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TEST REPORT

Application No.:	SZEM1804003498CR
Applicant:	Kandao lightforge Co., Ltd.
Address of Applicant:	Unit 5D, Block M7, SinoSteel Building, Nanshan, Shenzhen, Guangdong, China
Manufacturer:	Kandao lightforge Co., Ltd.
Address of Manufacturer:	Unit 5D, Block M7, SinoSteel Building, Nanshan, Shenzhen, Guangdong, China
Factory:	SKY Light Electronic (ShenZhen) Limited
Address of Factory:	Building1,Building5, Building6 ,JinBi Industrial Zone,HuangTian Community,Xixiang street, Bao'An District,Shenzhen City,Guangdong Province,China
Equipment Under Test (EUT):	
EUT Name:	QooCam 360&3D Camera
Model No.:	QCM0106
Trade mark:	KanDao
FCC ID:	2AMZV-KDQC
Standard(s) :	47 CFR Part 15, Subpart E 15.407
Date of Receipt:	2018-06-04
Date of Test:	2018-06-14 to 2018-06-30
Date of Issue:	2018-07-10
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
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		*2018-07-10*		*Original*

Authorized for issue by:				
		Edison Li /Project Engineer		
		Eric Fu /Reviewer		

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2 Test Summary

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

N/A: Not applicable

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions 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
99% Bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 II D	N/A	Pass
26db Emission Bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 II C	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Maximum Conducted output power	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II E	47 CFR Part 15, Subpart C 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 C 15.407 (a)	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
Radiated Emissions which fall in the restricted bands	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 C 15.407 (g)	Pass

N/A: Not applicable

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.6V, 2600mAh rechargeable battery which charged by USB port			
Cable:	USB cable: 100cm with a ferrite core			
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	IEEE 802.11a/n(HT20)/ac(HT20)	5180-5240	4
		IEEE 802.11n(HT40)/ac(HT40)	5190-5230	2
		IEEE 802.11ac(HT80)	5210	1
Modulation Type:	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
Sample Type:	Portable device			
Antenna Type:	Integral			
Antenna Gain:	3.5dBi			

Selected Test Channel for 802.11a/n(HT20)/ac(HT20)		
Band	Channel	Frequency
U-NII Band I	The lowest channel (CH36)	5180MHz
	The middle channel (CH40)	5200MHz
	The highest channel (CH48)	5240MHz

Selected Test Channel for 802.11n(HT40)/ac(HT40)		
Band	Channel	Frequency
U-NII Band I	The lowest channel (CH38)	5190MHz
	The highest channel (CH46)	5230MHz

Selected Test Channel for 802.11ac(HT80)		
Band	Channel	Frequency
U-NII Band I	One channel (CH42)	5210MHz

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4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	Apple	A1357 W010A051	REF. No.SEA0500

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	± 7.25 x 10^{-8}
2	Duty cycle	± 0.37%
3	Occupied Bandwidth	± 3%
4	RF conducted power	± 0.75dB
5	RF power density	± 2.84dB
6	Conducted Spurious emissions	± 0.75dB
7	RF Radiated power	± 4.5dB (below 1GHz)
		± 4.8dB (above 1GHz)
8	Radiated Spurious emission test	± 4.5dB (Below 1GHz)
		± 4.8dB (Above 1GHz)
9	Temperature test	± 1℃
10	Humidity test	± 3%
11	Supply voltages	± 1.5%
12	Time	± 3%

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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 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• **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

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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	ZhongYu Electron	GB-88	SEM001-06	2017-05-10	2020-05-09
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2017-07-13	2018-07-12
LISN	Rohde & Schwarz	ENV216	SEM007-01	2017-09-27	2018-09-26
LISN	ETS-LINDGREN	3816/2	SEM007-02	2018-04-02	2019-04-01
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2018-04-02	2019-04-01

RF Conducted Test					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2018-04-02	2019-04-01
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2017-07-13	2018-07-12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26

Radiated Emissions					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2018-04-02	2019-04-01
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2017-09-27	2018-09-27
Pre-amplifier(18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2018-04-02	2019-04-01
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2018-04-02	2019-04-01

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DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21
Band filter	N/A	N/A	SEM023-01	N/A	N/A

Radiated Emissions which fall in the restricted bands					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2018-04-02	2019-04-01
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2017-09-27	2018-09-27
Pre-amplifier(18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2018-04-02	2019-04-01
Pre-amplifier(26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2018-04-02	2019-04-01
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21
Band filter	N/A	N/A	SEM023-01	N/A	N/A

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	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2017-09-29	2018-09-28
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2018-04-08	2019-04-07

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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

6.1.2 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 3.5dBi.

Antenna Location: Please refer to appendix(Internal photos).

6.2 Transmission in the Absence of Data

6.2.1 Test Requirement:

47 CFR Part 15, Subpart C 15.407 (c)

6.2.2 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 (BCM43455) 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.

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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 & 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: 26.2 °C Humidity: 68.6 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case: f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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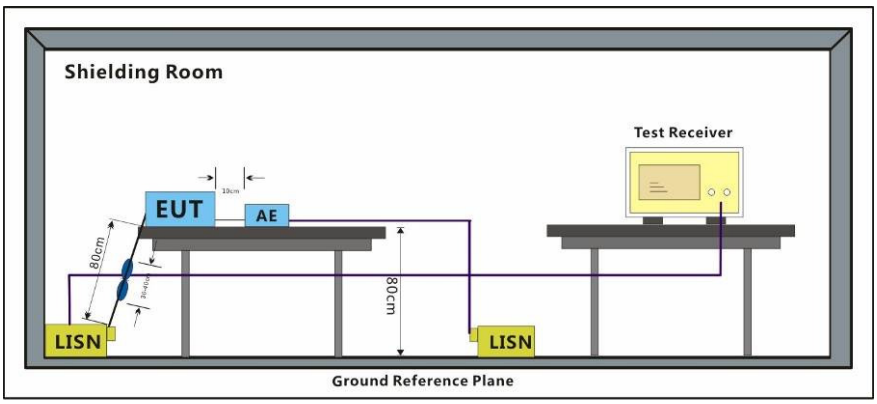
7.1.2 Test Setup Diagram



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.

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

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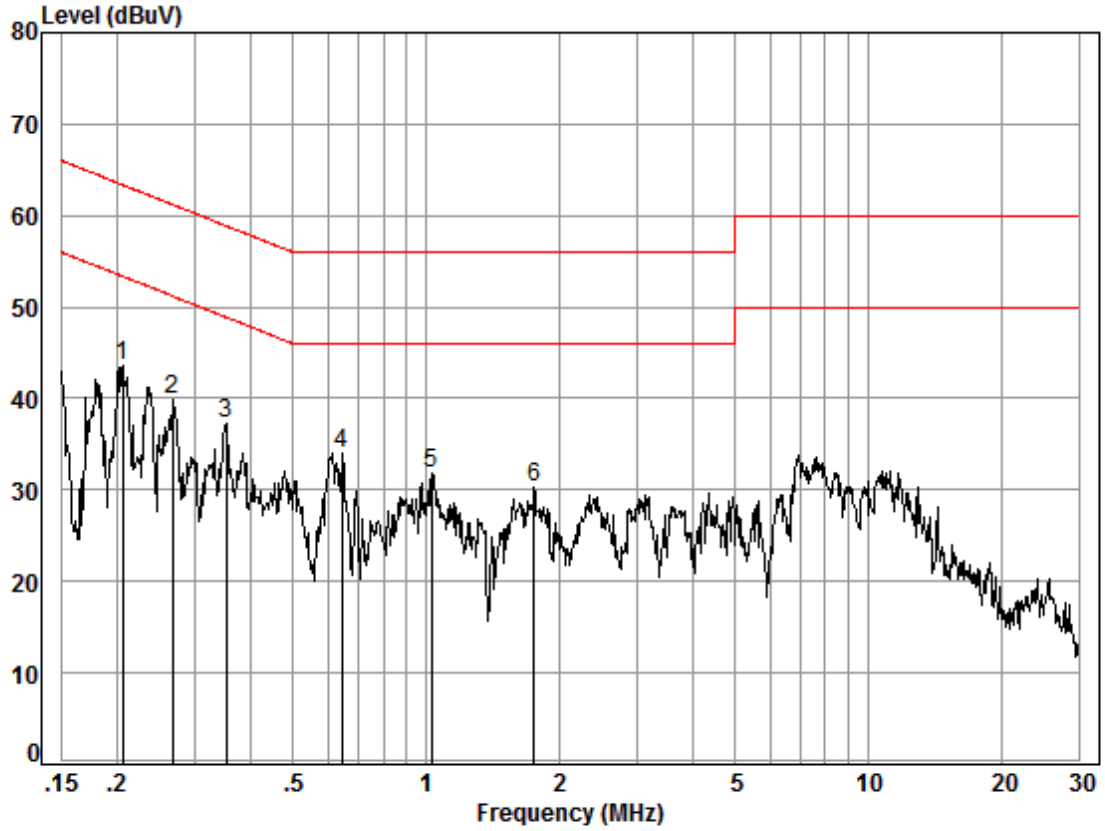
Mode:g; Line:Live Line



Site : Shielding Room
Condition: Line
Job No. : 03498CR
Test mode: g

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.21	0.03	9.50	33.97	43.50	53.36	-9.86	Peak
2	0.27	0.03	9.51	30.43	39.97	51.20	-11.23	Peak
3	0.35	0.03	9.50	27.66	37.19	48.87	-11.68	Peak
4	0.64	0.06	9.51	24.47	34.04	46.00	-11.96	Peak
5	1.03	0.10	9.50	22.21	31.81	46.00	-14.19	Peak
6	1.75	0.14	9.51	20.73	30.38	46.00	-15.62	Peak

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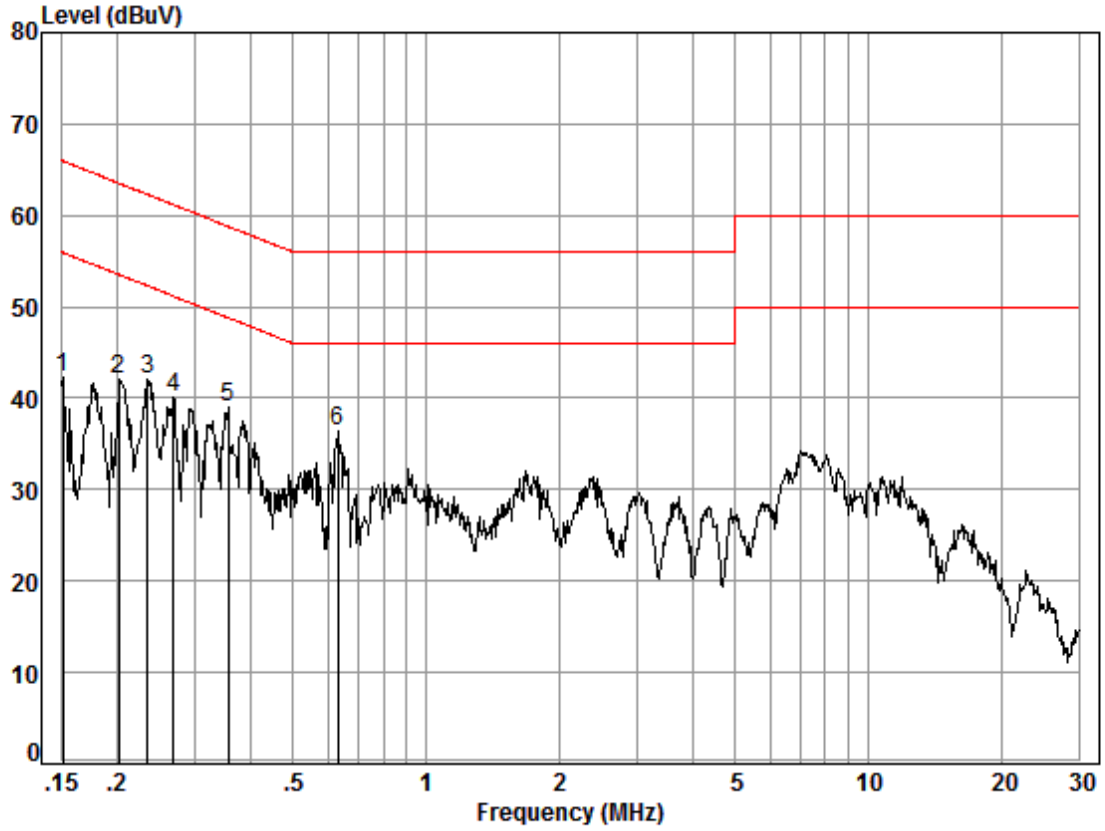
Mode:g; Line:Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 03498CR
Test mode: g

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.15	0.02	9.58	32.70	42.30	55.96	-13.66	Peak
2	0.20	0.03	9.57	32.43	42.03	53.54	-11.51	Peak
3	0.23	0.03	9.58	32.56	42.17	52.30	-10.13	Peak
4	0.27	0.03	9.58	30.46	40.07	51.16	-11.09	Peak
5	0.36	0.03	9.58	29.37	38.98	48.78	-9.80	Peak
6	0.63	0.06	9.62	26.81	36.49	46.00	-9.51	Peak

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7.2 99% Bandwidth

Test Requirement N/A

Test Method: KDB 789033 II D

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case: f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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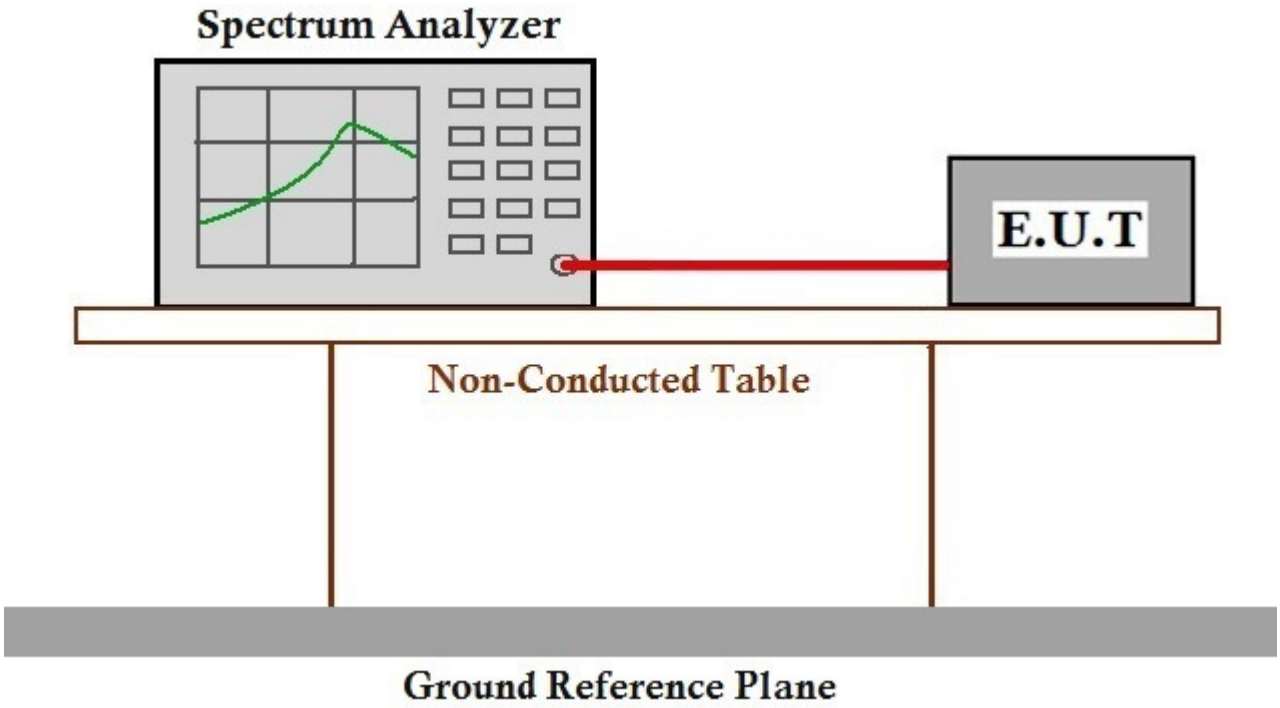
7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

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7.3 26dB Emission bandwidth

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

Test Method: KDB 789033 II C

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case:	f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report. g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
The worst case for final test:	f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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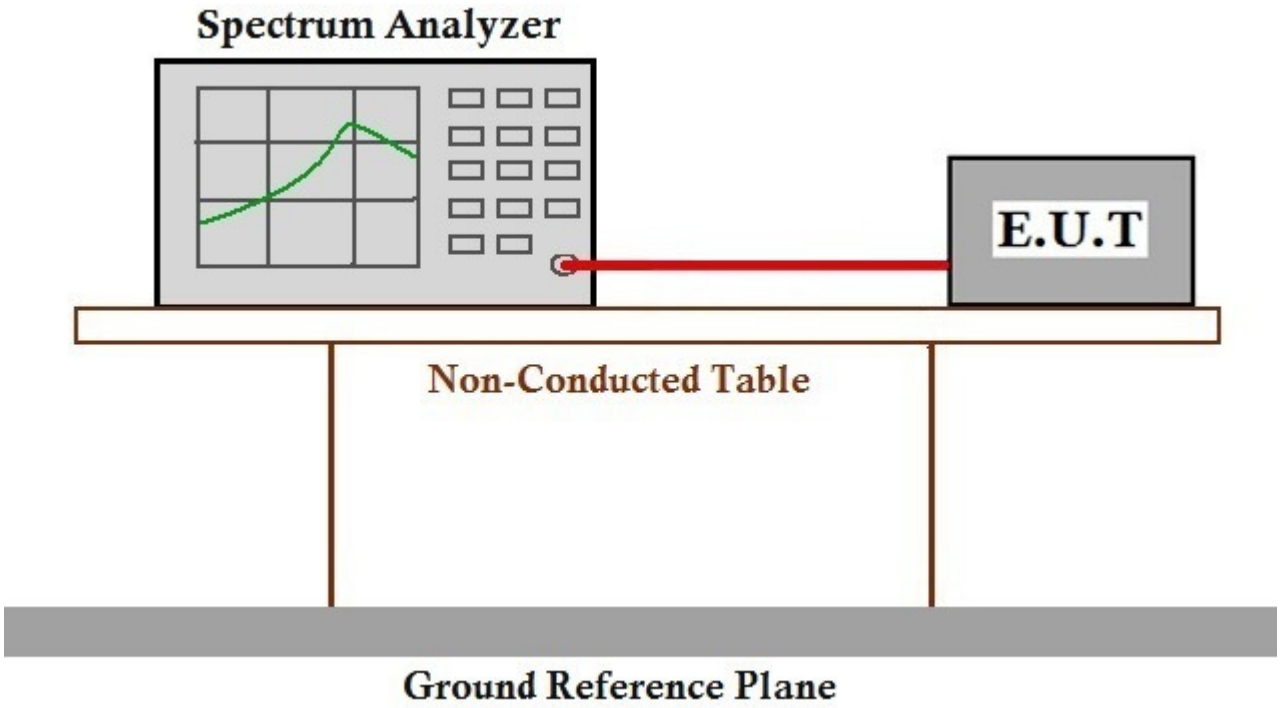
7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

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7.4 Maximum Conducted output power

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

Test Method: KDB 789033 D02 II E

Limit:

Frequency band(MHz)	Limit
5150-5250	≤1W(30dBm) for master device
	≤250mW(24dBm) for client device
5250-5350	≤250mW(24dBm) for client device or 11dBm+10logB*
5470-5725	≤250mW(24dBm) for client device or 11dBm+10logB*
5725-5850	≤1W(30dBm)
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: 23.7 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case: f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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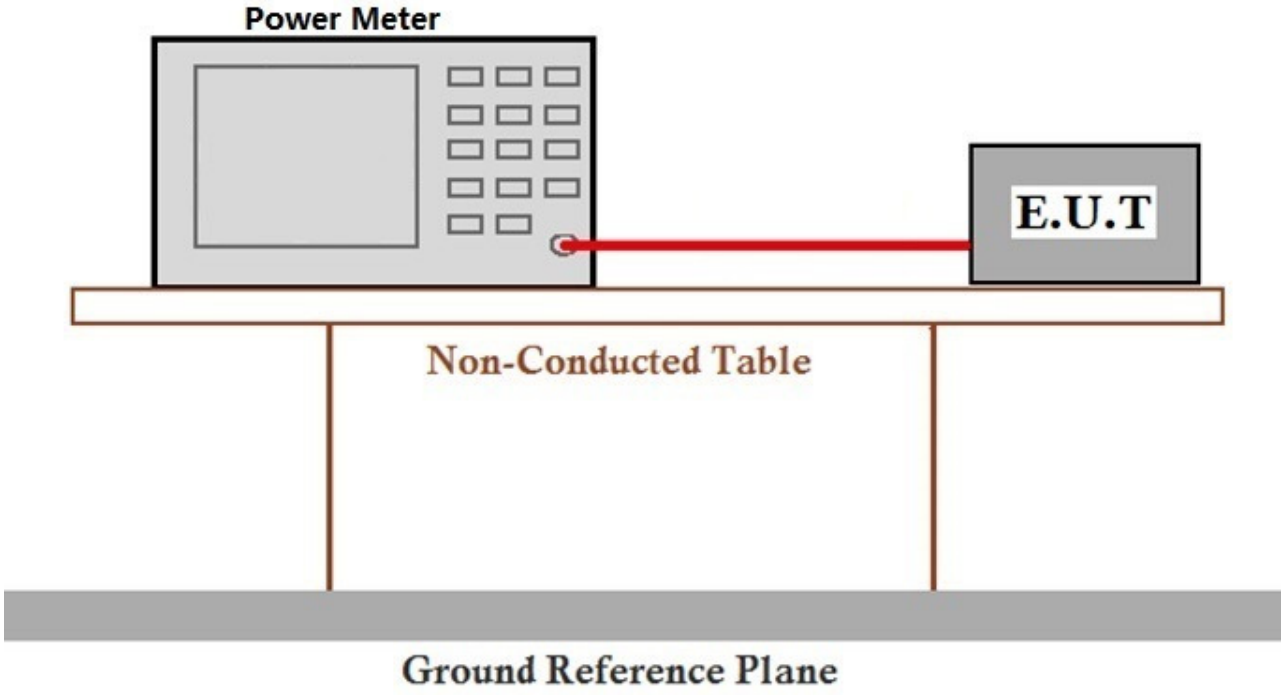
7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

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7.5 Peak Power spectrum density

Test Requirement 47 CFR Part 15, Subpart C 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: 23.7 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case: f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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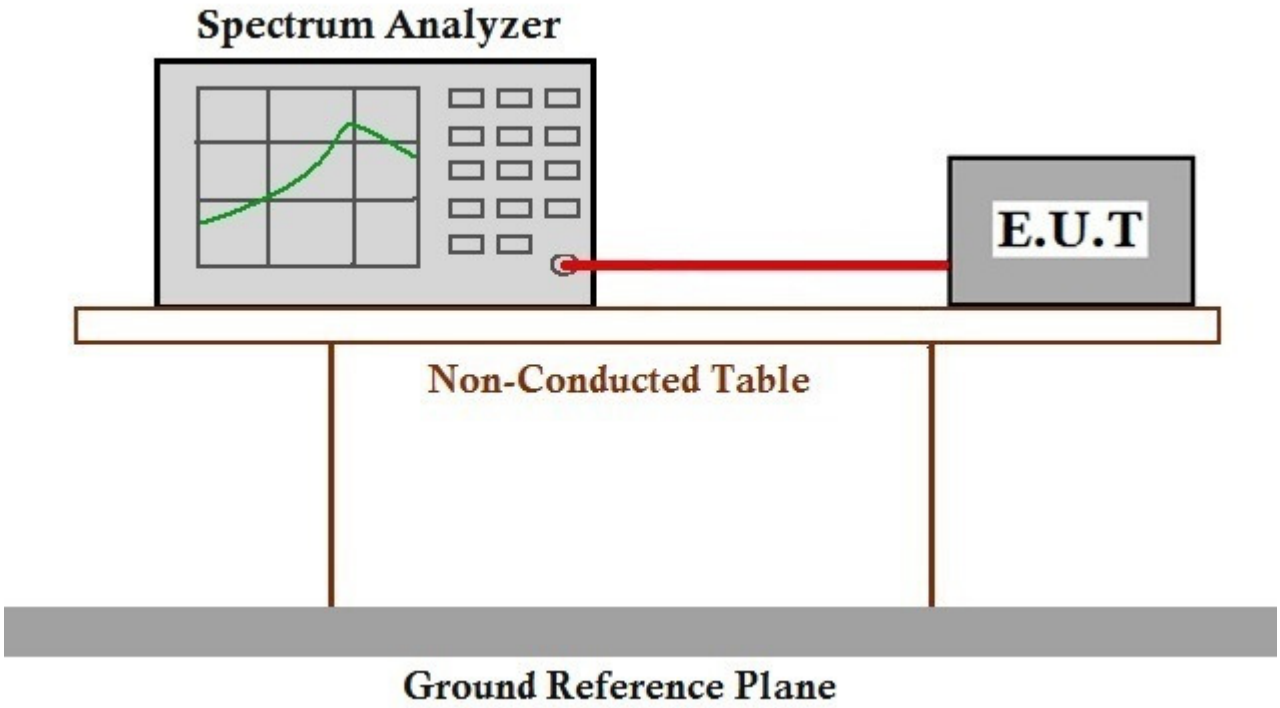
7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

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7.6 Radiated Emissions

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

Test Method: KDB 789033 D02 II G

Measurement Distance: 3m

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 23.3 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case: f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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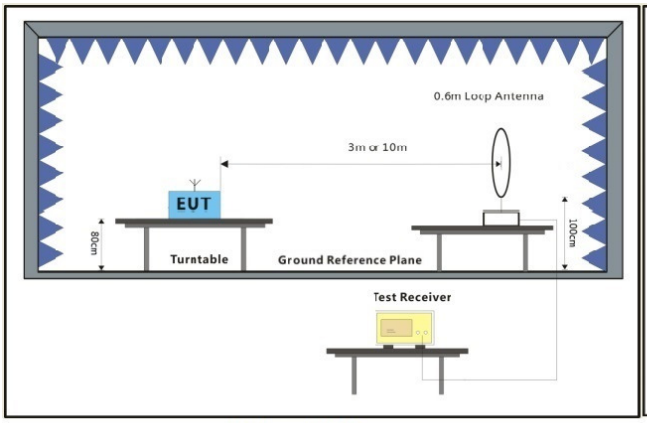
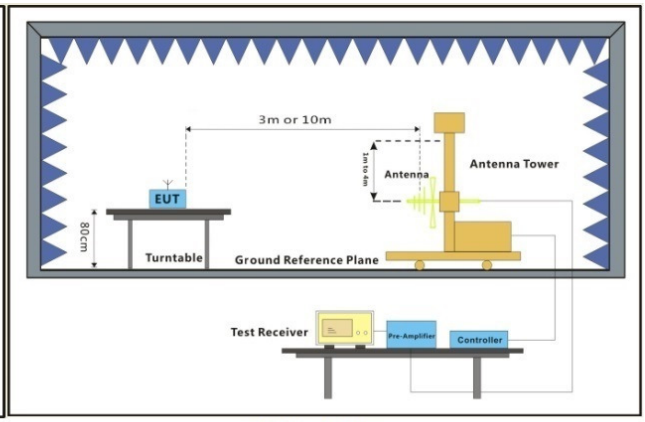
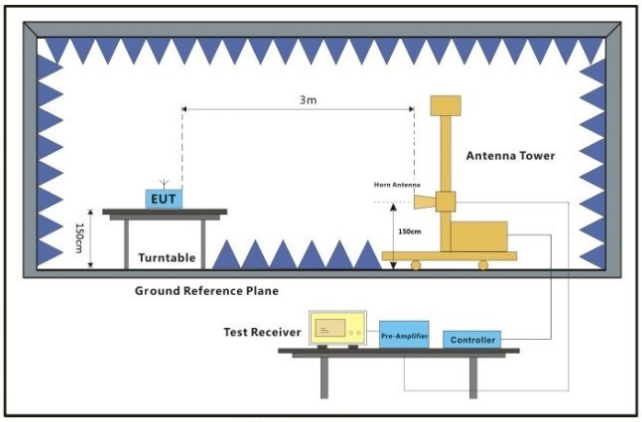
7.6.2 Test Setup Diagram



Below 30MHz



30MHz-1GHz



Above 1GHz

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7.6.3 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. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

2. For emission below 1GHz, through the pre-scan found the worst case is the lowest channel of 802.11a. Only the worst case is recorded in the report.

