

Schottky Diode Gen <sup>2</sup>

preliminary

$V_{RRM} = 100V$

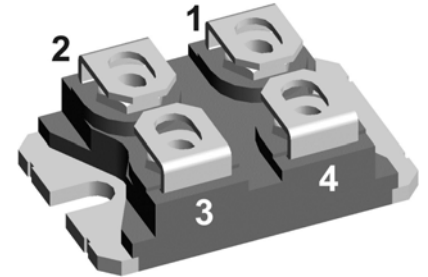
$I_{FAV} = 300A$

$V_F = 0.88V$

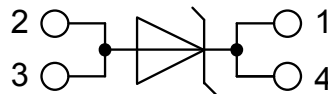
High Performance Schottky Diode  
 Low Loss and Soft Recovery  
 Single Diode

Part number

DSA300I100NA



Backside: Isolated

**Features / Advantages:**

- Very low  $V_f$
- Extremely low switching losses
- Low  $I_{rm}$  values
- Improved thermal behaviour
- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching

**Applications:**

- Rectifiers in switch mode power supplies (SMPS)
- Free wheeling diode in low voltage converters

**Package:** SOT-227B (minibloc)

- Isolation Voltage: 3000V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate: Copper internally DCB isolated
- Advanced power cycling

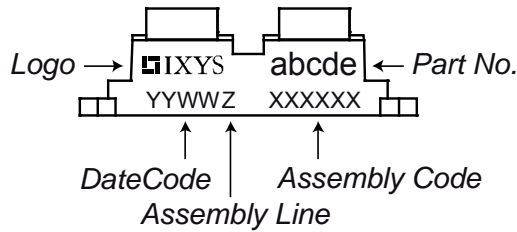
Schottky				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					100	V
$V_{RRM}$	max. repetitive reverse blocking voltage					100	V
$I_R$	reverse current, drain current	$V_R = 100\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		3	mA
		$V_R = 100\text{ V}$		$T_{VJ} = 150^\circ\text{C}$		30	mA
$V_F$	forward voltage drop	$I_F = 300\text{ A}$		$T_{VJ} = 25^\circ\text{C}$		0.99	V
		$I_F = 600\text{ A}$				1.30	V
		$I_F = 300\text{ A}$		$T_{VJ} = 125^\circ\text{C}$		0.88	V
		$I_F = 600\text{ A}$				1.21	V
$I_{FAV}$	average forward current	$T_C = 95^\circ\text{C}$	rectangular	$T_{VJ} = 150^\circ\text{C}$		300	A
$V_{FO}$	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^\circ\text{C}$		0.53	V
$r_F$	slope resistance					1.09	mΩ
$R_{thJC}$	thermal resistance junction to case					0.15	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.10		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		830	W
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$		$T_{VJ} = 45^\circ\text{C}$		4.80	kA
$C_J$	junction capacitance	$V_R = 12\text{ V}$	$f = 1\text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		4.86	nF

preliminary

Package SOT-227B (minibloc)		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal <sup>1)</sup>			150	A
$T_{stg}$	storage temperature		-40		150	°C
$T_{vj}$	virtual junction temperature		-40		150	°C
<b>Weight</b>				30		g
$M_D$	mounting torque		1.1		1.5	Nm
$M_T$	terminal torque		1.1		1.5	Nm
$d_{Spp/App}$	creepage distance on surface   striking distance through air	terminal to terminal	10.5	3.2		mm
$d_{Spb/Apb}$		terminal to backside	8.6	6.8		mm
$V_{ISOL}$	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V

<sup>1)</sup>  $I_{RMS}$  is typically limited by the pin-to-chip resistance (1); or by the current capability of the chip (2). In case of (1) and a product with multiple pins for one chip-potential, the current capability can be increased by connecting the pins as one contact.

