

深圳市欧恩光电技术研究所

On Institute of Optical & Electronic Technology

SEE THE WORLD IN A NEW PHOTOELECTRICITY

Po188 Apply scheme intro——Advanced applying occasion



Popular application devices:

➤ NOKIA/ MOTO/ LG Mobile phone :

- 1. Sense the environment light to auto- adjust keyboard backlight and LCD lightness
- 2. Sense the environment light to auto- adjust the phone ' s volume
- 3. Avoid the screen too light to strain your eyes in darkroom, simultaneously power

➤ HP/ Sharp Notebook/ LCD Display :

- 1. Sense the environment light to auto-adjust the screen lightness and color
- 2. Save power 30%, simultaneously more smart to protect your eyes.

➤ Skyworth 4 ' S auto illumination- adjust screen LCD TV

- 1. Sense the environment light to auto-adjust lightness and color.
- 2. Save power about 30%,no glare, and more healthy.

➤ ??高 ???物品 / GPS :

- 1. Sense the environment light to auto power on panel ' s backlight
- 2. Sense the environment light to auto-adjust lightness and color
- 3. Auto turn on/off car light, more safely and more save power.

➤ Digital camera

- 1. Sense the environment light to auto turn on photoflash lamp
- 2. Sense the environment light to auto control the aperture

光感屏变



▶ 传统液晶

高亮度图像在正常观看时特别是暗环境下会有刺眼的感觉，容易引起视觉疲劳

▶ 重新播放



▶ 屏变液晶

光感屏变

通过光感屏变智能调整背光源亮度，将背光亮度调至与周围环境光亮度相适应的最佳值，在一定程度上缓解亮度刺眼的问题。

Po188 Application scheme intro——世界主要可见光传感器对照表

Corp.	Type and Package	Spectrum Peak Value (nm)	Photo current 10 Lux(μ A)	Photo current 100Lux (μ A)	Merit	Demerit	Applicability
PerkinElmer	VTP1220 FB	----			Visible Si Cell	No amplifier, need filter glue Package	High Price
TAOS	TSLB/G	450 /550			??型三端元器件, linearity, applied at high luminance。	Better work above 50 lux	High Price
Microchip	LX1972	----	12	18	Linearity, applied at high luminance	Better work above 50 lux	High Price
Avago	HSDL-9002	----		10	Linearity, applied at low luminance.	Better work above 50 lux	High Price
Sharp	IS474	----		10	3-pin Vout, Linearity, applied at high luminance.	Better work above 50 lux	High Price
Panasonic	AMS104Y	---	13@5 lux	260	Linearity, applied at low luminance.	Better work above 5 lux	High Price
Po188	Po188 SMD1206	520	300	500	Linearity, IC COMS crafts, sensitive to visible light, low luminance response.	The Cost is higher than phototransistor, work above 0.1 lux	Most circuit is used directly. The application circuit is simple.
On9668	On9668 DIP/SMD	520	20000	20000	Logic ON/OFF output, Stability/Consistency, multi-user circuit include.	The cost is high than the common phototransistor, 4Pin package. And one pin is used to adjust	Multilevel amplifier and ON/OFF circuit is enclosed, dispense with periphery component. The top drawer photo

Po188 Application scheme intro——我们的研发团队

The institute has a expert team engaging in a photovoltaic semiconductor chip design, micro controller programming and functional optical materials for years. The design of semiconductor products involves discrete devices, hybrid integrated circuits, photoelectron devices, sensors signal processing, microprocessors, timer, power semiconductors, power supply management chips, optical device packaging material and so on. We offer ODM for users. The Institute has a number of independent intellectual property rights, and has the unique patented technology especially in the photovoltaic sensitive chips and sensors. Our development team can complete the programme from the basic photovoltaic chip design, character simulation, territory design, wafer processing , testing, packaging, and device serialization services.

On Institute of optical & electronic technology is a sector of professional photovoltaic semiconductor device research and development, design and manufacture of microelectronics Institute approved by the Shenzhen municipal government. ????



Po188 Application scheme intro——我们的生产能力

Sign up agreement with Shenzhen Jiuzhou optoelectronics Co, Ltd (Jiuzhou Group<State 378 Factory>), which offer OEM for us.

