Instruction Manual
for
Ku-band 3W BUC
[NJT8302 series]

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General Caution

1. NJRC strives to produce reliable and high quality microwave components. NJRC's microwave components are intended for specific applications and require proper maintenance and handling. To enhance the performance and service of NJRC's microwave components, the devices, machinery or equipment into which they are integrated should undergo preventative maintenance and inspection at regularly scheduled intervals. Failure to properly maintain equipment and machinery incorporating these products can result in catastrophic system failures.

2. To ensure the highest levels of reliability, NJRC products must always be properly handled. The introduction of external contaminants (e.g. dust, oil or cosmetics) can result in failures of microwave components.

3. NJRC offers a variety of microwave components intended for particular applications. It is important that you select the proper component for your intended application. You may contact NJRC's sales office or sales representatives, if you are uncertain about the products listed in the catalog and the specification sheets.

4. Special care is required in designing devices, machinery or equipment, which demand high levels of reliability. This is particularly important when designing critical components or systems whose foreseeable failure can result in situations that could adversely affect health or safety. In designing such critical devices, equipment or machinery, careful consideration should be given to, amongst other things, their safety design, fail-safe design, back-up and redundancy systems, and diffusion design.

5. The products listed in the catalog and specification sheets may not be appropriate for use in certain equipment where reliability is critical or where the products may be subjected to extreme conditions. You should consult our sales office or sales representatives before using the products in any of the following types of equipment.
   * Aerospace Equipment
   * Equipment Used in the Deep Sea
   * Power Generator Control Equipment (nuclear, steam, hydraulic)
   * Life Maintenance Medical Equipment
   * Fire Alarm/Intruder Detector
   * Vehicle Control Equipment (automobile, airplane, railroad, ship, etc.)
   * Various Safety Equipment

General Caution (continued)

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About This Instruction Manual

This instruction manual describes Ku-band 3W BUC (Model No.: NJT8302N, NJT8302F, NJT8302UN, and NJT8302UF) herein referred to as "the Unit".

This instruction manual provides information and instructions for installation and operation of the Unit.

This instruction manual is intended for use by trained field installers or system engineers responsible for satellite networks.

Updated instruction manual may be available from NJRC's sales group mcsales@njr.co.jp.

Contents

1. Introduction

This instruction manual is for Ku-band 3W BUCs with following model number: NJT8302N, NJT8302F, NJT8302UN, and NJT8302UF.

Standard Ku-band 3W BUC (Model No.: NJT8302N and NJT8302F) receives a reference signal (10 MHz) and an IF signal (L-Band: 950 to 1,450 MHz) input and transmits an RF signal (Standard Ku-band: 14.0 to 14.5 GHz) output.

Universal Ku-band 3W BUC (Model No.: NJT8302UN and NJT8302UF) receives a reference signal (10 MHz) and an IF signal (L-Band: 950 to 1,700 MHz) input and transmits an RF signal (Universal Ku-band: 13.75 to 14.5 GHz) output.

The Unit comes in a single, weatherized housing rated for outdoor use. The Unit has either an N-Type or a F-type female connector input, a WR75 waveguide output. The Unit is operated by +24 V DC power (Range: +15 to +30 V) input.

The line-up is mentioned in a chart below.

Model Number	Line-up Description
NJT8302N	Universal Ku-band, N-type female Interfece Connector
NJT8302F	Universal Ku-band, F-type female Interfece Connector
NJT8302UN	Standard Ku-band, N-type female Interfece Connector
NJT8302UF	Standard Ku-band, F-type female Interfece Connector

The detail of frequency for the reference, IF, RF and local oscillaton is mentioned in a chart below.

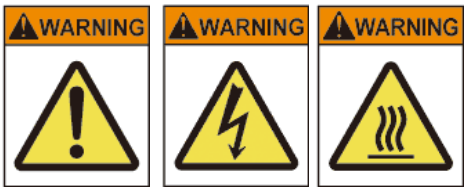
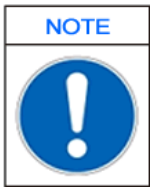
Model Number	RF Frequency	Local Oscillation Frequency	IF Frequency	Refefence Frequency
NJT8302N	14.00 to 14.50 GHz	13.05 GHz	950 to 1,450 MHz	10 MHz
NJT8302F				
NJT8302UN	13.75 to 14.50 GHz	12.80 GHz	950 to 1,700 MHz	
NJT8302UF				

2. Safety Instructions

Use the following safety guidelines to help protect the Unit from potential damage and to help ensure your own personal safety.

