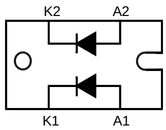
BYT230PIV-1000
BYT231PIV-1000

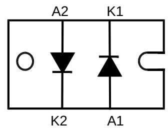
FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCT CHARACTERISTICS

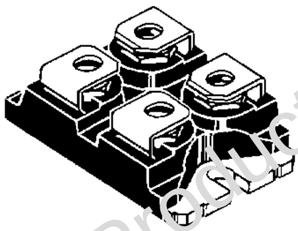
$I_{F(AV)}$	**2 x 30 A**
V_{RRM}	**1000 V**
V_F (max)	**1.8 V**
trr (max)	**80 ns**



BYT231PIV-1000



BYT230PIV-1000



ISOTOP™
(Plastic)

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	tp=5 µs F=1kHz	700	A
$I_{F(RMS)}$	RMS forward current		50	A
$I_{F(AV)}$	Average forward current	Tc = 55°C δ = 0.5	30	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal	200	A
T_{stg}	Storage temperature range		- 40 to + 150	°C
Tj	Maximum operating junction temperature		150	°C

TM: ISOTOP is a registered trademark of STMicroelectronics.

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode Total	1.5 0.8	°C/W
$R_{th(c)}$		Coupling	0.1	

When the diodes 1 and 2 are used simultaneously :
Δ Tj(diode 1) = P(diode) x $R_{th(j-c)}$ (Per diode) + P(diode 2) x $R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
V_F *	Forward voltage drop	Tj = 25°C	I_F = 30 A			1.9	V
		Tj = 100°C				1.8	
I_R **	Reverse leakage current	Tj = 25°C	$V_R = V_{RRM}$			100	µA
		Tj = 100°C				5	mA

Pulse test : * tp = 380 µs, δ < 2%
** tp = 5 ms, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 1.47 \times I_{F(AV)} + 0.010\, I_F^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS (per diode)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{rr}	Tj = 25°C	I_F = 1A V_R = 30V dI_F/dt = - 15A/µs			165	ns
		I_F = 0.5A I_R = 1A I_{rr} = 0.25A			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 A/µs	V_{CC} = 200 V I_F = 30 A $L_p \leq 0.05$ µH Tj = 100°C (see fig. 11)			200	ns
		dI_F/dt = - 240 A/µs			120		
I_{RM}	Maximum reverse recovery current	dI_F/dt = - 120 A/µs				19.5	A
		dI_F/dt = - 240 A/µs			22		
$C = \frac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	Tj = 100°C V_{CC} = 200V $I_F = I_{F(AV)}$ dI_F/dt = - 30A/µs L_p = 5µH (see fig. 12)				4.5	/

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

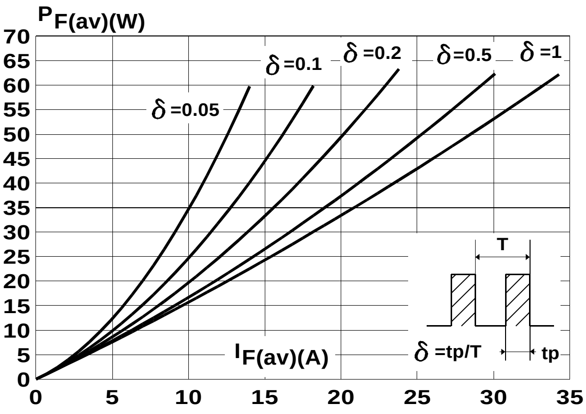


Fig. 2: Peak current versus form factor.

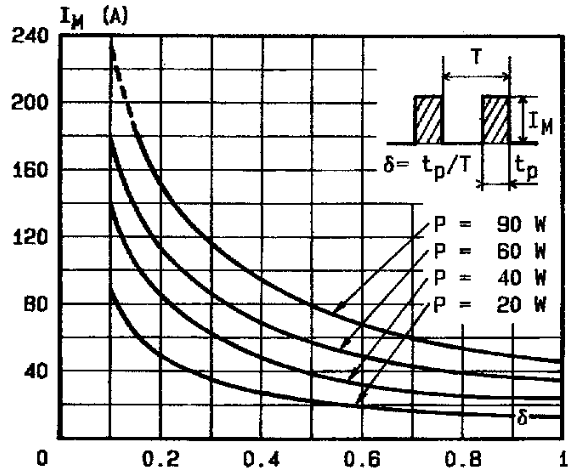


Fig. 3: Non repetitive peak surge current versus overload duration.

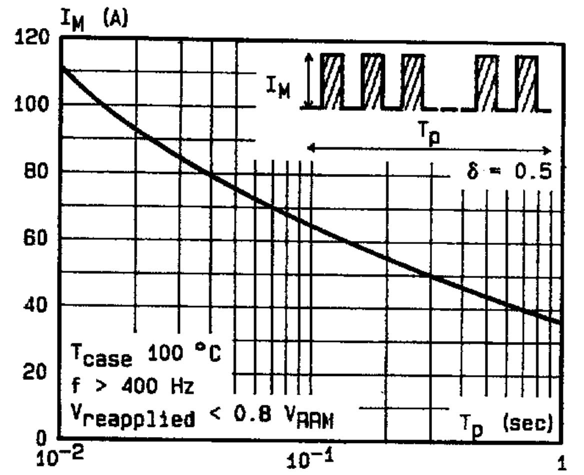


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration.

