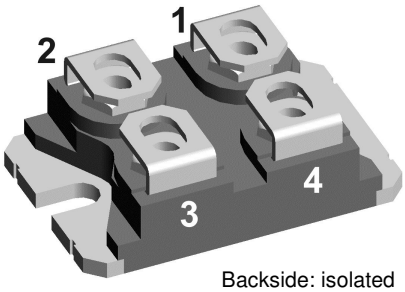
Standard Rectifier

3~ Rectifier		
V_{RRM}	=	1600 V
I_{DAV}	=	150 A
I_{FSM}	=	800 A

Half 3~ Bridge, Common Anode

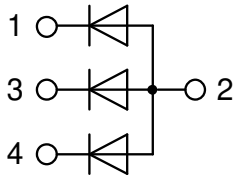
Part number

DMA150YA1600NA



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

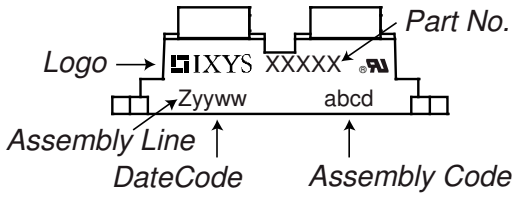
Package: SOT-227B (minibloc)

- 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			1700	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1600	V
I_R	*reverse current*	V_R = 1600 V	T_{VJ} = 25°C			100	µA
		V_R = 1600 V	T_{VJ} = 150°C			1.5	mA
V_F	*forward voltage drop*	I_F = 50 A	T_{VJ} = 25°C			1.21	V
		I_F = 150 A				1.62	V
		I_F = 50 A	T_{VJ} = 125°C			1.16	V
		I_F = 150 A				1.69	V
I_{DAV}	*bridge output current*	T_C = 95°C	T_{VJ} = 150°C			150	A
		rectangular d = ⅓					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.87	V
r_F	*slope resistance* }					5.6	mΩ
R_{thJC}	*thermal resistance junction to case*					0.6	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.10		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			165	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			800	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			865	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			680	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			735	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			3.20	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			3.12	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			2.31	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			2.25	kA²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		27		pF

Package SOT-227B (minibloc)					Ratings			
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal					150	A
T_{VJ}	*virtual junction temperature*				-40		150	°C
T_{op}	*operation temperature*				-40		125	°C
T_{stg}	*storage 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

Product Marking



Part description

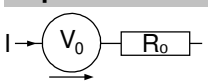
D = Diode
M = Standard Rectifier
A = (up to 1800V)
150 = Current Rating [A]
YA = Half 3~ Bridge, Common Anode
1600 = Reverse Voltage [V]
NA = SOT-227B (minibloc)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA150YA1600NA	DMA150YA1600NA	Tube	10	509181

