

# - Specification -

## C-band PLL LNB

Internal & External Reference Model

### Model No. NJS8496 series

| Model No.      | RF Frequency     | Local Frequency | IF Frequency     |
|----------------|------------------|-----------------|------------------|
| NJS8496 series | 3.4 to 4.2 GHz   | 5.15 GHz        | 950 to 1,750 MHz |
| NJS8497 series | 3.625 to 4.2 GHz | 5.15 GHz        | 950 to 1,525 MHz |
| NJS8498 series | 4.5 to 4.8 GHz   | 5.76 GHz        | 960 to 1,260 MHz |

Local Reference Type: Internal / External Reference

Local Stability: H-type, +/- 10 ppm (+/- 50 kHz typ.)  
S-type, +/- 3 ppm (+/- 15 kHz typ.)  
U-type, +/- 1 ppm (+/- 5 kHz typ.)  
V-type, +/- 0.3 ppm (+/- 1.5 kHz typ.)  
E-type, Same as External Reference Stability

RF Input Interface: Waveguide, CPR-229G

IF Output Interface: N-type / F-type, Female Connector

DC Power Input: IF Output Interface Connector

DC Power Voltage Range: +12 to +24 V

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**Microwave Business Headquarters**

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## Caution

1. While Nisshinbo Micro Devices Inc. (NISD) continually strives to improve the quality and reliability of our products, failures will occur in microwave products over time. For this reason, it is important that customers fulfill their responsibilities to ensure designed-in safety – including failsafe functions, redundancy, and measures to prevent malfunctions and the spread of fire – in order to avoid injuries, accidents, or social repercussions resulting from the failure of any products related to satellite communications on this website (hereinafter, “the product”). Customers must pay careful attention to ensuring the safety of their equipment.
2. The product is designed and tested to function in accordance with its specifications. Do not use under conditions that deviate from the product specifications included in the delivery specifications. NISD assume no responsibility and shall not be liable for any injuries, accidents, or social repercussions resulting from the product being in a poor or damaged state because it was used under conditions that depart from the specifications.
3. The product is covered by a warranty for one year following delivery unless otherwise stipulated in the contract or delivery conditions. In the event of a failure for which NISD are responsible occurring during the warranty period, NISD undertake to repair or replace the product free of charge. Note, however, that the warranty does not cover failures such as those listed here (see bullets below), even if they occur within the warranty period. In addition, in the case of a product being repaired or replaced by us, the starting date for the warranty period is still the original delivery date of the product.
  - Failure due to the product being used in conditions other than those stipulated in the data sheet, specification sheet, etc.
  - Failure due to modifications or repairs carried out by some entity other than our company
  - Failure determined to be the result of unsuitable maintenance or replacement of a consumable item that requires due maintenance
  - Failure due to circumstances that were unforeseeable given the scientific/technological standards at the time of shipment
  - Other failures due to external factors such as fire, earthquake, flood and power supply anomalies for which NISD are not responsible

In addition, the product warranty is limited to the provision of repair services or replacement at no cost. It does not cover secondary damage (to equipment, business opportunities, profits, etc.) or any other damage that may have resulted from failure of the product.

4. The product must be handled appropriately to ensure its continued reliability. Since it can be damaged by the intrusion of water, dust, oil, chemicals, etc., it must be given appropriate protection. Even in the case of a product with an airtight construction, avoid using it in an environment that exceeds the stated levels of waterproofing/dustproofing. Also, be sure to use connectors and waveguides properly.  
If replacement parts such as fans are included, proper maintenance is necessary. To maintain product performance and functionality, it is necessary to conduct inspections and maintenance at appropriate intervals and exchange replacement parts when necessary. Improper inspections or maintenance may result in failure.  
In addition, the warranty does not cover the use of the product in areas where salt damage can be expected or where there is a substantial presence of corrosive gases such as Cl<sub>2</sub>, H<sub>2</sub>S, SO<sub>2</sub>, and NO<sub>2</sub>. If the product is to be used in such areas, at the time of installation you must take appropriate steps to protect the product.
5. If the product is to be used with equipment/systems that must meet special quality and reliability standards (aerospace equipment, medical equipment, power generation control equipment, automotive/railway transportation equipment, safety equipment, disaster prevention and security equipment, etc.), please consult with our sales staff in advance.
6. Some products contain gallium arsenide (GaAs), classified as a harmful substance. To avoid danger, do not incinerate, crush, or chemically treat the product in such a way that gases or dust are released. When disposing of the product, comply with all applicable laws and regulations and do not treat it as general industrial waste or household waste.
7. When exporting a product or technology, observe export laws and regulations such as those governing foreign exchange and foreign trade, and obtain any necessary licenses for export, service transactions, etc.  
NISD request that you do not use our products or the technical data published on this website for developing weapons of mass destruction or for any other military purposes or applications.
8. The product specifications in this document are subject to change without notice. If you are considering using a product, delivery specifications must first be settled.

