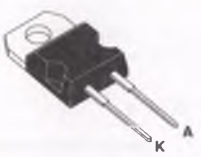
SGS-THOMSON MICROELECTRONICS

STPR510D/F
STPR520D/F

ULTRA FAST RECOVERY RECTIFIER DIODES

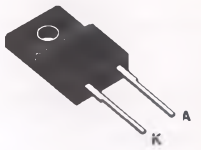
FEATURES

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



TO220AC
(Plastic)

STPR510D
STPR520D



ISOWATT220AC
(Plastic)

STPR510F
STPR520F

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	Tc = 125°C	5	A
		ISOWATT220AC	Tc = 115°C		
I_{FSM}	Surge Non Repetitive Forward Current		Tp = 10 ms Sinusoidal	50	A
Tstg Tj	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
Rth (j-c)	Junction-case	TO220AC	4	°C/W
		ISOWATT220AC	6	

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

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

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

RECOVERY CHARACTERISTICS

Symbol	Tests Conditions				Min.	Typ.	Max.	Unit
trr	Tj = 25°C	I_F = 0.5 A	I_R = 1A	Irr = 0.25 A			30	ns
tfr	Tj = 25°C	i_F = 1 A	tr = 10 ns	$V_{FR} = 1.1 \times V_F$		20		ns
V_{FP}	Tj = 25°C	I_F = 1 A	tr = 10 ns			3		V

To evaluate the conduction losses use the following equation :
$P = 0.78 \times I_{F(AV)} + 0.042\ I_F{}^2{}_{(RMS)}$

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

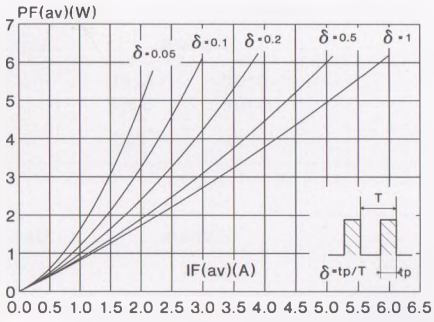


Fig.2 : Peak current versus form factor.

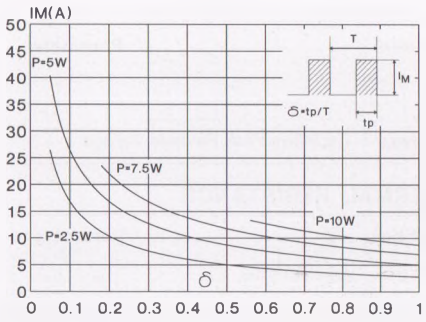


Fig.3 : Average current versus ambient temperature. (duty cycle : 0.5) (TO220AC)

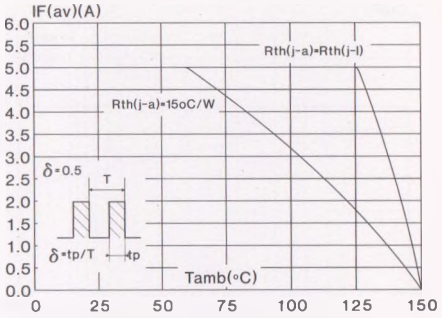


Fig.4 : Average current versus ambient temperature. (duty cycle : 0.5) (ISOWATT220AC)

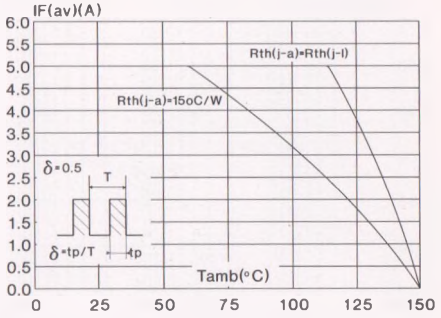


Fig.5 : Non repetitive surge peak forward current versus overload duration. (Maximum values) (TO220AC)

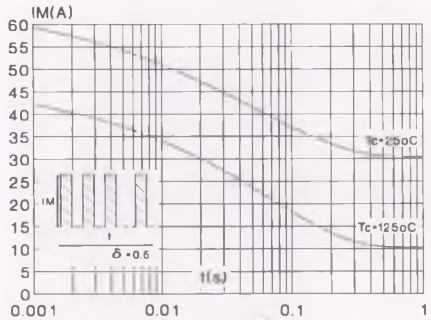


Fig.6 : Non repetitive surge peak forward current versus overload duration. (Maximum values) (ISOWATT220AC)

