



RoHS

Specification

规格书

Customer Name : _____

客户名称 :

Customer P/N : _____

客户品号 :

Factory P/N : HL-PC-3216H233W

公司品号 :

Sending Date : _____

送样日期 :

| Client approval 客户审核 | | | Hongli approval 鸿利智汇审核 | | |
|--|--|--------------------|---------------------------|-------------|--------------------|
| Approval 核准 | Audit 确认 | Confirmation 制作 | Approval 核准 | Audit 审核 | Confirmation 制作 |
| | | | | | |
| <input type="checkbox"/> Qualified 接受 | <input type="checkbox"/> Disqualified 不接受 | DATE: 日期: | | | |

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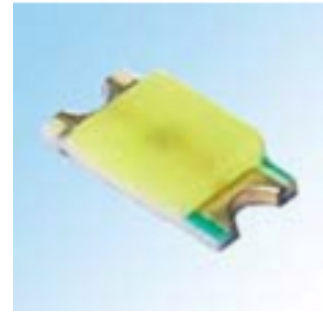
3. 此规格书的有效期限为两年,自盖章或签字之日起计算,期满时双方可以续签协议,但应采用书面形式



HL-PC-3216H233W

Features(特征)

- Extremely wide viewing angle. (宽的发光角度)
- Suitable for all SMT assembly and solder process. (适用于所有的SMT组装和焊接工艺)
- Available on tape and reel. (适用于载带及卷轴)
- Moisture sensitivity level: Level 4. (防潮等级 Level 4)
- Package:3000pcs/reel..(包装每卷3000PCS)
- RoHS compliant. (RoHS 认证)



Description (描述)

The White LED which was fabricated using a blue chip and the phosphor
白光LED由蓝光芯片与荧光粉激发而成



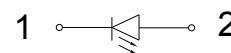
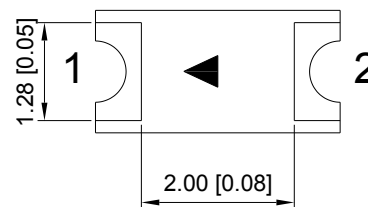
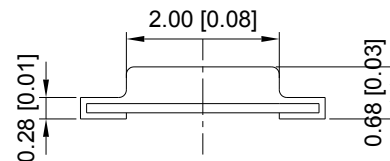
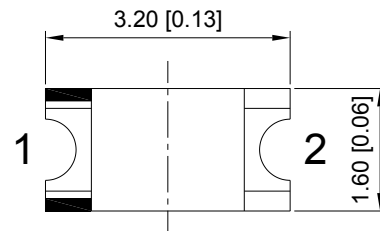
ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
DISCHARGE
SENSITIVE
DEVICES

注意：操作时应注意静电敏感
释放设备装置

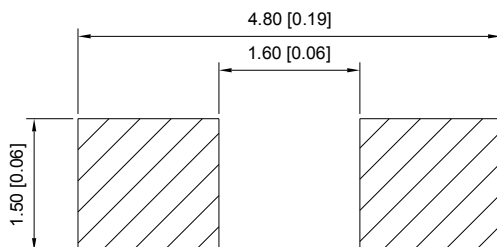
Applications (应用)

- Optical indicator (光学指示)
- Indoor display (室内显示)
- Backlight for LCD, switch and Symbol, display
(LCD背光、转换器，开关和标志，显示器等)
- General use (一般应用)

Package Dimensions (封装尺寸)



Recommended Soldering Pattern (建议焊盘尺寸图)



Notes: (备注)

1. Mark the size of the unit is mm.marked in brackets (标注尺寸单位为毫米,括号内标注为英寸)
2. All dimensions allow tolerance $\pm 0.1\text{mm}$ (所有尺寸允许公差 $\pm 0.1\text{mm}$)



HL-PC-3216H233W

Selection Guide (选择指南)

| Part No. 型号 | Dice | Lens Type 胶体类型 | Luminous intensity(mcd) 光强@ 20mA | | Viewing Angle 角度 |
|-----------------|------------------|-------------------|-------------------------------------|------|---------------------|
| | | | Min | Typ | 201/2 |
| HL-PC-3216H233W | White (InGaN) | Yellow Diffused | 1000 | 1300 | 140° |

Note:(备注)

- 1.The 201/2 measurement error ± 10 degrees(角度测试误差为 $\pm 10^\circ$)
2. the above luminous intensity measurement allowance tolerance $\pm 10\%$.
上述发光强度的测试允许公差为 $\pm 10\%$