Shenzhen JiuZhou Photoelectron Co., Ltd. is a branch of Jiuzhou group??one of Top 100 enterprise in China. Shenzhen Jiuzhou Optoelectronics Co., Ltd, an high-tech enterprise, whose enrol capital is RMB39,000,000. It has the most advanced automatic product line in the world such as Auto Die Bonder, Wire Bonder, Auto sorting equipment and so on. And It has passed ISO9001/2000 quality authentication and ISO14001/2004 environment authentication of Swiss SGS Company. If you want learn more, please enter : www.jz-led.com

Po188 shipment value is 1000KPCS/mon now. The output of our OEM factory is 1500KPCS.

SGS

Test Report No: QZ0703041206/CHEM Date: MAR 30, 2007 Page 1 of 4

ON INSTITUTE OF OPTICAL & ELECTRONIC TECHNOLOGY
RM388, NANFANG BLDG., SHANGBU INDUSTRIAL PARK, FUTIAN DISTRICT, SHENZHEN, CHINA

The following sample(s) was/were submitted and identified on behalf of the applicant as LIGHT SENSOR SERIES
Client Reference: QN9558/9668/9678/9688/9698/Po188(Po189)

SGS Ref No: QZ10301477EC
Sample Receiving Date: MAR 26, 2007
Testing Period: MAR 26, 2007 TO MAR 30, 2007

Test Requested: In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

Test Method: With reference to IEC 62321 Ed 1.11/54/CDV
Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products
(1) Determination of Cadmium by ICP
(2) Determination of Lead by ICP & AAS
(3) Determination of Mercury by ICP
(4) Determination of Hexavalent Chromium by Colorimetric Method
(5) Determination of PBBs and PBDEs by GC-MS

Test Results: Please refer to next page.

Conclusion: Based on the performed tests on submitted sample(s), the results comply with the RoHS Directive 2002/95/EC and its subsequent amendments.

Remark: As requested by client, the testing of No.1 was conducted as whole / part sample, for the sample can't be disposed.

Signed for and on behalf of
SGS-CSTC Ltd.

Jian YongPing, Terry
Sr Engineer

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf or available on request and accessible at www.sgs.com. Attention is drawn to the limitations of liability, indemnification and jurisdictional matters defined therein. Unless otherwise stated, the rights shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission from the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this report is unlawful and offenders will be liable to the fullest extent of the law.

GZCM1130375
100% RoHS Compliant
中国·广州·经济技术开发区科学城科丰路188号 邮编: 510663 电话: 020-82070300 传真: 020-82070301
Member of the SGS Group (SGS SA)

SGS

证书 HK06/01551.01

下述组织

深圳市九州光电子有限公司

中国广东省深圳市宝安区沙井街道
帝堂路沙二工业园第七栋厂房

的管理体系已经过审核，并被证明符合下述要求

ISO 9001:2000

所涉及的活动范围要素

贴片二极管、点阵模块、数码管和发光二极管的设计和制造。

如需进一步瞭解该证书的范围以及对 ISO 9001:2000 要求的适用程度，可向组织咨询获得

该证书的有效期自 2006-09-11 至 2009-09-10
版本号 1. 初始注册日期 2006-09

签署

P. Earl

SGS United Kingdom Ltd. Systems & Services Certification
Rosemere Business Park, Elsternham Park, Chislehurst, CH65 9EN, UK
t +44 (0)151 350-6666 f +44 (0)151 350-6600 www.sgs.com

