

# High Efficiency Standard Rectifier

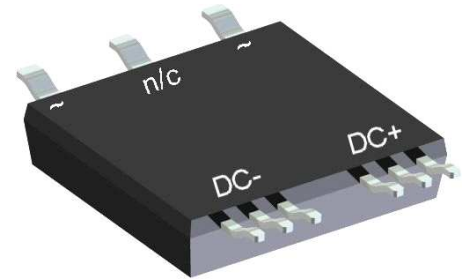
1~ Rectifier	
$V_{RRM}$	= 800 V
$I_{DAV}$	= 124 A
$I_{FSM}$	= 400 A

## 1~ Rectifier Bridge


### Part number

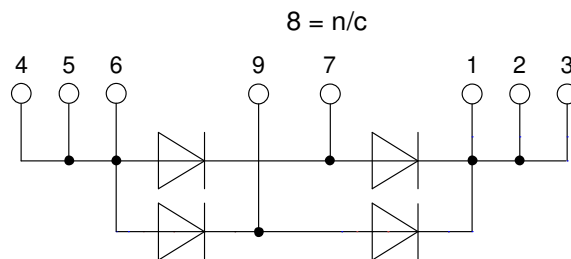
**DLA100B800LB**

Marking on Product: DLA100B800LB



Backside: isolated

 E72873



### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

### Applications:

- Diode Bridge for main rectification

### Package: SMPD

- Isolation Voltage: 3000 V~
- Industry convenient outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

### Disclaimer Notice

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Rectifier				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM}$	max. non-repetitive reverse blocking voltage				800	V	
$V_{RRM}$	max. repetitive reverse blocking voltage				800	V	
$I_R$	reverse current	$V_R = 800\text{ V}$			10	$\mu\text{A}$	
		$V_R = 800\text{ V}$			0.1	mA	
$V_F$	forward voltage drop	$I_F = 50\text{ A}$			1.23	V	
		$I_F = 100\text{ A}$			1.45	V	
		$I_F = 50\text{ A}$	$T_{VJ} = 150^\circ\text{C}$			1.15	V
		$I_F = 100\text{ A}$	$T_{VJ} = 150^\circ\text{C}$			1.44	V
$I_{DAV}$	bridge output current	$T_C = 135^\circ\text{C}$ 180° sine			124	A	
$V_{F0}$	threshold voltage	} for power loss calculation only			0.75	V	
$r_F$	slope resistance				4.2	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				1	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0.40		K/W	
$P_{tot}$	total power dissipation		$T_C = 25^\circ\text{C}$		150	W	
$I_{FSM}$	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$		400	A	
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$		430	A	
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$		340	A	
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$		365	A	
$I^2t$	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$		800	A <sup>2</sup> s	
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$		770	A <sup>2</sup> s	
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$		580	A <sup>2</sup> s	
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$		555	A <sup>2</sup> s	
$C_J$	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		13	pF	



Package SMPD		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			100	A
$T_{VJ}$	virtual junction temperature		-55		175	°C
$T_{op}$	operation temperature		-55		150	°C
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				8.5		g
$F_C$	mounting force with clip		40		130	N
$d_{Spp/ App}$	creepage distance on surface / striking distance through air	terminal to terminal	1.6			mm
$d_{Spb/ Apb}$		terminal to backside	4.0			mm
$V_{ISOL}$	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V



**Part description**

- D = Diode
- L = Low Voltage Standard Rectifier
- A = (up to 1200V)
- 100 = Current Rating [A]
- B = 1- Rectifier Bridge
- 800 = Reverse Voltage [V]
- LB = SMPD-B

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DLA100B800LB-TUB	DLA100B800LB	Tube	20	514614
Alternative	DLA100B800LB-TRR	DLA100B800LB	Tape & Reel	200	514621

