



深圳东裕光大电子有限公司
广州市东裕光电科技有限公司

产品规格书

SPECIFICATION

客户名称 CUSTOMER	
产品名称 PRODUCTION	对射式（槽型）光电开关 Transmissive Sensor
产品型号 MODEL	DY-KIT3032S
版本号 VERSION NO	A1.0

地址(Add): 深圳市光明区凤凰街道光明大道 481 号乐府广场 1B 栋 1609-1611 室

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客户确认 CUSTOMER CONFIRMATION	审 核 CHECKED BY	编 制 PREPARED BY
	周毅兴	陈少龙

产品描述 Descriptions

- 对射式（槽型）光电开关
(An transmissive sensor)

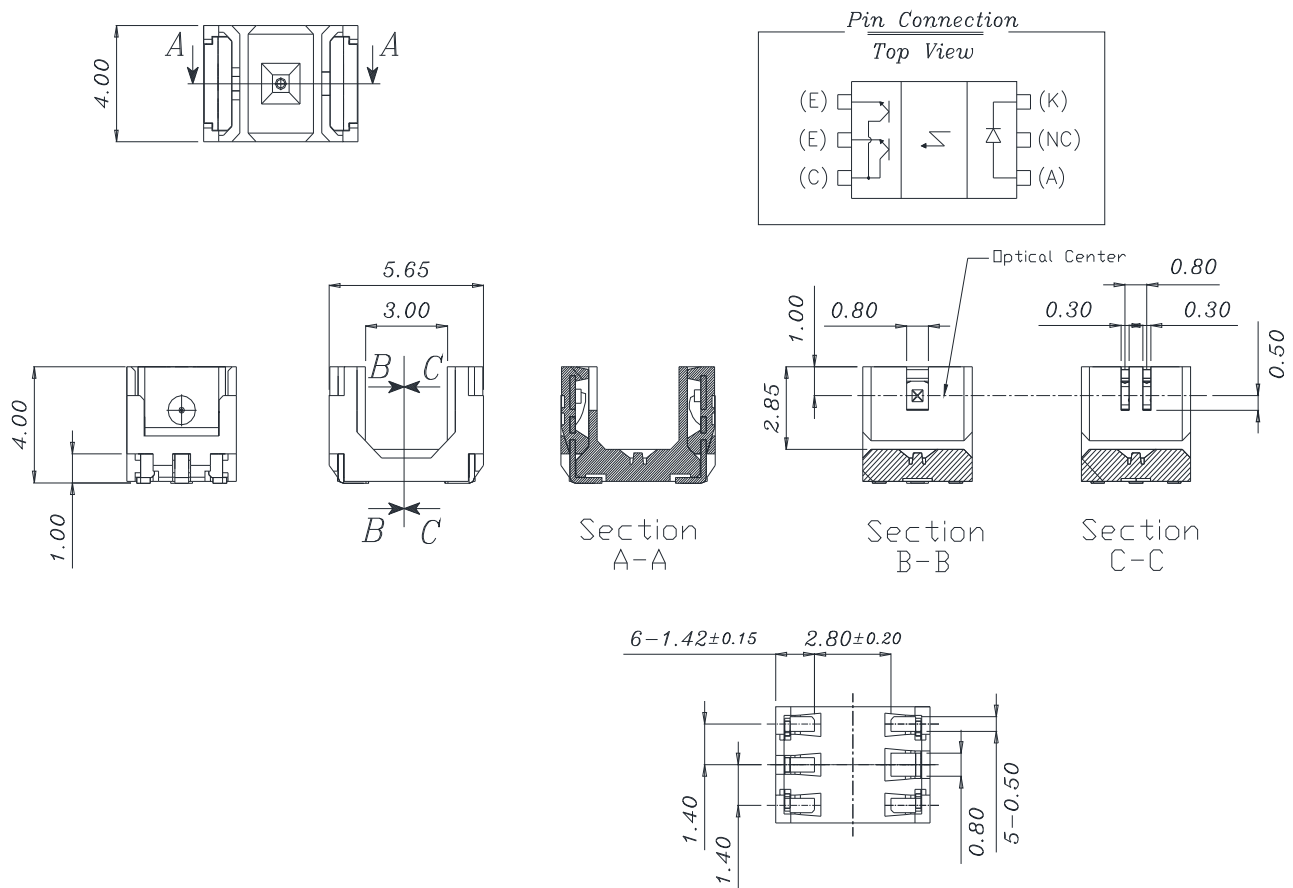
产品特性 Features

- 可靠性高 (High reliability)
- 响应时间快 (Fast response time)
- 解析度高 (High analytic)
- 敏感度高 (High sensitivity)
- 截止波长 940nm (Cut-off visible wavelength $\lambda_P=940\text{nm}$)
