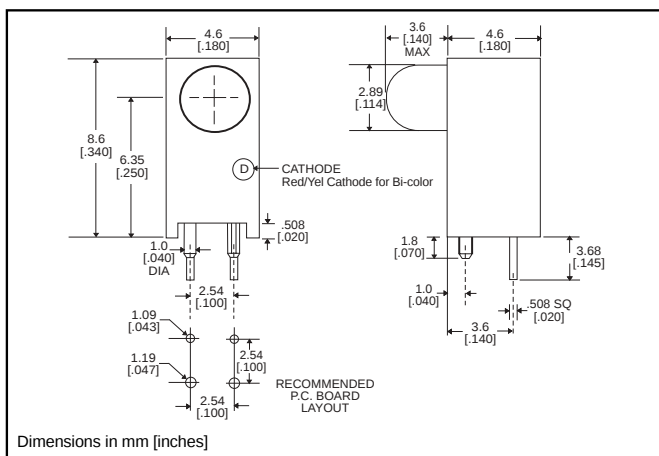


## LED CBI® Circuit Board Indicator

### .250" High LED Centerline

# Dialight

551-xx03



Standard Polarity shown in drawing: Cathode right

## Features

- Multiple CBIs form horizontal LED arrays on 4.7mm (0.185") center-lines
- High Contrast, UL 94 V-0 rated, black housing
- Oxygen index: 31.5%
- Polymer content: PBT, 0.190 g
- Housing stand-offs facilitate PCB cleaning
- Locating pins provide stability during soldering
- 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 [ $\pm 0.008$ ]

## PART NO.

## HIGH EFFICIENCY

551-0203

551-0303

551-0403

551-2503

**INTEGRAL RESISTOR, 5 VOLTS**

551-0503

551-0603

551-0703

## LOW CURRENT

551-1103

551-1203

551-1303

## BI-COLOR

551-3003

551-3103

**COLOR**

Green

Yellow

Red

Orange

Red

Green

Yellow

Red

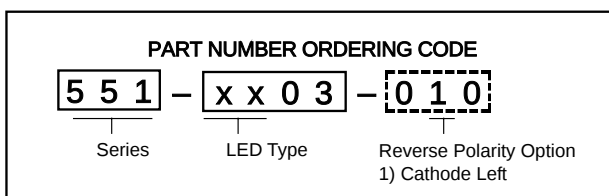
Yellow

Green

Red/Green

Yellow/Green

4



*-010 Ordering Code Suffix required ONLY for Reverse Polarity Option*

## 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 $2\theta_{\frac{1}{2}}$ | LED Data sheet | Page # |
|-------------|--------|--------------------|-----------|-------------|-------------------|---------------------------------------|----------------|--------|
| 551-0203    | Green  | 563                | 16        | 2.1         | 10                | 45°                                   | 521-9408       | 4-64   |
| 551-0303    | Yellow | 585                | 6.3       | 2.1         | 10                | 45°                                   | 521-9428       | 4-64   |
| 551-0403    | Red    | 650                | 10        | 2           | 10                | 45°                                   | 521-9427       | 4-64   |
| 551-2503    | Orange | 600                | 7         | 2.2         | 10                | 60°                                   | 521-9498       | 4-58   |

