

## 2.3" Single Digit PCB Based LED Display



This is a 2.3" height single digit display. It utilizes GaAsP/ GaP Red, Orange, Yellow, Green and AlGaAs/GaAs Red chips. This device is halogenated.

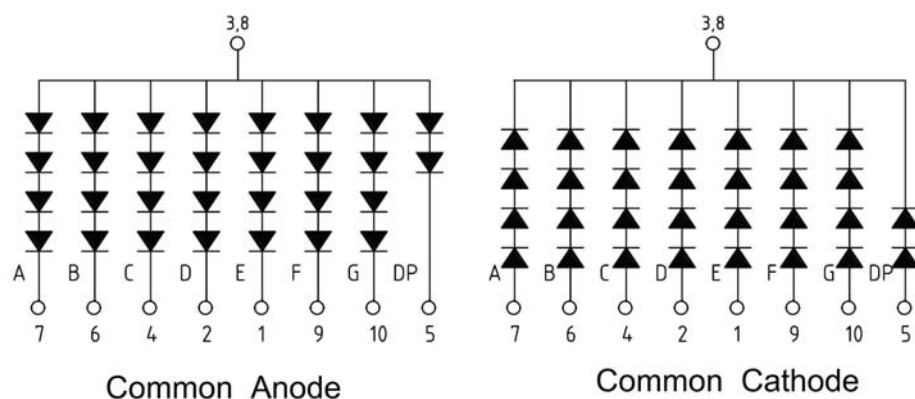
- High reliability
- Excellent characters appearance
- Available in CA and CC
- RoHS Compliant
- Gray top surface with white diffused segments.

| Red       | Green     | Yellow    | Orange    | AlGaAs Red | Description                        |
|-----------|-----------|-----------|-----------|------------|------------------------------------|
| HDSP-C2E1 | HDSP-C2G1 | HDSP-C2Y1 | HDSP-C2L1 | HDSP-C2A1  | Common Anode, Right Hand Decimal   |
| HDSP-C2E3 | HDSP-C2G3 | HDSP-C2Y3 | HDSP-C2L3 | HDSP-C2A3  | Common Cathode, Right Hand Decimal |

NOTES:

1. All dimensions are in millimeter.
2. Unless otherwise stated, the tolerance is  $\pm 0.25\text{mm}$ .

## Circuit Diagram



## Absolute Maximum Ratings at $T_A = 25^\circ\text{C}$

| Parameter                                             | Symbol | Red/Yellow/<br>Orange                    | Green     | AlGaAs Red | Units                |
|-------------------------------------------------------|--------|------------------------------------------|-----------|------------|----------------------|
| Power Dissipation per segment/Dot Point (DP)          | $P_D$  | 230/115                                  | 250/125   | 200/100    | mW                   |
| Continuous Forward Current per segment or DP          | $I_F$  | 25                                       | 25        | 25         | mA                   |
| Derating Linearly from $25^\circ\text{C}$ per segment |        | 0.33                                     | 0.33      | 0.33       | mA/ $^\circ\text{C}$ |
| Reverse Voltage per segment/DP                        | $V_R$  |                                          | 20/10     |            | V                    |
| Operating Temperature                                 | $T_O$  |                                          | -40 to 85 |            | $^\circ\text{C}$     |
| Storage Temperature                                   | $T_S$  |                                          | -40 to 85 |            | $^\circ\text{C}$     |
| Wave solder Condition 1.6mm below body                |        | 250 $^\circ\text{C}$ peak for 3 secs max |           |            |                      |

**Electrical / Optical Characteristic at  $T_A = 25^\circ\text{C}$** **Red**

| Parameter                                              | Symbol      | Min | Typ     | Max     | Units         | Test Conditions                    |
|--------------------------------------------------------|-------------|-----|---------|---------|---------------|------------------------------------|
| Average Luminous Intensity (Digit Average)             | $I_V$       | –   | 20      | –       | mcd           | $I_F = 10\text{mA}$                |
| Peak Wavelength                                        | $\lambda_P$ | –   | 640     | –       | nm            | $I_F = 20\text{mA}$                |
| Dominant Wavelength                                    | $\lambda_d$ | –   | 626     | –       | nm            | $I_F = 20\text{mA}$                |
| Forward Voltage per segment/DP                         | $V_F$       | –   | 8.0/4.0 | 9.2/4.6 | V             | $I_F = 20\text{mA}$                |
| Reverse Current per segment/DP                         | $I_R$       | –   | –       | 100     | $\mu\text{A}$ | $V_R = 20\text{V}/10\text{V (DP)}$ |
| Luminous Intensity Matching Ratio (Segment to Segment) | $I_{V-M}$   |     | 2:1     |         |               | $I_F = 10\text{mA}$                |

