

Ultrafast recovery diode

Main product characteristics

$I_{F(AV)}$	2 x 3 A
V_{RRM}	200 V
T_j (max)	175° C
V_F (typ)	0.80 V
t_{rr} (typ)	14 ns

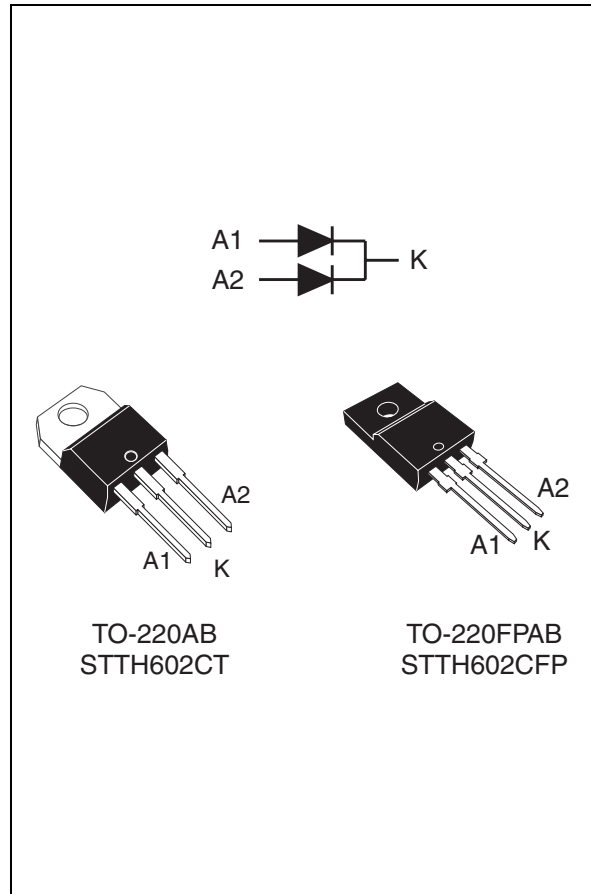
Features and benefits

- Suited for SMPS
- Low losses
- Low forward and reverse recovery time
- High surge current capability
- High junction temperature
- insulated package: TO-220FPAB

Description

Dual center tap diode suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in TO-220AB and TO-22FPAB, this device is intended for use in low voltage high frequency inverters, free wheeling and polarity protection.



Order codes

Part Number	Marking
STTH602CT	STTH602C
STTH602CFP	STTH602C

1 Characteristics

Table 1. Absolute ratings (limiting values at $T_j = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			200	V
I _{F(RMS)}	RMS forward current			22	A
I _{F(AV)}	Average forward current, δ = 0.5	TO-220AB	Per diode T _c = 160° C	3	A
			Per device T _c = 155° C	6	
		TO-220FPAB	Per diode T _c = 150° C	3	A
			Per device T _c = 140° C	6	
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms Sinusoidal		60	A
T _{stg}	Storage temperature range			-65 to + 175	° C
T _j	Maximum operating junction temperature			175	° C

Table 2. Thermal parameters

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB	Per diode	5	$^\circ\text{C/W}$
			Per device	3.0	
		TO-220FPAB	Per diode	7.5	
			Per device	5.25	
$R_{th(c)}$	Coupling	TO-220AB	Per diode	1	
		TO-220FPAB	Per diode	3	

When the two diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)} (\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		3	μA
		$T_j = 125^\circ\text{C}$		3	30	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 3\text{ A}$	0.98	1.1	V
		$T_j = 150^\circ\text{C}$		0.8	0.95	
		$T_j = 25^\circ\text{C}$	$I_F = 6\text{ A}$	1.1	1.25	
		$T_j = 150^\circ\text{C}$		0.9	1.05	