第 1 页, 共 1 页

UKAS
QUALITY
MANAGEMENT
005

SGS

证书 HK06/01538.01

下述组织

深圳市九州光电子有限公司

中国广东省深圳市宝安区沙井街道
帝堂路沙二工业园第七栋

的管理体系已经过审核，并被证明符合下述要求

ISO 14001:2004

所涉及的活动范围要素

贴片二极管、点阵模块、数码管和发光二极管的设计和制造。

该证书的有效期自 2006-09-12 至 2009-09-11
版本号 1. 初始注册日期 2006-09

签署

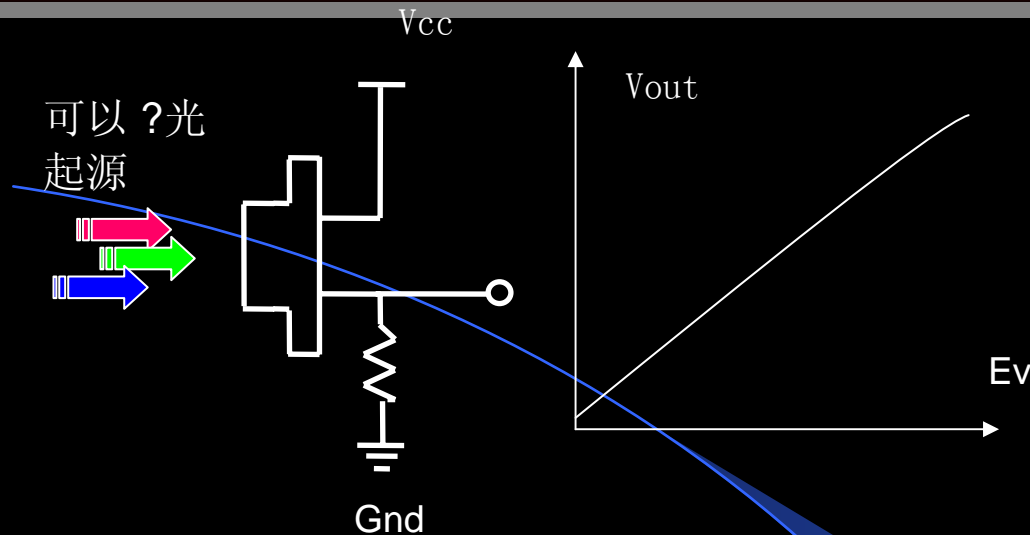
P. Earl

SGS United Kingdom Ltd. Systems & Services Certification
Rosemere Business Park, Elsternham Park, Chislehurst, CH65 9EN, UK
t +44 (0)151 350-6666 f +44 (0)151 350-6600 www.sgs.com

SGS EMAS 04 0108
第 1 页, 共 1 页

UKAS
ENVIRONMENTAL
MANAGEMENT
005

Po188 Application scheme intro——电气特性



■ Electric Characteristic

- Small dark current, low illumination response, high sensibility, output current in proportion to illumination ;
- Built in double sensitive receiver and Optical filter-less, attenuate near infrared automatically. Spectral response close to human eye sensitivity;
- Embedded micro signal CMOS amplifier, high precision voltage source, and correct circuit; Output current is high;
- Two Optics material packages to choose, to permeate visible light, cut off ultraviolet, relative damp infrared ray, and improve optical-filter effect;
- Accord with RoHS standard. Pb free, CdS free

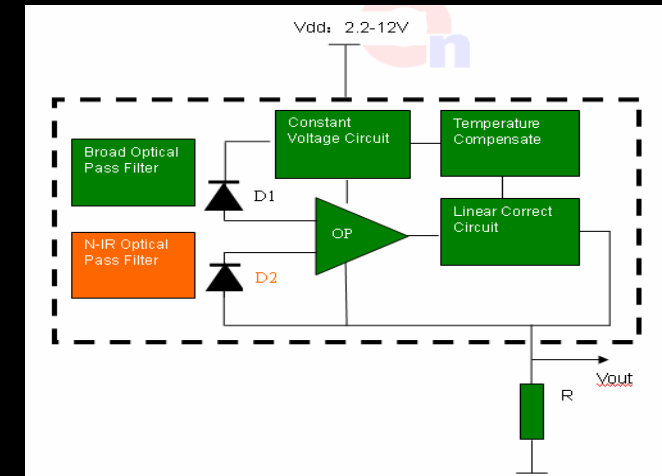
■ Typical Application

Back light source illuminations adjust: TV, Computer display, LCD Backlight, Data code camera, P3/MP4, PDA, and GPS;