### Product Marking



### Part number

- D = Diode
- S = Schottky Diode
- A = low VF
- 300 = Current Rating [A]
- I = Single Diode
- 100 = Reverse Voltage [V]
- NA = SOT-227B (minibloc)

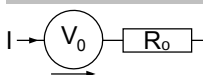
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSA300I100NA	DSA300I100NA	Tube	10	509813

Similar Part	Package	Voltage class
DSA300I45NA	SOT-227B (minibloc)	45
DSA300I200NA	SOT-227B (minibloc)	200

### Equivalent Circuits for Simulation

\* on die level

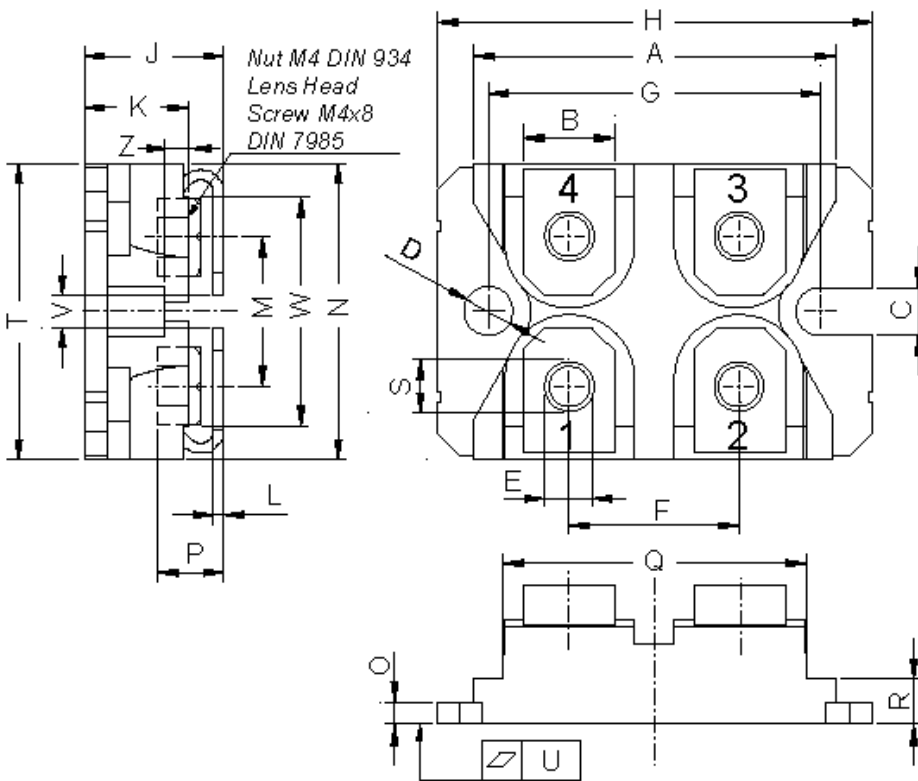
$T_{vj} = 150^\circ\text{C}$



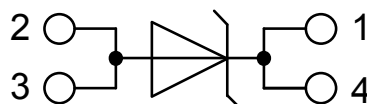
Schottky

$V_{0\max}$	threshold voltage	0.53	V
$R_{0\max}$	slope resistance *	0.25	mΩ

