

## Low Current

|             |           |
|-------------|-----------|
| LTL1CHJxDNN | 60 degree |
| LTL2F7JxDNN | 60 degree |
| LTL2R3JxDNN | 45 degree |

### Features

- Low Power Consumption.
- High Efficiency.
- CMOS-MOS Compatible.
- TTL Compatible.
- Wide Viewing Angle.
- Choice of Package.
- Choice of Color

### Description

These tinted diffuse LED lamps are designed and optimized specifically for low DC current operation. Luminous intensity and forward voltage are tested at 2mA to assure consistent brightness at TTL output current level.

### Application

- Low Power DC Circuits.
- Telecommunications Indicators.
- Portable Equipment.
- Keyboard Indicators.

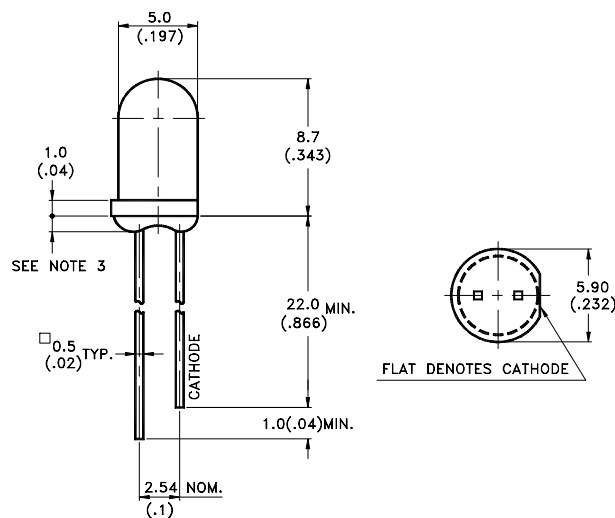
### Devices

| Part No. (LTL)                 | Lens            | Source Color          |
|--------------------------------|-----------------|-----------------------|
| 1CHJDDNN / 2F7JDDNN / 2R3JDDNN | Red Diffused    | AllnGap Hyper Red     |
| 1CHJRDNN / 2F7JRDNN / 2R3JRDNN | Red Diffused    | AllnGap Super Red     |
| 1CHJEDNN / 2F7JEDNN / 2R3JEDNN | Red Diffused    | AllnGap Red           |
| 1CHJFDNN / 2F7JFDNN / 2R3JFDNN | Amber Diffused  | AllnGap Yellow Orange |
| 1CHJYDNN / 2F7JYDNN / 2R3JYDNN | Yellow Diffused | AllnGap Amber Yellow  |
| 1CHJSDNN / 2F7JSDNN / 2R3JSDNN | Yellow Diffused | AllnGap Yellow        |
| 1CHJGDNN / 2F7JGDNN / 2R3JGDNN | Green Diffused  | AllnGap Green         |

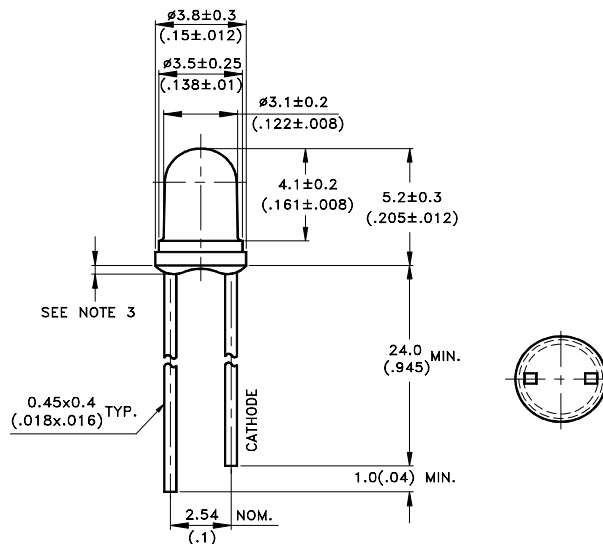
## Package Dimensions

### LTL2F7x Series

### LTL2R3x Series



### LTL1CHx Series



#### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25\text{mm}(.010\text{'})$  unless otherwise noted.
3. Protruded resin under flange is 1.0mm(.04") max.
4. Lead spacing is measured where the leads emerge from the package.
5. Specifications are subject to change without notice.



