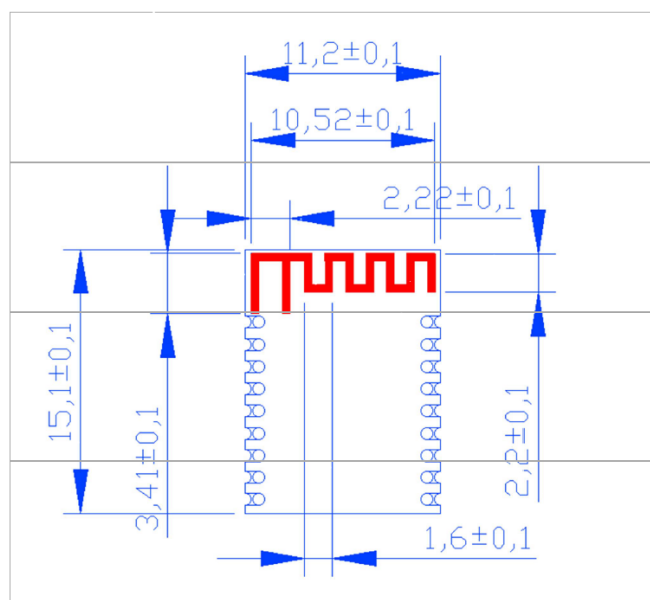


# ANTENNA PASSIVE TEST REPORT

|                                 |                                          |
|---------------------------------|------------------------------------------|
| Applicant                       | Nebula Electronic Technology Corporation |
| Manufacturer                    | Nebula Electronic Technology Corporation |
| Product Name                    | BT628 BLE Module                         |
| Model No                        | QZBT628-2                                |
| Date Initial Sample(s) Received | 2023-05-27                               |
| Testing Date                    | 2023-05-27                               |



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# 1. General Information

## 1.1 Details of Client

|              |                                                                                       |
|--------------|---------------------------------------------------------------------------------------|
| Applicant    | Nebula Electronic Technology Corporation                                              |
| Address:     | Room 1002A, Building 1, No. 570 Shengxia Road, China (Shanghai) Pilot Free Trade Zone |
| Manufacturer | Nebula Electronic Technology Corporation                                              |
| Address:     | Room 1002A, Building 1, No. 570 Shengxia Road, China (Shanghai) Pilot Free Trade Zone |

## 1.2 General Description of EUT

|                     |                  |
|---------------------|------------------|
| Device Description: | BT628 BLE Module |
| Device Model:       | QZBT628-2        |
| Hardware Version:   | N/A              |
| Software Version:   | N/A              |

