CTC Laboratories, Inc.

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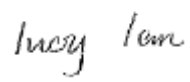
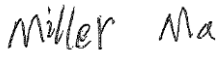
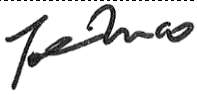
TEST REPORT

Report No. ……:	**CTC20221569E01**
FCC ID……:	**WNA-GN256VH**
Applicant……:	**Shenzhen Skyworth Digital Technology Co.,LTD**
Address……:	14/F,Block A,Skyworth Building,Gaoxin Ave.1.S.,Nanshan District,Shenzhen,China
Manufacturer ……:	Shenzhen Skyworth Digital Technology Co.,LTD
Address……:	14/F,Block A,Skyworth Building,Gaoxin Ave.1.S.,Nanshan District,Shenzhen,China
Product Name……:	**GPON ONT**
Trade Mark……:	/
Model/Type reference……:	GN256VH
Listed Model(s) ……:	WN37A, GN256V, GN256
Standard……:	**FCC CFR Title 47 Part 15 Subpart C Section 15.247**
Date of receipt of test sample…:	Aug. 16, 2022
Date of testing……..:	Aug. 16, 2022 to Sep.28, 2022
Date of issue……....:	Oct. 9, 2022
Result……:	**PASS**

Compiled by: (Printed name+signature)	Lucy Lan	
Supervised by: (Printed name+signature)	Miller Ma	
Approved by: (Printed name+signature)	Totti Zhao	

Testing Laboratory Name……:	**CTC Laboratories, Inc.**
Address……:	1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report version

Revised No.	Date of issue	Description
01	Oct.9, 2022	Original

1.3. Test Description

FCC Part 15 Subpart C (15.247)			
Test Item	Standard Section	Result	Test Engineer
	FCC		
Antenna Requirement	15.203	Pass	Alicia Liu
Conducted Emission	15.207	Pass	Alicia Liu
Band Edge Emissions	15.247(d)	Pass	Alicia Liu
6dB Bandwidth	15.247(a)(2)	Pass	Alicia Liu
Conducted Max Output Power	15.247(b)(3)	Pass	Alicia Liu
Power Spectral Density	15.247(e)	Pass	Alicia Liu
Transmitter Radiated Spurious	15.209&15.247(d)	Pass	Alicia Liu

Note: The measurement uncertainty is not included in the test result.

1.4. Test Facility

CTC Laboratories, Inc.
Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Laboratory accreditation
The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5365
CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation . Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 4340.01
CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in th e identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)
CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Indus try Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)
CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (F CC) Federal Communications Commission. The acceptance letter from the FCC is maintained inour files. Registration 951311, Aug 26, 2017.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	25°C
Relative Humidity:	40%
Air Pressure:	101kPa

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Shenzhen Skyworth Digital Technology Co.,LTD
Address:	14/F, Block A, Skyworth Building, Gaoxin Ave.1.S., Nanshan District, Shenzhen, China
Manufacturer :	Shenzhen Skyworth Digital Technology Co.,LTD
Address:	14/F, Block A, Skyworth Building, Gaoxin Ave.1.S.,Nanshan District, Shenzhen, China
Factory:	Shenzhen Skyworth Digital Technology Co.,LTD. Baoan Branch Factory
Address:	2-5F,Integration Multi-Storied Building, Skyworth Science and Technology Industrial Park, Tangtou Industrial Zone, Shiyan Street, Baoan District, Shenzhen city, China

2.2. General Description of EUT

Product Name:	GPON ONT
Trade Mark:	/
Model/Type reference:	GN256VH
Listed Model(s):	WN37A, GN256V, GN256
Model Difference:	All these models are identical in the same PCB, layout and electrical circuit, Different is trade mark and model number.
Power supply:	DC12V 1.5A from AC/DC Adapter
Adapter Model:	BY-SKY120150U70P[Note1] Input: 100-240V~ 50/60Hz 0.6A Output: 12Vdc/1.5A
Hardware version:	/
Software version:	/
WIFI 802.11b/ g/ n(HT20)/n(HT40)	
Modulation:	DSSS for 802.11b OFDM for 802.11g/802.11n(HT20)/802.11n(HT40)
Operation frequency:	2412MHz~2462MHz for 802.11b/802.11g/802.11n(HT20) 2422MHz~2452MHz for 802.11n(HT40)
Channel number:	11 for 802.11b/802.11g/802.11n(HT20) 7 for 802.11n(HT40)
Channel separation:	5MHz
Antenna 1 and 2 type:	External Antenna
Antenna 1 gain:	5dBi
Antenna 2 gain:	5dBi

Note :

1. BY-SKY120150UYYP(YY=00-99, 2 digits, Represent different marketing purpose only, does not affect the safety and electromagnetic compatibility)

2.3. Operation state

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

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

Note: CH 01~CH 11 for 802.11b/g/n(HT20), CH 03~CH 09 for 802.11n(HT40)

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
1	NA	NA	External Antenna	IPEX	5
2	NA	NA	External Antenna	IPEX	5

Note: Antenna Gain=5 dBi. For 2.4G, this EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Directional gain =$G_{Ant.}$+10log(N)dBi, that is Directional gain=5+10log(2)dBi=8.So output power limit is 30-8+6=28, the power spectral density limit is 8-8+6=6. The power spectral density limit is 8-8+6=6.

Data Rated

Preliminary tests were performed in different data rate, and found which the below bit rate is worst case mode, so only show data which it is a worst case mode.

Mode	Data rate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)	HT-MCS8
802.11n(HT40)	HT-MCS8

Test mode

For RF test items:
The engineering test program was provided and enabled to make EUT continuous transmit.
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%). EUT support for SISO and MIMO Transmission,802.11b/g only supports SISO Mode, SISO mode sets the same power level as MIMO mode, so MIMO mode is the worst case. Recorded in the report.

2.4. Measurement Instruments List

Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Keysight	N9020A	MY46471737	Dec.23, 2022
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2023
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec.23, 2022
4	Signal Generator	Agilent	E8257D	MY46521908	Dec.23, 2022
5	Power Sensor	Agilent	U2021XA	MY5365004	Mar. 15, 2023
6	Power Sensor	Agilent	U2021XA	MY5365006	Mar. 15, 2023
7	Simultaneous Sampling DAQ	Agilent	U2531A	TW54493510	Mar. 15, 2023
8	Climate Chamber	TABAI	PR-4G	A8708055	Dec.23, 2022
9	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec.23, 2022
10	Climate Chamber	ESPEC	MT3065	/	Dec.23, 2022
11	300328 v2.2.2 test system	TONSCEND	v2.6	/	/

Radiated emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-759	Nov. 09, 2022
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 23, 2022
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 23, 2022
4	Broadband Premplifier	SCHWARZBECK	BBV9743B	259	Dec. 23, 2022
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 23, 2022
6	3m chamber 3	YIHENG	EE106	/	Sep. 09, 2023

Conducted emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 23, 2022
2	LISN	R&S	ENV216	101113	Dec. 23, 2022
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 23, 2022
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 23, 2022
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 23, 2022

Note:1. The Cal. Interval was one year.
2. The cable loss has calculated in test result which connection between each test instruments.

3. TEST ITEM AND RESULTS

3.1. Conducted Emission

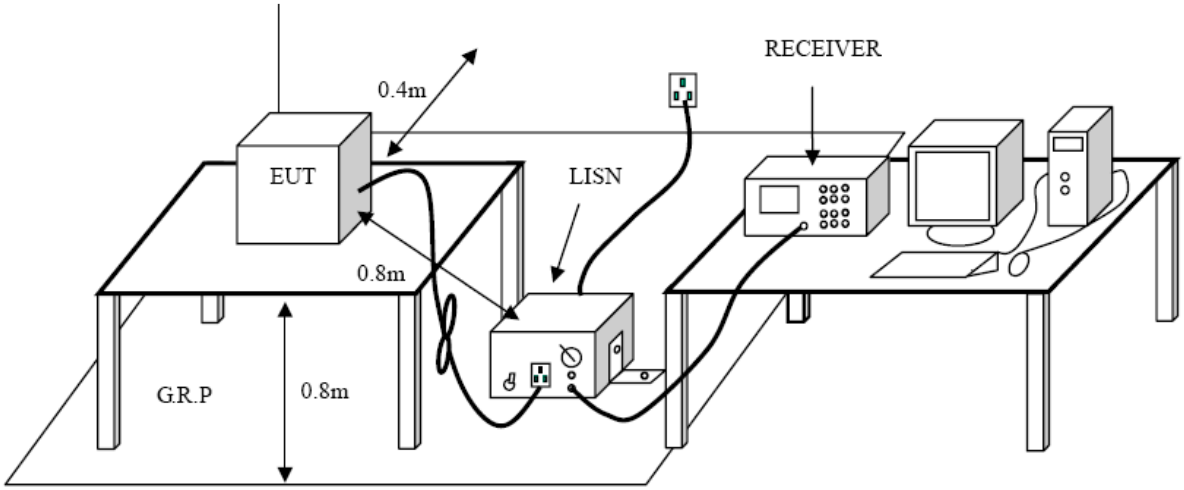
Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.207/ RSS - Gen 8.8:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Configuration



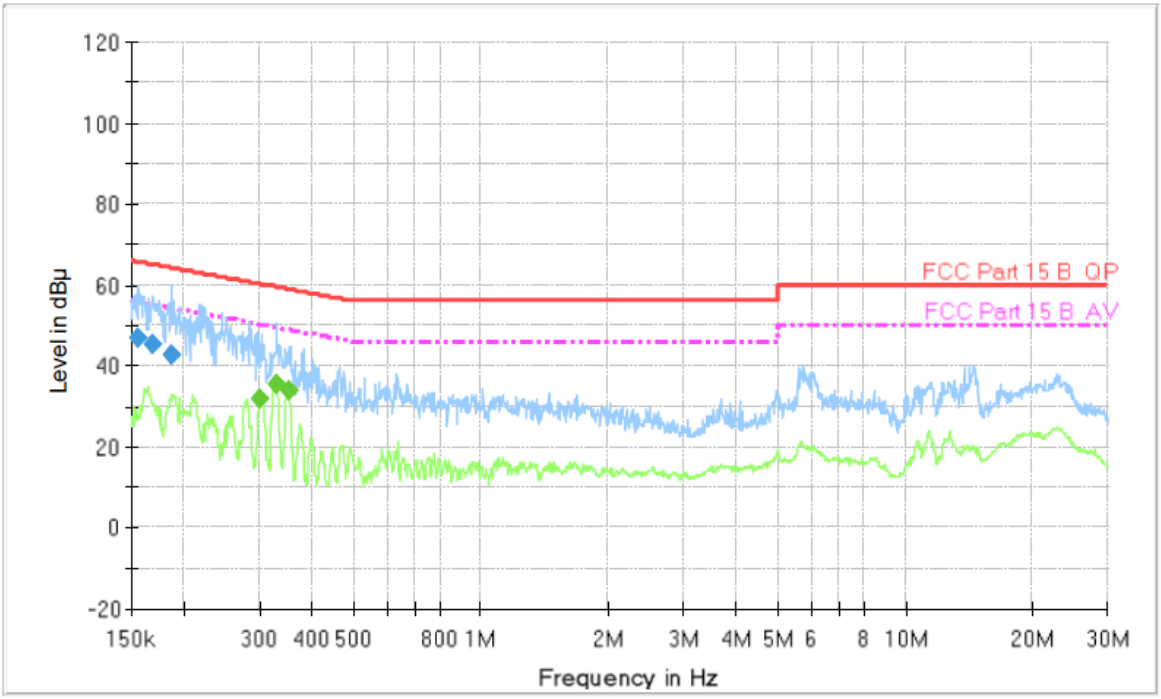
Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode:
Please refer to the clause 2.3.

Test Results

Test Voltage:	AC 120V/60 Hz
Terminal:	Line



Final Measurement Detector 1

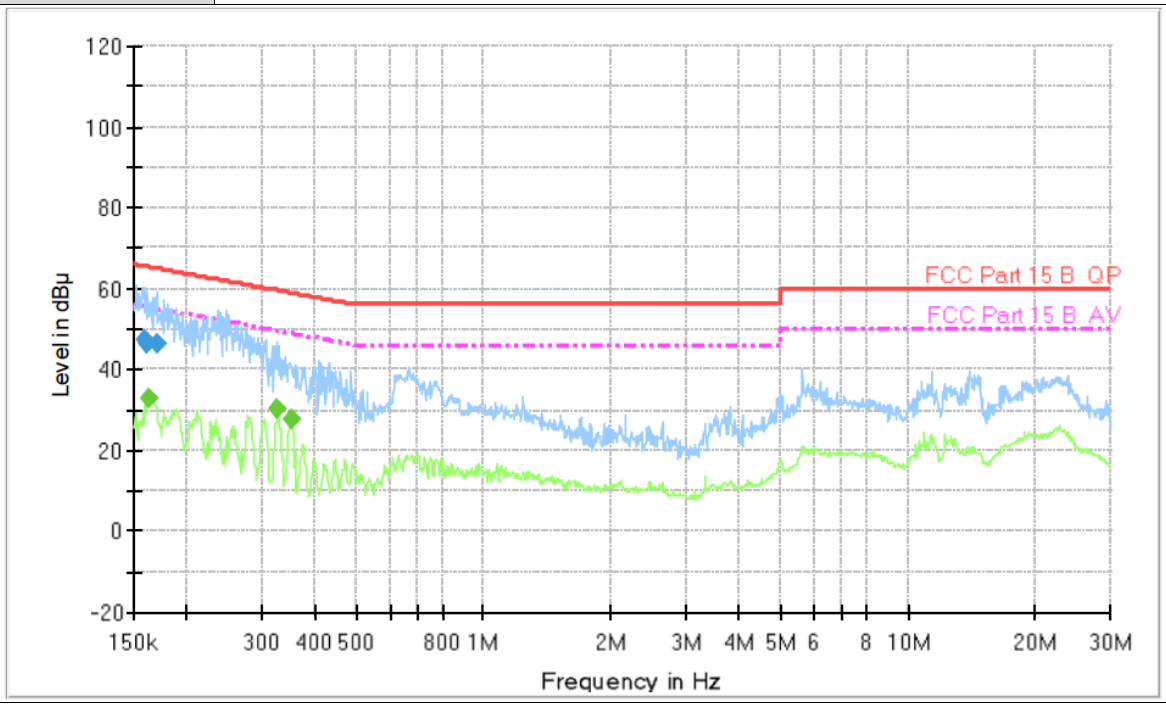
Frequency (MHz)	QuasiPeak (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.155490	47.1	1000.00	9.000	On	L1	9.7	18.6	65.7	
0.168410	45.4	1000.00	9.000	On	L1	9.7	19.6	65.0	
0.186090	42.7	1000.00	9.000	On	L1	9.7	21.5	64.2	

Final Measurement Detector 2

Frequency (MHz)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.301640	31.6	1000.00	9.000	On	L1	9.7	18.6	50.2	
0.328020	35.4	1000.00	9.000	On	L1	9.7	14.1	49.5	
0.351050	33.8	1000.00	9.000	On	L1	9.7	15.1	48.9	

Emission Level= Read Level+ Correct Factor

Test Voltage:	AC 120V/60 Hz
Terminal:	Neutral



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.157990	47.3	1000.00	9.000	On	N	10.0	18.3	65.6	
0.161180	46.2	1000.00	9.000	On	N	10.0	19.2	65.4	
0.169080	46.4	1000.00	9.000	On	N	10.0	18.6	65.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.162470	32.6	1000.00	9.000	On	N	10.0	22.7	55.3	
0.326710	30.3	1000.00	9.000	On	N	10.0	19.2	49.5	
0.351050	27.7	1000.00	9.000	On	N	10.0	21.2	48.9	

Emission Level= Read Level+ Correct Factor

3.2. Radiated Emission

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.209:

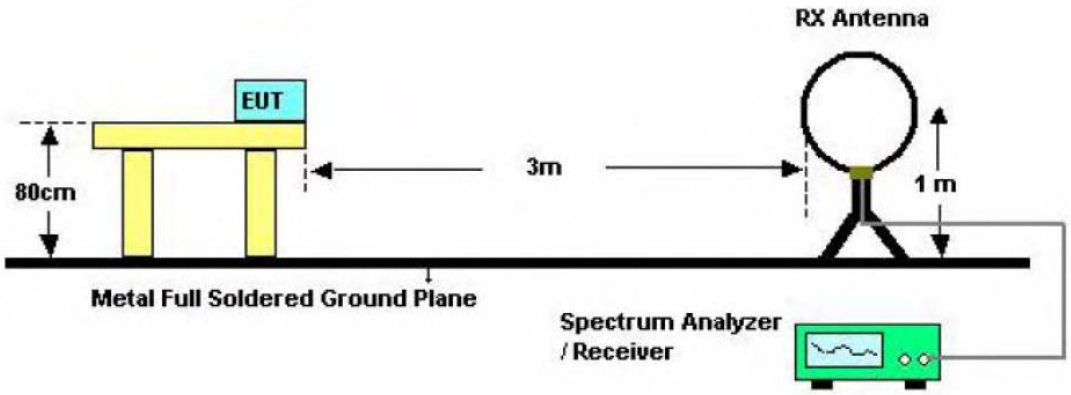
Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
Above 1 GHz	54.00	Average
	74.00	Peak

Note:

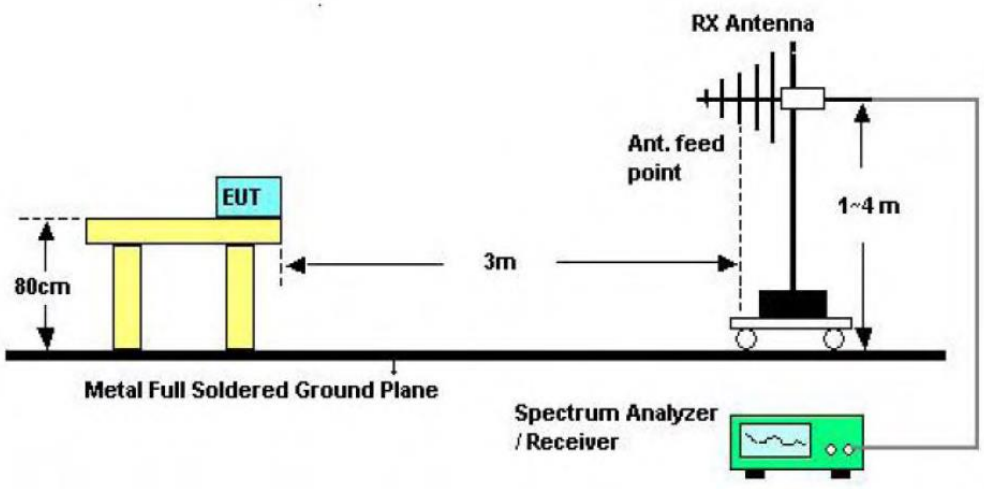
(1) The tighter limit applies at the band edges.

