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**DSA300I45NA**

## Schottky Diode Gen<sup>2</sup>

preliminary

$V_{RRM}$	=	45V
$I_{FAV}$	=	300A
$V_F$	=	0.76V

High Performance Schottky Diode  
Low Loss and Soft Recovery  
Single Diode

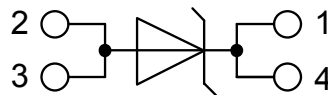
Part number

**DSA300I45NA**



Backside: Isolated

E72873



### 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



## DSA300I45NA

preliminary

Schottky				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage		$T_{VJ} = 25^{\circ}C$			45	V
$V_{RRM}$	max. repetitive reverse blocking voltage		$T_{VJ} = 25^{\circ}C$			45	V
$I_R$	reverse current, drain current	$V_R = 45 V$	$T_{VJ} = 25^{\circ}C$			3	mA
		$V_R = 45 V$	$T_{VJ} = 150^{\circ}C$			30	mA
$V_F$	forward voltage drop	$I_F = 300 A$	$T_{VJ} = 25^{\circ}C$			0.84	V
		$I_F = 600 A$				1.14	V
		$I_F = 300 A$	$T_{VJ} = 125^{\circ}C$			0.76	V
		$I_F = 600 A$				1.10	V
$I_{FAV}$	average forward current	$T_C = 100^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 150^{\circ}C$			300	A
$V_{F0}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}C$			0.41	V
$r_F$	slope resistance					1.12	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		$T_C = 25^{\circ}C$			830	W
$I_{FSM}$	max. forward surge current	$t = 10 ms; (50 Hz), sine; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$			4.80	kA
$C_J$	junction capacitance	$V_R = 5 V \quad f = 1 MHz$	$T_{VJ} = 25^{\circ}C$			16.5	nF



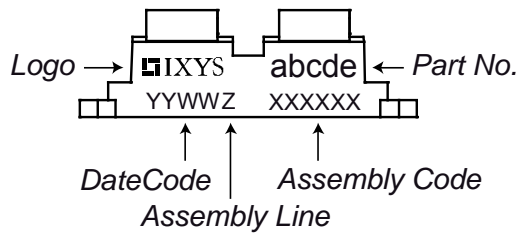
# DSA300I45NA

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
$d_{Spb/Abp}$		terminal to backside	8.6	6.8		mm
$V_{ISOL}$	isolation voltage	t = 1 second			3000	V
		t = 1 minute	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		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
- 45 = Reverse Voltage [V]
- NA = SOT-227B (minibloc)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSA300I45NA	DSA300I45NA	Tube	10	511251

Similar Part	Package	Voltage class
DSA300I100NA	SOT-227B (minibloc)	100
DSA300I200NA	SOT-227B (minibloc)	200

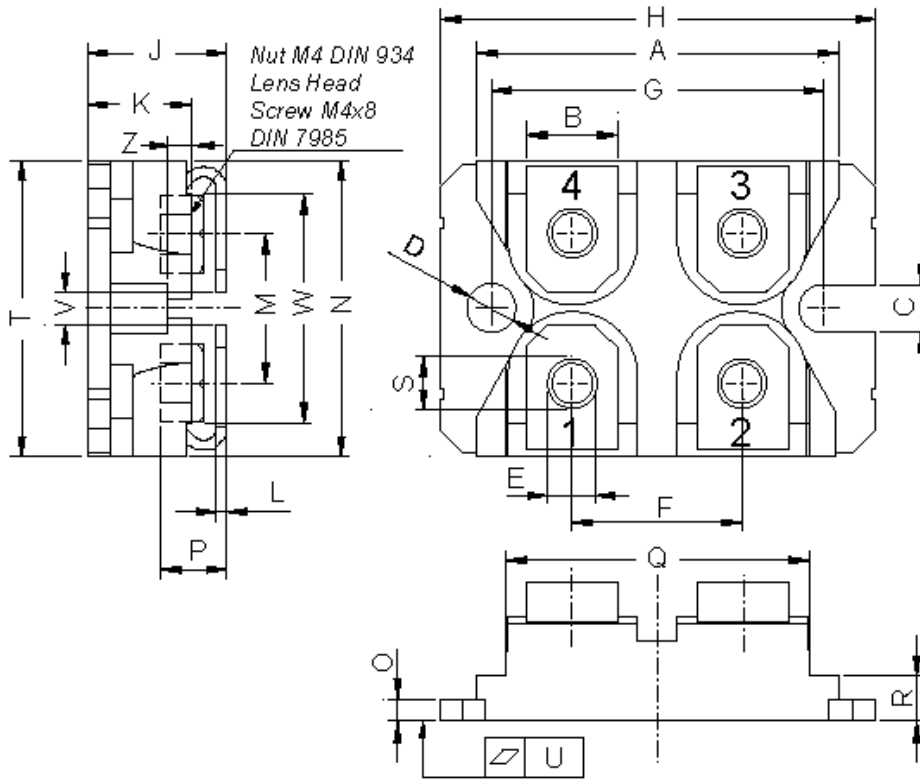
### Equivalent Circuits for Simulation

\* on die level

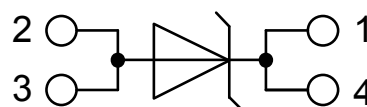
$T_{vj} = 150^\circ\text{C}$

Symbol	Definition	Value	Unit
$V_0$	threshold voltage	0.41	V
$R_0$	slope resistance *	0.28	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**

