产品目录
Product Catalogue

CITIZEN

CITILED & OPTICAL SENSOR

小型芯片LED，高灵敏度光感应器

Compact Chip LED & High-sensitivity Optical Sensor

西铁城电子的先进设备，为产品的小型化、薄型化、及高性能化提供强有力的支撑。

Our advanced devices support downsizing, thinning and high performance of application products.

手表的开发中所积累的独自的精密加工技术经过不断地进化，已经完全转化到高附加值的电子设备中。丰富多样的产品阵容，完全可以满足各种不同的应用需求。

High value added electronic devices have succeeded, based on the progress of our unique precision machining technologies cultivated in developing wrist watches. We offer a wide lineup of products to satisfy highly advanced applications.

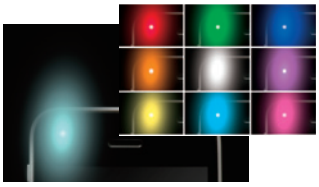
Introduction
CITILED
Technical note
Multi-color LED
High brightness white LED
General color LED
Flash LED
OPICAL SENSOR
Technical note
Infrared chip LED
Chip photo-transistor
Photo-reflector
ASSEMBLIES

CITILED® 小型芯片 LED Compact Chip LED

全部的产品都能支持SMD（表面贴装）贴装。通过全自动化的贴装来帮助客户降低成本。小型、高品质、高性能的产品阵容，可满足多种多样的不同需求。

All products are applicable for the SMD (Surface Mount Device) type. Automated mounting contributes significantly to cost reduction. Our compact, high-quality and high-performance lineup supports various needs.

多色LED Multi-color LED



单个封装内搭载R、G、B3种元件。可应用于指示灯（状态显示）、照明、徽标灯光等各种用途。

Three elements, R, G and B, are mounted in a single package. This product is for applications such as indicators, illumination and logo illumination.

CL-340　CL-505S　CL-503

高亮度白色LED High Brightness White LED

适合于通讯设备等LCD背光光源，是一种高亮度、薄型的封装产品。可与导光板组装使用。

Has high-brightness and thin packages that are suited for the light source of LCD backlights used in communication devices. This product can be used with a light guide.

CL-482T　CL-A100

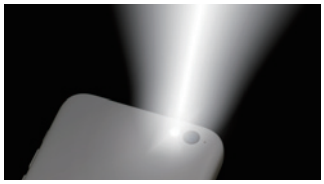
普通颜色LED（单色） General Color LED (Mono-color Type)

超小型，而且产品尺寸丰富多样。有正面发光型，也有侧部发光型，可根据用途选择使用。

Has remarkable compactness and is available in many sizes. Select upward- and side-lighting depending on your application.

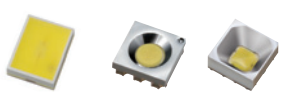
CL-194　CL-260

闪光灯LED CITILIGHT® Flash LED CITILIGHT®



内置于智能手机或者普通手机中，在暗处拍摄时用于照射拍摄物。可以驱动脉冲亮灯与一直亮灯。

Equipped in smart phones and cell phones to illuminate the subject when shooting in the dark. Both pulse lighting and full-time lighting can be selected.



CL-770S　CL-597S　CL-690

OPTICAL SENSOR 高灵敏度光感应器
High-sensitivity Optical Sensor

采用红外线发光元件(红外LED)及受光元件(光电晶体管、光电二极管)制成的高灵敏度光感应器。广泛应用于摄像机镜头的位置检测、设备间的通讯、穿戴设备的生物体检测及生物体验证等不同的领域。

High-sensitivity optical sensor uses an infrared light emitting element (infrared LED) and a light receiving element (phototransistor, photodiode). This product is used in a wide variety of applications such as detecting the camera lens position, communicating between devices, and somatometry and biometric authentication with wearable devices.

红外芯片LED
Infrared Chip LED

搭载红外发光二极管。可应用于光学通讯的信号发送中。

An infrared light emitting diode is equipped. This product can be used as a transmission part in optical communication.

CL-170IR-X

芯片型光电晶体管
Chip Photo-transistor

可应用于汽车的无线遥控门锁、以及DVD播放机的磁盘位置检测等各种广泛的领域。

Can be used in a wide variety of applications such as vehicle keyless entry and disk position detection of DVD players.

CPT-230

CPT-290

光反射器
Photo-Reflector

红外线的发光元件与受光元件同时搭载于单个封装中。可用于采用反射光的位置检测或者生物体检测。

Both an infrared light emitting element and a light receiving element are equipped in a single package. This product can be used for position detection and biometry by detecting reflected light.

PR-30

PR-40

ASSEMBLIES 组装产品
Assembly Products

融合了光学设计、精密模具以及注射成型等尖端技术。采用西铁城电子的LED制造而成,主要应用于背光单元。

The optical design, precision die and injection molding technology have been sophisticatedly combined. We primarily provide backlight units that utilize our LED.

液晶背光单元
LCD Backlight Unit

超薄型・圆状小型
Ultra-thin, round, and compact type

车载用(7英寸)
On-vehicle type (7 in.)

车载用(12英寸)
On-vehicle type (12 in.)

Contents

光的基础知识 Basic Knowledge of Light

LED作为显示或照明光源，已经越来越多地被应用于各种不同的机器或设备中。它的光与色彩具有基本属性以及各种不同的基准与条件。在此，对一些关键的要点进行说明，对选择LED产品会有一定的帮助。

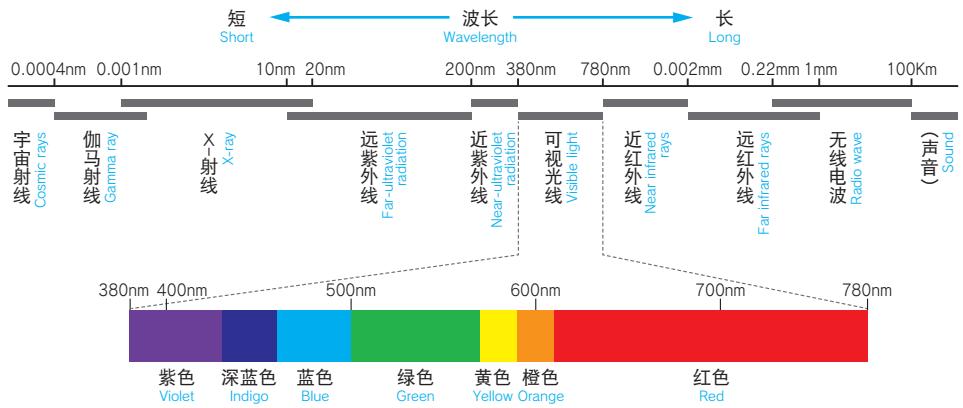
LEDs in apparatuses and devices are used as a light source for indication and illumination. The light and color are explained with various standards, conditions and more. This section introduces useful tips for selecting LED products.

光与三原色 Light and three primary colors

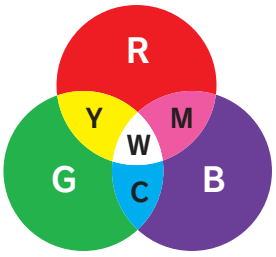
人们肉眼可看见的光是波长为380nm～780nm的电磁波，被称为“可视光线”。
可视光线通常是呈白色的无色光，但是通过棱镜观看太阳光时，我们会看到无数的如彩虹般的色带（光谱）。这个现象证明了一个道理，就是“无数的颜色聚集在一起，会汇聚成白色状的无色光”。
在无数的颜色中，红（R）、绿（G）、蓝（B）3种颜色被称为“光的三原色”。通过混合并调节RGB的比率，几乎可以制造出所有颜色的光。

The light we see is electromagnetic waves with wavelengths from 380 nm to 780 nm, which is called visible light.
This light normally looks whitish but decomposes into myriad color bands like a rainbow when sunlight is seen through a prism. This phenomenon indicates that myriad colors come together and constitute a whitish colorless light.
Among the myriad colors, red (R), green (G) and blue (B) are called the primary colors of light. Almost all light colors can be created by adjusting the mixture ratio of R, G and B.

■电磁波的波长与可视光线的光谱
Wavelength of electromagnetic waves and visible light spectrum



■光的三原色
Primary light colors



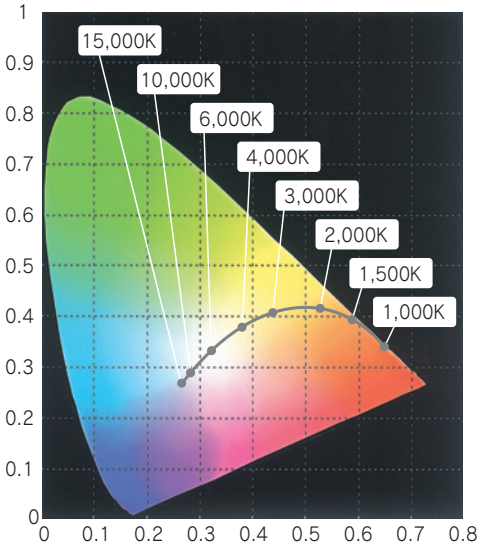
R+G=Y
G+B=C
B+R=M
R+G+B=W

光的颜色的数值化（色温） Quantification of light color (color temperature)

物体（黑色）的温度上升时会释放出光线，其颜色随着温度的上升会从红→黄→白→蓝→白依次变化。这种利用颜色的变化与温度之间的关系，使用温度来表达光的颜色被称为色温。单位使用“绝对温度”K（凯文）。人们主观地表现光的颜色时，同样的颜色在不同的人看来会有微妙的不同，通过使用色温这个基准，可以从物理上客观地表现各种不同的颜色。

When the temperature of a black body increases, it emits light and the color changes, red → yellow → white → blue → white, with the temperature rise. The color temperature is defined as the light color indicated with temperature by utilizing the relationship between the color change and temperature mentioned above. The absolute temperature K (Kelvin) is used for the color temperature unit. When people subjectively express the color of light, subtle differences exist depending on the person, even if it is the same color. When the standard called color temperature is used, each color can be physically and objectively expressed, which is an advantage.

■色度图与色温
Chromaticity diagram and color temperature



颜色的视觉效果(显色性) Color rendering index

光源发生变化时,相同颜色的视觉效果不相同。这种光源变化会影响颜色的视觉效果的性质,被称为显色性。当颜色效果与自然光(太阳光)下所呈现的颜色相近时,表示该光源的显色性良好。
在日本,显色性的程度由JIS根据CIE(国际照明委员会)的评价法进行判定。具体做法是,使用标准光源与样品光源,分别对15种试验颜色进行照射,其视觉效果的差表示为"特殊显色指数(R1)、(R2)、…(R8)"(例如,第1个的测试颜色与标准光源的效果相同时,则R1=100)。这样,R1～R8的平均值就是"平均显色指数(Ra)",一般情况下,当平均显色指数(Ra)达到80(Ra80)以上时,表示其显色性良好。
显色性因光源而异的原因在于光源中所含的光的波长各不相同。这个通过比较光源的光谱分布*就会明白。例如,自然光(太阳光)的各种波长均处于可视光区域内(380nm～780nm),波长比较均匀,而白色荧光灯所含的光的波长的分布状态极不均匀。因此,当光谱分布越接近自然光时,其颜色效果也越接近自然光,其显色性就越好。

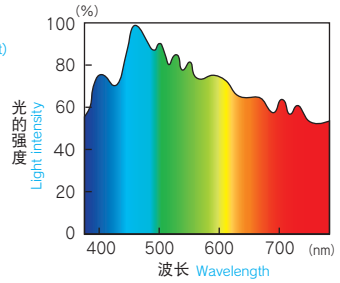
＊ 光谱分布是指将光源中所含的光按照波长进行分割后,使用分布图来表现各自的光能量。

If light sources are different, the same color may look different; where a light source affects the color appearance is called color rendering. When the color appearance is closer to the color under natural light (sunlight), the light source is better at color rendering.
In Japan, the color rendering level is determined by JIS in accordance with the CIE (International Commission on Illumination) evaluation method. Specifically, 15 test colors are lit by the reference light source and sample light source respectively. The differences in the appearance of the colors are expressed with special color rendering indices, (R1), (R2), ... and (R8). If the appearance of the 1st test color is the same as that of the reference light source, it is concluded as "R1 = 100." The averaged value obtained from R1 to R8 as above is the average color rendering index (Ra); if this index value is 80 (Ra 80) or more, the color rendering is good in general.
Color rendering differs depending on the light source because light wavelengths differ from each other, which can be understood by comparing spectral distributions* of light sources. For example, natural light (sunlight) includes lights with different wavelengths within the visible light region (380 nm to 780 nm) in a nearly uniform fashion, but the distribution of light wavelengths included in a white fluorescent light is uneven. The closer that a light source is to the spectral distribution of natural light, the closer the color appearance is to the appearance of natural light and the better the color rendering.

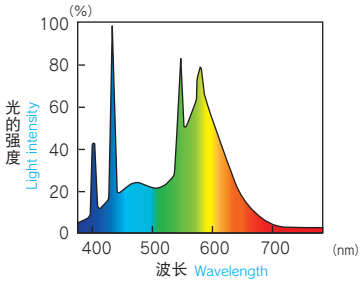
＊ Spectral distribution is a distribution chart, which is made by dividing light included in a light source by wavelength and indicating the energy amount of the light in each wavelength.

■光谱分布 Spectral distribution

● 自然光（日光）
Natural light (Sunlight)



● 白色荧光灯
Fluorescent light



白色LED中的颜色混合属性 Color mixing property of white LED

关于白色LED的白色光的制法,有几种不同的方式。一种是组合红色、绿色与蓝色LED的方式。这种方式需要解决良好显色性的成本及发光效率等方面的课题。因此,一般采用发光效率高的蓝色LED与黄色荧光体组合的方式。只不过,这种方式的发光色为模拟白色,难以获得良好的显色性。此外,还有近紫外线LED与蓝色、红色及绿色荧光体组合的方式,这种方式需要解决亮度等方面的课题。
西铁城电子采用蓝色LED与红色荧光体及绿色荧光体发光的方式。这种方式不仅解决了成本与发光效率方面的难题,而且红(R)绿(G)蓝(B)的色差小,白色光的纯度高,可获得良好的显色性。

Different methods can create the white light of a white LED. One is combining red, green and blue LEDs, which is good for color rendering but still problematic for the cost and luminous efficiency. Therefore, combining a blue LED with a yellow phosphor is often used, which has high luminous efficiency and can be readily obtained. The luminescent color obtained with this method, however, is pseudo-white and has difficulty obtaining high color rendering. Other methods can combine a near-ultraviolet LED with a blue, red or green phosphor, but these methods have problems with brightness.
Citizen Electronics uses a blue LED to make a red phosphor and a blue phosphor emit light. This solves the problems of cost and efficiency while also obtaining high color rendering with less unevenness among R, G, and B providing a clean white light.

■白色LED的制造方法 How to produce white LEDs

①蓝色LED＋绿色LED＋红色LED
Blue LEDs + Red LEDs + Green LEDs

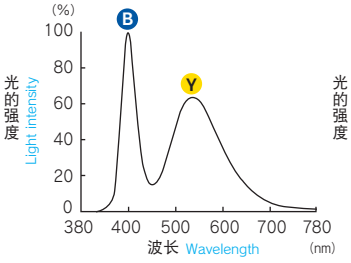
②蓝色LED＋黄色荧光体
Blue LEDs + Yellow phosphors

③蓝色LED＋红色・绿色荧光体
Blue LEDs + Red phosphors + Green phosphors

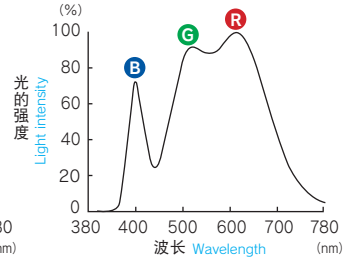
④近紫外LED＋红色・绿色・蓝色荧光体
Near-ultraviolet LEDs + Red phosphors + Green phosphors + Blue phosphors

■白色LED的光谱分布 Spectral distribution of white LEDs

● 普通的白色LED
(蓝色LED＋黄色荧光体)
General white LEDs (Blue LEDs + Yellow phosphors)



● 高显色的白色LED
(蓝色LED＋红色・绿色荧光体)
High CRI white LEDs (Blue LEDs + Red phosphors + Green phosphors)



Technical note

特征 Features

1. 全部的产品都是SMD(表面贴装器件)型。可以使用高贴装率的贴片机，实现自动贴装。
2. 从标准型到极小型、超小型，不同大小的产品阵容丰富多样。支持高密度贴装。
3. 亮度方面，全部的产品都备有标准型、高亮度型以及超高亮度型等不同的类型
4. 可使用回流焊接。
5. 无铅，符合RoHS指令
6. 支持批量或者编带方式交货，也支持组装到基板之后的单元形式的交货。

1. All products are SMD (Surface Mount Device). Auto-mount is enabled by a chip mounter which provides a high attachment rate.
2. A wide variety of selections from standard to minimal and ultra-compact are available. High density mounting is achieved.
3. Standard brightness, high brightness and ultra-high brightness are available for all products.
4. Reflow soldering is available.
5. Lead free, compliant with RoHS directive
6. Bulk, taped and even delivery of a unit assembled on a substrate are supported.

产品代码 Product Nomenclature

（例）闪光灯LED“CITILIGHT” (E.g.) Flash LED “CITILIGHT”

CL-690S-2 WN-C D-T

CITILED通用编号
CITILED common number

系列名
Series

元件数量
Quantity of elements
2:2个 2 pieces

发光色
Lighting color
WN:超高亮度白色 Ultra-high brightness white

树脂色
Resin color
C:着色(标准品) Coloration (standard product)

散射
Scattering
D:含散射剂(标准品) Dispersing agent included (standard product)

供货方式
Delivery style
T:编带 Taping

(注)“系列名”及“发光色”的位数可能会不一样。
Note: "Series" and "Luminescent color" may have different number of digits.

供货方式 Delivery

产品以编带的方式交货。编带的规格因产品而异(详情请向本公司求取详细规格表予以确认)。

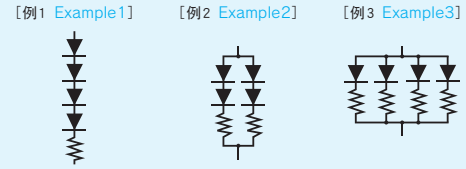
The products are delivered taped. Taping specifications differ depending on the product. (For more information, please ask for the specification sheets.)