**Equivalent Circuits for Simulation**

\* on die level

$T_{VJ} = 175\text{ °C}$



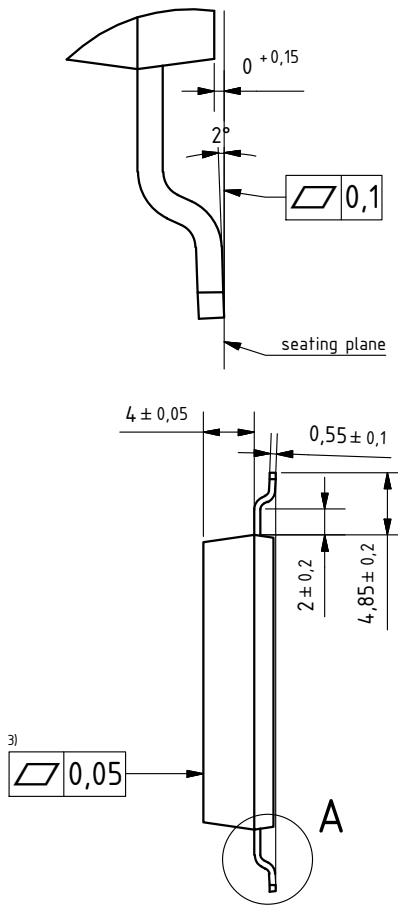
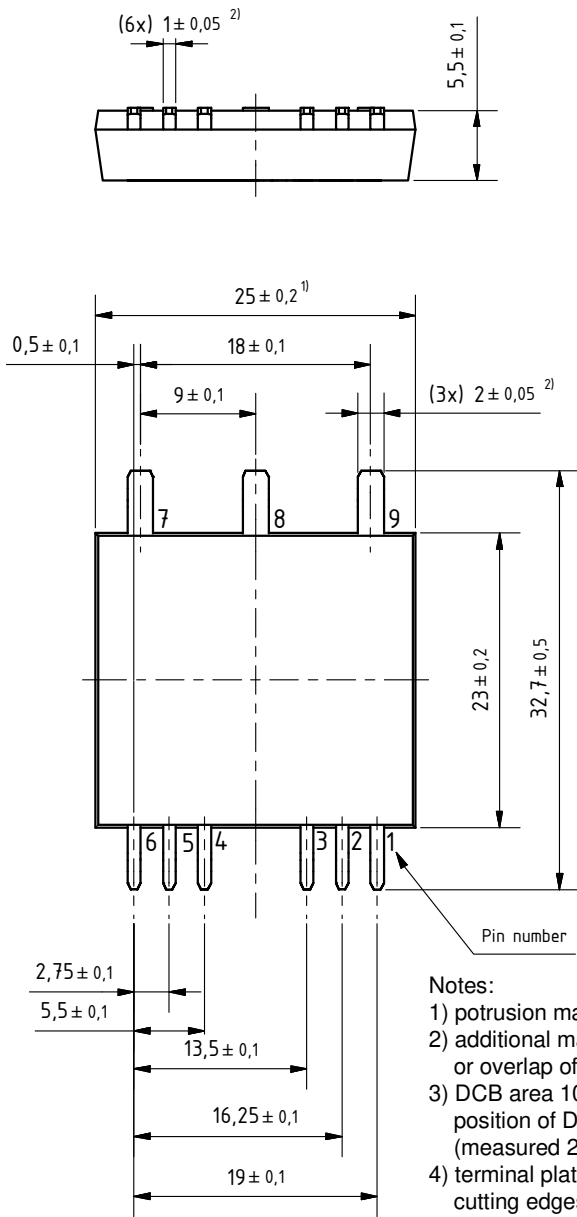
**Rectifier**

