

Antenna Test Report

Report No.: E4/2018/50028

Test Plan: Non-compliance with ISO17025

Applicant Name: Raytac Corporation

Manufacturer Name: Raytac Corporation

Product Name: Bluetooth Low Energy Module

Model Number: MDBT50Q-P

Measurements performed at

SGS Taiwan Ltd.

Hwaya District, Taiwan

Issued Date: July 10, 2018

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

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Measurement System Information

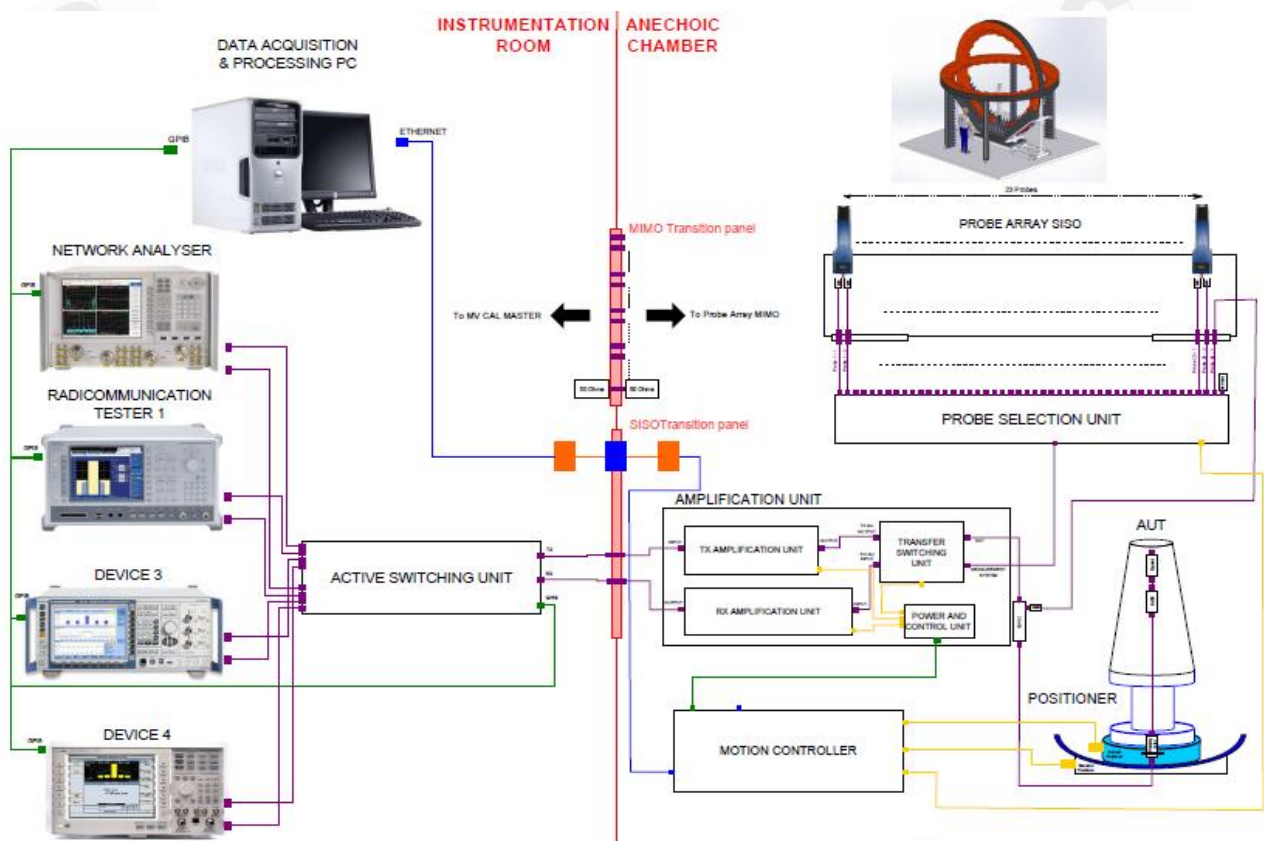
General Information

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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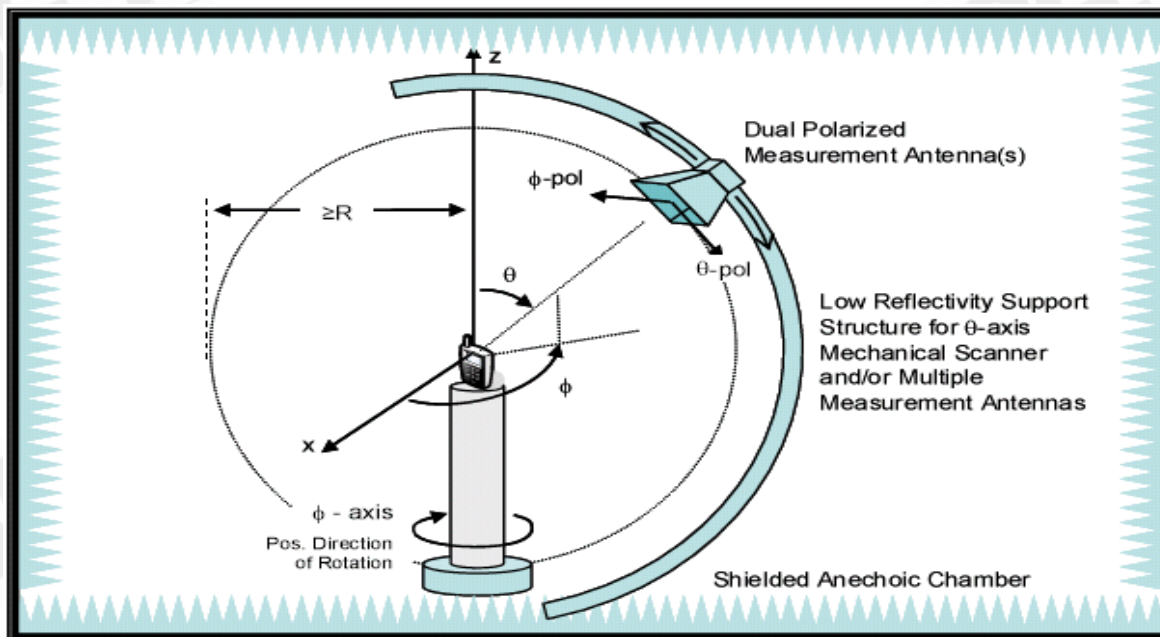
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Measurements are performed in a Satimo **Stargate-24-L** with the StarAct interface for a base station simulator. The **Stargate-24-L** has 23 probe antennas mounted with equal spacing on a circular arch. Electronic switching of the probe antennas 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.

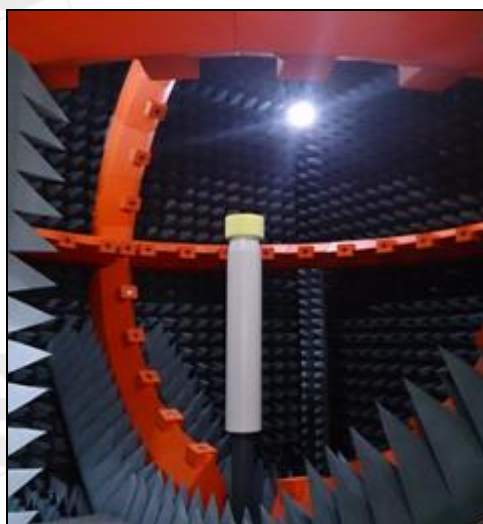
Typical Setup for Satimo Stargate-24-L:



Instruments View



Inside View



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Testing Laboratory: Identification of the Responsible Test Laboratory.● **OTA Laboratory:****SGS Taiwan Ltd. Electronics & Communication Laboratory**

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Telephone: +886 2 2299 3279

Fax: +886 2 2298 0488

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

● **Testing Location:**

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

Details of Applicant:

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

Details of Manufacturer:

