



# BYT230PIV-1000 BYT231PIV-1000

## FAST RECOVERY RECTIFIER DIODES

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 30 A
$V_{RRM}$	1000 V
$V_F(max)$	1.8 V
$t_{rr}(max)$	80 ns

### FEATURES AND BENEFITS

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED PACKAGE: ISOTOP  
Insulation voltage: 2500 V<sub>RMS</sub>  
Capacitance = 45 pF  
Inductance < 5 nH

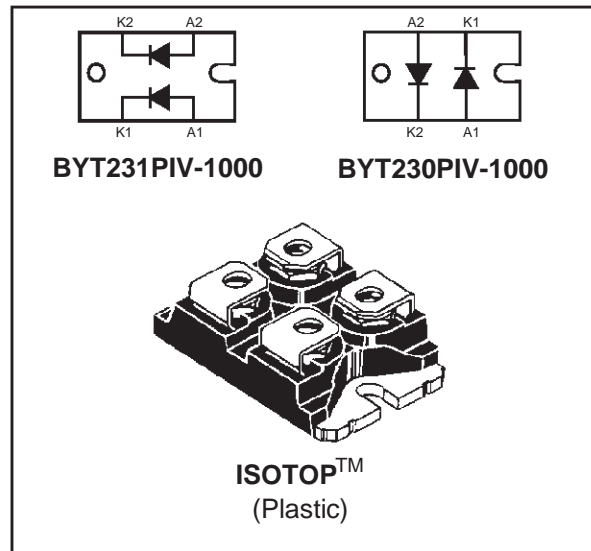
### DESCRIPTION

Dual high voltage rectifier devices are suited for free-wheeling function in converters and motor control circuits.

Packaged in ISOTOP, they are intended for use in Switch Mode Power Supplies.

### ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		1000	V
$I_{FRM}$	Repetitive peak forward current	$t_p = 5 \mu s \quad F = 1 kHz$	700	A
$I_{F(RMS)}$	RMS forward current		50	A
$I_{F(AV)}$	Average forward current	$T_c = 55^\circ C$ $\delta = 0.5$	30	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 ms \quad \text{Sinusoidal}$	200	A
$T_{stg}$	Storage temperature range		- 40 to + 150	°C
$T_j$	Maximum operating junction temperature		150	°C



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### THERMAL RESISTANCES

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

When the diodes 1 and 2 are used simultaneously :

$$\Delta T_j(\text{diode 1}) = P(\text{diode}) \times R_{th(j-c)} (\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

### STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
V <sub>F</sub> *	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 30 A			1.9	V
		T <sub>j</sub> = 100°C				1.8	
I <sub>R</sub> **	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			100	μA
		T <sub>j</sub> = 100°C				5	mA

Pulse test : \* t<sub>p</sub> = 380 μs, δ < 2%

\*\* t<sub>p</sub> = 5 ms, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 1.47 \times I_{F(AV)} + 0.010 I_{F(RMS)}^2$$

### RECOVERY CHARACTERISTICS (per diode)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A V <sub>R</sub> = 30V dI <sub>F</sub> /dt = - 15A/μs			165	ns
		I <sub>F</sub> = 0.5A I <sub>R</sub> = 1A I <sub>rr</sub> = 0.25A			80	

### TURN-OFF SWITCHING CHARACTERISTICS (per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>IRM</sub>	Maximum reverse recovery time	dI <sub>F</sub> /dt = - 120 A/μs	V <sub>CC</sub> = 200 V I <sub>F</sub> = 30 A L <sub>p</sub> ≤ 0.05 μH T <sub>j</sub> = 100°C (see fig. 11)			200	ns
		dI <sub>F</sub> /dt = - 240 A/μs				120	
I <sub>RM</sub>	Maximum reverse recovery current	dI <sub>F</sub> /dt = - 120 A/μs	T <sub>j</sub> = 100°C (see fig. 11)			19.5	A
		dI <sub>F</sub> /dt = - 240 A/μs				22	
C = $\frac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	T <sub>j</sub> = 100°C V <sub>CC</sub> = 200V I <sub>F</sub> = I <sub>F(AV)</sub> dI <sub>F</sub> /dt = - 30A/μs L <sub>p</sub> = 5μH (see fig. 12)				4.5	/

