

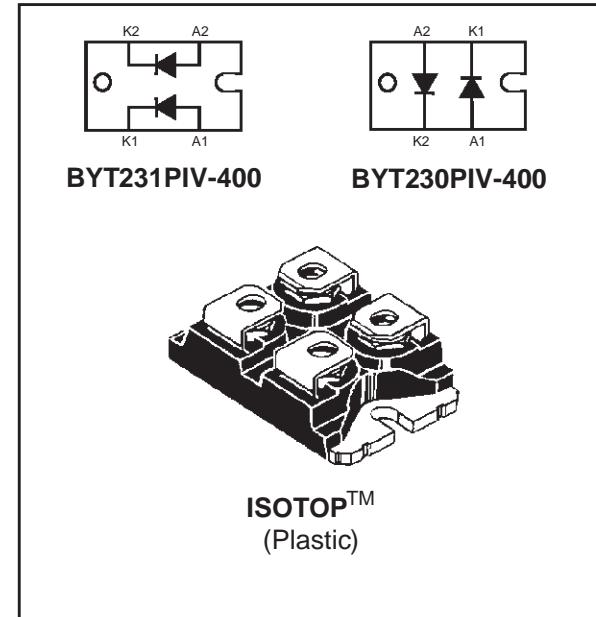


# BYT230PIV-400 BYT231PIV-400

## 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<sub>RMS</sub>  
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 <sub>FRM</sub>	Repetitive peak forward current		tp ≤ 10μs	500	A
I <sub>F(RMS)</sub>	RMS forward current		Per diode	50	A
I <sub>F(AV)</sub>	Average forward current		T <sub>c</sub> =75°C δ = 0.5	30	A
I <sub>FSM</sub>	Surge non repetitive forward current		tp=10ms sinusoidal	350	A
T <sub>tsg</sub> T <sub>j</sub>	Storage and junction temperature range			- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	BYT230PIV-/ BYT231PIV-	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage	400	V

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## BYT230PIV-400 / BYT231PIV-400

### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
Rth (j-c)	Junction to case	Per diode	1.5
		Total	0.8
Rth (c)	Coupling	0.1	°C/W

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

### ELECTRICAL CHARACTERISTICS (Per diode)

#### STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$V_F$ *	$T_j = 25^\circ\text{C}$	$I_F = 30\text{ A}$			1.5	V
	$T_j = 100^\circ\text{C}$				1.4	
$I_R$ **	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			35	$\mu\text{A}$
	$T_j = 100^\circ\text{C}$				6	mA

Pulse test : \* tp = 380  $\mu\text{s}$ , duty cycle < 2 %

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

#### RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{A}$	$I_{rr} = 0.25\text{A}$		50	ns
		$I_R = 1\text{A}$			100	
		$I_F = 1\text{A}$	$dI_F/dt = -15\text{A}/\mu\text{s}$			
		$V_R = 30\text{V}$				

#### TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>IRM</sub>	$dI_F/dt = -120\text{A}/\mu\text{s}$	$V_{CC} = 200\text{V}$	$I_F = 30\text{A}$		75	ns
	$dI_F/dt = -240\text{A}/\mu\text{s}$			50		
I <sub>RM</sub>	$dI_F/dt = -120\text{A}/\mu\text{s}$	see fig. 11			9	A
	$dI_F/dt = -240\text{A}/\mu\text{s}$				12	

#### TURN-OFF OVERVOLTAGE COEFFICIENT (With serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	$T_j = 100^\circ\text{C}$	$V_{CC} = 60\text{V}$	$I_F = I_{F(AV)}$	see note see fig.12	3.3	/
	$dI_F/dt = -30\text{A}/\mu\text{s}$	$L_p = 1\mu\text{H}$				

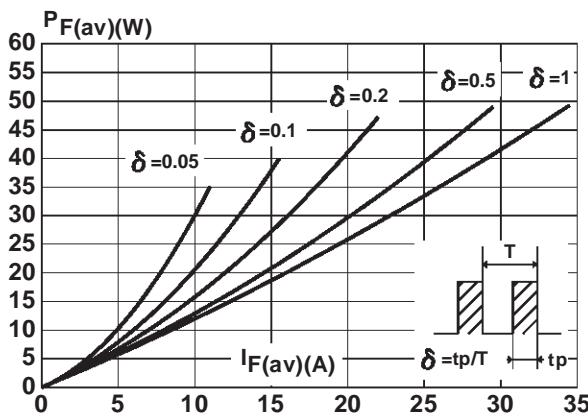
Note : Applicable to BYT230PIV-400/ BYT231PIV-400 only

