



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	光敏三极管贴片 SMD Phototransistor
产品型号 MODEL	DYWH-PT12-21B/2T
版本号 VERSION NO	A1.0

地址(Add): 广东省广州市番禺区石基镇海涌路 3 号 10 号厂房 2 楼

电话(Tel): 18038161512

传真(Fax): 020-39966833

网址(Net): www.tonyuled.cn www.tonyuled.com



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

DYWH-PT12-21B/2T



产品描述 Descriptions

- DYWH-PT12-21B/2T 是一种微型 SMD 封装的光电晶体管，在一个黑色的平顶透镜。
(DYWH-PT12-21B/2T is a phototransistor in miniature SMD package which is molded in a black with flat top view lens.)
- 该器件是光谱匹配的可见光和红外发射二极管。
(The device is Spectrally matched to visible and infrared emitting diode.)

产品特性 Features

- SMD 光电三极管 (SMD Phototransistor)
- 响应时间快 (Fast response time)
- 高灵敏度 (High photo sensitivity)
- 无铅 (Pb free)
- 符合 RoHS 要求 (This product itself will remain within RoHS compliant version)

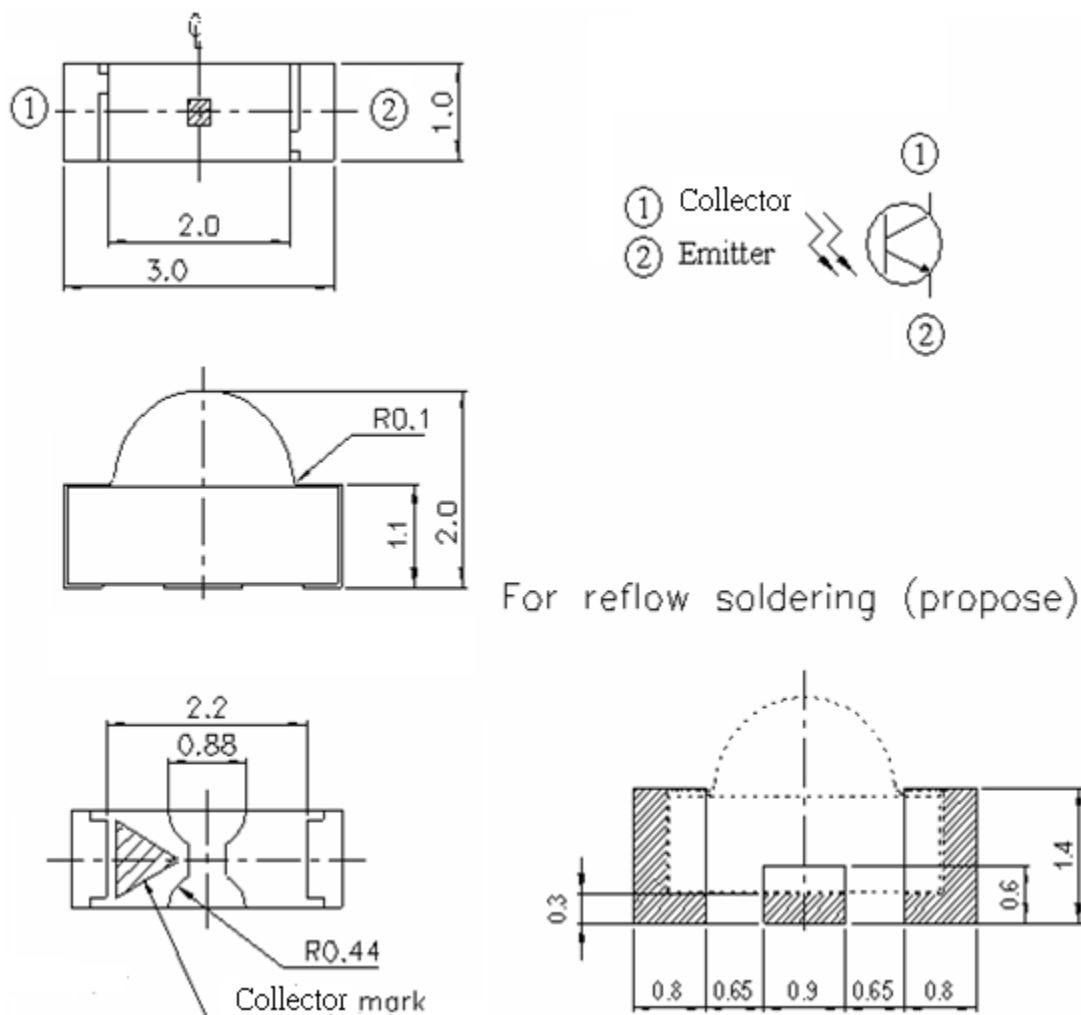
产品应用 Applications

- 打印机 (Printer)
- 烟感 (Smoke detector)
- 红外应用系统 (Infrared applied system)
- 光电开关 (Switch)

包装方式 Packing Quantity Specification

- 编带 2000 个/卷 (2000PCS/rolls)

一、外形图 Outline dimensions:



Notes: 1. All dimensions are in mm, tolerance is ± 0.1 unless otherwise noted.

