



TEST REPORT

Application No.: GZCR2105020317AT
Applicant: Echelon Fitness Multimedia, LLC
Address of Applicant: 605 Chestnut Street, Suite 700, Chattanooga, TN 37450 USA
Manufacturer: Echelon Fitness Multimedia, LLC
Address of Manufacturer: 605 Chestnut Street, Suite 700, Chattanooga, TN 37450 USA
Factory: TES Touch Embedded Solutions (Xiamen) Co., Ltd.
Address of Factory: No. 60, Xinglin South Rd., Jimei District, Xiamen, Fujian 361022, China
Equipment Under Test (EUT):
EUT Name: ECHELON TOUCH SCREEN
Model No.: ECHTES-101
Trade Mark: ECHELON
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2021-05-25
Date of Test: 2021-05-27 to 2021-07-12
Date of Issue: 2021-07-22

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian

Kobe Jian

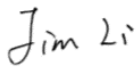

EMC Laboratory Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch EMC Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-07-22		Original

Authorized for issue by				
Tested By		 _____ Jim Li/Project Engineer		
Reviewed By		 _____ Ricky Liu/Reviewer		

2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Conducted Peak Output Power		ANSI C63.10 (2013) Section 11.9.1.3	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions		ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass**

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

** : The EUT passed Radiated Spurious Emissions test after modifications.



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 12 V powered by SWITCHING POWER SUPPLY MODEL: XH1200-3000 INPUT:100-240VAC, 50/60Hz, 0.8A OUTPUT:12.0V, 3.0A, 36.0W
Cable(s):	AC mains for adapter:1.8m, unshielded DC input for main unit:1.2m, with ferrite bead DC IN Jack USB Port USB/OTG Port TF Card Slot HDMI Port LAN Port LINE OUT Port 3.5mm Headphone Jack
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	PCB Antenna
Antenna Gain (Max):	Antenna 1: 2 dBi for 2.4G band Antenna 2: 2 dBi for 2.4G band Two antennas support MIMO synchronous transmission for 801.11n
Firmware Version:	MTB-818 V1-2 C002B002-20210610
Hardware Version:	rk3288_mtb818
Testing Software:	WLAN Test
Sample NO.:	117C102350
Power Setting:	7 dBm can not be changed by user.
Function:	Media PAD with 2.4G Wi-Fi function.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Mobile Phone	SAMSUNG	SM-G9810	RFCN309Q9QF
Note Book PC	LENOVO	Lenovo Xiaoxinchao 5000	PF0TLJX7
Wireless Router	TP-LINK	TL-WDR5620	120B531012491



4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	$\pm 3.12\text{dB}$
Conducted Peak Output Power	$\pm 0.75\text{dB}$
Minimum 6dB Bandwidth	$\pm 3\%$
Power Spectrum Density	$\pm 2.84\text{dB}$
Conducted Band Edges Measurement	$\pm 0.75\text{dB}$
Conducted Spurious Emissions	$\pm 0.75\text{dB}$
Radiated Emissions which fall in the restricted bands	5.06dB (30MHz-1GHz ; 3m) 4.46dB (30MHz-1GHz ; 10m) 5.08dB (1GHz-6GHz) 5.14dB (above 6GHz)
Radiated Spurious Emissions	5.06dB (30MHz-1GHz ; 3m) 4.46dB (30MHz-1GHz ; 10m) 5.08dB (1GHz-6GHz) 5.14dB (above 6GHz)

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555

Fax: +86 20 82075059

No tests were sub-contracted.



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4.5 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



4.8 Duty cycle of the EUT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percent.

Formula:

$$\text{Duty Cycle} = \text{Ton}/(\text{Ton}+\text{Toff})$$

Measurement Procedure:

1. Set span = Zero
2. RBW=8MHz
3. VBW=8MHz
4. Detector=Peak

Test Mode	Antenna	Channel(MHz)	Duty Cycle [%]	Correction Factor(dB)*
11B	Ant1	2412	96.00	0.177
	Ant2	2412	96.00	0.177
	Ant1	2442	96.01	0.177
	Ant2	2442	96.01	0.177
	Ant1	2462	96.01	0.177
	Ant2	2462	96.00	0.177
11G	Ant1	2412	80.00	0.969
	Ant2	2412	80.05	0.966
	Ant1	2442	80.05	0.966
	Ant2	2442	80.05	0.966
	Ant1	2462	80.04	0.966
	Ant2	2462	80.04	0.966
11N20SISO	Ant1	2412	78.86	1.031
	Ant2	2412	78.91	1.028
	Ant1	2442	78.86	1.031
	Ant2	2442	78.91	1.028
	Ant1	2462	78.91	1.028
	Ant2	2462	78.91	1.028
11N40SISO	Ant1	2422	64.75	1.887
	Ant2	2422	64.75	1.887
	Ant1	2442	64.75	1.887
	Ant2	2442	64.75	1.887
	Ant1	2452	64.75	1.887
	Ant2	2452	64.75	1.887

*Correction Factor(dB) = 10log(1/Duty Cycle)

Please refer to appendix for details.



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5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	N/A	N/A
Two-Line V-Network	Rohde & Schwarz	ENV216	EMC0118	2021-01-08	2022-01-06
Two-Line V-Network-GZ	Rohde & Schwarz	ENV216	EMC2135	2020-09-25	2021-09-24
Coaxial Cable	HangTianXing	2m	EMC0107	2020-09-09	2022-09-08
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A
EMI Test Receiver(9kHz-3.6GHz)	Rohde & Schwarz	ESR4	EMC2221	2021-06-01	2022-05-31

Conducted Peak Output Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Power Meter (U2021XA_Ch2)	Agilent Technologies	U2021XA_Ch2	SEM009-02	2021-05-19	2022-05-18
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Power Spectrum Density					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01



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Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Conducted Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Radiated Emissions which fall in the restricted bands					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver(20Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-01-08	2022-01-07
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020/9/9	2022/9/8
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver(10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2020-11-13	2021-11-12
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Notch Filter (5150-5880)	Mico-Tronics	BRM50716	EMC2168	2020-07-29	2021-07-28
Horn Antenna(14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2020-09-09	2021-09-08



Radiated Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)-Lab	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2019-12-27	2021-12-26
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
EMI Test Receiver(1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2021-05-26	2022-05-25

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-05
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-05



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

6.1.2 Conclusion

Standard Requirement:

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The 2 antennas are integrated on the main PCB and no consideration of replacement. The best case gain of both antennas are 2 dBi.

Please refer to internal photos.

EUT support 2x2 MIMO for 802.11n, any transmit signals are correlated with each other, as unequal antenna gains for antenna 1 and antenna 2 but with equal transmit power, therefore,

$$\text{Directional gain} = G_{\text{ANT}} + 10 \log (N_{\text{ANT}}) \text{ dBi}$$

Directional gain= 2+10log (2) dBi=5.01 dBi



7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	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.

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.9 °C

Humidity: 52 % RH

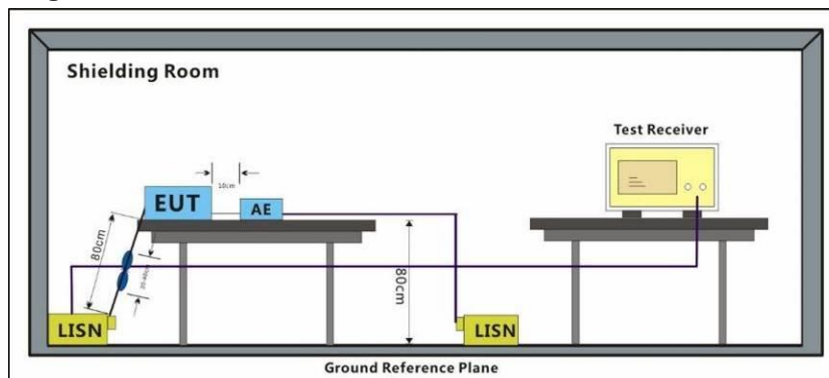
Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
--------------------------	--------------	-------------

Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.
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7.1.3 Test Setup Diagram

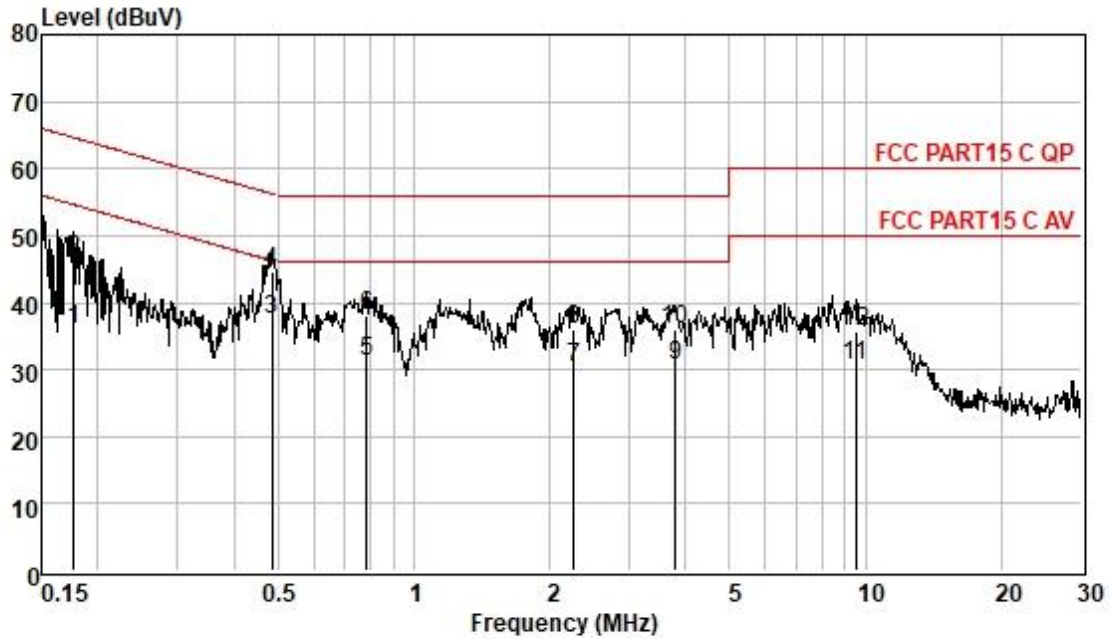


7.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

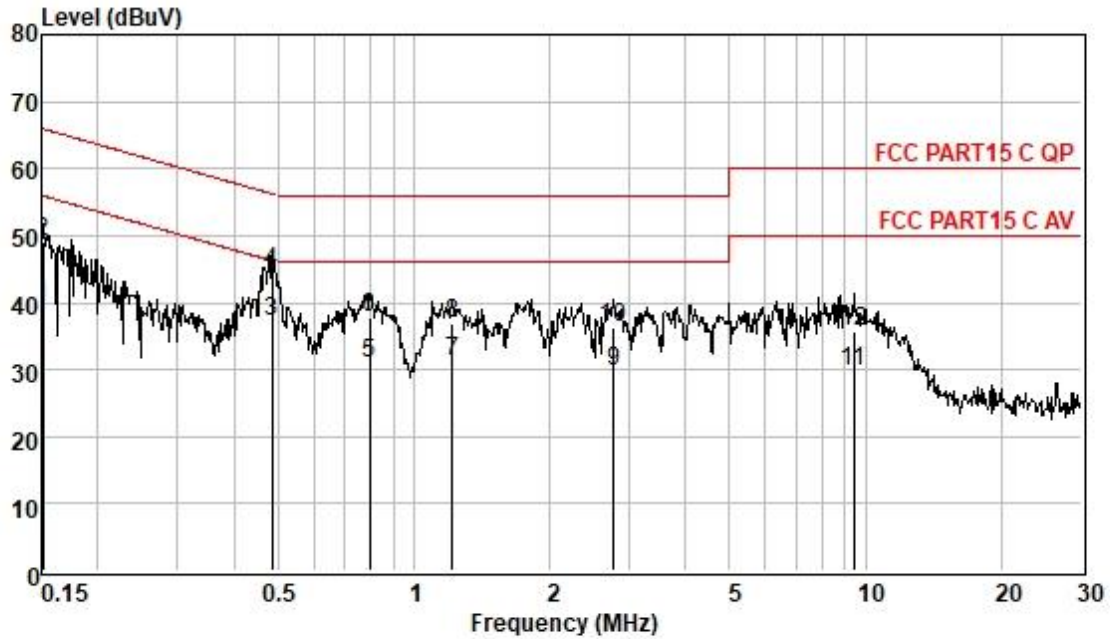
Test Mode: 05; Line: Live line



Pol : LINE
Mode :
Model :

Frequency MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.18	26.21	0.06	9.62	35.89	54.64	-18.75	Average
0.18	36.60	0.06	9.62	46.28	64.64	-18.36	QP
0.49	27.81	0.07	9.63	37.51	46.23	-8.72	Average
0.49	34.89	0.07	9.63	44.59	56.23	-11.64	QP
0.79	21.42	0.07	9.63	31.12	46.00	-14.88	Average
0.79	28.36	0.07	9.63	38.06	56.00	-17.94	QP
2.26	20.73	0.13	9.62	30.48	46.00	-15.52	Average
2.26	26.14	0.13	9.62	35.89	56.00	-20.11	QP
3.80	20.83	0.16	9.62	30.61	46.00	-15.39	Average
3.80	26.10	0.16	9.62	35.88	56.00	-20.12	QP
9.50	20.61	0.23	9.69	30.53	50.00	-19.47	Average
9.50	25.67	0.23	9.69	35.59	60.00	-24.41	QP

Test Mode: 05; Line: Neutral Line

Pol : NEUTRAL
Mode :
Model :

Frequency MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.15	29.70	0.06	9.55	39.31	55.96	-16.65	Average
0.15	39.42	0.06	9.55	49.03	65.96	-16.93	QP
0.49	27.54	0.07	9.55	37.16	46.23	-9.07	Average
0.49	34.90	0.07	9.55	44.52	56.23	-11.71	QP
0.80	21.42	0.07	9.55	31.04	46.00	-14.96	Average
0.80	28.02	0.07	9.55	37.64	56.00	-18.36	QP
1.22	21.47	0.08	9.55	31.10	46.00	-14.90	Average
1.22	27.38	0.08	9.55	37.01	56.00	-18.99	QP
2.76	20.03	0.14	9.55	29.72	46.00	-16.28	Average
2.76	26.64	0.14	9.55	36.33	56.00	-19.67	QP
9.40	19.96	0.23	9.59	29.78	50.00	-20.22	Average
9.40	25.77	0.23	9.59	35.59	60.00	-24.41	QP

7.2 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2013) Section 11.9.1.3

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥ 50 hopping channels
	0.25 for $25 \leq$ hopping channels < 50
	1 for digital modulation
2400-2483.5	1 for ≥ 75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 29.8 °C

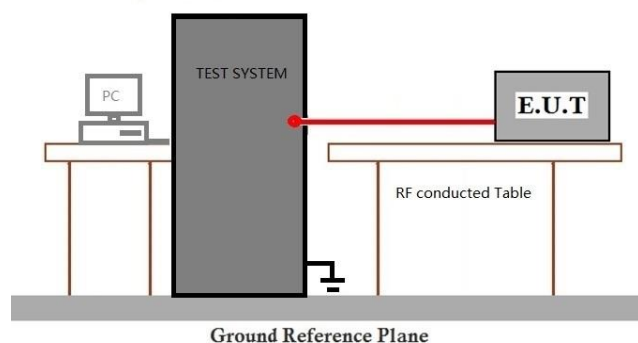
Humidity: 51.5 % RH

Atmospheric Pressure: 1005 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Please Refer To Appendix For Details

7.3 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
Test Method: ANSI C63.10 (2013) Section 11.8.1
Limit: ≥ 500 kHz

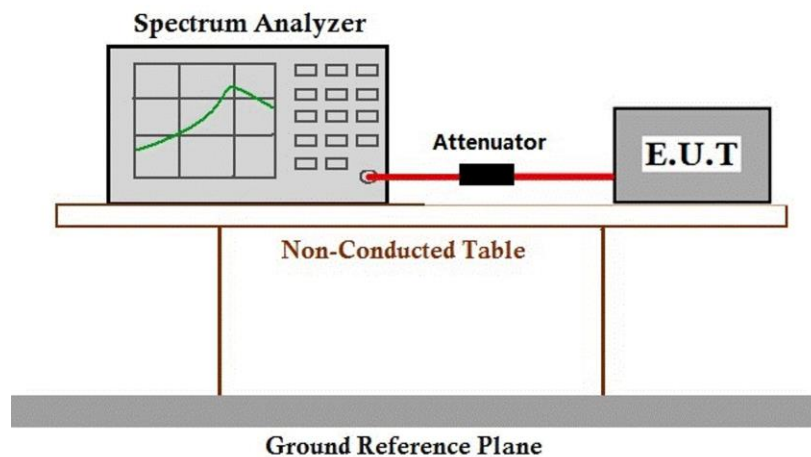
7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 29.8 °C Humidity: 51.5 % RH Atmospheric Pressure: 1005 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer To Appendix For Details

7.4 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)

Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

≤8dBm in any 3 kHz band during any time interval of continuous transmission

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 29.8 °C

Humidity: 51.5 % RH

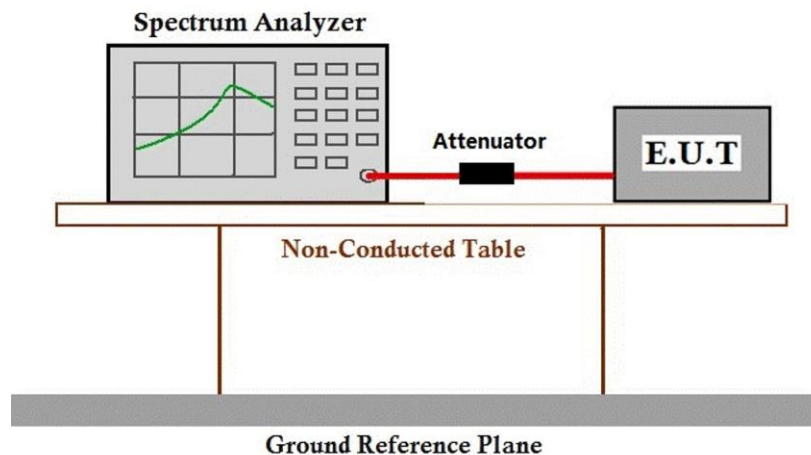
Atmospheric Pressure: 1005 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
--------------------------	--------------	-------------

Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.
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7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

Please Refer To Appendix For Details

7.5 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.13.3.2
Limit:

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. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.5.1 E.U.T. Operation

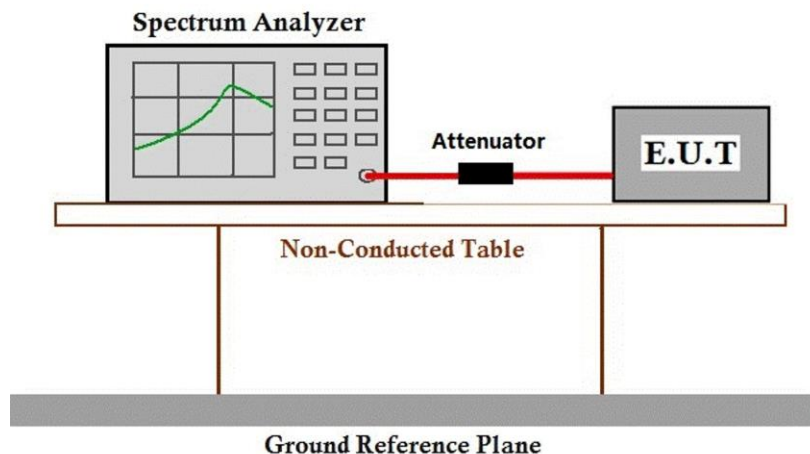
Operating Environment:

Temperature: 29.8 °C Humidity: 51.5 % RH Atmospheric Pressure: 1005 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer To Appendix For Details

7.6 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

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. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c).

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 29.8 °C

Humidity: 51.5 % RH

Atmospheric Pressure: 1005 mbar

7.6.2 Test Mode Description

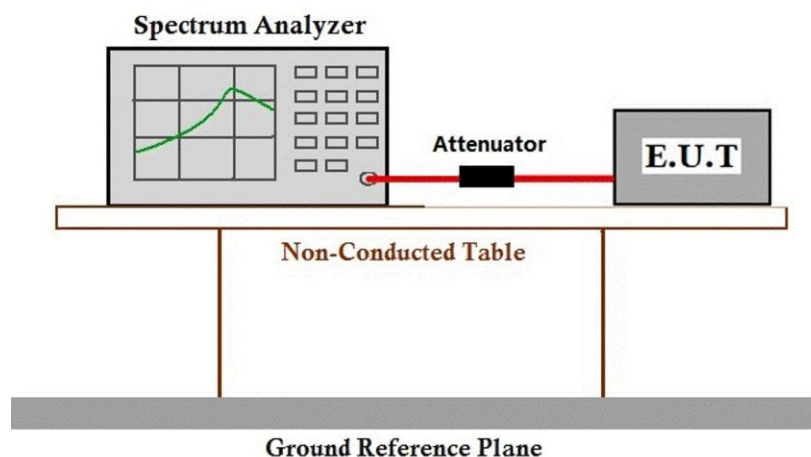
Pre-scan / Mode
Final test Code

Description

Final test 05

TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

Please Refer To Appendix For Details



7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C

Humidity: 64.9 % RH

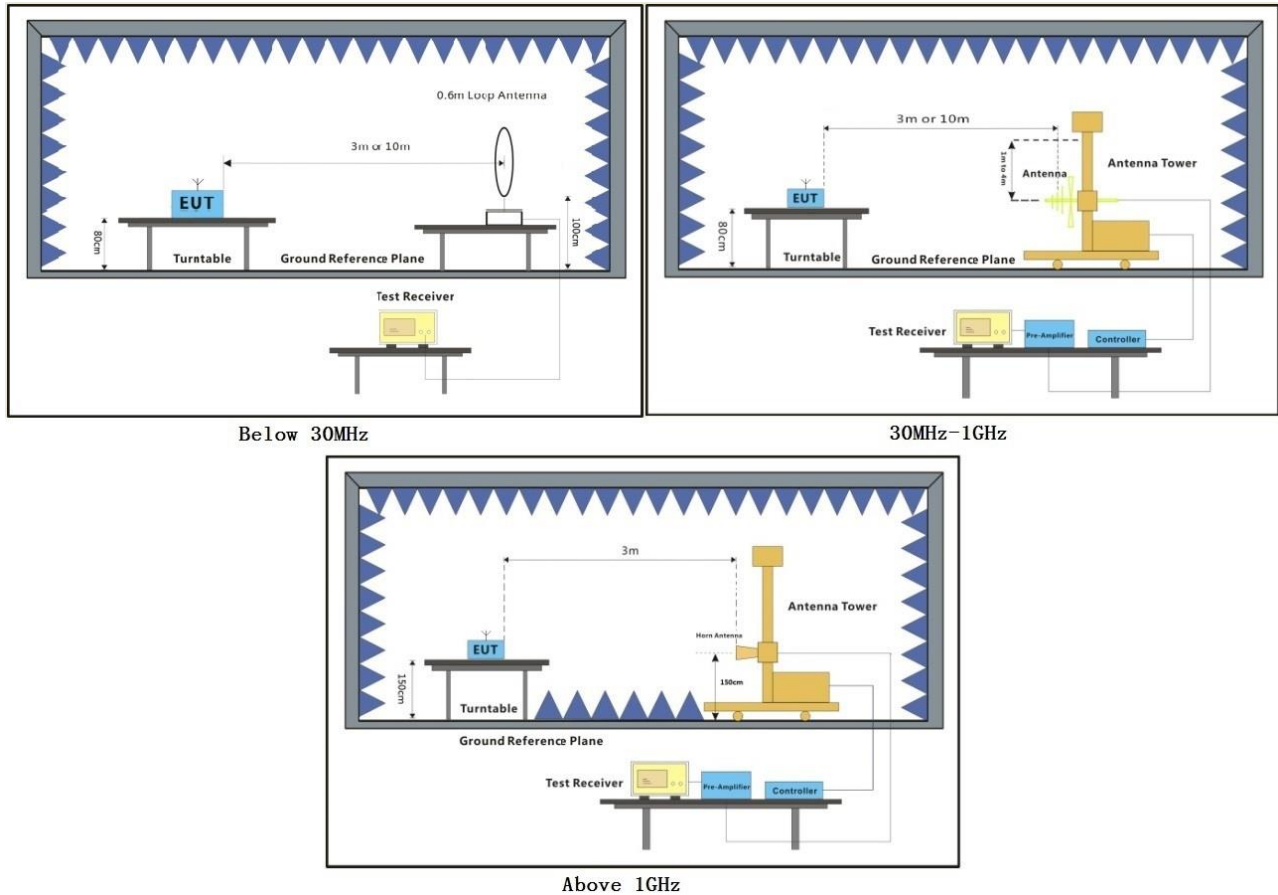
Atmospheric Pressure: 1005 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
--------------------------	--------------	-------------

Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.
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7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits.

