BYT230PIV-400
BYT231PIV-400

FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCT CHARACTERISTICS

|	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	400 V
V_F (max)	1.4 V
trr (max)	50 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

These 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.

BYT231PIV-400   BYT230PIV-400

ISOTOP^{TM}
(Plastic)
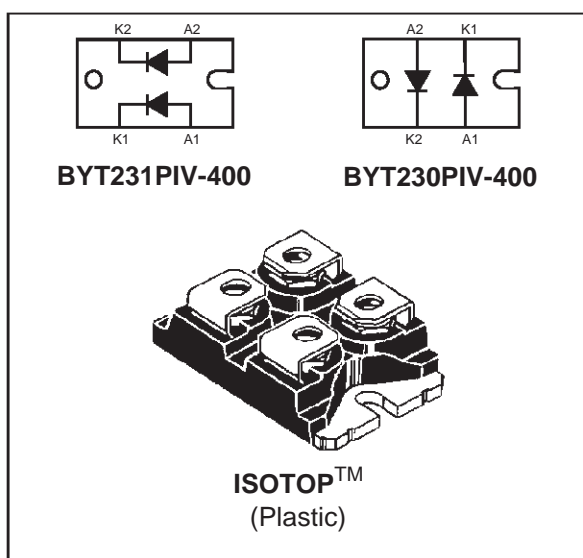
ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		400	V
I_{FRM}	Repetitive peak forward current	tp=5 μs F=1kHz	900	A
$I_{F(RMS)}$	RMS forward current		50	A
$I_{F(AV)}$	Average forward current	Tc = 75°C δ = 0.5	30	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal	350	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			1.5	V
		Tj = 100°C				1.4	
I_R **	Reverse leakage current	Tj = 25°C	V_R = V_{RRM}			35	μA
		Tj = 100°C				6	mA

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

To evaluate the conduction losses use the following equation:
P = 1.1 x $I_{F(AV)}$ + 0.0095 $I_F^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{rr}	Tj = 25°C	I_F = 1A V_R = 30V dI_F/dt = - 15A/μs			100	ns
		I_F = 0.5A I_R = 1A I_{rr} = 0.25A			50	

TURN-OFF SWITCHING CHARACTERISTICS

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 ® 0.05 μH Tj = 100°C (see fig. 13)			75	ns
		dI_F/dt = - 240 A/μs			50		
I_{RM}	Maximum reverse recovery current	dI_F/dt = - 120 A/μs				9	A
		dI_F/dt = - 240 A/μs			12		
$C = \dfrac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	Tj = 100°C V_{CC} = 60V I_F = $I_{F(AV)}$ dI_F/dt = - 30A/μs L_p = 1μH (see fig. 14)			3.3		/

Fig. 1: Average forward power dissipation versus average forward current (per diode).
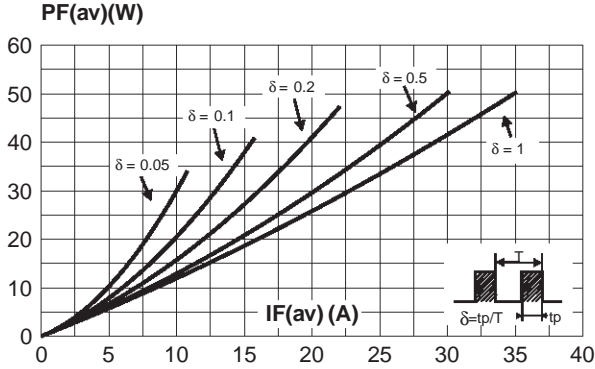
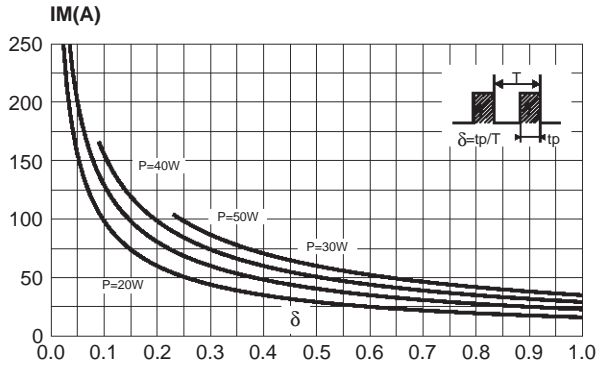**Fig. 2:** Peak current versus form factor (per diode).

