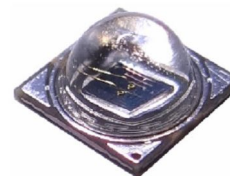


Specification For IR Series

HPL-H40DI1L4



Features

- Dimension : 4.0mm(L)×4.0mm(W)
- High Radiant Flux type
- All Metal Design Cu Substrate with Silicone Lens
- Exceed narrow beam angle 40°
- Low thermal resistance
- The AlGaAs/ AlGaAs , AlGaAs/ GaAs Chip inside

Applications

- IrDA
- Encoder
- Data Communication
- CCTV

5F, No 173-8, Yung-Fon Road, Tu-Cheng District, New Taipei City, Taiwan, R.O.C.
TEL: +886-2-8262-8886 FAX : +886-2-8262-8885

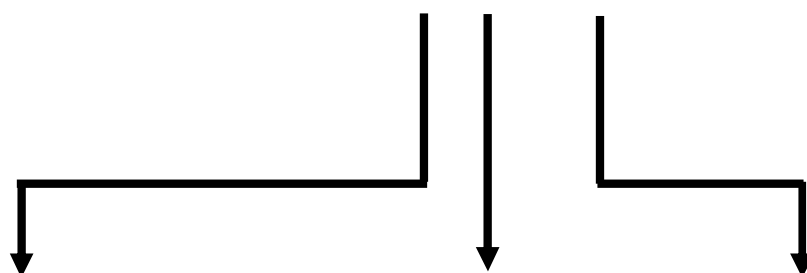


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General Information

HPL - H40DI1L4



Beam Angle-

Exceed narrow beam angle

Wavelength-

I : IR 730nm

Power-

L : 2W

Part Number Matrix

| Type Wavelength | 40° Lens | 40° Lens & Star |
|--------------------|--------------|-----------------|
| IR 730 | HPL-H40DI1L4 | HPL-H40XI1L4 |

Absolute Maximum Ratings

(T_j=25°C)

| Parameter | Symbol | Rating | Unit |
|---|-----------------------|----------------------|------|
| Power Dissipation | P | 1.9 | W |
| Forward Current | I _F | 700 | mA |
| Forward Pulse Current (1/10 Duty Cycle, 400msec Pulse Width) | I _{FP} | 1000 | mA |
| Thermal Resistance, Junction-Case | R _{th, J-C1} | 5 | °C/W |
| Reverse Voltage | V _R | 5 | V |
| LED Junction Temperature | T _J | 125 | °C |
| Operating Temperature Range | T _{opr} | - 40°C to + 80°C | |
| Storage Temperature Range | T _{stg} | - 40°C to + 120°C | |
| Soldering Condition | T _{sol} | 260°C For 10 Seconds | |

Note: 1. The thermal resistance value is measured with MCPCB (Star).

Initial Electrical/Optical Characteristics

- Forward Voltage** (T_j=25°C)

| Wavelength | Forward Voltage | | | | | |
|------------|-----------------|------|------|------|------------------------|------|
| | Symbol | MIN. | TYP. | MAX. | Test Condition | Unit |
| IR 730nm | V _F | - | 2.15 | - | I _F = 700mA | V |

- Reverse Current** (T_j=25°C)

| Wavelength | Reverse Current | | | | | |
|------------|-----------------|------|------|------|---------------------|------|
| | Symbol | MIN. | TYP. | MAX. | Test Condition | Unit |
| IR 730nm | I _R | - | - | 100 | V _R = 5V | μA |

- Radiant Flux** (T_j=25°C)

| Wavelength | Radiant Flux | | | | | |
|------------|----------------|------|------|------|------------------------|------|
| | Symbol | MIN. | TYP. | MAX. | Test Condition | Unit |
| IR 730nm | Φ _e | 350 | 580 | - | I _F = 700mA | mW |

- Radiant Intensity** (T_j=25°C)

| Wavelength | Radiant Intensity | | | | | |
|------------|-------------------|------|------|------|------------------------|-------|
| | Symbol | MIN. | TYP. | MAX. | Test Condition | Unit |
| IR 730nm | I _e | - | 520 | - | I _F = 700mA | mW/sr |

- Peak wavelength** (T_j=25°C)

| Wavelength | Wavelength | | | | | |
|------------|----------------|------|------|------|------------------------|------|
| | Symbol | MIN. | TYP. | MAX. | Test Condition | Unit |
| IR 730nm | λ _p | 730 | - | 750 | I _F = 700mA | nm |

- Spectra half-width** (T_j=25°C)

| Wavelength | Wavelength | | | | | |
|------------|------------|------|------|------|------------------------|------|
| | Symbol | MIN. | TYP. | MAX. | Test Condition | Unit |
| IR 730nm | Δλ | - | 25 | - | I _F = 700mA | nm |

