TEST REPORT

Report No.:	BCTC2411961763-3E
Applicant:	Acer India PVT Limited
Product Name:	Notebook
Test Model:	TRAVELLITE TL15-53M
Tested Date:	2024-11-11 to 2024-11-20
Issued Date:	2024-11-20

Shenzhen BCTC Testing Co., Ltd.

FCC ID: 2A94K-TL15-53M

Product Name:	Notebook
Trademark:	acer
Test Model:	TRAVELLITE TL15-53M TRAVELLITE TL15-53M-G2
Prepared For:	Acer India PVT Limited
Address:	Acer India PVT Limited, 6th Floor, Embassy Heights, No.13, Magrath Road, Bangalore, 560025, India
Manufacturer:	Acer India PVT Limited
Address:	RS No.38/2, Sedarapet Village Villianur Commune, Pondicherry 605111
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2024-11-11
Sample tested Date:	2024-11-11 to 2024-11-20
Issue Date:	2024-11-20
Report No.:	BCTC2411961763-3E
Test Standards:	FCC Part15.247 ANSI C63.10-2013
Test Results:	PASS
Remark:	This is WIFI-2.4GHz band radio test report.

Tested by:

Shanshan. Zhang

Shanshan. Zhang / Project Handler

Approved by:

Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

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(Note: N/A Means Not Applicable)

1. Version

Report No.	Issue Date	Description	Approved
BCTC2411961763-3E	2024-11-20	Original	Valid

2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	Conducted Emission	15.207	PASS
2	6dB Bandwidth	15.247 (a)(2)	PASS
3	Peak Output Power	15.247 (b)	PASS
4	Radiated Spurious Emission	15.247 (d)	PASS
5	Power Spectral Density	15.247 (e)	PASS
6	Restricted Band of Operation	15.205	PASS
7	Band Edge (Out of Band Emissions)	15.247 (d)	PASS
8	Antenna Requirement	15.203	PASS

3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(9KHz-30MHz)	U=3.7dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission (150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	U=0.59℃

4. Product Information And Test Setup

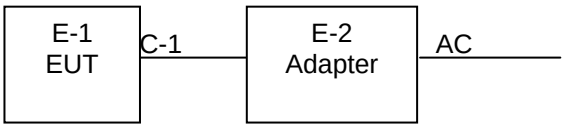
4.1 Product Information

Test Model:	TRAVELLITE TL15-53M TRAVELLITE TL15-53M-G2
Model differences:	All the model are the same circuit and RF module, except model names and appearance of the color.
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	802.11b/g/n20/ax20 MHz:2412~2462 MHz 802.11n40/ax40 MHz:2422~2452 MHz
Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n Up to 150Mbps 802.11ax:400Mbps
Type of Modulation:	WIFI: OFDM/DSSS/OFDMA
Number Of Channel:	802.11b/g/n20/ax20MHz:11 CH 802.11n40/ax40MHz: 7 CH
Antenna installation:	Internal antenna*2
Antenna Gain:	WIFI(2.4GHz): Antenna A: 2.5 dBi, Antenna B: 2.43 dBi Remark: ☒ The antenna gain of the product comes from the antenna report provided by the customer, and the test data is affected by the customer information. ☐ The antenna gain of the product is provided by the customer, and the test data is affected by the customer information.
Ratings:	DC 20V from adapter or DC 11.4V from battery
Adapter 1 Information:	MODEL: PA-1650-58 INPUT: 100-240V~ 1.6A 50-60Hz OUTPUT: 5.0V⎓3.0A/9.0V⎓3.0A/12.0V⎓3.0A/15.0V⎓3.0A/20.0V⎓3.25A
Adapter 2 Information:	MODEL: ADP-65KE D INPUT: 100-240V~ 1.7A 50-60Hz OUTPUT: 5.0V⎓3.0A/9.0V⎓3.0A/12.0V⎓3.0A/15.0V⎓3.0A/20.0V⎓3.25A

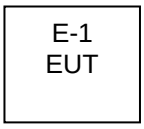
4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission:



Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	Notebook	Acer	TRAVELLITE TL15-53M	N/A	EUT
E-2	ADAPTER	N/A	PA-1650-58	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	3M	DC cable unshielded

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

Channel List for 802.11b/g/n(20)/ax(20)					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	02	2417	03	2422
04	2427	05	2432	06	2437
07	2442	08	2447	09	2452
10	2457	11	2462		

Channel List for 802.11n(40)/ax(40)					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	04	2427	05	2432
06	2437	07	2442	08	2447
09	2452				

4.5 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

For All Mode	Description	Modulation Type
Mode 1	CH 01	802.11b
Mode 2	CH 06	
Mode 3	CH 11	
Mode 4	CH 01	802.11g
Mode 5	CH 06	
Mode 6	CH 11	
Mode 7	CH 01	802.11n20/ax20
Mode 8	CH 06	
Mode 9	CH 11	
Mode 10	CH 03	802.11n40/ax40
Mode 11	CH 06	
Mode 12	CH 09	
Mode 13	Link mode (Conducted emission & Radiated emission)	

Notes:
1. The measurements are performed at the highest, middle, lowest available channels.
2. The measurements are performed at all Bit Rate of Transmitter, the worst data was reported
3. According to ANSI C63.10 standards, the test results are both the “worst case” and “worst setup” 11Mbps for 802.11b,6Mbps for 802.11g,13Mbps for 802.11n(H20), 54Mbps for 802.11n(H40), 400Mbps for 802.11ax20 and 802.11ax40.
4. This product does not support RU mode.

4.6 Table Of Parameters Of Text Software Setting

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Test software Version	**phwfw02372_22.10.0.7tools**		
Frequency	2412 MHz	2437 MHz	2462 MHz
Parameters	DEF	DEF	DEF
Frequency	2422MHz	2437MHz	2452MHz
Parameters	DEF	DEF	DEF

4.7 Antenna

Table for Internal antenna

Ant.	**Brand**	**Model Name**	**Antenna Type**	**Gain (dBi)**	**NOTE**
A	N/A	N/A	Internal antenna	2.5	N/A
B	N/A	N/A	Internal antenna	2.43	N/A

The EUT has two internal antennas, antenna A has a maximum gain GANT of 2.12 dBi and antenna B has a maximum gain GANT of 1.81dBi, CDD device with one spatial streams, also can operate with one spatial streams according to KDB662911 D01 v02r01,
Directional gain= GANT + Array Gain, where Array Gain is as follows.

1)For power spectral density(PSD) measurements,
Array Gain=10log(NANT/NSS)dB=10log(2/1)=3.01 dBi,
So the directional gain for PSD is 5.51 dBi

2)For power measurements,
The Array gain=0 for NANT≤4,
So the directional gain for Power measurements is 2.5 dBi

Directional gain may be calculated by using the formulas applicable to equal gain antennas with GANT set equal to the gain of the antenna having the highest gain.

5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.
FCC Test Firm Registration Number: 712850
A2LA certificate registration number is: CN1212
ISED Registered No.: 23583
ISED CAB identifier: CN0017

5.2 Test Instrument Used

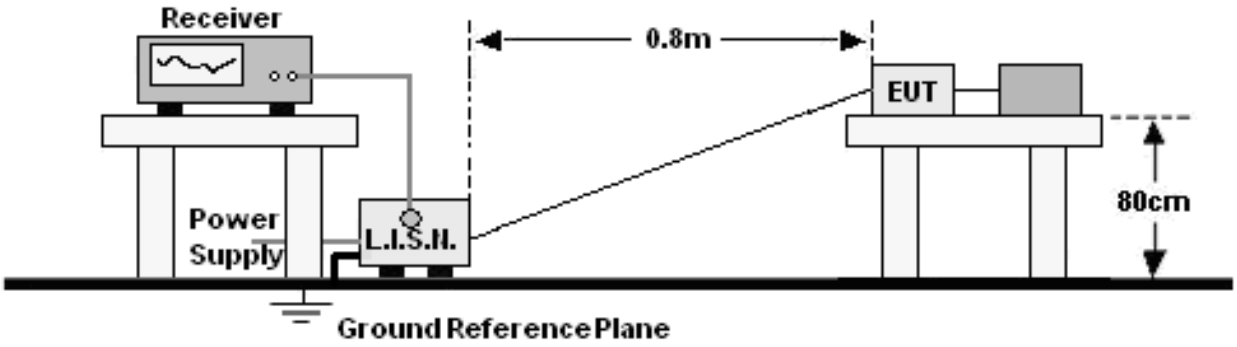
Conducted Emissions Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025
LISN	R&S	ENV216	101375	May 16, 2024	May 15, 2025
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\
Pulse limiter	Schwarzbeck	VTSD9561-F	01323	May 16, 2024	May 15, 2025
RF cables 9kHz-30MHz	Huber+Suhnar	\	B1702988-0008	May 16, 2024	May 15, 2025

RF Conducted Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Power meter	Keysight	E4419	\	May 16, 2024	May 15, 2025
Power Sensor (AV)	Keysight	E9300A	\	May 16, 2024	May 15, 2025
Signal Analyzer20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 16, 2024	May 15, 2025
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025
Radio frequency control box	MAIWEI	MW100-RFCB	\	\	\
Software	MAIWEI	MTS 8310	\	\	\

Radiated Emissions Test (966 Chamber02)					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
966 chamber	SKET	966 Room	966	Oct. 31. 2024	Oct. 30. 2027
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025
Receiver	R&S	ESRI7	100010	Oct. 31. 2024	Oct. 30. 2025
Amplifier	SKET	LNPA-30M01G-30	SK2021082004	Oct. 31. 2024	Oct. 30. 2025
TRILOG Broadband Antenna	Schwarzbeck	VULB9168	1323	May 21, 2024	May 20, 2025
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	May 21, 2024	May 20, 2025
Amplifier	SKET	LAPA_01G18G-45dB	SK2021040901	May 16, 2024	May 15, 2025
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 21, 2024	May 20, 2025
Amplifier(18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	May 16, 2024	May 15, 2025
Horn Antenn(18GHz-40GHz)	Schwarzbeck	BBHA9170	00822	May 21, 2024	May 20, 2025
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025
Software	Frad	EZ-EMC	FA-03A2 RE	\	\
Cable 30MHz-18GHZ	SKET	RC_18G-N-M/N-M-3M	#05	May 16, 2024	May 15, 2025

6. Conducted Emissions

6.1 Block Diagram Of Test Setup



6.2 Limit

Frequency (MHz)	Limit (dBuV)	
	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00
Notes: 1. *Decreasing linearly with logarithm of frequency. 2. The lower limit shall apply at the transition frequencies.		

6.3 Test procedure

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

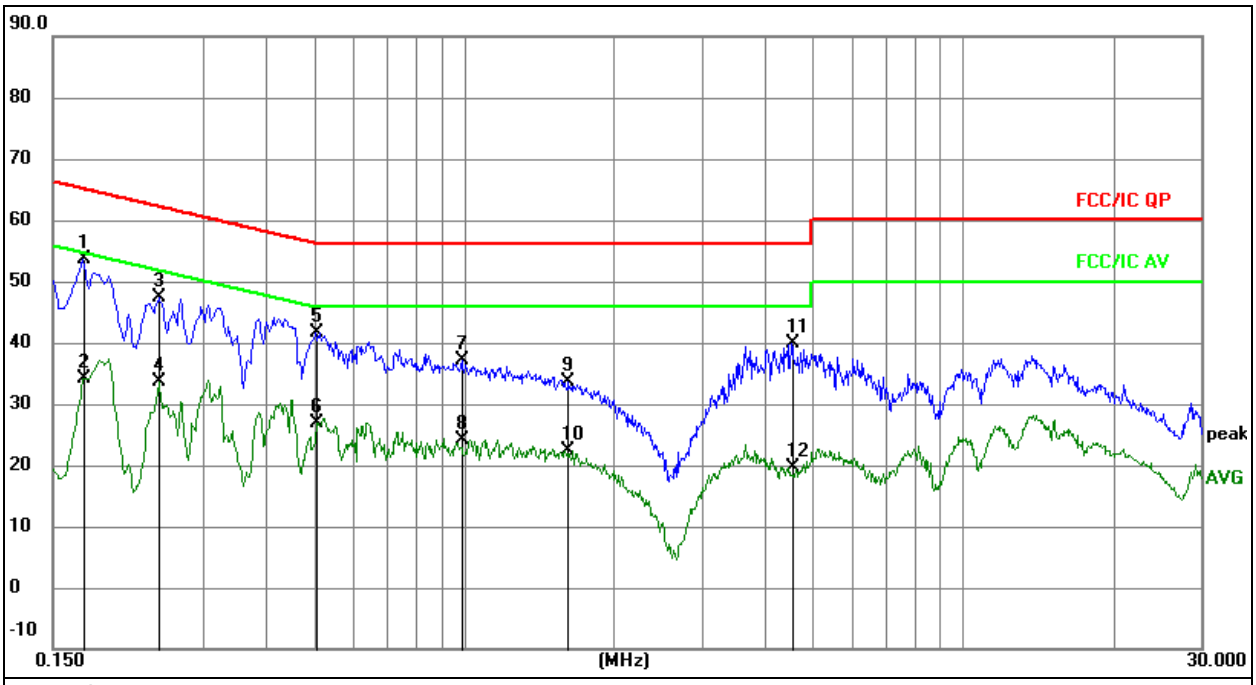
a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

