



Test report No:
22C0291R-RF-US-P06V01

FCC C2PC TEST REPORT

Product Name	DriveScape
Trademark	
Model and /or type reference	DS300NA
FCC ID	2AFGD-MUW1FX
Applicant's name / address	Cambridge Mobile Telematics 314 Main Street, Suite 1200, Cambridge, MA 02142, USA
Test method requested, standard	CFR 47, FCC Part 15 C ANSI C63.10: 2013
Verdict Summary	IN COMPLIANCE
Tested By (name / position & signature)	Jun Xu/Project Engineer 
Approved by (name / position & signature)	Jack Zhang/ Manager 
Date of issue	2023-02-14
Report Version	V1.0
Report template No	Template_FCC Part 15C-RF-V1.0

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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.

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)	Dec. 08, 2022
Date (start test)	Dec. 27, 2022
Date (finish test)	Feb. 08, 2023

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
Tx	: Transmitter
Rx	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
22C0291R-RF-US-P06V01	V1.0	Initial issue of report.	2023-02-14

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. The EUT is a limited module used with the host. The WIFI antenna is changed from a monopole antenna to a PCB antenna. The host is an automotive device. We implemented C2PC on the host and tested the RF output power and radiated emission. The test results comply with CFR 47 , FCC Part 15 C requirements, module FCC ID: VPYLB1DX. The host also contain another module which support LTE function, we also evaluate the simultaneous Radiated Emission.
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 Data Rate;
 - Chapter 1.4 Channel List;

USED EQUIPMENT

Conducted Test /TR8

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Coaxial Cable	N/A	N/A	2187	2022.06.09	2023.06.08
High and low temperature and fast temperature change test box	ASTUOD	ASTD-FBT-225K	N/A	2022.08.24	2023.08.23
Temperature/Humidity Meter	RTS	RTS-8S	RF08	2022.07.07	2023.07.06
Test system					
4TX MIMO Power Sensor	Keysight	X8750A	MY59400102	2022.03.16	2023.03.15
MAX Signal Analyzer	Keysight	N9020B	MY59050482	2022.09.17	2023.09.16
Switch Box	Keysight	X8749A	N/A	N/A	N/A
High and low temperature and fast temperature change test box	ASTUOD	ASTD-FBT-225K	N/A	2022.08.24	2023.08.23
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY61252529	2022.07.14	2023.07.13
Frequency extender for EXG or MXG	Keysight	N5182BX07	MY59362500	2022.07.14	2023.07.13
EXG-B MW Analog Signal Generator	Keysight	N5173B	MY61252566	2022.09.28	2023.09.27

Radiated Emission(9KHz-1GHz) / AC3

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due 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	Cal. Due Date
EXA Spectrum Analyzer	Keysight	N9010A	MY55370495	2022.12.08	2023.12.07
Amplifier	SKET	LNPA_0118G-45	SK2021041201	2022.04.15	2023.04.14
Preamplifier	EMCI	EMC184045SE	980263	2022.05.21	2023.05.20
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
Peak Power Output	± 1.13 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 Horizontal: 18GHz~40GHz: 4.70 dB Vertical: 18GHz~40GHz: 4.60 dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name	DriveScape
Model No.....	DS300NA
FCC ID	2AFGD-MUW1FX
Manufacturer	Cambridge Mobile Telematics
Manufacturer address	314 Main Street, Suite 1200, Cambridge, MA 02142, USA

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"/>	AC: 100 - 240 V, 50/60 Hz
	<input type="checkbox"/>	Input:100-240V, 50/60 Hz,0.48A Output:12V,1.6A,19.2W
	<input type="checkbox"/>	Battery:
	<input checked="" type="checkbox"/>	Adapter:
Adapter model.....	Model :SWI18-12-N	
	Input:100-240V, 50/60 Hz,0.48A Output:12V,1.6A,19.2W	
Mounting position.....	<input type="checkbox"/>	Table top equipment
	<input type="checkbox"/>	Wall/Ceiling mounted equipment
	<input type="checkbox"/>	Floor standing equipment
	<input type="checkbox"/>	Hand-held/portable equipment
	<input checked="" type="checkbox"/>	Other: 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	-2.8dBi		

1.3 Data Rate

IEEE 802.11b

Modulation	Data Rate(Mb/s)
DSSS	1
DSSS	2
CCK	5.5
CCK	11

IEEE 802.11g

Modulation	R	Data Rate(Mb/s)
BPSK	1/2	6
BPSK	3/4	9
QPSK	1/2	12
QPSK	3/4	18
16-QAM	1/2	24
16-QAM	3/4	36
64-QAM	2/3	48
64-QAM	3/4	54

IEEE 802.11n

Spatial streams	MCS Index	Modulation	R	Data Rate(Mb/s)			
				20MHz		40MHz	
				800ns GI	400ns GI	800ns GI	400ns GI
1	0	BPSK	1/2	6.5	7.2	13.5	15.0
1	1	QPSK	1/2	13.0	14.4	27.0	30.0
1	2	QPSK	3/4	19.5	21.7	40.5	45.0
1	3	16-QAM	1/2	26.0	28.9	54.0	60.0
1	4	16-QAM	3/4	39.0	43.3	81.0	90.0
1	5	64-QAM	2/3	52.0	57.8	108.0	120.0
1	6	64-QAM	3/4	58.5	65.0	121.5	135.0
1	7	64-QAM	5/6	65.0	72.2	135.0	150.0

Note 1: Support of 400ns GI is optional on transmit and receive.

Symbol	Explanation
R	Code rate
GI	guard interval

Note: The data rate marks blue are the worst.

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	-	-

Note: The General Description of the Item, antenna information, Test Data Rate and Channel List 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	Mode 1: Transmit by 802.11b
	Mode 2: Transmit by 802.11g
	Mode 3: Transmit by 802.11n(20MHz)

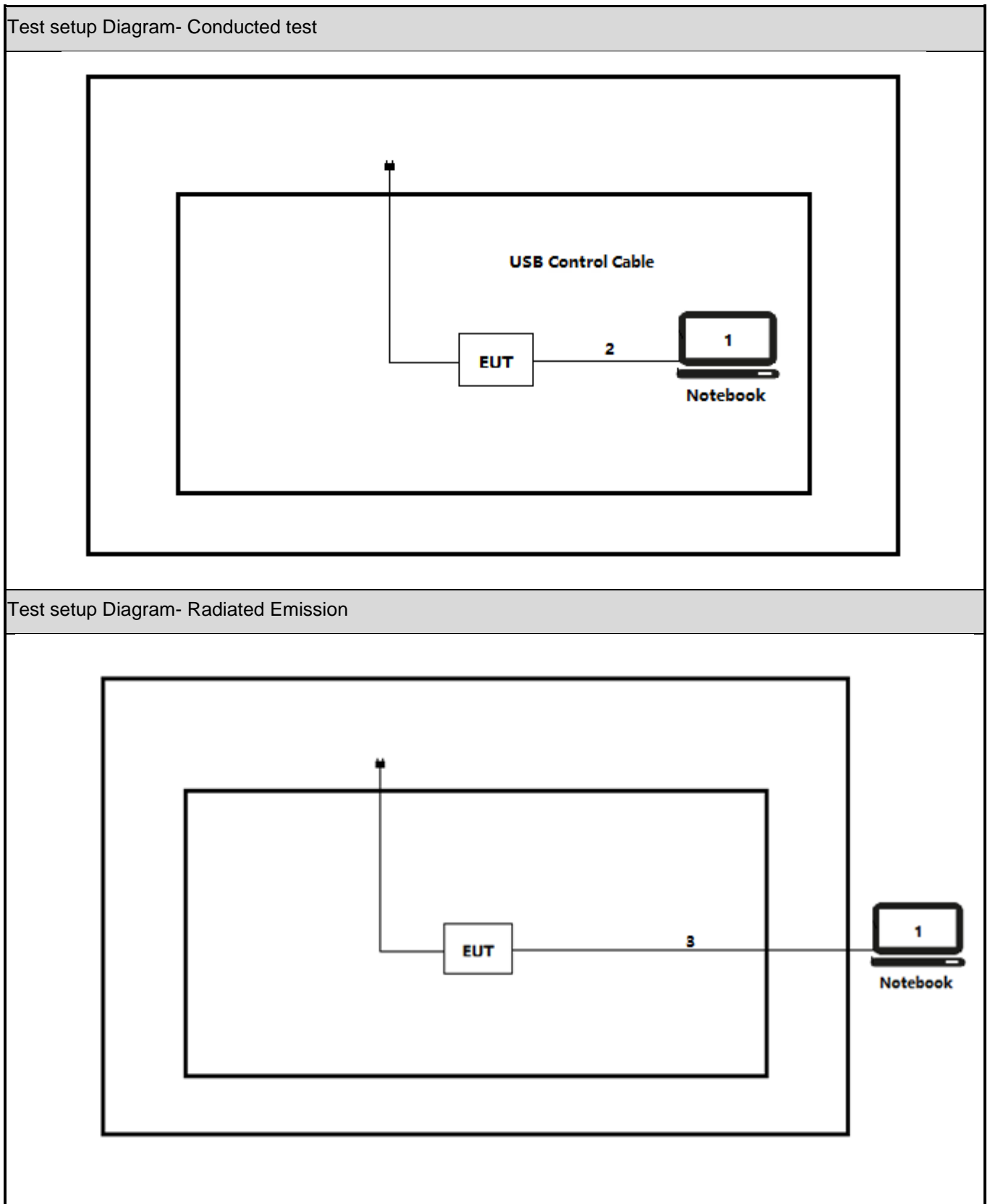
2.2 Accessories Information

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
(1) Notebook	Think pad x220	Lenovo	Adapter
(2) USB Control Cable	N/A	N/A	N/A
(3) USB Control Cable	N/A	N/A	N/
software	Type / Version	Manufacturer	Supplied by
Putty	N/A	N/A	N/A

Accessories Information	Cable		
	Length used during test [m]	Attached during test	Shielded
(2)USB Control Cable	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(3)USB Control Cable	8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

2.3 Test Configuration / Block diagram used for tests

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



2.4 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
CFR 47, FCC Part 15 C	2023	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

3.2 Test Matrix

Test item	DS300NA		
	1(#1)	2(#)	3()
Emissions in non-restricted frequency bands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fundamental emission output power	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.3 Overview of results

For FCC

Requirement – Test case	Basic standard(s)	Verdict	Remark
Emissions in non-restricted frequency bands	FCC 15.247(d), FCC 15.209	PASS	---
Fundamental emission output power	15.247 (b)(3)	PASS	---
Antenna Requirement	FCC 15.203	PASS	---

