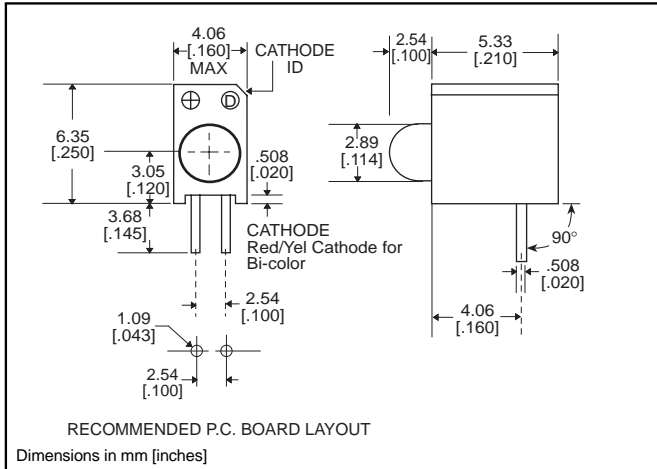


3mm

# LED CBI® Circuit Board Indicator .120" High LED Centerline



551-xx09



### Features

- Multiple CBIs form horizontal LED arrays on 4.2mm (0.165") center-lines
- High Contrast, UL 94 V-0 rated, black housing
- Oxygen index: 31.5%
- Polymer content: PBT, 0.128 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 [ $\pm 0.008$ ]

### PART NO.

#### HIGH EFFICIENCY

- 551-0209
- 551-0309
- 551-0409
- 551-0809
- 551-2509

### COLOR

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



#### INTEGRAL RESISTOR, 5 VOLTS

- 551-0509
- 551-0609
- 551-0709

- Red
- Green
- Yellow

#### LOW CURRENT

- 551-1109
- 551-1209
- 551-1309

- Red
- Yellow
- Green



#### BI-COLOR

- 551-3009
- 551-3109

- Red/Green
- Yellow/Green



### ATTENTION

OBSERVE PRECAUTIONS  
FOR HANDLING  
ELECTROSTATIC  
SENSITIVE  
DEVICES

## 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 # |
|-------------|--------|--------------------|-----------|-------------|-------------------|------------------------------|----------------|--------|
| 551-0209    | Green  | 563                | 16        | 2.1         | 10                | 45°                          | 521-9408       | 4-64   |
| 551-0309    | Yellow | 585                | 6.3       | 2.1         | 10                | 45°                          | 521-9428       | 4-64   |
| 551-0409    | Red    | 650                | 10        | 2           | 10                | 45°                          | 521-9427       | 4-64   |
| 551-0809    | Blue   | 428                | 12        | 3.5         | 10                | 70°                          | 521-9831       | 4-57   |
| 551-2509    | 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 $2\theta_{\%}$ | LED Data sheet | Page # |
|-------------|--------|--------------------|-----------|--------------|----------------------|------------------------------|----------------|--------|
| 551-0509    | Red    | 635                | 29        | 5            | 10                   | 60°                          | 521-9215       | 4-59   |
| 551-0609    | Green  | 565                | 19        | 5            | 10                   | 60°                          | 521-9323       | 4-59   |
| 551-0709    | 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 # |
|-------------|--------|--------------------|-----------|-------------|-------------------|------------------------------|----------------|--------|
| 551-1109    | Red    | 635                | 1.6       | 1.7         | 2                 | 60°                          | 521-9324       | 4-60   |
| 551-1209    | Yellow | 585                | 1.6       | 1.8         | 2                 | 60°                          | 521-9325       | 4-60   |
| 551-1309    | 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 # |
|-------------|--------------|--------------------|-----------|-------------|-------------------|------------------------------|----------------|--------|
| 551-3009    | Red/Green    | 635/565            | 4.7/10    | 2           | 10                | 50°                          | 521-9459       | 4-63   |
| 551-3109    | Yellow/Green | 585/565            | 4.3/6.3   | 2.1*/2.1*   | 10                | 80°                          | 521-9478       | 4-62   |

