

Dongguan Boju Electronics Co., Ltd

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Date: 2023/10/30

File No: 2023103001

Revision: 1.00

Specification

Customer: GLOBALSCALETECHNOLOGIES

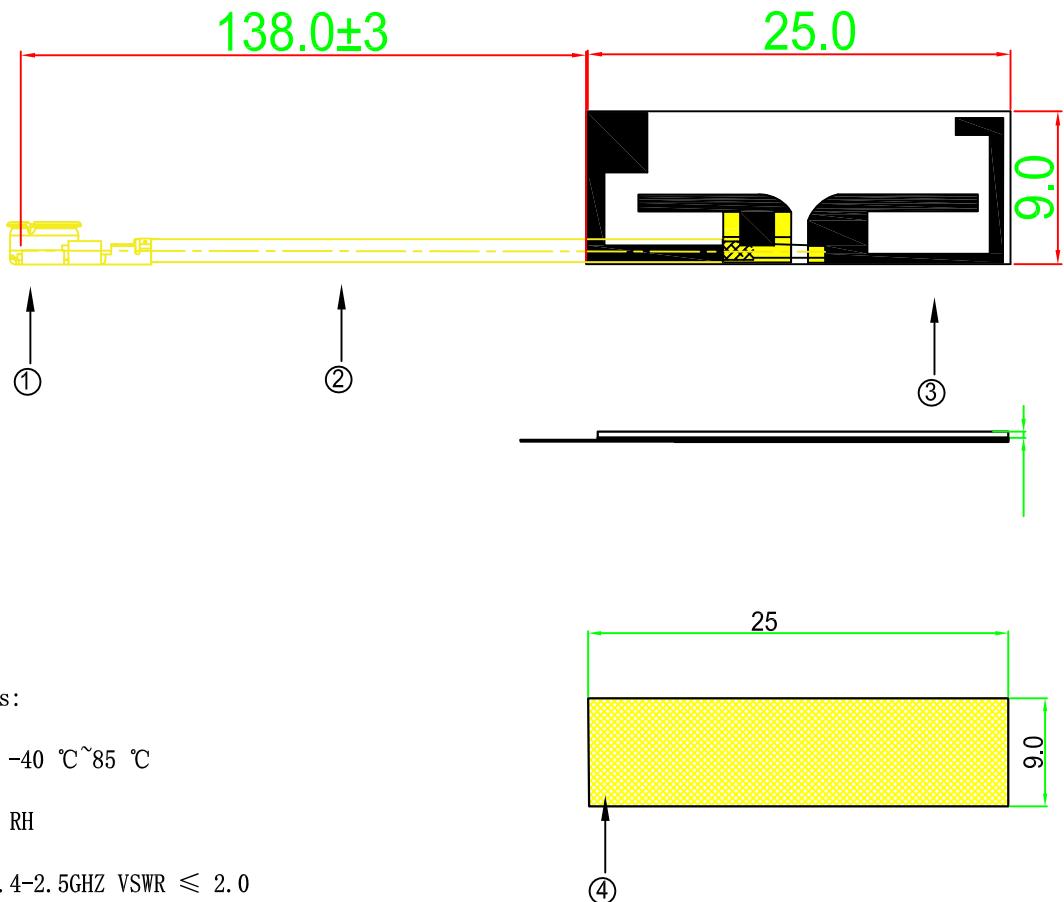
Product Name: 2.4G Antenna FPCB

Product part number: NB2400-2509-138B1

Customer acknowledges:

Approval	To examine

1	2	3	4	5	6	7	8
CUSTOMER					REV.	ORDER NO	DATE
PART NO					△		2023.10.30
E							E



Product performance parameters:

1. Storage temperature range: -40 °C ~ 85 °C
2. Storage humidity: 10% ~ 95% RH
3. Product characteristics: 2.4~2.5GHz VSWR ≤ 2.0
4. Gain: 2dBi
5. Product shelf life: 1 year.
6. ROHS: Compliant with ROHS

NO	Product Name	Specification Description	Product Number	Q.TY
1	FPCB	NB2509-WF01	25*9*T0.23mm	1
2	Coaxial Cable	1.13 Coaxial Cable	O.D.1.1 Black	1
1	1MiNi Connector	1.13 IPX 20279	CN-IPEX1-113-S	1

