

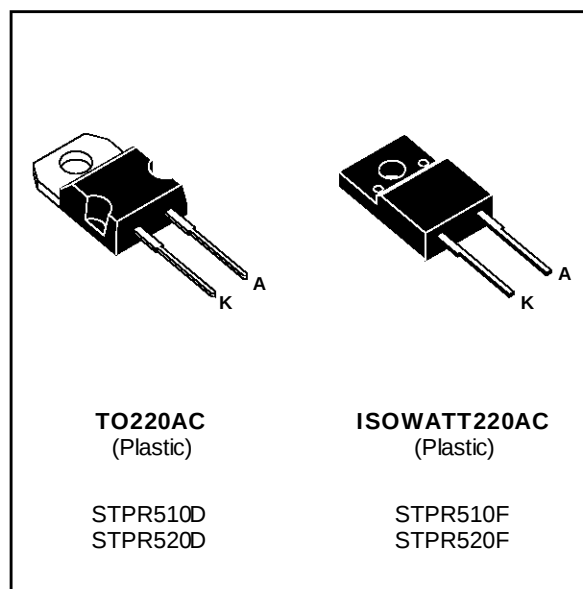
ULTRA FAST RECOVERY RECTIFIER DIODES

- 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 TO220AC and ISOWATT220AC, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter			Value	Unit
I _{F(RMS)}	RMS Forward Current			10	A
I _{F(AV)}	Average Forward Current $\delta = 0.5$	TO220AC	T _c = 125°C	5	A
		ISOWATT220AC	T _c = 115°C		
I _{FSM}	Surge Non Repetitive Forward Current		T _p = 10 ms Sinusoidal	50	A
T _{stg} T _j	Storage and Junction Temperature Range			- 65 to + 150 - 65 to + 150	°C

Symbol	Parameter	STPR		Unit
		510D 510F	520D 520F	
V _{RRM}	Repetitive Peak Reverse Voltage	100	200	V

THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
R _{th(j-c)}	Junction-case	TO220AC	4	°C/W
		ISOWATT220AC	6	

STPR510D/F / STPR520D/F

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Symbol	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			50	μA
	$T_j = 100^\circ\text{C}$				0.5	mA
V_F^{**}	$T_j = 125^\circ\text{C}$	$I_F = 5\text{ A}$			0.99	V
	$T_j = 125^\circ\text{C}$	$I_F = 10\text{ A}$			1.20	
	$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$			1.25	

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

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

RECOVERY CHARACTERISTICS

Symbol	Tests Conditions			Min.	Typ.	Max.	Unit
t_{rr}	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{ A}$	$I_R = 1\text{ A}$	$I_{rr} = 0.25\text{ A}$		30	ns
t_{fr}	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$	$t_r = 10\text{ ns}$		20		ns
V_{FP}	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$	$t_r = 10\text{ ns}$		3		V

To evaluate the conduction losses use the following equation :

$$P = 0.78 \times I_F(\text{AV}) + 0.042 I_F^2(\text{RMS})$$

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

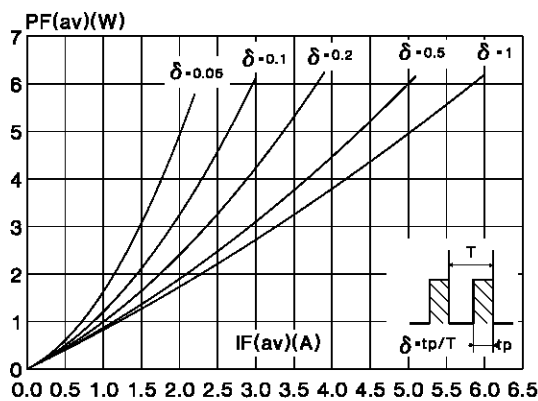


Fig.2 : Peak current versus form factor.

