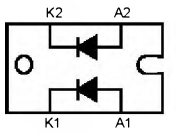
SGS-THOMSON MICROELECTRONICS

BYT230PIV-400
BYT231PIV-400

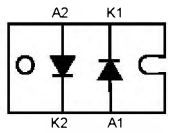
FAST RECOVERY RECTIFIER DIODES

FEATURES

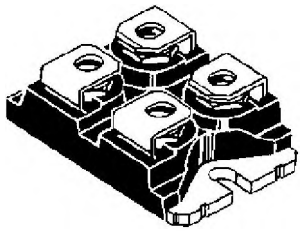
- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED PACKAGE :
  Insulating voltage = 2500 V_{RMS}
  Capacitance = 45 pF



BYT231PIV-400



BYT230PIV-400



ISOTOP™
(Plastic)

DESCRIPTION

Dual high voltage rectifiers ranging from 200V to 400V suited for Switch Mode Power Supplies and other power converters.
The devices are packaged in ISOTOP.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter			Value	Unit
I_{FRM}	Repetitive peak forward current	tp ≤ 10µs		500	A
$I_{F(RMS)}$	RMS forward current		Per diode	50	A
$I_{F(AV)}$	Average forward current	Tc=75°C δ = 0.5	Per diode	30	A
I_{FSM}	Surge non repetitive forward current	tp=10ms sinusoidal	Per diode	350	A
Tstg Tj	Storage and junction temperature range			- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	BYT230PIV-/ BYT231PIV-			Unit
		200	300	400	
V_{RRM}	Repetitive peak reverse voltage	200	300	400	V

TM : ISOTOP is a trademark of **SGS-THOMSON Microelectronics**.

THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction to case	Per diode	1.5	°C/W
		Total	0.8	
Rth (c)	Coupling		0.1	°C/W

When the diodes 1 and 2 are used simultaneously :
Δ Tj(diode 1) = P(diode) x Rth(Per diode) + P(diode 2) x Rth(c)

ELECTRICAL CHARACTERISTICS (Per diode)
STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
V_F *	T_j = 25°C	I_F = 30 A			1.5	V
	T_j = 100°C				1.4	
I_R **	T_j = 25°C	$V_R = V_{RRM}$			35	µA
	T_j = 100°C				6	mA

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

RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	T_j = 25°C	I_F = 0.5A Irr = 0.25A I_R = 1A			50	ns
		I_F = 1A dI_F/dt = -15A/µs V_R = 30V			100	

TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{IRM}	dI_F/dt = -120A/µs	V_{CC} = 200V I_F = 30A Lp ≤ 0.05µH T_j = 100°C see fig. 11			75	ns
	dI_F/dt = -240A/µs			50		
I_{RM}	dI_F/dt = -120A/µs				9	A
	dI_F/dt = -240A/µs			12		

TURN-OFF OVERVOLTAGE COEFFICIENT (With serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	T_j = 100°C V_{CC} = 60V $I_F = I_{F(AV)}$ dI_F/dt = -30A/µs Lp = 1µH	see note see fig.12		3.3		/

Note : Applicable to BYT230PIV-400 / BYT231PIV-400 only

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

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

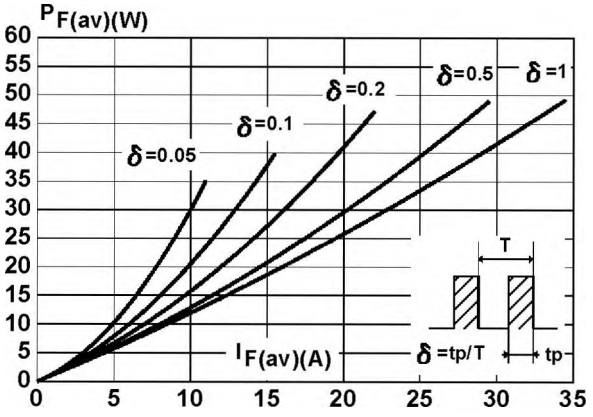


Fig.2 : Peak current versus form factor.

