

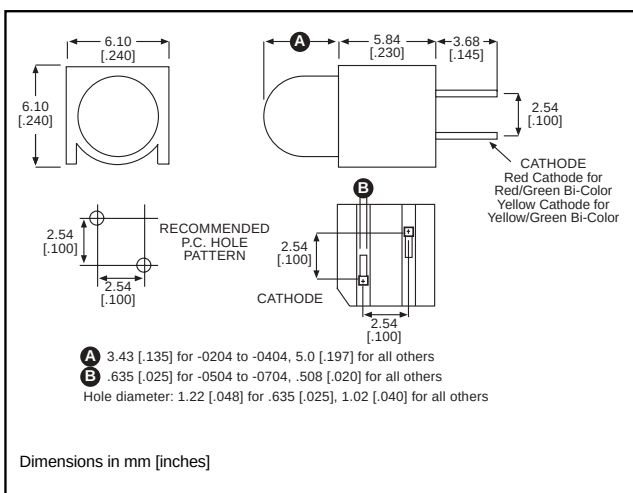
5mm

# LED CBI® Circuit Board Indicator

## Top View, Single

**Dialight**

550-xx04



Standard Polarity shown in drawing: Cathode same side as notch

### Features

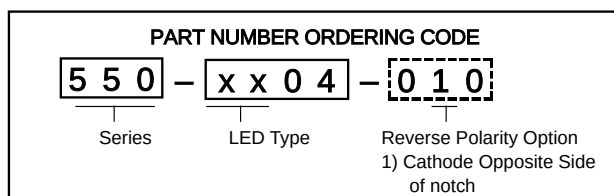
- Multiple CBIs form horizontal LED arrays on 6.35mm (0.250") center-lines.
- High Contrast, UL 94 V-0 rated, black housing
- Oxygen index: 32%
- Polymer content: PBT, 0.160 g
- Housing stand-offs facilitate PCB cleaning
- Solderability per MIL-STD-202F, method 208F
- LEDs are safe for direct viewing per IEC 825-1, EN-60825-1
- Compatible with: 550-xx04-004 quad block

### Custom

- For custom LEDs contact factory.

### 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.

#### GENERAL PURPOSE

550-0204  
550-0304  
550-0404

### COLOR

Green  
Yellow  
Red

#### INTEGRAL RESISTOR

550-0504  
550-0704  
550-0804

Red, 5V  
Green, 5V  
Yellow, 5V

#### LOW CURRENT

550-1104  
550-1204  
550-1304

Red  
Yellow  
Green

#### HIGH EFFICIENCY

550-2204  
550-2304  
550-2404  
550-2504

Green  
Yellow  
Red  
Orange

#### BI-COLOR

550-3004  
550-3104

Red/Green  
Yellow/Green

**NEW**

#### SUPER BRIGHT, DIFFUSED

550-5104  
550-5204  
550-5304

Red  
Green  
Yellow

#### SUPER BRIGHT, WATER CLEAR (Non-tinted, Non-diffused)

550-5504  
550-5604  
550-5704

Red  
Green  
Yellow

To order any of the 550-xx04 part numbers with Reverse Polarity (Cathode opposite side of notch), please add -010 to the part numbers shown above.

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## Typical Operating Characteristics (T<sub>A</sub>=25°C)

See LED data sheet for additional information

**GENERAL PURPOSE** See page 6-55 and 6-56 for Reference Only LED Drive Circuit Examples. See page 6-57 for Pin Out

| Part Number | Color  | Peak Wavelength nm | I <sub>V</sub> mcd | V <sub>F</sub> Volts | Test Current (mA) | Viewing Angle 2Θ <sub>1/2</sub> | LED Data sheet | Page # |
|-------------|--------|--------------------|--------------------|----------------------|-------------------|---------------------------------|----------------|--------|
| 550-0204    | Green  | 565                | 12.3               | 2.1                  | 20                | 60°                             | 5ND-9674       | 6-51   |
| 550-0304    | Yellow | 585                | 12.3               | 2.1                  | 20                | 60°                             | 5ND-9673       | 6-51   |
| 550-0404    | Red    | 635                | 12.3               | 2                    | 20                | 60°                             | 5ND-9672       | 6-51   |

