Antenna Test Report

Report No.: AGC02390220401PA01

PRODUCT DESIGNATION	:	BDE Dual-Band WiFi MCU Module
BRAND NAME	:	BDE
MODEL NAME	:	BDE-ANT-2458-3135
APPLICANT	:	Guangzhou BDE Technology Inc.
DATE OF ISSUE	:	Aug. 05, 2022
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Aug. 05, 2022	Valid	Initial release

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1. PRODUCT INFORMATON

General information	
Applicant	Guangzhou BDE Technology Inc.
Address	B2-403, Chuangyi Building, 162 Science Avenue, Huangpu District, Guangzhou 510663, China
Manufacturer	Guangzhou BDE Technology Inc.
Address	B2-403, Chuangyi Building, 162 Science Avenue, Huangpu District, Guangzhou 510663, China
Factory	Guangzhou BDE Technology Inc.
Address	B2-403, Chuangyi Building, 162 Science Avenue, Huangpu District, Guangzhou 510663, China
Product Designation	BDE Dual-Band WiFi MCU Module
Brand Name	BDE
Test Model	BDE-ANT-2458-3135
Date of test	Aug. 05, 2022
Report Template	AGCRT-ER-PA/V1.0
Technical information	
Frequency Range	2400-2500MHz/5150-5850MHz
Test Frequencies	2.4G：2400MHz, 2410MHz, 2420MHz, 2430MHz, 2440MHz, 2450MHz, 2460MHz, 2470MHz, 2480MHz, 2490MHz, 2500MHz， 5G：5150MHz, 5200MHz, 5250MHz, 5300MHz, 5350MHz, 5400MHz, 5450MHz, 5500MHz, 5550MHz, 5600MHz, 5650MHz, 5700MHz, 5750MHz, 5800MHz, 5850MHz
Antenna Type	PCB antenna
Dimensions	15*5mm
Impedance	50Ω
Maximum test values	2.4G：Gain: 2.5dBi; Efficiency: 55.704%; VSWR: 1.234:1 5G：Gain: 2.5dBi; Efficiency: 42.15%; VSWR: 2.585:1

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd.
The test results of this report relate only to the tested sample identified in this report.

Prepared By	Alan Duan (Project Engineer)	Aug. 05, 2022
Reviewed By	Calvin Liu (Reviewer)	Aug. 05, 2022
Approved By	Max Zhang (Authorized Officer)	Aug. 05, 2022

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Designated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

2. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3. TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	Cal. Date	Cal. Due
ANTENNA MEASUREMENT SYSTEM	ETS-Lindgren	AMS-8600	Nov. 26, 2021	Nov. 25, 2022
Network Analyzer	R&S	ZVL-6	Oct. 16, 2021	Oct. 15, 2022
Test software	ETS-Lindgren	EMQuest (Ver V1.12)	N/A	N/A

4. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of VSWR, Uc = ±1.5dB
- Uncertainty of Gain, Uc = ±0.8dB

