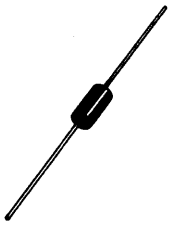
SGS-THOMSON MICROELECTRONICS

PFR 305/PFR 310

FAST RECOVERY RECTIFIER DIODES

- LOW FORWARD VOLTAGE DROP
- HIGH SURGE CURRENT CAPABILITY

APPLICATIONS
- AC-DC POWER SUPPLIES AND CONVERTERS
- CHOPPERS
- FREE WHEELING DIODES, etc.



DO 27 A
(Plastic)

DESCRIPTION

Their high efficiency and high reliability combined with small size and low cost make these fast recovery diodes very attractive components for many demanding applications.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
I_{FRM}	Repetitive Peak Forward Current	$t_p \leq 20\mu s$	70	A
$I_{F(AV)}$	Average Forward Current*	$T_a = 90°C$ $\delta = 0.5$	3	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	135	A
P_{tot}	Power Dissipation*	$T_a = 90°C$	3	W
T_{stg} T_j	Storage and Junction Temperature Range		– 55 to 150	°C
T_L	Maximum Lead Temperature for Soldering during 10s at 4mm from Case		230	°C

Symbol	Parameter	PFR 305	PFR 310	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	50	100	V

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction-ambient*	20	°C/W

* On infinite heatsink with 10mm lead length

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I_R	T_j = 25°C	$V_R = V_{RRM}$			10	µA
	T_j = 100°C				200	
V_F	T_j = 25°C	I_F = 3A			1	V

RECOVERY CHARACTERISTICS

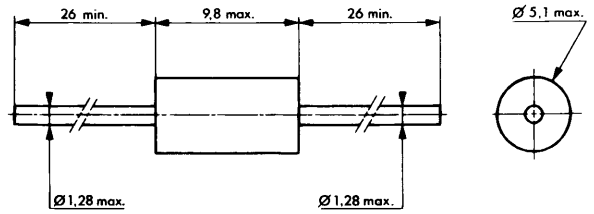
Symbol	Test Conditions			Min.	Typ.	Max.	Unit
t_{rr}	T_j = 25°C I_{rr} = 0.25A	I_F = 0.5A	I_R = 1A			50	ns

To evaluate the conduction losses use the Following equations :

$V_F = 0.75 + 0.035\ I_F$ $\quad P = 0.75 \times I_{F(AV)} + 0.035\ I_F{}^2{}_{(RMS)}$

PACKAGE MECHANICAL DATA

DO 27A Plastic



Cooling method : by convection (method A)
Marking : type number, white band indicate cathode
Weight : 1g

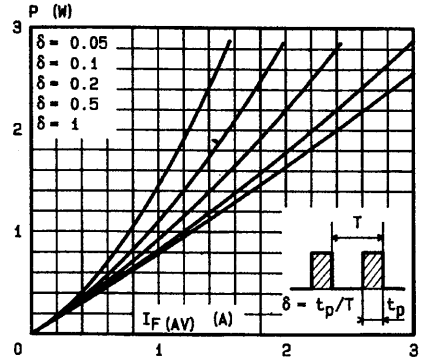


Fig.1 - Maximum average power dissipation versus average forward current.

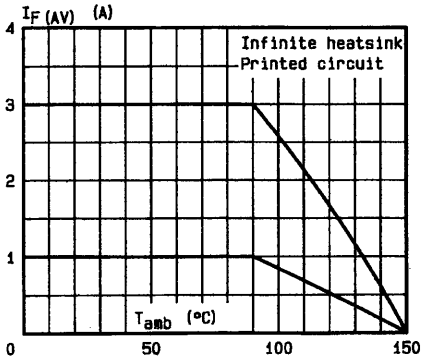


Fig.2 - Average forward current versus ambient temperature.

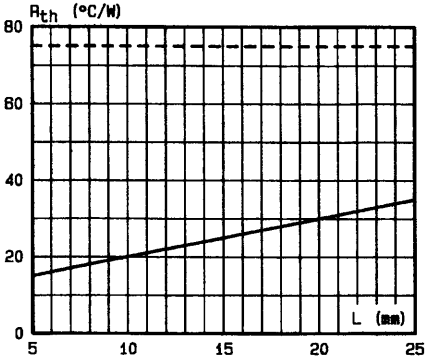
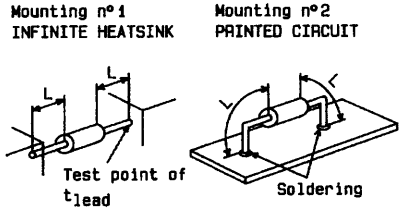


Fig.3 - Thermal resistance versus lead length.



