# High Efficiency Standard Rectifier

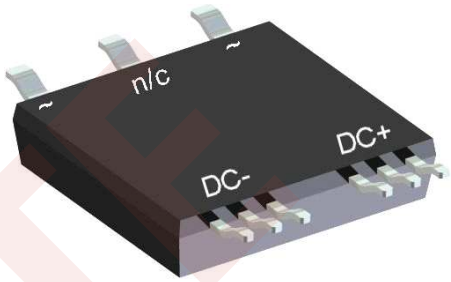
| 1~ Rectifier | | |
|---|---|---|
| $V_{RRM}$ | = | 800 V |
| $I_{DAV}$ | = | 124 A |
| $I_{FSM}$ | = | 400 A |

## 1~ Rectifier Bridge

**Part number**

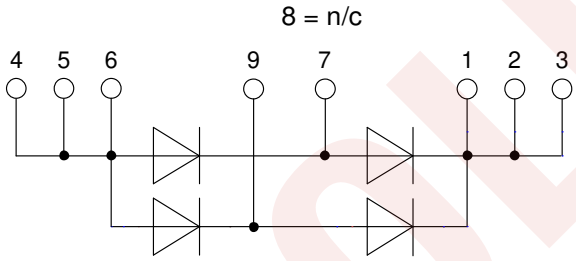
**DLA100B800LB**

*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

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## Rectifier

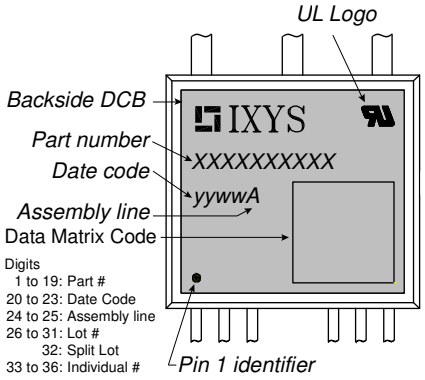
| Symbol | Definition | Conditions | | Ratings min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_{RSM}$ | *max. non-repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 800 | V |
| $V_{RRM}$ | *max. repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 800 | V |
| $I_R$ | *reverse current* | $V_R$ = 800 V | $T_{VJ}$ = 25°C | | | 10 | µA |
| | | $V_R$ = 800 V | $T_{VJ}$ = 150°C | | | 0.1 | mA |
| $V_F$ | *forward voltage drop* | $I_F$ = 50 A | $T_{VJ}$ = 25°C | | | 1.23 | V |
| | | $I_F$ = 100 A | | | | 1.45 | V |
| | | $I_F$ = 50 A | $T_{VJ}$ = 150°C | | | 1.15 | V |
| | | $I_F$ = 100 A | | | | 1.44 | V |
| $I_{DAV}$ | *bridge output current* | $T_C$ = 135°C<br>180° sine | $T_{VJ}$ = 175°C | | | 124 | A |
| $V_{F0}$ | *threshold voltage* } *for power loss calculation only* | | $T_{VJ}$ = 175°C | | | 0.75 | V |
| $r_F$ | *slope resistance* } | | | | | 4.2 | mΩ |
| $R_{thJC}$ | *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°C | | | 150 | W |
| $I_{FSM}$ | *max. forward surge current* | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 45°C | | | 400 | A |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 430 | A |
| | | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 150°C | | | 340 | A |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 365 | A |
| $I^2t$ | *value for fusing* | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 45°C | | | 800 | $A^2s$ |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 770 | $A^2s$ |
| | | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 150°C | | | 580 | $A^2s$ |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 555 | $A^2s$ |
| $C_J$ | *junction capacitance* | $V_R$ = 400 V; f = 1 MHz | $T_{VJ}$ = 25°C | | 13 | | pF |

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| 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 |
| **Weight** | | | | | 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 | 50/60 Hz, RMS; $I_{ISOL}$ ≤ 1 mA | 3000 | | | V |
| | | t = 1 minute | | 2500 | | | V |