**Green**

| Parameter                                              | Symbol      | Min | Typ     | Max  | Units         | Test Conditions                    |
|--------------------------------------------------------|-------------|-----|---------|------|---------------|------------------------------------|
| Average Luminous Intensity (Digit Average)             | $I_V$       | –   | 28      | –    | mcd           | $I_F = 10\text{mA}$                |
| Peak Wavelength                                        | $\lambda_P$ | –   | 565     | –    | nm            | $I_F = 20\text{mA}$                |
| Dominant Wavelength                                    | $\lambda_d$ | –   | 569     | –    | nm            | $I_F = 20\text{mA}$                |
| Forward Voltage per segment/DP                         | $V_F$       | –   | 9.0/4.5 | 10/5 | V             | $I_F = 20\text{mA}$                |
| Reverse Current per segment/DP                         | $I_R$       | –   | –       | 100  | $\mu\text{A}$ | $V_R = 20\text{V}/10\text{V (DP)}$ |
| Luminous Intensity Matching Ratio (Segment to Segment) | $I_{V-M}$   |     | 2:1     |      |               | $I_F = 10\text{mA}$                |

**Yellow**

| Parameter                                              | Symbol      | Min | Typ     | Max     | Units         | Test Conditions                    |
|--------------------------------------------------------|-------------|-----|---------|---------|---------------|------------------------------------|
| Average Luminous Intensity (Digit Average)             | $I_V$       | –   | 12      | –       | mcd           | $I_F = 10\text{mA}$                |
| Peak Wavelength                                        | $\lambda_P$ | –   | 587     | –       | nm            | $I_F = 20\text{mA}$                |
| Dominant Wavelength                                    | $\lambda_d$ | –   | 589     | –       | nm            | $I_F = 20\text{mA}$                |
| Forward Voltage per segment/DP                         | $V_F$       | –   | 8.6/4.3 | 9.2/4.6 | V             | $I_F = 20\text{mA}$                |
| Reverse Current per segment/DP                         | $I_R$       | –   | –       | 100     | $\mu\text{A}$ | $V_R = 20\text{V}/10\text{V (DP)}$ |
| Luminous Intensity Matching Ratio (Segment to Segment) | $I_{V-M}$   |     | 2:1     |         |               | $I_F = 10\text{mA}$                |

## Orange

| Parameter                                              | Symbol      | Min | Typ     | Max     | Units         | Test Conditions                    |
|--------------------------------------------------------|-------------|-----|---------|---------|---------------|------------------------------------|
| Average Luminous Intensity (Digit Average)             | $I_V$       | –   | 20      | –       | mcd           | $I_F = 10\text{mA}$                |
| Peak Wavelength                                        | $\lambda_p$ | –   | 610     | –       | nm            | $I_F = 20\text{mA}$                |
| Dominant Wavelength                                    | $\lambda_d$ | –   | 605     | –       | nm            | $I_F = 20\text{mA}$                |
| Forward Voltage per segment/DP                         | $V_F$       | –   | 8.6/4.3 | 9.2/4.6 | V             | $I_F = 20\text{mA}$                |
| Reverse Current per segment/DP                         | $I_R$       | –   | –       | 100     | $\mu\text{A}$ | $V_R = 20\text{V}/10\text{V (DP)}$ |
| Luminous Intensity Matching Ratio (Segment to Segment) | $I_{V-M}$   |     | 2:1     |         |               | $I_F = 10\text{mA}$                |

