



**REFOND**

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# Enterprise Introduction

-  
企业简介





# Enterprise introduction

## 关于我们

上市企业 Listed Enterprise

研发生产一体化 R&D and Production Integration

LED封装方案 LED Packaging Solution

科技创新 Scientific and Technological Innovation

技术领先 Advanced Technology

产品差异化 Differentiated Products

Shenzhen Refond Optoelectronics Co., Ltd. (stock code: 300241) is a world-renowned LED packaging solution and product provider, integrating R&D, production of LED light sources and application solutions.

Technological innovation, technology leadership, and product differentiation are the core competitiveness of our company. Refond has successively deployed and promoted the development of lighting, display, automotive, electrical and other professional fields. Refond has established deep business and strategic partnerships with the world's first-tier brands. At present, Refond focuses on Mini LED, Micro LED, AI sensor devices and other areas of research and development and business layout, to enhance the company's core competitiveness and sustainable profitability.

Refond was established in 2000. Scientific research and innovation have brought inexhaustible power to Refond development. We has helped customers in various industries and meet the needs of present and future social development with scientific and technological innovation. In the future, Refond Optoelectronics will continue to practice the brief of "enriching human life with innovation and technology", integrating global resources with technology, promoting innovation and development and taking "become the world's leading technology company" as the corporate vision.

深圳市瑞丰光电子股份有限公司(股票代码:300241)是一家集研发、生产LED光源并提供应用解决方案的全球知名LED封装方案及产品提供商。

科技创新、技术领先、产品差异化是瑞丰光电赖以生存的核心竞争力,瑞丰光电陆续布局和推动照明、显示、车用、电气等专业领域发展,并与全球一线品牌企业建立了深度的业务与战略合作关系。目前,公司将重点在Mini LED、Micro LED以及AI感测器件等新兴领域进行研发与业务布局,提升公司核心竞争力和持续盈利能力。

公司成立于2000年,科研创新为瑞丰的发展带来不竭的源动力,瑞丰光电致力于帮助各行业的客户满足当今和未来社会发展的需求。未来,瑞丰光电将继续秉承“创新科技 丰富人类生活”的理念,整合全球资源与技术,不断创新与发展,以“成为全球领先的科技公司”为企业愿景。

### 企业使命 Corporate Mission

创新科技,丰富人类生活  
-  
Innovation enriches life

### 企业愿景 Corporate Vision

成为全球领先的科技公司  
-  
Become the world's leading technology company

## Corporate Core Values: Altruism & Self-discipline

### 企业核心价值观:利他律己

**Altruism: Customer-focused:** Creating value for customers is the only reason for Refond to survive. Refond all internal and external activities need to focus on customer satisfaction.

利他-以客户为中心:为客户创造价值是瑞丰生存的唯一理由,瑞丰所有的内外部活动都需要围绕客户满意

**Self-discipline: Keep open and enterprising:** Complacency and Laziness are the biggest obstacle for pursuing excellence. Everyone in Refond must keep open, enterprising and self-criticism. Only through the hard work of several generations of Refond member, can we achieve the corporate mission and vision.

律己-坚持开放进取:人性的自满和惰性是我们追求卓越的最大障碍,瑞丰人必须持续开放进取,自我批判,通过几代人的艰苦奋斗,才能成就使命和愿景

# Development History

## 发展历程

**In 2000,**

公司成立

Refond founded

**In 2004,**

被授予高新技术企业  
布局电气领域, 并与电力和自动化技术领域的国际领导企业建立合作关系

Awarded the honor of high-tech enterprises.  
Established cooperative relationship with international well-known corporates in power and automation technology field.

**In 2006,**

创新引领, 与世界著名的国际综合性电子技术企业集团建立合作关系

Innovation-oriented, established cooperative relationship with the world-renowned comprehensive electronic technology group

**In 2005,**

强势进军海外市场, 成为全球领先的有线和无线通信半导体公司 OEM/ODM 合作伙伴

Enter overseas markets, and become global leading wireline and wireless communications semiconductor companies' OEM/ODM partner

**In 2015,**

并购玲涛光电  
获得CNAS国家实验室认证  
获批深圳市LED电视背光源工程技术研究开发中心  
获取TOYODA GOSEI白光专利授权

Mergered Shenzhen Ling Tao Optoelectronics Co., Ltd.

Obtained CNAS certification and the white light patent license of TOYODA GOSEI

**In 2011,**

创业板上市

IPO succeed



**In 2016,**

浙江全资子公司成立, 开始建立义乌工业园  
获取GE氟化物KSF荧光粉应用专利授权  
获得国家技术发明一等奖和二等奖

Founded wholly-owned Zhejiang subsidiary.  
Started to establish Yiwu industrial park.  
Obtained GE KSF phosphor application patent authorization.  
Obtained first prize and second prize of national technical invention



## In 2018,

Mini LED量产  
获批广东省LED背光电视  
工程技术研究中心

Mass production of MINI LED.  
Approved as Guangdong LED backlight TV  
engineering technology research center

## In 2012-2016

全力发展,与世界知名企业陆续建立合作伙伴  
关系

Established cooperative relationship with  
well-known international enterprises

## In 2019,

深圳创新企业70强

Top 70 Innovative enterprises  
in Shenzhen



## In 2020,

国内最早一批建成MINI LED量产线企业  
与全球领先的ICT提供商建立合作伙伴关系  
瑞丰深圳总部大厦主体封顶

The first batch of domestic enterprises to  
build MINI LED production line  
Established cooperative relationship with  
global leading ICT supplier  
The main body of Refond Shenzhen  
headquarters building was capped



## In 2021,

全资子公司湖北瑞华光电成立  
湖北瑞华光电Mini LED产业基地开工  
Mini LED背光终端产品上市  
通过世界领先的汽车零部件审核并进入供应链体系

Founded wholly-owned Hubei subsidiary  
Construction of Hubei subsidiary's MINI LED  
industrial base started up  
Mini LED backlight terminal products were launched  
Approved by the world's leading auto parts corpora-  
tion and into its supplying system

## In 2022,

瑞丰RGB点亮北京冬奥大雪花  
瑞丰助力发布Mini LED背光终端产品  
瑞丰光电总部大厦投入使用  
湖北瑞华Mini LED产业园建成投产

Refond RGB 1415 gold wire lighted up the  
large snowflake at Winter Olympics in  
Beijing.Helped launch Mini LED backlight  
terminal product.The headquarters  
building was put into use.Hubei subsidi-  
ary's Mini LED industrial base construc-  
tion finished and start mass production



# Technology History

## 技术历程

In 2002,

第一条SMD LED封装线

Established the first domestic SMD LED packaging lines

In 2005,

陶瓷大功率LED封装技术、专利及产品

Approved high power ceramic LED patent,package technology,package product

In 2006,

银胶欧姆接触底线保护专利及技术

DA-epoxy ohmic contact ottom line protection technology and patent

In 2009,

固晶技术优化,率先推出30Ma驱动的TOP LED

Improve die bonding,the first to promote the 30 mA driven TOP LED

In 2011,

推出TOP LED4014、7020

Promoted TOP LED4014、7020

In 2010,

LED大尺寸背光整体解决方案及产品大功率LED封装荧光粉涂敷技术优化、透镜一体成型技术

LED backlight TV overall solution and products.

High power package phosphor coating technology improvement and lens molding technology

In 2012,

大功率LED荧光粉KL图形化涂敷推出PCT TOP LED

High power LED phosphor KL graphical coating. Promoted PCT TOP LED

In 2013,

大功率LED共晶焊技术量产应用全周光封装技术及灯丝

High power LED eutectic bonding technology MP application;360°emitting package and filament product

In 2014,

CSP专利、技术及产品解决方案无机封装技术及产品解决方案推出EMC LED

CSP patent, technology and product solution.

Inorganic package technology and product solution, EMC LED MP

## In 2016,

倒装芯片支架式3D封装技术FEMC获得国家技术发明一等奖和二等奖

Flip-Chip Stand 3D Packaging Technology FEMC won the first and second prizes of National technology Invention

## In 2015,

获得CNAS国际实验室认证

Refond laboratory obtained CNAS certification

## In 2017,

Micro lens 制备技术封装应用解决方案

Micro lens fabrication technology and package application solution

## In 2018,

获批建立广东省LED电视背光源工程技术研究中心Mini-LED P0.68 新型显示技术实现批量生产推出SMC LED

Approved as Guangdong LED backlight TV engineering technology research center. Mini-LED P0.68 new display technology realizes mass production. Promoted SMC LED

## In 2019,

背光系列, 部分機種批量交付直接显示系列P0.49及以上批量交付P0.39 样品交付

Partial backlight series, P0.49 of direct display series and P0.39 samples were delivered

## In 2020,

背光系列覆盖VR/PAD/NB/NMT/TV等全线量产直接显示系列P0.49及以上产能扩充, 方量接单P0.39 小批量交付

Backlight series covered VR/PAD/NB/NMT/TV with mass production. P0.49 of direct display series expanded the yield

## In 2021,

Micro Lens技术CSP背光匀光技术及Demura技术底部增光技术及超薄模压技术

Micro Lens technology, CSP backlight leveling technology, Demura technology, bottom polish technology and ultra-thin molding technology

## In 2022,

建立车规级百级车间, 车载激光雷达产品量产无机封装技术, 多次模压技术落地光耦、VCSEL、光传感产品批量生产推出零死灯失效产品解决方案

Built a automotive-level and 100-level dust-free workshop, Automotive lidar products started mass production Inorganic packaging technology and multiple molding technology application Optocouplers, VCSELs, and optical sensing products entered MP Launched the product solution for 0 dead light failure

# Honorary qualification & patent

## 荣誉资质+专利

Science and technology is the soul of human progress. Refond continues to uphold the mission of scientific and technological innovation, respecting knowledge, protecting innovation and listing the intellectual property strategy as one of the company's core strategies.

Refond has established and continued to optimize the enterprise intellectual property management system, and successfully passed the intellectual property certification in 2018. Currently, Refond has applied for over 400 patents, including over 140 invention patents, over 240 utility model patents, and over 55 appearance patents. In addition, there are 329 projects, of which 42 inventions, 234 utility models, and 53 appearance authorizations. The patents basically cover Refond various product technology fields, especially in the core technology MINI LED field with over 50 independent intellectual property rights.

In recent years, Refond has been actively deploying patents in overseas markets, such as Europe, America, Japan and South Korea.

科技是人类进步的灵魂，瑞丰光电持续秉承着科技创新的使命，尊重知识，保护创新，并将知识产权战略已经列为公司的核心战略之一。

瑞丰光电建立并持续优化企业知识产权管理体系，2018年顺利通过知识产权认证；当前，瑞丰光电累计申请专利400+，其中发明专利140+项，实用新型240+，外观专利55+；专利基本覆盖公司各产品技术领域，尤其是在核心技术MINI LED领域拥有自主知识产权超80项。

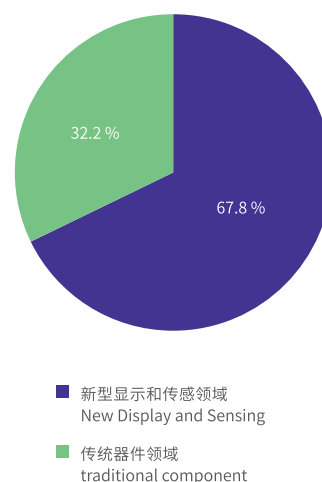
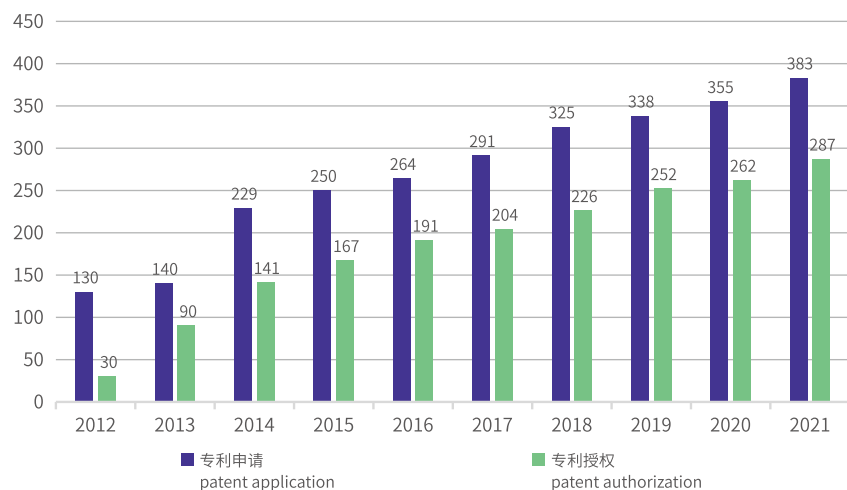
近年来，瑞丰光电积极布局海外市场专利，当前已在欧美、日韩等地区进行专利布局。

公司获专利授权 **300<sup>+</sup>** 件  
Refond has obtained **300<sup>+</sup>** patent authorizations

Refond patent layout focuses on the field of innovative technology. In recent years, about 70% of patent layout is in the field of new display and sensing

公司专利布局侧重于创新科技领域，近年约七成专利布局于新型显示和传感领域。

专利数量  
patent number



# Honorary qualification

## 荣誉资质



### 行业认可 | Award from LED industry

2011年度 优秀组织奖	2011年度 百强企业	2012年度 最具创新力企业	LED行业 技术领军企业	2012年度 先进单位	2012年度 最具潜力LED企业	2012年度广东省 诚信示范企业	2013年度广东省 诚信示范企业	2013年度广东省 企业500强	中国LED行业 技术领军企业
最具影响力企业	2013年度 优秀企业	2019年度 优秀企业	中国LED照明 灯饰行业100强	中国LED 25强企业	2015年度 首创企业奖	第四届LED行业 十大技术领军企业	2015年度 十佳企业	LED行业 十大技术领军企业	中国LED封装企业 国际竞争力TOP10
LED行业 杰出贡献奖	LED 社会责任卓越奖	2018年度 优秀企业	改革开放40年40 人影响力企业	2019年度 十大封装品牌	党建示范点	知识管理标杆	CSA中国LED 应用推广中心	LED行业 营收50强企业	

### 研发技术类奖项 | R&D technology award

知识产权 优势企业	最佳封装技术 创新奖	中国LED 技术创新30强	中国LED首创奖 知识产权30强	中国安防 十大新锐产品奖	最佳LED 光源技术创新奖	最有特色产品奖	LED显示 优秀产品奖	LED行业知识产权 50强企业

### 参会单位 | Industry association participated

深圳LED产业 联合会副会长单位	深圳LED产业标准 联盟核心会员单位	国家半导体照明 工程研发及产业联盟	半导体照明技术 标准工作组委员	国家半导体照明 工程研发及产业联盟 第四届常务理事单位	深圳半导体照明产业 发展促进会会员单位	广东微显示技术创新 联盟常务理事单位	深圳新型显示 知识产权与标准 联盟副理事长单位	深圳市两新组织 党建工作示范点

### 客户褒奖 | Praise from customer

欧曼照明 黄金级供应商	阿拉丁商务 战略合作供应商	美的照明 供应商大会	优秀供应商	供应商创新奖	十大供应链之星	LED国际 合作促进联盟	国际汽车创新科技 优秀供应商	优秀供应商

# patent

## 专利



### 实用新型专利证书 | Utility model patent certificate



### 外观设计专利证书 | Appearance design patent certificate





# R&D capability (laboratory)

## 科研实力(实验室)

Refond got CNAS certificate in December 2015 and is listed as a national laboratory. It provides complete-testing methods for company technology innovation and product development, and flexible testing data for LED quality control and management.

Refond adheres to the concept of emphasizing talents, scientific research and innovation. There are 377 high-tech talents and scientific research personnel, accounting for 22.5% of the total employees, 14 of them are masters and doctors (including national commissioners).

Refond Experimental Center adopts the latest theories and experimental technologies of various disciplines, and conducts continuous innovation and in-depth research in the three major blocks of product software and hardware development, advanced process development, and material opening. Meanwhile, Refond establishes a special group to develop and design advanced equipment, from product and process design to reference guidelines and test feedback. It will reduce product failure rate and provide better systematic optical design solutions.

The service scope of the experimental center covers optical, electrical, thermal parameter testing, environmental testing, mechanical strength testing, IP protection testing and failure analysis of LED packaging and device modules etc. The main standards include optical related CIE127:2007, JESD51-51, environmental related GB/T 2423 series national standards and IEC, ISO and other international standards.

瑞丰实验中心于2015年获得CNAS认可,由深圳实验室、义乌实验室,葛店实验室(筹建中)组成。凭借完整的实验室能力,致力于打造一流的LED研发中心,并先后获批国家级实验室、深圳LED电视背光工程技术研发中心、广东省LED电视背光工程技术研究开发中心,荣获CNAS证书。

瑞丰秉承重人才、重科研、重创新的理念。吸纳377名高技术人才科研人员,占瑞发总人数的22.5%,更有硕士、博士等(含国家特派员)在内的顶级技术人才14名。

瑞丰实验中心采用各学科最新的理论和实验技术,在产品软硬件开发、先进工艺开发、材料开放三大块不断革新深入研究,并成立专项组对先进设备进行联合开发设计,从产品设计、工艺设计到引用指引和测试反馈,全流程降低产品失效率,提供更佳的系统光学设计方案。

实验中心服务范围包含(LED封装及器件模组的光学、电学、热学参数测试、环境测试、机械强度测试、IP防护类测试、失效分析等)。主要覆盖的标准有:光学相关CIE127:2007、JESD51-51、环境相关GB/T 2423系列的国家标准以及IEC、ISO等国际标准。

**377** 名研发人员,占总人数的  
R&D employees

**14** 名博士&硕士  
masters and doctors

**22.5** %  
of the total employees

## R&D Center 研发中心

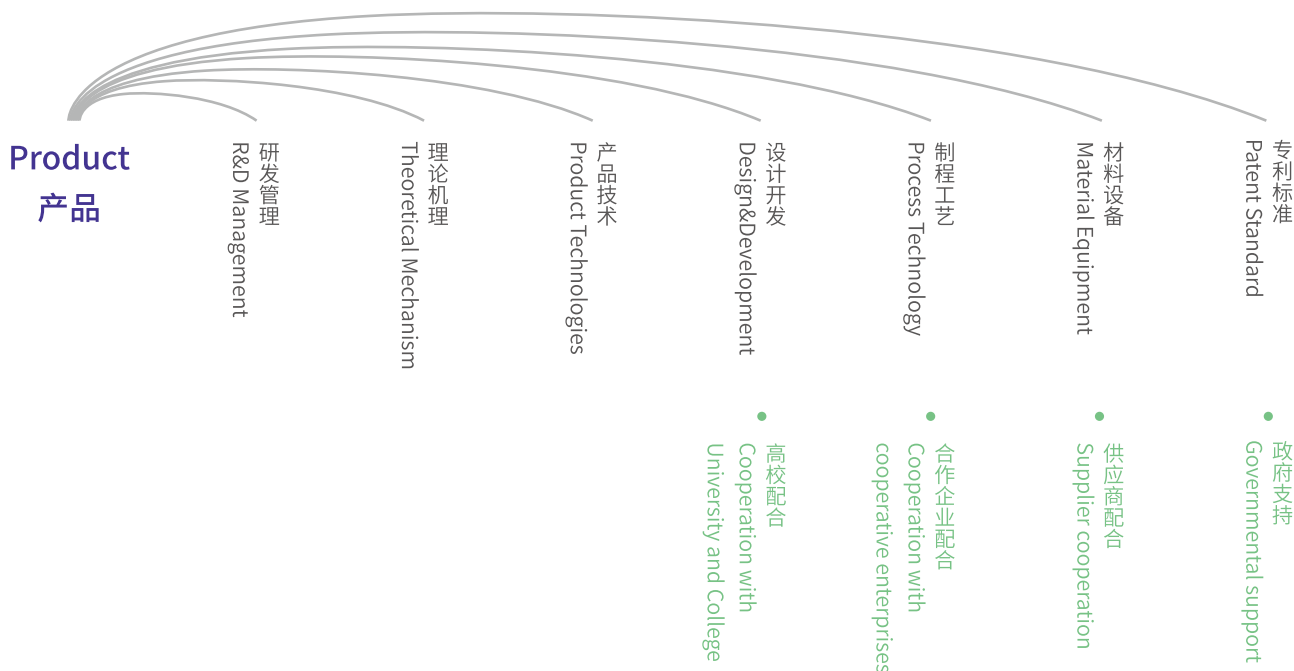


Got CNAS certificate in December 2015 and listed as a national laboratory  
Guangdong LED TV Backlight Engineering Technology Research and Development Center  
Shenzhen LED TV backlight engineering technology research and development center

中国合格评定国家认可委员会 CNAS认可  
广东电视背光源工程实验中心  
深圳电视背光源工程实验中心

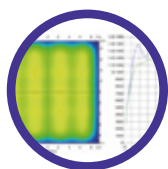
# R&D management mechanism

## 研发管理机制

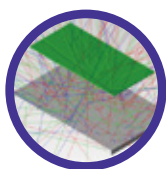


# Product design ability

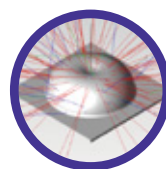
## 产品设计能力



模组: 光学亮度  
Module: optical brightness



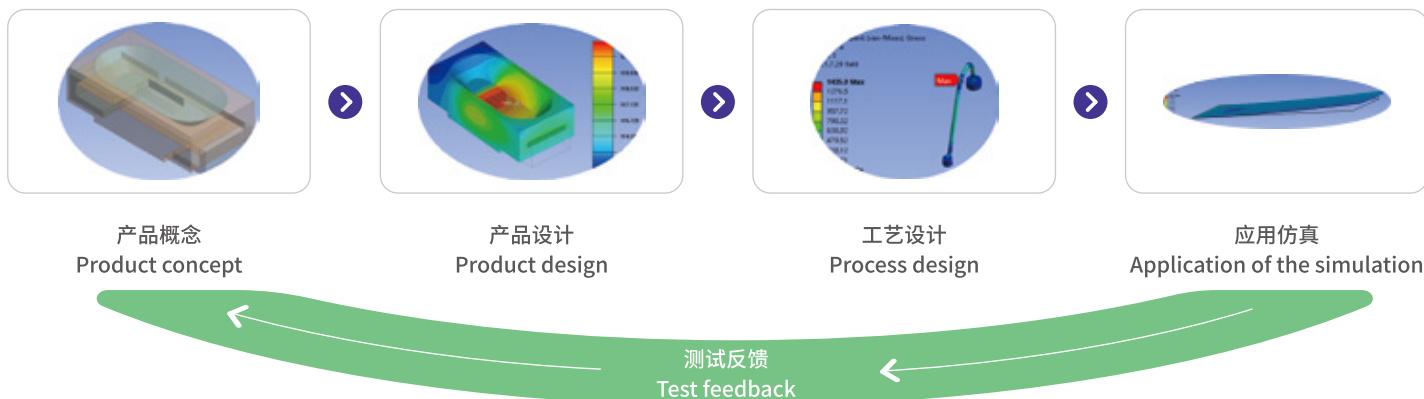
模组: 光学路径  
Module: Optical path



器件: 光学路径  
Component: Optical path

**Optical design:** Design and simulation capability for chip, device, mode-level lighting and display optics. The customer provides the optical design of the system

**光学设计:** 具备芯片、器件、模组级照明和显示光学设计仿真能力, 可以为客户提供系统的光学设计方案



**Thermodynamic design:** From product design, process design, to application guidance and test feedback, the whole process reduces product failure rate

**热力学设计:** 从产品设计、工艺设计, 到应用指引和测试反馈, 全流程降低产品失效率

# Develop ability

## 开发能力

### Software and hardware development

#### 软硬件开发

##### 硬件 | Hardware

Schematic design  
PCB Layout  
Selection of electronic components  
Functional module hardware design

原理图设计  
PCB Layout  
电子元器件选型  
功能模组硬件设计



##### 软件 | Software

FPGA develop  
MCU develop  
Functional module function realization

FPGA开发  
MCU开发  
功能模组功能实现



##### 测试 | Test

Function test  
Electronic components test  
Software test  
Failure analysis

功能测试  
电子元器件测试  
软件测试  
失效分析



### Advanced process development

#### 先进工艺开发

瑞丰 R&D provides various advanced process development programs to deal with the development of all kinds of LED related products, such as Mini LED/Micro LED/ flexible products/ sensing/functional modules and other products

Mass transfer technology  
COF Bonding  
3D shape  
Precise welding  
Molding

瑞丰研发提供各类先进工艺开发方案, 以应对各类LED相关产品的开发落地(如 Mini LED/Micro LED/柔性产品/传感/功能模组等产品)。

巨量转移技术  
COF Bonding  
3D 成型  
精密焊接  
Molding

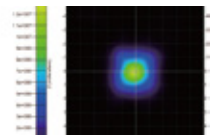
### Material development

#### 材料开发

##### 设计模拟 | Design simulation

Self-designed high reflection cup  
Ultra-high energy efficiency Flip chip  
No line, no failure risk  
High reflection dispensing technology  
Low thermal resistance, long life

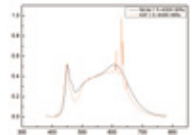
自主设计高反射杯  
超高能效 Flip chip  
免打线, 无死灯风险  
高反射点胶技术  
低热阻, 超长寿命



##### 技术路线 | Technical route

Material Technology Route  
Process technology route  
Product life capacity

材料技术路线  
工艺技术路线  
产品寿命能力



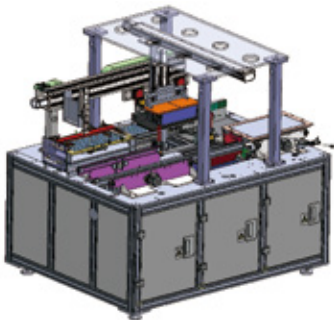
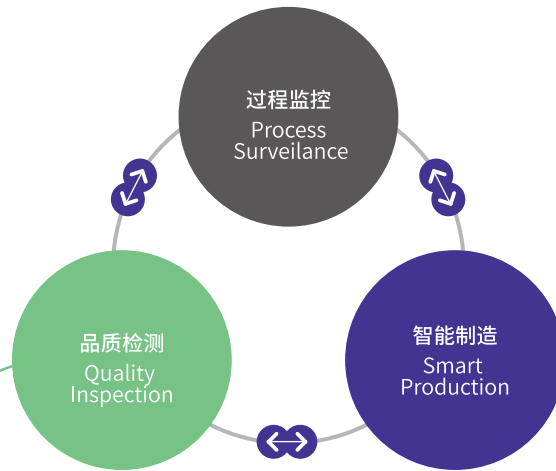
##### 材料机理分析 | Material mechanism analysis

Metal migration short circuit analysis  
Electrode corrosion open circuit analysis  
Light decay, voltage rise, ITO and P-GaN stripping

金属迁移短路分析  
电极腐蚀断路分析  
光衰、电压升, ITO与P-GaN剥离

# Advanced equipment joint development ability

先进设备联合开发能力



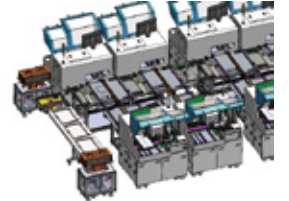
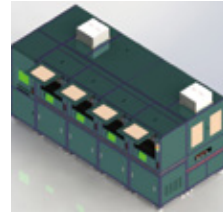
Automatic testing equipment for raw materials  
High precision test equipment for solder paste  
Mount high precision test equipment  
Optical high precision test equipment  
...

原物料自动检测设备  
锡膏高精度测试设备  
贴装高精度测试设备  
光学高精度测试设备  
...



Automatic X-ray test equipment  
High precision push and pull test equipment  
High precision electrical test equipment  
...

全自动X-ray测试设备  
高精度推拉测试设备  
高精密电性测试设备  
...



Automatic Molding equipment  
Automatic Die Bonding production line  
Automatic assembly line  
Intelligent aging test line  
High precision laser welding equipment  
Massive transfer equipment  
Whole line with MES plant management  
...

全自动Molding设备  
全自动Die Bonding线  
全自动组装线  
智能aging测试线  
高精度激光焊接设备  
巨量转移设备  
整线MES工厂管理  
...

# Manufacturing strength (Production & Quality)

## 制造实力(生产+品质)

Shenzhen Refond Optoelectronics Co., Ltd. is a world-renowned LED packaging solution and optoelectronic semiconductor manufacturer. We have 3 production bases located in Shenzhen Guangdong Province, Gedian Hubei Province and Yiwu Zhejiang Province, with a total area of about 294, 000m<sup>2</sup>. We have mature process technology, perfect production and processing equipments, with more than 6000 sets of advanced mechanical processing equipment (sets). Meanwhile, Refond also has advanced inspection and testing equipments. Annual qualified product rate is more than 99%. High automation and informization degree are the guarantee of Refond' s strong production capacity.

深圳市瑞丰光电子股份有限公司作为全球知名的LED封装解决方案和光电半导体制造商,我们拥有坐落于广东深圳、湖北葛店、浙江义乌等3座生产基地,总面积约294000m<sup>2</sup>。我们具有成熟的制程工艺和完善的生产加工设备,拥有先进机械加工设备6000+台(套),同时公司也拥有先进的检验和检测设备,年均生产良率高达99%以上,强大的自动化和信息化程度是我们强大生产实力的保证。

Directly managed by the CEO, Refond quality management center is responsible for all product lines, the whole process quality control and after-sales service. It has set up quality management platforms in Shenzhen, Zhejiang and Hubei production bases, and established SQE, DQA, system, laboratory these four function platforms in Shenzhen headquarters. These platforms will help to achieve the same quality standard between clients and suppliers, as well as to standardize Refond quality management process.

The quality management center is about 380 employees, covering all the quality management functions such as SQE/IQC, PQE, DQA, CQS, QS and laboratory.

瑞丰光电品质管理中心直属公司CEO管理,负责对公司所有产品线全流程品质管控及售后服务,组织内设立深圳、浙江、湖北三大生产基地的质量管理平台,并建立了SQE/DQA/体系/实验室四大总部职能平台,内外拉通供应商到客户端的品质标准及管控目标,统一规范公司品质管理流程。

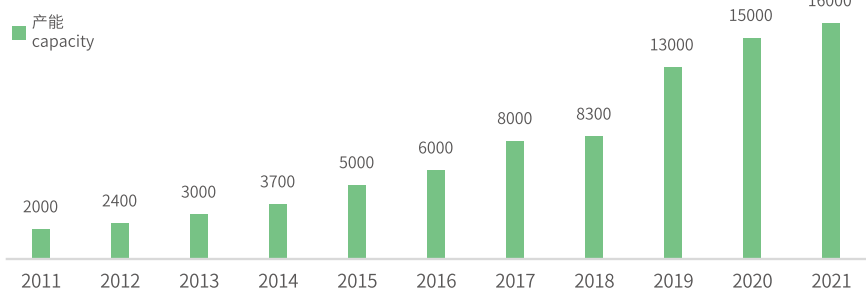
品质管理中心总人力约380人,涵盖SQE/IQC、PQE、DQA、CQS、QS和实验室等所有品质管理职能。



# Yielding capacity

## 产能效率

产能 (单位: KK/月)  
Capacity (unit: KK/month)



1	Refond Shenzhen headquarters	瑞丰深圳总部大厦
2	Shenzhen production base Area: 34,000m <sup>2</sup> Product: Automotive LED/Large size backlight LED Small size backlight LED/ Mini LED	深圳生产基地 面积: 34,000m <sup>2</sup> 生产: 车用LED/大、小背光/Mini LED
3	Zhejiang production base Area: 160,000m <sup>2</sup> Product: LED Lighting/chip LED	浙江生产基地 面积: 160,000m <sup>2</sup> 生产: LED Lighting/chip LED
4	Hubei production base Area: 100,000m <sup>2</sup> Product: Mini LED/Micro LED, RGB	湖北生产基地 面积: 100,000m <sup>2</sup> 生产: Mini LED/Micro LED, RGB

# Quality control

## 质量保证

SYSTEM 体系认证  
CERTIFICATION

➤

IATF 16949

ISO 9001

IEC QC 080000

ISO 14001

ISO 17025

ISO 45001

IEC 27001

ESD (ANSI S20.20)



Passed the audit of international TOP customers and SGS social responsibility of third party, in compliance with the requirements of the EICC electronic industry code of conduct.

Confirms to the international standard of ROHS, REACH, HF, IEC/EN62471 and LM-80.

通过国际标杆大企业和第三方SGS社会责任审核,符合EICC电子行业行为准则要求。

第三方检测符合ROHS、REACH、HF、IEC/EN 62471、LM-80等国际标准要求

# Automotive application

-  
车用产品





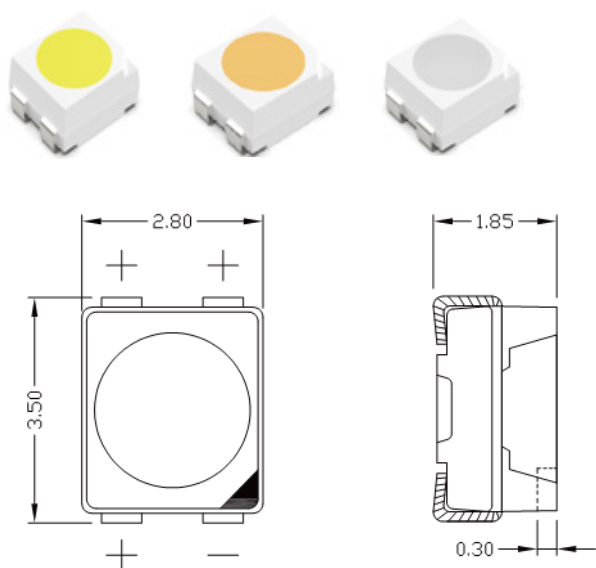
# Car exterior lighting application

## 车外应用

1. Super high reliability, 0 ppm defective rate
2. AEC-Q102 solution, good air tightness and anti-vulcanization performance
3. Complete product line, meet various scenes demand, support pin to pin replace
4. Ceramic material and high power, industry first hot pressing eutectic process, low thermal resistance

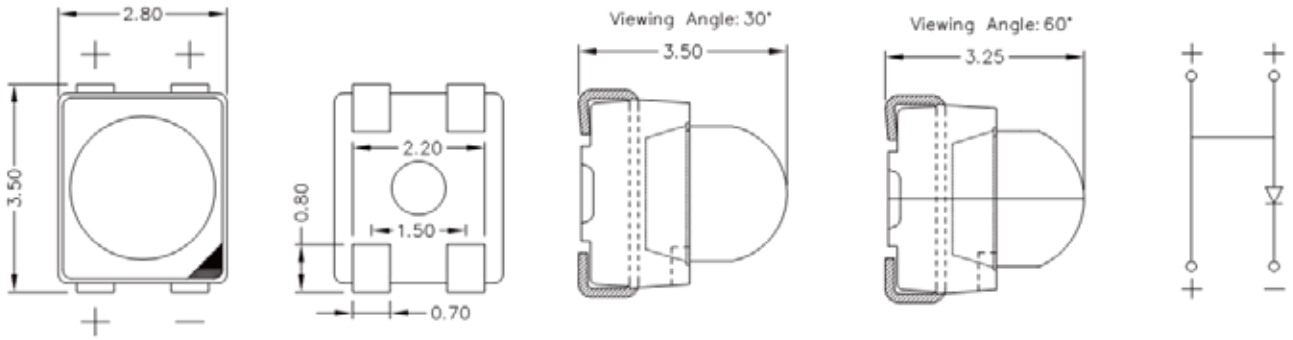
1. 超高可靠性, 产品质量零缺陷、零失效率
2. AEC-Q102解决方案, 产品气密性/防硫化性能好
3. 产品家族齐全, 矩阵丰富, 满足各类型场景需求, 可pin to pin替代
4. 陶瓷大功率热压共晶工艺行业首创, 热阻低

### 3528PLCC4



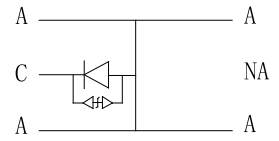
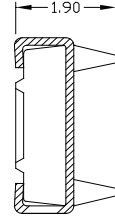
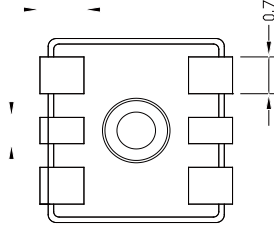
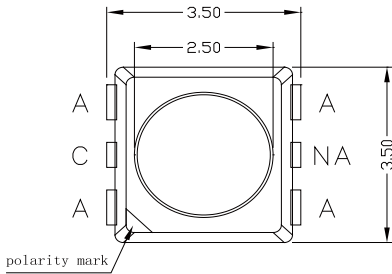
Color	Part No.	Forward Current		Forward Voltage	Luminous Intensity	CIE x/y or Dominant Wavelength	Rth j-s el.	TjMax.	Viewing Angle
		mA		V	mcd	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A2A31-W578-A2	50	70	3.0	6000	(0.326,0.345)	123	125	120
PC Amber	RF-A2A31-WYS8-A4	50	70	3.0	5000	(0.572,0.417)	123	125	120
Red	RF-OMRA30TS-AM-G	50	70	2.0	2500	622	100	125	120
Red	RF-RSRA30TS-CD-G	50	70	2.0	2300	631	100	125	120
Amber	RF-OMRA30TS-BM-G	50	70	2.0	2500	617	100	125	120
Yellow	RF-YMRA30TS-AB-G	50	70	2.0	2000	590	100	125	120

## 3528PLCC4 lens



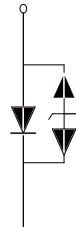
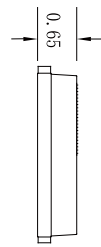
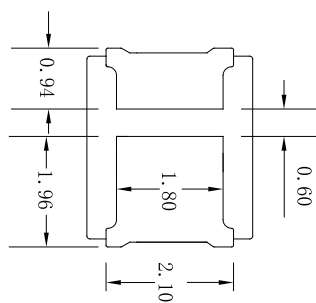
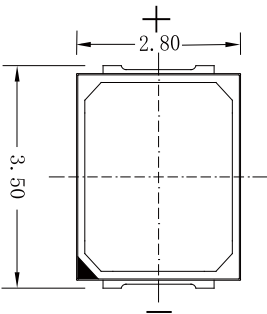
Color	Part No.	Forward Current		Forward Voltage	Luminous Intensity	CIE x/y or Dominant Wavelength	R <sub>thj-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	mcd	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
Red	RF-OMRL30TS-CG-G	50	70	2.0	20000	622	130	125	30
Red	RF-RSRL30TS-CG-G	50	70	2.0	14000	631	130	125	30
Yellow	RF-YMRL30TS-CG-G	50	70	2.0	18000	590	130	125	30
Green	RF-GNRL30TS-CG-G	50	70	2.0	18000	520	130	125	30
Blue	RF-BNRL30TS-CG-G	50	70	2.0	5500	470	130	125	30
Red	RF-OMRL30TS-AB-G	50	70	2.0	5500	622	130	125	60
Red	RF-RSRL30TS-AB-G	50	70	2.0	4800	631	130	125	60
Yellow	RF-YMRL30TS-AB-G	50	70	2.0	5600	590	130	125	60
Green	RF-GNRL30TS-AB-G	50	70	2.0	14000	520	130	125	60
Blue	RF-BNRL30TS-AB-G	50	70	2.0	2300	470	130	125	60

## 3535PLCC6

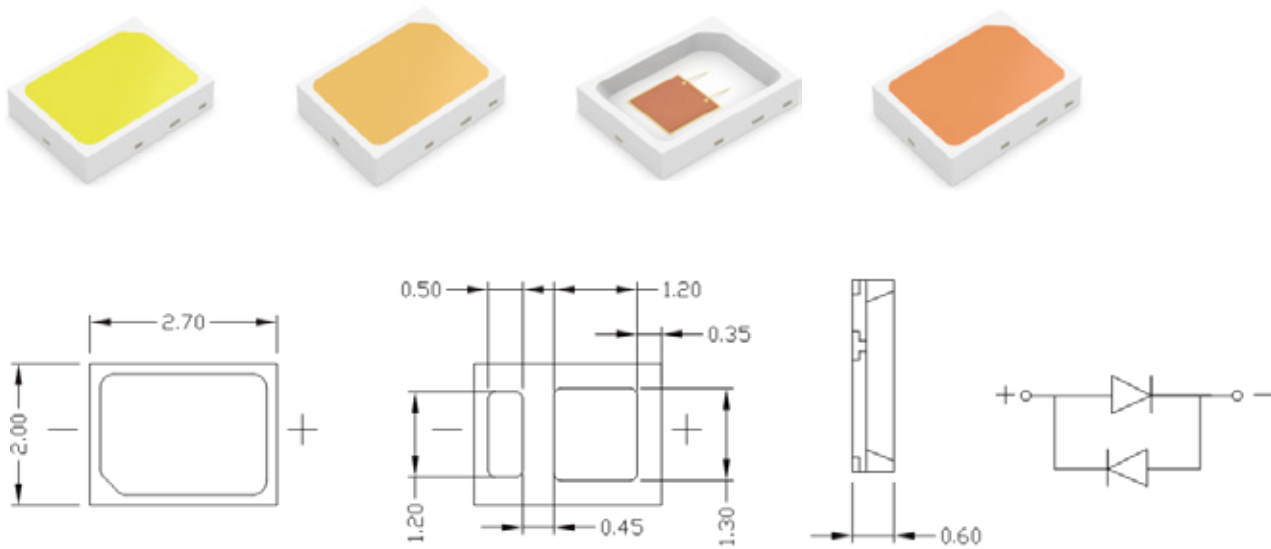


Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	$R_{th_{j-s}}$ el.	$T_J$ Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A1T35-W5SE-A9	150	180	3.0	61	(0.326,0.345)	40	150	120
PC Amber	RF-A1T35-WYSE-A9	150	180	3.0	48	(0.572,0.417)	40	150	120
Red	RF-OMRA35TS-AB-J	150	160	2.0	22	622	60	150	120
Yellow	RF-A2T35-Y93E-Y6	150	160	2.0	22	590	60	150	120

