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| Approved | Checked | Released | DEVELOPMENT SPECIFICATION |
| <i>N. Yamada</i> | <i>K. Sawada</i> | <i>K. Koyu</i> | |
| LNG995PFBW | | | |

| | | | | | | |
|--------------------------|---|------------|-----------|-------|------------|-------------|
| T Y P E | Blue Light Emitting Diode | | | | | |
| MATERIAL | GaN | | | | | |
| APPLICATION | Indicators | | | | | |
| OUTLINE | This spec is "Target Spec". so it may be revised a part of it as time of establishment of "Regular Spec". | | | | | |
| CONNECTION | | | | | | |
| ABSOLUTE MAXIMUM RATINGS | P | I_{rr}^* | I_{roc} | V_R | T_{op} | T_{stg} |
| | 120 mW | 100 mA | 30 mA | 5 V | -25~+80 °C | -30~+100 °C |
| CONDITION | $T_a = 25 \pm 3^\circ C$ | | | | | |

Test Specification

| Item | Symbol | Condition | Typ | Limit | | Unit |
|--------------------------|-----------------|-----------------------|-----|-------|-----|---------|
| | | | | Min | Max | |
| Forward Voltage | V_f | $I_f = 20 \text{ mA}$ | 3.5 | | 4.0 | V |
| Reverseleakage Current | I_R | $V_R = 5 \text{ V}$ | | | 10 | μA |
| Luminous Intensity | I_o | $I_f = 20 \text{ mA}$ | 370 | 145 | | mcd |
| Peak Emission Wavelength | λ_p | $I_f = 20 \text{ mA}$ | 468 | | | nm |
| Spectral Line Half Width | $\Delta\lambda$ | $I_f = 20 \text{ mA}$ | 30 | | | nm |
| Dominant Wavelength | λ_D | $I_f = 20 \text{ mA}$ | 470 | 465 | 475 | nm |

* The condition of pulse current I_{rr} is 10ms pulse width, 10% duty cycle.
 *1 Measurement tolerance is $\pm 2 \text{ nm}$
 (Note)
 1. If you have any questions or take special operation, please contact to Panasonic office.
 (Example) -Low current (below 1 mA DC)
 -Pulse current ($P_w \leq 10 \text{ ms}$, $Duty \leq 10 \%$)
 2. Lead material is iron, and its surface is dip-soldered.
 3. Do not apply mechanical stress during soldering.
 4.
 A blue LED is sensitive to static electricity and care should be fully taken in handling it. Particularly, when an overvoltage is applied, which exceeds the absolute maximum rating of the blue LED, its energy damages the LED. Therefore, take utmost proactive measures against static electricity and surge as to building an assembly line and handling the LED halfway the process.
 (1) Check the entire drive circuit including the power source. For example, a surge current, etc., generated at power-on/off should not exceed the absolute maximum rating of the LED. Also, insert an appropriate protective circuit into the LED drive circuit.
 (2) Beware of destruction by static electricity in handling the LED. As proactive measures against static electricity, it is effective to earth your body (via 1M Ω), spread conductive mat on the floor, wear semiconductive work uniform and shoes, and use semiconductive containers. Also, be sure to earth the nose of a soldering iron. It is recommended to use an ionizer, etc., in the facility or environment where static electricity may be generated easily.