6.5 Test Result

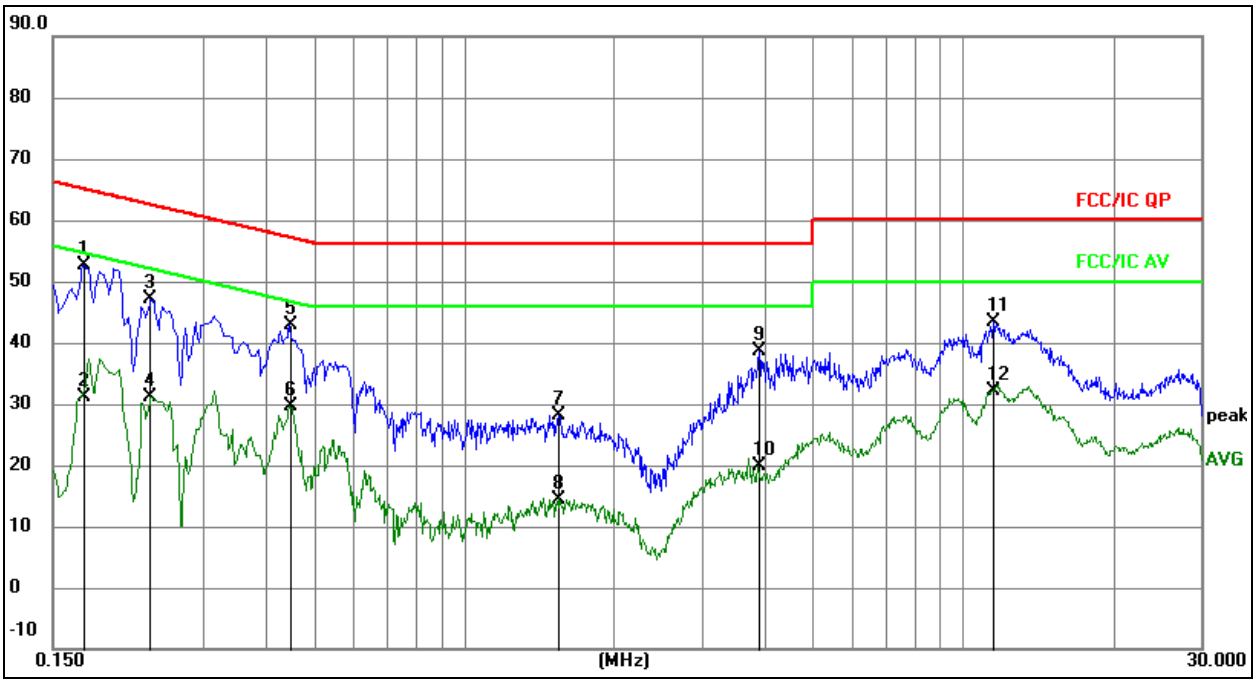
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 13(Adapter 1)	Test Voltage :	AC120V/60Hz



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.1722	33.48	20.07	53.55	64.85	-11.30	QP
2		0.1722	14.00	20.07	34.07	54.85	-20.78	AVG
3		0.2442	27.23	20.07	47.30	61.95	-14.65	QP
4		0.2442	13.50	20.07	33.57	51.95	-18.38	AVG
5		0.5047	21.48	20.08	41.56	56.00	-14.44	QP
6		0.5047	6.81	20.08	26.89	46.00	-19.11	AVG
7		0.9891	17.14	20.09	37.23	56.00	-18.77	QP
8		0.9891	4.03	20.09	24.12	46.00	-21.88	AVG
9		1.6190	13.43	20.10	33.53	56.00	-22.47	QP
10		1.6190	2.39	20.10	22.49	46.00	-23.51	AVG
11		4.5254	19.84	20.14	39.98	56.00	-16.02	QP
12		4.5254	-0.60	20.14	19.54	46.00	-26.46	AVG

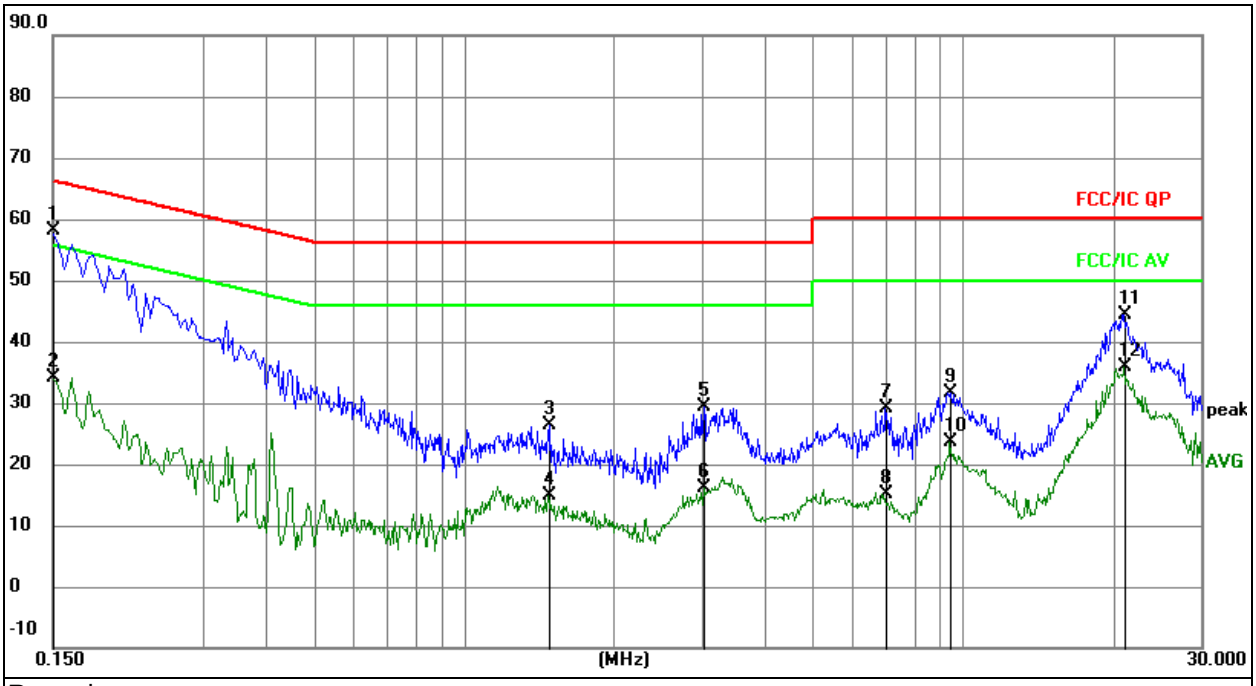
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	N
Test Mode:	Mode 13(Adapter 1)	Test Voltage :	AC120V/60Hz



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.1722	32.57	20.07	52.64	64.85	-12.21	QP
2		0.1722	11.16	20.07	31.23	54.85	-23.62	AVG
3		0.2353	27.04	20.07	47.11	62.26	-15.15	QP
4		0.2353	11.13	20.07	31.20	52.26	-21.06	AVG
5		0.4468	22.69	20.08	42.77	56.93	-14.16	QP
6		0.4468	9.47	20.08	29.55	46.93	-17.38	AVG
7		1.5518	8.13	20.10	28.23	56.00	-27.77	QP
8		1.5518	-5.73	20.10	14.37	46.00	-31.63	AVG
9		3.9014	18.60	20.14	38.74	56.00	-17.26	QP
10		3.9014	-0.27	20.14	19.87	46.00	-26.13	AVG
11		11.4983	23.13	20.21	43.34	60.00	-16.66	QP
12		11.4983	11.89	20.21	32.10	50.00	-17.90	AVG

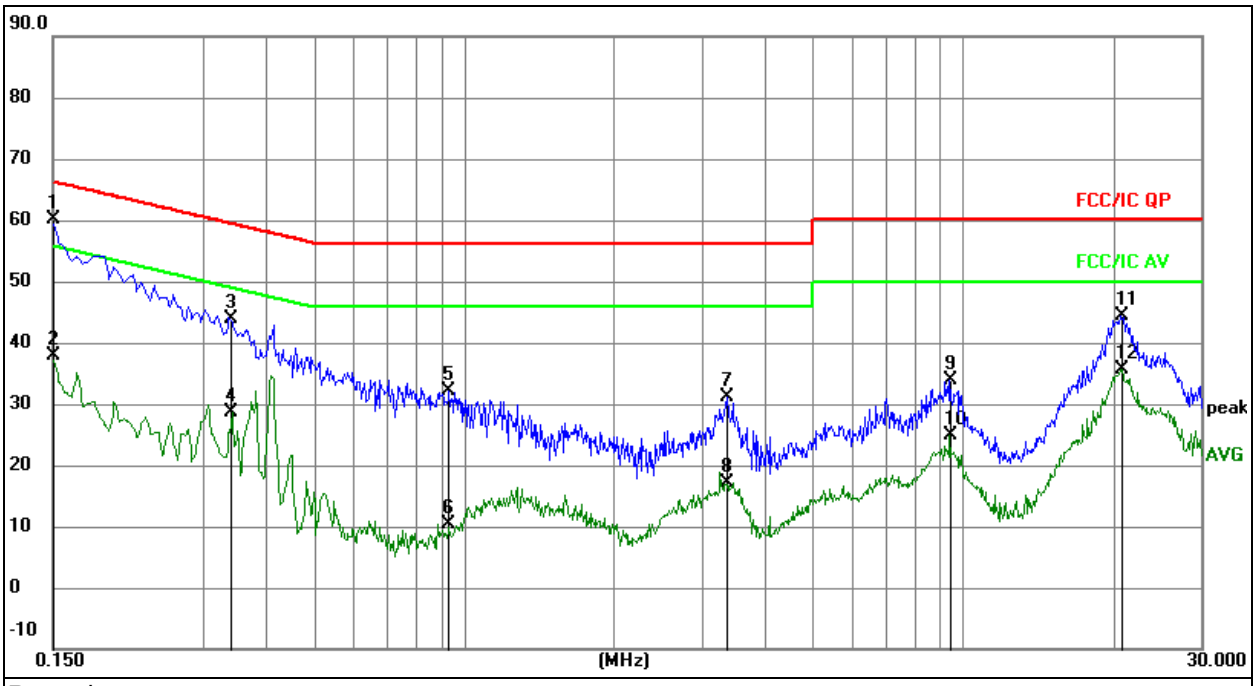
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 13(Adapter 2)	Test Voltage :	AC120V/60Hz



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.1500	38.08	20.07	58.15	66.00	-7.85	QP
2		0.1500	14.18	20.07	34.25	56.00	-21.75	AVG
3		1.4874	6.19	20.09	26.28	56.00	-29.72	QP
4		1.4874	-5.12	20.09	14.97	46.00	-31.03	AVG
5		3.0253	9.21	20.12	29.33	56.00	-26.67	QP
6		3.0253	-4.03	20.12	16.09	46.00	-29.91	AVG
7		6.9878	9.07	20.16	29.23	60.00	-30.77	QP
8		6.9878	-5.04	20.16	15.12	50.00	-34.88	AVG
9		9.4514	11.52	20.17	31.69	60.00	-28.31	QP
10		9.4514	3.34	20.17	23.51	50.00	-26.49	AVG
11		21.0355	24.09	20.32	44.41	60.00	-15.59	QP
12		21.0355	15.60	20.32	35.92	50.00	-14.08	AVG

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	N
Test Mode:	Mode 13(Adapter 2)	Test Voltage :	AC120V/60Hz



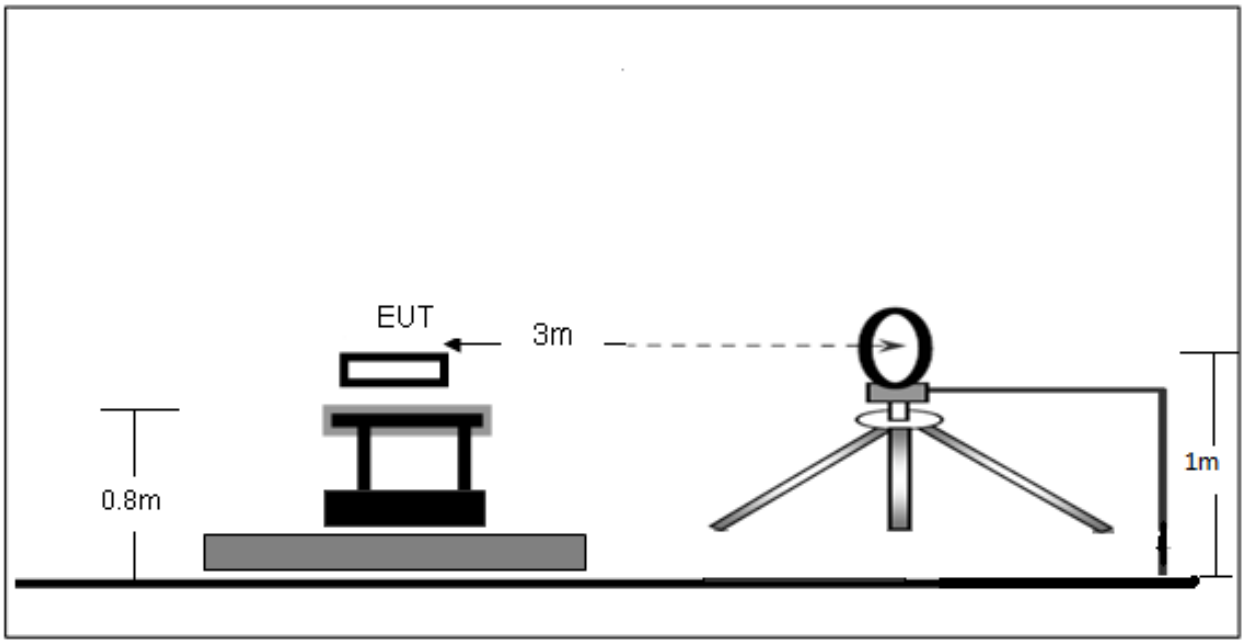
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.1500	40.06	20.07	60.13	66.00	-5.87	QP
2		0.1500	17.70	20.07	37.77	56.00	-18.23	AVG
3		0.3392	23.78	20.07	43.85	59.22	-15.37	QP
4		0.3392	8.46	20.07	28.53	49.22	-20.69	AVG
5		0.9331	11.97	20.09	32.06	56.00	-23.94	QP
6		0.9331	-9.66	20.09	10.43	46.00	-35.57	AVG
7		3.3635	10.90	20.13	31.03	56.00	-24.97	QP
8		3.3635	-2.90	20.13	17.23	46.00	-28.77	AVG
9		9.4015	13.62	20.17	33.79	60.00	-26.21	QP
10		9.4015	4.79	20.17	24.96	50.00	-25.04	AVG
11		20.7038	24.08	20.33	44.41	60.00	-15.59	QP
12		20.7038	15.27	20.33	35.60	50.00	-14.40	AVG

