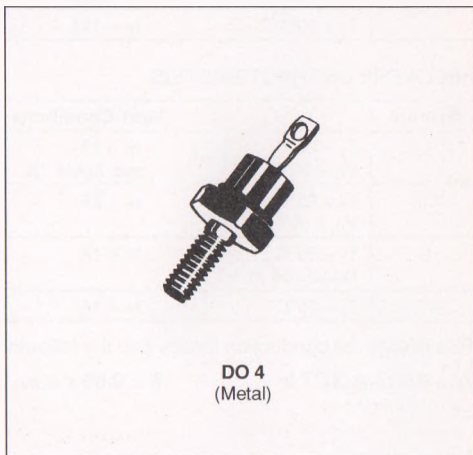


## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

- 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



### DESCRIPTION

Low voltage drop rectifiers suited for switchmode power supply.

### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{FRM}$	Repetitive Peak Forward Current	$t_p \leq 20\mu s$	200	A
$I_{F(RMS)}$	RMS Forward Current		35	A
$I_{F(AV)}$	Average Forward Current	$T_C = 120^\circ C$ $\delta = 0.5$	15	A
$I_{FSM}$	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	200	A
$P_{To1}$	Power Dissipation	$T_C = 100^\circ C$	22	W
$T_j$	Junction Temperature		- 40 to 150	°C

Symbol	Parameter	BYW 81-				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	2.3	°C/W

## ELECTRICAL CHARACTERISTICS

## STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
$I_R$	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			15	$\mu\text{A}$
	$T_j = 100^\circ\text{C}$				1.5	$\text{mA}$
$V_F$	$T_j = 25^\circ\text{C}$	$I_F = 38\text{A}$			1.25	V
	$T_j = 100^\circ\text{C}$	$I_F = 12\text{A}$			0.85	

## 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	$di_F/dt = -50\text{A}/\mu\text{s}$			35	ns
$Q_{rr}$	$T_j = 25^\circ\text{C}$ $V_R \leq 30\text{V}$	$I_F = 2\text{A}$	$di_F/dt = -20\text{A}/\mu\text{s}$			15	nC
$t_{fr}$	$T_j = 25^\circ\text{C}$ Measured at $1.1 \times V_F$	$I_F = 1\text{A}$	$t_r = 5\text{ns}$		15		ns
$V_{FP}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{A}$	$t_r = 5\text{ns}$		2		V

To evaluate the conduction losses use the following equations :

