



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_{RMS}
Capacitance = 45 pF
Inductance < 5 nH

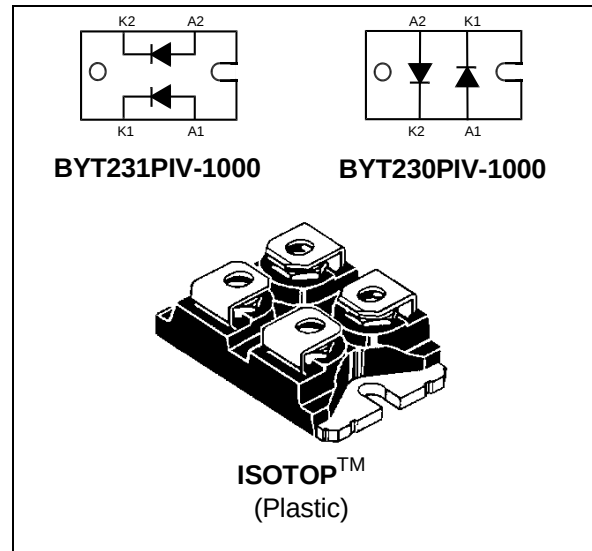
DESCRIPTION

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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BYT230PIV-1000 / BYT231PIV-1000**THERMAL RESISTANCES**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.5	°C/W
		Total	0.8	
$R_{th(c)}$		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_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 30\text{ A}$			1.9	V
		$T_j = 100^\circ\text{C}$				1.8	
I_R^{**}	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			100	μA
		$T_j = 100^\circ\text{C}$				5	mA

Pulse test : * $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

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

To evaluate the conduction losses use the following equation:

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

RECOVERY CHARACTERISTICS (per diode)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{rr}	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $V_R = 30\text{ V}$ $di_F/dt = -15\text{ A}/\mu\text{s}$			165	ns
		$I_F = 0.5\text{ A}$ $I_R = 1\text{ A}$ $I_{rr} = 0.25\text{ A}$			80	

TURN-OFF SWITCHING CHARACTERISTICS (per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t_{IRM}	Maximum reverse recovery time	$di_F/dt = -120\text{ A}/\mu\text{s}$	$V_{CC} = 200\text{ V}$ $I_F = 30\text{ A}$ $L_p \leq 0.05\text{ }\mu\text{H}$ $T_J = 100^\circ\text{C}$ (see fig. 11)			200	ns
		$di_F/dt = -240\text{ A}/\mu\text{s}$			120		
I_{RM}	Maximum reverse recovery current	$di_F/dt = -120\text{ A}/\mu\text{s}$				19.5	A
		$di_F/dt = -240\text{ A}/\mu\text{s}$			22		
$C = \frac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	$T_J = 100^\circ\text{C}$ $V_{CC} = 200\text{V}$ $I_F = I_{F(AV)}$ $di_F/dt = -30\text{A}/\mu\text{s}$ $L_p = 5\mu\text{H}$ (see fig. 12)				4.5	/

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

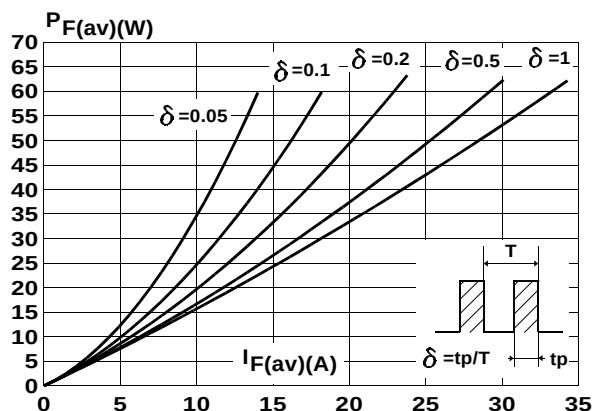


Fig. 2: Peak current versus form factor.

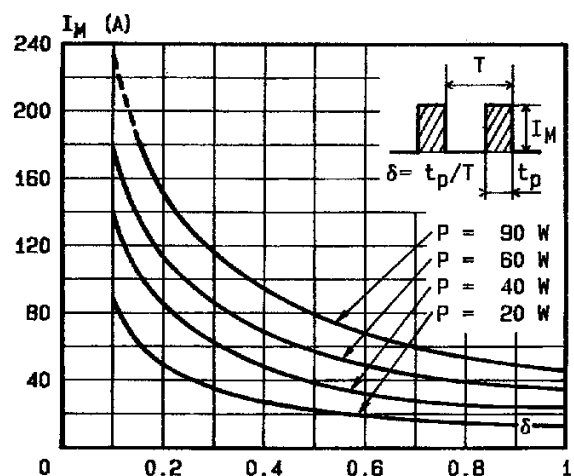


Fig. 3: Non repetitive peak surge current versus overload duration.