$V_{0\ max}$	threshold voltage	0.51	V
$R_{0\ max}$	slope resistance *	1.3	mΩ



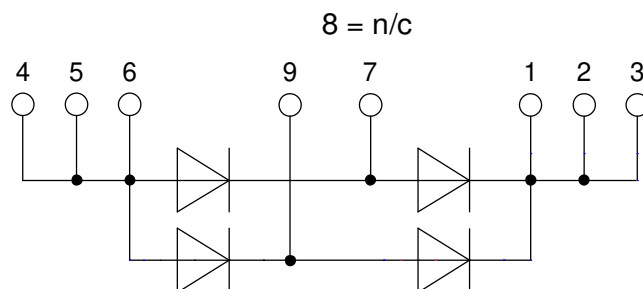
**Outlines SMPD**

**A ( 8 : 1 )**



**Notes:**

- 1) protusion may add 0.2 mm max. on each side
- 2) additional max. 0.05 mm per side by punching misalignment or overlap of dam bar or bending compression
- 3) DCB area 10 to 50  $\mu\text{m}$  convex; position of DCB area in relation to plastic rim:  $\pm 25 \mu\text{m}$  (measured 2 mm from Cu rim)
- 4) terminal plating: 0.2 - 1  $\mu\text{m}$  Ni + 10 - 25  $\mu\text{m}$  Sn (gal v.) cutting edges may be partially free of plating



