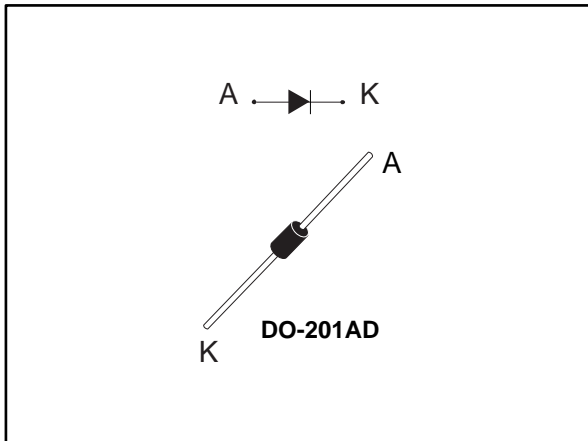


## Turbo 2 ultrafast high voltage rectifier

Datasheet - production data



### 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

### Features

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

# 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	20	°C/W
$R_{th(j-a)}$	Junction to ambient		
Terminal length = 10 mm		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,  $\delta < 2\%$

(2)Pulse test:  $t_p = 380$  μs,  $\delta < 2\%$

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

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

Table 5: Dynamic characteristics (per diode)

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

# 1.1 Characteristics (curves)

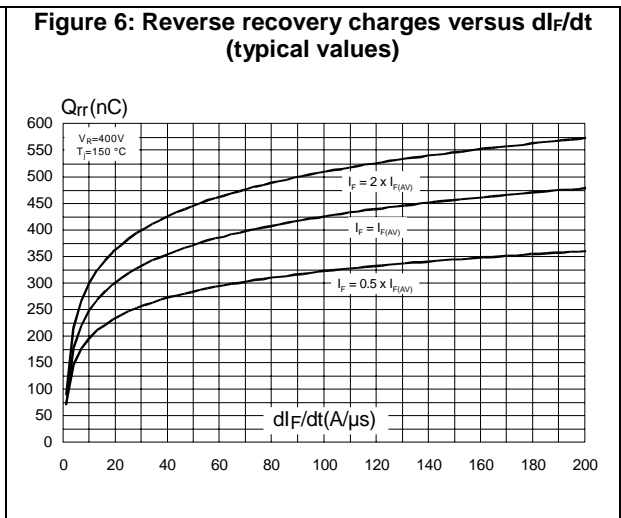
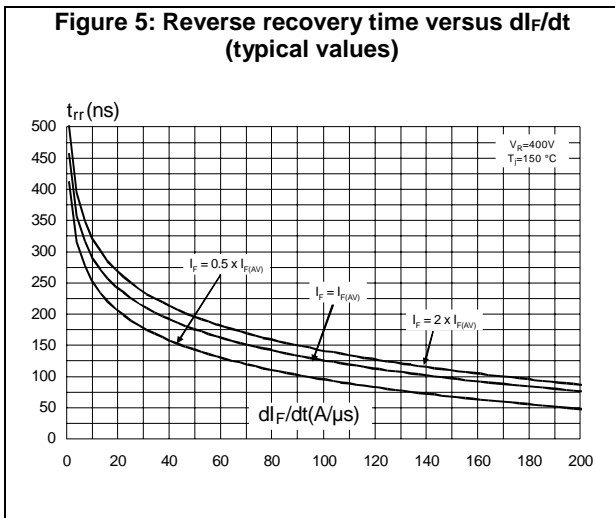
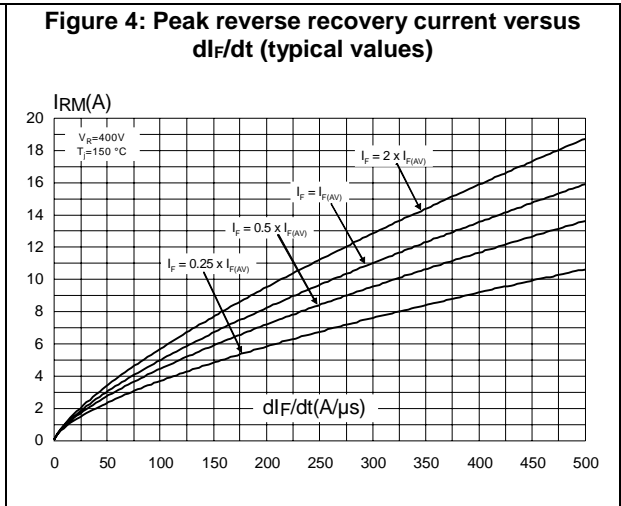
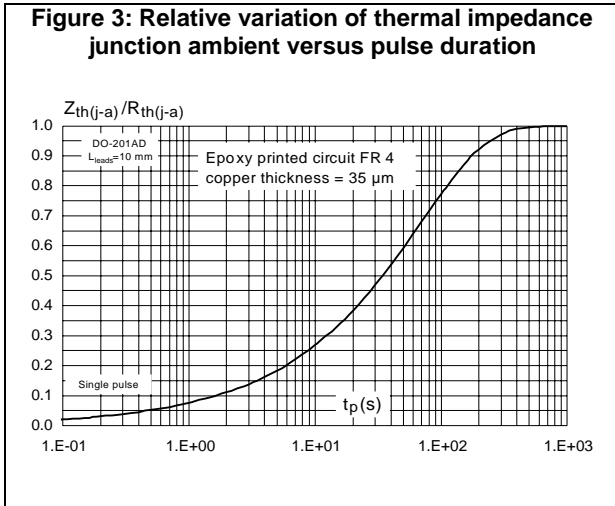
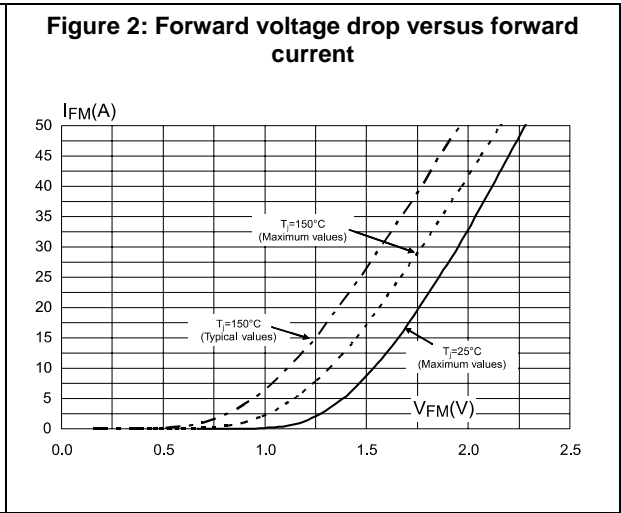
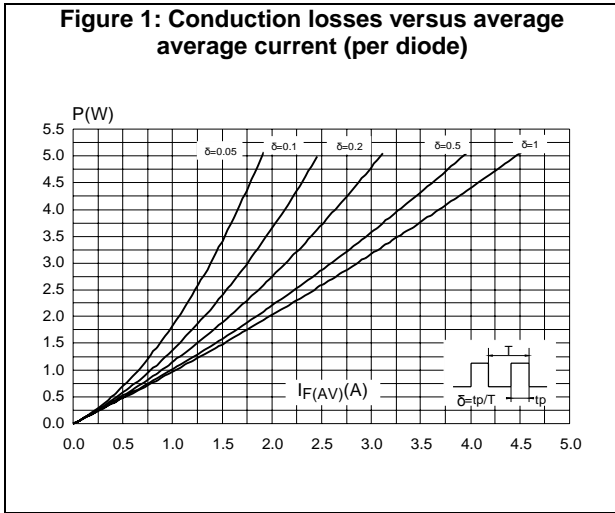


