



## FCC- TEST REPORT

Report Number : **708881503689-00** Date of Issue: April 6, 2016

Model : U1

Product Type : BCT Bluetooth Headset

Applicant : Suzhou YOKO BCT Electronic Corporation

Address : P-48, No.666 Jianlin Road, High tech Zone, Suzhou Jiangsu,  
People's Republic of China

Production Facility : Suzhou YOKO BCT Electronic Corporation

Address : P-48, No.666 Jianlin Road, High tech Zone, Suzhou Jiangsu,  
People's Republic of China

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including  
Appendices : 35

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## 2 Details about the Test Laboratory

### Details about the Test Laboratory

#### Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch  
No.16 Lane, 1951 Du Hui Road,  
Shanghai 201108,  
P.R. China

FCC Registration Number: 904822  
Telephone: +86 21 6037 9100  
Fax: +86 21 6037 6350

#### Test Site 2

Company name: MRT Technology (Suzhou) Co., Ltd  
D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong  
Economic Development Zone, Suzhou,  
P.R. China

FCC Registration Number: 809388  
Telephone: +86-512-66308358  
Fax: +86-512-66308368

### 3 Description of the Equipment under Test

#### Description of the Equipment Under Test

Product: BCT Bluetooth Headset

Model no.: U1

FCC ID: 2AC8AYKU1A

Options and accessories:

Rating: 5V, 150mA DC battery

RF Transmission 2402~2480MHz

Frequency:

No. of Operated Channel: 40

Modulation: GFSK

Duty Cycle: 24%

Antenna Type: PCB

Antenna Gain: 0dBi

Description of the EUT: Bluetooth Headset

Product: BCT Bluetooth Headset



## 4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2014 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB558074 D01 DTS Meas Guidance v03r02 and ANSI C63.10 (2013).

## 5 Summary of Test Results

Technical Requirements						
FCC Part 15 Subpart C						
Test Condition		Pages	Test Site	Test Result		
				Pass	Fail	N/A
§15.207	Conducted emission AC power port	12	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247 (b) (1)	Conducted peak output power	15	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(a)(1)	20dB bandwidth	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)	Carrier frequency separation	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii)	Number of hopping frequencies	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii)	Dwell Time	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(2)	6dB bandwidth	16	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(e)	Power spectral density	18	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d)	Spurious RF conducted emissions	20	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d)	Band edge	22	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d) & §15.209	Spurious radiated emissions for transmitter	24	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.203	Antenna requirement	See note 1		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remark 1: N/A – Not Applicable.

Note 1: The EUT uses a permanently PCB Antenna, which gain is 0dBi. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.

## 6 General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: 2AC8AYKU1A complies with Section 15.207, 15.209, 15.247 of the FCC Part 15.

### SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

The Equipment under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

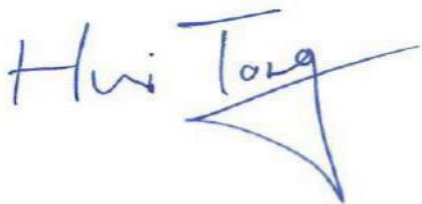
Sample Received Date: November 18, 2015

Testing Start Date: December 19, 2015

Testing End Date: January 28, 2016

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

Reviewed by:



Hui TONG  
Review Engineer

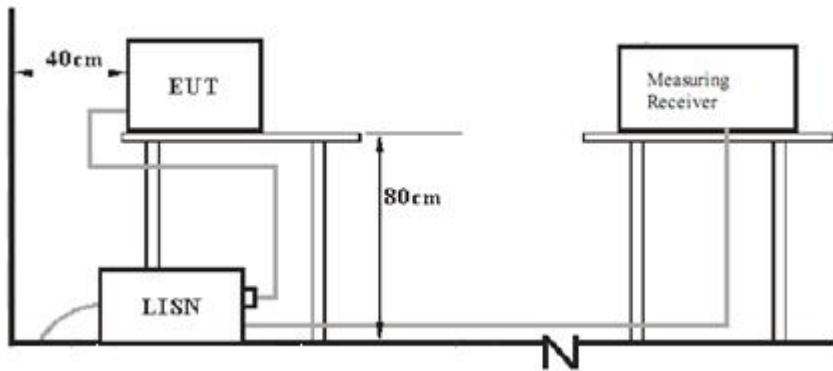
Prepared by:



Wenwen CHENG  
Test Engineer

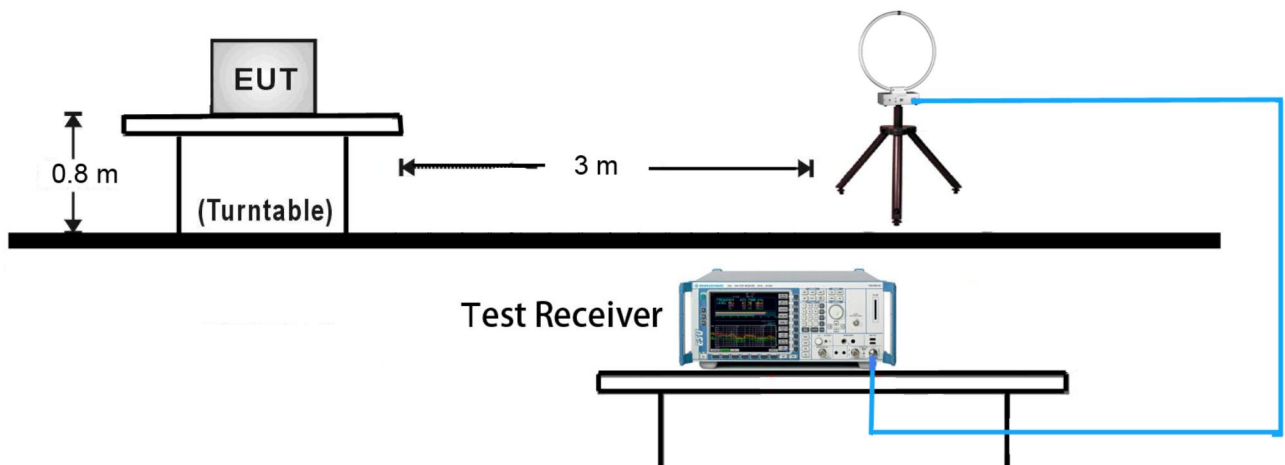
## 7 Test Setups

### 7.1 AC Power Line Conducted Emission test setups



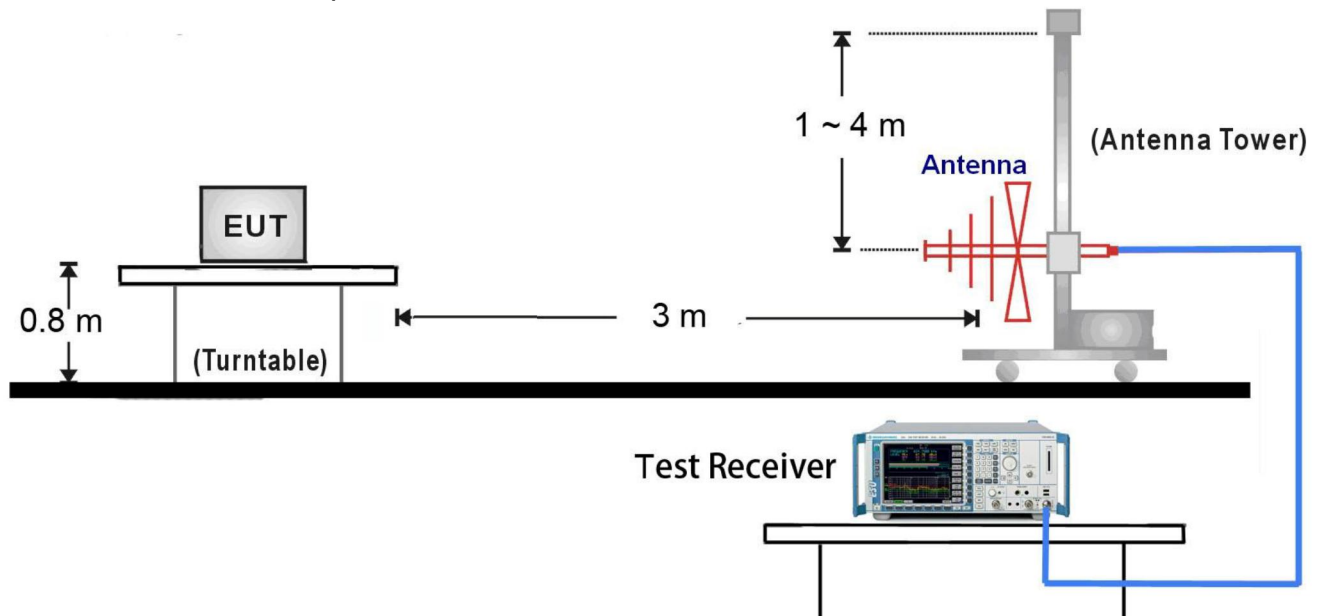
### 7.2 Radiated test setups

9kHz ~ 30MHz Test Setup:

