STTH15S12

Turbo 2 ultrafast high voltage rectifier

Datasheet − production data

DO-247 A

K

TO-220AC K

A

Features

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

Description

The STTH15S12 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
$I_{F(AV)}$	15 A
V_{RRM}	1200 V
t_{rr} (typ)	27 ns
V_F (typ)	1.9 V
T_j (max)	175 °C

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 = 100 °C	15	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	130	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	1.4	°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	$V_R = V_{RRM}$			10	µA
		T_j = 150 °C			40	400	
V_F[2]	Forward voltage drop	T_j = 25 °C	I_F = 15 A		3.1		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:

$P = 1.9 \times I_{F(AV)} + 0.0533\, I_F^2{}_{(RMS)}$

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		27	40	ns
I_{RM}	Reverse recovery current	T_j = 125 °C	I_F = 15 A, V_R = 600 V, dI_F/dt = 200 A/µs		12	17	A
S	Softness factor				2		
Q_{RR}	Reverse recovery charge				1300		nC

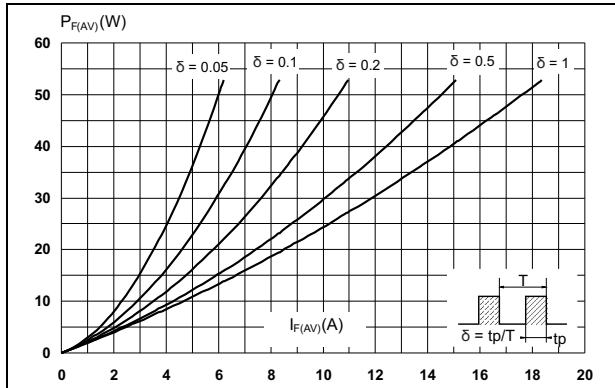**Figure 1. Average forward power dissipation versus average forward current**

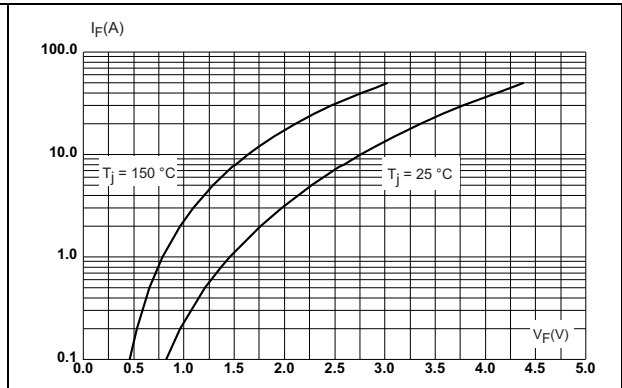**Figure 2. Forward voltage drop versus forward current (typical values)**

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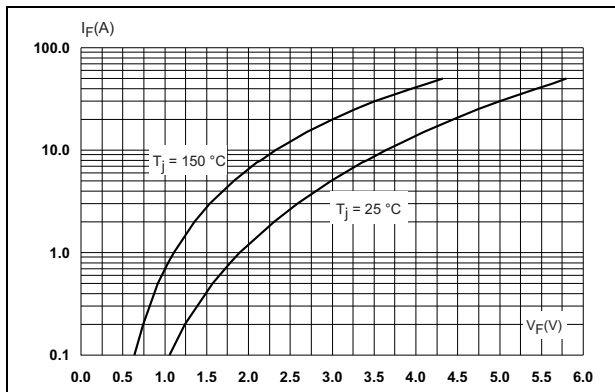

Figure 4. Relative variation of thermal impedance, junction to case, versus pulse duration
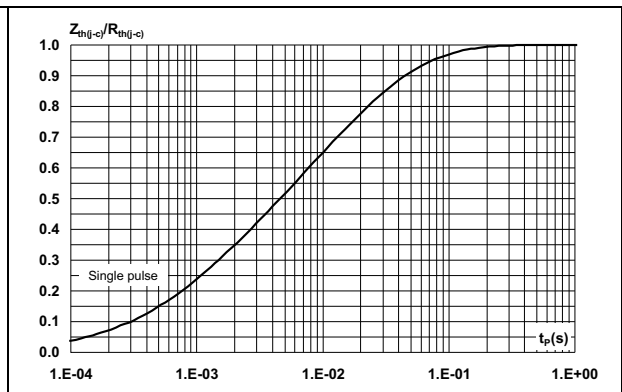

