

### FAST SOFT-RECOVERY RECTIFIER DIODES

Silicon diodes, each in a DO-4 metal envelope, featuring non-snap-off characteristics, and intended for use in high-frequency power supplies, thyristor inverters and multi-phase power rectifier applications. The series consists of the following types:  
 Normal polarity (cathode to stud): 1N3879, 1N3880, 1N3881, 1N3882 and 1N3883.

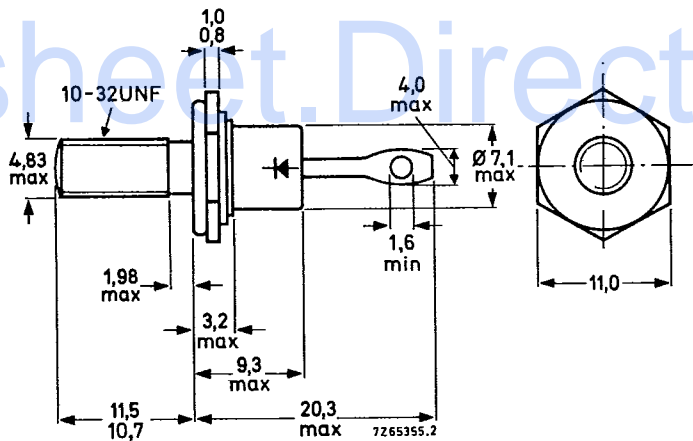
#### QUICK REFERENCE DATA

	1N3879	1N3880	1N3881	1N3882	1N3883
Repetitive peak reverse voltage $V_{RRM}$ max.	50	100	200	300	400 V
Average forward current $I_F(AV)$ max.				6	A
Non-repetitive peak forward current $I_{FSM}$ max.				80	A
Reverse recovery time $t_{rr}$				< 200	ns

#### MECHANICAL DATA

Dimensions in mm

Fig.1 DO-4, Supplied with device: 1 nut, 1 lock washer  
 Nut dimensions across the flats: 9.5 mm.



Net mass: 6 g

Diameter of clearance hole: max. 5,2 mm

Accessories supplied on request: mica washer (56295a);  
 PTFE ring (56295b); insulating bush (56295c).

Torque on nut: min. 0,9 Nm  
 (9 kg cm)  
 max. 1,7 Nm  
 (17 kg cm)

1N3879 to 1N3883

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RATINGS Limiting values in accordance with the Absolute Maximum System (IEC 134)

## Voltages

		1N3879	1N3880	1N3881	1N3882	1N3883
Non-repetitive peak reverse voltage ( $t \leq 10$ ms)	$V_{RSM}$ max	100	150	250	350	450 V
Repetitive peak reverse voltage ( $\delta \leq 0,01$ )	$V_{RRM}$ max.	50	100	200	300	400 V
Crest working reverse voltage	$V_{RWM}$ max.	50	100	200	300	400 V

## Currents

Average on-state current assuming zero switching losses (averaged over any 20 ms period)  
up to  $T_{mb} = 100$  °C  
at  $T_{mb} = 125$  °C

 $I_{F(AV)}$  max. 6 A $I_{F(AV)}$  max. 3,5 A

R.M.S. forward current

 $I_{F(RMS)}$  max. 10 A

Repetitive peak forward current

 $I_{FRM}$  max. 75 A

Non-repetitive peak forward current

$T_j = 150$  °C prior to surge;  
half sine-wave with reapplied  $V_{RWMmax}$ ;  
 $t = 10$  ms  
 $t = 8,3$  ms

 $I_{FSM}$  max. 75 A $I_{FSM}$  max. 80 A $I^2 t$  for fusing ( $t = 10$  ms) $I^2 t$  max. 28 A<sup>2</sup>s