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

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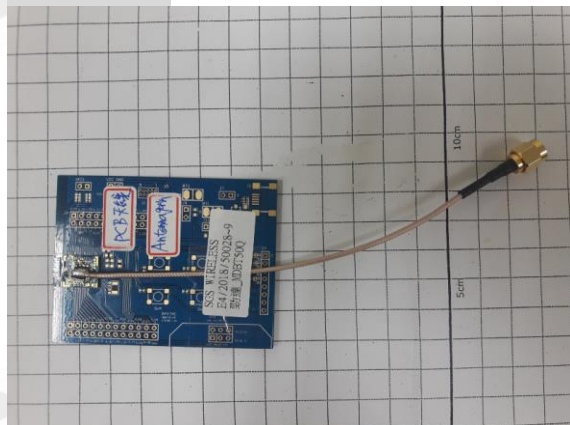
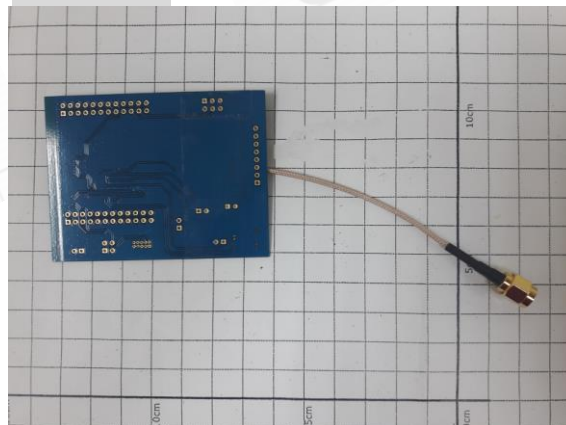
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Details of EUT:

Device Description:	Bluetooth Low Energy Module
Device Manufacturer:	Raytac Corporation
Device Model:	MDBT50Q-P
Hardware Version:	N/A
Software Version:	N/A
FCC ID:	SH6MDBT50Q
Frequency Range:	2400MHz ~ 2500MHz Step size: 10MHz
Antenna Type:	PCB Antenna

Duration of Tests:

Sample Receive Date:	2018-06-01
Test Starting Date:	2018-06-01
Test Ending Date:	2018-06-01
Report Issued Date:	2018-07-10

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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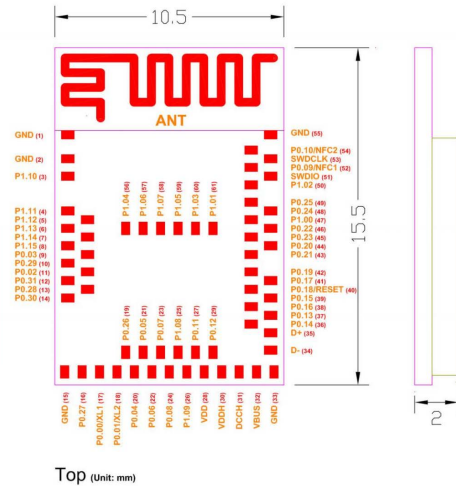
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Antenna Gain and Efficiency

MDBT50Q (PCB antenna)			
Freq(MHz)	Peak. dBi	Efficiency	Average . dBi
2400.00	-0.72	29.40%	-5.32
2410.00	-0.62	31.02%	-5.08
2420.00	-0.44	32.89%	-4.83
2430.00	-0.44	35.00%	-4.56
2440.00	0.08	36.98%	-4.32
2450.00	0.05	37.76%	-4.23
2460.00	0.24	37.40%	-4.27
2470.00	0.26	37.43%	-4.27
2480.00	0.41	36.96%	-4.32
2490.00	0.37	35.03%	-4.56
2500.00	-0.15	31.71%	-4.99