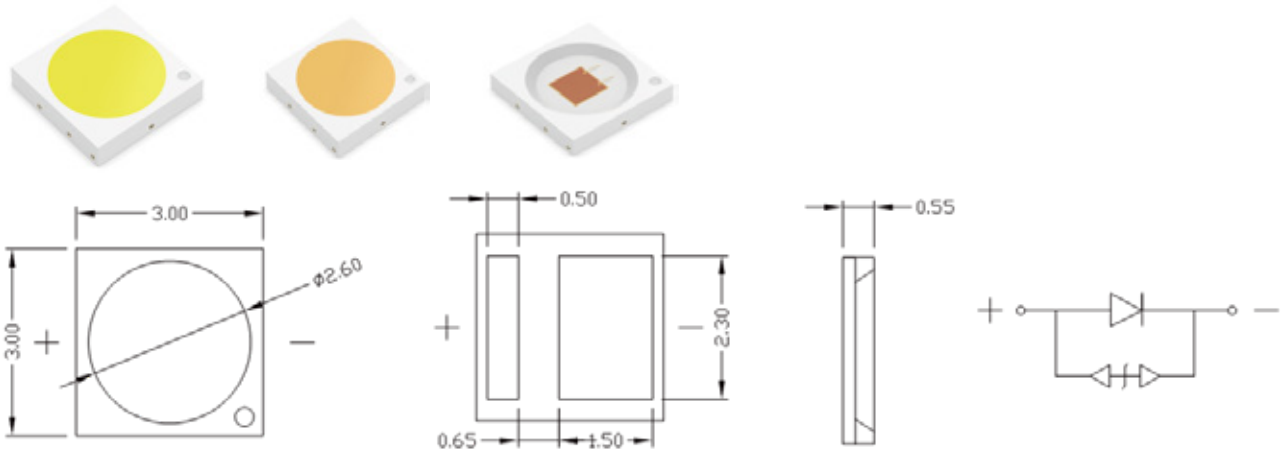
## 2835



Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	$R_{th_{j-s}}$ el.	$T_J$ Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A1T28-W57E-A9	150	180	3.0	62	(0.326,0.345)	36	150	120
PC Amber	RF-WMRI32DS-FH-JZ	150	180	3.0	45	(0.572,0.417)	36	150	120
Red	RF-OMRI32TS-CE-J	150	160	2.2	22	622	55	150	120
Yellow	RF-YMRI32TS-CE-J	150	160	2.2	22	590	55	150	120

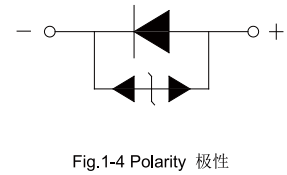
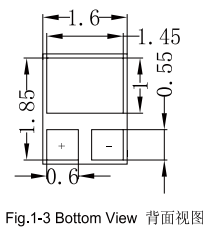
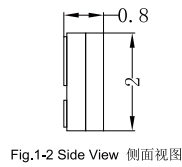
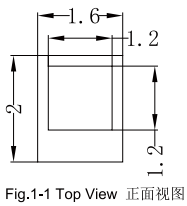


Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	Rth <sub>J-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A3E27-W60E-A8	150	180	3.2	60	(0.323,0.3349)	30	150	120
White	RF-A3E27-W60H-B3	350	380	3.2	125	(0.323,0.3349)	15	150	120
PC Amber	RF-A3E27-WYSE-A8	150	180	3.2	43	(0.572,0.417)	30	150	120
PC Amber	RF-A3E27-WYSG-B3	300	350	3.1	75	(0.572,0.417)	17	150	120
Red	RF-A4E27-R22E-R4	150	160	2.2	24	621	30	150	120
Red	RF-A4E27-R22H-S1	350	380	2.3	62	623	15	150	120
Red	RF-A4E27-R22M-S2	700	700	2.6	102	623	12	150	120
Yellow	RF-A4E27-Y92E-Y4	150	160	2.2	21	590	30	150	120
Yellow	RF-A4E27-Y92H-Y9	350	380	2.2	44	590	15	150	120
Yellow	RF-A4E27-Y92M-S0	700	700	2.5	88	590	12	150	120



Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A3E31-W60H-B3	350	380	3.1	125	(0.323,0.3349)	15	150	120
PC Amber	RF-A3E31-WYSG-B6	300	350	3.1	80	(0.572,0.417)	13	150	120
Red	RF-A4E31-R22H-S4	350	380	2.3	58	622	12	150	120
Yellow	RF-A4E31-Y90H-S4	350	380	2.3	45	592	12	150	120

Ceramic with one chip-3W series



Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A3H10-W60P-E4	1000	1200	3.2	330	(0.33,0.34)	4.5	150	120
White	RF-A3H10-W60P-E5	1000	1200	3.2	380	(0.33,0.34)	4.5	150	120
PC Amber	RF-A3H10-WYSP-E5	1000	1200	3.2	170	(0.572,0.417)	4.5	150	120

## Ceramic with two chip-6W series

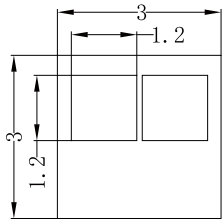


Fig.1-1 Top View 正面视图

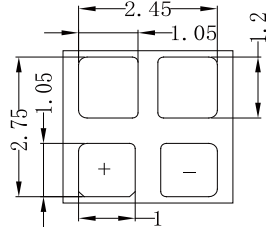


Fig.1-3 Bottom View 背面视图

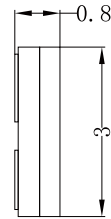


Fig.1-2 Side View 侧面视图

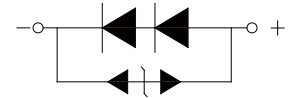
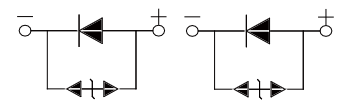
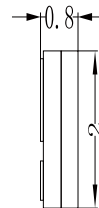
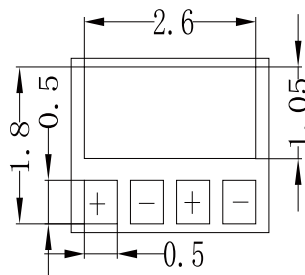
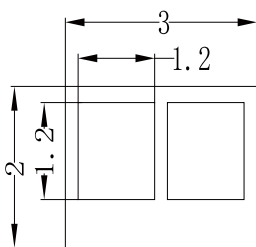


Fig.1-4 Polarity 极性

Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A3H22-W60P-E4	1000	1200	6.5	600	(0.33,0.34)	2.9	150	120
White	RF-A3H22-W60P-E5	1000	1200	6.5	660	(0.33,0.34)	2.9	150	120

## Ceramic with two chip-3W / 3W bi-color series



Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
Bi color	RF-A3H21-2B1P-E5	1000	1200	3.2	White:325 Amber:170	White: (0.33,0.34) Amber: (0.57,0.42)	3.2	150	120

## Ceramic with three chip-9W series

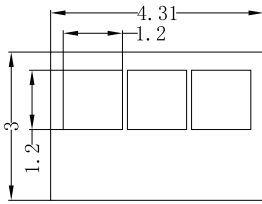


Fig.1-1 Top View 正面视图

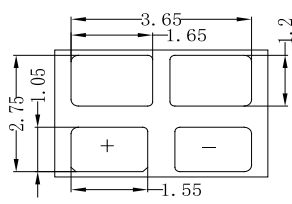


Fig.1-3 Bottom View 背面视图

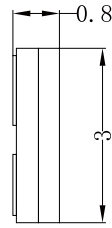


Fig.1-2 Side View 侧面视图

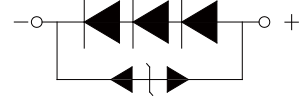
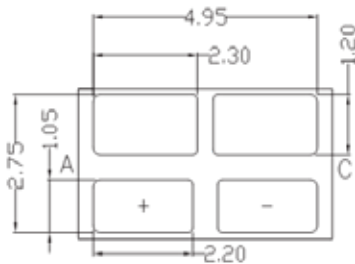
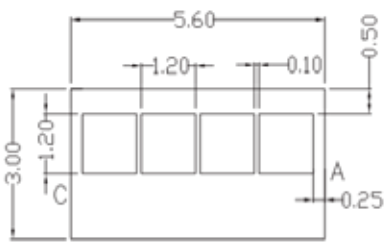


Fig.1-4 Polarity 极性

Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A3H30-W60P-E5	1000	1200	10	1000	(0.33,0.34)	2.9	150	120

## Ceramic with four chip-12W series



Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A3H40-W60P-E5	1000	1200	13	1400	(0.33,0.34)	2.2	150	120

# Ceramic with five chip-15W series

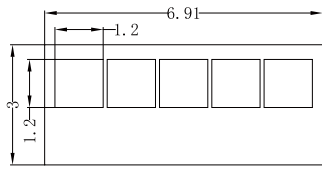


Fig.1-1 Top View 正面视图

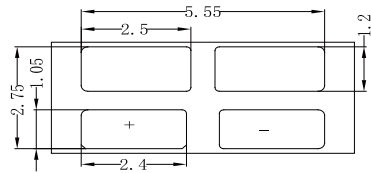


Fig.1-3 Bottom View 背面视图

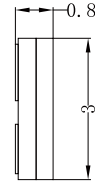


Fig.1-2 Side View 侧面视图

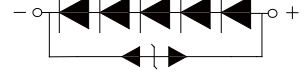


Fig.1-4 Polarity 极性

Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A3H50-W60P-E5	1000	1200	16	1600	(0.33,0.34)	2.2	150	120



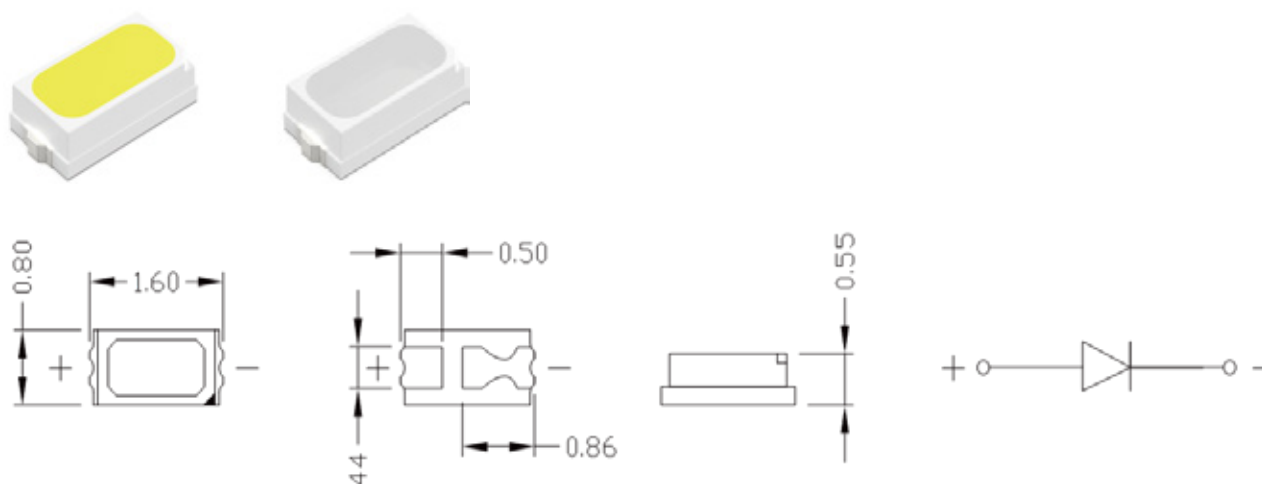
# Car interior lighting application

## 车内应用

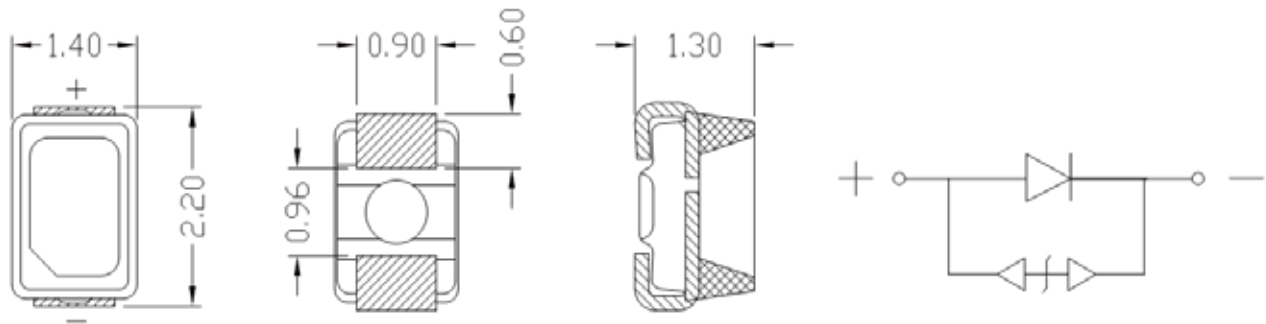
1. Super high reliability, 0 ppm defective rate
2. Customized color, full colors, single bin no chromatic aberration
3. AEC-Q102 solution, good air tightness and anti-vulcanization performance
4. Good service and quick delivery, shortest lead time for sample is only 3 days
5. Complete product line, meet various scenes demand, support pin to pin replace
6. Excellent color matching ability, provide equivalence LED module color solution in a short time once get the module from customer

1. 超高可靠性, 产品质量零缺陷、零失效率
2. 光色可选自由定制, 单bin无色差
3. AEC-Q102解决方案, 产品气密性/防硫化性能好
4. 快速响应及综合服务能力, 样品最快3天交样
5. 产品家族齐全, 矩阵丰富, 满足各类型场景需求
6. 模组调色能力优, 可实现从客户提供模组, 到LED模组颜色对标替换方案快速响应

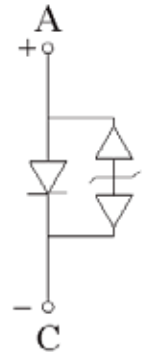
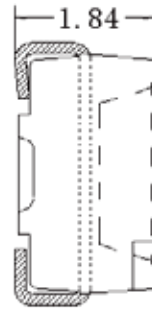
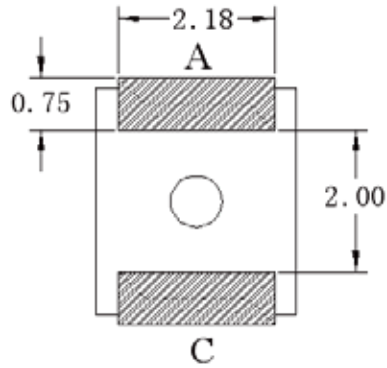
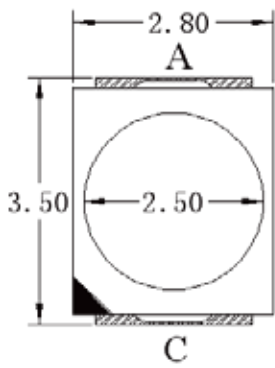
1608



Color	Part No.	Forward Current		Forward Voltage	Luminous Intensity	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	mcd	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-B1P08-W752-A32	5	20	3.0	650	(0.304,0.297)	300	120	120
White	RF-A2P08-WBE2-A1	5	30	3.0	400	(0.1826,0.263)	300	120	120
Red	RF-A2P08-R315-R0	20	30	3.0	135	631	180	120	120
Orange	RF-A2P08-O055-O1	20	30	2.0	190	606	210	120	120
Yellow	RF-A2P08-Y905-Y0	20	30	2.0	300	590	230	120	120
Green	RF-A2P08-G195-A2	20	30	3.0	1650	521	150	120	120

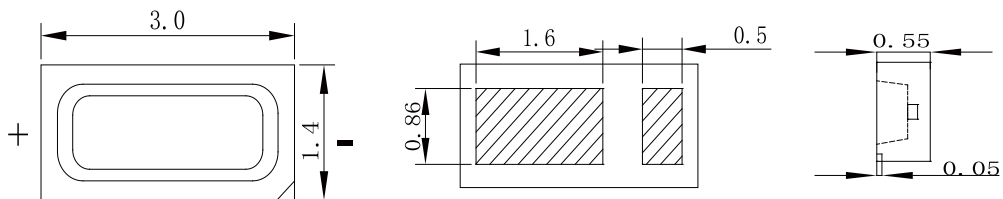


Color	Part No.	Forward Current		Forward Voltage	Luminous Intensity	CIE x/y or Dominant Wavelength	R <sub>th j-s</sub> el.	T <sub>j</sub> Max.	Viewing Angle
		mA		V	mcd	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-WMRB14DS-GG-Z	20	30	3.0	600	(0.3103,0.2975)	300	120	120
White	RF-WMRB14DS-FL-BZ	20	30	3.0	250	(0.3177,0.306)	360	120	120
White	RF-A1P14-W892-A11	5	30	3.0	55	(0.2805,0.294)	360	120	120
White	RF-A1P14-W122-A11	5	30	3.0	330	(0.2807,0.2737)	360	120	120
White	RF-BWRB14DS-FW-BZ	5	30	3.0	350	(0.264,0.247)	360	120	120
White	RF-A1P14-WBF2-A2	5	30	3.0	300	(0.2202,0.188)	360	120	120
White	RF-A1P14-WA52-A4	5	30	3.0	250	(0.1559,0.08)	360	120	120
PC Amber	RF-WMRB14DS-WY-F	20	30	3.0	2600	(0.572,0.417)	300	120	120
Red	RF-OMRB14TS-AK	20	30	2.0	1000	618	350	120	120
Red	RF-OMRB14TS-AA	20	30	2.0	1100	621	350	120	120
Red	RF-RSRB14TS-BB	20	30	2.0	700	631	350	120	120
Orange	RF-AURB14TS-AA-B	5	30	2.0	90	606	350	120	120
Yellow	RF-YMRB14TS-BB	20	30	2.0	900	590	340	120	120
Green	RF-GNRB14TS-CF-Z	20	30	3.0	1100	521	260	120	120
Blue	RF-BNRB14TS-AK-Z	20	30	3.0	450	469	250	120	120



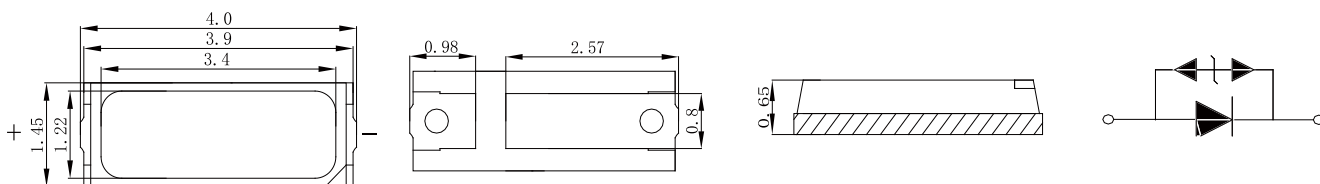
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		mA		V	mcd	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
White	RF-WNRA30DS-ED(1)	20	30	3.0	2700	(0.3325,0.3405)	160	120	120
White	RF-BWRA30DS-EG-Z	20	30	3.0	2500	(0.283,0.2777)	160	120	120
White	RF-WMRA30DS-AZ-D	15	30	3.0	2000	(0.304,0.297)	180	120	120
White	RA-A30Z-W01B-J23	5	30	3.0	560	(0.3025,0.313)	240	120	120
White	RF-A1A30-WD92-A31	5	30	3.0	250	(0.269,0.26)	240	120	120
White	RF-A1A30-WB12-A2	5	30	3.0	600	(0.2145,0.2)	240	120	120
White	RF-A1A30-WA02-A4	5	30	3.0	480	(0.1935,0.17)	240	120	120
PCAmber	RF-A1A30-WYS5-A1	5	30	3.0	1600	(0.154,0.0673)	240	120	120
Red	RF-A1A3F-R165-R1	20	30	2.0	1100	618	300	120	120
Red	RF-OURA30TS-AE	20	30	2.0	300	621	300	120	120
Red	RF-RSRA30TS-DD	20	30	2.0	450	631	300	120	120
Orange	RF-AURA30TS-ED(1)	20	30	2.0	300	606	300	120	120
Yellow	RF-A1A3F-Y895-Y1	20	30	2.0	750	590	300	120	120
Yellow	RF-AURA30TS-BB-Z	20	30	2.0	1100	590	300	120	120
Green	RF-GNRA30TS-CF-Z	20	30	2.0	1200	522	200	120	120
Blue	RF-BNRA30DS-BB-C	10	30	3.0	160	470	200	120	120

## EMC3014 series

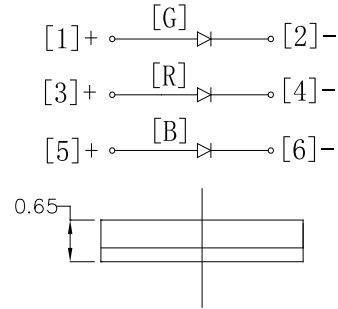
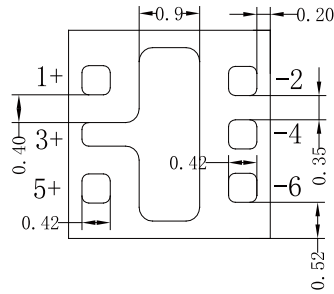
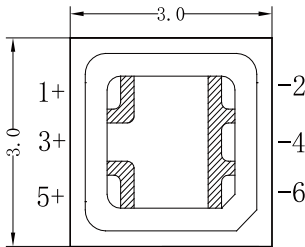


Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	Efficacy	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	lm/W	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Typ	Max	Typ
White	RF-A1F30-W1FD-B1	120	150	3.0	46	102	(0.26,0.24)	23	125	120
White( 高色域 )	RF-A1F30-W1ED-B1	120	150	3.0	44	97	(0.26,0.24)	23	125	120
White	RF-A1F30-W1FN-B1	80	150	2.9	33	76	(0.26,0.24)	50	125	120

## EMC4014 series



Color	Part No.	Forward Current		Forward Voltage	Luminous Flux	Efficacy	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>J</sub> Max.	Viewing Angle
		mA		V	lm	lm/W	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Typ	Max	Typ
Red	RF-A2F40-R23D-R6	120	150	2.0	18	/	623	300	115	120
Yellow	RF-A2F40-Y93D-Y6	120	150	2.0	18	/	593	300	115	120
White	RF-A1F40-W15B-A8	90	120	3.0	35	110	(0.28,0.27)	300	115	120
White	RF-A1F40-W75B-A8	90	120	3.0	32	107	(0.30,0.29)	300	115	120



Color	Part No.	Forward Current		Forward Voltage	Luminous Intensity	CIE x/y or Dominant Wavelength	Rth <sub>j-s</sub> el.	T <sub>j</sub> Max.	Viewing Angle
		mA		V	lm	-/nm	K/W	°C	Deg.
		Typ	Max	Typ	Typ	Typ	Typ	Max	Typ
RGB	RF-A2E31-RGB9-W1	R:60 G:60 B:60	60	R:2.2 G:3.3 B:3.3	R:8-12 G:12-18 B:3-6	R:624 G:520 B:467	50	125	120
RGB	RF-A2E31-RGBE-W1	R:150 G:150 B:150	160	R:2.2 G:3.2 B:3.2	R:13-19.6 G:24.2-37 B:6.9-13	R:624 G:525 B:465	10	125	120

# Electrical products

-  
电气产品



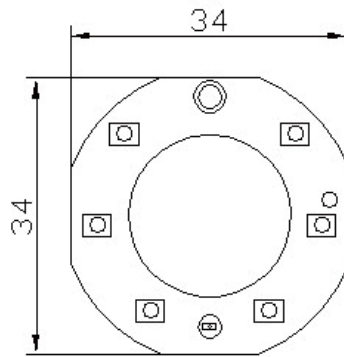
# Module

## 模组

1. Power coverage is complete, and various types of security lighting boards can be customized
2. The module can match LEDs with different viewing angle and realize secondary optical design
3. Complete product supporting services, support one stop development, sampling, mass production and delivery services
4. It can be equipped with different CMOS schemes, perfect design from device to module
5. Stable performance, high reliability and long service life

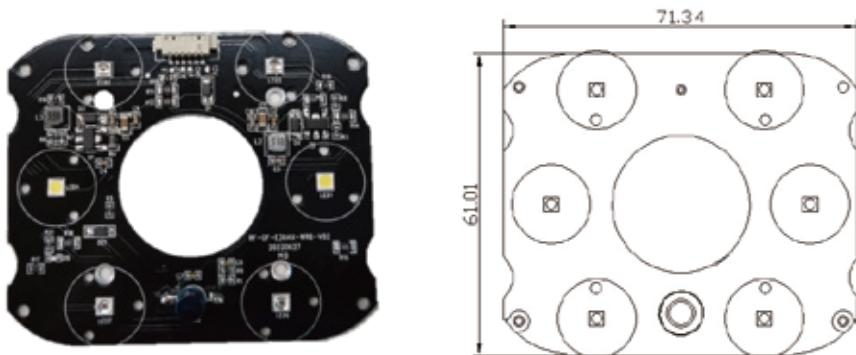
1. 功率覆盖齐全, 可定制各类安防补光灯板
2. 模组匹配不同封装角度灯珠和实现二次光学设计
3. 产品配套服务能力齐全, 支持一站式开发打样量产交付服务
4. 可搭载不同的CMOS方案从器件到模组设计优化
5. 性能稳定, 可靠性高, 寿命长

### Fixed turret surveillance camera series



Part No.	Photosensitive device		Driving Voltage	Light source type	IR Dominant Wavelength	Temperature Color of White Light
	Size	Photosensitive wavelength				
	mm	nm				
RF-MZ-IR-P28-6-V10	Φ3/Φ5	400-700	5V	IR	850/940	/
RF-MZ-IR-P28-8-V10	Φ3/Φ5	400-700	5V	IR	850/940	/
RF-HSP28-IR6-V10	/	/	5V	IR	850/940	/
RF-YSP28-IR6-V11	/	/	5V	IR	850/940	/

## Bullet surveillance camera series



Part No.	Photosensitive device		Driving Voltage	Light source type	IR Dominant Wavelength	Temperature Color of White Light
	Size	Photosensitive wavelength				
	mm	nm				
RF-OF-E30AX-WR6-V01	φ5	400-700	12V	IR+W	850	3000/4000/5000/6000
RF-XLE30-WR8A-V01	φ5	400-700	12V	IR+W	850	3000/4000/5000/6000
RF-SBP28-BG4-V01	/	/	12V	W/IR/IR+W	850	3000/4000/5000/6000
RF-JXE30-IR4-V01	φ5	400-700	5V	IR	850	/
RF-SBE30-WR2-8305-V01	/	/	12V	W/IR/IR+W	850	3000/4000/5000/6000

## Dome surveillance camera series



Part No.	Photosensitive device		Driving Voltage	Light source type	IR Dominant Wavelength	Temperature Color of White Light
	Size	Photosensitive wavelength				
	mm	nm				
RF-ZX-E30-BG6-V01	/	/	12V	W	/	3000
RF-SBP28-BG2-V01	/	/	12V	W	/	3000/4000/5000/6000
RF-JXE30-WR8-V01	/	/	5V	IR+W	850	3000/4000/5000/6000



# IR 红外

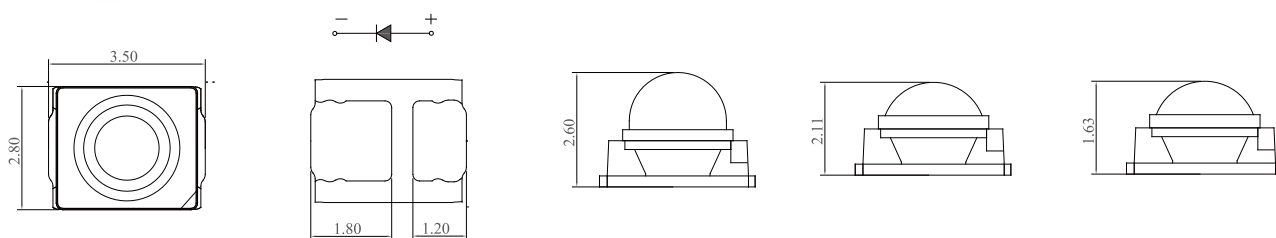
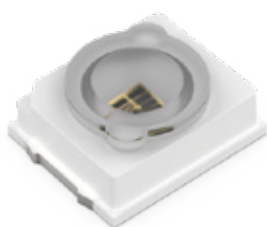
Full power from 0.2W to 5W

1. Full power range
2. Various viewing angles
3. Customized viewing angles
4. Full product types, pin to pin replace

产品功率覆盖从0.2w到5w

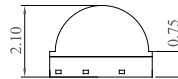
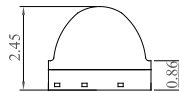
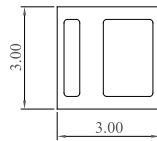
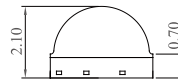
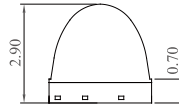
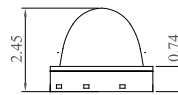
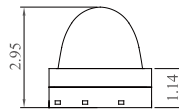
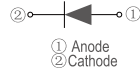
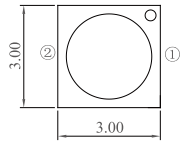
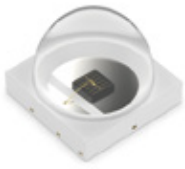
1. 角度丰富
2. 功率覆盖齐全
3. 角度定制化
4. 产品齐全, pin to pin替代

## 2835 series



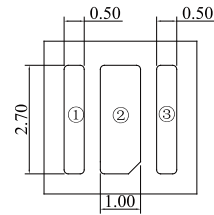
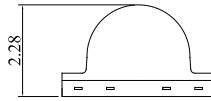
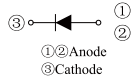
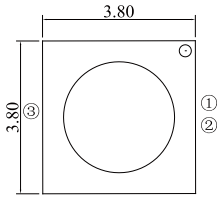
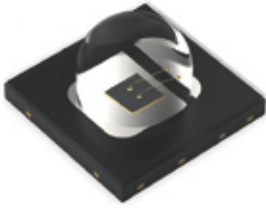
Part No.	Forward Current		Forward Voltage	Total radiant flux/Luminous Flux	CIE x/y or Dominant Wavelength	Viewing Angle
	mA		V	mW/lm	°/nm	Deg
	Typ	Max	Typ	Typ	Typ	Typ
RF-P28A3-IRN-FT	100	100	1.6	65	850	17
RF-P28Q3-IRN-FT	100	100	1.6	65	850	17
RF-P28A3-IRL-FT	100	100	1.6	60	850	17
RF-P28Q3-IRJ-FT	50	50	1.6	28	850	17
RF-P28D3-IPN-FT	100	100	1.6	60	940	17
RF-P28A6-IRN-FT	100	100	1.6	65	850	70
RF-P28Q6-IRN-FT	100	100	1.6	65	850	70
RF-P28A6-IRL-FT	50	50	1.6	60	850	70
RF-P28Q6-IRJ-FT	50	50	1.6	28	850	70
RF-P28D6-IPN-FT	100	100	1.6	65	940	70
RF-P28Q8-IRN-FT	100	100	1.6	65	850	80
RF-P28A8-IRL-FT	100	100	1.6	60	850	80
RF-P28A8-IRN-FT	100	100	1.6	65	850	80

## 3030 series



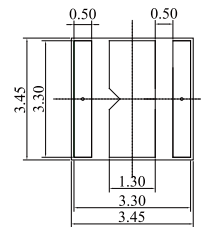
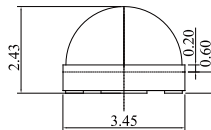
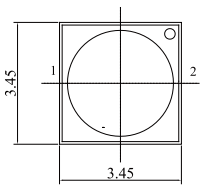
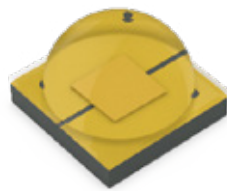
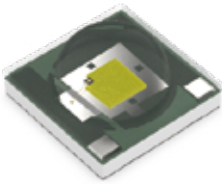
Part No.	Forward Current		Forward Voltage	Total radiant flux/Luminous Flux	CIE x/y or Dominant Wavelength	Viewing Angle
	mA		V	mW/lm	°/nm	Deg
	Typ	Max	Typ	Typ	Typ	Typ
RF-E30AH-IRT-FS	500	500	1.6	350	850	20
RF-E30AE-IRT-FS	500	500	1.6	350	850	20
RF-E30A4-IRT-FS	500	500	1.6	350	850	45
RF-E30A9-IRT-FS	500	500	1.6	350	850	100
RF-E30AG-IRT-FS	500	500	1.6	350	850	90
RF-E30AF-IRT-FS	500	500	1.6	350	850	50
RF-E30A6-IPX-FS	500	500	1.6	224	940	45
RF-E30AX-IPX-FS	500	500	1.6	224	940	100
RE30A0-IPX-FR	500	500	1.6	224	940	120
RF-E30AX-BNZ-FS	500	500	3.2	20	460	100
RF-E30AX-OUH-FS	500	500	2.2	45	620	100
RF-E30AX-GNZ-FS	500	500	3.2	100	520	100
RF-E30J5-WHZ-FS	350	500	3.2	90	0.4365/0.4091	30
RF-E30J8-WHZ-FS	350	500	3.2	90	0.4365/0.4091	45
RF-E30JG-WHZ-FS	350	500	3.2	90	0.4365/0.4091	90
RF-E30S9-IRS-FS-J	500	500	16	320	850	35*60
RF-E30SF-IRS-FS-J	500	500	16	320	850	25*50

### 3838 series

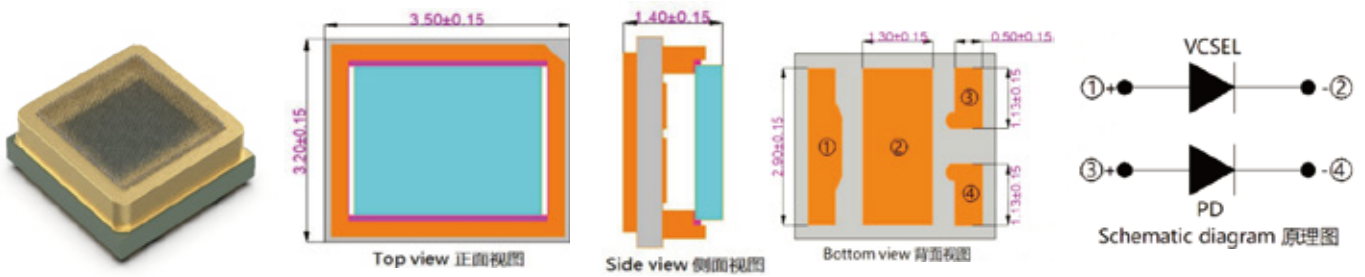


Part No.	Forward Current		Forward Voltage	Total radiant flux	Peak Wavelength	Viewing Angle
	mA		V	mW	nm	Deg
	Typ	Max	Typ	Typ	Typ	Typ
RF-E38A8-IRB-FR	1000	1000	1.8	800	850	80
RF-E38A8-IRD-FR	1000	1500	1.8	900	850	80
RF-E38A8-IRD-FR-D	1000	1500	3.2	1400	850	80
RF-E38A8-IQD-FR	1000	1500	1.8	900	940	80
RF-E38A8-IQD-FR-D	1000	1500	3.2	1400	940	80

### 3535 series



Part No.	Forward Current		Forward Voltage	Total radiant flux/Luminous Flux	CIE x/y or Dominant Wavelength	Viewing Angle
	mA		V	mW/lm	λ-nm	Deg
	Typ	Max	Typ	Typ	Typ	Typ
RF-X35E0-WMF-DR	350	1500	3	165	0.318/0.338	110
RF-X35E0-WHF-DR	350	1500	3	160	0.4365/0.4091	110
RF-C35J0-WMB-FS	230	800	3	90	0.318/0.338	120



Part No.	Forward Current		Forward Voltage	Total radiant flux/Luminous Flux	CIE x/y or Dominant Wavelength	Viewing Angle
	mA		V	mW/lm	'-/nm	Deg
	Typ	Max	Typ	Typ	Typ	Typ
RF-TAD3203PA00-C78	3500	3500	2.1	3000	940	72°*58

## Optocoupler 光耦

81X

Optocoupler 81X series including 817, 814 and 816 etc.

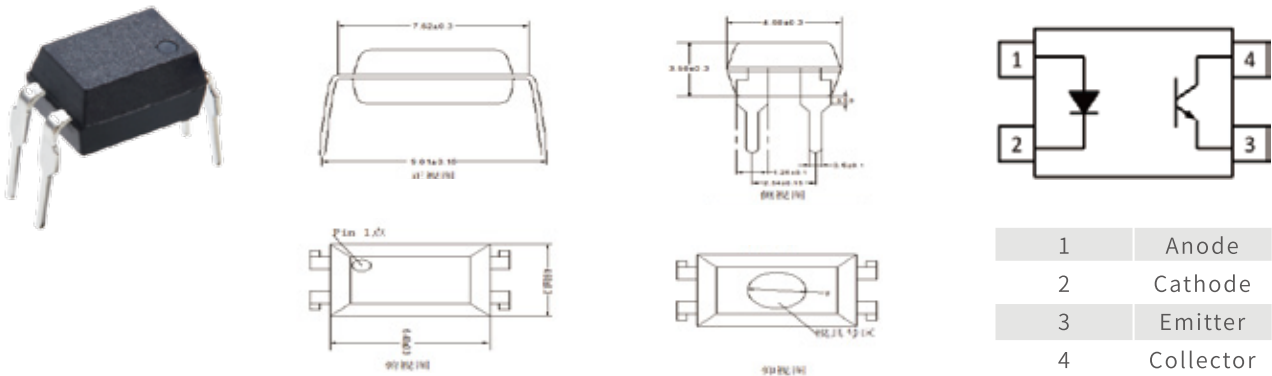
1. Special dispensing red silica gel, then AOI full inspection, 0 ppm of no glue dispersion failure.
2. PIN TO PIN compatible for the first-Line brands
3. Large size chip can improve the yield and bin drop rate
4. Two-piece leadframe to match each other with high reliability high stability.
5. Materials solution: using environmental harmony type halogen-free materials.

81X

光耦81X晶体管系列,其中包括817、814、816等

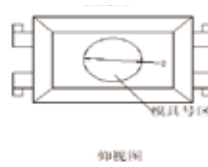
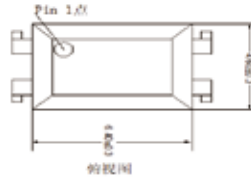
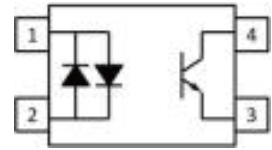
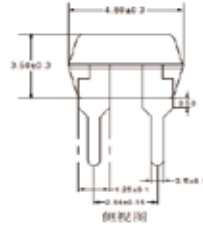
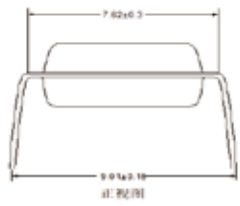
- 1.红胶工艺 零缺陷失效率
- 2.PIN TO PIN 替代一线品牌
- 3.内部采用大尺寸芯片搭配,分档细,客制化高,落BIN率集中
- 4.采用传统的工艺,双片支架,上下对射,稳定性高。
5. 材料选择环保无卤素方案

## 8XX series



1	Anode
2	Cathode
3	Emitter
4	Collector

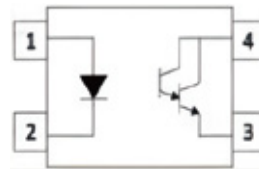
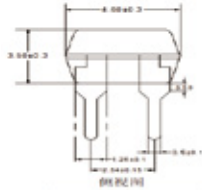
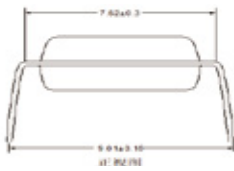
Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time(us)	BVCØ min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR(%)
RF-816	6.4 × 4.6 × 3.50	1.2	4 / 3	80	5000	0.2	50-600
RF-817	6.4 × 4.6 × 3.50	1.2	4 / 3	35	5000	0.2	50-600
RF-851	6.4 × 4.6 × 3.50	1.2	4 / 3	350	5000	0.2	50-600



1	Anode
2	Cathode
3	Emitter
4	Collector

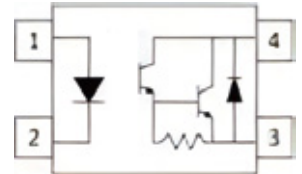
Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time(us)	BVCE0 min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR(%)
RF-814	6.4 × 4.6 × 3.50	1.2	4 / 3	80	5000	0.2	200-300

## 8XX series



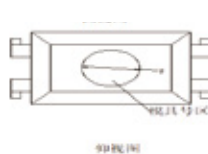
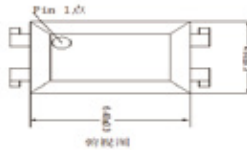
815

1	Anode
2	Cathode
3	Emitter
4	Collector



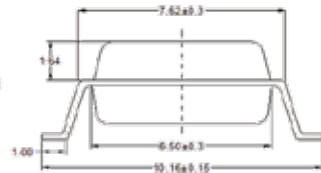
852

1	Anode
2	Cathode
3	Emitter
4	Collector

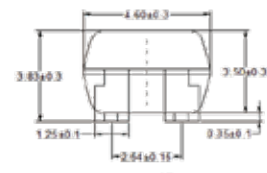


Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time(us)	BVCE0 min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR (%)
RF-815	6.4 × 4.6 × 3.50	1.2	60 / 53	35	5000	1	600-7500
RF-852	6.4 × 4.6 × 3.50	1.2	300/100	350	5000	1.2	1000-15000

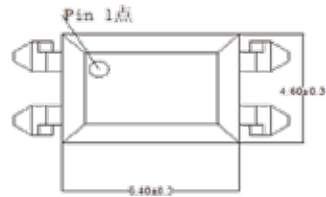
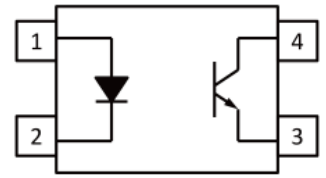
## 8XXS series



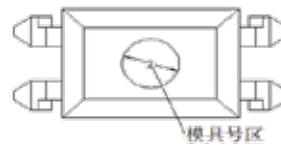
正视图



侧视图



俯视图

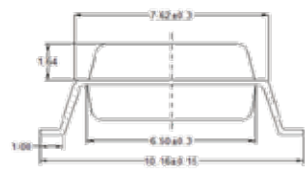


仰视图

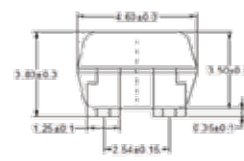
1	Anode
2	Cathode
3	Emitter
4	Collector

Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time (us)	BVCEO min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR(%)
RF-816S	6.4 × 4.6 × 3.50	1.2	4 / 3	80	5000	0.2	50-600
RF-817S	6.4 × 4.6 × 3.50	1.2	4 / 3	80	5000	0.2	50-600
RF-851S	6.4 × 4.6 × 3.50	1.2	4 / 3	350	5000	0.2	50-600

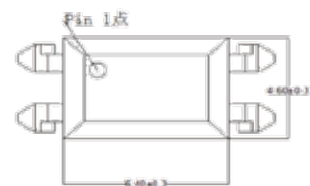
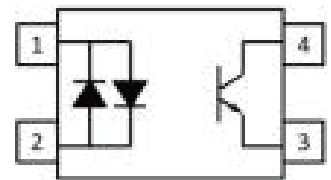
## 8XXS series



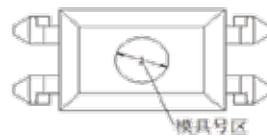
正视图



侧视图



俯视图

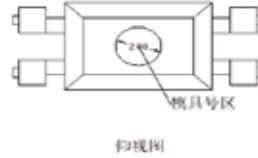
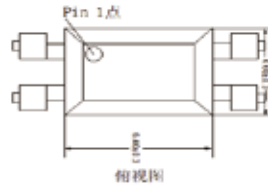
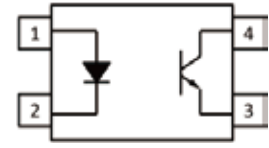
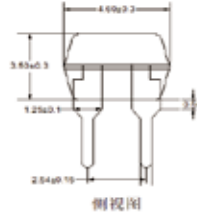
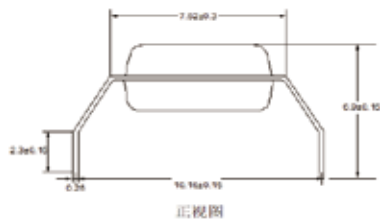


仰视图

1	Anode
2	Cathode
3	Emitter
4	Collector

Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time (us)	BVCEO min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR(%)
RF-814S	6.4 × 4.6 × 3.50	1.2	4 / 3	80	5000	0.2	200-300

## 8XXM series



1	Anode
2	Cathode
3	Emitter
4	Collector

Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time (us)	BVCEO min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR(%)
RF-816M	6.4 × 4.6 × 3.50	1.2	4 / 3	80	5000	0.2	50-600
RF-817M	6.4 × 4.6 × 3.50	1.2	4 / 3	80	5000	0.2	50-600
RF-851M	6.4 × 4.6 × 3.50	1.2	4 / 3	350	5000	0.2	50-600

### 35X

Optocoupler 81X series including 357, 354 and 351 etc.

