SGS-THOMSON MICROELECTRONICS

BY 233-200 →600

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

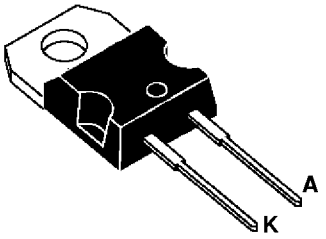
APPLICATIONS

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

DESCRIPTION

Fast recovery rectifiers suited for power switching applications.

Cathode connected to case



TO220AC
(Plastic)

ABSOLUTE MAXIMUM RATINGS (limiting values)

Symbol	Parameter		Value	Unit
I_{FRM}	Repetive 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°C δ = 0.5	10	A
I_{FSM}	Surge non Repetitive Forward Current	t_p = 10ms Sinusoidal	100	A
P_{tot}	Power Dissipation	T_c = 90°C	20	W
T_{stg} T_j	Storage and Junction Temperature Range		- 40 to + 150 - 40 to + 150	°C

Symbol	Parameter	BY 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°C	$V_R = V_{RRM}$			20	µA
	T_j = 100°C				1	mA
V_F	T_j = 25°C	I_F = 8A			1.5	V
	T_j = 100°C				1.25	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
t_{rr}	T_j = 25°C V_R = 30V	I_F = 1A	dI_F/dt = - 15A/µs			150	ns
Q_{rr}	T_j = 25°C V_R = 100V	I_F = 8A	dI_F/dt = - 20A/µs		2.2		µC
I_{RM}	T_j = 25°C V_R = 100V	I_F = 8A	dI_F/dt = - 20A/µs			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

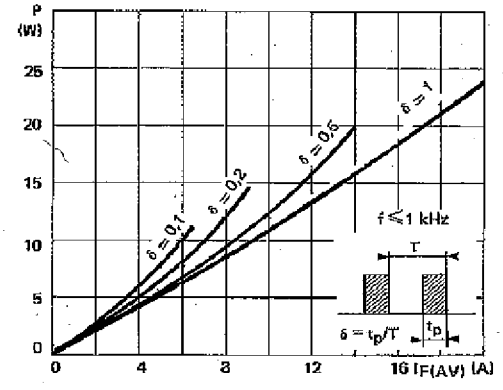


Figure 2. Peak current versus form factor

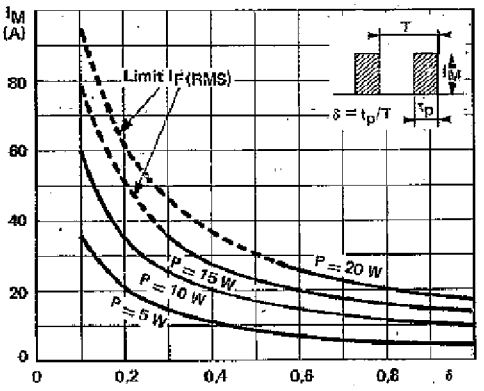


Figure 3. Non repetitive peak surge current versus overload duration

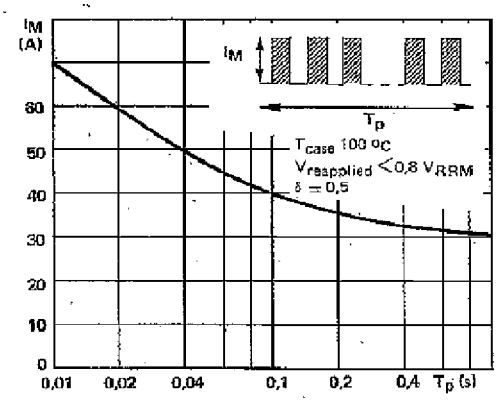


Figure 4. Thermal impedance versus pulse width

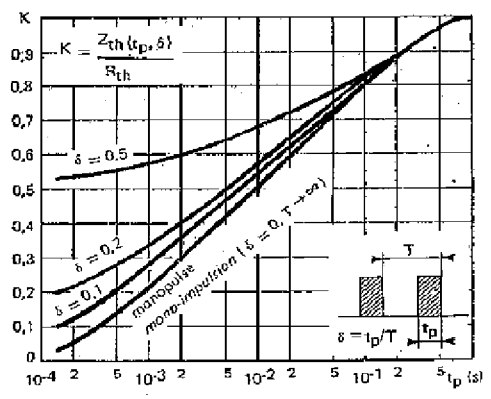


Figure 5. Voltage drop versus forward current

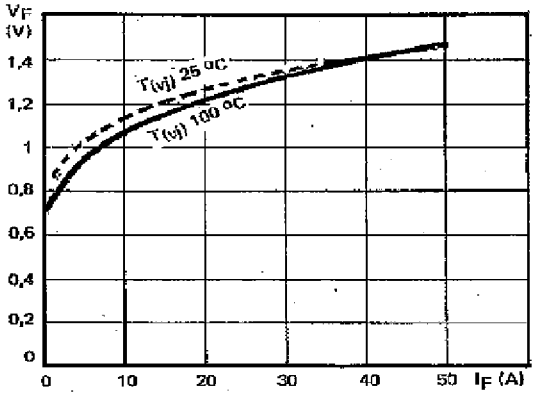


Figure 6. Capacitance versus reverse voltage

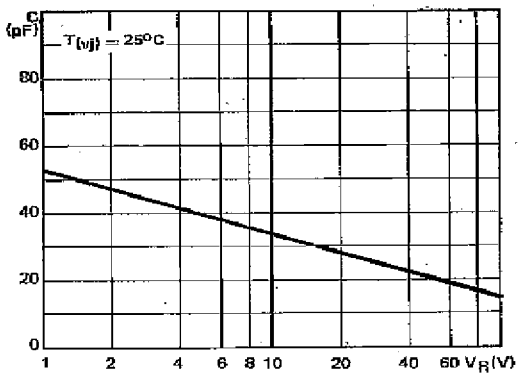


Figure 7. Recovery time versus di_F/dt.