3.4 Test Facility

USA : FCC Designation Number: CN1199

4 TEST RESULTS

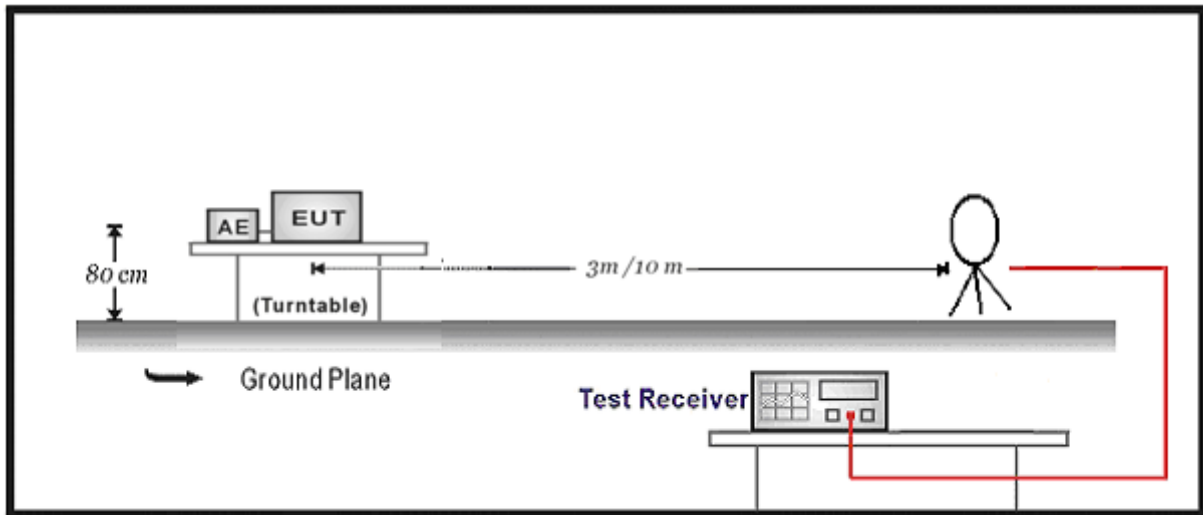
4.1 Emissions in restricted frequency bands	VERDICT: PASS
--	----------------------

4.1.1 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	30 _(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</p>			

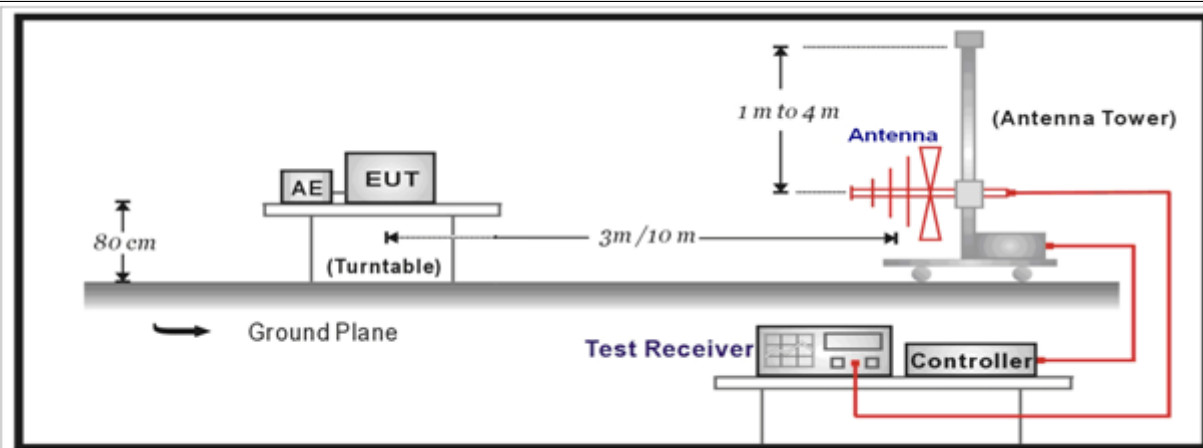
measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can 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).

4.1.2 Test Setup

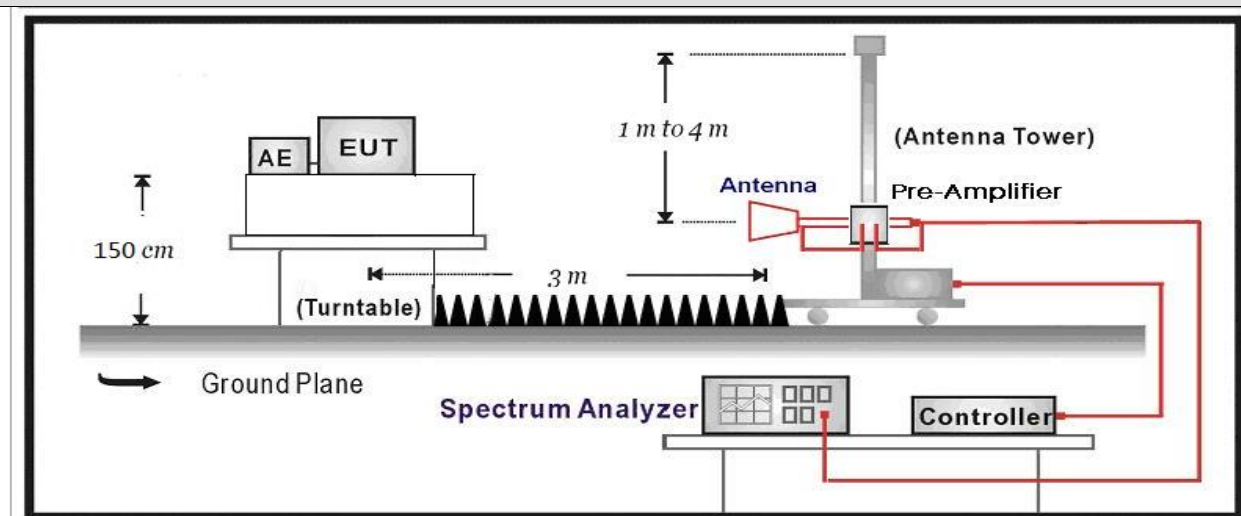
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



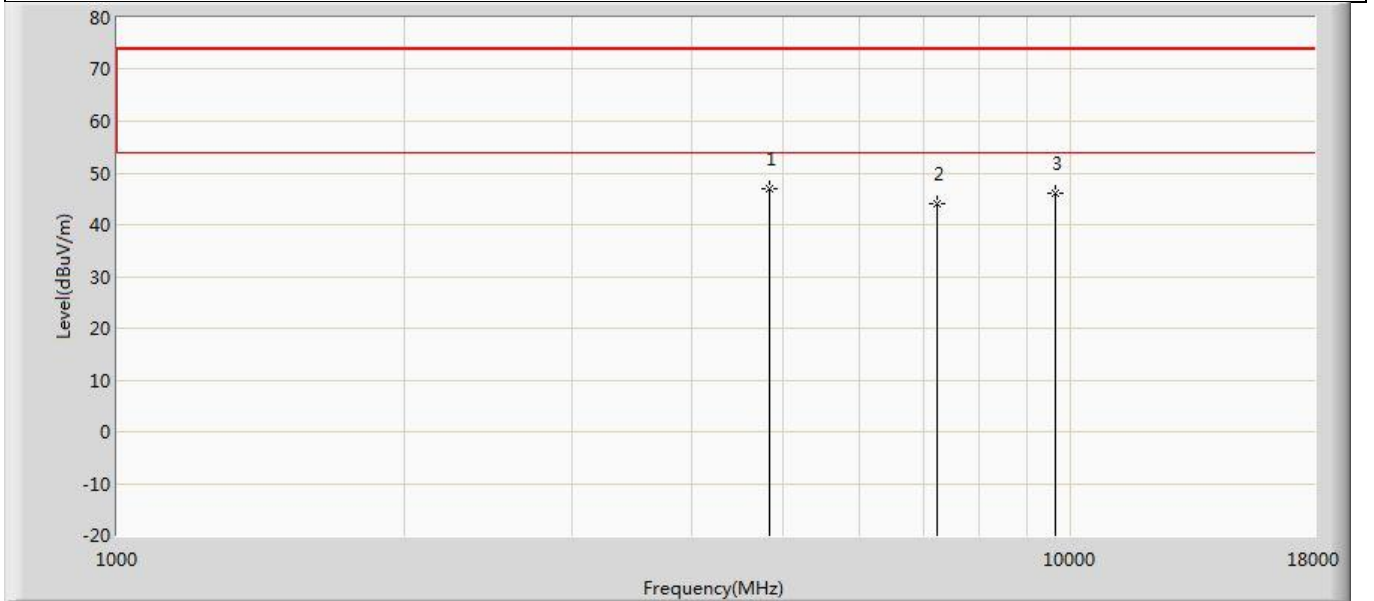
Above 1GHz Test Setup:



4.1.3 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

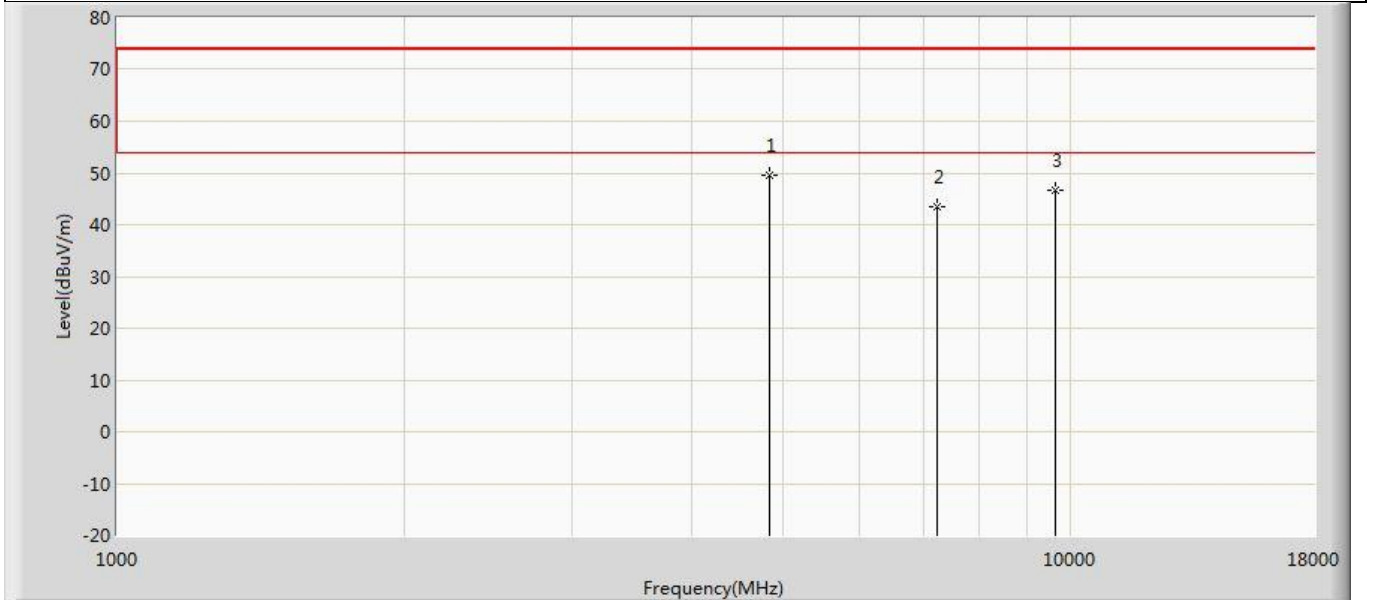
4.1.4 Test Data

Profile: 22C0291R	Page No.: 43
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 1 : Transmit at 2412MHz by 802.11b	



