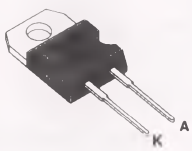
SGS-THOMSON MICROELECTRONICS

STPR1210D/F
STPR1220D/F

ULTRA FAST RECOVERY RECTIFIER DIODES

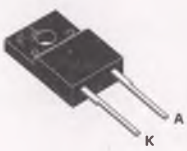
FEATURES

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



TO220AC
(Plastic)

STPR1210D
STPR1220D



ISOWATT220AC
(Plastic)

STPR1210F
STPR1220F

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			30	A
$I_{F(AV)}$	Average Forward Current $\delta = 0.5$	TO220AC	Tc = 115°C	12	A
		ISOWATT220AC	Tc = 80°C		
I_{FSM}	Surge Non Repetitive Forward Current		Tp = 10 ms Sinusoidal	120	A
Tstg Tj	Storage and Junction Temperature Range			- 65 to + 150 - 65 to + 150	°C

Symbol	Parameter	STPR		Unit
		1210D 1210F	1220D 1220F	
V_{RRM}	Repetitive Peak Reverse Voltage	100	200	V

THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction-case	TO220AC	2.5	°C/W
		ISOWATT220AC	5.0	

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Symbol	Tests Conditions		Min.	Typ.	Max.	Unit
I_R *	T_j = 25°C	$V_R = V_{RRM}$			50	µA
	T_j = 100°C				0.8	mA
V_F **	T_j = 125°C	I_F = 12 A			0.99	V
	T_j = 125°C	I_F = 24 A			1.20	
	T_j = 25°C	I_F = 24 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	T_j = 25°C	I_F = 0.5 A	I_R = 1A	Irr = 0.25 A			30	ns
tfr	T_j = 25°C	I_F = 1 A	tr = 10 ns	V_{FR} = 1.1 x V_F		20		ns
V_{FP}	T_j = 25°C	I_F = 1 A	tr = 10 ns			3		V

To evaluate the conduction losses use the following equation :
$P = 0.78 \times I_{F(AV)} + 0.0175\ I_F{}^2{}_{(RMS)}$

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

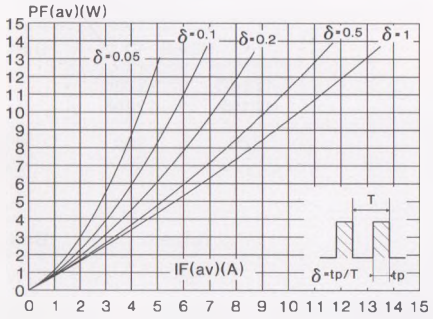


Fig.2 : Peak current versus form factor.

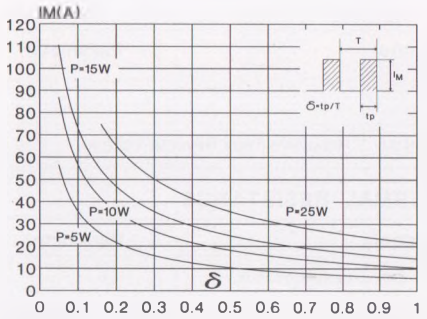


Fig.3 : Average current versus ambient temperature. (duty cycle : 0.5) (TO220AC)

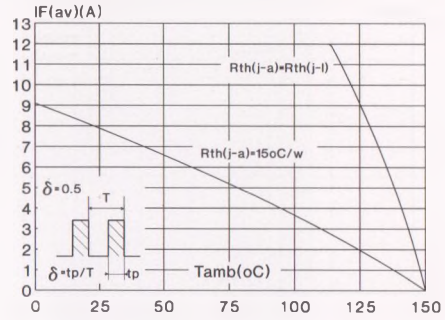


Fig.4 : Average current versus ambient temperature. (duty cycle : 0.5) (ISOWATT220AC)

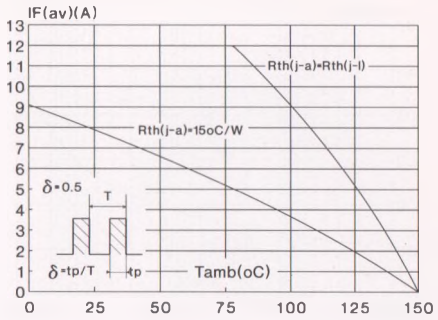


Fig.5 : Non repetitive surge peak forward current versus overload duration. (Maximum values) (TO220AC)