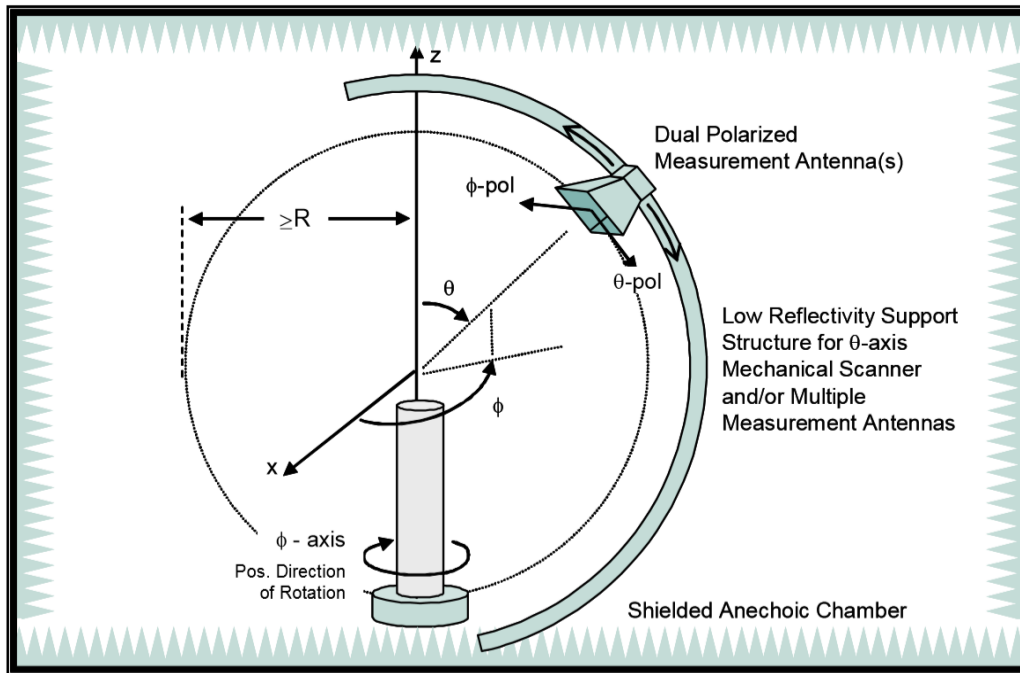
## 1.3 Laboratory Environment

|                   |                        |         |
|-------------------|------------------------|---------|
| Temperature       | Min. =19℃ , Max. = 25℃ |         |
| Relative humidity | Min. =40%, Max. =72%   |         |
| Shield effect     | 0.7-6GHz               | > 100dB |
| Ground resistance | <0.5Ω                  |         |

## 2. OTA Measurements System Configuration

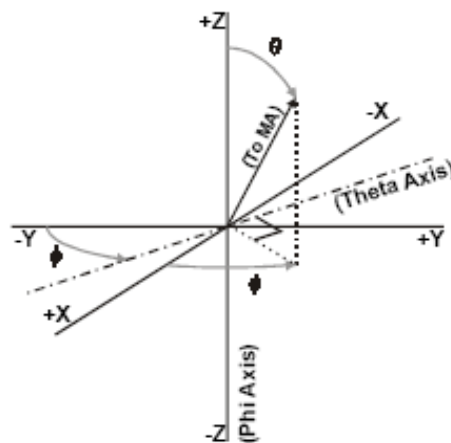
### 2.1 Test Configuration

Conical-Cut method is used to measure the antenna 3D GAIN of EUT in OTA qualified anechoic chamber. Equipment Under Test (EUT) geometry centre vertical projection at the centre of platform, the distance from EUT to measurement antenna is 1.5m



