

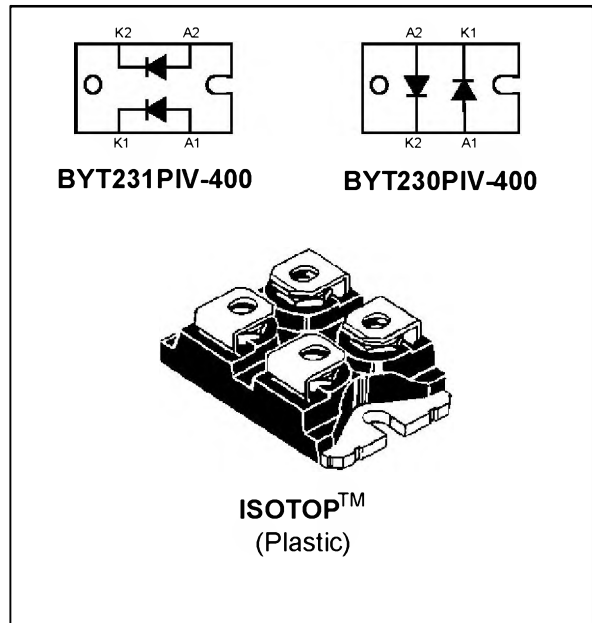
**FAST RECOVERY RECTIFIER DIODES**

**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 Per diode	30	A
I <sub>FSM</sub>	Surge non repetitive forward current	tp=10ms sinusoidal Per diode	350	A
T <sub>stg</sub> T <sub>J</sub>	Storage and junction temperature range		- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	BYT230PIV- / BYT231PIV-			Unit
		200	300	400	
V <sub>RRM</sub>	Repetitive peak reverse voltage	200	300	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	°C/W
		Total	0.8	
Rth (c)	Coupling		0.1	°C/W

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

### ELECTRICAL CHARACTERISTICS (Per diode) STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$V_F$ *	$T_j = 25^\circ\text{C}$	$I_F = 30\text{ A}$			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 : \*  $t_p = 380\ \mu\text{s}$ , duty cycle < 2 %

\*\*  $t_p = 5\ \text{ms}$ , duty cycle < 2 %

### RECOVERY CHARACTERISTICS

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

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

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$t_{IRM}$	$dI_F/dt = -120\text{ A}/\mu\text{s}$	$V_{CC} = 200\text{ V}$ $I_F = 30\text{ A}$ $L_p \leq 0.05\ \mu\text{H}$ $T_j = 100^\circ\text{C}$ see fig. 11			75	ns
	$dI_F/dt = -240\text{ A}/\mu\text{s}$			50		
$I_{RM}$	$dI_F/dt = -120\text{ A}/\mu\text{s}$				9	A
	$dI_F/dt = -240\text{ A}/\mu\text{s}$			12		

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

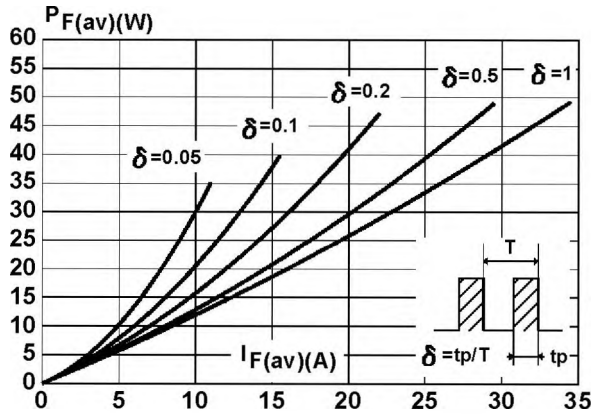
Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	$T_j = 100^\circ\text{C}$ $V_{CC} = 60\text{ V}$ $I_F = I_{F(AV)}$ $dI_F/dt = -30\text{ A}/\mu\text{s}$ $L_p = 1\ \mu\text{H}$	see note see fig.12		3.3		/

