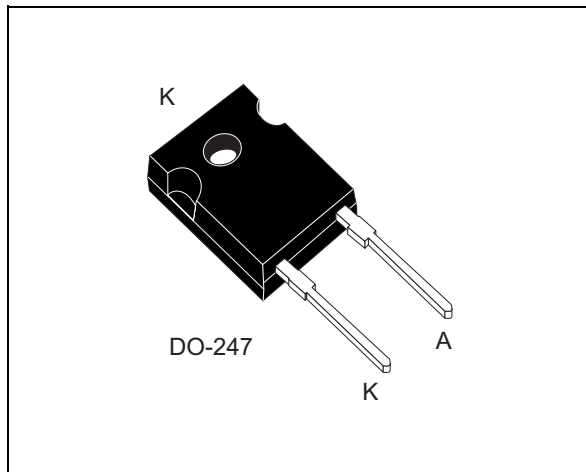# STTH30S12

Turbo 2 ultrafast high voltage rectifier

Datasheet − production data

DO-247

Description

The STTH30S12 is developed using ST's Turbo 2 1200 V technology. It is well-suited as a boost diode, especially for use in UPS.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	30 A
V_{RRM}	1200 V
t_{rr} (typ)	35 ns
V_F (typ)	1.9 V
T_j (max)	175 °C

Features

- Ultrafast switching
- Low reverse current
- Low thermal resistance
- Reduces switching and conduction losses

1 Characteristics

Table 2. Absolute ratings (limiting values at T_j = 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		1200	V
$I_{F(RMS)}$	Forward rms current		50	A
$I_{F(AV)}$	Average forward current, δ = 0.5	T_c = 70 °C	30	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	180	A
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Maximum operating junction temperature		175	°C

Table 3. Thermal parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	0.95	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R[1]	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			15	µA
		T_j = 150 °C			60	600	
V_F[2]	Forward voltage drop	T_j = 25 °C	I_F = 30 A		2.9		V
		T_j = 150 °C			1.9	2.7	

1. Pulse test: t_p = 5 ms, δ < 2%

2. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

$P = 1.8 \times I_{F(AV)} + 0.03\, I_F^2{}_{(RMS)}$

Table 5. Dynamic characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	T_j = 25 °C	I_F = 1 A, V_R = 30 V, dI_F/dt = 200 A/µs		35	50	ns
I_{RM}	Reverse recovery current	T_j = 125 °C	I_F = 30 A, V_R = 600 V, dI_F/dt = 200 A/µs		17	24	A
S	Softness factor				2		
Q_{RR}	Reverse recovery charge				2900		nC

Figure 1. Average forward power dissipation versus average forward current

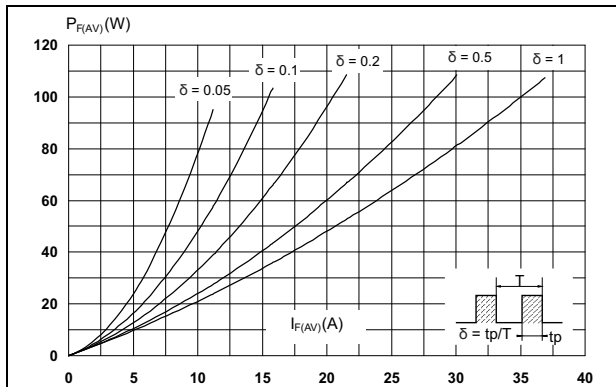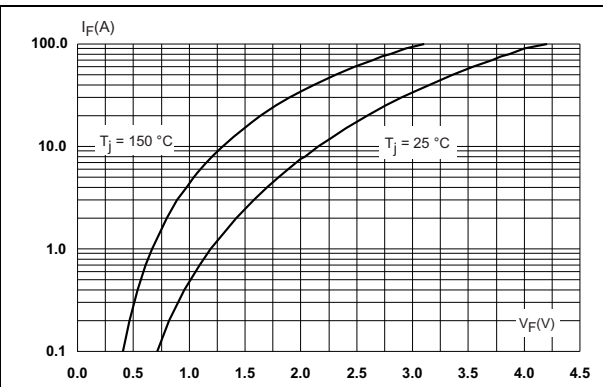**Figure 2. Forward voltage drop versus forward current (typical values)**

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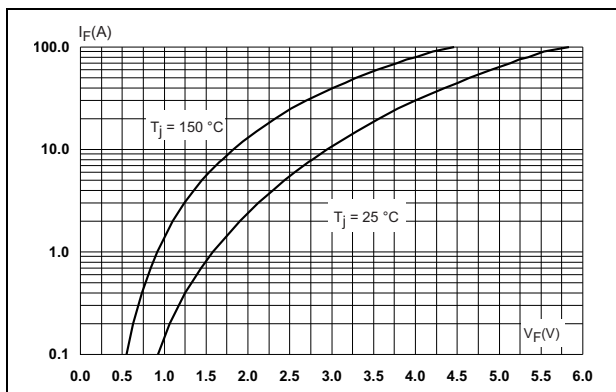

