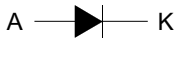
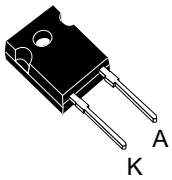
STTH30ACS06W

Turbo 2 ultrafast high voltage rectifier

Datasheet - production data





DO-247

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 °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 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 °C	$V_R = V_{RRM}$	-		5	µA
		T_j = 150 °C		-	30	300	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 30 A	-		2.4	V
		T_j = 150 °C		-	1.45	1.9	

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:

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

Table 5. Dynamic electrical characteristics

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

Figure 1. Average forward power dissipation versus average forward current

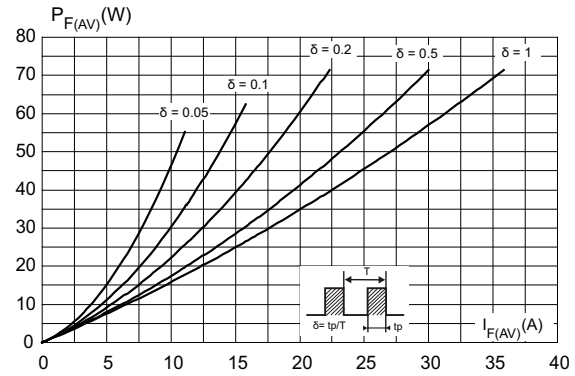


Figure 2. Forward voltage drop versus forward current (typical values)

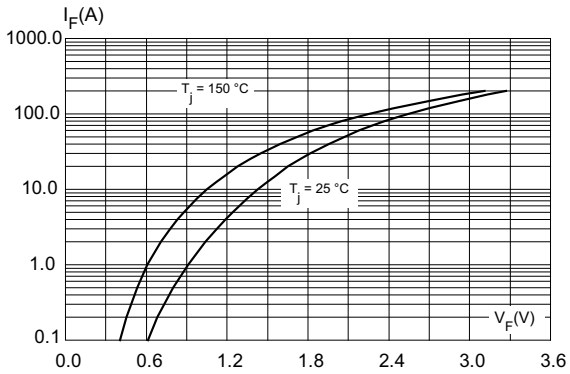


Figure 3. Forward voltage drop versus forward current (maximum values)

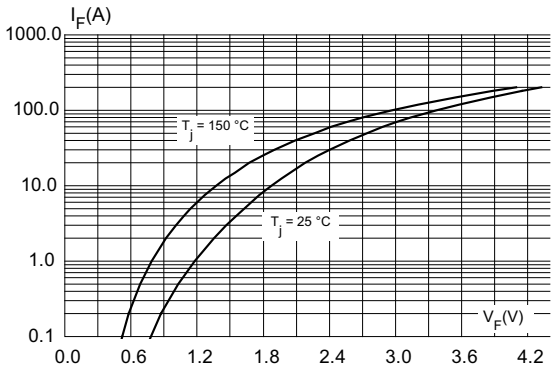


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

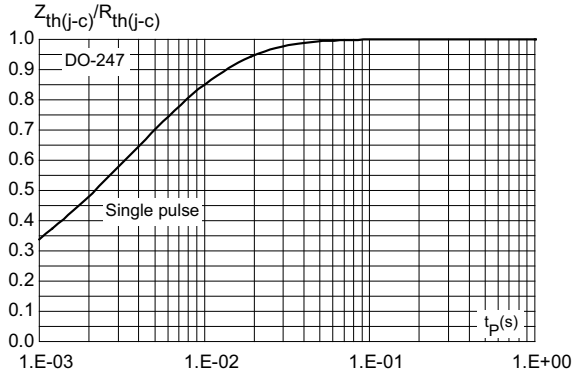


Figure 5. Peak reverse recovery current versus dI_F/dt (typical values)

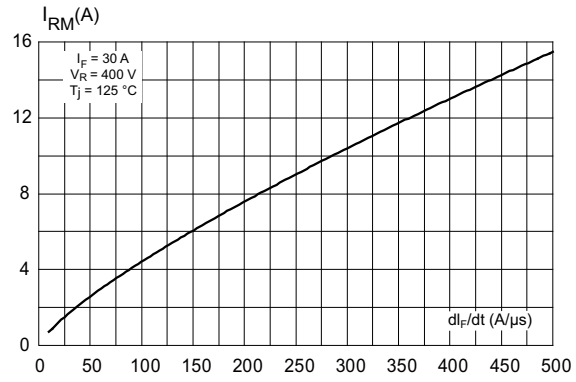


Figure 6. Reverse recovery time versus dI_F/dt (typical values)

