

FAST RECOVERY RECTIFIER DIODES

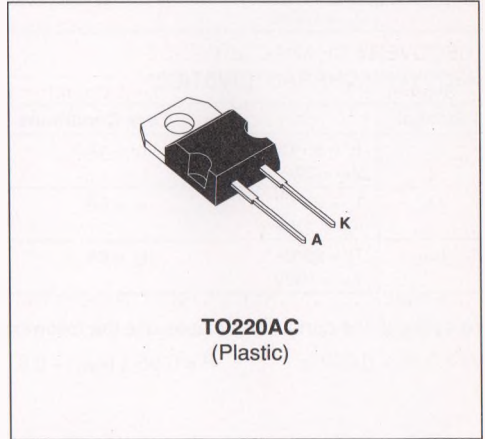
- LOW SWITCHING LOSSES
- LOW PEAK RECOVERY CURRENT I_{RM}
- THE SPECIFICATIONS AND CURVES ENABLE THE DETERMINATION OF t_{rr} AND I_{RM} AT 100°C UNDER USERS CONDITIONS

APPLICATIONS

- MOTOR CONTROLS (FREE-WHEELING DIODE)
- SWITCHMODE POWER SUPPLIES
- SNUBBER DIODES

DESCRIPTION

Fast recovery rectifiers suited for power switching applications.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
I_{FRM}	Repetitive Peak Forward Current	$t_p \leq 20\mu s$	100	A
$I_F (RMS)$	RMS Forward Current		20	A
$I_F (AV)$	Average Forward Current	$T_C = 115^\circ C$ $\delta = 0.5$	10	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	100	A
P_{tot}	Power Dissipation	$T_C = 90^\circ C$	20	W
T_{stg} T_j	Storage and Junction Temperature Range		- 40 to 150	°C

Symbol	Parameter	BYX 233-			Unit
		200	400	600	
V_{RRM}	Repetitive Peak Reverse Voltage	200	400	600	V
V_{RSM}	Non Repetitive Peak Reverse Voltage	250	450	650	V

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-case	3	°C/W

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I_R	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			20	μA
	$T_j = 100^\circ\text{C}$				1	mA
V_F	$T_j = 25^\circ\text{C}$	$I_F = 8\text{A}$			1.5	V
	$T_j = 100^\circ\text{C}$				1.25	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
t_{rr}	$T_j = 25^\circ\text{C}$ $V_R = 30\text{V}$	$I_F = 1\text{A}$	$di_F/dt = -15\text{A}/\mu\text{s}$			150	ns
Q_{rr}	$T_j = 25^\circ\text{C}$ $V_R = 100\text{V}$	$I_F = 8\text{A}$	$di_F/dt = -20\text{A}/\mu\text{s}$		2.2		μC
I_{RM}	$T_j = 25^\circ\text{C}$ $V_R = 100\text{V}$	$I_F = 8\text{A}$	$di_F/dt = -20\text{A}/\mu\text{s}$			4	A

To evaluate the conduction losses use the following equations :