## Temperatures

Storage temperature

 $T_{stg}$  -65 to +175 °C

Operating junction temperature

 $T_j$  max. 150 °C

## THERMAL RESISTANCE

From junction to ambient in free air

 $R_{th j-a}$  = 50 K/W

From junction to mounting base

 $R_{th j-mb}$  = 4,4 K/W

From mounting base to heatsink

 $R_{th mb-h}$  = 0,5 K/WTransient thermal impedance;  $t = 1$  ms;  $\delta = 0$  $Z_{th j-mb}$  = 1 K/W

Fast soft-recovery rectifier diodes

1N3879 to 1N3883

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**CHARACTERISTICS**

**Forward voltage**

$I_F = 6 \text{ A}; T_j = 25 \text{ }^\circ\text{C}$

$V_F < 1,4 \text{ V}^*$

**Reverse current**

$V_R = V_{RWMmax}; T_j = 125 \text{ }^\circ\text{C}$

$I_R < 3 \text{ mA}$

**Reverse recovery when switched from**

$I_F = 1 \text{ A to } V_R = 30 \text{ V};$

$-dI_F/dt = 35 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}$

Recovery time

$t_{rr} < 200 \text{ ns}$

$I_F = 2 \text{ A to } V_R = 30 \text{ V};$

$-dI_F/dt = 20 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}$

Recovery charge

$Q_s < 250 \text{ nC}$

$I_F = 1 \text{ A to } V_R = 30 \text{ V};$

$-dI_F/dt = 2 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}$

Max. slope of the reverse recovery current

$|dI_R/dt| < 5 \text{ A}/\mu\text{s}$

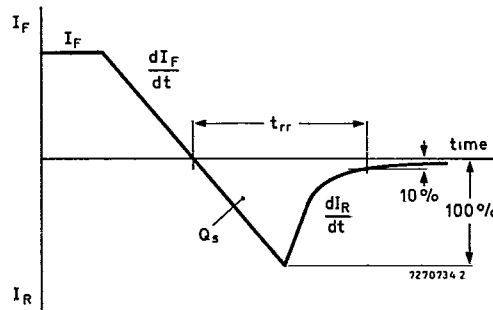
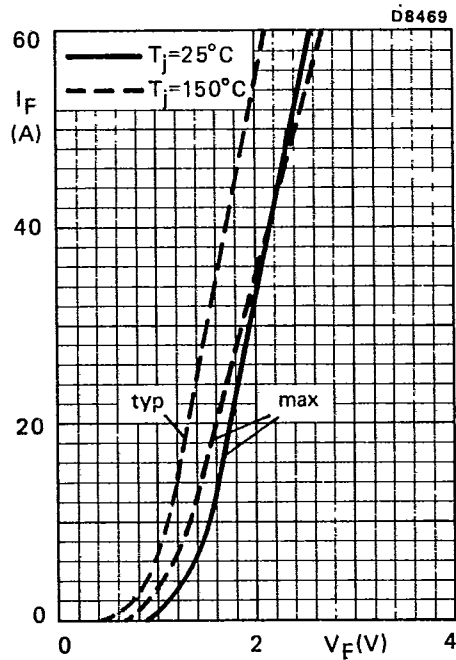
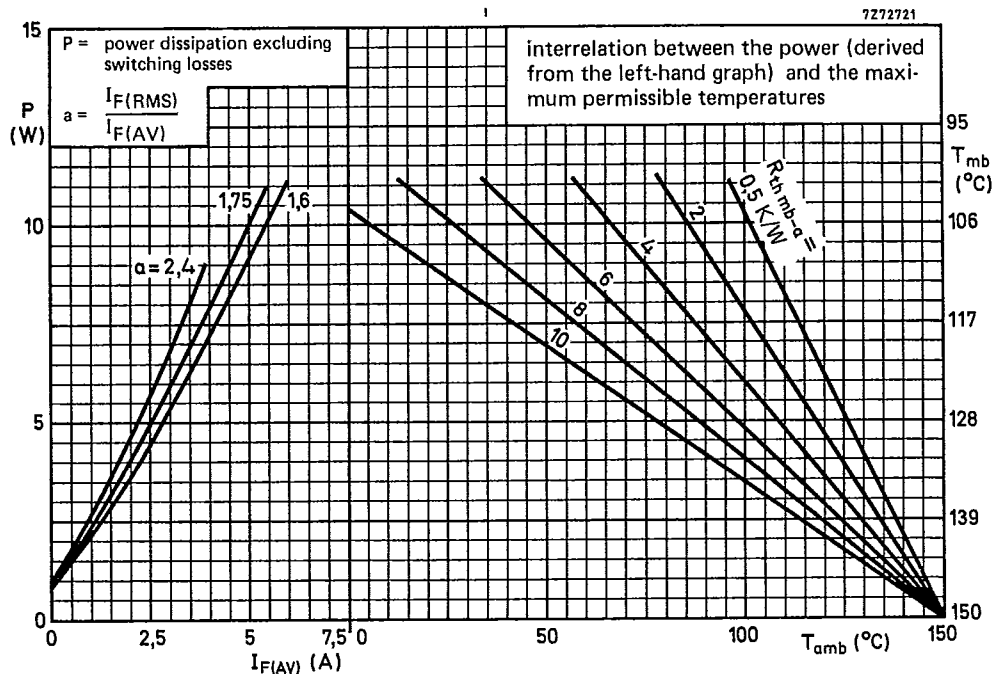