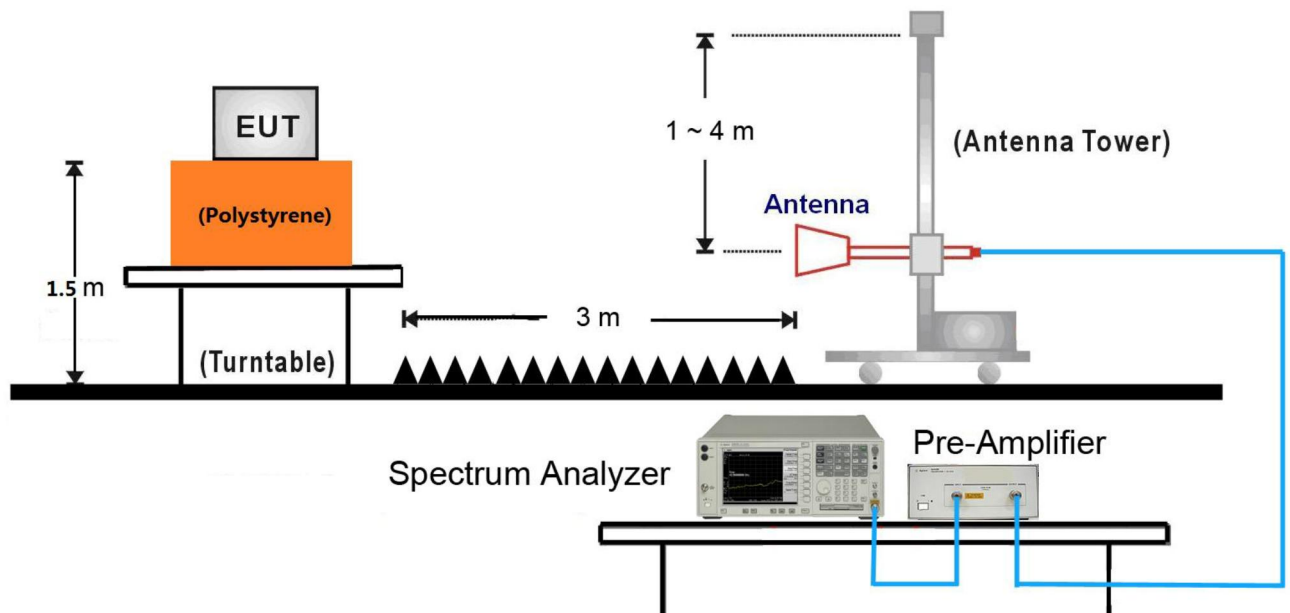




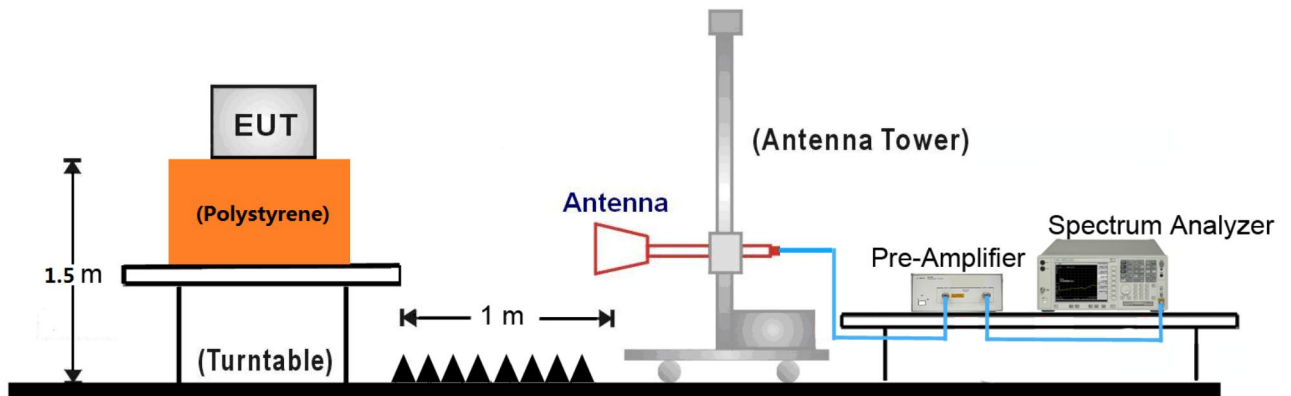
### 30MHz ~ 1GHz Test Setup:



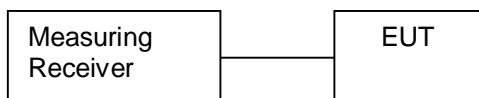
### 1GHz ~ 18GHz Test Setup:



### 18GHz ~25GHz Test Setup:



### 7.3 Conducted RF test setups



## 8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Laptop	Lenovo	X230	---

Test software: BlueTest 3, which used to control the EUT in continues transmitting mode

The system was configured to channel 0, 19, and 39 for the test.

## 9 Technical Requirement

### 9.1 Conducted Emission

#### Test Method

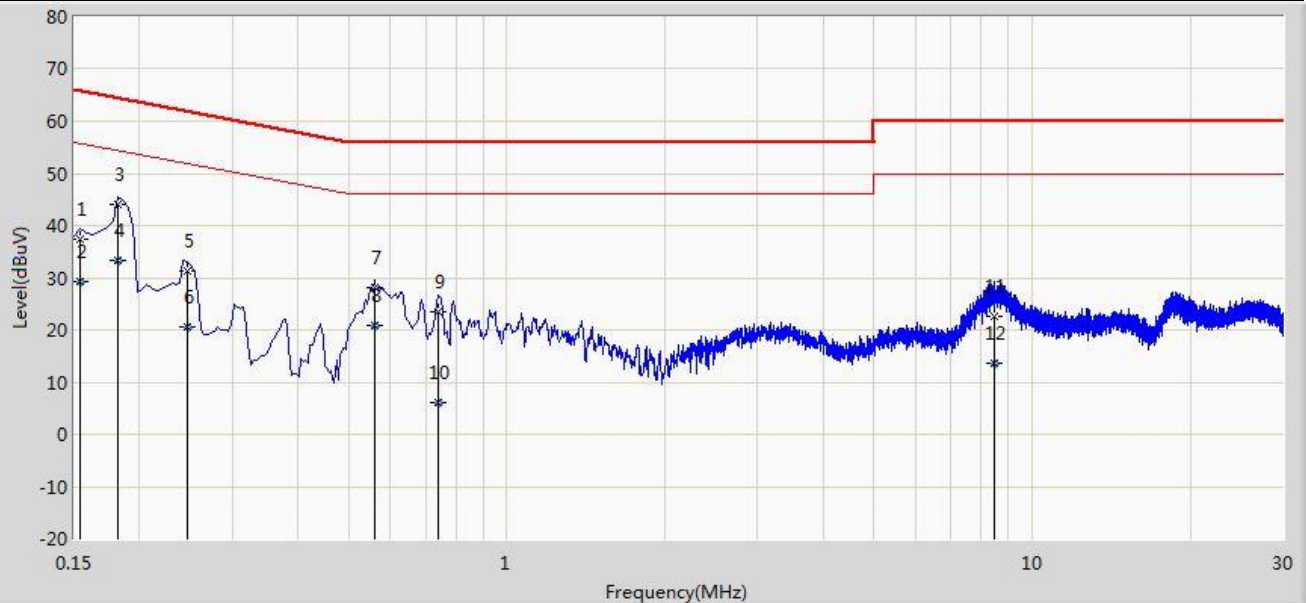
1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

