

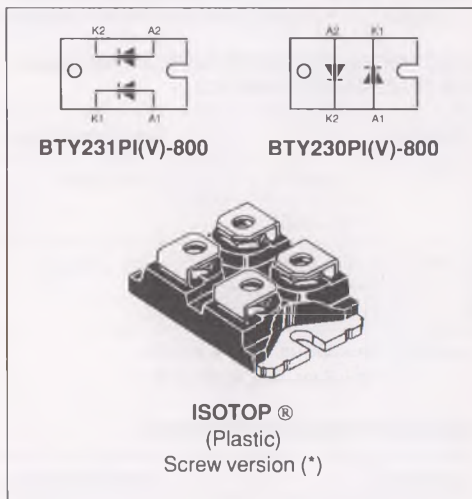
## FAST RECOVERY RECTIFIER DIODES

### FEATURES

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED PACKAGE :  
 Insulating voltage = 2500 V<sub>RMS</sub>  
 Capacitance = 45 pF

### DESCRIPTION

Dual high voltage rectifiers ranging from 600V to 800V suited for Switch Mode Power Supplies and other power converters.  
 The devices are packaged in ISOTOP.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
I <sub>FRM</sub>	Repetitive peak forward current	tp ≤ 10μs	375	A
I <sub>F(RMS)</sub>	RMS forward current	Per diode	70	A
I <sub>F(AV)</sub>	Average forward current	T <sub>C</sub> =55°C δ = 0.5 Per diode	30	A
I <sub>FSM</sub>	Surge non repetitive forward current	tp=10ms sinusoidal Per diode	200	A
T <sub>stg</sub> T <sub>J</sub>	Storage and junction temperature range		- 40 to + 150 - 40 to + 150	°C °C

Symbol	Parameter	BYT230PI(V)- / BYT231PI(V)-		Unit
		600	800	
V <sub>RRM</sub>	Repetitive peak reverse voltage	600	800	V

\* : Tin plated Fast-on version is also available (without V suffix).

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

**THERMAL RESISTANCE**

Symbol	Parameter		Value	Unit
R <sub>th</sub> (j-c)	Junction to case	Per diode	1.5	°C/W
		Total	0.8	
R <sub>th</sub> (c)	Coupling		0.1	°C/W

When the diodes 1 and 2 are used simultaneously :

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

**ELECTRICAL CHARACTERISTICS (Per diode)**
**STATIC CHARACTERISTICS**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
V <sub>F</sub> *	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> **	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			100	μA
	T <sub>j</sub> = 100°C				5	mA

Pulse test : \* t<sub>p</sub> = 380 μs, duty cycle < 2 %

\*\* t<sub>p</sub> = 5 ms, duty cycle < 2 %

**RECOVERY CHARACTERISTICS**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A      I <sub>rr</sub> = 0.25A I <sub>R</sub> = 1A			55	ns
		I <sub>F</sub> = 1A      dI <sub>F</sub> /dt = -15A/μs V <sub>R</sub> = 30V			130	

**TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>IRM</sub>	dI <sub>F</sub> /dt = -120A/μs	V <sub>CC</sub> = 200V      I <sub>F</sub> = 30A L <sub>p</sub> ≤ 0.05μH      T <sub>j</sub> = 100°C see fig. 11			160	ns
	dI <sub>F</sub> /dt = -240A/μs			100		
I <sub>RM</sub>	dI <sub>F</sub> /dt = -120A/μs				15	A
	dI <sub>F</sub> /dt = -240A/μs			19		

**TURN-OFF OVERVOLTAGE COEFFICIENT (With serie inductance)**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	T <sub>j</sub> = 100°C      V <sub>CC</sub> = 150V dI <sub>F</sub> /dt = -30A/μs      L <sub>p</sub> = 4μH	I <sub>F</sub> = I <sub>F(AV)</sub> see fig. 12			4	/

To evaluate the conduction losses use the following equation :

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

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

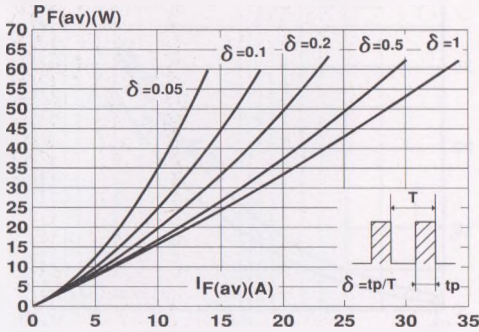


Fig.2 : Peak current versus form factor.

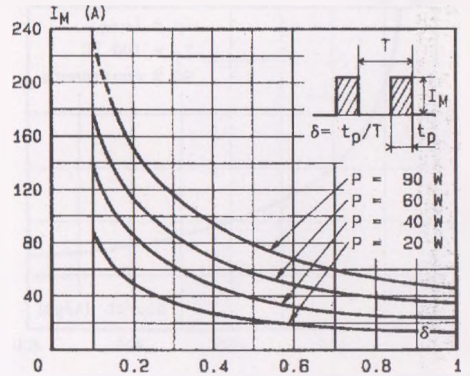


Fig.3 : Non repetitive peak surge current versus overload duration.

