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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832 Email & Skype: info@chipsmall.com Web: www.chipsmall.com Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





# BYT30G-400

### HIGH EFFICIENCY FAST RECOVERY DIODES

#### MAIN PRODUCT CHARACTERISTICS

IF(AV)	30 A
V <sub>RRM</sub>	400 V
trr	50 ns
VF	1.4 V

#### FEATURES AND BENEFITS

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- SMD PACKAGE

#### DESCRIPTION

Single rectifier suited for freewheeling in converters and motor control circuits. Packaged in  $D^2PAK$ , this surface mount device is

intended for use in high frequency inverters, free wheeling and polarity protection applications.

#### **ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit	
VRRM	Repetitive peak reverse voltage	400	V	
I <sub>F(RMS)</sub>	RMS forward current	MS forward current		
IF(AV)	Average forward current	30	A	
I <sub>FSM</sub>	Surge non repetitive forward current	tp=10ms sinusoidal	350	A
IFRM	Repetitive peak forward current	tp = 5μs f = 5 kHz	280	A
Tstg Tj	Storage and junction temperature range		- 40 to + 150	°C

October 1999 - Ed: 3A



#### BYT30G-400

#### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
Rth (j-c)	Junction to case	1	°C/W

#### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Тур.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	$V_R = V_{RRM}$ $T_j = 25^{\circ}C$				35	μA
			T <sub>j</sub> = 100°C			6	mA
VF **	Forward voltage drop	I <sub>F</sub> = 30 A	$T_j = 100^{\circ}C$			1.4	V
		I <sub>F</sub> = 30 A	$T_j = 25^{\circ}C$			1.5	

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

\*\* tp = 380 μs, δ < 2 %

To evaluate the conduction losses use the following equation : P = 1.1 x  $I_{F(AV)}$  + 0.0095  ${I_F}^2({\sf RMS})$ 

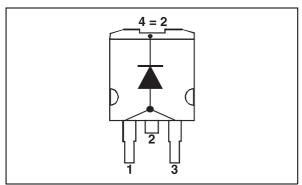
#### **RECOVERY CHARACTERISTICS**

Symbol	Parameter	Test Conditions		Min.	Тур.	Max.	Unit
t <sub>rr</sub>	Reverse recovery time	Tj = 25°C Irr = 0.25 A	I <sub>F</sub> = 0.5A I <sub>R</sub> = 1A			50	ns
		$T_j = 25^{\circ}C$ dI <sub>F</sub> /dt = -15A/µs	$I_F = 1A$ $V_R = 30V$			100	

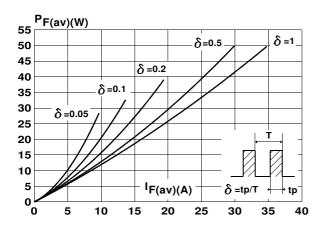
#### **TURN-OFF SWITCHING CHARACTERISTICS**

Symbol	Parameter	Test Conditions		Min.	Тур.	Max.	Unit
tirm	Maximum reverse	$T_j = 100^\circ C$	dI <sub>F</sub> /dt = -120A/µs			75	ns
	recovery time	I <sub>F</sub> = 30 A	dI <sub>F</sub> /dt = -240A/µs		50		
I <sub>RM</sub>	Maximum reverse	V <sub>CC</sub> = 200 V	dI <sub>F</sub> /dt = -120A/µs			9	ns
	recovery current	Lp < 0.05 μH	dI <sub>F</sub> /dt = -240A/µs		12		
C factor	Turn-off overvoltage coefficient	$T_j = 100^{\circ}C$ $V_{CC} = 60 V$ $dI_F/dt = -30A/\mu$	$I_{F} = I_{F(AV)}$ $L_{D} = 1 \ \mu H$		3.3		/

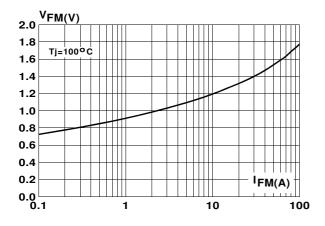
### PIN OUT configuration in D<sup>2</sup>PAK:



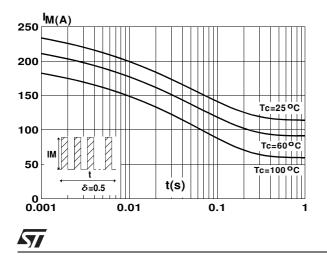
## **Fig.1 :** Average forward power dissipation versus average forward current.