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

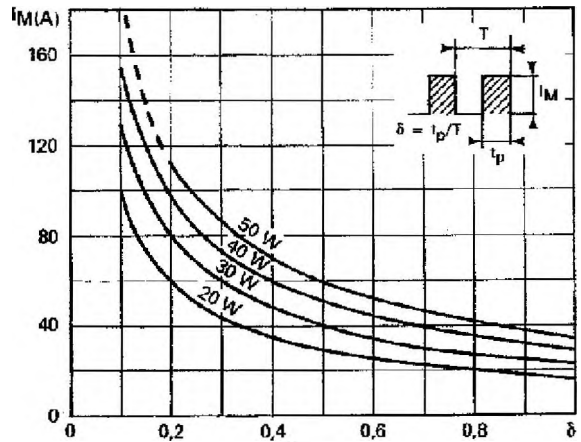
To evaluate the conduction losses use the following equation :

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

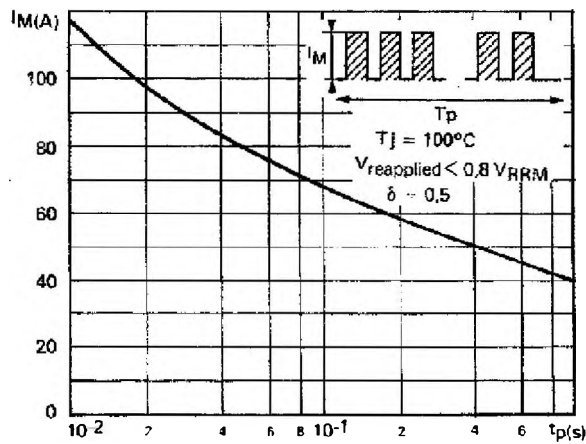
**Fig.1 :** Low frequency power losses versus average current.



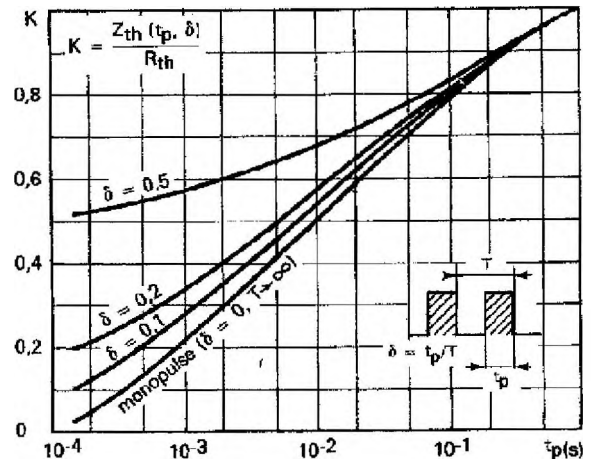
**Fig.2 :** Peak current versus form factor.



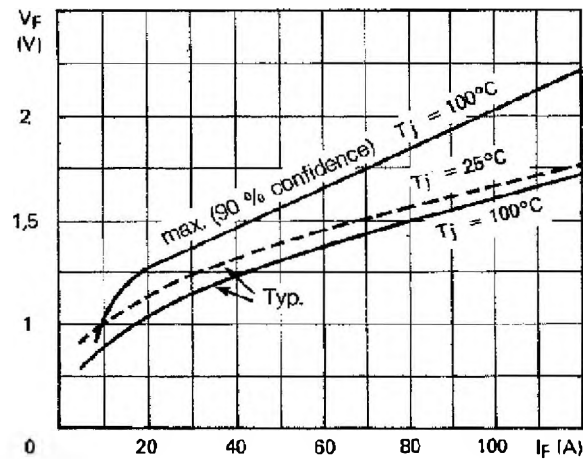
**Fig.3 :** Non repetitive peak surge current versus overload duration.



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



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



**Fig.6 :** Recovery charge versus di\_F/dt.

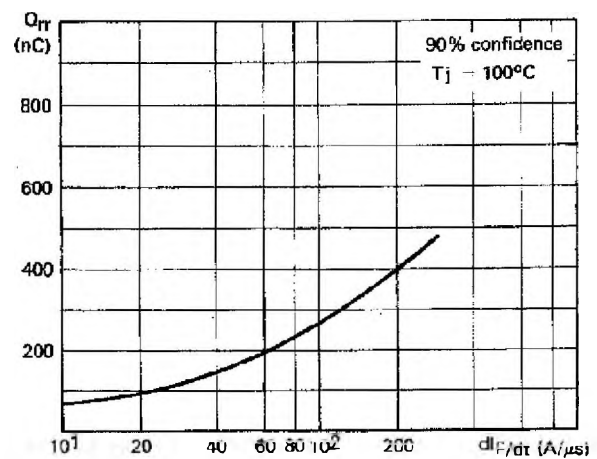


Fig.7 : Recovery time versus  $di_F/dt$ .