● Typical Radiation Pattern

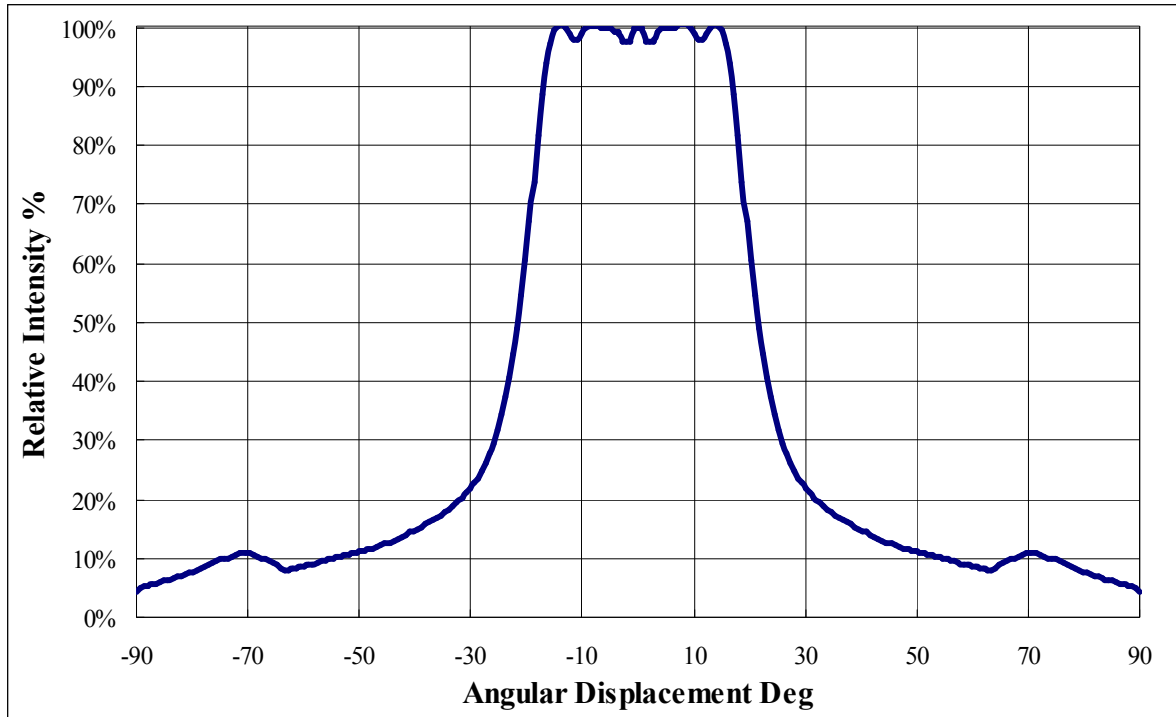


Fig. Typical Representative Spatial Radiation Pattern : 40 degree

● Bin Code List for Reference

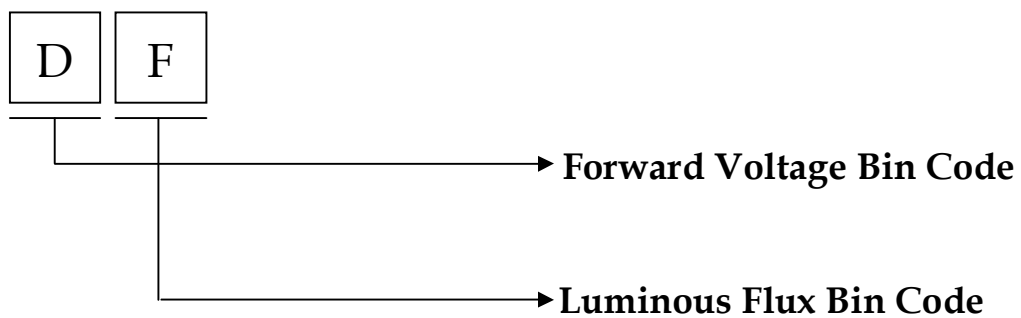
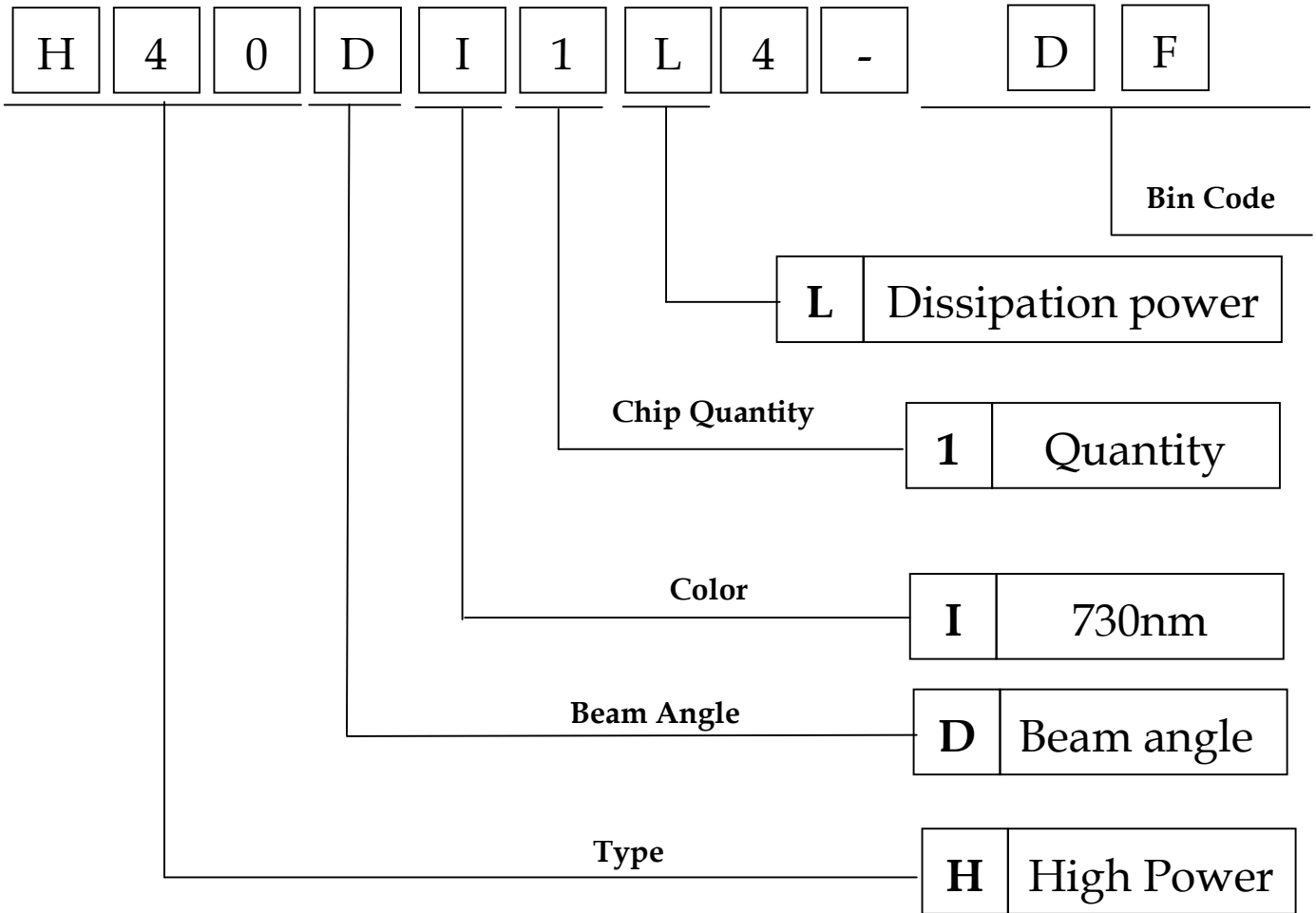
(T_j=25°C)

| Item | Bin Code | Symbol | Condition | Min. | Max. | Unit |
|------------------------------|----------|----------------|---------------------------|------|------|------|
| Forward Voltage ¹ | C | V _F | I _F = 700 [mA] | 1.83 | 2.07 | V |
| | D | | | 2.07 | 2.31 | |
| | E | | | 2.31 | 2.55 | |
| | F | | | 2.55 | 2.79 | |
| Luminous Flux ² | D | Φ _e | I _F = 700 [mA] | 350 | 425 | mW |
| | E | | | 425 | 500 | |
| | F | | | 500 | 600 | |
| | G | | | 600 | 700 | |

