

Schottky Diode Gen ²

preliminary

$$V_{RRM} = 45V$$

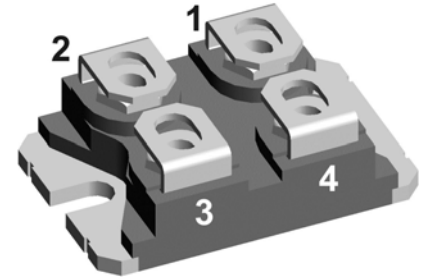
$$I_{FAV} = 300A$$

$$V_F = 0.76V$$

High Performance Schottky Diode
Low Loss and Soft Recovery
Single Diode

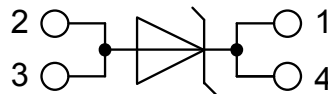
Part number

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

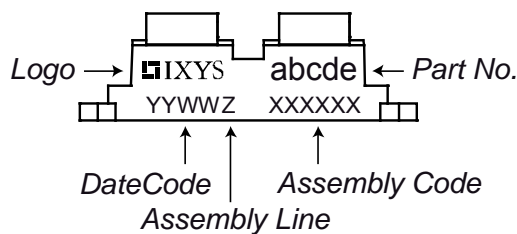
Schottky				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
V_{RSM}	max. non-repetitive reverse blocking voltage				45	V	
V_{RRM}	max. repetitive reverse blocking voltage				45	V	
I_R	reverse current, drain current	$V_R = 45\text{ V}$			3	mA	
		$V_R = 45\text{ V}$			30	mA	
V_F	forward voltage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

preliminary

Package SOT-227B (minibloc)		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal ¹⁾			150	A
T_{stg}	storage temperature		-40		150	°C
T_{vj}	virtual junction temperature		-40		150	°C
Weight				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

¹⁾ 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)

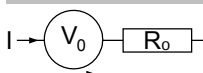
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSA300I45NA	DSA300I45NA	Tube	10	511251

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

Equivalent Circuits for Simulation

* on die level

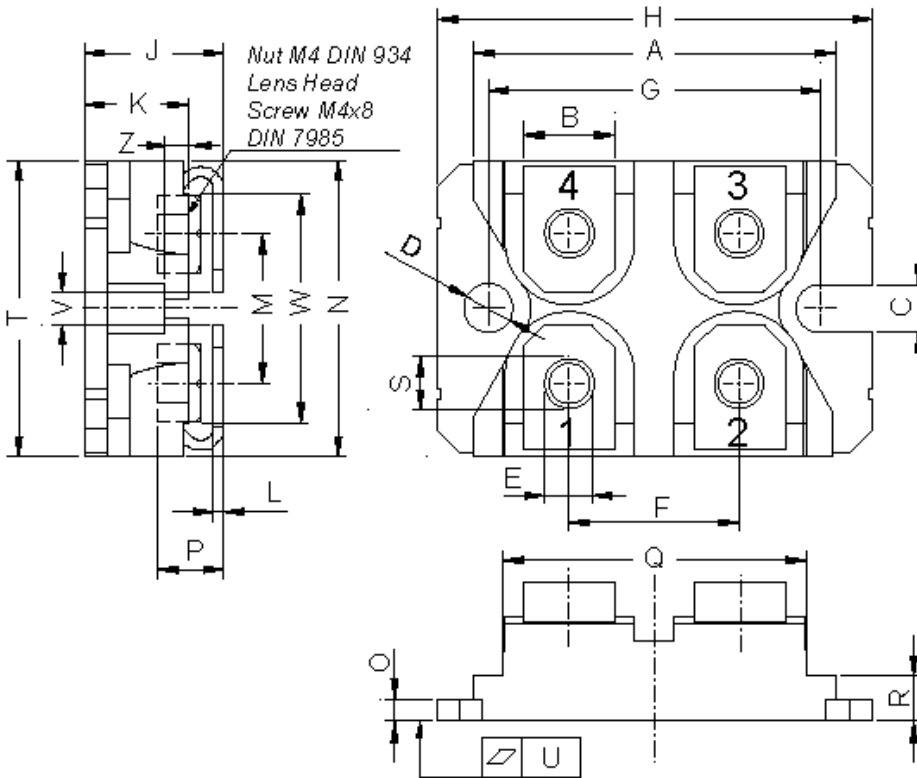
$T_{vj} = 150^{\circ}C$



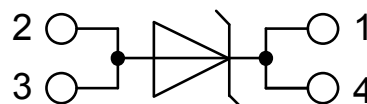
Schottky

$V_{0\ max}$	threshold voltage	0.41	V
$R_{0\ max}$	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



