



# 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

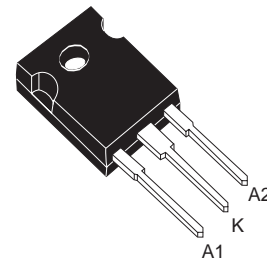
### FEATURES AND BENEFITS

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

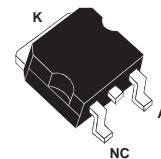
### DESCRIPTION

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.



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### 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	$T_c = 120^\circ\text{C}$ $\delta = 0.5$	Per diode 15 Per device 30	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms sinusoidal}$	120	A
$T_{stg}$	Storage temperature range		- 65 + 175	°C
$T_j$	Maximum operating junction temperature		+ 175	°C

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### THERMAL AND POWER DATA

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	2.0	$^{\circ}\text{C/W}$
		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	$\mu\text{A}$
			$T_j = 125^{\circ}\text{C}$		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

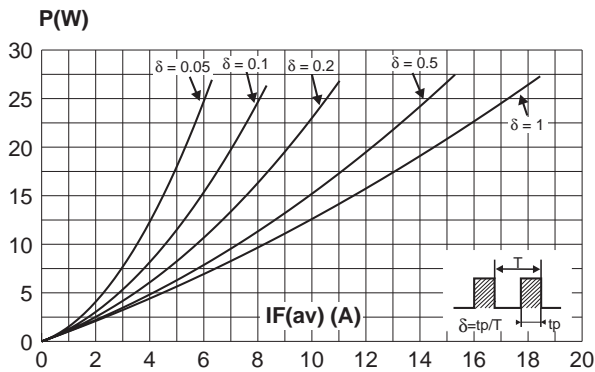


Fig. 2: Forward voltage drop versus forward current

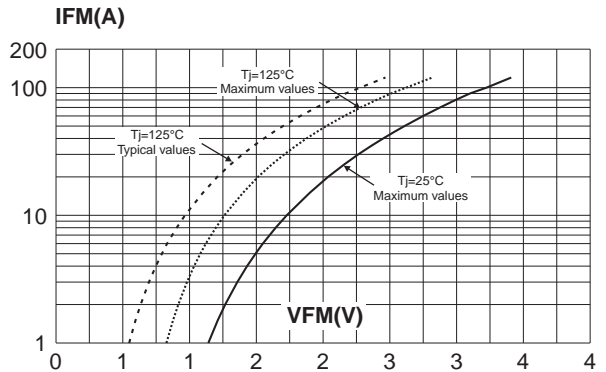


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration

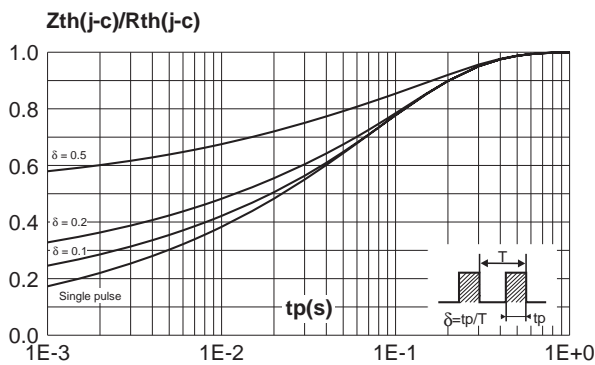


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence)

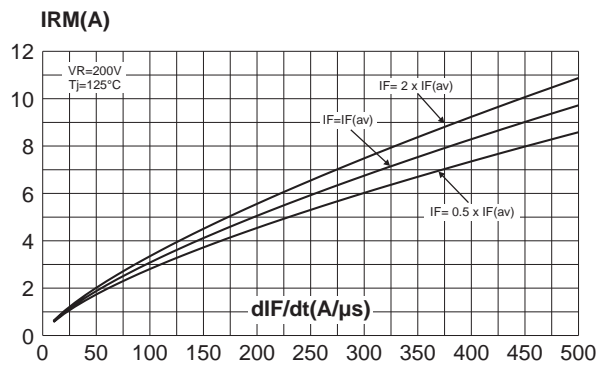


Fig. 5: Reverse recovery time versus dIF/dt (90% confidence)