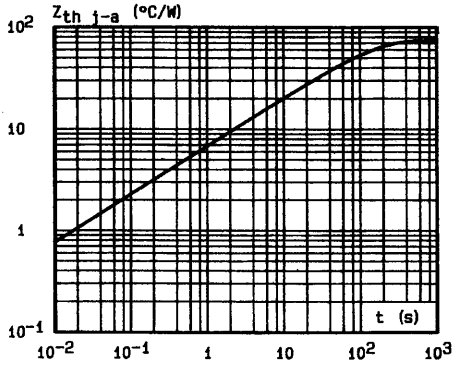


Fig.4 - Transient thermal impedance junction-ambient for mounting n°2 versus pulse duration (L = 10 mm).

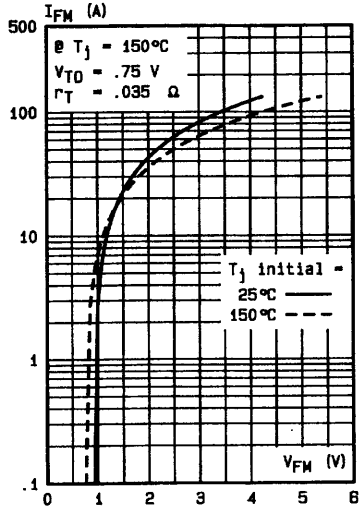


Fig.5 - Peak forward current versus peak forward voltage drop (maximum values).

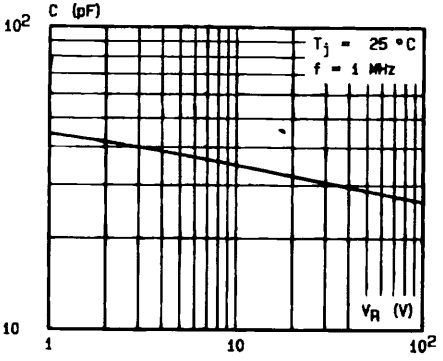


Fig.6 - Capacitance versus reverse applied voltage

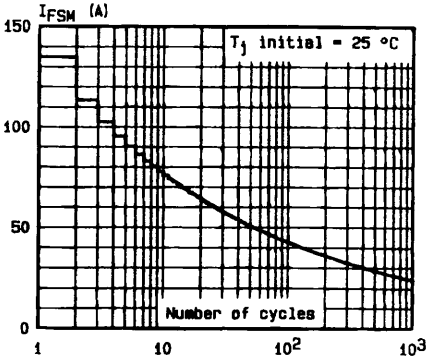


Fig.7 - Non repetitive surge peak current versus number of cycles

SGS-THOMSON MICROELECTRONICS

PFR 850 → 856

FAST RECOVERY RECTIFIER DIODES

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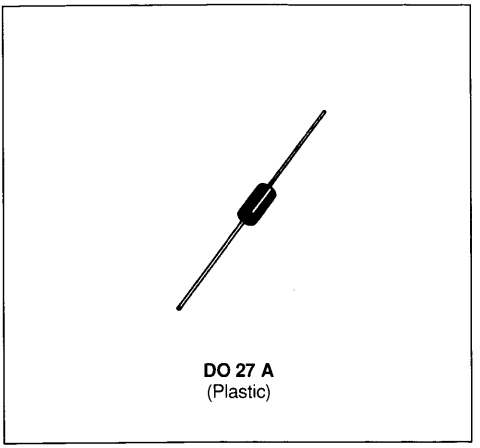
APPLICATIONS
- AC-DC POWER SUPPLIES AND CONVERTERS
- FREE WHEELING DIODES, etc.



DO 27 A
(Plastic)

DESCRIPTION

Their high efficiency and high reliability combined with small size and low cost make these fast recovery rectifier diodes very attractive components for many demanding applications.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
I_{FRM}	Repetitive Peak Forward Current	$t_p \leq 20\mu s$	100	A
$I_{F(AV)}$	Average Forward Current*	$T_a = 90°C$	3	A
I_{FSM}	Surge non Repetitive Forward Current	$t_p = 10ms$ Sinusoidal	150	A
P_{tot}	Power Dissipation*	$T_a = 90°C$	3.5	W
T_{stg} T_j	Storage and Junction Temperature Range		− 40 to 175	°C
T_L	Maximum Lead Temperature for Soldering during 10s at 4mm from Case		230	°C

Symbol	Parameter	PFR					Unit
		850	851	852	854	856	
V_{RRM}	Repetitive Peak Reverse Voltage	50	100	200	400	600	V
V_{RSM}	Non Repetitive Peak Reverse Voltage	75	150	250	450	650	V

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th\ (j-a)}$	Junction-ambient*	25	°C/W

* On infinite heatsink with 10mm lead length.

ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

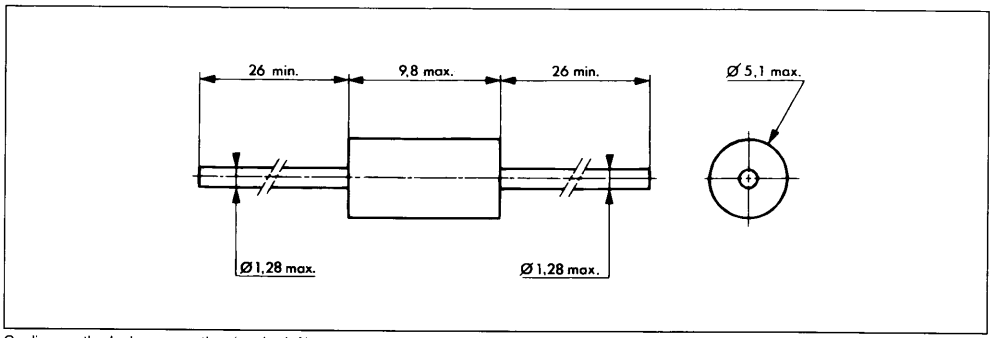
Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I_R	T_j = 25°C	$V_R = V_{RRM}$			10	µA
	T_j = 100°C				500	
V_F	T_j = 25°C	I_F = 3A			1.25	V

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
t_{rr}	T_j = 25°C	I_F = 1A	PFR 850 → 854			150	ns
	V_R = 30V	d_{iF}/dt = – 25A/µs	PFR 856			200	
I_{RM}	T_j = 25°C	I_F = 1A				2	A
	V_R = 30V	d_{iF}/dt = – 25A/µs					

PACKAGE MECHANICAL DATA

DO 27 A (Plastic)



Cooling method : by convection (method A)
Marking : type number, white band indicate cathode
Weight : 1g

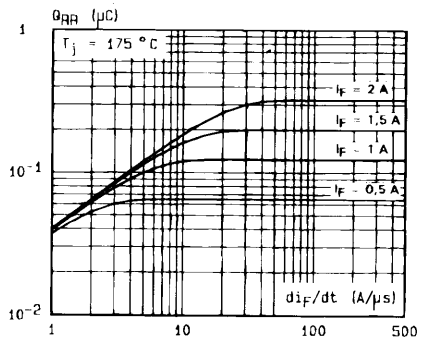
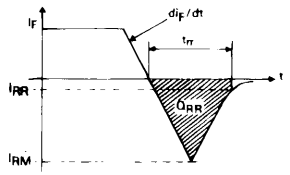


Fig.1 Recovered charge versus di_F/dt (typical values).



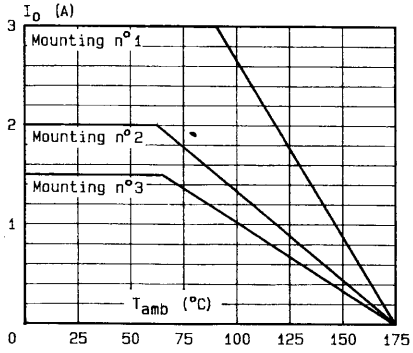


Fig.2 - Mean forward current I_O versus ambient temperature (maximum values).

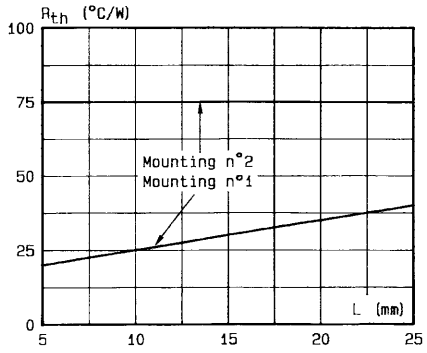


Fig.3 - Thermal resistance versus lead length (maximum values).

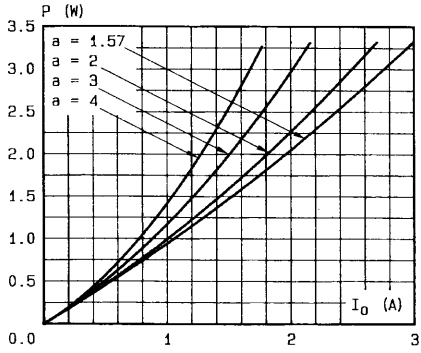


Fig.4 - Mean power dissipation versus mean forward current I for different rectifying types, in the case of :
- a resistive load (a = 1.57)
- a capacitive load (a > 1.57)