3. Scan from 9kHz to 40GHz, 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. As shown in this section, 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.

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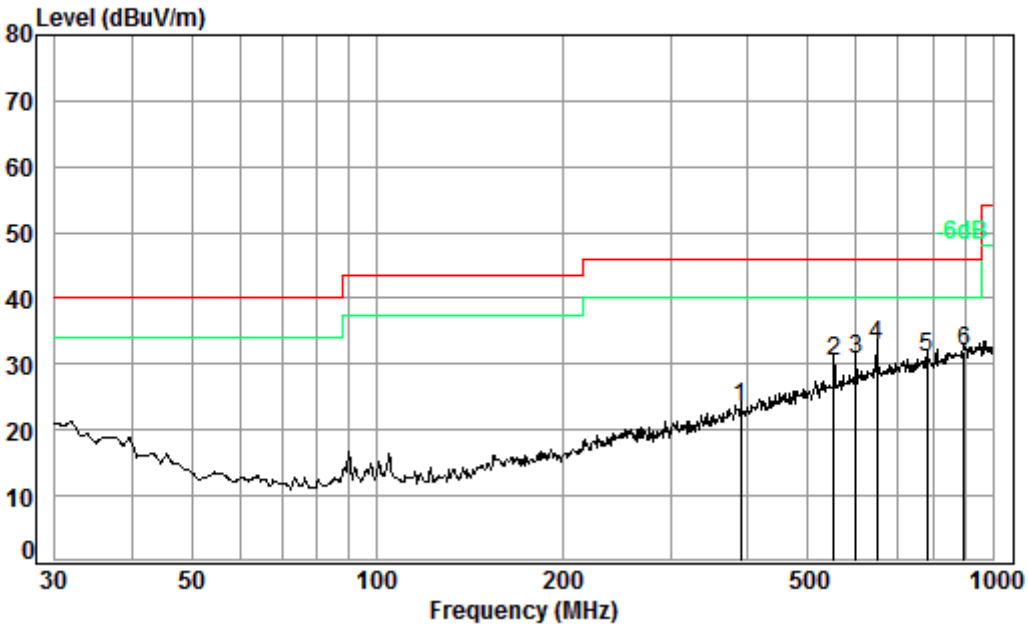
Radiated emission below 1GHz

Mode:g; Polarization:Horizontal



Condition: 3m HORIZONTAL
Job No. : 03498CR
Test mode: f

	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	389.39	2.17	22.14	27.07	26.06	23.30	46.00	-22.70
2	550.98	2.65	25.67	27.61	29.67	30.38	46.00	-15.62
3	599.32	2.70	26.59	27.54	28.99	30.74	46.00	-15.26
4 pp	647.39	2.80	27.24	27.48	30.20	32.76	46.00	-13.24
5	782.35	3.15	28.40	27.32	26.91	31.14	46.00	-14.86
6	897.00	3.59	29.76	26.78	25.40	31.97	46.00	-14.03

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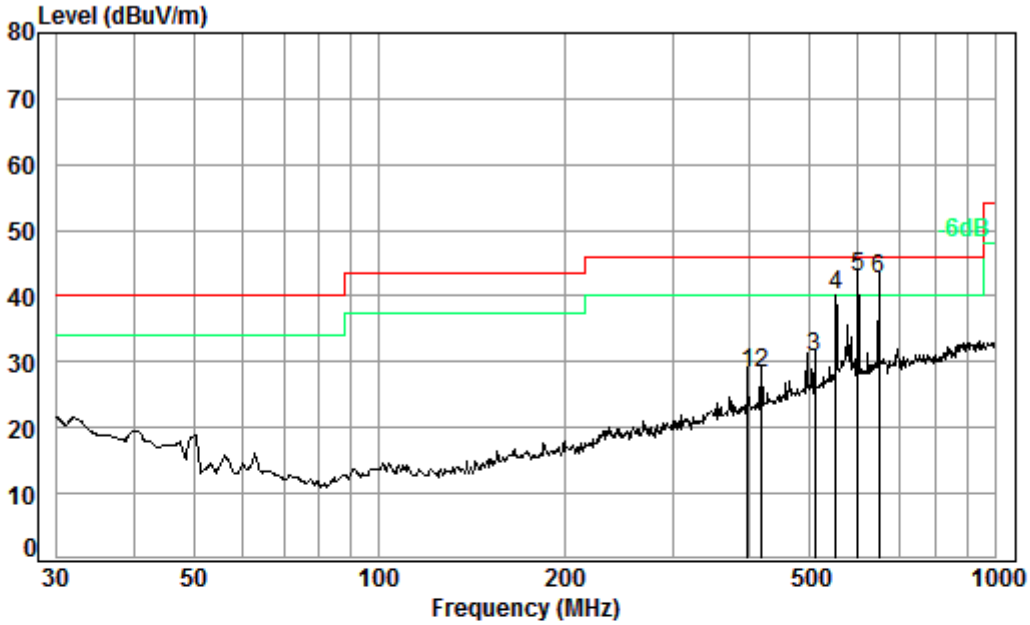
Mode:g; Polarization:Vertical



Condition: 3m VERTICAL
Job No. : 03498CR
Test mode: f

	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	396.24	2.19	22.31	27.11	30.79	28.18	46.00	-17.82
2	417.64	2.28	22.83	27.25	30.38	28.24	46.00	-17.76
3	510.06	2.61	24.82	27.68	30.83	30.58	46.00	-15.42
4	550.98	2.65	25.67	27.61	39.30	40.01	46.00	-5.99
5 pp	599.33	2.70	26.59	27.54	41.15	42.90	46.00	-3.10
6	647.56	2.80	27.24	27.48	40.05	42.61	46.00	-3.39

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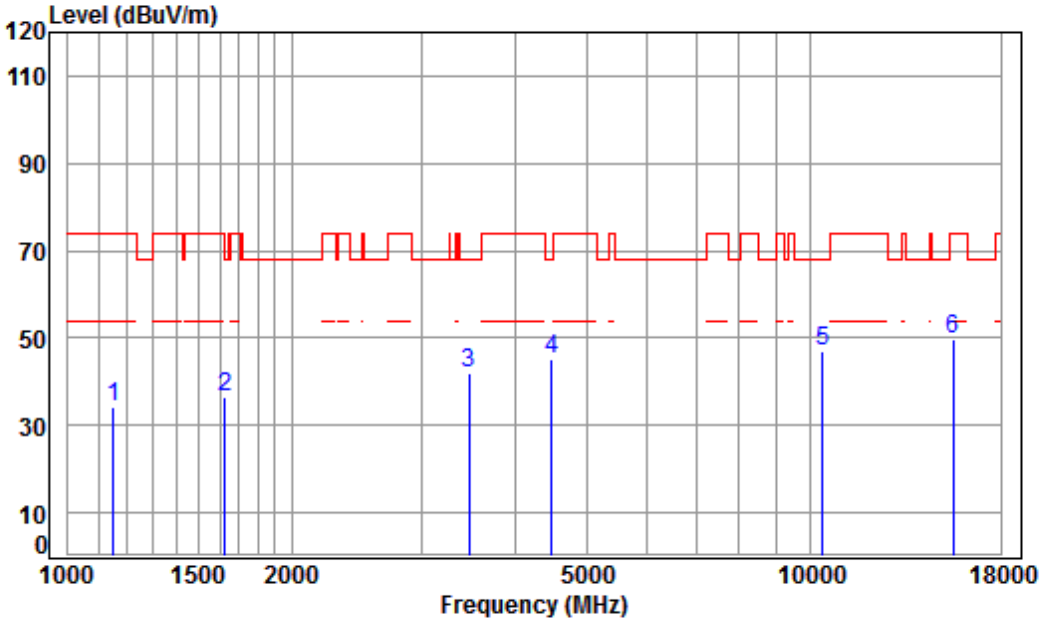
Transmitter emission above 1GHz

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



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5180 TX RSE
Note : 5G WIFI 11A

	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	1152.148	4.22	24.37	41.14	46.62	34.07	74.00	-39.93	peak
2	1625.121	5.32	26.36	41.49	46.33	36.52	74.00	-37.48	peak
3	3465.510	6.43	31.65	42.21	46.20	42.07	68.20	-26.13	peak
4	4482.150	7.54	33.57	42.41	46.67	45.37	68.20	-22.83	peak
5	pp10360.000	11.19	37.76	37.45	35.53	47.03	68.20	-21.17	peak
6	15540.000	14.30	40.72	39.00	33.58	49.60	74.00	-24.40	peak

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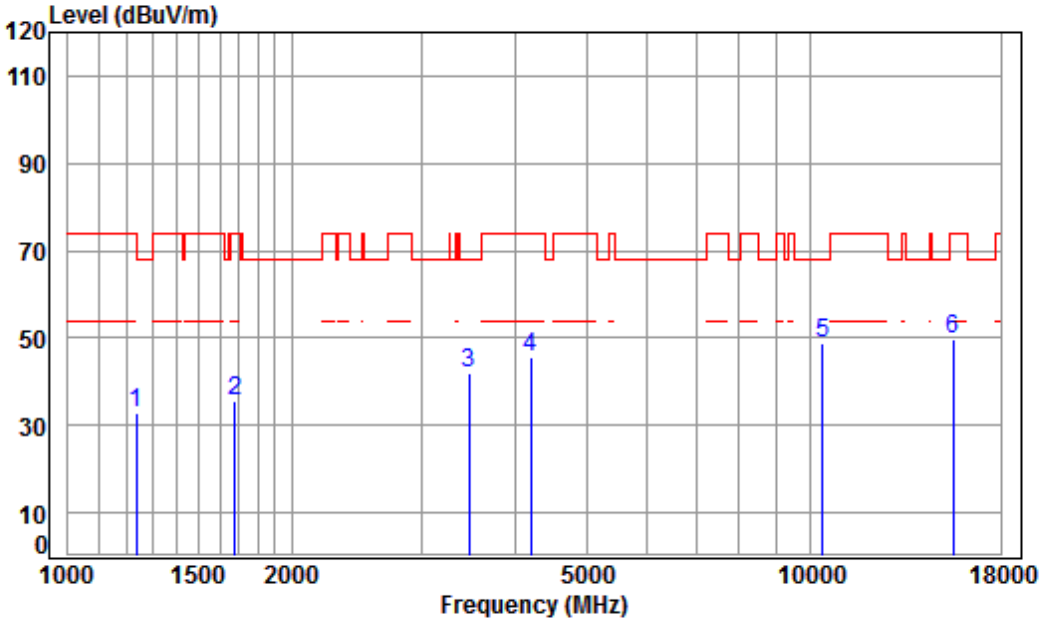
Mode:g; Polarization:Vertical; Modulation:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5180 TX RSE
Note : 5G WIFI 11A

	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	1234.909	4.55	24.74	41.21	44.62	32.70	74.00	-41.30	peak
2	1677.621	5.25	26.58	41.52	45.33	35.64	74.00	-38.36	peak
3	3465.510	6.43	31.65	42.21	46.02	41.89	68.20	-26.31	peak
4	4193.872	7.21	33.06	42.36	47.50	45.41	74.00	-28.59	peak
5	pp10360.000	11.19	37.76	37.45	37.32	48.82	68.20	-19.38	peak
6	15540.000	14.30	40.72	39.00	33.68	49.70	74.00	-24.30	peak

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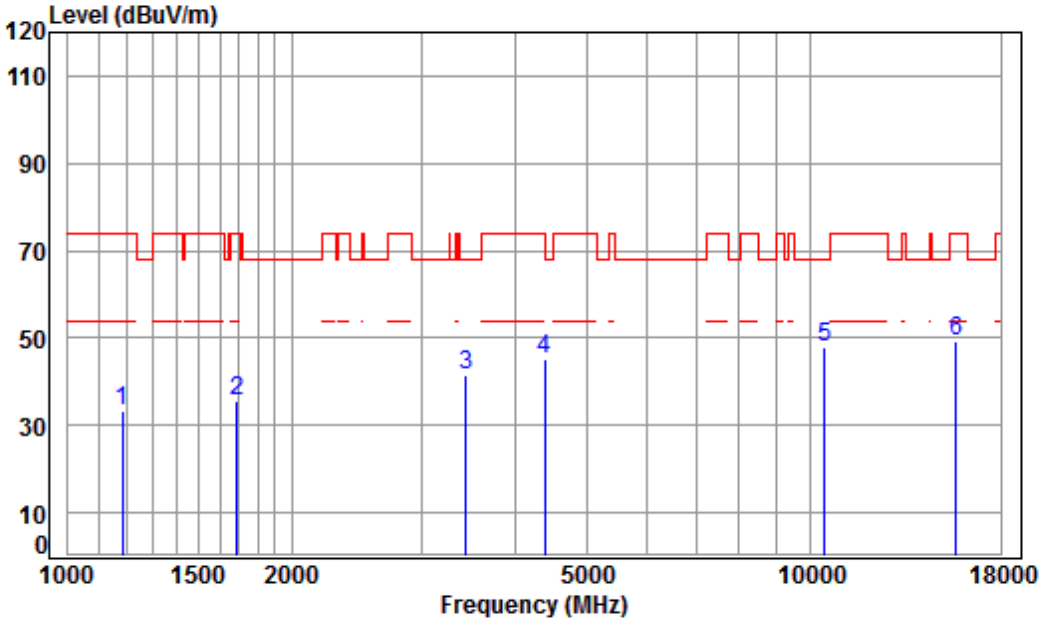
Mode:g; Polarization:Horizontal; Modulation:802.11a; bandwidth:20MHz; Channel:middle



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5220 TX RSE
Note : 5G WIFI 11A

	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	1182.513	4.35	24.51	41.17	45.79	33.48	74.00	-40.52	peak
2	1687.347	5.24	26.62	41.52	45.18	35.52	74.00	-38.48	peak
3	3435.590	6.40	31.60	42.21	45.88	41.67	68.20	-26.53	peak
4	4379.699	7.43	33.39	42.40	46.83	45.25	74.00	-28.75	peak
5	pp10440.000	11.25	37.72	37.51	36.59	48.05	68.20	-20.15	peak
6	15660.000	14.48	40.80	39.11	32.92	49.09	74.00	-24.91	peak

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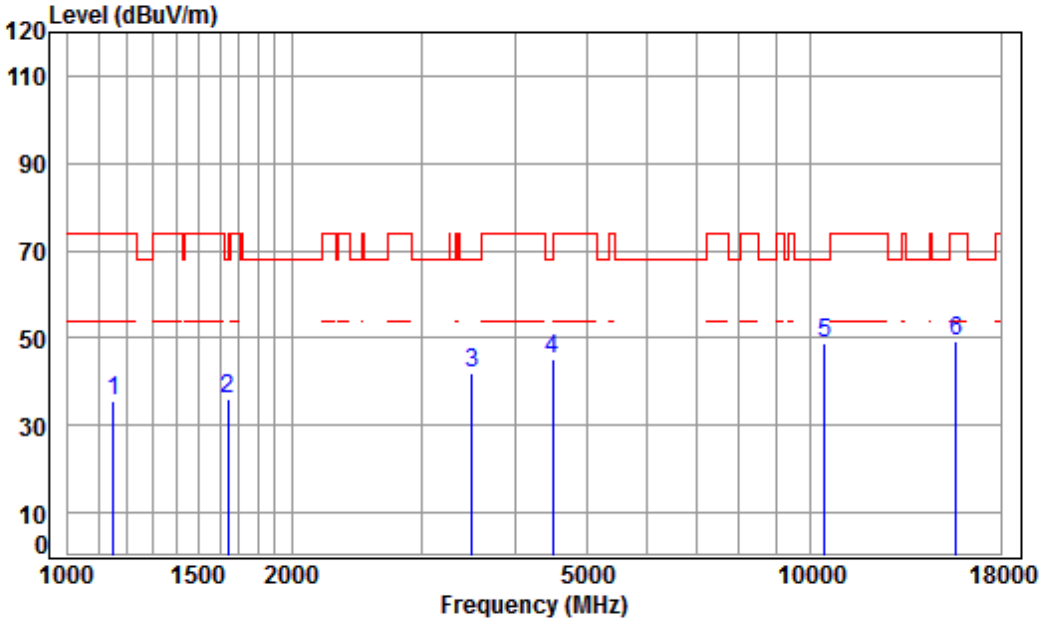
Mode:g; Polarization:Vertical; Modulation:802.11a; bandwidth:20MHz; Channel:middle



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5220 TX RSE
Note : 5G WIFI 11A

	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	1152.148	4.22	24.37	41.14	47.95	35.40	74.00	-38.60	peak
2	1644.019	5.30	26.44	41.50	45.76	36.00	68.20	-32.20	peak
3	3495.691	6.46	31.69	42.22	45.95	41.88	68.20	-26.32	peak
4	4495.125	7.55	33.59	42.42	46.45	45.17	68.20	-23.03	peak
5	pp10440.000	11.25	37.72	37.51	37.24	48.70	68.20	-19.50	peak
6	15660.000	14.48	40.80	39.11	33.28	49.45	74.00	-24.55	peak

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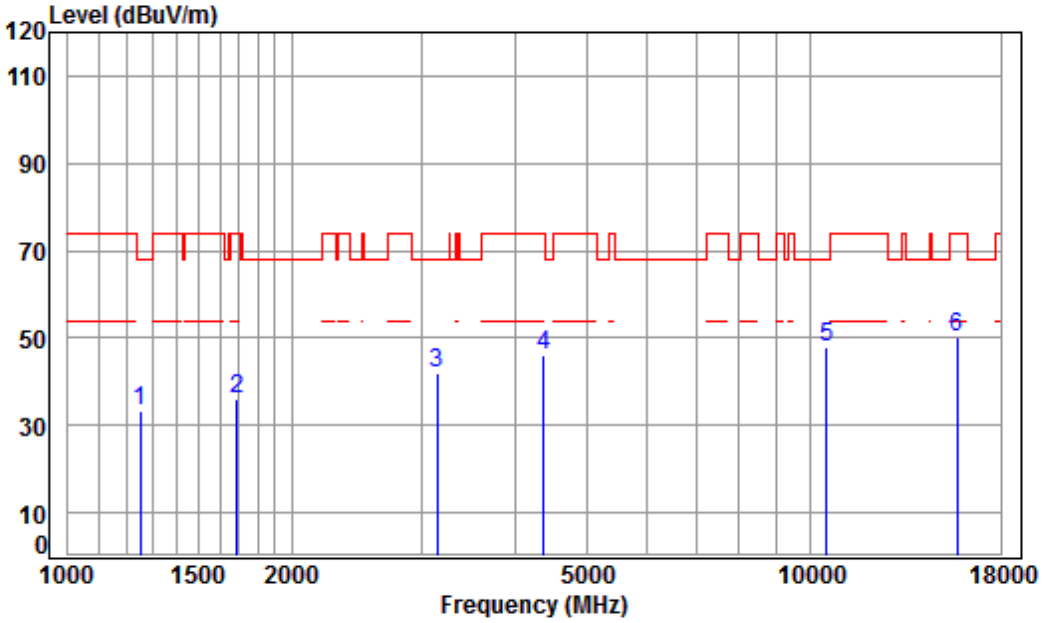
Mode:g; Polarization:Horizontal; Modulation:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5240 TX RSE
Note : 5G WIFI 11A

	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	1252.885	4.62	24.82	41.23	45.04	33.25	68.20	-34.95	peak
2	1687.347	5.24	26.62	41.52	45.53	35.87	74.00	-38.13	peak
3	3141.145	6.12	31.14	42.14	46.76	41.88	68.20	-26.32	peak
4	4367.058	7.41	33.37	42.39	47.88	46.27	74.00	-27.73	peak
5	pp10480.000	11.28	37.71	37.53	36.37	47.83	68.20	-20.37	peak
6	15720.000	14.57	40.83	39.17	34.03	50.26	74.00	-23.74	peak

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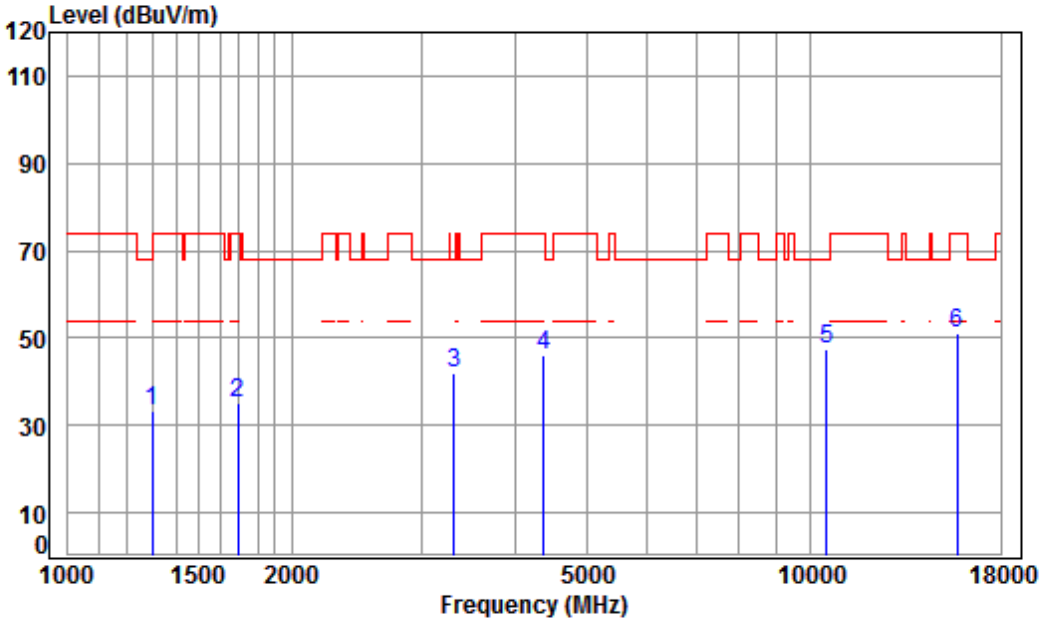
Mode:g; Polarization:Vertical; Modulation:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5240 TX RSE
Note : 5G WIFI 11A

	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	1297.103	4.79	25.01	41.26	44.58	33.12	68.20	-35.08	peak
2	1692.231	5.24	26.64	41.53	44.89	35.24	74.00	-38.76	peak
3	3308.894	6.29	31.41	42.18	46.41	41.93	68.20	-26.27	peak
4	4367.058	7.41	33.37	42.39	47.75	46.14	74.00	-27.86	peak
5	pp10480.000	11.28	37.71	37.53	36.09	47.55	68.20	-20.65	peak
6	15720.000	14.57	40.83	39.17	35.01	51.24	74.00	-22.76	peak

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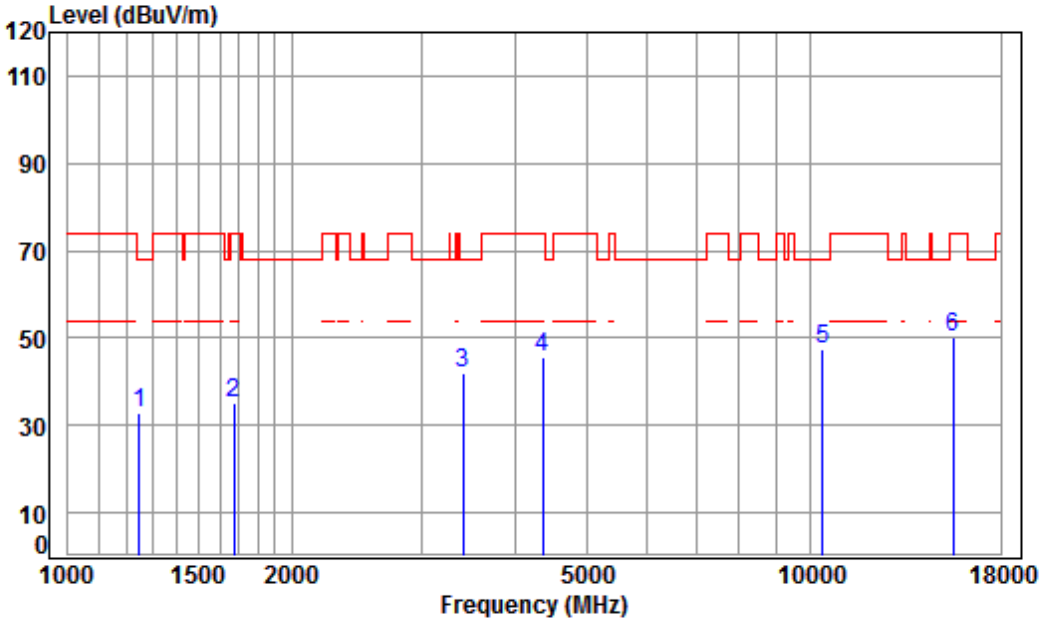
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5180 TX RSE
Note : 5G WIFI 11N20

	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	1249.269	4.61	24.81	41.22	44.85	33.05	68.20	-35.15	peak
2	1672.779	5.26	26.56	41.52	44.97	35.27	74.00	-38.73	peak
3	3405.929	6.38	31.56	42.20	46.19	41.93	68.20	-26.27	peak
4	4354.454	7.40	33.35	42.39	47.21	45.57	74.00	-28.43	peak
5	pp10360.000	11.19	37.76	37.45	35.99	47.49	68.20	-20.71	peak
6	15540.000	14.30	40.72	39.00	34.20	50.22	74.00	-23.78	peak

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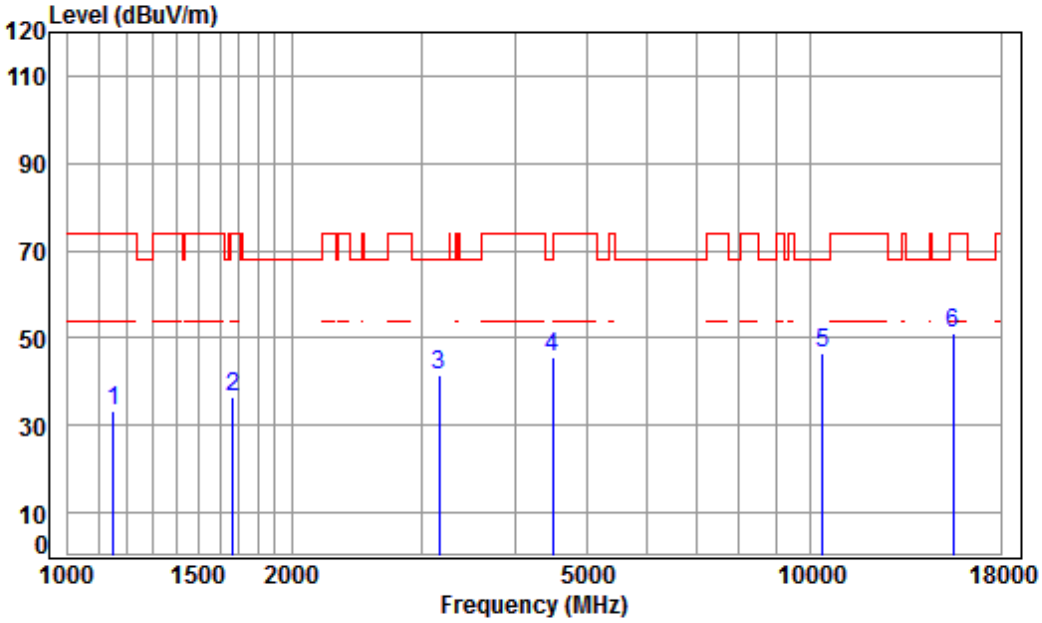
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5180 TX RSE
Note : 5G WIFI 11N20

	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	1152.148	4.22	24.37	41.14	45.78	33.23	74.00	-40.77	peak
2	1667.951	5.27	26.54	41.51	46.37	36.67	74.00	-37.33	peak
3	3159.355	6.14	31.17	42.14	46.40	41.57	68.20	-26.63	peak
4	4495.125	7.55	33.59	42.42	46.81	45.53	68.20	-22.67	peak
5	pp10360.000	11.19	37.76	37.45	34.91	46.41	68.20	-21.79	peak
6	15540.000	14.30	40.72	39.00	34.92	50.94	74.00	-23.06	peak

