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# HBS610

## 6.0A SURFACE MOUNT GLASS PASSIVATED BRIDGE RECTIFIER

## Product Summary (@$T_A$ = +25°C)

| $V_{RRM}$ (V) | $I_O$ (A) | $V_F$ (V) | $I_R$ (µA) |
|---|---|---|---|
| 1000 | 6.0 | 0.96 | 5 |

## Features and Benefits

- Glass Passivated Die Construction
- Miniature Surface Mount Package Saves Space on PC Boards
- High Current Capability
- High Forward Current Capability up to 6.0A
- High Heat Dissipation Capability
- Low Profile Package
- Low Forward Voltage Drop
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

## Description and Applications

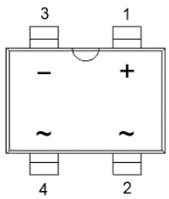
General purpose use in AC-to-DC bridge full wave rectification for Fast Charging, Switching Power Supply, USB PD, Adapter and 3-in-1 DTV Power Board, etc.

## Mechanical Data

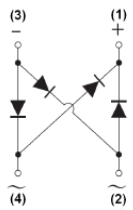
- Case: HBS
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208 (e3)
- Polarity: As Marked on Body
- Weight: 0.387grams (Approximate)



Top View




Pin Diagram



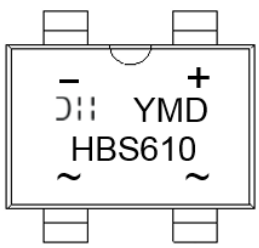

Internal Schematic

## Ordering Information (Note 4)

| Part Number | Compliance | Case | Packaging |
|---|---|---|---|
| HBS610-13 | Commercial | HBS | 2,500/Tape & Reel |

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

## Marking Information




HBS610 = Product Type Marking Code
YMD = Date Code Marking
Y = Last Digit of Year (ex: 0 = 2020)
M = See Month/Code Table Below
D = Day 1 to 9 = 1 to 9; Day 10 to 31 = A to V

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |


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## Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 1,000 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 700 | V |
| Average Rectified Output Current (Note 5) @ $T_A$ = +25°C | $I_O$ | 6.0 | A |
| Non-Repetitive Peak Forward Surge Current, 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 170 | A |
| Non-Repetitive Peak Forward Surge Current, 1.0ms<br>Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 280 | A |
| $I^2t$ Rating for Fusing (1ms < t < 8.3ms) | $I^2t$ | 120 | $A^2S$ |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Typical Thermal Resistance, Junction to Ambient (Note 5)<br>(Per Element) | $R_{\theta JA}$ | 75 | °C/W |
| Typical Thermal Resistance, Junction to Lead (Per Element) | $R_{\theta JL}$ | 14 | °C/W |
| Typical Thermal Resistance, Junction to Case (Per Element) | $R_{\theta JC}$ | 10 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Breakdown Voltage (Note 6) | $V_{(BR)R}$ | 1,000 | — | — | V | $I_R$ = 10μA |
| Forward Voltage (Per Element) | $V_F$ | —<br>—<br>— | 0.83<br>0.88<br>0.91 | 0.88<br>0.93<br>0.96 | V | $I_F$ = 1A, $T_A$ = +25°C<br>$I_F$ = 3A, $T_A$ = +25°C<br>$I_F$ = 6A, $T_A$ = +25°C |
| Leakage Current (Note 6) (Per Element) | $I_R$ | —<br>— | 0.15<br>20 | 5<br>100 | μA | $V_R$ = 1,000V, $T_A$ = +25°C<br>$V_R$ = 1,000V, $T_A$ = +125°C |
| Total Capacitance (Per Element) | $C_T$ | — | 50 | — | pF | $V_R$ = 4V, f = 1.0MHz |

Notes: 5. Device mounted on 15mmx12mmx1.6mm AL Pad attached on 100mmx75mmx27mm Fin heatsink. Thermal resistance test performed in accordance with JESD-51.
6. Short duration pulse test used to minimize self-heating effect.


