



Test report No:  
2260325R-RF-US-P06V02

## FCC & ISED TEST REPORT

Product Name	WLAN+Bluetooth Module
Trademark	Murata
Model and /or type reference	LBEE5HY2DU
FCC ID	VPYLB2DU
IC	772C-LB2DU
Applicant's name / address	Murata Manufacturing Co., Ltd. 10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555, Japan
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10: 2013 KDB558074 D01 15.247 Meas Guidance v05r02 RSS-Gen Issue 5 RSS-247 Issue 2
Verdict Summary	IN COMPLIANCE
Tested by (name / position & signature)	Tim Cao/ Project Engineer 
Approved by (name / position & signature)	Jack Zhang/ Manager 
Date of issue	2022-07-31
Report Version	V1.0
Report template No	Template_FCC 15.247-RF-V1.0

## INDEX

	page
General conditions .....	4
Environmental conditions .....	4
Possible test case verdicts .....	5
Abbreviations .....	5
Document History .....	6
Remarks and Comments.....	6
Used Equipment .....	7
Uncertainty .....	9
1 General Information.....	10
1.1 General Description of the Item(s) .....	10
1.2 Antenna Information .....	11
1.3 Channel List .....	12
1.4 Power Setting.....	12
2 Description of Test Setup .....	13
2.1 Operating mode(s) used for tests.....	13
2.2 Accessories Information .....	13
2.3 Auxiliary equipment / Test software for the EUT.....	13
2.4 Test Configuration / Block diagram used for tests .....	14
2.5 Testing process.....	15
3 Verdict summary section .....	16
3.1 Standards.....	16
3.2 Deviation(s) from the Standard(s) / Test Specification(s).....	16
3.3 Overview of results.....	17
3.4 Test Facility.....	18
4 Test Results .....	19
4.1 AC Power Line Conducted Emission .....	19
4.1.1 Limit .....	19
4.1.2 Test Setup.....	19
4.1.3 Test Procedure.....	19
4.1.4 Test Data .....	20
4.2 Emissions in restricted frequency bands .....	21
4.2.1 Limit .....	21
4.2.2 Test Setup.....	23
4.2.3 Test Procedure.....	24

---

4.2.4	Test Data .....	25
4.3	Emissions in non-restricted frequency band.....	41
4.3.1	Limit .....	41
4.3.2	Test Setup.....	41
4.3.3	Test Procedure.....	41
4.3.4	Test Data .....	42
4.4	Duty cycle .....	44
4.4.1	Limit .....	44
4.4.2	Test Setup.....	44
4.4.3	Test Procedure.....	44
4.4.4	Test Data .....	45
4.5	Band Edge .....	46
4.5.1	Limit .....	46
4.5.2	Test Setup.....	46
4.5.3	Test Procedure.....	46
4.5.4	Test Data .....	47
4.6	DTS Bandwidth .....	63
4.6.1	Limit .....	63
4.6.2	Test Setup.....	63
4.6.3	Test Procedure.....	63
4.6.4	Test Data .....	64
4.7	Fundamental emission output power .....	65
4.7.1	Limit .....	65
4.7.2	Test Setup.....	65
4.7.3	Test Procedure.....	66
4.7.4	Test Data .....	67
4.8	Power Density .....	68
4.8.1	Limit: .....	68
4.8.2	Test Setup.....	68
4.8.3	Test Procedure.....	68
4.8.4	Test Data .....	69
4.9	Antenna Requirement.....	70
4.9.1	Limit: .....	70
4.9.2	Antenna Connector Construction: .....	70
5	Test setup photo and EUT Photo.....	71

## COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

**IMPORTANT:** No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

## GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Jun. 20, 2022
Date (start test)	Jun. 22, 2022
Date (finish test)	Jul. 20, 2022

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

## ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

## POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

## ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
$U_N$	: Nominal voltage
$T_x$	: Transmitter
$R_x$	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

## DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
2260325R-RF-US-P06V02	V1.0	Initial issue of report.	2022-07-31

## REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.247, RSS-Gen Issue 5, RSS-247 Issue 2.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results presented in this report relate only to the object tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
  - Chapter 1.1 General Description of the Item(s);
  - Chapter 1.2 Antenna Information;
  - Chapter 1.3 Channel List;
  - Chapter 1.4 Power Setting.

## USED EQUIPMENT

### AC Power Line Conducted Emission / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2021.10.30	2022.10.29
Two-Line V-Network	R&S	ENV216	101044	2022.03.12	2023.03.11
Current Probe	R&S	EZ-17	100678	2021.12.31	2022.12.30
50ohm Termination	SHX	TF2	07081403	2021.09.04	2022.09.03
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	TR1-TH	2021.07.09	2022.07.08
Temperature/Humidity Meter	RTS	RTS-8S	TR1-TH	2022.07.07	2023.07.06
Coaxial Cable	Suhner	RG 223	TR1-C2	2022.03.21	2023.03.20
Dekra test software	Dekra	-	-	-	-

### Emissions in non-restricted frequency bands/ Occupied Bandwidth/ Fundamental emission output power/ Power Spectral Density/Band Edge/ TR8

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
MAX Signal Analyzer	Agilent	N9020A	MY49100159	2021.11.17	2022.11.16
MXA Signal Analyzer	Keysight	N9020A	MY56060147	2021.11.18	2022.11.17
Temperature/Humidity Meter	RTS	RTS-8S	RF08	2021.07.09	2022.07.08
Temperature/Humidity Meter	RTS	RTS-8S	RF08	2022.07.07	2023.07.06
Tonscend test software	Tonscend	-	-	-	-

### Radiated Emission(30MHz-1GHz) / AC3

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2021.10.30	2022.10.29
Loop Antenna	R&S	HFH2-Z2	833799/003	2022.04.15	2023.04.14
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2021.12.03	2022.12.02
Temperature/Humidity Meter	RTS	RTS-8S	AC3-TH	2021.07.09	2022.07.08
Temperature/Humidity Meter	RTS	RTS-8S	AC3-TH	2022.07.07	2023.07.06
Coaxial Cable	Huber+Suhner	RG 214	AC3-C	2022.03.21	2023.03.20
Dekra test software	Dekra	-	-	-	-

## Radiated Emission(1GHz-40GHz) / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EXA Spectrum Analyzer	Keysight	N9010A	MY55370495	2021.08.12	2022.08.11
Pre-Amplifier	SKET	LNPA_0118G-45	SK2021090101	2021.12.13	2022.12.12
Preamplifier	CHENGYI	EMC184045SE	980263	2022.05.21	2023.05.20
DRG Horn	ETS-Lindgren	3117	00123988	2021.10.22	2022.10.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2022.05.19	2023.05.18
Temperature/Humidity Meter	RTS	RTS-8S	AC5-TH	2021.07.09	2022.07.08
Temperature/Humidity Meter	RTS	RTS-8S	AC5-TH	2022.07.07	2023.07.06
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2022.03.21	2023.03.20
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2022.03.21	2023.03.20
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2022.03.21	2023.03.20
Dekra test software	Dekra	-	-	-	-



## UNCERTAINTY

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%. The Uncertainties is comply with standard required as below.

Test item	Uncertainty
AC Power Line Conducted Emission	9kHz~150kHz: 2.80dB 150kHz~30MHz: 2.40dB
Peak Power Output	$\pm 1.27$ dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 3.50 dB 300MHz~1GHz: 3.60 dB Vertical: 30MHz~200MHz: 3.60 dB 300MHz~1GHz: 3.50 dB
Radiated Emission(1GHz~26.5GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB
RF antenna conducted test	$\pm 1.27$ dB
Radiated Emission Band Edge	$\pm 3.9$ dB
DTS Bandwidth	$\pm 150$ Hz
Occupied Bandwidth	$\pm 1$ kHz
Power Density	$\pm 1.27$ dB

# 1 GENERAL INFORMATION

## 1.1 General Description of the Item(s)

Product Name..... :	WLAN+Bluetooth Module
Model No. .... :	LBEE5HY2DU
FCC ID ..... :	VPYLB2DU
IC..... :	772C-LB2DU
Hardware Version ..... :	1.0
Software Version..... :	1.0
Manufacturer..... :	Murata Manufacturing Co., Ltd.
Manufacturer Address..... :	10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555, Japan
Factory ..... :	Murata Manufacturing Co., Ltd.
Factory Address..... :	10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555, Japan

Wireless specification..... :	Bluetooth V5.2 - LE					
Operating frequency range(s)..... :	2400~2483.5MHz					
Type of Modulation..... :	GFSK					
PHYs ..... :	<input checked="" type="checkbox"/>	LE 1M	<input checked="" type="checkbox"/>	LE 2M	<input type="checkbox"/>	LE Coded S=2/8
Data Rate ..... :	<input checked="" type="checkbox"/>	1Mbit/s	<input checked="" type="checkbox"/>	2Mbit/s	<input type="checkbox"/>	500/125 Kbit/s
Number of channel..... :	40					

Rated power supply .....	Voltage and Frequency					
	<input type="checkbox"/>	AC: 220 – 240 V, 50/60 Hz				
	<input checked="" type="checkbox"/>	DC:3.2 – 4.2V				
	<input type="checkbox"/>	Adapter: .....				
	<input type="checkbox"/>	Battery:.....				
Mounting position..... :	<input type="checkbox"/>	Table top equipment				
	<input type="checkbox"/>	Wall/Ceiling mounted equipment				
	<input type="checkbox"/>	Floor standing equipment				
	<input type="checkbox"/>	Head-mounted equipment				
	<input checked="" type="checkbox"/>	Other: Module				

## 1.2 Antenna Information

Antenna model / type number.....:	N/A		
Antenna serial number .....	N/A		
Antenna Delivery .....	<input checked="" type="checkbox"/>	1TX + 1RX	
	<input type="checkbox"/>	2TX + 2RX	
	<input type="checkbox"/>	Others:.....	
Antenna technology.....:	<input checked="" type="checkbox"/>	SISO	
	<input type="checkbox"/>	MIMO	<input type="checkbox"/> CDD
			<input type="checkbox"/> Beam-forming
Antenna Type.....:	<input checked="" type="checkbox"/>	External	<input type="checkbox"/> Dipole
			<input type="checkbox"/> Sectorized
			<input checked="" type="checkbox"/> PCB
	<input type="checkbox"/>	Internal	<input type="checkbox"/> PIFA
			<input type="checkbox"/> PCB
			<input type="checkbox"/> Dipole
			<input type="checkbox"/> Others.....
Antenna Gain.....:	0.1 dBi		

### 1.3 Channel List

Bluetooth Working Frequency of Each Channel (LE):							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz	03	2408 MHz
04	2410 MHz	05	2412 MHz	06	2414 MHz	07	2416 MHz
08	2418 MHz	09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz	15	2432 MHz
16	2434 MHz	17	2436 MHz	18	2438 MHz	19	2440 MHz
20	2442 MHz	21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz	27	2456 MHz
28	2458 MHz	29	2460 MHz	30	2462 MHz	31	2464 MHz
32	2466 MHz	33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz	39	2480 MHz

### 1.4 Power Setting

Mode	Channel	Test Frequency (MHz)	Power Setting
LE_1Mbps	00	2402	0
	19	2440	0
	39	2480	0
LE_2Mbps	00	2402	0
	19	2440	0
	39	2480	0

Note: The general description of the Item(s), antenna information, channel list and Power Setting in clause 1 are provided and confirmed by the client.

## 2 DESCRIPTION OF TEST SETUP

### 2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Test Mode For Bluetooth	Mode1: Transmit by LE_1Mbps
	Mode2: Transmit by LE_2Mbps

Note : For client device, radiated tests was verified over X, Y, Z axis, and shown the worst case Z axis on this report.

### 2.2 Accessories Information

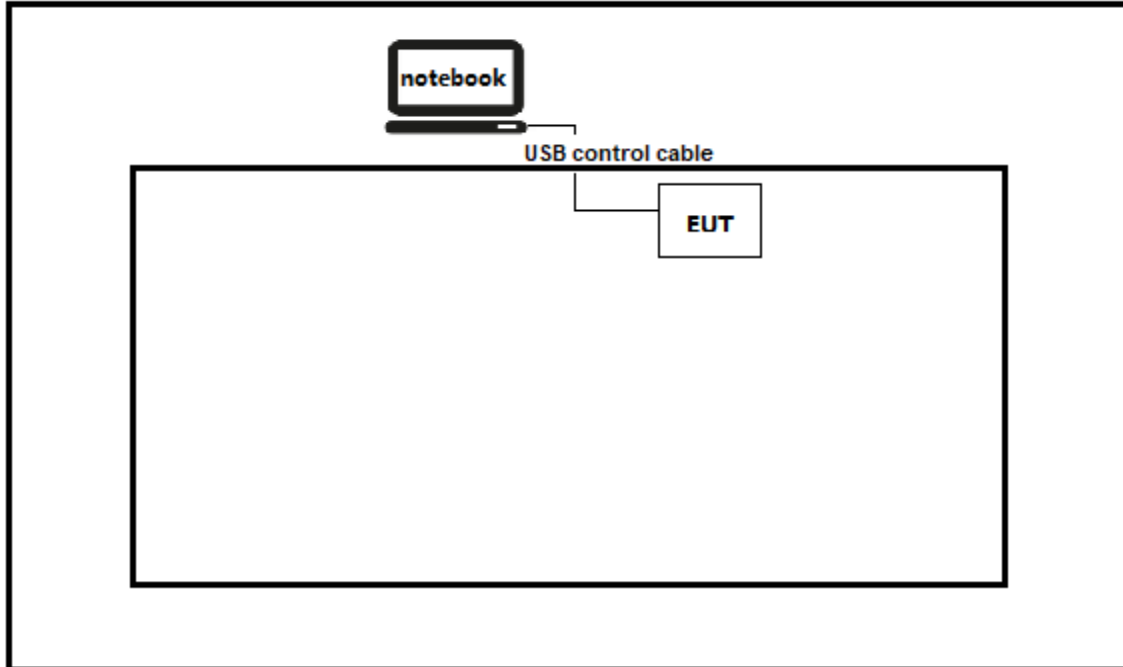
Accessories Information	Brand/model name	Cable		
		Length used during test [m]	Attached during test	Shielded
USB Cable	N/A	10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
USB Cable	N/A	0.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

### 2.3 Auxiliary equipment / Test software for the EUT

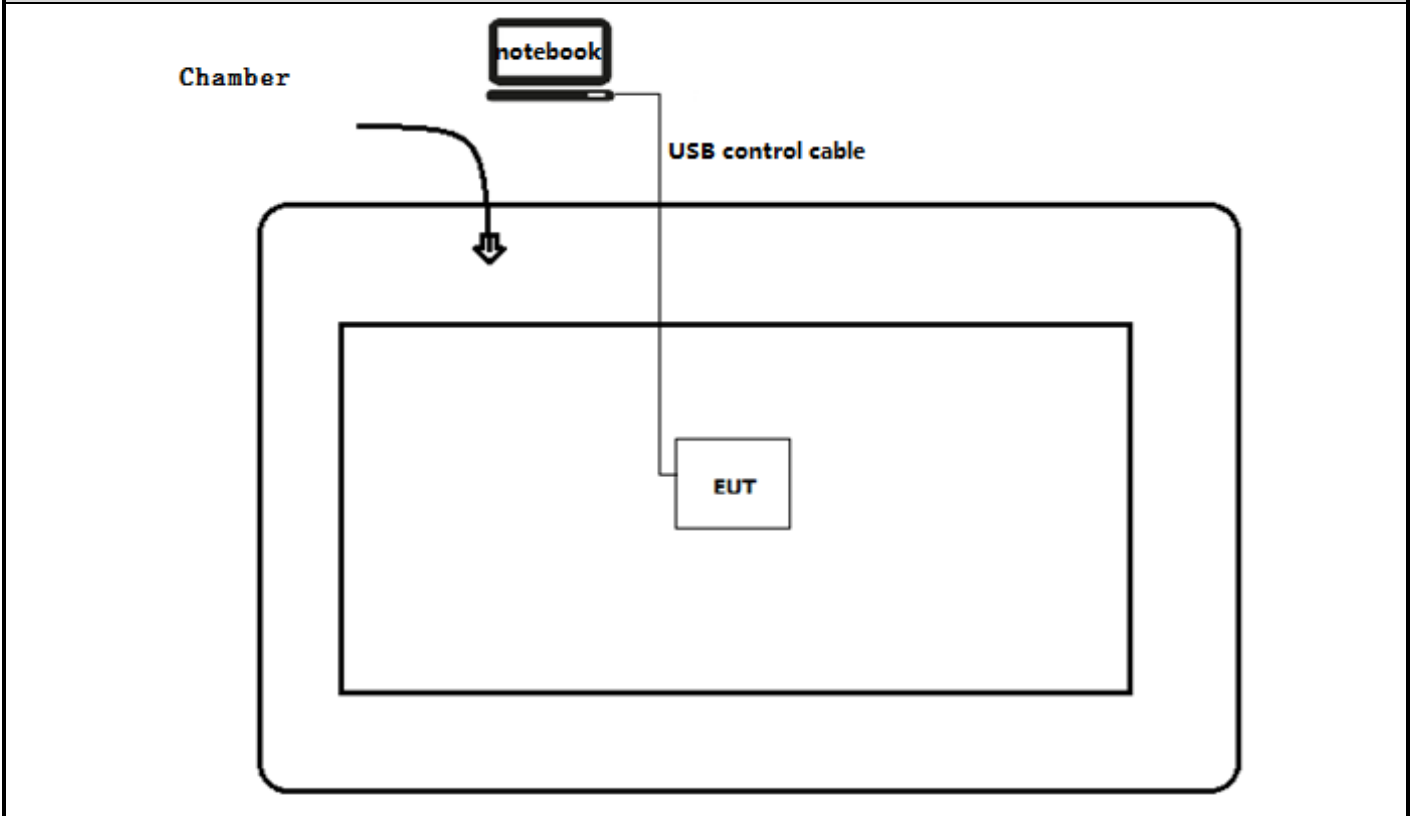
Auxiliary equipment	Type / Version	Manufacturer	Supplied by
Notebook	2526	Think Pad	N/A
Software	Type / Version	Manufacturer	Supplied by
BlueTool	N/A	N/A	N/A

## 2.4 Test Configuration / Block diagram used for tests

Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Radiated Emission



## 2.5 Testing process

1	Setup the EUT as shown in Section 2.4.
2	Run the software "BlueTool.exe" on the notebook computer.
3	Open the serial port and enter the corresponding commands to configure the test mode, test channel, test power and data rate.
4	Verify that the EUT works properly.