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

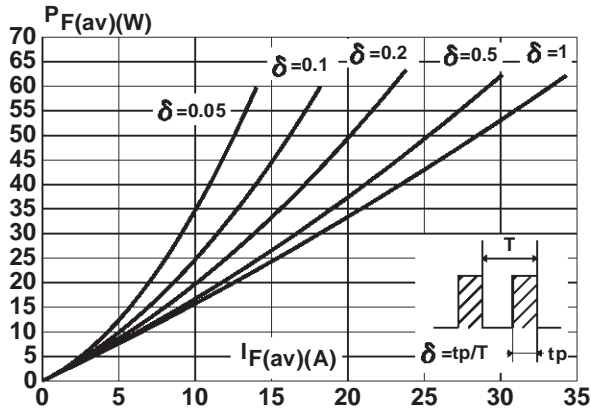


Fig. 2: Peak current versus form factor.

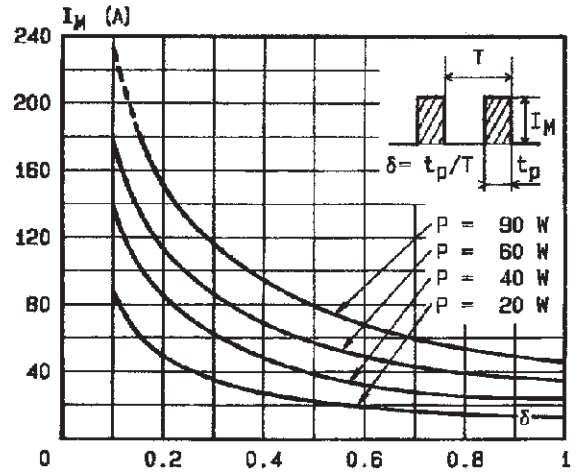


Fig. 3: Non repetitive peak surge current versus overload duration.

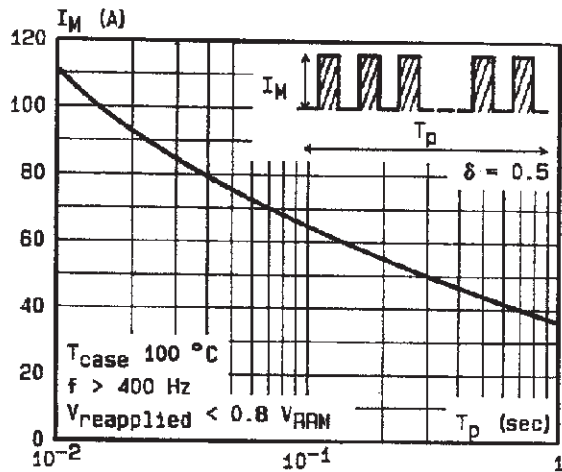


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration.

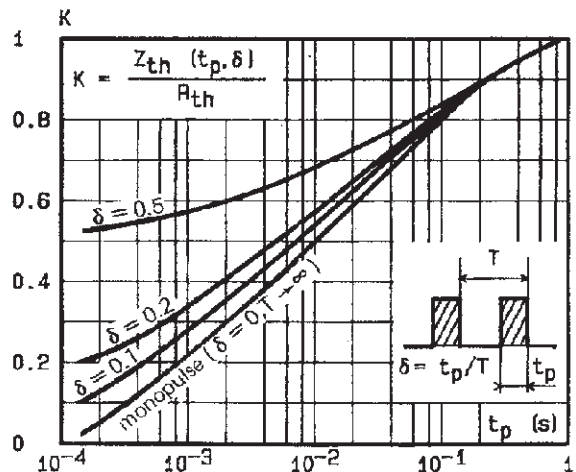


Fig. 5: Voltage drop versus forward current.