单位 Unit	公差 Tolerance	芯片材料 Die material	发光颜色 Emission color	胶体颜色 Lens color
mm	± 0.1 mm	Silicon	—	Black

※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.
集-射极崩溃电压 Collector-Emitter Breakdown Voltage	BV _{ceo}	I _c =100uA E _e =0mW/cm ²	30	-	-	V
射-集极崩溃电压 Emitter-Collector Breakdown Voltage	BV _{eco}	I _E =100uA E _e =0mW/cm ²	5	-	-	
集-射极饱和电压 Collector-Emitter Saturation Voltage	V _{ce(sat)}	I _c =2mA E _e =1mW/cm ²	-	-	0.4	
集极暗电流 Collector Dark Current	I _{CEO}	E _e =1mW/cm ² V _{CE} =20V	-	-	50	nA
集极光电流 On State Collector Current	I _{c(on)}	E _e =1mW/cm ² V _{CE} =5V	0.76	1.0	-	mA
光谱带宽 Rang of spectral Band width	λ _{0.1}	---	730	-	1100	nm
峰值波长 Peak wavelength	λ _p	---	-	940	-	nm

Intensity Specifications for Bin Grading :

Rank	Test condition	Min	Max	Unit
BIN 3	V _{CE} =5V E _e =1mW/cm ² λ _P =940nm	0.76	1.90	mA
BIN 4		1.14	2.60	
BIN 5		1.77	---	

Notes): *正向电压公差范围(Forward voltage tolerance): ±0.1v
*光电流公差范围(Collector Current tolerance): ±10%
*波长公差范围(wavelength tolerance): ±1.0nm

