SPECIFICATIONS FOR NICHIA LUMINOUS INTENSITY **RED** STANDARD LED

MODEL : **NLPR01S01A**

NICHIA CORPORATION

1. FEATURES

· Red LED in a 5mm lamp type package designed and developed for luminous intensity calibration.
· Uniform directivity (luminous intensity and color) suitable for calibration.
· Excellent accuracy and reproducibility by using a unique temperature stabilization system.
· Great versatility in actual use simplifies location adjustment when measuring.

2. APPLICATION

· Calibration for luminous intensity measuring instrument.

3.SPECIFICATIONS

(1) Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Absolute Maximum Rating	Unit
Forward Current	I_F	30	mA
Allowable Reverse Current	I_R	50	mA
Operating Temperature	T_{opr}	20 ~ 30	°C
Storage Temperature	T_{stg}	0 ~ 40	°C
Platinum resistance temperature device (RTD) Current	I_{pt}	2	mA
Platinum RTD temperature	T_{pt}	30 ~ 35	°C
Peltier Device Current	I_{pel}	-1 ~ 1	A
Peltier Device Voltage	V_{pel}	3.7	V

(2) Initial Electrical/Optical Characteristics (Ta=25°C, Platinum RTD Temp. Tpt=30°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	I_F=20[mA]	-	2.2	2.6	V
Luminous Intensity	Iv	I_F=20[mA]	-	0.5	—	cd
Chromaticity Coordinate*	x	I_F=20[mA]	-	0.70	—	-
	y	I_F=20[mA]	-	0.30	—	-
Directivity	I (ϕ,θ)	I_F=20[mA]	Within ± 5% of Luminous intensity (Within ± 5° vs. Mechanical axis)			
	x,y (ϕ,θ)		Within ±0.003 of Chromaticity (x, y) (Within ± 5° vs. Mechanical axis)			

＊ Please refer to CIE 1931 chromaticity diagram.
＊＊ Measured when the LED is inserted into a socket.
＊＊＊ Measured after aging (conditions: Ta = 25°C, I_F = 20 mA, 200 hours)

(3) Lumen Maintenance

Remain in the rage of ± 3% from the initial value.
＊ After 100 hours of use.
＊＊ Ta = 25°C, LED drive current I_F = 20 mA (±0.1%), Platinum RTD temp. Tpt = 30°C (±0.03°C)

4.TYPICAL INITIAL OPTICAL/ELECTRICAL CHARACTERISTICS, DIRECTIVITY

Please refer to “TYP.CHARACTERISTICS” and “DIRECTIVITY” on the following pages.

5.PRODUCT CONSTRUCTION

Please refer to “PRODUCT CONSTRUCTION” on the following page.

6.OUTLINE DIMENSIONS

Please refer to “OUTLINE DIMENSIONS” on the following page.

7.PRODUCT IDENTIFICATION

Please refer to “PRODUCT IDENTIFICATION” on the following page.

8.INTERNAL CIRCUIT

Please refer to “INTERNAL CIRCUIT” on the following page.

