

FAST RECOVERY RECTIFIER DIODES

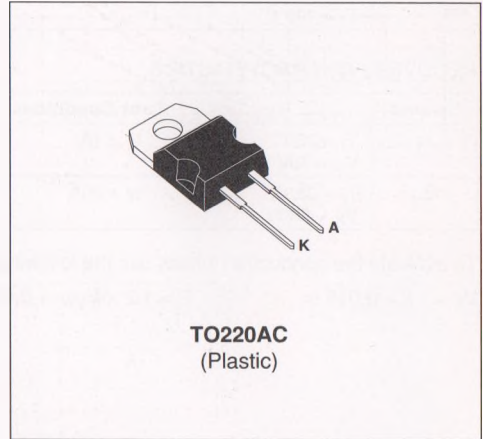
- HIGH VOLTAGE CAPABILITY
- FAST AND SOFT RECOVERY
- THE SPECIFICATIONS AND CURVES ENABLE THE DETERMINATION OF THE t_{rr} AND I_{RM} AT 100°C UNDER USERS CONDITIONS

APPLICATIONS

- MOTOR CONTROLS AND CONVERTERS
- SWITCHMODE POWER SUPPLIES

DESCRIPTION

Fast recovery rectifiers suited for applications in combination with superswitch transistors



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
I_{FRM}	Repetitive Peak Forward Current	$t_p \leq 20\mu s$	120	A
$I_{F(RMS)}$	RMS Forward Current		16	A
$I_{F(AV)}$	Average Forward Current	$T_c = 100^\circ C$ $\delta = 0.5$	10	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	120	A
P_{Tot}	Power Dissipation	$T_c = 100^\circ C$	20	W
T_{stg} T_j	Storage and Junction Temperature Range		- 40 to 150	°C

Symbol	Parameter	ESM 765-					Unit
		100	200	400	600	800	
V_{RRM}	Repetitive Peak Reverse Voltage	100	200	400	600	800	V
V_{RSM}	Non Repetitive Peak Reverse Voltage	100	200	400	600	800	V

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-case	2	°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	$T_j = 25^\circ\text{C}$	$I_F = 10\text{A}$			1.4	V
	$T_j = 100^\circ\text{C}$				1.35	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
t_{rr}	$T_j = 25^\circ\text{C}$ $V_R = 30\text{V}$	$I_F = 1\text{A}$	$di_F/dt = -15\text{A}/\mu\text{s}$			300	ns
Q_{rr}	$T_j = 25^\circ\text{C}$ $V_R = 200\text{V}$	$I_F = 10\text{A}$	$di_F/dt = -50\text{A}/\mu\text{s}$		2.3		μC

To evaluate the conduction losses use the following equations :