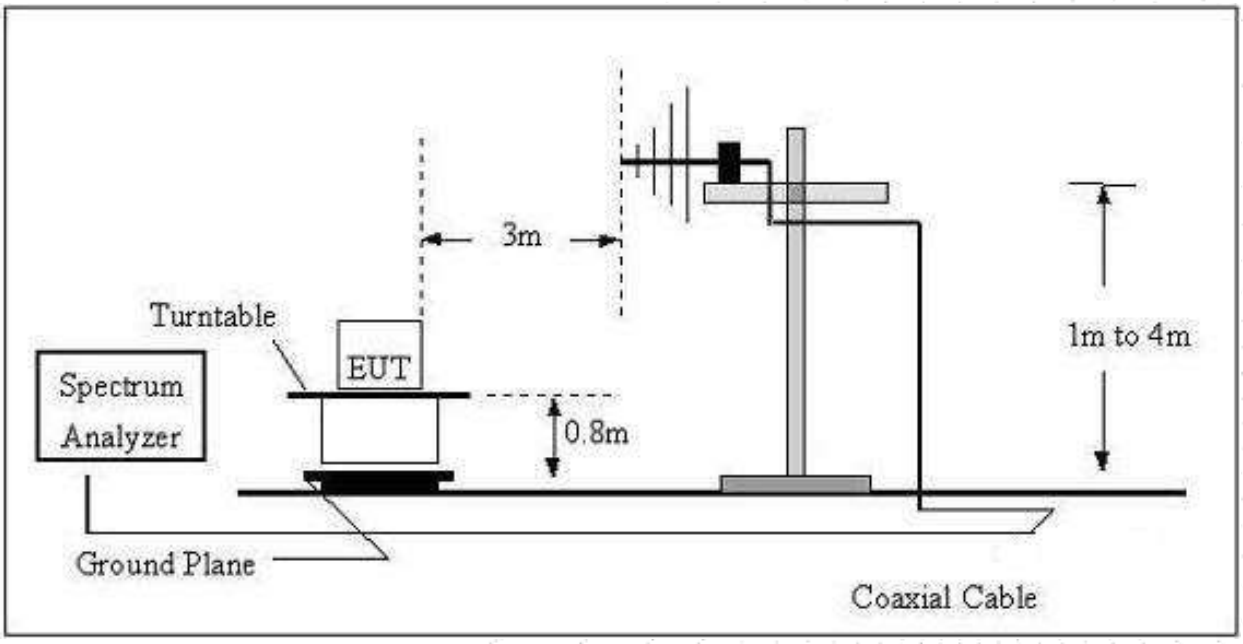
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

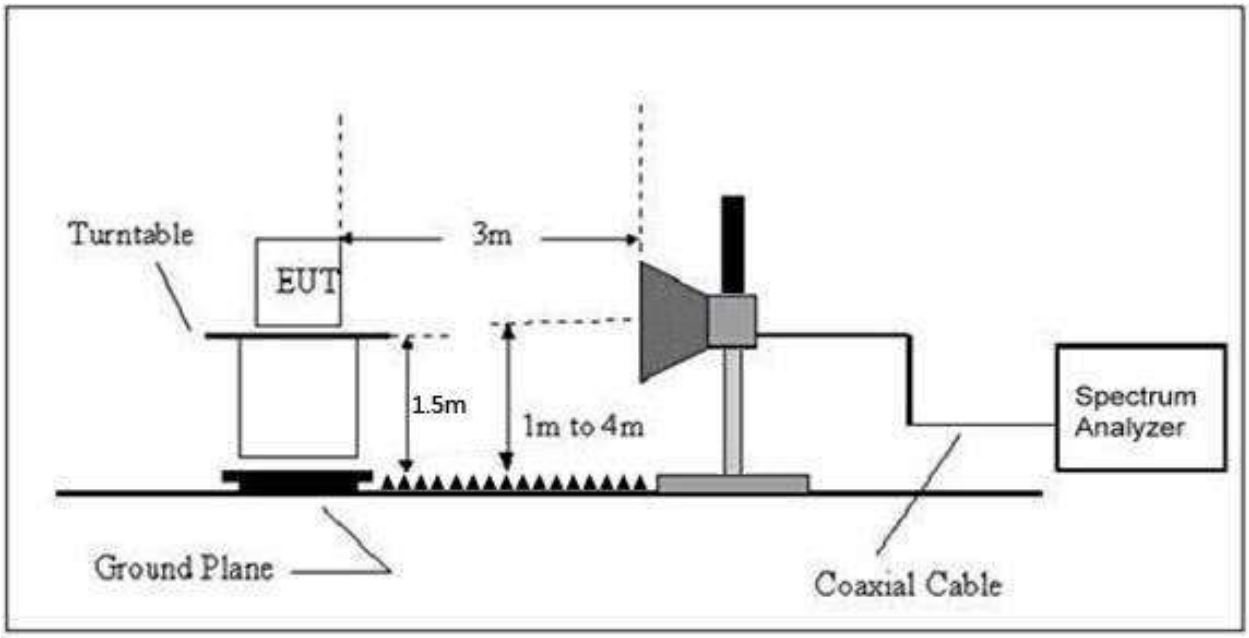
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



7.2 Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequency	Field Strength	Distance	Field Strength Limit at 3m Distance	
(MHz)	uV/m	(m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Limits Of Radiated Emission Measurement (Above 1000MHz)

Frequency (MHz)	Limit (dBuV/m) (at 3M)	
	Peak	Average
Above 1000	74	54

Notes:
(1) The limit for radiated test was performed according to FCC PART 15C.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Frequency Range Of Radiated Measurement

(a) For an intentional radiator the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in this paragraph:

(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
(4) If the intentional radiator operates at or above 95 GHz: To the third harmonic of the highest fundamental frequency or to 750 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
(5) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a) (1)through (4) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this section, whichever is the higher frequency range of investigation.

7.3 Test procedure

Receiver Parameter	Setting
Attenuation	Auto
9kHz~150kHz	RBW 200Hz for QP
150kHz~30MHz	RBW 9kHz for QP
30MHz~1000MHz	RBW 120kHz for QP

Spectrum Parameter	Setting
1-25GHz	RBW 1 MHz /VBW 1 MHz for Peak, RBW 1 MHz / VBW 10Hz for Average

Below 1GHz test procedure as below:
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:
a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middlest channel, the Highest channel.
Note:
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

7.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

7.5 Test Result

Below 30MHz

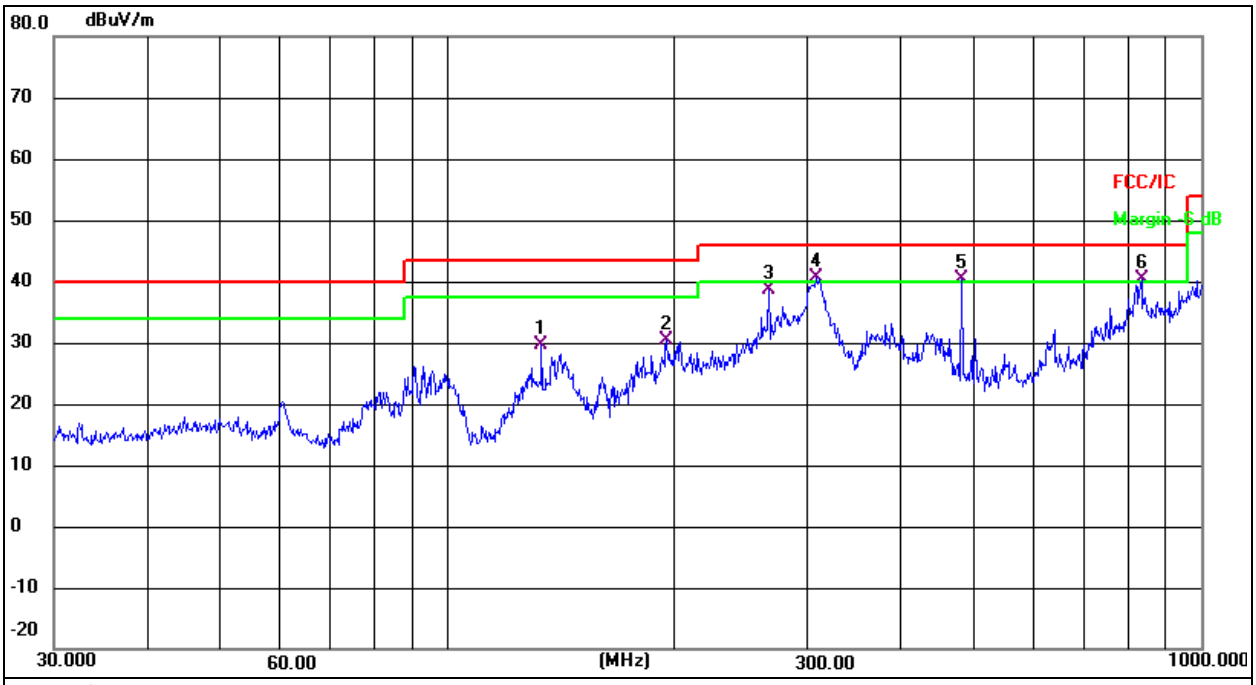
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	AC 120V/60Hz, DC 11.4V
Test Mode:	Mode 13	Polarization :	--

Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1GHz

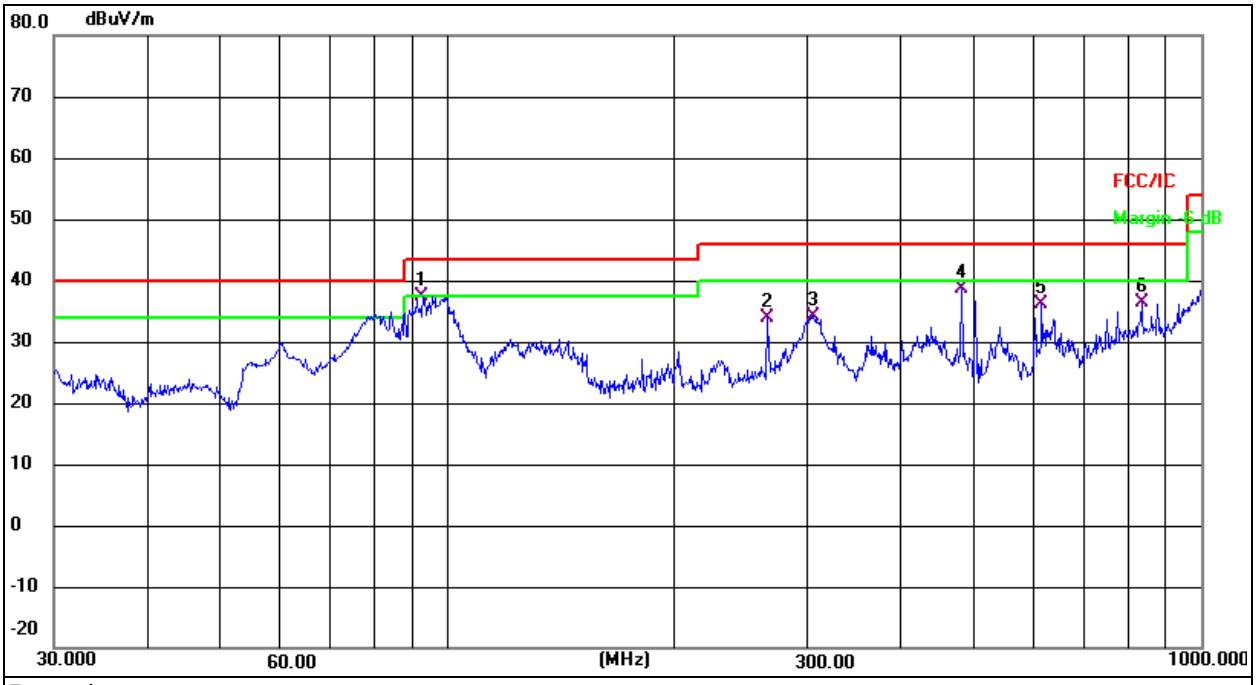
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 13(Adapter 1)	Test Voltage :	AC 120V/60Hz



Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	133.1511	41.86	-12.35	29.51	43.50	-13.99	QP
2	195.1365	44.50	-14.24	30.26	43.50	-13.24	QP
3	266.6089	50.35	-11.67	38.68	46.00	-7.32	QP
4 *	308.9126	50.94	-10.33	40.61	46.00	-5.39	QP
5 !	480.5276	45.98	-5.55	40.43	46.00	-5.57	QP
6 !	833.3171	39.51	0.77	40.28	46.00	-5.72	QP

