



Test report No:
22A0738R-RF-US-P06V01

FCC & ISSED TEST REPORT

Product Name	Infotainment Headunit
Model and /or type reference	X297
Trademark	HARMAN
FCC ID	2ACRL-X297
IC	12339A-X297
Applicant's name / address	Harman Automotive Electronic Systems (Suzhou) Co., Ltd. No.125, Fangzhou Road, Suzhou Industrial Park, Jiangsu Province, China 215024
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10: 2013 RSS-Gen Issue 5 /RSS-247 Issue 2
Verdict Summary	IN COMPLIANCE
Tested By (name / position & signature)	Jun Xu/ Project Engineer 
Approved by (name / position & signature)	Jack Zhang/ Manager 
Date of issue	2022-12-20
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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.

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GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Oct. 19, 2022
Date (start test)	Oct. 21, 2022
Date (finish test)	Nov. 29, 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.
5. The 2.4G WLAN part of AirEngine6761-21T is exactly the same as AirEngine5761-11, so we only verified the power and AC Power Line Conducted Emission, and other data are quoted from AirEngine5761-11.

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
22A0738R-RF-US-P06V01	V1.0	Initial issue of report.	2022-12-20

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 Informaion;
 - Chapter 1.3 Test Data Rate;
 - Chapter 1.4 Channel List;

USED EQUIPMENT

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
Spectrum Analyzer	Agilent	N9010A	MY48030494	2021.12.15	2022.12.14
MXA Signal Analyzer	Keysight	N9020A	MY56060147	2022.07.14	2023.07.13
4TX MIMO Power Sensor	Keysight	X8750A	MY59400102	2022.03.16	2023.03.15
Coaxial Cable	Woken	N/A	N/A	2022.01.18	2023.01.17
Temperature/Humidity Meter	RTS	RTS-8S	RF08	2022.08.23	2023.08.22

Radiated Emission(30MHz-1GHz) / AC3

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100176	2022.07.10	2023.07.09
Loop Antenna	R&S	HFH2-Z2	833799/003	2022.04.15	2023.04.14
Bilog Antenna	Teseq GmbH	CBL6112D	27613	2022.08.28	2023.08.27
Coaxial Cable	Huber+Suhner	RG 214	AC3-C	2022.03.30	2023.03.29
Temperature/Humidity Meter	RTS	RTS-8S	AC3-TH	2022.07.07	2023.07.06
Dekra test software	Dekra	-	-	-	-

Radiated Emission(1GHz-40GHz) / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
MXA Signal Analyzer	Keysight	N9020B	MY60112218	2022.01.09	2023.01.08
Amplifier	SKET	LNPA_0118G-45	SK2021041201	2022.04.15	2023.04.14
Preamplifier	EMCI	EMC184045SE	980263	2022.07.19	2023.07.18
DRG Horn Antenna	ETS-Lindgren	3117	00167055	2022.08.29	2023.08.28
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2022.05.19	2023.05.18
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2022.05.22	2023.05.21
Coaxial Cable	ROSENBERGER	LA1-C011-2000/3000	AC5-40G	2022.03.21	2023.03.20
High-Pass Filter	Wainwright	WHKX3.0/18G-12SS	AC5&AC6	2022.06.07	2023.06.06
Temperature/Humidity Meter	RTS	RTS-8S	AC5-TH	2022.07.07	2023.07.06
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%.

Test item	Uncertainty
AC Power Line Conducted Emission	± 2.92 dB
Peak Power Output	± 1.13 dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 4.60 dB 200MHz~1GHz: 4.10 dB Vertical: 30MHz~200MHz: 4.80 dB 200MHz~1GHz: 4.10 dB
Radiated Emission(1GHz~40GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB Horizontal: 18GHz~40GHz: 4.70 dB Vertical: 18GHz~40GHz: 4.60 dB
RF antenna conducted test	± 1.13 dB
Radiated Emission Band Edge	± 5.00 dB
DTS Bandwidth	± 279 Hz
Occupied Bandwidth	± 279 Hz
Power Density	± 1.13 dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name	Infotainment Headunit
Model No.....	X297
Trademark.....	HARMAN
Hardware Version	DVx
Software Version.....	FISKER_MY23_ FISKER_V_DB22304E
Firmware Version.....	N/A
FCC ID	2ACRL-X297
IC	12339A-X297
Manufacturer	Harman Automotive Electronic Systems (Suzhou) Co., Ltd.
Manufacturer address	No.125, Fangzhou Road, Suzhou Industrial Park, Jiangsu Province, China 215024
Factory	Harman Automotive Electronic Systems (Suzhou) Co., Ltd.
Address.....	No.125, Fangzhou Road, Suzhou Industrial Park, Jiangsu Province, China 215024

Wireless specification	WIFI
Operating frequency range(s).....	2400~2483.5MHz
Type of modulation	802.11b: DSSS-DBPSK, DQPSK, CCK 802.11g/n: OFDM-BPSK, QPSK, 16QAM, 64QAM
Number of channel.....	802.11b/g/n(20MHz) : 11
Data Rate.....	802.11n: up to 72.2Mbps
Device category	<input type="checkbox"/> Fixed point-to-point <input type="checkbox"/> Emit multiple directional beams, simultaneously or sequentially <input checked="" type="checkbox"/> Other cases

Rated power supply	Voltage and Frequency	
	<input type="checkbox"/>	AC: 220 – 240 V, 50/60 Hz
	<input type="checkbox"/>	Adapter: Input:100-240V,50/60Hz,0.5A Output:5.0V,3A /9.0V,2.23A /12V,1.67A/3.3-5.9V,3A/3.3-11V,2.2A
	<input checked="" type="checkbox"/>	DC: 12 V
	<input type="checkbox"/>	Battery:3.85V
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: Equipment for vehicular use

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 type="checkbox"/>	External	<input type="checkbox"/> Dipole
			<input type="checkbox"/> Sectorized
	<input checked="" type="checkbox"/>	Internal	<input type="checkbox"/> FPC
			<input checked="" type="checkbox"/> PCB
			<input type="checkbox"/> Metal Monopole Antenna
			<input type="checkbox"/> Ceramic chip
			<input type="checkbox"/> Others.....
Antenna Gain	-4.08dBi		

1.3 Test Data Rate

Note: The test rate is the lowest rate of 802.11b/g/n(20MHz)

1.4 Channel List

IEEE 802.11b/g & IEEE 802.11n (20MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412 MHz	2	2417 MHz	3	2422 MHz	4	2427 MHz
5	2432 MHz	6	2437 MHz	7	2442 MHz	8	2447 MHz
9	2452 MHz	10	2457 MHz	11	2462 MHz	-	-

Note1: The General Description of the Item, antenna information, Test Data Rate and Channel List in clause 1 are provided and confirmed by the client.

Note 2: For portable device, radiated tests was verified over X, Y, Z axis, and shown the worst case on this report.

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	Mode 1: Transmit by 802.11b
	Mode 2: Transmit by 802.11g
	Mode 3: Transmit by 802.11n(20MHz)

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"/>

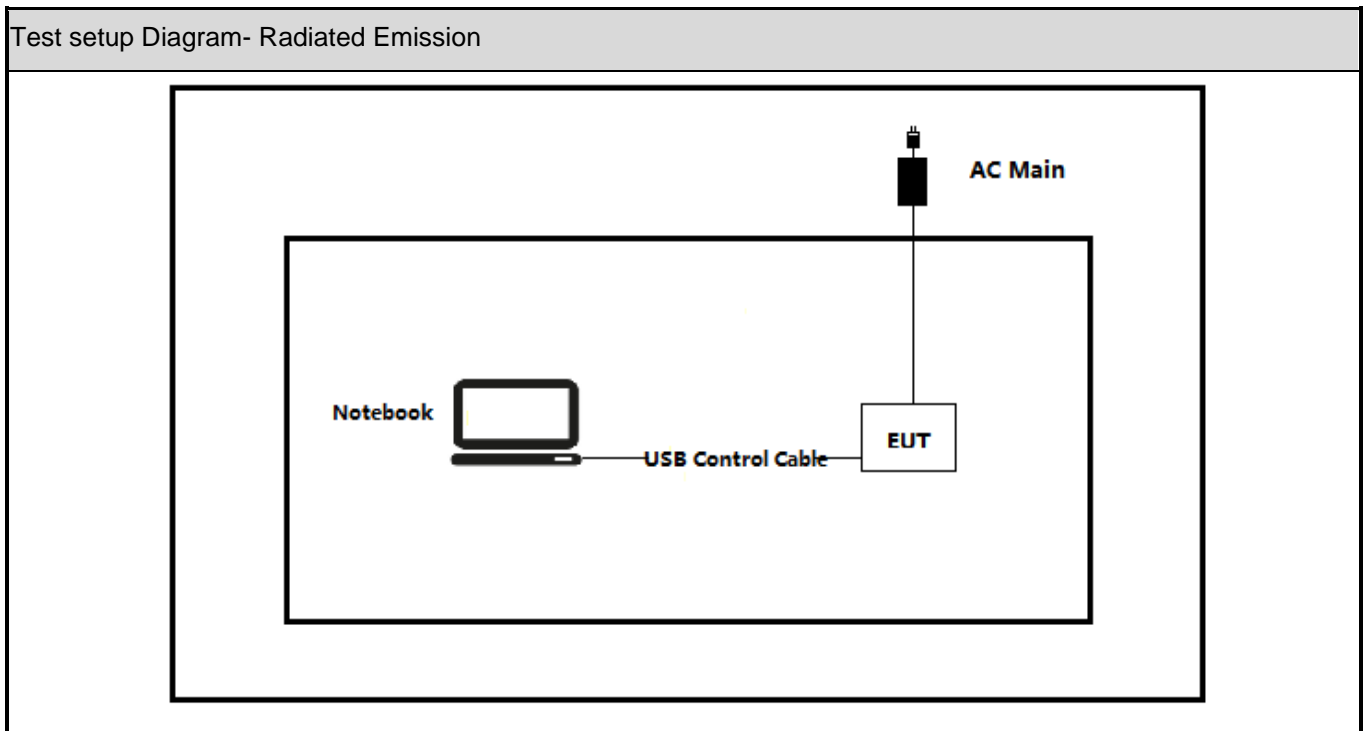
2.3 Support / Auxiliary equipment / unit / Test software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
Notebook	Think pad x220	Lenovo	Adapter
software	Type / Version	Manufacturer	Supplied by
Putty	N/A	N/A	N/A

2.4 Test Configuration / Block diagram used for tests

The following test setup / configuration / block diagram has been used during the tests:



2.5 Testing process

1	Setup the EUT as shown in Section 2.4.
2	Run the software "Putty" 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
KDB 558074 D01V05r02	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 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	---

3.3 Test Facility

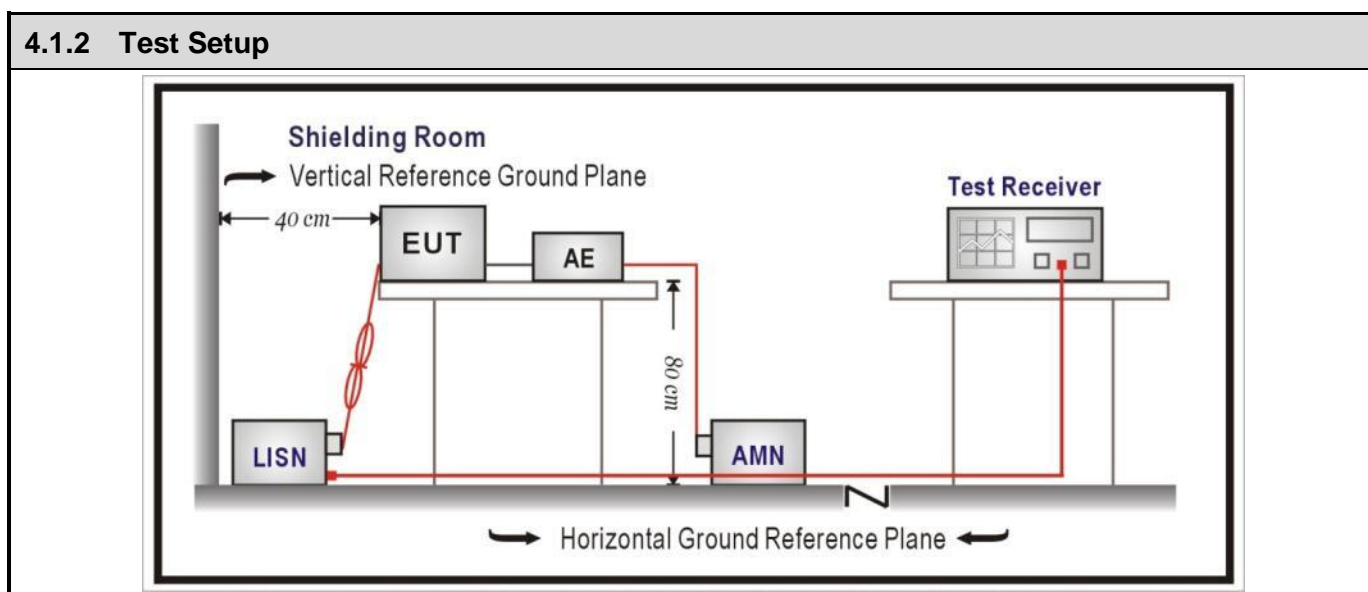
USA	:	FCC Designation Number: CN1199
CA	:	ISED CAB identifier: CN0040

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(μ V) ¹⁾	Limit: AV [dB(μ V) ¹⁾
0,15 - 0,50	66 - 56 ²⁾	56 - 46 ²⁾
0,50 - 5,0	56	46
5,0 - 30	60	50

¹⁾ At the transition frequency, the lower limit applies.
²⁾ 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.



4.1.3 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

Note: EUT is DC powered.

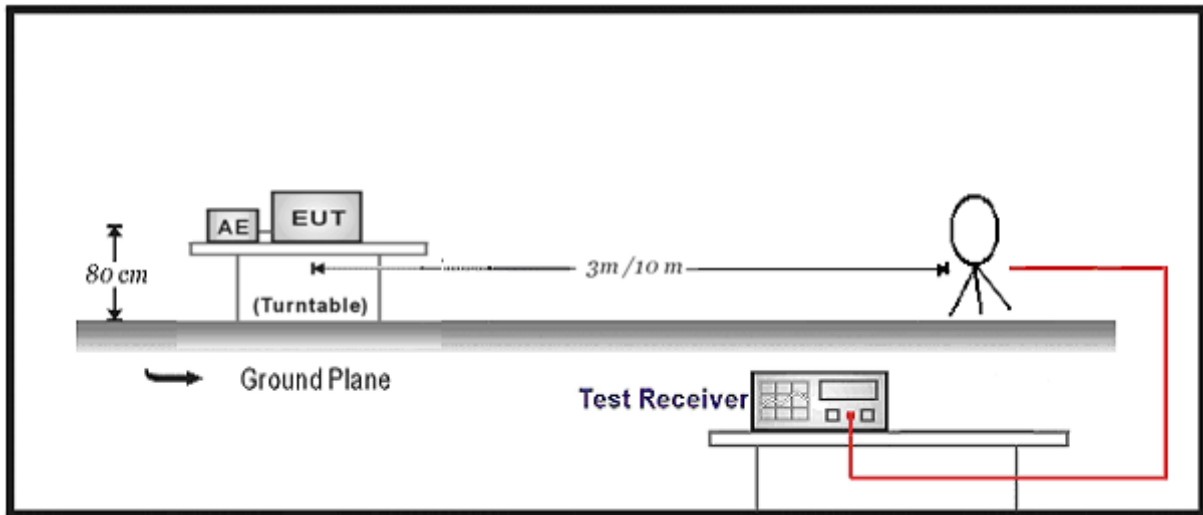
4.2 Emissions in restricted frequency bands	VERDICT: PASS
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4.2.1 Limit			
Standard		FCC Part 15 Subpart C Paragraph 15.205; 15.209	
Restricted Bands of operation for FCC			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	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	Above 38.6
13.36 – 13.41	--	--	--
Restricted Band Emissions Limit			
Frequency (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 _(Note 1)
1.705 - 30	30	29.5	30 _(Note 1)
30 - 88	100	40	3 _(Note 2)
88 - 216	150	43.5	3 _(Note 2)
216 - 960	200	46	3 _(Note 2)
Above 960	500	54	3 _(Note 2)
<p>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).</p> <p>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</p>			

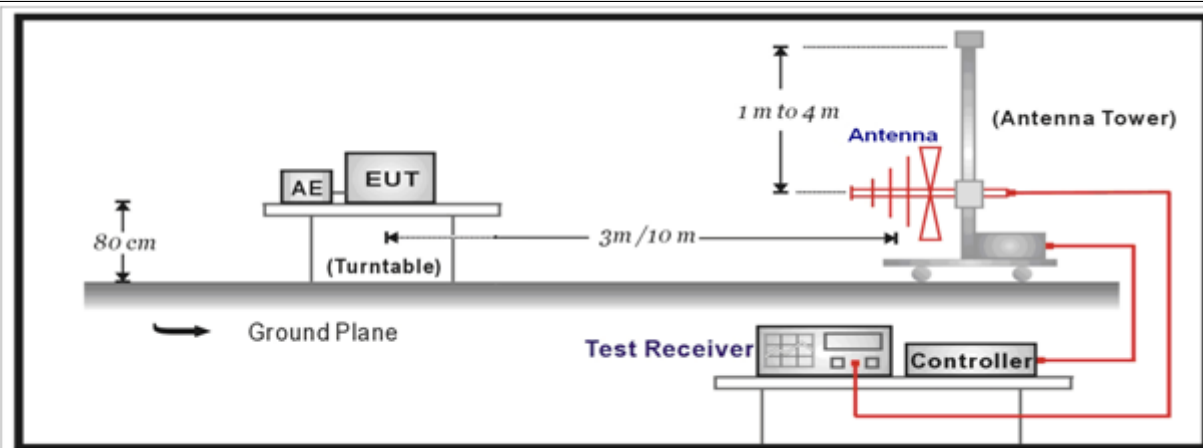
that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.2.2 Test Setup

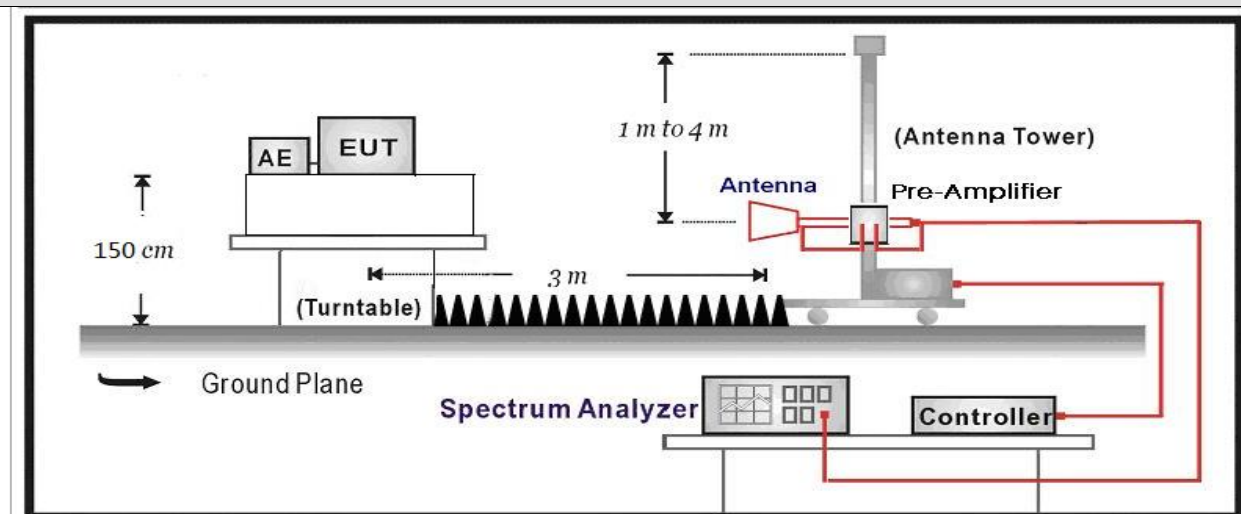
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



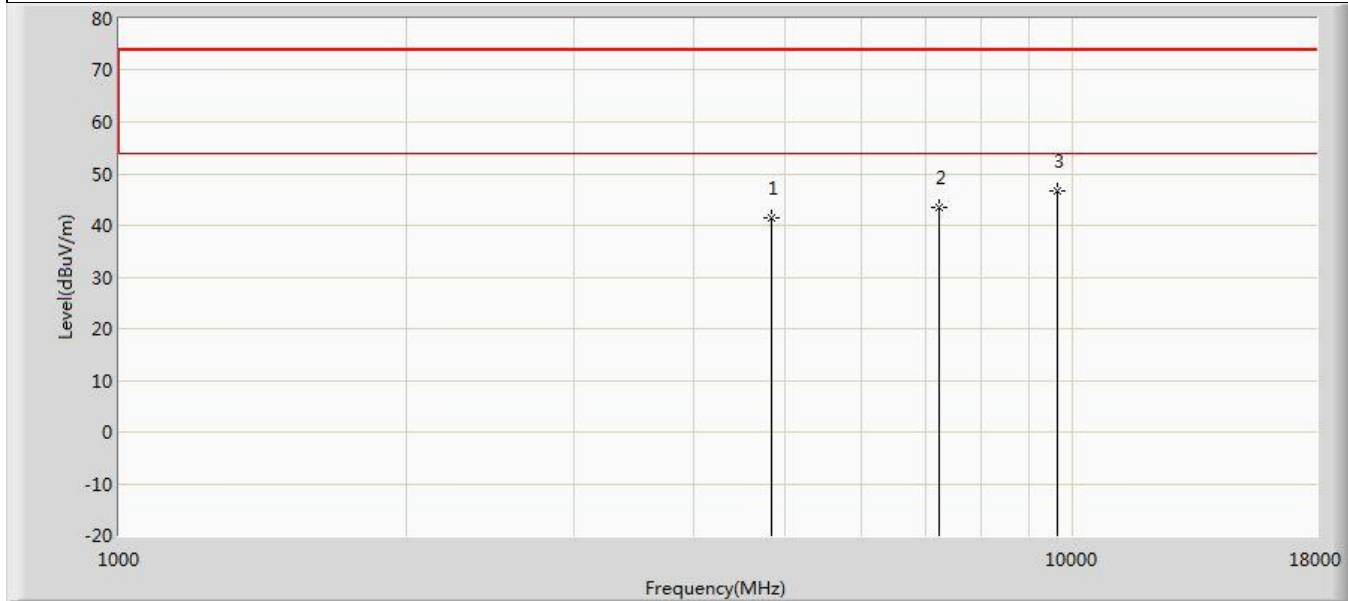
Above 1GHz Test Setup:



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	6.3	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
	<input 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 type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

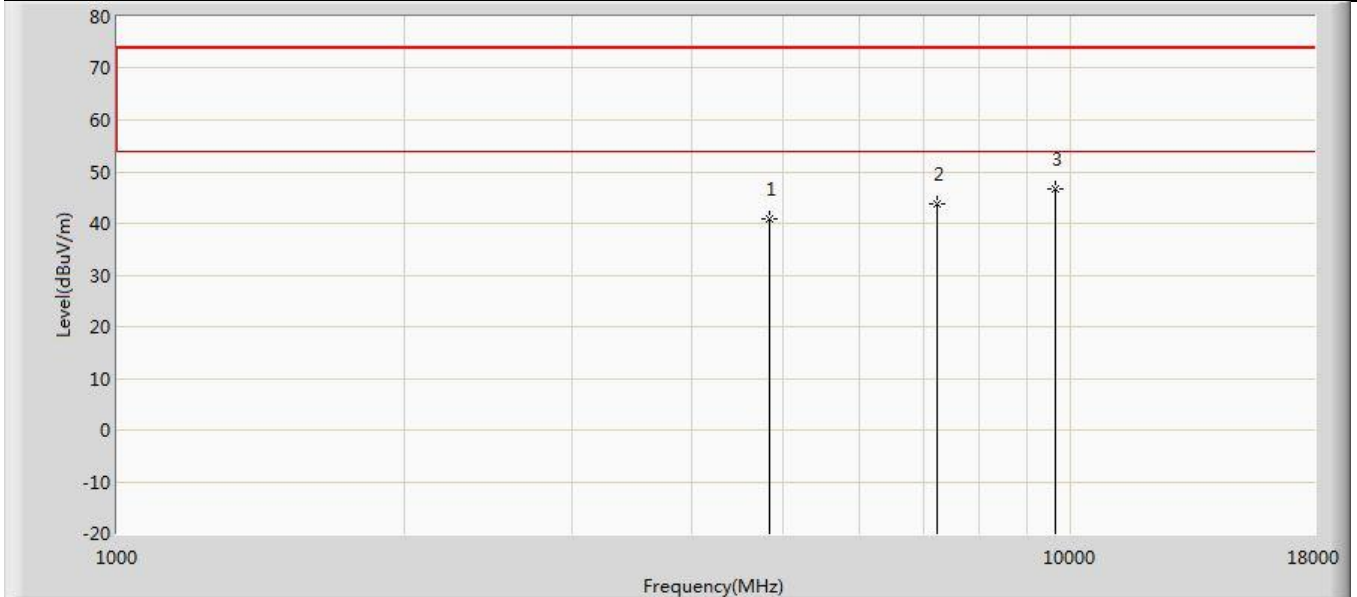
4.2.4 Test Data

Profile: 22A0738R	Page No.: 43
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2412MHz by 11b	



