

3mm

# LED CBI® Circuit Board Indicator (DIN 41494 Compatible)



## 551-xx01



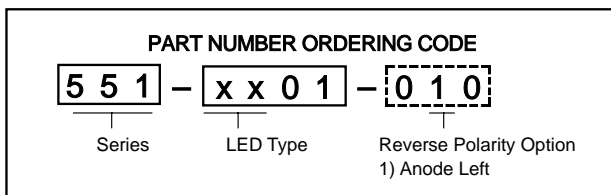
Standard Polarity shown in drawing: Anode right

### Features

- Designed to accommodate DIN 41494
- Mounting pin increases stability
- Multiple CBIs form horizontal LED arrays on 5.0mm (0.197") center-lines
- High Contrast, UL 94 V-0 rated, black housing
- Oxygen index: 31.5%
- Polymer content: PBT, 0.519 g
- Housing stand-offs facilitate PCB cleaning
- Solderability per MIL-STD-202F, method 208F
- LEDs are safe for direct viewing per IEC 825-1, EN-60825-1

### Tolerance note: As noted, otherwise:

- LED Protrusion:  $\pm 0.04$  mm [ $\pm 0.016$ ]
- CBI Housing:  $\pm 0.02$ mm [ $\pm 0.008$ ]



-010 Ordering Code Suffix required ONLY for Reverse Polarity Option

### PART NO.

### COLOR

#### HIGH EFFICIENCY

- 551-0201
- 551-0301
- 551-0401
- 551-0801
- 551-2501

- Green
- Yellow
- Red
- Blue<sup>3</sup>
- Orange



#### INTEGRAL RESISTOR, 5 VOLTS

- 551-0501
- 551-0601
- 551-0701

- Red
- Green
- Yellow

#### LOW CURRENT

- 551-1101
- 551-1201
- 551-1301

- Red
- Yellow
- Green

#### BI-COLOR

- 551-3001
- 551-3101

- Red/Green
- Yellow/Green

To order any of the 551-xx01 part numbers with Reverse Polarity (Anode Left), please add -010 to the part numbers shown above.



**ATTENTION**  
OBSERVE PRECAUTIONS  
FOR HANDLING  
ELECTROSTATIC  
SENSITIVE  
DEVICES

# 551-xx01

(DIN 41494 Compatible)

## Typical Operating Characteristics ( $T_A=25^\circ\text{C}$ )

See LED data sheet for additional information

See page 4-70 and 4-71 for Reference Only LED Drive Circuit Examples. See page 4-72 for Pin Out

### HIGH EFFICIENCY

| Part Number | Color  | Peak Wavelength nm | $I_V$ mcd | $V_F$ Volts | Test Current (mA) | Viewing Angle $2\theta_{\%}$ | LED Data sheet | Page # |
|-------------|--------|--------------------|-----------|-------------|-------------------|------------------------------|----------------|--------|
| 551-0201    | Green  | 565                | 12.6      | 2.1*        | 10                | 60°                          | 521-9210       | 4-58   |
| 551-0301    | Yellow | 585                | 10        | 2.1*        | 10                | 60°                          | 521-9211       | 4-58   |
| 551-0401    | Red    | 635                | 10        | 2*          | 10                | 60°                          | 521-9216       | 4-58   |
| 551-0801    | Blue   | 428                | 12        | 3.5         | 10                | 70°                          | 521-9831       | 4-57   |
| 551-2501    | Orange | 600                | 7         | 2.2         | 10                | 60°                          | 521-9498       | 4-58   |

\*  $I_F = 20\text{mA}$

### INTEGRAL RESISTOR, 5 VOLTS

| Part Number | Color  | Peak Wavelength nm | $I_V$ mcd | Test Voltage | Forward Current (mA) | Viewing Angle $2\theta_{\%}$ | LED Data sheet | Page # |
|-------------|--------|--------------------|-----------|--------------|----------------------|------------------------------|----------------|--------|
| 551-0501    | Red    | 635                | 29        | 5            | 10                   | 60°                          | 521-9215       | 4-59   |
| 551-0601    | Green  | 565                | 19        | 5            | 10                   | 60°                          | 521-9323       | 4-59   |
| 551-0701    | Yellow | 585                | 12.6      | 5            | 10                   | 60°                          | 521-9322       | 4-59   |