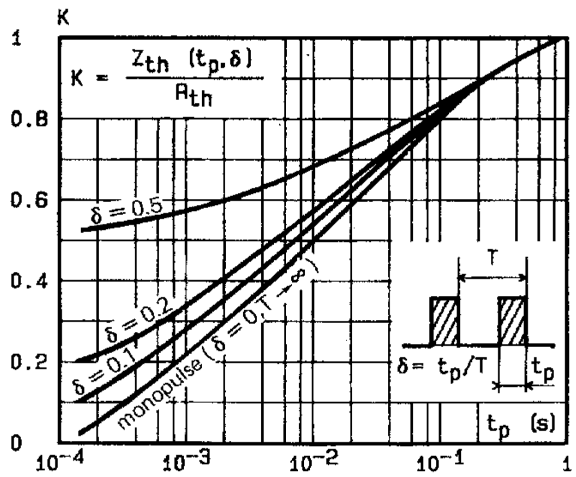


Fig. 5: Voltage drop versus forward current.

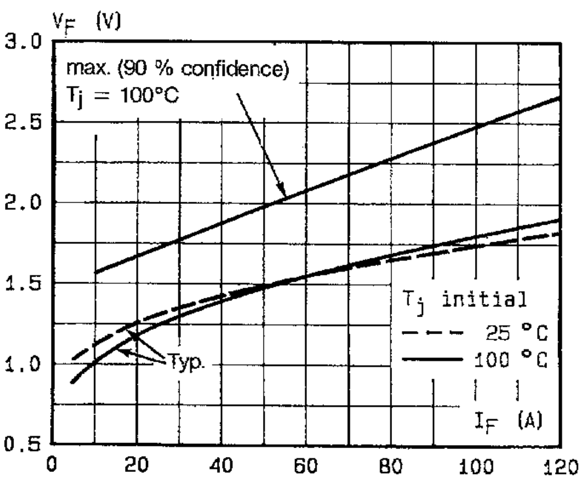


Fig. 6: Recovery charge versus di_F/dt.

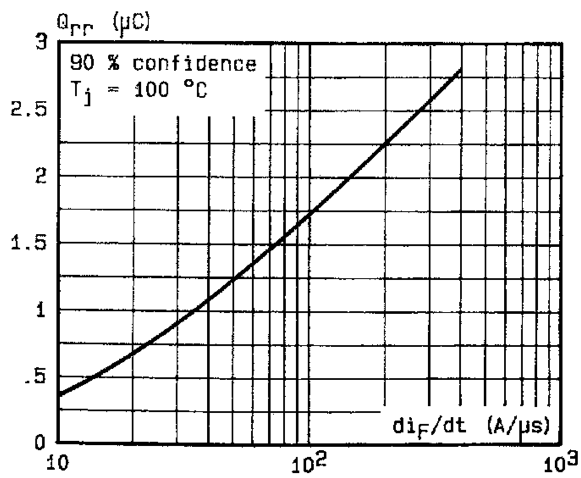


Fig. 7: Recovery time versus dI_F/dt.

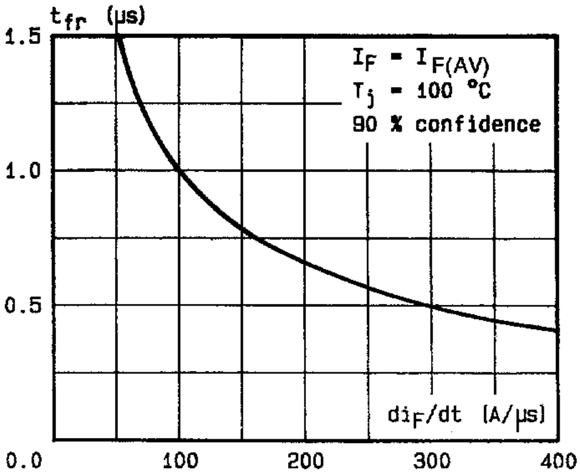


Fig. 8: Peak reverse current versus dI_F/dt.

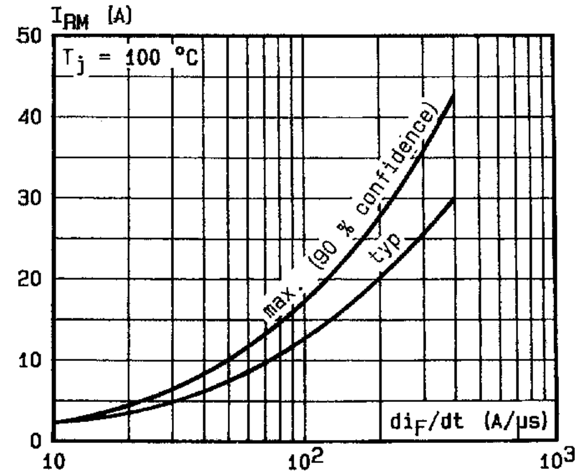


Fig. 9: Peak forward voltage versus dI_F/dt.

