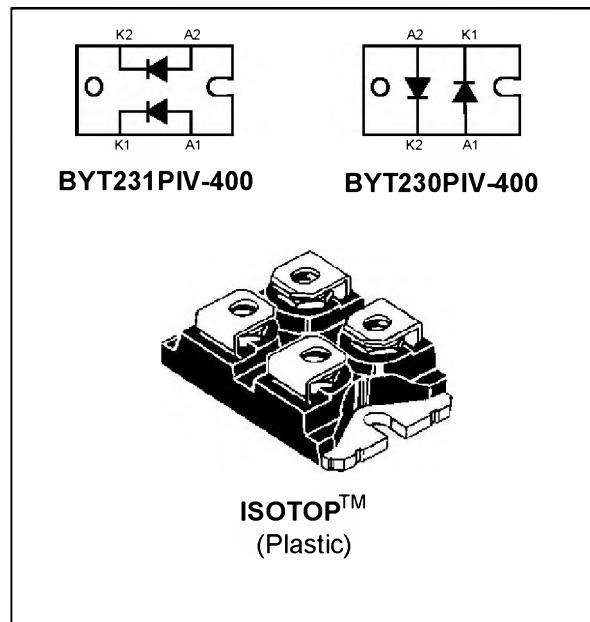


FAST RECOVERY RECTIFIER DIODES

FEATURES

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED PACKAGE :
 - Insulating voltage = 2500 V_{RMS}
 - Capacitance = 45 pF



DESCRIPTION

Dual high voltage rectifiers ranging from 200V to 400V suited for Switch Mode Power Supplies and other power converters.

The devices are packaged in ISOTOP.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter			Value	Unit
I _{FRM}	Repetitive peak forward current		tp ≤ 10μs	500	A
I _{F(RMS)}	RMS forward current		Per diode	50	A
I _{F(AV)}	Average forward current		T _c =75°C δ = 0.5	30	A
I _{FSM}	Surge non repetitive forward current		tp=10ms sinusoidal	350	A
T _{stg} T _J	Storage and junction temperature range			- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	BYT230PIV-/ BYT231PIV-			Unit
		200	300	400	
V _{RRM}	Repetitive peak reverse voltage	200	300	400	V

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BYT230PIV-400 / BYT231PIV-400

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
R _{th} (j-c)	Junction to case	Per diode	1.5
		Total	0.8
R _{th} (c)	Coupling	0.1	°C/W

When the diodes 1 and 2 are used simultaneously:
 $\Delta T_j(\text{diode } 1) = P(\text{diode}) \times R_{th}(\text{Per diode}) + P(\text{diode } 2) \times R_{th}(c)$

ELECTRICAL CHARACTERISTICS (Per diode)

STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
V _F *	T _j = 25°C	I _F = 30 A			1.5	V
	T _j = 100°C				1.4	
I _R **	T _j = 25°C	V _R = V _{RRM}			35	μA
	T _j = 100°C				6	

Pulse test : * tp = 380 μs, duty cycle < 2 %

** tp = 5 ms, duty cycle < 2 %

RECOVERY CHARACTERISTICS

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

TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t _{IRM}	dI _F /dt = -120A/μs	V _{CC} = 200V L _p ≤ 0.05μH see fig. 11	I _F = 30A		75	ns
	dI _F /dt = -240A/μs		T _j = 100°C	50		
I _{RM}	dI _F /dt = -120A/μs				9	A
	dI _F /dt = -240A/μs				12	

TURN-OFF OVERVOLTAGE COEFFICIENT (With serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
C = $\frac{V_{RP}}{V_{CC}}$	T _j = 100°C dI _F /dt = -30A/μs	V _{CC} = 60V L _p = 1μH	I _F = I _{F(AV)} see note see fig.12	3.3		/

Note : Applicable to BYT230PIV-400 / BYT231PIV-400 only

To evaluate the conduction losses use the following equation :

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

Fig.1 : Low frequency power losses versus average current.