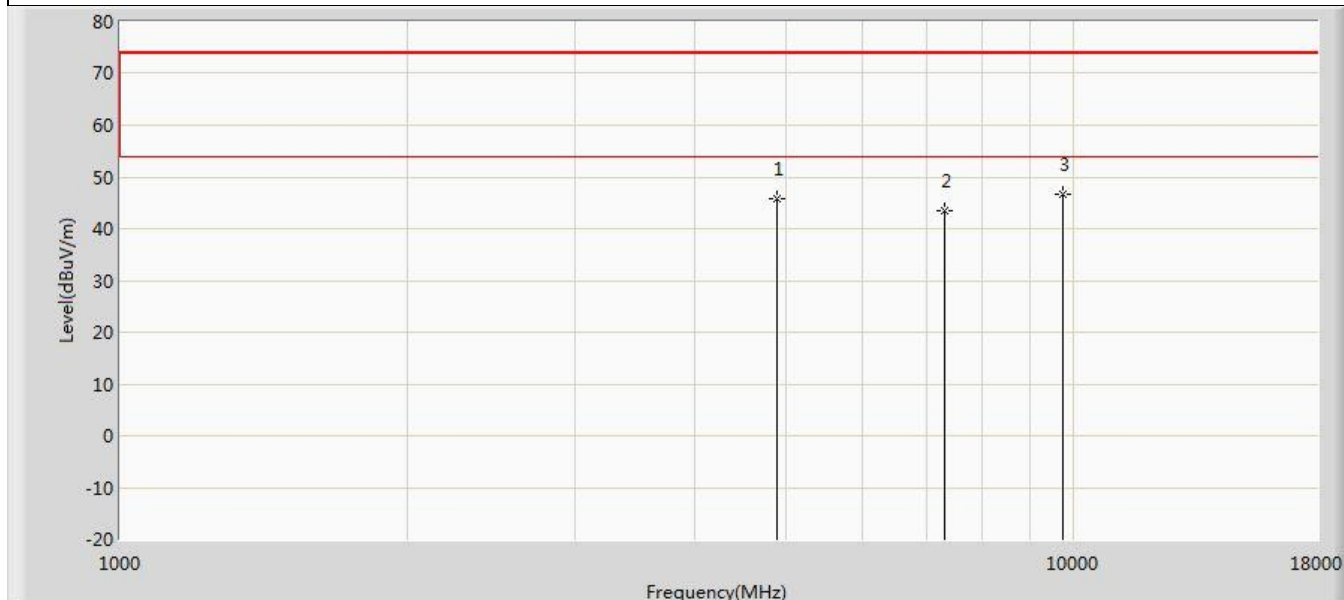
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	4825.000	46.989	61.875	-27.011	74.000	-14.886	PK
2		7236.000	44.137	54.981	-29.863	74.000	-10.844	PK
3		9648.000	46.227	54.088	-27.773	74.000	-7.860	PK

Profile: 22C0291R	Page No.: 44
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 1 : Transmit at 2412MHz by 802.11b	



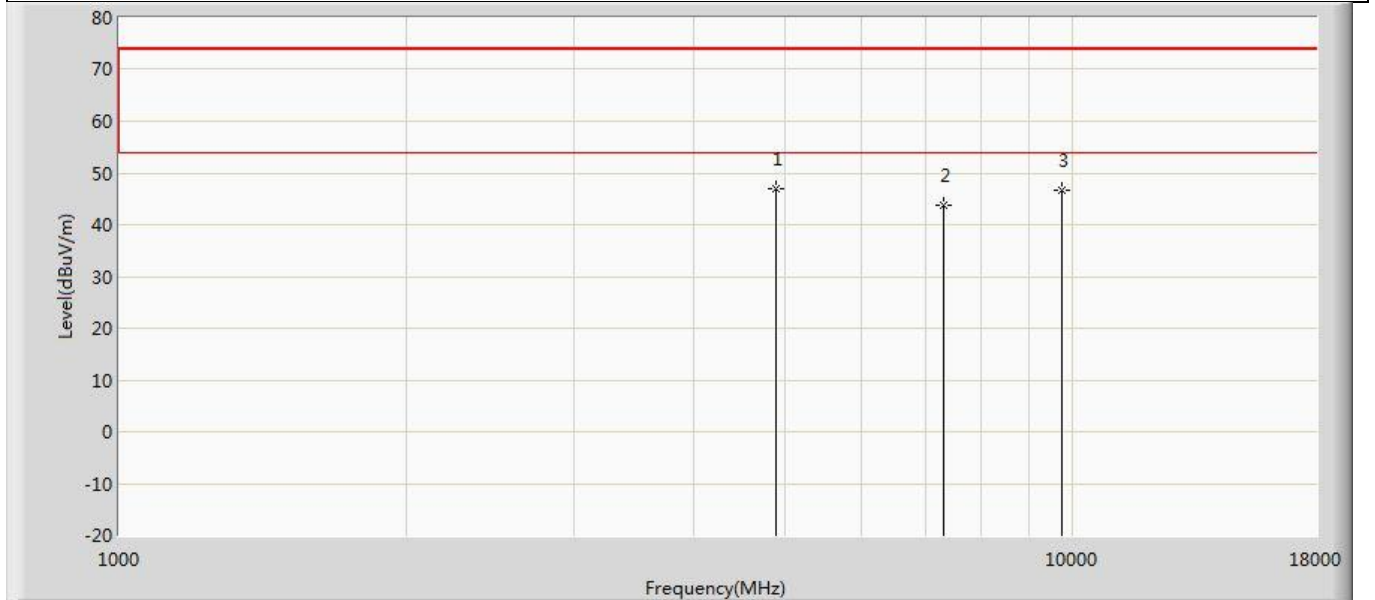
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	4825.000	49.554	64.440	-24.446	74.000	-14.886	PK
2		7236.000	43.352	54.196	-30.648	74.000	-10.844	PK
3		9648.000	46.665	54.526	-27.335	74.000	-7.860	PK

Profile: 22C0291R	Page No.: 45
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 1 : Transmit at 2437MHz by 802.11b	



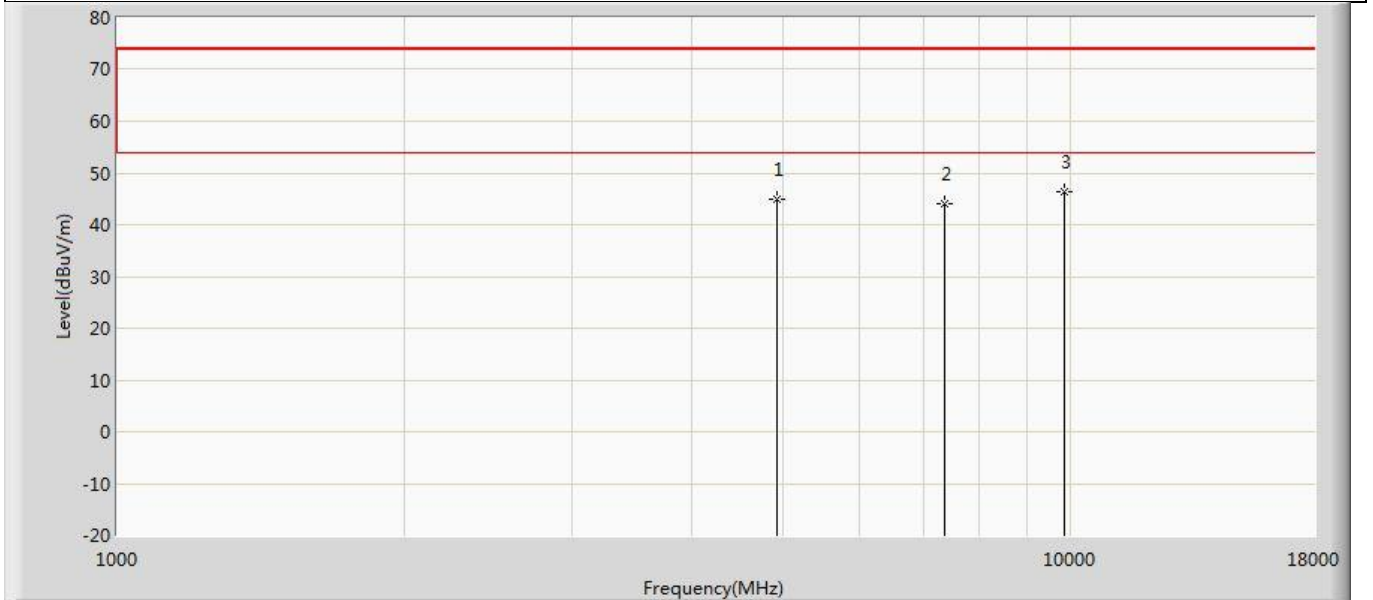
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4876.000	45.909	60.484	-28.091	74.000	-14.575	PK
2		7311.000	43.442	54.287	-30.558	74.000	-10.844	PK
3	*	9748.000	46.781	54.572	-27.219	74.000	-7.791	PK

Profile: 22C0291R	Page No.: 46
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 1 : Transmit at 2437MHz by 802.11b	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	4876.000	46.860	61.435	-27.140	74.000	-14.575	PK
2		7311.000	43.766	54.611	-30.234	74.000	-10.844	PK
3		9748.000	46.576	54.367	-27.424	74.000	-7.791	PK

