

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

$I_F(\text{AV})$	3A
V_{RRM}	200 V
$T_j(\text{max})$	175 °C
$V_F(\text{max})$	0.75 V
$t_{rr}(\text{max})$	35 ns

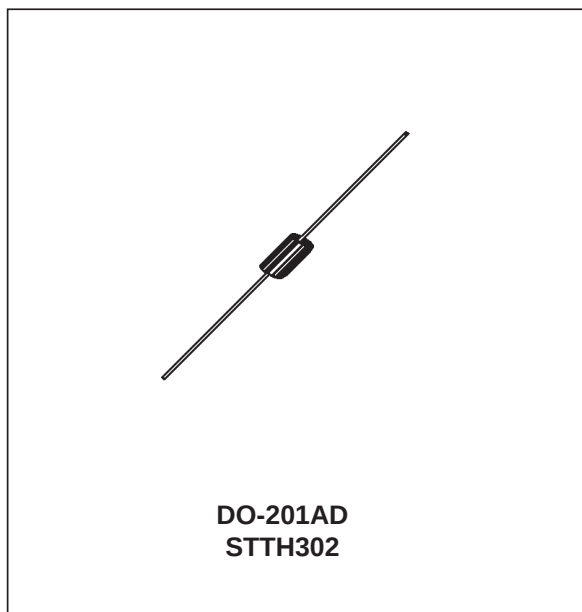
FEATURES AND BENEFITS

- Very low conduction losses
- Negligible switching losses
- Low forward and reverse recovery times
- High junction temperature

DESCRIPTION

The STTH302 which is using ST's new 200V planar technology, is specially suited for switching mode base drive & transistor circuits.

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



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		200	V
$I_F(\text{AV})$	Average forward current	$T_I = 107^\circ\text{C}$ $\delta = 0.5$	3	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ms}$ Sinusoidal	130	A
T_{stg}	Storage temperature range		- 65 to + 175	°C
T_j	Maximum operating junction temperature		175	°C

THERMAL PARAMETERS

Symbol	Parameter	Value	Unit
$R_{th}(j-a)$	Junction-ambient*	25	°C/W

* On infinite heatsink with 10mm lead length.

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			3	μA
		$T_j = 125^\circ\text{C}$			4	75	
V_F^{**}	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 3\text{A}$			0.95	V
		$T_j = 125^\circ\text{C}$			0.66	0.75	

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

** $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equations:

$$P = 0.60 \times I_{F(AV)} + 0.05 I_F^2(RMS)$$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
trr	Reverse recovery time	$I_F = 1\text{A}$ $di_F/dt = -50\text{A}/\mu\text{s}$ $V_R = 30\text{V}$	$T_j = 25^\circ\text{C}$			35	ns
tfr	Forward recovery time	$I_F = 3\text{A}$ $di_F/dt = 50\text{A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_F \text{ max}$	$T_j = 25^\circ\text{C}$		70		ns
V_{FP}	Forward recovery voltage		$T_j = 25^\circ\text{C}$		1.6		V

Fig. 1: Average forward power dissipation versus average forward current.

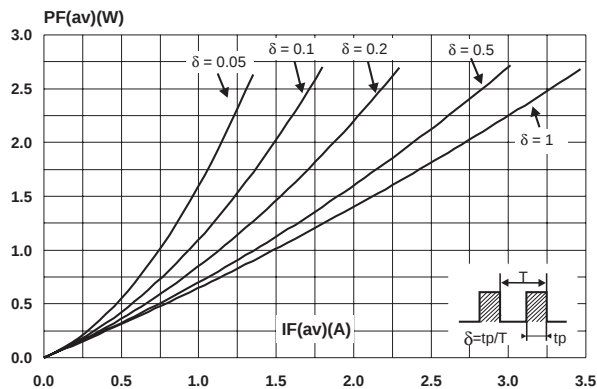


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$).

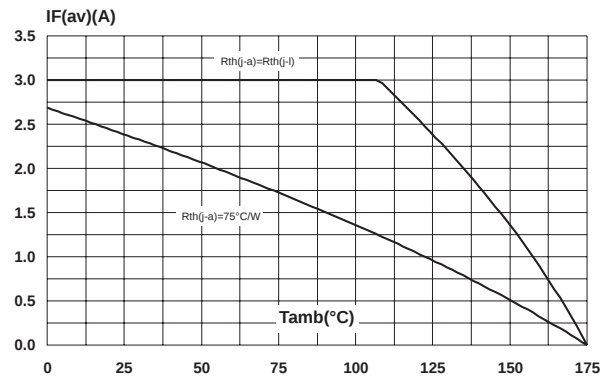


Fig. 3: Thermal resistance versus lead length.

