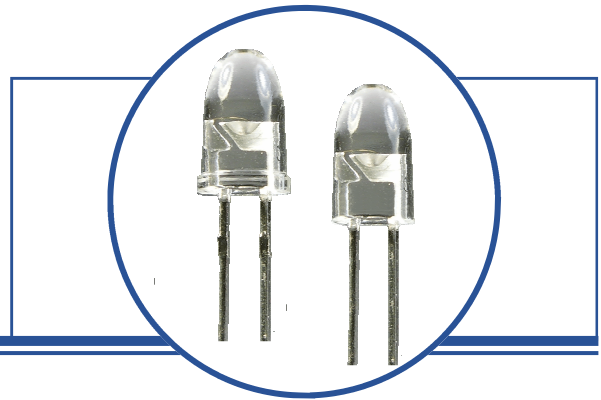


# High-Intensity LED in Plastic T-1<sup>3</sup>/<sub>4</sub> Package

## OVLG Series

- Narrow beam angle
- High brightness LED
- Water clear plastic package
- UV resistant epoxy



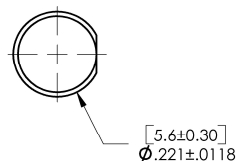
Each device in the **OVLG Series** is a high intensity LED mounted in a clear plastic T-1<sup>3</sup>/<sub>4</sub> package. Each device incorporates an integral molded lens that enables a narrow beam angle and provides an even emission pattern. Designed to produce light over a wide range of drive currents, these LEDs are useful in applications that require a higher on-axis brightness than that achievable with standard lamps.

## Applications

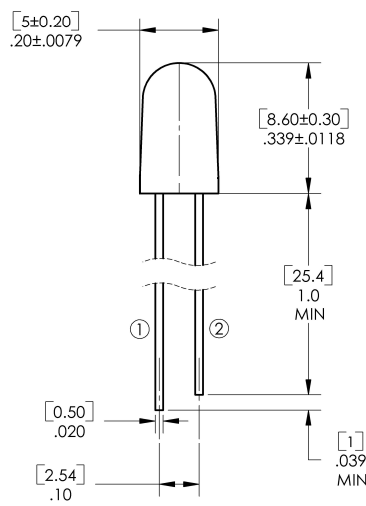
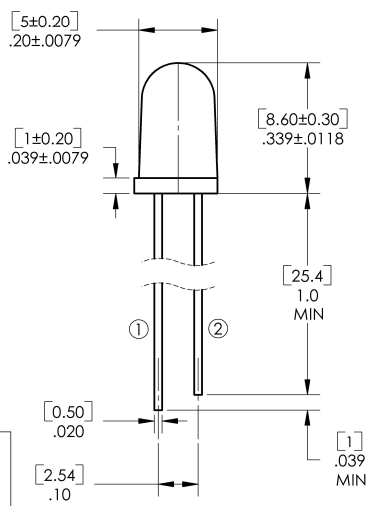
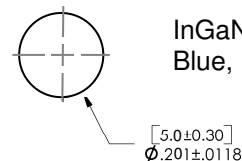
- Indoor/outdoor applications
- Variable message boards
- Store front signage
- Indicators

| Part Number | Material | Emitted Color | Intensity Typ. mcd | Lens Color  |
|-------------|----------|---------------|--------------------|-------------|
| OVLGB0C6B9  | InGaN    | Blue          | 3800               | Water Clear |
| OVLGC0C6B9  |          | Blue-Green    | 9800               |             |
| OVLGS0C8B9  | AlInGaP  | Red           | 8550               |             |
| OVLGY0C9B9  |          | Yellow        | 10300              |             |

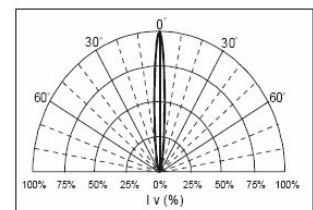
AllInGaP Package  
Red, Yellow



InGaN Package  
Blue, Blue-Green



1 ANODE 2 CATHODE  
DIMENSIONS ARE IN INCHES  
AND [MILLIMETERS]



Beam Pattern

**DO NOT LOOK DIRECTLY AT LED WITH UNSHIELDED EYES OR DAMAGE TO RETINA MAY OCCUR.**



ATTENTION  
OBSERVE PRECAUTIONS  
ELECTROSTATIC  
SENSITIVE DEVICES

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

# T-1 $\frac{3}{4}$ High-Intensity LED

## OVLG Series

### Absolute Maximum Ratings

$T_A = 25^\circ\text{C}$

| Parameter                                | Red, Yellow    | Blue, Blue-Green |
|--|----------------|------------------|
| DC Forward Current                       | 30mA           | 20mA             |
| Peak Pulsed Forward Current <sup>1</sup> | 100mA          | 50mA             |
| Power Dissipation                        | 72mW           | 80mW             |
| Current Linearity vs Ambient Temperature | -0.5mA/°C      | -0.2mA/°C        |
| Junction Temperature                     | 125°C          |                  |
| Reverse Voltage                          | 5V             |                  |
| Storage Temperature Range                | -40° ~ +100 °C |                  |
| Operating Temperature Range              | -40° ~ +85 °C  |                  |
| Soldering Temperature <sup>2</sup>       | 260°/5 seconds |                  |

