

# Antenna Test Report

**Report No.: E4/2018/50029**  
**Test Plan: Non-compliance with ISO17025**

**Applicant Name: Raytac Corporation**  
**Manufacturer Name: Raytac Corporation**

**Product Name: Bluetooth Low Energy Module**  
**Model Number: MDBT50Q (CHIP antenna)**

**Measurements performed at**  
**SGS Taiwan Ltd.**  
**Hwaya District, Taiwan**

**Issued Date: July 10, 2018**

	Name	Date & Signature	Distribution
Prepared by:	Shawn Yen Asst. Supervisor	 July 10, 2018	
Approved by:	Dragon Wu Asst. Manager	 July 10, 2018	

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## Measurement System Information

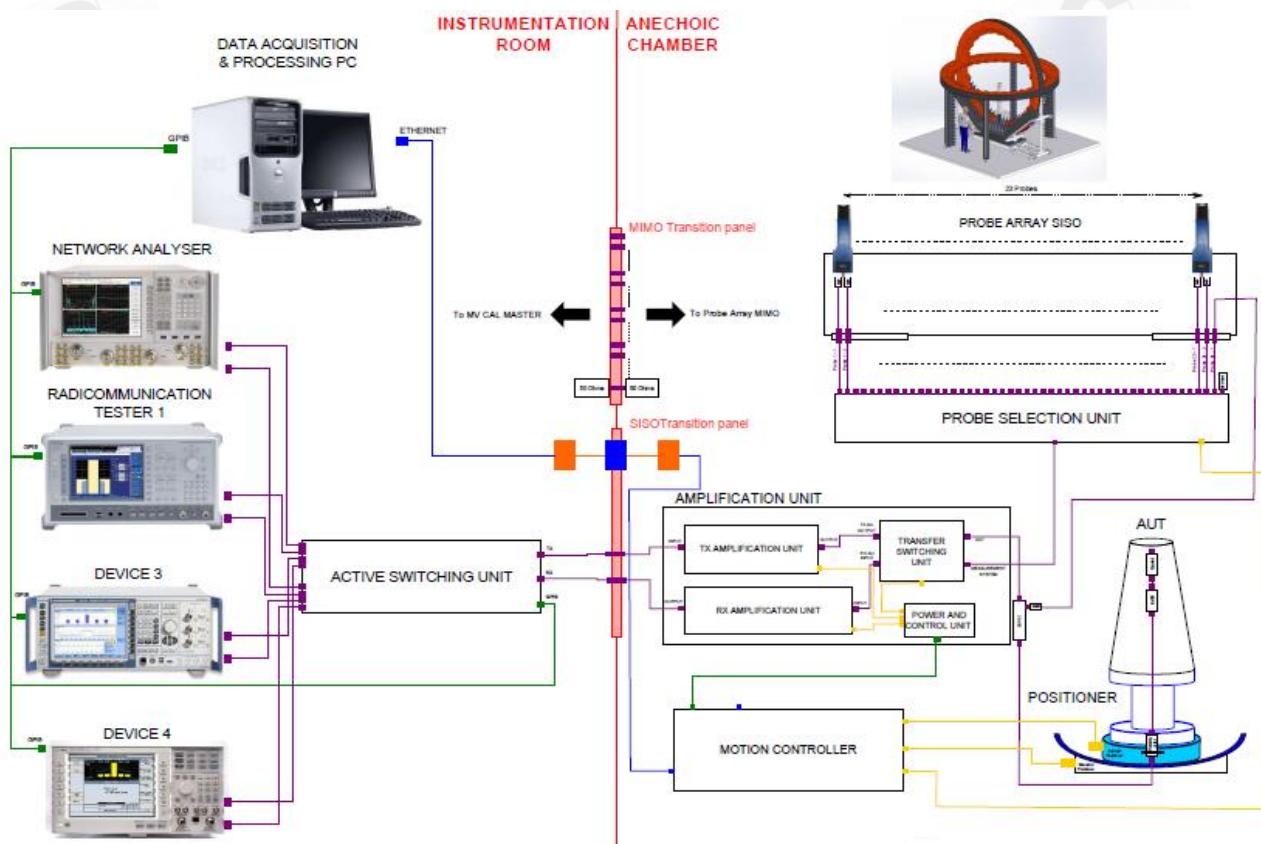
### General Information

#### Testing Condition:

- Temperature:  $22 \pm 3^\circ\text{C}$
- Humidity: <80%