DANGER, WARNING, CAUTION, and NOTE Statements

DANGER, WARNING, CAUTION, and NOTE statements are used throughout this instruction manual to emphasize important and critical information. You must read these statements to help ensure safety and to prevent product damage. The statement are defined below.

Statement	Symbol	Description
DANGER		DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING		WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION		CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. CAUTION may also be used to indicate other unsafe practices or risks of property damage.
NOTE		NOTE is used to notify of installation, operation, or maintenance information that is important, but not hazard-related.

Symbol	Description
	GENERIC HAZARD
	ELECTRIC HAZARD
	HOT SURFACE

When installing the Unit, observe the following safety guidelines.

2.1. Safety Statements

1. Opening / Removing

DO NOT dismantle this product.
Dismantlement may cause malfunction and electric shock.

2. Input Voltage

Only input a voltage within the range indicated in specified voltage.
DO operate at the input voltage of +15 to +30 V DC power.

3. RF Radiation

A radiation hazard exists if the BUC is operated with its RF signal output unterminated.
DO NOT operate the BUC without a load or termination attached to the RF signal output.

4. High Temperatures

DO NOT touch the body, especially fins, during operating the Unit.
High touch temperatures may exist, depending on load conditions.

5. Input Level

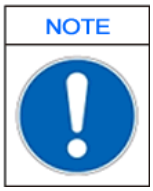
DO NOT input an IF signal over the range of +13 dBm maximum and a reference signal within the range of -5 to +5 dBm.

6. Operating Temperature.

Operate the Unit within the ambient temperature range of -40 to +55 degree C.

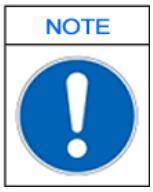
2.2. Instruction Statements

1. Mounting



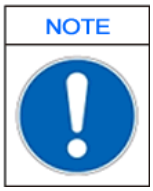
DO NOT block the fins.
Normally the Unit should be mounted with long fins face up.

2. Weatherproof



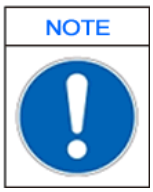
The Unit is mounted outdoors must be adequately weatherproofed.
Ensure the waveguide joints are properly sealed with the supplied o-ring (gasket).
Use self-amalgamating tape to seal connectors and cable entry points from the connector to the cable sheath.

3. Waveguide Sealing Film



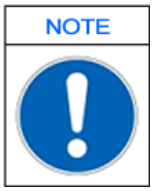
DO NOT remove the fim on the waveguide when the unit has it. If the film is removed, it may lose the performance of waterproof.

4. Connecter



Connect the IF cable to the input connector of both N and F-type with 0.68 to 1.13 N･m torque.

5. Warranty



Opening or removing any component (e.g. label, and screws) or sealed area will immediately void the warranty.

3. Packing List

The Unit is shipped in a single shipping container with the following content:

No.	Qty	Description
1.	1 unit	Ku-band 3W BUC NJT8302N, NJT8302F, NJT8302UN, OR NJT8302UF
2.	1 set	Accessory of BUC Qty(4), Hexagon Socket Head Bolt (M4x10) Qty(1), Hexagon Wrench Key (M4) Qty(1), Cross-recessed Head Screw (M4x6) Qty(1), O-ring
3.	1 sheet	Date sheet

4. Overview

The Unit transmits an RF singal output with up to 3W (+34 dBm) linear.

