

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

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

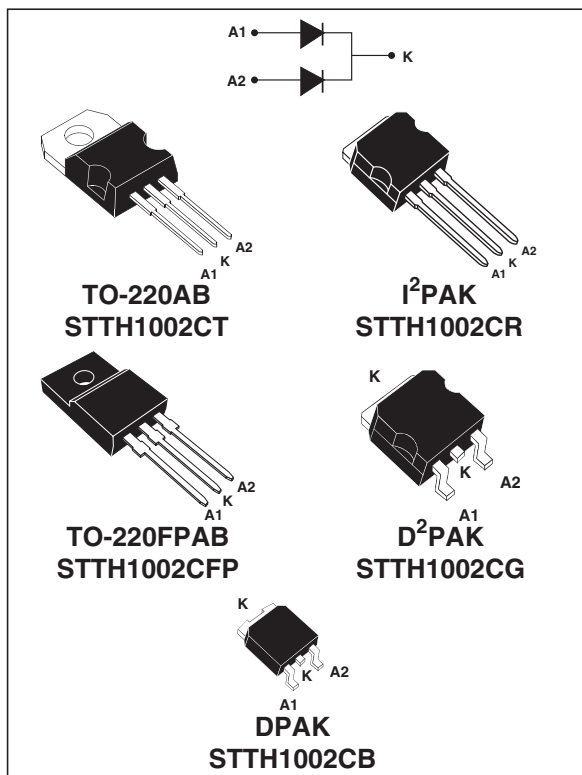
FEATURES AND BENEFITS

- 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, D²PAK, TO-220AB, TO220-FPAB and I²PAK, 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 ² PAK / D ² PAK /			20	A
		DPAK			10	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB / I ² PAK / D ² PAK / 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
T_j	Maximum operating junction temperature					175 °C

STTH1002C

THERMAL PARAMETERS

Symbol	Parameter			Maximum	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB / I ² PAK / D ² PAK / 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 ² PAK / D ² PAK / DPAK		1.0	°C/W
		TO-220FPAB		3.5	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode1}) = P(\text{diode1}) \times R_{th(j-c)} (\text{per diode}) + P(\text{diode2}) \times R_{th(c)}$$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