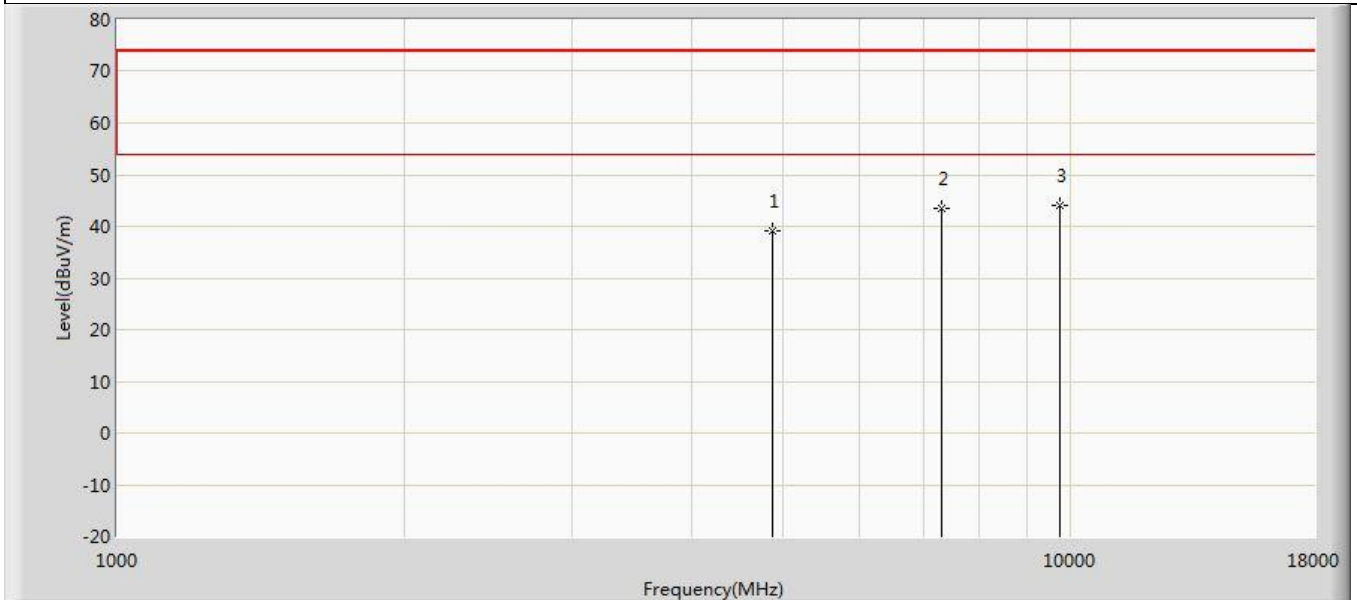
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	41.368	56.260	-32.632	74.000	-14.892	PK
2		7236.000	43.543	54.387	-30.457	74.000	-10.844	PK
3	*	9648.000	46.559	54.420	-27.441	74.000	-7.860	PK

Profile: 22A0738R	Page No.: 44
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2412MHz by 11b	



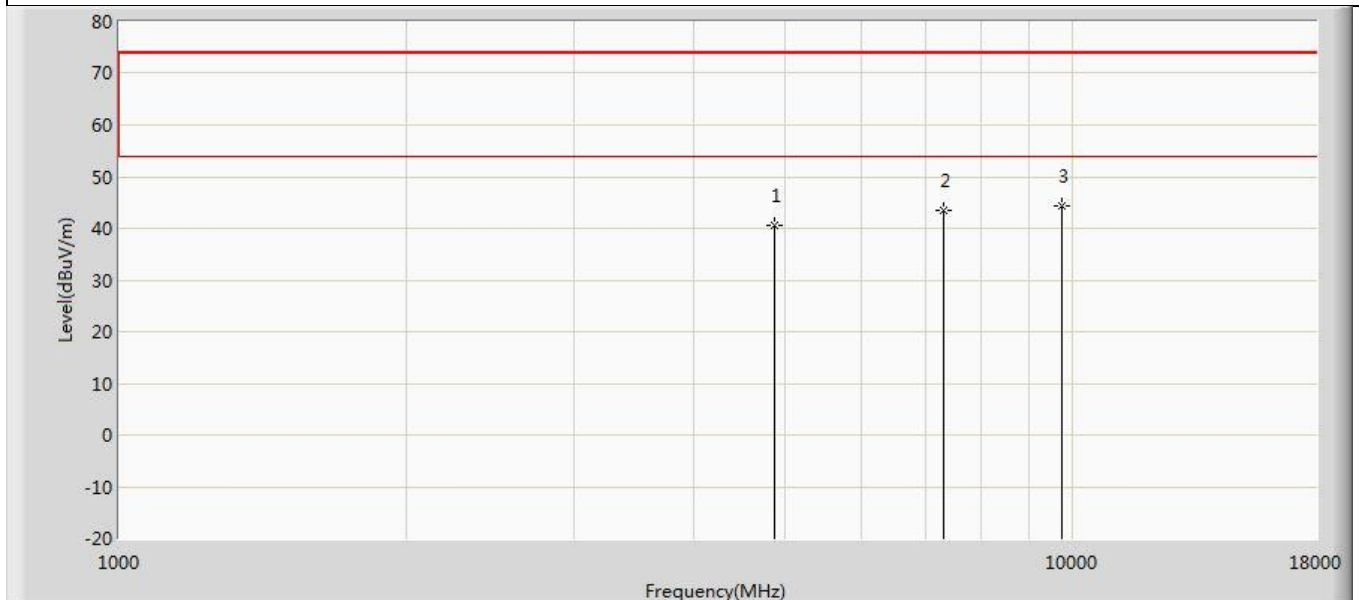
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	40.944	55.836	-33.056	74.000	-14.892	PK
2		7236.000	43.812	54.656	-30.188	74.000	-10.844	PK
3	*	9648.000	46.573	54.434	-27.427	74.000	-7.860	PK

Profile: 22A0738R	Page No.: 45
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2437MHz by 11b	



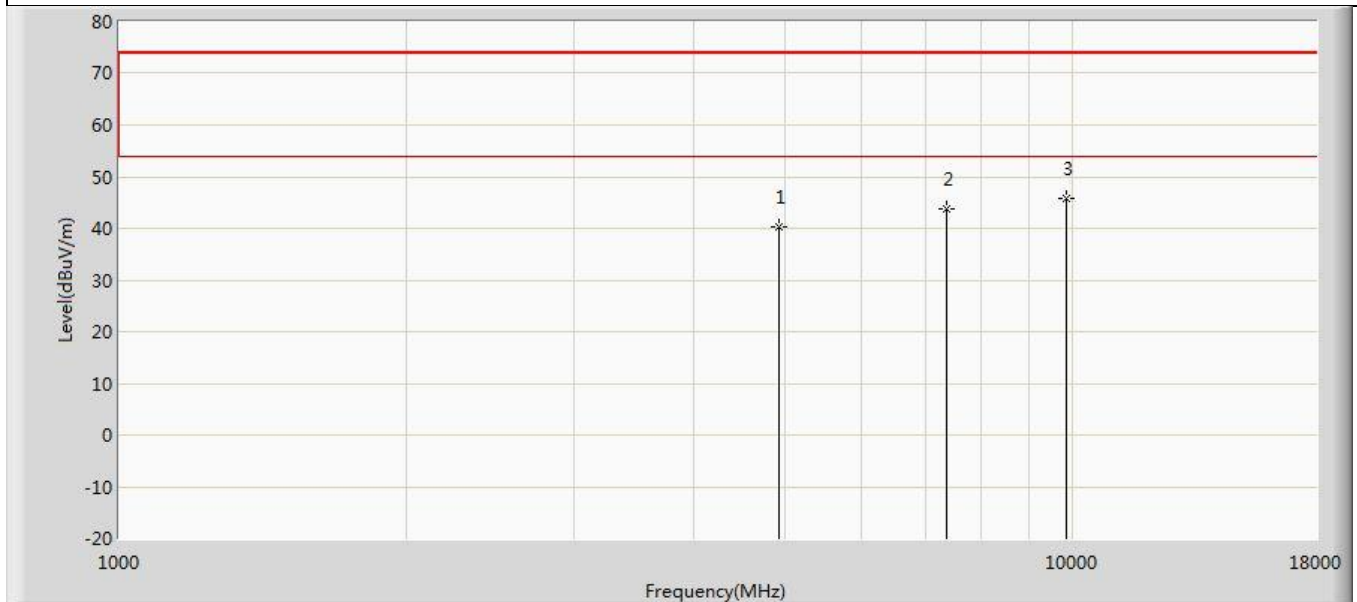
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	39.255	53.865	-34.745	74.000	-14.610	PK
2		7311.000	43.386	54.231	-30.614	74.000	-10.844	PK
3	*	9748.000	44.161	51.952	-29.839	74.000	-7.791	PK

Profile: 22A0738R	Page No.: 46
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2437MHz by 11b	



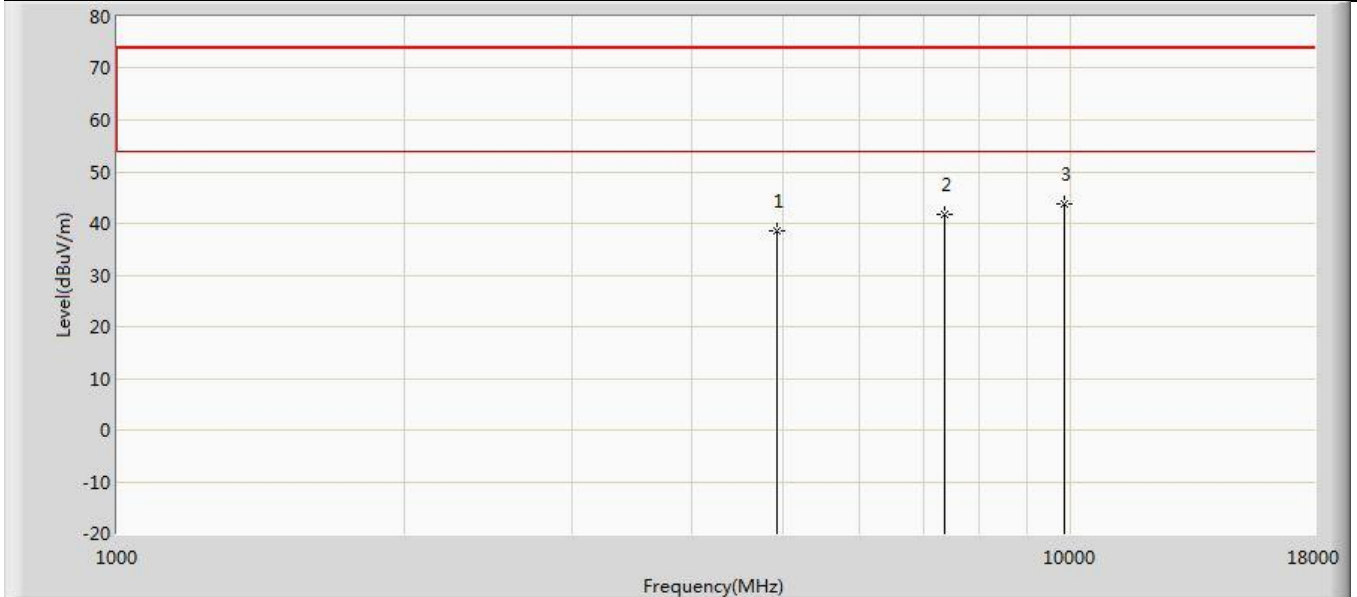
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	40.467	55.077	-33.533	74.000	-14.610	PK
2		7311.000	43.469	54.314	-30.531	74.000	-10.844	PK
3	*	9748.000	44.319	52.110	-29.681	74.000	-7.791	PK

Profile: 22A0738R	Page No.: 47
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2462MHz by 11b	



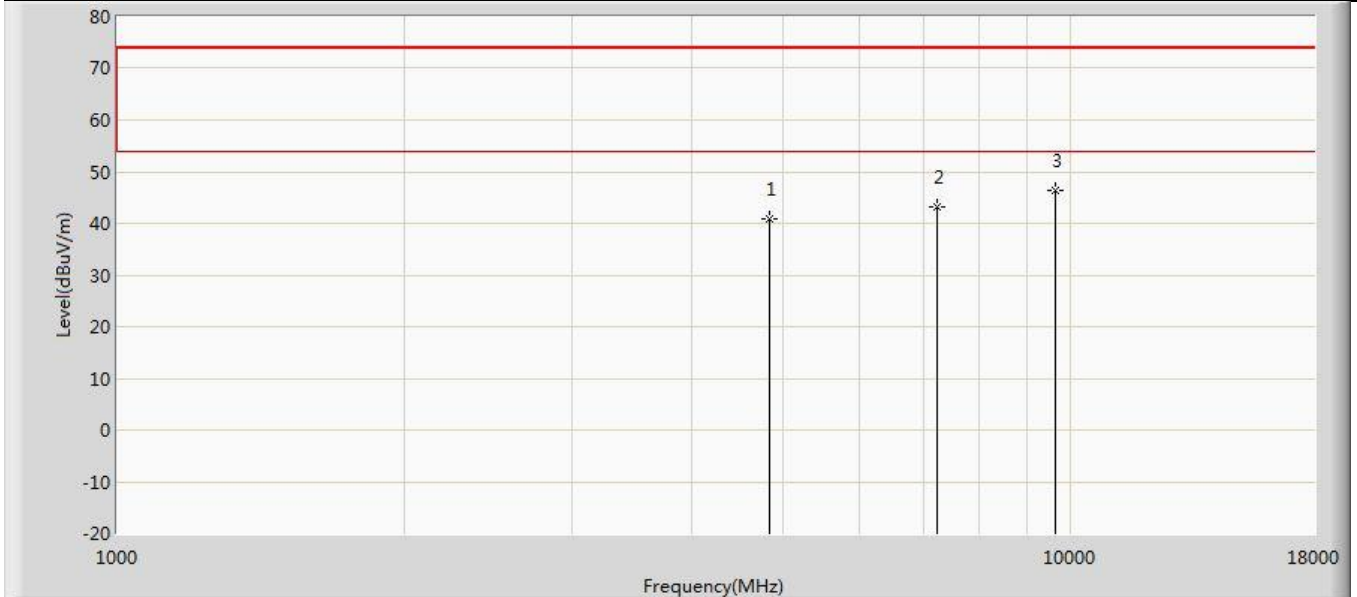
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	40.400	55.140	-33.600	74.000	-14.741	PK
2		7386.000	43.785	54.650	-30.215	74.000	-10.866	PK
3	*	9848.000	45.860	53.485	-28.140	74.000	-7.625	PK

Profile: 22A0738R	Page No.: 48
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2462MHz by 11b	



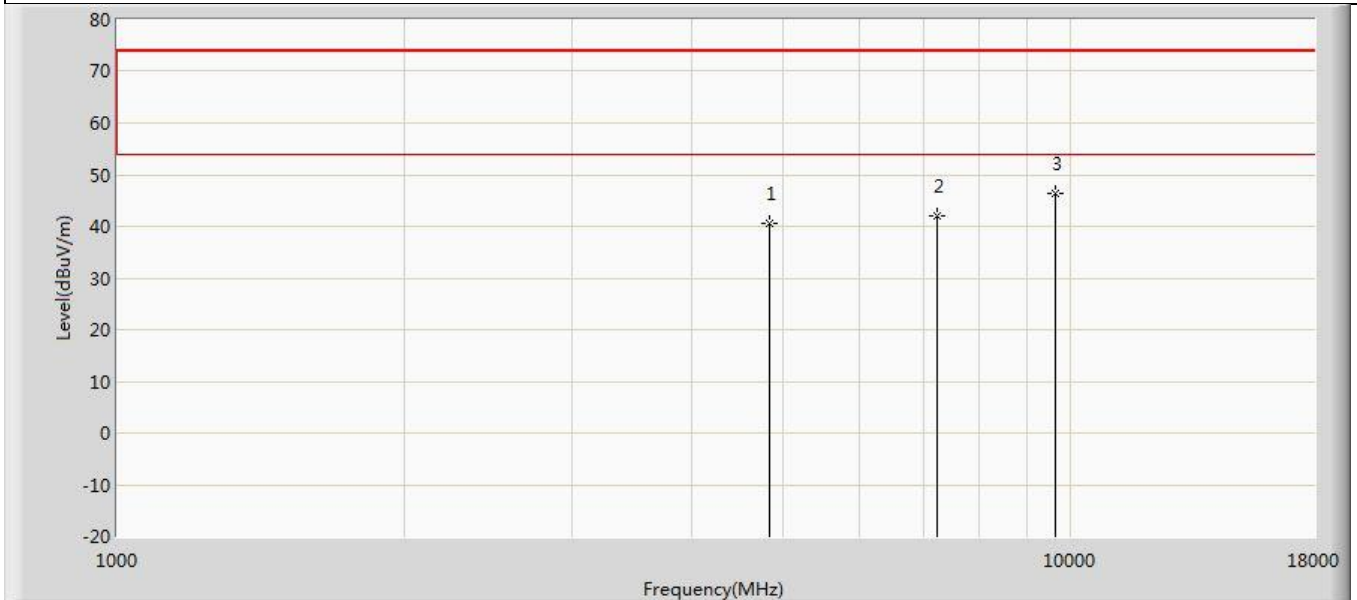
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	38.561	53.301	-35.439	74.000	-14.741	PK
2		7386.000	41.740	52.605	-32.260	74.000	-10.866	PK
3	*	9848.000	43.846	51.471	-30.154	74.000	-7.625	PK

Profile: 22A0738R	Page No.: 49
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2:Transmit at 2412MHz by 11g	



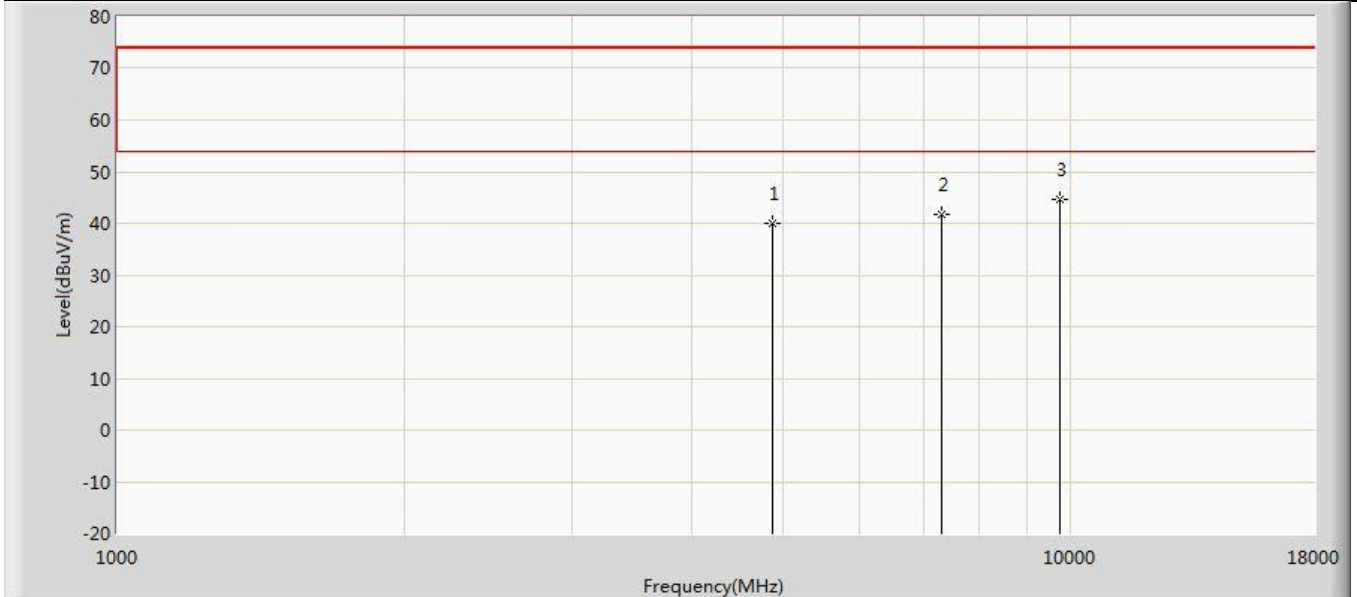
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	40.899	55.791	-33.101	74.000	-14.892	PK
2		7236.000	43.116	53.960	-30.884	74.000	-10.844	PK
3	*	9648.000	46.309	54.170	-27.691	74.000	-7.860	PK

Profile: 22A0738R	Page No.: 50
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2:Transmit at 2412MHz by 11g	



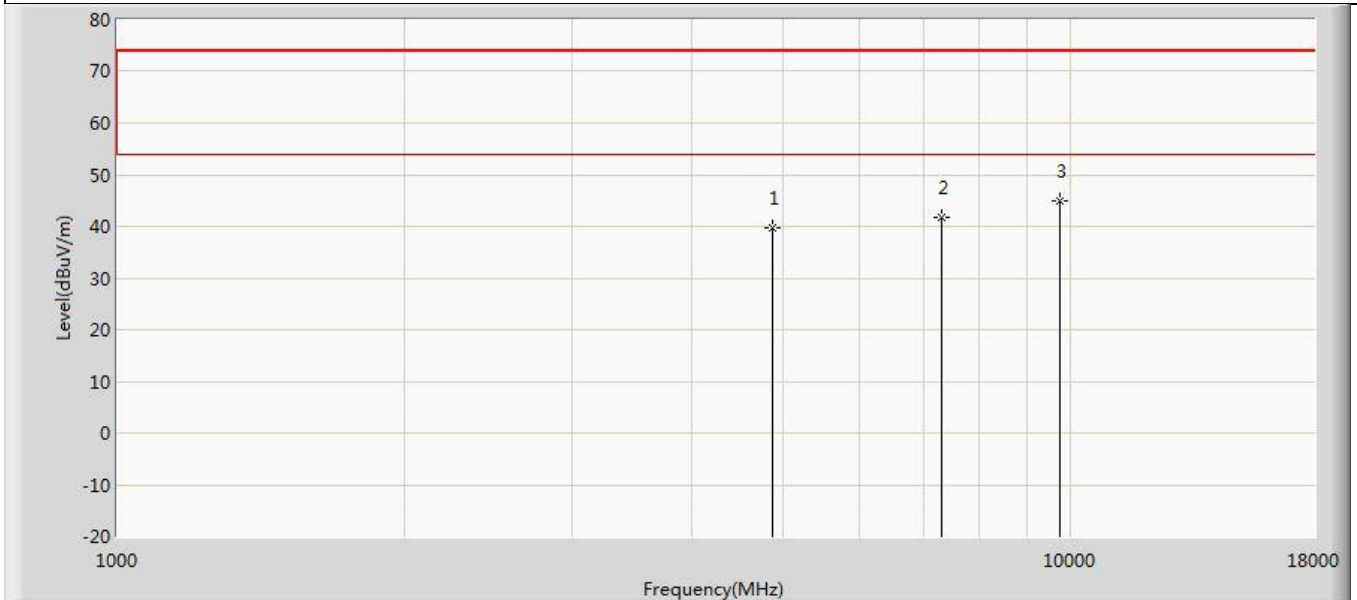
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	40.590	55.482	-33.410	74.000	-14.892	PK
2		7236.000	42.138	52.982	-31.862	74.000	-10.844	PK
3	*	9648.000	46.268	54.129	-27.732	74.000	-7.860	PK

Profile: 22A0738R	Page No.: 51
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2:Transmit at 2437MHz by 11g	



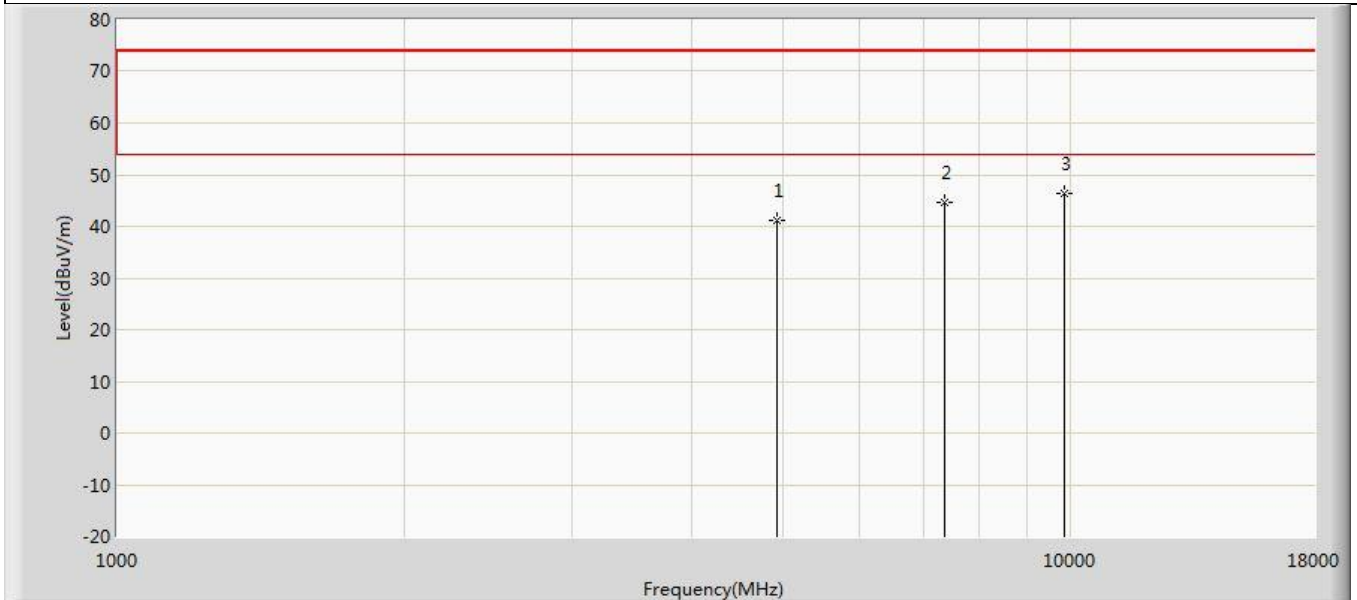
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	40.089	54.699	-33.911	74.000	-14.610	PK
2		7311.000	41.814	52.659	-32.186	74.000	-10.844	PK
3	*	9748.000	44.651	52.442	-29.349	74.000	-7.791	PK