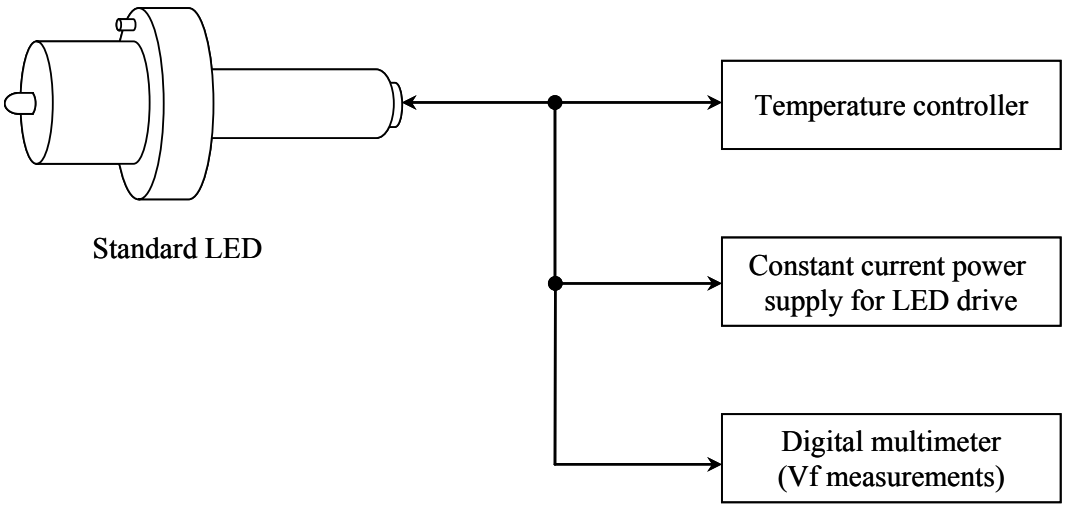
9.PACKING

Please refer to “PACKING” on the following page.

10.DIRECTIONS OF USE

(1) Connecting

· The following figure shows how the Luminous Intensity Standard LED is connected.



Recommended specifications for the peripheral equipments

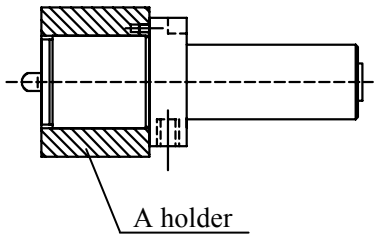
Temperature controller	PID controller. Temperature measurement accuracy of ± 0.03°C.
Constant current power supply for LED drive	Drive current accuracy: ≤ 0.1% of the set current
Digital multimeter (Vf measurements)	Input impedance: ≥ 1 GΩ

Please refer to “INTERNAL CIRCUIT” on the following page for circuit wiring.

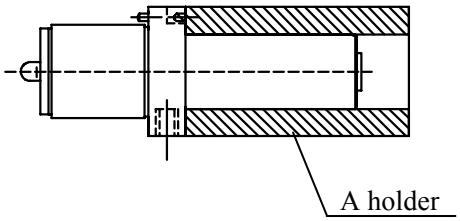
(2) Installation

· The following figure shows the Luminous Intensity Standard LED should be held by a holder.

Example 1:
(Held by the part with 25mm diameter)



Example 2:
(Held by the part with 20mm diameter)



· The measurement distance shall start from the top surface of the LED. Please refer to "OUTLINE DIMENSIONS" on the following page.
The surface of detector shall be perpendicular to the mechanical axis of the Standard LED.

(3) Measurement

· The Standard LED should be measured when the luminous intensity has stabilized after the start of temperature control and constant current drive.
Typically, the standard LED will be stable and ready to be used for calibration within 1 to 3 minutes.
Please refer to "TYP.CHARACTERISTICS " on the following page for the characteristics during the first 5 minutes after the LED starts emission.

11.CAUTIONS

(1) Storage

· This product should be kept at 30°C or less and 70% RH or less. When storing, moisture proof packaging with absorbent material (silica gel) is recommended.
· Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

(2) Static Electricity

· Static electricity or surge voltage damages the LEDs.
It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.
· All devices, equipment and machinery must be properly grounded. It is recommended that precautions be taken against surge voltage to the equipment that mounts the LEDs.

