

**HIGH EFFICIENCY ULTRAFAST DIODE**
**MAIN PRODUCT CHARACTERISTICS**

<b>I<sub>F(AV)</sub></b>	<b>3 A</b>
<b>V<sub>RRM</sub></b>	<b>400 V</b>
<b>T<sub>j</sub> (max)</b>	<b>150°C</b>
<b>V<sub>F</sub> (max)</b>	<b>1.4 V</b>
<b>t<sub>rr</sub> (max)</b>	<b>25 ns</b>

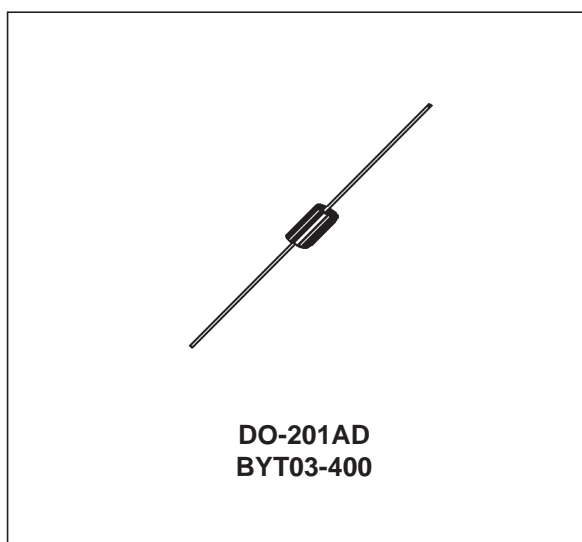
**FEATURES AND BENEFITS**

- Very low conduction losses
- Negligible switching losses
- Low forward & reverse recovery times

**DESCRIPTION**

The BYT03-400 which is using ST's 400V planar technology, is specially suited for switching mode base drive & transistor circuits.

The device, which is available in axial (DO-201AD) package, is also intended for use as a free wheeling diode in power supplies and other power switching applications.


**ABSOLUTE RATINGS** (limiting values)

<b>Symbol</b>	<b>Parameter</b>		<b>Value</b>	<b>Unit</b>
V <sub>RRM</sub>	Repetive peak reverse voltage		400	V
I <sub>F(AV)</sub>	Average forward current	T <sub>I</sub> = 55°C    δ = 0.5	3	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10ms Sinusoidal	60	A
T <sub>stg</sub>	Storage temperature range		- 65 to +150	°C
T <sub>j</sub>	Maximum operating junction temperature		150	°C

## BYT03-400

### THERMAL PARAMETERS

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient*	20	°C/W

\* On infinite heatsink with 10mm lead length.

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameters	Test Conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			20	$\mu\text{A}$
		$T_j = 100^\circ\text{C}$			0.2	0.5	mA
$V_F^{**}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 3\text{A}$			1.5	V
		$T_j = 100^\circ\text{C}$			1.0	1.4	

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

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

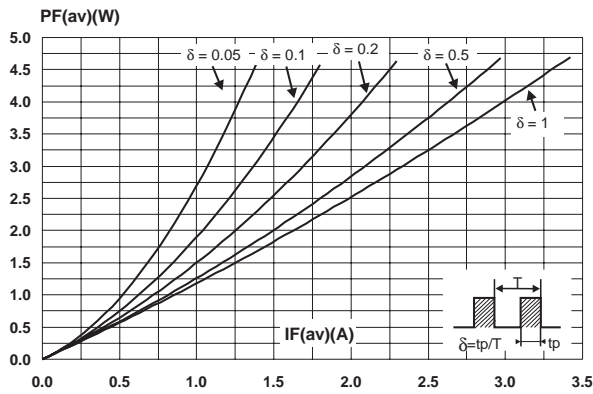
To evaluate the maximum conduction losses use the following equation:

$$P = 1.1 \times I_{F(AV)} + 0.08 I_{F(RMS)}^2$$

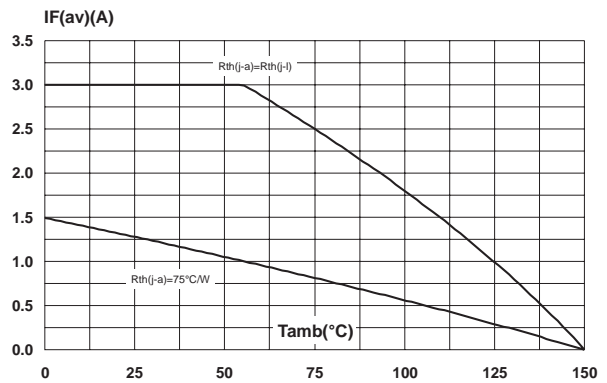
### DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{A}$ $I_R = 1\text{A}$ $I_{rr} = 0.25\text{A}$		16	25	ns
			$I_F = 1\text{A}$ $di_F/dt = -15\text{A}/\mu\text{s}$ $V_R = 30\text{V}$			55	
$t_{fr}$	Forward recovery time	$T_j = 25^\circ\text{C}$	$I_F = 3\text{A}$ $di_F/dt = 50\text{A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$		75		ns
$V_{FP}$	Forward recovery voltage	$T_j = 25^\circ\text{C}$	$I_F = 3\text{A}$ $di_F/dt = 50\text{A}/\mu\text{s}$		7.0		V

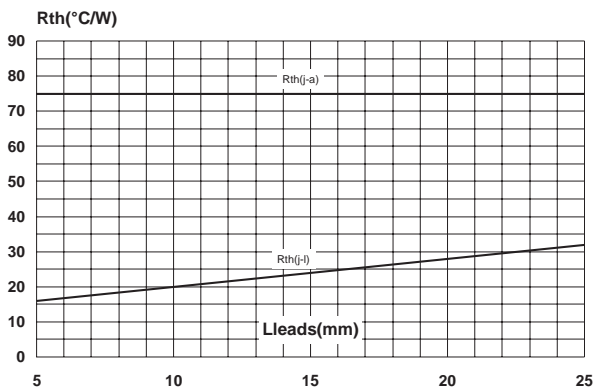
**Fig. 1:** Average forward power dissipation versus average forward current.



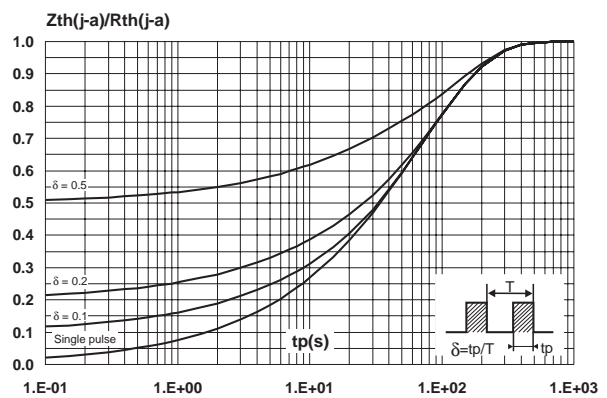
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ )



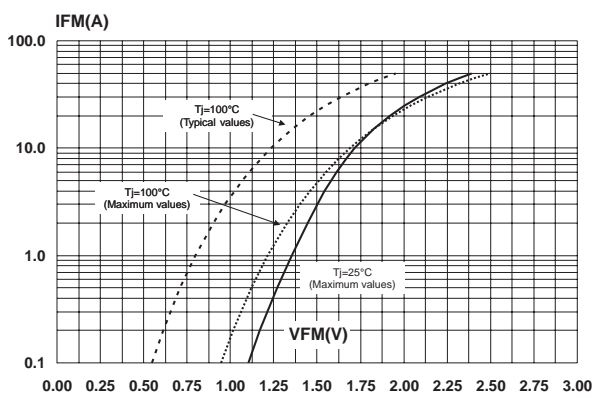
**Fig. 3:** Thermal resistance versus lead length.