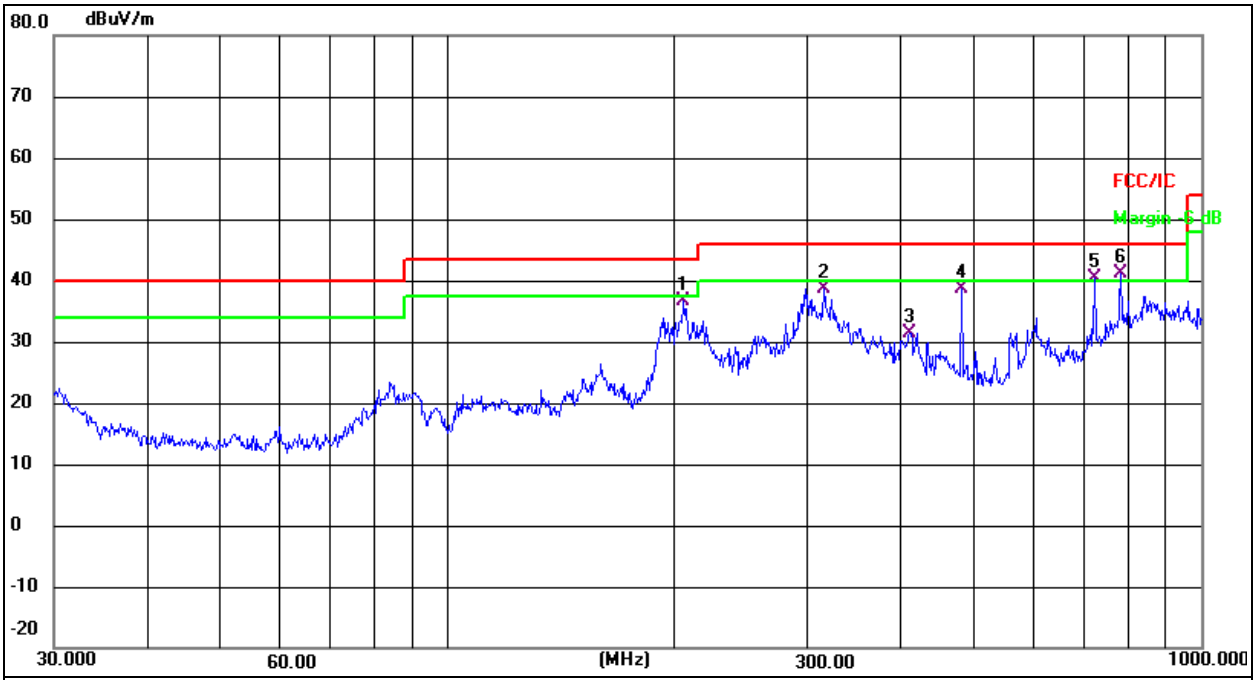
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 13(Adapter 1)	Test Voltage :	AC 120V/60Hz



Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	92.7871	53.01	-15.63	37.38	43.50	-6.12	QP
2	265.6757	45.52	-11.70	33.82	46.00	-12.18	QP
3	305.6800	44.65	-10.43	34.22	46.00	-11.78	QP
4	480.5276	44.27	-5.55	38.72	46.00	-7.28	QP
5	614.2142	38.33	-2.26	36.07	46.00	-9.93	QP
6	833.3171	35.57	0.77	36.34	46.00	-9.66	QP

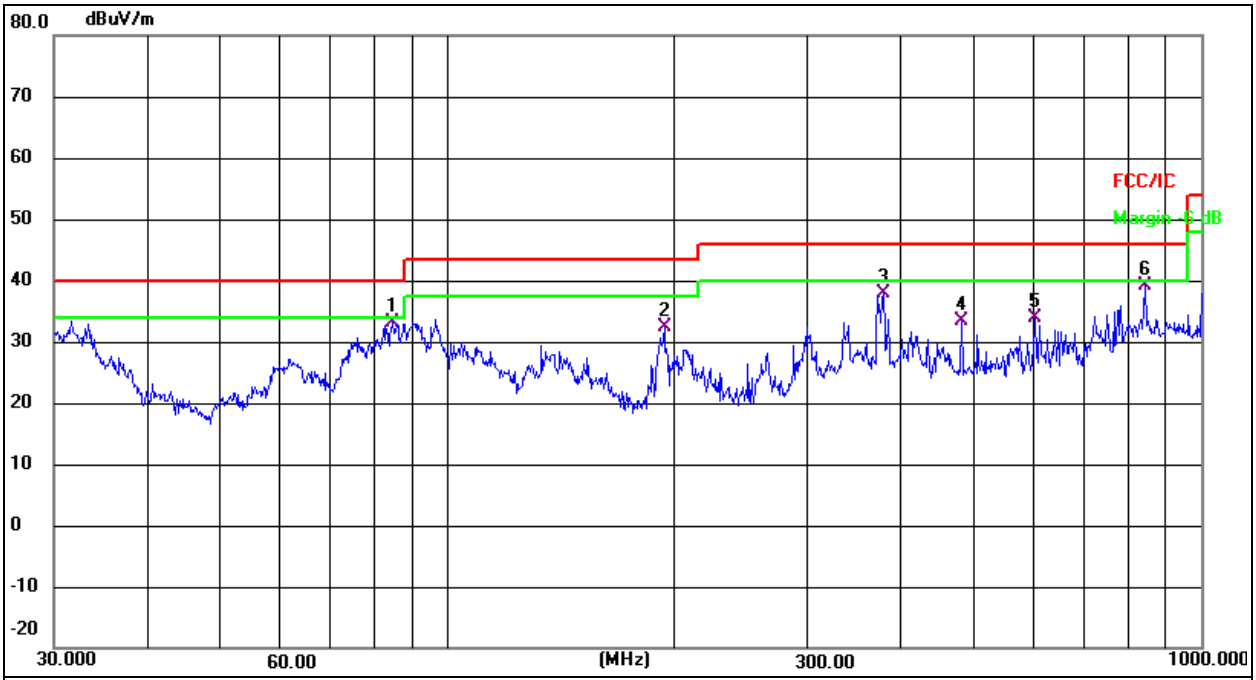
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 13(Adapter 2)	Test Voltage :	AC 120V/60Hz



Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	205.6751	50.95	-14.37	36.58	43.50	-6.92	QP
2	315.4808	48.87	-10.14	38.73	46.00	-7.27	QP
3	410.3825	38.84	-7.35	31.49	46.00	-14.51	QP
4	480.5276	44.34	-5.67	38.67	46.00	-7.33	QP
5 !	721.7259	40.69	-0.20	40.49	46.00	-5.51	QP
6 *	782.3453	40.67	0.34	41.01	46.00	-4.99	QP

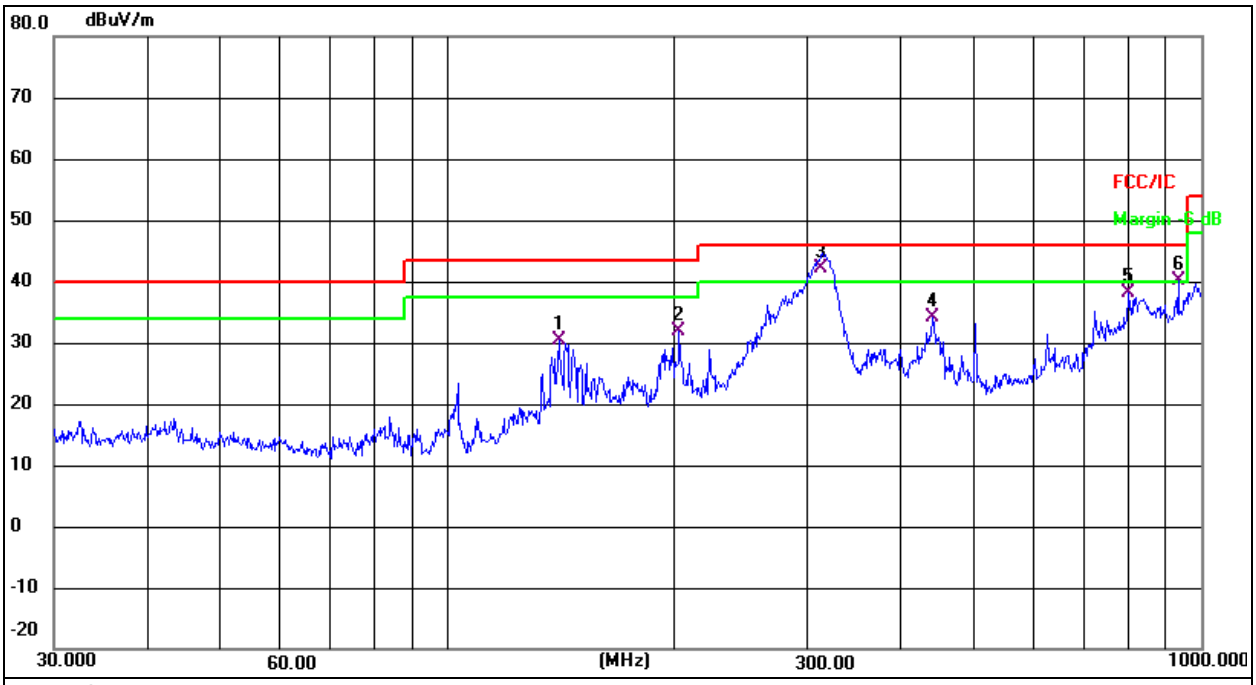
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 13(Adapter 2)	Test Voltage :	AC 120V/60Hz



Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	84.4054	49.11	-15.97	33.14	40.00	-6.86	QP
2	193.7727	46.49	-14.14	32.35	43.50	-11.15	QP
3	378.5842	46.19	-8.24	37.95	46.00	-8.05	QP
4	480.5276	39.07	-5.67	33.40	46.00	-12.60	QP
5	601.4265	36.35	-2.57	33.78	46.00	-12.22	QP
6	842.1296	38.05	1.09	39.14	46.00	-6.86	QP

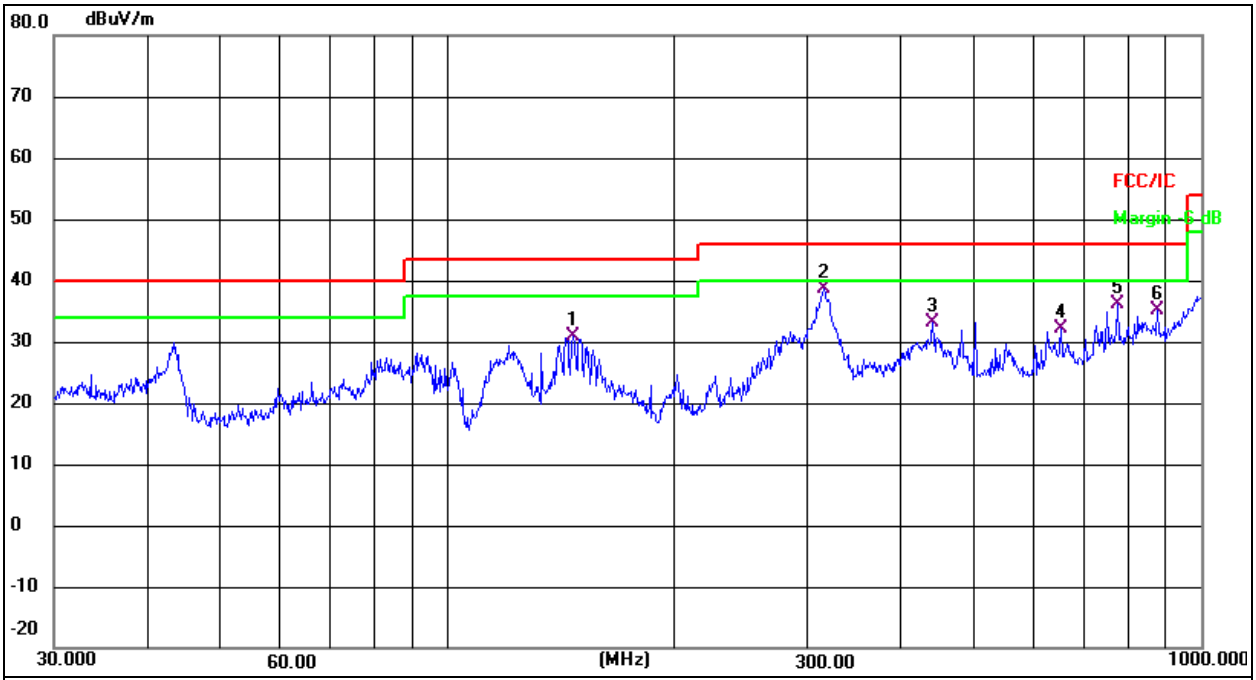
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 13	Test Voltage :	DC 11.4V



Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	140.3421	42.06	-11.73	30.33	43.50	-13.17	QP
2	202.8104	46.27	-14.47	31.80	43.50	-11.70	QP
3 *	313.5865	52.37	-10.19	42.18	46.00	-3.82	QP
4	440.1963	40.52	-6.39	34.13	46.00	-11.87	QP
5	801.7863	37.62	0.51	38.13	46.00	-7.87	QP
6 !	932.2715	37.53	2.61	40.14	46.00	-5.86	QP

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 13	Test Voltage :	DC 11.4V



Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	146.8877	42.05	-11.17	30.88	43.50	-12.62	QP
2 *	315.4808	48.86	-10.14	38.72	46.00	-7.28	QP
3	440.1963	39.46	-6.39	33.07	46.00	-12.93	QP
4	651.9417	33.44	-1.36	32.08	46.00	-13.92	QP
5	774.1584	35.76	0.40	36.16	46.00	-9.84	QP
6	875.2470	33.74	1.40	35.14	46.00	-10.86	QP

Between 1GHz – 25GHz
802.11b

Polar (H/V)	Fre-quency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure-ment (dBuV/m)	Limits (dBuV/m)	Over (dB)	Detector Type
Low channel:2412MHz							
V	4824.00	72.94	-19.95	52.99	74.00	-21.01	PK
V	4824.00	63.04	-19.95	43.09	54.00	-10.91	AV
V	7236.00	64.72	-14.14	50.58	74.00	-23.42	PK
V	7236.00	55.30	-14.14	41.16	54.00	-12.84	AV
H	4824.00	69.84	-19.95	49.89	74.00	-24.11	PK
H	4824.00	59.55	-19.95	39.60	54.00	-14.40	AV
H	7236.00	62.42	-14.14	48.28	74.00	-25.72	PK
H	7236.00	54.46	-14.14	40.32	54.00	-13.68	AV
Middle channel:2437MHz							
V	4874.00	70.16	-19.85	50.31	74.00	-23.69	PK
V	4874.00	62.89	-19.85	43.04	54.00	-10.96	AV
V	7311.00	62.55	-13.93	48.62	74.00	-25.38	PK
V	7311.00	53.95	-13.93	40.02	54.00	-13.98	AV
H	4874.00	65.96	-19.85	46.11	74.00	-27.89	PK
H	4874.00	55.76	-19.85	35.91	54.00	-18.09	AV
H	7311.00	60.45	-13.93	46.52	74.00	-27.48	PK
H	7311.00	53.34	-13.93	39.41	54.00	-14.59	AV
High channel:2462MHz							
V	4924.00	72.03	-19.75	52.28	74.00	-21.72	PK
V	4924.00	61.20	-19.75	41.45	54.00	-12.55	AV
V	7386.00	65.07	-13.72	51.35	74.00	-22.65	PK
V	7386.00	54.34	-13.72	40.62	54.00	-13.38	AV
H	4924.00	70.34	-19.75	50.59	74.00	-23.41	PK
H	4924.00	60.55	-19.75	40.80	54.00	-13.20	AV
H	7386.00	62.53	-13.72	48.81	74.00	-25.19	PK
H	7386.00	53.69	-13.72	39.97	54.00	-14.03	AV

Remark:
1.Measurement = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier,
Over= Measurement – Limit
2.If peak below the average limit, the average emission was no test.
3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB
4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
5. The worst case is Antenna A.