(2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

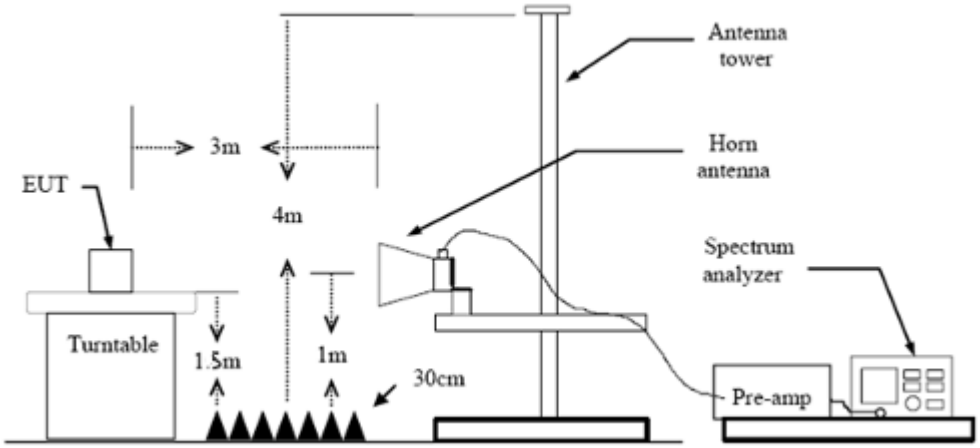
Test Configuration



Below 30MHz Test Setup



Below1000MHz Test Setup



Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings

(1) Span shall wide enough to fully capture the emission being measured;
(2) Below 1 GHz:
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
(3) From 1 GHz to 10th harmonic:
RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW=3MHz RMS detector for Average value.

Test Mode

Please refer to the clause 2.3.

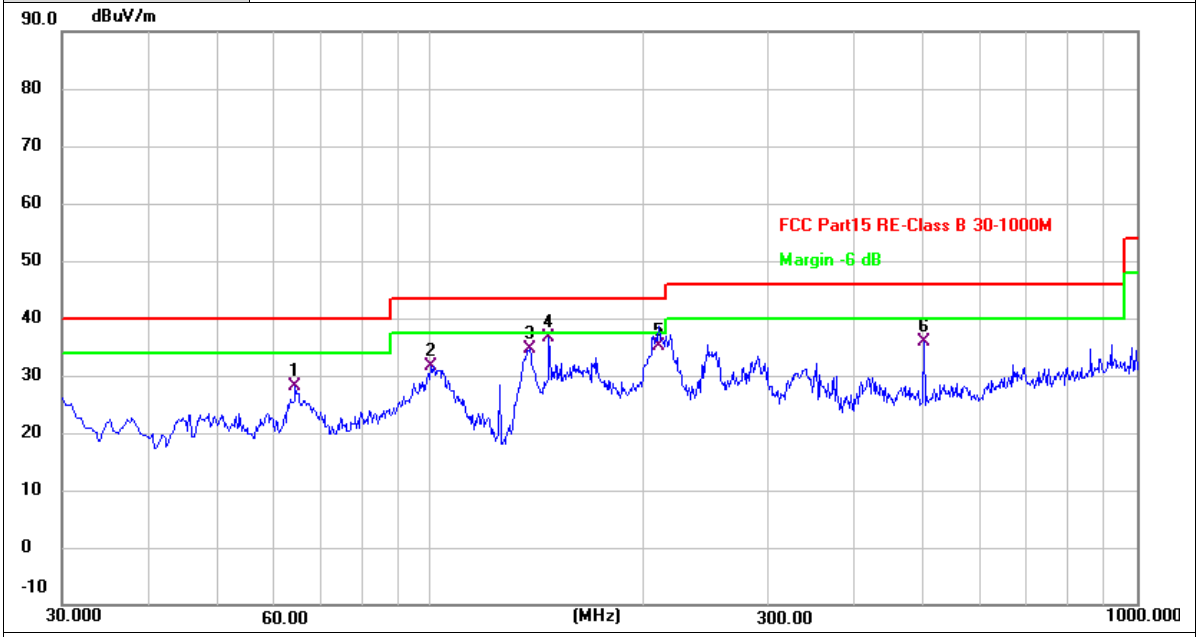
Test Result

9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS
Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

30MHz-1GHz

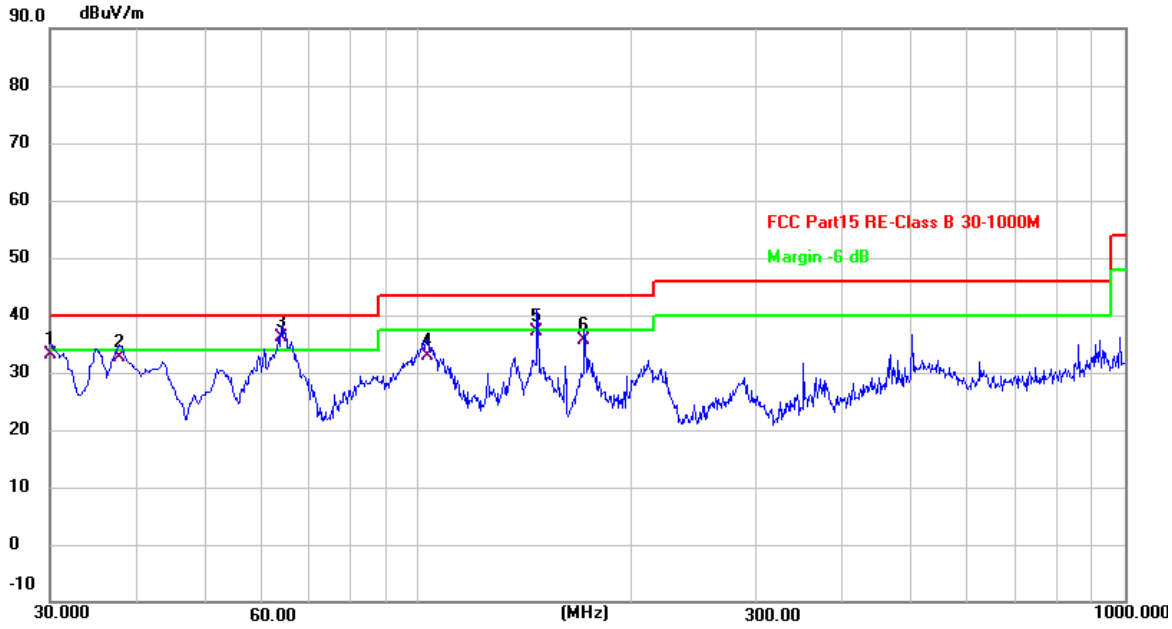
Ant. Pol.	Horizontal
Test Mode:	802.11b Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	64.2733	45.02	-17.00	28.02	40.00	-11.98	QP
2	100.1633	47.98	-16.37	31.61	43.50	-11.89	QP
3	137.9933	54.62	-19.90	34.72	43.50	-8.78	QP
4 *	147.3700	56.29	-19.70	36.59	43.50	-6.91	QP
5	210.7433	50.77	-15.76	35.01	43.50	-8.49	QP
6	500.1267	44.96	-9.19	35.77	46.00	-10.23	QP

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. Pol.	Vertical
Test Mode:	802.11b Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.0000	49.21	-16.01	33.20	40.00	-6.80	QP
2	37.7599	47.89	-15.33	32.56	40.00	-7.44	QP
3 *	63.9500	53.08	-16.93	36.15	40.00	-3.85	QP
4	102.7500	49.32	-16.39	32.93	43.50	-10.57	QP
5	147.3700	56.90	-19.70	37.20	43.50	-6.30	QP
6	171.9433	54.21	-18.51	35.70	43.50	-7.80	QP

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Adobe 1GHz

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX B Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4822.589	26.31	2.20	28.51	54.00	-25.49	AVG
2	4823.158	38.76	2.20	40.96	74.00	-33.04	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX B Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4823.791	26.55	2.20	28.75	54.00	-25.25	AVG
2	4825.464	38.96	2.20	41.16	74.00	-32.84	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX B Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4872.736	38.46	2.30	40.76	74.00	-33.24	peak
2 *	4873.626	26.46	2.30	28.76	54.00	-25.24	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX B Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4872.919	26.59	2.30	28.89	54.00	-25.11	AVG
2	4873.224	38.51	2.30	40.81	74.00	-33.19	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX B Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4922.796	38.03	2.41	40.44	74.00	-33.56	peak
2 *	4924.053	26.49	2.41	28.90	54.00	-25.10	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX B Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4922.866	38.42	2.41	40.83	74.00	-33.17	peak
2 *	4924.597	26.45	2.41	28.86	54.00	-25.14	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX G Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4822.711	26.52	2.20	28.72	54.00	-25.28	AVG
2	4823.236	38.52	2.20	40.72	74.00	-33.28	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX G Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4822.864	38.82	2.20	41.02	74.00	-32.98	peak
2 *	4824.263	26.51	2.20	28.71	54.00	-25.29	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX G Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4874.463	26.59	2.30	28.89	54.00	-25.11	AVG
2	4874.978	38.75	2.30	41.05	74.00	-32.95	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX G Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4872.865	26.47	2.30	28.77	54.00	-25.23	AVG
2	4873.587	39.28	2.30	41.58	74.00	-32.42	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	TX G Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4922.563	38.22	2.41	40.63	74.00	-33.37	peak
2 *	4925.131	26.54	2.41	28.95	54.00	-25.05	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	TX G Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4922.563	38.22	2.41	40.63	74.00	-33.37	peak
2 *	4925.131	26.54	2.41	28.95	54.00	-25.05	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	TX B Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4824.799	37.93	2.20	40.13	74.00	-33.87	peak
2 *	4824.985	26.47	2.20	28.67	54.00	-25.33	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	TX B Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4822.529	26.51	2.20	28.71	54.00	-25.29	AVG
2	4823.112	38.20	2.20	40.40	74.00	-33.60	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	TX B Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4872.927	38.82	2.30	41.12	74.00	-32.88	peak
2 *	4874.292	26.70	2.30	29.00	54.00	-25.00	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	TX B Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4873.615	38.66	2.30	40.96	74.00	-33.04	peak
2 *	4873.768	26.55	2.30	28.85	54.00	-25.15	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	TX B Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4923.037	38.51	2.41	40.92	74.00	-33.08	peak
2 *	4923.622	26.48	2.41	28.89	54.00	-25.11	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	TX B Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4925.134	26.44	2.41	28.85	54.00	-25.15	AVG
2	4925.328	38.47	2.41	40.88	74.00	-33.12	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	TX G Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4822.799	26.41	2.20	28.61	54.00	-25.39	AVG
2	4824.456	38.63	2.20	40.83	74.00	-33.17	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	TX G Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4823.730	26.59	2.20	28.79	54.00	-25.21	AVG
2	4824.680	38.43	2.20	40.63	74.00	-33.37	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	TX G Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4872.756	38.62	2.30	40.92	74.00	-33.08	peak
2 *	4873.411	26.74	2.30	29.04	54.00	-24.96	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	TX G Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4873.091	26.51	2.30	28.81	54.00	-25.19	AVG
2	4875.203	39.07	2.30	41.37	74.00	-32.63	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	TX G Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4924.174	38.79	2.41	41.20	74.00	-32.80	peak
2 *	4925.083	26.67	2.41	29.08	54.00	-24.92	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	TX G Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4924.858	26.56	2.41	28.97	54.00	-25.03	AVG
2	4925.424	38.08	2.41	40.49	74.00	-33.51	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	TX N20 Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4822.507	27.07	2.20	29.27	54.00	-24.73	AVG
2	4823.346	38.47	2.20	40.67	74.00	-33.33	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	TX N20 Mode 2412MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4823.029	38.15	2.20	40.35	74.00	-33.65	peak
2 *	4824.449	26.60	2.20	28.80	54.00	-25.20	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	TX N20 Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4872.633	26.58	2.30	28.88	54.00	-25.12	AVG
2	4873.804	38.08	2.30	40.38	74.00	-33.62	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	TX N20 Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4873.392	26.54	2.30	28.84	54.00	-25.16	AVG
2	4873.481	38.38	2.30	40.68	74.00	-33.32	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	TX N20 Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4925.220	26.51	2.41	28.92	54.00	-25.08	AVG
2	4925.388	38.45	2.41	40.86	74.00	-33.14	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	TX N20 Mode 2462MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4923.924	38.38	2.41	40.79	74.00	-33.21	peak
2 *	4924.743	26.50	2.41	28.91	54.00	-25.09	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	TX N40 Mode 2422MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4842.625	38.43	2.24	40.67	74.00	-33.33	peak
2 *	4844.198	26.75	2.24	28.99	54.00	-25.01	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	TX N40 Mode 2422MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4843.652	26.91	2.24	29.15	54.00	-24.85	AVG
2	4844.949	38.57	2.24	40.81	74.00	-33.19	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	TX N40 Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4872.510	39.82	2.30	42.12	74.00	-31.88	peak
2 *	4873.724	26.92	2.30	29.22	54.00	-24.78	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	TX N40 Mode 2437MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4873.405	27.01	2.30	29.31	54.00	-24.69	AVG
2	4874.607	38.97	2.30	41.27	74.00	-32.73	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	TX N40 Mode 2452MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4903.698	26.02	2.36	28.38	54.00	-25.62	AVG
2	4906.122	37.68	2.37	40.05	74.00	-33.95	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	TX N40 Mode 2452MHz
Remark:	No report for the emission which more than 10 dB below the prescribed limit. Only worse case is reported

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	4902.682	26.08	2.36	28.44	54.00	-25.56	AVG
2	4905.121	37.50	2.36	39.86	74.00	-34.14	peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

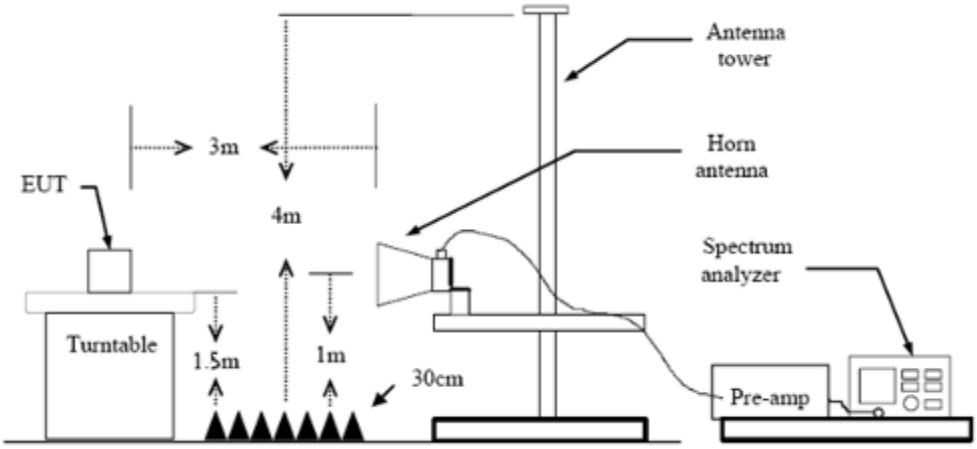
3.3. Band Edge Emissions

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)/ RSS 247 5.5:

Restricted Frequency Band (MHz)	(dBuV/m)(at 3m)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

Test Configuration



Test Procedure

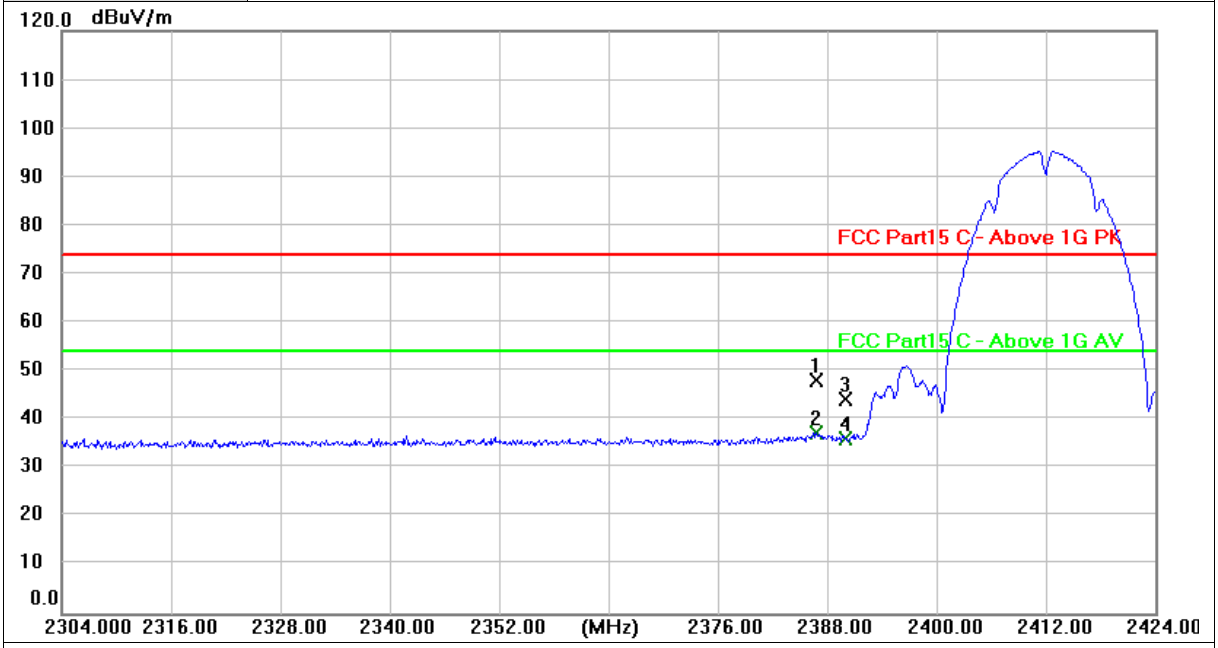
1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:
   RBW=1MHz, VBW=3MHz PEAK detector for Peak value.
   RBW=1MHz, VBW=10Hz with PEAK Detector for Average Value.