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## Model Number

**N J S 8 4 9 6 H F**

### IF Interface Connector

F: F-type (75 ohms), Female Connector

N: N-type (50 ohms), Female Connector

### Local Stability Line-up

H: Internal Reference, Local Stability: +/- 10 ppm, H-type

S: Internal Reference, Local Stability: +/- 3 ppm, S-type

U: Internal Reference, Local Stability: +/- 1 ppm, U-type

V: Internal Reference, Local Stability: +/- 0.3 ppm, V-type

E: External Reference, E-type

### RF Frequency

6: 3.4 to 4.2 GHz [Full C-band]

7: 3.625 to 4.2 GHz [Standard C-band]

8: 4.5 to 4.8 GHz [INSAT C-band]

### Product Series Number

### Reference & Local Stability Line-up

(H-type Model) Internal Reference, +/- 10 ppm Local Stability

(S-type Model) Internal Reference, +/- 3 ppm Local Stability

(U-type Model) Internal Reference, +/- 1 ppm Local Stability

(V-type Model) Internal Reference, +/- 0.3 ppm Local Stability

(E-type Model) External Reference

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## 1. Electrical Specifications

| #     | Items   | Specifications   |
|-------|---|--|
| 1.1.  | Absolute Maximum Rating<br>[RF Input Power]<br><br>[Supply Voltage]   | -10 dBm for CW Signal<br>+10 dBm for Peak of Pulse Signal<br>+28 V DC                          |
| 1.2.  | Input RF Frequency Range<br><br><Model No. NJS8496><br><Model No. NJS8497><br><Model No. NJS8498>                         | <br><br>3.4 to 4.2 GHz<br>3.625 to 4.2 GHz<br>4.5 to 4.8 GHz                                   |
| 1.3.  | Noise Temperature @ +25 °C  | 15 K typ., 30 K max.   |
| 1.4.  | Output IF Frequency Range<br><br><Model No. NJS8496><br><Model No. NJS8497><br><Model No. NJS8498>                        | <br><br>950 to 1,750 MHz<br>950 to 1,525 MHz<br>960 to 1,260 MHz                               |
| 1.5.  | Conversion Gain @ +25 °C  | 59 dB min., 67 dB max.   |
| 1.6.  | Conversion Gain Ripple @ +25 °C   | 2 dBp-p max. at any 50 MHz segments.   |
| 1.7.  | Conversion Gain Flatness over Frequency<br><br><Model No. NJS8496><br><Model No. NJS8497><br><Model No. NJS8498>          | <br><br>5 dBp-p max. at 800 MHz BW<br>5 dBp-p max. at 575 MHz BW<br>4 dBp-p max. at 300 MHz BW |
| 1.8.  | Conversion Gain Stability over Temperature  | 5 dB max.  |
| 1.9.  | Output Power @ 1dB G.C.P. (P1dB)  | +3 dBm min.  |
| 1.10. | IM3 for two dBm input carriers<br>< Condition ><br>Input Level: -75 dBm for each carriers<br>Separation Frequency: 10 MHz | -45 dBc max.   |
| 1.11. | Output Intercept Point  | +13 dBm min.   |
| 1.12. | Local Oscillator Frequency<br><br><Model No. NJS8496><br><Model No. NJS8497><br><Model No. NJS8498>                       | <br><br>5.15 GHz nom.<br>5.15 GHz nom.<br>5.76 GHz nom.  |