5. TEST SUMMARY LIST

NO.	Test item	Remark
1	VSWR	--
2	Gain and efficiency	--
3	Radiation pattern	--

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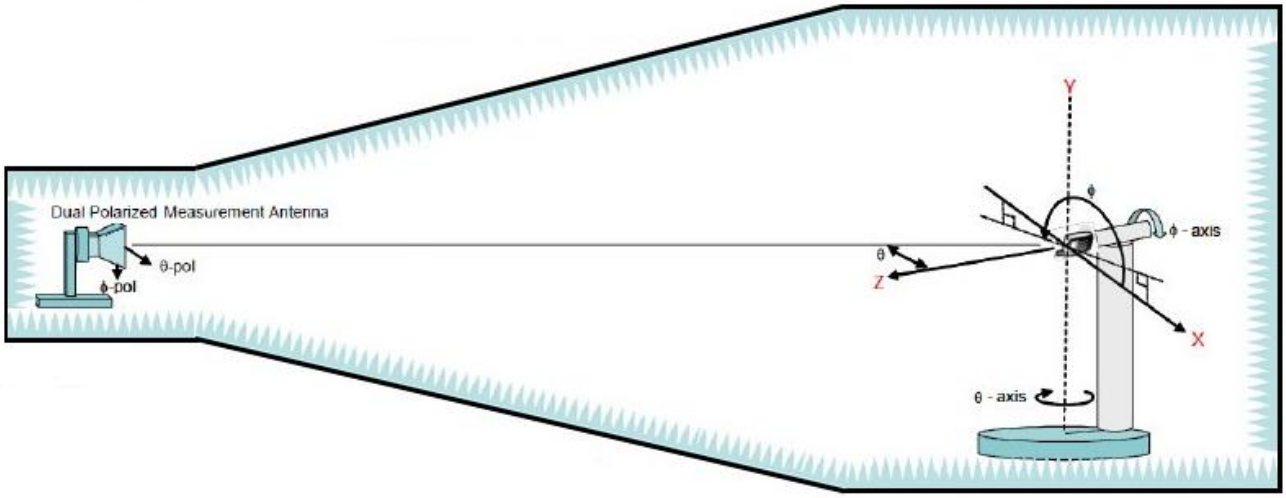
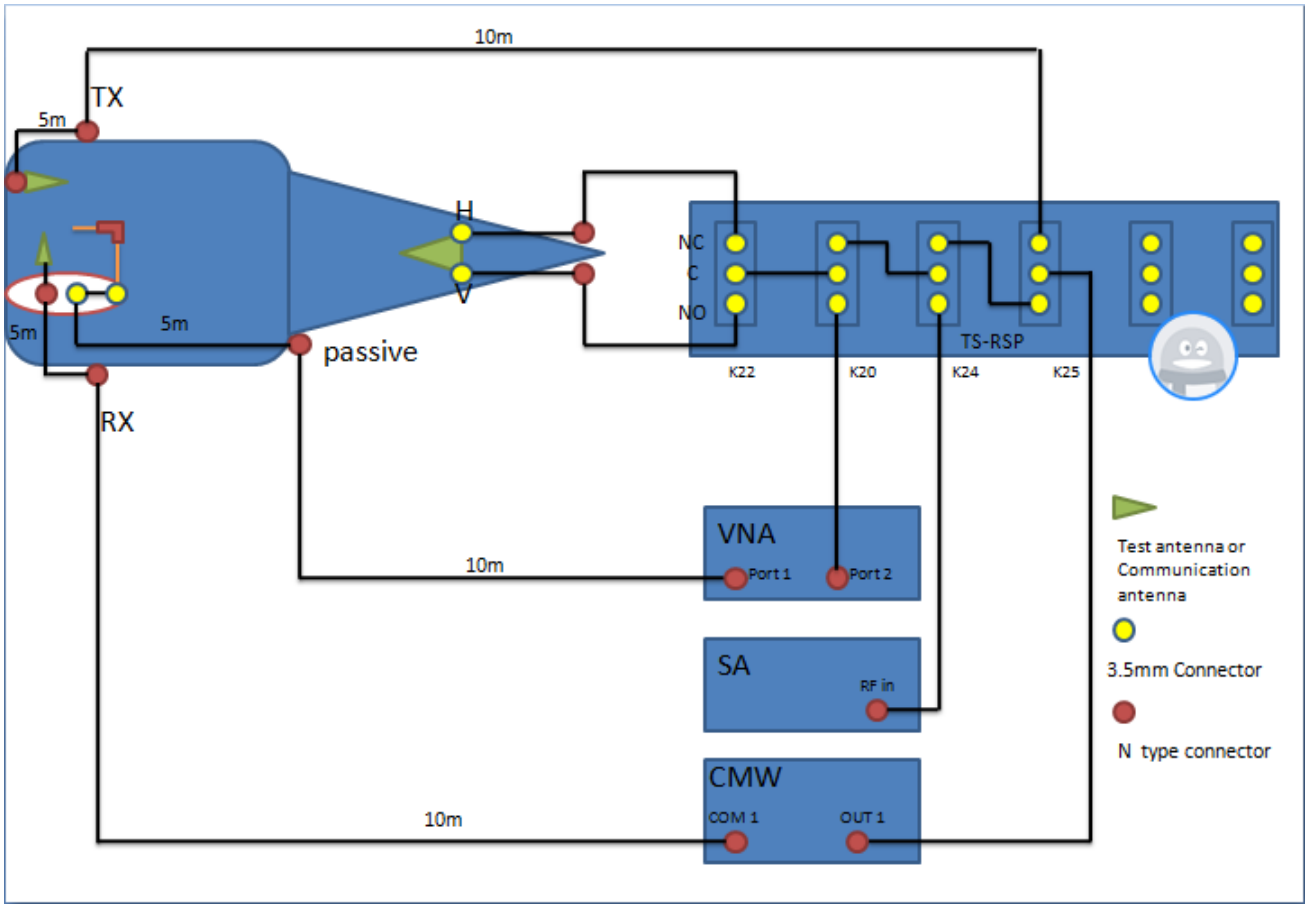
6. TEST SETUP