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

Fig.1 Collector Power Dissipation vs. Ambient Temperature

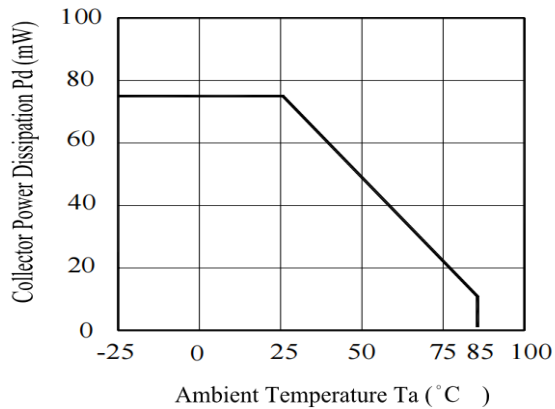


Fig.2 Spectral Sensitivity

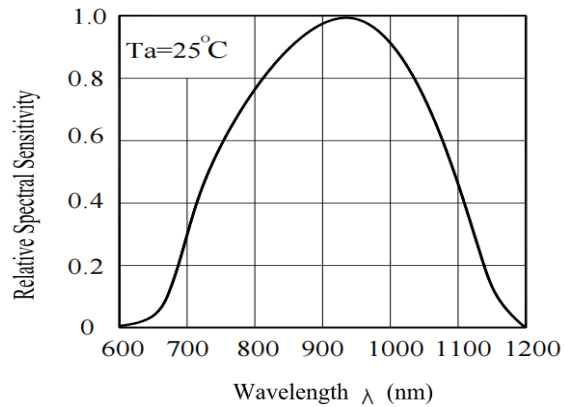


Fig.3 Relative Collector Current vs. Ambient Temperature

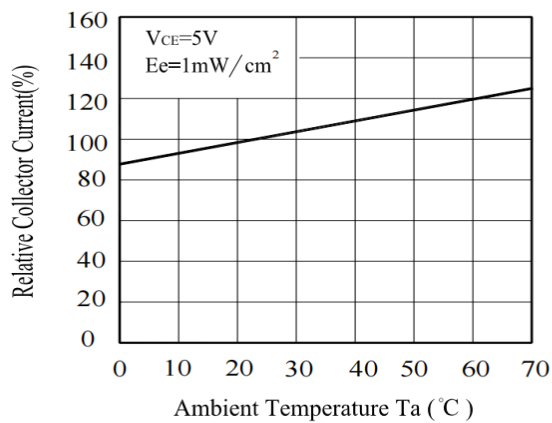


Fig.4 Collector Current vs. Irradiance

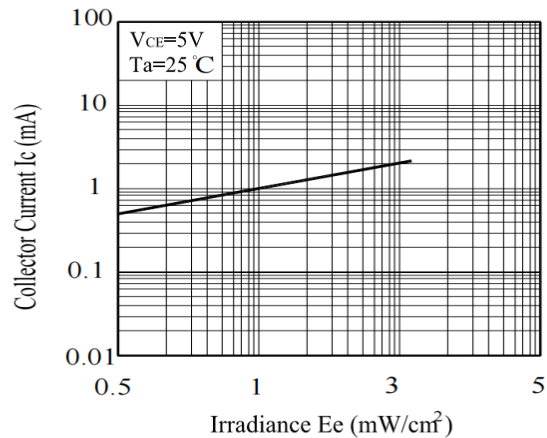


Fig.5 Collector Dark Current vs. Ambient Temperature

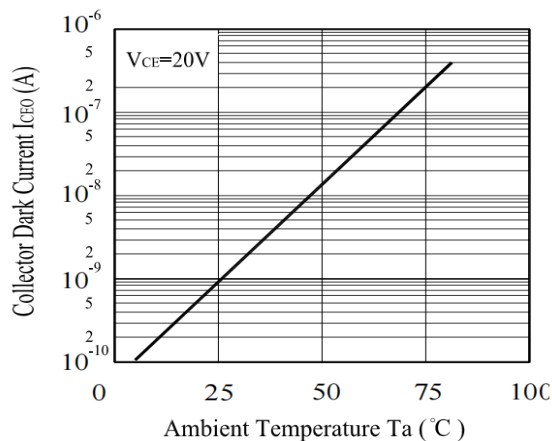
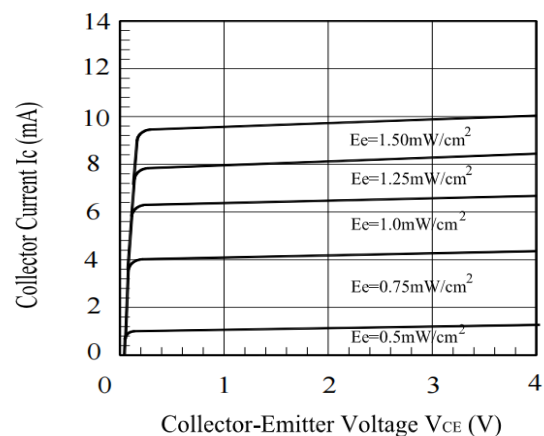


Fig.6 Collector Current vs. Collector-Emitter Voltage





四、极限参数 Absolute Maximum Rating:

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

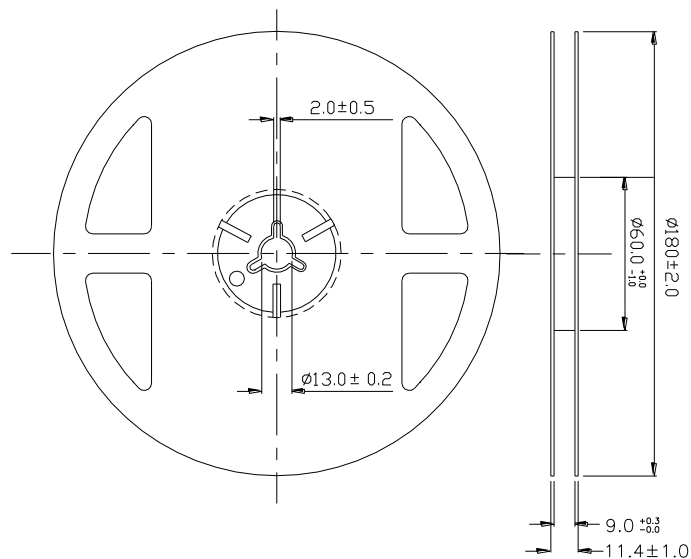
项目 Item	符号 Symbol	数值 Value	单位 Unit	备注 Remark
集电极-发射极电压 Collector-Emitter Voltage	V _{CEO}	30	V	---
发射极-集电极电压 Emitter-Collector-Voltage	V _{ECO}	5	V	---
集电极电流 Collector Currente	I _c	50	mA	---
耗散功率 Power Dissipation	P _d	75	mW	---
工作环境温度 Operation temperature	T _{amb}	-25 至+85	°C	---
贮藏温度 Storage temperature	T _{stg}	-40 至+85	°C	---
焊接温度*1 Soldering temperature	T _{sol}	260	°C	回流焊 Reflow soldering : 260 °C for 5 sec. 手工焊 Hand soldering: 300°C for 3 sec.
Notes*1: Solding time ≤5 seconds.				