## INTEGRAL RESISTOR

| Part Number | Color  | Peak Wavelength nm | I <sub>V</sub> mcd | Test Voltage | Forward Current (mA) | Viewing Angle 2Θ <sub>1/2</sub> | LED Data sheet | Page # |
|-------------|--------|--------------------|--------------------|--------------|----------------------|---------------------------------|----------------|--------|
| 550-0504    | Red    | 655                | 2                  | 5            | 13                   | 60°                             | 5RD-9422       | 6-52   |
| 550-0704    | Green  | 565                | 8                  | 5            | 12                   | 60°                             | 5RD-9423       | 6-52   |
| 550-0804    | Yellow | 583                | 8                  | 5            | 10                   | 60°                             | 521-9284       | 6-41   |

## LOW CURRENT

| Part Number | Color  | Peak Wavelength nm | I <sub>V</sub> mcd | V <sub>F</sub> Volts | Test Current (mA) | Viewing Angle 2Θ <sub>1/2</sub> | LED Data sheet | Page # |
|-------------|--------|--------------------|--------------------|----------------------|-------------------|---------------------------------|----------------|--------|
| 550-1104    | Red    | 635                | 2                  | 1.8                  | 2                 | 50°                             | 521-9320       | 6-42   |
| 550-1204    | Yellow | 583                | 1.8                | 1.9                  | 2                 | 50°                             | 521-9321       | 6-42   |
| 550-1304    | Green  | 565                | 1.8                | 1.8                  | 2                 | 50°                             | 521-9327       | 6-42   |

## HIGH EFFICIENCY

| Part Number | Color  | Peak Wavelength nm | I <sub>V</sub> mcd | V <sub>F</sub> Volts | Test Current (mA) | Viewing Angle 2Θ <sub>1/2</sub> | LED Data sheet | Page # |
|-------------|--------|--------------------|--------------------|----------------------|-------------------|---------------------------------|----------------|--------|
| 550-2204    | Green  | 563                | 10                 | 2.1                  | 10                | 65°                             | 5HD-9270-5     | 6-49   |
| 550-2304    | Yellow | 585                | 6.3                | 2.1                  | 10                | 50°                             | 5HD-9271-5     | 6-49   |
| 550-2404    | Red    | 650                | 7                  | 2.2                  | 10                | 50°                             | 5HD-9269       | 6-49   |
| 550-2504    | Orange | 600                | 7                  | 1.9                  | 10                | 60°                             | 521-9704       | 6-43   |

## BI-COLOR

| Part Number | Color        | Peak Wavelength nm | I <sub>V</sub> mcd | V <sub>F</sub> Volts | Test Current (mA) | Viewing Angle 2Θ <sub>1/2</sub> | LED Data sheet | Page # |
|-------------|--------------|--------------------|--------------------|----------------------|-------------------|---------------------------------|----------------|--------|
| 550-3004    | Red/Green    | 660/565            | 90/40              | 1.8/2.1              | 20                | 60°                             | 521-9651       | 6-46   |
| 550-3104    | Yellow/Green | 585/565            | 8.7/8.7            | 2.1/2.1              | 20                | 50°                             | 521-9724       | 6-46   |