### 3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

#### 3.1 Standards

Standard	Year	Description
FCC CFR Title 47 Part 15 Subpart C Section 15.247	2020	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB558074 D01 v05r02	2019	Guidance for performing compliance measurements on Digital Transmission System (DTS) operating under section 15.247
RSS-Gen Issue 5 Amendment 2	2021	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 2	2017	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

#### 3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

*(Please define the deviations from the standard(s) if applicable)*



### 3.3 Overview of results

#### For FCC

Requirement – Test case	Basic standard(s)	Verdict	Remark
AC Power Line Conducted Emission	FCC 15.207	N/A	---
Emissions in restricted frequency bands	FCC 15.247(b)(3)	PASS	---
Duty cycle	ANSI C63.10:2013	PASS	---
Emissions in non-restricted frequency bands	FCC 15.247(d), FCC 15.209	PASS	---
Band Edge	FCC 15.247(d)	PASS	---
Fundamental emission output power	FCC 15.247(d), FCC 15.209	PASS	---
DTS Bandwidth	FCC 15.247(a)(2)	PASS	---
Power Spectral Density	FCC 15.247(e)	PASS	---
Antenna Requirement	FCC 15.203	PASS	---

#### For ISED

Requirement – Test case	Basic standard(s)	Verdict	Remark
AC Power Line Conducted Emission	RSS-Gen Issue 5 Section 8.8	N/A	---
Emissions in restricted frequency bands	RSS-Gen Issue 5 Section 8.9	PASS	---
Duty cycle	ANSI C63.10:2013	PASS	---
Emissions in non-restricted frequency bands	RSS-247 Issue 2 Section 5.5	PASS	---
Band Edge	RSS-Gen Issue 5 Section 8.10	PASS	---
Fundamental emission output power	RSS-247 Issue 2 Section 5.4(d)	PASS	---
DTS Bandwidth	RSS-Gen Issue 5 Section 6.7	PASS	---
Power Spectral Density	RSS-247 Issue 2 Section 5.2(b)	PASS	---
Antenna Requirement	RSS-Gen Issue 5 Section 6.8	PASS	---

---

### 3.4 Test Facility

USA	:	FCC Designation Number: CN1199
CA	:	ISED CAB identifier: CN0040

## 4 TEST RESULTS

### 4.1 AC Power Line Conducted Emission

VERDICT: N/A

#### 4.1.1 Limit

Standard		
FCC Part 15 Subpart C Paragraph 15.207		
Frequency range [MHz]	Limit: QP [dB(μV) <sup>1)</sup>	Limit: AV [dB(μV) <sup>1)</sup>
0,15 - 0,50	66 - 56 <sup>2)</sup>	56 - 46 <sup>2)</sup>
0,50 - 5,0	56	46
5,0 - 30	60	50

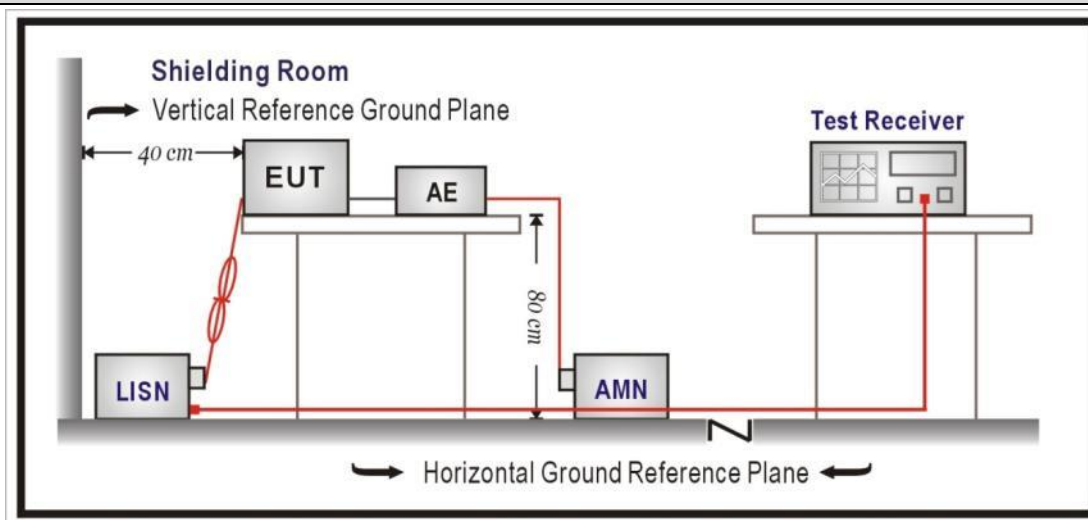
<sup>1)</sup> At the transition frequency, the lower limit applies.

<sup>2)</sup> The limit decreases linearly with the logarithm of the frequency.

**NOTE 1:** The exclusion band for transmitters shall be considered for transmitters operating at frequencies below 30 MHz.

**NOTE 2:** Where the AC output port is directly connected (or via a circuit breaker) to the AC power input port of the EUT the AC power output port need not to be tested.

#### 4.1.2 Test Setup



#### 4.1.3 Test Procedure

	References Rule	Chapter	Item
<input checked="" type="checkbox"/>	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices

---

#### 4.1.4 Test Data

N/A: The EUT is powered by DC.

<b>4.2 Emissions in restricted frequency bands</b>	<b>VERDICT: PASS</b>
--	----------------------

4.2.1 Limit			
<b>Standard</b>		FCC Part 15 Subpart C Paragraph 15.209	
Restricted Bands of operationfor FCC			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	
13.36 – 13.41			
Restricted Bands of operationfor IC			
0.090 - 0.110	13.36 - 13.41	960 - 1427	9.0 - 9.2
0.495 - 0.505	16.42 - 16.423	1435 - 1626.5	9.3 - 9.5
2.1735 - 2.1905	16.69475 - 16.69525	1645.5 - 1646.5	10.6 - 12.7
3.020 - 3.026	16.80425 - 16.80475	1660 - 1710	13.25 - 13.4
4.125 - 4.128	25.5 - 25.67	1718.8 - 1722.2	14.47 - 14.5
4.17725 - 4.17775	37.5 - 38.25	2200 - 2300	15.35 - 16.2
4.20725 - 4.20775	73 - 74.6	2310 - 2390	17.7 - 21.4
5.677 - 5.683	74.8 - 75.2	2483.5 - 2500	22.01 - 23.12
6.215 - 6.218	108 - 138	2655 - 2900	23.6 - 24.0
6.26775 - 6.26825	149.9 - 150.05	3260 - 3267	31.2 - 31.8
6.31175 - 6.31225	156.52475 - 156.52525	3332 - 3339	36.43 - 36.5
8.291 - 8.294	156.7 - 156.9	3345.8 - 3358	Above 38.6
8.362 - 8.366	162.0125 - 167.17	3500 - 4400	
8.37625 - 8.38675	167.72 - 173.2	4500 - 5150	
8.41425 - 8.41475	240 - 285	5350 - 5460	
12.29 - 12.293	322 - 335.4	7250 - 7750	
12.51975 - 12.52025	399.9 - 410	8025 - 8500	
12.57675 - 12.57725	608 - 614	--	

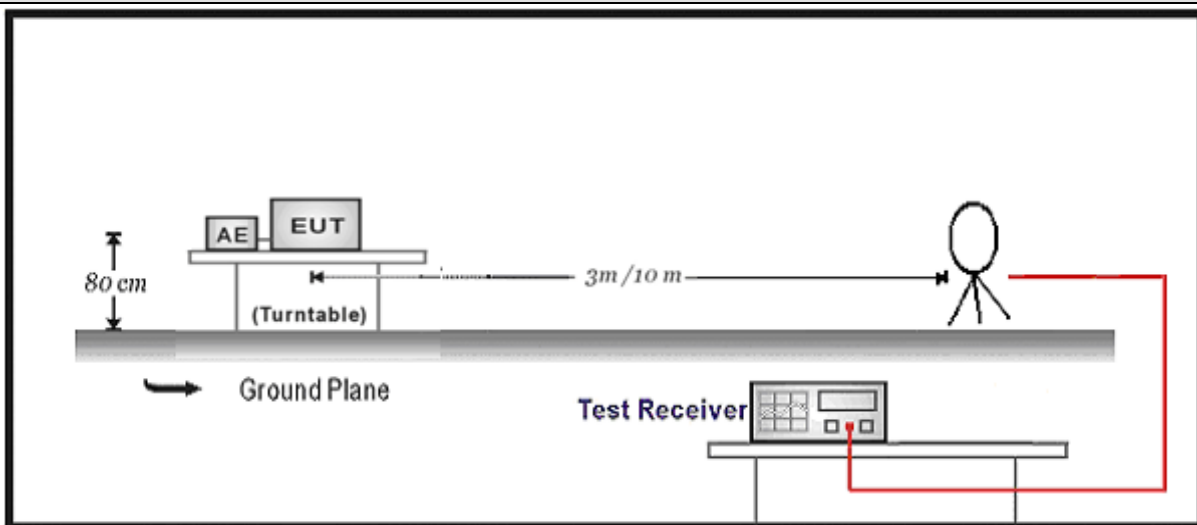
Restricted Band Emissions Limit			
Frequency (MHz)	Field strength ( $\mu\text{V/m}$ )	Field strength ( $\text{dB}\mu\text{V/m}$ )	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 <sub>(Note 1)</sub>
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 <sub>(Note 1)</sub>
1.705 - 30	30	29.5	30 <sub>(Note 1)</sub>
30 -88	100	40	3 <sub>(Note 2)</sub>
88-216	150	43.5	3 <sub>(Note 2)</sub>
216 - 960	200	46	3 <sub>(Note 2)</sub>
Above 960	500	54	3 <sub>(Note 2)</sub>

Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

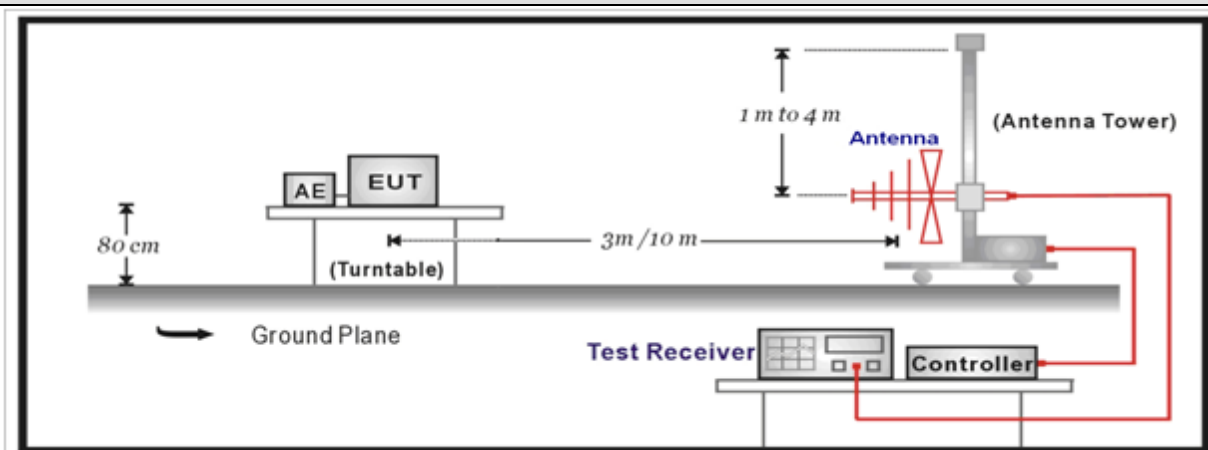
Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

### 4.2.2 Test Setup

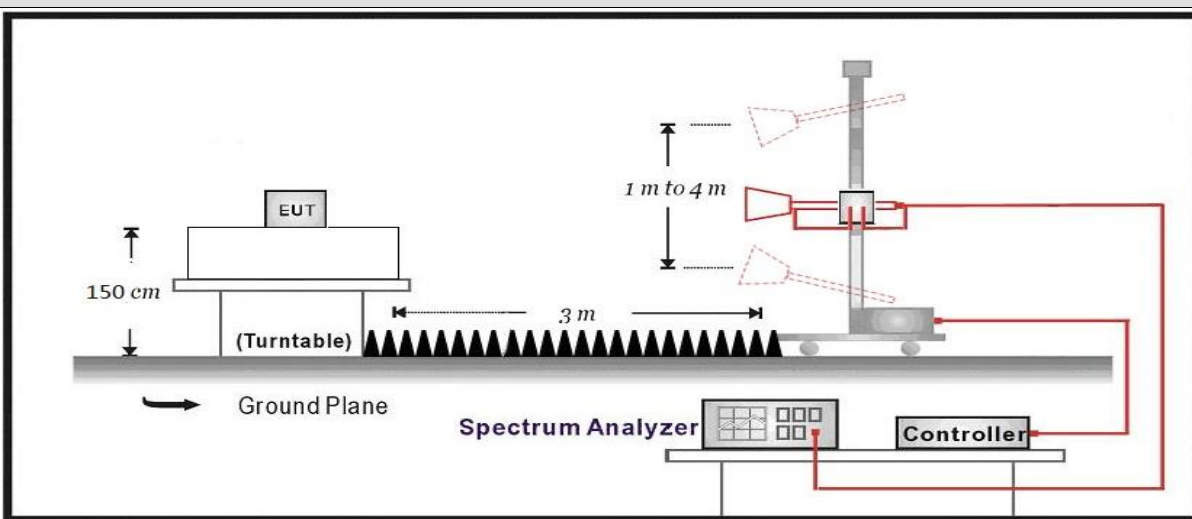
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:

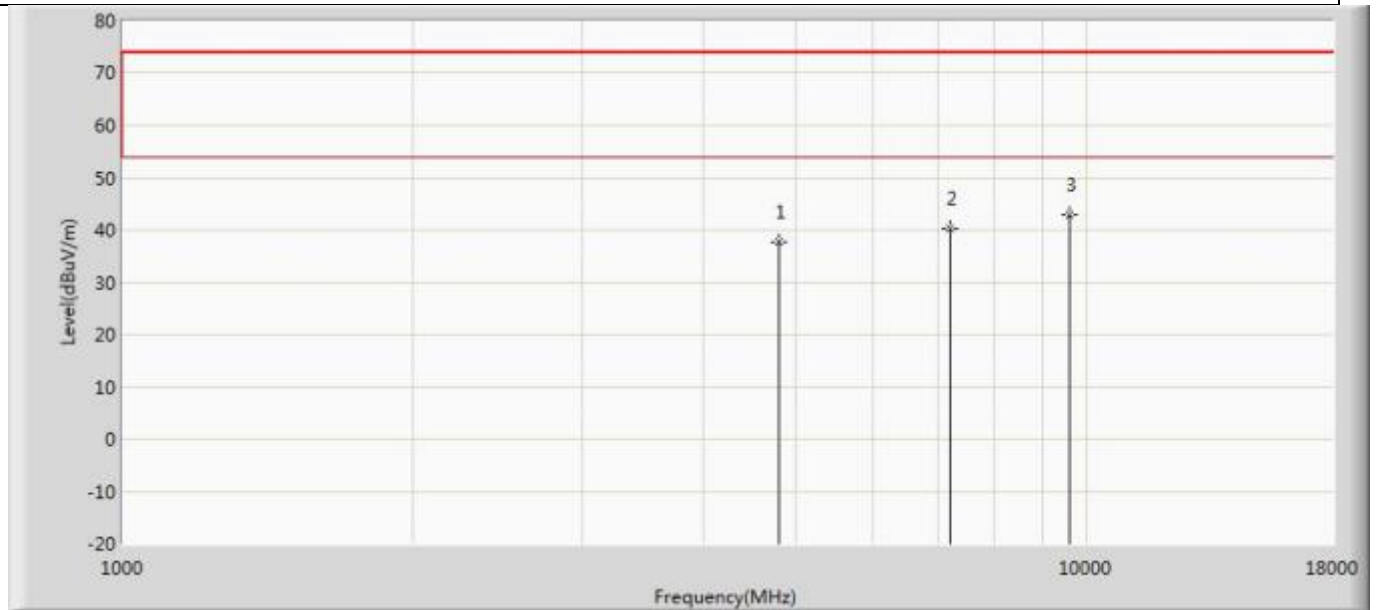


4.2.3 Test Procedure			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
	<input checked="" type="checkbox"/> ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz



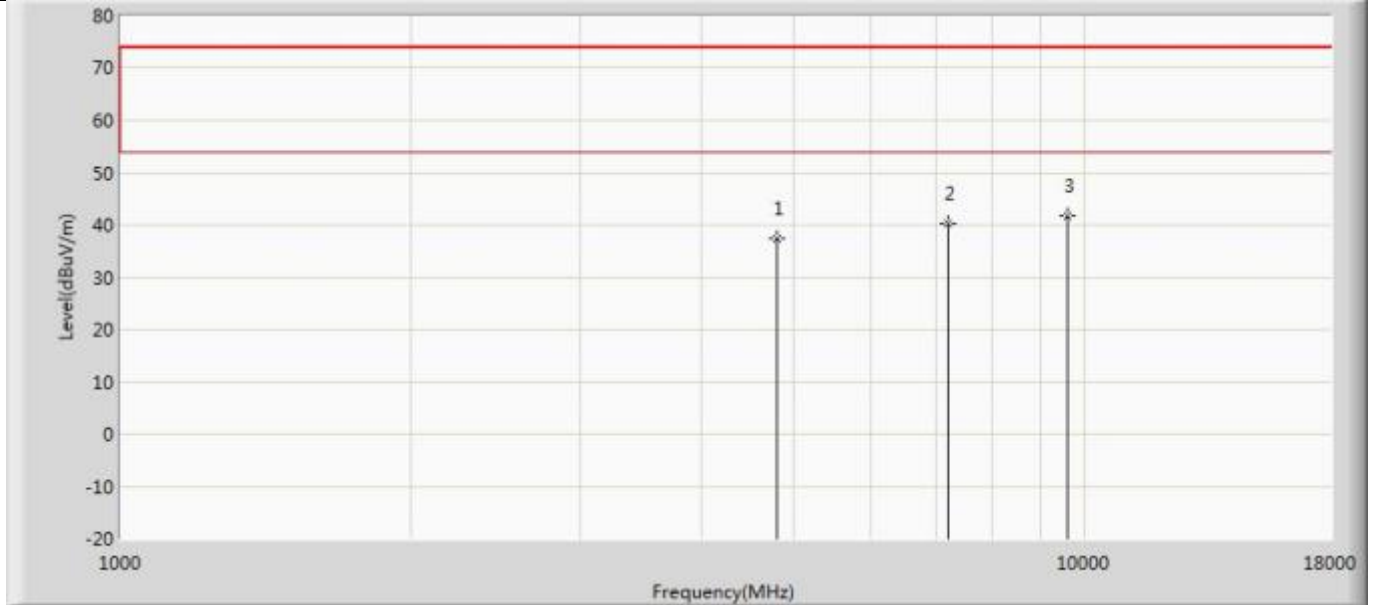
**4.2.4 Test Data**

Profile: 2260325R	Page No.: 13
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2402MHz by LE_1Mbps	



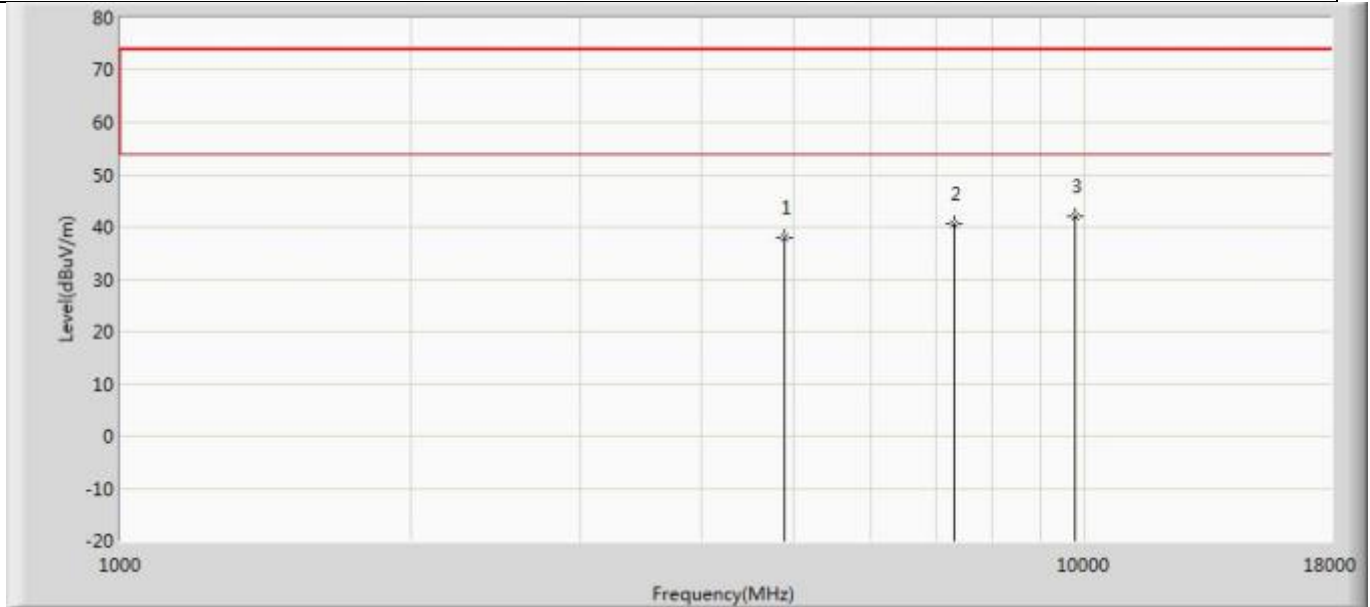
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	37.571	48.905	-36.429	74.000	-11.334	PK
2		7206.000	40.298	47.612	-33.702	74.000	-7.314	PK
3	*	9608.000	42.875	48.597	-31.125	74.000	-5.722	PK

Profile: 2260325R	Page No.: 14
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2402MHz by LE_1Mbps	