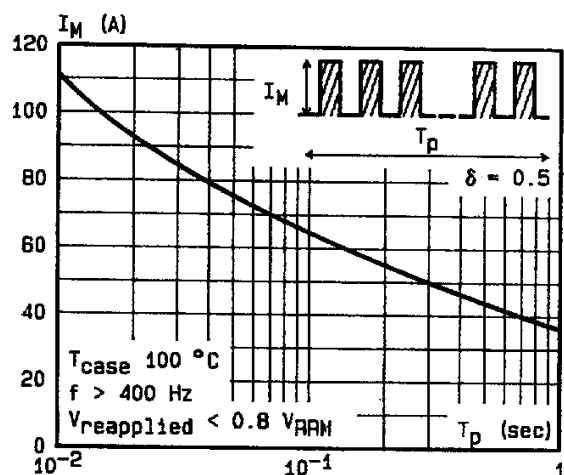


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration.

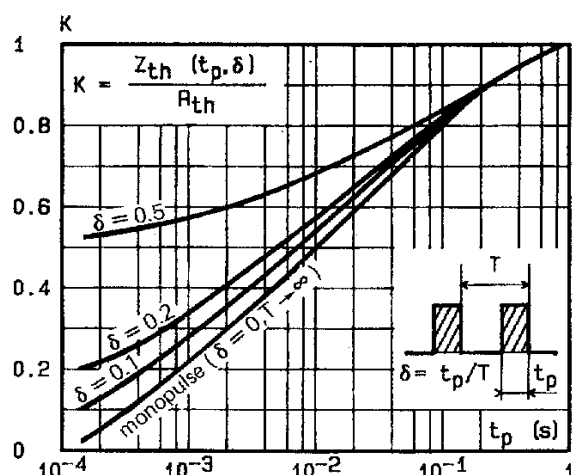


Fig. 5: Voltage drop versus forward current.

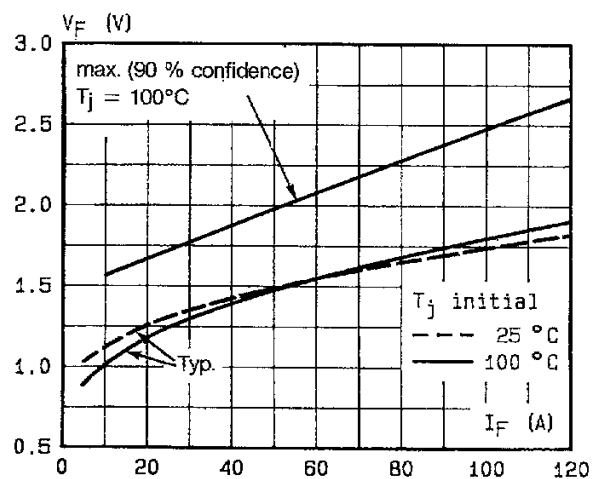


Fig. 6: Recovery charge versus di_F/dt .

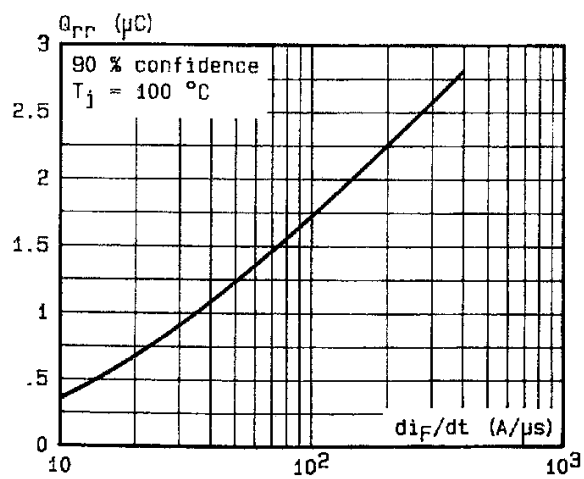


Fig. 7: Recovery time versus di_F/dt .

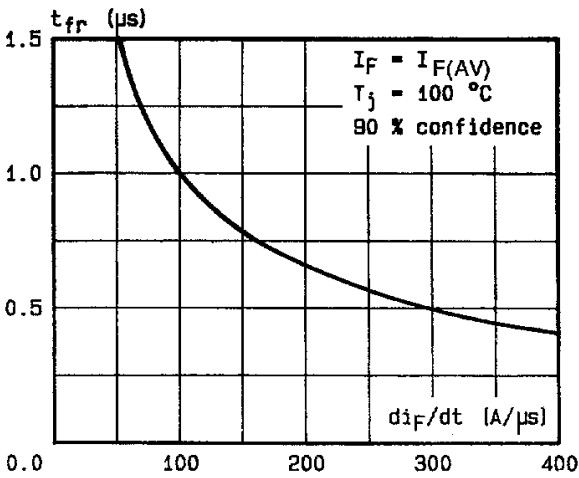


Fig. 9: Peak forward voltage versus di_F/dt .

