

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

$I_F(AV)$	3 A
V_{RRM}	400 V
$T_j(max)$	150°C
$V_F(max)$	1.4 V
$t_{rr}(max)$	25 ns

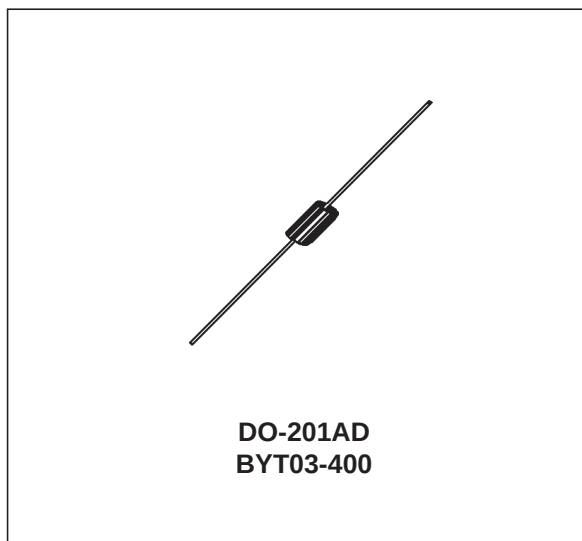
FEATURES AND BENEFITS

- 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)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			400	V
I _F (AV)	Average forward current	Tl = 55°C	δ = 0.5	3	A
I _{FSM}	Surge non repetitive forward current	tp = 10ms Sinusoidal		60	A
T _{stg}	Storage temperature range			- 65 to +150	°C
T _j	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	μA
		$T_j = 100^\circ\text{C}$			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:

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

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.

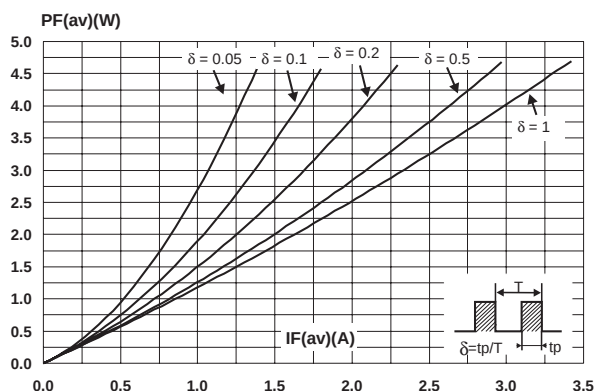


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

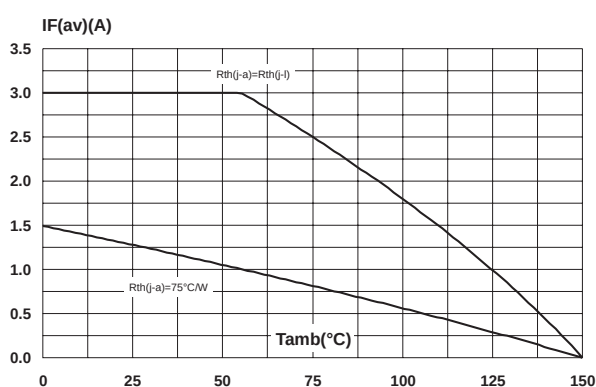


Fig. 3: Thermal resistance versus lead length.

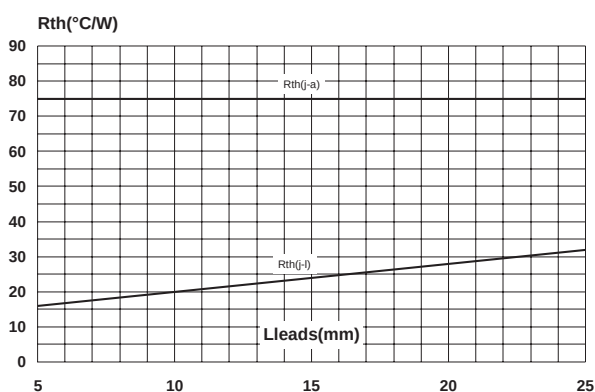


Fig. 4: Relative variation of thermal impedance junction ambient versus pulse duration (printed circuit board epoxy FR4, Leads = 10mm).

