

## FAST RECOVERY RECTIFIER DIODES

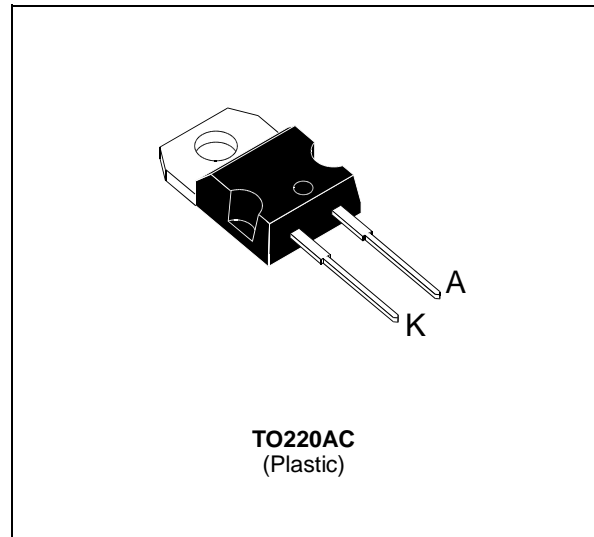
- HIGH VOLTAGE CAPABILITY
- FAST AND SOFT RECOVERY
- THE SPECIFICATIONS AND CURVES ENABLE THE DETERMINATION OF THE  $t_{rr}$  AND  $I_{RM}$  AT 100 °C UNDER USERS CONDITION

### APPLICATIONS

- MOTOR CONTROLS AND CONVERTERS
- SWITCH MODE POWER SUPPLIES

### DESCRIPTION

Fast recovery rectifiers suited for applications in combination with superswitch transistors.



### ABSOLUTE MAXIMUM 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 - 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	$\mu\text{A}$
	$T_j = 100^\circ\text{C}$				1	$\text{mA}$
$V_F$	$T_j = 25^\circ\text{C}$	$I_F = 10\text{A}$			1.4	$\text{V}$
	$T_j = 100^\circ\text{C}$				1.35	

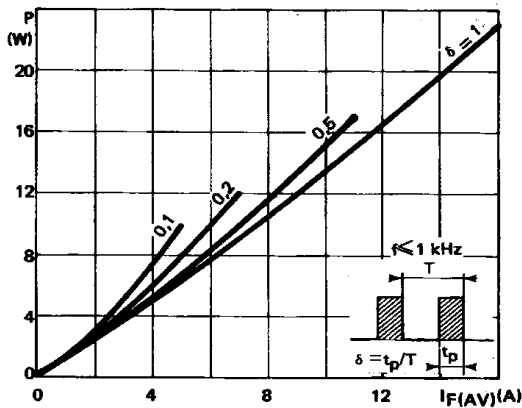
**RECOVERY CHARACTERISTICS**

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	$\text{ns}$
$Q_{rr}$	$T_j = 25^\circ\text{C}$ $V_R = 200\text{V}$	$I_F = 10\text{A}$ $di_F/dt = -50\text{A}/\mu\text{s}$		2.3		$\mu\text{C}$

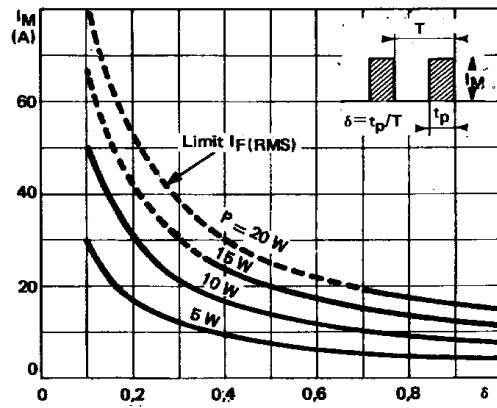
To evaluate the conduction losses use the following equations :

$$V_F = 1.2 + 0.015 I_F \quad P = 1.2 \times I_{F(AV)} + 0.015 I_{F(RMS)}^2$$

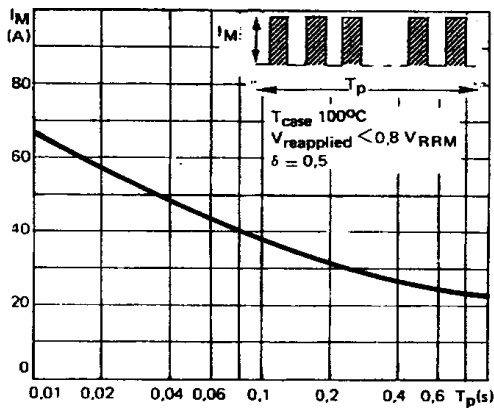
**Figure 1. Low frequency power losses versus average current**