### INTEGRAL RESISTOR, 5 VOLTS

| Part Number | Color  | Peak Wavelength nm | $I_V$ mcd | Test Voltage | Forward Current (mA) | Viewing Angle $2\theta_{\frac{1}{2}}$ | LED Data sheet | Page # |
|-------------|--------|--------------------|-----------|--------------|----------------------|---------------------------------------|----------------|--------|
| 551-0503    | Red    | 635                | 29        | 5            | 10                   | 60°                                   | 521-9215       | 4-59   |
| 551-0603    | Green  | 565                | 19        | 5            | 10                   | 60°                                   | 521-9323       | 4-59   |
| 551-0703    | 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 $2\theta_{\frac{1}{2}}$ | LED Data sheet | Page # |
|-------------|--------|--------------------|-----------|-------------|-------------------|---------------------------------------|----------------|--------|
| 551-1103    | Red    | 635                | 1.6       | 1.7         | 2                 | 60°                                   | 521-9324       | 4-60   |
| 551-1203    | Yellow | 585                | 1.6       | 1.8         | 2                 | 60°                                   | 521-9325       | 4-60   |
| 551-1303    | 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 $2\theta_{\frac{1}{2}}$ | LED Data sheet | Page # |
|-------------|--------------|--------------------|-----------|-------------|-------------------|---------------------------------------|----------------|--------|
| 551-3003    | Red/Green    | 635/565            | 4.7/10    | 2/2.1       | 10                | 50°                                   | 521-9459       | 4-63   |
| 551-3103    | Yellow/Green | 585/565            | 4.3/6.3   | 2.1*/2.1*   | 10                | 80°                                   | 521-9478       | 4-62   |

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

# 3mm Discrete LED

## High Efficiency

### Diffused

# Dialight

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



### 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> ( $T_A=25^\circ\text{C}$ ) | 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 <sup>1</sup> 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

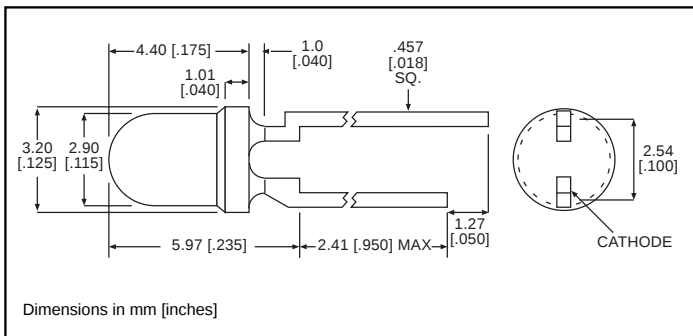
| <b>OPERATING CHARACTERISTICS</b> ( $T_A=25^\circ\text{C}$ ) |                         | Green<br><b>-9210</b> | Yellow<br><b>-9211</b> | Red<br><b>-9216</b> | Orange<br><b>-9498</b> | Red<br><b>-9636</b> |
|-------------------------------------------------------------|-------------------------|-----------------------|------------------------|---------------------|------------------------|---------------------|
| Luminous Intensity (mcd)                                    | Min.                    | 4.7                   | 7.4                    | 7.4                 | 3.4                    | 8.7 <sup>1</sup>    |
|                                                             | Typical                 | 12.6                  | 10                     | 10                  | 7                      | 48 <sup>1</sup>     |
| Peak Wavelength (nm)                                        | Typical                 | 565                   | 585                    | 635                 | 600                    | 660                 |
|                                                             | $\lambda_{\text{Peak}}$ |                       |                        |                     |                        |                     |
| Viewing Angle ( $2\theta^\circ$ )                           | 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>    |
|                                                             | Max.                    | 2.8 <sup>1</sup>      | 2.8 <sup>1</sup>       | 2.8 <sup>1</sup>    | 3                      | 2.4 <sup>1</sup>    |
| Reverse Voltage (V), $I_R=100\mu\text{A}$                   | Max.                    | 5                     | 5                      | 5                   | 5                      | 4                   |

<sup>1</sup>  $\theta$  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.

521-9215  
521-9322  
521-9323

### COLOR

Red  
Yellow  
Green

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

4

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

|                                                  | Red<br>-9215                       | Yellow<br>-9322 | Green<br>-9323 |
|--------------------------------------------------|------------------------------------|-----------------|----------------|
| Forward Voltage (V)<br>Derating (V/°C) From 50°C | 7.5<br>.086                        | 7.5<br>.086     | 7.5<br>.071    |
| Operating Temperature (°C)                       | -40/+85                            | -40/+85         | -20/+85        |
| 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>-9215 | Yellow<br>-9322 | Green<br>-9323 |
|------------------------------------------------|-----------------|--------------|-----------------|----------------|
| Luminous Intensity (mcd)<br>V <sub>F</sub> =5V | Min.<br>Typical | 8.7<br>29    | 3.7<br>12.6     | 5.6<br>19      |
| Peak Wavelength (nm)<br>λ Peak                 | Typical         | 635          | 585             | 565            |
| Viewing Angle (2Θ <sub>1/2</sub> )             | Typical         | 60°          | 60°             | 60°            |
| Forward Current (mA)<br>V <sub>F</sub> =5V     | Typical<br>Max. | 10<br>20     | 10<br>20        | 10<br>20       |
| Reverse Voltage (V), I <sub>R</sub> =100μA     | Min.            | 5            | 5               | 5              |

