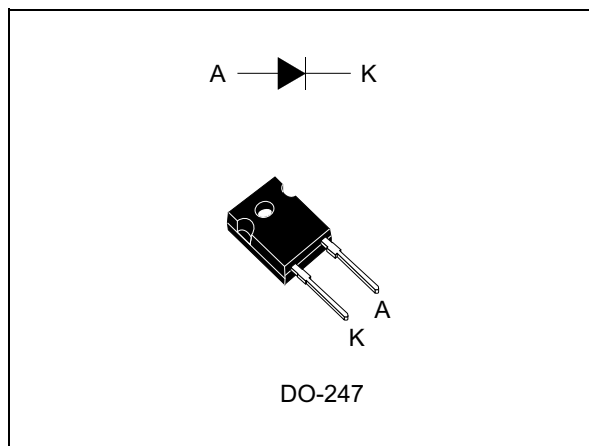


Turbo 2 ultrafast high voltage rectifier

Datasheet - production data



Features

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

Description

The STTH30ACS06W, which is ST Turbo 2 600 V technology, is suited as boost diode especially in air conditioning equipment for continuous mode interleaved power factor correction.

The device is also intended for use as a freewheeling diode in power supplies and other power switching applications.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	30 A
V_{RRM}	600 V
T_j (max)	175 °C
V_F (typ)	1.45 V
t_{rr} (max)	30 ns

1 Characteristics

Table 2. Absolute ratings (limiting values at $T_j = 25\text{ °C}$, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	RMS forward current		50	A
$I_{F(AV)}$	Average forward current		30	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	190	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	1.2	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		5	μA
		$T_j = 150\text{ °C}$		-	30	300	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 30\text{ A}$	-		2.4	V
		$T_j = 150\text{ °C}$		-	1.45	1.9	

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:

$$P = 1.42 \times I_{F(AV)} + 0.016 \times I_{F(RMS)}^2$$

Table 5. Dynamic electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25\text{ °C}$	$I_F = 0.5\text{ A}$, $I_{rr} = 0.25\text{ A}$, $I_R = 1\text{ A}$			30	ns
			$I_F = 1\text{ A}$, $V_R = 30\text{ V}$, $dI_F/dt = -50\text{ A}/\mu\text{s}$		40	55	ns
I_{RM}	Reverse recovery current	$T_j = 125\text{ °C}$	$I_F = 30\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_R = 400\text{ V}$		7.8	10.5	A
t_{fr}	Forward recovery time	$T_j = 25\text{ °C}$	$I_F = 30\text{ A}$, $dI_F/dt = 200\text{ A}/\mu\text{s}$, $V_{FR} = 2.8\text{ V}$			300	ns
V_{FP}	Forward recovery voltage				3.5		V