**Absolute Maximum Ratings at TA=25°C**

| Parameter  | Hyper Red           | Super Red | Red | Yellow Orange | Amber Yellow | Yellow | Green | Unit    |
|--|---------------------|-----------|-----|---------------|--------------|--------|-------|---------|
| Power Dissipation  | 75                  | 75        | 75  | 75            | 75           | 75     | 75    | mW      |
| Peak Forward Current<br>(1/10 Duty Cycle, 0.1ms Pulse Width) | 90                  | 90        | 90  | 60            | 60           | 60     | 60    | mA      |
| Continuous Forward Current                                   | 30                  | 30        | 30  | 30            | 30           | 30     | 30    | mA      |
| Derating Linear From 70°C                                    | 0.4                 | 0.4       | 0.4 | 0.4           | 0.4          | 0.4    | 0.4   | mA / °C |
| Reverse Voltage (IR =100 $\mu$ A)                            | 5                   | 5         | 5   | 5             | 5            | 5      | 5     | V       |
| Operating Temperature Range                                  | -40°C to + 100°C    |           |     |               |              |        |       |         |
| Storage Temperature Range                                    | -55°C to + 100°C    |           |     |               |              |        |       |         |
| Lead Soldering Temperature<br>[1.6mm(.063") From Body]       | 260°C for 5 Seconds |           |     |               |              |        |       |         |



**Electrical / Optical Characteristics at TA=25°C (F Series)**

| Parameter                | Symbol             | Part No. (LTL) | Min. | Typ. | Max. | Unit | Test Condition                           |
|--------------------------|--------------------|----------------|------|------|------|------|--|
| Luminous Intensity       | I <sub>v</sub>     | 1CHJDDNN       | 3.0  | 5.0  |      | mcd  | I <sub>F</sub> = 2mA<br>Note 1<br>Note 2 |
|                          |                    | 1CHJRDNN       | 3.0  | 5.6  |      |      |  |
|                          |                    | 1CHJEDNN       | 3.0  | 7.2  |      |      |  |
|                          |                    | 1CHJFDNN       | 3.0  | 7.2  |      |      |  |
|                          |                    | 1CHJYDNN       | 3.0  | 7.2  |      |      |  |
|                          |                    | 1CHJSDNN       | 3.0  | 7.2  |      |      |  |
|                          |                    | 1CHJGDNN       | 3.0  | 7.2  |      |      |  |
| Viewing Angle            | 2 θ <sub>1/2</sub> |                |      | 60   |      | deg  | Note 3 (Fig.5)                           |
| Peak Emission Wavelength | λ <sub>P</sub>     | 1CHJDDNN       |      | 650  |      | nm   | Measurement @ peak (Fig.1)               |
|                          |                    | 1CHJRDNN       |      | 639  |      |      |  |
|                          |                    | 1CHJEDNN       |      | 632  |      |      |  |
|                          |                    | 1CHJFDNN       |      | 611  |      |      |  |
|                          |                    | 1CHJYDNN       |      | 595  |      |      |  |
|                          |                    | 1CHJSDNN       |      | 588  |      |      |  |
|                          |                    | 1CHJGDNN       |      | 575  |      |      |  |
| Dominant Wavelength      | λ <sub>d</sub>     | 1CHJDDNN       |      | 639  |      | nm   | Note 5                                   |
|                          |                    | 1CHJRDNN       |      | 632  |      |      |  |
|                          |                    | 1CHJEDNN       |      | 624  |      |      |  |
|                          |                    | 1CHJFDNN       |      | 605  |      |      |  |
|                          |                    | 1CHJYDNN       |      | 592  |      |      |  |
|                          |                    | 1CHJSDNN       |      | 587  |      |      |  |
|                          |                    | 1CHJGDNN       |      | 572  |      |      |  |
| Spectral Line Half-Width | Δλ                 | 1CHJDDNN       |      | 20   |      | nm   |  |
|                          |                    | 1CHJRDNN       |      | 20   |      |      |  |
|                          |                    | 1CHJEDNN       |      | 20   |      |      |  |
|                          |                    | 1CHJFDNN       |      | 17   |      |      |  |
|                          |                    | 1CHJYDNN       |      | 15   |      |      |  |
|                          |                    | 1CHJSDNN       |      | 15   |      |      |  |
|                          |                    | 1CHJGDNN       |      | 15   |      |      |  |
| Forward Voltage          | V <sub>F</sub>     | 1CHJDDNN       |      | 1.8  | 2.4  | V    | I <sub>F</sub> = 2mA                     |
|                          |                    | 1CHJRDNN       |      | 1.8  | 2.3  |      |  |
|                          |                    | 1CHJEDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 1CHJFDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 1CHJYDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 1CHJSDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 1CHJGDNN       |      | 1.8  | 2.4  |      |  |
| Reverse Current          | I <sub>R</sub>     |                |      |      | 100  | μA   | V <sub>R</sub> = 5V                      |
| Capacitance              | C                  |                |      | 40   |      | pF   | V <sub>F</sub> = 0, f = 1 MHz            |