五、可靠性实验项目 Reliability Test Project:

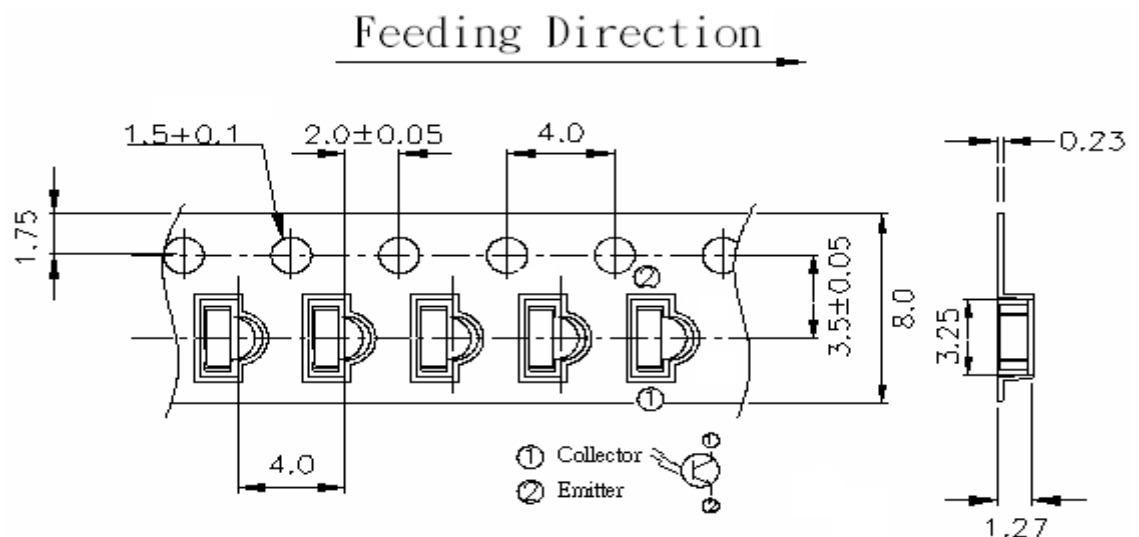
描述 Description	项目 Item	测试标准 Test criterion	测试条件 Test condition	测试时间 Test time	数量 Qty.	失效数量 Fail Qty.
寿命测试 Life test	常温寿命测试 Life test (room temperature)	JIS7021:B4	Ta=25°C±5°C, IF=20mA	1000Hrs	22	0
环境测试 Ambience test	高温存储 High temperature store	JIS7021:B10 MIL-STD-202:210A MIL-STD-750:2031	Ta=85°C±5°C	1000Hrs	22	0
	低温存储 Low temperature store	JIS7021:B12	Ta= -35°C±5°C	1000Hrs	22	0
	高温高湿测试 High temperature/ humidity test	JIS7021:B11 MIL-STD-202:103D	Ta=85°C±5°C RH=85%	1000Hrs	22	0
	冷热冲击测试 Cold / Heat strike test	JIS7021:B4 MIL-STD-202:107D MIL-STD-750:1026	30min -10°C±5°C←→100°C±5°C 5min 5min	50Cycles	22	0
	冷热循环测试 Cold and heat cycle test	JIS7021:A3 MIL-STD-202:107D MIL-STD-705:105E	5min 5min 5min -35°C~25°C~85°C~-35°C 30min 5min 30min 5min	50Cycles	22	0

六、包装规格 Packing Specification

(1) 卷轴包装尺寸 Package Dimension

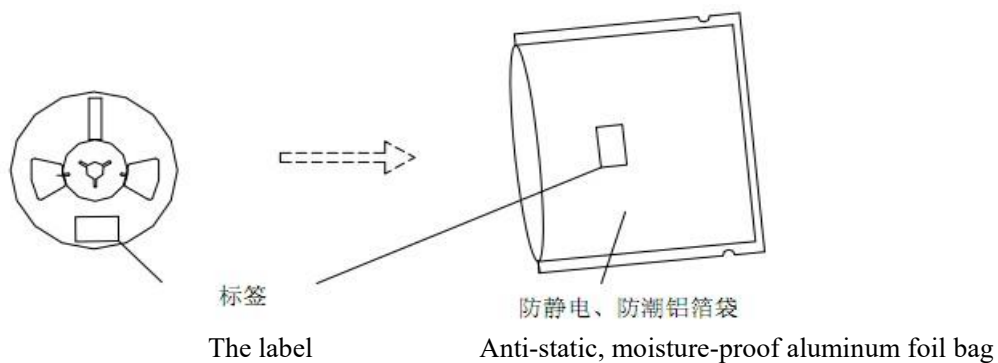


(2) 载带编带的尺寸 Carrier Tape Dimension



装载数量 Loaded Quantity
2000 个/卷 (2000PCS/rolls)

(3) 标签及标识/ Label Explanation:



七、使用注意事项 Precautions For Use

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the Phototransistor should be kept at 10°C~30°C and 90%RH or less.