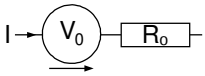

**Part description**

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 °C




**Rectifier**

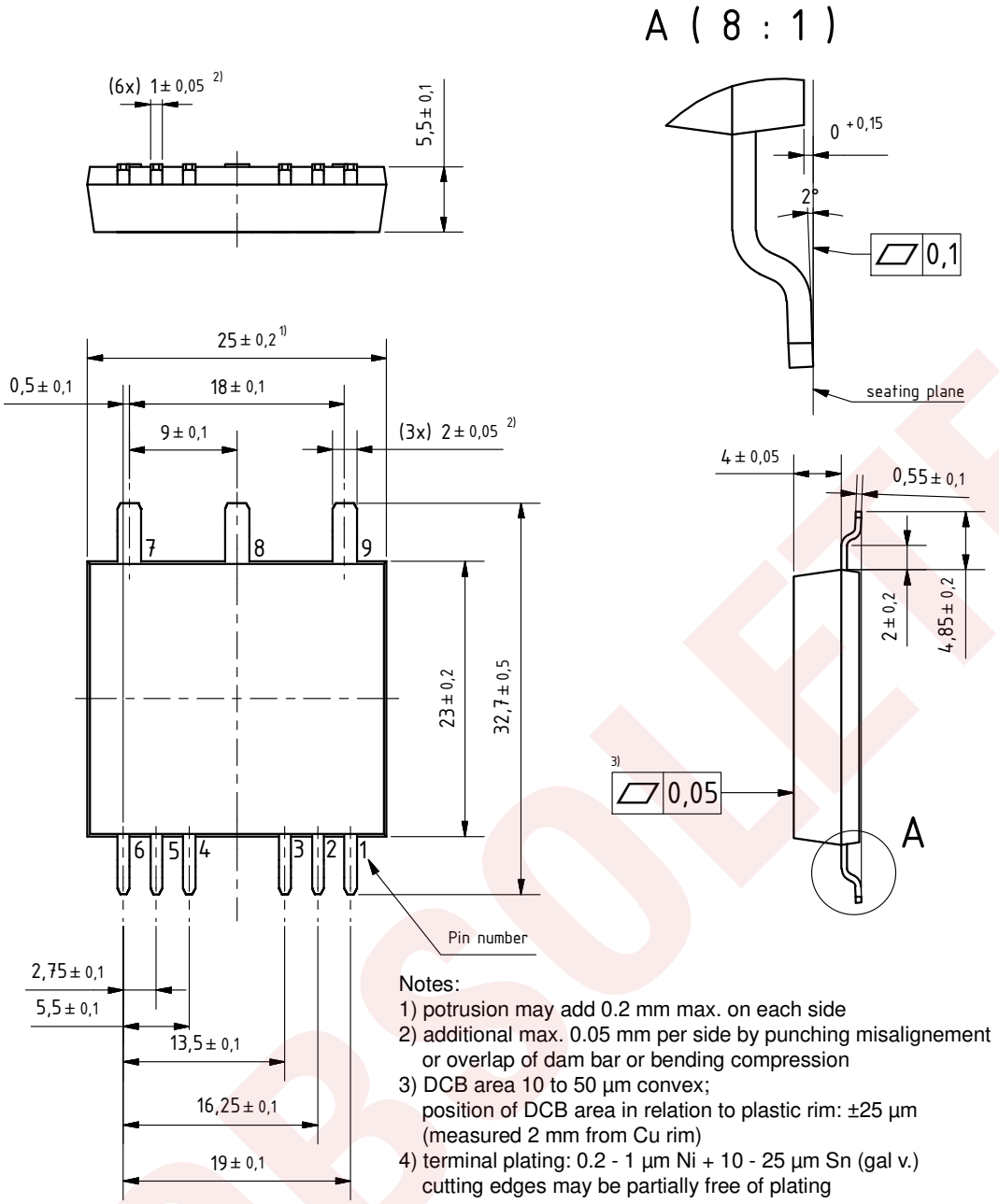
| | | | |
|---|---|---|---|
| $V_{0\,max}$ | *threshold voltage* | 0.51 | V |
| $R_{0\,max}$ | *slope resistance ** | 1.3 | mΩ |