To evaluate the conduction losses use the following equation :

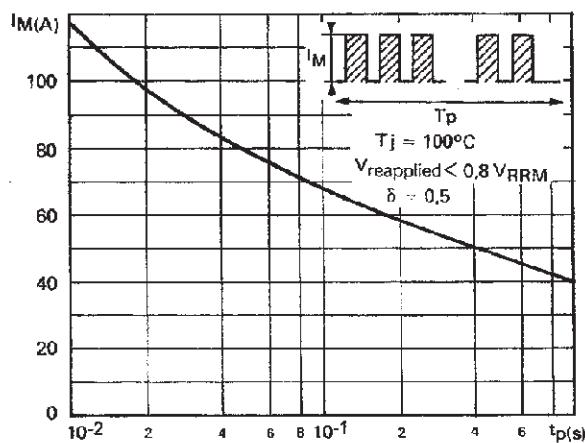
$$P = 1.1 \times I_{F(AV)} + 0.0095 \times I_F^2(\text{RMS})$$

## BYT230PIV-400 / BYT231PIV-400

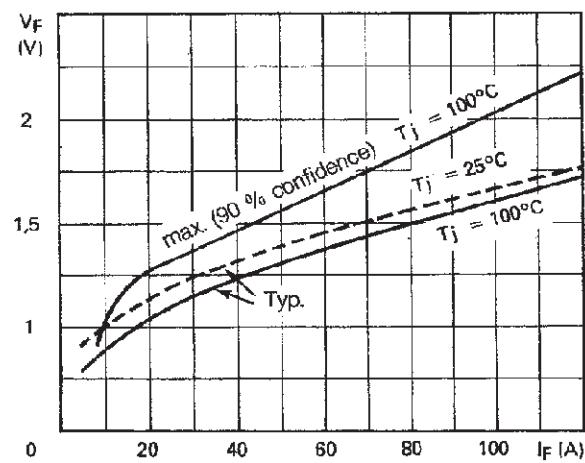
**Fig.1** : Low frequency power losses versus average current.



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

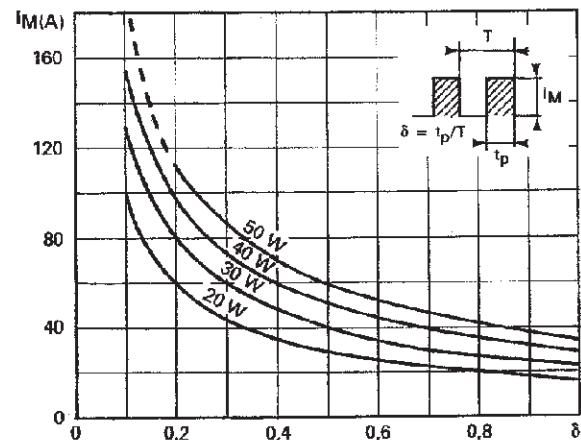


**Fig.5** : Voltage drop versus forward current.

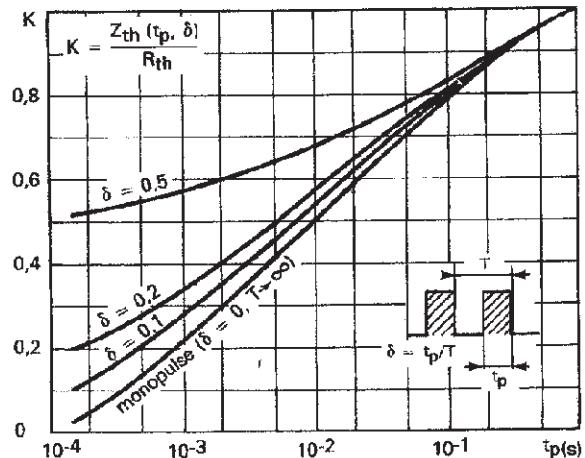


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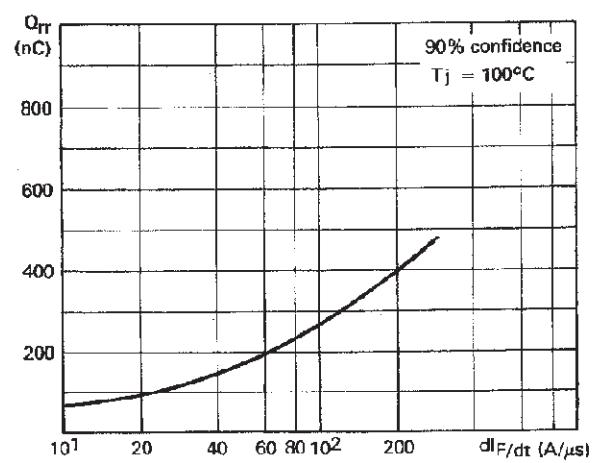
**Fig.2** : Peak current versus form factor.



