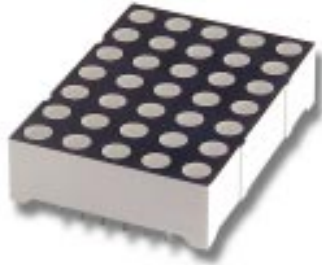
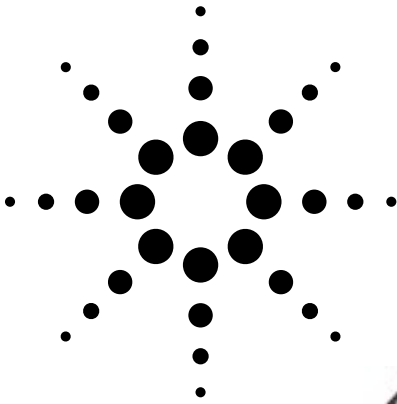


# Agilent HDSP-B5xZ Series

## 31.8 mm (1.25 inch) General Purpose

### 5 x 7 Dot Matrix Alphanumeric Displays

#### Data Sheet



#### Description

These displays have a 31.8 mm (1.25 inch) character height. The devices are available in either common row anode or common row cathode configurations. The displays come in only black face paint. The Bi-color display consists of GaP Red (HER) and GaP Green colors.

These parts are subjected to Outgoing Quality Assurance (OQA) inspection with an AQL of 0.065% for functional and visual/cosmetic defects.

#### Devices

HDSP-	Description
B5AZ	31.8 mm Black Surface Bi-Color Common Row Anode
B5BZ	31.8 mm Black Surface Bi-Color Common Row Cathode

#### Note:

1. For details, please contact your local Agilent components sales office or an authorized distributor.

#### Features

- **5 x 7 Dot matrix font**
- **X-Y stackable**
- **Pin-out**
  - 26.66 mm (1.05 in.) Dual-In-Line (DIP) leads on 2. mm (0.079 in.) centers
- **Choice of colors**
  - Bi-color: red and green
- **Face paint color: black**
- **Design flexibility**
  - Common row anode or common row cathode
- **Categorized for luminance**

#### Applications

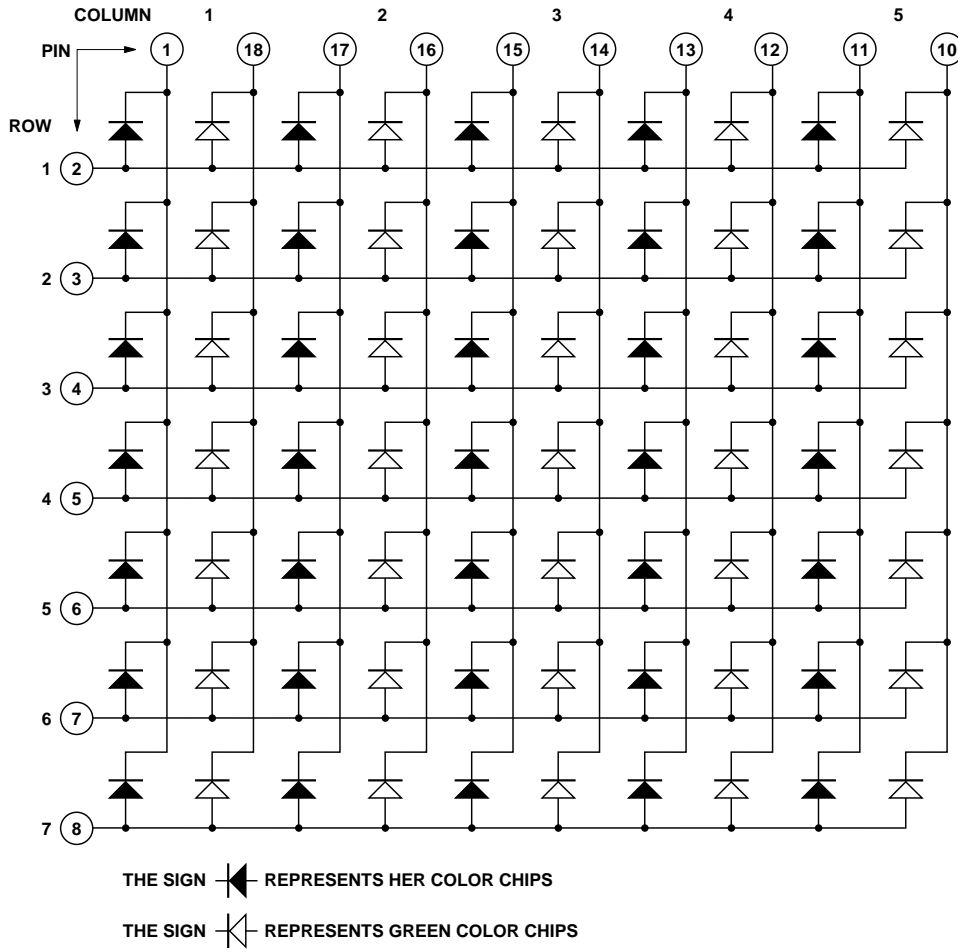
- **Suitable for indoor use**
- **Not recommended for industrial applications, i.e., operating temperature requirements exceeding 85°C or below -35°C**
- **Extreme temperature cycling not recommended<sup>[1]</sup>**