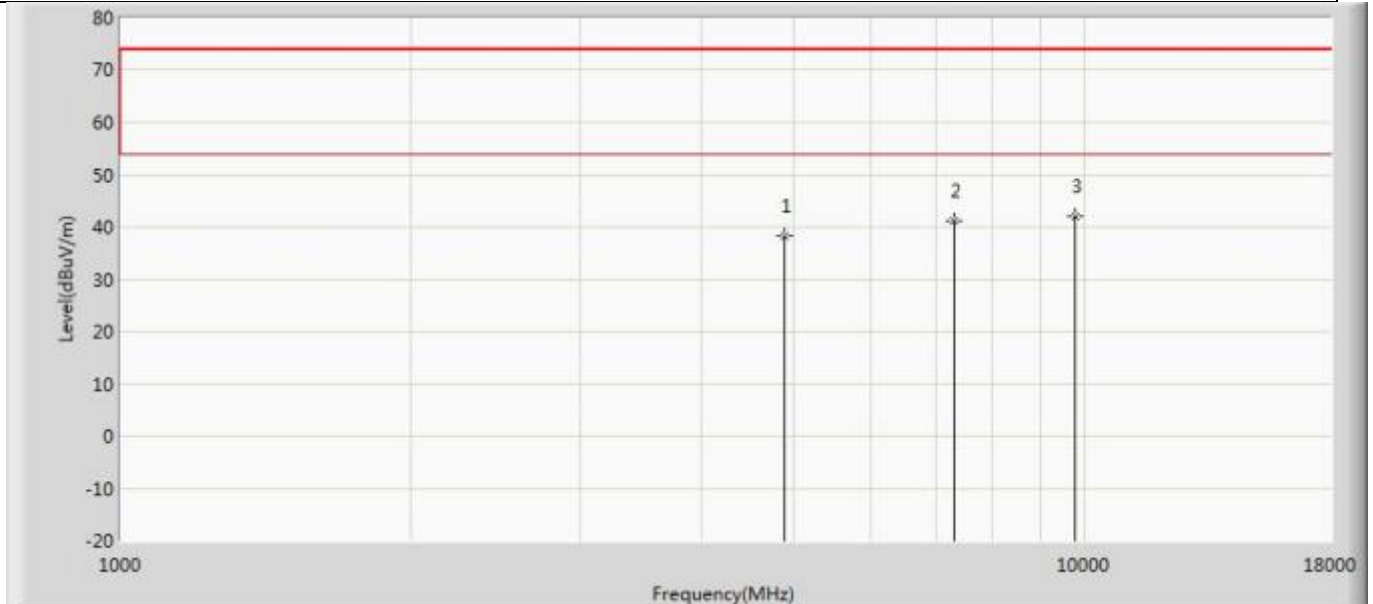
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	37.423	48.757	-36.577	74.000	-11.334	PK
2		7206.000	40.321	47.635	-33.679	74.000	-7.314	PK
3	*	9608.000	41.869	47.591	-32.131	74.000	-5.722	PK

Profile: 2260325R	Page No.: 15
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2440MHz by LE_1Mbps	



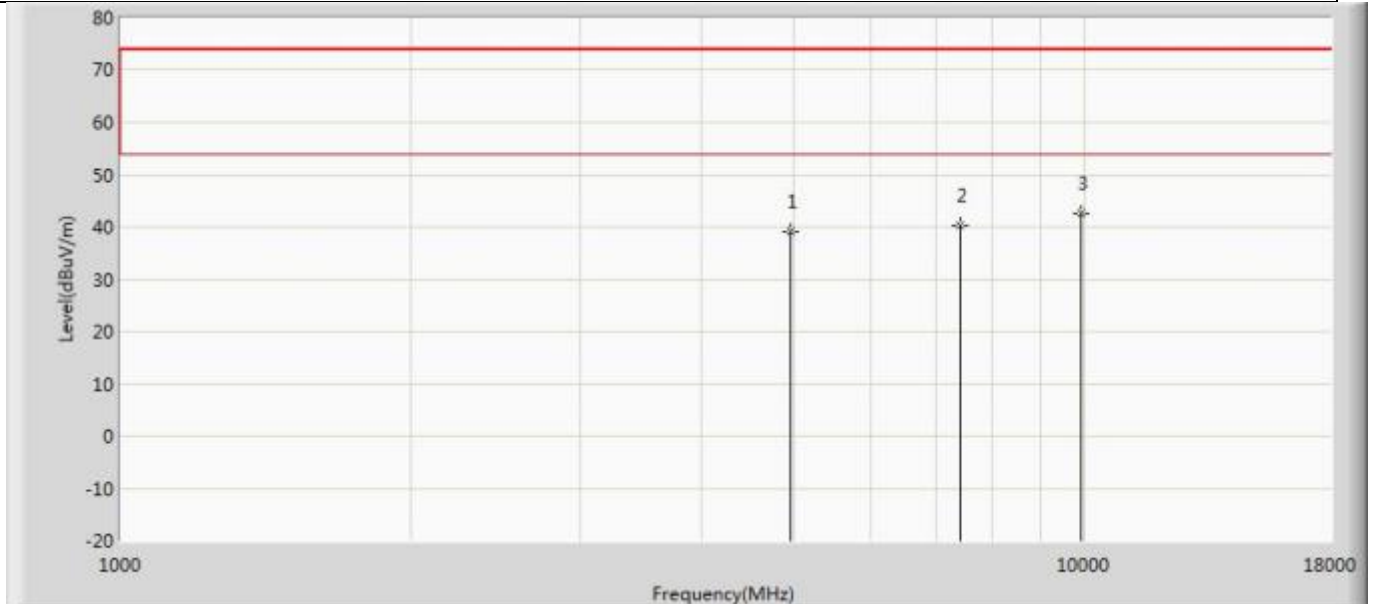
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	37.992	49.130	-36.008	74.000	-11.138	PK
2		7320.000	40.568	47.625	-33.432	74.000	-7.057	PK
3	*	9760.000	42.067	47.429	-31.933	74.000	-5.362	PK

Profile: 2260325R	Page No.: 16
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2440MHz by LE_1Mbps	



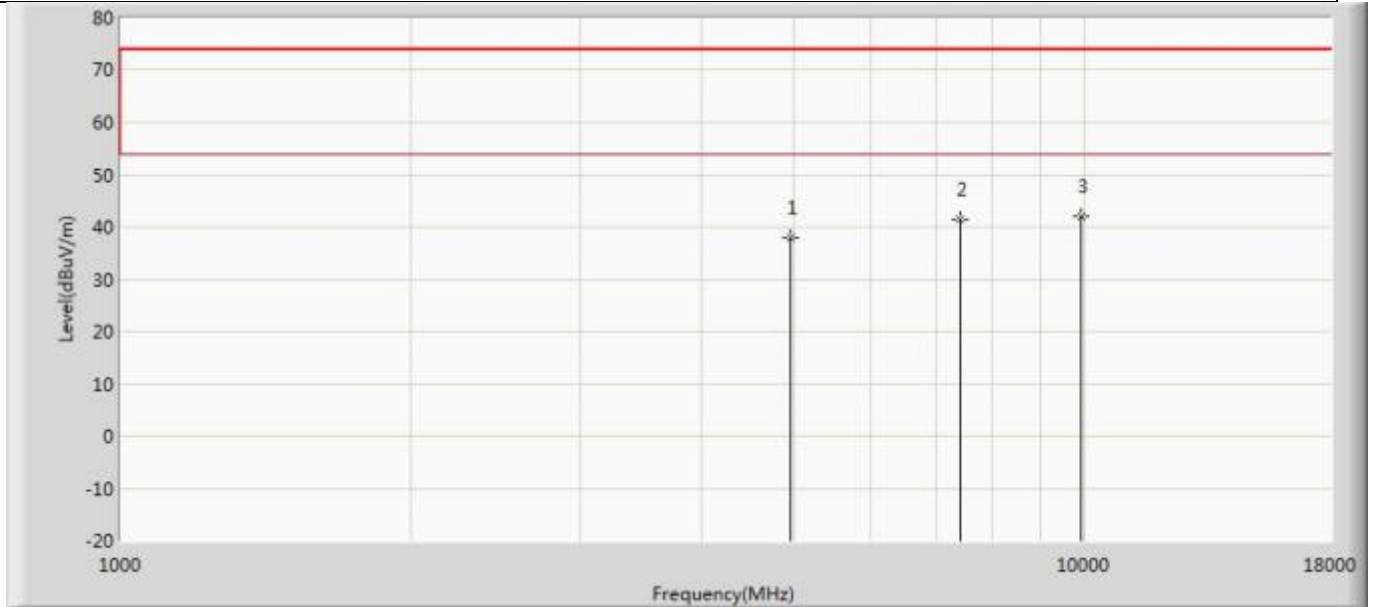
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	38.384	49.522	-35.616	74.000	-11.138	PK
2		7320.000	41.169	48.226	-32.831	74.000	-7.057	PK
3	*	9760.000	41.920	47.282	-32.080	74.000	-5.362	PK

Profile: 2260325R	Page No.: 17
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2480MHz by LE_1Mbps	



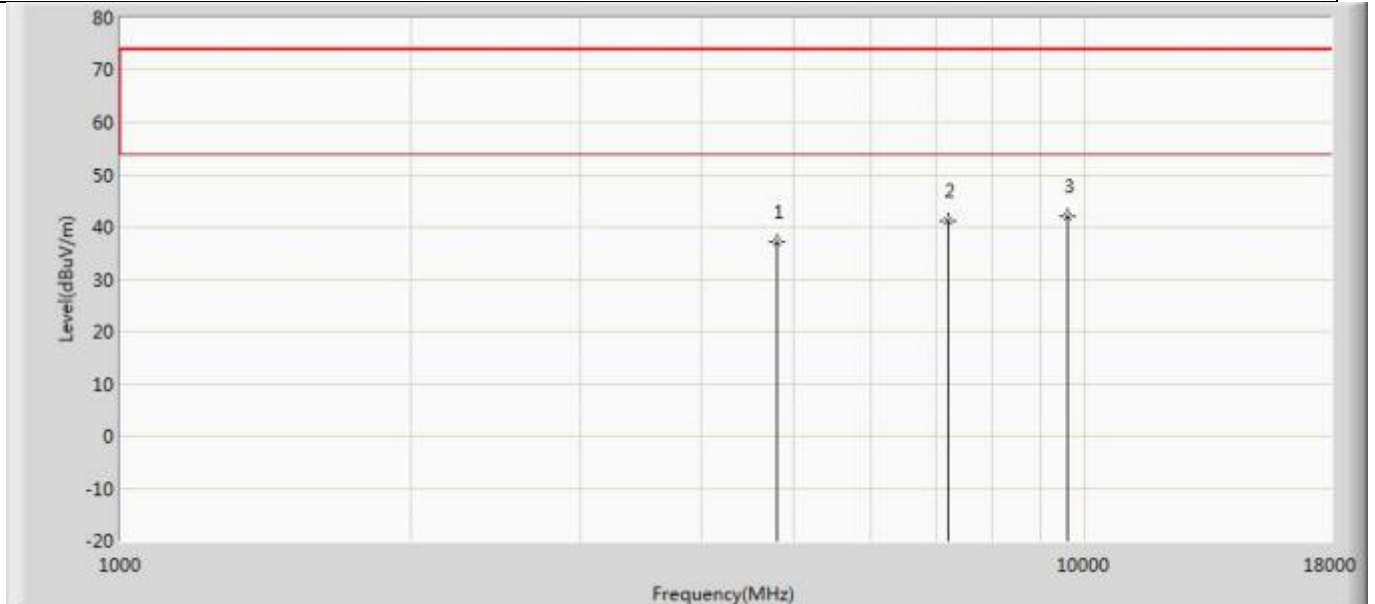
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	39.132	50.783	-34.868	74.000	-11.651	PK
2		7440.000	40.371	47.400	-33.629	74.000	-7.029	PK
3	*	9920.000	42.741	48.128	-31.259	74.000	-5.386	PK

Profile: 2260325R	Page No.: 18
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2480MHz by LE_1Mbps	



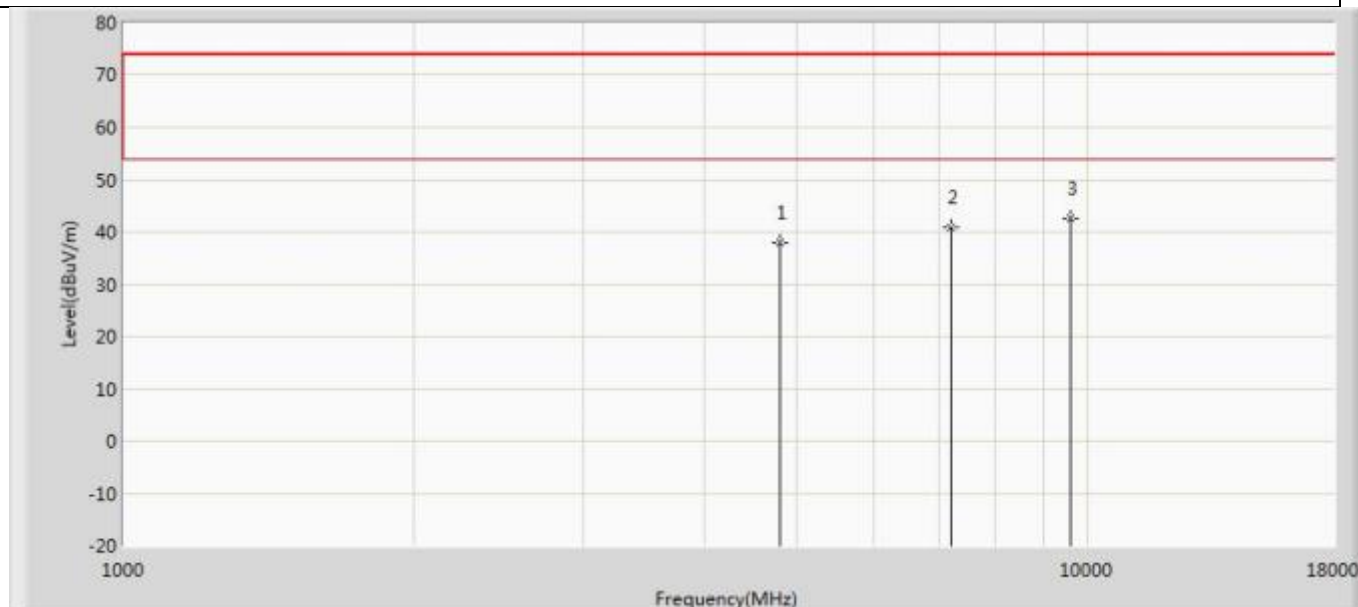
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	37.926	49.577	-36.074	74.000	-11.651	PK
2		7440.000	41.311	48.340	-32.689	74.000	-7.029	PK
3	*	9920.000	42.020	47.407	-31.980	74.000	-5.386	PK

Profile: 2260325R	Page No.: 19
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2402MHz by LE_2Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	37.183	48.517	-36.817	74.000	-11.334	PK
2		7206.000	41.043	48.357	-32.957	74.000	-7.314	PK
3	*	9608.000	41.923	47.645	-32.077	74.000	-5.722	PK

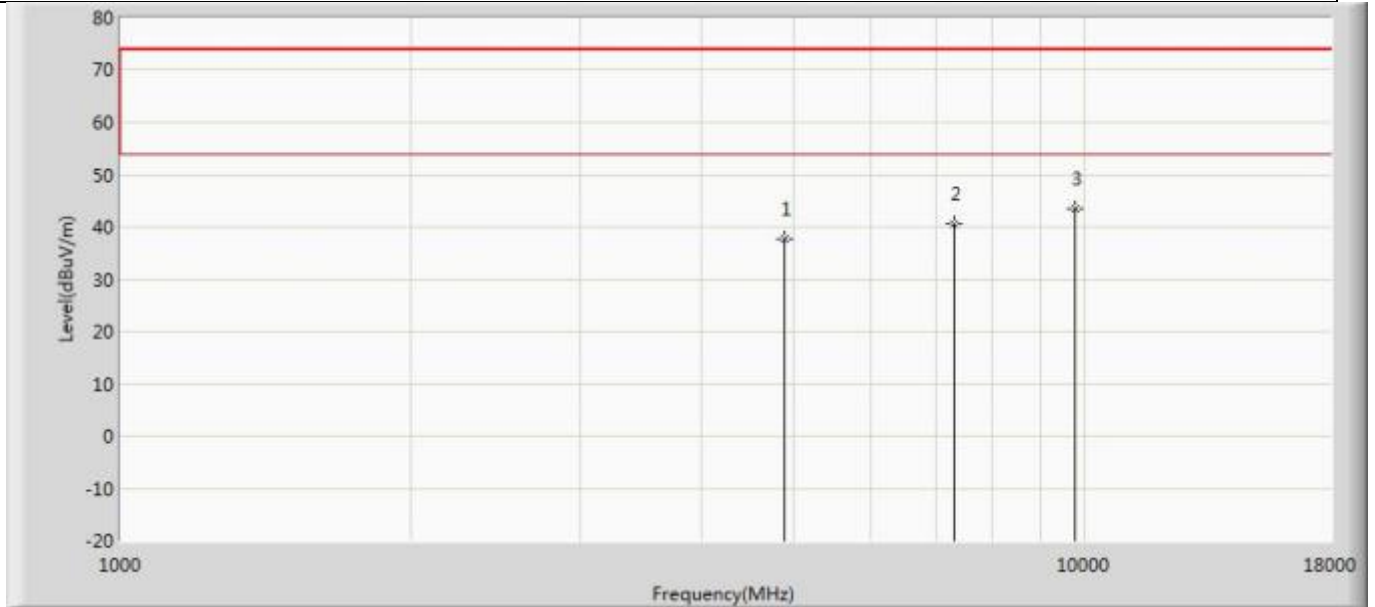
Profile: 2260325R	Page No.: 20
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2402MHz by LE_2Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	38.097	49.431	-35.903	74.000	-11.334	PK
2		7206.000	40.788	48.102	-33.212	74.000	-7.314	PK
3	*	9608.000	42.570	48.292	-31.430	74.000	-5.722	PK

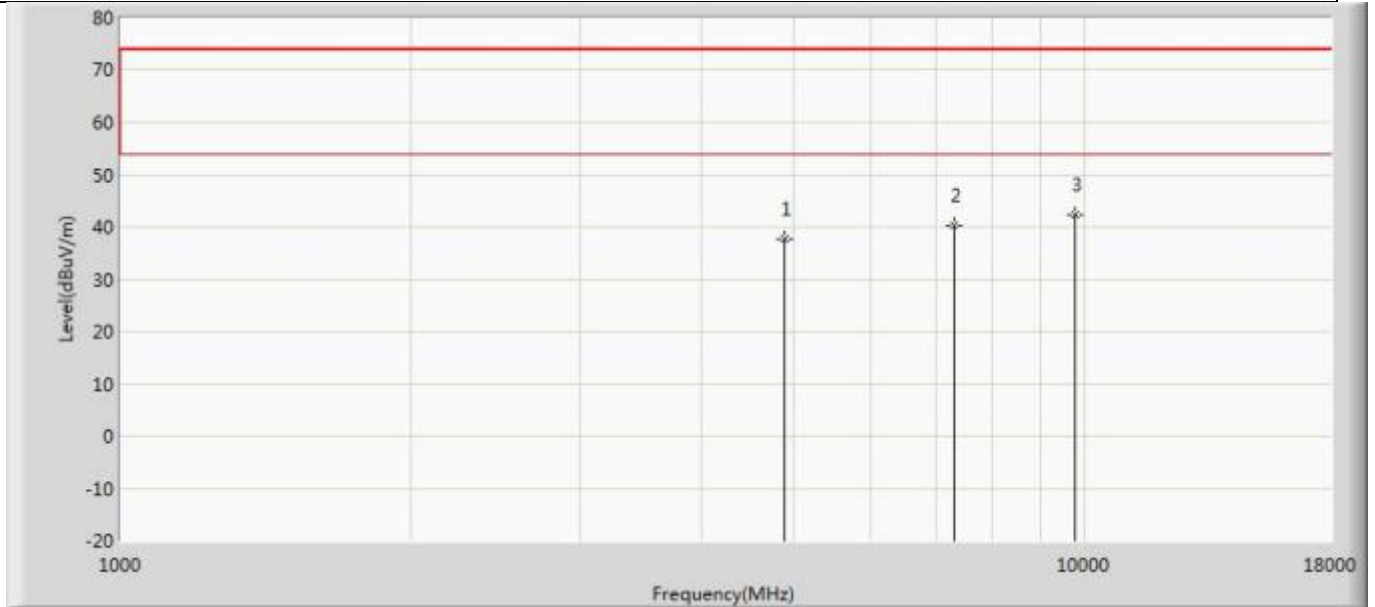


Profile: 2260325R	Page No.: 21
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2440MHz by LE_2Mbps	