Note:

1. Duty Ratio = 1/10, Pulse Width = 0.1ms
2. 4mm (.157") away from epoxy

### Electrical and Optical Characteristics —Blue

$T_A = 25^\circ\text{C}$

| SYMBOL                       | PARAMETER           | MIN  | TYP  | MAX  | UNITS         | CONDITIONS           |
|------------------------------|---------------------|------|------|------|---------------|----------------------|
| $I_V$                        | Luminous Intensity  | 2225 | 3800 | 6105 | mcd           | $I_F = 20\text{ mA}$ |
| $V_F$                        | Forward Voltage     | 2.6  | 3.4  | 4.0  | V             | $I_F = 20\text{ mA}$ |
| $I_R$                        | Reverse Current     | ---- | ---- | 50   | $\mu\text{A}$ | $V_R = 5\text{ V}$   |
| $\lambda_D$                  | Dominant Wavelength | 460  | 465  | 475  | nm            | $I_F = 20\text{ mA}$ |
| $\Delta\lambda$              | Spectral Half Width | ---- | 25   | ---- | nm            | $I_F = 20\text{ mA}$ |
| 2 $\Theta$ $\frac{1}{2}$ H-H | 50% Power Angle     | ---- | 6    | ---- | deg           | $I_F = 20\text{ mA}$ |

### Electrical and Optical Characteristics —Blue-Green

$T_A = 25^\circ\text{C}$

| SYMBOL                       | PARAMETER           | MIN  | TYP  | MAX   | UNITS         | CONDITIONS           |
|------------------------------|---------------------|------|------|-------|---------------|----------------------|
| $I_V$                        | Luminous Intensity  | 6105 | 9800 | 16758 | mcd           | $I_F = 20\text{ mA}$ |
| $V_F$                        | Forward Voltage     | 2.6  | 3.4  | 4.0   | V             | $I_F = 20\text{ mA}$ |
| $I_R$                        | Reverse Current     | ---- | ---- | 50    | $\mu\text{A}$ | $V_R = 5\text{ V}$   |
| $\lambda_D$                  | Dominant Wavelength | 499  | 505  | 511   | nm            | $I_F = 20\text{ mA}$ |
| $\Delta\lambda$              | Spectral Half Width | ---- | 25   | ----  | nm            | $I_F = 20\text{ mA}$ |
| 2 $\Theta$ $\frac{1}{2}$ H-H | 50% Power Angle     | ---- | 6    | ----  | deg           | $I_F = 20\text{ mA}$ |

# T-1<sup>3</sup>/<sub>4</sub> High-Intensity LED

## OVLG Series

### Electrical and Optical Characteristics —Red

T<sub>A</sub> = 25°C

| SYMBOL                             | PARAMETER           | MIN  | TYP  | MAX   | UNITS | CONDITIONS             |
|------------------------------------|---------------------|------|------|-------|-------|------------------------|
| I <sub>v</sub>                     | Luminous Intensity  | 6105 | 8550 | 11970 | mcd   | I <sub>F</sub> = 20 mA |
| V <sub>F</sub>                     | Forward Voltage     | 1.8  | 2.0  | 2.4   | V     | I <sub>F</sub> = 20 mA |
| I <sub>R</sub>                     | Reverse Current     | ---- | ---- | 10    | μA    | V <sub>R</sub> = 5 V   |
| λ <sub>D</sub>                     | Dominant Wavelength | 620  | 623  | 630   | nm    | I <sub>F</sub> = 20 mA |
| Δλ                                 | Spectral Half Width | ---- | 25   | ----  | nm    | I <sub>F</sub> = 20 mA |
| 2Θ <sup>1</sup> / <sub>2</sub> H-H | 50% Power Angle     | ---- | 6    | ----  | deg   | I <sub>F</sub> = 20 mA |

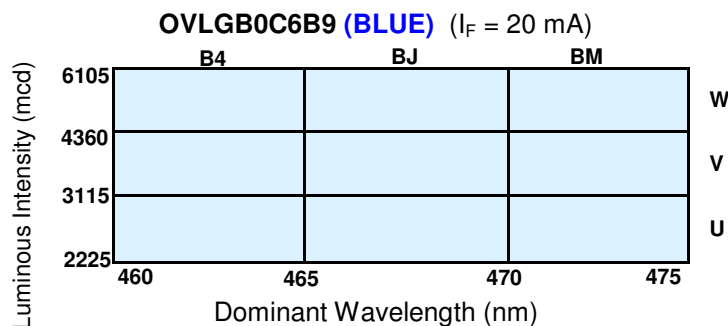
### Electrical and Optical Characteristics —Yellow

