High Voltage Standard Rectifier

3~ Rectifier		
V_{RRM} =		2200 V
I_{DAV} =		90 A
I_{FSM} =		370 A

Half 3~ Bridge, Common Cathode

Part number

DNA90YC2200NA
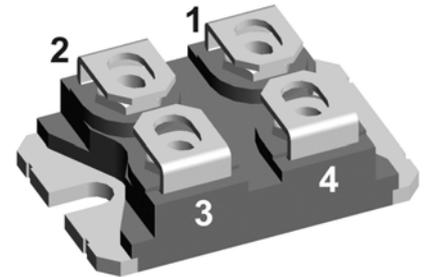
Backside: isolated

E72873
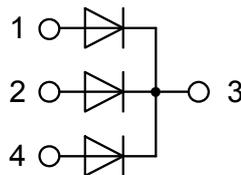
Features / Advantages:
- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

Applications:
- Diode for main rectification
- For single and three phase bridge configurations

Package: SOT-227B (minibloc)
- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate: Copper internally DCB isolated
- Advanced power cycling

Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	T_{VJ} = 25°C				2300	V
V_{RRM}	max. repetitive reverse blocking voltage	T_{VJ} = 25°C				2200	V
I_R	reverse current, drain current	V_R = 2200 V	T_{VJ} = 25°C			100	μA
		V_R = 2200 V	T_{VJ} = 150°C			1.5	mA
V_F	forward voltage drop	I_F = 30 A	T_{VJ} = 25°C			1.23	V
		I_F = 90 A				1.70	V
		I_F = 30 A	T_{VJ} = 125 °C			1.21	V
		I_F = 90 A				1.85	V
I_{DAV}	bridge output current	T_C = 85°C	T_{VJ} = 150°C			90	A
		rectangular d = ⅓					
V_{F0}	threshold voltage	T_{VJ} = 150°C				0.86	V
r_F	slope resistance } for power loss calculation only					11.4	mΩ
R_{thJC}	thermal resistance junction to case					1.2	K/W
R_{thCH}	thermal resistance case to heatsink				0.10		K/W
P_{tot}	total power dissipation	T_C = 25°C				100	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			370	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			400	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			315	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			340	A
I^2t	value for fusing	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			685	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			665	A²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			495	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			480	A²s
C_J	junction capacitance	V_R = 700 V; f = 1 MHz	T_{VJ} = 25°C		7		pF

Package	SOT-227B (minibloc)						Ratings	
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal					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; $I_{ISOL} \leq 1$ mA		3000			V
		t = 1 minute			2500			V

Product Marking

Logo → IXYS abcde ← Part No.
YYWWZ XXXXXX

DateCode
Assembly Line
Assembly Code
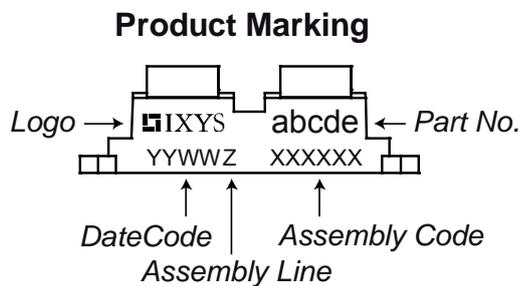
Part number

D = Diode
N = High Voltage Standard Rectifier
A = (>= 2000V)
90 = Current Rating [A]
YC = Half 3~ Bridge, Common Cathode
2200 = Reverse Voltage [V]
NA = SOT-227B (minibloc)

| Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DNA90YC2200NA	DNA90YC2200NA	Tube	10	513723

Similar Part	Package	Voltage class
DNA90YA2200NA	SOT-227B (minibloc)	2200

Equivalent Circuits for Simulation   *on die level* $T_{VJ} = 150°C$
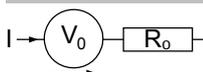
I → V₀ — R₀ —   **Rectifier**