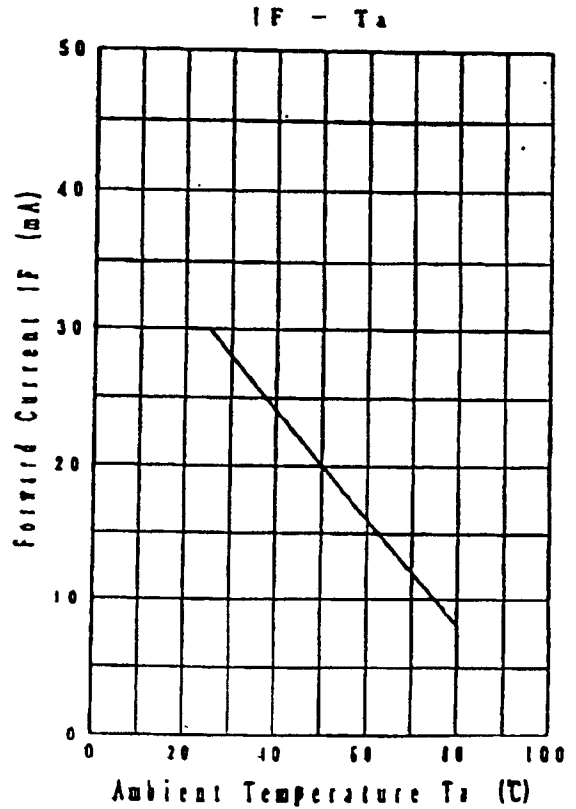
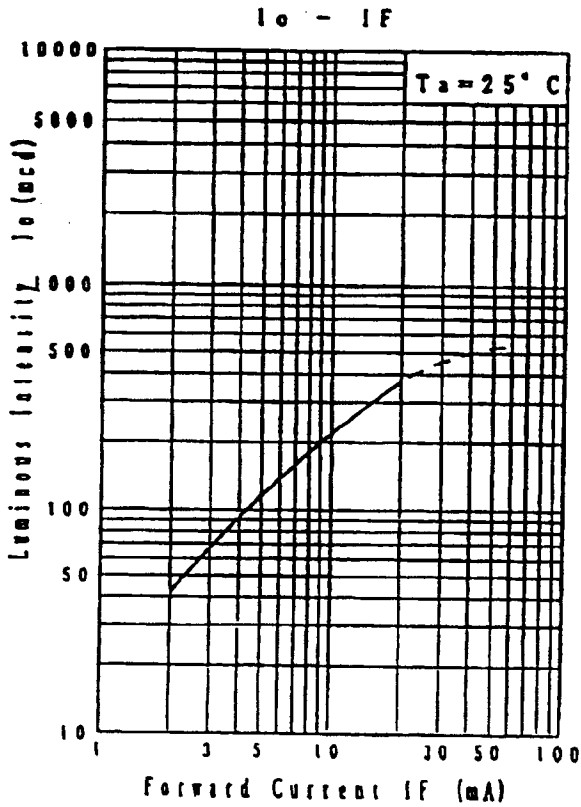
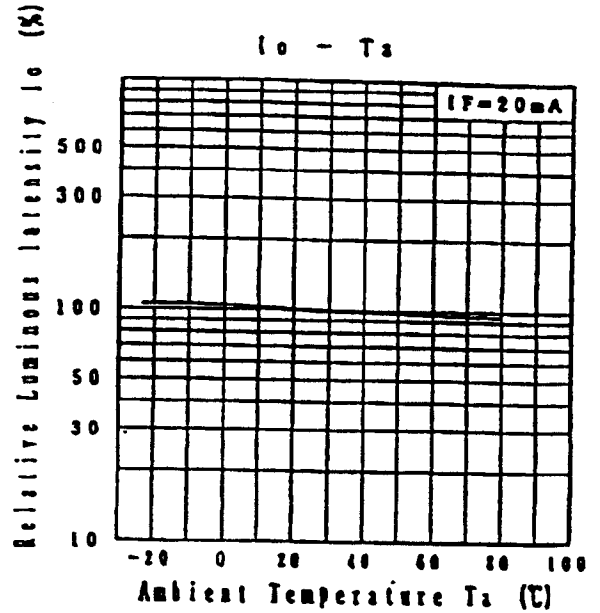
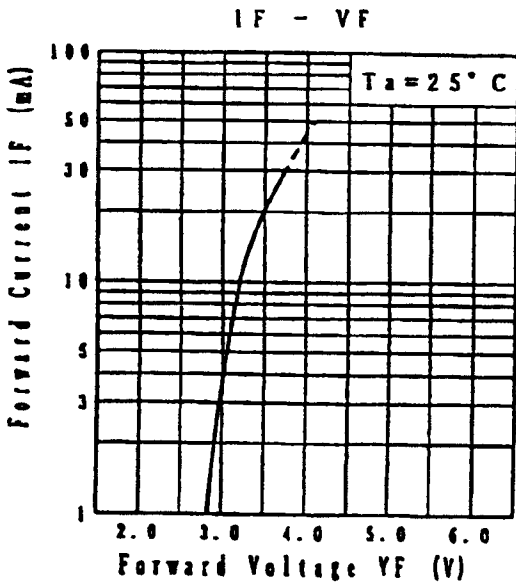
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| Apr. 1997 | | |
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LNG995PFBW

