

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

<b>I<sub>F(AV)</sub></b>	<b>1 A</b>
<b>V<sub>RRM</sub></b>	<b>400 V</b>
<b>T<sub>j(max)</sub></b>	<b>150°C</b>
<b>V<sub>F(max)</sub></b>	<b>1.4 V</b>
<b>t<sub>rr(max)</sub></b>	<b>25 ns</b>

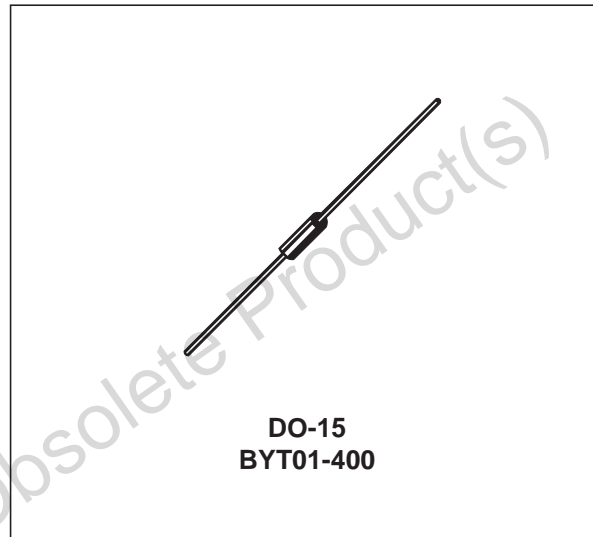
**FEATURES AND BENEFITS**

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

**DESCRIPTION**

The BYT01-400 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-15) 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> = 80°C    δ = 0.5	1	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10ms Sinusoidal	30	A
T <sub>stg</sub>	Storage temperature range		- 65 to +150	°C
T <sub>j</sub>	Maximum operating junction temperature		150	°C

## BYT01-400

### THERMAL PARAMETERS

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient*	45	°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	$\mu\text{A}$
		$T_j = 100^\circ\text{C}$			0.1	0.5	mA
$V_F^{**}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$			1.5	V
		$T_j = 100^\circ\text{C}$			1.0	1.4	

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

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

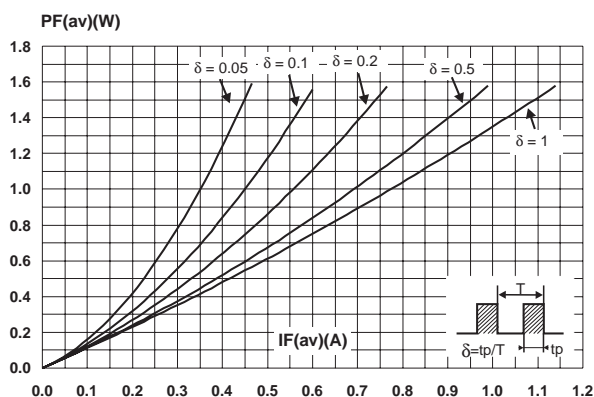
To evaluate the maximum conduction losses use the following equation:

$$P = 1.1 \times I_{F(AV)} + 0.25 I_{F(RMS)}^2$$

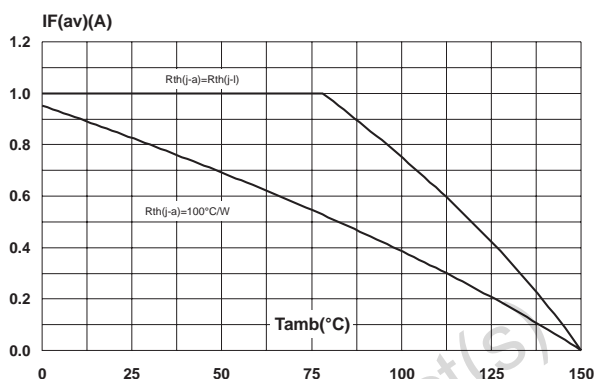
### DYNAMIC ELECTRICAL CHARACTERISTICS

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	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$ $di_F/dt = 50\text{A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$		60		ns
$V_{FP}$	Forward recovery voltage	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$ $di_F/dt = 50\text{A}/\mu\text{s}$		9.5		V

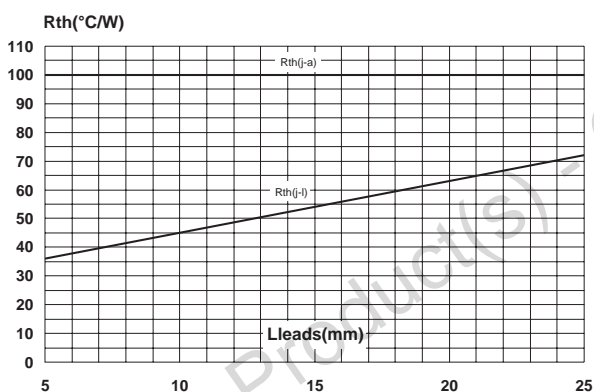
**Fig. 1:** Average forward power dissipation versus average forward current.