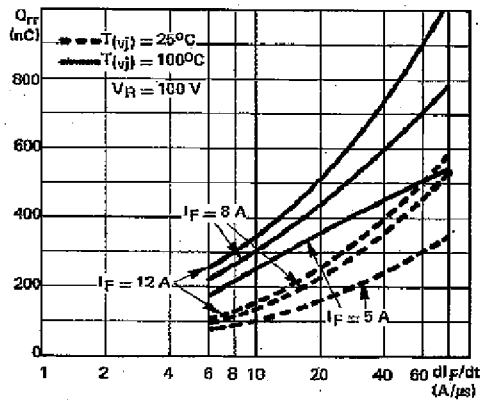


Figure 8. Recovery time versus di_F/dt.

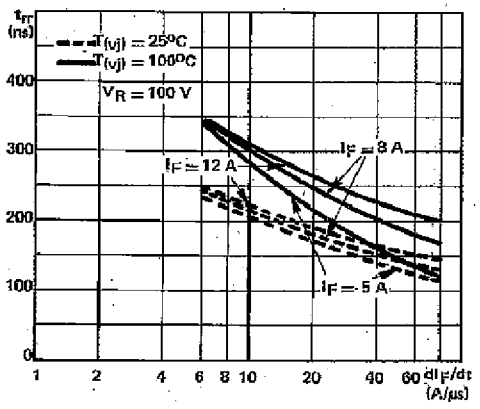
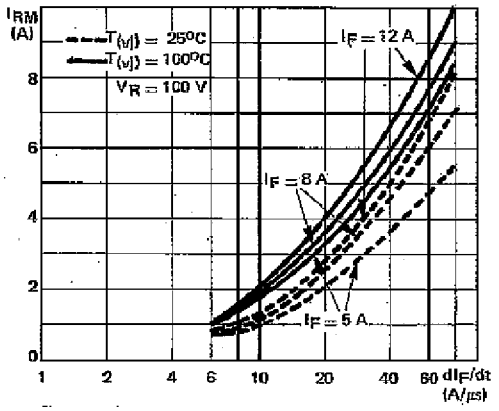
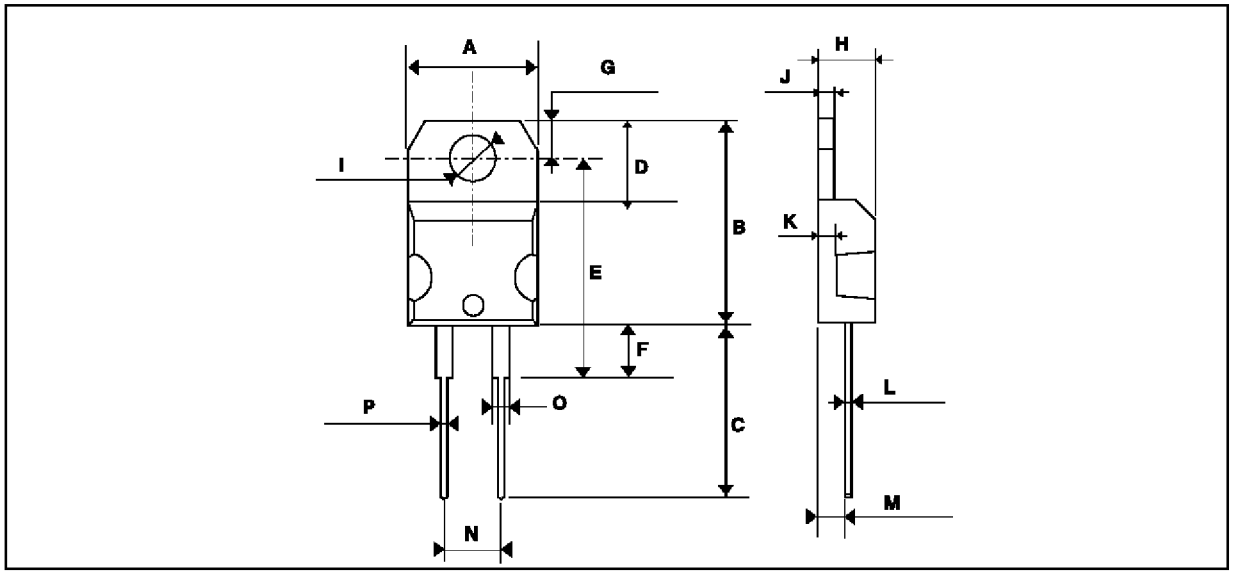


Figure 9. Peak reverse current versus di_F/dt.



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