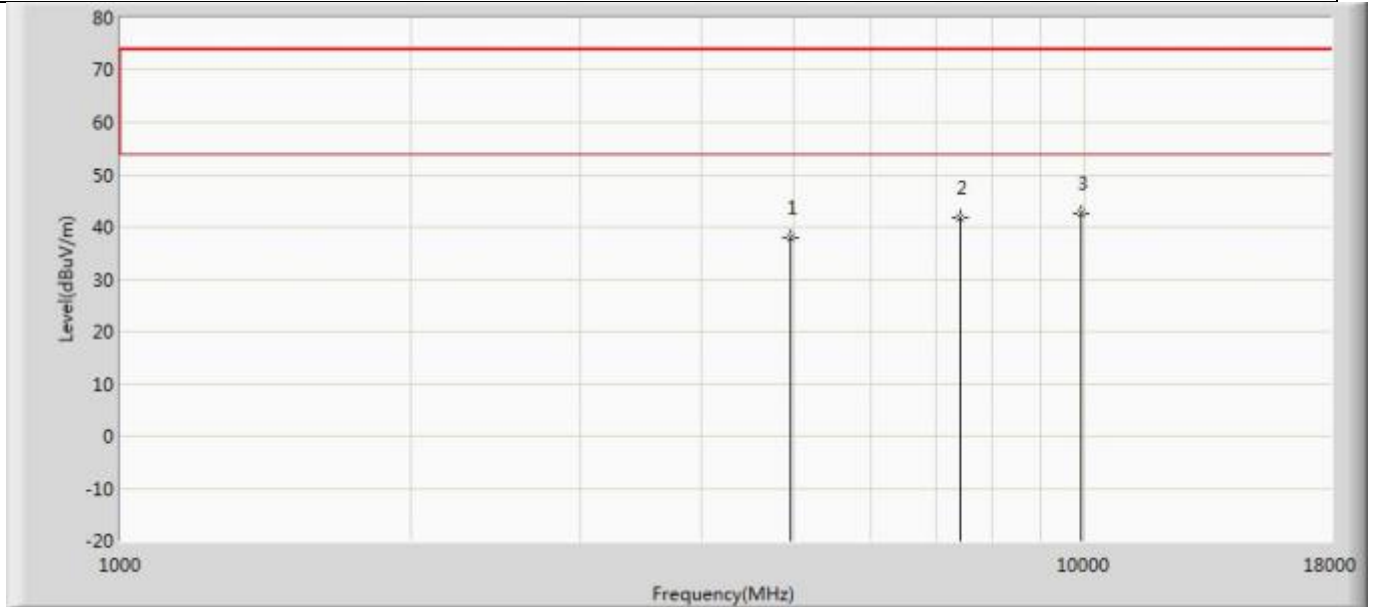
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	37.601	48.739	-36.399	74.000	-11.138	PK
2		7320.000	40.486	47.543	-33.514	74.000	-7.057	PK
3	*	9760.000	43.568	48.930	-30.432	74.000	-5.362	PK

Profile: 2260325R	Page No.: 22
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2440MHz by LE_2Mbps	



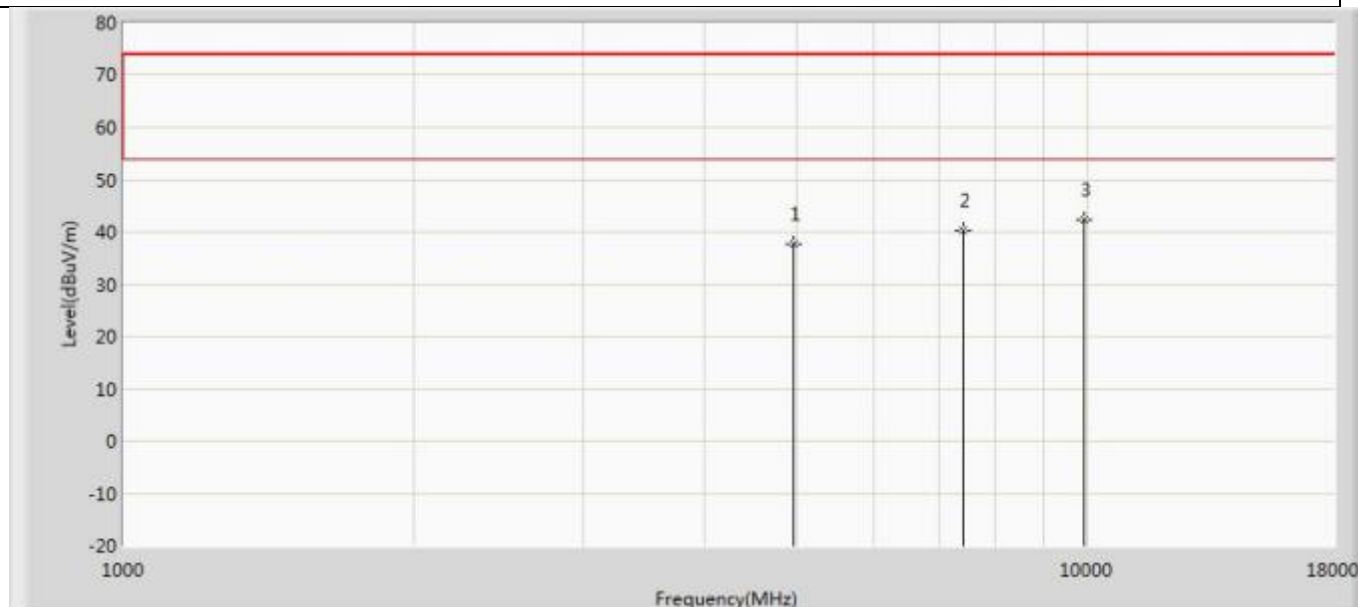
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4880.000	37.589	48.727	-36.411	74.000	-11.138	PK
2		7320.000	40.392	47.449	-33.608	74.000	-7.057	PK
3	*	9760.000	42.255	47.617	-31.745	74.000	-5.362	PK

Profile: 2260325R	Page No.: 23
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2480MHz by LE_2Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	38.030	49.681	-35.970	74.000	-11.651	PK
2		7440.000	41.773	48.802	-32.227	74.000	-7.029	PK
3	*	9920.000	42.604	47.991	-31.396	74.000	-5.386	PK

Profile: 2260325R	Page No.: 24
Engineer: Carlos shen	
Site: AC5	Time: 2022/06/30 - 02:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2480MHz by LE_2Mbps	



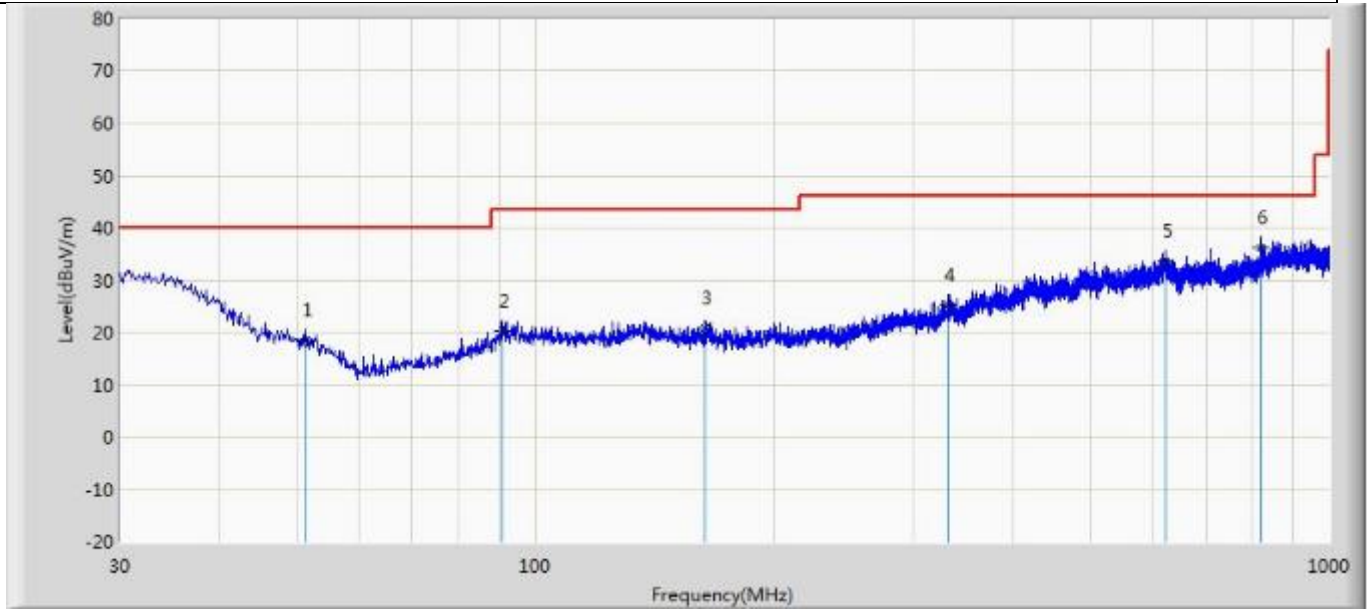
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4960.000	37.732	49.383	-36.268	74.000	-11.651	PK
2		7440.000	40.365	47.394	-33.635	74.000	-7.029	PK
3	*	9920.000	42.380	47.767	-31.620	74.000	-5.386	PK

Note:

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, worst case are at least 20dB below the limits, therefore no data appear in the report.
3. This limit applies for both peak and average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
4. The points in graph are the highest data in test frequency range.

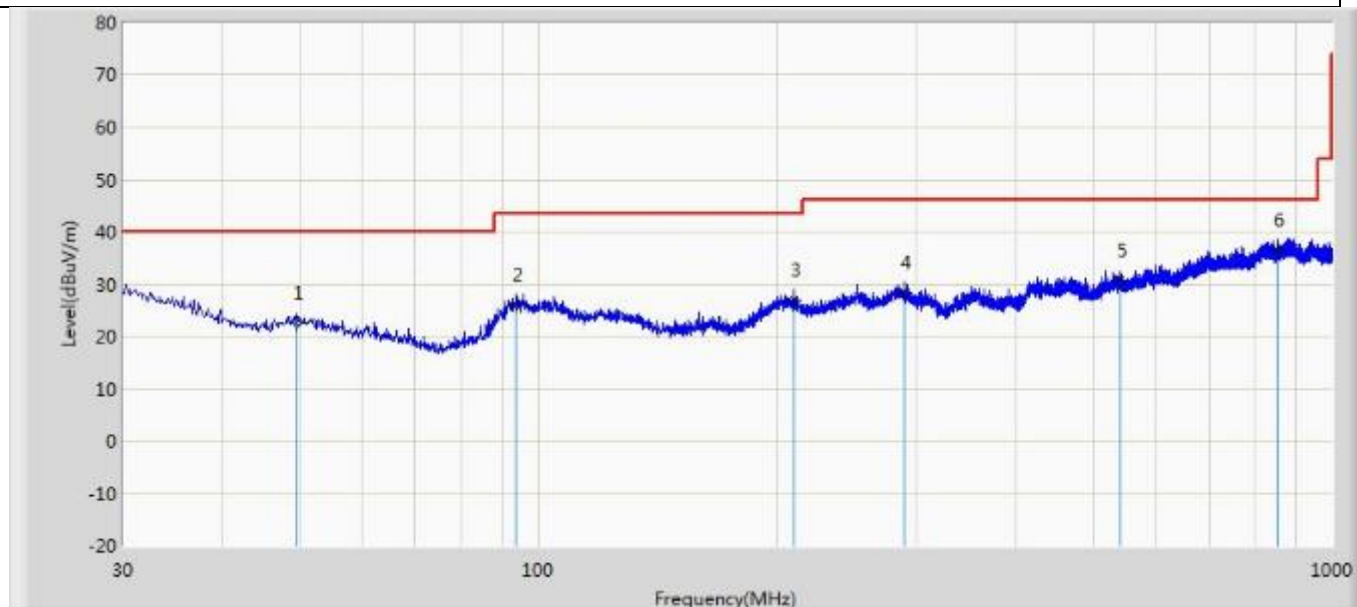
**The worst case of Radiated Emission below 1GHz:**

Profile: 2260325R	Page No.: 61
Engineer: YuLiu	
Site: AC3	Time: 2022/07/04 - 22:31
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2440MHz by LE_2Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		51.340	18.468	3.256	-21.532	40.000	15.212	QP
2		90.989	20.305	6.535	-23.195	43.500	13.770	QP
3		163.345	20.806	3.497	-22.694	43.500	17.310	QP
4		331.306	25.322	2.431	-20.678	46.000	22.890	QP
5		621.943	33.549	2.801	-12.451	46.000	30.747	QP
6	*	821.884	36.316	4.943	-9.684	46.000	31.373	QP

Profile: 2260325R	Page No.: 62
Engineer: YuLiu	
Site: AC3	Time: 2022/07/04 - 22:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2440MHz by LE_2Mbps	



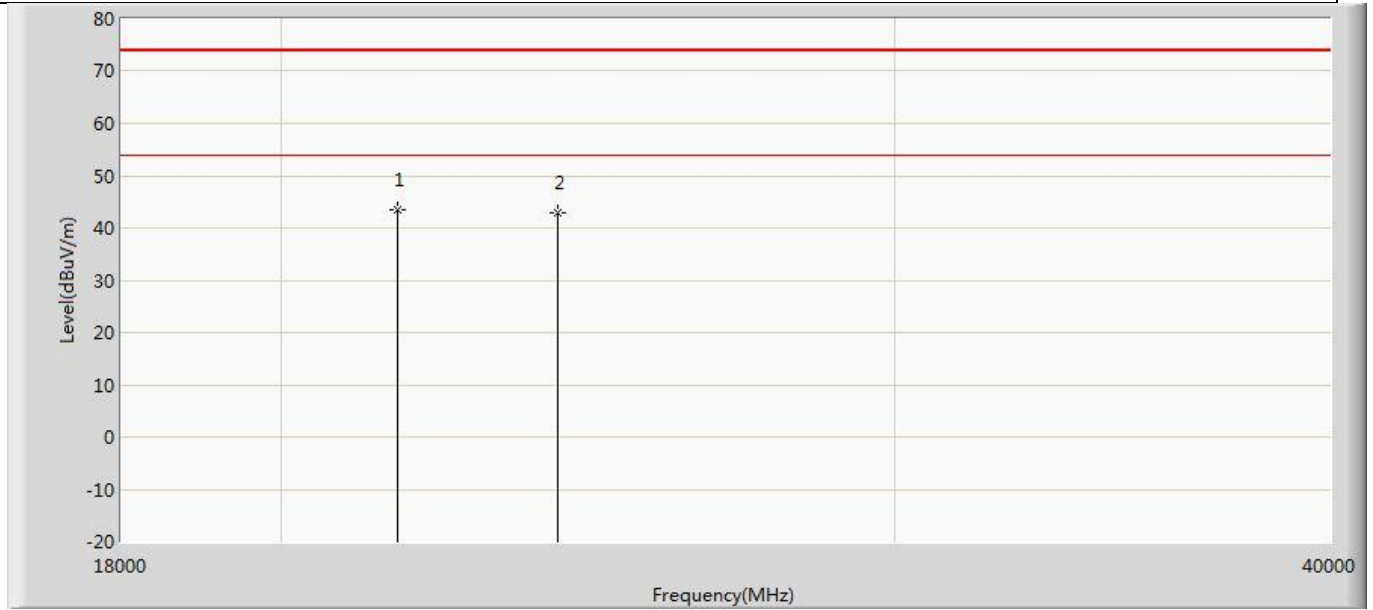
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		49.764	22.488	3.058	-17.512	40.000	19.430	QP
2		93.899	26.070	6.812	-17.430	43.500	19.258	QP
3		209.693	26.862	3.600	-16.638	43.500	23.262	QP
4		288.747	28.425	3.570	-17.575	46.000	24.854	QP
5		541.190	30.607	3.700	-15.393	46.000	26.907	QP
6	*	853.287	36.466	3.950	-9.534	46.000	32.516	QP

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " \* ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

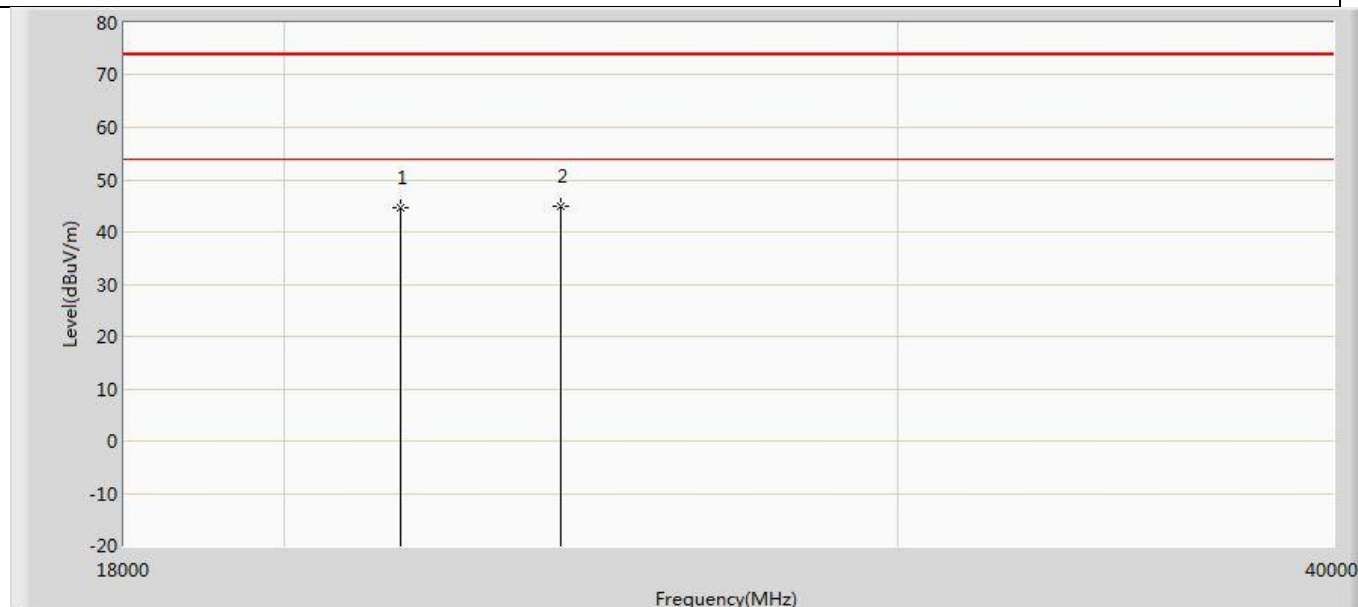
**The worst case of Radiated Emission above 18GHz:**

Profile: 2260325R	Page No.: 49
Engineer: Yu Liu	
Site: AC5	Time: 2022/07/05 - 14:54
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2402MHz by BLE_1M	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	21618.000	43.585	44.301	-30.415	74.000	-0.716	PK
2		24020.000	42.939	42.121	-31.061	74.000	0.818	PK

Profile: 2260325R	Page No.: 50
Engineer: Yu Liu	
Site: AC5	Time: 2022/07/05 - 14:54
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9170_294(18-40GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2402MHz by BLE_1M	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		21618.000	44.557	45.273	-29.443	74.000	-0.716	PK
2	*	24020.000	44.821	44.003	-29.179	74.000	0.818	PK

Note:

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, worst case are at least 20dB below the limits, therefore no data appear in the report.
3. This limit applies for both peak and average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
4. The points in graph are the highest data in test frequency range.