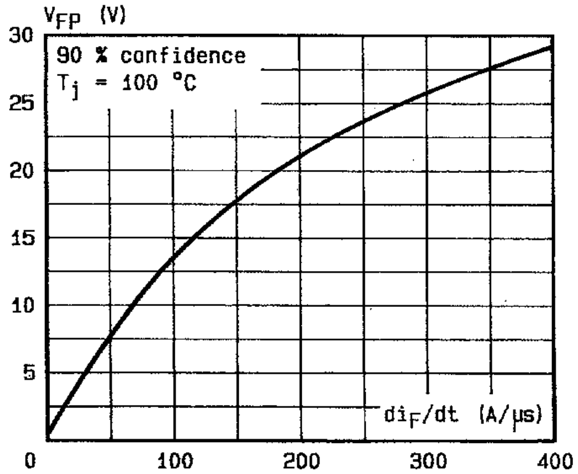


Fig. 10: Dynamic parameters versus junction temperature.

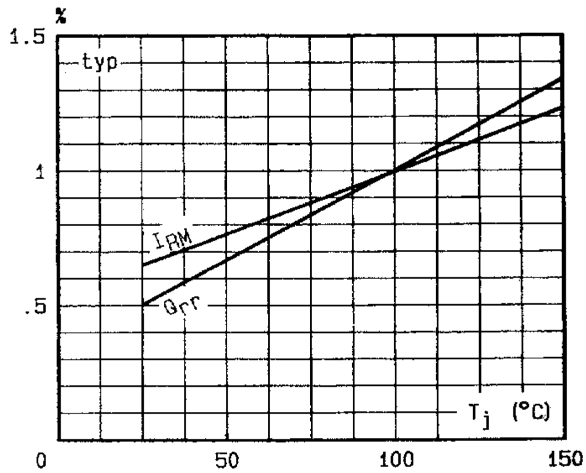


Fig. 11: Turn-off switching characteristics (without serie inductance).

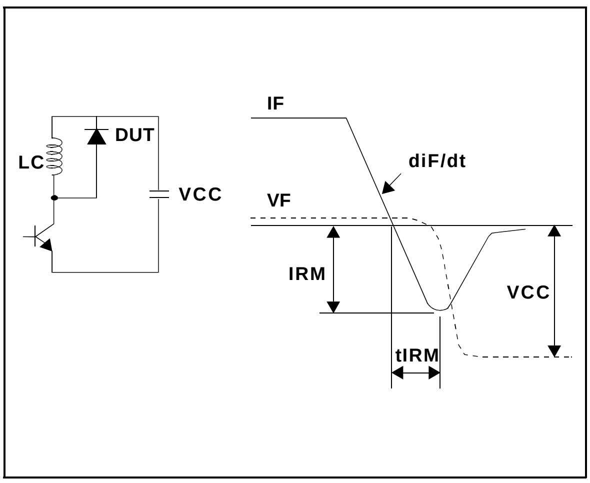
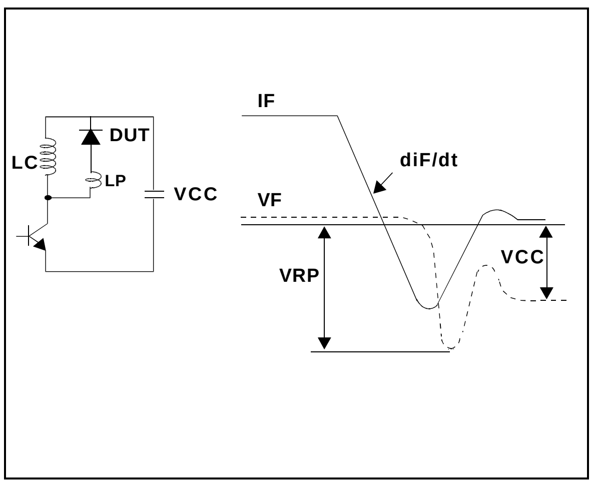
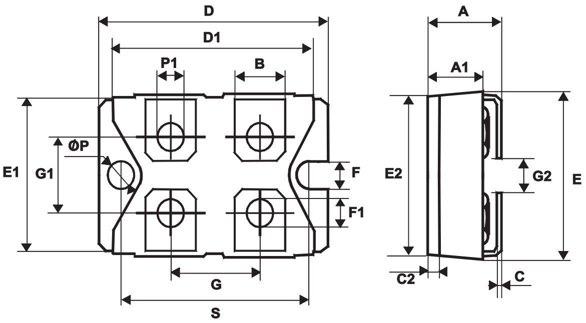


Fig. 12: Turn-off switching characteristics (with serie inductance).



PACKAGE MECHANICAL DATA

ISOTOP



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
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- 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