

CONTROLLED AVALANCHE RECTIFIER DIODES

Also available to BS9333-F005

Silicon diodes in a DO-4 metal envelope, capable of absorbing transients and intended for use in power rectifier application.

The series consists of the following types:

Normal polarity (cathode to stud): BYX39-600 to BYX39-1400.

Reverse polarity (anode to stud): BYX39-600R to BYX39-1400R.

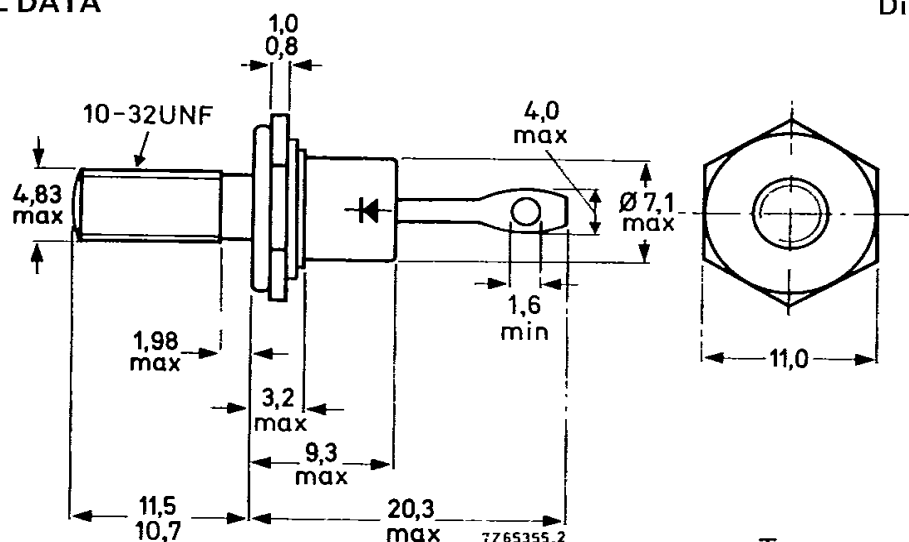
QUICK REFERENCE DATA

		BYX39-600(R)	800(R)	1000(R)	1200(R)	1400(R)	
Crest working reverse voltage	V_{RWM}	max. 600	800	1000	1200	1400	V
Reverse avalanche breakdown voltage	$V_{(BR)R} >$	750	1000	1250	1450	1650	V
Average forward current	$I_{F(AV)}$		max. 9.5				A
Non-repetitive peak forward current	I_{FSM}		max. 125				A
Non-repetitive peak reverse power dissipation	P_{RSM}		max. 4				kW

MECHANICAL DATA

Dimensions in mm

Fig. 1 DO-4



Net mass: 6 g

Diameter of clearance hole: max. 5.2 mm

Accessories supplied on request:
see ACCESSORIES section

Supplied with device: 1 nut, 1 lock-washer.

Nut dimensions across the flats: 9.5 mm.

The mark shown applies to normal polarity types.

Torque on nut:
min. 0.9 Nm (9 kg cm),
max. 1.7 Nm (17 kg cm).



RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC134)

Voltages*

		BYX39-600(R)	800(R)	1000(R)	1200(R)	1400(R)	
Continuous reverse voltage	V_R	max. 600	800	1000	1200	1400	V
Crest working reverse voltage	V_{RWM}	max. 600	800	1000	1200	1400	V

Currents

Average forward current (averaged over any 20 ms period) up to $T_{mb} = 85^\circ C$
at $T_{mb} = 125^\circ C$

$I_{F(AV)}$	max.	9.5	A
$I_{F(AV)}$	max.	6.0	A

R.M.S. forward current

$I_{F(RMS)}$	max.	15	A
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Repetitive peak forward current

I_{FRM}	max.	100	A
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Non-repetitive peak forward current
 $t = 10$ ms (half sine-wave); $T_j = 175^\circ C$ prior to surge;
with reapplied V_{RWMmax}

I_{FSM}	max.	125	A
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$I^2 t$ for fusing ($t = 10$ ms)

$I^2 t$	max.	78	$A^2 s$
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Reverse power dissipation

Average reverse power dissipation
(averaged over any 20 ms period); $T_j = 125^\circ C$

$P_{R(AV)}$	max.	10	W
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Repetitive peak reverse power dissipation
 $t = 10 \mu s$ (square-wave; $f = 50$ Hz); $T_j = 125^\circ C$

P_{RRM}	max.	2	kW
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Non-repetitive peak reverse power dissipation
 $t = 10 \mu s$ (square-wave)
 $T_j = 25^\circ C$ prior to surge
 $T_j = 175^\circ C$ prior to surge

P_{RSM}	max.	4	kW
P_{RSM}	max.	0.8	kW

Temperatures

Storage temperature

T_{stg}		-55 to +175	$^\circ C$
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Junction temperature

T_j	max.	175	$^\circ C$
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*To ensure thermal stability: $R_{th j-a} \leq 5^\circ C/W$ (continuous reverse voltage) or $\leq 20^\circ C/W$ (a.c.)



THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	50	$^{\circ}C/W$
From junction to mounting base	$R_{th\ j-mb}$	=	4.5	$^{\circ}C/W$
From mounting base to heatsink without heatsink compound	$R_{th\ mb-h}$	=	1.0	$^{\circ}C/W$
with heatsink compound	$R_{th\ mb-h}$	=	0.5	$^{\circ}C/W$
with mica washer	$R_{th\ mb-h}$	=	2.0	$^{\circ}C/W$
Transient thermal impedance; $t = 1\ ms$	$Z_{th\ j-mb}$	=	0.35	$^{\circ}C/W$

CHARACTERISTICS

		BYX39-600(R)	800(R)	1000(R)	1200(R)	1400(R)	
Forward voltage							
$I_F = 20\ A; T_j = 25\ ^{\circ}C$	V_F	< 1.7	1.7	1.7	1.7	1.7	V^*
Reverse avalanche breakdown voltage							
$I_R = 5\ mA; T_j = 25\ ^{\circ}C$	$V_{(BR)R}$	> 750	1000	1250	1450	1650	V
		< 2400	2400	2400	2400	2400	V
Reverse current							
$V_R = V_{RWMmax};$ $T_j = 125\ ^{\circ}C$	I_R	< 200	200	200	200	200	μA

OPERATING NOTES

The top connector should neither be bent nor twisted; it should be soldered into the circuit so that there is no strain on it.

During soldering the heat conduction to the junction should be kept to a minimum.

*Measured under pulse conditions to avoid excessive dissipation.