$$V_F = 1.2 + 0.015 I_F$$

$$P = 1.2 \times I_F(AV) + 0.015 I_F^2(RMS)$$

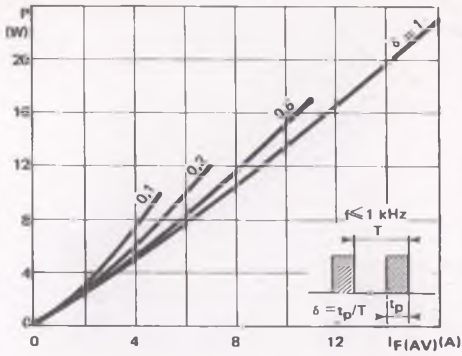


FIGURE 1: Low frequency power losses versus average current

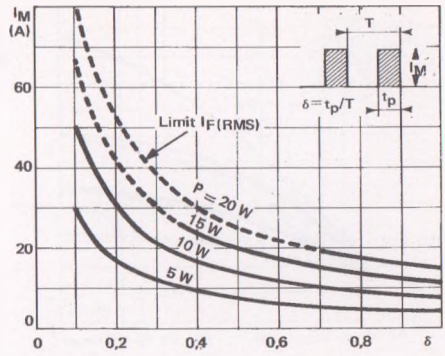


FIGURE 2: Peak current versus form factor

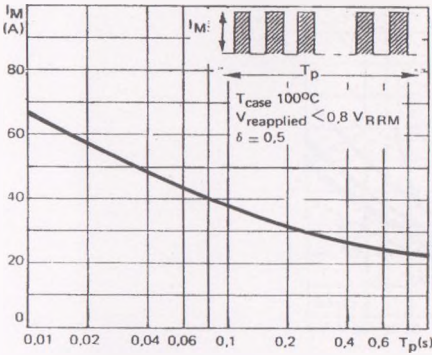


FIGURE 3: Non repetitive peak surge current versus overload duration

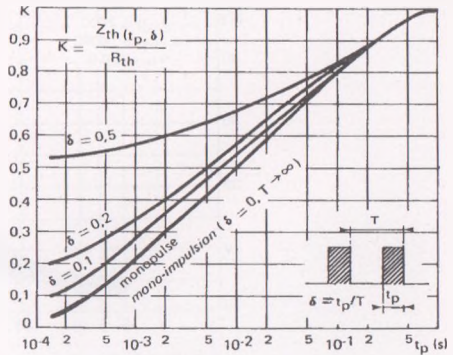


FIGURE 4: Thermal impedance versus pulse width

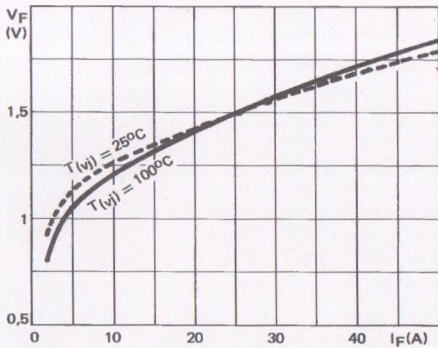


FIGURE 5: Forward voltage drop versus forward current

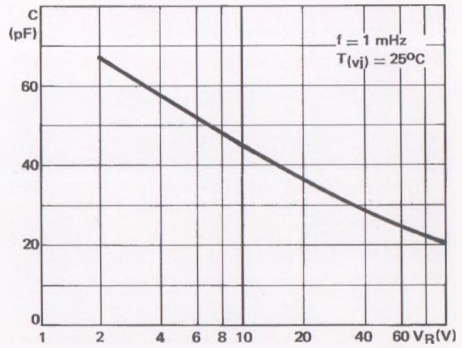


FIGURE 6: Capacitance versus applied reverse voltage

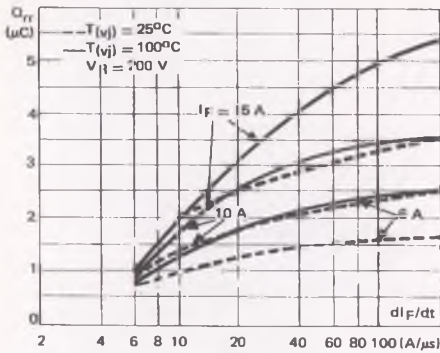


FIGURE 7: Recovery charge versus di_F/dt

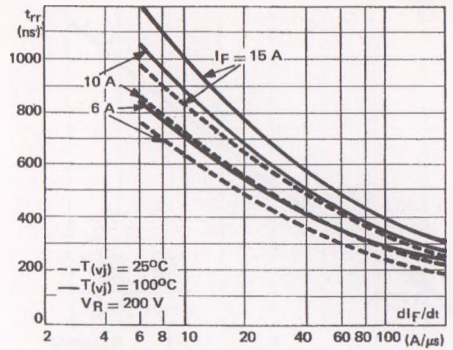


FIGURE 8: Recovery time versus di_F/dt

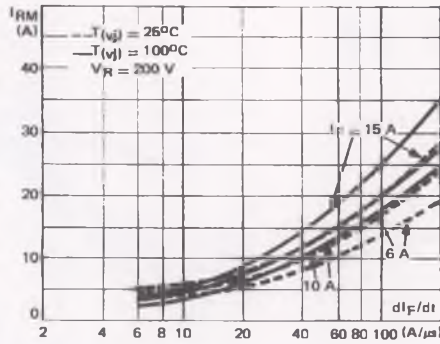


FIGURE 9: Peak reverse current versus di_F/dt