



# BYT230PIV-1000

# BYT231PIV-1000

## FAST RECOVERY RECTIFIER DIODES

### MAIN PRODUCT CHARACTERISTICS

I <sub>F(AV)</sub>	2 x 30 A
V <sub>RRM</sub>	1000 V
V <sub>F(max)</sub>	1.8 V
trr (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

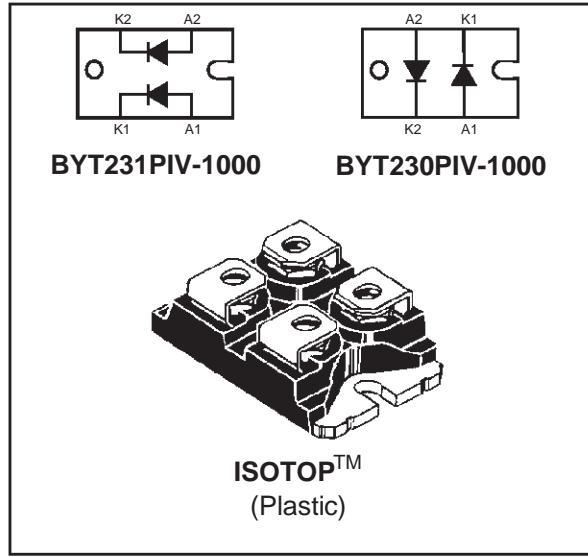
### DESCRIPTION

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 <sub>RRM</sub>	Repetitive peak reverse voltage		1000	V
I <sub>FRM</sub>	Repetitive peak forward current	tp=5 µs F=1kHz	700	A
I <sub>F(RMS)</sub>	RMS forward current		50	A
I <sub>F(AV)</sub>	Average forward current	T <sub>c</sub> = 55°C δ = 0.5	30	A
I <sub>FSM</sub>	Surge non repetitive forward current	tp = 10 ms Sinusoidal	200	A
T <sub>stg</sub>	Storage temperature range		- 40 to + 150	°C
T <sub>j</sub>	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	1.5 0.8	°C/W
R <sub>th(c)</sub>	Coupling	0.1	

When the diodes 1 and 2 are used simultaneously:

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

### 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	

Pulse test : \* tp = 380 μs, δ < 2%

\*\* tp = 5 ms, δ < 2%

To evaluate the conduction losses use the following equation:

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

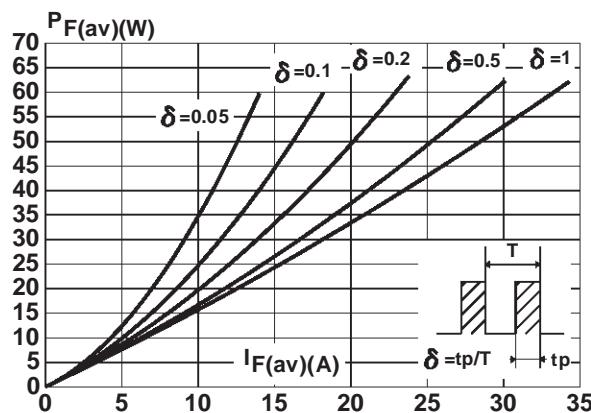
### RECOVERY CHARACTERISTICS (per diode)

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	

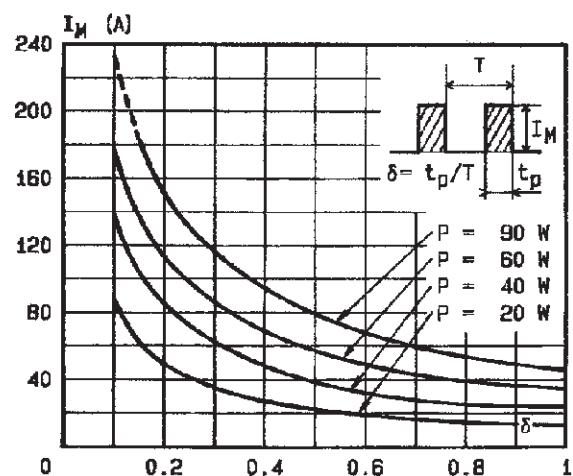
### TURN-OFF SWITCHING CHARACTERISTICS (per diode)

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			200	ns
		dI <sub>F</sub> /dt = - 240 A/μs					120	
I <sub>IRM</sub>	Maximum reverse recovery current	dI <sub>F</sub> /dt = - 120 A/μs	L <sub>p</sub> ≤ 0.05 μH	T <sub>j</sub> = 100°C			19.5	A
		dI <sub>F</sub> /dt = - 240 A/μs			(see fig. 11)		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	/

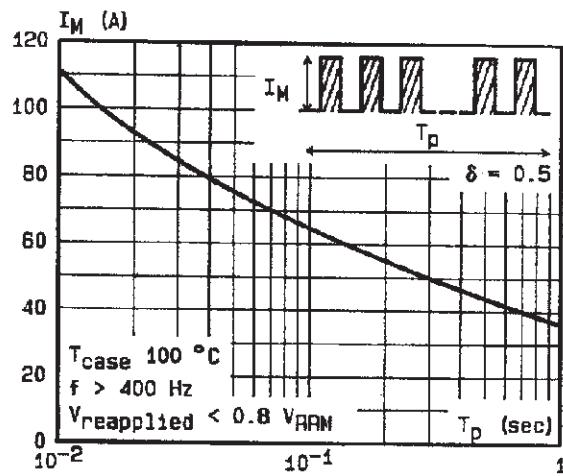
**Fig. 1:** Low frequency power losses versus average current.