Test Mode

Please refer to the clause 2.3.

Test Results

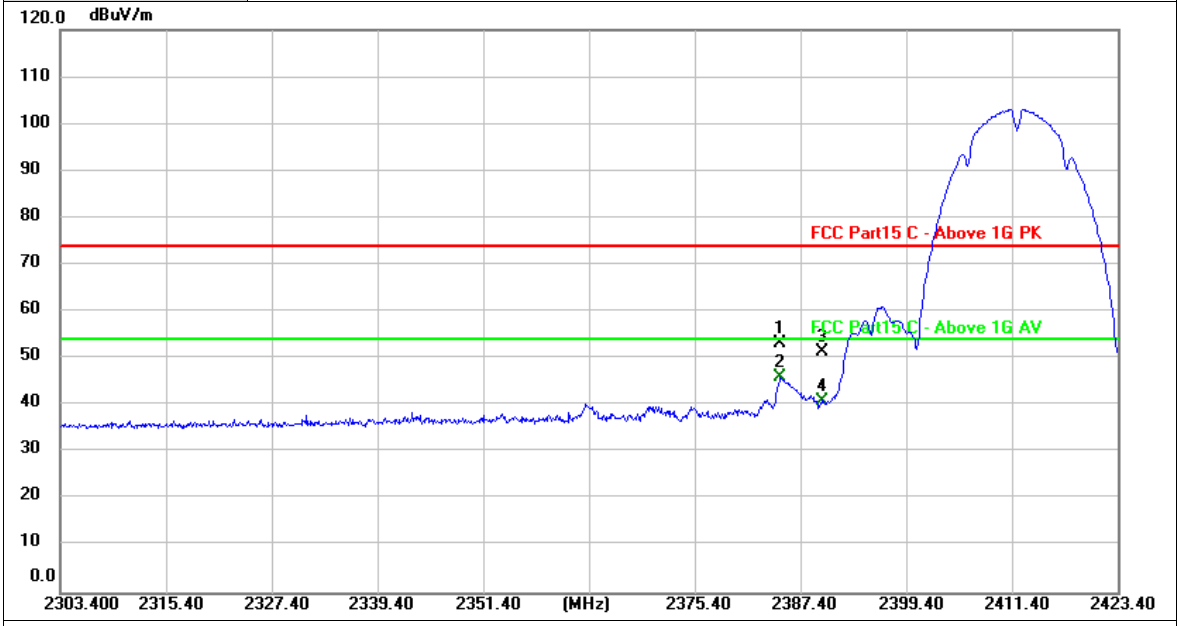
Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	B Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2386.800	17.37	30.83	48.20	74.00	-25.80	peak
2 *	2386.800	6.46	30.83	37.29	54.00	-16.71	AVG
3	2390.000	13.27	30.84	44.11	74.00	-29.89	peak
4	2390.000	5.23	30.84	36.07	54.00	-17.93	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

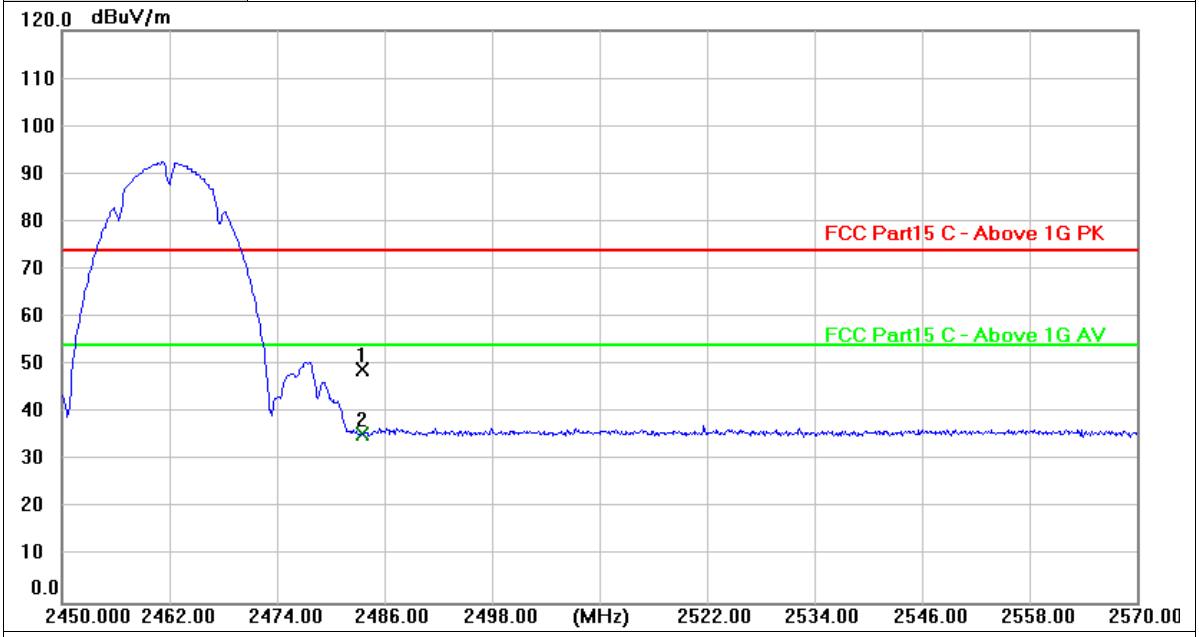
Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	B Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2385.160	22.45	30.82	53.27	74.00	-20.73	peak
2 *	2385.160	15.16	30.82	45.98	54.00	-8.02	AVG
3	2390.000	20.70	30.84	51.54	74.00	-22.46	peak
4	2390.000	9.97	30.84	40.81	54.00	-13.19	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

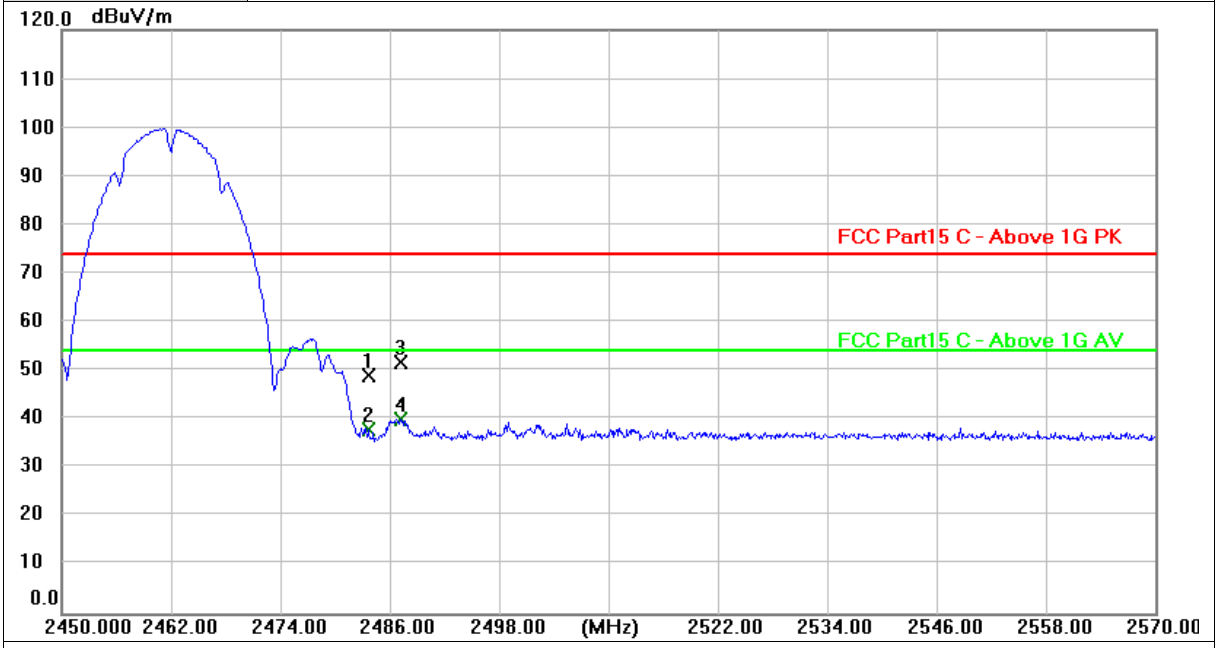
Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	B Mode 2462 MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.80	31.24	49.04	74.00	-24.96	peak
2 *	2483.500	4.35	31.24	35.59	54.00	-18.41	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

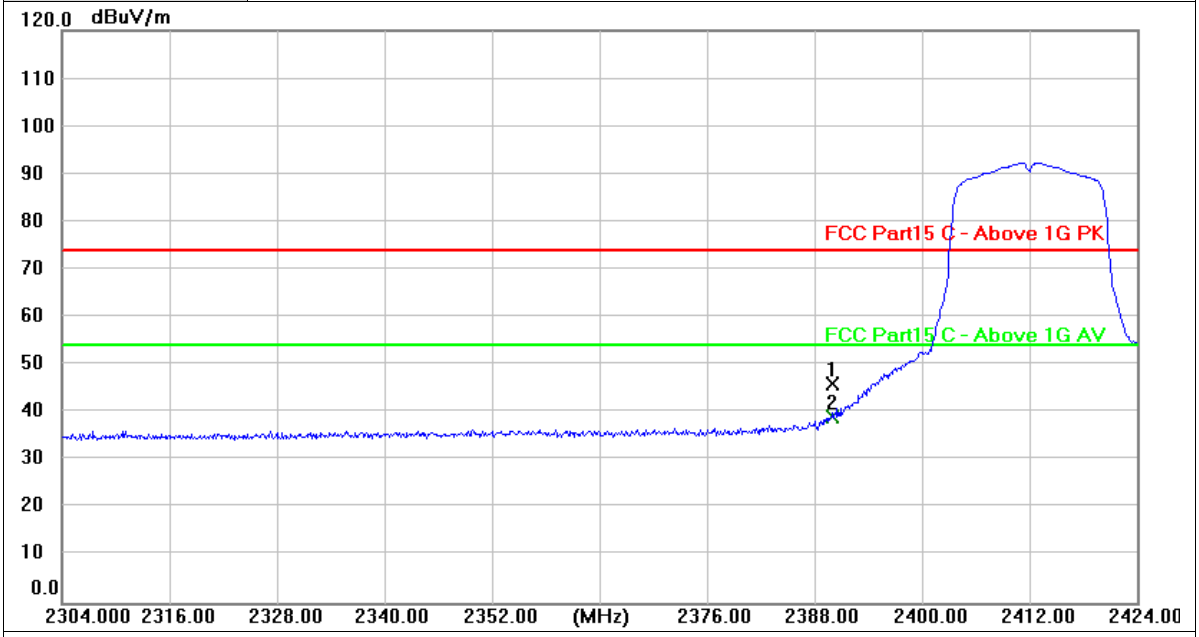
Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	B Mode 2462 MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.79	31.24	49.03	74.00	-24.97	peak
2	2483.500	6.71	31.24	37.95	54.00	-16.05	AVG
3	2487.280	20.42	31.26	51.68	74.00	-22.32	peak
4 *	2487.280	8.67	31.26	39.93	54.00	-14.07	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

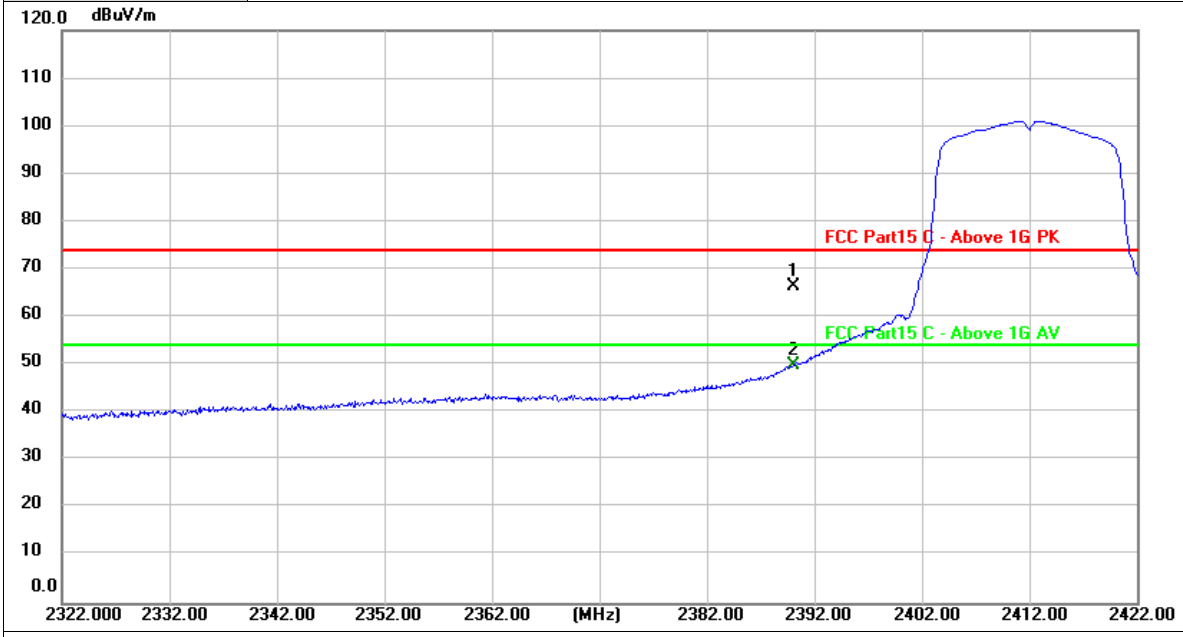
Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	G Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	15.31	30.84	46.15	74.00	-27.85	peak
2 *	2390.000	8.29	30.84	39.13	54.00	-14.87	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

