

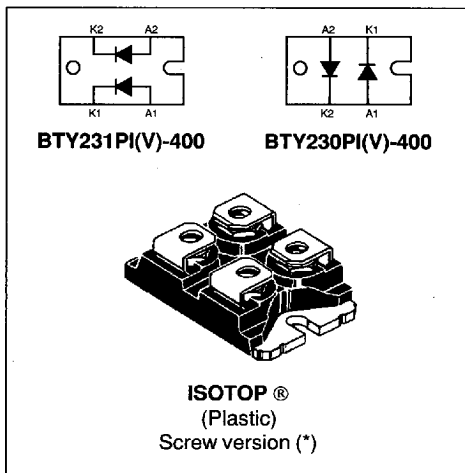
FAST RECOVERY RECTIFIER DIODES

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

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	$t_p \leq 10\mu s$		500	A
$I_{F(RMS)}$	RMS forward current		Per diode	50	A
$I_{F(AV)}$	Average forward current	$T_C = 75^\circ C$ $\delta = 0.5$	Per diode	30	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10ms$ sinusoidal	Per diode	350	A
T_{stg} T_J	Storage and junction temperature range			- 40 to + 150 - 40 to + 150	$^\circ C$ $^\circ C$

Symbol	Parameter	BYT230PI(V)- / BYT231PI(V)-			Unit
		200	300	400	
V_{RRM}	Repetitive peak reverse voltage	200	300	400	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
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 :

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

ELECTRICAL CHARACTERISTICS (Per diode)

STATIC CHARACTERISTICS

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

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

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

RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
trr	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{A}$ $I_{rr} = 0.25\text{A}$ $I_R = 1\text{A}$			50	ns
		$I_F = 1\text{A}$ $dI_F/dt = -15\text{A}/\mu\text{s}$ $V_R = 30\text{V}$			100	

TURN-OFF SWITCHING CHARACTERISTICS (Without serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{IRM}	$dI_F/dt = -120\text{A}/\mu\text{s}$	$V_{CC} = 200\text{V}$ $I_F = 30\text{A}$ $L_p \leq 0.05\text{ }\mu\text{H}$ $T_j = 100^\circ\text{C}$ see fig. 11			75	ns
	$dI_F/dt = -240\text{A}/\mu\text{s}$			50		
I_{RM}	$dI_F/dt = -120\text{A}/\mu\text{s}$				9	A
	$dI_F/dt = -240\text{A}/\mu\text{s}$			12		

TURN-OFF OVERVOLTAGE COEFFICIENT (With serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	$T_j = 100^\circ\text{C}$ $V_{CC} = 60\text{V}$ $I_F = I_{F(AV)}$ $dI_F/dt = -30\text{A}/\mu\text{s}$ $L_p = 1\text{ }\mu\text{H}$	see note see fig.12		3.3		/

Note : Applicable to BYT230PI(V)-400 / BYT231PI(V)-400 only

To evaluate the conduction losses use the following equation :

$$P = 1.1 \times I_{F(AV)} + 0.0095 \times I_F^2(\text{RMS})$$

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

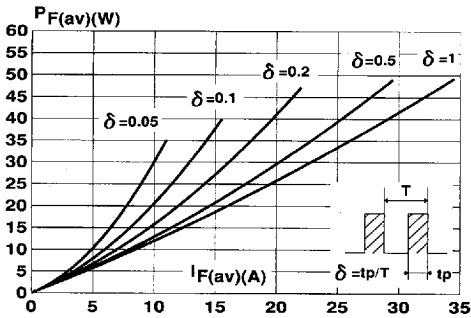


Fig.3 : Non repetitive peak surge current versus overload duration.

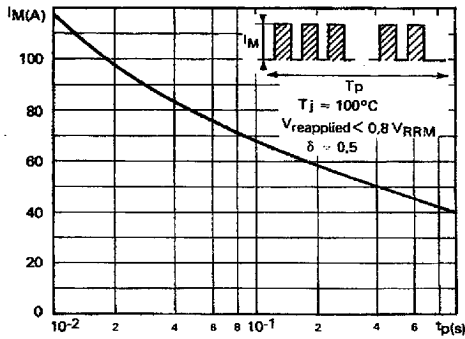


Fig.5 : Voltage drop versus forward current.

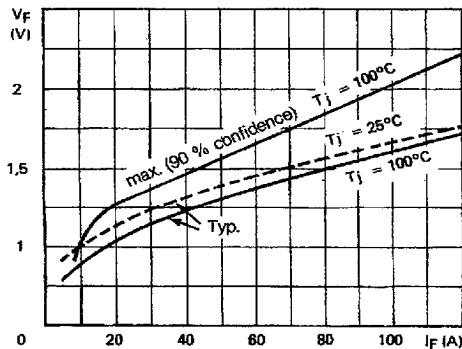


Fig.2 : Peak current versus form factor.