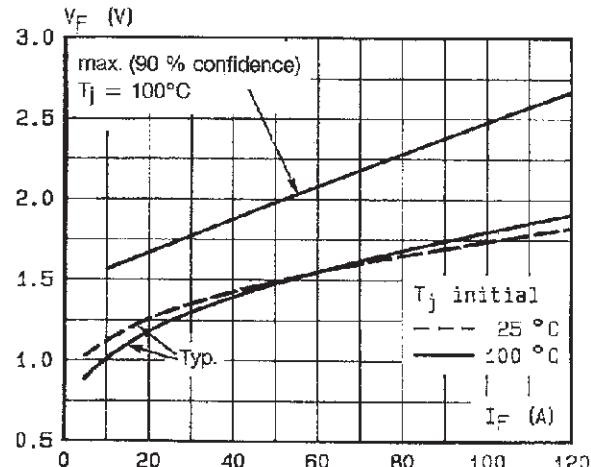
**Fig. 2:** Peak current versus form factor.



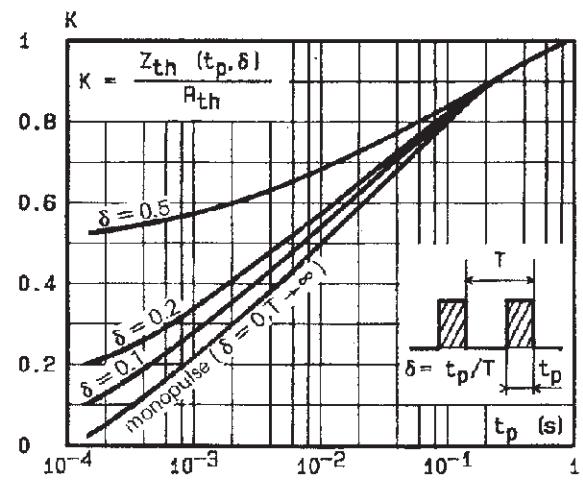
**Fig. 3:** Non repetitive peak surge current versus overload duration.



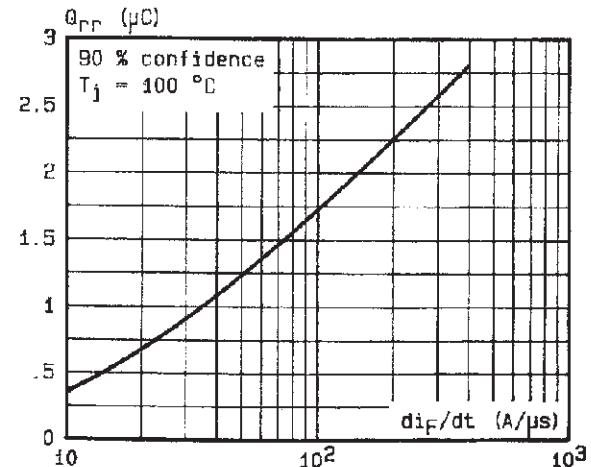
**Fig. 5:** Voltage drop versus forward current.