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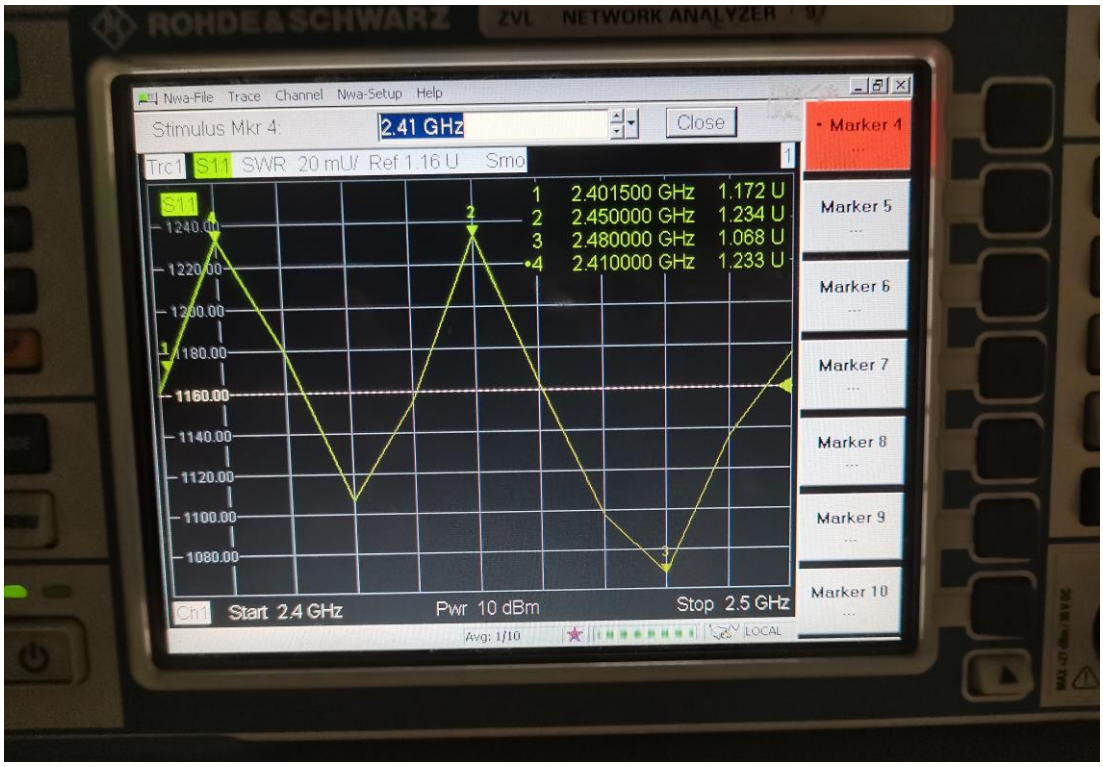
7. TEST RESULTS

7.1. VSWR

2.4G

Frequency(MHz)	VSWR
2402	1.172:1
2410	1.233:1
2450	1.234:1
2480	1.068:1



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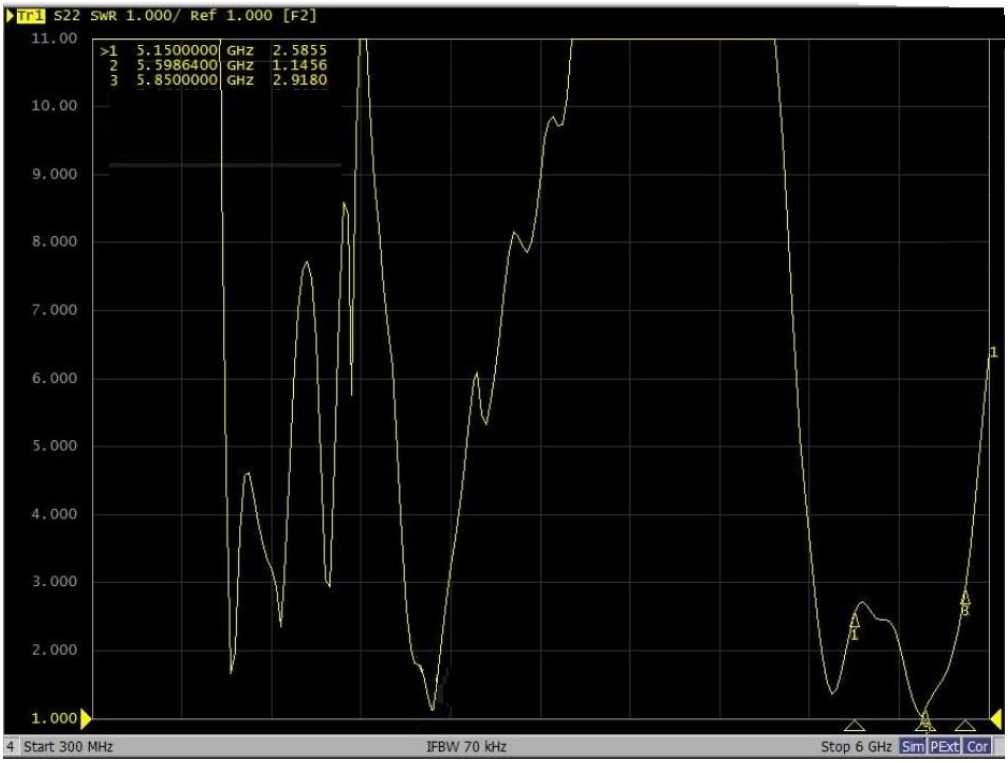
5G