## SUPER BRIGHT, DIFFUSED

| Part Number | Color  | Peak Wavelength nm | I <sub>V</sub> mcd | V <sub>F</sub> Volts | Test Current (mA) | Viewing Angle 2Θ <sub>1/2</sub> | LED Data sheet | Page # |
|-------------|--------|--------------------|--------------------|----------------------|-------------------|---------------------------------|----------------|--------|
| 550-5104    | Red    | 650                | 34                 | 2.1                  | 20                | 50°                             | 5SD-9441       | 6-53   |
| 550-5204    | Green  | 563                | 34                 | 2.2                  | 20                | 50°                             | 5SD-9456       | 6-53   |
| 550-5304    | Yellow | 585                | 34                 | 2.2                  | 20                | 50°                             | 5SD-9455       | 6-53   |

## SUPER BRIGHT, WATER CLEAR (NON-TINTED, NON-DIFFUSED)

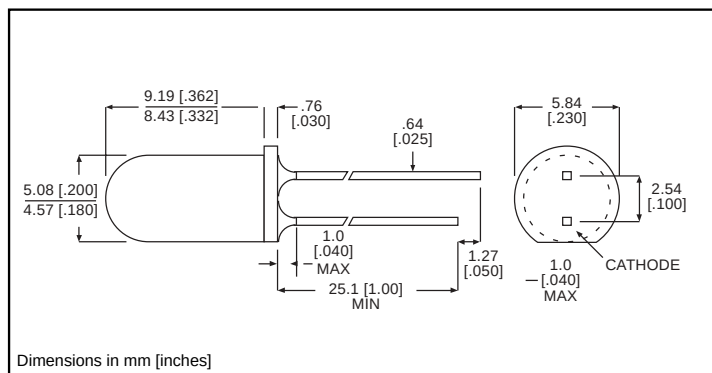
| Part Number | Color  | Peak Wavelength nm | I <sub>V</sub> mcd | V <sub>F</sub> Volts | Test Current (mA) | Viewing Angle 2Θ <sub>1/2</sub> | LED Data sheet | Page # |
|-------------|--------|--------------------|--------------------|----------------------|-------------------|---------------------------------|----------------|--------|
| 550-5504    | Red    | 635                | 125                | 2.2                  | 20                | 24°                             | 521-9464       | 6-47   |
| 550-5604    | Green  | 565                | 120                | 2.3                  | 20                | 24°                             | 521-9465       | 6-47   |
| 550-5704    | Yellow | 583                | 140                | 2.2                  | 20                | 24°                             | 521-9466       | 6-47   |

# Dialight

# 5mm Discrete LED Integral Resistor, 5 Volts Diffused

# Dialight

## 521-9183, -9284



### PART NO.

521-9183

521-9284

### LED COLOR

Red

Yellow

**MOUNTING CLIP:** 515-0004  
located on page 6-48

| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A=25^\circ\text{C}$ ) | Red<br><b>-9183</b>                                | Yellow<br><b>-9284</b> |
|------------------------------------------------------------|----------------------------------------------------|------------------------|
| Forward Voltage (V)                                        | 7.5                                                | 7.5                    |
| Derating ( $V/^\circ\text{C}$ ) From $50^\circ\text{C}$    | .071                                               | .071                   |
| Operating Temperature ( $^\circ\text{C}$ )                 | -40/+85                                            | -40/+85                |
| Storage Temperature ( $^\circ\text{C}$ )                   | -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<br><b>-9183</b> | Yellow<br><b>-9284</b> |
|-------------------------------------------------------------|---------|---------------------|------------------------|
| Luminous Intensity (mcd)                                    | Min.    | 2                   | 2                      |
| $V_F = 5\text{V}$                                           | Typical | 8                   | 8                      |
| Peak Wavelength (nm)                                        | Typical | 635                 | 583                    |
| $\lambda$ Peak                                              |         |                     |                        |
| Viewing Angle ( $2\theta^{1/2}$ )                           | Typical | 60 $^\circ$         | 60 $^\circ$            |
| Forward Current (I)                                         | Typical | 10                  | 10                     |
| $V_F = 5\text{V}$                                           | Max     | 15                  | 15                     |
| Reverse Voltage (V), $I_R=100\mu\text{A}$                   | Min.    | 5                   | 5                      |

