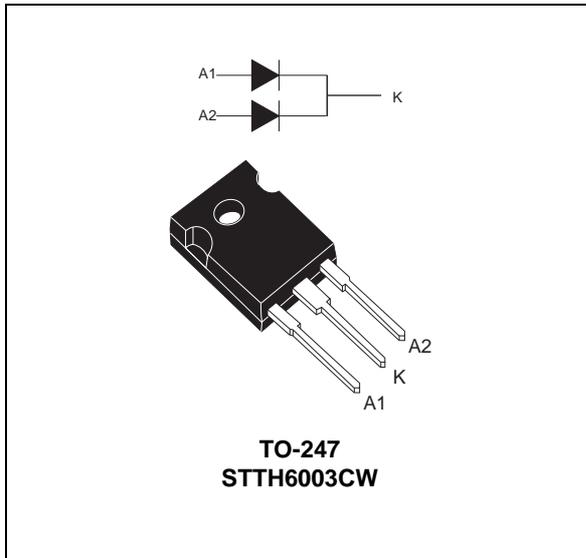


High frequency secondary rectifier

Datasheet - production data


Description

Dual rectifier suited for switch mode power supply and high frequency DC to DC converters. Packaged in TO-247, this device is intended for use in low voltage, high frequency inverters, free wheeling operation, welding equipment and telecom power supplies

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 30 A
V_{RRM}	300 V
V_F (max)	1 V
t_{rr} (max)	55 ns

Features

- Combines highest recovery and voltage performance
- Ultrafast, soft and noise-free recovery
- Low inductance and low capacitance allow simplified layout

1 Characteristics

Table 2. Absolute ratings (limiting values, per diode)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		300	V
$I_{F(RMS)}$	Forward rms current		60	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	$T_c = 135^\circ\text{C}$ $\delta = 0.5$	Per diode 30 Per device 60	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ Sinusoidal	300	A
I_{RSM}	Non repetitive peak reverse current	$t_p = 100\ \mu\text{s}$ square	4	A
T_{stg}	Storage temperature range		-65 to + 175	$^\circ\text{C}$
T_j	Maximum operating junction temperature		175	$^\circ\text{C}$

Table 3. Thermal parameter

Symbol	Parameter		Maximum	Unit
$R_{th(j-c)}$	Junction to case	Per diode Total	1 0.55	$^\circ\text{C/W}$
$R_{th(j-c)}$	Coupling		0.1	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode1}) = P_{(\text{diode1})} \times R_{th(j-c)} (\text{per diode}) + P_{(\text{diode2})} \times R_{th(c)}$$

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit	
$I_R^{(1)}$	Reverse leakage current	$V_R = 300V$	$T_j = 25^\circ C$	-	-	60	μA
			$T_j = 125^\circ C$	-	60	600	
$V_F^{(2)}$	Forward voltage drop	$I_F = 30 A$	$T_j = 25^\circ C$	-	-	1.25	V
			$T_j = 125^\circ C$	-	0.85	1	

1. Pulse test: $t_p = 5 \text{ ms}$, $\delta < 2 \%$

2. Pulse test: $t_p = 380 \mu\text{s}$, $\delta < 2 \%$

To evaluate the maximum conduction losses use the following equation:

$$P = 0.75 \times I_{F(AV)} + 0.008 I_{F(RMS)}^2$$

Table 5. Recovery characteristics

Symbol	Test conditions	Min.	Typ.	Max.	Unit
t_{rr}	$I_F = 0.5 A$, $I_{rr} = 0.25 A$, $I_R = 1 A$	-	-	40	ns
	$I_F = 1 A$, $dI_F/dt = -50 A/\mu\text{s}$, $V_R = 30 V$			55	
t_{fr}	$I_F = 30 A$, $dI_F/dt = 200 A/\mu\text{s}$, $V_{FR} = 1.1 \times V_{Fmax}$.	-	-	350	ns
V_{FP}				-	-
S_{factor}	$V_{CC} = 200 V$, $I_F = 30A$, $dI_F/dt = 200 A/\mu\text{s}$	-	0.3	-	-
I_{RM}			-	-	11

Figure 1. Conduction losses versus average current (per diode).

