



STTH2002CRC

High efficiency ultrafast diode

Main product characteristics

$I_{F(AV)}$	2 x 10 A
V_{RRM}	200 V
T_j (max)	175° C
V_F (typ)	0.76 V
t_{rr} (typ)	20 ns

Features and benefits

- Suited for SMPS
- Low losses
- Low forward and reverse recovery times
- High surge current capability
- High junction temperature

Description

Dual center tab rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in I²PAK double track, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection



I²PAK double track
STTH2002CRC

Order codes

Part Number	Marking
STTH2002CRC	STTH2002C
STTH2002CRC-TR	STTH2002C

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	Per diode	32	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	Per diode $T_c = 150^\circ\text{C}$	10	A
		Per device $T_c = 145^\circ\text{C}$	20	
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ Sinusoidal	100	A
T_{stg}	Storage temperature range		-65 to + 175	$^\circ\text{C}$
T_j	Maximum operating junction temperature		175	$^\circ\text{C}$

Table 2. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	2.5	$^\circ\text{C/W}$
		Total	1.4	
$R_{th(c)}$	Coupling		0.25	

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		Min.	Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			10	μA
		$T_j = 125^\circ\text{C}$			10	100	
$V_F^{(2)}$	Forward voltage drop	$T_j = 150^\circ\text{C}$	$I_F = 10\text{ A}$		0.76	0.85	
		$T_j = 25^\circ\text{C}$	$I_F = 20\text{ A}$			1.2	V
		$T_j = 150^\circ\text{C}$			0.90	1.02	

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:

$$P = 0.68 \times I_{F(AV)} + 0.017 I_{F(RMS)}^2$$

Table 4. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	$I_F = 1\text{ A}$, $di_F/dt = -100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $T_j = 25\text{ }^\circ\text{C}$		20	25	ns
		$I_F = 1\text{ A}$, $di_F/dt = -50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $T_j = 25\text{ }^\circ\text{C}$		28	35	
I_{RM}	Reverse recovery current	$I_F = 10\text{ A}$, $di_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 160\text{ V}$, $T_j = 125\text{ }^\circ\text{C}$		5.8	7.5	A
t_{fr}	Forward recovery time	$I_F = 10\text{ A}$, $di_F/dt = 50\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$, $T_j = 25\text{ }^\circ\text{C}$		180		ns
V_{FP}	Forward recovery voltage	$I_F = 10\text{ A}$, $di_F/dt = 50\text{ A}/\mu\text{s}$, $V_{FR} = 1.1 \times V_{Fmax}$, $T_j = 25\text{ }^\circ\text{C}$		1.6		V

Figure 1. Peak current versus duty cycle

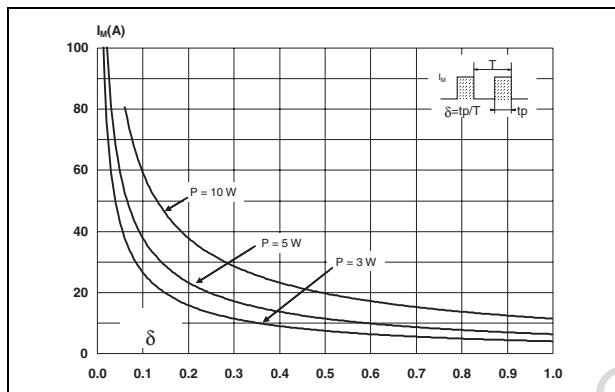


Figure 2. Forward voltage drop versus forward current (typical values)

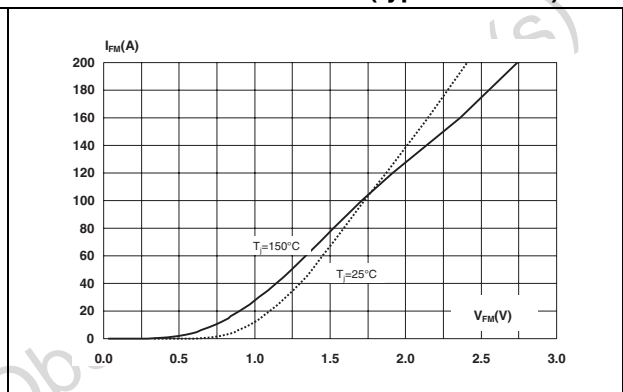


Figure 3. Forward voltage drop versus forward current (maximum values)