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

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

|                                                          | Red<br>-9324                                       | Yellow<br>-9325 | Green<br>-9326 |
|----------------------------------------------------------|----------------------------------------------------|-----------------|----------------|
| Power Dissipation (mW)                                   | 20                                                 | 20              | 20             |
| Forward Current (mA)                                     | 7                                                  | 7               | 7              |
| Derating (mA/ $^\circ\text{C}$ ) From $90^\circ\text{C}$ | .7                                                 | .7              | .7             |
| Peak Current (mA)<br>Pulse width = 10 $\mu\text{s}$      | 500                                                | 500             | 500            |
| Operating Temperature ( $^\circ\text{C}$ )               | -55/+100                                           | -55/+100        | -55/+100       |
| 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

### OPERATING CHARACTERISTICS ( $T_A=25^\circ\text{C}$ )

|                                          |         | Red<br>-9324 | Yellow<br>-9325 | Green<br>-9326 |
|------------------------------------------|---------|--------------|-----------------|----------------|
| Luminous Intensity (mcd)                 | Min.    | 1            | 1               | 1              |
|                                          | Typical | 1.6          | 1.6             | 1.6            |
| Peak Wavelength (nm)                     | Typical | 635          | 585             | 565            |
| $\lambda$ Peak                           |         |              |                 |                |
| Viewing Angle ( $2\theta$ $^\circ$ )     | Typical | 60 $^\circ$  | 60 $^\circ$     | 60 $^\circ$    |
| Forward Voltage (V)                      | Typical | 1.7          | 1.8             | 1.9            |
|                                          | Max.    | 2.2          | 2.7             | 2.2            |
| Reverse Voltage (V), $I_R=50\mu\text{A}$ | Min.    | 5            | 5               | 5              |

$\theta$  is the off axis angle at which the luminous intensity is half the axial luminous intensity

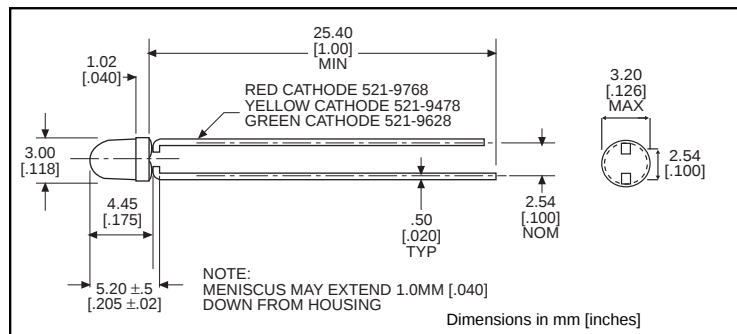
# 3mm Discrete LED

## Bi-Color

### Non-Tinted, Diffused

# Dialight

## 521-9478, -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 <sup>1</sup> 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

