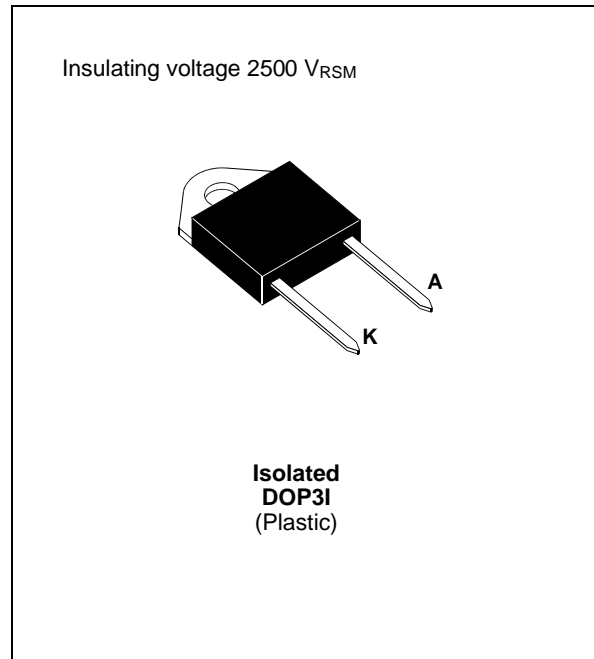# SGS-THOMSON MICROELECTRONICS

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}	$di_F/dt = -120A/μs$	$V_{CC} = 200 V$ $I_F = 30A$ $L_p \leq 0.05μH$ $T_j = 100°C$ 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
$C = \dfrac{V_{RP}}{V_{CC}}$	$T_j = 100°C$ $di_F/dt = -30A/μs$	$V_{CC} = 200V$ $L_p = 5μH$	$I_F = I_{F (AV)}$ See figure 12			4.5	

To evaluate the conduction losses use the following equations:

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

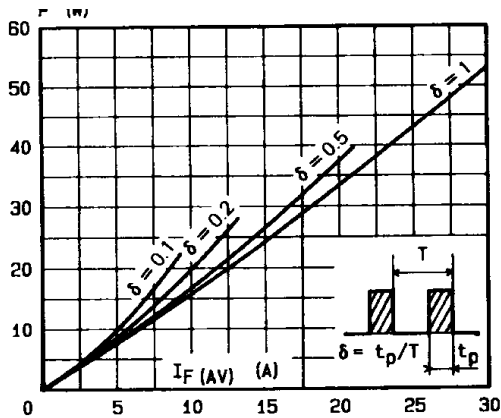**Figure 1. Low frequency power losses versus average current**

Figure 2. Peak current versus form factor
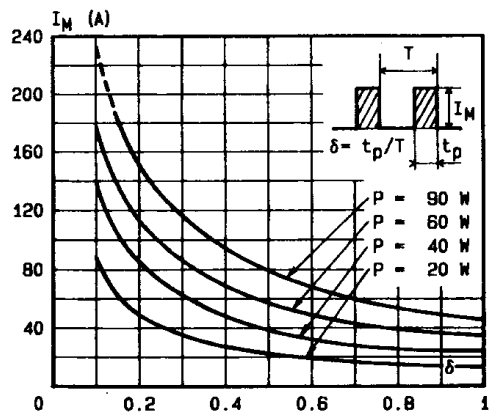
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Figure 3. Non repetitive peak surge current versus overload duration
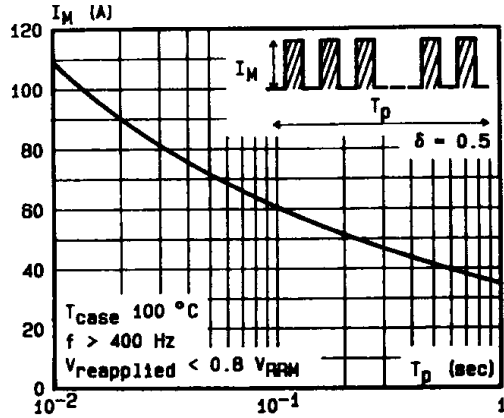