Frequency(MHz)	VSWR
5150	2.585:1
5560	1.145:1
5850	1.918:1



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7.2. GAIN AND EFFICIENCY

2.4G

Frequency(MHz)	Efficiency(dB)	Efficiency(%)	Gain(dBi)
2400	-4.870	32.576	1.4
2410	-4.580	34.830	1.0
2420	-4.531	35.224	0.3
2430	-4.580	34.833	0.1
2440	-4.762	33.397	0.7
2450	-4.655	34.233	1.4
2460	-4.098	38.920	1.8
2470	-3.954	40.233	1.2
2480	-3.689	42.760	1.2
2490	-2.999	50.128	1.9
2500	-2.541	55.704	2.5

5G

Frequency(MHz)	Efficiency(dB)	Efficiency(%)	Gain(dBi)
5150	-4.41	36.20	0.2
5200	-4.64	34.34	0.6
5250	-4.34	36.80	0.7
5300	-4.67	34.12	0.4
5350	-4.01	39.73	0.7
5400	-4.28	37.36	0.7
5450	-3.67	42.98	1.7
5500	-3.88	40.96	2.0
5550	-4.10	38.92	2.0
5600	-4.38	36.46	1.8
5650	-3.75	42.15	2.5
5700	-4.50	35.46	1.7
5750	-3.79	41.74	2.4
5800	-4.48	35.62	1.0
5850	-4.63	34.46	0.5

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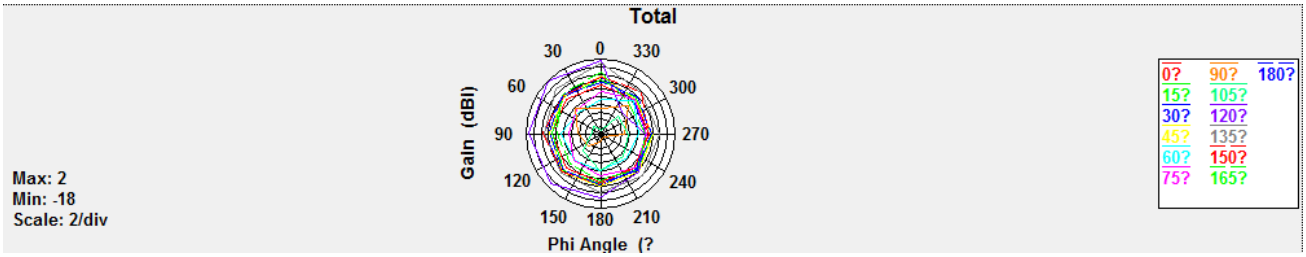
7.3. RADIATION PATTERN

2.4G

2D POLAR RADIATION PATTERN
FREQUENCY=2400MHZ

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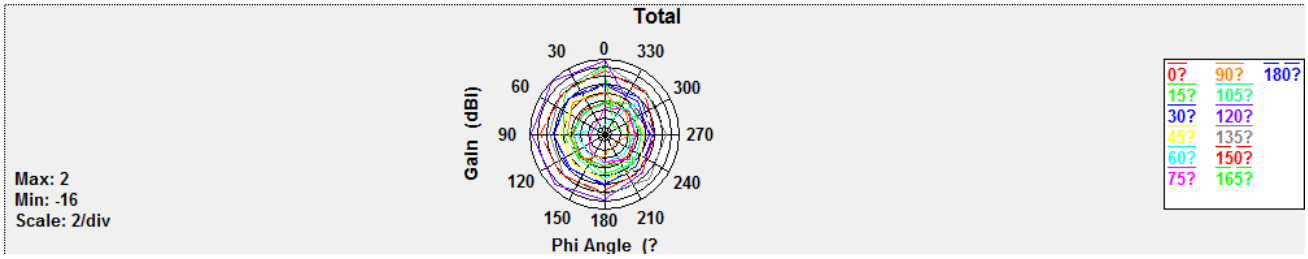
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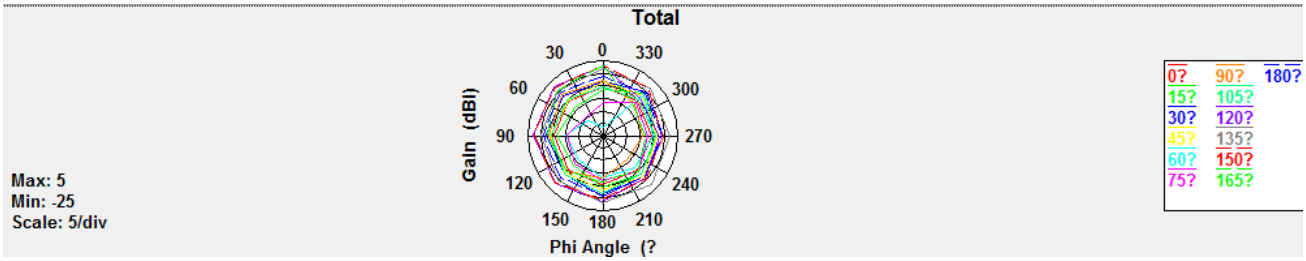