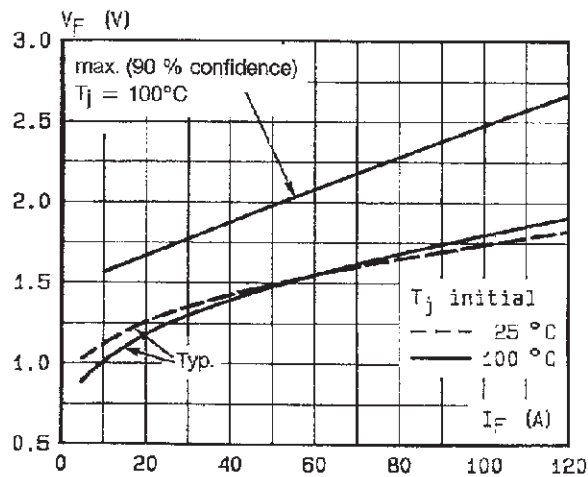


Fig. 6: Recovery charge versus diF/dt.

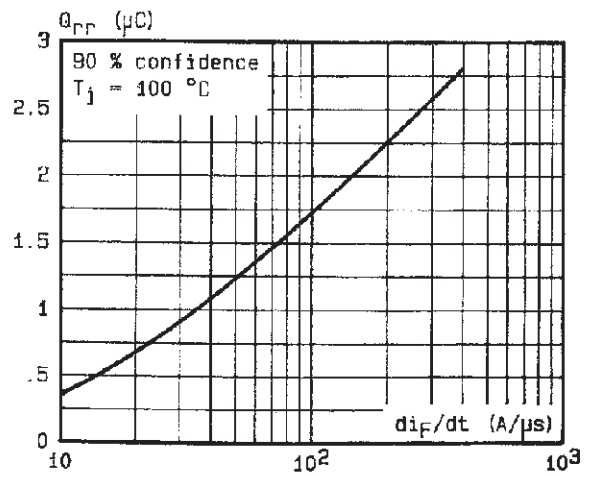


Fig. 7: Recovery time versus  $di_F/dt$ .

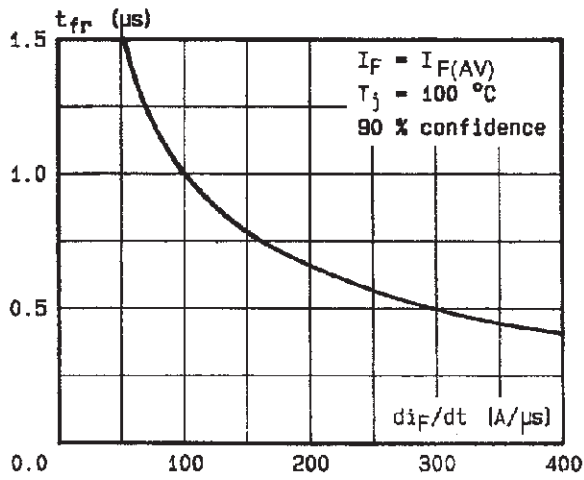


Fig. 9: Peak forward voltage versus  $di_F/dt$ .

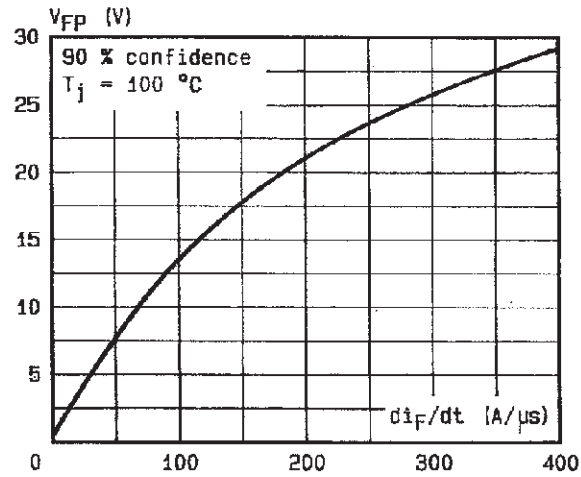


Fig. 11: Turn-off switching characteristics (without serie inductance).