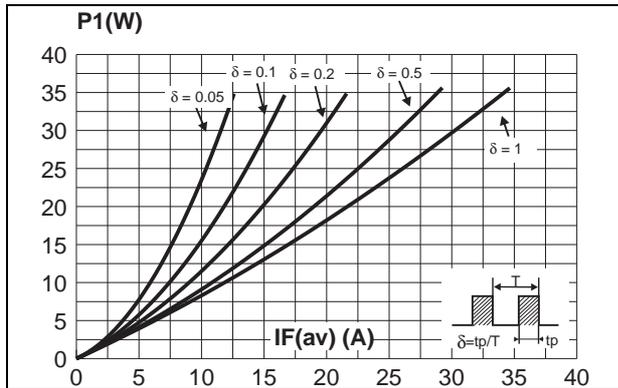


Figure 2. Forward voltage drop versus forward current (maximum values, per diode)

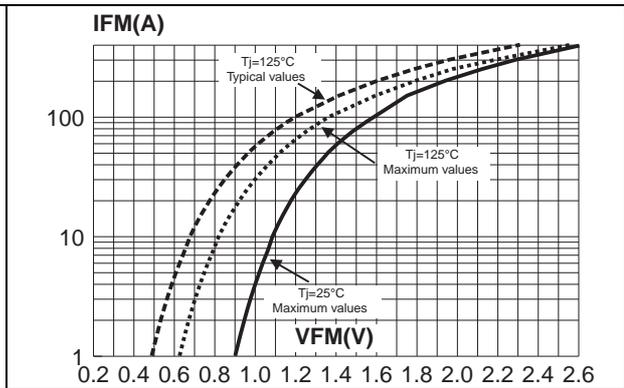


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration (TO-247).

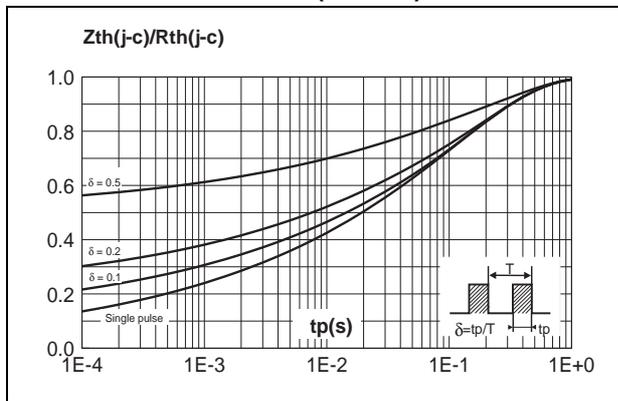


Figure 4. Peak reverse recovery current versus dIF/dt (90% confidence, per diode).

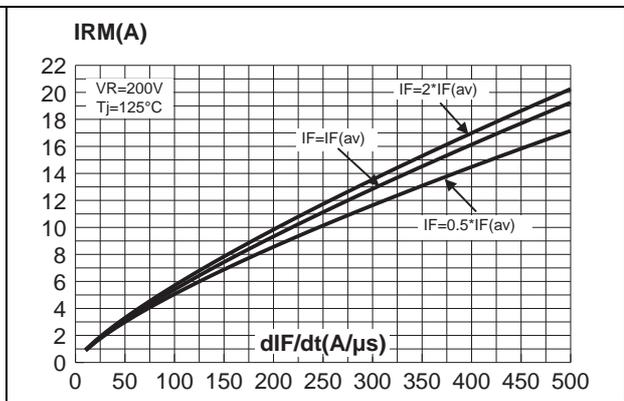


Figure 5. Reverse recovery time versus dIF/dt (90% confidence, per diode).

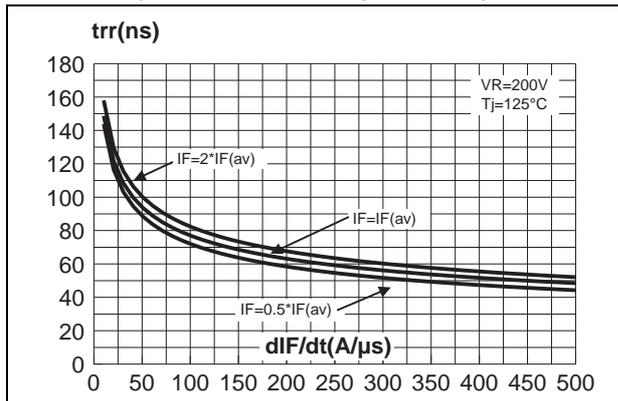


Figure 6. Softness factor (tb/ta) versus dIF/dt (typical values, per diode).