设计上的注意点 Design cautions

1. 设计时，电路中请务必连接限流电阻，使其在额定值以内驱动。
2. 使用脉冲驱动时，平均电流值必须设计在额定值之内。此外，LED熄灯时，不能施加反向电压。
3. 使用多个LED时，必须对流向LED的各个电流设置限流电阻，避免各个LED之间产生电流差。

1. Design the system to drive it within the rating by connecting a power supply limiting resistance.
2. Design the system to set the average current value within the rating when using the system by pulse drive. Prevent a reverse voltage from being applied when LEDs are inactive.
3. When multiple LEDs are used, mount a current limiting resistance in each current path flowing to an LED to eliminate current difference among the LEDs.

设计示例 Design example



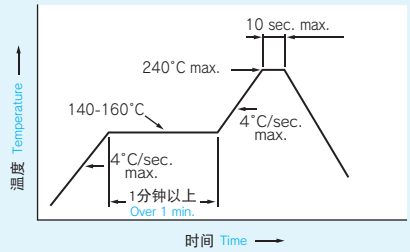
焊接的推荐条件 Recommended soldering

[回流焊接] Reflow soldering

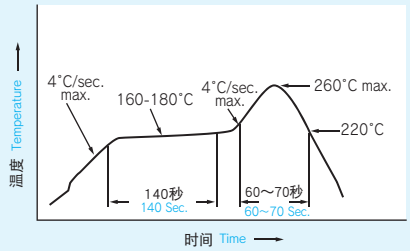
贴装时的回流焊接温度分布图如下所示。关于对具体产品的支持详情，请事先咨询本公司。

Refer to the following diagram for the temperature profile for reflow soldering at mounting. We recommend consulting us in advance for individual products.

推荐"回流焊接温度分布图"
Recommendable "profile for reflow soldering"



推荐"无铅回流焊接分布图"
Recommendable "profile for lead-free reflow soldering"



[手工焊接] Manual soldering

电烙铁的温度控制在350℃以下，各个环节均需在3秒之内完成。

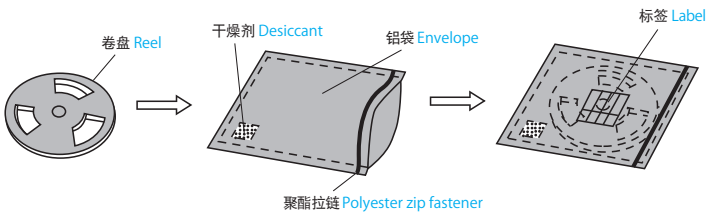
Keep the temperature of the soldering iron tip at 350°C or less and solder within 3 seconds for each round.

包装规格 Packing

[防湿包装] Moisture-proof packaging

为了防止运输途中或者保管期间遭受潮湿，使用内含干燥剂(硅胶)的铝材进行防湿包装。硅胶从绿色变为粉色时，表示吸潮已经到相当程度，请务必注意。

Moisture-proof packaging uses an aluminum bag including a desiccant (silica gel) to protect the product from moisture during shipment and storage. Be aware that the silica gel changing from green to pink is due to moisture absorption.



＊上述之外的详情，请向本公司求取详细规格表后予以确认。
For details of other than the above, please inquire for each specification sheet.

CL-505S Series

1.0(L)×
1.0(W)×0.26(H)mm

特征 Features

1. 同一封装内3色发光
   3 colors emitting from a single package
2. 正面发光，超小型・薄型
   Upward-lighting, ultra-compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

系列 Series	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-505S	红色 Red	125	78	30	100*2	4	−25～+80	−30～+85
	绿色 Green		76	20				
	蓝色 Blue		72	20				

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

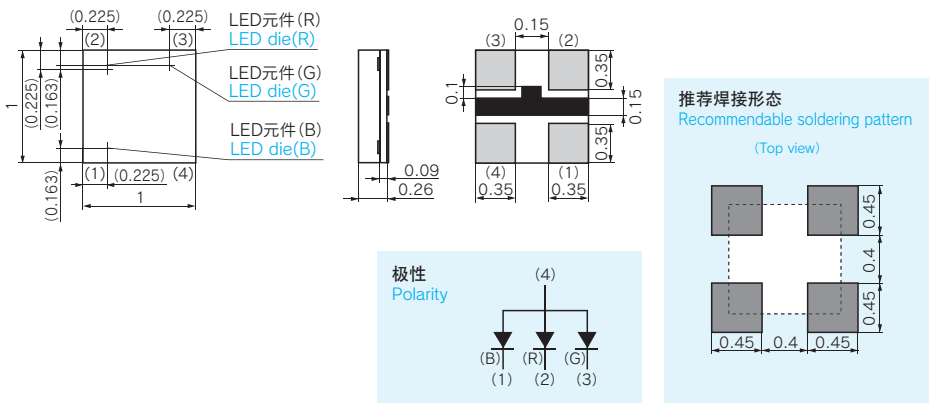
(Ta 25℃)

参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=5mA	1.36	1.85	2.47	V
	绿色 Green			2.33	2.70	3.19	
	蓝色 Blue			2.33	2.75	3.19	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	100	μA
	绿色 Green			—	—	2	
	蓝色 Blue			—	—	2	
光强 Luminous Intensity*	红色 Red	Iv	IF=5mA	23	40	—	mcd
	绿色 Green			91	220	—	
	蓝色 Blue			36	65	—	
主波长 Dominant Wavelength	红色 Red	λd	IF=5mA	601	618	629	nm
	绿色 Green			516	530	540	
	蓝色 Blue			461	470	479	

＊ 符合NIST标准 ＊ Compliant with NIST standards

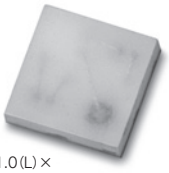
●外形尺寸图 Outline drawing

单位 Unit：mm



包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

CL-505S Series RGW



1.0(L)×
1.0(W)×0.26(H)mm

特征 Features

1. 同一封装内3色发光
   3 colors emitting from a single package

2. 正面发光，超小型・薄型
   Upward-lighting, ultra-compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

系列 Series	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-505S-RGW	红色 Red	125	78	30	100*2	4	−25～+80	−30～+85
	绿色 Green		76	20				
	白色 White		72	20				

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

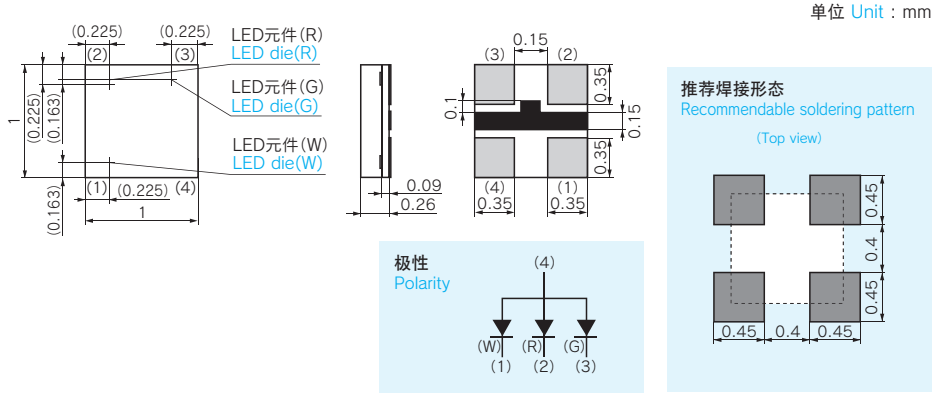
参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=5mA	1.36	1.85	2.47	V
	绿色 Green			2.33	2.7	3.19	
	白色 White			2.33	2.75	3.19	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	100	μA
	绿色 Green			—	—	2	
	白色 White			—	—	2	
光强 Luminous Intensity*1	红色 Red	Iv	IF=5mA	23	40	110	mcd
	绿色 Green			91	220	468	
	白色 White			82	220	396	
主波长 Dominant Wavelength	红色 Red	λd	IF=5mA	601	618	629	nm
	绿色 Green			516	530	539	
	白色 White			—	—	—	

色度坐标 Chromaticity coordinates*2	x, y	IF=5mA		x(±0.02)	y(±0.02)
			a	0.205	0.118
			b	0.205	0.216
			c	0.285	0.330
			d	0.285	0.232

＊1 符合NIST标准／＊2 色度坐标是a、b、c、d所围合的范围。
＊1 Compliant with NIST standards／＊2 Chromaticity coordinates are surrounded by points a, b, c, and d.

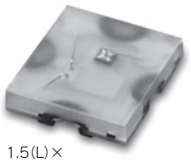
●外形尺寸图 Outline drawing

单位 Unit：mm



包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

CL-503 Series



1.5(L)×
1.3(W)×0.35(H)mm

特征 Features

1. 同一封装内3色发光
   3 colors emitting from a single package
2. 正面发光，超小型・薄型
   Upward-lighting, ultra-compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-503S-TCC	红色 Red	125	78	30	100*2	4	-25~+80	-30~+85
	绿色 Green		80	20				
	蓝色 Blue		73	20				

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-503T	红色 Red	125	78	30	100*2	4	-25~+80	-30~+85
	绿色 Green		76	20				
	蓝色 Blue		72	20				

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

[CL-503S-TCC] (Ta 25℃)

参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=5mA	—	1.85	2.47	V
	绿色 Green			—	2.70	3.19	
	蓝色 Blue			—	2.75	3.19	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	100	μA
	绿色 Green			—	—	2	
	蓝色 Blue			—	—	2	
光强 Luminous Intensity*	红色 Red	Iv	IF=5mA	17	33	—	mcd
	绿色 Green			82	220	—	
	蓝色 Blue			18	65	—	
主波长 Dominant Wavelength	红色 Red	λd	IF=5mA	—	618	—	nm
	绿色 Green			—	530	—	
	蓝色 Blue			—	470	—	

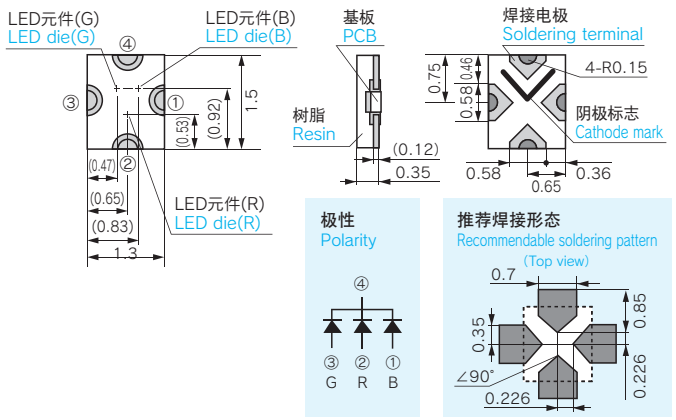
[CL-503T] (Ta 25℃)

参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=5mA	1.36	1.85	2.47	V
	绿色 Green			2.33	2.70	3.19	
	蓝色 Blue			2.33	2.75	3.19	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	100	μA
	绿色 Green			—	—	2	
	蓝色 Blue			—	—	2	
光强 Luminous Intensity*	红色 Red	Iv	IF=5mA	16	36	79	mcd
	绿色 Green			55	180	330	
	蓝色 Blue			11	40	88	
主波长 Dominant Wavelength	红色 Red	λd	IF=5mA	603	618	642	nm
	绿色 Green			518	530	542	
	蓝色 Blue			461	470	477	

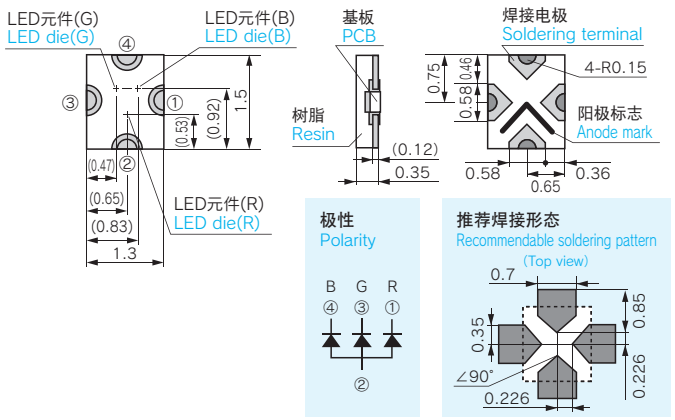
＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

CL-503S-TCC 单位 Unit：mm



CL-503T 单位 Unit：mm



包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

CL-341 Series

2.0(L)×
1.6(W)×0.75(H)mm

特征 Features

1. 同一封装内3色发光
   3 colors emitting from a single package
2. 正面发光，小型・高输出
   Upward-lighting, compact/high output type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

系列 Series	Color variation	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-341	红色 Red	52	20	100*	4	−25～+85	−30～+100
	绿色 Green	74	20				
	蓝色 Blue	74	20				

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

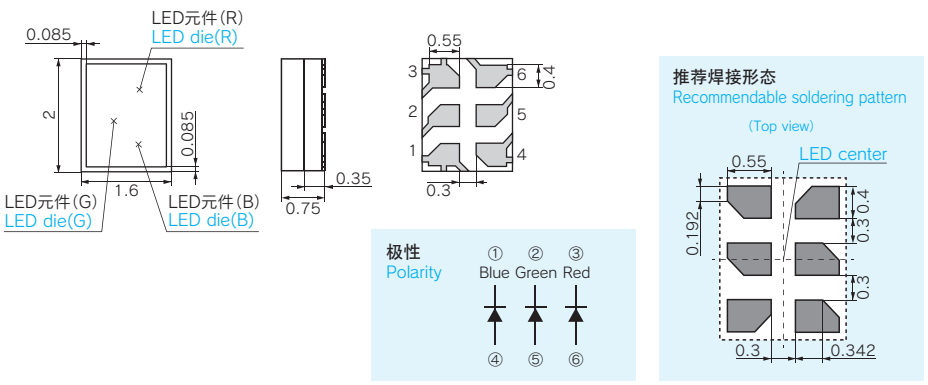
(Ta 25℃)

参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=20mA	1.75	—	2.68	V
	绿色 Green			2.72	—	3.81	
	蓝色 Blue			2.76	—	3.81	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	(10)	μA
	绿色 Green			—	—	(10)	
	蓝色 Blue			—	—	(10)	
光强 Luminous Intensity*	红色 Red	Iv	IF=20mA	—	820	—	mcd
	绿色 Green			—	2140	—	
	蓝色 Blue			—	325	—	
主波长 Dominant Wavelength	红色 Red	λd	IF=20mA	619	624	629	nm
	绿色 Green			520	528	535	
	蓝色 Blue			455	460	465	

＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

单位 Unit：mm



包装数量：2,500个/卷（φ180mm） Loaded quantity:2,500pcs./1 reel(φ180mm)

多色LED Multi-color LED

CL-340 Series

1.7(L)×
1.4(W)×0.35(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-340T	红色 Red	125	78	30	100*2	4	−25～+80	−30～+85
	绿色 Green		76	20				
	蓝色 Blue		72	20				

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

产品代码 Product code	Color variation	VF			λd typ (nm)	Iv*		
		IF (mA)	typ (V)	max (V)		IF (mA)	min (mcd)	typ (mcd)
CL-340T	红色 Red	5	1.85	2.47	618	5	16	30
	绿色 Green	5	2.7	3.19	530	5	55	180
	蓝色 Blue	5	2.75	3.19	470	5	11	40

＊ 符合NIST标准 ＊ Compliant with NIST standards

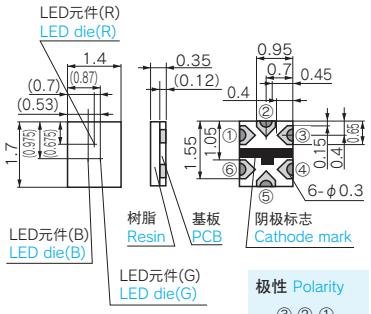
包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

1. 同一封装内3色发光
   3 colors emitting from a single package
2. 正面发光，小型・薄型
   Upward-lighting, compact/thin type

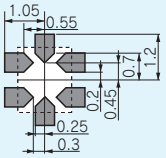
●外形尺寸图 Outline drawing

单位 Unit：mm



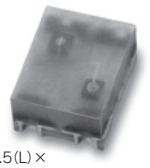
极性 Polarity

推荐焊接形态
Recommendable soldering pattern
(Top view)



多色LED Multi-color LED

CL-165 Series



1.5(L)×
1.2(W)×0.7(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-165HR/YG	黄绿色 Yellow green	90	65	25	100*2	4	−25～+80	−30～+85
	红色 Red		78	30				

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

产品代码 Product code	Color variation	VF			λd typ (nm)	λp typ (nm)	Iv*		
		IF (mA)	typ (V)	max (V)			IF (mA)	min (mcd)	typ (mcd)
CL-165HR/YG	黄绿色 Yellow green	20	2.2	2.63	575	—	20	4.8	18
	红色 Red	20	1.8	2.63	—	655	20	5.0	23

＊ 符合NIST标准 ＊ Compliant with NIST standards

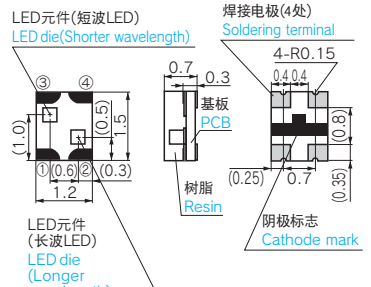
包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

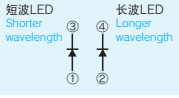
1. 同一封装内2色发光
   2 colors emitting from a single package
2. 正面发光，小型・薄型
   Upward-lighting, compact/thin type

●外形尺寸图 Outline drawing

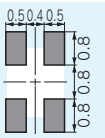
单位 Unit：mm



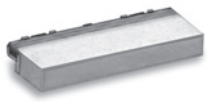
极性 Polarity



推荐焊接形态
Recommendable soldering pattern
(Top view)



CL-426 Series



2.8(L)×
0.85(W)×0.35(H)mm

特征 Features

1. 同一封装内3色发光
   3 colors emitting from a single package

2. 侧面发光，小型・超薄型
   Side-lighting, compact/ultra-thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-426F-AA	红色 Red	125	54	20	100*2	4	−25~+80	−30~+85
	绿色 Green		69					
	蓝色 Blue		70					