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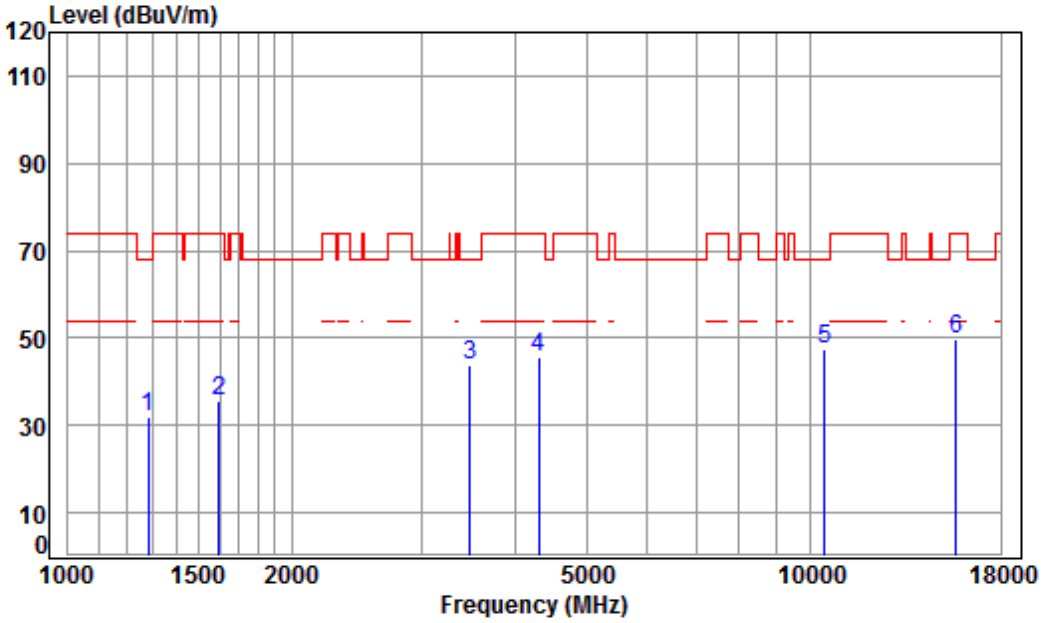
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:middle



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5220 TX RSE
Note : 5G WIFI 11N20

	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	1282.193	4.73	24.95	41.25	43.71	32.14	68.20	-36.06	peak
2	1597.181	5.35	26.24	41.47	45.32	35.44	74.00	-38.56	peak
3	3475.541	6.44	31.66	42.22	48.15	44.03	68.20	-24.17	peak
4	4304.400	7.34	33.26	42.38	47.18	45.40	74.00	-28.60	peak
5	pp10440.000	11.25	37.72	37.51	36.04	47.50	68.20	-20.70	peak
6	15660.000	14.48	40.80	39.11	33.64	49.81	74.00	-24.19	peak

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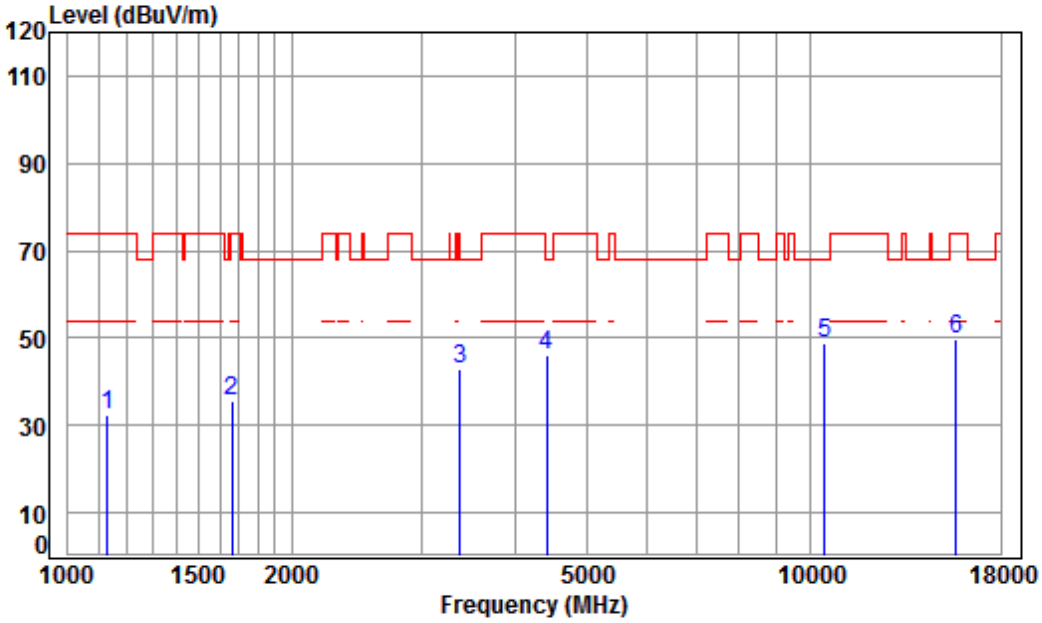
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:middle



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5220 TX RSE
Note : 5G WIFI 11N20

	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	1129.072	4.13	24.26	41.12	45.27	32.54	74.00	-41.46	peak
2	1663.137	5.27	26.52	41.51	45.12	35.40	74.00	-38.60	peak
3	3366.778	6.34	31.50	42.19	47.15	42.80	68.20	-25.40	peak
4	4405.090	7.46	33.44	42.40	47.75	46.25	68.20	-21.95	peak
5	pp10440.000	11.25	37.72	37.51	37.48	48.94	68.20	-19.26	peak
6	15660.000	14.48	40.80	39.11	33.53	49.70	74.00	-24.30	peak

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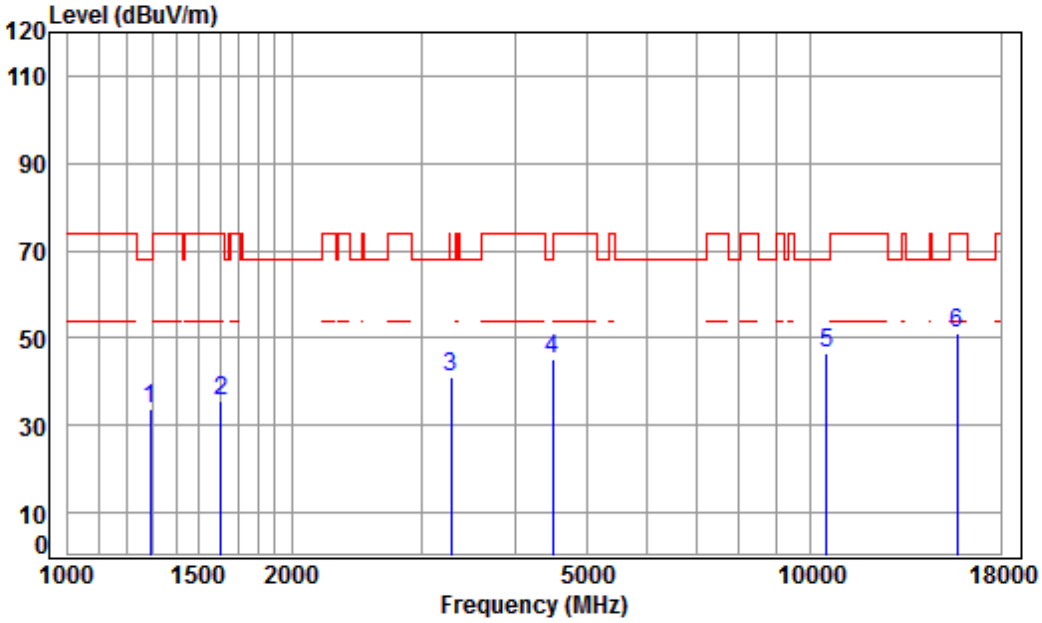
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5240 TX RSE
Note : 5G WIFI 11N20

	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	1289.627	4.76	24.98	41.25	45.47	33.96	68.20	-34.24	peak
2	1606.441	5.34	26.28	41.47	45.43	35.58	74.00	-38.42	peak
3	3280.326	6.26	31.36	42.17	45.69	41.14	68.20	-27.06	peak
4	4495.125	7.55	33.59	42.42	46.42	45.14	68.20	-23.06	peak
5	pp10480.000	11.28	37.71	37.53	35.24	46.70	68.20	-21.50	peak
6	15720.000	14.57	40.83	39.17	34.89	51.12	74.00	-22.88	peak

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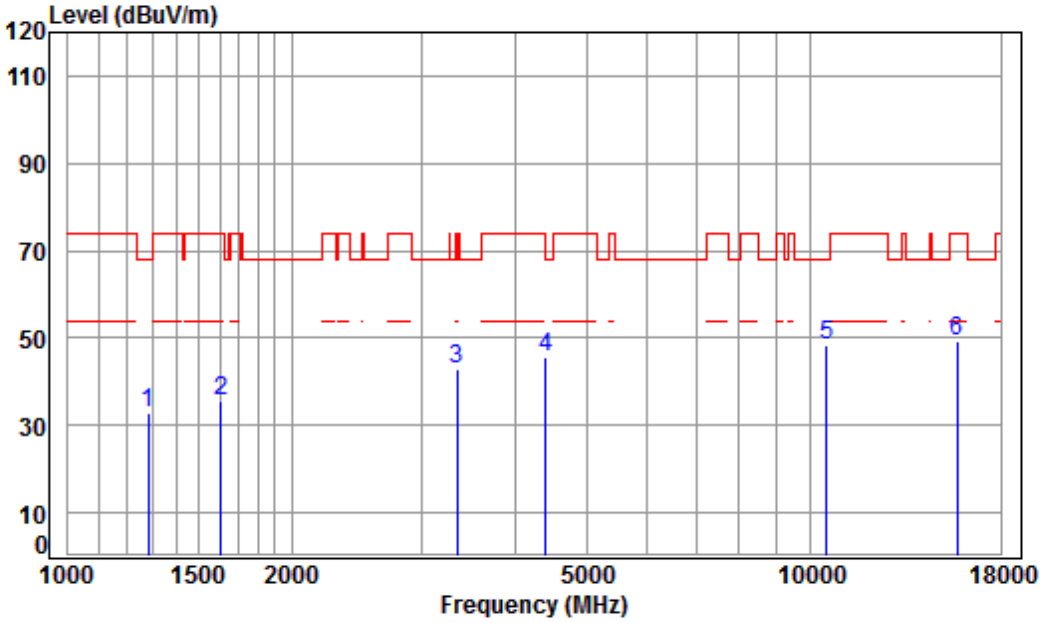
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5240 TX RSE
Note : 5G WIFI 11N20

	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	1282.193	4.73	24.95	41.25	44.26	32.69	68.20	-35.51	peak
2	1606.441	5.34	26.28	41.47	45.66	35.81	74.00	-38.19	peak
3	3337.710	6.31	31.45	42.18	47.50	43.08	74.00	-30.92	peak
4	4392.376	7.44	33.42	42.40	47.12	45.58	74.00	-28.42	peak
5	pp10480.000	11.28	37.71	37.53	37.05	48.51	68.20	-19.69	peak
6	15720.000	14.57	40.83	39.17	33.08	49.31	74.00	-24.69	peak

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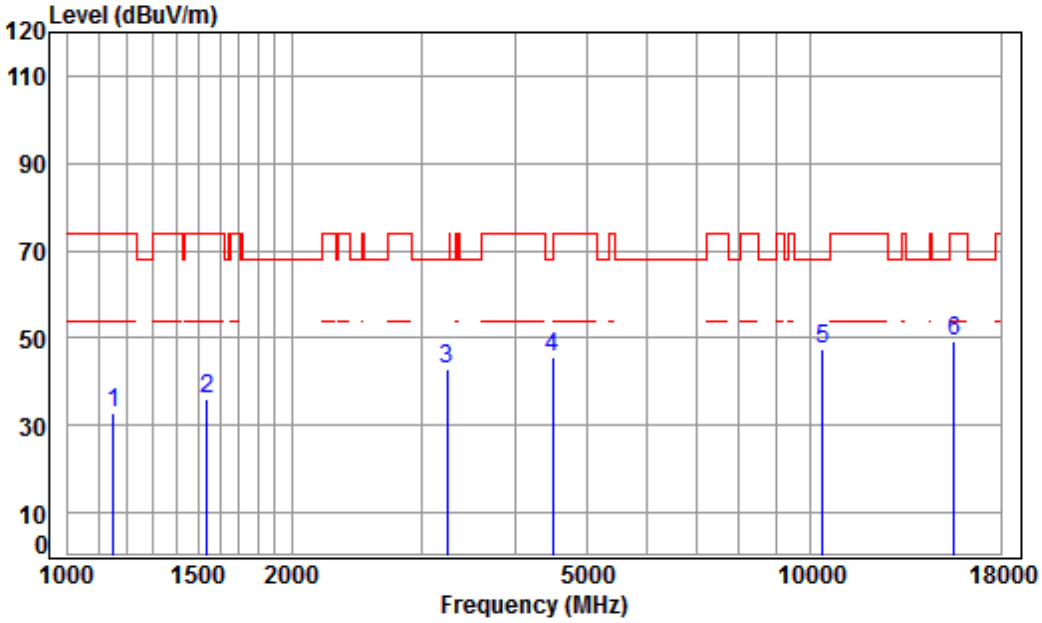
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5190 TX RSE
Note : 5G WIFI 11N40

	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	1152.148	4.22	24.37	41.14	45.57	33.02	74.00	-40.98	peak
2	1538.281	5.43	25.98	41.43	46.26	36.24	74.00	-37.76	peak
3	3242.619	6.22	31.30	42.16	47.55	42.91	68.20	-25.29	peak
4	4495.125	7.55	33.59	42.42	47.03	45.75	68.20	-22.45	peak
5	pp10380.000	11.21	37.75	37.47	35.94	47.43	68.20	-20.77	peak
6	15570.000	14.35	40.74	39.03	33.36	49.42	74.00	-24.58	peak

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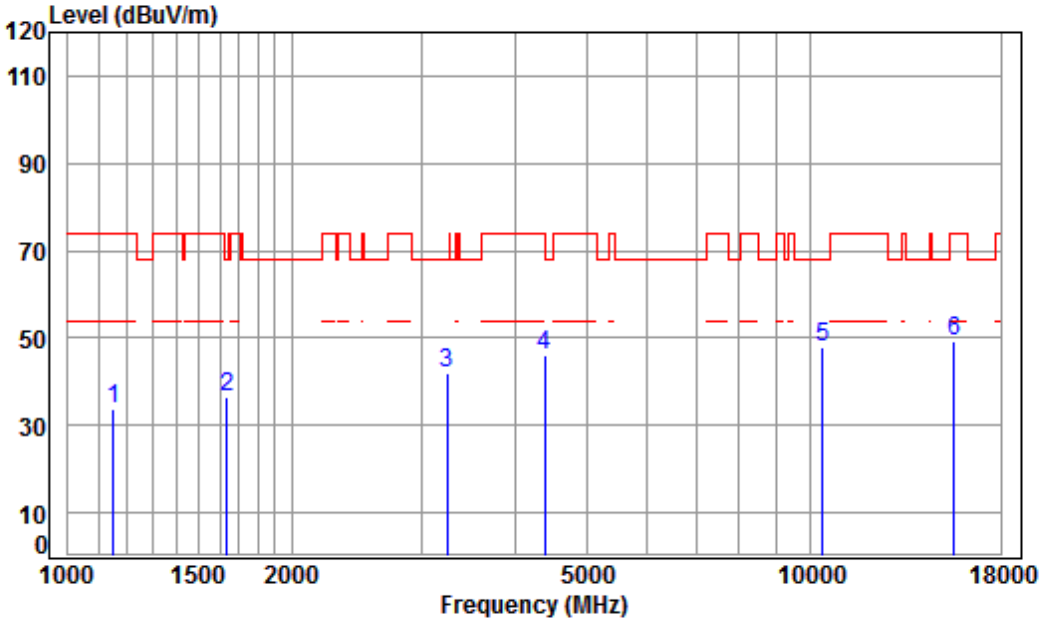
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5190 TX RSE
Note : 5G WIFI 11N40

	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	1152.148	4.22	24.37	41.14	46.25	33.70	74.00	-40.30	peak
2	1639.274	5.30	26.42	41.49	46.43	36.66	68.20	-31.54	peak
3	3242.619	6.22	31.30	42.16	46.50	41.86	68.20	-26.34	peak
4	4379.699	7.43	33.39	42.40	47.47	45.89	74.00	-28.11	peak
5	pp10380.000	11.21	37.75	37.47	36.32	47.81	68.20	-20.39	peak
6	15570.000	14.35	40.74	39.03	33.39	49.45	74.00	-24.55	peak

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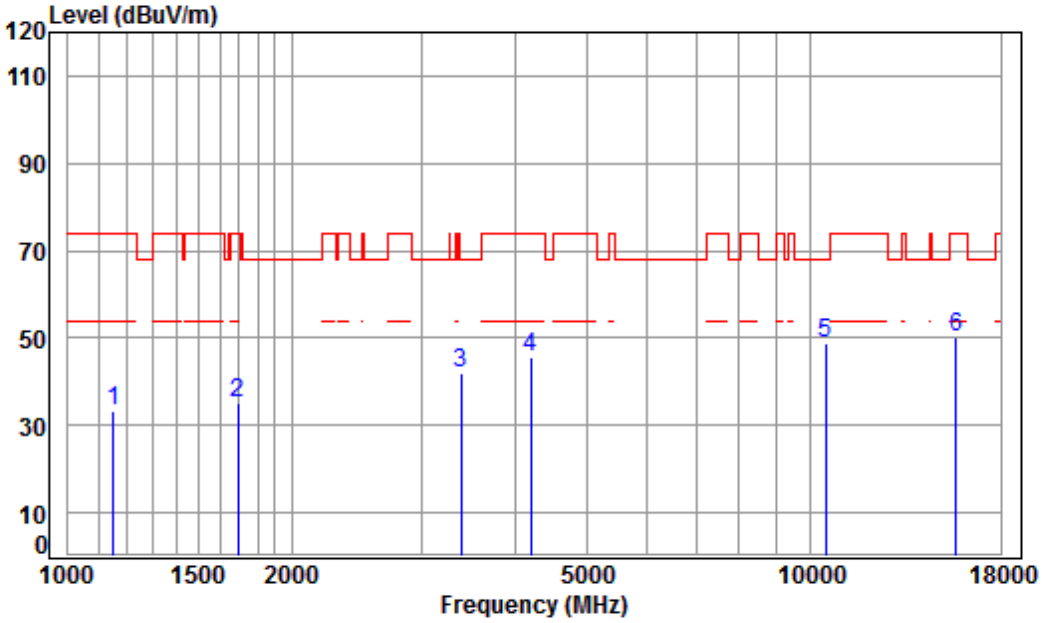
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5230 TX RSE
Note : 5G WIFI 11N40

	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	1152.148	4.22	24.37	41.14	45.76	33.21	74.00	-40.79	peak
2	1692.231	5.24	26.64	41.53	44.94	35.29	74.00	-38.71	peak
3	3386.297	6.36	31.53	42.19	46.40	42.10	68.20	-26.10	peak
4	4193.872	7.21	33.06	42.36	47.61	45.52	74.00	-28.48	peak
5	pp10460.000	11.26	37.72	37.52	37.29	48.75	68.20	-19.45	peak
6	15690.000	14.53	40.82	39.14	34.08	50.29	74.00	-23.71	peak

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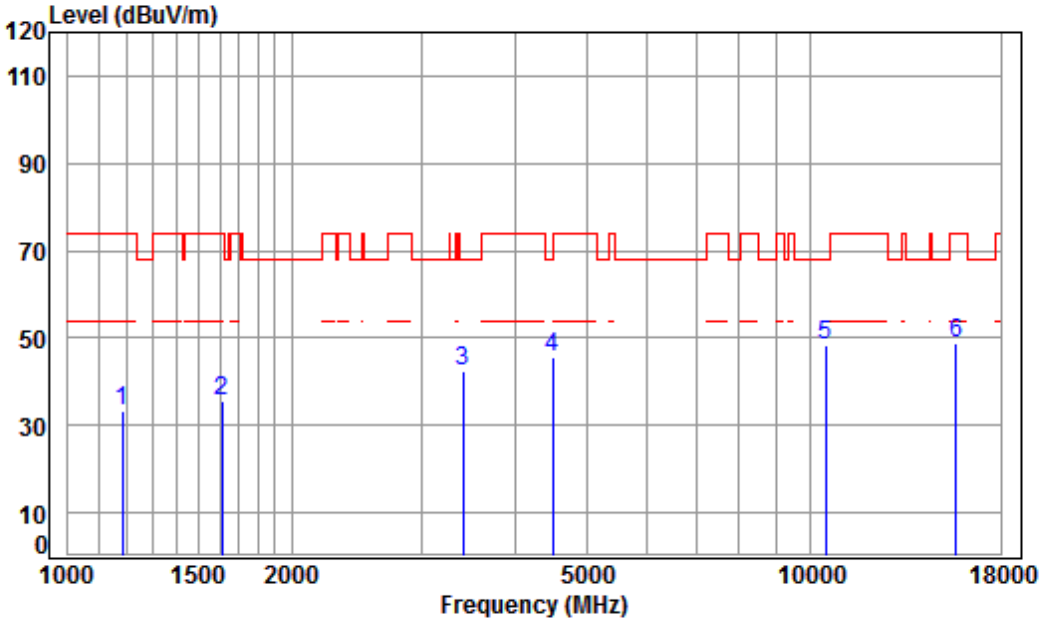
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5230 TX RSE
Note : 5G WIFI 11N40

	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	1185.936	4.36	24.53	41.17	45.64	33.36	74.00	-40.64	peak
2	1611.091	5.34	26.30	41.48	45.61	35.77	74.00	-38.23	peak
3	3405.929	6.38	31.56	42.20	46.84	42.58	68.20	-25.62	peak
4	4495.125	7.55	33.59	42.42	46.71	45.43	68.20	-22.77	peak
5	pp10460.000	11.26	37.72	37.52	36.98	48.44	68.20	-19.76	peak
6	15690.000	14.53	40.82	39.14	32.82	49.03	74.00	-24.97	peak

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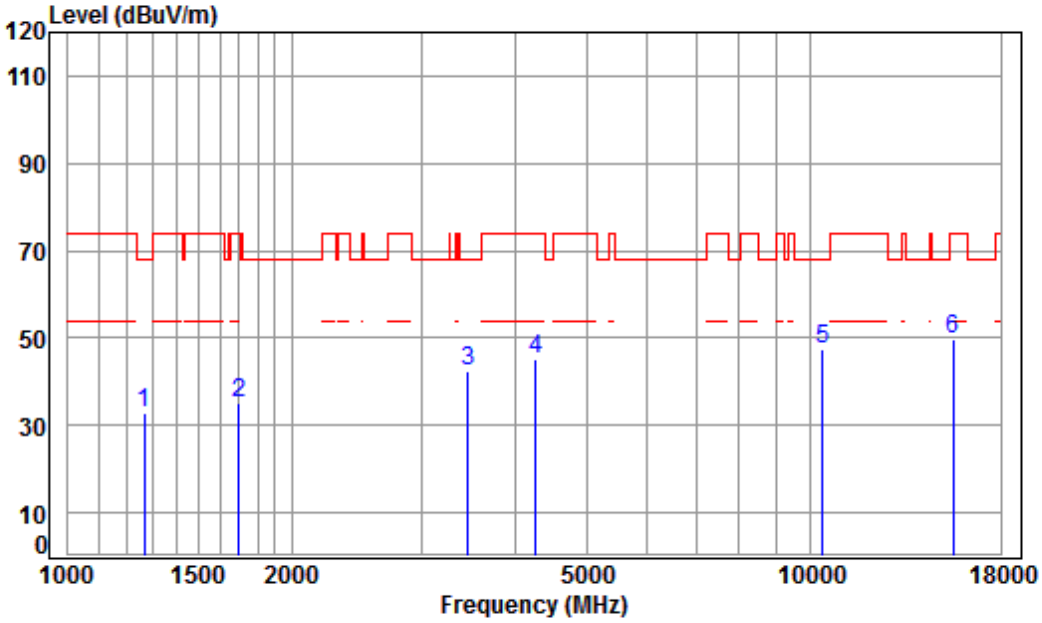
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5180 TX RSE
Note : 5G WIFI 11AC20

	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	1267.454	4.68	24.89	41.24	44.65	32.98	68.20	-35.22	peak
2	1697.129	5.23	26.66	41.53	44.71	35.07	74.00	-38.93	peak
3	3455.508	6.42	31.63	42.21	46.39	42.23	68.20	-25.97	peak
4	4267.237	7.30	33.19	42.38	46.95	45.06	74.00	-28.94	peak
5	pp10360.000	11.19	37.76	37.45	35.94	47.44	68.20	-20.76	peak
6	15540.000	14.30	40.72	39.00	33.87	49.89	74.00	-24.11	peak

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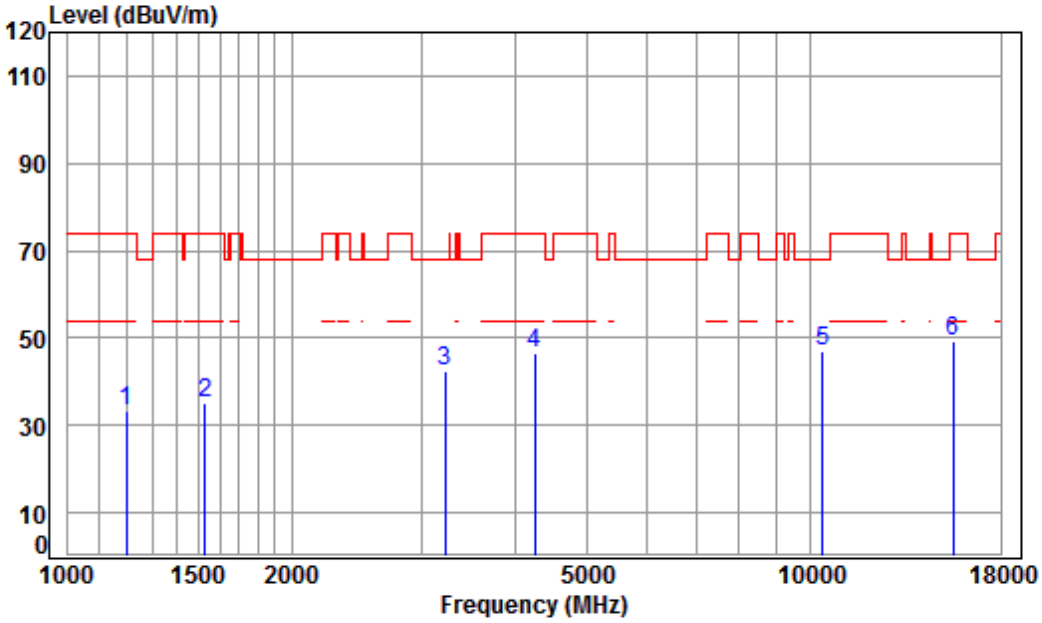
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5180 TX RSE
Note : 5G WIFI 11AC20

	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	1199.726	4.42	24.59	41.18	45.40	33.23	74.00	-40.77	peak
2	1529.414	5.44	25.94	41.43	45.15	35.10	74.00	-38.90	peak
3	3214.623	6.20	31.26	42.15	47.10	42.41	68.20	-25.79	peak
4	4254.921	7.28	33.17	42.37	48.33	46.41	74.00	-27.59	peak
5	pp10360.000	11.19	37.76	37.45	35.50	47.00	68.20	-21.20	peak
6	15540.000	14.30	40.72	39.00	33.07	49.09	74.00	-24.91	peak