Profile: 22A0738R	Page No.: 52
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2:Transmit at 2437MHz by 11g	



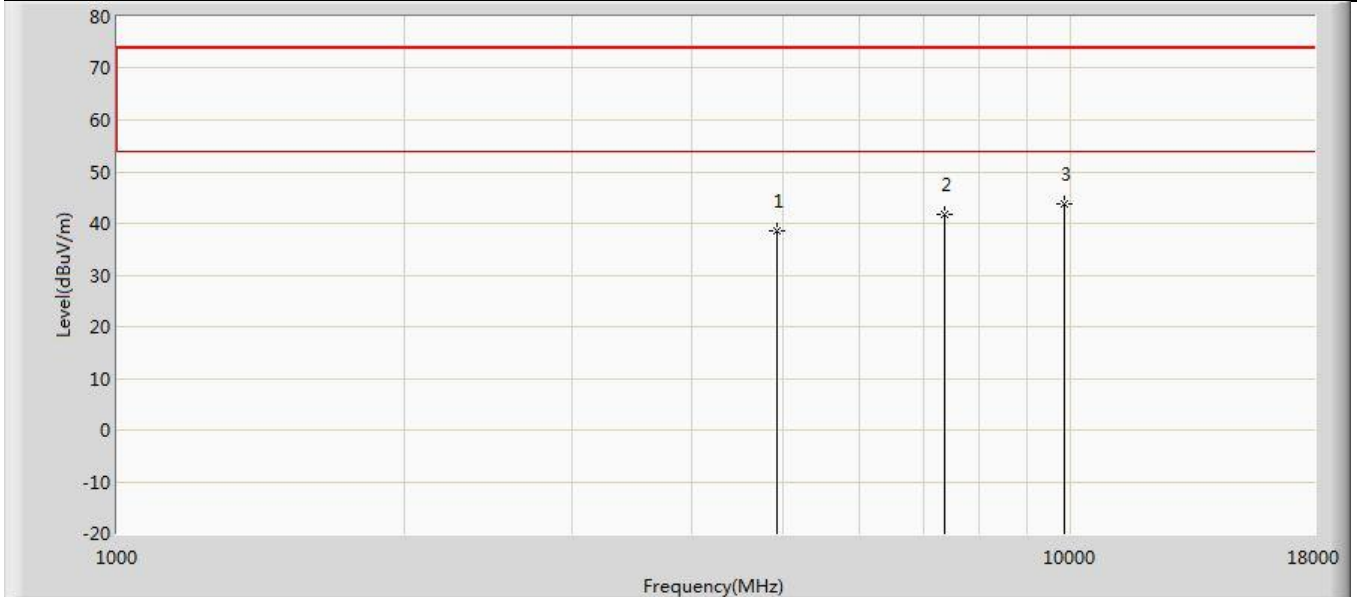
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	39.656	54.266	-34.344	74.000	-14.610	PK
2		7311.000	41.863	52.708	-32.137	74.000	-10.844	PK
3	*	9748.000	44.852	52.643	-29.148	74.000	-7.791	PK

Profile: 22A0738R	Page No.: 53
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2:Transmit at 2462MHz by 11g	



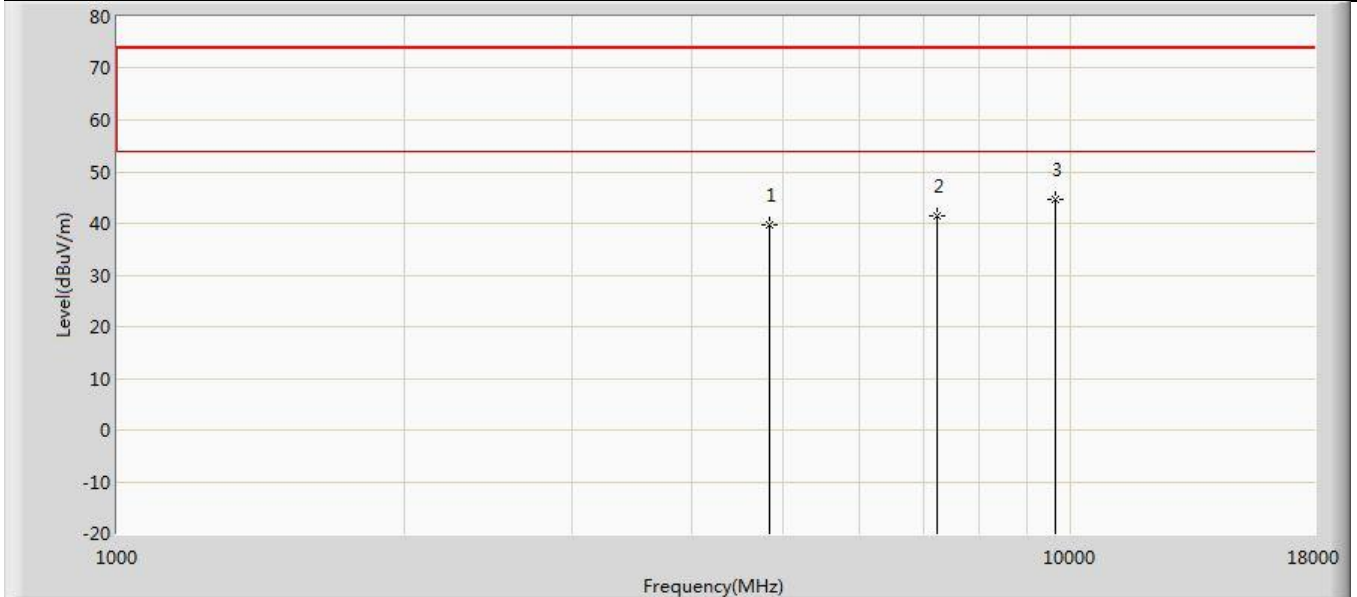
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	41.272	56.012	-32.728	74.000	-14.741	PK
2		7386.000	44.781	55.646	-29.219	74.000	-10.866	PK
3	*	9848.000	46.285	53.910	-27.715	74.000	-7.625	PK

Profile: 22A0738R	Page No.: 54
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2:Transmit at 2462MHz by 11g	



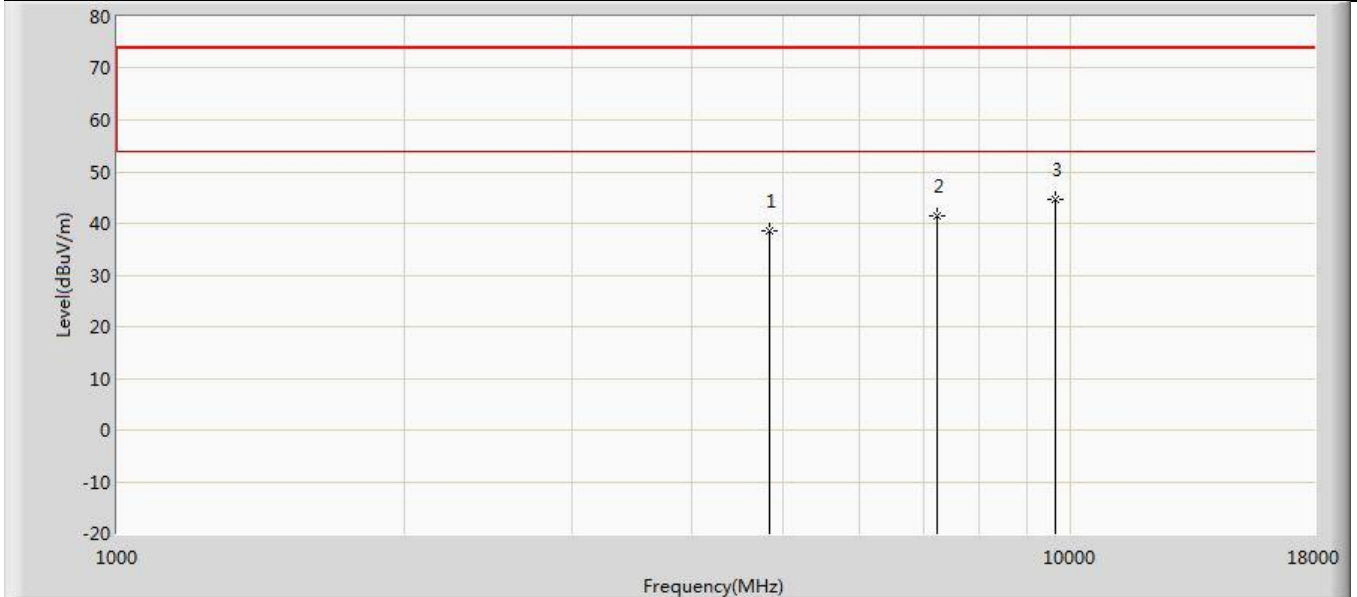
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	38.451	53.191	-35.549	74.000	-14.741	PK
2		7386.000	41.745	52.610	-32.255	74.000	-10.866	PK
3	*	9848.000	43.669	51.294	-30.331	74.000	-7.625	PK

Profile: 22A0738R	Page No.: 55
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3:Transmit at 2412MHz by 11n20	



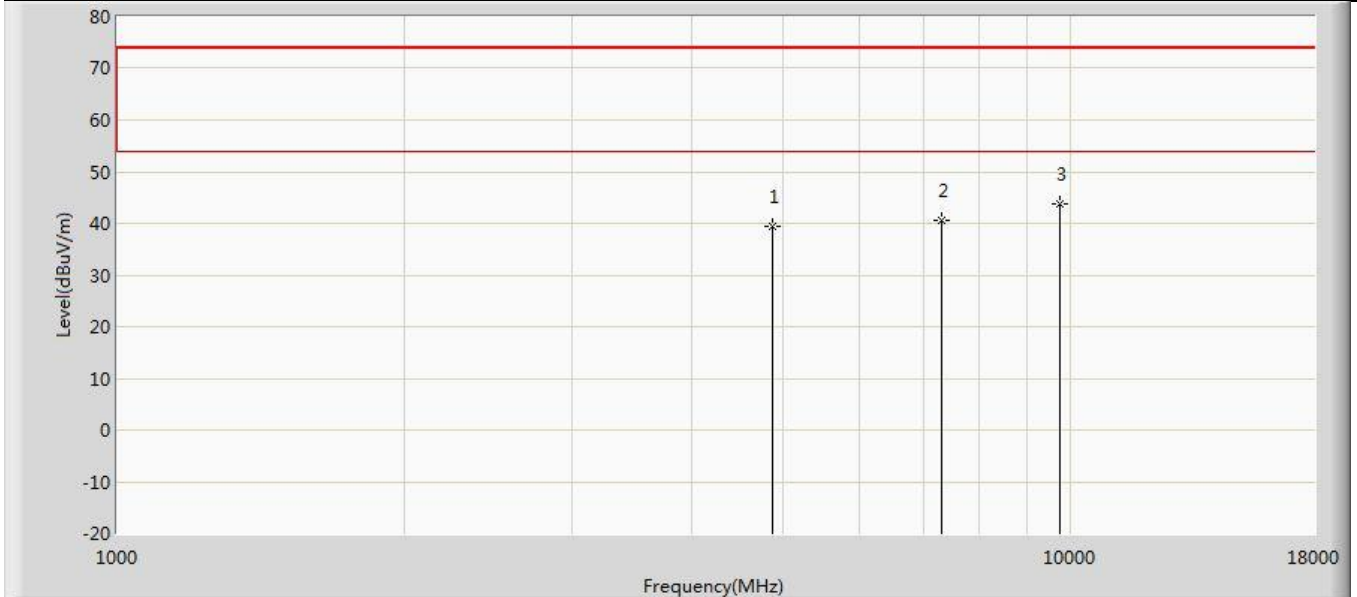
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	39.824	54.716	-34.176	74.000	-14.892	PK
2		7236.000	41.499	52.343	-32.501	74.000	-10.844	PK
3	*	9648.000	44.680	52.541	-29.320	74.000	-7.860	PK

Profile: 22A0738R	Page No.: 56
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3:Transmit at 2412MHz by 11n20	



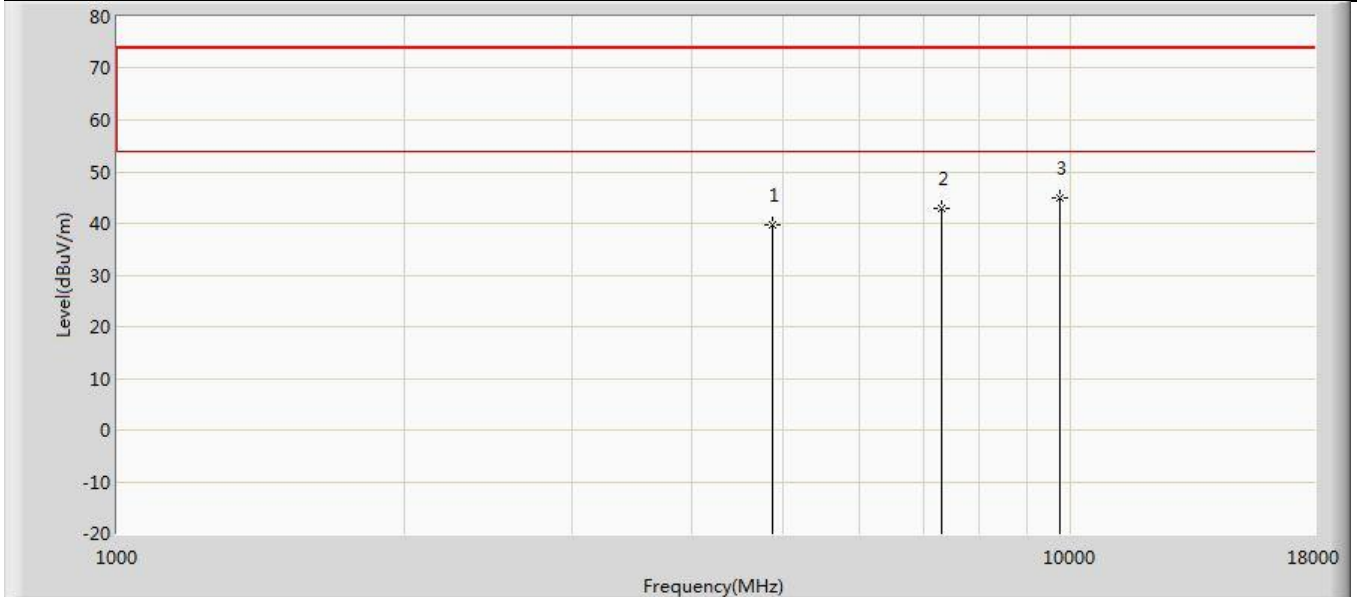
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	38.628	53.520	-35.372	74.000	-14.892	PK
2		7236.000	41.554	52.398	-32.446	74.000	-10.844	PK
3	*	9648.000	44.684	52.545	-29.316	74.000	-7.860	PK

Profile: 22A0738R	Page No.: 57
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3:Transmit at 2437MHz by 11n20	



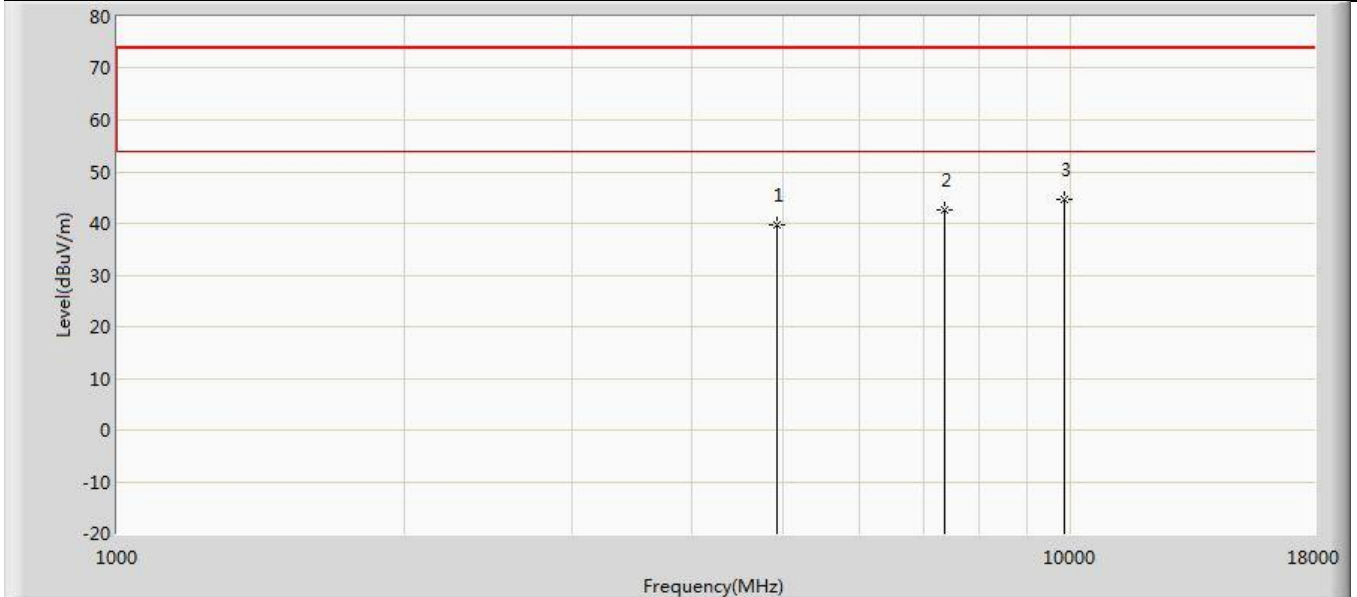
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	39.430	54.040	-34.570	74.000	-14.610	PK
2		7311.000	40.449	51.294	-33.551	74.000	-10.844	PK
3	*	9748.000	43.876	51.667	-30.124	74.000	-7.791	PK

Profile: 22A0738R	Page No.: 58
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3:Transmit at 2437MHz by 11n20	



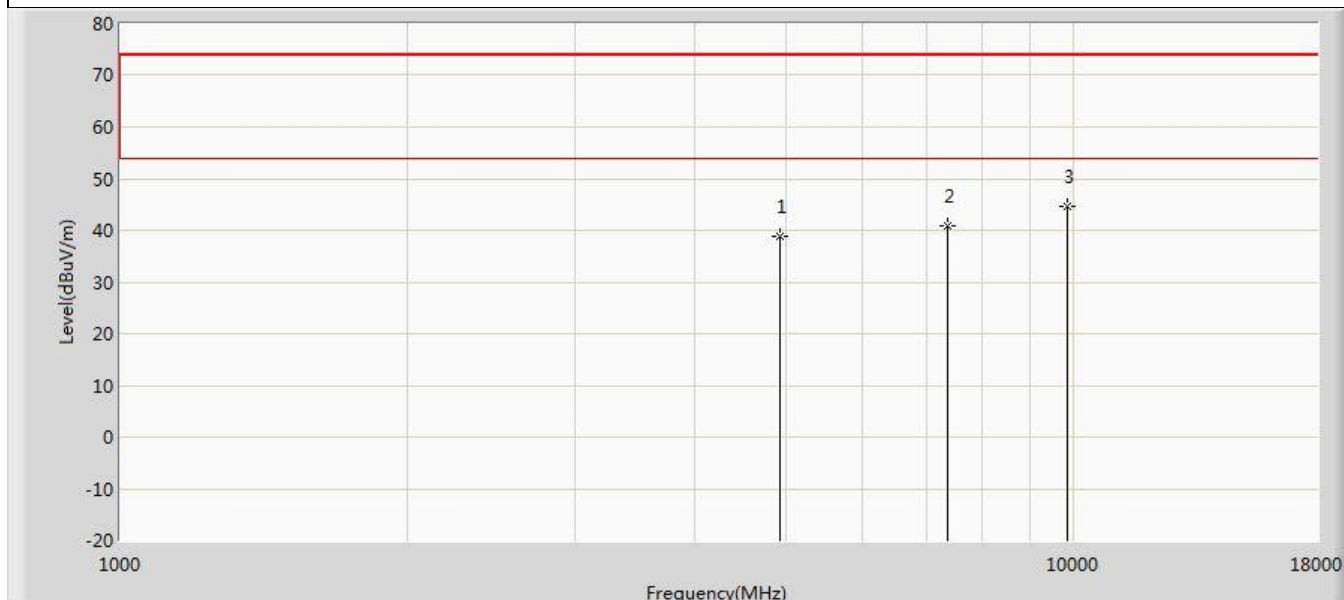
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	39.673	54.283	-34.327	74.000	-14.610	PK
2		7311.000	42.952	53.797	-31.048	74.000	-10.844	PK
3	*	9748.000	44.882	52.673	-29.118	74.000	-7.791	PK

Profile: 22A0738R	Page No.: 59
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3:Transmit at 2462MHz by 11n20	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	39.730	54.470	-34.270	74.000	-14.741	PK
2		7386.000	42.698	53.563	-31.302	74.000	-10.866	PK
3	*	9848.000	44.681	52.306	-29.319	74.000	-7.625	PK

Profile: 22A0738R	Page No.: 60
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 02:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3:Transmit at 2462MHz by 11n20	



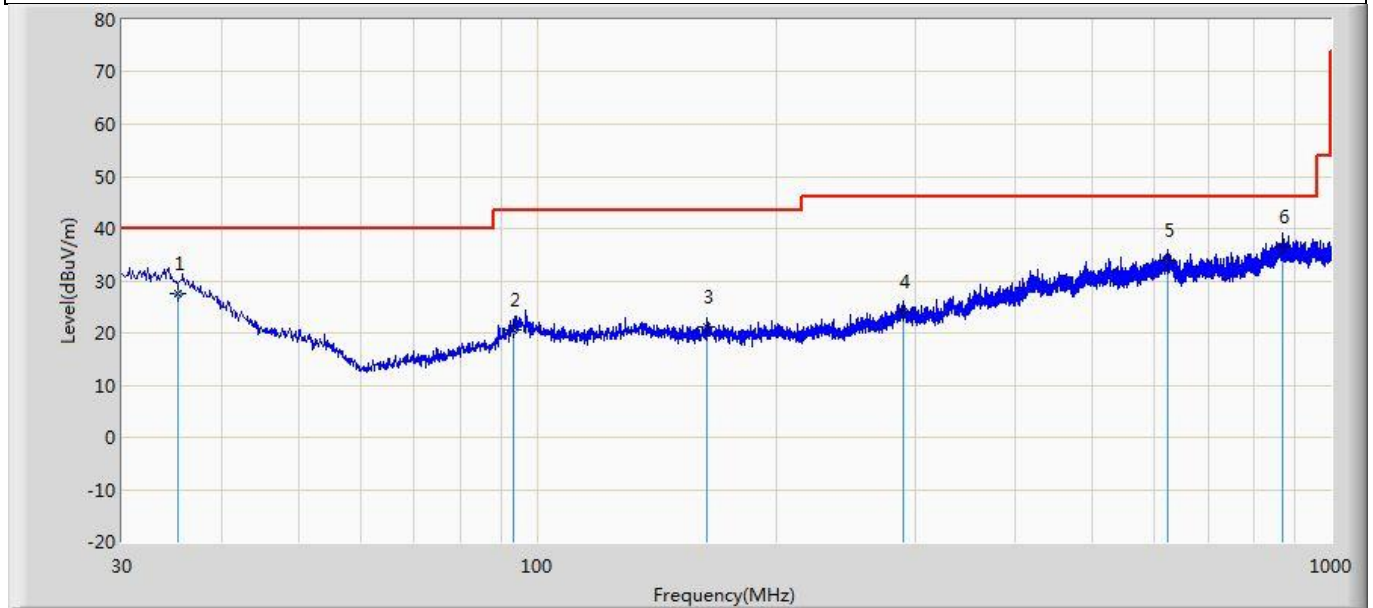
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	38.874	53.614	-35.126	74.000	-14.741	PK
2		7386.000	40.846	51.711	-33.154	74.000	-10.866	PK
3	*	9848.000	44.718	52.343	-29.282	74.000	-7.625	PK

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. The test frequency range, 18GHz~26GHz test result on peak is lower than average limit, all is the noise base, therefore no data appear in the report.
4. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
5. As the radiated emission was performed, so conducted emission was not tested.

