

# High-Brightness Backlight

## HBB Datasheet

### Product Highlights

- High-Brightness
- Compact Size
- Designed To Meet IP67
- Integrated Heatsink
- Temperature Compensated

### Applications

- Head Mounted Displays
- AR / XR / MR
- Heads-Up-Display
- Projectors

Items covered in this datasheet:

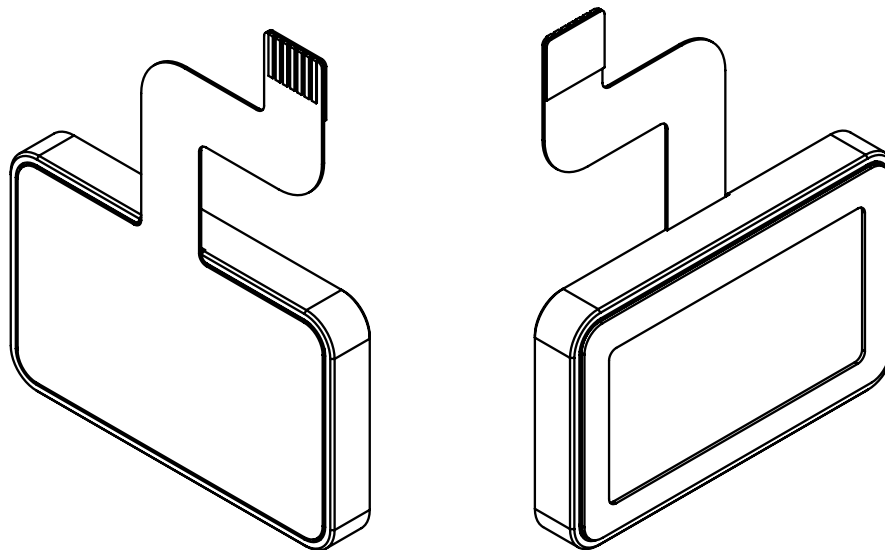
| Part Number | Product Description       |
|-------------|---------------------------|
| HBB-50002   | High-Brightness Backlight |

### Abstract

The HBB-50001 and HBB-50002 are high-performance tricolor LED backlights designed to work in a wide range of harsh environmental conditions. Homogenized dispersion, concentrated projection angle, and wide brightness range make this backlight suitable for LCoS and DMD AR, VR, and HUD applications.

The HBB-50001 is built for industrial and commercial use. An integrated 3M VHB gasket provides a strong and low-profile mounting to a wide range of metals, plastics, and glass types.

HBB-50002



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## Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

001 - Initial Release  
First Release of HBB-50002.

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## Part Number Ordering Information

SSS - NNNNN - **XX** - VVV

(Series) - (Part Type & Number) - (**Option Configuration**) - (Version)

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# Specifications

## Functional Specifications

| Feature               | Remark                        | Red          | Green     | Blue      | Units |
|-----------------------|-------------------------------|--------------|-----------|-----------|-------|
| Forward Voltage       | Per LED                       | 2.35         | 3.4       | 3.45      | V     |
| Luminous Intensity    | Total                         | 3600 - 7200  |           |           | mcd   |
| Dominant Wavelength   | -                             | 619 - 624    | 520 - 540 | 460 - 480 | nm    |
| Forward Current (Typ) | Total                         | 30           | 20        | 20        | mA    |
| Reverse Voltage       | Per LED                       | 5            | 5         | 5         | V     |
| Projection Area       | Dimensions of projected light | 17 x 9       |           |           | mm    |
| Polarization Axis     | Direction of polarization     | Vertical (S) |           |           | -     |

### Notes

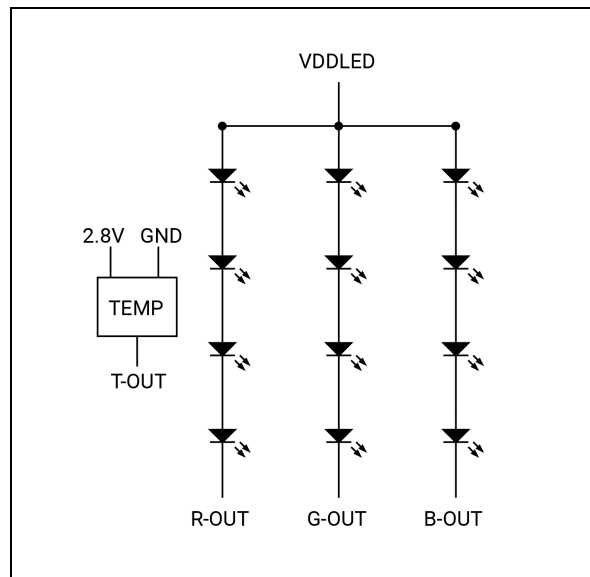
1. Max values are with single-color light and duty of  $\leq 1/10$
2. Continued reverse voltage can cause damage
3. Prolong use at the min and/or max temperatures will reduce ingress protection
4. Adaptive voltage is recommended for the LEDs. Contact VX for a reference design

## Absolute Maximum Ratings

Exceeding the Absolute Maximum Rating may cause permanent damage to the device. Continuous use at the absolute maximum rating for extended periods may affect device reliability. Absolute maximum ratings are based on environmental conditions of 22°C and 50% relative humidity. Use outside of these conditions will require independent testing and verification by the customer.

| Name          | Description                 | Minimum | Maximum | Units |
|---------------|-----------------------------|---------|---------|-------|
| Current (Max) | Total                       | -       | 40      | mA    |
| TUSE          | Operating temperature range | -25     | 55      | °C    |
| TSTG          | Storage temperature range   | -18     | 38      | °C    |