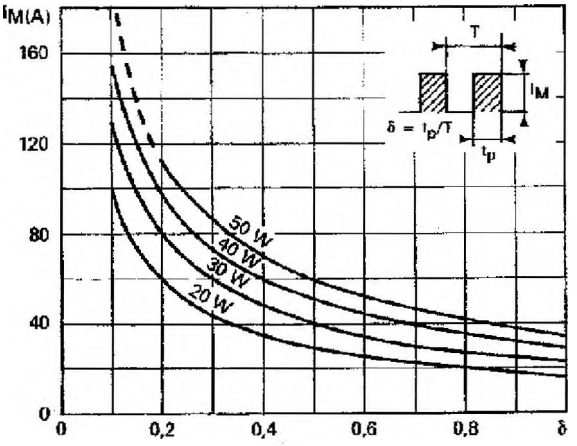


Fig.3 : Non repetitive peak surge current versus overload duration.

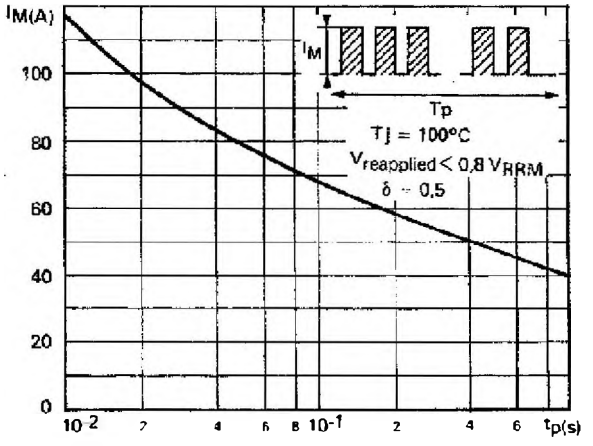


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

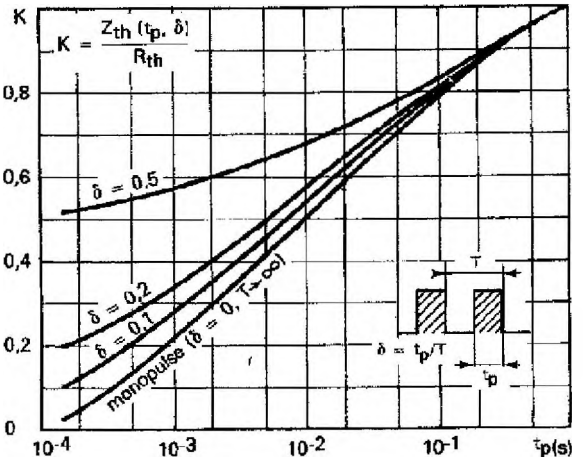


Fig.5 : Voltage drop versus forward current.

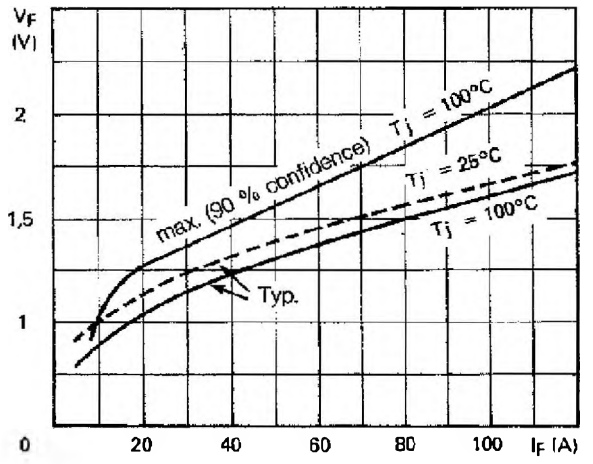


Fig.6 : Recovery charge versus dI_F/dt.