(3) Safety Guideline for Human Eyes

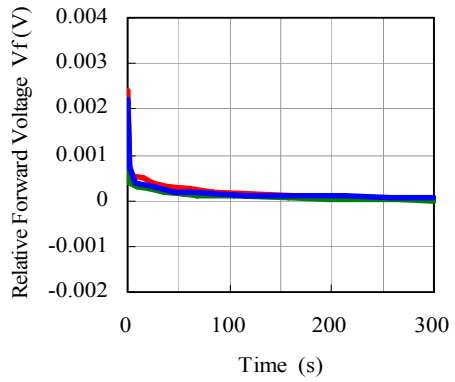
· The International Electrical Commission (IEC) published in 2006 IEC 62471:*2006 Photobiological safety of lamps and lamp systems* which includes LEDs within its scope. Meanwhile LEDs were removed from the scope of the IEC 60825-1:2007 laser safety standard, the 2001 edition of which included LED sources within its scope. However, keep in mind that some countries and regions have adopted standards based on the IEC laser safety standard IEC 60825-1:2001 which includes LEDs within its scope.
Following IEC 62471:2006, most of Nichia LEDs can be classified as belonging to either Exempt Group or Risk Group 1. Optical characteristics of a LED such as output power, spectrum and light distribution are factors that affect the risk group determination of the LED. Especially a high-power LED, that emits light containing blue wavelengths, may be in Risk Group 2.
Great care should be taken when viewing directly the LED driven at high current or the LED with optical instruments, which may greatly increase the hazard to your eyes.

(4) Others

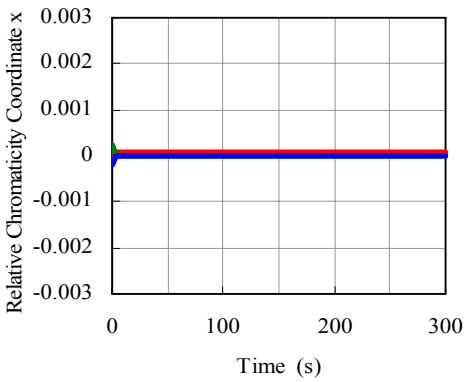
· Flashing lights have been known to cause discomfort in people; you can prevent this by taking precautions during use. Also, people should be cautious when using equipment that has had LEDs incorporated into it.
· This product is designed to be used for calibration. Do not use this product for any other purposes or other applications.
· User shall not reverse engineer by disassembling or analysis of the LEDs without having prior written consent from Nichia. When defective LEDs are found, the User shall inform Nichia directly before disassembling or analysis.
· The formal specifications must be exchanged and signed by both parties before purchase.
· The appearance and specifications of the product may be modified for improvement without notice.

TYP.CHARACTERISTIC

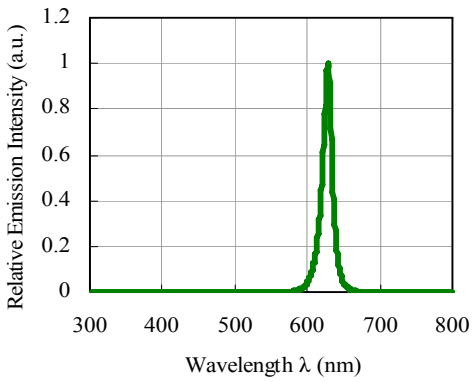
Time vs. Relative Forward Voltage



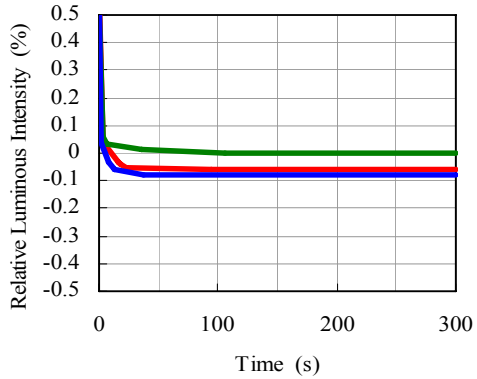
Time vs. Relative Chromaticity Coordinate x