#### Measurement Facility:

- Measurement Chamber: Satimo 3D fully anechoic chamber and its measuring system (Stargate-24-L)
- Base Station Simulator: Anritsu MT8820C (or R&S CMU200)
- Network Analyzer: Agilent E5071C



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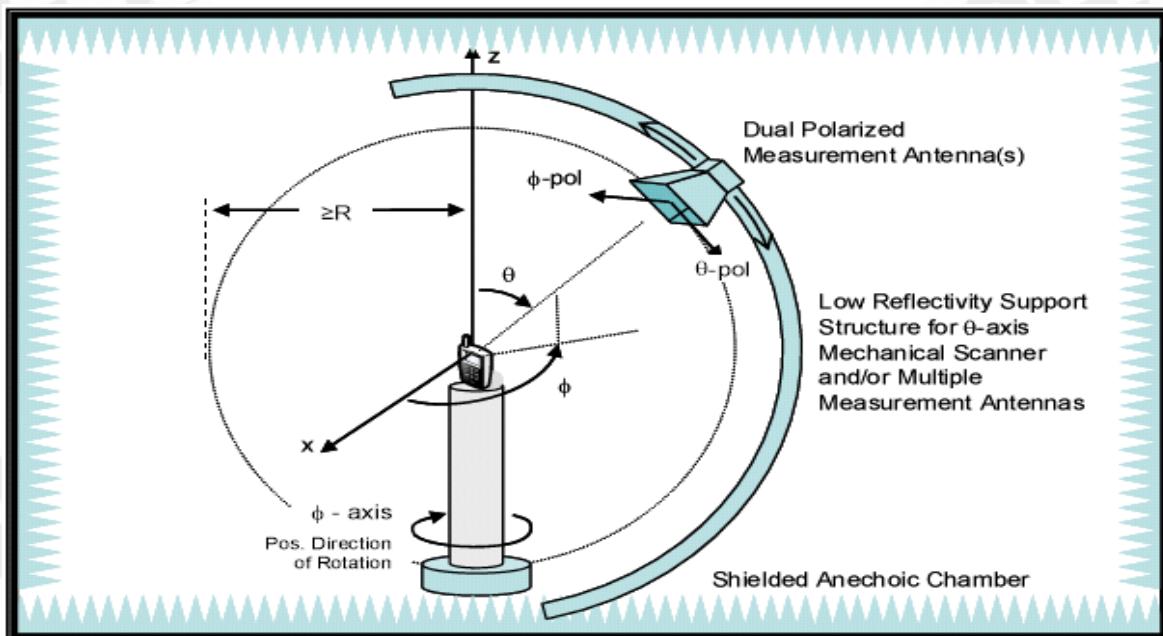
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Measurements are performed in a Satimo **Stargate-24-L** with the StarAct interface for a base station simulator. The **Stargate-24-L** has 23 probe antennas mounted with equal spacing on a circular arch. Electronic switching of the probe antennas provides outstanding measurement speed. The geometry of the setup, with only a Styrofoam column within 1.6 meters of the EUT, ensures minimum interference and low ripple on the measured radiation patterns. The DUT is placed on top of the pedestal, in the center of the system.

