

Controlled avalanche Schottky
barrier diodes

1N5820ID/21ID/22ID

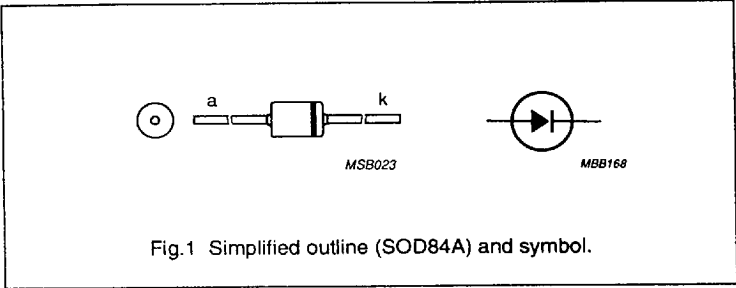
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DESCRIPTION

Schottky barrier diodes in hermetically sealed SOD84A Implosion Diode (ID) envelope, intended for use in low output voltage, low power switched-mode power supplies and high-frequency circuits in general, where low conduction and switching losses are important. The devices are capable of absorbing reverse surge current.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		
	1N5820	20	V
	1N5821	30	V
	1N5822	40	V
V_{RWM}	crest working reverse voltage		
	1N5820	20	V
	1N5821	30	V
	1N5822	40	V
V_R	continuous reverse voltage		
	1N5820	20	V
	1N5821	30	V
	1N5822	40	V
$I_{F(AV)}$	average forward current	3	A
I_{FSM}	non-repetitive peak forward current	80	A
T_j	junction temperature	125	°C



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LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage				
	1N5820		—	20	V
	1N5821		—	30	V
	1N5822		—	40	V
V_{RRM}	repetitive peak reverse voltage				
	1N5820		—	20	V
	1N5821		—	30	V
	1N5822		—	40	V
V_{RWM}	crest working reverse voltage				
	1N5820		—	20	V
	1N5821		—	30	V
	1N5822		—	40	V
$I_{F(AV)}$	average forward current	$V_{R(equiv)} = 0.2 V_{R(DC)}$; $T_{amb} = 50\text{ }^{\circ}\text{C}$; lead length 4 mm; $R_{th\ j-a} = 28\text{ K/W}$	—	3	A
		$V_{R(equiv)} = 0.2 V_{R(DC)}$; $T_{amb} = 60\text{ }^{\circ}\text{C}$; PCB mounting; $R_{th\ j-a} = 68\text{ K/W}$ (see Fig.5)	—	1.3	A
I_{FSM}	non-repetitive peak forward current	$t = 8.3\text{ ms}$; half sine-wave; JEDEC method	—	80	A
I_{RSM}	non-repetitive reverse surge current	$t_p = 100\text{ }\mu\text{s}$	—	0.5	A
T_{stg}	storage temperature range		—65	125	$^{\circ}\text{C}$
T_j	junction temperature		—	125	$^{\circ}\text{C}$
T_{amb}	ambient temperature	rated V_R ; $P_F = 0$; $R_{th\ j-a} = 68\text{ K/W}$			
	1N5820		—	70	$^{\circ}\text{C}$
	1N5821		—	65	$^{\circ}\text{C}$
	1N5822		—	60	$^{\circ}\text{C}$

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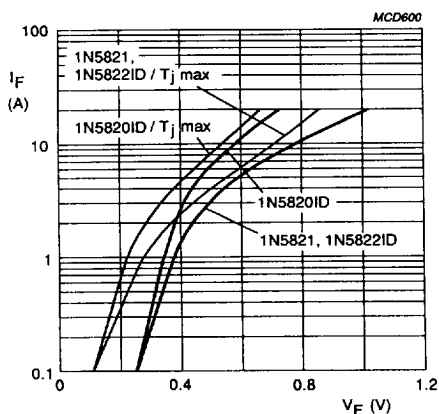
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THERMAL RESISTANCE

SYMBOL	PARAMETER	CONDITIONS	THERMAL RESISTANCE
$R_{th\ j-p}$	from junction to tie-point	lead length 4 mm	28 K/W
$R_{th\ j-a}$	from junction to ambient	note 1	68 K/W

Note

- Device mounted on a 1.5 mm thick epoxy-glass printed circuit board, with 3 cm² copper surface to each terminal; lead length 10 mm; see Fig.5.