The worst case of Radiated Emission below 1GHz:

Profile: 22A0738R	Page No.: 54
Engineer: YuLiu	
Site: AC3	Time: 2022/11/28 - 21:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC3_3m(30-1000M)	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode 1: Transmit at 2437MHz by 11b	

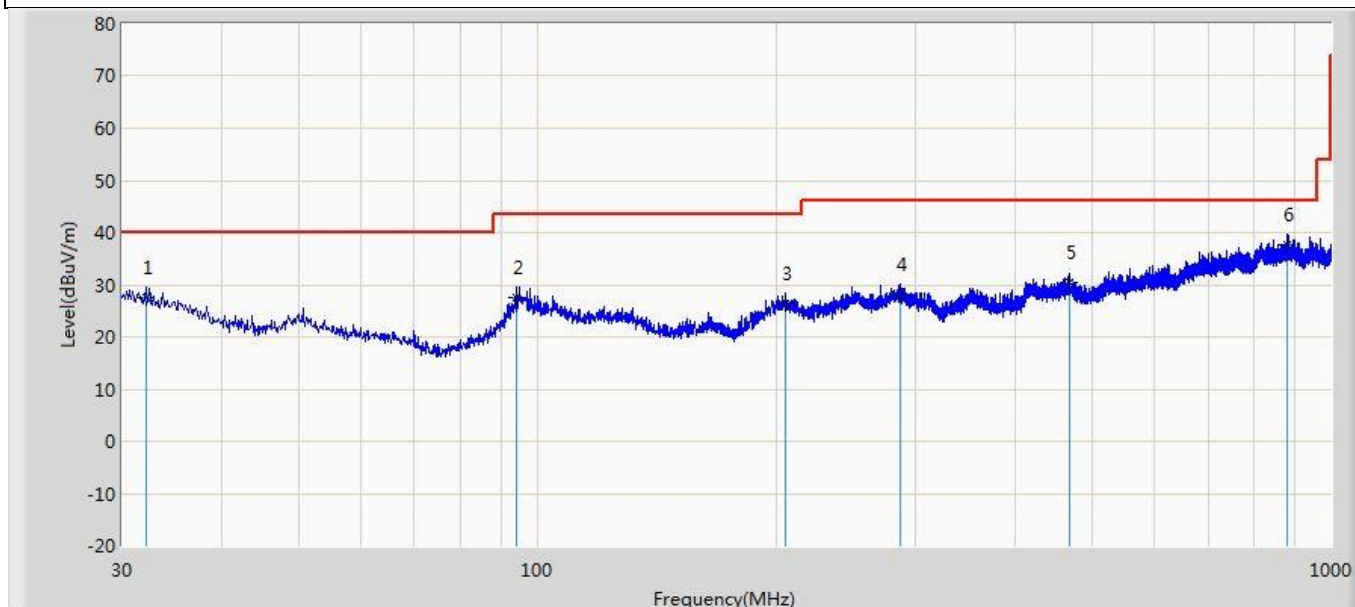


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		35.335	27.438	0.786	-12.562	40.000	26.651	QP
2		93.535	20.720	6.127	-22.780	43.500	14.593	QP
3		163.617	21.039	3.711	-22.461	43.500	17.328	QP
4		289.596	24.155	3.511	-21.845	46.000	20.643	QP
5		623.034	33.879	3.163	-12.121	46.000	30.716	QP
6	*	869.899	36.660	3.688	-9.340	46.000	32.973	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)

Profile: 22A0738R	Page No.: 55
Engineer: YuLiu	
Site: AC3	Time: 2022/11/28 - 21:20
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC3_3m(30-1000M)	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode 1: Transmit at 2437MHz by 11b	



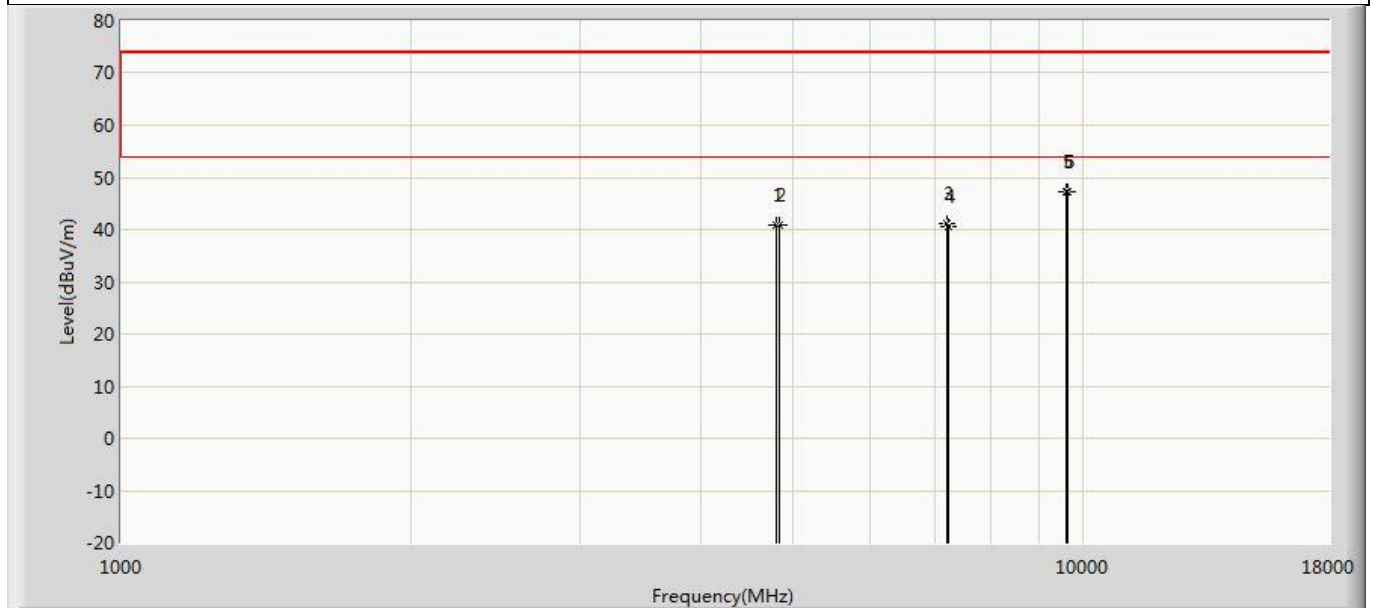
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		32.182	27.495	4.197	-12.505	40.000	23.298	QP
2		94.262	27.460	7.993	-16.040	43.500	19.468	QP
3		205.449	26.480	3.016	-17.020	43.500	23.464	QP
4		286.929	28.118	3.098	-17.882	46.000	25.019	QP
5		467.470	30.305	3.499	-15.695	46.000	26.806	QP
6	*	879.599	37.578	4.179	-8.422	46.000	33.399	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)

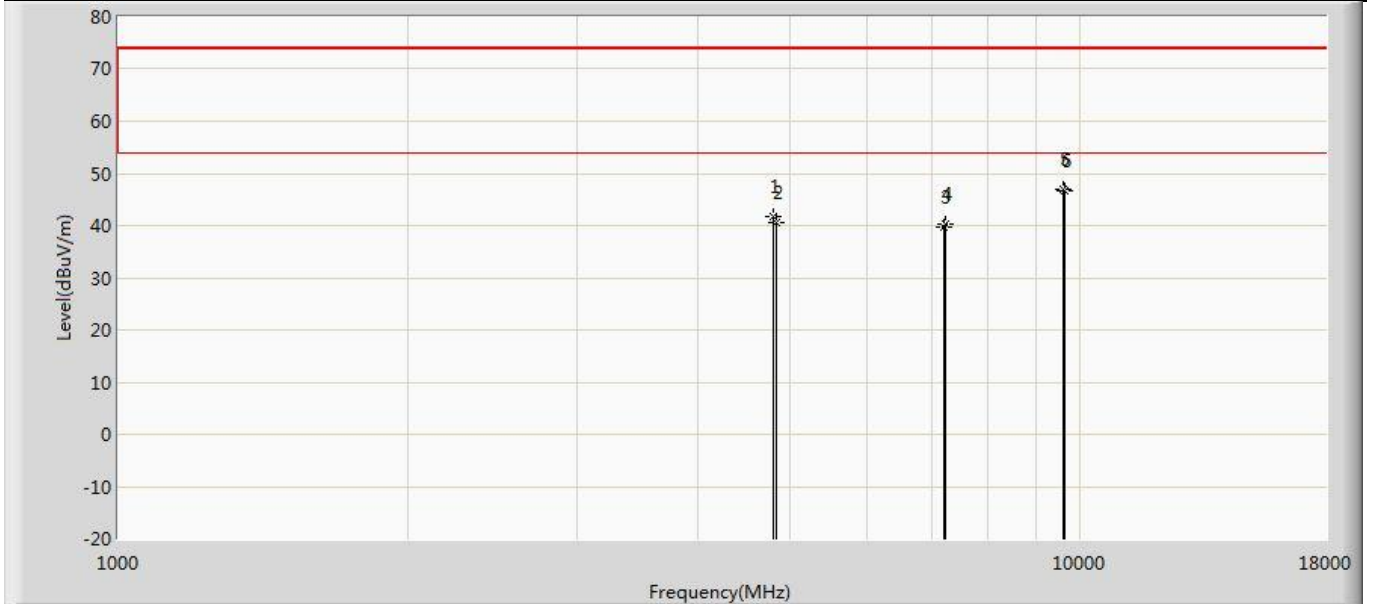
The worst case of Simultaneous Radiated Emission:

Profile: 22A0738R	Page No.: 13
Engineer: YuLiu	
Site: AC5	Time: 2022/12/04 - 20:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at BLE 2402MHz and 2.4G WIFI 11b 2412MHz	



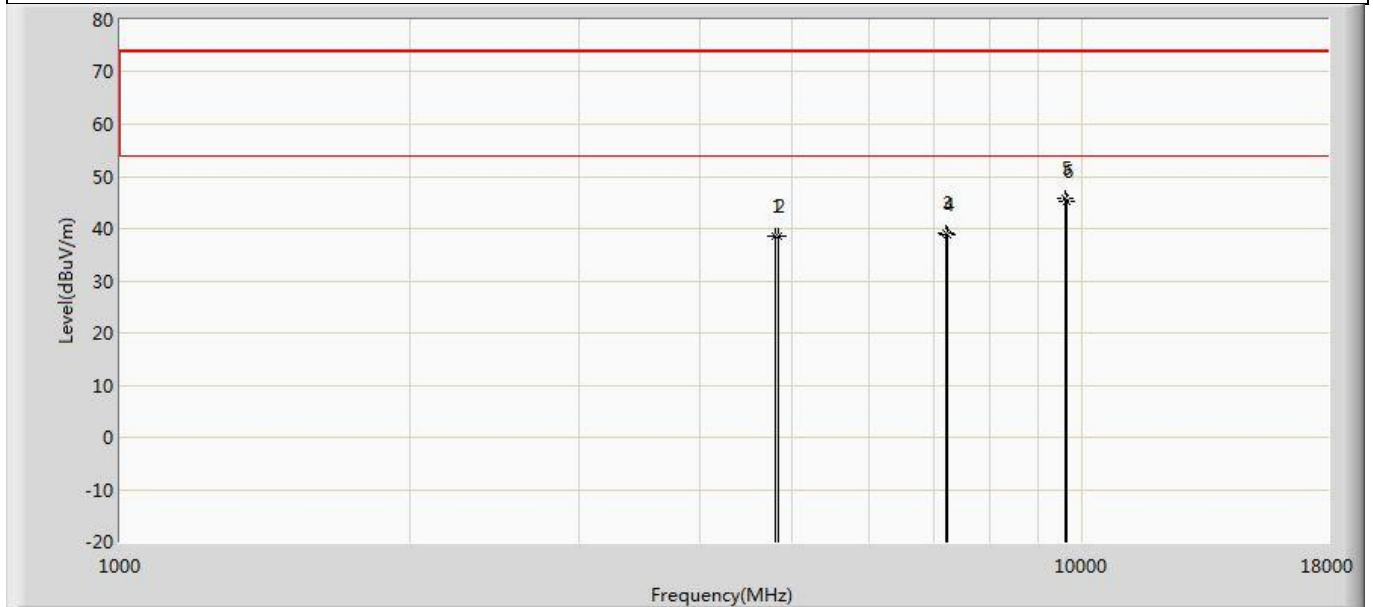
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	40.828	55.808	-33.172	74.000	-14.981	PK
2		4824.000	40.862	55.754	-33.138	74.000	-14.892	PK
3		7206.000	41.175	51.995	-32.825	74.000	-10.820	PK
4		7236.000	40.479	51.323	-33.521	74.000	-10.844	PK
5	*	9608.000	47.164	55.258	-26.836	74.000	-8.094	PK
6		9648.000	47.142	55.003	-26.858	74.000	-7.860	PK

Profile: 22A0738R	Page No.: 14
Engineer: YuLiu	
Site: AC5	Time: 2022/12/04 - 20:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1: Transmit at BLE 2402MHz and 2.4G WIFI 11b 2412MHz	



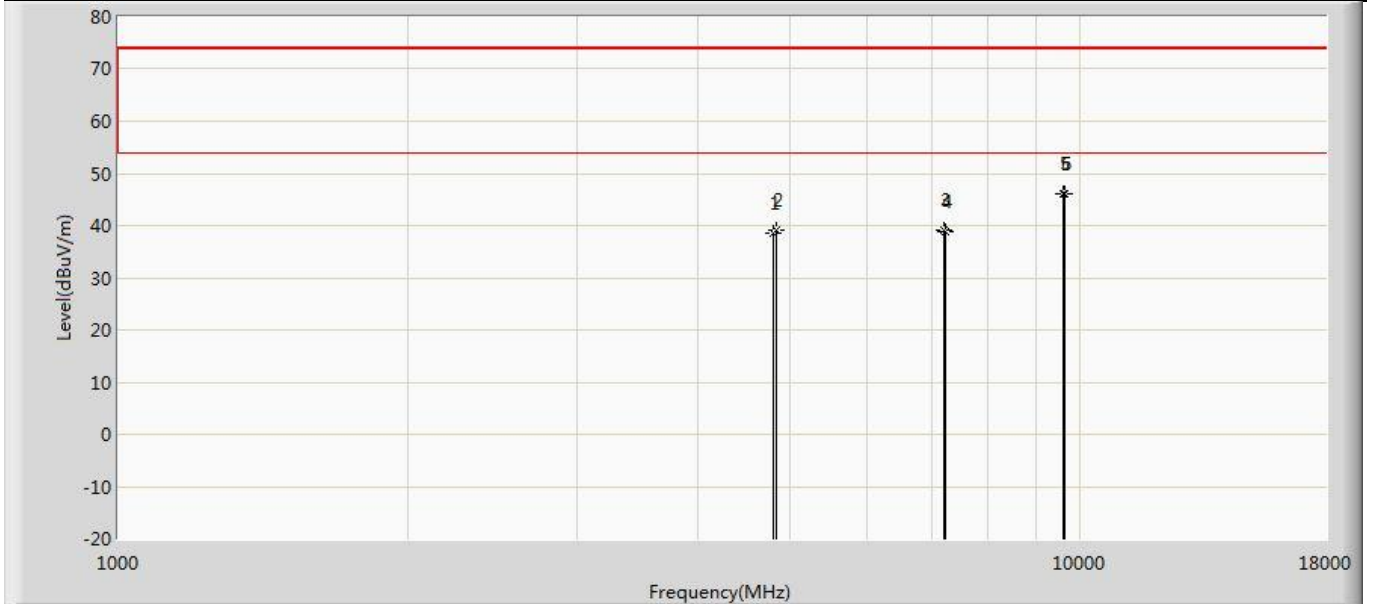
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	41.602	56.582	-32.398	74.000	-14.981	PK
2		4824.000	40.637	55.529	-33.363	74.000	-14.892	PK
3		7206.000	39.742	50.562	-34.258	74.000	-10.820	PK
4		7236.000	40.292	51.136	-33.708	74.000	-10.844	PK
5	*	9608.000	47.020	55.114	-26.980	74.000	-8.094	PK
6		9648.000	46.631	54.492	-27.369	74.000	-7.860	PK

Profile: 22A0738R	Page No.: 15
Engineer: YuLiu	
Site: AC5	Time: 2022/12/04 - 20:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1: Transmit at DH5 2402MHz and 2.4G WIFI 11b 2412MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	38.672	53.652	-35.328	74.000	-14.981	PK
2		4824.000	38.410	53.302	-35.590	74.000	-14.892	PK
3		7206.000	39.264	50.084	-34.736	74.000	-10.820	PK
4		7236.000	38.816	49.660	-35.184	74.000	-10.844	PK
5	*	9608.000	45.918	54.012	-28.082	74.000	-8.094	PK
6		9648.000	45.180	53.041	-28.820	74.000	-7.860	PK

Profile: 22A0738R	Page No.: 16
Engineer: YuLiu	
Site: AC5	Time: 2022/12/04 - 20:15
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1: Transmit at DH5 2402MHz and 2.4G WIFI 11b 2412MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4804.000	38.571	53.551	-35.429	74.000	-14.981	PK
2		4824.000	39.140	54.032	-34.860	74.000	-14.892	PK
3		7206.000	39.239	50.059	-34.761	74.000	-10.820	PK
4		7236.000	38.947	49.791	-35.053	74.000	-10.844	PK
5		9608.000	46.096	54.190	-27.904	74.000	-8.094	PK
6	*	9648.000	46.145	54.006	-27.855	74.000	-7.860	PK

4.3 Emissions in non-restricted frequency band	VERDICT: PASS
---	----------------------

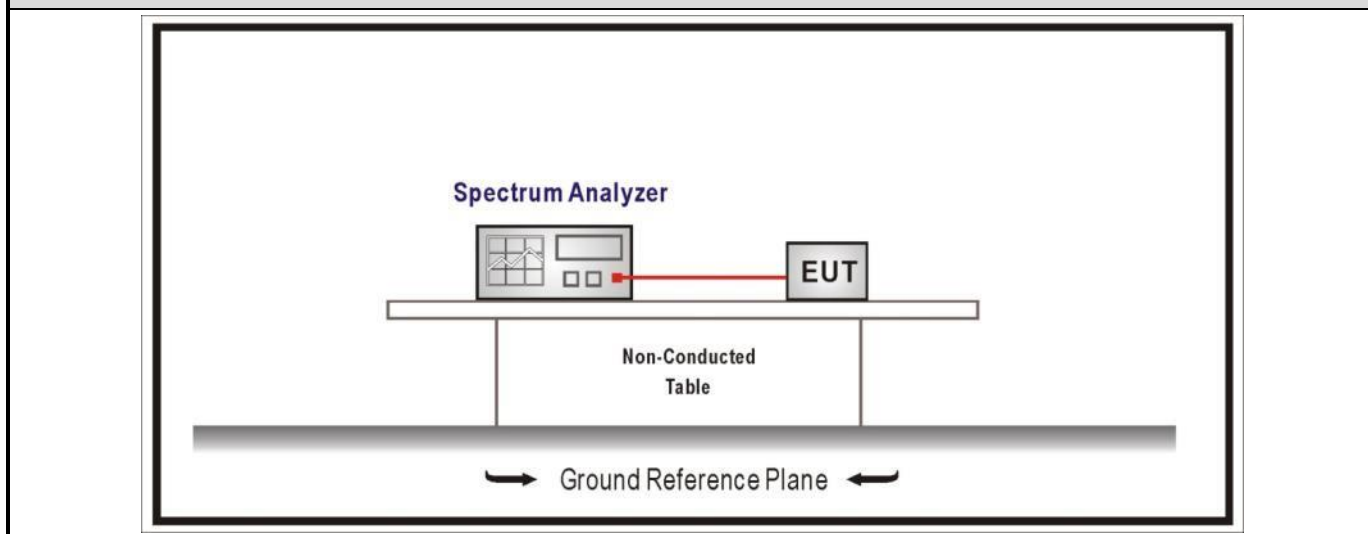
4.3.1 Limit

Standard	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



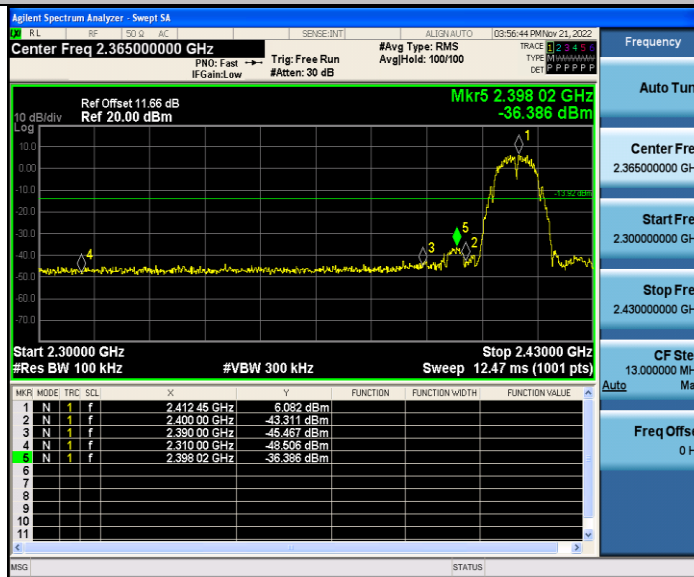
4.3.3 Test Procedure

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

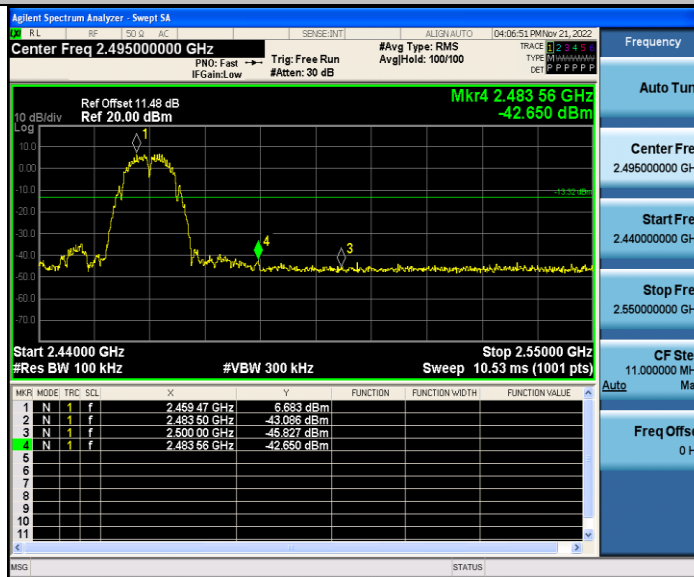
4.3.4 Test Data

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	6.08	-36.39	≤-13.92	PASS
		High	2462	6.68	-42.65	≤-13.32	PASS
11G	Ant1	Low	2412	3.17	-29.12	≤-16.83	PASS
		High	2462	3.53	-37.3	≤-16.47	PASS
11N20SISO	Ant1	Low	2412	0.96	-35.67	≤-19.04	PASS
		High	2462	1.28	-42.79	≤-18.72	PASS

