



STTH30R03CW/CG

HIGH FREQUENCY SECONDARY RECTIFIER

MAJOR PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 15 A
V_{RRM}	300 V
$I_{RM} (typ.)$	4.5A
$T_j (max)$	175 °C
$V_F (max)$	1.4 V
$t_{rr} (max)$	35 ns

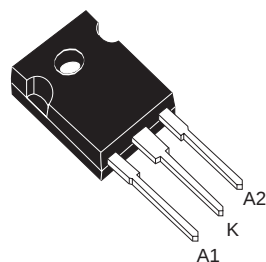
FEATURES AND BENEFITS

- Designed for high frequency applications.
- Hyperfast recovery competes with GaAs devices.
- Allows size decrease of snubbers and heatsinks.

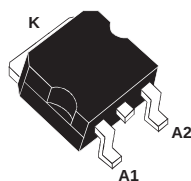
DESCRIPTION

The TURBOSWITCH "R" is an ultra high performance diode.

This TURBOSWITCH family, which drastically cuts losses in associated MOSFET when run at high dI_F/dt , is suited for HF OFF-Line SMPS and DC/DC converters.



TO-247
STTH30R03CW



D²PAK
STTH30R03CG

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			300	V
I _{F(RMS)}	RMS forward current			30	A
I _{F(AV)}	Average forward current	Tc = 120°C δ = 0.5	Per diode Per device	15 30	A
I _{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal		120	A
T _{stg}	Storage temperature range			- 65 + 175	°C
Tj	Maximum operating junction temperature			+ 175	°C

THERMAL AND POWER DATA

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	2.0	°C/W
		Total	1.2	
$R_{th(c)}$		Coupling	0.4	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$V_R = V_{RRM}$	$T_j = 25^\circ\text{C}$			20	μA
			$T_j = 125^\circ\text{C}$		30	200	
V_F^{**}	Forward voltage drop	$I_F = 15\text{ A}$	$T_j = 25^\circ\text{C}$			1.9	V
			$T_j = 125^\circ\text{C}$		1.1	1.4	

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

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

To evaluate the maximum conduction losses use the following equation :

$$P = 1 \times I_{F(AV)} + 0.026 I_{F(RMS)}^2$$

RECOVERY CHARACTERISTICS

Symbol	Tests conditions		Min.	Typ.	Max.	Unit
t_{rr}	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$	$T_j = 25^\circ\text{C}$		20		ns
	$I_F = 1\text{ A}$ $di_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$				35	
I_{RM}	$V_R = 200\text{ V}$ $I_F = 15\text{ A}$ $di_F/dt = -200\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$		4.5	6	A
S factor				0.4		

TURN-ON SWITCHING CHARACTERISTICS

Symbol	Tests conditions	Min.	Typ.	Max.	Unit
t_{fr}	$T_j = 25^\circ\text{C}$ $I_F = 15\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ measured at $1.1 \times V_{Fmax}$			300	ns
V_{FP}	$T_j = 25^\circ\text{C}$ $I_F = 15\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$			3.5	V