Figure 4. Thermal impedance versus pulse width
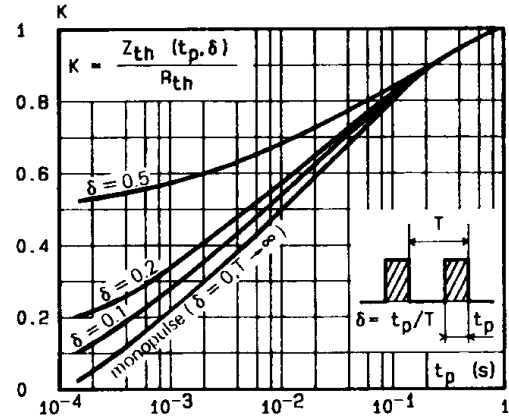

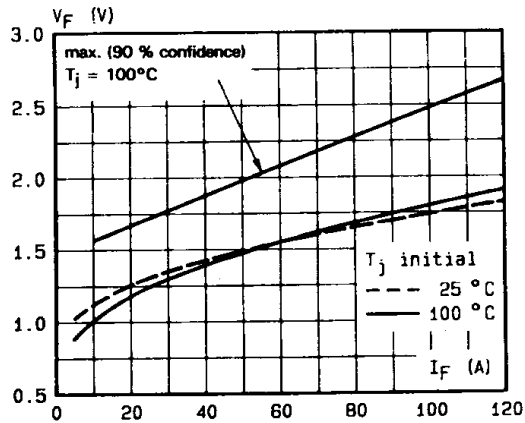## Figure 5. Voltage drop versus forward current

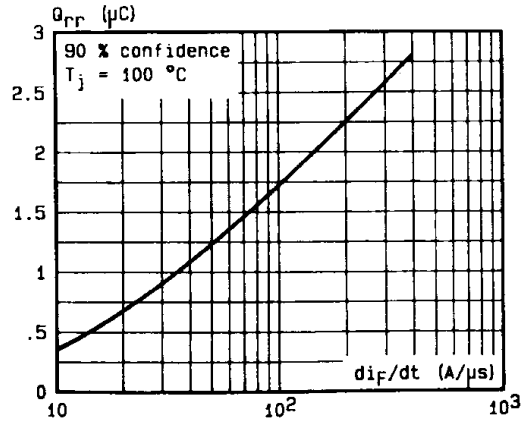## Figure 6. Recovery charge versus di_F/dt
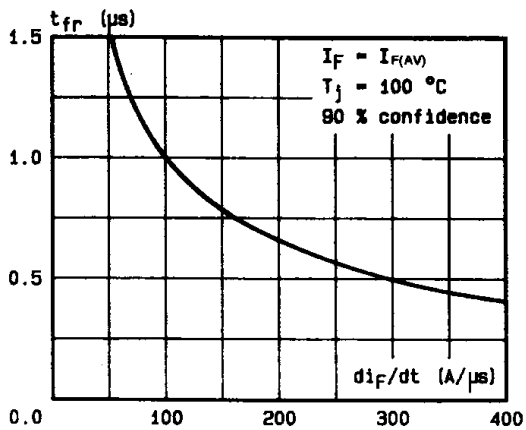