Electrical / Optical Characteristics at Ta=25°C 电性与光学特性

| Parameter (参数) | Symbol (符号) | Min. (最小) | Typ. (平均) | Max. (最大) | Units (单位) | Test Conditions 测试条件 |
|--------------------------------|----------------|-----------|-----------|-----------|----------------|----------------------|
| Forward Voltage 正向电压 | V _F | 2.8 | -- | 3.4 | V | I _F =20mA |
| Reverse Current 反向电流 | I _R | -- | -- | 10 | μA | V _R = 5V |
| Color Coordinates 色度坐标 | X | -- | 0.31 | -- | -- | I _F =20mA |
| | Y | -- | 0.32 | -- | -- | I _F =20mA |
| Color Temperature 色温 | T _c | -- | 6500 | -- | K | I _F =20mA |
| Color Rendering Index 显色性指数 | CRI | 65 | -- | -- | R _a | I _F =20mA |

Absolute Maximum Ratings at Ta=25°C 绝对最大额定值

| Parameter (参数) | Symbol (符号) | Rating (值) | Units (单位) |
|------------------------------------|-----------------|------------|------------|
| Power Dissipation (功耗) | P _d | 102 | mW |
| Forward Current (正向电流) | I _F | 30 | mA |
| Peak Forward Current [1] (峰值正向电流) | I _{FP} | 100 | mA |
| Reverse Voltage (反向电压) | V _R | 5 | V |
| Electrostatic Discharge (HBM) (静电) | ESD | 1000 | V |
| Operating Temperature (操作温度) | Topr | -40 ~ +85 | °C |
| Storage Temperature (保存温度) | Tstg | -40 ~ +100 | °C |

Note: (备注)

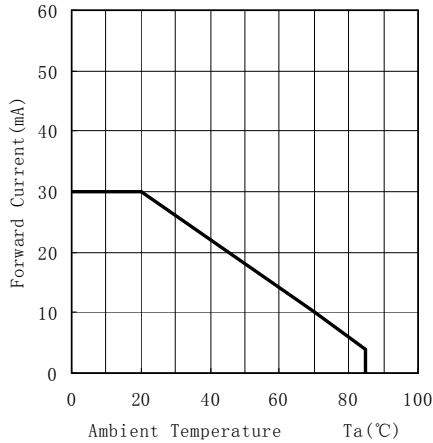
1. 1/10 Duty cycle, 0.1ms pulse width. (脉宽0.1ms,周期1/10)
2. The above forward voltage measurement allowance tolerance is $\pm 0.1V$. (以上所示电压测量误差 $\pm 0.1V$)
3. The above color coordinates measurement allowance tolerance is ± 0.003 . (以上所示坐标测量误差 ± 0.003)



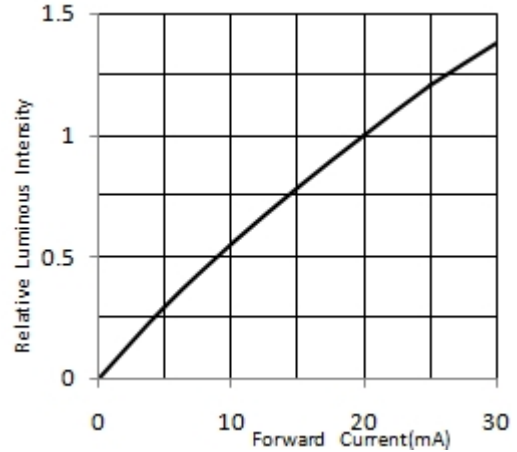
HL-PC-3216H233W

Typical optical characteristics curves 典型光学特性曲线

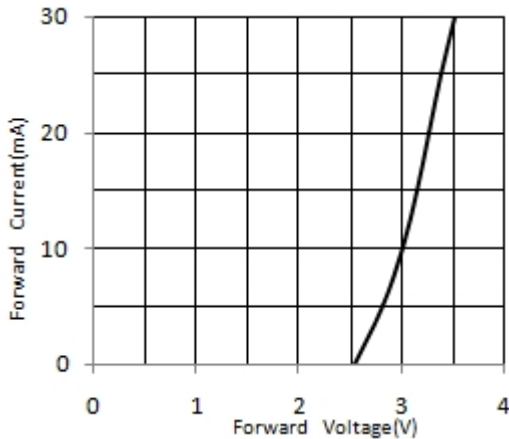
Ambient Temperature vs. Forward Current
环境温度与正向电流特性曲线