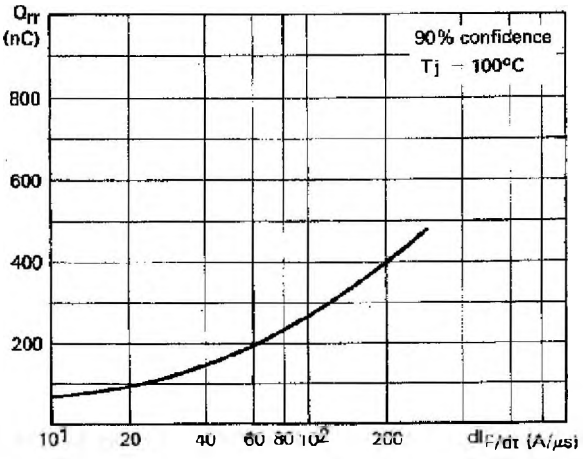


Fig.7 : Recovery time versus dI_F/dt.

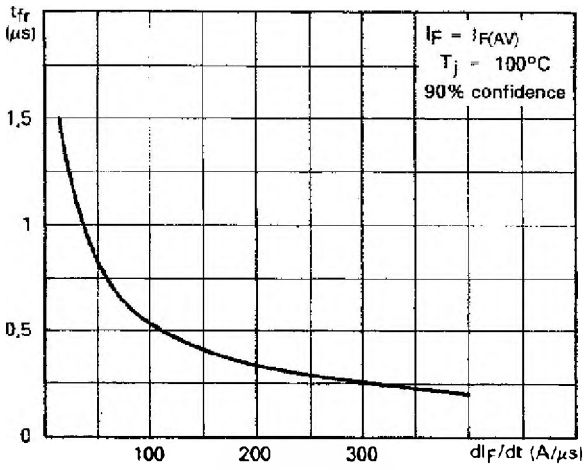


Fig.8 : Peak reverse current versus dIF/dt.

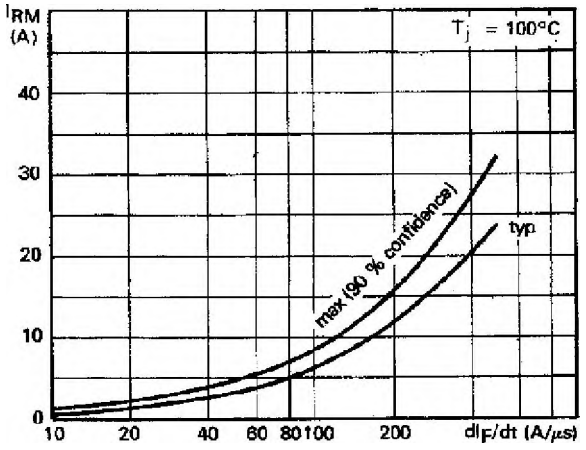


Fig.9 : Peak forward voltage versus dI_F/dt.

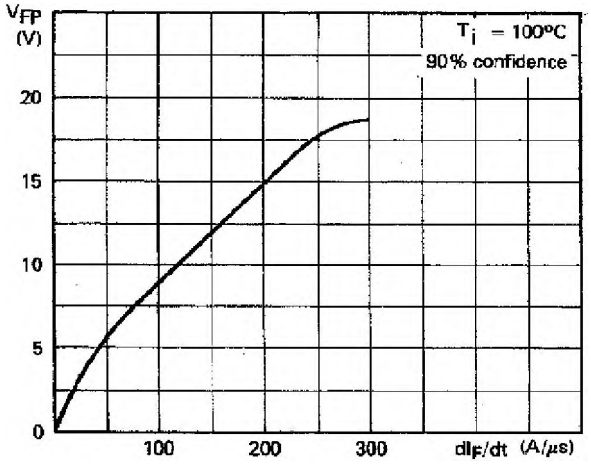


Fig.10 : Dynamic parameters versus junction temperature.