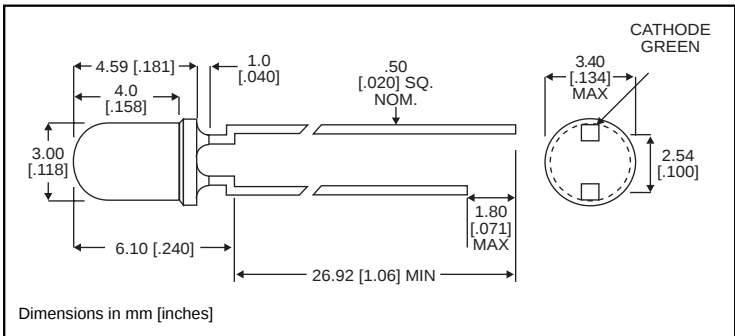
| <b>OPERATING CHARACTERISTICS</b> ( $T_A=25^\circ\text{C}$ ) |                 | Yellow/Green<br><b>-9478</b> | Red/Green<br><b>-9628</b> | Red/Yellow<br><b>-9768</b> |
|-------------------------------------------------------------|-----------------|------------------------------|---------------------------|----------------------------|
| 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 <sup>1/2</sup> )                          | Typical         | 80°                          | 200°                      | 80°                        |
| Forward Voltage (V)<br>I <sub>F</sub> =20mA                 | Typical<br>Max. | 2.1/2.1<br>2.8/2.8           | 1.8/2.1<br>2.4/2.8        | 2/2.1<br>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** ( $T_A=25^\circ\text{C}$ )

Red/Green  
**-9459**

|                                                |                                    |
|------------------------------------------------|------------------------------------|
| Power Dissipation (mW)                         | 140                                |
| Forward Current (mA)                           | 45                                 |
| Derating (mA/°C) <i>From 25°C</i>              | .6                                 |
| Peak Current (mA)<br><i>Pulse width = 10μs</i> | 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** ( $T_A=25^\circ\text{C}$ )

Red/Green  
**-9459**

|                                                 |                 |                   |
|-------------------------------------------------|-----------------|-------------------|
| Luminous Intensity (mcd)<br>$I_F=10\text{mA}$   | Min.<br>Typical | 2.5/3.7<br>4.7/10 |
| Peak Wavelength (nm)<br>$\lambda_{\text{Peak}}$ | Typical         | 635/565           |
| Viewing Angle ( $2\theta_{1/2}$ )               | Typical         | 50°               |
| Forward Voltage (V)<br>$I_F=10\text{mA}$        | Typical<br>Max. | 2/2.1<br>2.8/2.8  |

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

# 3mm Discrete LED

## High Efficiency

## Diffused

# Dialight

## 521-94xx



**TYPE**  
521-9408  
521-9427  
521-9428

**COLOR**  
Green  
Red  
Yellow

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

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

|                            | Green<br><b>-9408</b>              | Red<br><b>-9427</b> | Yellow<br><b>-9428</b> |
|----------------------------|------------------------------------|---------------------|------------------------|
| Power Dissipation (mW)     | 75                                 | 60                  | 60                     |
| Forward Current (mA)       | 25                                 | 20                  | 20                     |
| Derating (mA/°C) From 50°C | .5                                 | .5                  | .5                     |
| Peak Current (mA)          | 60                                 | 60                  | 60                     |
| Operating Temperature (°C) | -25/+85                            | -25/+85             | -25/+85                |
| Storage Temperature (°C)   | -30/+100                           | -30/+100            | -30/+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)

|                                           |         | Green<br><b>-9408</b> | Red<br><b>-9427</b> | Yellow<br><b>-9428</b> |
|-------------------------------------------|---------|-----------------------|---------------------|------------------------|
| Luminous Intensity (mcd)                  | Min.    | 5.6                   | 3.6                 | 2.2                    |
| I <sub>F</sub> =10mA                      | Typical | 16                    | 10                  | 6.3                    |
| Peak Wavelength (nm)                      | Typical | 563                   | 650                 | 585                    |
| λ Peak                                    |         |                       |                     |                        |
| Viewing Angle (2θ ½)                      | Typical | 45°                   | 45°                 | 45°                    |
| Forward Voltage (V)                       | Typical | 2.1                   | 2                   | 2.1                    |
| I <sub>F</sub> =10mA                      | Max.    | 3                     | 3                   | 3                      |
| Reverse Voltage (V), I <sub>R</sub> =10μA | Min.    | 3                     | 3                   | 3                      |

θ ½ is the off axis angle at which the luminous intensity is half the axial luminous intensity