Similar Part	Package	Voltage class
DMA150YC1600NA	SOT-227B (minibloc)	1600

Equivalent Circuits for Simulation

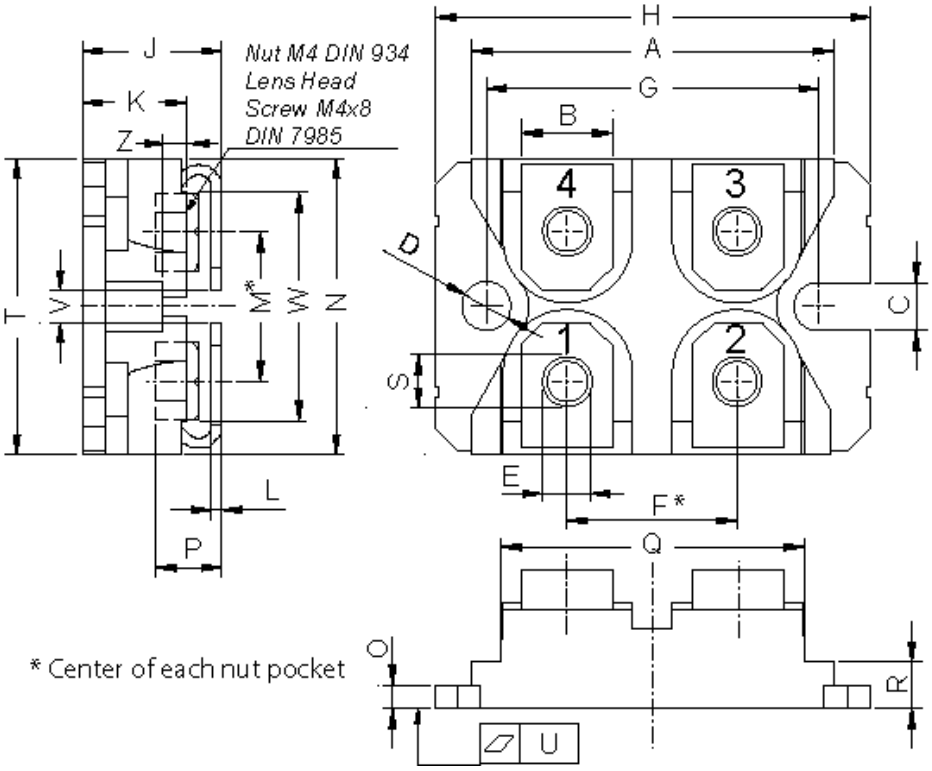
** on die level* T_{VJ} = 150 °C



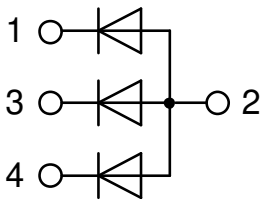
Rectifier

$V_{0\,max}$	*threshold voltage*	0.87	V
$R_{0\,max}$	*slope resistance **	4.4	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