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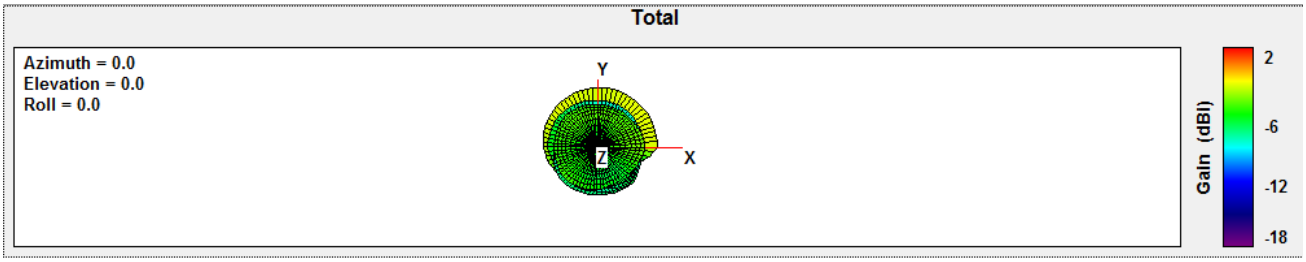
2.4G

3D RADIATION PATTERN
FREQUENCY=2400MHZ



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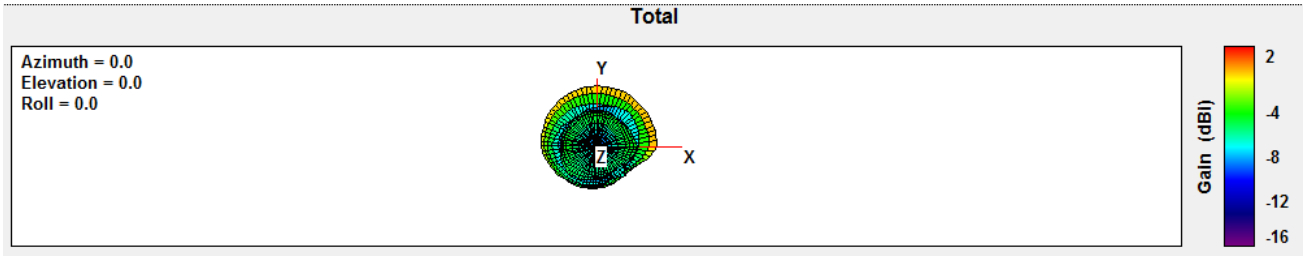
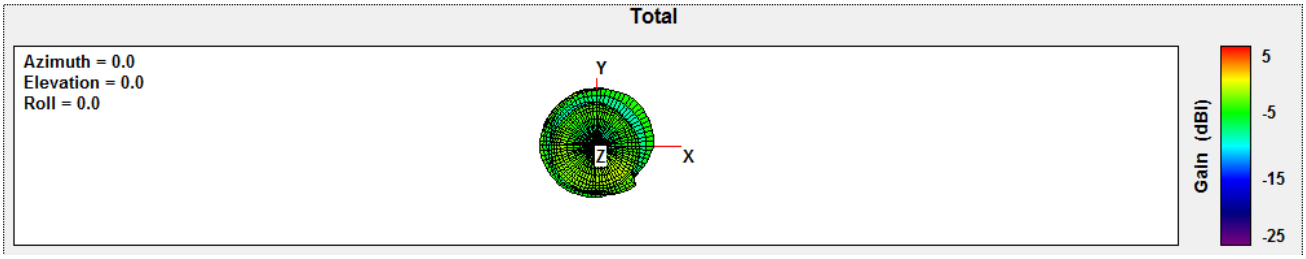


FREQUENCY=2500MHZ



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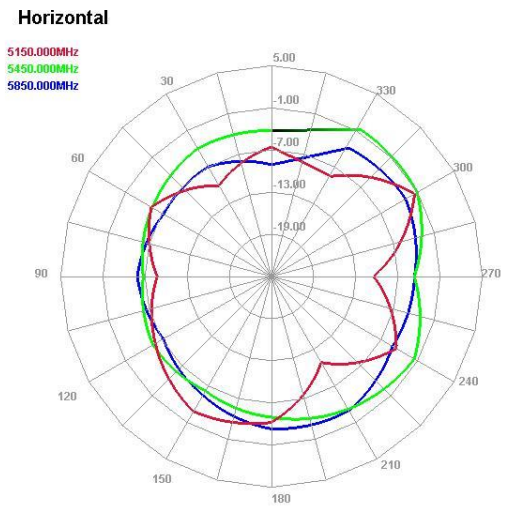
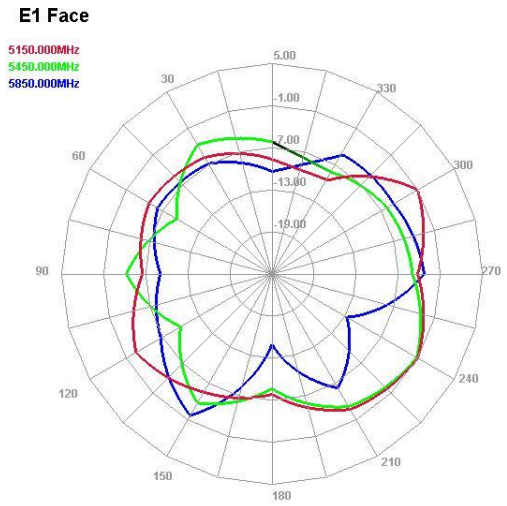
5G