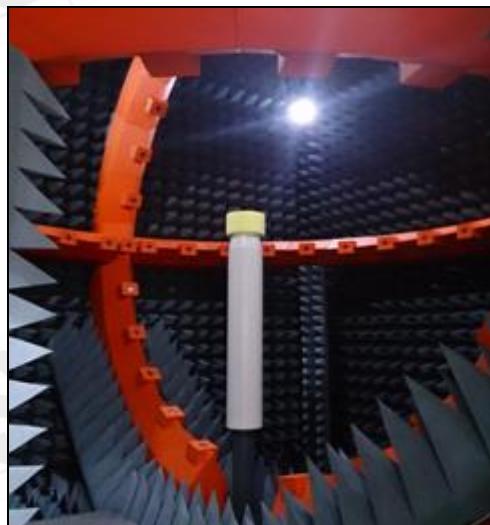
### Typical Setup for Satimo Stargate-24-L:



**Instruments View**



**Inside View**



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### **Testing Laboratory: Identification of the Responsible Test Laboratory.**

- **OTA Laboratory:**

**SGS Taiwan Ltd. Electronics & Communication Laboratory**

No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803.

Telephone: +886 2 2299 3279

Fax: +886 2 2298 0488

Internet: <http://www.tw.sgs.com>

- **Testing Location:**

No. 2, Keji 1<sup>st</sup> Rd., Hwaya Technology Park, Guishan District, Taoyuan City, Taiwan 33383.

### **Details of Applicant:**

<b>Applicant's name:</b>	<b>Raytac Corporation</b>
<b>Applicant's address:</b>	<b>5F, No.3, Jiankang Rd., Zhonghe Dist., New Taipei City, 235, Taiwan</b>
<b>Contact person:</b>	<b>Mr. Lyon Liu</b>
<b>Telephone:</b>	<b>886.2.3234.0208</b>
<b>Fax:</b>	<b>886.2.3234.0547</b>
<b>E-mail:</b>	<b>lyon@raytac.com</b>

### **Details of Manufacturer:**

<b>Manufacturer's name:</b>	<b>Raytac Corporation</b>
<b>Manufacturer's address:</b>	<b>5F, No.3, Jiankang Rd., Zhonghe Dist., New Taipei City, 235, Taiwan</b>
<b>Contact person:</b>	<b>Mr. Lyon Liu</b>
<b>Telephone:</b>	<b>886.2.3234.0208</b>
<b>Fax:</b>	<b>886.2.3234.0547</b>
<b>E-mail:</b>	<b>lyon@raytac.com</b>

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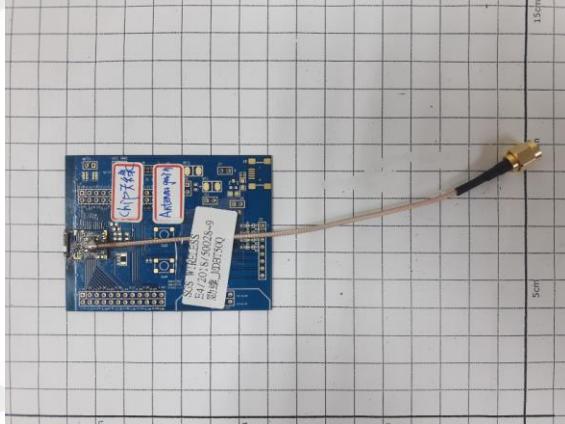
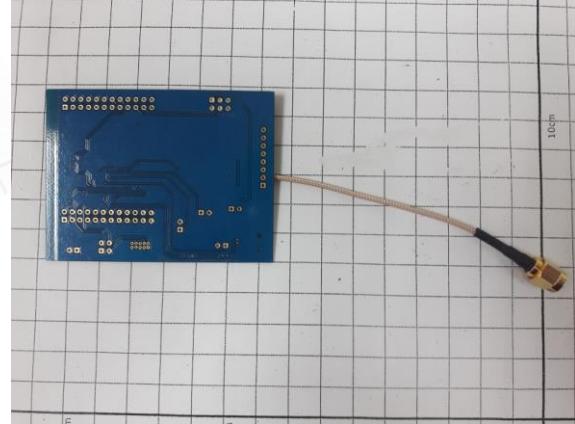
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**Details of EUT:**

