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Report No.: HKES170100022003
Page: 1 of 101

TEST REPORT

Application No.: HKES1701000220IT
Applicant: PACIFIC SMART SYSTEM LIMITED
Address of Applicant: A5, 5/F, HK SPINNERS IND BLDG, PHASE 6, 481 CASTLE PEAK RD,
CHEUNG SHA WAN, KL, HONGKONG

Equipment Under Test (EUT):

EUT Name: Smart Terminal with LCD Display
Model No.: Smart Terminal
Brand Name: Pepxim
FCC ID: 2AK6U-P1IOT
Standards: 47 CFR Part 15, Subpart E 15.407
Date of Receipt: 2017-02-07
Date of Test: 2017-02-13 to 2017-02-28
Date of Issue: 2017-03-22

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



Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2017-03-22		Original

Authorized for issue by:			
Tested By			
	Hank Yan /Project Engineer	2017-03-22	Date
Checked By			
	Eric Fu /Reviewer	2017-03-22	Date



2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Transmission in the Absence of Data	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart E 15.407 (c)	Pass
Antenna Requirement	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart C 15.203	Pass

N/A: Not applicable

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Disturbance at AC Power Line(150kHz-30MHz)	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207 & 15.407 b(6)	Pass
26dB Emission bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 1	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Minimum 6 dB bandwidth (5.725-5.85 GHz band)	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 2	47 CFR Part 15, Subpart E 15.407 (e)	Pass
Maximum Conducted output power	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II E	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Peak Power spectrum density	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II F	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Radiated Spurious emissions and Band-edge	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
Frequency Stability	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart E 15.407 (g)	Pass
Radiated Emissions	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
99% Bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 II D	KDB 789033 II D	Pass

N/A: Not applicable



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4 General Information

4.1 Details of E.U.T.

Power supply:	Powered by PoE port			
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	IEEE 802.11a	5180-5240	4
		IEEE 802.11n 20MHz	5180-5240	4
		IEEE 802.11n 40MHz	5190-5230	2
	UNII Band III	IEEE 802.11a	5745-5825	5
		IEEE 802.11n 20MHz	5745-5825	5
		IEEE 802.11n 40MHz	5755-5795	2
Type of Modulation:	IEEE 802.11a: OFDM(BPSK/QPSK/16QAM/64QAM) IEEE 802.11n: OFDM(BPSK/QPSK/16QAM/64QAM)			
Antenna Type:	Integral Antenna			
Antenna Gain:	2dBi			

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Network Cable	SGS	N/A	REF. No.SEA1100
PoE power supply	PHIHONG	POE36U-1AT-R	--

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction emission	3.45dB (9kHz to 150kHz)
		3.0dB (150kHz to 30MHz)
2	Radiated Power	3.64dB
3	Radiated emission	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-6GHz)
4	Radio Frequency	7.25×10^{-8}
5	Duty cycle	0.37%
6	Occupied Bandwidth	3%
7	RF conducted power	0.75dB
8	RF power density	2.84dB
9	Conducted Spurious emissions	0.75dB
10	Temperature test	1 °C
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%



4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-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.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



5 Equipment List

Conducted Disturbance at AC Power Line(150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2016-05-13	2017-05-13
LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
LISN	ETS-LINDGREN	3816/2	SEM007-02	2016-04-25	2017-04-25
8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2016-09-28	2017-09-28
4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2016-09-28	2017-09-28
2 Line ISN	Fischer Custom	FCC-TLISN-T2-02	EMC0122	2016-09-28	2017-09-28

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2016-05-18	2017-05-18



6 Radio Spectrum Technical Requirement

6.1 Transmission in the Absence of Data

6.1.1 Test Requirement:

47 CFR Part 15, Subpart E 15.407

6.1.2 Conclusion

Standard Requirement:

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

Applicants shall include in their application for equipment authorization a description of how this requirement is met.

EUT Details:

WIFI chip (AR9344) support automatically discontinue transmission in case of either absence of information to transmit or operational failure, if the chip detect absence of information to transmit or operational failure, it will be automatically shut off.

6.2 Antenna Requirement

6.2.1 Test Requirement:

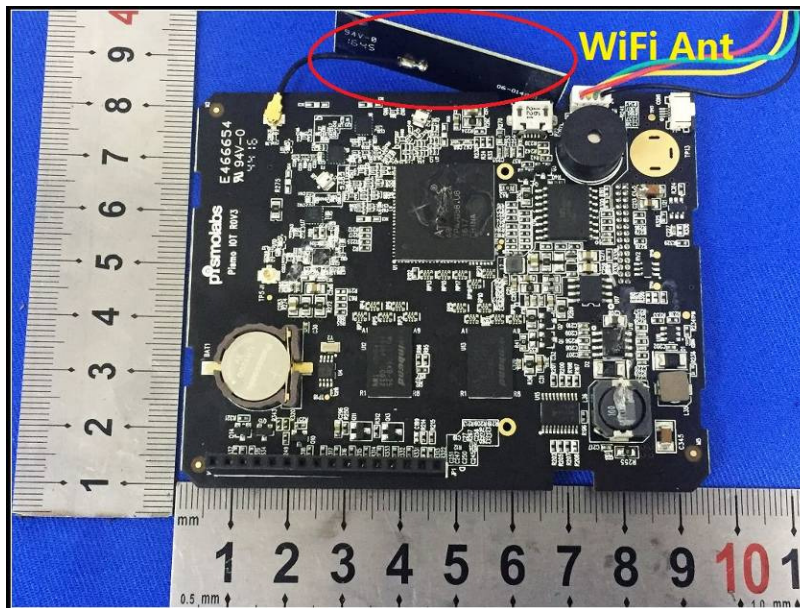
47 CFR Part 15, Subpart E 15.407

6.2.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:



The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.

7 Radio Spectrum Matter Test Results

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

Test Requirement 47 CFR Part 15, Subpart C 15.207 & 15.407 b(6)

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.

7.1.1 E.U.T. Operation

Operating Environment:

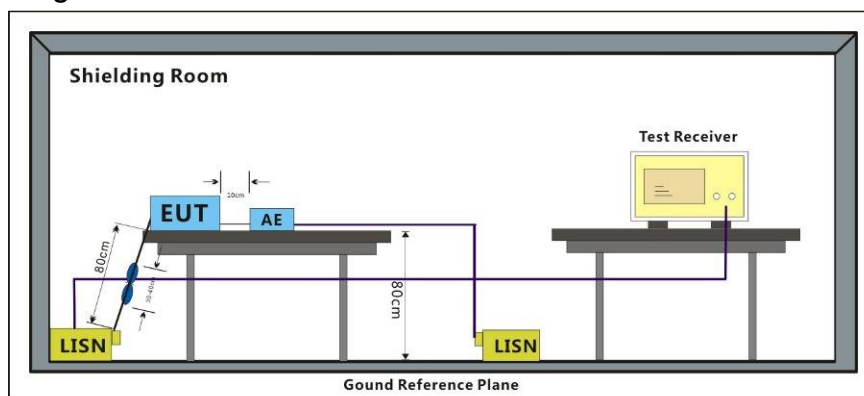
Temperature: 24 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar

Pretest these Transmitting with all kind of modulations, data rates at lowest, middle and highest mode to find the channel.
worst case:

The worst case Through Pre-scan, find the MCS0 of rate of 802.11n(HT20) at 48 channel is the worst for final test:

Only the worst case is recorded in the report.

7.1.2 Test Setup Diagram

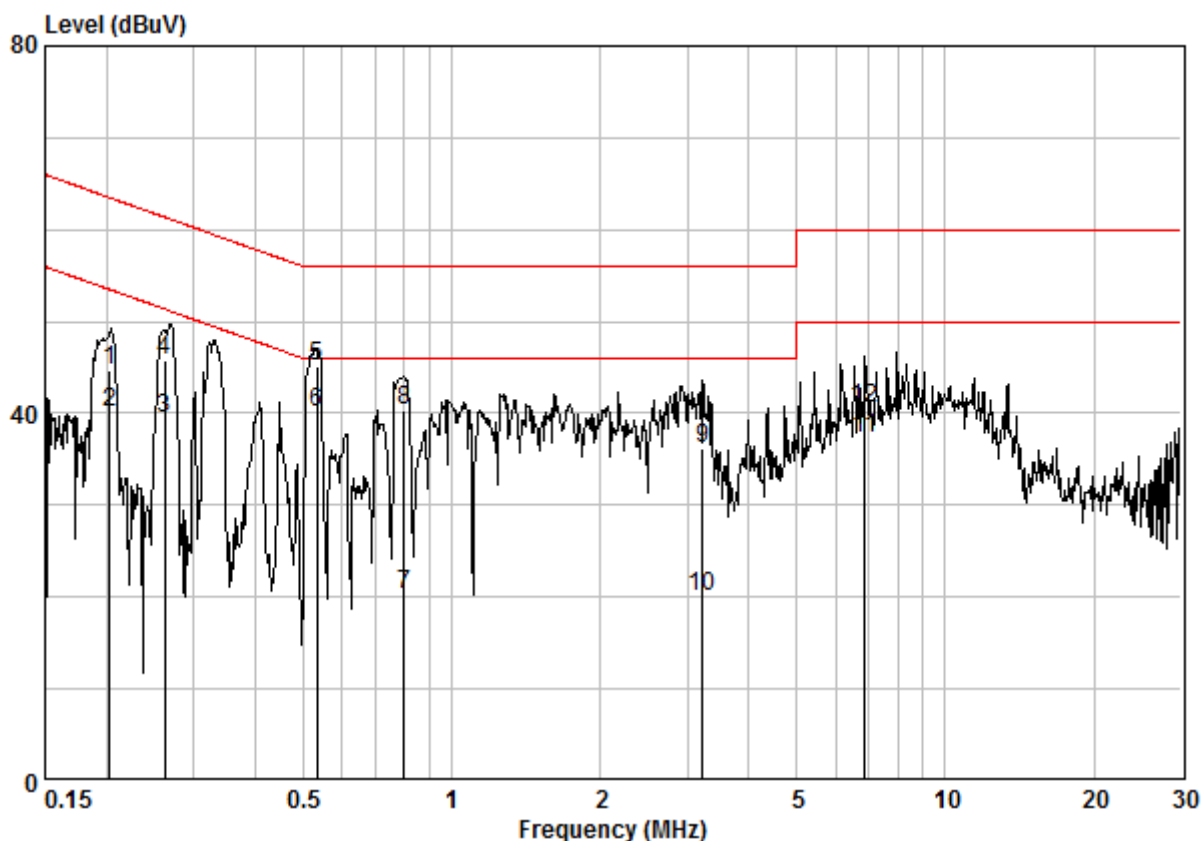




7.1.3 Measurement Procedure and Data

- 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.

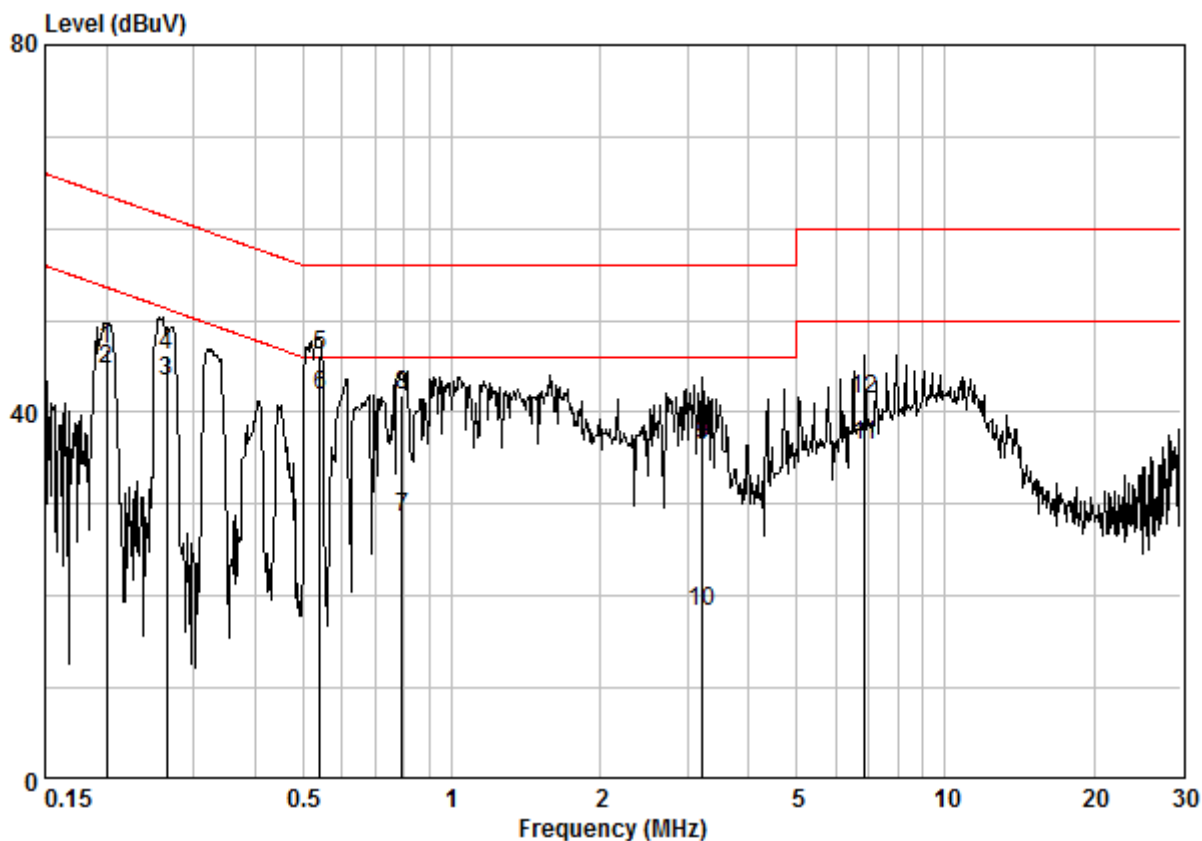
Mode:TX mode; Line:Live Line



Site : Shielding Room
Condition : CE LINE
Job.No : 00220IT
Test Mode : TX mode

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.20289	0.02	9.64	35.02	44.68	63.49	-18.81	QP
2	0.20289	0.02	9.64	30.38	40.04	53.49	-13.45	AVERAGE
3	0.26164	0.02	9.64	29.81	39.47	51.38	-11.90	AVERAGE
4	0.26164	0.02	9.64	36.07	45.73	61.38	-15.65	QP
5	0.53215	0.02	9.64	35.40	45.07	56.00	-10.93	QP
6 @	0.53215	0.02	9.64	30.49	40.15	46.00	-5.85	AVERAGE
7	0.80023	0.03	9.65	10.59	20.27	46.00	-25.73	AVERAGE
8	0.80023	0.03	9.65	30.60	40.28	56.00	-15.72	QP
9	3.224	0.02	9.70	26.47	36.19	56.00	-19.81	QP
10	3.224	0.02	9.70	10.43	20.15	46.00	-25.85	AVERAGE
11	6.878	0.07	9.79	27.37	37.23	50.00	-12.77	AVERAGE
12	6.878	0.07	9.79	30.60	40.46	60.00	-19.54	QP

Mode:TX mode; Line:Neutral Line



Site : Shielding Room
Condition : CE NEUTRAL
Job.No : 00220IT
Test Mode : TX mode

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.19986	0.02	9.63	37.13	46.78	63.62	-16.84	QP
2	0.19986	0.02	9.63	34.99	44.64	53.62	-8.97	AVERAGE
3	0.26442	0.02	9.63	33.66	43.31	51.29	-7.98	AVERAGE
4	0.26442	0.02	9.63	36.56	46.21	61.29	-15.08	QP
5	0.54068	0.02	9.63	36.63	46.29	56.00	-9.71	QP
6 @	0.54068	0.02	9.63	32.29	41.94	46.00	-4.06	AVERAGE
7	0.79180	0.03	9.64	18.84	28.51	46.00	-17.49	AVERAGE
8	0.79180	0.03	9.64	32.22	41.89	56.00	-14.11	QP
9	3.224	0.02	9.68	26.69	36.39	56.00	-19.61	QP
10	3.224	0.02	9.68	8.66	18.36	46.00	-27.64	AVERAGE
11	6.878	0.07	9.77	26.47	36.31	50.00	-13.69	AVERAGE
12	6.878	0.07	9.77	31.63	41.47	60.00	-18.53	QP

7.2 26dB Emission bandwidth

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)
 Test Method: KDB 789033 D02 II C 1

7.2.1 E.U.T. Operation

Operating Environment:

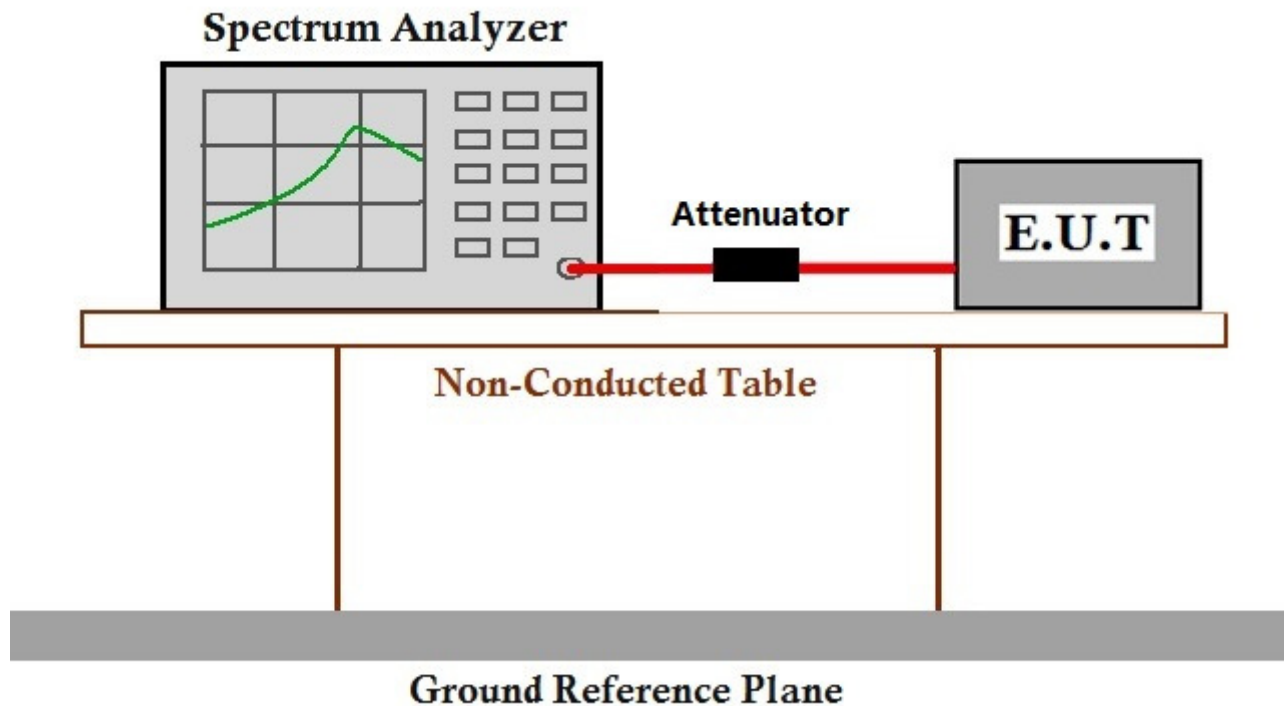
Temperature: 24 °C Humidity: 55 % RH Atmospheric Pressure: 1015 mbar

Pretest these Transmitting with all kind of modulations, data rates
 mode to find the
 worst case:

The worst case Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a;
 for final test: MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40).

Only the worst case is recorded in the report.

7.2.2 Test Setup Diagram



7.2.3 Measurement Data

The detailed test data see: Appendix 15.407

7.3 Minimum 6 dB bandwidth (5.725-5.85 GHz band)

Test Requirement	47 CFR Part 15, Subpart E 15.407 (e)
Test Method:	KDB 789033 D02 II C 2
Limit:	≥500 kHz

7.3.1 E.U.T. Operation

Operating Environment:

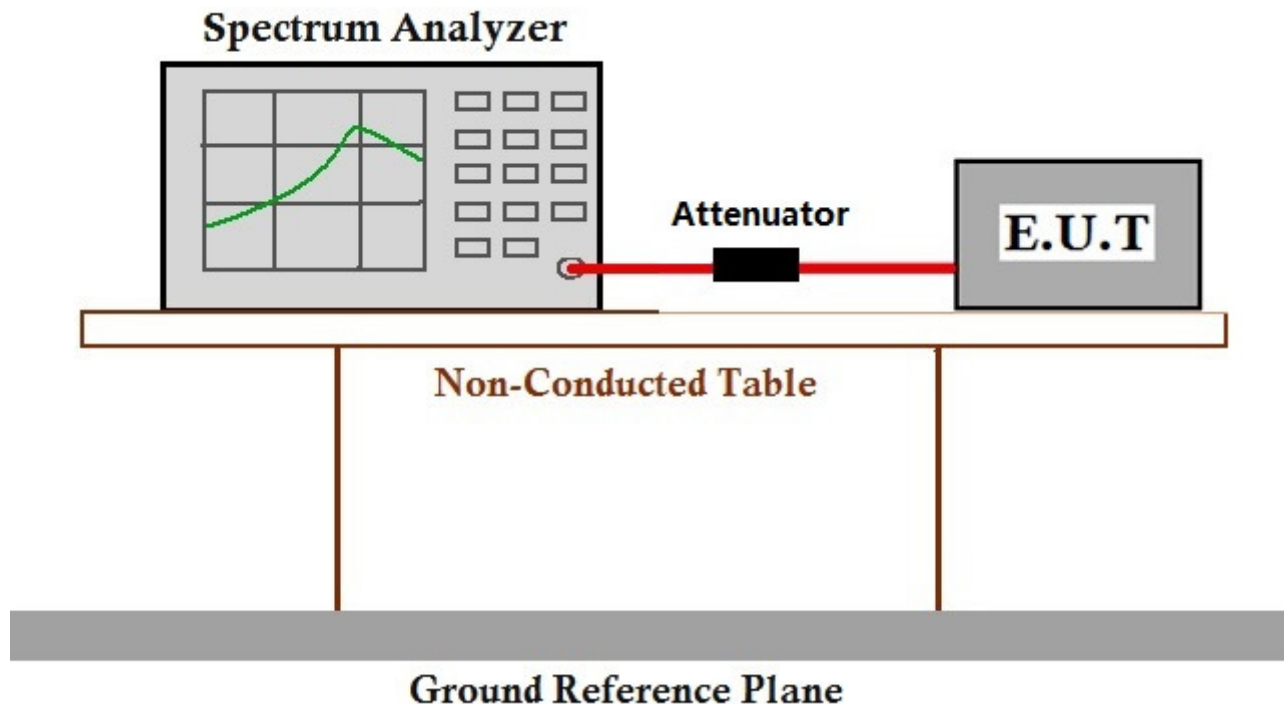
Temperature:	24 °C	Humidity:	55 % RH	Atmospheric Pressure:	1015 mbar
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Pretest these mode to find the worst case: Transmitting with all kind of modulations, data rates

The worst case for final test: Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a;
MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40).

Only the worst case is recorded in the report.

7.3.2 Test Setup Diagram



7.3.3 Measurement Data

The detailed test data see: Appendix 15.407



7.4 Maximum Conducted output power

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)

Test Method: KDB 789033 D02 II E

Limit:

Frequency band(MHz)	Limit
5150-5250	$\leq 1\text{W}(30\text{dBm})$ for master device
	$\leq 250\text{mW}(24\text{dBm})$ for client device
5250-5350	$\leq 250\text{mW}(24\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$
5470-5725	$\leq 250\text{mW}(24\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$
5725-5850	$\leq 1\text{W}(30\text{dBm})$
Remark: *Where B is the 26dB emission bandwidth in MHz. The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.	

7.4.1 E.U.T. Operation

Operating Environment:

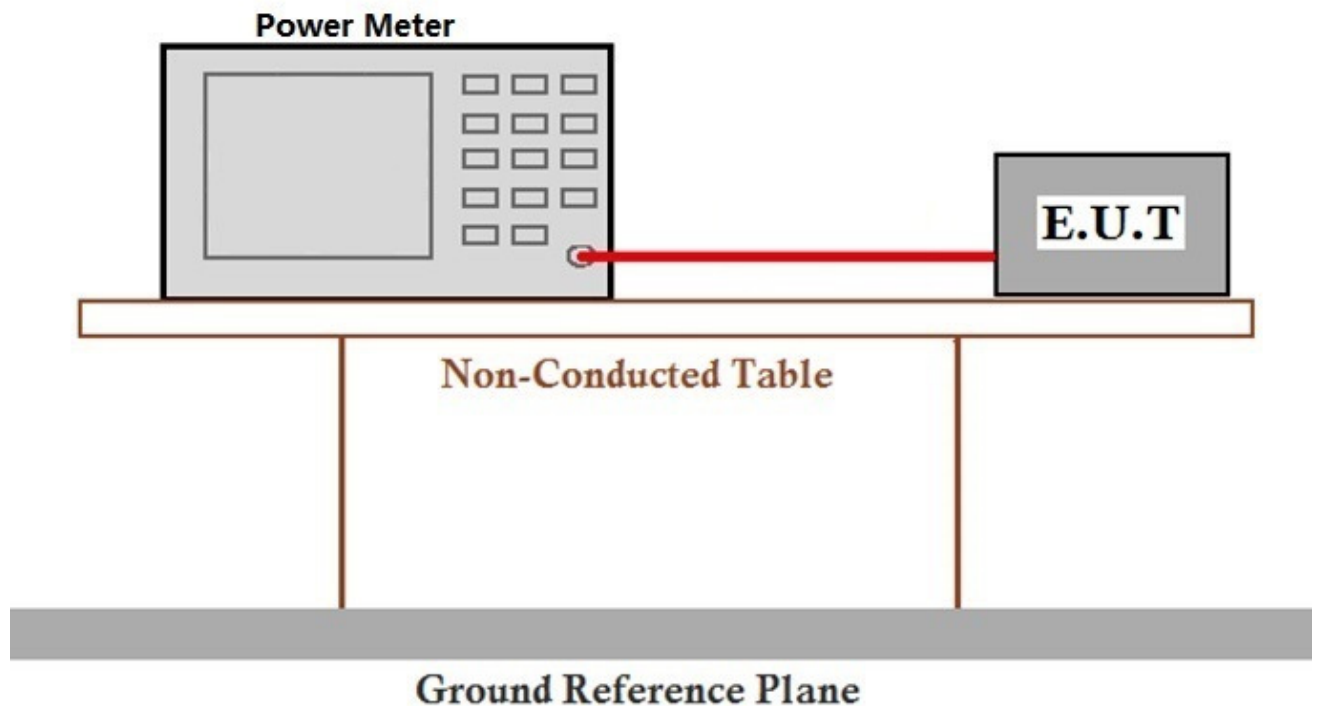
Temperature: 24 °C Humidity: 55 % RH Atmospheric Pressure: 1015 mbar

Pretest these mode to find the worst case: Transmitting with all kind of modulations, data rates

The worst case for final test: Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a;
 MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40).

Only the worst case is recorded in the report.

7.4.2 Test Setup Diagram



7.4.3 Measurement Data

The detailed test data see: Appendix 15.407



7.5 Peak Power spectrum density

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)
Test Method: KDB 789033 D02 II F
Limit:

Frequency band(MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz
Remark: The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.	