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-426F-AACC	红色 Red	125	(54)	20	100*2	4	−25~+80	−30~+85
	绿色 Green		(69)					
	蓝色 Blue		(70)					

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

[CL-426F-AA] (Ta 25℃)

参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=5mA	1.36	2.0	2.47	V
	绿色 Green			2.33	2.7	3.19	
	蓝色 Blue			2.38	2.8	3.24	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	100	μA
	绿色 Green			—	—	2	
	蓝色 Blue			—	—	2	
光强 Luminous Intensity*	红色 Red	Iv	IF=5mA	81	160	—	mcd
	绿色 Green			113	250	—	
	蓝色 Blue			23	52	—	
主波长 Dominant Wavelength	红色 Red	λd	IF=5mA	624	628	637	nm
	绿色 Green			518	530	542	
	蓝色 Blue			461	470	479	

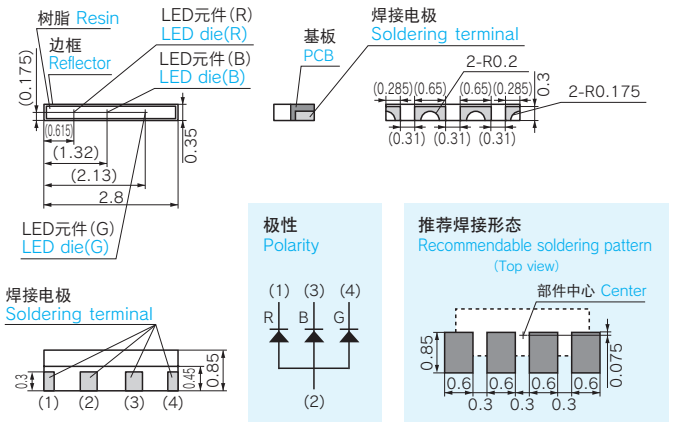
[CL-426F-AACC] (Ta 25℃)

参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=5mA	(1.36)	(2.0)	(2.47)	V
	绿色 Green			(2.33)	(2.7)	(3.19)	
	蓝色 Blue			(2.33)	(2.8)	(3.3)	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	(2)	μA
	绿色 Green			—	—	(2)	
	蓝色 Blue			—	—	(2)	
光强 Luminous Intensity*	红色 Red	Iv	IF=5mA	(54)	(120)	—	mcd
	绿色 Green			(113)	(250)	—	
	蓝色 Blue			(23)	(62)	—	
主波长 Dominant Wavelength	红色 Red	λd	IF=5mA	(619)	(628)	(637)	nm
	绿色 Green			(516)	(530)	(542)	
	蓝色 Blue			(461)	(470)	(479)	

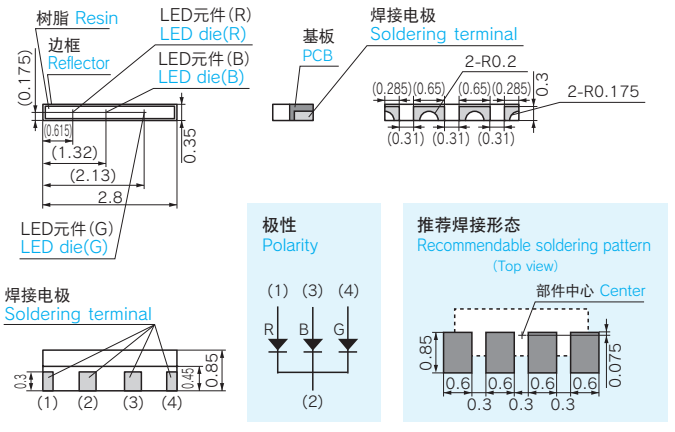
＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

CL-426F-AA 单位 Unit：mm

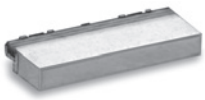


CL-426F-AACC 单位 Unit：mm



包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

CL-425 Series



3.25(L)×
1.35(W)×0.45(H)mm

特征 Features

1. 同一封装内3色发光
   3 colors emitting from a single package
2. 侧面发光，小型・薄型
   Side-lighting, compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-425F-V	红色 Red	125	80	30	100*2	4	-25~+80	-30~+85
	绿色 Green		69	20				
	蓝色 Blue		68	20				

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-425F-C1CC	红色 Red	(125)	(78)	(30)	(100*2)	4	-25~+80	-30~+85
	绿色 Green		(69)	(20)				
	蓝色 Blue		(68)	(20)				

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

[CL-425F-V]

(Ta 25℃)

参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=5mA	1.50	1.85	2.47	V
	绿色 Green			2.33	2.70	3.19	
	蓝色 Blue			2.33	2.75	3.19	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	10	μA
	绿色 Green			—	—	2	
	蓝色 Blue			—	—	2	
光强 Luminous Intensity*	红色 Red	Iv	IF=5mA	54	115	231	mcd
	绿色 Green			81	180	396	
	蓝色 Blue			18	45	132	
主波长 Dominant Wavelength	红色 Red	λd	IF=5mA	615	625	635	nm
	绿色 Green			518	530	542	
	蓝色 Blue			461	470	479	

[CL-425F-C1CC]

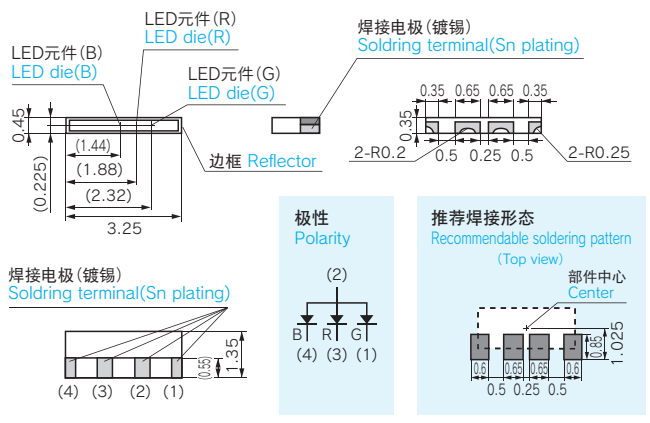
(Ta 25℃)

参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=5mA	1.55	1.85	2.40	V
	绿色 Green			2.40	2.70	3.19	
	蓝色 Blue			2.40	2.75	3.19	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	100	μA
	绿色 Green			—	—	2	
	蓝色 Blue			—	—	2	
光强 Luminous Intensity*	红色 Red	Iv	IF=5mA	13.5	20	44	mcd
	绿色 Green			135	180	275	
	蓝色 Blue			18	45	132	
主波长 Dominant Wavelength	红色 Red	λd	IF=5mA	618	625	637	nm
	绿色 Green			518	530	542	
	蓝色 Blue			456	465	473	

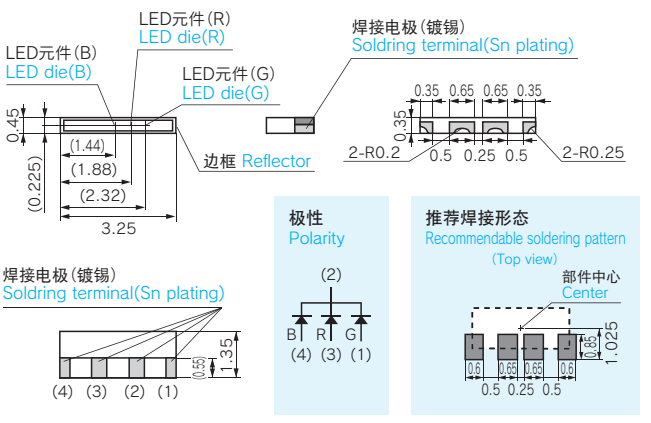
＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

CL-425F-V 单位 Unit：mm



CL-425F-C1CC 单位 Unit：mm



包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

CL-Z891 Series

4.7(L)×
1.05(W)×1.1(H)mm

特征 Features

1. 同一封装内3色发光
   3 colors emitting from a single package
2. 侧面发光，高输出
   Side-lighting, high output type
3. 搭载齐纳二极管，防静电击穿性能佳。
   Zener diode mounted for excellence in electrostatic withstand voltage

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

系列 Series	Color variation	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-Z891	红色 Red	66.25	25	100*	4	−25～+85	−30～+100
	绿色 Green	93.75	25		—		
	蓝色 Blue	93.75	25		—		

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

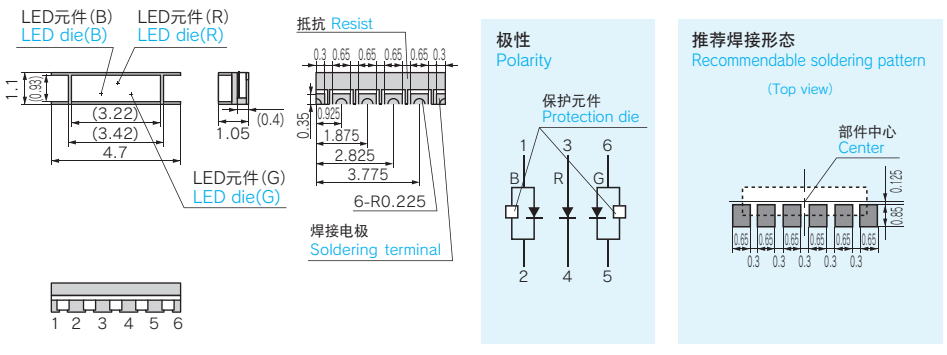
(Ta 25℃)

参数 Parameter	Color variation	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	红色 Red	VF	IF=20mA	1.75	—	2.68	V
	绿色 Green			2.72	—	3.81	
	蓝色 Blue			2.72	—	3.81	
反向电流 Reverse Current	红色 Red	IR	VR=4V	—	—	(10)	μA
光强 Luminous Intensity*	红色 Red	Iv	IF=20mA	—	(1,020)	—	mcd
	绿色 Green			—	(2,560)	—	
	蓝色 Blue			—	(390)	—	
主波长 Dominant Wavelength	红色 Red	λd	IF=20mA	—	(624)	—	nm
	绿色 Green			—	(528)	—	
	蓝色 Blue			—	(460)	—	

＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

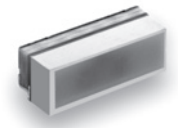
单位 Unit：mm



包装数量：2,000个/卷（φ180mm） Loaded quantity:2,000pcs./1 reel(φ180mm)

多色LED Multi-color LED

CL-421 Series



2.8(L)×
1.35(W)×1.0(H)mm

特征 Features

1. 同一封装内3色发光
   3 colors emitting from a single package
2. 侧面发光
   Side-lighting type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-421C4	红色 Red	140	50	20	100*2	4	−25～+80	−30～+85
	绿色 Green		140	30				
	蓝色 Blue		130	30				

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

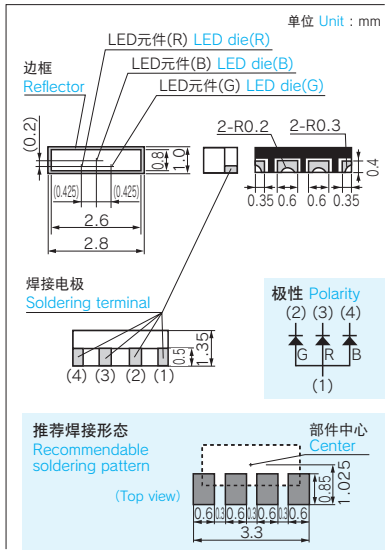
●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

产品代码 Product code	Color variation	VF			λd	Iv*		
		IF (mA)	typ (V)	max (V)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-421C4	红色 Red	20	2.2	2.78	624	20	520	700
	绿色 Green	20	3.45	4.12	530	20	850	1,350
	蓝色 Blue	20	3.2	3.81	470	20	250	400

＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing



包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

多色LED Multi-color LED

CL-385 Series

2.8(L)×
1.0(W)×0.6(H)mm

特征 Features

1. 同一封装内2色发光
   2 colors emitting from a single package
2. 侧面发光，小型・薄型
   Side-lighting, compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-385TD2/HG5	橙色 Orange	90	80	30	100*2	4	−25～+80	−30～+85
	绿色 Green		76	20				

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

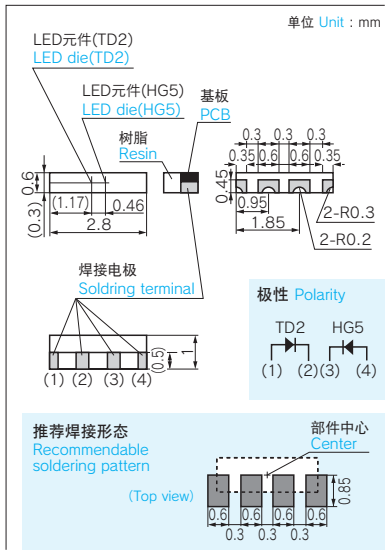
●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

产品代码 Product code	Color variation	VF			λd		Iv*		
		IF (mA)	typ (V)	max (V)	IF (mA)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-385TD2/HG5	橙色 Orange	20	2.1	2.68	10	605	20	64	180
	绿色 Green	20	3.3	3.91	20	530	20	36	100

＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing



包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

多色LED Multi-color LED

CL-375 Series

2.4(L)×
1.35(W)×1.0(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Color variation	P*1 (mW)	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-375HR/YG	黄绿色 Yellow green	90	65	25	100*2	4	−25～+80	−30～+85
	红色 Red		78	30				

＊1 P表示同时亮灯时的全部的容许损耗。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 P means total value of power dissipation when both colors are on.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

产品代码 Product code	Color variation	VF			λd	λp	Iv*		
		IF (mA)	typ (V)	max (V)	typ (nm)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-375HR/YG	黄绿色 Yellow green	20	2.2	2.63	575	—	20	4.7	18
	红色 Red	20	1.8	2.63	—	655	20	5.0	23

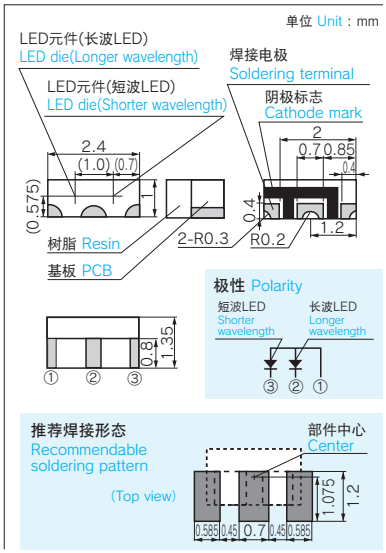
＊ 符合NIST标准 ＊ Compliant with NIST standards

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

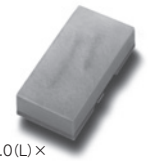
1. 同一封装内2色发光
   2 colors emitting from a single package
2. 侧面发光，小型・薄型
   Side-lighting, compact/thin type

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-287S Series



1.0(L)×
0.5(W)×0.25(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-287S-WS	33	10	50	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	135	250	—	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.260	0.188	
			b	0.260	0.293	
			c	0.360	0.431	
			d	0.360	0.330	

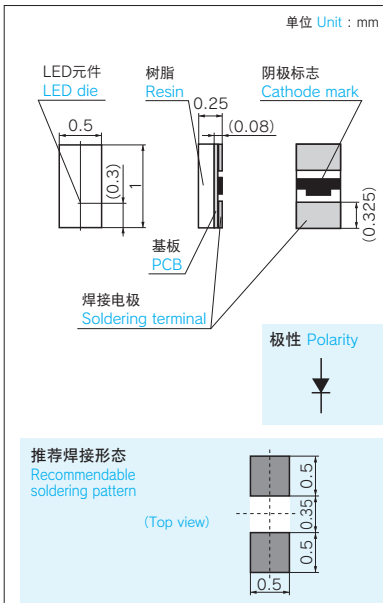
＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

包装数量：3,500个/卷（φ180mm） Loaded quantity:3,500pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 正面发光，超小型・薄型
   Upward-lighting, ultra-compact/thin type

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-198N Series

1.6(L)×0.8(W)×0.235(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-198N-WS	38	10	100	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	136	250	649	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.260	0.188	
			b	0.260	0.293	
			c	0.360	0.435	
			d	0.360	0.330	

＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

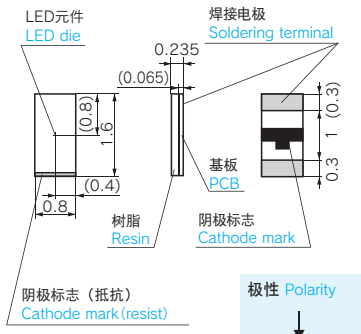
包装数量：7,000个/卷（φ180mm） Loaded quantity:7,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 正面发光，小型・超薄型
   Upward-lighting, compact/ultra-thin type

●外形尺寸图 Outline drawing

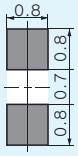
单位 Unit：mm



极性 Polarity

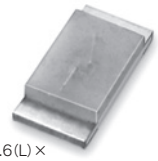
推荐焊接形态
Recommendable soldering pattern

(Top view)



高亮度白色LED High brightness white LED

CL-194S Series



1.6(L)×0.8(W)×0.3(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-194S-WS	76	20	50	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.25	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	145	260	—	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.260	0.188	
			b	0.260	0.293	
			c	0.360	0.435	
			d	0.360	0.330	

＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

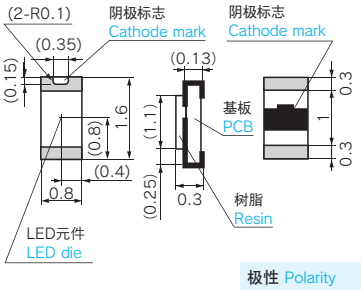
包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 正面发光，小型・超薄型
   Upward-lighting, compact/ultra-thin type

●外形尺寸图 Outline drawing

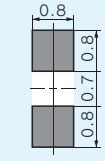
单位 Unit：mm



极性 Polarity

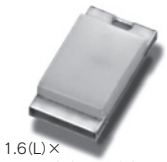
推荐焊接形态
Recommendable soldering pattern

(Top view)



高亮度白色LED High brightness white LED

CL-Z194S Series



1.6(L)×
0.8(W)×0.3(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	Top (℃)	Tst (℃)
CL-Z194S-WS	76	20	100	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
光强 Luminous Intensity*2	Iv	IF=5mA	141	260	—	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.260	0.188	
			b	0.260	0.293	
			c	0.360	0.435	
			d	0.360	0.330	

＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

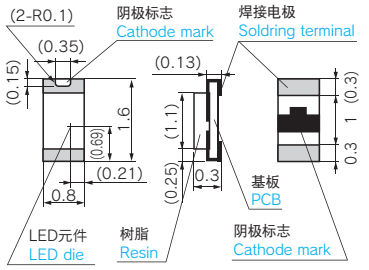
包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

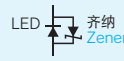
1. 白色LED
   White LED
2. 正面发光，小型・超薄型
   Upward-lighting, compact/ultra-thin type
3. 搭载齐纳二极管，防静电击穿性能佳。
   Zener diode mounted for excellence in electrostatic withstand voltage

●外形尺寸图 Outline drawing

单位 Unit：mm

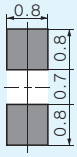


极性 Polarity



推荐焊接形态
Recommendable soldering pattern

(Top view)



高亮度白色LED High brightness white LED

CL-600S Series

2.0(L)×
0.8(W)×0.9(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-600S-CW15-SD	—	20	20	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为10msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 10msec width.