However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

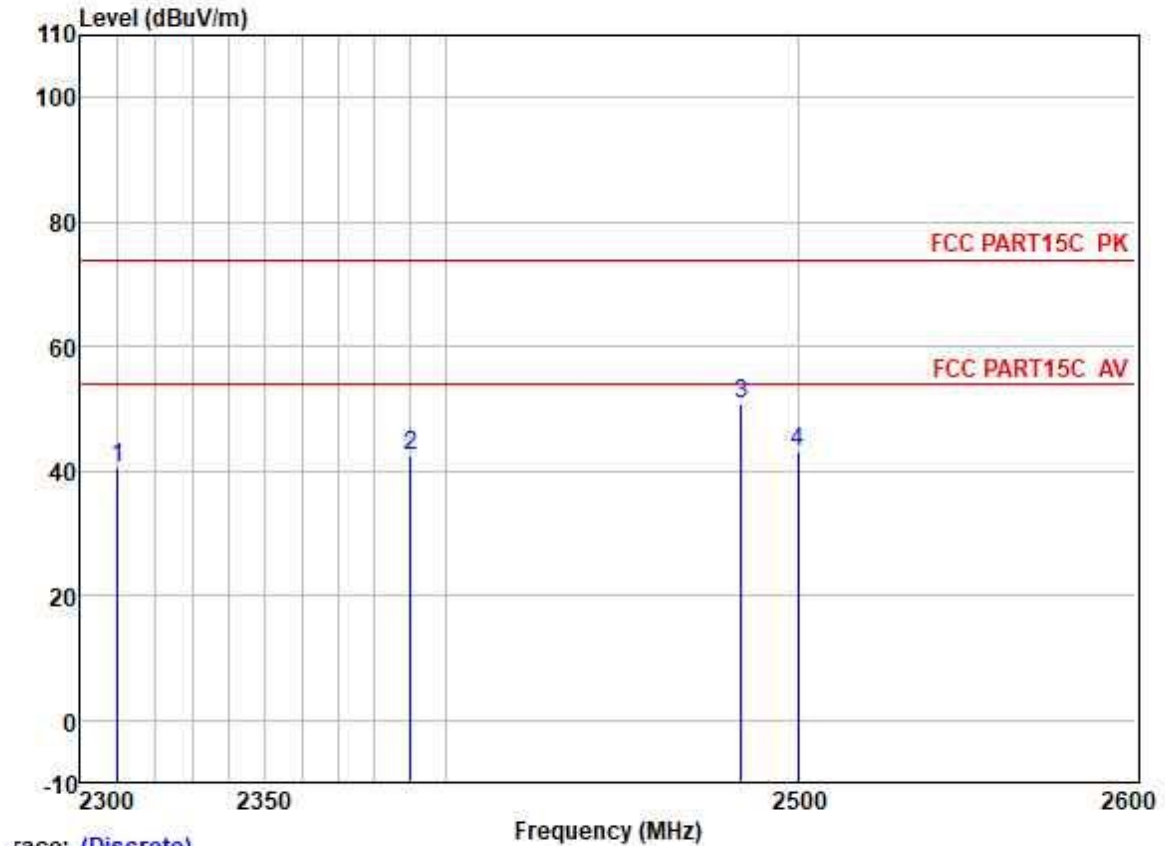
Remark 3: Pretest the EUT at antenna 1 and antenna 2 and MIMO mode find antenna 1 for 802.11b/g and MIMO mode for 802.11n are the worst-case mode. only record the worst-case test data 802.11b/g/n in this report.



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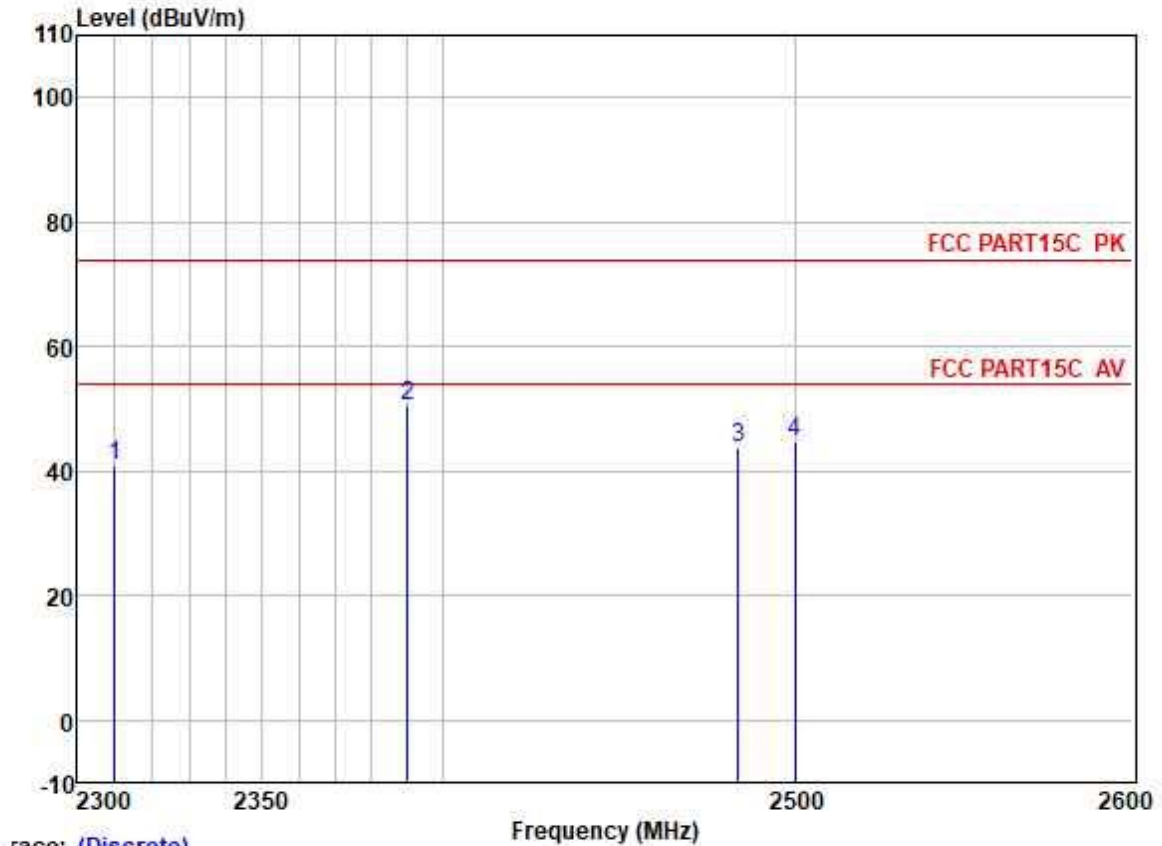
Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High;



	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2310.000	47.07	27.15	3.32	36.94	40.60	74.00	-33.40
2	2390.000	48.45	27.33	3.48	36.92	42.34	74.00	-31.66
3	2483.500	56.83	27.48	3.53	36.90	50.94	74.00	-23.06
4	2500.000	49.10	27.50	3.40	36.89	43.11	74.00	-30.89

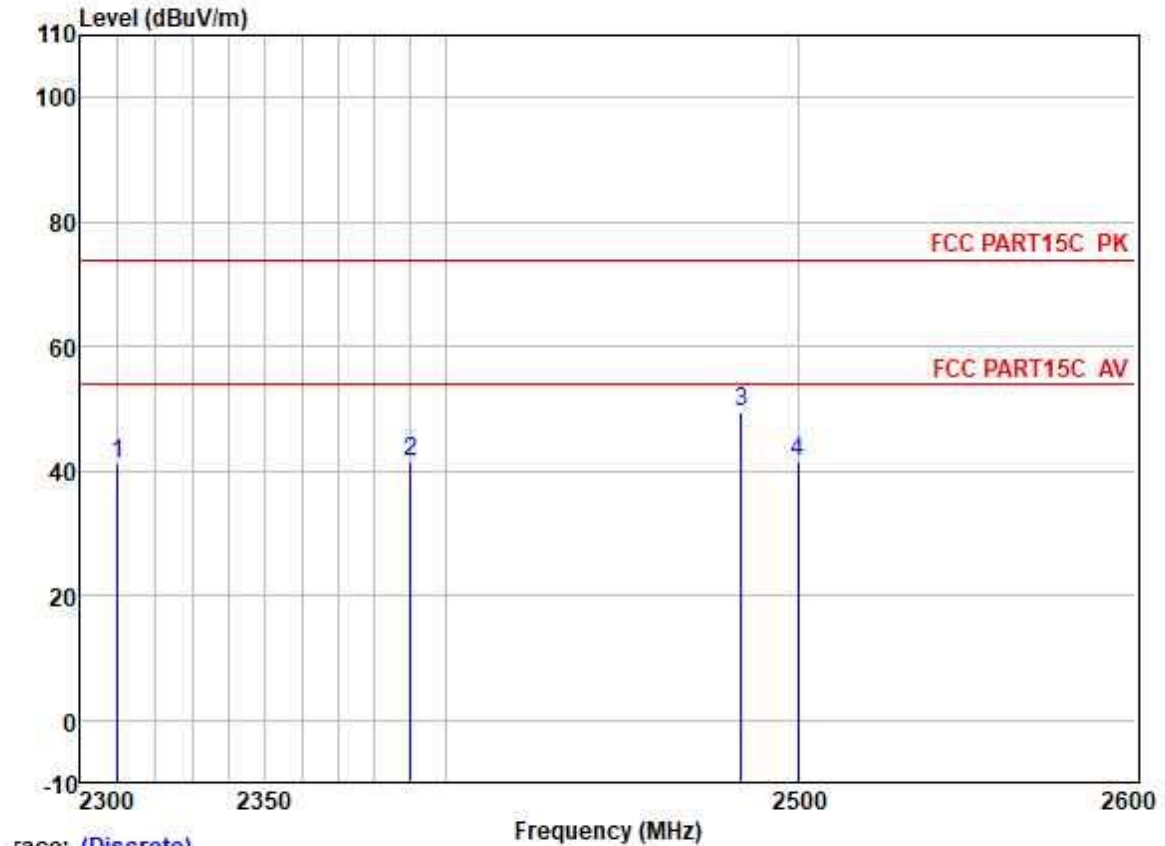
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

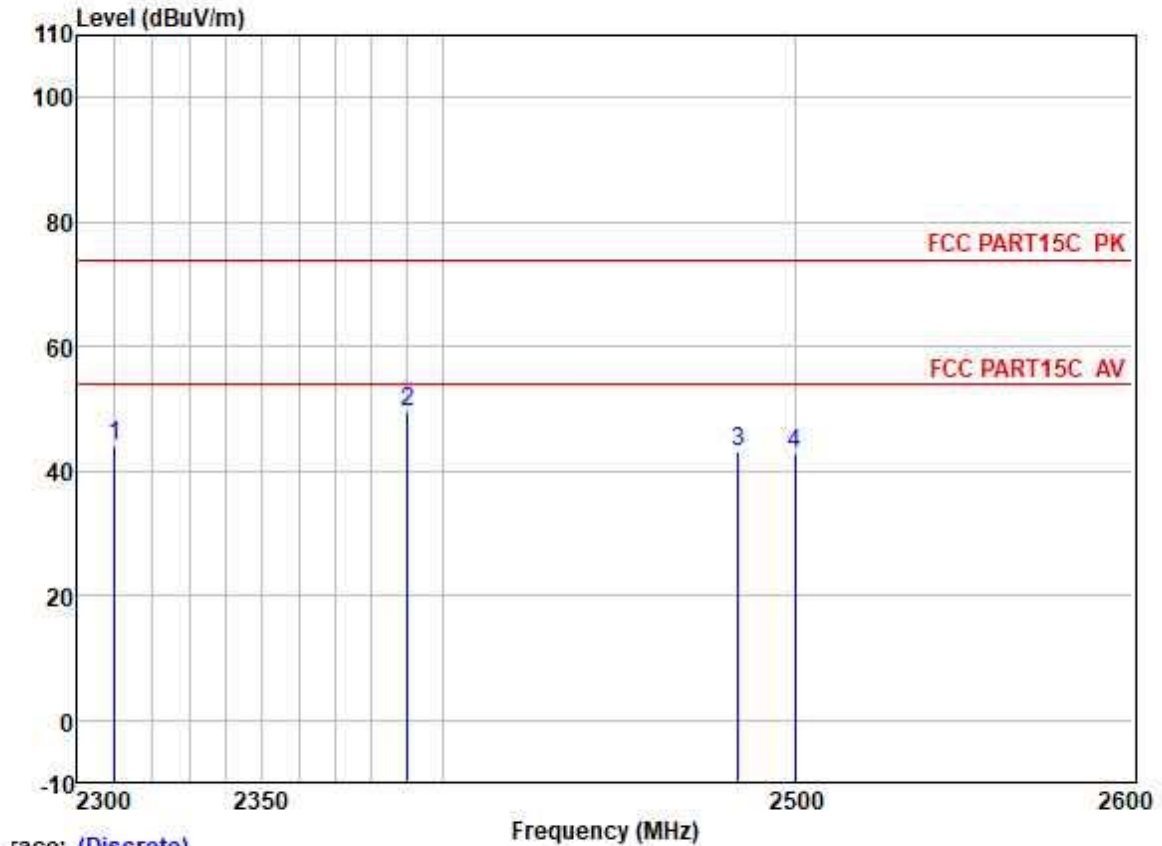
	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2310.000	47.48	27.15	3.32	36.94	41.01	74.00	-32.99
2	2390.000	56.68	27.33	3.48	36.92	50.57	74.00	-23.43
3	2483.500	49.67	27.48	3.53	36.90	43.78	74.00	-30.22
4	2500.000	50.56	27.50	3.40	36.89	44.57	74.00	-29.43

Test Mode: 05; Polarity: Horizontal; Modulation: 802.11g; Bandwidth: 20MHz; Channel: High;



	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2310.000	47.70	27.15	3.32	36.94	41.23	74.00	-32.77
2	2390.000	47.64	27.33	3.48	36.92	41.53	74.00	-32.47
3	2483.500	55.25	27.48	3.53	36.90	49.36	74.00	-24.64
4	2500.000	47.39	27.50	3.40	36.89	41.40	74.00	-32.60

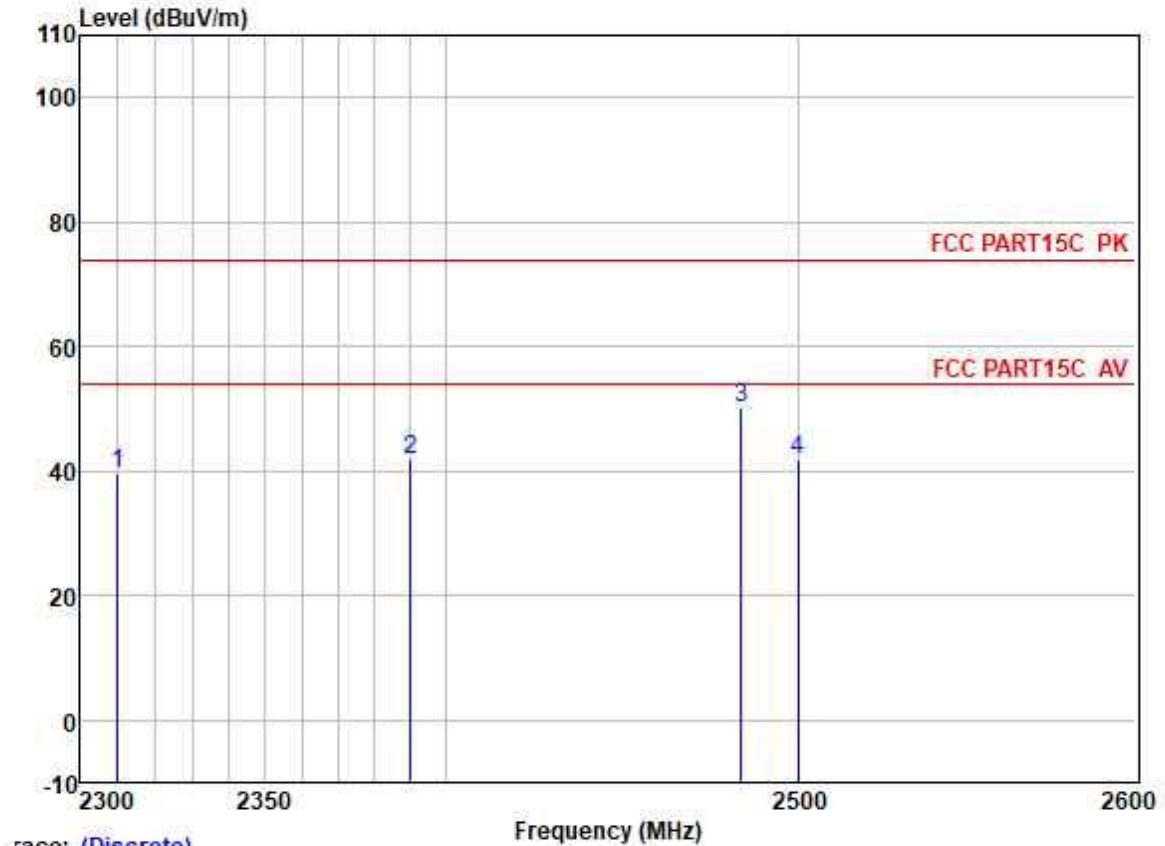
Test Mode: 05; Polarity: Horizontal; Modulation: 802.11g; Bandwidth: 20MHz; Channel: Low;



Trace: (Discrete)

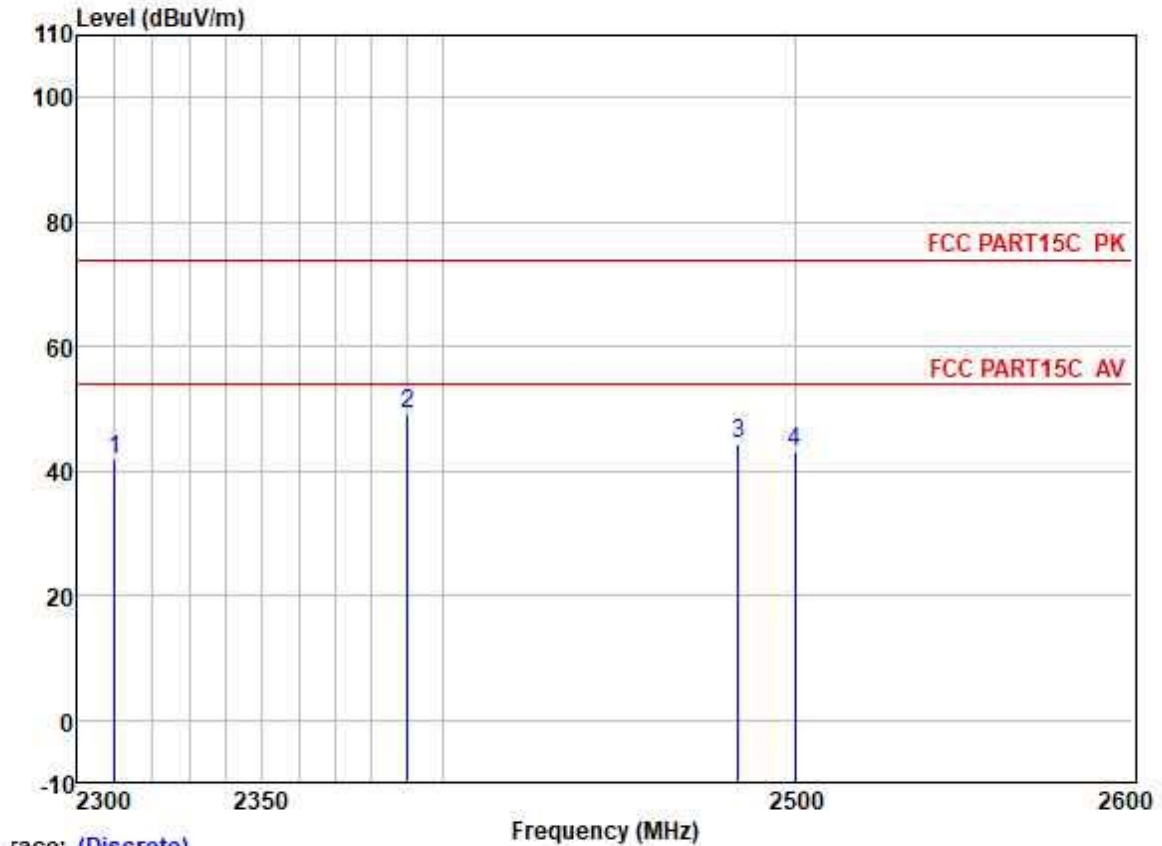
	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2310.000	50.61	27.15	3.32	36.94	44.14	74.00	-29.86
2	2390.000	55.69	27.33	3.48	36.92	49.58	74.00	-24.42
3	2483.500	49.14	27.48	3.53	36.90	43.25	74.00	-30.75
4	2500.000	48.82	27.50	3.40	36.89	42.83	74.00	-31.17

Test Mode: 05; Polarity: Horizontal; Modulation: 802.11n; Bandwidth: 20MHz; Channel: High;



	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2310.000	46.11	27.15	3.32	36.94	39.64	74.00	-34.36
2	2390.000	48.04	27.33	3.48	36.92	41.93	74.00	-32.07
3	2483.500	56.09	27.48	3.53	36.90	50.20	74.00	-23.80
4	2500.000	47.88	27.50	3.40	36.89	41.89	74.00	-32.11

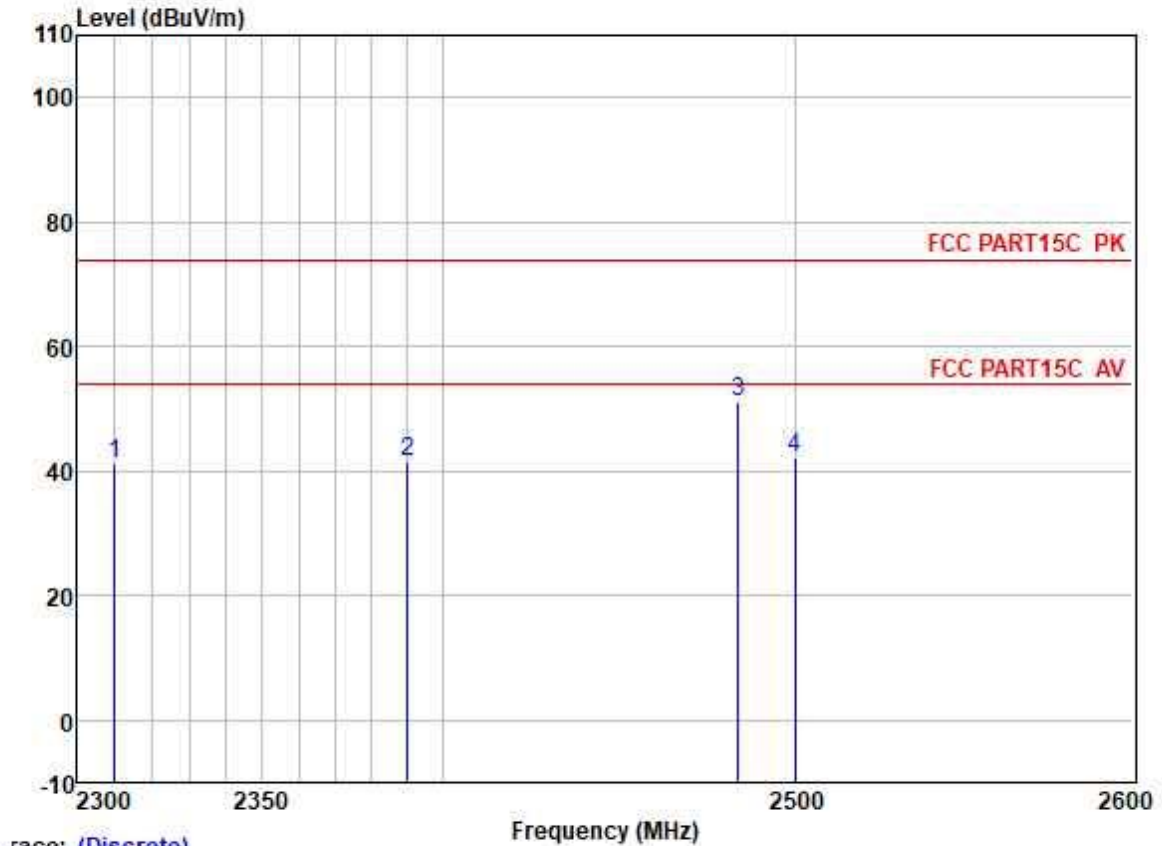
Test Mode: 05; Polarity: Horizontal; Modulation: 802.11n; Bandwidth: 20MHz; Channel: Low;



