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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





STPR1520D/F

ULTRA-FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCTS CHARACTERISTICS

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

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.



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	$T_c = 115^\circ\text{C}$	15	A
		ISOWATT220AC	$T_c = 70^\circ\text{C}$		
I_{FSM}	Surge non repetitive forward current		$T_p = 10$ ms Sinusoidal	150	A
T_{stg}	Storage temperature range		- 65 to + 150	°C	
T_j	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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			50	μA
		$T_j = 100^\circ\text{C}$				1	nA
V_F^{**}	Forward voltage drop	$T_j = 125^\circ\text{C}$	$I_F = 15\text{ A}$			0.99	V
		$T_j = 125^\circ\text{C}$	$I_F = 30\text{ A}$			1.20	
		$T_j = 25^\circ\text{C}$	$I_F = 30\text{ A}$			1.25	

Pulse test : * $t_p = 5\text{ ms}$, $\delta < 2\%$

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

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
t_{rr}	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{ A}$	$i_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$			30	ns
t_{fr}	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$	$t_r = 10\text{ ns}$ $V_{FR} = 1.1 \times V_F$		20		
V_{FP}	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$	$t_r = 10\text{ ns}$		3		V

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

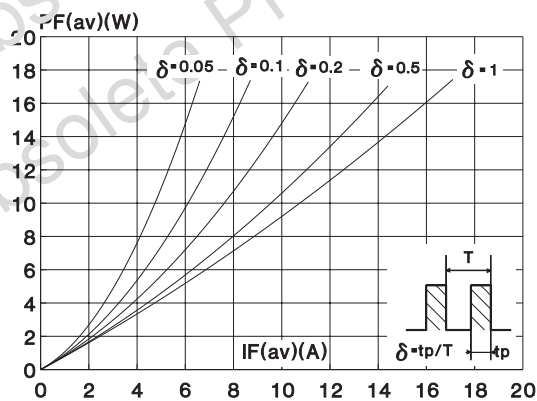


Fig. 2: Peak current versus form factor.

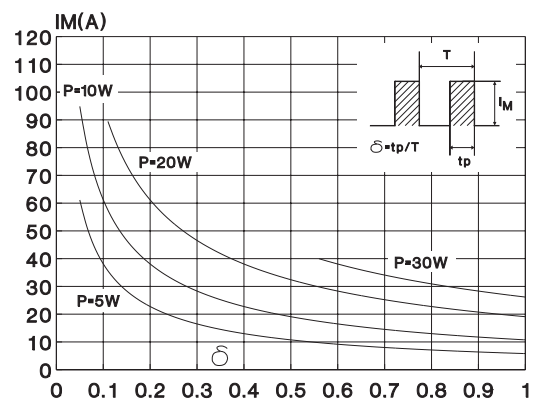


Fig. 3: Average current versus ambient temperature.

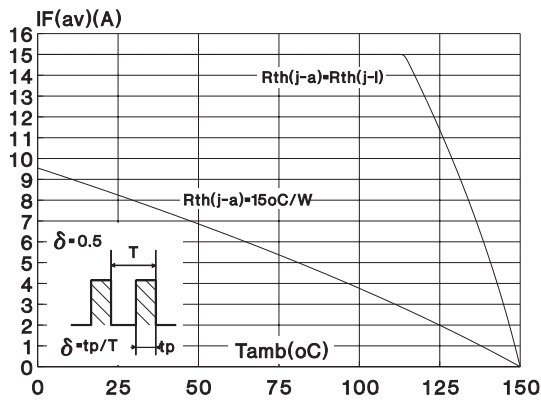


Fig. 4: Average current versus ambient temperature.

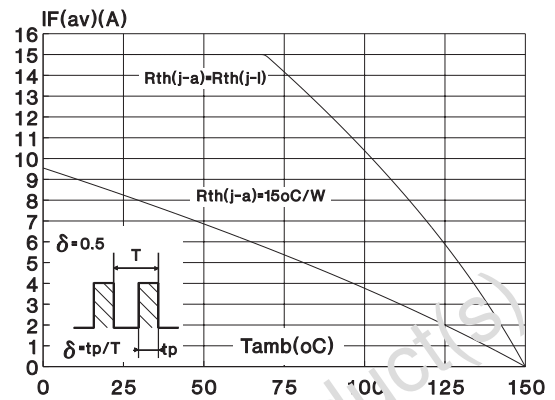


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AC)

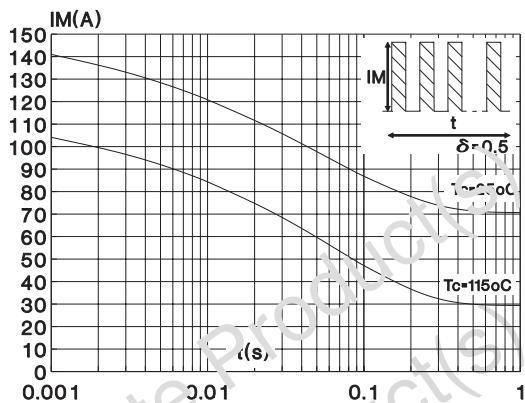


Fig. 6: Non repetitive surge peak forward current versus overload duration (maximum values) (ISOWATT220AC).