●电气・光学特性 Electrical and Optical Characteristics*1

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	2.43	2.65	2.99	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	360	720	1,100	mcd
色度坐标 Chromaticity coordinates*4	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.265	0.185	
			b	0.265	0.265	
			c	0.310	0.338	
			d	0.310	0.258	

＊1 上述的电气・光学特性中，正向电压的测量公差为±3%，轴向光强的测量公差为±10%。／＊2 1个元件的值。／＊3 符合NIST标准，是各个元件同时亮灯时的值。／＊4 色度坐标是a、b、c、d所围合的范围。
＊1 The electrical and optical characteristics mentioned above include measurement tolerances of forward voltage±3% and axial luminous intensity±10%.／＊2 The values are based on 1-die performance.／＊3 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊4 Chromaticity coordinates are surrounded by points a, b, c, and d.

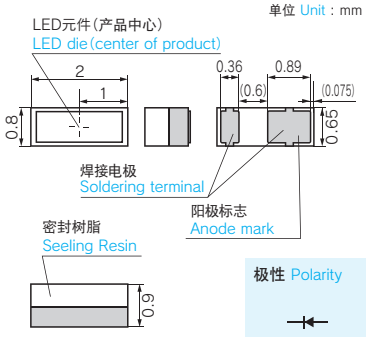
包装数量：2,500个/卷（φ180mm） Loaded quantity:2,500pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 正面发光，小型
   Upward-lighting, compact type

●外形尺寸图 Outline drawing

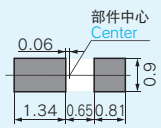
单位 Unit：mm



极性 Polarity

推荐焊接形态
Recommendable soldering pattern

(Top view)



高亮度白色LED High brightness white LED

CL-260S Series

3.4(L)×
1.25(W)×1.1(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-260S-WS	72	20	50	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	55	140	—	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.260	0.188	
			b	0.260	0.293	
			c	0.360	0.435	
			d	0.360	0.330	

＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

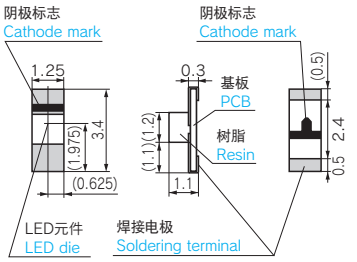
包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 正面发光，小型
   Upward-lighting, compact type
3. 可从印刷电路板的背面实施自动贴装
   Automatically mountable from rear side of PCB

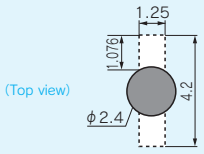
●外形尺寸图 Outline drawing

单位 Unit：mm



极性 Polarity

推荐焊接形态
Recommendable soldering pattern



高亮度白色LED High brightness white LED

CL-282S Series

1.0(L)×
0.5(W)×0.2(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-282S-WZ	76	20	50	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	136	250	660	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.255	0.181	
			b	0.255	0.286	
			c	0.365	0.442	
			d	0.365	0.337	

＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

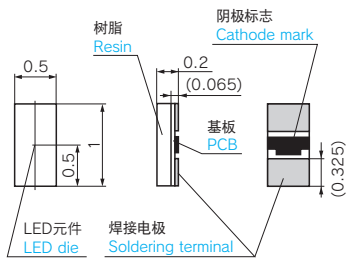
包装数量：7,000个/卷（φ180mm） Loaded quantity:7,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 正面发光，超小型・薄型
   Upward-lighting, ultra-compact/thin type

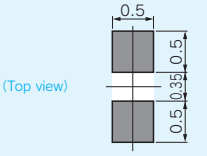
●外形尺寸图 Outline drawing

单位 Unit：mm



极性 Polarity

推荐焊接形态
Recommendable soldering pattern



高亮度白色LED High brightness white LED

CL-830S Series

1.0(L)×
0.5(W)×0.3(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-830S-WSN	76	20	50	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	88	170	—	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA				

	x(±0.02)	y(±0.02)
a	0.238	0.201
b	0.238	0.240
c	0.337	0.349
d	0.341	0.307

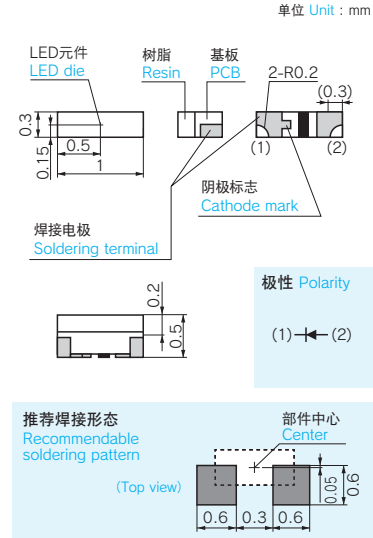
＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

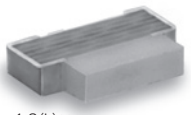
1. 白色LED
   White LED
2. 侧面发光，小型
   Side-lighting, compact type

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-482T Series



1.8(L)×
1.0(W)×0.3(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-482T-WS	76	20	50	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为30msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 30msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	—	115	—	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA				

	x(±0.02)	y(±0.02)
a	0.260	0.188
b	0.260	0.293
c	0.360	0.435
d	0.360	0.330

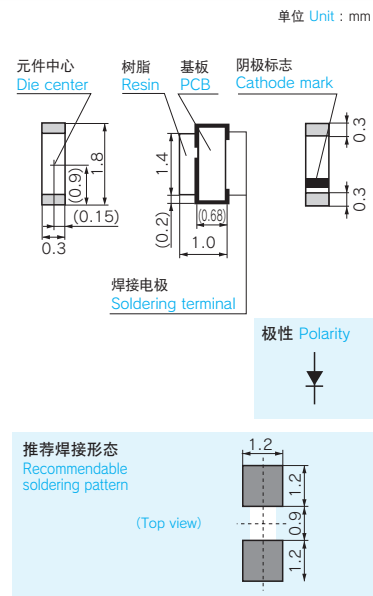
＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 侧面发光，小型・薄型
   Side-lighting, compact/thin type

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-Z482T Series

1.8(L)×
1.0(W)×0.3(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	Top (℃)	Tst (℃)
CL-Z482T-WSA	76	20	100	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	2.47	—	3.04	V
光强 Luminous Intensity*2	Iv	IF=5mA	81	—	198	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.281	0.238	
			b	0.255	0.265	
			c	0.297	0.328	
			d	0.315	0.299	

＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

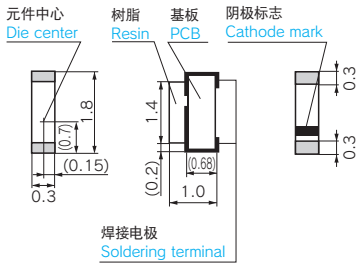
包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 侧面发光，小型・薄型
   Side-lighting, compact/thin type
3. 搭载齐纳二极管，防静电击穿性能佳。
   Zener diode mounted for excellence in electrostatic withstand voltage

●外形尺寸图 Outline drawing

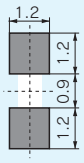
单位 Unit：mm



极性 Polarity

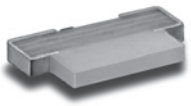
推荐焊接形态
Recommendable soldering pattern

(Top view)



高亮度白色LED High brightness white LED

CL-483S Series



1.8(L)×
0.88(W)×0.2(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-483S-WT	76	20	100	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	—	120	187	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.260	0.188	
			b	0.260	0.293	
			c	0.360	0.435	
			d	0.360	0.330	

＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

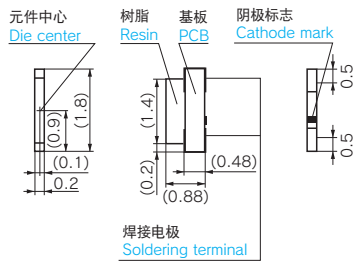
包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 侧面发光，小型・薄型
   Side-lighting, compact/thin type

●外形尺寸图 Outline drawing

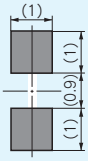
单位 Unit：mm



极性 Polarity

推荐焊接形态
Recommendable soldering pattern

(Top view)



高亮度白色LED High brightness white LED

CL-840S Series

1.8(L)×
1.0(W)×0.3(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-840S-WTST	76	20	100	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	127	200	—	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA				

	x(±0.02)	y(±0.02)
a	0.260	0.199
b	0.260	0.264
c	0.320	0.369
d	0.320	0.304

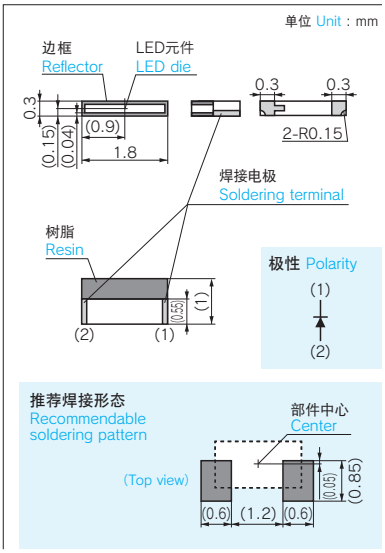
＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 侧面发光，小型・薄型
   Side-lighting, compact/thin type
3. 带反射器
   Reflector equipped

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-270S Series

1.6(L)×
1.15(W)×0.6(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-270S-WS	76	20	50	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	99	190	—	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA				

	x(±0.02)	y(±0.02)
a	0.260	0.188
b	0.260	0.293
c	0.360	0.435
d	0.360	0.330

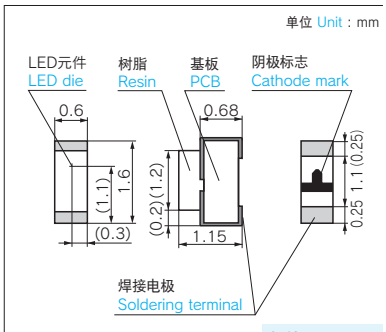
＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

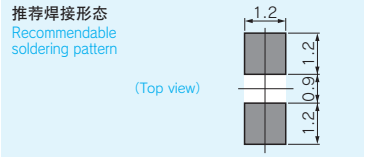
包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 侧面发光，小型
   Side-lighting, compact type

●外形尺寸图 Outline drawing





高亮度白色LED High brightness white LED

CL-435F2 Series

2.8(L)×
0.85(W)×0.4(H)mm

特征 Features

1. 白色LED
   White LED
2. 侧面发光，小型
   Side-lighting, compact type
3. 带反射器
   Reflector equipped

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-435F2-AW01	114	30	100	4	−25～+80	−30～+85

*1 1个元件的值。／*2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
*1 The values are based on 1-die performance.／*2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

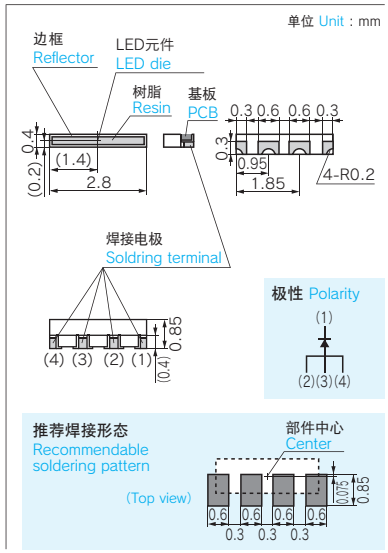
(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=20mA	2.7	3.3	3.7	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=20mA	900	1,380	2,288	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=20mA		x(±0.02)	y(±0.02)	
			a	0.232	0.208	
			b	0.232	0.267	
			c	0.329	0.328	
			d	0.329	0.254	

*1 1个元件的值。／*2 符合NIST标准，是各个元件同时亮灯时的值。／*3 色度坐标是a、b、c、d所围合的范围。
*1 The values are based on 1-die performance.／*2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／*3 Chromaticity coordinates are surrounded by points a, b, c, and d.

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-432F2 Series

2.8(L)×
1.0(W)×0.6(H)mm

特征 Features

1. 白色LED
   White LED
2. 侧面发光，小型
   Side-lighting, compact type
3. 带反射器
   Reflector equipped

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-432F2-WS	76	20	50	4	−25～+80	−30～+85

*1 1个元件的值。／*2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
*1 The values are based on 1-die performance.／*2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

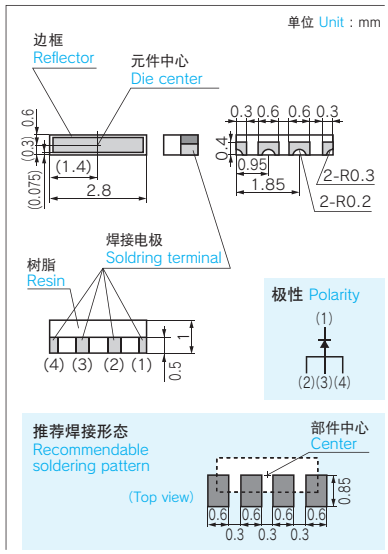
(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=5mA	—	2.9	3.24	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=5mA	247.5	380	—	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=5mA		x(±0.02)	y(±0.02)	
			a	0.242	0.175	
			b	0.242	0.285	
			c	0.342	0.412	
			d	0.342	0.320	

*1 1个元件的值。／*2 符合NIST标准，是各个元件同时亮灯时的值。／*3 色度坐标是a、b、c、d所围合的范围。
*1 The values are based on 1-die performance.／*2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／*3 Chromaticity coordinates are surrounded by points a, b, c, and d.

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-963 Series

1.4(L)×
1.05(W)×0.6(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-963-1W-C01	32	10	50	4	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=7mA	—	2.8	3.42	V
反向电流 Reverse Current*1	IR	VR=4V	—	—	2	μA
光强 Luminous Intensity*2	Iv	IF=7mA	362	520	754	mcd
色度坐标 Chromaticity coordinates*3	x, y	IF=7mA		x(±0.02)	y(±0.02)	
			a	0.263	0.210	
			b	0.257	0.240	
			c	0.298	0.317	
			d	0.304	0.287	

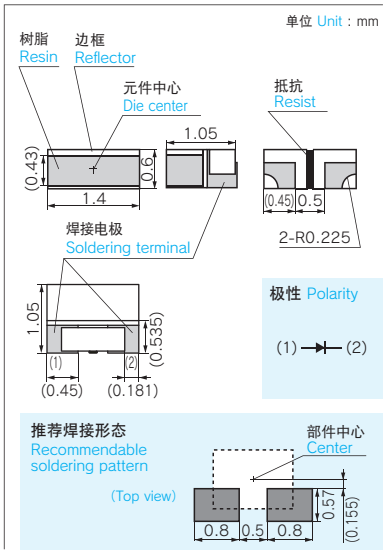
＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

1. 白色LED
   White LED
2. 侧面发光，小型
   Side-lighting, compact type
3. 3面发光
   Three-face lighting type

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-A120 Series

2.8(L)×
0.95(W)×0.8(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP* (mA)	IR (mA)	Top (℃)	Tst (℃)
CL-A120-1W-SD	155	40	100	40	−40～+100	−40～+100

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	VF	IF=30mA	3.2	3.45	3.7	V
光通量 Luminous Flux	φv	IF=30mA	—	(9.22)	—	lm
光强 Luminous Intensity*	Iv	IF=30mA	3.09	3.4	3.71	cd
色度坐标 Chromaticity coordinates	x	IF=30mA	—	0.265	—	—
	y		—	0.230	—	

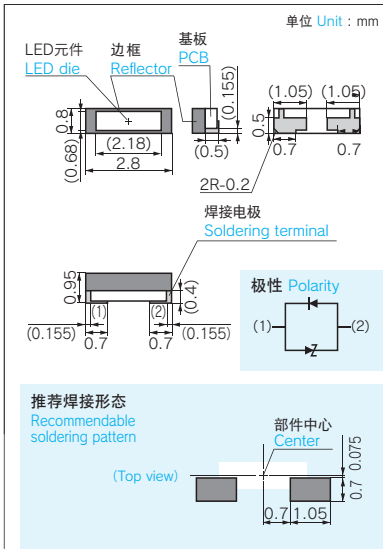
＊ 符合NIST标准 ＊ Compliant with NIST standards

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

1. 背光光源用的白色LED
   White LED for backlight source
2. 侧面发光
   Side-lighting type
3. 搭载齐纳二极管，防静电击穿性能佳。
   Zener diode mounted for excellence in electrostatic withstand voltage

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-A100 Series

4.5(L)×
1.6(W)×0.8(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP* (mA)	IR (mA)	Top (℃)	Tst (℃)
CL-A100-1W2-SD	242	70	150	70	−40～+100	−40～+100
CL-A100-2W2-SD	300	90	180	90		

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter		Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	CL-A100-1W2-SD	VF	IF=60mA	—	3.15	3.4	V
	CL-A100-2W2-SD		IF=80mA	—	3.05	3.3	
光通量 Luminous Flux	CL-A100-1W2-SD	ϕv	IF=60mA	—	(19)	—	lm
	CL-A100-2W2-SD		IF=80mA	—	(23.5)	—	
光强 Luminous Intensity*	CL-A100-1W2-SD	Iv	IF=60mA	6.1	7.8	—	cd
	CL-A100-2W2-SD		IF=80mA	7.5	9.5	—	
色度坐标 Chromaticity coordinates	CL-A100-1W2-SD	x	IF=60mA	—	0.269	—	—
		y		—	0.238	—	
	CL-A100-2W2-SD	x	IF=80mA	—	0.269	—	
		y		—	0.238	—	

