

## Standard Rectifier

$$V_{RRM} = 1600 \text{ V}$$

$$I_{FAV} = 150 \text{ A}$$

$$V_F = 1.05 \text{ V}$$

## Single Diode

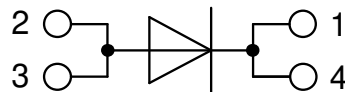
Part number

**DMA150E1600NA**



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

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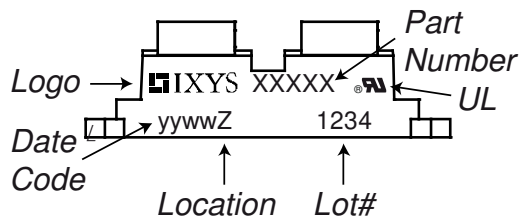
Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					1700	V
$V_{RRM}$	max. repetitive reverse blocking voltage					1600	V
$I_R$	reverse current	$V_R = 1600$ V		$T_{VJ} = 25^\circ\text{C}$		200	$\mu\text{A}$
		$V_R = 1600$ V		$T_{VJ} = 150^\circ\text{C}$		3.5	mA
$V_F$	forward voltage drop	$I_F = 150$ A		$T_{VJ} = 25^\circ\text{C}$		1.15	V
		$I_F = 300$ A				1.36	V
		$I_F = 150$ A		$T_{VJ} = 125^\circ\text{C}$		1.05	V
		$I_F = 300$ A				1.33	V
$I_{FAV}$	average forward current	$T_C = 110^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		150	A
		rectangular	d = 0.5				
$V_{FO}$	threshold voltage			$T_{VJ} = 150^\circ\text{C}$		0.78	V
$r_F$	slope resistance					1.8	m $\Omega$
						} for power loss calculation only	
$R_{thJC}$	thermal resistance junction to case					0.2	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.1		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		620	W
$I_{FSM}$	max. forward surge current	t = 10 ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		3.00	kA
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		3.24	kA
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		2.55	kA
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		2.76	kA
$I^2t$	value for fusing	t = 10 ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		45.0	kA <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		43.7	kA <sup>2</sup> s
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		32.5	kA <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		31.6	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400$ V; f = 1 MHz		$T_{VJ} = 25^\circ\text{C}$		60	pF



Package SOT-227B (minibloc)		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal <sup>1)</sup>			150	A
$T_{VJ}$	virtual junction temperature		-40		150	°C
$T_{op}$	operation temperature		-40		125	°C
$T_{stg}$	storage 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
$d_{Spb/Apb}$		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 description**

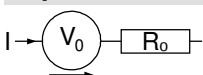
- D = Diode
- M = Standard Rectifier
- A = (up to 1800V)
- 150 = Current Rating [A]
- E = Single Diode
- 1600 = Reverse Voltage [V]
- NA = SOT-227B (minibloc)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA150E1600NA	DMA150E1600NA	Tube	10	508942

**Equivalent Circuits for Simulation**

\* on die level

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



**Rectifier**

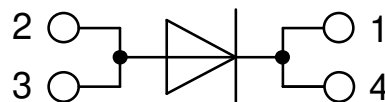
$V_{0\ max}$	threshold voltage	0.78	V
$R_{0\ max}$	slope resistance *	1	mΩ