11B_Ant1_Low_2412



11B_Ant1_High_2462



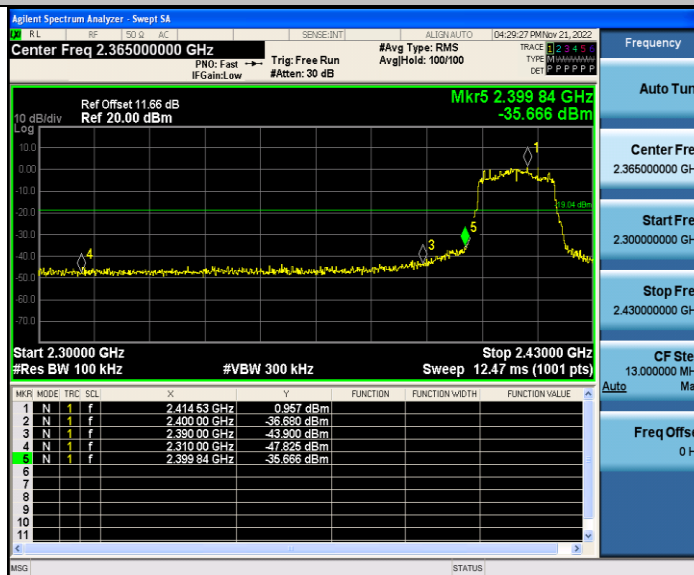
11G_Ant1_Low_2412



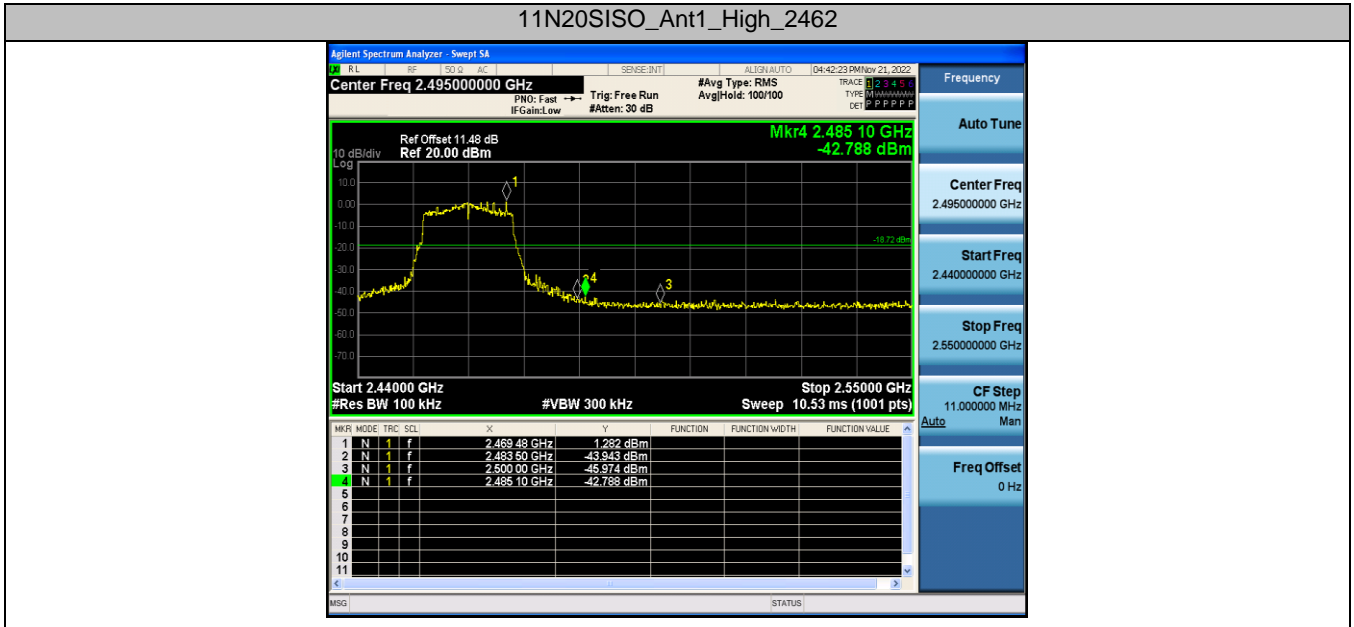
11G_Ant1_High_2462



11N20SISO_Ant1_Low_2412



11N20SISO_Ant1_High_2462



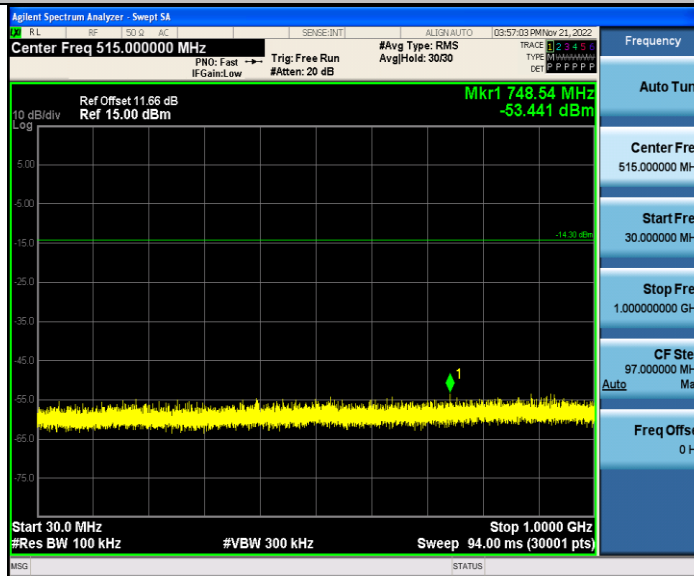
The data of entire corresponding spectrum:

TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	5.70	5.70	---	PASS
			30~1000	5.70	-53.44	≤-14.3	PASS
			1000~26500	5.70	-37.94	≤-14.3	PASS
		2437	Reference	5.17	5.17	---	PASS
			30~1000	5.17	-53.73	≤-14.83	PASS
			1000~26500	5.17	-37.96	≤-14.83	PASS
		2462	Reference	6.95	6.95	---	PASS
			30~1000	6.95	-53.71	≤-13.05	PASS
			1000~26500	6.95	-38.35	≤-13.05	PASS
11G	Ant1	2412	Reference	2.84	2.84	---	PASS
			30~1000	2.84	-53.98	≤-17.16	PASS
			1000~26500	2.84	-38.42	≤-17.16	PASS
		2437	Reference	3.09	3.09	---	PASS
			30~1000	3.09	-52.54	≤-16.91	PASS
			1000~26500	3.09	-38.54	≤-16.91	PASS
		2462	Reference	2.99	2.99	---	PASS
			30~1000	2.99	-54.04	≤-17.01	PASS
			1000~26500	2.99	-37.63	≤-17.01	PASS
11N20SISO	Ant1	2412	Reference	-0.50	-0.50	---	PASS
			30~1000	-0.50	-53.12	≤-20.5	PASS
			1000~26500	-0.50	-37.7	≤-20.5	PASS
		2437	Reference	-0.45	-0.45	---	PASS
			30~1000	-0.45	-53.78	≤-20.45	PASS
			1000~26500	-0.45	-37.48	≤-20.45	PASS
		2462	Reference	-0.10	-0.10	---	PASS
			30~1000	-0.10	-52.98	≤-20.1	PASS
			1000~26500	-0.10	-38.02	≤-20.1	PASS

11B_Ant1_2412_0~Reference



11B_Ant1_2412_30~1000



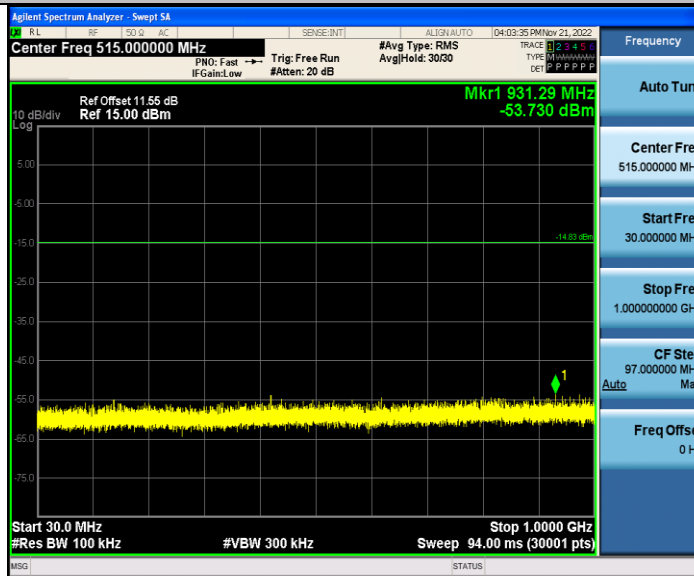
11B_Ant1_2412_1000~26500



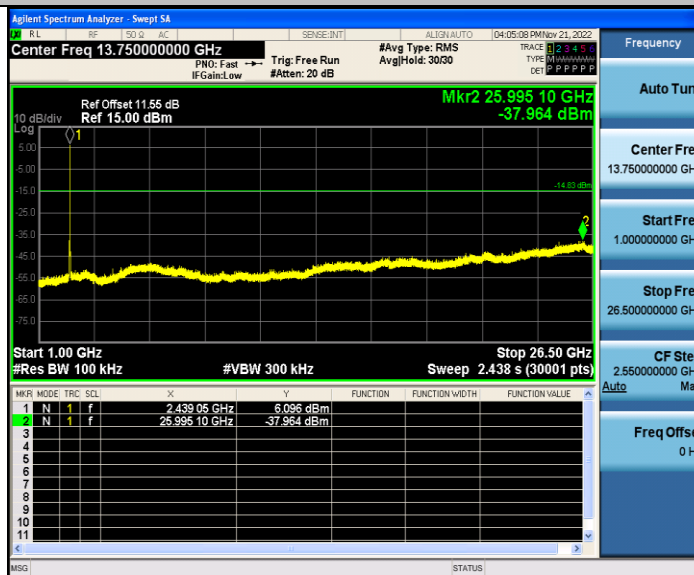
11B_Ant1_2437_0~Reference



11B_Ant1_2437_30~1000



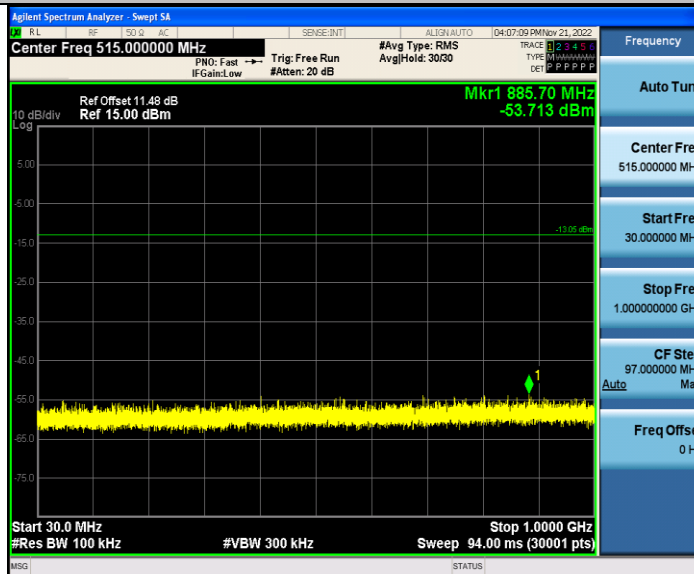
11B_Ant1_2437_1000~26500



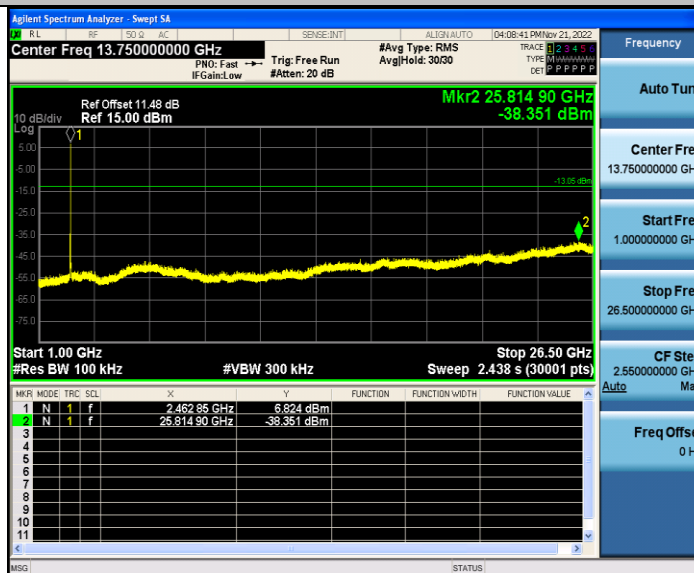
11B_Ant1_2462_0~Reference



11B_Ant1_2462_30~1000



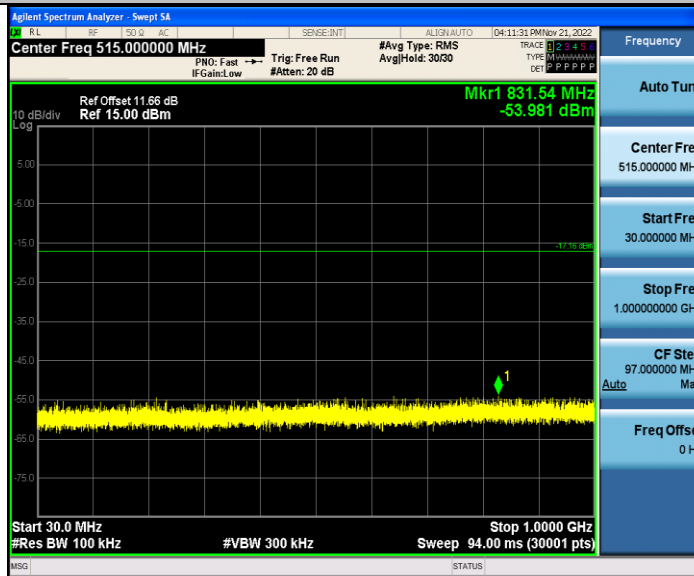
11B_Ant1_2462_1000~26500



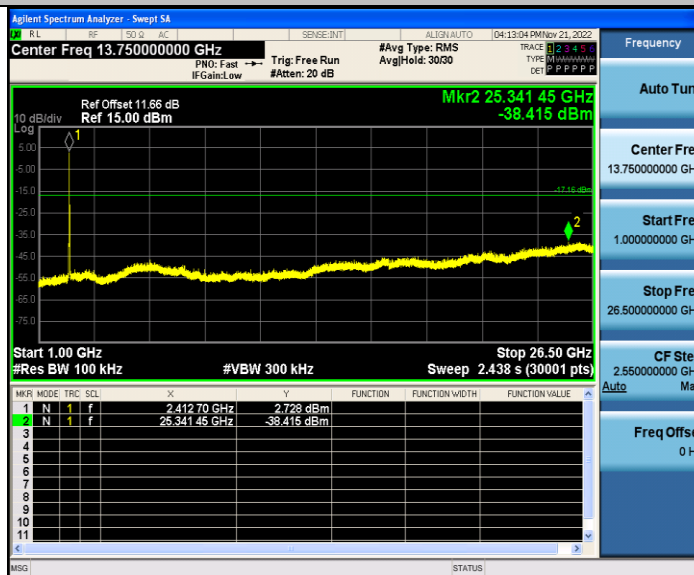
11G_Ant1_2412_0~Reference



11G_Ant1_2412_30~1000



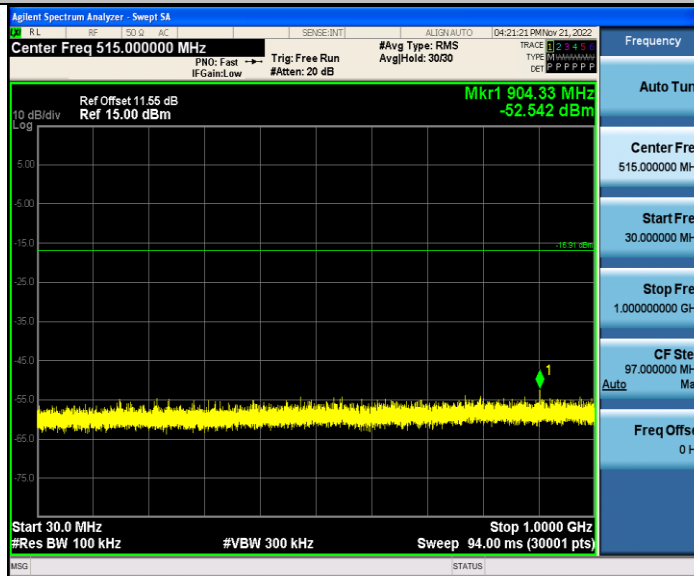
11G_Ant1_2412_1000~26500



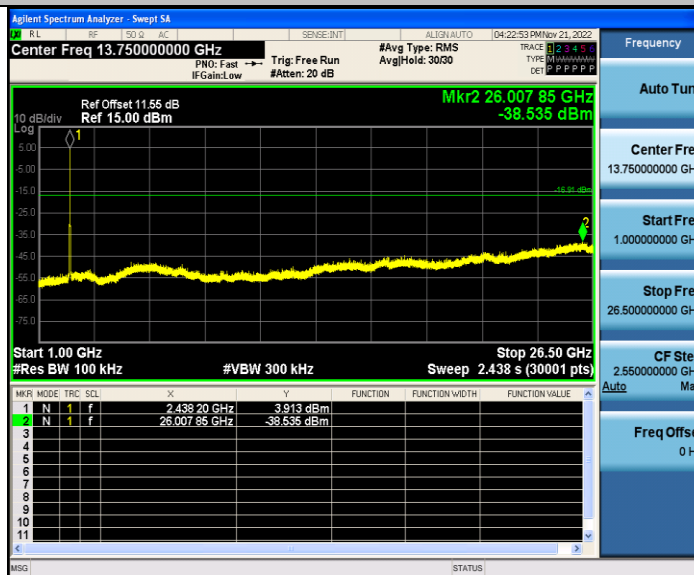
11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000



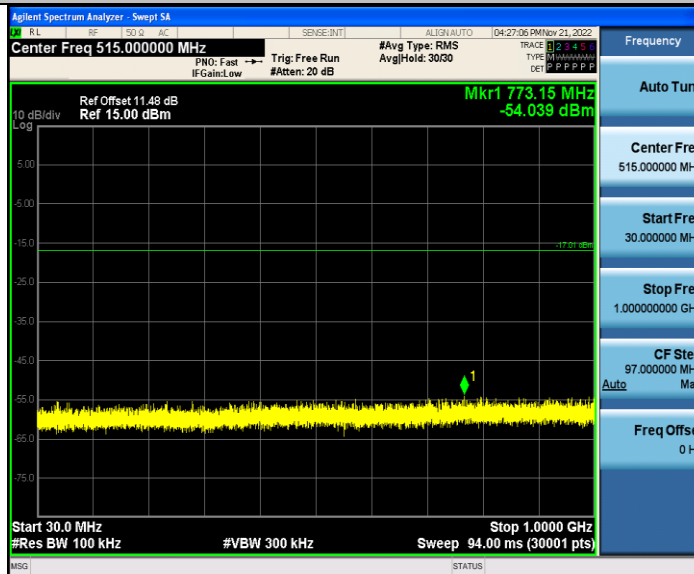
11G_Ant1_2437_1000~26500



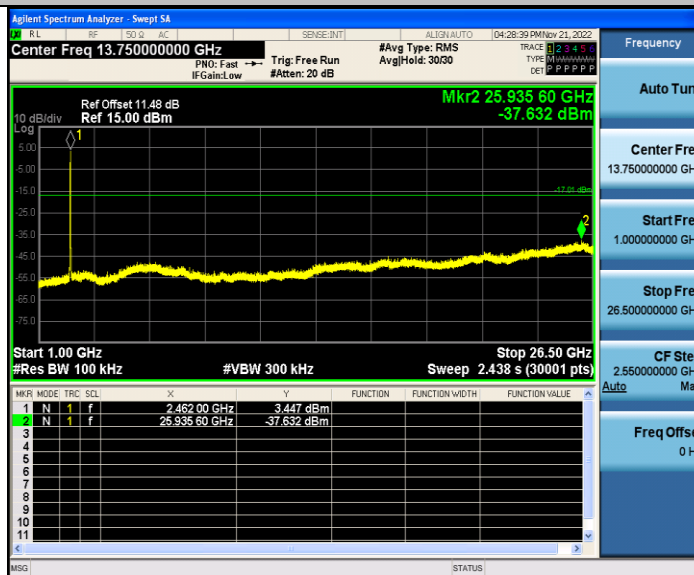
11G_Ant1_2462_0~Reference



11G_Ant1_2462_30~1000



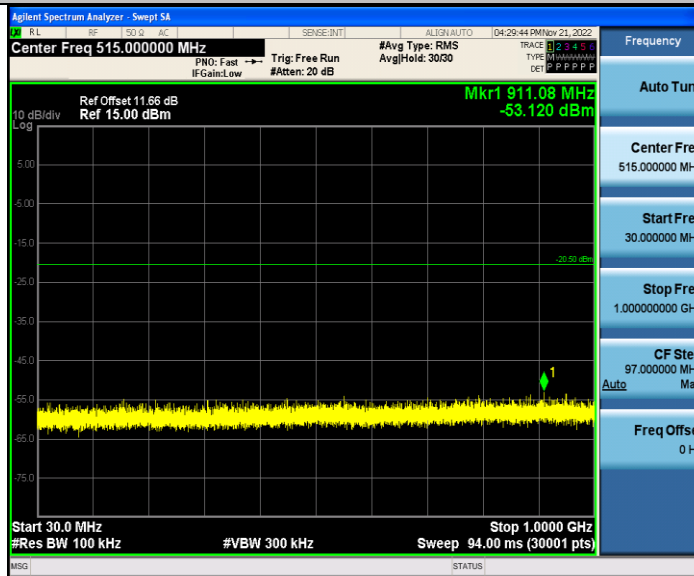
11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_0~Reference



11N20SISO_Ant1_2412_30~1000



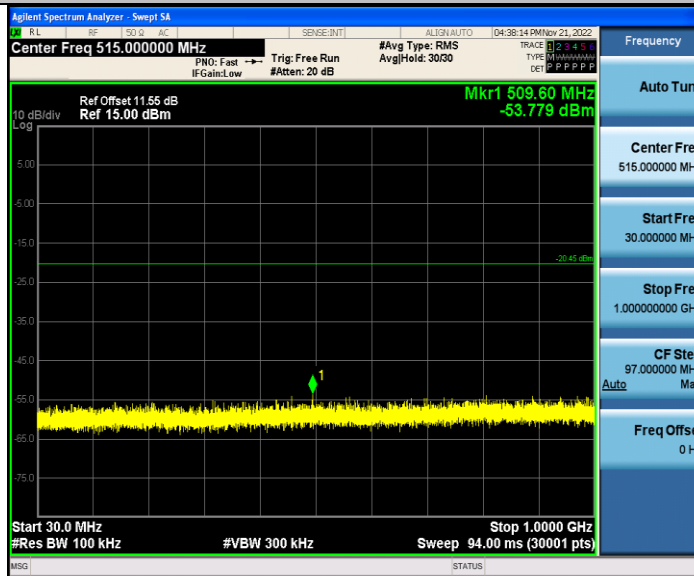
11N20SISO_Ant1_2412_1000~26500



11N20SISO_Ant1_2437_0~Reference



11N20SISO_Ant1_2437_30~1000



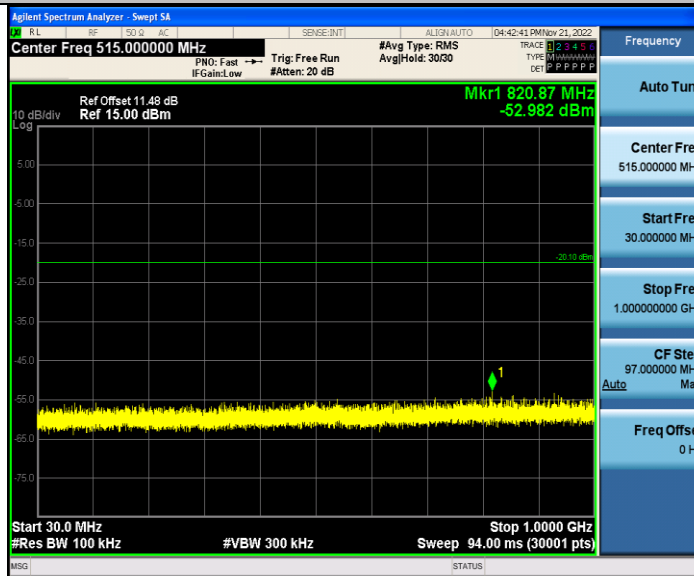
11N20SISO_Ant1_2437_1000~26500



11N20SISO_Ant1_2462_0~Reference



11N20SISO_Ant1_2462_30~1000

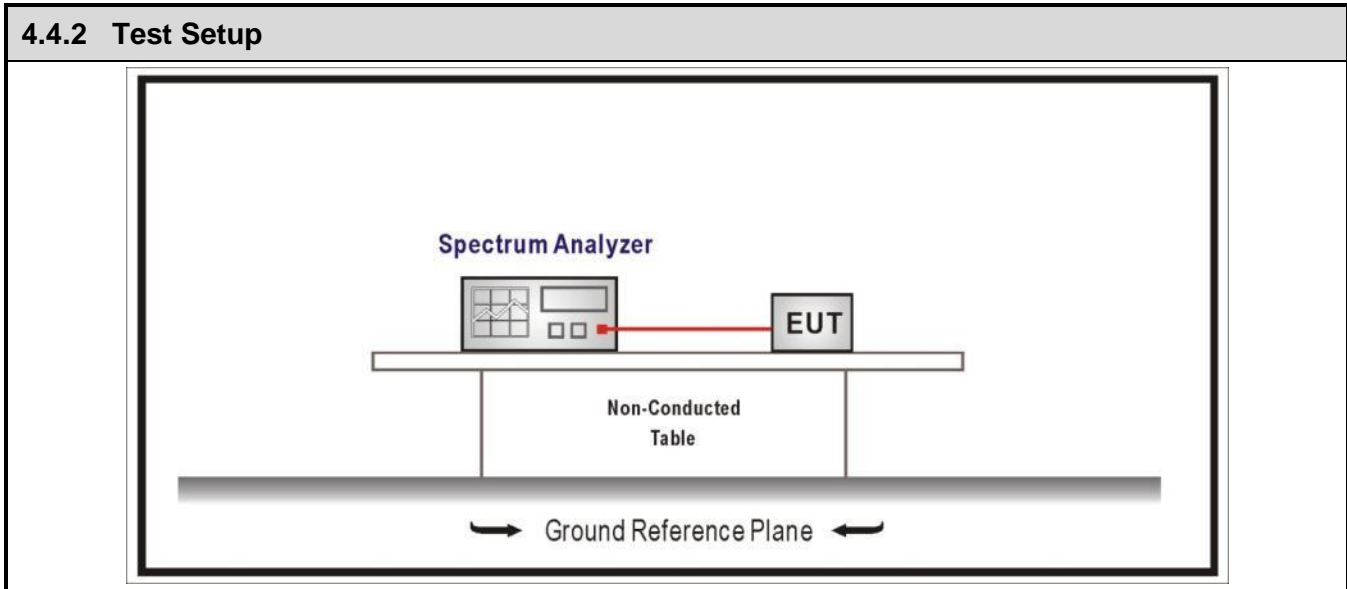


11N20SISO_Ant1_2462_1000~26500



4.4 Duty cycle	VERDICT: PASS
-----------------------	----------------------

4.4.1 Limit
N/A



4.4.3 Test Procedure

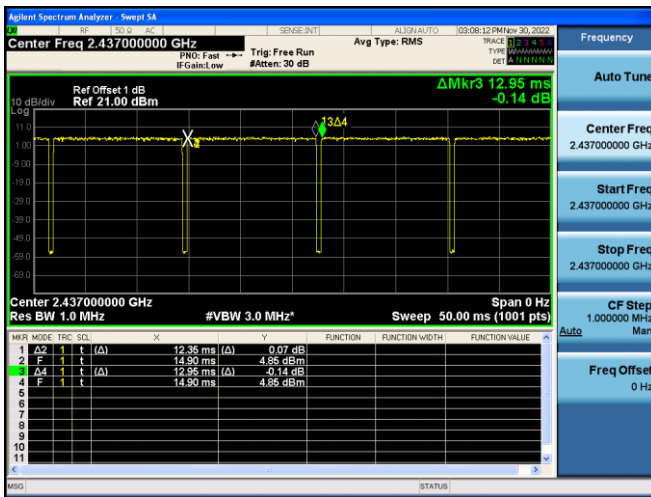
References Rule	Chapter	Description
<input checked="" type="checkbox"/> ANSI C63.10	11.6	Duty cycle (D), transmission duration (T), and maximum power control level

4.4.4 Test Data

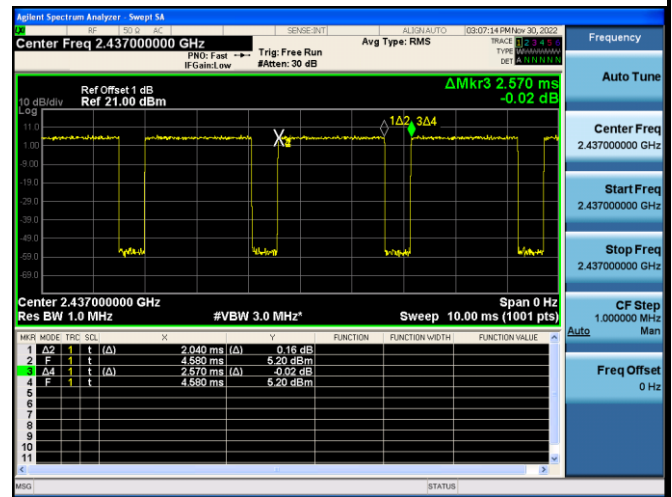
Test Mode	Tx On (ms)	VBW (Hz)	Tx On + Tx Off (ms)	Duty Cycle (%)
Mode 1	12.35	0.08	12.95	95.37%
Mode 2	2.04	0.49	2.57	79.38%
Mode 3	1.90	0.53	2.42	78.51%

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.