Note

1. Forward voltage measurement allowance is ± 0.1V.
2. Radiant flux measurement allowance is ± 10%.

Part Number Formation



Characteristic Diagram

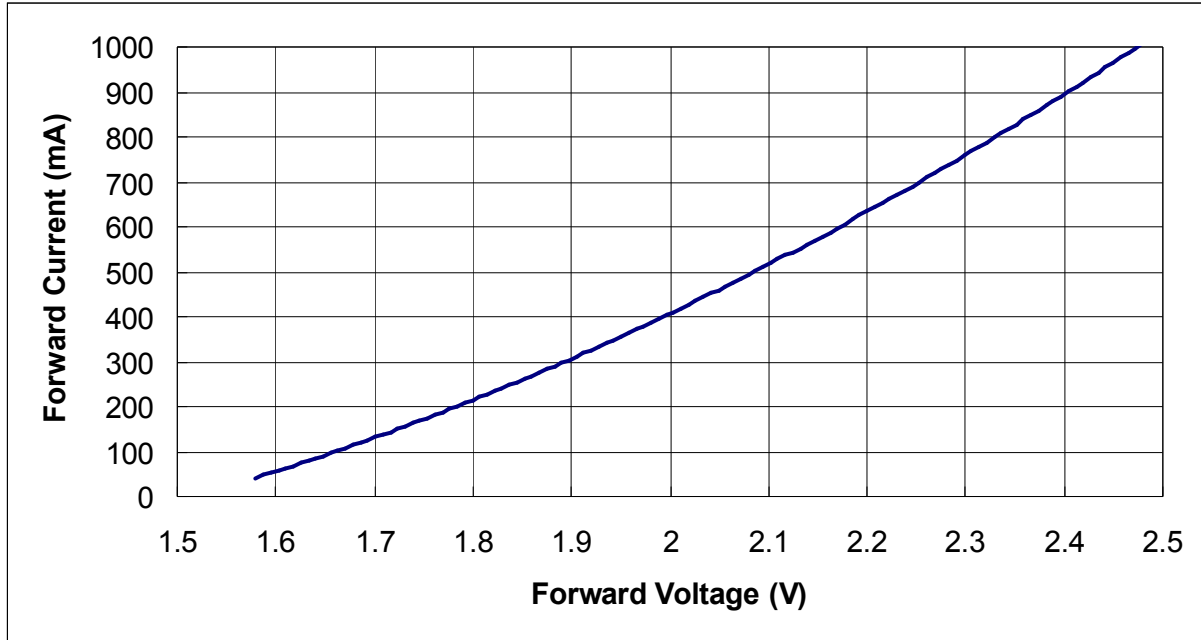


Fig. Forward Current vs. Forward Voltage

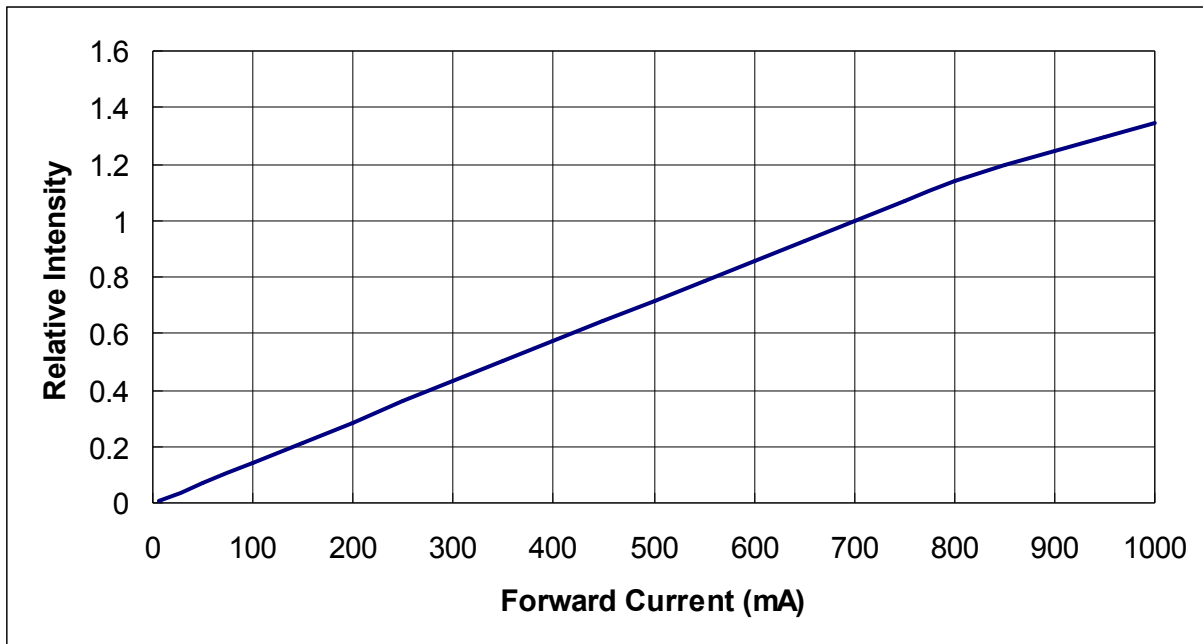


Fig. Relative Intensity vs. Forward Current.

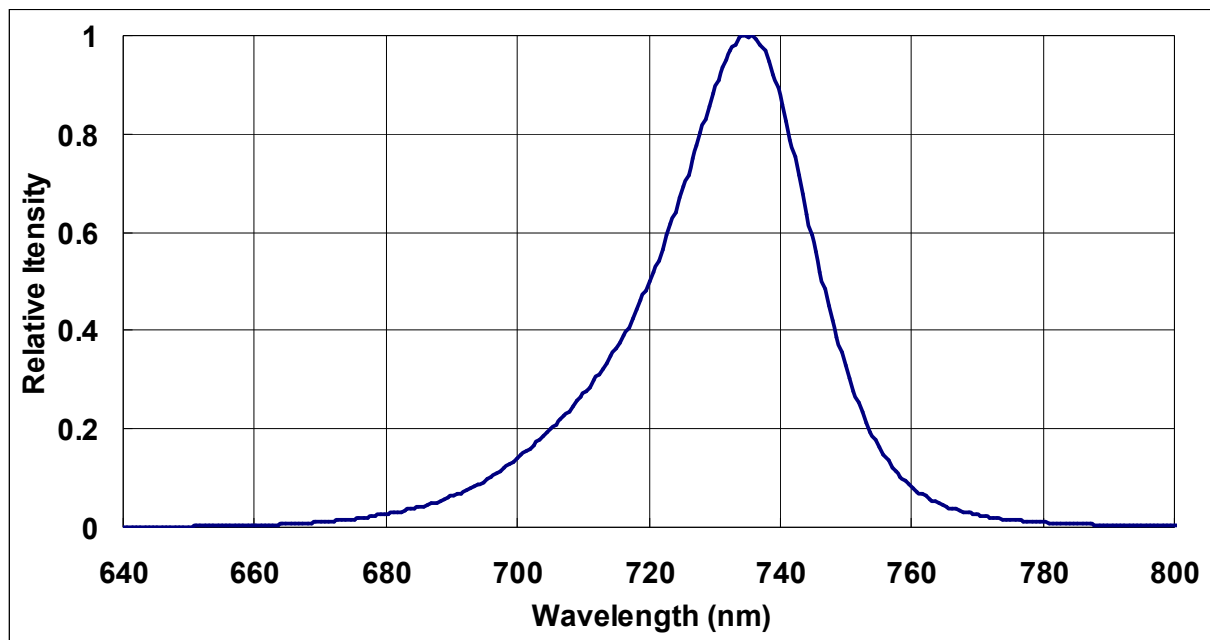


Fig. Typical Relative Intensity vs. wavelength

Outline Dimension

Unit : mm

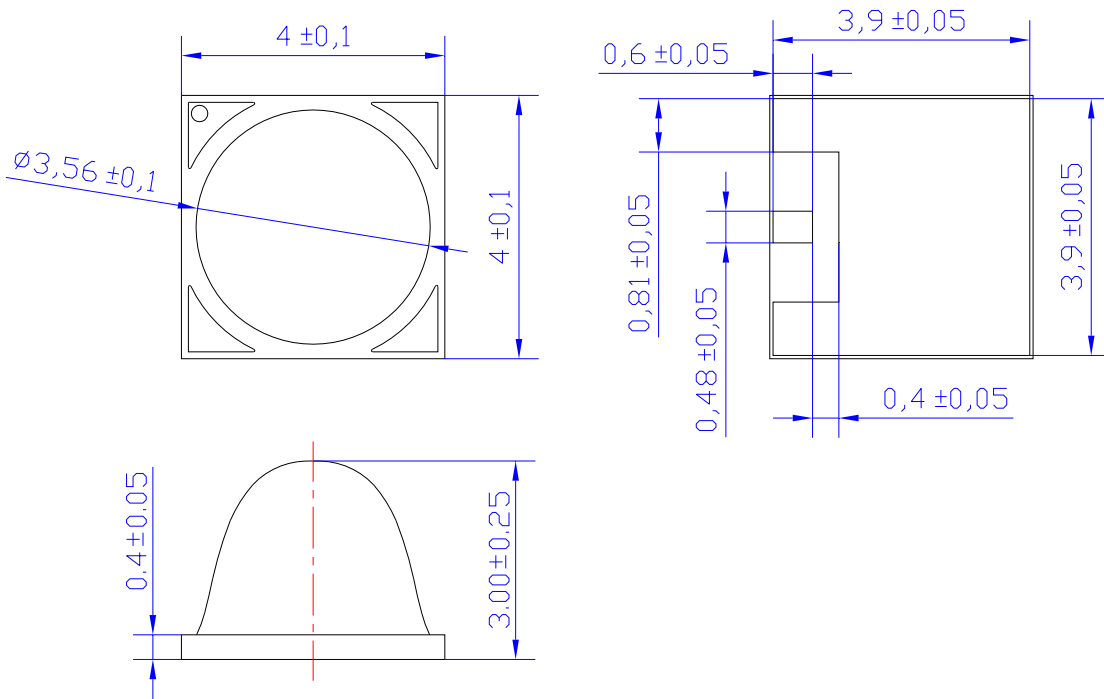
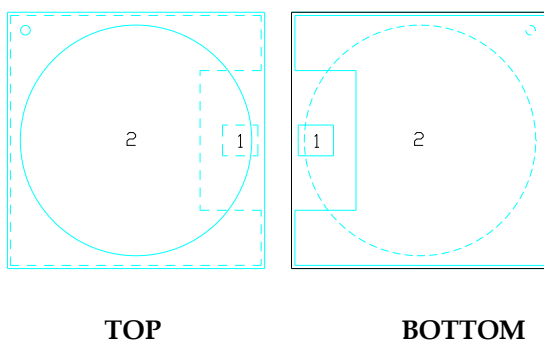


Fig. Package Outline Drawing.

