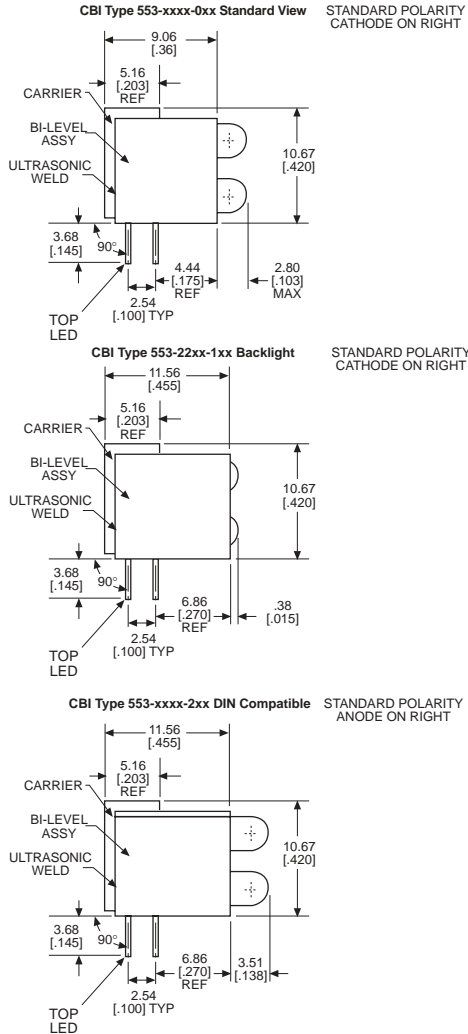


3mm LED CBI Circuit Board Indicator Ganged Arrays

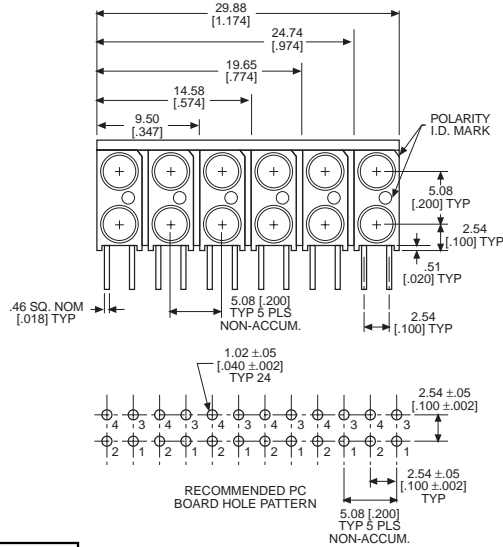


Features

- 2 through 12 LEDs
- Mount on .200 center lines
- Standard View: 553-xxxx-0xx compatible with: 553-xxxx single bi-level
- Backlight: 553-22xx-1xx compatible with: 553-22xx-100 single backlighting bi-level
- DIN Compatible: 553-xxxx-2xx compatible with: 553-xxxx-200 single DIN41494 bi-level
- Reduces insertion labor cost
- Welded angle bracket construction assures rigidity
- Carrier and housing material meets UL 94 V-0

Custom Combinations

- Consult factory for color or LED variations
- Narrow .185 mounting pitches available, consult factory



Standard Polarity Shown in Above Drawings

PART NUMBER ORDERING CODE

| | | |
|----------------------------|--------------------------|--------------------|
| LED Type | Top LED Color | Bottom LED Color |
| 01 - High Efficiency | | |
| 02 - Low Current, 2mA | | |
| 03 - Integral Resistor, 5V | | |
| 07 - Bi-color | | |
| 22 - Non-diffused | | |
| Series | CBI Type | # of Positions 2-6 |
| | 0 - Standard View | |
| | 1 - Backlight | |
| | 2 - DIN 41494 Compatible | |

Example: **5 5 3 - X X X X - X X X**

| | |
|-----------------------------|----------------------------|
| Polarity Option | |
| 0) Standard Polarity | 1) Reverse Polarity |
| Cathode Right Standard View | Cathode Left Standard View |
| Cathode Right Backlight | Cathode Left Backlight |
| Anode Right DIN Compatible | Anode Left DIN Compatible |

Colors: 0) Blank 1) Red or Red/Green Bi-Color 2) Green 3) Yellow 4) Yellow/Green Bi-Color 7) Orange 8) Blue³

Tolerance note: As noted, otherwise:

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



Typical Operating Characteristics (T_A = 25°C)