$T_j = 25\ ^\circ\text{C}$; $T_{j\ max} = 125\ ^\circ\text{C}$.

Fig.2 Forward current as a function of forward voltage, typical values.

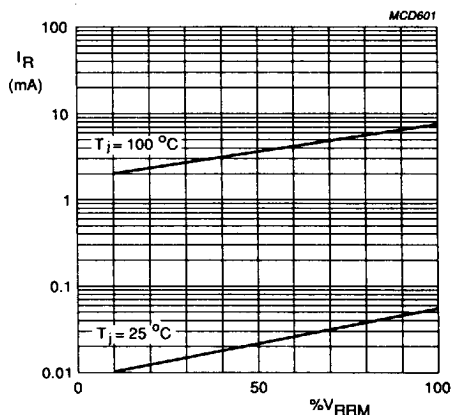


Fig.3 Reverse current as a function of repetitive peak reverse voltage, typical values.

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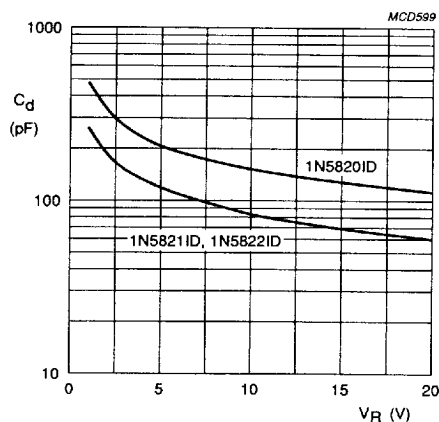
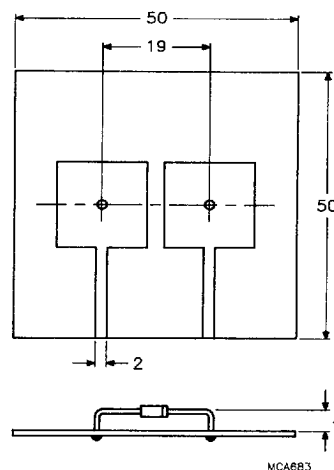


Fig.4 Diode capacitance as a function of reverse voltage, typical values.



Dimensions in mm.

Fig.5 Method of mounting.

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CHARACTERISTICS

 $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage (note 1)	$I_F = 1\text{ A}$	—	0.370	V
	1N5820		—	0.380	V
	1N5821		—	0.390	V
	1N5822				
		$I_F = 3\text{ A}$	—	0.475	V
	1N5820		—	0.500	V
	1N5821		—	0.525	V
	1N5822				
		$I_F = 9.4\text{ A}$	—	0.850	V
$V_{(BR)R}$	reverse breakdown voltage	$I_R = 10\text{ mA}$			
	1N5820		24	—	V
	1N5821		36	—	V
	1N5822		48	—	V
I_R	reverse current (note 1)	$V_R = V_{RRM\text{ max}}$	—	2	mA
		$V_R = V_{RRM\text{ max}}$ $T_J = 100\text{ }^{\circ}\text{C}$	—	20	mA
C_d	diode capacitance	$V_R = 4\text{ V};$ $f = 1\text{ MHz}$			
	1N5820		—	250	pF
	1N5821		—	175	pF
	1N5822		—	175	pF

