

High frequency secondary rectifier

Main product characteristics

$I_{F(AV)}$	2 x 10 A
V_{RRM}	300 V
T_j (max)	170° C
V_F (max)	1 V
t_{rr} (typ)	35 ns

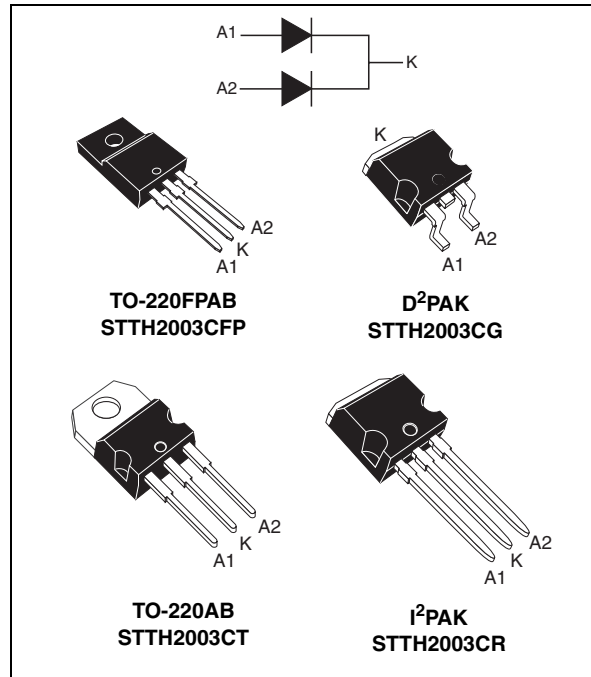
Features and benefits

- Combines highest recovery and reverse voltage performance
- Ultra-fast, soft and noise-free recovery
- Insulated packages: TO-220FPAB
Electric insulation: 2000 V DC
Capacitance: 12 pF

Description

Dual center tap Fast Recovery Epitaxial Diodes suited for Switch Mode Power Supply and high frequency DC/DC converters.

Packaged in TO-220AB, TO-220FPAB, I²PAK or D²PAK, this device is especially intended for secondary rectification.



Order codes

Part Number	Marking
STTH2003CT	STTH2003CT
STTH2003CG	STTH2003CG
STTH2003CG-TR	STTH2003CG
STTH2003CF	STTH2003CF
STTH2003CFP	STTH2003CFP
STTH2003CR	STTH2003CR

1 Characteristics

Table 1. Absolute ratings (limiting values, per diode)

Symbol	Parameter				Value	Unit
V _{RRM}	Repetitive peak reverse voltage				300	V
I _{F(RMS)}	RMS forward voltage				30	A
I _{F(peak)}	Peak working forward current δ = 0.5	I ² PAK, D ² PAK, TO-220AB	T _c = 140°C	Per diode Per device	10	A
		TO-220FPAB	T _c = 125°C		20	
I _{FSM}	Surge non repetitive forward current		t _p = 10 ms sinusoidal		110	A
I _{RSM}	Non repetitive avalanche current		t _p = 10 μs square		5	A
T _{stg}	Storage temperature range				-65 to + 175	°C
T _j	Maximum operating junction temperature				175	°C

Table 2. Thermal resistance

Symbol	Parameter			Value (max)	Unit
$R_{th(j-c)}$	Junction to case	I^2 PAK, D ² PAK, TO-220AB	Per diode	2.5	$^\circ\text{C/W}$
			Total	1.3	
		TO-220FPAB	Per diode	4.6	
			Total	4	
$R_{th(c)}$		I^2 PAK, D ² PAK, TO-220AB	Coupling	0.1	
		TO-220FPAB	Coupling	3.5	

Table 3. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = 300$ V			20	μA
		$T_j = 125^\circ\text{C}$			30	300	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 10$ A			1.25	V
		$T_j = 125^\circ\text{C}$			0.85	1	

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

2. Pulse test: $t_p = 380$ μ s, $\delta < 2\%$

Note: To evaluate the conduction losses use the following equation:

$$P = 0.75 \times I_{F(AV)} + 0.025 I_{F(RMS)}^2$$

Table 4. Recovery Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	$T_J = 25^\circ\text{C}$	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$			25	ns
			$I_F = 1\text{ A}$ $V_R = 30\text{ V}$ $di_F/dt = -50\text{ A}/\mu\text{s}$			35	
t_{fr}	Forward recovery time	$T_J = 25^\circ\text{C}$	$I_F = 10\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$			230	ns
V_{FP}	Peak forward voltage	$T_J = 25^\circ\text{C}$	$I_F = 10\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$			3.5	V
I_{RM}	Reverse recovery current	$T_J = 125^\circ\text{C}$	$I_F = 10\text{ A}$ $V_{CC} = 200\text{ V}$ $di_F/dt = 200\text{ A}/\mu\text{s}$			8	A
S_{factor}	Softness factor				0.3		-

Figure 1. Conduction losses versus average forward current (per diode)