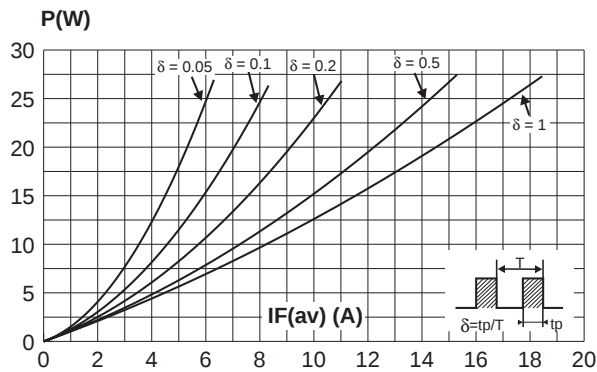
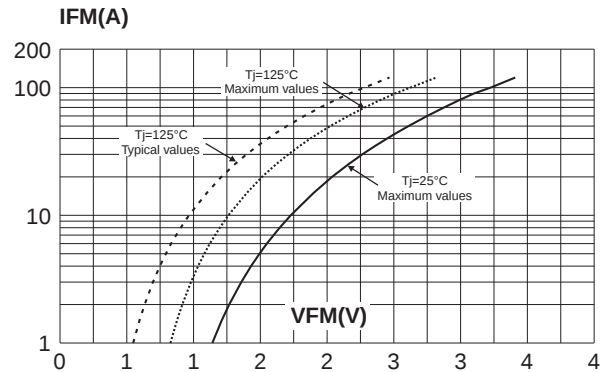
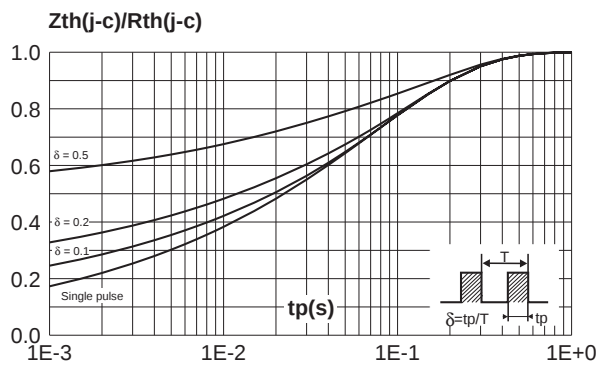
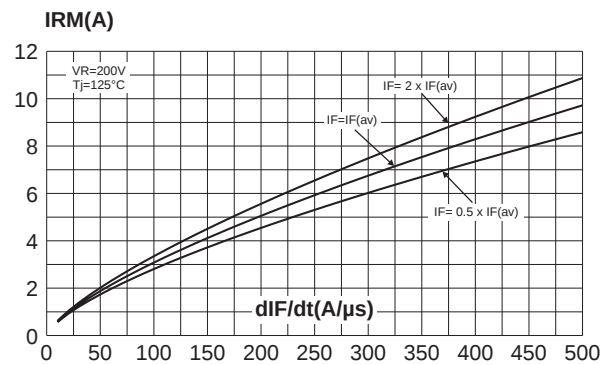
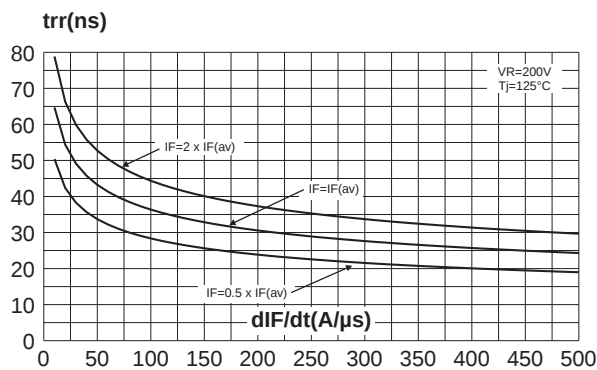
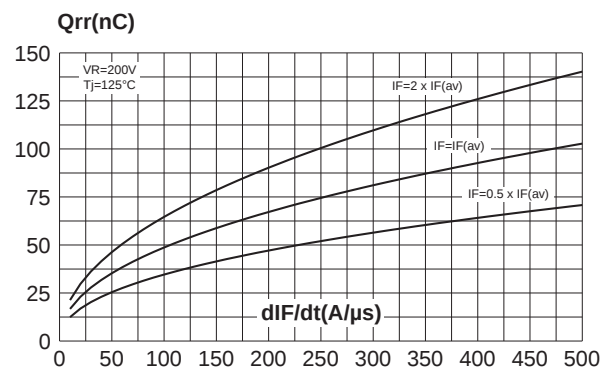
Fig. 1: Conduction losses versus average current**Fig. 2:** Forward voltage drop versus forward current**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration**Fig. 4:** Peak reverse recovery current versus dI_F/dt (90% confidence).**Fig. 5:** Reverse recovery time versus dI_F/dt (90% confidence).**Fig. 6:** Reverse recovery charges versus dI_F/dt (90% confidence).