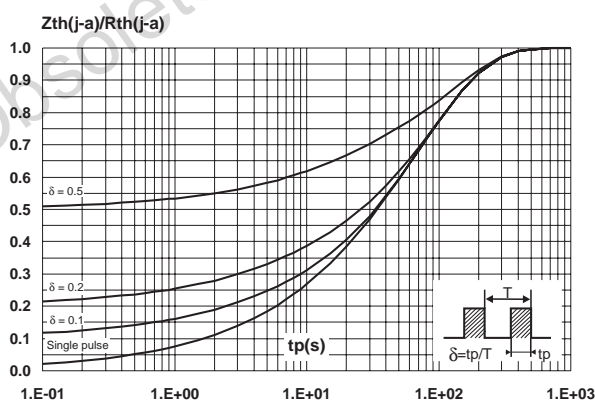
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ )



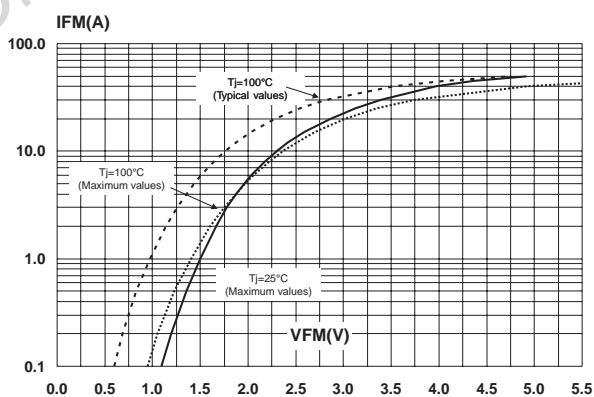
**Fig. 3:** Thermal resistance versus lead length.



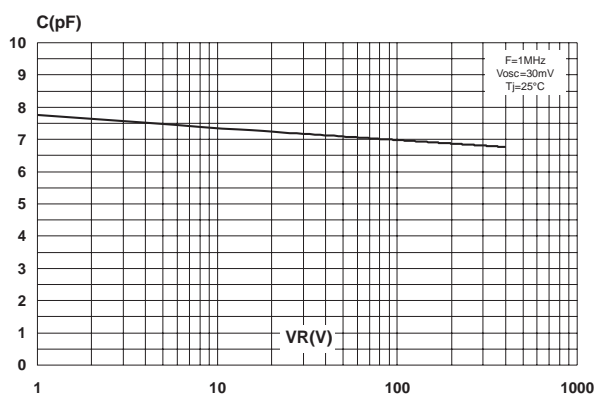
**Fig. 4:** Relative variation of thermal impedance junction ambient versus pulse duration (printed circuit board epoxy FR4, Leads = 10mm).



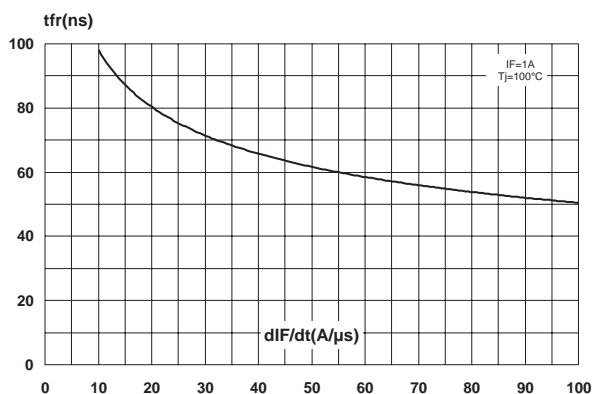
**Fig. 5:** Forward voltage drop versus forward current.



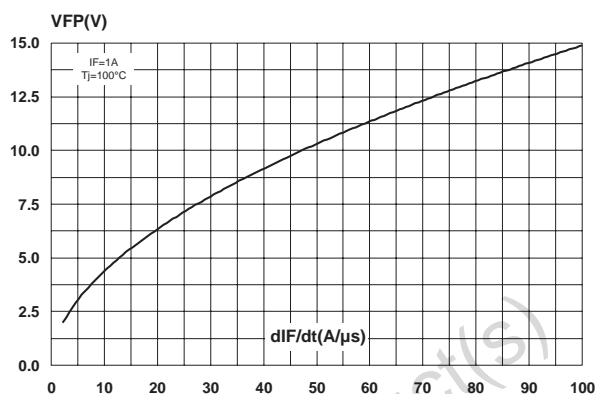
**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values).