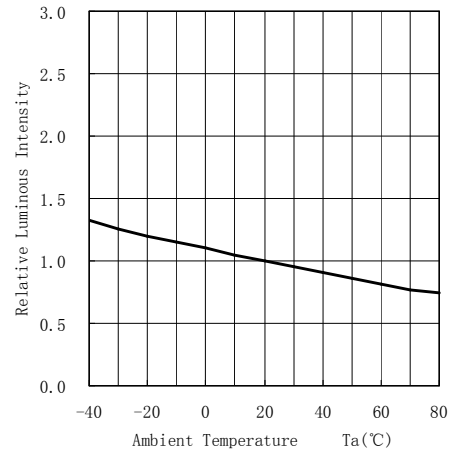
Forward Current VS. Relative Intensity
正向电流与相对光强特性曲线



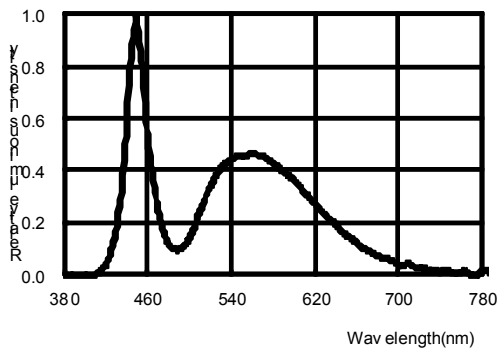
Forward Voltage VS. Forward Current
正向电压与正向电流特性曲线



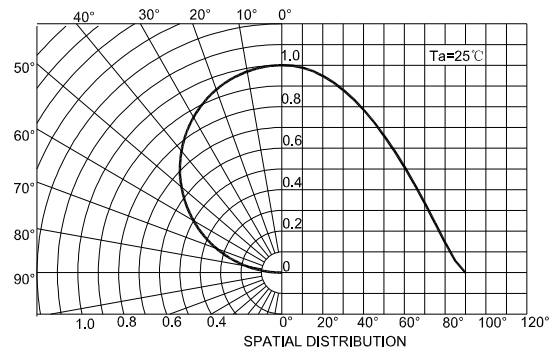
Ambient Temperature VS. Relative Intensity
环境温度与相对光强特性曲线