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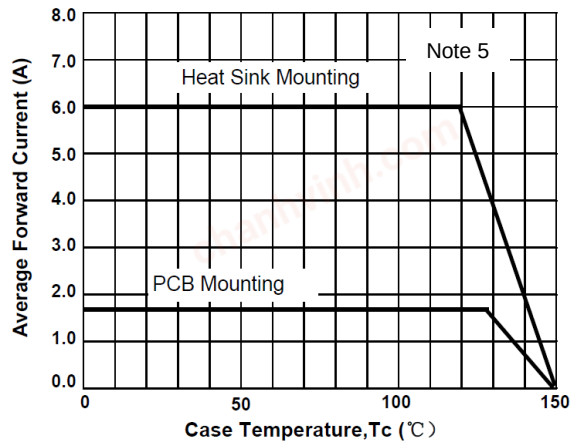



Figure 1. Forward Current Derating

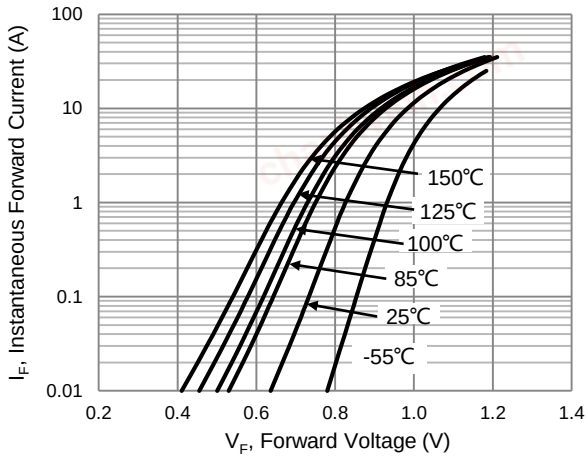



Figure 2. Typical Forward Characteristics

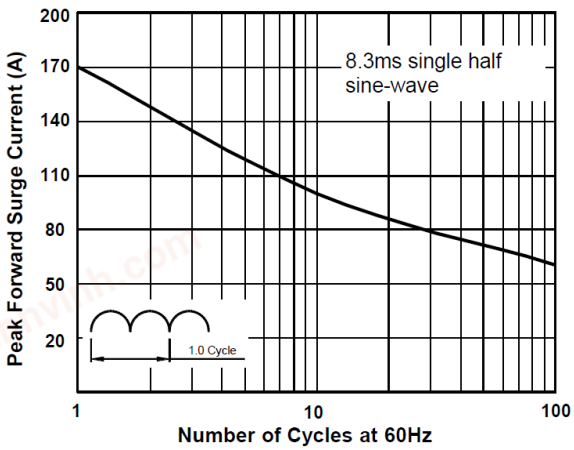



Figure 3. Maximum Non-Repetitive Forward Surge Current

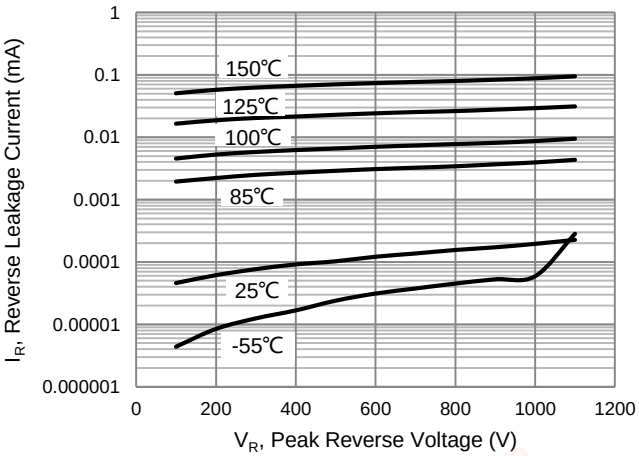



Figure 4. Typical Reverse Characteristics

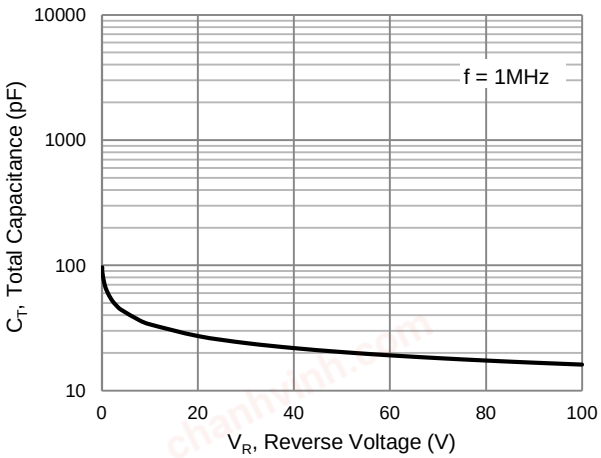



Figure 5. Typical Total Capacitance


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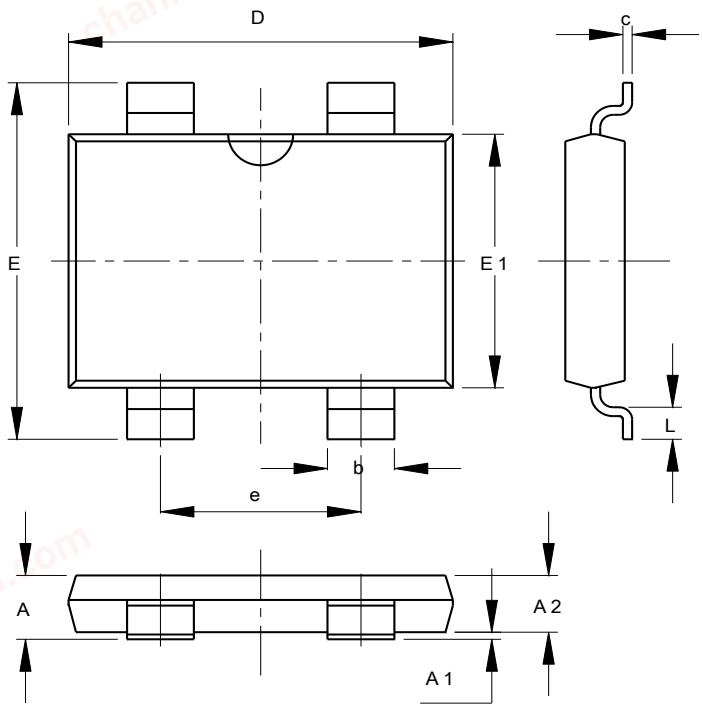
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## Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

