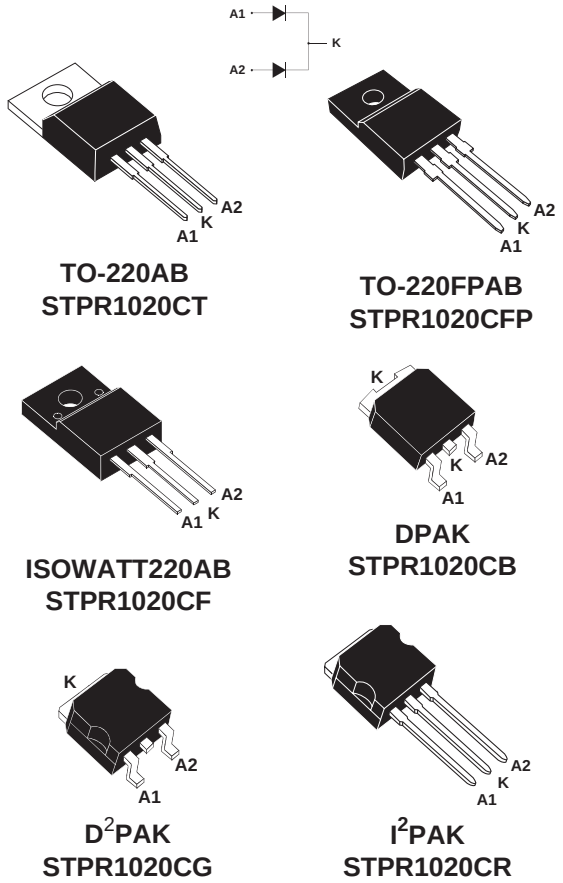
STPR1020CB/CG/CT/CF/CFP/CR

ULTRA-FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 5 A
V_{RRM}	200 V
Tj (max)	150°C
V_F (max)	0.99 V
trr (max)	30 ns



FEATURES

- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY
- INSULATED PACKAGES: ISOWATT220AB / TO-220FPAB
  Insulation Voltage = 2000V DC
  Capacitance = 12 pF

DESCRIPTION

Dual center tap rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters.
Packaged in DPAK, D^2PAK, I^2PAK, TO-220AB, TO-220FPAB or ISOWATT220AB, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

ABSOLUTE MAXIMUM (limiting values, per diode)

Symbol	Parameter				Value	Unit
V_{RRM}	Repetitive peak reverse voltage				200	V
$I_{F(RMS)}$	RMS forward current	D^2PAK / TO-220AB / ISOWATT220AB / TO-220FPAB / I^2PAK			10	A
		DPAK			7	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	D^2PAK / DPAK TO-220AB / I^2PAK	Tc=125°C	Per diode	5	A
		ISOWATT220AB	Tc=115°C	Per device	10	
		TO-220FPAB	Tc=110°C	Per device	10	
I_{FSM}	Surge non repetitive forward current		tp=10ms sinusoidal		50	A
T_{stg}	Storage temperature range				- 65 to + 150	°C

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th\ (j-c)}$	Junction to case	TO-220AB / D^2PAK / DPAK I^2PAK	Per diode	4.0	°C/W
			Total	2.4	
		ISOWATT220AB	Per diode	6.0	
			Total	4.0	
		TO-220FPAB	Per diode	6.5	
			Total	5	
$R_{th\ (c)}$	Coupling	TO-220AB / D^2PAK / DPAK / I^2PAK		0.7	
		ISOWATT220AB		2.0	
		TO-220FPAB		3.5	

When diodes 1 and 2 are used simultaneously :
Δ Tj(diode 1) = P(diode 1) x Rth(j-c) (Per diode) + P(diode 2) x Rth(c)

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameters	Test conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	T_j = 25°C	$V_R = V_{RRM}$			50	µA
		T_j = 100°C				0.6	mA
V_F **	Forward voltage drop	T_j = 125°C	I_F = 5 A		0.8	0.99	V
		T_j = 125°C	I_F = 10 A		0.95	1.20	
		T_j = 25°C	I_F = 10 A			1.25	

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

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

RECOVERY CHARACTERISTICS

Symbol	Test conditions			Min.	Typ.	Max.	Unit
trr	T_j = 25°C	I_F = 0.5A I_R = 1A	Irr = 0.25A			30	ns
tfr	T_j = 25°C	I_F = 1A $V_{FR} = 1.1 \times V_F$ max	dI_F/dt = 50 A/µs		20		ns
V_{FP}	T_j = 25°C	I_F = 1A	dI_F/dt = 50 A/µs		3		V

Fig. 1: Average forward power dissipation versus average forward current (per diode).

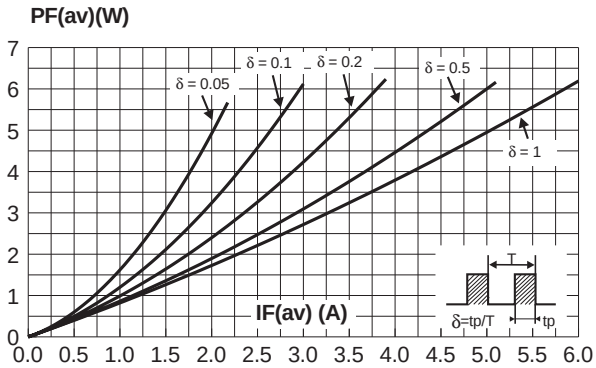


Fig. 2: Peak current versus form factor (per diode).