Note

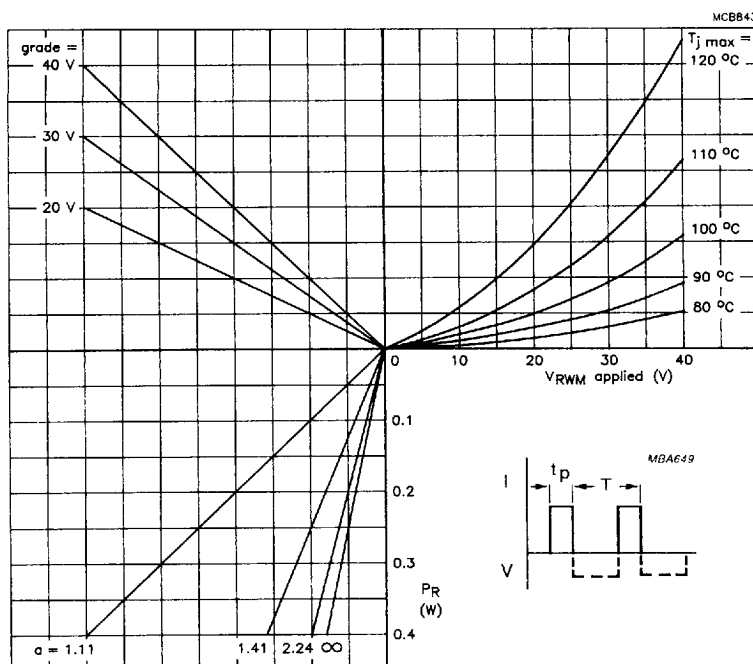
1. Pulsed test: pulse width = 300 μs ; $\delta = 0.02$.

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'a' = form factor = $\sqrt{T/t_p}$.

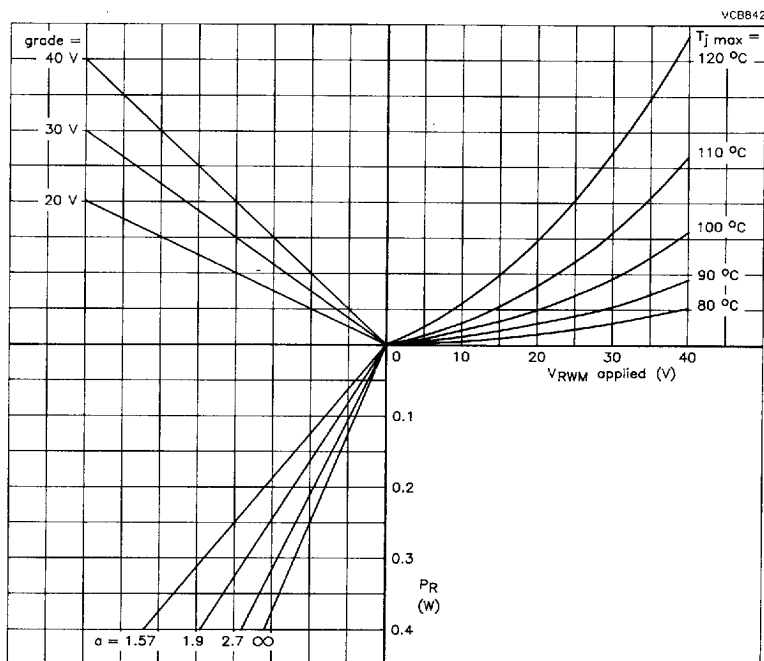
Fig.6 Nomogram for calculation of reverse leakage power dissipation (P_R) for given values of $T_j \text{ max}$, V_{RWM} applied, voltage grade and form factor; square wave operation.