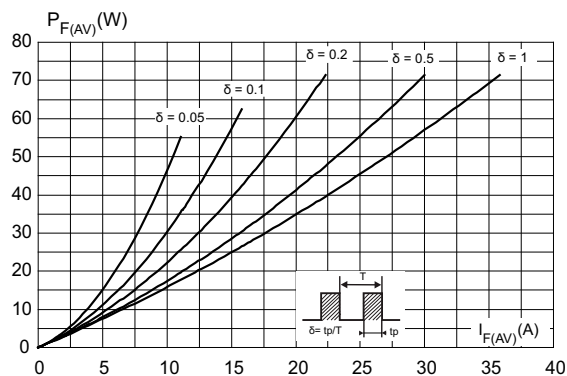
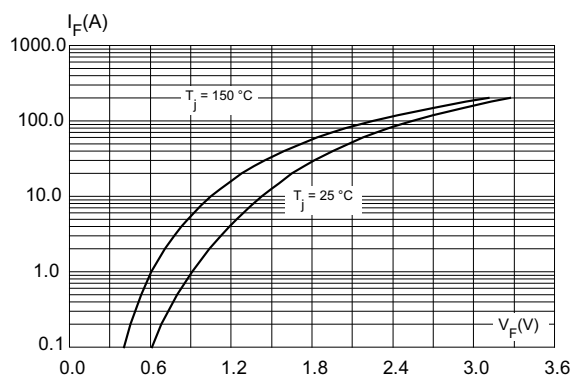
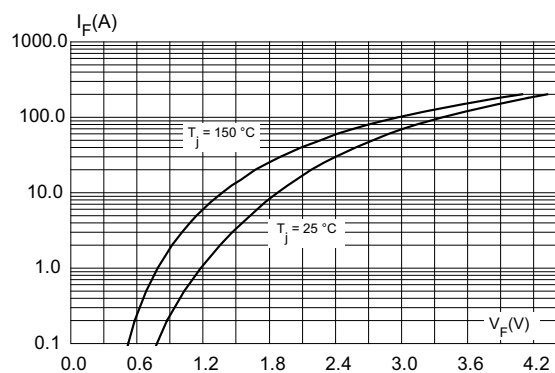
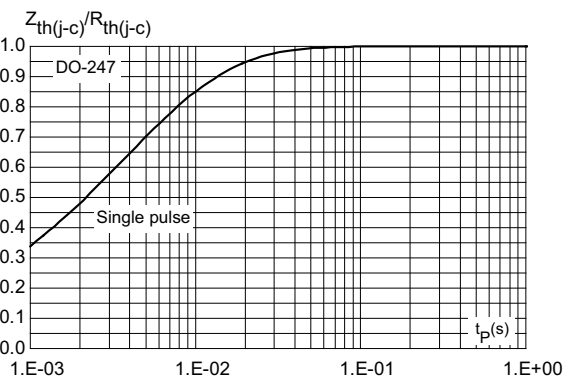
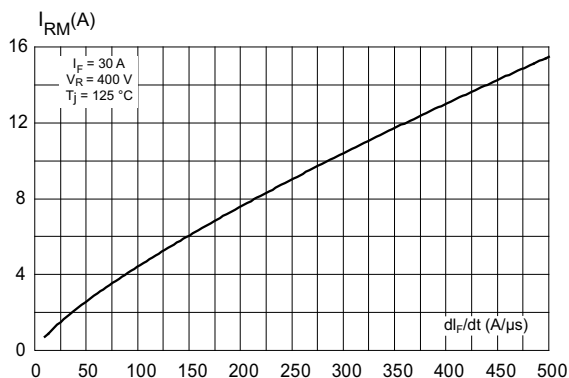
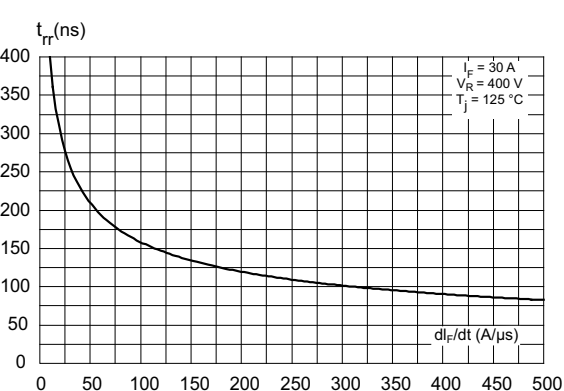
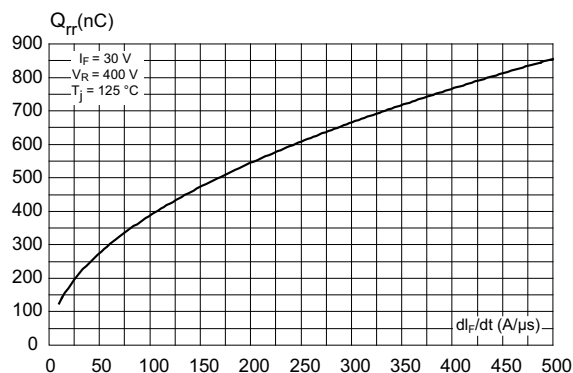
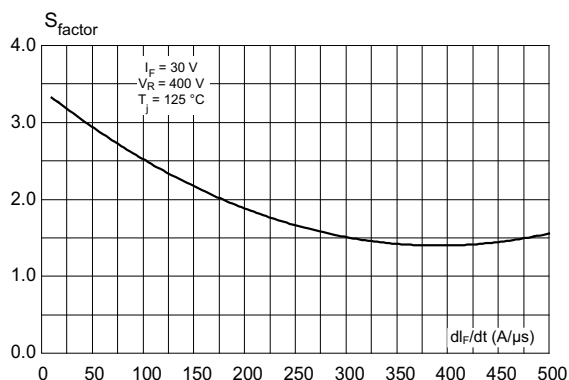
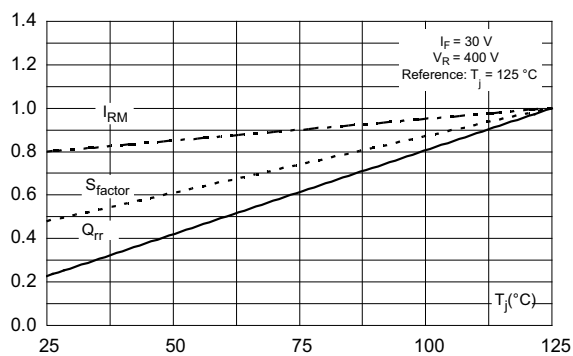
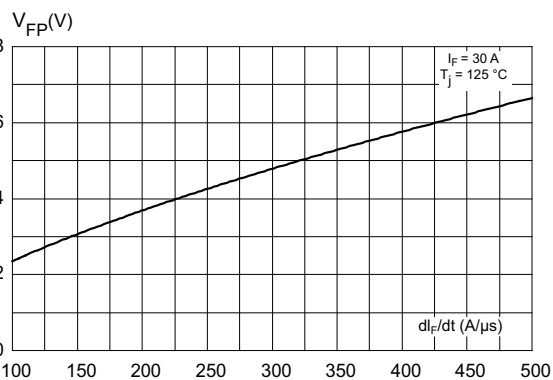
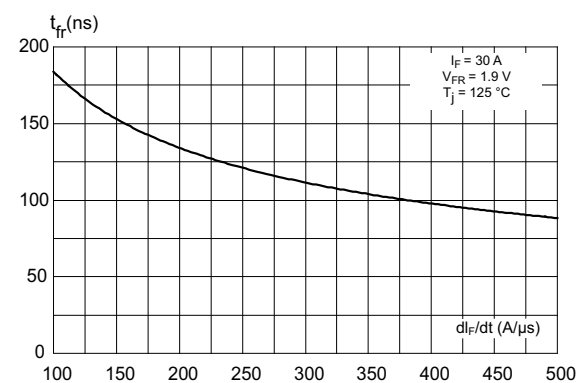
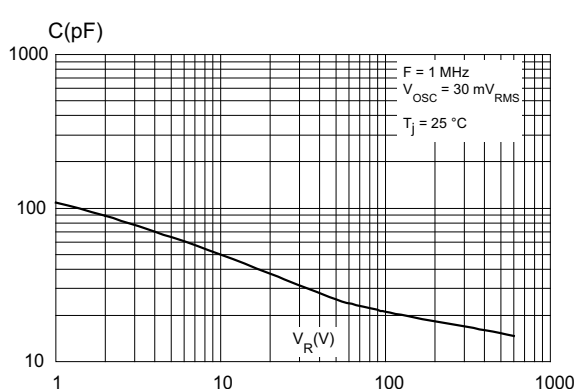
Figure 1. Average forward power dissipation versus average forward current**Figure 2. Forward voltage drop versus forward current (typical values)****Figure 3. Forward voltage drop versus forward current (maximum values)****Figure 4. Relative variation of thermal impedance junction to case versus pulse 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. Softness factor versus di_F/dt (typical values)****Figure 9. Relative variations of dynamic parameters versus junction temperature****Figure 10. Transient peak forward voltage versus di_F/dt (typical values)****Figure 11. Forward recovery time versus di_F/dt (typical values)****Figure 12. Junction capacitance versus reverse voltage applied (typical values)**