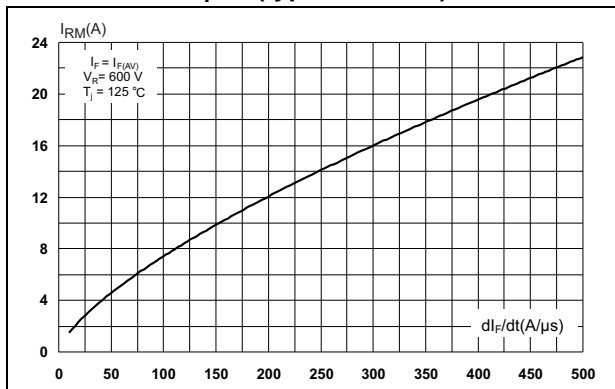**Figure 5. Peak reverse recovery current versus dI$_F$/dt (typical values)**

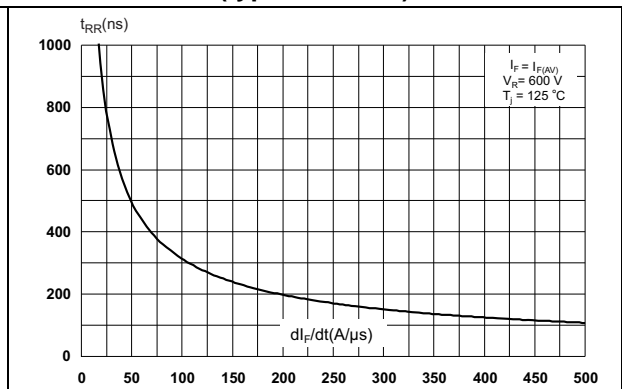**Figure 6. Reverse recovery time versus dI$_F$/dt (typical values)**

Figure 7. Reverse recovery charges versus dI$_F$/dt (typical values)
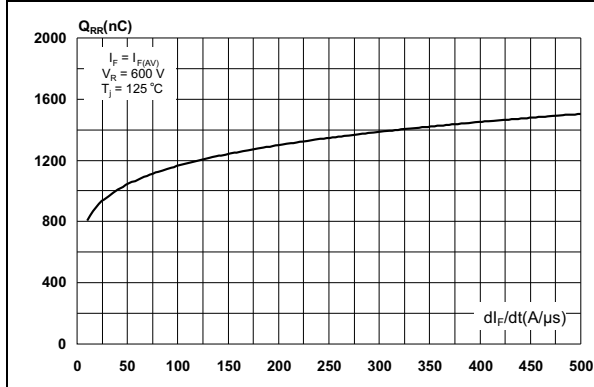

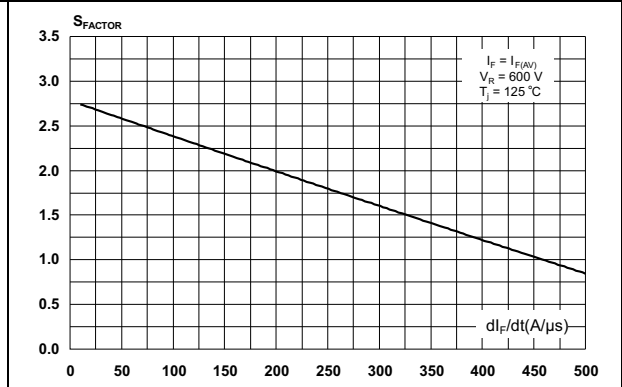### Figure 8. Reverse recovery softness factor versus dI$_F$/dt (typical values)

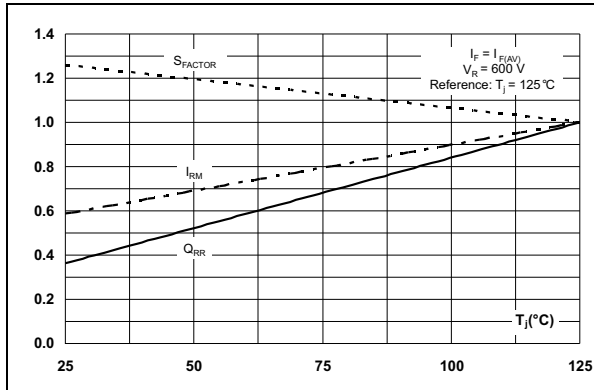### Figure 9. Relative variations of dynamic parameters versus junction temperature
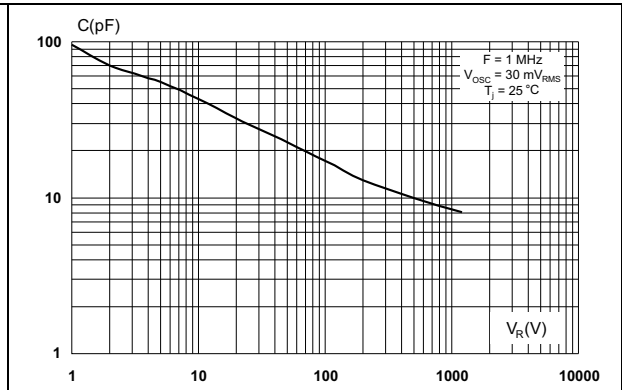