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

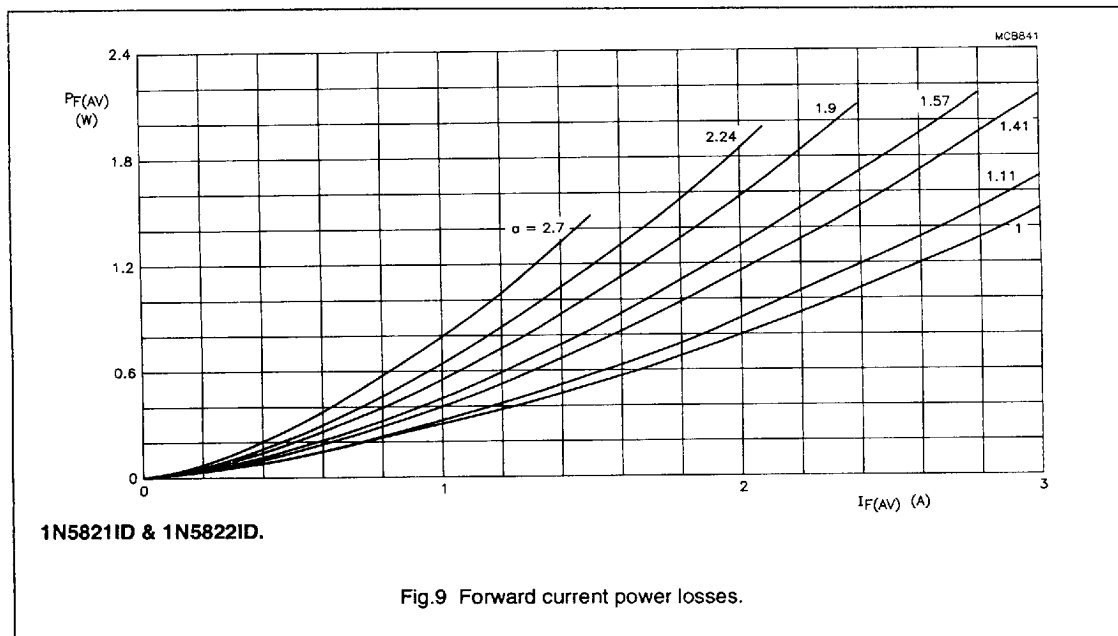
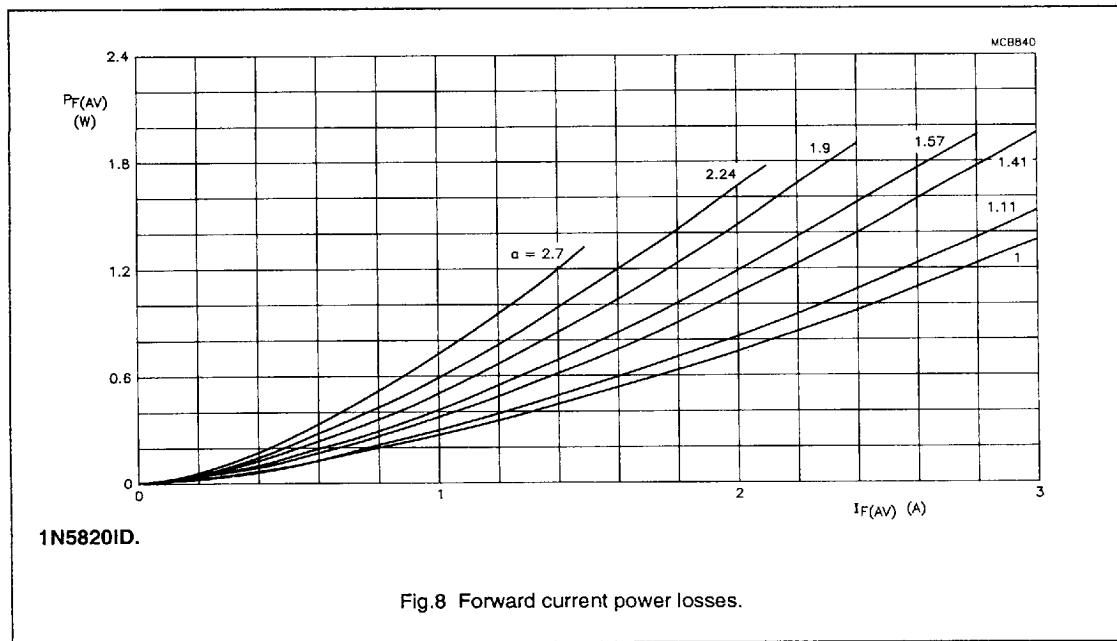
Fig.7 Nomogram for calculation of reverse leakage power dissipation (P_R) for given values of $T_{J \text{ max}}$, V_{RWM} applied, voltage grade and form factor; sinusoidal wave operation (RC load).

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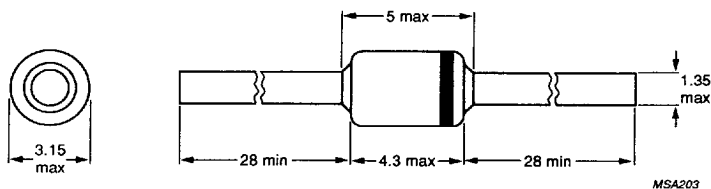


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PACKAGE OUTLINE



Dimensions in mm.

The marking band indicates the cathode.

Fig.10 SOD84A.