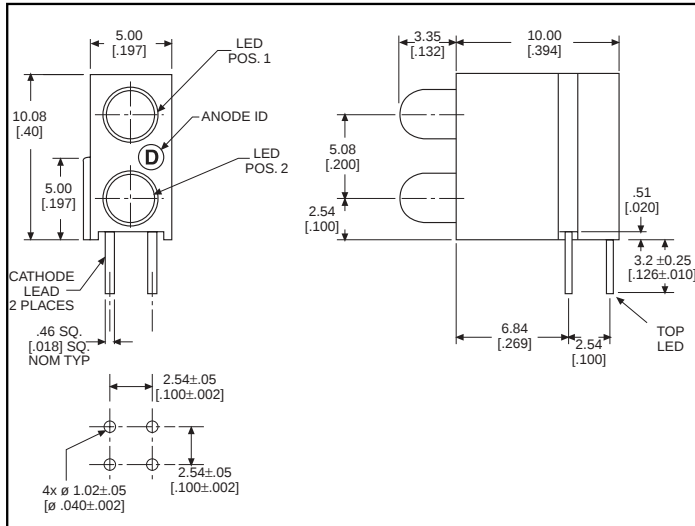


# 3mm LED CBI® Circuit Board Indicator DIN 41494 Bi-Level

**Dialight**  
553-xxxx-400



Standard Polarity shown in drawing: Cathode left

## Features

- Designed to accommodate DIN 41494
- Multiple CBIs form horizontal LED arrays on 5.0mm (0.197") center-lines.
- High Contrast, UL 94 V-0 rated, black housing
- Oxygen index: 32%
- Polymer content: PBT, 0.542 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

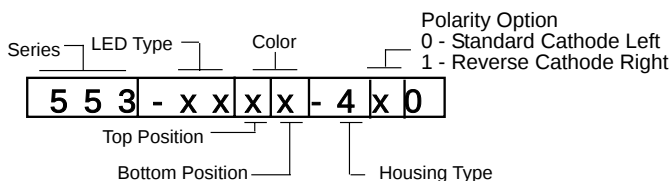
## Tolerance note: As noted, otherwise:

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

## Custom Combinations

- Contact factory for information on custom bi-level arrays and color combinations.

## PART NUMBER ORDERING CODE



Color = 0) Blank 1) Red or Red/Green Bi color 2) Green 3) Yellow 4) Yellow/Green Bi-color  
7) Orange 8) Blue

## PART NO.

### HIGH EFFICIENCY - LED TYPE 01

553-0111-400  
553-0122-400  
553-0133-400  
553-0188-400

## COLOR\*

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

**NEW**

### LOW CURRENT - LED TYPE 02

553-0211-400  
553-0222-400  
553-0233-400

Red  
Green  
Yellow

### RESISTOR 5 VOLTS - LED TYPE 03

553-0311-400  
553-0322-400  
553-0333-400

Red  
Green  
Yellow

### BI-COLOR - LED TYPE 07

553-0711-400  
553-0744-400

Red/Green  
Yellow/Green

### NON-DIFFUSED - LED TYPE 22

553-2211-400  
553-2222-400  
553-2233-400

Red  
Green  
Yellow

\* Top-Bottom LED

## REVERSE POLARITY OPTION AVAILABLE

See Part Number Ordering Code below.



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

# 553-xxxx-400

(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 # |
|--------------|--------|--------------------|-----------|-------------|-------------------|------------------------------|----------------|--------|
| 553-0111-400 | Red    | 635                | 10        | 2*          | 10                | 60°                          | 521-9216       | 4-58   |
| 553-0122-400 | Green  | 565                | 12.6      | 2.1*        | 10                | 60°                          | 521-9210       | 4-58   |
| 553-0133-400 | Yellow | 585                | 10        | 2.1*        | 10                | 60°                          | 521-9211       | 4-58   |
| 553-0177-400 | Orange | 600                | 7         | 2.2         | 10                | 60°                          | 521-9498       | 4-58   |
| 553-0188-400 | Blue   | 428                | 12        | 3.5         | 10                | 70°                          | 521-9831       | 4-57   |

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

### 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 # |
|--------------|--------|--------------------|-----------|-------------|-------------------|------------------------------|----------------|--------|
| 553-0211-400 | Red    | 635                | 1.6       | 1.7         | 2                 | 60°                          | 521-9324       | 4-60   |
| 553-0222-400 | Green  | 565                | 1.6       | 1.9         | 2                 | 60°                          | 521-9326       | 4-60   |
| 553-0233-400 | Yellow | 585                | 1.6       | 1.8         | 2                 | 60°                          | 521-9325       | 4-60   |

### 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 # |
|--------------|--------|--------------------|-----------|--------------|----------------------|------------------------------|----------------|--------|
| 553-0311-400 | Red    | 635                | 29        | 5            | 10                   | 60°                          | 521-9215       | 4-59   |
| 553-0322-400 | Green  | 565                | 19        | 5            | 10                   | 60°                          | 521-9323       | 4-59   |
| 553-0333-400 | Yellow | 585                | 12.6      | 5            | 10                   | 60°                          | 521-9322       | 4-59   |