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| #              | Items  | Specifications   |
|----------------|--|--|
| 1.13.          | Local Oscillator Stability including Temperature Stability of -40 to +60 °C, Initial Setting Error and Aging Error |  |
|                | <H-type Model>   | +/- 10 ppm max.  |
|                | <S-type Model>   | +/- 3 ppm max.   |
|                | <U-type Model>   | +/- 1 ppm max.   |
|                | <V-type Model>   | +/- 0.3 ppm max.   |
| <E-type Model> | Depend on External Reference   |  |
| 1.14.          | L.O. Phase Noise (SSB)   | -70 dBc/Hz typ., -59 dBc/Hz max. @ 100 Hz<br>-80 dBc/Hz typ., -75 dBc/Hz max. @ 1 kHz<br>-90 dBc/Hz typ., -85 dBc/Hz max. @ 10 kHz<br>-100 dBc/Hz typ., -95 dBc/Hz max. @ 100 kHz<br>-110 dBc/Hz typ., -105 dBc/Hz max. @ 1 MHz  |
| 1.15.          | Requirement for External Reference<br>(Only E-type Model Specified)  |  |
|                | [Input Port]   | IF Output Interface<br>*Combine reference with IF Signal and DC Power  |
|                | [Frequency]  | 10 MHz (sine-wave)   |
|                | [Input Power]  | -10 to 0 dBm @IF Output connector  |
|                | [Phase Noise]  | -135 dBc/Hz max. at 100 Hz<br>-143 dBc/Hz max. at 1 kHz<br>-145 dBc/Hz max. at 10 kHz  |
| 1.16.          | Spurious   | a) -140 dBm max.<br>at input, Fixed frequency spur, unrelated to test CW signal. (Measured at specified IF band: 950 to 1,750 MHz, 950 to 1,525 MHz, or 960 to 1,260 MHz)<br>b) -55 dBc max.<br>with test CW signal -10 dBm IF output (Measured at specified IF band: 950 to 1,750 MHz, 950 to 1,525 MHz, or 960 to 1,260 MHz) |
| 1.17.          | Image Rejection  | 60 dB min.   |
| 1.18.          | Input V.S.W.R.   | 2.5 : 1 typ.   |
| 1.19.          | Output V.S.W.R.  | 2.0 : 1 max.   |
| 1.20.          | DC Power Requirement   |  |
|                | [Input Port]   | IF Output Interface  |
|                | [Input Voltage]  | +12 to +24 VDC   |
|                | [Current Drain]  | 350 mA   |

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## 2. Mechanical Specifications

| #    | Items                         | Specifications  |
|------|-------------------------------|---|
| 2.1. | RF Input Interface            | Waveguide, CPR-229G (with Grooved) and equivalent Waveguide Flange: Type of Through hole ( $\phi 6.5$ nom.) |
| 2.2. | IF Output Interface Connector |   |
|      | <F-type Model>                | F-type female connector, 75 ohms  |
|      | <N-type Model>                | N-type female connector, 50 ohms  |
| 2.3. | Dimension & Housing           | 144.5 (L) × 98.4 (W) × 69.9 (H) mm<br>without interface connectors and screws                               |
| 2.4. | Weight                        | 670 g   |