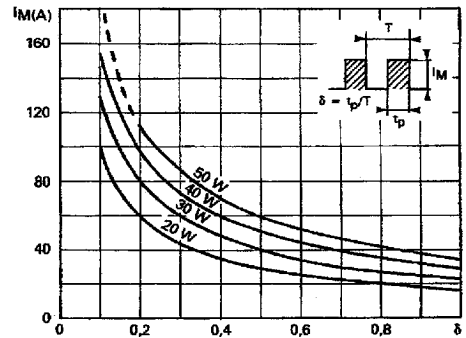


Fig.4 : Relative variation of thermal impedance junction to case versus pulse duration.

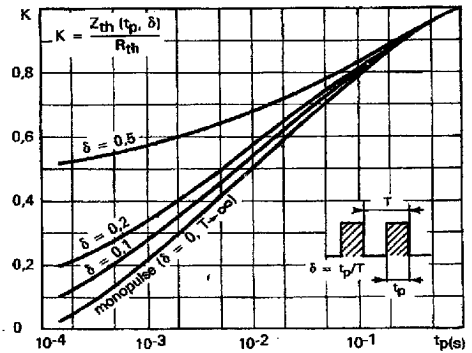


Fig.6 : Recovery charge versus diF/dt.

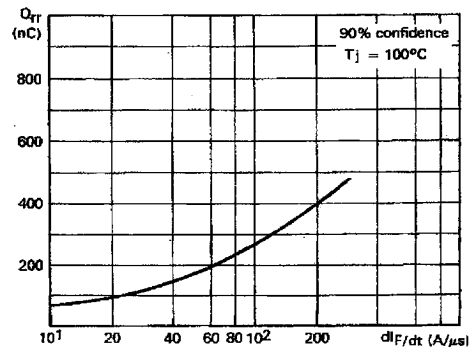


Fig.7 : Recovery time versus di_F/dt .

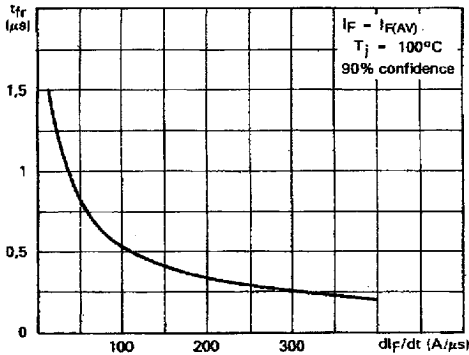


Fig.9 : Peak forward voltage versus di_F/dt .

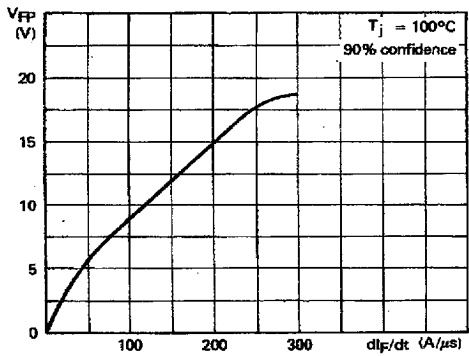


Fig.11 : TURN-OFF SWITCHING CHARACTERISTICS (Without series inductance)

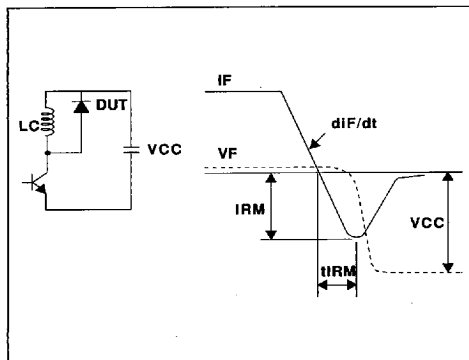


Fig.8 : Peak reverse current versus di_F/dt .

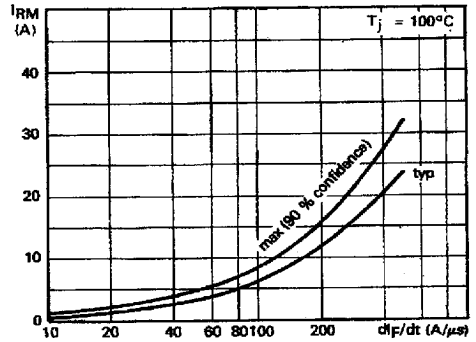


Fig.10 : Dynamic parameters versus junction temperature.

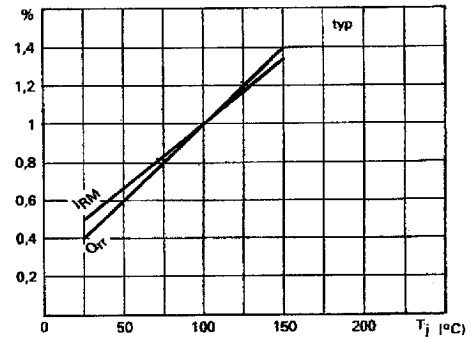


Fig.12 : TURN-OFF SWITCHING CHARACTERISTICS (With series inductance)