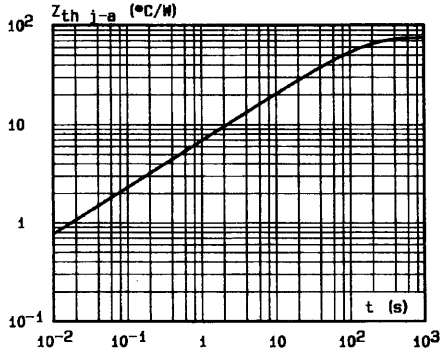
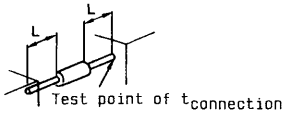
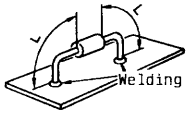


Fig.5 - Transient thermal impedance junction-ambient for mounting n°2 versus pulse duration (L = 10 mm)

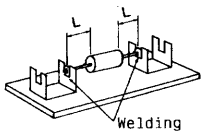
Mounting n°1 : INFINITE HEATSINK



Mounting n°2 : PRINTED CIRCUIT



Mounting n°3 :
L = 10 mm
R_{th} = 55 °C/W



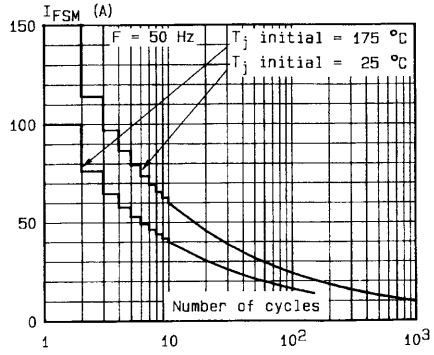
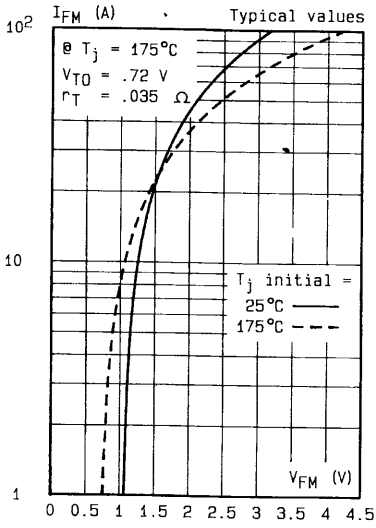


Fig.6 - Non repetitive surge peak forward current versus number of cycles.



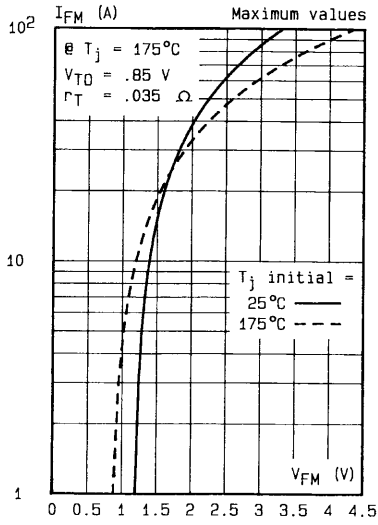


Fig.3a/3b - Peak forward current versus peak forward voltage drop.

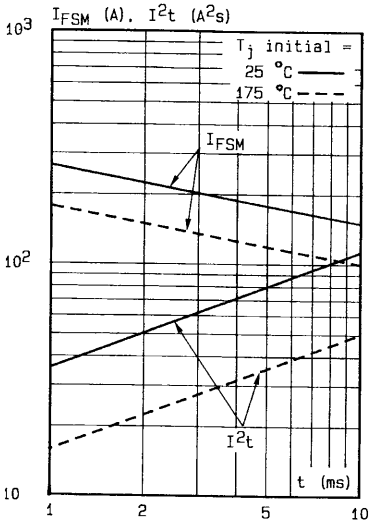


Fig.8 - Non repetitive surge peak forward current for a sinusoidal pulse with width : t ⩽ 10 ms, and corresponding value of I^2t.

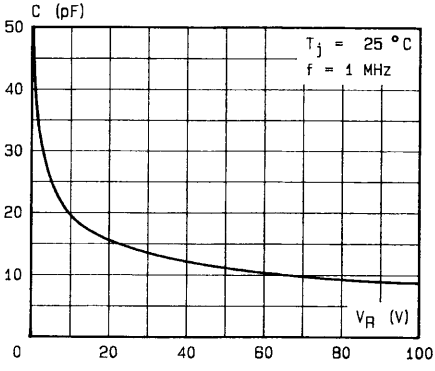


Fig.9 - Capacity C versus reverse applied voltage V_R (typical values).