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

2. Pulse test: $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

$$P = 0.85 \times I_{F(AV)} + 0.033 I_{F(RMS)}^2$$

Table 4. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	$I_F = 1\text{ A}$, $dI_F/dt = -100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $T_j = 25\text{ }^\circ\text{C}$		14	20	ns
		$I_F = 1\text{ A}$, $dI_F/dt = -50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $T_j = 25\text{ }^\circ\text{C}$		21	30	
I_{RM}	Reverse recovery current	$I_F = 3\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 160\text{ V}$, $T_j = 125\text{ }^\circ\text{C}$		4	5.5	A
t_{fr}	Forward recovery time	$I_F = 3\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_{FR} = 1.1 \times V_{Fmax}$, $T_j = 25\text{ }^\circ\text{C}$		24		ns
V_{FP}	Forward recovery voltage	$I_F = 3\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $T_j = 25\text{ }^\circ\text{C}$		3.7		V

Figure 1. Peak current versus duty cycle (per diode)

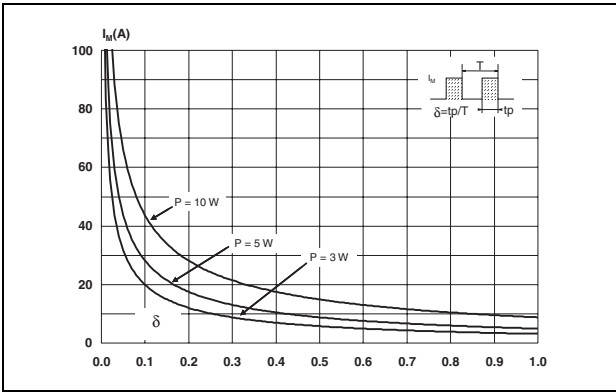


Figure 2. Forward voltage drop versus forward current (typical values per diode)

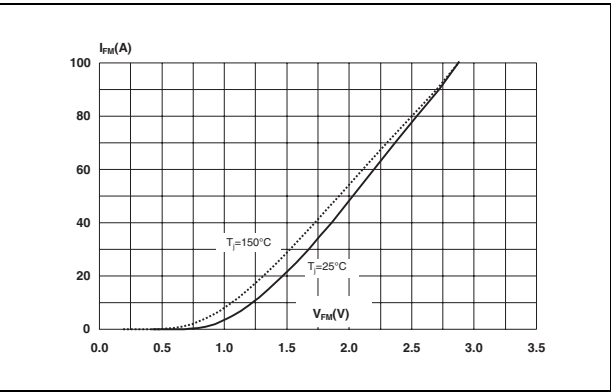


Figure 3. Forward voltage drop versus forward current (maximum values per diode)

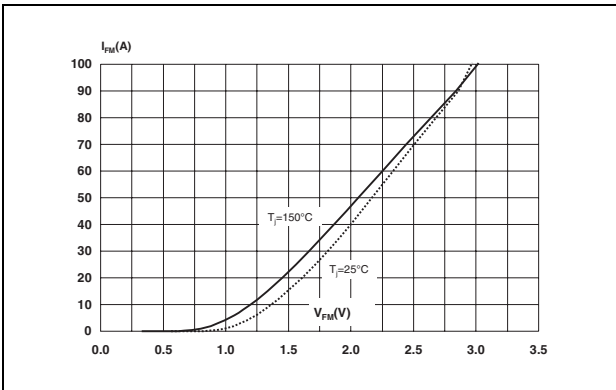
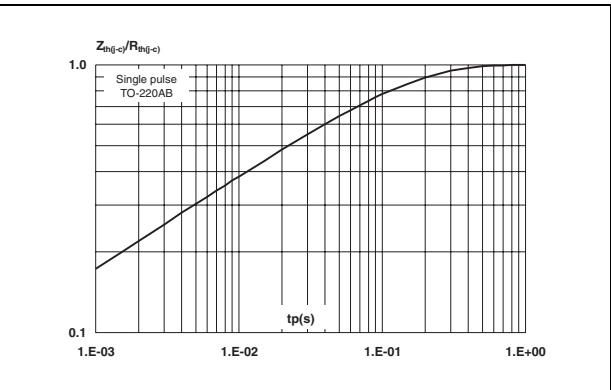


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration (T0-220AB)



4 Ordering information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STTH602CT	STTH602C	TO-220AB	2.23 g	50	Tube
STTH602CFP	STTH602C	TO-220FPAB	2 g	50	Tube