802.11g

Polar (H/V)	Fre-quency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure-ment (dBuV/m)	Limits (dBuV/m)	Over (dB)	Detector Type
Low channel:2412MHz							
V	4824.00	70.49	-19.95	50.54	74.00	-23.46	PK
V	4824.00	61.47	-19.95	41.52	54.00	-12.48	AV
V	7236.00	60.84	-14.14	46.70	74.00	-27.30	PK
V	7236.00	50.02	-14.14	35.88	54.00	-18.12	AV
H	4824.00	68.23	-19.95	48.28	74.00	-25.72	PK
H	4824.00	58.95	-19.95	39.00	54.00	-15.00	AV
H	7236.00	59.47	-14.14	45.33	74.00	-28.67	PK
H	7236.00	51.09	-14.14	36.95	54.00	-17.05	AV
Middle channel:2437MHz							
V	4874.00	67.13	-19.85	47.28	74.00	-26.72	PK
V	4874.00	59.54	-19.85	39.69	54.00	-14.31	AV
V	7311.00	57.44	-13.93	43.51	74.00	-30.49	PK
V	7311.00	48.66	-13.93	34.73	54.00	-19.27	AV
H	4874.00	62.96	-19.85	43.11	74.00	-30.89	PK
H	4874.00	52.91	-19.85	33.06	54.00	-20.94	AV
H	7311.00	56.27	-13.93	42.34	74.00	-31.66	PK
H	7311.00	48.45	-13.93	34.52	54.00	-19.48	AV
High channel:2462MHz							
V	4924.00	69.67	-19.75	49.92	74.00	-24.08	PK
V	4924.00	59.14	-19.75	39.39	54.00	-14.61	AV
V	7386.00	61.33	-13.72	47.61	74.00	-26.39	PK
V	7386.00	51.73	-13.72	38.01	54.00	-15.99	AV
H	4924.00	68.64	-19.75	48.89	74.00	-25.11	PK
H	4924.00	58.43	-19.75	38.68	54.00	-15.32	AV
H	7386.00	58.94	-13.72	45.22	74.00	-28.78	PK
H	7386.00	50.43	-13.72	36.71	54.00	-17.29	AV

Remark:
1.Measurement = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier,
Over= Measurement – Limit
2.If peak below the average limit, the average emission was no test.
3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB
4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
5. The worst case is Antenna A.

802.11n20

Polar (H/V)	Fre-quency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure-ment (dBuV/m)	Limits (dBuV/m)	Over (dB)	Detector Type
Low channel:2412MHz							
V	4824.00	70.83	-19.95	50.88	74.00	-23.12	PK
V	4824.00	62.55	-19.95	42.60	54.00	-11.40	AV
V	7236.00	62.28	-14.14	48.14	74.00	-25.86	PK
V	7236.00	52.85	-14.14	38.71	54.00	-15.29	AV
H	4824.00	65.86	-19.95	45.91	74.00	-28.09	PK
H	4824.00	55.15	-19.95	35.20	54.00	-18.80	AV
H	7236.00	60.94	-14.14	46.80	74.00	-27.20	PK
H	7236.00	52.55	-14.14	38.41	54.00	-15.59	AV
Middle channel:2437MHz							
V	4874.00	67.28	-19.85	47.43	74.00	-26.57	PK
V	4874.00	59.80	-19.85	39.95	54.00	-14.05	AV
V	7311.00	58.20	-13.93	44.27	74.00	-29.73	PK
V	7311.00	48.93	-13.93	35.00	54.00	-19.00	AV
H	4874.00	64.64	-19.85	44.79	74.00	-29.21	PK
H	4874.00	54.74	-19.85	34.89	54.00	-19.11	AV
H	7311.00	55.58	-13.93	41.65	74.00	-32.35	PK
H	7311.00	47.27	-13.93	33.34	54.00	-20.66	AV
High channel:2462MHz							
V	4924.00	68.61	-19.75	48.86	74.00	-25.14	PK
V	4924.00	59.58	-19.75	39.83	54.00	-14.17	AV
V	7386.00	60.60	-13.72	46.88	74.00	-27.12	PK
V	7386.00	49.84	-13.72	36.12	54.00	-17.88	AV
H	4924.00	66.07	-19.75	46.32	74.00	-27.68	PK
H	4924.00	56.71	-19.75	36.96	54.00	-17.04	AV
H	7386.00	59.13	-13.72	45.41	74.00	-28.59	PK
H	7386.00	51.38	-13.72	37.66	54.00	-16.34	AV

Remark:
1.Measurement = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier,
Over= Measurement – Limit
2.If peak below the average limit, the average emission was no test.
3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB
4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
5. Test Mode is MIMO Mode.

802.11n40

Polar (H/V)	Fre-quency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure-ment (dBuV/m)	Limits (dBuV/m)	Over (dB)	Detector Type
Low channel:2422MHz							
V	4844.00	72.53	-19.91	52.62	74.00	-21.38	PK
V	4844.00	62.38	-19.91	42.47	54.00	-11.53	AV
V	7266.00	64.18	-14.06	50.12	74.00	-23.88	PK
V	7266.00	54.30	-14.06	40.24	54.00	-13.76	AV
H	4844.00	71.31	-19.91	51.40	74.00	-22.60	PK
H	4844.00	60.81	-19.91	40.90	54.00	-13.10	AV
H	7266.00	61.42	-14.06	47.36	74.00	-26.64	PK
H	7266.00	52.90	-14.06	38.84	54.00	-15.16	AV
Middle channel:2437MHz							
V	4874.00	71.23	-19.85	51.38	74.00	-22.62	PK
V	4874.00	62.46	-19.85	42.61	54.00	-11.39	AV
V	7311.00	61.92	-13.93	47.99	74.00	-26.01	PK
V	7311.00	53.89	-13.93	39.96	54.00	-14.04	AV
H	4874.00	67.00	-19.85	47.15	74.00	-26.85	PK
H	4874.00	57.43	-19.85	37.58	54.00	-16.42	AV
H	7311.00	60.44	-13.93	46.51	74.00	-27.49	PK
H	7311.00	51.65	-13.93	37.72	54.00	-16.28	AV
High channel:2452MHz							
V	4904.00	73.63	-19.79	53.84	74.00	-20.16	PK
V	4904.00	64.39	-19.79	44.60	54.00	-9.40	AV
V	7356.00	65.66	-13.80	51.86	74.00	-22.14	PK
V	7356.00	56.08	-13.80	42.28	54.00	-11.72	AV
H	4904.00	72.19	-19.79	52.40	74.00	-21.60	PK
H	4904.00	61.35	-19.79	41.56	54.00	-12.44	AV
H	7356.00	63.57	-13.80	49.77	74.00	-24.23	PK
H	7356.00	56.25	-13.80	42.45	54.00	-11.55	AV

Remark:
1.Measurement = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier,
Over= Measurement – Limit
2.If peak below the average limit, the average emission was no test.
3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB
4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
5. Test Mode is MIMO Mode.

802.11ax20

Polar (H/V)	Fre-quency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure-ment (dBuV/m)	Limits (dBuV/m)	Over (dB)	Detector Type
Low channel:2412MHz							
V	4824.00	72.35	-19.95	52.40	74.00	-21.60	PK
V	4824.00	62.95	-19.95	43.00	54.00	-11.00	AV
V	7236.00	61.61	-14.14	47.47	74.00	-26.53	PK
V	7236.00	52.54	-14.14	38.40	54.00	-15.60	AV
H	4824.00	69.69	-19.95	49.74	74.00	-24.26	PK
H	4824.00	60.27	-19.95	40.32	54.00	-13.68	AV
H	7236.00	60.32	-14.14	46.18	74.00	-27.82	PK
H	7236.00	52.21	-14.14	38.07	54.00	-15.93	AV
Middle channel:2437MHz							
V	4874.00	69.87	-19.85	50.02	74.00	-23.98	PK
V	4874.00	61.71	-19.85	41.86	54.00	-12.14	AV
V	7311.00	61.76	-13.93	47.83	74.00	-26.17	PK
V	7311.00	52.83	-13.93	38.90	54.00	-15.10	AV
H	4874.00	67.47	-19.85	47.62	74.00	-26.38	PK
H	4874.00	58.16	-19.85	38.31	54.00	-15.69	AV
H	7311.00	59.76	-13.93	45.83	74.00	-28.17	PK
H	7311.00	52.04	-13.93	38.11	54.00	-15.89	AV
High channel:2462MHz							
V	4924.00	71.52	-19.75	51.77	74.00	-22.23	PK
V	4924.00	63.26	-19.75	43.51	54.00	-10.49	AV
V	7386.00	62.99	-13.72	49.27	74.00	-24.73	PK
V	7386.00	52.62	-13.72	38.90	54.00	-15.10	AV
H	4924.00	69.99	-19.75	50.24	74.00	-23.76	PK
H	4924.00	60.93	-19.75	41.18	54.00	-12.82	AV
H	7386.00	61.19	-13.72	47.47	74.00	-26.53	PK
H	7386.00	53.85	-13.72	40.13	54.00	-13.87	AV

Remark:
1.Measurement = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier,
Over= Measurement – Limit
2.If peak below the average limit, the average emission was no test.
3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB
4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
5. Test Mode is MIMO Mode.

802.11ax40

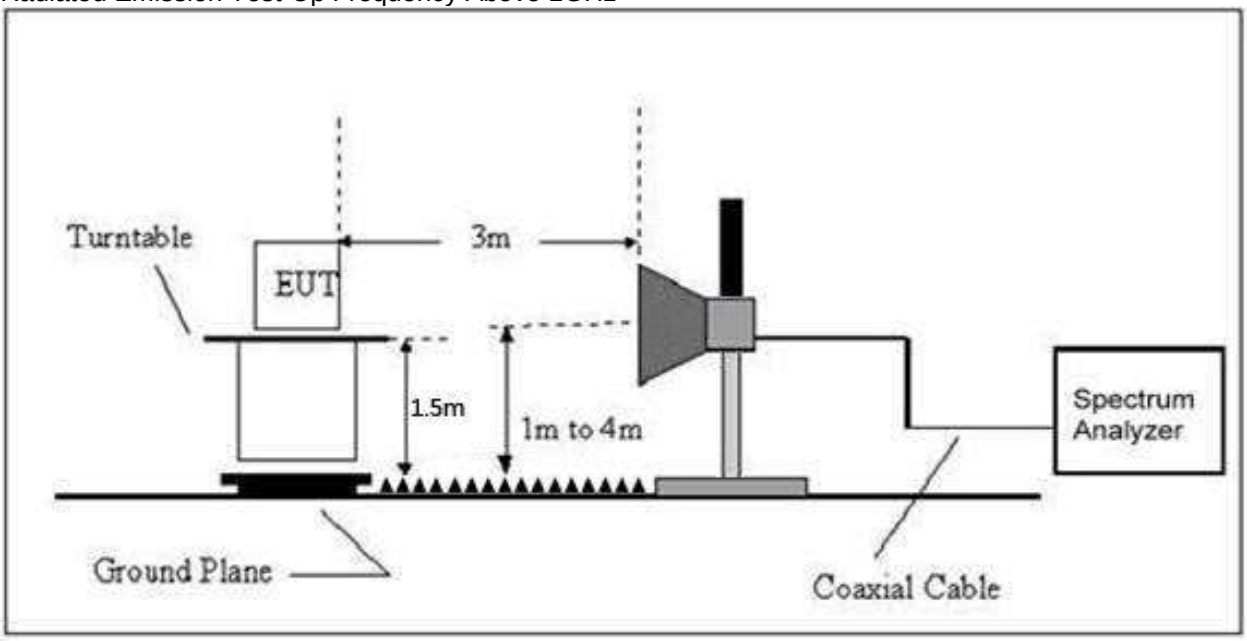
Polar (H/V)	Fre-quency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure-ment (dBuV/m)	Limits (dBuV/m)	Over (dB)	Detector Type
Low channel:2422MHz							
V	4844.00	72.65	-19.91	52.74	74.00	-21.26	PK
V	4844.00	63.93	-19.91	44.02	54.00	-9.98	AV
V	7266.00	65.49	-14.06	51.43	74.00	-22.57	PK
V	7266.00	56.02	-14.06	41.96	54.00	-12.04	AV
H	4844.00	70.88	-19.91	50.97	74.00	-23.03	PK
H	4844.00	60.59	-19.91	40.68	54.00	-13.32	AV
H	7266.00	64.26	-14.06	50.20	74.00	-23.80	PK
H	7266.00	56.02	-14.06	41.96	54.00	-12.04	AV
Middle channel:2437MHz							
V	4874.00	70.48	-19.85	50.63	74.00	-23.37	PK
V	4874.00	61.88	-19.85	42.03	54.00	-11.97	AV
V	7311.00	62.94	-13.93	49.01	74.00	-24.99	PK
V	7311.00	54.29	-13.93	40.36	54.00	-13.64	AV
H	4874.00	68.20	-19.85	48.35	74.00	-25.65	PK
H	4874.00	57.44	-19.85	37.59	54.00	-16.41	AV
H	7311.00	61.47	-13.93	47.54	74.00	-26.46	PK
H	7311.00	52.61	-13.93	38.68	54.00	-15.32	AV
High channel:2452MHz							
V	4904.00	72.74	-19.79	52.95	74.00	-21.05	PK
V	4904.00	63.90	-19.79	44.11	54.00	-9.89	AV
V	7356.00	65.69	-13.80	51.89	74.00	-22.11	PK
V	7356.00	55.21	-13.80	41.41	54.00	-12.59	AV
H	4904.00	70.26	-19.79	50.47	74.00	-23.53	PK
H	4904.00	60.19	-19.79	40.40	54.00	-13.60	AV
H	7356.00	63.85	-13.80	50.05	74.00	-23.95	PK
H	7356.00	56.32	-13.80	42.52	54.00	-11.48	AV

Remark:
1.Measurement = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier,
Over= Measurement – Limit
2.If peak below the average limit, the average emission was no test.
3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB
4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
5. Test Mode is MIMO Mode.