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

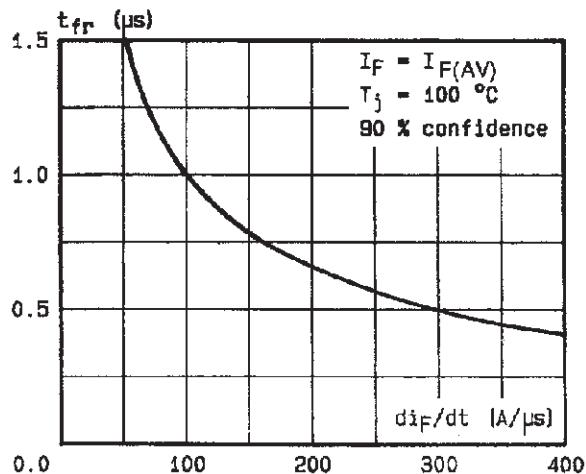


**Fig. 6:** Recovery charge versus  $dI_F/dt$ .

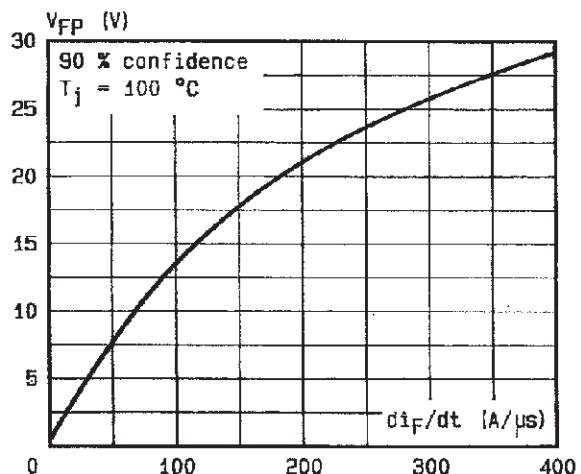


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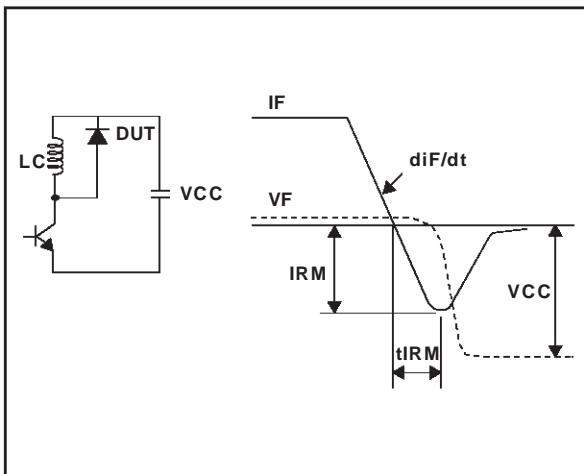
**Fig. 7:** Recovery time versus  $dI_F/dt$ .



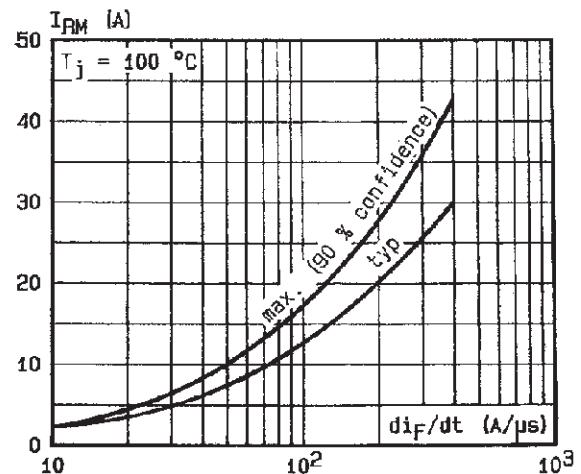
**Fig. 9:** Peakforward voltage versus  $dI_F/dt$ .



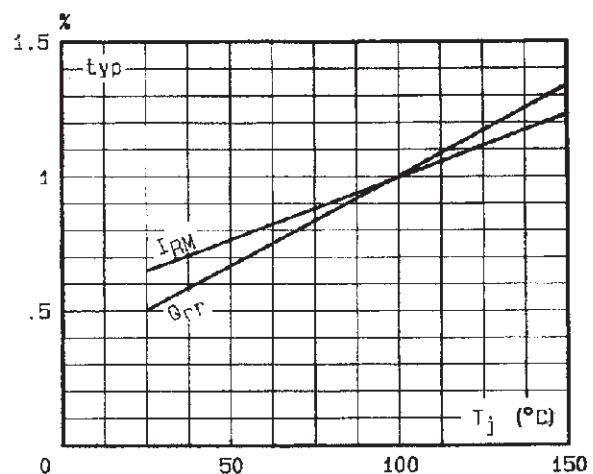
**Fig. 11:** Turn-off switching characteristics (without serie inductance).



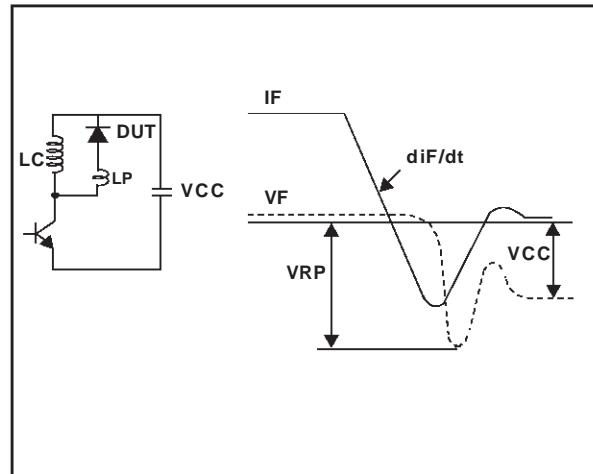
**Fig. 8:** Peak reverse current versus  $dI_F/dt$ .



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



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



**PACKAGE MECHANICAL DATA**  
 ISOTOP

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	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 typ.		0.976 typ.	
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

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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