<b>4.3 Emissions in non-restricted frequency band</b>	<b>VERDICT: PASS</b>
---	----------------------

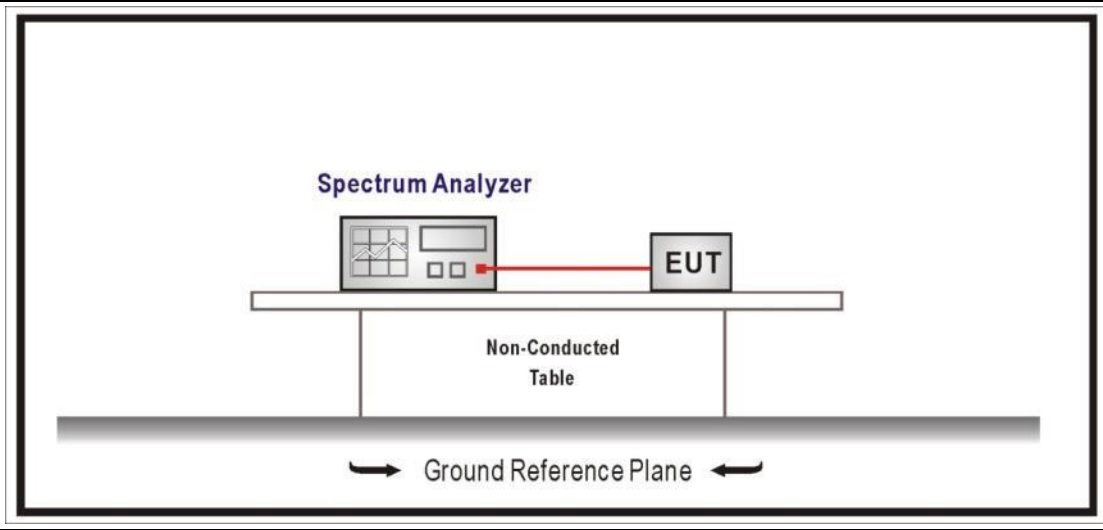
**4.3.1 Limit**

<b>Standard</b>	FCC Part 15 Subpart C Paragraph 15.247(d)
RF Output power (Detection methods)	Limit(dB)
RF Output power(Average detector)	30dBc(Note1)
RF Output power(PK detector)	20dBc(Note2)

Note 1: If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

**4.3.2 Test Setup**

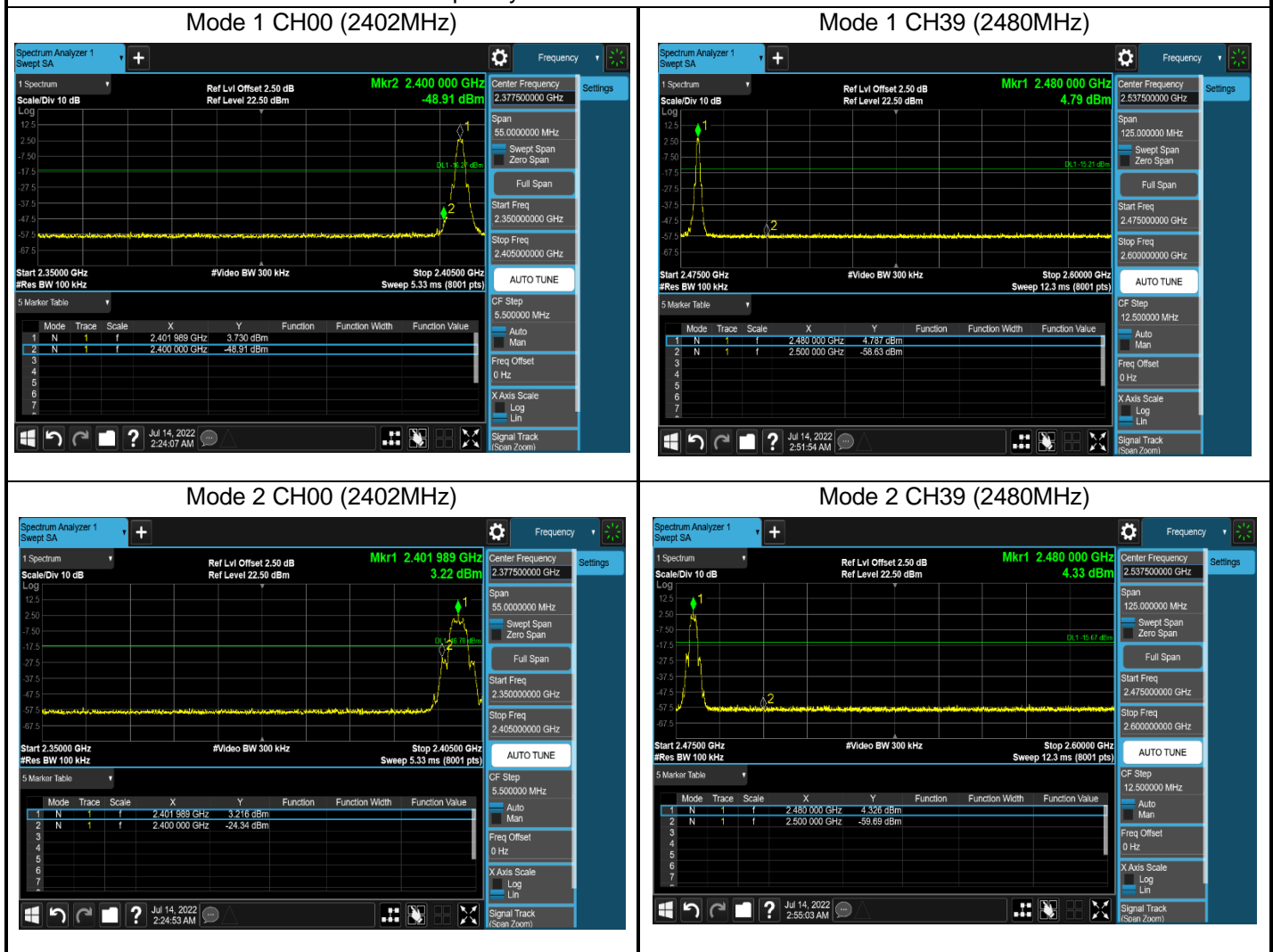


**4.3.3 Test Procedure**

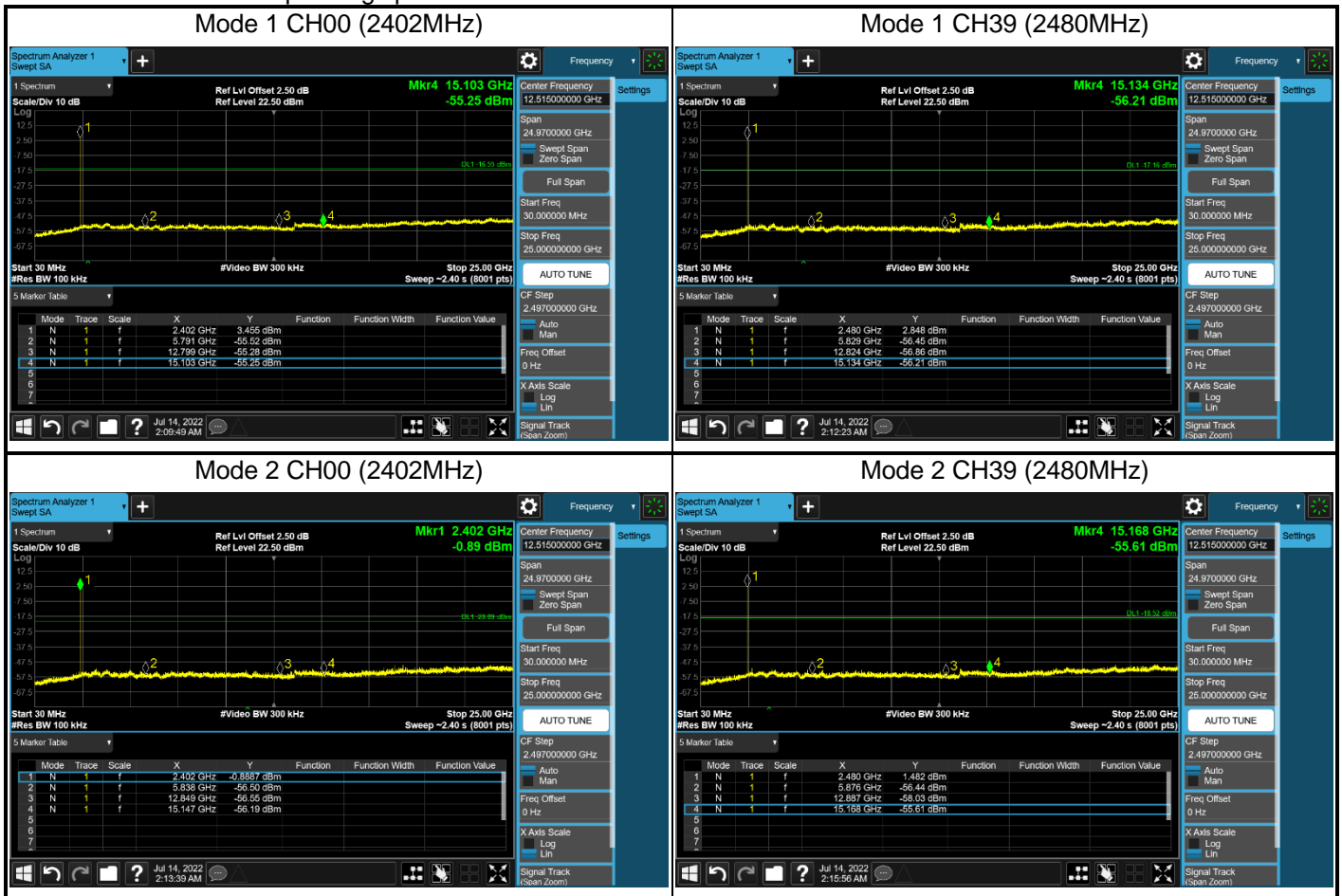
References Rule	Chapter	Description
<input checked="" type="checkbox"/> ANSI C63.10	11.11	Emissions in non-restricted frequency bands
<input checked="" type="checkbox"/>	11.11.1	General
<input checked="" type="checkbox"/>	11.11.2	Reference level measurement
<input checked="" type="checkbox"/>	11.11.3	Emission level measurement

4.3.4 Test Data								
Mode	Channel	Test Frequency (MHz)	Maximum In-Band PSD[a] (dBm/100kHz)	Frequency (MHz)	Out-Band PSD[b] (dBm/100kHz)	[a]-[b] (dB)	Limit (dB)	Result
1	00	2402	3.370	2400	-48.91	52.280	≥20	Pass
	39	2480	4.787	2500	-58.63	63.417	≥20	Pass
2	00	2402	3.216	2400	-24.34	27.556	≥20	Pass
	39	2480	4.326	2500	-59.69	61.05	≥20	Pass

Note: The emissions in non-restricted frequency bands as below:



The data of entire corresponding spectrum:



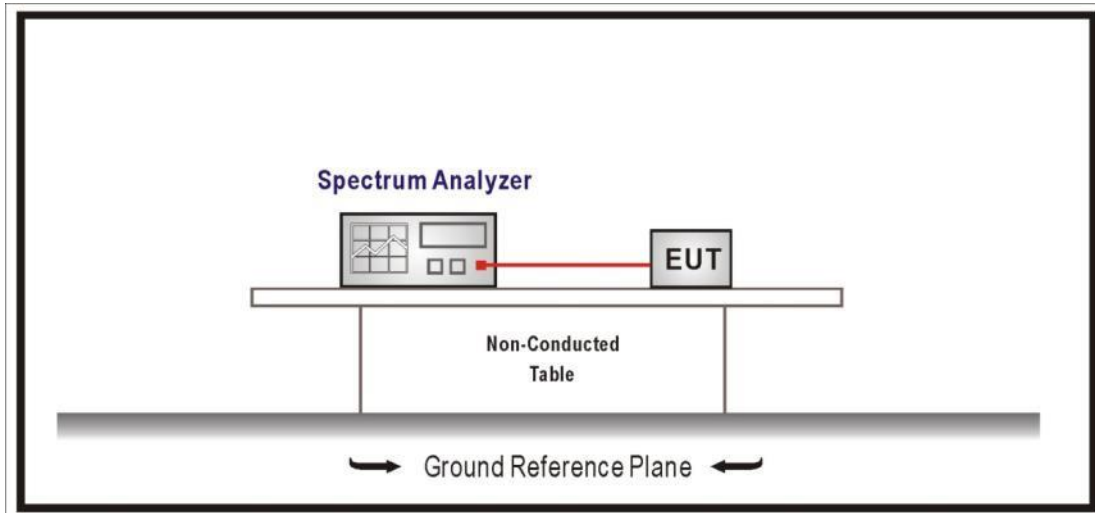
**4.4 Duty cycle**

**VERDICT: PASS**

**4.4.1 Limit**

N/A

**4.4.2 Test Setup**



**4.4.3 Test Procedure**

References Rule	Chapter	Description
<input checked="" type="checkbox"/> ANSI C63.10	11.6	Duty cycle (D), transmission duration (T), and maximum power control level

### 4.4.4 Test Data

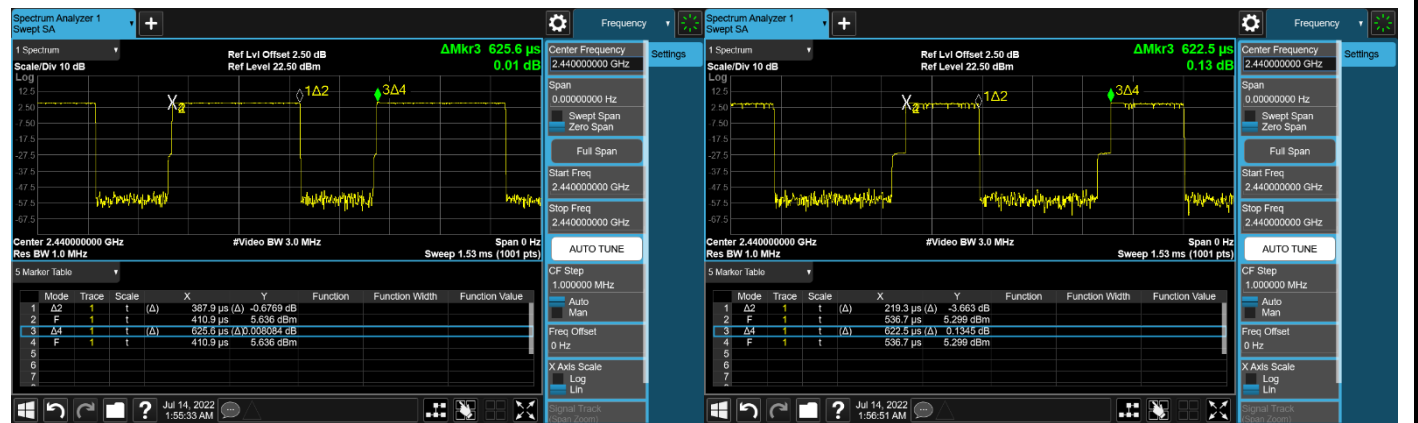
Test Mode	Tx On (us)	Tx Off (us)	VBW (kHz)	Tx On + Tx Off (us)	Duty Cycle (%)
Mode 1	387.9	233.7	2.7	625.6	62
Mode 2	219.3	403.2	4.7	622.5	35.23

Note 1: T means the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Note 2: According to KDB 558074, when test for Radiated Emission Band Edge and Radiated Emission, for average detector set:  $VBW \geq 1/T$  will be used.

Mode 1 CH19 2440MHz

Mode 2 CH19 2440MHz



**4.5 Band Edge**

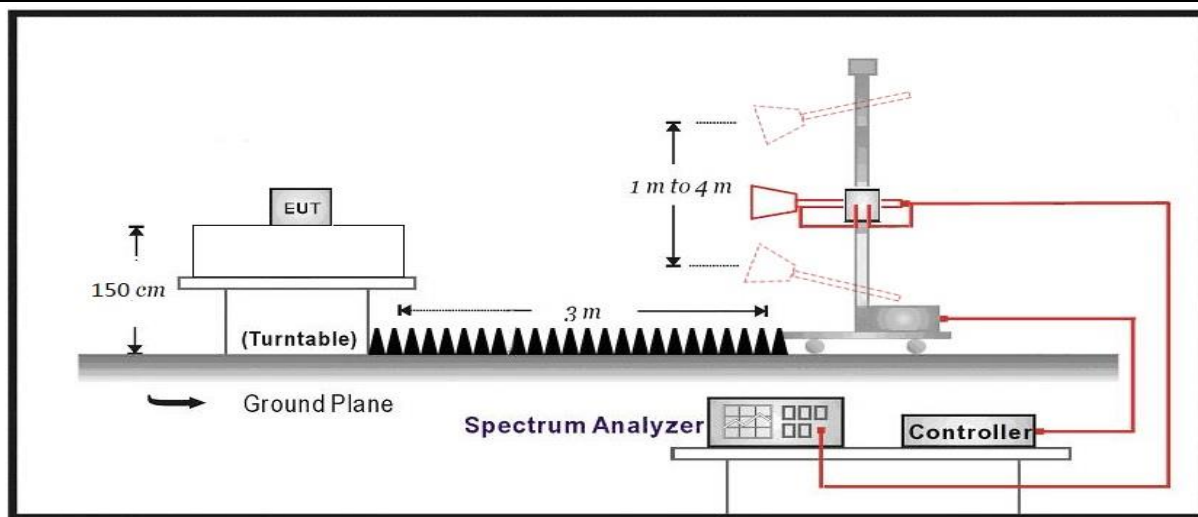
**VERDICT: PASS**

**4.5.1 Limit**

<b>Standard</b>		FCC Part 15 Subpart C Paragraph 15.247(d) ,15.209		
Frequency bands (MHz)	Detector	Limit (dB $\mu$ V/m)	RBW (MHz)	Distance (m)
2310-2390	PK	74	1	3
2483.5-2500	AV	54	1	3

Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.