# Internal Circuit Diagram

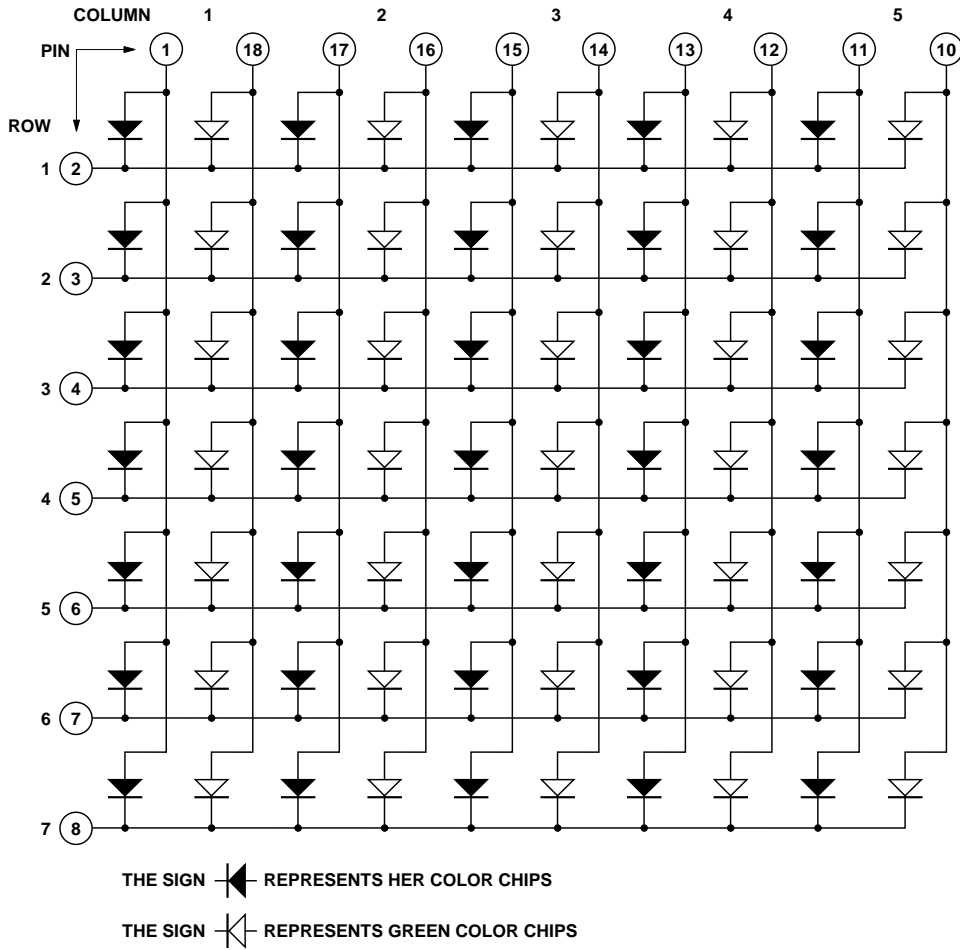
HDSP-B5AZ



PIN	CONNECTION
1	CATHODE COLUMN 1 HER
2	ANODE ROW 1
3	ANODE ROW 2
4	ANODE ROW 3
5	ANODE ROW 4
6	ANODE ROW 5
7	ANODE ROW 6
8	ANODE ROW 7
9	NO PIN
10	CATHODE COLUMN 5 GREEN
11	CATHODE COLUMN 5 HER
12	CATHODE COLUMN 4 GREEN
13	CATHODE COLUMN 4 HER
14	CATHODE COLUMN 3 GREEN
15	CATHODE COLUMN 3 HER
16	CATHODE COLUMN 2 GREEN
17	CATHODE COLUMN 2 HER
18	CATHODE COLUMN 1 GREEN

