

HIGH EFFICIENCY FAST RECOVERY DIODES

MAIN PRODUCT CHARACTERISTICS

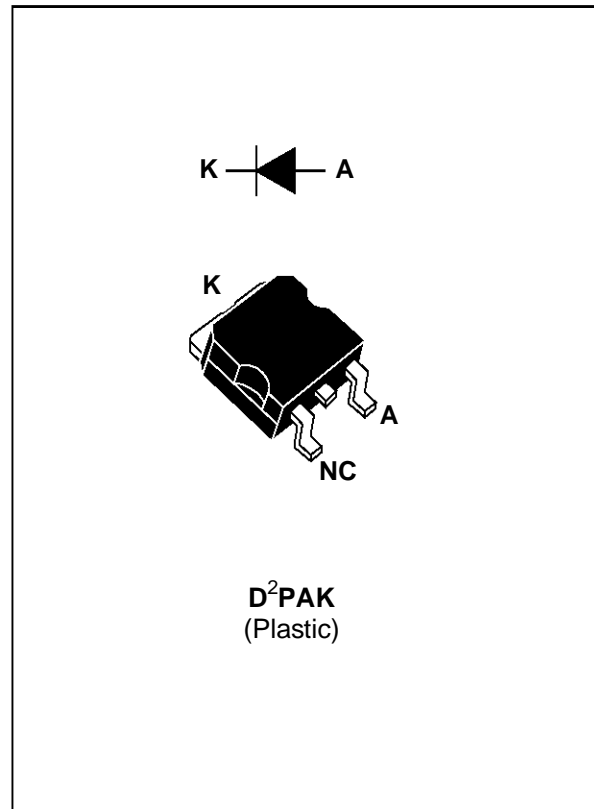
$I_{F(AV)}$	30 A
V_{RRM}	400 V
t_{rr}	50 ns
V_F	1.4 V

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 thermal resistance	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, duty cycle < 2 %

** tp = 380 μs, duty cycle < 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					

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

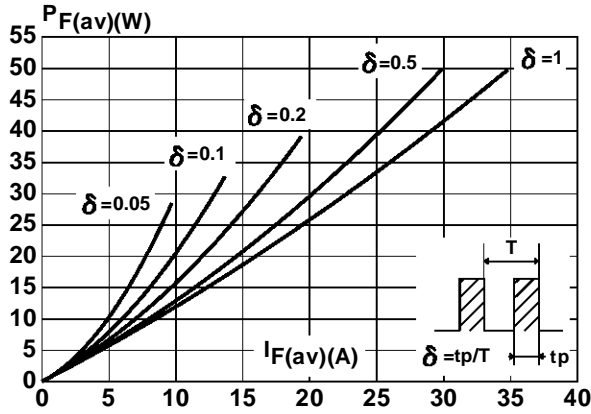


Fig.2 : Peak current versus form factor.

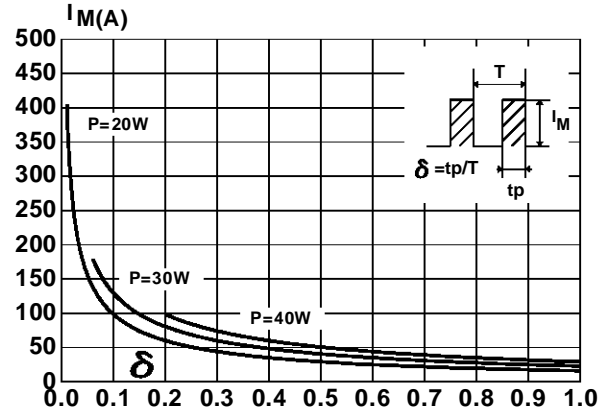


Fig.3 : Forward voltage drop versus forward current (maximum values).