<b>Device Description:</b>	<b>Bluetooth Low Energy Module</b>
<b>Device Manufacturer:</b>	<b>Raytac Corporation</b>
<b>Device Model:</b>	<b>MDBT50Q (CHIP antenna)</b>
<b>Hardware Version:</b>	<b>N/A</b>
<b>Software Version:</b>	<b>N/A</b>
<b>FCC ID:</b>	<b>SH6MDBT50Q</b>
<b>Frequency Range:</b>	<b>2400MHz ~ 2500MHz</b> <b>Step size: 10MHz</b>
<b>Antenna Type:</b>	<b>Internal antenna</b>

**Duration of Tests:**

<b>Sample Receive Date:</b>	<b>2018-06-01</b>
<b>Test Starting Date:</b>	<b>2018-06-01</b>
<b>Test Ending Date:</b>	<b>2018-06-01</b>
<b>Report Issued Date:</b>	<b>2018-07-10</b>

**Photographs of EUT:****Front View****Back View**

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**List of Equipment****Equipment Summary Sheet**

Equipment Description	Manufacturer	Identification no.	Current calibration date	Next calibration date
Universal Radio Communication tester	Anritsu	MT8820C	2017/10/16	2018/10/15
Network Analyzer	Agilent	E5071C	2017/10/16	2018/10/15
Sleeve Dipole	Satimo	SD740	2017/11/09	2018/11/08
Dual Ridge Horn	Satimo	SH800	2017/08/02	2018/08/01
Stargate-24-L probe array	Satimo	Stargate-24-L	2017/11/24	2018/11/23
Measurement software	Satimo	SPM V1.9	N/A	N/A

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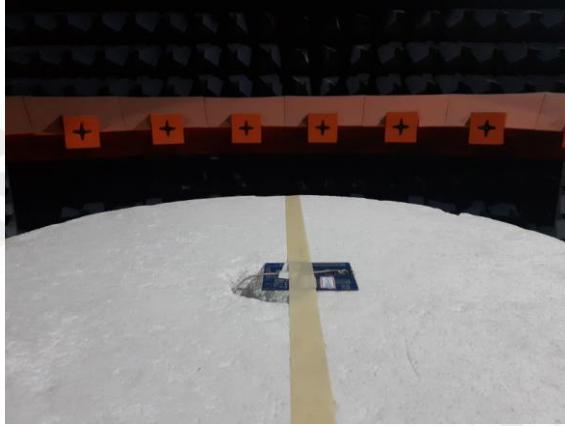
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## Antenna Gain and Efficiency

MDBT50Q (CHIP antenna)			
Freq(MHz)	Peak. dBi	Efficiency	Average . dBi
2400.00	-1.47	25.18%	-5.99
2410.00	-1.27	26.07%	-5.84
2420.00	-1.32	27.15%	-5.66
2430.00	-1.12	28.51%	-5.45
2440.00	-0.80	29.41%	-5.32
2450.00	-0.65	29.59%	-5.29
2460.00	-0.82	28.98%	-5.38
2470.00	-0.94	29.31%	-5.33
2480.00	-0.88	29.12%	-5.36
2490.00	-0.98	27.60%	-5.59
2500.00	-1.49	24.96%	-6.03