Profile: 22C0291R	Page No.: 47
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 1 : Transmit at 2462MHz by 802.11b	



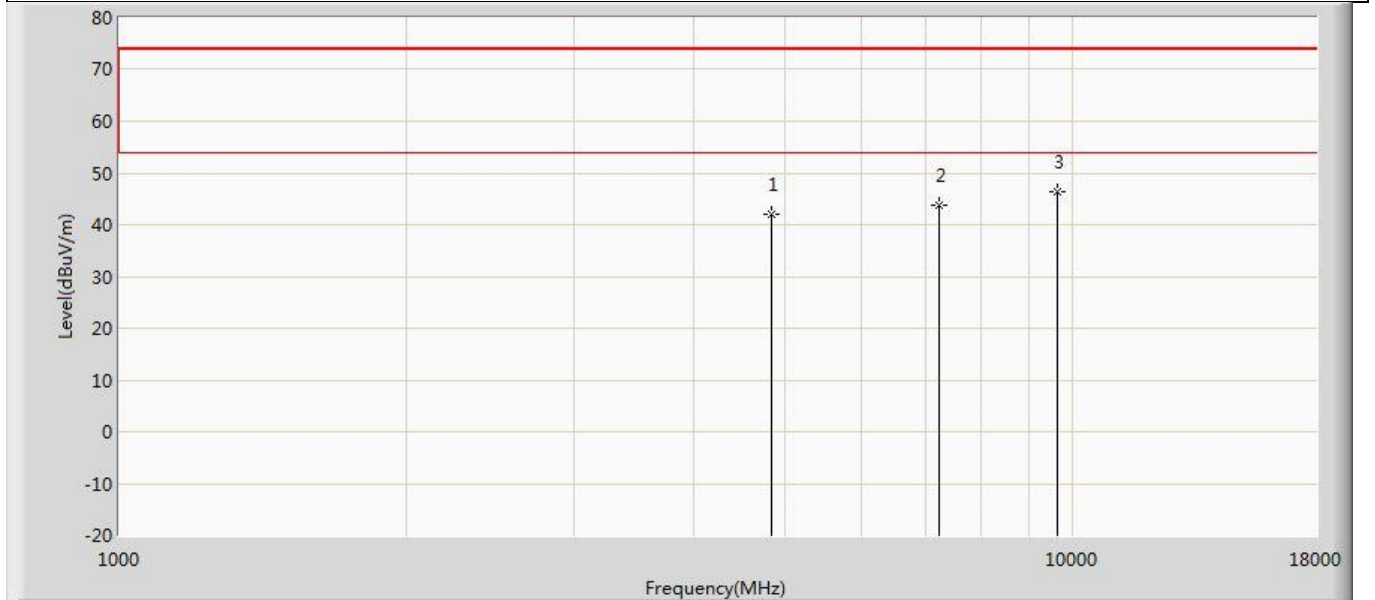
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4927.000	44.833	59.590	-29.167	74.000	-14.758	PK
2		7386.000	44.117	54.982	-29.883	74.000	-10.866	PK
3	*	9848.000	46.257	53.882	-27.743	74.000	-7.625	PK

Profile: 22C0291R	Page No.: 48
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 1 : Transmit at 2462MHz by 802.11b	



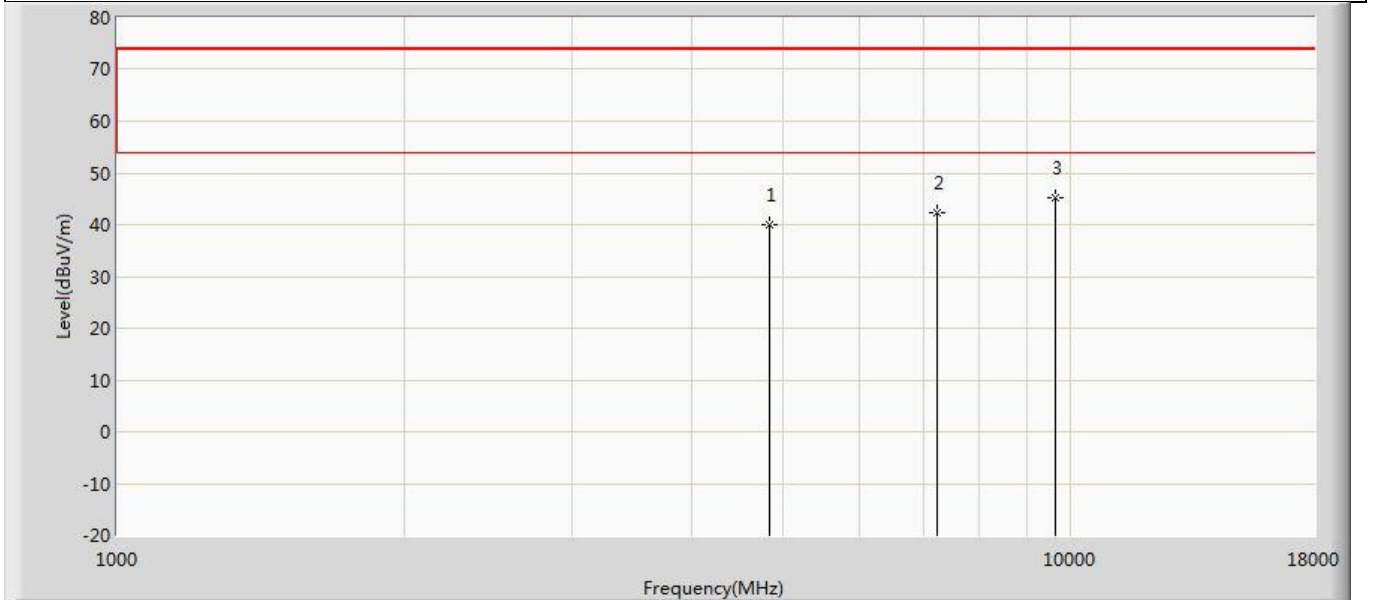
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4927.000	45.624	60.381	-28.376	74.000	-14.758	PK
2		7386.000	44.189	55.054	-29.811	74.000	-10.866	PK
3	*	9848.000	46.171	53.796	-27.829	74.000	-7.625	PK

Profile: 22C0291R	Page No.: 49
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 2 : Transmit at 2412MHz by 802.11g	



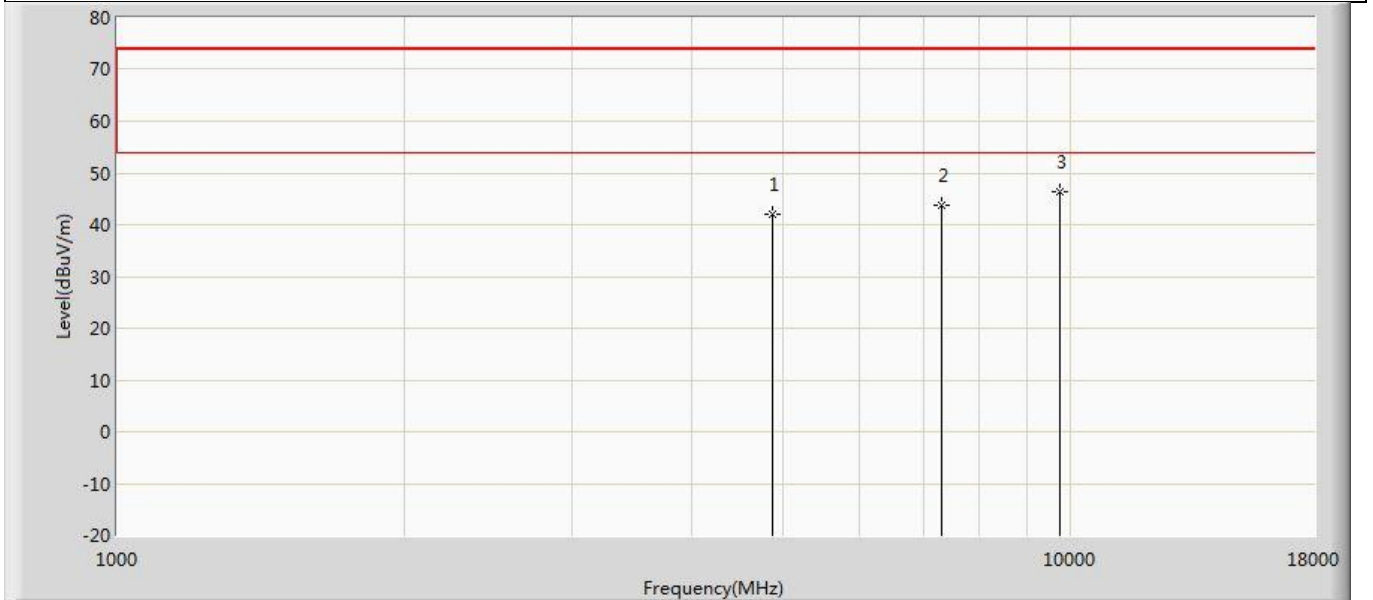
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	41.892	56.784	-32.108	74.000	-14.892	PK
2		7236.000	43.755	54.599	-30.245	74.000	-10.844	PK
3	*	9648.000	46.309	54.170	-27.691	74.000	-7.860	PK

Profile: 22C0291R	Page No.: 50
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 2 : Transmit at 2412MHz by 802.11g	