8. Radiated Band Emission Measurement And Restricted Bands Of Operation

8.1 Block Diagram Of Test Setup

Radiated Emission Test-Up Frequency Above 1GHz



8.2 Limit

FCC Part15 C Section 15.209 and 15.205

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]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
8.41425-8.41475	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	([2])
13.36-13.41			

Limits Of Radiated Emission Measurement (Above 1000MHz)

Frequency (MHz)	Limit (dBuV/m) (at 3M)	
	Peak	Average
Above 1000	74	54

Notes:
(1) The limit for radiated test was performed according to FCC PART 15C.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).

8.3 Test procedure

Receiver Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Above 1GHz test procedure as below:
a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middlest channel, the Highest channel.
Note:
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

8.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

8.5 Test Result

Test mode	Polar (H/V)	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure-ment (dBuV/m)	Limits (dBuV/m)		Result
					PK	PK	AV	
802.11b	Low Channel 2412MHz							
	H	2390.00	73.71	-25.43	48.28	74.00	54.00	PASS
	H	2400.00	76.56	-25.40	51.16	74.00	54.00	PASS
	V	2390.00	72.91	-25.43	47.48	74.00	54.00	PASS
	V	2400.00	74.21	-25.40	48.81	74.00	54.00	PASS
	High Channel 2462MHz							
	H	2483.50	72.54	-25.15	47.39	74.00	54.00	PASS
	H	2500.00	68.85	-25.10	43.75	74.00	54.00	PASS
	V	2483.50	72.80	-25.15	47.65	74.00	54.00	PASS
	V	2500.00	69.52	-25.10	44.42	74.00	54.00	PASS
802.11g	Low Channel 2412MHz							
	H	2390.00	73.94	-25.43	48.51	74.00	54.00	PASS
	H	2400.00	76.89	-25.40	51.49	74.00	54.00	PASS
	V	2390.00	73.67	-25.43	48.24	74.00	54.00	PASS
	V	2400.00	73.68	-25.40	48.28	74.00	54.00	PASS
	High Channel 2462MHz							
	H	2483.50	73.44	-25.15	48.29	74.00	54.00	PASS
	H	2500.00	69.35	-25.10	44.25	74.00	54.00	PASS
	V	2483.50	73.24	-25.15	48.09	74.00	54.00	PASS
	V	2500.00	69.36	-25.10	44.26	74.00	54.00	PASS

Remark:
1.Measurement = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier,
Over= Measurement – Limit
2. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.
3 In restricted bands of operation, The spurious emissions below the permissible value more than 20dB
4.The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
5.The worst case is Antenna A.

Test mode	Polar (H/V)	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure-ment (dBuV/m)	Limits (dBuV/m)		Result
					PK	PK	AV	
802.11n20	Low Channel 2412MHz							
	H	2390.00	72.34	-25.43	46.91	74.00	54.00	PASS
	H	2400.00	75.25	-25.40	49.85	74.00	54.00	PASS
	V	2390.00	72.63	-25.43	47.20	74.00	54.00	PASS
	V	2400.00	74.01	-25.40	48.61	74.00	54.00	PASS
	High Channel 2462MHz							
	H	2483.50	71.17	-25.15	46.02	74.00	54.00	PASS
	H	2500.00	68.43	-25.10	43.33	74.00	54.00	PASS
	V	2483.50	72.88	-25.15	47.73	74.00	54.00	PASS
	V	2500.00	69.00	-25.10	43.90	74.00	54.00	PASS
802.11n40	Low Channel 2422MHz							
	H	2390.00	72.33	-25.43	46.90	74.00	54.00	PASS
	H	2400.00	74.80	-25.40	49.40	74.00	54.00	PASS
	V	2390.00	71.39	-25.43	45.96	74.00	54.00	PASS
	V	2400.00	72.29	-25.40	46.89	74.00	54.00	PASS
	High Channel 2452MHz							
	H	2483.50	72.18	-25.15	47.03	74.00	54.00	PASS
	H	2500.00	67.56	-25.10	42.46	74.00	54.00	PASS
	V	2483.50	70.25	-25.15	45.10	74.00	54.00	PASS
	V	2500.00	66.98	-25.10	41.88	74.00	54.00	PASS

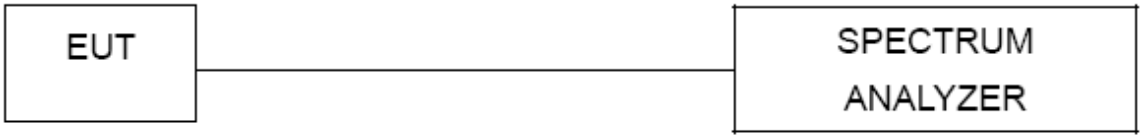
Remark:
1.Measurement = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier,
Over= Measurement – Limit
2. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.
3 In restricted bands of operation, The spurious emissions below the permissible value more than 20dB
4.The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
5.Test Mode is MIMO Mode.

Test mode	Polar (H/V)	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure-ment (dBuV/m)	Limits (dBuV/m)		Result
					PK	PK	AV	
802.11ax20	Low Channel 2412MHz							
	H	2390.00	72.44	-25.43	47.01	74.00	54.00	PASS
	H	2400.00	74.93	-25.40	49.53	74.00	54.00	PASS
	V	2390.00	71.65	-25.43	46.22	74.00	54.00	PASS
	V	2400.00	72.76	-25.40	47.36	74.00	54.00	PASS
	High Channel 2462MHz							
	H	2483.50	70.48	-25.15	45.33	74.00	54.00	PASS
	H	2500.00	68.92	-25.10	43.82	74.00	54.00	PASS
	V	2483.50	70.70	-25.15	45.55	74.00	54.00	PASS
	V	2500.00	67.47	-25.10	42.37	74.00	54.00	PASS
802.11ax40	Low Channel 2422MHz							
	H	2390.00	72.34	-25.43	46.91	74.00	54.00	PASS
	H	2400.00	74.21	-25.40	48.81	74.00	54.00	PASS
	V	2390.00	72.47	-25.43	47.04	74.00	54.00	PASS
	V	2400.00	73.73	-25.40	48.33	74.00	54.00	PASS
	High Channel 2452MHz							
	H	2483.50	72.63	-25.15	47.48	74.00	54.00	PASS
	H	2500.00	67.45	-25.10	42.35	74.00	54.00	PASS
	V	2483.50	70.67	-25.15	45.52	74.00	54.00	PASS
	V	2500.00	67.56	-25.10	42.46	74.00	54.00	PASS

Remark:
1.Measurement = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier,
Over= Measurement – Limit
2. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.
3 In restricted bands of operation, The spurious emissions below the permissible value more than 20dB
4.The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
5.Test Mode is MIMO Mode.

9. Power Spectral Density Test

9.1 Block Diagram Of Test Setup



9.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

Limits Of Radiated Emission Measurement (Above 1000MHz)

9.3 Test procedure

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: 3 kHz
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

9.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.
Note: Power Spectral Density(dBm)=Reading+Cable Loss

9.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 11.4V

Test Mode	Frequency	Power Spectral Density (dBm/10kHz)		Power Spectral Density (dBm/3kHz)		Total power density (dBm/3KHz)	Limit (dBm/3kHz)
		Ant. A	Ant. B	Ant. A	Ant. B		
TX b Mode	2412 MHz	-8.57	-6.29	-13.80	-11.52	/	8
	2437 MHz	-8.42	-6.29	-13.65	-11.52	/	8
	2462 MHz	-8.41	-6.50	-13.64	-11.73	/	8
TX g Mode	2412 MHz	-11.00	-10.49	-16.23	-15.72	/	8
	2437 MHz	-10.27	-10.14	-15.50	-15.37	/	8
	2462 MHz	-10.93	-10.67	-16.16	-15.90	/	8
TX n Mode(20M)	2412 MHz	-11.75	-10.71	-16.98	-15.94	-13.42	8
	2437 MHz	-12.40	-9.13	-17.63	-14.36	-12.68	8
	2462 MHz	-12.52	-11.35	-17.75	-16.58	-14.12	8
TX n Mode(40M)	2422 MHz	-16.98	-16.31	-22.21	-21.54	-18.85	8
	2437 MHz	-16.92	-16.16	-22.15	-21.39	-18.74	8
	2452 MHz	-16.85	-16.32	-22.08	-21.55	-18.80	8
TX ax Mode(20M)	2412 MHz	-13.87	-12.37	-19.10	-17.60	-15.28	8
	2437 MHz	-13.24	-12.21	-18.47	-17.44	-14.91	8
	2462 MHz	-13.05	-11.94	-18.28	-17.17	-14.68	8
TX ax Mode(40M)	2422 MHz	-18.15	-17.66	-23.38	-22.89	-20.12	8
	2437 MHz	-18.14	-17.09	-23.37	-22.32	-19.80	8
	2452 MHz	-18.89	-17.67	-24.12	-22.90	-20.46	8
Note: Correction Factor = 10log(3KHz/RBW in measurement) =-5.23							

Note: A(B) Represent the value of antenna A and B, The worst data is Antenna B, only shown Antenna B Plot.