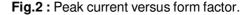


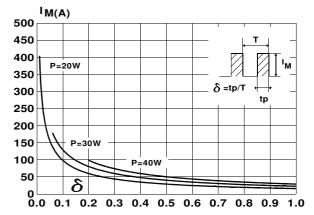
**Fig.3 :** Forward voltage drop versus forward current (maximum values).



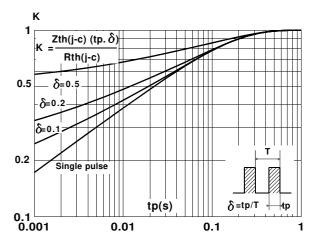
**Fig.5**: Non repetitive surge peak forward current versus overload duration.



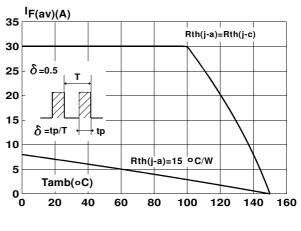




**Fig.4** : Relative variation of thermal impedance junction to case versus pulse duration.



**Fig.6** : Average current versus ambient temperature. ( $\delta$ : 0.5)



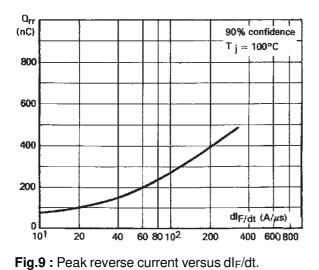


Fig.7 : Reverse recovery charge versus dl<sub>F</sub>/dt.

Fig.8 : Forward recovery times versus dl<sub>F</sub>/dt.

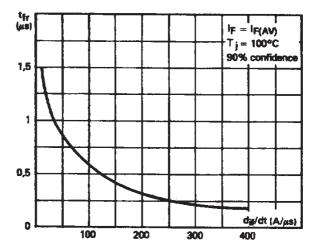


Fig.10 : Peak forward voltage versus dl<sub>F</sub>/dt.

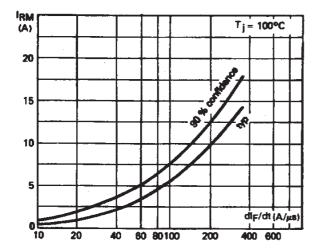
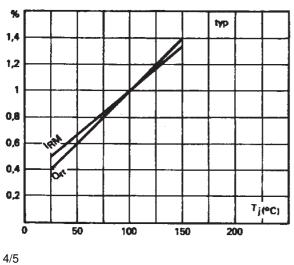
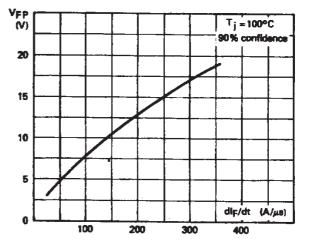
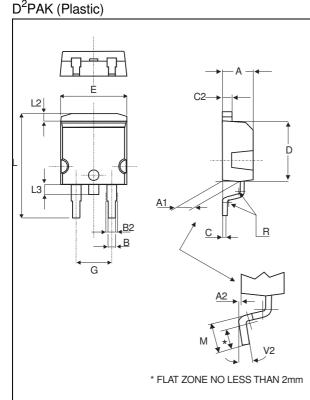


Fig.11: Dynamic parameters versus junction temperature.



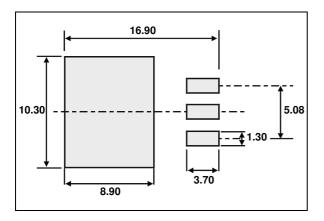


#### PACKAGE MECHANICAL DATA



	DIMENSIONS				
REF.	Millimeters		Inches		
	Min.	Min. Max.		Max.	
А	4.40	4.60	0.173	0.181	
A1	2.49	2.69	0.098	0.106	
A2	0.03	0.23	0.001	0.009	
В	0.70	0.93	0.027	0.037	
B2	1.14	1.70	0.045	0.067	
С	0.45	0.60	0.017	0.024	
C2	1.23	1.36	0.048	0.054	
D	8.95	9.35	0.352	0.368	
Е	10.00	10.40	0.393	0.409	
G	4.88	5.28	0.192	0.208	
L	15.00	15.85	0.590	0.624	
L2	1.27	1.40	0.050	0.055	
L3	1.40	1.75	0.055	0.069	
М	2.40	3.20	0.094	0.126	
R	0.40 typ.		0.016	6 typ.	
V2	0°	8°	0°	8°	

FOOT PRINT (in millimeters)



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