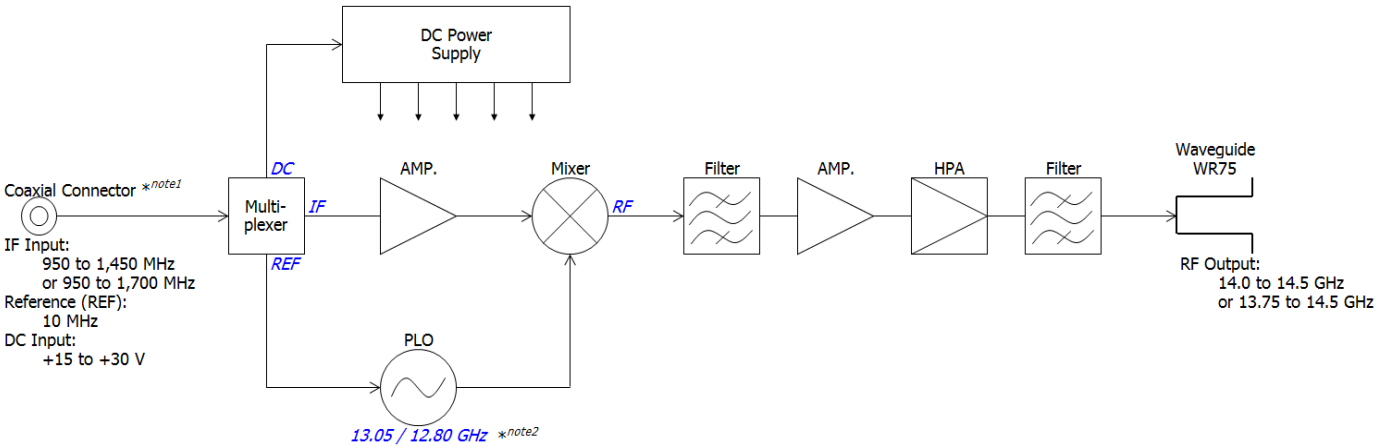
The unique features are

- Leading Technology Equipped
- Full Ku-band Coverage Line-up:
  - * Universal Ku-band: 13.75 to 14.5 GHz
  - * Standard Ku-band: 14.0 to 14.5 GHz
- Super High Efficiency & Low Distortion:
  - * P1dB: +34 dBm min. over temperature
  - * ACPR: -26 dBc @ Pout = +34 dBm
  - * Power Consumption: 18 W
- Smallest Size & Lightest Weight *(*note)*
  - * Dimension: 91.55 x 68 x 42.5 mm
  - * Weight: 350 g
- RoHS Compliance

*(*note) As 3W Ku-band BUCs for VSAT released in June 2011*

The Unit has the following line-up:

Model Number	Line-up Description
NJT8302N	Standard Ku-band, N-type female Interfece Connector
NJT8302F	Standard Ku-band, F-type female Interfece Connector
NJT8302UN	Universal Ku-band, N-type female Interfece Connector
NJT8302UF	Universal Ku-band, F-type female Interfece Connector



Note1: The Coaxial Connector depends on the model number: NJT8302N and NJT8302UN: N-type Female Connecter
NJT8302F and NJT8302UF: F-type Female Connecter

Note2: The PLO Frequency depends on the model number: NJT8302N and NJT8302F: 13.05 GHz
NJT8302UN and NJT8302UF: 12.80 GHz

Block Diagram

5. Physical Description

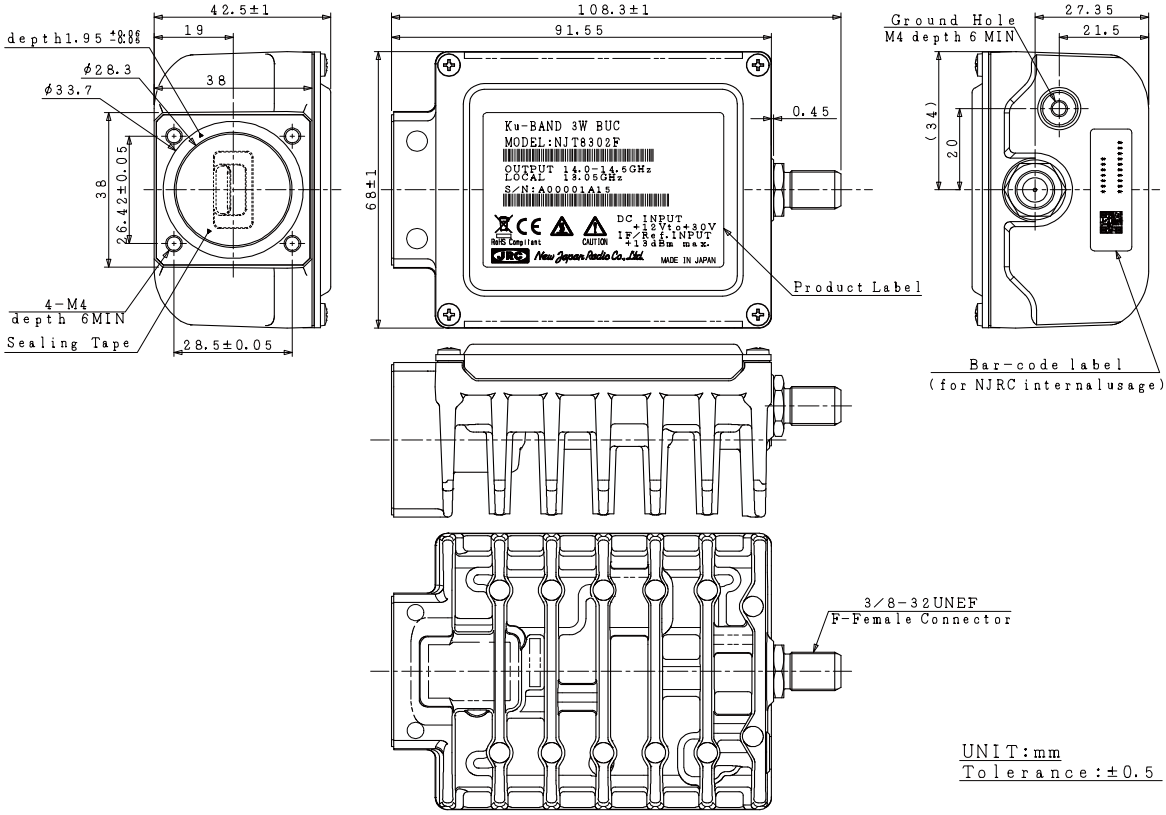
This section describes appearance and outline for the Unit.