**HBS**

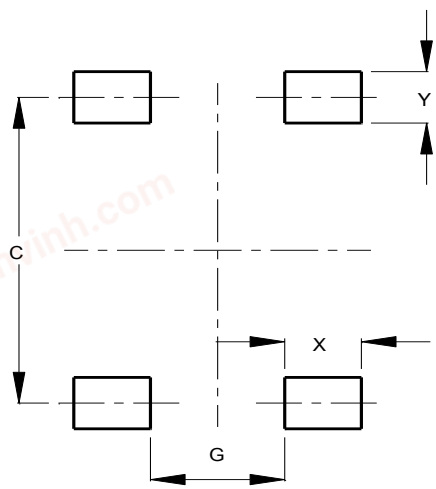



| HBS | | | |
|---|---|---|---|
| Dim | Min | Max | Typ |
| A | 1.45 | 1.80 | -- |
| A1 | 0.00 | 0.20 | -- |
| A2 | 1.45 | 1.65 | -- |
| b | 1.70 | 1.90 | -- |
| c | 0.15 | 0.35 | -- |
| D | 10.05 | 10.35 | -- |
| E | 9.75 | 10.05 | -- |
| E1 | 6.85 | 7.15 | -- |
| e | 5.25 | 5.60 | -- |
| L | 0.45 | 0.95 | -- |
| All Dimensions in mm | | | |

## Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

**HBS**




| Dimensions | Value (in mm) |
|---|---|
| C | 8.92 |
| G | 3.50 |
| X | 2.00 |
| Y | 1.50 |


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