520F

FEATURES

- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY

DESCRIPTION

Low cost single chip rectifier suited for switchmode power supply and high frequency DC to DC converters.

Packaged in TO-220AC and ISOWATT220AC, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

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Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			200	V
$I_{F(RMS)}$	RMS forward current			30	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AC	Tc = 115°C	15	A
		ISOWATT220AC	Tc = 70°C		
I_{FSM}	Surge non repetitive forward current		Tp = 10 ms Sinusoidal	150	A
T_{stg}	Storage temperature range			- 65 to + 150	°C
Tj	Maximum operating junction temperature			+ 150	

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THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC	2	°C/W
		ISOWATT220AC	4.5	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameters	Test conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	Tj = 25°C	$V_R = V_{RRM}$			50	µA
		Tj = 100°C				1	mA
V_F **	Forward voltage drop	Tj = 125°C	I_F = 15 A			0.99	V
		Tj = 125°C	I_F = 30 A			1.20	
		Tj = 25°C	I_F = 30 A			1.25	

Pulse test : * tp = 5 ms, δ < 2 %
** tp = 380 µs, δ < 2 %

To evaluate the conduction losses use the following equation :
$P = 0.78 \times I_{F(AV)} + 0.014 \times I_F{}^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Test conditions		Min.	Typ.	Max.	Unit
trr	T_j = 25°C	I_F = 0.5A Irr = 0.25A I_R = 1A			30	ns
tfr	T_j = 25°C	I_F = 1A tr = 10 ns V_{FR} = 1.1 x V_F		20		
V_{FP}	T_j = 25°C	I_F = 1A tr = 10 ns		3		V

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

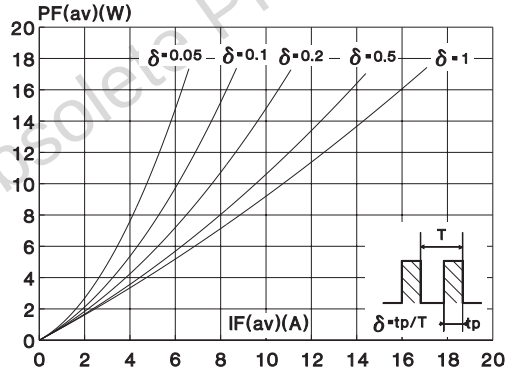

Fig. 2: Peak current versus form factor.

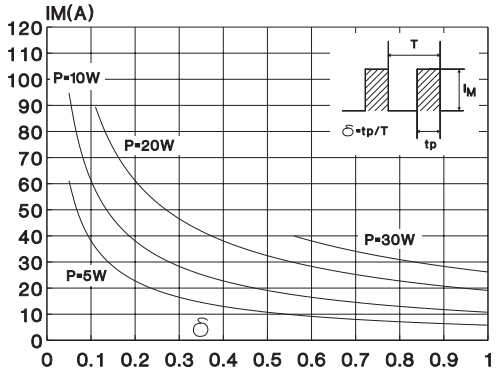

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Fig. 3: Average current versus ambient temperature.

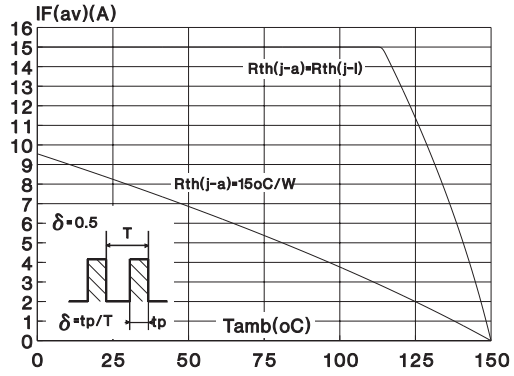

Fig. 4: Average current versus ambient temperature.

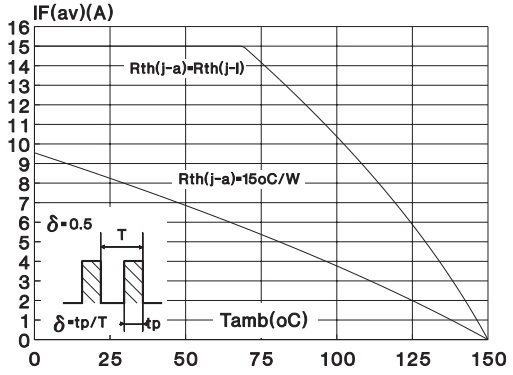

Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AC)

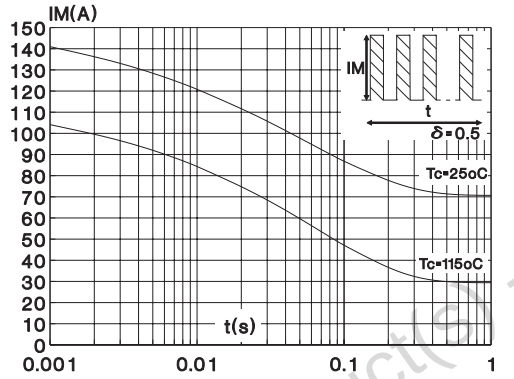

Fig. 6: Non repetitive surge peak forward current versus overload duration (maximum values) (ISOWATT220AC).