- 无铅 (Pb free)
- 符合 RoHS 要求 (This product itself will remain within RoHS compliant version)

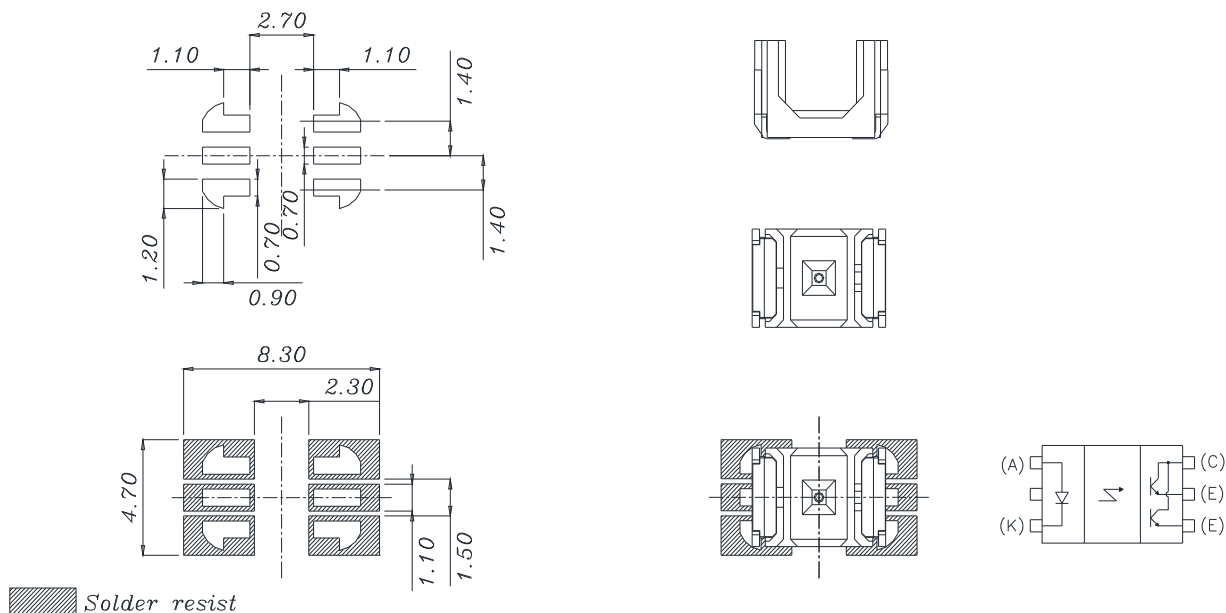
产品应用 Applications

- 鼠标 (Mouse Copier)
- 码盘 (Switchc Scanner)
- 非接触式开关 (Non-contact Switching)
- 智能家电 (Smart Appliances)

一、外形图及建议焊盘尺寸 Package Profile & Soldering PAD Suggested



Recommended Solder Pad



注(Notes): 1、所有尺寸均以毫米为单位(All dimensions are in millimeters)。

2、尺寸公差值为±0.25mm(Tolerances unless dimensions ±0.25mm)。

※备注: 承认书之编号和型号可用于查询, 客户如有需要, 请提供相应的编号和型号。

Remark: P/N & Model in samples approval sheet can be used to inquire, please provide corresponding P/N & model if customer need.