Fig. 7: Softness factor (t_b/t_a) versus dI_F/dt (typical values).

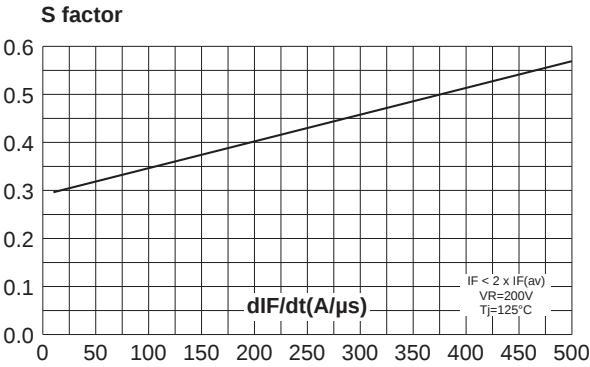


Fig. 8: Relative variation of dynamic parameters versus junction temperature (Reference: $T_J = 125^\circ C$).

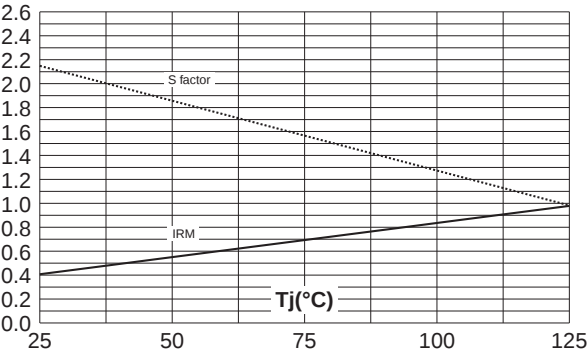


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

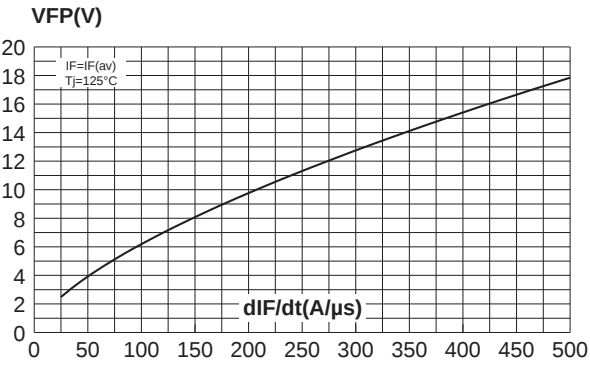
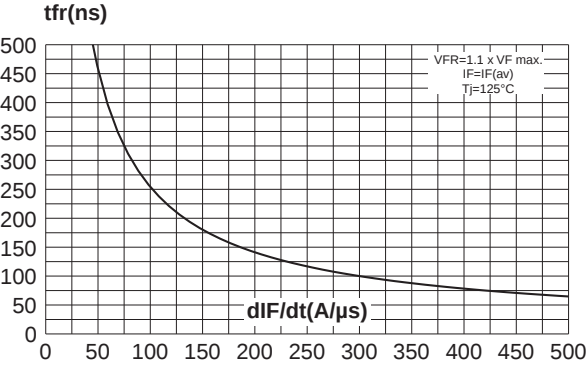
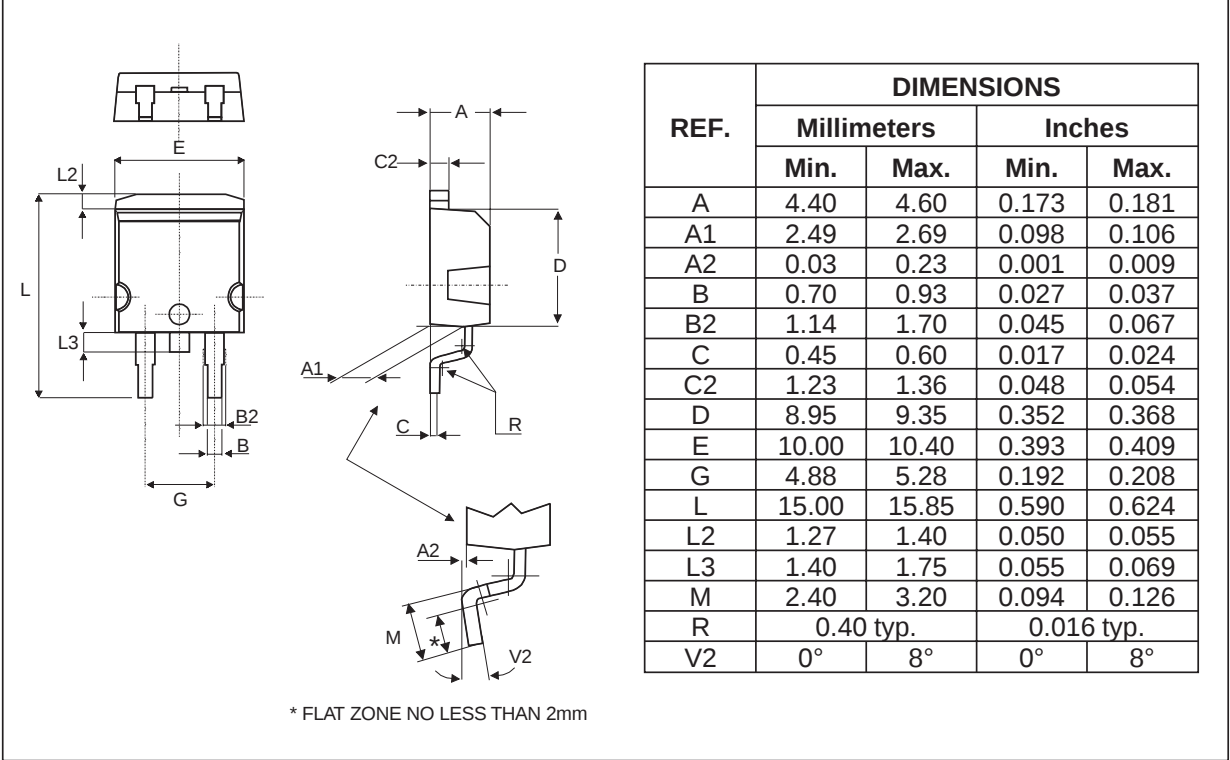


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

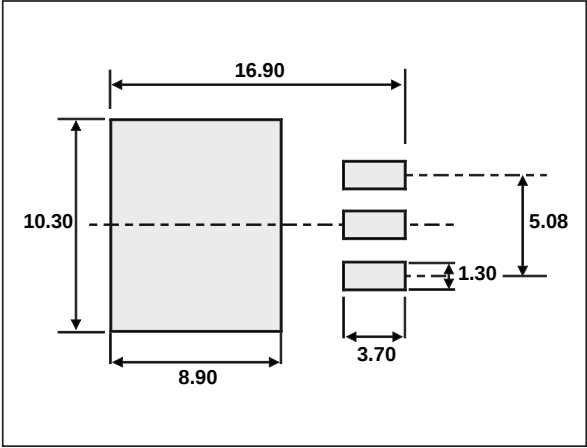


PACKAGE MECHANICAL DATA

D²PAK



FOOTPRINT



PACKAGE MECHANICAL DATA

TO-247

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH30R03CW	STTH30R03CW	TO-247	4.36g	30	Tube
STTH30R03CG	STTH30R03CG	D ² PAK	1.48g	50	Tube
STTH30R03CG-TR	STTH30R03CG	D ² PAK	1.48g	1000	Tape & Reel

- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1 N.m.
- Epoxy meets UL 94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied.

STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2002 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany
 Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore
 Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>