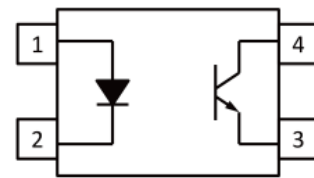
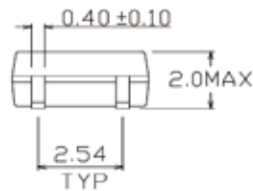
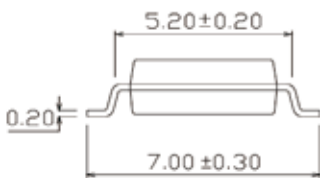
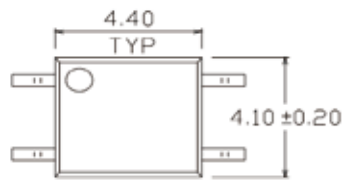
1. Special dispensing red silica gel, AOI full inspection, 0 ppm of no glue dispensation failure.
2. PIN TO PIN compatible for the first-Line brands
3. Large size chip can improve the yield and bin drop rate
4. Materials solution: using environmental harmony type halogen-free materials.

### 35X

光耦35X晶体管系列, 其中包括357、354、351等

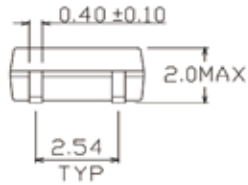
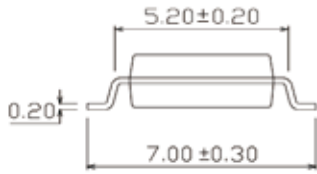
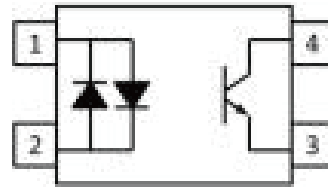
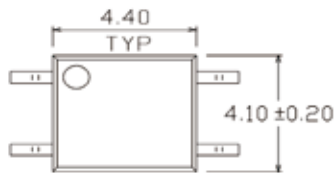
- 1.红胶工艺 零缺陷失效率
- 2.PIN TO PIN 替代一线品牌
- 3.采用传统的工艺, 双片支架, 上下对射, 稳定性高
- 4.材料选择环保无卤素方案

## 35X series



1	Anode
2	Cathode
3	Emitter
4	Collector

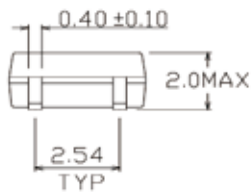
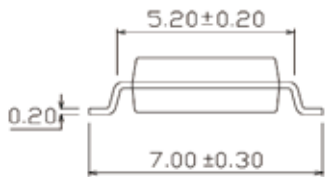
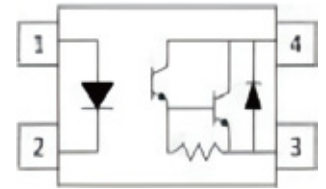
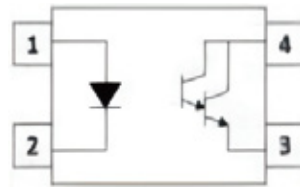
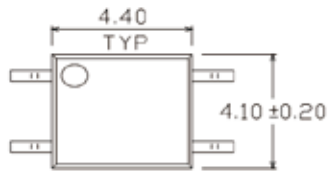
Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time (us)	BVCEO min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR(%)
RF-357	4.4 × 3.85 × 2	1.2	3 / 4	80	3750	0.2	50-600
RF-351	4.4 × 3.85 × 2	1.2	4 / 3	350	5000	0.2	50-600



1	Anode
2	Cathode
3	Emitter
4	Collector

Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time(us)	BV <sub>CEO</sub> min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR (%)
RF-354	4.4 × 3.85 × 2	1.2	3 / 4	80	3750	0.2	200-300

### 35X series



**355**

1	Anode
2	Cathode
3	Emitter
4	Collector

**352**

1	Anode
2	Cathode
3	Emitter
4	Collector

Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time(us)	BV <sub>CEO</sub> min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR (%)
RF-355	4.4 × 3.85 × 2	1.2	60 / 53	35	3750	1	600-7500
RF-352	4.4 × 3.85 × 2	1.2	100 / 20	350	3750	1.2	1000 min.



10XX-2023 new product

Optocoupler 10XX series, miniaturized and long creepage distance

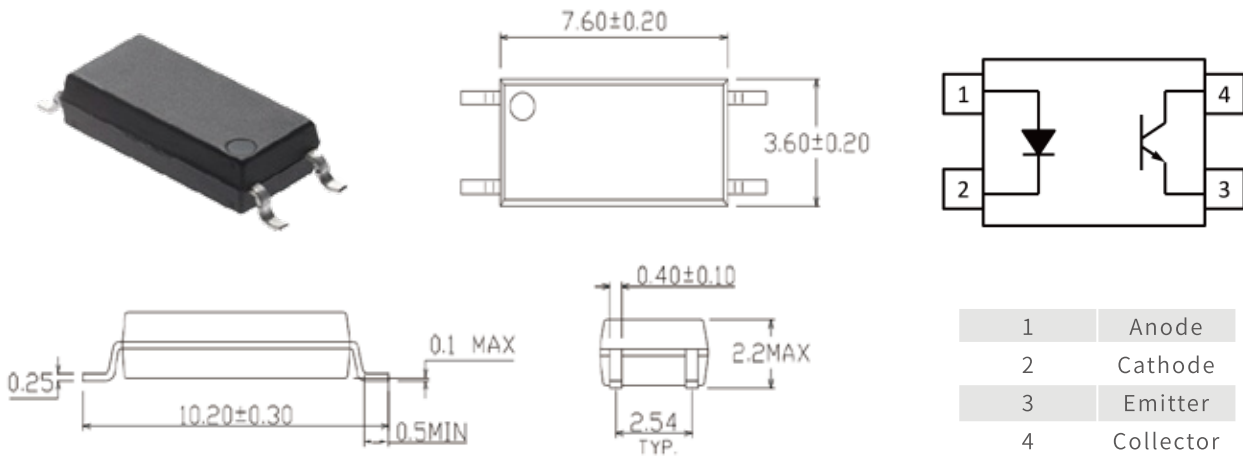
1. Special dispensing red silica gel, then AOI full inspection, 0 ppm of no glue dispensation failure.
2. PIN TO PIN compatible for the first-Line brands
3. Large size chip can improve the yield and bin drop rate
4. Materials solution: using environmental harmony type halogen-free materials.

10XX-2023新品

光耦10XX晶体管系列,小型化光耦,长爬电距离光耦

- 1.红胶工艺 零缺陷失效率
- 2.PIN TO PIN 替代一线品牌
- 3.采用传统的工艺,双片支架,上下对射,稳定性高
- 4.材料选择环保无卤素方案

## 10XX series



1	Anode
2	Cathode
3	Emitter
4	Collector

Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time(us)	BVCØ min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR (%)
RF-1000	7.5 × 3.6 × 2	1.25	2 / 3	80	5000	0.3	50-600
RF-1001	7.5 × 3.6 × 2	1.25	2 / 3	80	5000	0.3	100-150
RF-1002	7.5 × 3.6 × 2	1.25	2 / 3	80	5000	0.3	60-125
RF-1003	7.5 × 3.6 × 2	1.25	2 / 3	80	5000	0.3	100-200
RF-1004	7.5 × 3.6 × 2	1.25	2 / 3	80	5000	0.3	160-320
RF-1005	7.5 × 3.6 × 2	1.25	2 / 3	80	5000	0.3	50-150
RF-1006	7.5 × 3.6 × 2	1.25	2 / 3	80	5000	0.3	100-300
RF-1007	7.5 × 3.6 × 2	1.25	2 / 3	80	5000	0.3	80-160
RF-1008	7.5 × 3.6 × 2	1.25	2 / 3	70	5000	0.3	130-260
RF-1009	7.5 × 3.6 × 2	1.25	2 / 3	70	5000	0.3	200-400

3HX-2023 new product

Optocoupler 3HX series, belonging to mini optocoupler

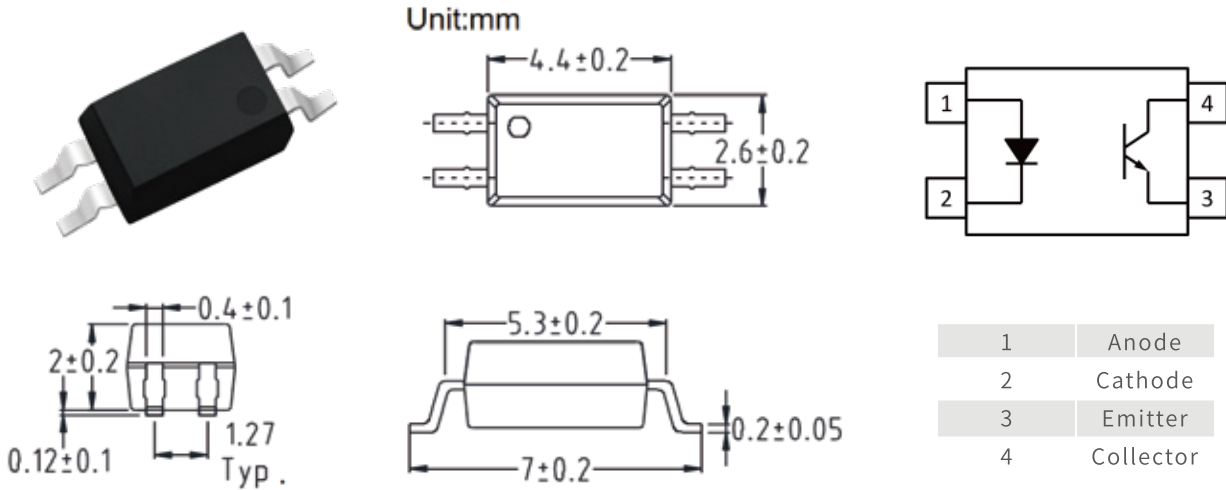
1. Special dispensing red silica gel, then AOI full inspection, 0 ppm of no glue dispensation failure.
2. PIN TO PIN replace.
3. Large size chip can improve the yield and bin drop rate
4. Materials solution: using environmental harmony type halogen-free materials.

3HX-2023新品

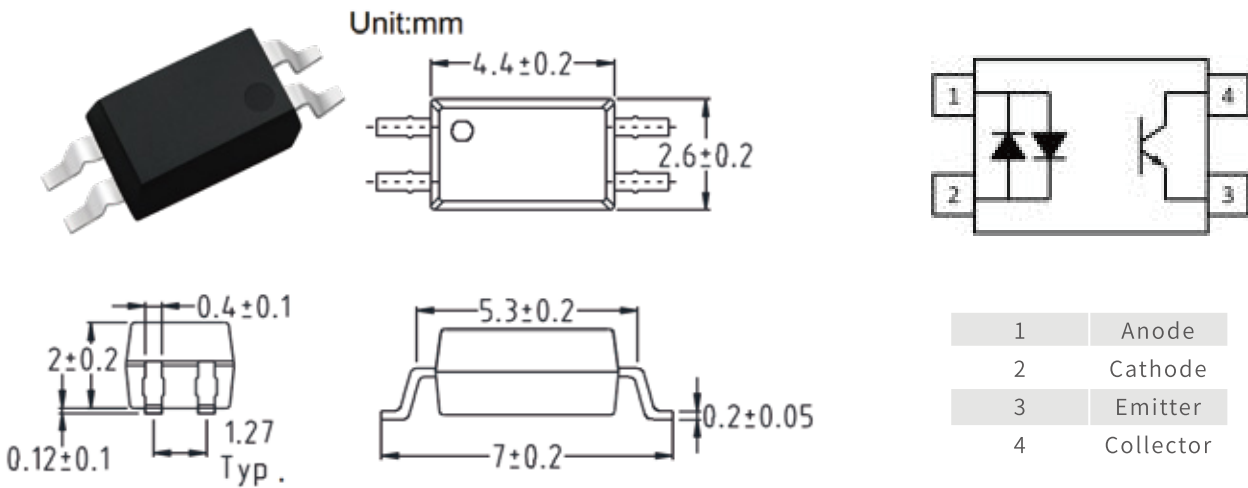
光耦3HX晶体管系列,小型化光耦,属于mini型光耦

- 1.红胶工艺 零缺陷失效率
- 2.PIN TO PIN 替代一线品牌
- 3.采用传统的工艺,双片支架,上下对射,稳定性高
- 4.材料选择环保无卤素方案

3HX series



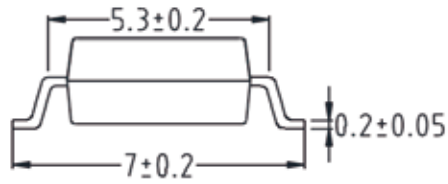
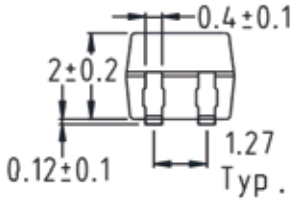
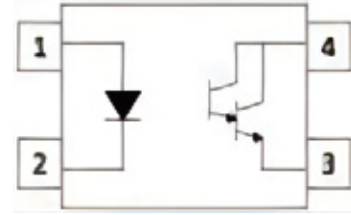
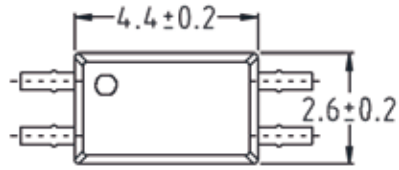
Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time (us)	BVCEO min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR (%)
RF-3H7	4.4 × 2.6 × 2	1.2	5 / 3	80	3750	0.2	20-400



Product	Size (L*W*H mm)	VF Typ(V)	Rise/Fall Time (us)	BVCEO min(V)	Viso (Vrms)	VCE(SAT) max(V)	CTR (%)
RF-3H4	4.4 × 2.6 × 2	1.2	6 / 8	80	3750	0.2	20-400



Unit:mm



1	Anode
2	Cathode
3	Emitter
4	Collector

Product	Size (L*W*H mm)	V <sub>F</sub> Typ(V)	Rise/Fall Time (us)	BV <sub>CEO</sub> min(V)	V <sub>iso</sub> (V <sub>rms</sub> )	V <sub>CE(SAT)</sub> max(V)	CTR (%)
RF-3H5	4.4 × 2.6 × 2	1.2	60 / 53	35	3750	1	600-7500

# High-speed optocoupler 6N13X Series -2024New Product

## 高速光耦6N13X系列-2024新品

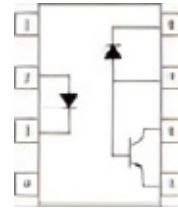
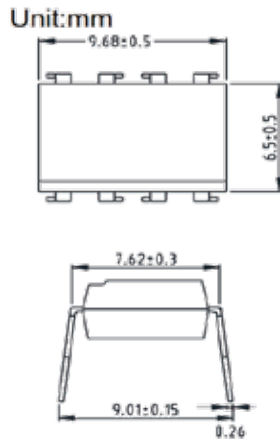
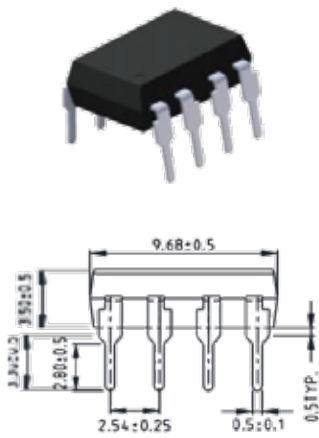
6N13X Series, belongs to the high-speed optocoupler, whose structure is a photodiode amplification drive circuit

1. Red glue process: zero defect and failure
2. PIN TO PIN compatible for the first-Line brands
3. Adopt the traditional technics, two brackets, emitter at the top and the receiver right under the emitter to ensure the high stability
4. Materials solution: using environmental harmony type halogen-free materials.

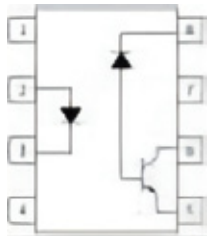
6N13X系列,属于高速光耦,它的结构是光电二极管放大驱动电路

- 1.红胶工艺 零缺陷失效率
- 2.PIN TO PIN 替代一线品牌
- 3.采用传统的工艺,双片支架,上下对射,稳定性高
- 4.材料选择环保无卤素方案

### 6N13X / 45XX / 25XX series

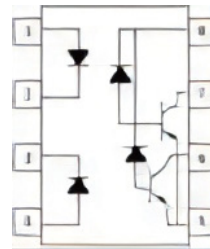


1	No Connection
2	Anode
3	Cathode
4	No Connection
5	Gnd
6	Vout
7	VB
8	VCC



\*

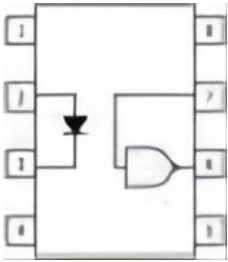
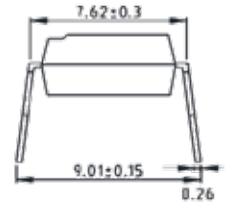
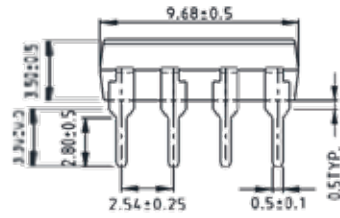
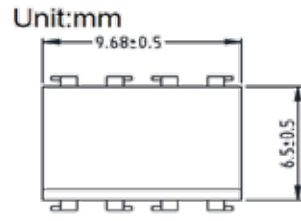
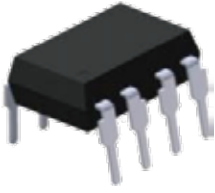
1	No Connection
2	Anode
3	Cathode
4	No Connection
5	Gnd
6	Vout
7	No Connection
8	VCC



\*\*

1	Anode
2	Cathode
3	Cathode
4	Anode
5	Gnd
6	Vout 2
7	Vout 1
8	VCC

Product	Size (L*W*H mm)	Supply Voltage(V)	tPHL/tPLH (ns)	CTR (%)	Viso (V <sub>rm</sub> s)	CMR (KV/us)	IO (mA)
RF-6N135	9.68×6.5×3.5	30 max.	2000 / 2000	7-50	5000	1	8
RF-6N136	9.68×6.5×3.5	30 max.	1000 / 1000	19-50	5000	1	8
*RF-4502	9.68×6.5×3.5	30 max.	1000 / 1000	19-50	5000	1	8
*RF-4503	9.68×6.5×3.5	30 max.	1000 / 1000	19-50	5000	15	8
*RF-4504	9.68×6.5×3.5	30 max.	400 / 400	25-60	5000	15	8
**RF-2530	9.68×6.5×3.5	30 max.	2000 / 2000	7-50	5000	1	8
**RF-2531	9.68×6.5×3.5	30 max.	1000 / 1000	19-50	5000	1	8

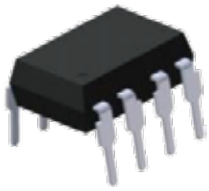


1	No Connection
2	Anode
3	Cathode
4	No Connection
5	Gnd
6	Vout
7	No Connection
8	VCC

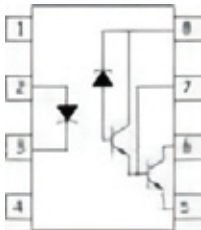
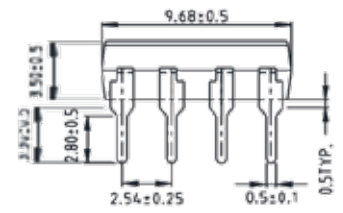
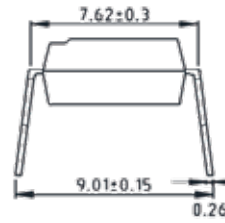
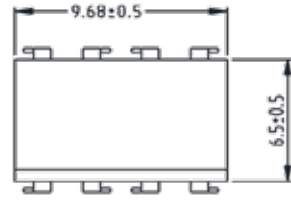
\*

1	No Connection
2	Anode
3	Cathode
4	No Connection
5	Gnd
6	Vout
7	No Connection
8	VCC

Product	Size (L*W*H mm)	Supply Voltage(V)	tPHL/tPLH (ns)	IFT(mA)	Viso (Vrms)	CMR (KV/us)	IO (mA)
RF-6N137	9.68×6.5×3.5	7 max.	75 / 75	5	5000	-	50 max.
RF-2601	9.68×6.5×3.5	7 max.	75 / 75	5	5000	5	50 max.
RF-2611	9.68×6.5×3.5	7 max.	75 / 75	5	5000	10	50 max.
RF-260L	9.68×6.5×3.5	7 max.	75 / 75	5	5000	10	50 max.
*RF-2630	9.68×6.5×3.5	7 max.	100 / 100	5	5000	5	50 max.
*RF-2631	9.68×6.5×3.5	7 max.	100 / 100	5	5000	10	50 max.



Unit:mm



1	No Connection
2	Anode
3	Cathode
4	No Connection
5	Gnd
6	Vout
7	No Connection
8	VCC

Product	Size (L*W*H mm)	Supply Voltage(V)	tPHL/tPLH (ns)	CTR (%)	Viso (Vrms)	CMR (KV/us)	IO (mA)
RF-6N138	9.68×6.5×3.5	7 max.	15000 / 50000	300 min.	5000	1	60 max.
RF-6N139	9.68×6.5×3.5	18 max.	30000 / 90000	500 min.	5000	1	60 max.

# Thyristor Optocoupler MOC30XX Series -2024 New product

## 可控硅光耦MOC30XX系列-2024新品

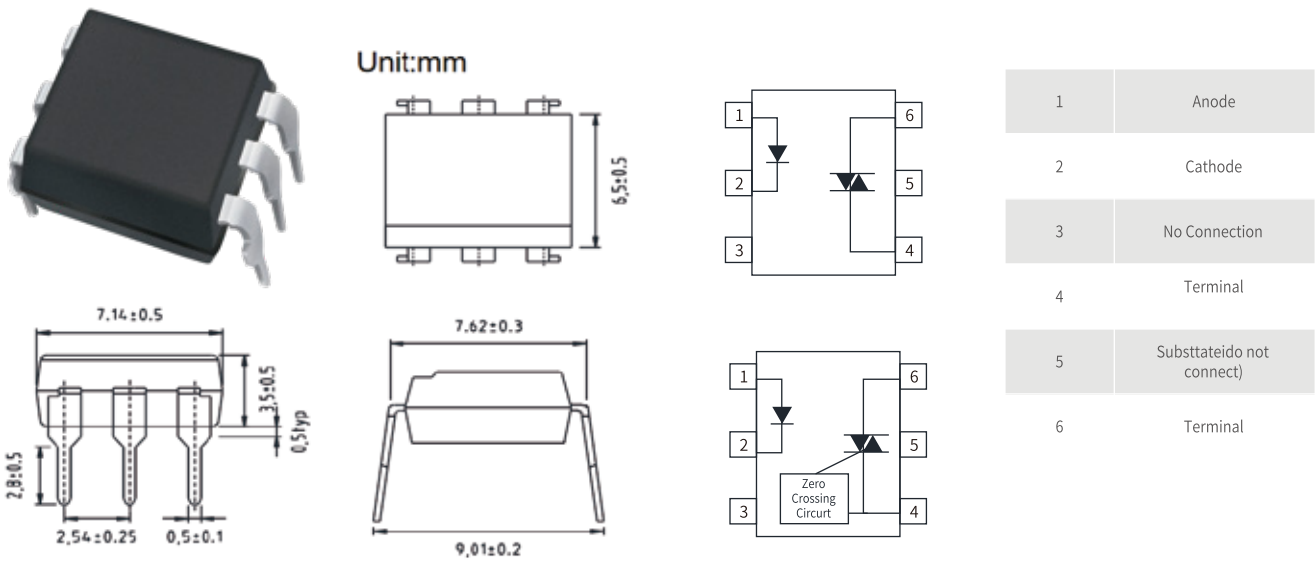
MOC30XX Series, belongs to Thyristor Optocoupler . Except output from crystal , there are also controllable optocouplers.

1. Red glue process: zero defect and failure
2. PIN TO PIN compatible for the first-Line brand
3. Adopt the traditional technics, two brackets, emitter at the top and the receiver right under the emitter to ensure the high stability
4. Materials solution: using environmental harmony type halogen-free materials.

MOC30XX系列,属于可控硅光耦,从晶体输出以外,同样有可控制的光耦

- 1.红胶工艺 零缺陷失效率
- 2.PIN TO PIN 替代一线品牌
- 3.采用传统的工艺,双片支架,上下对射,稳定性高
- 4.材料选择环保无卤素方案

### MOC30XX series



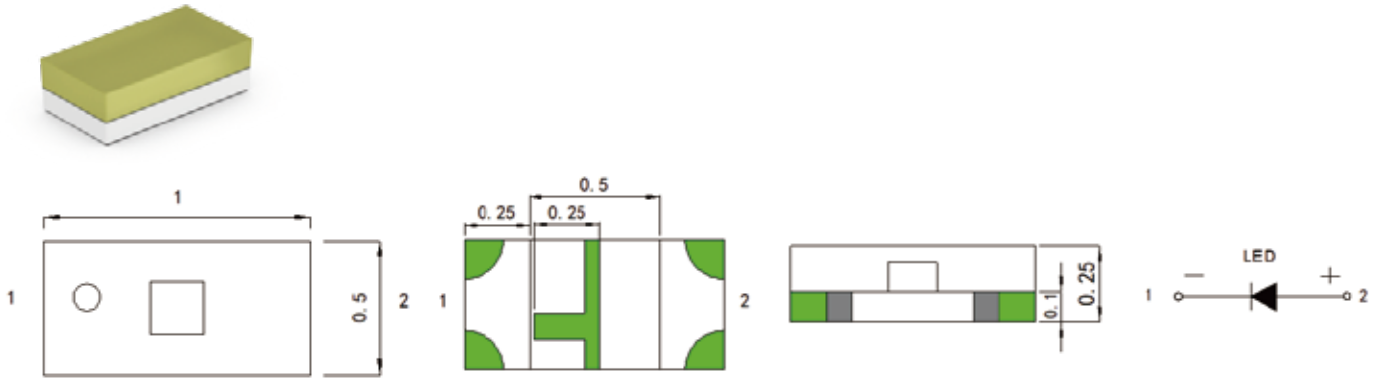
Product	Size	VTM(V)	VINH (V)	VDRM(V)	Viso (Vrms)	VF,Max (V)	IFT (mA)
RF-MOC3061	7.14 x 6.5 x 3.5	3	20	600	5000	1.2	15
RF-MOC3062	7.14 x 6.5 x 3.5	3	20	600	5000	1.2	10
RF-MOC3063	7.14 x 6.5 x 3.5	3	20	600	5000	1.2	5
RF-MOC3081	7.14 x 6.5 x 3.5	3	20	800	5000	1.2	15
RF-MOC3082	7.14 x 6.5 x 3.5	3	20	800	5000	1.2	10
RF-MOC3083	7.14 x 6.5 x 3.5	3	20	800	5000	1.2	5

# CHIP LED

1. Zero defect and failure
2. Customized and full color
3. High ESD and high reliability
4. Complete product family, pin to pin compatible

1. 零缺陷失效率
2. 颜色定制, 全色系覆盖
3. 高ESD 高耐候性
4. 产品家族齐全, pin to pin替代

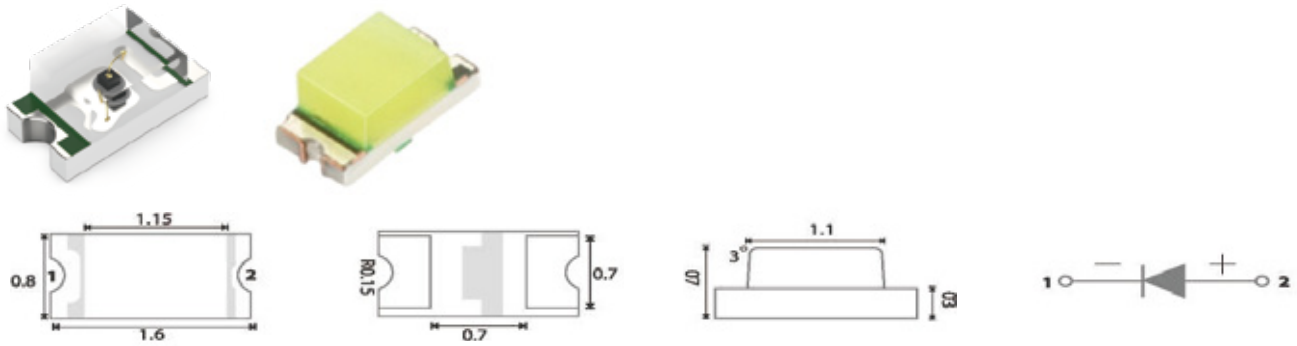
## T402 series



Part No.	Color	IF (mA)	WLD (nm)/ XY	VF(V)	IV (mcd)	2θ1/2 (°)
RF-BUT402TS-CE-E0	Blue	20	470	3.1	150	140
RF-TUT402TS-CF-E0	Green	20	525	3.1	900	140
RF-GUT402TS-BF-E0	Yellow Green	20	570	2.0	50	140
RF-OUT402TS-CB-E0	Orange	20	625	2.0	100	140
RF-RUT402TS-BD-E0	Red	20	633	2.2	70	140
RF-WUT402DS-CK-B0	White	5	0.294/0.324	2.7	400	140

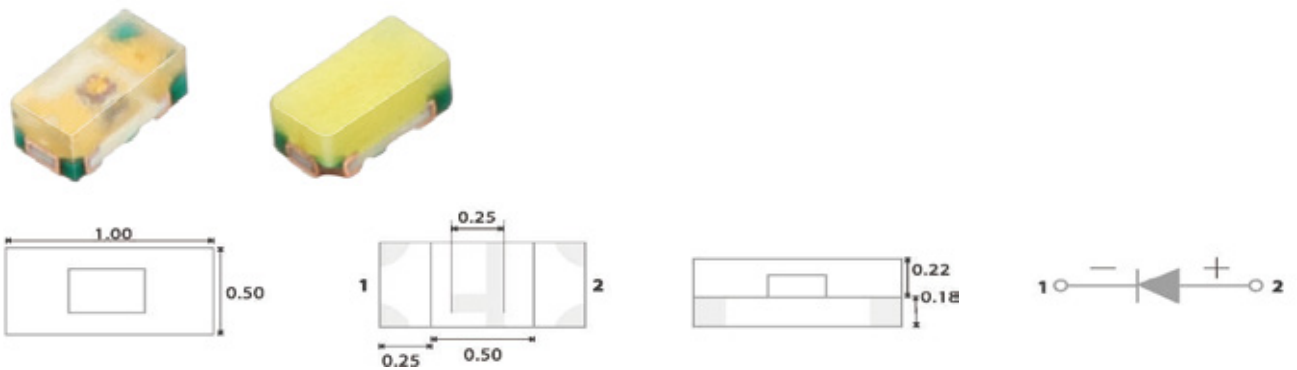


## B190 series



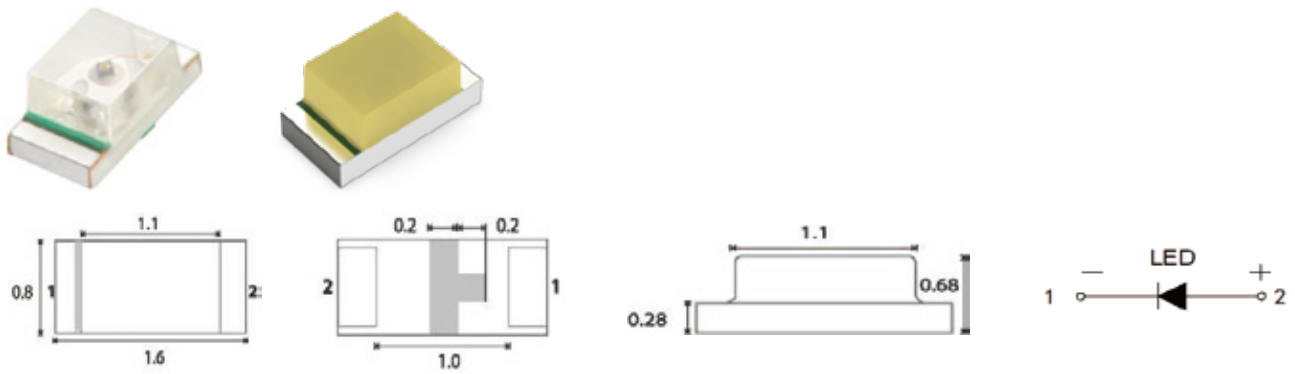
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ <sub>1/2</sub> (°)
RF-GTB190TS-CA	Yellow Green	20	570	2.0	23	140
RF-YUB190TS-CA	Yellow	20	588	2.0	120	140
RF-AUB190TS-CA	Amber	20	603	2.0	120	140
RF-OUB190TS-CA	Orange	20	620	2.0	120	140
RF-RUB190TS-CA	Red	20	630	2.0	60	140
RF-GUB190TS-CA	Green	20	522	3.0	500	140
RF-BUB190TS-CA	Blue	20	470	3.0	150	140
RF-WUB190DS-DC-B1	White	5	0.28/0.27	2.7	210	140
RF-WUB190DS-JD-E0	White	20	0.24/0.22	3.0	900	140
RT-WUB190DS-DD-E0	White	20	0.2380/0.2458	3.0	800	140
RF-WUB190DS-DD-E2	White	20	0.2380/0.2458	3.0	850	140

## 0402 series



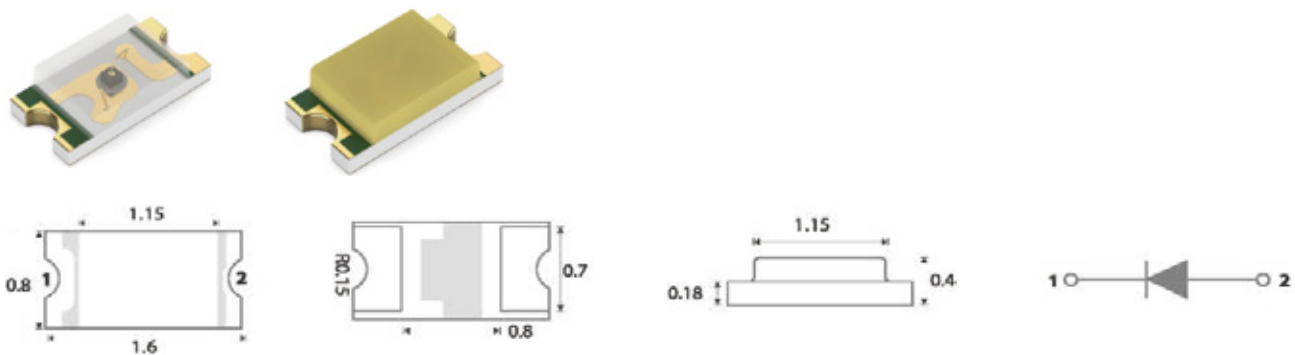
Part No.	Color	IF (mA)	WLD/XY	VF (V)	IV (mcd)	2θ <sub>1/2</sub> (°)
RF-BU0402TS-CE-B	Blue	5	470	2.8	70	140
RF-GN0402TS-CF-B	Green	5	527	2.7	290	140
RF-YU0402TS-CE-B	Yellow	5	588	1.9	35	140
RF-OU0402TS-CE-B	Orange	5	622	1.9	28	140
RF-WU0402DS-DD-B	White	5	0.27/0.27	2.75	300	140

## B191 series



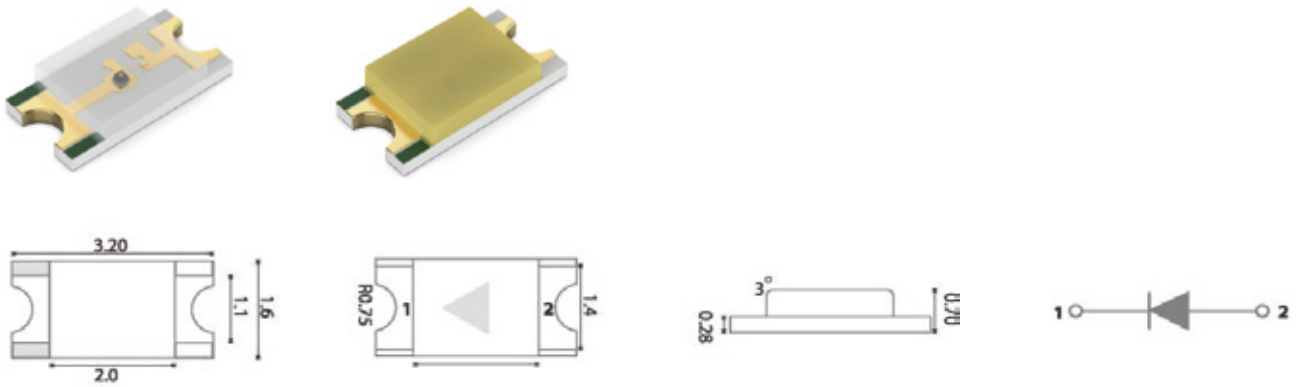
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	201/2 (°)
RF-BUB191TS-CE	Blue	20	467	3.1	240	140
RF-GNB191TS-CF	Green	20	525	3.1	650	140
RF-YUB191TS-AE	Yellow	20	590	2	180	140
RF-OUB191TS-CE	Orange	20	622	2	120	140
RF-GTB191TS-BC	Yellow Green	20	570	2	70	140
RF-WUB191DS-DD	White	20	0.255/0.240	3.0	800	140
RF-WUB191DS-DD-P	White	20	0.255/0.240	3.1	800	140
RF-WUB191DS-DD-GP	White	20	0.255/0.240	3.1	800	140
RF-BWB191DS-DD	White	20	0.227/0.185	3.1	700	140
RF-BWB191DS-CE	White	20	0.215/0.170	3.1	520	140
RF-BWB191DS-EB-C	White	10	0.2196/0.2164	3	350	140

## M190 series



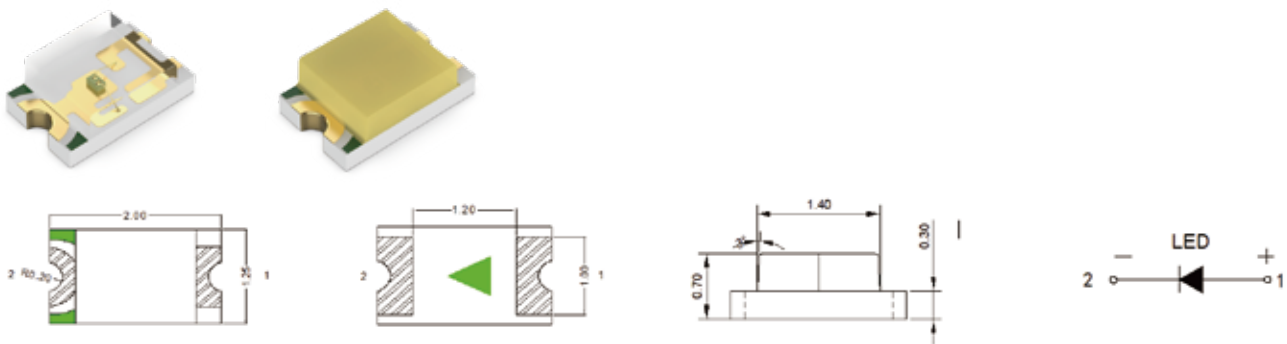
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	201/2 (°)
RF-OUM190TS-CA-E1	Orange	20	625	2.0	150	140
RF-TGM190TS-CA-P1	Green	2	530	2.7	120	140
RF-WNM190DS-DB-B	White	5	0.265/0.25	2.8	150	140
RF-WUM190DS-DC-B	White	5	0.29/0.30	2.8	150	140

## S150 series



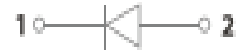
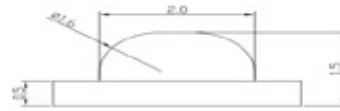
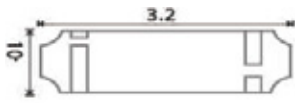
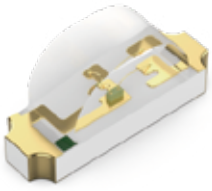
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-GSS150TS-BC	Yellow Green	20	570	2	50	140
RF-BNS150TS-CE	Blue	20	470	3.1	150	140
RF-YUS150TS-AE	Yellow	20	588	2	150	140
RF-GNS150TS-CF	Green	20	525	3.1	650	140
RF-OUS150TS-CE	Orange	20	620	2	150	140
RF-RUS150TS-BD	Red	20	630	2	90	140
RF-WNS150DS-DD	White	20	0.28/0.28	3	660	140

## B170 series



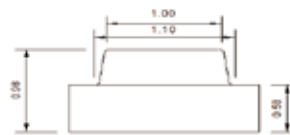
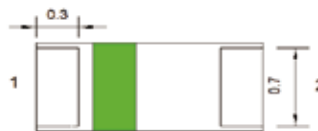
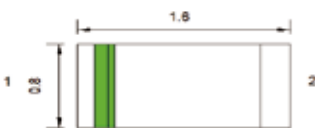
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-BNB170TS-CE	Blue	20	465	3.2	120	140
RF-GNB170TS-CF	Green	20	525	3.1	650	140
RF-GSB170TS-BC	Yellow Green	20	570	2.1	50	140
RF-OUB170TS-CE	Orange	20	620	2.0	170	140
RF-RUB170TS-BD	Red	20	629	2.0	80	140
RF-WNB170DS-DD	White	20	0.28/0.28	3.0	690	140

## T112 series

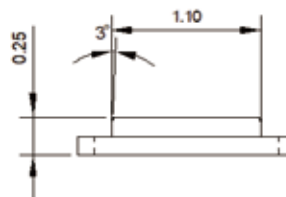
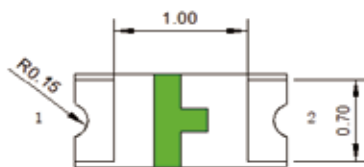
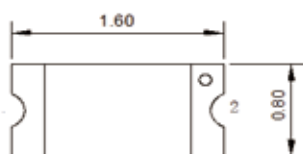


Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-RUT112TS-BD	Red	20	630	2	70	140
RF-OUT112TS-CE	Orange	20	622	2.1	173	140
RF-YUT112TS-AE	Yellow	20	588	2.1	95	140
RF-BNT112TS-CF	Blue	20	466	3.1	121	140
RF-GNT112TS-CF	Green	20	525	3.1	650	140
RF-GST112TS-BC	Yellow Green	20	570	2.1	66	140

## D191 series

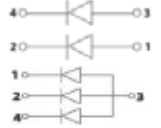
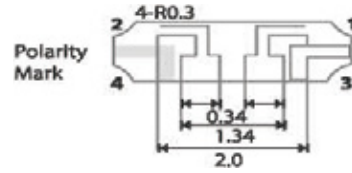
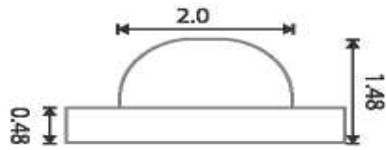
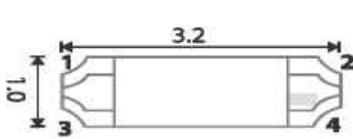
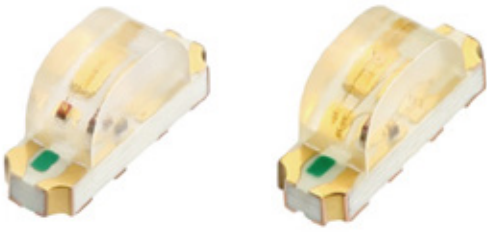


Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-BUD191TS-CA-E1	Blue	20	465	3.2	120	140
RF-TUD191TS-CA-E1	Green	20	525	3.1	650	140
RF-GUD191TS-CA-E1	Yellow Green	20	572	2.1	35	140
RF-LOUD191TS-CA-E1	Orange	20	620	2.0	100	140
RF-RUD191TS-CA-E1	Red	20	629	2.0	80	140
RF-AUD191TS-CA-E1	Amber	20	603	2.0	140	140

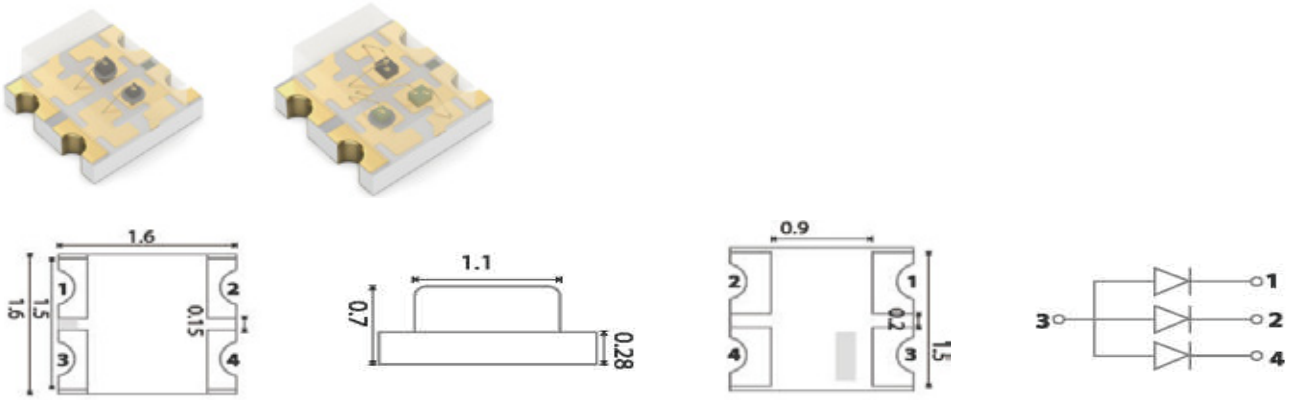


Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ <sub>1/2</sub> (°)
RF-BUT130TS-CE	Blue	20	470	3.1	150	140
RF-TUT130TS-CF	Green	20	525	3.1	1000	140
RF-GUT130TS-BF	Yellow Green	20	570	2.0	50	140
RF-OUT130TS-CB	Orange	20	625	2.0	100	140
RF-RUT130TS-BD	Red	20	633	2.2	70	140
RF-AUT130TS-EB	Amber	20	603	2.0	140	140

# S115/118 series

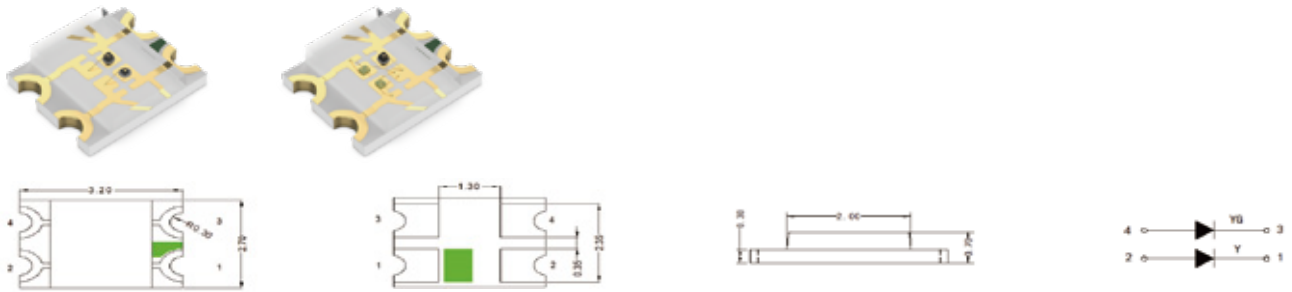


Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	$2\theta_{1/2}$ (°)
RF-W1S118TS-A42	Orange	20	622	2	157	140
	Green	20	525	3.1	650	
	Blue	20	467	3.2	140	
RF-W2S118TS-A41	Red	20	630	2	66	140
	Green	20	525	3.1	650	
	Blue	20	470	3.2	120	
RF-P3S115TS-B09	Orange	20	629	2	125	140
	Yellow Green	20	590	2.1	40	
RF-P3S115TS-B37	Red	20	634	2.1	65	140
	Yellow Green	20	570	2.1	50	
RF-P3S115TS-B51	Yellow	20	589	2.1	175	140
	Yellow Green	20	572	2.1	45	
RF-P3S115TS-B52	Red	20	630	2	60	140
	Yellow Green	20	587	2	90	



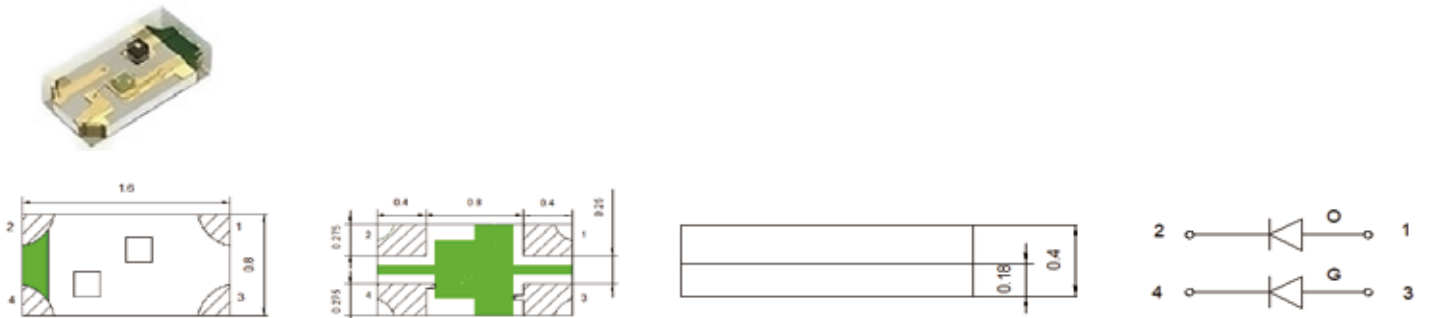
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	$\theta_{1/2}$ (°)
RF-P1S196TS-B49	Yellow	20	590	2	120	140
	Green	20	525	3.1	650	140
RF-P1S196TS-B53	Red	20	630	2	80	140
	YellowGreen	20	570	2	30	140
RF-P1S196TS-B54	Orange	20	621	2.0	240	140
	Green	20	525	3.1	650	140
RF-P2S196TS-B38	Orange	20	622	2	210	140
	Blue	20	460	3.1	40	140
RF-W3S198TS-A12	Orange	20	622	2	120	140
	Green	20	525	3.1	650	140
	Blue	20	466	3.1	100	140
RF-W3S198TS-A37	Yellow	20	590	2	120	140
	Green	20	525	3.1	650	140
	Blue	20	467	3.1	140	140
RF-W3S198TS-A41	Red	20	630	2	60	140
	Green	20	525	3.1	650	140
	Blue	20	466	3.1	140	140

## S155 series



Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2 $\theta$ 1/2 (°)
RF-P3S155TS-B51	Yellow	20	590	2.1	130	140
	Yellow Green	20	565	2.1	45	
RF-P3S155TS-B53	Red	20	634	2.1	60	140
	Yellow Green	20	570	2.1	63	
RF-P3S155TS-B54	Orange	20	621	2.1	135	140
	Green	20	525	3.1	650	
RF-W2S155TS-A41	Red	20	633	2.0	70	140
	Green	20	525	3.1	650	
	Blue	20	467	3.1	140	

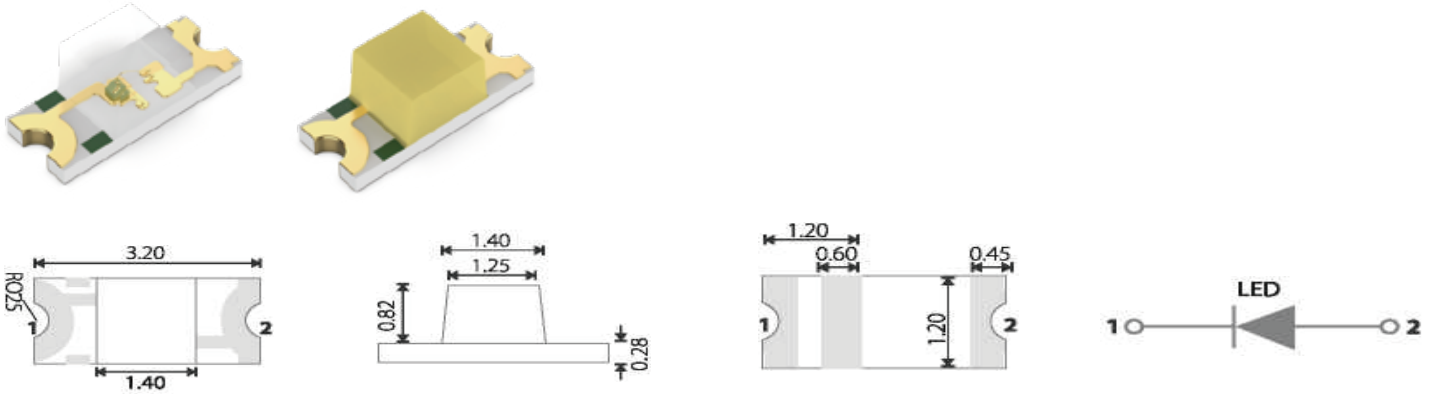
## S191 series



Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2 $\theta$ 1/2 (°)
RF-P1S191TS-B47	Amber	5	605	2.0	60	140
	Yellow-green	5	570	2.0	25	
RF-P1S191TS-B51	Yellow-green	5	570	2.0	25	140
	Yellow	5	590	2.0	65	
RF-P1S191TS-B53	Yellow-green	5	570	2.0	25	140
	Red	5	625	2.0	60	
RF-P1S191TS-B59-E1	Green	20	525	3.1	650	140
	Red	20	625	2.0	160	
RF-P1S191TS-B62-E0	Yellow	20	590	2.0	150	140
	Blue	20	470	2.8	180	

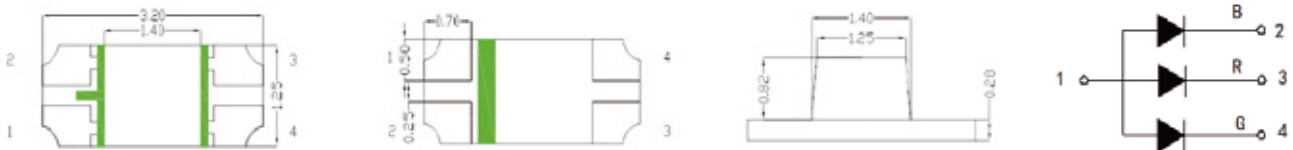


## R150 series



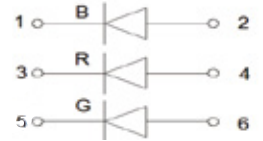
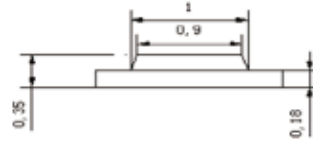
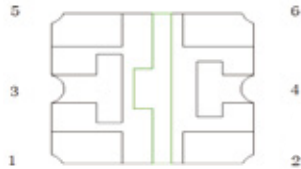
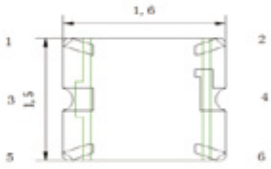
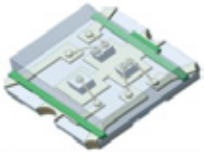
Part No.	Color	(mA)	WLD (nm)/ XY	V <sub>F</sub> (V)	I <sub>V</sub> (mcd)	2θ <sub>1/2</sub> (°)
RF-BUR150TS-BF-E1	Blue	20	465	3.0	140	140
RF-GUR150TS-BF-E1	Yellow-green	20	570	2.1	40	140
RF-OUR150TS-BF-E1	Orange	20	621	2.0	180	140
RF-RUR150TS-BF-E1	Red	20	630	2.0	60	140
RF-YUR150TS-CA-E1	Yellow	20	589	2.1	65	140
RF-WUR150DS-EC-E1	White	20	0.26/0.27	3.0	350	140

## R158 series



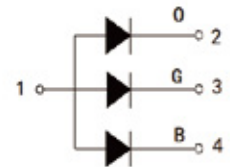
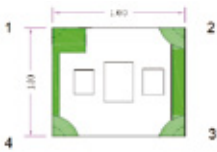
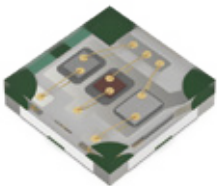
Part No.	Color	I <sub>F</sub> (mA)	WLD (nm)/ XY	V <sub>F</sub> (V)	I <sub>V</sub> (mcd)	2θ <sub>1/2</sub> (°)
RF-W3R158TS-A41	Red	20	625	2.0	60	140
	Green		525	3.0	500	
	Blue		470	2.0	130	
RF-W3R158TS-A37	Yellow	20	590	2.0	120	140
	Green		525	3.1	500	
	Blue		467	3.1	140	

## 1615 series



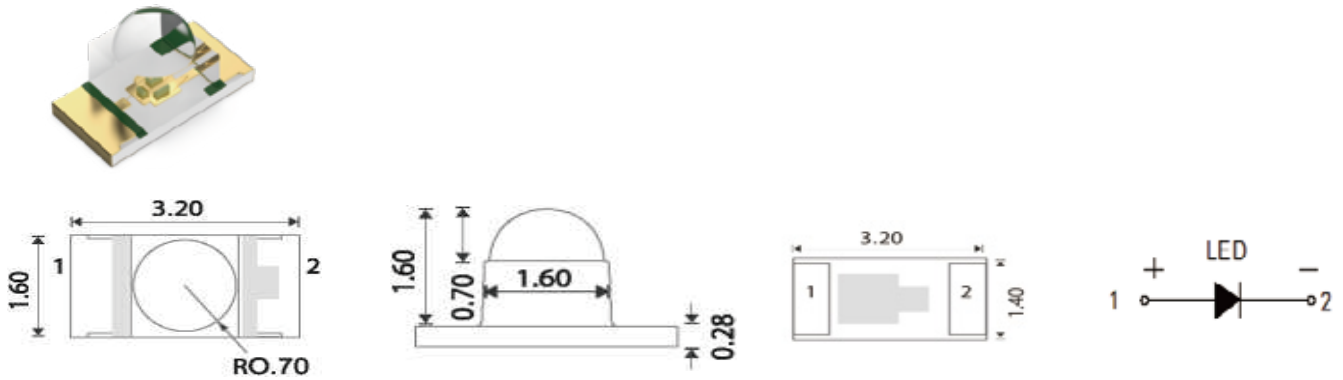
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-W61615TS-A42	Red	20	625	2.0	150	140
	Green		525	2.8	500	
	Blue		470	2.8	130	
RF-W61615TS-A37	Yellow	20	590	2	120	140
	Green		525	3.1	500	
	Blue		467	3.1	140	

## 1010 series



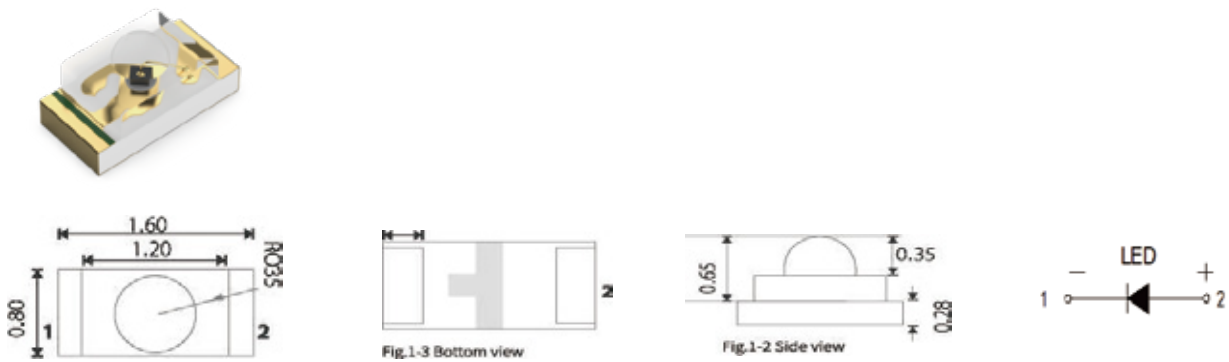
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-W11010TS-A42-P0	Red	2	620	1.8	45	140
	Green		531	2.5	140	
	Blue		470	2.6	24	
RF-W11010TS-HW-P0	White	2	0.2754/0.3233	2.0	250	140

## L150 series



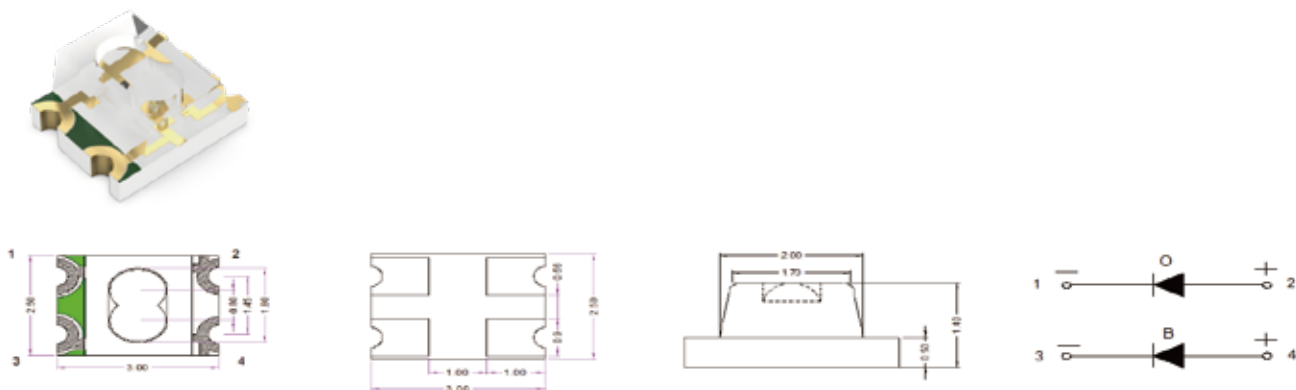
Part No.	Color	IF (mA)	IV (mcd)	WLD (nm)/ XY	VF(V)	2θ <sub>1/2</sub> (°)
RF-AUL150TS-CB-E1	Amber	20	1800	630	2	30
RF-BUL150TS-CE-E1	Blue	20	1000	470	3	30
RF-GUL150TS-BE-E1	Yellow-green	20	500	570	2	30
RF-OUL150TS-CA-E1	Orange	20	1800	625	2	30
RF-RUL150TS-CA-E1	Red	20	1600	629	2	30
RF-TUL150TS-CG-E1	Green	20	5000	520	3.2	30
RF-YUL150TS-AC-E1	Yellow	20	1200	587	2	30

## L191 series



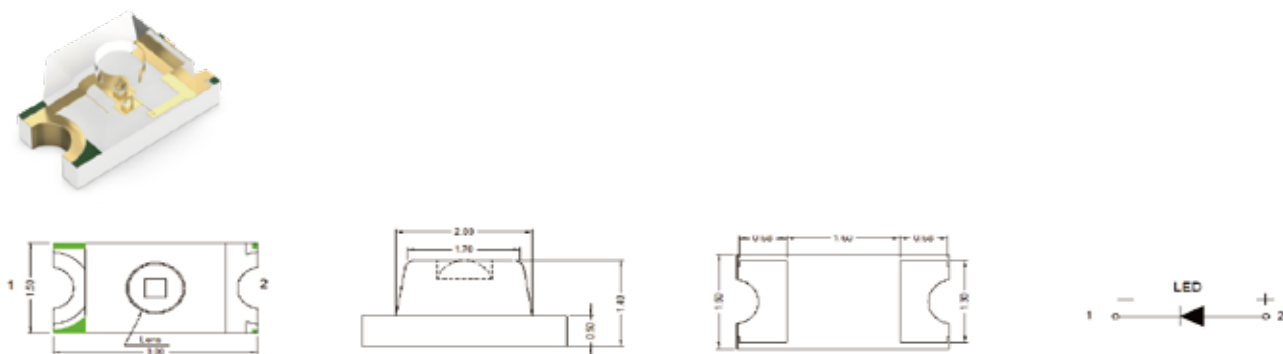
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ <sub>1/2</sub> (°)
RF-AUL191TS-BC-E1	Amber	20	602	2.1	500	60
RF-BUL191TS-BC-E1	Blue	20	468	3	400	60
RF-BWL191DS-DD-E1	White	20	0.23/0.22	2	1500	60
RF-GUL191TS-BC-E1	Yellow-green	20	570	2.9	150	60
RF-OUL191TS-BC-E1	Orange	20	622	2	350	60
RF-TUL191TS-BC-E1	Green	20	525	3	1800	60
RF-YUL191TS-BC-E1	Yellow	20	588	2	400	60
RF-RUL191TS-CE-E0	Red	20	622	2.1	2200	60

### 3025 series



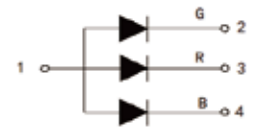
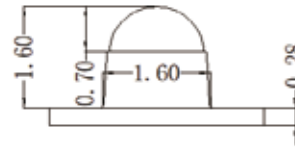
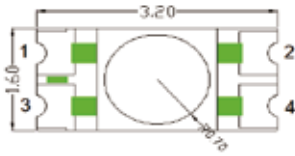
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-P13025TS-B37	Blue	20	467	3.1	600	60
	Orange		621	2.0		
RF-P13025TS-B53	Red	20	630	2	400	60
	YellowGreen		570	2	150	

### 3015 series



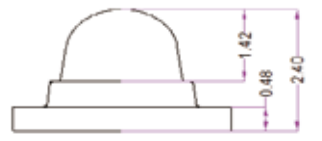
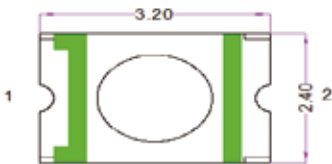
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-GU3015TS-BF-E0	Yellow Green	20	570	2.0	130	70
RF-OU3015TS-CA-E0	Orange	20	625	2.0	500	70
RF-TU3015TS-CA-E0	Green	20	525	3.0	1800	70
RF-BU3015TS-CA-E0	Blue	20	470	3.0	450	70

## L158 series



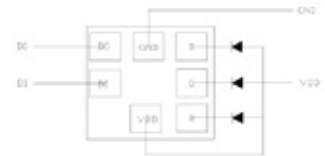
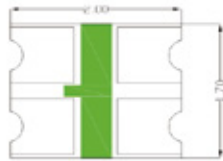
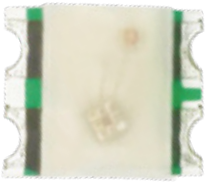
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-W1L158TS-A61-E1	Red	20	622	2.0	250	30
	Green		521	3.0	1000	
	Blue		469	3.0	200	
RF-W1L158TS-A37	Yellow	20	590	2	250	30
	Green		525	3.1	1000	
	Blue		467	3.1	200	

## 3224 series



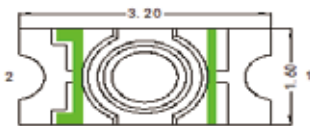
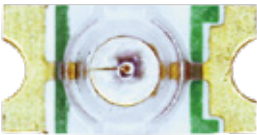
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-GU3224TS-CB-E0	Yellow Green	20	570	2.1	400	15
RF-TU3224TS-CA-E0	Green	20	522	3.0	2000	15
RF-BU3224TS-CA-E0	Blue	20	470	3.0	700	15
RF-OU3224TS-CA-E0	Orange	20	620	2.0	650	15

## 0807 series



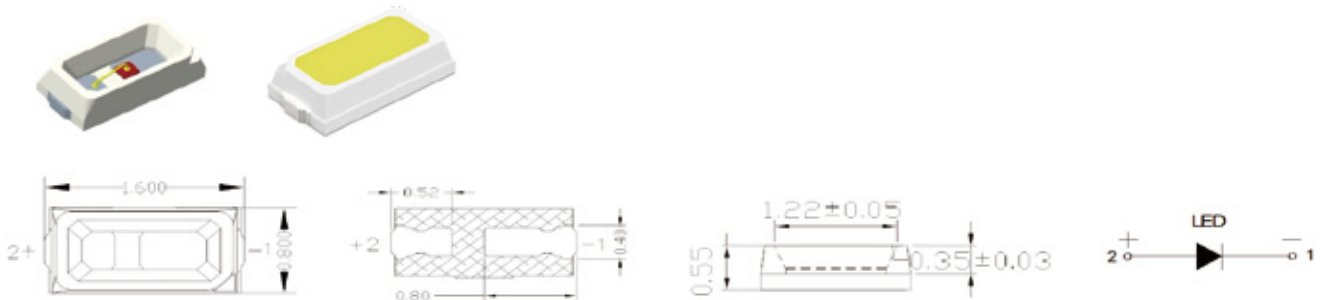
Part No.	Color	VDD (V)	WLD (nm)	IV (mcd)	2θ1/2 (°)
RF-IC30807TS-H01-B0	Red	5	625	200	140
	Green		525	650	
	Blue		470	150	
RF-IC30807TS-H01-B1	Red	5	625	500	140
	Green		525	1200	
	Blue		465	300	

## A150 series



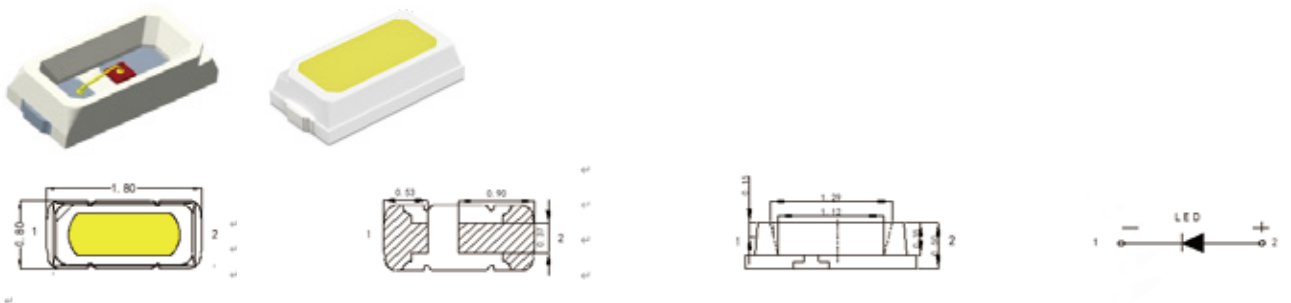
Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-YUA150TS-AE-E0	Yellow	20	589	2.1	425	70
RF-OUA150TS-CA-E0	Orange	20	625	2.0	520	70
RF-TUA150TS-CA-E0	Green	20	525	3.0	1700	70
RF-BUA150TS-CA-E0	Blue	20	470	3.0	480	70

## 1608 series

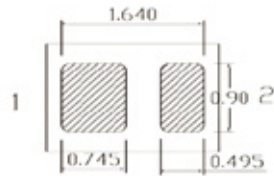
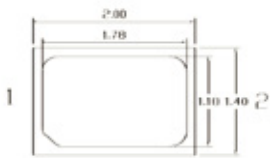


Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-AG1608TS-EB-E0	Amber	20	602	2.07	222	140
RF-BU1608TS-DC-E0	Blue	20	470	3.0	204	140
RF-GG1608TS-BE-E0	yellow green	20	571	2.0	70	140
RF-OG1608TS-CE-E0	Orange	20	622	2.0	300	140
RF-RG1608TS-BC-E0	Red	20	630	2.0	109	140
RF-TG1608TS-CF-E0	green	20	523	3.0	1976	140
RF-YG1608TS-AE-E0	yellow	20	588	2.1	200	140
RF-GW1608DS-DD-B0	White	5	0.1841/0.1838	2.7	367	140
RF-WU1608DS-DD-E0	White	20	0.27/0.256	3.1	1670	140

## 1808 series



Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-AG1808TS-ED-E0	Amber	20	602	2.07	500	140
RF-BU1808TS-DC-E0	Blue	20	470	3.0	204	140
RF-GG1808TS-BE-E0	yellow green	20	571	2.0	70	140
RF-OG1808TS-CB-E0	Orange	20	622	2.0	600	140
RF-RG1808TS-BC-E0	Red	20	630	2.0	109	140
RF-TG1808TS-CF-E0	green	20	523	3.0	1500	140
RF-YG1808TS-AC-E0	yellow	20	588	2.1	500	140
RF-WN1808DS-DD-E1	White	20	0.255/0.245	3.1	1800	140
RF-WU1808DS-DD-C0	White	10	0.3/0.305	3.1	1000	140
RF-WU1808DS-DD-E1	White	20	0.231/0.198	3.1	2100	140
RF-WN1808DS-DD-E3	White	20	0.252/0.238	3.1	2000	140



Part No.	Color	IF (mA)	WLD (nm)/ XY	VF (V)	IV (mcd)	2θ1/2 (°)
RF-AG2014TS-CF-E0	Amber	20	602	2.07	300	140
RF-BG2014TS-CK-E0	Blue	20	470	3.0	204	140
RF-GG2014TS-AE-E0	yellow green	20	571	2.0	70	140
RF-OG2014TS-CF-E0	Orange	20	622	2.0	800	140
RF-RG2014TS-CA-E0	Red	20	630	2.0	300	140
RF-TG2014TS-CK-E0	green	20	523	3.0	1500	140
RF-YG2014TS-AE-E0	yellow	20	588	2.1	500	140
RF-WU2014DS-CK-E1	White	20	6500K	3.1	1800	140
RF-WU2014DS-CK-E3	White	20	3000K	3.1	1000	140
RF-WU2014DS-CK-N0	White	60	9000K	3.1	2100	140
RF-WU2014DS-CK-N1	White	60	6500K	3.1	2000	140



# Optical Sensor

## 光传感

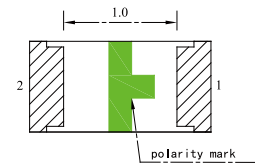
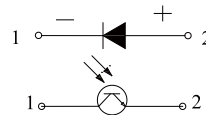
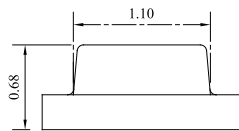
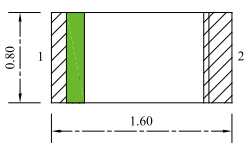
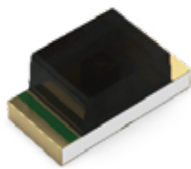
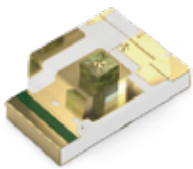
From intelligent water and gas meter to intelligent remote control and intelligent wearing, infrared sensing is applied in all aspects of our life.

1. Various viewing angle
2. Various application
3. Angle customization available
4. Complete product range

从智能水气表, 到智能遥控, 智能穿戴等, 红外传感应用在我们生活的方方面面。

1. 角度丰富
2. 应用丰富
3. 角度定制化
4. 产品齐全

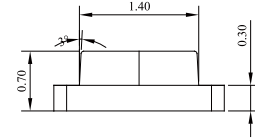
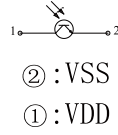
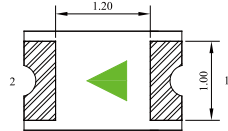
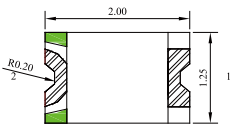
### 0603 series



Part No.	Forward Current		Forward Voltage	Radiant Intensity	CIE x/y or Dominant Wavelength	Viewing Angle
	mA		V	mW/sr	°/nm	Deg
	Typ	Max	Typ	Typ	Typ	Typ
RF-IRDB191TS-12-E2	20	65	1.3	1.12	940	140

Part No.	Collector-Emitter Breakdown Voltage	Emitter-Collector-Voltage	Optical Current	Wavelength corresponding range	Viewing Angle
	v	v	mA	nm	Deg
	Min	Min	Typ	/	Typ
RF-PTDB191TB-21-G	30	5	1.52	700-1100	140

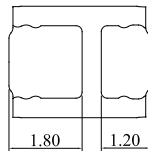
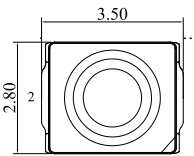
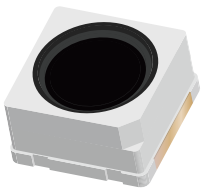
## B170 series



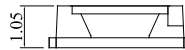
Part No.	Collector-Emitter Breakdown Voltage	Emitter-Collector-Voltage	Light Current	Wavelength corresponding range	Viewing Angle
	v	v	mA	nm	Deg
	Min	Min	Typ	/	Typ
RF-PTDB170TS-21-G	30	5	1.52	400-1100	140

Part No.	Collector-Emitter Breakdown Voltage	Emitter-Collector-Voltage	Light Current	Spectral range of sensitivity	Viewing Angle
	v	v	mA	nm	Deg
	Min	Min	Typ	/	Typ
RF-PTDB170TS-21-G	30	5	1.52	400-1100	140

## 2835 Photosensitive Series

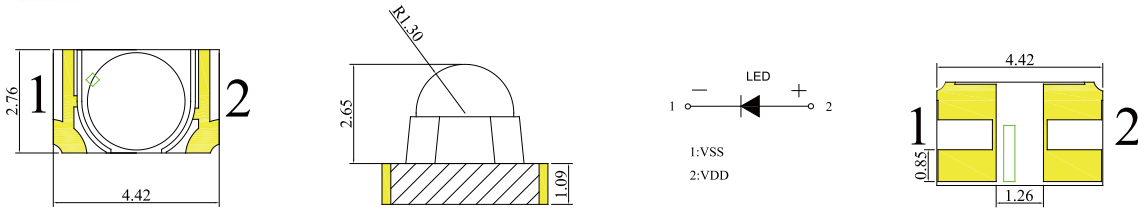
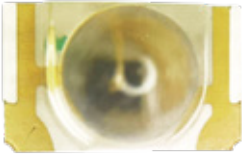


1:VSS  
2:VDD



Part No.	Operating Voltage	Light Current	Peak Spectral Response	Rang of Spectral Bandwidth
	v	nA	nm	nm
	Min	Typ	/	/
RF-P28W0-PDO-FUG	1 - 12	4	550	400-700

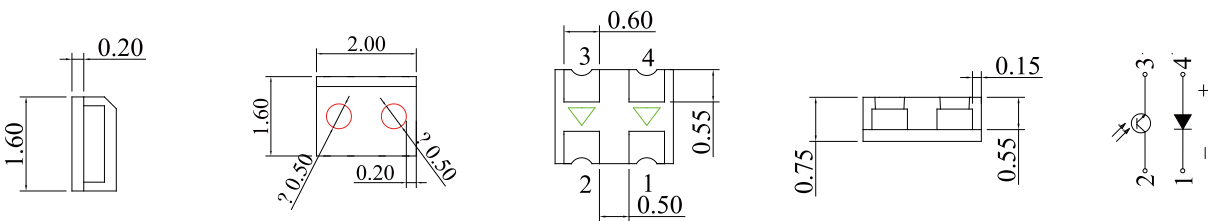
## 4428 Series



Part No.	Forward Current		Forward Voltage	Radiant Intensity	CIE x/y or Dominant Wavelength	Viewing Angle
	mA		V	mW/sr	°/nm	Deg
	Typ	Max	Typ	Typ	Typ	Typ
RF-IPD4428TS-14-G	50	100	1.4	60	940	30

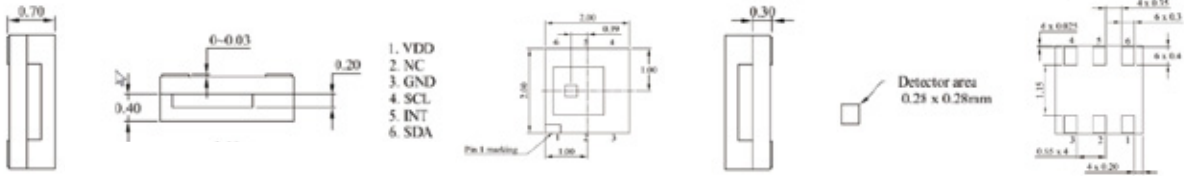
Part No.	Operating Voltage	Light Current	Peak Spectral Response	Range of Spectral Bandwidth
	v	nA	nm	nm
	Min	Typ	/	/
RF-ICD4428TS-14-G	1-10	400-1200	550	400-700

## 2016 Series



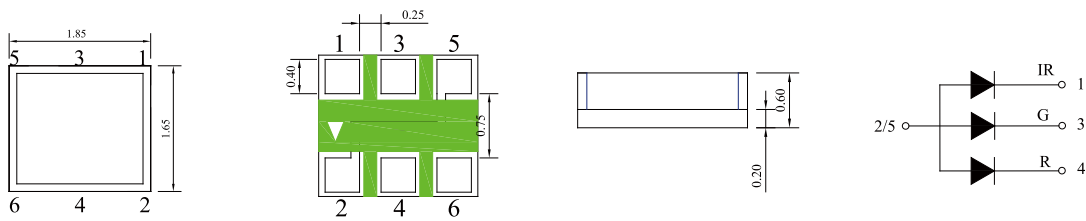
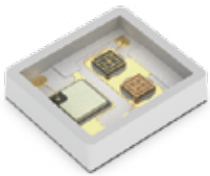
Part No.	Dice	Forward Current		Forward Voltage	Total radiant flux/Luminous Flux	CIE x/y or Dominant Wavelength	Viewing Angle
	mA	mA		V	mW/sr	°/nm	Deg
	Typ	Typ	Max	Typ	Typ	Typ	Typ
RF-PNB21A5PA00C78	IR	5	15	1.7	3	940	120
	PT	/	/	0.9	/	/	/

## 2020 Series



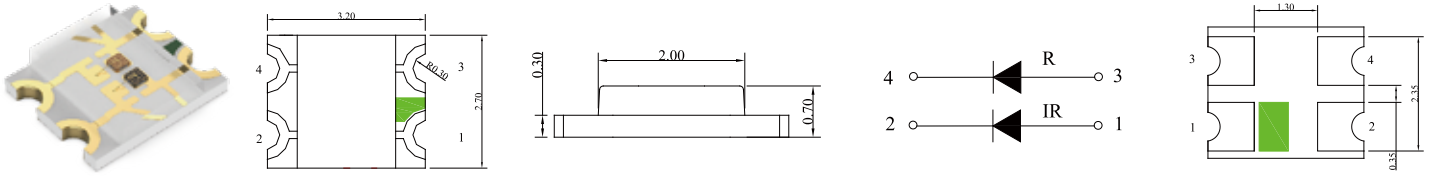
Product	Supply Voltage(V)	Full scale ADC counts value	Full scale ADC counts per step	Range/(nm)	ADC Resolution
ALS-IC-2020	1.7-3.6	65535	1023	550	Up to 16 bit

## Blood Oxygen Emission Series



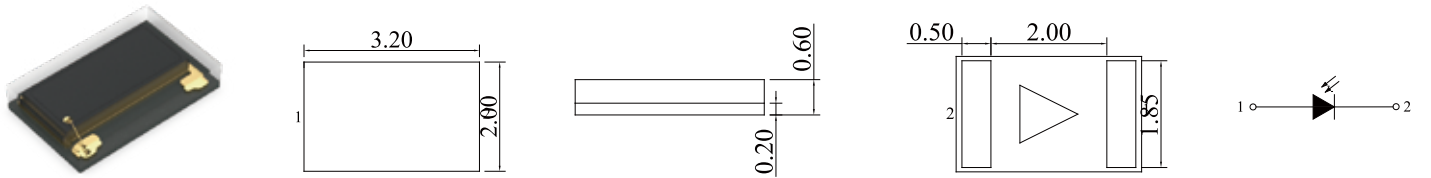
Part No.	Forward Current		Forward Voltage	Radiant Intensity	CIE x/y or Dominant Wavelength	Viewing Angle
	mA		V	mW/sr	nm	Deg
	Typ	Max	Typ	Typ	Typ	Typ
RF-W31816TS-A56-E	20	IR:60;R:40;G:30	IR:1.3;R:2.0;G:2.4	IR:3;R:4;G:3.5	IR:940;R:660;G:530	120

## Blood Oxygen Emission Series



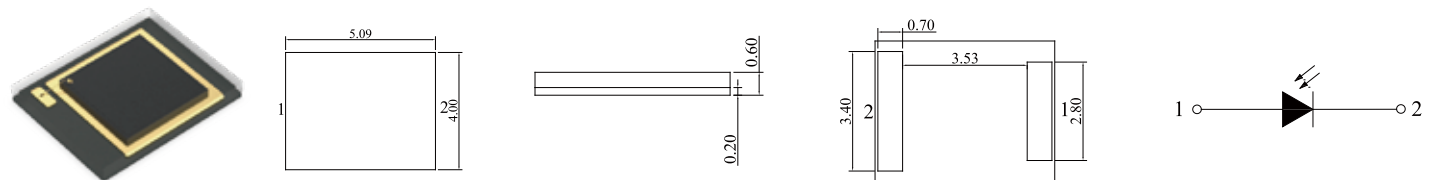
Part No.	Forward Current		Forward Voltage	Radiant Intensity	CIE x/y or Dominant Wavelength	Viewing Angle
	mA		V	mW/sr	'-/nm	Deg
	Typ	Max	Typ	Typ	Typ	Typ
RF-P3S155TS-B96-E	20	IR:100;R:80	IR:1.3;R:2.2	IR:2.2;R:4.5	IR:905;R:660	120

## Blood Oxygen Reception Series



Part No.	Photocurrent	Range of Spectral Bandwidth
	$\mu\text{A}/(\text{mW}/\text{cm}^2)$	nm
	Typ	/
RF-PDD3220TS-80-C	2.3@940nm; 1.6@660nm; 1.1@530nm	400-1100

## Blood Oxygen Reception Series



Part No.	Light current	Range of Spectral Bandwidth
	$\mu\text{A}/(\text{mW}/\text{cm}^2)$	nm
	Typ	/
RF-PDD5040TS-120-C	4.6@940nm; 3.1@660nm; 2.1@530nm	400-1100

# Display product

显示产品



# Backlight

## 背光

REFOND display backlight product line is specialized in the R & D, production and sales of backlight LED products, providing various display backlight LED solutions from industrial control display, TFT small size to large size products.