Figure 4. Relative variation of thermal impedance, junction to case, versus pulse duration
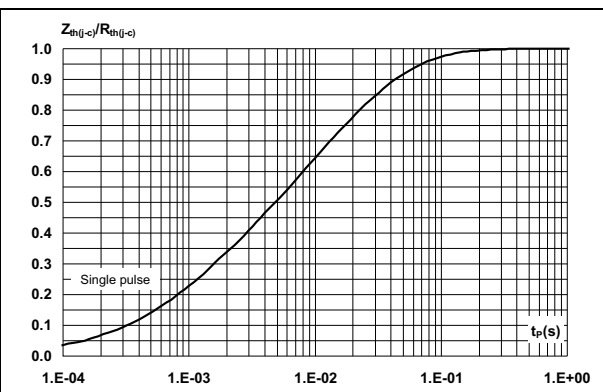

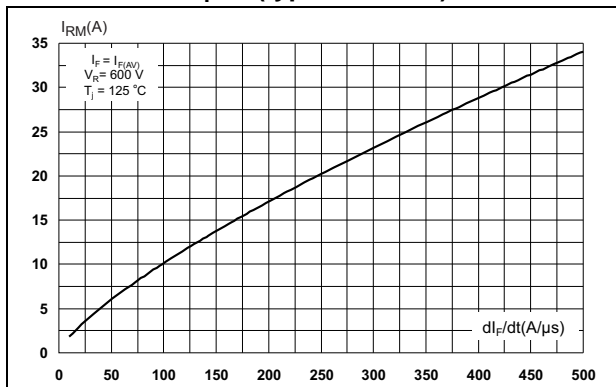**Figure 5. Peak reverse recovery current versus dI_F/dt (typical values)**

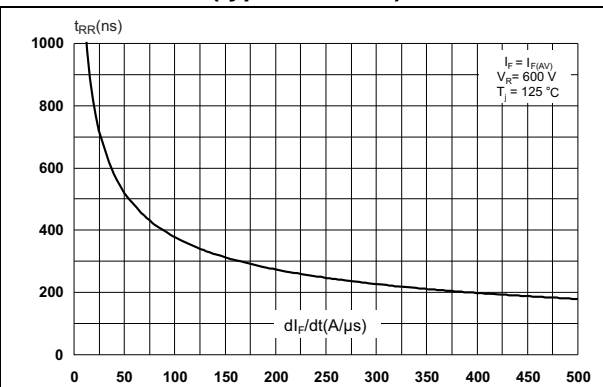**Figure 6. Reverse recovery time versus dI_F/dt (typical values)**

Figure 7. Reverse recovery charges versus dI_F/dt (typical values)
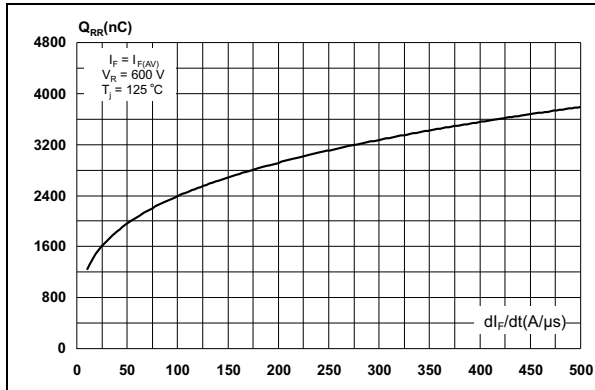

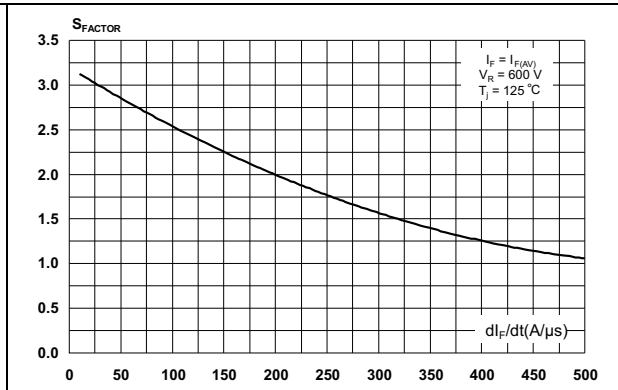**Figure 8. Reverse recovery softness factor versus dI_F/dt (typical values)**

Figure 9. Relative variations of dynamic parameters versus junction temperature
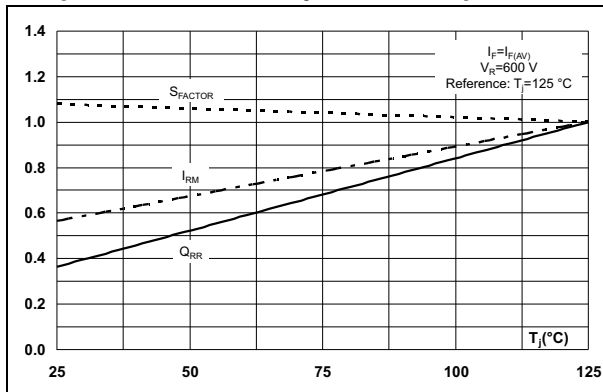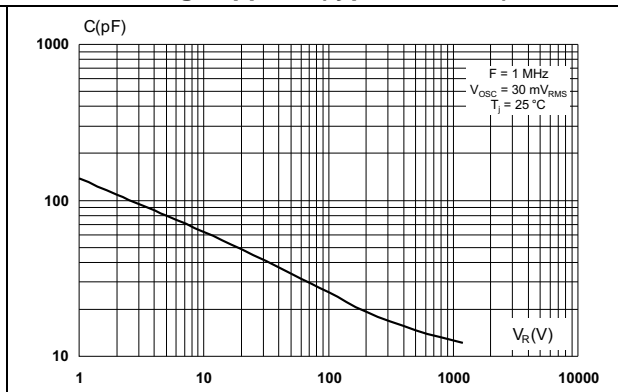