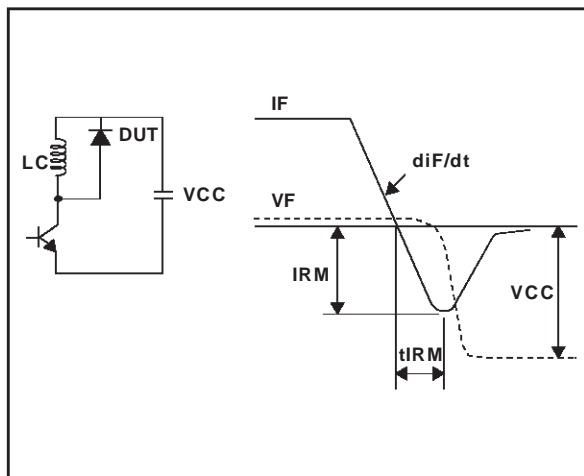


Fig. 8: Peak reverse current versus  $di_F/dt$ .

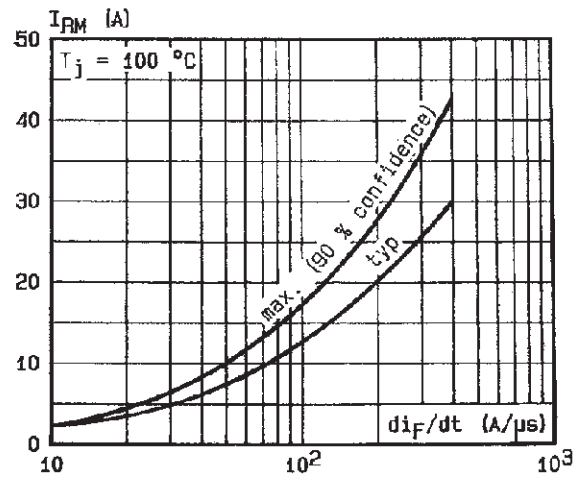


Fig. 10: Dynamic parameters versus junction temperature.