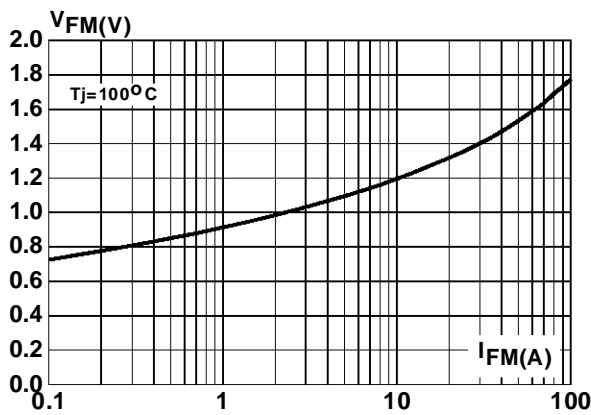


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

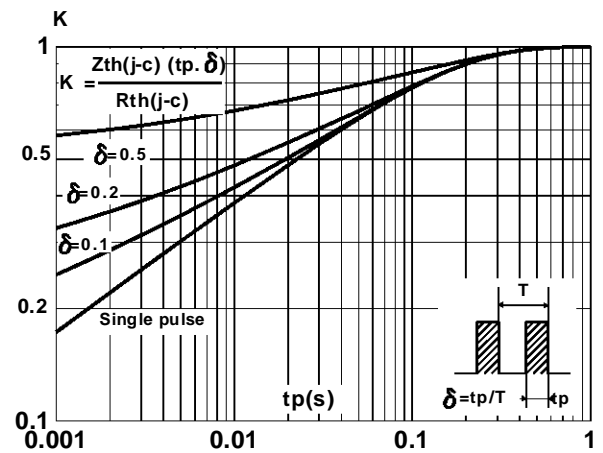


Fig.5 : Non repetitive surge peak forward current versus overload duration.

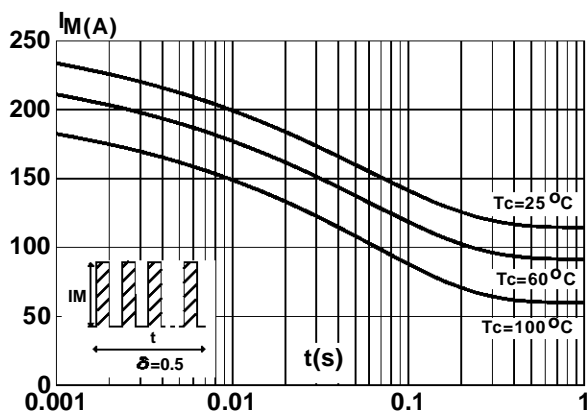


Fig.6 : Average current versus ambient temperature. (delta: 0.5)

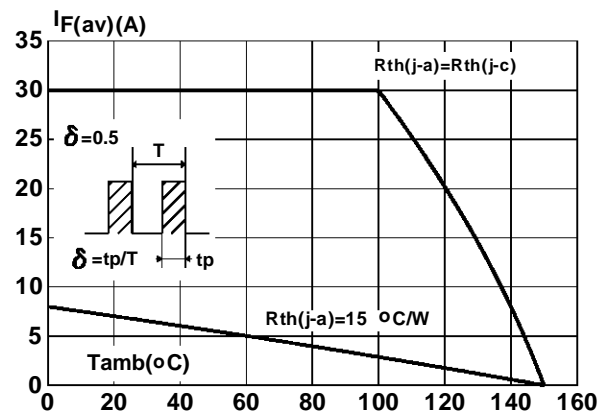


Fig.7 : Reverse recovery charge versus di_F/dt .

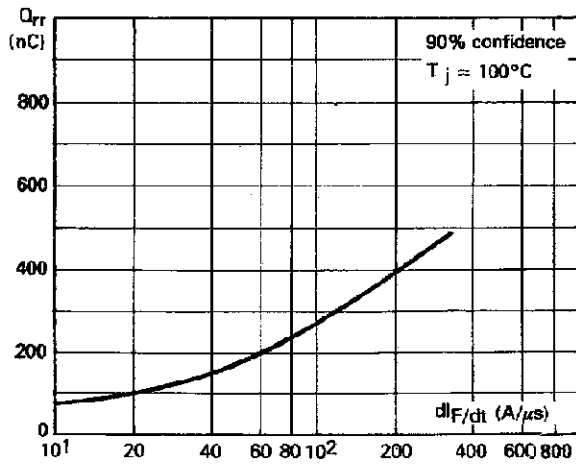


Fig.8 : Forward recovery times versus di_F/dt .