5.1. Appearance

Overall Picture
(Model No. NJT8302UF)

5.2. Outline

5.2.1. Outline Drawing of NJT8302F



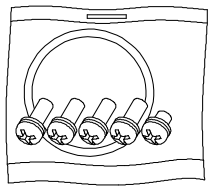
5.3. Description of Connectors, Switches, and LEDs

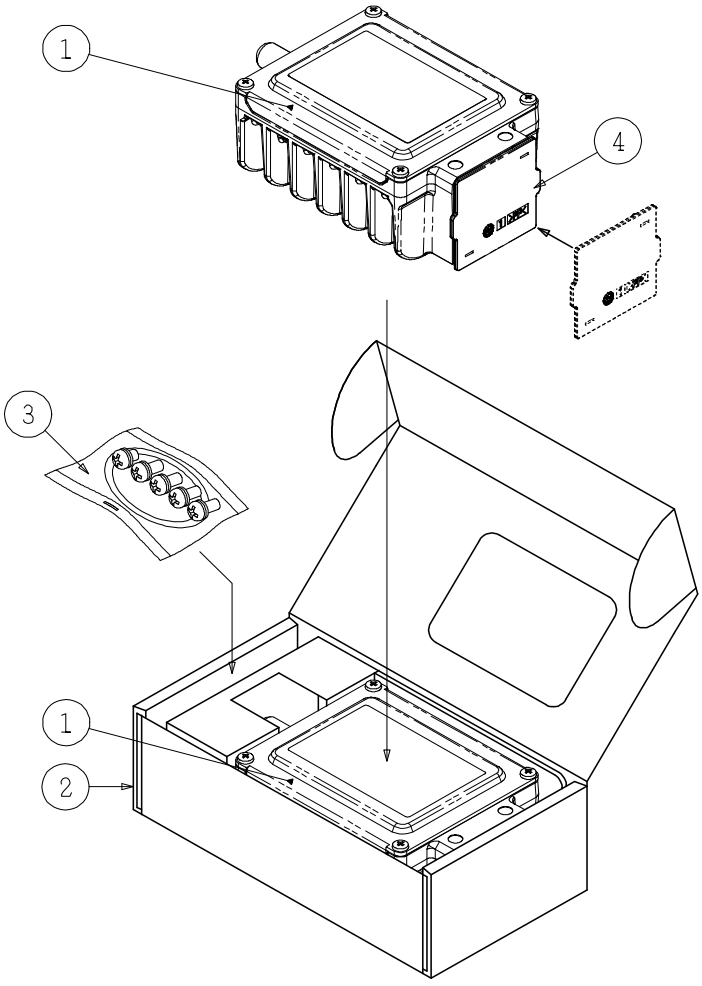
Item	Description	Purpose
N-type OR F-type Female Connector	IF / Reference Input and DC Power Input	The Unit receives an IF signal (950 to 1,450 MHz or 950 to 1,700 MHz) and a reference signal (10 MHz) and is required to supply +15 to +30 V DC power via this connector.
WR-75	RF Output	The Unit transmits an RF signal (13.75 to 14.5 GHz or 14.0 to 14.5 GHz) via this waveguide.
Ground Hole	M4 Threaded Hole	Common chassis ground