Figure 7: Relative variations of dynamic parameters versus junction temperature

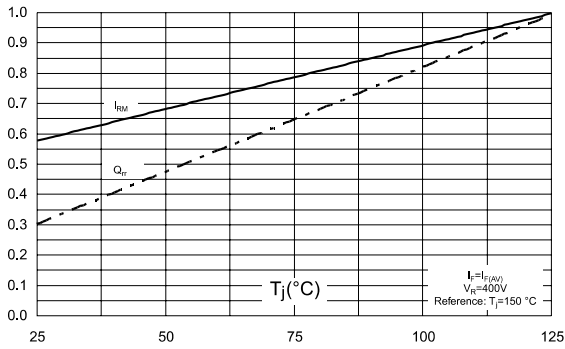


Figure 8: Transient peak forward voltage versus  $di_F/dt$  (typical values)

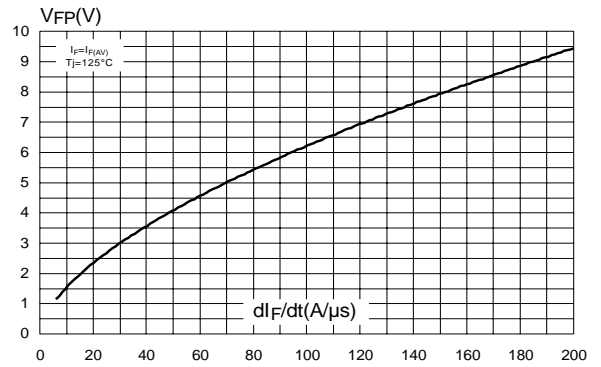


Figure 9: Forward recovery time versus  $di_F/dt$  (typical values)

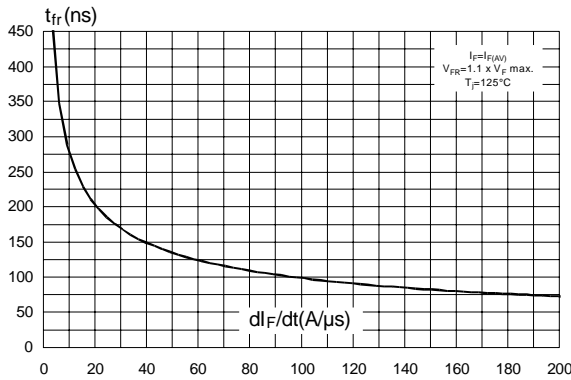


Figure 10: Junction capacitance versus reverse voltage applied (typical values)

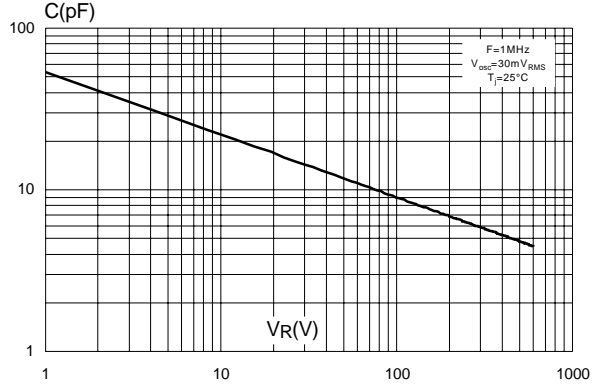


Figure 11: Thermal resistance junction to ambient versus copper surface under lead