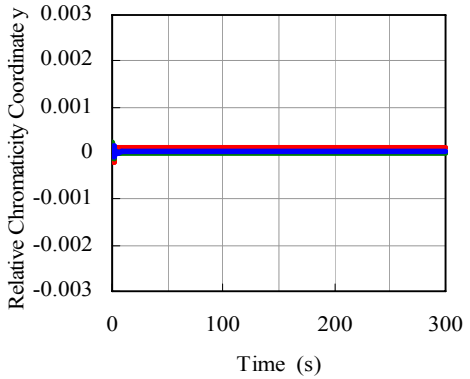
Spectrum

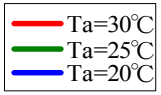


Time vs. Relative Luminous Intensity



Time vs. Relative Chromaticity Coordinate y



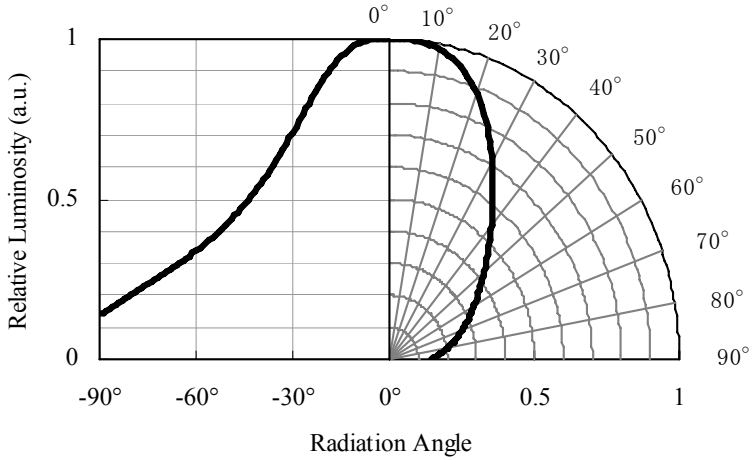


(注1)　標準LEDに取り付けられた白金測温抵抗素子の温度が30℃になるように温度コントロールしたときの特性です(If=20mA)。
(注2)　温度コントローラーの温度制御安定度は±0.03℃です(メーカー仕様値)。
(注3)　点灯時間－相対順電圧特性、点灯時間－相対光度特性、点灯時間－相対色度x特性、
点灯時間－相対色度y特性は、Ta=25℃、LED点灯300s後の値を基準としています。

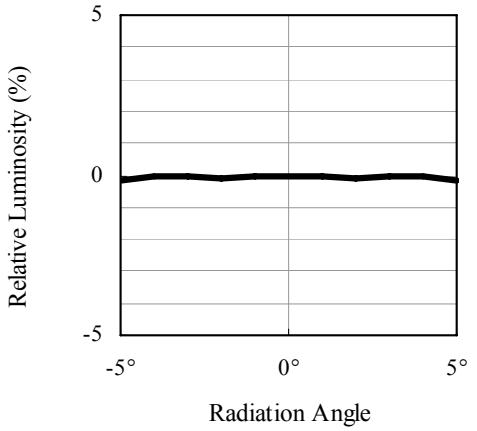
(NOTE 1) The graphs show the characteristics when the platinum RTD incorporated in the Standard LED is controlled to be 30±0.03℃(If=20mA).
(NOTE 2) Stability of temperature controller is ±0.03℃.
(Manufacturer specification value)
(NOTE 3) Except for Spectrum, the graphs show the data relative to the point (after an operation time of 300 seconds at Ta = 25℃).