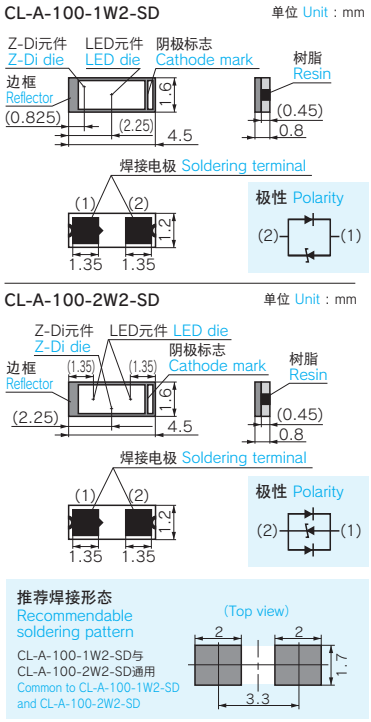
＊ 符合NIST标准 ＊ Compliant with NIST standards

包装数量：3,000个/卷（ϕ180mm） Loaded quantity:3,000pcs./1 reel(ϕ180mm)

特征 Features

1. 背光光源用的白色LED
   White LED for backlight source
2. 正面发光
   Upward-lighting type
3. 搭载齐纳二极管，防静电击穿性能佳。
   Zener diode mounted for excellence in electrostatic withstand voltage

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-A130 Series

2.5(L)×
1.4(W)×0.85(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP* (mA)	IR (mA)	Tj (℃)	Top (℃)	Tst (℃)
CL-A130-1W3-SD	356	100	200	100	140	−40～+100	−40～+105

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	VF	IF=80mA	2.95	3.2	3.45	V
光通量 Luminous Flux	ϕv	IF=80mA	—	(27.8)	—	lm
光强 Luminous Intensity*	Iv	IF=80mA	8.34	10.3	12.06	cd
色度坐标 Chromaticity coordinates	x	IF=80mA	—	0.277	—	—
	y		—	0.253	—	

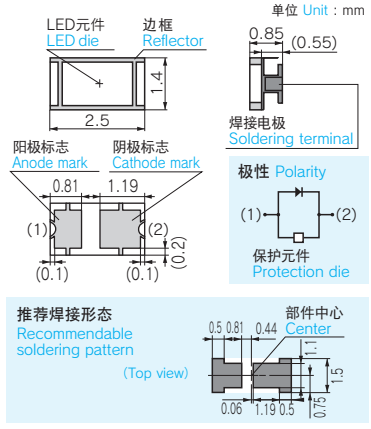
＊ 符合NIST标准 ＊ Compliant with NIST standards

包装数量：3,000个/卷（ϕ180mm） Loaded quantity:3,000pcs./1 reel(ϕ180mm)

特征 Features

1. 背光光源用的白色LED
   White LED for backlight source
2. 正面发光
   Upward-lighting type
3. 搭载齐纳二极管，防静电击穿性能佳。
   Zener diode mounted for excellence in electrostatic withstand voltage

●外形尺寸图 Outline drawing



高亮度白色LED High brightness white LED

CL-A131 Series

2.5(L)×
1.4(W)×0.85(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP* (mA)	IR (mA)	Tj (℃)	Top (℃)	Tst (℃)
CL-A131-1W4-SD	345	100	200	90	140	−40～+100	−40～+105
CL-A131-1W5-SD	(495)	(150)	(200)	90	140		

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter		Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage	CL-A131-1W4-SD	VF	IF=80mA	2.85	3.1	3.35	V
	CL-A131-1W5-SD		IF=80mA	(2.8)	(3.05)	(3.3)	
光通量 Luminous Flux	CL-A131-1W4-SD	ϕV	IF=80mA	—	(31)	—	lm
	CL-A131-1W5-SD		IF=80mA	—	(34.1)	—	
光强 Luminous Intensity*	CL-A131-1W4-SD	Iv	IF=80mA	8.75	10.8	12.64	cd
	CL-A131-1W5-SD		IF=80mA	(9.42)	(11.8)	(13.91)	
色度坐标 Chromaticity coordinates	CL-A131-1W5-SD	x	IF=80mA	—	0.277	—	—
		y		—	0.253	—	
	CL-A131-1W5-SD	x	IF=80mA	—	0.277	—	
		y		—	0.253	—	

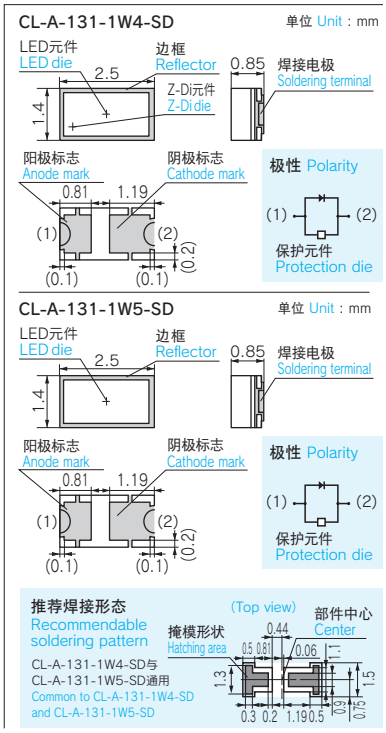
＊ 符合NIST标准 ＊ Compliant with NIST standards

包装数量：3,000个/卷（ϕ180mm） Loaded quantity:3,000pcs./1 reel(ϕ180mm)

特征 Features

1. 背光光源用的白色LED
   White LED for backlight source
2. 正面发光
   Upward-lighting type
3. 搭载齐纳二极管，防静电击穿性能佳。
   Zener diode mounted for excellence in electrostatic withstand voltage

●外形尺寸图 Outline drawing



普通颜色LED(单色) General Color LED(Mono-color Type)

CL-198T Series

1.6(L)×
0.8(W)×0.2(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-198T-TD2	78	30	100*	4	−25～+80	−30～+85

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

产品代码 Product code	VF			λd	Iv*		
	IF (mA)	typ (V)	max (V)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-198T-TD2	5	(2.0)	(2.68)	(605)	5	(13.6)	(30)

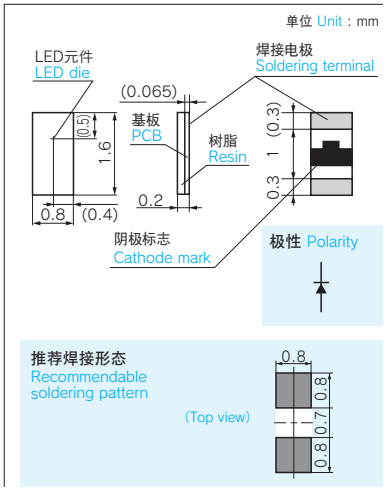
＊ 符合NIST标准 ＊ Compliant with NIST standards

包装数量：7,000个/卷（ϕ180mm） Loaded quantity:7,000pcs./1 reel(ϕ180mm)

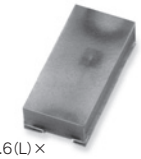
特征 Features

1. 单色发光LED
   Mono-color lighting LED
2. 正面发光，小型・超薄型
   Upward-lighting, compact/ultra-thin type

●外形尺寸图 Outline drawing



CL-198N Series



1.6(L)×
0.8(W)×0.235(H)mm

特征 Features

1. 单色发光LED
Mono-color lighting LED

2. 正面发光，小型・超薄型
Upward-lighting, compact/ultra-thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-198N-HB8	76	20	50*	4	−25～+80	−30～+85
CL-198N-HGC	76	20	100*	4	−25～+80	−30～+85
CL-198N-TLY	78	30	100*	4	−25～+80	−30～+85
CL-198N-TR1	78	30	100*	4	−25～+80	−30～+85

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

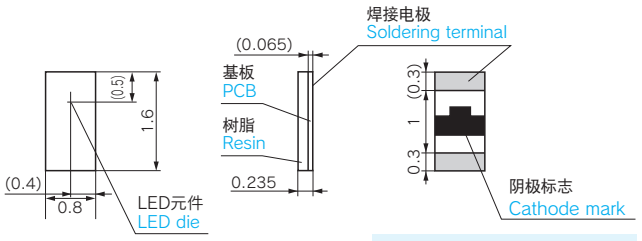
(Ta 25℃)

产品代码 Product code	VF			λd	Iv*		
	IF (mA)	typ (V)	max (V)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-198N-HB8	7	—	3.45	—	7	50	—
CL-198N-HGC	5	2.75	3.19	527	5	136.4	—
CL-198N-TLY	4	2.1	2.63	590	4	11.8	—
CL-198N-TR1	10	—	2.47	—	10	43.6	—

＊ 符合NIST标准 ＊ Compliant with NIST standards

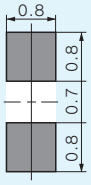
●外形尺寸图 Outline drawing

单位 Unit：mm



极性
Polarity

推荐焊接形态
Recommendable soldering pattern
(Top view)



包装数量：7,000个/卷（φ180mm） Loaded quantity:7,000pcs./1 reel(φ180mm)

普通颜色LED(单色) General Color LED(Mono-color Type)

CL-197 Series

1.6(L)×
0.8(W)×0.4(H)mm

特征 Features

1. 单色发光LED
Mono-color lighting LED

2. 正面发光，小型・薄型
Upward-lighting, compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	I_F (mA)	I_{FP} (mA)	V_R (V)	Top (℃)	Tst (℃)
CL-197HB1	76	20	100*	4	−25～+80	−30～+85
CL-197HG5	76	20	100*	4	−25～+80	−30～+85
CL-197YG	50	20	100*	4	−25～+80	−30～+85
CL-197TLY	78	30	100*	4	−25～+80	−30～+85
CL-197TD2	80	30	100*	4	−25～+80	−30～+85
CL-197TR2	78	30	100*	4	−25～+80	−30～+85

＊ I_{FP}的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for I_{FP} are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

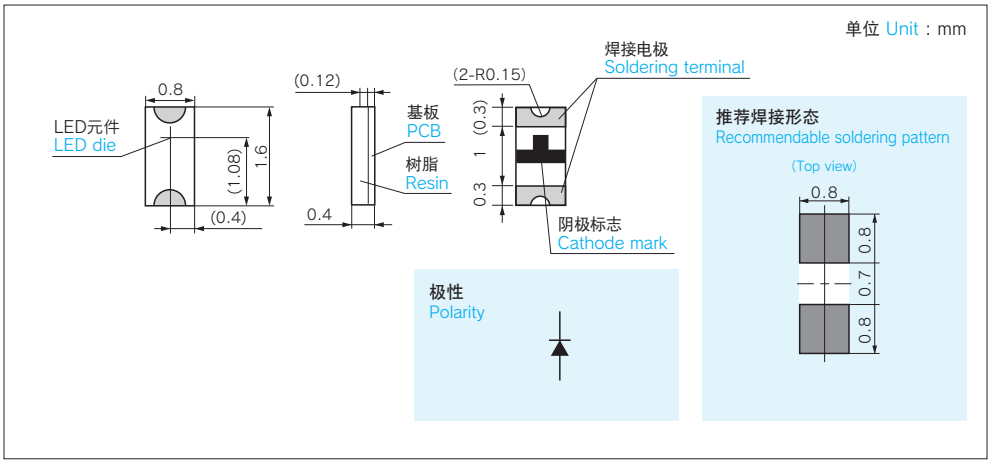
(Ta 25℃)

产品代码 Product code	V_F			λ_d	I_V*		
	I_F (mA)	typ (V)	max (V)	typ (nm)	I_F (mA)	min (mcd)	typ (mcd)
CL-197HB1	5	2.9	3.24	470	5	5.4	20
CL-197HG5	20	3.3	3.91	—	20	36.4	100
CL-197YG	20	2.2	2.63	—	20	9	18
CL-197TLY	2	1.95	2.47	—	2	2.7	—
CL-197TD2	20	2.1	2.68	605	20	63.6	180
CL-197TR2	20	2.1	2.6	—	20	22	80

＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

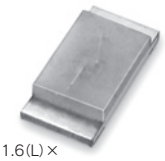
单位 Unit：mm



包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

普通颜色LED(单色) General Color LED(Mono-color Type)

CL-194S Series



1.6(L)×0.8(W)×0.3(H)mm

特征 Features

1. 单色发光LED
   Mono-color lighting LED
2. 正面发光，小型・薄型
   Upward-lighting, compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-194S-HB8	76	20	50*	4	−25～+80	−30～+85
CL-194S-TD2	78	30	100*	4	−25～+80	−30～+85

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

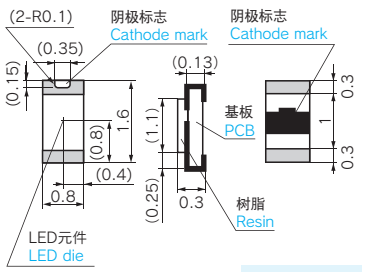
(Ta 25℃)

产品代码 Product code	VF			λd	Iv*		
	IF (mA)	typ (V)	max (V)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-194S-HB8	5	2.9	3.24	470	5	45.5	85
CL-194S-TD2	20	2.1	2.68	605	20	45	110

＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

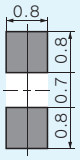
单位 Unit：mm



极性 Polarity

推荐焊接形态
Recommendable soldering pattern

(Top view)



包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

普通颜色LED(单色) General Color LED(Mono-color Type)

CL-670S Series

2.0(L)×0.8(W)×0.9(H)mm

特征 Features

1. 单色发光LED
   Mono-color lighting LED
2. 正面发光，小型
   Upward-lighting, compact type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-670S-HBE	—	30	100*	4	−25～+80	−30～+85

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

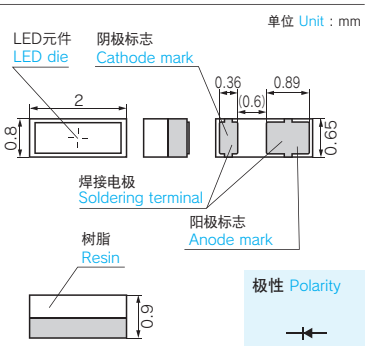
(Ta 25℃)

产品代码 Product code	VF			λd	Iv*		
	IF (mA)	typ (V)	max (V)	typ (nm)	IF (mA)	typ (mcd)	max (mcd)
CL-670S-HBE	20	3.2	3.6	470	20	—	630

＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

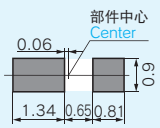
单位 Unit：mm



极性 Polarity

推荐焊接形态
Recommendable soldering pattern

(Top view)



包装数量：2,500个/卷（φ180mm） Loaded quantity:2,500pcs./1 reel(φ180mm)

普通颜色LED(单色) General Color LED(Mono-color Type)

CL-196 Series

1.6(L)×
0.8(W)×0.6(H)mm

特征 Features

1. 单色发光LED
Mono-color lighting LED

2. 正面发光，小型
Upward-lighting, compact type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	I_F (mA)	I_{FP} (mA)	V_R (V)	Top (℃)	Tst (℃)
CL-196YG	50	20	100*	4	−25～+80	−30～+85
CL-196TLY	78	30	100*	4	−25～+80	−30～+85
CL-196D	50	20	100*	4	−25～+80	−30～+85
CL-196HR	78	30	100*	4	−25～+80	−30～+85

＊ I_{FP}的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for I_{FP} are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

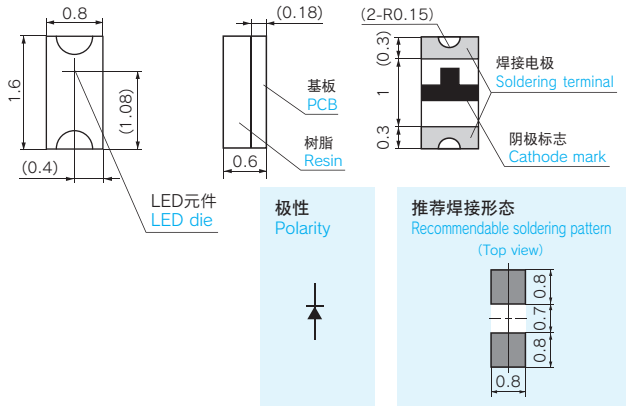
(Ta 25℃)

产品代码 Product code	V_F			λ_d	λ_p	I_V*		
	I_F (mA)	typ (V)	max (V)	typ (nm)	typ (nm)	I_F (mA)	min (mcd)	typ (mcd)
CL-196YG	20	2.2	2.63	570	—	20	5.0	18
CL-196TLY	20	2.1	2.63	—	—	20	16	60
CL-196D	20	2.2	2.63	605	—	20	2.4	7.1
CL-196HR	20	1.8	2.63	—	655	20	5.0	23

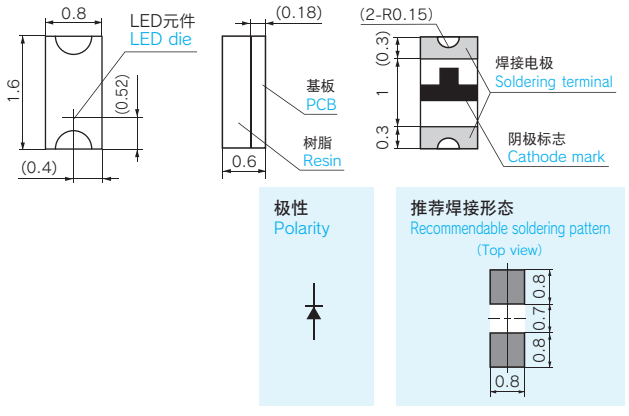
＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

LED元件(YG, TLY, D) LED die(YG, TLY, D)　　单位 Unit：mm



LED元件(HR) LED die(HR)　　单位 Unit：mm



包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

CL-195 Series

1.6(L)×
0.8(W)×0.8(H)mm

特征 Features

1. 单色发光LED
Mono-color lighting LED

2. 正面发光，小型
Upward-lighting, compact type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-195PG	50	20	100*	4	−25～+80	−30～+85
CL-195YG	50	20	100*	4	−25～+80	−30～+85
CL-195Y	50	20	100*	4	−25～+80	−30～+85
CL-195D	50	20	100*	4	−25～+80	−30～+85
CL-195HR	78	30	100*	4	−25～+80	−30～+85