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

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

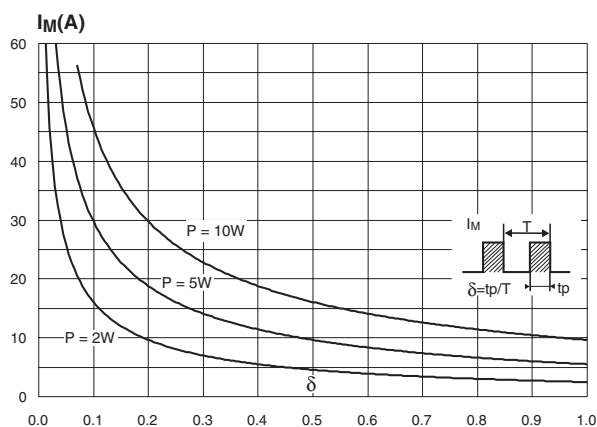
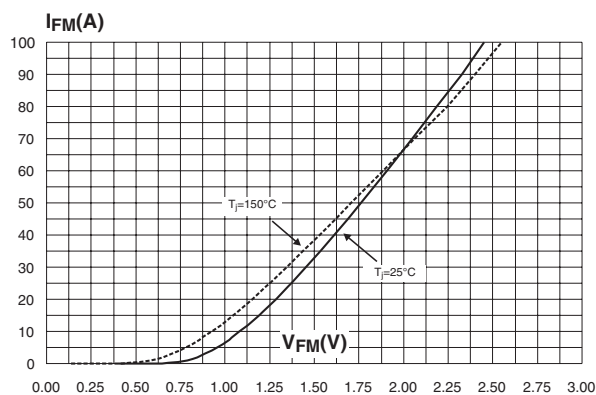
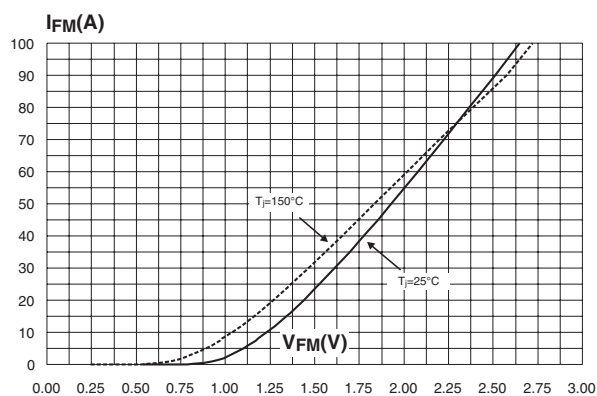
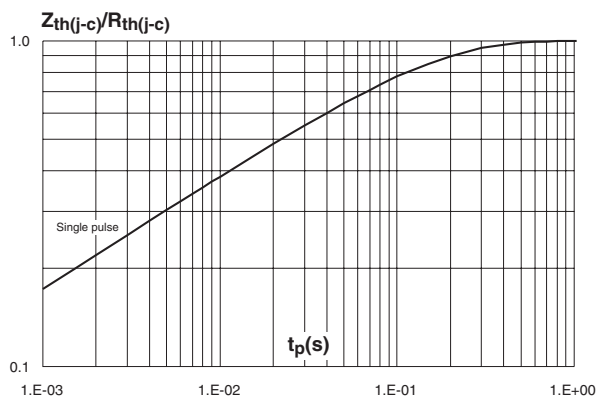
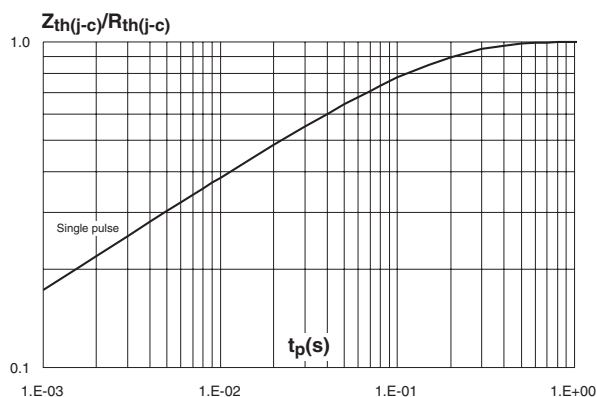
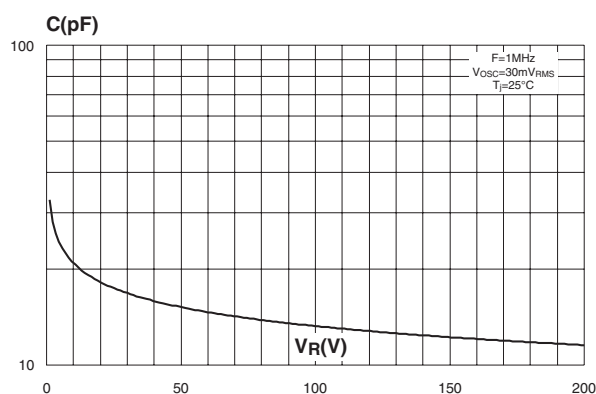
** $t_p = 380\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation :

$$P = 0.73 \times I_{F(AV)} + 0.032 I_{F(RMS)}^2$$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $V_R = 30\text{V}$ $di_F/dt = 100\text{ A}/\mu\text{s}$		20	25	ns
I_{RM}	Reverse recovery current	$T_j = 125^\circ\text{C}$	$I_F = 5\text{ A}$ $V_R = 160\text{V}$ $di_F/dt = 200\text{ A}/\mu\text{s}$		5.9	7.6	A
t_{fr}	Forward recovery time	$T_j = 25^\circ\text{C}$	$I_F = 5\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$			110	ns
V_{FP}	Forward recovery voltage	$T_j = 25^\circ\text{C}$	$I_F = 5\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$		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, I²PAK, D²PAK, 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).

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH1002CB	STTH1002CB	DPAK	0.3 g	75	Tube
STTH1002CB-TR	STTH1002CB	DPAK	0.3 g	2500	Tape & reel
STTH1002CT	STTH1002CT	TO-220AB	2.23 g	50	Tube
STTH1002CG	STTH1002CG	D ² PAK	1.48 g	50	Tube
STTH1002CG-TR	STTH1002CG	D ² PAK	1.48g	1000	Tape & reel
STTH1002CR	STTH1002CR	I ² PAK	1.49 g	50	Tube
STTH1002CFP	STTH1002CFP	TO-220FPAB	1.70 g	50	Tube

PACKAGE MECHANICAL DATA**DPAK**

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
H	9.35	10.10	0.368	0.397
L2	0.80 typ.		0.031 typ.	
L4	0.60	1.00	0.023	0.039
V2	0°	8°	0°	8°

FOOTPRINT