## Test Setup

**Free Space - Front View****Free Space - Side View**

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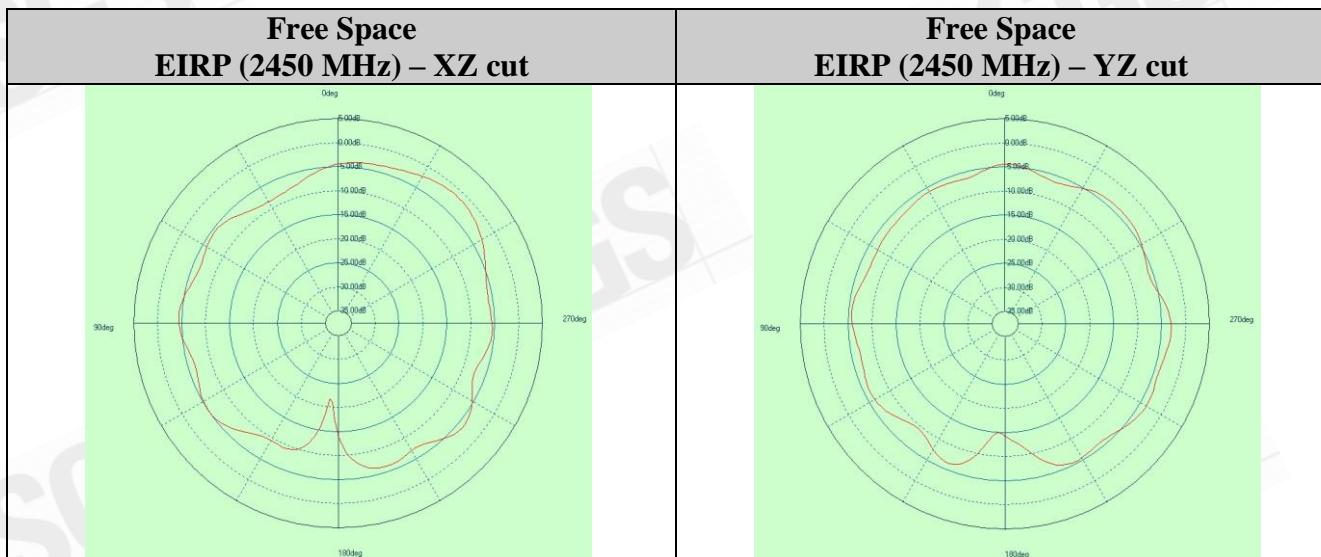
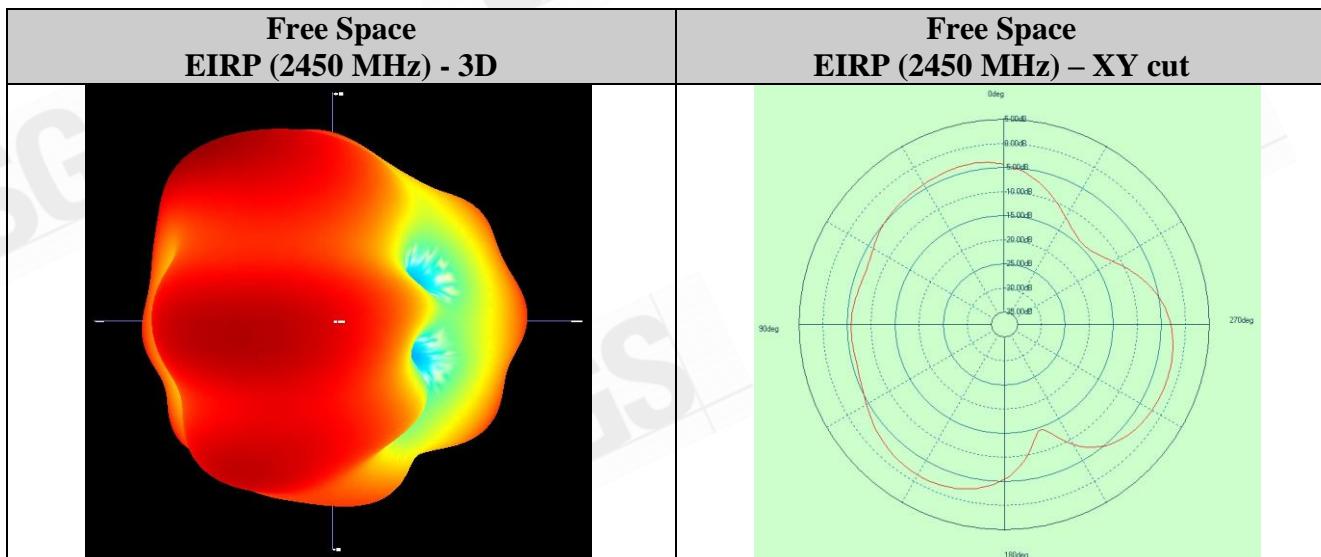
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## Antenna 3D Plot Matrix

All plots in this section show the total EIRP ( $EIRP_\theta + EIRP_\phi$ ) with the  $+x$ -axis pointing out of the page,  $+y$ -axis pointing right, and  $+z$ -axis pointing up.



## End of Report

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