**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



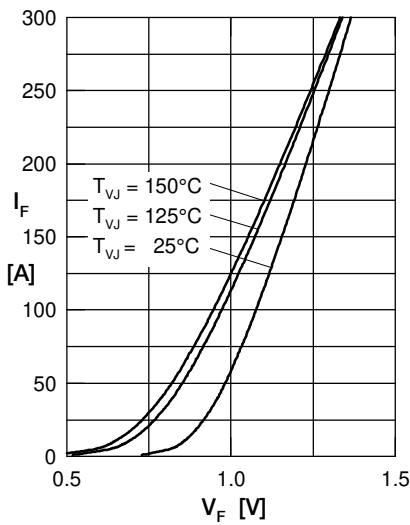
**Rectifier**


Fig. 1 Forward current versus voltage drop per diode

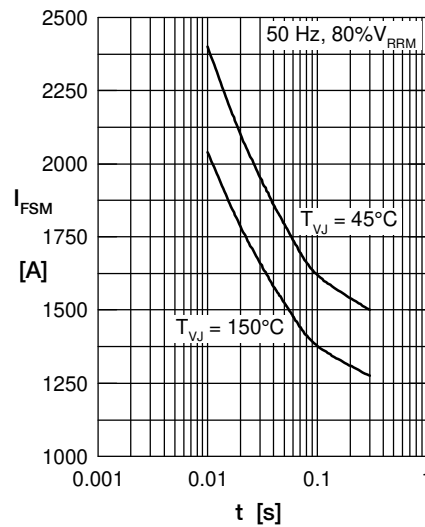


Fig. 2 Surge overload current

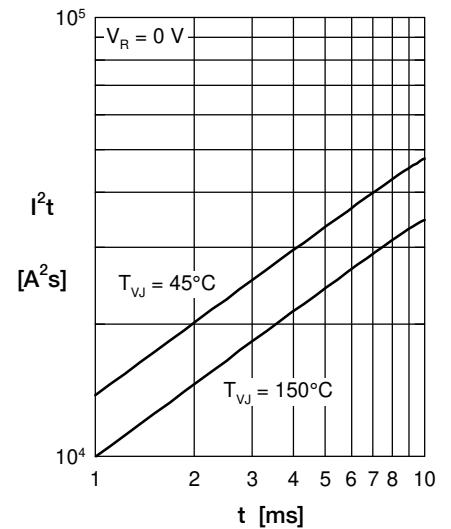
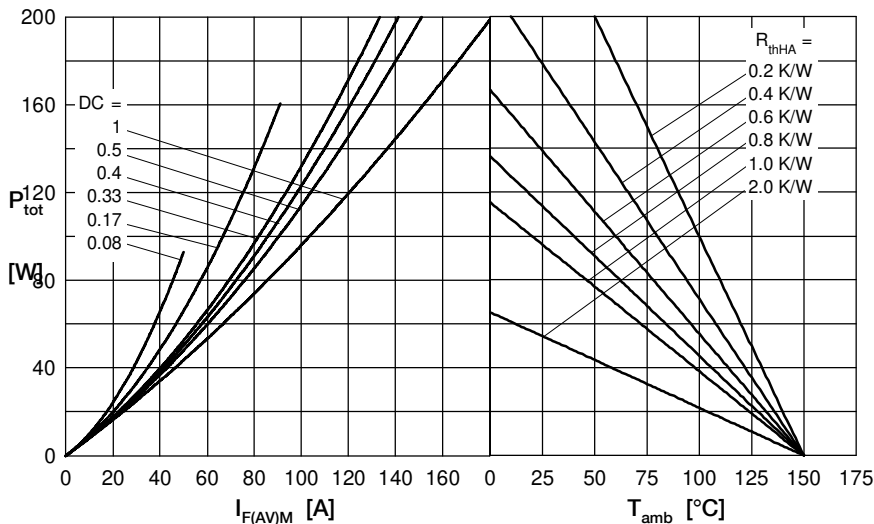

 Fig. 3  $I^2t$  versus time per diode


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

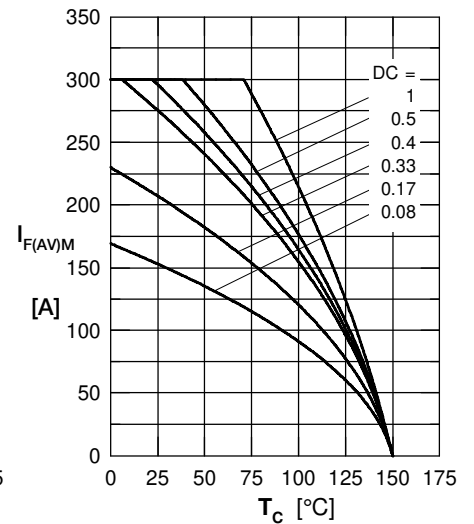


Fig. 5 Max. forward current versus case temperature

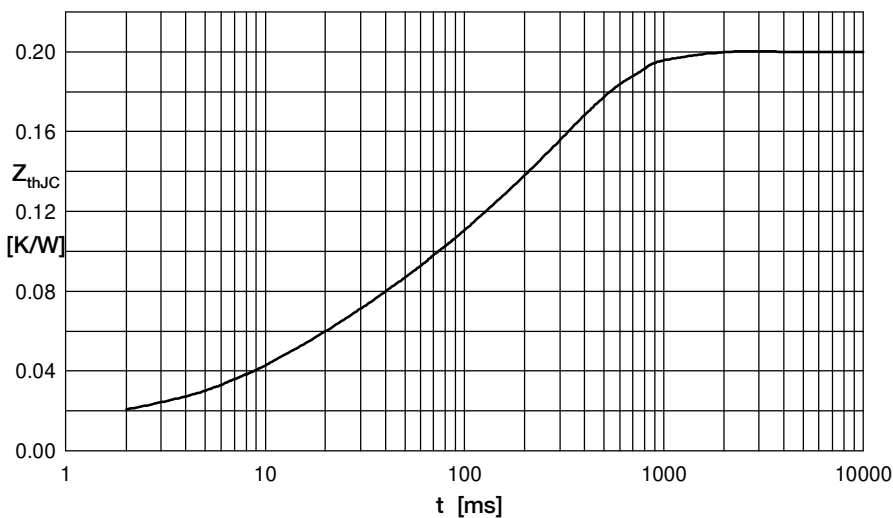


Fig. 6 Transient thermal impedance junction to case

 Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.017	0.01
2	0.013	0.00001
3	0.010	0.01
4	0.04	0.04
5	0.12	0.3

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