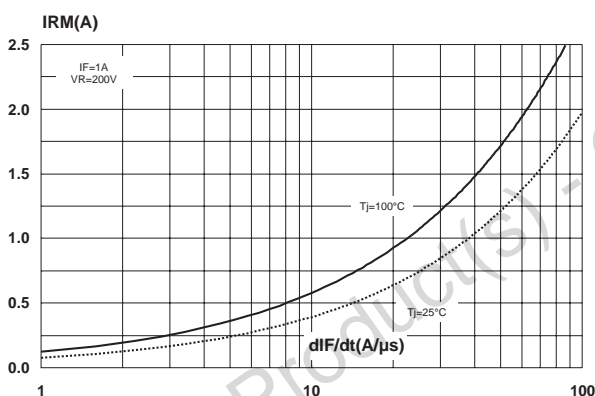
**Fig. 7:** Forward recovery time versus  $dI_F/dt$  (90% confidence).



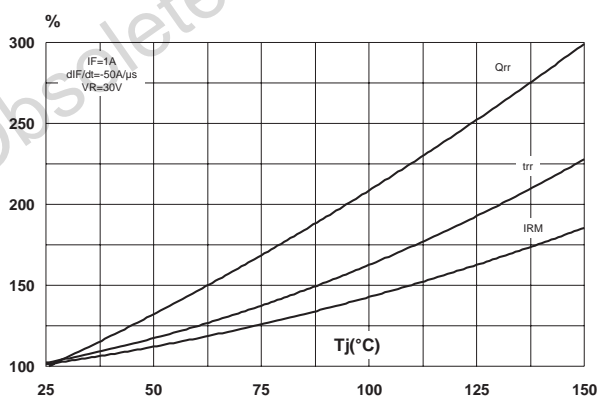
**Fig. 8:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



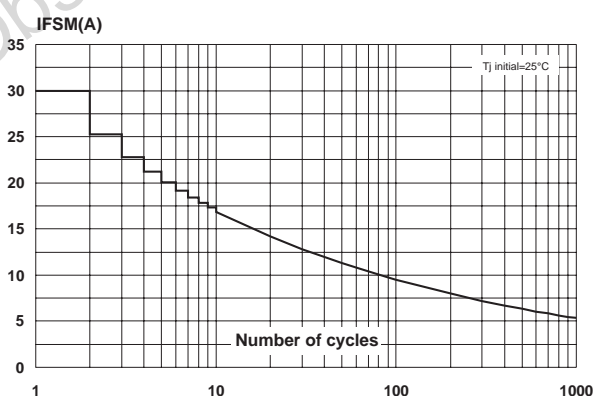
**Fig. 9:** Peak reverse recovery current versus  $dI_F/dt$  (90% confidence).



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

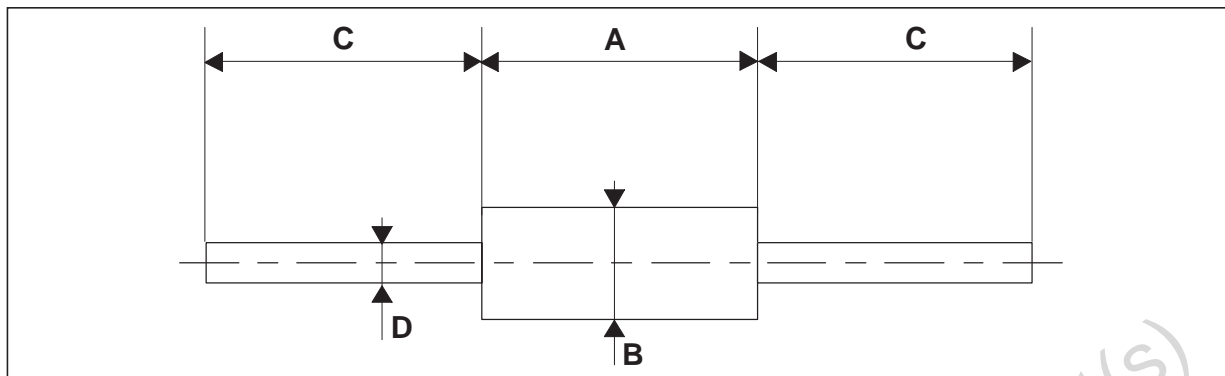


**Fig. 11:** Non repetitive surge peak current versus number of cycles.



## PACKAGE MECHANICAL DATA

DO-15



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	6.05	6.75	0.238	0.266
B	2.95	3.53	0.116	0.139
C	26	31	1.024	1.220
D	0.71	0.88	0.028	0.035

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
BYT01-400	BYT01-400	DO-15	0.4 g	1000	Ammopack
BYT01-400RL	BYT01-400	DO-15	0.4 g	6000	Tape & Reel

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

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