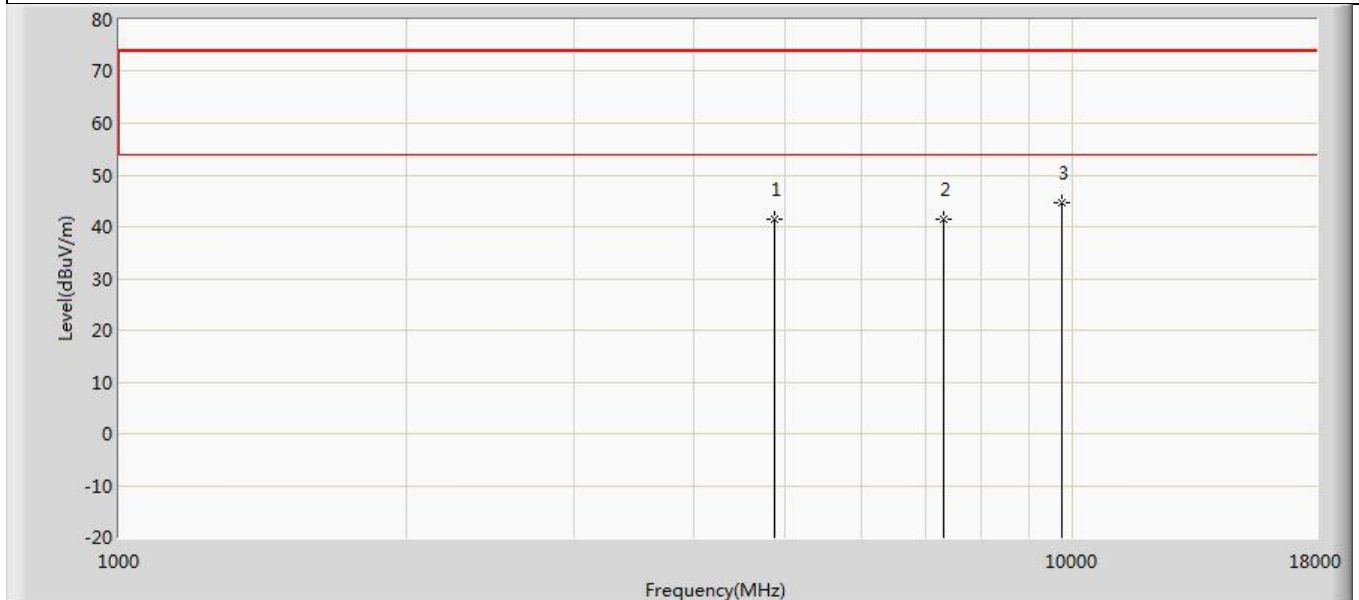
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	40.081	54.973	-33.919	74.000	-14.892	PK
2		7236.000	42.174	53.018	-31.826	74.000	-10.844	PK
3	*	9648.000	45.162	53.023	-28.838	74.000	-7.860	PK

Profile: 22C0291R	Page No.: 51
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 2 : Transmit at 2437MHz by 802.11g	



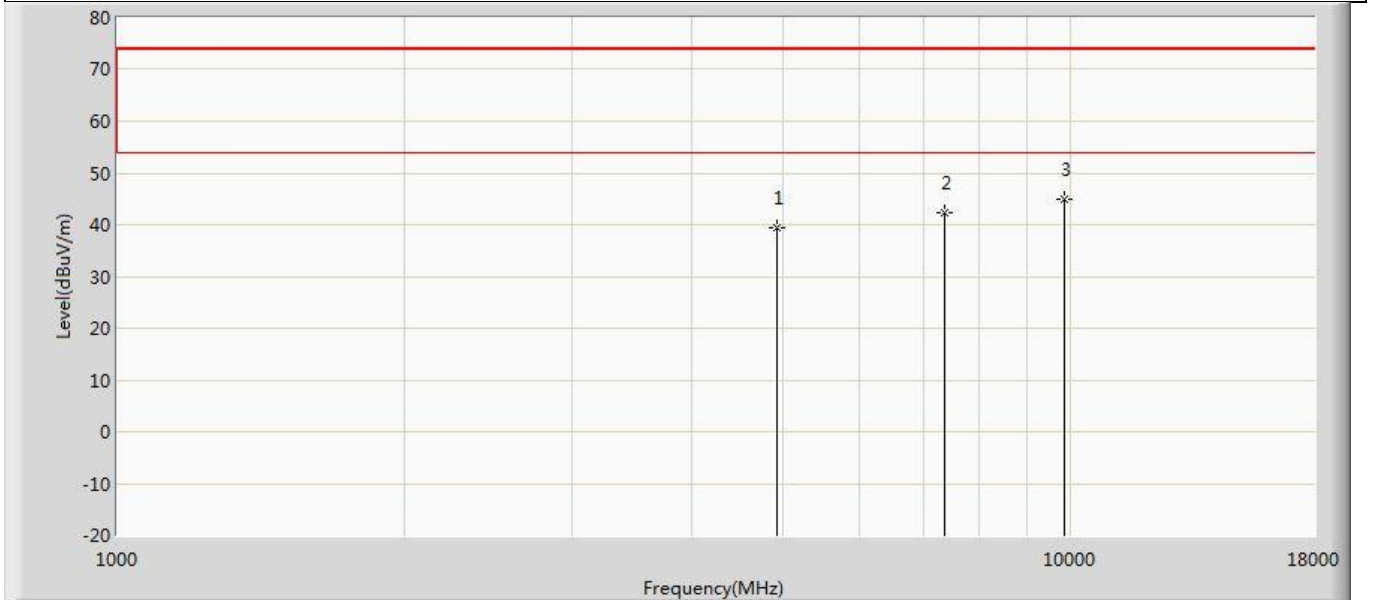
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	41.904	56.514	-32.096	74.000	-14.610	PK
2		7311.000	43.634	54.479	-30.366	74.000	-10.844	PK
3	*	9748.000	46.343	54.134	-27.657	74.000	-7.791	PK

Profile: 22C0291R	Page No.: 52
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 2 : Transmit at 2437MHz by 802.11g	



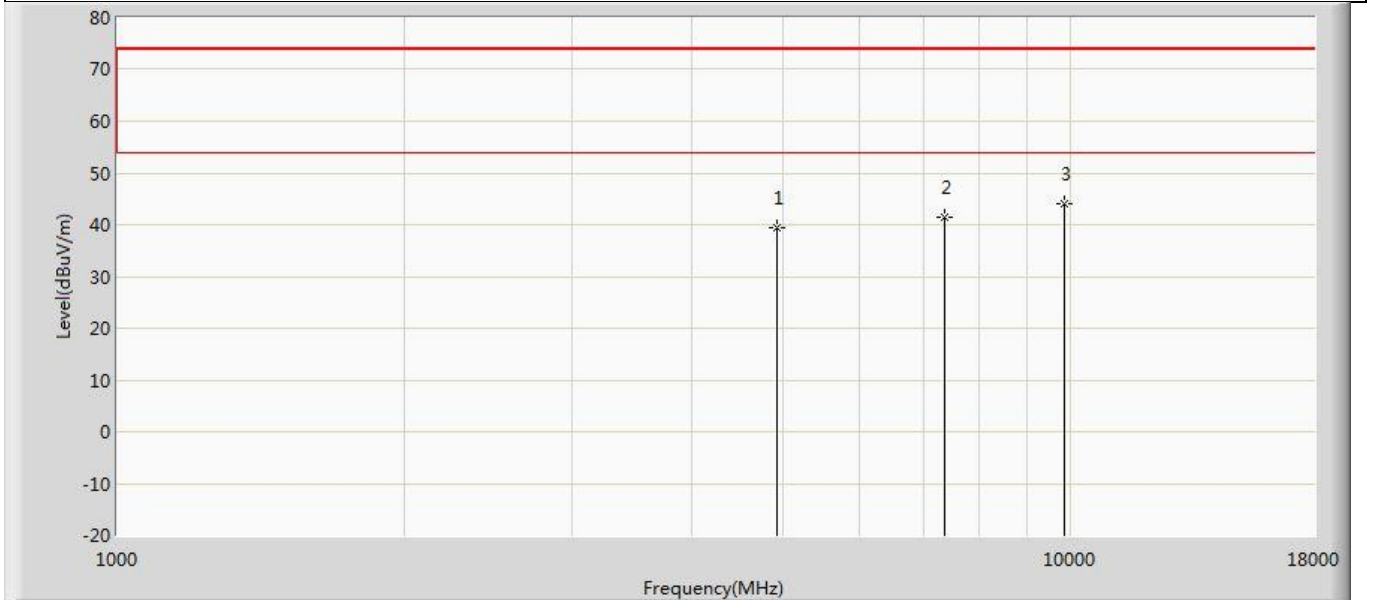
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	41.425	56.035	-32.575	74.000	-14.610	PK
2		7311.000	41.579	52.424	-32.421	74.000	-10.844	PK
3	*	9748.000	44.726	52.517	-29.274	74.000	-7.791	PK

Profile: 22C0291R	Page No.: 53
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 2 : Transmit at 2462MHz by 802.11g	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	39.416	54.156	-34.584	74.000	-14.741	PK
2		7386.000	42.175	53.040	-31.825	74.000	-10.866	PK
3	*	9848.000	44.912	52.537	-29.088	74.000	-7.625	PK

Profile: 22C0291R	Page No.: 54
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 2 : Transmit at 2462MHz by 802.11g	



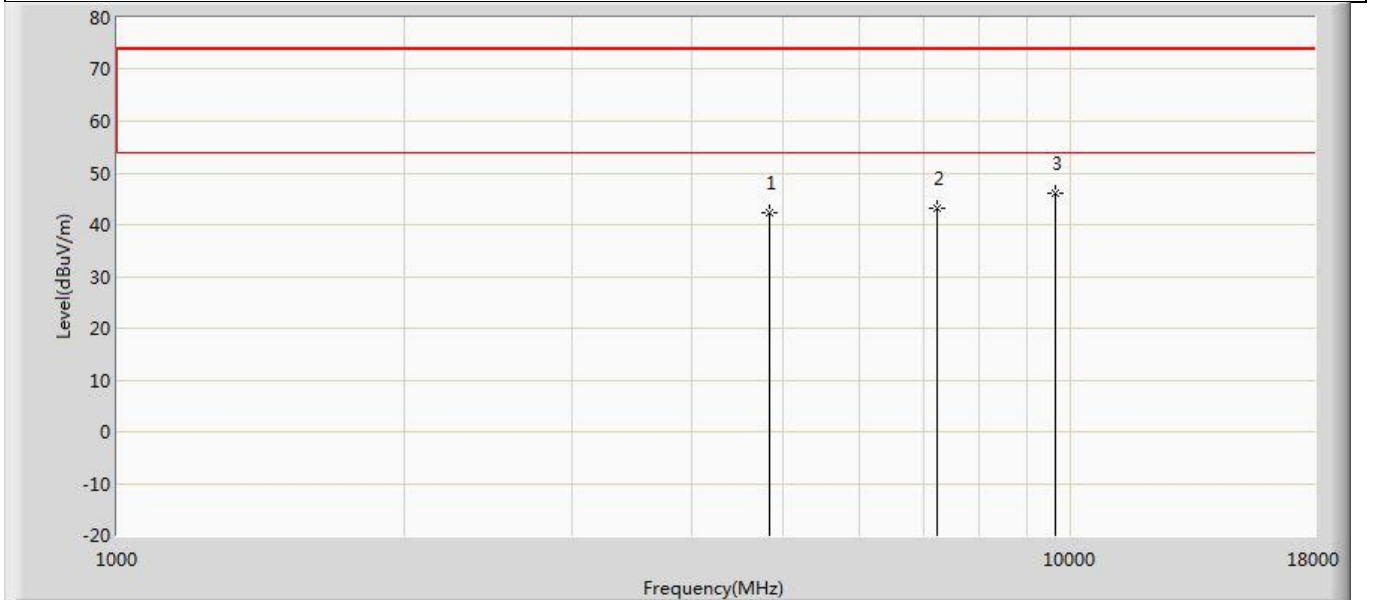
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	39.508	54.248	-34.492	74.000	-14.741	PK
2		7386.000	41.342	52.207	-32.658	74.000	-10.866	PK
3	*	9848.000	44.166	51.791	-29.834	74.000	-7.625	PK