$$V_F = 0.66 + 0.0077 I_F$$

$$P = 0.66 \times I_{F(AV)} + 0.0077 I_{F(RMS)}^2$$

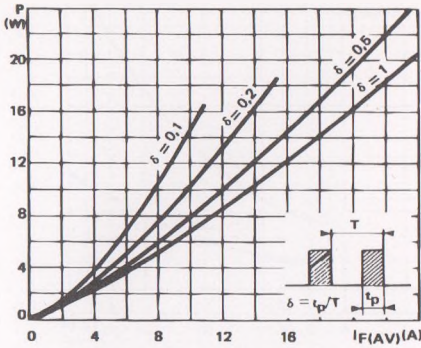


FIGURE 1 : Power loss versus average current

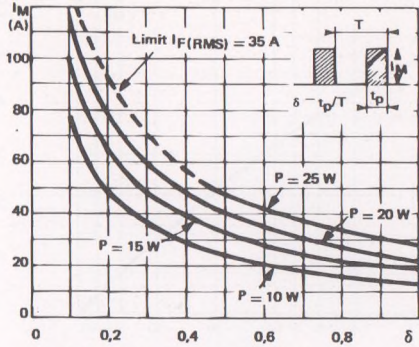


FIGURE 2 : Peak current versus form factor

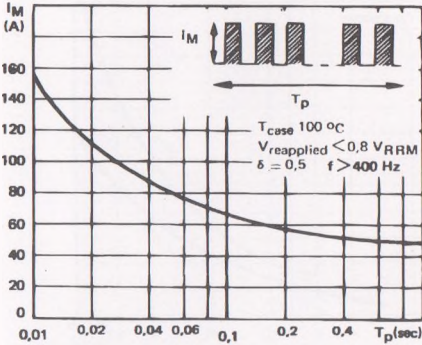


FIGURE 3 : Non repetitive peak surge current versus duration

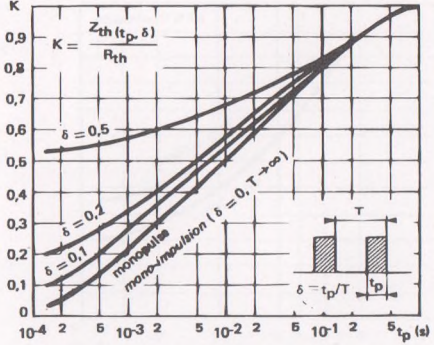


FIGURE 4 : Thermal impedance versus pulse width

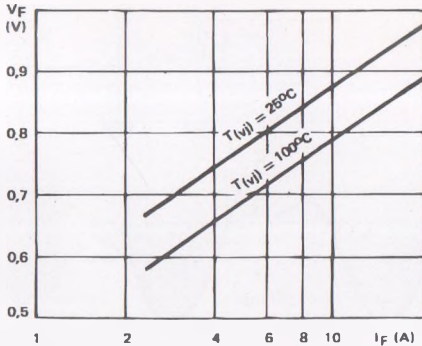


FIGURE 5 : Voltage drop versus forward current

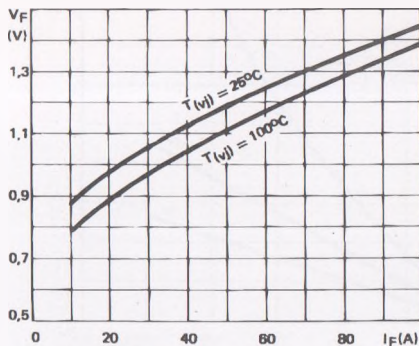


FIGURE 6 : Voltage drop versus forward current

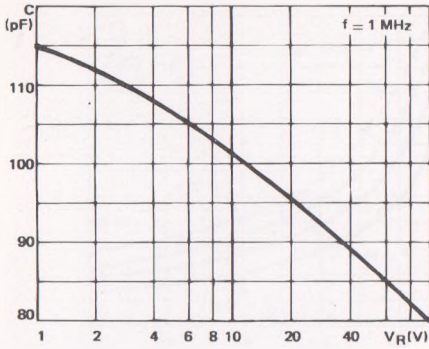


FIGURE 7 : Capacitance versus reverse voltage applied

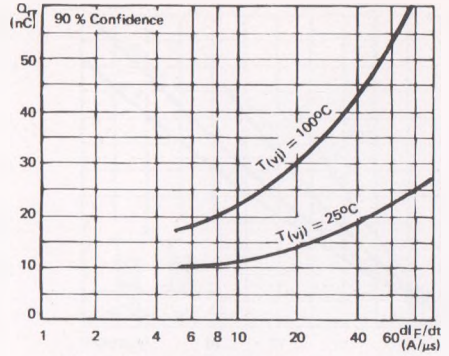


FIGURE 8 : Recovery charge versus  $di/dt$

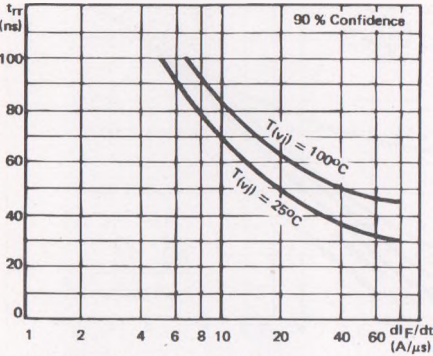


FIGURE 9 : Recovery time versus  $di/dt$

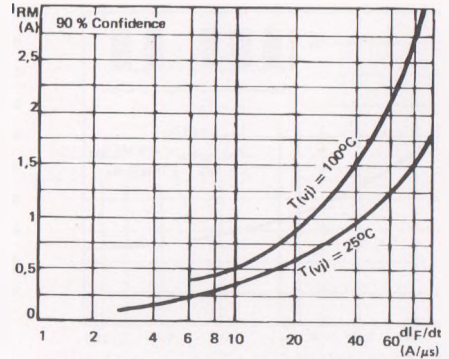


FIGURE 10 : Peak reverse current versus  $di/dt$

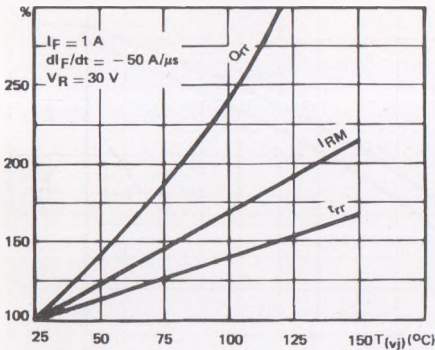


FIGURE 11 : Dynamic parameters versus junction temperature

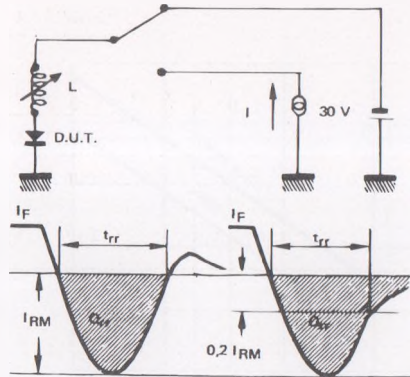


FIGURE 12 : Measurement of  $t_{rr}$  (fig. 9) and  $I_{RM}$