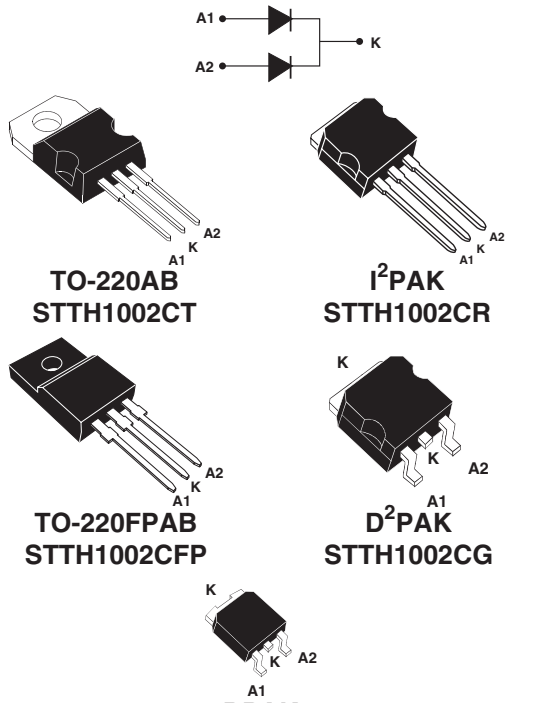
STTH1002C

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	Up to 2 x 8A
V_{RRM}	200 V
Tj (max)	175 °C
V_F (typ)	0.78 V
t_{rr} (typ)	20 ns



FEATURES AND BENEFITS

- Suited for SMPS
- Low losses
- Low forward and reverse recovery times
- Insulated package: TO-220FPAB
- High junction temperature
- Low leakage current

DESCRIPTION

Dual center tap rectifier suited for Switch Mode Power Supplies and High frequency DC to DC converters.
Packaged in DPAK, D^2PAK, TO-220AB, TO220-FPAB and I^2PAK, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter				Value	Unit
V_{RRM}	Repetitive peak reverse voltage				200	V
$I_{F(RMS)}$	RMS forward current	TO-220AB / TO-220FPAB / I^2PAK / D^2PAK /			20	A
		DPAK			10	
$I_{F(AV)}$	Average forward current δ =0.5	TO-220AB / I^2PAK / D^2PAK / DPAK	Tc = 155°C	Per diode	5	A
			Tc = 150°C	Per device	10	
			Tc = 135°C	Per diode	8	
			Tc = 125°C	Per device	16	
		TO-220FPAB	Tc = 140°C	Per diode	5	
			Tc = 120°C	Per device	10	
			Tc = 110°C	Per diode	8	
			Tc = 75°C	Per device	16	
I_{FSM}	Surge non repetitive forward current		tp = 10 ms Sinusoidal		50	A
T_{stg}	Storage temperature range				- 65 + 175	°C
Tj	Maximum operating junction temperature				175	°C

THERMAL PARAMETERS

Symbol	Parameter			Maximum	Unit
$R_{th\ (j-c)}$	Junction to case	TO-220AB / I^2PAK / D^2PAK / DPAK	Per diode	4.0	°C/W
			Per device	2.5	
		TO-220FPAB	Per diode	6.5	
			Per device	5	
$R_{th\ (j-c)}$	Coupling	TO-220AB / I^2PAK / D^2PAK / DPAK		1.0	°C/W
		TO-220FPAB		3.5	

When the diodes 1 and 2 are used simultaneously:
Δ Tj (diode1) = P(diode1) x $R_{th(j-c)}$ (per diode) + P(diode2) x $R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R*	Reverse leakage current	Tj = 25°C	$V_R = V_{RRM}$			5	µA
		Tj = 125°C			3	40	
V_F**	Forward voltage drop	Tj = 25°C	I_F = 5 A			1.1	V
		Tj = 25°C	I_F = 10 A			1.25	
		Tj = 150°C	I_F = 5 A		0.78	0.89	
		Tj = 150°C	I_F = 10 A			1.05	

Pulse test: * tp = 5ms, $\delta < 2\%$

** tp = 380µs, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation :
$P = 0.73 \times I_{F(AV)} + 0.032\ I_{F^2(RMS)}$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	Tj = 25°C	I_F = 1 A V_R = 30V dI_F/dt = 100 A/µs		20	25	ns
I_{RM}	Reverse recovery current	Tj = 125°C	I_F = 5 A V_R = 160V dI_F/dt = 200 A/µs		5.9	7.6	A
t_{fr}	Forward recovery time	Tj = 25°C	I_F = 5 A dI_F/dt = 100 A/µs V_{FR} = 1.1 x $V_F$max			110	ns
V_{FP}	Forward recovery voltage	Tj = 25°C	I_F = 5 A dI_F/dt = 100 A/µs		2.4		V

Fig. 1: Peak current versus duty cycle (per diode).

