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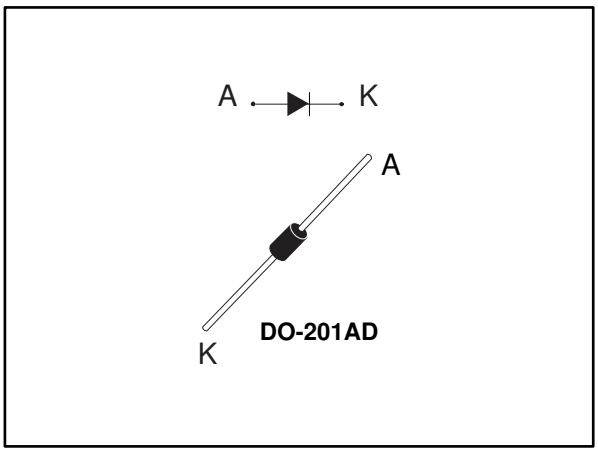
STTH4L06

Turbo 2 ultrafast high voltage rectifier

Datasheet - production data



Features

- Ultrafast switching
- Low forward voltage drop
- Low leakage current (platinum doping)
- High operating junction temperature

Description

This device uses ST Turbo 2 600 V technology and is specially suited for use as a boost diode in discontinuous or critical mode power factor correction.

Packaged in DO-201AD it is ideal for use as freewheeling diode in power supplies and other power switching applications.

Table 1: Device summary

Symbol	Value
$I_{F(AV)}$	4 A
V_{RRM}	600 V
T_j (max.)	175 °C
V_F (typ.)	0.9 V
t_{rr} (typ.)	40 ns

1 Characteristics

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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	Forward rms current		10	A
$I_{F(AV)}$	Average forward current		4	A
I_{FSM}	Surge non repetitive forward current	t_p = 8.3 ms sinusoidal	80	A
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Maximum operating junction temperature		175	°C

Table 3: Thermal parameters

Symbol	Parameter		Maximum values	Unit
$R_{th(j-l)}$	Junction to lead	Terminal length = 10 mm	20	°C/W
$R_{th(j-a)}$	Junction to ambient		75	

Table 4: Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-	-	3	µA
		T_j = 150 °C		-	15	100	
V_F (2)	Forward voltage drop	T_j = 25 °C	I_F = 3 A	-		1.30	V
		T_j = 150 °C		-	0.85	1.05	
		T_j = 150 °C	I_F = 4 A	-	0.90	1.10	

Notes:

(1)Pulse test: t_p = 5 ms, δ < 2%

(2)Pulse test: t_p = 380 µs, δ < 2%

To evaluate the maximum conduction losses, use the following equation:

$P = 0.92 \times I_{F(AV)} + 0.0045 \times I_{F^2(RMS)}$

Table 5: Dynamic characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time		I_F = 1 A, dI_F/dt = -50 A/µs, V_R = 30 V	-	55	75	ns
			I_F = 1 A, dI_F/dt = -100 A/µs, V_R = 30 V	-	40	55	
I_{RM}	Reverse recovery current	T_j = 25 °C	I_F = 4 A, dI_F/dt = -100 A/µs, V_R = 400 V	-	3	4	A
		T_j = 150 °C		-	5	6.5	
t_{fr}	Forward recovery time		I_F = 4 A, dI_F/dt = -100 A/µs, V_{FR} = 1.1 x V_{Fmax}	-		130	ns
V_{FP}	Forward recovery voltage		I_F = 4 A, dI_F/dt = 100 A/µs	-		7.5	V