● Pad Configuration



| PAD | Function |
|-----|---------------|
| 1 | Cathode |
| 2 | Anode、Thermal |

Fig. Pad configuration.

Note: Please don't put conductive material on the top surface of LEDs.

HPL-H40XI1L4

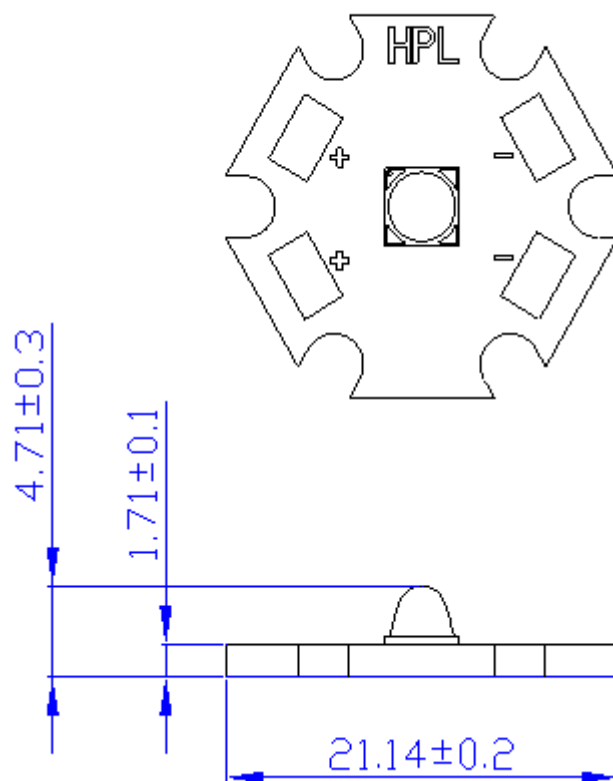
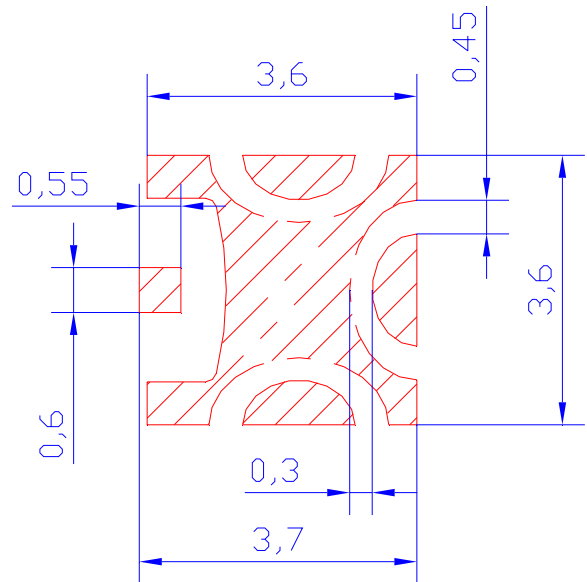
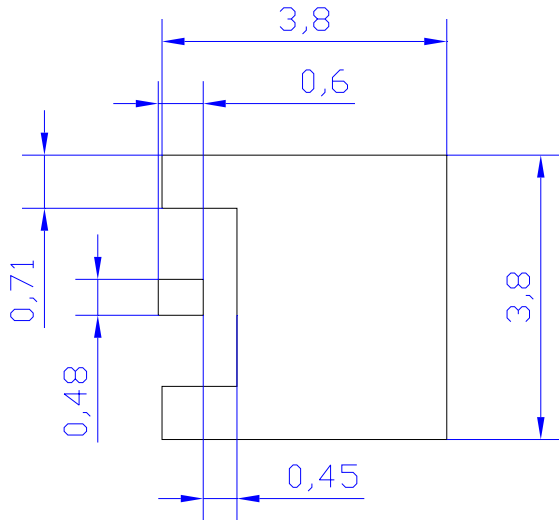


Fig. Assembly Outline Drawing.

Recommended Solder Pattern

Unit : mm

Tolerance±0.05



MCPCB LAYOUT

SOLDER MASK

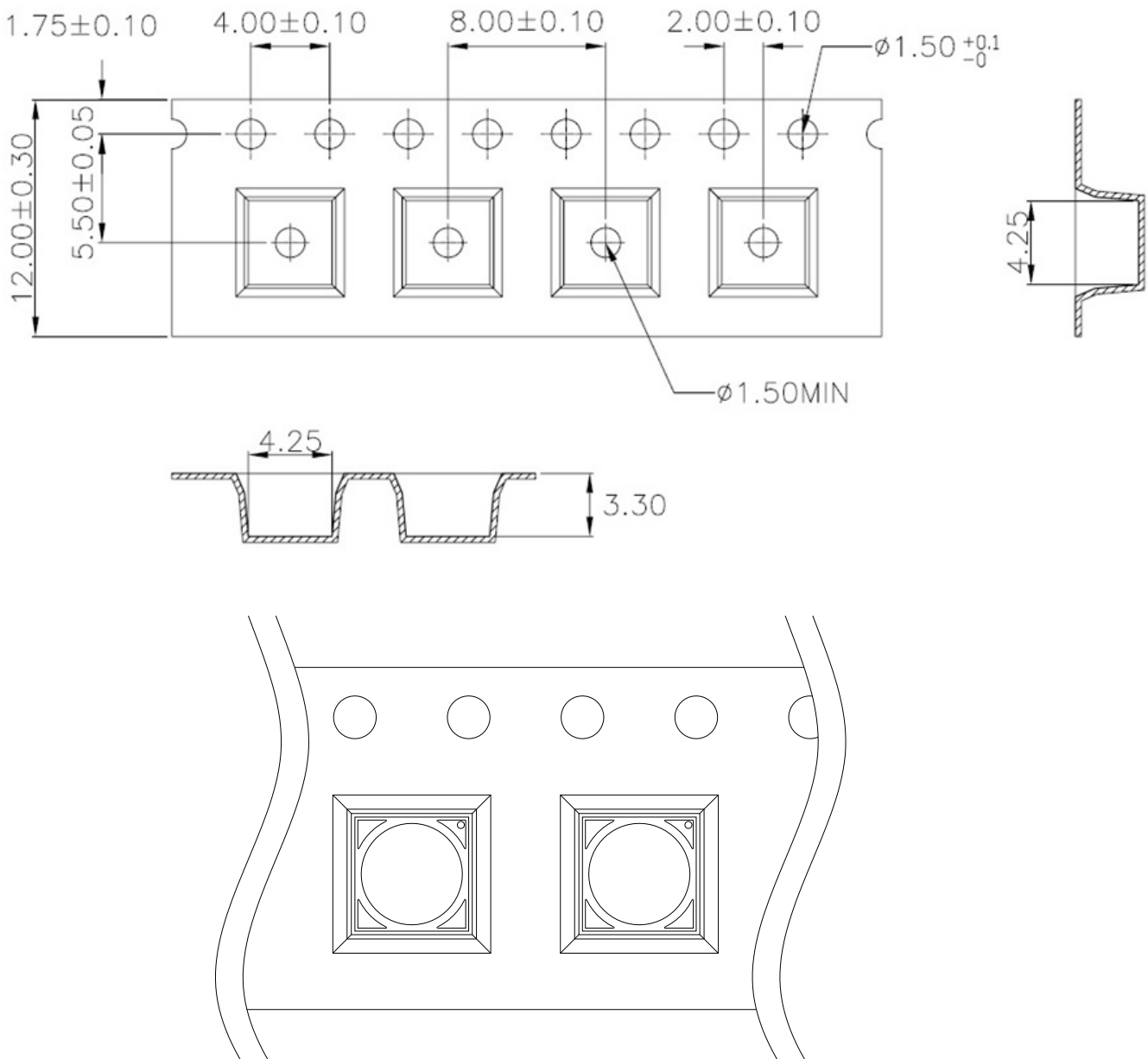
Fig. Solder Pad Layout.