### LOW CURRENT

| Part Number | Color  | Peak Wavelength nm | $I_V$ mcd | $V_F$ Volts | Test Current (mA) | Viewing Angle $2\theta_{\%}$ | LED Data sheet | Page # |
|-------------|--------|--------------------|-----------|-------------|-------------------|------------------------------|----------------|--------|
| 551-1101    | Red    | 635                | 1.6       | 1.7         | 2                 | 60°                          | 521-9324       | 4-60   |
| 551-1201    | Yellow | 585                | 1.6       | 1.8         | 2                 | 60°                          | 521-9325       | 4-60   |
| 551-1301    | Green  | 565                | 1.6       | 1.9         | 2                 | 60°                          | 521-9326       | 4-60   |

### BI-COLOR

| Part Number | Color        | Peak Wavelength nm | $I_V$ mcd | $V_F$ Volts | Test Current (mA) | Viewing Angle $2\theta_{\%}$ | LED Data sheet | Page # |
|-------------|--------------|--------------------|-----------|-------------|-------------------|------------------------------|----------------|--------|
| 551-3001    | Red/Green    | 635/565            | 5         | 2           | 10                | 50°                          | 521-9459       | 4-63   |
| 551-3101    | Yellow/Green | 585/565            | 4.3/6.3   | 2.1*/2.1*   | 10                | 80°                          | 521-9478       | 4-62   |

\*  $I_F = 20\text{mA}$

4

**Dialight**



# 3mm Discrete LED Tinted, Diffused



## 521-9831



**PART NO.** 521-9831  
**COLOR** Blue<sup>3</sup>

**MOUNTING CLIP:** 515-0006  
located on page 4-65



**ATTENTION**  
OBSERVE PRECAUTIONS  
FOR HANDLING  
ELECTROSTATIC  
SENSITIVE  
DEVICES

4

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C)

Blue  
-9831

|                            |                                    |
|----------------------------|------------------------------------|
| Power Dissipation (mW)     | 100                                |
| Forward Current (mA)       | 20                                 |
| Derating (mA/°C) From 55°C | .44                                |
| Operating Temperature (°C) | -40/+100                           |
| Storage Temperature (°C)   | -40/+100                           |
| Soldering Temperature      | 260°C, 5 seconds, 1.6 mm from case |

Solder Adherence per MIL-STD-202E, Method 208C

### OPERATING CHARACTERISTICS (T<sub>A</sub>=25°C)

Blue  
-9831

|                                    |         |     |
|------------------------------------|---------|-----|
| Luminous Intensity (mcd)           | Min.    | 6.3 |
| I <sub>F</sub> =10mA               | Typical | 12  |
| Peak Wavelength (nm)               | Typical | 428 |
| λ Peak                             |         |     |
| Viewing Angle (2Θ <sub>1/2</sub> ) | Typical | 70° |
| Forward Voltage (V)                | Typical | 3.5 |
| I <sub>F</sub> =10mA               | Max.    | 4.2 |
| Reverse Voltage (V) IR=10μA        | Min.    | 3   |

Θ<sub>1/2</sub> is the off axis angle at which the luminous intensity is half the axial luminous intensity

# 3mm Discrete LED

## High Efficiency

## Diffused

# 521-9210, -9211, -9216, -9498, -9636

# Dialight



### PART NO. COLOR

- 521-9210 Green
- 521-9211 Yellow
- 521-9216 Red
- 521-9498 Orange
- 521-9636 Red