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

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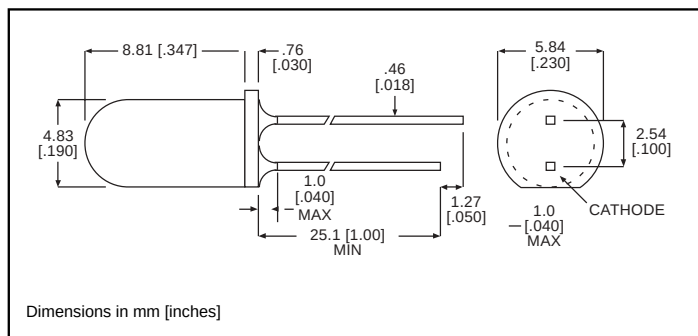
# 5mm Discrete LED

## Low Current, 2mA

## Diffused

# Dialight

## 521-9320, -9321, -9327



### PART NO.

521-9320

521-9321

521-9327

### COLOR

Red

Yellow

Green

**MOUNTING CLIP:** 515-0004  
located on page 6-48

### ABSOLUTE MAXIMUM RATINGS (TA=25°C)

|                                          | Red<br>-9320                       | Yellow<br>-9321 | Green<br>-9327 |
|------------------------------------------|------------------------------------|-----------------|----------------|
| Power Dissipation (mW)                   | 27                                 | 36              | 24             |
| Derating (mW/°C) From 92°C               | 1                                  | 1               | 1              |
| Forward Current (mA)                     | 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 (TA=25°C)

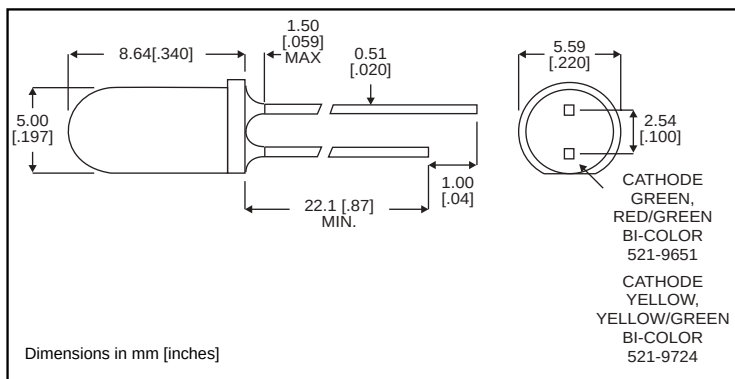
|                                           |         | Red<br>-9320 | Yellow<br>-9321 | Green<br>-9327 |
|-------------------------------------------|---------|--------------|-----------------|----------------|
| Luminous Intensity (mcd)                  | Min.    | 1.2          | 1.2             | 1.2            |
| I <sub>F</sub> =2mA                       | Typical | 2            | 1.8             | 1.8            |
| Peak Wavelength (nm)                      | Typical | 635          | 583             | 565            |
| λ Peak                                    |         |              |                 |                |
| Viewing Angle (2Θ <sup>1/2</sup> )        | Typical | 50°          | 50°             | 50°            |
| Forward Voltage (V)                       | Typical | 1.8          | 1.9             | 1.8            |
| I <sub>F</sub> =2mA                       | Max.    | 2.2          | 2.7             | 2.2            |
| Reverse Voltage (V), I <sub>R</sub> =50μA | Min.    | 5            | 5               | 5              |