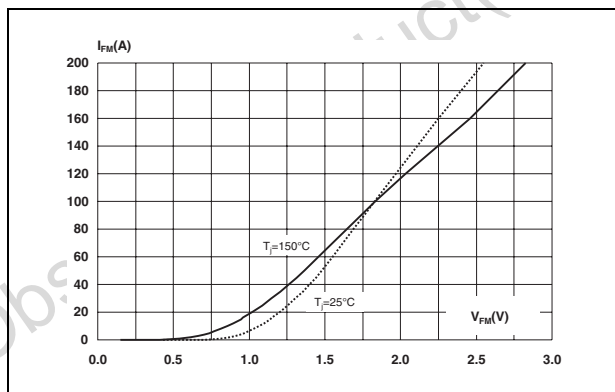


Figure 4. Relative variation of thermal impedance, junction to case, versus pulse duration

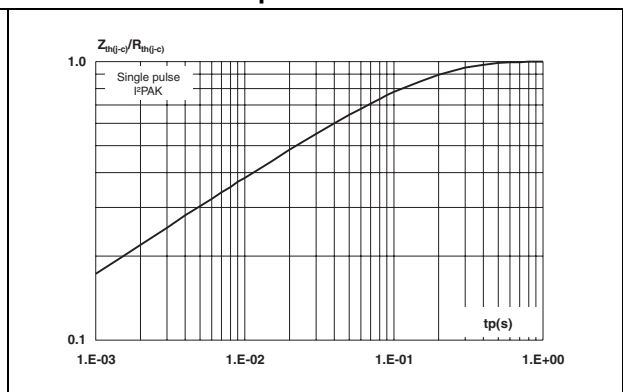


Figure 5. Junction capacitance versus reverse applied voltage (typical values)

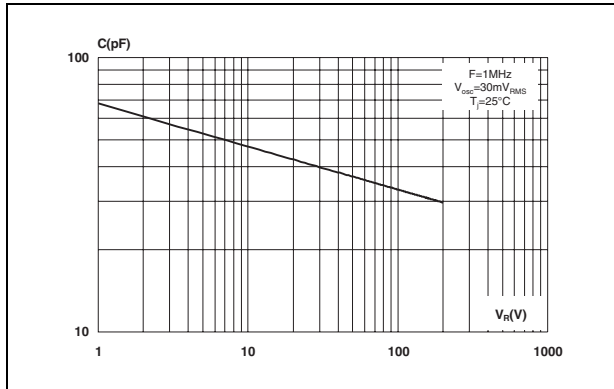


Figure 6. Reverse recovery charges versus di_F/dt (typical values)

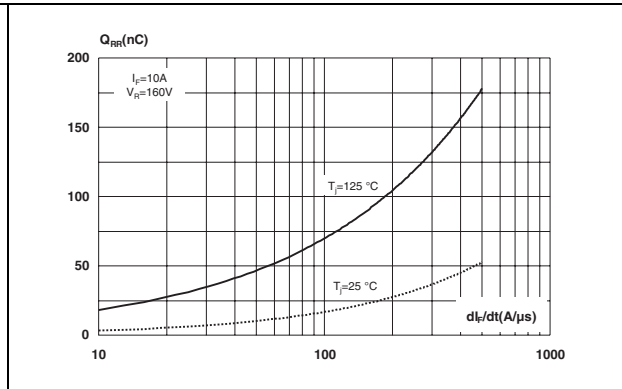


Figure 7. Reverse recovery time versus di_F/dt (typical values)

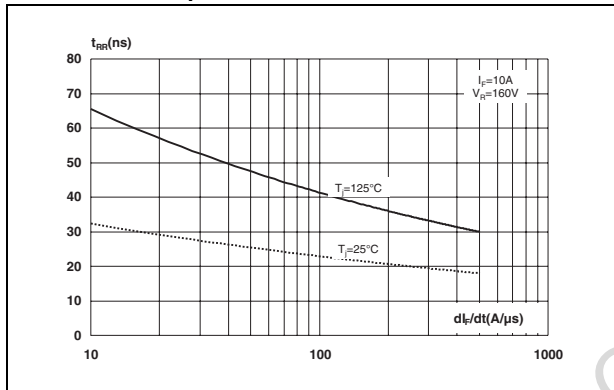


Figure 8. Peak reverse recovery current versus di_F/dt (typical values)