Figure 10. Junction capacitance versus reverse voltage applied (typical values)

2 Package information

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

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

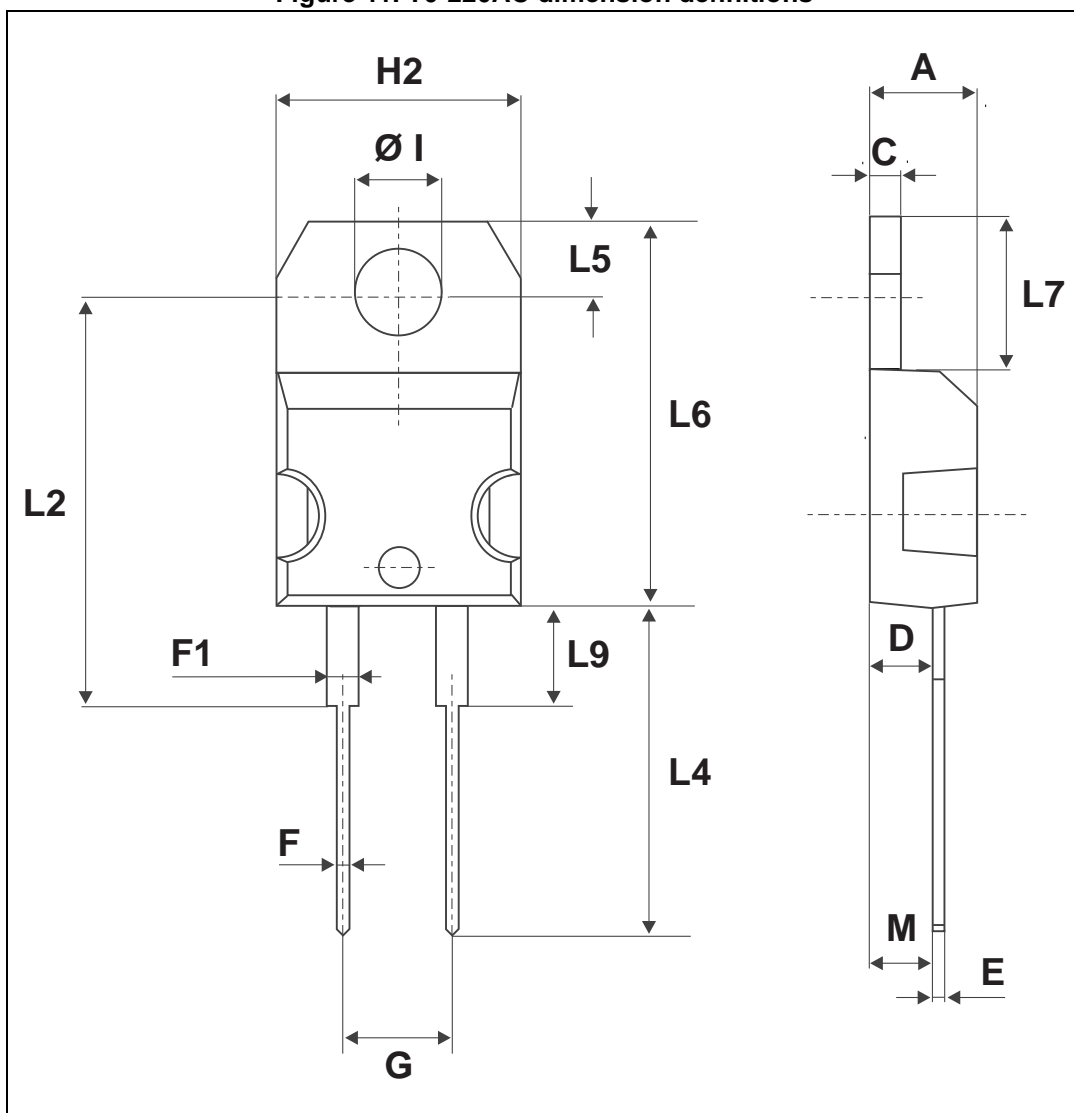**Figure 11. T0-220AC dimension definitions**

Table 6. T0-220AC dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	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
G	4.95		5.15	0.194		0.202
H2	10.00		10.40	0.393		0.409
L2		16.40			0.645	
L4	13.00		14.00	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	3.5		3.93	0.137		0.154
M		2.6			0.102	
Diam. I	3.75		3.85	0.147		0.151

Figure 12. DO-247 dimension definitions

Table 7. 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 8. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH15S12D	STTH15S12D	TO-220AC	1.9 g	50	Tube
STTH15S12W	STTH15S12W	DO-247	4.46 g	50	Tube

4   Revision history

Table 9. Document revision history

Date	Revision	Changes
18-Sep-2014	1	Initial release

IMPORTANT NOTICE – PLEASE READ CAREFULLY