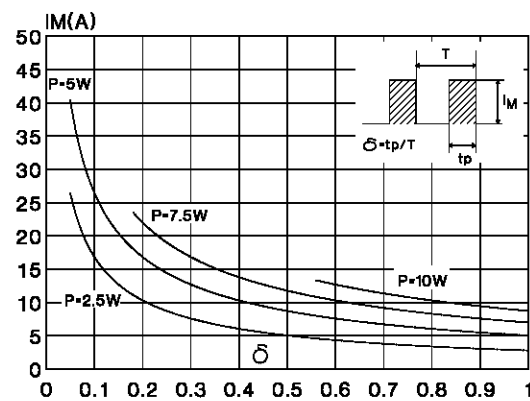


Fig.3 : Average current versus ambient temperature.
(duty cycle : 0.5) (TO220AC)

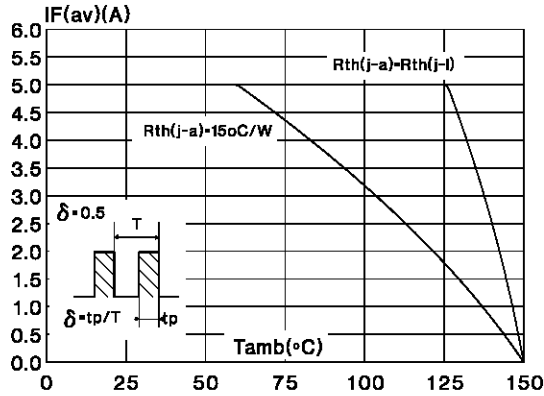


Fig.4 : Average current versus ambient temperature.
(duty cycle : 0.5) (ISOWATT220AC)

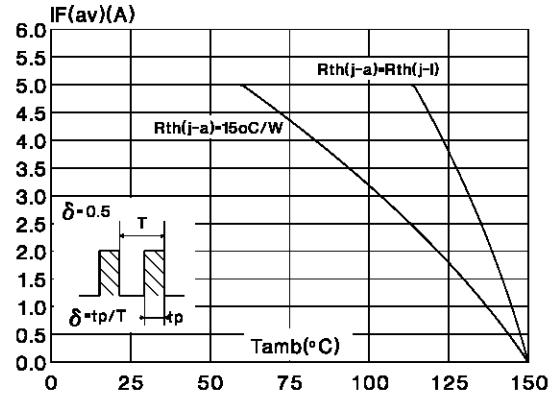


Fig.5 : Non repetitive surge peak forward current versus
overload duration.
(Maximum values) (TO220AC)

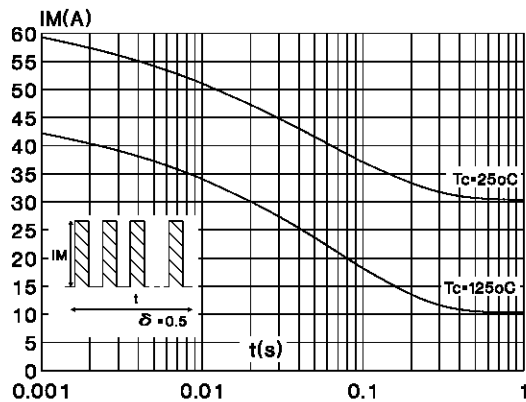


Fig.6 : Non repetitive surge peak forward current versus
overload duration.
(Maximum values) (ISOWATT220AC)

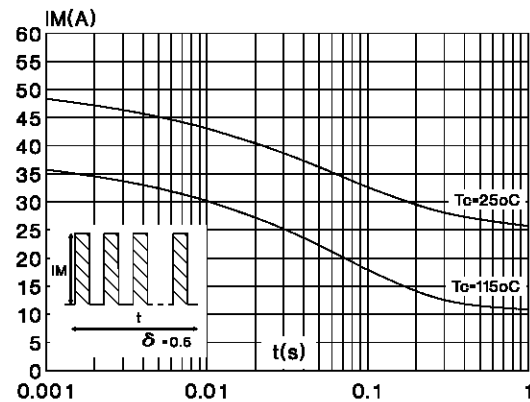


Fig.7 : Relative variation of thermal transient impedance
junction to case versus pulse duration.
(TO220AC)