Trace: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Limit Level	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	2310.000	48.25	27.15	3.32	36.94	41.78	74.00	-32.22	HORIZONTAL Peak
2	2390.000	55.34	27.33	3.48	36.92	49.23	74.00	-24.77	HORIZONTAL Peak
3	2483.500	50.27	27.48	3.53	36.90	44.38	74.00	-29.62	HORIZONTAL Peak
4	2500.000	49.27	27.50	3.40	36.89	43.28	74.00	-30.72	HORIZONTAL Peak

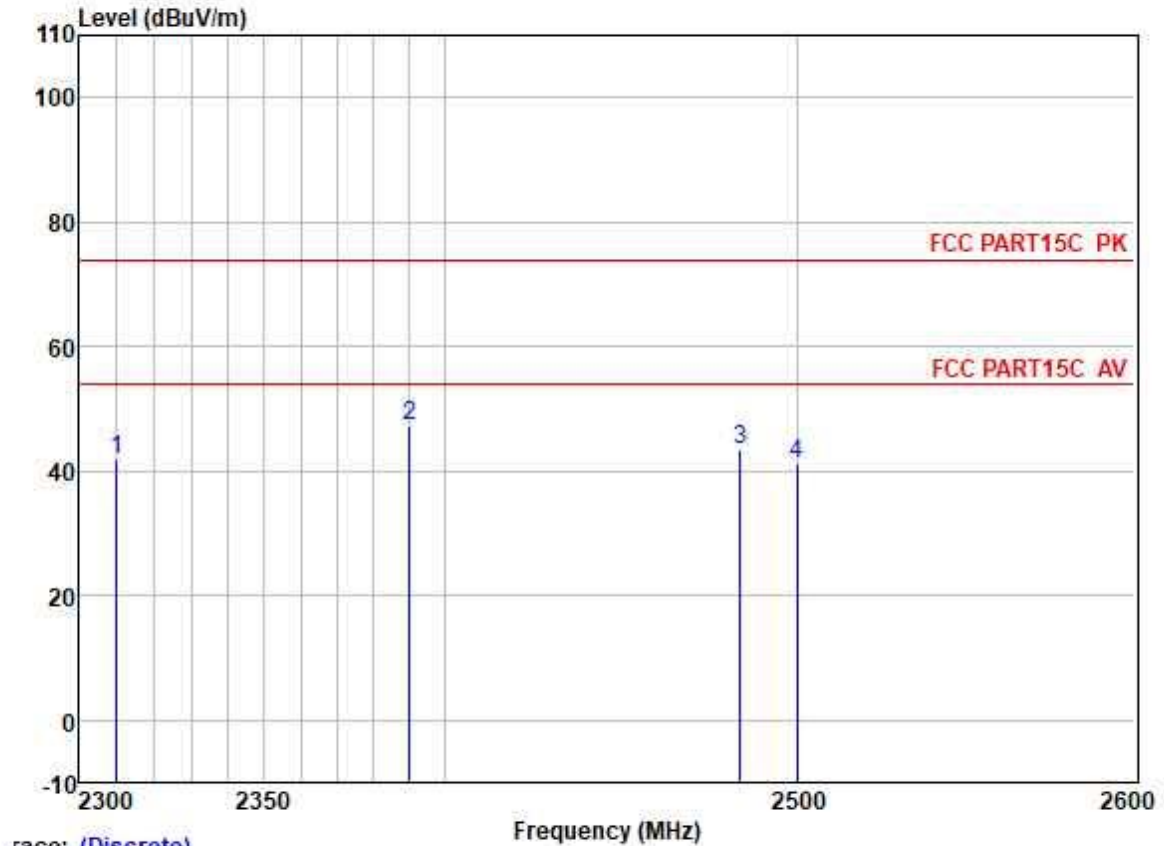
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High;



Trace: (Discrete)

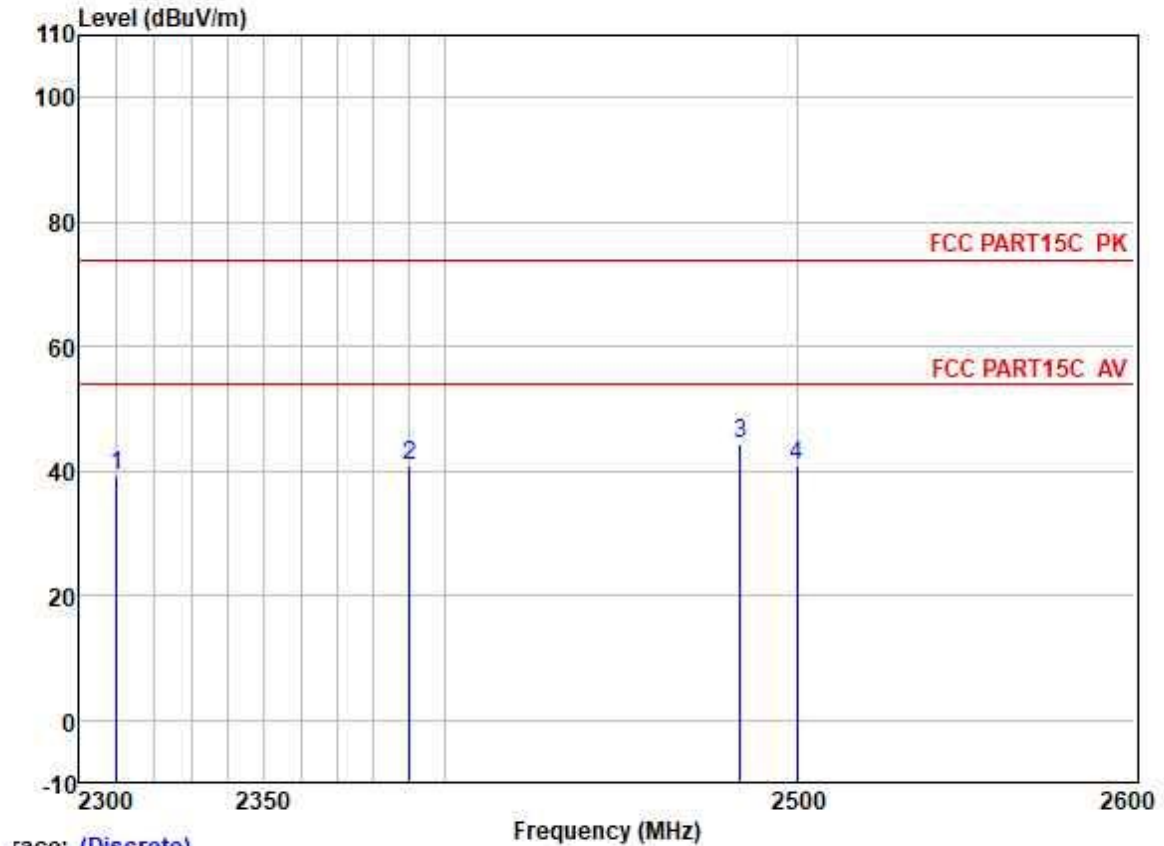
	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	dB
1	2310.000	47.53	27.15	3.32	36.94	41.06	74.00	-32.94	HORIZONTAL Peak
2	2390.000	47.60	27.33	3.48	36.92	41.49	74.00	-32.51	HORIZONTAL Peak
3	2483.500	56.93	27.48	3.53	36.90	51.04	74.00	-22.96	HORIZONTAL Peak
4	2500.000	48.26	27.50	3.40	36.89	42.27	74.00	-31.73	HORIZONTAL Peak

Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low;



	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2310.000	48.20	27.15	3.32	36.94	41.73	74.00	-32.27
2	2390.000	53.44	27.33	3.48	36.92	47.33	74.00	-26.67
3	2483.500	49.43	27.48	3.53	36.90	43.54	74.00	-30.46
4	2500.000	47.25	27.50	3.40	36.89	41.26	74.00	-32.74

Test Mode: 05; Polarity: Vertical; Modulation: 802.11b; Bandwidth: 20MHz; Channel: High;



Trace: (Discrete)

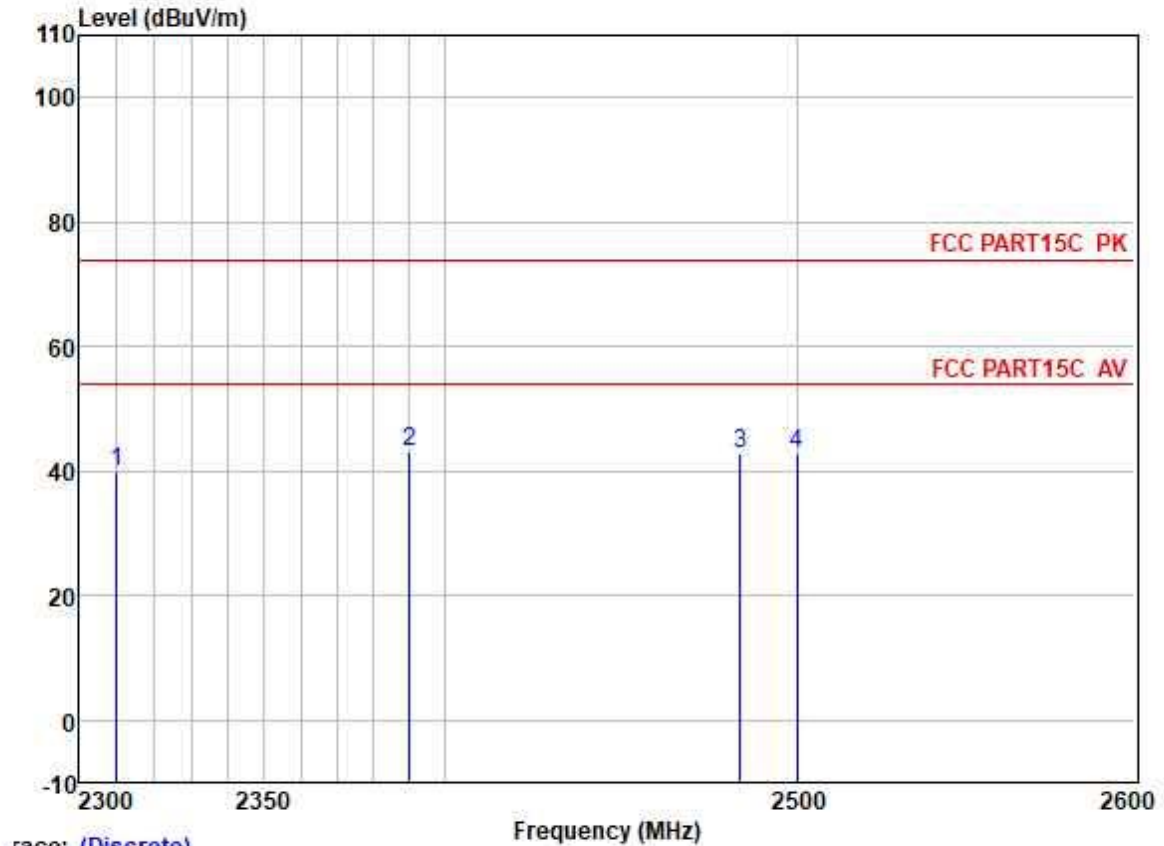
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	45.81	27.15	3.32	36.94	39.34	74.00	-34.66	VERTICAL	Peak
2	2390.000	47.03	27.33	3.48	36.92	40.92	74.00	-33.08	VERTICAL	Peak
3	2483.500	50.40	27.48	3.53	36.90	44.51	74.00	-29.49	VERTICAL	Peak
4	2500.000	46.89	27.50	3.40	36.89	40.90	74.00	-33.10	VERTICAL	Peak



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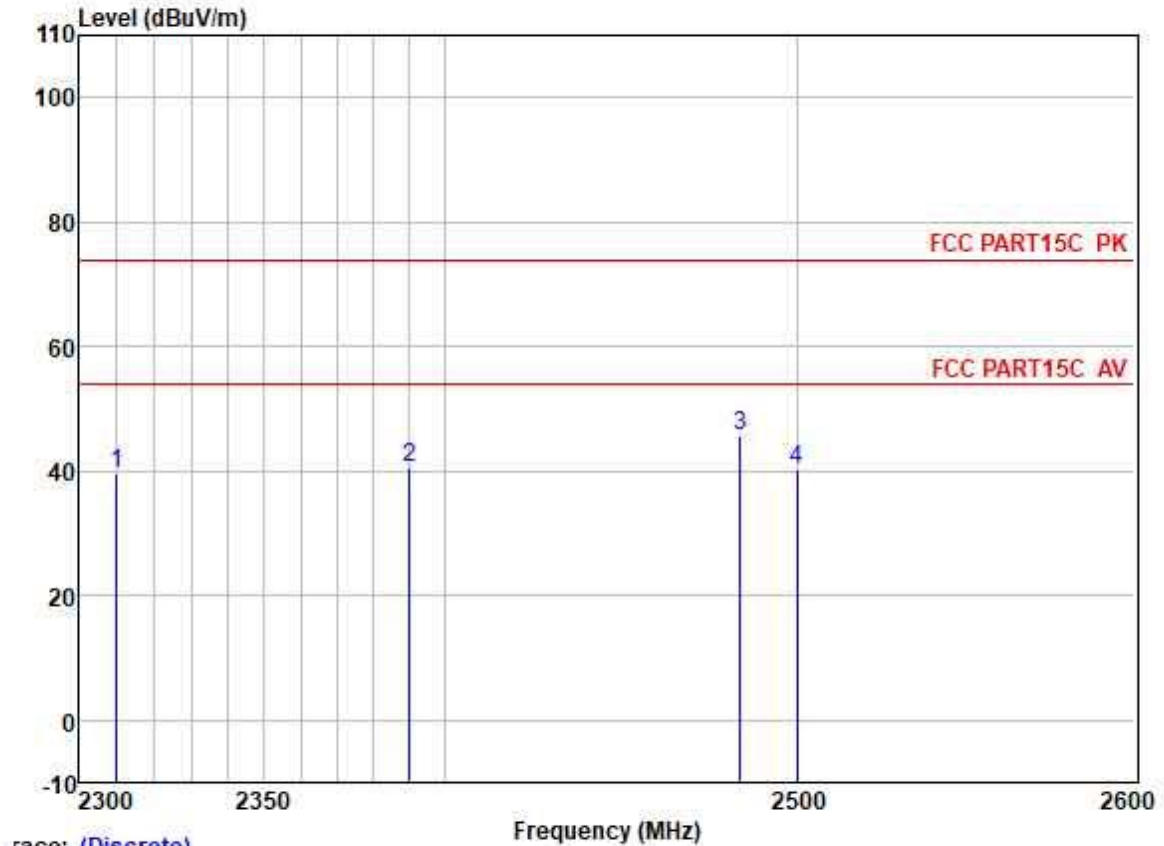
Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low;



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	46.30	27.15	3.32	36.94	39.83	74.00	-34.17	VERTICAL	Peak
2	2390.000	49.23	27.33	3.48	36.92	43.12	74.00	-30.88	VERTICAL	Peak
3	2483.500	48.81	27.48	3.53	36.90	42.92	74.00	-31.08	VERTICAL	Peak
4	2500.000	48.83	27.50	3.40	36.89	42.84	74.00	-31.16	VERTICAL	Peak

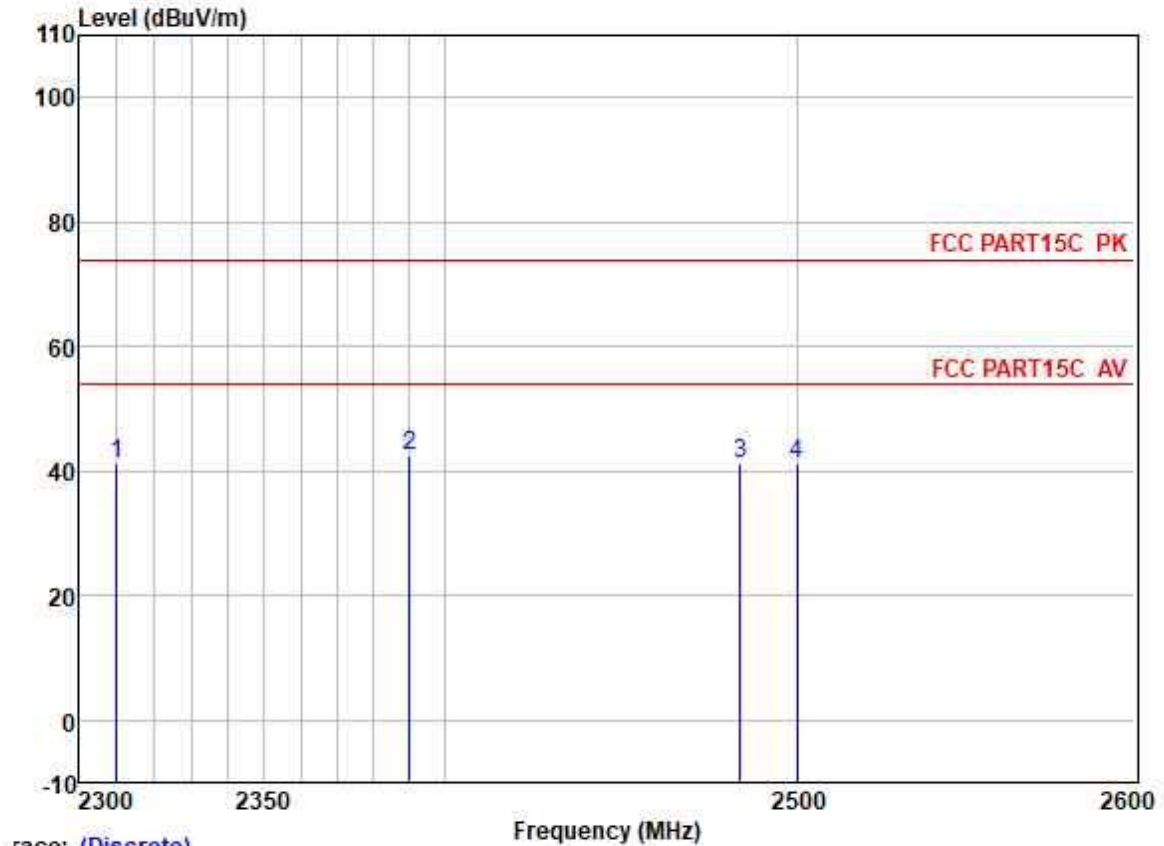
Test Mode: 05; Polarity: Vertical; Modulation: 802.11g; Bandwidth: 20MHz; Channel: High;



Trace: (Discrete)

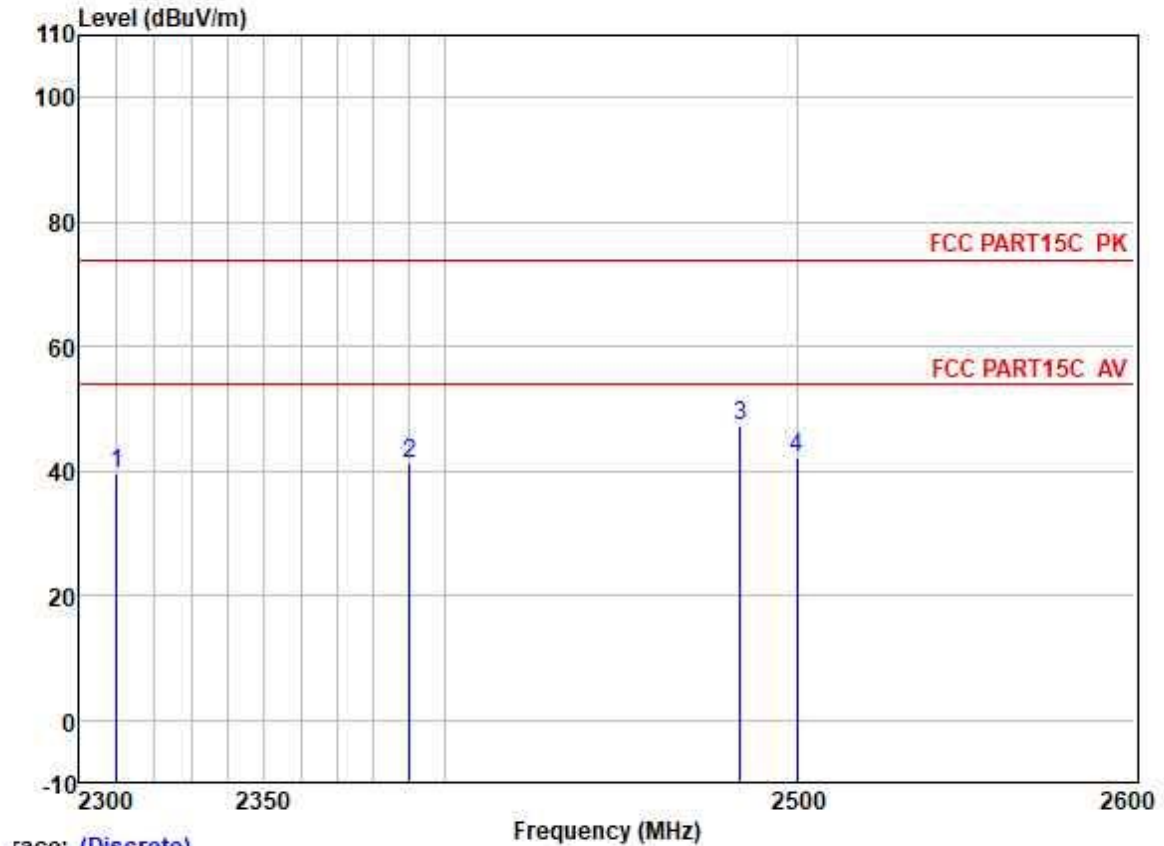
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	45.96	27.15	3.32	36.94	39.49	74.00	-34.51	VERTICAL	Peak
2	2390.000	46.68	27.33	3.48	36.92	40.57	74.00	-33.43	VERTICAL	Peak
3	2483.500	51.46	27.48	3.53	36.90	45.57	74.00	-28.43	VERTICAL	Peak
4	2500.000	46.30	27.50	3.40	36.89	40.31	74.00	-33.69	VERTICAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low;



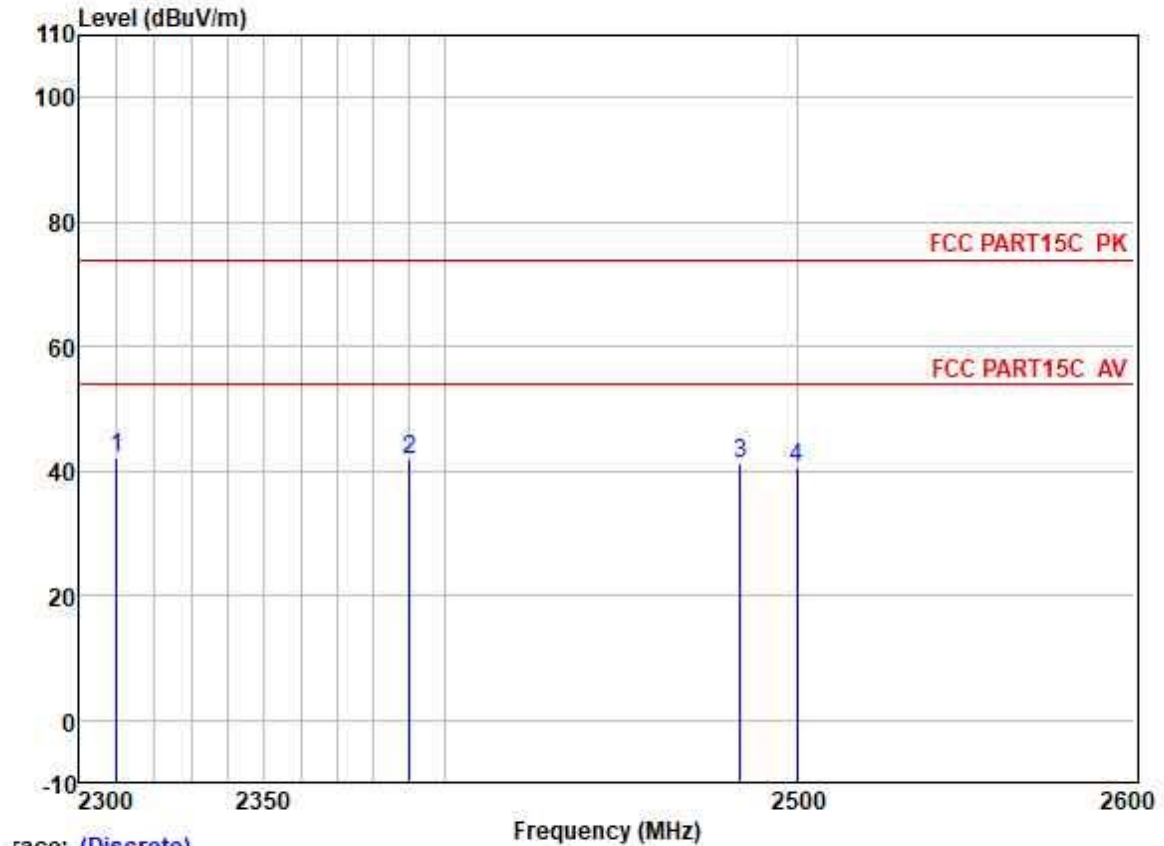
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	47.64	27.15	3.32	36.94	41.17	74.00	-32.83	VERTICAL	Peak
2	2390.000	48.67	27.33	3.48	36.92	42.56	74.00	-31.44	VERTICAL	Peak
3	2483.500	47.06	27.48	3.53	36.90	41.17	74.00	-32.83	VERTICAL	Peak
4	2500.000	47.22	27.50	3.40	36.89	41.23	74.00	-32.77	VERTICAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High;



