

HIGH EFFICIENCY ULTRAFAST DIODE
MAIN PRODUCT CHARACTERISTICS

I_{F(AV)}	1 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 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)

Symbol	Parameter		Value	Unit
V _{RRM}	Repetive peak reverse voltage		400	V
I _{F(AV)}	Average forward current	T _I = 80°C δ = 0.5	1	A
I _{FSM}	Surge non repetitive forward current	t _p = 10ms Sinusoidal	30	A
T _{stg}	Storage temperature range		- 65 to +150	°C
T _j	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	μA
		$T_j = 100^\circ\text{C}$			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.

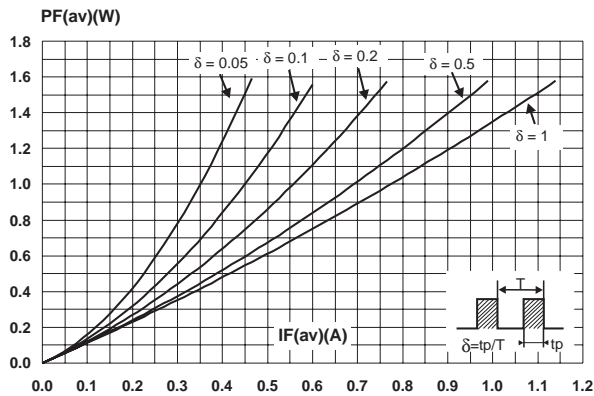


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$)

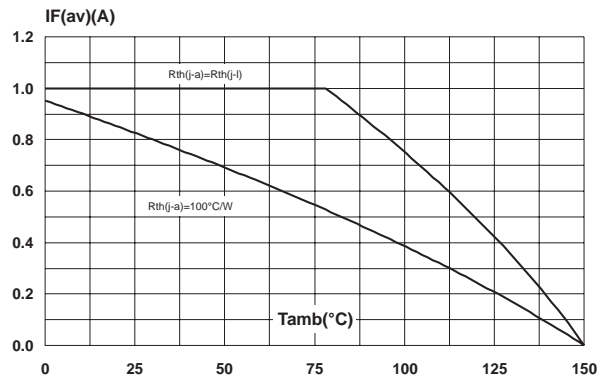


Fig. 3: Thermal resistance versus lead length.

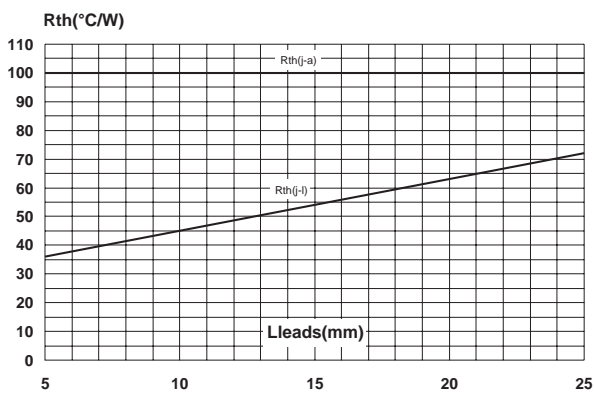


Fig. 4: Relative variation of thermal impedance junction ambient versus pulse duration (printed circuit board epoxy FR4, Leads = 10mm).

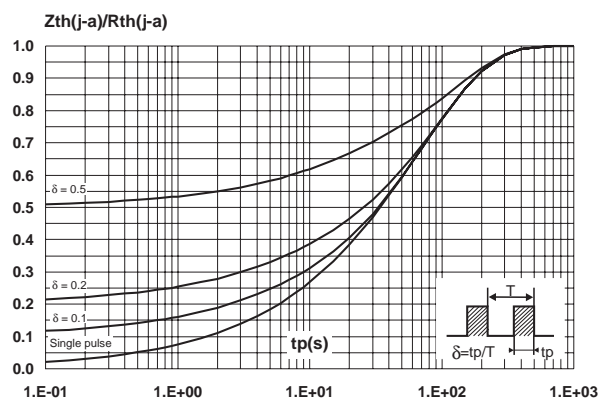


Fig. 5: Forward voltage drop versus forward current.