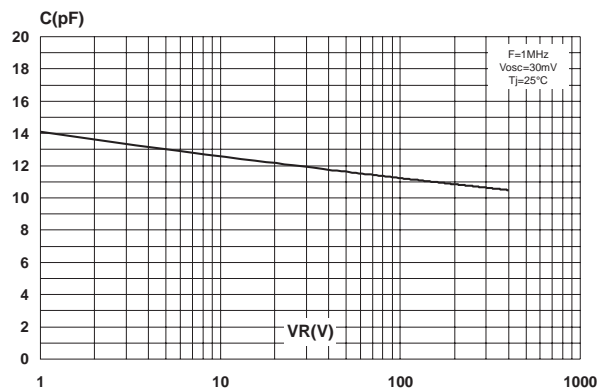
**Fig. 4:** Relative variation of thermal impedance junction ambient versus pulse duration (printed circuit board epoxy FR4, Leads = 10mm).



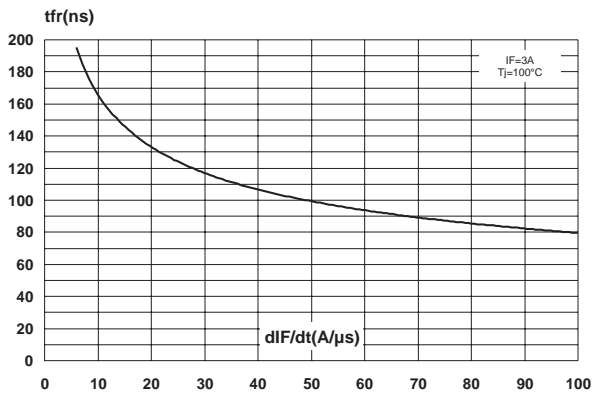
**Fig. 5:** Forward voltage drop versus forward current.



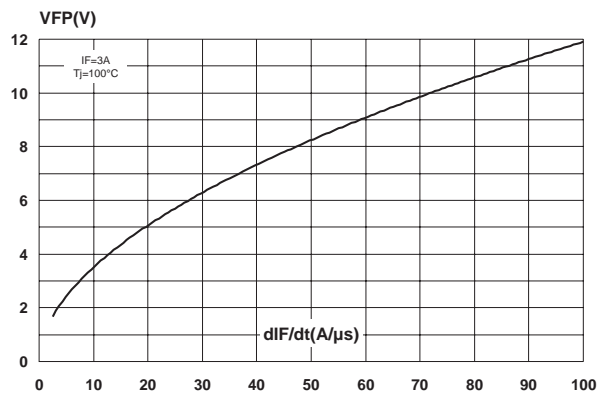
**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values).



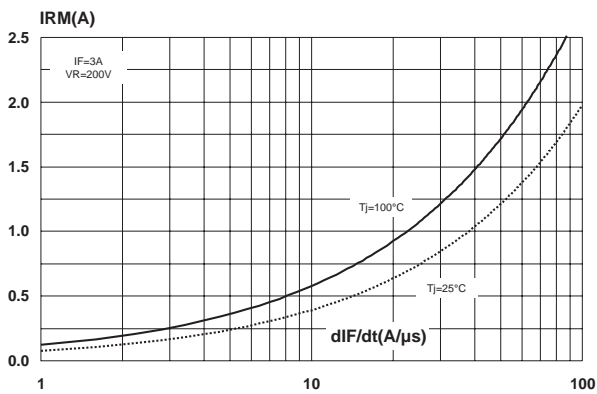
**Fig. 7:** Forward recovery time versus  $dI_F/dt$  (90% confidence).