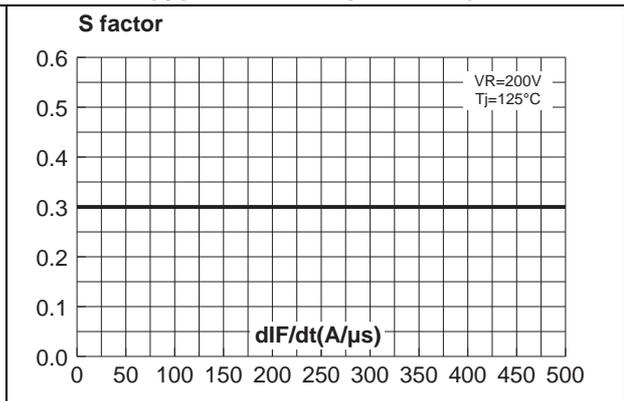


Figure 7. Relative variation of dynamic parameters versus junction temperature (reference: $T_j = 125^\circ\text{C}$).

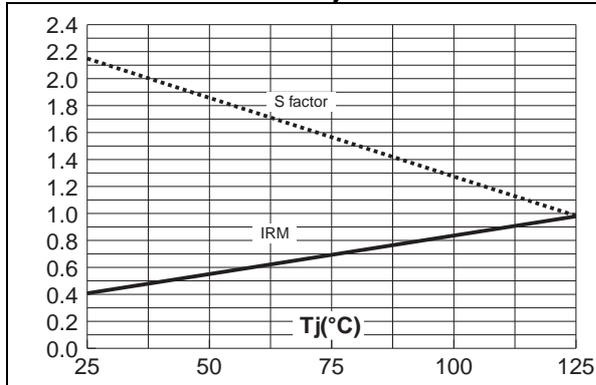


Figure 8. Transient peak forward voltage versus dI_F/dt (90% confidence, per diode).

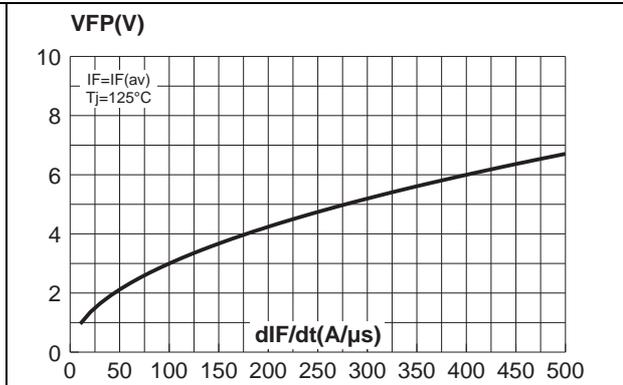
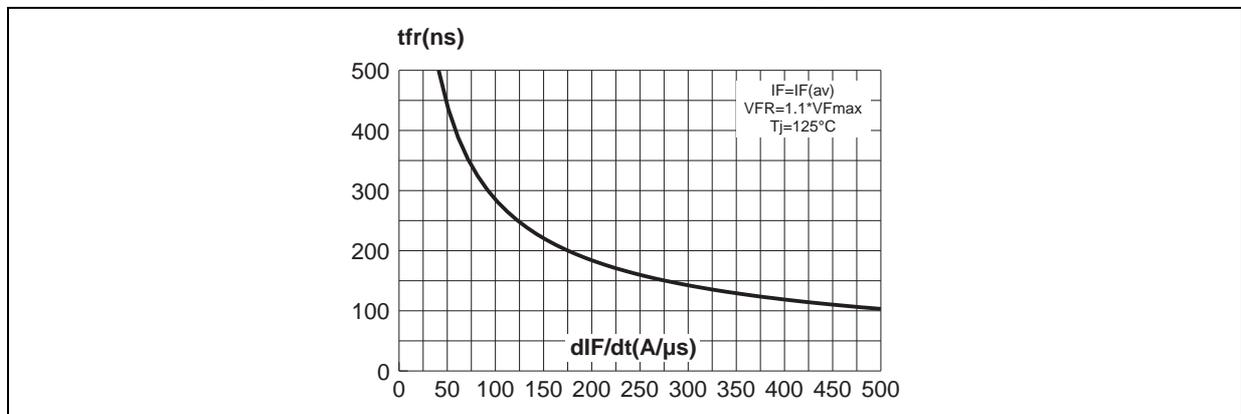


Figure 9. Forward recovery time versus dI_F/dt (90% confidence, per diode).