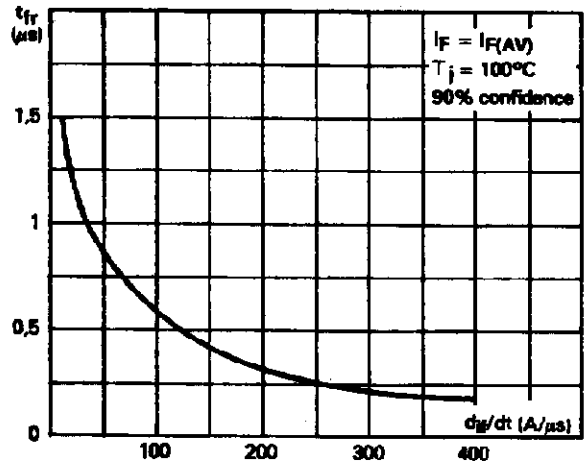


Fig.9 : Peak reverse current versus di_F/dt .

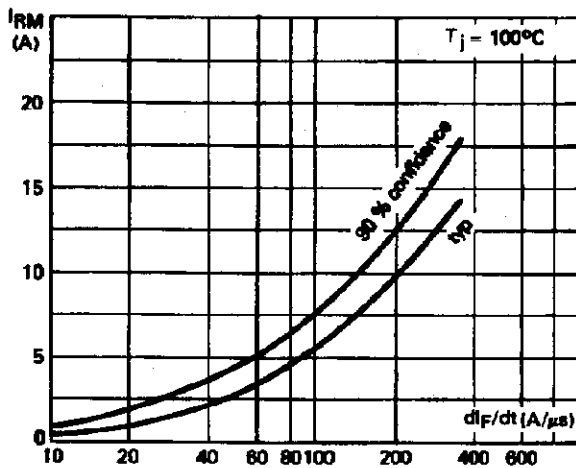


Fig.10 : Peak forward voltage versus di_F/dt .

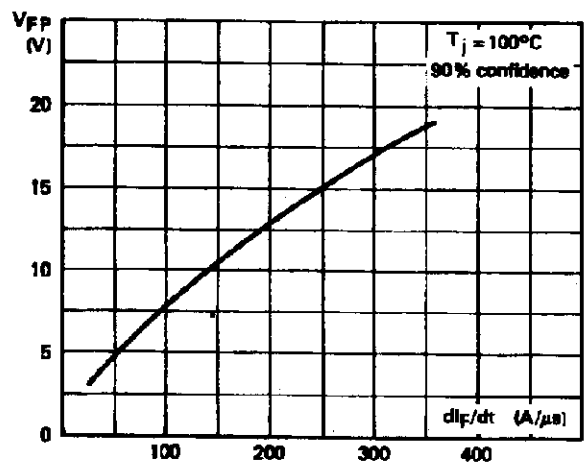
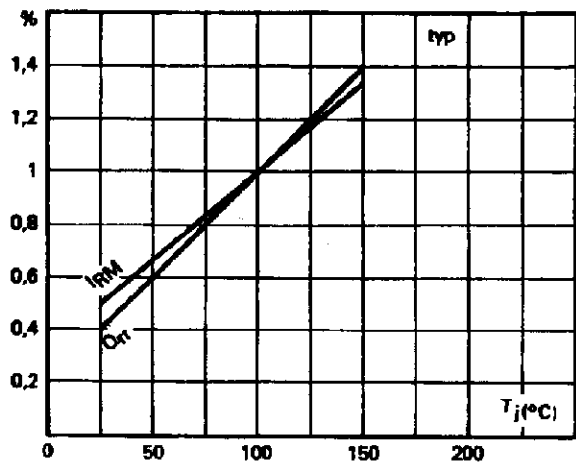


Fig.11: Dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA
 D²PAK (Plastic)

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.169		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.037
B2	1.25		1.40	0.049		0.055
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	9.00		9.35	0.354		0.368
E	10.00		10.28	0.393		0.405
G	4.88		5.28	0.192		0.208
L	15.00		15.85	0.590		0.624
L2	1.27		1.37	0.050		0.054
L3	1.40		1.75	0.055		0.069
R		0.40			0.016	
V2	0°		8°	0°		8°

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