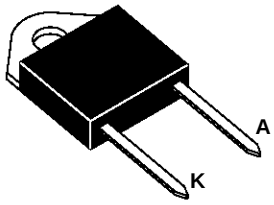
SGS-THOMSON MICROELECTRONICS

BYT 30PI-1000

FAST RECOVERY RECTIFIER DIODE

- VERY HIGH REVERSE VOLTAGE CAPABILITY
- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED: Capacitance 15pF

Insulating voltage 2500 V_{RSM}



Isolated
DOP3I
(Plastic)

SUITABLE APPLICATIONS

- FREE WHEELING DIODE IN CONVERTERS AND MOTOR CONTROL CIRCUITS
- RECTIFIER IN S.M.P.S.

ABSOLUTE MAXIMUM RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		1000	V
V_{RSM}	Non Repetitive Peak Reverse Voltage		1000	V
I_{FRM}	Repetive Peak Forward Current	$t_p \leq 10\mu s$	375	A
$I_{F\ (RMS)}$	RMS Forward Current		70	A
$I_{F\ (AV)}$	Average Forward Current	$T_c = 50°C$ $\delta = 0.5$	30	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	200	A
P	Power Dissipation	$T_c = 50°C$	60	W
T_{stg} T_j	Storage and Junction Temperature Range		- 40 to +150	°C

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th\ (j-c)}$	Junction-case	1.6	°C/W

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I_R	T_j = 25°C	$V_R = V_{RRM}$			100	µA
	T_j = 100°C				5	mA
V_F	T_j = 25°C	I_F = 30A			1.9	V
	T_j = 100°C				1.8	

RECOVERY CHARACTERISTICS

Symbol	Test Conditions				Min.	Typ.	Max.	Unit
t_{rr}	T_j = 25°C	I_F = 1A	dI_F/dt = - 15A/µs	V_R = 30V			165	ns
		I_F = 0.5A	I_R = 1A	I_{rr} = 0.25A			70	

TURN-OFF SWITCHING CHARACTERISTICS (Without Series Inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t_{IRM}	dI_F/dt = - 120A/µs	V_{CC} = 200 V I_F = 30A $L_p \leq 0.05\mu H$ T_j = 100°C See figure 11			200	ns
	dI_F/dt = - 240A/µs			120		
I_{RM}	dI_F/dt = -120A/µs				19.5	A
	dI_F/dt = - 240A/µs			22		

TURN-OFF OVERVOLTAGE COEFFICIENT (With Series Inductance)

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
$C = \frac{V_{RP}}{V_{CC}}$	T_j = 100°C dI_F/dt = - 30A/µs	V_{CC} = 200V L_p = 5µH	$I_F = I_{F(AV)}$ See figure 12			4.5	

To evaluate the conduction losses use the following equations:

$V_F = 1.47 + 0.010\ I_F$ $\qquad P = 1.47 \times I_{F(AV)} + 0.010\ I_F{}^2{}_{(RMS)}$