T<sub>A</sub> = 25°C

| SYMBOL                             | PARAMETER           | MIN  | TYP   | MAX   | UNITS | CONDITIONS             |
|------------------------------------|---------------------|------|-------|-------|-------|------------------------|
| I <sub>v</sub>                     | Luminous Intensity  | 6105 | 10300 | 16758 | mcd   | I <sub>F</sub> = 20 mA |
| V <sub>F</sub>                     | Forward Voltage     | 1.8  | 2.0   | 2.4   | V     | I <sub>F</sub> = 20 mA |
| I <sub>R</sub>                     | Reverse Current     | ---- | ----  | 10    | μA    | V <sub>R</sub> = 5 V   |
| λ <sub>D</sub>                     | Dominant Wavelength | 585  | 589   | 595   | nm    | I <sub>F</sub> = 20 mA |
| Δλ                                 | Spectral Half Width | ---- | 25    | ----  | nm    | I <sub>F</sub> = 20 mA |
| 2Θ <sup>1</sup> / <sub>2</sub> H-H | 50% Power Angle     | ---- | 6     | ----  | deg   | I <sub>F</sub> = 20 mA |

### Standard Bins

Lamps are sorted to luminous intensity (I<sub>v</sub>) and dominant wavelength (λ<sub>D</sub>) bins shown. Orders may be filled with any or all bins contained as below.



Forward Voltage (V<sub>F</sub>)

| Rank        | H       | J       | K       | L       |
|-------------|---------|---------|---------|---------|
| Voltage (V) | 2.6—3.0 | 3.0—3.3 | 3.3—3.6 | 3.6—4.0 |

#### Important Notes:

- All ranks will be included per delivery, rank ratio will be based on the chip distribution.
- To designate luminous intensity ranks, please contact OPTEK.

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

# T-1<sup>3</sup>/<sub>4</sub> High-Intensity LED

## OVLG Series

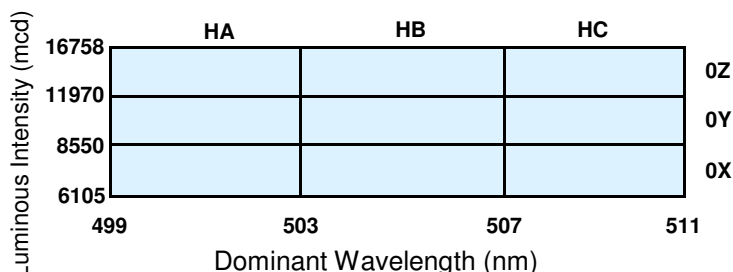


OPTEK Technology

### Standard Bins

Lamps are sorted to luminous intensity ( $I_v$ ) and dominant wavelength ( $\lambda_D$ ) bins shown. Orders may be filled with any or all bins contained as below.

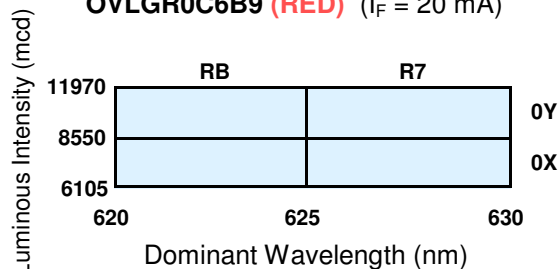
#### OVLGC0C6B9 (BLUE-GREEN) ( $I_F = 20$ mA)



#### Forward Voltage ( $V_F$ )

| Rank        | H       | J       | K       | L       |
|-------------|---------|---------|---------|---------|
| Voltage (V) | 2.6—3.0 | 3.0—3.3 | 3.3—3.6 | 3.6—4.0 |

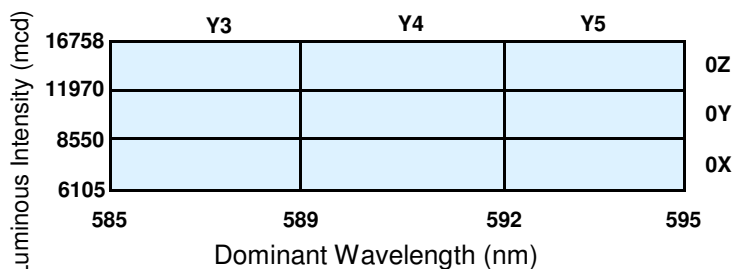
#### OVLGR0C6B9 (RED) ( $I_F = 20$ mA)



#### Forward Voltage ( $V_F$ )

| Rank        | G       | H       | J       |
|-------------|---------|---------|---------|
| Voltage (V) | 1.8—2.0 | 2.0—2.2 | 2.2—2.4 |