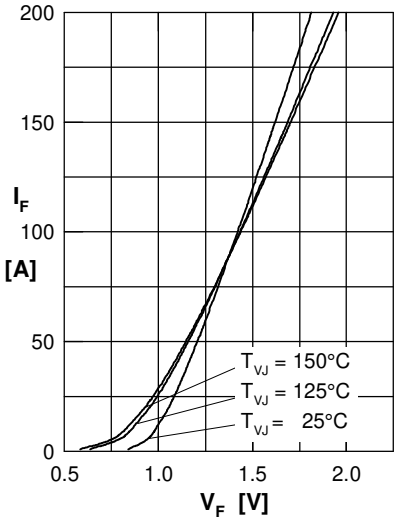


Fig. 1 Forward current versus voltage drop per diode

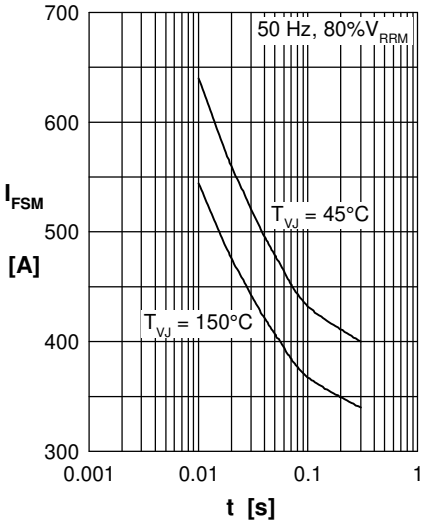


Fig. 2 Surge overload current vs. time per diode

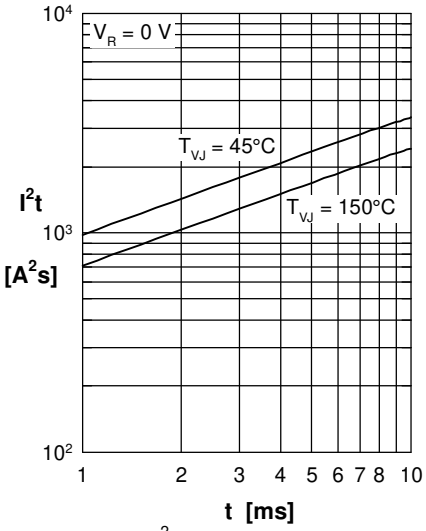


Fig. 3 I^2t versus time per diode

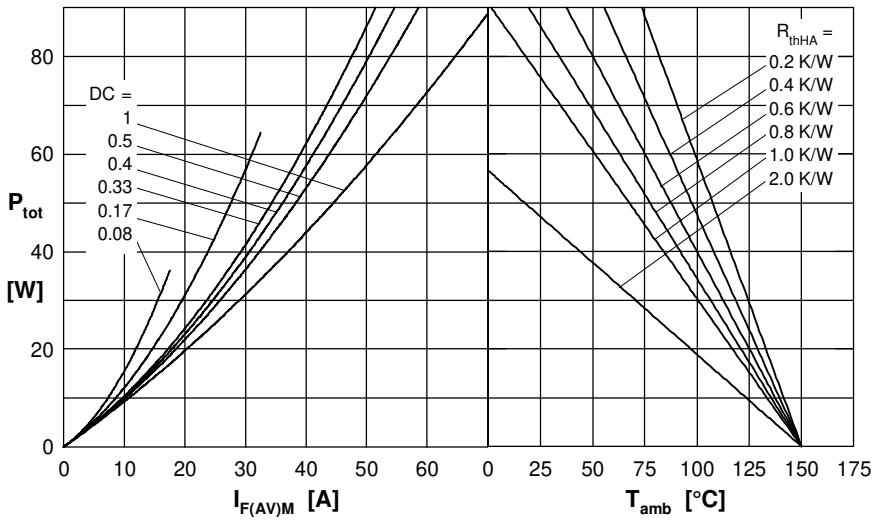


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

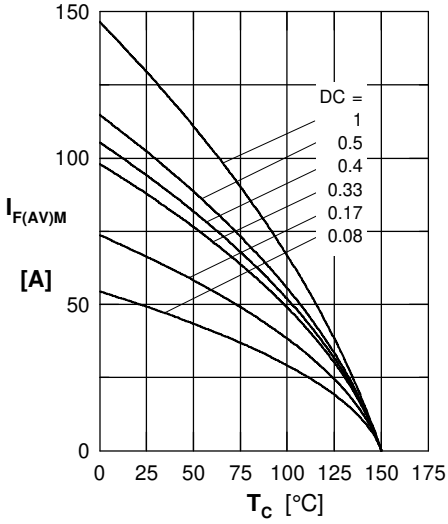


Fig. 5 Max. forward current vs. case temperature per diode

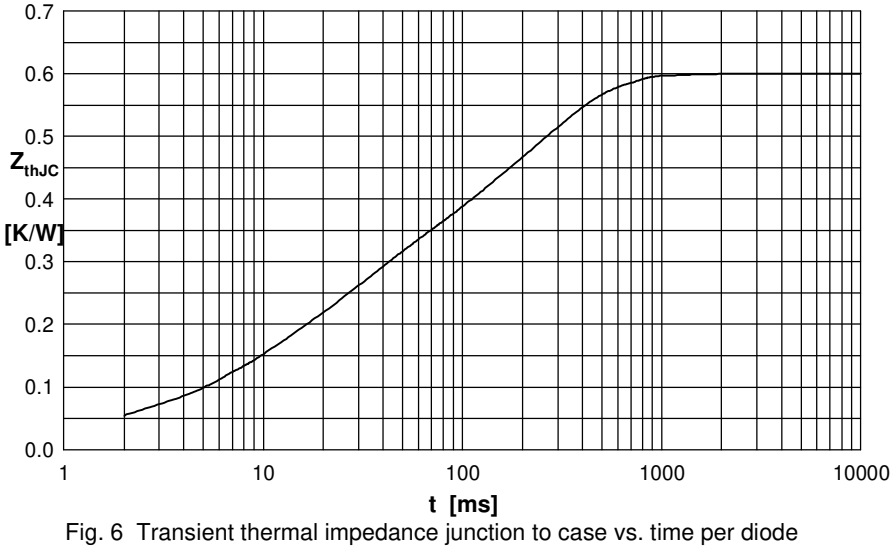


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0240	0.01000
2	0.0160	0.00001
3	0.0500	0.00500
4	0.1800	0.02300
5	0.3300	0.22000