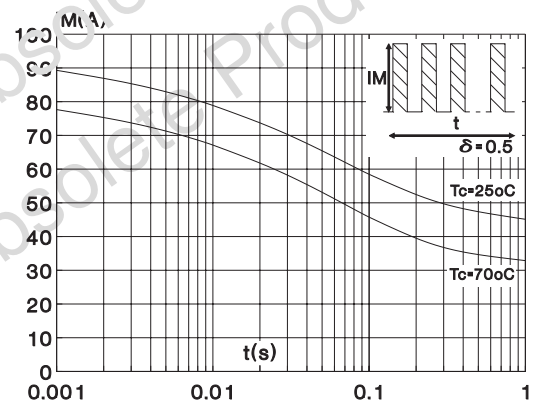


Fig. 7: Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AC).

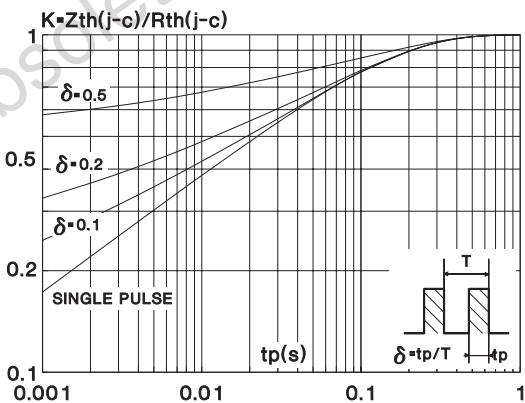
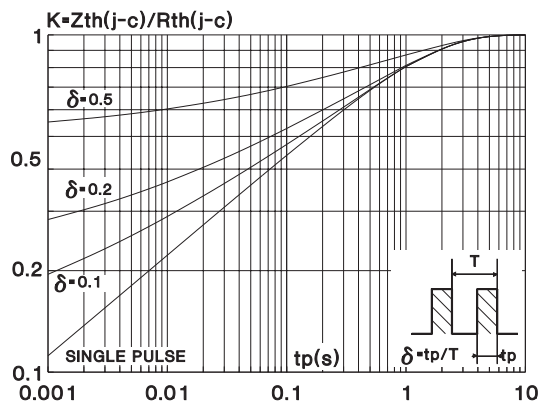


Fig. 8: Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AC).



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Fig. 9: Forward voltage drop versus forward current.

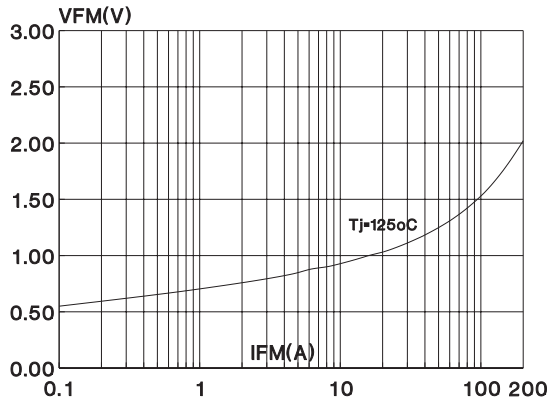


Fig. 10: Junction capacitance versus reverse voltage applied (typical values).

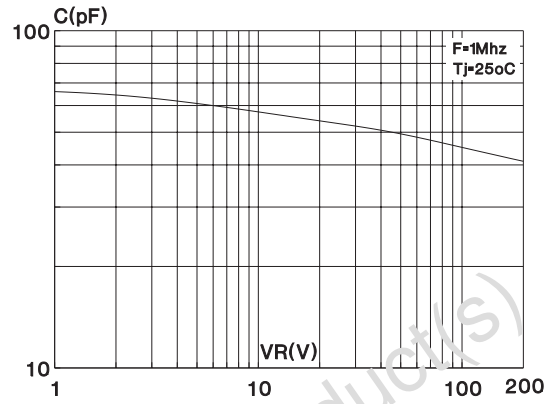


Fig. 11: Recovery charge versus di_F/dt .