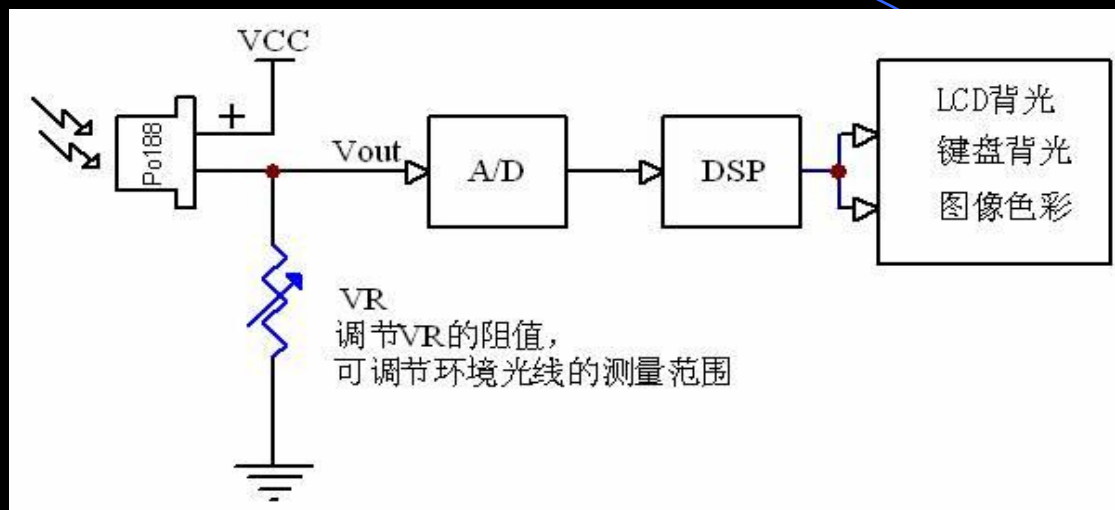
Energy saving: Outdoor advertisement machine, inductive lightening utensil, and toy;

Instrument: Illuminometer and industrial control;

Environment protection substitute: Substitute for light sensitive resistor, photosensitive diode, photosensitive

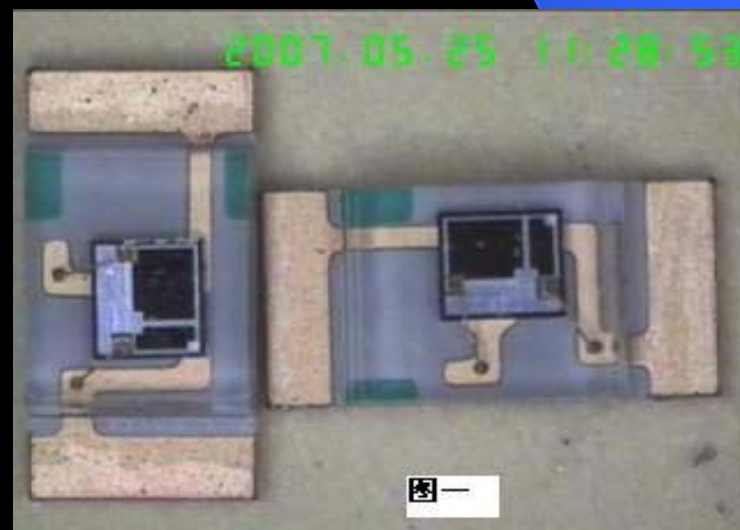


Po188 application scheme introduce—Design reference



Typical application chart

The right circuit is the blown-up photo of Po188, the polar signed with green bar is cathode, the other polar is anode. The package is SMD1206, with anti-ultraviolet transparent araldite envelope. The thermal shock test, the brine test, the product intension liberation test, high temperature test and the temperature humidity storage test the reliability test is under strict test condition. IC COMS techniques ensure Po188 the consistency and the dependability. So Po188 outclass the common photosensitive component.



Po188 application and test circuit

The IC is a photo-electric sensor. When the light irradiate (the black region in Figure 1) of the chip, the signal which is produced by the receiver passes inner amplifier and inner nonlinear modifier, then the cathode of Po188 produced a signal in proportion to illumination. Figure 2, the V_{out} is in the range of $0-2/3V_{dd}$. You can but design the A/D detection range.