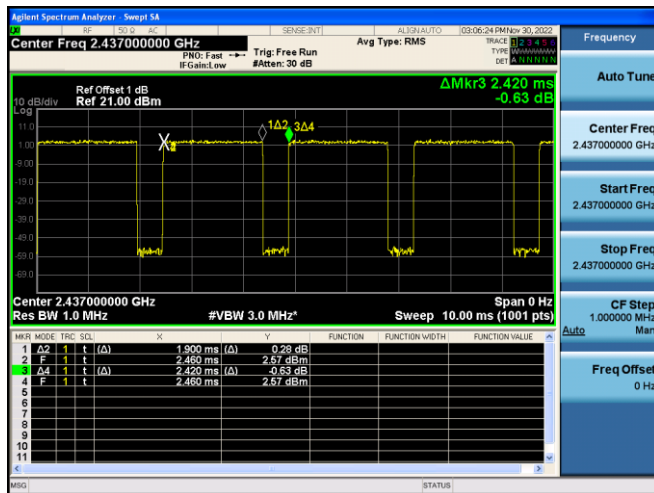
Mode 1 2437MHz



Mode 2 2437MHz



Mode 3 2437MHz



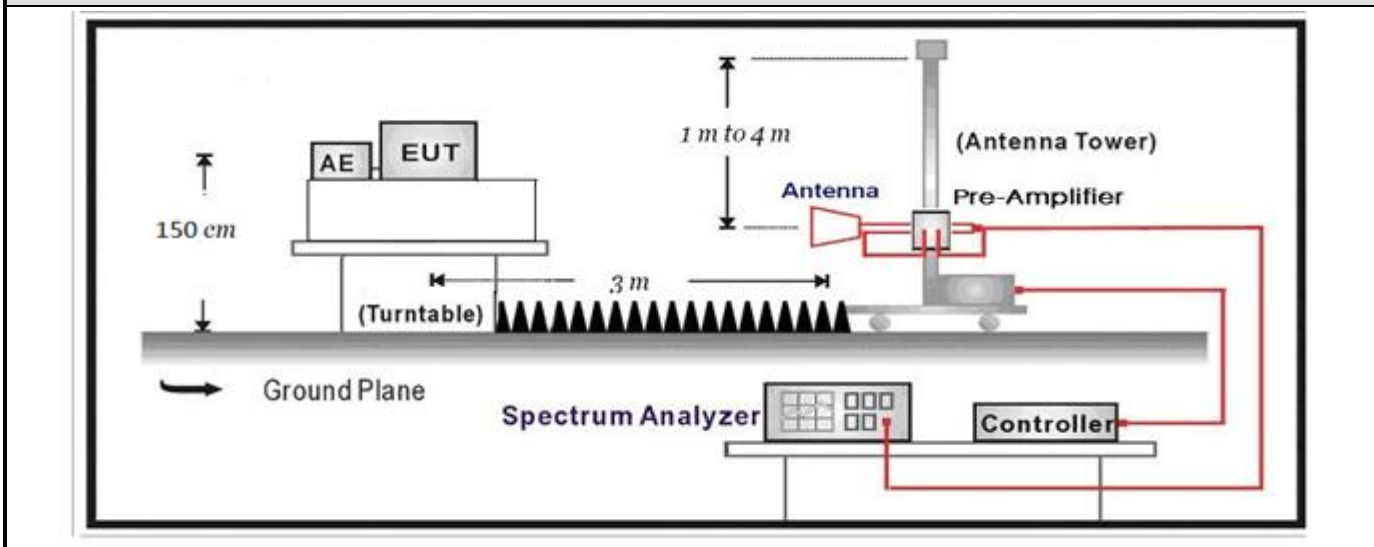
4.5 Radiated Emission Band Edge	VERDICT: PASS
--	----------------------

4.5.1 Limit				
Standard	FCC Part 15 Subpart C Paragraph 15.247(d) , 15.205, 15.209			
Frequency bands (MHz)	Detector	Limit (dBµV/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

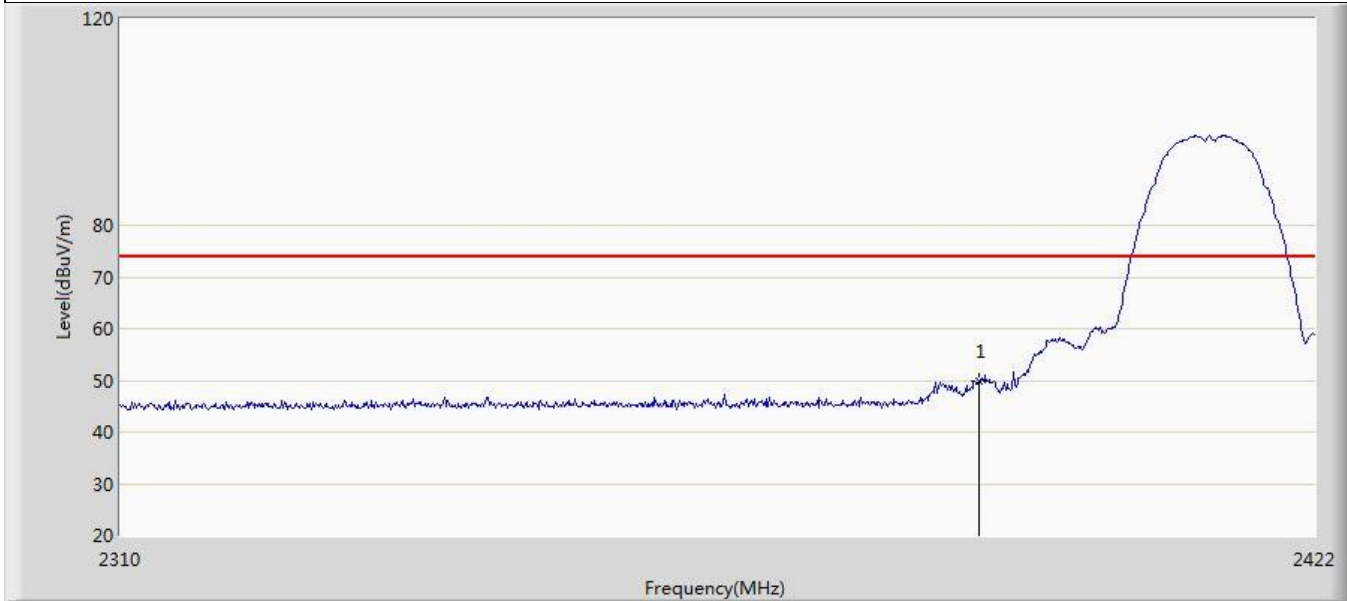
Above 1GHz Test Setup:



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	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	6.3	Radiated spurious emission test
<input type="checkbox"/>	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
<input 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

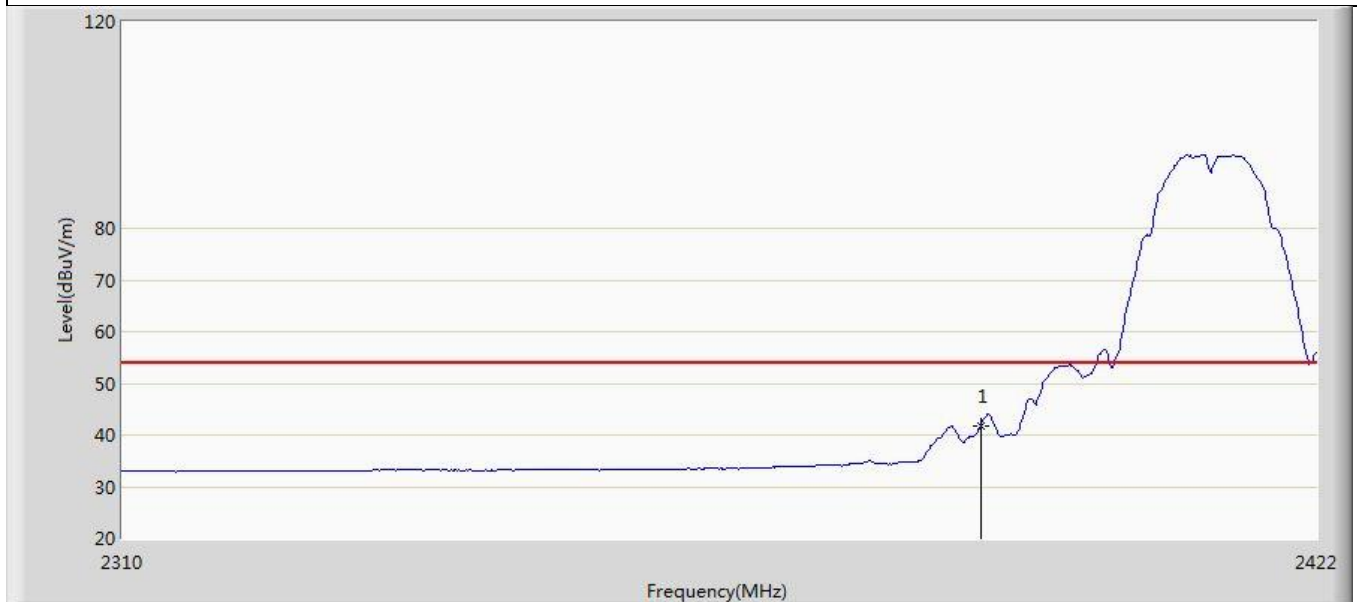
4.5.4 Test Data

Profile: 22A0738R	Page No.: 1
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 00:46
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2412MHz by 11b	



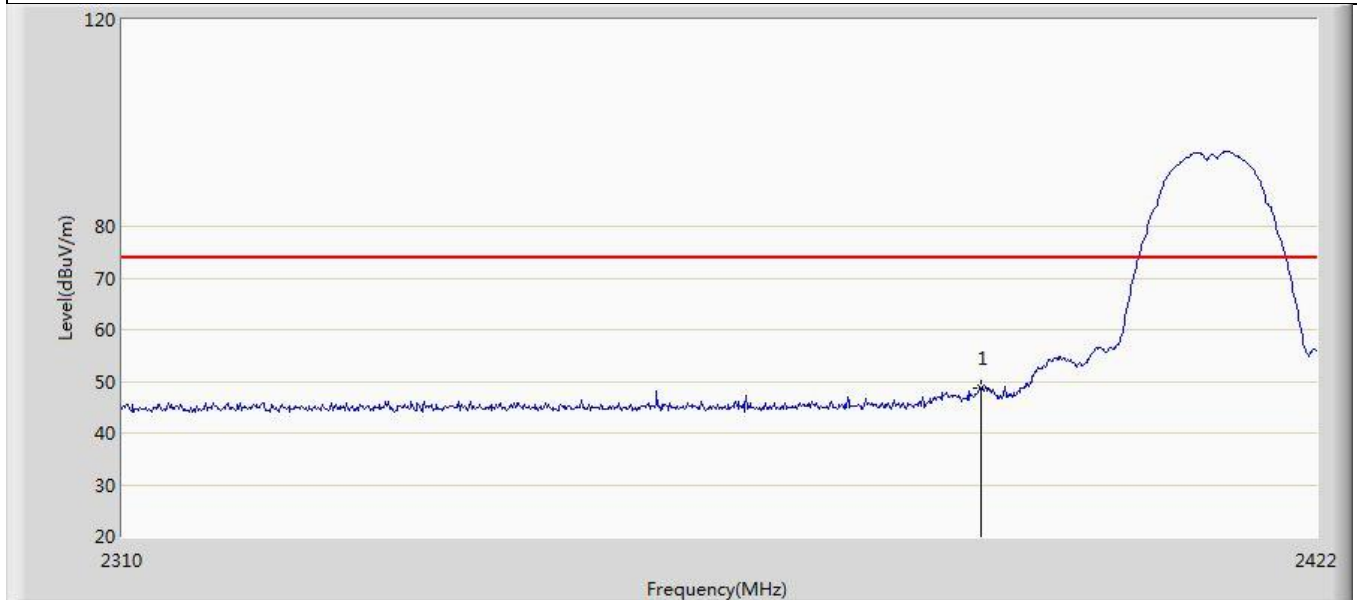
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	49.878	15.794	-24.122	74.000	34.084	PK

Profile: 22A0738R	Page No.: 2
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 00:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2412MHz by 11b	



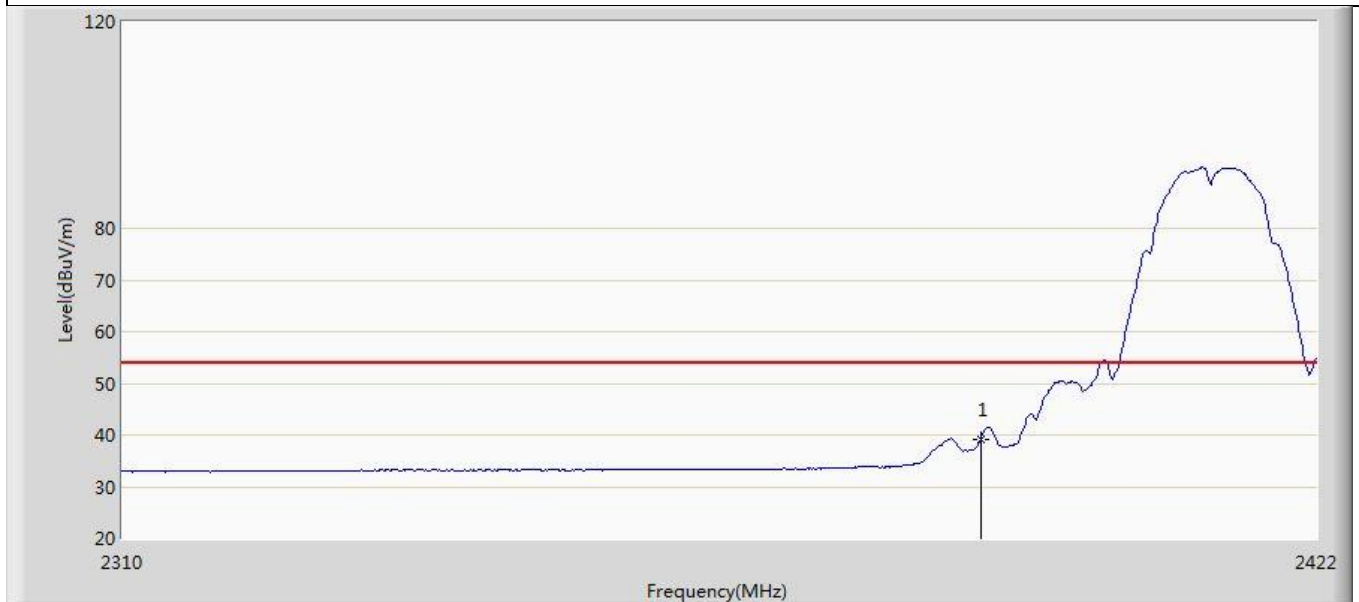
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	41.696	7.612	-12.304	54.000	34.084	AV

Profile: 22A0738R	Page No.: 3
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 00:56
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2412MHz by 11b	



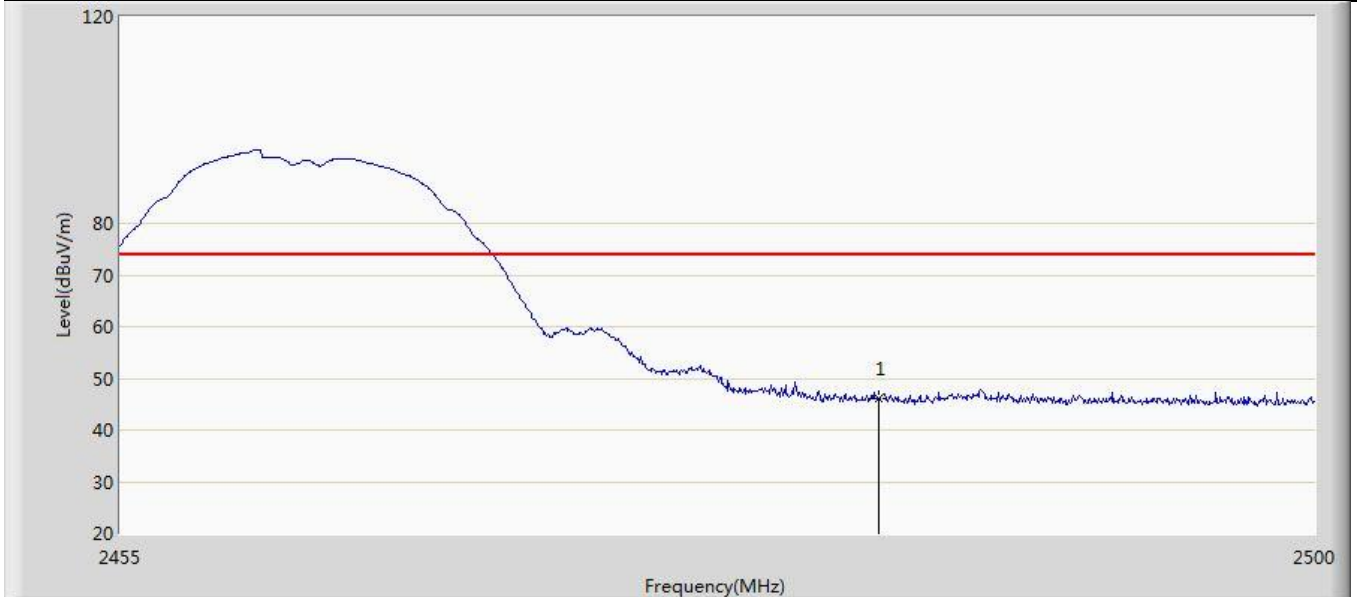
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	48.570	14.486	-25.430	74.000	34.084	PK

Profile: 22A0738R	Page No.: 4
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 00:57
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2412MHz by 11b	



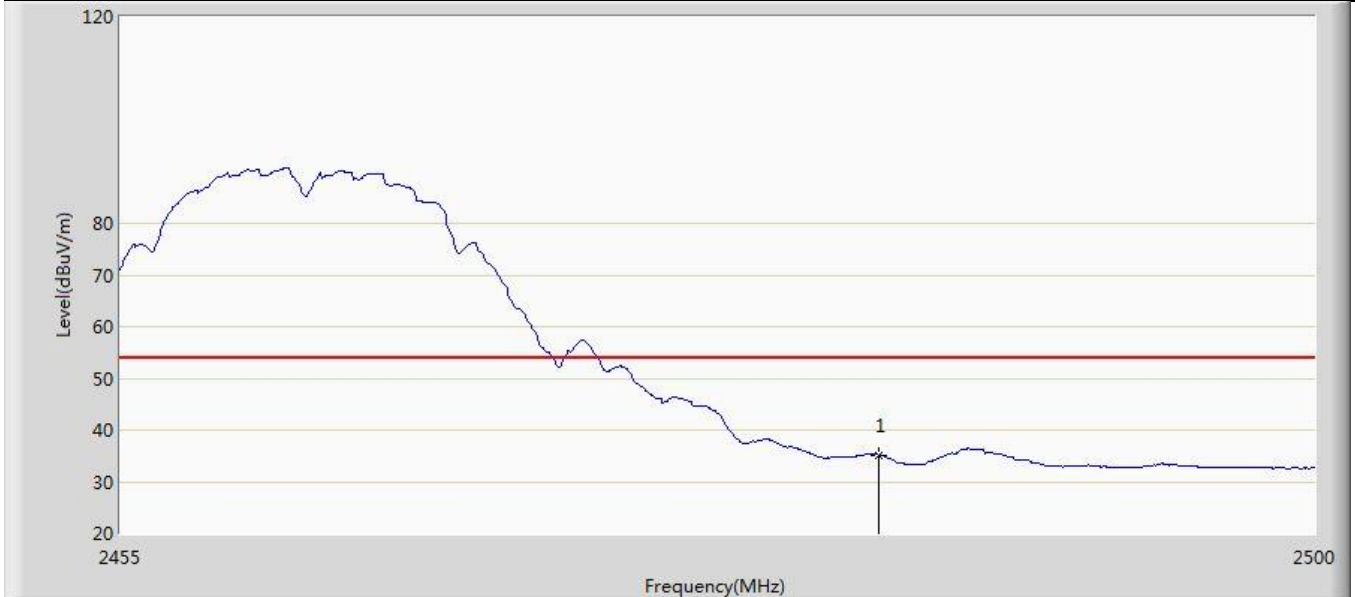
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	39.130	5.046	-14.870	54.000	34.084	AV

Profile: 22A0738R	Page No.: 5
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2462MHz by 11b	



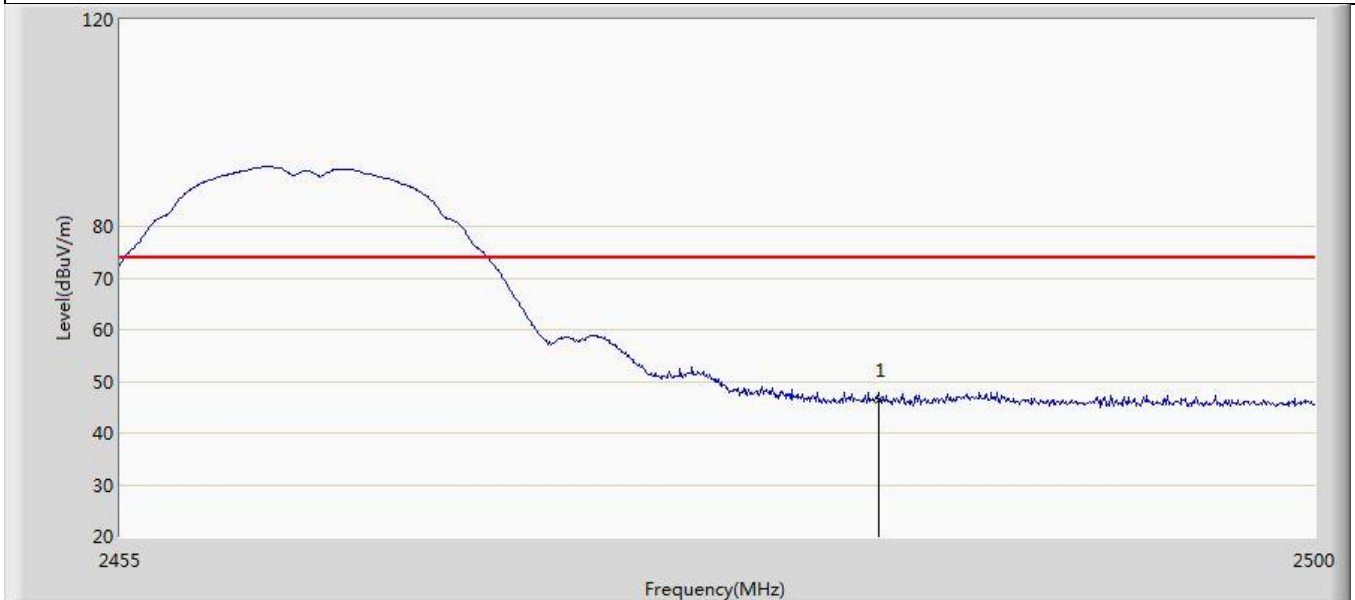
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	45.944	11.453	-28.056	74.000	34.491	PK

Profile: 22A0738R	Page No.: 6
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:06
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2462MHz by 11b	