7.5.1 E.U.T. Operation

Operating Environment:

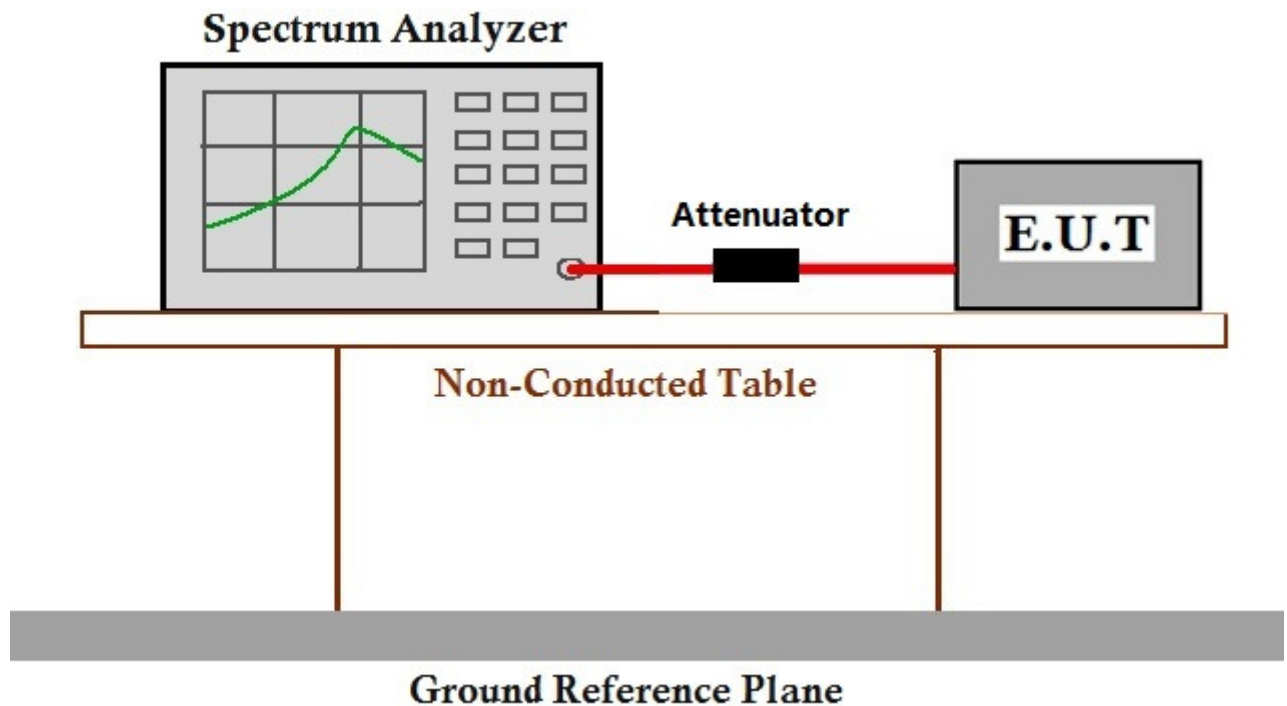
Temperature: 24 °C Humidity: 55 % RH Atmospheric Pressure: 1015 mbar

Pretest these mode to find the worst case: Transmitting with all kind of modulations, data rates

The worst case for final test: Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a;
MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40).

Only the worst case is recorded in the report.

7.5.2 Test Setup Diagram



7.5.3 Measurement Data

The detailed test data see: Appendix 15.407



7.6 Radiated Spurious emissions and Band-edge

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.407(b)

Test Method: KDB 789033 D02 II G

Measurement Distance: 3m

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.

7.6.1 E.U.T. Operation

Operating Environment:

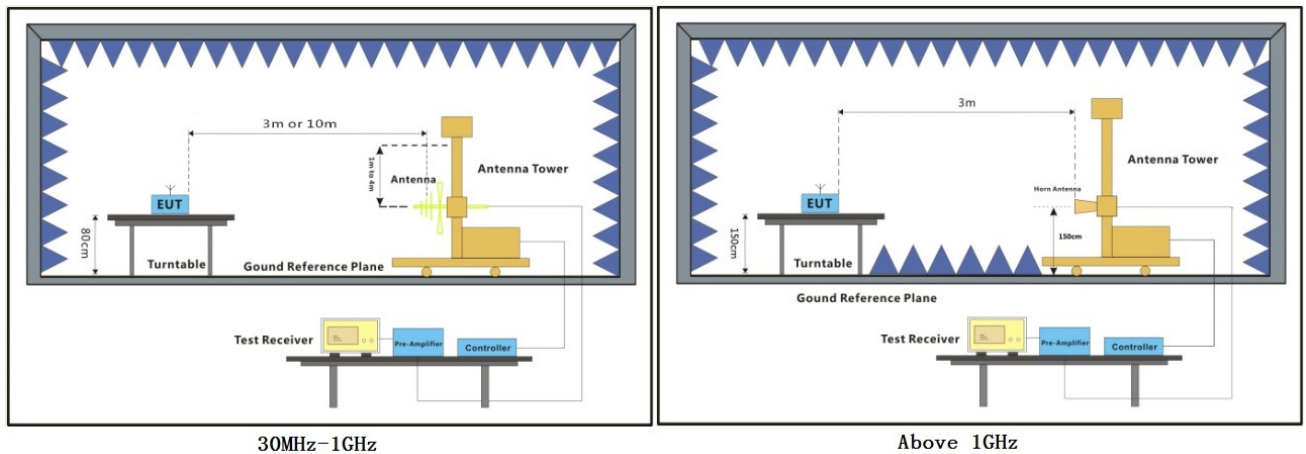
Temperature: 23 °C Humidity: 56 % RH Atmospheric Pressure: 1015 mbar

Pretest these mode to find the worst case: Transmitting with all kind of modulations, data rates.

The worst case for final test: Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a;
MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40).

Only the worst case is recorded in the report.

7.6.2 Test Setup Diagram



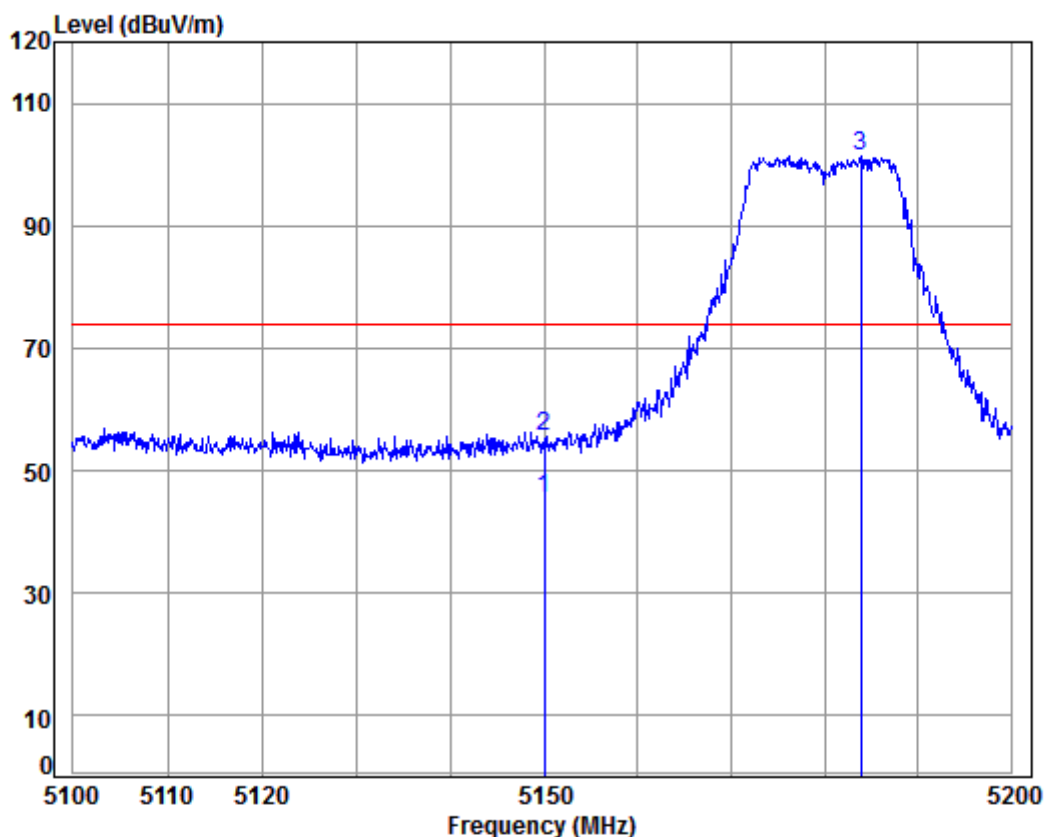


7.6.3 Measurement Data

- 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.



Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m Horizontal

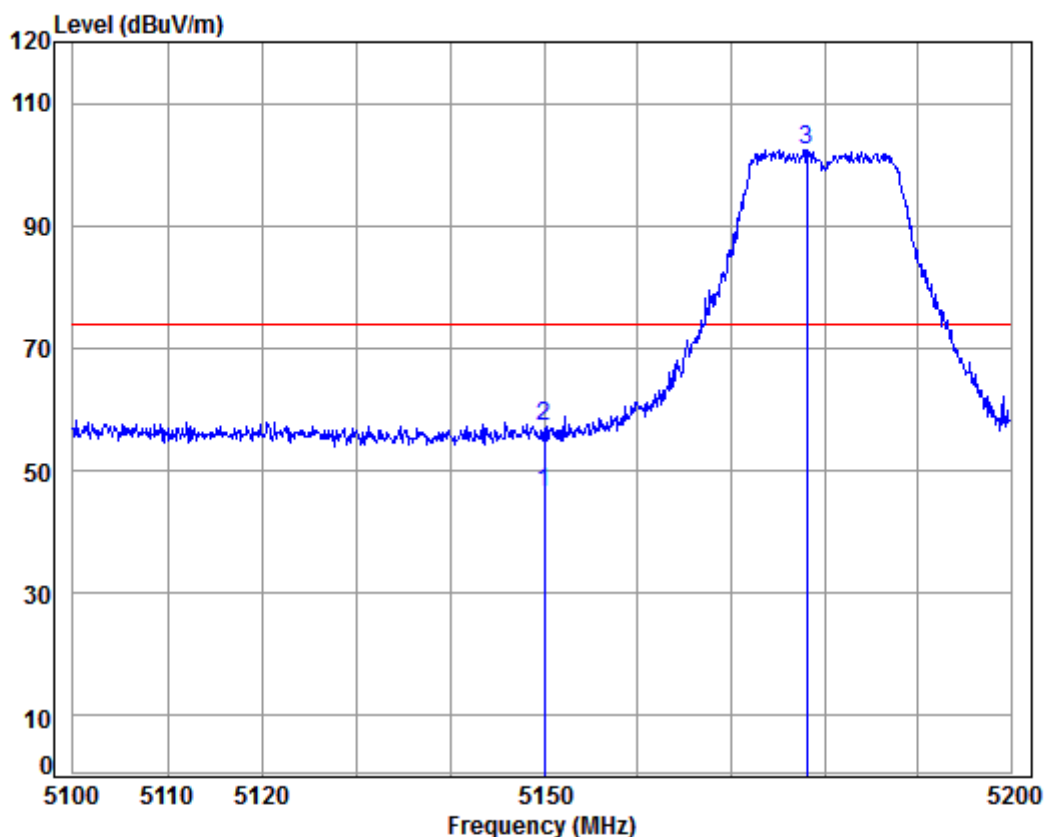
Job No: : 00220IT

Mode: : 5180 Bandedge

: A20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 av	5150.000	8.08	34.47	38.47	41.29	45.37	54.00	-8.63 Average
2	5150.000	8.08	34.47	38.47	51.53	55.61	74.00	-18.39 Peak
3 pp	5183.869	8.09	34.46	38.46	97.25	101.34	74.00	27.34 Peak

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m Vertical

Job No: : 00220IT

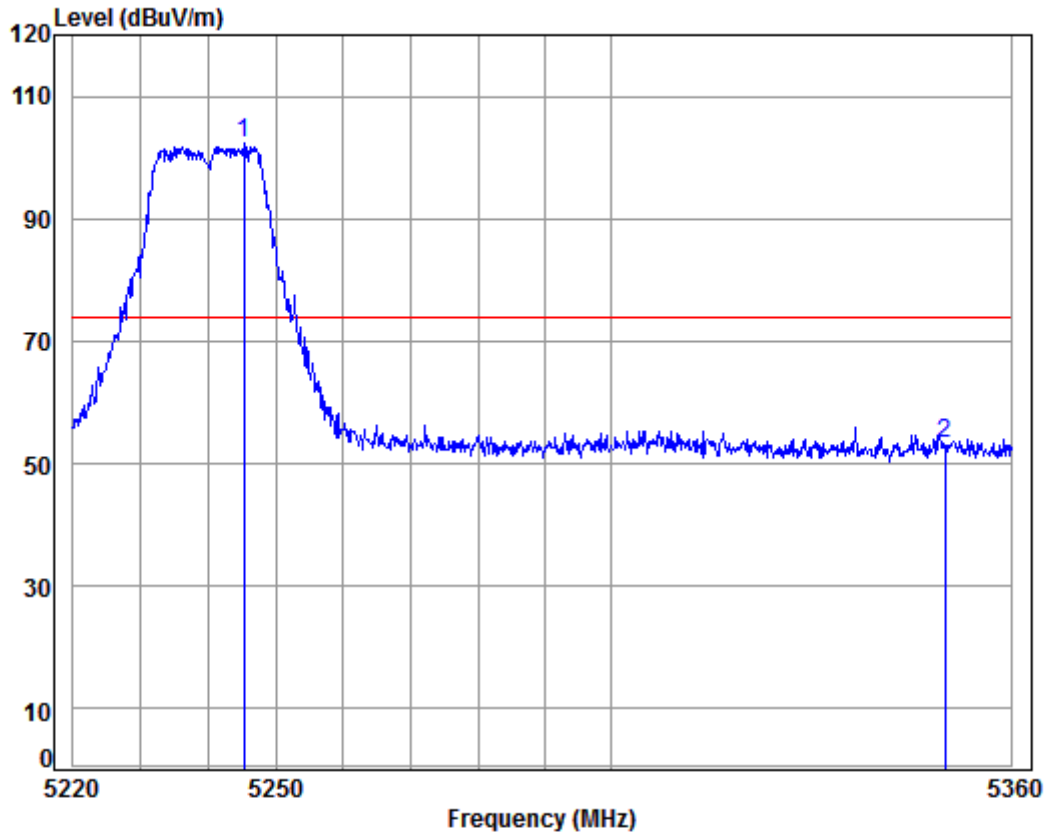
Mode: : 5180 Bandedge

: A20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 av	5150.000	8.08	34.47	38.47	42.26	46.34	54.00	-7.66 Average
2	5150.000	8.08	34.47	38.47	53.24	57.32	74.00	-16.68 Peak
3 pp	5178.034	8.09	34.46	38.46	98.27	102.36	74.00	28.36 Peak



Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m Horizontal

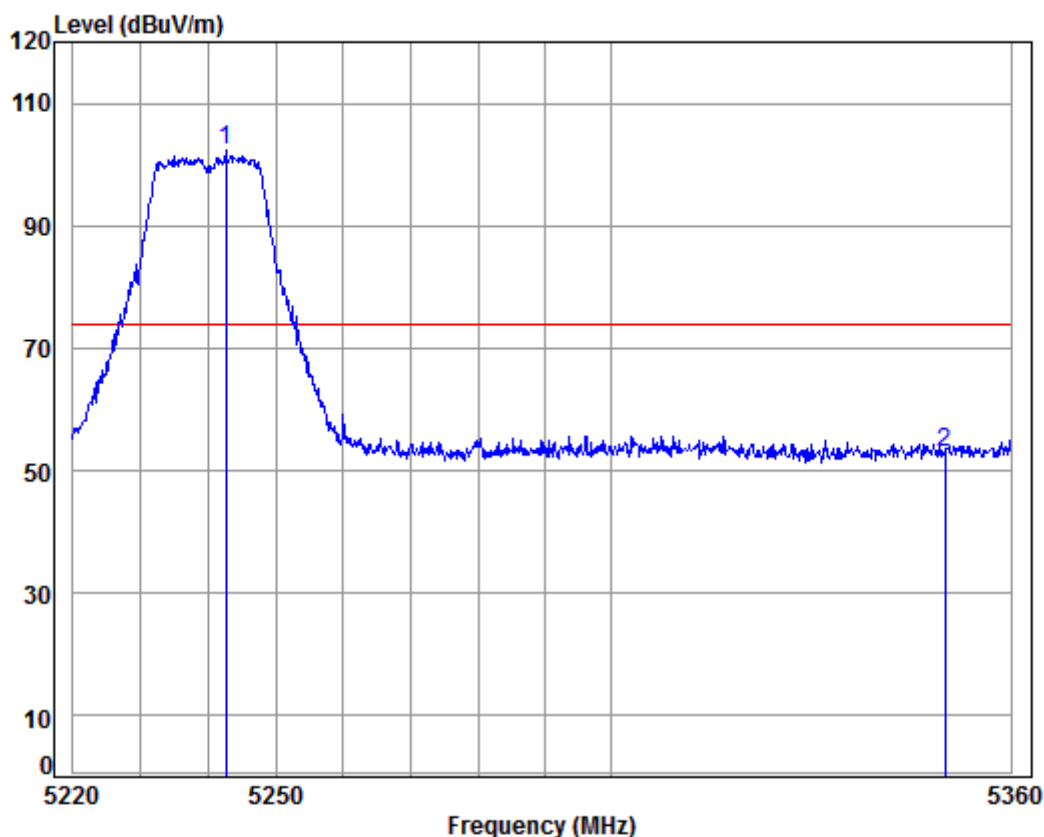
Job No: : 00220IT

Mode: : 5240 Bandedge

: A20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 5245.205	8.13	34.45	38.45	98.19	102.32	74.00	28.32	Peak
2	5350.000	8.18	34.43	38.43	48.99	53.17	74.00	-20.83	Peak

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m Vertical

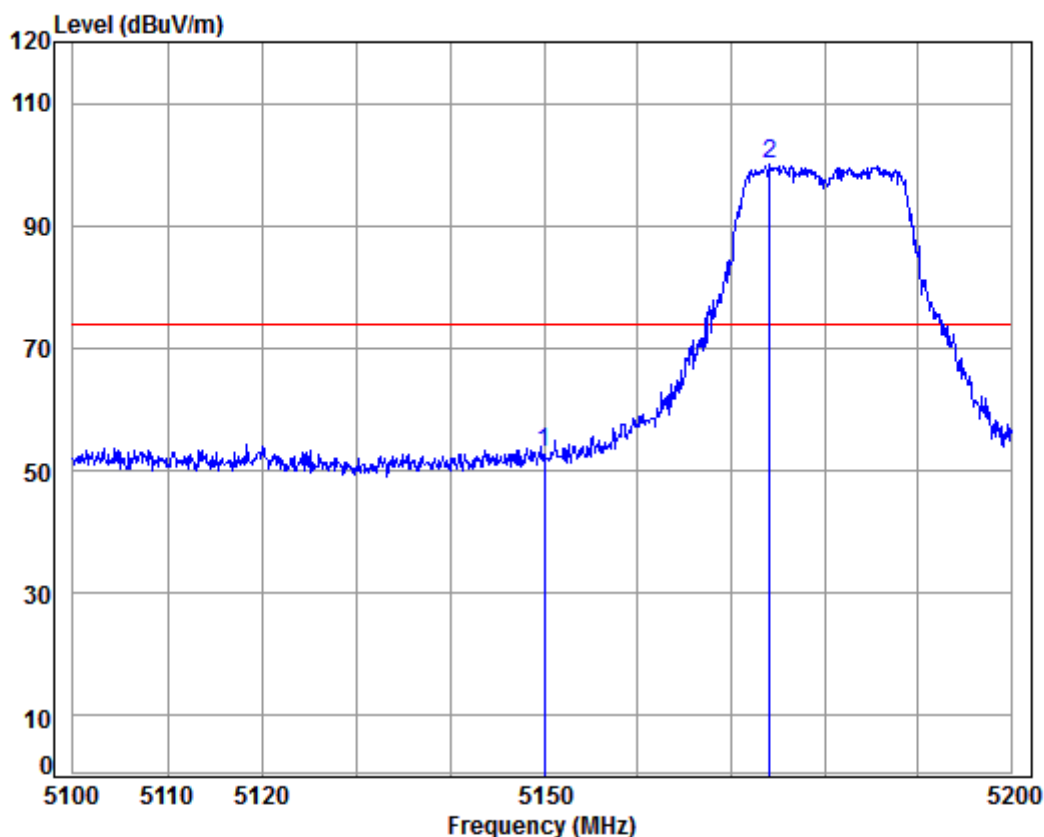
Job No: : 00220IT

Mode: : 5240 Bandedge

: A20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	5242.568	8.12	34.45	38.45	98.19	102.31	74.00	28.31	Peak
2	5350.000	8.18	34.43	38.43	48.81	52.99	74.00	-21.01	Peak

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m Horizontal

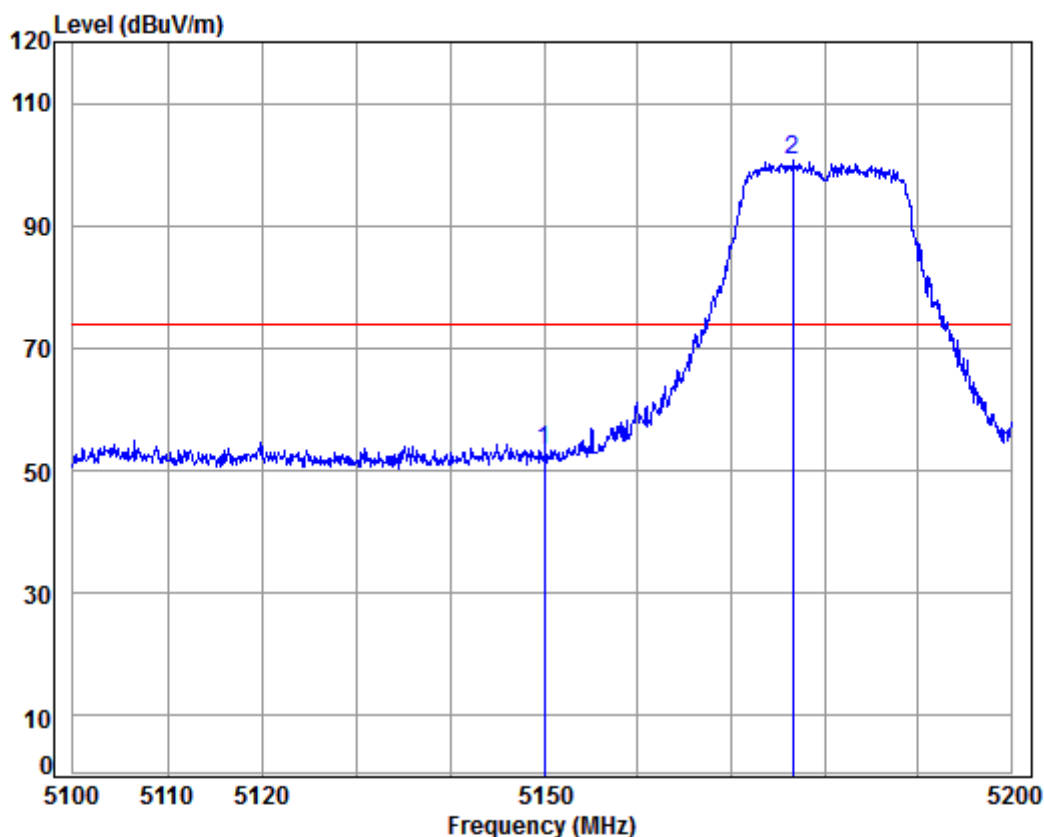
Job No: : 00220IT

Mode: : 5180 Bandedge

: N20

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5150.000	8.08	34.47	38.47	48.96	53.04	74.00	-20.96	Peak
2 pp	5174.114	8.09	34.46	38.47	96.11	100.19	74.00	26.19	Peak

Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m Vertical

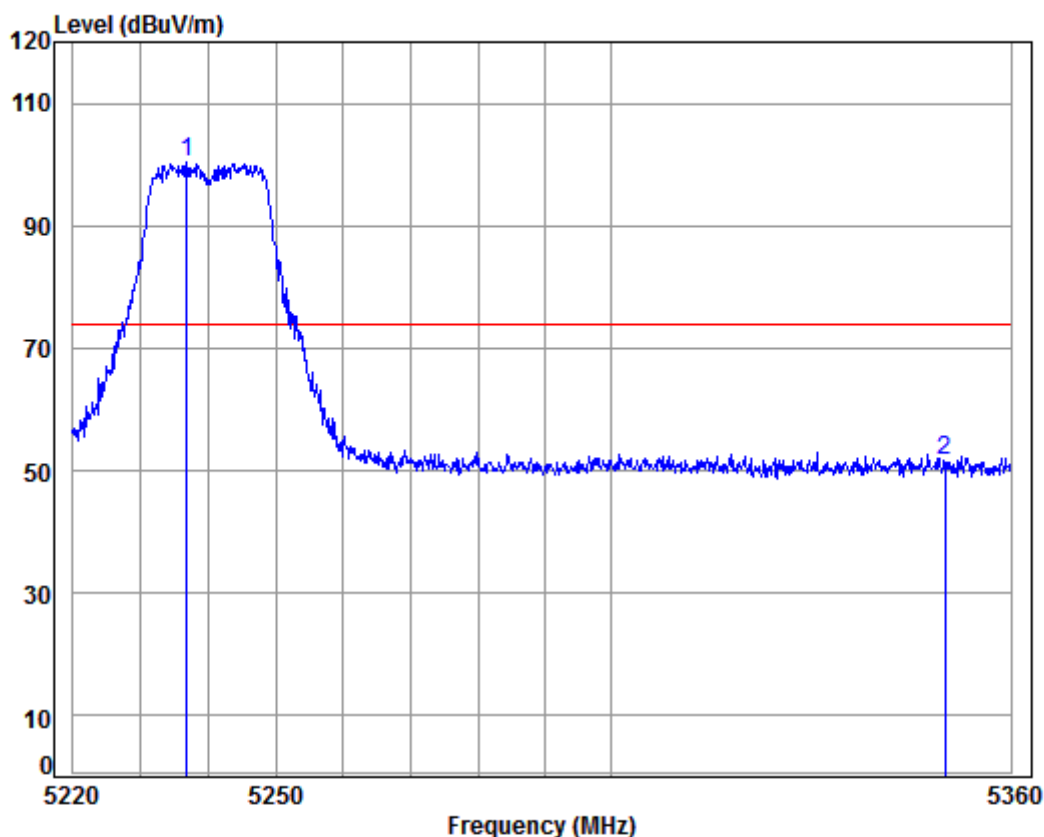
Job No: : 00220IT

Mode: : 5180 Bandedge

: N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5150.000	8.08	34.47	38.47	49.21	53.29	74.00	-20.71	Peak
2 pp	5176.526	8.09	34.46	38.46	96.49	100.58	74.00	26.58	Peak