## AlGaAs Red

| Parameter                                              | Symbol      | Min | Typ     | Max     | Units         | Test Conditions                    |
|--------------------------------------------------------|-------------|-----|---------|---------|---------------|------------------------------------|
| Average Luminous Intensity (Digit Average)             | $I_V$       | –   | 78      | –       | mcd           | $I_F = 10\text{mA}$                |
| Peak Wavelength                                        | $\lambda_p$ | –   | 660     | –       | nm            | $I_F = 20\text{mA}$                |
| Dominant Wavelength                                    | $\lambda_d$ | –   | 643     | –       | nm            | $I_F = 20\text{mA}$                |
| Forward Voltage for segment/DP                         | $V_F$       | –   | 7.4/3.7 | 8.0/4.0 | V             | $I_F = 20\text{mA}$                |
| Reverse Current per segment/DP                         | $I_R$       | –   | –       | 100     | $\mu\text{A}$ | $V_R = 20\text{V}/10\text{V (DP)}$ |
| Luminous Intensity Matching Ratio (Segment to Segment) | $I_{V-M}$   |     | 2:1     |         |               | $I_F = 10\text{mA}$                |

## Red

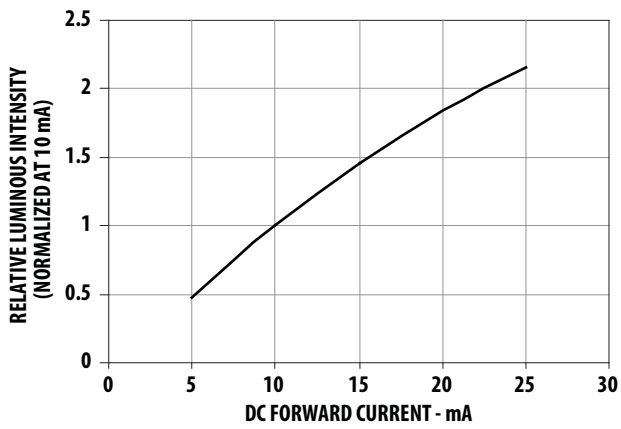


Figure 1. Relative Luminous Intensity Vs Forward Current

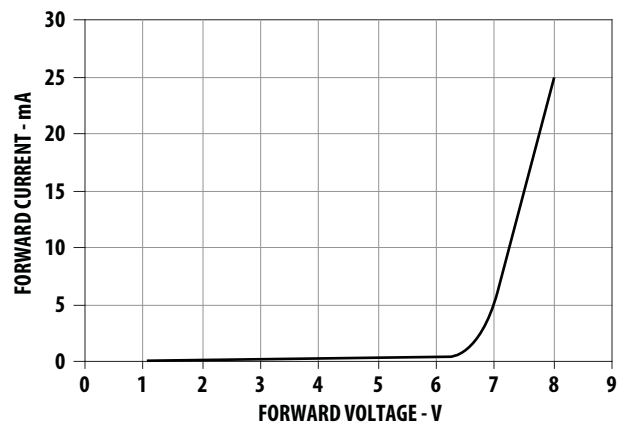


Figure 2. Forward Voltage Vs Current (Segment)

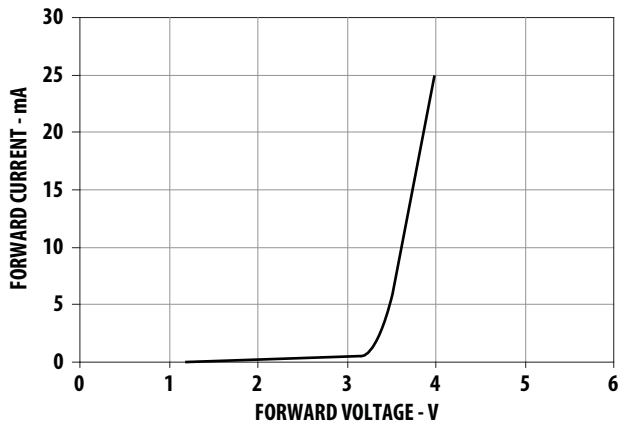


Figure 3. Forward Voltage Vs Current (DP)

