

Sonic Fast Recovery Diode

$$V_{RRM} = 1200 \text{ V}$$

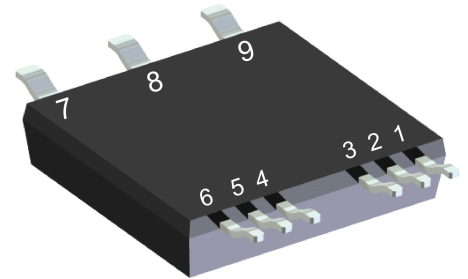
$$I_{DAV} = 60 \text{ A}$$

$$t_{rr} = 160 \text{ ns}$$


High Performance Fast Recovery Diode
Low Loss and Soft Recovery
3~ Rectifier Bridge

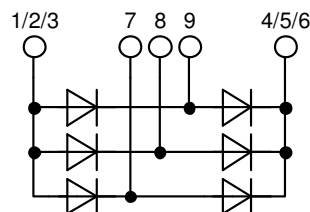
Part number

DHG60U1200LB



Backside: isolated

 E72873



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low I_{rm} -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{rm} reduces:
 - Power dissipation within the diode
 - Turn-on loss in the commutating switch

Applications:

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

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

Terms Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact the sales office, which is responsible for you.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

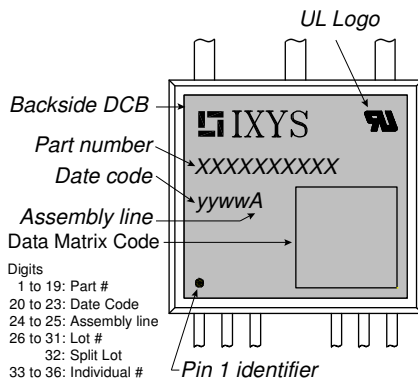
- to perform joint risk and quality assessments;

- the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

| Fast Diode | | | | Ratings | | | |
|------------|--|---|-------------------|------------------------------|------|------|---------------|
| Symbol | Definition | Conditions | | min. | typ. | max. | Unit |
| V_{RSM} | max. non-repetitive reverse blocking voltage | | | | | 1200 | V |
| V_{RRM} | max. repetitive reverse blocking voltage | | | | | 1200 | V |
| I_R | reverse current, drain current | $V_R = 1200$ V | | $T_{VJ} = 25^\circ\text{C}$ | | 50 | μA |
| | | $V_R = 1200$ V | | $T_{VJ} = 125^\circ\text{C}$ | | 0.5 | mA |
| V_F | forward voltage drop | $I_F = 20$ A | | $T_{VJ} = 25^\circ\text{C}$ | | 1.99 | V |
| | | $I_F = 60$ A | | | | 1.93 | V |
| | | $I_F = 20$ A | | $T_{VJ} = 125^\circ\text{C}$ | | 2.30 | V |
| | | $I_F = 60$ A | | | | 3.21 | V |
| I_{DAV} | bridge output current | $T_C = 80^\circ\text{C}$ | rectangular | $T_{VJ} = 150^\circ\text{C}$ | | 60 | A |
| | | | $d = \frac{1}{3}$ | | | | |
| V_{FO} | threshold voltage | } for power loss calculation only | | $T_{VJ} = 150^\circ\text{C}$ | | 1.35 | V |
| r_F | slope resistance | | | | | 29 | m Ω |
| R_{thJC} | thermal resistance junction to case | | | | | 1.2 | K/W |
| R_{thCH} | thermal resistance case to heatsink | | | | 0.40 | | K/W |
| P_{tot} | total power dissipation | | | $T_C = 25^\circ\text{C}$ | | 100 | W |
| I_{FSM} | max. forward surge current | $t = 10$ ms; (50 Hz), sine; $V_R = 0$ V | | $T_{VJ} = 45^\circ\text{C}$ | | 200 | A |
| C_J | junction capacitance | $V_R = 600$ V $f = 1$ MHz | | $T_{VJ} = 25^\circ\text{C}$ | | 11 | pF |
| I_{RM} | max. reverse recovery current | } $I_F = 20$ A; $V = 600$ V | | $T_{VJ} = 25^\circ\text{C}$ | | 19 | A |
| | | | | $T_{VJ} = 125^\circ\text{C}$ | | 25 | A |
| t_{rr} | reverse recovery time | } $-d_F/dt = 600$ A/ μs | | $T_{VJ} = 25^\circ\text{C}$ | | 160 | ns |
| | | | | $T_{VJ} = 125^\circ\text{C}$ | | 280 | ns |