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m Horizontal

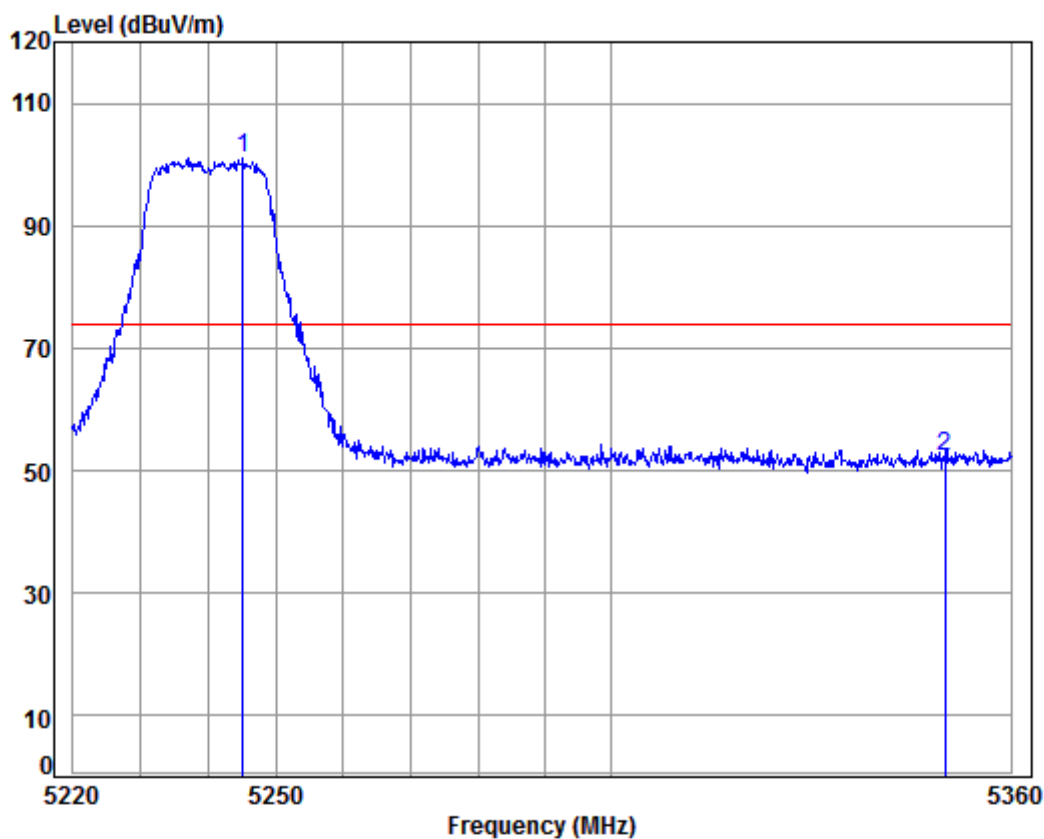
Job No: : 00220IT

Mode: : 5240 Bandedge

: N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	5236.744	8.12	34.45	38.45	96.31	100.43	74.00	26.43	Peak
2	5350.000	8.18	34.43	38.43	47.45	51.63	74.00	-22.37	Peak

Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m Vertical

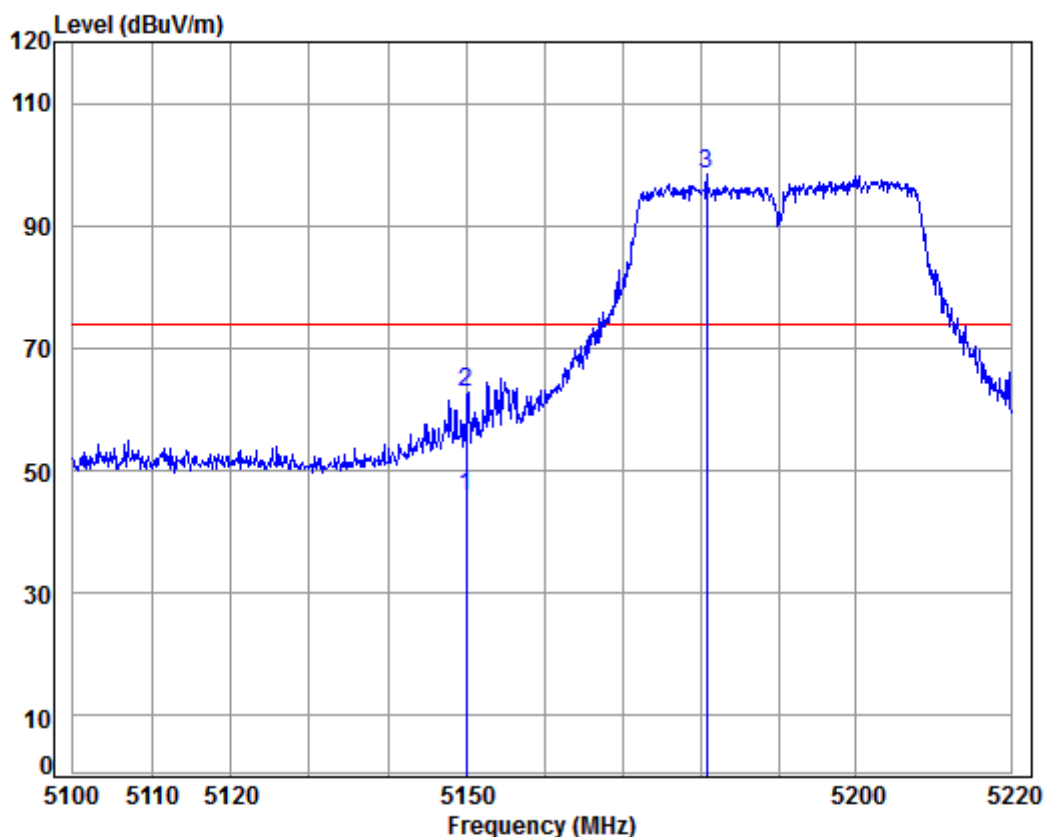
Job No: : 00220IT

Mode: : 5240 Bandedge

: N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	5245.066	8.13	34.45	38.45	96.77	100.90	74.00	26.90	Peak
2	5350.000	8.18	34.43	38.43	48.15	52.33	74.00	-21.67	Peak

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m Horizontal

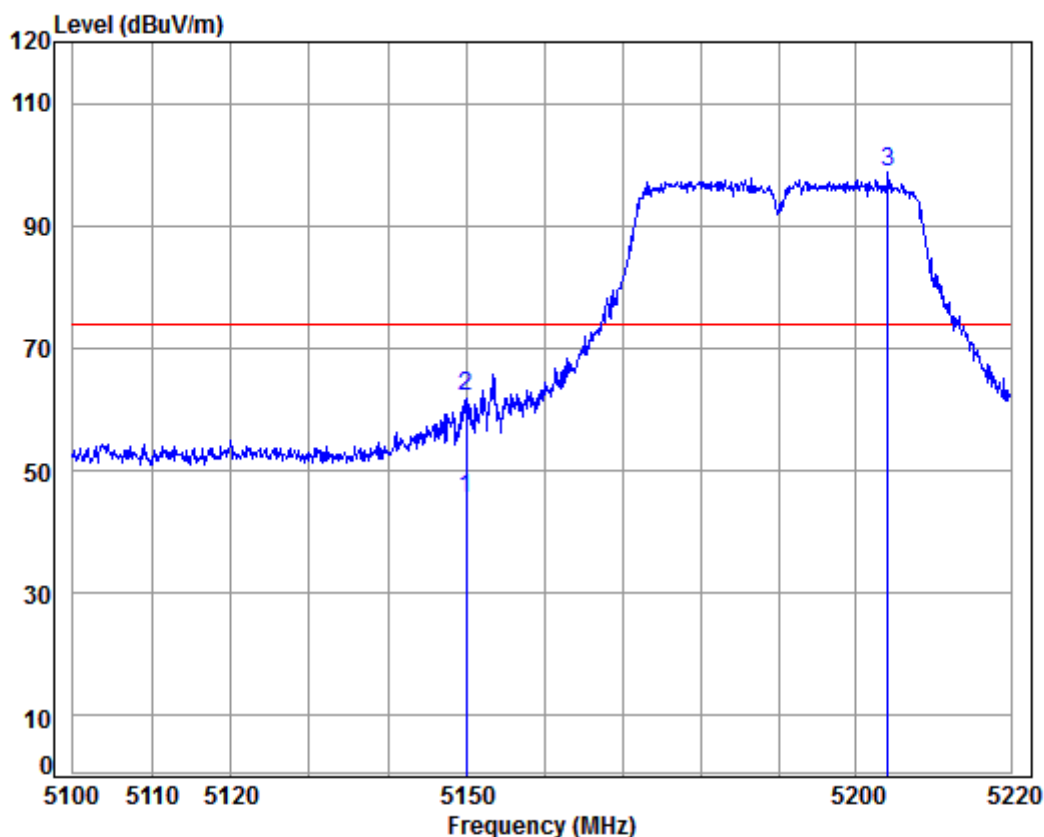
Job No: : 00220IT

Mode: : 5190 Bandedge

: N40

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 av	5150.000	8.08	34.47	38.47	41.83	45.91	54.00	-8.09 Average
2	5150.000	8.08	34.47	38.47	58.81	62.89	74.00	-11.11 Peak
3 pp	5180.814	8.09	34.46	38.46	94.31	98.40	74.00	24.40 Peak

Polarization:Vertical; Modulation Type:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m Vertical

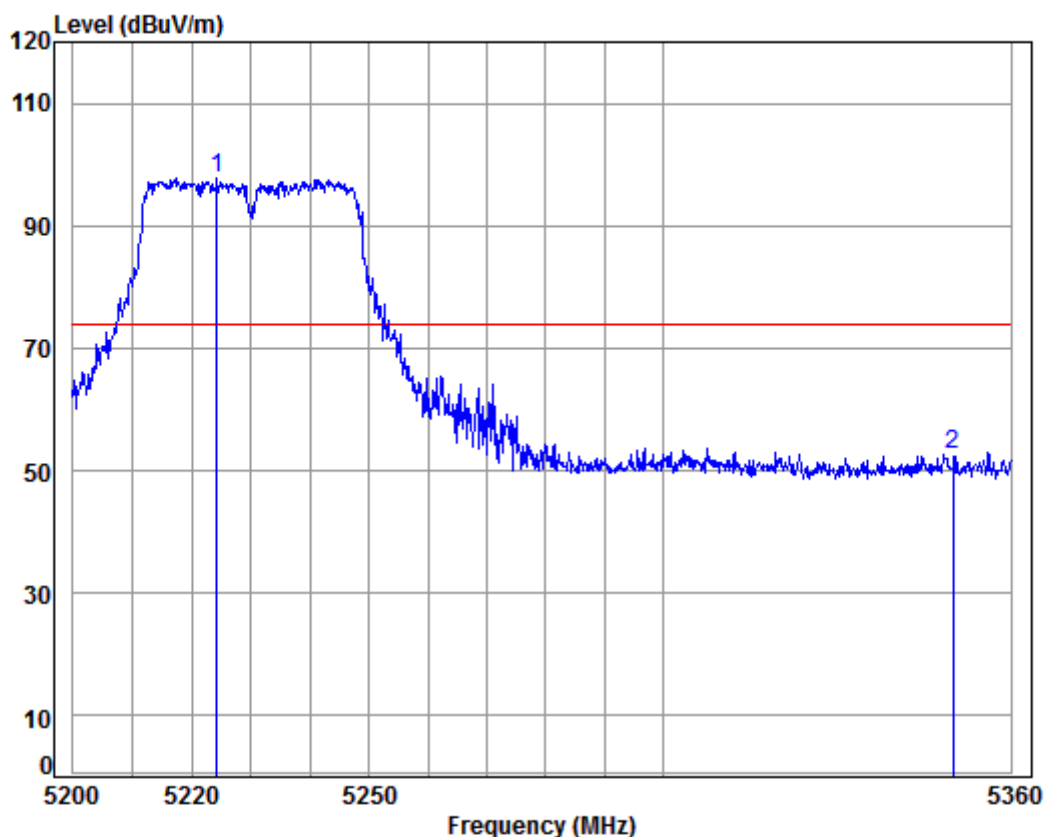
Job No: : 00220IT

Mode: : 5190 Bandedge

: N40

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 av	5150.000	8.08	34.47	38.47	41.21	45.29	54.00	-8.71 Average
2	5150.000	8.08	34.47	38.47	58.17	62.25	74.00	-11.75 Peak
3 pp	5204.121	8.10	34.46	38.46	94.53	98.63	74.00	24.63 Peak

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m Horizontal

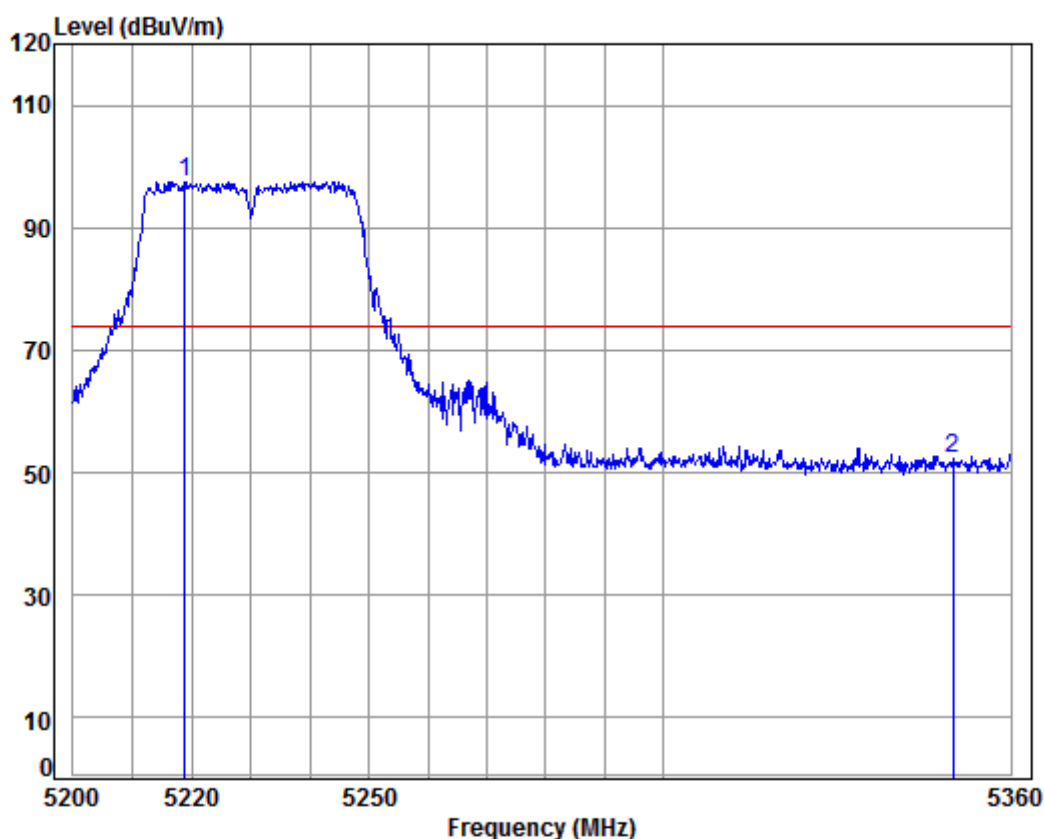
Job No: : 00220IT

Mode: : 5230 Bandedge

: N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 5224.167	8.12	34.45	38.46	93.70	97.81	74.00	23.81	Peak
2	5350.000	8.18	34.43	38.43	48.41	52.59	74.00	-21.41	Peak

Polarization:Vertical; Modulation Type:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m Vertical

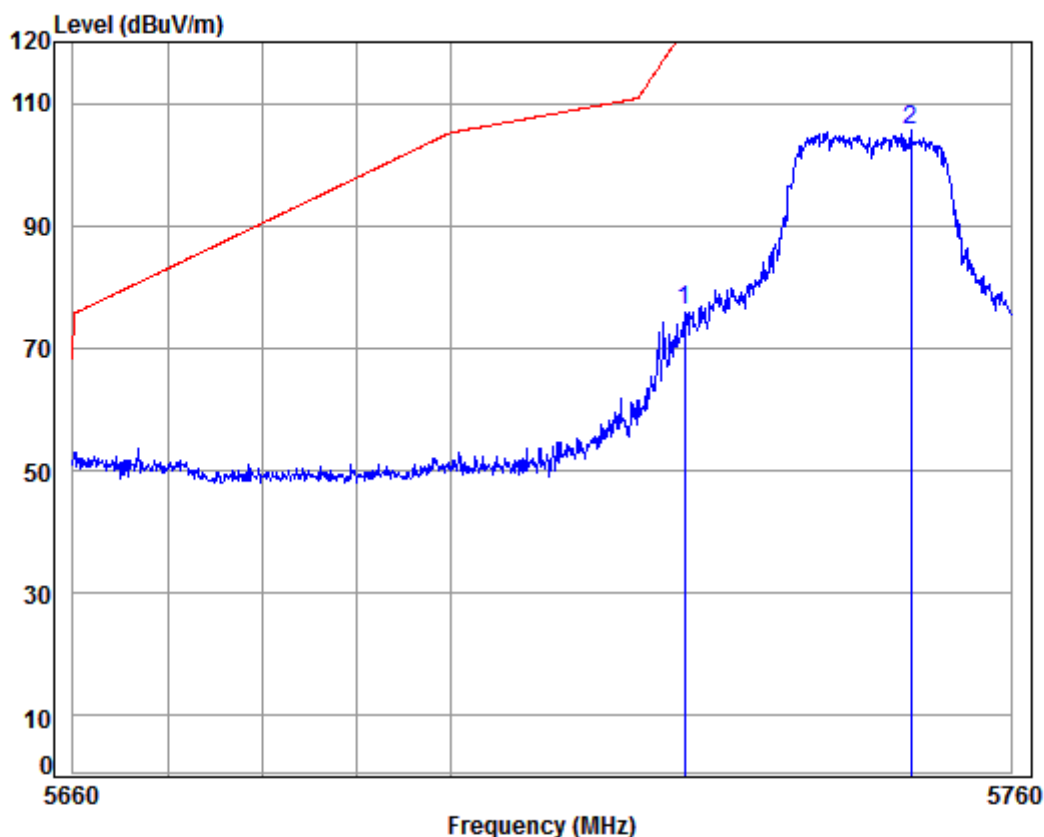
Job No: : 00220IT

Mode: : 5230 Bandedge

: N40

	Cable	Ant	Preamp	Read	Limit	Over		
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 5218.787	8.11	34.46	38.46	93.47	97.58	74.00	23.58	Peak
2 5350.000	8.18	34.43	38.43	48.00	52.18	74.00	-21.82	Peak

Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m Horizontal

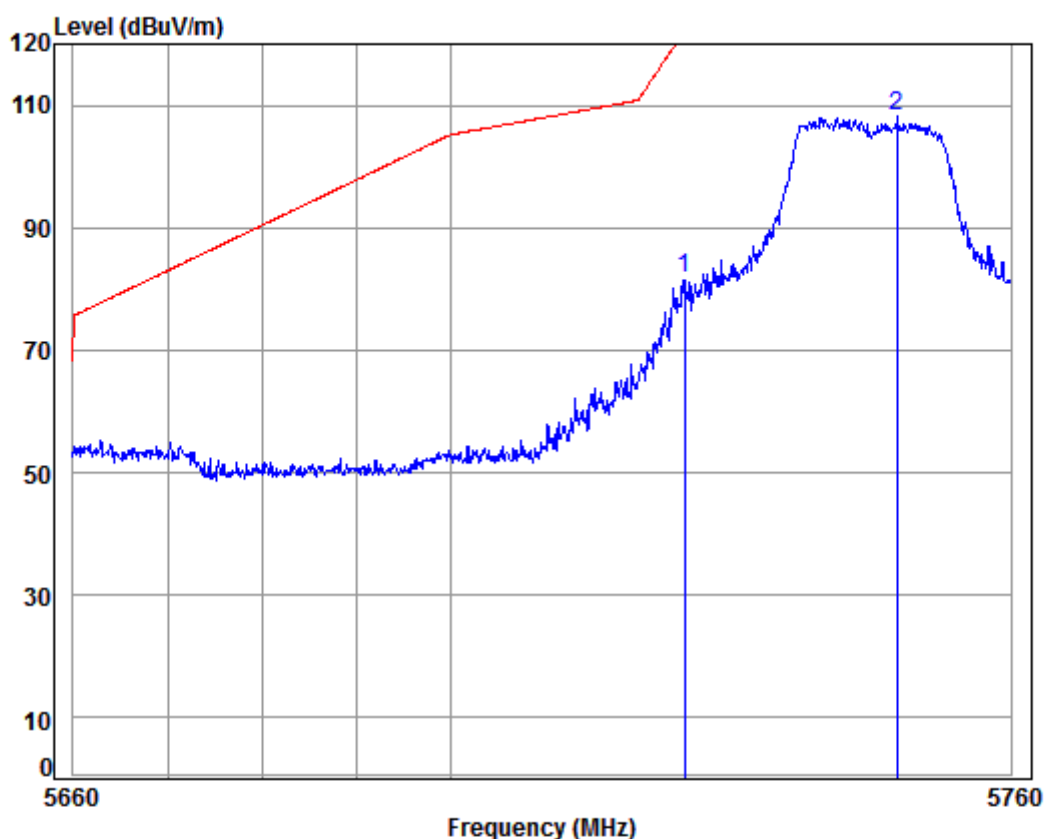
Job No: : 00220IT

Mode: : 5745 Bandedge

: A20

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5725.000	8.48	34.54	38.35	71.41	76.08	122.20	-46.12	Peak
2	5749.317	8.50	34.55	38.35	100.80	105.50	125.20	-19.70	Peak

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m Vertical

Job No: : 00220IT

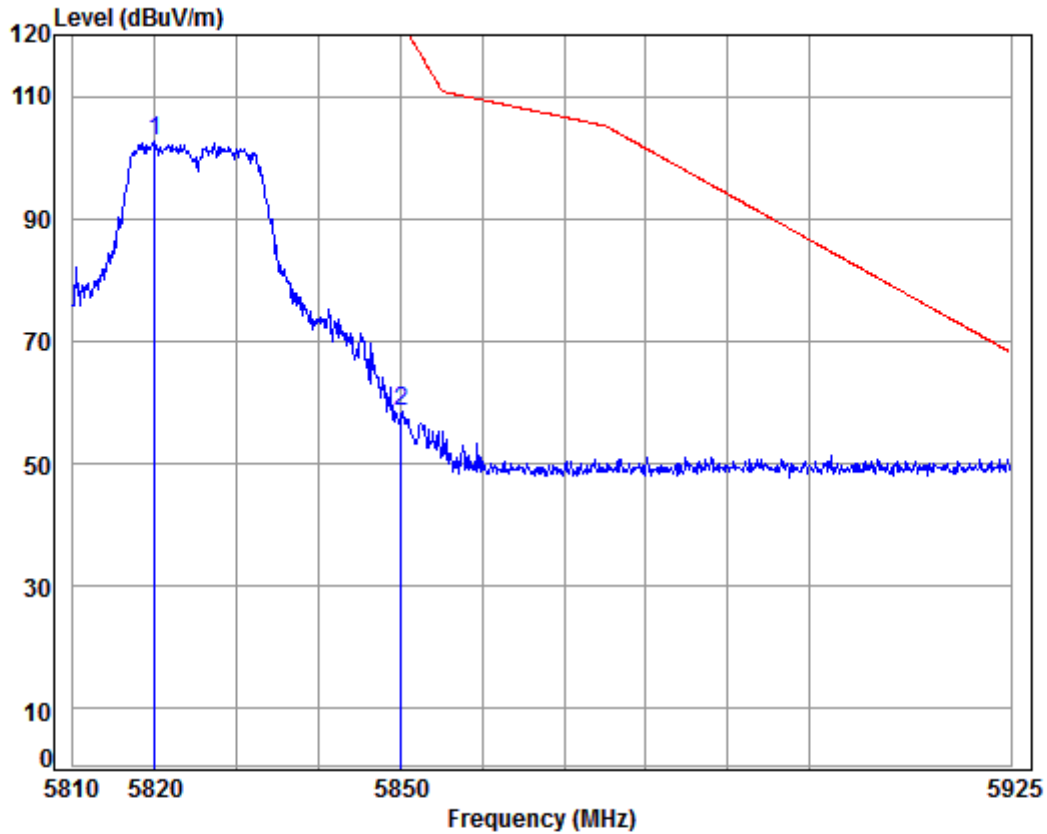
Mode: : 5745 Bandedge

: A20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	5725.000	8.48	34.54	38.35	76.99	81.66	122.20	-40.54 Peak
2 pp	5747.807	8.50	34.55	38.35	103.65	108.35	125.20	-16.85 Peak



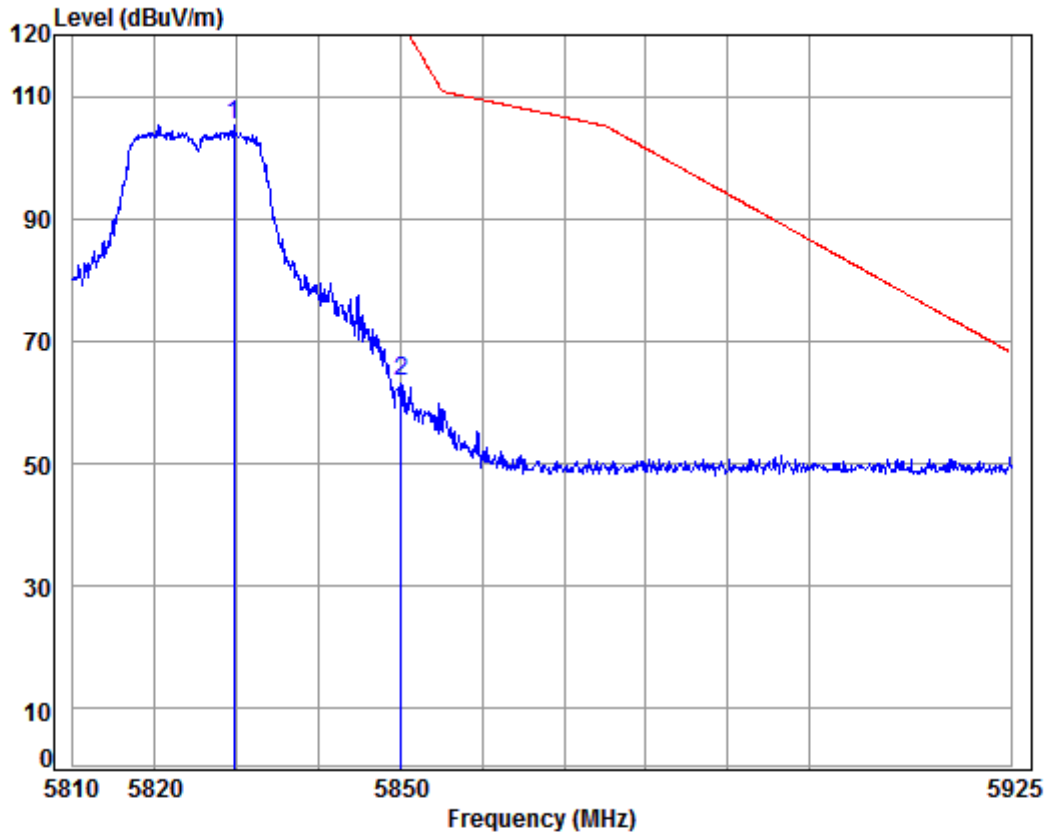
Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m Horizontal
Job No: : 00220IT
Mode: : 5825 Bandedge
: A20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 5819.916	8.57	34.59	38.34	97.78	102.60	125.20	-22.60	Peak
2	5850.000	8.60	34.61	38.33	53.62	58.50	122.20	-63.70	Peak