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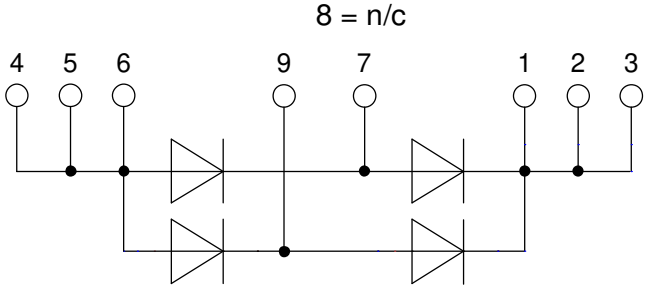


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## Outlines SMPD




Notes:
1) potrusion may add 0.2 mm max. on each side
2) additional max. 0.05 mm per side by punching misalignement or overlap of dam bar or bending compression
3) DCB area 10 to 50 µm convex; position of DCB area in relation to plastic rim: ±25 µm (measured 2 mm from Cu rim)
4) terminal plating: 0.2 - 1 µm Ni + 10 - 25 µm Sn (gal v.) cutting edges may be partially free of plating




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## Rectifier

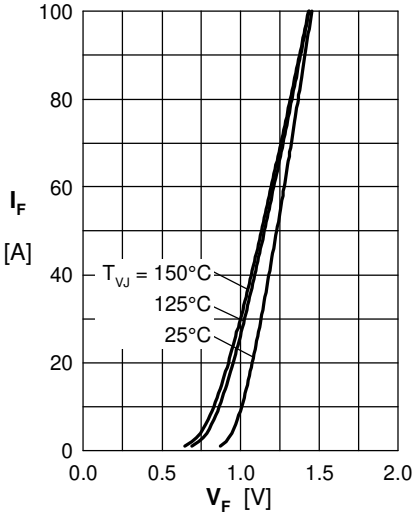