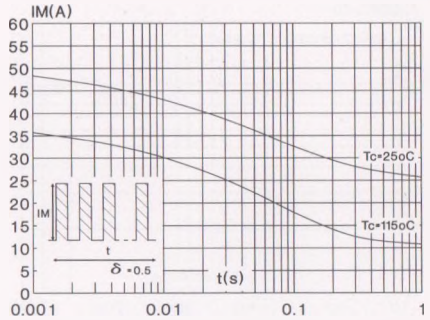


Fig.7 : Relative variation of thermal transient impedance junction to case versus pulse duration. (TO220AC)

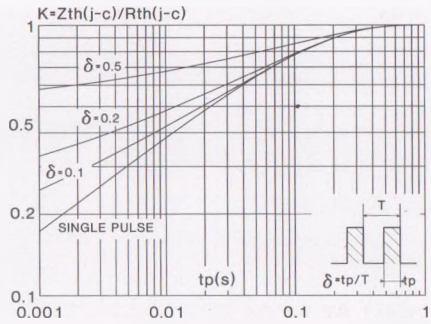


Fig.8 : Relative variation of thermal transient impedance junction to case versus pulse duration. (ISOWATT220AC)

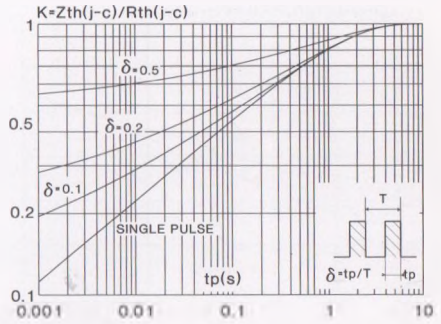


Fig.9 : Forward voltage drop versus forward current. (Maximum values)

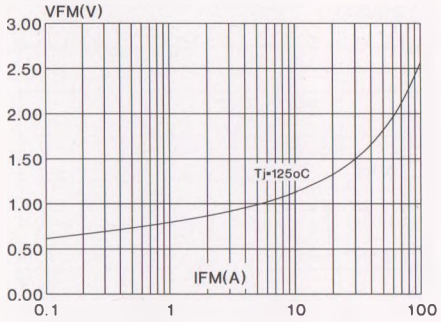


Fig.10 : Junction capacitance versus reverse voltage applied. (Typical values)

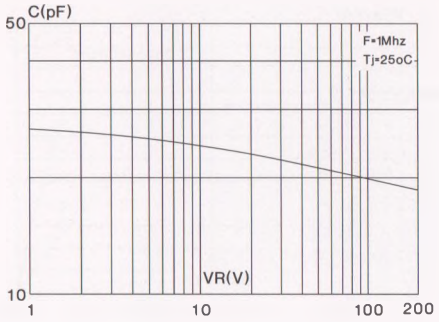


Fig.11 : Recovery charge versus dIF/dt.

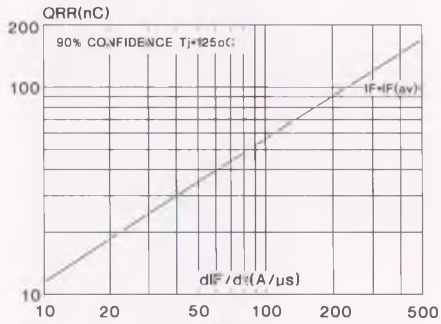


Fig.12 : Peak reverse current versus dIF/dt.

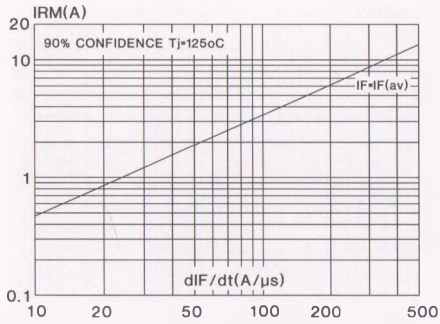


Fig.13 : Dynamic parameters versus junction temperature.