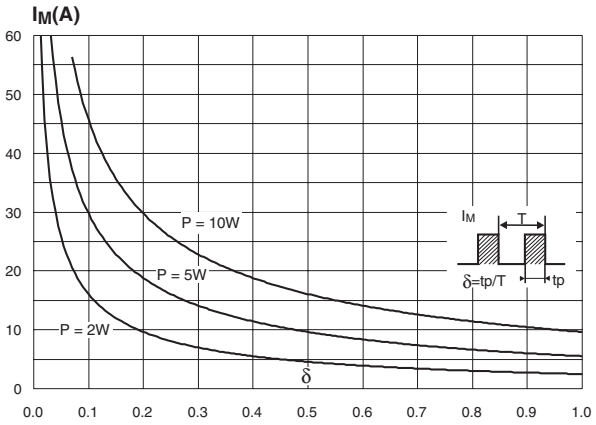


Fig. 2-1: Forward voltage drop versus forward current (typical values, per diode).

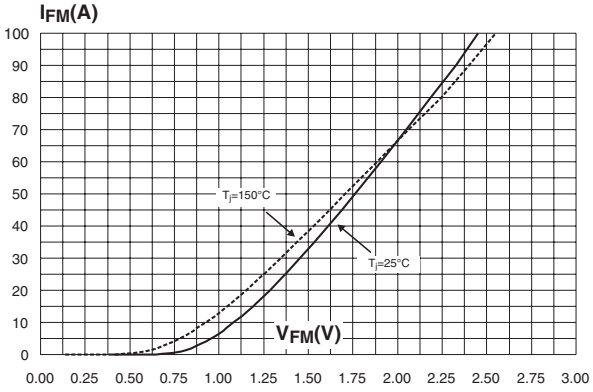


Fig. 2-2: Forward voltage drop versus forward current (maximum values, per diode).

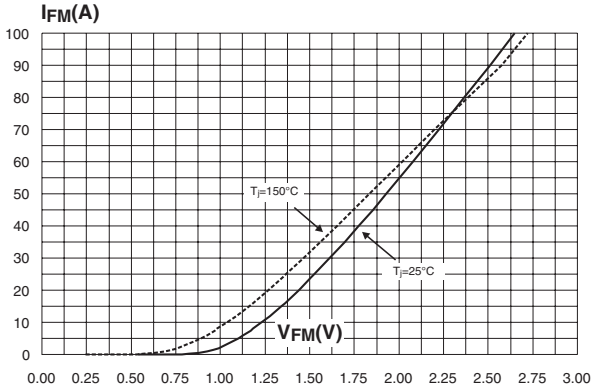


Fig. 3-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB, I^2PAK, D^2PAK, DPAK).

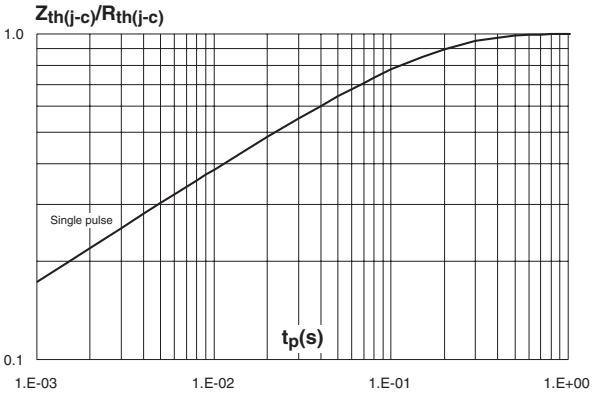


Fig. 3-2: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAB).

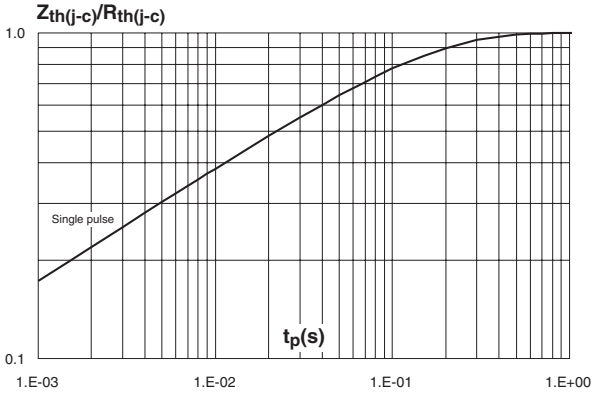


Fig. 4: Junction capacitance versus reverse voltage applied (typical values, per diode).