Another application: as follows in figure 3. the output characteristic is reverse to the the characteristic in Figure 2. the V_{out} in figure 3 is in the range of $V_{dd}-1/3V_{dd}$

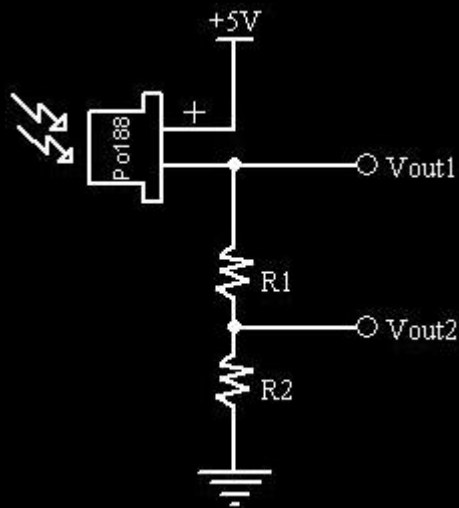


Figure 2

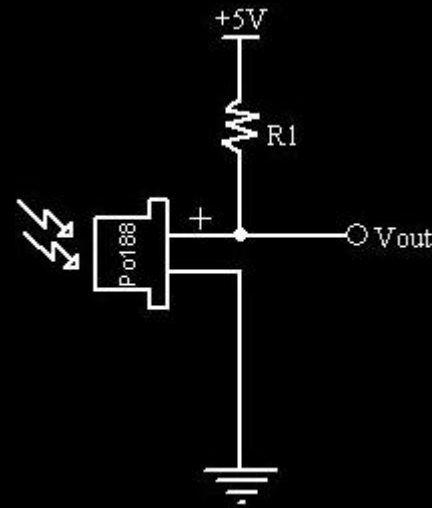


Figure 3

PO-188 design reference

The attached drawing is the photo of one phone of NOKIA, which use photo electricity sensor, the lighting hole is $\varnothing 1.5\text{mm}$. To convenient to structure design, the detector is sealed on the circuit board, and the sensitization surface has a distance to product DOS shell. Accord to narrow attenuation law in optics, the experience attenuation is about (10:1 aperture is 3mm; 20:1 aperture is 3mm). The ray attenuation should based on the law. R & ray dynamic range as follows. (@5 VDC TEST)

R (Ω)	Lux
100 Ω	1600
510 Ω	1200
1 K Ω	1000
5 K Ω	480
10 K Ω	180
51 K Ω	20
510 K Ω	5

Po188 application scheme introduce——Design reference

There are more and more periphery functions in the mobile phone, so the power energy is higher and higher. Higher power energy brings more problem for our engineers. And then some engineers supply electricity by a set of LDO, as right in figure 4. (@5 VDC TEST)

To control the back light of the small screen LCD, advice that the sampling cycle is 0.5s and the sampling time is 10ms.

1.After 2-3 sampling cycle, the keystroke brightness accord to sampling data.

2.After 4-6 sampling cycle, the screen brightness accord to sampling data.

The above two item is to avoid misaction and screen-flash.

Commonly the illumination of the ambient light is enacted as 3 sect change(above 2000lux,100-2000lux,under 100lux),accordingly, the PWM to drive the screen backlight is 100%,60%,10%.the keystroke light is shut off in common ambient, and only open when in the dark.