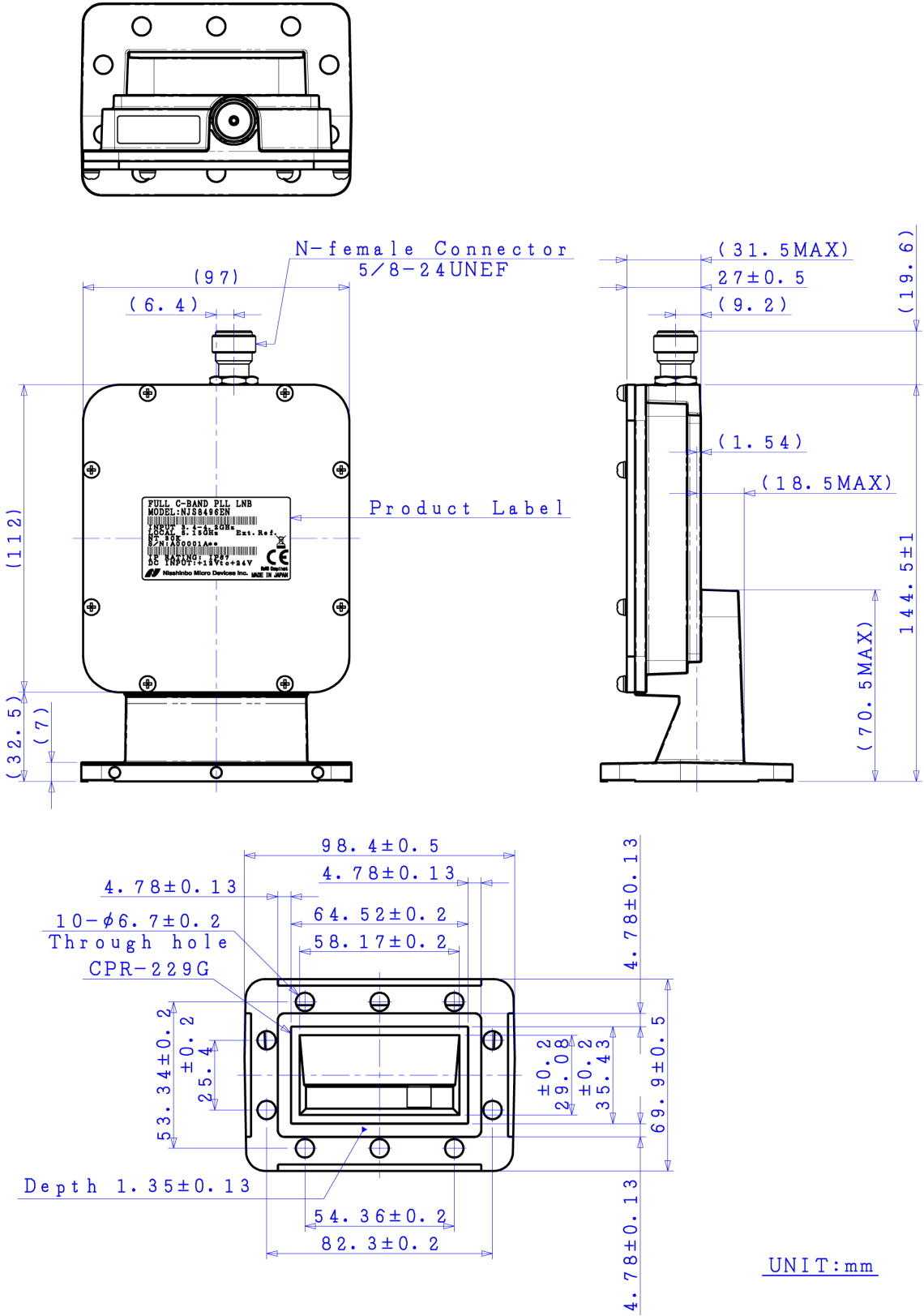
## 3. Environmental Specifications

| #    | Items                            | Specifications  |
|------|----------------------------------|---|
| 3.1. | Temperature Range (ambient)      |   |
|      | [Operating]                      | -40 to +60 °C   |
|      | [Storage]                        | -40 to +80 °C   |
| 3.2. | Humidity                         | 0 to 100 % RH   |
| 3.3. | Altitude                         | 15,000 feet (4,572 m)   |
| 3.4. | Vibration                        | 5 G [49.03 m/s <sup>2</sup> ] (3 axis, 50 Hz to 2 kHz)<br>1 mm p-p (3 axis, 5 to 50 Hz)   |
| 3.5. | Shock                            | 30 G [294.20 m/s <sup>2</sup> ] (3 axis)  |
| 3.6. | Waterproof / Dustproof (IP Code) | IP 67   |
| 3.7. | Regulations                      | EU Directive (CE Marking)<br>RE - 2014/53/EU<br>EMC - 2014/30/EU<br>RoHS - 2011/65/EU + (EU)2015/863<br>Safety: EN62368-1, EN60950-22 |

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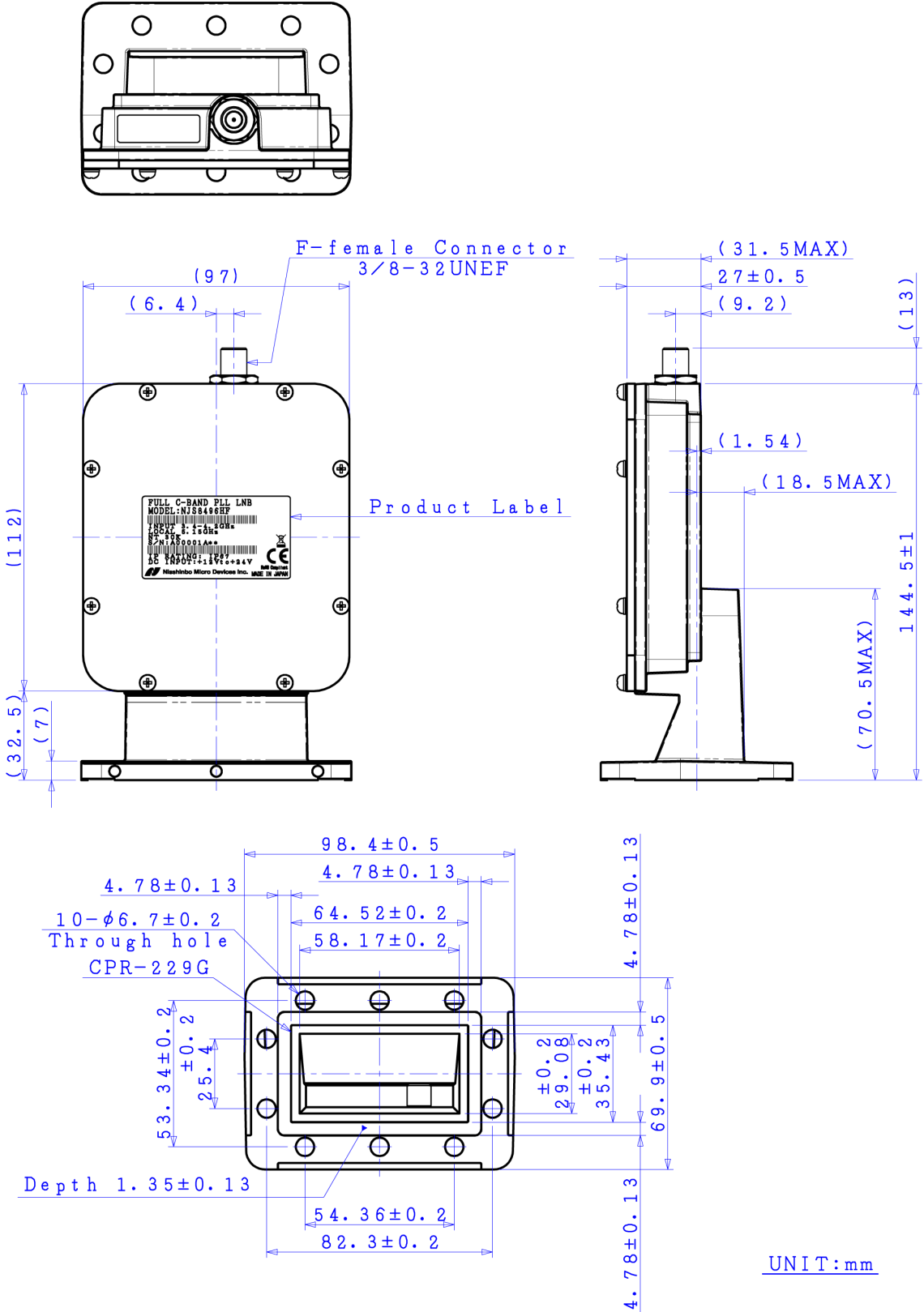
## 4. Outline Drawing