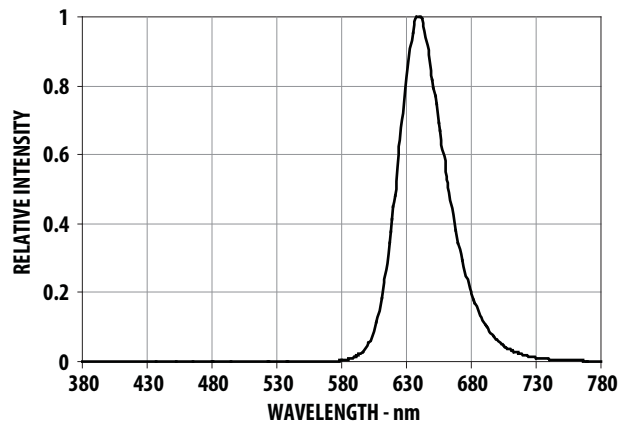


Figure 4. Relative Luminous Intensity Vs Wavelength

## Green

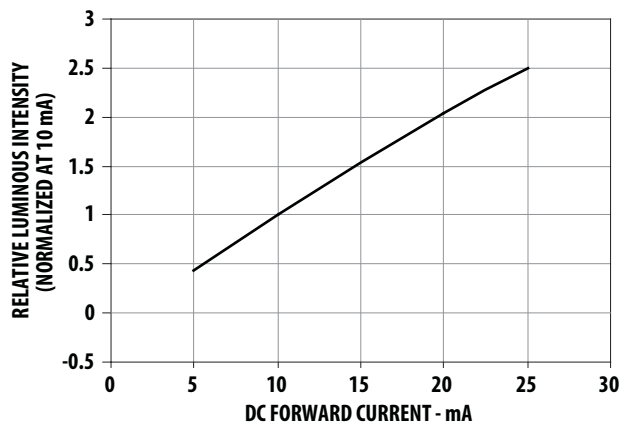


Figure 5. Relative Luminous Intensity Vs Forward Current

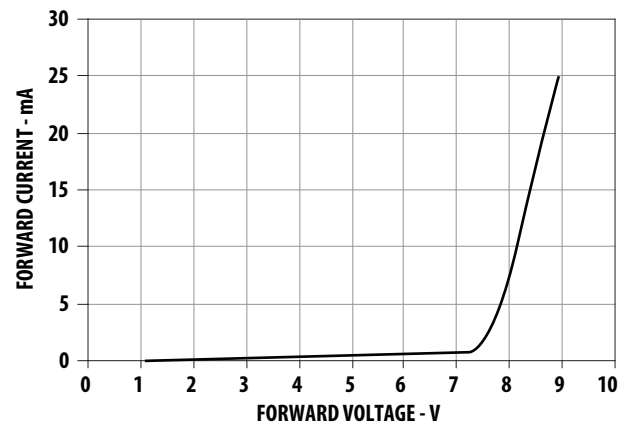


Figure 6. Forward Voltage Vs Current (Segment)

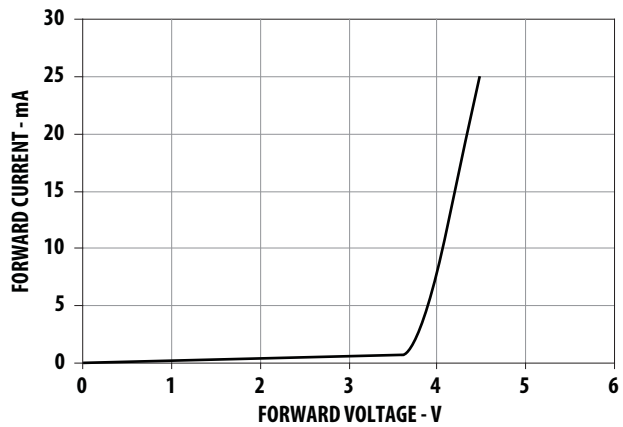


Figure 7. Forward Voltage Vs Current (DP)