Fig. 1 Forward current versus voltage drop per diode

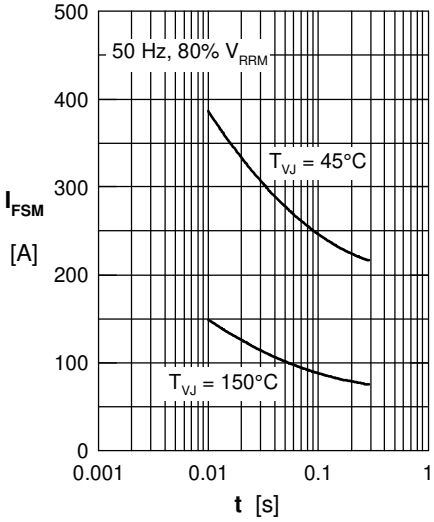



Fig. 2 Surge overload current

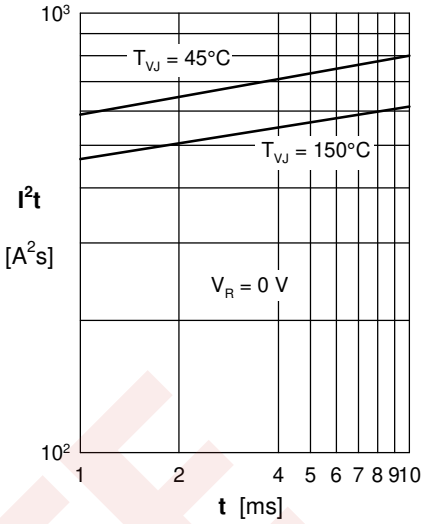



Fig. 3 $I^2t$ versus time per diode

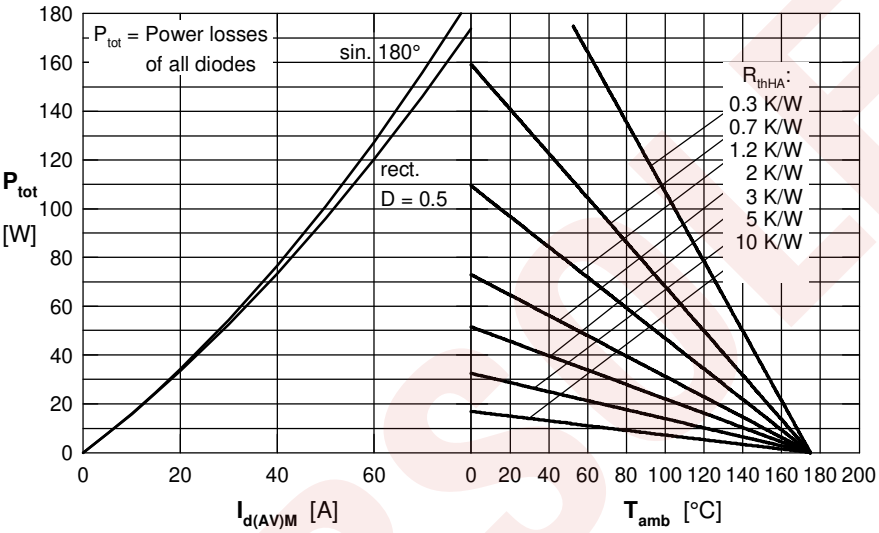



Fig. 4 Power dissipation vs. bridge output current and ambient temperature

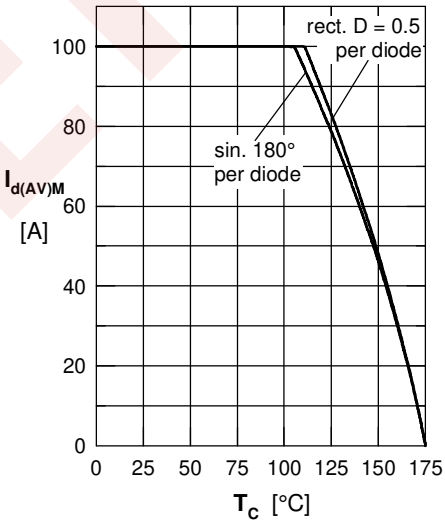



Fig. 5 Max. bridge output current vs. case temperature

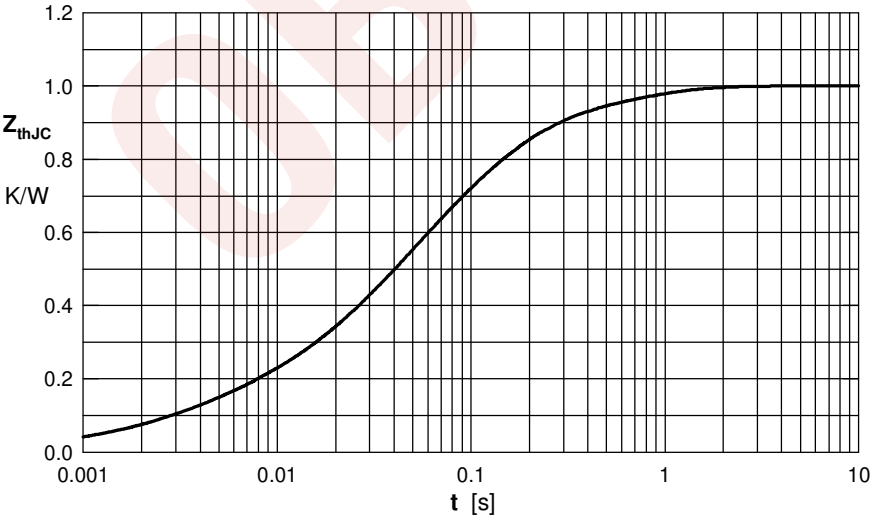



Fig. 6 Transient thermal impedance junction to case

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 |

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