2 Package information

- Epoxy meets UL94, V0
- Cooling method by conduction (C)
- Recommended torque value: 0.8 N·m
- Maximum torque value: 1.0 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.

2.1 DO-247 package information

Figure 13. DO-247 package outline

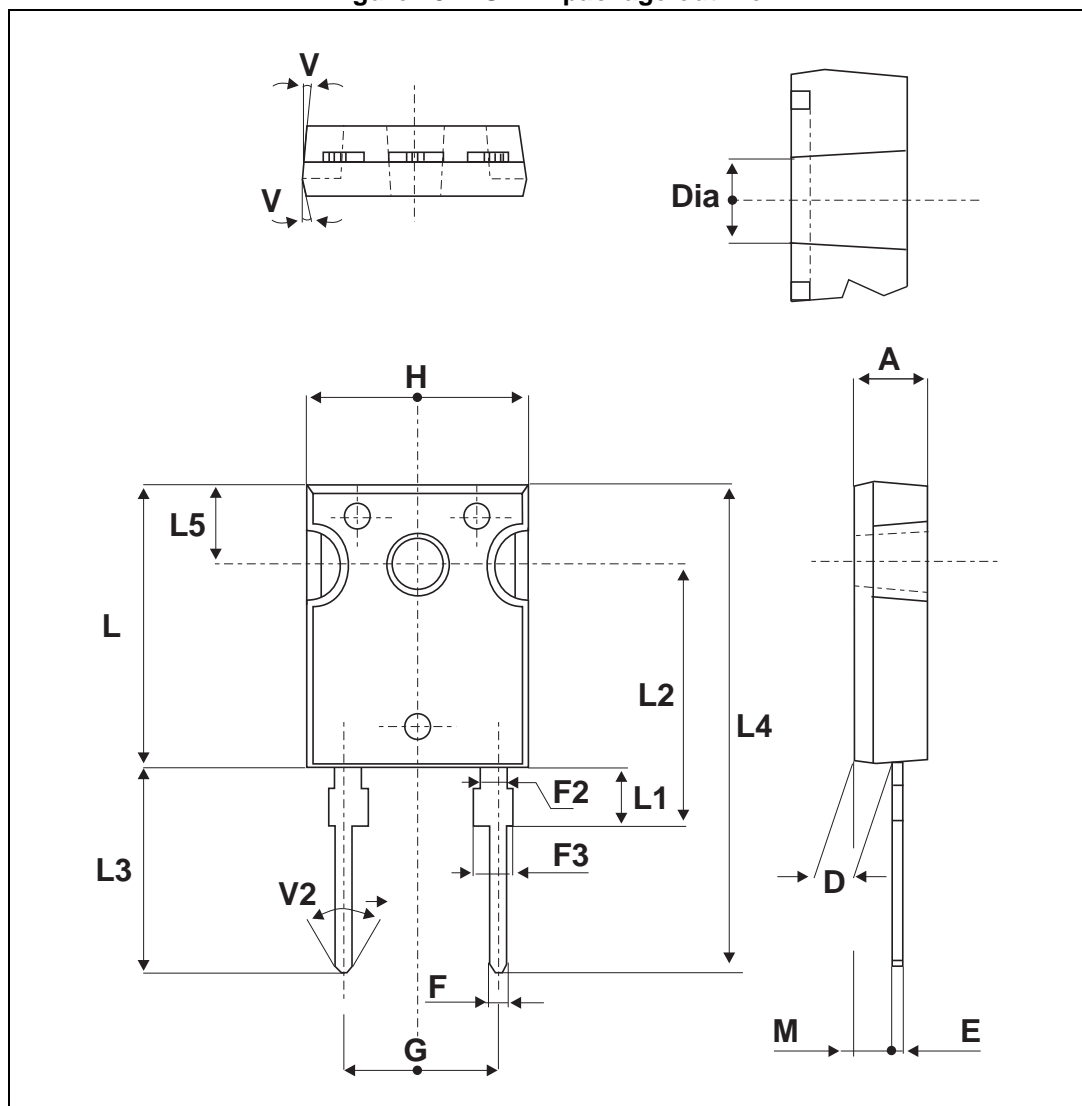


Table 6. DO-247 package mechanical data

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
STTH30ACS06W	STTH30ACS06W	DO-247	1.8 g	50	Tube

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
22-Sep-2015	1	First issue.

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