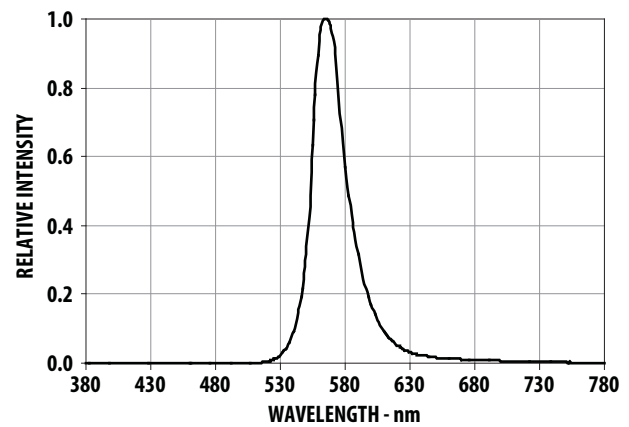


Figure 8. Relative Luminous Intensity Vs Wavelength

## Yellow

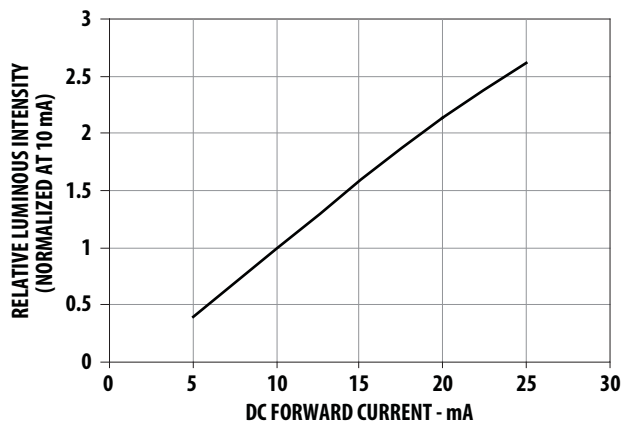


Figure 9. Relative Luminous Intensity Vs Forward Current

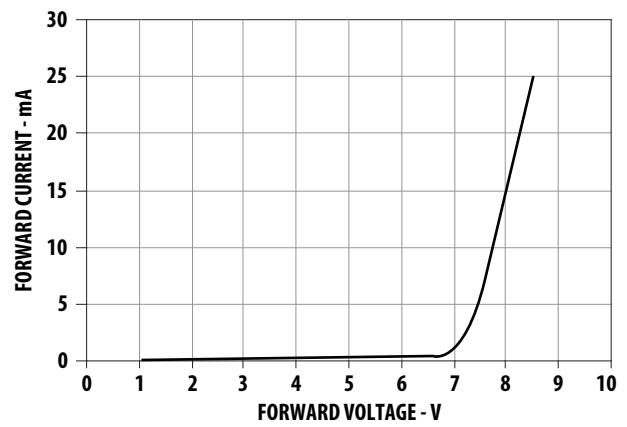


Figure 10. Forward Voltage Vs Current (Segment)

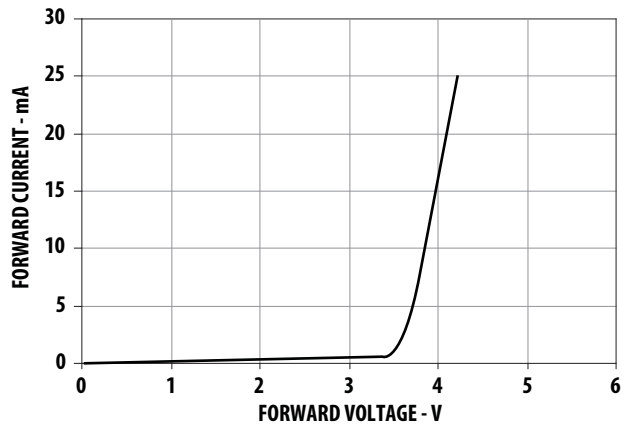


Figure 11. Forward Voltage Vs Current (DP)