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m Vertical

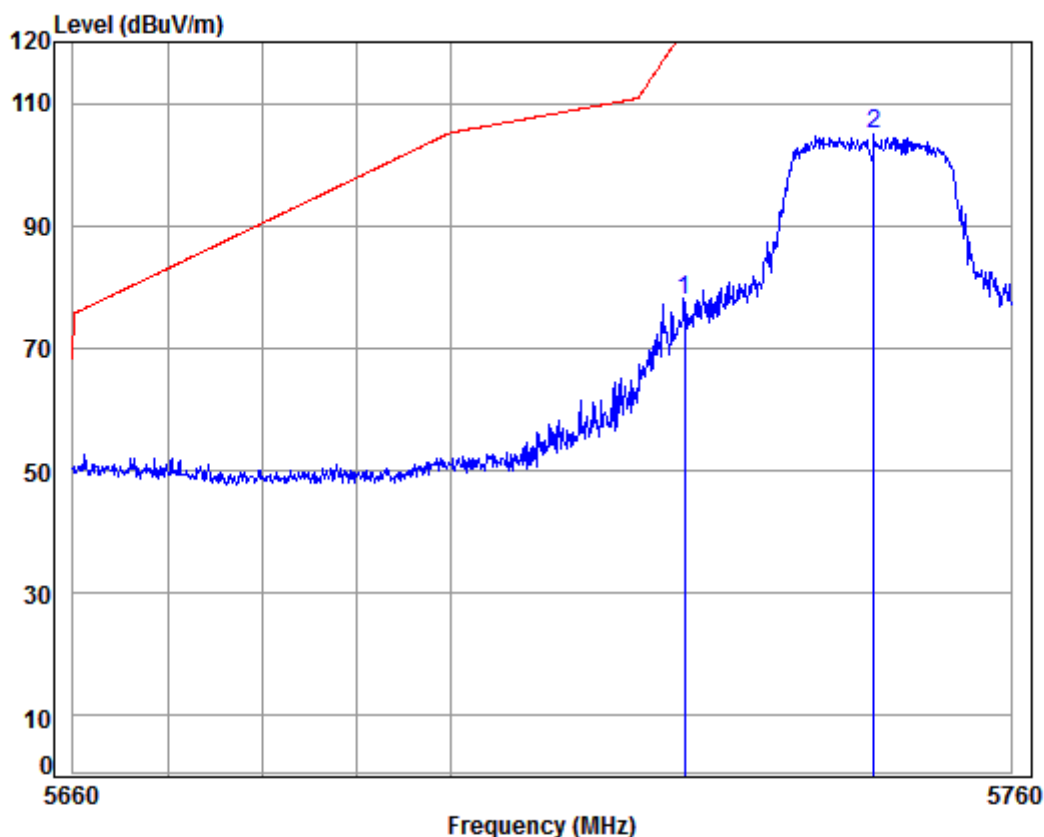
Job No: : 00220IT

Mode: : 5825 Bandedge

: A20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 5829.620	8.58	34.60	38.33	100.57	105.42	125.20	-19.78	Peak
2	5850.000	8.60	34.61	38.33	58.46	63.34	122.20	-58.86	Peak

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m Horizontal

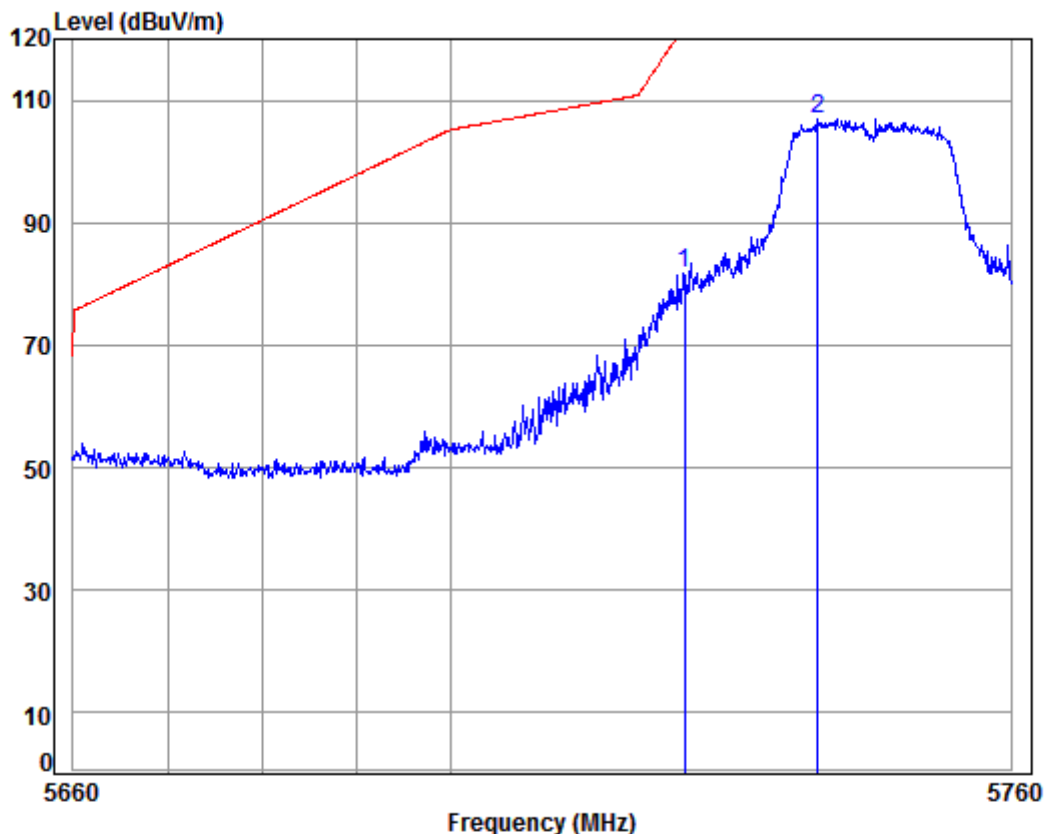
Job No: : 00220IT

Mode: : 5745 Bandedge

: N20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	5725.000	8.48	34.54	38.35	73.04	77.71	122.20	-44.49 Peak
2 pp	5745.291	8.50	34.55	38.35	100.42	105.12	125.20	-20.08 Peak

Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m Vertical

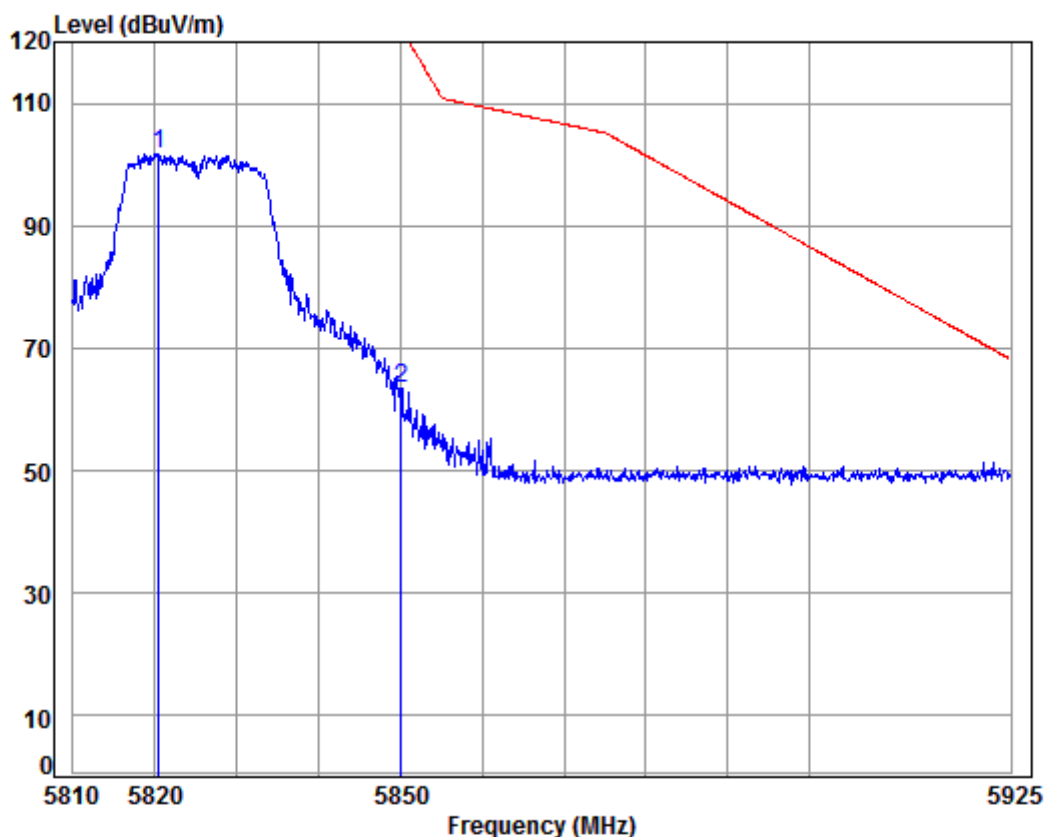
Job No: : 00220IT

Mode: : 5745 Bandedge

: N20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	5725.000	8.48	34.54	38.35	77.22	81.89	122.20	-40.31 Peak
2 pp	5739.256	8.49	34.55	38.35	102.29	106.98	125.20	-18.22 Peak

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m Horizontal

Job No: : 00220IT

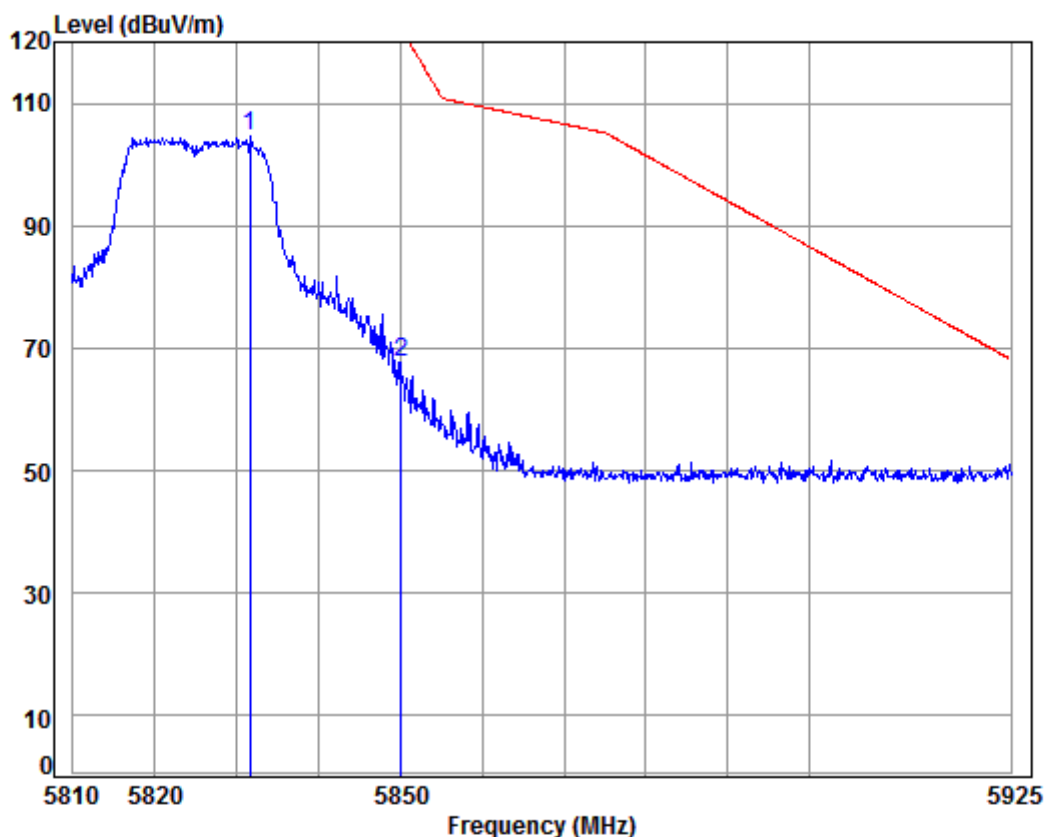
Mode: : 5825 Bandedge

: N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	5820.486	8.58	34.60	38.34	96.96	101.80	125.20	-23.40	Peak
2	5850.000	8.60	34.61	38.33	58.43	63.31	122.20	-58.89	Peak



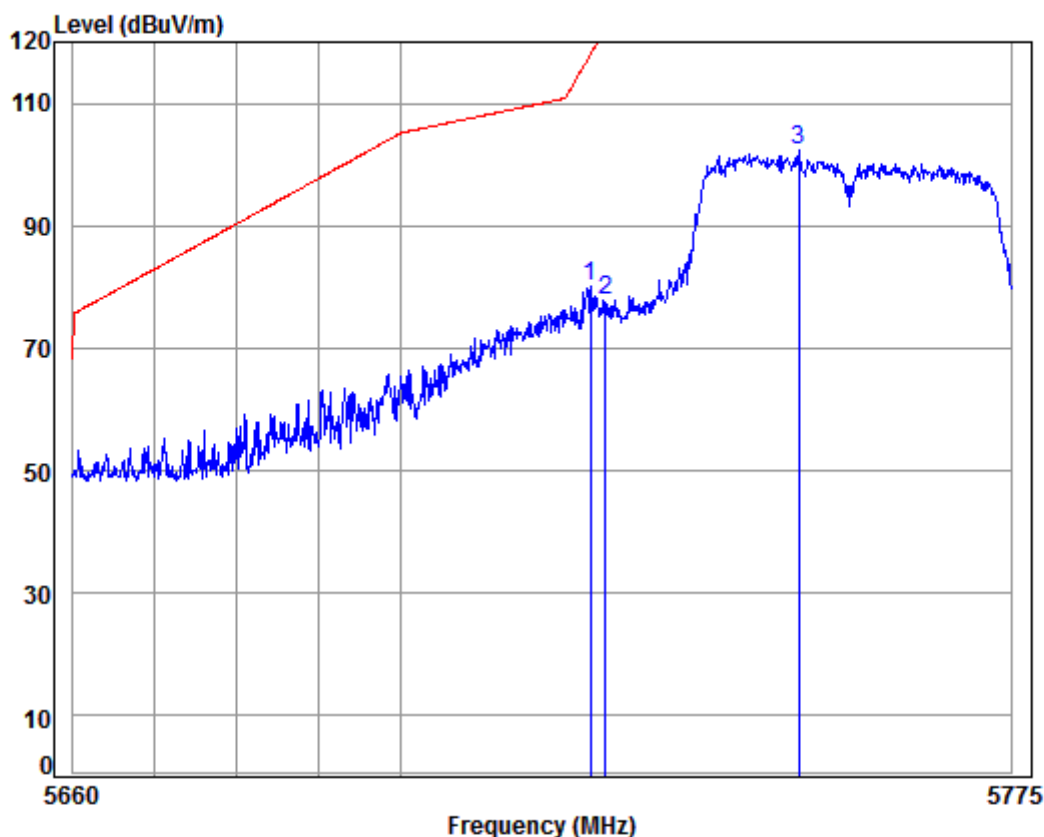
Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m Vertical
Job No: : 00220IT
Mode: : 5825 Bandedge
: N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	5831.563	8.59	34.60	38.33	99.81	104.67	125.20	-20.53	Peak
2	5850.000	8.60	34.61	38.33	62.93	67.81	122.20	-54.39	Peak

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m Horizontal

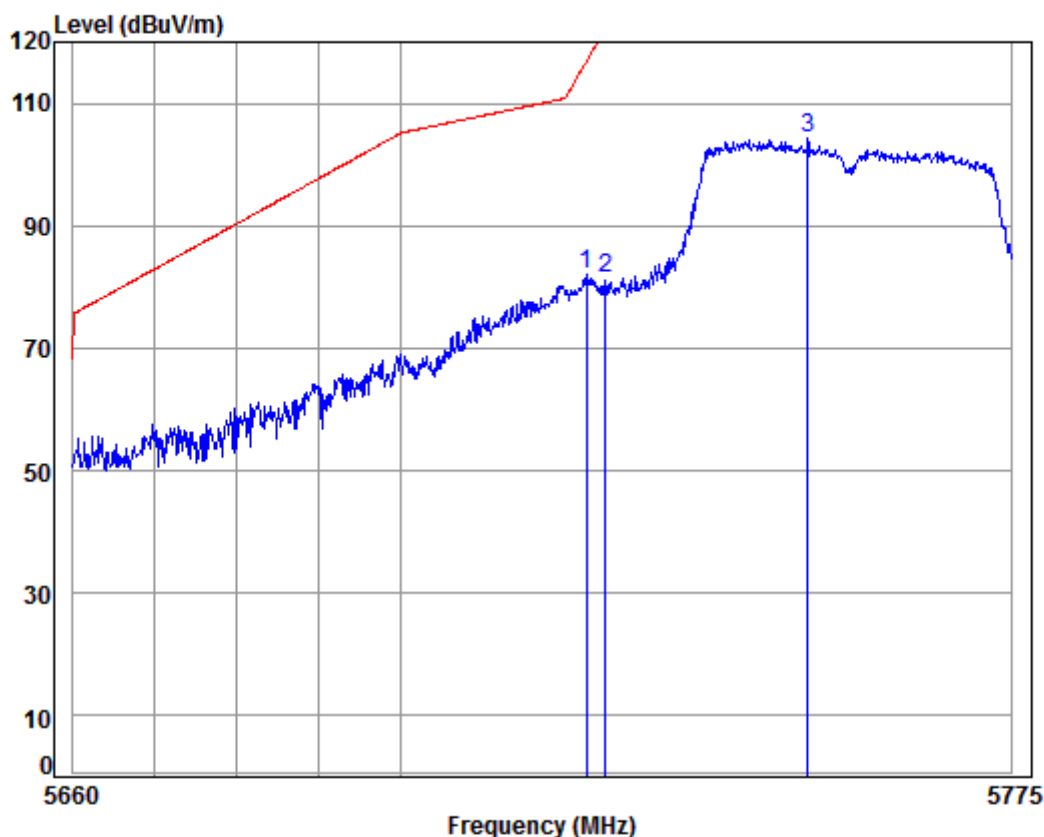
Job No: : 00220IT

Mode: : 5755 Bandedge

: N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5723.194	8.48	34.54	38.36	75.41	80.07	118.08	-38.01	Peak
2	5725.000	8.48	34.54	38.35	73.12	77.79	122.20	-44.41	Peak
3 pp	5748.807	8.50	34.55	38.35	97.51	102.21	125.20	-22.99	Peak

Polarization:Vertical; Modulation Type:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m Vertical

Job No: : 00220IT

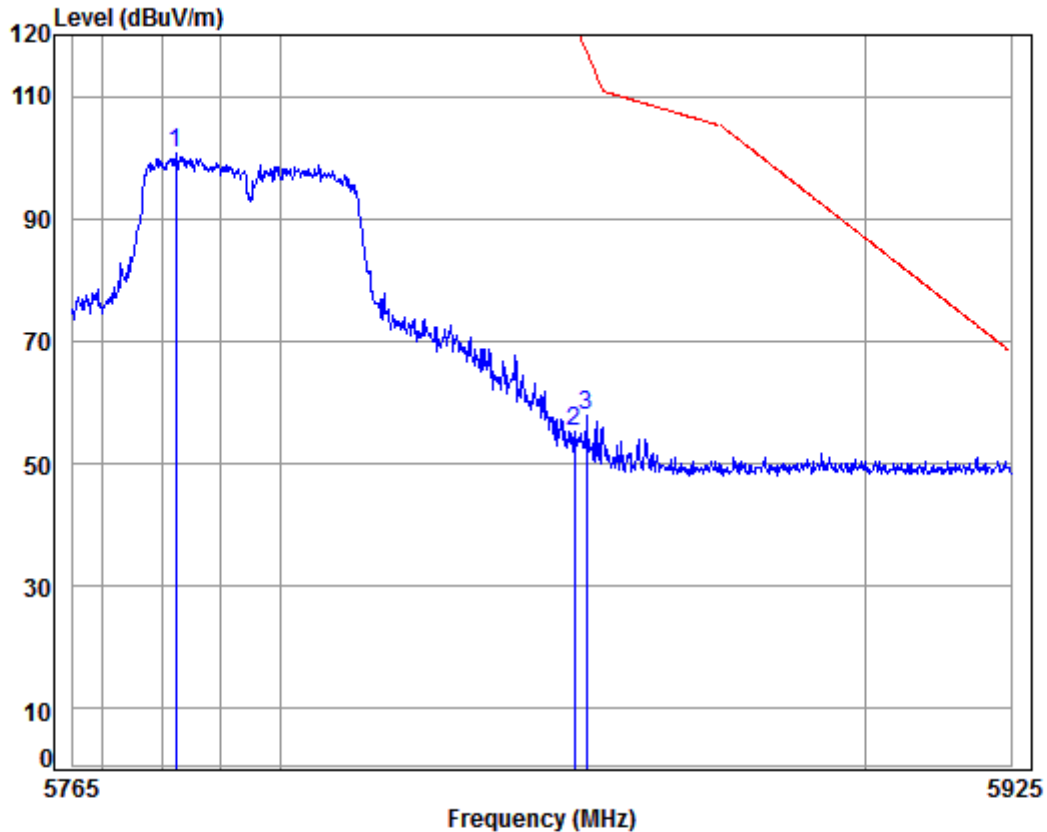
Mode: : 5755 Bandedge

: N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5722.618	8.48	34.54	38.36	77.42	82.08	116.77	-34.69	Peak
2	5725.000	8.48	34.54	38.35	76.65	81.32	122.20	-40.88	Peak
3 pp	5749.964	8.51	34.55	38.35	99.71	104.42	125.20	-20.78	Peak



Polarization:Horizontal; Modulation Type:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m Horizontal

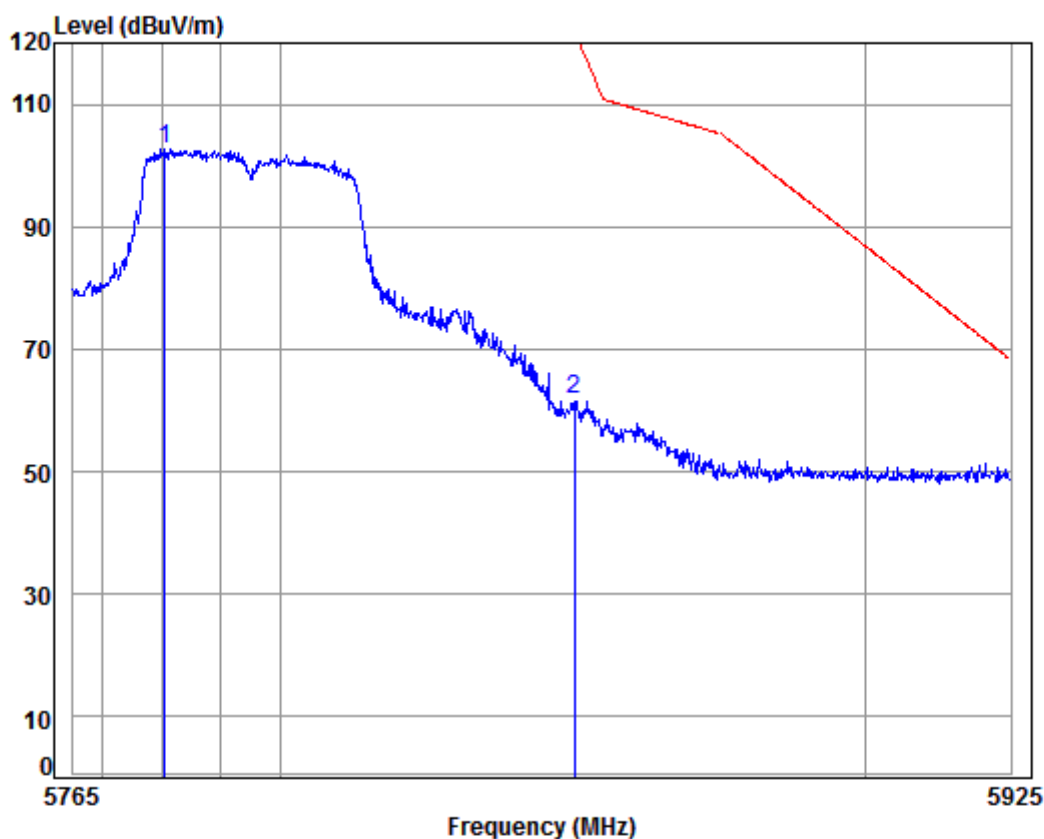
Job No: : 00220IT

Mode: : 5795 Bandedge

: N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	5782.386	8.54	34.57	38.34	96.01	100.78	125.20	-24.42	Peak
2	5850.000	8.60	34.61	38.33	50.26	55.14	122.20	-67.06	Peak
3	5851.977	8.61	34.61	38.33	53.07	57.96	117.69	-59.73	Peak

Polarization:Vertical; Modulation Type:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m Vertical

Job No: : 00220IT

Mode: : 5795 Bandedge

: N40

	Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp 5780.487	8.54	34.57	38.34	97.81	102.58	125.20	-22.62 Peak
2 5850.000	8.60	34.61	38.33	56.92	61.80	122.20	-60.40 Peak

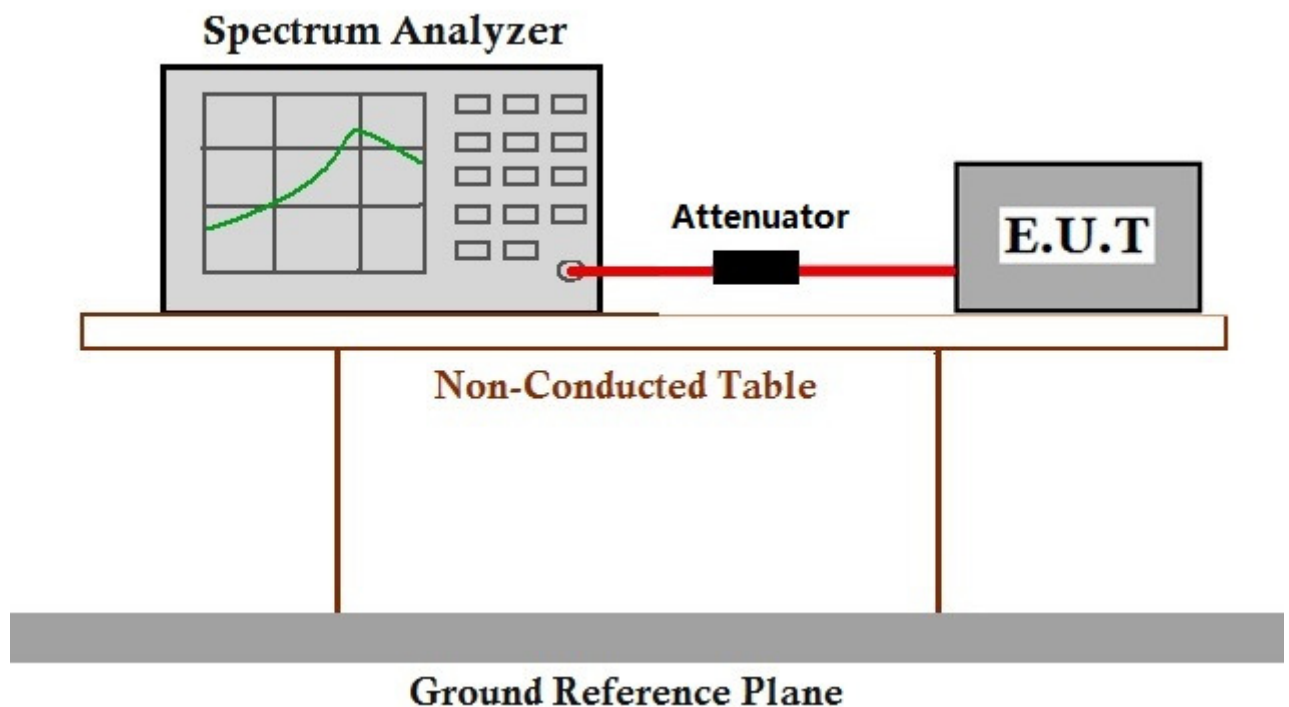
7.7 Frequency Stability

Test Requirement	47 CFR Part 15, Subpart E 15.407 (g)
Test Method:	ANSI C63.10 (2013) Section 6.8
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

7.7.1 E.U.T. Operation

Operating Environment:								
Temperature:	24	°C	Humidity:	55	% RH	Atmospheric Pressure:	1015	mbar
Pretest these mode to find the worst case:	Transmitting with all kind of modulations, data rates.							
The worst case for final test:	Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40). Only the worst case is recorded in the report.							