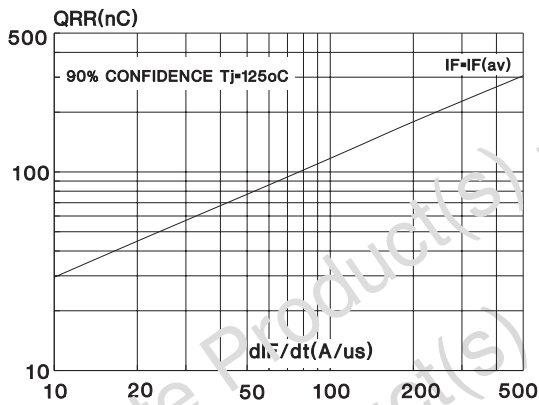


Fig. 12: Peak reverse current versus di_F/dt .

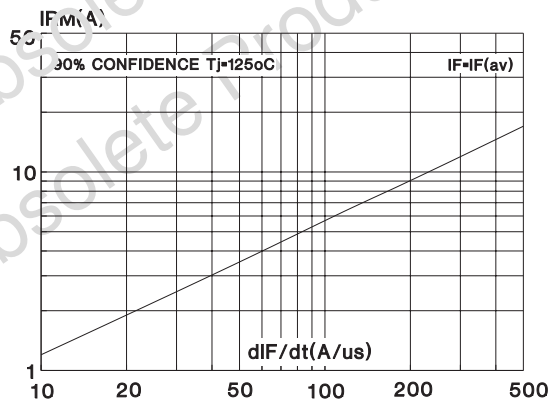
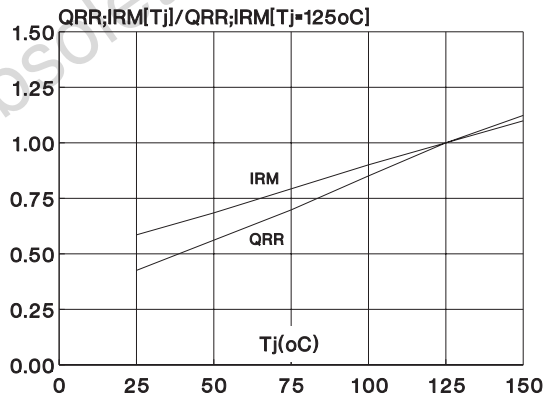
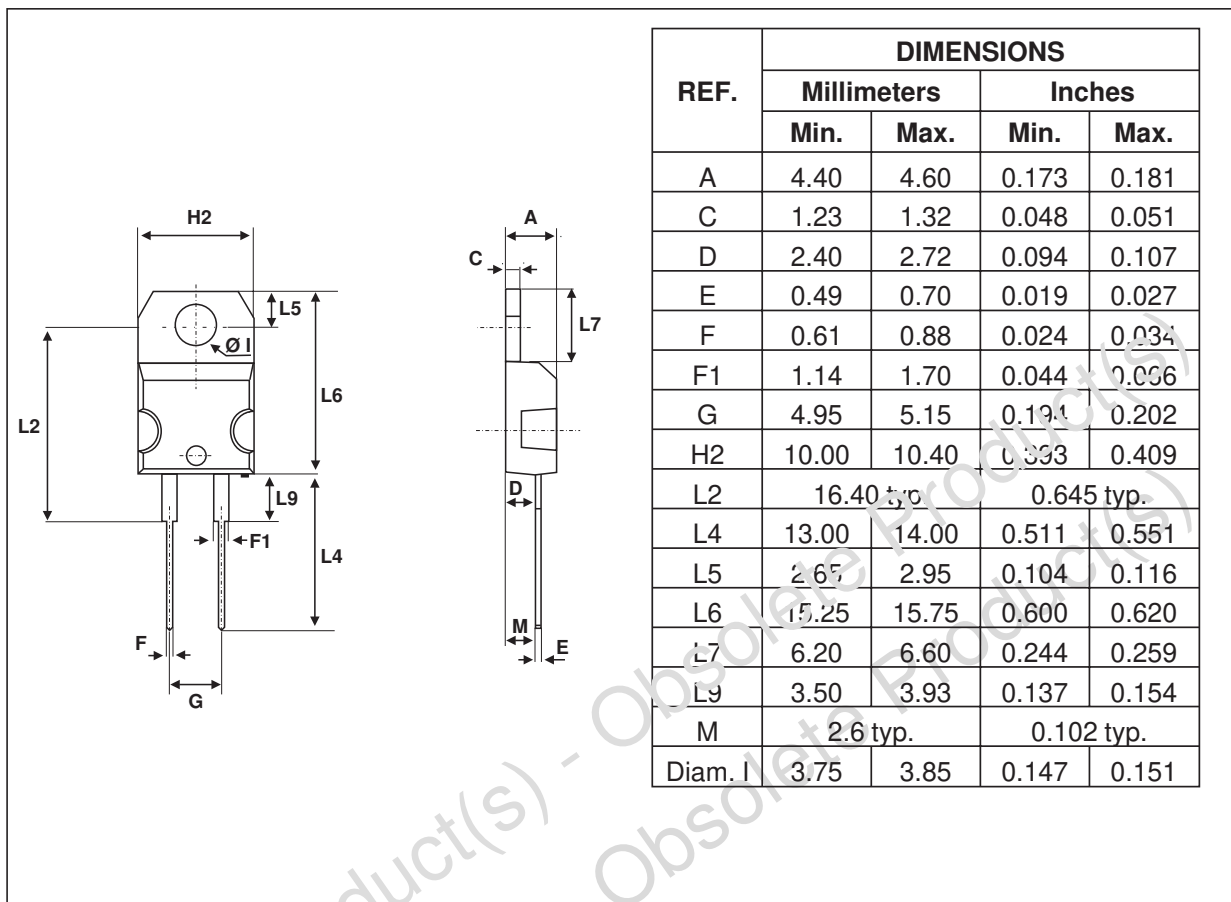