Profile: 22C0291R	Page No.: 55
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 3 : Transmit at 2412MHz by 802.11n(20MHz)	



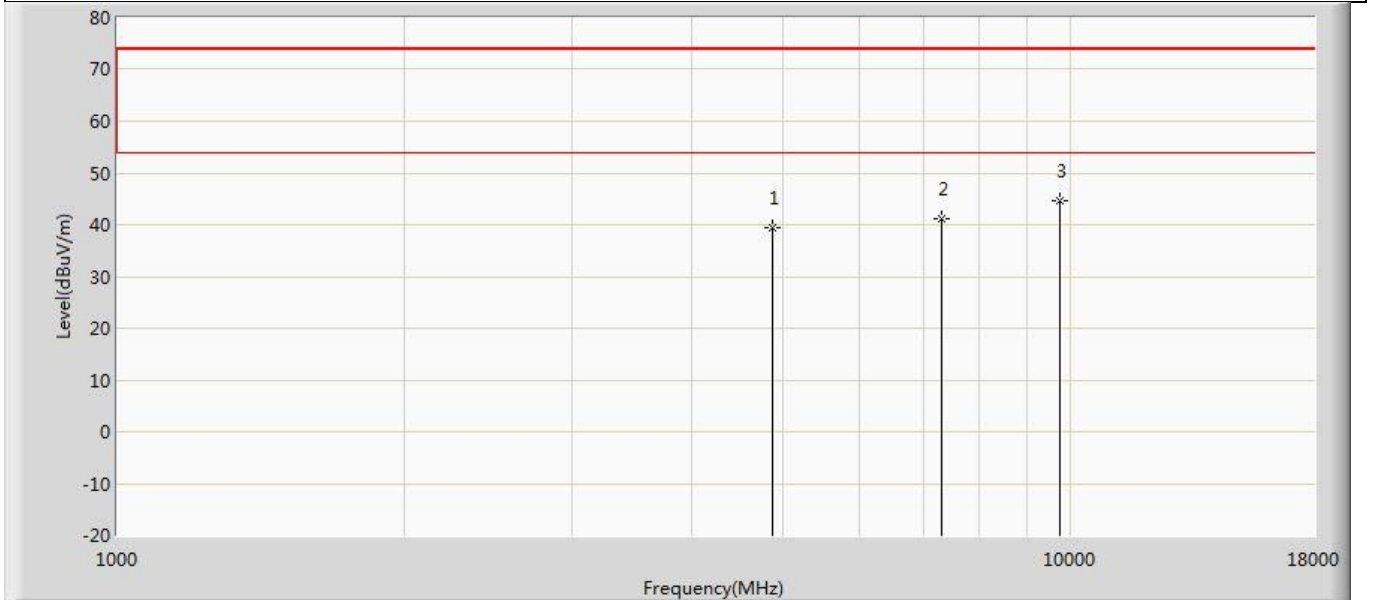
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	42.683	57.575	-31.317	74.000	-14.892	PK
2		7236.000	43.641	54.485	-30.359	74.000	-10.844	PK
3	*	9648.000	46.816	54.677	-27.184	74.000	-7.860	PK

Profile: 22C0291R	Page No.: 56
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 3 : Transmit at 2412MHz by 802.11n(20MHz)	



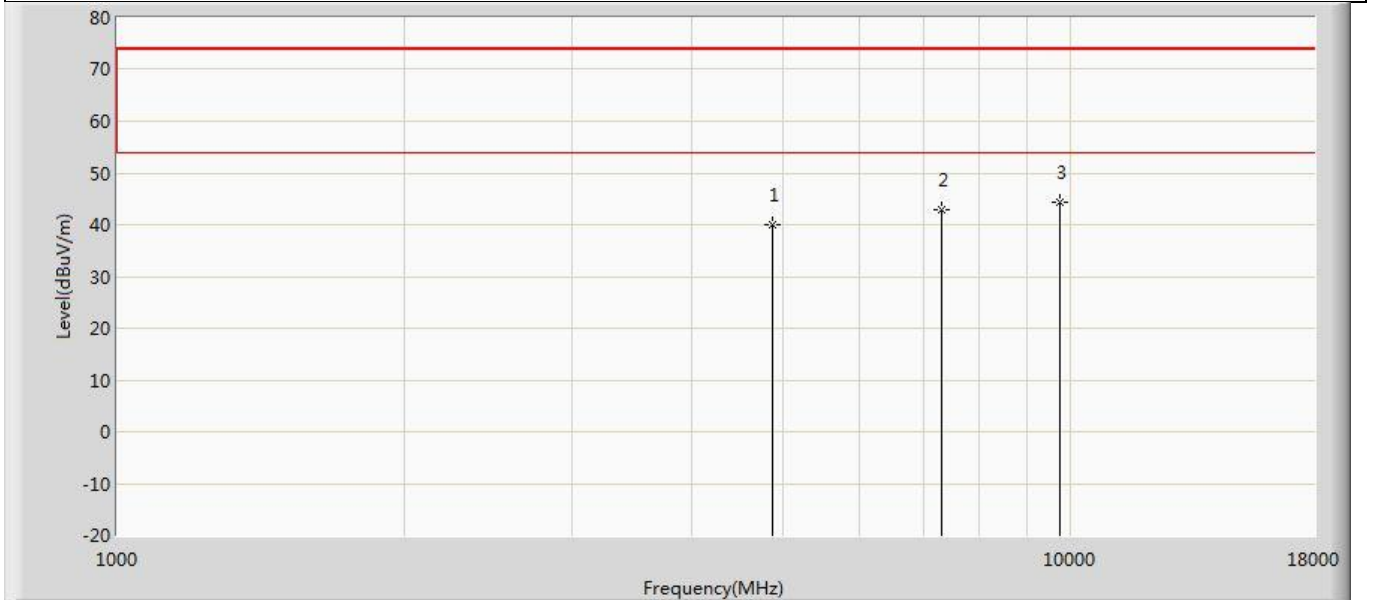
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4824.000	42.436	57.328	-31.564	74.000	-14.892	PK
2		7236.000	43.179	54.023	-30.821	74.000	-10.844	PK
3	*	9648.000	46.220	54.081	-27.780	74.000	-7.860	PK

Profile: 22C0291R	Page No.: 57
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 3 : Transmit at 2437MHz by 802.11n(20MHz)	



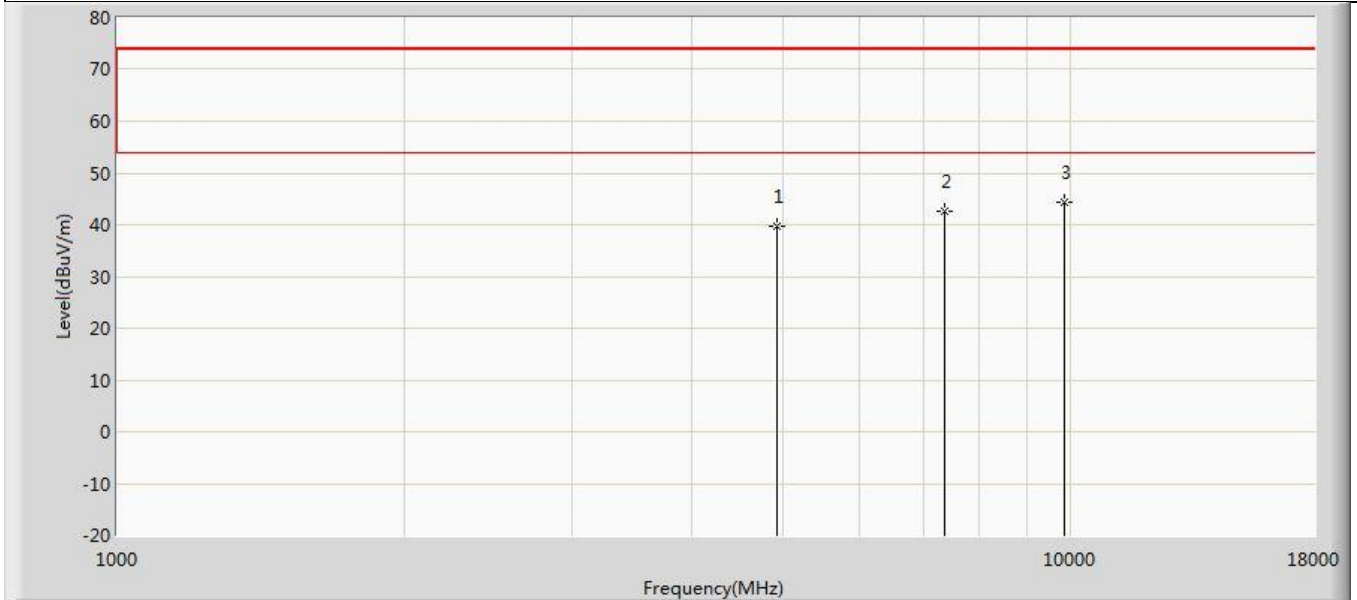
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	39.501	54.111	-34.499	74.000	-14.610	PK
2		7311.000	41.150	51.995	-32.850	74.000	-10.844	PK
3	*	9748.000	44.707	52.498	-29.293	74.000	-7.791	PK

Profile: 22C0291R	Page No.: 58
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 3 : Transmit at 2437MHz by 802.11n(20MHz)	