Figure 7. Recovery time versus di_F/dt
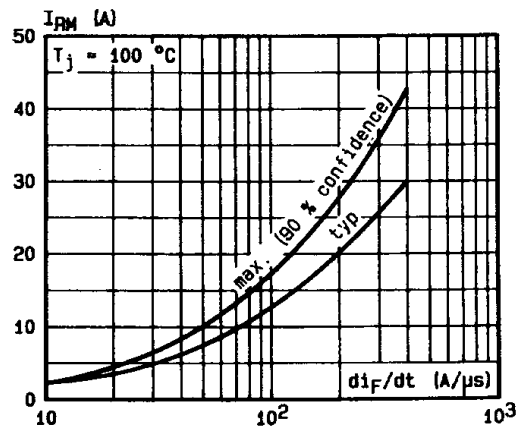

Figure 8. Peak reverse current versus di_F/dt
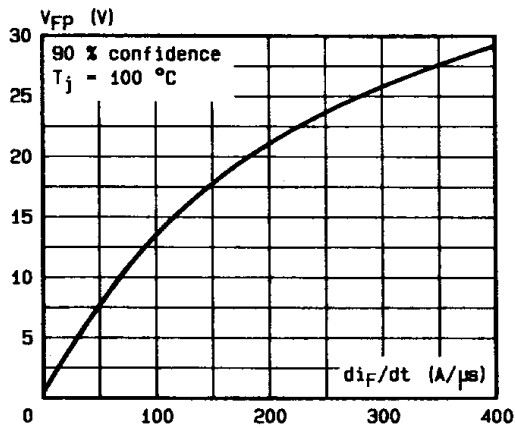
Figure 9. Peak forward voltage versus di_F/dt.
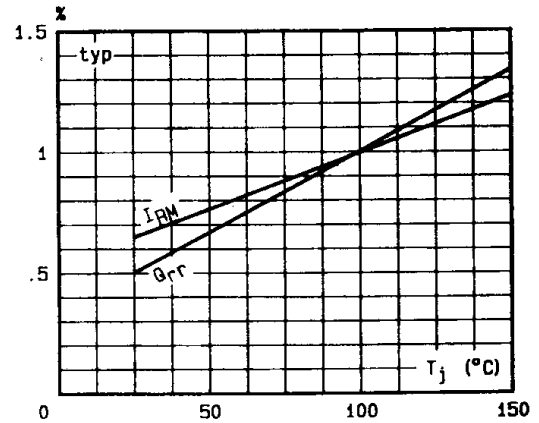

Figure 10. Dynamic parameters versus junction temperature.

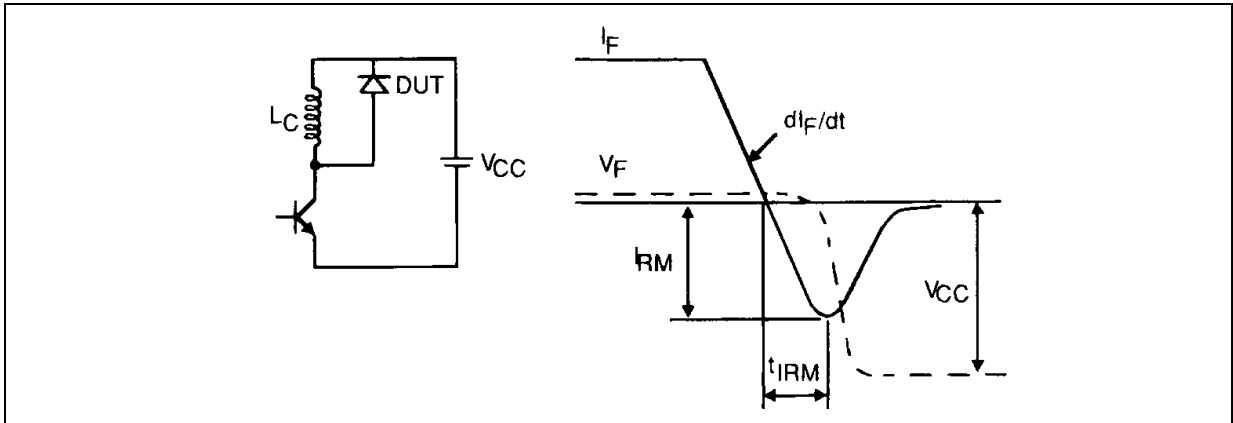Figure 11. Turn-off switching characteristics (without series inductance).