Products includes Mini LED、Micro LED、Automotive Mini LED、Automotive 3014、Automotive 4014、Side View (3806、3805、3804、3006、3004、2604)、Top View (3030、flip 3030、3014、4014、2835) LED.

REFOND display backlight technology has been settled for more than 20 years. It has rich product types and professional packaging technology, and constantly improves itself, providing high-quality products and fast response services for backlight customers, and providing integrated services for customers.

瑞丰显示背光产品线专业从事背光源 LED产品的研发、生产和销售，提供从工控显示、TFT小尺寸到大尺寸各类显示背光源LED解决方案。

产品以Mini LED、Micro LED、车载Mini LED、车规3014、车规4014、Side View (3806、3805、3804、3006、3004、2604)、Top View (3030、倒装3030、3014、4014、2835) LED为主。

瑞丰显示背光技术沉淀20余年，具有丰富的产品种类及专业的封装技术，不断沉淀升华提升自身，为背光源客户提供高品质的产品和快速响应的服务，为客户提供一体化服务。

## Side View Product Series

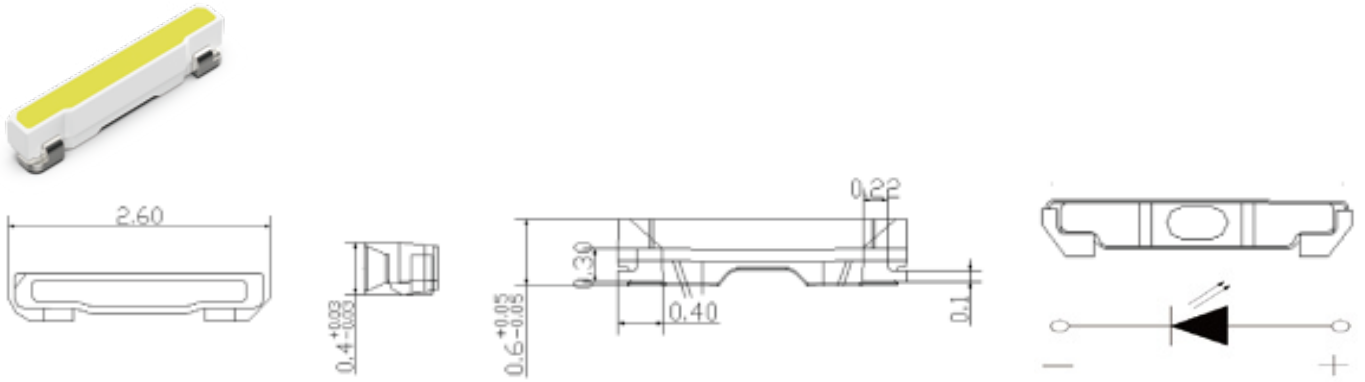
Realize full screen, ultra-thin and narrow bezel of mobile phone

1. Backlight of mobile phone, tablet PC and Laptop ;
2. High quality, high light efficiency, long lifespan, high NTCs, comprehensive cost-effective advantages;
3. Deeply explore consumer demand, realize full screen, ultra-thin and narrow border of mobile phone, improve end-product consumer satisfaction.
4. Rich product range could meet various customer needs, perfect global patent protection solutions available.

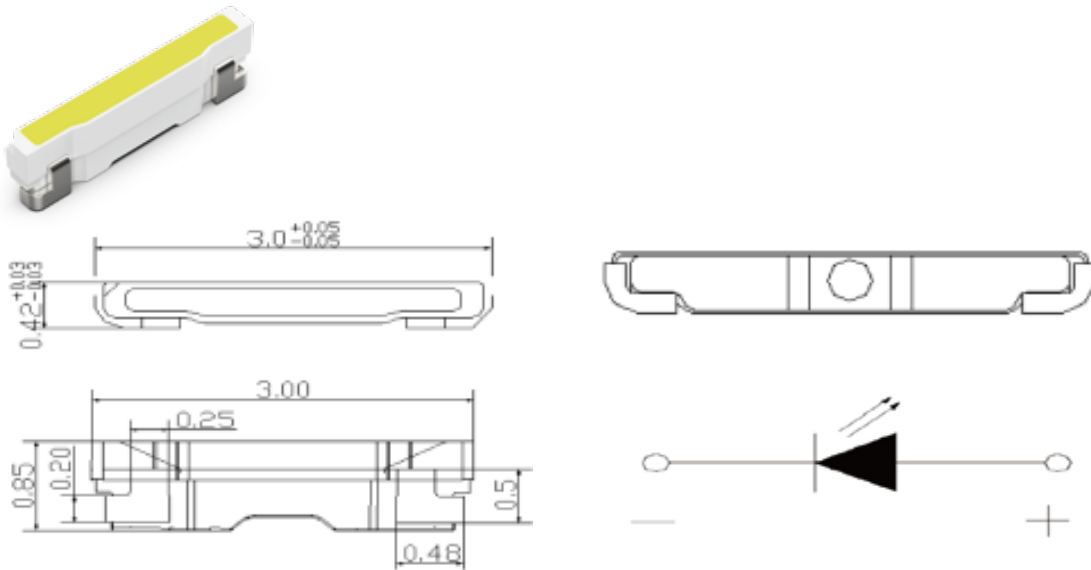
实现手机全面屏、超薄、窄边框

1. 手机、平板电脑和笔记本电脑等产品背光源；
2. 高品质、高光效、高寿命、高NTCS，综合性价比优势；
3. 深度挖掘消费者需求，实现手机全面屏、超薄、窄边框，提升终端产品消费者满意度。
4. 产品丰富满足各类客户需求，完善的全球专利保障。

Typical case	Border	PKG	Phosphor solution		
	3.0-5.0mm	3806	Silicate	Nitrate	B塞隆+KSF
		3805	蓝光护眼		
	2.8-3.2mm	3006	Silicate	Nitrate	B塞隆+KSF
		3004	蓝光护眼		
	2.0-2.4mm	2605	Silicate	Nitrate	B塞隆+KSF
		2604	蓝光护眼		

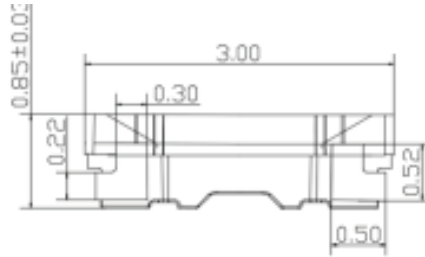
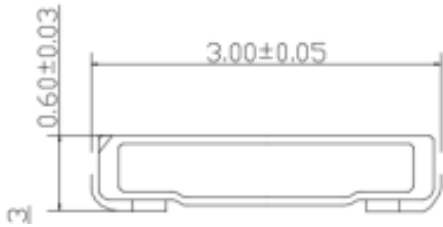
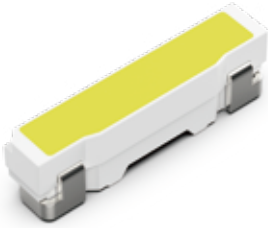


Part No.	IV(MCD)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	Color
	Typ	Typ	Typ	Typ	Typ	Max	
LT264WH-A-Q	2950	(0.29,0.28)	3.0	20	120	105	White
LT264WHS-A-Q	3050	(0.29,0.28)	3.0	20	120	105	White
LT264WH-GL	2750	(0.29,0.28)	3.0	20	120	105	White

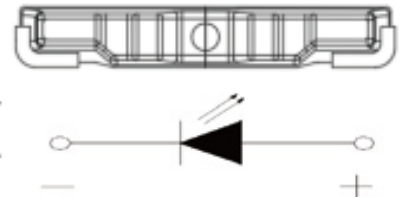
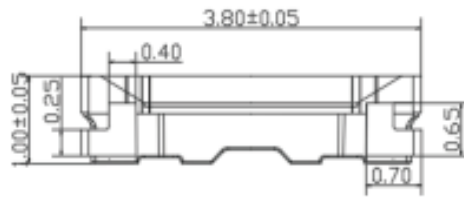
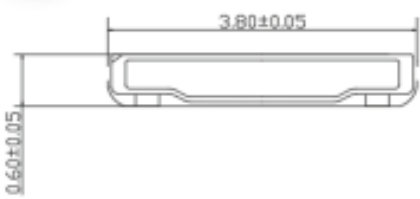
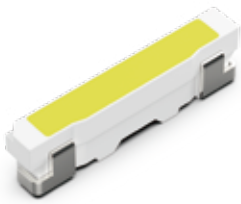


Part No.	IV(MCD)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	Color
	Typ	Typ	Typ	Typ	Typ	Max	
LT3004WH-A-Q	2950	(0.29,0.28)	3.0	20	120	105	White
LT3004WHS-A-Q	3050	(0.29,0.28)	3.0	20	120	105	White
LT3004WH-GL	2750	(0.29,0.28)	3.0	20	120	105	White
LT304WH-A-Q	2950	(0.29,0.28)	3.0	20	120	105	White
LT304WHS-A-Q	3050	(0.29,0.28)	3.0	20	120	105	White
LT304WH-GL	2750	(0.29,0.28)	3.0	20	120	105	White





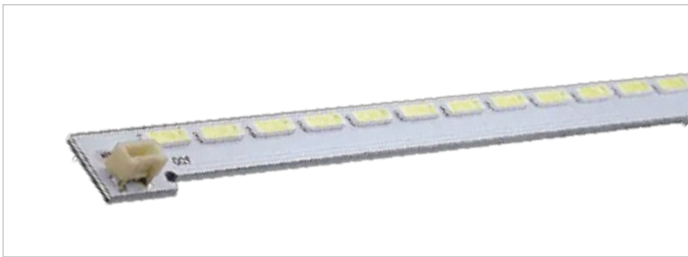
Part No.	IV(MCD)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	Color
	Typ	Typ	Typ	Typ	Typ	Max	
LT3006WH-A-Q	3050	(0.29,0.28)	3.0	20	120	105	White
LT3006WHS-A-Q	3150	(0.29,0.28)	3.0	20	120	105	White
LT3006WH-GL	2850	(0.29,0.28)	3.0	20	120	105	White
LT3006WH-GL-E	2650	(0.29,0.28)	3.0	20	120	105	White



Part No.	IV(MCD)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	Color
	Typ	Typ	Typ	Typ	Typ	Max	
LT3806WH-A-Q	3050	(0.29,0.28)	3.0	20	120	105	White
LT3806WHS-A-Q	3150	(0.29,0.28)	3.0	20	120	105	White
LT3806WH-GL	2850	(0.29,0.28)	3.0	20	120	105	White
LT3806WH-GL-E	2650	(0.29,0.28)	3.0	20	120	105	White



## Side view LED strips



规格描述 Specifications	贴装精度	共线性 0.15mm MAX	SMD precision	Collinearity 0.15mm MAX
	LED倾斜角	<1.5 度	LEDInclination angle	<1.5degrees
	小电流测试	0.3mA 测试电亮	Small current test	0.3mA Test electric light
	ESD管控	2KV~15KV	ESD Control	2KV~15KV
	模组色域	80% Min	Module color gamut	80% Min
	LED焊接强度	1.5KG Min	LED Welding strength	1.5KG Min
	亮度1000 尼特	Min	Luminance 1000 nit	Min
产品特点 Features	尺寸支持定制		Size customization	
	丰富的色系选型，满足客户任意颜色要求		RRich color system selection to meet any color requirements of customers	
	高显示指数，满足客户 NTSC, sRGB, Adobe, DCI-P3任意显色需求		High display index, meet customers NTSC, sRGB, adobe, dci-p3 any Color demand	
	全球专利保证		Global patent guarantee	
产品应用 Application	适用于PAD/ 笔电背光源产品		Suitable for pad / laptop backlight products	

## Automotive backlight product series

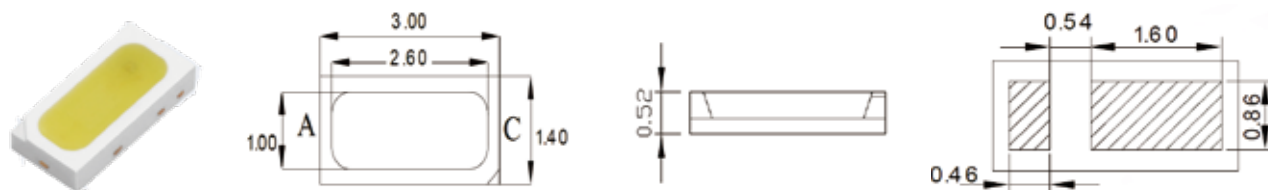
Full screen, ultra-thin and narrow bezel of mobile phone could be achieved.

1. high reliability, Lifespan reach 50000H
2. AEC-Q102 certification
3. High color rendering index scheme, color zone diversification customization
4. Customized in any size, rich solutions to meet customer needs
5. Automotive Mini LED full pitch solution realizes mass production at full spacing, realizes the integration of lamp and driver, and meets the visual perception of different angles.

实现手机全面屏、超薄、窄边框

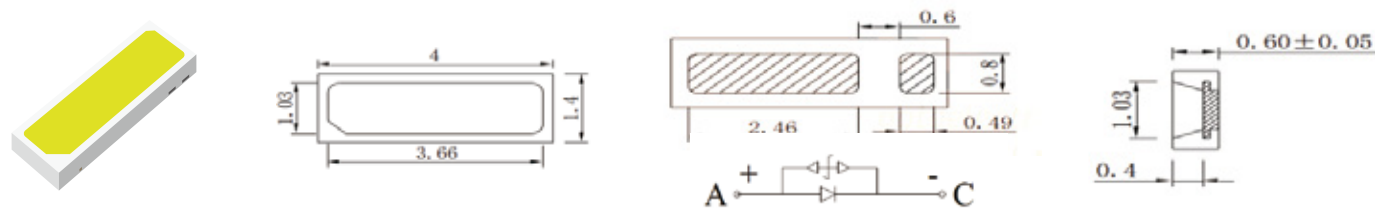
1. 高可靠性, 寿命满足50000H
2. 通过AEC-Q102认证
3. 高显色指数方案, 色区多元化定制
4. 任意尺寸定制, 解决方案丰富满足客户需求
5. Mini车载方案全间距实现量产, 实现灯驱一体, 满足不同角度视觉感受。

### EMC3014



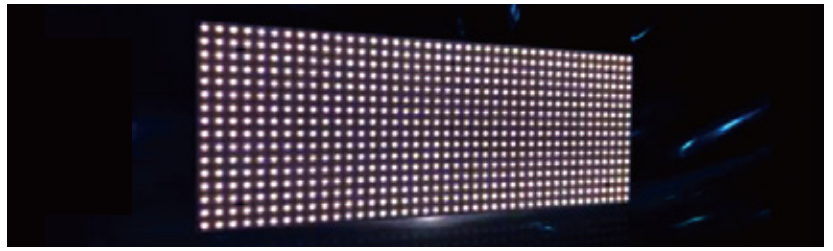
Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	NTSC
	Typ	Typ	Typ	Typ	Typ	Max	
RF3014ZWH-EMC-F-YAG	50	0.28,0.265	3	120	120	120	75%
RF3014ZWH-EMC-F-GL	45	0.28,0.265	3	120	120	120	85%
RF3014ZWH-EMC-F-GL-E (lower blue light energy)	32	0.28,0.265	3	80	120	100	85%
RF3014ZWH-EMC-E-YAG	35	0.28,0.265	3	80	120	100	75%
RF3014ZWH-EMC-E-GL	30	0.28,0.265	3	80	120	100	85%

### EMC4014



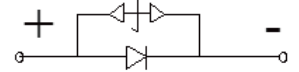
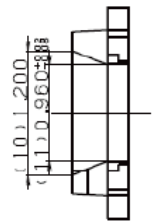
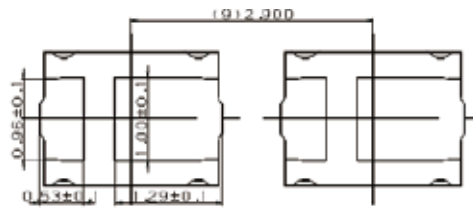
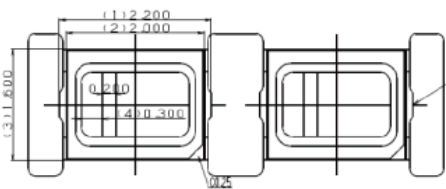
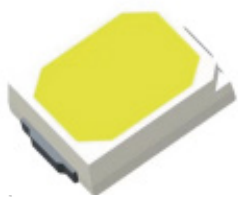
Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	NTSC
	Typ	Typ	Typ	Typ	Typ	Max	
RF4014ZWH-EMC-F-YAG	60	0.28,0.265	3	120	120	120	75%
RF4014ZWH-EMC-F-GL	55	0.28,0.265	3	120	120	120	85%
RF4014ZWH-EMC-F-GL-E (lower blue light energy)	52	0.28,0.265	3	120	120	120	85%
RF4014ZWH-EMC-E-YAG	40	0.28,0.265	3	80	120	120	75%
RF4014ZWH-EMC-E-GL	35	0.28,0.265	3	80	120	120	85%

# Mini COB/POB Vehicle Product



<p>规格描述 Specifications</p>	<p>灯驱一体，千级分区，一灯一驱； 超高显色、亮色一致性； 高可靠性，通过 AEC Q102 认证 适用于 OD0-OD10 ESD 能力 ≥8KV</p>	<p>IC integrated, with 1000 level zoning, one lamp and one drive; Ultra high color rendering and bright color consistency; High reliability, passed AEC Q102 certification Adapted to OD0-OD10 ESD ability ≥8KV</p>
<p>产品特点 Features</p>	<p>任意尺寸定制化 全球专利保证 高对比度，有效缩短视距 满足不同角度视效 根据客户需求设计不同分区控制，满足客户需求</p>	<p>Any size customization Global patent guarantee High contrast, effectively shortening sight distance Meet the visual effects of different angles According to the customer's needs, diverse zoning solutions are designed to meet the customer's need</p>
<p>产品应用 Application</p>	<p>适用于车用背光显示</p>	<p>Suitable for automotive backlight display</p>

## 车载2016



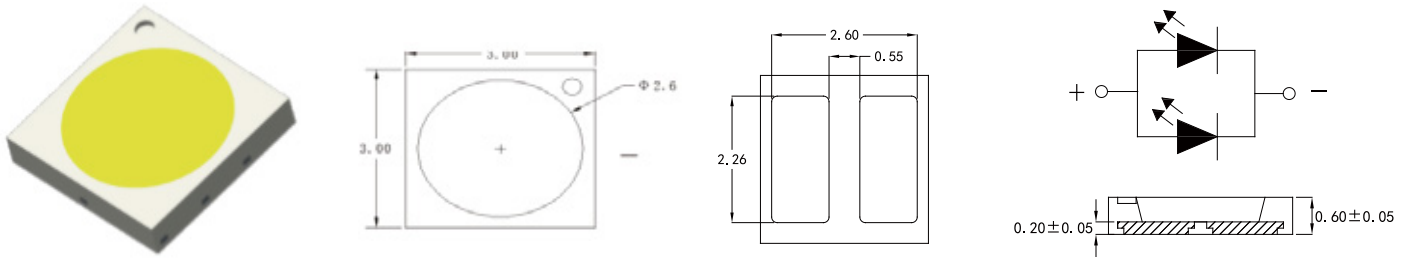
Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 (°)	TJ(°C)	NTSC
	Typ	Typ	Typ	Typ	Typ	Max	
RF2016ZWH-A-GL-YAG	8	0.28,0.265	3	20	120	120	75%
RF2016ZWH-A-GL	7	0.28,0.265	3	20	120	120	85%
RF2016ZWH-A-GL-E (lower blue light energy)	6	0.28,0.265	3	20	120	120	85%
RF2016ZWH-A-GL3	6	0.28,0.265	3	20	120	120	95%
RF2016TWH-A-GL-YAG	8	0.28,0.265	3	20	135 (large viewing angle)	120	75%
RF2016TWH-A-GL	7	0.28,0.265	3	20	135 (large viewing angle)	120	85%
RF2016TWH-A-GL-E (lower blue light energy)	6	0.28,0.265	3	20	135 (large viewing angle)	120	85%
RF2016TWH-A-GL3	6	0.28,0.265	3	20	135 (large viewing angle)	120	95%

## TOP View Product Series

1. High brightness, high luminous efficiency, different color gamut schemes to meet customer needs
2. High reliability, stable performance, L50 life guarantee 30000h
3. Phosphor convert technology, high color gamut KSF powder global patent protection
4. Various CIE color points, covering all color bins in the industry

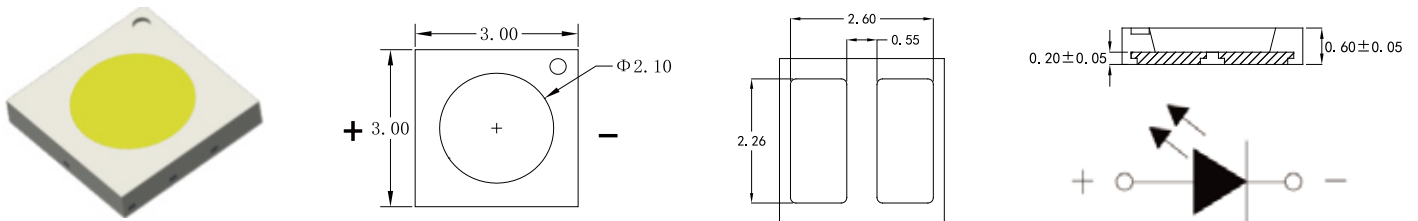
- 1.高亮度、高光效、不同色域方案匹配客户需求
- 2.可靠性高,性能稳定,L50寿命保证30000H
- 3.白光转换专利,高色域KSF粉全球专利保障
- 4.CIE色点丰富,覆盖行业所有色块

### Nomal 3030-EMC3030(2.6 cup)



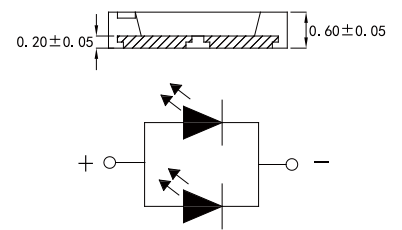
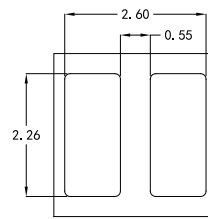
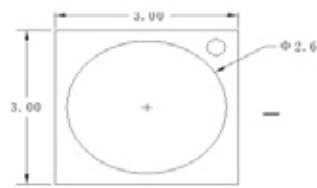
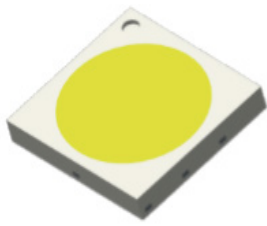
Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( °)	TJ(°C)	Color
	Typ	Typ	Typ	Typ	Typ	Max	
RF-TVY UE33MCN	200	(0.28,0.25)	3.2	600	120	115	White
RF-TVH UE33MCN	180	(0.28,0.25)	3.2	600	120	115	White
RF-TVY UE33LBN	200	(0.28,0.25)	3.2	300	120	115	White
RF-TVH UE33LBN	180	(0.28,0.25)	3.2	300	120	115	White

### Nomal 3030-EMC3030(2.1 cup)



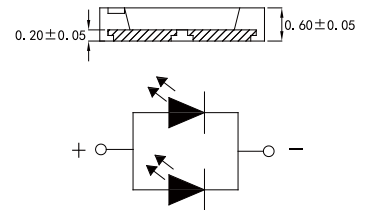
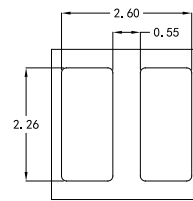
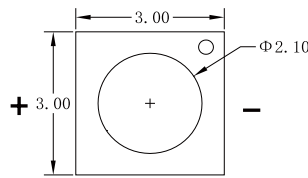
Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( °)	TJ(°C)	Color
	Typ	Typ	Typ	Typ	Typ	Max	
RF-TVY UC33MCN	195	(0.28,0.25)	3.2	600	120	115	White
RF-TVH UC33MCN	175	(0.28,0.25)	3.2	600	120	115	White
RF-TVY UC33LBN	195	(0.28,0.25)	3.2	300	120	115	White
RF-TVH UC33LBN	175	(0.28,0.25)	3.2	300	120	115	White

## Standard 3030-SMC3030(2.6 cup)



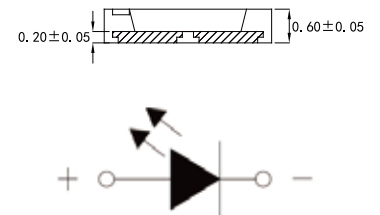
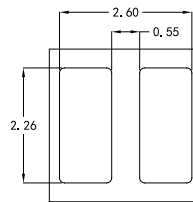
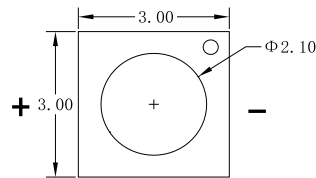
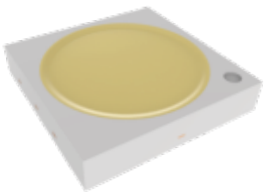
Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	Color
	Typ	Typ	Typ	Typ	Typ	Max	
RF-TVY *SE33KCN	240	(0.28,0.25)	3.2	800	120	115	White
RF-TVY *SE33NBN	240	(0.28,0.25)	3.2	400	120	115	White

## Nomal 3030-SMC3030(2.1 cup)



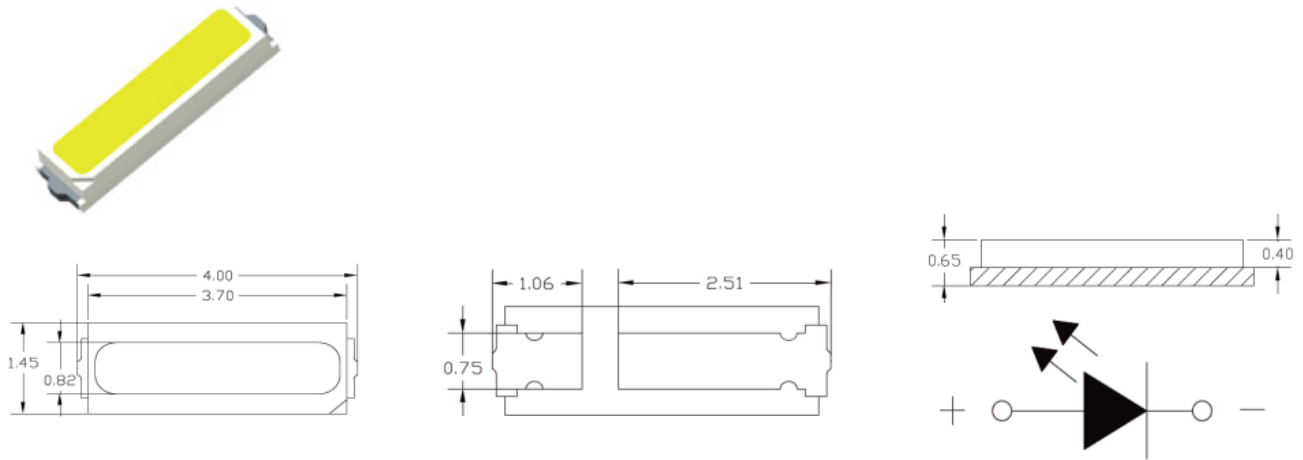
Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	Color
	Typ	Typ	Typ	Typ	Typ	Max	
RF-TVY *SC33KCN	240	(0.28,0.25)	3.2	800	120	115	White
RF-TVY *SC33NBN	240	(0.28,0.25)	3.2	400	120	115	White

## Flip 3030



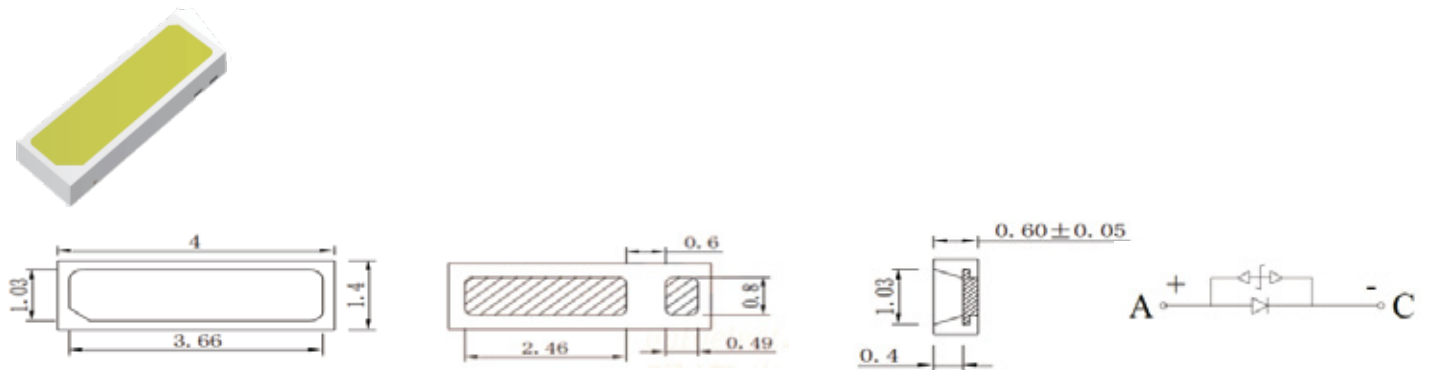
Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	Color	NTSC
	Typ	Typ	Typ	Typ	Typ	Max		
RF-TVYEUC33MIN	220	(0.2734,0.2482)	3.0	600	120	125	White	72%
RF-TVNYUC33MIN	26	400-500nm	3.0	600	120	125	BLUE	/
RF-TVHEUC33MIN	180	(0.2734,0.2482)	3.0	600	120	125	White	85%

## Sideview 4014 Narrow light emitting surface



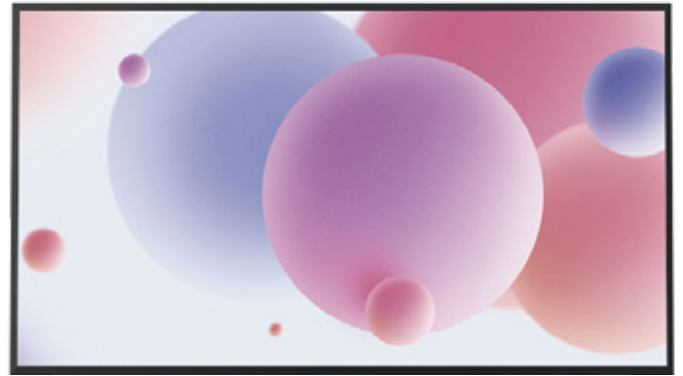
Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	NTSC
	Typ	Typ	Typ	Typ	Typ	Max	
R*PB10EAN	34	0.30,0.28	3	90	120	110	72%
H*PB10EAN	30	0.306,0.28	3	90	120	100	85%
H*PB10EAN	28	0.295,0.27	3	90	120	100	90%

## Sideview 4014



Part No.	IV(LM)	X/Y(nm)	VF(V)	IF(mA)	2θ1/2 ( ° )	TJ(°C)	NTSC
	Typ	Typ	Typ	Typ	Typ	Max	
Y*PA14FAN	50	0.28,0.265	3	120	120	110	65%
R*PA14FAN	45	0.29,0.265	3	120	120	110	75%
B*PA14CAN	25	0.27,0.26	3	60	120	105	75%
H*PA14EAN	35	0.275,0.265	3	90	120	100	85%
Y*EA14FBN	50	0.29,0.285	6	120	120	110	65%
H*EA14FBN	50	0.27,0.25	6	120	120	100	85%

## Direct LED Light bar Series



<p>规格描述 Specifications</p>	<p>产品设计最大尺寸: 1.2m 不同 OD 空间设计: 12-40mm 发光颜色: 蓝光、白光 色域可调范围: 68%-97%(NTSC)</p>	<p>Maximum size of product design: 1.2m Different OD space design: 12-40mm Luminous color: blue light, white light Color gamut adjustable range: 68%-97%(NTSC)</p>
<p>产品特点 Features</p>	<p>规格尺寸支持定制 丰富的色系选型, 满足客户任意颜色要求 满足客户NTSC, sRGB, Adobe, DCI-P3不同标准下的高色域定制需求 可进行全球专利保证</p>	<p>Specification and size support customization Satisfy customer requirements for high color gamut customization under different NTSC, sRGB, Adobe,DCI-P3 standards Global patent gurantee available</p>
<p>产品应用 Application</p>	<p>适用于24寸-110寸背光应用 ( TV、会议机、教育机、拼接屏等)</p>	<p>Suitable for 24 inch-110 inch backlight applications (TV, conferencing machine, teaching machine, stitched screen, etc.)</p>

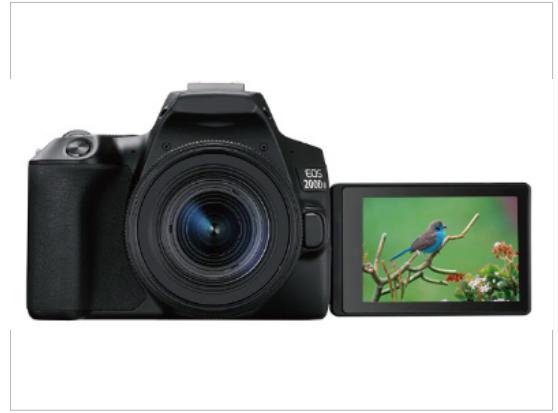


## Mini Micro LED

1. High brightness, high color gamut, high contrast, ultra-thin, low power consumption, high partition
2. COB integrated package, high reliability and long life
3. Small OD can be realized, minimum 0 OD.
4. Easily assembly: large stroke, large imposition, easily for rear assembly
5. Low cost: unique secondary optical design, reduce the number of LED, aluminum substrate with sink type terminal
6. Any size customization available.
7. Suitable for small size, automotive mounted, VR / pad / Nb / MNT / TV and other applications

- 1.高亮度、高色域、高对比度、超薄、低功耗、高分区
- 2.COB一体封装,高可靠性,高寿命
- 3.可实现小OD,最低可做0 OD
- 4.便捷组装:大行程、大拼版,方便后段组装
- 5.低成本:独特的二次光学设计,减少灯数,铝基板+下沉式端子
- 6.任意尺寸定制化
- 7.适用于小尺寸、车载、VR/PAD/NB/MNT/TV等应用

### MINI LED Small and medium size backlight products (1.19inches-34inches )



规格描述 Specifications	MINI LED间距小到P1mm 超薄灯板0.3-0.7mm 超高对比度,可做到10万:1 超高亮度,户外显示1500nits以上	Mini led spacing as small as P 1mm Ultra thin light plate 0.3-0.7mm Ultra high contrast, can achieve 100 thousand: 1 Ultra high brightness, outdoor display over 1500nit
产品特点 Features	超薄背光模组, NB可做到2mm 超高对比度 高亮度满足户外显示需求 产品根据客户要求定制化	Ultra thin backlight module, NB can achieve 2mm Ultra high contrast High brightness to meet outdoor display requirements Customization available
产品应用 Application	中小尺寸Mini 背光应用于穿戴, 户外显示器、MNT等应用场景。 户外高亮显示	Small size and medium-size Mini backlight are used in wearable, outdoor display, MNT and other application scenarios. Outdoor high brightness display

## MINI LED Large size backlight products ( 55 inches and above )



<p>规格描述 Specifications</p>	<p>灯驱分离，灯驱一体，自由选择 超高亮度3000nits、对比度1千万：分区数量2880分区和高色域 极致OD，最低可应用于OD: 0</p>	<p>LED and driver separated solution or LED and driver integrated solution based on your choice Super high brightness 3000nit, contrast 10000000: 1, number of partitions 2880 partitions and high color gamut Extreme OD, minimum 0 OD</p>
<p>产品特点 Features</p>	<p>大尺寸、少拼版，方便后段组装 低成本：二次光学设计减少灯数，铝基板+下沉式端子 产品根据客户要求定制化</p>	<p>Large size, less imposition, convenient for rear assembly Low cost: secondary optical design reduces the number of lamps, aluminum substrate + sink terminal Products are customized according to customer requirements</p>
<p>产品应用 Application</p>	<p>适用于TV、商显、教育机等</p>	<p>Suitable for TV, commercial display, educational machine, etc</p>

# Touch display

## 触显

Refond's touch module product line specializes in the development, production and sales of touch and DES colour e-paper modules.

Products of e-paper module business cover 1~6" black&white, black&white&red, black&white&yellow, black&white&orange electronic label, 6~42" black&white&color electronic paper for smart education, smart medical care, smart office, smart furniture, smart city, etc.

Refond electronic paper module has various product types. With a fully automatic assembly line, FPL&PS automatic SMD machine, COG&FOG automatic bonding machine, EC automatic dispensing machine, RTV automatic sealing machine, AOI optical detector and digital information platform & process capability control, Refond continually improve product quality, and provide customers integration of black and white & color e-paper module solutions and services.

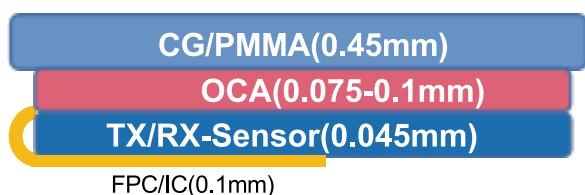
瑞丰触控模组产品线专业从事触控、DES彩色电子纸模组的研发、生产和销售。

产品覆盖超薄-TP (GF2) / 超薄-TP (GFF) 系列、电子标签、电子纸平板、电子纸TV、全贴合件、整机电子纸等业务。

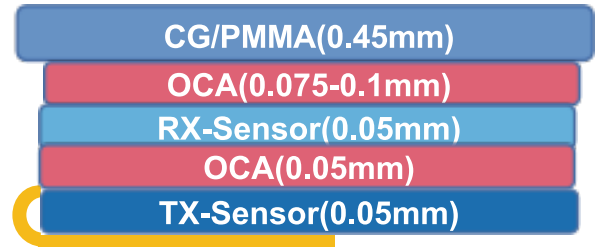
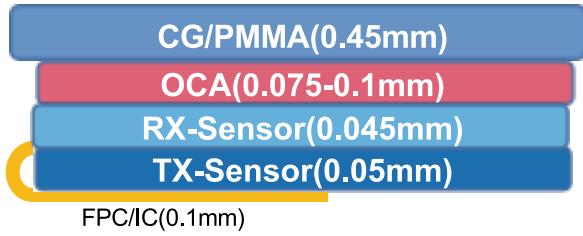
瑞丰触控模组具有丰富的产品种类及专业的Printing、Laser、软对硬&硬对硬贴合、双面Bonding技术与制程能力管控，不断迭代提升产品质量，为客户提供触控模组一体化的解决方案和服务。

## Touch Series

### TP-Ultra thin series (GF2 stylus)



产品应用 Application	平板、笔记本电脑、电子纸平板、TV等		laptop, electronic paper tablet, TV, etc	
产品特点 Features	大尺寸-超轻薄、平板外挂式触控产品		Large size - ultra-thin, flat-panel external touch control products	
	厚度:	0.57~0.6mm	slim:	0.57 to 0.6mm
	重量:	180g的平板外挂式触控产品	Weight:	180g
	等距超载边框:	4.9mm	Isometric overload bezel:	4.9mm
	屏占比:	90%的平板外挂式触控产品	screen-to-body ratio:	90%
	触控方案:	多点触控+触控笔	Touch solution:	multi-touch + stylus
	首款采用屏下盲孔摄像的高透光性方案		The first high light transmission solution with blind under-screen camera	
	透光率:	90%以上	light transmission rate:	over 90%
	Glass材质表面硬度:	7H/750g	Glass material:	surface hardness: 7H/750g
	Glass表面应力:	CS≥620Mpa, DOL≥6.8um, DOC≥70um 四点弯折≥600Mpa	Glass surface stress:	CS ≥ 620Mpa, DOL ≥ 6.8um, DOC ≥ 70um four-point bending ≥ 600Mpa
工作温度:	-20~70°C	Working temperature:	-20 ~ 70°C	



产品应用 Application	平板、笔记本电脑、电子纸平板、TV 等		laptop, electronic paper tablet, TV, etc	
产品特点 Features	超轻薄		Ultra-slim	
	厚度:	0.65~0.7mm (超轻薄)	Thickness:	0.65 to 0.7mm
	重量:	210g的笔记本外挂式触控	Weight:	210g for notebook external touch
	屏占比:	83.6%的笔记本外挂式触控	Screen-to-body ratio:	83.6% for notebooks with external touch
	边框:	6.89-13.3mm	Bezel:	6.89-13.3mm
	触控方案:	多点触控	Touch solution:	multi-touch
	透光率:	85%~88%	Product light transmission:	85% to 88%
	Glass材质:	GG6	Glass material:	GG6
	表面硬度:	7H/750g	surface hardness:	7H/750g
	Glass表面应力:	CS $\geq$ 700Mpa DOL $\geq$ 35um DOC $\geq$ 70um 四点弯折 $\geq$ 600Mpa	Glass surface stress:	CS $\geq$ 700Mpa, DOL $\geq$ 35um, DOC $\geq$ 70um four-point bending $\geq$ 600Mpa
	工作温度:	-20~70°C	Working temperature:	-20~70°C

## Full Lamination Series

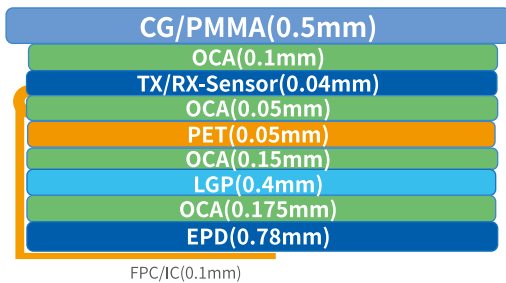
Refond's touch module product line specializes in the R&D, production and sales of touch and DES colour e-paper modules. Our products cover ultra-thin-TP (GF2) / ultra-thin-TP (GFF) series, e-label, e-paper flat panel, e-paper TV, full lamination parts, and whole e-paper business. With a wide range of products and professional printing, laser, soft-to-hard & hard-to-hard lamination, double-sided bonding technology & process capability control, Refond touch modules are constantly iterating to improve product quality and provide customers with integrated solutions and services for touch modules.