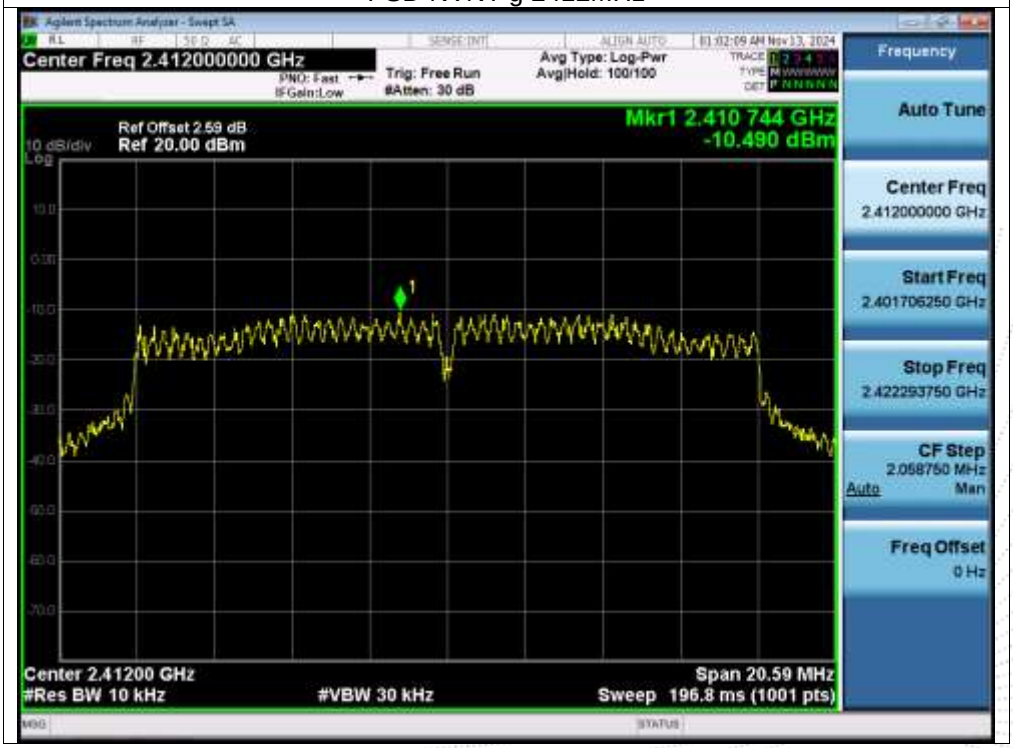
Test Graphs

PSD NVNT b 2412MHz

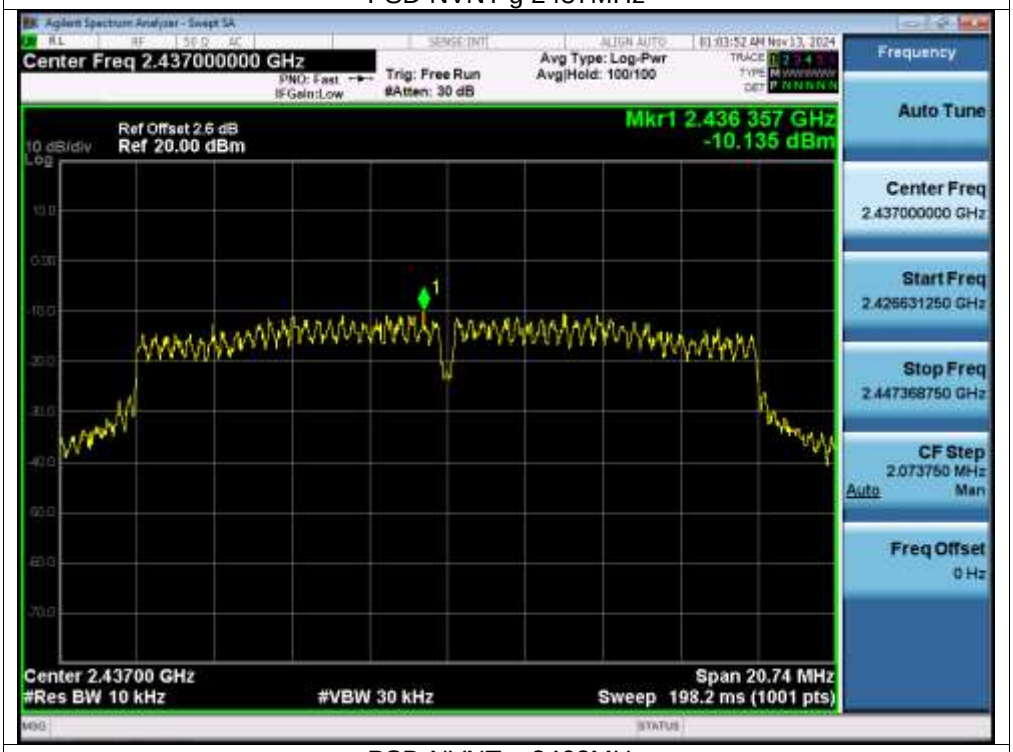
PSD NVNT b 2437MHz

PSD NVNT b 2462MHz

PSD NVNT g 2412MHz

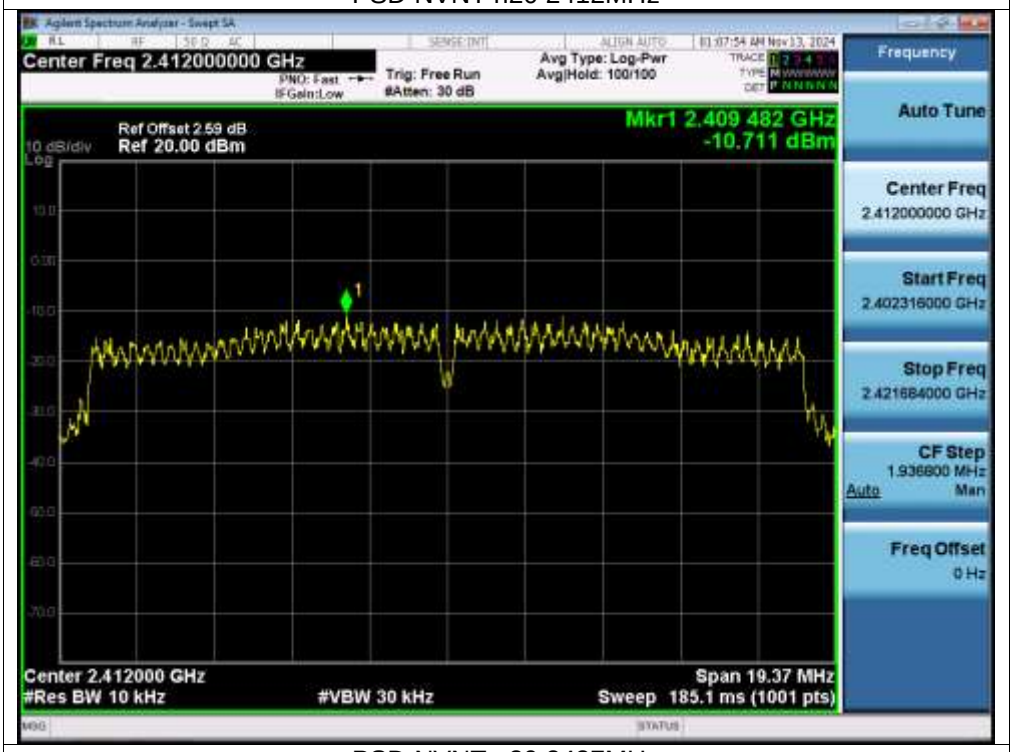


PSD NVNT g 2437MHz

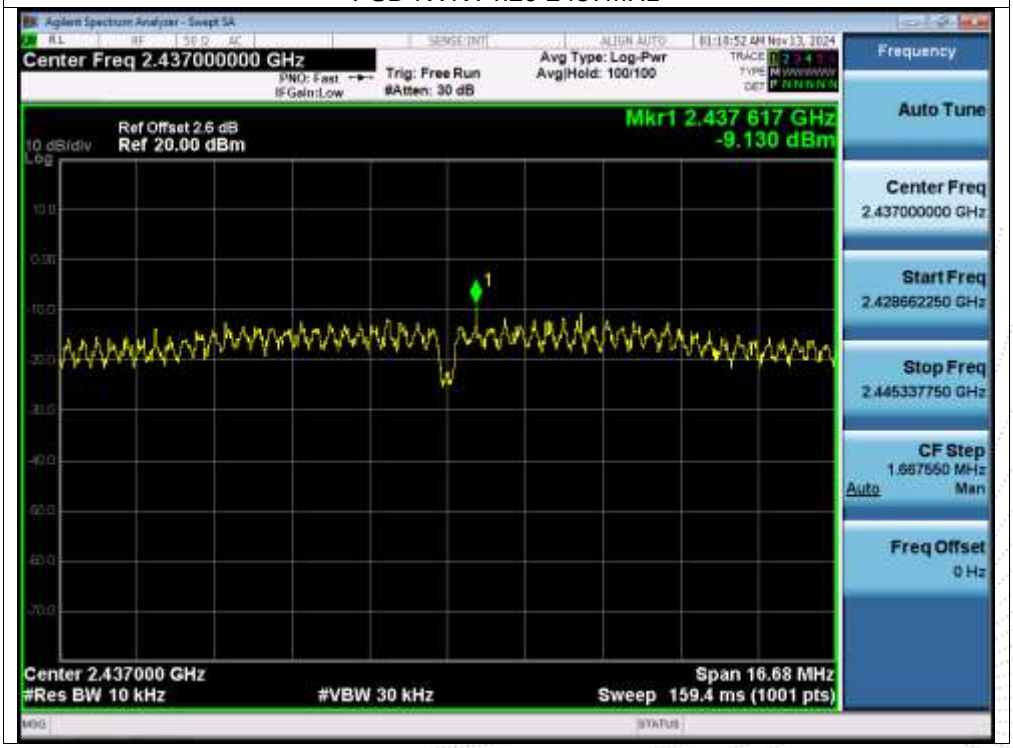


PSD NVNT g 2462MHz

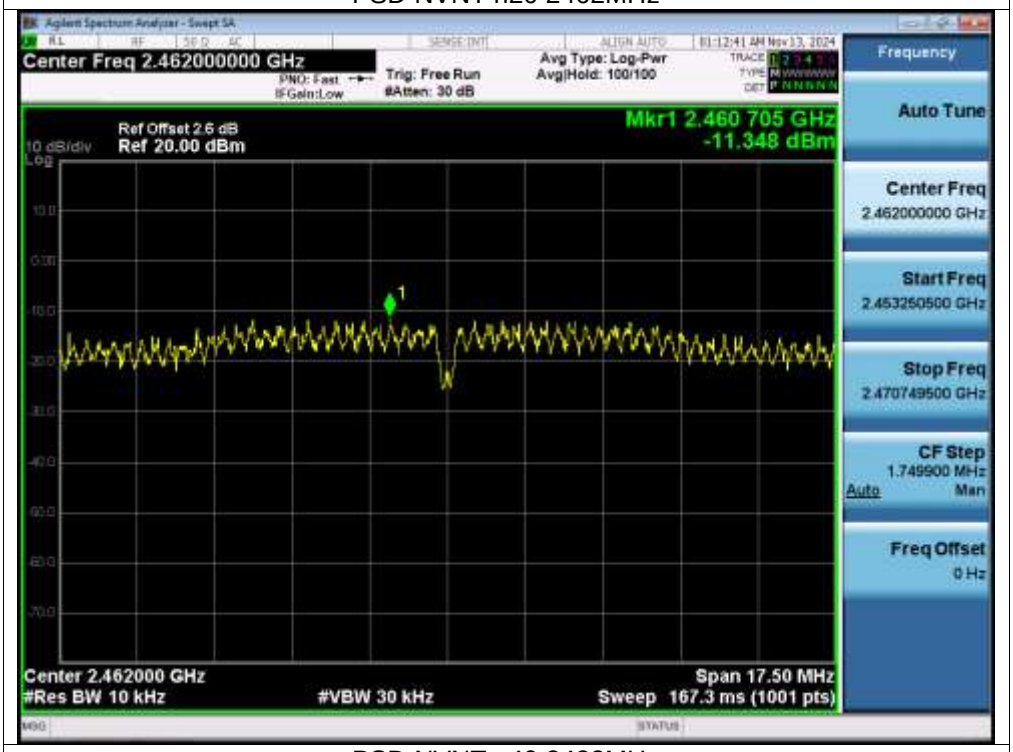
PSD NVNT n20 2412MHz



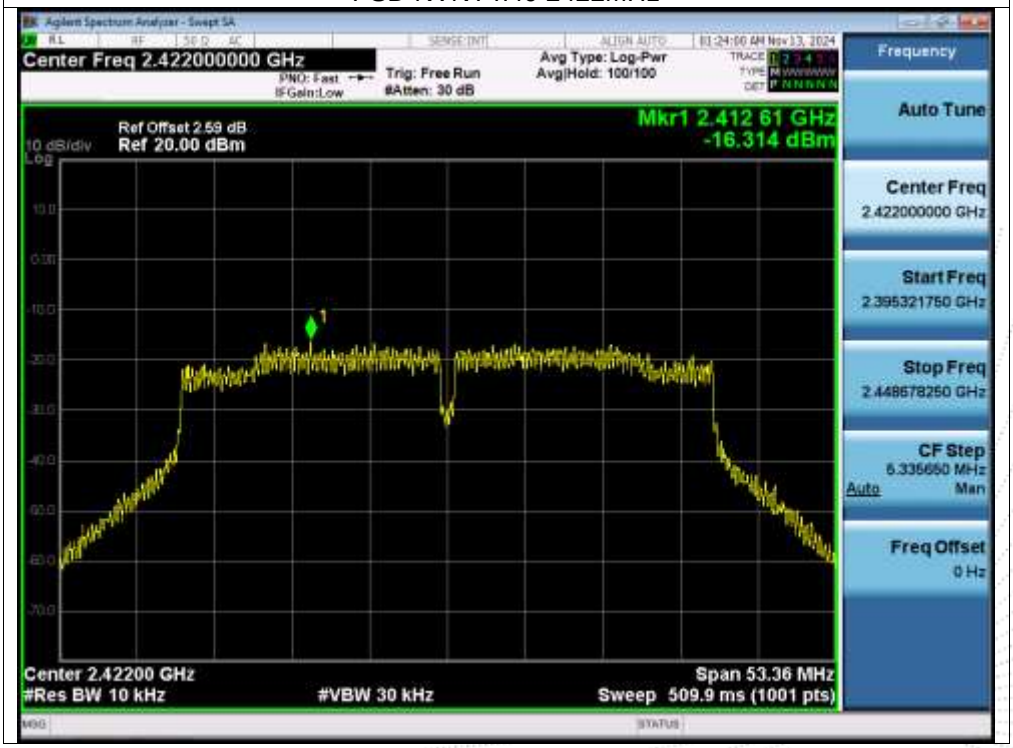
PSD NVNT n20 2437MHz



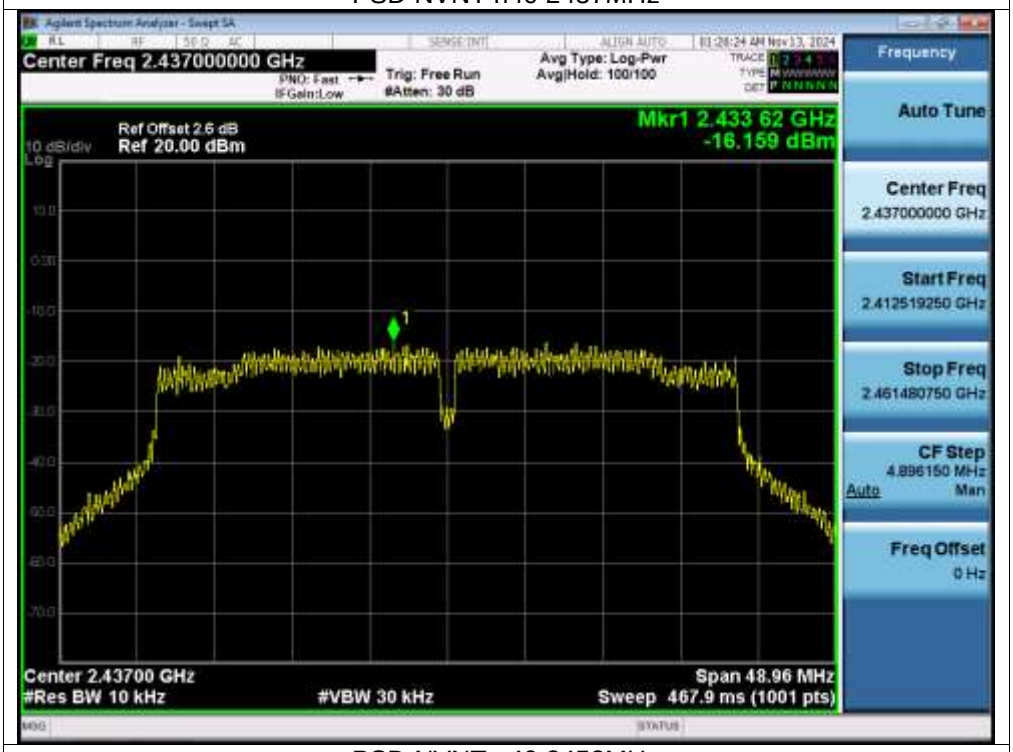
PSD NVNT n20 2462MHz



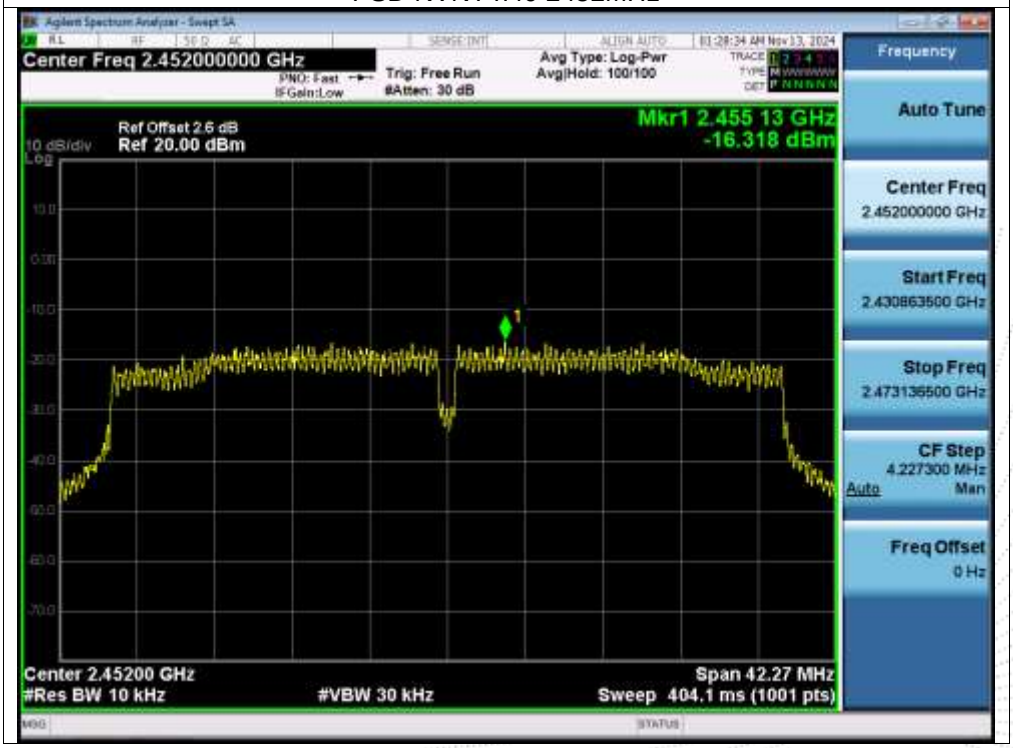
PSD NVNT n40 2422MHz



PSD NVNT n40 2437MHz



PSD NVNT n40 2452MHz



PSD NVNT ax20 2412MHz

PSD NVNT ax20 2437MHz

PSD NVNT ax20 2462MHz

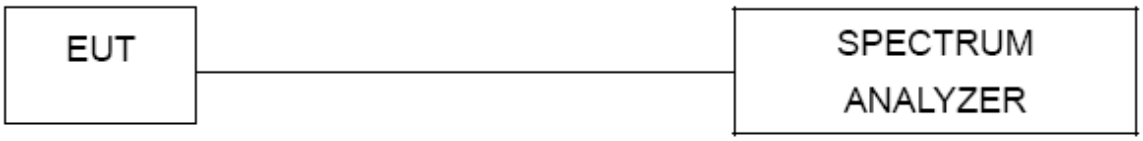
PSD NVNT ax40 2422MHz

PSD NVNT ax40 2437MHz

PSD NVNT ax40 2452MHz

10. Bandwidth Test

10.1 Block Diagram Of Test Setup



10.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (-6dB bandwidth)	2400-2483.5	PASS

10.3 Test procedure

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

10.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.
Note: Power Spectral Density(dBm)=Reading+Cable Loss

10.5 Test Result

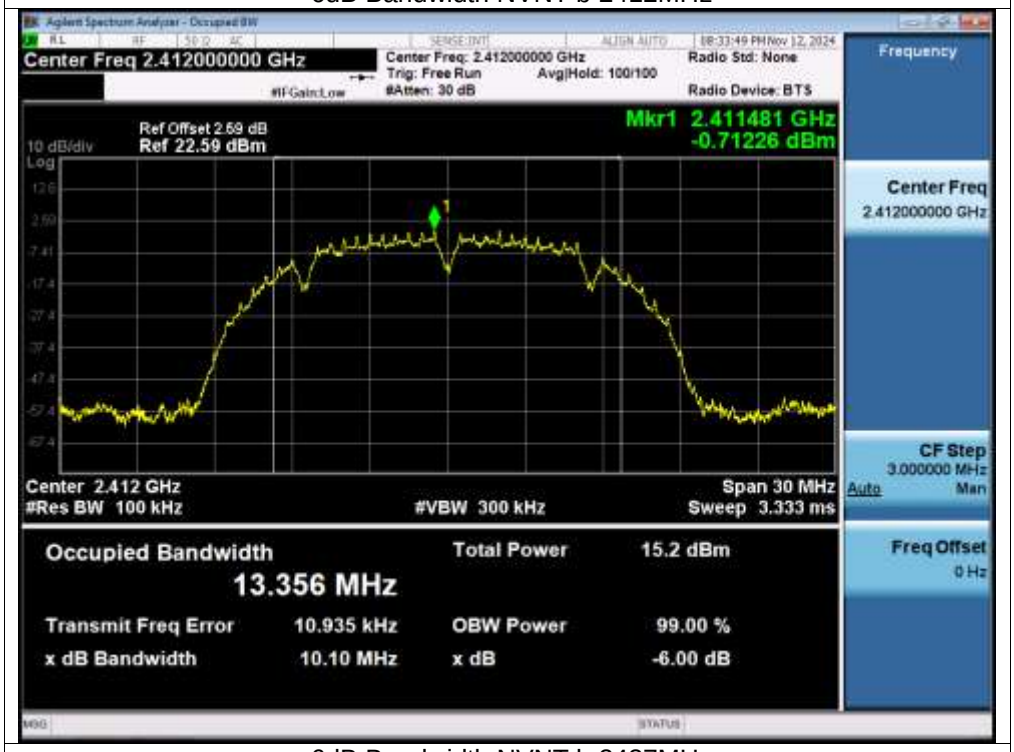