#### OVLGY0C6B9 (YELLOW) ( $I_F = 20$ mA)



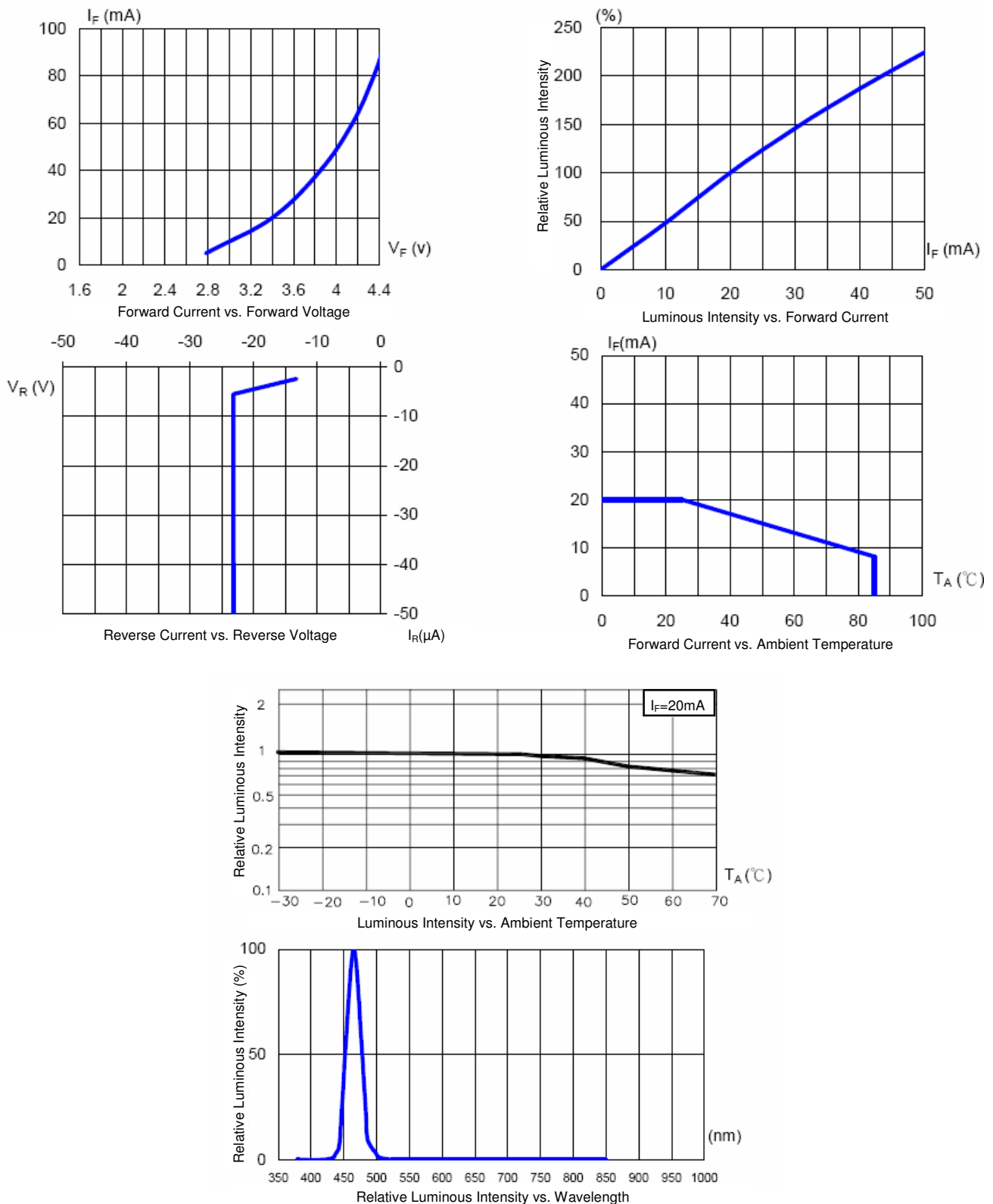
#### Forward Voltage ( $V_F$ )

| Rank        | G       | H       | J       |
|-------------|---------|---------|---------|
| Voltage (V) | 1.8—2.0 | 2.0—2.2 | 2.2—2.4 |