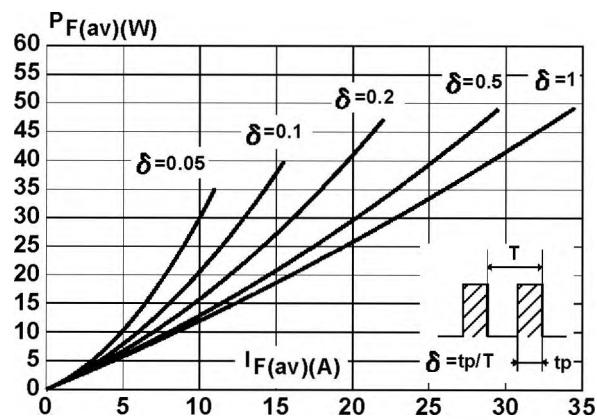


Fig.3 : Non repetitive peak surge current versus overload duration.

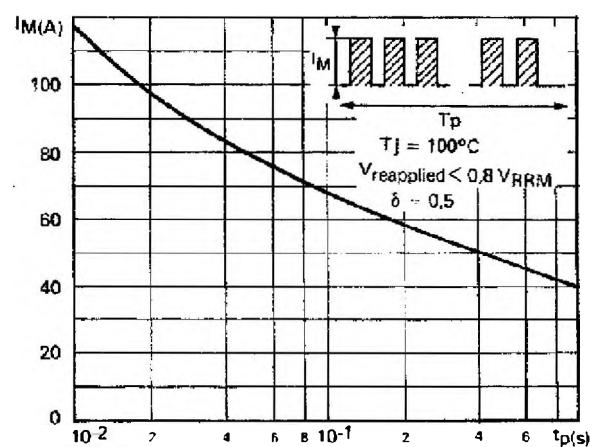


Fig.5 : Voltage drop versus forward current.

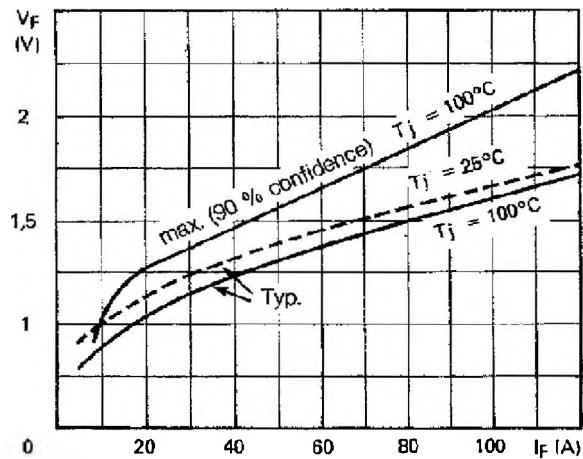


Fig.2 : Peak current versus form factor.