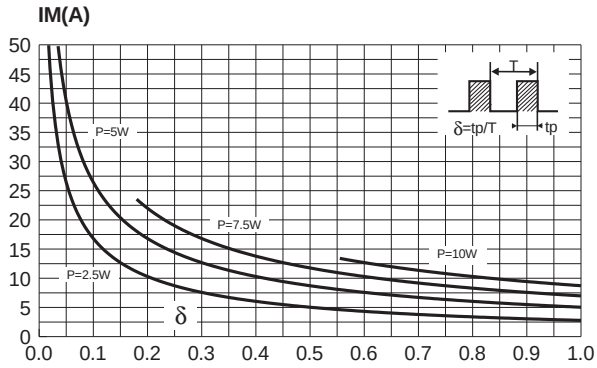


Fig. 3-1: Average forward current versus ambient temperature ($\delta = 0.5$, TO-220AB, DPAK, D^2PAK).

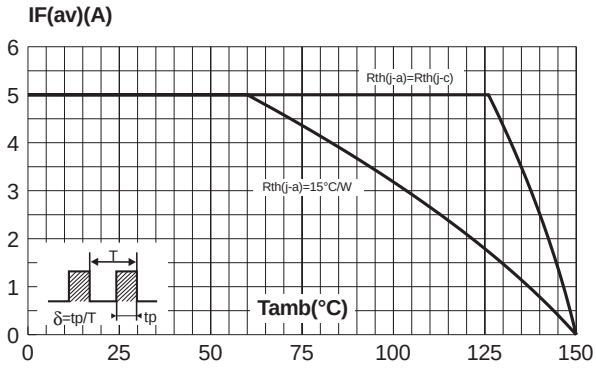


Fig. 3-2: Average forward current versus ambient temperature ($\delta = 0.5$, ISOWATT220AB, TO-220FPAB).

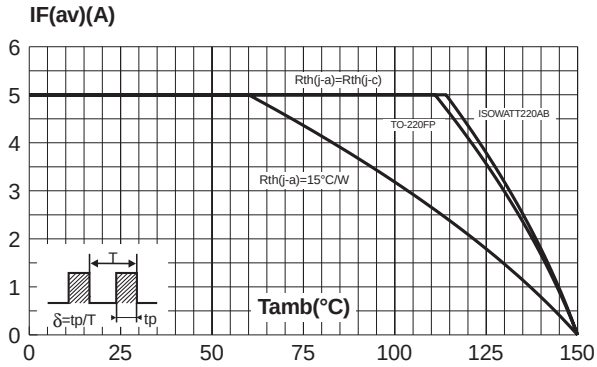


Fig. 4-1: Non repetitive surge peak forward current versus overload duration (TO-220AB, DPAK, D^2PAK).

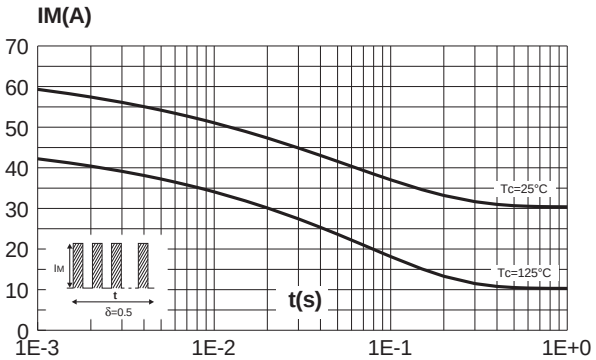
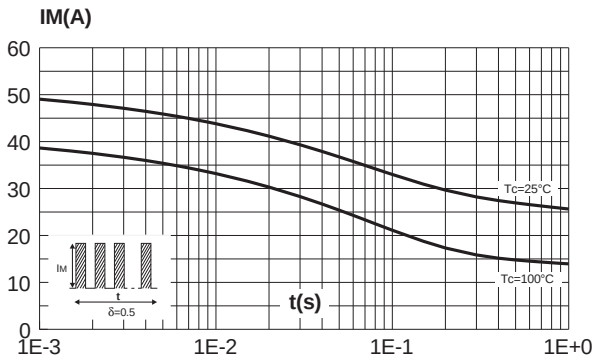


Fig. 4-2: Non repetitive surge peak forward current versus overload duration (ISOWATT220AB).



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPR1020CB	STPR1020CB	DPAK	0.3g	75	Tube
STPR1020CB-TR	STPR1020CB	DPAK	0.3g	2500	Tape & reel
STPR1020CT	STPR1020CT	TO-220AB	2.23g	50	Tube
STPR1020CF	STPR1020CF	ISOWATT220AB	2.2g	50	Tube
STPR1020CG	STPR1020CG	D^2PAK	1.48g	50	Tube
STPR1020CFP	STPR1020CFP	TO-220FP	2.0g	50	Tube
STPR1020CR	STPR1020CR	I^2PAK	1.49 g	50	Tube

- Cooling method : by conduction (C)
- Recommended torque value (ISOWATT220AB, TO-220FPAB): 0.55 N.m.
- Maximum torque value (ISOWATT220AB, TO-220FPAB): 0.70 N.m.
- Recommended torque value (TO-220AB): 0.8 N.m
- Maximum torque value (TO-220AB): 1.0 N.m.
- Epoxy meets UL94,V0