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	46.20	27.15	3.32	36.94	39.73	74.00	-34.27	VERTICAL	Peak
2	2390.000	47.37	27.33	3.48	36.92	41.26	74.00	-32.74	VERTICAL	Peak
3	2483.500	53.11	27.48	3.53	36.90	47.22	74.00	-26.78	VERTICAL	Peak
4	2500.000	48.08	27.50	3.40	36.89	42.09	74.00	-31.91	VERTICAL	Peak

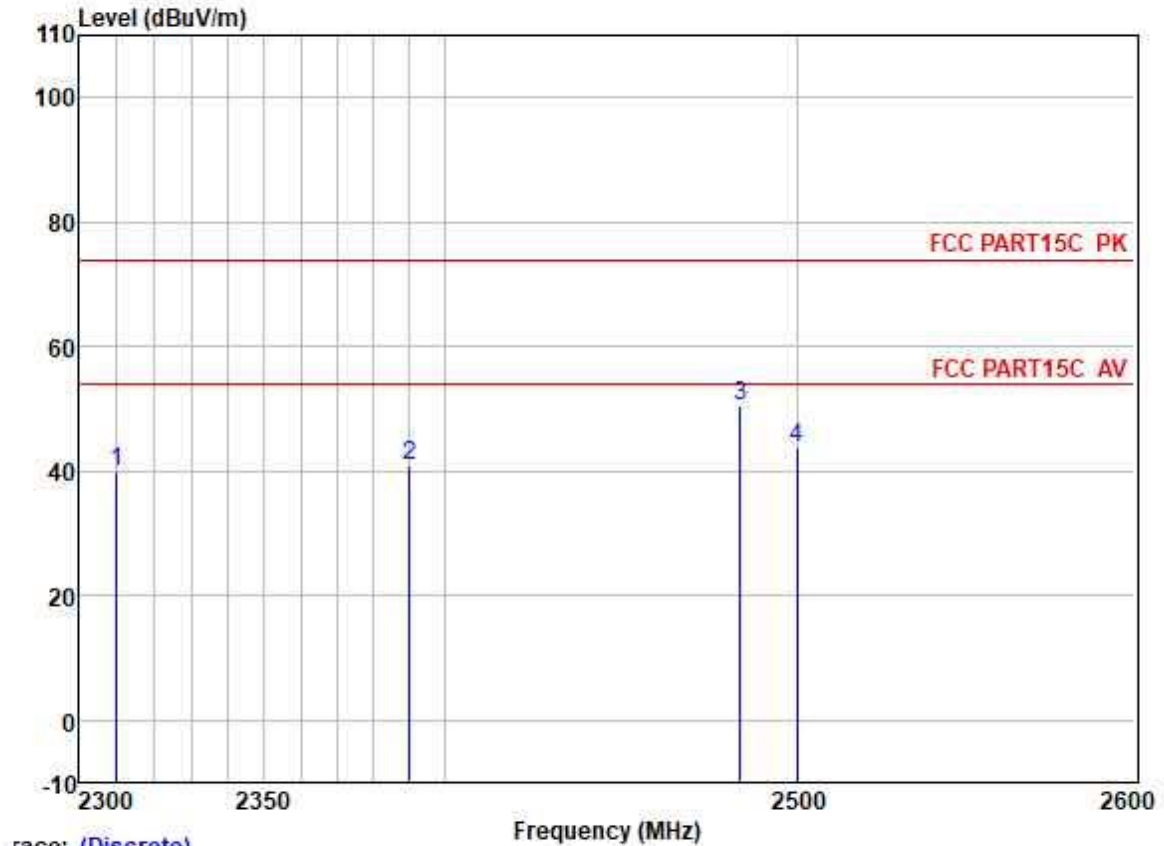
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

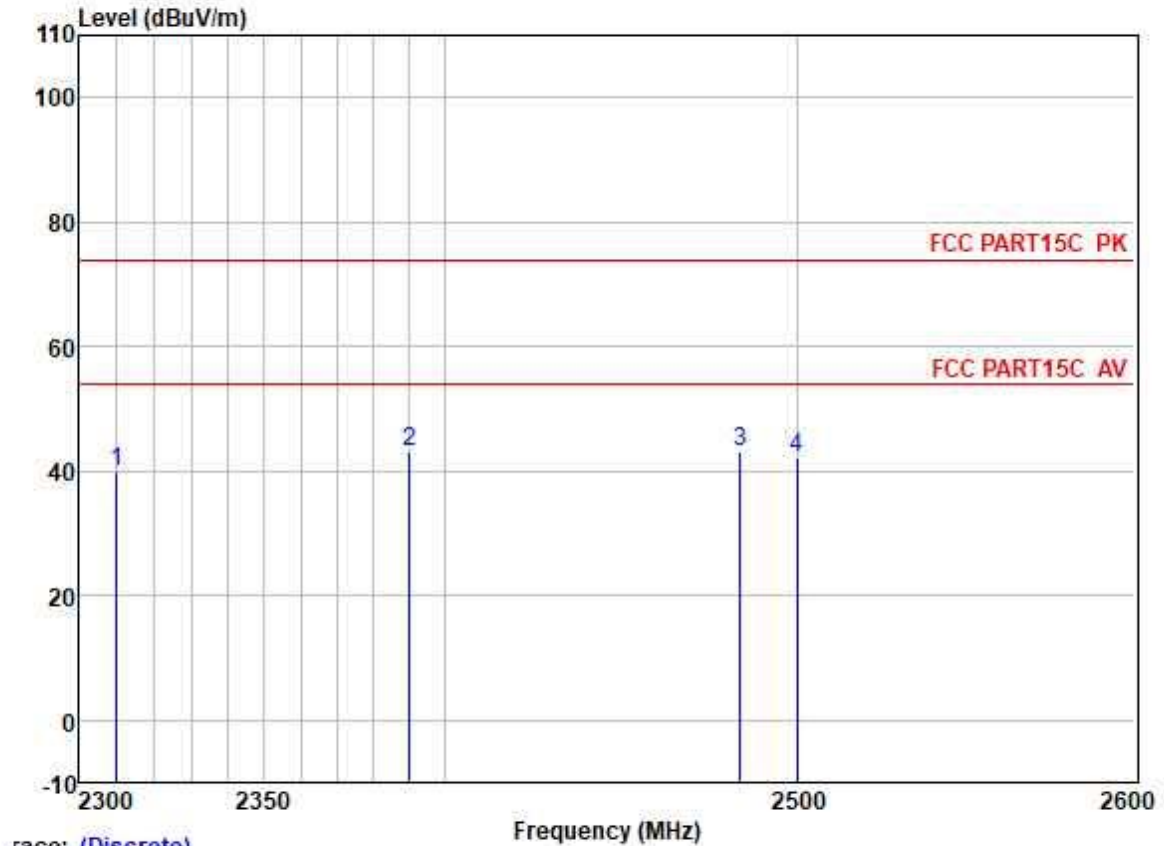
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	48.64	27.15	3.32	36.94	42.17	74.00	-31.83	VERTICAL	Peak
2	2390.000	48.03	27.33	3.48	36.92	41.92	74.00	-32.08	VERTICAL	Peak
3	2483.500	47.22	27.48	3.53	36.90	41.33	74.00	-32.67	VERTICAL	Peak
4	2500.000	46.40	27.50	3.40	36.89	40.41	74.00	-33.59	VERTICAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation: 802.11n; Bandwidth: 40MHz; Channel: High;



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	46.26	27.15	3.32	36.94	39.79	74.00	-34.21	VERTICAL	Peak
2	2390.000	46.93	27.33	3.48	36.92	40.82	74.00	-33.18	VERTICAL	Peak
3	2483.500	56.32	27.48	3.53	36.90	50.43	74.00	-23.57	VERTICAL	Peak
4	2500.000	49.63	27.50	3.40	36.89	43.64	74.00	-30.36	VERTICAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low;



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	46.34	27.15	3.32	36.94	39.87	74.00	-34.13	VERTICAL	Peak
2	2390.000	49.17	27.33	3.48	36.92	43.06	74.00	-30.94	VERTICAL	Peak
3	2483.500	48.95	27.48	3.53	36.90	43.06	74.00	-30.94	VERTICAL	Peak
4	2500.000	48.11	27.50	3.40	36.89	42.12	74.00	-31.88	VERTICAL	Peak

7.8 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 22.6 °C

Humidity: 55.9 % RH

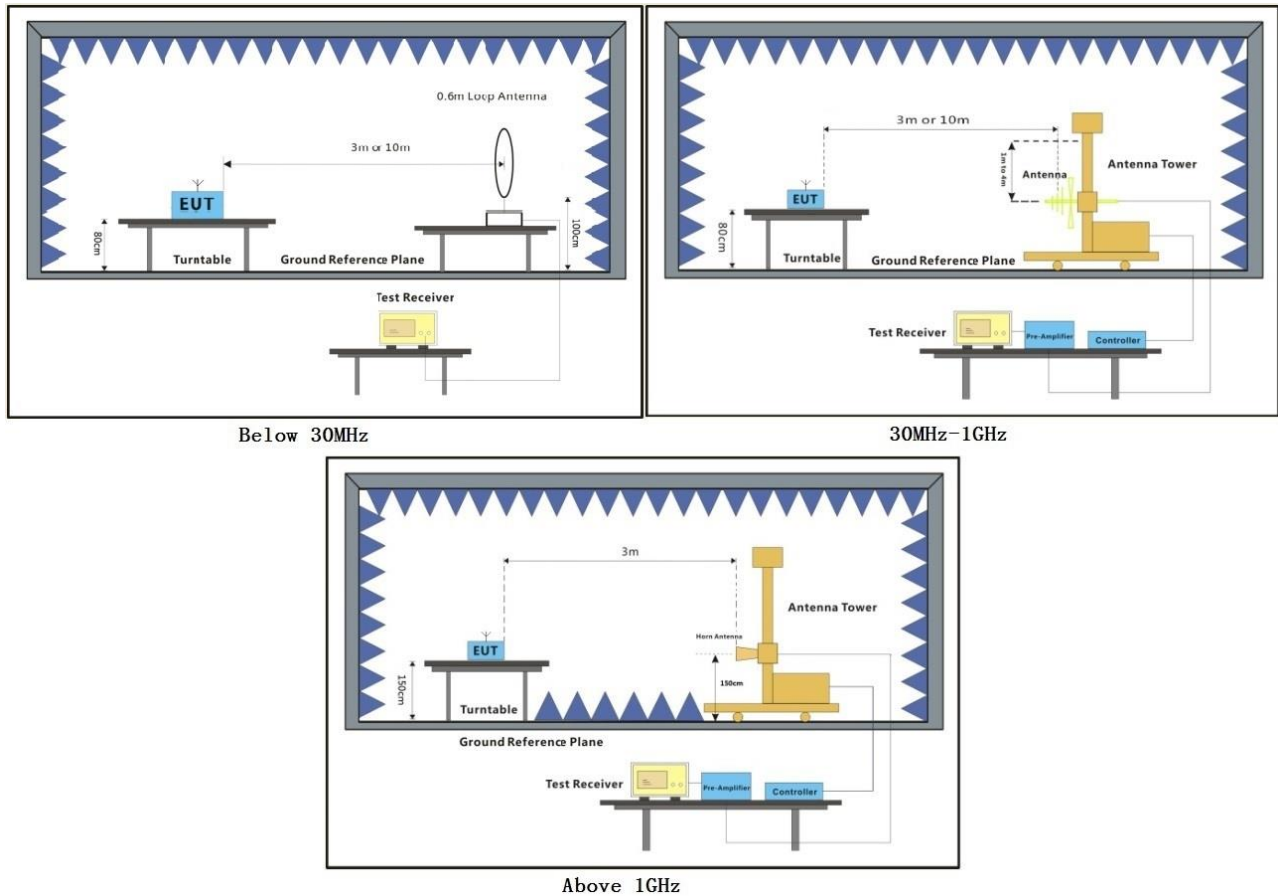
Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
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Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.
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7.8.3 Test Setup Diagram



7.8.4 Measurement Procedure and Data

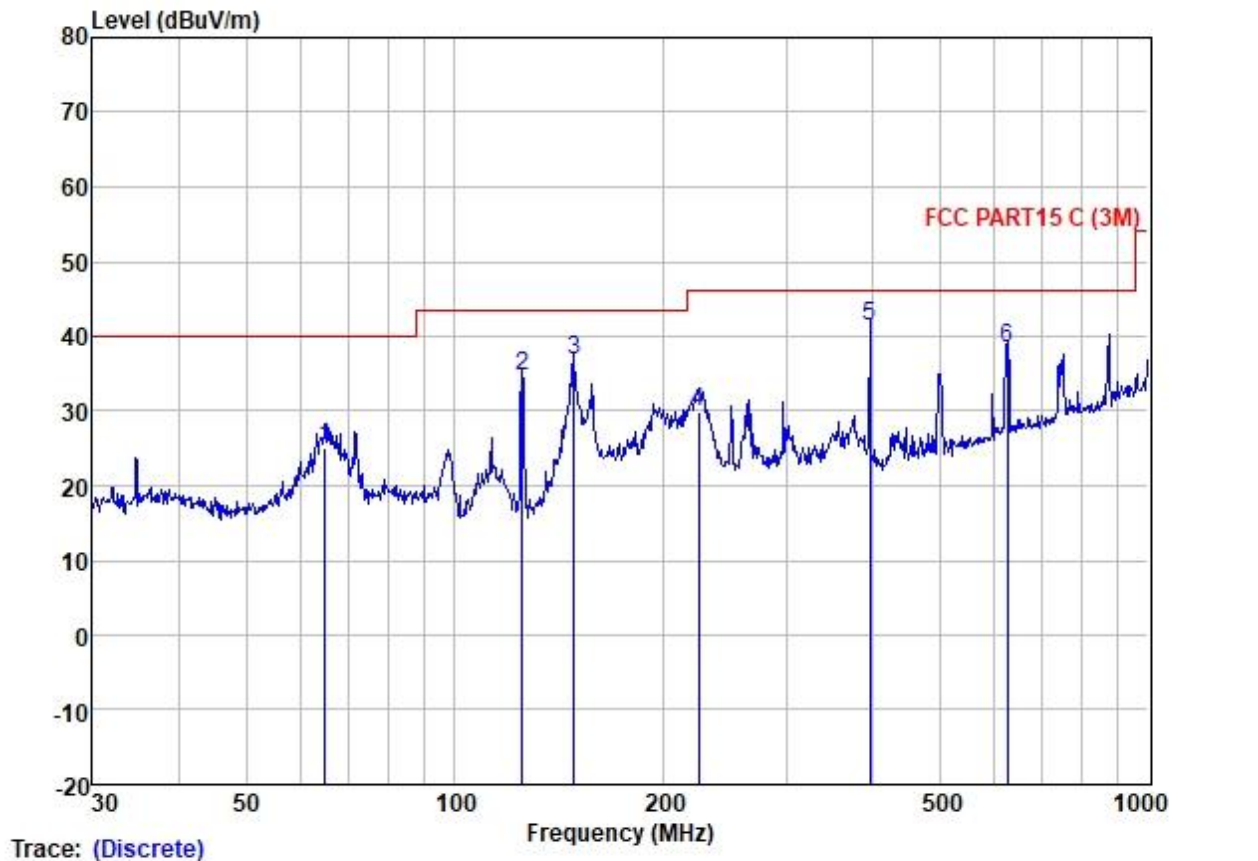
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
- 5) Pretest the EUT at antenna 1 and antenna 2 and MIMO mode find antenna 1 for 802.11b/g and MIMO mode for 802.11n are the worst-case mode. only record the worst-case test data 802.11b/g/n in this report.



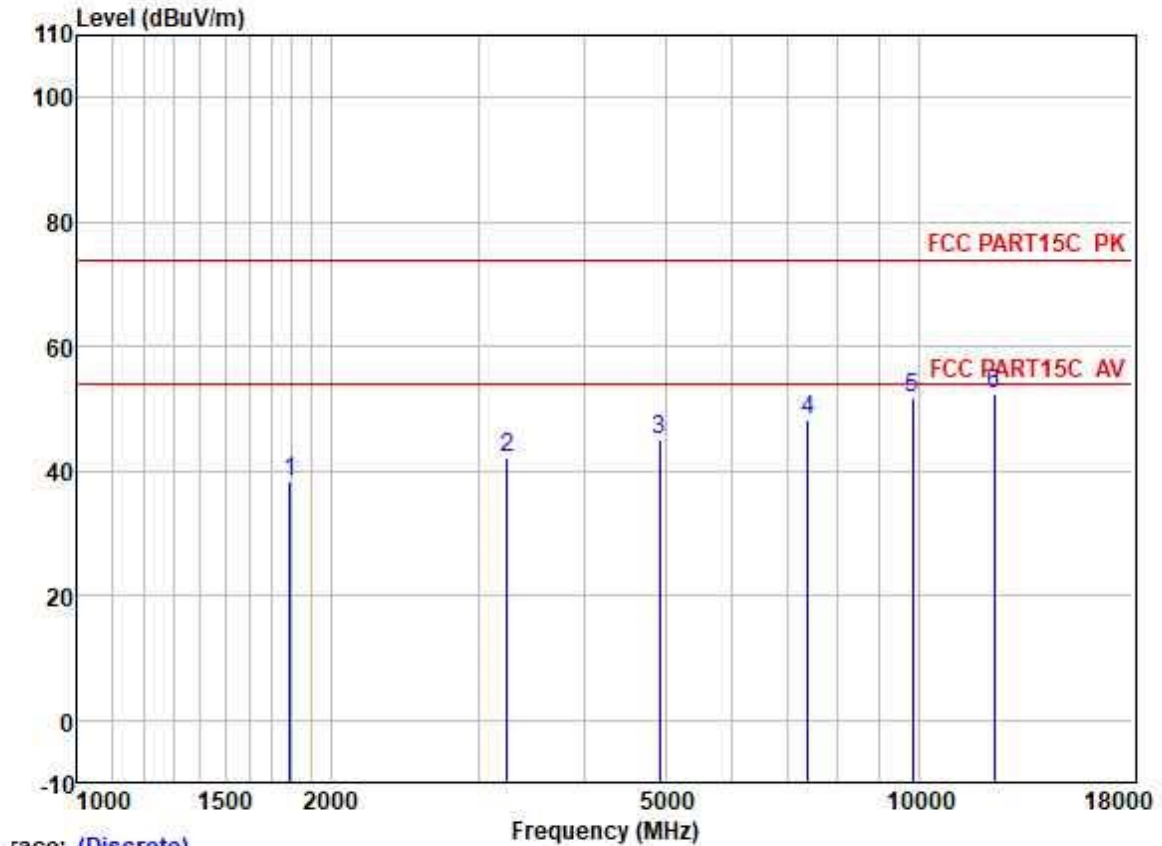
Test Mode: 05; Polarity: Horizontal



Site : SGS
Condition : FCC PART15 C (3M) HORIZONTAL
Job :
Model :
Power :
Test Mode :

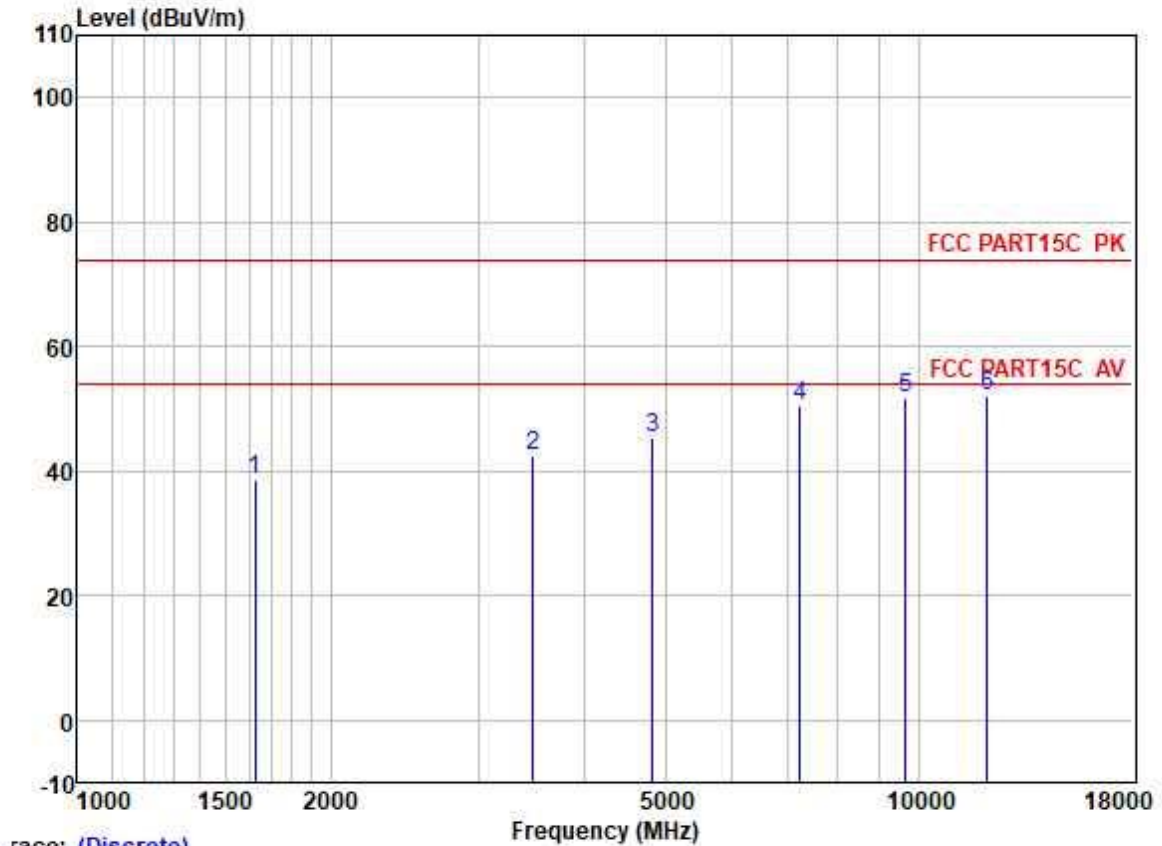
	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dBuV		
1	64.89	38.25	12.75	1.35	27.15	25.20	40.00	-14.80	HORIZONTAL	QP
2	125.01	48.17	11.50	1.91	27.01	34.57	43.50	-8.93	HORIZONTAL	QP
3	148.50	47.60	13.72	2.22	26.84	36.70	43.50	-6.80	HORIZONTAL	QP
4	224.52	44.14	9.88	2.67	26.70	29.99	46.00	-16.01	HORIZONTAL	QP
5	396.24	49.02	15.62	3.91	27.31	41.24	46.00	-4.76	HORIZONTAL	QP
6	627.27	40.81	20.40	5.33	28.20	38.34	46.00	-7.66	HORIZONTAL	QP

Test Mode: 05; Polarity: Horizontal; Modulation: 802.11b; Bandwidth: 20MHz; Channel: High;