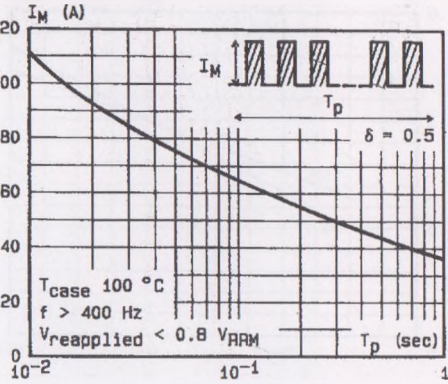


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

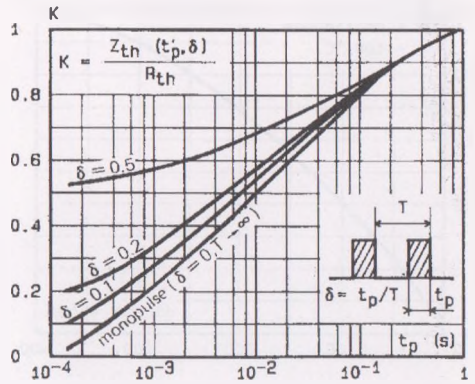


Fig.5 : Voltage drop versus forward current.

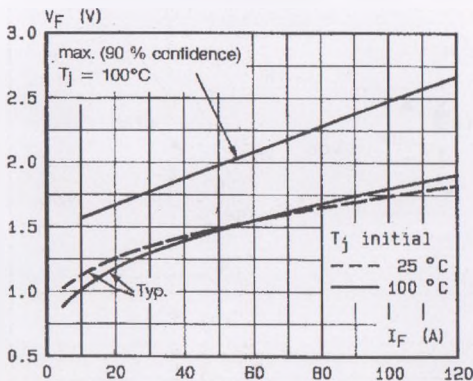


Fig.6 : Recovery charge versus di\_F/dt.

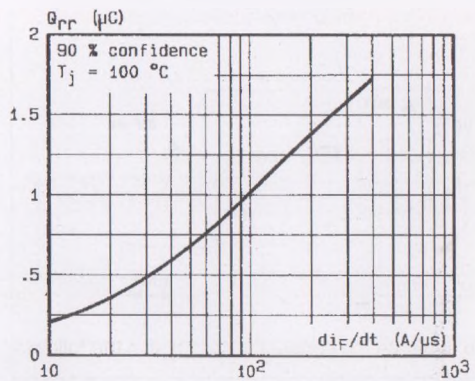




Fig.7 : Recovery time versus  $di_F/dt$ .

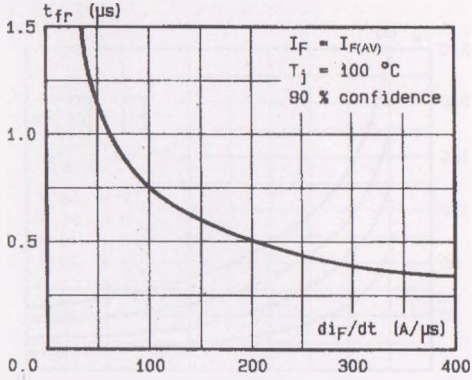


Fig.9 : Peak forward voltage versus  $di_F/dt$ .

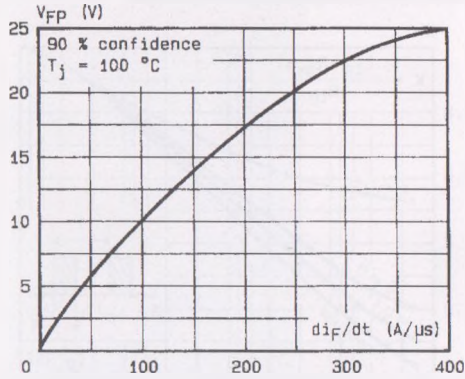


Fig.11 : TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)

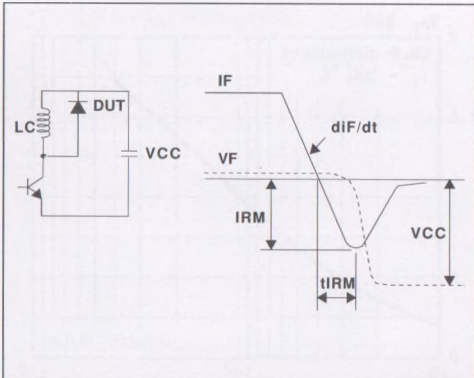


Fig.8 : Peak reverse current versus  $di_F/dt$ .

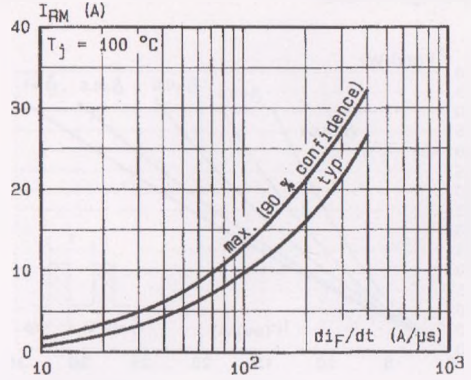


Fig.10 : Dynamic parameters versus junction temperature.

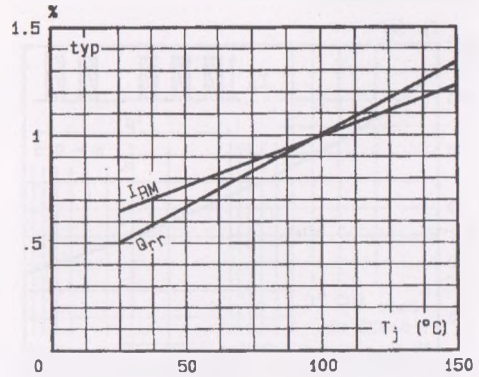


Fig.12 : TURN-OFF SWITCHING CHARACTERISTICS (With serie inductance)