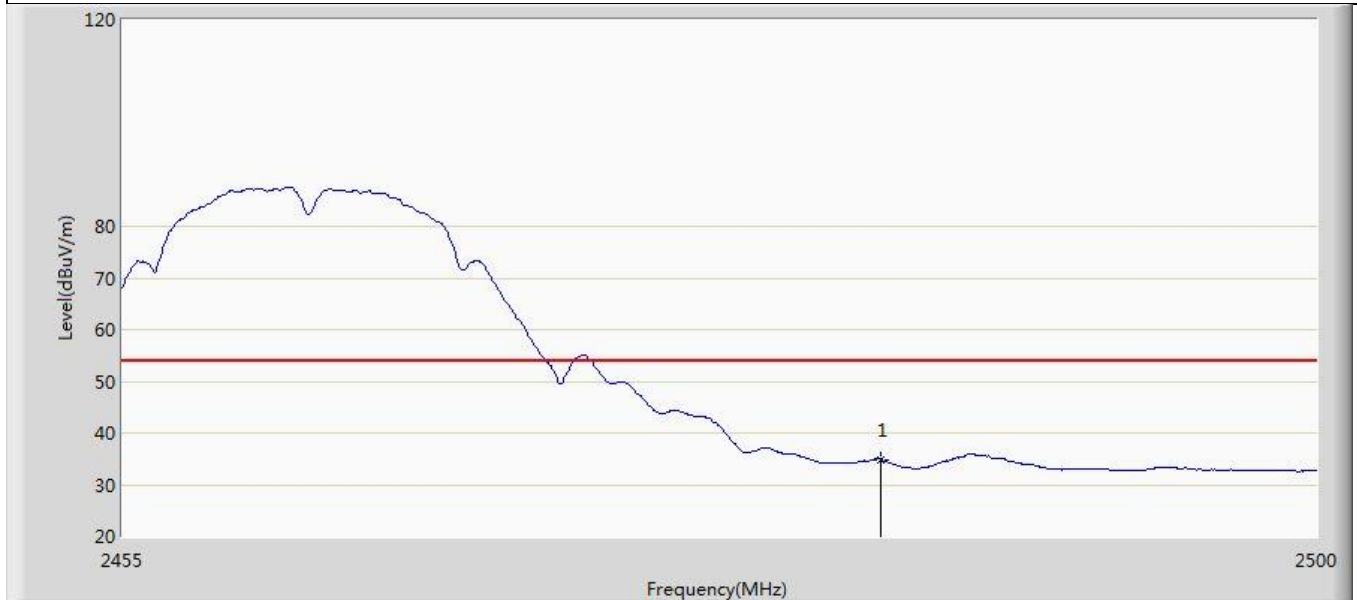
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	35.188	0.697	-18.812	54.000	34.491	AV

Profile: 22A0738R	Page No.: 7
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2462MHz by 11b	



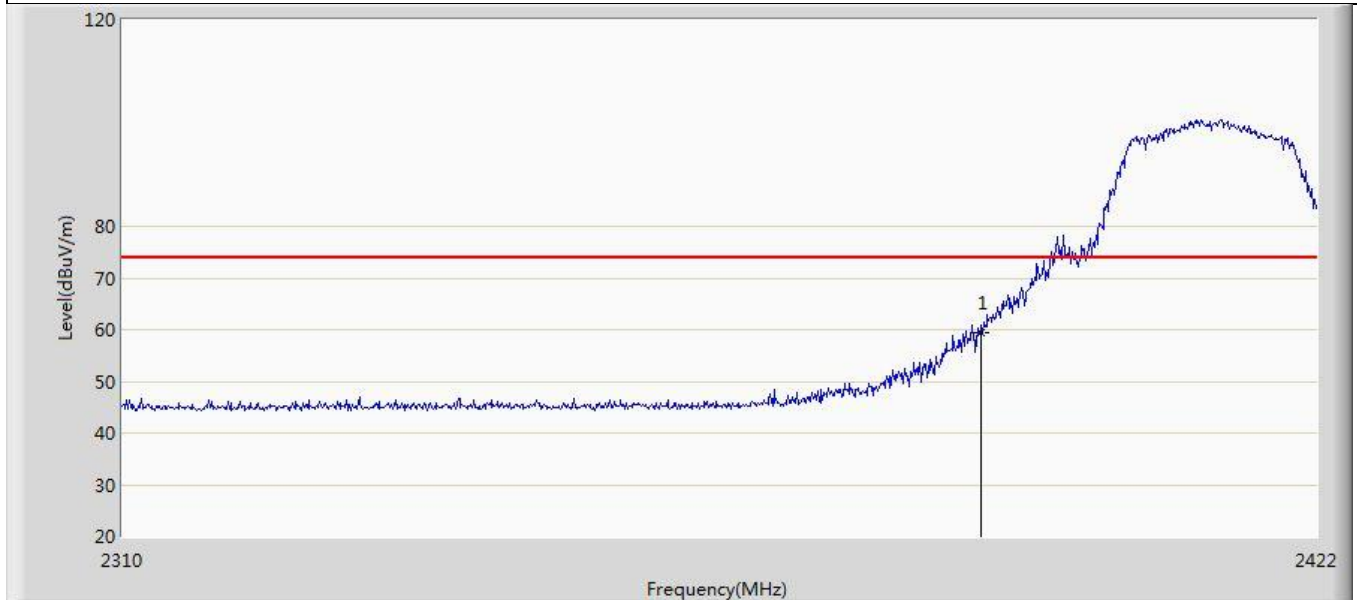
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	46.424	11.933	-27.576	74.000	34.491	PK

Profile: 22A0738R	Page No.: 8
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode1:Transmit at 2462MHz by 11b	



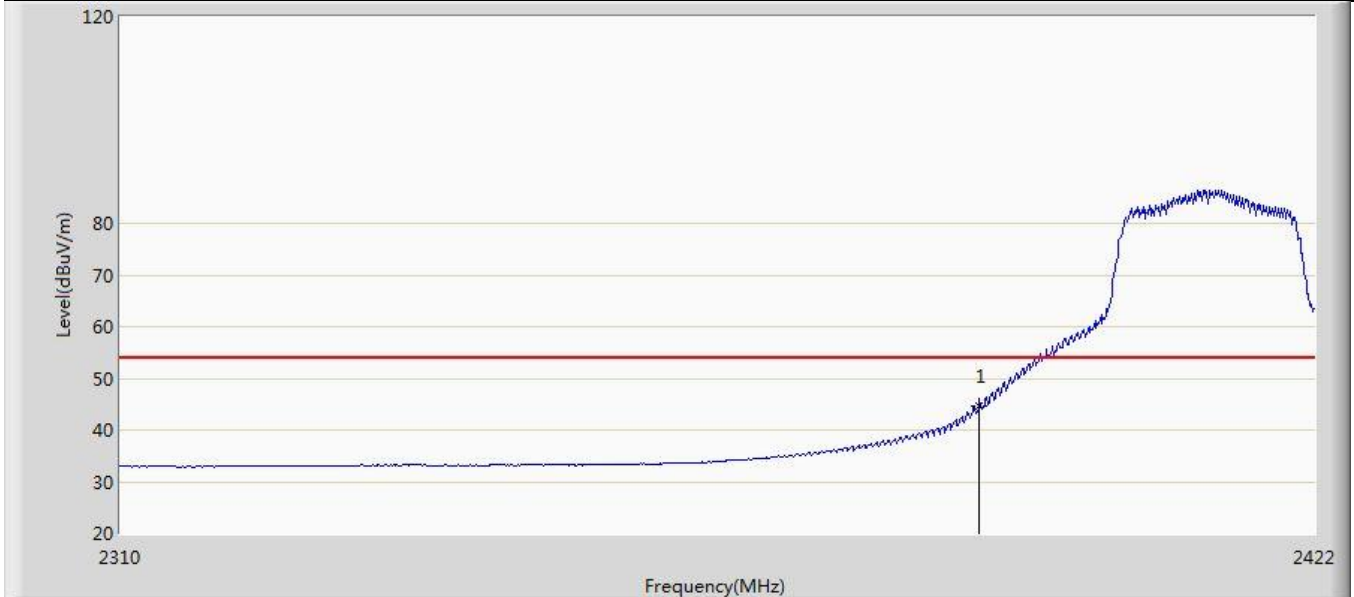
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	34.926	0.435	-19.074	54.000	34.491	AV

Profile: 22A0738R	Page No.: 9
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:11
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2: Transmit at 2412MHz by 11g	



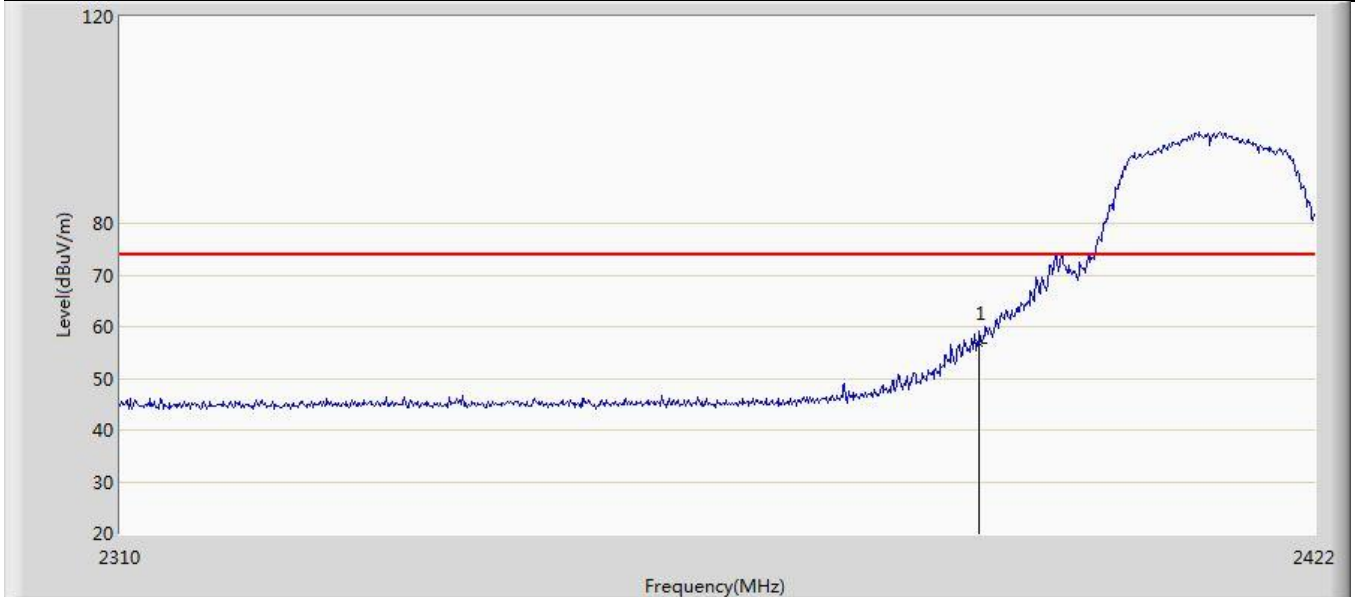
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	59.412	25.328	-14.588	74.000	34.084	PK

Profile: 22A0738R	Page No.: 10
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2: Transmit at 2412MHz by 11g	



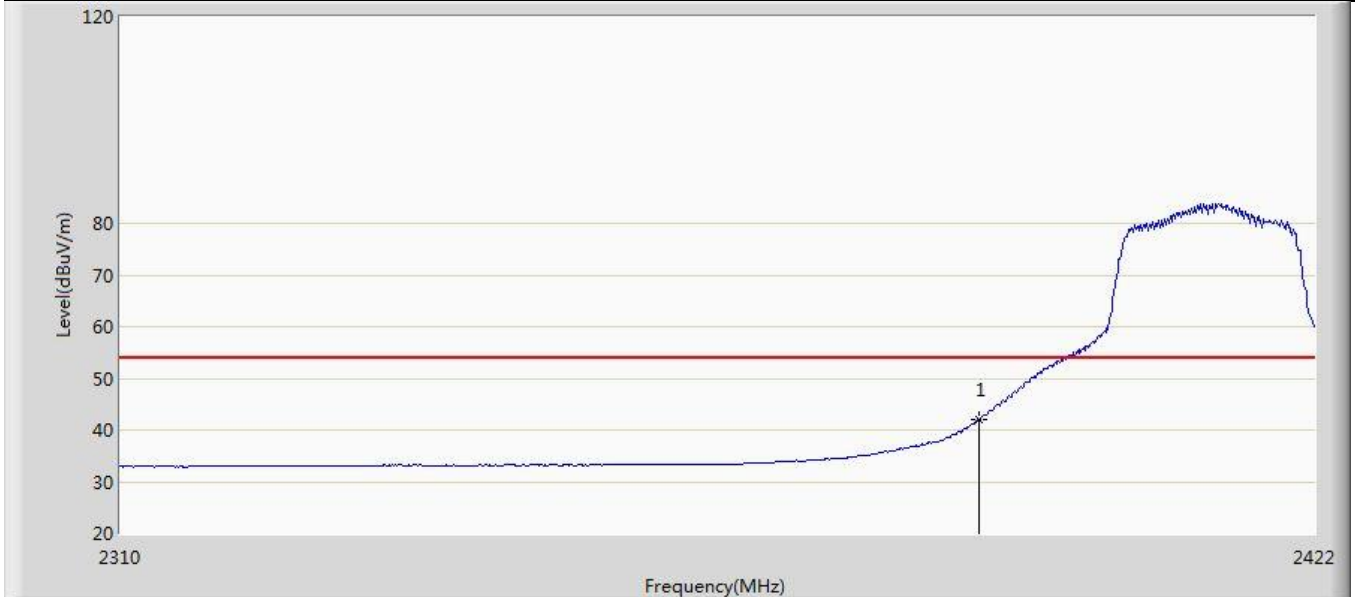
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	44.690	10.606	-9.310	54.000	34.084	AV

Profile: 22A0738R	Page No.: 11
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:15
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2: Transmit at 2412MHz by 11g	



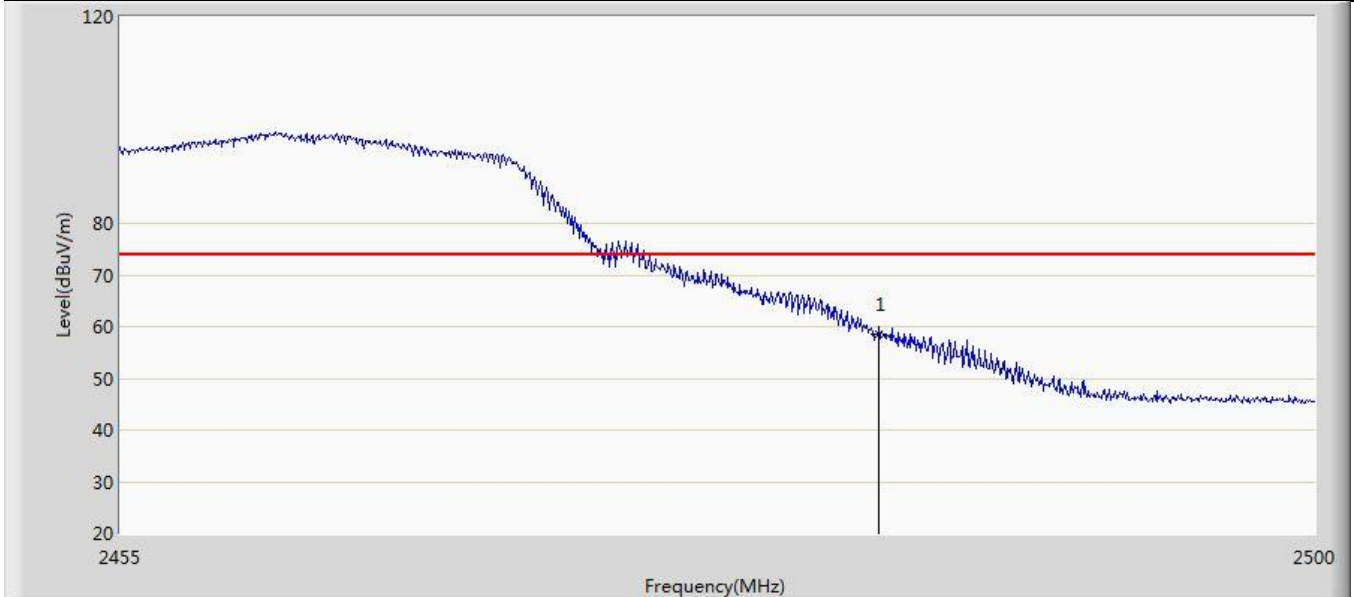
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	56.689	22.605	-17.311	74.000	34.084	PK

Profile: 22A0738R	Page No.: 12
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2: Transmit at 2412MHz by 11g	



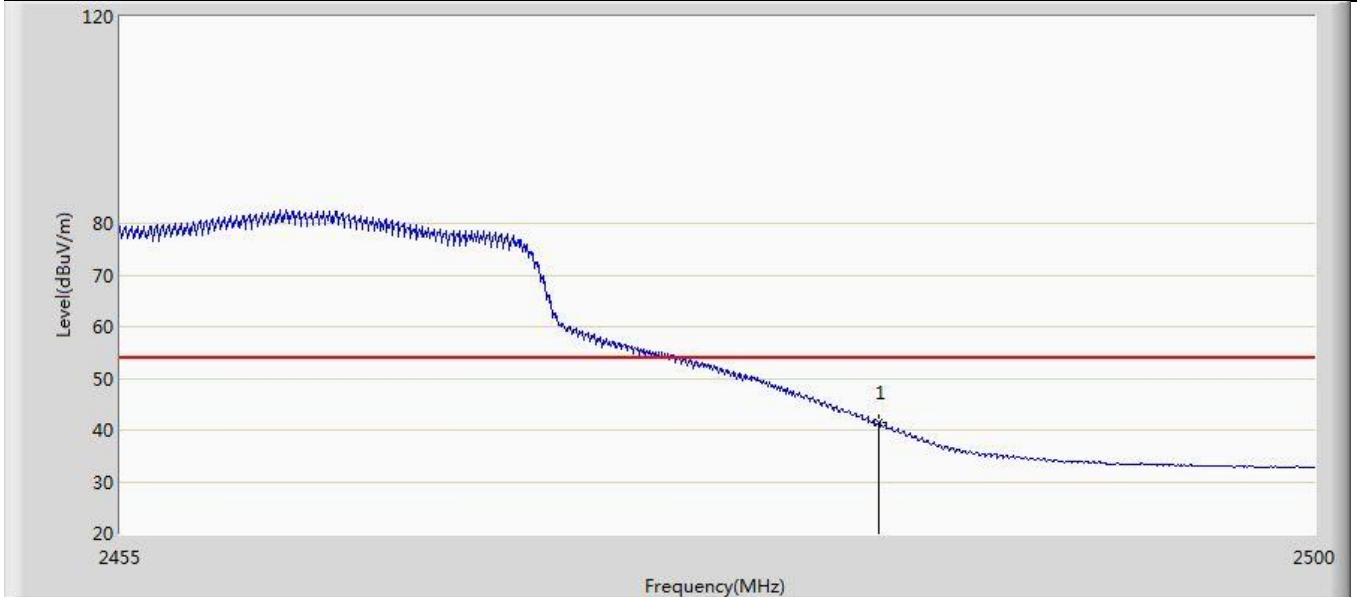
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	42.063	7.979	-11.937	54.000	34.084	AV

Profile: 22A0738R	Page No.: 13
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:19
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2:Transmit at 2462MHz by 11g	



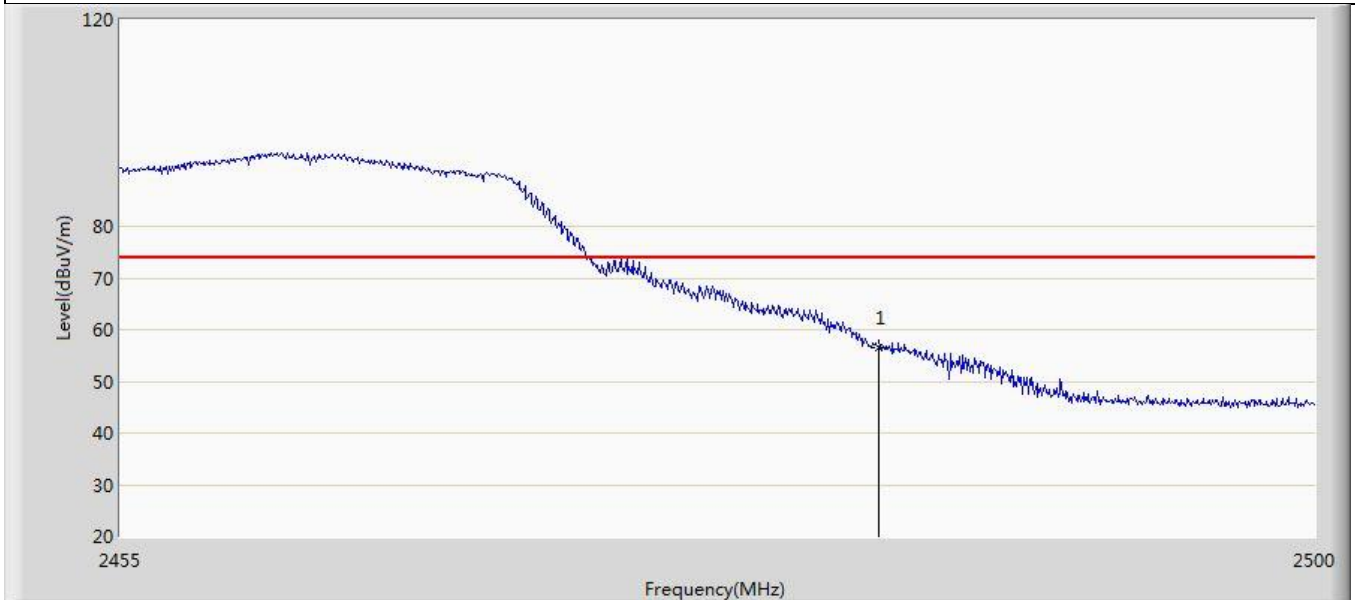
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	58.668	24.177	-15.332	74.000	34.491	PK

Profile: 22A0738R	Page No.: 14
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:22
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2: Transmit at 2462MHz by 11g	



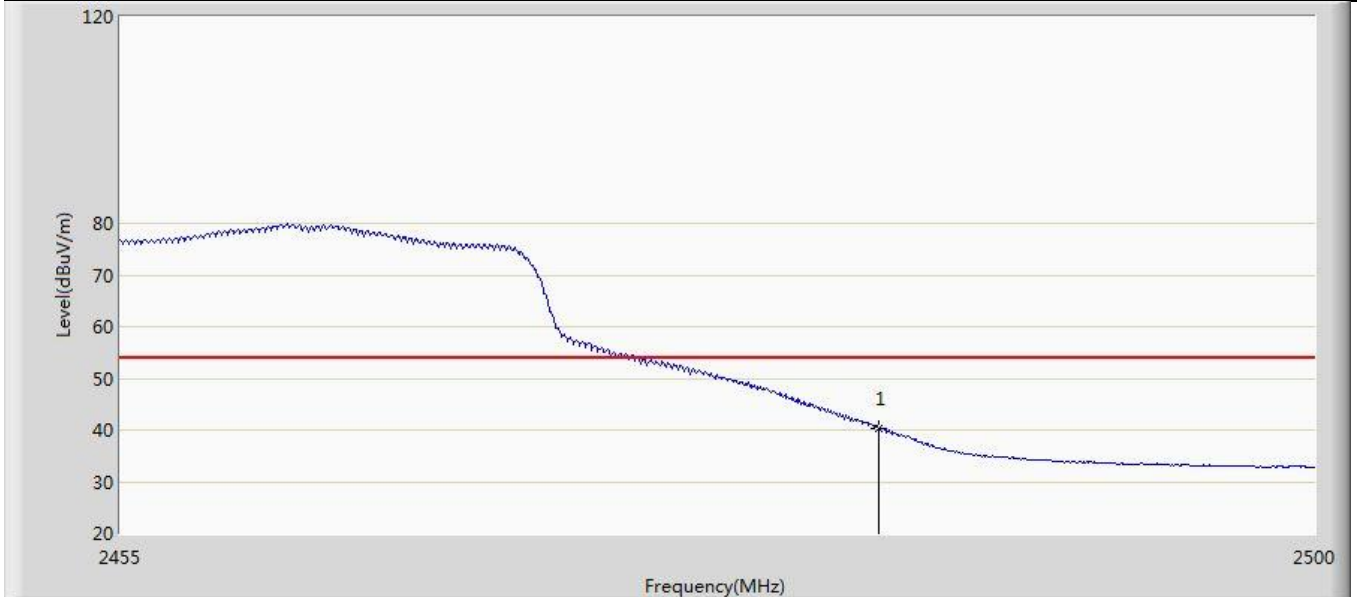
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	41.503	7.012	-12.497	54.000	34.491	AV

Profile: 22A0738R	Page No.: 15
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2: Transmit at 2462MHz by 11g	