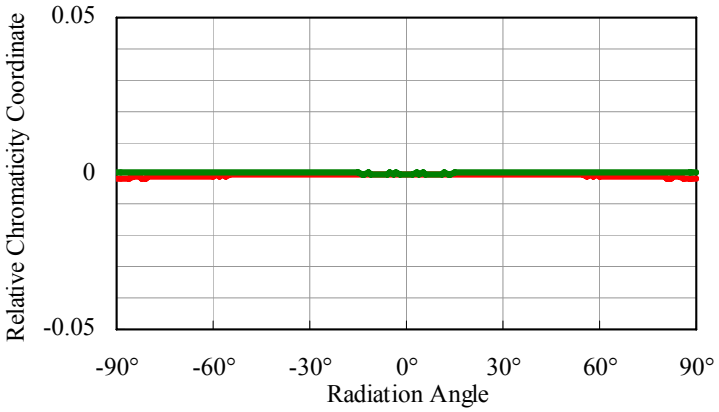
DIRECTIVITY

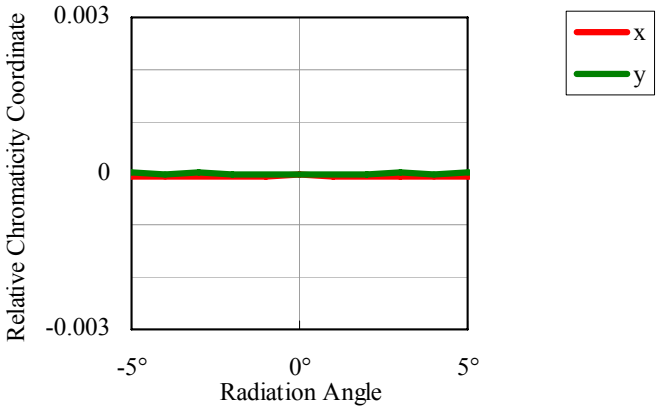
Directivity



Directivity Details

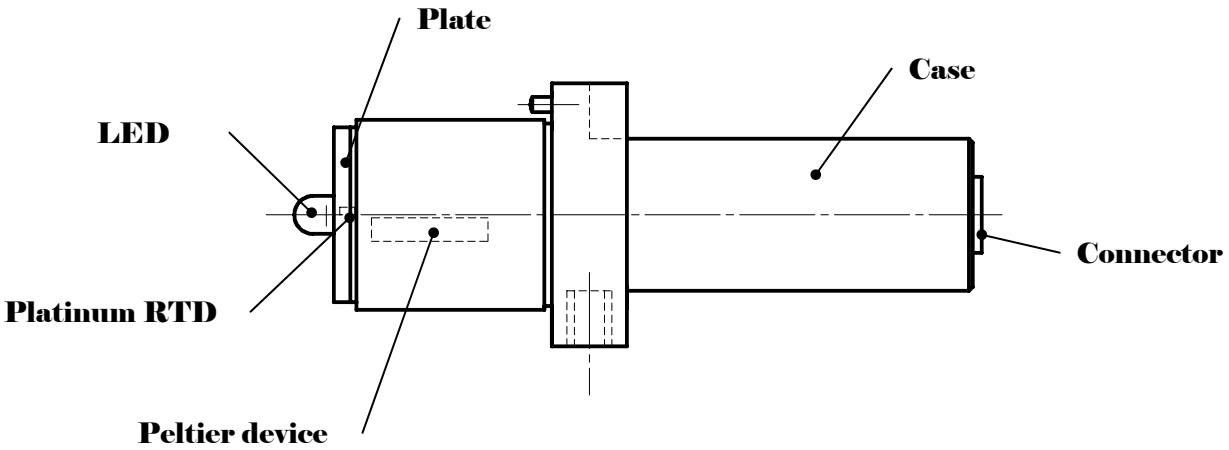






(注1)　標準LEDに取り付けられた白金測温抵抗素子の温度が30℃になるように温度コントロールしたときの特性です(Ifp=20mA、Ta=25℃)。
(注2)　温度コントローラーの温度制御安定度は±0.03℃です(メーカー仕様値)。