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

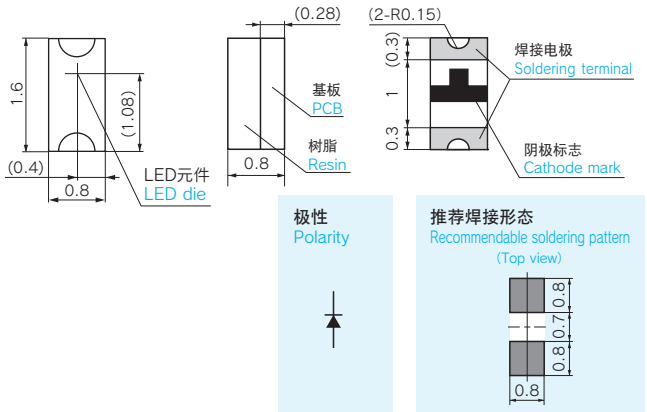
(Ta 25℃)

产品代码 Product code	VF			λd	λp	IV*		
	IF (mA)	typ (V)	max (V)	typ (nm)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-195PG	20	2.2	2.63	557	—	20	1.0	3.0
CL-195YG	20	2.2	2.63	570	—	20	5.0	18
CL-195Y	20	2.1	2.63	586	—	20	2.6	6.4
CL-195D	20	2.2	2.63	605	—	20	2.4	7.1
CL-195HR	20	1.8	2.63	—	655	20	5.0	23

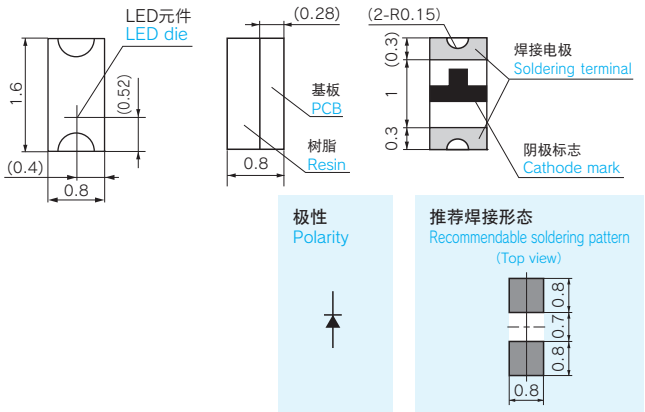
＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

LED元件(PG, YG, Y, D) LED die(PG, YG, Y, D)　　单位 Unit：mm



LED元件(HR) LED die(HR)　　单位 Unit：mm



包装数量：3,000个/卷（ϕ180mm） Loaded quantity:3,000pcs./1 reel(ϕ180mm)

普通颜色LED(单色) General Color LED(Mono-color Type)

CL-170 Series

2.0(L)×
1.25(W)×1.1(H)mm

特征 Features

1. 单色发光LED
Mono-color lighting LED

2. 正面发光，小型
Upward-lighting, compact type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-170G	65	25	100*	4	−25～+80	−30～+85
CL-170YG	65	25	100*	4	−25～+80	−30～+85
CL-170Y	65	25	100*	4	−25～+80	−30～+85
CL-170D	65	25	100*	4	−25～+80	−30～+85
CL-170HR	78	30	100*	4	−25～+80	−30～+85

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

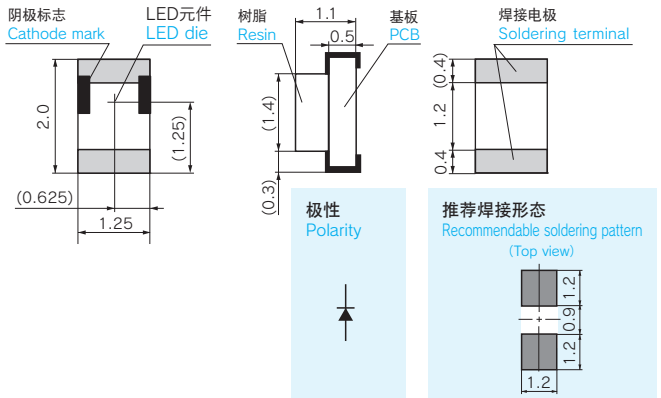
(Ta 25℃)

产品代码 Product code	VF			λd	λp	Iv*		
	IF (mA)	typ (V)	max (V)	typ (nm)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-170G	20	2.2	2.63	570	—	20	2.5	10
CL-170YG	20	2.2	2.63	575	—	20	4.7	18
CL-170Y	20	2.1	2.63	589	—	20	2.6	6.4
CL-170D	20	2.2	2.63	605	—	20	2.4	7.1
CL-170HR	20	1.8	2.63	—	655	20	5.0	23

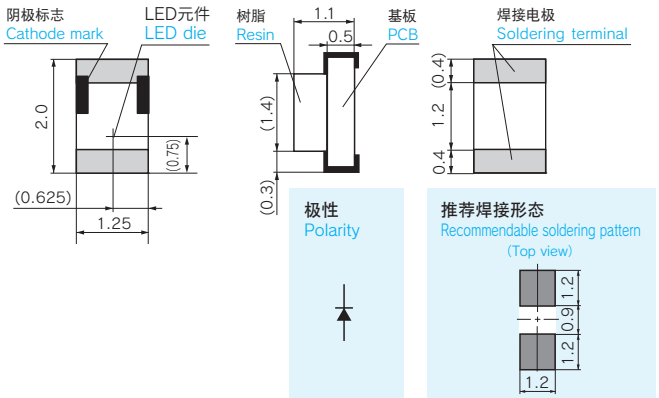
＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

LED元件(G, YG, Y, D) LED die(G, YG, Y, D)　　单位 Unit：mm



LED元件(HR) LED die(HR)　　单位 Unit：mm



包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

CL-260 Series

3.4(L)×
1.25(W)×1.1(H)mm

特征 Features

1. 单色发光LED
Mono-color lighting LED

2. 正面发光，小型
Upward-lighting, compact type

3. 可从印刷电路板的背面实施自动贴装
Automatically mountable from rear side of PCB

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-260G	65	25	100*	4	−25～+80	−30～+85
CL-260YG	65	25	100*	4	−25～+80	−30～+85
CL-260Y	65	25	100*	4	−25～+80	−30～+85
CL-260TD2	78	30	100*	4	−25～+80	−30～+85
CL-260HR	78	30	100*	4	−25～+80	−30～+85

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

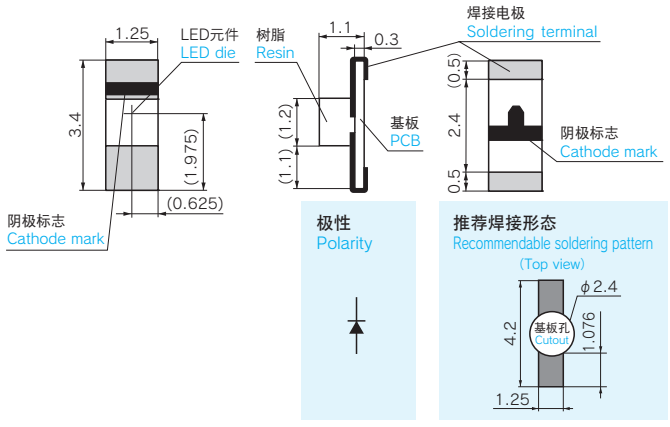
(Ta 25℃)

产品代码 Product code	VF			λd	λp	Iv*		
	IF (mA)	typ (V)	max (V)	typ (nm)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-260G	20	2.2	2.63	567	—	20	2.5	10
CL-260YG	20	2.2	2.63	575	—	20	5.0	18
CL-260Y	20	2.1	2.63	589	—	20	2.6	6.4
CL-260TD2	20	2.1	2.63	605	—	20	60	180
CL-260HR	20	1.8	2.63	—	655	20	5.0	23

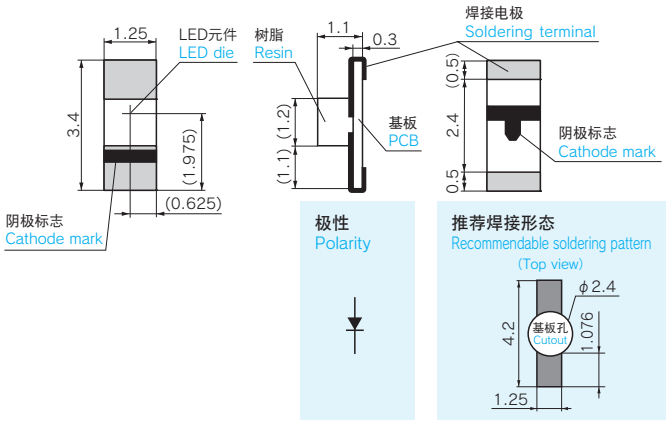
＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

LED元件(G, YG, Y, TD2) LED die(G, YG, Y, TD2)　　单位 Unit：mm



LED元件(HR) LED die(HR)　　单位 Unit：mm



包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

普通颜色LED（单色） General Color LED(Mono-color Type)

CL-270 Series

1.6(L)×
1.15(W)×0.6(H)mm

特征 Features

1. 单色发光LED
Mono-color lighting LED

2. 侧面发光，小型・薄型
Side-lighting, compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-270G	50	20	100*	4	−25～+80	−30～+85
CL-270YG	50	20	100*	4	−25～+80	−30～+85
CL-270Y	50	20	100*	4	−25～+80	−30～+85
CL-270D	50	20	100*	4	−25～+80	−30～+85
CL-270HR	78	30	100*	4	−25～+80	−30～+85

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

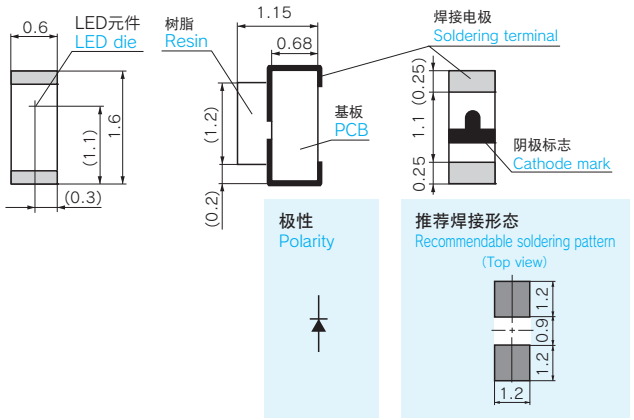
(Ta 25℃)

产品代码 Product code	VF			λd	λp	Iv*		
	IF (mA)	typ (V)	max (V)	typ (nm)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-270G	20	2.2	2.63	570	—	20	2.5	10
CL-270YG	20	2.2	2.63	575	—	20	5.0	18
CL-270Y	20	2.1	2.63	590	—	20	2.6	6.4
CL-270D	20	2.2	2.63	605	—	20	2.4	7.1
CL-270HR	20	1.8	2.63	—	655	20	5.0	23

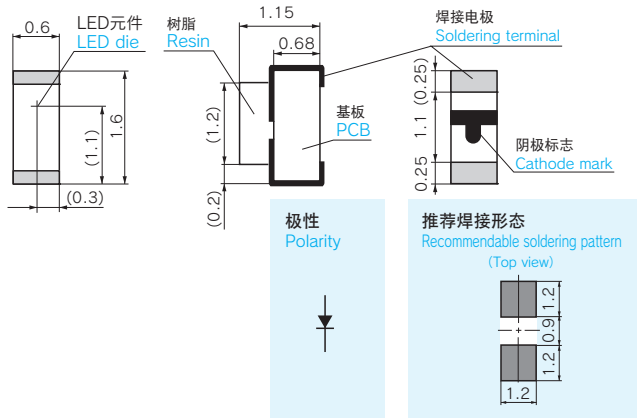
＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

LED元件(G, YG, Y, D) LED die(G, YG, Y, D)　　单位 Unit：mm

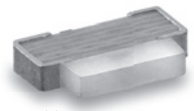


LED元件(HR) LED die(HR)　　单位 Unit：mm



包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

CL-482S Series



1.8(L)×
1.1(W)×0.3(H)mm

特征 Features

1. 单色发光LED
Mono-color lighting LED

2. 侧面发光，小型・薄型
Side-lighting, compact/thin type

3. 可从印刷电路板的背面实施自动贴装
Automatically mountable from rear side of PCB

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-482S-TR2	58	30	100*	4	−25～+80	−30～+85
CL-482S-TD2	78	30	100*	4	−25～+80	−30～+85
CL-482S-HG8	72	20	100*	4	−25～+80	−30～+85
CL-482S-HB8	76	20	50*	4	−25～+80	−30～+85

＊ IFP的条件为duty 1/10，脉冲宽度为0.1msec。
＊ Conditions for IFP are pulse of 1/10 duty and 0.1msec width.

●电气・光学特性 Electrical and Optical Characteristics

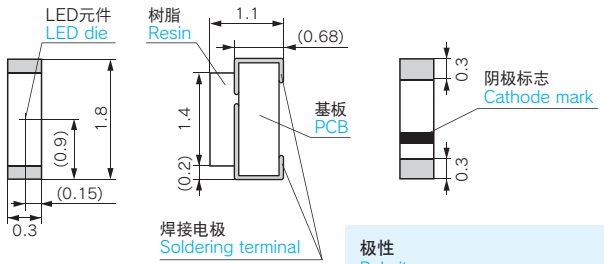
(Ta 25℃)

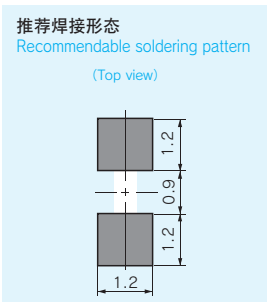
产品代码 Product code	VF			λp	Iv*		
	IF (mA)	typ (V)	max (V)	typ (nm)	IF (mA)	min (mcd)	typ (mcd)
CL-482S-TR2	20	2.1	2.68	630	20	23	80
CL-482S-TD2	20	2.1	2.68	605	20	23	110
CL-482S-HG8	5	2.9	3.4	530	5	63.6	140
CL-482S-HB8	5	2.9	3.24	470	5	20	32

＊ 符合NIST标准 ＊ Compliant with NIST standards

●外形尺寸图 Outline drawing

单位 Unit：mm





包装数量：5,000个/卷（ϕ180mm） Loaded quantity:5,000pcs./1 reel(ϕ180mm)

CL-773F Series

2.0(L)×
1.6(W)×0.7(H)mm

特征 Features

1. 顶部发光的闪光灯LED
   Flash LED of single upward-lighting
2. 小型 · 薄型
   Compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP* (mA)	Top (℃)	Tst (℃)	Tj max DC/Pulse (℃)
CL-773F-CW18C4-SDW	1,650	500	2,000	−40～+85	−40～+85	135 / 150

＊ IFP的条件如下所示。 ＊ Condition of IFP (driving pulse) is as follows.
(a) IFP=500mA−1,500mA : Pulse width≦500msec, duty≦10%, Ta=25℃.
(b) IFP=1,500mA−2,000mA : Pulse width≦33msec, duty≦6.6%, Ta=25℃.

●电气 · 光学特性 Electrical and Optical Characteristics

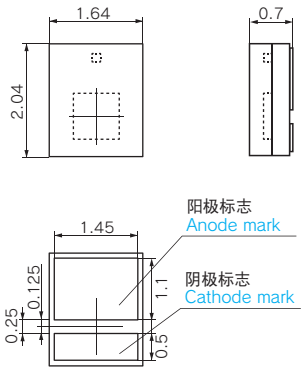
(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=1,000mA*6	3.2	3.5	3.8	V
光通量 Luminous Flux*2·3	ϕv	IF=1,000mA*6	260	300	340	lm
色度坐标 Chromaticity coordinates*4·5	x, y	IF=1,000mA*6		x(±0.02) / y(±0.02)		—
			a	0.3133 / 0.3251		
			b	0.3324 / 0.3592		
			c	0.3323 / 0.3348		
			d	0.3160 / 0.3046		
CCT范围 CCT Range	—	IF=1,000mA*6	5,500	6,000	6,50	K
半值视角 View Angle at 50% Intensity	2ϕ	—	—	(120)	—	deg

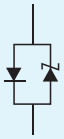
＊1 正向电压的测量误差为±3%。／＊2 符合NIST标准／＊3 光通量的测量误差为±10%。／＊4 色度坐标是a、b、c、d所围合的范围。／＊5 色度坐标的测量公差小于0.01。／＊6 各特性值是脉冲宽度在20ms之内的测量值。
＊1 The tolerance of Forward Voltage measurement is ±3% at our tester.／＊2 Compliant with NIST standards.／＊3 The tolerance of Luminous Flux measurement is ±10% at our tester.／＊4 Chromaticity coordinates are surrounded by points a, b, c, and d.／＊5 The tolerance of the Chromaticity coordinates measurement shall be under ±0.01.／＊6 Characteristics are measured during a pulse of 20ms.

●外形尺寸图 Outline drawing

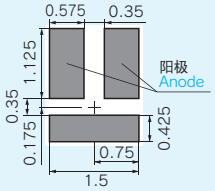
单位 Unit : mm



极性
Polarity



推荐焊接形态
Recommendable soldering pattern
(Top view)



包装数量：3,000个/卷（ϕ180mm） Loaded quantity:3,000pcs./1 reel(ϕ180mm)

CL-776A3 Series

2.0(L)×
1.6(W)×0.7(H)mm

特征 Features

1. 顶部发光的闪光灯LED
   Flash LED of upward-lighting
2. 小型 · 薄型
   Compact/thin type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP* (mA)	Top (℃)	Tst (℃)	Tj max DC/Pulse (℃)
CL-776A2-CW04S2-SDW	1,903	500	1,000	−40～+85	−40～+85	135 / 150

＊ IFP的条件如下所示。 ＊ Condition of IFP (driving pulse) is as follows.
(a) IFP=250mA−500mA : Pulse width≦500msec, duty≦10%, Ta=25℃.
(b) IFP=500mA−1,000mA : Pulse width≦300msec, duty≦10%, Ta=25℃.