7.7.2 Test Setup Diagram



7.7.3 Measurement Data



Test mode:	802.11a	Frequency(MHz):	5180
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5181.4295	Pass
35		5181.4303	Pass
25		5181.4310	Pass
15		5181.4306	Pass
5		5181.4298	Pass
-5		5181.4298	Pass
25	138	5181.4303	Pass
	120	5181.4312	Pass
	102	5181.4295	Pass

Test mode:	802.11a	Frequency(MHz):	5200
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5198.5630	Pass
35		5198.5635	Pass
25		5198.5641	Pass
15		5198.5632	Pass
5		5198.5623	Pass
-5		5198.5629	Pass
25	138	5198.5635	Pass
	120	5198.5645	Pass
	102	5198.5630	Pass



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Test mode:	802.11a	Frequency(MHz):	5240
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5240.3953	Pass
35		5240.3955	Pass
25		5240.3956	Pass
15		5240.3947	Pass
5		5240.3944	Pass
-5		5240.3952	Pass
25	138	5240.3955	Pass
	120	5240.3962	Pass
	102	5240.3953	Pass

Test mode:	802.11a	Frequency(MHz):	5745
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5744.4483	Pass
35		5744.4488	Pass
25		5744.4498	Pass
15		5744.4488	Pass
5		5744.4481	Pass
-5		5744.4486	Pass
25	138	5744.4488	Pass
	120	5744.4497	Pass
	102	5744.4483	Pass



Test mode:	802.11a	Frequency(MHz):	5785
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5786.8438	Pass
35		5786.8443	Pass
25		5786.8452	Pass
15		5786.8445	Pass
5		5786.8436	Pass
-5		5786.8439	Pass
25	138	5786.8443	Pass
	120	5786.8447	Pass
	102	5786.8438	Pass

Test mode:	802.11a	Frequency(MHz):	5825
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5825.3681	Pass
35		5825.3689	Pass
25		5825.3694	Pass
15		5825.3690	Pass
5		5825.3686	Pass
-5		5825.3684	Pass
25	138	5825.3689	Pass
	120	5825.3696	Pass
	102	5825.3681	Pass



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Test mode:	802.11n(HT20)	Frequency(MHz):	5180
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5178.5959	Pass
35		5178.5963	Pass
25		5178.5966	Pass
15		5178.5960	Pass
5		5178.5951	Pass
-5		5178.5957	Pass
25	138	5178.5963	Pass
	120	5178.5973	Pass
	102	5178.5959	Pass

Test mode:	802.11n(HT20)	Frequency(MHz):	5200
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5198.5730	Pass
35		5198.5738	Pass
25		5198.5740	Pass
15		5198.5736	Pass
5		5198.5733	Pass
-5		5198.5734	Pass
25	138	5198.5738	Pass
	120	5198.5739	Pass
	102	5198.5730	Pass



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Test mode:	802.11n(HT20)	Frequency(MHz):	5240
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5238.3846	Pass
35		5238.3852	Pass
25		5238.3854	Pass
15		5238.3847	Pass
5		5238.3840	Pass
-5		5238.3848	Pass
25	138	5238.3852	Pass
	120	5238.3859	Pass
	102	5238.3846	Pass

Test mode:	802.11n(HT20)	Frequency(MHz):	5745
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5745.7270	Pass
35		5745.7275	Pass
25		5745.7277	Pass
15		5745.7269	Pass
5		5745.7262	Pass
-5		5745.7266	Pass
25	138	5745.7275	Pass
	120	5745.7283	Pass
	102	5745.7270	Pass



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Test mode:	802.11n(HT20)	Frequency(MHz):	5785
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5786.4568	Pass
35		5786.4570	Pass
25		5786.4578	Pass
15		5786.4568	Pass
5		5786.4563	Pass
-5		5786.4565	Pass
25	138	5786.4570	Pass
	120	5786.4575	Pass
	102	5786.4568	Pass

Test mode:	802.11n(HT20)	Frequency(MHz):	5825
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5823.1488	Pass
35		5823.1496	Pass
25		5823.1505	Pass
15		5823.1503	Pass
5		5823.1499	Pass
-5		5823.1488	Pass
25	138	5823.1496	Pass
	120	5823.1506	Pass
	102	5823.1488	Pass



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Test mode:	802.11n(HT40)	Frequency(MHz):	5190
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5191.8335	Pass
35		5191.8340	Pass
25		5191.8348	Pass
15		5191.8341	Pass
5		5191.8336	Pass
-5		5191.8338	Pass
25	138	5191.8340	Pass
	120	5191.8349	Pass
	102	5191.8335	Pass

Test mode:	802.11n(HT40)	Frequency(MHz):	5230
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5229.7307	Pass
35		5229.7316	Pass
25		5229.7323	Pass
15		5229.7318	Pass
5		5229.7313	Pass
-5		5229.7310	Pass
25	138	5229.7316	Pass
	120	5229.7324	Pass
	102	5229.7307	Pass



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Test mode:	802.11n(HT40)	Frequency(MHz):	5755
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5757.0095	Pass
35		5757.0102	Pass
25		5757.0108	Pass
15		5757.0105	Pass
5		5757.0096	Pass
-5		5757.0099	Pass
25	138	5757.0102	Pass
	120	5757.0111	Pass
	102	5757.0095	Pass

Test mode:	802.11n(HT40)	Frequency(MHz):	5795
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Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Result
45	120	5796.3765	Pass
35		5796.3770	Pass
25		5796.3777	Pass
15		5796.3769	Pass
5		5796.3761	Pass
-5		5796.3764	Pass
25	138	5796.3770	Pass
	120	5796.3772	Pass
	102	5796.3765	Pass

7.8 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.407(b)
Test Method: KDB 789033 D02 II G
Measurement Distance: 10m

7.8.1 E.U.T. Operation

Operating Environment:

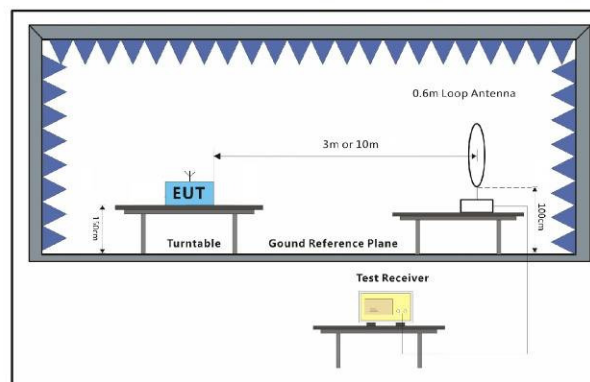
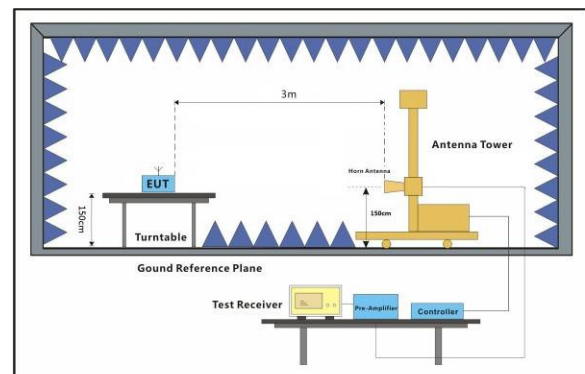
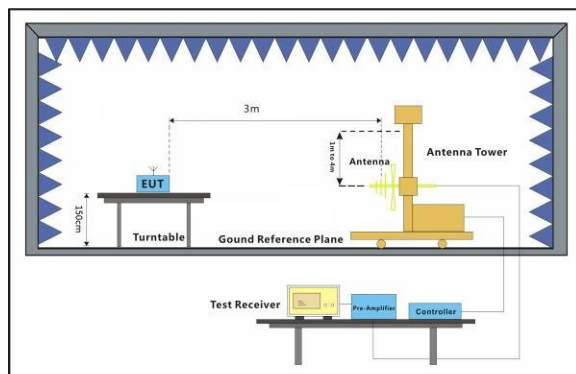
Temperature: 24 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar

Pretest these Transmitting with all kind of modulations, data rates.
mode to find the worst case:

The worst case Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a;
for final test: MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40).

Only the worst case is recorded in the report.

7.8.2 Test Setup Diagram



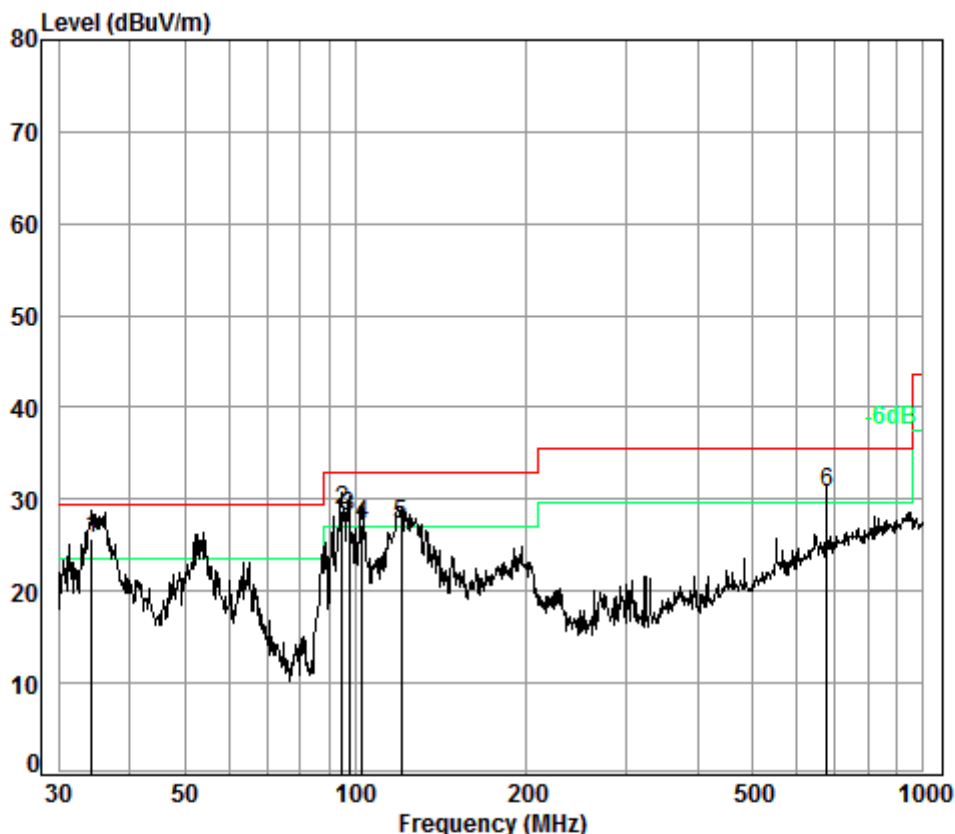


7.8.3 Measurement Data

- 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.

7.8.4 Radiated emission below 1GHz

30MHz~1GHz (QP)		
Test mode:	Transmitting	Vertical



Condition: 10m VERTICAL

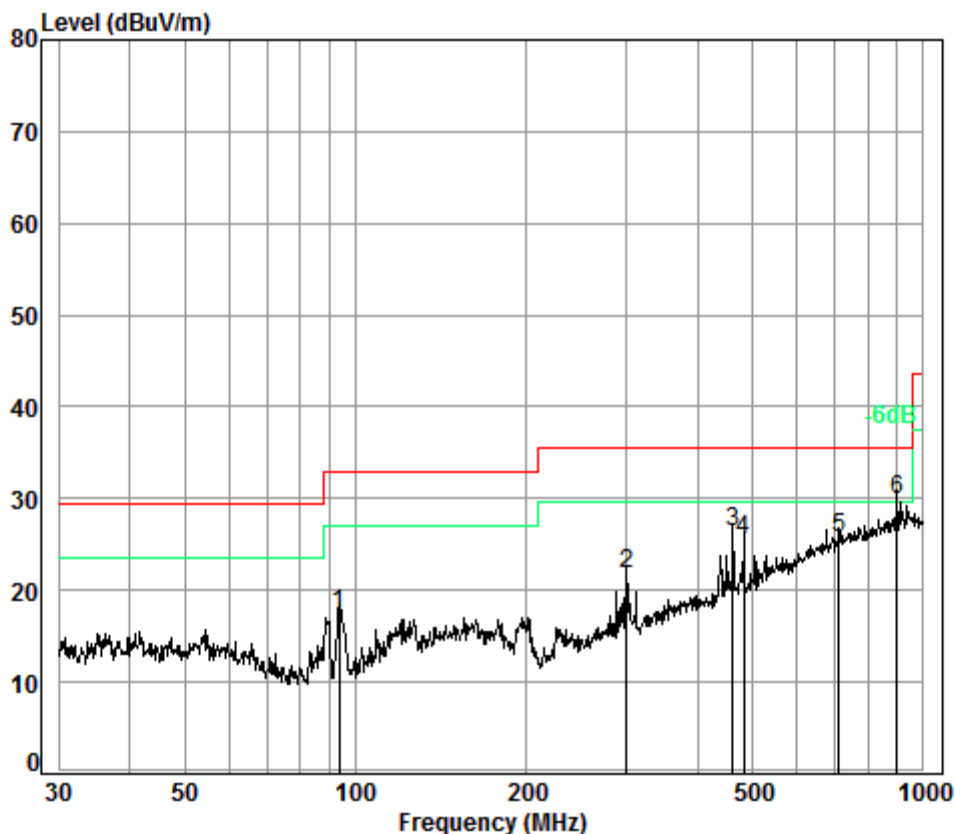
Job No. : 00220IT

Test Mode: TX mode

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	34.40	6.70	12.62	32.98	39.43	25.77	29.50	-3.73
2	94.76	7.20	9.03	32.82	45.42	28.83	33.00	-4.17
3	97.46	7.20	9.22	32.81	44.61	28.22	33.00	-4.78
4	102.72	7.21	9.67	32.80	43.26	27.34	33.00	-5.66
5	120.28	7.30	11.51	32.77	41.22	27.26	33.00	-5.74
6	675.21	9.09	19.84	32.60	34.39	30.72	35.60	-4.88



Test mode:	Transmitting	Horizontal
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Condition: 10m HORIZONTAL

Job No. : 00220IT

Test Mode: TX mode

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	93.77	7.20	8.96	32.82	34.13	17.47	33.00	-15.53
2	300.37	8.05	12.67	32.60	33.65	21.77	35.60	-13.83
3	462.35	8.46	16.32	32.60	34.16	26.34	35.60	-9.26
4	483.91	8.52	16.57	32.60	32.98	25.47	35.60	-10.13
5	709.18	9.17	20.24	32.60	28.91	25.72	35.60	-9.88
6 pp	900.15	9.50	22.22	32.50	30.69	29.91	35.60	-5.69



For frequencies below 1GHz, the test was performed at a 10m test site. According to below formulate and the test data at 10m test distance,

$$L_3 / L_{10} = D_{10} / D_3$$

Note:

L_3 : Level @ 3m distance. Unit: uV/m;

L_{10} : Level @ 10m distance. Unit: uV/m;

D_3 : 3m distance. Unit: m

D_{10} : 10m distance. Unit: m

The level at 3m test distance is below:

Frequency (MHz)	Level @ 10m (dBuV/m)	Level @ 10m (uV/m)	Level @ 3m (uV/m)	Level @ 3m (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dB)	Ant. Polarization
34.40	25.77	19.43	64.77	36.23	40.00	-3.77	V
94.76	28.83	27.64	92.13	39.29	43.50	-4.21	V
97.46	28.22	25.76	85.88	38.68	43.50	-4.82	V
102.72	27.34	23.28	77.60	37.80	43.50	-5.70	V
120.28	27.26	23.07	76.89	37.72	43.50	-5.78	V
675.21	30.72	34.36	114.52	41.18	46.00	-4.82	V
93.77	17.47	7.47	24.91	27.93	43.50	-15.57	H
300.37	21.77	12.26	40.87	32.23	46.00	-13.77	H
462.35	26.34	20.75	69.16	36.80	46.00	-9.20	H
483.91	25.47	18.77	62.57	35.93	46.00	-10.07	H
709.18	25.72	19.32	64.40	36.18	46.00	-9.82	H
900.15	29.91	31.30	104.32	40.37	46.00	-5.63	H



7.8.5 Transmitter emission above 1GHz

Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7228.430	36.41	10.69	37.09	40.19	50.20	74.00	-23.80	
8839.163	36.41	11.81	35.56	39.24	51.90	74.00	-22.10	
10360.000	37.24	12.98	35.08	36.88	52.02	74.00	-21.98	
12775.540	38.84	14.93	37.46	36.95	53.26	74.00	-20.74	
15540.000	41.38	17.07	38.31	32.88	53.02	74.00	-20.98	
17332.670	43.20	19.84	36.13	26.59	53.50	74.00	-20.50	

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7959.426	36.58	11.04	36.44	39.62	50.80	74.00	-23.20	
10360.000	37.24	12.98	35.08	44.93	60.07	74.00	-13.93	
10360.000	37.24	12.98	35.08	34.72	49.86	54.00	-4.14	Average
12209.300	38.73	14.39	36.10	36.47	53.49	74.00	-20.51	
13817.310	38.98	16.04	38.82	36.26	52.46	74.00	-21.54	
15540.000	41.38	17.07	38.31	33.42	53.56	74.00	-20.44	
17332.670	43.20	19.84	36.13	26.32	53.23	74.00	-20.77	

Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:middle

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7126.747	36.45	10.65	37.19	41.34	51.25	74.00	-22.75	
9266.588	37.09	12.14	35.27	38.91	52.87	74.00	-21.13	
10440.000	37.16	13.04	35.12	38.30	53.38	74.00	-20.62	
12348.460	38.81	14.27	36.44	36.34	52.98	74.00	-21.02	
15660.000	41.34	17.18	38.17	33.45	53.80	74.00	-20.20	
17646.510	43.67	20.92	35.98	24.51	53.12	74.00	-20.88	

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:middle

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7026.495	36.49	10.61	37.28	41.60	51.42	74.00	-22.58	
8772.629	36.33	11.82	35.63	38.72	51.24	74.00	-22.76	
10440.000	37.16	13.04	35.12	43.50	58.58	74.00	-15.42	
10440.000	37.16	13.04	35.12	34.30	49.38	54.00	-4.62	Average
12860.280	38.83	15.16	37.66	36.72	53.05	74.00	-20.95	
15660.000	41.34	17.18	38.17	32.55	52.90	74.00	-21.10	
17797.150	43.94	21.44	35.90	23.64	53.12	74.00	-20.88	



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Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7436.168	36.32	10.77	36.91	40.76	50.94	74.00	-23.06	
8872.619	36.45	11.80	35.53	39.60	52.32	74.00	-21.68	
10480.000	37.12	13.07	35.14	37.89	52.94	74.00	-21.06	
12560.180	38.89	14.32	36.94	37.27	53.54	74.00	-20.46	
15720.000	41.31	17.24	38.11	32.52	52.96	74.00	-21.04	
17797.150	43.94	21.44	35.90	23.50	52.98	74.00	-21.02	

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7214.789	36.41	10.68	37.11	40.77	50.75	74.00	-23.25	
8914.617	36.50	11.80	35.49	38.98	51.79	74.00	-22.21	
10480.000	37.12	13.07	35.14	45.49	60.54	74.00	-13.46	
10480.000	37.11	13.08	35.14	34.32	49.37	54.00	-4.63	Average
12209.300	38.73	14.39	36.10	35.83	52.85	74.00	-21.15	
15720.000	41.31	17.24	38.11	33.40	53.84	74.00	-20.16	
17646.510	43.67	20.92	35.98	24.50	53.11	74.00	-20.89	

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7394.148	36.34	10.75	36.95	40.35	50.49	74.00	-23.51	
8931.473	36.52	11.80	35.47	39.33	52.18	74.00	-21.82	
10360.000	37.24	12.98	35.08	36.69	51.83	74.00	-22.17	
13093.140	38.76	15.57	38.09	36.19	52.43	74.00	-21.57	
15540.000	41.38	17.07	38.31	33.56	53.70	74.00	-20.30	
17563.380	43.52	20.64	36.02	24.93	53.07	74.00	-20.93	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7366.267	36.35	10.74	36.97	39.83	49.95	74.00	-24.05	
8839.163	36.41	11.81	35.56	39.20	51.86	74.00	-22.14	
10360.000	37.24	12.98	35.08	37.03	52.17	74.00	-21.83	
12896.770	38.82	15.27	37.75	36.59	52.93	74.00	-21.07	
15540.000	41.38	17.07	38.31	32.72	52.86	74.00	-21.14	
17780.350	43.91	21.38	35.91	24.19	53.57	74.00	-20.43	



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Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:middle

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7235.260	36.40	10.69	37.09	40.65	50.65	74.00	-23.35	
9559.950	37.51	12.47	35.12	38.16	53.02	74.00	-20.98	
10440.000	37.16	13.04	35.12	36.77	51.85	74.00	-22.15	
12691.350	38.86	14.69	37.26	36.68	52.97	74.00	-21.03	
15660.000	41.34	17.18	38.17	32.23	52.58	74.00	-21.42	
17613.210	43.61	20.81	35.99	24.59	53.02	74.00	-20.98	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:middle

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7810.490	36.49	10.96	36.57	39.86	50.74	74.00	-23.26	
9452.214	37.42	12.38	35.17	38.35	52.98	74.00	-21.02	
10440.000	37.16	13.04	35.12	36.31	51.39	74.00	-22.61	
13622.950	38.75	15.82	38.62	37.03	52.98	74.00	-21.02	
15660.000	41.34	17.18	38.17	33.28	53.63	74.00	-20.37	
17797.150	43.94	21.44	35.90	23.67	53.15	74.00	-20.85	

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7373.228	36.35	10.74	36.96	40.39	50.52	74.00	-23.48	
9222.932	37.01	12.08	35.29	39.19	52.99	74.00	-21.01	
10480.000	37.12	13.07	35.14	36.50	51.55	74.00	-22.45	
13635.820	38.77	15.84	38.64	36.71	52.68	74.00	-21.32	
15720.000	41.31	17.24	38.11	33.27	53.71	74.00	-20.29	
17746.790	43.85	21.26	35.93	23.76	52.94	74.00	-21.06	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7180.799	36.43	10.67	37.14	40.28	50.24	74.00	-23.76	
9110.385	36.80	11.94	35.34	38.80	52.20	74.00	-21.80	
10480.000	37.12	13.07	35.14	36.45	51.50	74.00	-22.50	
12301.900	38.78	14.31	36.32	35.29	52.06	74.00	-21.94	
15720.000	41.31	17.24	38.11	31.75	52.19	74.00	-21.81	
17563.380	43.52	20.64	36.02	24.94	53.08	74.00	-20.92	



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Polarization:Horizontal; Modulation Type:802.11n; bandwidth:40MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limi t (dB)	Remark
7729.766	36.44	10.92	36.64	40.22	50.94	74.00	-23.06	
9231.646	37.02	12.10	35.28	39.05	52.89	74.00	-21.11	
10380.000	37.22	13.00	35.09	37.08	52.21	74.00	-21.79	
12933.360	38.81	15.37	37.84	36.86	53.20	74.00	-20.80	
15570.000	41.37	17.09	38.27	33.34	53.53	74.00	-20.47	
17797.150	43.94	21.44	35.90	23.86	53.34	74.00	-20.66	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:40MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limi t (dB)	Remark
7194.375	36.42	10.68	37.13	40.34	50.31	74.00	-23.69	
8948.359	36.54	11.80	35.45	39.05	51.94	74.00	-22.06	
10380.000	37.22	13.00	35.09	37.16	52.29	74.00	-21.71	
13105.510	38.76	15.58	38.11	36.94	53.17	74.00	-20.83	
15570.000	41.37	17.09	38.27	32.84	53.03	74.00	-20.97	
17513.680	43.42	20.47	36.04	25.88	53.73	74.00	-20.27	

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:40MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7235.260	36.40	10.69	37.09	39.98	49.98	74.00	-24.02	
9007.715	36.61	11.80	35.40	39.56	52.57	74.00	-21.43	
10460.000	37.14	13.06	35.13	36.99	52.06	74.00	-21.94	
12255.510	38.75	14.35	36.21	36.42	53.31	74.00	-20.69	
15690.000	41.32	17.21	38.14	32.43	52.82	74.00	-21.18	
17299.960	43.16	19.73	36.15	26.10	52.84	74.00	-21.16	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:40MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7228.430	36.41	10.69	37.09	41.29	51.30	74.00	-22.70	
9363.361	37.26	12.27	35.22	38.08	52.39	74.00	-21.61	
10460.000	37.14	13.06	35.13	38.14	53.21	74.00	-20.79	
13217.380	38.71	15.61	38.22	37.24	53.34	74.00	-20.66	
15690.000	41.32	17.21	38.14	32.53	52.92	74.00	-21.08	
17332.670	43.20	19.84	36.13	26.45	53.36	74.00	-20.64	



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Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7899.514	36.54	11.01	36.49	40.40	51.46	74.00	-22.54	
9659.786	37.53	12.53	35.07	37.91	52.90	74.00	-21.10	
11490.000	38.09	14.01	35.50	35.38	51.98	74.00	-22.02	
12727.360	38.85	14.79	37.35	36.98	53.27	74.00	-20.73	
14803.570	40.95	16.48	38.92	34.86	53.37	74.00	-20.63	
17235.000	43.08	19.50	36.18	26.55	52.95	74.00	-21.05	

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7832.651	36.50	10.97	36.55	40.40	51.32	74.00	-22.68	
9461.145	37.43	12.39	35.17	38.46	53.11	74.00	-20.89	
11490.000	38.09	14.01	35.50	36.97	53.57	74.00	-20.43	
13279.950	38.69	15.62	38.28	36.87	52.90	74.00	-21.10	
15388.050	41.38	16.92	38.47	33.59	53.42	74.00	-20.58	
17235.000	43.08	19.50	36.18	26.72	53.12	74.00	-20.88	

Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:middle

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7221.606	36.41	10.69	37.10	40.27	50.27	74.00	-23.73	
9596.134	37.52	12.49	35.10	38.02	52.93	74.00	-21.07	
11570.000	38.17	14.09	35.51	36.80	53.55	74.00	-20.45	
13056.090	38.78	15.56	38.06	37.21	53.49	74.00	-20.51	
15475.500	41.40	17.00	38.38	33.43	53.45	74.00	-20.55	
17355.000	43.23	19.92	36.12	25.90	52.93	74.00	-21.07	

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:middle

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7153.722	36.44	10.66	37.16	41.64	51.58	74.00	-22.42	
9623.362	37.53	12.51	35.09	38.17	53.12	74.00	-20.88	
11570.000	38.17	14.09	35.51	36.42	53.17	74.00	-20.83	
13405.960	38.64	15.66	38.41	36.84	52.73	74.00	-21.27	
15388.050	41.38	16.92	38.47	33.72	53.55	74.00	-20.45	
17355.000	43.23	19.92	36.12	26.06	53.09	74.00	-20.91	



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Polarization:Horizontal; Modulation Type:802.11a; bandwidth:20MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_ Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7471.367	36.31	10.78	36.88	40.86	51.07	74.00	-22.93	
9816.135	37.56	12.61	34.99	38.13	53.31	74.00	-20.69	
11650.000	38.25	14.18	35.53	44.77	61.67	74.00	-12.33	
11650.000	38.25	14.18	35.53	33.19	50.09	54.00	-3.91	Average
13292.500	38.68	15.63	38.29	36.98	53.00	74.00	-21.00	
15490.120	41.40	17.02	38.36	32.76	52.82	74.00	-21.18	
17475.000	43.37	20.33	36.06	25.46	53.10	74.00	-20.90	