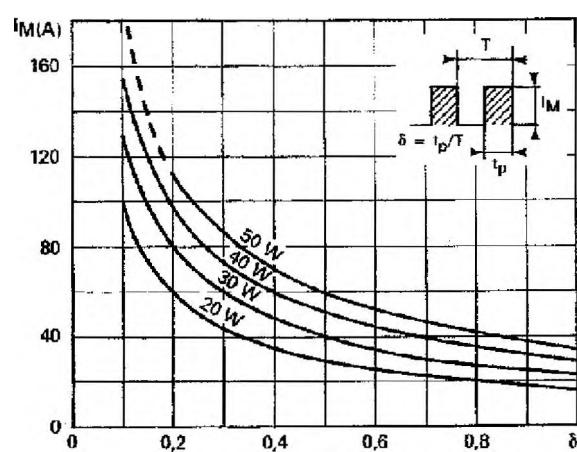


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

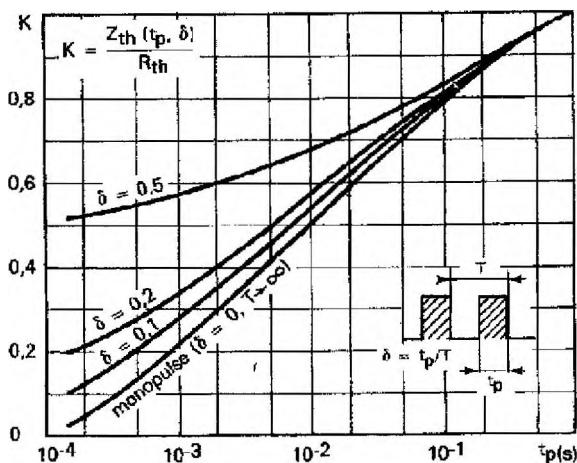
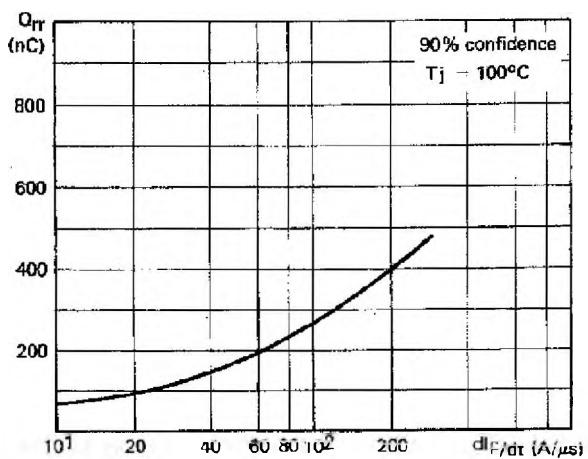


Fig.6 : Recovery charge versus dI_F/dt .



BYT230PIV-400 / BYT231PIV-400

Fig.7 : Recovery time versus dI_F/dt .

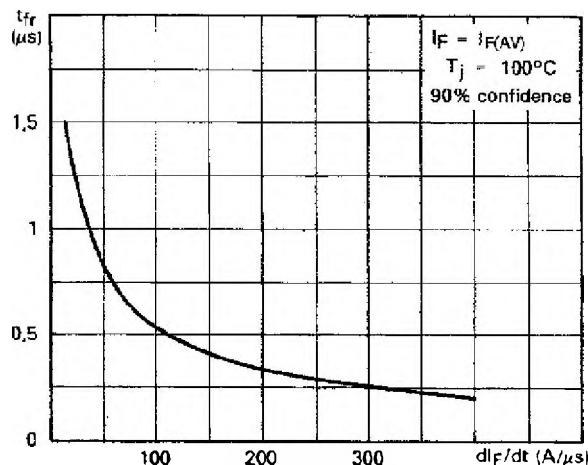


Fig.9 : Peak forward voltage versus dI_F/dt .

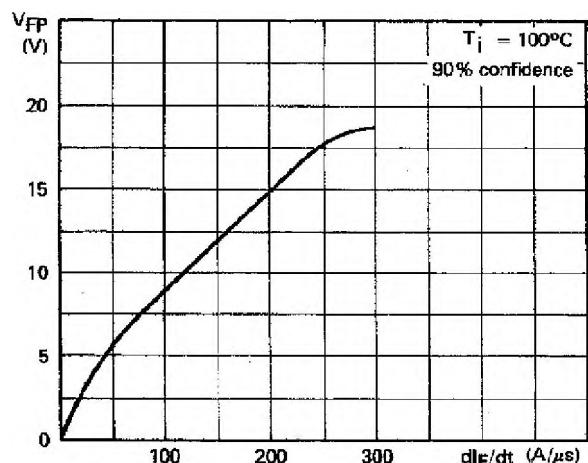
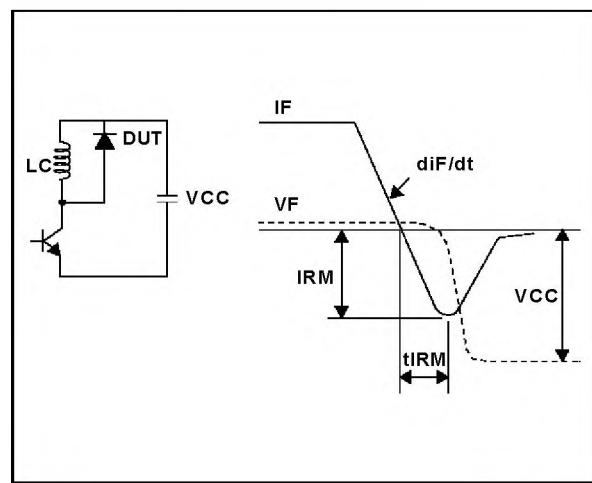


Fig.11 : TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)



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Fig.8 : Peak reverse current versus dI_F/dt .