See LED data sheet for additional information

STANDARD VIEW

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

| Part Number | Color** | Peak Wavelength nm | I _v mcd | V _F Volts | Test Current (mA) | Viewing Angle 2Θ _½ | LED Data sheet | Page # |
|--------------|--------------|--------------------|--------------------|----------------------|-------------------|-------------------------------|----------------|--------|
| 553-0111-0xx | Red | 650 | 10 | 2 | 10 | 45° | 521-9427 | 4-64 |
| 553-0122-0xx | Green | 563 | 16 | 2.1 | 10 | 45° | 521-9408 | 4-64 |
| 553-0133-0xx | Yellow | 585 | 6.3 | 2.1 | 10 | 45° | 521-9428 | 4-64 |
| 553-0177-0xx | Orange | 600 | 7 | 2.2 | 10 | 60° | 521-9498 | 4-58 |
| 553-0188-0xx | Blue | 428 | 12 | 3.5 | 10 | 70° | 521-9831 | 4-57 |
| 553-0211-0xx | Red | 635 | 1.6 | 1.7 | 2 | 60° | 521-9324 | 4-60 |
| 553-0222-0xx | Green | 565 | 1.6 | 1.9 | 2 | 60° | 521-9326 | 4-60 |
| 553-0233-0xx | Yellow | 585 | 1.6 | 1.8 | 2 | 60° | 521-9325 | 4-60 |
| 553-0311-0xx | Red | 635 | 29 | 5† | 10†† | 60° | 521-9215 | 4-59 |
| 553-0322-0xx | Green | 565 | 19 | 5† | 10†† | 60° | 521-9323 | 4-59 |
| 553-0333-0xx | Yellow | 585 | 12.6 | 5† | 10†† | 60° | 521-9322 | 4-59 |
| 553-0711-0xx | Red/Green | 635/565 | 4.7/10 | 2/2.1 | 10 | 50° | 521-9459 | 4-63 |
| 553-0744-0xx | Yellow/Green | 585/565 | 4.3/6.3 | 2.1*/2.1* | 10 | 80° | 521-9478 | 4-62 |
| 553-2211-0xx | Red | 635 | 29 | 2* | 10 | 45° | 521-9432 | 4-61 |
| 553-2222-0xx | Green | 565 | 50 | 2.1* | 10 | 45° | 521-9430 | 4-61 |
| 553-2233-0xx | Yellow | 585 | 20 | 2.1* | 10 | 45° | 521-9431 | 4-61 |

BACKLIGHT

| Part Number | Color** | Peak Wavelength nm | I _v mcd | V _F Volts* | Test Current (mA) | Viewing Angle 2Θ _½ | LED Data sheet | Page # |
|--------------|---------------|--------------------|--------------------|-----------------------|-------------------|-------------------------------|----------------|--------|
| 553-2211-1xx | Red-Red | 635/635 | 29/29 | 2/2 | 10 | 45° | 521-9432 | 4-61 |
| 553-2222-1xx | Green-Green | 565/565 | 50/50 | 2.1/2.1 | 10 | 45° | 521-9430 | 4-61 |
| 553-2223-1xx | Green-Yellow | 565/585 | 50/20 | 2.1/2.1 | 10 | 45° | 521-9430/-9431 | 4-61 |
| 553-2232-1xx | Yellow-Green | 585/565 | 20/50 | 2.1/2.1 | 10 | 45° | 521-9431/-9430 | 4-61 |
| 553-2233-1xx | Yellow-Yellow | 585/585 | 20/20 | 2.1/2.1 | 10 | 45° | 521-9431 | 4-61 |

DIN COMPATIBLE

| Part Number | Color** | Peak Wavelength nm | I _v mcd | V _F Volts | Test Current (mA) | Viewing Angle 2Θ _½ | LED Data sheet | Page # |
|--------------|--------------|--------------------|--------------------|----------------------|-------------------|-------------------------------|----------------|--------|
| 553-0111-2xx | Red | 635 | 10 | 2* | 10 | 60° | 521-9216 | 4-58 |
| 553-0122-2xx | Green | 565 | 12.6 | 2.1* | 10 | 60° | 521-9210 | 4-58 |
| 553-0133-2xx | Yellow | 585 | 10 | 2.1* | 10 | 60° | 521-9211 | 4-58 |
| 553-0177-2xx | Orange | 600 | 7 | 2.2 | 10 | 60° | 521-9498 | 4-58 |
| 553-0188-2xx | Blue | 428 | 12 | 3.5 | 10 | 70° | 521-9831 | 4-57 |
| 553-0211-2xx | Red | 635 | 1.6 | 1.7 | 2 | 60° | 521-9324 | 4-60 |
| 553-0222-2xx | Green | 565 | 1.6 | 1.9 | 2 | 60° | 521-9326 | 4-60 |
| 553-0233-2xx | Yellow | 585 | 1.6 | 1.8 | 2 | 60° | 521-9325 | 4-60 |
| 553-0311-2xx | Red | 635 | 29 | 5† | 10†† | 60° | 521-9215 | 4-59 |
| 553-0322-2xx | Green | 565 | 19 | 5† | 10†† | 60° | 521-9323 | 4-59 |
| 553-0333-2xx | Yellow | 585 | 12.6 | 5† | 10† | 60° | 521-9322 | 4-59 |
| 553-0711-2xx | Red/Green | 635/565 | 4.7/10 | 2/2.1 | 10 | 50° | 521-9459 | 4-63 |
| 553-0744-2xx | Yellow/Green | 585/565 | 4.3/6.3 | 2.1*/2.1* | 10 | 80° | 521-9478 | 4-62 |
| 553-2211-2xx | Red | 635 | 29 | 2* | 10 | 45° | 521-9432 | 4-61 |
| 553-2222-2xx | Green | 565 | 50 | 2.1* | 10 | 45° | 521-9430 | 4-61 |
| 553-2233-2xx | Yellow | 585 | 20 | 2.1* | 10 | 45° | 521-9431 | 4-61 |