Handwritten signatures:
M. Honda
K. Sanada
A. Koye

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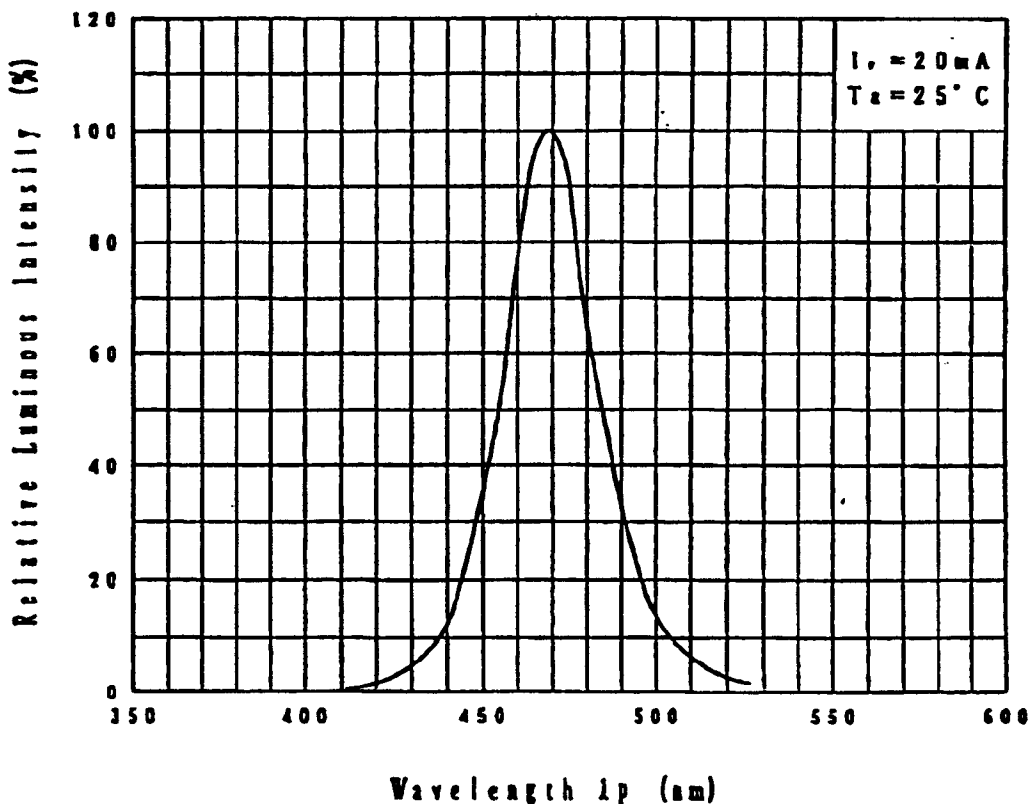
Mar. 4. 1997

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| <i>M. Yamada</i> | <i>K. Sanada</i> | <i>K. Koyu</i> |
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Relative Luminous Intensity Wavelength Characteristics



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Y. Yamashita
K. Sasaki
K. Koyu