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1787.762	46.39	25.92	2.98	37.03	38.26	74.00	-35.74	HORIZONTAL	Peak
2	3242.619	45.95	28.67	4.02	36.50	42.14	74.00	-31.86	HORIZONTAL	Peak
3	4924.396	44.45	31.62	5.60	36.50	45.17	74.00	-28.83	HORIZONTAL	Peak
4	7386.542	42.62	36.17	6.19	36.77	48.21	74.00	-25.79	HORIZONTAL	Peak
5	9848.161	42.57	38.58	6.99	36.32	51.82	74.00	-22.18	HORIZONTAL	Peak
6	12310.480	41.90	38.63	8.01	36.23	52.31	74.00	-21.69	HORIZONTAL	Peak

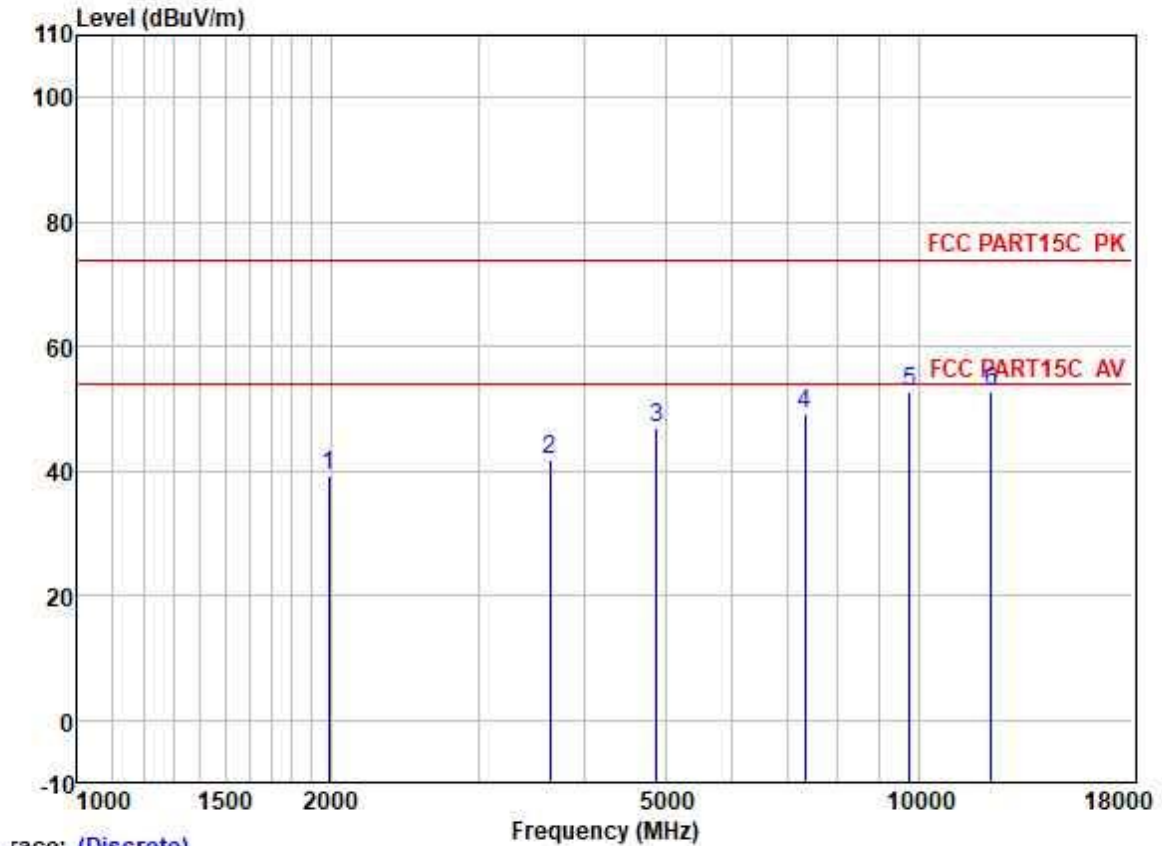
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

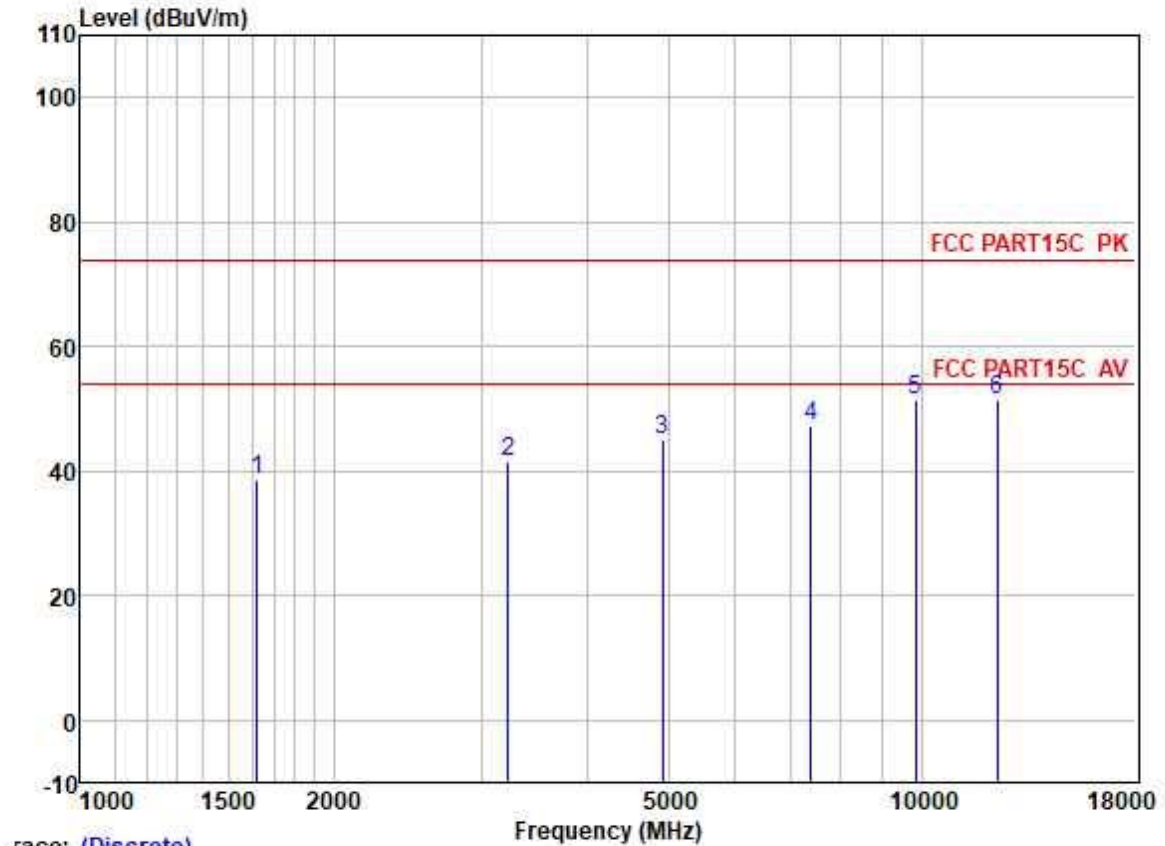
	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	1625.121	47.43	25.61	2.80	37.06	38.78	74.00	-35.22
2	3485.601	45.88	28.89	4.27	36.46	42.58	74.00	-31.42
3	4824.335	45.00	31.45	5.42	36.48	45.39	74.00	-28.61
4	7236.475	45.42	35.70	6.03	36.75	50.40	74.00	-23.60
5	9648.670	42.56	38.40	7.06	36.35	51.67	74.00	-22.33
6	12060.130	41.34	38.88	8.17	36.38	52.01	74.00	-21.99

Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle;



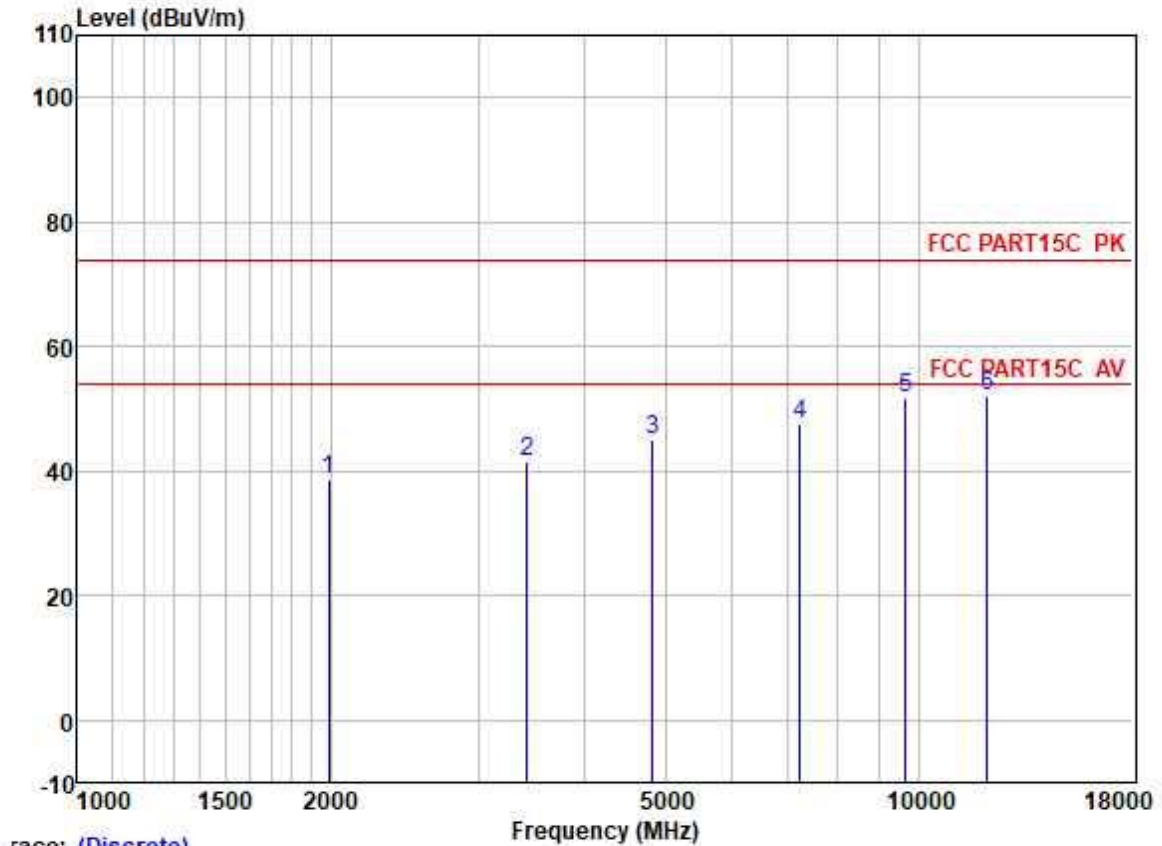
		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1989.550	47.12	26.09	3.08	37.00	39.29	74.00	-34.71	HORIZONTAL	Peak
2	3650.582	44.63	29.13	4.52	36.43	41.85	74.00	-32.15	HORIZONTAL	Peak
3	4884.975	46.23	31.56	5.52	36.50	46.81	74.00	-27.19	HORIZONTAL	Peak
4	7326.267	43.90	36.00	6.13	36.76	49.27	74.00	-24.73	HORIZONTAL	Peak
5	9768.221	43.41	38.53	7.01	36.33	52.62	74.00	-21.38	HORIZONTAL	Peak
6	12210.420	42.10	38.74	8.08	36.30	52.62	74.00	-21.38	HORIZONTAL	Peak

Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High;



	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	1620.431	47.30	25.60	2.80	37.07	38.63	74.00	-35.37
2	3223.928	45.33	28.63	4.01	36.50	41.47	74.00	-32.53
3	4924.190	44.18	31.62	5.60	36.50	44.90	74.00	-29.10
4	7386.375	41.85	36.17	6.19	36.77	47.44	74.00	-26.56
5	9848.123	42.04	38.58	6.99	36.32	51.29	74.00	-22.71
6	12310.710	40.98	38.63	8.01	36.23	51.39	74.00	-22.61

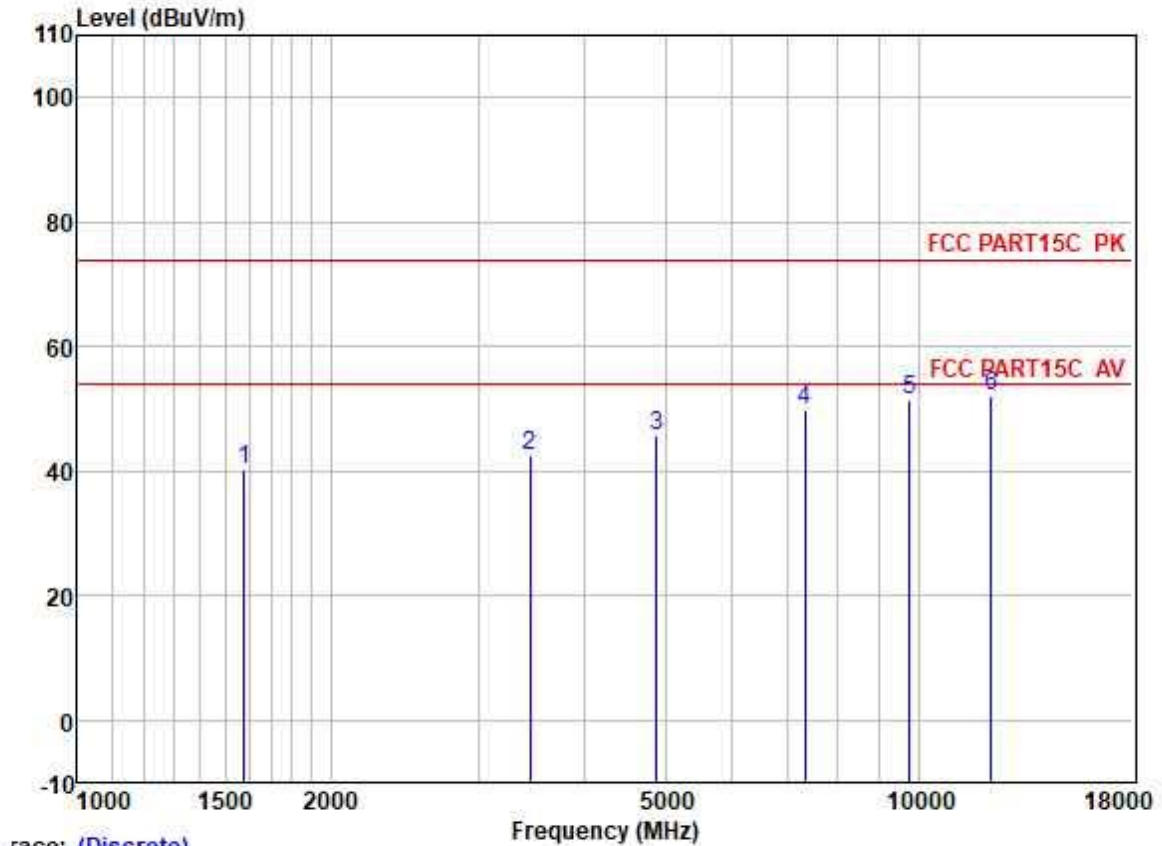
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

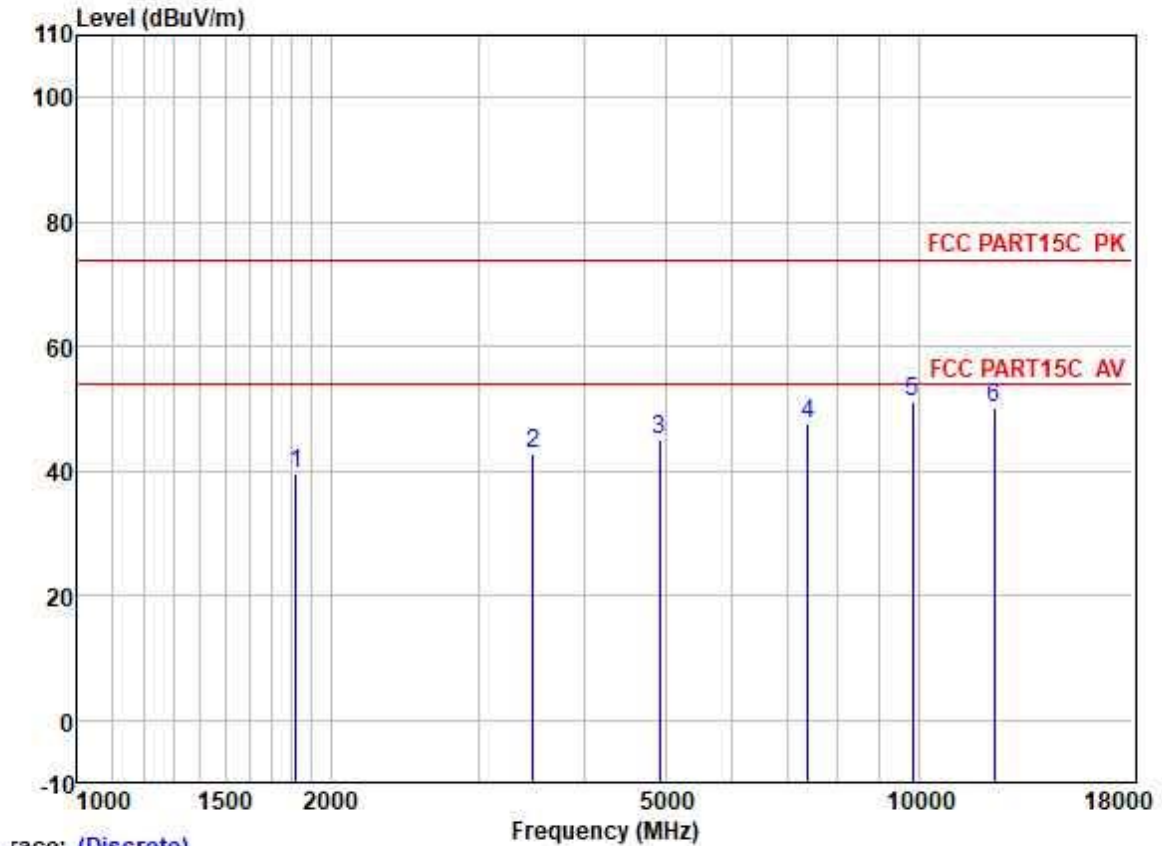
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1989.550	46.39	26.09	3.08	37.00	38.56	74.00	-35.44	HORIZONTAL	Peak
2	3425.675	44.97	28.86	4.15	36.46	41.52	74.00	-32.48	HORIZONTAL	Peak
3	4824.633	44.60	31.45	5.42	36.48	44.99	74.00	-29.01	HORIZONTAL	Peak
4	7236.373	42.49	35.70	6.03	36.75	47.47	74.00	-26.53	HORIZONTAL	Peak
5	9648.123	42.70	38.40	7.06	36.35	51.81	74.00	-22.19	HORIZONTAL	Peak
6	12060.470	41.45	38.88	8.17	36.38	52.12	74.00	-21.88	HORIZONTAL	Peak

Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle;



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1578.822	48.93	25.56	2.80	37.08	40.21	74.00	-33.79	HORIZONTAL	Peak
2	3455.508	45.75	28.88	4.20	36.46	42.37	74.00	-31.63	HORIZONTAL	Peak
3	4884.888	45.13	31.56	5.52	36.50	45.71	74.00	-28.29	HORIZONTAL	Peak
4	7326.015	44.46	36.00	6.13	36.76	49.83	74.00	-24.17	HORIZONTAL	Peak
5	9768.149	42.20	38.53	7.01	36.33	51.41	74.00	-22.59	HORIZONTAL	Peak
6	12210.760	41.64	38.74	8.08	36.30	52.16	74.00	-21.84	HORIZONTAL	Peak

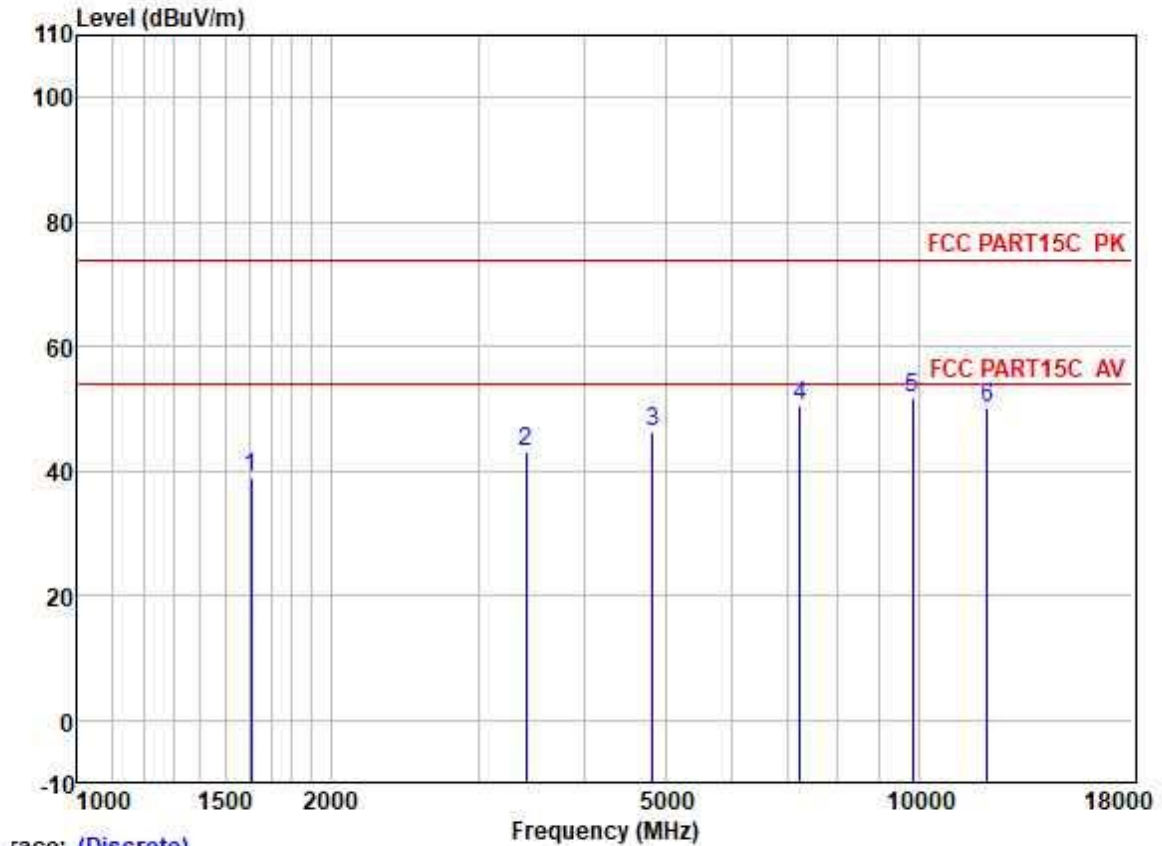
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High;



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1819.036	47.55	25.97	2.98	37.02	39.48	74.00	-34.52	HORIZONTAL	Peak
2	3485.601	46.10	28.89	4.27	36.46	42.80	74.00	-31.20	HORIZONTAL	Peak
3	4924.007	44.32	31.62	5.60	36.50	45.04	74.00	-28.96	HORIZONTAL	Peak
4	7386.763	42.13	36.17	6.19	36.77	47.72	74.00	-26.28	HORIZONTAL	Peak
5	9848.480	41.77	38.58	6.99	36.32	51.02	74.00	-22.98	HORIZONTAL	Peak
6	12310.070	39.68	38.63	8.01	36.23	50.09	74.00	-23.91	HORIZONTAL	Peak

