

# Agilent HDSP-B58x Series 53.3 mm (2.1 inch) General Purpose 5 x 8 Dot Matrix Bi-Color Alphanumeric Displays

## Data Sheet



### Description

These displays have a 53.3 mm (2.1 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. This 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.

### Features

- **5 x 8 Dot matrix font**
- **X-Y stackable**
- **Pin-out**
  - 45.72 mm (1.8 in.) Dual-In-Line (DIP) leads on 2.54 mm (0.1 in.) centers
- **Color**
  - Bi-color: GaP Red and GaP 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>**

### Devices

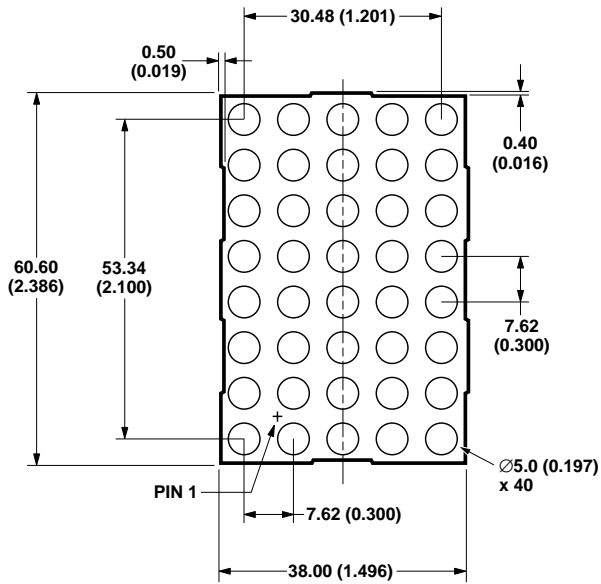
HDSP-	Description
B581	53.3 mm Black Surface Common Row Anode
B582	53.3 mm Black Surface Common Row Cathode

### Note:

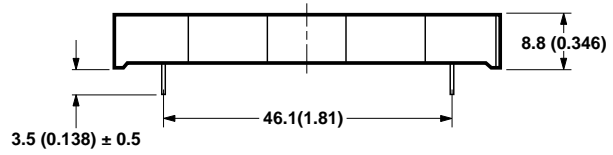
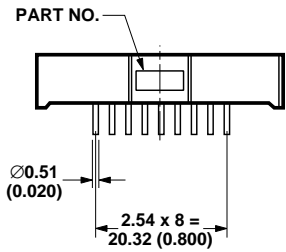
1. For details, please contact your local Agilent components sales office or an authorized distributor.



# Package Dimensions



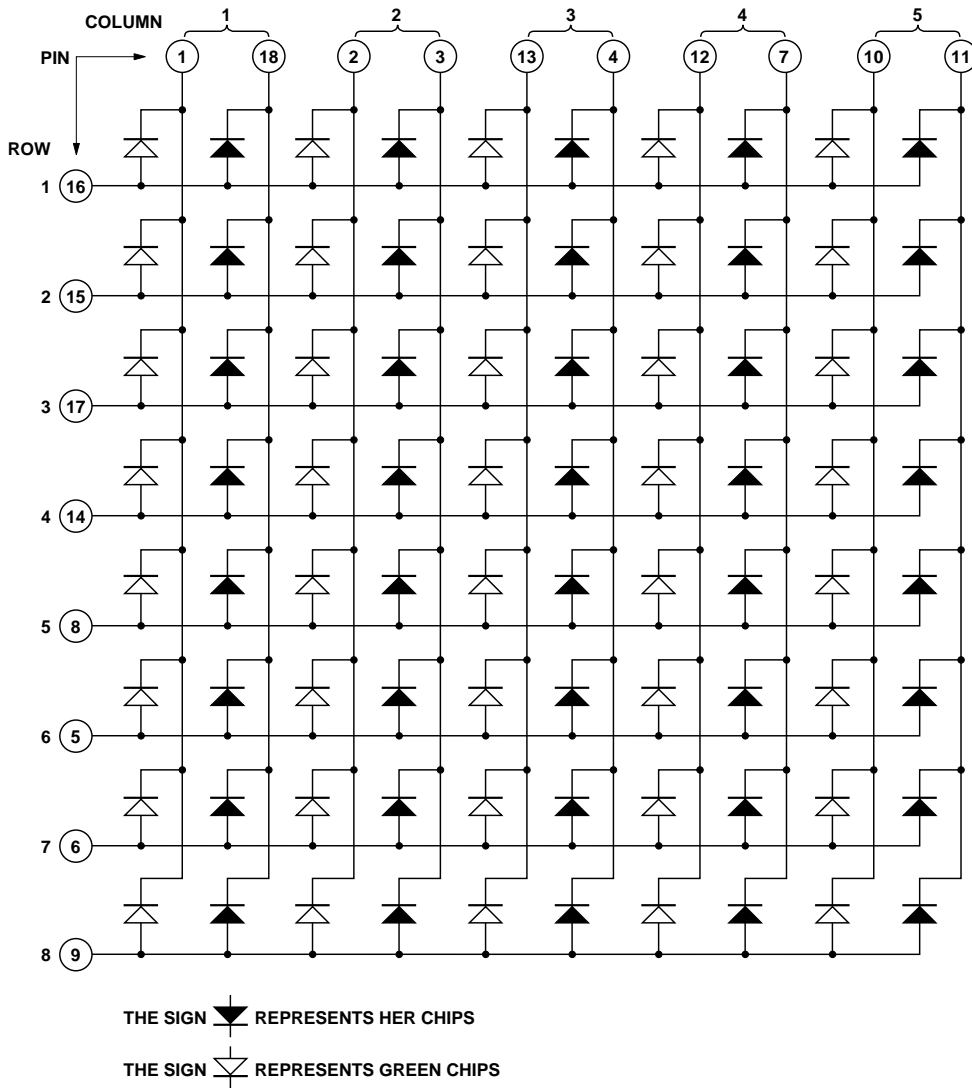
	COL 1	2	3	4	5
1	○	○	○	○	○
2	○	○	○	○	○
3	○	○	○	○	○
4	○	○	○	○	○
5	○	○	○	○	○
6	○	○	○	○	○
7	○	○	○	○	○
8	○	○	○	○	○
ROW					



- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETERS (INCHES).
  2. UNLESS OTHERWISE STATED, TOLERANCES ARE  $\pm 0.25$  mm.

# Internal Circuit Diagram

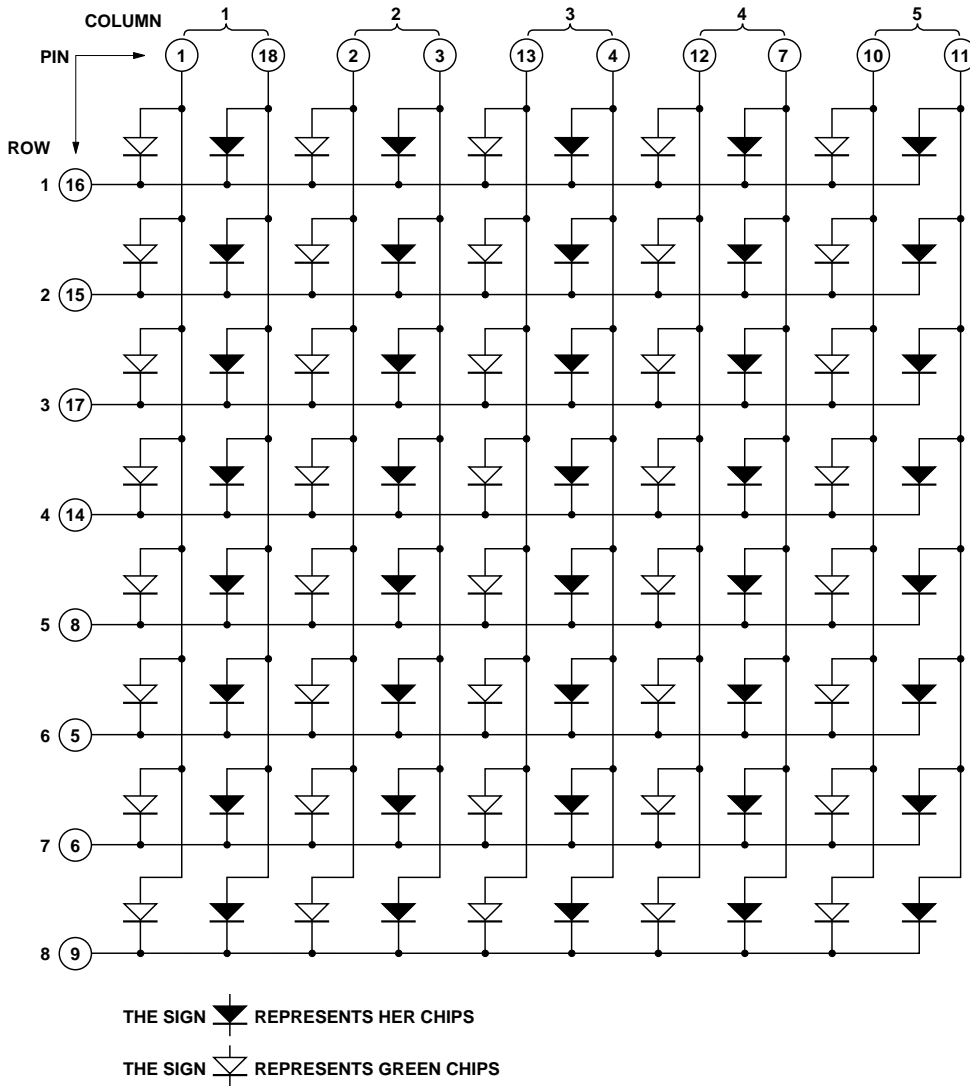
HDSP-B581



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

# Internal Circuit Diagram

HDSP-B582



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

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

<b>Parameter</b>	<b>GaP Red HDSP-B581/B582</b>	<b>GaP Green HDSP-B581/B582</b>	<b>Units</b>
Average Power per Dot <sup>[1]</sup>	65	65	mW
Peak Forward Current per Dot <sup>[1]</sup> (1/8 Duty Cycle at 10 kHz)	80	100	mA
Average Forward Current per Dot	25 <sup>[1,2]</sup>	25 <sup>[1,3]</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
Wave Soldering Temperature for 3 seconds <sup>[4]</sup> (2 mm [0.078 in.] below Body)	250	250	°C

**Notes:**

1. Do not exceed maximum average current per dot.
2. Derate above 25°C at 0.20 mA/°C.
3. Derate above 25°C at 0.33 mA/°C.
4. Not recommended to be soldered more than two 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
B581/ B582	Peak Wavelength	$\lambda_{\text{peak}}$		640		nm	I <sub>F</sub> = 20 mA
	Dominant Wavelength <sup>[2]</sup>	$\lambda_{\text{d}}$		628		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 $\mu$ A
	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
B581/ B582	Peak Wavelength	$\lambda_{\text{peak}}$		568		nm	I <sub>F</sub> = 20 mA
	Dominant Wavelength <sup>[2]</sup>	$\lambda_{\text{d}}$		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 $\mu$ A