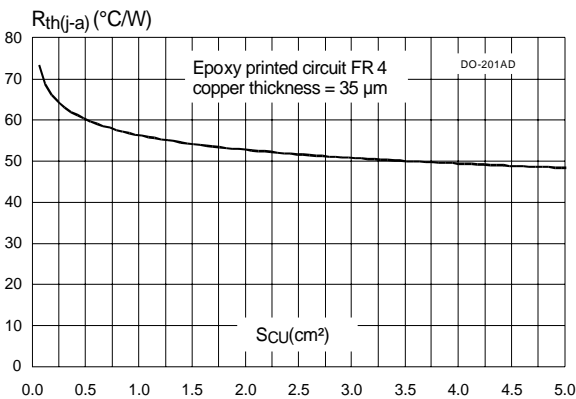
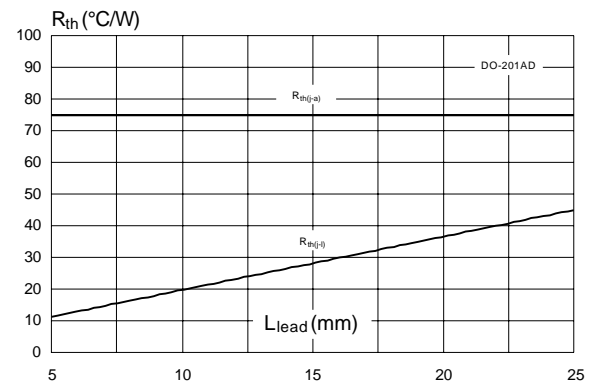


Figure 12: Thermal resistance versus lead length



## 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](http://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

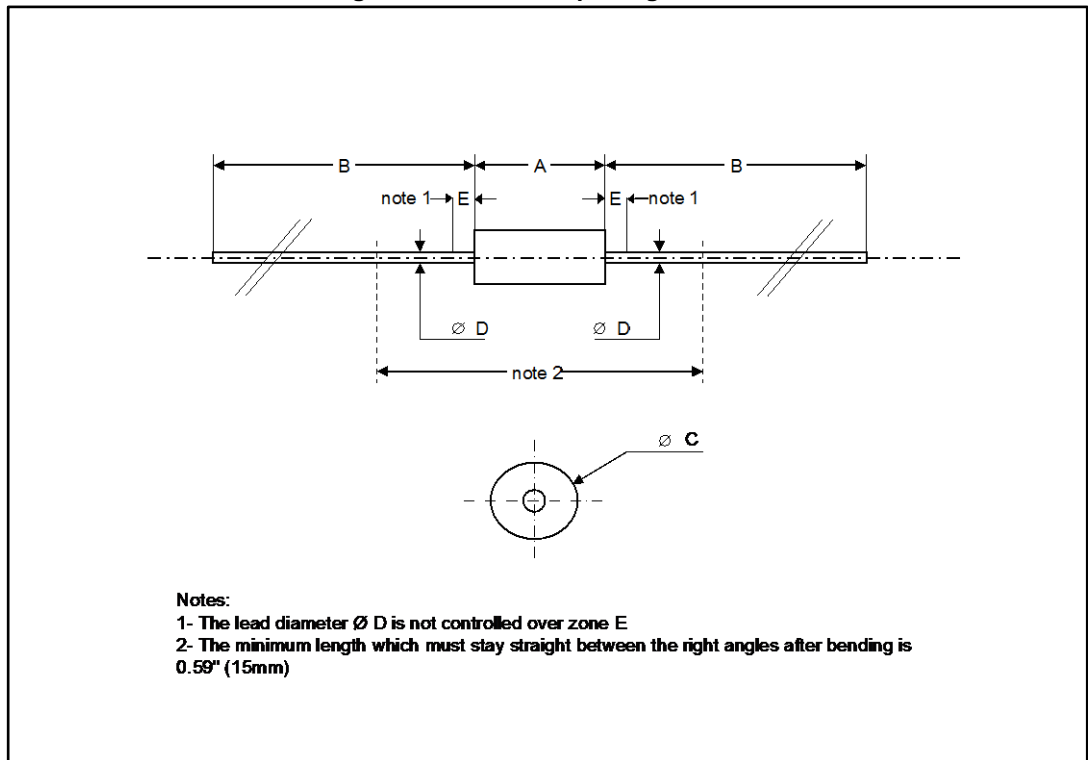


Table 6: DO-201AD package mechanical data

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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