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

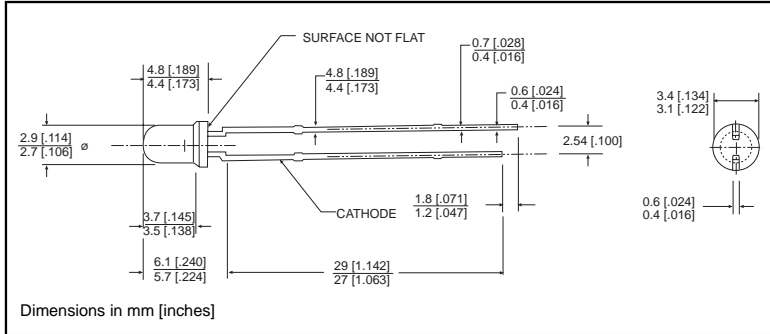




# 3mm Discrete LED Tinted, Diffused

# Dialight

## 521-9831



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

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



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

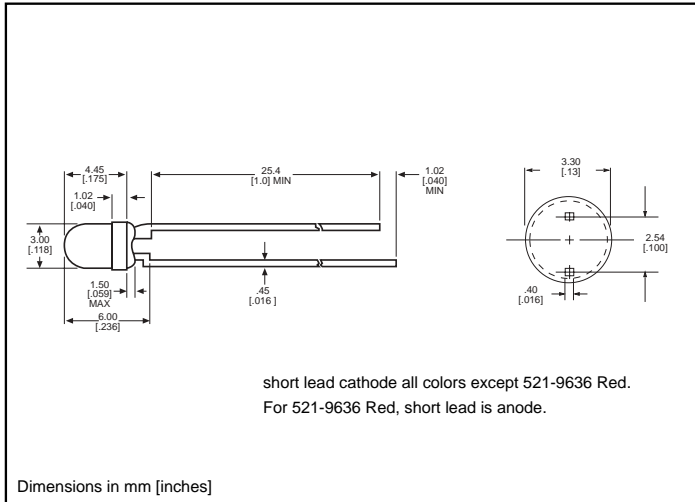
|                                    |         |     |
|------------------------------------|---------|-----|
| Luminous Intensity (mcd)           | Min.    | 6.3 |
| I <sub>F</sub> =10mA               | Typical | 12  |
| Peak Wavelength (nm)               | Typical | 428 |
| λ Peak                             |         |     |
| 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**



**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 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*

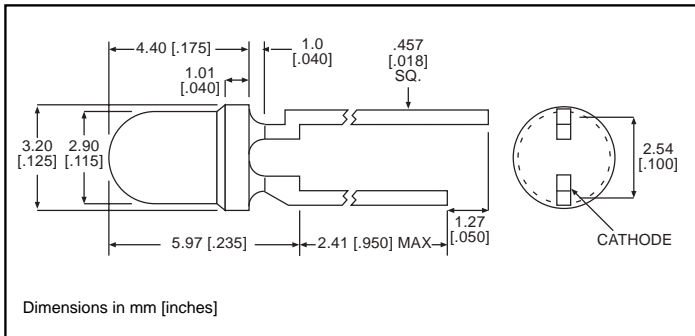
| <b>OPERATING CHARACTERISTICS</b> ( $T_A=25^\circ\text{C}$ ) |         | Green<br><b>-9210</b> | Yellow<br><b>-9211</b> | Red<br><b>-9216</b> | Orange<br><b>-9498</b> | Red<br><b>-9636</b> |
|---|---------|-----------------------|------------------------|---------------------|------------------------|---------------------|
| 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                 |
| Viewing Angle ( $2\theta$ °)                                | 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. | 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            |

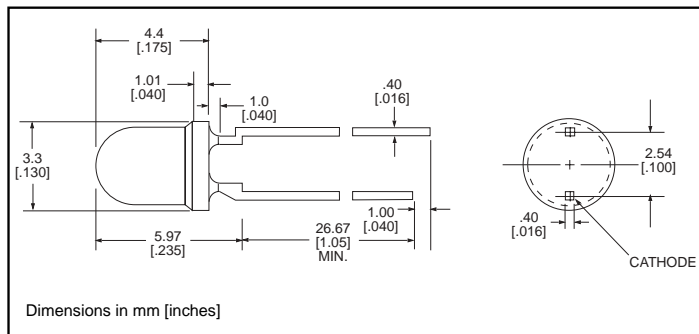
$\theta_{1/2}$  is the off axis angle at which the luminous intensity is half the axial luminous intensity

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

|   | Red<br><b>-9324</b>                | Yellow<br><b>-9325</b> | Green<br><b>-9326</b> |
|---|------------------------------------|------------------------|-----------------------|
| 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 $\mu\text{s}$ | 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** ( $T_A=25^\circ\text{C}$ )