Fig. 3: Average forward current versus ambient temperature (δ=0.5, per diode).
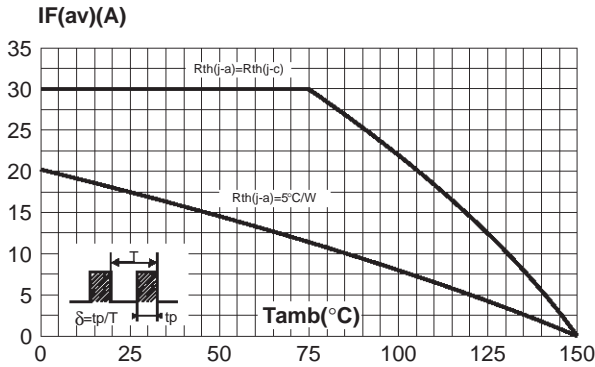
Fig. 4: Non repetitive surge peak forward current versus overload duration (per diode).
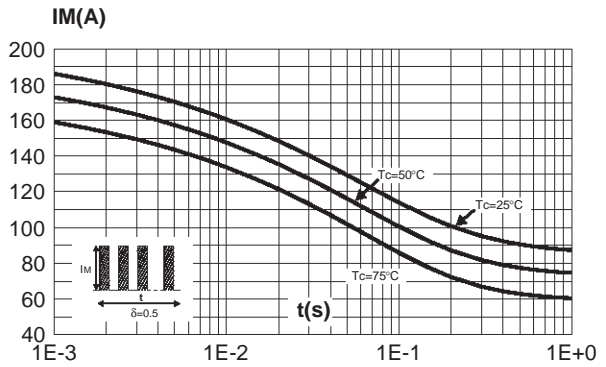

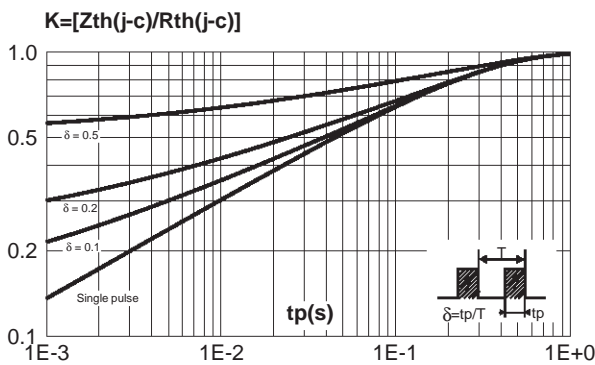**Fig. 5:** Relative variation of thermal impedance junction to case versus pulse duration (per diode).

Fig. 6: Forward voltage drop versus forward current (maximum values, per diode).
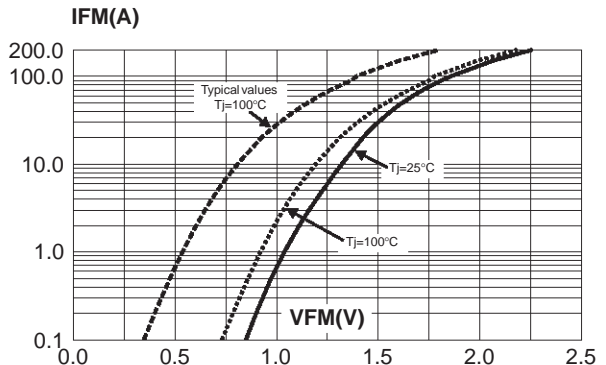
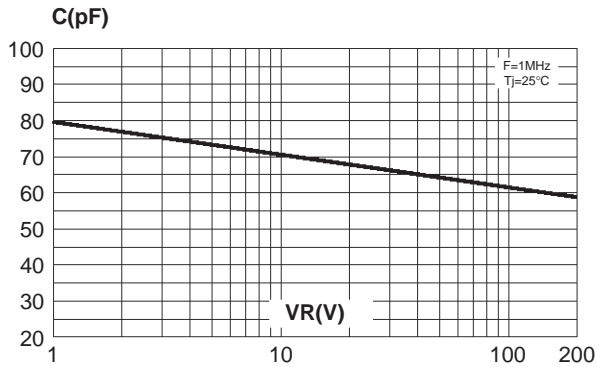**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values, per diode).