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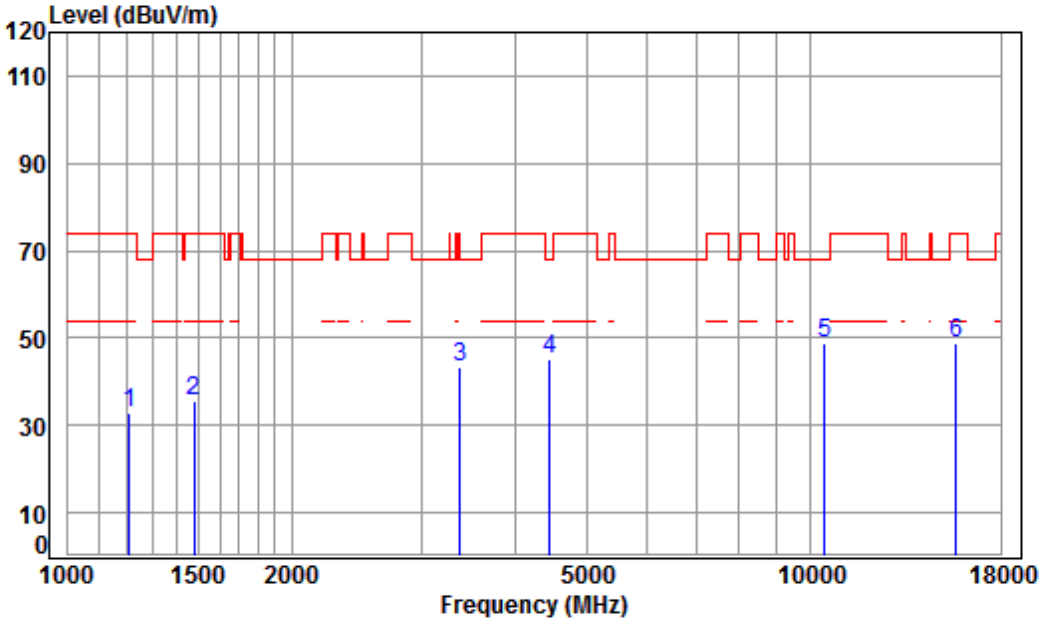
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:20MHz; Channel:middle



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5220 TX RSE
Note : 5G WIFI 11AC20

	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	1210.174	4.46	24.64	41.19	44.77	32.68	74.00	-41.32	peak
2	1477.276	5.41	25.72	41.39	45.96	35.70	74.00	-38.30	peak
3	3366.778	6.34	31.50	42.19	47.86	43.51	68.20	-24.69	peak
4	4456.315	7.51	33.53	42.41	46.45	45.08	68.20	-23.12	peak
5	pp10440.000	11.25	37.72	37.51	37.56	49.02	68.20	-19.18	peak
6	15660.000	14.48	40.80	39.11	32.44	48.61	74.00	-25.39	peak

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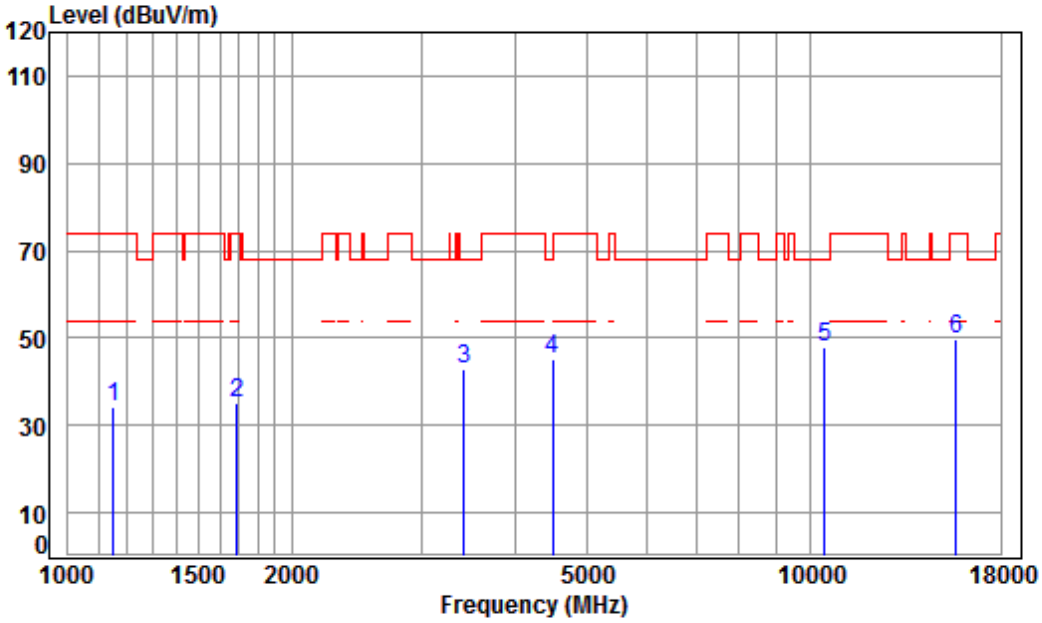
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:20MHz; Channel:middle



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5220 TX RSE
Note : 5G WIFI 11AC20

	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	1152.148	4.22	24.37	41.14	46.89	34.34	74.00	-39.66	peak
2	1687.347	5.24	26.62	41.52	44.63	34.97	74.00	-39.03	peak
3	3415.787	6.38	31.57	42.20	47.33	43.08	68.20	-25.12	peak
4	4495.125	7.55	33.59	42.42	46.62	45.34	68.20	-22.86	peak
5	pp10440.000	11.25	37.72	37.51	36.50	47.96	68.20	-20.24	peak
6	15660.000	14.48	40.80	39.11	33.54	49.71	74.00	-24.29	peak

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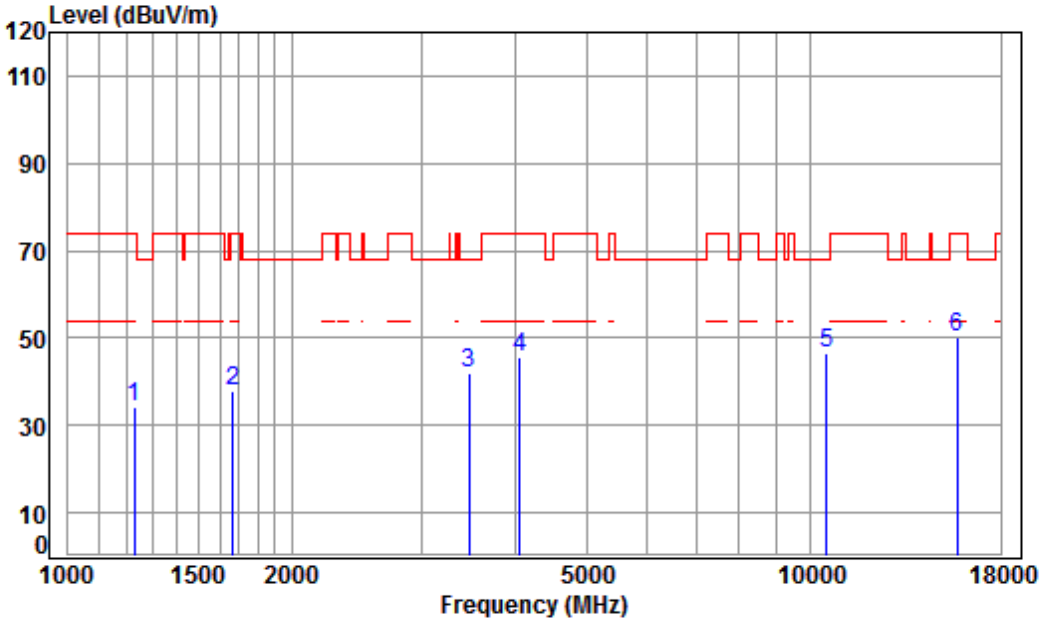
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5240 TX RSE
Note : 5G WIFI 11AC20

	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	1227.791	4.53	24.71	41.21	46.09	34.12	74.00	-39.88	peak
2	1667.951	5.27	26.54	41.51	47.53	37.83	74.00	-36.17	peak
3	3465.510	6.43	31.65	42.21	46.24	42.11	68.20	-26.09	peak
4	4062.629	7.06	32.82	42.34	47.99	45.53	74.00	-28.47	peak
5	pp10480.000	11.28	37.71	37.53	34.97	46.43	68.20	-21.77	peak
6	15720.000	14.57	40.83	39.17	33.76	49.99	74.00	-24.01	peak

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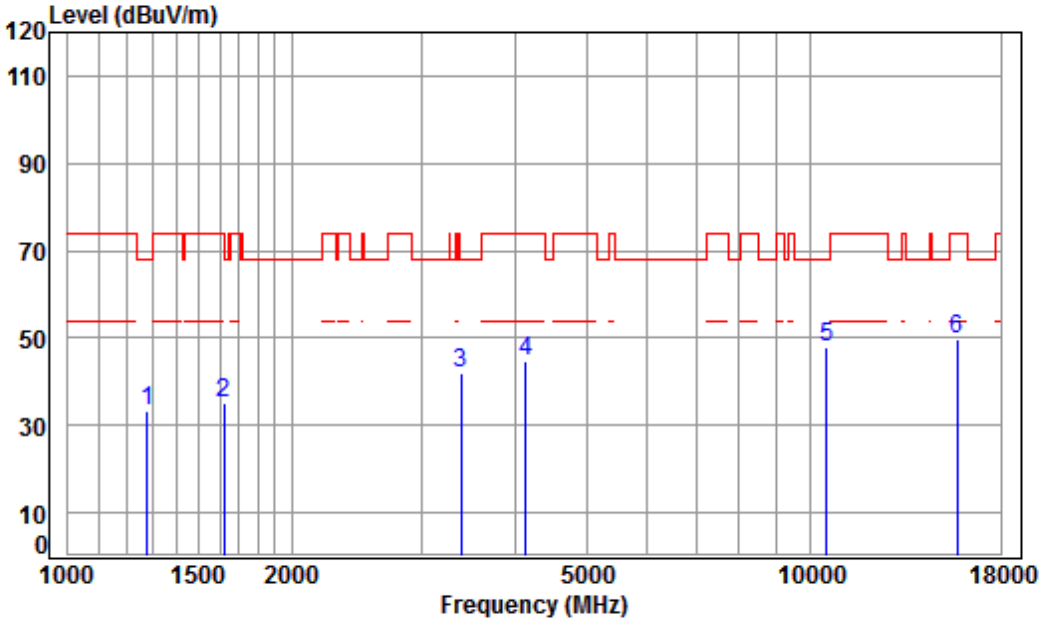
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5240 TX RSE
Note : 5G WIFI 11AC20

	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	1278.492	4.72	24.93	41.25	44.92	33.32	68.20	-34.88	peak
2	1620.431	5.32	26.34	41.48	44.98	35.16	74.00	-38.84	peak
3	3386.297	6.36	31.53	42.19	46.14	41.84	68.20	-26.36	peak
4	4133.699	7.14	32.95	42.35	47.10	44.84	74.00	-29.16	peak
5	pp10480.000	11.28	37.71	37.53	36.22	47.68	68.20	-20.52	peak
6	15720.000	14.57	40.83	39.17	33.29	49.52	74.00	-24.48	peak

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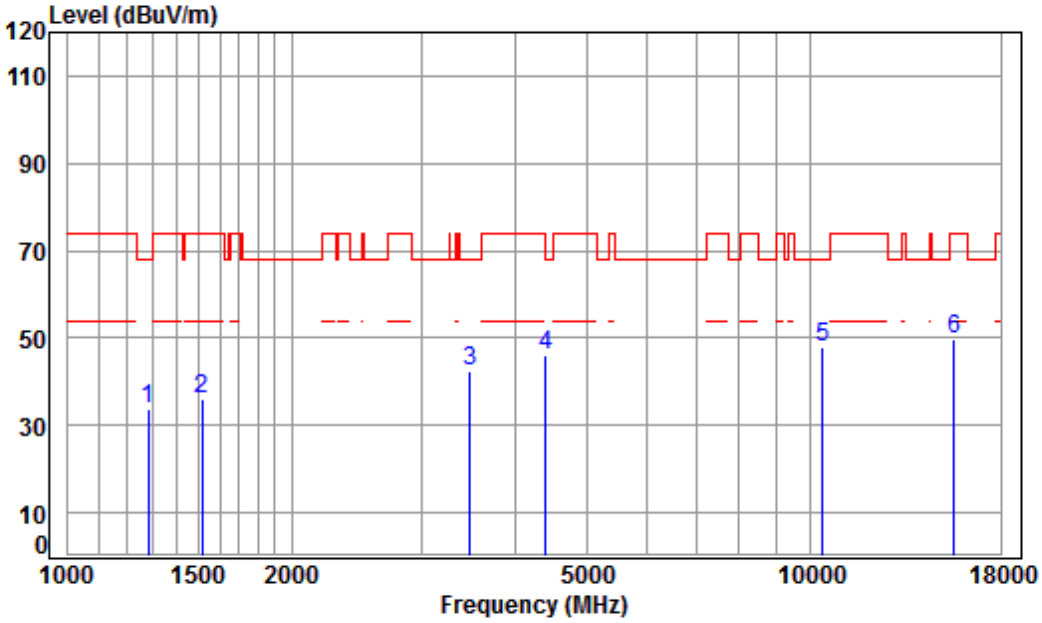
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:40MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5190 TX RSE
Note : 5G WIFI 11AC40

	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	1282.193	4.73	24.95	41.25	45.44	33.87	68.20	-34.33	peak
2	1516.210	5.46	25.87	41.42	46.30	36.21	74.00	-37.79	peak
3	3475.541	6.44	31.66	42.22	46.39	42.27	68.20	-25.93	peak
4	4392.376	7.44	33.42	42.40	47.84	46.30	74.00	-27.70	peak
5	pp10380.000	11.21	37.75	37.47	36.42	47.91	68.20	-20.29	peak
6	15570.000	14.35	40.74	39.03	33.88	49.94	74.00	-24.06	peak

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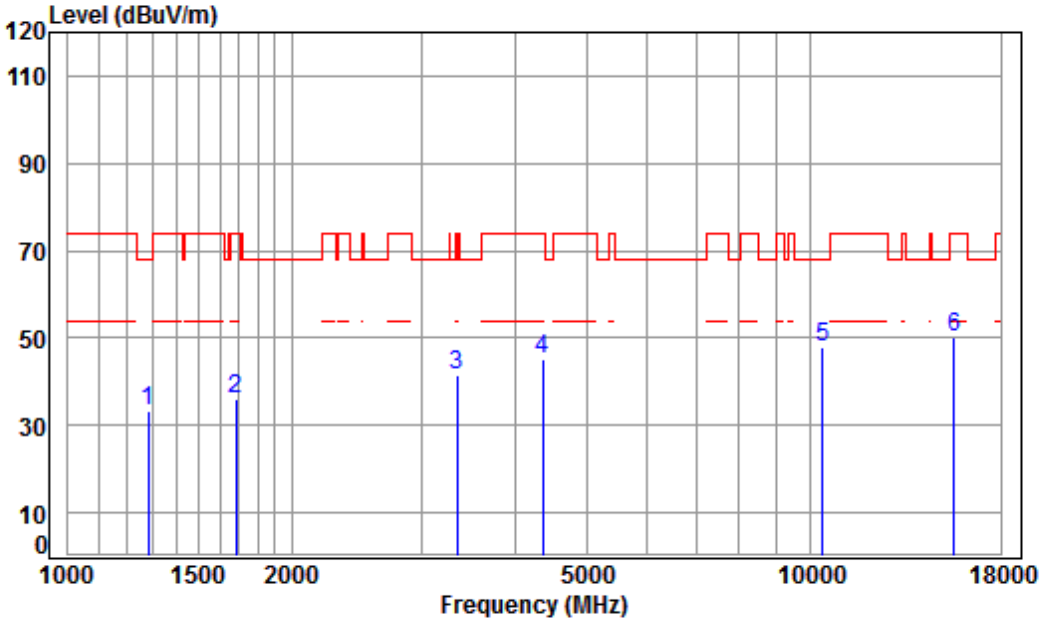
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:40MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5190 TX RSE
Note : 5G WIFI 11AC40

	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	1282.193	4.73	24.95	41.25	44.77	33.20	68.20	-35.00	peak
2	1682.477	5.25	26.60	41.52	45.53	35.86	74.00	-38.14	peak
3	3337.710	6.31	31.45	42.18	46.12	41.70	74.00	-32.30	peak
4	4354.454	7.40	33.35	42.39	46.96	45.32	74.00	-28.68	peak
5	pp10380.000	11.21	37.75	37.47	36.26	47.75	68.20	-20.45	peak
6	15570.000	14.35	40.74	39.03	34.15	50.21	74.00	-23.79	peak

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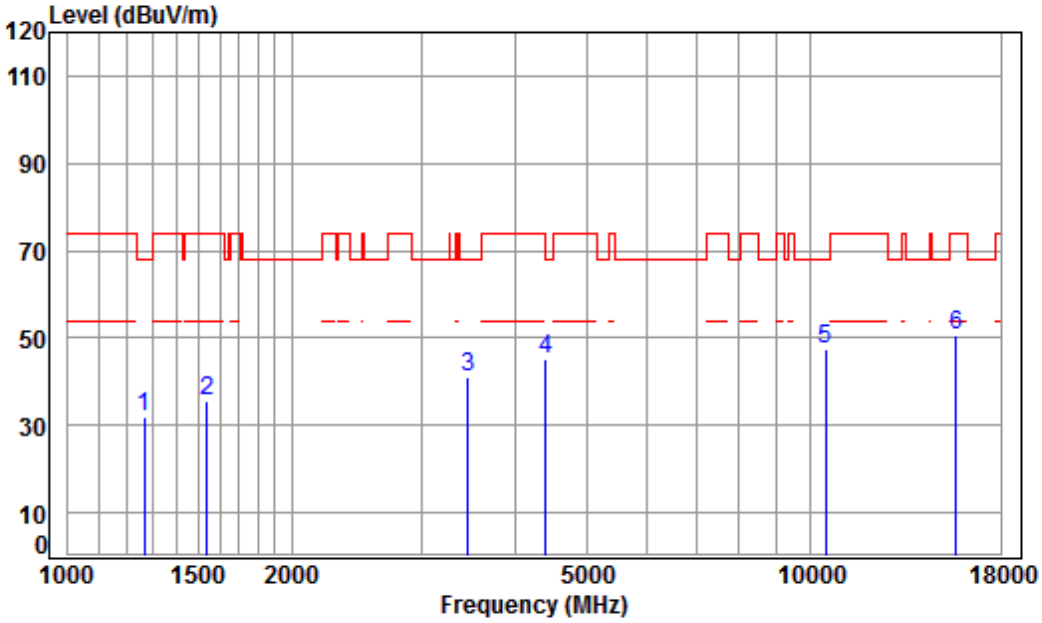
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:40MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5230 TX RSE
Note : 5G WIFI 11AC40

	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	1267.454	4.68	24.89	41.24	43.82	32.15	68.20	-36.05	peak
2	1538.281	5.43	25.98	41.43	45.71	35.69	74.00	-38.31	peak
3	3455.508	6.42	31.63	42.21	45.36	41.20	68.20	-27.00	peak
4	4392.376	7.44	33.42	42.40	46.49	44.95	74.00	-29.05	peak
5	pp10460.000	11.26	37.72	37.52	36.21	47.67	68.20	-20.53	peak
6	15690.000	14.53	40.82	39.14	34.62	50.83	74.00	-23.17	peak

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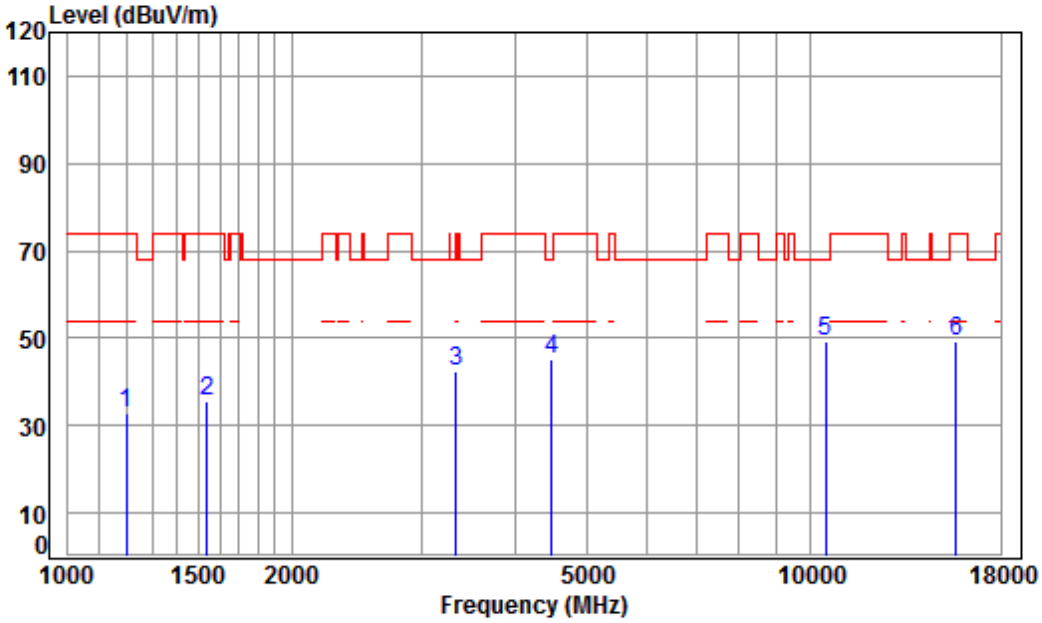
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:40MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5230 TX RSE
Note : 5G WIFI 11AC40

	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	1199.726	4.42	24.59	41.18	45.02	32.85	74.00	-41.15	peak
2	1538.281	5.43	25.98	41.43	45.47	35.45	74.00	-38.55	peak
3	3328.077	6.30	31.44	42.18	46.89	42.45	68.20	-25.75	peak
4	4482.150	7.54	33.57	42.41	46.49	45.19	68.20	-23.01	peak
5	pp10460.000	11.26	37.72	37.52	37.63	49.09	68.20	-19.11	peak
6	15690.000	14.53	40.82	39.14	32.93	49.14	74.00	-24.86	peak

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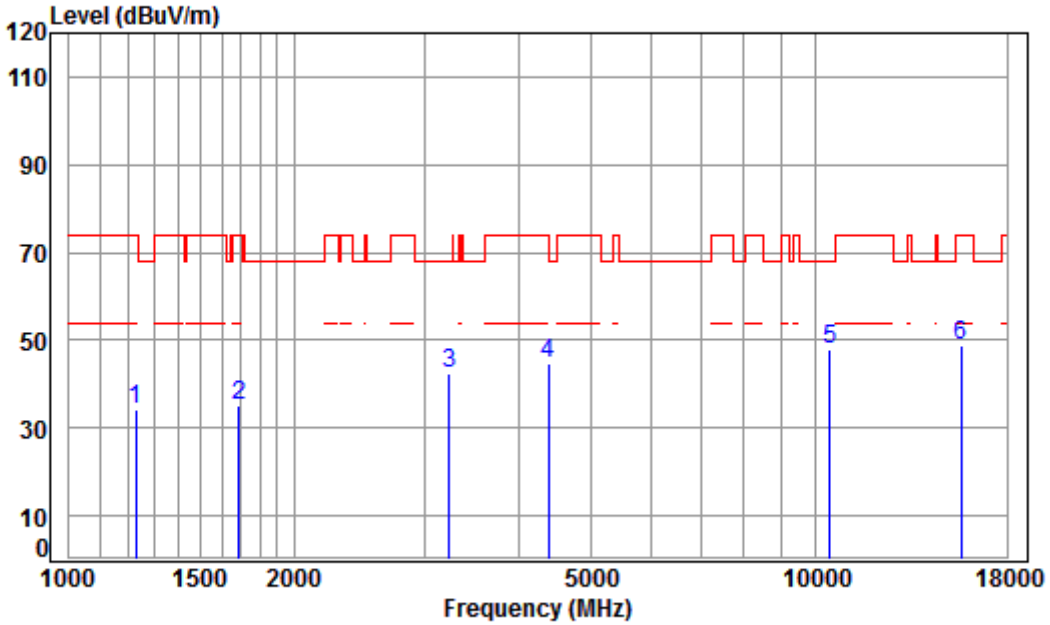
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:80MHz; Channel:Middle



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5210 TX RSE
Note : 5G WIFI 11AC80

	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	1227.791	4.53	24.71	41.21	46.21	34.24	74.00	-39.76	peak
2	1687.347	5.24	26.62	41.52	44.95	35.29	74.00	-38.71	peak
3	3233.260	6.21	31.29	42.16	47.04	42.38	68.20	-25.82	peak
4	4379.699	7.43	33.39	42.40	46.40	44.82	74.00	-29.18	peak
5	pp10420.000	11.24	37.73	37.49	36.26	47.74	68.20	-20.46	peak
6	15630.000	14.44	40.78	39.09	32.91	49.04	74.00	-24.96	peak

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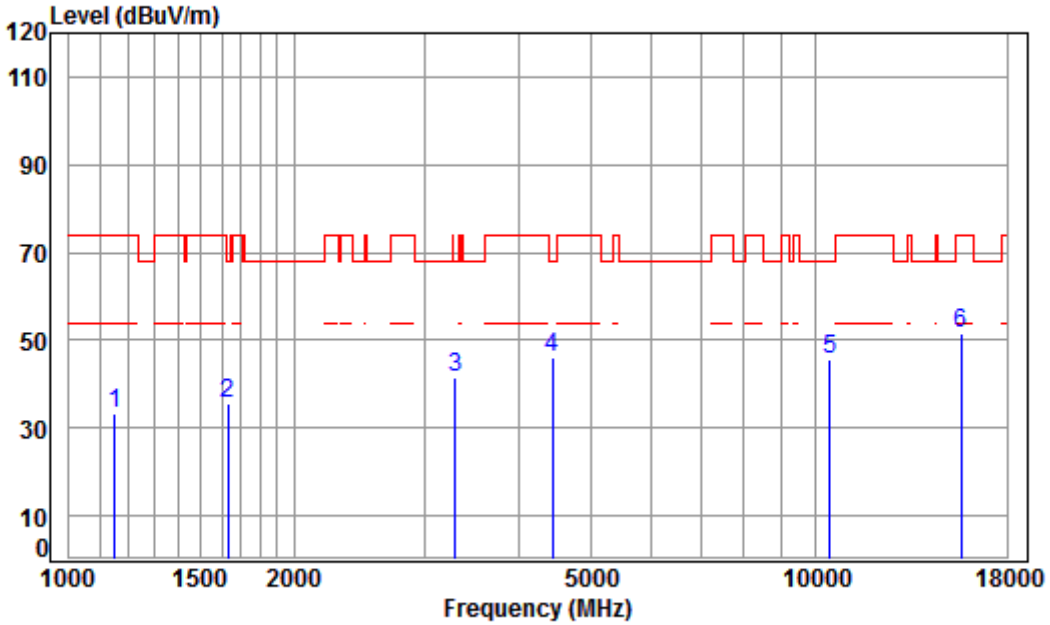
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:80MHz; Channel:Middle



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5210 TX RSE
Note : 5G WIFI 11AC80

	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	1152.148	4.22	24.37	41.14	45.73	33.18	74.00	-40.82	peak
2	1629.825	5.31	26.38	41.49	45.24	35.44	68.20	-32.76	peak
3	3289.821	6.27	31.38	42.17	46.11	41.59	68.20	-26.61	peak
4 pp	4430.628	7.48	33.48	42.41	47.45	46.00	68.20	-22.20	peak
5	10420.000	11.24	37.73	37.49	34.11	45.59	68.20	-22.61	peak
6	15630.000	14.44	40.78	39.09	35.28	51.41	74.00	-22.59	peak

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7.7 Radiated Emissions which fall in the restricted bands

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.		