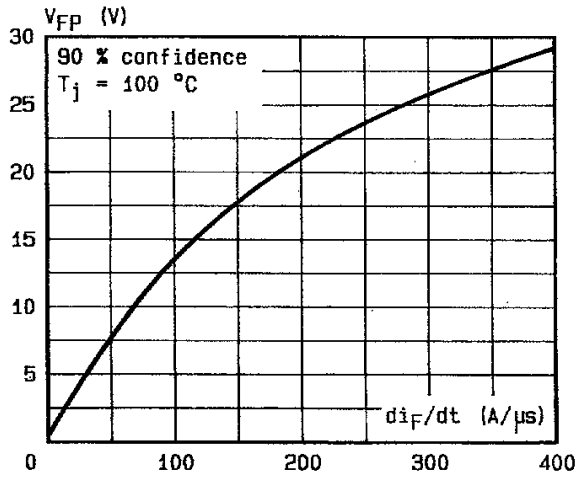


Fig. 11: Turn-off switching characteristics (without series inductance).

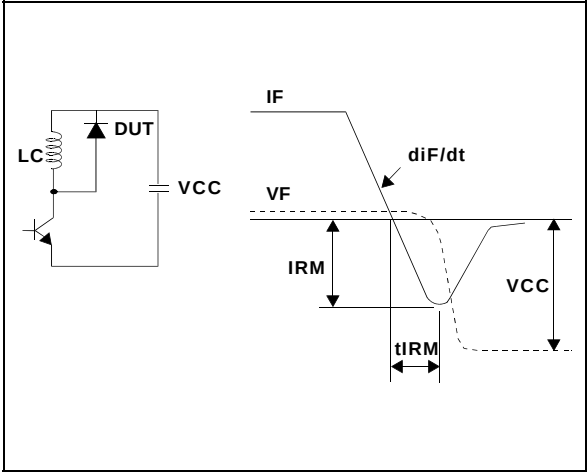


Fig. 8: Peak reverse current versus di_F/dt .

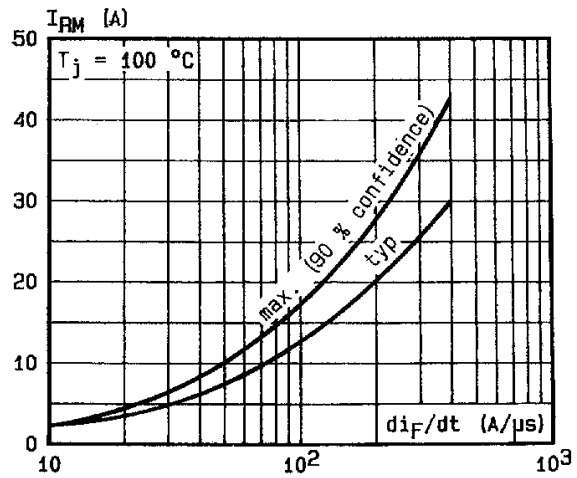


Fig. 10: Dynamic parameters versus junction temperature.

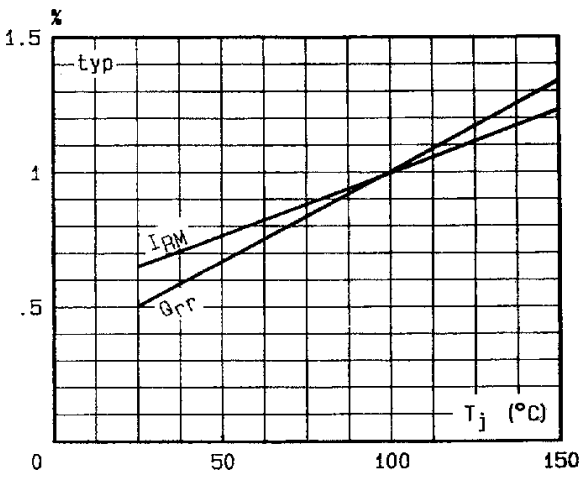
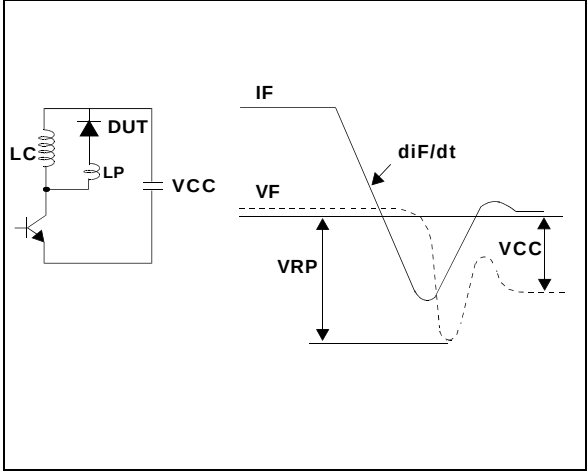


Fig. 12: Turn-off switching characteristics (with series inductance).



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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