# Internal Circuit Diagram

HDSP-B5BZ



PIN	CONNECTION
1	ANODE COLUMN 1 HER
2	CATHODE ROW 1
3	CATHODE ROW 2
4	CATHODE ROW 3
5	CATHODE ROW 4
6	CATHODE ROW 5
7	CATHODE ROW 6
8	CATHODE ROW 7
9	NO PIN
10	ANODE COLUMN 5 GREEN
11	ANODE COLUMN 5 HER
12	ANODE COLUMN 4 GREEN
13	ANODE COLUMN 4 HER
14	ANODE COLUMN 3 GREEN
15	ANODE COLUMN 3 HER
16	ANODE COLUMN 2 GREEN
17	ANODE COLUMN 2 HER
18	ANODE COLUMN 1 GREEN

**Absolute Maximum Ratings at T<sub>A</sub> = 25°C**

<b>Parameter</b>	<b>GaP Red HDSP-B5AZ/B5BZ</b>	<b>GaP Green HDSP-B5AZ/B5BZ</b>	<b>Units</b>
Average Power per Dot <sup>[1]</sup>	36	36	mW
Peak Forward Current per Dot <sup>[1]</sup> (1/8 Duty Cycle at 10 KHz)	100	100	mA
Average Forward Current per Dot	13 <sup>[1,2]</sup>	13 <sup>[1,2]</sup>	mA
Reverse Voltage per Dot	3	3	V
Operating Temperature	-35 to +85	-35 to +85	°C
Storage Temperature	-35 to +85	-35 to +85	°C
Lead Solder Temperature for 3 seconds <sup>[3]</sup> (2 mm [0.078 in.] below seating plane)	260	260	°C

**Notes:**

1. Do not exceed maximum average current per dot.
2. Derate above 25°C at 0.17 mA/°C.
3. Not recommended to be soldered more than 2 times. Minimum interval between solderings is 15 minutes.  
Total soldering time not to exceed 3 seconds.

**Optical/Electrical Characteristics at T<sub>A</sub> = 25°C**  
**GaP Red**

Devices HDSP-	Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
B5AZ B5BZ	Luminous Intensity/Dot (Digit Average) <sup>[1]</sup>	I <sub>v</sub>		2		mcd	I <sub>FP</sub> = 40 mA, 1/8 Duty Factor
	Peak Wavelength	λ <sub>peak</sub>		632		nm	I <sub>F</sub> = 20 mA
	Dominant Wavelength <sup>[2]</sup>	λ <sub>d</sub>		622		nm	I <sub>F</sub> = 20 mA
	Forward Voltage	V <sub>F</sub>		2.1	2.6	V	I <sub>F</sub> = 20 mA
	Reverse Voltage <sup>[3]</sup>	V <sub>R</sub>	3.0			V	I <sub>R</sub> = 100 μA
	Luminous Intensity Matching Ratio	I <sub>v-m</sub>			2:1		I <sub>FP</sub> = 40 mA, 1/8 Duty Factor

**GaP Green**

Devices HDSP-	Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
B5AZ B5BZ	Luminous Intensity/Dot (Digit Average) <sup>[1]</sup>	I <sub>v</sub>		3.4		mcd	I <sub>FP</sub> = 40 mA, 1/8 Duty Factor
	Peak Wavelength	λ <sub>peak</sub>		568		nm	I <sub>F</sub> = 20 mA
	Dominant Wavelength <sup>[2]</sup>	λ <sub>d</sub>		573		nm	I <sub>F</sub> = 20 mA
	Forward Voltage	V <sub>F</sub>		2.3	2.6	V	I <sub>F</sub> = 20 mA
	Reverse Voltage <sup>[3]</sup>	V <sub>R</sub>	3.0			V	I <sub>R</sub> = 100 μA
	Luminous Intensity Matching Ratio	I <sub>v-m</sub>			2:1		I <sub>FP</sub> = 40 mA, 1/8 Duty Factor

**Bi-Color**

Devices HDSP-	Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
B5AZ B5BZ	Luminance/Unit (Digit Average) <sup>[1]</sup>	I <sub>v</sub>	124.1	215	372	Cd/m <sup>2</sup>	I <sub>FP</sub> = 40 mA, 1/8 Duty Factor

**Notes:**

1. The digits are categorized for luminance. The category is designated by a letter on the side of the package.
2. The dominant wavelength, λ<sub>d</sub>, is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
3. Typical specification for reference only. Do not exceed absolute maximum ratings.