Relative spectral emission
相对光谱分布特性曲线

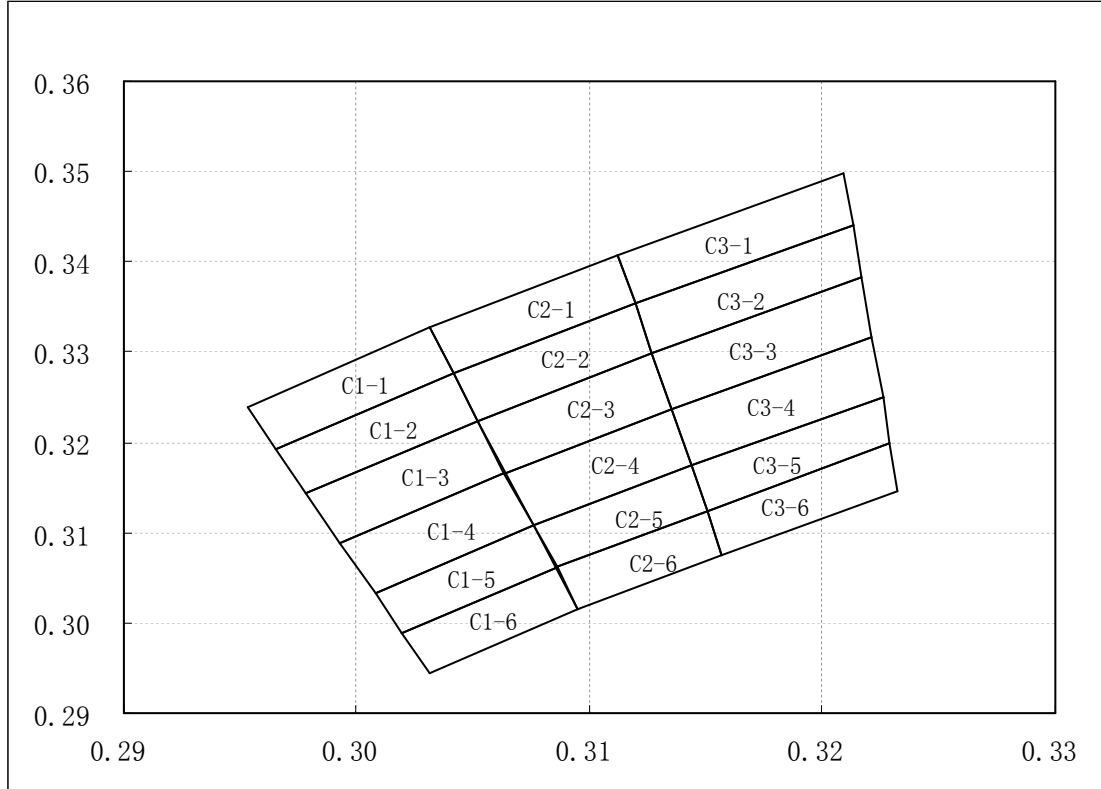


Radiation diagram
辐射图特性曲线





HL-PC-3216H233W



| | | | | | | | | | | | | | | |
|-----------------|--------|--------|--------|-----------------|---|--------|--------|-----------------|--------|---|--------|--------|--------|--------|
| C1-1 7000-7500K | | | | C1-2 7000-7500K | | | | C1-3 7000-7500K | | | | | | |
| x | 0.2953 | 0.3031 | 0.3042 | 0.2966 | x | 0.2966 | 0.3042 | 0.3052 | 0.2978 | x | 0.2978 | 0.3052 | 0.3064 | 0.2993 |
| y | 0.3240 | 0.3327 | 0.3276 | 0.3192 | y | 0.3192 | 0.3276 | 0.3224 | 0.3143 | y | 0.3143 | 0.3224 | 0.3166 | 0.3088 |
| C1-4 7000-7500K | | | | C1-5 7000-7500K | | | | C1-6 7000-7500K | | | | | | |
| x | 0.2993 | 0.3064 | 0.3076 | 0.3008 | x | 0.3008 | 0.3076 | 0.3086 | 0.3020 | x | 0.3020 | 0.3086 | 0.3095 | 0.3031 |
| y | 0.3088 | 0.3166 | 0.3108 | 0.3033 | y | 0.3033 | 0.3108 | 0.3062 | 0.2989 | y | 0.2989 | 0.3062 | 0.3015 | 0.2944 |
| C2-1 6500-7000K | | | | C2-2 6500-7000K | | | | C2-3 6500-7000K | | | | | | |
| x | 0.3031 | 0.3112 | 0.3120 | 0.3042 | x | 0.3042 | 0.3120 | 0.3127 | 0.3052 | x | 0.3052 | 0.3127 | 0.3136 | 0.3064 |
| y | 0.3327 | 0.3408 | 0.3354 | 0.3276 | y | 0.3276 | 0.3354 | 0.3299 | 0.3224 | y | 0.3224 | 0.3299 | 0.3237 | 0.3166 |
| C2-4 6500-7000K | | | | C2-5 6500-7000K | | | | C2-6 6500-7000K | | | | | | |
| x | 0.3064 | 0.3136 | 0.3144 | 0.3076 | x | 0.3076 | 0.3144 | 0.3151 | 0.3086 | x | 0.3086 | 0.3151 | 0.3157 | 0.3095 |
| y | 0.3166 | 0.3237 | 0.3174 | 0.3108 | y | 0.3108 | 0.3174 | 0.3124 | 0.3062 | y | 0.3062 | 0.3124 | 0.3074 | 0.3015 |
| C3-1 6000-6500K | | | | C3-2 6000-6500K | | | | C3-3 6000-6500K | | | | | | |
| x | 0.3112 | 0.3209 | 0.3213 | 0.3120 | x | 0.3120 | 0.3213 | 0.3217 | 0.3127 | x | 0.3127 | 0.3217 | 0.3221 | 0.3136 |
| y | 0.3408 | 0.3498 | 0.3440 | 0.3354 | y | 0.3354 | 0.3440 | 0.3382 | 0.3299 | y | 0.3299 | 0.3382 | 0.3317 | 0.3237 |
| C3-4 6000-6500K | | | | C3-5 6000-6500K | | | | C3-6 6000-6500K | | | | | | |
| x | 0.3136 | 0.3221 | 0.3226 | 0.3144 | x | 0.3144 | 0.3226 | 0.3229 | 0.3151 | x | 0.3151 | 0.3229 | 0.3232 | 0.3157 |
| y | 0.3237 | 0.3317 | 0.3251 | 0.3174 | y | 0.3174 | 0.3251 | 0.3198 | 0.3124 | y | 0.3124 | 0.3198 | 0.3145 | 0.3074 |