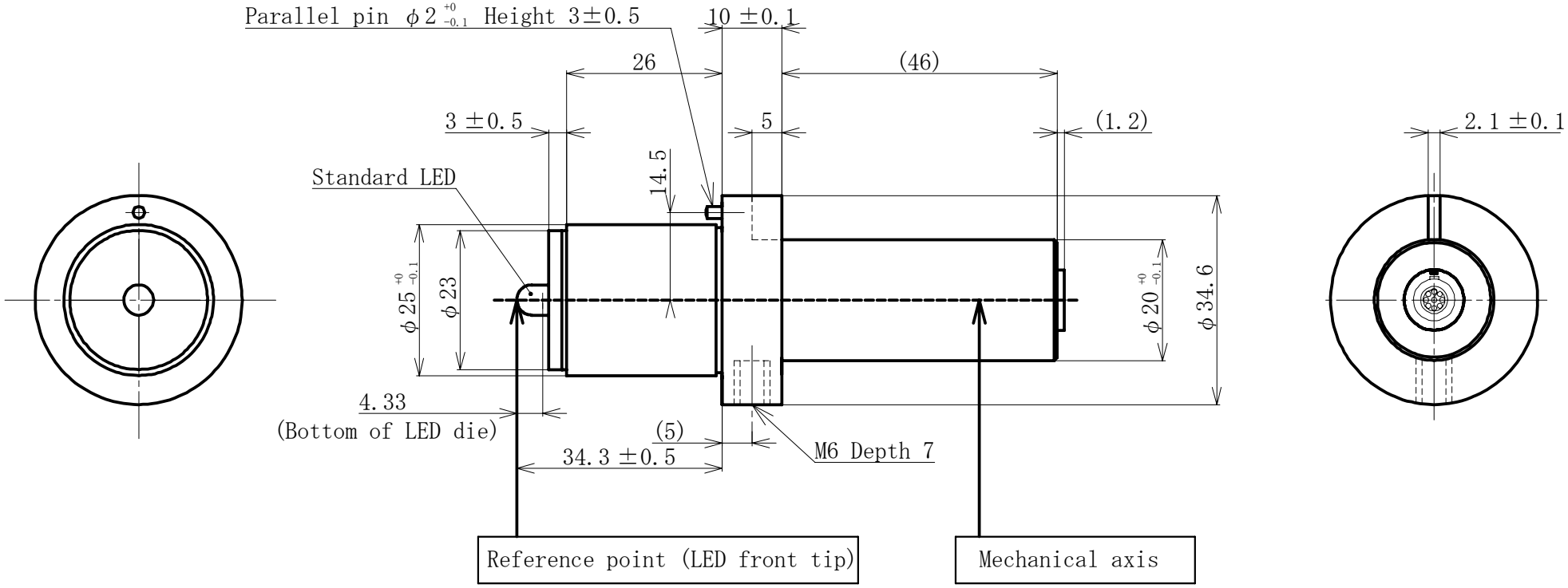
(NOTE 1) The graphs show the characteristics when the platinum RTD incorporated in the Standard LED is controlled to be 30±0.03℃.
(Ifp=20mA, Ta=25℃)
(NOTE 2) Stability of temperature controller is ±0.03℃.
(Manufacturer specification value)



Weight about 85 g

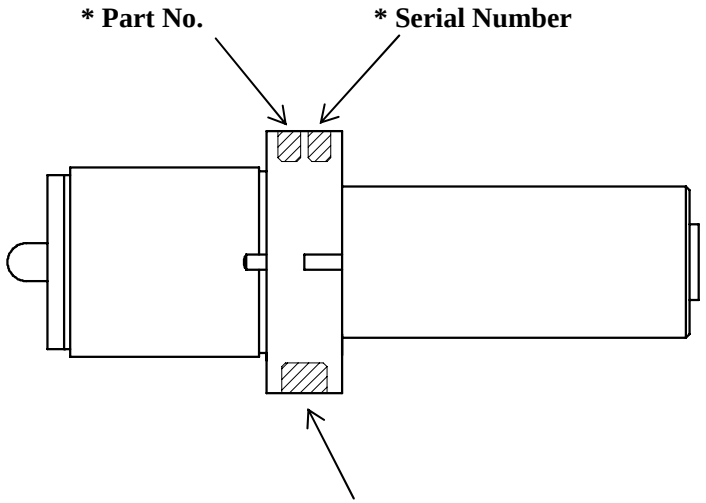
Item	Notes	Quantity
LED	Φ5 Lamp type Material : Resin : Epoxy Lens color : Milk-white (with Diffusion agent) Lead frame : Copper compound metal + Silver plating	1
PLATINUM RTD	Pt100 class B (JIS C 1604-1997)	1
PELTIER DEVICE	For temperature control	1
CONNECTOR	LEMO JAPAN Ltd. EGG-0B-309-CLL	1
CASE	Material : Aluminum	1
PLATE	Material : Resin	1

OUTLINE DIMENSIONS



Unit : mm

Allow : ±0.2



* Part No.

