

HIGH EFFICIENCY FAST RECOVERY DIODES

MAIN PRODUCT CHARACTERISTICS

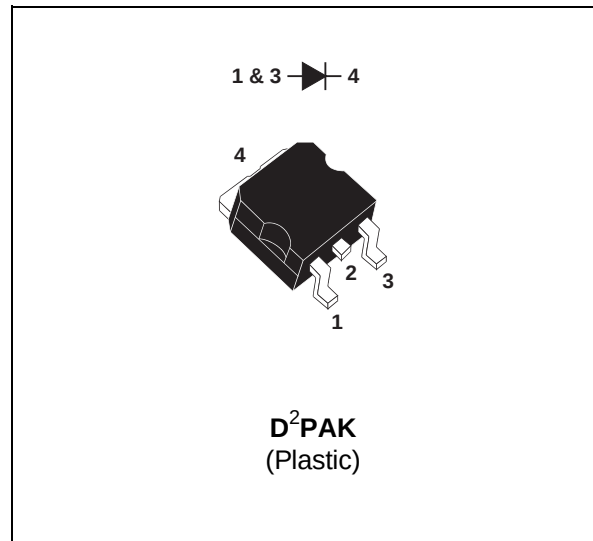
$I_{F(AV)}$	30 A
V_{RRM}	400 V
t_{rr}	50 ns
V_F	1.4 V

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 D²PAK, 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
V_{RRM}	Repetitive peak reverse voltage		400	V
$I_{F(RMS)}$	RMS forward current		50	A
$I_{F(AV)}$	Average forward current	$T_c=100^{\circ}\text{C}$ $\delta = 0.5$	30	A
I_{FSM}	Surge non repetitive forward current	$t_p=10\text{ms}$ sinusoidal	350	A
I_{FRM}	Repetitive peak forward current	$t_p = 5\mu\text{s}$ $f = 5\text{ kHz}$	280	A
T_{stg} T_j	Storage and junction temperature range		- 40 to + 150	$^{\circ}\text{C}$

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.	Typ.	Max.	Unit
I _R *	Reverse leakage current	V _R = V _{RRM}	T _j = 25°C			35	μA
			T _j = 100°C			6	mA
V _F **	Forward voltage drop	I _F = 30 A	T _j = 100°C			1.4	V
		I _F = 30 A	T _j = 25°C			1.5	

Pulse test : * tp = 5 ms, δ < 2 %

** tp = 380 μs, δ < 2 %

To evaluate the conduction losses use the following equation :

$$P = 1.1 \times I_{F(AV)} + 0.0095 I_{F(RMS)}^2$$

RECOVERY CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t _{rr}	Reverse recovery time	T _j = 25°C	I _F = 0.5A			50	ns
		I _{rr} = 0.25 A	I _R = 1A				
		T _j = 25°C	I _F = 1A			100	
		dI _F /dt = -15A/μs	V _R = 30V				

TURN-OFF SWITCHING CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t _{IRM}	Maximum reverse recovery time	T _j = 100°C	dI _F /dt = -120A/μs			75	ns
		I _F = 30 A	dI _F /dt = -240A/μs		50		
I _{RM}	Maximum reverse recovery current	V _{CC} = 200 V	dI _F /dt = -120A/μs			9	ns
		L _p < 0.05 μH	dI _F /dt = -240A/μs		12		
C factor	Turn-off overvoltage coefficient	T _j = 100°C	I _F = I _{F(AV)}		3.3		/
		V _{CC} = 60 V	L _p = 1 μH				
		dI _F /dt = -30A/μs					

PIN OUT configuration in D²PAK:

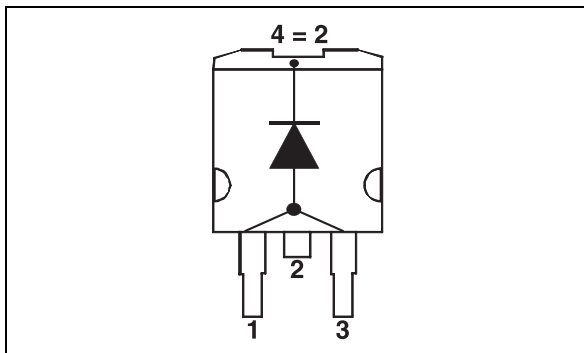


Fig.1 : Average forward power dissipation versus average forward current.