5.4. Package

5.4.1. Drawing of Individual Package

Accessories
・O-ring
・Cross Recessed Head Screws
M4×10 4 pieces(SUS, SW and W) for Waveguide Flange Holes
M4×6 1 piece(SUS, SW and W) for Ground Hole





①:BUC
②:Single Wall Corrugated Fiberboard
③:Accessories
④:Polypropylene Flange Cover

UNIT:mm

6. Installing

This section describes basic installation for the Unit.

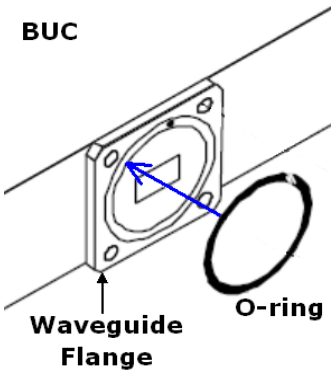
6.1. Mounting Configuration

The Unit can be mounted in the feed horn of the satellite antenna.

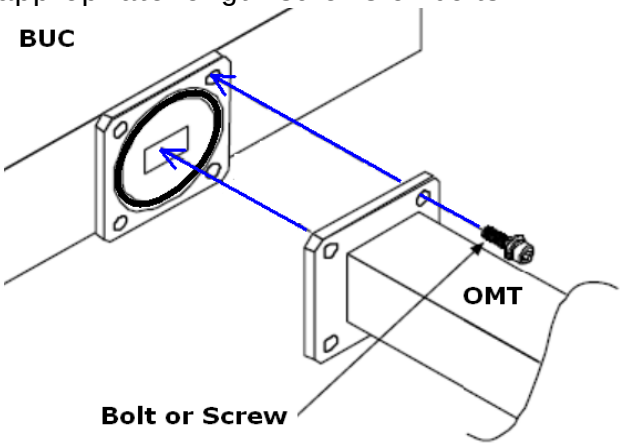
6.1.1. Guidelines for Attachment of OMT

When attaching the OMT or the filter, you should follow the following steps:

Step 1: Verify that the o-ring groove on the waveguide flange of the Unit is clean. Insert the enclosed o-ring (gasket) the groove as shown.



Step 2: Secure the OMT or the filter to the Unit using the enclosed hexagon socket head bolts (M4x10) with 1.15 to 1.4 N･m torque as shown, when the thickness of the flange of the OMT or the filter is 3.5 to 5.0 mm.
When the thickness is not 3.5 to 5.0 mm, you should prepare the appropriate length screws or bolts.



NOTE

DO NOT remove the fim on the waveguide when the unit has it. If the film is removed, it may lose the performance of waterproof.

6.1.2. Guidelines for Mounting

When mounting on the the OMT or the filter, you should follow the following cautions:

- DO NOT block the fins.
- Normally the Unit should be mounted with long fins face up.

6.2. Connecting System

The Unit is connected a coaxial cable and ground wire.

6.2.1. Connecting Coaxial Cable

The Unit receives an IF signal and a reference signal via coaxial cable from modem, and is required to supply +15 to +30 V DC power via coaxial cable from modem.

Connecting the coaxial cable is proceeded with the following steps:

Step 1: Connect the coaxial cable with the N or F-type male connectors to the coaxial connecter equipped with the Unit which is shown in a figure below under 0.68 to 1.13 N･m torque.

Step 2: Use self-amalgamating tape to seal connector and cable entry points from the connector to the cable sheath.

Only input a voltage within the range indicated in specified voltage.
DO operate at the input voltage of +15 to +30 V DC power at the coaxial connecter on the Unit.