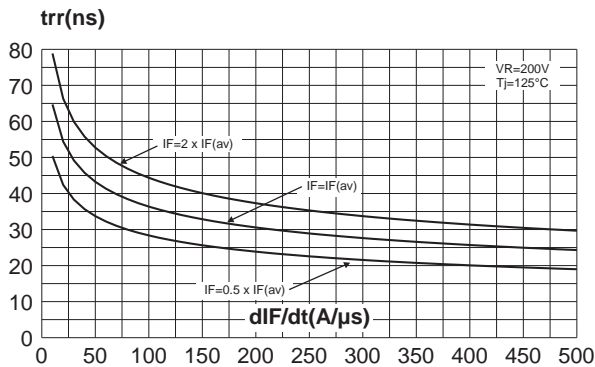
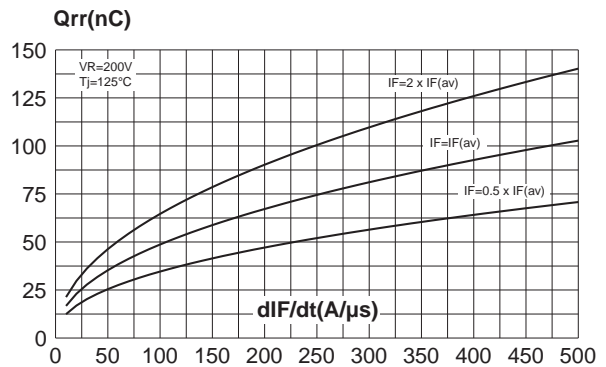
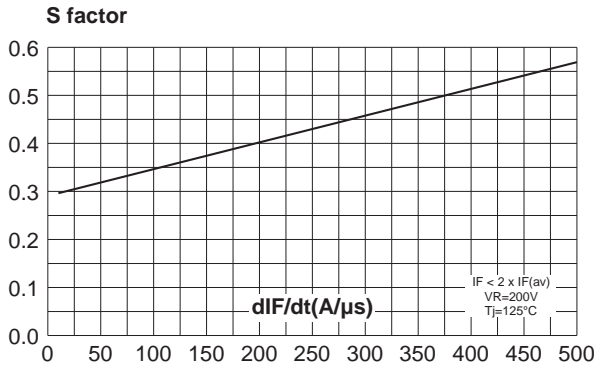


Fig. 6: Reverse recovery charges versus dIF/dt (90% confidence)

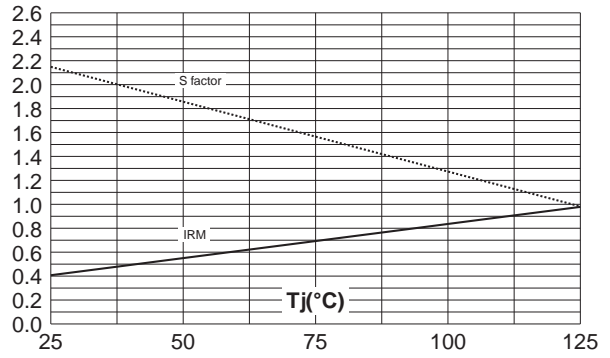


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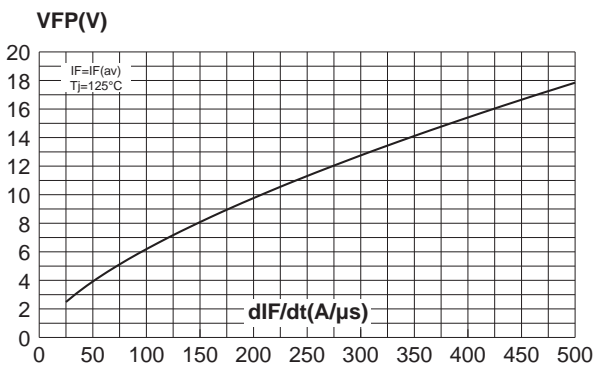
**Fig. 7:** Softness factor (tb/ta) versus dI<sub>F</sub>/dt (typical values).



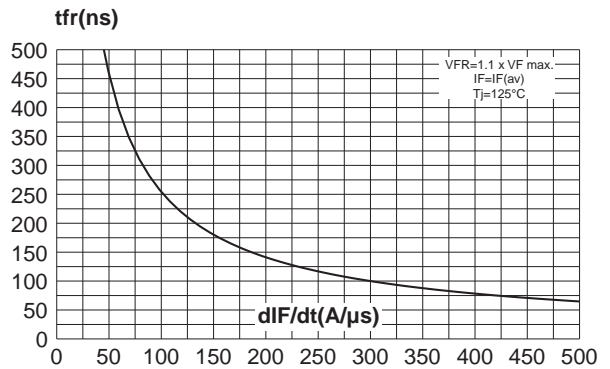
**Fig. 8:** Relative variation of dynamic parameters versus junction temperature (Reference: T<sub>J</sub>=125°C).