**Rectifier**

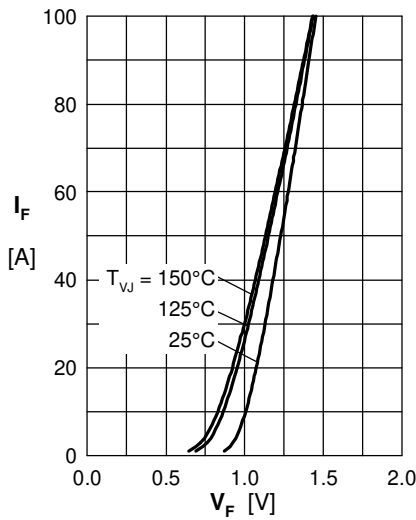


Fig. 1 Forward current versus voltage drop per diode

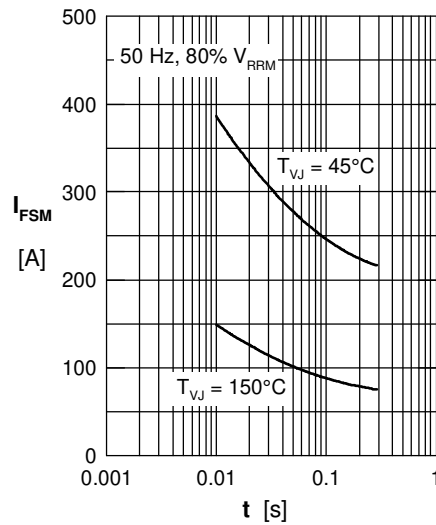


Fig. 2 Surge overload current

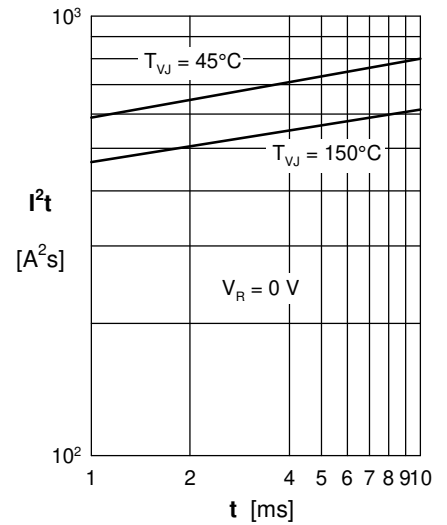


Fig. 3  $I^2t$  versus time per diode

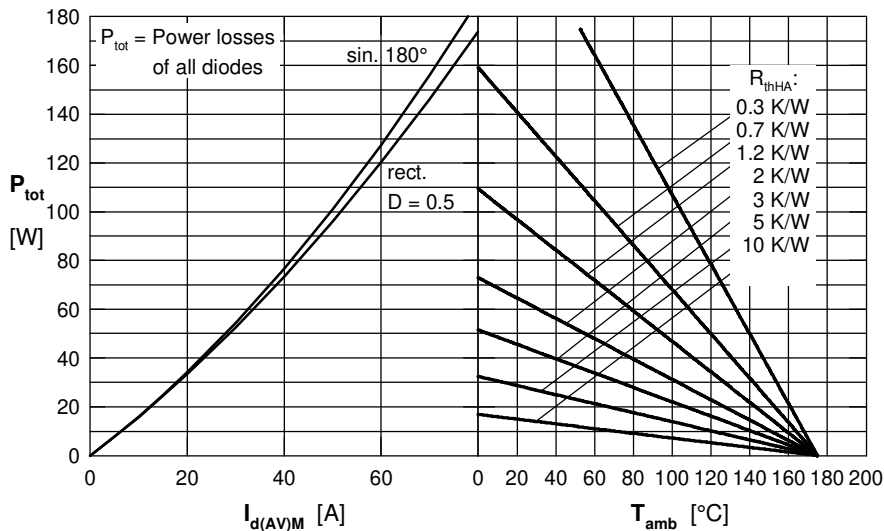


Fig. 4 Power dissipation vs. bridge output current and ambient temperature

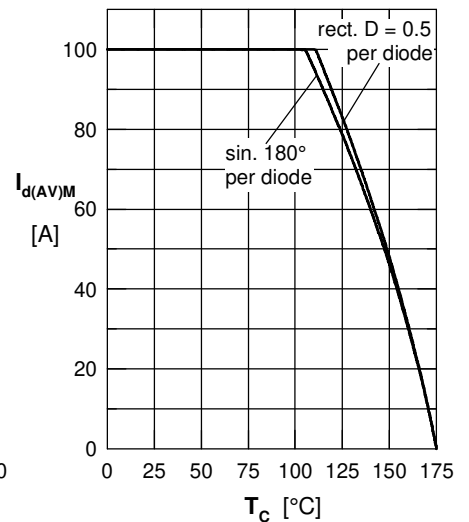


Fig. 5 Max. bridge output current vs. case temperature

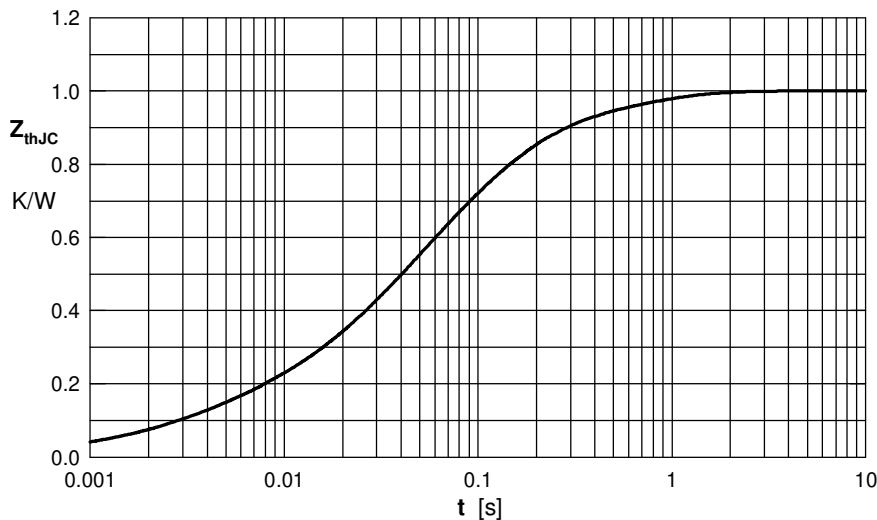


Fig. 6 Transient thermal impedance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ [K/W]	$t_i$ [s]
1	0.09	0.003
2	0.116	0.062
3	0.386	0.1
4	0.128	0.55