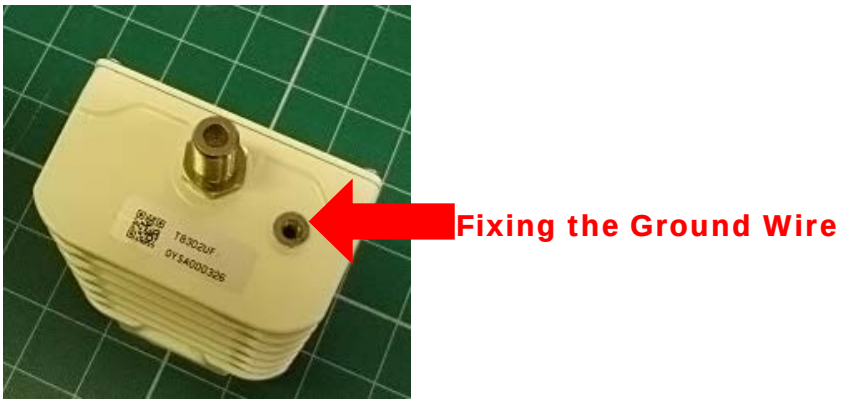
DO NOT input an IF signal over the range of +13 dBm maximum and a reference signal within the range of -5 to +5 dBm.

6.2.2. Fixing Ground Wire

The Unit should be common with ground of other equipments (e.g. antenna).

Fixing a ground wire from the common ground of other equipments for grounding is proceed with the following step:

Step 1: Fix the ground wire from other equipments to the ground hole near the coaxical connector with enclosed on the Unit.



To reduce the risk of damage or broken by lightning surge, the Unit should be fixed with the ground wire.

7. Specification

The Unit is in compliance with the following specifications:

7.1. Electrical Specifications

No.	Item	Specifications
1.	Output Frequency Range <Standard Ku-band> <Universal Ku-band>	 14.00 to 14.50 GHz 13.75 to 14.50 GHz
2.	Input Frequency Range <Standard Ku-band> <Universal Ku-band>	 950 to 1,450 MHz 950 to 1,700 MHz
3.	Maximum IF Input Level (without damage)	+13 dBm max.
4.	Conversion Type	Single, fixed L.O.
5.	L.O. Frequency <Standard Ku-band> <Universal Ku-band>	 13.05 GHz 12.80 GHz
6.	Frequency Sense	Positive
7.	Output Power @ 1dB G.C.P.	+34 dBm min. over temperature
8.	Linear Gain	58 dB typ., 51 dB min.
9.	ACPR	-26 dBc typ. @ Pout = +34 dBm
10.	Requirement for External Reference [Frequency] [Input Power] [Phase Noise]	 10 MHz (sine-wave) -5 to +5 dBm @ Input port -125 dBc/Hz max. @ 100 Hz -135 dBc/Hz max. @ 1 kHz -140 dBc/Hz max. @ 10 kHz
11.	L.O. Phase Noise	-60 dBc/Hz max. @ 100 Hz -70 dBc/Hz max. @ 1 kHz -80 dBc/Hz max. @ 10 kHz -90 dBc/Hz max. @ 100 kHz -100 dBc/Hz max. @ 1MHz
12.	Input Impedance <N-type Connector> <F-type Connector>	 50 ohms nominal 75 ohms nominal
13.	Input VSWR	2 : 1 max.
14.	Output VSWR	2 : 1 max.
15.	Output Load VSWR for Non Damage	Infinite : 1

No.	Item	Specifications
16.	DC Power Requirement [Voltage Range] [Power Consumption]	 +24 VDC (+15 to +30 VDC) 18 W typ., 23 W max. @Pout=+34dBm 15 W max. @ No IF, +25 C 2 W max. @ 10 MHz reference off
17.	Mute	Shut off the HPA in case of L.O. unlocked or no 10 MHz reference signal.

7.2. Mechanical and Environmental Specification:

No.	Item	Specifications
1.	Input Interface <NJT8302N / 02UN> <NJT8302F / 02UF>	 IF / Ref. / DC Power: N-type, female IF / Ref. / DC Power: F-type, female
2.	Output Interface	Waveguide, WR75 (with Groove)
3.	Dimension & Housing without Interface Connector (L) (W) (H)	 91.55 mm [3.60"] 68 mm [2.68"] 42.5 mm [1.67"]
4.	Weight	350 g [0.77 lbs]
5.	Cooling	Convection Cooling
6.	Temperature Range (ambient) [Operating] [Storage]	 -40 to +55 °C *1* -40 to +75 °C
7.	Humidity	0 to 100 % *2*
8.	Dustproof / Waterproof	IP67 (IEC 60529)
9.	Regulatory Compliance	CE / EMC Directive (2004/108/EC)
10.	Comply with RoHS (Restricting the use of Hazardous Substances) directives	

**1: Conditioned on connection with OMT and TRF.*

**2: Premised on connection with the hermetically-sealed OMT and Feed horn.*