Shipping Package Style

Tapping Dimension Packaging Specification

- Moisture proof bag.
- 1 Reel/bag.
- Q'ty : 700(MAX) / 7 inch Reel
- Q'ty : 2500(MAX) / 13 inch Reel

Unit : mm



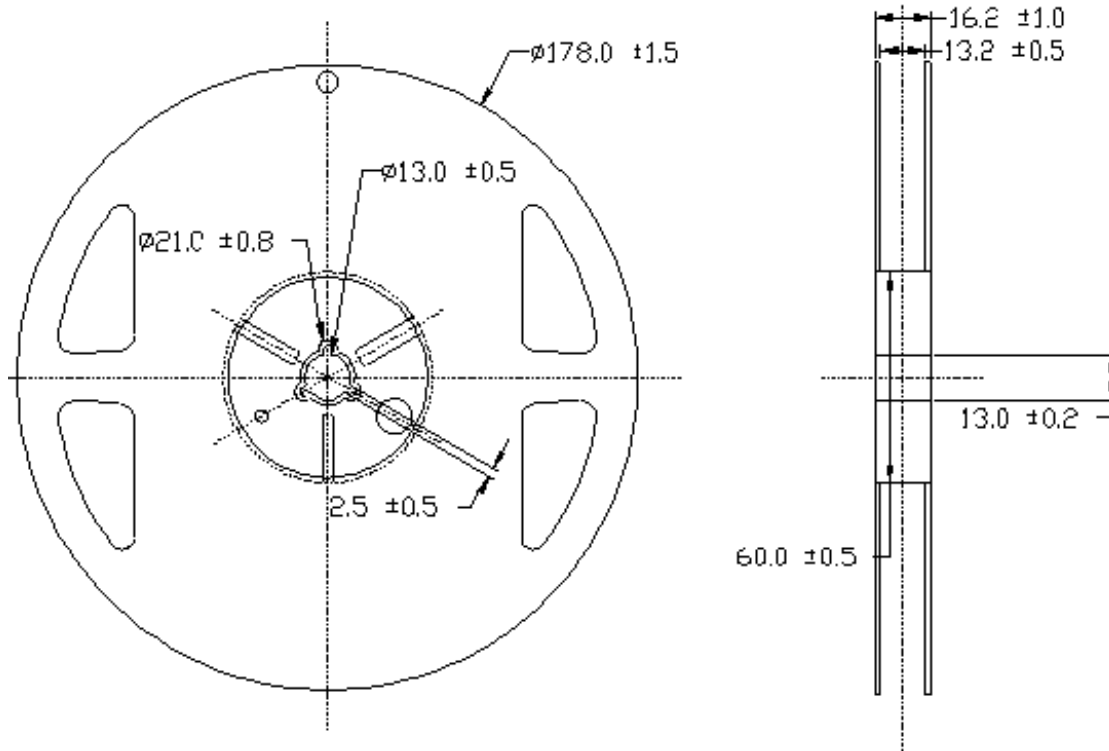
7 inch Reel Package

| Box Type | Dimension (mm) | Reel/Box | 40°Lens Type (Pcs) |
|---------------|----------------|-------------|--------------------|
| Small Box(S) | 230x85x265 | 5 Reel/Box | 3500 |
| Middle Box(M) | 470x265x270 | 30 Reel/Box | 21000 |
| Large Box(L) | 470x435x270 | 50 Reel/Box | 35000 |

Reel Packaging :

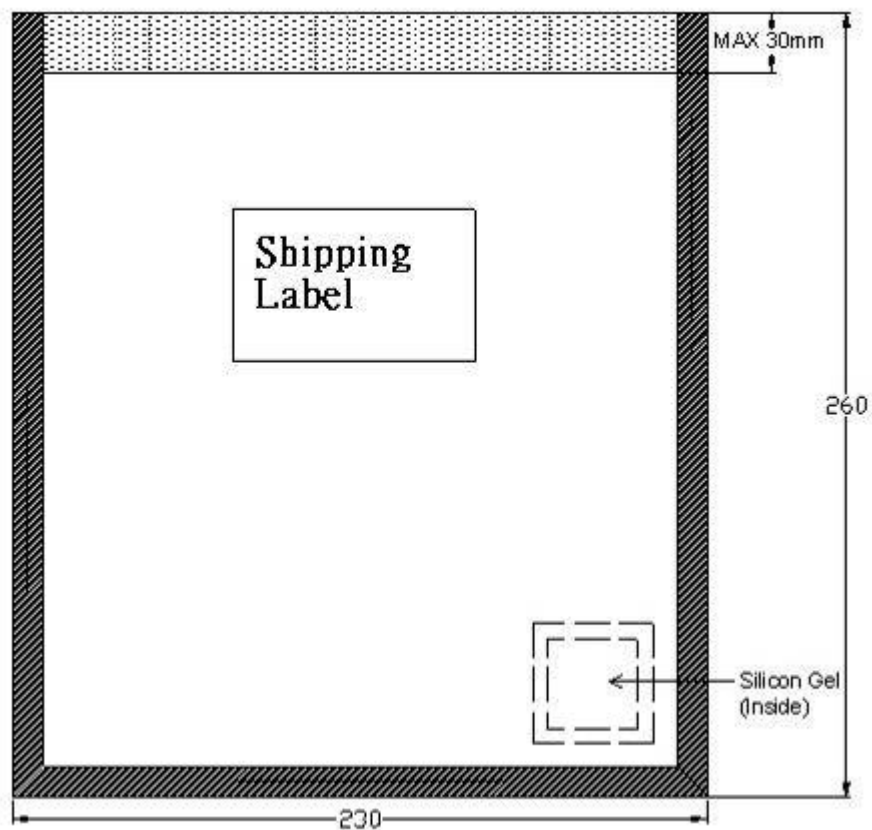
Reel Part :

Unit : mm



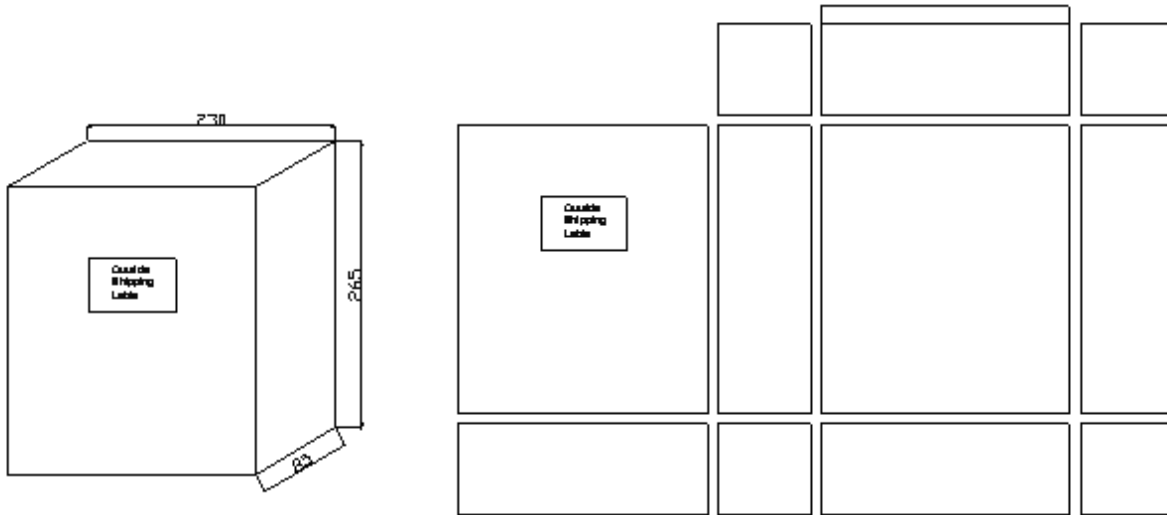
Anti Statistic Bag :