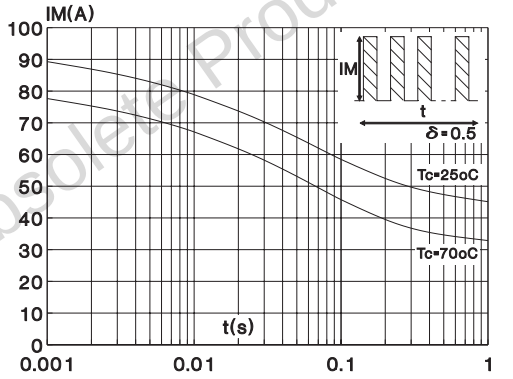

Fig. 7: Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AC).

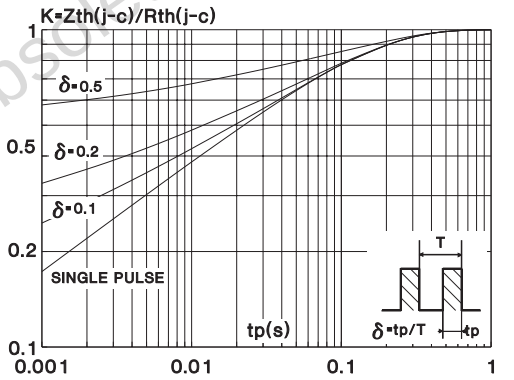

Fig. 8: Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AC).

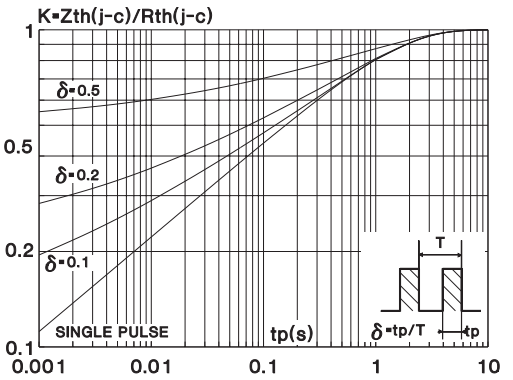

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Fig. 9: Forward voltage drop versus forward current.

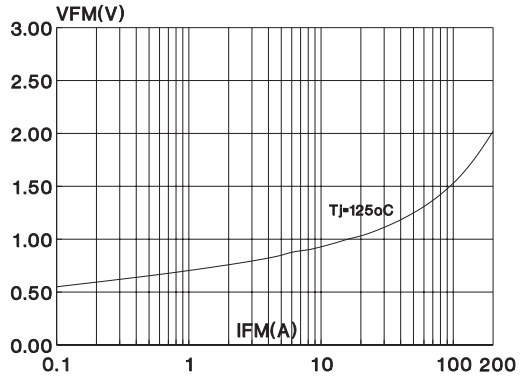


Fig. 10: Junction capacitance versus reverse voltage applied (typical values).

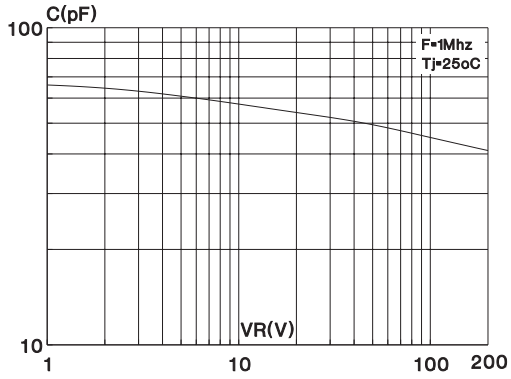


Fig. 11: Recovery charge versus dI_F/dt.

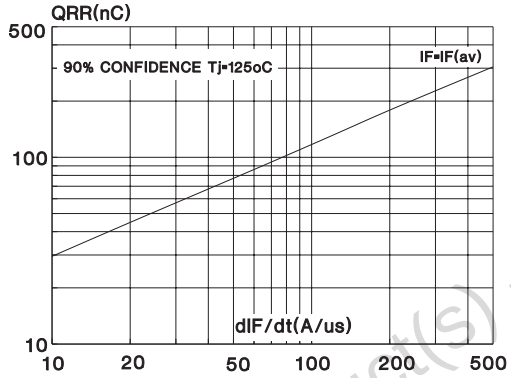


Fig. 12: Peak reverse current versus dI_F/dt.