| Package SMPD | | Ratings | | | | |
|---------------|--|----------------------|------|------|------|------|
| Symbol | Definition | Conditions | min. | typ. | max. | Unit |
| I_{RMS} | RMS current | per terminal | | | 100 | A |
| T_{VJ} | virtual junction temperature | | -55 | | 150 | °C |
| T_{op} | operation temperature | | -55 | | 125 | °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 | 3000 | | | V |
| | | t = 1 minute | 2500 | | | V |



Part description

- D = Diode
- H = Sonic Fast Recovery Diode
- G = extreme fast
- 60 = Current Rating [A]
- U = 3- Rectifier Bridge
- 1200 = Reverse Voltage [V]
- LB = SMPD-B

| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|-------------|------------------|--------------------|---------------|----------|----------|
| Standard | DHG60U1200LB | DHG60U1200LB | Blister | 45 | 513421 |
| Alternative | DHG60U1200LB-TRR | DHG60U1200LB | Tape & Reel | 200 | 513414 |

Equivalent Circuits for Simulation

* on die level

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

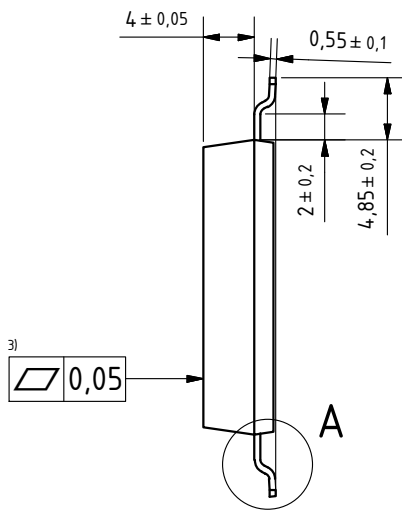
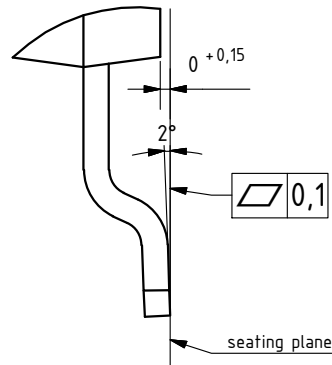
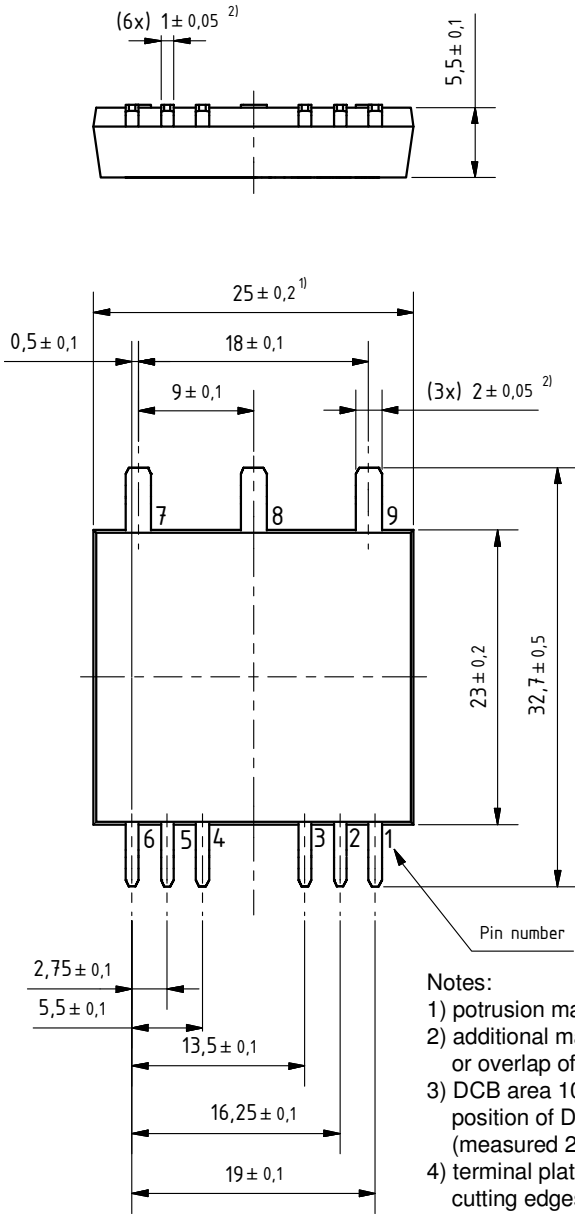