1.1 Characteristics (curves)

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

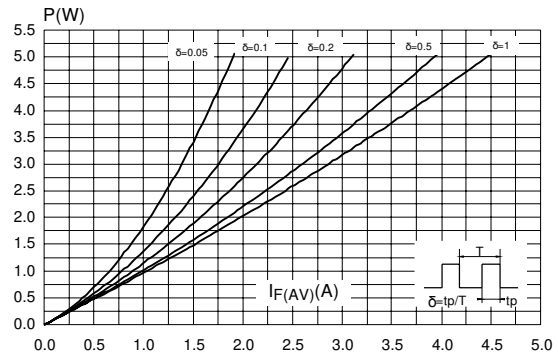


Figure 2: Forward voltage drop versus forward current

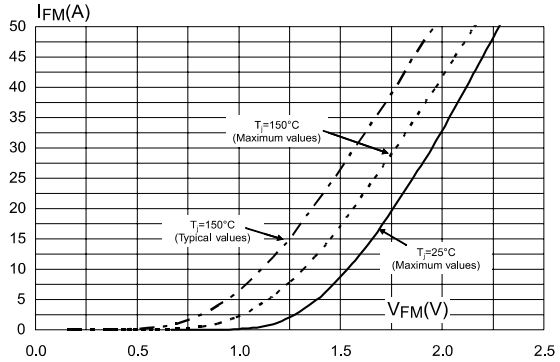


Figure 3: Relative variation of thermal impedance junction ambient versus pulse duration

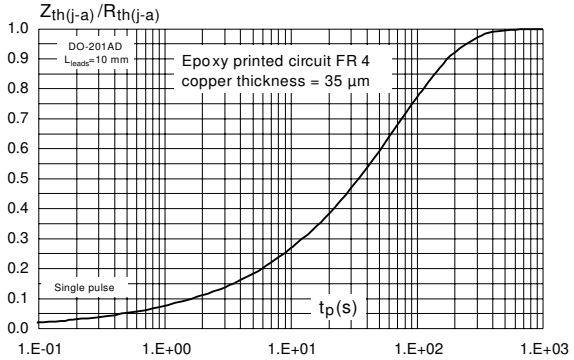


Figure 4: Peak reverse recovery current versus dI_F/dt (typical values)

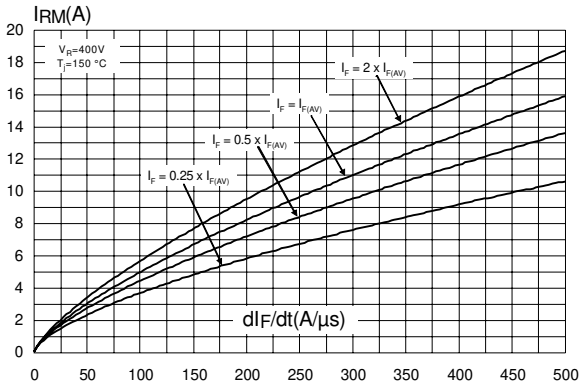


Figure 5: Reverse recovery time versus dI_F/dt (typical values)

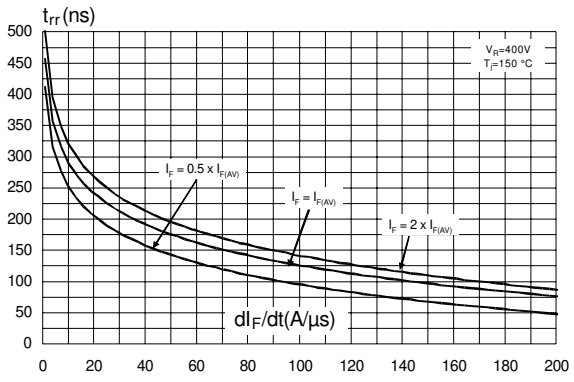


Figure 6: Reverse recovery charges versus dI_F/dt (typical values)