$$V_F = 0.95 + 0.012 I_F \qquad P = 0.95 \times I_{F(AV)} + 0.012 I_F^2 (RMS)$$

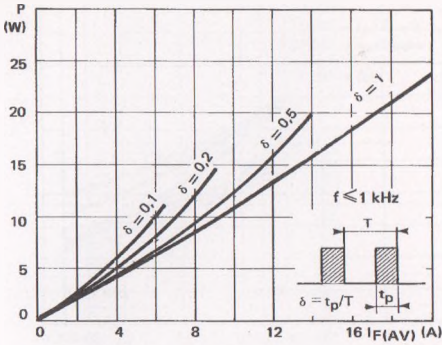


FIGURE 1 : Low frequency power losses versus average current

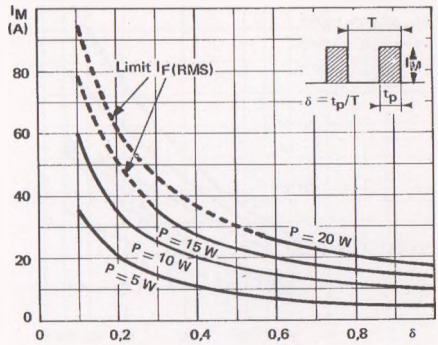


FIGURE 2 : Peak current versus form factor

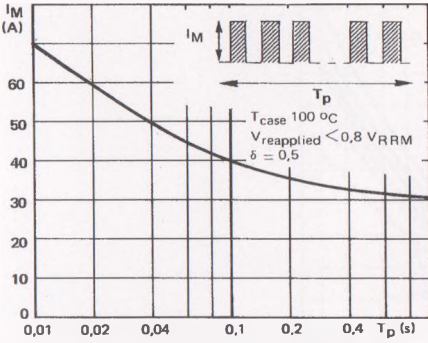


FIGURE 3 : Non repetitive peak surge current versus overload duration

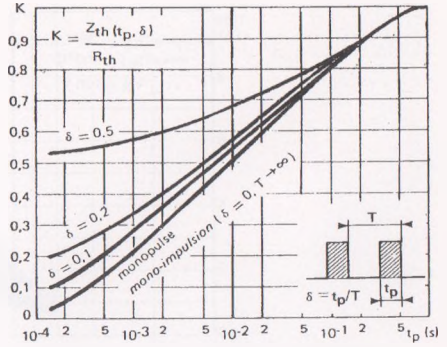


FIGURE 4 : Thermal impedance versus pulse width

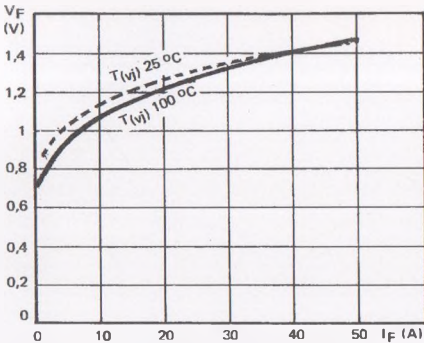


FIGURE 5 : Voltage drop versus forward current

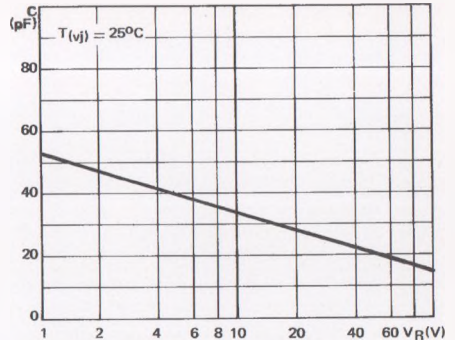


FIGURE 6 : Capacitance versus reverse voltage

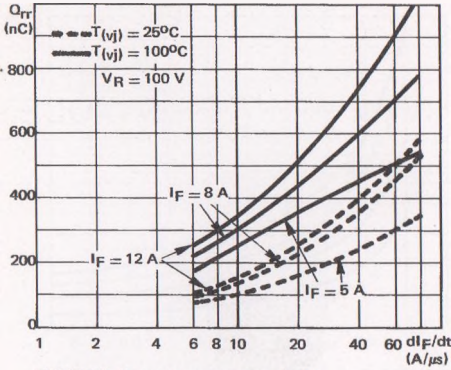


FIGURE 7 : Recovery charge versus di_F/dt

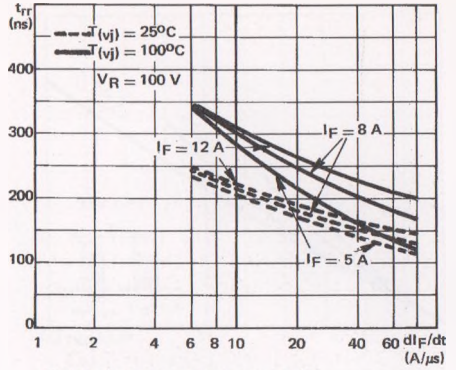


FIGURE 8 : Recovery time versus di_F/dt

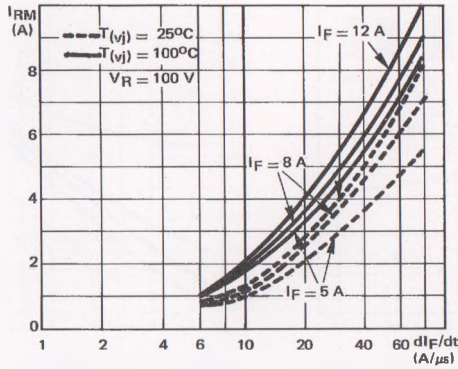


FIGURE 9 : Peak reverse current versus di_F/dt