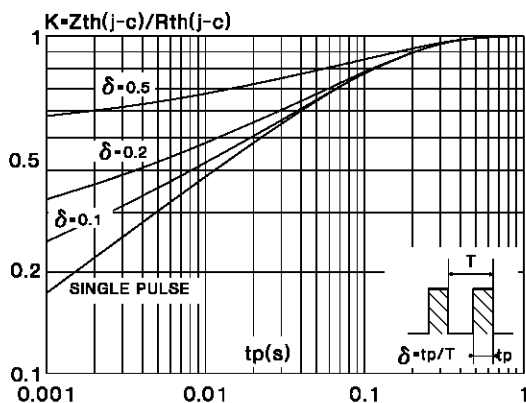
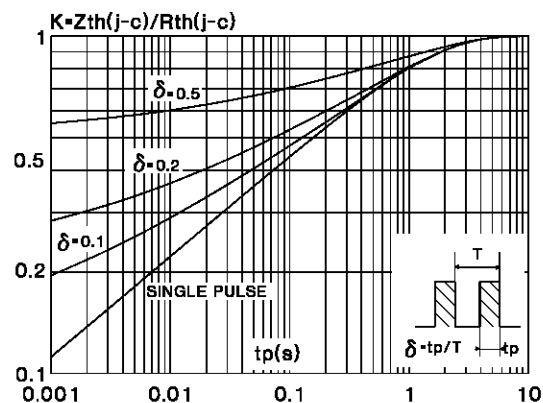


Fig.8 : Relative variation of thermal transient impedance
junction to case versus pulse duration.
(ISOWATT220AC)



STPR510D/F / STPR520D/F

Fig.9 : Forward voltage drop versus forward current.
(Maximum values)

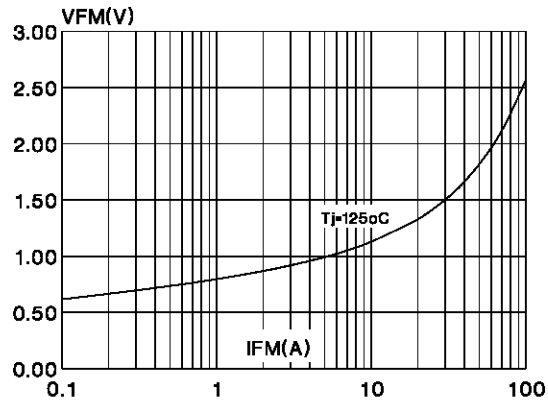


Fig.10 : Junction capacitance versus reverse voltage applied. (Typical values)

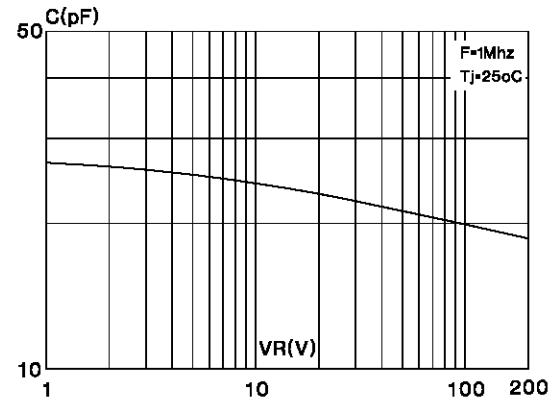


Fig.11 : Recovery charge versus dI_F/dt .