#### Important Notes:

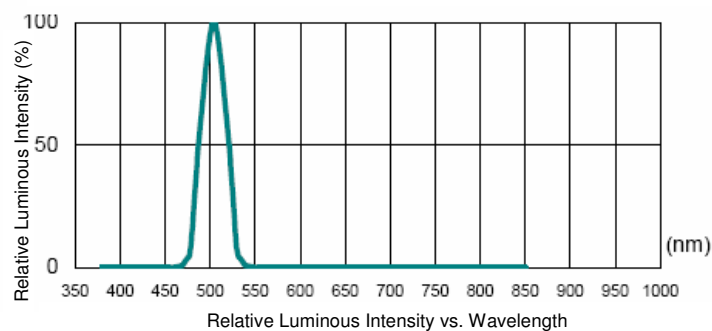
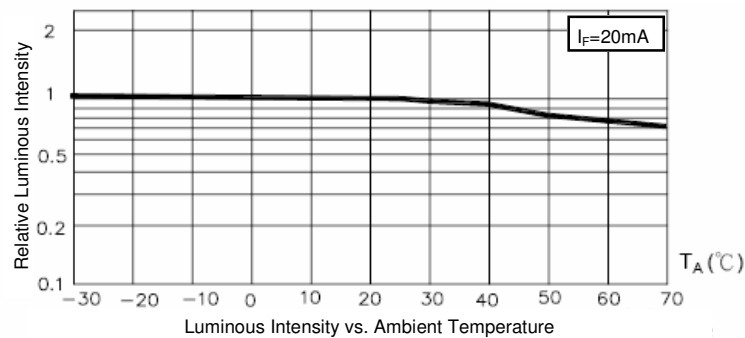
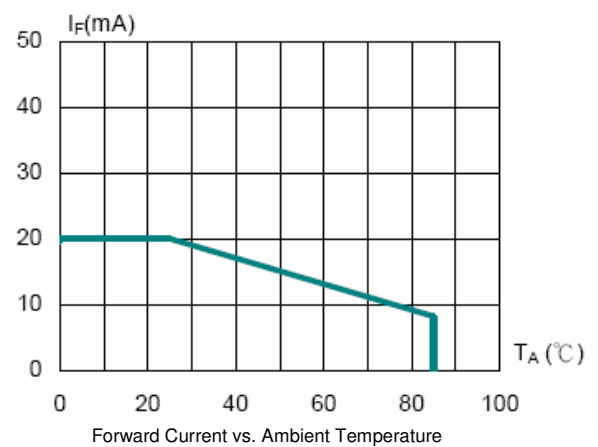
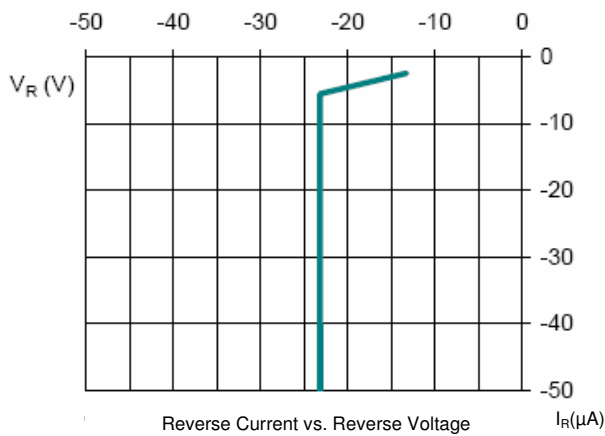
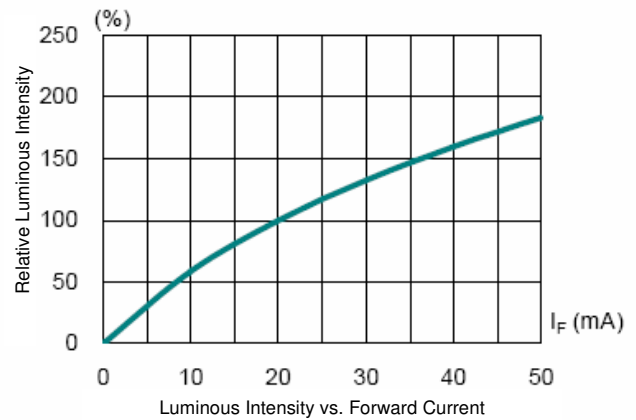
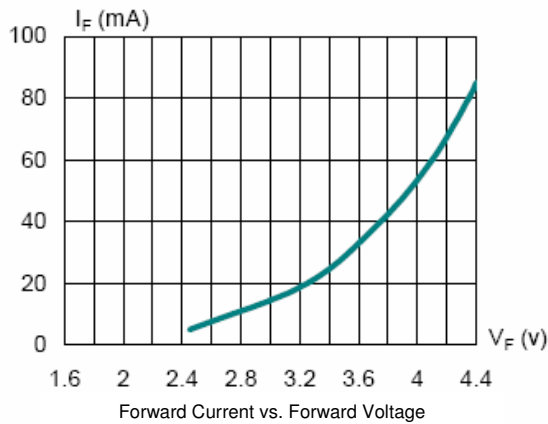
1. All ranks will be included per delivery, rank ratio will be based on the chip distribution.
2. To designate luminous intensity ranks, please contact OPTEK.