Unit : mm



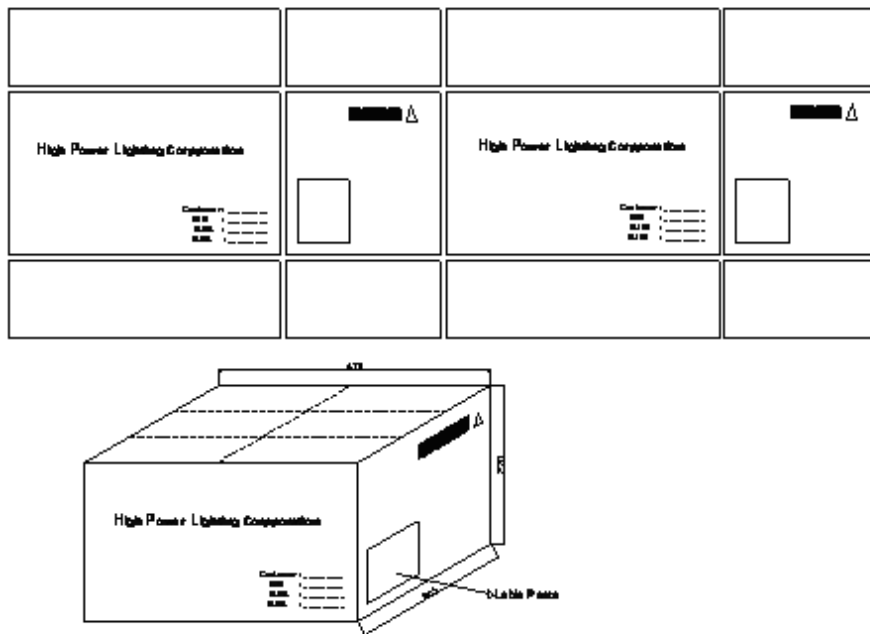
Small Box

Unit : mm



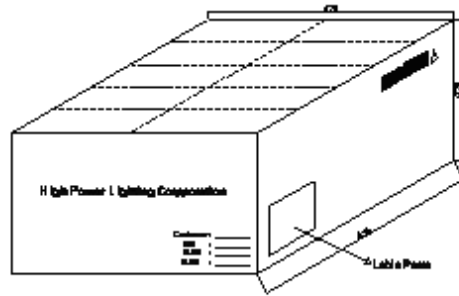
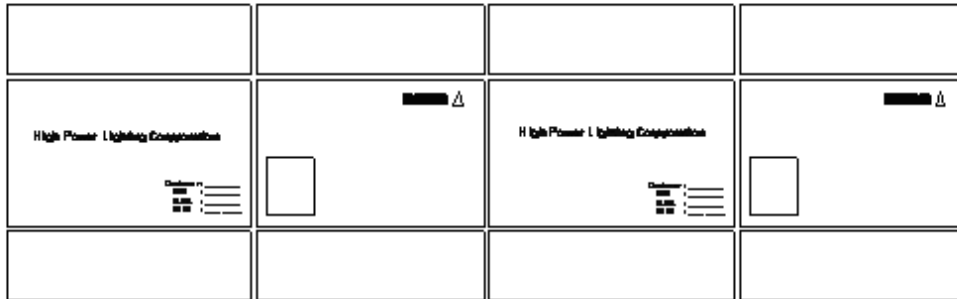
Middle Box

Unit : mm



Large Box

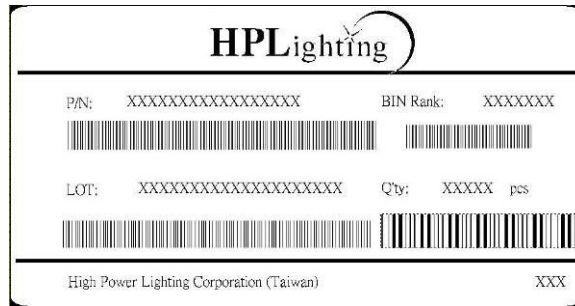
Unit : mm



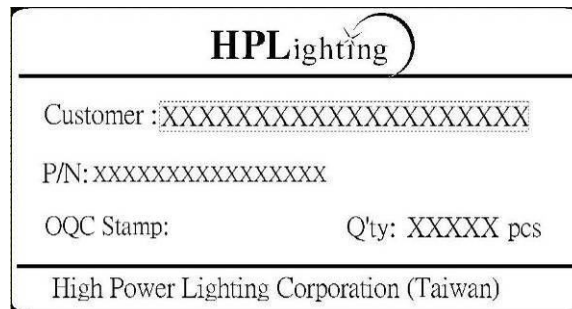
Label Formation

Unit : mm

70mm



40mm



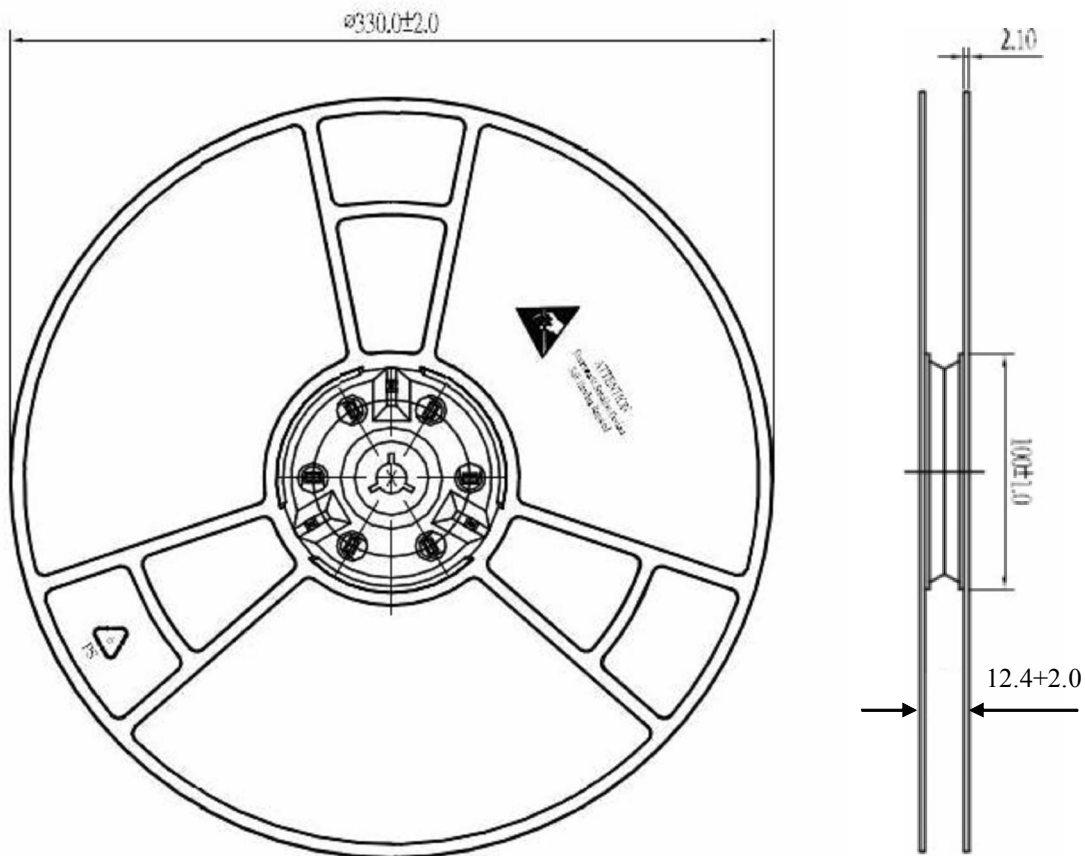
13 inch Reel Package

| Box Type | Dimension (mm) | Reel/Box | 40°Lens Type (Pcs) |
|---------------|-----------------|-------------|--------------------|
| Small Box(S) | 415 x 380 x 95 | 5 Reel/Box | 12500 |
| Middle Box(M) | 415 x 380 x 290 | 15 Reel/Box | 37500 |
| Large Box(L) | 780 x 432 x 310 | 30 Reel/Box | 75000 |