Fast Diode

| | | | |
|--------------------|--------------------|------|----|
| $V_{0\text{ max}}$ | threshold voltage | 1.35 | V |
| $R_{0\text{ max}}$ | slope resistance * | 27 | mΩ |

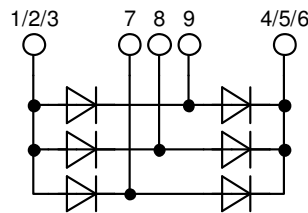
Outlines SMPD

A (8 : 1)



Notes:

- 1) potrusion 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 μm 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 μm Ni + 10 - 25 μm Sn (gal v.) cutting edges may be partially free of plating



Fast Diode

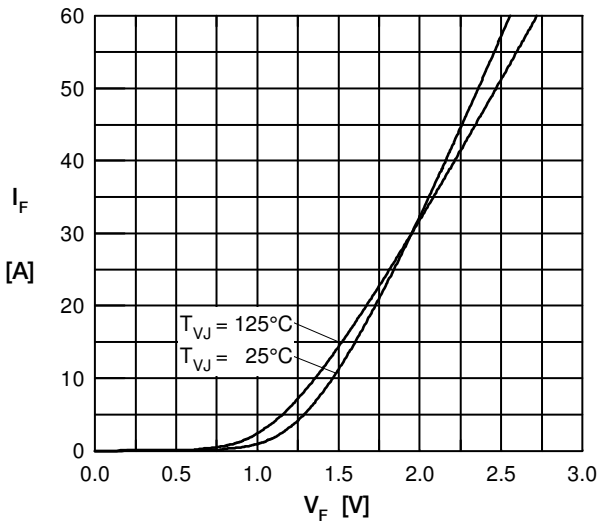