* I_F = 20mA † Test Voltage †† Forward Current mA ** Top-Bottom LED



3mm Discrete LED Tinted, Diffused



521-9831



PART NO. 521-9831
COLOR Blue³

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



ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE
DEVICES

4

ABSOLUTE MAXIMUM RATINGS (T_A=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_A=25°C)

Blue
-9831

| | | |
|--|---------|-----|
| Luminous Intensity (mcd) | Min. | 6.3 |
| I _F =10mA | Typical | 12 |
| Peak Wavelength (nm) | Typical | 428 |
| λ Peak | | |
| Viewing Angle (2Θ _{1/2}) | Typical | 70° |
| Forward Voltage (V) | Typical | 3.5 |
| I _F =10mA | Max. | 4.2 |
| Reverse Voltage (V) I _R =10μA | Min. | 3 |

Θ_{1/2} 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

| ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$) | Green -9210 | Yellow -9211 | Red -9216 | Orange -9498 | Red -9636 |
|--|------------------------------------|------------------------|---------------------|------------------------|---------------------|
| 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 ¹ |
| 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

| OPERATING CHARACTERISTICS ($T_A=25^\circ\text{C}$) | | Green -9210 | Yellow -9211 | Red -9216 | Orange -9498 | Red -9636 |
|---|---------|-----------------------|------------------------|---------------------|------------------------|---------------------|
| Luminous Intensity (mcd) | Min. | 4.7 | 7.4 | 7.4 | 3.4 | 8.7 ¹ |
| | Typical | 12.6 | 10 | 10 | 7 | 48 ¹ |
| Peak Wavelength (nm) | Typical | 565 | 585 | 635 | 600 | 660 |
| Viewing Angle (2θ °) | Typical | 60° | 60° | 60° | 60° | 60° |
| Forward Voltage (V) | Typical | 2.1 ¹ | 2.1 ¹ | 2 ¹ | 2.2 | 1.8 ¹ |
| | Max. | 2.8 ¹ | 2.8 ¹ | 2.8 ¹ | 3 | 2.4 ¹ |
| Reverse Voltage (V), $I_R=100\mu\text{A}$ | Max. | 5 | 5 | 5 | 5 | 4 |

¹ θ is the off axis angle at which the luminous intensity is half the axial luminous intensity

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

Dialight

521-9215, -9322, -9323



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

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

| ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$) | Red | Yellow | Green |
|--|--|--------------|--------------|
| | -9215 | -9322 | -9323 |
| Forward Voltage (V) | 7.5 | 7.5 | 7.5 |
| Derating ($V/^\circ\text{C}$) From 50°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

| OPERATING CHARACTERISTICS ($T_A=25^\circ\text{C}$) | | Red | Yellow | Green |
|---|---------|--------------|--------------|--------------|
| | | -9215 | -9322 | -9323 |
| Luminous Intensity (mcd) | Min. | 8.7 | 3.7 | 5.6 |
| | Typical | 29 | 12.6 | 19 |
| Peak Wavelength (nm) | Typical | 635 | 585 | 565 |
| λ 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



| <u>PART NO.</u> | <u>COLOR</u> |
|-----------------|--------------|
| 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 -9324 | Yellow -9325 | Green -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) Pulse width = 10 μs | 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 ($T_A=25^\circ\text{C}$)