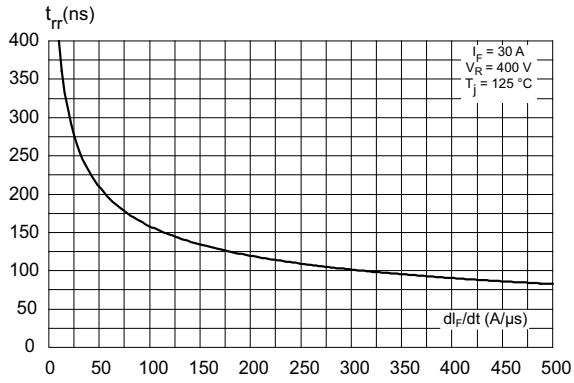


Figure 7. Reverse recovery charges versus dI_F/dt (typical values)

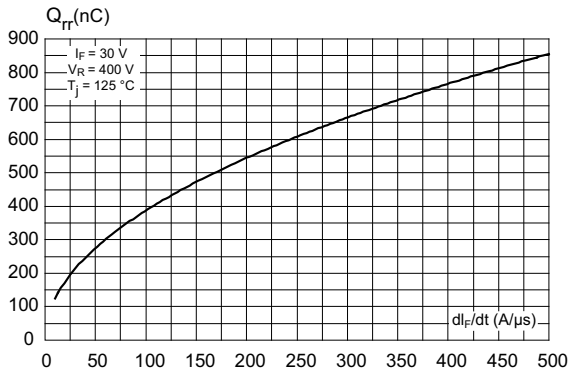


Figure 8. Softness factor versus dI_F/dt (typical values)

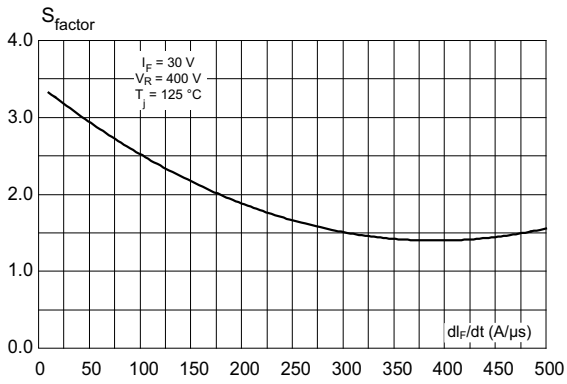


Figure 9. Relative variations of dynamic parameters versus junction temperature

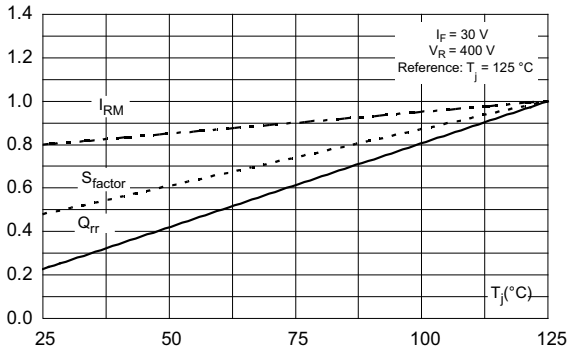


Figure 10. Transient peak forward voltage versus dI_F/dt (typical values)

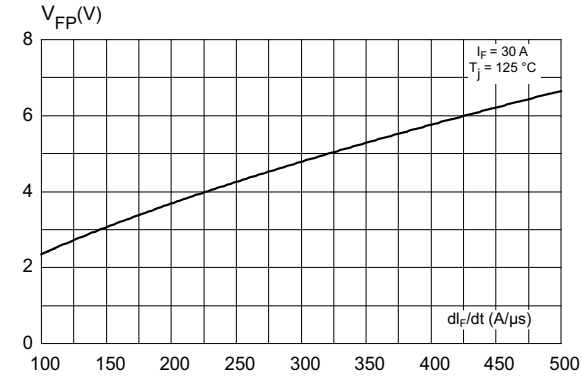


Figure 11. Forward recovery time versus dI_F/dt (typical values)

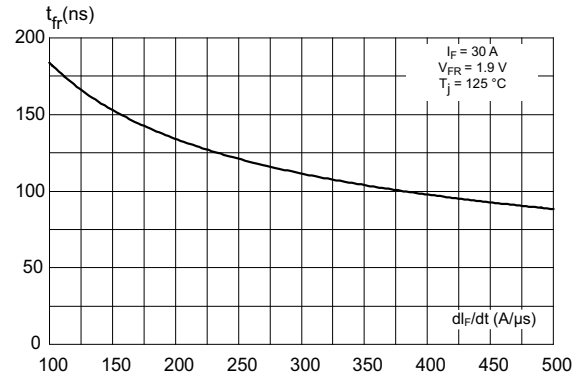
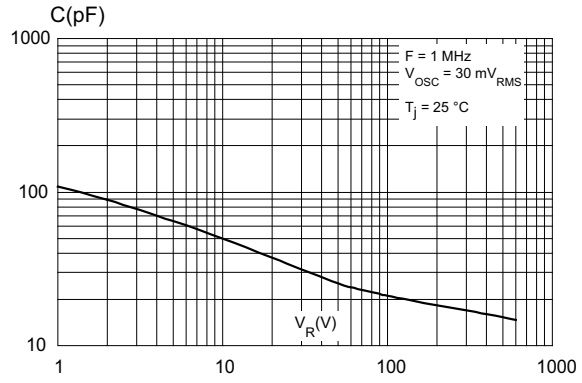