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

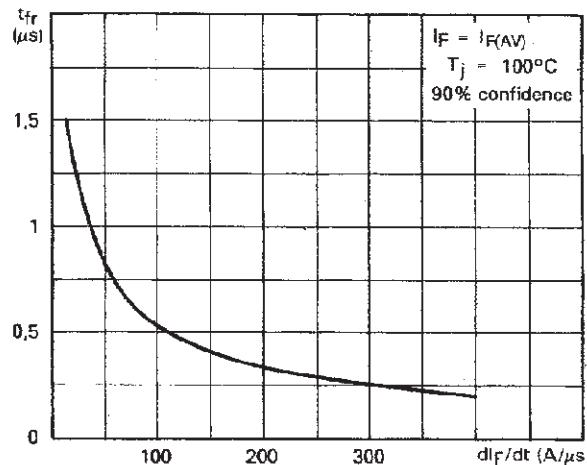


**Fig.6** : Recovery charge versus  $dI_F/dt$ .

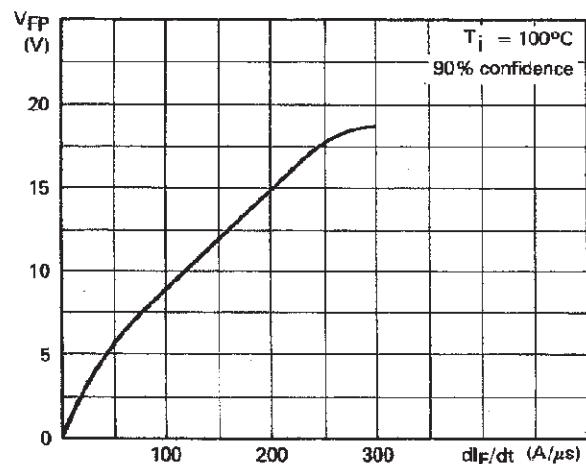


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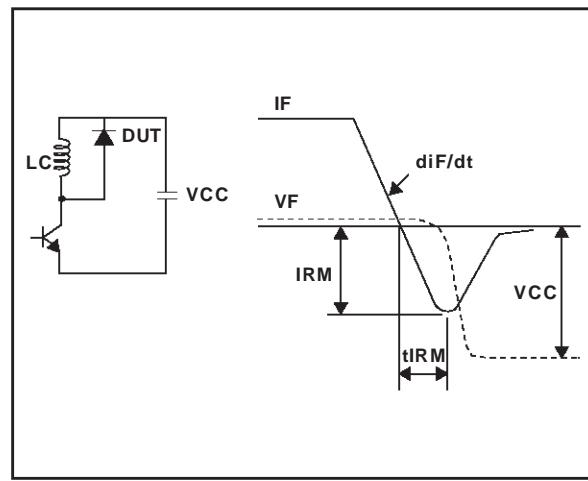
**Fig.7 :** Recovery time versus  $di_F/dt$ .



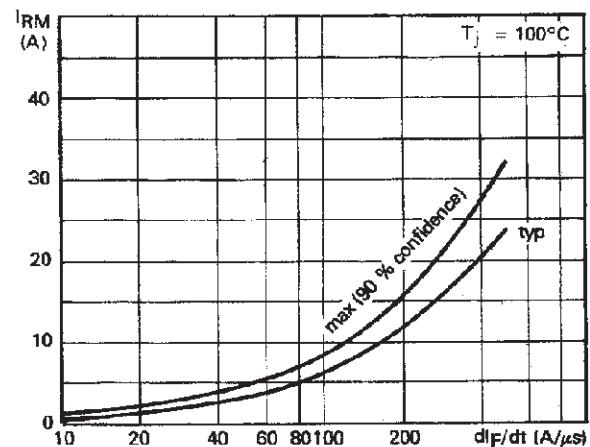
**Fig.9 :** Peak forward voltage versus  $di_F/dt$ .