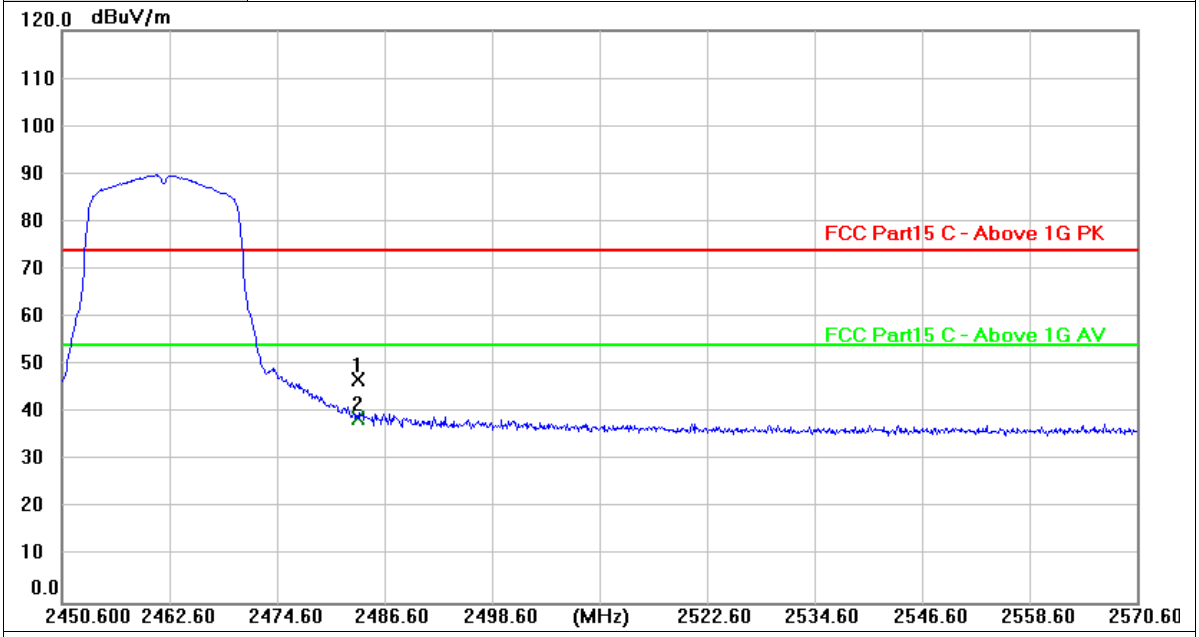
Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	G Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	35.60	30.84	66.44	74.00	-7.56	peak
2 *	2390.000	19.00	30.84	49.84	54.00	-4.16	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

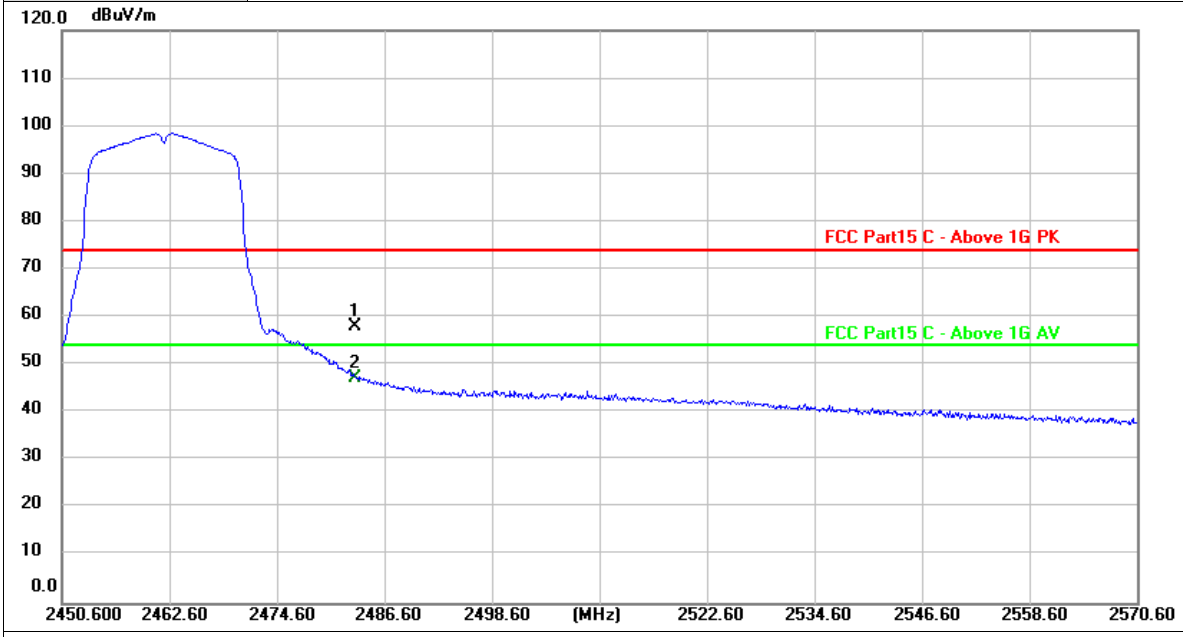
Ant No.	ANT1
Ant. Pol.	Horizontal
Test Mode:	G Mode 2462MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	15.79	31.24	47.03	74.00	-26.97	peak
2 *	2483.500	7.75	31.24	38.99	54.00	-15.01	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

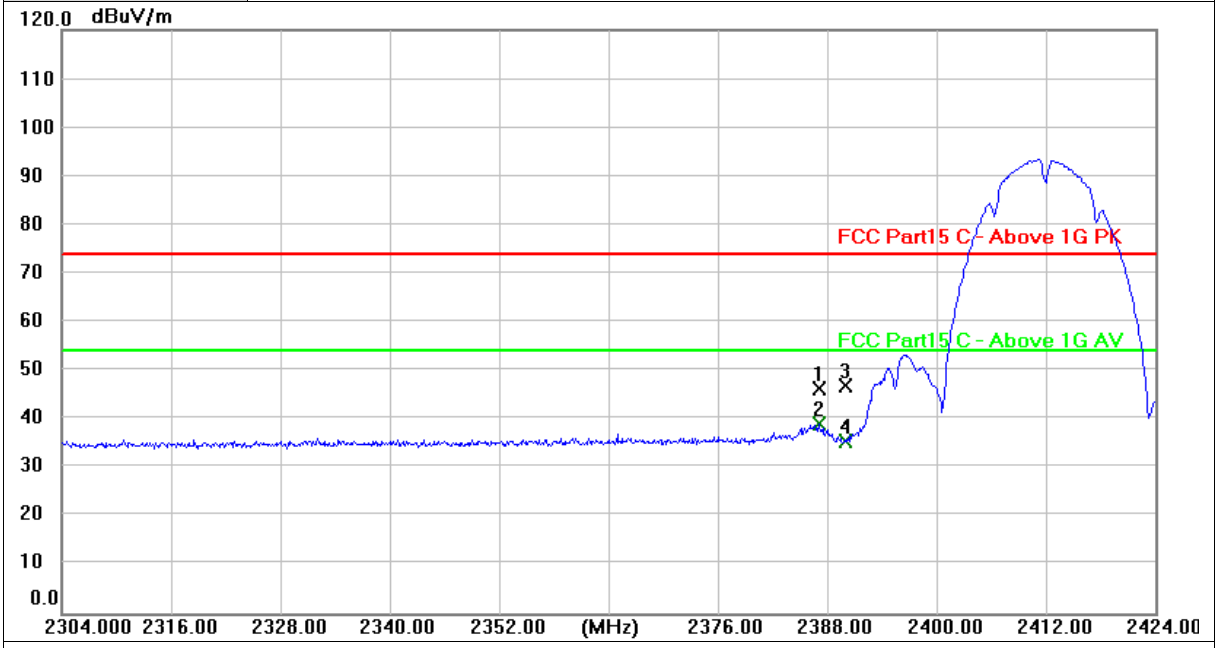
Ant No.	ANT1
Ant. Pol.	Vertical
Test Mode:	G Mode 2462MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	26.76	31.24	58.00	74.00	-16.00	peak
2 *	2483.500	15.94	31.24	47.18	54.00	-6.82	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

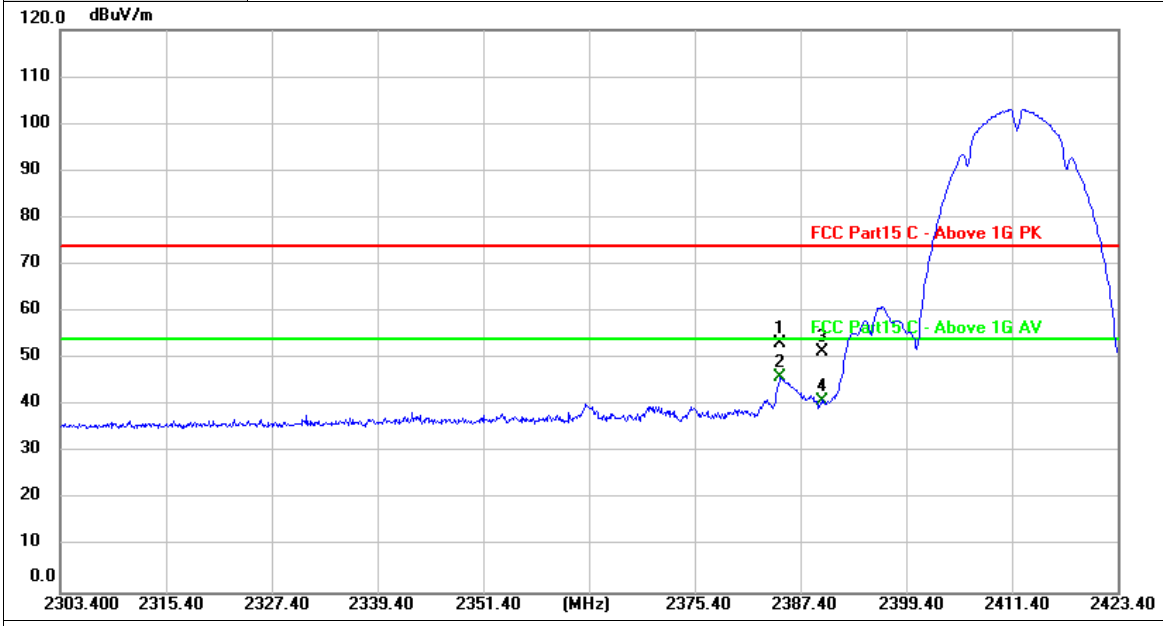
Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	B Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2387.080	15.41	30.83	46.24	74.00	-27.76	peak
2 *	2387.080	8.43	30.83	39.26	54.00	-14.74	AVG
3	2390.000	16.06	30.84	46.90	74.00	-27.10	peak
4	2390.000	4.76	30.84	35.60	54.00	-18.40	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

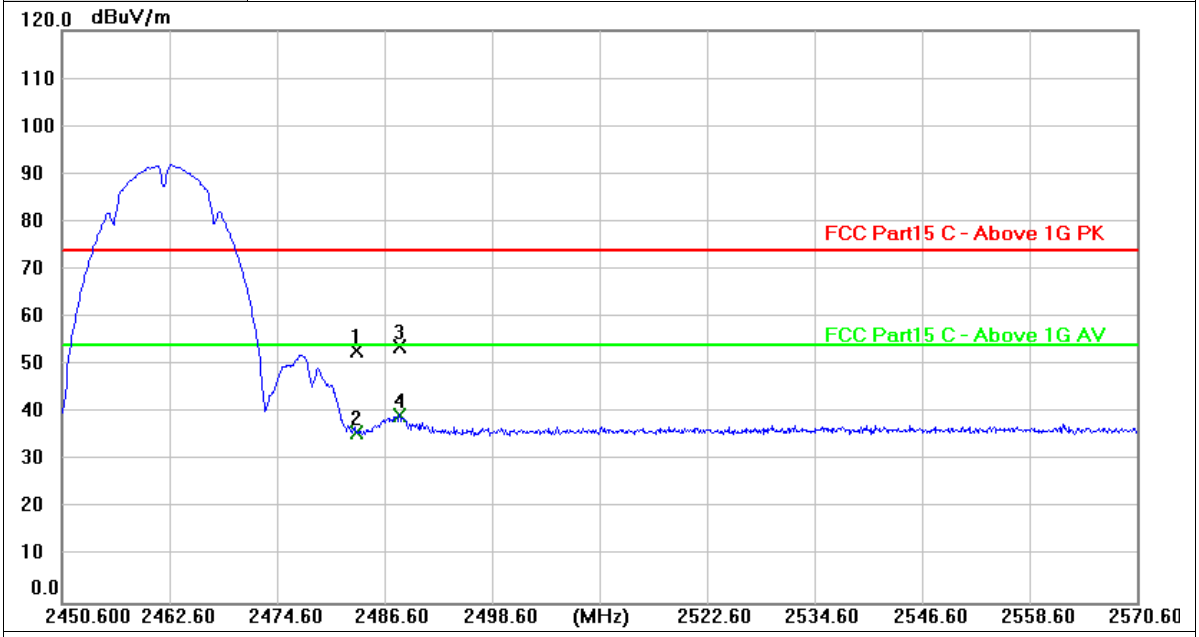
Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	B Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2385.160	22.45	30.82	53.27	74.00	-20.73	peak
2 *	2385.160	15.16	30.82	45.98	54.00	-8.02	AVG
3	2390.000	20.70	30.84	51.54	74.00	-22.46	peak
4	2390.000	9.97	30.84	40.81	54.00	-13.19	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

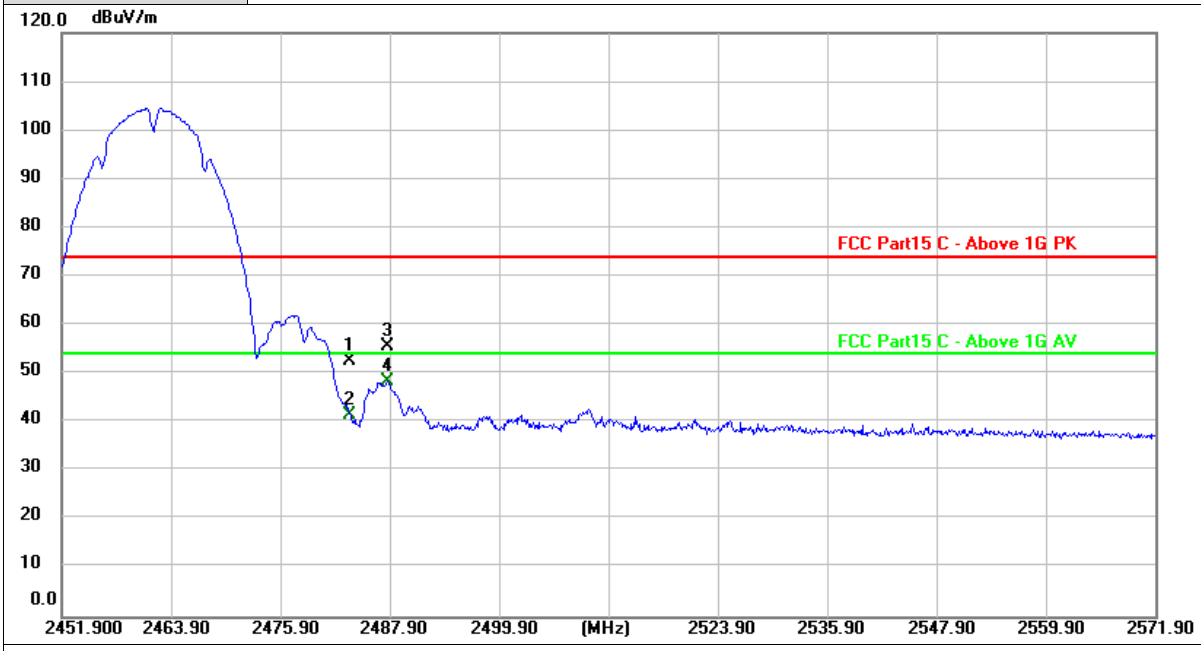
Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	B Mode 2462 MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	21.57	31.24	52.81	74.00	-21.19	peak
2	2483.500	4.64	31.24	35.88	54.00	-18.12	AVG
3	2488.280	22.71	31.26	53.97	74.00	-20.03	peak
4 *	2488.280	8.34	31.26	39.60	54.00	-14.40	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

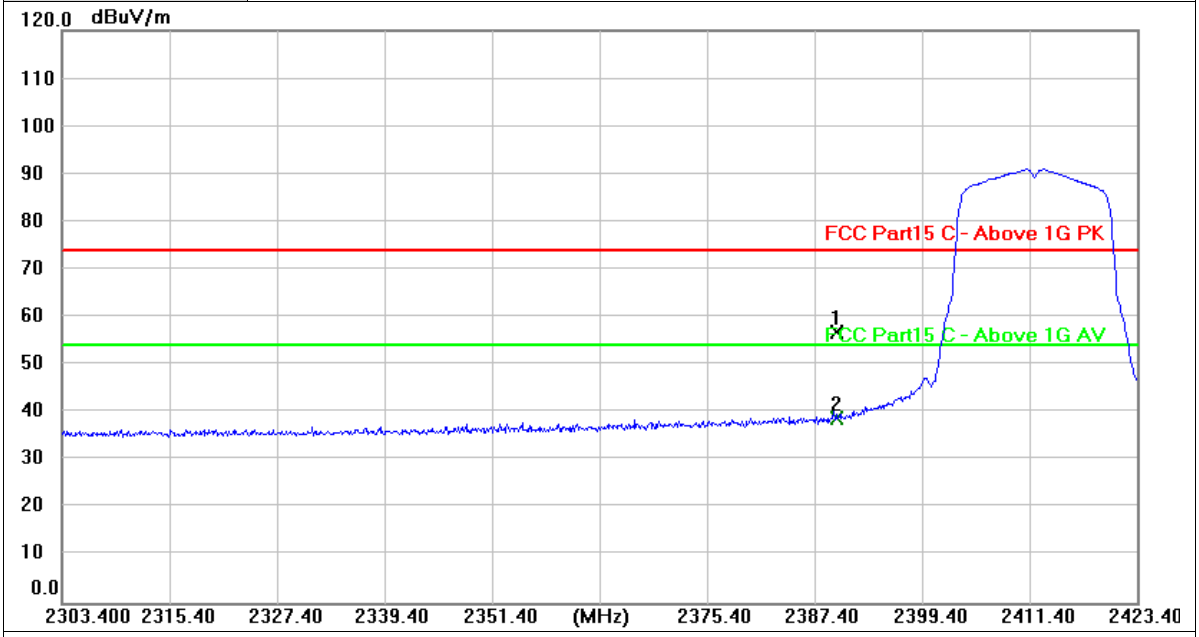
Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	B Mode 2462 MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	21.34	31.24	52.58	74.00	-21.42	peak
2	2483.500	10.19	31.24	41.43	54.00	-12.57	AVG
3	2487.700	24.41	31.26	55.67	74.00	-18.33	peak
4 *	2487.700	17.07	31.26	48.33	54.00	-5.67	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