#### Limit

Frequency MHz	QP Limit dB $\mu$ V	AV Limit dB $\mu$ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

Engineer: Vince Yu	
Site: SR2	Time: 2015/12/25 - 19:15
Limit: FCC_Part15.207_CE_AC Power	Margin: 0
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: U1	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at Channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	37.282	26.542	-28.500	65.781	10.740	QP
2			0.154	29.287	18.547	-26.494	55.781	10.740	AV
3		*	0.182	44.179	34.131	-20.215	64.394	10.048	QP
4			0.182	33.193	23.145	-21.200	54.394	10.048	AV
5			0.246	31.171	21.210	-30.720	61.891	9.961	QP
6			0.246	20.507	10.546	-31.384	51.891	9.961	AV
7			0.562	28.048	17.914	-27.952	56.000	10.135	QP
8			0.562	20.885	10.750	-25.115	46.000	10.135	AV
9			0.742	23.379	13.337	-32.621	56.000	10.041	QP
10			0.742	6.036	-4.005	-39.964	46.000	10.041	AV
11			8.446	22.500	12.324	-37.500	60.000	10.176	QP
12			8.446	13.755	3.579	-36.245	50.000	10.176	AV

Note: Measure Level (dBuV) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Engineer: Vince Yu

Site: SR2

Time: 2015/12/25 - 19:19

Limit: FCC\_Part15.207\_CE\_AC Power

Margin: 0

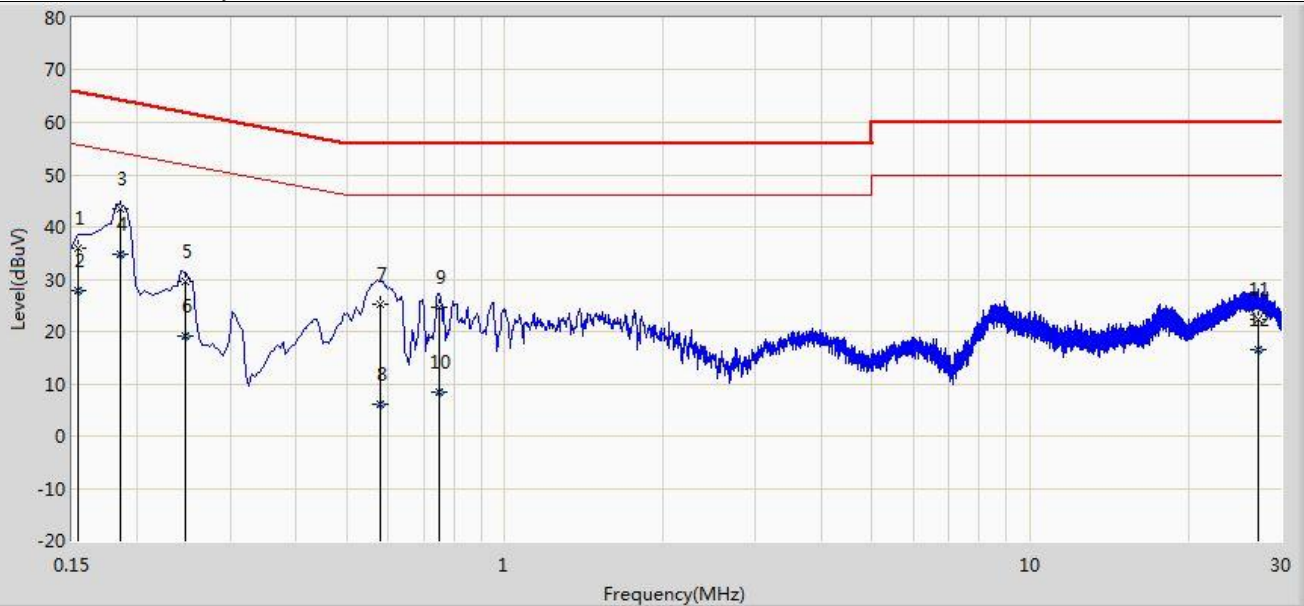
Probe: ENV216\_101683\_Filter On

Polarity: Neutral

EUT: U1

Power: AC 120V/60Hz

Test Mode: Transmit by BLE at Channel 2402MHz



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	36.004	25.288	-29.777	65.781	10.716	QP
2			0.154	27.936	17.220	-27.845	55.781	10.716	AV
3			0.186	43.350	33.315	-20.863	64.213	10.035	QP
4		*	0.186	34.779	24.744	-19.434	54.213	10.035	AV
5			0.246	29.494	19.496	-32.397	61.891	9.998	QP
6			0.246	19.266	9.267	-32.626	51.891	9.998	AV
7			0.578	25.210	15.067	-30.790	56.000	10.143	QP
8			0.578	6.095	-4.048	-39.905	46.000	10.143	AV
9			0.750	24.650	14.602	-31.350	56.000	10.047	QP
10			0.750	8.463	-1.584	-37.537	46.000	10.047	AV
11			27.078	22.265	11.900	-37.735	60.000	10.366	QP
12			27.078	16.501	6.136	-33.499	50.000	10.366	AV