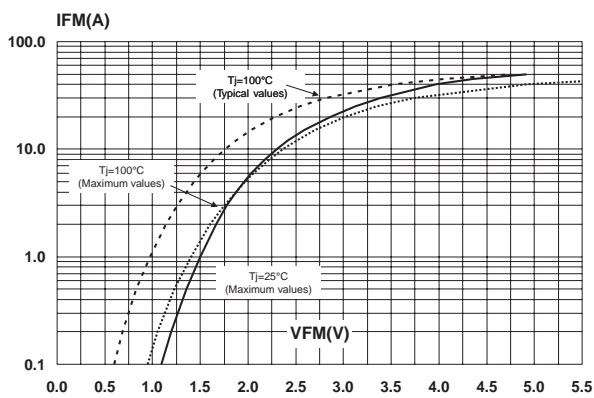


Fig. 6: Junction capacitance versus reverse voltage applied (typical values).

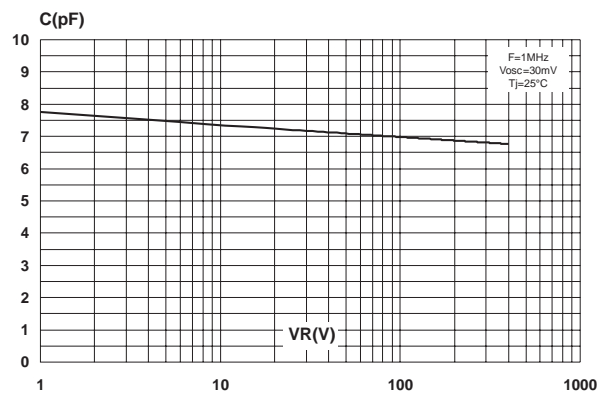


Fig. 7: Forward recovery time versus dI_F/dt (90% confidence).

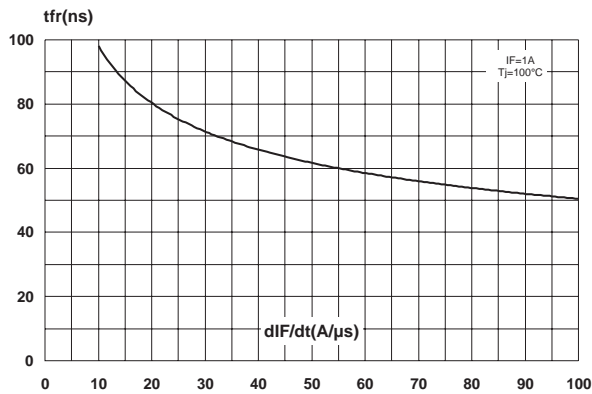


Fig. 8: Transient peak forward voltage versus dI_F/dt (90% confidence).

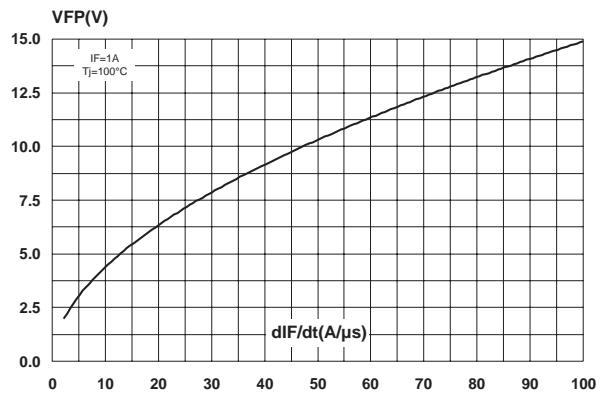


Fig. 9: Peak reverse recovery current versus dI_F/dt (90% confidence).

