

Schottky Diode Gen ²

preliminary

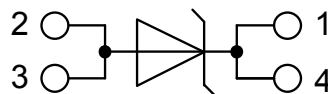
$$\begin{aligned} V_{RRM} &= 45V \\ I_{FAV} &= 300A \\ V_F &= 0.76V \end{aligned}$$

High Performance Schottky Diode
Low Loss and Soft Recovery
Single Diode

Part number

DSA300I45NA


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

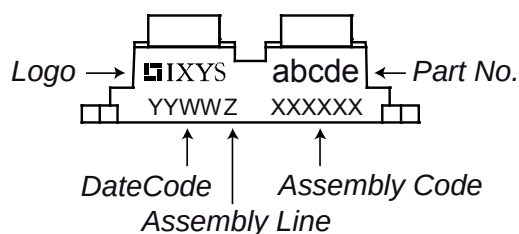
Schottky				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V _{RSM}	max. non-repetitive reverse blocking voltage	T _{VJ} = 25°C				45	V
V _{RRM}	max. repetitive reverse blocking voltage	T _{VJ} = 25°C				45	V
I _R	reverse current, drain current	V _R = 45 V	T _{VJ} = 25°C			3	mA
		V _R = 45 V	T _{VJ} = 150°C			30	mA
V _F	forward voltage drop	I _F = 300 A	T _{VJ} = 25°C			0.84	V
		I _F = 600 A				1.14	V
		I _F = 300 A	T _{VJ} = 125°C			0.76	V
		I _F = 600 A				1.10	V
I _{FAV}	average forward current	T _C = 100°C	T _{VJ} = 150°C			300	A
		rectangular d = 0.5					
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 150°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°C				830	W
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V	T _{VJ} = 45°C			4.80	kA
C _J	junction capacitance	V _R = 5 V f = 1 MHz	T _{VJ} = 25°C		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	50/60 Hz, RMS; I _{ISOL} ≤ 1 mA	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