Reel Packaging :

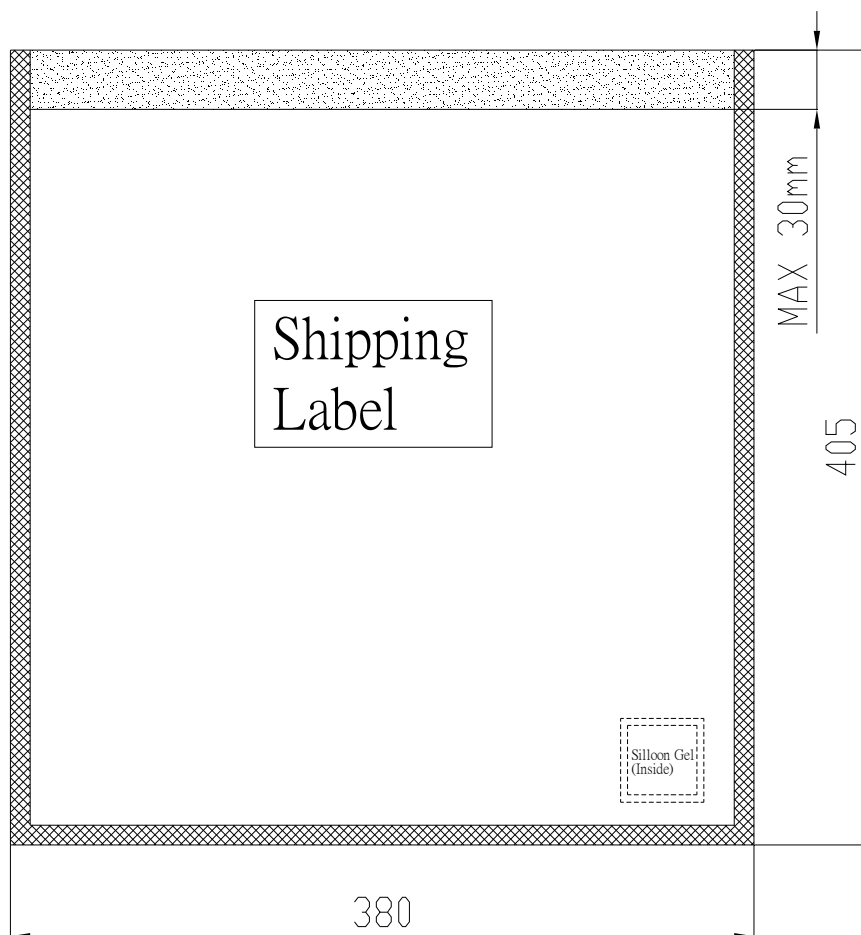
Reel Part :

Unit : mm



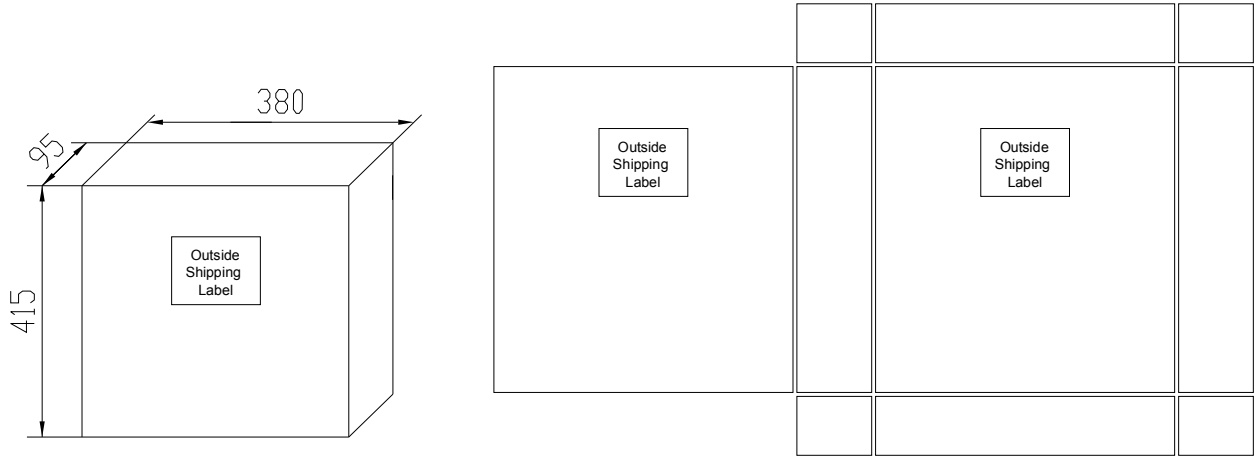
Anti Statistic Bag :

Unit : mm



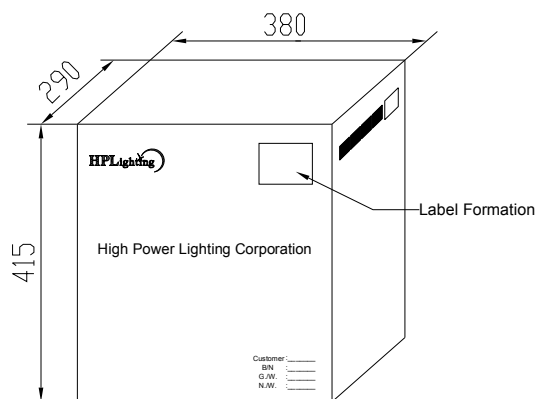
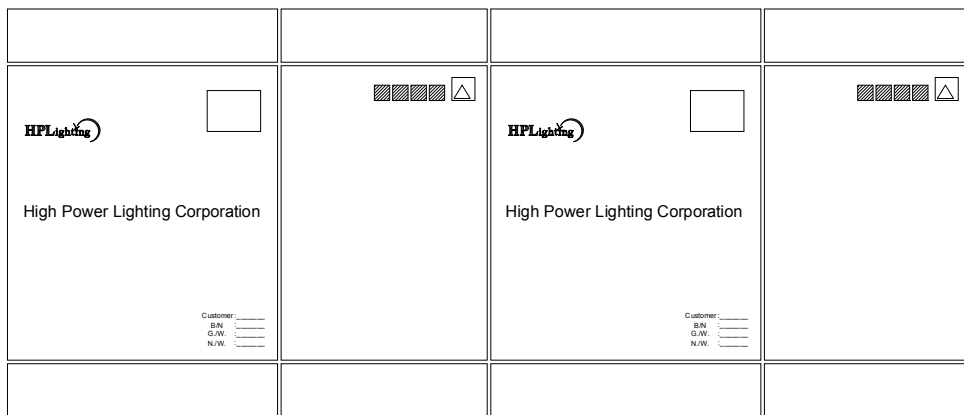
Small Box