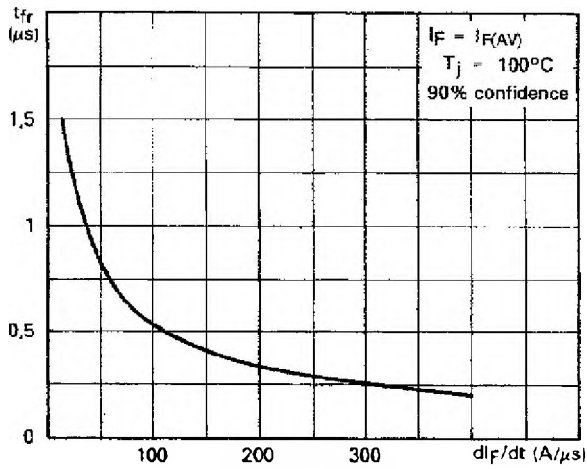


Fig.8 : Peak reverse current versus  $di_F/dt$ .

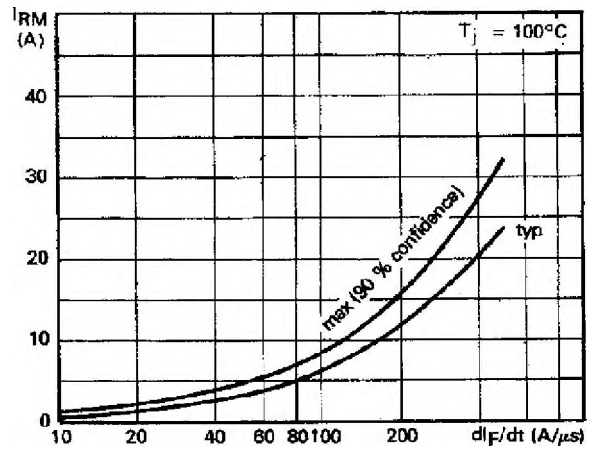


Fig.9 : Peak forward voltage versus  $di_F/dt$ .

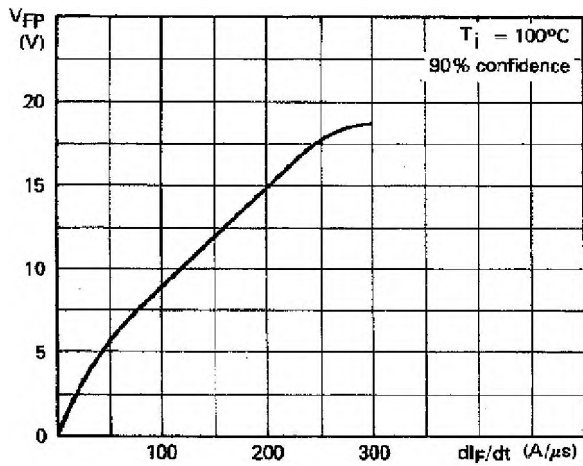


Fig.10 : Dynamic parameters versus junction temperature.

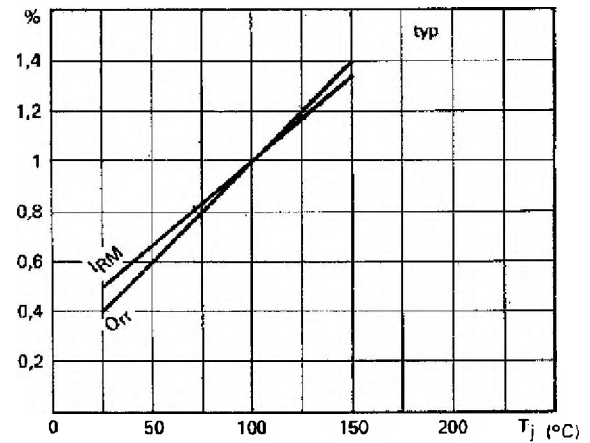


Fig.11 : TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)