### Typical Electro-Optical Characteristics Curves—Blue



OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

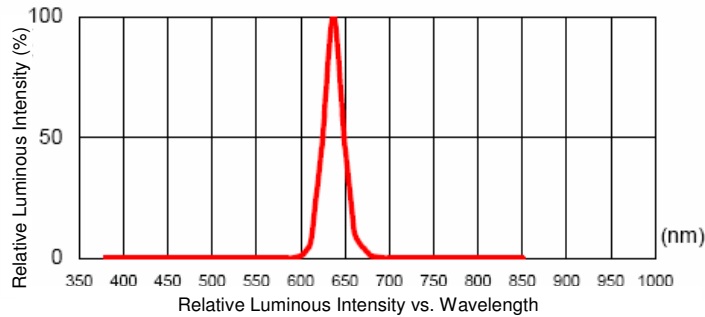
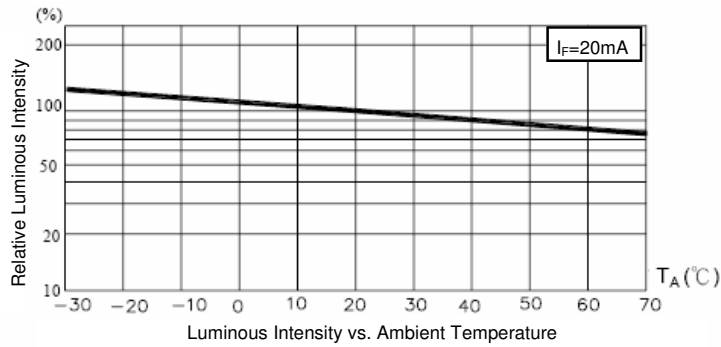
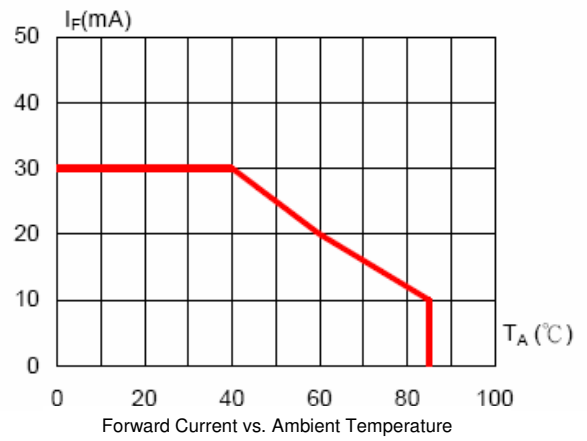
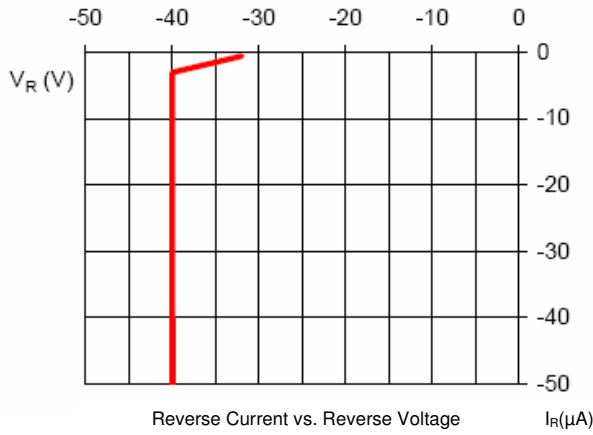
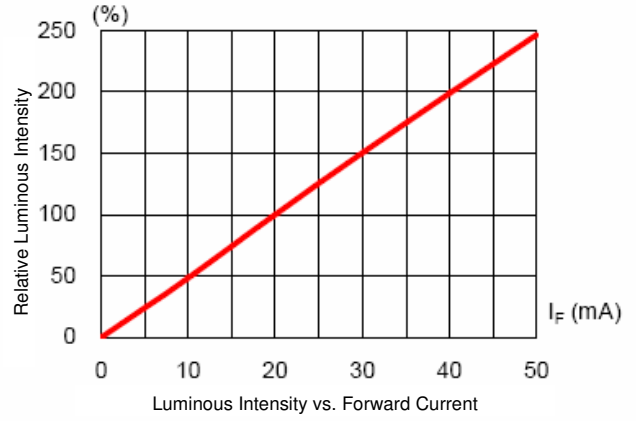
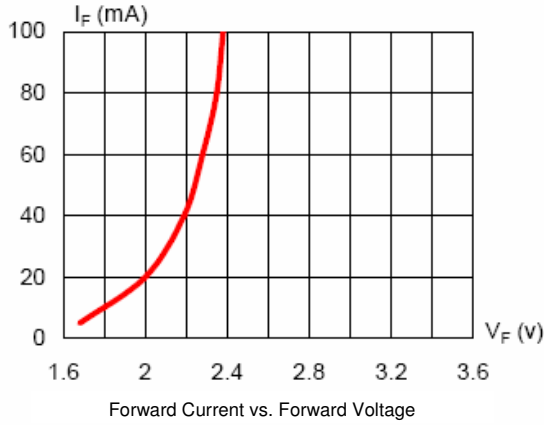
### Typical Electro-Optical Characteristics Curves—Blue-Green