### 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 # |
|--------------|--------------|--------------------|-----------|-------------|-------------------|------------------------------|----------------|--------|
| 553-0711-400 | Red/Green    | 635/565            | 4.7/10    | 2/2.1       | 10                | 50°                          | 521-9459       | 4-63   |
| 553-0744-400 | Yellow/Green | 585/565            | 4.3/6.3   | 2.1*/2.1*   | 10                | 80°                          | 521-9478       | 4-62   |

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

### NON-DIFFUSED

| Part Number  | Color  | Peak Wavelength nm | $I_V$ mcd | $V_F$ Volts* | Test Current (mA) | Viewing Angle $2\theta_{\%}$ | LED Data sheet | Page # |
|--------------|--------|--------------------|-----------|--------------|-------------------|------------------------------|----------------|--------|
| 553-2211-400 | Red    | 635                | 29        | 2            | 10                | 45°                          | 521-9432       | 4-61   |
| 553-2222-400 | Green  | 565                | 50        | 2.1          | 10                | 45°                          | 521-9430       | 4-61   |
| 553-2233-200 | Yellow | 585                | 20        | 2.1          | 10                | 45°                          | 521-9431       | 4-61   |

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

### CBI ARRAYS .200 PITCH

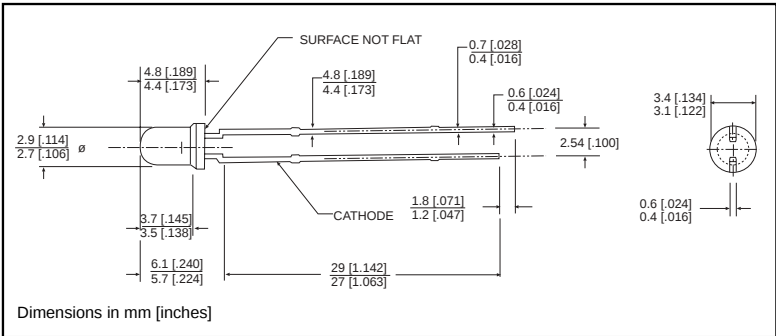
Dialight offers its Multiarray to reduce insertions and to assure indicator alignment. Multiarrays mount indicators on .200 centers. These assemblies are available in arrays of 2 to 6. See pages 4-41 and 4-42 for information. Call factory for information on .185 pitched arrays.

**Dialight**



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<br>-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<br>-9831 |
|--------------------------------------------------|---------|---------------|
| Luminous Intensity (mcd)                         | Min.    | 6.3           |
| I <sub>F</sub> =10mA                             | Typical | 12            |
| Peak Wavelength (nm)                             | Typical | 428           |
| λ Peak                                           |         |               |
| Viewing Angle (2Θ½)                              | Typical | 70°           |
| Forward Voltage (V)                              | Typical | 3.5           |
| I <sub>F</sub> =10mA                             | Max.    | 4.2           |
| Reverse Voltage (V) I <sub>R</sub> =10μA         | Min.    | 3             |

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

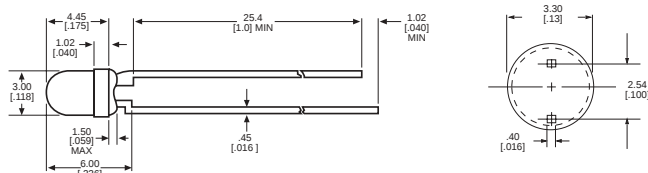
# 3mm Discrete LED

## High Efficiency

### Diffused

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

# Dialight



short lead cathode all colors except 521-9636 Red.  
For 521-9636 Red, short lead is anode.

Dimensions in mm [inches]

#### PART NO. COLOR

521-9210 Green

521-9211 Yellow

521-9216 Red

521-9498 Orange

521-9636 Red

**NEW**

**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/ $^{\circ}\text{C}$ ) From 50 $^{\circ}\text{C}$ <sup>1</sup> from 25 $^{\circ}\text{C}$ | .4                                                   | .25                    | .4                  | .5                     | .5 <sup>1</sup>     |
| Operating Temperature ( $^{\circ}\text{C}$ )                                                          | -55/+100                                             | -55/+100               | -55/+100            | -55/+100               | -55/+100            |
| Storage Temperature ( $^{\circ}\text{C}$ )                                                            | -55/+100                                             | -55/+100               | -55/+100            | -55/+100               | -55/+100            |
| Soldering Temperature                                                                                 | 260 $^{\circ}\text{C}$ , 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 $^{\circ}$         | 60 $^{\circ}$          | 60 $^{\circ}$       | 60 $^{\circ}$          | 60 $^{\circ}$       |
| 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                   |

$\theta^{\circ}$  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 (2Θ½)                            | 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              |