2 Package information

- Epoxy meets UL 94,V0
- Cooling method: by conduction (C)
- Recommended torque values: 0.55 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.

Figure 10. TO-247 drawing

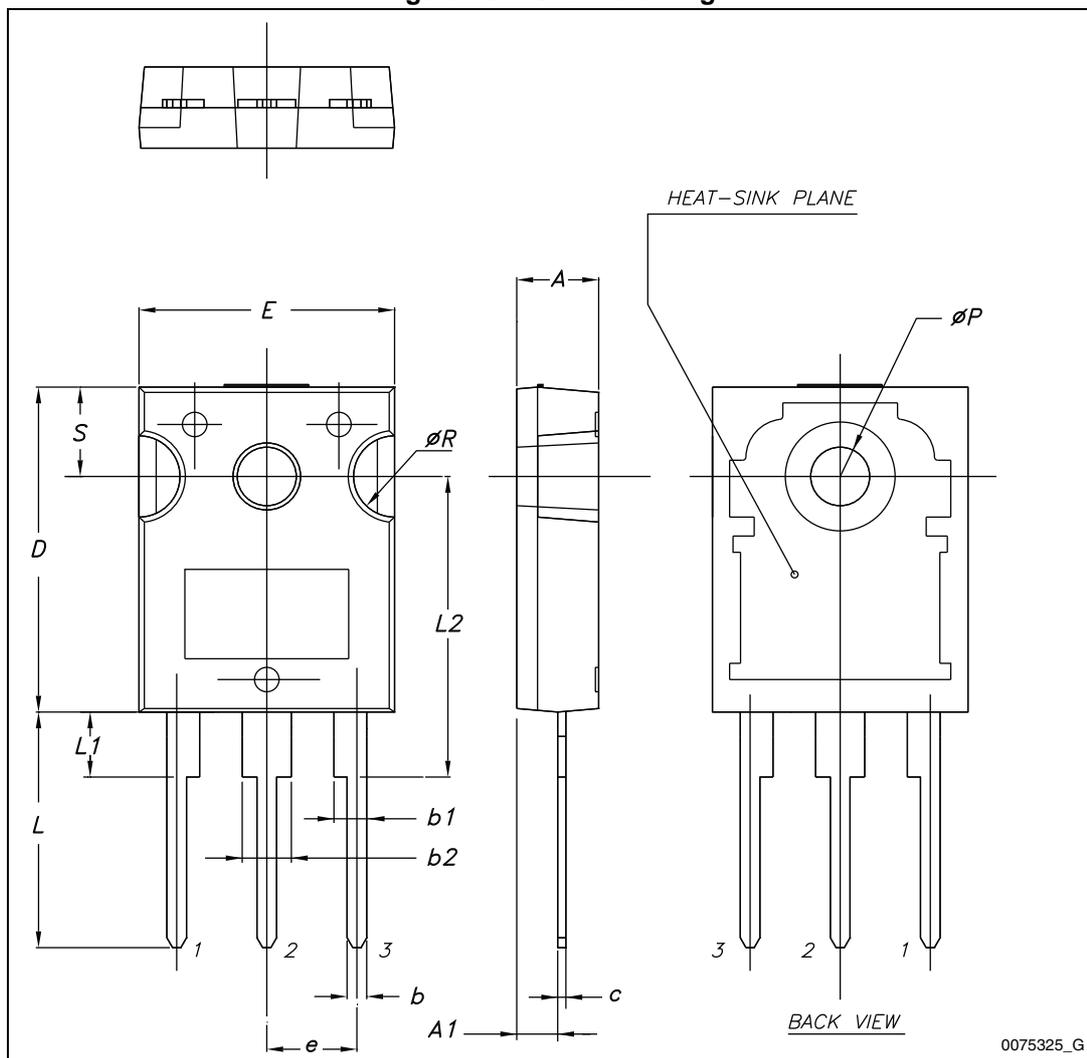


Table 6. TO-247 mechanical data

Dim.	mm.		
	Min.	Typ.	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e	5.30	5.45	5.60
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
ØP	3.55		3.65
ØR	4.50		5.50
S	5.30	5.50	5.70

3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH6006CW	STTH6006CW	TO-247	4.36g	30	Tube

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
Oct-1999	5C	Previous revision.
18-Jun-2014	6	Removed ISOTOP package. Updated Section 2: Package information .

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