	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
B581 B582	Luminance/Unit (Digit Average) <sup>[1]</sup>	I <sub>v</sub>	72	110	179	Cd/m <sup>2</sup>	I <sub>FP</sub> = 40 mA, 1/8 Duty Factor

**Notes:**

1. The digits are categorized for luminance. The luminance category is designated by a letter on the side of the package.
2. The dominant wavelength,  $\lambda_{\text{d}}$ , 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)**

<b>Bin Name</b>	<b>Min.<sup>[2]</sup></b>	<b>Max.<sup>[2]</sup></b>
E	72	86
F	86	104
G	104	124
H	124	149
I	149	179

**Hue Grade**

<b>Coordinate</b>	<b>Bin</b>				
	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
X	0.542-0.553	0.552-0.563	0.562-0.573	0.572-0.583	0.582-0.593
Y	0.445-0.456	0.435-0.446	0.425-0.436	0.415-0.426	0.405-0.416

**Notes:**

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

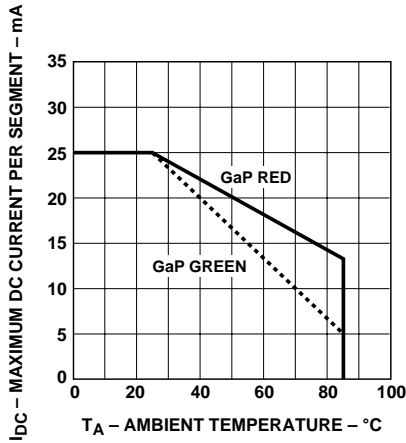


Figure 1. Maximum allowable average current per dot vs. ambient temperature.

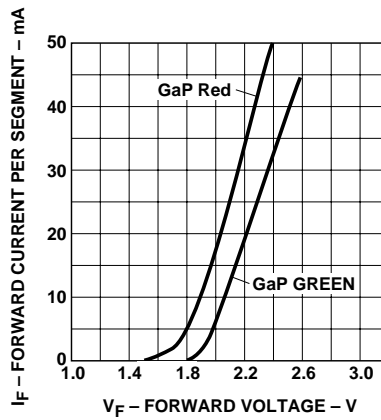


Figure 2. Forward current vs. forward voltage.

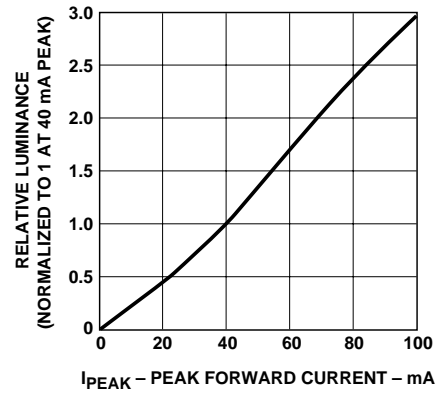


Figure 3. Relative luminance vs. peak forward current.

### 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 and Note 1060.

### Device Reliability

For reliability information, please see the reliability datasheet *General Purpose 5 x 8 Dot Matrix Bi-Color Displays*.

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Data subject to change.

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