二、光电参数 Electro-Optical Characteristics

（环境温度 Ambient temperature: 25°C, 环境湿度 Humidity: RH60%）

项目 Item		符号 Symbol	测试条件 Test condition	最小值 Min.	典型值 Type	最大值 Max..	单位 Unit.
输入 Input	正向电压 Forward voltage	V _F	I _F =20mA	-	1.2	1.4	V
	反向电流 Reverse current	I _R	V _R =5V	-	-	10	μA
	峰值波长 Peak wavelength	λ _p	I _F =15mA	-	940	-	nm
输出 Output	暗电流 Dark Current	I _{CEO}	V _{CE} =20V, 0Lux	-	1	100	nA
	C-E 饱和电压 C-E Saturation Voltage	V _{CE(sat)}	I _F =15mA, I _c =0.05mA	-	-	0.4	V
集电极电流(*) Collector Current(*)		I _{C(ON)}	V _{CE} =5V,I _F =15mA	0.3	-	-	mA
响应时间 Response Time	上升时间 Rise Time	T _R	V _{CE} =5V,I _c =0.3mA R _L =100Ω	-	25	150	
	下降时间 Fall Time	T _F		-	50	150	

注(Notes): *正向电压公差范围(Forward voltage tolerance): $\pm 0.1\text{V}$

*辐射强度公差范围(Radiant intensity tolerance): $\pm 10\%$

*波长公差范围(wavelength tolerance): $\pm 1.0\text{nm}$

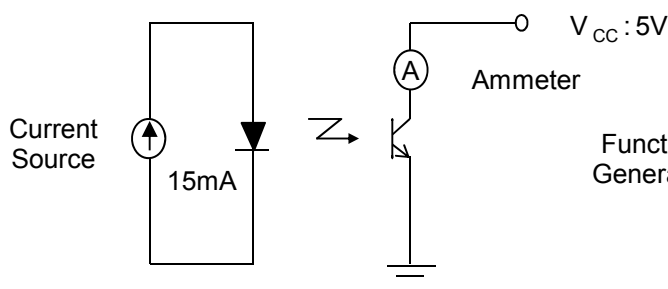


Fig 1. Test Circuit for I_C

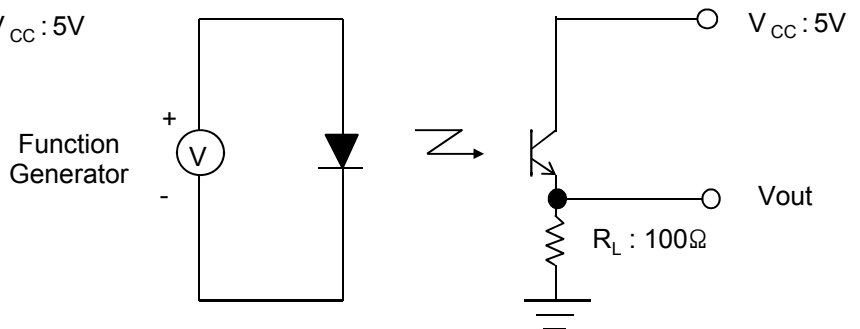


Fig 2. Test Circuit for Rise and Fall Time

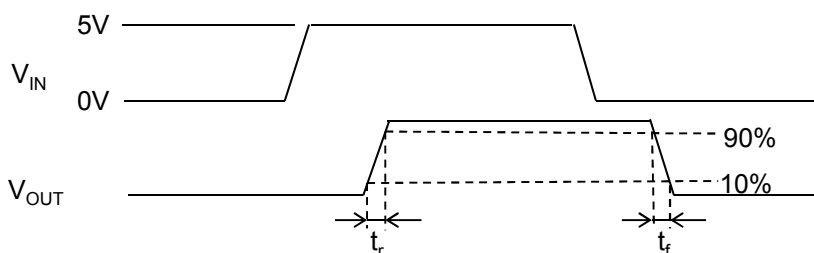


Fig 3. Definitions for Response Times

三、设计注意事项 Design Considerations

1. 设计指南 Design guide

防止检测错误 Prevention of detection error

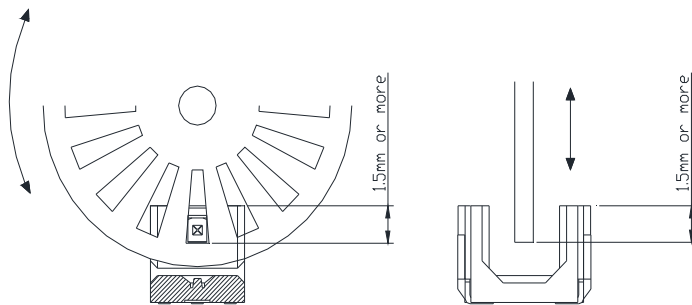
为防止光中断器因外界光而导致故障工作，检测面不要设置为外部的光。

To prevent photointerrupter from faulty operation caused by external light, do not set the detecting face to the external light.