Θ½ 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

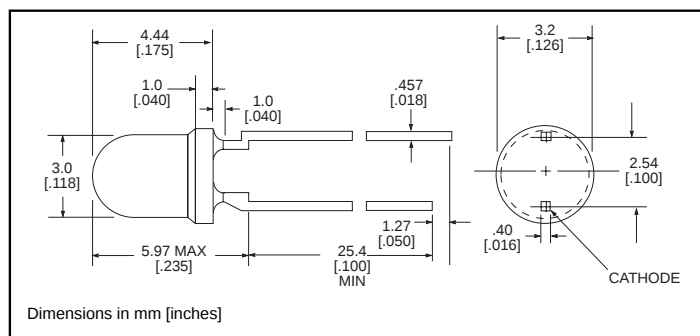
# 3mm Discrete LED

## High Efficiency

## Tinted, Non-Diffused

# Dialight

## 521-9430, -9431, -9432



### PART NO.

521-9430  
521-9431  
521-9432

### COLOR

Green  
Yellow  
Red

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

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

|                                          | Green<br>-9430                     | Yellow<br>-9431 | Red<br>-9432 |
|------------------------------------------|------------------------------------|-----------------|--------------|
| Power Dissipation (mW)                   | 100                                | 60              | 100          |
| Forward Current (mA)                     | 30                                 | 20              | 30           |
| Derating (mA/°C) From 50°C               | .4                                 | .25             | .4           |
| Peak Current (mA)<br>Pulse width = 100μs | 120                                | 80              | 120          |
| 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)

|                                    |         | Green<br>-9430 | Yellow<br>-9431 | Red<br>-9432 |
|------------------------------------|---------|----------------|-----------------|--------------|
| Luminous Intensity (mcd)           | Min.    | 32             | 10              | 8.7          |
| I <sub>F</sub> =10mA               | Typical | 50             | 20              | 29           |
| Peak Wavelength (nm)               | Typical | 565            | 585             | 635          |
| λ Peak                             |         |                |                 |              |
| Viewing Angle (2Θ <sub>1/2</sub> ) | Typical | 45°            | 45°             | 45°          |
| Forward Voltage (V)                | Typical | 2.1            | 2.1             | 2            |
| I <sub>F</sub> =20mA               | Max.    | 2.8            | 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

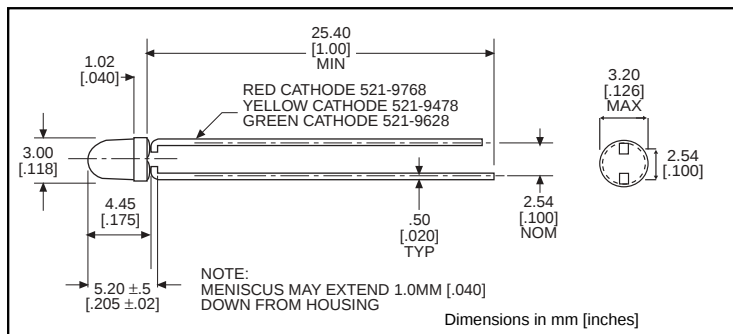
# 3mm Discrete LED

## 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/ $^{\circ}\text{C}$ ) From $25^{\circ}\text{C}$ <sup>1</sup> From $50^{\circ}\text{C}$ | .25 <sup>1</sup> /.40 <sup>1</sup>                    | .5/.4                     | .4 <sup>1</sup> /.25 <sup>1</sup> |
| Peak Current (mA)<br>Pulse width = 10 $\mu\text{s}$                                                 | 80/120                                                | 200/120                   | 120/80                            |
| 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, 1.66 mm from case |                           |                                   |

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

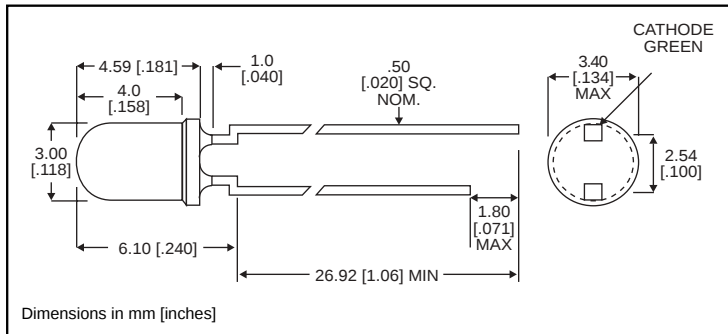
| <b>OPERATING CHARACTERISTICS</b> ( $T_A=25^{\circ}\text{C}$ ) |                 | Yellow/Green<br><b>-9478</b> | Red/Green<br><b>-9628</b> | Red/Yellow<br><b>-9768</b> |
|---------------------------------------------------------------|-----------------|------------------------------|---------------------------|----------------------------|
| 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>$\lambda$ Peak                        | Typical         | 585/565                      | 660/565                   | 630/585                    |
| Viewing Angle ( $2\theta^{\circ}$ )                           | Typical         | 80 $^{\circ}$                | 200 $^{\circ}$            | 80 $^{\circ}$              |
| Forward Voltage (V)<br>$I_F=20\text{mA}$                      | 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) $I_R=100\text{ua}$                        | Min.            | 5                            | 5                         | 5                          |

$\theta^{\circ}$  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