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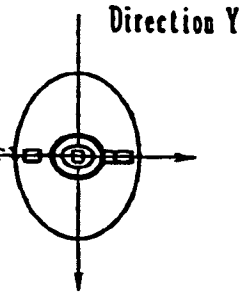
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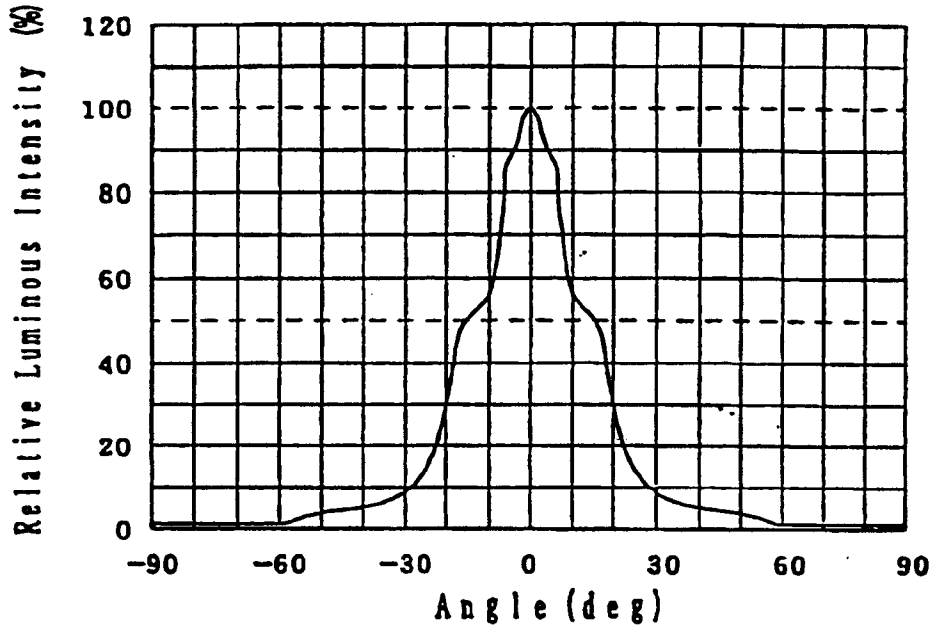
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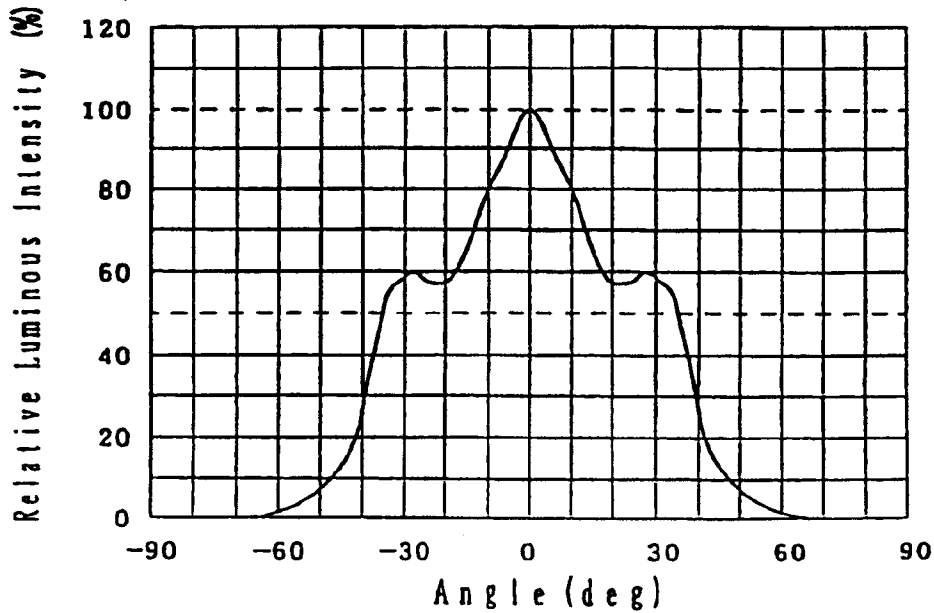
Direction X



