

HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

- VERY LOW CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIMES
- HIGH SURGE CURRENT AND AVALANCHE CAPABILITY
- THE SPECIFICATIONS AND CURVES ENABLE THE DETERMINATION OF t_{rr} AND I_{RM} AT 100°C UNDER USERS CONDITIONS



DO 5
(Metal)

DESCRIPTION

Low voltage drop rectifiers suited for switching mode power supply.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
I_{FRM}	Repetitive Peak Forward Current	$t_p \leq 20\mu s$	500	A
$I_F (RMS)$	RMS Forward Current		70	A
$I_F (AV)$	Average Forward Current	$T_C = 115^\circ C$ $\delta = 0.5$	35	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	500	A
P_{tot}	Power Dissipation	$T_C = 100^\circ C$	50	W
T_{stg} T_J	Storage and Junction Temperature Range		- 40 to 150	°C

Symbol	Parameter	BYW 92-				Unit
		50	100	150	200	
V_{RRM}	Repetitive Peak Reverse Voltage	50	100	150	200	V
V_{RSM}	Non Repetitive Peak Reverse Voltage	55	110	165	220	V

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j,c)}$	Junction-case	1	°C/W

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I_R	$T_J = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			50	μA
	$T_J = 100^{\circ}\text{C}$				5	mA
V_F	$T_J = 25^{\circ}\text{C}$	$I_F = 100\text{A}$			1.3	V
	$T_J = 100^{\circ}\text{C}$	$I_F = 35\text{A}$			0.92	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
t_{rr}	$T_J = 25^{\circ}\text{C}$ $V_R = 30\text{V}$	$I_F = 1\text{A}$ see figure 12	$di_F/dt = - 50\text{A}/\mu\text{s}$			50	ns
Q_{rr}	$T_J = 25^{\circ}\text{C}$ $V_R \leq 30\text{V}$	$I_F = 2\text{A}$	$di_F/dt = - 20\text{A}/\mu\text{s}$			20	nC
t_{fr}	$T_J = 25^{\circ}\text{C}$ Measured at $1.1 \times V_F$	$I_F = 1\text{A}$	$t_r = 5\text{ns}$		10		ns
V_{FP}	$T_J = 25^{\circ}\text{C}$	$I_F = 1\text{A}$	$t_r = 5\text{ns}$		1.5		V

To evaluate the conduction losses use the following equations :