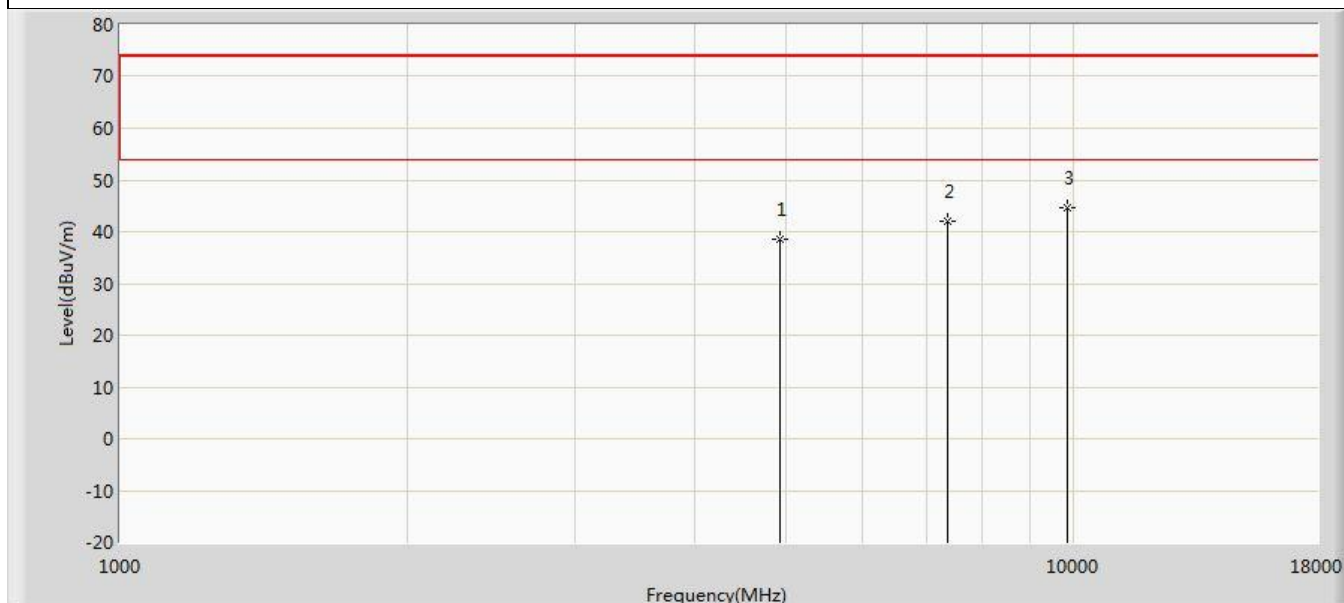
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4874.000	39.939	54.549	-34.061	74.000	-14.610	PK
2		7311.000	42.870	53.715	-31.130	74.000	-10.844	PK
3	*	9748.000	44.489	52.280	-29.511	74.000	-7.791	PK

Profile: 22C0291R	Page No.: 59
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 3 : Transmit at 2462MHz by 802.11n(20MHz)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	39.573	54.313	-34.427	74.000	-14.741	PK
2		7386.000	42.651	53.516	-31.349	74.000	-10.866	PK
3	*	9848.000	44.337	51.962	-29.663	74.000	-7.625	PK

Profile: 22C0291R	Page No.: 60
Engineer: YuLiu	
Site: AC5	Time: 2022/12/28 - 00:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 3 : Transmit at 2462MHz by 802.11n(20MHz)	



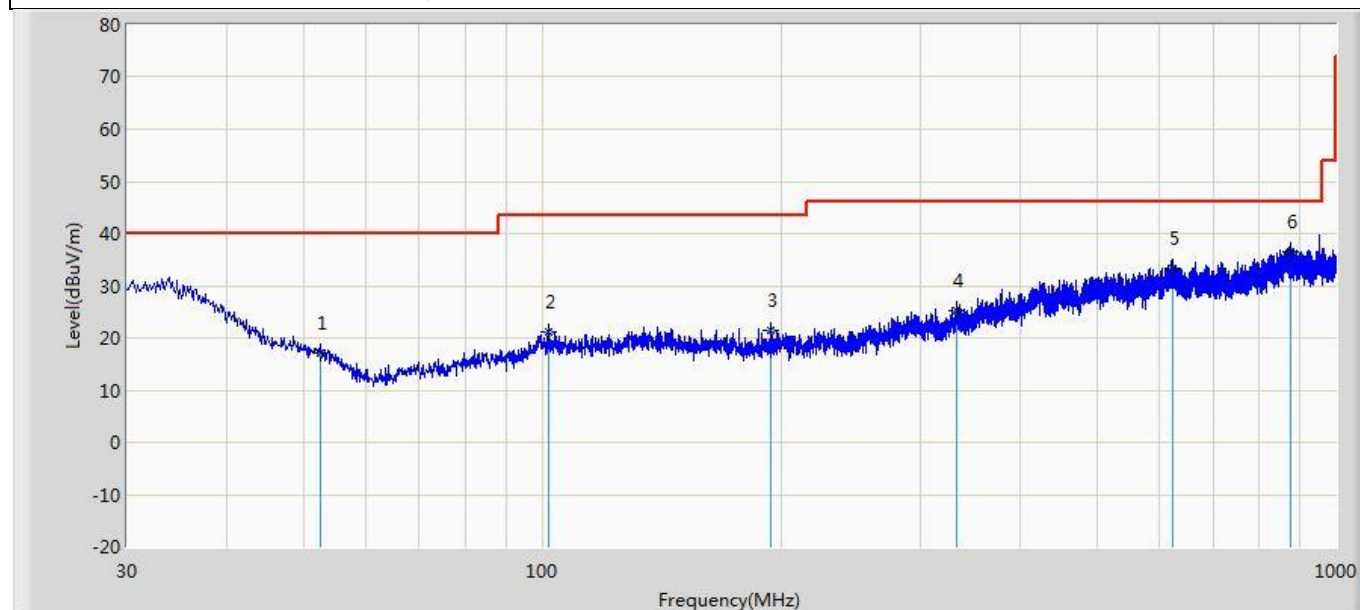
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4924.000	38.685	53.425	-35.315	74.000	-14.741	PK
2		7386.000	42.004	52.869	-31.996	74.000	-10.866	PK
3	*	9848.000	44.538	52.163	-29.462	74.000	-7.625	PK

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.

The worst case of Radiated Emission below 1GHz:

Profile: 22C0291R	Page No.: 1
Engineer: YuLiu	
Site: AC3	Time: 2023/02/08 - 05:28
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: AC3_3M(30-1000M)	Polarity: Horizontal
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 1:Transmit at 2437MHz by 802.11b	

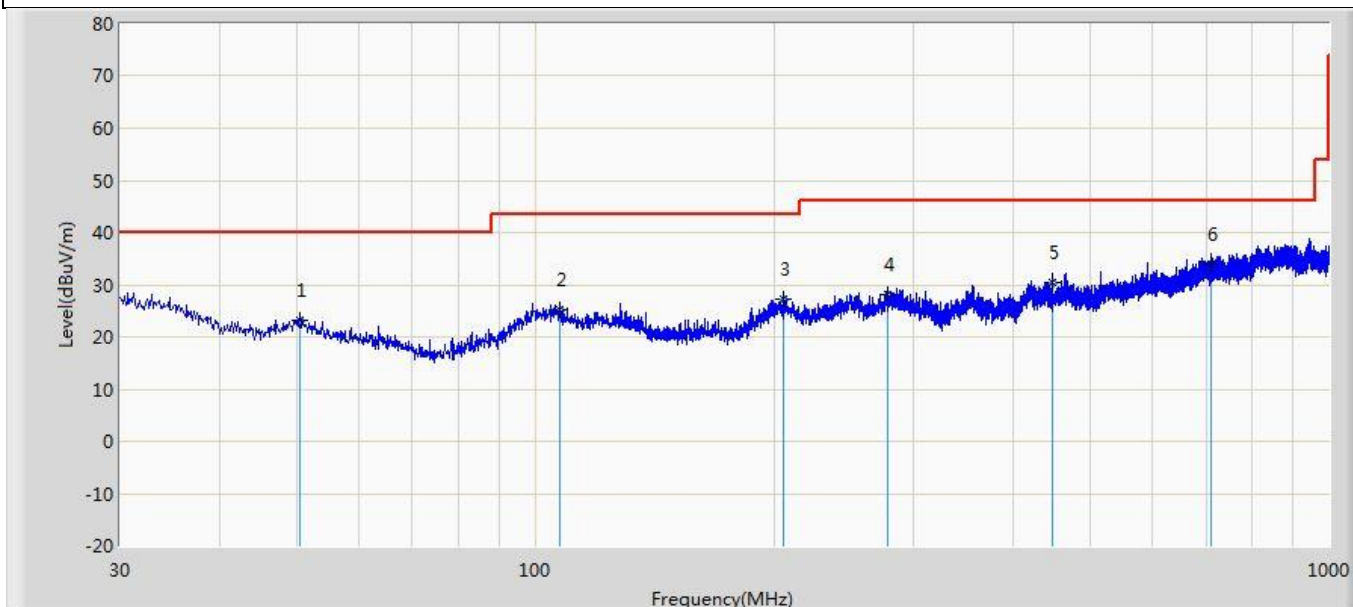


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		52.674	16.991	2.396	-23.009	40.000	14.595	QP
2		101.901	21.234	4.199	-22.266	43.500	17.035	QP
3		194.051	21.424	4.003	-22.076	43.500	17.421	QP
4		332.883	25.101	2.202	-20.899	46.000	22.899	QP
5		623.761	33.329	2.635	-12.671	46.000	30.694	QP
6	*	876.446	36.418	3.976	-9.582	46.000	32.442	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: 22C0291R	Page No.: 2
Engineer: YuLiu	
Site: AC3	Time: 2023/02/08 - 05:29
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: AC3_3M(30-1000M)	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 1:Transmit at 2437MHz by 802.11b	