NLPx01S01y

x – Color (example. W : White)

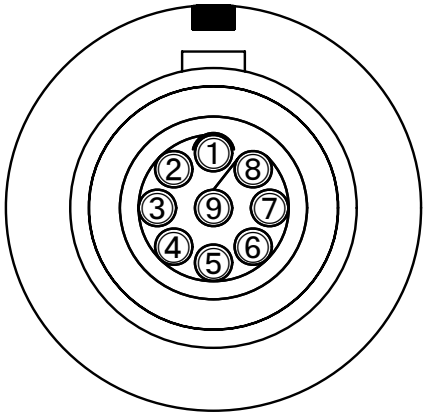
y – Revision Number

* Serial Number ×××××

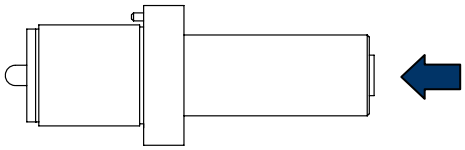
* NICHIA LOGO mark

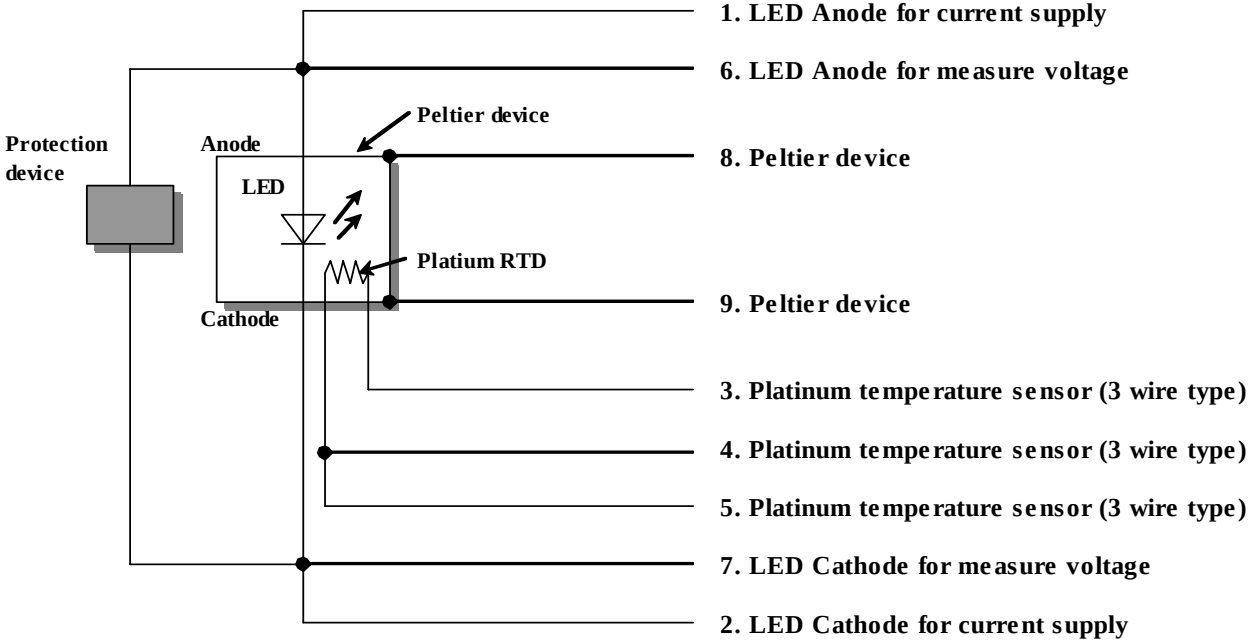
INTERNAL CIRCUIT

Connector Number

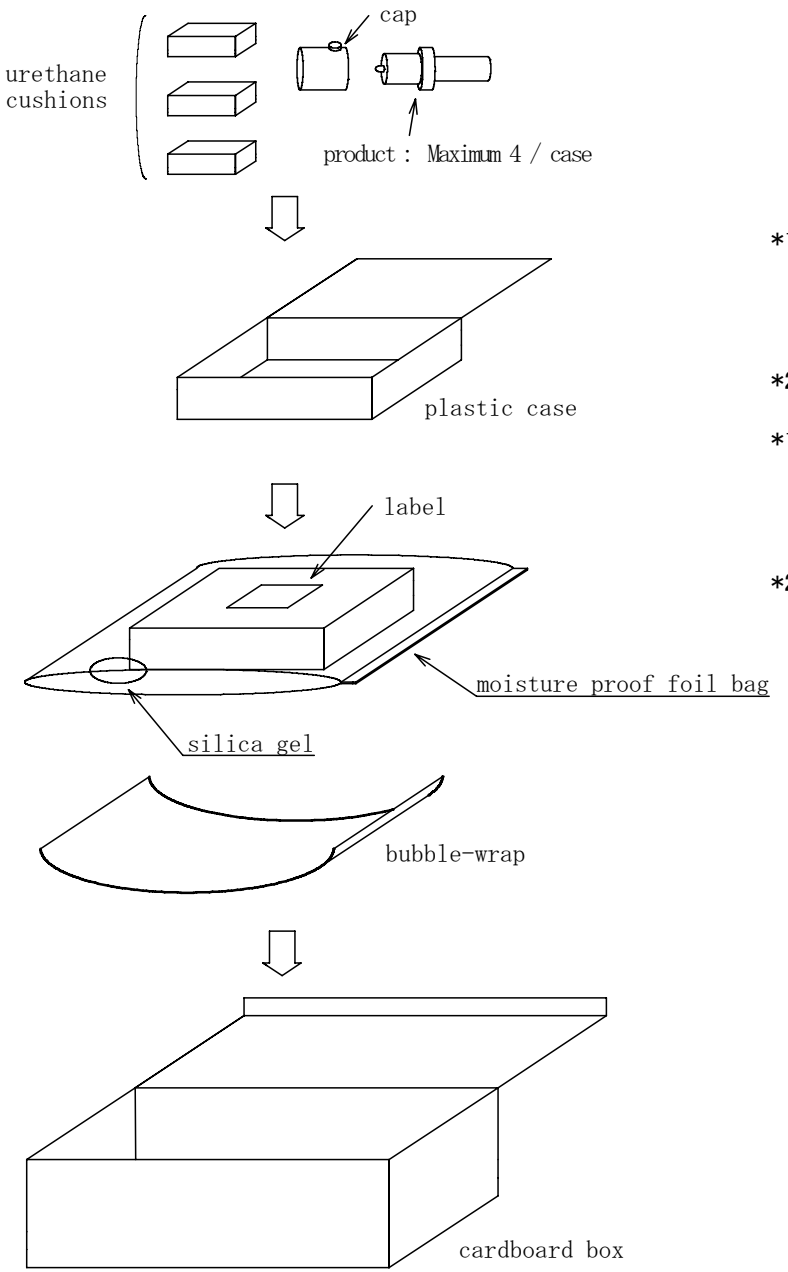


(Figure seen from direction of arrow of figure below)





PACKING



NOTE

*1 製品、キャップ、緩衝ウレタンをプラスチックケースに入れます。
プラスチックケースをシリカゲルとともにアルミ防湿袋に入れ、熱シールにより封をします。
製品を入れたアルミ防湿袋をプチシートでくるみ、段ボール箱に梱包します。
段ボール箱内に空きスペースがなくなるまでプチシートを重ね、
最後に段ボール箱のふたをガムテープで止めます。
*2 プラスチックケースには出荷先、型名、数量、備考を明記したラベルを貼りつけます。

*1 Place products, caps and urethane cushions in a plastic case.
Place the plastic case into a moisture proof foil bag with desiccant (silica gel) and then heat seal it.
Wrap the bag with bubble-wrap and place it in a cardboard box.
Add extra bubble-warp to fill the empty space of the box.
Seal the box with packing tape.
*2 Attach a label identifying "User Name, Part No., Quantity, Notes" to the plastic case.

yyyy/mm/dd

User Name	xxxxx
Part No.	NLPx01S01x
Quantity	x
Notes	

Nichia Corporation

(Refer to left figure.)