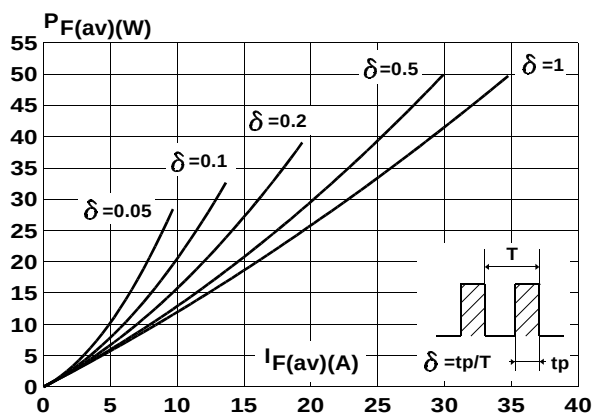


Fig.2 : Peak current versus form factor.

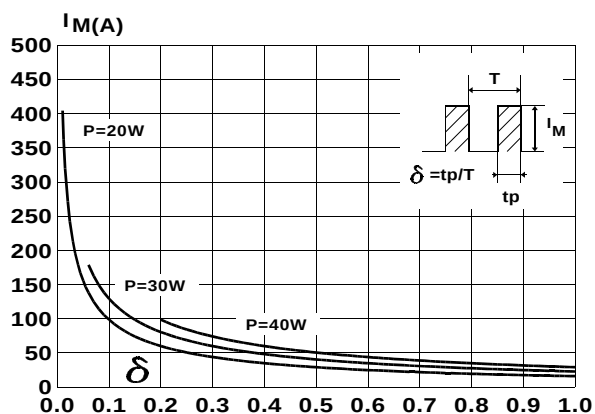


Fig.3 : Forward voltage drop versus forward current (maximum values).

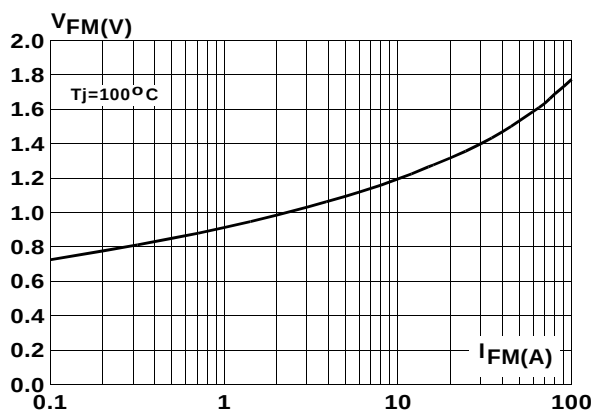


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

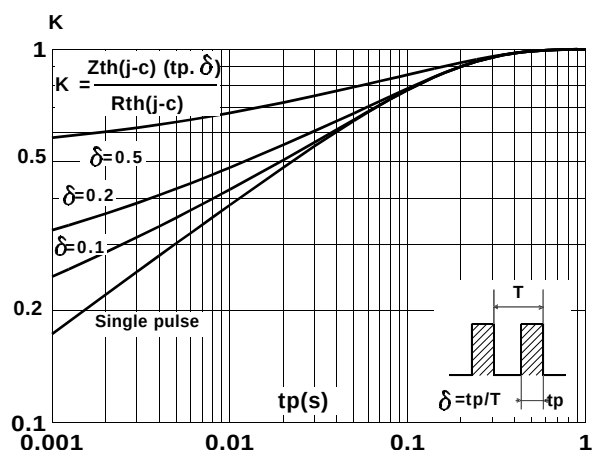


Fig.5 : Non repetitive surge peak forward current versus overload duration.

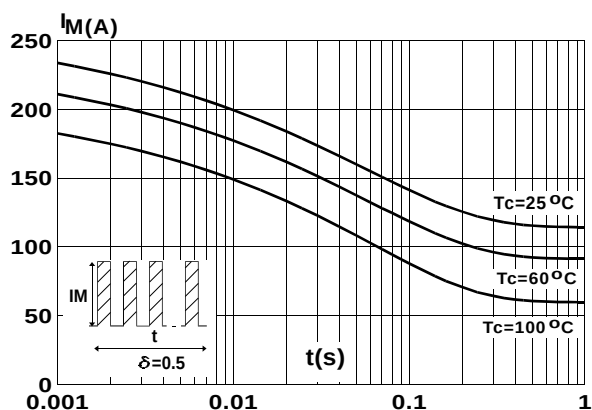


Fig.6 : Average current versus ambient temperature. ($\delta: 0.5$)

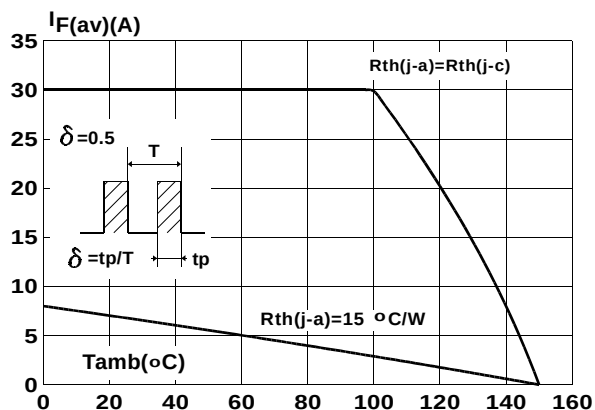


Fig.7 : Reverse recovery charge versus di_F/dt .