不透明板位置 Position of opaque board

不透明板应安装在距元件顶部 1.6mm 或以上的地方。Opaque board shall be installed at place 1.6mm or more from the top of elements.

(例子)(Example)



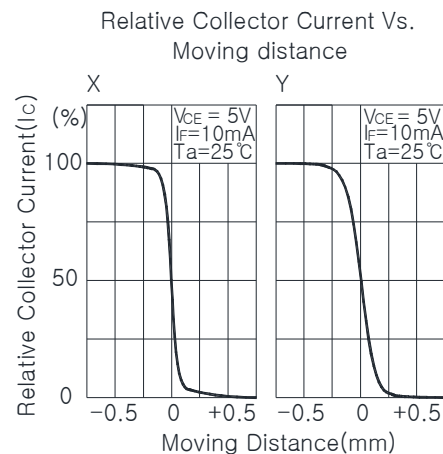
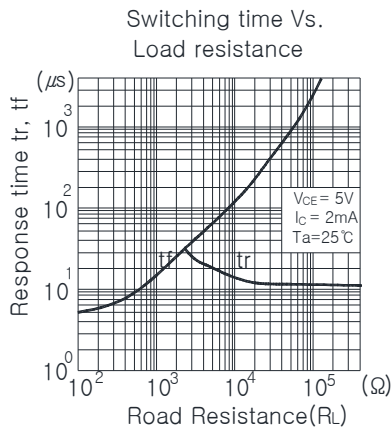
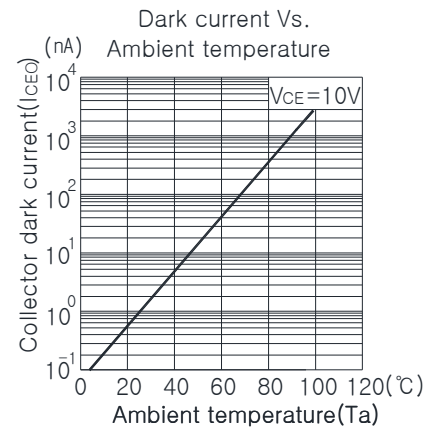
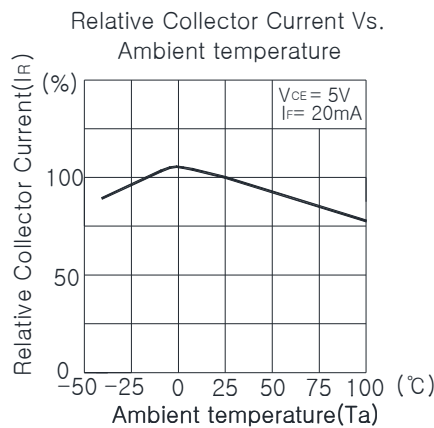
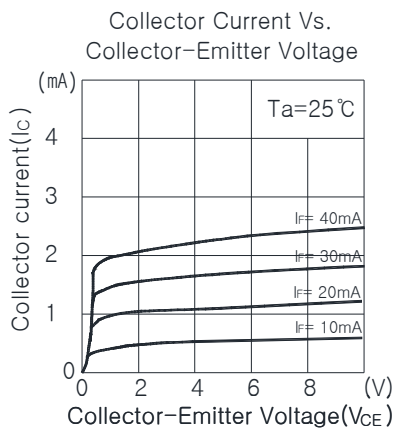
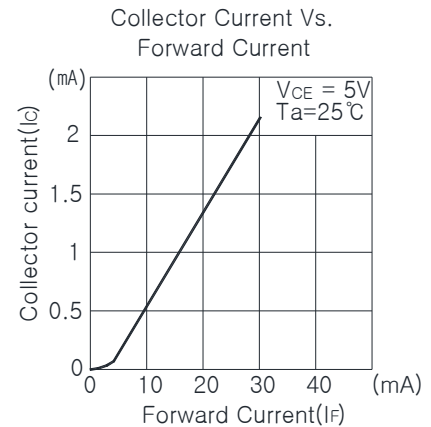
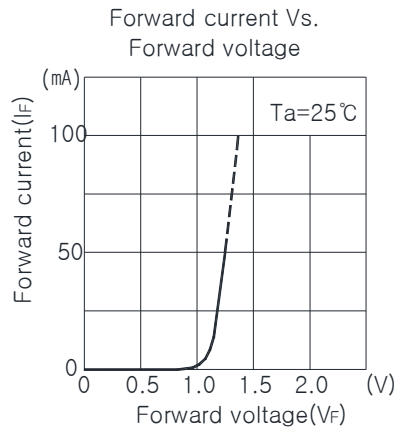
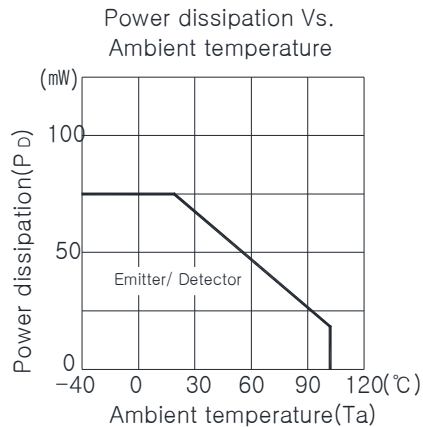
2. 衰减 Degradation