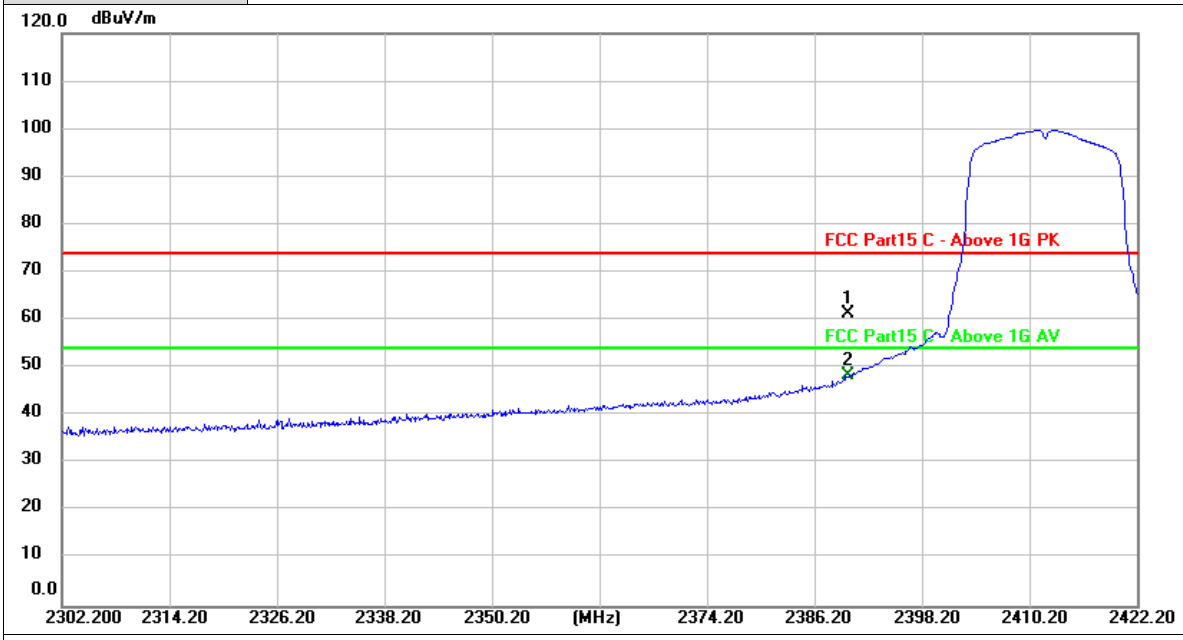
Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	G Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	26.11	30.84	56.95	74.00	-17.05	peak
2 *	2390.000	8.14	30.84	38.98	54.00	-15.02	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

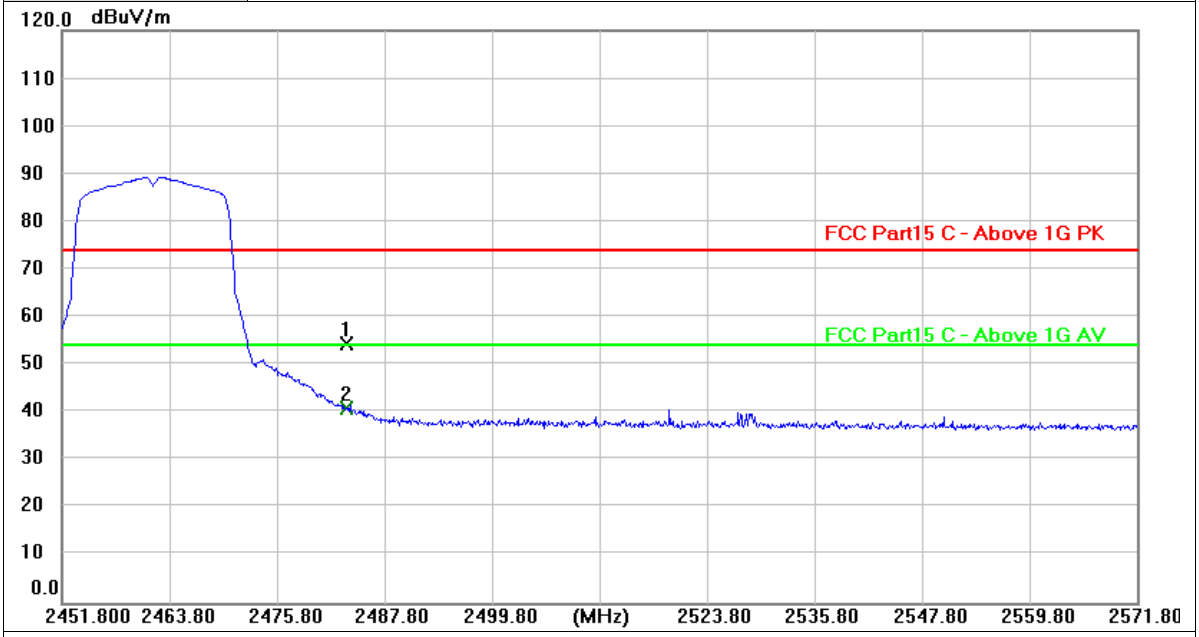
Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	G Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	30.49	30.84	61.33	74.00	-12.67	peak
2 *	2390.000	17.52	30.84	48.36	54.00	-5.64	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

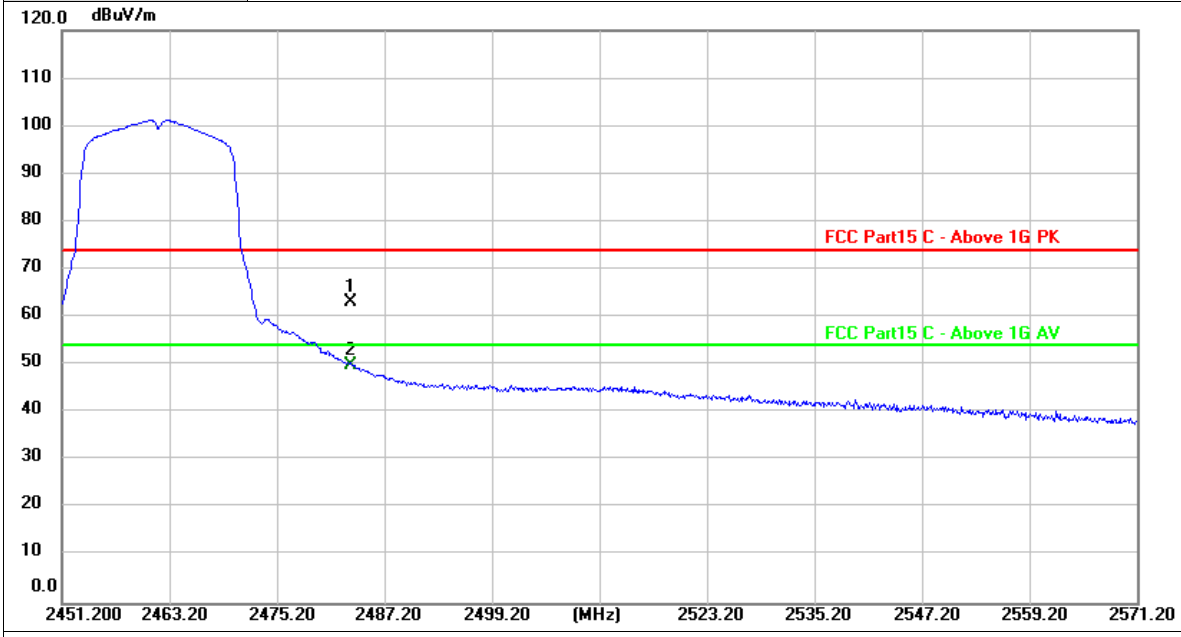
Ant No.	ANT2
Ant. Pol.	Horizontal
Test Mode:	G Mode 2462MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	23.13	31.24	54.37	74.00	-19.63	peak
2 *	2483.500	9.65	31.24	40.89	54.00	-13.11	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

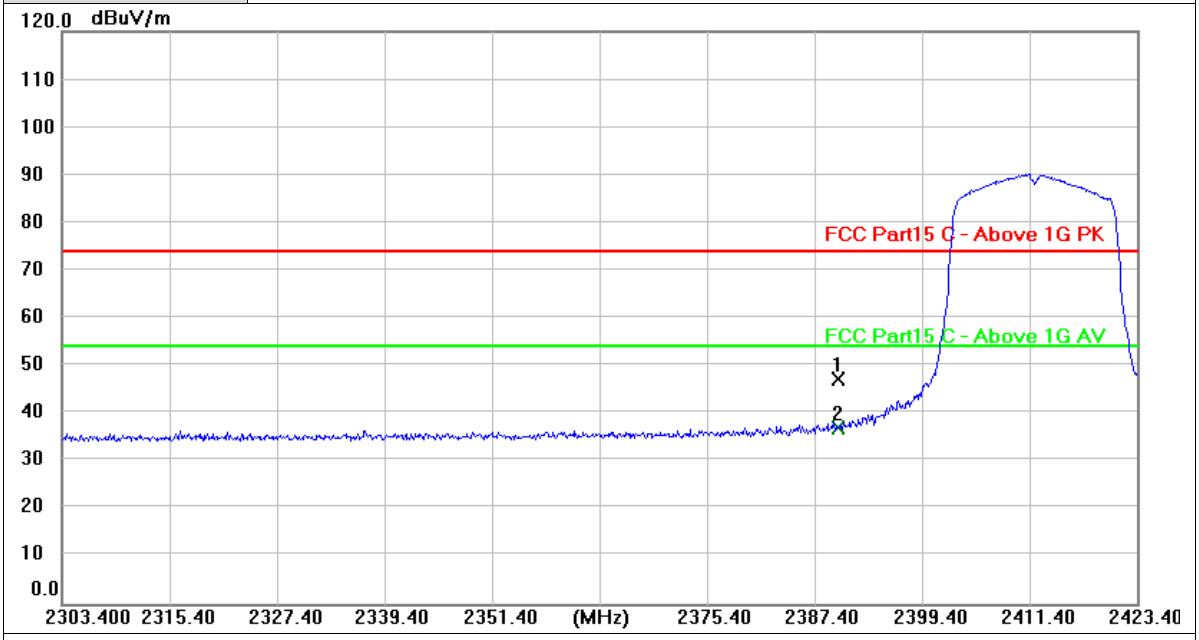
Ant No.	ANT2
Ant. Pol.	Vertical
Test Mode:	G Mode 2462MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	32.04	31.24	63.28	74.00	-10.72	peak
2 *	2483.500	18.69	31.24	49.93	54.00	-4.07	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

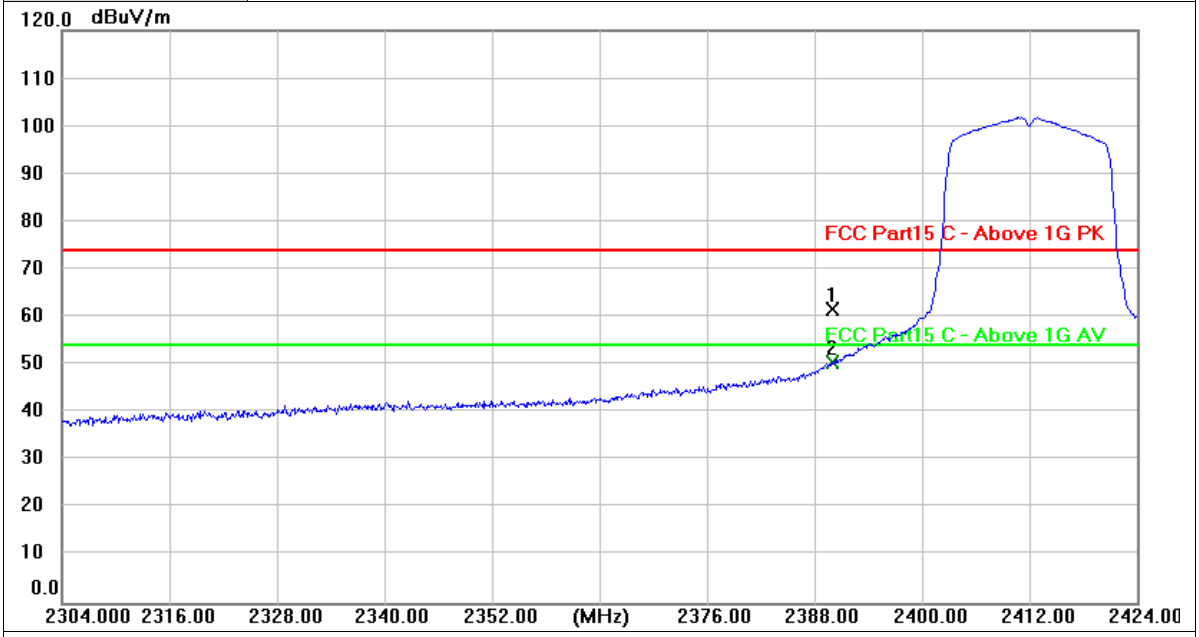
Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	N(HT20) Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	16.35	30.84	47.19	74.00	-26.81	peak
2 *	2390.000	6.29	30.84	37.13	54.00	-16.87	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

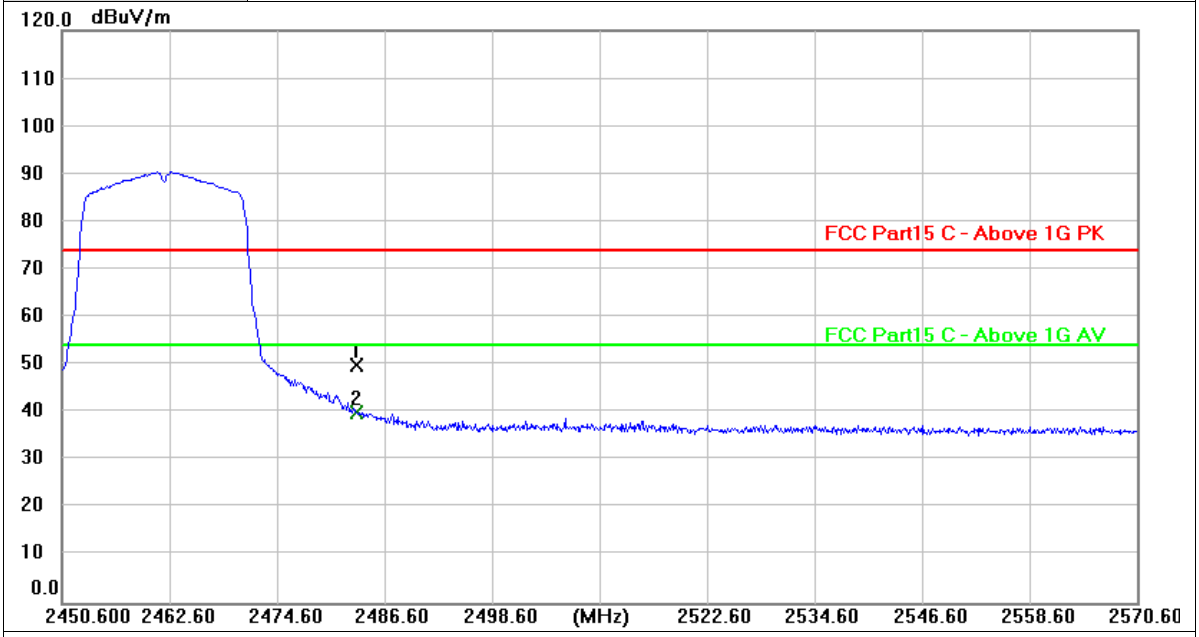
Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	N(HT20) Mode 2412MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	30.71	30.84	61.55	74.00	-12.45	peak
2 *	2390.000	19.65	30.84	50.49	54.00	-3.51	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