瑞丰DES电子纸模组产品线-专业从事DES技术的黑白&彩色电子纸模组的研发、生产和销售。

产品覆盖1~6“黑白、黑白红、黑白黄、黑白橙电子标签、6~42”黑白&彩色电子纸的智慧教育、智慧医疗、智慧办公、智慧家具、智慧城市等系列电子纸模组业务。

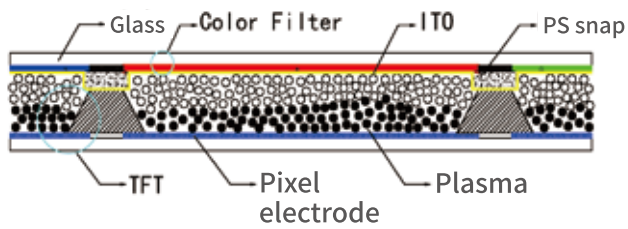
瑞丰电子纸模组具有丰富的产品种类及专业, 拥有全自动流水线, FPL&PS全自动贴合机、COG&FOG全自动Bonding机、EC全自动点胶机、RTV全自动封胶机、AOI光学检测仪以及数字化信息平台&制程能力管控, 不断迭代提升产品质量, 为客户提供黑白&彩色的电子纸模组一体化的解决方案和服务。

## EPD-Full Lamination Series (GF2)

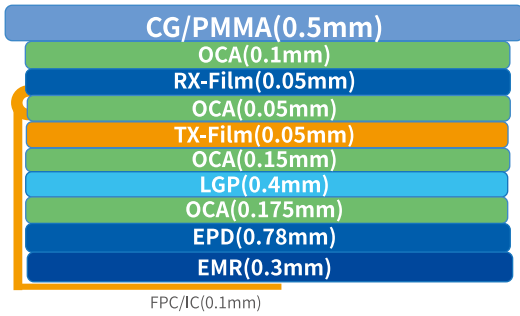


产品应用 Application	智慧办公、智慧城市、智慧校园、智慧家具等	Smart Office、Smart City、Smart Campus、Smart Furniture,etc		
产品特点 Features	厚度:	2.25mm (超轻薄)	Ultra-slim:	2.25mm thickness
	重量:	360g的电子纸外挂式触显产品	Weight:	360g
	屏占比:	86.3%	Screen-to-body ratio:	86.3%
	边框:	6.5-7.64mm的电子纸外挂式触显产品	bezel:	6.5-7.64mm
	低成本触控方案:	多点触控+触控笔 (Metal Mash方案)	Low cost touch solution:	multi-touch + stylus (Metal Mash solution)
	功耗:	待机时间一个月、运行时间15-20天	Power consumption:	one month standby time, 15-20 days running time
	材质:	PMMA	Material:	PMMA
	表面硬度:	5~7H/750g	surface hardness:	5~7H/750g
	分辨率:	300PPI (黑白屏)、150PPI (彩色屏)	Resolution:	300PPI (black and white screen) 150PPI (colour screen)
	夜读功能:	冷暖调色 (64级, 支持DC调光)	Reading at night:	cool and warm colour mixing (64 levels DC dimming supported)
	护眼功能:	护眼 (无蓝光)	Eye protection function:	Eye protection (no blue light)
	工作温度:	-20~70°C	Operating temperature:	-20~70°C

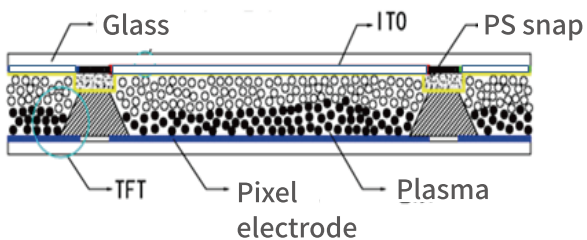
## DES colorful e-paper module series



产品应用 The product application	智慧办公、智慧城市、智慧校园、智慧家具等		Smart Office、Smart City、Smart Campus、Smart Furniture etc	
产品特点 Product features	显示技术:	DES (彩色电子纸模组)	Display technology:	DES
	尺寸:	160(H)×218.9(V)×1.05(D), 尺寸可定制	Dimension:	160(H)×218.9(V)×1.05(D),support cutomization
	分辨率:	1680*2232, DPI: 280	Resolution:	1680*2232, DPI: 280
	IC:	双颗JD79631*2	IC:	double JD79631*2
	功耗 :	1.5~2.5mw	Power consumption:	1.5~2.5mw
	驱动电压:	3V	drive voltage:	3V
	对比度:	>1: 40	Contrast:	>1: 40
	响应时间(黑白粒子):	80 ~ 120ms	Response time (monochrome particles):	80 ~ 120ms
工作温湿度:	-20~ +60°C、湿度0 ~80RH%	Operating temperature and humidity:	-20~ +60°C、humidity:0 ~80RH%	



产品应用 The product application	智慧办公、智慧城市、智慧校园、智慧家具等	Smart Office、Smart City、Smart Campus、Smart Furniture etc		
产品特点 Product features	超轻薄性能	Ultra-slim performance		
	厚度:	2.6mm	Thickness:	2.25mm
	重量:	415g的电子纸外挂式触显产品	Weight:	415g
	屏占比:	86.3%	Screen-to-body ratio:	86.3%
	边框:	6.5-7.64mm的电子纸外挂式触显产品	bezel:	6.5-7.64mm
	触控方案:	多点触控+EMR结构触控笔	Touch solution:	Multi-touch + EMR structured stylus
	功耗:	待机时间一个月、运行时间15-20天	Power consumption:	one month standby time, 15-20 days running time
	材质:	PMMA	Material:	PMMA
	表面硬度:	5~7H/750g	surface hardness:	5~7H/750g
	分辨率:	300PPI (黑白屏)、150PPI (彩色屏)	Resolution:	300PPI (black and white screen) 150PPI (colour screen)
	夜读功能:	冷暖调色 (64级, 支持DC调光)	Reading at night:	cool and warm colour mixing (64 levels DC dimming supported)
	护眼功能:	护眼 (无蓝光)	Eye protection function:	Eye protection (no blue light)
	工作温度:	-20~70°C	Operating temperature:	-20 to 70°C



产品应用 The product application	智慧零售、智慧办公、智慧城市、智慧校园、智慧家具等		Smart Office、Smart City、Smart Campus、Smart Furniture etc	
产品特点 Product features	显示技术:	DES (黑白电子纸模组)	Display technology:	DES
	尺寸:	120.6(H)×173.8(V)×1.05(D), 尺寸可定制	Dimension:	120.6(H)×173.8(V)×1.05(D) support customization
	分辨率:	1404*1872, DPI: 300	Resolution:	1404*1872, DPI: 300
	IC:	双颗EK79632*2	IC:	double EK79632*2
	功耗:	1.5~2.5mw	Power consumption:	1.5~2.5mw
	驱动电压:	3V	drive voltage:	3V
	对比度:	>1: 60	Contrast:	>1: 60
	响应时间(黑白粒子):	80~120ms	Response time (monochrome particles):	80~120ms
工作温湿度:	-20~+60°C、湿度:0~80RH%	Operating temperature and humidity:	-20~+60°C、humidity:0~80RH%	



# RGB

Since foundation, Refond RGB product line has followed the market trend and product iterations of the LED display market, always focusing on providing customers with high-quality LED devices, continuously devoting itself to focusing on products, innovation, customer experience, improving the comprehensive competitiveness of products, and continuously lighting up the C-position of the city!

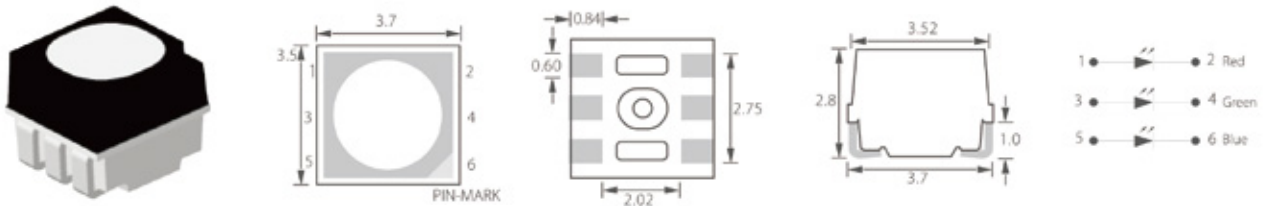
Refond RGB mainly provides customers with LED solutions for outdoor engineering displays, outdoor landscape lighting, traffic displays and indoor and outdoor small pitch displays.

瑞丰RGB产品线从成立之初,就紧随LED显示市场的变化和产品更迭,始终聚焦于为客户提供高品质的LED器件,持续致力于聚焦产品、聚焦创新、聚焦客户体验,提升产品综合竞争力,不断点亮城市C位!

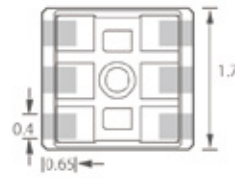
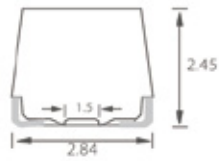
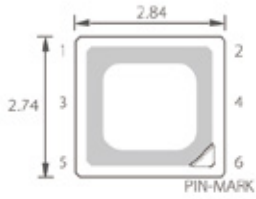
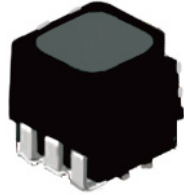
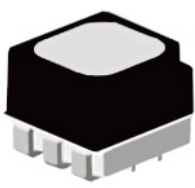
瑞丰RGB主要为客户提供户外工程显示、户外景观亮化照明、交通显示以及户内、户外小间距显示等LED解决方案。

## Outdoor Product Series

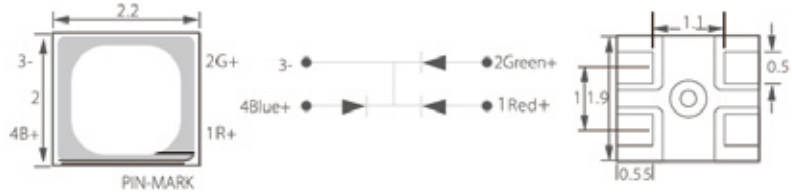
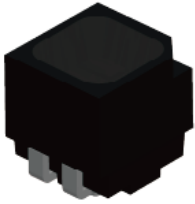
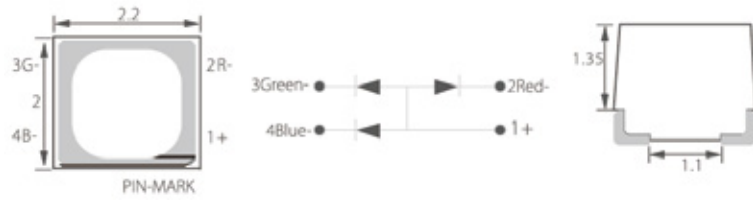
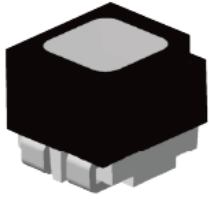
### 3535 Outdoor



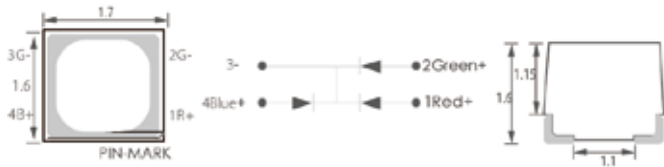
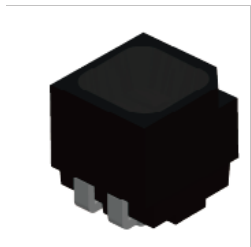
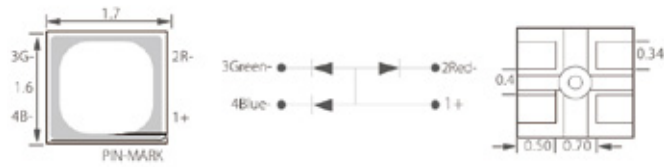
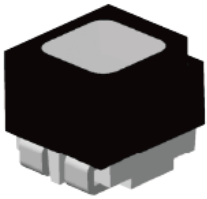
Part Number	L/F Type	Color	Test Condition(mA)	IV(mcd)	$\lambda$ D(nm)	VF(V)	50% Power Angle
RF-W1SA35IS-A42	Surface Black	R	20	1000	618-628	1.7-2.4	110
		G	20	2100	518-540	2.5-3.4	
		B	20	520	460-475	2.5-3.4	
RF-W1SA35IS-M42	Surface Black	R	20	1200	618-628	1.7-2.4	110
		G	20	2300	518-540	2.5-3.4	
		B	20	510	460-475	2.5-3.4	
RF-W1SA35IS-A43	Surface Black	R	20	820	618-628	1.7-2.4	110
		G	20	1900	518-540	2.5-3.4	
		B	20	430	460-475	2.5-3.4	
RF-W1SA35IS-A47	Surface Black	R	20	650	618-628	1.7-2.4	110
		G	20	1500	518-540	2.5-3.4	
		B	20	380	460-475	2.5-3.4	



Part Number	L/F Type	Color	Test Condition(mA)	IV(mcd)	$\lambda$ D(nm)	VF(V)	50% Power Angle
RF-W1SA27IS-M42	Surface Black	R	20	1050	618-628	1.7-2.4	110
		G	20	2000	518-540	2.5-3.4	
		B	20	430	460-475	2.5-3.4	
RF-W1SA28IS-A47	Surface Black	R	20	650	618-628	1.7-2.4	110
		G	20	1500	518-540	2.5-3.4	
		B	20	380	460-475	2.5-3.4	
RF-F1SA28IS-A55	Surface Black	R	20	600	618-628	1.7-2.4	110
		G	20	1600	518-540	2.5-3.4	
		B	20	260	460-475	2.5-3.4	
RF-W1SA27HS-M42	All Black	R	20	550	618-628	1.7-2.4	110
		G	20	960	518-540	2.5-3.4	
		B	20	185	460-475	2.5-3.4	

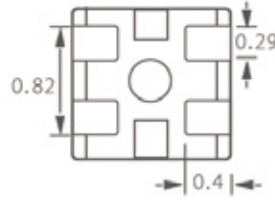
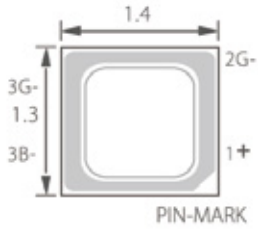
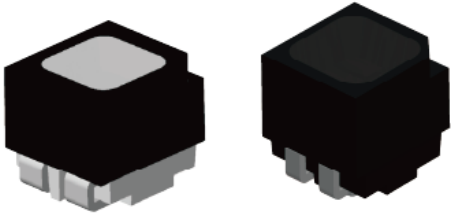


Part Number	L/F Type	Color	Test Condition(mA)	IV(mcd)	$\lambda D$ (nm)	VF(V)	50% Power Angle
RF-W1SA21IS-M41	Surface Black	R	15	640	618-628	1.7-2.4	110
		G	15	1415	518-540	2.5-3.4	
		B	10	215	460-475	2.5-3.4	
RF-W1SA21IS-A49	Surface Black	R	15	520	618-628	1.7-2.4	110
		G	15	1100	518-540	2.5-3.4	
		B	10	200	460-475	2.5-3.4	
RF-W1SA21HS-A45	All Black	R	15	420	618-628	1.7-2.4	110
		G	15	810	518-540	2.5-3.4	
		B	10	125	460-475	2.5-3.4	
RF-W2SA21HS-N44	All Black (Common-cathode)	R	15	390	618-628	1.7-2.4	110
		G	15	940	518-540	2.5-3.4	
		B	10	100	460-475	2.5-3.4	



Part Number	L/F Type	Color	Test Condition(mA)	IV(mcd)	λD(nm)	VF(V)	50% Power Angle
RF-W1SA15IS-A47	Surface Black	R	10	330	618-628	1.7-2.4	110
		G	10	880	518-540	2.5-3.4	
		B	5	102	460-475	2.5-3.4	
RF-C1SA15IS-A58	Surface Black	R	10	210	618-628	1.7-2.4	110
		G	10	640	518-540	2.5-3.4	
		B	5	80	460-475	2.5-3.4	
RF-C1SA15IS-M57	Surface Black	R	15	345	618-628	1.7-2.4	110
		G	8	460	518-540	2.5-3.4	
		B	5	75	460-475	2.5-3.4	
RF-W1SA15HS-A47	All Black	R	10	205	618-628	1.7-2.4	110
		G	10	440	518-540	2.5-3.4	
		B	5	52	460-475	2.5-3.4	
RF-C1SA15HS-A55	All Black	R	10	185	618-628	1.7-2.4	110
		G	10	470	518-540	2.5-3.4	
		B	5	35	460-475	2.5-3.4	
RF-W1SA15HS-N47	All Black (Common-cathode)	R	15	205	618-628	1.7-2.4	110
		G	15	440	518-540	2.5-3.4	
		B	10	52	460-475	2.5-3.4	

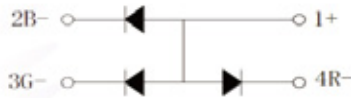
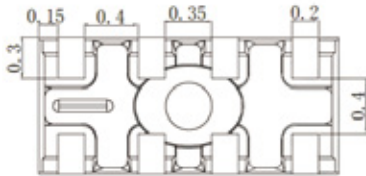
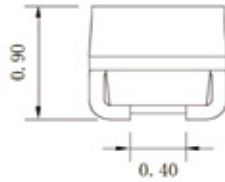
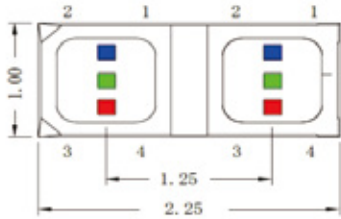
# 1212 Outdoor



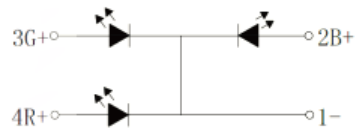
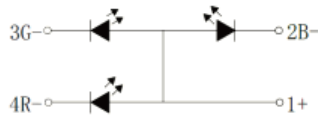
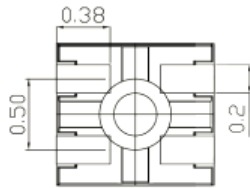
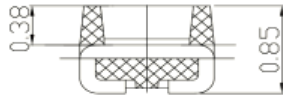
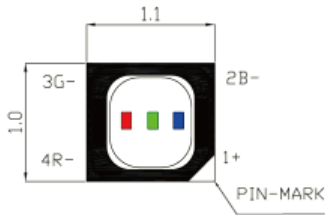
Part Number	L/F Type	Color	Test Condition(mA)	IV(mcd)	$\lambda$ D(nm)	VF(V)	50% Power Angle
RF-W2SA12IS-A47	Surface Black	R	10	290	618-628	1.7-2.4	110
		G	10	750	518-540	2.5-3.4	
		B	5	110	460-475	2.5-3.4	
RF-C2SA12IS-A58	Surface Black	R	10	140	618-628	1.7-2.4	110
		G	10	420	518-540	2.5-3.4	
		B	5	52	460-475	2.5-3.4	
RF-W2SA12HS-A47	All Black	R	10	195	618-628	1.7-2.4	110
		G	10	440	518-540	2.5-3.4	
		B	5	55	460-475	2.5-3.4	
RF-C2SA12HS-A56	All Black	R	10	195	618-628	1.7-2.4	110
		G	10	320	518-540	2.5-3.4	
		B	5	39	460-475	2.5-3.4	

# Indoor Product Series

## 2 in 1 1020 Indoor



Part Number	L/F Type	Color	Test Condition(mA)	IV(mcd)	$\lambda$ D(nm)	VF(V)	50% Power Angle
RF-C4HR10HS-M57	All Black	R	5	21	618-628	1.7-2.4	110
		G	3	80	518-540	2.5-3.4	
		B	3	17	460-475	2.5-3.4	
RF-F4HR10HS-M57	All Black	R	5	21	618-628	1.7-2.4	110
		G	3	80	518-540	2.5-3.4	
		B	3	17	460-475	2.5-3.4	



Part Number	L/F Type	Color	Test Condition(mA)	IV(mcd)	$\lambda$ D(nm)	VF(V)	50% Power Angle
RF-W5HR10HS-A52	All Black	R	5	30	618-628	1.7-2.4	110
		G	3	100	518-540	2.5-3.4	
		B	3	16	460-475	2.5-3.4	
RF-C5HR10HS-A52	All Black	R	5	30	618-628	1.7-2.4	110
		G	3	95	518-540	2.5-3.4	
		B	3	16	460-475	2.5-3.4	
RF-C5HR10HS-N57	All Black	R	5	53	618-628	1.7-2.4	110
		G	3	86	518-540	2.5-3.4	
		B	3	14	460-475	2.5-3.4	

# Mini Display

Mini 显示

## 家用电器 | Household Appliances



## 消费电子 | Consumer Electronics



## 车用显示 | Vehicle Display



## Mini Micro screen

成熟产品路线 Mature product route

mini微屏家族 mini Micro screen family

承接设计创新 Undertake design innovation



Flight Series  
High quality and high performance

飞航系列  
高品质高性能



Characters Series  
Increase FMCG premiums  
Empowering FMCG products

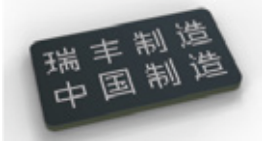
字符系列  
增加快消品溢价  
为快消品赋能



Feather Yarn Series  
Lightweight

羽纱系列  
轻薄





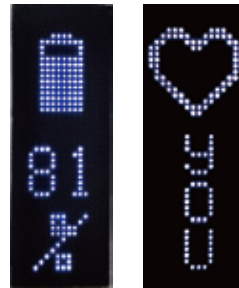
micro display screen

1. Min Pitch 0.13mm, Observable crosstalk ;
2. Aviation quality
3. Night vision compatible
4. Under dark vision, Contrast Ratio>1000:1
5. 0.17~2500nit Brightness adjustable

准micro显示屏

1. Min Pitch 0.13mm, 无可察串扰;
2. 航空品质
3. 夜视兼容
4. 暗视下, 对比度>1000:1
5. 0.17~2500nit亮度可调

## Character product series



Clearer than digital tube, Sturdier than LCD , smaller、brighter、thinner:

1. Complete display of Chinese characters, clear display of numbers, including national languages, support for setting the screen
2. High brightness, low heat, wide viewing angle, drop, abrasion and scratch resistant
3. Dazzling models R, G, B, W, colourful models RGB, RG, RB, GB, at your choice
4. Pitch 0.2~1.5mm (PPI:30-140)
5. Light-sensitive, pressure-sensitive, voice-activated, Bluetooth and other optional functions

比数码管更清晰, 比LCD更结实, 更小、更亮、更轻薄:

1. 完整展示汉字, 清晰显示数字, 囊括各国语言, 支持设置画面
2. 高亮度、低热量、广视角、耐摔、耐磨、耐刮擦
3. 炫彩款R、G、B、W, 缤纷款RGB、RG、RB、GB, 任君选择
4. Pitch 0.2~1.5mm 放肆定制 (PPI:30-140)
5. 光感、压敏、声控、蓝牙等功能选配



P0.68
Film0.48mm
Heterotype
A Class a appearance parts
Gray and white

Lightweight, that is eather yarn ;

1. extremely thin 0.25~0.5mm with self-luminous.
2. flexible, conformable fit.
3. dense chip distribution, delicate light sense.
4. aerospace quality assurance.
5. energy-saving, environmental protection.
6. support each shape customization, support editable control, support full light colour customization.;

轻薄, 就是羽纱;

- 1、极致超薄0.25~0.5mm自主发光
- 2、可柔, 随形贴合;
- 3、密集的芯片分布, 细腻光感;
- 4、航天品质保障;
- 5、节能、环保;
- 6、支持各形状定制、支持可编辑控制、支持全光色定制;

### Micro Screen Family - Flight, Characters, Feather Yarn

	Flight series		Characters series		Feather Yarn series	
Colourful models W/R/G/B	Pitch:	0.2-1.5mm	Pitch:	standard >0.9mm support >0.2mm customization	Pitch:	standard >0.7mm support >0.2mm customization
	Refresh:	3840HZ	Refresh:	60-80HZ	Refresh:	60-80HZ
	Brightness:	linear adjustable Customization	Refresh:	fixed brightness, custom hardware step adjustable Customization	Refresh:	fixed brightness, custom hardware step adjustable Customization
	cycle	8-12 weeks	Refresh:	4-6 weeks	Refresh:	4-6 weeks
Binfen Model RGB/RG/RB/GB	Pitch:	0.39-1.5mm	Pitch:	GB standard >0.9 support >0.39mm customization	Pitch:	Standard >0.6mm support >0.2mm customization
	Refresh:	3840HZ	Refresh:	60-80HZ	Refresh:	60-80HZ
	Brightness:	linear adjustable Customization	Brightness:	fixed brightness, custom models hardware step adjustable Customization	Brightness:	fixed brightness, custom hardware step adjustable Customization
	cycle:	8-16 weeks	cycle:	8-12 weeks	cycle:	4-6 weeks

# Mini large screen

成熟设计 Mature design

mini大屏家族 mini Large Screen Family

稳定持续供应 Stable and continuous supply

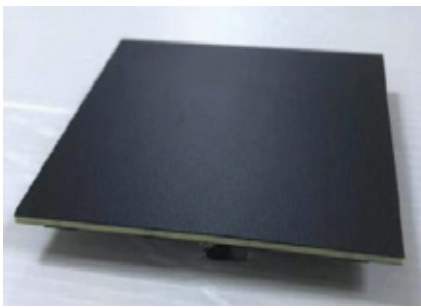


大屏系列 | Large screen series



车用系列 | Automotive series

## Display series-RF-NV125



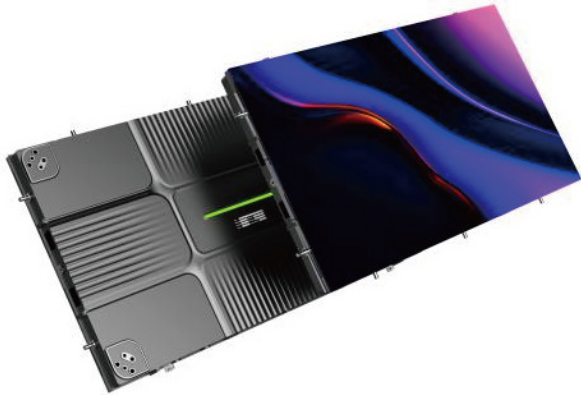
Front View



Bottom View

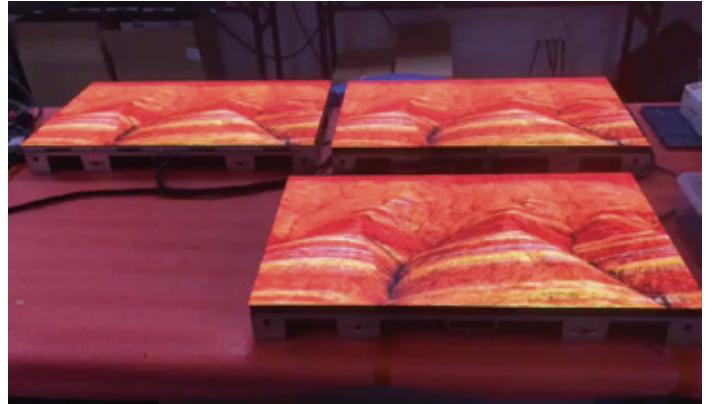
Items		Parameters
Display Module	Size	150 (W) *168.75mm (H)
	The physical resolution	135*120(W*H)
	PP	1.25mm
Display Unit	Size	600mm*337.5mm*32 mm
	The physical resolution	480* 270(W*H) (4*2 Modules)
	peak brightness	TYP.600 nits
	Contrast	10000:1
	Horizontal viewing angle	>160°
	Vertical viewing angle	>160°
	Gray level	>14bit
	Refresh rate	3840Hz
	Brightness Uniformity	≥97%
	Chromaticity Uniformity	Cx/Cy:+/-0.003
	CCT	D65(3200~9300K)
	Operating Temperature	-10~40 °C
	Storage Temperature	-20~60 °C
Operating humidity	20~90% RH	
Storage humidity	20~90% RH	
Build-up Optionals		4K, 8*8Units

## Display series -RF-NV093

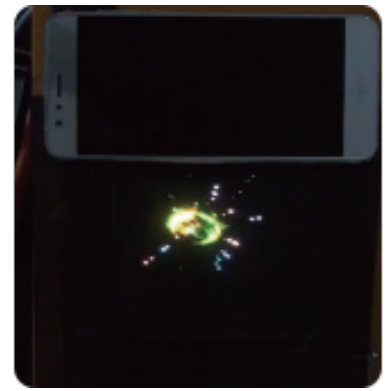


	1	2	3	4	5	6
A	640* 360	1280x360	1920x360	2560x360	3200x360	3840x360
B	640* 720	1280x720	1920x720	2560x720	3200x720	3840x720
C	640* 1080	1280x1080	1920x1080	2560x1080	3200x1080	3840x1080
D	640* 1440	1280x1440	1920x1440	2560x1440	3200x1440	3840x1440
E	640* 1800	1280x1800	1920x1800	2560x1800	3200x1800	3840x1800
F	640* 2160	1280x2160	1920x2160	2560x2160	3200x2160	3840x2160

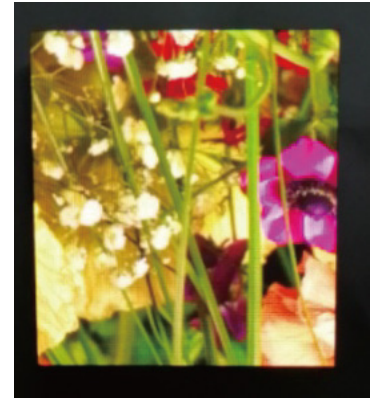
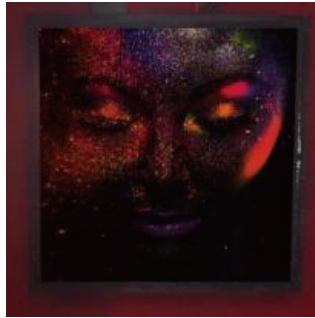
Items		Parameters
Display Module	Size	150 (W) *168.75mm (H)
	The physical resolution	160*180(W*H)
	Pich	0.9375mm
Display Unit	Size	600mm*337.5mm*32 mm
	The physical resolution	640* 360(W*H) (4*2 Modules)
	peak brightness	TYP.600 nits
	Contrast	10000:1
	Horizontal viewing angle	>160°
	Vertical viewing angle	>160°
	Gray level	>14bit
	Refresh rate	3840Hz
	Brightness Uniformity	≥97%
	Chromaticity Uniformity	Cx/Cy:+/-0.003
	CCT	D65(3200-9300K)
	Operating Temperature	-10~40 °C
	Storage Temperature	-20~60 °C
Operating humidity	20~90% RH	
Storage humidity	20~90% RH	
Build-up Optionals		4K, 6*6Units



Items		Parameters
Display Module	Size	81.6mm(W)*91.8mm(H)
	The physical resolution	120*135(W*H)
	PP	0.68mm
Display Unit	Size	652.8mm*367.2mm*75 mm
	The physical resolution	960*540(W*H)/(8*4 Modules )
	Color Gamut	R:0.693/0.305/G:0.220/0.727/B:0.122,0.080.
	peak brightness	≥1000 nits
	Contrast	6000:1
	Horizontal viewing angle	>170°
	Vertical viewing angle	>170°
	Gray level	14bit each
	Refresh rate	3840Hz
	Brightness Uniformity	≥97%
	Chromaticity Uniformity	Cx/Cy:±0.003
	CCT	3200~9300K
	Power Dissipation(max.)	600 W/m <sup>2</sup>
	Power Dissipation(avg.)	280 W/m <sup>2</sup>
	Operating Temperature	-10~50 °C
	Storage Temperature	-20~60 °C
	Operating humidity	10~80% RH
Storage humidity	10~80% RH	
Build-up Options		4K,118 inch, 4*4Units

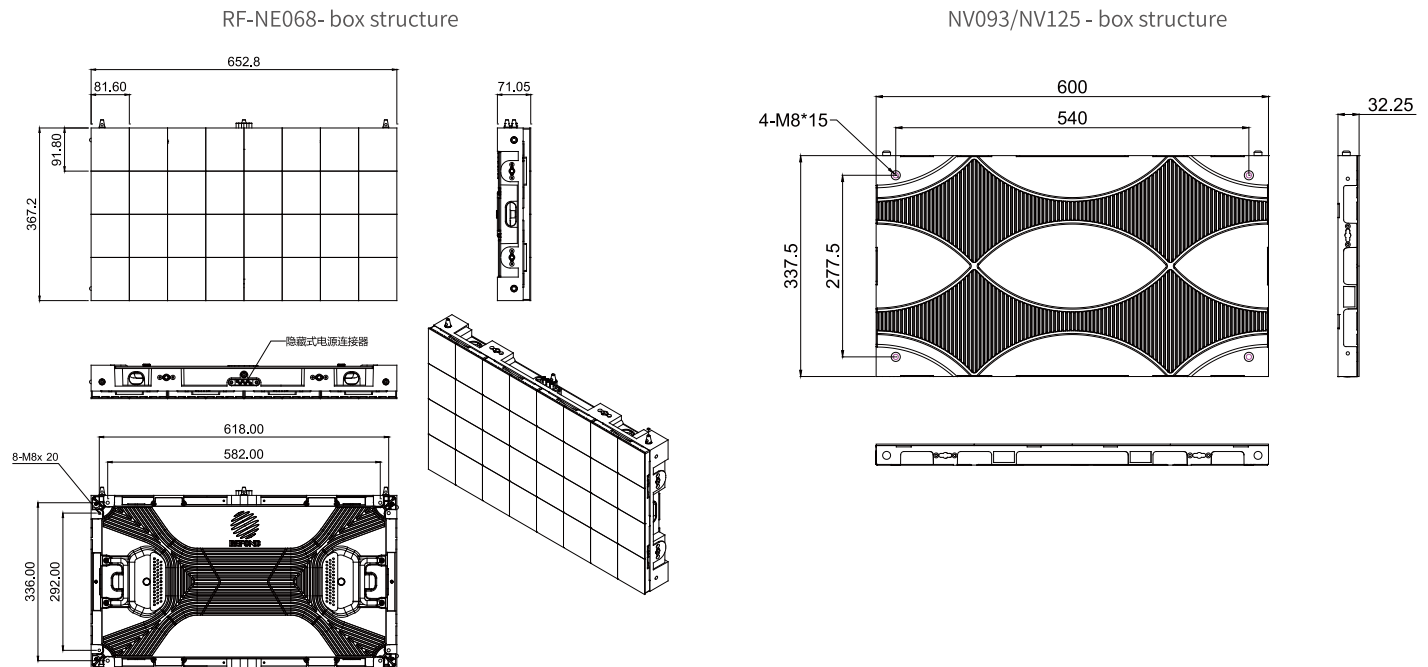


Items		Parameters
Physical Parameters	Size	78.4(W)*88.2mm(H)
	The physical resolution	160*180(W*H)
	PP	0.49mm
	Size	470.4*264.6*75 mm
	The physical resolution	960*540(W*H) (6*3 Modules )
Optical Specifications	peak brightness	Typ.600 nits
	Contrast	5000:1
	Horizontal viewing angle	>160°
	Vertical viewing angle	>160°
	Gray level	≥14bit
	Refresh rate	3840Hz
	Brightness Uniformity	≥97%
	Chromaticity Uniformity	Cx/Cy:+/-0.003
	CCT	D65(3200~9300K)
	Power Dissipation(max.)	750W/m <sup>2</sup>
	Power Dissipation(avg.)	350W/m <sup>2</sup>
Operation Specifications	Operating Temperature	-10~40 °C
	Storage Temperature	-20~60 °C
	Operating humidity	20~90% RH
	Storage humidity	20~90% RH
Build-up Optionals		4K, 85 inch, 4*4Units



	Items	Parameters
Physical Parameters	Size	62.4(W)*70.2mm(H)
	The physical resolution	160*180(W*H)
	PP	0.39mm
Optical Specifications	peak brightness	Typ..500 nits
	Horizontal viewing angle	>160°
	Vertical viewing angle	>160°
	Gray level	14bit
	Refresh rate	>3000Hz
	Brightness Uniformity	≥95%
	Chromaticity Uniformity	Cx/Cy:+/-0.003
Operation Specifications	CCT	D65(3200~9300K)
	Operating Temperature	-10~40 °C
	Storage Temperature	-20~60 °C
	Operating humidity	20~90% RH
	Storage humidity	20~90% RH

## Large screen display series - Product parameter summary



Part number	RF-NE068	RF-NV093	RF-NV125
Physical point spacing	0.68	0.9375	1.25
Package type	COB integrated package		
Pixel composition	1R1G1B		
Module size (W*H)	81.6*91.8	150*168.75	150*168.75
Module resolution (W*H)	120*135	160*180	120*135
Module size (W*H)	652.8*367.2	600*337.5	
Box structure resolution (W*H)	960*540	640*360	480*270
Box material	Die casting aluminum	Die casting aluminum	Die casting aluminum
Box Area	0.24m <sup>2</sup>	0.2025m <sup>2</sup>	
White balance brightness	≤600cd/m <sup>2</sup> (adjustable in 256 levels), the peak brightness can reach 1000cd/m <sup>2</sup>		
Best sight distance	2~25m	3~25m	3.5~25m
Viewing angle	Horizontal/Vertical≥160°		
Input voltage (V)	AC110/220V ±10% 50-60Hz		
Output voltage (V)	DC2.8V/3.8V dual output power supply		
Average Power	≤ 400w/m <sup>2</sup>	≤ 270w/m <sup>2</sup>	≤ 250w/m <sup>2</sup>
Maximum power	≤ 765w/m <sup>2</sup>	≤ 400w/m <sup>2</sup>	≤ 410w/m <sup>2</sup>
Grayscale class	≥13bit		
Refresh frequency	3840Hz		
Contrast	≥ 10000: 1		
Tc(K)	D65 (3200-9300K adjustable)		
Color gamut	Above 115%NTSC		
Chromaticity uniformity	Within 0.003Cx, Cy		
Brightness correction	Support single-point brightness correction, data is stored on the unit module		
Signal double backup	Optional	Optional	Optional
Dual power backup	Optional	Optional	Optional
Color correction	Support for color correction		
Range of working temperature	-10°C~40°C		
Storage temperature and humidity range	-20°C~60°C/20%-90%		
Signal source	DVI, HDMI2.0, DP1.2		
MTBF	≥8000H		
Lifetime	100000H		
IP class	IP30		



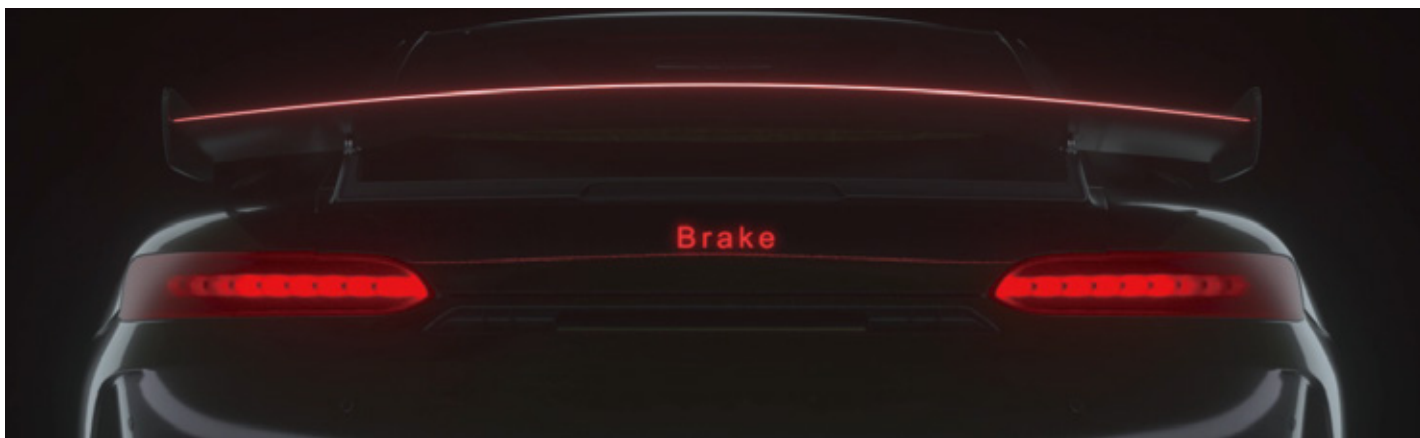
## Automotive LED series

### Logo light



Pixel pitch:	P0.68mm/0.9mm	Single module size:	Φ150mm
Signal Interface:	LVDS	Single module resolution:	222*226

### Tail light



Pixel pitch:	optional, more than Pitch 0.9mm
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Lighting LED

-  
照明产品

# Filament

灯丝

## Hard filament series

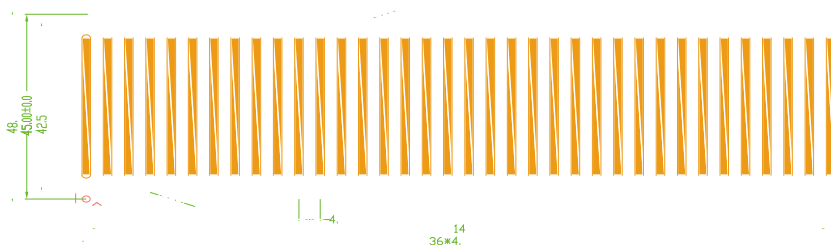
Mainly include 4015/5315/5330 and other specifications  
Products can be customized according to customer needs

主要包含4015/5315/5330等规格  
可依客户需求定制产品

### 4015

Integrated products, high light efficiency, high cost performance  
Assembly shipment, less gap, suitable for automatic spot welding  
equipment

集成产品, 光效高, 性价比高  
拼版出货, 缺口少, 适用自动点焊设备



Series	Part No.	L/F Type	Color	Test Condition(V)	IV(lm)	P (W)	Ra	Angle
4015	RF-FT4FW **67-T *-B-P	40*1.5*2.2mm	2700K-8000K	65-70	150-300	0.7-1.8	80	360
4015	RF-FT4FW **67-D *-B-P	40*1.5*2.2mm	2700K-8000K	65-70	100-250	0.7-1.8	90	360

## Flexible Filament Series

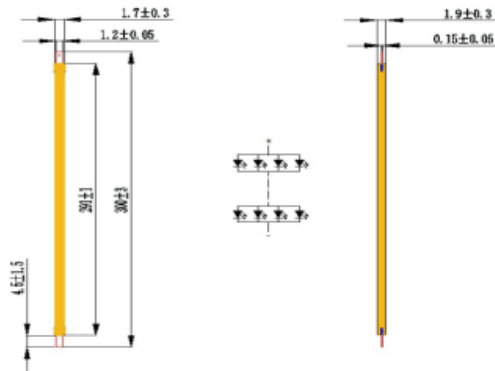
Mainly include single-color/dual-color/four-color/five-color specifications  
 Products can be customized according to customer needs

主要包含单色/双色/四色/五色等规格  
 可依客户需求定制产品

### FPC300

Strong plasticity, suitable for changing shapes and decorative applications  
 The appearance is delicate and smooth, and the light color has no dark spots