**Fig. 9:** Transient peak forward voltage versus dI<sub>F</sub>/dt (90% confidence).

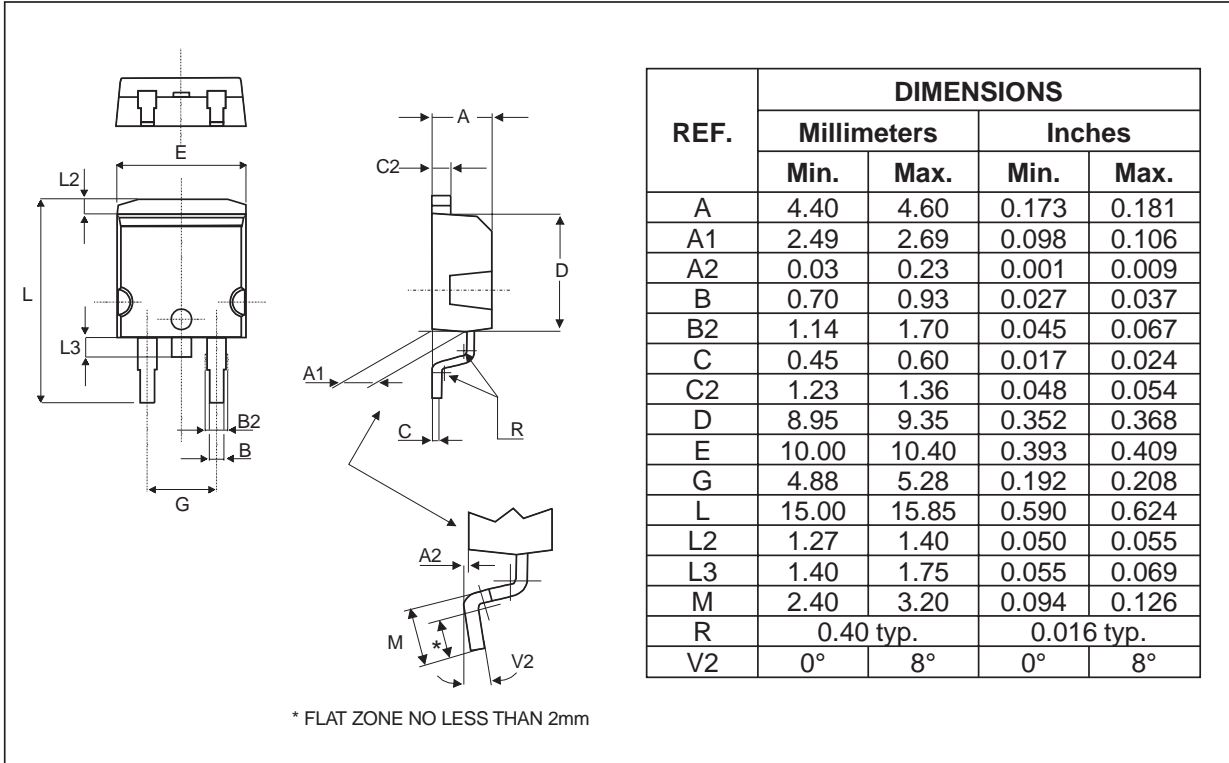


**Fig. 10:** Forward recovery time versus dI<sub>F</sub>/dt (90% confidence).

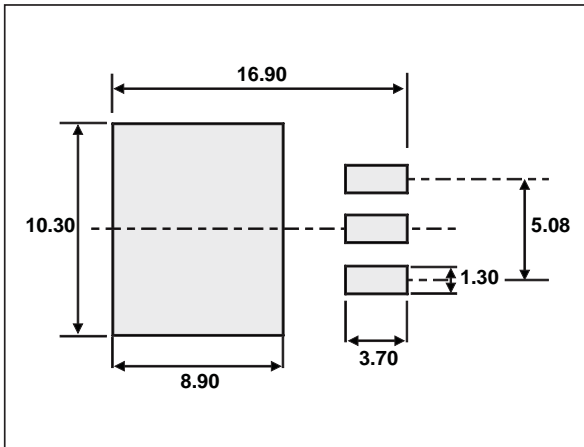


PACKAGE MECHANICAL DATA

D<sup>2</sup>PAK



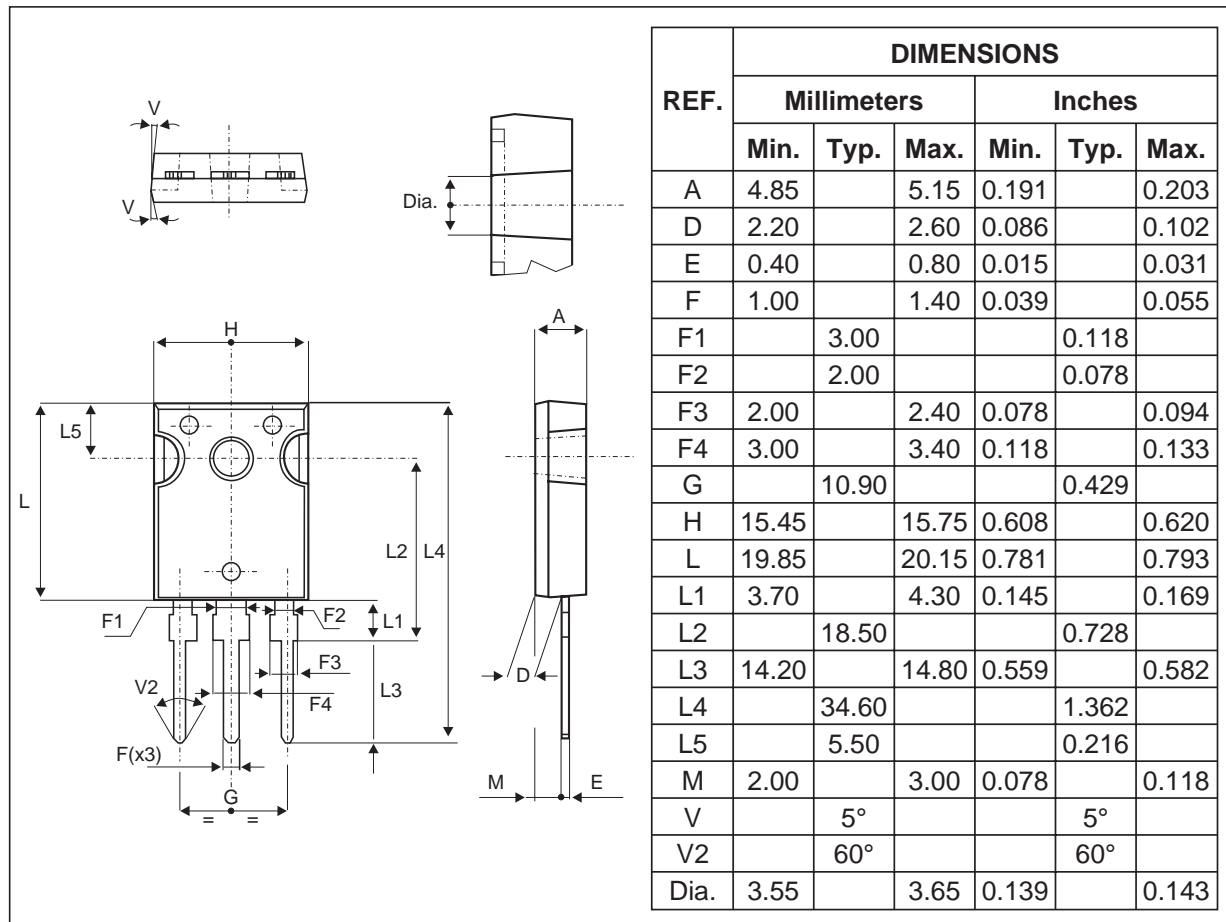
FOOTPRINT



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## PACKAGE MECHANICAL DATA

TO-247



Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH30R03CW	STTH30R03CW	TO-247	4.36g	30	Tube
STTH30R03CG	STTH30R03CG	D <sup>2</sup> PAK	1.48g	50	Tube
STTH30R03CG-TR	STTH30R03CG	D <sup>2</sup> 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

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