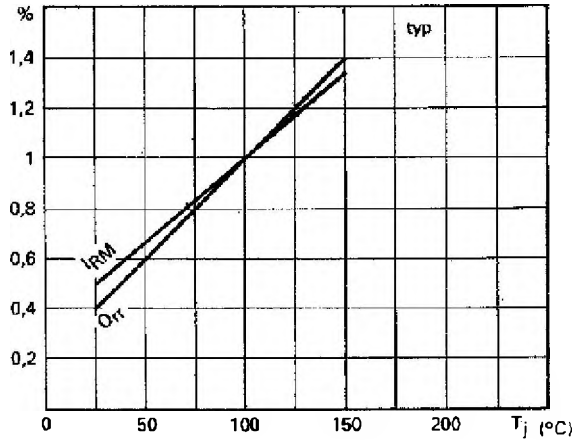


Fig.11 : TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)

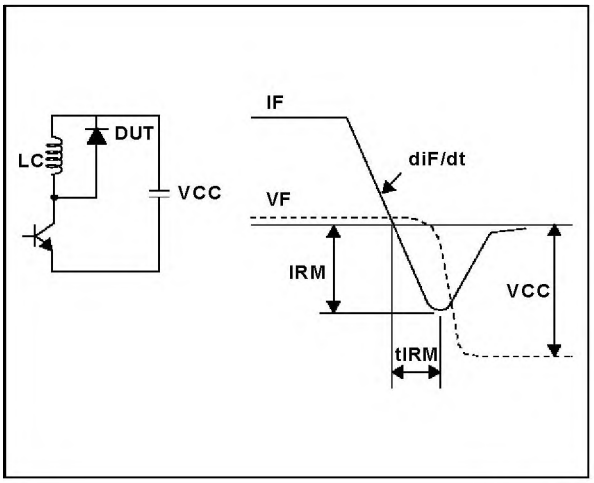
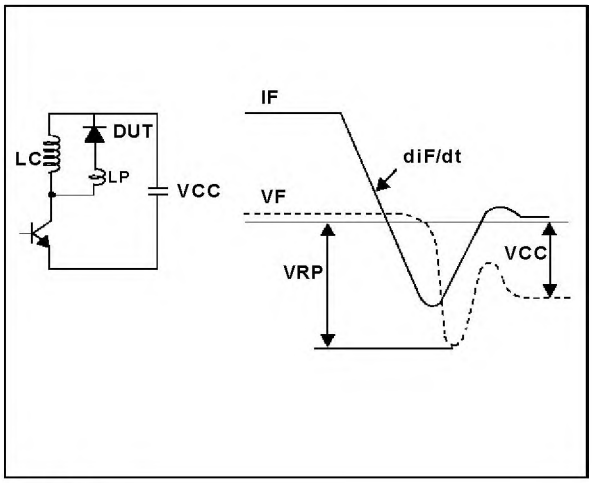
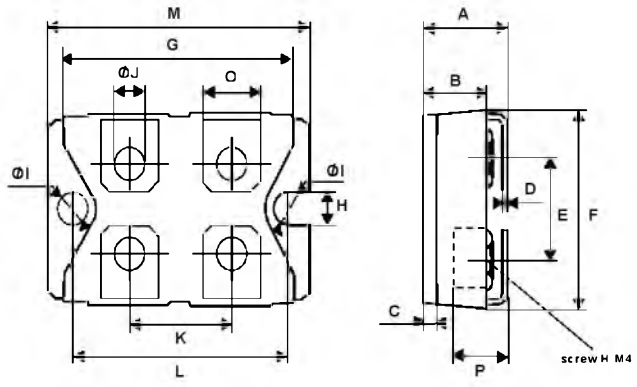


Fig.12 : TURN-OFF SWITCHING CHARACTERISTICS (With serie inductance)



PACKAGE MECHANICAL DATA

ISOTOP Screw version



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	11.80	12.20	0.465	0.480
B	8.90	9.10	0.350	0.358
C	1.95	2.05	0.077	0.081
D	0.75	0.85	0.029	0.034
E	12.60	12.80	0.496	0.504
F	25.10	25.50	0.988	1.004
G	31.50	31.70	1.240	1.248
H	4.00		0.157	
I	4.10	4.30	0.161	0.169
J	4.10	4.30	0.161	0.169
K	14.90	15.10	0.586	0.595
L	30.10	30.30	1.185	1.193
M	37.80	38.20	1.488	1.504
O	7.80	8.20	0.307	0.323
P	5.50		0.216	

Cooling method : C
Marking : Type number
Weight : 28 g (without screws)
Electrical isolation : 2500$V_{(RMS)}$
Capacitance : < 45 pF
Inductance : < 5nH

- 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.