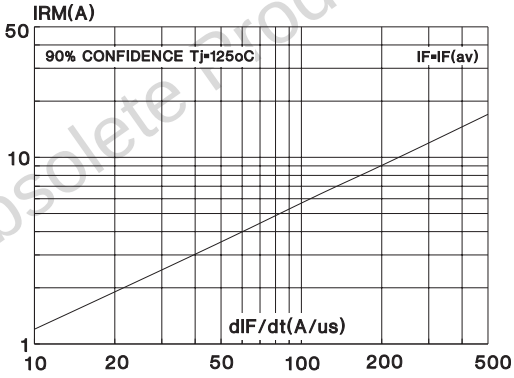
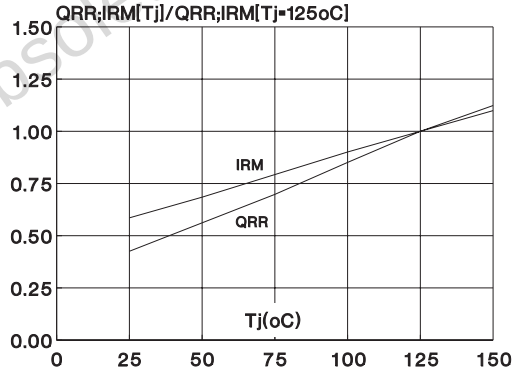


Fig. 13: Dynamic parameters versus junction temperature.



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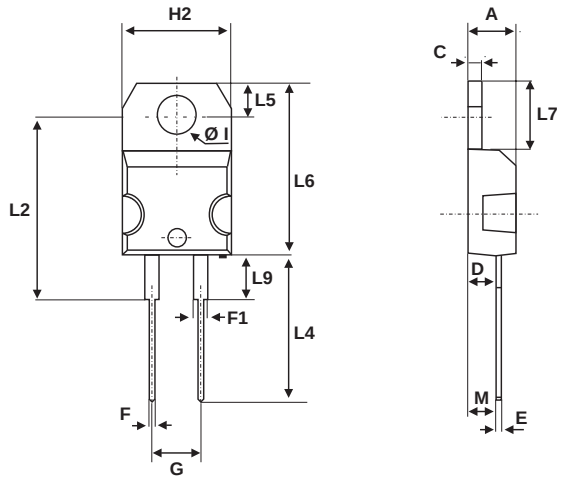
PACKAGE MECHANICAL DATA

TO-220AC



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
G	4.95	5.15	0.194	0.202
H2	10.00	10.40	0.393	0.409
L2	16.40 typ.		0.645 typ.	
L4	13.00	14.00	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. I	3.75	3.85	0.147	0.151

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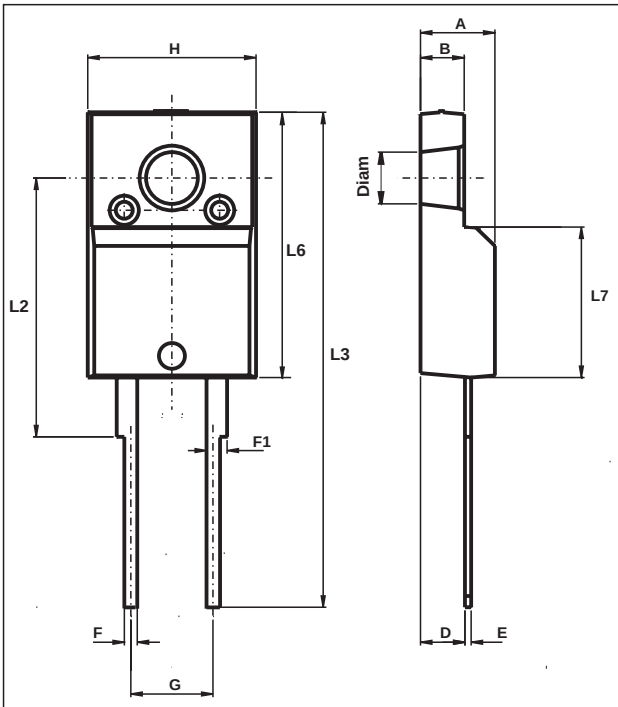
PACKAGE MECHANICAL DATA

ISOWATT220AC



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	2.40		2.75	0.094		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
G	4.95		5.20	0.195		0.205
H	10.00		10.40	0.394		0.409
L2		16.00			0.630	
L3	28.60		30.60	1.125		1.205
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

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