Note: Measure Level (dBuV) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

## 9.2 Conducted peak output power

### Test Method

1. Use the following spectrum analyzer settings:  
RBW > the 6 dB bandwidth of the emission being measured, VBW $\geq$ 3RBW, Span $\geq$ 3RBW  
Sweep = auto, Detector function = peak, Trace = max hold.
2. Add a correction factor to the display.
3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

### Limits

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	$\leq 1$	$\leq 30$

Test result as below table

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	7.34	Pass
Middle channel 2440MHz	8.49	Pass
High channel 2480MHz	8.89	Pass



9.3 6dB bandwidth and 99% Occupied Bandwidth

Test Method

- 1. Use the following spectrum analyzer settings:  
RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
- 3. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

Limit [kHz]

≥500

Test result

Frequency MHz	6dB bandwidth kHz	Result
Top channel 2402MHz	695.6	Pass
Middle channel 2440MHz	689.3	Pass
Bottom channel 2480MHz	692.0	Pass

2402MHz







2440MHz



2480MHz



## 9.4 Power spectral density

### Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency.  
RBW=3kHz,VBW≥3RBW,Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed.

### Limit

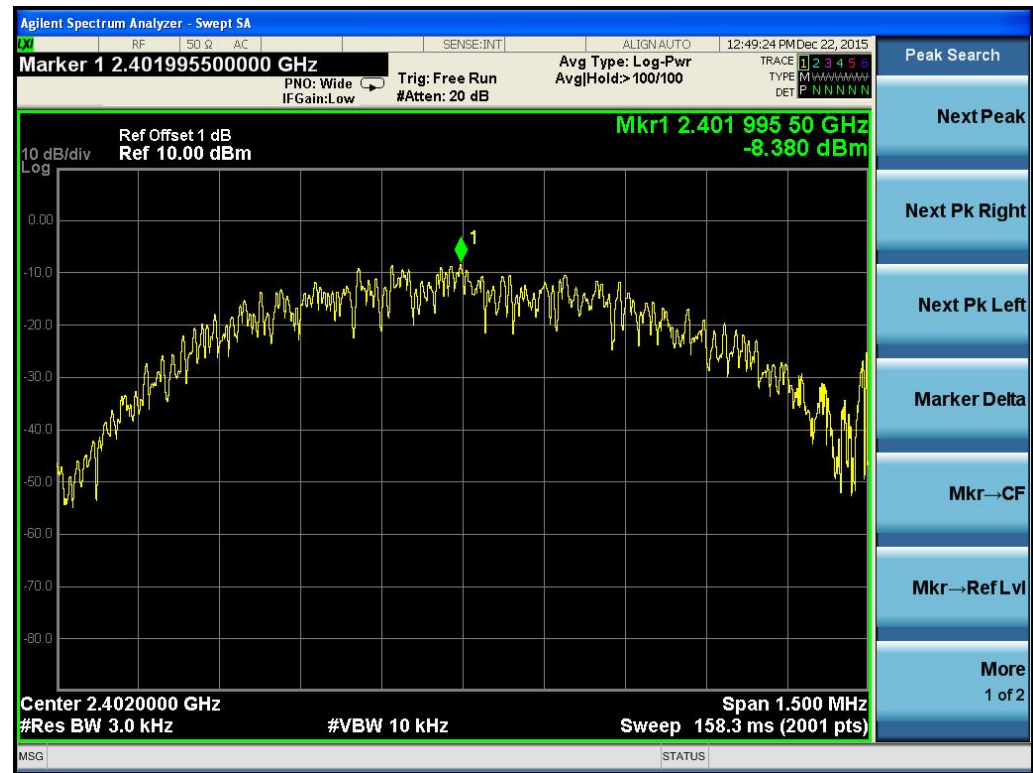
Limit [dBm]