### 4.1. N-type Model (e.g. NJS8496EN)



\* Above Specifications are subject to change without notice.

## 4.2. F-type Model (e.g. NJS8496HF)

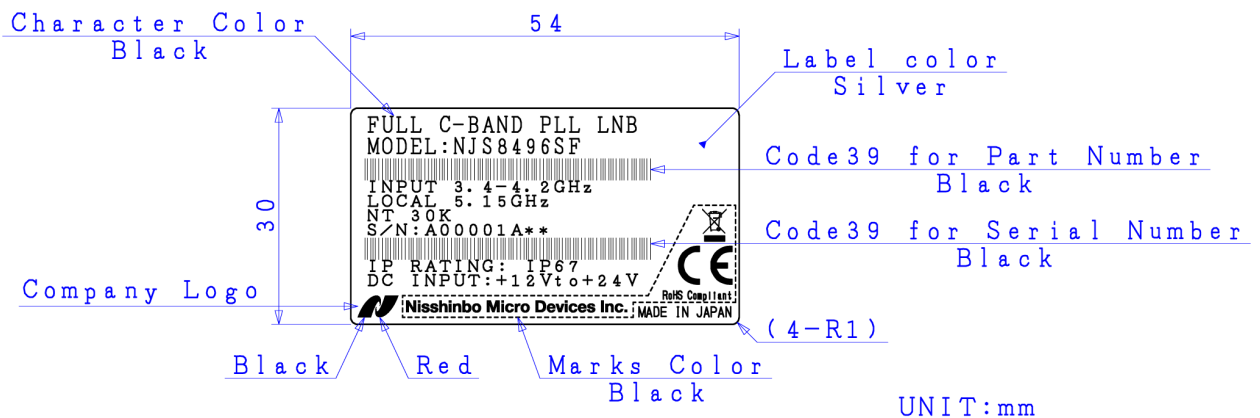


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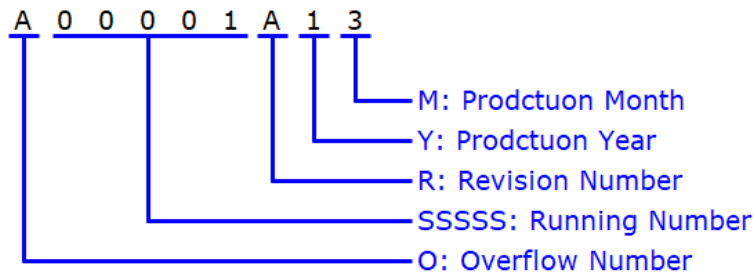
## 5. Label

### 5.1. Label Outline (e.g. NJS8496SF)



### 5.2. Definitions

Serial Number (OSSSSRYM) - ALPHANUMERIC (9 characters)



O: Overflow Number - ALPHABET (1 character)

"A" to "T" except "I" and "O", e.g.: A99999 ⇒ B00001

"V" to "Z": Specified Numbers

SSSS: Running Number - NUMBER (5 digits)

"00001" to "99999"

R: Revision Number - ALPHABET (1 character)

"A" to "T" except "I", "O", and "U"

Y: Production Year - NUMBER (1 digit)

"0" to "9", Last Digit of Calendar Number

e.g.: 2021:"1", 2022:"2", 2023:"3".....