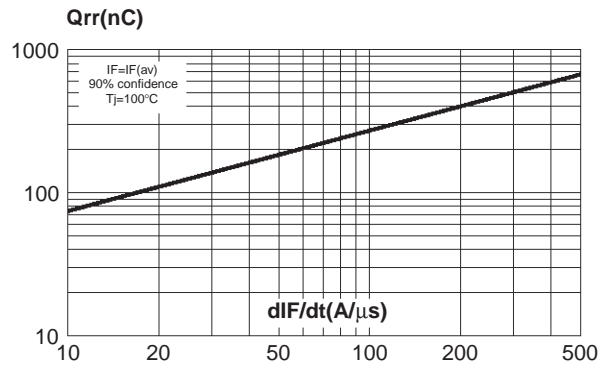**Fig. 8:** Recovery charges versus dI_F/dt (per diode).

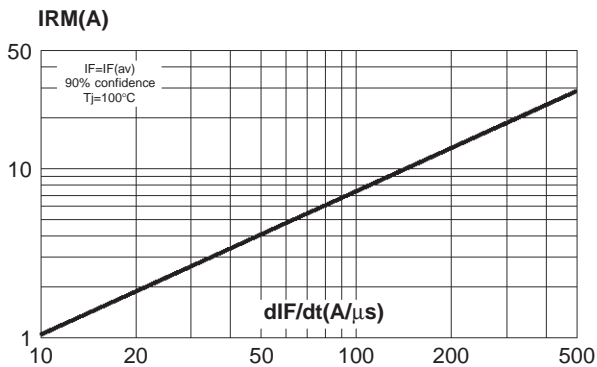**Fig. 9:** Recovery current versus dI_F/dt (per diode).

Fig. 10: Transient peak forward voltage versus dI_F/dt (per diode).
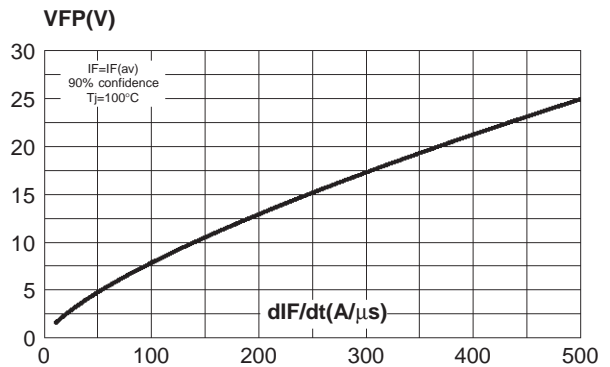

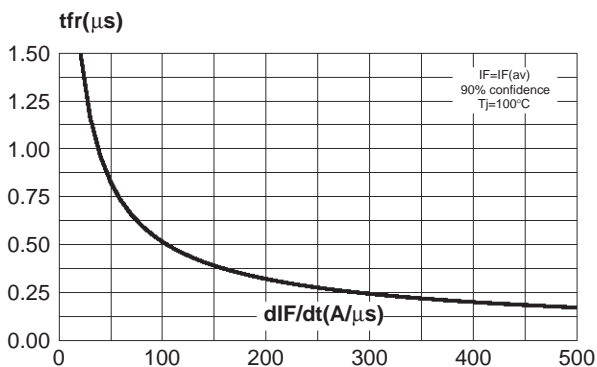**Fig. 11:** Forward recovery time versus dI_F/dt (per diode).

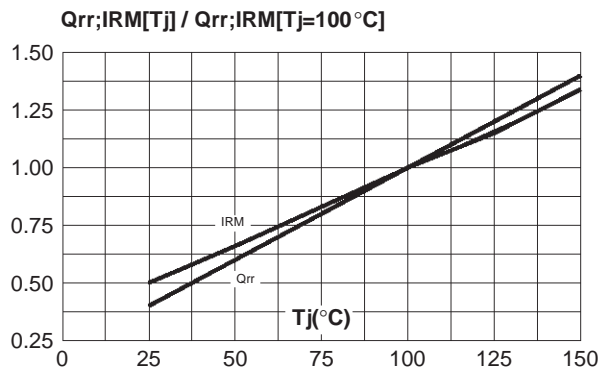**Fig. 12:** Dynamic parameters versus junction temperature.

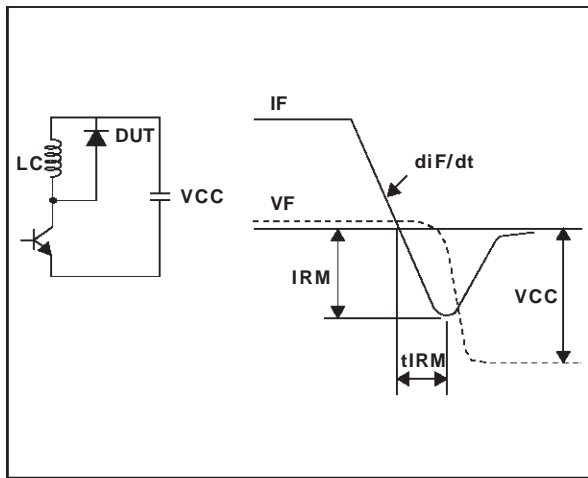**Fig. 13:** Turn-off switching characteristics (without serie inductance).