Fig. 13: Dynamic parameters versus junction temperature.



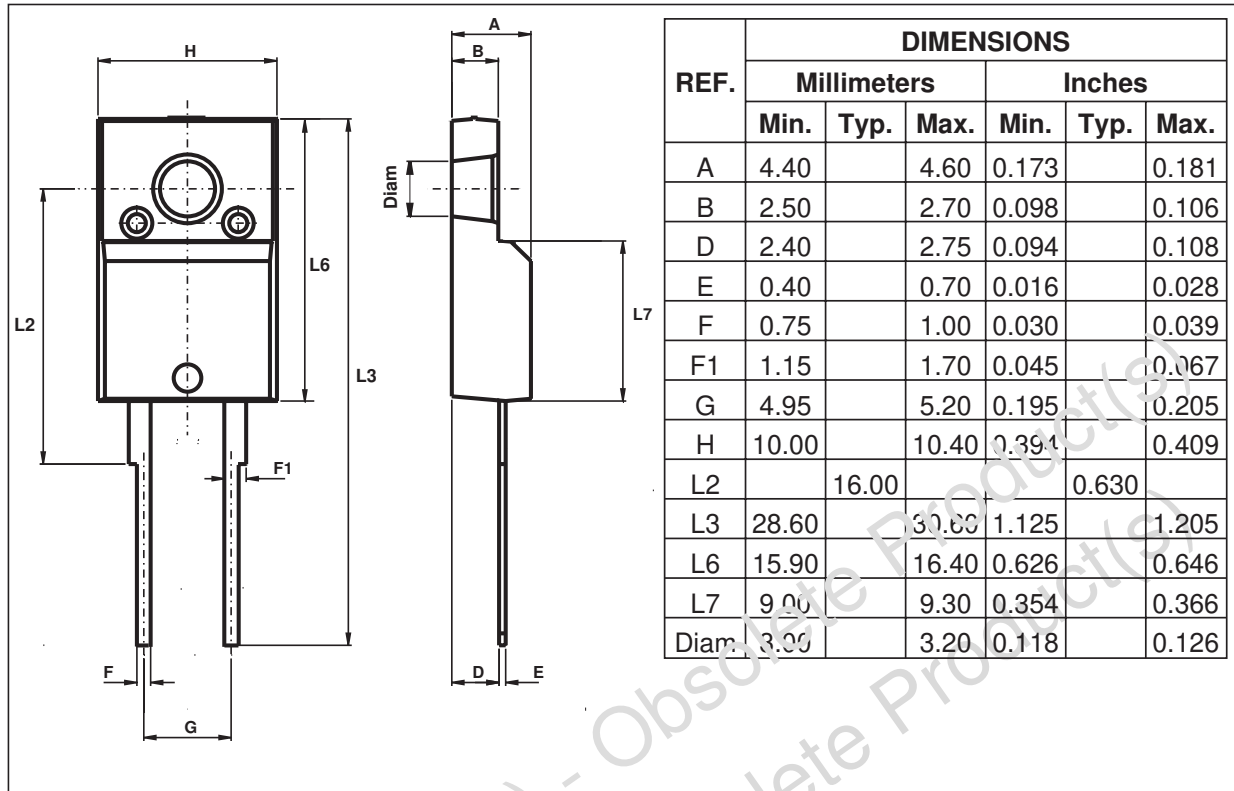
PACKAGE MECHANICAL DATA

TO-220AC



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PACKAGE MECHANICAL DATA
ISOWATT220AC



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