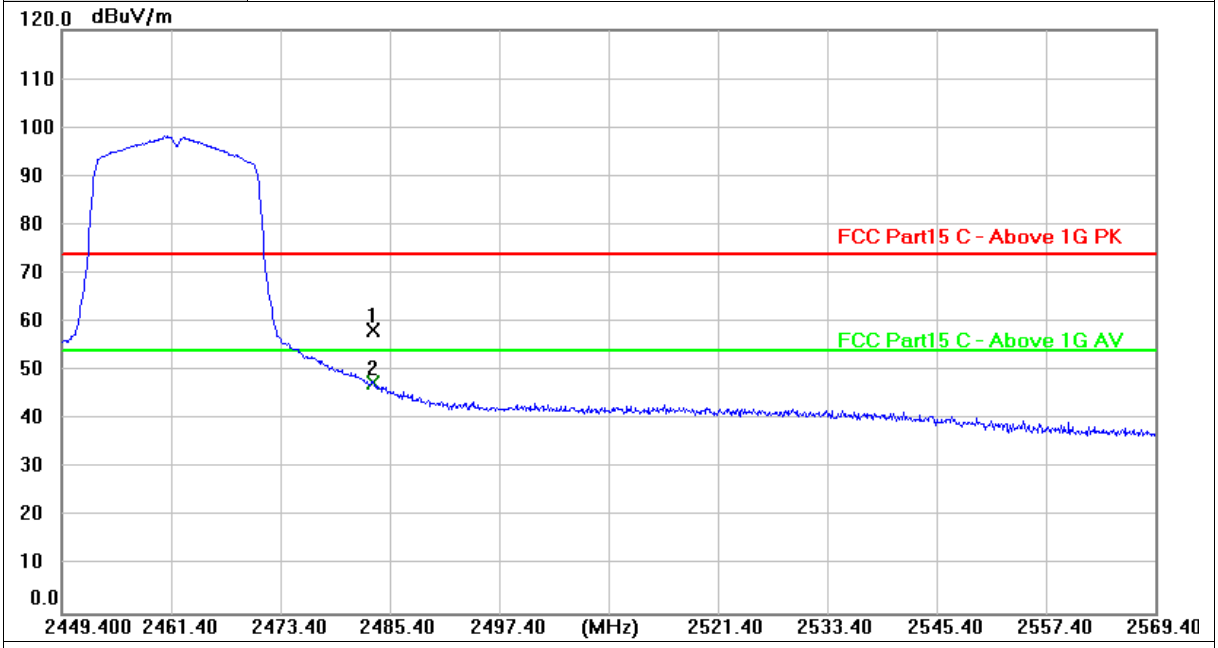
Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	N(HT20) Mode 2462MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	18.63	31.24	49.87	74.00	-24.13	peak
2 *	2483.500	8.74	31.24	39.98	54.00	-14.02	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

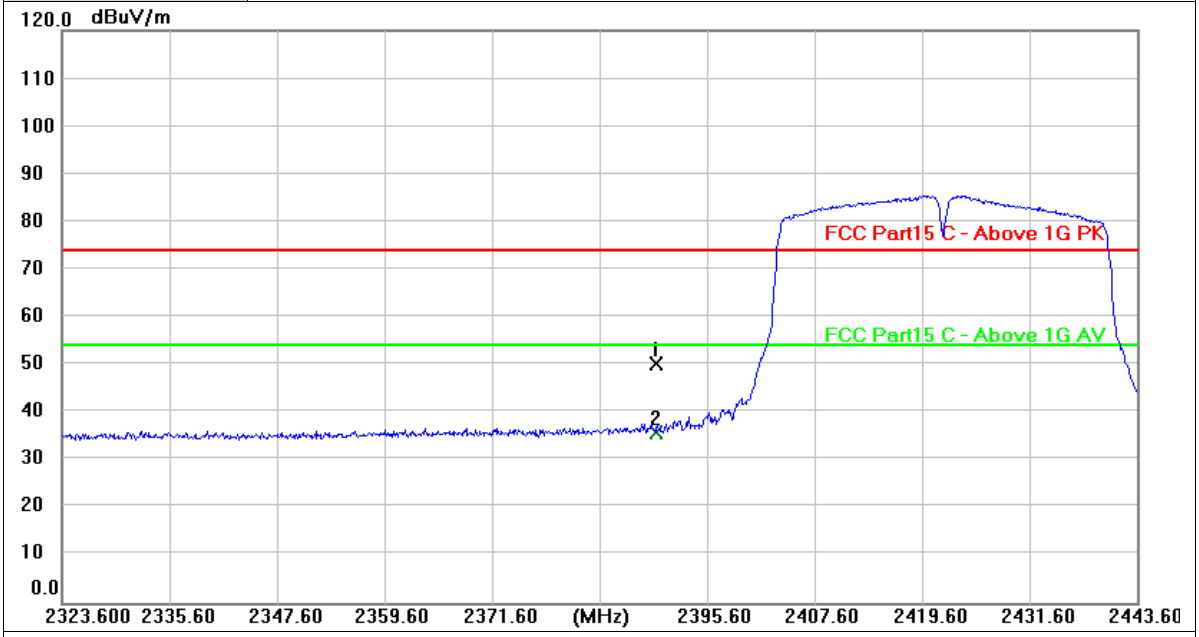
Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	N(HT20) Mode 2462MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	27.19	31.24	58.43	74.00	-15.57	peak
2 *	2483.500	16.29	31.24	47.53	54.00	-6.47	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

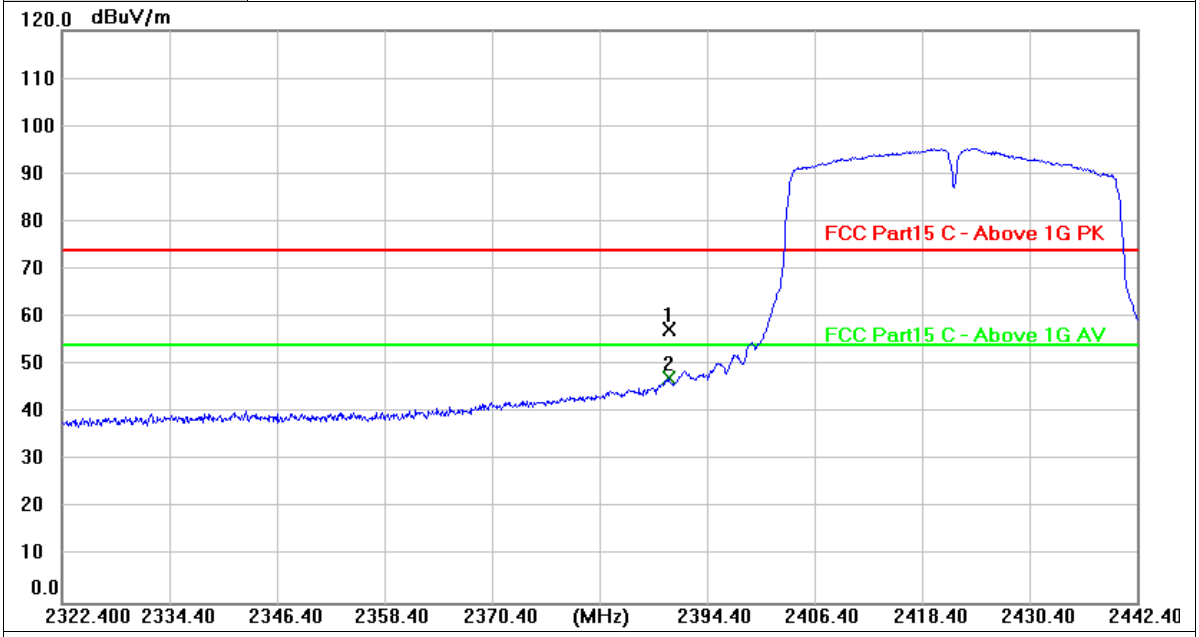
Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	N(HT40) Mode 2422MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	19.31	30.84	50.15	74.00	-23.85	peak
2 *	2390.000	5.03	30.84	35.87	54.00	-18.13	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

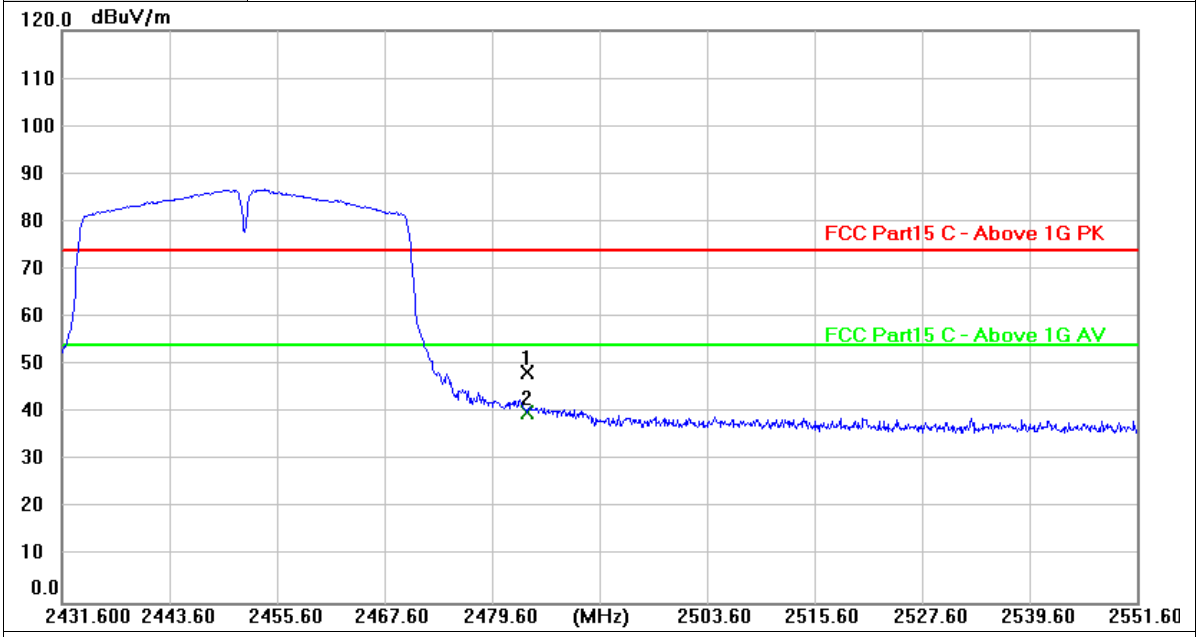
Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	N(HT40) Mode 2422MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	26.72	30.84	57.56	74.00	-16.44	peak
2 *	2390.000	16.37	30.84	47.21	54.00	-6.79	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

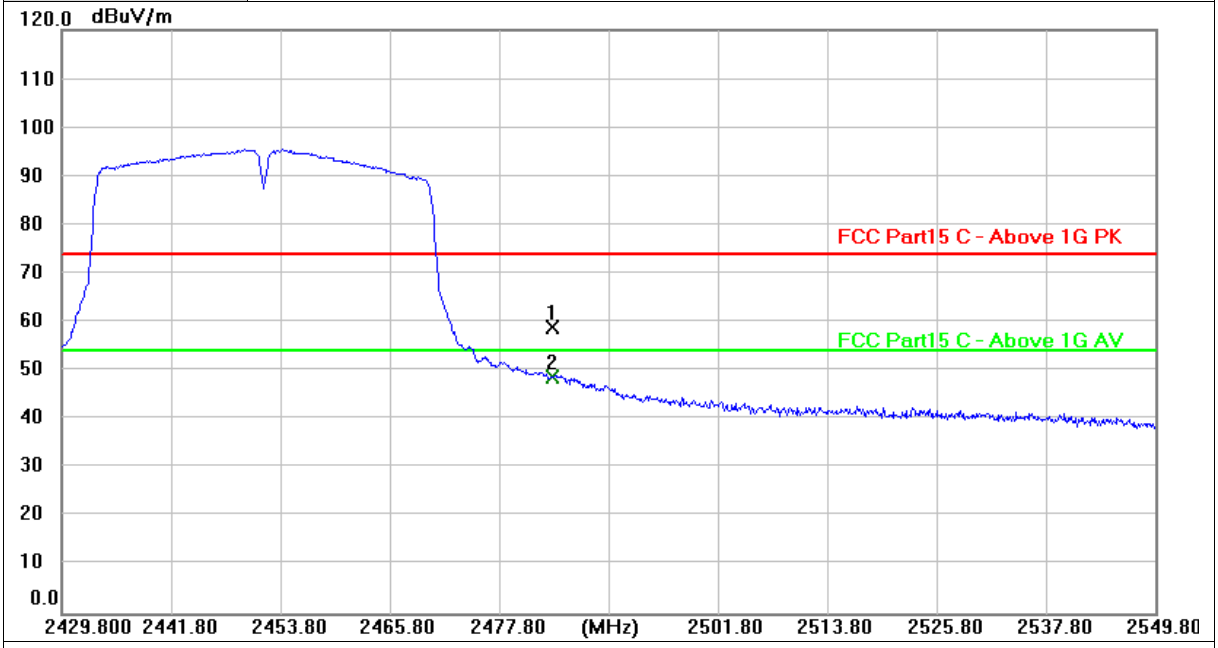
Ant No.	MIMO
Ant. Pol.	Horizontal
Test Mode:	N(HT40) Mode 2452MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	17.22	31.24	48.46	74.00	-25.54	peak
2 *	2483.500	8.78	31.24	40.02	54.00	-13.98	AVG

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant No.	MIMO
Ant. Pol.	Vertical
Test Mode:	N(HT40) Mode 2452MHz
Remark:	Only worse case is reported



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	27.68	31.24	58.92	74.00	-15.08	peak
2 *	2483.500	17.54	31.24	48.78	54.00	-5.22	AVG

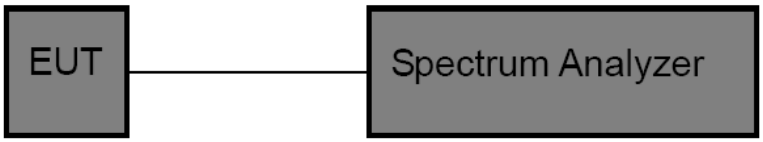
Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

3.4. Band edge and Spurious Emissions (Conducted)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Test Configuration



Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
   RBW = 100 kHz, VBW ≥ RBW, scan up through 10th harmonic.
   Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

Test Mode

Please refer to the clause 2.4.

Test Results

Band edge measurements

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	8.33	-34.22	≤-21.67	PASS
	Ant2	Low	2412	6.52	-35.9	≤-23.48	PASS
	Ant1	High	2462	8.56	-43.49	≤-21.44	PASS
	Ant2	High	2462	6.18	-49.03	≤-23.82	PASS
11G	Ant1	Low	2412	6.17	-35.48	≤-23.83	PASS
	Ant2	Low	2412	4.47	-37.72	≤-25.53	PASS
	Ant1	High	2462	5.96	-41.31	≤-24.04	PASS
	Ant2	High	2462	4.78	-47.28	≤-25.22	PASS
11N20MIMO	Ant1	Low	2412	5.07	-37.12	≤-24.93	PASS
	Ant2	Low	2412	2.20	-39.88	≤-27.8	PASS
	Ant1	High	2462	7.51	-41.16	≤-22.49	PASS
	Ant2	High	2462	3.63	-46.02	≤-26.37	PASS
11N40MIMO	Ant1	Low	2422	4.32	-31.78	≤-25.68	PASS
	Ant2	Low	2422	-2.17	-42.96	≤-22.17	PASS
	Ant1	High	2452	4.74	-38.78	≤-25.26	PASS
	Ant2	High	2452	0.63	-45.17	≤-29.37	PASS