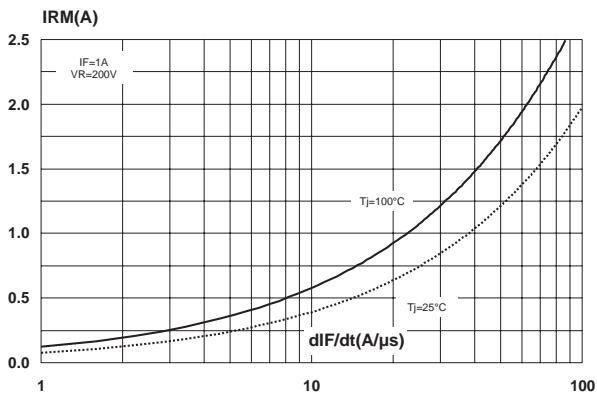


Fig. 10: Dynamic parameters versus junction temperature.

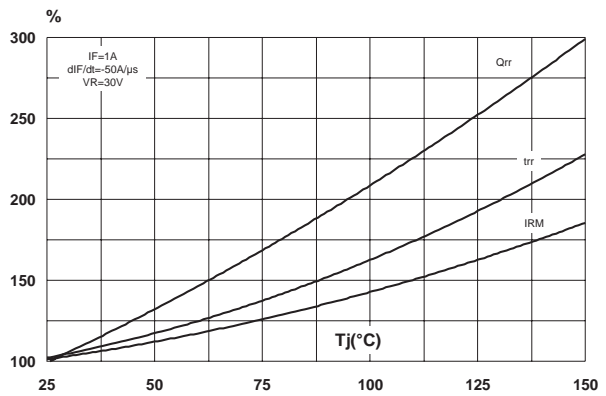
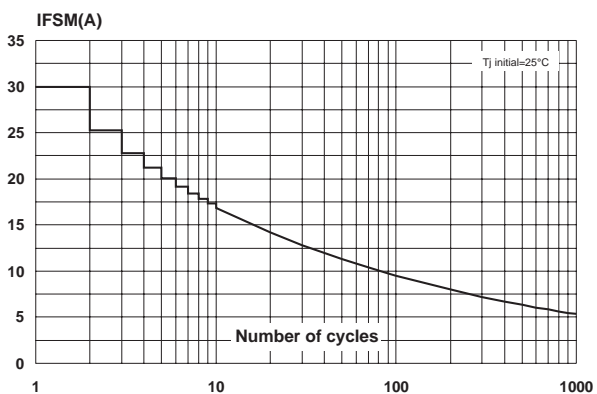
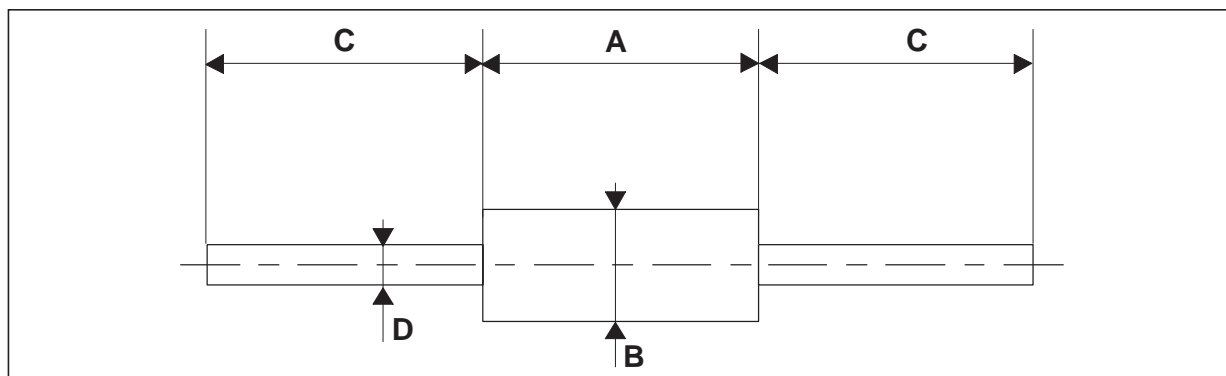


Fig. 11: Non repetitive surge peak current versus number of cycles.



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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