# T-1 $\frac{3}{4}$ High-Intensity LED

## OVLG Series

### Typical Electro-Optical Characteristics Curves—Red

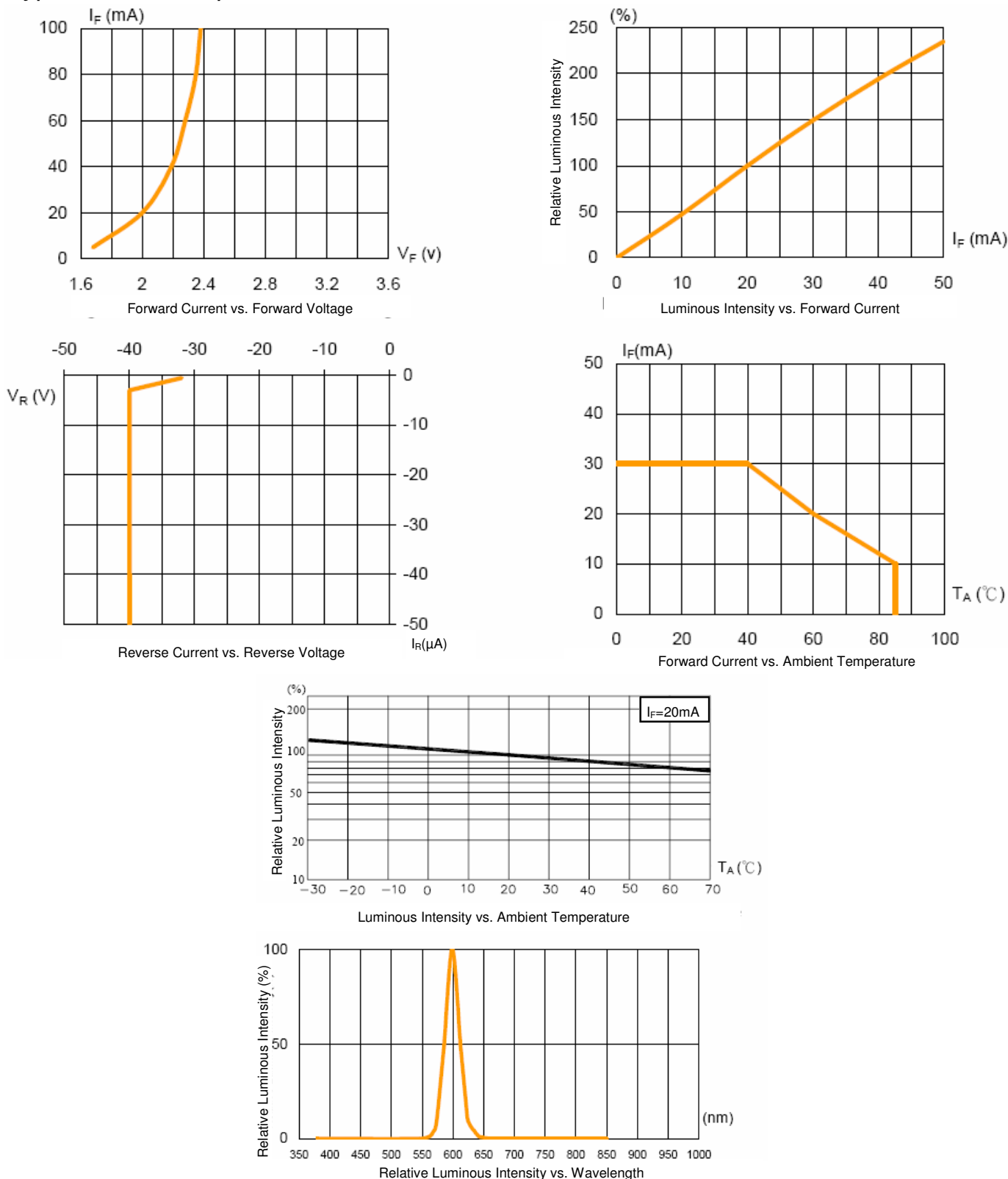


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# T-1<sup>3</sup>/<sub>4</sub> High-Intensity LED