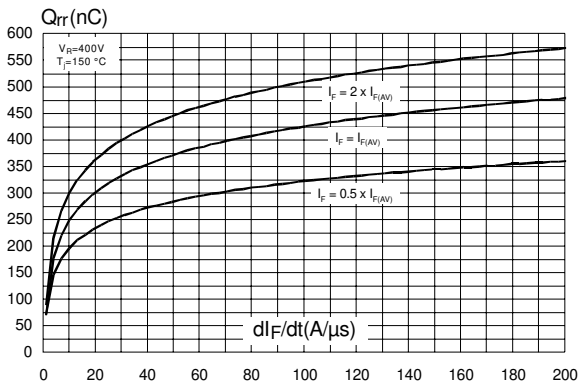


Figure 7: Relative variations of dynamic parameters versus junction temperature

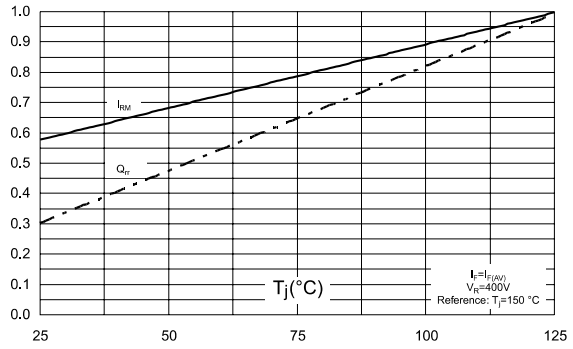


Figure 8: Transient peak forward voltage versus dI_F/dt (typical values)

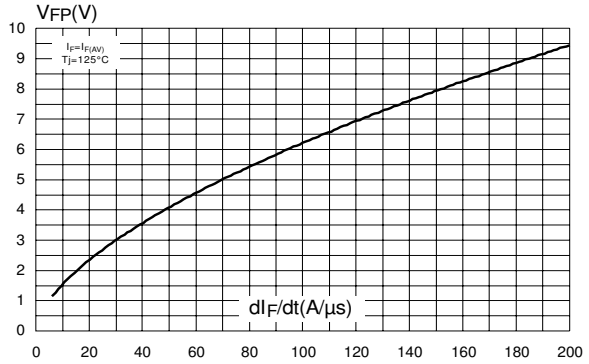


Figure 9: Forward recovery time versus dI_F/dt (typical values)

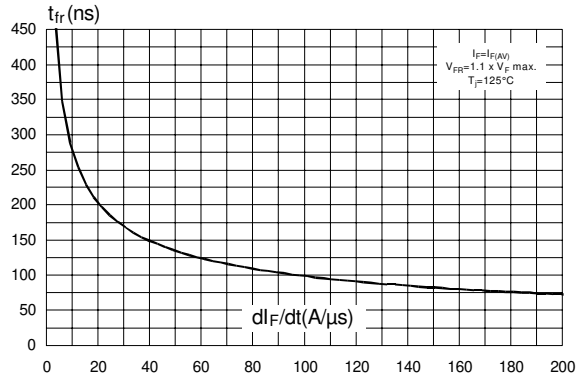


Figure 10: Junction capacitance versus reverse voltage applied (typical values)

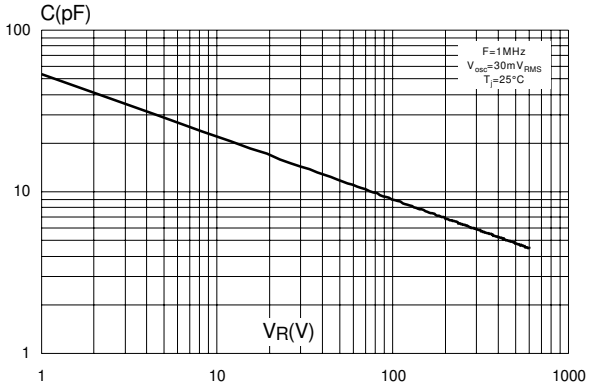


Figure 11: Thermal resistance junction to ambient versus copper surface under lead

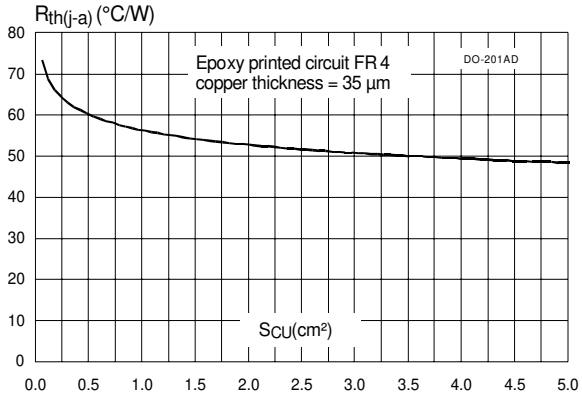
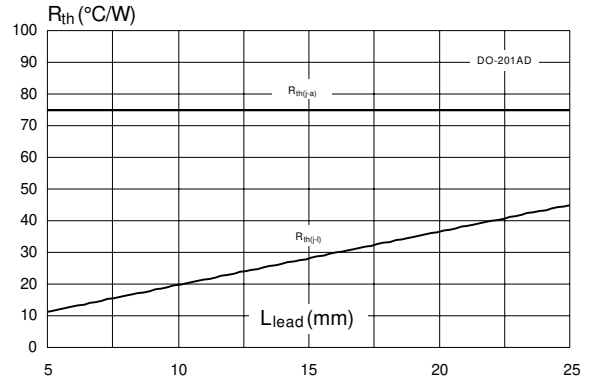