2D POLAR RADIATION PATTERN
XY

XZ

YZ

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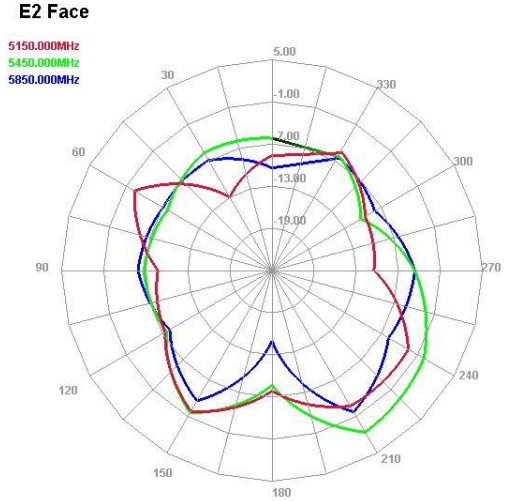

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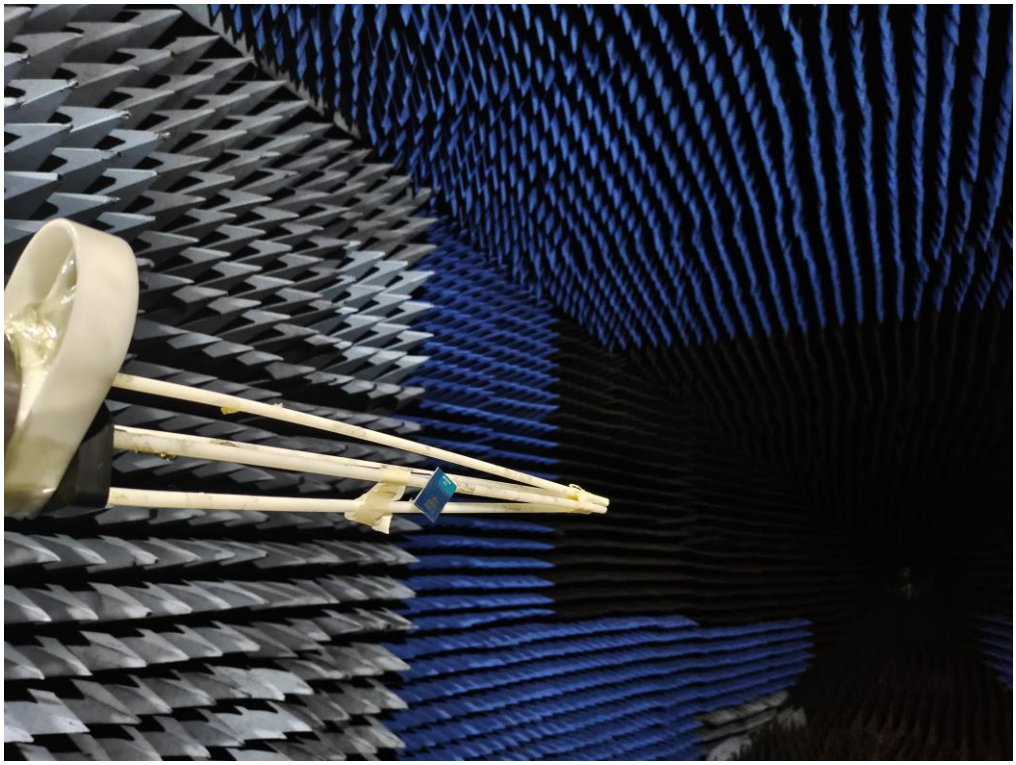
APPENDIX A: PHOTOGRAPHS OF TEST SETUP