NOTES: eet4U.com

- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- Luminous intensity rank classified products support two ranks.
- θ 1/2 is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
- I<sub>v</sub> classification code is marked on each packing bag.
- The dominant wavelength, λ<sub>d</sub> is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.



**Electrical / Optical Characteristics at TA=25°C (H Series)**

| Parameter                | Symbol             | Part No. (LTL) | Min. | Typ. | Max. | Unit | Test Condition                           |
|--------------------------|--------------------|----------------|------|------|------|------|--|
| Luminous Intensity       | I <sub>v</sub>     | 2F7JDDNN       | 3.0  | 5.0  |      | mcd  | I <sub>F</sub> = 2mA<br>Note 1<br>Note 2 |
|                          |                    | 2F7JRDNN       | 3.0  | 5.6  |      |      |  |
|                          |                    | 2F7JEDNN       | 3.0  | 7.2  |      |      |  |
|                          |                    | 2F7JFDNN       | 3.0  | 7.2  |      |      |  |
|                          |                    | 2F7JYDNN       | 3.0  | 7.2  |      |      |  |
|                          |                    | 2F7JSDNN       | 3.0  | 7.2  |      |      |  |
|                          |                    | 2F7JGDNN       | 3.0  | 7.2  |      |      |  |
| Viewing Angle            | 2 θ <sub>1/2</sub> |                |      | 60   |      | deg  | Note 3 (Fig.5)                           |
| Peak Emission Wavelength | λ <sub>P</sub>     | 2F7JDDNN       |      | 650  |      | nm   | Measurement @ peak (Fig.1)               |
|                          |                    | 2F7JRDNN       |      | 639  |      |      |  |
|                          |                    | 2F7JEDNN       |      | 632  |      |      |  |
|                          |                    | 2F7JFDNN       |      | 611  |      |      |  |
|                          |                    | 2F7JYDNN       |      | 595  |      |      |  |
|                          |                    | 2F7JSDNN       |      | 588  |      |      |  |
|                          |                    | 2F7JGDNN       |      | 575  |      |      |  |
| Dominant Wavelength      | λ <sub>d</sub>     | 2F7JDDNN       |      | 639  |      | nm   | Note 5                                   |
|                          |                    | 2F7JRDNN       |      | 632  |      |      |  |
|                          |                    | 2F7JEDNN       |      | 624  |      |      |  |
|                          |                    | 2F7JFDNN       |      | 605  |      |      |  |
|                          |                    | 2F7JYDNN       |      | 592  |      |      |  |
|                          |                    | 2F7JSDNN       |      | 587  |      |      |  |
|                          |                    | 2F7JGDNN       |      | 572  |      |      |  |
| Spectral Line Half-Width | Δλ                 | 2F7JDDNN       |      | 20   |      | nm   |  |
|                          |                    | 2F7JRDNN       |      | 20   |      |      |  |
|                          |                    | 2F7JEDNN       |      | 20   |      |      |  |
|                          |                    | 2F7JFDNN       |      | 17   |      |      |  |
|                          |                    | 2F7JYDNN       |      | 15   |      |      |  |
|                          |                    | 2F7JSDNN       |      | 15   |      |      |  |
|                          |                    | 2F7JGDNN       |      | 15   |      |      |  |
| Forward Voltage          | V <sub>F</sub>     | 2F7JDDNN       |      | 1.8  | 2.4  | V    | I <sub>F</sub> = 2mA                     |
|                          |                    | 2F7JRDNN       |      | 1.8  | 2.3  |      |  |
|                          |                    | 2F7JEDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 2F7JFDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 2F7JYDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 2F7JSDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 2F7JGDNN       |      | 1.8  | 2.4  |      |  |
| Reverse Current          | I <sub>R</sub>     |                |      |      | 100  | μA   | V <sub>R</sub> = 5V                      |
| Capacitance              | C                  |                |      | 40   |      | pF   | V <sub>F</sub> = 0, f = 1 MHz            |