**Bi-Color (Cd/m<sup>2</sup> at I<sub>FP</sub> = 40 mA, 1/8 Duty Factor)**

Bin Name	Min. <sup>[2]</sup>	Max. <sup>[2]</sup>
H	124.1	149
I	149.1	179
J	179.1	215
K	215.1	258
L	258.1	310
M	310.1	372

**Hue Grade**

Coordinate	Bin						
	4	5	6	7	8	9	10
X	0.542-0.553	0.552-0.563	0.562-0.573	0.572-0.583	0.582-0.593	0.592-0.603	0.602-0.613
Y	0.445-0.456	0.435-0.446	0.425-0.436	0.415-0.426	0.405-0.416	0.395-0.406	0.385-0.396

**Notes:**

- Hue categories are established for classification of products. Products may not be available in all bin categories.
- Tolerance for each intensity bin limit is  $\pm 10\%$ .

**Color Bin Limits (nm)<sup>[1]</sup>****GaP Green**

Bin Name	Min. <sup>[2]</sup>	Max. <sup>[2]</sup>
3	569.1	571
4	571.1	573
5	573.1	575

**Notes:**

- Bin categories are established for classification of products. Products may not be available in all bin categories.
- Tolerance for each color bin limit is  $\pm 1.0$  nm.

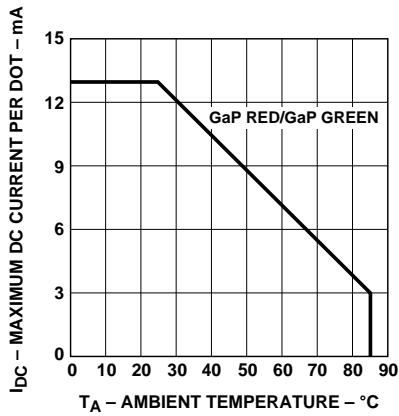


Figure 1. Maximum allowable average current per dot vs. ambient temperature.

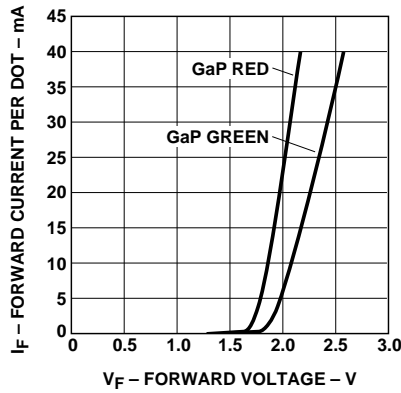


Figure 2. Forward current vs. forward voltage.

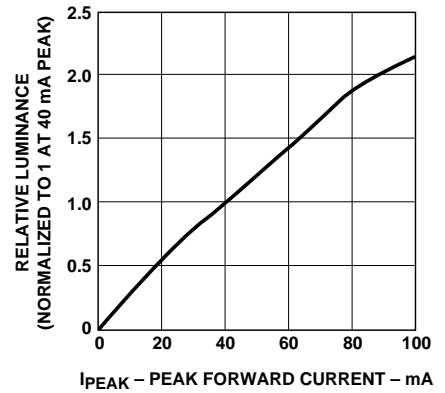


Figure 3. Relative luminance vs. peak forward current.

### Contrast Enhancement

For information on contrast enhancement, please see Application Note 1015.

### Soldering/Cleaning

Cleaning agents from the ketone family (acetone, methyl ethyl ketone, etc.) and from the chlorinated hydrocarbon family (methylene chloride, trichloroethylene, carbon tetrachloride, etc.) are not recommended for cleaning LED parts. All of these various solvents attack or dissolve the encapsulating epoxies used to form the package of plastic LED parts.

For information on soldering LEDs please refer to Application Note 1027.

### Device Reliability

For reliability information, please see the reliability datasheet *31.8 mm General Purpose 5 x 7 Dot Matrix Alphanumeric Displays*.

### [www.agilent.com/semiconductors](http://www.agilent.com/semiconductors)

For product information and a complete list of distributors, please go to our web site.

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