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case: f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

The worst case for final test: g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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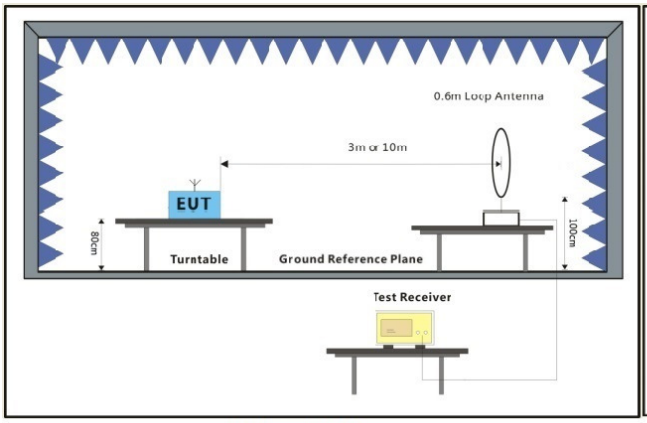
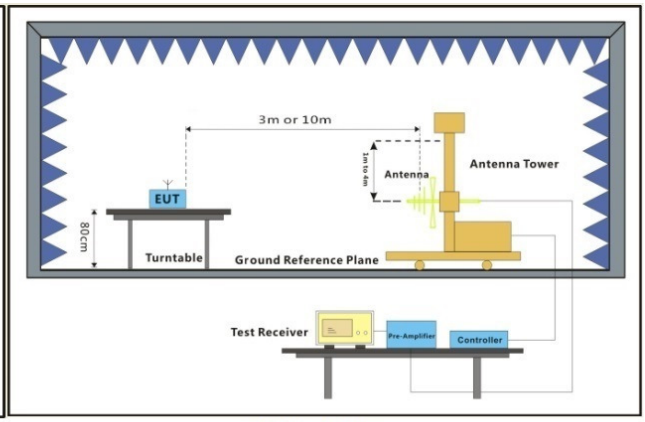
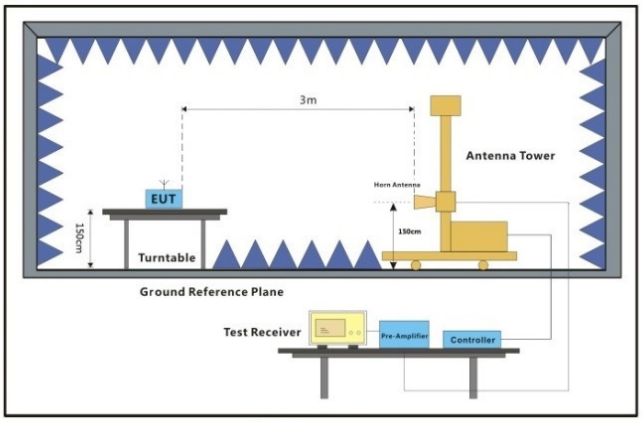
7.7.2 Test Setup Diagram



Below 30MHz



30MHz-1GHz



Above 1GHz

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7.7.3 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: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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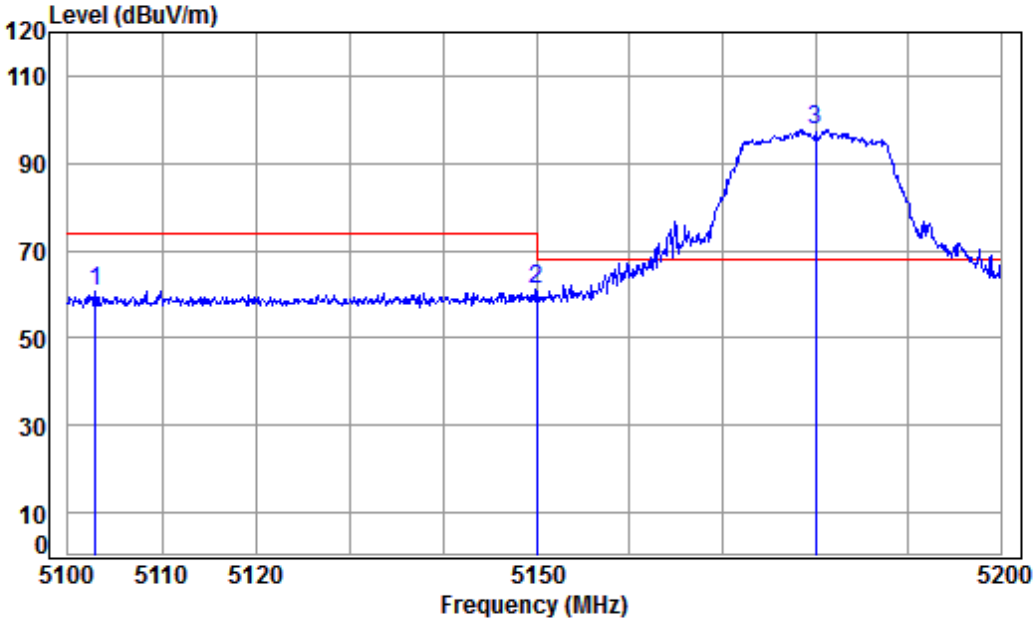
Mode:g; Polarization:Horizontal; Modulation:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11A

	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	5102.972	8.25	34.29	42.40	60.60	60.74	74.00	-13.26	peak
2	5149.980	8.33	34.32	42.36	60.75	61.04	74.00	-12.96	peak
3 pp	5180.000	8.37	34.35	42.33	97.39	97.78	68.20	29.58	peak

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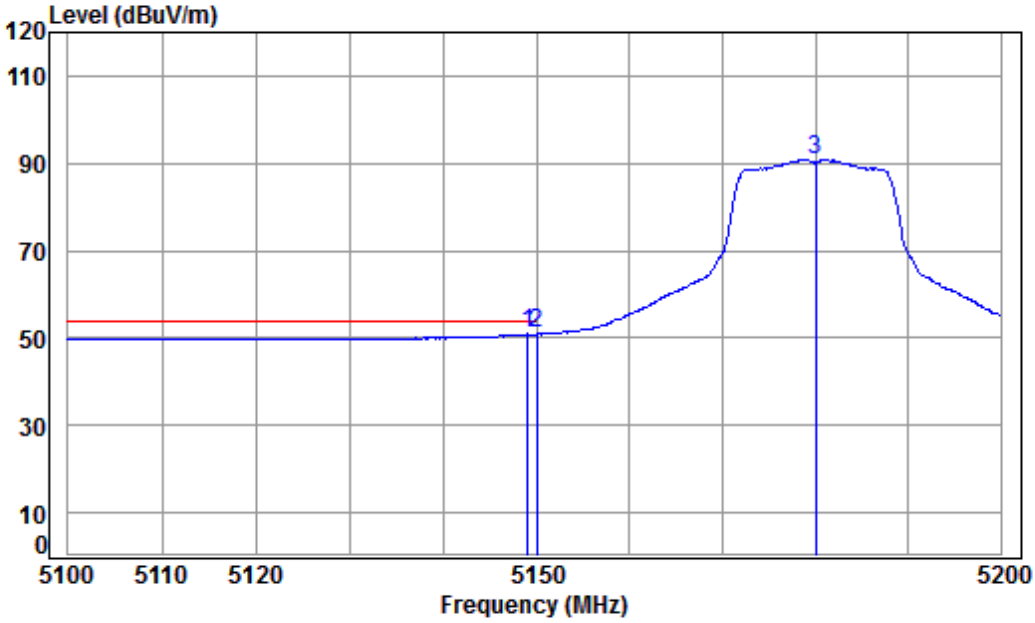
Mode:g; Polarization:Horizontal; Modulation:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11A

	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	5149.057	8.32	34.32	42.36	50.66	50.94	54.00	-3.06	Average
2 pp	5149.980	8.33	34.32	42.36	50.71	51.00	54.00	-3.00	Average
3	5180.000	8.37	34.35	42.33	90.53	90.92	------	------	Average

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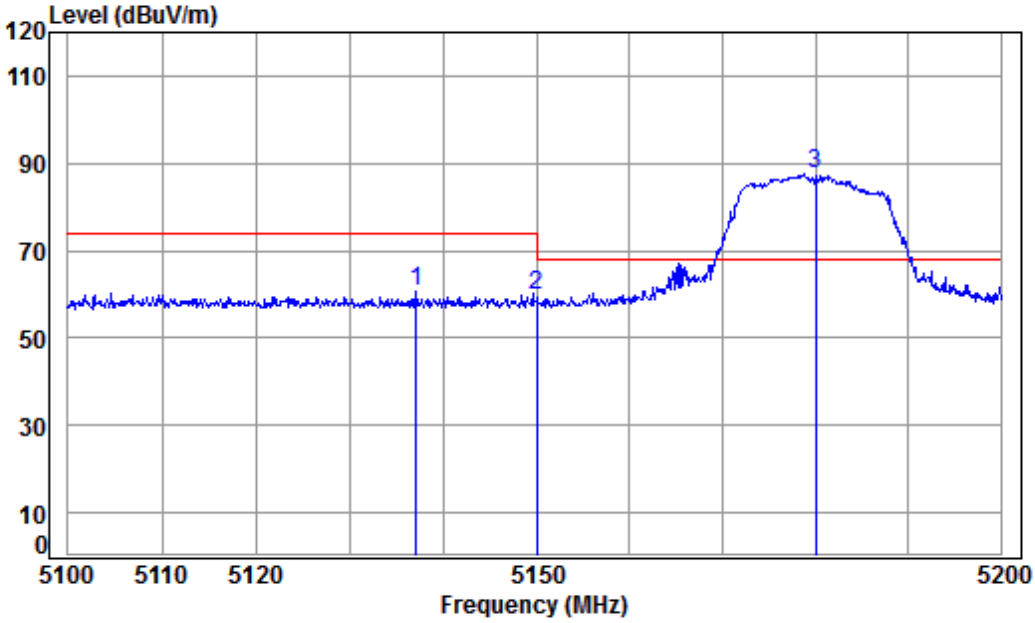
Mode:g; Polarization:Vertical; Modulation:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11A

	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	5137.173	8.31	34.31	42.37	60.39	60.64	74.00	-13.36	Peak
2	5149.980	8.33	34.32	42.36	59.32	59.61	74.00	-14.39	Peak
3 pp	5180.000	8.37	34.35	42.33	87.11	87.50	68.20	19.30	Peak

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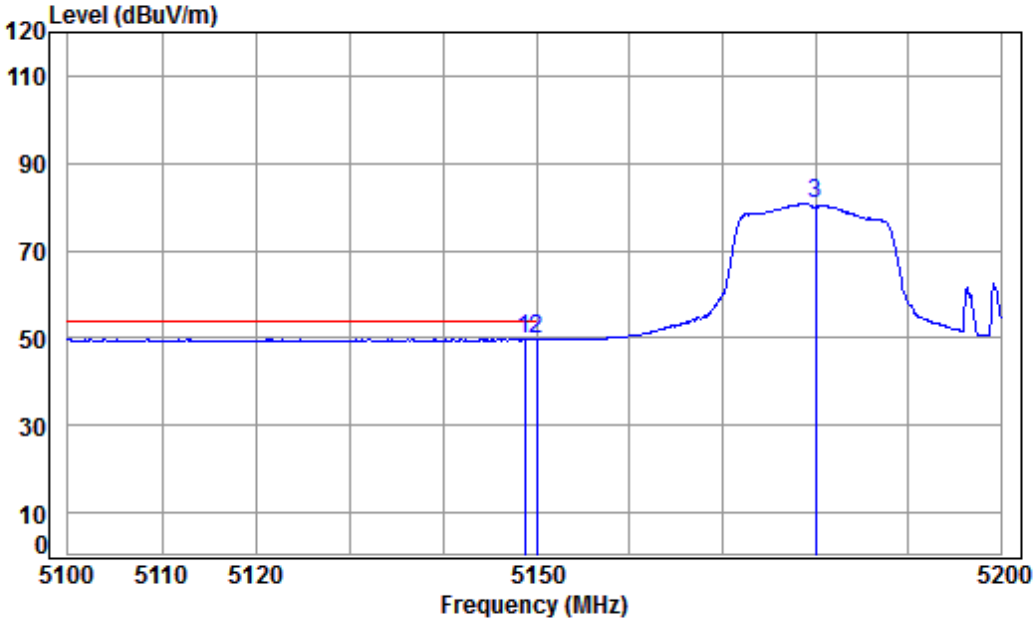
Mode:g; Polarization:Vertical; Modulation:802.11a; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11A

	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	5148.757	8.32	34.32	42.36	49.43	49.71	54.00	-4.29	Average
2	5149.980	8.33	34.32	42.36	49.40	49.69	54.00	-4.31	Average
3	5180.000	8.37	34.35	42.33	80.39	80.78	------	------	Average

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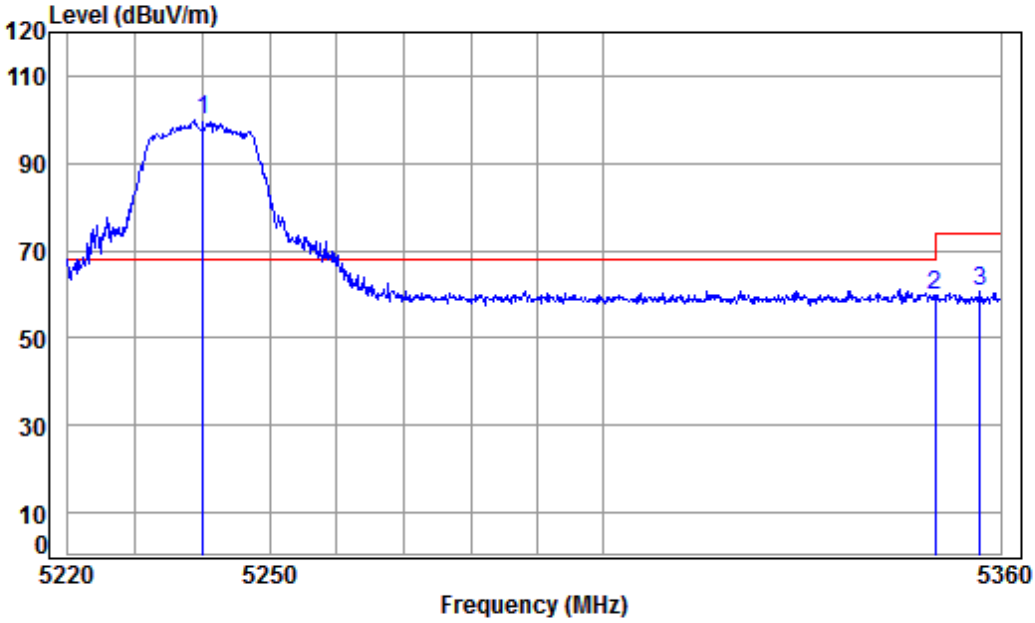
Mode:g; Polarization:Horizontal; Modulation:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11A

	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	5240.000	8.46	34.40	42.27	99.15	99.74	68.20	31.54	peak
2	5350.020	8.63	34.48	42.17	58.97	59.91	74.00	-14.09	peak
3	5356.880	8.64	34.49	42.16	59.69	60.66	74.00	-13.34	peak

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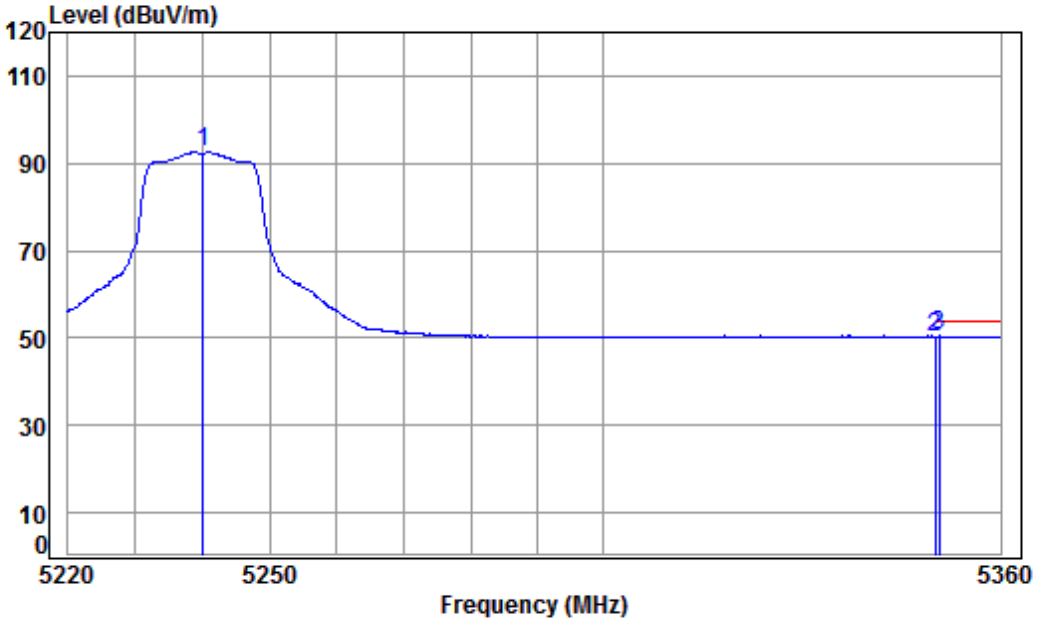
Mode:g; Polarization:Horizontal; Modulation:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11A

	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	5240.000	8.46	34.40	42.27	92.14	92.73	------	------	Average
2	5350.020	8.63	34.48	42.17	49.43	50.37	54.00	-3.63	Average
3 pp	5350.646	8.63	34.48	42.17	49.49	50.43	54.00	-3.57	Average

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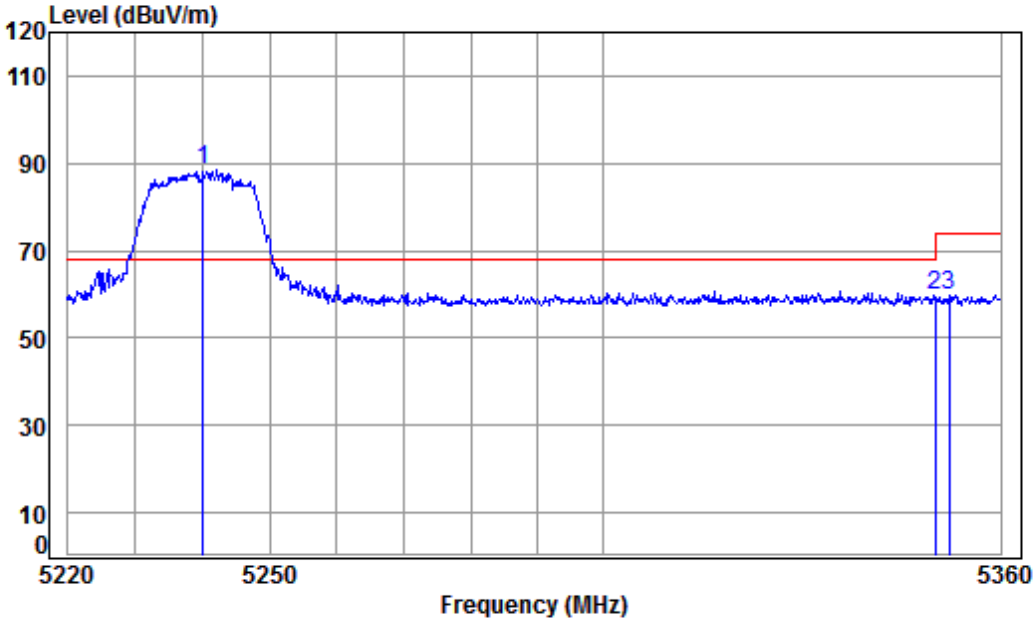
Mode:g; Polarization:Vertical; Modulation:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11A

	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	5240.000	8.46	34.40	42.27	87.97	88.56	68.20	20.36	Peak
2	5350.020	8.63	34.48	42.17	58.80	59.74	74.00	-14.26	Peak
3	5352.203	8.63	34.49	42.17	58.90	59.85	74.00	-14.15	Peak

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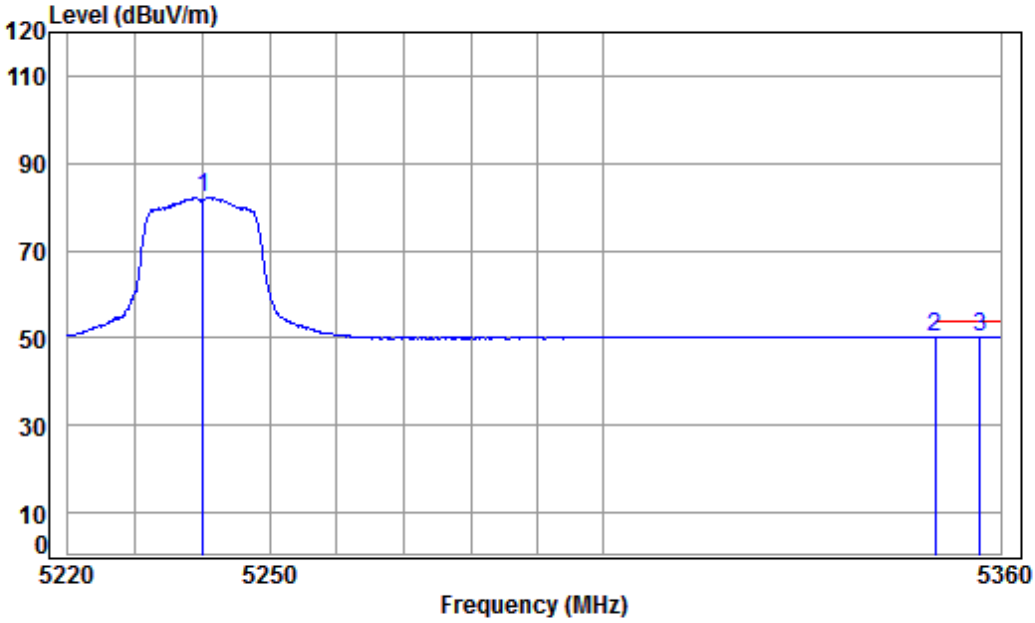
Mode:g; Polarization:Vertical; Modulation:802.11a; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11A

	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	5240.000	8.46	34.40	42.27	81.69	82.28	------	------	Average
2	5350.020	8.63	34.48	42.17	49.32	50.26	54.00	-3.74	Average
3 pp	5356.880	8.64	34.49	42.16	49.29	50.26	54.00	-3.74	Average

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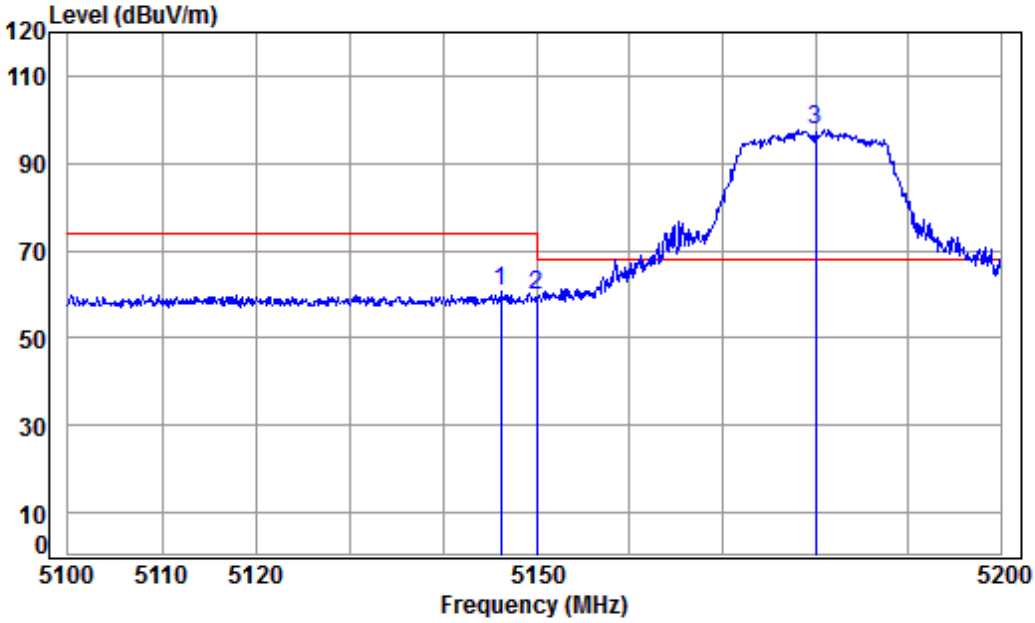
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11N 20

	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	5146.159	8.32	34.32	42.36	60.29	60.57	74.00	-13.43	peak
2	5149.980	8.33	34.32	42.36	59.48	59.77	74.00	-14.23	peak
3 pp	5180.000	8.37	34.35	42.33	97.40	97.79	68.20	29.59	peak

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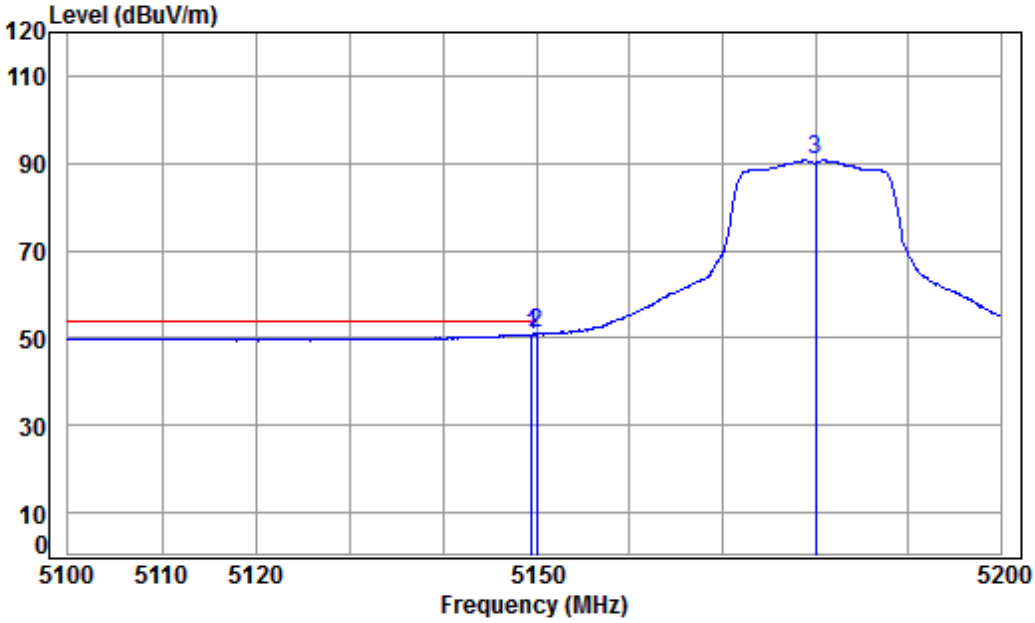
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11N 20

	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	5149.458	8.32	34.32	42.36	50.58	50.86	54.00	-3.14	Average
2 pp	5149.980	8.33	34.32	42.36	50.69	50.98	54.00	-3.02	Average
3	5180.000	8.37	34.35	42.33	90.30	90.69	------	------	Average

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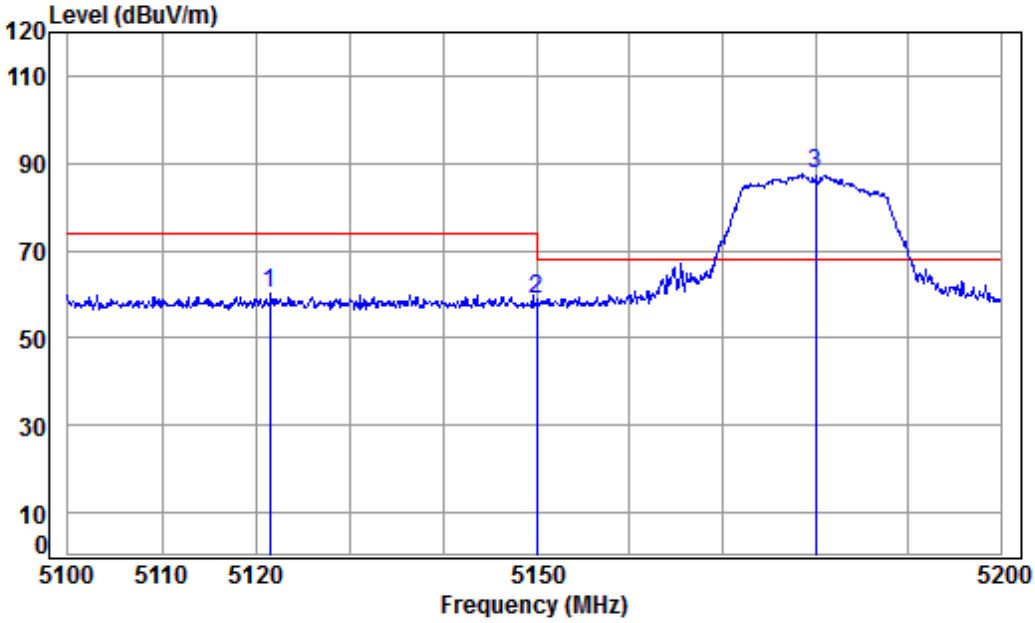
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11N 20