$V_F = 0.66 + 0.0047 I_F$

$P = 0.66 \times I_{F(AV)} + 0.0047 I_F^2 (RMS)$

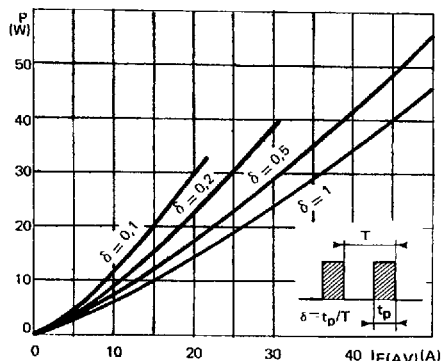


FIGURE 1 : Power losses versus average current

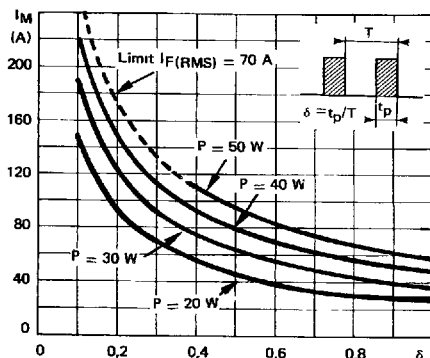


FIGURE 2 : Peak current versus form factor

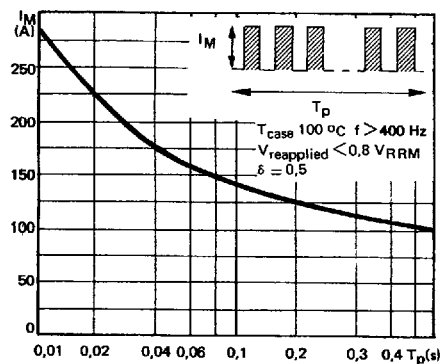


FIGURE 3 : Non repetitive peak surge current versus duration

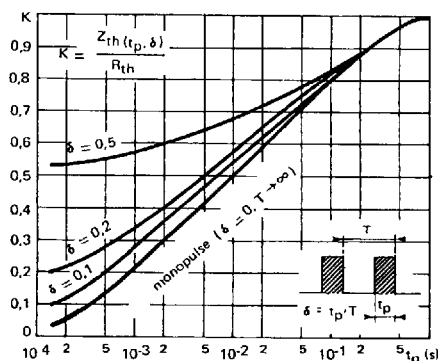


FIGURE 4 : Thermal impedance versus pulse width

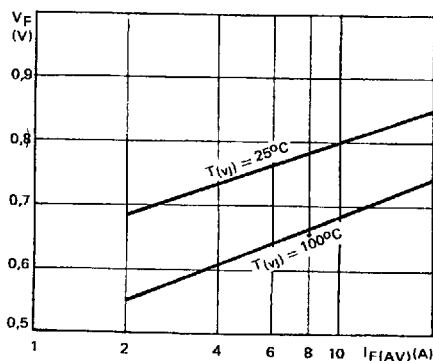


FIGURE 5 : Voltage drop versus forward current

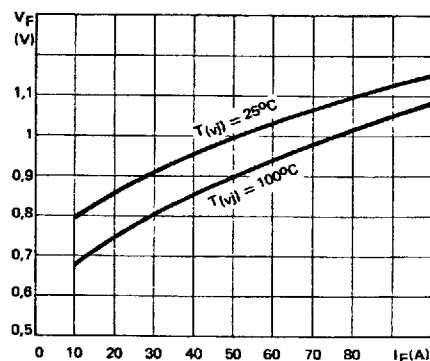


FIGURE 6 : Voltage drop versus forward current

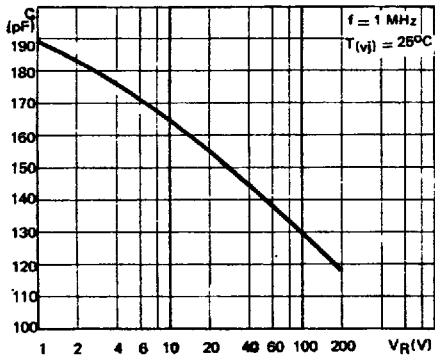


FIGURE 7 : Capacitance versus reverse voltage applied

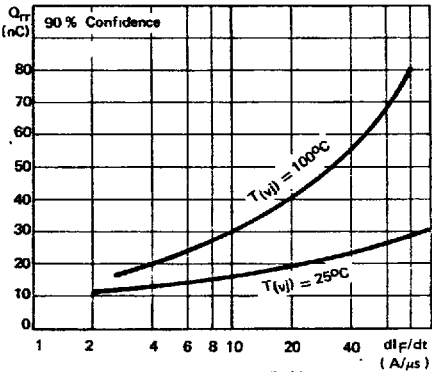


FIGURE 8 Recovery charge versus di_F/dt

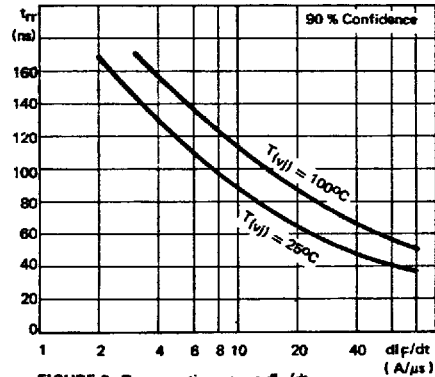


FIGURE 9 : Recovery time versus di_F/dt

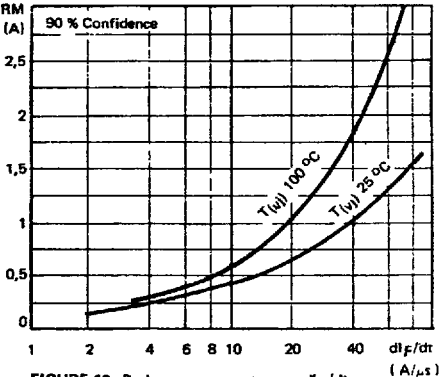


FIGURE 10 : Peak reverse current versus di_F/dt

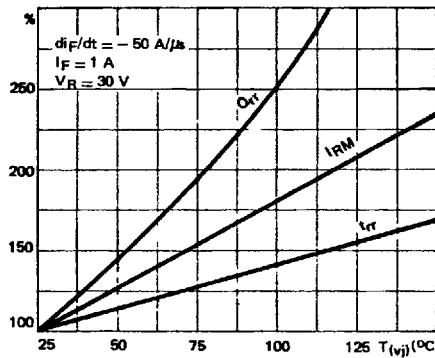


FIGURE 11 : Dynamic parameters versus junction temperature

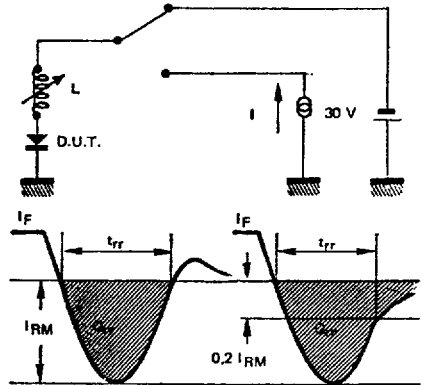


FIGURE 12 : Measurement of t_{rr} (fig. 9) and I_{RM} (fig. 10)