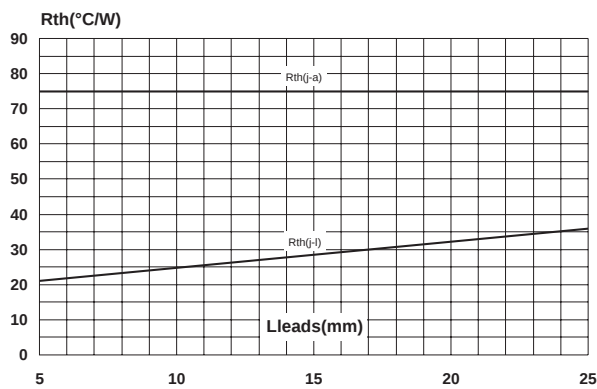


Fig. 4: Relative variation of thermal impedance junction ambient versus pulse duration (printed circuit board epoxy FR4, Leads = 10mm).

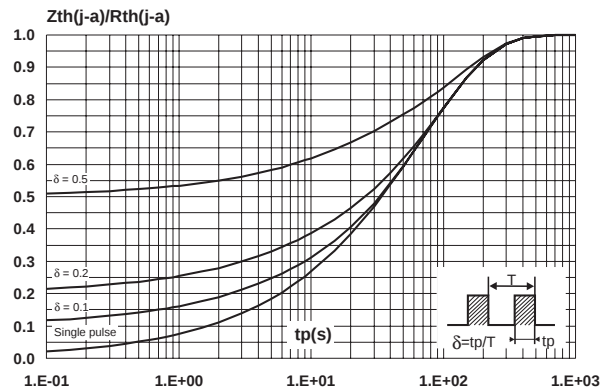


Fig. 5: Forward voltage drop versus forward current.

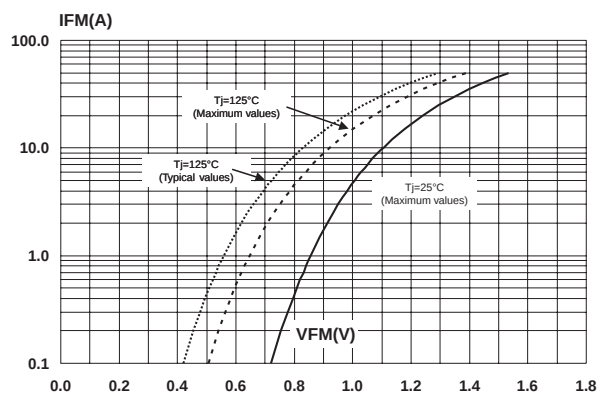


Fig. 6: Junction capacitance versus reverse voltage applied (typical values).

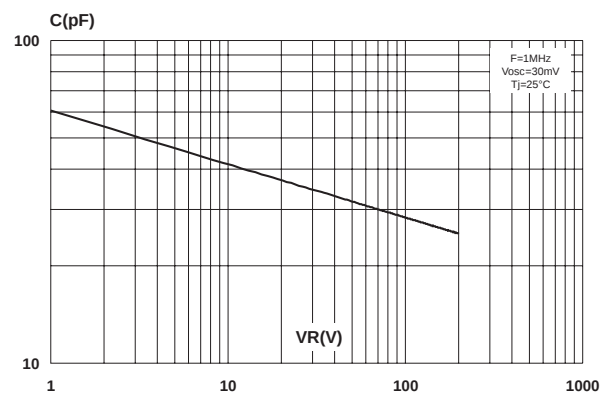


Fig. 7: Reverse recovery time versus dI_F/dt (90% confidence).

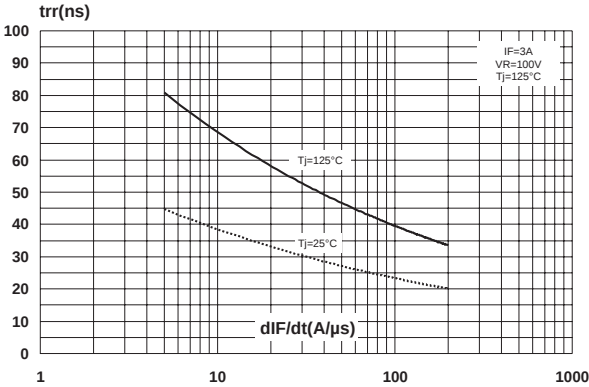


Fig. 8: Peak reverse recovery current versus dI_F/dt (90% confidence).