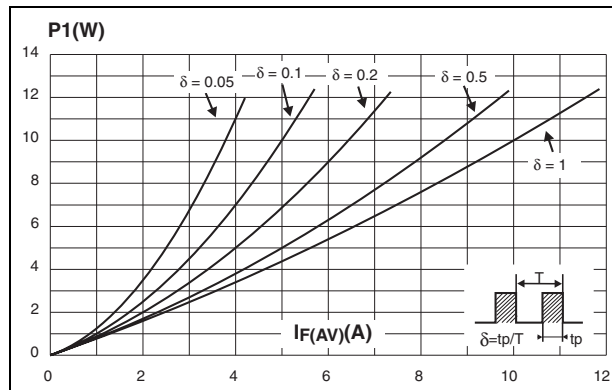


Figure 2. Forward voltage drop versus forward current (maximum values, per diode)

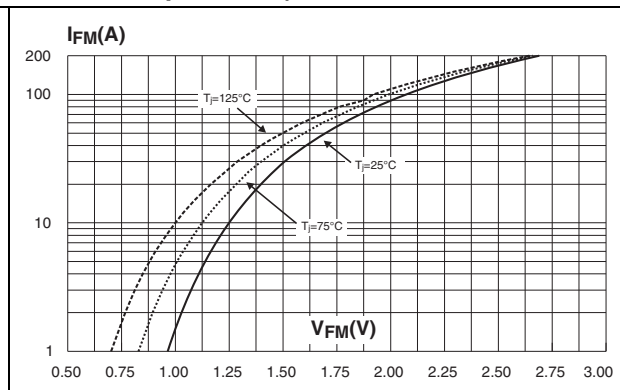


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB / D²PAK / I²PAK)

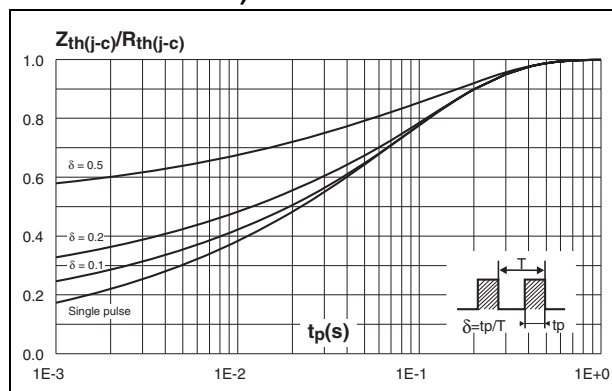


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration (TO-22FP0AB)

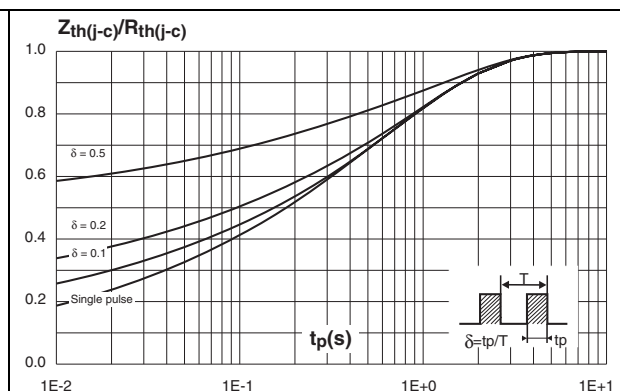


Figure 5. Peak reverse recovery current versus dI_F/dt (90% confidence, per diode)

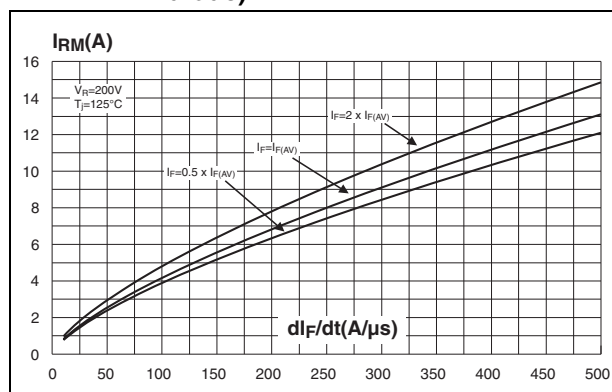
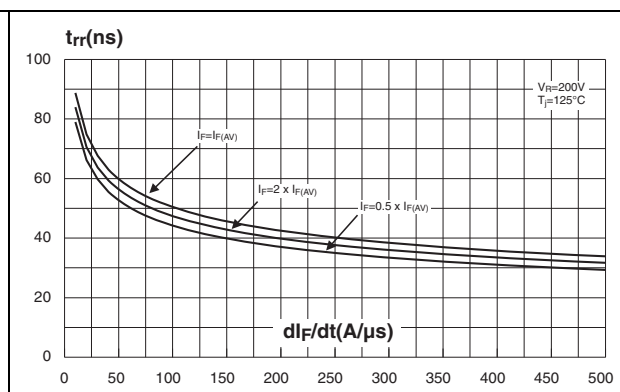


Figure 6. Reverse recovery time versus dI_F/dt (90% confidence, per diode)



3 Ordering information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STTH2003CT	STTH2003CT	TO-220AB	2.2 g	50	Tube
STTH2003CG	STTH2003CG	D ² PAK	1.48 g	50	Tube
STTH2003CG-TR	STTH2003CG	D ² PAK	1.48 g	500	Tape & reel
STTH2003CFP	STTH2003CFP	TO-220AB	2.08 g	50	Tube
STTH2003CR	STTH2003CR	I ² PAK	1.49 g	50	Tube