Figure 1. Low frequency power losses versus average current

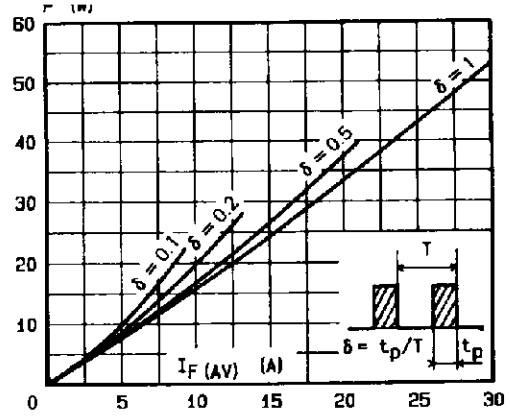


Figure 2. Peak current versus form factor

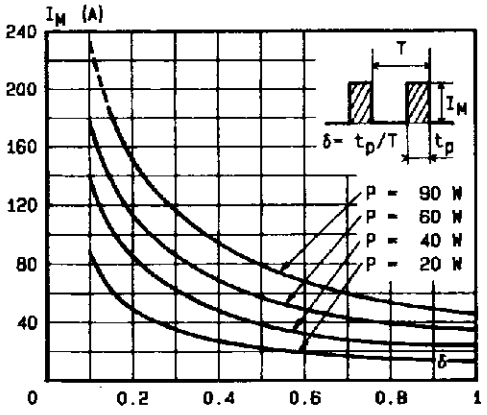


Figure 3. Non repetitive peak surge current versus overload duration

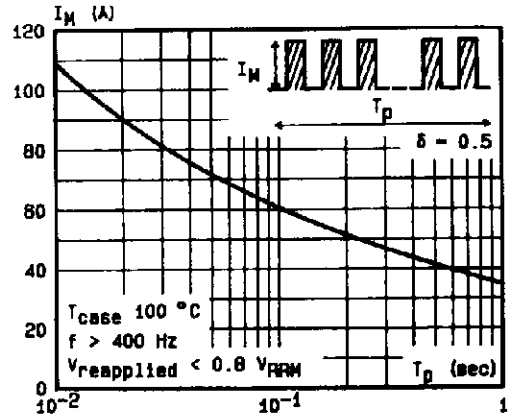


Figure 4. Thermal impedance versus pulse width

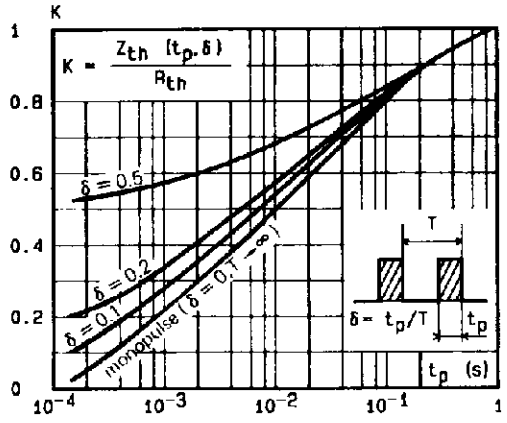


Figure 5. Voltage drop versus forward current

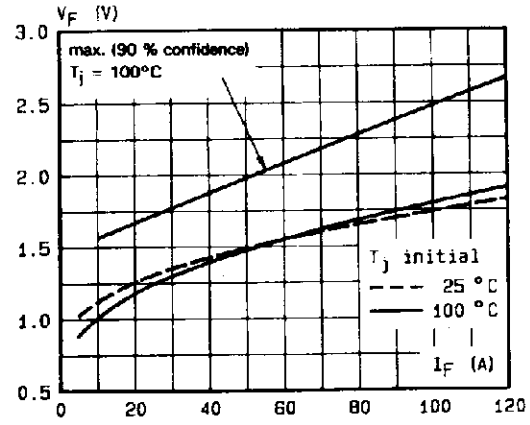


Figure 6. Recovery charge versus di_F/dt