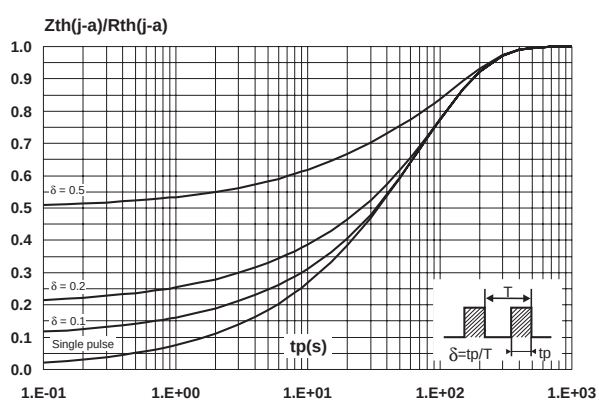


Fig. 5: Forward voltage drop versus forward current.

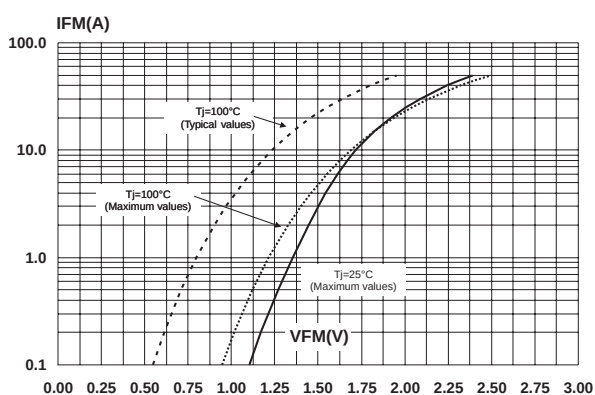


Fig. 6: Junction capacitance versus reverse voltage applied (typical values).

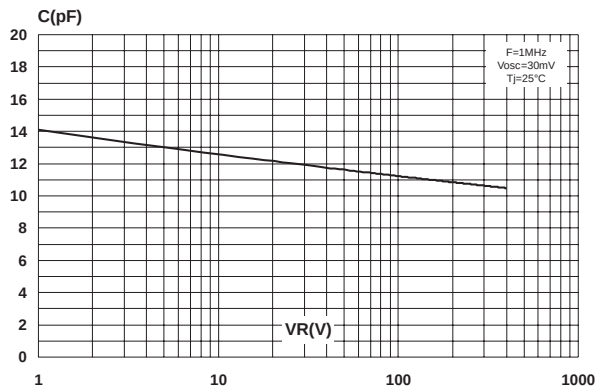


Fig. 7: Forward recovery time versus dI_F/dt (90% confidence).

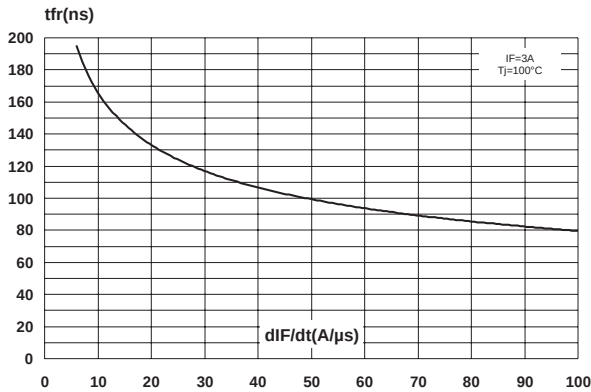


Fig. 8: Transient peak forward voltage versus dI_F/dt (90% confidence).

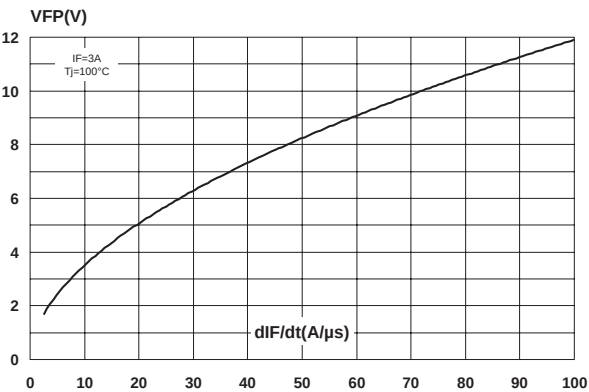


Fig. 9: Peak reverse recovery current versus dI_F/dt (90% confidence).