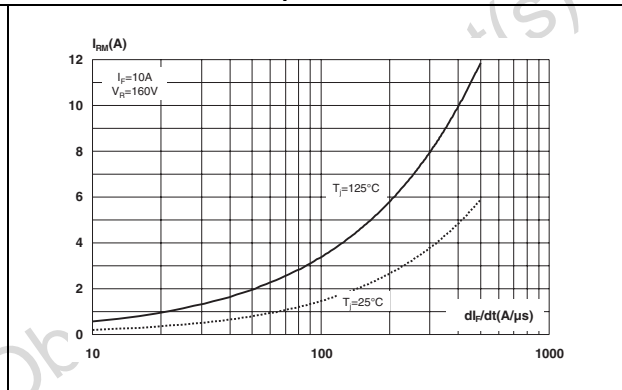
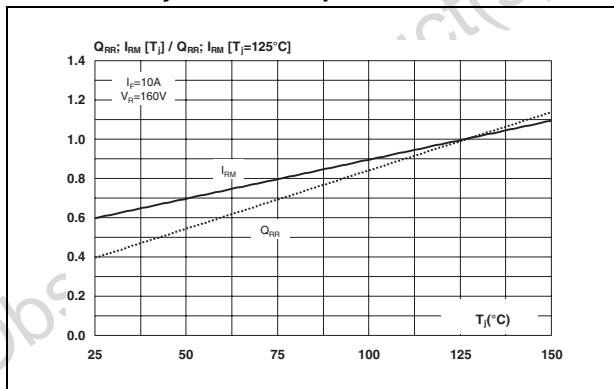
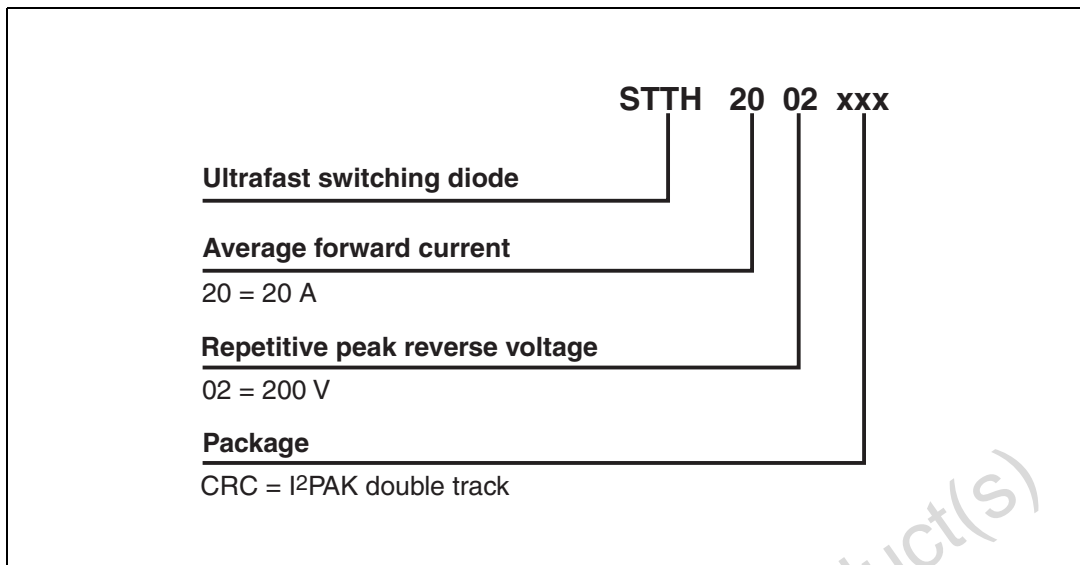


Figure 9. Dynamic parameters versus junction temperature



2 Ordering information scheme

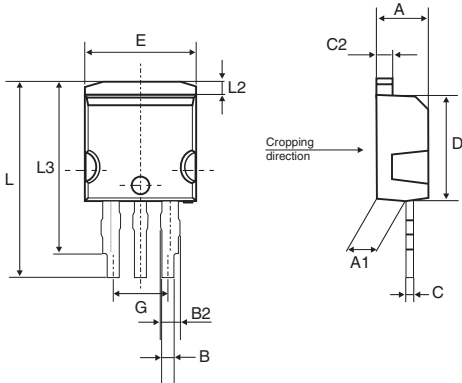


3 Package information

Epoxy meets UL94, V0

Cooling method: by conduction (C)

Table 5. I²PAK double track dimensions



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
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.018	0.024
C2	1.23	1.36	0.048	0.053
D	8.95	9.35	0.352	0.368
E	10	10.40	0.394	0.409
G	4.88	5.28	0.192	0.208
L	16.70	17.5	0.657	0.689
L2	1.27	1.40	0.050	0.055
L3	13.82	14.42	0.544	0.568

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

4 Ordering information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STTH2002CRC	STTH2002C	I ² PAK DT	1.48 g	50	Tube
STTH2002CRC-TR	STTH2002C	I ² PAK DT	1.48 g	1000	Tape and reel

5 Revision history

Date	Revision	Description of Changes
05-Apr-2006	1	First issue

Obsolete Product(s) - Obsolete Product(s)

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