**Figure 2. Peak current versus form factor**



**Figure 3. Non repetitive peak surge current versus overload duration**



**Figure 4. Thermal impedance versus pulse width**

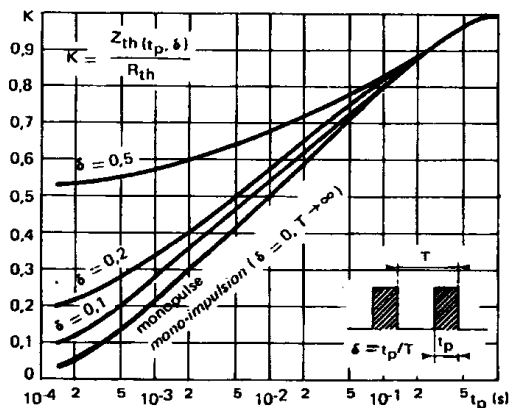


Figure 5. Voltage drop versus forward current

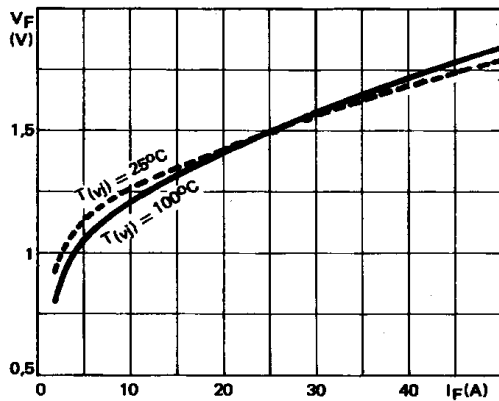


Figure 6. Capacitance versus applied reverse voltage

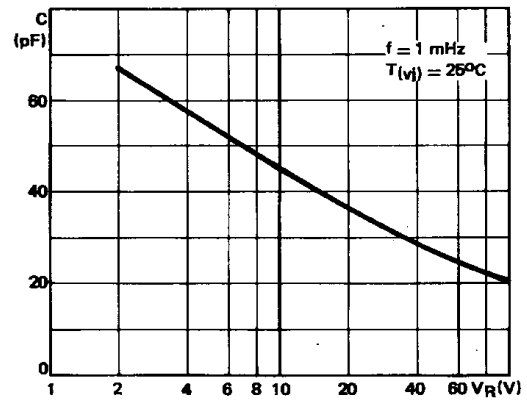


Figure 7. Recovery charge versus  $di_F/dt$

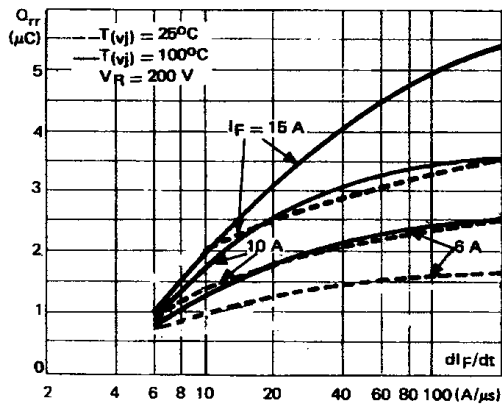


Figure 8. Recovery time versus  $di_F/dt$

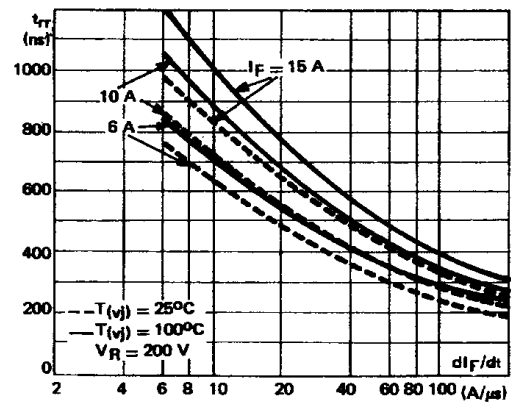
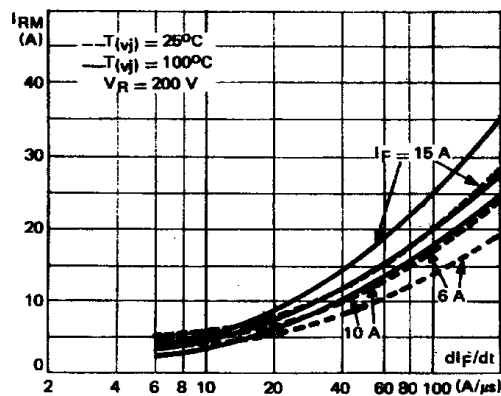
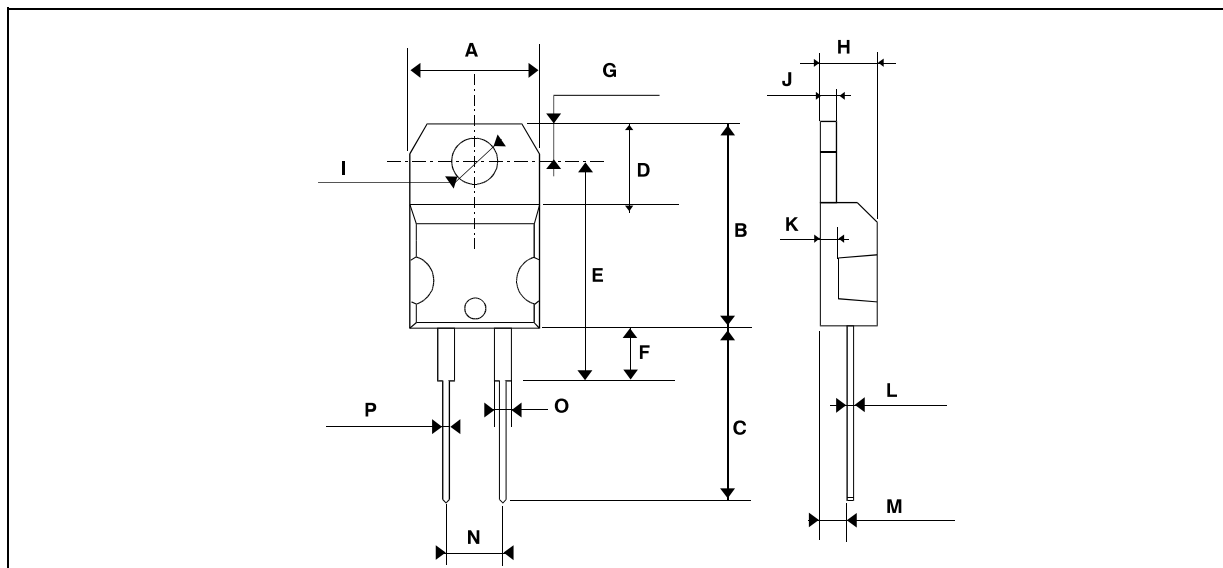


Figure 9. Peak reverse current versus  $di_F/dt$



**PACKAGE MECHANICAL DATA**

TO220AC Plastic



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10.0	10.4	0.393	0.409
B	15.2	15.9	0.598	0.626
C	13	14	0.511	0.551
D	6.2	6.6	0.244	0.260
E	16.4 typ.		0.645 typ.	
F	3.5	4.2	0.137	0.165
G	2.65	2.95	0.104	0.116
H	4.4	4.6	0.173	0.181
I	3.75	3.85	0.147	0.151
J	1.23	1.32	0.048	0.051
K	1.27 typ.		0.050 typ.	
L	0.49	0.70	0.019	0.027
M	2.4	2.72	0.094	0.107
N	4.95	5.15	0.194	0.203
O	1.14	1.70	0.044	0.067
P	0.61	0.88	0.024	0.034

Cooling method : by conduction (method C)  
 Marking : type number  
 Weight : 2.4g  
 Recommended torque value : 80cm. N  
 Maximum torque value : 100cm. N

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