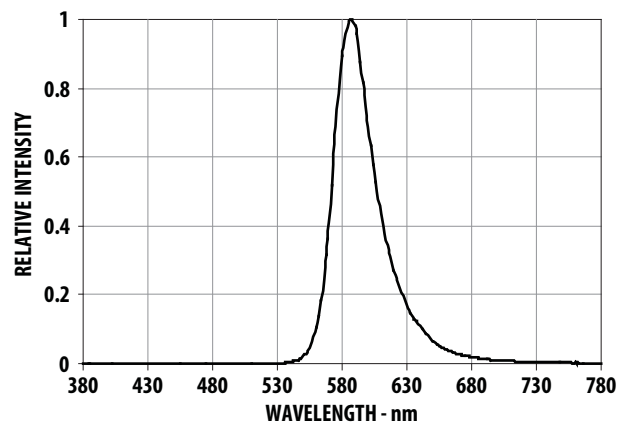


Figure 12. Relative Luminous Intensity Vs Wavelength

## Orange

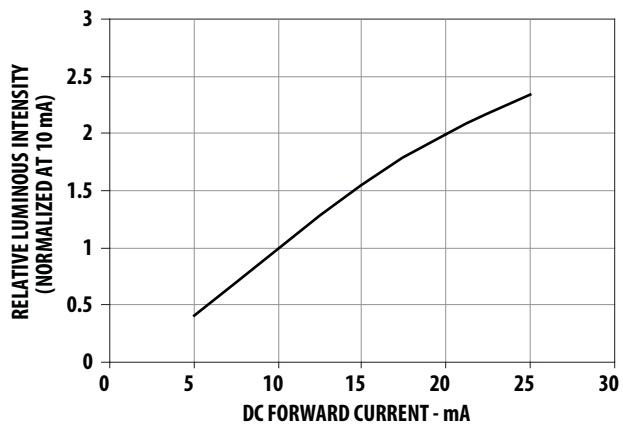


Figure 13. Relative Luminous Intensity Vs Forward Current

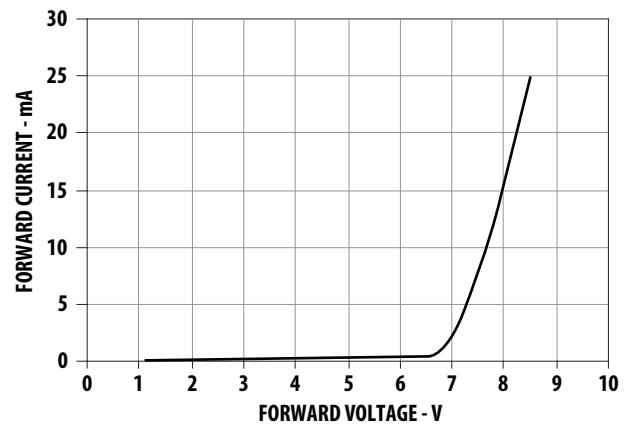


Figure 14. Forward Voltage Vs Current (Segment)

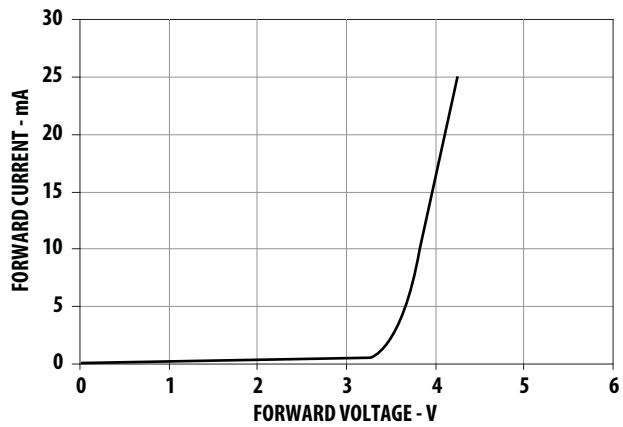


Figure 15. Forward Voltage Vs Current (DP)