Direction X



Direction Y



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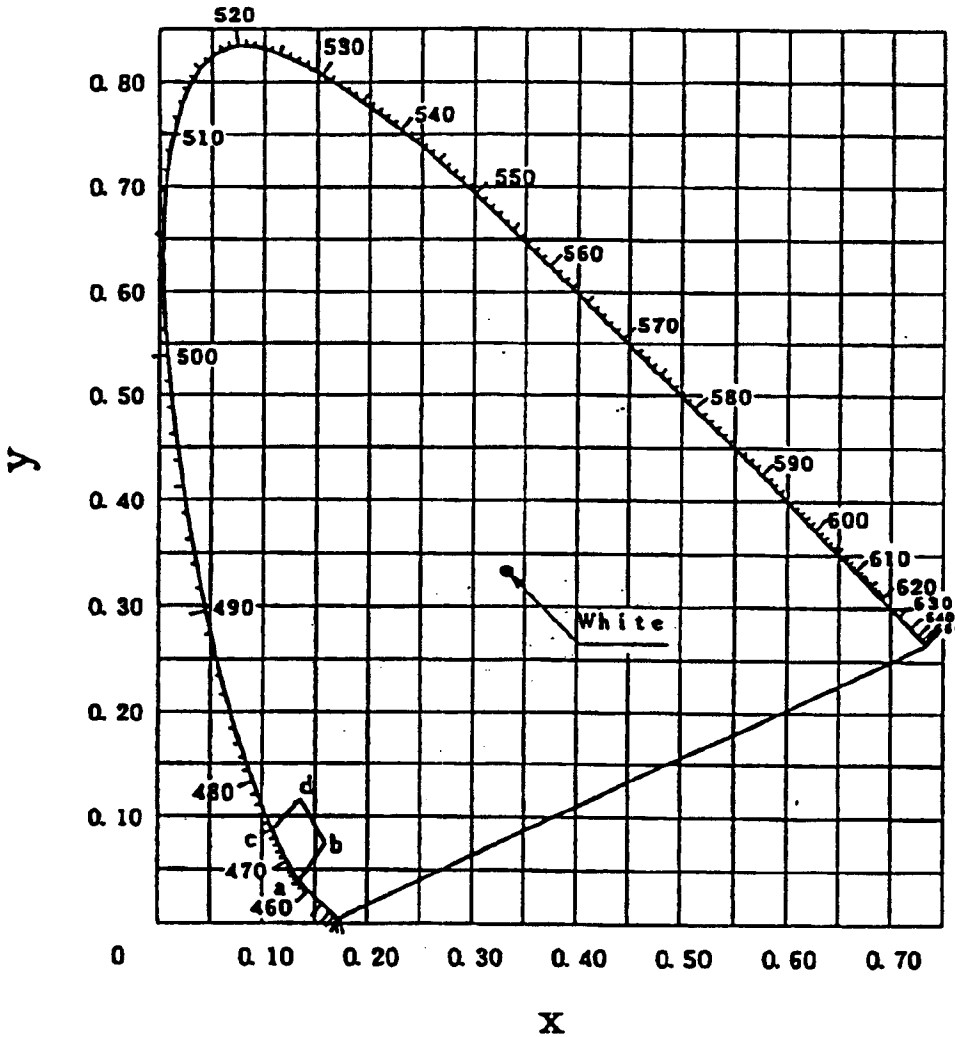
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| DESIGNER | DATE | REVISION |
| K. Sano | | |
| K. Kato | | |

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Chromaticity diagram



This spec is "Target Spec", so it may be revised a part of it as time of establishment of "Regular Spec".

Chromaticity coordinates

| | a | b | c | d |
|---|-------|-------|-------|-------|
| x | 0.136 | 0.159 | 0.110 | 0.136 |
| y | 0.040 | 0.075 | 0.087 | 0.116 |