≤8

### Test result

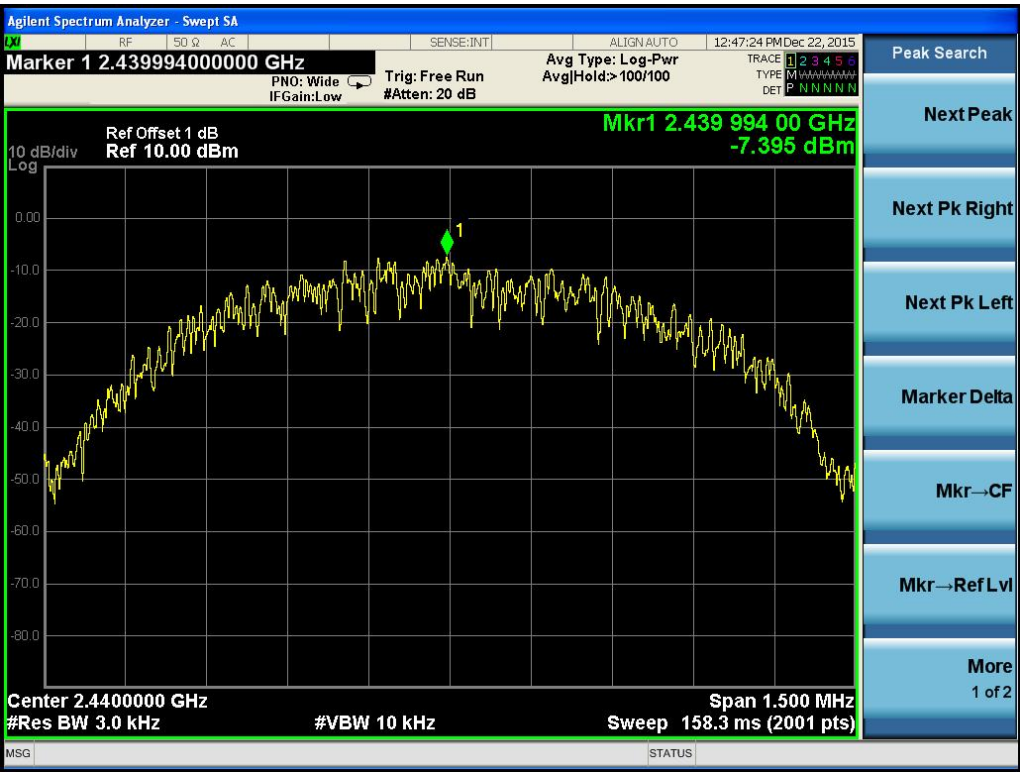
Frequency MHz	Power spectral density dBm	Result
Top channel 2402MHz	-8.38	Pass
Middle channel 2440MHz	-7.40	Pass
Bottom channel 2480MHz	-7.03	Pass

2402MHz





2440MHz



2480MHz



## 9.5 Spurious RF conducted emissions

### Test Method

1. Establish a reference level by using the following procedure:
  - a. Set RBW=100 kHz. VBW $\geq$ 3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
  - b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
2. Use the maximum PSD level to establish the reference level.
  - a. Set the center frequency and span to encompass frequency range to be measured.
  - b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
3. Repeat above procedures until other frequencies measured were completed.

### Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

## Spurious RF conducted emissions

2402MHz





2440MHz



2480MHz





## 9.6 Band edge

### Test Method

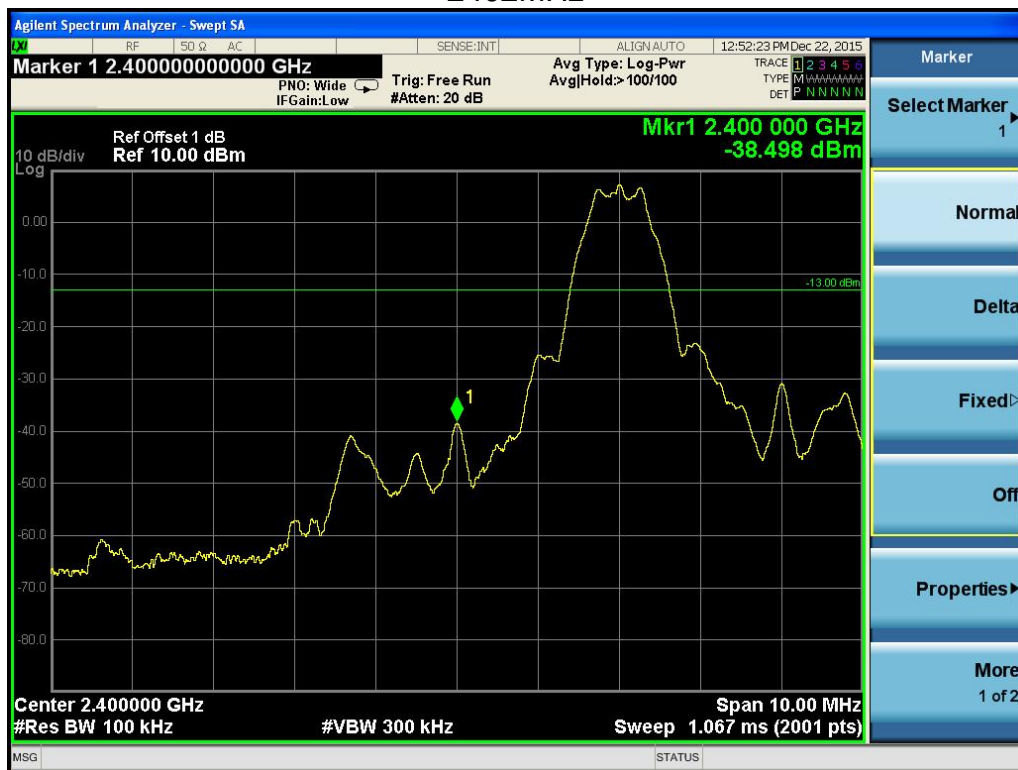
- 1 Use the following spectrum analyzer settings:  
Span = wide enough to capture the peak level of the in-band emission and all spurious  
RBW = 100 kHz, VBW  $\geq$  RBW, Sweep = auto, Detector function = peak, Trace = max hold.
- 2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
- 3 The level displayed must comply with the limit specified in this Section.