Fig. 7 Typ. Forward current versus V_F

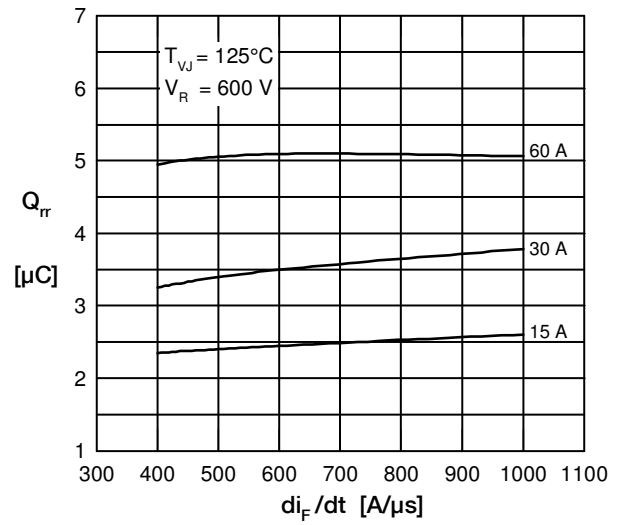


Fig. 8 Typ. reverse recov.charge Q_{rr} vs. di/dt

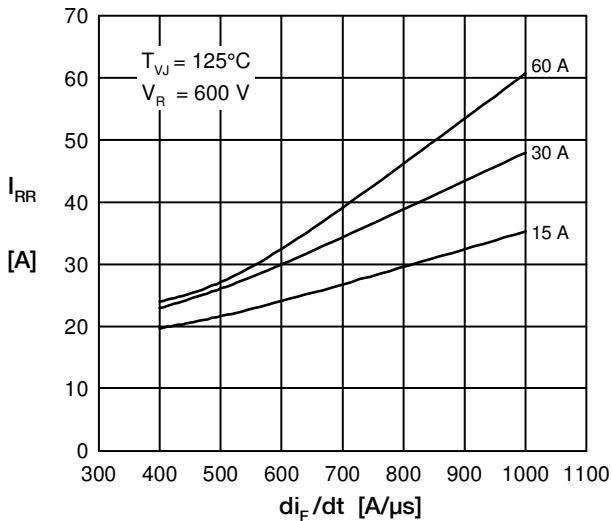


Fig. 9 Typ. peak reverse current I_{RM} vs. di/dt

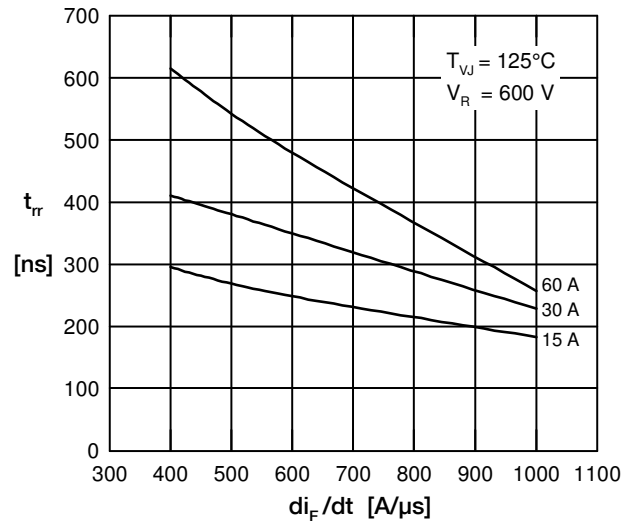


Fig. 10 Typ. recovery time t_{rr} versus di/dt

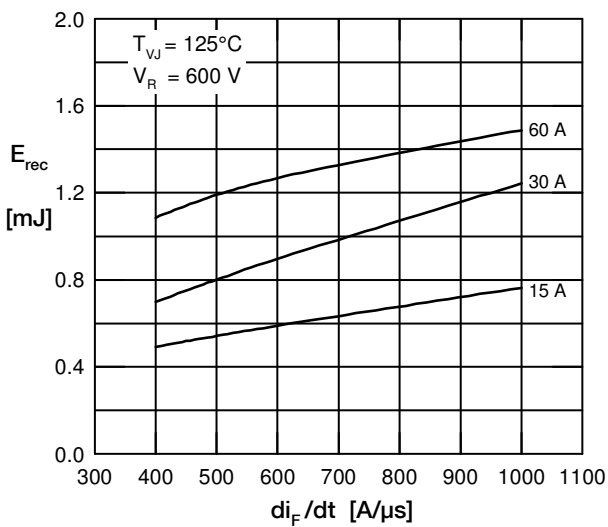


Fig.11 Typ. recovery energy E_{rec} versus di/dt

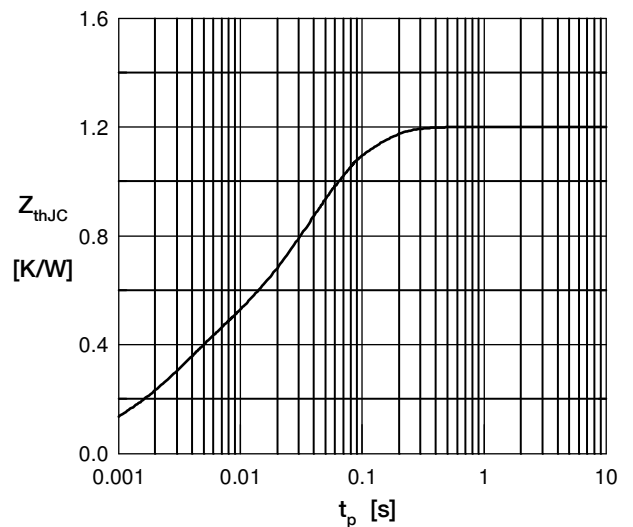


Fig. 12 Typ. transient thermal impedance