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- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
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- θ 1/2 is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
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- The dominant wavelength, λ<sub>d</sub> is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.



**Electrical / Optical Characteristics at TA=25°C (H Series)**

| Parameter                | Symbol             | Part No. (LTL) | Min. | Typ. | Max. | Unit | Test Condition                           |
|--------------------------|--------------------|----------------|------|------|------|------|--|
| Luminous Intensity       | I <sub>v</sub>     | 2R3JDDNN       | 3.8  | 7.2  |      | mcd  | I <sub>F</sub> = 2mA<br>Note 1<br>Note 2 |
|                          |                    | 2R3JRDNN       | 3.8  | 8.0  |      |      |  |
|                          |                    | 2R3JEDNN       | 3.8  | 10.6 |      |      |  |
|                          |                    | 2R3JFDNN       | 3.8  | 10.6 |      |      |  |
|                          |                    | 2R3JYDNN       | 3.8  | 10.6 |      |      |  |
|                          |                    | 2R3JSDNN       | 3.8  | 10.6 |      |      |  |
|                          |                    | 2R3JGDNN       | 3.8  | 10.6 |      |      |  |
| Viewing Angle            | 2 θ <sub>1/2</sub> |                |      | 45   |      | deg  | Note 3 (Fig.5)                           |
| Peak Emission Wavelength | λ <sub>P</sub>     | 2R3JDDNN       |      | 650  |      | nm   | Measurement @ peak (Fig.1)               |
|                          |                    | 2R3JRDNN       |      | 639  |      |      |  |
|                          |                    | 2R3JEDNN       |      | 632  |      |      |  |
|                          |                    | 2R3JFDNN       |      | 611  |      |      |  |
|                          |                    | 2R3JYDNN       |      | 595  |      |      |  |
|                          |                    | 2R3JSDNN       |      | 588  |      |      |  |
|                          |                    | 2R3JGDNN       |      | 575  |      |      |  |
| Dominant Wavelength      | λ <sub>d</sub>     | 2R3JDDNN       |      | 639  |      | nm   | Note 5                                   |
|                          |                    | 2R3JRDNN       |      | 632  |      |      |  |
|                          |                    | 2R3JEDNN       |      | 624  |      |      |  |
|                          |                    | 2R3JFDNN       |      | 605  |      |      |  |
|                          |                    | 2R3JYDNN       |      | 592  |      |      |  |
|                          |                    | 2R3JSDNN       |      | 587  |      |      |  |
|                          |                    | 2R3JGDNN       |      | 572  |      |      |  |
| Spectral Line Half-Width | Δλ                 | 2R3JDDNN       |      | 20   |      | nm   |  |
|                          |                    | 2R3JRDNN       |      | 20   |      |      |  |
|                          |                    | 2R3JEDNN       |      | 20   |      |      |  |
|                          |                    | 2R3JFDNN       |      | 17   |      |      |  |
|                          |                    | 2R3JYDNN       |      | 15   |      |      |  |
|                          |                    | 2R3JSDNN       |      | 15   |      |      |  |
|                          |                    | 2R3JGDNN       |      | 15   |      |      |  |
| Forward Voltage          | V <sub>F</sub>     | 2R3JDDNN       |      | 1.8  | 2.4  | V    | I <sub>F</sub> = 2mA                     |
|                          |                    | 2R3JRDNN       |      | 1.8  | 2.3  |      |  |
|                          |                    | 2R3JEDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 2R3JFDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 2R3JYDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 2R3JSDNN       |      | 1.8  | 2.4  |      |  |
|                          |                    | 2R3JGDNN       |      | 1.8  | 2.4  |      |  |
| Reverse Current          | I <sub>R</sub>     |                |      |      | 100  | μA   | V <sub>R</sub> = 5V                      |
| Capacitance              | C                  |                |      | 40   |      | pF   | V <sub>F</sub> = 0, f = 1 MHz            |