Fig.2 Definition of  $t_{rr}$  and  $Q_s$ .

\*Measured under pulse conditions to avoid excessive dissipation



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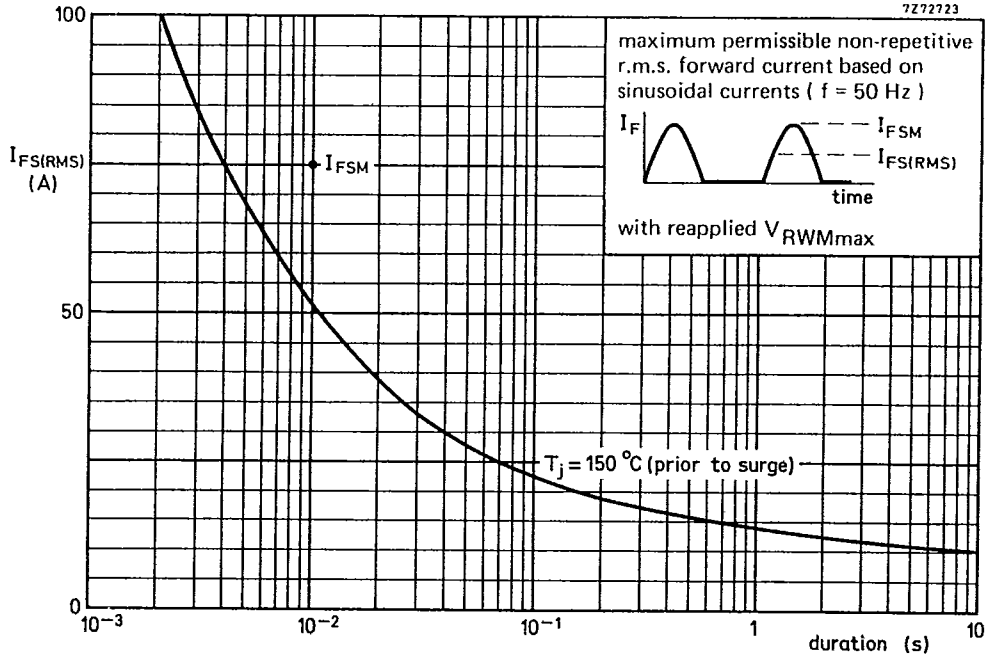