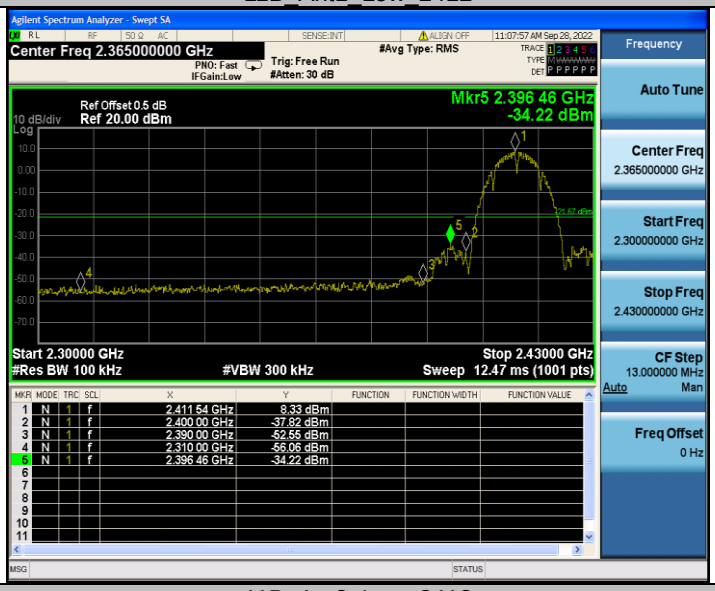
Conducted Spurious Emission

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	8.23	8.23	---	PASS
			30~1000	8.23	-69.23	≤-21.77	PASS
			1000~26500	8.23	-43.38	≤-21.77	PASS
	Ant2	2412	Reference	6.44	6.44	---	PASS
			30~1000	6.44	-68.68	≤-23.56	PASS
			1000~26500	6.44	-45.21	≤-23.56	PASS
	Ant1	2437	Reference	7.94	7.94	---	PASS
			30~1000	7.94	-68.39	≤-22.06	PASS
			1000~26500	7.94	-46.04	≤-22.06	PASS
	Ant2	2437	Reference	6.29	6.29	---	PASS
			30~1000	6.29	-69.01	≤-23.71	PASS
			1000~26500	6.29	-47.02	≤-23.71	PASS
	Ant1	2462	Reference	8.38	8.38	---	PASS
			30~1000	8.38	-68.22	≤-21.62	PASS
			1000~26500	8.38	-48.94	≤-21.62	PASS
	Ant2	2462	Reference	6.05	6.05	---	PASS
			30~1000	6.05	-69	≤-23.95	PASS
			1000~26500	6.05	-49.44	≤-23.95	PASS
11G	Ant1	2412	Reference	6.45	6.45	---	PASS
			30~1000	6.45	-68.96	≤-23.55	PASS
			1000~26500	6.45	-43.38	≤-23.55	PASS
	Ant2	2412	Reference	4.90	4.90	---	PASS
			30~1000	4.90	-68.94	≤-25.1	PASS
			1000~26500	4.90	-50.59	≤-25.1	PASS
	Ant1	2437	Reference	5.60	5.60	---	PASS
			30~1000	5.60	-68.95	≤-24.4	PASS
			1000~26500	5.60	-48.3	≤-24.4	PASS
	Ant2	2437	Reference	4.56	4.56	---	PASS
			30~1000	4.56	-68.28	≤-25.45	PASS
			1000~26500	4.56	-50.45	≤-25.45	PASS
	Ant1	2462	Reference	6.62	6.62	---	PASS
			30~1000	6.62	-69.02	≤-23.38	PASS
			1000~26500	6.62	-49.87	≤-23.38	PASS
	Ant2	2462	Reference	4.13	4.13	---	PASS
			30~1000	4.13	-69.05	≤-25.87	PASS
			1000~26500	4.13	-50.4	≤-25.87	PASS
11N20MIMO	Ant1	2412	Reference	5.24	5.24	---	PASS
			30~1000	5.24	-69.2	≤-24.76	PASS
			1000~26500	5.24	-43.43	≤-24.76	PASS
	Ant2	2412	Reference	1.81	1.81	---	PASS
			30~1000	1.81	-67.64	≤-28.19	PASS
			1000~26500	1.81	-49.46	≤-28.19	PASS
	Ant1	2437	Reference	6.13	6.13	---	PASS
			30~1000	6.13	-68.76	≤-23.87	PASS
			1000~26500	6.13	-49.39	≤-23.87	PASS
	Ant2	2437	Reference	3.29	3.29	---	PASS
			30~1000	3.29	-68.69	≤-26.71	PASS
			1000~26500	3.29	-50.88	≤-26.71	PASS
	Ant1	2462	Reference	7.61	7.61	---	PASS
			30~1000	7.61	-68.65	≤-22.4	PASS
			1000~26500	7.61	-48.3	≤-22.4	PASS
	Ant2	2462	Reference	3.49	3.49	---	PASS
			30~1000	3.49	-68.47	≤-26.51	PASS
			1000~26500	3.49	-50.34	≤-26.51	PASS
11N40MIMO	Ant1	2422	Reference	4.13	4.13	---	PASS
			30~1000	4.13	-68.7	≤-25.87	PASS
			1000~26500	4.13	-64.02	≤-25.87	PASS
	Ant2	2422	Reference	4.12	4.12	---	PASS
			30~1000	4.12	-68.54	≤-25.88	PASS
			1000~26500	4.12	-50.31	≤-25.88	PASS
	Ant1	2437	Reference	4.46	4.46	---	PASS
			30~1000	4.46	-69.2	≤-25.54	PASS
			1000~26500	4.46	-50.31	≤-25.54	PASS

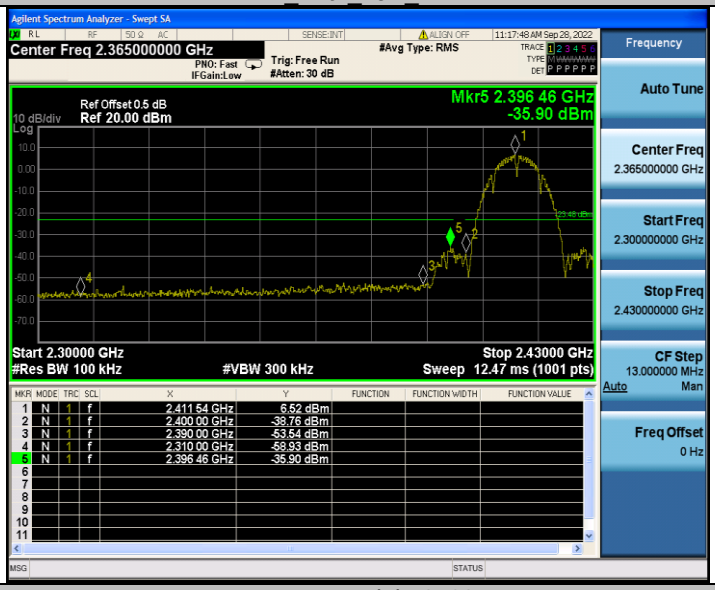
	Ant2	2437	Reference	0.67	0.67	---	PASS
			30~1000	0.67	-69.06	≤-29.33	PASS
			1000~26500	0.67	-50.19	≤-29.33	PASS
	Ant1	2452	Reference	4.72	4.72	---	PASS
			30~1000	4.72	-69.36	≤-25.28	PASS
			1000~26500	4.72	-49.66	≤-25.28	PASS
	Ant2	2452	Reference	0.63	0.63	---	PASS
			30~1000	0.63	-69.05	≤-29.38	PASS
			1000~26500	0.63	-50.67	≤-29.38	PASS