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Reliability Test Items And Conditions 信赖性测试项目及条件

| Test Items 项目 | Ref.Standard 参考标准 | Test Condition 测试条件 | Time 时间 | Quantity 数量 | Ac/Re 接收/拒收 |
|---|----------------------|---|------------|----------------|----------------|
| Reflow 回流焊 | JESD22-B106 | Temp:260°Cmax T=10 sec | 3 times. | 22Pcs. | 0/1 |
| Temperature Cycle 温度循环 | JESD22-A104 | 100°C±5°C 30 min. ↑↓5 min -40°C±5°C 30 min. | 100 Cycles | 22Pcs. | 0/1 |
| High Temperature Storage 高温保存 | JESD22-A103 | Temp:100°C±5°C | 1000Hrs. | 22Pcs. | 0/1 |
| Low Temperature Storage 低温保存 | JESD22-A119 | Temp:-40°C±5°C | 1000Hrs. | 22Pcs. | 0/1 |
| Life Test 常温通电 | JESD22-A108 | Ta=25°C±5°C IF=20mA | 1000Hrs. | 22Pcs. | 0/1 |
| High Temperature High Humidity 高温高湿保存 | JESD22-A101 | 85°C±5°C/ 85%RH | 1000Hrs. | 22Pcs. | 0/1 |

Criteria For Judging Damage 失效判定标准

| Test Items 项目 | Symbol 符号 | Test Condition 测试条件 | Criteria For Judgement 判定标准 | |
|-------------------------|--------------|------------------------|--------------------------------|-------------|
| | | | Min. 最小 | Max. 最大 |
| Forward Voltage 正向电压 | VF | IF=20mA | -- | U.S.L*)x1.1 |
| Reverse Current 反向电流 | IR | VR = 5V | -- | U.S.L*)x2.0 |
| Luminous Flux 光通量 | Im | IF=20mA | L.S.L*)x0.7 | -- |

U.S.L: Upper standard level 规格上限

L.S.L: Lower standard level 规格下限

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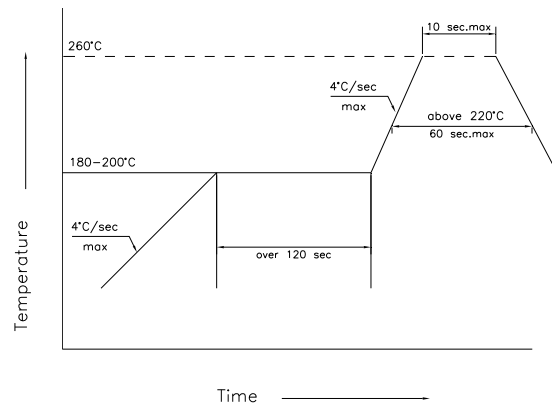


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SMT Reflow Soldering Instructions SMT回流焊说明

- 1.Reflow soldering should not be done more than two times. 回流焊不可以做两次以上
- 2.When soldering , do not put stress on the LEDs during heating

当焊接时，不要在材料受热时用力压胶体表面



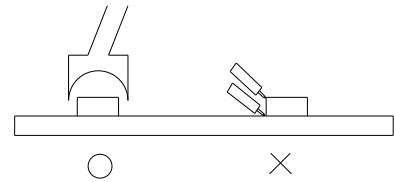
Soldering iron 烙铁焊接

- 1.When hand soldering, keep the temperature of iron below less 300°C less than 3 seconds
当手工焊接时，烙铁的温度必须小于300°C，时间不可超过3秒
- 2.The hand solder should be done only one times
手工焊接只可焊接一次

Repairing 修补

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed in advance whether the characteristics of LEDs will or will not be damaged by repairing.

LED回流焊后不应该修复，当修复是不可避免时，必须使用双头烙铁（如下图），但必须事先确认此种方式会或不会损坏LED本身的特性。



Cautions 注意事项

The encapsulated material of the LEDs is silicone. Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when use the picking up nozzle, the pressure on the silicone resin should be proper.