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 11.4V

Condition	Test Mode	Frequency (MHz)	-6dB bandwidth (MHz)		Limit (kHz)	Result
			Ant. A	Ant. B		
NVNT	b	2412	10.104	10.072	500	Pass
NVNT	b	2437	10.086	9.814	500	Pass
NVNT	b	2462	10.072	10.085	500	Pass
NVNT	g	2412	13.833	13.725	500	Pass
NVNT	g	2437	15.349	13.825	500	Pass
NVNT	g	2462	16.033	14.442	500	Pass
NVNT	n20	2412	11.972	12.912	500	Pass
NVNT	n20	2437	13.500	11.117	500	Pass
NVNT	n20	2462	13.769	11.666	500	Pass
NVNT	n40	2422	27.931	35.571	500	Pass
NVNT	n40	2437	35.783	32.641	500	Pass
NVNT	n40	2452	32.890	28.182	500	Pass
NVNT	ax20	2412	13.636	14.960	500	Pass
NVNT	ax20	2437	15.054	14.958	500	Pass
NVNT	ax20	2462	13.763	18.383	500	Pass
NVNT	ax40	2422	33.732	35.570	500	Pass
NVNT	ax40	2437	34.109	30.825	500	Pass
NVNT	ax40	2452	36.315	34.720	500	Pass

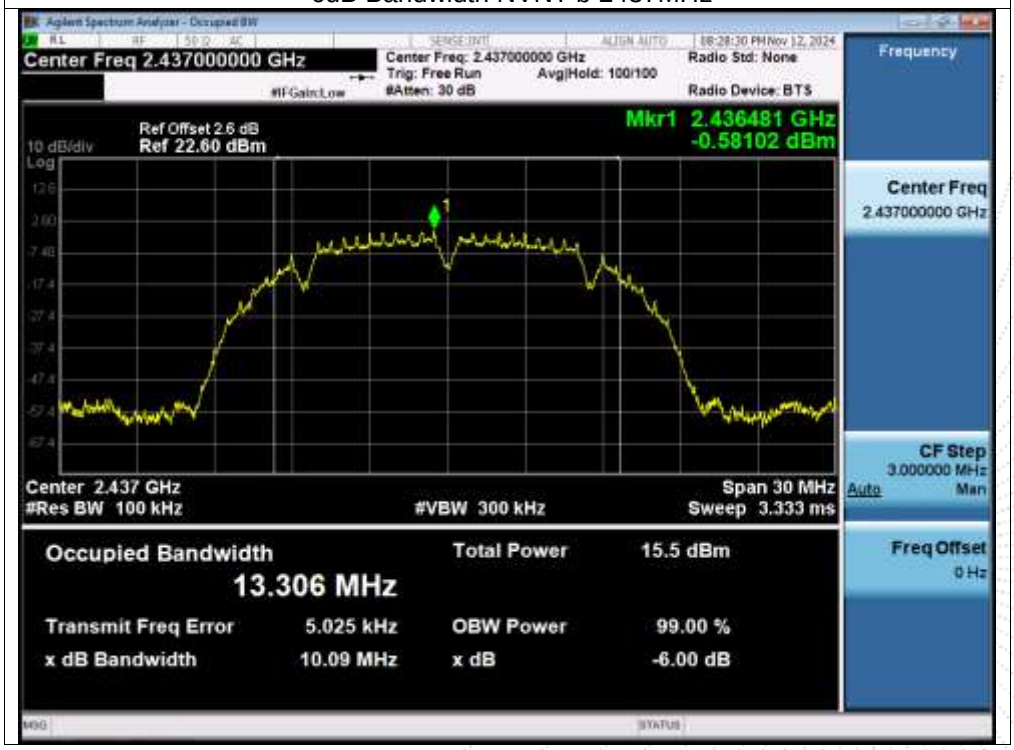
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A Plot.

Test Graphs

-6dB Bandwidth NVNT b 2412MHz



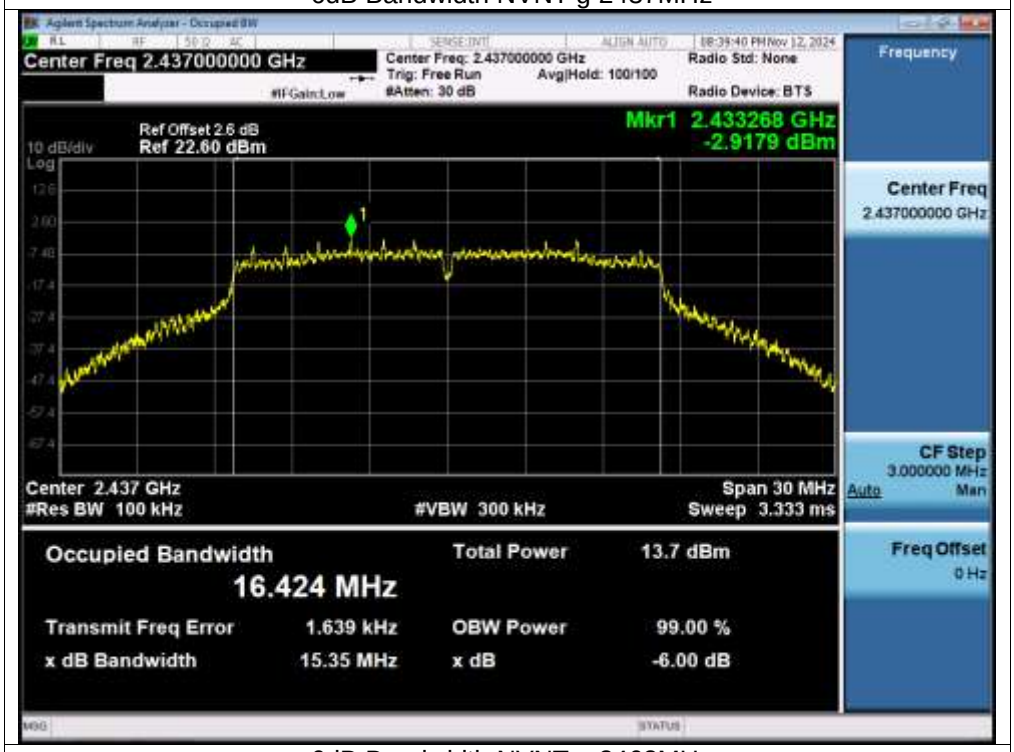
-6dB Bandwidth NVNT b 2437MHz



-6dB Bandwidth NVNT b 2462MHz

-6dB Bandwidth NVNT g 2412MHz

-6dB Bandwidth NVNT g 2437MHz



-6dB Bandwidth NVNT g 2462MHz