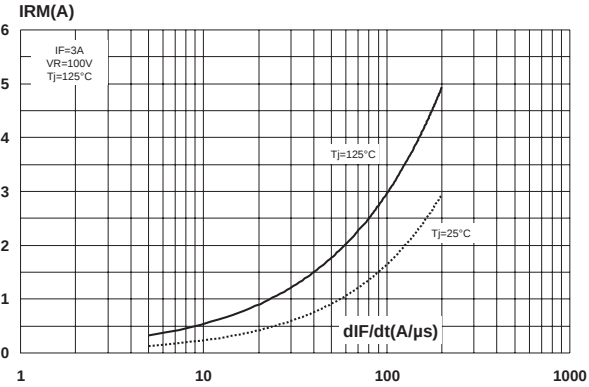
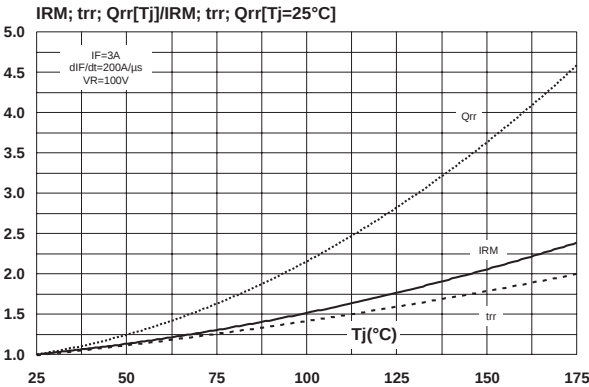
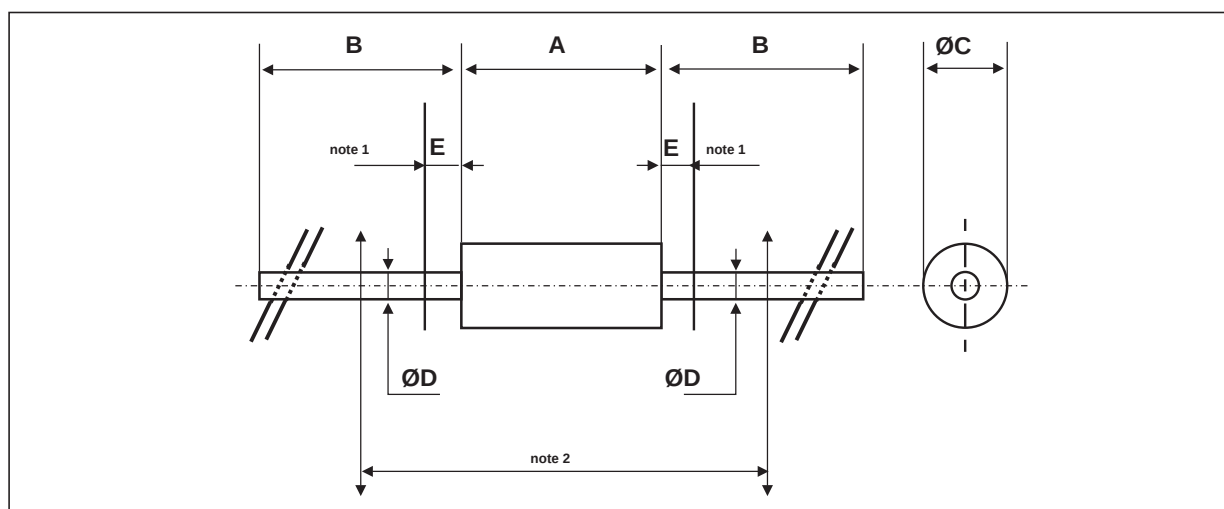


Fig. 9: Relative variations of dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA

DO-201AD



REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A		9.50		0.374	1 - The lead diameter Ø D is not controlled over zone E 2 - The minimum axial length within which the device may be placed with its leads bent at right angles is 0.59"(15 mm)
B	25.40		1.000		
Ø C		5.30		0.209	
Ø D		1.30		0.051	
E		1.25		0.049	

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH302	STTH302	DO-201AD	1.16 g	600	Ammopack
STTH302RL	STTH302	DO-201AD	1.16 g	1900	Tape and reel

- White band indicates cathode
- Epoxy meets UL94,V0

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