可塑性强, 适用造型多变装饰应用  
 外观细致平滑, 光色无暗斑  
 耐高温, 符合LM80测试要求



Series	Part No.	L/F Type	Color(K)	Test Condition(mA)	IV(lm)	Vf(V)	Ra	Angle
300mm	RF-FPR6W2C1G-T5	300*1.5mm	2200	40	680-760	135	82	360
300mm	RF-FPR6W2E1G-T5	300*1.5mm	2700	40	760-840	135	82	360
300mm	RF-FPR6W2C1K-T5	300*1.5mm	2200	20	680-760	270	82	360
300mm	RF-FPR6W2E1K-T5	300*1.5mm	2700	20	760-840	270	82	360

## FPS300

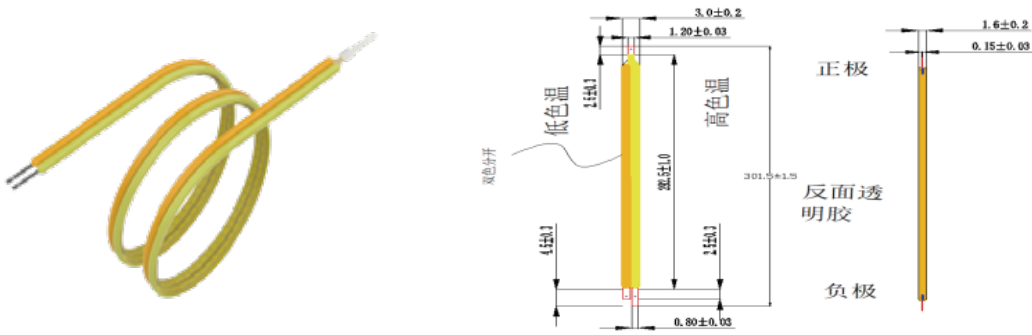
Strong plasticity, suitable for intelligent applications with variable shapes

The appearance is delicate and smooth, and the light color has no dark spots High temperature resistance, in line with LM80 test

可塑性强, 适用造型多变智能应用

外观细致平滑, 光色无暗斑

耐高温, 符合LM80测试要求



Series	Part No.	L/F Type	Color(K)	Test Condition(mA)	IV(lm)	Vf(V)	Ra	Angle
300mm	RF-FPS6W261G-T5	300*3.0mm	2200+6500	40	350-450	135	82	360
300mm	RF-FPS6W261K-T5	300*3.0mm	2200+6500	20	350-450	270	82	360

## FPF248

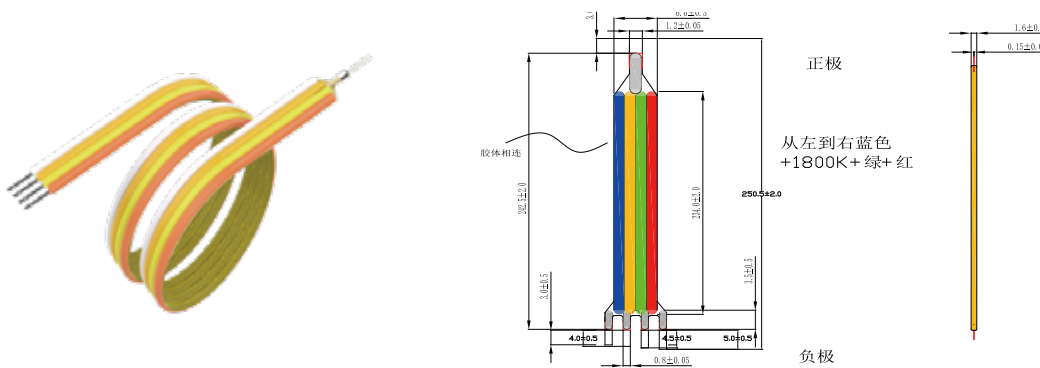
Strong plasticity, suitable for intelligent applications with variable shapes

The appearance is delicate and smooth, and the light color has no dark spots High temperature resistance, in line with LM80 test

可塑性强, 适用造型多变智能应用

外观细致平滑, 光色无暗斑

耐高温, 符合LM80测试要求



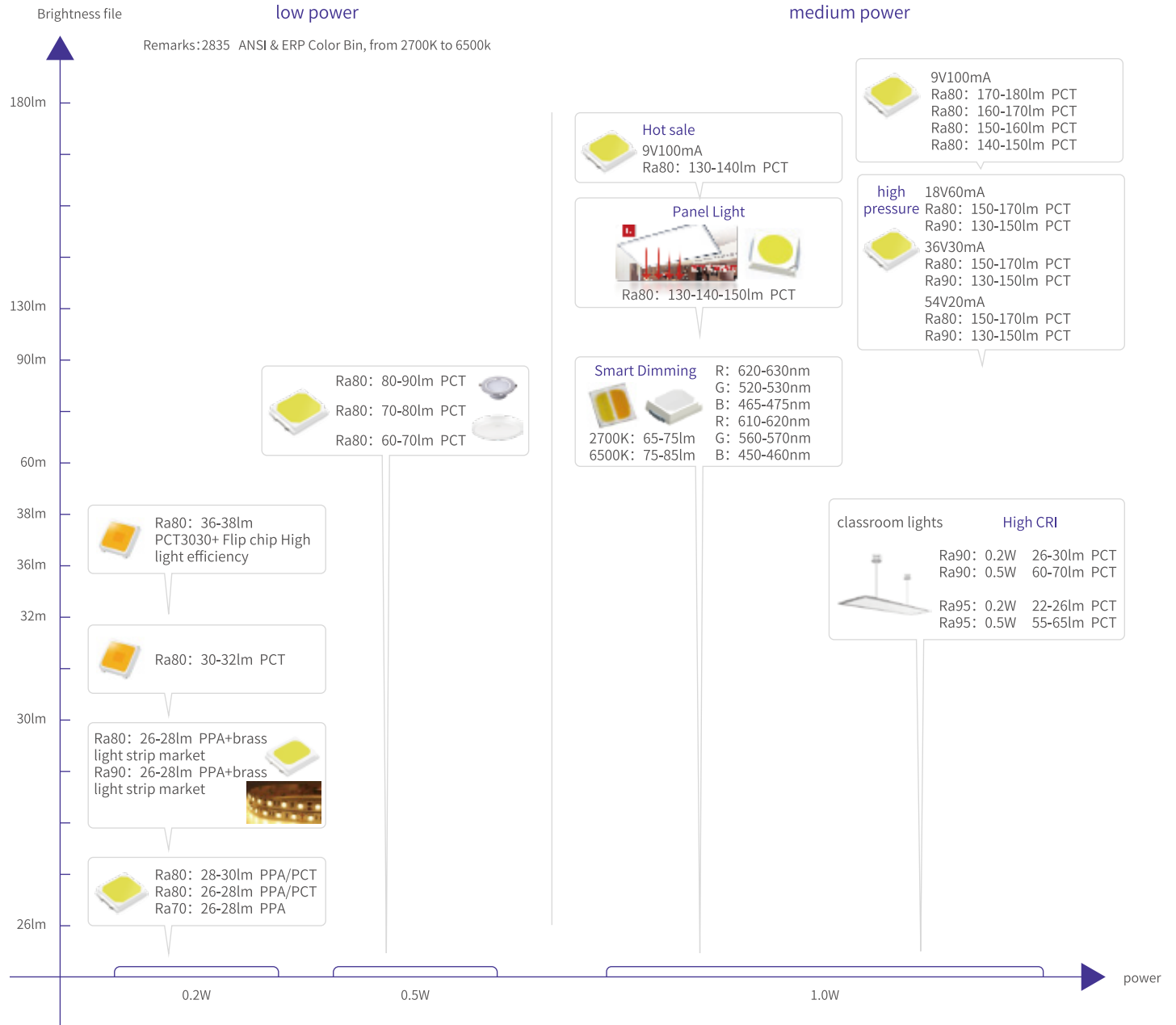
Series	Part No.	L/F Type	Color(K)	Test Condition(mA)	IV(lm)	Vf(V)	Ra	Angle
248mm	RF-FPF4W2RGB1G-T5	248*3.0mm	2200+RGB	40	320-420	135	82	360
248mm	RF-FPF4W2RGB1K-T5	248*3.0mm	2200+RGB	20	320-420	270	82	360



# white light

白光

## 2835 product series



## 2835-Main product series

### 2835 high light efficiency series products

Covering full-power products within 1W, the luminous efficiency can reach 230lm/W, and the products cover the full-color temperature, different CRI, different luminous efficiency, and with wide variety choice

### Vertical surface mount package

Package size 2.8\*3.5\*0.7mm

PPA/PCT material

Color tolerance  $\leq 5\text{SDCM}/7\text{SDCM}$

The light color consistency is stable, and the full color temperature  $\leq 5\text{SDCM}$

LM80 L70>54Khrs, L90>36Khrs

### 2835高光效系列产品

覆盖1W以内全功率产品, 光效可达230lm/W, 产品覆盖了全色温、不同显指、不同光效, 种类丰富

### 垂直型表贴封装

封装尺寸 2.8\*3.5\*0.7mm

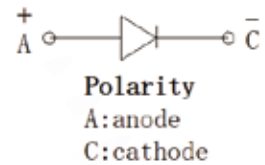
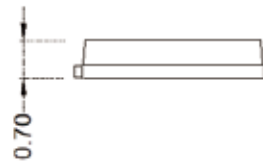
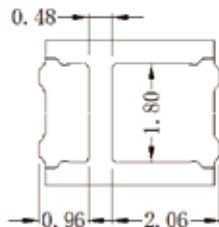
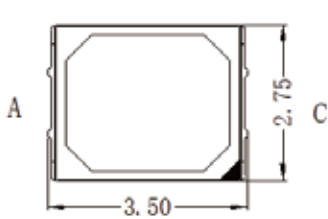
PPA/PCT材质

色容差 $\leq 5\text{SDCM}/7\text{SDCM}$

光色一致性好, 全色温 $\leq 5\text{SDCM}$

LM80 L70>54Khrs, L90>36Khrs

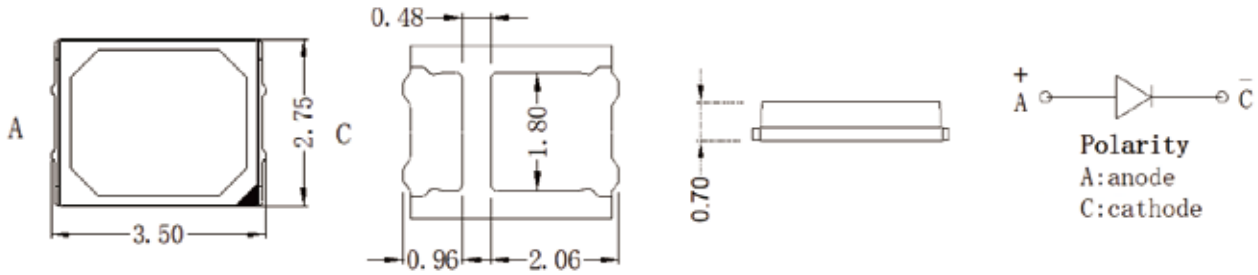
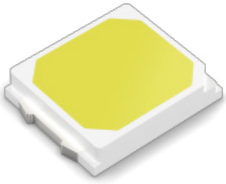
## 2835- Main product series



LED Series	picture	Part Number	Color	CRI (min)	$\phi$ (lm)	Efficacy (lm/w)	VF (V)	IF (mA)	Po (W)	Viewing angle 2 $\theta$ 1/2(degree)	Tj (°C)	IF- Max (mA)
2835		RF-P65MI32DS-AF-N-Y	6500K	70	28	151	3.1	60	0.2	120	115	70
		RF-P65HI32DS-AF-N-Y	6500K	80	28	156	3.0	60	0.2		115	70
		RF-H65HI32DS-EF-2N	6500K	80	35	208	2.8	60	0.2		125	180
		RF-65HI32DS-FH-2N	6500K	80	36.5	221	2.8	60	0.2		125	360
		RF-65HP32DS-FG-2N	6500K	80	37.5	229	2.7	60	0.2		125	360
2835		RF-P6HI32DS-FF-J	6500K	80	68	142	3.2	150	0.5	120	125	180
		RF-P6HI32DS-FH-J	6500K	80	73	157	3.1	150	0.5		125	180
		RF-H65HI32DS-EF-2J	6500K	80	78	176	3.0	150	0.5		125	180
2835		RF-W6HP32DS-AF-I3	6500K	80	136	149	9.1	100	1.0	120	125	120
		RF-65HP32DS-EF-I3	6500K	80	145	161	9.0	100	1.0		125	120
		RF-65HP32DS-FH-I3	6500K	80	155	174	8.9	100	1.0		125	120
		RF-K65HP32DS-FK-I3	6500K	80	178	205	8.7	100	1.0		125	120
2835		RF-R6HP32DS-BF-I3-Y	6500K	80	135	148	9.1	100	1.0	120	125	120
		RF-R65HP32DS-EF-I3	6500K	80	143	159	9.0	100	1.0		125	120



## 2835-High Voltage Product Series



LED Series	picture	Part Number	Color	CRI (min)	$\phi$ (lm)	Efficacy (lm/w)	VF (V)	IF (mA)	Po (W)	Viewing angle 2 $\theta$ 1/2(degree)	Tj (°C)	IF- Max (mA)
2835 high pressure		RF-W6HV32DS-BF-N	6500K	80	75	137	9.1	60	0.6	120	125	70
		RF-W6HV32DS-DF-N2	6500K	80	150	140	17.8	60	1.0		125	65
		RF-W6HV32DS-FD-2N	6500K	80	175	166	17.6	60	1.0		125	70
		RF-65HV32DS-FF-F2-01	6500K	80	155	142	36.4	30	1.0		125	33
		RF-65HV32DS-FD-F2	6500K	80	170	157	36	30	1.0		125	36
		RF-65HV32DS-FF-E3	6500K	80	165	155	53.3	20	1.0		125	22
		RF-65HV32DS-FG-E3	6500K	80	175	166	52.8	20	1.0		125	25

## 2835-High gloss quality product series

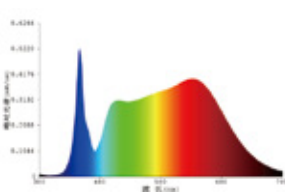
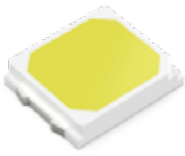
2835 high-gloss quality series products  
Covering full-power products within 1W, product apparent value 90/95/full spectrum, etc., a wide variety

Vertical surface mount package  
Package size 2.8\*3.5\*0.7mm  
Perfect color with 90, 95, 98  
Provide RG0 non-blue light hazard lamp application solution  
The spectrum is continuously saturated and the color reproduction is high  
Anti-vulcanization process, good air tightness  
LM80 L70>54Khrs, L90>36Khrs

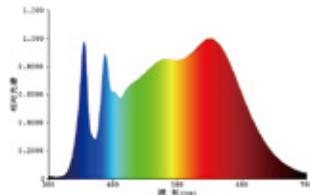
2835高光品质系列产品  
覆盖1W以内全功率产品,产品显值90/95/全光谱等,种类丰富

垂直型表贴封装  
封装尺寸 2.8\*3.5\*0.7mm  
完美色彩,显值90、95、98  
提供RG0无蓝光危害灯具应用方案  
光谱连续饱和,色彩还原度高  
防硫化工艺,气密性佳  
LM80 L70>54Khrs, L90>36Khrs

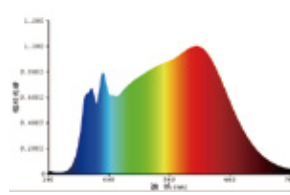
## 2835-High display high light quality product series



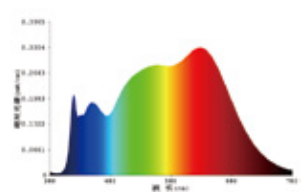
Single blue light full spectrum



Double blue light full spectrum



Triple blue light full spectrum



Full spectrum of violet light

LED Series	picture	Part Number	Color	CRI (typ)	φ (lm)	Efficacy (lm/w)	VF (V)	IF (mA)	Po (W)	Viewing angle 2θ1/2(degree)	Tj (°C)	IF- Max (mA)	
2835	90 Explicit value	3V0.2W	RF-W4TI32DS-EF-2N-01	4000K	92	27	161	2.8	60	0.2	120	125	180
		3V0.2W	RF-W4TP32DS-FH-2N	4000K	92	29	176	2.75	60	0.2		125	180
		3V0.5W	RF-40TI32DS-FH-J	4000K	92	60	129	3.1	150	0.5		125	180
		3V0.5W	RF-W4TP32DS-FH-2J	4000K	92	70	161	2.9	150	0.5		125	360
		6V1W	RF-W4TP32DS-FF-J2	4000K	92	140	151	6.2	150	1.0		125	160
		9V1W	RF-W4TP32DS-FF-I3	4000K	92	138	155	8.9	100	1.0		125	120
	95 Explicit value	3V0.2W	RF-40QI35DS-DF-N-Y	4000K	96	18	103	2.9	60	0.2	120	125	70
		3V0.5W	RF-40QP32DS-FH-J	4000K	96	58	125	3.1	150	0.5		125	180
		9V1W	RF-W40QP32DS-DH-I3	4000K	96	110	124	8.9	100	1.0		125	120
	Full spectrum	Single Blu-ray	RF-W*QI35DS-EF-N-Y	4000K	97	19	109	2.9	60	0.2	120	125	70
		Single Blu-ray	RF-P40QP32DS-FH-N	4000K	98	22	131	2.8	60	0.2		125	180
		Double blue light	RF-P40QT32DS-FD-2J	4000K	98	60	138	2.9	150	0.5		125	180
Triple blue light		RF-W40QP32DS-FF-I3	4000K	98	110	125	8.8	100	1.0	125		120	
Full spectrum of violet light		RF-SF40QI35DS-FH-N-Y	4000K	98	20	119	2.8	60	0.2	125		180	



## EMC3030-High Light Efficiency Product Series

### Q3030

EMC3030 high luminous efficiency series products cover full power products within 1W, 0.2W time effect up to 230lm/W, products cover full color temperature, different luminous efficiency, with variety of products for choice

High integration and small size

Package size 3.0\*3.0\*0.65mm

EMC material, high air tightness, UV resistance

Good light color consistency, full color temperature  $\leq 5\text{SDCM}$

LM80 L70>54Khrs, L90>36Khrs

### Q3030

EMC3030高光效系列产品覆盖1W以内全功率产品, 0.2W时光效可达230lm/W, 产品覆盖了全色温、不同光效, 种类丰富

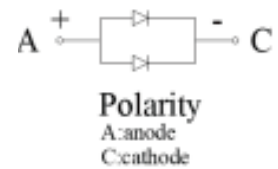
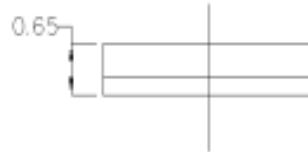
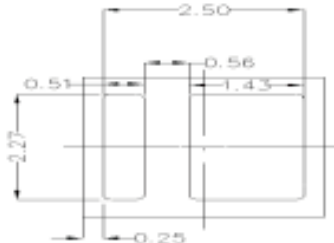
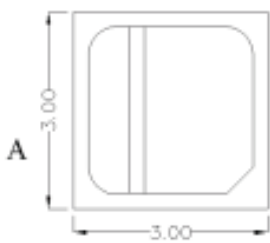
高集成体积小

封装尺寸 3.0\*3.0\*0.65mm

EMC材质, 气密性高, 抗UV

光色一致性好, 全色温 $\leq 5\text{SDCM}$

LM80 L70>54Khrs, L90>36Khrs



Part Number	Color	CRI (min)	$\phi$ (lm)	Efficacy (lm/w)	VF(V) (typ)	IF (mA)	Po (W)	Viewing angle 2 $\theta$ 1/2	Tj (°C)	IF- Max (mA)
RF-Q30SA50B-25-2T	5000K	80	34.45	196.75	2.69	65	0.2	120	125	360
	5000K	80	157.83	172.61	3.05	300	1		125	360
RF-Q30SA50B-01-2J2	5000K	80	33.7	212.17	5.29	30	0.2		125	240
	5000K	80	160.4	187.61	5.66	150	1		125	240
RF-Q30SA50B-25-2X-S	5000K	80	36.74	210.05	2.69	65	0.2		125	360
	5000K	80	155.41	172.42	3.01	300	1		125	360

## EMC5050 - High luminous product series

### Q5050

EMC5050 high luminous efficiency series products cover full power products within 5W, 1W time efficiency up to 226lm/W, products cover full color temperature, different luminous efficiency, with variety of products for choice

High integration and small size

Package size 5.0\*5.0\*0.7mm

EMC material, high air tightness, UV resistance

Good light color consistency, full color temperature  $\leq 5\text{SDCM}$

LM80 L70>54Khrs, L90>36Khrs

High temperature resistance, low thermal resistance  $<5^{\circ}\text{C/W}$

### Q5050

EMC5050高光效系列产品覆盖5W以内全功率产品, 1W时光效可达226lm/W, 产品覆盖了全色温、不同光效, 种类丰富

高集成体积小

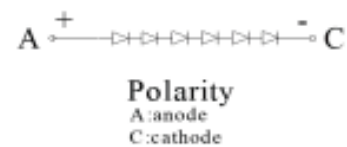
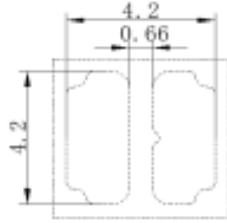
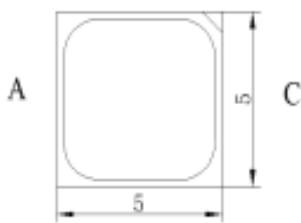
封装尺寸 5.0\*5.0\*0.7mm

EMC材质, 气密性高, 抗UV

光色一致性好, 全色温 $\leq 5\text{SDCM}$

LM80 L70>54Khrs, L90>36Khrs

耐高温, 低热阻  $<5^{\circ}\text{C/W}$



Part Number	Color	CRI (min)	$\phi$ (lm)	Efficacy (lm/w)	VF(V) (typ)	IF (mA)	Po (W)	Viewing angle 2 $\theta$ 1/2	Tj ( $^{\circ}\text{C}$ )	IF- Max (mA)
RF-Q50SA50A-25-4X2	5000K	70	865.62	174.52	6.2	800	5	120	125	960
RF-Q50SA50B-25-4X2	5000K	80	805.03	162.04	6.21	800	5		125	960
RF-Q50SA50A-25-H8	5000K	70	863.70	172.40	25.05	200	5		125	240
RF-Q50SA50B-25-H8	5000K	80	803.24	160.01	25.1	200	5		125	240
RF-Q50SA50A-25-4X2 -S	5000K	70	882.93	178.30	6.19	800	5		125	960
RF-Q50SA50B-25-4X2-S	5000K	80	821.13	165.82	6.19	800	5		125	960
RF-Q50SA50A-25-H8-S	5000K	70	879.95	176.34	24.95	200	5		125	240
RF-Q50SA50B-25-H8-S	5000K	80	818.36	163.87	24.97	200	5		125	240

## EMC7070 - High Power Product Series

### Q7070

EMC7070 high-power series products cover full-power products within 10W, luminous efficiency up to 205lm/W at 4W, products cover full color temperature, different luminous efficiency

High integration, high luminous efficiency, high reliability

Package size 7.0\*7.0\*0.8mm

EMC material high temperature resistance package, good air tightness, UV resistance

Different power versions, luminous flux output of single LED can achieve 330-1800lm

Good light and color consistency, can be customized  $\leq 3$ SDCM

Low thermal resistance  $<3^{\circ}\text{C}/\text{W}$

High and low voltage can be customized to meet the needs of the customer

### Q7070

EMC7070大功率系列产品覆盖10W以内全功率产品, 4W时光效可达205lm/W, 产品覆盖了全色温、不同光效, 种类丰富

高集成, 高光效, 高可靠性

封装尺寸 7.0\*7.0\*0.8mm

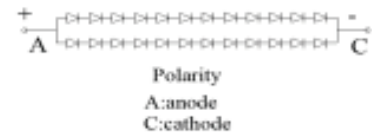
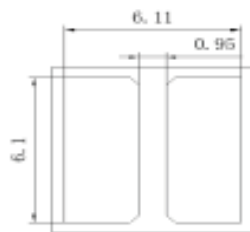
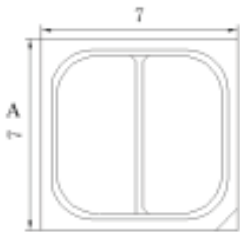
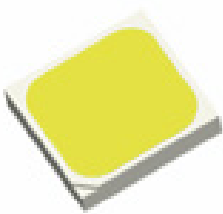
EMC材质高耐热封装, 气密性好, 抗UV

不同功率版本, 单颗实现330-1800lm输出

光色一致性好, 可定制 $\leq 3$ SDCM

低热阻  $<3^{\circ}\text{C}/\text{W}$

高低电压可按定制需求, 满足客户端使用



Part Number	Color	CRI (min)	$\phi$ (lm)	Efficacy (lm/w)	VF(V) (typ)	IF (mA)	Po (W)	Viewing angle $2\theta_{1/2}$	Tj ( $^{\circ}\text{C}$ )	IF- Max (mA)
RF-Q70SA50A-24-2T12	5000K	70	1817	167.95	36.04	300	11	120	125	350
RF-Q70SA50B-24-2T12	5000K	80	1726	159.78	36.01	300	11		125	350
RF-Q70SA50D-24-2T12	5000K	90	1588	146.8	36.06	300	11		125	350
RF-Q70SA50A-25-2T12	5000K	70	1853	171.94	35.93	300	11		125	350
RF-Q70SA50B-25-2T12	5000K	80	1761	163.15	35.97	300	11		125	350
RF-Q70SA50D-25-2T12	5000K	90	1620	149.94	36.01	300	11		125	350

## 2216-LED strip product series

### 2216

The industry's first, large-scale mass production and excellent batch light color consistency, full color zone, full explicit finger, full spectrum  $SCDM \leq 3$ , can provide  $SCDM = 1$  product, compact and flexible, suitable for different widths, different densities, different combinations of light strip light strip needs

Suitable for different widths, different densities, different combinations of strip strips

Package size 2.2\*1.6\*0.65mm

PPA material package

Panchromatic zone, full dominant finger, full spectrum

$SCDM \leq 3$ , which provides  $SCDM=1$  products

LM80 L70>54Khrs

### 2216

业内首创,大规模量产且批次光色一致性极佳,全色区、全显指、全光谱  $SCDM \leq 3$ ,可提供 $SCDM=1$ 的产品小巧灵活,适合于不同宽度、不同密度、不同组合方式的灯条灯带需求

适合于不同宽度、不同密度、不同组合方式的灯条灯带

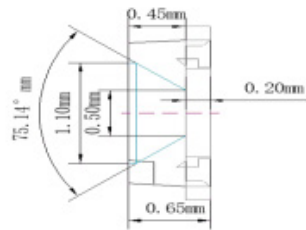
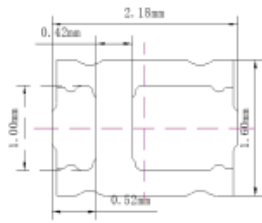
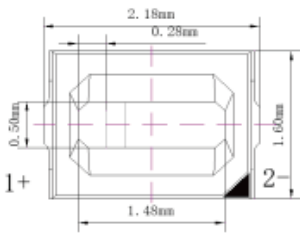
封装尺寸 2.2\*1.6\*0.65mm

PPA材质封装

全色区、全显指、全光谱

$SCDM \leq 3$ ,可提供 $SCDM=1$ 的产品

LM80 L70>54Khrs



Part Number	Color	CRI (min)	$\phi$ (lm)	VF(V)	IF (mA)	Po (W)	Viewing angle 2 $\theta$ 1/2	Tj (°C)	IF- Max (mA)
RF-M **TK16DS-EC-Y	2700-6500K	90	5-10	2.7-3.2	20	0.06	120	91	40
RF- **TK16DS-EE-Y	2700-6500K	90	4-10	2.7-3.3	20	0.06	120	91	40
RF-M **TK16DS-EE-Y	2200-7500K	90	4-10	2.7-3.3	20	0.06	120	91	40
RF- **TK16DS-CF-Y	2400-6000K	90	6-10	2.6-2.9	20	0.06	120	91	40
RF- **TI16DS-EE-Y	1800-10000K	90	4-10	2.7-3.3	20	0.06	120	91	40
RF-K **TI16DS-EE-Y	2700-6500K	90	4-10	2.7-3.3	20	0.06	120	91	40
RF-M **TI16DS-EE-Y	2700-6000K	90	4-10	2.7-3.3	20	0.06	120	91	40
RF- **QI16DS-EE-Y	2700-6000K	95	4-9	2.7-3.3	20	0.06	120	91	40

备注:以上产品数据由远方机台测试(远方光电,型号:HAAS2000)

Remarks: The above product data is tested by the remote machine (Far Away Optoelectronics, model: HAAS2000)

## 2110-LED strip product series

2110

The minimum size of soft led strip in the industry to meet the needs of high density; High mechanical strength, resistant to bending and non-breaking; Can be supplied single Bin, good color consistency; Domestic & PCT patent protection

Soft strip strips have the smallest size to meet the needs of high density

Package size 2.1\*1.0\*1.1mm

PPA material package, high mechanical strength, resistant to bending and non-breaking

Panchromatic zone, full dominant finger, full spectrum

SCDM  $\leq$  3 single Bin supply, good color consistency

LM80 L70>54Khrs

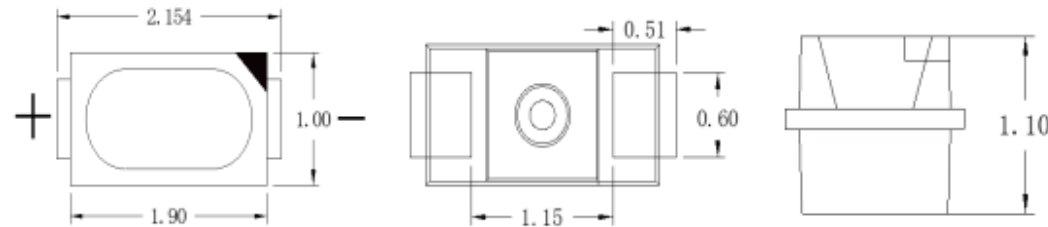


Fig.1-4 Polarity 极性

Part Number	Color	CRI (min)	$\phi$ (lm)	VF(V)	IF (mA)	Po (W)	Viewing angle 201/2	Tj (°C)	IF- Max (mA)
RF-**HK10DS-EC-F-Y	2500-6500K	80	8-14	2.7-3.3	30	0.1	120	97	30
RF-**TK10DS-EC-F-Y	1700-6500K	90	4-12	2.7-3.3	30	0.1	120		30
RF-E**TK10DS-EC-F-Y	2700-6500K	90	7-12	2.7-3.3	30	0.1	120		30
RF-**QK10DS-EC-F-Y	1800-6500K	95	4-10	2.7-3.3	30	0.1	120		30
RF-WCRK10DS-**-Y* (蓝白)	(0.24,0.215)	/	3-9	2.7-3.4	20	0.06	120		30

备注: 以上产品数据由远方机台测试 (远方光电, 型号: HAAS2000)

Remarks: The above product data is tested by the remote machine (Far Away Optoelectronics, model: HAAS2000)



# Colored light

彩光

## Single Colored light series

The main products contain size range: from 2110 to 5050

Power: from 0.04W to 1W

Color wavelength: from 260-850nm

Product color, variety styles

产品主要包含尺寸范围:从2110到5050

功率:从0.04W到1W

颜色波长:从260-850nm

产品颜色、型号丰富

### 3014 side view SMT

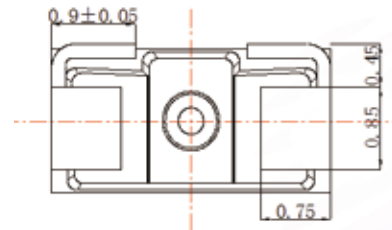
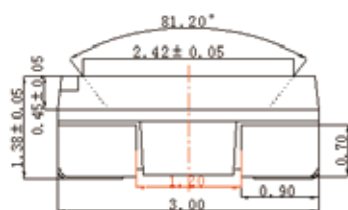
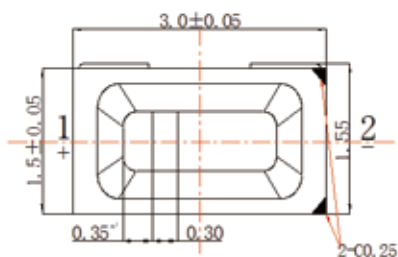
Small size, strong breaking resistance

The product can be top view and side view SMT to meet the different design needs of customers in the direction of light

The color is diverse, and the light color is uniform and soft

小尺寸, 抗折断能力强

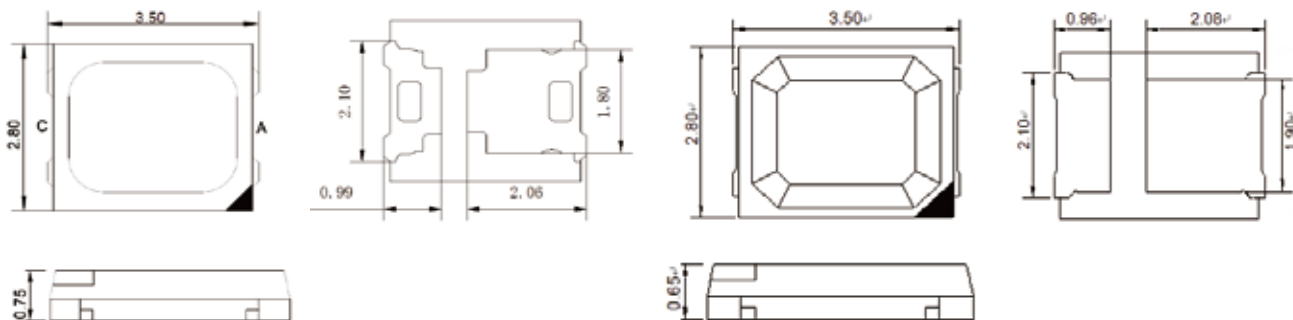
产品可正面及侧面贴片, 满足客户不同的出光方向设计需求  
颜色多样, 光色均匀柔和



Part No.	Luminous intensity	Dominant wavelength	Forward Voltage	Test Condition	Size
	IV(mcd)	Wd(nm)	Vf(V)	If(mA)	L*W*H(mm)
RF-BNRC13TS-CE	230-650	465-475	2.8-3.4	20	3.0*1.55*1.38
RF-GNRC13TS-CF	1200-2800	515-530	2.8-3.5	20	3.0*1.55*1.38
RF-OURC13TS-CE	230-530	615-630	1.8-2.4	20	3.0*1.55*1.38
RF-YURC13TS-AE	180-530	585-595	1.8-2.4	20	3.0*1.55*1.38
RF-OURC13TS-CE-F	1000-1800	615-630	1.9-2.6	30	3.0*1.55*1.38
RF-YURC13TS-AE-F	1000-1800	585-595	1.8-2.6	30	3.0*1.55*1.38

High integration and small size  
 High reliability  
 The color is diverse, and the light color is uniform and soft

高集成体积小  
 高可靠性  
 颜色多样, 光色均匀柔和



2835 Part No.	Luminous intensity	Dominant wavelength	Forward Voltage	Test Condition	Size
	Flux(lm)	Wd(nm)	Vf(V)	If(mA)	L*W*H(mm)
RF-OURI35TS-EK-2T	30-50	620-630	1.9-2.5	300	2.8*3.5*0.65
RF-GNRI35TS-DK-2T	55-95	520-530	2.6-3.4	300	2.8*3.5*0.65
RF-BNRI35TS-DK-2T	12-22	450-460	2.8-3.4	300	2.8*3.5*0.65
RF-BNRI35TS-EK-2T	26-36	465-475	2.8-3.4	300	2.8*3.5*0.65
RF-OURI35TS-EK-J	18-28	620-630	1.8-2.4	150	2.8*3.5*0.75
RF-GNRI35TS-DK-J	33-55	520-530	2.8-3.5	150	2.8*3.5*0.75
RF-BNRI35TS-DK-J	8-18	465-475	2.8-3.5	150	2.8*3.5*0.75
RF-YURI35TS-EK-J	16-26	585-595	1.6-2.6	150	2.8*3.5*0.75
RF-OURI35TS-CH-N	8-13	615-630	1.8-2.5	60	2.8*3.5*0.75
RF-GNRI35TS-CK-N	16-26	515-530	2.9-3.8	60	2.8*3.5*0.75
RF-BNRI35TS-CK-N	3-7	465-475	2.9-3.6	60	2.8*3.5*0.75
RF-YURI35TS-AF-N	5-10	585-595	1.8-2.6	60	2.8*3.5*0.75

## Tri-color light series

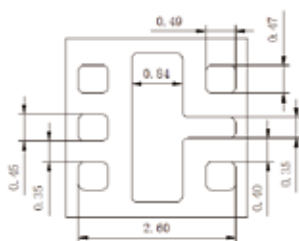
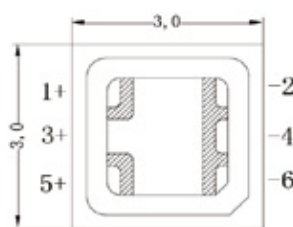
Mainly contains 3030RGB, 3528RGB, 3535RGB, 5050RGB products  
 Power: from 0.2W to 3W  
 Product color, model rich

主要包含3030RGB, 3528RGB, 3535RGB, 5050RGB产品  
 功率: 从0.2W到3W  
 产品颜色、型号丰富

### 3030

High integration and small size  
 High temperature resistance, high power, high reliability  
 The color is diverse, and the light color is uniform and soft

高集成体积小  
 高耐温, 高功率, 高可靠性  
 颜色多样, 光色均匀柔和

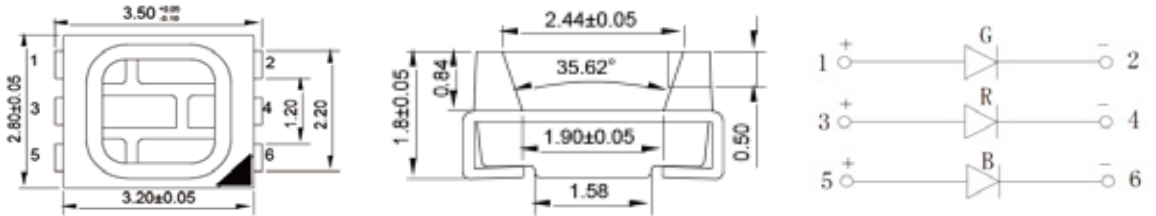
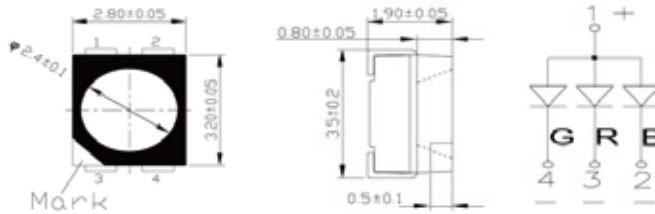


3030 Color Part No.	Luminous flux $\phi$ (lm)			Dominant wavelength $\lambda_d$ (nm)			Forward Voltage $V_f$ (V)			Test Condition $I_f$ (mA)			Size
	R	G	B	R	G	B	R	G	B	R	G	B	L*W*H(mm)
RF-Q30SARGB-02-N	8-12	12-24	3-6	615-630	510-530	465-475	2.2-2.8	3.0-3.8	3.0-3.8	60	60	60	3.0*3.0*0.65
RF-Q30SARGB-05-J	17-23	36-46	7-13	620-630	520-530	465-475	2.0-2.4	2.8-3.6	2.8-3.6	150	150	150	3.0*3.0*0.65

### 3528

Compact structure, high integration  
 Good reliability  
 Rich Color  
 Uniform color  
 Customizable Specification

结构紧凑, 集成度高  
 产品可靠性高  
 色彩丰富  
 颜色均匀  
 可定制规格

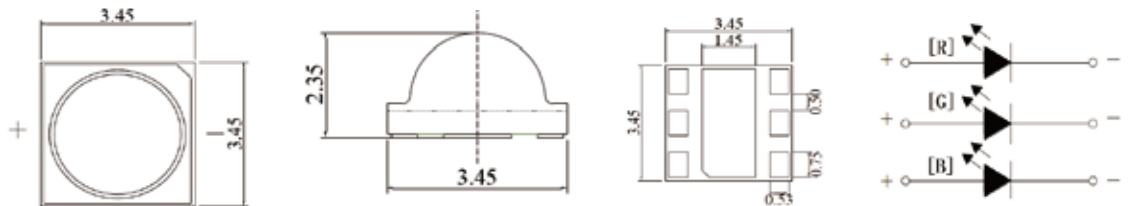
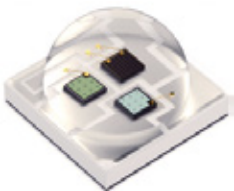


3528 Color Part No.	Luminous intensity Iv(mcd)			Dominant wavelength Wd(nm)			Forward Voltage Vf(V)			Test Condition			If (mA)	Size L*W*H(mm)
	R	G	B	R	G	B	R	G	B	R	G	B		
RF-W2SA30BS-A15	200-430	1200-2300	180-530	615-630	515-530	465-475	1.8-2.4	2.8-3.6	2.8-3.6	20	20	20	3.5*2.8*1.9	
RF-W2SA30BS-A17	600-1200	1000-2300	180-530	618-628	517.5-530	465-475	1.8-2.5	2.7-3.6	2.7-3.6	20	20	20	3.5*2.8*1.9	
RF-W7SP30TS-A44	530-1200	1200-2300	180-650	615-625	515-530	465-475	1.8-2.4	2.7-3.6	2.7-3.6	20	20	20	3.5*2.8*1.85	
RF-W3SA30TS-A20	230-430	950-1600	260-470	618-623	516-521	465-470	1.8-2.4	2.9-3.5	2.9-3.5	20	20	20	3.5*2.8*1.85	
RF-W7SP30BS-A44	530-1000	1200-2300	280-650	615-625	515-530	465-475	1.8-2.4	2.7-3.4	2.7-3.4	20	20	20	3.5*2.8*1.85	

### 3535

High power, High brightness  
 Good reliability  
 Rich Color  
 Uniform color  
 Customizable Specification

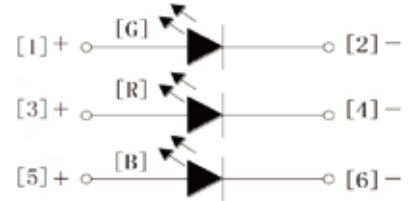
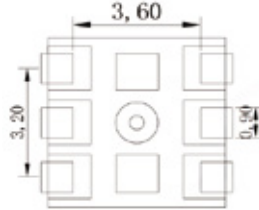
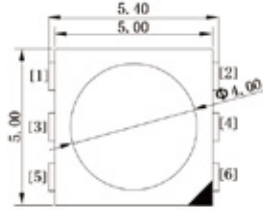
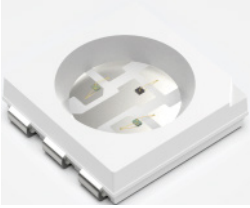
高功率, 高亮度  
 产品可靠性高  
 色彩丰富  
 颜色均匀  
 可定制规格