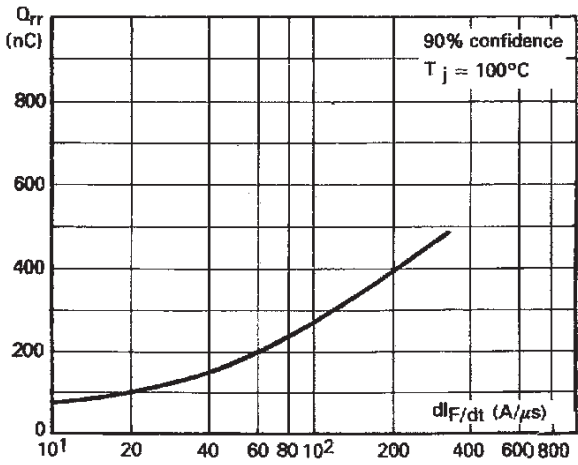


Fig.9 : Peak reverse current versus di_F/dt .

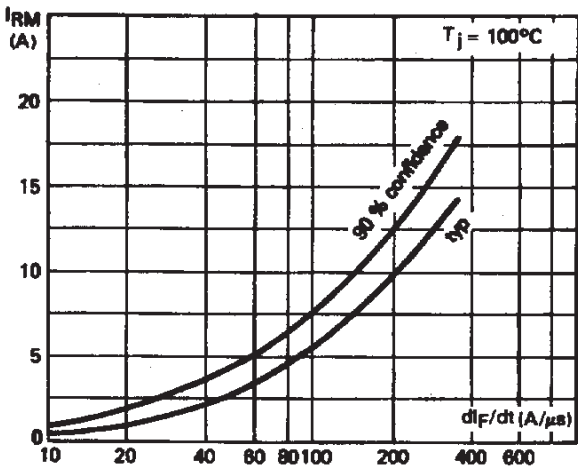


Fig.11: Dynamic parameters versus junction temperature.

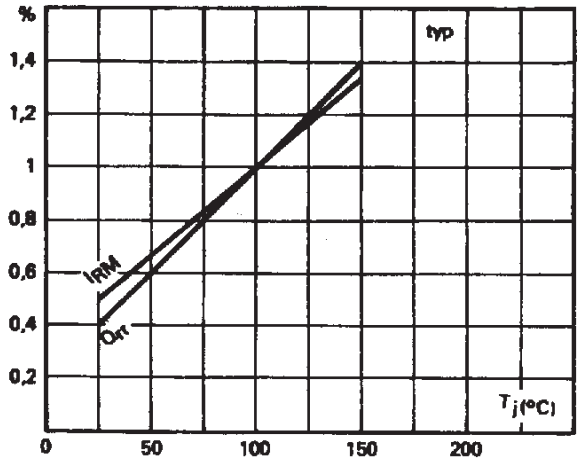


Fig.8 : Forward recovery times versus di_F/dt .