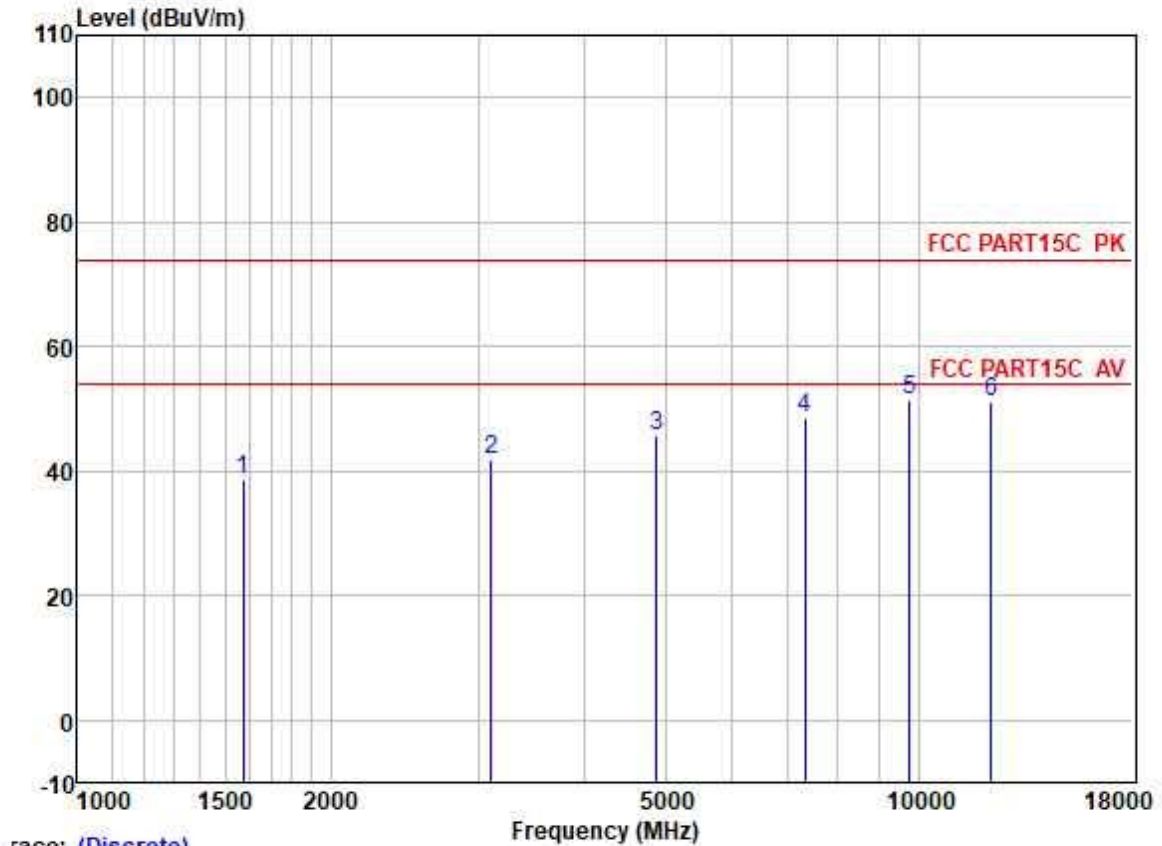
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

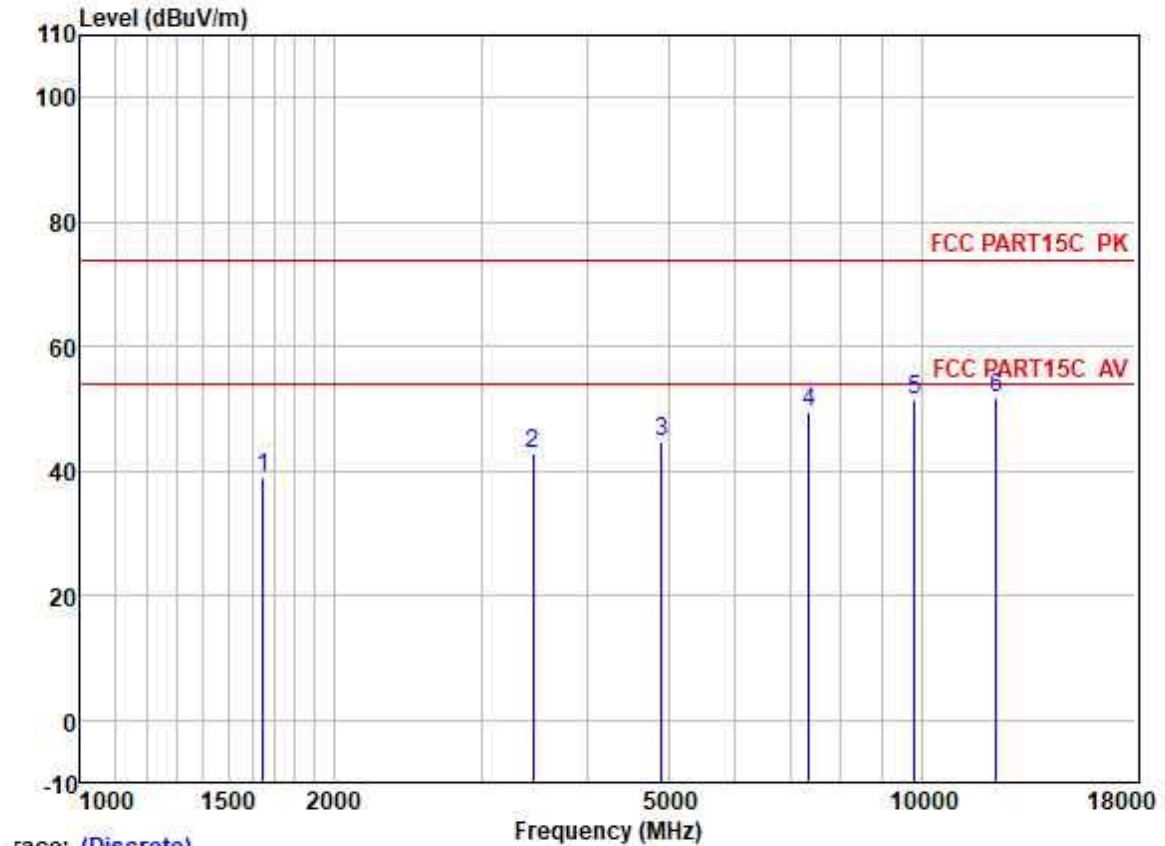
		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1611.091	47.65	25.59	2.80	37.07	38.97	74.00	-35.03	HORIZONTAL	Peak
2	3415.787	46.53	28.85	4.13	36.47	43.04	74.00	-30.96	HORIZONTAL	Peak
3	4824.440	45.90	31.45	5.42	36.48	46.29	74.00	-27.71	HORIZONTAL	Peak
4	7236.461	45.46	35.70	6.03	36.75	50.44	74.00	-23.56	HORIZONTAL	Peak
5	9848.525	42.53	38.58	6.99	36.32	51.78	74.00	-22.22	HORIZONTAL	Peak
6	12060.470	39.59	38.88	8.17	36.38	50.26	74.00	-23.74	HORIZONTAL	Peak

Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle;



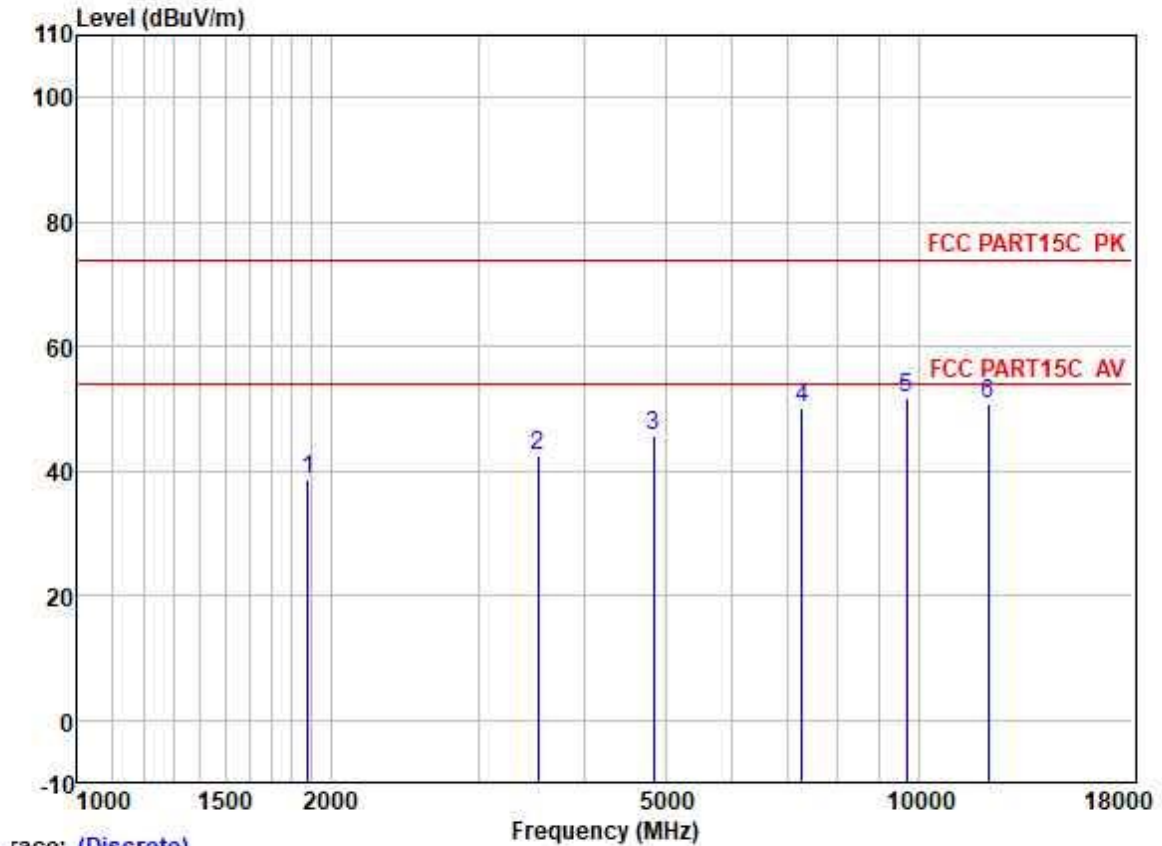
	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Level	Line	Limit	Pol/Phase
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	1574.265	47.46	25.56	2.80	37.08	38.74	74.00	-35.26
2	3105.037	45.95	28.48	3.91	36.53	41.81	74.00	-32.19
3	4884.300	45.09	31.56	5.52	36.50	45.67	74.00	-28.33
4	7326.052	43.13	36.00	6.13	36.76	48.50	74.00	-25.50
5	9768.020	42.22	38.53	7.01	36.33	51.43	74.00	-22.57
6	12210.750	40.75	38.74	8.08	36.30	51.27	74.00	-22.73

Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High;



	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	1648.778	47.64	25.63	2.80	37.06	39.01	74.00	-34.99
2	3455.508	46.11	28.88	4.20	36.46	42.73	74.00	-31.27
3	4904.151	44.06	31.58	5.55	36.50	44.69	74.00	-29.31
4	7356.763	44.03	36.06	6.15	36.76	49.48	74.00	-24.52
5	9808.972	42.18	38.56	7.00	36.32	51.42	74.00	-22.58
6	12260.610	41.23	38.70	8.06	36.27	51.72	74.00	-22.28

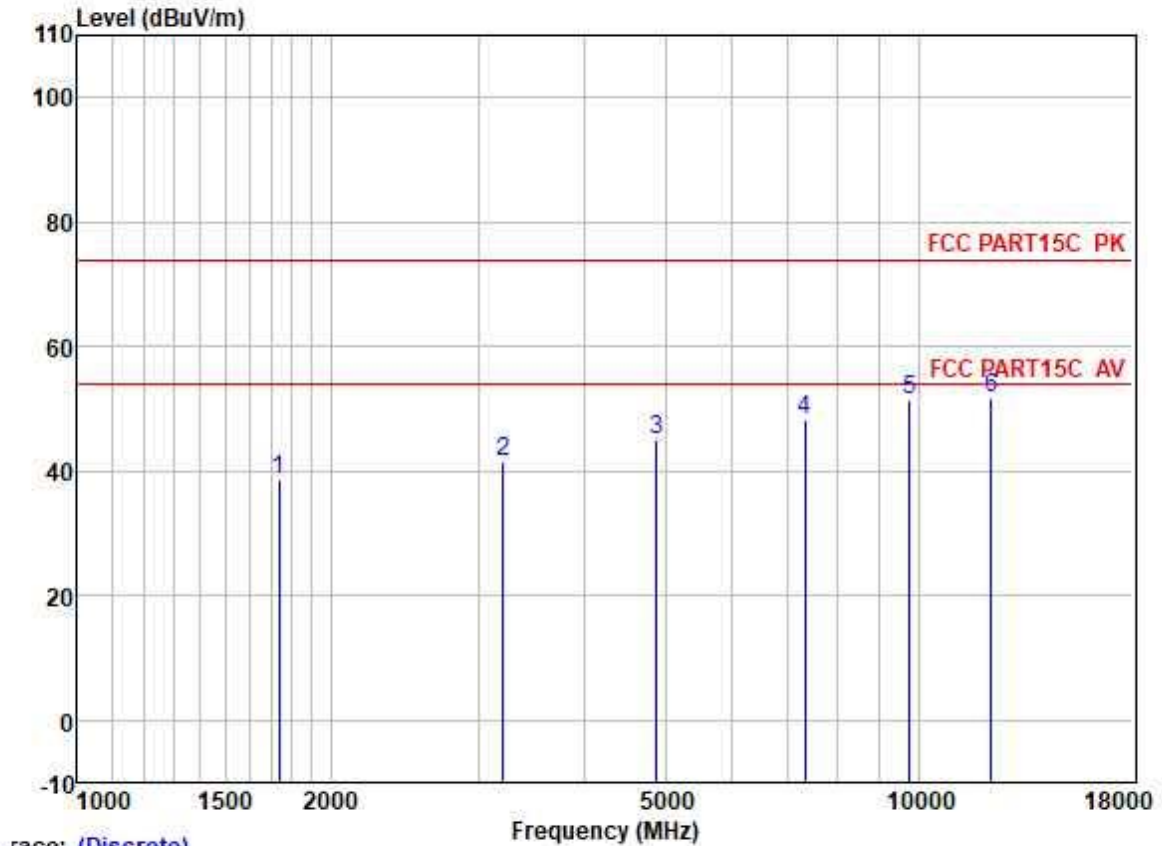
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low;



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1877.800	46.81	26.02	2.92	37.02	38.73	74.00	-35.27	HORIZONTAL	Peak
2	3526.134	45.50	28.94	4.38	36.45	42.37	74.00	-31.63	HORIZONTAL	Peak
3	4844.299	45.28	31.50	5.45	36.48	45.75	74.00	-28.25	HORIZONTAL	Peak
4	7266.788	44.93	35.78	6.06	36.75	50.02	74.00	-23.98	HORIZONTAL	Peak
5	9688.450	42.60	38.44	7.04	36.34	51.74	74.00	-22.26	HORIZONTAL	Peak
6	12110.470	40.32	38.83	8.14	36.36	50.93	74.00	-23.07	HORIZONTAL	Peak

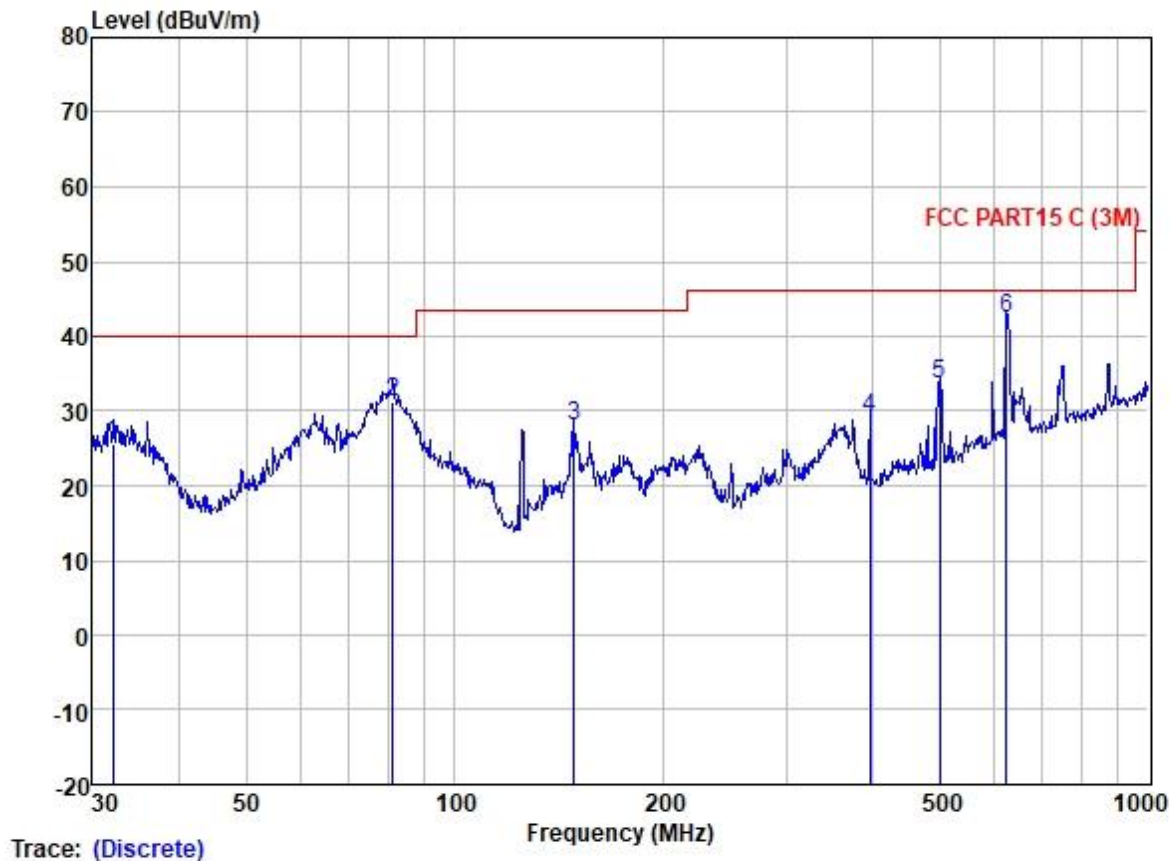
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:middle;



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	1736.829	46.91	25.82	2.86	37.04	38.55	74.00	-35.45
2	3205.345	45.29	28.60	4.00	36.51	41.38	74.00	-32.62
3	4884.490	44.55	31.56	5.52	36.50	45.13	74.00	-28.87
4	7326.708	43.01	36.00	6.13	36.76	48.38	74.00	-25.62
5	9768.925	42.30	38.53	7.01	36.33	51.51	74.00	-22.49
6	12210.270	41.35	38.74	8.08	36.30	51.87	74.00	-22.13

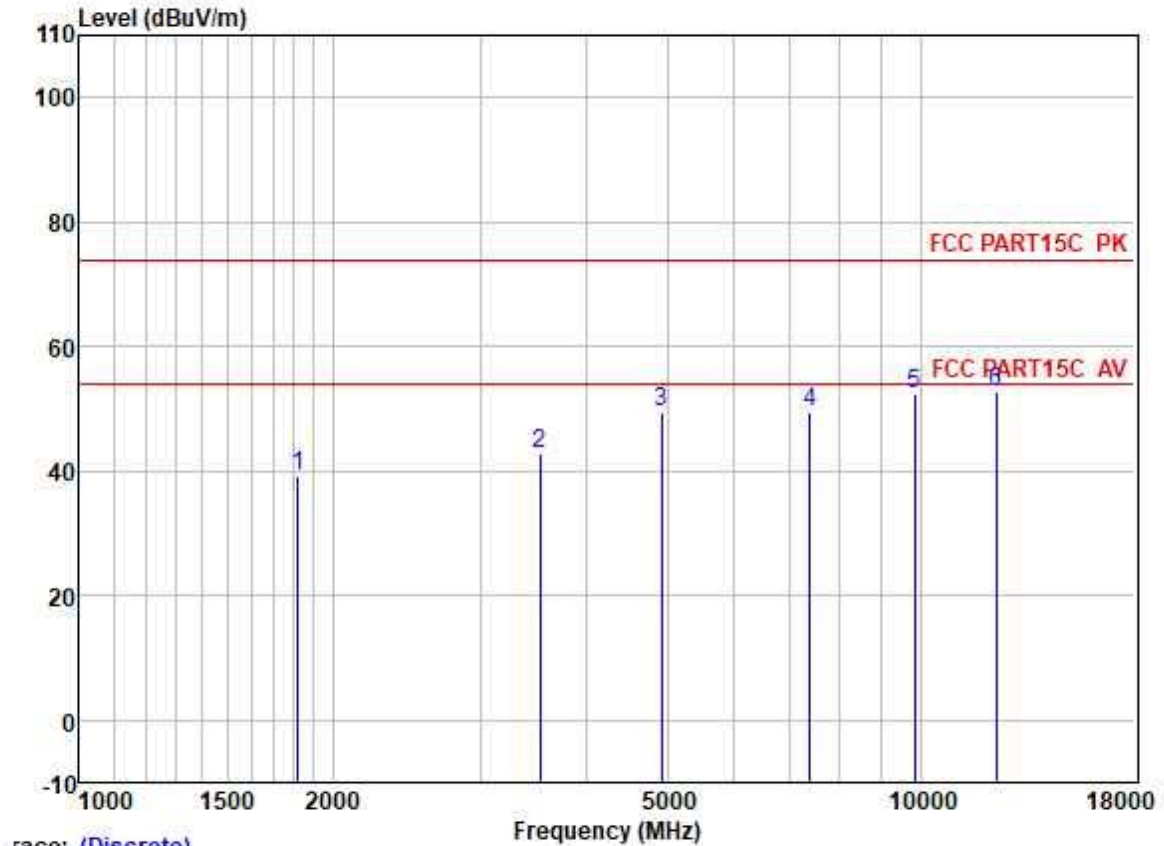
Test Mode: 05; Polarity: Vertical



Site : SGS
Condition : FCC PART15 C (3M) VERTICAL
Job :
Model :
Power :
Test Mode :

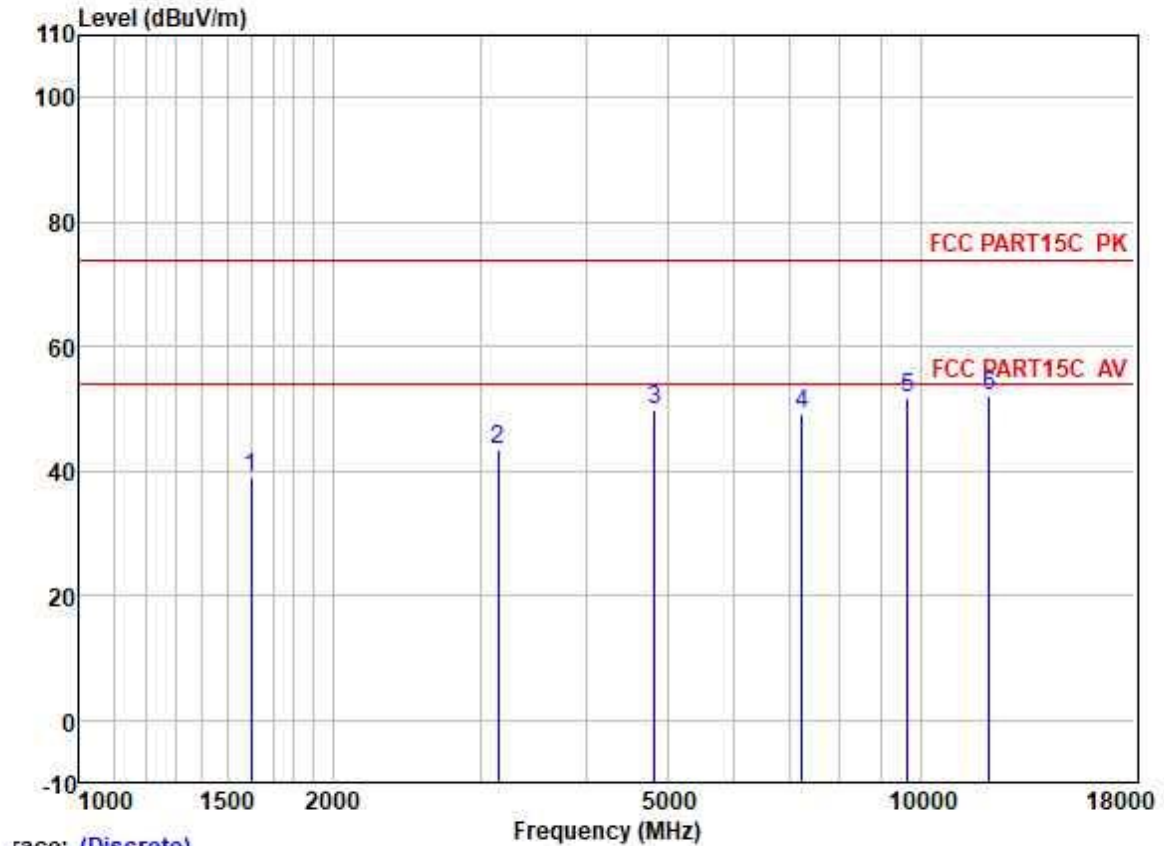
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dBuV		
1	32.07	39.15	12.70	1.04	27.19	25.70	40.00	-14.30	VERTICAL	QP
2	81.21	48.09	8.65	1.49	27.10	31.13	40.00	-8.87	VERTICAL	QP
3	148.44	39.00	13.72	2.22	26.84	28.10	43.50	-15.40	VERTICAL	QP
4	396.24	36.79	15.62	3.91	27.31	29.01	46.00	-16.99	VERTICAL	QP
5	499.42	39.36	17.90	4.39	27.98	33.67	46.00	-12.33	VERTICAL	QP
6	625.08	44.86	20.40	5.33	28.20	42.39	46.00	-3.61	VERTICAL	QP

Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High;



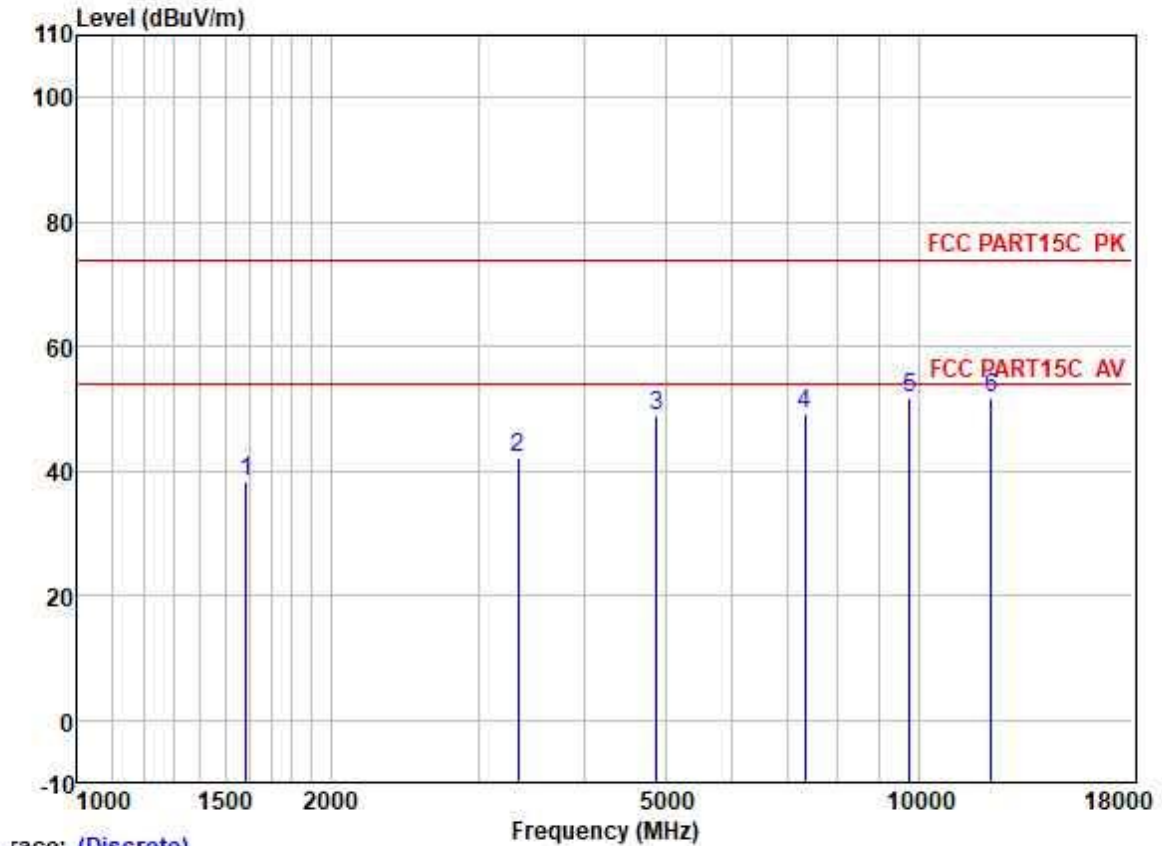
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1819.036	47.23	25.97	2.98	37.02	39.16	74.00	-34.84	VERTICAL	Peak
2	3526.134	46.05	28.94	4.38	36.45	42.92	74.00	-31.08	VERTICAL	Peak
3	4924.490	48.81	31.62	5.60	36.50	49.53	74.00	-24.47	VERTICAL	Peak
4	7386.052	44.00	36.17	6.19	36.77	49.59	74.00	-24.41	VERTICAL	Peak
5	9848.789	43.00	38.58	6.99	36.32	52.25	74.00	-21.75	VERTICAL	Peak
6	12310.760	42.25	38.63	8.01	36.23	52.66	74.00	-21.34	VERTICAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low;



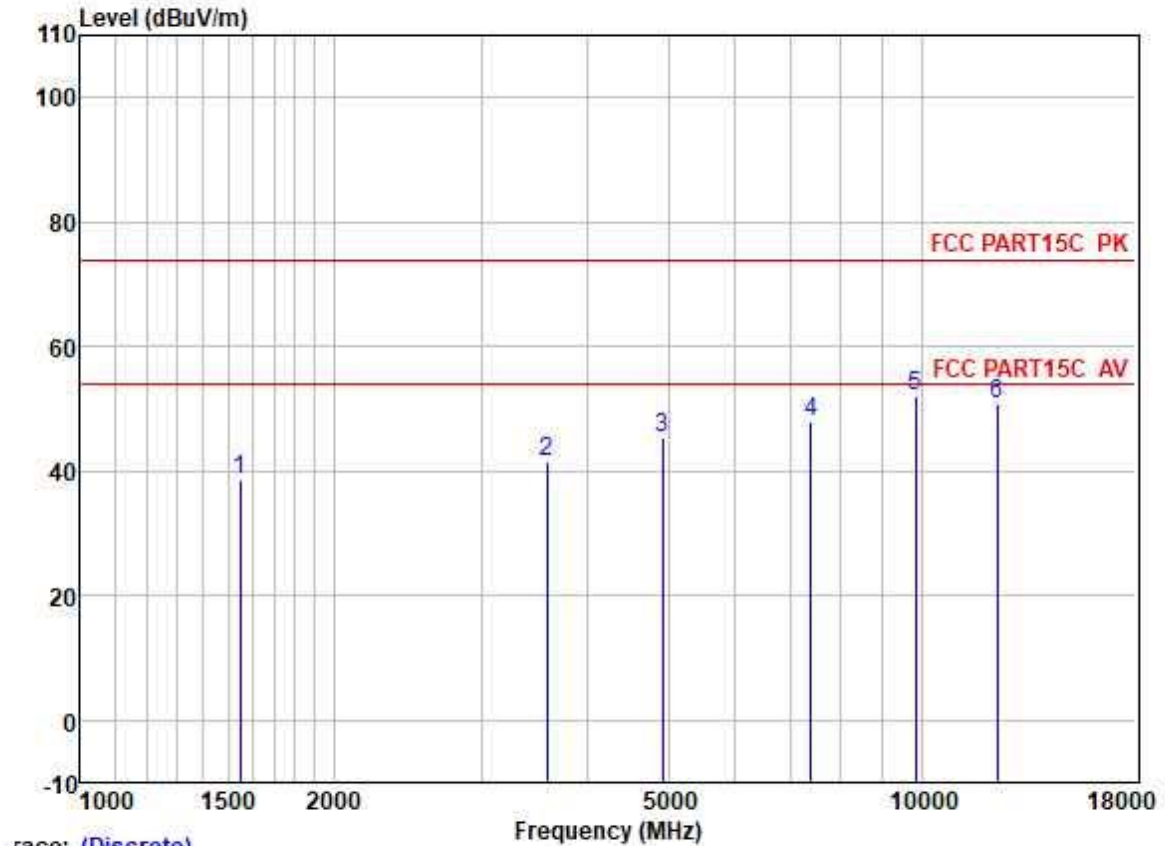
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1601.804	47.72	25.58	2.80	37.07	39.03	74.00	-34.97	VERTICAL	Peak
2	3150.237	47.38	28.52	3.96	36.52	43.34	74.00	-30.66	VERTICAL	Peak
3	4824.505	49.55	31.45	5.42	36.48	49.94	74.00	-24.06	VERTICAL	Peak
4	7236.015	44.28	35.70	6.03	36.75	49.26	74.00	-24.74	VERTICAL	Peak
5	9648.925	42.77	38.40	7.06	36.35	51.88	74.00	-22.12	VERTICAL	Peak
6	12060.420	41.34	38.88	8.17	36.38	52.01	74.00	-21.99	VERTICAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle;



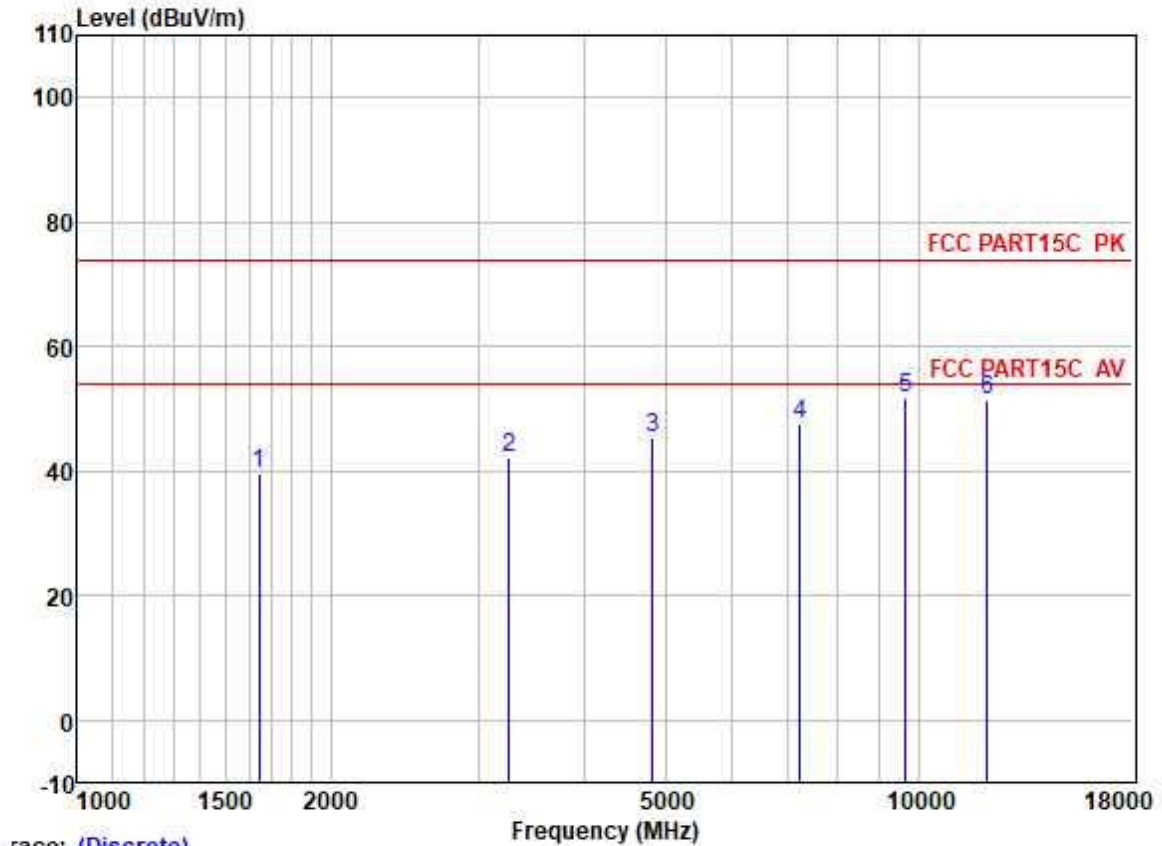
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1587.975	47.18	25.57	2.80	37.08	38.47	74.00	-35.53	VERTICAL	Peak
2	3337.710	45.66	28.79	4.08	36.48	42.05	74.00	-31.95	VERTICAL	Peak
3	4884.946	48.20	31.56	5.52	36.50	48.78	74.00	-25.22	VERTICAL	Peak
4	7326.122	43.79	36.00	6.13	36.76	49.16	74.00	-24.84	VERTICAL	Peak
5	9768.710	42.63	38.53	7.01	36.33	51.84	74.00	-22.16	VERTICAL	Peak
6	12210.220	41.21	38.74	8.08	36.30	51.73	74.00	-22.27	VERTICAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High;



	Freq	Read	Antenna	Cable	Preamp		Limit	Over		
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1547.199	47.45	25.53	2.80	37.09	38.69	74.00	-35.31	VERTICAL	Peak
2	3587.818	44.54	29.02	4.49	36.44	41.61	74.00	-32.39	VERTICAL	Peak
3	4924.440	44.66	31.62	5.60	36.50	45.38	74.00	-28.62	VERTICAL	Peak
4	7386.727	42.31	36.17	6.19	36.77	47.90	74.00	-26.10	VERTICAL	Peak
5	9848.717	42.98	38.58	6.99	36.32	52.23	74.00	-21.77	VERTICAL	Peak
6	12310.270	40.23	38.63	8.01	36.23	50.64	74.00	-23.36	VERTICAL	Peak

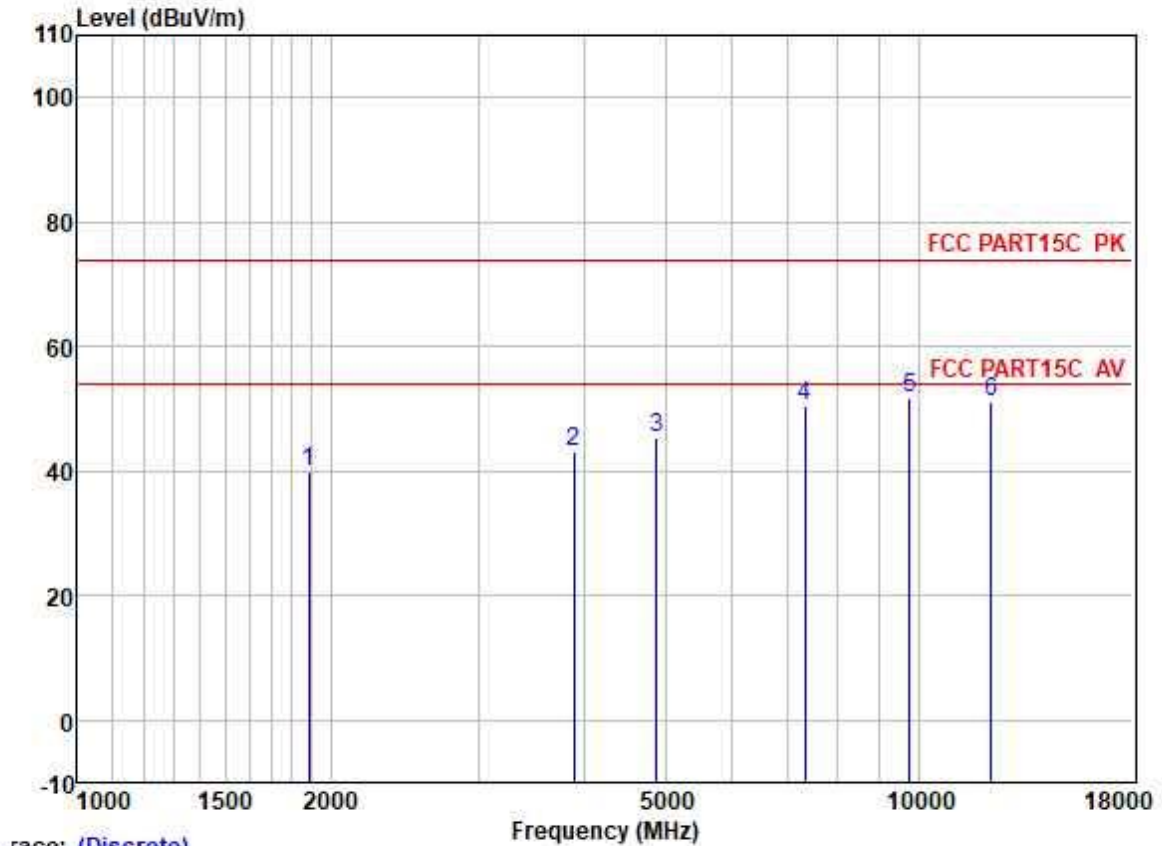
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

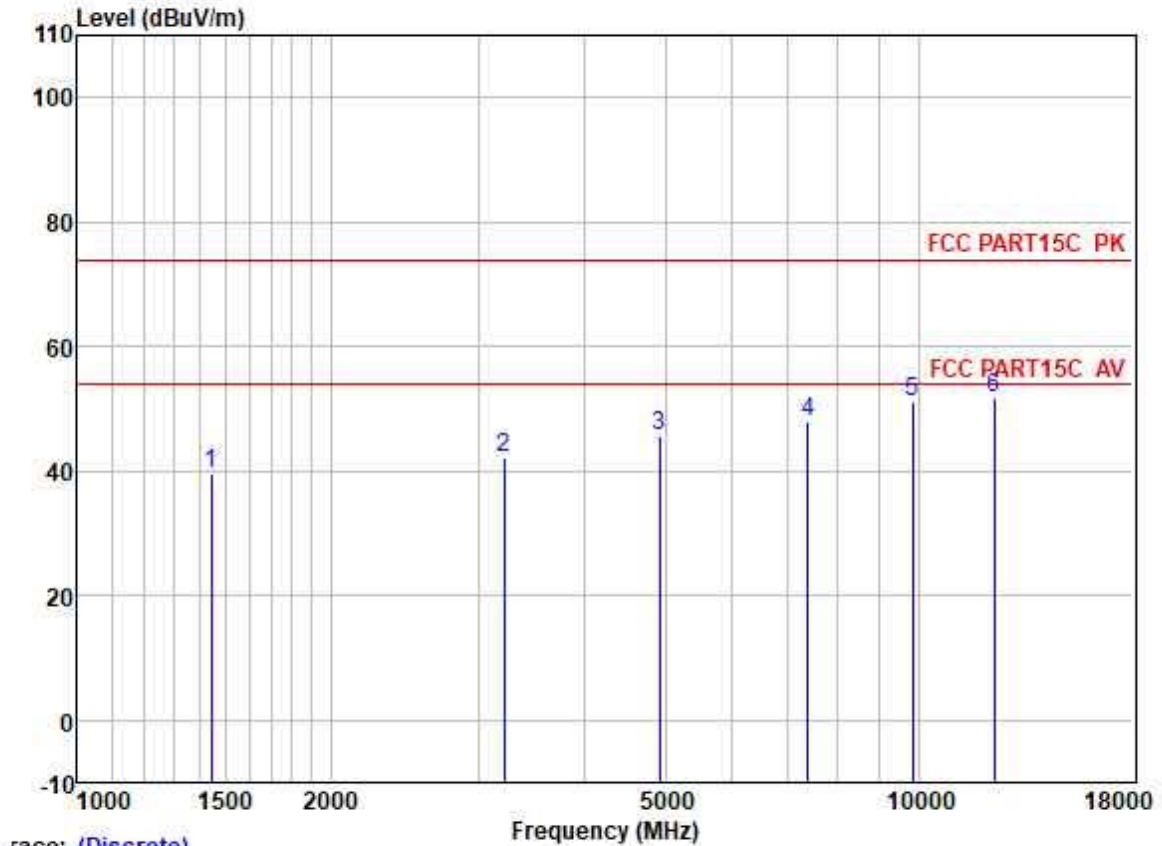
	Freq	Read	Antenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1644.019	48.38	25.63	2.80	37.06	39.75	74.00	-34.25	VERTICAL Peak
2	3261.418	46.03	28.70	4.03	36.49	42.27	74.00	-31.73	VERTICAL Peak
3	4824.151	44.92	31.45	5.42	36.48	45.31	74.00	-28.69	VERTICAL Peak
4	7236.373	42.76	35.70	6.03	36.75	47.74	74.00	-26.26	VERTICAL Peak
5	9648.540	42.77	38.40	7.06	36.35	51.88	74.00	-22.12	VERTICAL Peak
6	12060.700	40.62	38.88	8.17	36.38	51.29	74.00	-22.71	VERTICAL Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle;



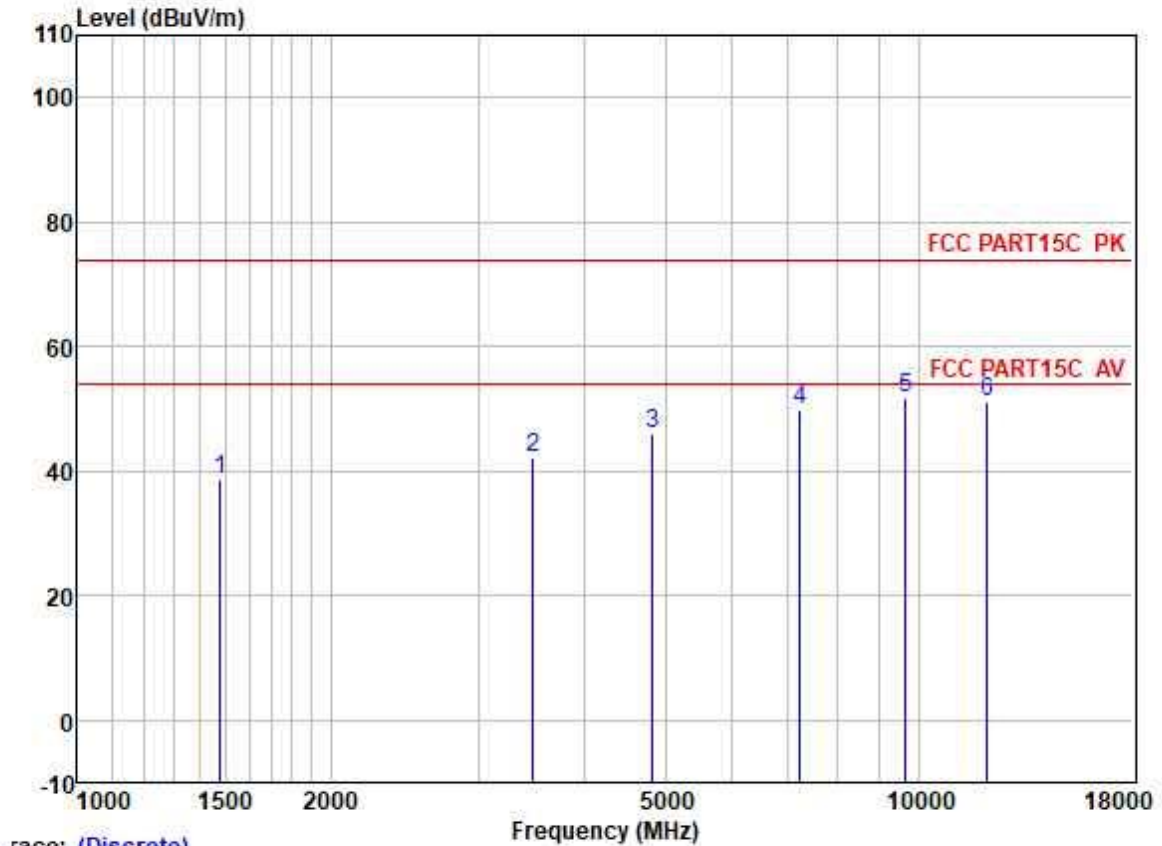
	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Factor	Loss	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1883.236	47.91	26.03	2.91	37.01	39.84	74.00	-34.16	VERTICAL Peak
2	3890.255	45.15	29.67	4.60	36.41	43.01	74.00	-30.99	VERTICAL Peak
3	4884.069	44.69	31.56	5.52	36.50	45.27	74.00	-28.73	VERTICAL Peak
4	7326.646	45.08	36.00	6.13	36.76	50.45	74.00	-23.55	VERTICAL Peak
5	9768.430	42.67	38.53	7.01	36.33	51.88	74.00	-22.12	VERTICAL Peak
6	12210.850	40.65	38.74	8.08	36.30	51.17	74.00	-22.83	VERTICAL Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High;



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1443.509	48.60	25.44	2.69	37.16	39.57	74.00	-34.43	VERTICAL	Peak
2	3214.623	46.00	28.61	4.01	36.51	42.11	74.00	-31.89	VERTICAL	Peak
3	4924.751	44.81	31.62	5.60	36.50	45.53	74.00	-28.47	VERTICAL	Peak
4	7386.373	42.25	36.17	6.19	36.77	47.84	74.00	-26.16	VERTICAL	Peak
5	9848.852	41.94	38.58	6.99	36.32	51.19	74.00	-22.81	VERTICAL	Peak
6	12310.870	41.35	38.63	8.01	36.23	51.76	74.00	-22.24	VERTICAL	Peak