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

# 5mm Discrete LED Bi-Color Non-Tinted, Diffused

# Dialight

## 521-9651, -9724



### PART NO.

521-9651

521-9724

### LED COLOR

Red/Green

Yellow/Green

**MOUNTING CLIP:** 515-0005  
located on page 6-48

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

|                                                              | Red/Green<br><b>-9651</b>                            | Yellow/Green<br><b>-9724</b> |
|--------------------------------------------------------------|------------------------------------------------------|------------------------------|
| Power Dissipation (mW)                                       | 100/100                                              | 60/100                       |
| Forward Current (mA)                                         | 40/30                                                | 20/30                        |
| Derating (mA/ $^{\circ}\text{C}$ ) From $50^{\circ}\text{C}$ | .5/.4                                                | .25/.40                      |
| Peak Current (mA)<br>Pulse width = 100 $\mu\text{s}$         | 200/120                                              | 80/120                       |
| Operating Temperature ( $^{\circ}\text{C}$ )                 | -55/+100                                             | -55/+100                     |
| Storage Temperature ( $^{\circ}\text{C}$ )                   | -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/Green<br><b>-9651</b> | Yellow/Green<br><b>-9724</b> |
|-------------------------------------|---------|---------------------------|------------------------------|
| Luminous Intensity (mcd)            | Min.    | 29/12.6                   | 2.5/2.5                      |
|                                     | Typical | 90/40                     | 8.7/8.7                      |
| Peak Wavelength (nm)                | Typical | 660/565                   | 585/565                      |
| $\lambda_{\text{Peak}}$             |         |                           |                              |
| Viewing Angle ( $2\theta^{\circ}$ ) | Typical | 60 $^{\circ}$             | 50 $^{\circ}$                |
| Forward Voltage (V)                 | Typical | 1.8/2.1                   | 2.1/2.1                      |
|                                     | Max.    | 2.4/2.8                   | 2.8/2.8                      |

$\theta^{\circ}$  is the off axis angle at which the luminous intensity is half the axial luminous intensity

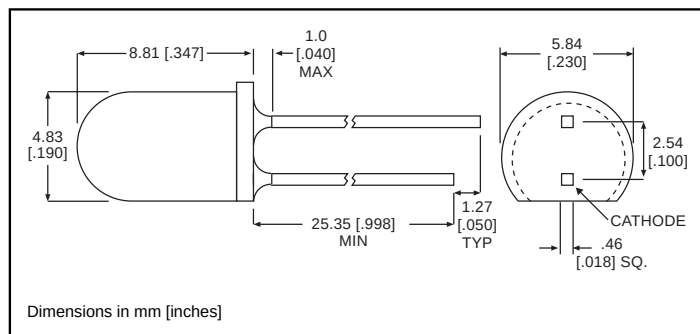
# 5mm Discrete LED

## Super Bright, Water Clear

## Non-Tinted, Non-Diffused

# Dialight

## 521-9464,-9465,-9466



### PART NO.

### COLOR

521-9464

Red

521-9465

Green

521-9466

Yellow

**MOUNTING CLIP:** 515-0004  
located on page 6-48

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

|                                                     | Red<br>-9464                        | Green<br>-9465 | Yellow<br>-9466  |
|-----------------------------------------------------|-------------------------------------|----------------|------------------|
| Power Dissipation (mW)                              | 135                                 | 135            | 85               |
| Derating (mW/°C) From 25°C 1. From 50 °C            | 1.8                                 | 1.8            | 1.6 <sup>1</sup> |
| Forward Current (mA)                                | 30                                  | 30             | 20               |
| Peak Current (mA)<br>Pulse width = 10 $\mu\text{s}$ | 500                                 | 500            | 500              |
| Operating Temperature (°C)                          | -55/+100                            | -20/+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>-9464 | Green<br>-9465 | Yellow<br>-9466 |
|-------------------------------------------|---------|--------------|----------------|-----------------|
| Luminous Intensity (mcd)                  | Min.    | 80           | 80             | 80              |
|                                           | Typical | 125          | 120            | 140             |
| Peak Wavelength (nm)                      | Typical | 635          | 565            | 583             |
| $\lambda$ Peak                            |         |              |                |                 |
| Viewing Angle ( $2\theta^{\frac{1}{2}}$ ) | Typical | 24°          | 24°            | 24°             |
| Forward Voltage (V)                       | Typical | 2.2          | 2.3            | 2.2             |
|                                           | Max.    | 3            | 3              | 3               |
| Reverse Voltage (V), $I_R=100\mu\text{A}$ | Min.    | 5            | 5              | 5               |