**4.5.2 Test Setup**

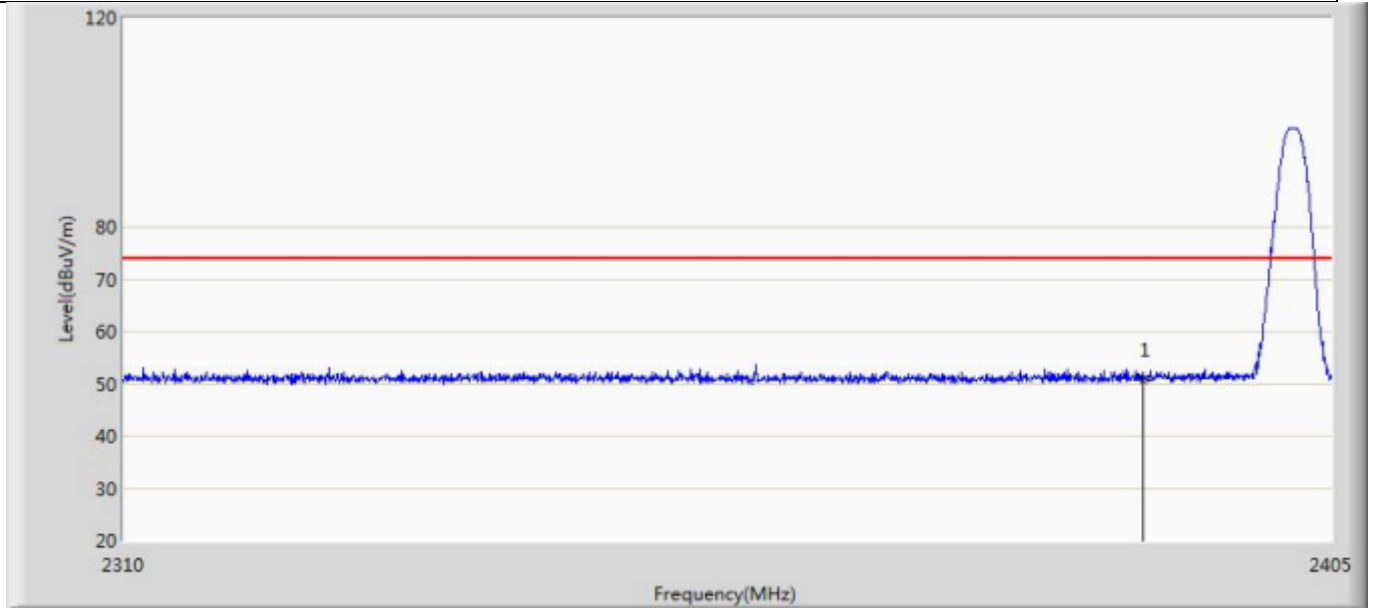


**4.5.3 Test Procedure**

	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	6.10	Band-edge testing
	<input checked="" type="checkbox"/> ANSI C63.10	6.10.5	Restricted-band band-edge measurements
	<input type="checkbox"/> ANSI C63.10	6.10.6	Marker-delta method
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures

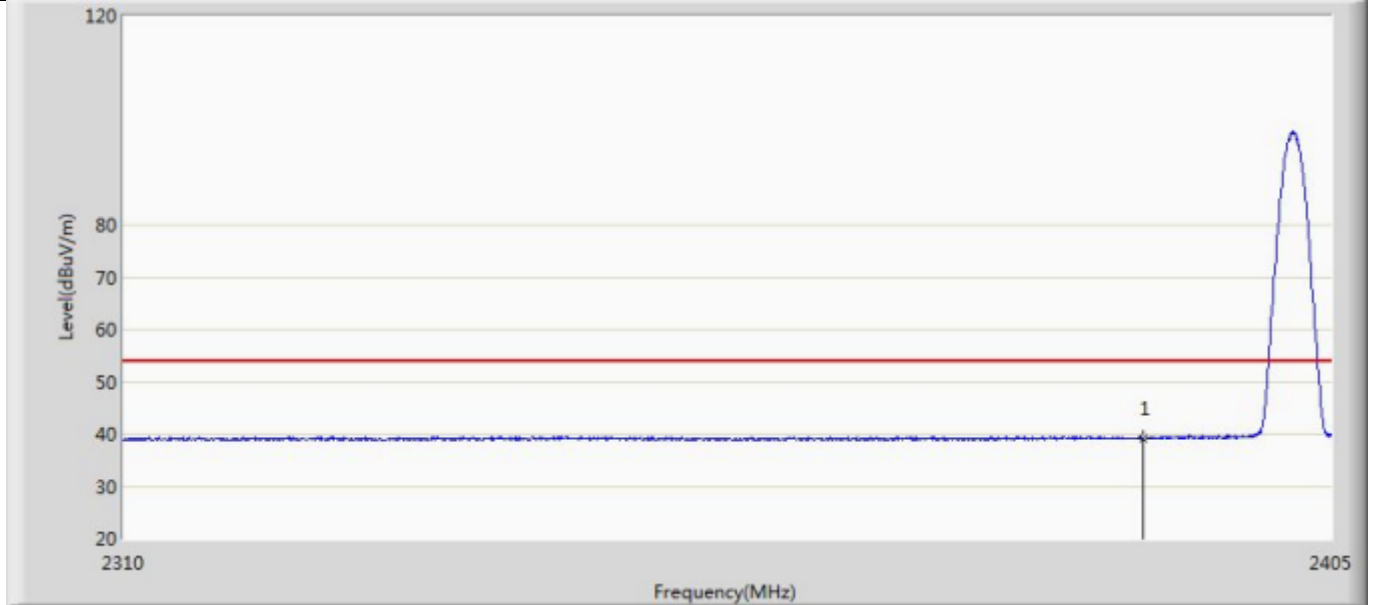
**4.5.4 Test Data**

Profile: 2260325R	Page No.: 2
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 23:02
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2402MHz by LE_1Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	50.715	14.617	-23.285	74.000	36.098	PK

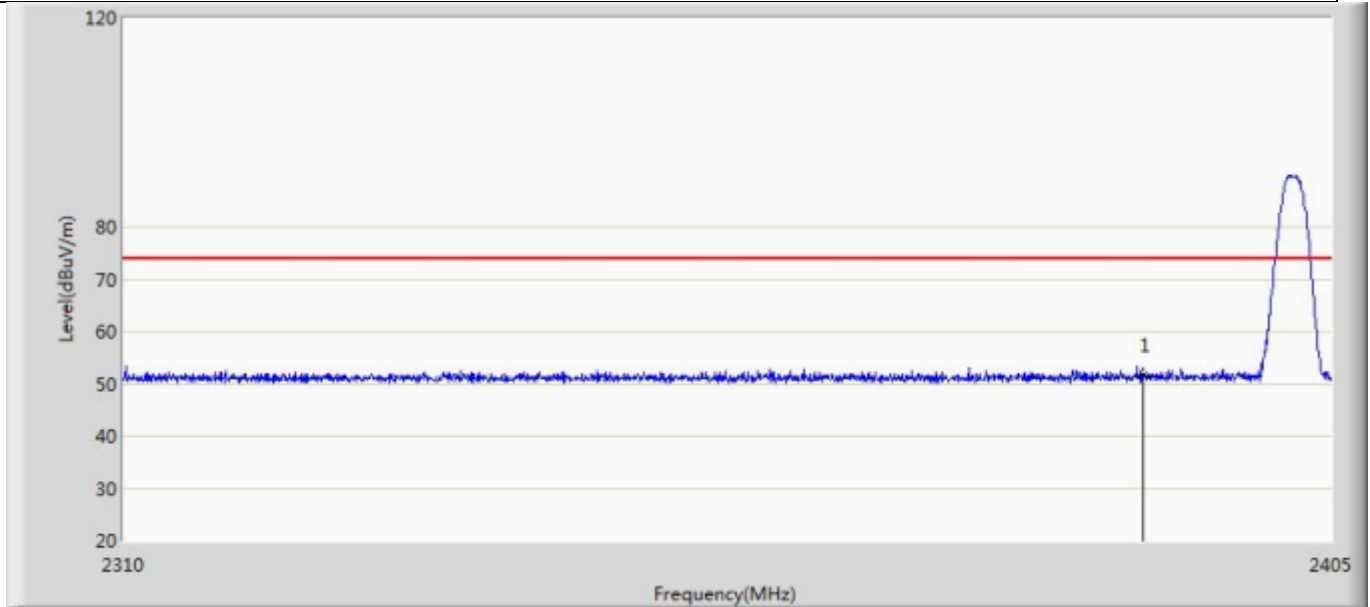
Profile: 2260325R	Page No.: 1
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 22:31
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2402MHz by LE_1Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	39.186	3.088	-14.814	54.000	36.098	AV

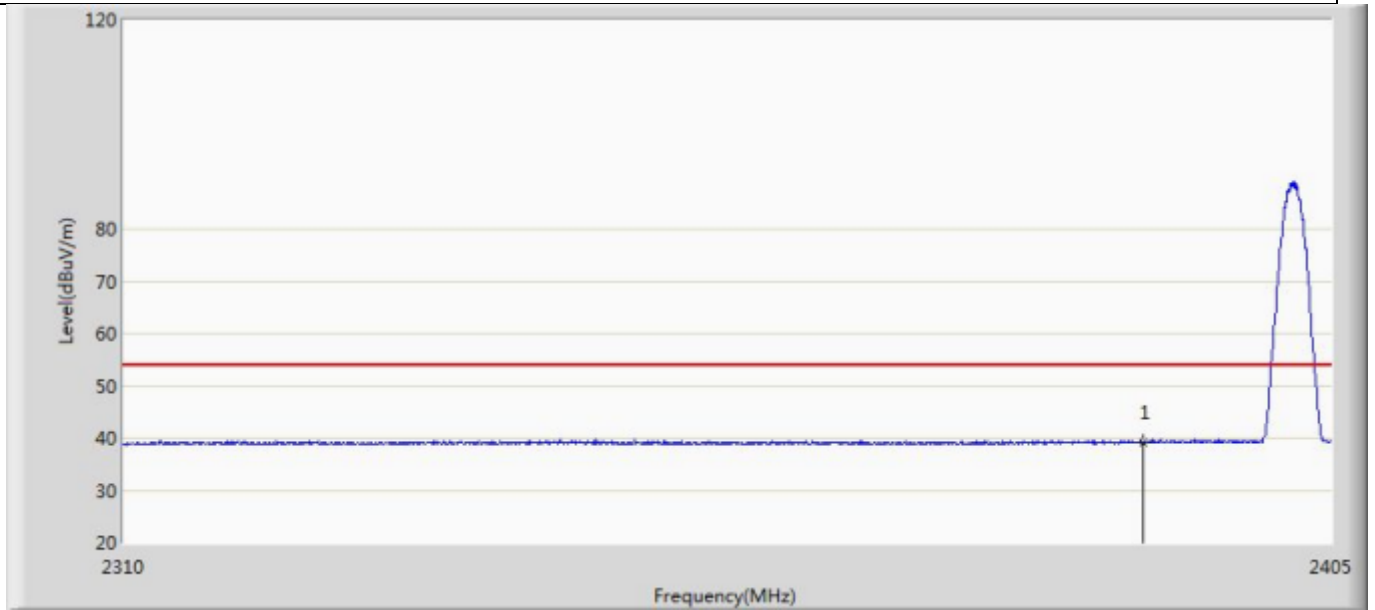


Profile: 2260325R	Page No.: 4
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 23:04
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2402MHz by LE_1Mbps	



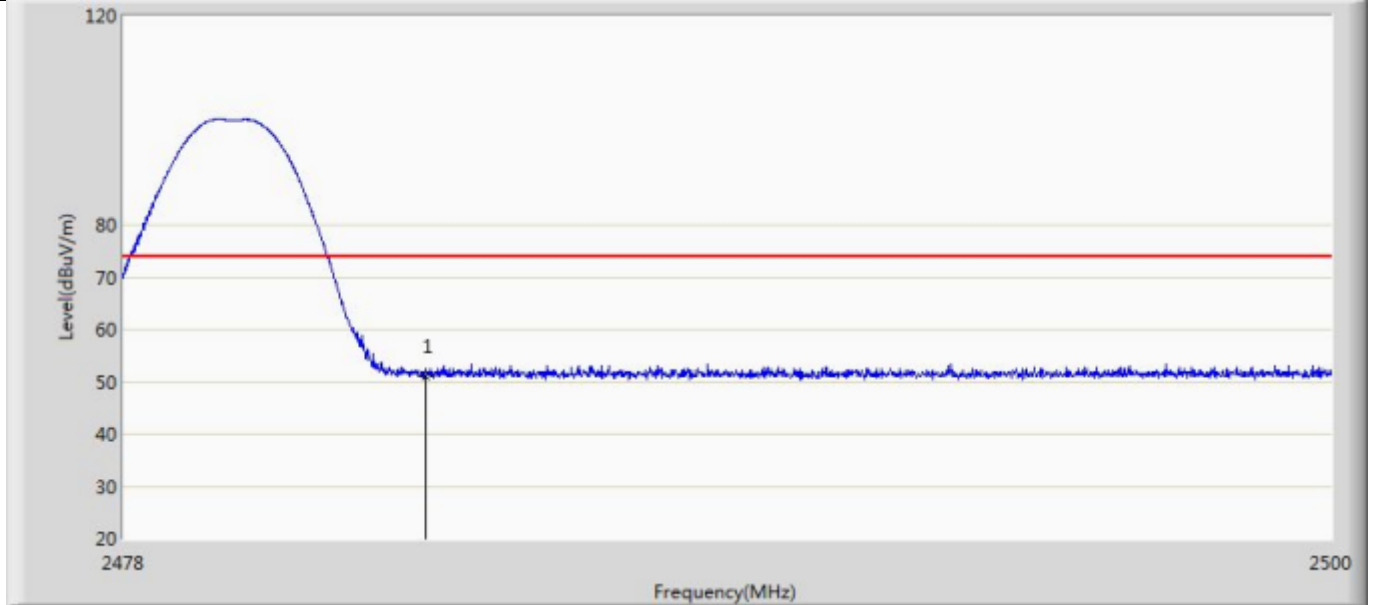
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	51.660	15.562	-22.340	74.000	36.098	PK

Profile: 2260325R	Page No.: 3
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 23:03
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2402MHz by LE_1Mbps	



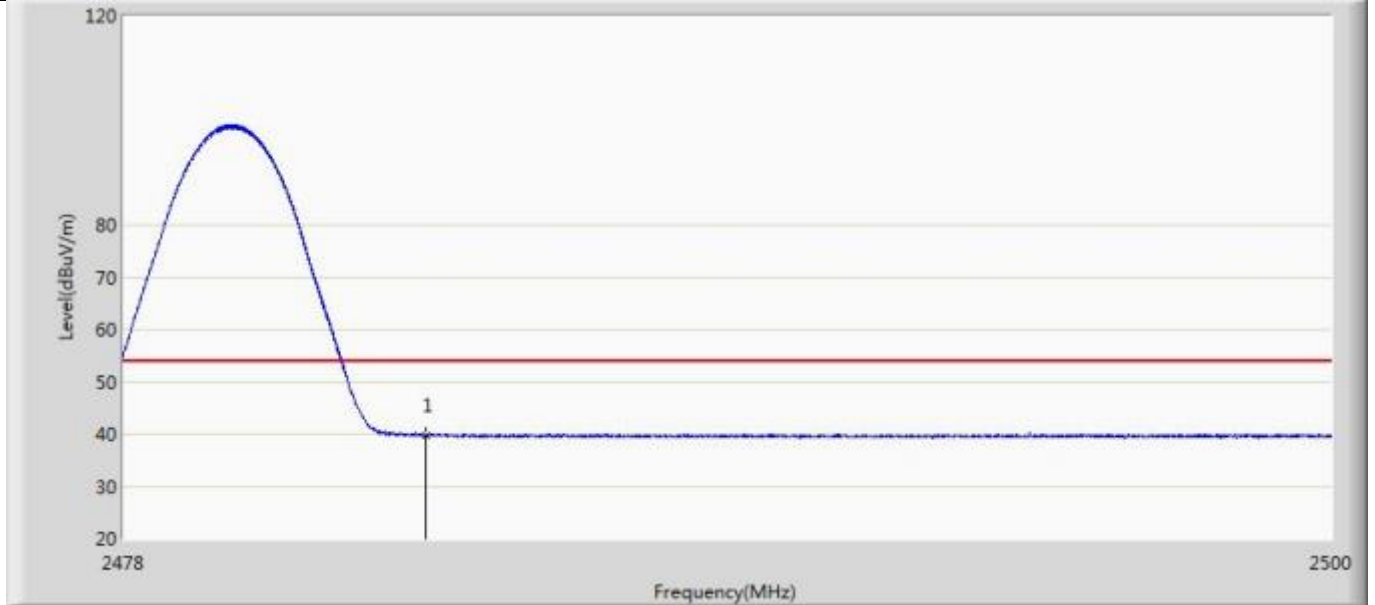
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	39.083	2.985	-14.917	54.000	36.098	AV

Profile: 2260325R	Page No.: 6
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 20:37
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2480MHz by LE_1Mbps	



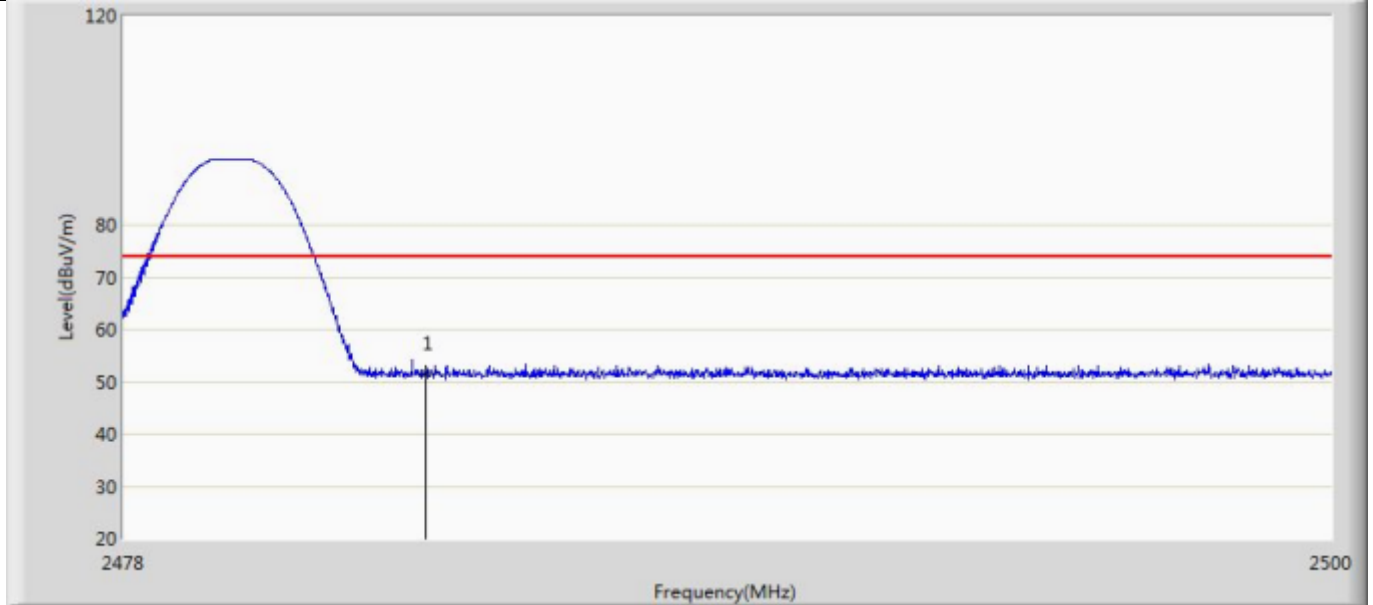
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	50.955	14.734	-23.045	74.000	36.220	PK

Profile: 2260325R	Page No.: 5
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/3 - 20:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2480MHz by LE_1Mbps	



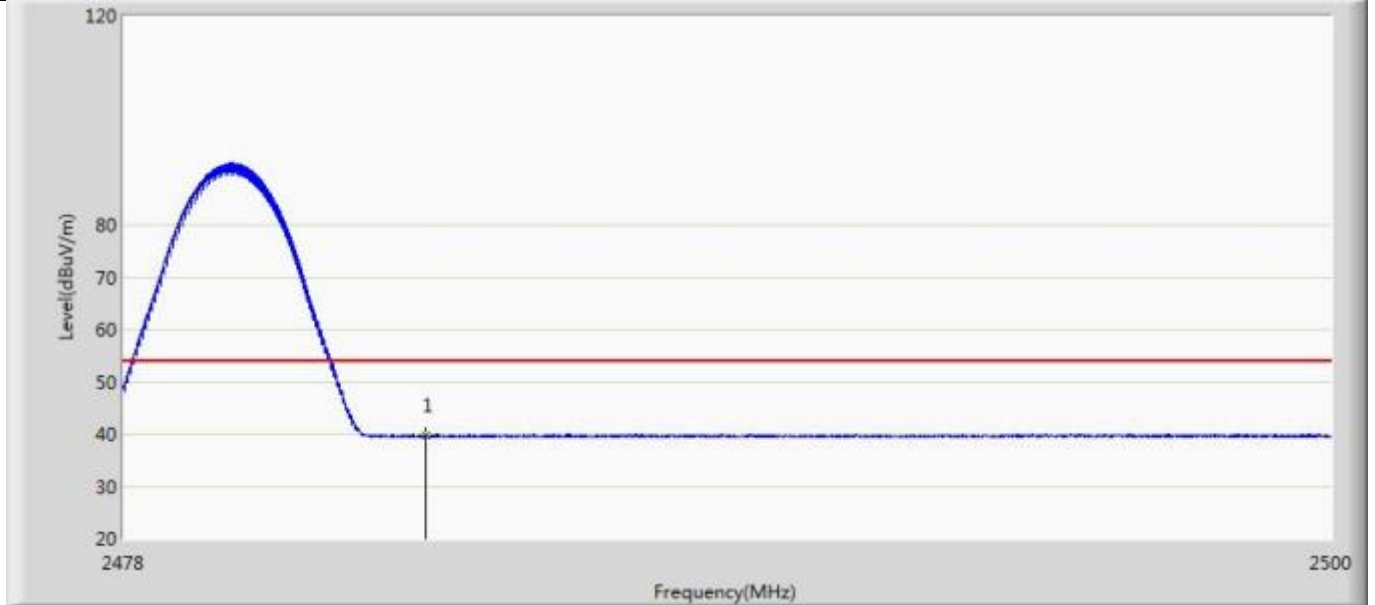
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	39.789	3.568	-14.211	54.000	36.220	AV