2.3 The Phototransistor suggested be used within one year.

2.4 After opening the package, the devices must be stored at 10°C~30°C and $\leq 60\%RH$, and used within 168 hours (floor life). If unused Phototransistor remain, it should be stored in moisture proof packages.

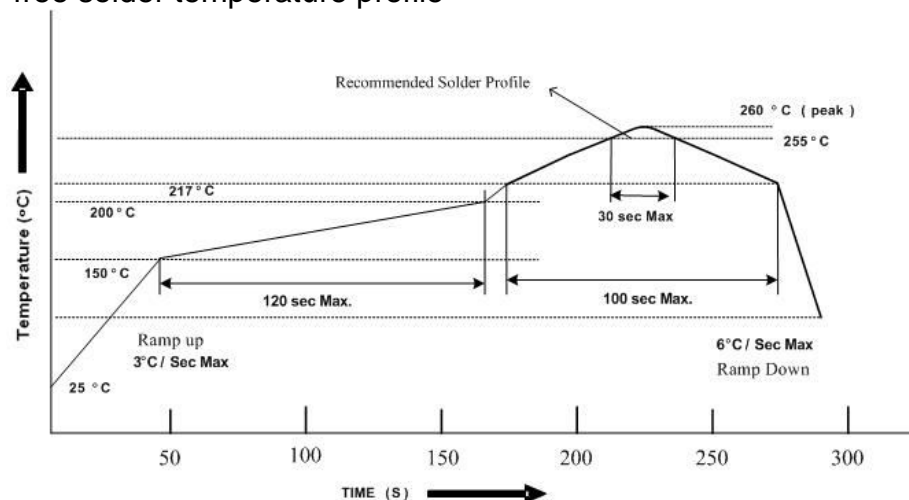
2.5 If the moisture absorbent material (desiccant material) has faded or unopened bag has exceeded the shelf life or devices (out of bag) have exceeded the floor life, baking treatment is required.

2.6 If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure or recommend the following conditions:

96 hours at 60°C $\pm 5^\circ\text{C}$ and $< 5\% RH$ (reeled/tubed/loose units)

3. Soldering Condition

3.1 Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the Phototransistor during heating.

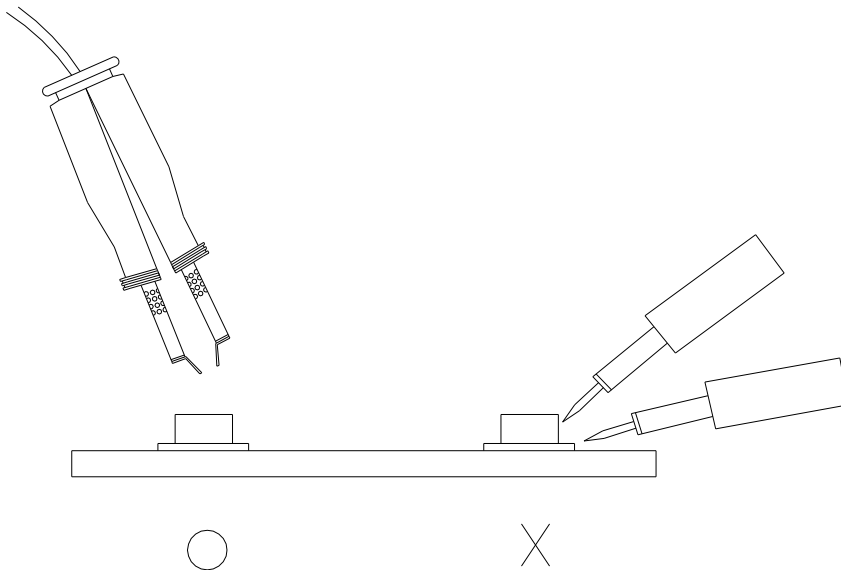
3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

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



八、免责声明 DISCLAIMER

1. TONYU reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets TONYU published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. TONYU assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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