## Outlines SOT-227B (minibloc)



Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106



## Schottky

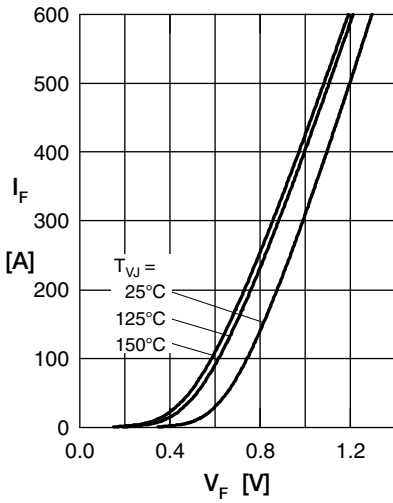


Fig. 1 Max. forward voltage drop characteristics

Fig. 2 Typ. reverse current  $I_R$  vs. reverse voltage  $V_R$

Fig. 3 Typ. junction capacitance  $C_T$  vs. reverse voltage  $V_R$

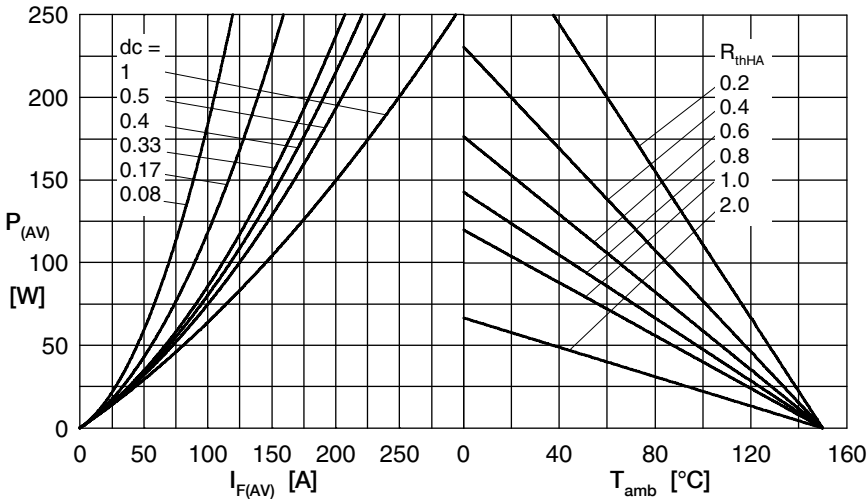


Fig. 4a Power dissipation versus direct output current  
Fig. 4b and ambient temperature

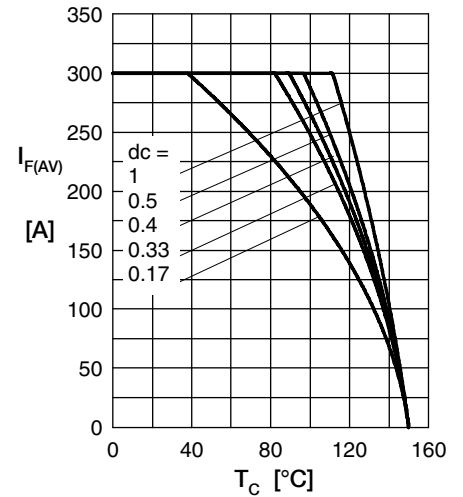


Fig. 5 Average forward current  $I_{F(AV)}$  vs. case temp.  $T_C$

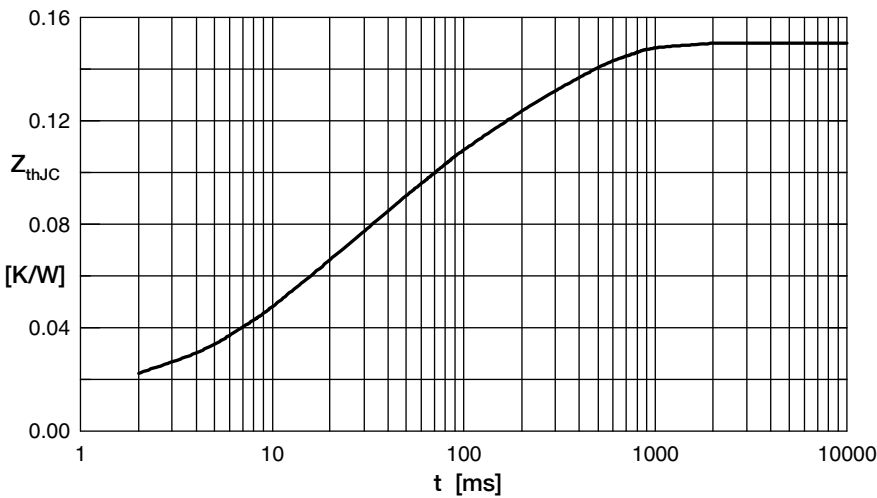


Fig. 6 Transient thermal impedance junction to case

$R_{thi}$ [K/W]	$t_i$ [s]
0.017	0.01
0.013	0.00001
0.02	0.01
0.05	0.045
0.05	0.3