Dongguan Boju Electronics Co., Ltd

PART NAME: 2.4GHz Antenna

PART NO.: NB2400-2509-138B1

DATE: 2023-10-30

APPROVED BY	CHECKED BY	DESIDNED BY	△	Tolerance X.X ±0.50
		BJ-01		UNITS: mm SCALE: 1/1 REVISION: A

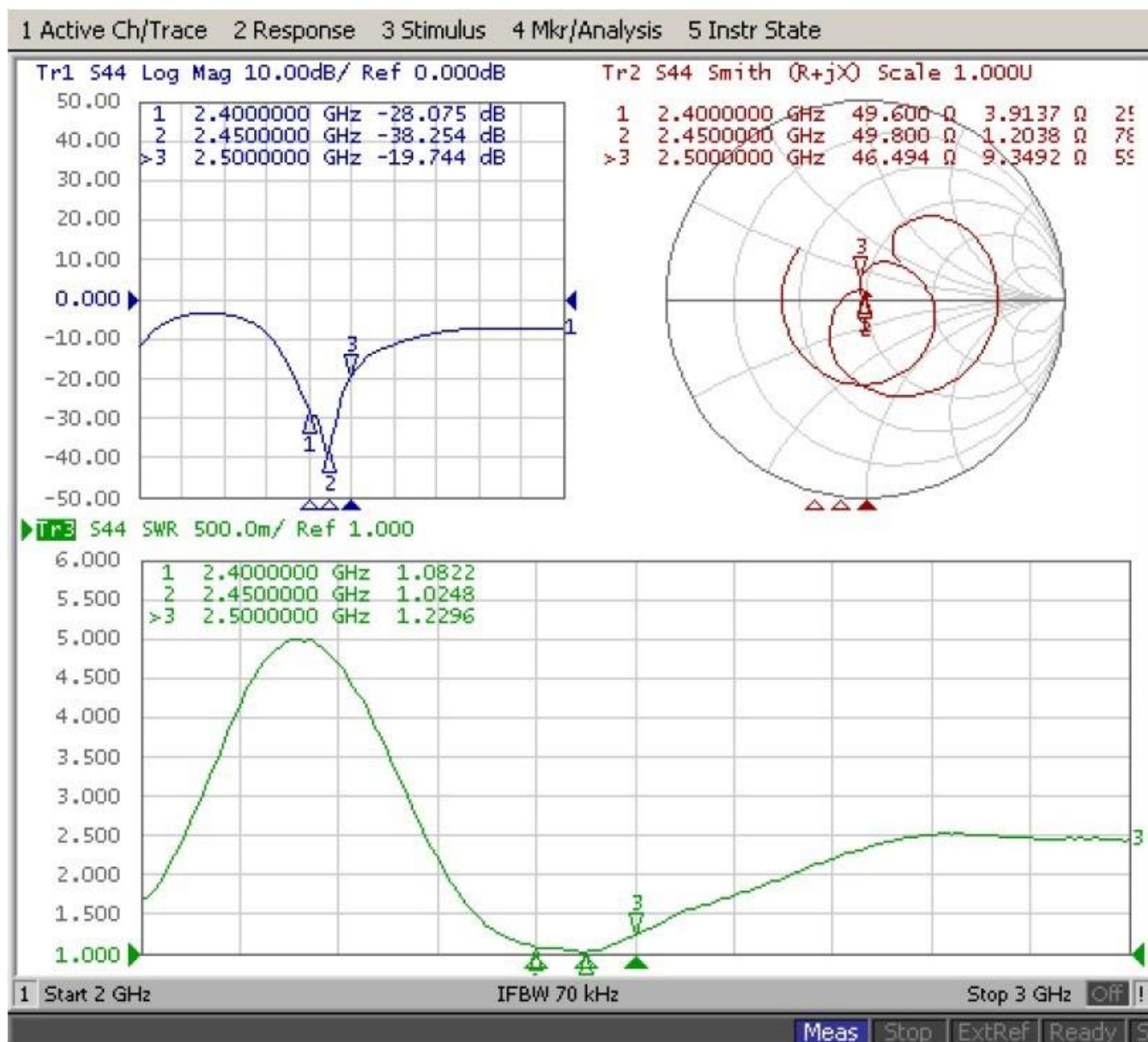
1. Specification

Sample Photo	
	
A. Electrical Characteristics	
Frequency 2400 ~ 2500 MHz	
S.W.R.	<= 2.0
Efficiency	> 50%
Polarization	Linear
Impedance	50 Ohm
Antenna Type	PIFA
B. Material & Mechanical Characteristics	
Material of Radiator	FPCB
Cable Type	O.D. 1.13 mm (Black) 138mm
Connector Type	Mini Connector for O.D. 1.13 mm Coaxial Cable
Pull Test	>= 1.0 Kg
C. Environmental	
Operation Temperature	- 40 °C ~ + 65 °C
Storage Temperature	- 40 °C ~ + 80 °C