Profile: 2260325R	Page No.: 8
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 20:39
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2480MHz by LE_1Mbps	



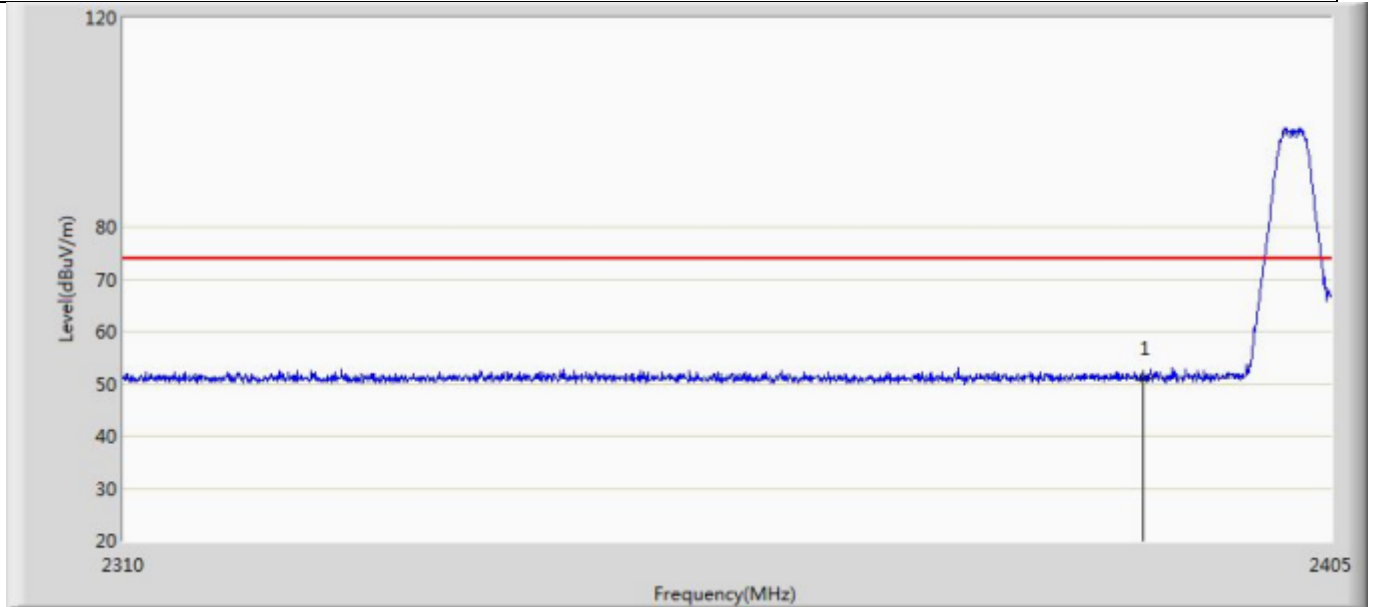
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	51.563	15.342	-22.437	74.000	36.220	PK

Profile: 2260325R	Page No.: 7
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 20:38
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 1:Transmit at 2480MHz by LE_1Mbps	



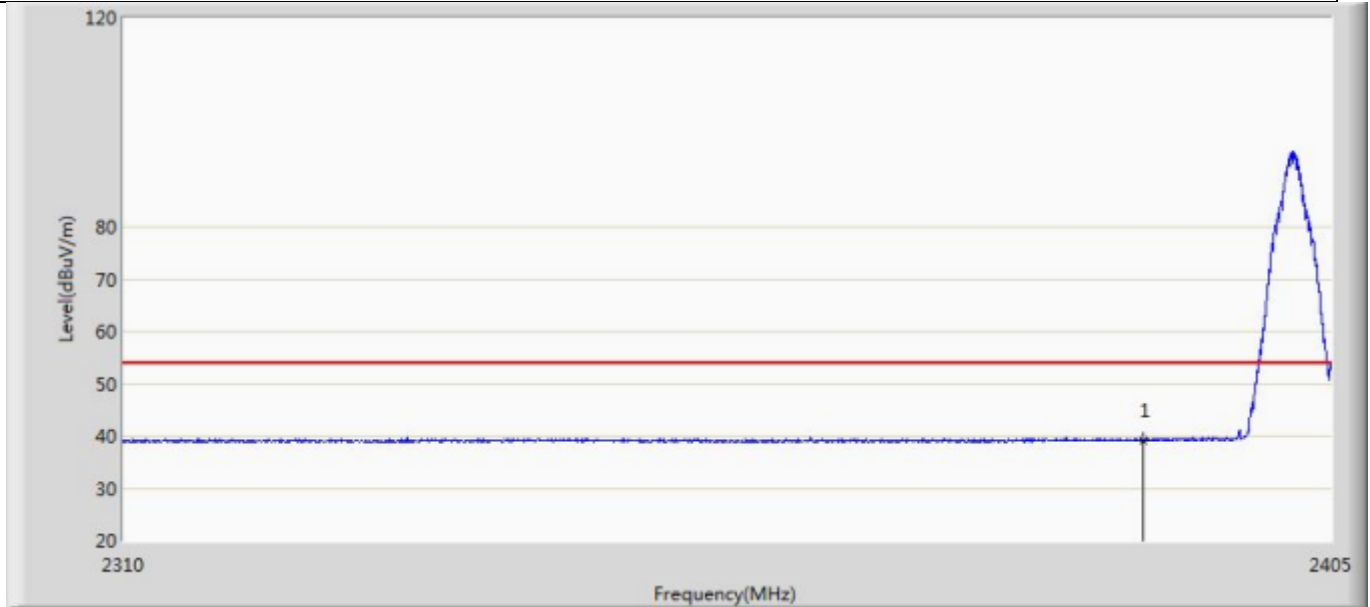
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	39.581	3.360	-14.419	54.000	36.220	AV

Profile: 2260325R	Page No.: 10
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 21:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2402MHz by LE_2Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	51.032	14.934	-22.968	74.000	36.098	PK

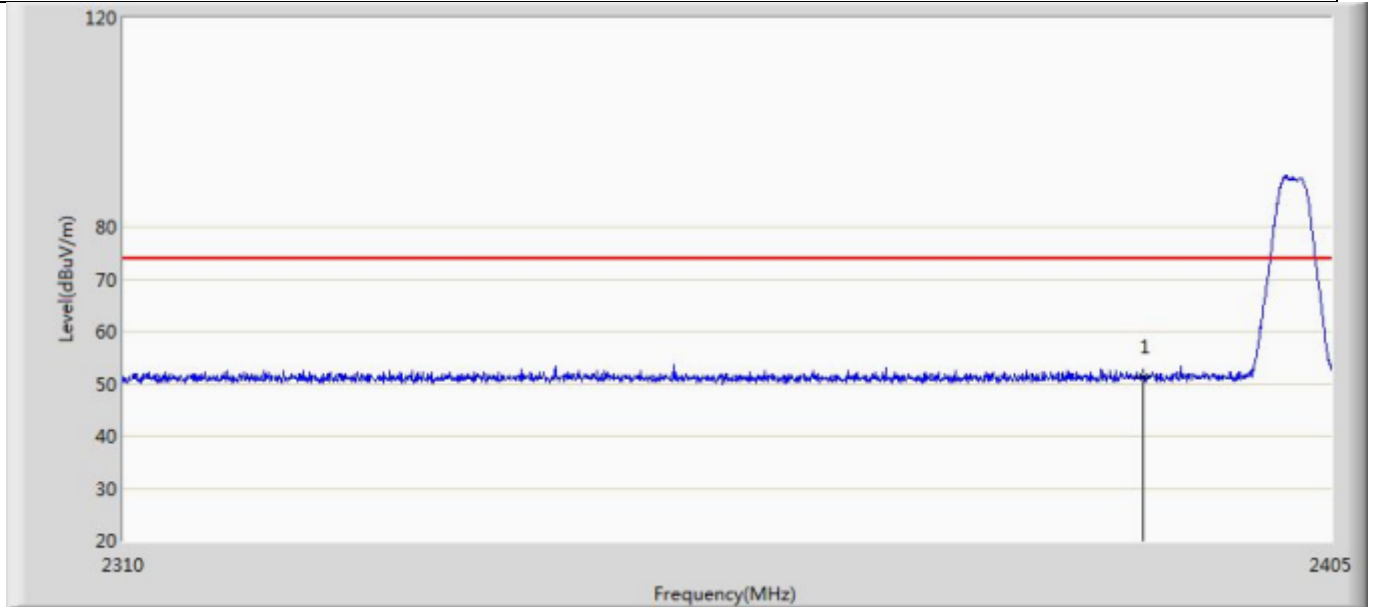
Profile: 2260325R	Page No.: 9
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 21:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2402MHz by LE_2Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	39.223	3.125	-14.777	54.000	36.098	AV

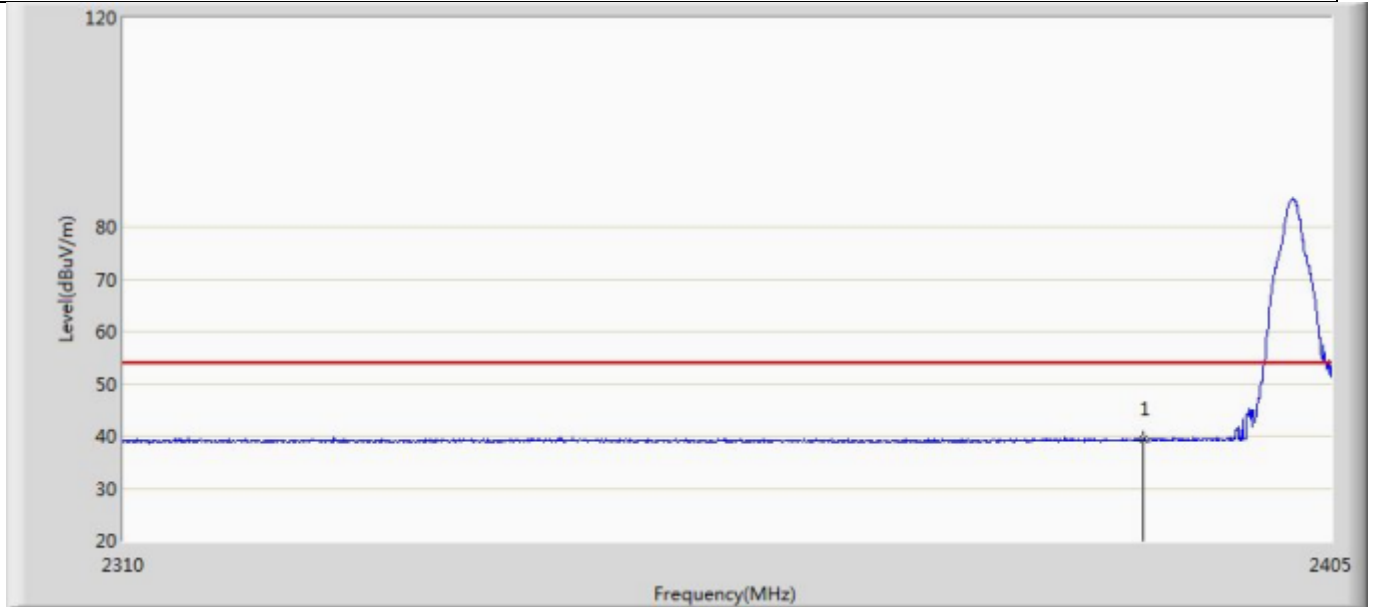


Profile: 2260325R	Page No.: 12
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 21:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2402MHz by LE_2Mbps	



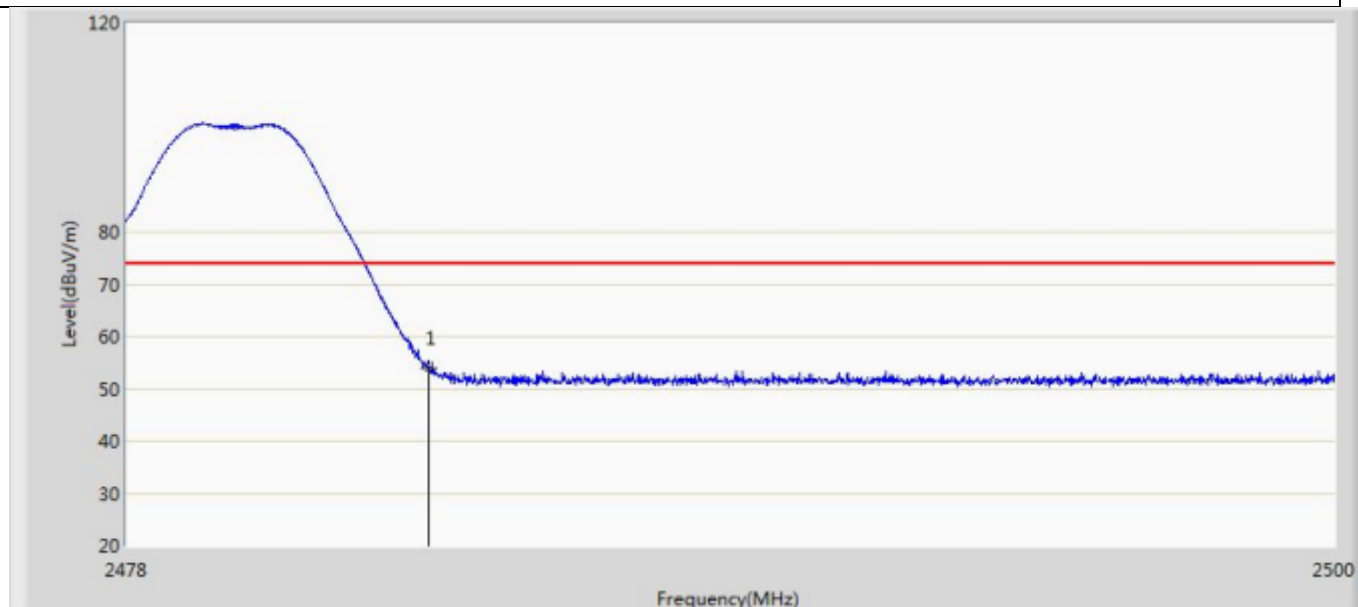
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	51.176	15.078	-22.824	74.000	36.098	PK

Profile: 2260325R	Page No.: 11
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 21:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2402MHz by LE_2Mbps	



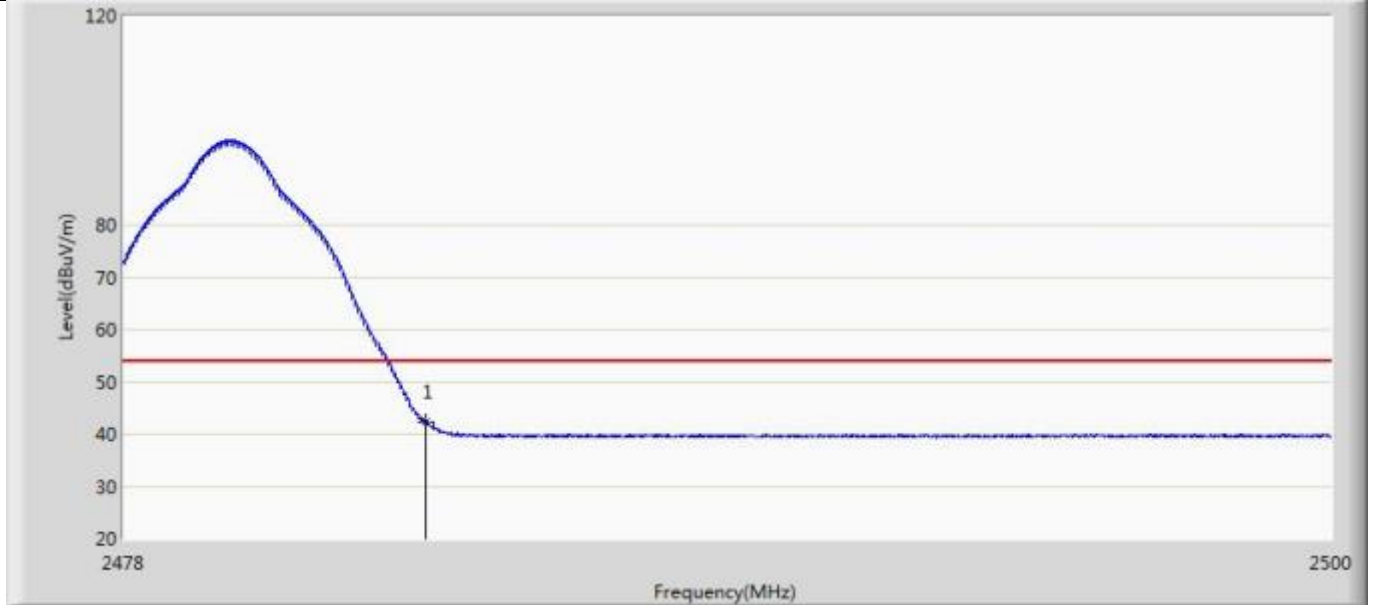
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	39.420	3.322	-14.580	54.000	36.098	AV

Profile: 2260325R	Page No.: 14
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 21:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2480MHz by LE_2Mbps	



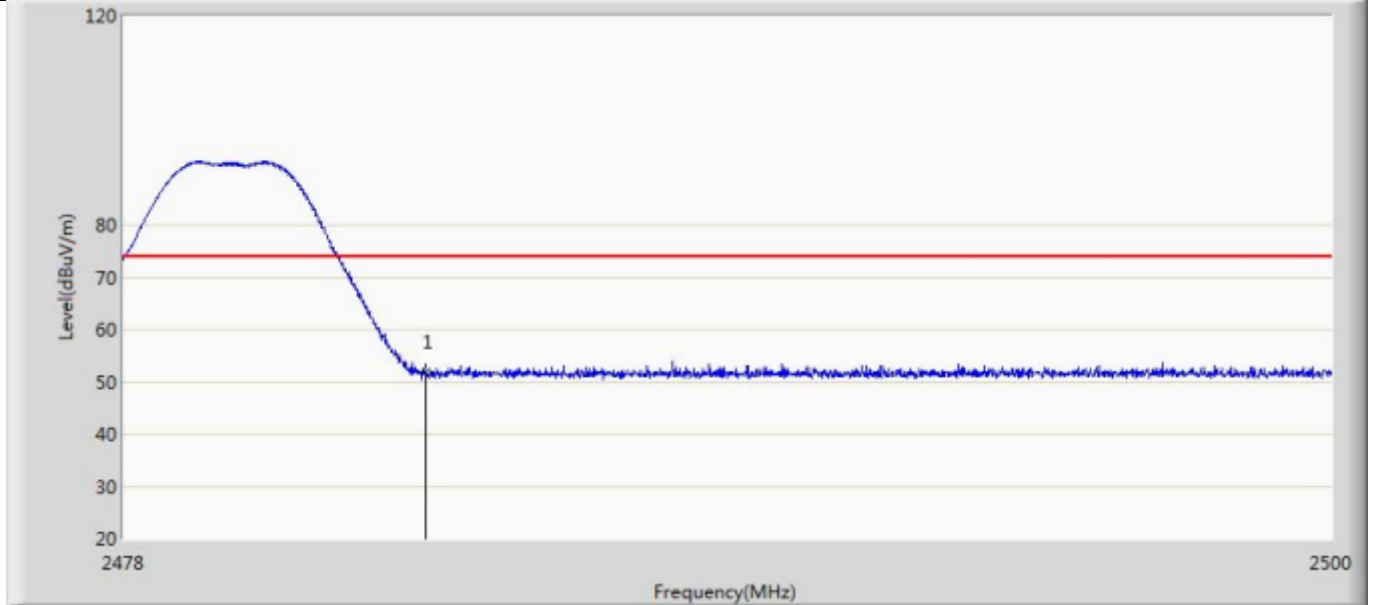
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	53.944	17.723	-20.056	74.000	36.220	PK

Profile: 2260325R	Page No.: 13
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 21:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2480MHz by LE_2Mbps	