	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	5121.535	8.28	34.30	42.38	60.02	60.22	74.00	-13.78	Peak
2	5149.980	8.33	34.32	42.36	58.49	58.78	74.00	-15.22	Peak
3 pp	5180.000	8.37	34.35	42.33	87.06	87.45	68.20	19.25	Peak

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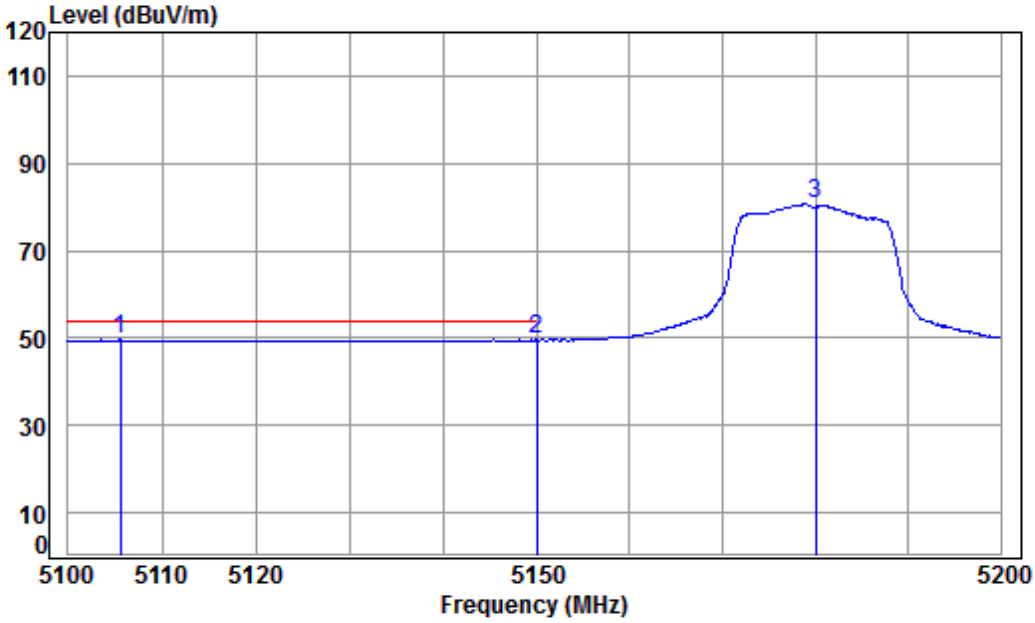
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11N 20

	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	5105.549	8.26	34.29	42.40	49.45	49.60	54.00	-4.40	Average
2	5149.980	8.33	34.32	42.36	49.24	49.53	54.00	-4.47	Average
3	5180.000	8.37	34.35	42.33	80.22	80.61	------	------	Average

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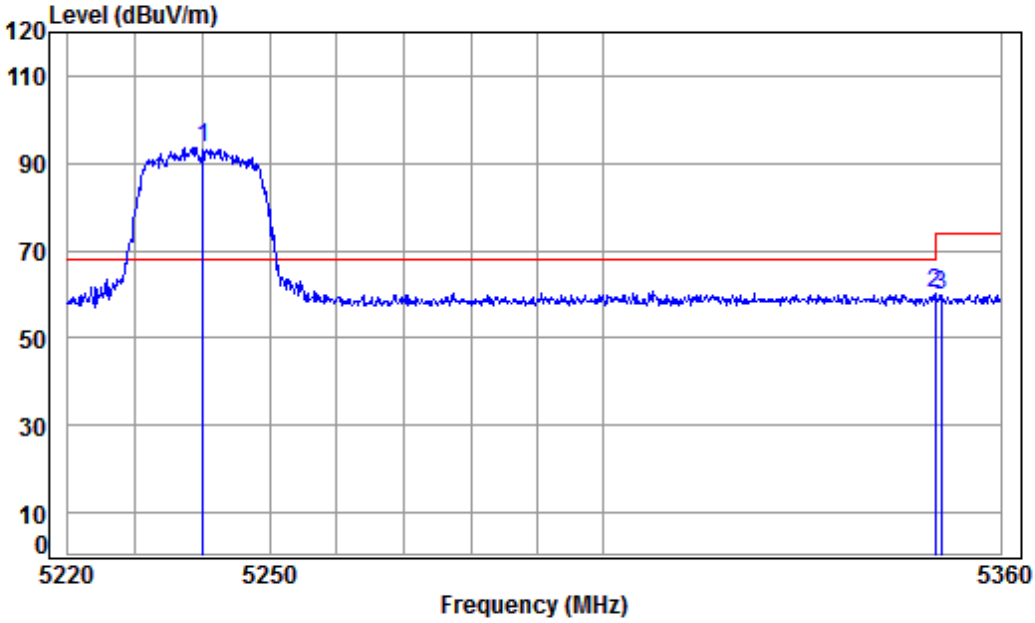
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11N 20

		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	5240.000	8.46	34.40	42.27	93.14	93.73	68.20	25.53	peak
2		5350.020	8.63	34.48	42.17	59.21	60.15	74.00	-13.85	peak
3		5350.929	8.63	34.48	42.17	59.03	59.97	74.00	-14.03	peak

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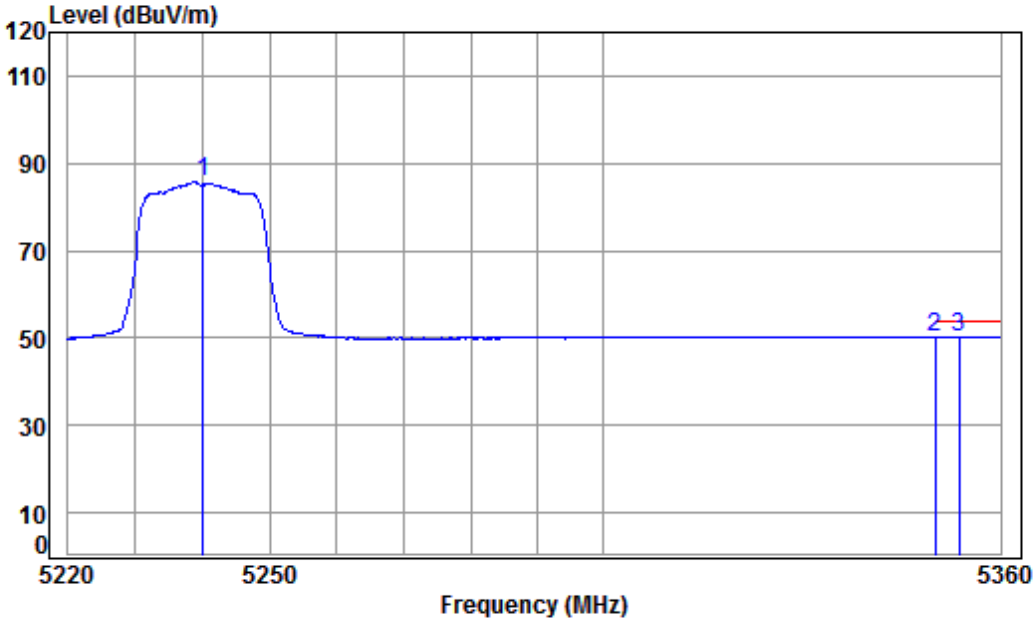
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11N 20

	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	5240.000	8.46	34.40	42.27	85.29	85.88	------	------	Average
2	5350.020	8.63	34.48	42.17	49.30	50.24	54.00	-3.76	Average
3 pp	5353.620	8.63	34.49	42.17	49.36	50.31	54.00	-3.69	Average

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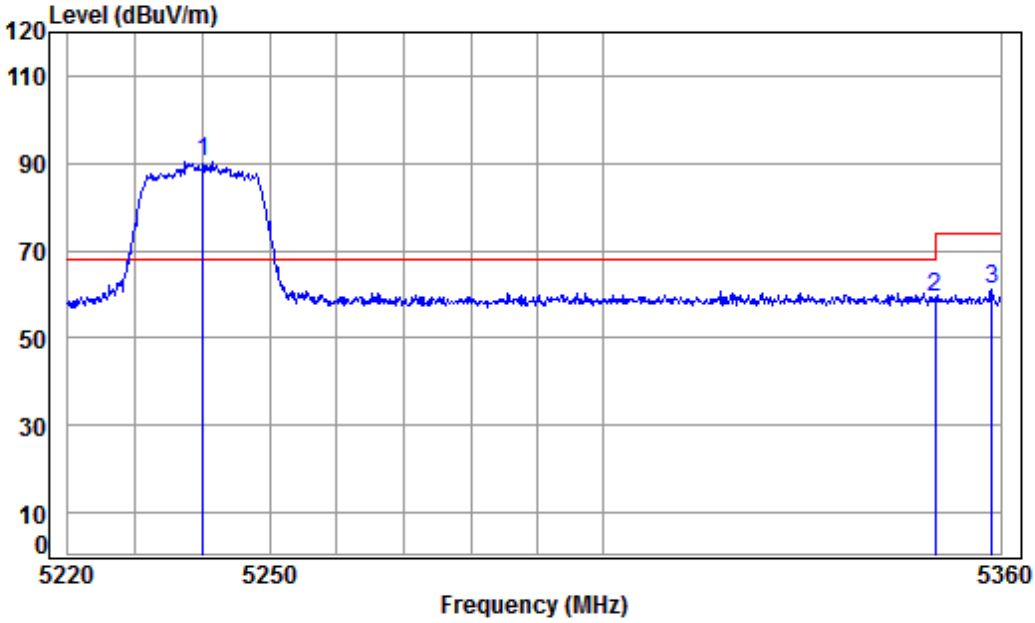
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11N 20

	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	5240.000	8.46	34.40	42.27	89.94	90.53	68.20	22.33	Peak
2	5350.020	8.63	34.48	42.17	58.29	59.23	74.00	-14.77	Peak
3	5358.724	8.64	34.49	42.16	60.13	61.10	74.00	-12.90	Peak

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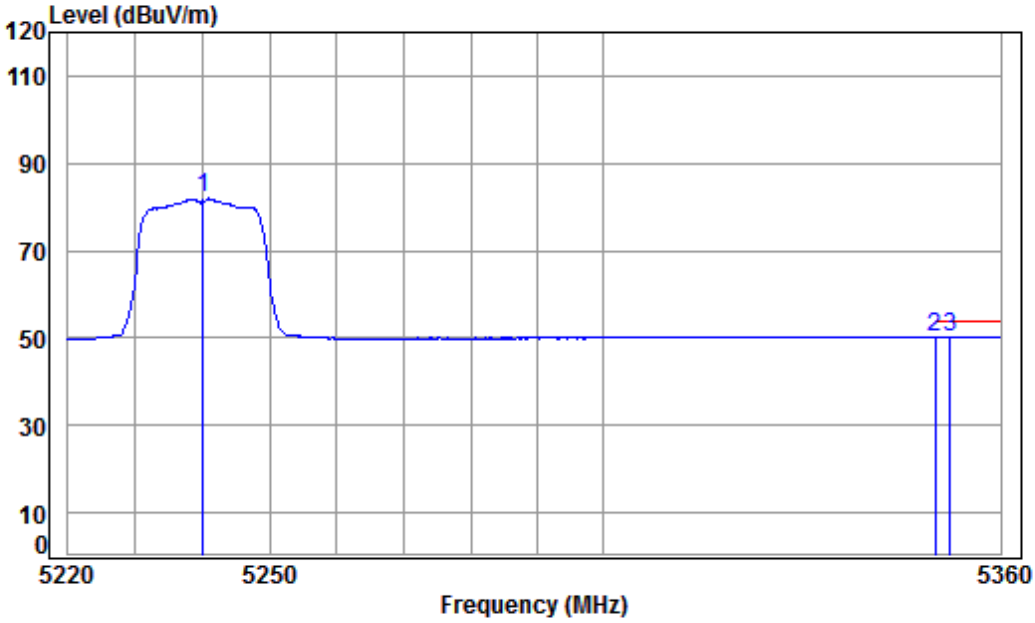
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11N 20

	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	5240.000	8.46	34.40	42.27	81.35	81.94	------	------	Average
2 pp	5350.020	8.63	34.48	42.17	49.31	50.25	54.00	-3.75	Average
3	5352.345	8.63	34.49	42.17	49.29	50.24	54.00	-3.76	Average

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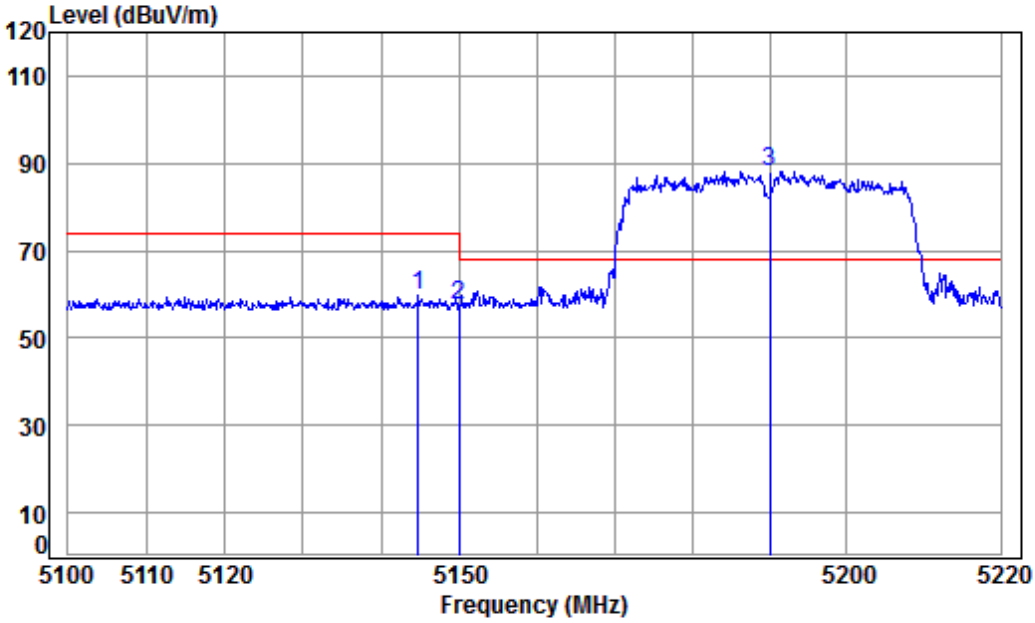
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5190 Band edge
Note : 5G WiFi 11N 40

	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	5144.793	8.32	34.32	42.36	59.37	59.65	74.00	-14.35	peak
2	5149.980	8.33	34.32	42.36	57.37	57.66	74.00	-16.34	peak
3 pp	5190.000	8.39	34.36	42.32	87.58	88.01	68.20	19.81	peak

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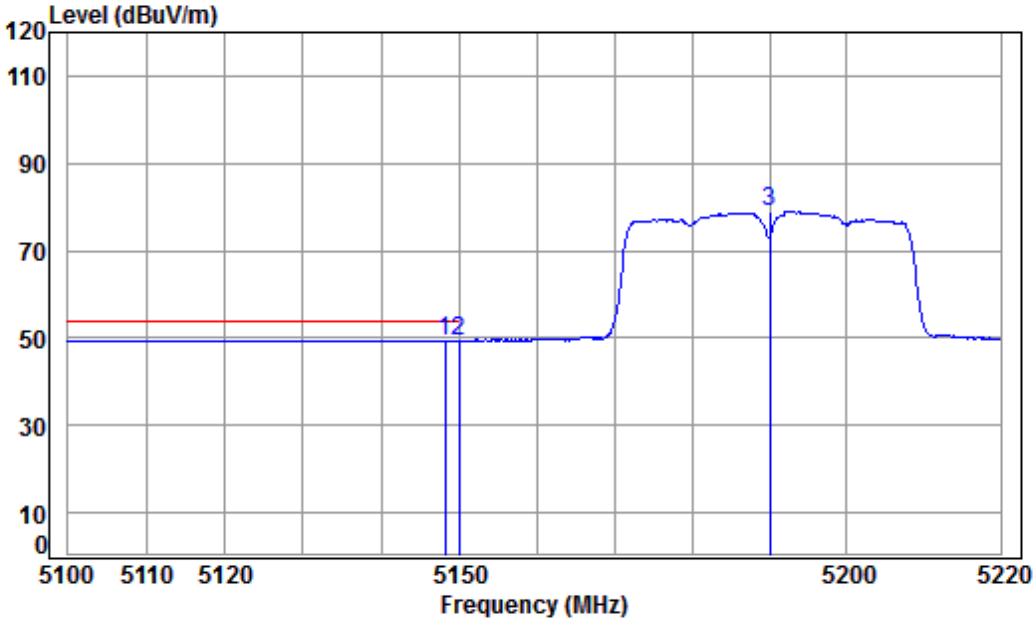
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5190 Band edge
Note : 5G WiFi 11N 40

		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	5148.144	8.32	34.32	42.36	49.07	49.35	54.00	-4.65	Average
2		5149.980	8.33	34.32	42.36	48.98	49.27	54.00	-4.73	Average
3		5190.000	8.39	34.36	42.32	78.57	79.00	------	------	Average

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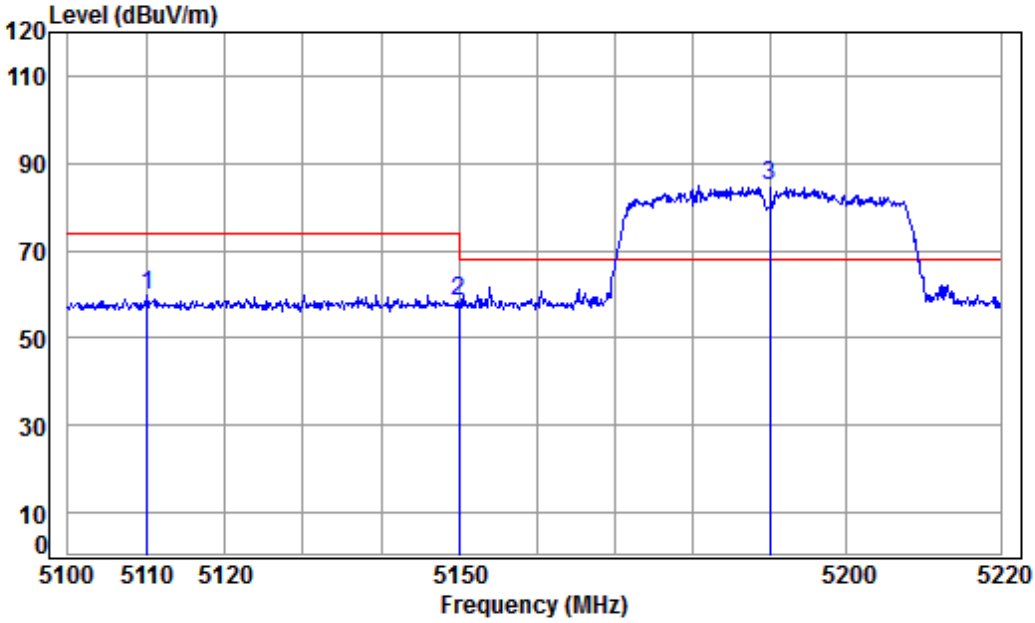
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5190 Band edge
Note : 5G WiFi 11N 40

	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	5110.092	8.26	34.29	42.39	59.70	59.86	74.00	-14.14	Peak
2	5149.980	8.33	34.32	42.36	58.25	58.54	74.00	-15.46	Peak
3 pp	5190.000	8.39	34.36	42.32	84.58	85.01	68.20	16.81	Peak

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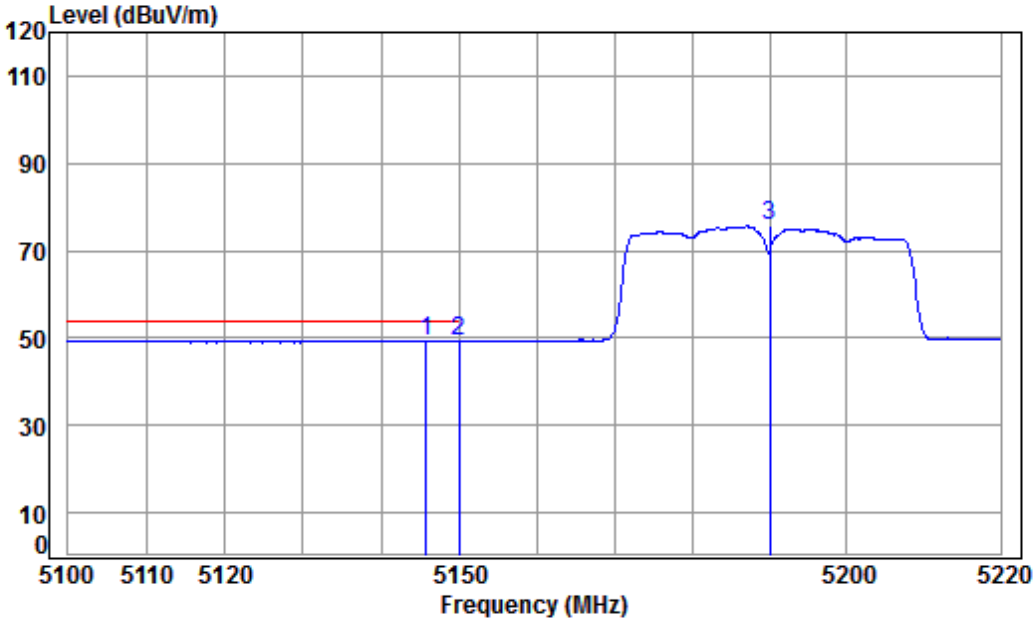
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:40MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5190 Band edge
Note : 5G WiFi 11N 40

	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	5145.750	8.32	34.32	42.36	49.03	49.31	54.00	-4.69	Average
2	5149.980	8.33	34.32	42.36	48.93	49.22	54.00	-4.78	Average
3	5190.000	8.39	34.36	42.32	75.10	75.53	------	------	Average

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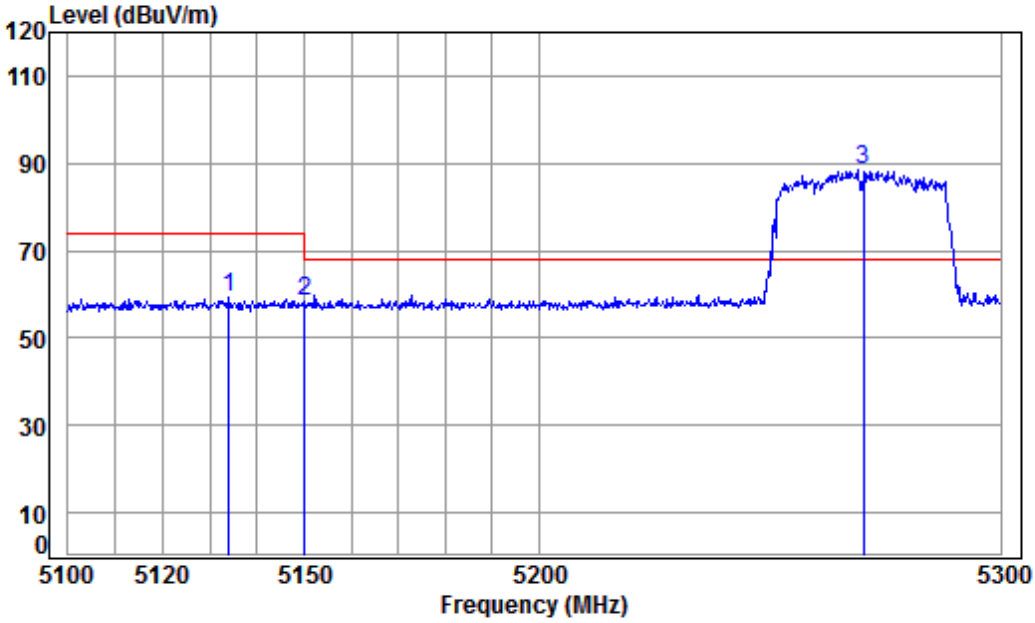
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5270 Band edge
Note : 5G WiFi 11N 40

	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	5134.052	8.30	34.31	42.37	59.23	59.47	74.00	-14.53	peak
2	5149.980	8.33	34.32	42.36	58.12	58.41	74.00	-15.59	peak
3 pp	5270.000	8.51	34.42	42.24	87.77	88.46	68.20	20.26	peak

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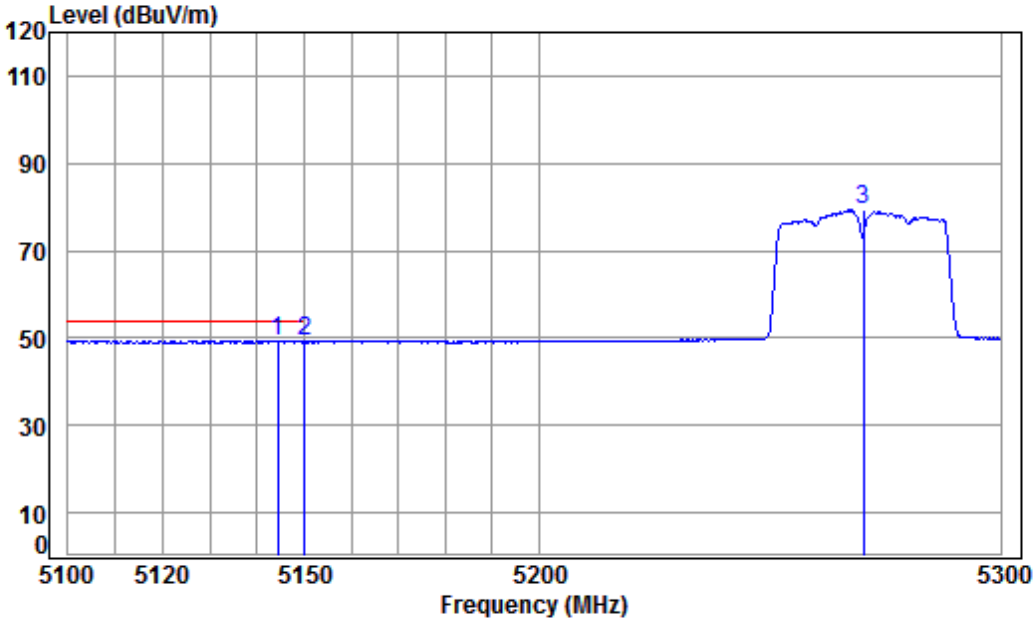
Mode:g; Polarization:Horizontal; Modulation:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5270 Band edge
Note : 5G WiFi 11N 40

	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	5144.332	8.32	34.32	42.36	48.91	49.19	54.00	-4.81	Average
2	5149.980	8.33	34.32	42.36	48.84	49.13	54.00	-4.87	Average
3	5270.000	8.51	34.42	42.24	78.71	79.40	------	------	Average