NOTES:

- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- Luminous intensity rank classified products support two ranks.
- θ 1/2 is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
- I<sub>v</sub> classification code is marked on each packing bag.
- The dominant wavelength, λ<sub>d</sub> is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

Property of Lite-On Only

## Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

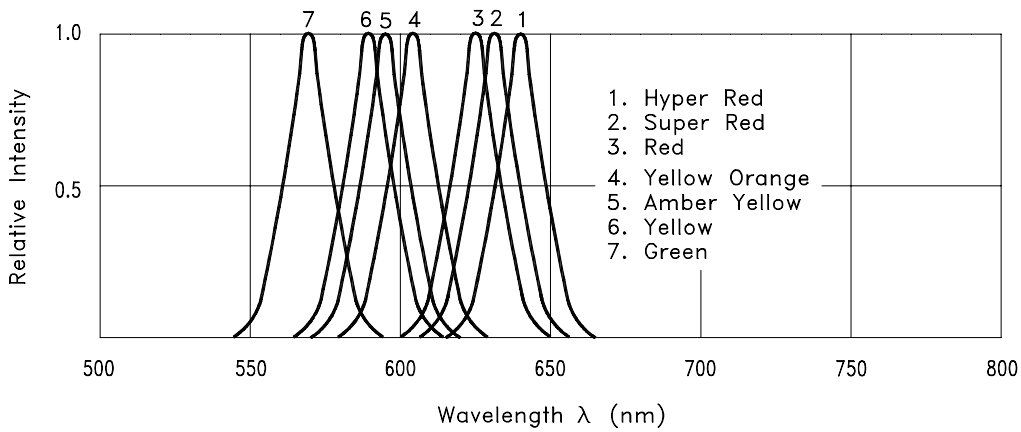


Fig.1 Relative Intensity vs. Wavelength

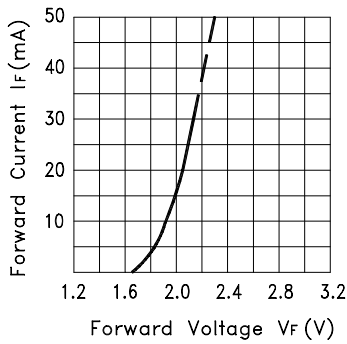


Fig.2 Forward Current vs. Forward Voltage

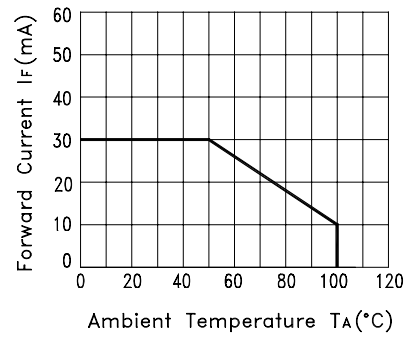


Fig.3 Forward Current Derating Curve

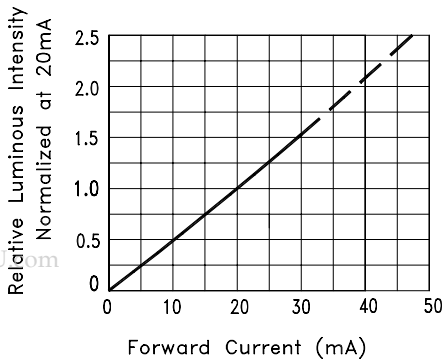


Fig.4 Relative Luminous Intensity vs. Forward Current

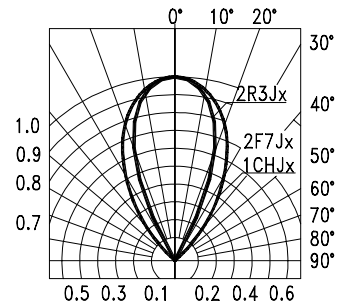


Fig.5 Spatial Distribution