Polarization:Vertical; Modulation Type:802.11a; bandwidth:20MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7207.978	36.42	10.68	37.11	41.83	51.82	74.00	-22.18	
9461.145	37.43	12.39	35.17	38.30	52.95	74.00	-21.05	
11650.000	38.25	14.18	35.53	45.56	62.46	74.00	-11.54	
11650.000	38.25	14.18	35.53	33.85	50.75	54.00	-3.25	Average
13242.370	38.70	15.61	38.24	37.45	53.52	74.00	-20.48	
14873.640	41.08	16.50	38.91	34.71	53.38	74.00	-20.62	
17475.000	43.37	20.33	36.06	25.57	53.21	74.00	-20.79	

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7825.257	36.50	10.97	36.56	39.87	50.78	74.00	-23.22	
9284.108	37.12	12.16	35.26	37.88	51.90	74.00	-22.10	
11490.000	38.09	14.01	35.50	35.87	52.47	74.00	-21.53	
13988.010	39.19	16.24	38.99	36.47	52.91	74.00	-21.09	
16101.710	41.51	17.52	37.65	32.01	53.39	74.00	-20.61	
17235.000	43.08	19.50	36.18	26.94	53.34	74.00	-20.66	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7657.105	36.40	10.88	36.71	40.01	50.58	74.00	-23.42	
9632.455	37.53	12.51	35.08	38.68	53.64	74.00	-20.36	
11490.000	38.09	14.01	35.50	36.41	53.01	74.00	-20.99	
13229.870	38.71	15.61	38.23	36.58	52.67	74.00	-21.33	
15446.290	41.39	16.98	38.41	33.30	53.26	74.00	-20.74	
17235.000	43.08	19.50	36.18	27.45	53.85	74.00	-20.15	



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Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:middle

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamplifier_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7366.267	36.35	10.74	36.97	40.48	50.60	74.00	-23.40	
9058.904	36.71	11.87	35.37	38.72	51.93	74.00	-22.07	
11570.000	38.17	14.09	35.51	36.39	53.14	74.00	-20.86	
12921.150	38.82	15.33	37.81	37.04	53.38	74.00	-20.62	
16486.420	42.66	17.59	37.07	30.01	53.19	74.00	-20.81	
17355.000	43.23	19.92	36.12	26.51	53.54	74.00	-20.46	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:middle

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamplifier_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7803.117	36.48	10.96	36.58	40.49	51.35	74.00	-22.65	
9853.288	37.57	12.63	34.97	37.97	53.20	74.00	-20.80	
11570.000	38.17	14.09	35.51	36.67	53.42	74.00	-20.58	
13843.440	39.01	16.07	38.84	36.72	52.96	74.00	-21.04	
16658.590	42.73	17.94	36.81	29.10	52.96	74.00	-21.04	
17355.000	43.23	19.92	36.12	26.76	53.79	74.00	-20.21	

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:High

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamplifier_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7929.414	36.56	11.02	36.46	40.26	51.38	74.00	-22.62	
10300.530	37.30	12.94	35.05	36.56	51.75	74.00	-22.25	
11650.000	38.25	14.18	35.53	35.12	52.02	74.00	-21.98	
12848.140	38.83	15.13	37.64	36.37	52.69	74.00	-21.31	
15214.630	41.34	16.75	38.66	33.96	53.39	74.00	-20.61	
17475.000	43.37	20.33	36.06	25.58	53.22	74.00	-20.78	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:High

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamplifier_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7803.117	36.48	10.96	36.58	40.19	51.05	74.00	-22.95	
9596.134	37.52	12.49	35.10	38.61	53.52	74.00	-20.48	
11650.000	38.25	14.18	35.53	36.43	53.33	74.00	-20.67	
13279.950	38.69	15.62	38.28	37.07	53.10	74.00	-20.90	
15460.890	41.39	16.99	38.39	32.97	52.96	74.00	-21.04	
17475.000	43.37	20.33	36.06	25.85	53.49	74.00	-20.51	



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Polarization:Horizontal; Modulation Type:802.11n; bandwidth:40MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_Lo ss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limi t (dB)	Remark
7242.097	36.40	10.69	37.08	40.82	50.83	74.00	-23.17	
9487.990	37.48	12.42	35.16	37.85	52.59	74.00	-21.41	
11510.000	38.11	14.03	35.50	36.44	53.08	74.00	-20.92	
12848.140	38.83	15.13	37.64	36.51	52.83	74.00	-21.17	
14803.570	40.95	16.48	38.92	35.02	53.53	74.00	-20.47	
17265.000	43.12	19.60	36.17	26.76	53.31	74.00	-20.69	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:40MHz; Channel:Low

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7642.655	36.39	10.87	36.72	39.92	50.46	74.00	-23.54	
9797.610	37.56	12.60	35.00	38.12	53.28	74.00	-20.72	
11510.000	38.11	14.03	35.50	36.08	52.72	74.00	-21.28	
12994.580	38.80	15.54	37.99	36.55	52.90	74.00	-21.10	
14817.560	40.98	16.49	38.92	34.98	53.53	74.00	-20.47	
17265.000	43.12	19.60	36.17	26.77	53.32	74.00	-20.68	

Polarization:Horizontal; Modulation Type:802.11n; bandwidth:40MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_Lo ss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Remark
7825.257	36.50	10.97	36.56	39.91	50.82	74.00	-23.18	
9881.246	37.58	12.65	34.96	37.98	53.25	74.00	-20.75	
11590.000	38.19	14.12	35.52	36.51	53.30	74.00	-20.70	
13167.540	38.73	15.59	38.17	36.79	52.94	74.00	-21.06	
15460.890	41.39	16.99	38.39	33.51	53.50	74.00	-20.50	
17385.000	43.26	20.02	36.11	26.57	53.74	74.00	-20.26	

Polarization:Vertical; Modulation Type:802.11n; bandwidth:40MHz; Channel:High

Freq (MHz)	Antenna_ Factor (dB/m)	Cable_ Loss (dB)	Preamp_ Gain (dB)	Read_Lev el (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limi t (dB)	Remark
7621.031	36.37	10.86	36.74	39.80	50.29	74.00	-23.71	
9310.451	37.16	12.20	35.24	38.12	52.24	74.00	-21.76	
11590.000	38.19	14.12	35.52	35.25	52.04	74.00	-21.96	
13267.410	38.69	15.62	38.27	37.05	53.09	74.00	-20.91	
15770.590	41.29	17.29	38.05	32.58	53.11	74.00	-20.89	
17385.000	43.26	20.02	36.11	26.31	53.48	74.00	-20.52	

7.9 99% Bandwidth

Test Requirement KDB 789033 II D
 Test Method: KDB 789033 II D

7.9.1 E.U.T. Operation

Operating Environment:

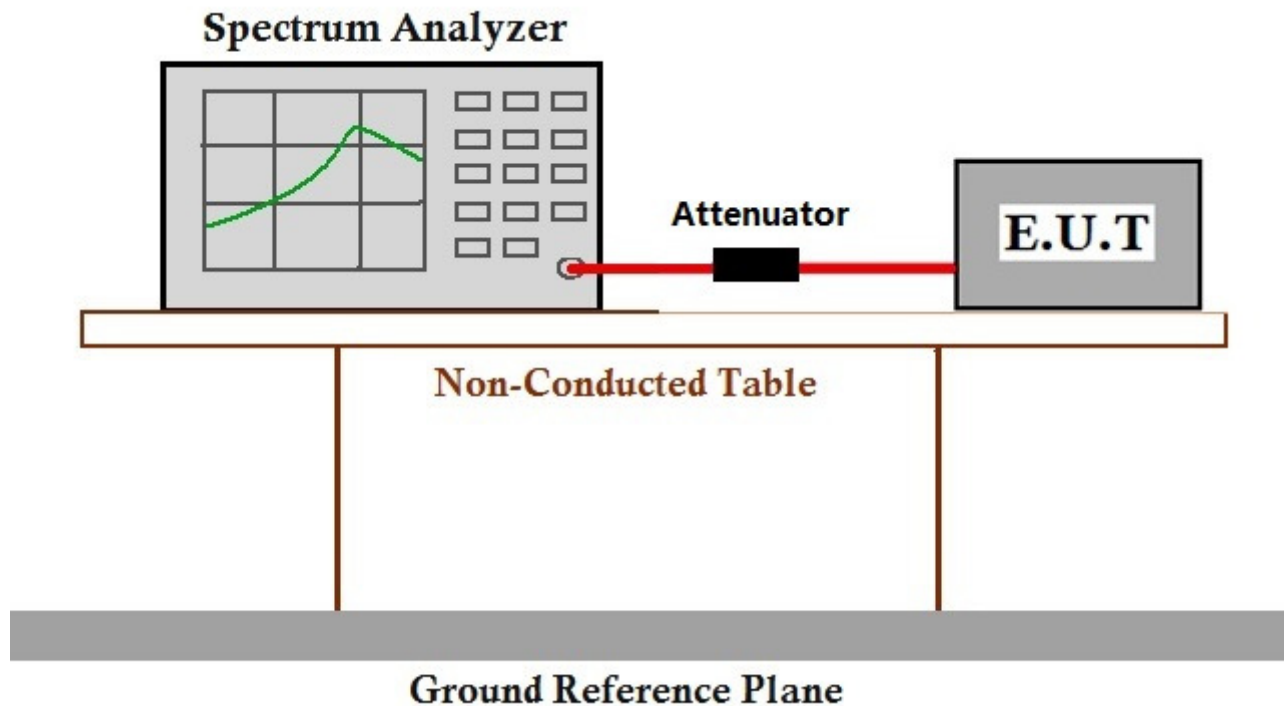
Temperature: 24 °C Humidity: 55 % RH Atmospheric Pressure: 1015 mbar

Pretest these mode to find the worst case:
 Transmitting with all kind of modulations, data rates

The worst case for final test: Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a;
 MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40).

Only the worst case is recorded in the report.

7.9.2 Test Setup Diagram



7.9.3 Measurement Data

The detailed test data see: Appendix 15.407

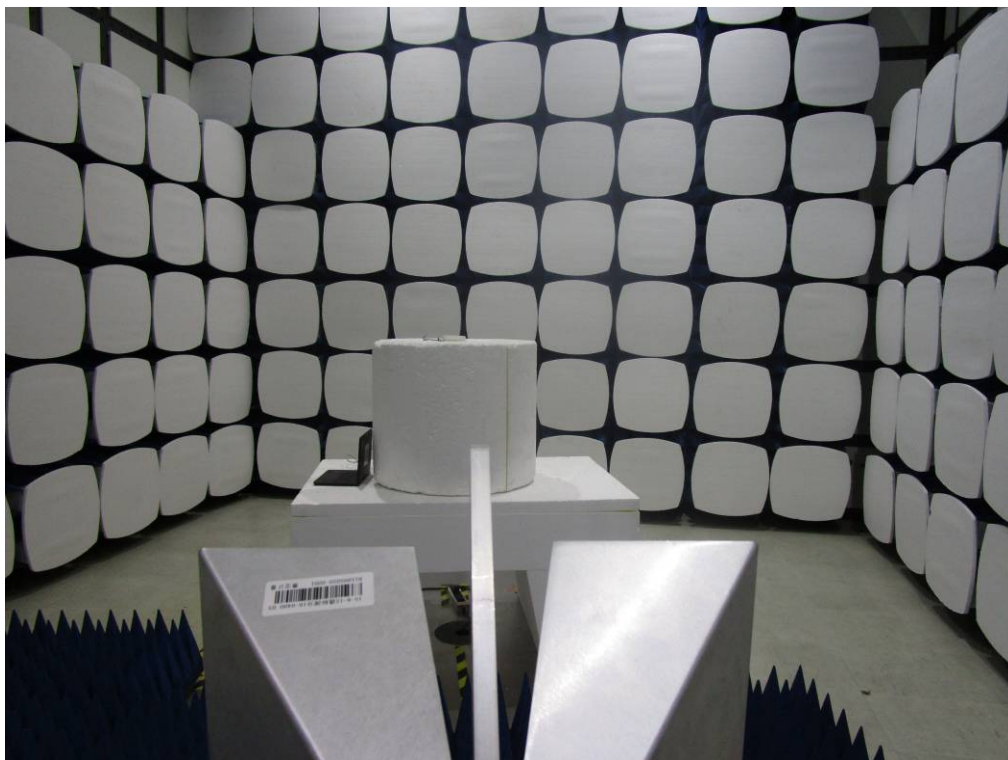
8 Photographs

8.1 Conducted Disturbance at AC Power Line(150kHz-30MHz) Test Setup



8.2 Radiated Spurious Emissions Test Setup





8.3 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for HKES1701000220IT.

9 Appendix

9.1 Appendix 15.407

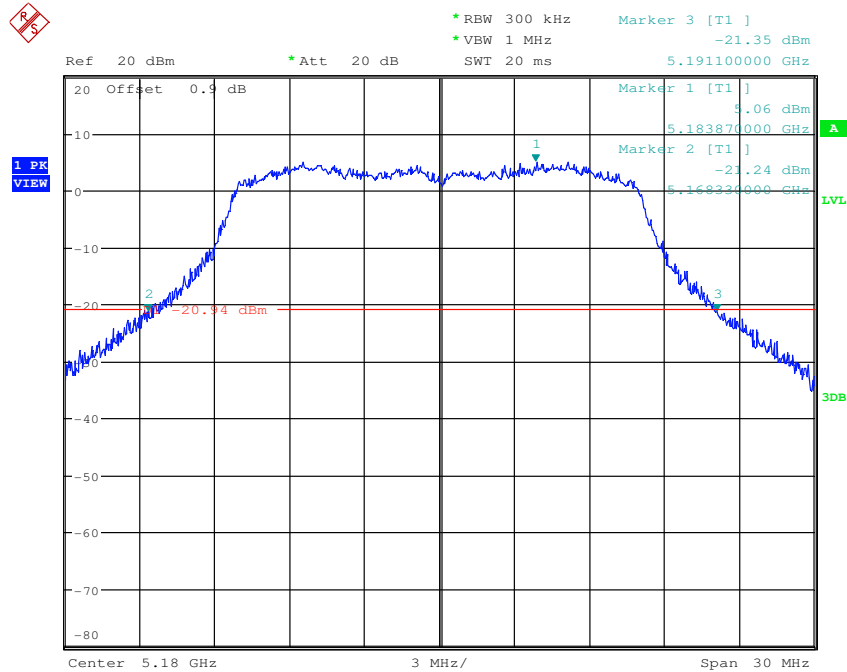
1.Emission Bandwidth Measurement

Test Mode	Test Channel	Ant	EBW[MHz]	Limit[MHz]	Verdict
11A	5180	Ant1	22.770	---	PASS
11A	5200	Ant1	23.070	---	PASS
11A	5240	Ant1	23.520	---	PASS
11A	5745	Ant1	16.410	≥ 0.5	PASS
11A	5785	Ant1	16.470	≥ 0.5	PASS
11A	5825	Ant1	16.500	≥ 0.5	PASS
11N20	5180	Ant1	23.490	---	PASS
11N20	5200	Ant1	23.610	---	PASS
11N20	5240	Ant1	24.510	---	PASS
11N20	5745	Ant1	17.760	≥ 0.5	PASS
11N20	5785	Ant1	17.760	≥ 0.5	PASS
11N20	5825	Ant1	17.280	≥ 0.5	PASS
11N40	5190	Ant1	47.280	---	PASS
11N40	5230	Ant1	48.360	---	PASS
11N40	5755	Ant1	36.540	≥ 0.5	PASS
11N40	5795	Ant1	36.600	≥ 0.5	PASS

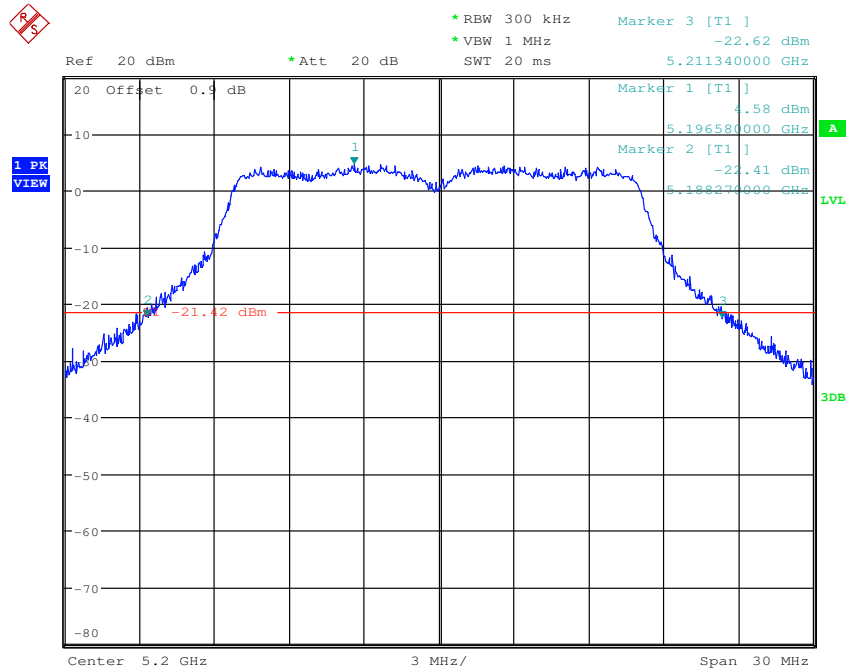


TEST PLOT

Emission Bandwidth Measurement_11A_5180_Ant1

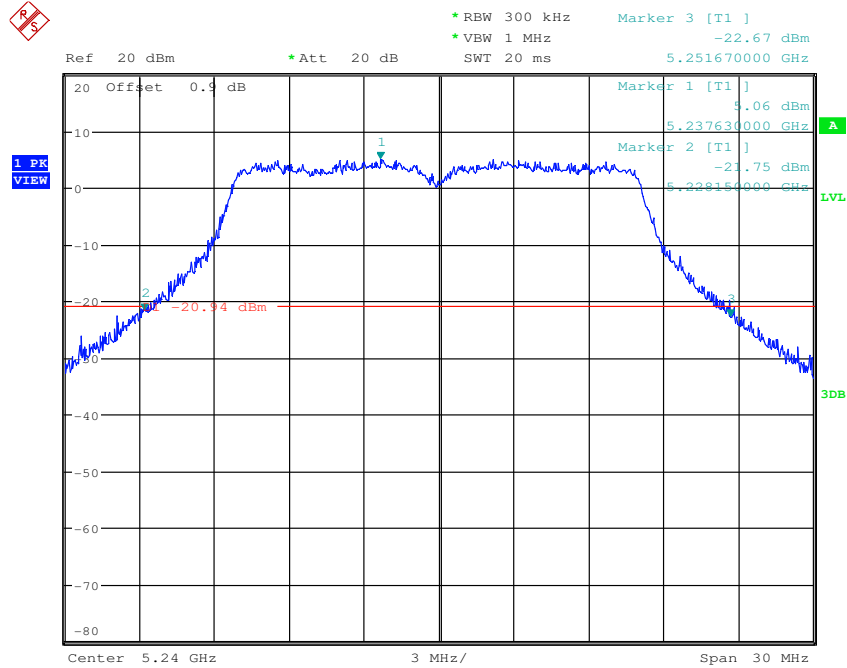


Emission Bandwidth Measurement_11A_5200_Ant1

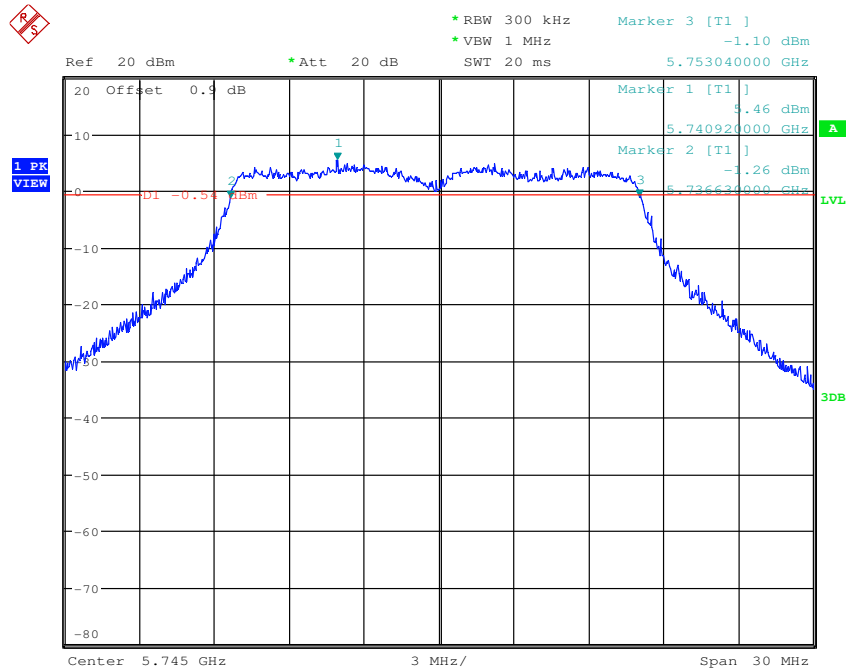


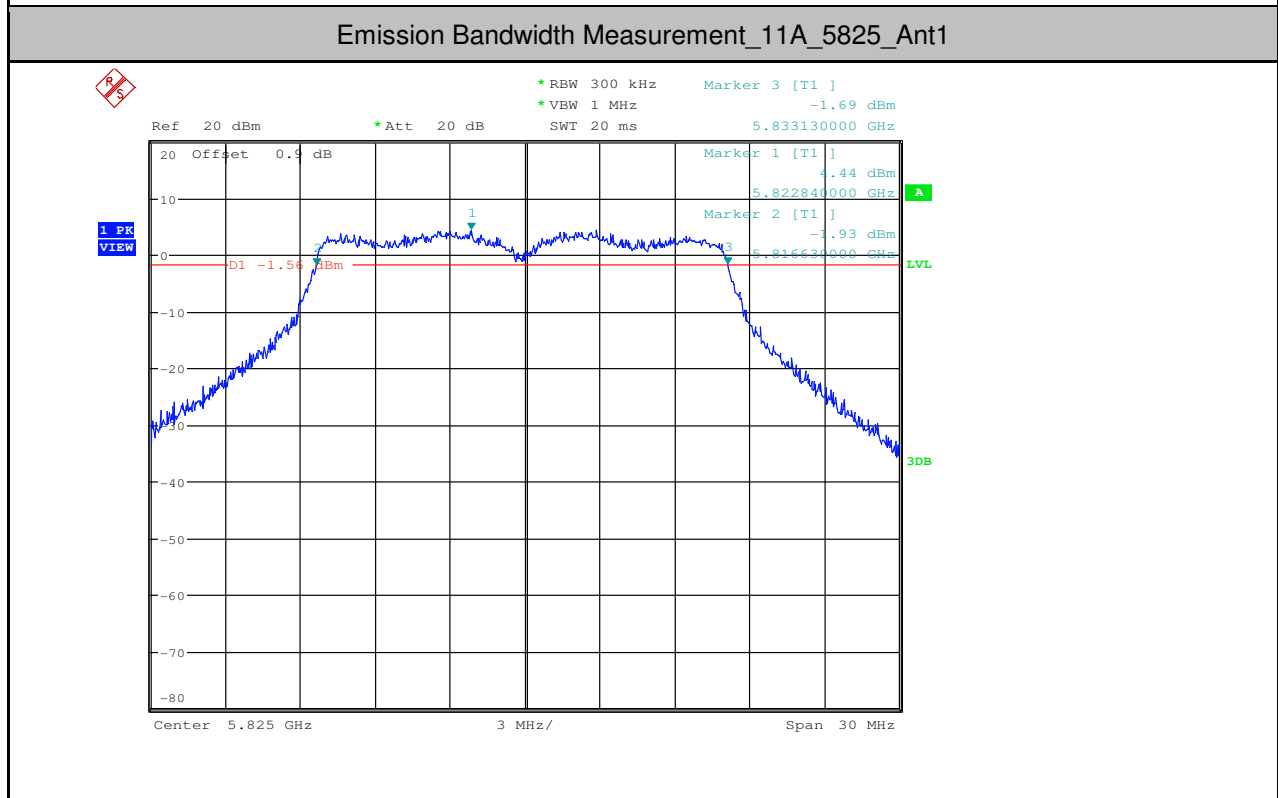
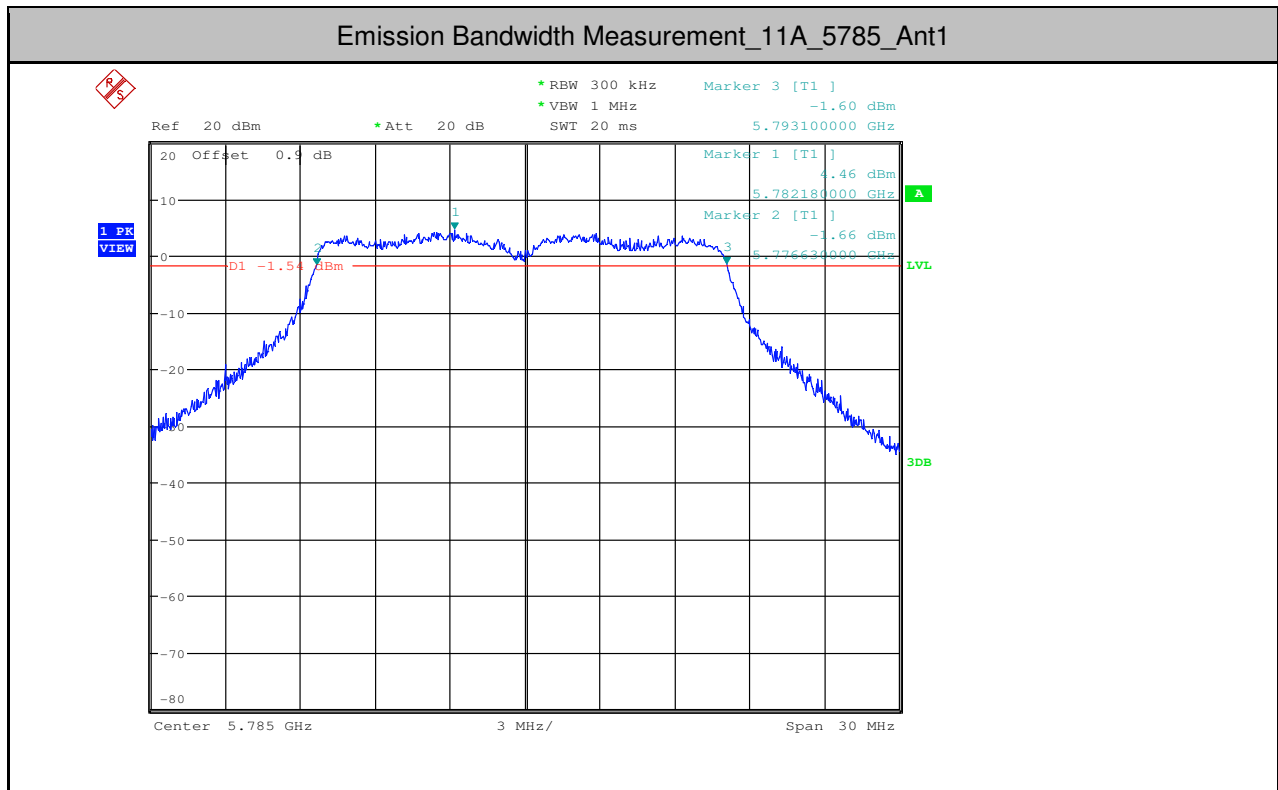