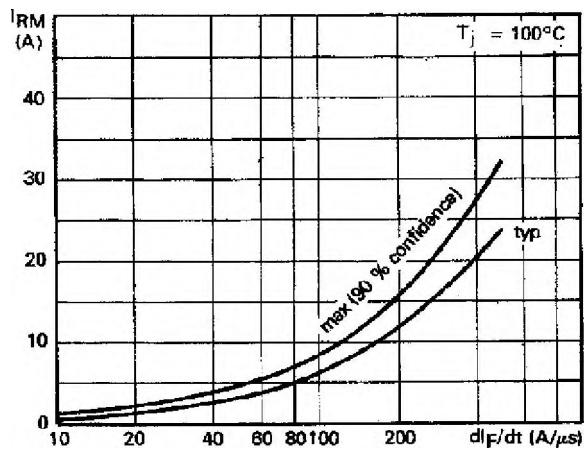


Fig.10 : Dynamic parameters versus junction temperature.

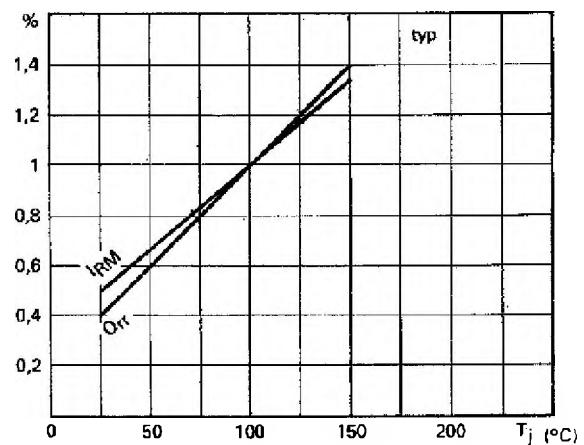
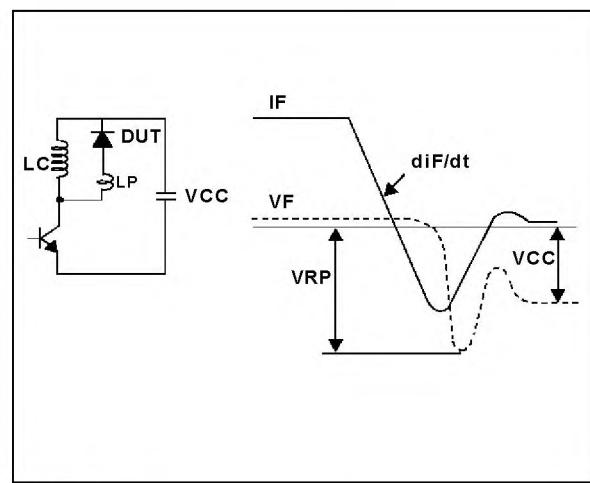


Fig.12 : TURN-OFF SWITCHING CHARACTERISTICS (With serie inductance)



PACKAGE MECHANICAL DATA

ISOTOP Screw version

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	11.80	12.20	0.465	0.480
B	8.90	9.10	0.350	0.358
C	1.95	2.05	0.077	0.081
D	0.75	0.85	0.029	0.034
E	12.60	12.80	0.496	0.504
F	25.10	25.50	0.988	1.004
G	31.50	31.70	1.240	1.248
H	4.00		0.157	
I	4.10	4.30	0.161	0.169
J	4.10	4.30	0.161	0.169
K	14.90	15.10	0.586	0.595
L	30.10	30.30	1.185	1.193
M	37.80	38.20	1.488	1.504
O	7.80	8.20	0.307	0.323
P	5.50		0.216	

Cooling method : C

Marking : Type number

Weight : 28 g (without screws)

Electrical isolation : 2500V_(RMS)

Capacitance : < 45 pF

Inductance : < 5nH

- Recommended torque value : 1.3 N.m (MAX 1.5 N.m) for the 6 x M4 screws. (2 x M4 screws recommended for mounting the package on the heatsink and the 4 screws given with the screw version).
- The screws supplied with the package are adapted for mounting on a board (or other types of terminals) with a thickness of 0.6 mm min and 2.2 mm max.

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