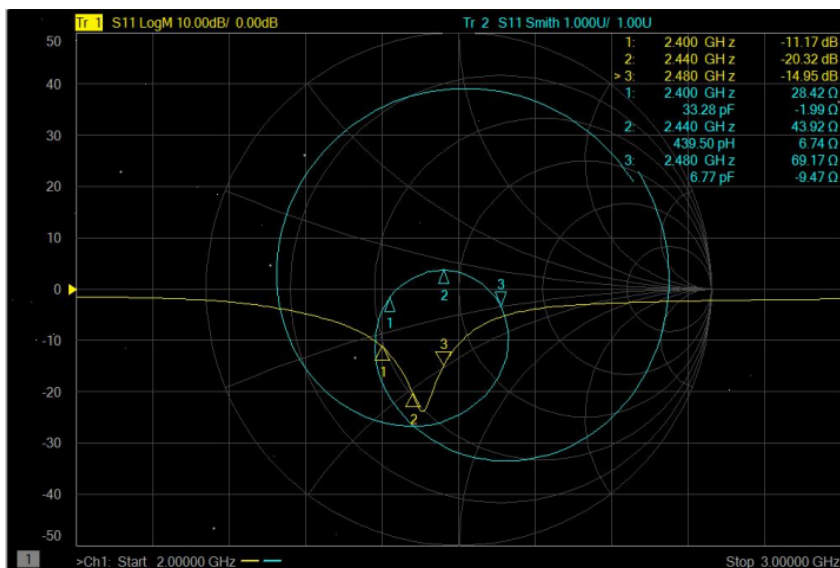
### 2.2 Test Measurement

Spherical coordinate system



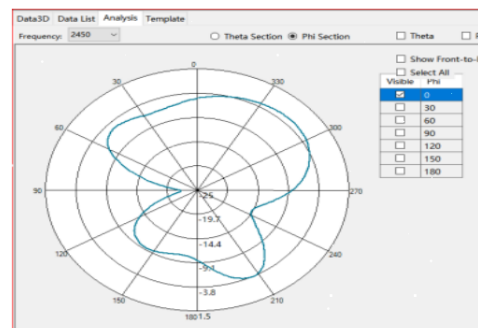
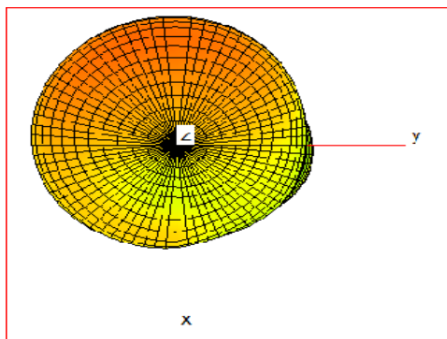
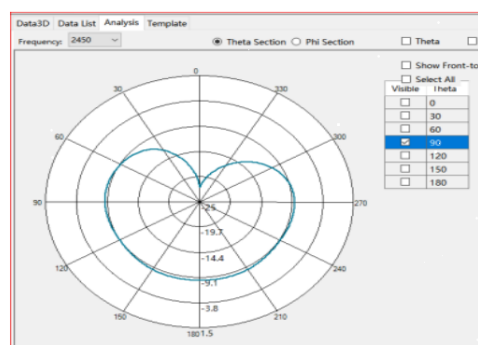
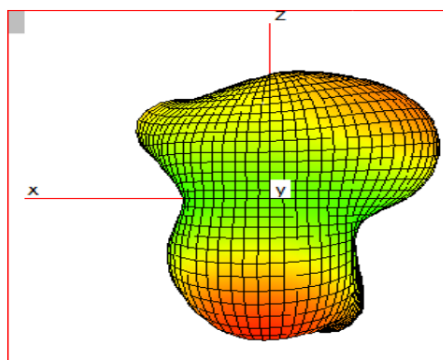
### 3. Test Equipment List

| Type of Equipment                   | Model Number                            | Manufacture       |
|-------------------------------------|-----------------------------------------|-------------------|
| Network Analyzer                    | ZNB8<br>S/N 103535                      | R&S               |
| Switch Control System               | OSP 130<br>S/N 100358                   | R&S               |
| MAPS Controller                     | 2090<br>S/N 114576                      | ETS-Lindgren L.P. |
| Test Software                       | EMQuest™ REV 1.14<br>Build 31654        | ETS-Lindgren L.P  |
| Full Anechoic Wireless Test chamber | ETS-Lindgren AMS- 8923<br>CT000596-1149 | ETS-Lindgren L.P  |



## 4. Measurement Uncertainty

| Item                                                  | 617-<br>698MHz<br>(dB) | 699-<br>798MHz<br>(dB) | 814-<br>894MHz<br>(dB) | 1695-<br>1780MHz<br>(dB) | 1850-<br>2020MHz<br>(dB) | 2300-<br>2800MHz<br>(dB) | 3300-<br>3800MHz<br>(dB) | 5150-<br>5925MHz<br>(dB) |
|-------------------------------------------------------|------------------------|------------------------|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Gain                                                  | 0.75                   | 0.9                    | 0.74                   | 0.84                     | 0.83                     | 0.9                      | 0.84                     | 0.86                     |
| Efficiency                                            | 0.75                   | 0.9                    | 0.74                   | 0.84                     | 0.83                     | 0.9                      | 0.84                     | 0.86                     |
| Measurement Uncertainty (95% CONFIDENCE INTERVAL) K=2 |                        |                        |                        |                          |                          |                          |                          |                          |



## 5. Test Results

| Frequency(MHz) | Gain(dBi) | Efficiency(dB) | Efficiency(%) |
|----------------|-----------|----------------|---------------|
| 2400           | -10.08    | -17.08         | 1.96          |
| 2410           | -9.25     | -16.11         | 2.45          |
| 2420           | -8.82     | -15.72         | 2.68          |
| 2430           | -8.16     | -15.23         | 3.00          |
| 2440           | -7.47     | -14.63         | 3.44          |
| 2450           | -7.54     | -14.51         | 3.54          |
| 2460           | -6.98     | -13.76         | 4.21          |
| 2470           | -6.49     | -13.45         | 4.52          |
| 2480           | -6.25     | -13.20         | 4.79          |
| 2490           | -6.16     | -13.15         | 4.84          |
| 2500           | -6.13     | -13.08         | 4.92          |

END