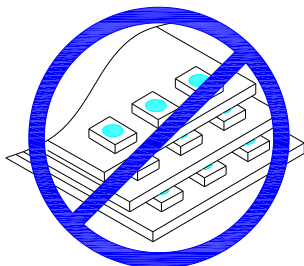
LED封装为硅胶，故LED胶体表面较软，用力按压胶体表面会影响LED可靠性，因此应有预防措施避免在封装的零件上的强大压力，当使用吸嘴时，胶体表面的压力应是恰当的。

- 3.Do not stack together assembled PCBs containing LEDs. Impact may scratch the silicone lens or damage the internal circuitry

不可将模组材料堆积在一起，它可能会损坏内部电路

- 4.Not suitable to operate in acidic environment, PH<7

不可用在PH<7的酸性场所





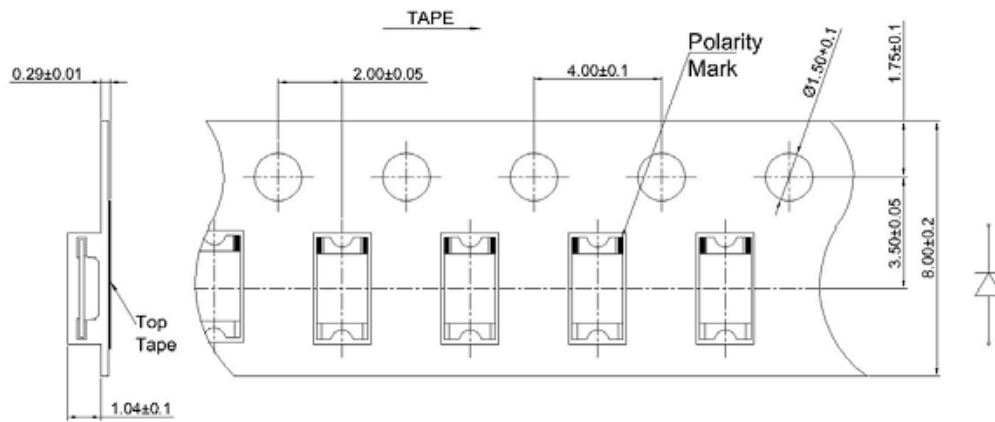
HL-PC-3216H233W

Label 标签

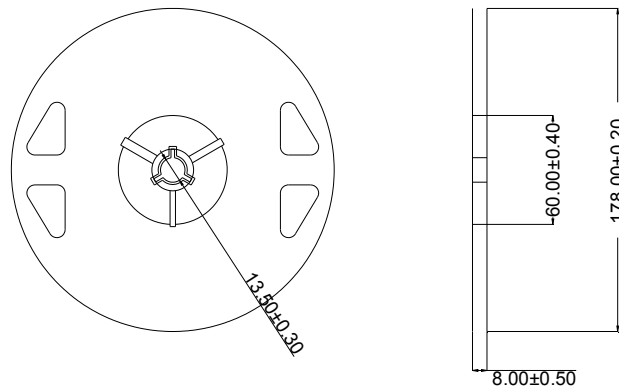
IV: Luminous intensity rank 亮度等级
VF: Forward voltage rank 电压等级
X/Y: Coordinate rank 色坐标



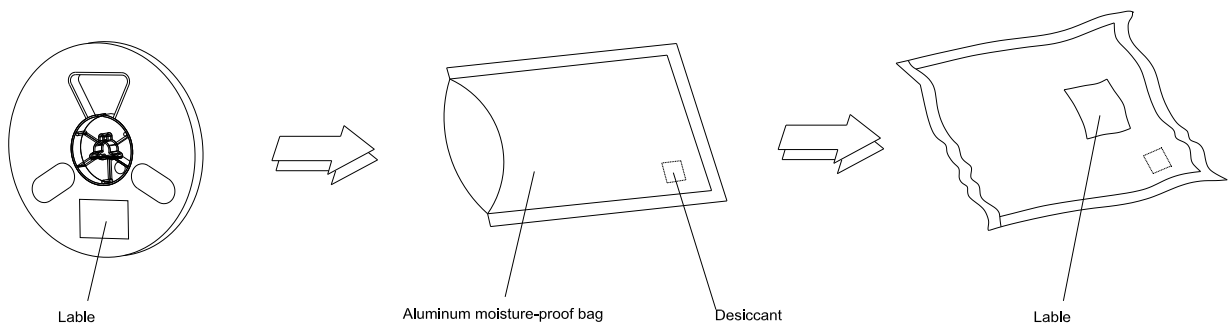
Tape Specifications (Units : mm) 载带规格 (单位: mm)



Reel Dimensions 卷轴尺寸



Moisture Resistant Packaging 防潮带包装



Note: The tolerances unless mentioned is ±0.1mm, Unit: mm 注: 标注公差为±0.1mm, 单位: mm