2. Characteristics and Reliability Test

Test Items		Test Condition and Procedure	Requirements
C1	S.W.R.	Set DUT on Network Analyzer; make individual calibration to test	Directive DUT specification
C2	Antenna Gain	Set DUT on Antenna Chamber; make individual calibration to test	Directive DUT specification
M1	Vibration	MIL-STD-202G, 201A Amplitude: 0.03 inch (0.76mm); Freq: 10 to 55 Hz 3 directions; 2 hours for each direction	1. No Visual Damage 2. Frequency Tol.<= 5%
M2	Random Drop	Height: 1.5 Meter; 3 directions; 1 time for each direction	1. No parts separated 2. Frequency Tol.<= 5%
M3	Solderability	MIL-STD-202G, 210F, cond. A Solder iron: 350±10°C; Duration: 5 seconds	1. Mounted on PCB 2. No Visual Damage
M4	Terminal-Pull Test	MIL-STD-202G, 211A, cond. A Holding with individual specification; force applied to axis of terminal	1. Directive DUT specification 2. Frequency Tol.<= 5%
M5	Dimension	Inspection of dimension, color, material, package, surface process	Directive DUT specification
E1	Salt Spray	MIL-STD-202G, 101E, cond. B Temp: 35°C; RH: >= 95%; NaCl solution: >= 5%; Time: 48 hours	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.<= 5%
E2	Humidity	MIL-STD-202G, 103B, cond. B Temp: 40°C; RH: >= 95%; Time: 48 hours	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.<= 5%
E3	Thermal Shock	1 Cycle: - 40°C (30 minutes) to + 80°C (30 minutes) Cycles: 24	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.<= 5%
E4	Life (High Temp.)	MIL-STD-202G, 108A, cond. A Temp: 85°C; Time: 96 hours	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.<= 5%
R1	RoHS	With Reference to IEC 62321:2008 with flow chart	Directive RoHS 2002/95/EC
R2	PFOS	With Reference to USA EPA 3540C:1996 by LC/MS	Directive RoHS 2006/122/EC
R3	PFOA	With Reference to USA EPA 3540C:1996 by LC/MS	Directive RoHS 2006/122/EC

3. Antenna - S Parameter Test Data



4. Antenna - Radiation Pattern Test Data

See attached files

Testing Equipment Specification:

Antenna Anechoic Chamber Dimension: 6x 3 x 3 m

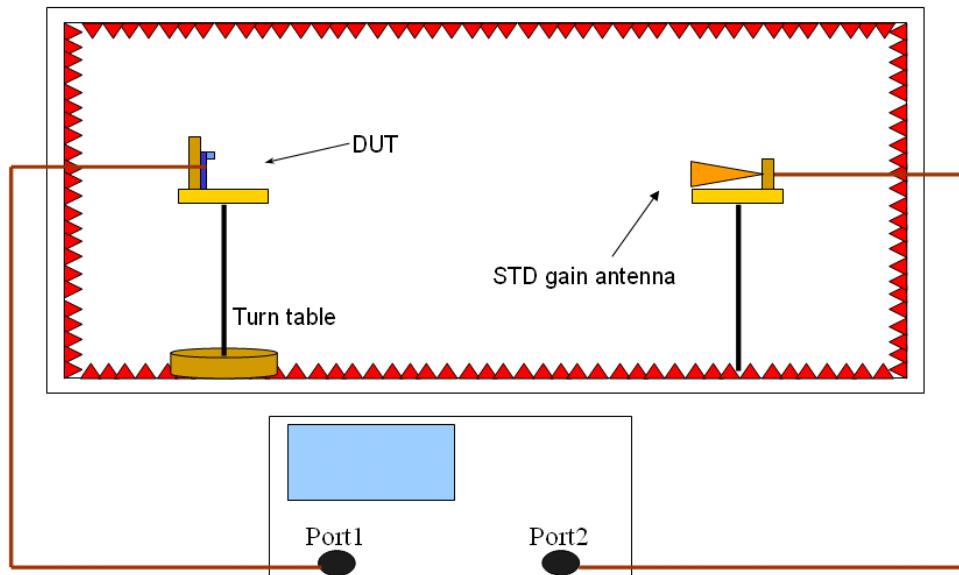
Quite Zone: 600mm @1 GHz

Isolation: >100dB @ 1 MHz ~ 10 GHz

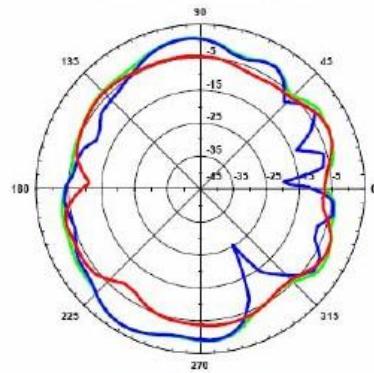
Testing Equipment: Agilent 5071B

Received Antenna: 0.7 ~ 6.0 GHz for Gain Calibration

Double Ridged Horn Antenna



H-Plane // 2450MHz



Ver. Pol. (max.)=	-1.9
Ver. Pol. (avg.)=	-4.6
Hor. Pol. (max.)=	2.7
Hor. Pol. (avg.)=	-2.6
Tol. Gain (max.)=	2
Tol. Gain (avg.)=	-1.6

5. Antenna Test method

As shown in the above diagram, first debug the technical parameters of the network analyzer to be OK, and then insert the antenna into the testing end of the network analyzer for testing. Define the range value of the waveform parameters. If the test data is within the range, it is judged as OK, and vice versa, it is considered a defective product.

Technical parameters reference range:

Test frequency	V.S.W.R
2.4GHz	<2.0
2.45GHz	<2.0
2.5GHz	<2.5