**MOUNTING CLIP: 515-0006**  
located on page 4-65

| <b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>A</sub> =25°C) | Green<br><b>-9210</b>              | Yellow<br><b>-9211</b> | Red<br><b>-9216</b> | Orange<br><b>-9498</b> | Red<br><b>-9636</b> |
|--|------------------------------------|------------------------|---------------------|------------------------|---------------------|
| Power Dissipation (mW)                                 | 100                                | 60                     | 100                 | 135                    | 100                 |
| Forward Current (mA)                                   | 30                                 | 20                     | 30                  | 25                     | 40                  |
| Derating (mA/°C) From 50°C 1 from 25°C                 | .4                                 | .25                    | .4                  | .5                     | .5 <sup>1</sup>     |
| Operating Temperature (°C)                             | -55/+100                           | -55/+100               | -55/+100            | -55/+100               | -55/+100            |
| Storage Temperature (°C)                               | -55/+100                           | -55/+100               | -55/+100            | -55/+100               | -55/+100            |
| Soldering Temperature                                  | 260°C, 5 seconds, 1.6 mm from body |                        |                     |                        |                     |

Solder Adherence per MIL-STD-202E, Method 208C

| <b>OPERATING CHARACTERISTICS</b> (T <sub>A</sub> =25°C) |   | Green<br><b>-9210</b> | Yellow<br><b>-9211</b> | Red<br><b>-9216</b> | Orange<br><b>-9498</b> | Red<br><b>-9636</b> |
|---|---|-----------------------|------------------------|---------------------|------------------------|---------------------|
| Luminous Intensity (mcd)                                | Min.  | 4.7                   | 7.4                    | 7.4                 | 3.4                    | 8.7 <sup>1</sup>    |
|   | I <sub>F</sub> =10mA 1 I <sub>F</sub> =20mA | Typical               | 12.6                   | 10                  | 10                     | 7                   |
| Peak Wavelength (nm)                                    | Typical                                     | 565                   | 585                    | 635                 | 600                    | 660                 |
| Viewing Angle (2θ °)                                    | Typical                                     | 60°                   | 60°                    | 60°                 | 60°                    | 60°                 |
| Forward Voltage (V)                                     | Typical                                     | 2.1 <sup>1</sup>      | 2.1 <sup>1</sup>       | 2 <sup>1</sup>      | 2.2                    | 1.8 <sup>1</sup>    |
|   | I <sub>F</sub> =10mA 1 I <sub>F</sub> =20mA | Max.                  | 2.8 <sup>1</sup>       | 2.8 <sup>1</sup>    | 2.8 <sup>1</sup>       | 3                   |
| Reverse Voltage (V), I <sub>R</sub> =100µA              | Max.  | 5                     | 5                      | 5                   | 5                      | 4                   |

<sup>1</sup> θ is the off axis angle at which the luminous intensity is half the axial luminous intensity

**3mm Discrete LED  
Integral Resistor, 5V  
Diffused**

**Dialight**

**521-9215, -9322, -9323**



| PART NO. | COLOR  |
|----------|--------|
| 521-9215 | Red    |
| 521-9322 | Yellow |
| 521-9323 | Green  |

**MOUNTING CLIP:** 515-0006  
located on page 4-65

| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A=25^\circ\text{C}$ ) | Red  | Yellow       | Green        |
|--|--|--------------|--------------|
|  | <b>-9215</b>                                       | <b>-9322</b> | <b>-9323</b> |
| Forward Voltage (V)  | 7.5  | 7.5          | 7.5          |
| Derating ( $V/^\circ\text{C}$ ) From $50^\circ\text{C}$    | .086   | .086         | .071         |
| Operating Temperature ( $^\circ\text{C}$ )                 | -40/+85  | -40/+85      | -20/+85      |
| Storage Temperature ( $^\circ\text{C}$ )                   | -55/+100   | -55/+100     | -55/+100     |
| Soldering Temperature                                      | 260 $^\circ\text{C}$ , 5 seconds, 1.6 mm from case |              |              |