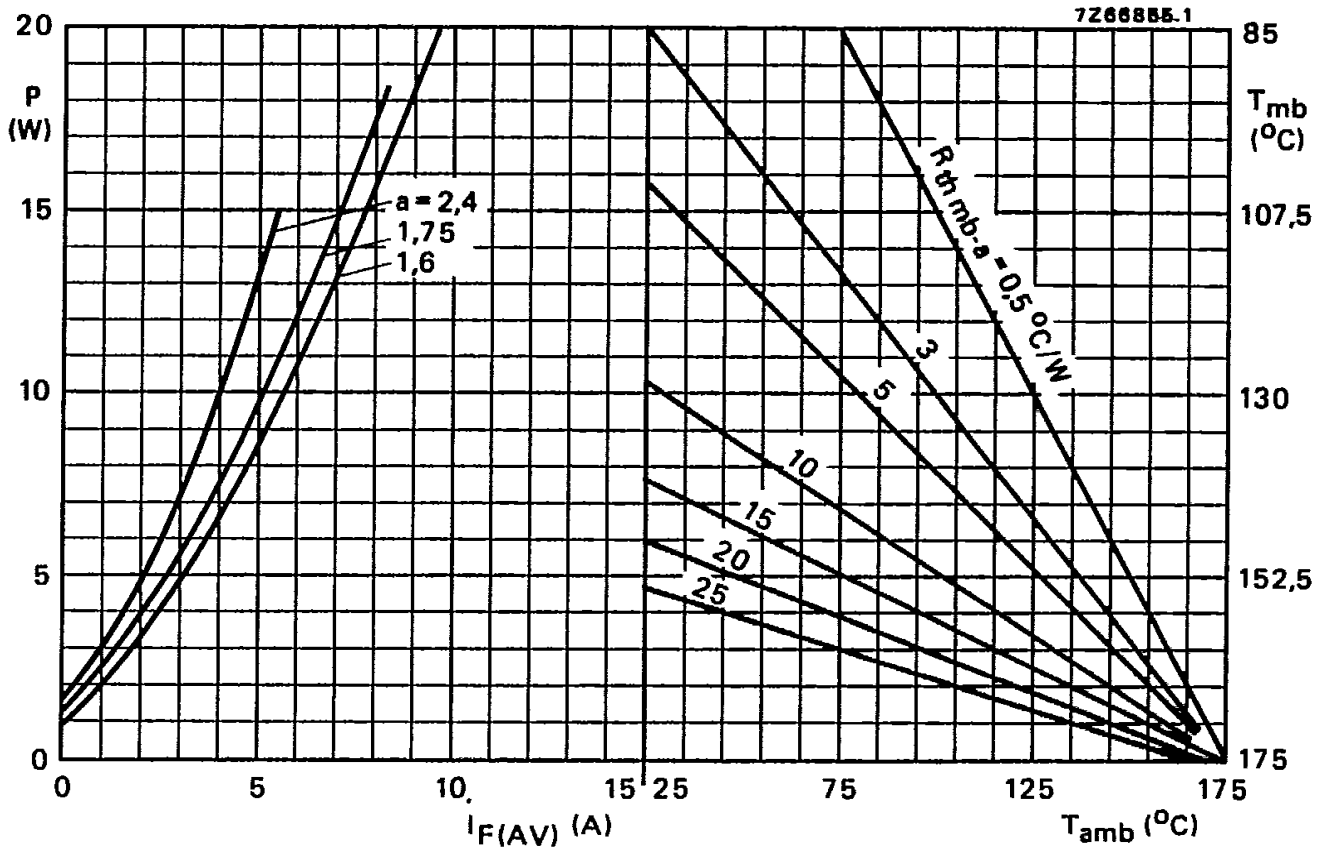


Fig.2

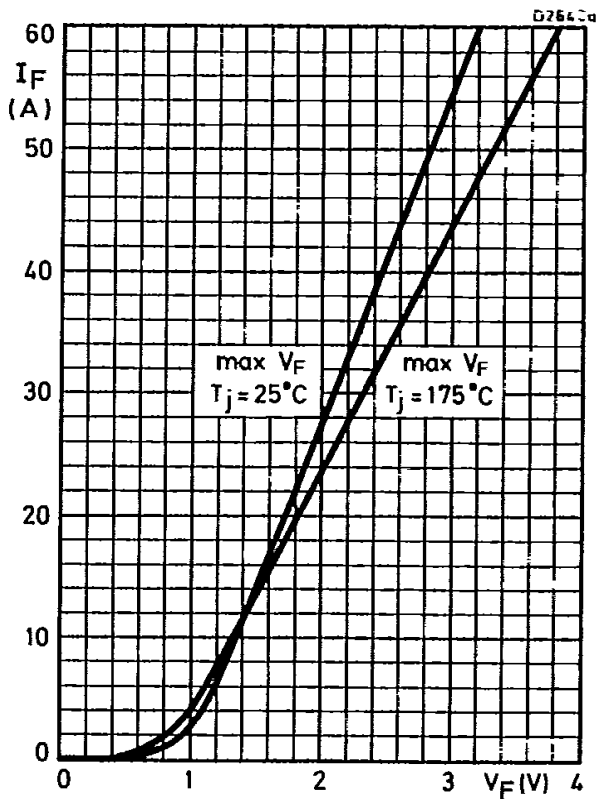


Fig.3

The right-hand part shows the inter-relationship between the power (derived from the left-hand part) and the maximum permissible temperatures.

P = dissipation excluding power in the avalanche region.