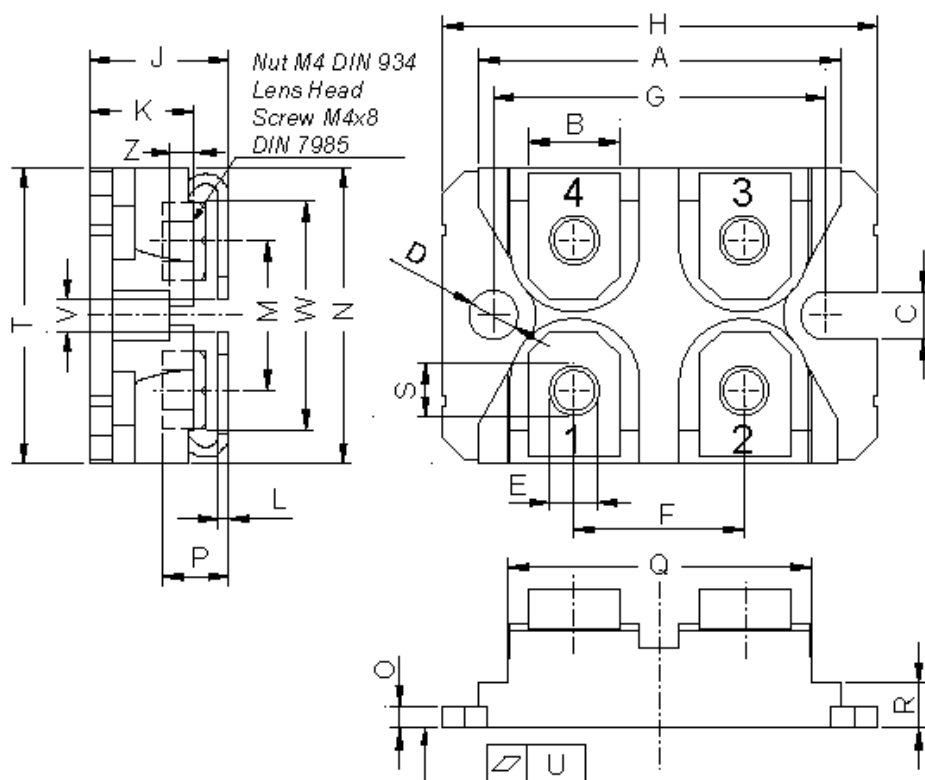
Equivalent Circuits for Simulation

* on die level

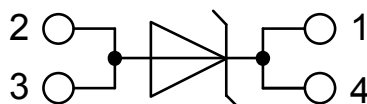
 $T_{VJ} = 150^{\circ}\text{C}$

		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



Schottky

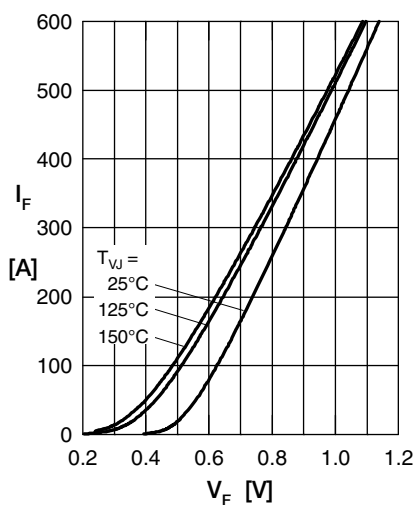


Fig. 1 Max. forward voltage drop characteristics

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

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

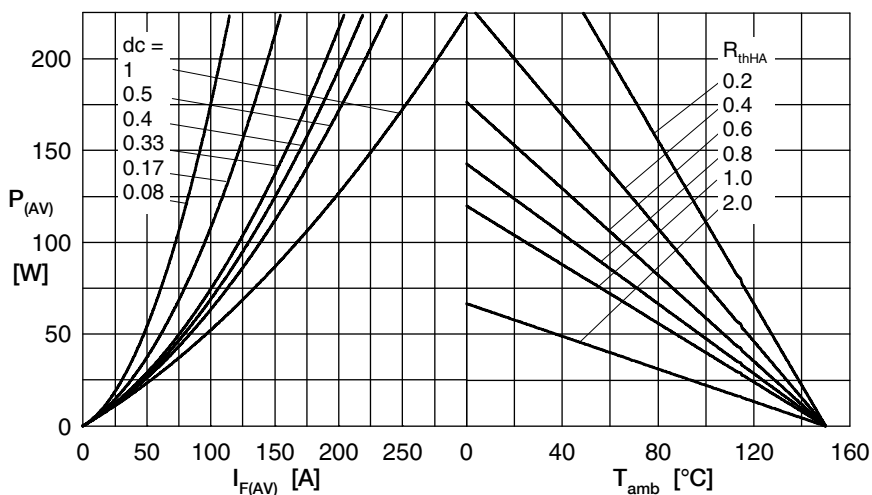


Fig. 4a Power dissipation versus direct output current
Fig. 4b and ambient temperature

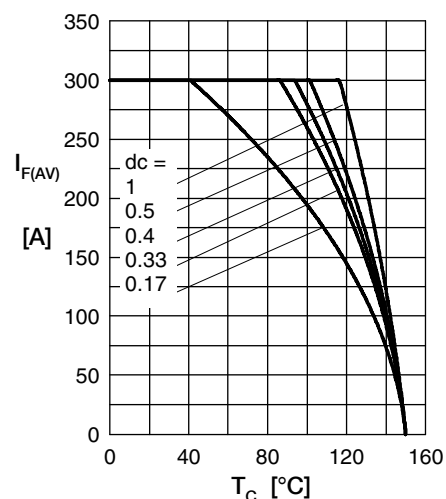


Fig. 5 Average forward current $I_{F(AV)}$ vs. case temp. T_C

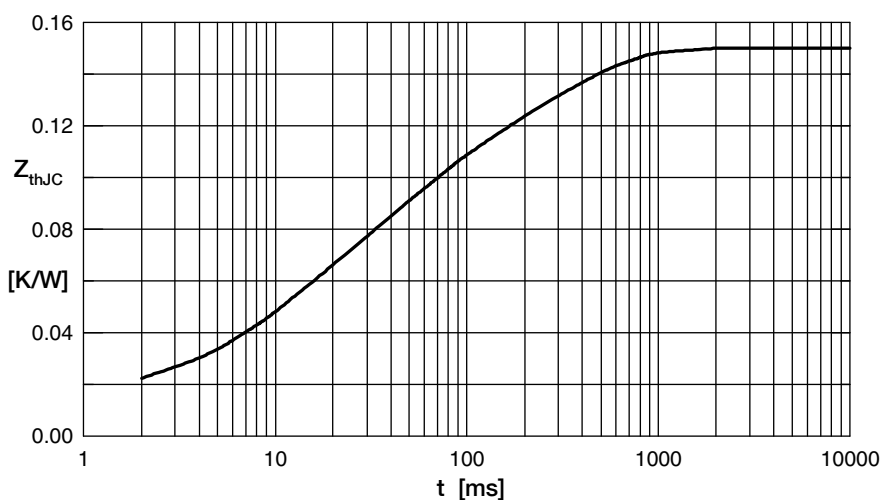


Fig. 6 Transient thermal impedance junction to case

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