

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	Up to 2 x 10A
V_{RRM}	200 V
$T_j (max)$	175 °C
$V_F (typ)$	0.78 V
$t_{rr} (typ)$	21 ns

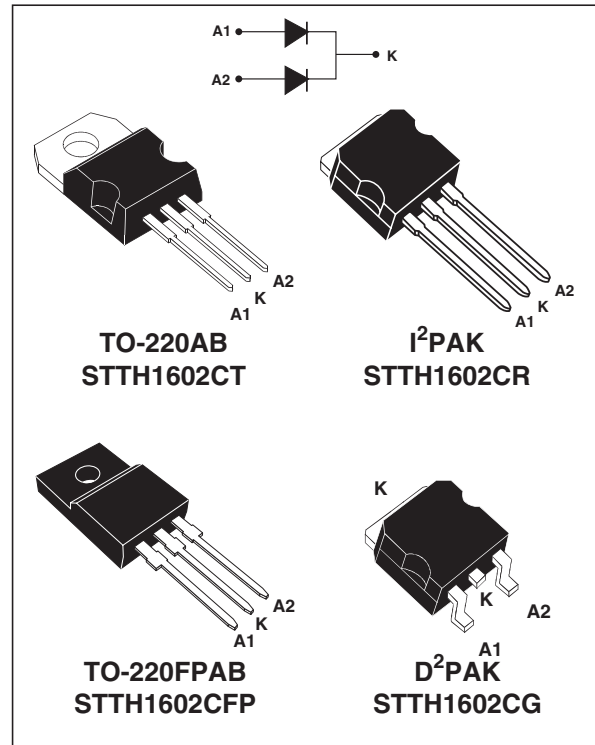
FEATURES AND BENEFITS

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

DESCRIPTION

Dual center tap rectifier suited for Switch Mode Power Supplies and High frequency DC to DC converters.

Packaged in TO-220AB, D²PAK, TO-220FPAB 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				30	A
I _{F(AV)}	Average forward current δ =0.5	TO-220AB / I ² PAK / D ² PAK	Tc = 150°C	Per diode	8	A
			Tc = 140°C	Per device	16	
			Tc = 140°C	Per diode	10	
			Tc = 130°C	Per device	20	
		TO-220FPAB	Tc = 130°C	Per diode	8	
			Tc = 100°C	Per device	16	
			Tc = 110°C	Per diode	10	
			Tc = 75°C	Per device	20	
I _{FSM}	Surge non repetitive forward current		tp = 10 ms Sinusoidal		80	A
T _{stg}	Storage temperature range				- 65 + 175	°C
T _j	Maximum operating junction temperature				175	°C

STTH1602C

THERMAL PARAMETERS

Symbol	Parameter			Maximum	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB / I ² PAK / D ² PAK	Per diode	3.0	°C/W
			Per device	1.9	
		TO-220FPAB	Per diode	5.5	
			Per device	4.5	
$R_{th(j-c)}$	Coupling	TO-220AB / I ² PAK / D ² PAK		0.8	°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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			6	μA
		$T_j = 125^\circ\text{C}$			4	60	
V_F^{**}	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 8\text{ A}$			1.1	V
		$T_j = 25^\circ\text{C}$	$I_F = 16\text{ A}$			1.25	
		$T_j = 150^\circ\text{C}$	$I_F = 8\text{ A}$		0.78	0.89	
		$T_j = 150^\circ\text{C}$	$I_F = 16\text{ A}$			1.05	