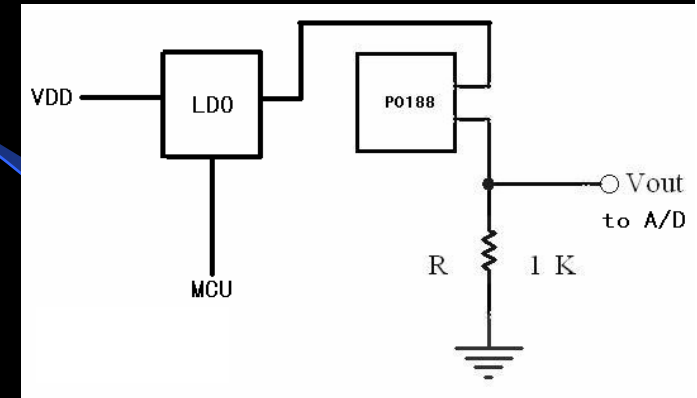


Figure 4

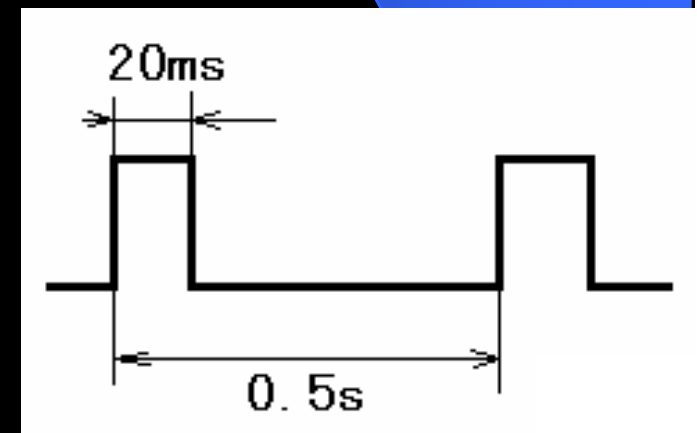


Figure 5

Po188 application scheme introduce——Fashion Mobile Phone

NOKIA N73



Lenovo P208/XP208



Sony Ericsson W850



Po188 application scheme introduce

——Notebook and LCD TV fashion application

HP notebook, one of eight designs:

Ambient light induce tech.
Save energy
Eye-protection.

Skyworth 4 ' S auto illumination- adjust screen LCD TV set
No glare, more healthy !

- Sense the environment light to auto-adjust lightness and color.
- Save power about 30%,no glare, and more healthy.



Po188 application scheme introduce

GPS fashion application



IPHONE fashion application



MP4 fashion application



Po188 application scheme introduce

Key board illumination auto-adjust

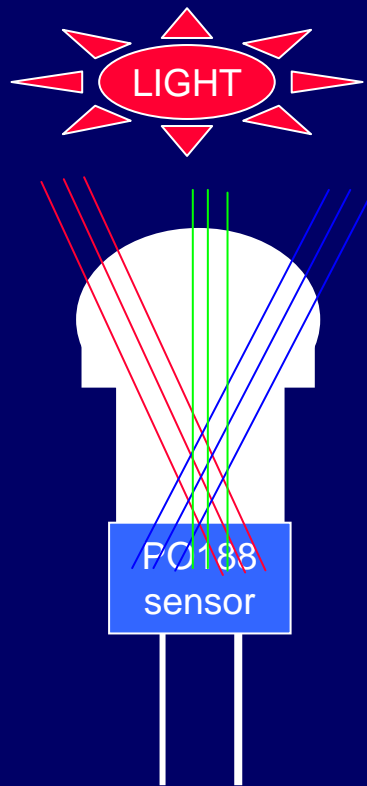


DF fashion application



Po188 application scheme introduce

—attention proceeding in design



The light pipe made of Optics resin
1, the material of light pipe needs to pass visible light, and has high transparent, for example high transparent resin injection or optics araldite titration;

2, the optic incidence is sphere or plane, request the light focus on the receiver. The dimension needs to assort to modulation effect, DOS shell beauty and dustproof. If the profile of the pipe is besmeared reflect dope, the capacity will be better;