## Functional Block Diagram



## Pinout Tables

The following tables define the basic pin functions. Full pin definitions are available in the reference package. The following tables are for information only. Schematics are available with the reference package.

| Connector - Pin | Name   | Type       | Description                               |
|-----------------|--------|------------|---|
| FPC - 1         | DGND   | Ground     | Device Ground                             |
| FPC - 2         | T-OUT  | Output     | Temperature Output (HBB Side)             |
| FPC - 3         | 2.8V   | Power      | Optional 2.8 Volts for Temperature Output |
| FPC - 4         | VDDLED | LED Input  | LED Sequential Pulse                      |
| FPC - 5         | B-OUT  | LED Output | Blue LED Output                           |
| FPC - 6         | G-OUT  | LED Output | Green LED Output                          |
| FPC - 7         | R-OUT  | LED Output | Red LED Output                            |

## Mating Connector

Use a 0.5mm pitch, 0.3mm height, zero insertion force (ZIF) FPC to board connector.

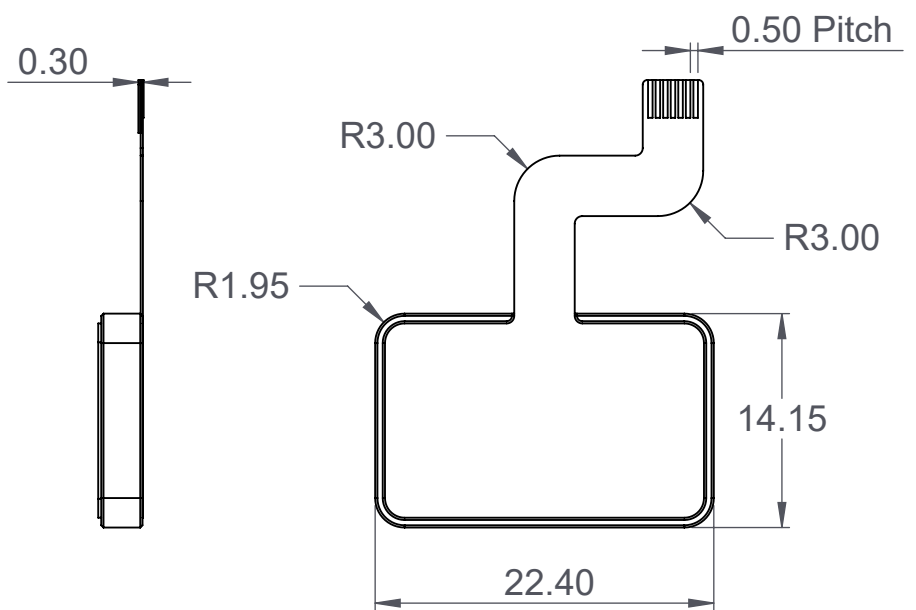
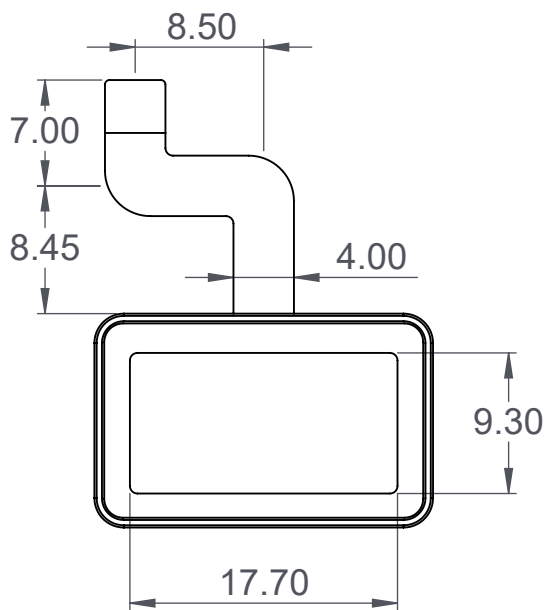
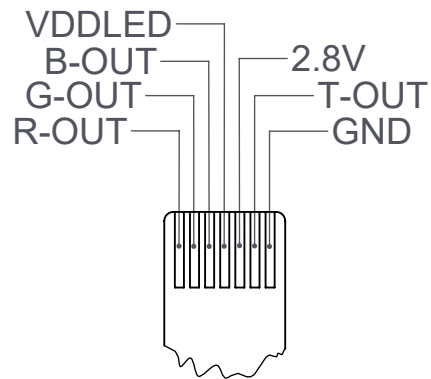
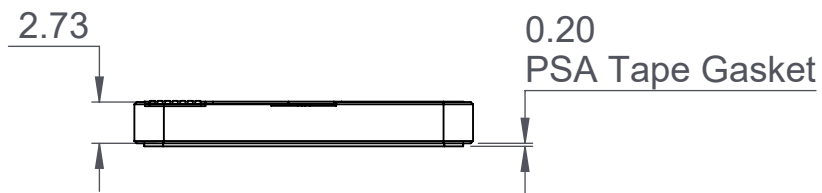
Hirose Electric Co: FH19C-7S-0.5SH is recommended.

# Mechanical Drawings

This is a limited dimension drawing to be used for part information and reference. 3D CAD takes precedence over these drawings.

Global tolerance is 0.3mm unless otherwise stated.

3D STEP models are available under NDA.



## Important Notice – Please Read Carefully

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Customers should obtain the latest information, by contacting VX, before placing orders.

Customers are solely responsible for the use of VX products and VX assumes no liability for application assistance or the design of Customers' products.

Storage: 22°C at 50% relative humidity is recommended. Prolonged storage is not recommended.

Resale of VX products shall void any warranty granted by VX for such products.

This product shall not be used in life-support devices or other medical systems. Customer to independently verify information and shall test for all required certifications, including but not limited to, RoHS, ANSI Z87, and FDA.

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