$\theta^{\frac{1}{2}}$  is the off axis angle at which the luminous intensity is half the axial luminous intensity

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5mm  
High Efficiency  
Diffused

**Dialight**

5HD-XXXX

**\* NOT A VALID PART  
NUMBER. THIS SHEET IS FOR  
REFERENCE ONLY.**

| TYPE        | COLOR  |
|-------------|--------|
| *5HD-9269   | Red    |
| *5HD-9270-2 | Green  |
| *5HD-9270-5 | Green  |
| *5HD-9271-2 | Yellow |
| *5HD-9271-5 | Yellow |

#### ABSOLUTE MAXIMUM RATINGS

| (T <sub>A</sub> =25°C)                  | Red<br>-9269                       | Green<br>-9270-2 | Green<br>-9270-5 | Yellow<br>-9271-2 | Yellow<br>-9271-5 |
|-----------------------------------------|------------------------------------|------------------|------------------|-------------------|-------------------|
| Power Dissipation (mW)                  | 60                                 | 140              | 75               | 200               | 60                |
| Derating (mW/°C) From 50°C 1. From 40°C | .66 <sup>1</sup>                   |                  | .66 <sup>1</sup> |                   | .66 <sup>1</sup>  |
| Forward Current (mA)                    | 20                                 | 40               | 25               | 60                | 20                |
| Derating (mA/°C) From 25°C              |                                    | .6               |                  | .8                |                   |
| Peak Current (mA)<br>Pulse width = 1μs  | 60                                 | 500              | 60               | 1000              | 60                |
| Operating Temperature (°C)              | -25/+85                            | -55/+100         | -25/+85          | -55/+100          | -25/+85           |
| Storage Temperature (°C)                | -30/+100                           | -55/+100         | -30/+100         | -55/+100          | -30/+100          |
| Soldering Temperature                   | 260°C, 5 seconds, 1.6 mm from case |                  |                  |                   |                   |

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

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#### OPERATING CHARACTERISTICS

| (T <sub>A</sub> =25°C)                      |                                             | Red<br>-9269 | Green<br>-9270-2 | Green<br>-9270-5 | Yellow<br>-9271-2 | Yellow<br>-9271-5 |
|---------------------------------------------|---------------------------------------------|--------------|------------------|------------------|-------------------|-------------------|
| Luminous Intensity (mcd)                    | Min.                                        | 2.2          | 4                | 3.6              | 4                 | 2.2               |
|                                             | Typical                                     | 7            | 32               | 10               | 10                | 6.3               |
| Peak Wavelength (nm)                        | Typical                                     | 650          | 565              | 563              | 590               | 585               |
| λ Peak                                      |                                             |              |                  |                  |                   |                   |
| Viewing Angle (2Θ °)                        | Typical                                     | 50°          | 50°              | 65°              | 70°               | 50°               |
| Forward Voltage (V)                         | Typical                                     | 2.2          | 2*               | 2.1              | 2.4*              | 2.1               |
|                                             | I <sub>F</sub> =10mA, *I <sub>F</sub> =20mA | 2.5          | 2.6*             | 3                | 3*                | 3                 |
| Reverse Voltage (V),                        | Min.                                        | 5            | 5*               | 3*               | 5*                | 3                 |
| I <sub>R</sub> =100μA *I <sub>R</sub> =10μA |                                             |              |                  |                  |                   |                   |