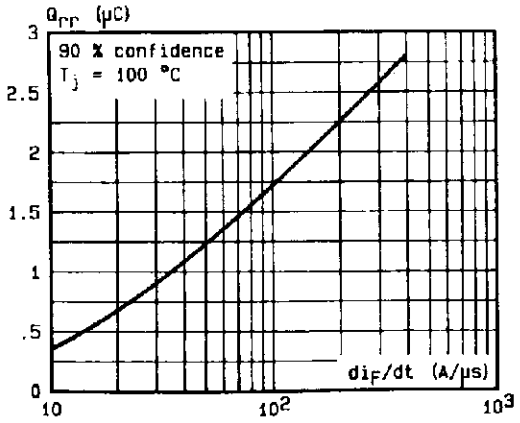


Figure 7. Recovery time versus di_F/dt

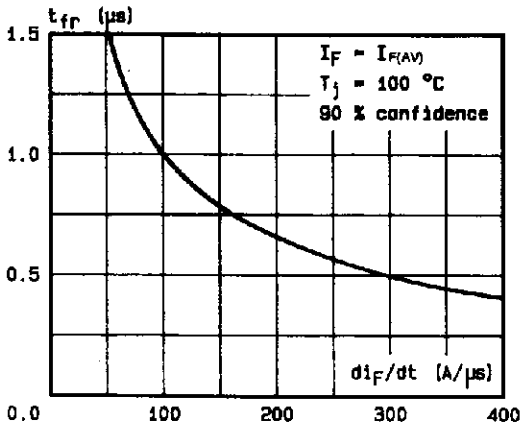


Figure 8. Peak reverse current versus di_F/dt

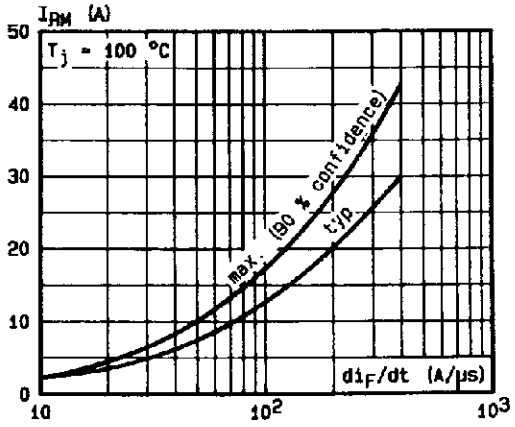


Figure 9. Peak forward voltage versus di_F/dt.

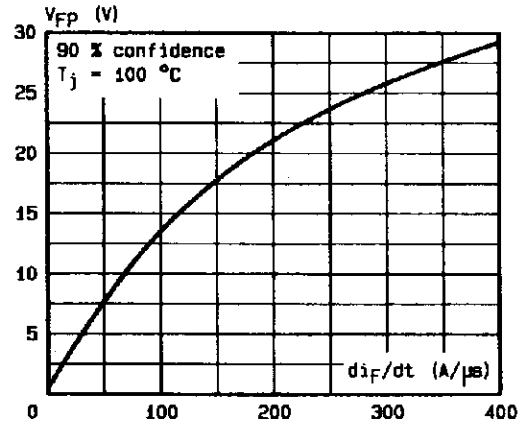


Figure 10. Dynamic parameters versus junction temperature.

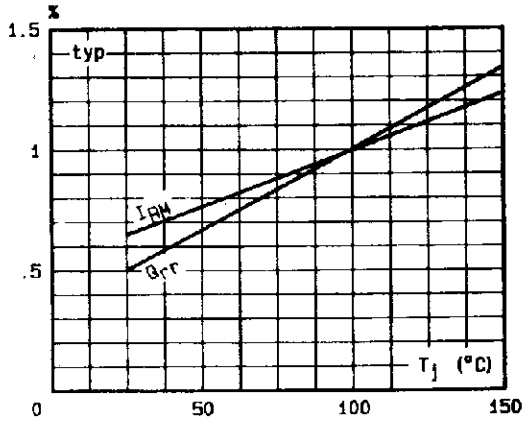


Figure 11. Turn-off switching characteristics (without series inductance).