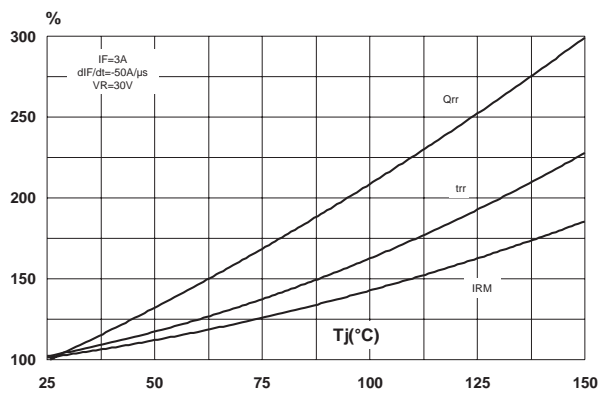
**Fig. 8:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



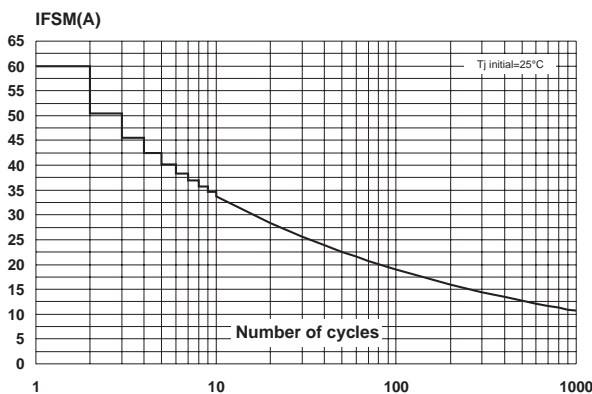
**Fig. 9:** Peak reverse recovery current versus  $dI_F/dt$  (90% confidence).



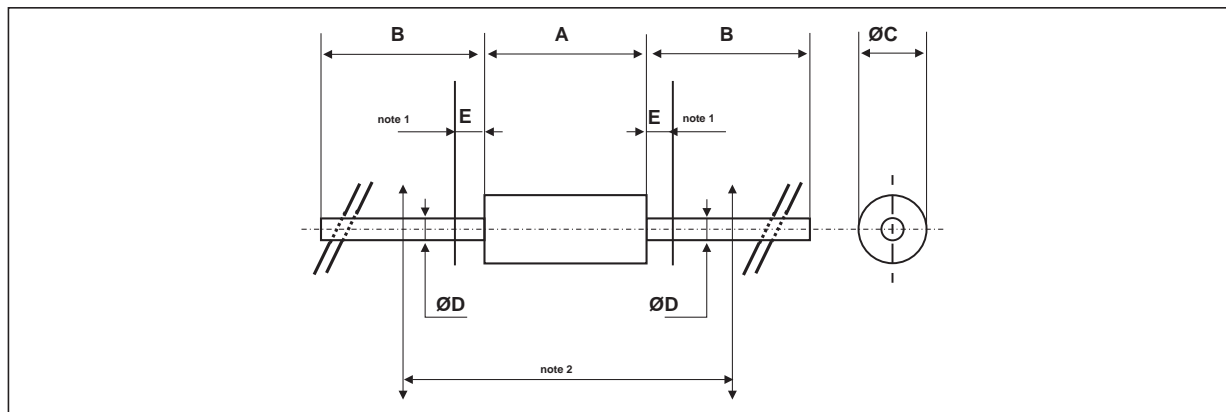
**Fig. 10:** Dynamic parameters versus junction temperature.



**Fig. 11:** Non repetitive surge peak current versus number of cycles.



**PACKAGE MECHANICAL DATA**  
DO-201AD



REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A		9.50		0.374	1 - The lead diameter $\varnothing D$ is not controlled over zone E  2 - The minimum length which must stay straight between the right angles after bending is 0.59"(15 mm)
B	25.40		1.000		
C		5.30		0.209	
D		1.30		0.051	
E		1.25		0.049	

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
BYT03-400	BYT03-400	DO-201AD	1.16 g	600	Ammopack
BYT03-400RL	BYT03-400	DO-201AD	1.16 g	1900	Tape & Reel

- Cooling method: by conduction (method A)
- Epoxy meets UL 94,V0
- Bending method: Application note AN1471.

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics  
 © 2001 STMicroelectronics - Printed in Italy - All rights reserved.  
 STMicroelectronics GROUP OF COMPANIES  
 Australia - Brazil - Canada - China - Finland - France - Germany  
 Hong Kong - India - Israel - Italy - Japan - Malaysia -Malta - Morocco - Singapore  
 Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>