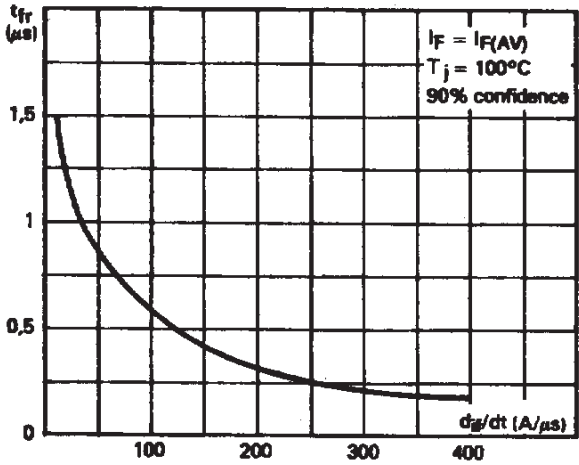
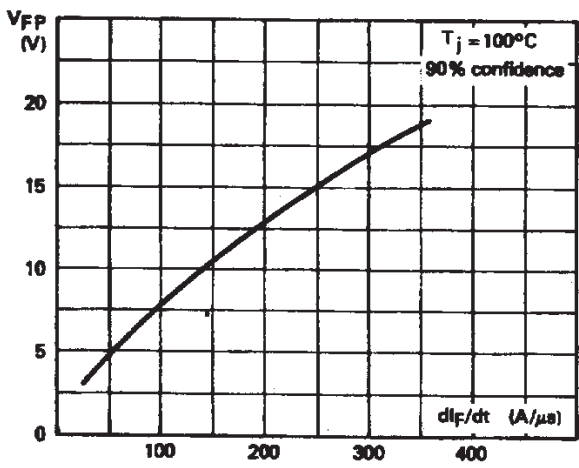
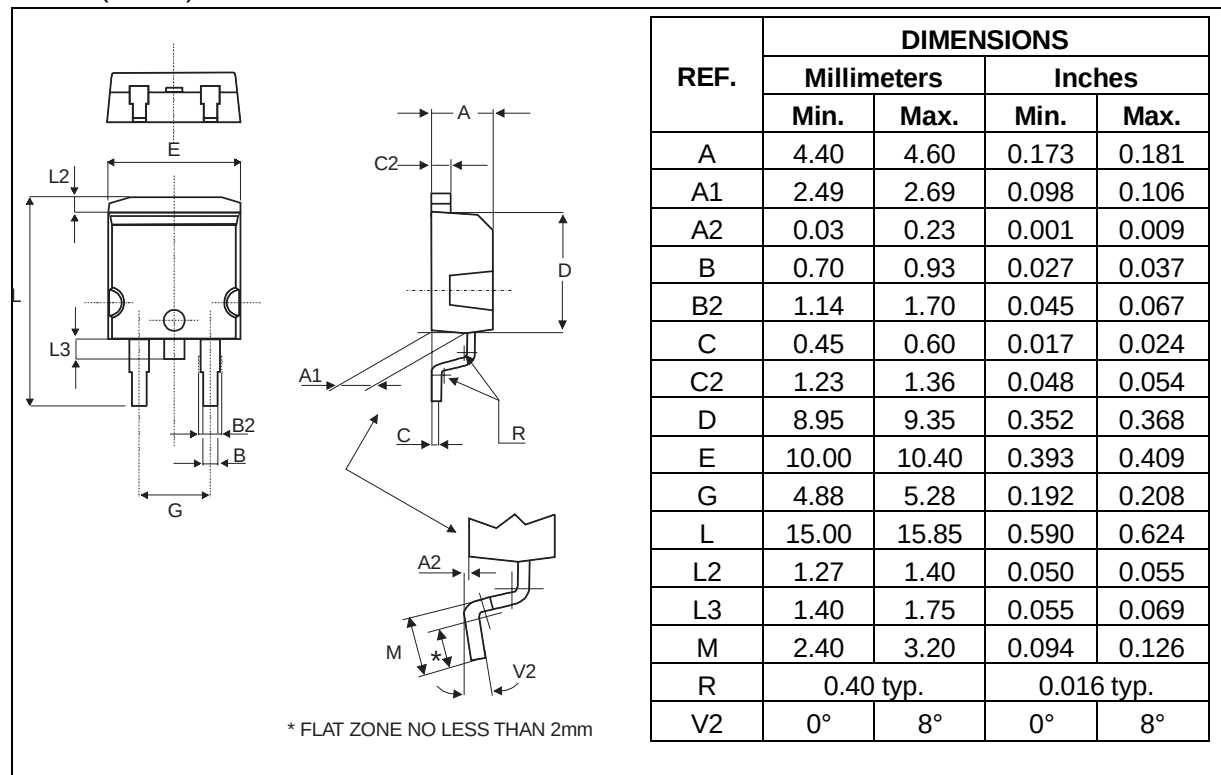
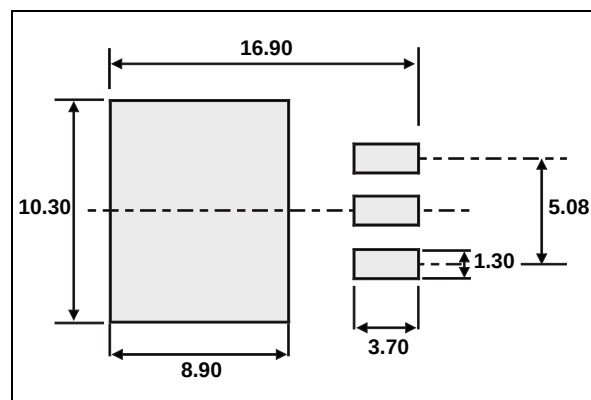


Fig.10 : Peak forward voltage versus di_F/dt .



PACKAGE MECHANICAL DATA
D²PAK (Plastic)

FOOT PRINT (in millimeters)


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

© 1999 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia
 Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>