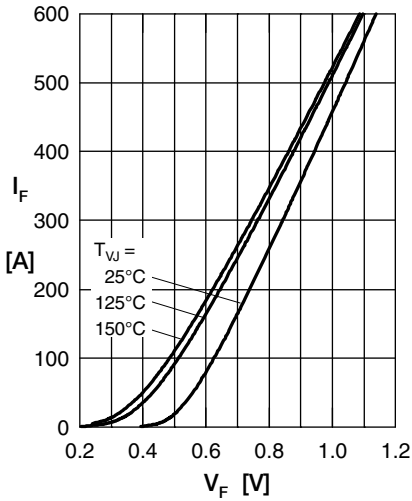


Fig. 1 Max. forward voltage drop characteristics

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

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

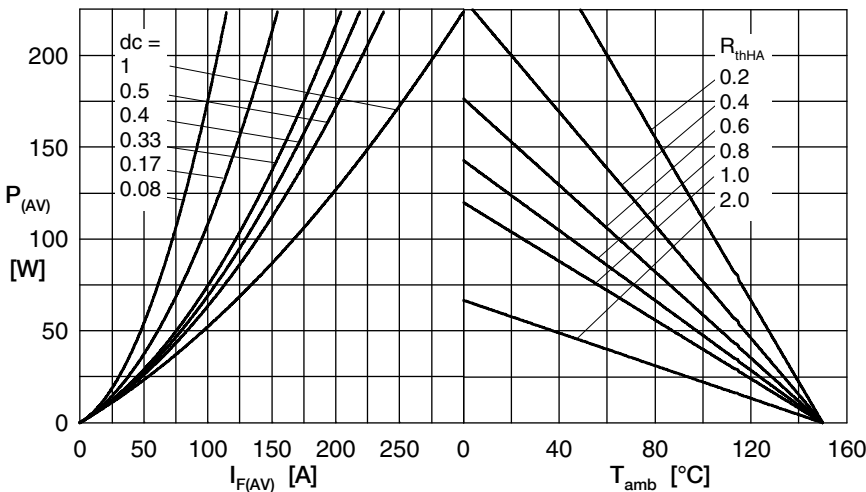


Fig. 4a Power dissipation versus direct output current  
 Fig. 4b and ambient temperature

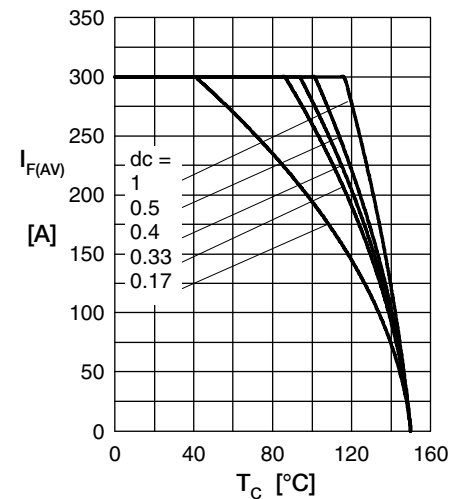


Fig. 5 Average forward current  $I_{F(AV)}$  vs. case temp.  $T_C$

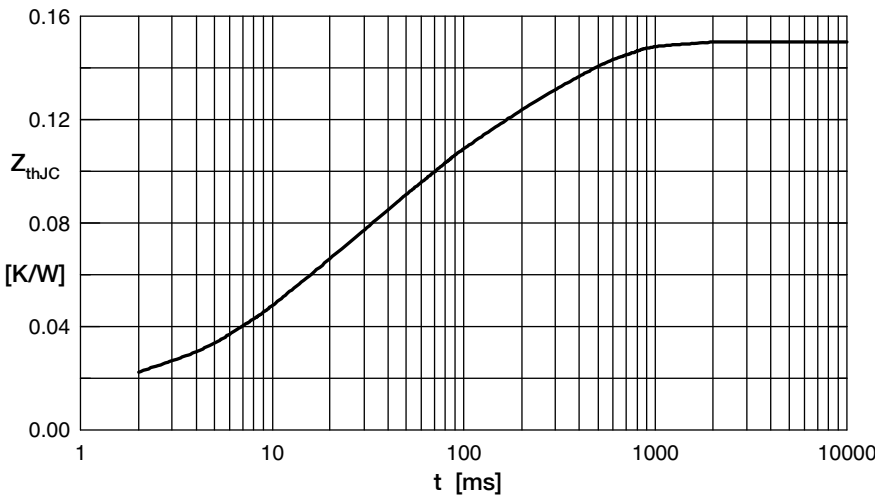


Fig. 6 Transient thermal impedance junction to case

$R_{thi}$ [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