3535 Color Part No.	Luminous flux φ(lm)			Dominant wavelength Wd(nm) or Color temperature(K)			Forward Voltage Vf(V)			Test Condition			Size & The Angle L*W(mm)&(°)
	R	G	B	R	G	B	R	G	B	R	G	B	
RF-RC35RGB-L6-K0-A120	30-60	70-100	14-26	615-630	520-530	450-475	1.8-2.6	2.8-3.6	2.8-3.6	350	350	350	3.5*3.5&120°

Good reliability  
 Rich Color  
 Uniform color  
 Customizable Specification

产品可靠性高  
 色彩丰富  
 颜色均匀  
 可定制规格



5050 Color Part No.	Luminous flux $\phi$ (lm) or intensity I <sub>v</sub> (mcd)			Dominant wavelength W <sub>d</sub> (nm) or Color temperature(K)			Forward Voltage V <sub>f</sub> (V)			Test Condition			If (mA)	Size & The Angle L*W*H(mm)
	R	G	B	R	G	B	R	G	B	R	G	B		
RF-W2SA50TS-A39R	530-1200	1200-2300	180-530	619-625	515-524	463-475	1.8-2.4	2.8-3.6	2.8-3.6	20	20	20	5.4*5.0*1.6	
RF-W2SA50TS-A39RS	530-1200	1200-2300	180-530	619-625	515-530	465-475	1.8-2.4	2.8-3.6	2.8-3.6	20	20	20	5.4*5.0*1.6	
RF-W2SA50TS-A51	650-1200	1200-2300	350-650	619-625	515-530	465-475	1.8-2.6	2.8-3.6	2.8-3.6	20	20	20	5.4*5.0*1.48	
RF-W2SP50TS-A36-U	3.6-5.5lm	10.5-19.6	3.0-4.4	618-625	520-530	465-475	1.8-2.6	2.8-3.4	2.8-3.4	40	40	40	5.4*5.0*1.6	

## Four-color light series

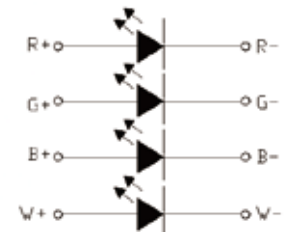
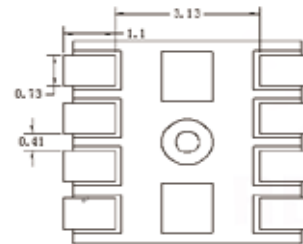
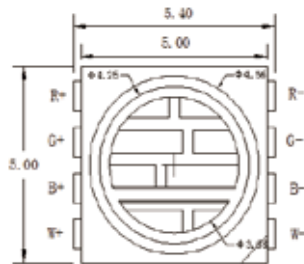
Mainly contains 5050RGBW products  
 Power: from 0.2W to 2W  
 Product color, model rich

主要包含5050RGBW产品  
 功率:从0.2W到2W  
 产品颜色、型号丰富

### 5050

Good reliability  
 Rich Color  
 Uniform color  
 Customizable Specification

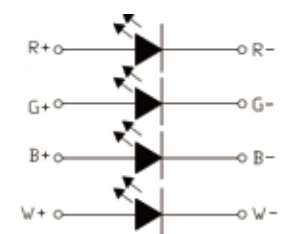
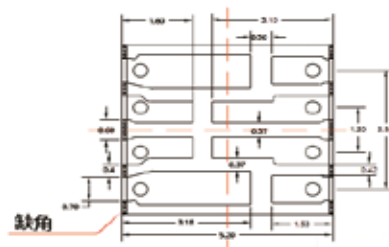
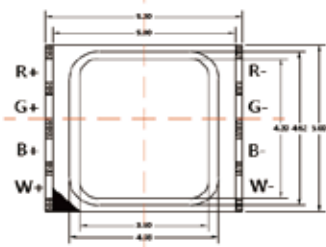
产品可靠性高  
 色彩丰富  
 颜色均匀  
 可定制规格



5050 Color Part No.	Luminous flux $\phi$ (lm) or intensity I(mcd)				Dominant wavelength Wd(nm) or Color temperature(K)				Forward Voltage Vf(V)				Test Condition If (mA)				Size & The Angle L*W*H(mm)
	R	G	B	W1	R	G	B	W1	R	G	B	W1	R	G	B	W1	
RF-W2SA50TS-R**W(显指80)	700-1200	1900-2700	350-650	5-10	618-625	515-530	465-475	2300-6500	1.8-2.4	2.8-3.6	2.8-3.6	2.7-3.6	20	20	20	20	5.4*5.0*1.6
RF-DW2SA50TS-H**W-E-Y	600-1000	1300-1800	230-650	5-9.5	618-623	515-525	465-475	2700-6500	1.8-2.4	2.8-3.6	2.8-3.6	2.7-3.6	20	20	20	20	5.4*5.0*1.6

Good reliability  
 High air tightness  
 Rich Color  
 Uniform color  
 Customizable Specification

产品可靠性高  
 气密性高  
 色彩丰富  
 颜色均匀  
 可定制规格



5050 Color Part No.	Luminous flux $\phi$ (lm)				Dominant wavelength Wd(nm) or Color temperature(K)				Forward Voltage Vf(V)				Test Condition If (mA)				Size & The Angle L*W*H(mm)
	R	G	B	W1	R	G	B	W1	R	G	B	W1	R	G	B	W1	
RF-W2SP50CS-**W-J/S	13-26	35-62	10-24	40-75	615-630	520-530	465-475	1800-6500	1.8-2.4	2.6-3.6	2.6-3.6	2.6-3.6	150/200	150/200	150/200	150/200	5.2*5.0*1.1

## Five-color light series

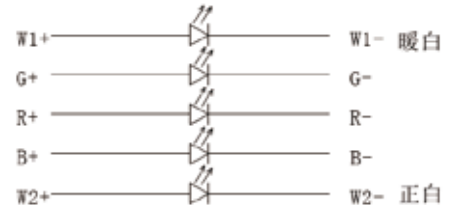
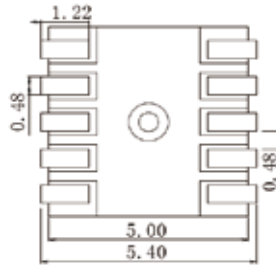
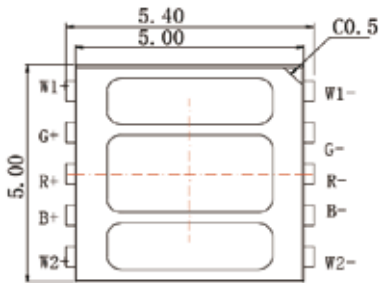
Mainly contains 5050RGBWW products  
Product color, model rich

主要包含5050RGBWW产品  
产品颜色、型号丰富

### 5050

Good reliability  
Rich Color  
Uniform color  
Customizable Specification

产品可靠性高  
色彩丰富  
颜色均匀  
可定制规格



5050 Color Part No.	Luminous flux $\phi$ (lm) or intensity Iv(mcd)					Dominant wavelength Wd(nm) or Color temperature(K)					Forward Voltage Vf(V)					Test Condition			If (mA)		Size & The Angle
	R	G	B	W1	W2	R	G	B	W1	W2	R	G	B	W1	W2	R	G	B	W1	W2	
RF-W2SA50TS-A**W(显指80)	300-1200	1200-2300	280-650	4-10	5-10	618-625	515-530	465-475	1800-3500	5000-8000	1.8-2.6	2.8-3.6	2.8-3.6	2.7-3.6	2.7-3.6	20	20	20	20	20	5.4*5.0*1.6

# Integrated IC color light series

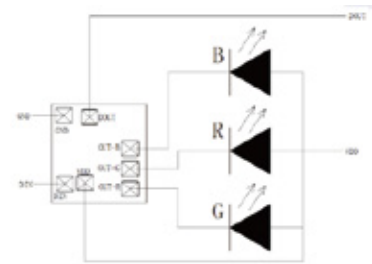
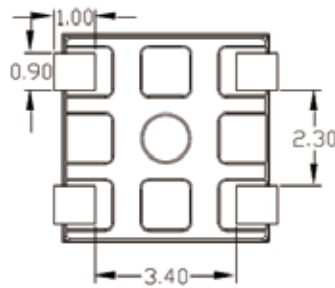
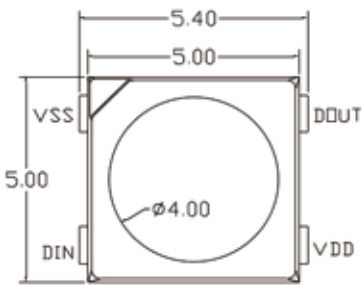
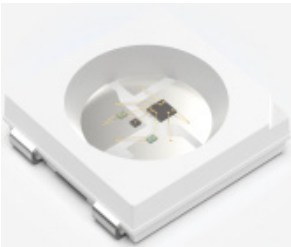
Mainly contains 5050RGB+ IC products  
Product color, rich

主要包含5050RGB+IC产品  
产品颜色、丰富

## 5050

Good reliability  
Rich Color  
Uniform color  
Customizable Specification

产品可靠性高  
色彩丰富  
颜色均匀  
可定制规格



5050 Color Part No.	Luminous flux $\phi$ (lm) or intensity Iv(mcd)			Dominant wavelength Wd(nm) or Color temperature(K)			Forward Voltage Vf(V)			Test Condition			If (mA)	Size & The Angle L*W*H(mm)
	R	G	B	R	G	B	R	G	B	R	G	B		
RF-W7SA50TS-A51-IC	280-650	900-1500	150-450	619-624	520-530	465-475	/	/	/	5V	5V	5V	5	5.4*5.0*1.58



# Module

## 模组

### Refond's mod strength

#### Module light color thermal characteristics

可每1Ra变化(产品方向)  
Can change every 1Ra (product direction)

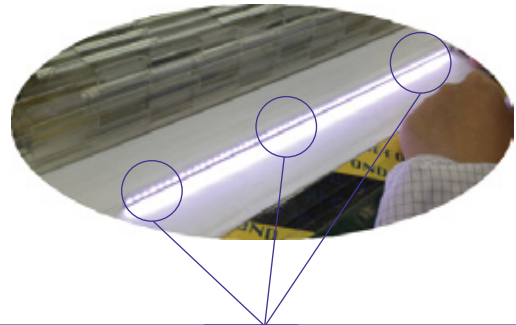
Ra:80 → Ra:95



6500K → 3000K

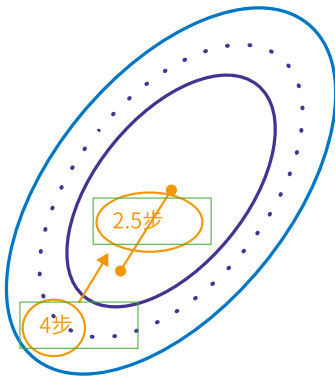
可每100K变化色温(产品方向)

Color temperature can be changed every 100K (product direction)



The parameters of the lamp bead are mixed and pasted, the brightness/color consistency of the entire module is high, and the voltage difference between the end and the end is 0.3v.

灯珠各参数混贴  
模组整条亮度/颜色一致性高  
首尾电压相差0.3v。

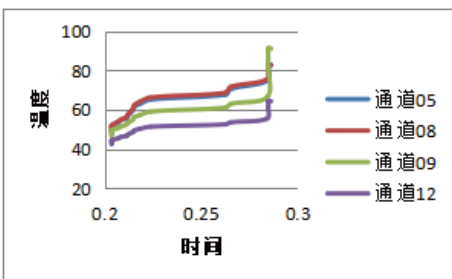


2022年  
全色区混贴, 模组单色温做到100%3步以内, 混色温接近100%4步

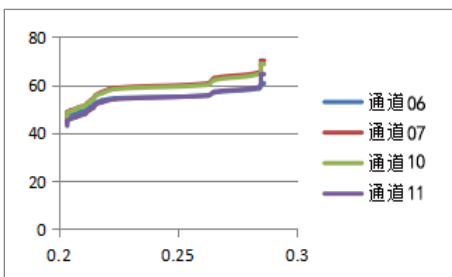
In 2022,  
The full-color area is mixed, the monochrome temperature of the module is within 100% 3 steps, and the mixing color temperature is close to 100% 4 steps

2023年  
全色区混贴, 模组单色温做到100%2.5步以内, 混色温接近100%3步

In 2023,  
Mixed paste in the full color area, the monochrome temperature of the module is within 100% within 2.5 steps, and the mixed color temperature is close to 100% 3 steps



S公司  
S company



瑞丰  
Refond



模组温升对比  
Module temperature rise comparison

## RGBCW soft light strip

1. Color includes RGB and white full color temperature, a variety of colors can be adjusted, suitable for a variety of application scenarios;
2. Linear light, uniform and continuous, no light spots;
3. Linear light source Viewing Angle is large, Up to 140°, the light-emitting surface angle can reach 180°;
4. The light strip can be cut at 62.5mm (along the cutting line), which is easy to install and use according to the needs, and can be freely combined;
5. The chip is directly soldered to the board, with good heat dissipation and long life.

1. 颜色包含RGB和白光全色温, 多种颜色可调, 适合各种应用场景;
2. 线性发光、均匀连续、不见光点;
3. 线性光源出光角度大, 可达140°, 发光面角度可达180°;
4. 灯带62.5mm处可(沿裁剪线)裁剪, 根据需求方便安装使用, 可自由搭配组合;
5. 芯片直接焊接到板上, 散热好, 寿命长。



Product size	12*3000mm	12*5000mm
power	24W	36W
VF	Constant voltage DC24V	
Chip QTY	560PCS/M	
Operating temperature	-40°C~+45°C	

产品尺寸	12*3000mm	12*5000mm
功率	24W	36W
电压	恒压DC24V	
芯片数量	560PCS/M	
工作温度	-40°C~+45°C	



Product application areas:  
home dark groove trim decoration, irregular design body decoration, e-sports games, cinemas, KTV, game halls, home theaters, large entertainment venues, etc.

产品应用领域:  
家居暗槽镶边装饰, 不规则设计体的装饰、电竞游戏、电影院、KTV、游戏厅、家庭影院、大型娱乐场所等。

## 0817 Neon Symphony Light Strip

This light strip uses the WS2811 three-channel LED drive control dedicated circuit. The chip contains an intelligent digital interface data latch signal shaping and amplifying drive circuit, as well as a high-precision internal oscillator and a 20V high-voltage programmable constant current output driver.

此灯带使用了WS2811三通道LED驱动控制专用电路,芯片内部包含智能数字接口数据锁存信号整形放大驱动电路,还包含有高精度的内部振荡器和20V高压可编程定电流输出驱动器。



product size	08*17*2015MM	08*17*3015MM	08*17*5015MM
power	16W/M	15.6W/M	13.6W/M
VF	Constant voltage DC24V		
LED QTY	84PCS/M		
LED Part number	5050RGB		
IC Part number	WS2811		
IC modality	Lamp bead inner seal		
Operating temperature	-40°C~+80 °C		

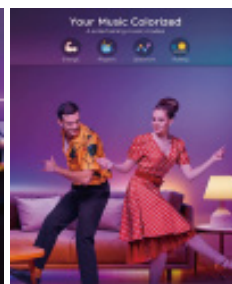
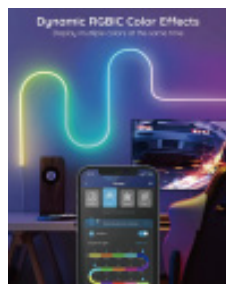
产品尺寸	08*17*2015MM	08*17*3015MM	08*17*5015MM
功率	16W/M	15.6W/M	13.6W/M
电压	恒压DC24V		
灯珠数量	84PCS/M		
灯珠型号	5050RGB		
IC型号	WS2811		
IC形式	灯珠内封		
工作温度	-40°C~+80 °C		

### Product application areas:

Home dark groove trim decoration, Irregular design body decoration, e-sports games, cinemas, KTV, game halls, home theaters, large entertainment venues, etc. Enjoy more colors and features like timer, video, DIY and music modes to help you create the ambience you need.

### 产品应用领域:

家居暗槽镶边装饰,不规则设计体的装饰、电竞游戏、电影院、KTV、游戏厅、家庭影院、大型娱乐场所等。享受更多颜色和功能,如计时器、视频、DIY 和音乐模式,帮助您创造所需的氛围。



Smart Voice Control: Manage neon lights with simple voice commands via Alexa, Google Assistant apps.

智能语音控制:通过 Alexa、Google Assistant 应用简单语音指令管理霓虹灯。

Music Mode: The built-in high-sensitivity microphone syncs with the music, producing spectacular light shows and dynamic decorations. Multiple music modes: Energy, Rhythm, Spectrum, Roll and Christmas, Dynamic, Calm and more.

音乐模式:内置高灵敏度麦克风与音乐同步,产生壮观的灯光表演和动态装饰。多种音乐模式:能量、节奏、光谱、滚动和圣诞节、动态、冷静等。

64 Scene Modes: Choose from a variety of colors to create a stunning scene atmosphere for family and friends gatherings or parties.

64种场景模式:多种颜色可供选择,可以为亲友聚会或开派对营造令人惊叹的场景氛围。

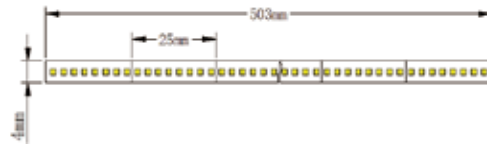
## LED灯带产品-在开发

MINI1010 Flexible Strip-small size with big viewing angle

Small Led size, highest density led strip, 320 LEDs/m  
 The width of PCB is very narrow; 4mm, our target is to do 2mm  
 Linear light emission, small light spacing, no dark area  
 The smallest size LED  
 High reliability and strong bending resistance performance

MINI1010灵活条-小尺寸,大视角

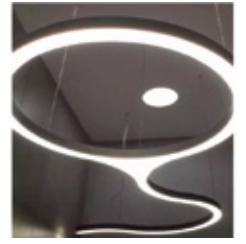
Led尺寸小,密度最高,320个Led /m  
 PCB的宽度很窄,4mm,我们的目标是做2mm  
 线性发光,光间距小,无暗区  
 最小尺寸LED



Part No.	Color Rendering Index	Power	Luminous intensity	Correlated Color Temperature	Voltage	FPC width	IP Rate	Installation
	Ra (min)	Po(W/m)	Flux(lm/m, min)	CCT (K) Optional	Vf(V) Optional	(mm)	Optional	
RF-G**HA1013-243202041-A0	80	13	1690	2700-6500	24	4	20	3M tape/Mounting Clips/Aluminum Profiles

### Comparison between Mini1010 and other LED

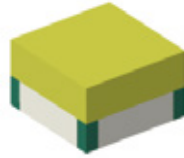
	2835	5050	MINI white light	CSP
Size	2.8*3.5	5.0*5.0	1.0*1.0	≤1.5*1.5
Light-emitting surface	Single-sided light emitting	Single-sided light emitting	Light emitting from five sides	Light emitting from five sides
Viewing angle	110°-120°	110°-120°	~175°	130°~150°
Power	≤1W	≤0.3W	≤1W	≤3W
Thermal resistance	≈12	≈80	≈5	≈5
Light efficiency	++++	++	+++	+
Production efficiency	+++	++	+++++	++++
Air tightness	MSL3	MSL3	MSL1	MSL1
Ease of SMT	++++	++++	+++	+
cost	++++	++	+++	+



CSP



MINI white light



MINI white light



2835



5050

Large viewing angle, light emitting from five sides, the strip emits light all over the body, no dark area  
 Flip chip package with substrate for high light efficiency & cost performance  
 Silicone molding, high reliability  
 Low thermal resistance, withstands large currents  
 The chip has a substrate protection, with high strength and bending resistance  
 Small size, wide range of application space

大视角, 五面发光, 发光条全身发光, 无暗区  
 带有基板的倒装芯片封装, 具有高效率和高性价比  
 硅胶模具, 可靠性高  
 热阻低, 能承受大电流  
 该芯片具有基板保护, 具有高强度和抗弯曲性  
 体积小, 应用空间广

MINI white light

3014



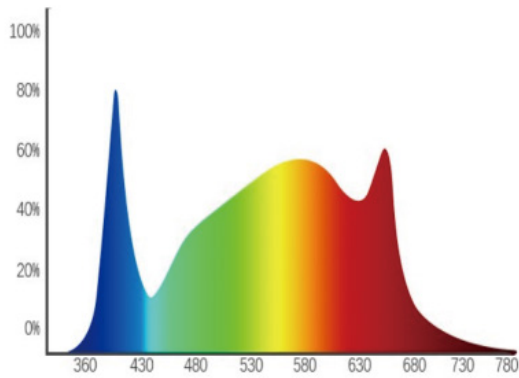
MINI white light

2835

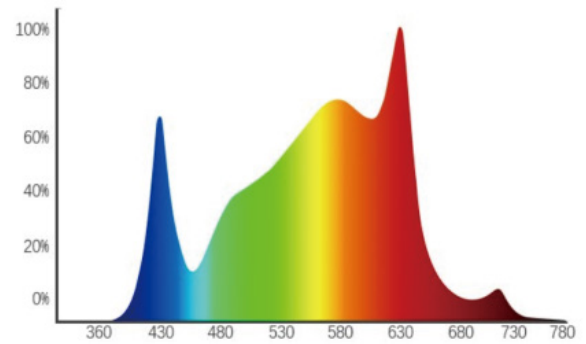


# Plant Lights - Cannabis Plant Lights

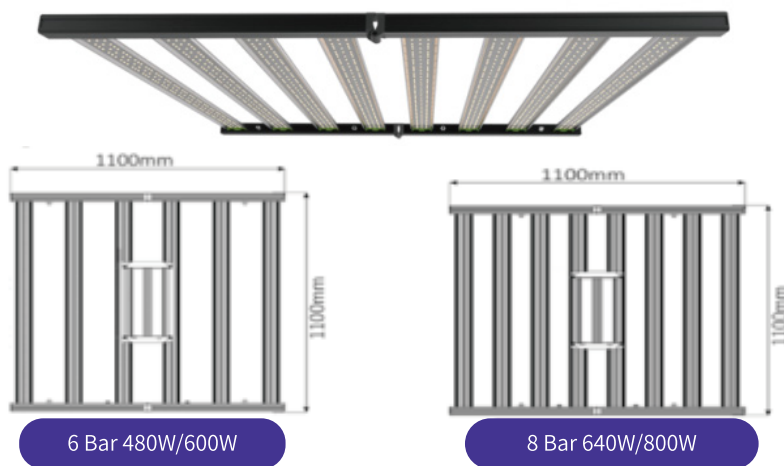
生长期光谱  
Veg Spectrum



花期光谱  
Full Cycle--Flower Spectrum



## Lamp Size



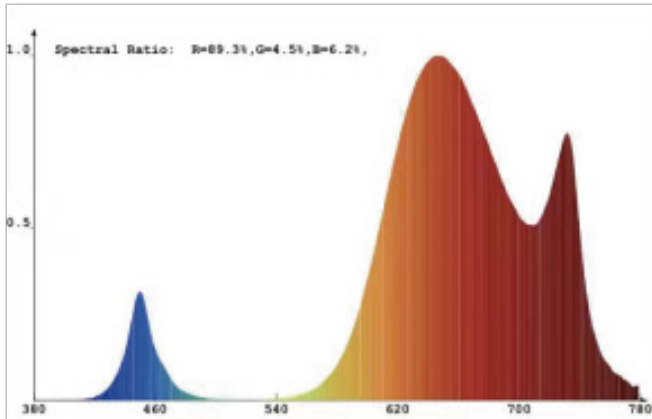
Part No.	RF-FT11B448B6-A0	RF-FT11B460B6-A0	RF-FT11B464B8-A0	RF-FT11B480B8-A0
Power	480W/6 bars	600W/6 bars	640W/6 bars	800W/6 bars
product program	3000K+6500K+660nm +730nm			
Efficacy	2.7umol/J			
PPF	1296 umol/s	1620 umol/s	1728 umol/s	2160 umol/s
input parameter	AC100-227V/347-547V(50/60hz)			
PF value	≥0.9			
Viewing Angle	120°			
Dimming scheme	0-10V/1-10V			
quality guarantee	≥50000 Hours			

Main application fields of plant lights:  
cannabis plant factory, high-value medicinal plant cultivation,  
Dendrobium officinale cultivation, plant testing, etc.

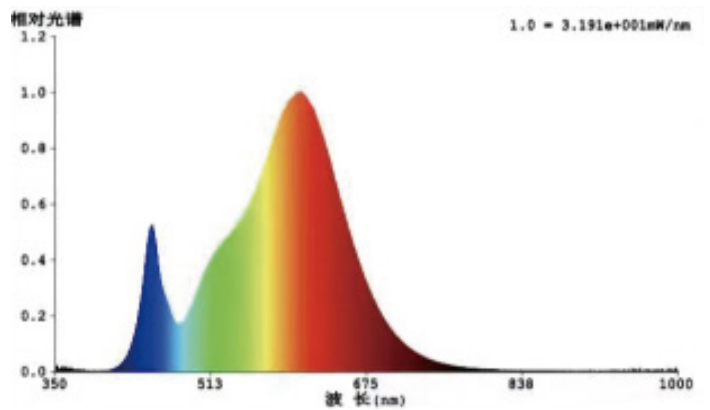
植物灯主要应用领域：  
大麻植物工厂，高价值医药植物种植，铁皮石斛种植，植物试验等。

## Plant light. - Dragon Fruit plant light

越南火龙果光谱  
Vietnamese dragon fruit spectrum



中国火龙果光谱  
Chinese dragon fruit spectrum



### 产品尺寸



- Part number: RF-QAZ2H075-Z1
- 1.VF: 100-277V 50/60Hz
  - 2.Light source matching scheme: full spectrum 4000K+660NM red light matching
  3. Irradiation distance :50-80CM
  4. Irradiation time: 7-10H/night
  5. Filling period: 2-4 months

- 产品品名: RF-QAZ2H075-Z1
- 1.工作电压: 100-277V 50/60Hz
  - 2.光源配比方案: 全光谱4000K+660NM红光搭配
  - 3.照射距离: 50-80CM
  - 4.照射时间: 7-10H/晚
  - 5.补光周期: 2-4月

### Product application features:

The product is widely used in dragon fruit, and the use of light at night can meet its growth needs for light, which can shorten its growth cycle, help better pollination, and also promote its off-season flowering. Improve fruit quality and yield. If the light time is short, it will affect its normal growth and reduce the quality and taste of the fruit. Therefore, at night, it is necessary to use light to fill the seedling period, increase the color and increase the growth of the fruit and the harvest period.

### 产品应用特点:

产品广泛用于火龙果,晚上使用灯照可以满足它生长对于光照的需求,从而能够缩短它的生长周期,帮助更好的授粉,还能促使它在反季节开花,在开花结果期间,还能提高果实的品质及产量。如果说光照时间短的话,就会影响它的正常长势,还会降低果实的品质和口感,因此在晚上就要用灯照补光育苗期,增色增加果实的生长,收获期等。



## Refrigerator Lights - Smart Refrigerator Lights



Module parameter table

Part No.	Module Size(mm)	Module Power(W)	SDCM	Efficiency(lm/W)	CRI	Viewing Angle	Color Temperature
RF-MTGAB2T11-A1	426.4*12*1.6	3-6	<5	100-120	>80	120°	Dual color temperature (brightness can be adjusted in a single segment)

### Characteristic:

1. High light efficiency and good color consistency.
2. Each module is equipped with a WS2811 IC for single-stage and single-color temperature, and realizes single-stage dimming and color temperature through different dimming schemes on the controller.
3. The length of the module can be customized according to different application specifications of customers.

### 特点:

1. 光效高、颜色一至性好。
2. 模组单段单色温都各配一颗WS2811的IC, 在通过控制器上不同调光方案实现单段调光、调色温。
3. 模组长度可根据客户不同应用规格进行定制。



长条灯主要应用场所: 各种酒柜、冰箱、冰柜等。

Main application places of strip lights: all kinds of wine cabinets, refrigerators, freezers, etc.



## Outdoor landscape lighting



LED洗墙灯  
LED Wall Washer



LED线条灯  
LED line lights



LED点光源  
LED point Light

Direct type ceiling lamp module parameter table

power	4W/6W/8W
(lm/W)	90-115lm/w
CRI	≥80
Viewing Angle	120-160°
SDCM	≤5

### Product Characteristics:

1. Color and color temperature: This type of product is divided into seven colors, full color, and monochrome, and the color temperature is controlled at around 2800-7100k.
2. Lighting angle: The light-emitting arc usually has three categories: narrow, medium, and wide, which are about 15, 60, and 120 degrees respectively. Currently, the farthest irradiation of high-power products is about 5-10 meters.
3. Control method: There are two types of control methods. Internal control refers to directly setting the light-on program inside the lamp, which cannot be adjusted from the outside, and the light cannot be changed. External control refers to an externally linked controller, which determines the irradiation through regulation. Effect. Perfectly outlines the contours of various building walls, taking into account both the lighting effect and the shape of the building itself

### 产品特点:

- 1.颜色 and 色温: 这类产品分七彩, 全彩还有单色, 色温把控在2800-7100k左右。
- 2.发光角度: 发光弧度通常有窄、中、宽三类, 分别是在15、60、120度左右, 目前大功率的产品最远照射是在5-10米左右。
- 3.控制方式: 控制方式分两类, 内控是指直接将灯亮程序设置到灯具的里面, 不能从外部调节, 而且灯光不可变动, 外控则是指外链接的控制器, 通过调控来确定照射的效果。完美勾勒出各种建筑物墙体的轮廓, 既要考虑照明效果, 又要兼顾建筑物本身的造型

主要应用场所: 建筑, 景观, 公园, 桥梁, 别墅等

Main application places: buildings, landscapes, parks, bridges, villas, etc.

## LED outdoor lighting products

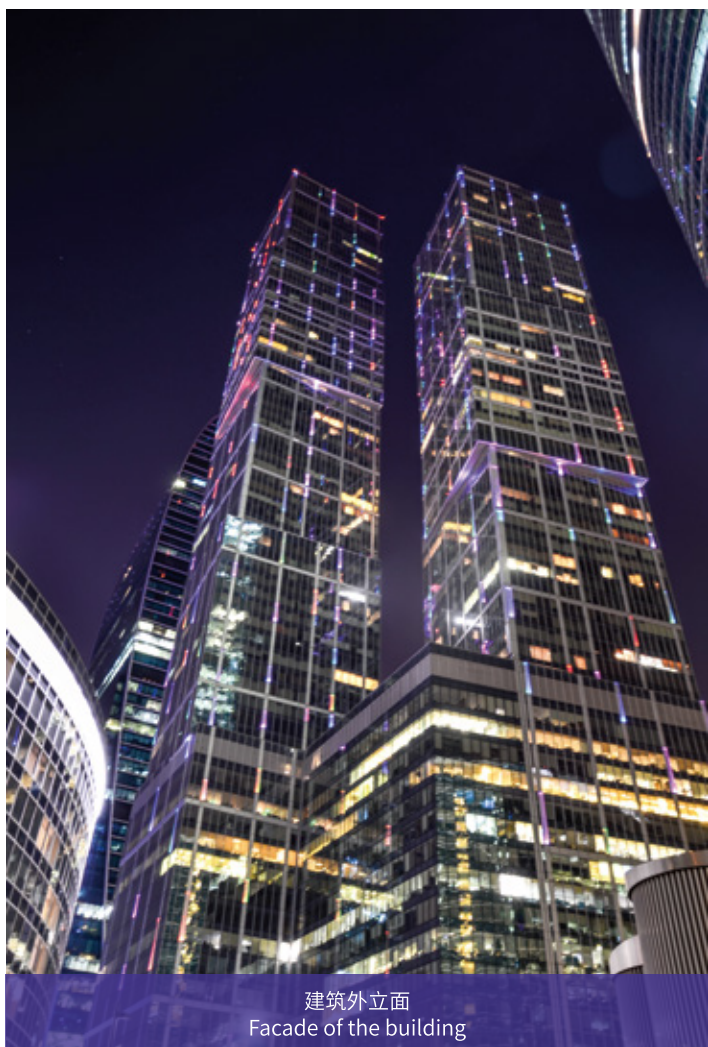
Product parameters			
Product type	LED Wall Washer	LED guardrail tube	LED point Light
VF	DC24V	DC24V	DC24V
Power	36/48/60/72W	10-12W	0.3/0.7/1.44W
control method	Monochromatic always on/DMX512	Monochromatic always on/DMX512	Monochrome always on/Internal control colorful/Breakpoint resume/DMX512
Viewing Angle	15/24/38°	120°	120-180°
LED	3030/5050	2835/3030/5050	3030/3535/5050
Ingress Protection Rating	IP65	IP65	IP65/IP68
Colour	RGB/R/G/B/Y/W/CW	RGB/R/G/B/Y/W/CW	RGB/R/G/B/Y/W/CW

### Main application places:

Panoramic floodlighting of interior and exterior walls such as lighting projects, commercial places, stages, ancient buildings, cultural squares, elevated overpasses, building exterior walls, building landmarks, etc. Landscape buildings, outdoor plazas, landscape objects, walls, and displays are painted. The main function is to light the wall so that the light can appear in various colors on the wall

### 主要应用场所:

亮化工程、商业场所、舞台、古建筑群、文化广场、高架立交桥、建筑外墙、建筑地标等内外墙面的全景式泛光照明。景观建筑物楼体，户外广场，景观物及墙面、陈列品刷色。主要功能是给墙面打光，让光在墙面上浮现各种颜色



## UV Series

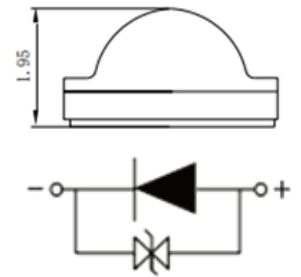
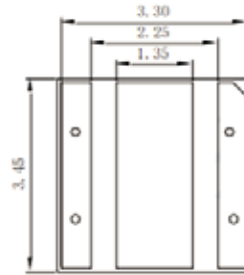
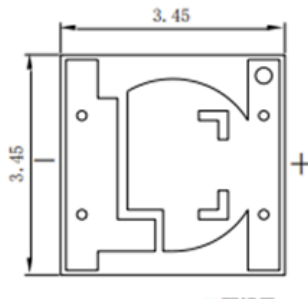
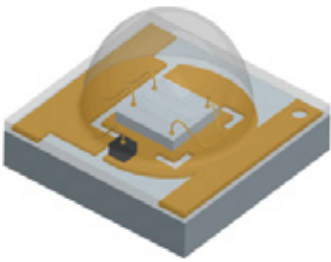
Mainly include 2835, 3535, 3737, 3838, 6565, 7070UVA, UVB, UVC products. The product has high luminous efficiency and good air tightness.

主要包含2835、3535、3737、3838、6565、7070UVA, UVB, UVC产品。产品光效高, 气密性好。

### UVA3535

Good reliability  
High air tightness  
High photosynthetic efficiency  
Customizable Specification

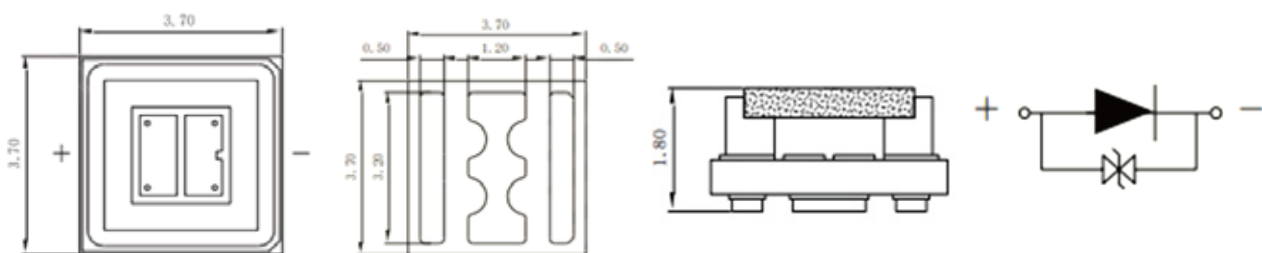
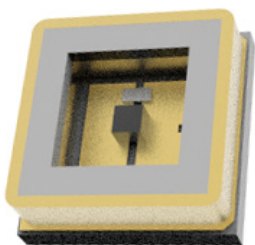
产品可靠性高  
气密性高  
高光效  
可定制规格



Part No.	Po(W)	$\lambda P$ (nm)	Vf(V)	If(mA)	$\Phi_e$ (mW)	$2\theta_{1/2}(\circ)$
RF-N35AEG36C-R11	1.5-1.9	365-370	3.0-3.8	500	675-940	120
RF-N35AEG38C-R11	2.1-2.6	380-390	3.0-3.8	700	1110-1545	120
RF-N35AEG39C-R11	2.1-2.6	390-400	3.0-3.8	700	1110-1545	120
RF-N35AEG40C-R11	2.1-2.6	400-410	3.0-3.8	700	1110-1545	120
RF-N35AEG41C-R11	2.1-2.6	410-425	3.0-3.8	700	940-1545	120
RF-N35AEG36B-R11	1.6-1.9	365-370	3.2-3.8	500	675-940	60
RF-N35AEG38B-R11	2.2-2.6	380-390	3.2-3.8	700	1110-1545	60
RF-N35AEG39B-R11	2.2-2.6	390-400	3.2-3.8	700	1110-1545	60
RF-N35AEG40B-R11	2.2-2.6	400-410	3.2-3.8	700	1110-1545	60
RF-N35AEG39B-R11	2.2-2.6	395-400	3.2-3.8	700	1110-1545	60
RF-N35AEG41B-R11	2.2-2.6	410-420	3.2-3.8	700	1110-1545	60
RF-N35AED36C-R11	1.5-1.9	365-370	3.0-3.8	500	575-940	120
RF-N35AED36B-R11	1.5-1.9	365-370	3.0-3.8	500	575-940	60

Good reliability  
 High air tightness  
 High photosynthetic efficiency  
 Customizable Specification

产品可靠性高  
 气密性高  
 高光效  
 可定制规格



Part No.	Po(W)	$\lambda P$ (nm)	Vf(V)	If(mA)	$\Phi_e$ (mW)	$2\theta_{1/2}(\circ)$
RF-C37AEA270-R11	0.09-0.17	270-280	4.5-8.5	20	1-6	120
RF-C37AEA276-R11	0.27-0.46	270-280	4.6-7.8	30	1-6	60
RF-C37AEC276-R11	0.27-0.45	270-280	4.6-7.6	100	6-15	60
RF-C37ANA270-R11	0.54-0.9	270-280	4.5-7.5	20	1-6	120
RF-C37ANA276-R11	0.27-0.45	270-280	4.5-7.5	20	1-6	60
RF-C37APD270-R11	0.54-0.9	270-280	4.5-7.5	150	10-25	120
RF-C37APC270-R11	0.54-0.9	270-280	4.5-7.5	100	3-15	120
RF-C37AUC270-R11	0.55-0.84	270-280	4.6-7.0	150	10-25	120
RF-C37AUC276-R11	0.27-0.42	270-280	4.6-7.0	150	10-25	60

## Plant light series

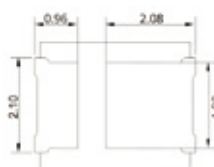
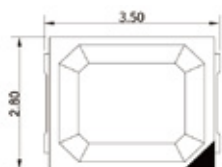
Products mainly include 2835, 3030 and 3535 (440nm, 660nm, 730nm) products. The product has high luminous efficiency and good air tightness.

产品主要包含2835、3030和3535 (440nm、660nm、730nm) 产品。产品光效高, 气密性好。

### 2835

Good reliability  
High air tightness  
Customizable Specification

产品可靠性高  
气密性高  
可定制规格

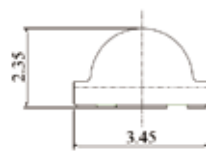
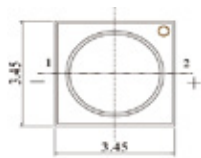
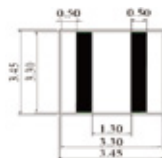
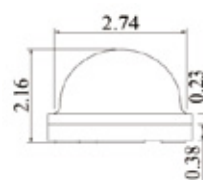
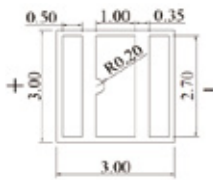
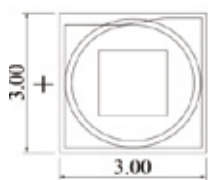
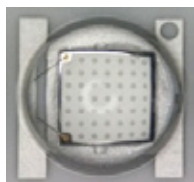


Description	Color	Part Number	Test current	VF (Typ) @IF	Wavelength/CCT	PPF (typ) @IF μmol/s	PPE (typ) @IF μmol/J	Angle
Horti2835 0.2/0.5W	Royal Blue	RF-AL-A28352H0RB-00	150mA	3.0	440-460nm	1.12	2.35	120°
	Deep Red	RF-AL-A28352H0DR-01	150mA	2.0	655-670nm	0.87	2.85	120°
	Far Red	RF-AL-T28352H0FR-00	150mA	1.9	725-740nm	0.70	2.50	120°

### 3030/3535

Good reliability  
High air tightness  
High photosynthetic efficiency  
Customizable Specification  
Q90 ≥ 36000H

产品可靠性高  
气密性高  
高光效  
可定制规格  
Q90 ≥ 36000H



Description	Color	Part Number	Test current	VF (Typ) @IF	Wavelength/CCT	PPF (typ) @IF μmol/s	PPE (typ) @IF μmol/J	Angle
Horti3535	Royal Blue	RF-AL-C3535L2K1RB-00	350mA	2.6-3.2	450-460nm	2.6-2.8	2.6-2.9	120°
	Far Red	RF-AL-C3535L2K1FR-00	350mA	1.8-2.4	725-740nm	2.4-2.7	3.3-3.8	120°
	Deep Red	RF-AL-C3535L2K1DR-00	350mA	2.0	655-670nm	2.450	3.500	120°
	Deep Red	RF-AL-C3535L2K1DR-01	350mA	1.95	655-670nm	2.946	4.32	120°
Horti3030	Deep Red	RF-AL-C3030L2K1DR-00	350mA	2.0	655-670nm	2.610	3.700	120°

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#### Thal Technologies

Add: Grindzuigerstraat 9 - Almere –  
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Tel: +31 36 202 60 60  
Email: info@thal-technologies.com

### Russia

#### Distributor in Russia - Led-Components LLC

Add: 77,78, Paralnaya str., 3/1A,191014 St.  
Petersburg Russian Federation - Led-Com-  
ponents LLC.  
Tel: +7-812-309-84-83  
Email: order@led-components.com  
Web: www.led-components.com

### Russia

#### Distributor in Russia - Platan LLC

Add: Begovaya str. 6A , 125284 Moscow  
Russian Federation - Platan LLC  
Tel: +7 495 252 07 77  
Email: larionov@platan-energo.ru  
Web: www.platan.ru

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---

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Blvd - Yazd - Iran  
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Fax: (+98)35 - 35238077  
Email: info@refondiran.com

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#### Refond Opto Korea (Except Automotive business)

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