$V_{0\,max}$	threshold voltage	0.86	V
$R_{0\,max}$	slope resistance *	9.5	mΩ

Outlines   SOT-227B (minibloc)
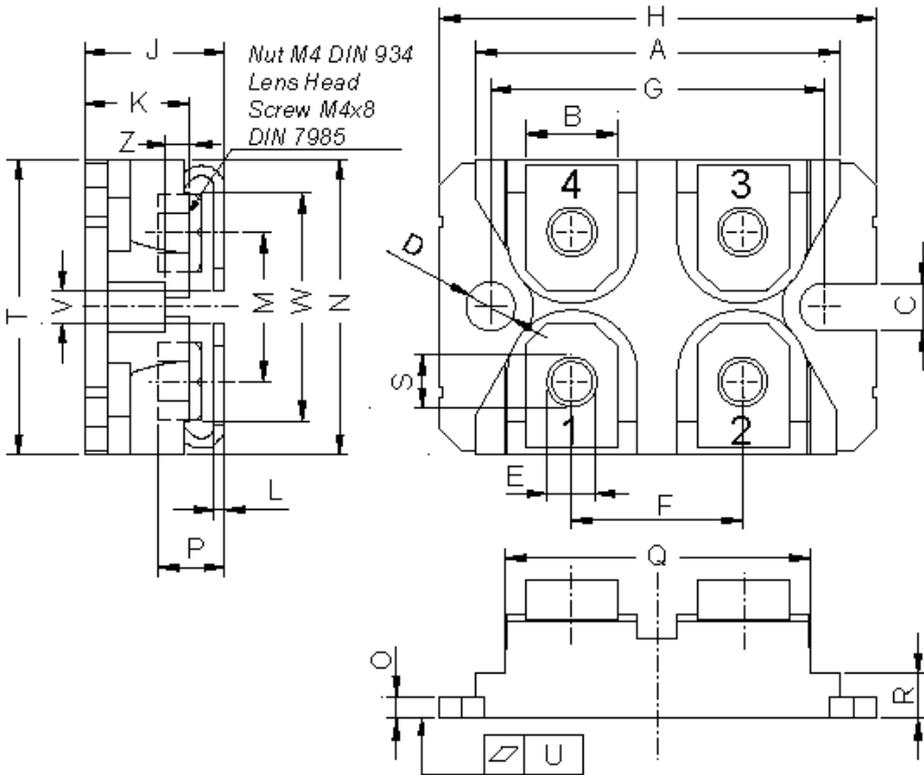
| Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	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
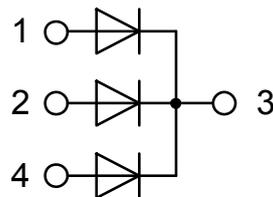
Rectifier
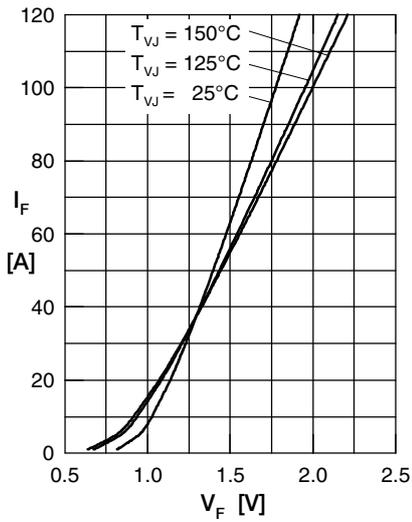
Fig. 1 Forward current versus voltage drop per diode
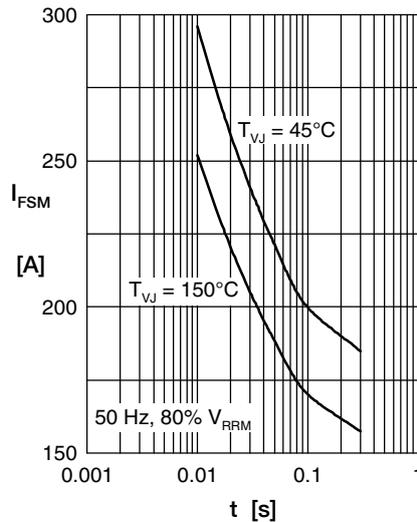
Fig. 2 Surge overload current
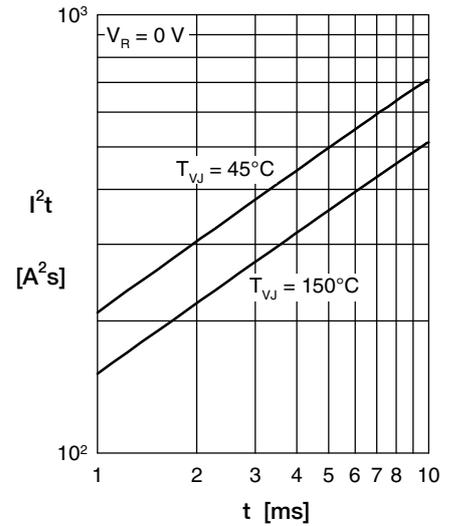
Fig. 3 I^2t versus time per diode