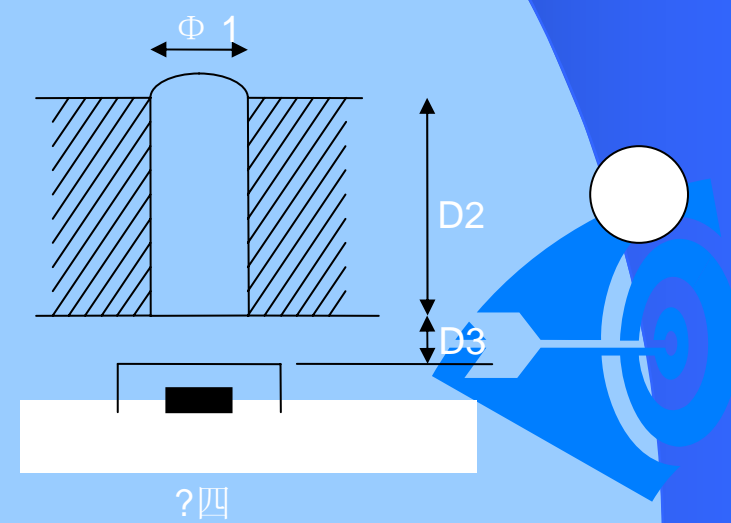
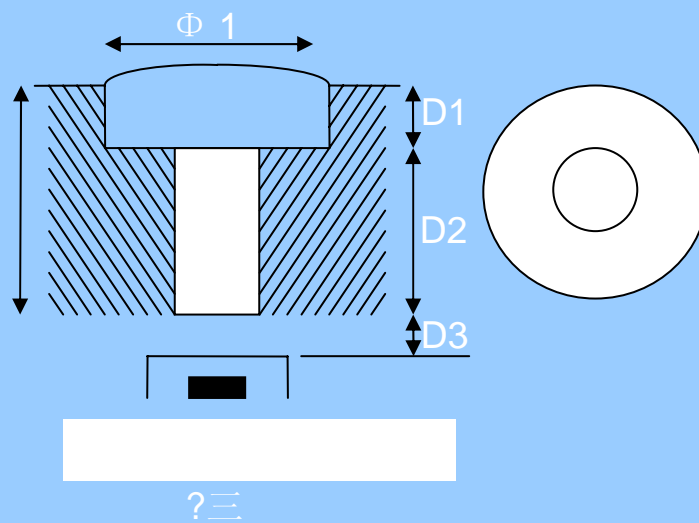
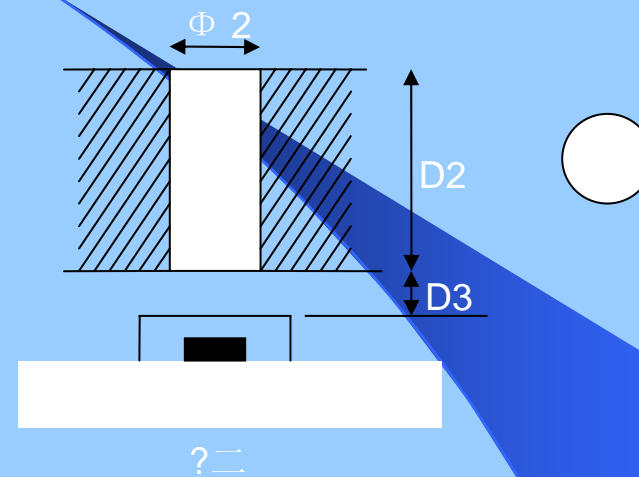
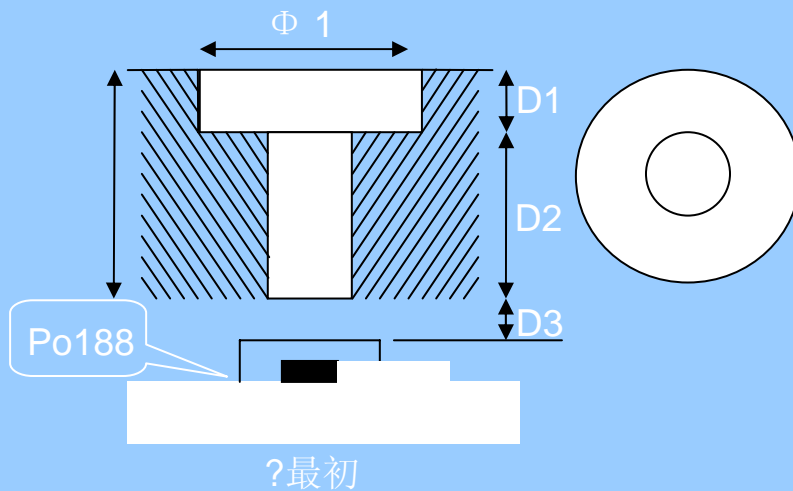
3, any material and medium is attenuation to light, so when use light pipe, you need to adjust light receiver sensitivity;

4, the light pipe is not the necessary;

Po188 application scheme introduce——attention proceeding in design

Light pipe sketch map:

To prevent dust com in and boost up stability, advice to add light pipe, as follows:



More Innovation, continue

Web: www.on-ele.org

E-mail: on-ele@on-ele.org

Tel: 0086-755-83223160

Fax: 0086-755-83223326