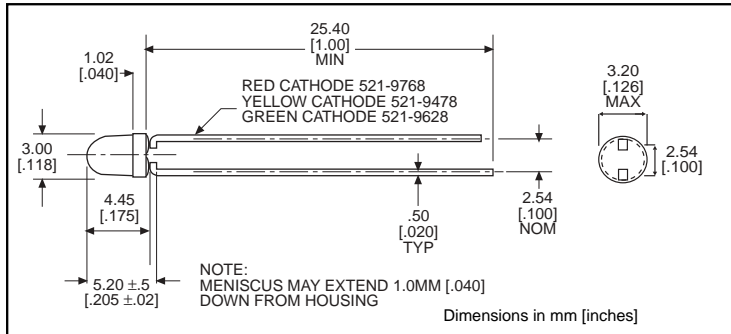
|  |         | Red<br><b>-9324</b> | Yellow<br><b>-9325</b> | Green<br><b>-9326</b> |
|--|---------|---------------------|------------------------|-----------------------|
| Luminous Intensity (mcd)<br>$I_F=2\text{mA}$ | Min.    | 1                   | 1                      | 1                     |
|  | Typical | 1.6                 | 1.6                    | 1.6                   |
| Peak Wavelength (nm)<br>$\lambda$ Peak       | Typical | 635                 | 585                    | 565                   |
| Viewing Angle ( $2\theta$ °)                 | Typical | 60°                 | 60°                    | 60°                   |
| Forward Voltage (V)<br>$I_F=2\text{mA}$      | 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**



**521-9478, -9628, -9768**



| <u>PART NO.</u> | <u>COLOR</u> |
|-----------------|--------------|
| 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

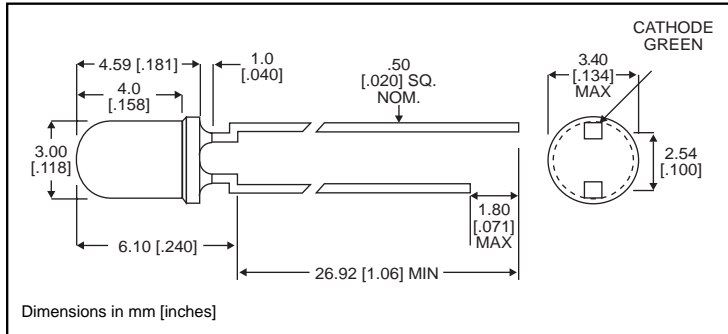
| <b>OPERATING CHARACTERISTICS</b> ( $T_A=25^\circ\text{C}$ ) |         | Yellow/Green<br><b>-9478</b> | Red/Green<br><b>-9628</b> | Red/Yellow<br><b>-9768</b> |
|---|---------|------------------------------|---------------------------|----------------------------|
| Luminous Intensity (mcd)                                    | 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** ( $T_A=25^\circ\text{C}$ )

Red/Green  
**-9459**

|  |                                    |
|--|------------------------------------|
| Power Dissipation (mW)                         | 140                                |
| Forward Current (mA)                           | 45                                 |
| Derating (mA/°C) From 25°C                     | .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>$\lambda$ 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  |

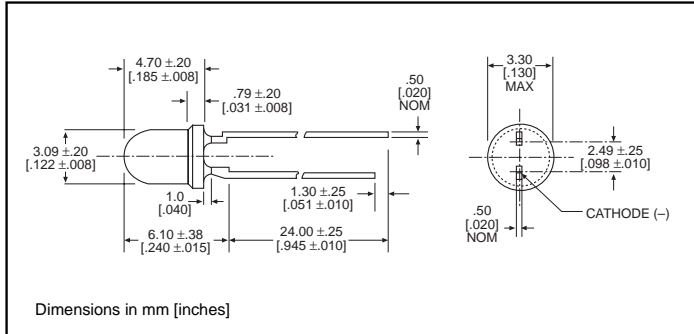
$\theta_{1/2}$  is the off axis angle at which the luminous intensity is half the axial luminous intensity



# 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                    |
|   | Typical | 16                    | 10                  | 6.3                    |
| Peak Wavelength (nm)                      | Typical | 563                   | 650                 | 585                    |
| Viewing Angle (2θ <sup>1/2</sup> )        | Typical | 45°                   | 45°                 | 45°                    |
| Forward Voltage (V)                       | Typical | 2.1                   | 2                   | 2.1                    |
|   | Max.    | 3                     | 3                   | 3                      |
| Reverse Voltage (V), I <sub>R</sub> =10μA | Min.    | 3                     | 3                   | 3                      |

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



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.