M: Production Month - ALPHANUMERIC (2 characters)

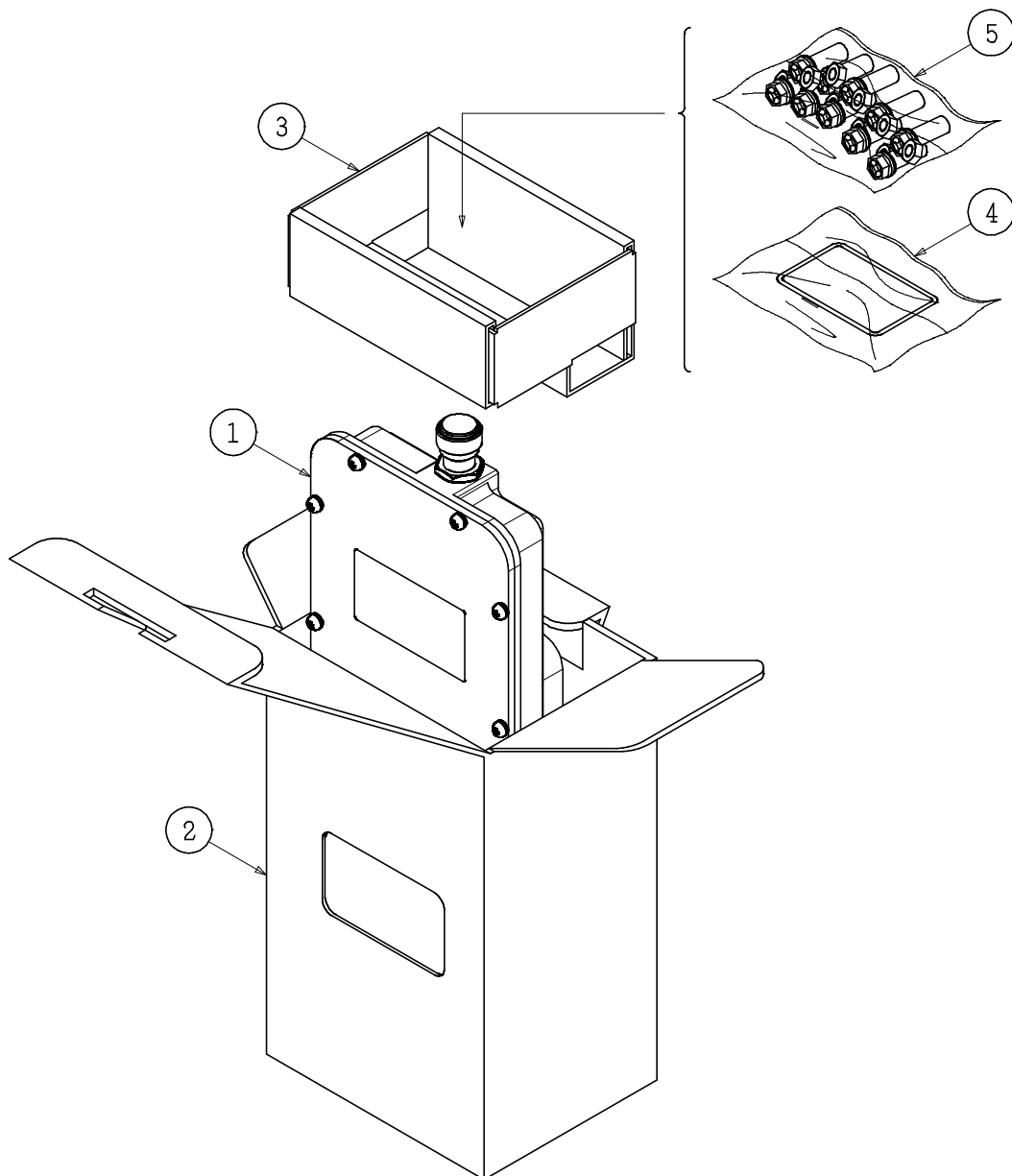
"1" to "9", "X" as October, "Y" as November, "Z" as December

\* Above Specifications are subject to change without notice.