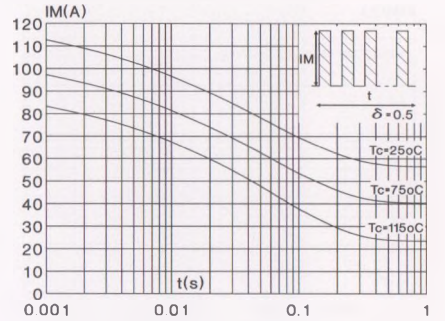


Fig.6 : Non repetitive surge peak forward current versus overload duration. (Maximum values) (ISOWATT220AC)

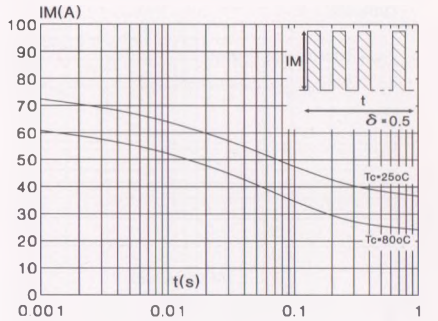


Fig.7 : Relative variation of thermal transient impedance junction to case versus pulse duration. (TO220AC)

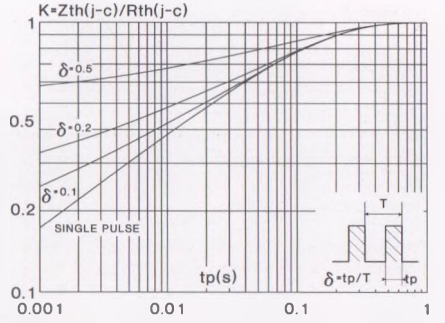


Fig.8 : Relative variation of thermal transient impedance junction to case versus pulse duration. (ISOWATT220AC)

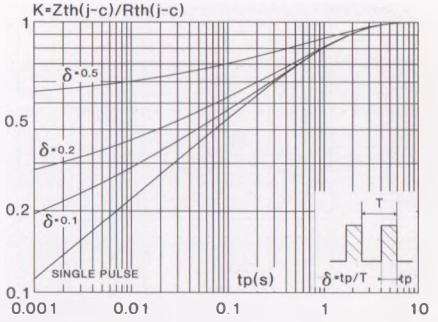


Fig.9 : Forward voltage drop versus forward current. (Maximum values)

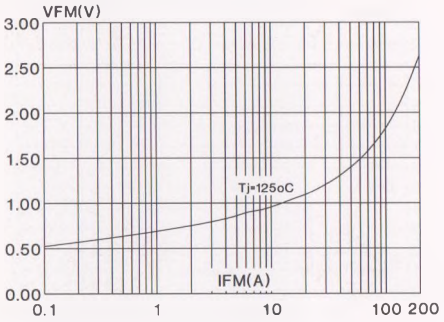


Fig.10 : Junction capacitance versus reverse voltage applied. (Typical values)

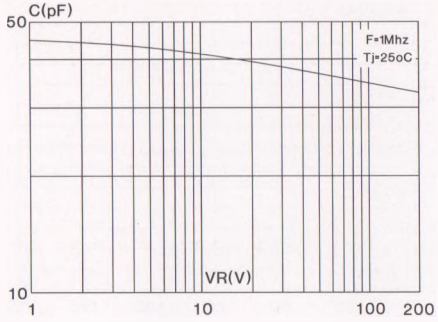


Fig.11 : Recovery charge versus dIF/dt.

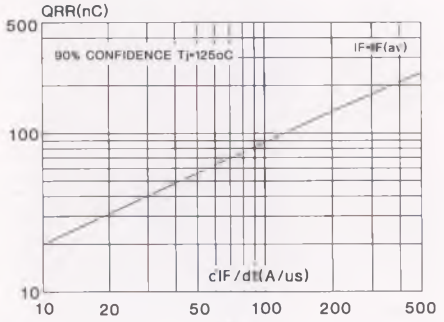


Fig.12 : Peak reverse current versus dIF/dt.

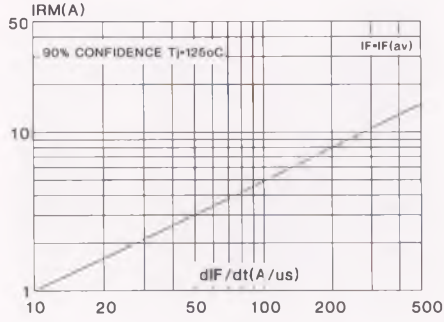


Fig.13 : Dynamic parameters versus junction temperature.