Mar. 5. 1997

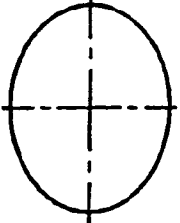
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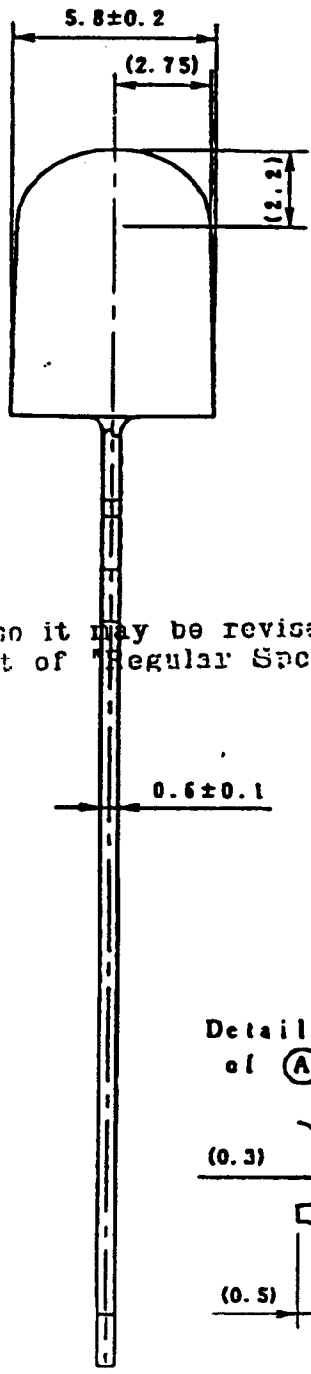
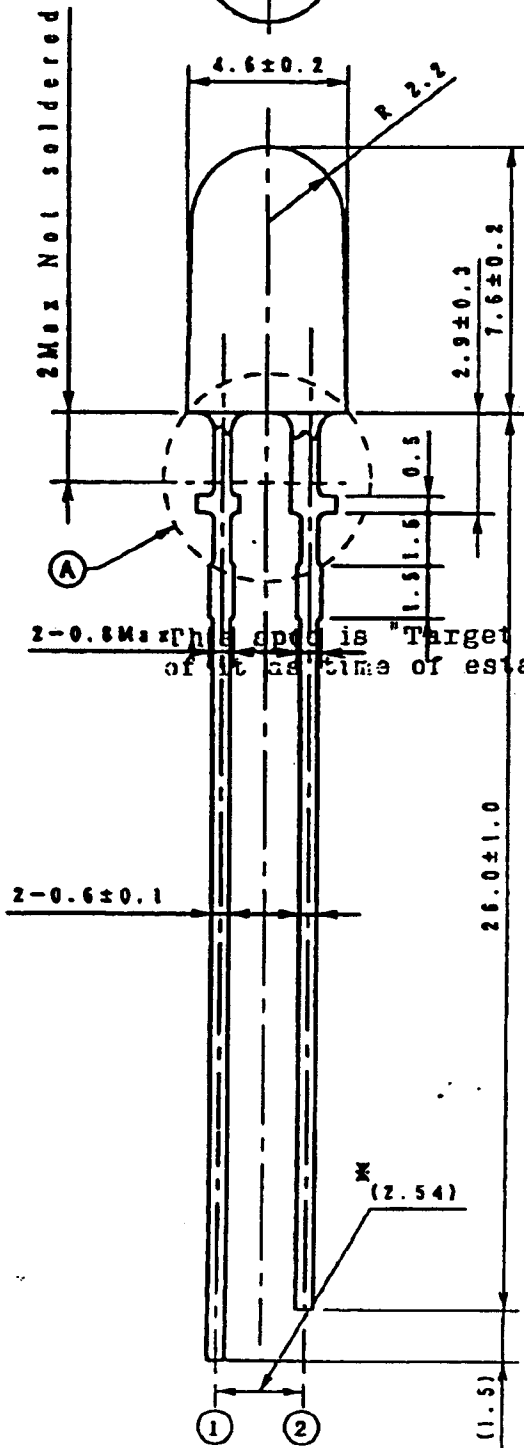
LNG995PFBW

K. Srinivas
K. Srinivas
K. Srinivas

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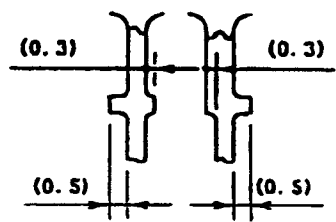


- ① Anode
- ② Cathode



2-0.6 Max This spec is "Target Spec", so it may be revised a part of it at time of establishment of "Regular Spec".

Detail drawing of ① part



Tolerance is ± 0.2 , unless otherwise specified
 *Reference.

Mar. 4. 1997

Approved [Signature] Checked [Signature] Design [Signature]

K. Sando

K. Kyo

DEVELOPMENT SPECIFICATION

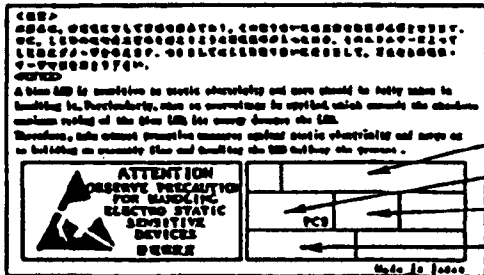
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1. Packing Division

- 1) Al laminate bag 500 pieces (105x225)
- 2) Packing (inner) 1000 pieces (110x235x57.5)
- 3) Packing (outer) 10000 pieces (238x573x120)

- *1 Ranks can't be mixed in the inner case.
- *2 Ranks can be mixed in the outer case.