### Limit

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

### Test result

2402MHz





2480MHz



## 9.7 Spurious radiated emissions for transmitter

### Test Method

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
3. Use the following spectrum analyzer settings:  
Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for  $f \geq 1\text{GHz}$ , 100 kHz for  $f < 1\text{GHz}$ , VBW  $\geq$  RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Follow the guidelines in ANSI C63.4-1992 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc.  
The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the duty cycle per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20\log(\text{duty cycle}/100\text{ ms})$ , in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

### Limit

The radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBμV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK



### Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

#### Transmitting spurious emission test result as below:

##### 2402MHz

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Margin dBμV/m	Result
4808.0	42.12	H	74.00	PK	31.88	Pass
7205.0	46.26	H	74.00	PK	27.74	Pass
4808.0	43.31	V	74.00	PK	30.69	Pass
7205.0	51.08	V	74.00	PK	22.92	Pass

##### 2440MHz

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Margin dBμV/m	Result
4876.0	44.89	H	74.00	PK	29.11	H
7315.5	49.27	H	74.00	PK	24.73	H
4876.0	45.22	V	74.00	PK	28.78	H
7315.5	53.92	V	74.00	PK	20.08	V

##### 2480MHz

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Margin dBμV/m	Result
4961.0	44.71	H	74.00	PK	29.29	H
7443.0	50.27	H	74.00	PK	23.73	H
4961.0	45.48	V	74.00	PK	28.52	H
7443.0	55.76	V	74.00	PK	18.24	H
7439.9	42.47	V	54.00	AV	11.53	V

#### Remark:

- (1) AV Emission Level= PK Emission Level+20log (duty cycle)
- (2) Data of measurement within 30-1000MHz frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.
- (3) "\*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

## 10 Test Equipment List

### List of Test Instruments

#### Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2016/11/03
Temperature/Humidity Meter	Ouleinuo	N/A	MRTSUE06114	1 year	2016/11/20

#### Radiated Emission

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	MRTSUE06028	1 year	2016/12/08
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2016/11/03
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2016/04/16
Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2016/03/29
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2016/12/14
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2016/11/07
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2016/11/07
Broadband Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06024	1 year	2016/01/05
Temperature/Humidity Meter	Ouleinuo	N/A	MRTSUE06115	1 year	2016/11/20

#### Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2016/05/08
USB Wideband Power Sensor	Boonton	55006	MRTSUE06109	1 year	2016/05/08
Temperature/Humidity Meter	Ouleinuo	N/A	MRTSUE06112	1 year	2016/11/20

#### C - Conducted RF tests

- Conducted peak output power
- 6dB bandwidth and 99% Occupied Bandwidth
- Power spectral density\*
- Spurious RF conducted emissions
- Band edge

## 11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

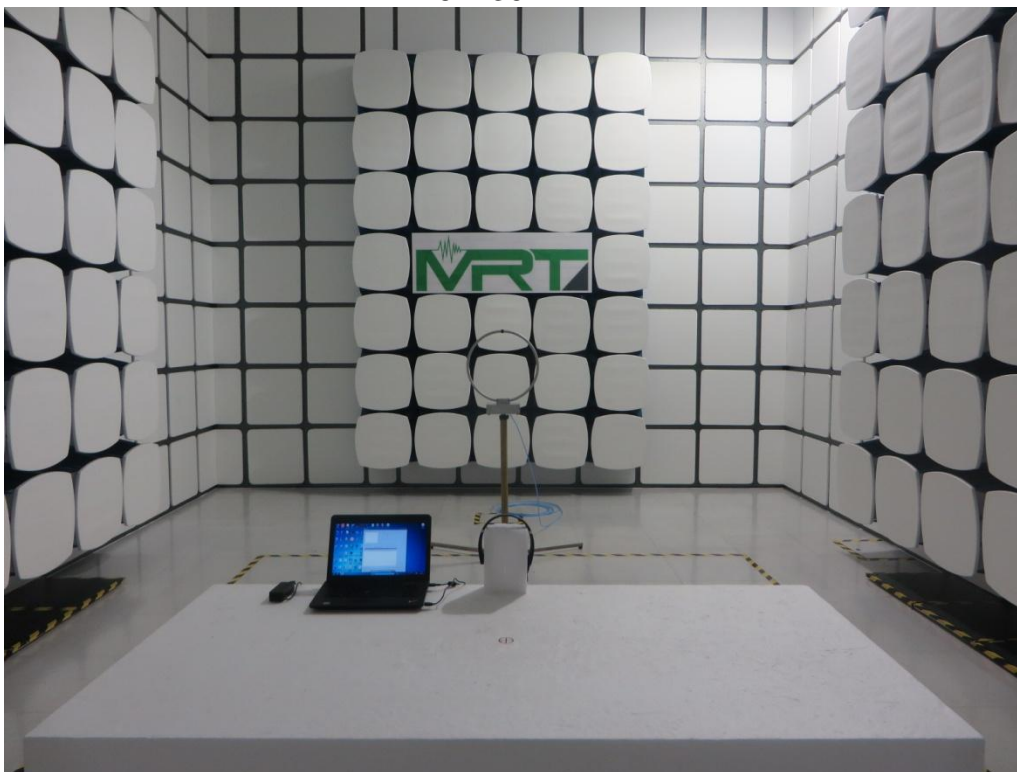
System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 9kHz-1000MHz	4.18dB
Uncertainty for Radiated Emission in 3m chamber 1000MHz-40000MHz	4.76dB
Uncertainty for Conducted Emission 150KHz-30MHz	3.46dB