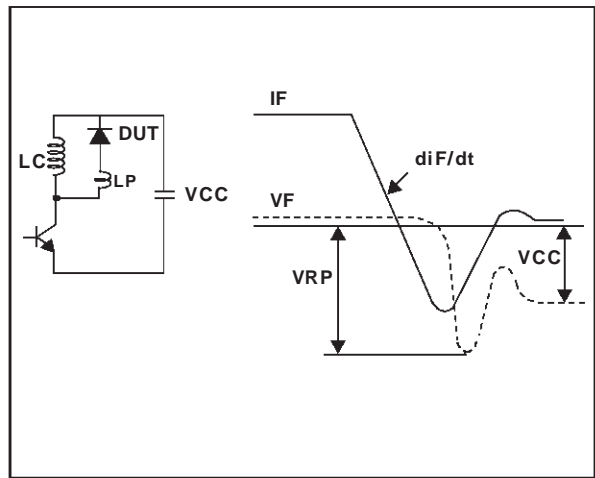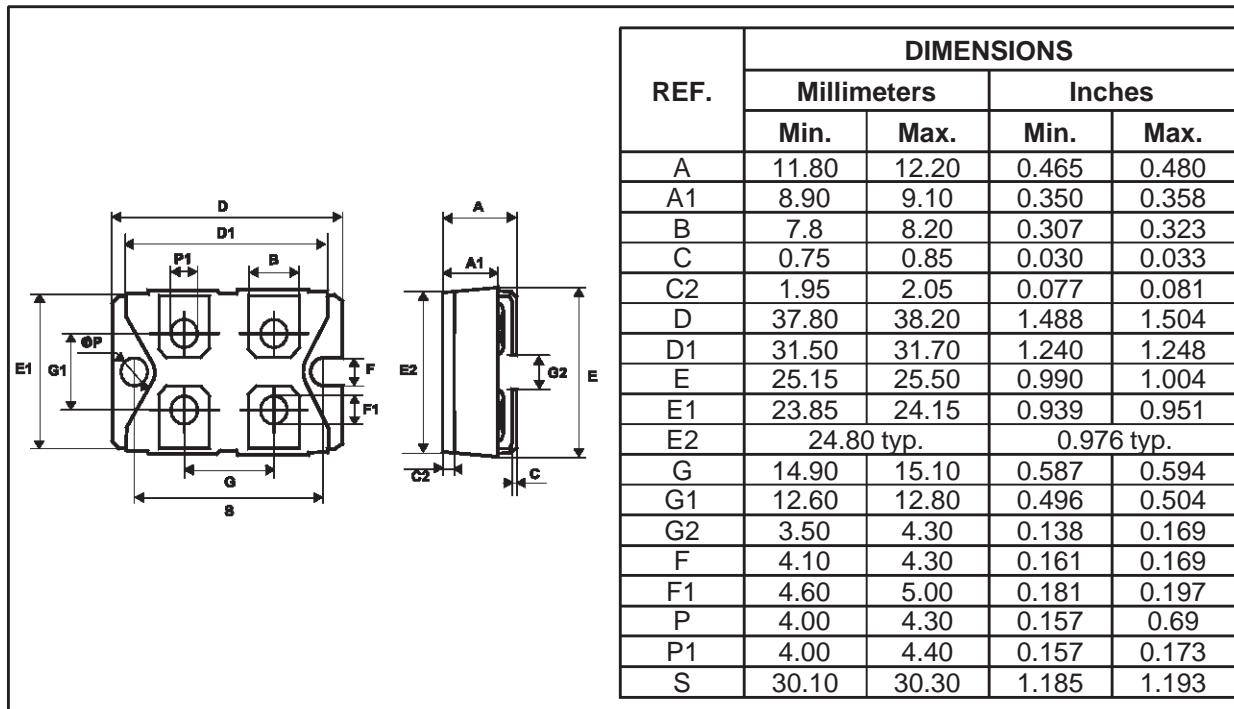**Fig. 14:** Turn-off switching characteristics (with serie inductance).

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-400	BYT230PIV-400	ISOTOP	28 g. (without screws)	10	Tube
BYT231PIV-400	BYT231PIV-400	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