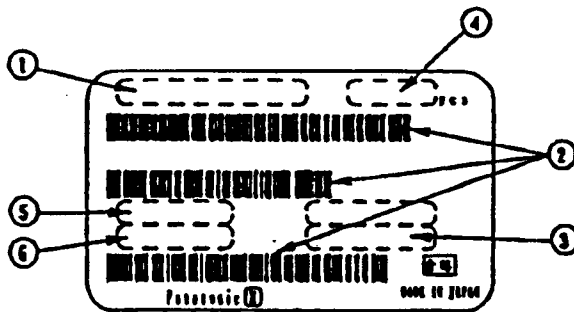
2. Al laminate bag indication. (Label ①)



- ① — Product No.
 - ② — Quantity
 - ③ — Rank
 - ④ — Date code
- This indicated is only Al laminate bag.

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3. Label Items. (Label ②)



- ① — Customer code
- ② — Bar code symbol
- ③ — Product No.
- ④ — Quantity
- ⑤ — Rank
- ⑥ — Date code

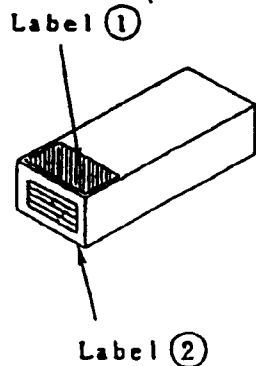
Note.

1. Example of date code.

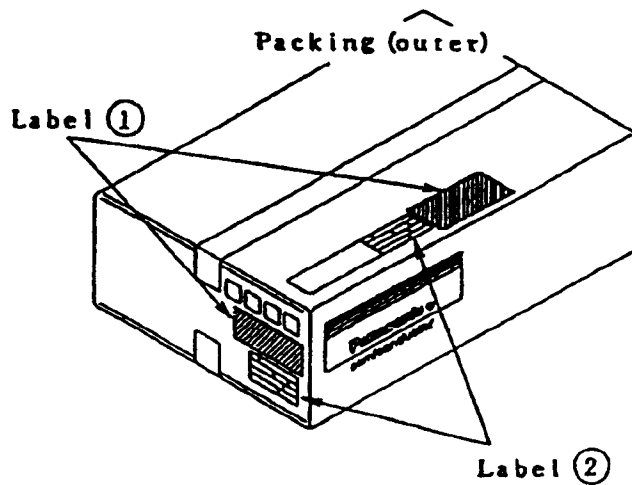
Date code of '73' indicates March, 1997 (Date of Al laminate bag and case packing).

2. Ranks can be mixed in the outer case.

Packing (inner)



Packing (outer)



Mar. 4. 1997

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| Approved | Checked | Designed | DEVELOPMENT SPECIFICATION | LNG995PFBW |
| <i>M. Yamamoto</i> | <i>K. Sasaki</i> | <i>K. H. 72</i> | | |

Requests and Capabilities exceeds "Target Spec", so it may be revised a part of it as time of establishment of "Regular Spec".

1. An export permit needs to be obtained from the competent authorities of the Japanese Government if any of the products or technologies described in this document and controlled under the "Foreign Exchange and Foreign Trade Control Law" is to be exported or taken out of Japan.
2. The technical information described in this document is limited to showing representative characteristics and applied circuit examples of the products. It does not constitute the warranting of industrial property, the granting of relative rights, or the granting of any license.
3. The products described in this document are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
 - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
 - Any applications other than the standard applications intended.
4. When designing your equipment, comply with the guaranteed values, in particular those of maximum rating, the range of operating power supply voltage and heat radiation characteristics. Otherwise, we will not be liable for any defect which may arise later in the equipment.
Even when the products are used within the guaranteed values, redundant design is recommended, so that such equipment may not violate relevant laws or regulations because of the function of our products.
5. When using products for which vacuum packing is required, observe the conditions (including shelf life and after-unpacking stand-by time) agreed upon when specification sheets are individually exchanged.

6. OTHERS

For the doubts or necessity of change in this specification, mutual discussion will be made for the solution.

Not using the O. D. C and PBBOs in the LED's.

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| Mar. 5. 1997 | | |
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