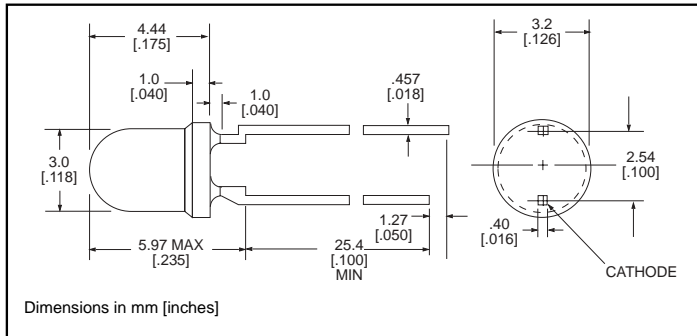
| | | Red -9324 | Yellow -9325 | Green -9326 |
|--|---------|---------------------|------------------------|-----------------------|
| Luminous Intensity (mcd) $I_F=2\text{mA}$ | Min. | 1 | 1 | 1 |
| | Typical | 1.6 | 1.6 | 1.6 |
| Peak Wavelength (nm) λ Peak | Typical | 635 | 585 | 565 |
| Viewing Angle (2θ $\%$) | Typical | 60 $^\circ$ | 60 $^\circ$ | 60 $^\circ$ |
| Forward Voltage (V) $I_F=2\text{mA}$ | 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 |

θ 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.

COLOR

521-9430
 521-9431
 521-9432

Green
 Yellow
 Red

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

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

| | Green -9430 | Yellow -9431 | Red -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) 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 ($T_A=25^\circ\text{C}$)

| | | Green -9430 | Yellow -9431 | Red -9432 |
|---|---------|-----------------------|------------------------|---------------------|
| Luminous Intensity (mcd) $I_F=10\text{mA}$ | Min. | 32 | 10 | 8.7 |
| | Typical | 50 | 20 | 29 |
| Peak Wavelength (nm) λ Peak | Typical | 565 | 585 | 635 |
| Viewing Angle ($2\theta_{1/2}$) | Typical | 45° | 45° | 45° |
| Forward Voltage (V) $I_F=20\text{mA}$ | Typical | 2.1 | 2.1 | 2 |
| | Max. | 2.8 | 2.8 | 2.8 |

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

4

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

| ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$) | Yellow/Green -9478 | Red/Green -9628 | Red/Yellow -9768 |
|--|-------------------------------------|---------------------------|-----------------------------------|
| 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 ¹ /.40 ¹ | .5/.4 | .4 ¹ /.25 ¹ |
| Peak Current (mA) 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

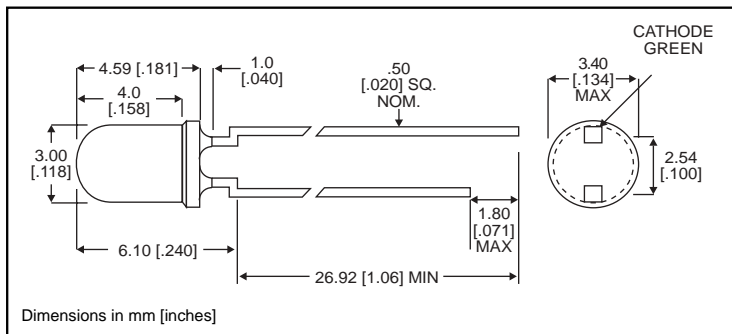
| OPERATING CHARACTERISTICS ($T_A=25^\circ\text{C}$) | | Yellow/Green -9478 | Red/Green -9628 | Red/Yellow -9768 |
|---|---------|------------------------------|---------------------------|----------------------------|
| Luminous Intensity (mcd) | Min. | 2.5/2.5 | 3.7*/1.1* | 1.7*/1.7* |
| | Typical | 4.3/6.3 | 12.6*/3.7* | 5.6*/5.6* |
| Peak Wavelength (nm) 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 _R =100ua | Min. | 5 | 5 | 5 |

θ¹ 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°C)

Red/Green
-9459

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

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

OPERATING CHARACTERISTICS (T_A=25°C)

Red/Green
-9459

| | | |
|--|-----------------|-------------------|
| Luminous Intensity (mcd) I _F =10mA | Min. Typical | 2.5/3.7 4.7/10 |
| Peak Wavelength (nm) λ Peak | Typical | 635/565 |
| Viewing Angle (2θ _{1/2}) | Typical | 50° |
| Forward Voltage (V) I _F =10mA | Typical Max. | 2/2.1 2.8/2.8 |

θ_{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_A=25°C)

| | Green -9408 | Red -9427 | Yellow -9428 |
|----------------------------|------------------------------------|---------------------|------------------------|
| 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_A=25°C)

| | | Green -9408 | Red -9427 | Yellow -9428 |
|---|---------|-----------------------|---------------------|------------------------|
| 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 ^{1/2}) | Typical | 45° | 45° | 45° |
| Forward Voltage (V) | Typical | 2.1 | 2 | 2.1 |
| | Max. | 3 | 3 | 3 |
| Reverse Voltage (V), I _R =10μA | Min. | 3 | 3 | 3 |

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