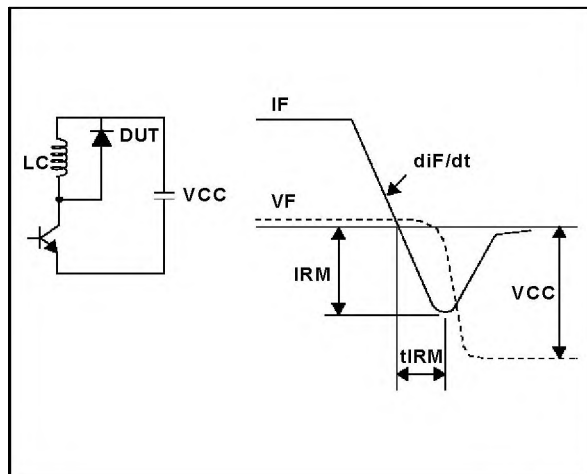
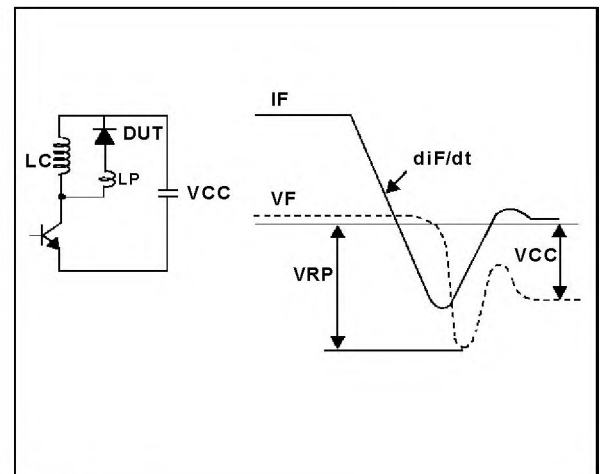
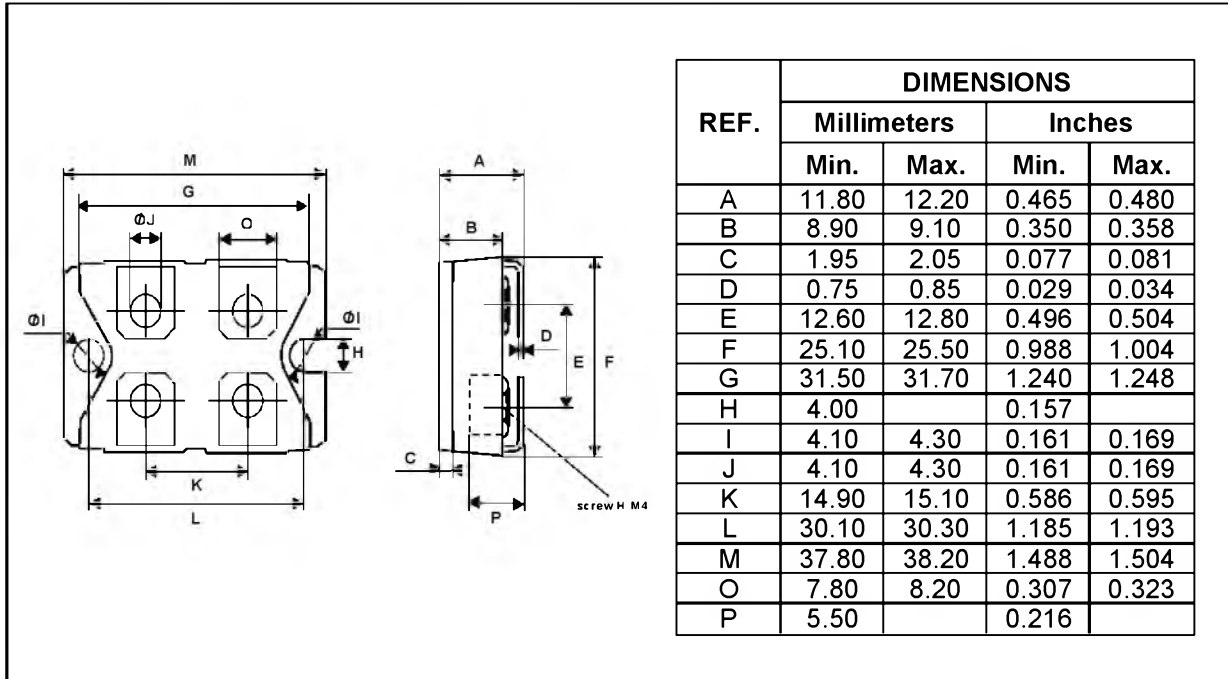


Fig.12 : TURN-OFF SWITCHING CHARACTERISTICS (With serie inductance)



**PACKAGE MECHANICAL DATA**  
ISOTOP Screw version



Cooling method : C  
 Marking : Type number  
 Weight : 28 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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