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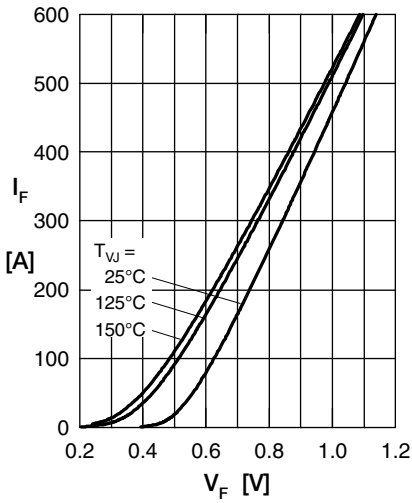


Fig. 1 Max. forward voltage drop characteristics

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

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

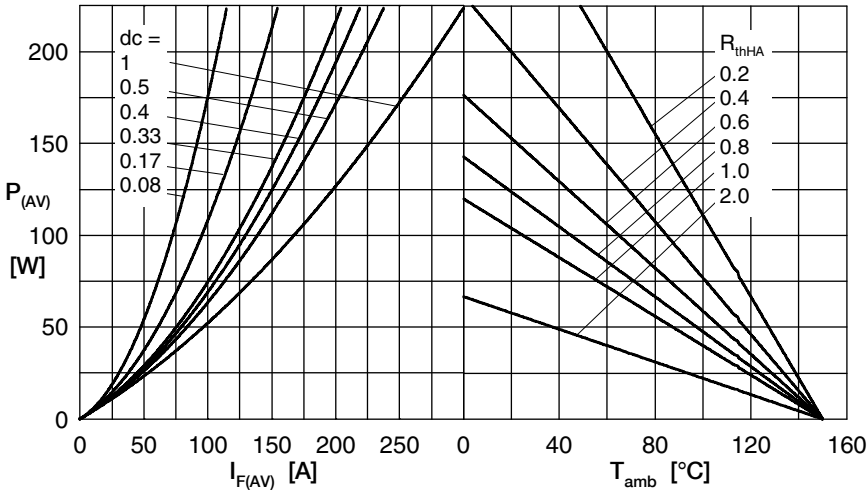


Fig. 4a Power dissipation versus direct output current
Fig. 4b and ambient temperature

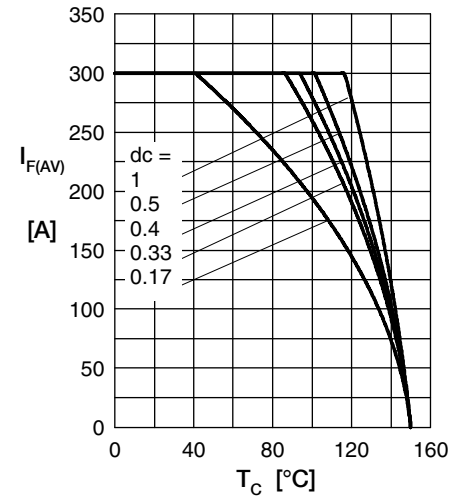


Fig. 5 Average forward current $I_{F(AV)}$ vs. case temp. T_C

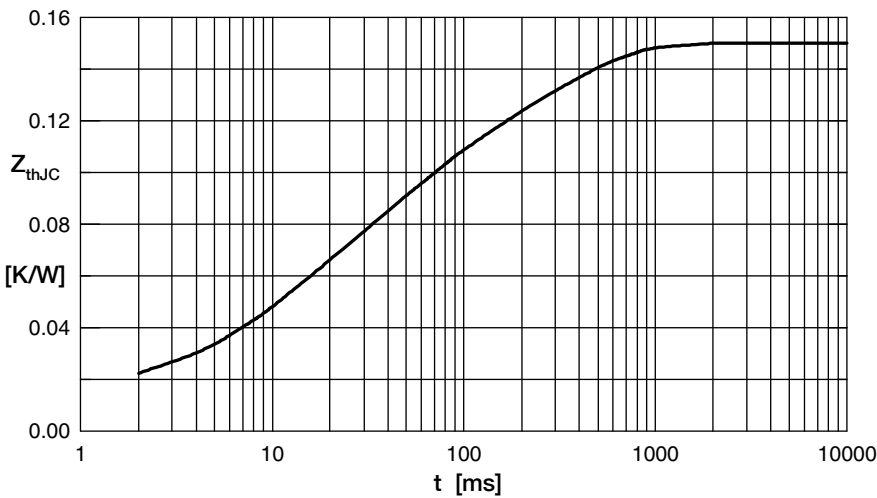


Fig. 6 Transient thermal impedance junction to case

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