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

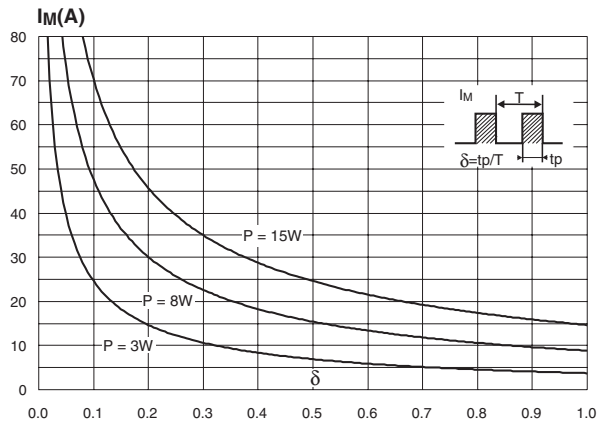
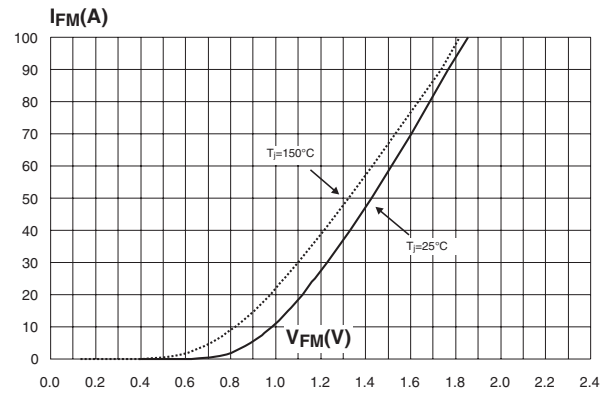
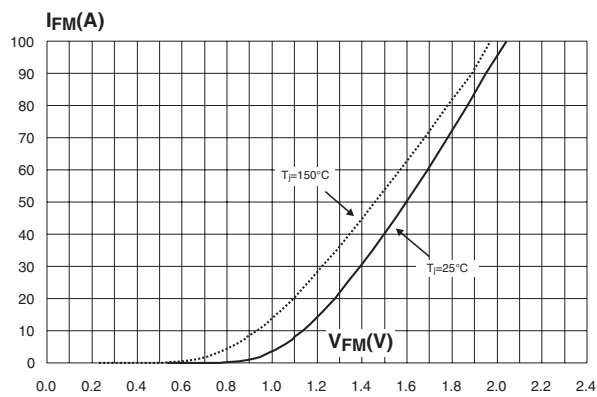
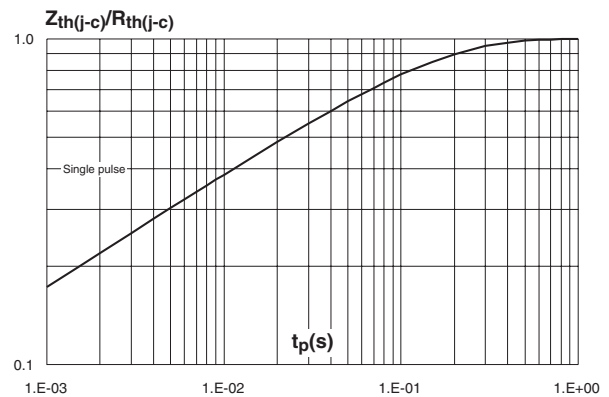
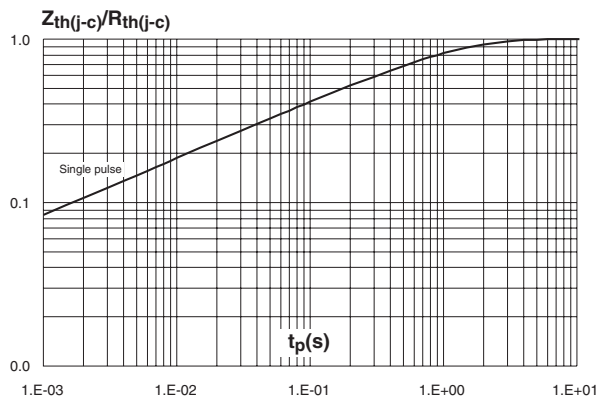
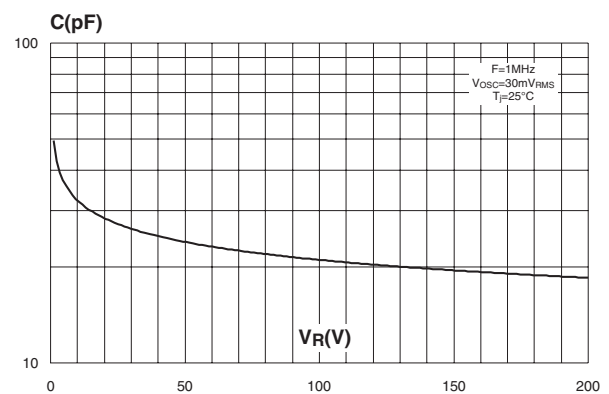
** $t_p = 380\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation :

$$P = 0.73 \times I_{F(AV)} + 0.020 I_{F(RMS)}^2$$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $V_R = 30\text{V}$ $di_F/dt = 100\text{ A}/\mu\text{s}$		21	26	ns
I_{RM}	Reverse recovery current	$T_j = 125^\circ\text{C}$	$I_F = 8\text{ A}$ $V_R = 160\text{V}$ $di_F/dt = 200\text{ A}/\mu\text{s}$		6.8	8.8	A
t_{fr}	Forward recovery time	$T_j = 25^\circ\text{C}$	$I_F = 8\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$			160	ns
V_{FP}	Forward recovery voltage	$T_j = 25^\circ\text{C}$	$I_F = 8\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$		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, D²PAK, I²PAK).**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
STTH1602CT	STTH1602CT	TO-220AB	2.23 g	50	Tube
STTH1602CG	STTH1602CG	D ² PAK	1.48 g	50	Tube
STTH1602CG-TR	STTH1602CG	D ² PAK	1.48 g	1000	Tape & reel
STTH1602CR	STTH1602CR	I ² PAK	1.49 g	50	Tube
STTH1602CFP	STTH1602CFP	TO-220FPAB	1.70g	50	Tube

PACKAGE MECHANICAL DATAD²PAK

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

FOOTPRINT DIMENSIONS (in millimeters)