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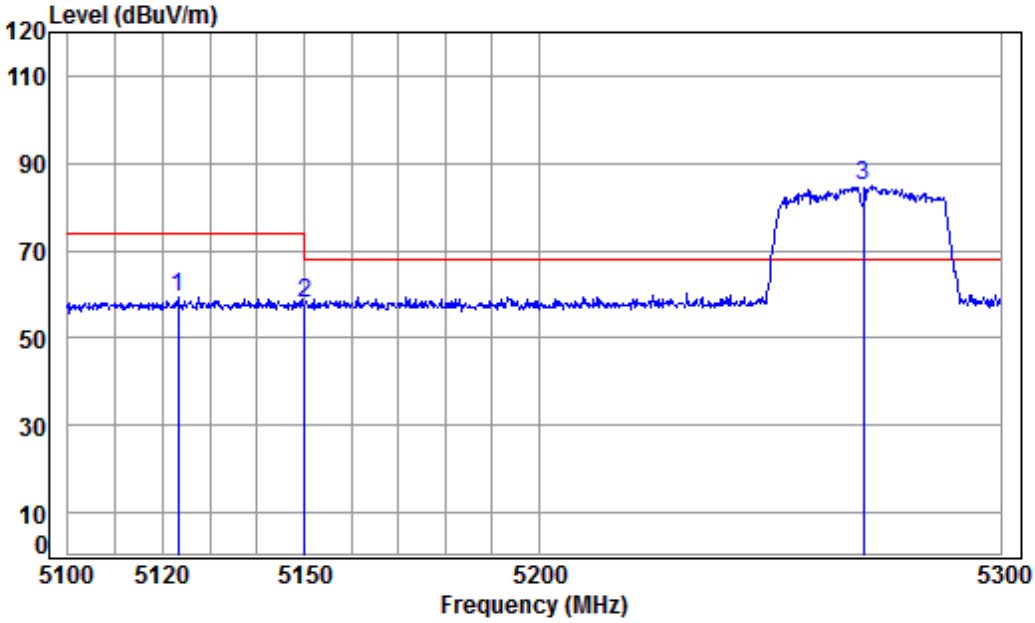
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5270 Band edge
Note : 5G WiFi 11N 40

	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	5123.202	8.28	34.30	42.38	59.08	59.28	74.00	-14.72	Peak
2	5149.980	8.33	34.32	42.36	57.54	57.83	74.00	-16.17	Peak
3 pp	5270.000	8.51	34.42	42.24	84.39	85.08	68.20	16.88	Peak

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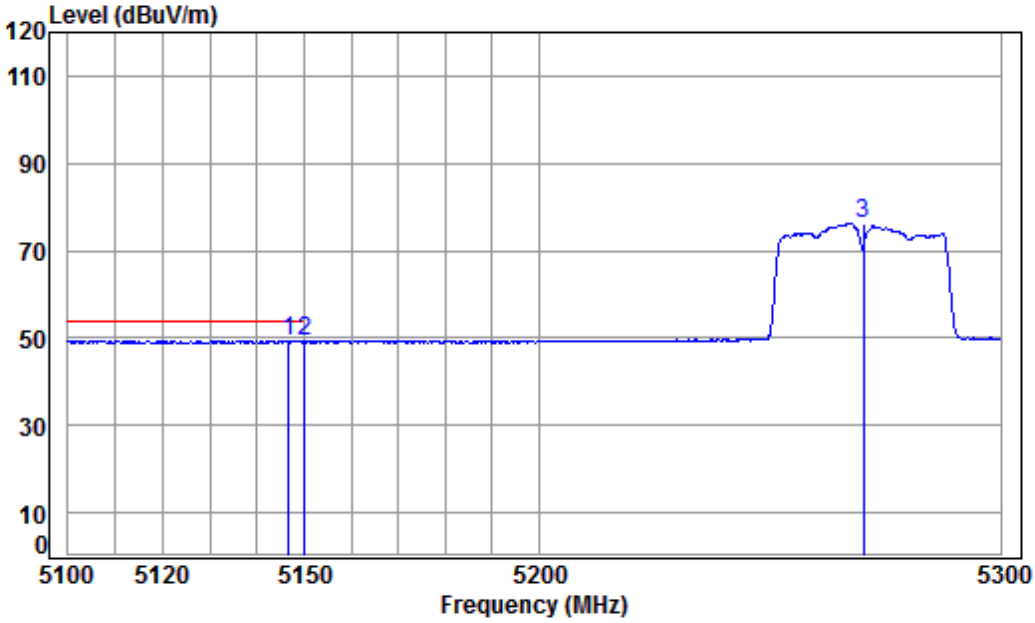
Mode:g; Polarization:Vertical; Modulation:802.11n; bandwidth:40MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5270 Band edge
Note : 5G WiFi 11N 40

	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	5146.707	8.32	34.32	42.36	48.88	49.16	54.00	-4.84	Average
2	5149.980	8.33	34.32	42.36	48.79	49.08	54.00	-4.92	Average
3	5270.000	8.51	34.42	42.24	75.40	76.09	------	------	Average

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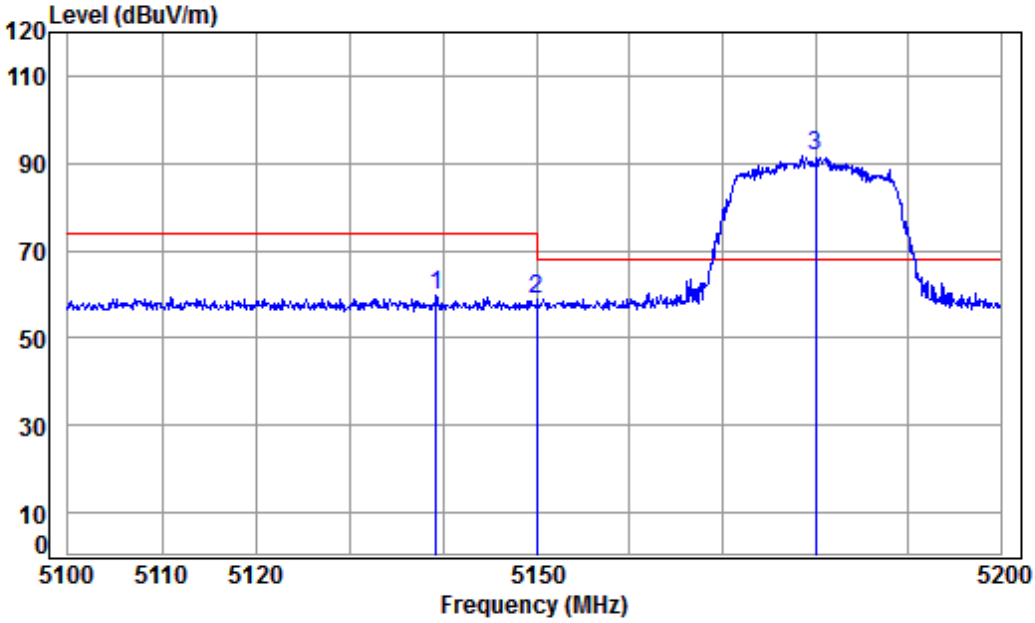
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11AC 20

	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	5139.268	8.31	34.32	42.37	59.42	59.68	74.00	-14.32	peak
2	5149.980	8.33	34.32	42.36	58.64	58.93	74.00	-15.07	peak
3 pp	5180.000	8.37	34.35	42.33	91.24	91.63	68.20	23.43	peak

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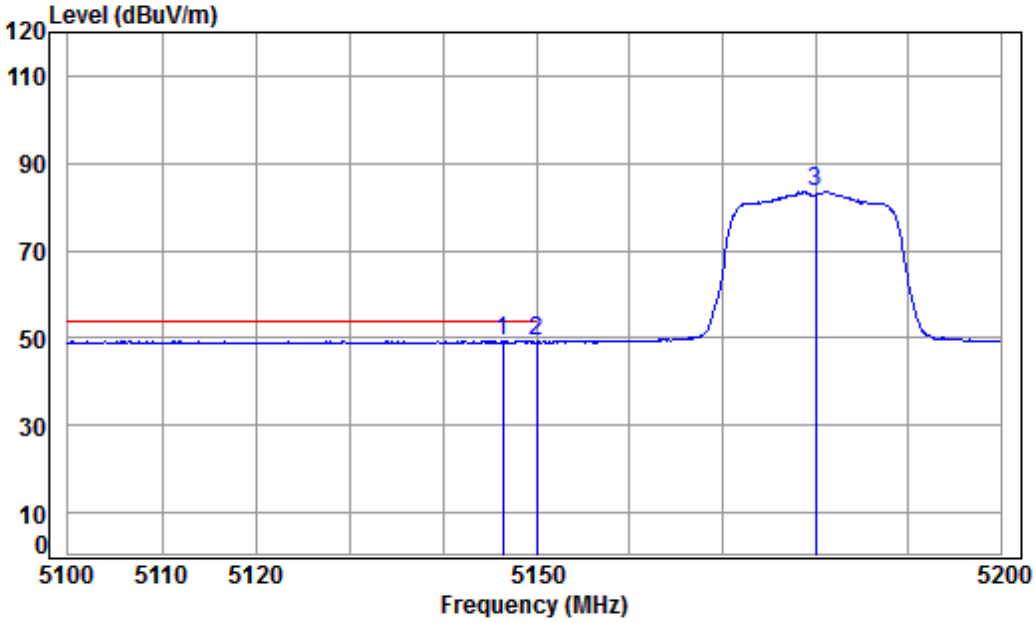
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11AC 20

	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	5146.358	8.32	34.32	42.36	48.89	49.17	54.00	-4.83	Average
2	5149.980	8.33	34.32	42.36	48.86	49.15	54.00	-4.85	Average
3	5180.000	8.37	34.35	42.33	83.17	83.56	------	------	Average

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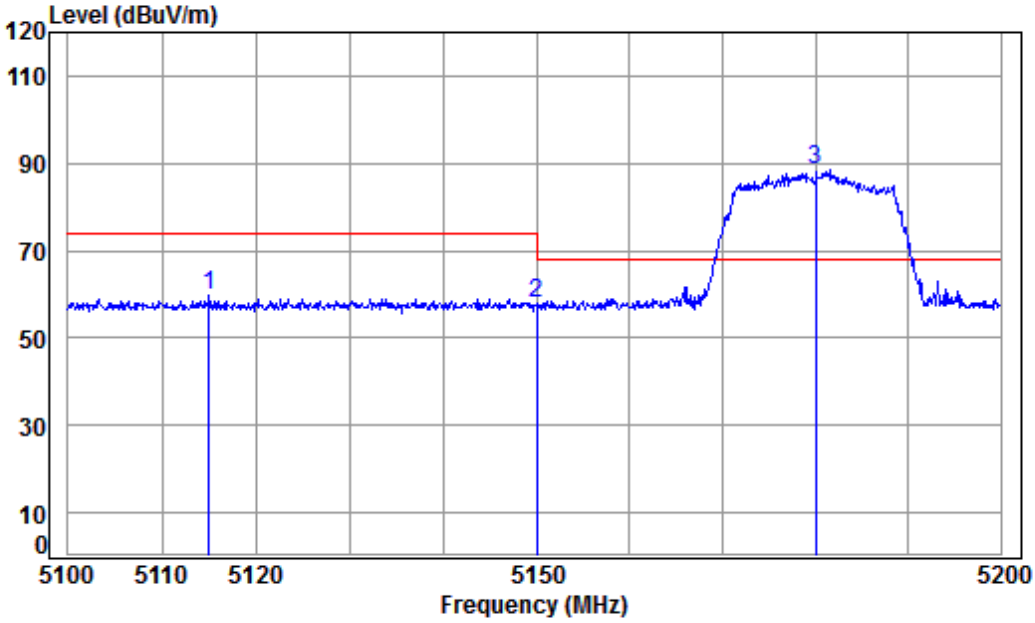
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11AC 20

	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	5114.976	8.27	34.30	42.39	59.43	59.61	74.00	-14.39	Peak
2	5149.980	8.33	34.32	42.36	57.62	57.91	74.00	-16.09	Peak
3 pp	5180.000	8.37	34.35	42.33	88.10	88.49	68.20	20.29	Peak

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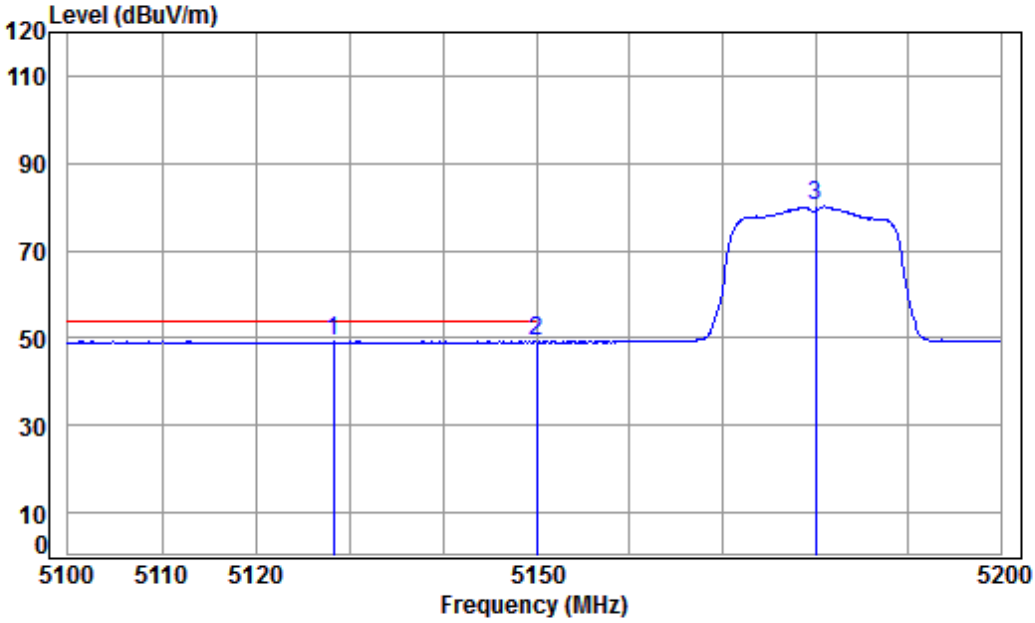
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5180 Band edge
Note : 5G WiFi 11AC 20

	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	5128.302	8.29	34.31	42.38	48.94	49.16	54.00	-4.84	Average
2	5149.980	8.33	34.32	42.36	48.78	49.07	54.00	-4.93	Average
3	5180.000	8.37	34.35	42.33	79.77	80.16	------	------	Average

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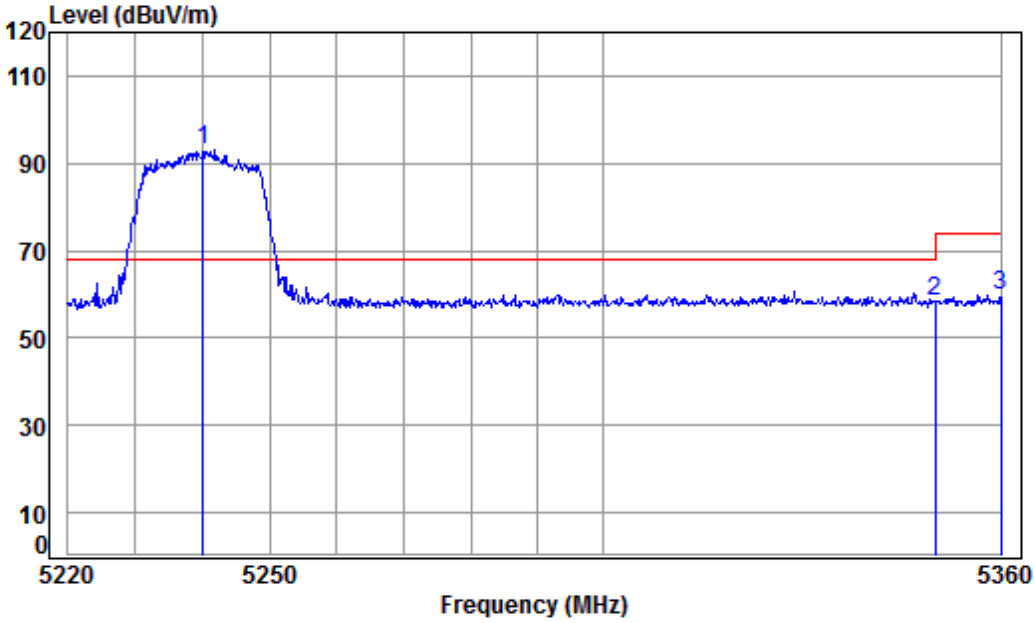
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11AC 20

	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	5240.000	8.46	34.40	42.27	92.57	93.16	68.20	24.96	peak
2	5350.020	8.63	34.48	42.17	57.69	58.63	74.00	-15.37	peak
3	5360.000	8.64	34.49	42.16	58.89	59.86	74.00	-14.14	peak

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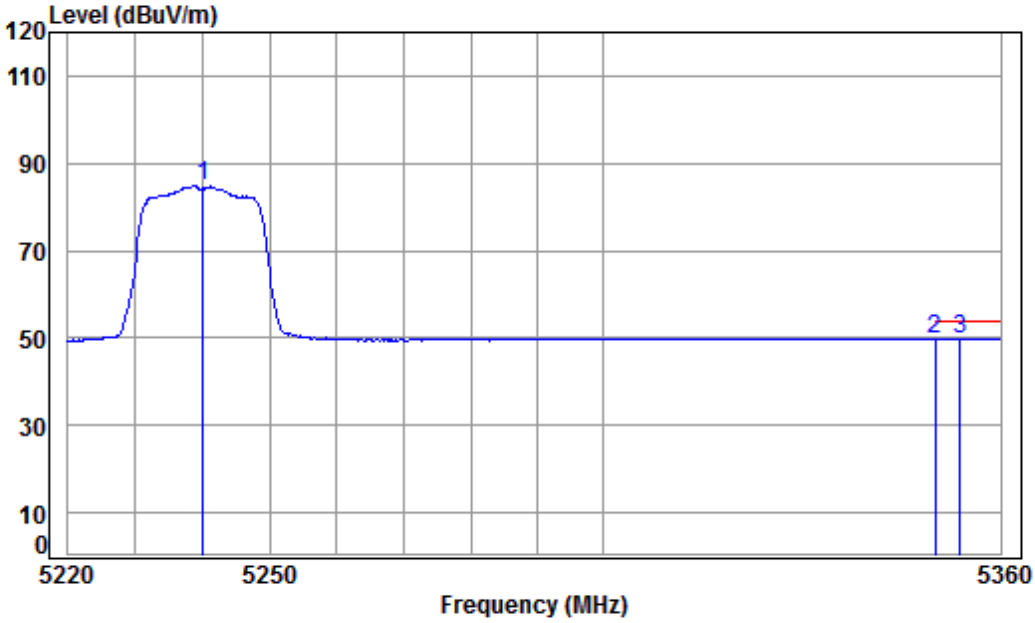
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11AC 20

	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	5240.000	8.46	34.40	42.27	84.17	84.76	------	------	Average
2	5350.020	8.63	34.48	42.17	48.92	49.86	54.00	-4.14	Average
3 pp	5353.903	8.64	34.49	42.17	48.94	49.90	54.00	-4.10	Average

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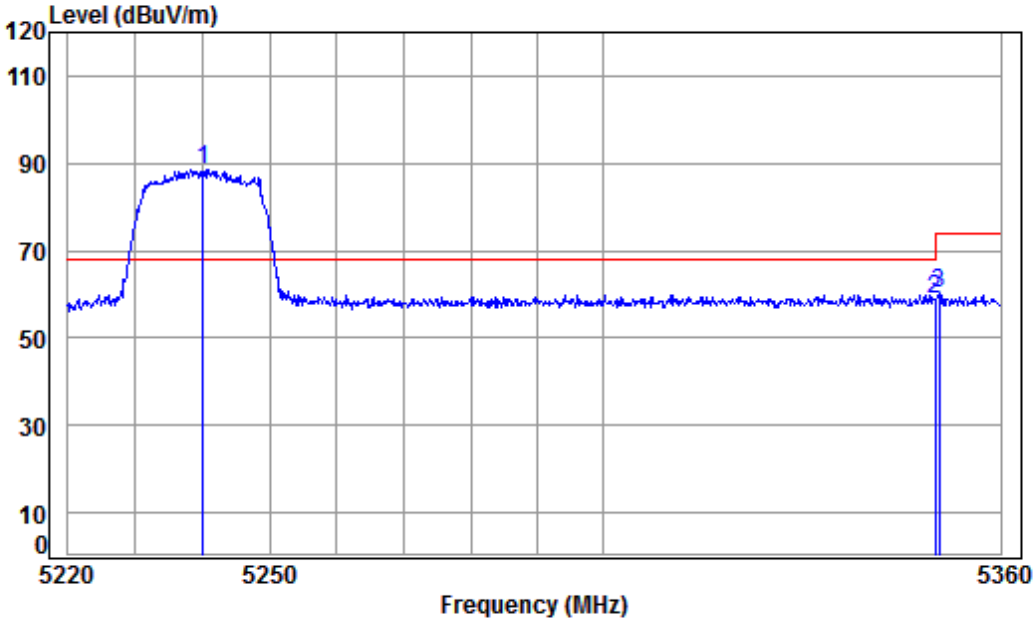
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11AC 20

	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	5240.000	8.46	34.40	42.27	87.83	88.42	68.20	20.22	Peak
2	5350.020	8.63	34.48	42.17	57.75	58.69	74.00	-15.31	Peak
3	5350.646	8.63	34.48	42.17	59.31	60.25	74.00	-13.75	Peak

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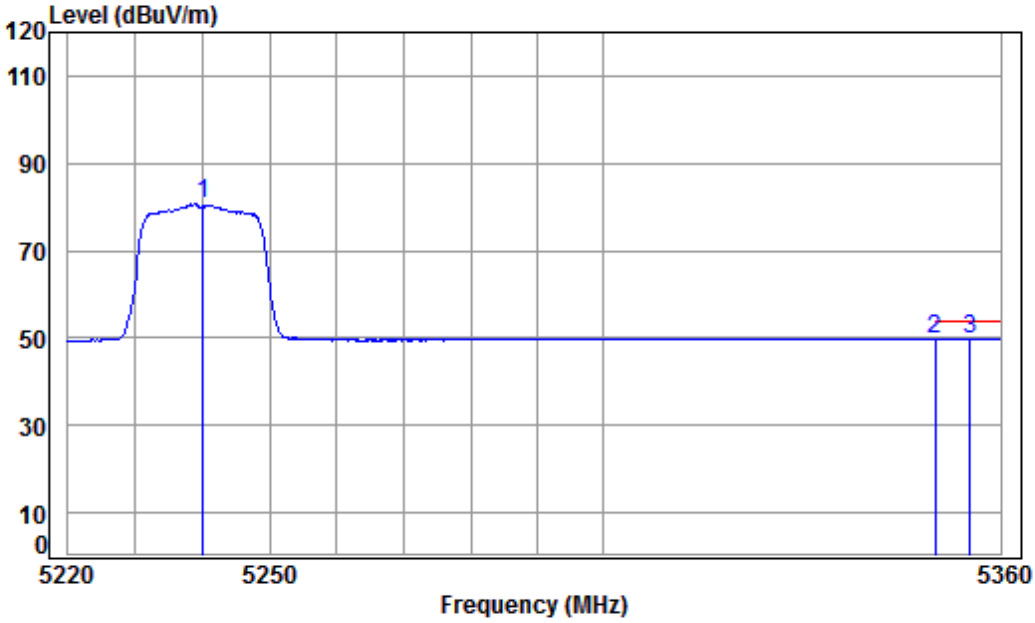
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5240 Band edge
Note : 5G WiFi 11AC 20

	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	5240.000	8.46	34.40	42.27	80.16	80.75	------	------	Average
2	5350.020	8.63	34.48	42.17	48.89	49.83	54.00	-4.17	Average
3 pp	5355.321	8.64	34.49	42.16	48.96	49.93	54.00	-4.07	Average

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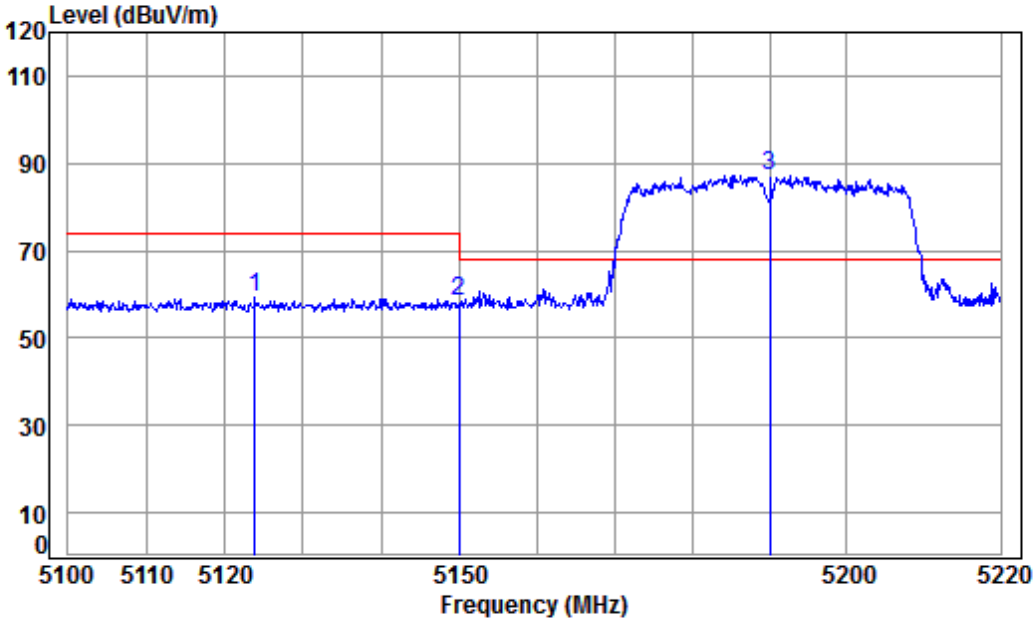
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:40MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5190 Band edge
Note : 5G WiFi 11AC 40

	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	5123.896	8.29	34.30	42.38	58.95	59.16	74.00	-14.84	peak
2	5149.980	8.33	34.32	42.36	58.29	58.58	74.00	-15.42	peak
3 pp	5190.000	8.39	34.36	42.32	86.94	87.37	68.20	19.17	peak

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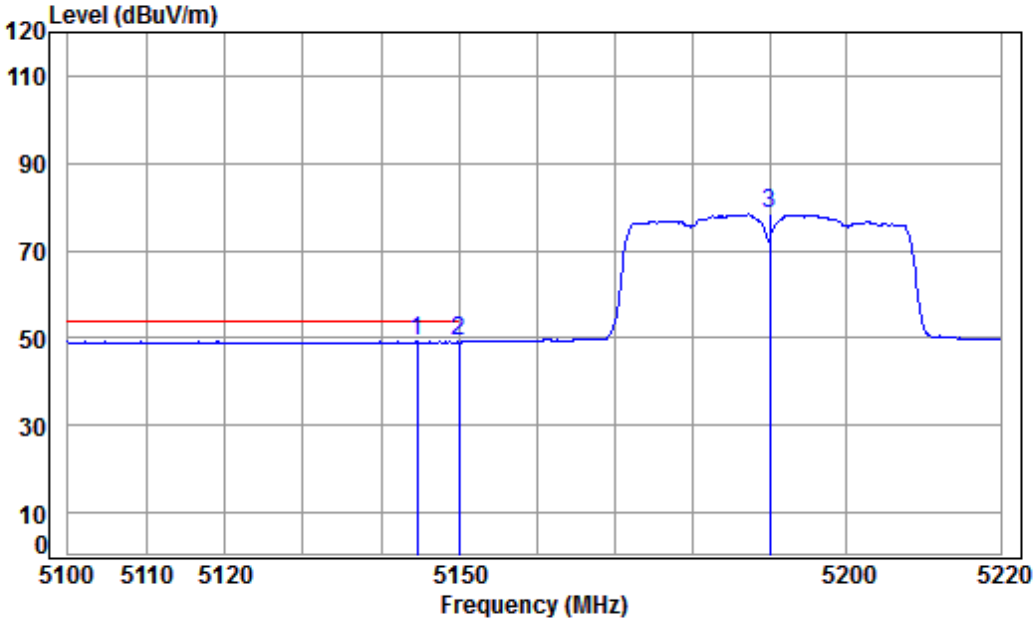
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:40MHz; Channel:Low



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5190 Band edge
Note : 5G WiFi 11AC 40

		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	5144.673	8.32	34.32	42.36	48.86	49.14	54.00	-4.86	Average
2		5149.980	8.33	34.32	42.36	48.76	49.05	54.00	-4.95	Average
3		5190.000	8.39	34.36	42.32	77.93	78.36	------	------	Average