一般情况下，用于光遮断器的 IRED 的发射会随着时间的推移而降低。如果长期使用，请取一般的 IRED 光衰情况 (5 年光衰 50%) 纳入设计考虑。

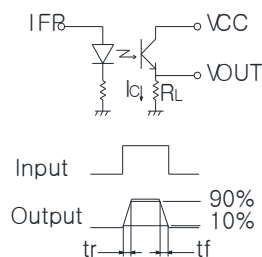
In general, the emission of the IRED used in photointerrupter will degrade over time.

In the case of long term operation, please take the general IRED degradation (50% degradation over 5 years) into the design consideration.

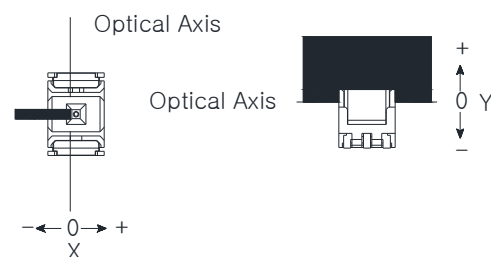
四、典型光电特性曲线图 Typical photoelectricity characteristic curve chart:



Switching time measurement circuit



Method of measuring position detection characteristic



五、极限参数 Absolute Maximum Rating:

（环境温度 Ambient temperature: 25°C, 环境湿度 Humidity: RH60%）

项目 Item		符号 Symbol	数值 Value	单位 Unit	备注 Remark
输入 Input	常温下功耗 Power Dissipation	Pd	75	mW	at(or below) 25°C Free Air Temperature
	反向耐压 Reverse Voltage	V _R	5	V	---
	正向电流 Forward Current	I _F	50	mA	---
	正向峰值电流 Peck forward current	I _{FP}	1	A	Pulse width ≤100μs, Duty cycle=1% tw=100 μsec, T=10 msec
输出 Output	集电极功耗 Collector Power Dissipation	Pc	75	mW	---
	集电极电流 Collector Current	Ic	20	mA	---
	C-E 电压 Collector-Emitter Voltage	BV _{CEO}	30	V	
	E-C 电压 Emitter-Collector Voltage	BV _{ECO}	5	V	
使用温度 Operating Temperature		Topr	-40~+105	°C	No icebond or dew
储存温度 Storage Temperature		Tstg	-40~+105	°C	
焊接温度 Soldering Temperature		Tsol	260	°C	For 5S or less
回流焊温度 Reflow Soldering Temperature		Tsol	245	°C	

六、可靠性实验项目 Reliability Test Project:

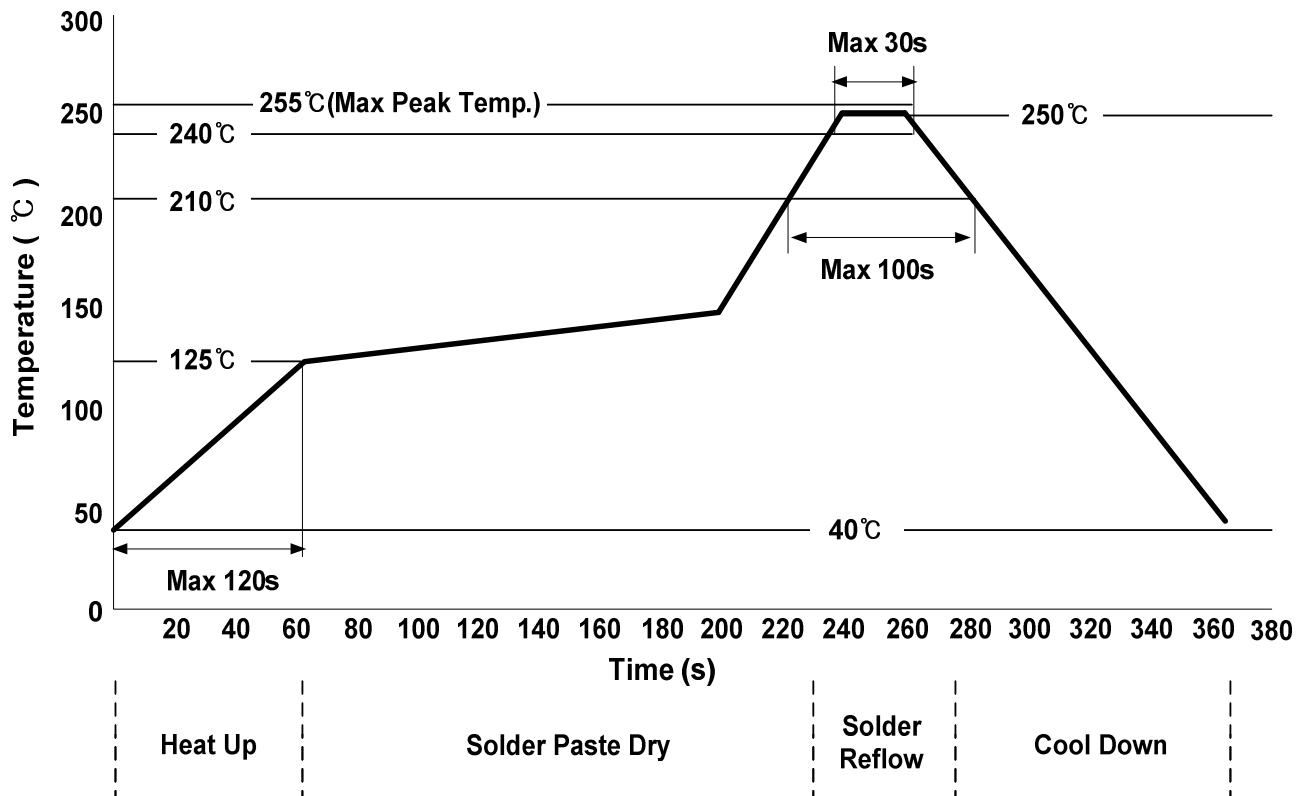
Test item	Test conditions	Failure Judgement Criteria	Samples (n)
			Defective(C)
Pre-Conditioning	MSL Level 3	N/A	
Parametric Verification	-40℃, 25℃, 105℃	-	n = 22, C = 0
Temperature Cycling	-40℃/+ 105℃, 20 Cycles	$V_F \geq U \times 1.2$ $I_R \geq U \times 2$ $I_{CEO} \geq U \times 2$ $I_C \leq L \times 0.8$	n = 22, C = 0
High Temperature Reverse Bias	105℃, 168h Emitter : $V_R = 4V$, Detectors : $V_{CEO} = 5V$		n = 22, C = 0
High Humidity High Temperature Reverse Bias	85℃/85%RH, 168h Emitter : $V_R = 4V$, Detectors : $V_{CEO} = 5V$		n = 22, C = 0
Power and Temperature Cycle	Emitter : $I_F = 20mA$ DC, Detectors : $V_{CE} = 5V$		n = 22, C = 0
ESD	HBM : $\pm 2kV$, MM : $\pm 200V$		n = 22, C = 0