## 6. Package

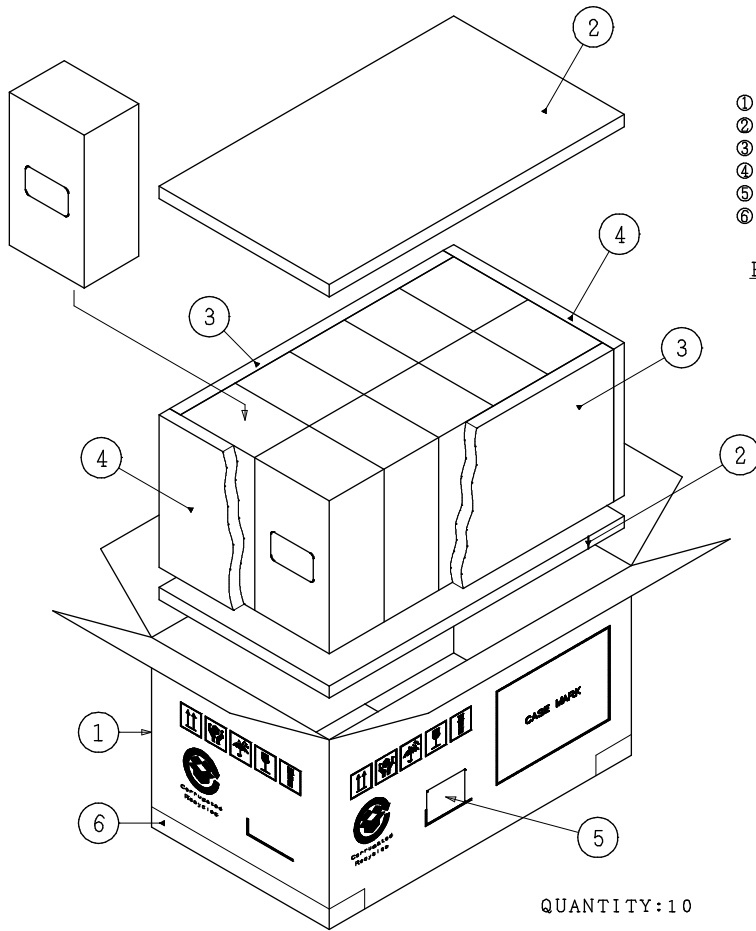
### 6.1. Individual Package

- ①: C-Band PLL LNB
- ②: Single wall corrugated fiberboard
  - Individual packaging box
- ③: Single wall corrugated fiberboard
  - Cushioning material
- ④: Accessories
  - O-RING (FULL)
- ⑤: Accessories
  - Cross recessed hex upset screws
  - M6×25 10 Pieces (SUS, SW and W) for Waveguide Flange Holes
  - Hexagon nuts
  - M6 Type 10 Pieces (SUS) for Waveguide Flange Holes



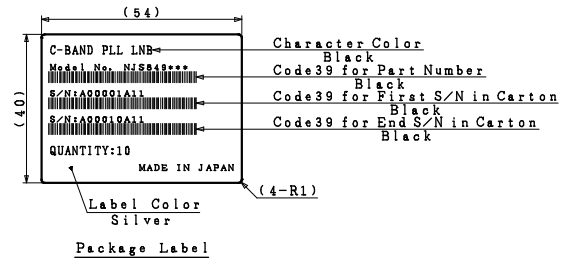
\* Above Specifications are subject to change without notice.

## 6.2. Shipping Package

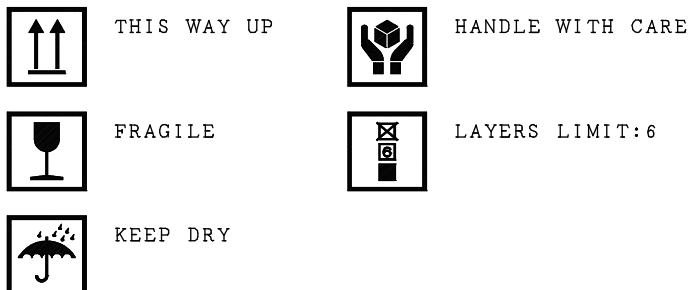


- ①: Double Wall Corrugated Fiberboard
- ②: Polyethylene Foam For Package Cushioning
- ③: Polyethylene Foam For Package Cushioning
- ④: Polyethylene Foam For Package Cushioning
- ⑤: Package Label
- ⑥: Carton Tape

### Package Label



### Pictorial Marking for Handling of Goods



\* Above Specifications are subject to change without notice.

## 6.3. Enclosed Accessories

- O-ring Gasket, Qty (1), Full-type, for Waveguide Flange
- Bolts, Qty (10), M6 x 25, Cross Recessed Hexagon Head with Spring Washer and Flat Washer, SUS
- Nuts, Qty (10), M6, Hexagon Nuts, SUS

\* Above Specifications are subject to change without notice.