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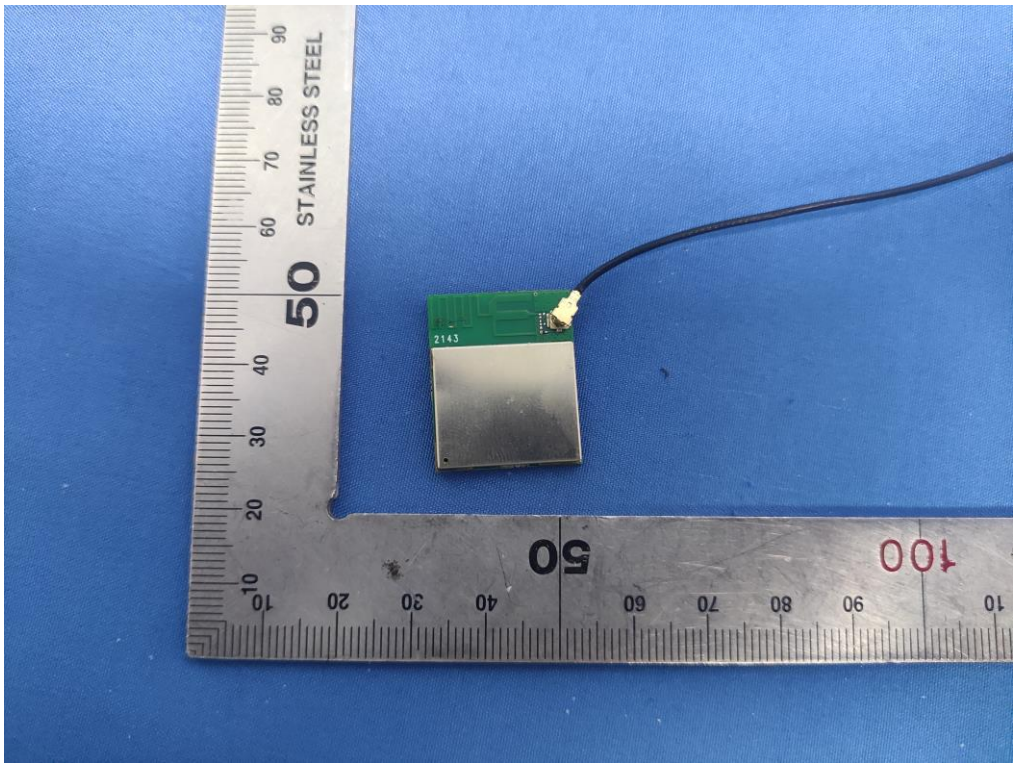
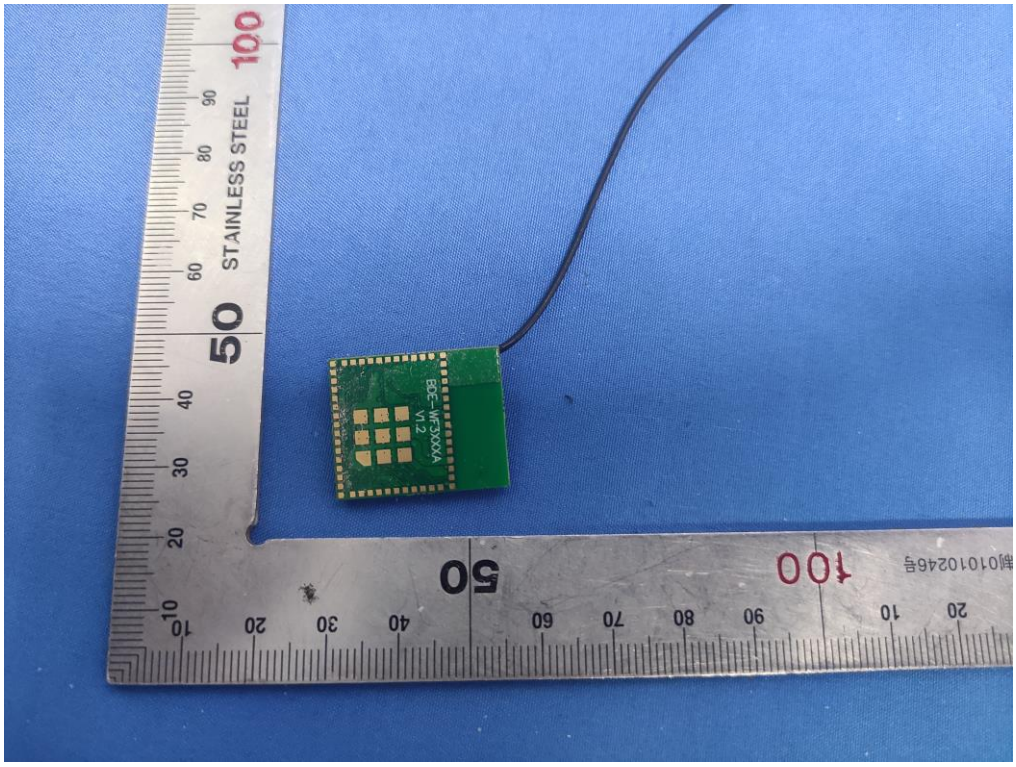
APPENDIX B: PHOTOGRAPHS OF EUT