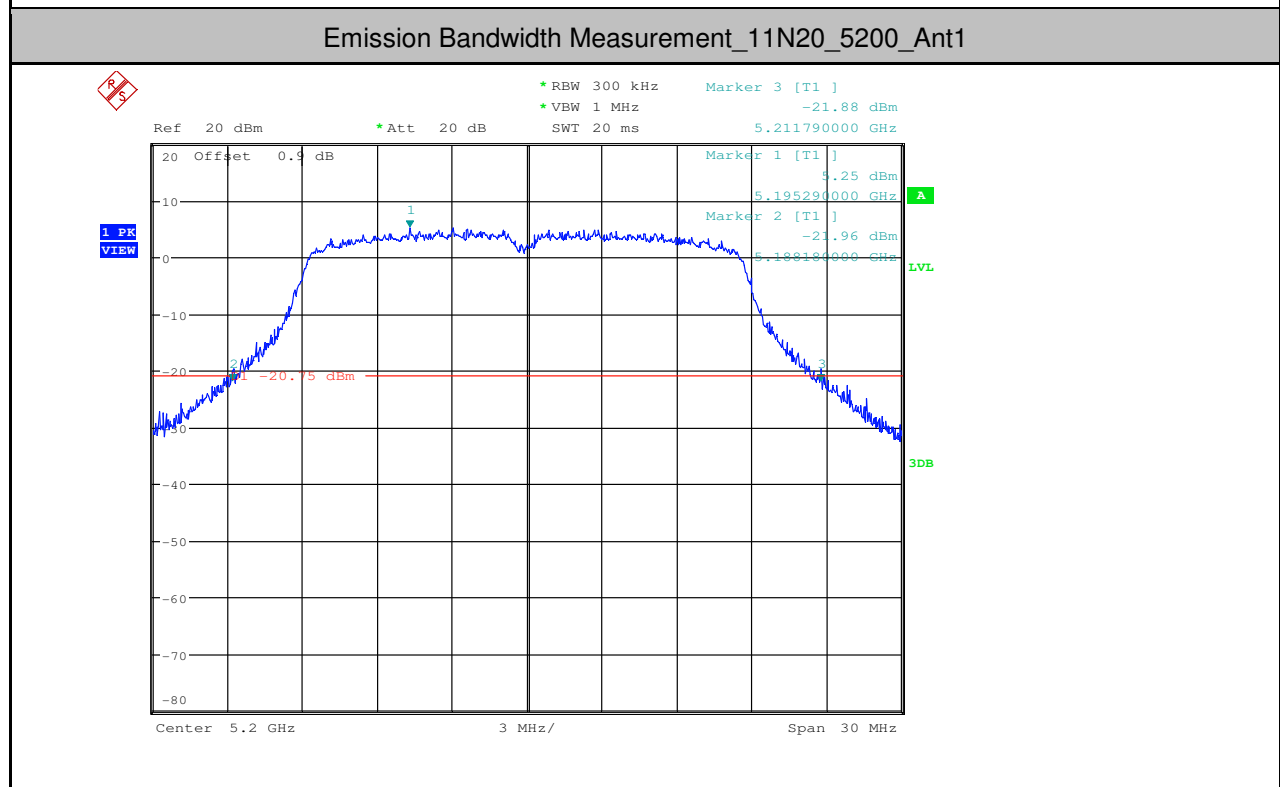
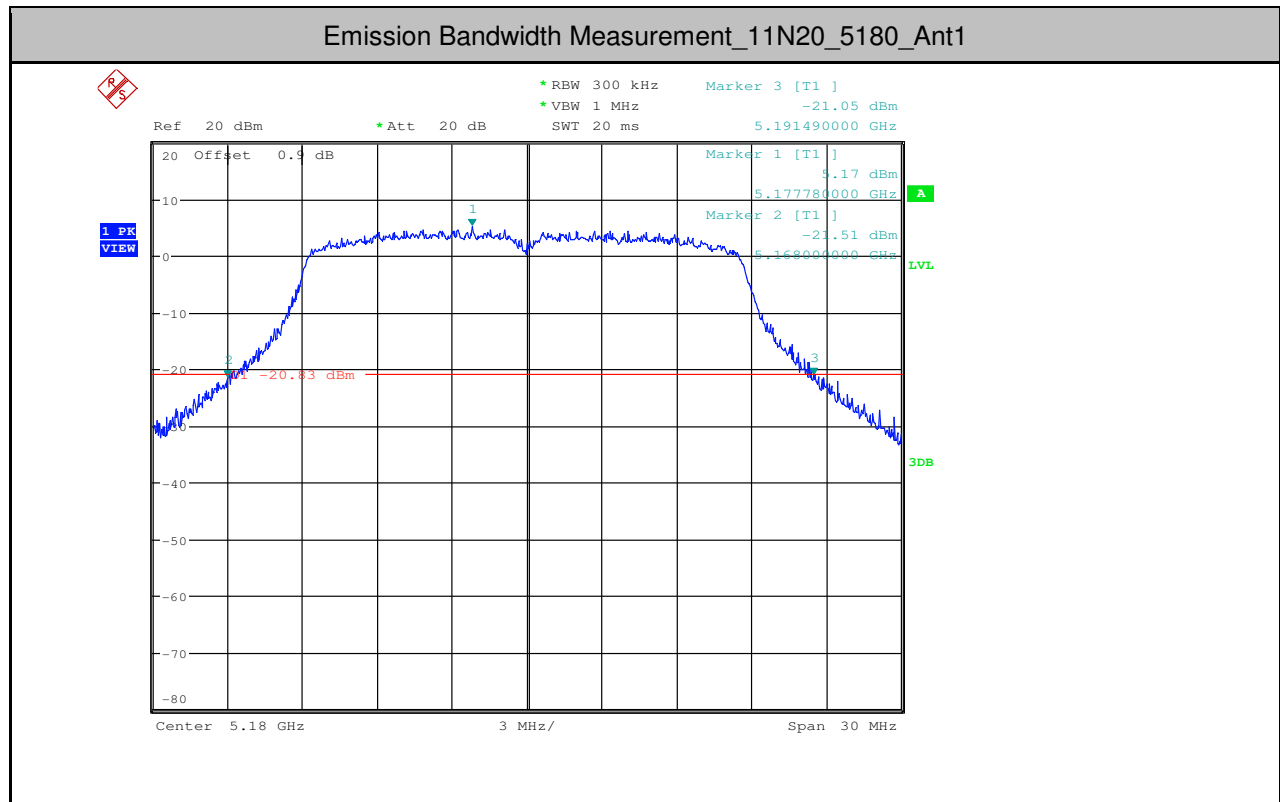
Emission Bandwidth Measurement_11A_5240_Ant1



Emission Bandwidth Measurement_11A_5745_Ant1

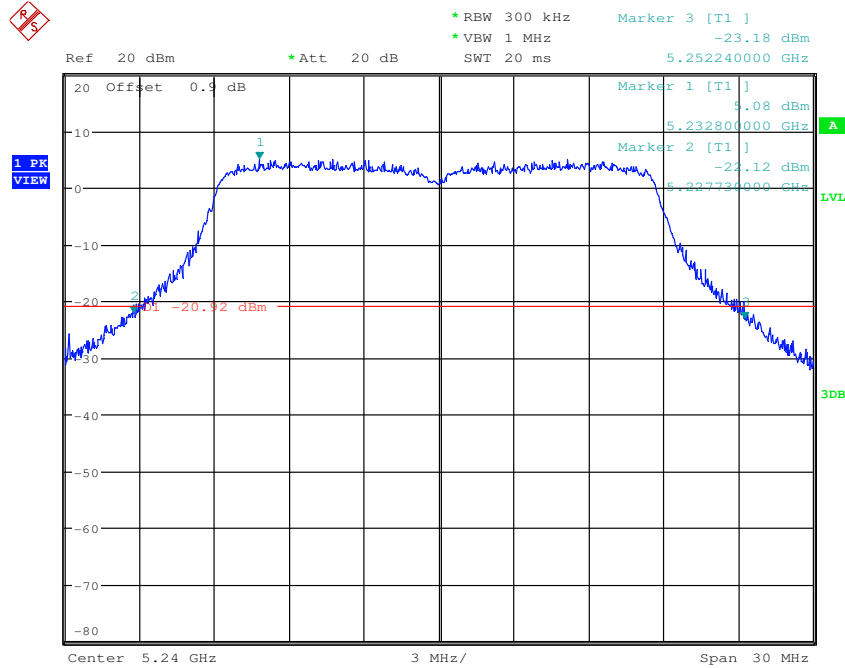




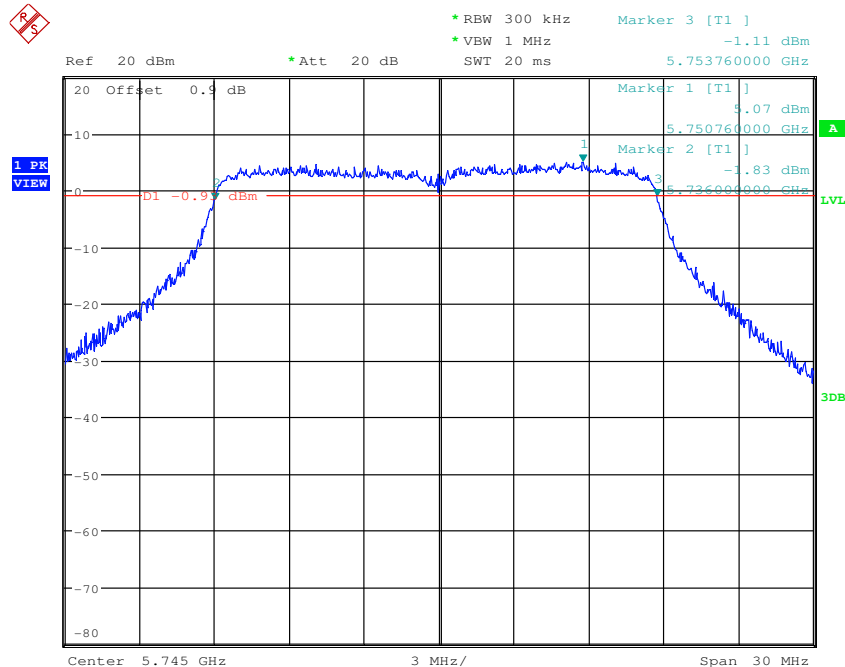




Emission Bandwidth Measurement_11N20_5240_Ant1

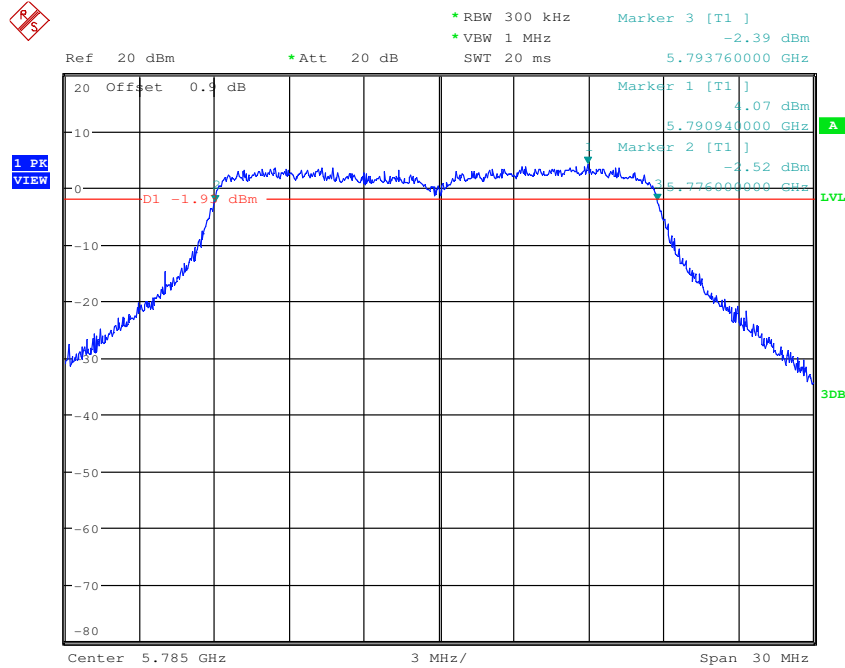


Emission Bandwidth Measurement_11N20_5745_Ant1

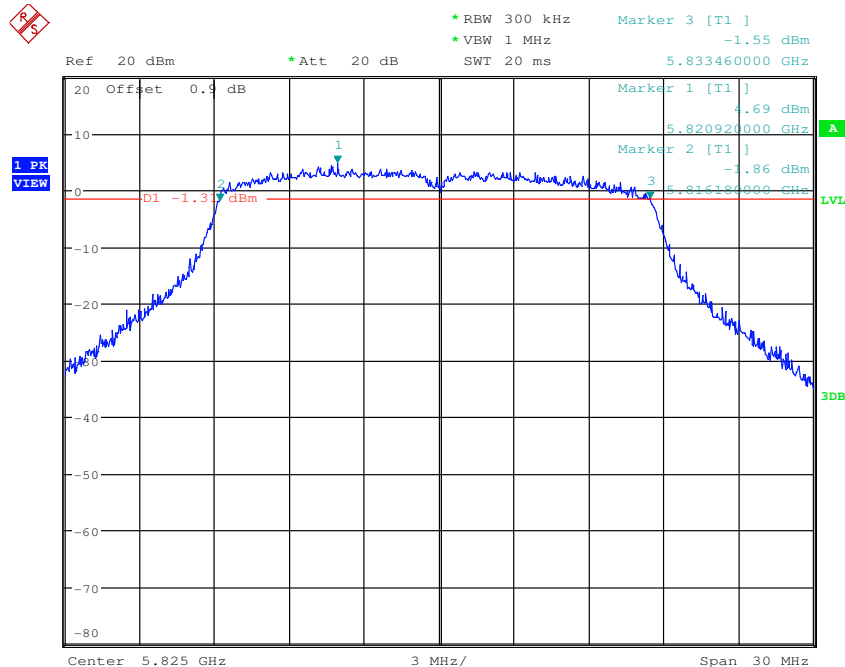




Emission Bandwidth Measurement_11N20_5785_Ant1

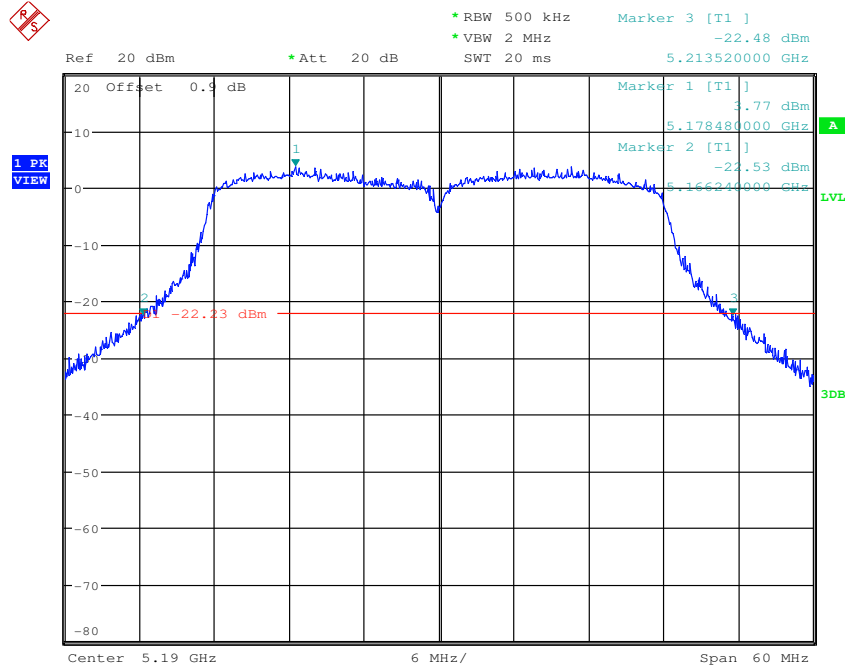


Emission Bandwidth Measurement_11N20_5825_Ant1

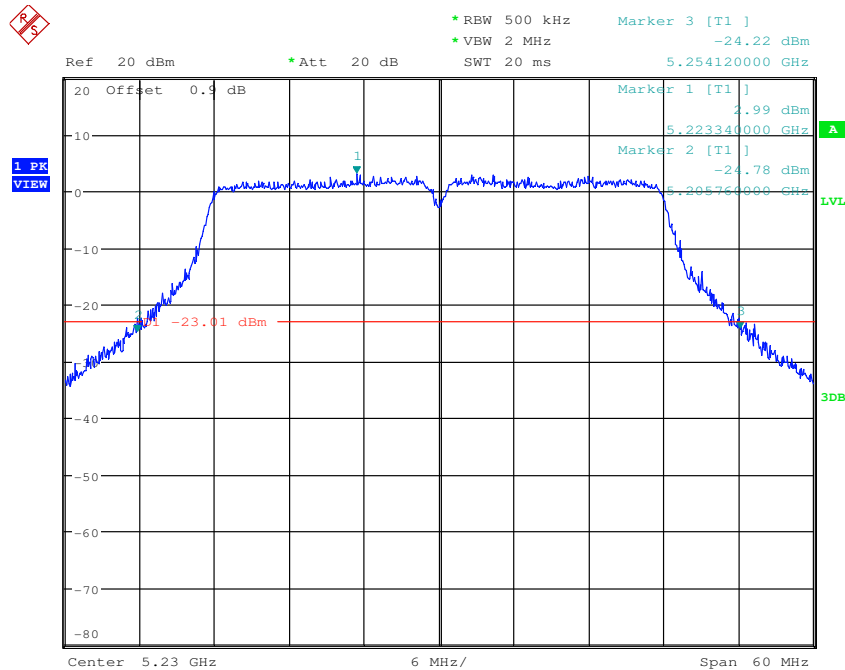




Emission Bandwidth Measurement_11N40_5190_Ant1

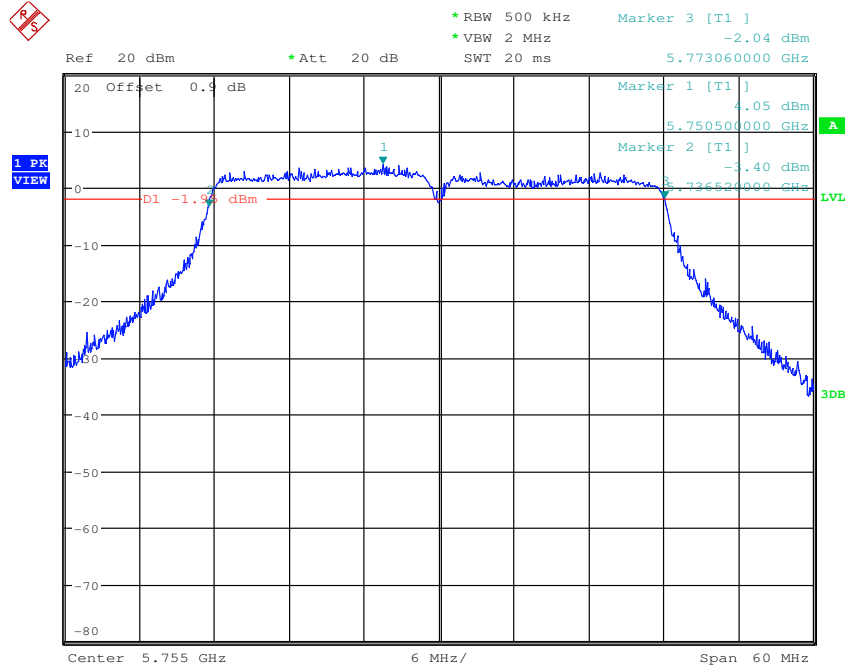


Emission Bandwidth Measurement_11N40_5230_Ant1

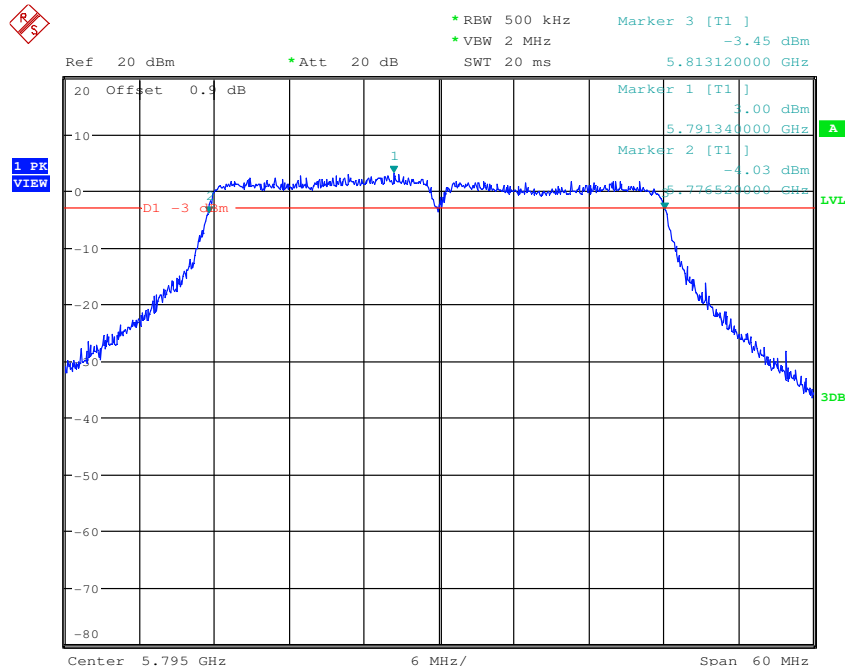




Emission Bandwidth Measurement_11N40_5755_Ant1



Emission Bandwidth Measurement_11N40_5795_Ant1





2. Maximum Conduct Output Power

Test Mode	Test Channel	Ant	Level [dBm]	10log(1/x) Factor [dB]	Power [dBm]	Limit [dBm]	Verdict
11A	5180	Ant1	12.83	0	12.83	<23.98	PASS
11A	5200	Ant1	12.93	0	12.93	<23.98	PASS
11A	5240	Ant1	13.32	0	13.32	<23.98	PASS
11A	5745	Ant1	12.95	0	12.95	<30.00	PASS
11A	5785	Ant1	12.27	0	12.27	<30.00	PASS
11A	5825	Ant1	12.33	0	12.33	<30.00	PASS
11N20	5180	Ant1	13.19	0	13.19	<23.98	PASS
11N20	5200	Ant1	13.44	0	13.44	<23.98	PASS
11N20	5240	Ant1	13.59	0	13.59	<23.98	PASS
11N20	5745	Ant1	13.49	0	13.49	<30.00	PASS
11N20	5785	Ant1	12.32	0	12.32	<30.00	PASS
11N20	5825	Ant1	12.05	0	12.05	<30.00	PASS
11N40	5190	Ant1	12.41	0	12.41	<23.98	PASS
11N40	5230	Ant1	12.19	0	12.19	<23.98	PASS
11N40	5755	Ant1	12.62	0	12.62	<30.00	PASS
11N40	5795	Ant1	11.7	0	11.70	<30.00	PASS



3. Maximum Power Spectral Density

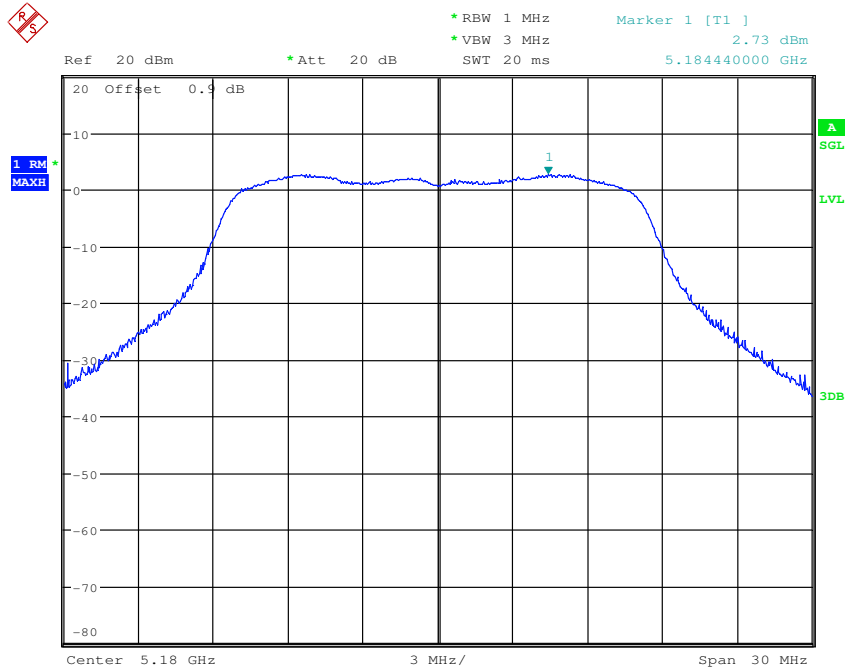
Test Mode	Test Channel	Ant	Level [dBm/MHz]	10log(1/x) Factor [dB]	PSD [dBm/MHz]	Limit [dBm/MHz]	Verdict
11A	5180	Ant1	2.73	0	2.73	<11.00	PASS
11A	5200	Ant1	3.32	0	3.32	<11.00	PASS
11A	5240	Ant1	3.08	0	3.08	<11.00	PASS
11N20	5180	Ant1	2.95	0	2.95	<11.00	PASS
11N20	5200	Ant1	2.91	0	2.91	<11.00	PASS
11N20	5240	Ant1	3.16	0	3.16	<11.00	PASS
11N40	5190	Ant1	-0.43	0	-0.43	<11.00	PASS
11N40	5230	Ant1	-1.64	0	-1.64	<11.00	PASS

Test Mode	Test Channel	Ant	Level [dBm/500kHz]	10log(1/x) Factor [dB]	10log(500kHz/RBW) Factor [dB]	PSD [dBm/500kHz]	Limit [dBm/500kHz]	Verdict
11A	5745	Ant1	0.49	0	0	0.49	<17.00	PASS
11A	5785	Ant1	0.21	0	0	0.21	<17.00	PASS
11A	5825	Ant1	-0.03	0	0	-0.03	<17.00	PASS
11N20	5745	Ant1	1.29	0	0	1.29	<17.00	PASS
11N20	5785	Ant1	-0.6	0	0	-0.6	<17.00	PASS
11N20	5825	Ant1	-0.58	0	0	-0.58	<17.00	PASS
11N40	5755	Ant1	-2.89	0	0	-2.89	<17.00	PASS
11N40	5795	Ant1	-3.95	0	0	-3.95	<17.00	PASS