- single phase: $a = 1.6$
- 3-phase : $a = 1.75$
- 6-phase : $a = 2.4$

$$a = I_{F(RMS)} / I_{F(AV)}$$

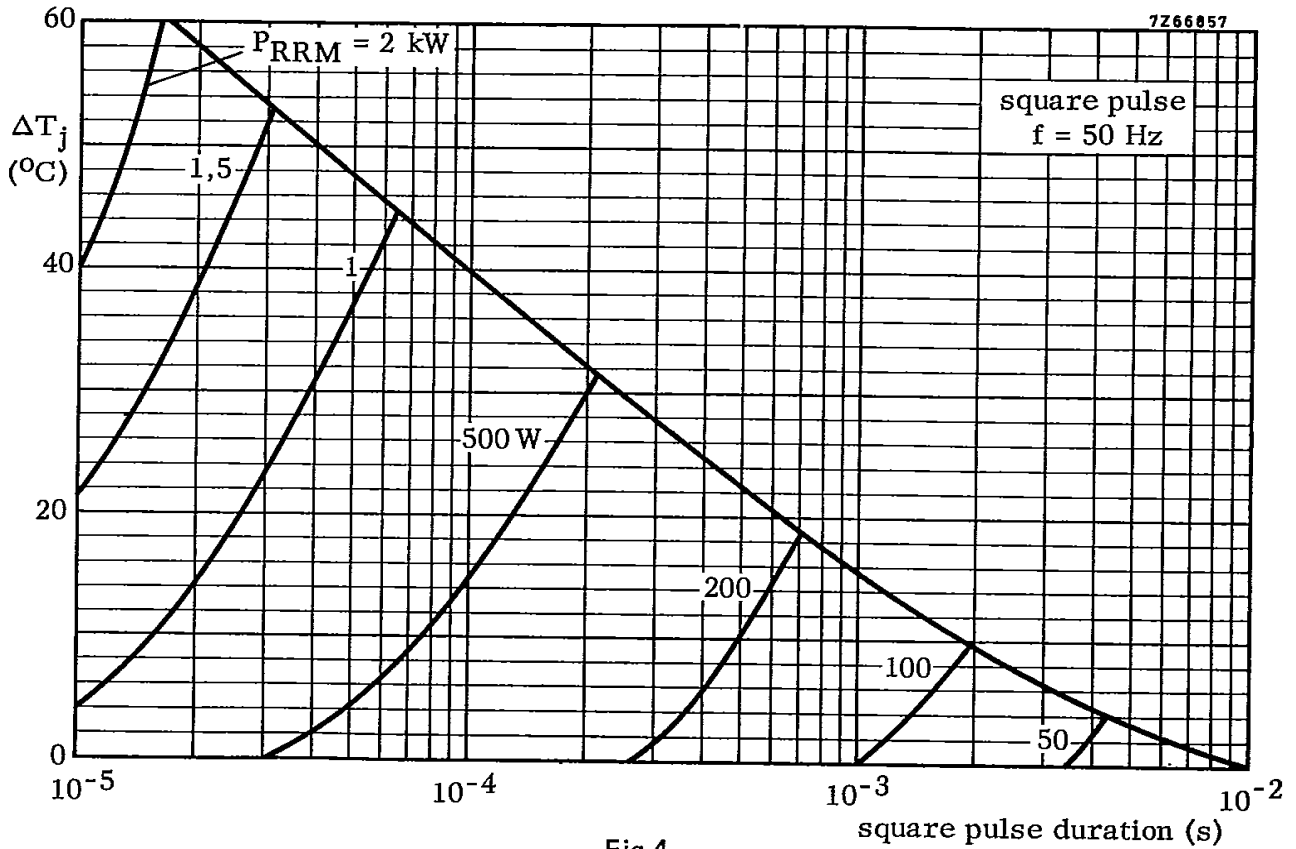