## OVLG Series

### Typical Electro-Optical Characteristics Curves—Yellow

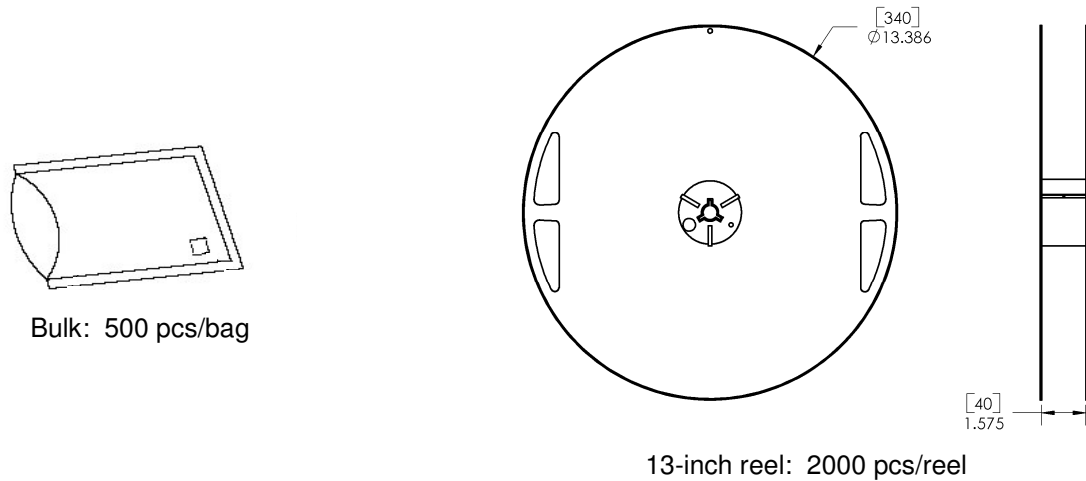




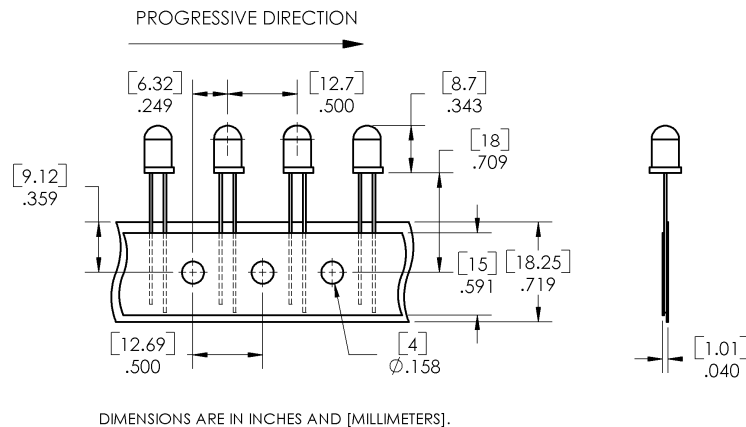
# T-1 $\frac{3}{4}$ High-Intensity LED

## OVLG Series

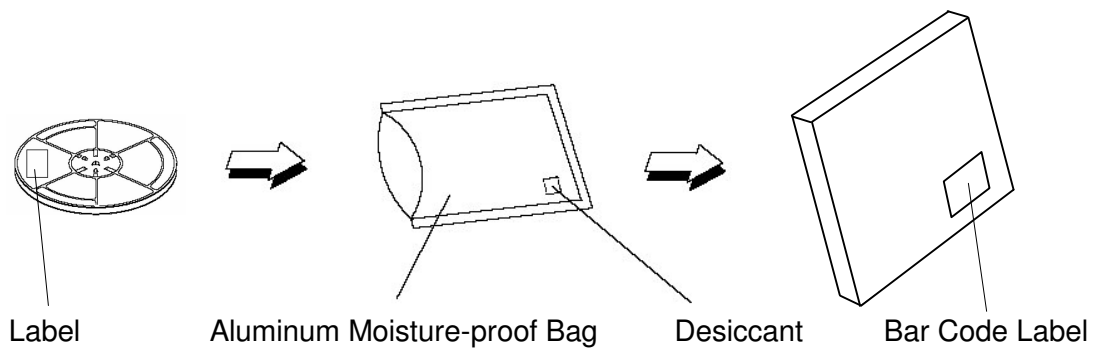
Packing Information: Available in bulk or reel



Carrier Tape Dimensions: Loaded quantity 2000 pieces per reel



## Moisture Resistant Packaging



OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

# T-1<sup>3</sup>/<sub>4</sub> High-Intensity LED

## OVLG Series

### Reliability Test

LED lamps are checked by reliability tests based on MIL standards.

#### 1. Test Conditions, Acceptable Criteria & Results

| Classification   | Test Item                        | Standard Test Method       | Test Conditions  | Duration   | Unit | Acc / Rej Criteria | Result |
|------------------|----------------------------------|----------------------------|--|------------|------|--------------------|--------|
| Life Test        | Operation Life Test (OLT)        | MIL-STD-750D Method 1026.3 | $T_A=25^{\circ}\text{C}$ , $I_F=30\text{mA}$ *   | 1000 Hrs   | 100  | 0 / 1              | Pass   |
| Environment Test | High Temperature Storage (HTS)   | MIL-STD-750D Method 1032.1 | $T_A=100^{\circ}\text{C}$  | 1000 Hrs   | 100  | 0 / 1              | Pass   |
|                  | Low Temperature Storage (LTS)    | MIL-STD-750D Method 1032.1 | $T_A=-40^{\circ}\text{C}$  | 1000 Hrs   | 100  | 0 / 1              | Pass   |
|                  | Temp. & Humidity with Bias (THB) | MIL-STD-750D Method 103B   | $T_A=85^{\circ}\text{C}$ , $\text{Rh}=85\%$ , $I_F=20\text{mA}$ **   | 500 Hrs    | 100  | 0 / 1              | Pass   |
|                  | Thermal Shock Test (TST)         | MIL-STD-750D Method 1056.1 | $0^{\circ}\text{C}$ ~ $100^{\circ}\text{C}$<br>2min            2min  | 100 cycles | 100  | 0 / 1              | Pass   |
|                  | Temperature Cycling Test (TCT)   | MIL-STD-750D Method 1051.5 | $-40^{\circ}\text{C}$ ~ $25^{\circ}\text{C}$ ~ $100^{\circ}\text{C}$ ~ $25^{\circ}\text{C}$<br>30min   5min   30min   5min | 100 cycles | 100  | 0 / 1              | Pass   |
| Mechanical Test  | Solderability                    | MIL-STD-750D Method 2026.4 | $235\pm 5^{\circ}\text{C}$ , 5 sec   | 1 time     | 20   | 0 / 1              | Pass   |
|                  | Resistance to Soldering Heat     | MIL-STD-750D Method 2031.1 | $260\pm 5^{\circ}\text{C}$ , 10 sec  | 1 time     | 20   | 0 / 1              | Pass   |
|                  | Lead Integrity                   | MIL-STD-750D Method 2036.3 | Load 2.5N (0.25kgf)<br>$0^{\circ}$ ~ $90^{\circ}$ ~ $0^{\circ}$ , bend   | 3 times    | 20   | 0 / 1              | Pass   |

Remark : (\*)  $I_F=30\text{mA}$  for AlInGaP chip ;  $I_F=20\text{mA}$  for InGaN chip

(\*\*)  $I_F=20\text{mA}$  for AlInGaP chip ;  $I_F=10\text{mA}$  for InGaN chip

#### 2. Failure Criteria ( $T_A=25^{\circ}\text{C}$ ):

| Test Item          | Symbol | Test Conditions   | Criteria for Judgment     |                          |
|--------------------|--------|-------------------|---------------------------|--------------------------|
|                    |        |                   | Min.                      | Max.                     |
| Luminous Intensity | $I_V$  | $I_F=20\text{mA}$ | $\text{LSL}\times 0.7$ ** |                          |
| Voltage (Forward)  | $V_F$  | $I_F=20\text{mA}$ |                           | $\text{USL}\times 1.1$ * |

(\*) USL : Upper Standard Level , (\*\*) LSL : Lower Standard Level