Figure 10. Junction capacitance versus reverse voltage applied (typical values)

2   Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.4 N·m to 0.6 N·m

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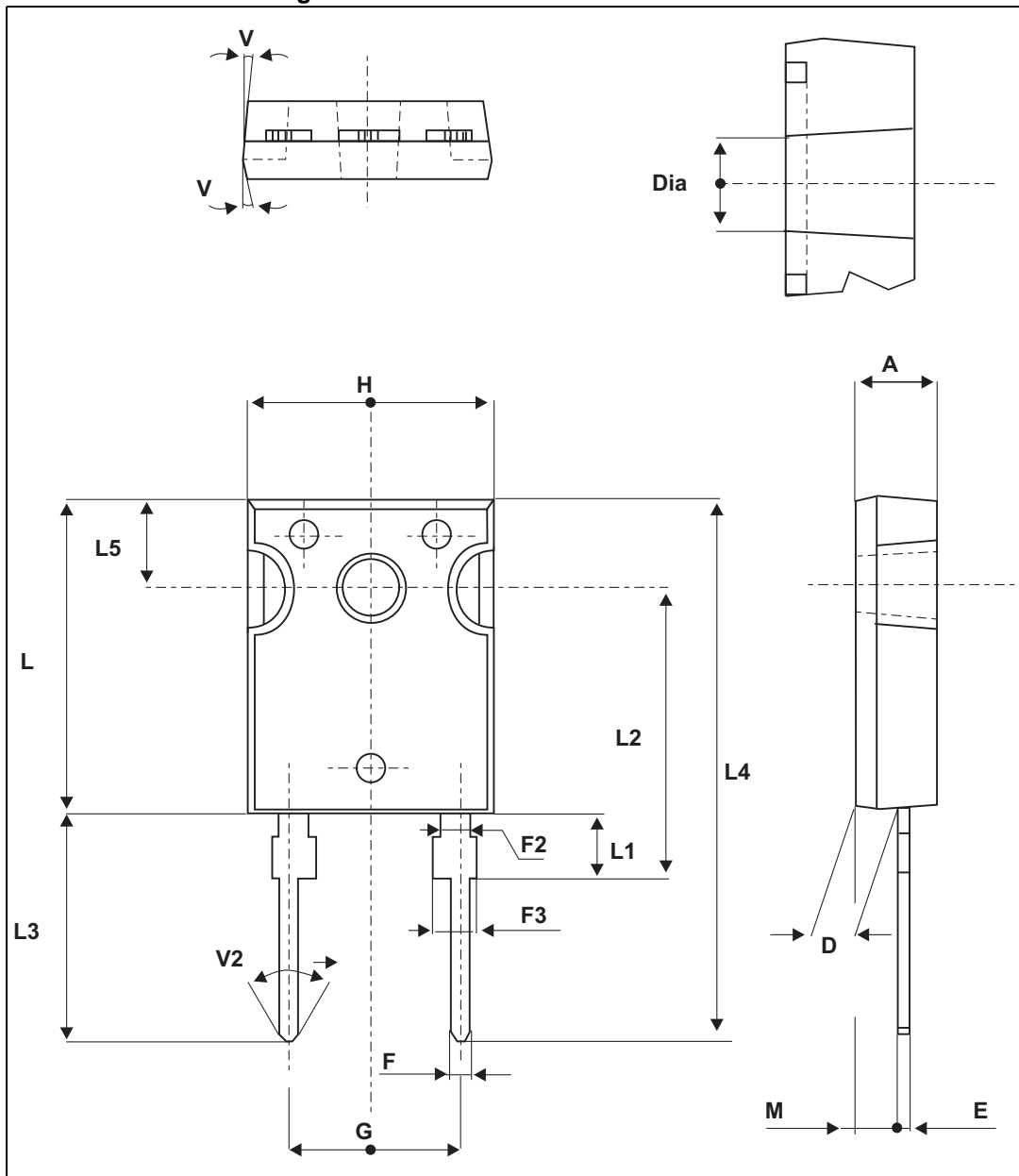
Figure 11. DO-247 dimension definitions

Table 6. DO-247 dimension values

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
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
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

3   Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH30S12W	STTH30S12W	DO-247	4.46 g	50	Tube

4   Revision history

Table 8. Document revision history

Date	Revision	Changes
18-Sep-2014	1	Initial release

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