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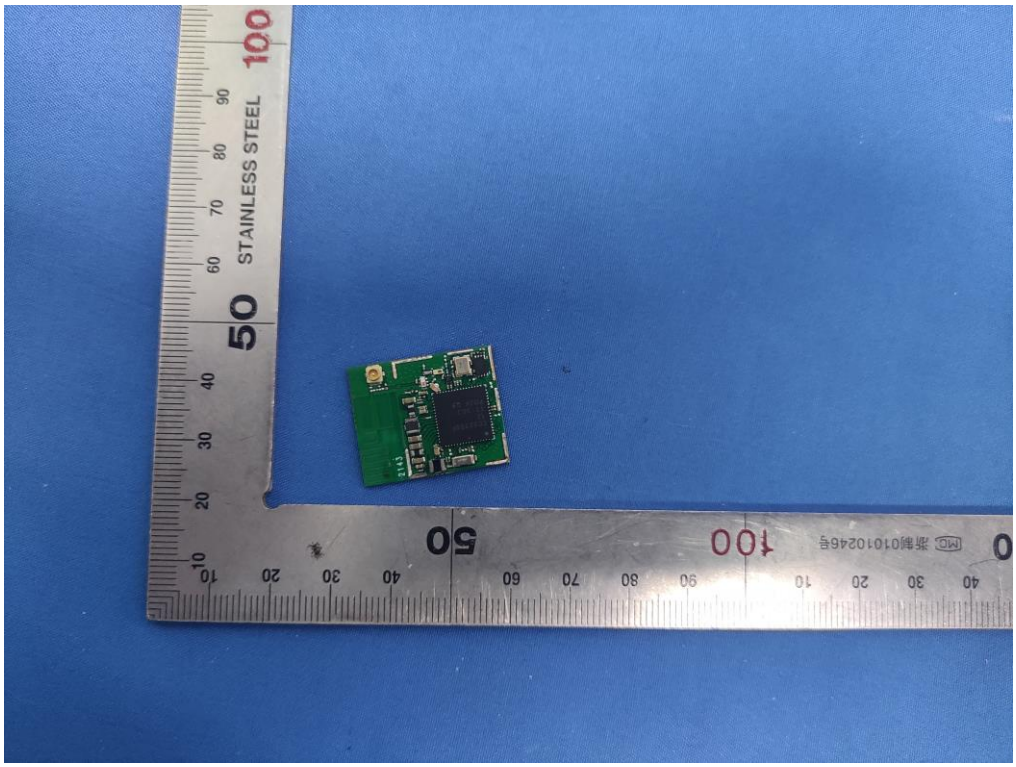

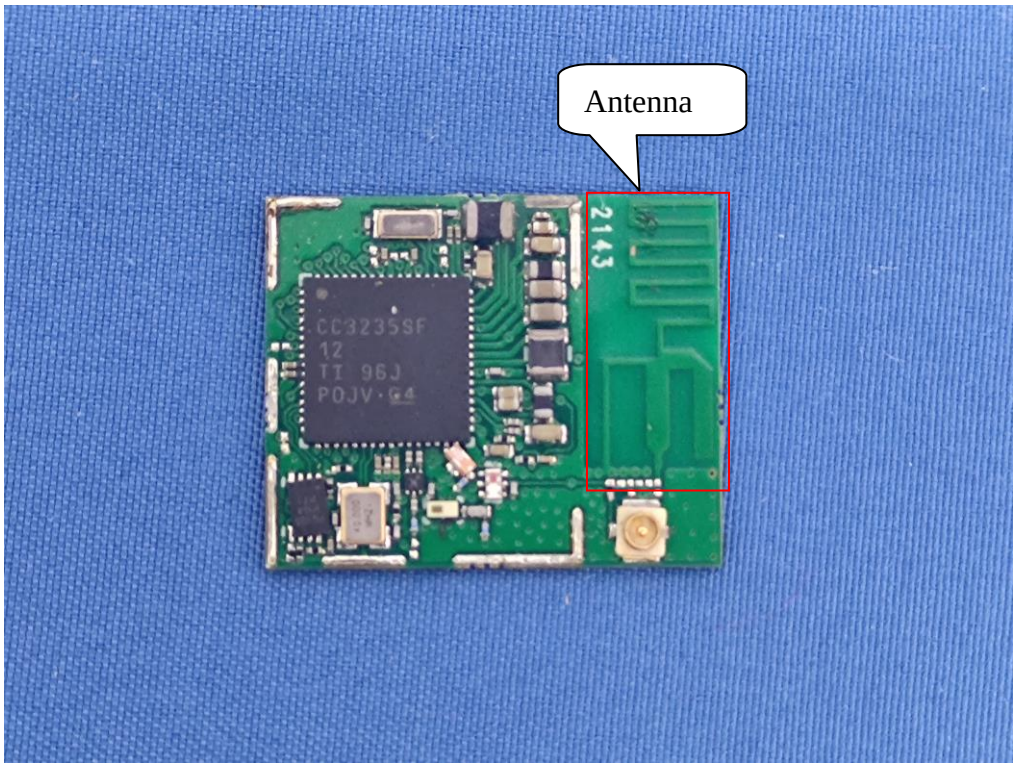

----END OF REPORT----

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd. (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").
2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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