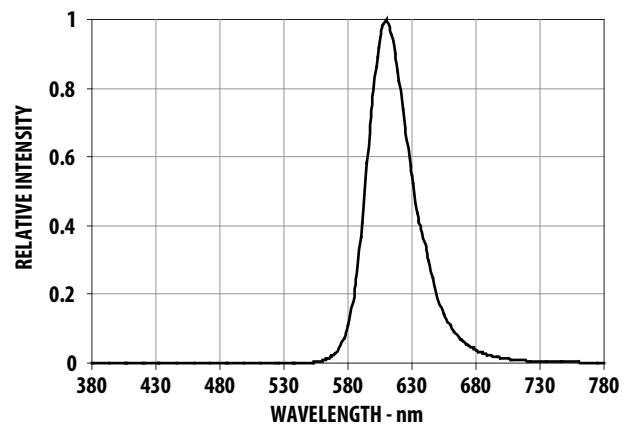


Figure 16. Relative Luminous Intensity Vs Wavelength

## AlGaAs Red

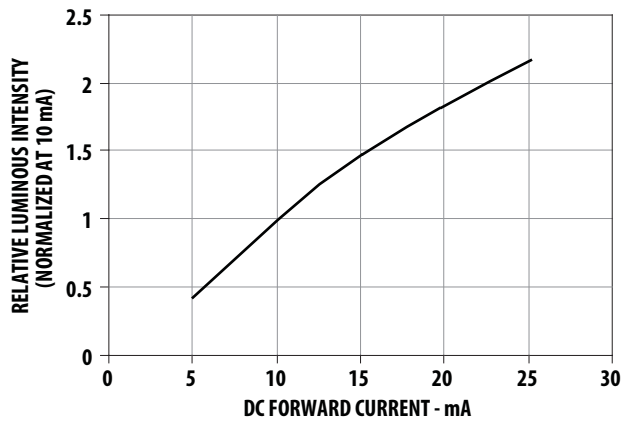


Figure 17. Relative Luminous Intensity Vs Forward Current

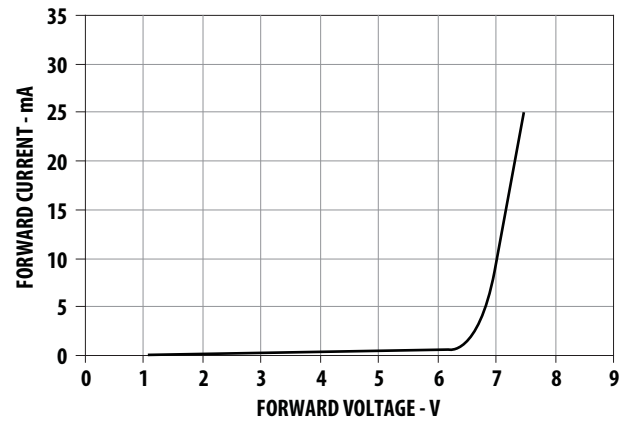


Figure 18. Forward Voltage Vs Current (Segment)

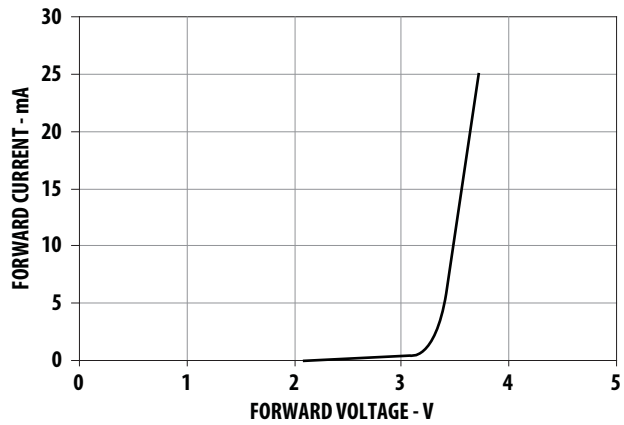


Figure 19. Forward Voltage Vs Current (DP)

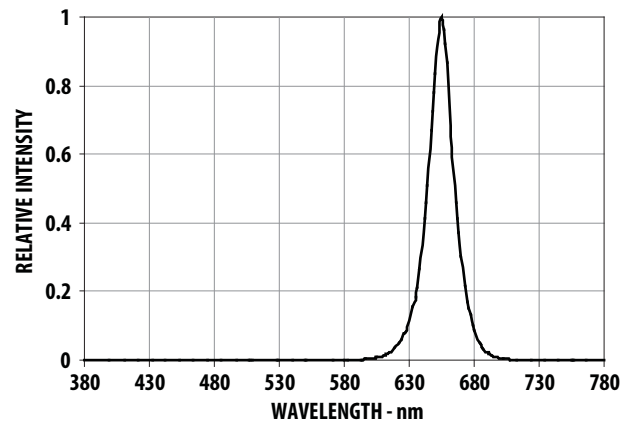
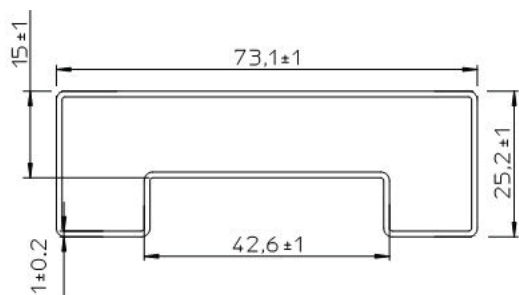
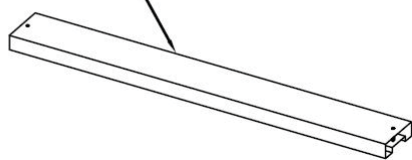


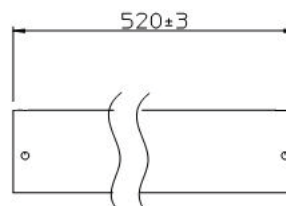
Figure 20. Relative Luminous Intensity Vs Wavelength

## Packing Tube Specifications:

10 PCS PRODUCTS PER IC TUBE



Tube Front View



Tube Top View

For product information and a complete list of distributors, please go to our web site: [www.avagotech.com](http://www.avagotech.com)

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