## 7. Handling Precautions

### 7.1. DANGER



This statement indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

| Items         | Description  |
|---------------|--|
| Input Voltage | Only input a DC voltage within the range indicated in specifications.<br><u>Do</u> operate with the input voltage range between +12 and +24 V DC power. When applying higher voltage than specifications (+28 V as absolute maximum rating), it will not only cause this unit failure, but it may also result in <u>electric shock</u> and <u>fire</u> . |
| Disassembling | <u>Do not</u> disassemble the unit.<br>Disassembling will not only cause this unit failure, but it may also result in <u>electric shock</u> .  |

### 7.2. CAUTION



This statement indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. The statement may also be used to indicate other unsafe practices or risks of property damage.

| Items    | Description  |
|----------|--|
| Disposal | This unit contains gallium arsenide (GaAs), classified as a harmful substance. To avoid danger, <u>do not</u> incinerate, crush, or chemically treat the unit in such a way that gases or dust are released.<br>When disposing the unit, comply with all applicable laws and regulations and do not treat it as general industrial waste or household waste. |

### 7.3. NOTE



This statement is used to notify of installation, operation, or maintenance information that is important, but not hazard-related.

| Items             | Description  |
|-------------------|--|
| Torque Management | <u>Do not</u> tighten with excessive torque when attaching screws/bolts and connectors.<br>The following value as tighten torque is recommended.<br><ul style="list-style-type: none"> <li>■ Screws/Bolts - M6: 4.5 N·m ±0.45 N·m</li> <li>■ IF Connector (N-type / F-type): 0.68 to 1.13 N·m</li> </ul> |

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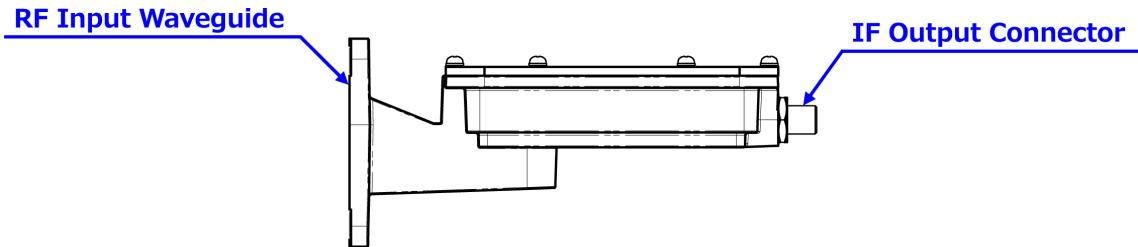
| Items                      | Description  |
|----------------------------|--|
| Weatherproof               | <p>The unit mounted in outdoor should be conducted with adequately weatherproof procedure.</p> <p>Do seal all of cable connection points from the connector to the cable sheath by usage of self-amalgamating tape.</p> <p>Ensure the waveguide connection is properly assembled with the enclosed o-ring gasket as accessories. The o-ring gasket is full-type and it is assumed to connect the unit to a grooved waveguide flange.</p>   |
| Input Voltage              | <p><u>Do</u> operate with the input voltage range between +12 and +24 V DC power. Avoid applying more than the maximum voltage in this range (including ripple voltage) under any conditions.</p>  |
| Input RF Signal Power      | <p><u>Do not</u> supply the input RF signal over the absolute maximum rating indicated in specifications (-10 dBm @ CW / +10 dBm @ Pulse).</p>   |
| Input 10MHz Signal Power   | <p>The 10 MHz reference signal should be supplied with the range between -10 and 0 dBm with sine-wave for correctly operation.</p> <p><u>Do not</u> supply the signal level of more than +13 dBm.</p>  |
| High Temperature Operation | <p>It may cause damage and/or degradation of reliability / lifetime to operate the unit in a condition where the ambient temperature exceeds the maximum value, <u>+60 °C</u>, at operating temperature described in the specifications.</p>   |
| Vibration / Shock          | <p>When vibration and/or shock impact exceeding the conditions described in the specifications is applied, internal parts may be damaged.</p>  |
| Warranty                   | <p>The unit is covered by a warranty for one(1) year following delivery unless otherwise stipulated in the contract or delivery conditions.</p> <p>Repairs may be possible under payment of charge even for the unit whose warranty period has expired.</p> <p>Opening, removing, disassembling and modifying any parts and components (including the product label, sealing tape and screws) without fan equipment will immediately void the warranty.</p> <p>In any case, the unit of invalid warranty cannot be repaired.</p> |

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## 8. Instructions Manual

### 8.1. Descriptions

This section describes the information of connectors and etc.



| Items               | Description  | Purpose  |
|---------------------|--|--|
| RF Input Waveguide  | Waveguide: WR-229<br>Flange: CPR-229G<br>(with Groove)                                     | The LNB receives an RF signal of C-band (3.4 to 4.2 GHz, 3.625 to 4.2 GHz, or 4.5 to 4.8 GHz) via this waveguide.  |
| IF Output Connector | F-type Female Coaxial Connector, 75 Ohms<br>OR<br>N-type Female Coaxial Connector, 50 Ohms | The LNB outputs an IF signal of L-band (950 to 1,750 MHz, 950 to 1,525 MHz or 960 to 1,260 MHz) and requires to supply +12 to +24 V DC power via this connector.<br>For external reference models, a 10 MHz reference signal must be supplied. |

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