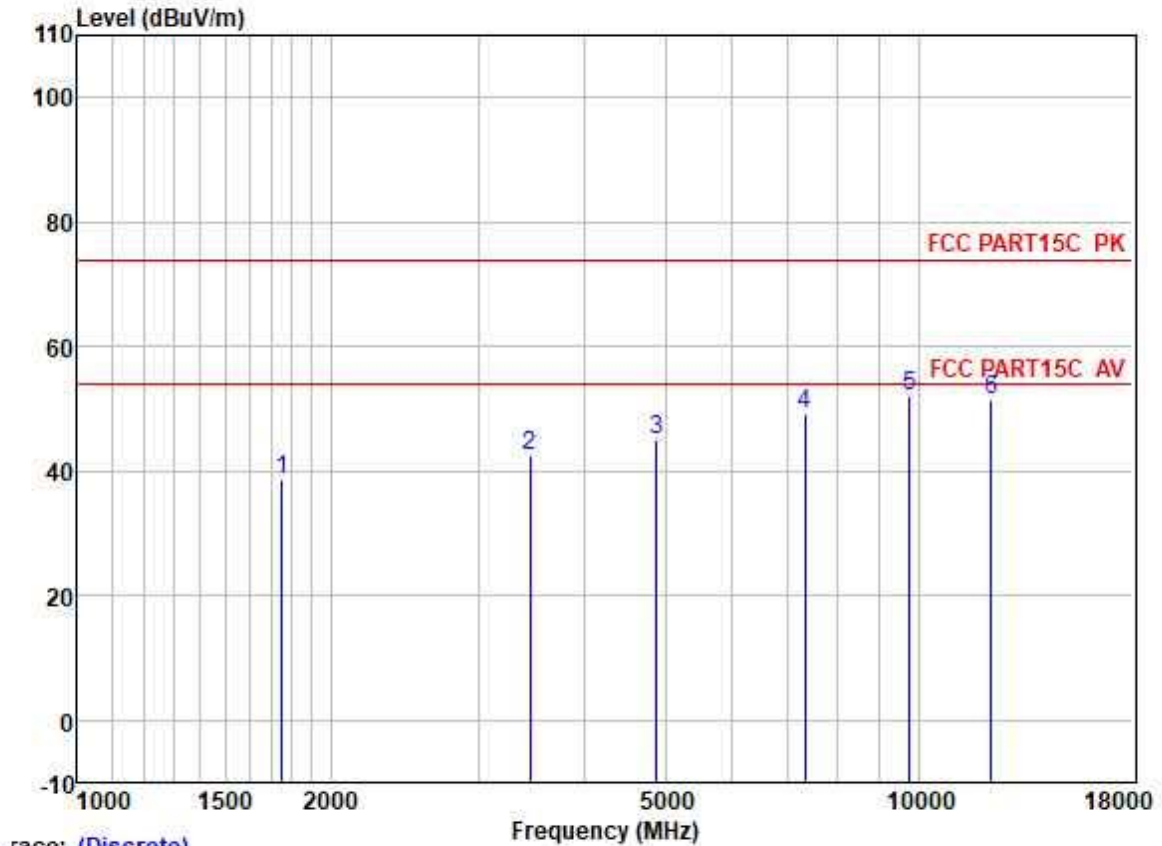
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

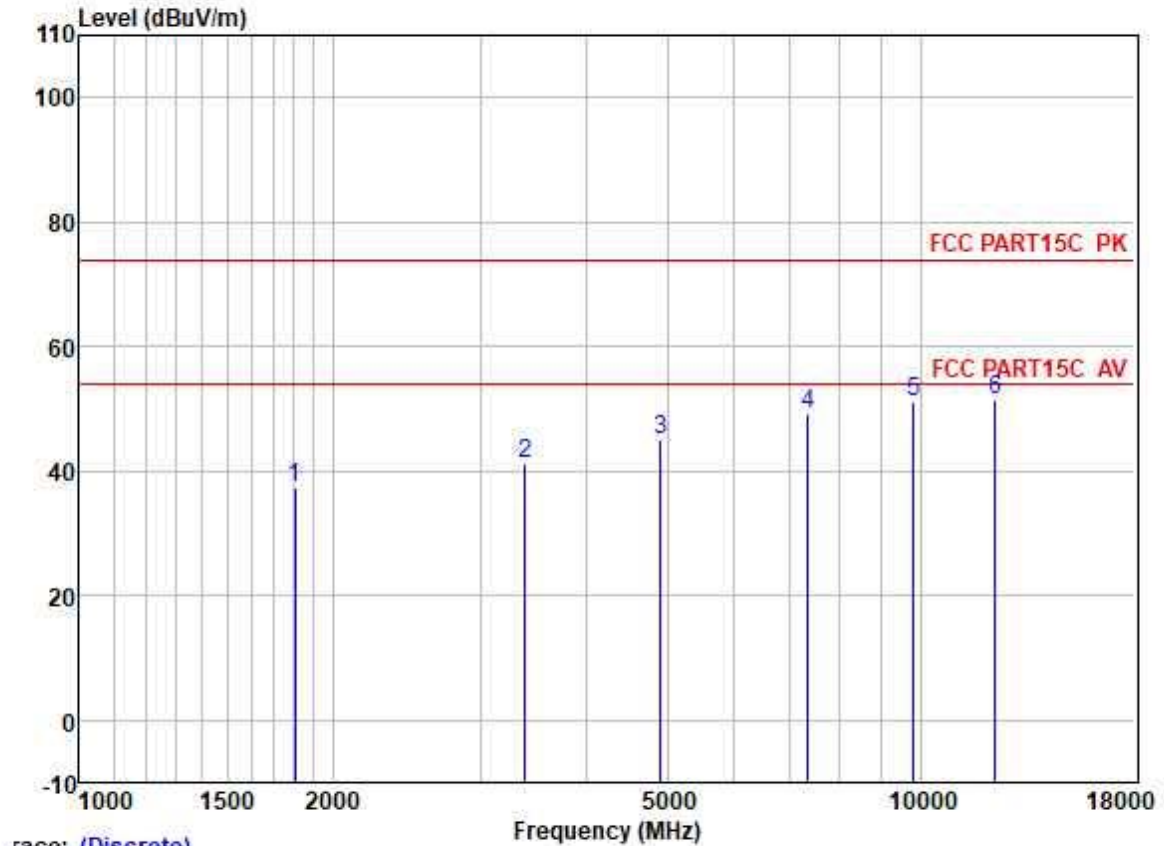
	Freq	Read	Antenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1477.276	47.54	25.48	2.77	37.13	38.66	74.00	-35.34	VERTICAL Peak
2	3485.601	45.52	28.89	4.27	36.46	42.22	74.00	-31.78	VERTICAL Peak
3	4824.007	45.51	31.45	5.42	36.48	45.90	74.00	-28.10	VERTICAL Peak
4	7236.122	44.75	35.70	6.03	36.75	49.73	74.00	-24.27	VERTICAL Peak
5	9648.525	42.77	38.40	7.06	36.35	51.88	74.00	-22.12	VERTICAL Peak
6	12060.520	40.45	38.88	8.17	36.38	51.12	74.00	-22.88	VERTICAL Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:middle;



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1751.955	46.93	25.86	2.90	37.04	38.65	74.00	-35.35	VERTICAL	Peak
2	3455.508	45.71	28.88	4.20	36.46	42.33	74.00	-31.67	VERTICAL	Peak
3	4884.016	44.53	31.56	5.52	36.50	45.11	74.00	-28.89	VERTICAL	Peak
4	7326.461	43.82	36.00	6.13	36.76	49.19	74.00	-24.81	VERTICAL	Peak
5	9768.149	42.90	38.53	7.01	36.33	52.11	74.00	-21.89	VERTICAL	Peak
6	12210.750	40.80	38.74	8.08	36.30	51.32	74.00	-22.68	VERTICAL	Peak

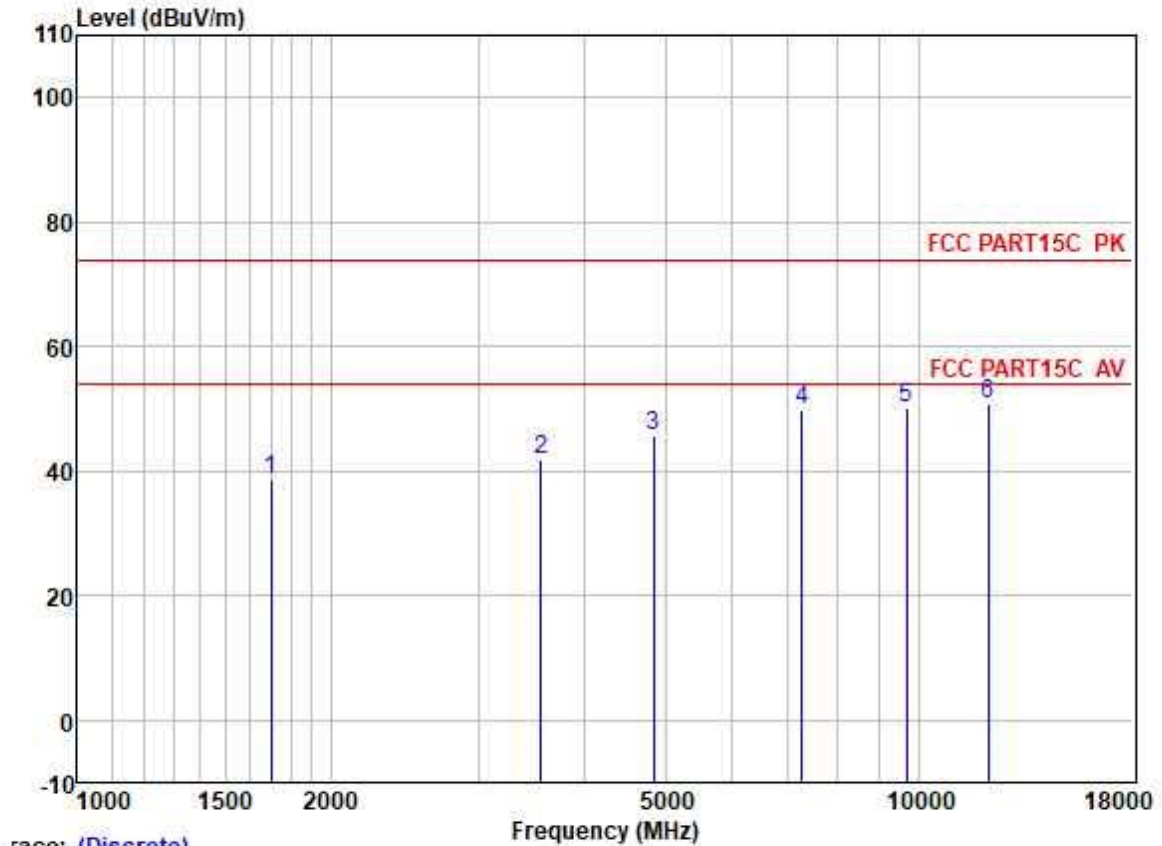
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High;



Trace: (Discrete)

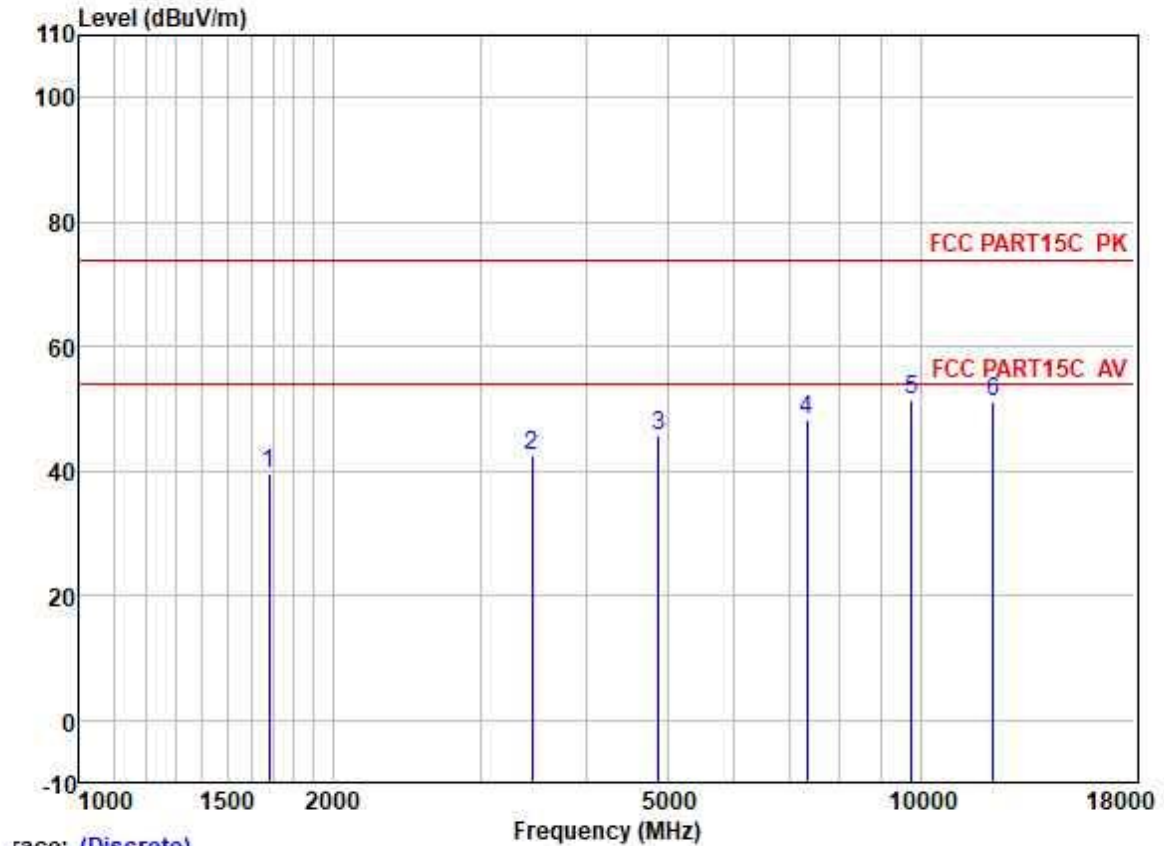
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1803.332	45.59	25.95	3.00	37.03	37.51	74.00	-36.49	VERTICAL	Peak
2	3386.297	44.85	28.83	4.10	36.47	41.31	74.00	-32.69	VERTICAL	Peak
3	4904.043	44.37	31.58	5.55	36.50	45.00	74.00	-29.00	VERTICAL	Peak
4	7356.806	43.65	36.06	6.15	36.76	49.10	74.00	-24.90	VERTICAL	Peak
5	9808.460	42.03	38.56	7.00	36.32	51.27	74.00	-22.73	VERTICAL	Peak
6	12260.760	40.97	38.70	8.06	36.27	51.46	74.00	-22.54	VERTICAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low;



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1697.129	47.13	25.71	2.80	37.05	38.59	74.00	-35.41	VERTICAL	Peak
2	3556.843	44.87	28.98	4.44	36.45	41.84	74.00	-32.16	VERTICAL	Peak
3	4844.274	45.34	31.50	5.45	36.48	45.81	74.00	-28.19	VERTICAL	Peak
4	7266.038	44.70	35.78	6.06	36.75	49.79	74.00	-24.21	VERTICAL	Peak
5	9688.371	41.12	38.44	7.04	36.34	50.26	74.00	-23.74	VERTICAL	Peak
6	12110.700	40.21	38.83	8.14	36.34	50.84	74.00	-23.16	VERTICAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:middle;



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1682.477	48.01	25.68	2.80	37.05	39.44	74.00	-34.56	VERTICAL	Peak
2	3455.508	45.79	28.88	4.20	36.46	42.41	74.00	-31.59	VERTICAL	Peak
3	4884.151	45.14	31.56	5.52	36.50	45.72	74.00	-28.28	VERTICAL	Peak
4	7326.763	42.74	36.00	6.13	36.76	48.11	74.00	-25.89	VERTICAL	Peak
5	9768.473	42.12	38.53	7.01	36.33	51.33	74.00	-22.67	VERTICAL	Peak
6	12210.270	40.49	38.74	8.08	36.30	51.01	74.00	-22.99	VERTICAL	Peak

8 Appendix

(Cable Loss=0.9 dB)

8.1 Appendix A: DTS Bandwidth

8.1.1 Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.160	2406.920	2417.080	>=0.5	PASS
	Ant2	2412	10.160	2406.920	2417.080	>=0.5	PASS
	Ant1	2442	10.080	2436.960	2447.040	>=0.5	PASS
	Ant2	2442	10.160	2436.920	2447.080	>=0.5	PASS
	Ant1	2462	10.160	2456.920	2467.080	>=0.5	PASS
	Ant2	2462	10.160	2456.920	2467.080	>=0.5	PASS
11G	Ant1	2412	16.400	2403.800	2420.200	>=0.5	PASS
	Ant2	2412	16.360	2403.840	2420.200	>=0.5	PASS
	Ant1	2442	16.360	2433.840	2450.200	>=0.5	PASS
	Ant2	2442	15.920	2434.000	2449.920	>=0.5	PASS
	Ant1	2462	16.360	2453.800	2470.160	>=0.5	PASS
	Ant2	2462	16.440	2453.800	2470.240	>=0.5	PASS
11N20SISO	Ant1	2412	16.640	2403.800	2420.440	>=0.5	PASS
	Ant2	2412	16.600	2403.600	2420.200	>=0.5	PASS
	Ant1	2442	16.720	2433.800	2450.520	>=0.5	PASS
	Ant2	2442	17.360	2433.200	2450.560	>=0.5	PASS
	Ant1	2462	17.680	2453.160	2470.840	>=0.5	PASS
	Ant2	2462	16.000	2453.800	2469.800	>=0.5	PASS
11N40SISO	Ant1	2422	35.200	2404.400	2439.600	>=0.5	PASS
	Ant2	2422	35.120	2404.480	2439.600	>=0.5	PASS
	Ant1	2442	34.320	2425.280	2459.600	>=0.5	PASS
	Ant2	2442	35.280	2424.320	2459.600	>=0.5	PASS
	Ant1	2452	35.280	2434.320	2469.600	>=0.5	PASS
	Ant2	2452	34.000	2434.400	2468.400	>=0.5	PASS
11N20MIMO	Ant1	2412	17.120	2403.440	2420.560	>=0.5	PASS
	Ant2	2412	16.160	2403.440	2419.600	>=0.5	PASS
	Ant1	2442	17.120	2433.400	2450.520	>=0.5	PASS
	Ant2	2442	17.320	2433.160	2450.480	>=0.5	PASS
	Ant1	2462	16.840	2453.600	2470.440	>=0.5	PASS
	Ant2	2462	15.680	2453.800	2469.480	>=0.5	PASS
11N40MIMO	Ant1	2422	35.280	2404.320	2439.600	>=0.5	PASS
	Ant2	2422	33.840	2404.480	2438.320	>=0.5	PASS
	Ant1	2442	35.920	2423.760	2459.680	>=0.5	PASS
	Ant2	2442	35.600	2424.000	2459.600	>=0.5	PASS
	Ant1	2452	34.560	2434.000	2468.560	>=0.5	PASS
	Ant2	2452	34.320	2435.280	2469.600	>=0.5	PASS



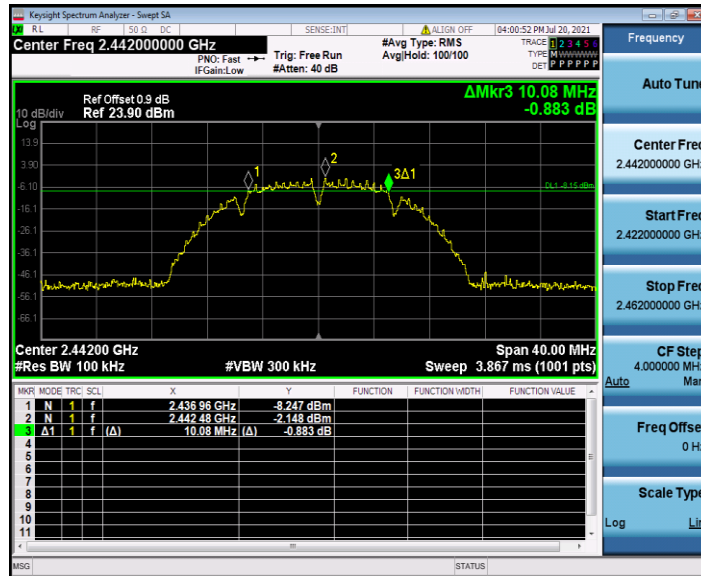
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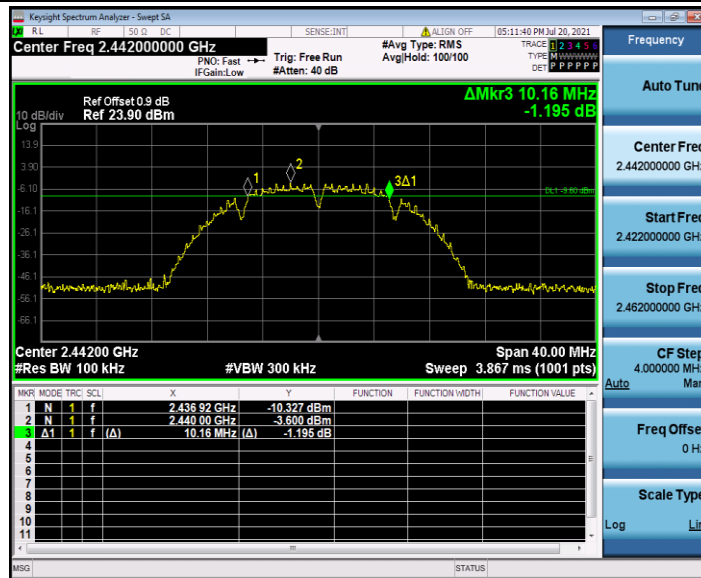
8.1.2 Test Graphs



11B_Ant1_2442



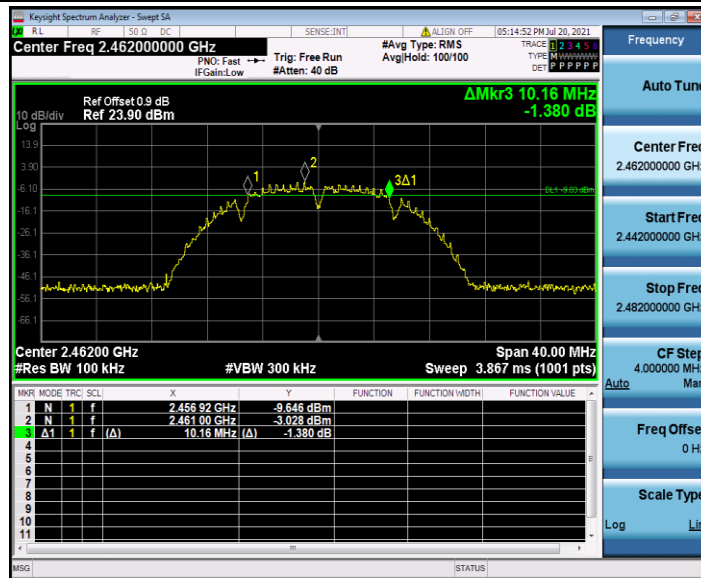
11B_Ant2_2442



11B_Ant1_2462



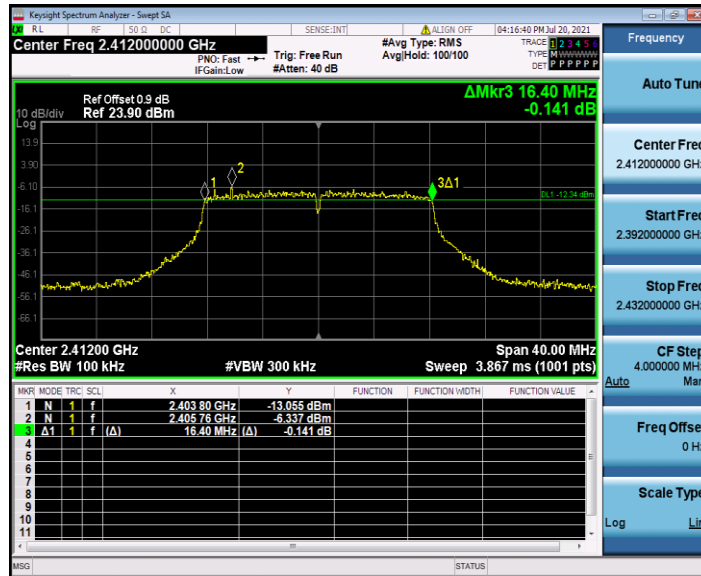
11B_Ant2_2462



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11G_Ant1_2412



11G_Ant2_2412