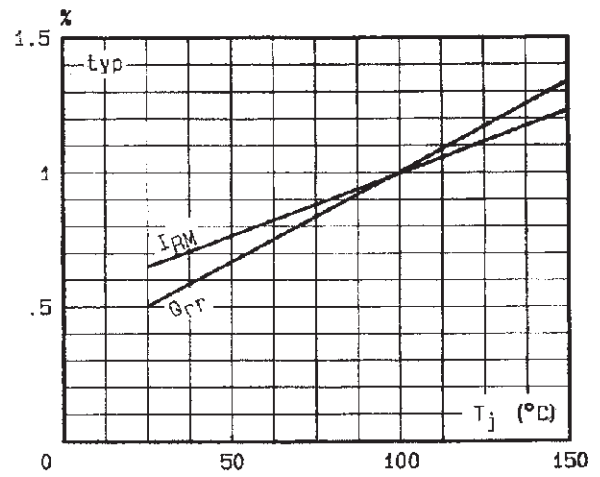
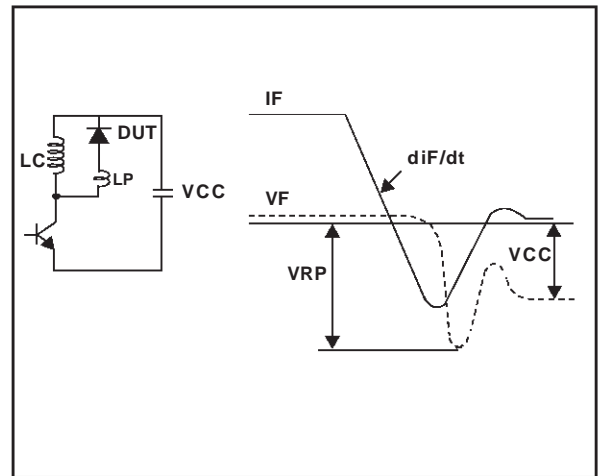
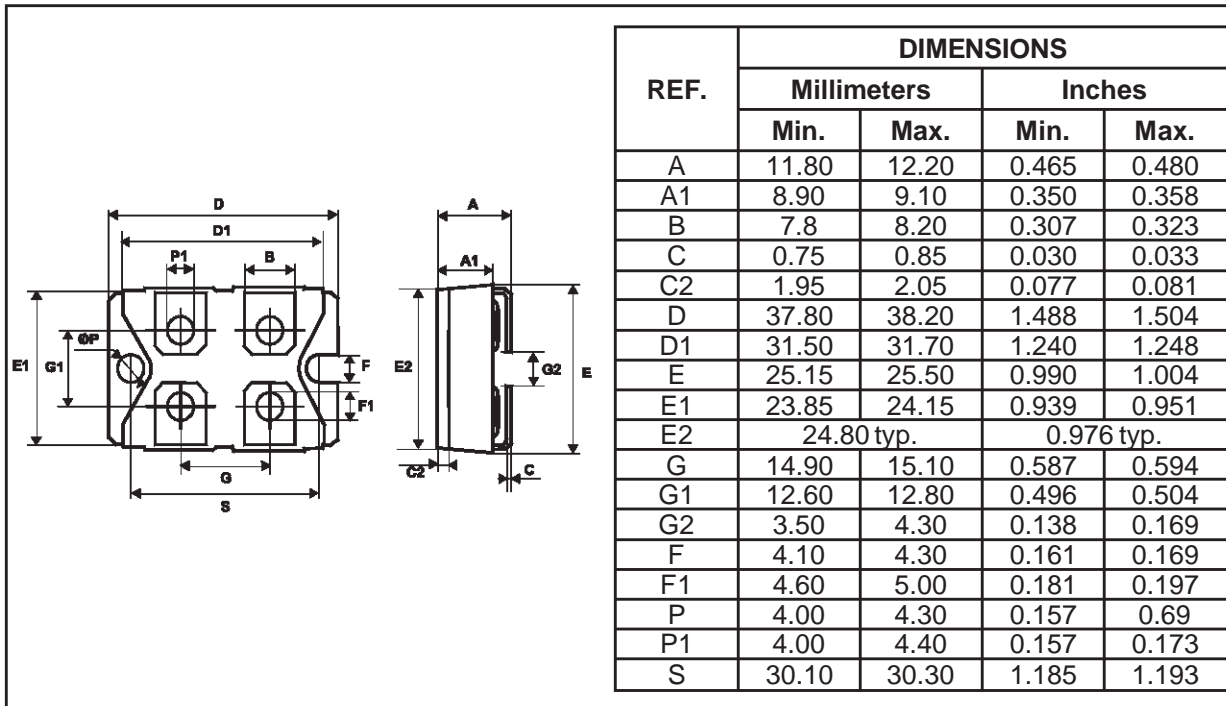


Fig. 12: Turn-off switching characteristics (with serie inductance).



**PACKAGE MECHANICAL DATA**  
ISOTOP



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BYT230PIV-1000	BYT230PIV-1000	ISOTOP	28 g. (without screws)	10	Tube
BYT231PIV-1000	BYT231PIV-1000	ISOTOP	28 g. (without screws)	10	Tube

- Cooling method: by conduction (C)
- 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.
- Epoxy meets UL94,V0

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