Solder Adherence per MIL-STD-202E, Method 208C

| <b>OPERATING CHARACTERISTICS</b> ( $T_A=25^\circ\text{C}$ ) |         | Red          | Yellow       | Green        |
|---|---------|--------------|--------------|--------------|
|   |         | <b>-9215</b> | <b>-9322</b> | <b>-9323</b> |
| Luminous Intensity (mcd)                                    | Min.    | 8.7          | 3.7          | 5.6          |
|   | Typical | 29           | 12.6         | 19           |
| Peak Wavelength (nm)  | Typical | 635          | 585          | 565          |
| $\lambda$ Peak  |         |              |              |              |
| Viewing Angle ( $2\theta_{1/2}$ )                           | Typical | 60 $^\circ$  | 60 $^\circ$  | 60 $^\circ$  |
| Forward Current (mA)  | Typical | 10           | 10           | 10           |
|   | Max.    | 20           | 20           | 20           |
| Reverse Voltage (V), $I_R=100\mu\text{A}$                   | Min.    | 5            | 5            | 5            |

$\theta_{1/2}$  is the off axis angle at which the luminous intensity is half the axial luminous intensity

**4**

# 3mm Discrete LED

## Low Current

## Diffused

# Dialight

## 521-9324, -9325, -9326



### PART NO. COLOR

|          |        |
|----------|--------|
| 521-9324 | Red    |
| 521-9325 | Yellow |
| 521-9326 | Green  |

**MOUNTING CLIP:** 515-0006  
located on page 4-65

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C)

|  | Red<br>-9324                       | Yellow<br>-9325 | Green<br>-9326 |
|--|------------------------------------|-----------------|----------------|
| Power Dissipation (mW)                   | 20                                 | 20              | 20             |
| Forward Current (mA)                     | 7                                  | 7               | 7              |
| Derating (mA/°C) From 90°C               | .7                                 | .7              | .7             |
| Peak Current (mA)<br>Pulse width = 10 μs | 500                                | 500             | 500            |
| Operating Temperature (°C)               | -55/+100                           | -55/+100        | -55/+100       |
| Storage Temperature (°C)                 | -55/+100                           | -55/+100        | -55/+100       |
| Soldering Temperature                    | 260°C, 5 seconds, 1.6 mm from case |                 |                |

Solder Adherence per MIL-STD-202E, Method 208C

### OPERATING CHARACTERISTICS (T<sub>A</sub>=25°C)

|   |         | Red<br>-9324 | Yellow<br>-9325 | Green<br>-9326 |
|---|---------|--------------|-----------------|----------------|
| Luminous Intensity (mcd)<br>I <sub>F</sub> =2mA | Min.    | 1            | 1               | 1              |
|   | Typical | 1.6          | 1.6             | 1.6            |
| Peak Wavelength (nm)<br>λ Peak                  | Typical | 635          | 585             | 565            |
| Viewing Angle (2Θ °)                            | Typical | 60°          | 60°             | 60°            |
| Forward Voltage (V)<br>I <sub>F</sub> =2mA      | Typical | 1.7          | 1.8             | 1.9            |
|   | Max.    | 2.2          | 2.7             | 2.2            |
| Reverse Voltage (V), I <sub>R</sub> =50μA       | Min.    | 5            | 5               | 5              |

Θ is the off axis angle at which the luminous intensity is half the axial luminous intensity

# 3mm Discrete LED

## Bi-Color

### Non-Tinted, Diffused



# 521-9478, -9628, -9768



| PART NO. | COLOR        |
|----------|--------------|
| 521-9478 | Yellow/Green |
| 521-9628 | Red/Green    |
| 521-9768 | Red/Yellow   |