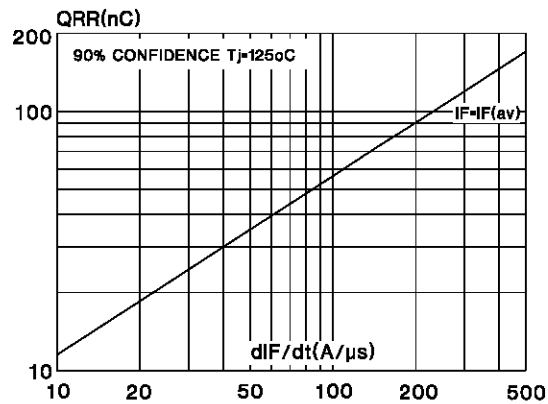


Fig.12 : Peak reverse current versus dI_F/dt .

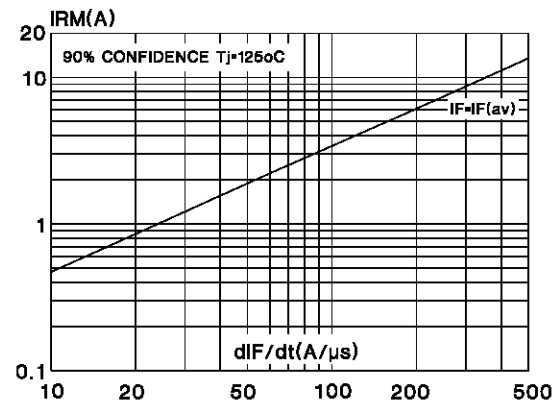
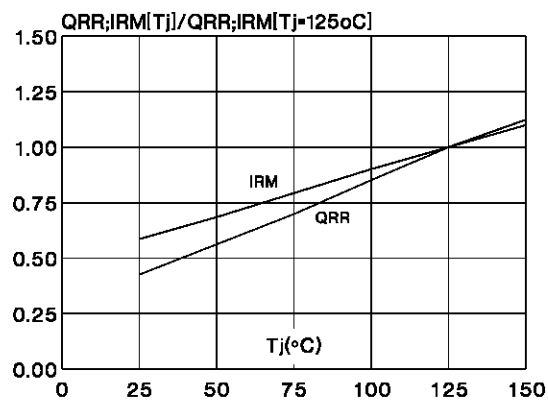


Fig.13 : Dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA

TO220AC (JEDEC outline)

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10	10.4	0.393	0.409
B	15.2	15.9	0.598	0.626
C	13	14	0.511	0.551
D	6.2	6.6	0.244	0.260
E	16.4 typ.		0.645 typ.	
F	3.5	4.2	0.137	0.165
G	2.65	2.95	0.104	0.116
H	4.4	4.6	0.173	0.181
I	3.75	3.85	0.147	0.151
J	1.23	1.32	0.048	0.051
K	1.27 typ.		0.050 typ.	
L	0.49	0.70	0.019	0.027
M	2.4	2.72	0.094	0.107
N	4.95	5.15	0.194	0.203
O	1.14	1.70	0.044	0.067
P	0.61	0.88	0.024	0.034

Cooling method : C

Marking : Type number

Weight : 1.9 g

Recommended torque value : 0.55m.N

Maximum torque value : 0.7m.N

PACKAGE MECHANICAL DATA

ISOWATT220AC (JEDEC outline)

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10	10.4	0.393	0.409
B	15.9	16.4	0.626	0.645
C	28.6	30.6	1.126	1.204
D	16 typ		0.630 typ	
E	9	9.3	0.354	0.366
H	4.4	4.6	0.173	0.181
I	3	3.2	0.118	0.126
J	2.5	2.7	0.098	0.106
L	0.4	0.7	0.015	0.027
M	2.4	2.75	0.094	0.108
N	4.95	5.2	0.195	0.204
O	1.15	1.7	0.045	0.067
P	0.75	1	0.030	0.039

Cooling method : C

Marking : Type number

Weight : 2 g

Recommended torque value : 0.55m.N

Maximum torque value : 0.70m.N

Electrical Isolation : 2000V DC

Capacitance : 12pF

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