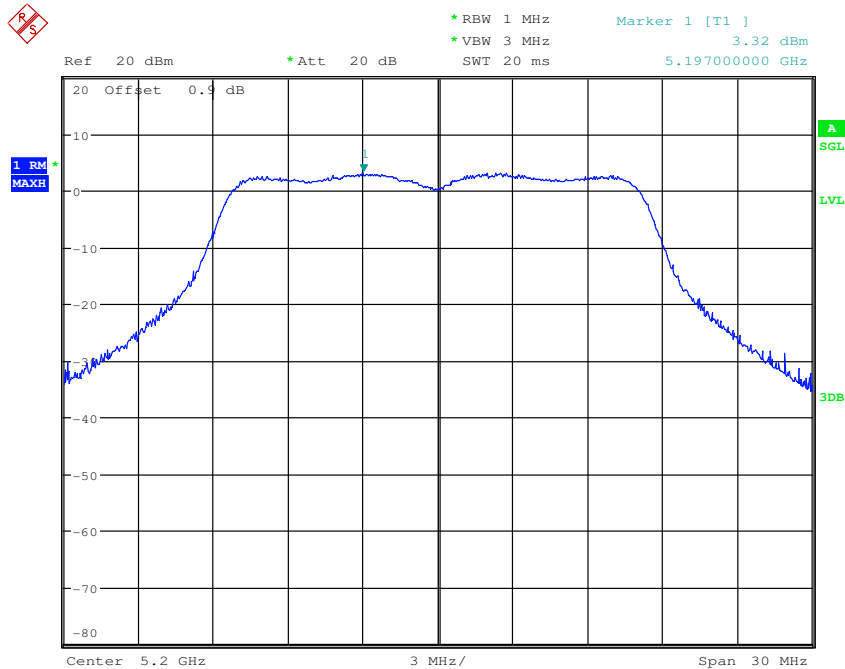


TEST PLOT

Maximum Power Spectral Density_TNVN_11A_5180_Ant1

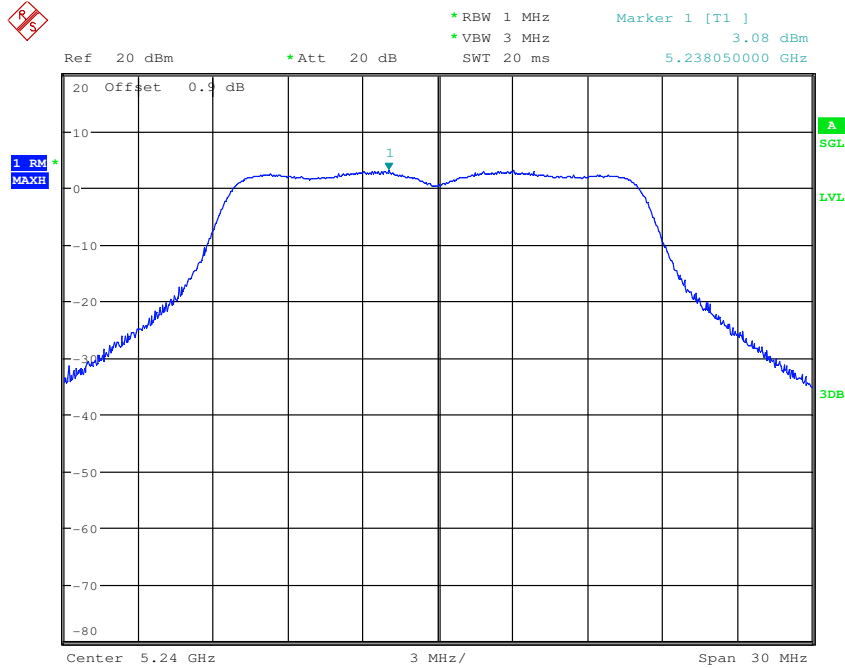


Maximum Power Spectral Density_TNVN_11A_5200_Ant1

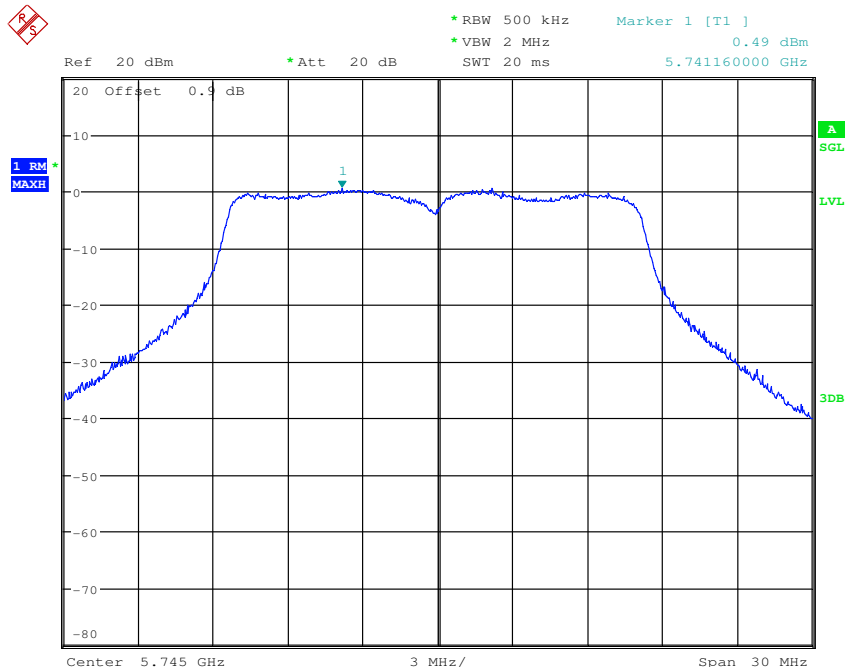




Maximum Power Spectral Density_TNVN_11A_5240_Ant1

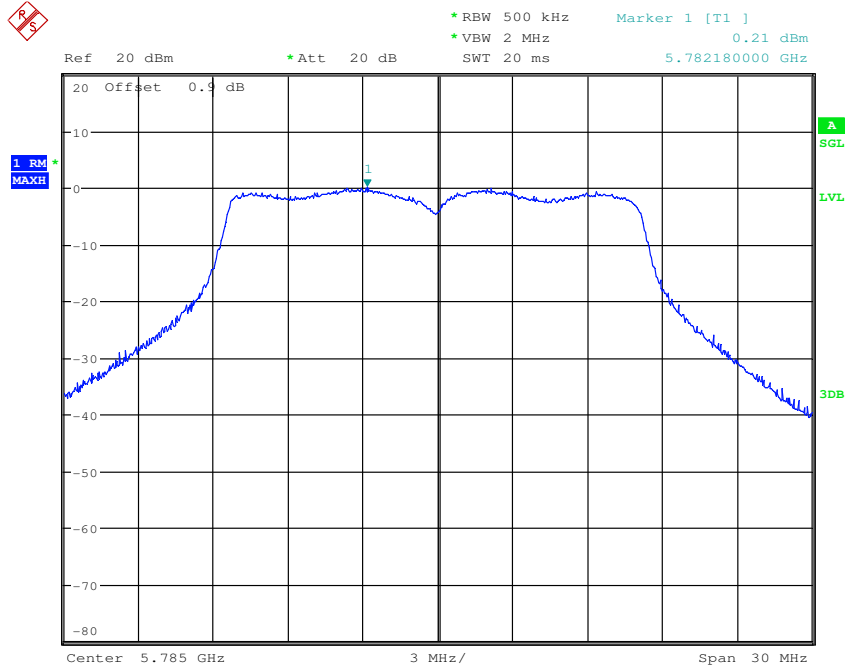


Maximum Power Spectral Density_TNVN_11A_5745_Ant1

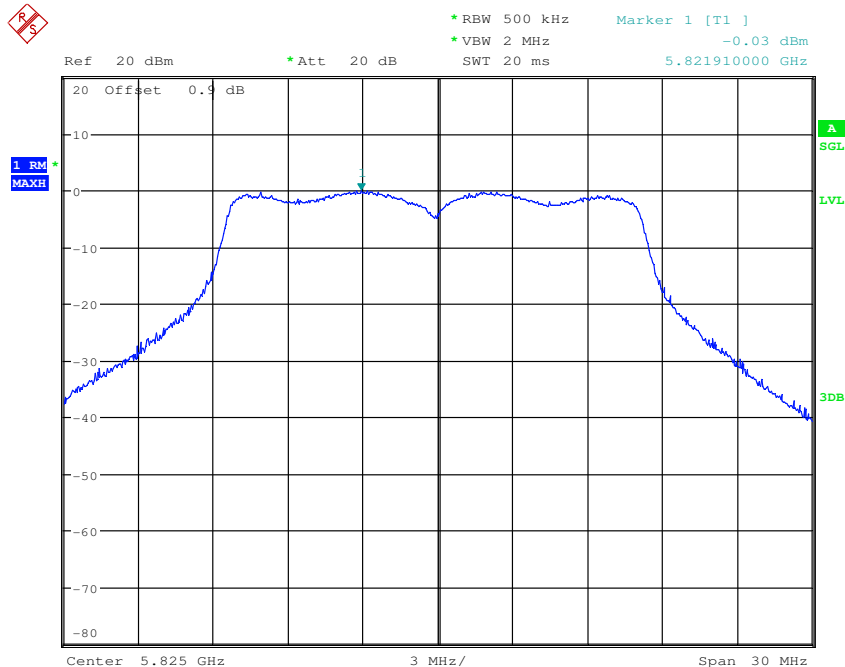




Maximum Power Spectral Density_TNVN_11A_5785_Ant1

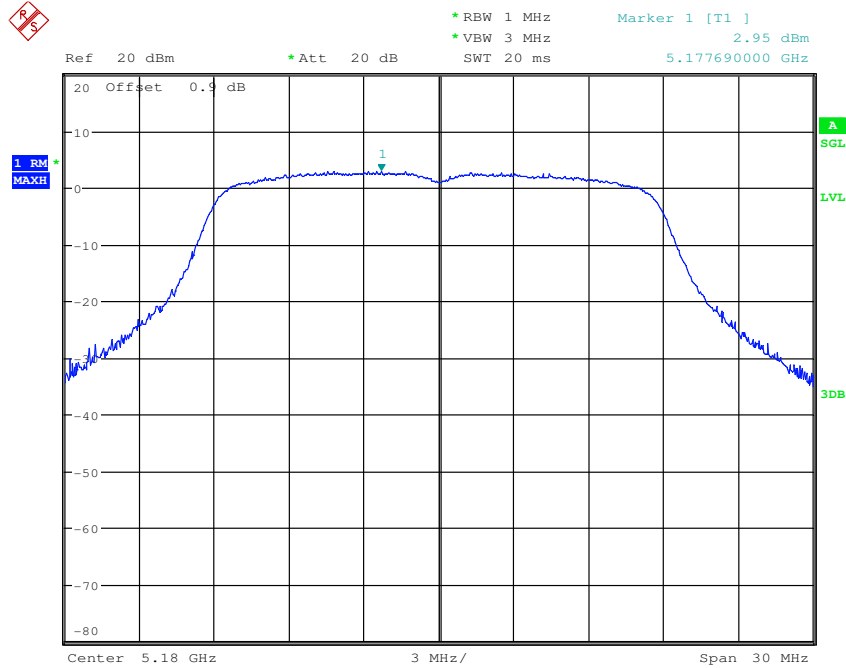


Maximum Power Spectral Density_TNVN_11A_5825_Ant1

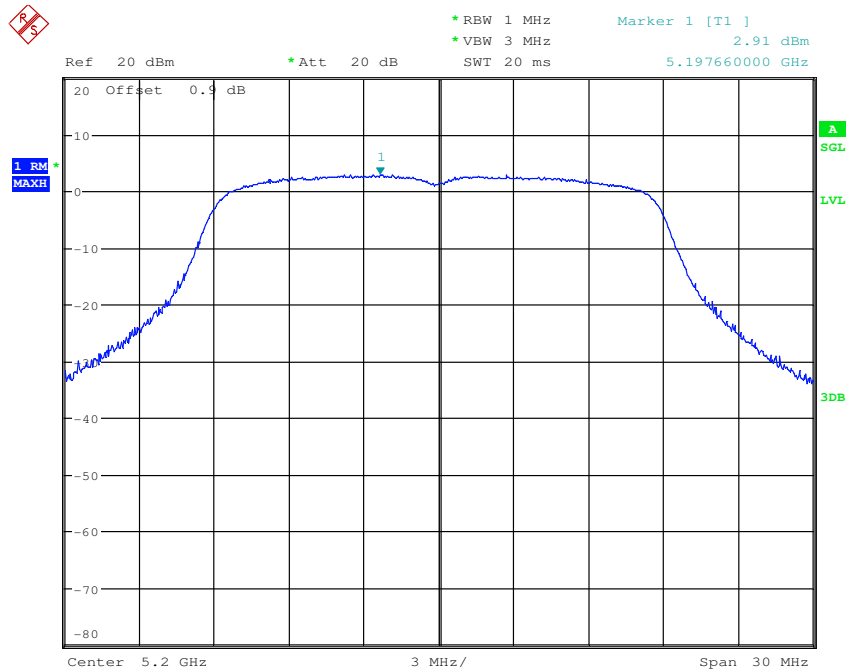




Maximum Power Spectral Density_TNVN_11N20_5180_Ant1

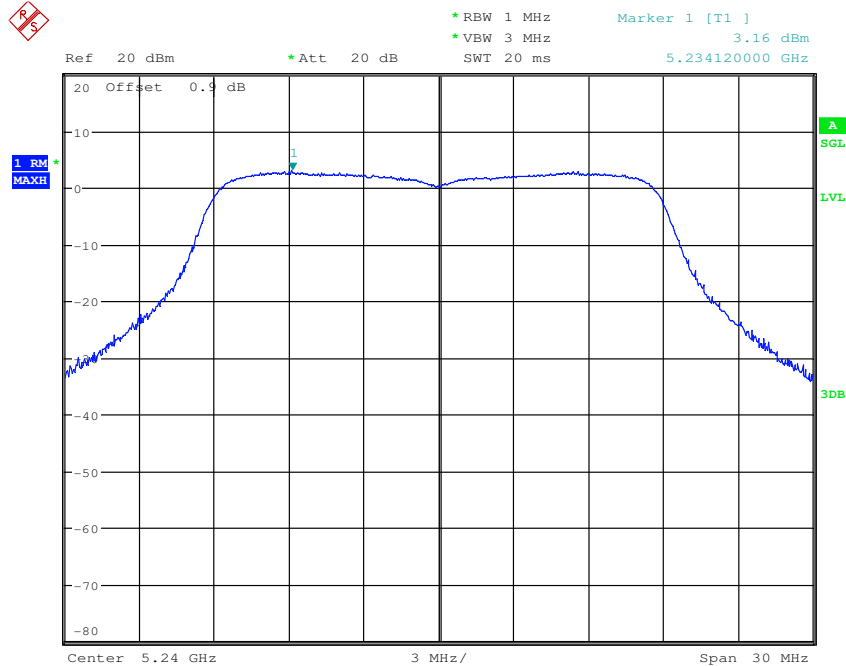


Maximum Power Spectral Density_TNVN_11N20_5200_Ant1

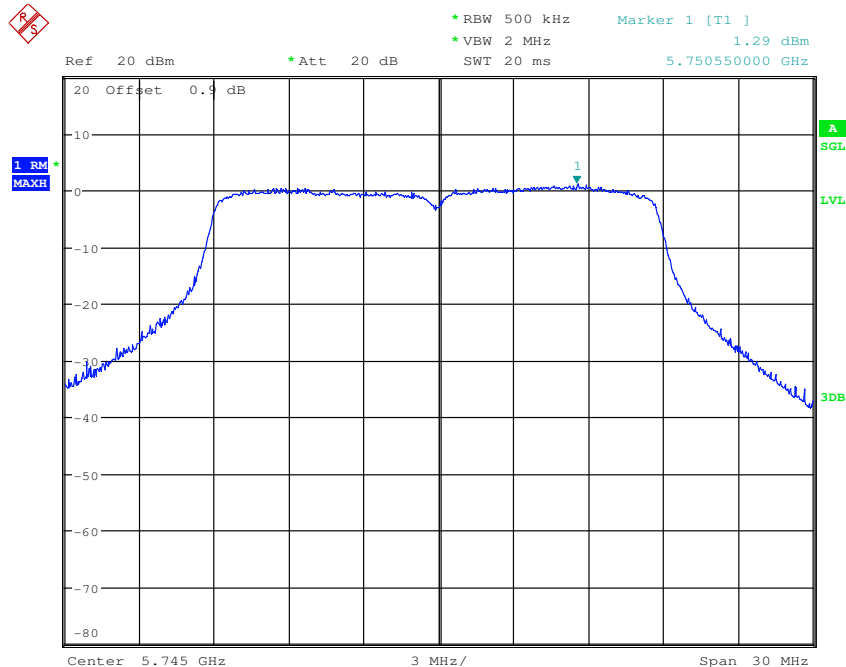




Maximum Power Spectral Density_TNVN_11N20_5240_Ant1

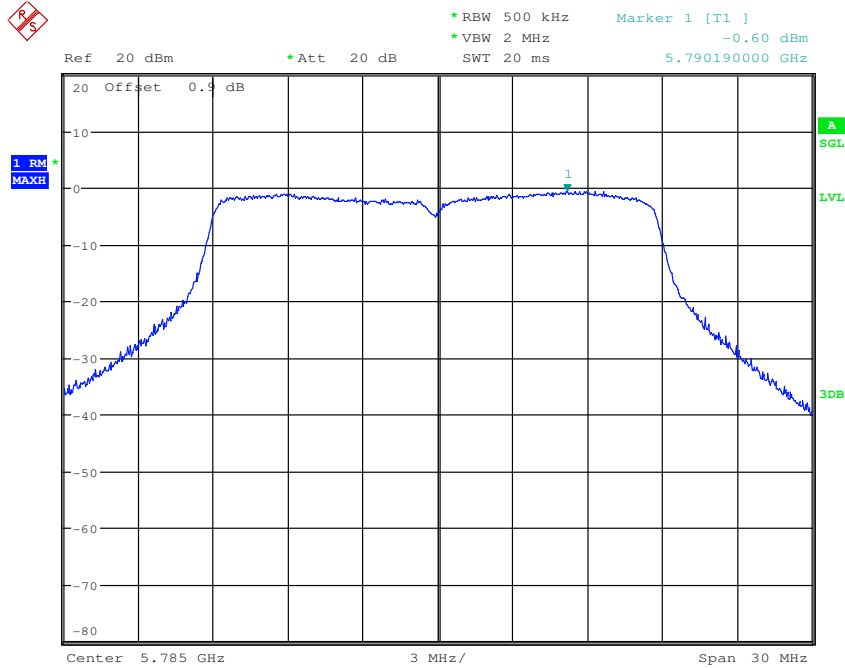


Maximum Power Spectral Density_TNVN_11N20_5745_Ant1

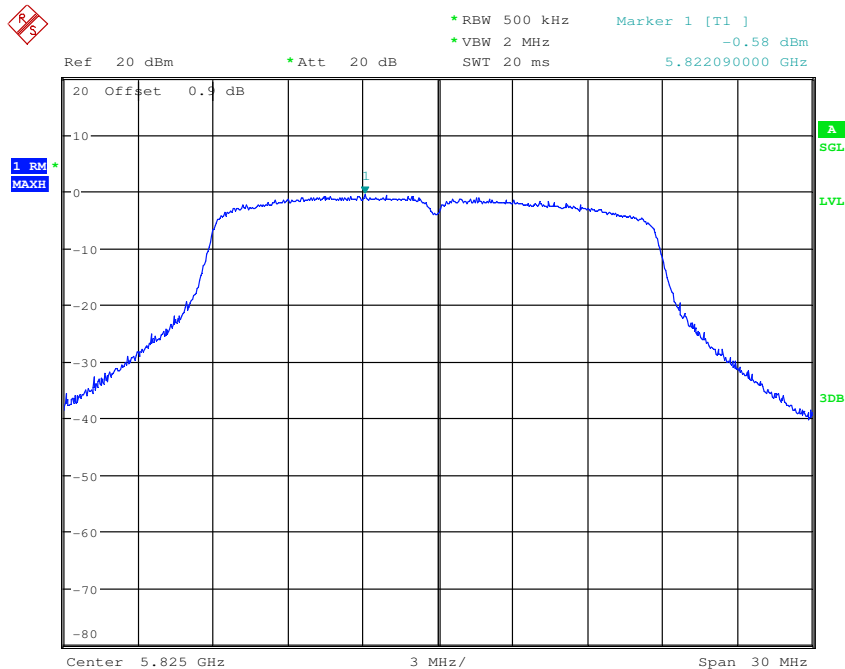




Maximum Power Spectral Density_TNVN_11N20_5785_Ant1

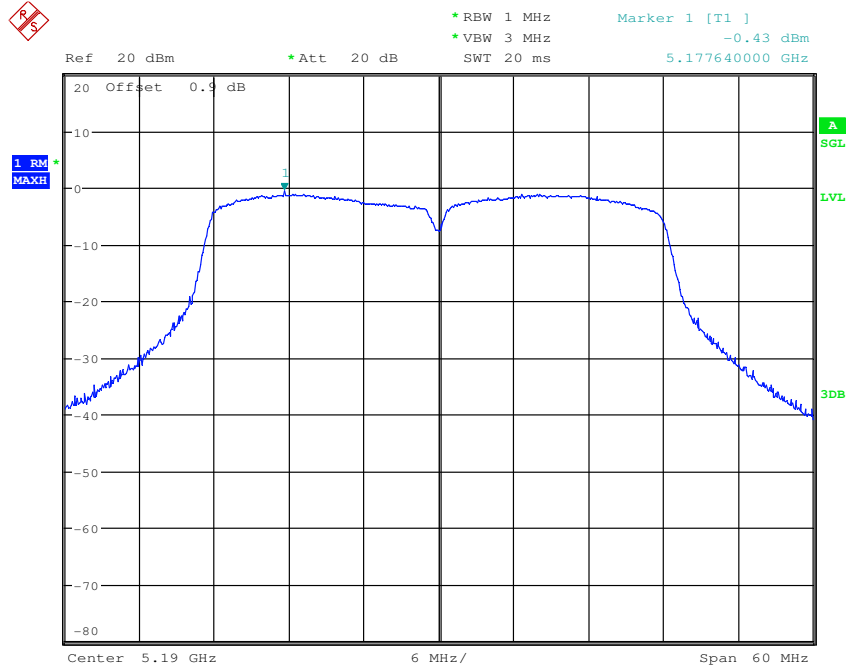


Maximum Power Spectral Density_TNVN_11N20_5825_Ant1

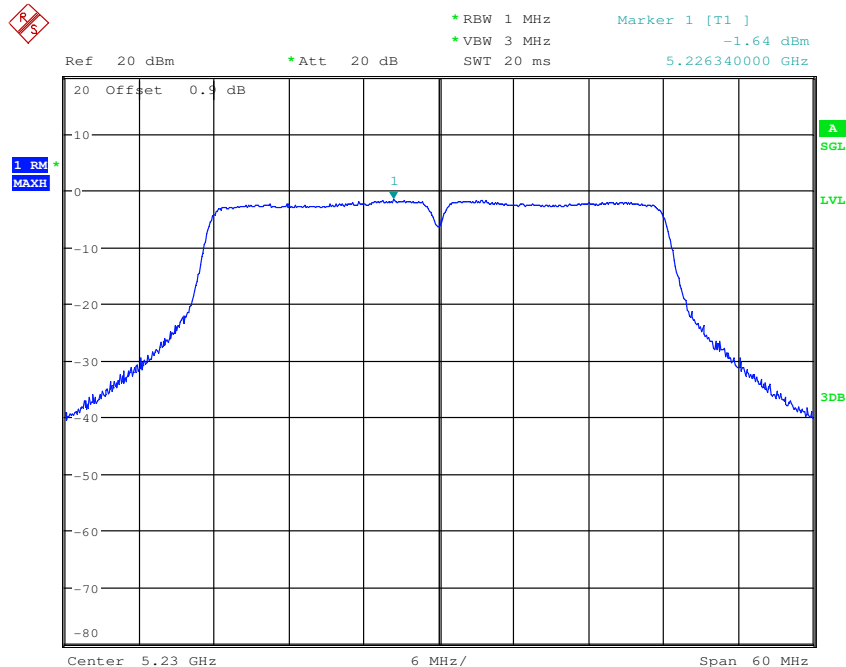




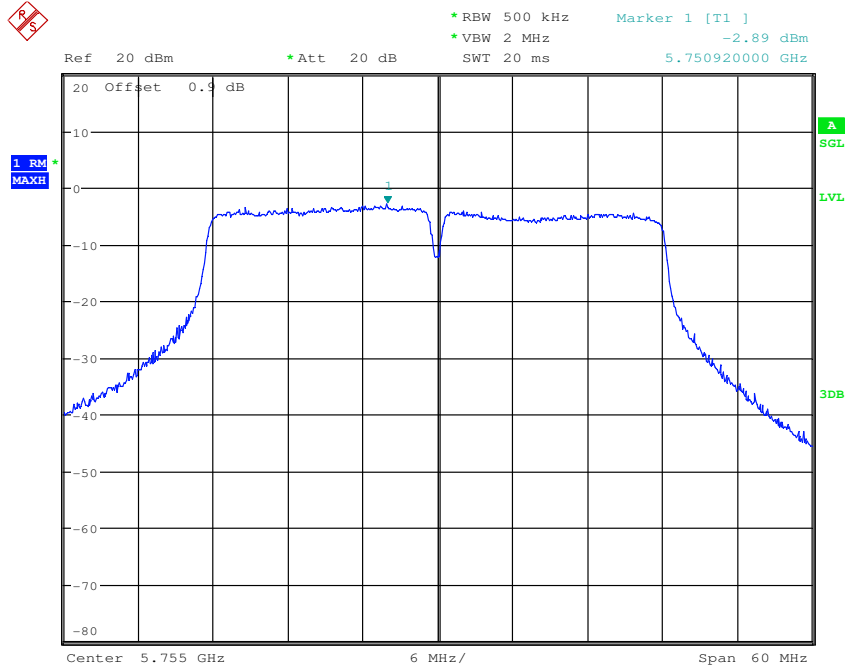
Maximum Power Spectral Density_TNVN_11N40_5190_Ant1



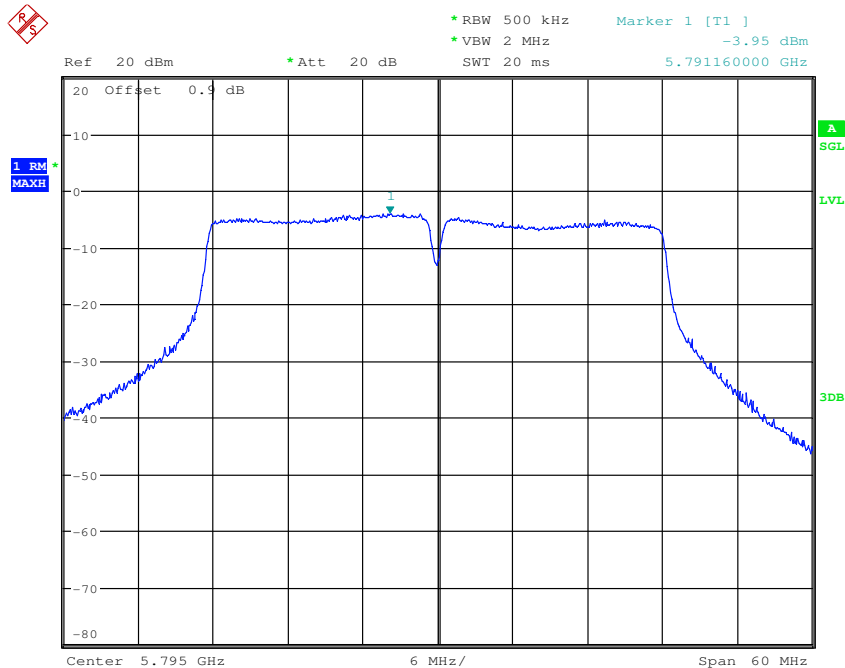
Maximum Power Spectral Density_TNVN_11N40_5230_Ant1



Maximum Power Spectral Density_TNVN_11N40_5755_Ant1



Maximum Power Spectral Density_TNVN_11N40_5795_Ant1





4.Duty Cycle (x)

Test Mode	Test Channel	Ant	Duty Cycle[%]	10log(1/x) Factor[dB]
11A	5200	Ant1	100	0
11A	5240	Ant1	100	0
11A	5745	Ant1	100	0
11A	5785	Ant1	100	0
11A	5825	Ant1	100	0
11N20	5180	Ant1	100	0
11N20	5200	Ant1	100	0
11N20	5240	Ant1	100	0
11A	5180	Ant1	100	0
11N20	5745	Ant1	100	0
11N20	5785	Ant1	100	0
11N20	5825	Ant1	100	0
11N40	5190	Ant1	100	0
11N40	5230	Ant1	100	0
11N40	5755	Ant1	100	0
11N40	5795	Ant1	100	0