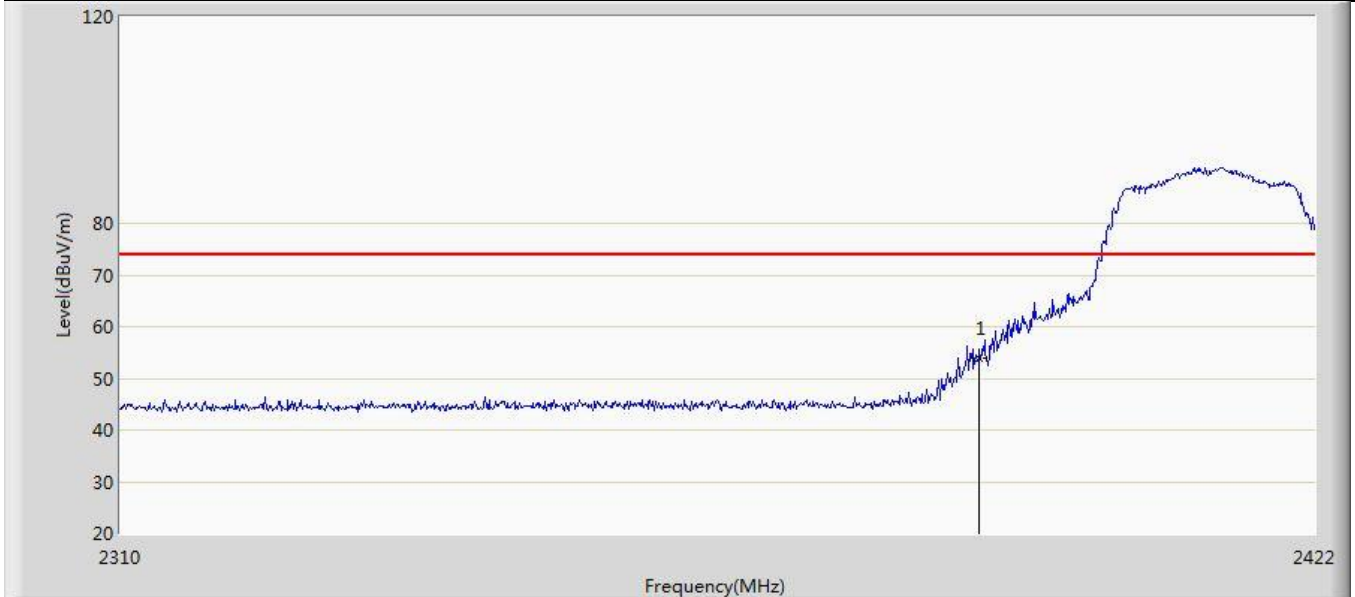
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	56.654	22.163	-17.346	74.000	34.491	PK

Profile: 22A0738R	Page No.: 16
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:25
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode2: Transmit at 2462MHz by 11g	



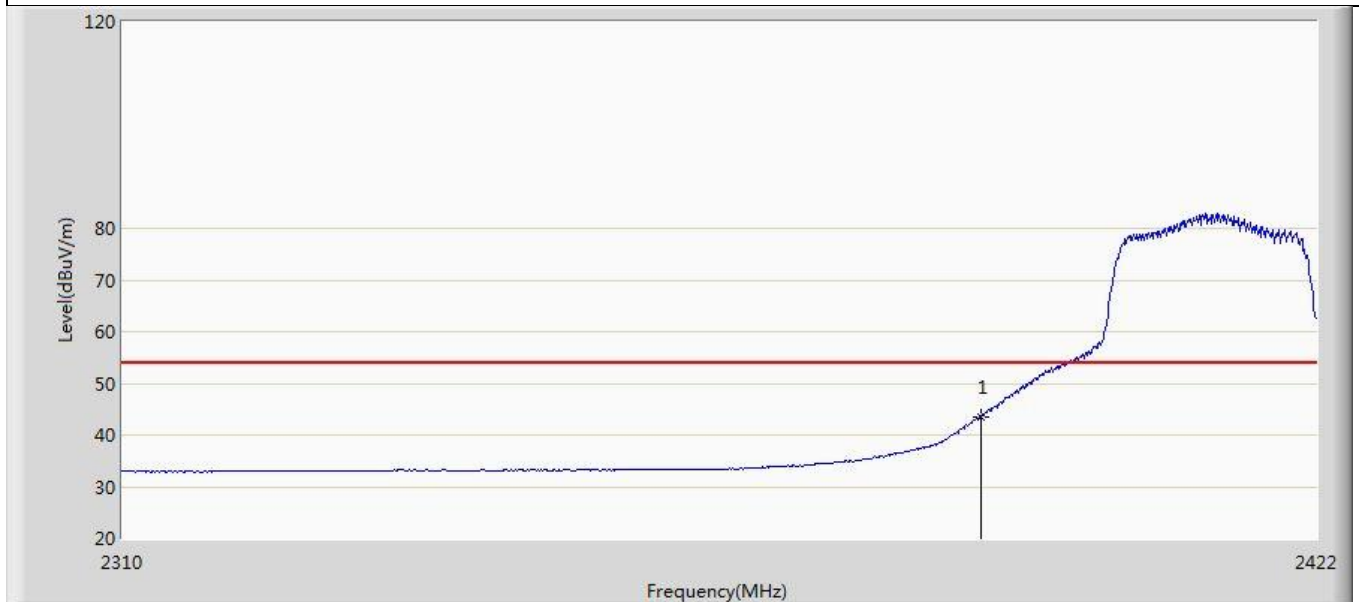
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	40.361	5.870	-13.639	54.000	34.491	AV

Profile: 22A0738R	Page No.: 17
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:27
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3: Transmit at 2412MHz by 11n20	



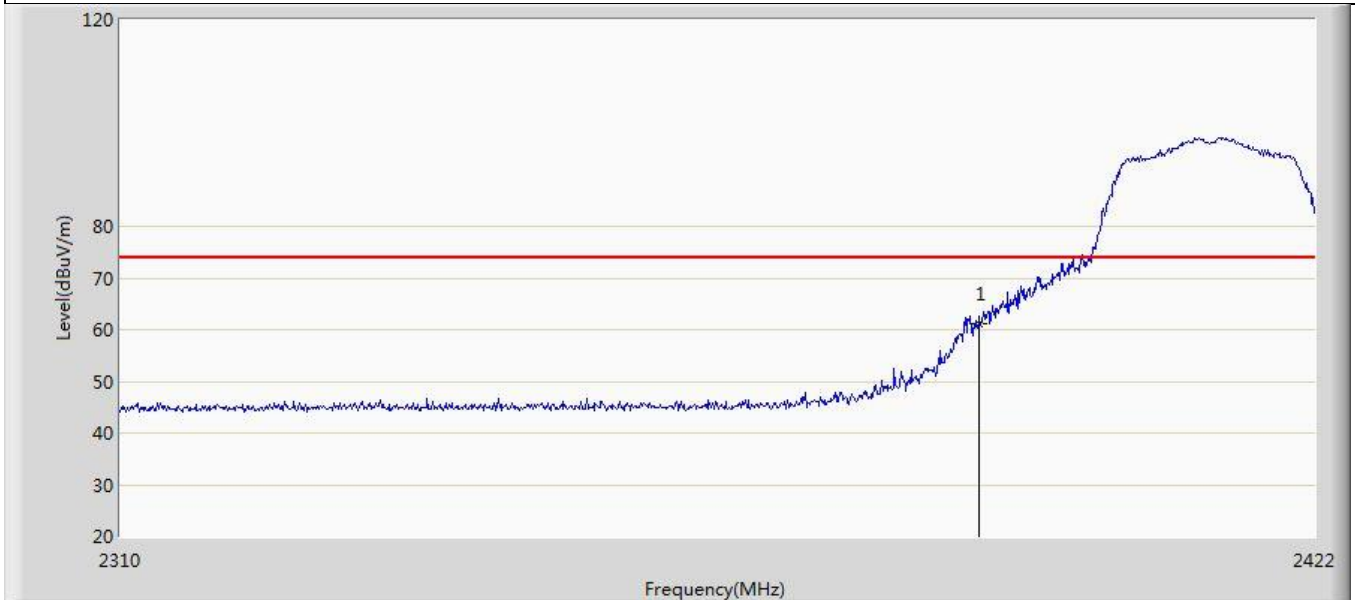
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	53.892	19.808	-20.108	74.000	34.084	PK

Profile: 22A0738R	Page No.: 18
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:30
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3: Transmit at 2412MHz by 11n20	



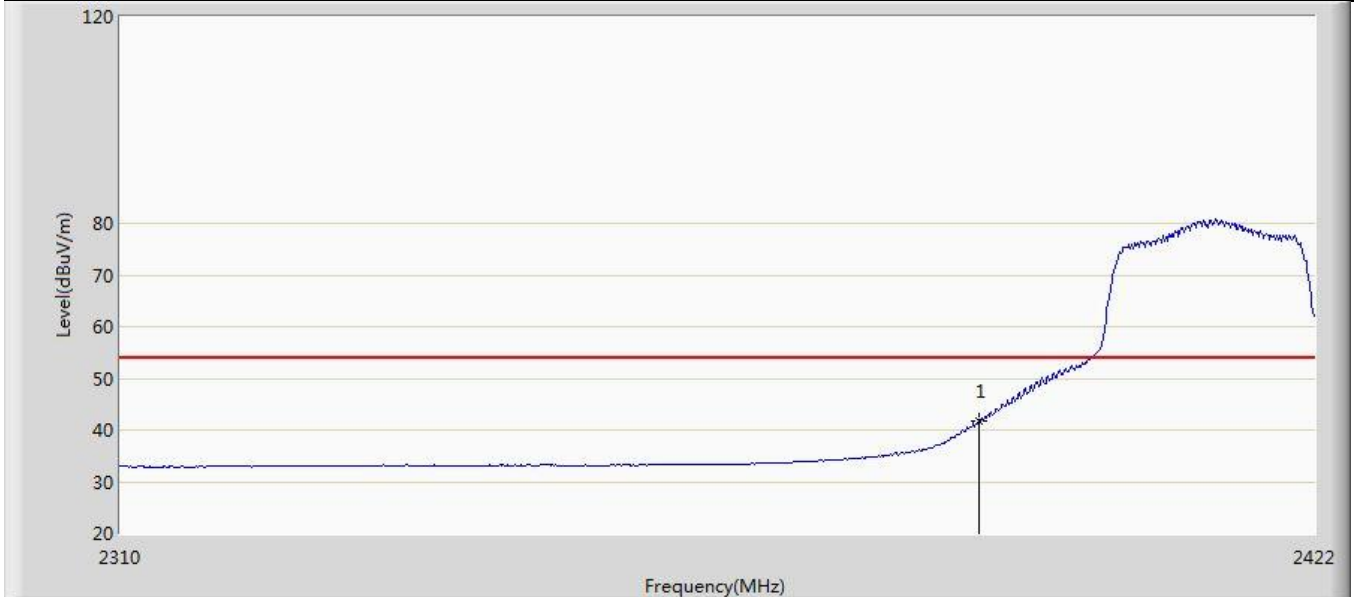
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	43.587	9.503	-10.413	54.000	34.084	AV

Profile: 22A0738R	Page No.: 19
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3: Transmit at 2412MHz by 11n20	



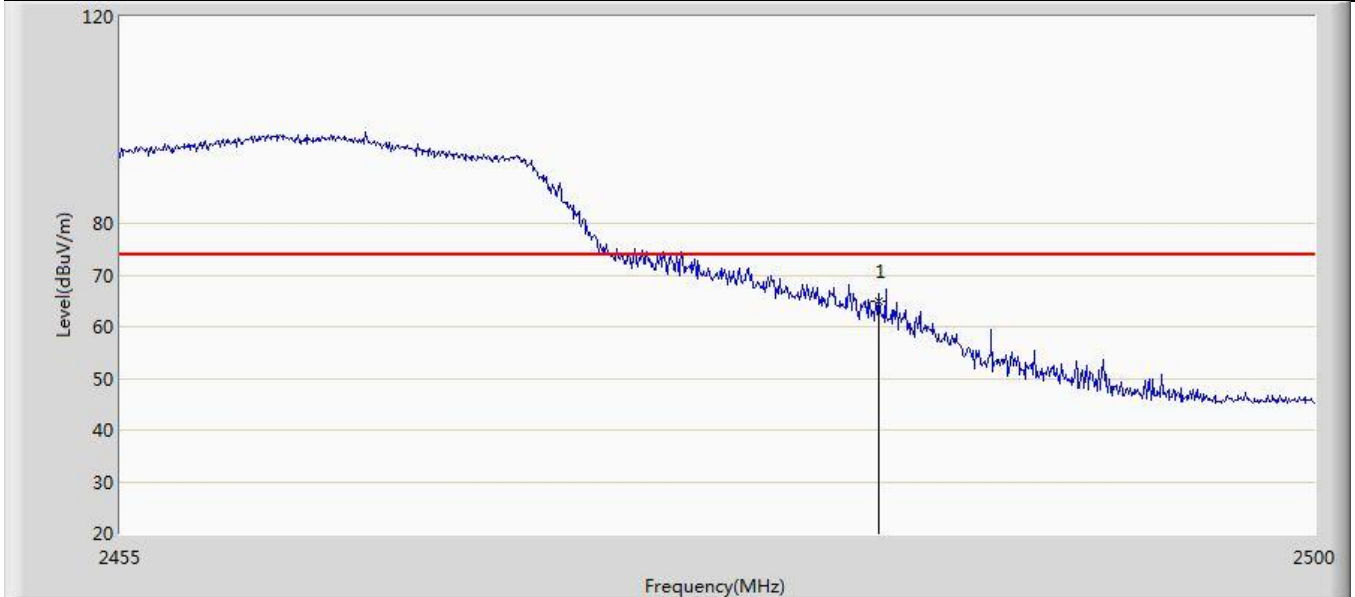
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	61.239	27.155	-12.761	74.000	34.084	PK

Profile: 22A0738R	Page No.: 20
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3: Transmit at 2412MHz by 11n20	



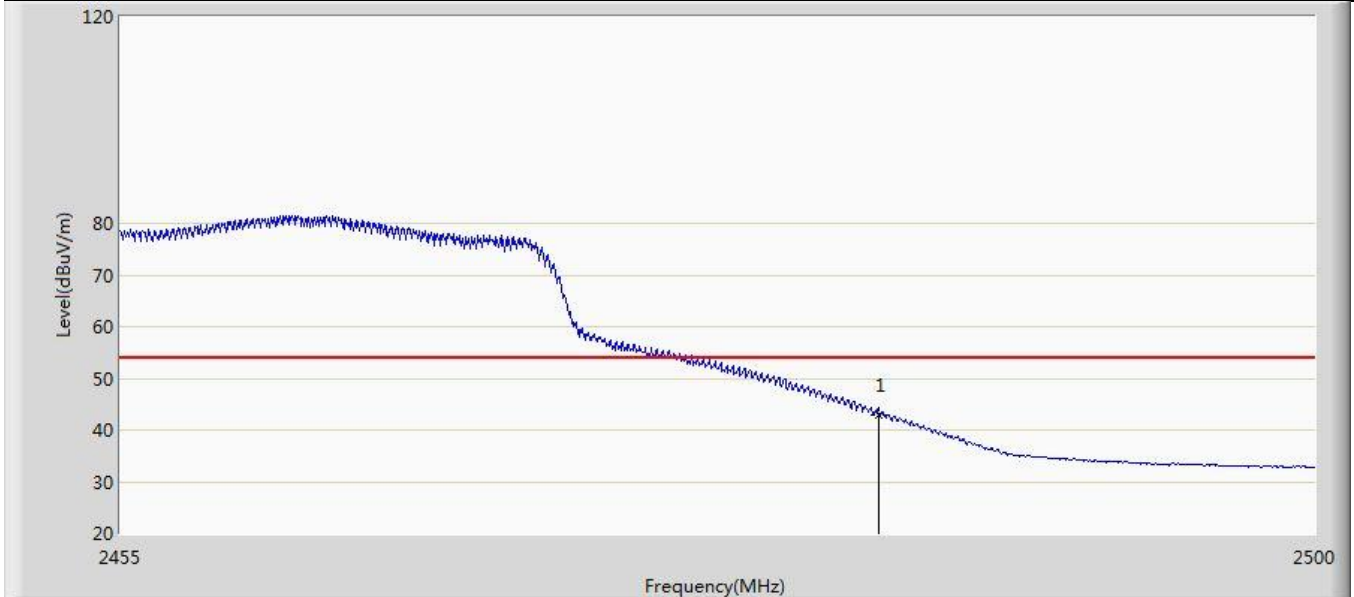
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2390.000	41.777	7.693	-12.223	54.000	34.084	AV

Profile: 22A0738R	Page No.: 21
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:35
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3: Transmit at 2462MHz by 11n20	



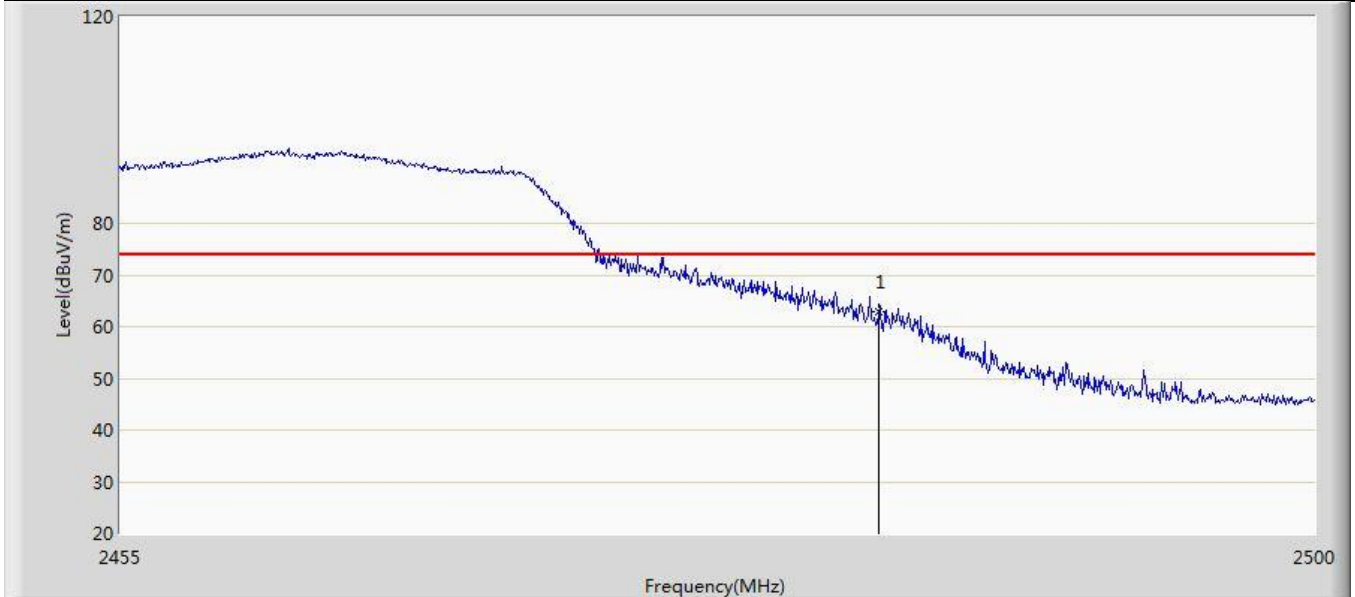
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	64.874	30.383	-9.126	74.000	34.491	PK

Profile: 22A0738R	Page No.: 22
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:38
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3: Transmit at 2462MHz by 11n20	



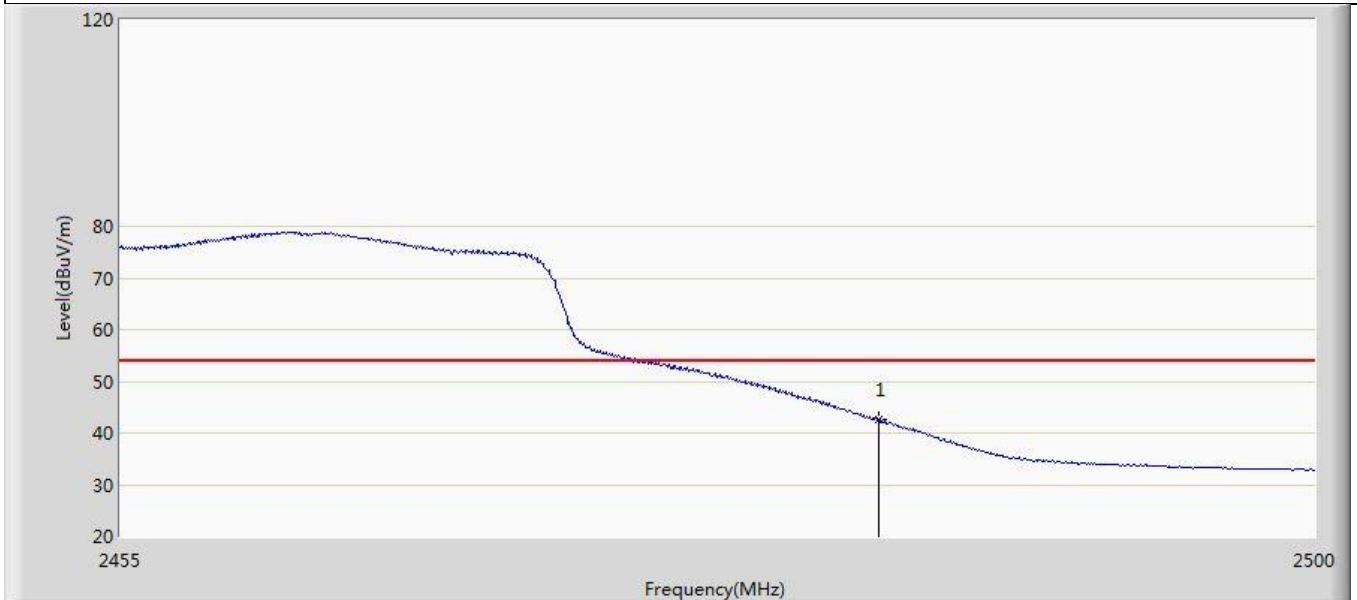
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	42.926	8.435	-11.074	54.000	34.491	AV

Profile: 22A0738R	Page No.: 23
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:39
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3: Transmit at 2462MHz by 11n20	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	62.873	28.382	-11.127	74.000	34.491	PK

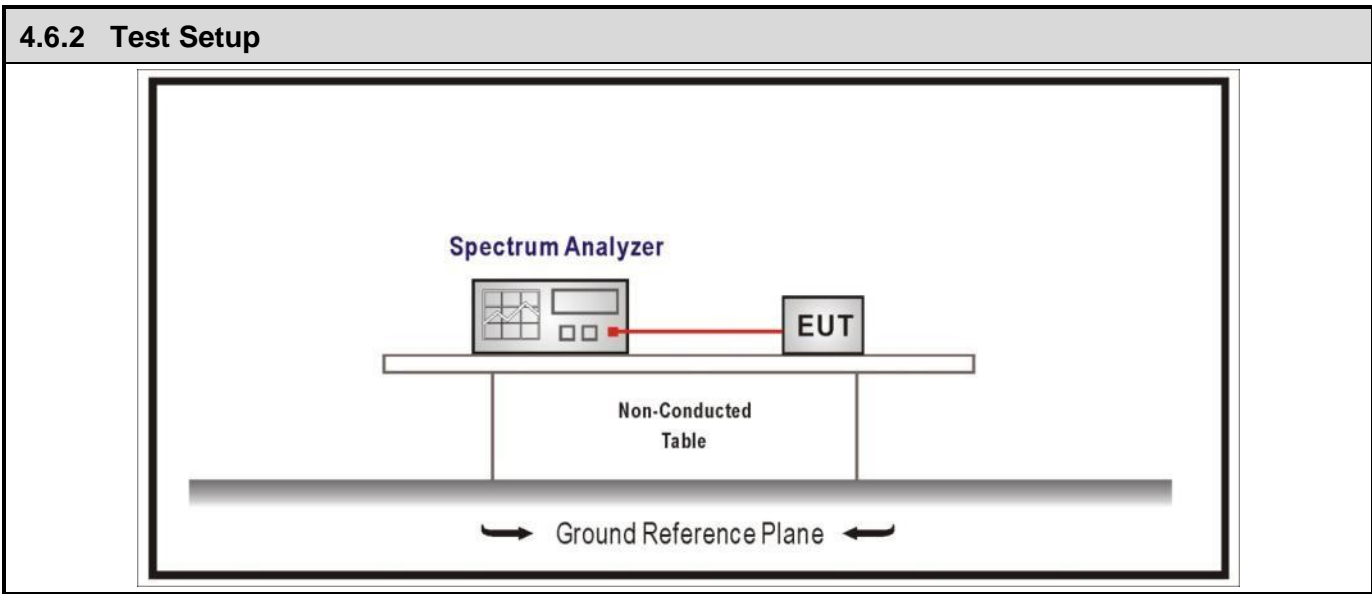
Profile: 22A0738R	Page No.: 24
Engineer: YuLiu	
Site: AC5	Time: 2022/11/18 - 01:41
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: INFOTAINMENT HEADUNIT	Power: DC 12V
Note: Mode3: Transmit at 2462MHz by 11n20	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2483.500	42.469	7.978	-11.531	54.000	34.491	AV

4.6 DTS Bandwidth	VERDICT: PASS
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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	
Standard	ANSI C63.10 Paragraph 6.7
The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs. The occupied bandwidth should be within the required frequency range.	



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
<input checked="" type="checkbox"/>	ANSI C63.10	6.9	Occupied bandwidth
<input type="checkbox"/>	ANSI C63.10	6.9.2	relative measurement procedure
<input checked="" type="checkbox"/>	ANSI C63.10	6.9.3	power bandwidth (99%) measurement procedure