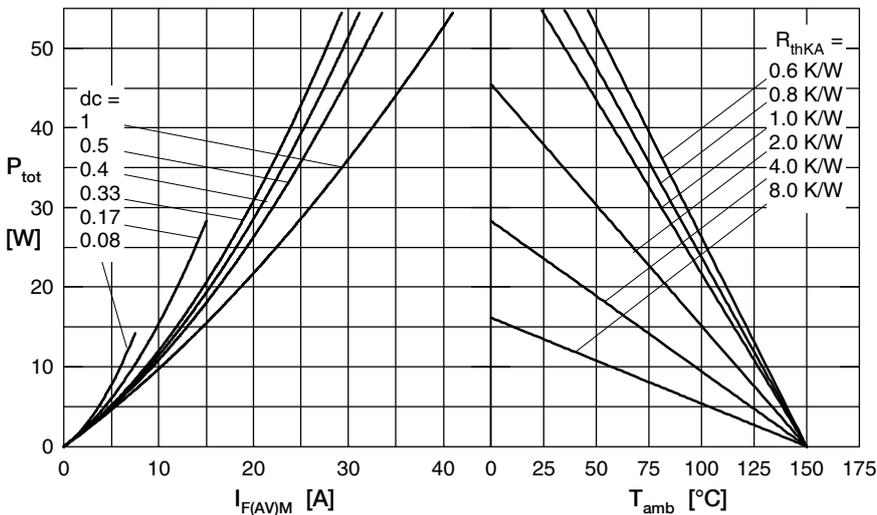
Fig. 4 Power dissipation versus direct output current and ambient temperature
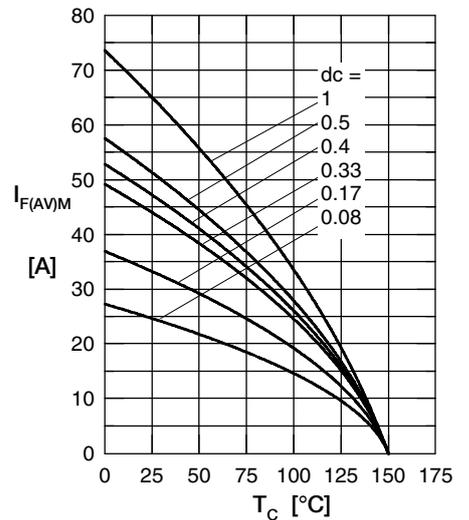
Fig. 5 Max. forward current versus case temperature
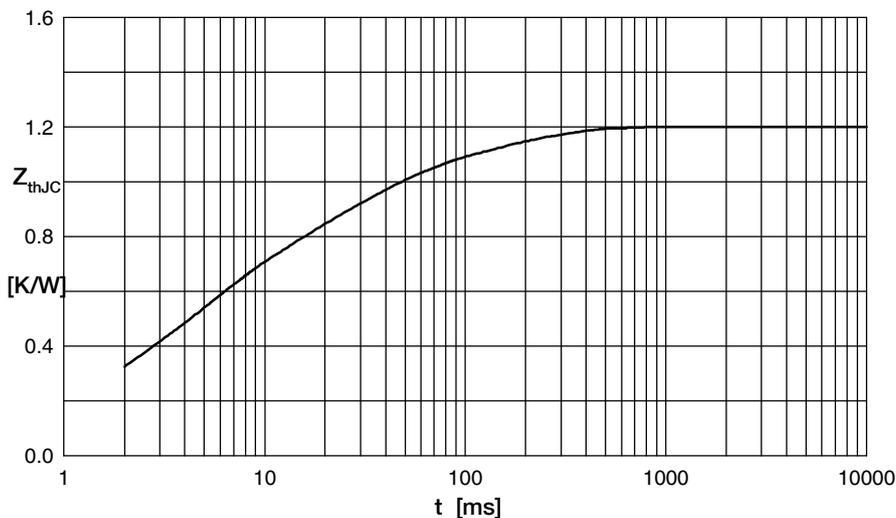
Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.06	0.0004
2	0.2	0.00265
3	0.34	0.0045
4	0.4	0.0242
5	0.2	0.15

IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747and per semiconductor unless otherwise specified   20130125a

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