●电气・光学特性 Electrical and Optical Characteristics

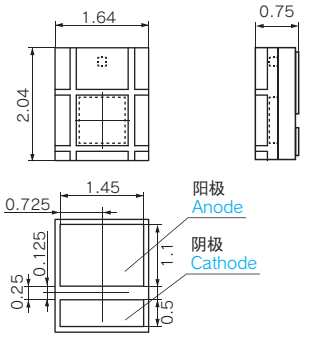
(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=500mA*6	2.8	3.3	3.8	V
		IF=1,000mA*6	(3.1)	(3.65)	(4.22)	
光通量 Luminous Flux*2·3	ϕv	IF=500mA*6	125	150	180	lm
		IF=1,000mA*6	(200)	(240)	(285)	
色度坐标 Chromaticity coordinates*4·5	x, y	IF=500mA*6		x(±0.02)	y(±0.02)	—
			a	0.320	0.369	
			b	0.349	0.399	
			c	0.342	0.311	
			d	0.325	0.296	
		IF=1,000mA*6		x(±0.02)	y(±0.02)	
			a	(0.317)	(0.363)	
			b	(0.346)	(0.393)	
			c	(0.339)	(0.305)	
			d	(0.322)	(0.290)	
CCT范围 CCT Range	—	IF=500mA*6	5,000	5,500	6,000	K
		IF=1,000mA*6	(5,100)	(5,650)	(6,150)	

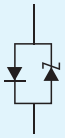
＊1 正向电压的测量误差为±3%。／＊2 符合NIST标准／＊3 光通量的测量误差为±10%。／＊4 色度坐标是a、b、c、d所围合的范围。／＊5 色度坐标的测量公差小于0.01。／＊6 各特性值是脉冲宽度在20ms之内的测量值。
＊1 The tolerance of Forward Voltage measurement is ±3% at our tester.／＊2 Compliant with NIST standards.／＊3 The tolerance of Luminous Flux measurement is ±10% at our tester.／＊4 Chromaticity coordinates are surrounded by points a, b, c, and d.／＊5 The tolerance of the Chromaticity coordinates measurement shall be under ±0.01.／＊6 Characteristics are measured during a pulse of 20ms.

●外形尺寸图 Outline drawing

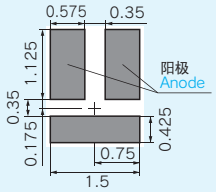
单位 Unit : mm



极性
Polarity



推荐焊接形态
Recommendable soldering pattern
(Top view)



包装数量：3,000个/卷（ϕ180mm） Loaded quantity:3,000pcs./1 reel(ϕ180mm)

闪光灯LED CITILIGHT Flash LED CITILIGHT

CL-770S Series

2.0(L)×
1.6(W)×0.7(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-770S-4WQ	72	20	100	5	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为30msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 30msec width.

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=20mA	—	3.2	3.6	V
反向电流 Reverse Current*1	IR	VR=5V	—	—	100	μA
光强 Luminous Intensity*2	Iv	IF=20mA	—	6.7	—	cd
色度坐标 Chromaticity coordinates*3	x, y	IF=20mA		x(±0.02)	y(±0.02)	
			a	0.270	0.220	
			b	0.270	0.290	
			c	0.350	0.400	
			d	0.350	0.330	

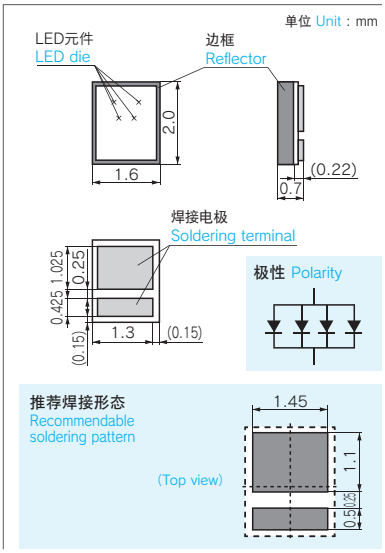
＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

1. 顶部发光的闪光灯LED
   Flash LED of upward-lighting
2. 小型 ・ 薄型
   Compact/thin type

●外形尺寸图 Outline drawing



闪光灯LED CITILIGHT Flash LED CITILIGHT

CL-774S Series

2.04(L)×
1.64(W)×0.75(H)mm

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd*2 (W)	IF (mA)	IFP*3 (mA)	Top (℃)	Tst (℃)
CL-774S-3CW05-SDW	2.15	120	500	−25～+80	−30～+85

＊1 1个元件的值。／＊2 Pd的条件为duty 1/10，脉冲宽度为200msec。／＊3 IFP的条件为duty 1/10，脉冲宽度为200msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for Pd are pulse of 1/10 duty and 200msec width.／＊3 Conditions for IFP are pulse of 1/10 duty and 200msec width.

●电气・光学特性 Electrical and Optical Characteristics*1

(Ta 25℃)

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*2	VF	IF=500mA, 200ms	2.8	3.7	4.3	V
光通量 Luminous Flux*3	φv	IF=500mA, 200ms	100	135	170	lm
CCT范围 CCT Range	—	IF=500mA, 200ms	5,000	5,750	6,500	K

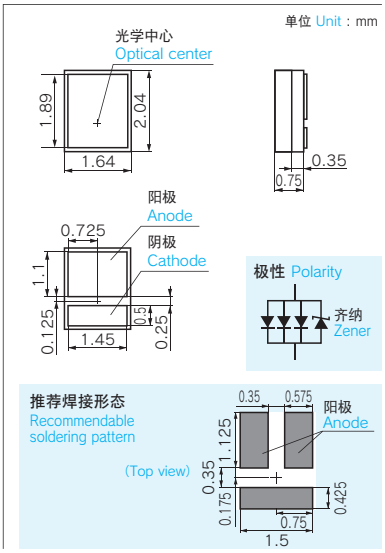
＊1 安装到本公司的基准基板之后所测量的值。／＊2 正向电压的测量误差为±3%。／＊3 全光通量与光强的测量误差为±10%。
＊1 The characteristics are based on the characteristics of the LED under the condition of mounting standard substrate.／＊2 The tolerance of Forward Voltage measurement is ±3% at our tester.／＊3 The tolerance of Luminous Flux measurement is ±10% at our tester.

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

1. 顶部发光的闪光灯LED
   Flash LED of upward-lighting
2. 小型 ・ 薄型
   Compact/thin type
3. 高光效型
   High light efficiency type

●外形尺寸图 Outline drawing



CL-690S Series

3.3(L)×
3.3(W)×1.5(H)mm

特征 Features

1. 顶部发光的闪光灯LED
Flash LED of upward-lighting

2. 带反射器，高输出型
Reflector equipped/high-powered type

3. 2BW01-SD支持高输出・小电流
2BW01-SD supporting high power and small current

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP (mA)	VR (V)	Top (℃)	Tst (℃)
CL-690S-WQ	72	20	100*2	5	−25～+80	−30～+85
CL-690S-2WQ						
CL-690S-3WQ						
CL-690S-2BW01-SD	343	100	500*3			

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为30msec。／＊3 IFP的条件为duty 1/10，脉冲宽度为200msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 30msec width.／＊3 Conditions for IFP are pulse of 1/10 duty and 200msec width.

●电气・光学特性 Electrical and Optical Characteristics

[CL-690S-WQ／CL-690S-2WQ／CL-690S-3WQ]

(Ta 25℃)

参数 Parameter		Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	CL-690S-WQ	VF	IF=20mA	—	3.2	3.6	V
	CL-690S-2WQ						
	CL-690S-3WQ						
反向电流 Reverse Current*1		IR	VR=5V	—	—	100	μA
光强 Luminous Intensity*2	CL-690S-WQ	Iv	IF=20mA	2.8	5.6	—	cd
	CL-690S-2WQ			5.0	10.1		
	CL-690S-3WQ			7.2	14.3		

色度坐标 Chromaticity coordinates*3		x, y	IF=20mA		x(±0.02)	y(±0.02)	
				a	0.270	0.220	
				b	0.270	0.290	
				c	0.350	0.400	
				d	0.350	0.330	

＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

[CL-690S-2BW01-SD]

(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=100mA	2.8	3.0	3.6	V
		IF=500mA, 200ms	(3.4)	(3.8)	(4.3)	
照度 Illuminance*2·3	Iv	IF=100mA	25.7	36.8	47.9	lux@1m
		IF=500mA, 200ms	(72)	(96)	(120)	

色度坐标 Chromaticity coordinates*4·5	x, y	IF=100mA		x(±0.02)	y(±0.02)	
			a	0.300	0.352	
			b	0.395	0.435	
			c	0.367	0.330	
			d	0.313	0.288	

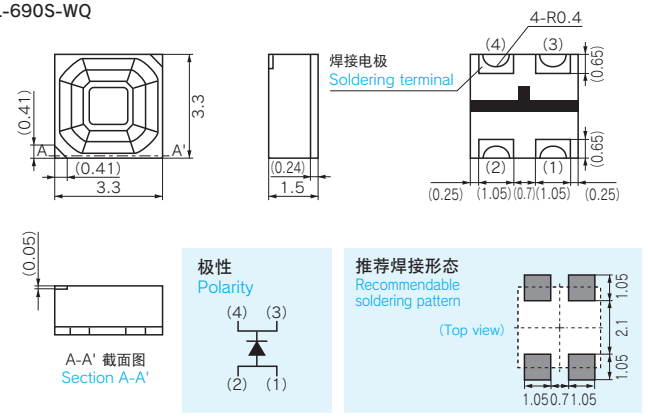
CCT范围 CCT Range	—	IF=100mA	4,000	5,500	7,000	K

＊1 正向电压的测量误差为±3%。／＊2 符合NIST标准 ／＊3 照度的测量误差为±10%。 ／＊4 色度坐标是a、b、c、d所围合的范围。／＊5 符合CIE 1931。
＊1 The tolerance of Forward Voltage measurement is ±3% at our tester.／＊2 Compliant with NIST standards.／＊3 The tolerance of Illuminance measurement is ±10% at our tester.／＊4 Chromaticity coordinates are surrounded by points a, b, c, and d.／＊5 According to CIE 1931.

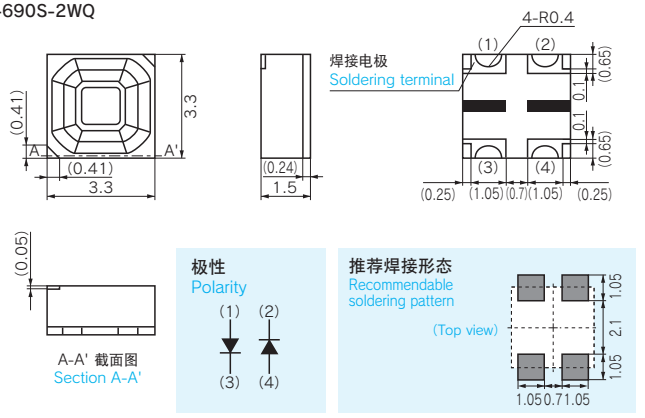
●外形尺寸图 Outline drawing

单位 Unit：mm

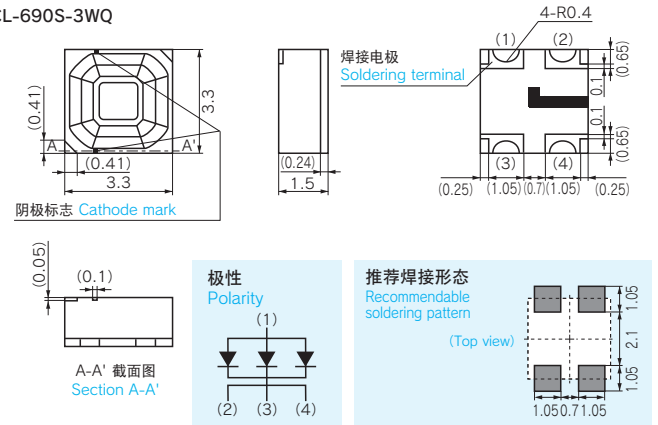
CL-690S-WQ



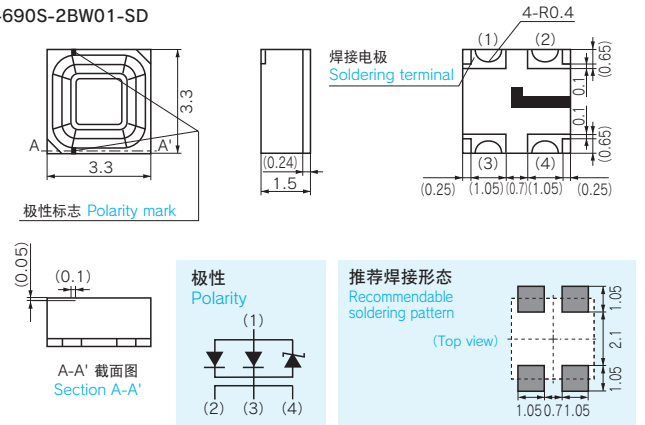
CL-690S-2WQ



CL-690S-3WQ



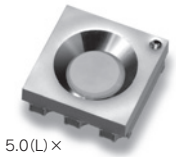
CL-690S-2BW01-SD



包装数量：4,000个/卷（φ330mm） Loaded quantity:4,000pcs./1 reel(φ330mm)

闪光灯LED *CITILIGHT* Flash LED *CITILIGHT*

CL-597S Series



5.0(L)×
5.0(W)×1.5(H)mm

特征 Features

1. 顶部发光的闪光灯LED
   Flash LED of upward-lighting
2. 带反射器，高输出型
   Reflector equipped/high-powered type

●绝对最大额定值 Absolute Maximum Rating*1

(Ta 25℃)

产品代码 Product code	Pd (mW)	IF (mA)	IFP*2 (mA)	VR (V)	Top (℃)	Tst (℃)
CL-597S-4WQ	72	20	100	5	−25～+80	−30～+85

＊1 1个元件的值。／＊2 IFP的条件为duty 1/10，脉冲宽度为30msec。
＊1 The values are based on 1-die performance.／＊2 Conditions for IFP are pulse of 1/10 duty and 30msec width.

●电气・光学特性 Electrical and Optical Characteristics

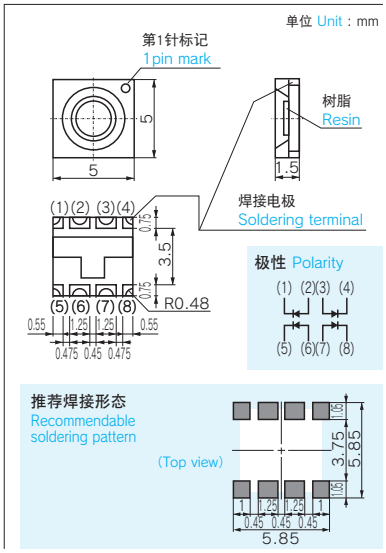
(Ta 25℃)

参数 Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward Voltage*1	VF	IF=20mA	—	3.2	3.6	V
反向电流 Reverse Current*1	IR	VR=5V	—	—	100	μA
光强 Luminous Intensity*2	Iv	IF=20mA	—	14.4	—	cd
色度坐标 Chromaticity coordinates*3	x, y	IF=20mA		x(±0.02)	y(±0.02)	
			a	0.270	0.220	
			b	0.270	0.290	
			c	0.350	0.400	
			d	0.350	0.330	

＊1 1个元件的值。／＊2 符合NIST标准，是各个元件同时亮灯时的值。／＊3 色度坐标是a、b、c、d所围合的范围。
＊1 The values are based on 1-die performance.／＊2 Compliant with NIST standards. The values are based on the condition that each die lights simultaneously.／＊3 Chromaticity coordinates are surrounded by points a, b, c, and d.

●外形尺寸图 Outline drawing

单位 Unit：mm



包装数量：4,000个/卷（φ330mm） Loaded quantity:4,000pcs./1 reel(φ330mm)

Technical note

特征 Features

1. 全部的产品都是SMD(表面贴装器件)型。可以使用高贴装率的贴片机，实现自动贴装。
2. 超小型，高性能
3. 可使用回流焊接。
4. 无铅，符合RoHS指令
5. 支持批量或者编带方式交货，也支持组装到基板之后的单元形式的交货。

1. All products are SMD (Surface Mount Device). Auto-mount is enabled by a chip mounter which provides a high attachment rate.
2. Ultra-compactness and high performance are achieved.
3. Reflow soldering is available.
4. Lead free, compliant with RoHS directive
5. Bulk, taped and even delivery of a unit assembled on a substrate are supported.

产品代码 Product Nomenclature

(例)红外芯片LED (E.g.) Infrared chip LED

CL - 670IR - □ - □

- CL：产品通用编号 Product common number
- 670IR：系列 Series
- □：树脂色 Resin color
  - C：着色(标准品) Coloration (standard product)
  - X：透明 Transparent
- □：供货方式 Delivery style
  - T：编带 Taping
  - 无标记：批量 No coded: Bulk packing

(例)芯片型光电晶体管 (E.g.) Chip Photo-transistor

CPT - 230 S - □ - □

- CPT：产品通用编号 Product common number
- 230：系列 Series
  - 230：上下面安装型 Top and bottom faces mountable type
  - 290：侧面安装型 Side face mountable type
- S：使用元件 Element to be used
  - S：单一型 Single
- □：树脂色 Resin color
  - V：红外截止树脂 Infrared cut resin
  - C：可视光截止树脂 Visible light cut resin
  - X：透明 Transparent
- □：供货方式 Delivery style
  - 无标记：批量 No coded: Bulk packing
  - TU：顶部包边 Top face taping
  - TS：侧面包边 Side face taping
  - TD：底部包边 Bottom face taping

(例)光反射器 (E.g.) Photo-reflector

PR - 30 - □ - □

- PR：产品通用编号 Product common number
- 30：系列 Series
- □：树脂色 Resin color
  - C：着色(标准品) Coloration (standard product)
  - X：透明 Transparent
- □：供货方式 Delivery style
  - T：编带 Taping
  - 无标记：批量 No coded: Bulk packing

(注)“系列名”及“发光色”的位数可能会不一样。
Note: "Series" and "Luminescent color" may have different number of digits.

供货方式 Delivery

产品以编带的方式交货。编带的规格因产品而异(详情请向本公司求取详细规格表予以确认)。

The products are delivered taped. Taping specifications differ depending on the product. (For more information, please ask for the specification sheets.)

安装（里面贴装CPT-230时） Mounting the CPT-230 on the rear face

1. 请使用搭载有图像识别装置的贴片机，安装时，装置对基板孔的精度必须在±0.15mm以内。
2. 不能通过图案，必须通过孔来识别要贴装的印刷电路板的位置。
3. 安装时，施加在产品上的重量请控制在300g以内。

1. A chip mounter with an image recognition device equipped should be used, and the mounting precision should be within ±0.15 mm with respect to the board hole.
2. The position recognition of the PCB to be mounted should be performed by the hole, not the pattern.
3. The load applied to a product at mounting should be 300 g or less.