Fig. 4

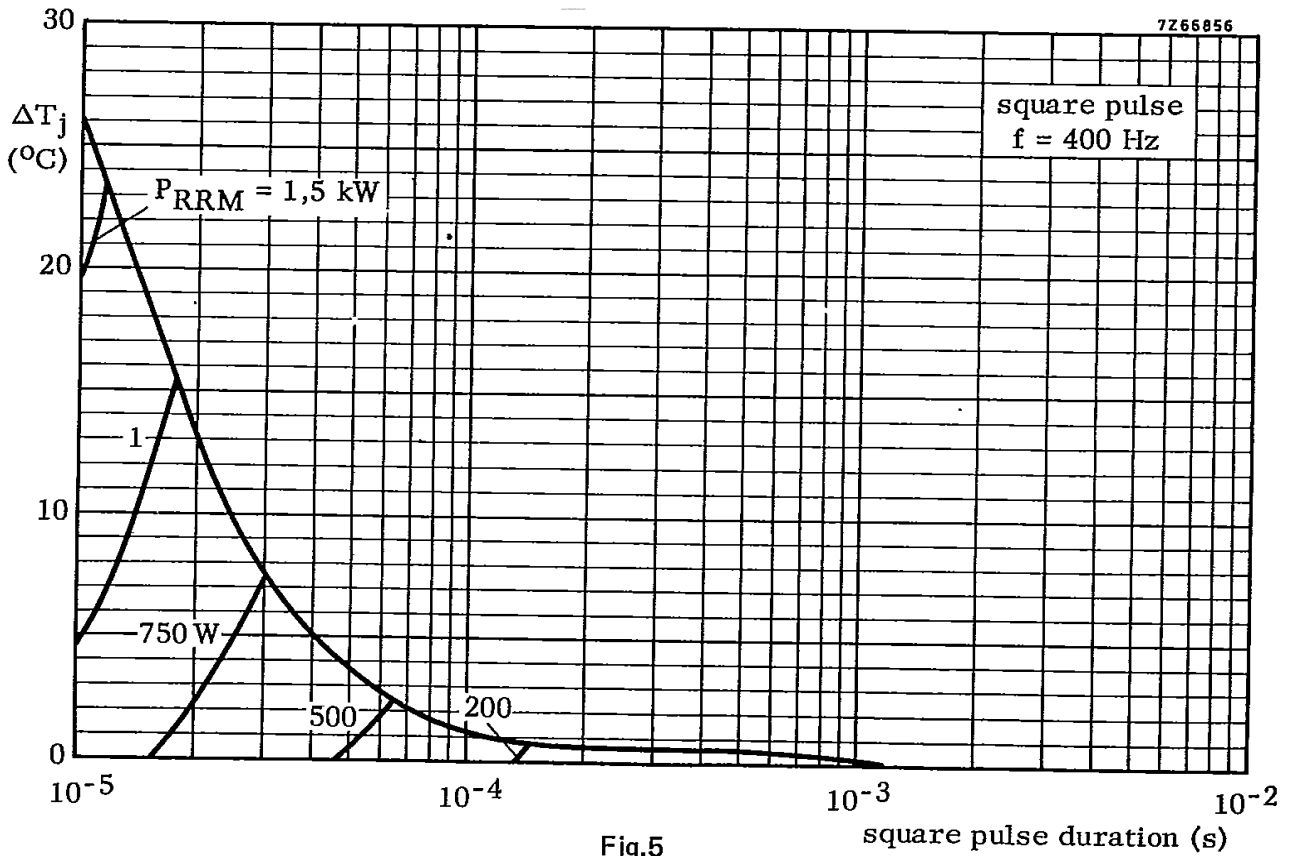


Fig. 5

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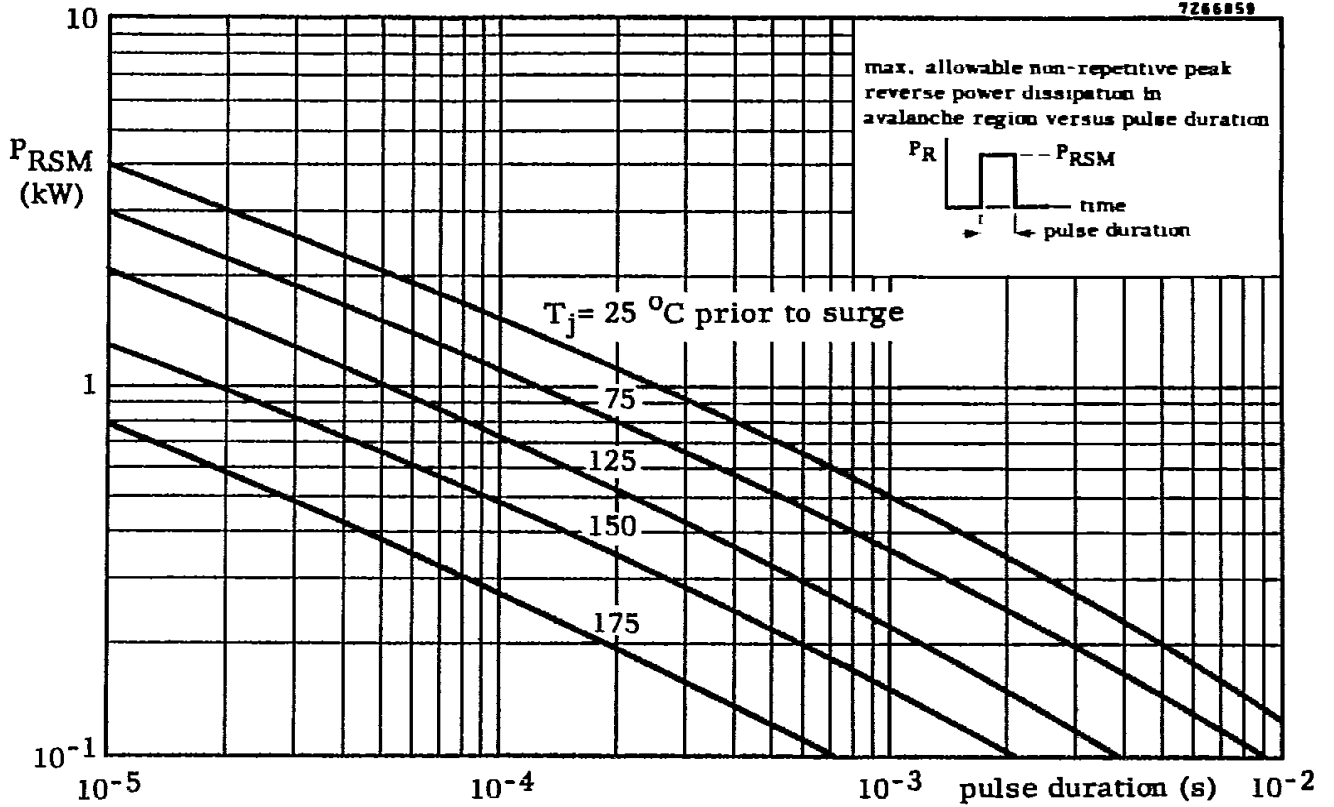