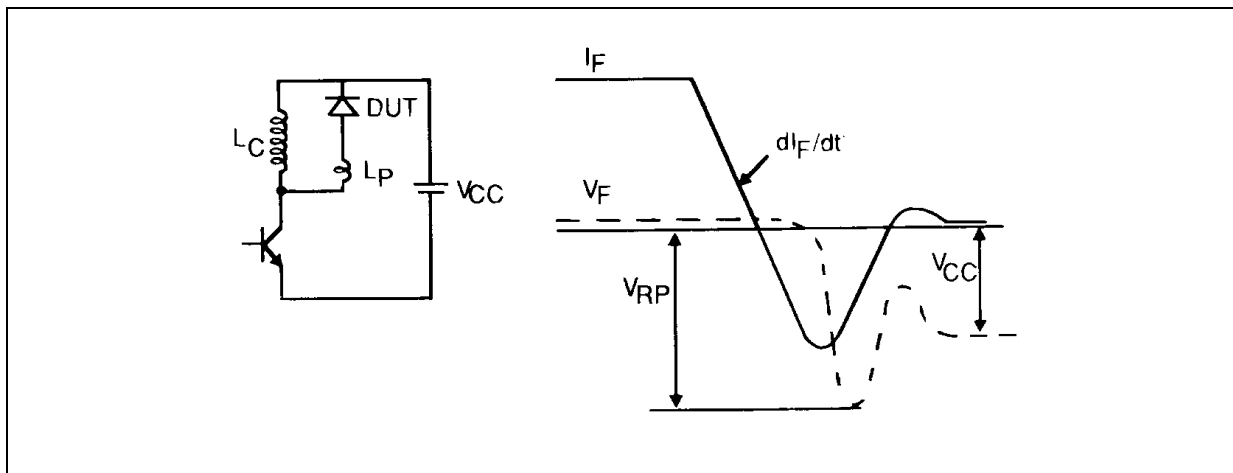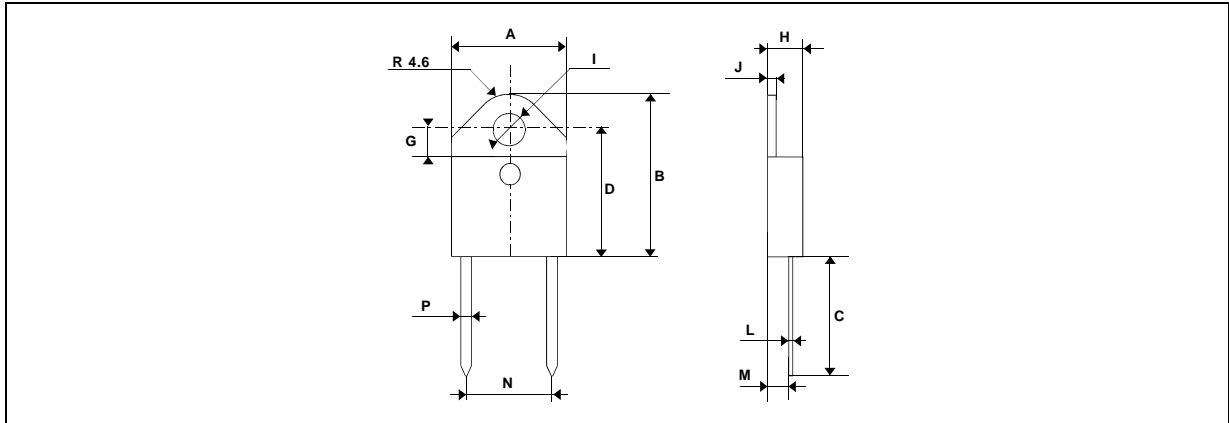Figure 12. Turn-off switching characteristics (with series inductance)

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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

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