Unit : mm



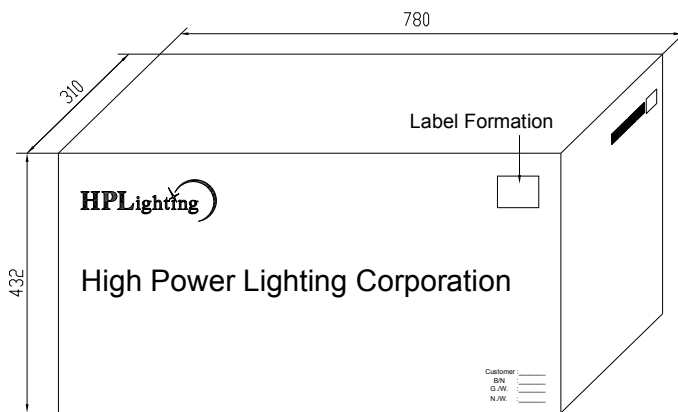
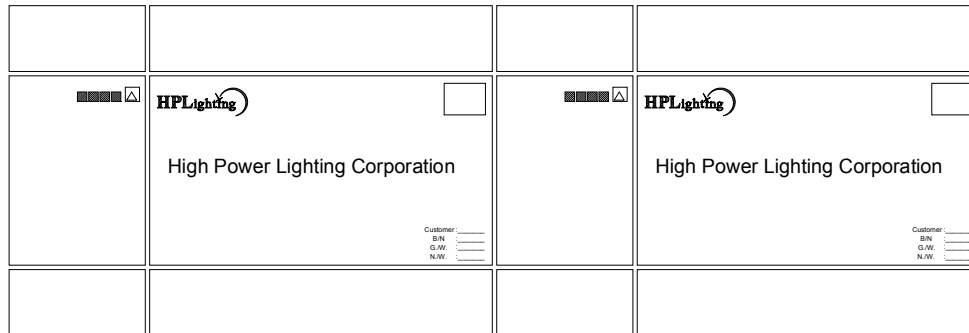
Middle Box

Unit : mm



Large Box

Unit : mm



Label Formation

70mm

| | |
|--|-------------------|
| | |
| P/N: XXXXXXXXXXXXXXXXX | BIN Rank: XXXXXXX |
| | |
| LOT: XXXXXXXXXXXXXXXXX | Q'ty: XXXXX pcs |
| | |
| High Power Lighting Corporation (Taiwan) | XXX |

40mm

| | |
|--|-----------------|
| | |
| Customer :XXXXXXXXXXXXXXXXXXXXXX | |
| P/N: XXXXXXXXXXXXXXXXX | |
| OQC Stamp: | Q'ty: XXXXX pcs |
| High Power Lighting Corporation (Taiwan) | |

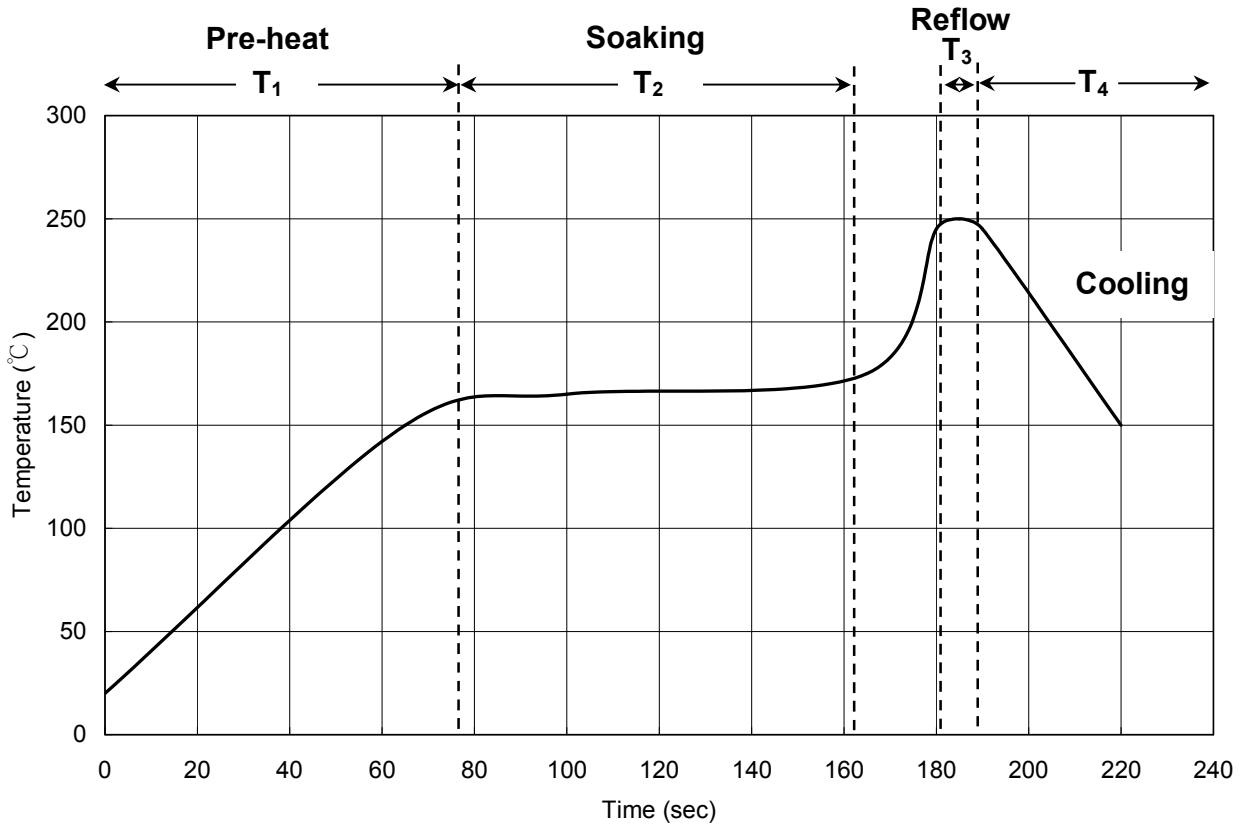
Qualification Reliability Testing

| Classification | Test Item | Test conditions | Reference Standard |
|--------------------|--|---|--|
| Endurance Test | Operation Life | $I_F = 700\text{mA}$ $T_a = 25^\circ\text{C}$ Test Duration = 1000hrs | MIL-STD-750: 1026 MIL-STD-883: 1005 JIS C 7021: B-1 |
| | High Temperature High Humidity Storage | $T_a = 85\pm 5^\circ\text{C}$ RH = 85±5% Test Duration = 1000hrs | MIL-STD-202: 103B JIS C 7021: B-11 |
| | High Temperature Storage | $T_a = 105\pm 5^\circ\text{C}$ Test Duration = 1000hrs | MIL-STD-202: 1008 JIS C 7021: B10 |
| | Low Temperature Storage | $T_a = -40\pm 5^\circ\text{C}$ Test Duration = 1000hrs | JIS C 7021: B-12 |
| Environmental Test | Temperature Cycling | $-30^\circ\text{C} \sim 25^\circ\text{C} \sim 105^\circ\text{C} \sim 25^\circ\text{C}$ 30min 5min 30min 5min Test Duration = 10 cycle | MIL-STD-202: 107D MIL-STD-750: 1051 MIL-STD-883: 1010 JIS C 7021: A-4 |
| | Thermal Shock | $-30\pm 5^\circ\text{C} \sim 105\pm 5^\circ\text{C}$ 30min 30min Test Duration = 10 cycle | MIL-STD-202: 107D MIL-STD-750: 1051 MIL-STD-883: 1011 |
| | Solder Resistance | $T_{sol} = 260\pm 5^\circ\text{C}$ Dwell Time = 10sec | MIL-STD-202: 210A MIL-STD-750: 2031 JIS C 7021: A-1 |

| Measuring Items | Symbol | Measuring Conditions | Failure Criteria |
|-----------------|---------|----------------------|---------------------|
| Forward voltage | V_F | $I_F = 700\text{mA}$ | V_F shift > 10% |
| Luminous | $I_v\%$ | $I_F = 700\text{mA}$ | $I_v\%$ shift > 10% |

Recommended Solder Profile

Soldering Recommended soldering conditions:



| | | |
|----------------|----------------------------|------------------|
| T ₁ | Ramp up rate | 1.0 ~ 3.0 °C/sec |
| | Pre-heat time | 50 ~ 80 sec |
| T ₂ | Soaking temperature | 155 ~ 185 °C |
| | Dwell time during soaking | 60 ~ 120 sec |
| T ₃ | Reflow temperature | 240 ~ 250 °C |
| | Reflow time | Max 10 sec |
| | Ramp up rate during reflow | 1.2 ~ 2.3 °C/sec |
| T ₄ | Cooling | 1.0 ~ 6.0 °C/sec |

Note: Suggest using Sn96Ag3Cu0.5 lead free solder.

Cleaning

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED if necessary.



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