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

5mm  
General Purpose  
Diffused

**Dialight**

5ND-xxxx

**\* NOT A VALID PART  
NUMBER. THIS SHEET IS FOR  
REFERENCE ONLY.**

TYPE

\*5ND-9672  
\*5ND-9673  
\*5ND-9674

COLOR

Red  
Yellow  
Green

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

|                                                                       | Red<br>-9672                       | Yellow<br>-9673 | Green<br>-9674 |
|-----------------------------------------------------------------------|------------------------------------|-----------------|----------------|
| Power Dissipation (mW)                                                | 80                                 | 60              | 100            |
| Forward Current (mA)                                                  | 40                                 | 20              | 30             |
| Derating (mA/°C) <i>From 25°C</i>                                     | .5                                 | .25             | .4             |
| Peak Current (mA)<br><i>Pulse width = 10 <math>\mu\text{s}</math></i> | 200                                | 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** ( $T_A=25^\circ\text{C}$ )

|                                           |         | Red<br>-9672 | Yellow<br>-9673 | Green<br>-9674 |
|-------------------------------------------|---------|--------------|-----------------|----------------|
| Luminous Intensity (mcd)                  | Min.    | 3.5          | 3.5             | 3.5            |
| $I_F=20\text{mA}$                         | Typical | 12.3         | 12.3            | 12.3           |
| Peak Wavelength (nm)                      | Typical | 635          | 585             | 565            |
| $\lambda_{\text{Peak}}$                   |         |              |                 |                |
| Viewing Angle ( $2\theta_{1/2}$ )         | Typical | 60°          | 60°             | 60°            |
| Forward Voltage (V)                       | Typical | 2            | 2.1             | 2.1            |
| $I_F=20\text{mA}$                         | Max.    | 2.8          | 2.8             | 2.8            |
| 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

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5mm  
Integral Resistor  
Diffused

**Dialight**

5RD-XXXX

**\* NOT A VALID PART  
NUMBER. THIS SHEET IS FOR  
REFERENCE ONLY.**

| TYPE      | COLOR  | VOLTS |
|-----------|--------|-------|
| *5RD-9378 | Green  | 12    |
| *5RD-9379 | Yellow | 12    |
| *5RD-9422 | Red    | 5     |
| *5RD-9423 | Green  | 5     |

**ABSOLUTE MAXIMUM RATINGS**

(T<sub>A</sub>=25°C)

|                                                | Green 12V<br>-9378                 | Yellow 12V<br>-9379 | Red 5V<br>-9422 | Green 5V<br>-9423 |
|------------------------------------------------|------------------------------------|---------------------|-----------------|-------------------|
| Forward Voltage (V)<br>*(T <sub>A</sub> =70°C) | 15 *                               | 15                  | 7.5             | 7.5               |
| Operating Temperature (°C)                     | -20/+85                            | -40/+85             | -40/+85         | -20/+85           |
| Storage Temperature (°C)                       | -55/+100                           | -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 12V<br>-9378 | Yellow 12V<br>-9379 | Red 5V<br>-9422 | Green 5V<br>-9423 |
|--------------------------------------------|---------|--------------------|---------------------|-----------------|-------------------|
| Luminous Intensity (mcd)                   | Min.    | 1.5*               | 1.5*                | 1               | 2                 |
| V <sub>F</sub> =5V, *V <sub>F</sub> =12V   | Typical | 4*                 | 4*                  | 2               | 8                 |
| Peak Wavelength (nm)                       | Typical | 565                | 583                 | 655             | 565               |
| λ Peak                                     |         |                    |                     |                 |                   |
| Viewing Angle (2θ *)                       | Typical | 60°                | 60°                 | 60°             | 60°               |
| Forward Current (mA), V <sub>F</sub> =5V   | Typical | 13*                | 13*                 | 13              | 12                |
| *V <sub>F</sub> =12V                       | Max.    | 20*                | 20*                 | 20              | 15                |
| Reverse Voltage (V), I <sub>R</sub> =100μA | Typical | 5                  | 5                   | 5               | 5                 |

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