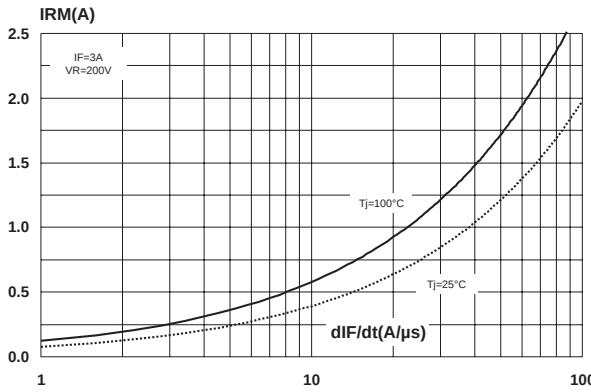


Fig. 10: Dynamic parameters versus junction temperature.

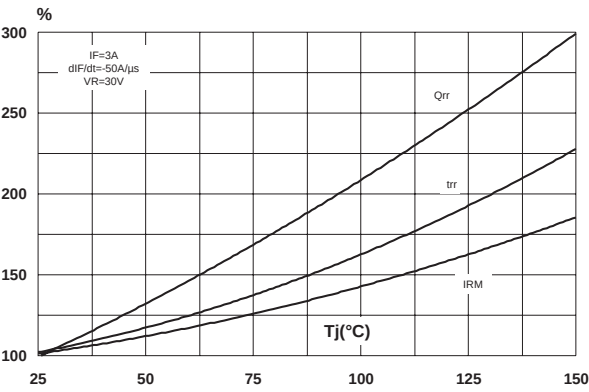
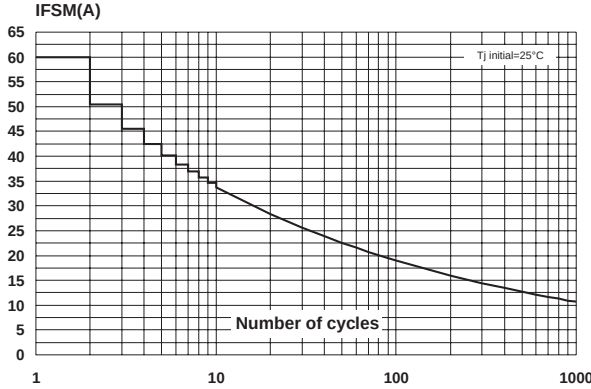
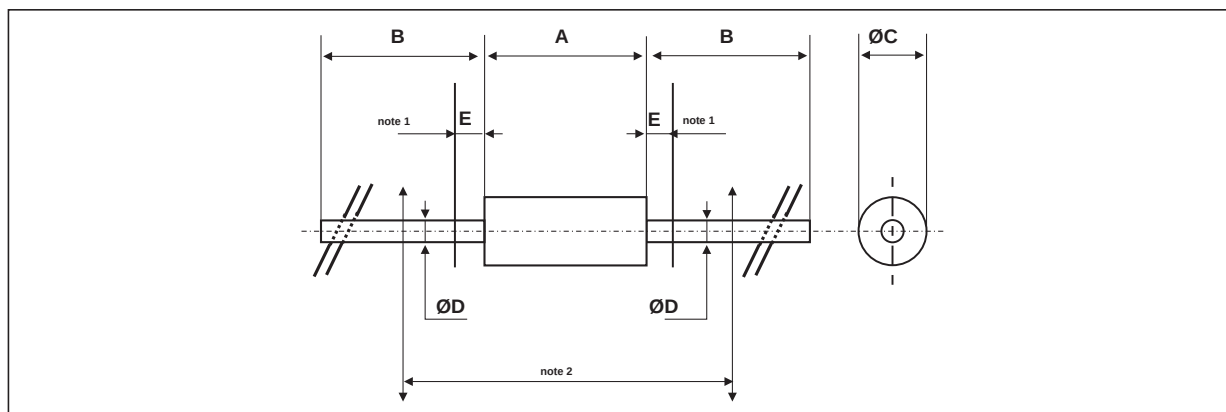


Fig. 11: Non repetitive surge peak current versus number of cycles.



PACKAGE MECHANICAL DATA **DO-201AD**



REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A		9.50		0.374	1 - The lead diameter Ø 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.

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