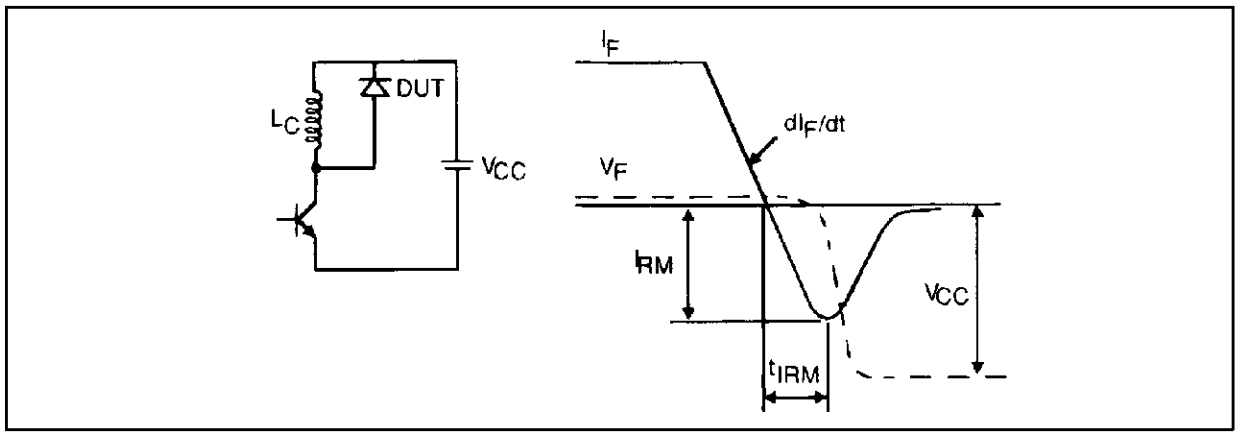
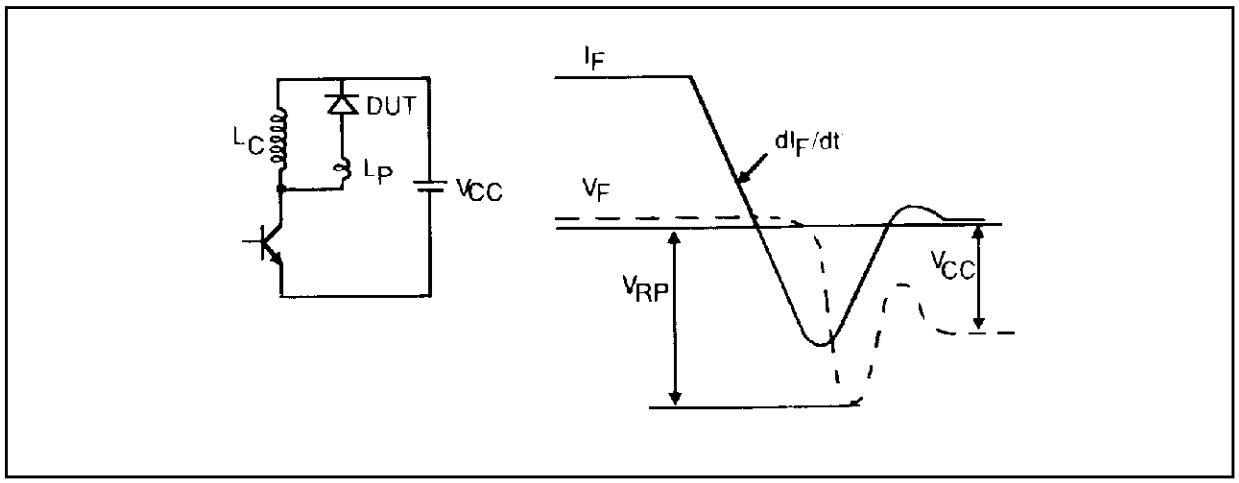
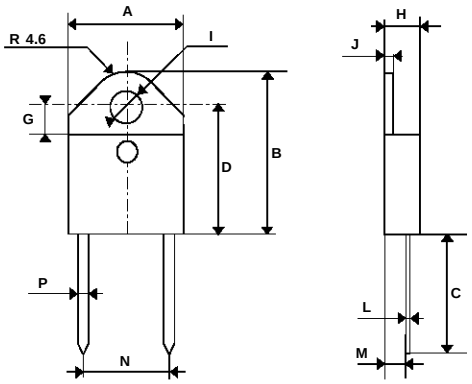


Figure 12. Turn-off switching characteristics (with series inductance)



PACKAGE MECHANICAL DATA : Isolated DOP3I Plastic



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	15.10	15.50	0.594	0.611
B	20.70	21.10	0.814	0.831
C	14.30	15.60	0.561	0.615
D	16.10	16.50	0.632	0.650
G	3.40	-	0.133	-
H	4.40	4.60	O.173	0.182
I	4.08	4.17	0.161	0.164
J	1.45	1.55	0.057	0.062
L	0.50	0.70	0.019	0.028
M	2.70	2.90	0.106	0.115
N	10.80	11.30	0.42	0.45
P	1.20	1.40	0.047	0.056

Cooling method: by conduction (method C)
Marking: type number
Weight: 18.84g
Recommended torque value: 250cm. N
Maximum torque value: 310cm. N