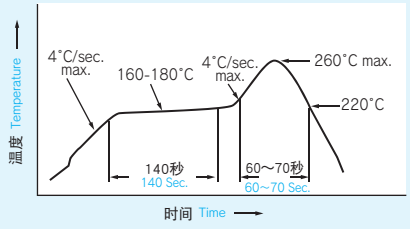
焊接的推荐条件 Recommended soldering

[无铅回流焊接] Lead-free reflow soldering

1. 推荐使用符合以下规格的焊锡膏。
   熔解温度: 216～220℃
   成分: 96.5Sn、3Ag、0.5Cu
2. 回流时请根据下图所示的温度分布图的条件设置树脂顶部温度(关于对具体产品的支持详情，请事先咨询本公司)。
3. 回流后，请等到产品恢复到常温之后再进行下一步的处理。

1. The following solder paste is recommended:
   Melting temperature: 216 to 220° C
   Components: Sn 96.5%, Ag 3%, Cu 0.5%
2. Perform reflow soldering with the settings so that the top face temperature of the resin matches the temperature profile in the diagram below. (We recommend consulting us in advance concerning individual products.)
3. For handling after soldering, wait until the product temperature returns to normal.

推荐"无铅回流焊接分布图"
Recommendable "profile for lead-free reflow soldering"



[手工焊接] Manual soldering

1. 推荐使用96.5Sn、3Ag、0.5Cu的焊锡膏。
2. 手工焊接时，树脂吸潮后会产生裂痕，因此每次使用前请进行烘干处理。
3. 必须使用25W以下的电烙铁，使用时电烙铁的温度请控制在350℃以下。
4. 焊接时，请勿对树脂部施加外力。
5. 焊接时，各个环节均需在3秒之内完成。
6. 焊接后，请等到产品恢复到常温之后再进行下一步的处理。

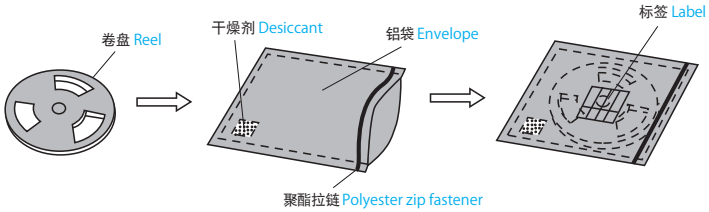
1. A solder paste with Sn 96.5%, Ag 3% and Cu 0.5% is recommended.
2. For handling PCBs with manual soldering, bake the PCBs every time before use to prevent them from cracking, which is caused by the hygroscopic property of the resin.
3. Use a soldering iron of 25 W or less, and keep the temperature of the soldering iron tip at 350° C or less.
4. At soldering, do not apply any external force to the resin portion.
5. Perform soldering within 3 seconds for each round.
6. For handling after soldering, wait until the temperature of the product returns to normal.

包装规格 Packing

[防湿包装] Moisture-proof packaging

为了防止运输途中或者保管期间遭受潮湿，使用内含干燥剂(硅胶)的铝材进行防湿包装。硅胶从绿色变为粉色时，表示吸潮已经到相当程度，请务必注意。

Moisture-proof packaging uses an aluminum bag including a desiccant (silica gel) to protect the product from moisture during shipment and storage. Be aware that the silica gel changing from green to pink is due to moisture absorption.



＊上述之外的详情，请向本公司求取详细规格表后予以确认。
For details of other than the above, please inquire for each specification sheet.

红外芯片LED Infrared chip LED

CL-170IR-X Series

2.0(L)×
1.25(W)×1.1(H)mm

特征 Features

1. 内置红外光发光元件
Infrared light emitting element embedded

2. 超小型
Ultra-compact type

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

项目 Item	Symbol	Rating	Unit
允许功耗 Power dissipation	Pd	80	mW
正向电流 Forward current	IF	50	mA
脉冲正向电流 Pulse forward current	IFP	1*	A
反向电压 Reverse voltage	VR	5	V
操作温度范围 Operating temperature range	TOP	−25～+80	℃
保存温度范围 Storage temperature range	TST	−30～+85	℃

＊ Duty比率 1%，f=1KHz ＊ Duty ratio≦1% Frequency=1KHz

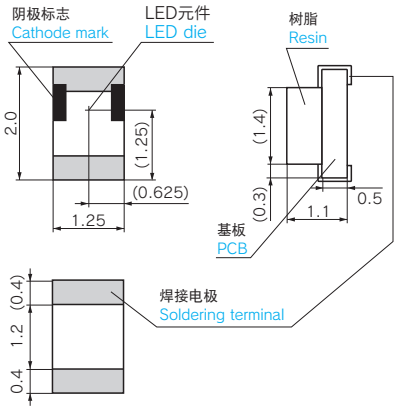
●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

项目 Item	Symbol	Conditions	MIN	TYP	MAX	Unit
正向电压 Forward voltage	VF	IF=20mA	—	1.2	1.6	V
反向电流 Reverse current	IR	VR=5V	—	—	100	μA
端子间的容量 Capacitance between terminals	Ct	V=0V f=1MHz	—	13	—	pF
响应时间 Response time	Tr,Tf	IF=20mA	—	2	—	μS
辐射强度 Radiant intensity	Ie	IF=20mA	0.25	0.6	—	mW/sr
峰值发光波长 Peak wave length	λp	IF=20mA	—	950	—	nm
半值谱宽 Spectrum width of half value	Δλ	IF=20mA	—	45	—	nm

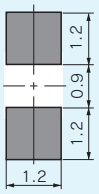
●外形尺寸图 Outline drawing

单位 Unit：mm



极性
Polarity

推荐焊接形态
Recommendable soldering pattern
(Top view)



包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

芯片型光电晶体管 Chip photo-transistor

CPT-230 Series

3.2(L)×
1.6(W)×1.1(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

项目 Item	Symbol	Rating	Unit
集电极与发射极间的电压 Voltage between collecter & emitter	V_{CEO}	25	V
发射极与集电极间的电压 Voltage between emitter & collector	V_{ECO}	5	V
集电极电流 Collector current	I_C	20	mA
集电极损耗 Collector dissipation	P_C	75	mW
操作温度范围 Operating temperature range	T_{OP}	−25～+80	℃
保存温度范围 Storage temperature range	T_{ST}	−30～+85	℃

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

项目 Item		Symbol	Conditions		MIN	TYP	MAX	Unit
光电流 Light current		I_C	V_{CE}=5V Ev=0.1mW/cm²*1	Rank A	18	—	33	μA
				Rank B	27	—	44	
				Rank C	36	—	55	
				Rank D	45	—	84	
				Rank E	69	—	110	
暗电流 Collector dark current		I_{CEO}	V_{CE}=5V		—	5	100	nA
集电极与发射极间的饱和电压 Saturated voltage between collector & emitter		$V_{CE(Sat)}$	I_C=100μA Ev=0.1mW/cm²		—	0.15	0.4	V
峰值灵敏度波长 Peak sensitive wave length		λp*2	—		—	820	—	nm
频谱效率 Spectral efficiency		λ*2	—		450～1,050			nm
响应时间 Response Time	上升 Rise time	Tr	V_{CE}=5V I_C=2mA R_L=100Ω		—	6	—	μSEC
	下降 Fall time	Tf			—	6	—	μSEC
半值谱宽 Spectral width of half value		θ1/2	—		—	±75	—	—

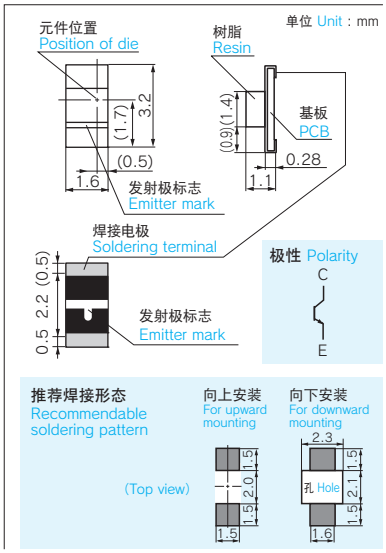
＊1 Ev=950nm 红外光的辐射照度／＊2 X型标准 ＊1 Ev=Infrared irradiance at 950 nm／＊2 Standard for X type

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

支持上下面贴装。
Top and bottom faces mountable

●外形尺寸图 Outline drawing



芯片型光电晶体管 Chip photo-transistor

CPT-290 Series

2.2(L)×
1.45(W)×1.1(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

项目 Item	Symbol	Rating	Unit
集电极与发射极间的电压 Voltage between collecter & emitter	V_{CEO}	25	V
发射极与集电极间的电压 Voltage between emitter & collector	V_{ECO}	4	V
集电极电流 Collector current	I_C	20	mA
集电极损耗 Collector dissipation	P_C	75	mW
操作温度范围 Operating temperature range	T_{OP}	−25～+80	℃
保存温度范围 Storage temperature range	T_{ST}	−30～+85	℃

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

项目 Item		Symbol	Conditions		MIN	TYP	MAX	Unit
光电流 Light current		I_C	V_{CE}=5V Ev=0.1mW/cm²*1	Rank A	55	—	88	μA
				Rank B	72	—	115	
				Rank C	94	—	150	
				Rank D	123	—	197	
暗电流 Collector dark current		I_{CEO}	V_{CE}=5V		—	5	100	nA
集电极与发射极间的饱和电压 Saturated voltage between collector & emitter		$V_{CE(Sat)}$	I_C=100μA Ev=0.1mW/cm²		—	0.15	0.4	V
峰值灵敏度波长 Peak sensitive wave length		λp*2	—		—	940	—	nm
频谱效率 Spectral efficiency		λ*2	—		860～1,090			nm
响应时间 Response Time	上升 Rise time	Tr	V_{CE}=5V I_C=5mA R_L=100Ω		—	3.2	—	μSEC
	下降 Fall time	Tf			—	4.8	—	μSEC
半值谱宽 Spectral width of half value		θ1/2	—		—	±75	—	—

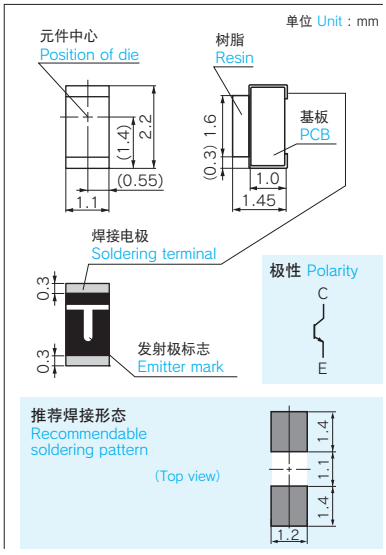
＊1 Ev=950nm 红外光的辐射照度／＊2 C型标准 ＊1 Ev=Infrared irradiance at 950 nm／＊2 Standard for C type

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

可接收侧面方向的光源的侧面贴装型
Side face mountable type, side direction light receivable

●外形尺寸图 Outline drawing



光反射器 Photo-reflector

PR-30

2.18(L)×
1.9(W)×0.75(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

项目 Item			Symbol	Rating
Input	允许功耗 Power dissipation	(mW)	P_d	32.5
	正向电流 Forward current	(mA)	I_F	25
	脉冲正向电流 Pulse forward current*	(mA)	I_{FP}	100
	反向电压 Reverse voltage	(V)	V_R	6
Output	集电极损耗 Collector dissipation	(mW)	P_C	75
	集电极电流 Collector current	(mA)	I_C	20
	集电极与发射极间的电压 Voltage between collector and emitter	(V)	V_{CEO}	18
	发射极与集电极间的电压 Voltage between emitter and collector	(V)	V_{ECO}	4
总允许功耗 Total power dissipation		(mW)	P	100
操作温度 Operating temperature range		(℃)	Top	−30～+80
保存温度 Storage temperature range		(℃)	Tst	−40～+85

* Duty：1/100，脉冲宽度：0.1msec ＊ Duty: 1/100, Pulse width: 0.1msec

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

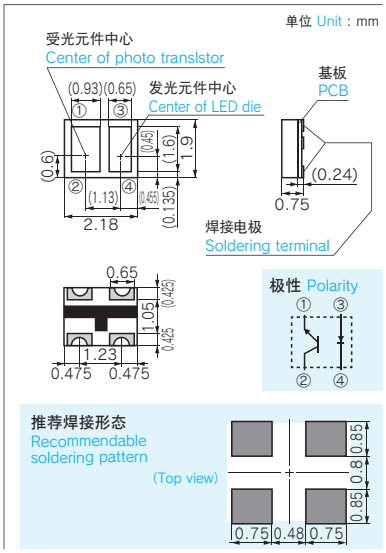
项目 Item			Symbol	Conditions		MIN	TYP	MAX
Input	正向电压 Forward voltage	(V)	V_F	I_F=4mA		—	1.1	1.3
	反向电流 Reverse current	(μA)	I_R	V_R=6V		—	—	10
	峰值发光波长 Peak wave length	(nm)	λ_p	I_F=20mA		—	940	—
Output	暗电流 Collector dark current	(μA)	I_{CEO}	V_{CE}=10V		—	—	0.1
耦合特性 Coupling Characteristics	光电流 Light current	(μA)	I_C	V_{CE}=2V	Rank B	105	—	195
				I_F=4mA	Rank C	165	—	310
				d=1mm	Rank D	280	—	515
	泄漏电流 Leakage current	(μA)	I_{LEAK}	V_{CE}=2V I_F=4mA		—	—	1
	上升时间 Rise time	(μsec)	Tr	V_{CE}=2V I_C=100μA		—	25	—
	下降时间 Fall time	(μsec)	Tf	R_L=1KΩ		—	30	—

包装数量：3,000个/卷（φ180mm） Loaded quantity:3,000pcs./1 reel(φ180mm)

特征 Features

1. 超小型・薄型
   Ultra-compact/thin type
2. 检测距离为1mm，可高精度地检测位置
   1 mm of detection distance, position detectable at high-precision level
3. 采用可截止可视光的树脂，以防止受外部光线的干扰而导致异常发生。
   Thanks to introduction of visible light cut resin, malfunction caused by disturbance light prevented

●外形尺寸图 Outline drawing



光反射器 Photo-reflector

PR-40

1.5(L)×
1.375(W)×0.6(H)mm

●绝对最大额定值 Absolute Maximum Rating

(Ta 25℃)

项目 Item			Symbol	Rating
Input	允许功耗 Power dissipation	(mW)	P_d	32.5
	正向电流 Forward current	(mA)	I_F	25
	脉冲正向电流 Pulse forward current*	(mA)	I_{FP}	100
	反向电压 Reverse voltage	(V)	V_R	6
Output	集电极损耗 Collector dissipation	(mW)	P_C	75
	集电极电流 Collector current	(mA)	I_C	20
	集电极与发射极间的电压 Voltage between collector and emitter	(V)	V_{CEO}	18
	发射极与集电极间的电压 Voltage between emitter and collector	(V)	V_{ECO}	4
总允许功耗 Total power dissipation		(mW)	P	100
操作温度 Operating temperature range		(℃)	Top	−30～+80
保存温度 Storage temperature range		(℃)	Tst	−40～+85

* Duty：1/100，脉冲宽度：0.1msec ＊ Duty: 1/100, Pulse width: 0.1msec

●电气・光学特性 Electrical and Optical Characteristics

(Ta 25℃)

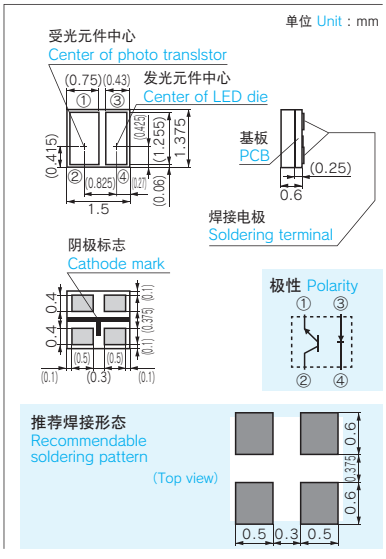
项目 Item			Symbol	Conditions		MIN	TYP	MAX
Input	正向电压 Forward voltage	(V)	V_F	I_F=4mA		—	1.14	(1.35)
	反向电流 Reverse current	(μA)	I_R	V_R=6V		—	—	10
	峰值发光波长 Peak wave length	(nm)	λ_p	I_F=20mA		—	940	—
Output	暗电流 Collector dark current	(μA)	I_{CEO}	V_{CE}=10V		—	—	0.1
耦合特性 Coupling Characteristics	光电流 Light current	(μA)	I_C	V_{CE}=2V	Rank B	105	—	195
				I_F=4mA	Rank C	165	—	315
				d=1mm	Rank D	280	—	515
	泄漏电流 Leakage current	(μA)	I_{LEAK}	V_{CE}=2V I_F=4mA		—	—	1
	上升时间 Rise time	(μsec)	Tr	V_{CE}=2V I_C=100μA		—	25	—
	下降时间 Fall time	(μsec)	Tf	R_L=1KΩ		—	30	—

包装数量：5,000个/卷（φ180mm） Loaded quantity:5,000pcs./1 reel(φ180mm)

特征 Features

1. 超小型・薄型
   Ultra-compact/thin type
2. 检测距离为1mm，可高精度地检测位置
   1 mm of detection distance, position detectable at high-precision level
3. 采用可截止可视光的树脂，以防止受外部光线的干扰而导致异常发生。
   Thanks to introduction of visible light cut resin, malfunction caused by disturbance light prevented

●外形尺寸图 Outline drawing



融合了光学设计与精密加工技术的背光单元

Backlight unit integrating optical design and precision processing technologies.

特征 Features

1. 从LED到整个单元的集成产品开发
2. 高亮度,高品质,长寿命
3. 支持变体形、曲面等各种不同的形状

1. Integrated product development from LEDs to unit.
2. High brightness, high quality and long service life.
3. Free forms available such as variously-shaped and curved surface.

液晶背光单元

LCD Backlight Unit

超薄型・圆状小型 Ultra-thin, round, and compact type

车载用（7英寸） On-vehicle type (7 in.)

车载用（12英寸） On-vehicle type (12 in.)

CITIZEN

西铁城电子株式会社

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Website　http://www.cecol.com

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Tel.〈1〉408-899-2961

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