Figure 12. Junction capacitance versus reverse voltage applied (typical values)



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

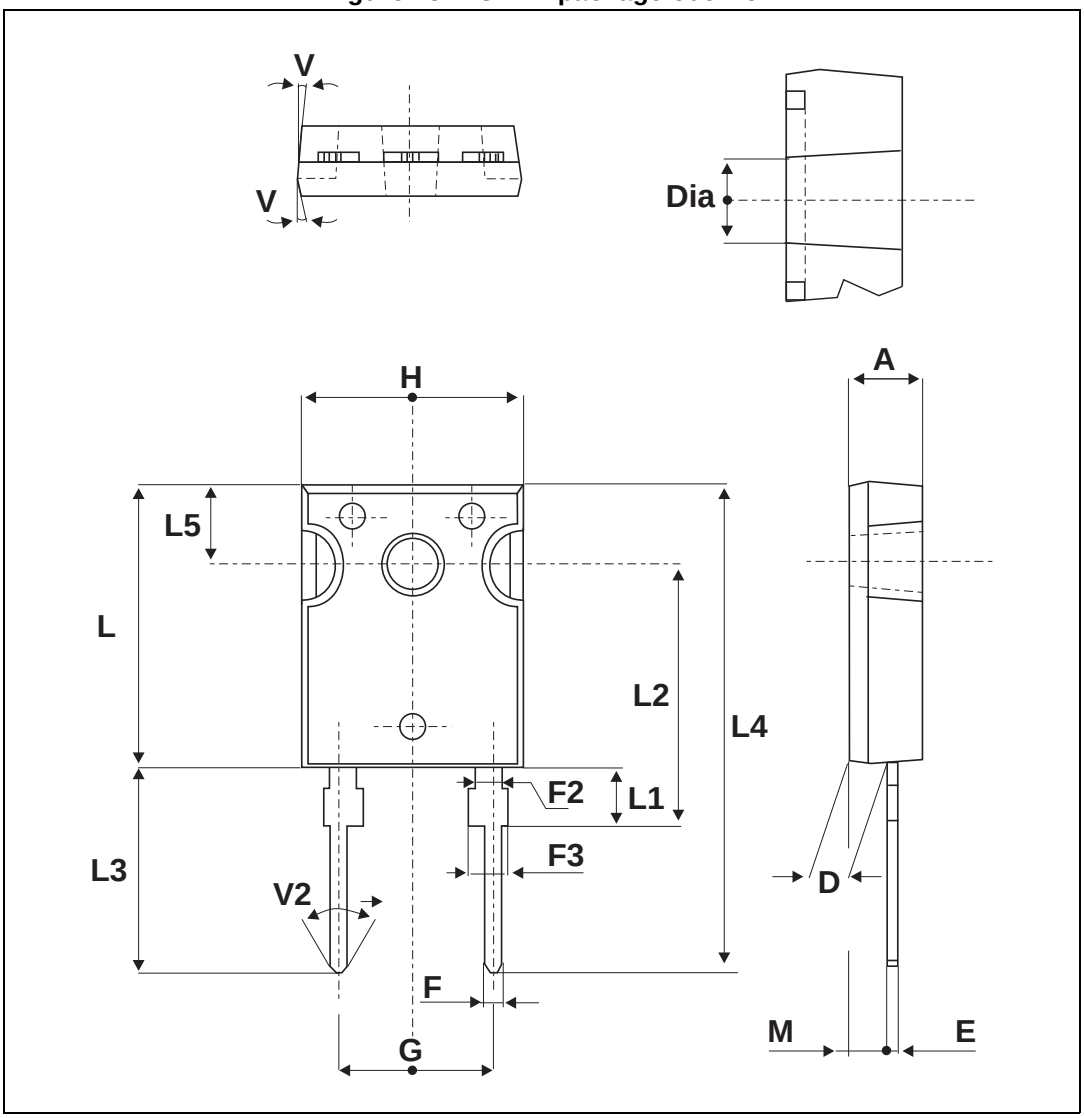


Table 6. DO-247 package mechanical data

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.