• MDBT50Q-P1MV2

PCB Size (in mm)			
	Min.	Norm	MAX.
L		15.5	
W	- 0.15	10.5	+ 0.2
H		2.0	

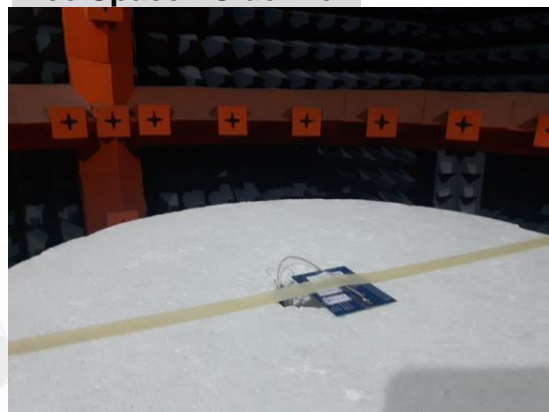


Test Setup

Free Space - Front View



Free Space - Side View



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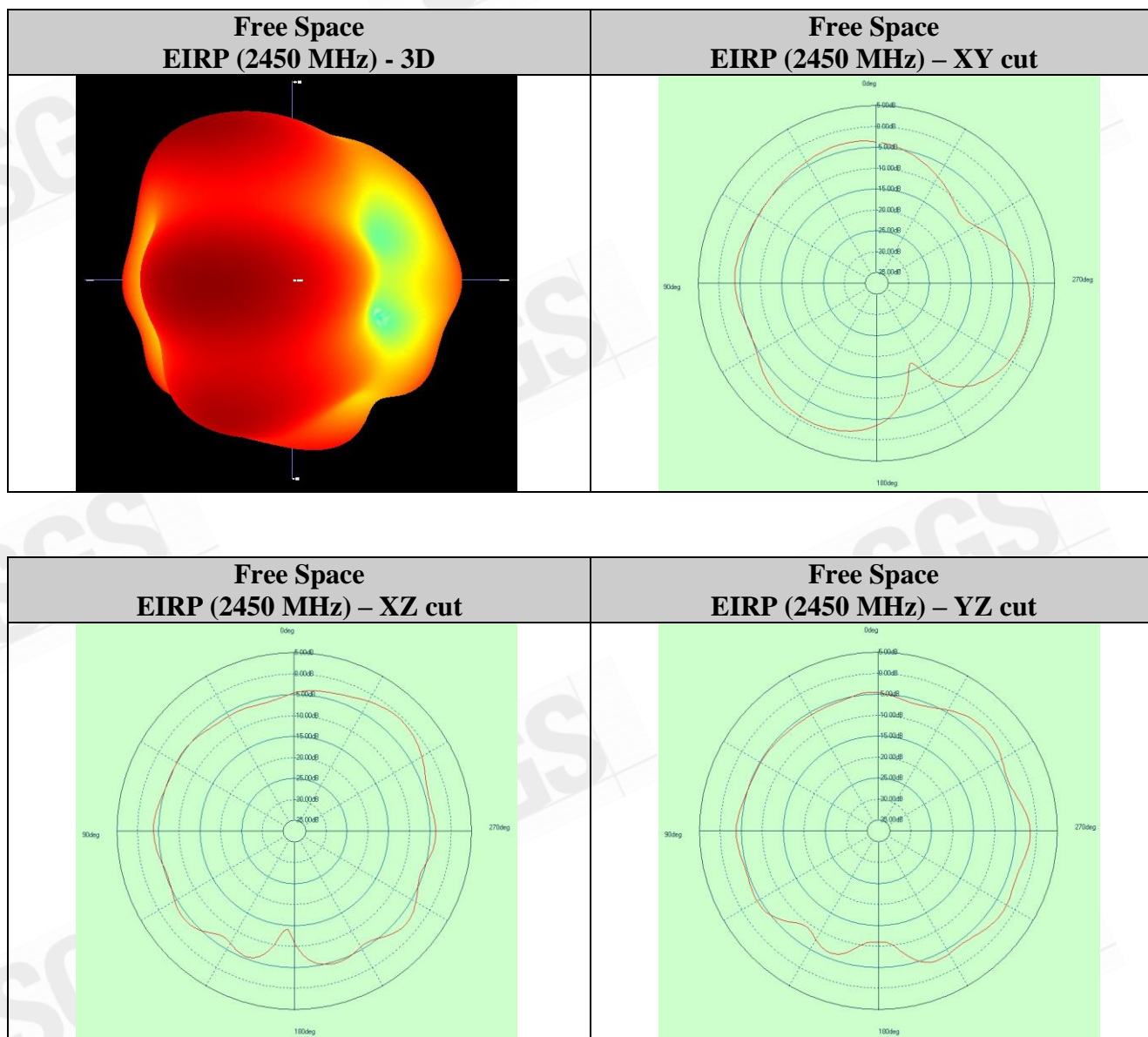
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Antenna 3D Plot Matrix

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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