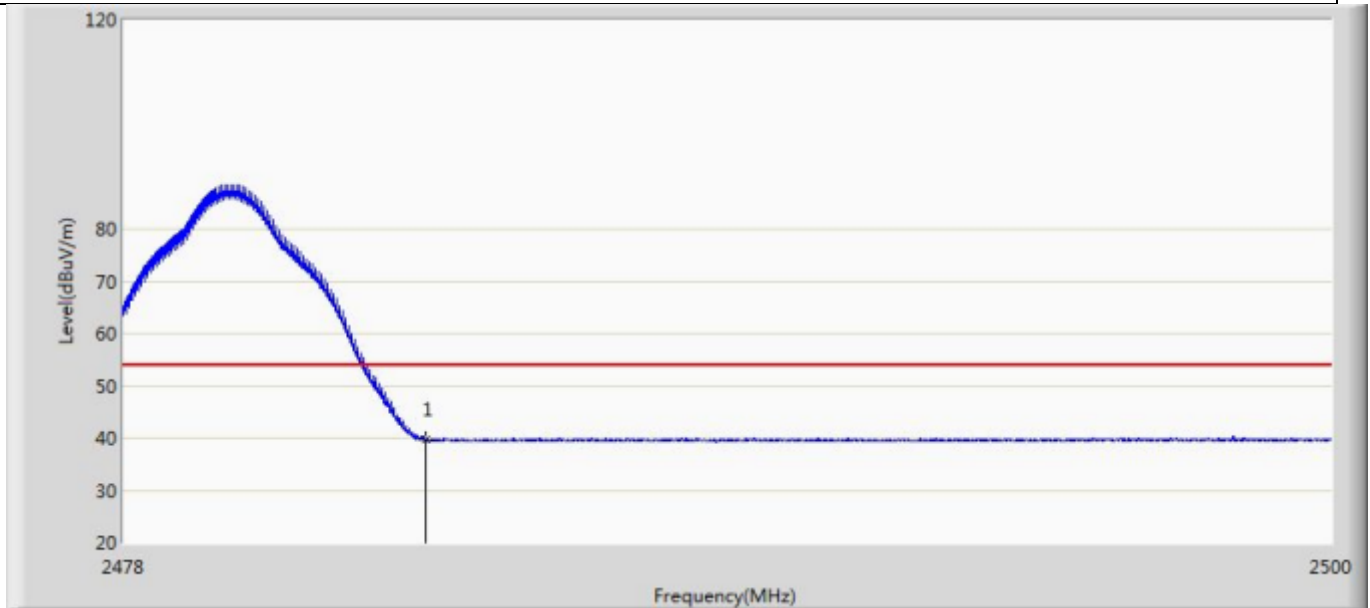
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	42.449	6.228	-11.551	54.000	36.220	AV

Profile: 2260325R	Page No.: 16
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 21:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2480MHz by LE_2Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	51.975	15.754	-22.025	74.000	36.220	PK

Profile: 2260325R	Page No.: 15
Engineer: Carlosshen	
Site: AC5	Time: 2022/06/30 - 21:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: LBEE5HY2DU	Power: DC 3.6V
Note: Mode 2:Transmit at 2480MHz by LE_2Mbps	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	39.615	3.394	-14.385	54.000	36.220	AV

Note:

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp)

**4.6 DTS Bandwidth**

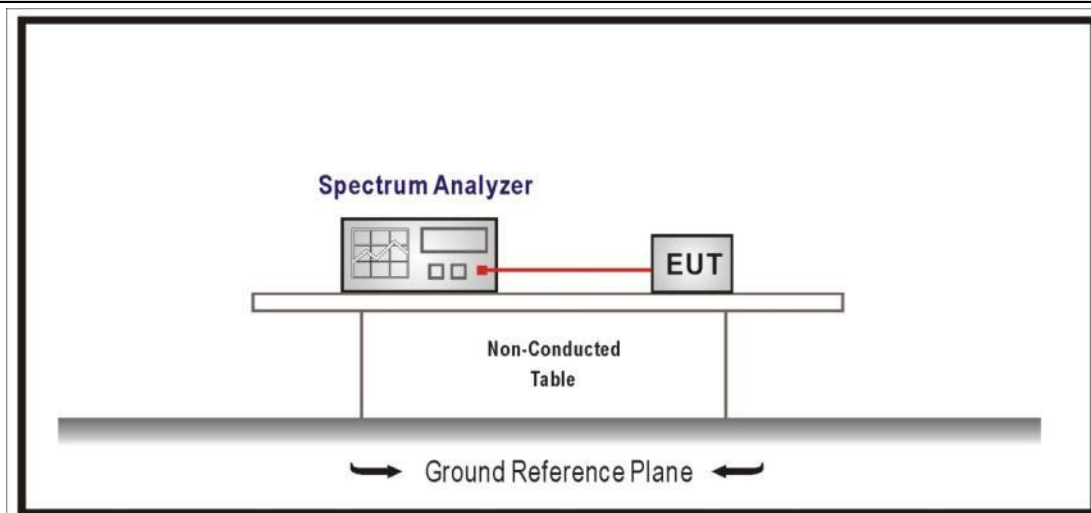
**VERDICT: PASS**

**4.6.1 Limit**

**Standard** FCC Part 15 Subpart C Paragraph 15.247 (a)(2)

Systems using digital modulation techniques operate in the 2400-2483.5 MHz. The minimum 6 dB bandwidth shall be at least 500 kHz

**4.6.2 Test Setup**



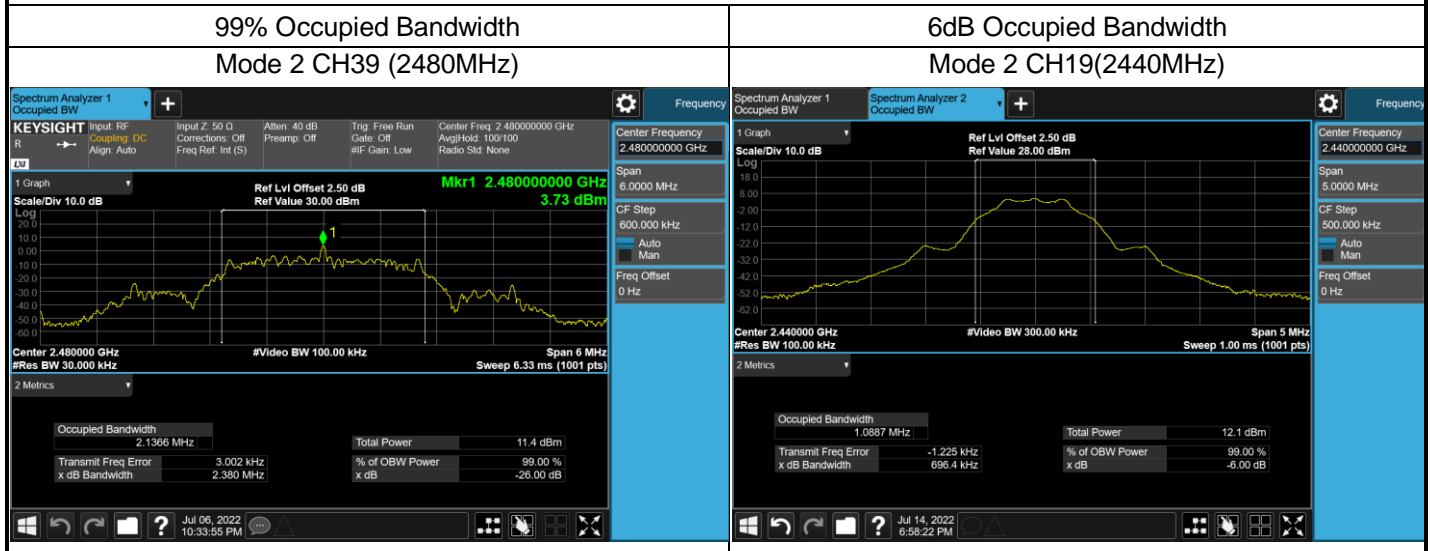
**4.6.3 Test Procedure**

	Reference Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.8	DTS bandwidth
<input type="checkbox"/>	ANSI C63.10	11.8.1	Option 1
<input checked="" type="checkbox"/>	ANSI C63.10	11.8.2	Option 2

### 4.6.4 Test Data

Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (MHz)	6dB Occupied Bandwidth (KHz)	Limit (kHz)	Result
1	00	2402	1.0660	706.8	>500	Pass
	19	2440	1.0607	696.4	>500	Pass
	39	2480	1.0624	704.2	>500	Pass
2	00	2402	2.1312	1489	>500	Pass
	19	2440	2.1358	1492	>500	Pass
	39	2480	2.1366	1478	>500	Pass

Note : The worst case of Occupied Bandwidth as below:





**4.7 Fundamental emission output power**

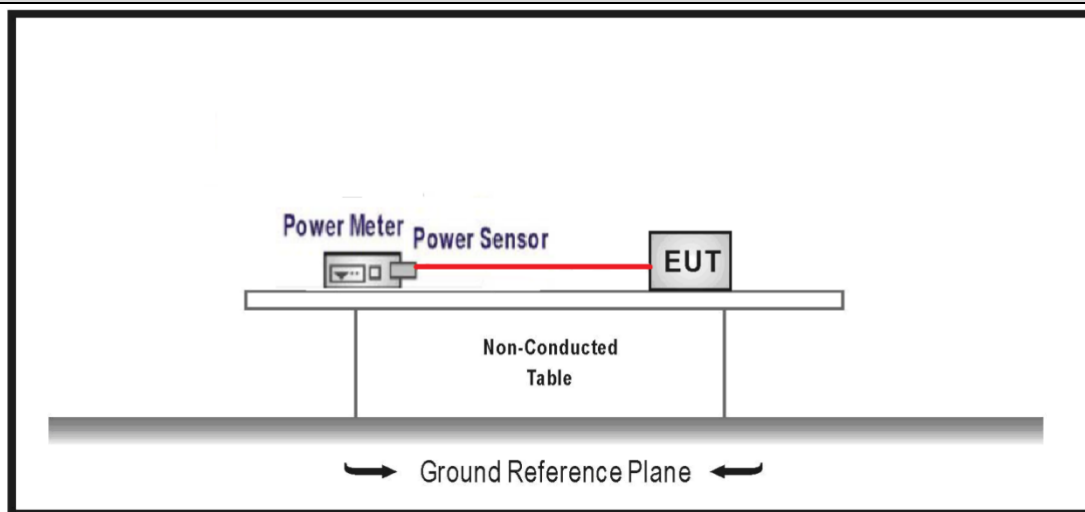
**VERDICT: PASS**

**4.7.1 Limit**

Standard		FCC Part 15 Subpart C Paragraph 15.247 (b)(3)
<input checked="" type="checkbox"/>	GTX < 6dBi	$P_{out} \leq 30\text{dBm}$
<input type="checkbox"/>	GTX > 6dBi	
<input type="checkbox"/>	Non-Fix point-point	$P_{out} \leq 30 - (GTX - 6)$
<input type="checkbox"/>	Fix point-point	$P_{out} \leq 30 - [(GTX - 6)]/3$
<input type="checkbox"/>	Point-to-multipoint	$P_{out} \leq 30 - (GTX - 6)$
<input type="checkbox"/>	Overlap Beams	$P_{out} \leq 30 - [(GTX - 6)]/3$
<input type="checkbox"/>	Aggregate power transmitted simultaneously on all beams	$P_{out} \leq 30 - [(GTX - 6)]/3$
<input type="checkbox"/>	single directional beam	$P_{out} \leq 30 - [(GTX - 6)]/3 + 8\text{dB}$

Note 1 : GTX directional gain of transmitting antennas.  
 Note 2 : Pout is maximum peak conducted output power .

**4.7.2 Test Setup**



4.7.3 Test Procedure				
	References Rule		Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10		11.9	Fundamental emission output power
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ANSI C63.10	11.9.1	Maximum peak conducted output power
	<input checked="" type="checkbox"/>	ANSI C63.10	11.9.1.1	RBW $\geq$ DTS bandwidth
	<input type="checkbox"/>	ANSI C63.10	11.9.1.2	Integrated band power method
	<input type="checkbox"/>	ANSI C63.10	11.9.1.3	PKPM1 Peak power meter method
<input type="checkbox"/>	ANSI C63.10		11.9.2	Maximum conducted (average) output power
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2	Measurement using a spectrum analyzer (SA)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.2	Method AVGSA-1(Duty cycle $\geq$ 98%)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.3	Method AVGSA-1A(Duty cycle $\geq$ 98%)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-2(Duty cycle $\leq$ 98%)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-2A(Duty cycle $\leq$ 98%)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-3
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-3A
<input type="checkbox"/>	ANSI C63.10		11.9.2.3	Measurement using a power meter (PM)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.3.1	Method AVGPM
	<input type="checkbox"/>	ANSI C63.10	11.9.2.3.2	Method AVGPM-G

**4.7.4 Test Data**

Mode	Channel	Test Frequency (MHz)	Conducted Power (dBm)	EIRP (dBm)	Conducted Power Limit (dBm)	EIRP Limit (dBm)	Result
Mode 1	00	2402	5.96	6.06	≤30	≤36	Pass
	19	2440	7.61	7.71	≤30	≤36	Pass
	39	2480	7.06	7.16	≤30	≤36	Pass
Mode 2	00	2402	7.36	7.46	≤30	≤36	Pass
	19	2440	9.11	9.21	≤30	≤36	Pass
	39	2480	8.59	8.69	≤30	≤36	Pass

**4.8 Power Density**

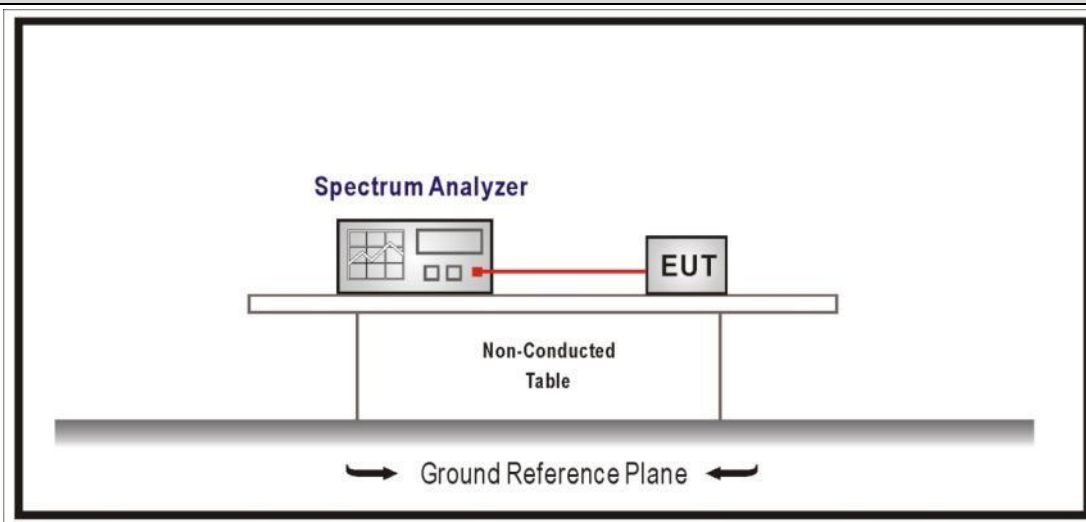
**VERDICT: PASS**

**4.8.1 Limit:**

**Standard** FCC Part 15 Subpart C Paragraph 15.247 (b)(3)

Power Spectral Density  $\leq 8\text{dBm}/3\text{kHz}$

**4.8.2 Test Setup**



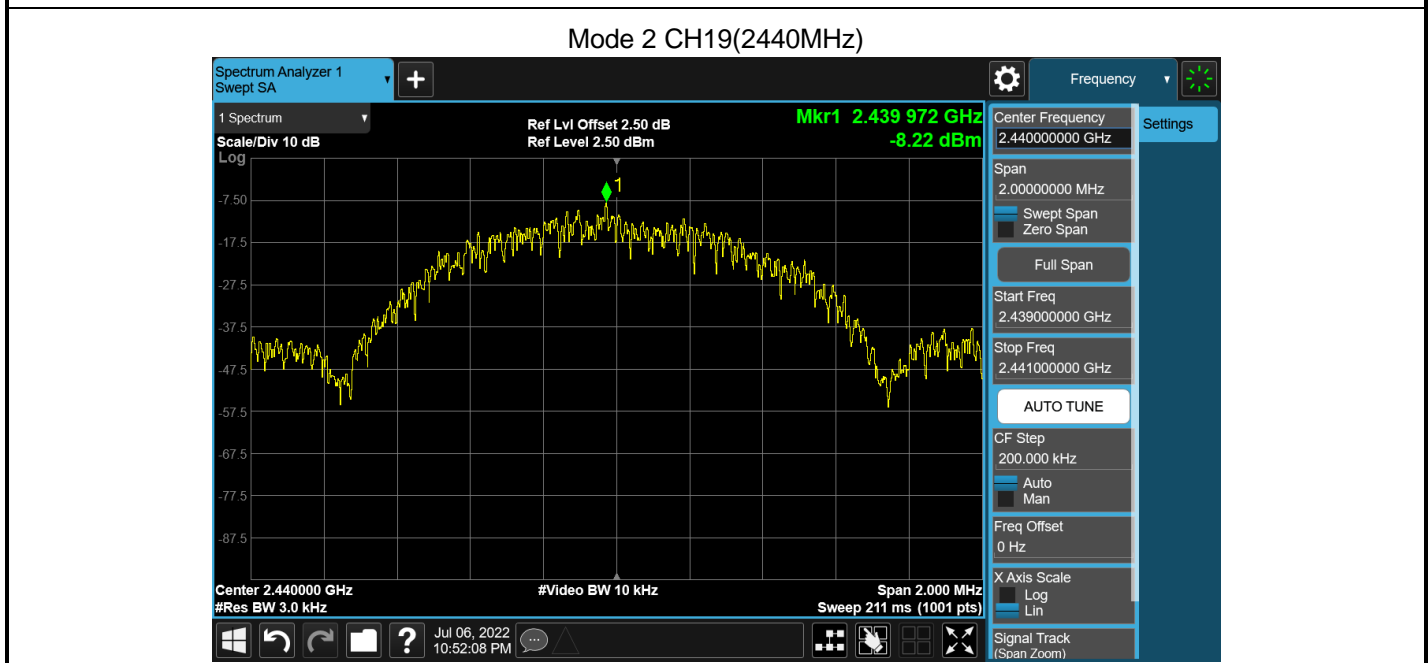
**4.8.3 Test Procedure**

	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.10	Maximum power spectral density level in the fundamental emission
<input checked="" type="checkbox"/>	ANSI C63.10	11.10.2	Method PKPSD (peak PSD)
<input type="checkbox"/>	ANSI C63.10	11.10.3	Method AVGPSD-1(Duty cycle $\geq 98\%$ )
<input type="checkbox"/>	ANSI C63.10	11.10.4	Method AVGPSD-1A(Duty cycle $\geq 98\%$ )
<input type="checkbox"/>	ANSI C63.10	11.10.5	Method AVGPSD-2(Duty cycle $< 98\%$ )
<input type="checkbox"/>	ANSI C63.10	11.10.6	Method AVGPSD-2A(Duty cycle $< 98\%$ )
<input type="checkbox"/>	ANSI C63.10	11.10.7	Method AVGPSD-3
<input type="checkbox"/>	ANSI C63.10	11.10.8	Method AVGPSD-3A

**4.8.4 Test Data**

Mode	Channel	Test Frequency (MHz)	Measurement PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
Mode 1	00	2402	-10.05	≤8	Pass
	19	2440	-8.22	≤8	Pass
	39	2480	-8.91	≤8	Pass
Mode 2	00	2402	-11.24	≤8	Pass
	19	2440	-9.96	≤8	Pass
	39	2480	-10.01	≤8	Pass

Note : The worst case of PSD as below:



**4.9 Antenna Requirement**

**VERDICT: PASS**

**4.9.1 Limit:**

<b>Standard</b>	FCC Part 15 Subpart C Paragraph 15.203
-----------------	--

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

**4.9.2 Antenna Connector Construction:**

- |                                     |  |
|-------------------------------------|--|
| <input type="checkbox"/>            | The use of a permanently attached antenna                        |
| <input type="checkbox"/>            | The antenna use of a unique coupling to the intentional radiator |
| <input checked="" type="checkbox"/> | The use of a nonstandard antenna jack or electrical connector    |

Please refer to the attached document "Internal Photograph" to show the antenna connector.

---

## 5 TEST SETUP PHOTO AND EUT PHOTO

Remark: The test setup photo and EUT Photo please see appendix.

\_\_\_\_\_ The End \_\_\_\_\_