

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

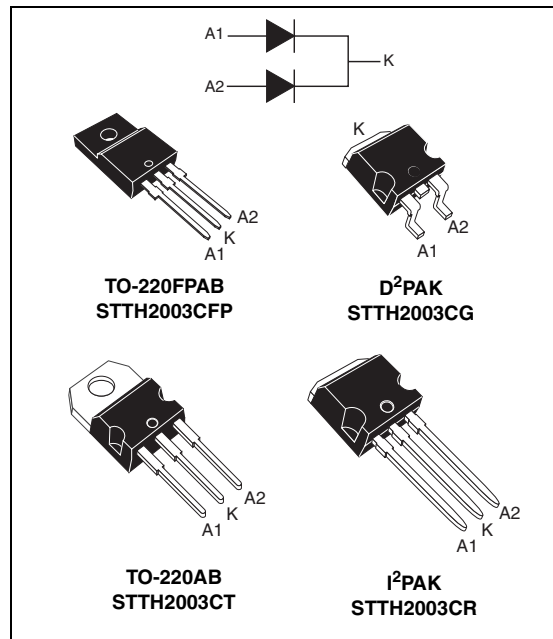
Features and benefits

- 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 $\delta = 0.5$	$I^2PAK, D^2PAK, TO-220AB$	$T_c = 140^\circ C$	Per diode Per device	10 20	A
		$TO-220FPAB$	$T_c = 125^\circ C$			
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	$^\circ C$	
T_j	Maximum operating junction temperature			175	$^\circ C$	

Table 2. Thermal resistance

Symbol	Parameter			Value (max)	Unit
$R_{th(j-c)}$	Junction to case	$I^2PAK, D^2PAK, TO-220AB$	Per diode	2.5	$^\circ C/W$
			Total	1.3	
		$TO-220FPAB$	Per diode	4.6	
			Total	4	
$R_{th(c)}$		$I^2PAK, D^2PAK, TO-220AB$	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	$T_j = 25^\circ C$	$V_R = 300$ V			20	μA
		$T_j = 125^\circ C$			30	300	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ C$	$I_F = 10$ A			1.25	V
		$T_j = 125^\circ C$			0.85	1	

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

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

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		-

2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.55 Nm
- Maximum torque value: 0.70 Nm

Table 5. I²PAK dimensions

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.40	2.72	0.094	0.107
b	0.61	0.88	0.024	0.035
b1	1.14	1.70	0.044	0.067
c	0.49	0.70	0.019	0.028
c2	1.23	1.32	0.048	0.052
D	8.95	9.35	0.352	0.368
e	2.40	2.70	0.094	0.106
e1	4.95	5.15	0.195	0.203
E	10	10.40	0.394	0.409
L	13	14	0.512	0.551
L1	3.50	3.93	0.138	0.155
L2	1.27	1.40	0.050	0.055

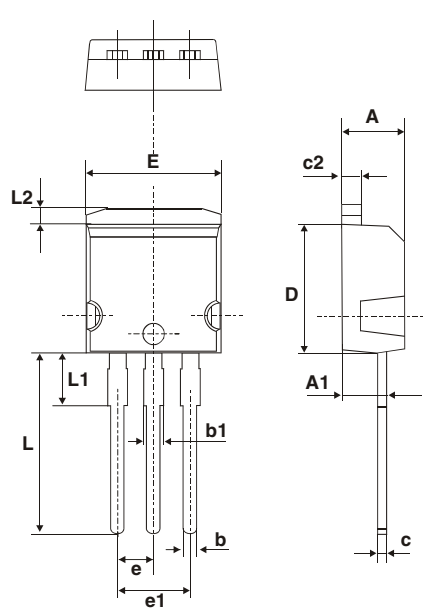


Table 7. TO-220AB dimensions

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
L2	16.4 typ.		0.645 typ.	
L4	13	14	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam.	3.75	3.85	0.147	0.151

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

4 Revision history

Date	Revision	Description of Changes
Aug-2003	7D	Last release.
26-Mar-2007	8	Removed ISOWATT package.