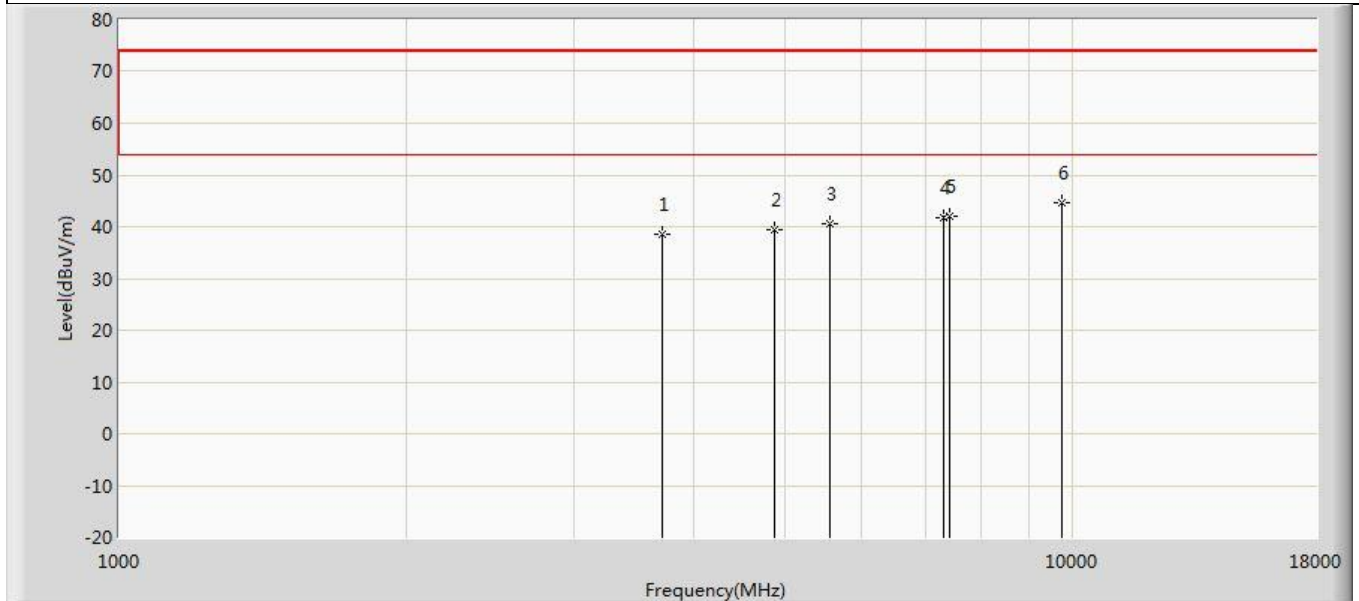
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		50.491	23.153	3.747	-16.847	40.000	19.406	QP
2		107.479	25.104	3.456	-18.396	43.500	21.648	QP
3		205.934	27.341	3.898	-16.159	43.500	23.443	QP
4		278.562	28.083	3.378	-17.917	46.000	24.705	QP
5		447.706	30.339	4.303	-15.661	46.000	26.036	QP
6	*	710.698	33.834	3.519	-12.166	46.000	30.314	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)

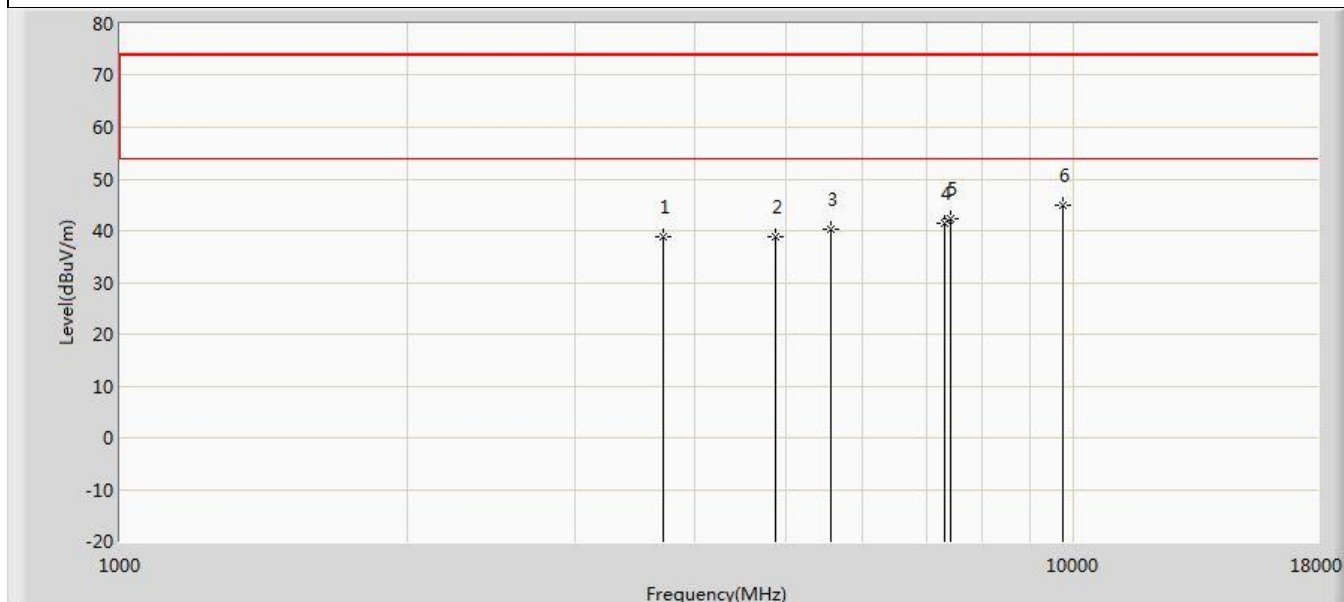
The worst case of Simultaneous Radiated Emission:

Profile: 22C0291R	Page No.: 3
Engineer: Yuliu	
Site: AC5	Time: 2023/02/08 - 01:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT: Drive Scope	Power: 120V/60Hz
Note: Mode 1:Transmit at 2437MHz By 802.11b & LTE Band 25	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		3710.000	38.621	55.282	-35.379	74.000	-16.661	PK
2		4874.000	39.472	54.082	-34.528	74.000	-14.610	PK
3		5565.000	40.514	53.336	-33.486	74.000	-12.823	PK
4		7311.000	41.684	52.529	-32.316	74.000	-10.844	PK
5		7420.000	42.083	52.718	-31.917	74.000	-10.635	PK
6	*	9748.000	44.528	52.319	-29.472	74.000	-7.791	PK

Profile: 22C0291R	Page No.: 4
Engineer: Yuliu	
Site: AC5	Time: 2023/02/08 - 01:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT: Drive Scape	Power: 120V/60Hz
Note: Mode 1:Transmit at 2437MHz By 802.11b & LTE Band 25	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		3710.000	38.941	55.602	-35.059	74.000	-16.661	PK
2		4874.000	38.983	53.593	-35.017	74.000	-14.610	PK
3		5565.000	40.363	53.185	-33.637	74.000	-12.823	PK
4		7311.000	41.490	52.335	-32.510	74.000	-10.844	PK
5		7420.000	42.180	52.815	-31.820	74.000	-10.635	PK
6	*	9748.000	44.901	52.692	-29.099	74.000	-7.791	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.Host supports WIFI+LTE to work at the same time.

4.2 Fundamental emission output power	VERDICT: PASS
--	----------------------

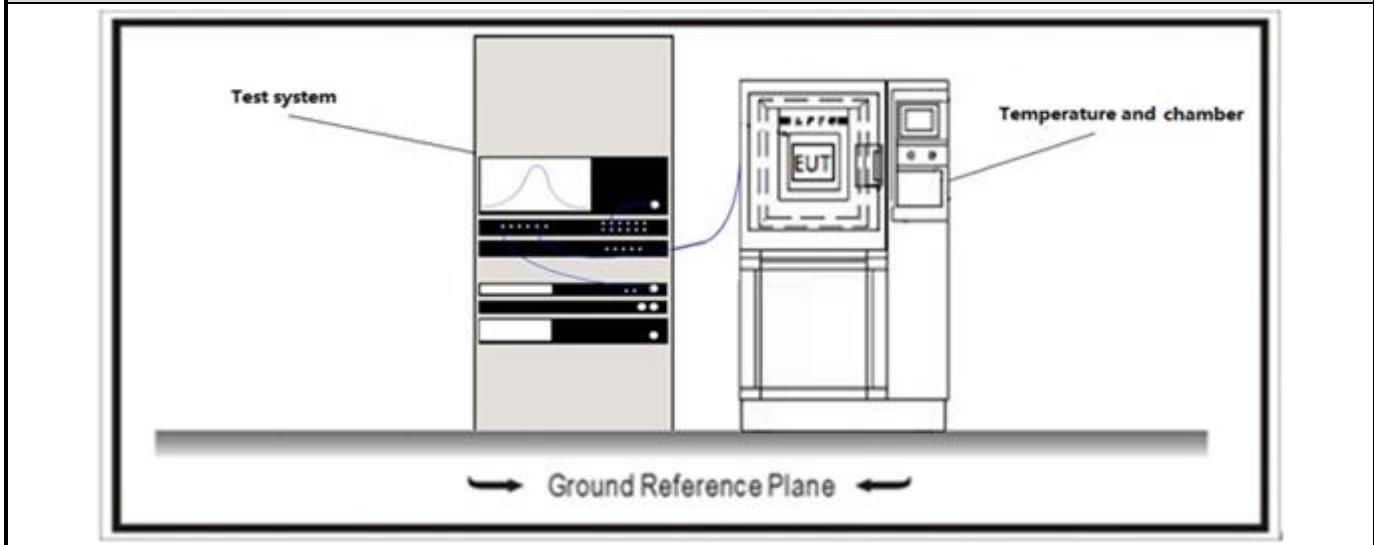
4.2.1 Limit

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

Note 1 : GTX directional gain of transmitting antennas.

Note 2 : Pout is maximum conducted output power .

4.2.2 Test Setup



4.2.3 Test Procedure				
	References Rule		Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10		11.9	Fundamental emission output power
<input type="checkbox"/>	ANSI C63.10		11.9.1	Maximum peak conducted output power
	<input type="checkbox"/>	ANSI C63.10	11.9.1.1	RBW ≥ 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 checked="" 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≥98%)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.3	Method AVGSA-1A(Duty cycle≥98%)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-2(Duty cycle≤98%)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-2A(Duty cycle≤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 checked="" type="checkbox"/>	ANSI C63.10	11.9.2.3	Measurement using a power meter (PM)
	<input checked="" 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

4.2.4 Test Data					
Mode	Channel	Test Frequency (MHz)	Conducted Power (dBm)	Conducted Power Limit (dBm)	Result
Mode 1	1	2412	17.14	≤30	Pass
	6	2437	16.99	≤30	Pass
	11	2462	16.97	≤30	Pass
Mode 2	1	2412	13.18	≤30	Pass
	6	2437	13.07	≤30	Pass
	11	2462	12.94	≤30	Pass
Mode 3	1	2412	12.12	≤30	Pass
	6	2437	11.97	≤30	Pass
	11	2462	12.23	≤30	Pass

Power Setting:

Mode	Channel	Test Frequency (MHz)	Power Setting
Mode 1	1	2412	18
	6	2437	18
	11	2462	18
Mode 2	1	2412	13
	6	2437	13
	11	2462	13
Mode 3	1	2412	13
	6	2437	13
	11	2462	13

4.3 Antenna Requirement	VERDICT: PASS
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4.3.1 Limit:

Standard	FCC Part 15 Subpart C Paragraph 15.203
<p>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.</p>	

4.3.2 Antenna Connector Construction:

<input checked="" type="checkbox"/>	The use of a permanently attached antenna
<input type="checkbox"/>	The antenna use of a unique coupling to the intentional radiator
<input 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 _____