Fig.5

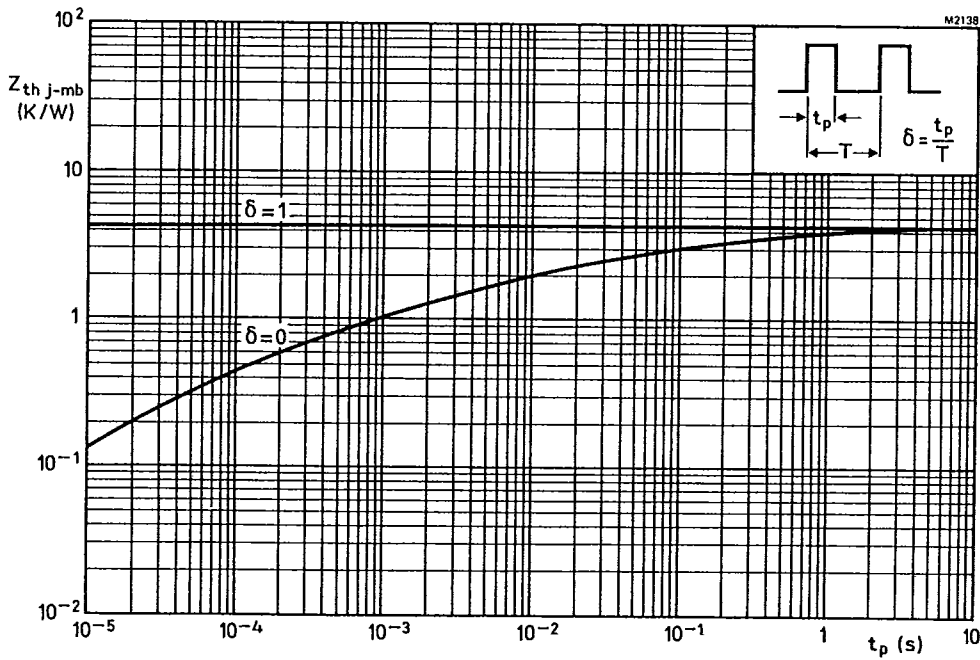


Fig.6

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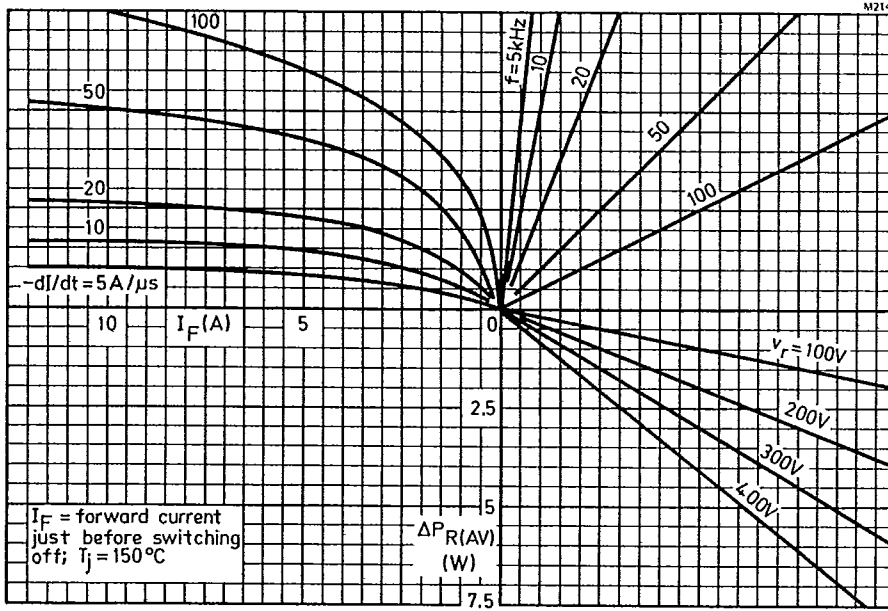


Fig.7

NOMOGRAM

Power loss  $\Delta P_R \text{ (AV)}$  due to switching only (to be added to steady state power losses).