Band edge Test Graphs

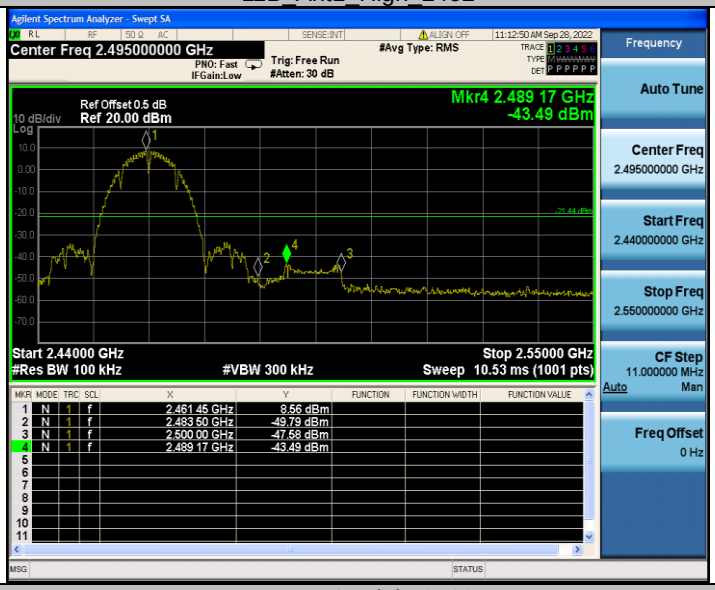
11B_Ant1_Low_2412



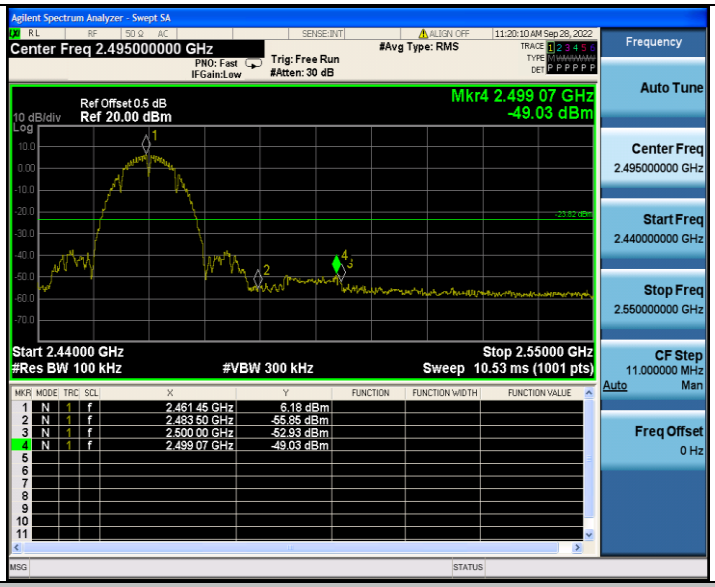
11B_Ant2_Low_2412



11B_Ant1_High_2462

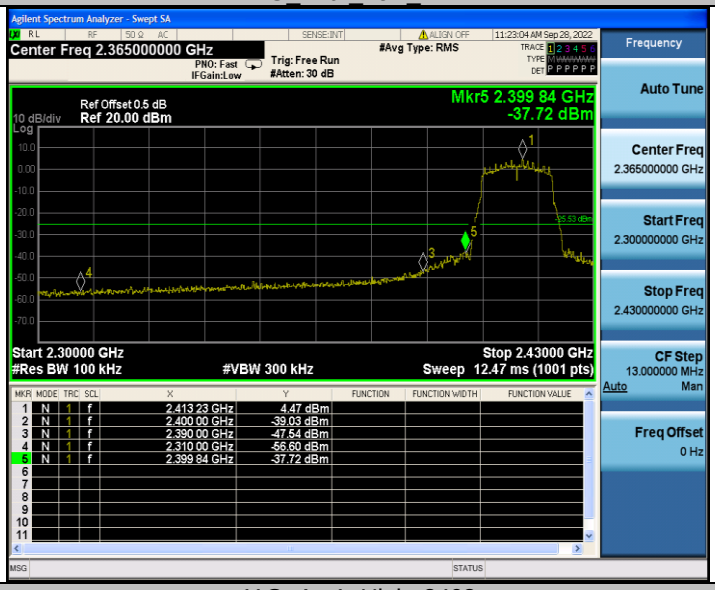


11B_Ant2_High_2462

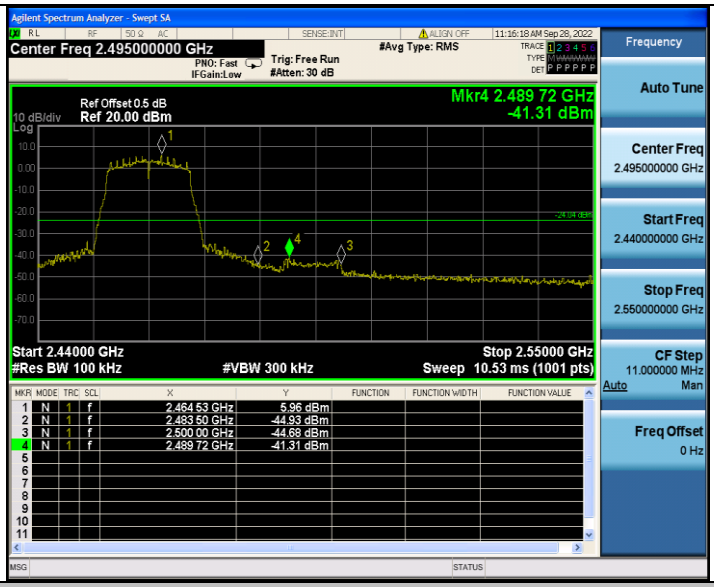


11G_Ant1_Low_2412

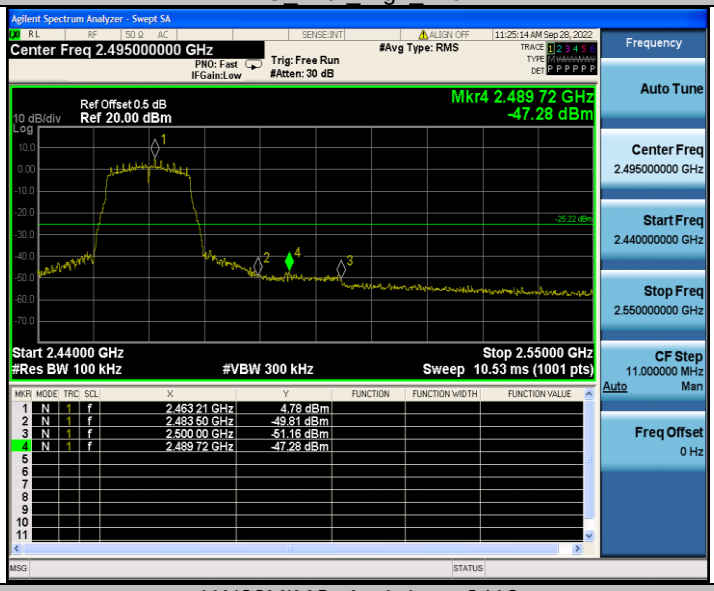
11G_Ant2_Low_2412



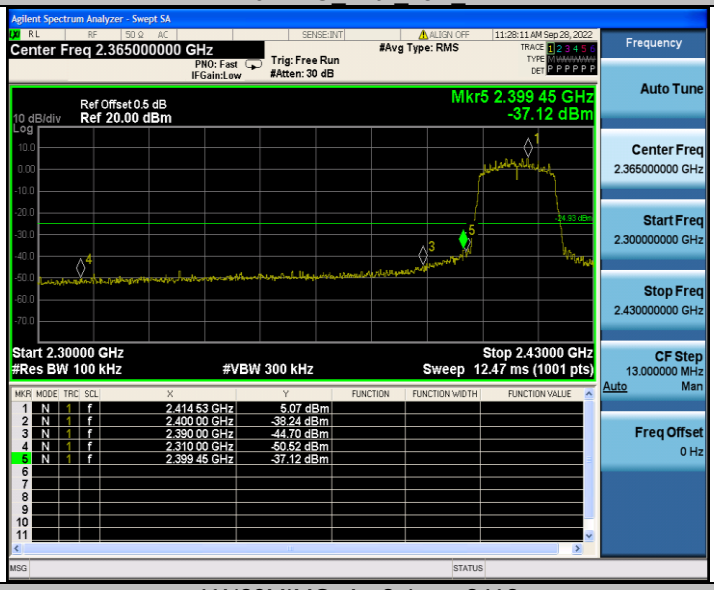
11G_Ant1_High_2462



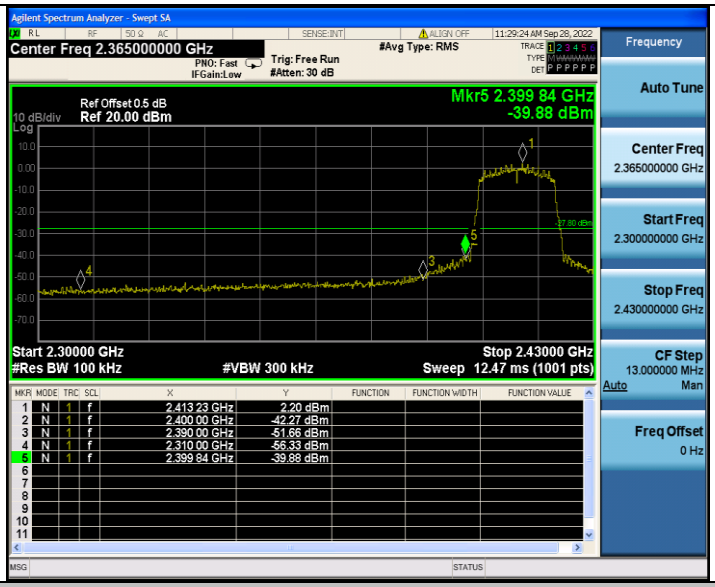
11G_Ant2_High_2462



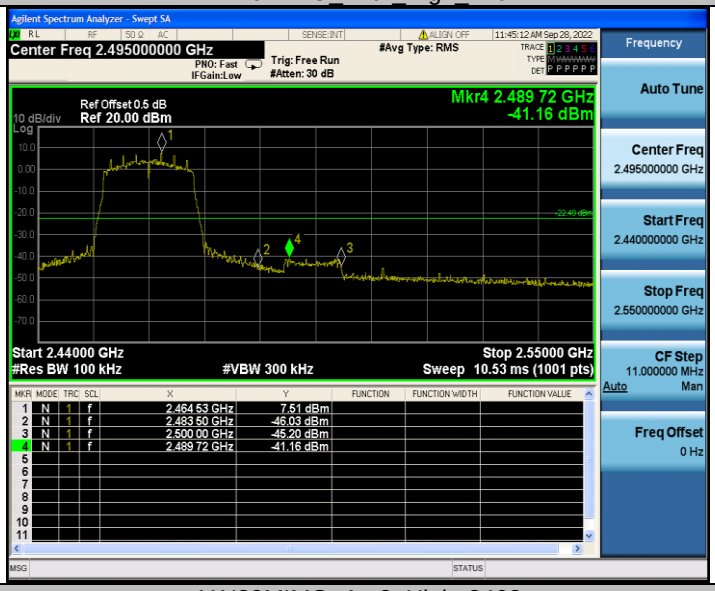
11N20MIMO_Ant1_Low_2412



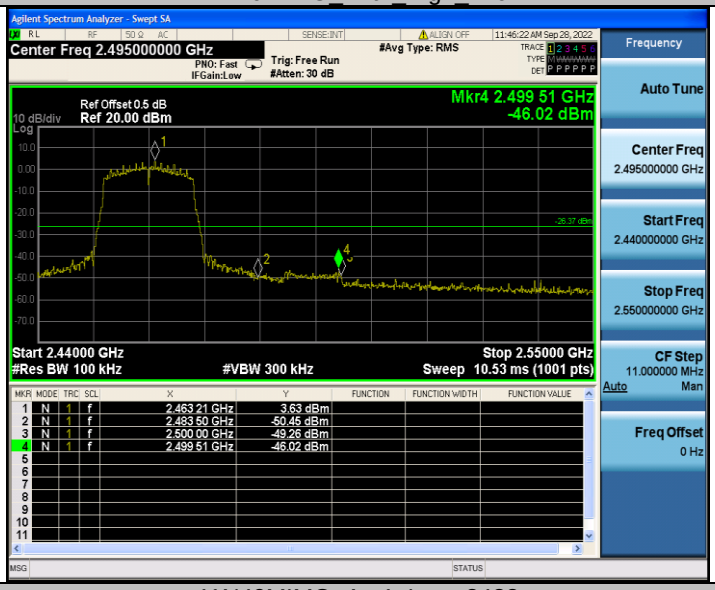
11N20MIMO_Ant2_Low_2412



11N20MIMO_Ant1_High_2462



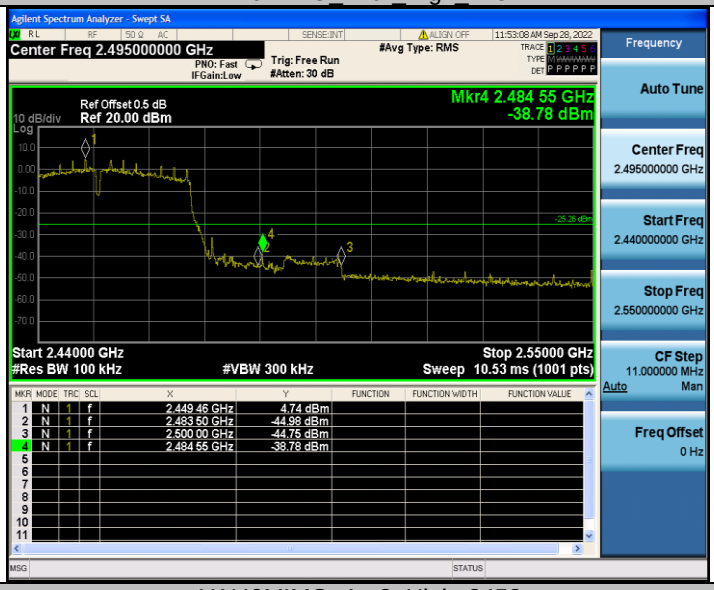
11N20MIMO_Ant2_High_2462



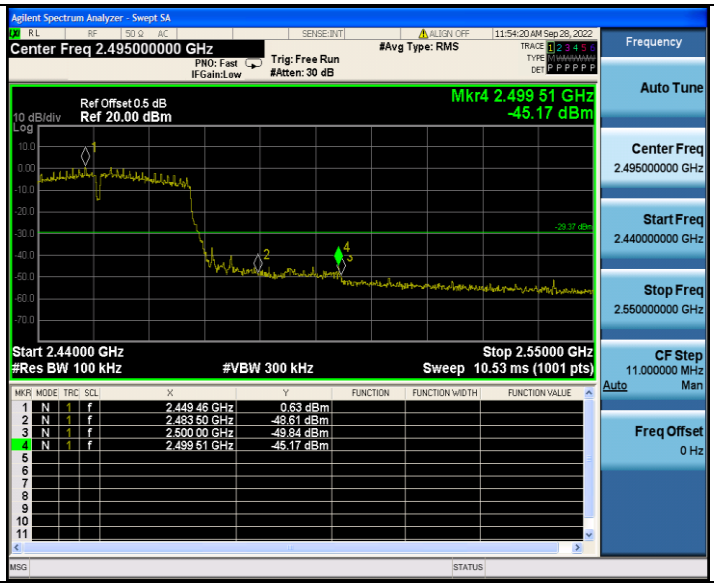
11N40MIMO_Ant1_Low_2422

11N40MIMO_Ant2_Low_2422

11N40MIMO_Ant1_High_2452

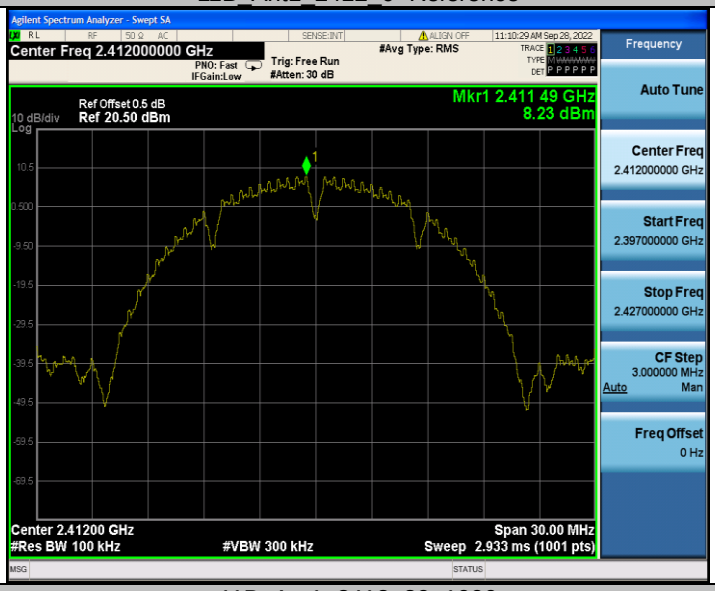


11N40MIMO_Ant2_High_2452

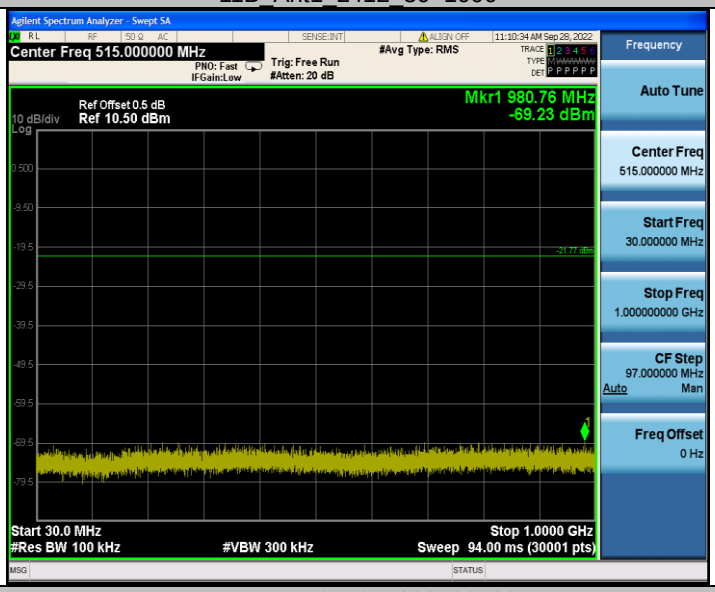

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.495000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
11:54:20 AM Sep 28, 2022
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr4 2.499 51 GHz
-45.17 dBm
-29.37 dBm
Start 2.44000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.55000 GHz
Sweep 10.53 ms (1001 pts)
1 N 1 f 2.449 46 GHz 0.63 dBm
2 N 1 f 2.483 50 GHz -48.61 dBm
3 N 1 f 2.500 00 GHz -49.84 dBm
4 N 1 f 2.499 51 GHz -45.17 dBm
Frequency
Auto Tune
Center Freq
2.495000000 GHz
Start Freq
2.440000000 GHz
Stop Freq
2.550000000 GHz
CF Step
11.000000 MHz
Auto
Man
Freq Offset
0 Hz

Conducted Spurious Emission Test Graphs

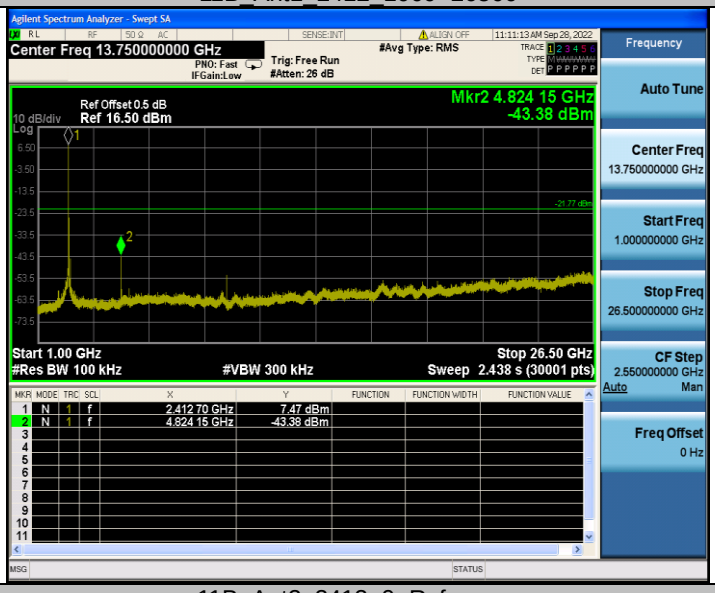
11B_Ant1_2412_0~Reference



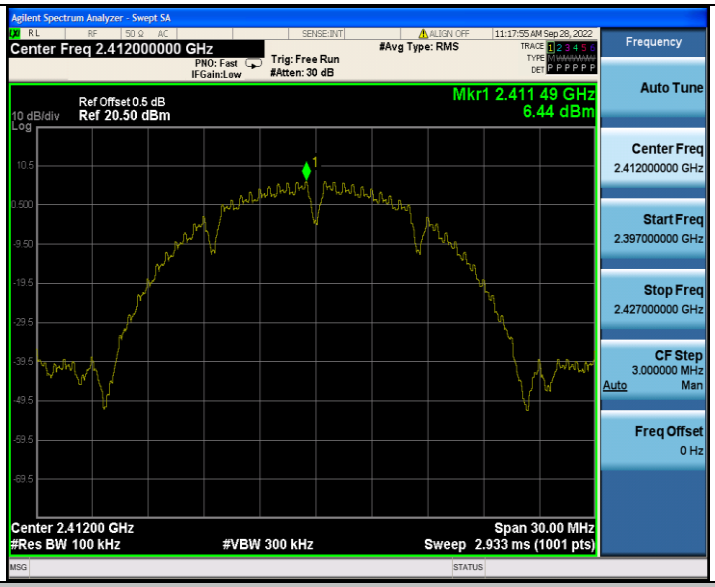
11B_Ant1_2412_30~1000



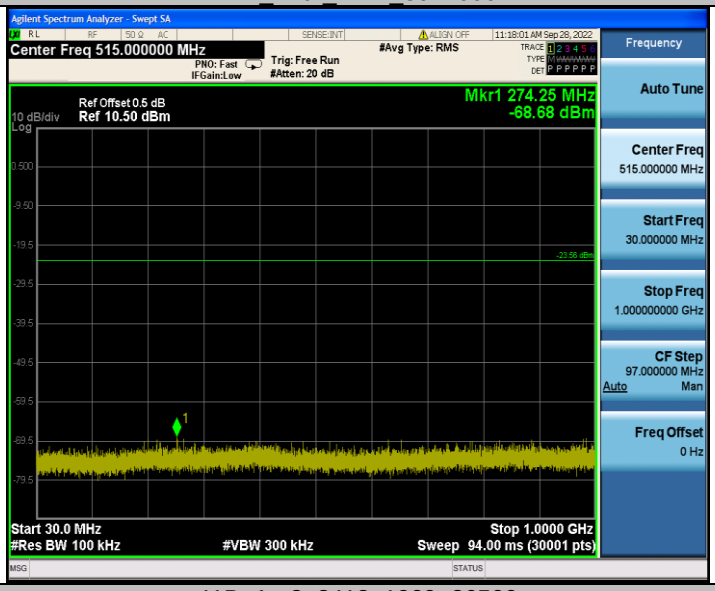
11B_Ant1_2412_1000~26500



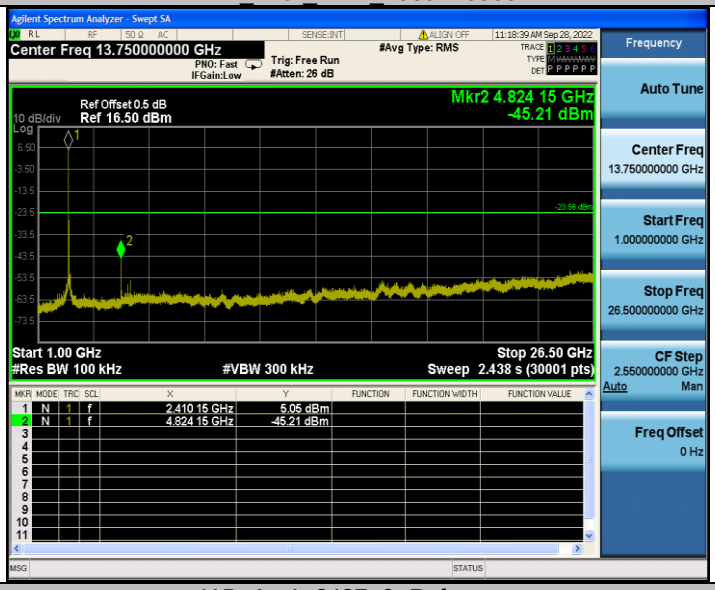
11B_Ant2_2412_0~Reference



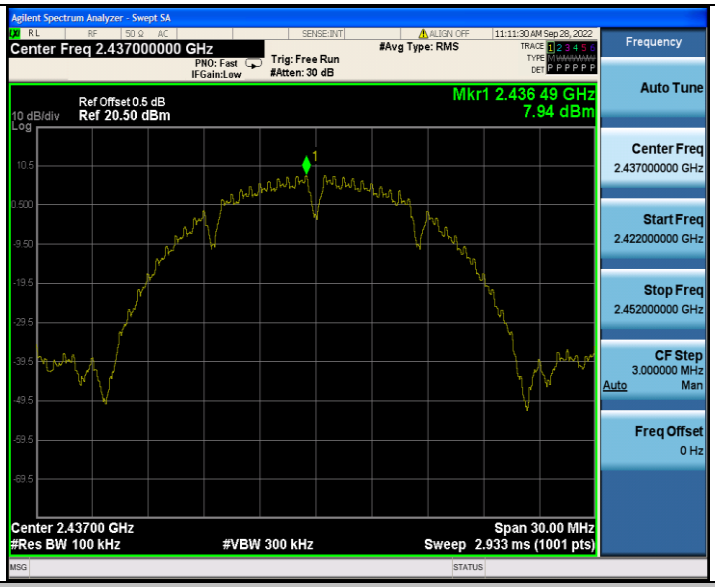
11B_Ant2_2412_30~1000



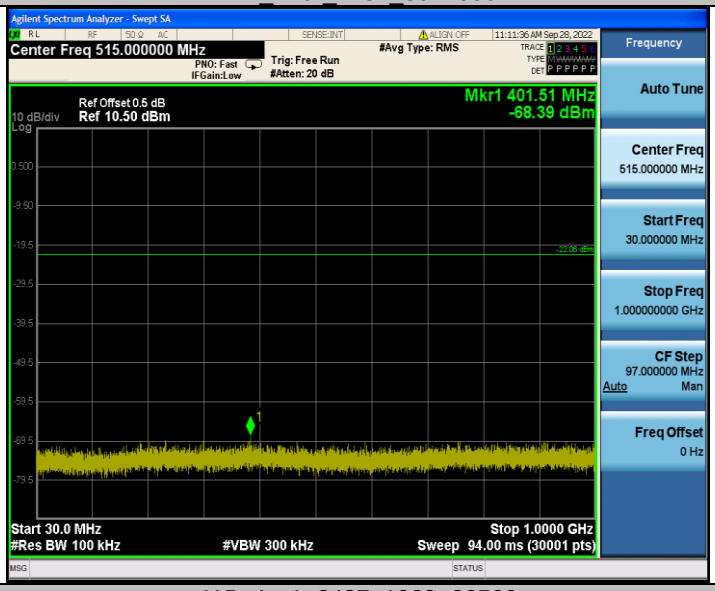
11B_Ant2_2412_1000~26500



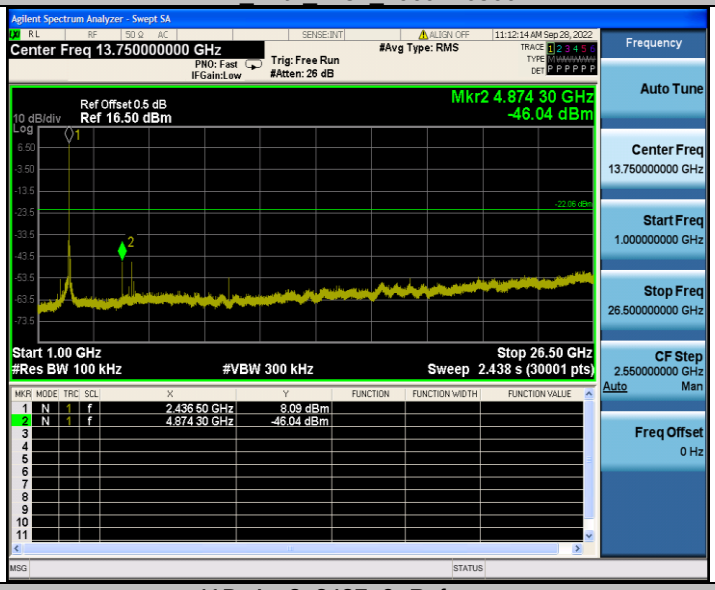
11B_Ant1_2437_0~Reference



11B_Ant1_2437_30~1000



11B_Ant1_2437_1000~26500



11B_Ant2_2437_0~Reference