**MOUNTING CLIP: 515-0006**  
located on page 4-65

| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A=25^\circ\text{C}$ ) | Yellow/Green<br><b>-9478</b>        | Red/Green<br><b>-9628</b> | Red/Yellow<br><b>-9768</b>        |
|--|-------------------------------------|---------------------------|-----------------------------------|
| Power Dissipation (mW)                                     | 60/100                              | 140/100                   | 100/60                            |
| Forward Current (mA)                                       | 20/30                               | 40/30                     | 30/20                             |
| Derating (mA/°C) From 25°C From 50°C                       | .25 <sup>1</sup> /.40 <sup>1</sup>  | .5/.4                     | .4 <sup>1</sup> /.25 <sup>1</sup> |
| Peak Current (mA)<br>Pulse width = 10µs                    | 80/120                              | 200/120                   | 120/80                            |
| Operating Temperature (°C)                                 | -55/+100                            | -55/+100                  | -55/+100                          |
| Storage Temperature (°C)                                   | -55/+100                            | -55/+100                  | -55/+100                          |
| Soldering Temperature                                      | 260°C, 5 seconds, 1.66 mm from case |                           |                                   |

Solder Adherence per MIL-STD-202E, Method 208C

| <b>OPERATING CHARACTERISTICS</b> ( $T_A=25^\circ\text{C}$ ) |         | Yellow/Green<br><b>-9478</b> | Red/Green<br><b>-9628</b> | Red/Yellow<br><b>-9768</b> |
|---|---------|------------------------------|---------------------------|----------------------------|
| Luminous Intensity (mcd)                                    | Min.    | 2.5/2.5                      | 3.7*/1.1*                 | 1.7*/1.7*                  |
|   | Typical | 4.3/6.3                      | 12.6*/3.7*                | 5.6*/5.6*                  |
| Peak Wavelength (nm)<br>λ Peak                              | Typical | 585/565                      | 660/565                   | 630/585                    |
| Viewing Angle (2θ °)  | Typical | 80°                          | 200°                      | 80°                        |
| Forward Voltage (V)   | Typical | 2.1/2.1                      | 1.8/2.1                   | 2/2.1                      |
|   | Max.    | 2.8/2.8                      | 2.4/2.8                   | 2.8/2.8                    |
| Reverse Voltage (V) I <sub>R</sub> =100ua                   | Min.    | 5                            | 5                         | 5                          |

θ<sup>1</sup> is the off axis angle at which the luminous intensity is half the axial luminous intensity

# 3mm Discrete LED Bi-Color Non-Tinted, Diffused

# Dialight

## 521-9459



**PART NO.**

521-9459

**COLOR**

Red/Green

**MOUNTING CLIP:** 515-0006

located on page 4-65

4

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C)

Red/Green  
**-9459**

|   |                                    |
|---|------------------------------------|
| Power Dissipation (mW)                  | 140                                |
| Forward Current (mA)                    | 45                                 |
| Derating (mA/°C) From 25°C              | .6                                 |
| Peak Current (mA)<br>Pulse width = 10µs | 1000                               |
| Operating Temperature (°C)              | -55/+100                           |
| Storage Temperature (°C)                | -55/+100                           |
| Soldering Temperature                   | 260°C, 5 seconds, 1.6 mm from case |

Solder Adherence per MIL-STD-202E, Method 208C

### OPERATING CHARACTERISTICS (T<sub>A</sub>=25°C)

Red/Green  
**-9459**

|  |                 |                   |
|--|-----------------|-------------------|
| Luminous Intensity (mcd)<br>I <sub>F</sub> =10mA | Min.<br>Typical | 2.5/3.7<br>4.7/10 |
| Peak Wavelength (nm)<br>λ Peak                   | Typical         | 635/565           |
| Viewing Angle (2Θ <sub>1/2</sub> )               | Typical         | 50°               |
| Forward Voltage (V)<br>I <sub>F</sub> =10mA      | Typical<br>Max. | 2/2.1<br>2.8/2.8  |

Θ<sub>1/2</sub> is the off axis angle at which the luminous intensity is half the axial luminous intensity