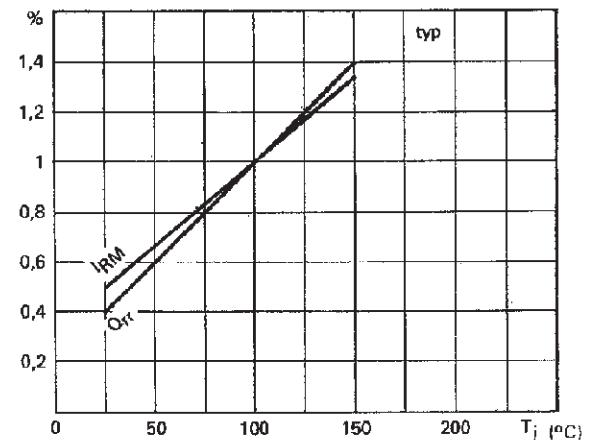
**Fig.11 :** TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)



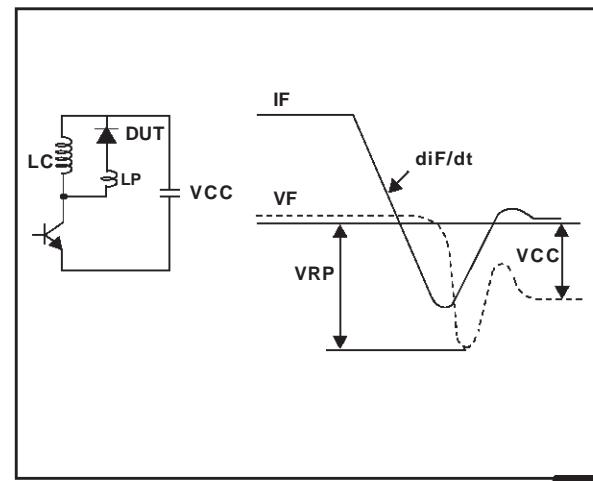
**Fig.8 :** Peak reverse current versus  $di_F/dt$ .



**Fig.10 :** Dynamic parameters versus junction temperature.

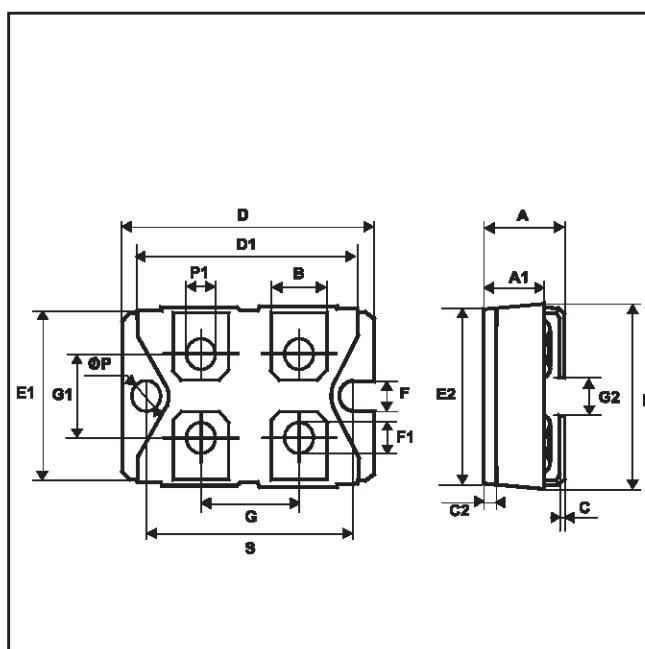


**Fig.12 :** TURN-OFF SWITCHING CHARACTERISTICS (With serie inductance)



## PACKAGE MECHANICAL DATA

ISOTOP Screw version



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	11.80		12.20	0.465		0.480
A1	8.90		9.10	0.350		0.358
B	7.8		8.20	0.307		0.323
C	0.75		0.85	0.030		0.033
C2	1.95		2.05	0.077		0.081
D	37.80		38.20	1.488		1.504
D1	31.50		31.70	1.240		1.248
E	25.15		25.50	0.990		1.004
E1	23.85		24.15	0.939		0.951
E2	24.80			0.976		
G	14.90		15.10	0.587		0.594
G1	12.60		12.80	0.496		0.504
G2	3.50		4.30	0.138		0.169
F	4.10		4.30	0.161		0.169
F1	4.60		5.00	0.181		0.197
P	4.00		4.30	0.157		0.69
P1	4.00		4.40	0.157		0.173
S	30.10		30.30	1.185		1.193

- **Marking :** Type number
- **Cooling method :** C
- **Weight :** 27 g (without screws)
- **Electrical isolation :** 2500V<sub>(RMS)</sub>
- **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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