## 12 Photographs of Test Set-ups

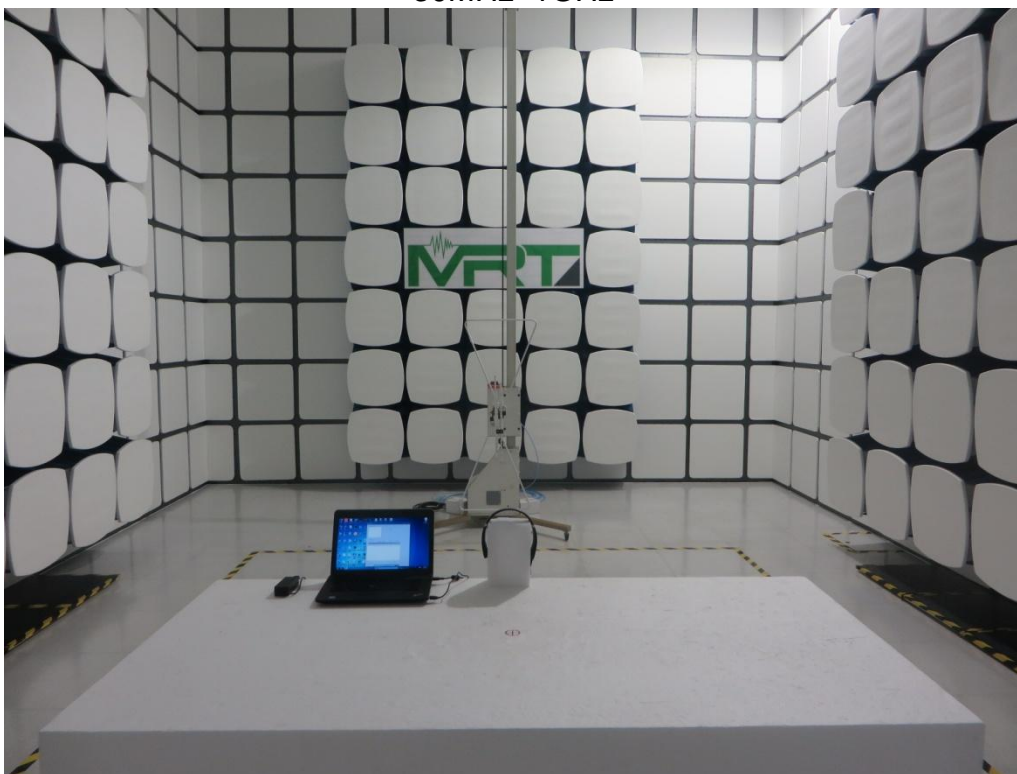
Conducted Emission Setup



Radiated Emission Setup  
9k~30MHz

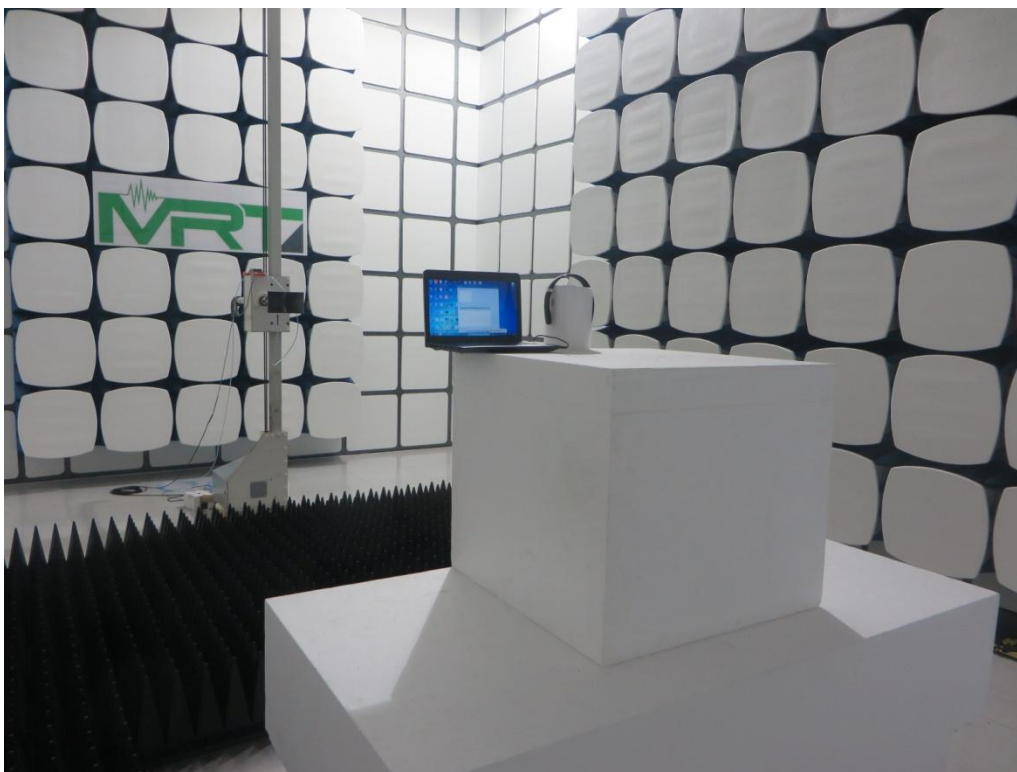


30MHz~1GHz





1GHz~18GHz



18GHz~40GHz



## 13 Photographs of EUT

External Photographs









## Internal Photographs