* U : Upper specification limit, L : Lower specification limit

七、注意事项 Note:

► Soldering Method

● Recommended Lead-Free Reflow Soldering Temperature Profile



Preheat Temperature 40°C to 125°C = Max 120s.
 Temperature Maintain above 210°C = Max 100s
 Peak Temperature = 245 - 255°C
 Time above 245°C = Max 30s

Hand soldering

Hand soldering should be completed within 3 s when the point of solder iron is below 350°C.

Please solder within one time.

Please don't touch the terminals directly by soldering iron.

Soldered product shall treat at normal temperature.

Other notice

Please take care not to let any external force exert on lead pins.

Please test the soldering method in actual condition and make sure the soldering works fine, since the impact on the junction between the device and PCB varies depending on the cooling and soldering conditions.

*Note

Lead(Pb)-Free Reflow Solder Profile accepts. J-STD-020D.1.

► Manufacturing Guidelines

● Storage and management after open

Storage condition

Storage temp.: 5 to 30°C, Storage humidity : 70%RH or less at regular packaging.

Treatment after opening the moisture-proof package

After opening, you should mount the products while keeping them on the condition of 5 to 25°C and 70%RH or less in humidity within 7 days.

After opening the bag once even if the prolonged storage is necessary, you should mount the products within two weeks.

And when you store the rest of products you should put into a DRY BOX. Otherwise after the rest of products and silicagel are sealed up again, you should keep them under the condition of 5 to 30°C and 70%RH or less in humidity.

Baking before mounting

When the above-mentioned storage method could not be executed, please process the baking treatment before mounting the products.

However the baking treatment is permitted within one time.

Recommended condition : 125°C, 16 to 24 hours

*Do not process the baking treatment with the product wrapped. When the baking treatment processing, you should move the products to a metallic tray or fix temporarily the products to substrate.

● Cleaning instructions

Solvent cleaning :

Solvent temperature should be 45°C or below. Immersion time should be 3 minutes or less.

Ultrasonic cleaning :

Do not execute ultrasonic cleaning.

Recommended solvent materials :

Ethyl alcohol, Methyl alcohol and Isopropyl alcohol.

► Quality Assurance Inspection

7-1. Inspection Form

MIL-STD-105D, Normal Inspection, Single sampling inspection.

7-2. Inspected Items and Standards

Item	Class	Judgement factor	AQL
Collector Current (I_C) Dark Current(I_{CEO})	Major	Satisfies the 5th item of the Electro-Optical Characteristics.	0.065%
Exterior (Crack, Chip, Dirt, etc.)	Minor	Those that effect the 5th item of the Electro-Optical Characteristics are not good.	0.25%

► Cautions in Usage

8-1. Store product where there is no exterior force causing product to be deformed or change in quality.

8-2. Store and use where there is no hydrogen sulfide gas etc, causing corrosion.

8-3. Use active area where there is no direct light. Sunlight and tungsten lamp light.

8-4. Do not allow dirt or dust to fill in the slit part.

8-5. Desing the gobo so that it covers the slit.

8-6. Take into consideration the drop in the emitting diode's output on continuous use.

8-7. Solder the lead pin under the rating conditions. Do not apply any unnecessary force to the lead pin during and after soldering.



- 8-8. Use ethyl alcohol, methyl alcohol, iso-propylene alcohol for cleansing and do not place product in the mentioned three alcohols for more than threeminutes.
Be sure that there is no flux on the active area the emitting area or it may cause the light quantity to reduce.

9. Guarantee Period and Scope

9-1. Period of Guarantee

1 year after delivery to designated place.

9-2. Scope

Replacement of products will be done, if any problems lie in out company's products.
However, we are not liable for your damage by lack of caution.

10. Others

- 10-1. This product is not designed against radiative rays, electro-magnetic waves or rays that have heavily charged particles.
10-2. Synthetic resin is used in the package.
10-3. Electricity is used for input and output.
10-4. If any doubts concernig on this specification will be discussed and solved by both parties concerned.