Figure 12: Thermal resistance versus lead length



2 Package information

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.

- Epoxy meets UL94, V0
- Band indicated cathode (DO-201AD)
- Bending method: see application note AN1471 (DO-201AD)

2.1 DO-201AD package information

Figure 13: DO-201AD package outline

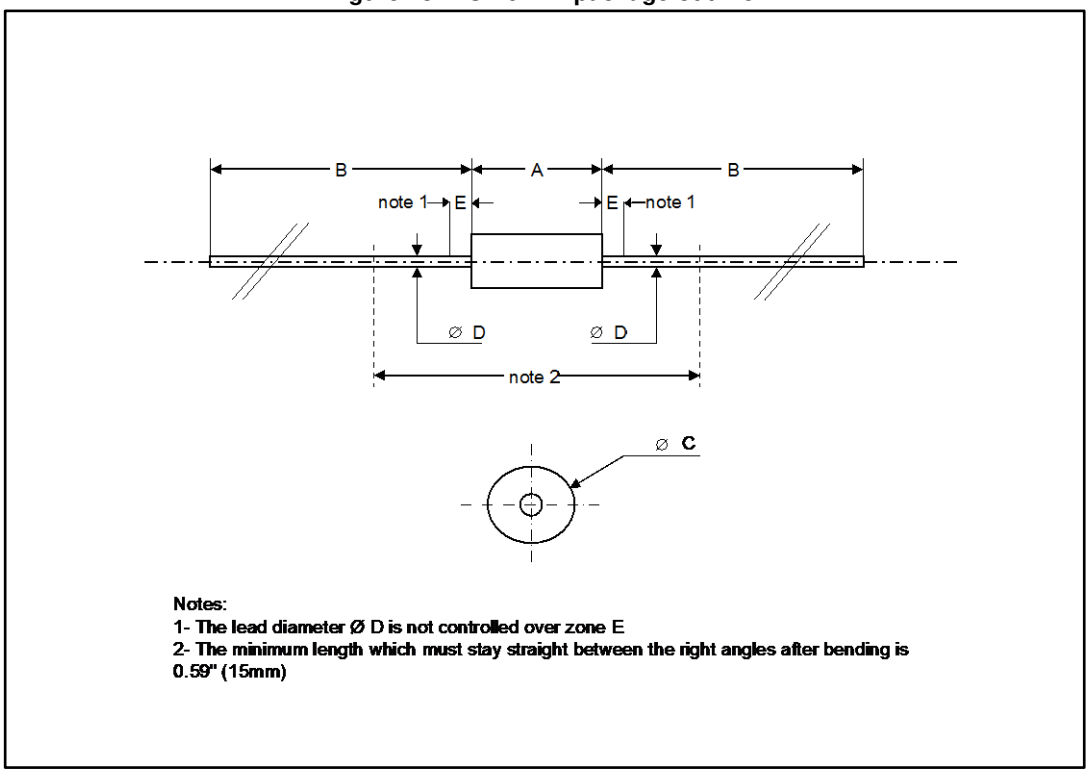


Table 6: DO-201AD package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		9.5		0.3740
B	25.4		1.000	
C		5.3		0.2087
D		1.3		0.0512
E		1.25		0.0492

3 Ordering information

Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STTH4L06	STTH4L06	DO-201AD	1.16 g	600	Ammopack
STTH4L06RL	STTH4L06			1900	Tape and reel

4 Revision history

Table 8: Document revision history

Date	Revision	Changes
22-Sep-2009	1	First issue.
27-Jan-2017	2	Removed DO-15 package.

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