Fig.6

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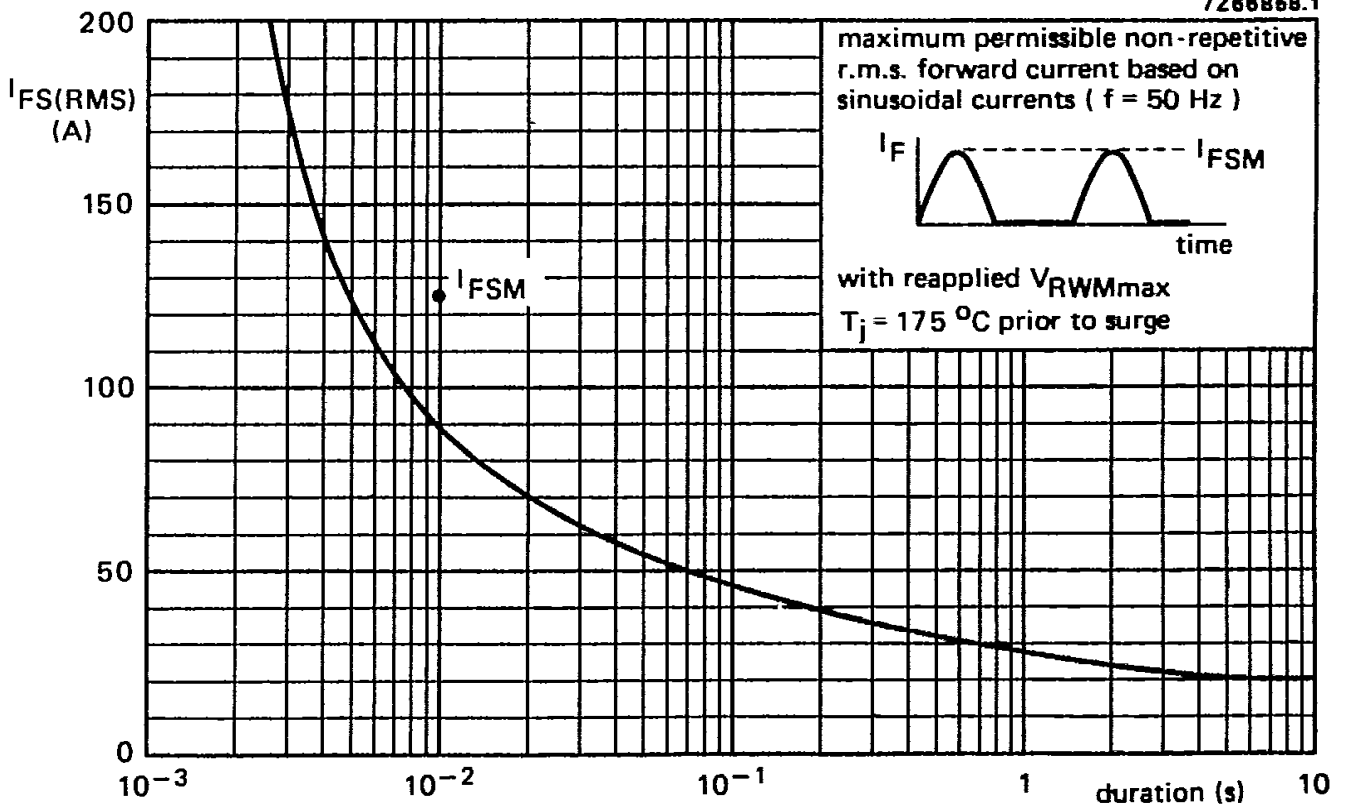


Fig.7