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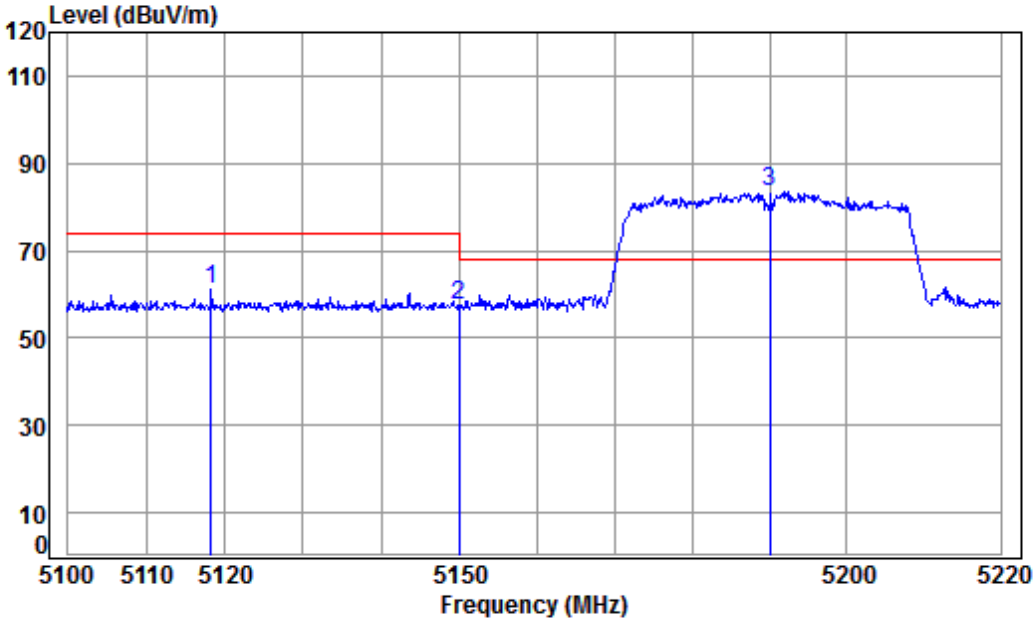
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:40MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5190 Band edge
Note : 5G WiFi 11AC 40

	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	5118.180	8.28	34.30	42.39	60.72	60.91	74.00	-13.09	Peak
2	5149.980	8.33	34.32	42.36	57.32	57.61	74.00	-16.39	Peak
3 pp	5190.000	8.39	34.36	42.32	82.89	83.32	68.20	15.12	Peak

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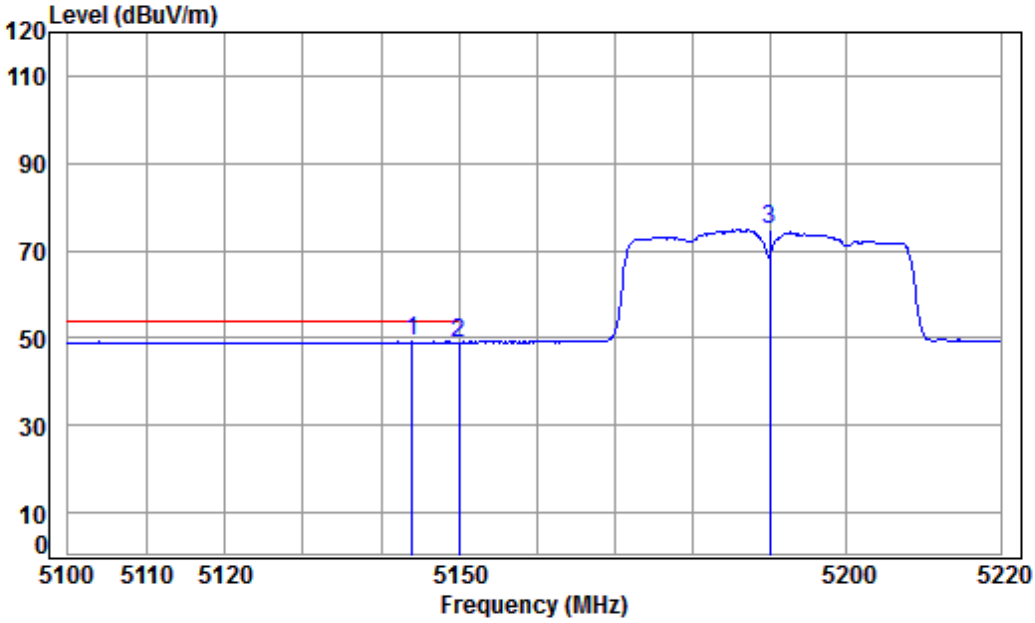
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:40MHz; Channel:Low



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5190 Band edge
Note : 5G WiFi 11AC 40

		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	5143.956	8.32	34.32	42.36	48.81	49.09	54.00	-4.91	Average
2		5149.980	8.33	34.32	42.36	48.68	48.97	54.00	-5.03	Average
3		5190.000	8.39	34.36	42.32	74.38	74.81	------	------	Average

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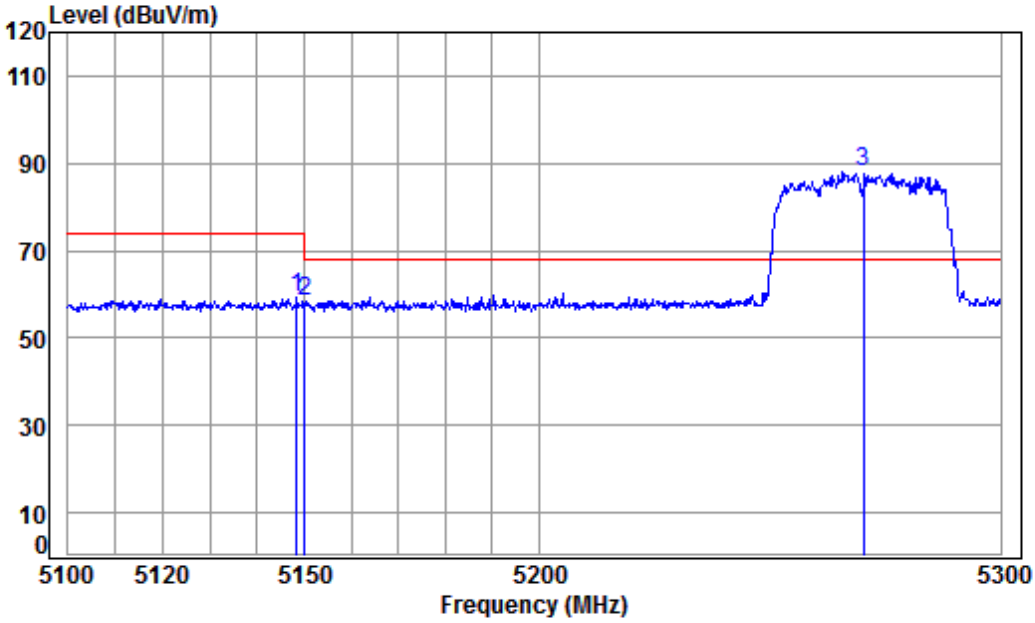
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:40MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5270 Band edge
Note : 5G WiFi 11AC 40

	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	5148.291	8.32	34.32	42.36	58.81	59.09	74.00	-14.91	peak
2	5149.980	8.33	34.32	42.36	57.97	58.26	74.00	-15.74	peak
3 pp	5270.000	8.51	34.42	42.24	87.26	87.95	68.20	19.75	peak

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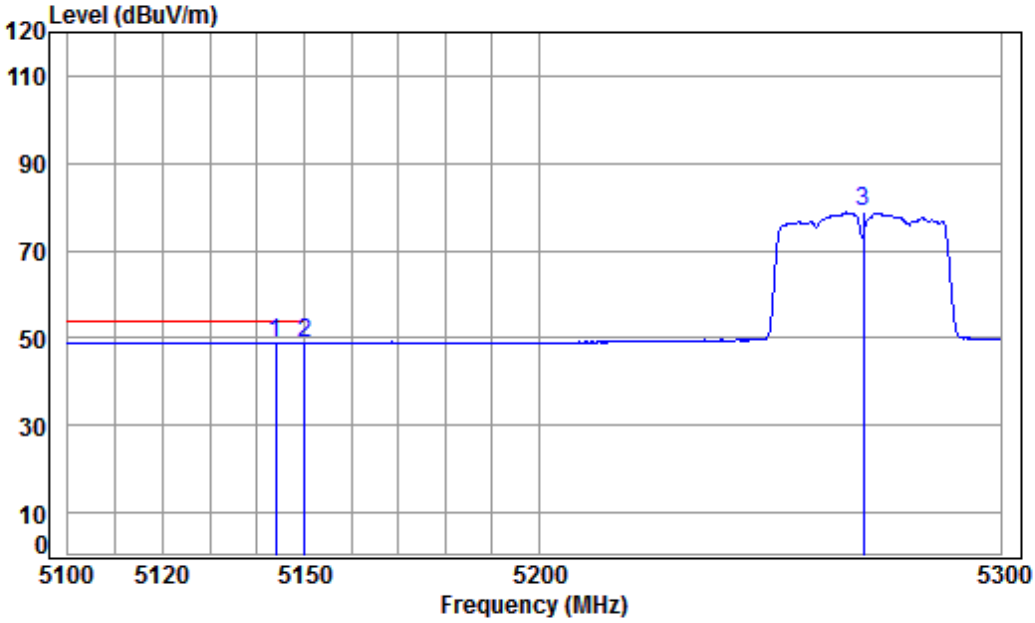
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:40MHz; Channel:High



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5270 Band edge
Note : 5G WiFi 11AC 40

		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	5143.936	8.32	34.32	42.36	48.77	49.05	54.00	-4.95	Average
2		5149.980	8.33	34.32	42.36	48.65	48.94	54.00	-5.06	Average
3		5270.000	8.51	34.42	42.24	78.04	78.73	------	------	Average

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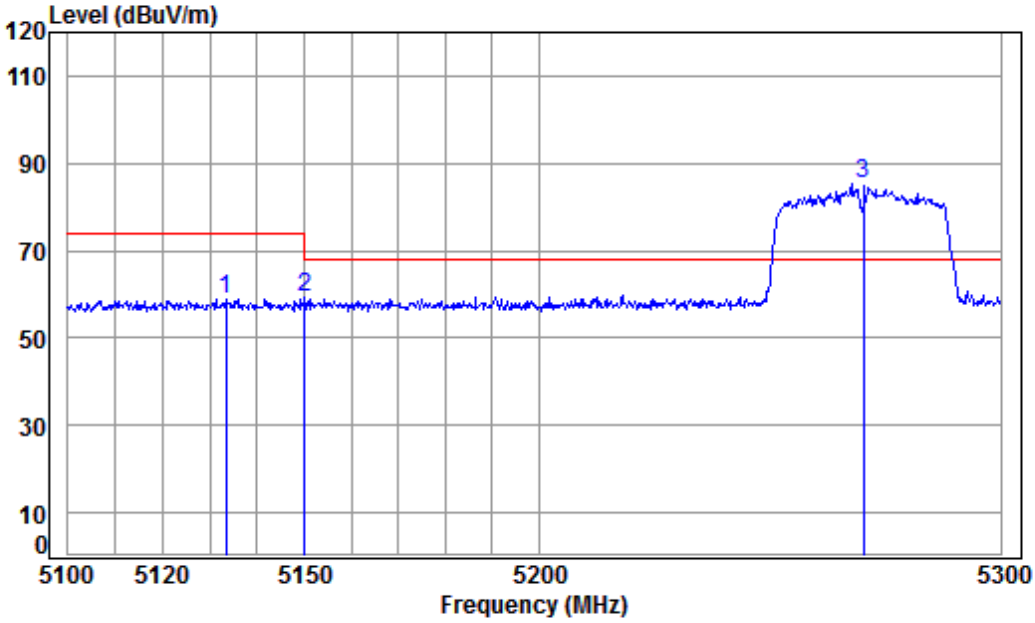
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:40MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5270 Band edge
Note : 5G WiFi 11AC 40

	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	5133.459	8.30	34.31	42.37	58.79	59.03	74.00	-14.97	Peak
2	5149.980	8.33	34.32	42.36	58.91	59.20	74.00	-14.80	Peak
3 pp	5270.000	8.51	34.42	42.24	84.47	85.16	68.20	16.96	Peak

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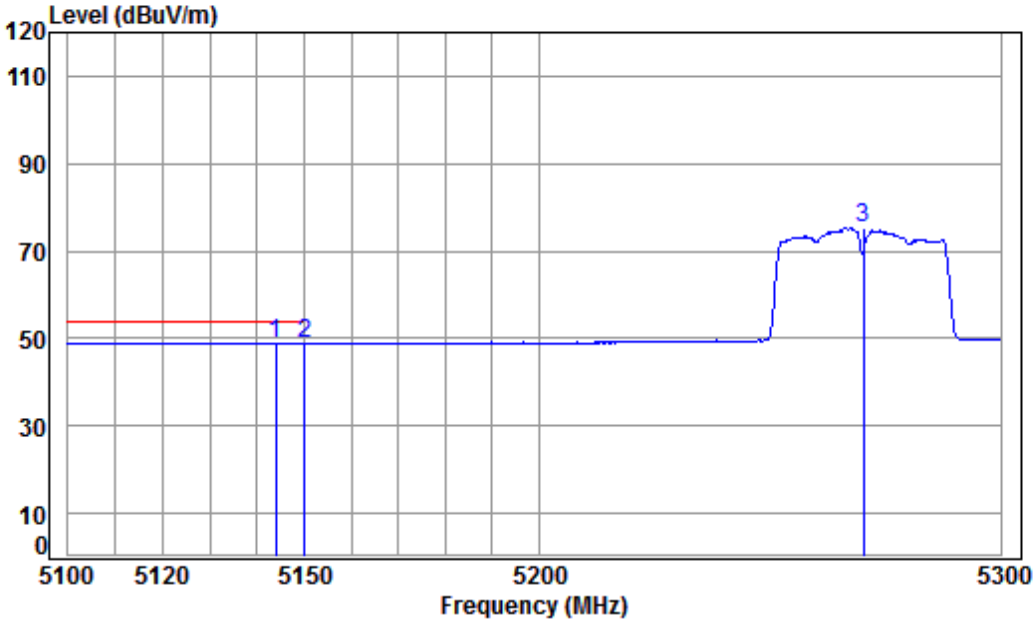
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:40MHz; Channel:High



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5270 Band edge
Note : 5G WiFi 11AC 40

		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	5143.936	8.32	34.32	42.36	48.74	49.02	54.00	-4.98	Average
2		5149.980	8.33	34.32	42.36	48.72	49.01	54.00	-4.99	Average
3		5270.000	8.51	34.42	42.24	74.49	75.18	------	------	Average

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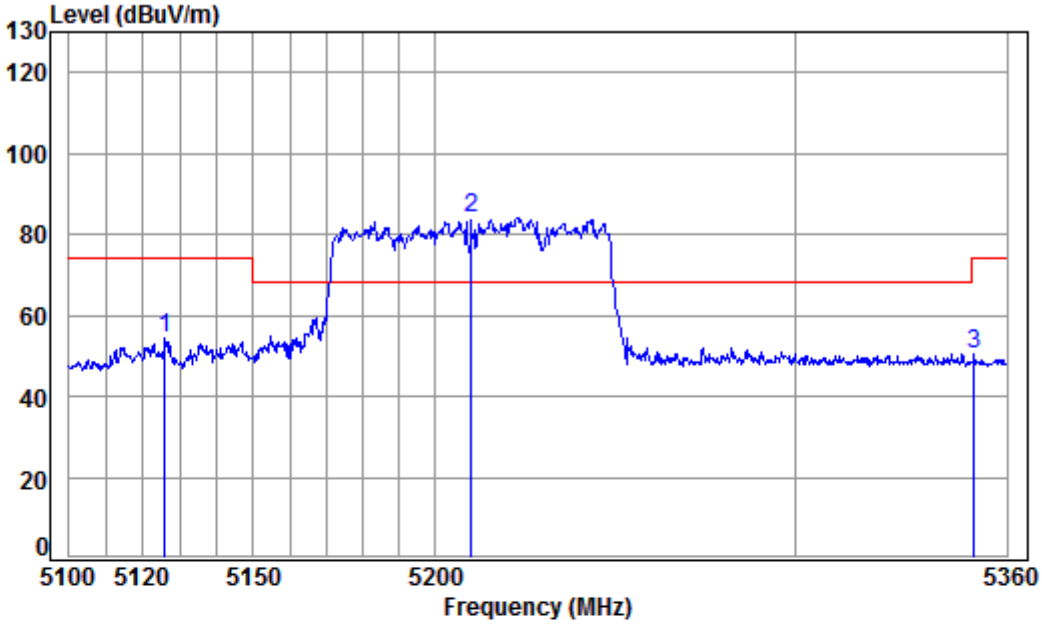
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:80MHz; Channel:Middle



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5210 Band edge
Note : 5G WIFI 11AC 80

		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		5125.932	8.29	34.30	42.38	54.07	54.28	74.00	-19.72	peak
2	pp	5210.000	8.42	34.37	42.30	83.58	84.07	68.20	15.87	peak
3		5350.680	8.63	34.48	42.17	49.70	50.64	74.00	-23.36	peak

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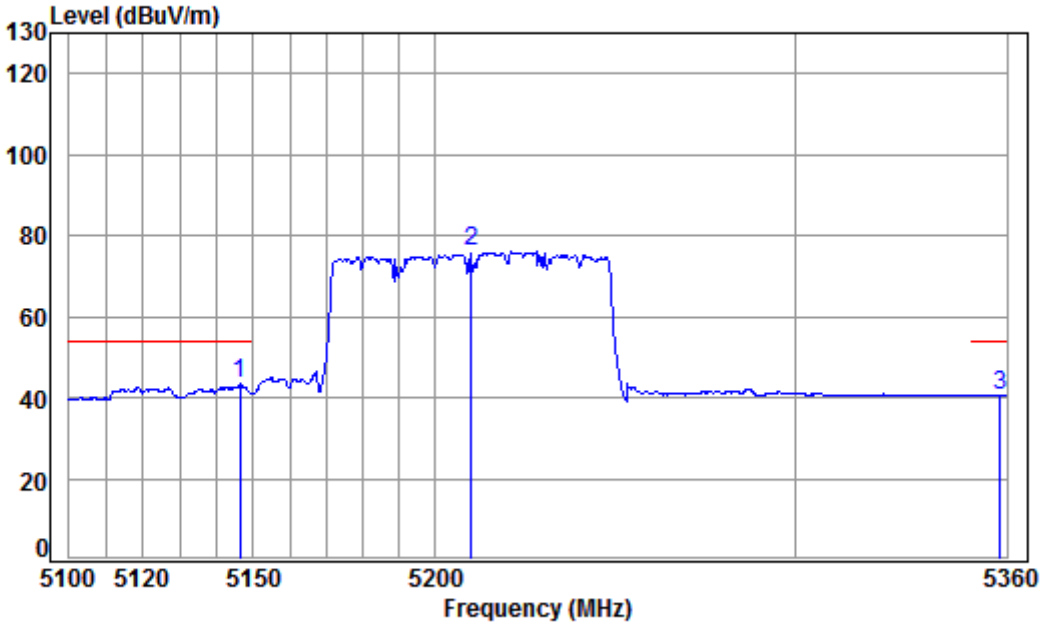
Mode:g; Polarization:Horizontal; Modulation:802.11ac; bandwidth:80MHz; Channel:Middle



Condition: 3m HORIZONTAL
Job No : 03498CR
Mode : 5210 Band edge
Note : 5G WIFI 11AC 80

	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	5146.363	8.32	34.32	42.36	43.03	43.31	54.00	-10.69	Average
2	5210.000	8.42	34.37	42.30	75.40	75.89	------	------	Average
3	5358.135	8.64	34.49	42.16	39.68	40.65	54.00	-13.35	Average

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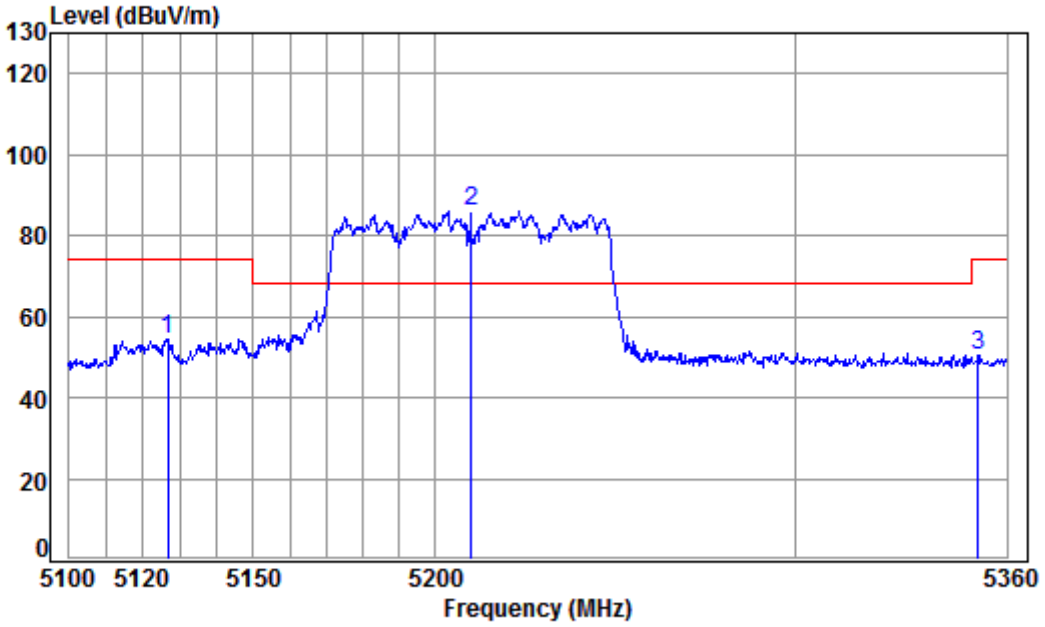
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:80MHz; Channel:Middle



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5210 Band edge
Note : 5G WIFI 11AC 80

	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	5126.696	8.29	34.31	42.38	54.32	54.54	74.00	-19.46	Peak
2 pp	5210.000	8.42	34.37	42.30	85.73	86.22	68.20	18.02	Peak
3	5351.744	8.63	34.49	42.17	49.51	50.46	74.00	-23.54	Peak

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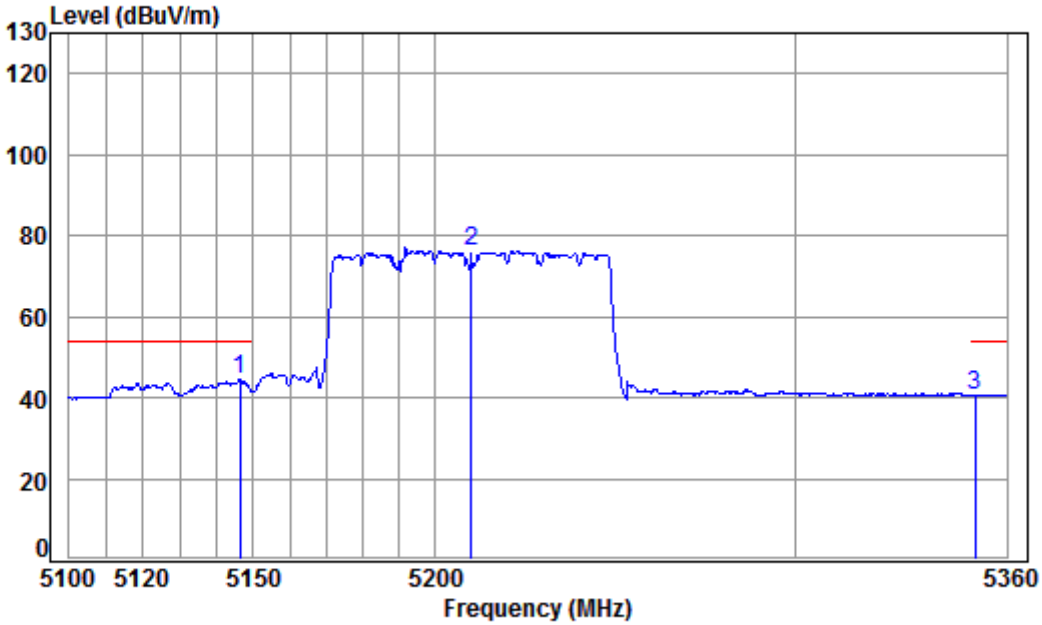
Mode:g; Polarization:Vertical; Modulation:802.11ac; bandwidth:80MHz; Channel:Middle



Condition: 3m VERTICAL
Job No : 03498CR
Mode : 5210 Band edge
Note : 5G WIFI 11AC 80

	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	5146.363	8.32	34.32	42.36	44.12	44.40	54.00	-9.60	Average
2	5210.000	8.42	34.37	42.30	75.64	76.13	------	------	Average
3	5350.946	8.63	34.48	42.17	39.84	40.78	54.00	-13.22	Average

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7.8 Frequency Stability

Test Requirement	47 CFR Part 15, Subpart C 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.

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case:	f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report. g:Charge + TX mode (Band 1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
The worst case for final test:	f:TX mode (Band 1)_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 @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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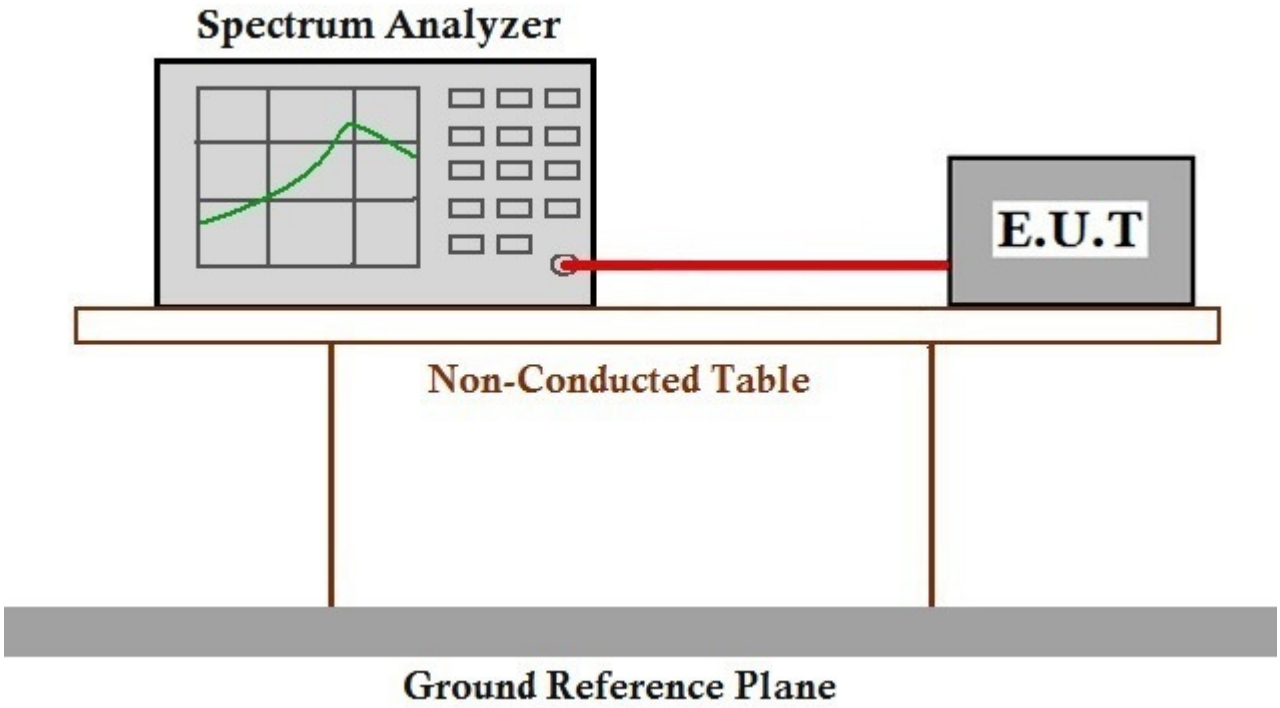
7.8.2 Test Setup Diagram



7.8.3 Measurement Procedure and Data

The applicant declares that the emissions are maintained within the band of operation under all conditions of normal operation as specified in the user's manual and meets Section 15.407(g) requirements.

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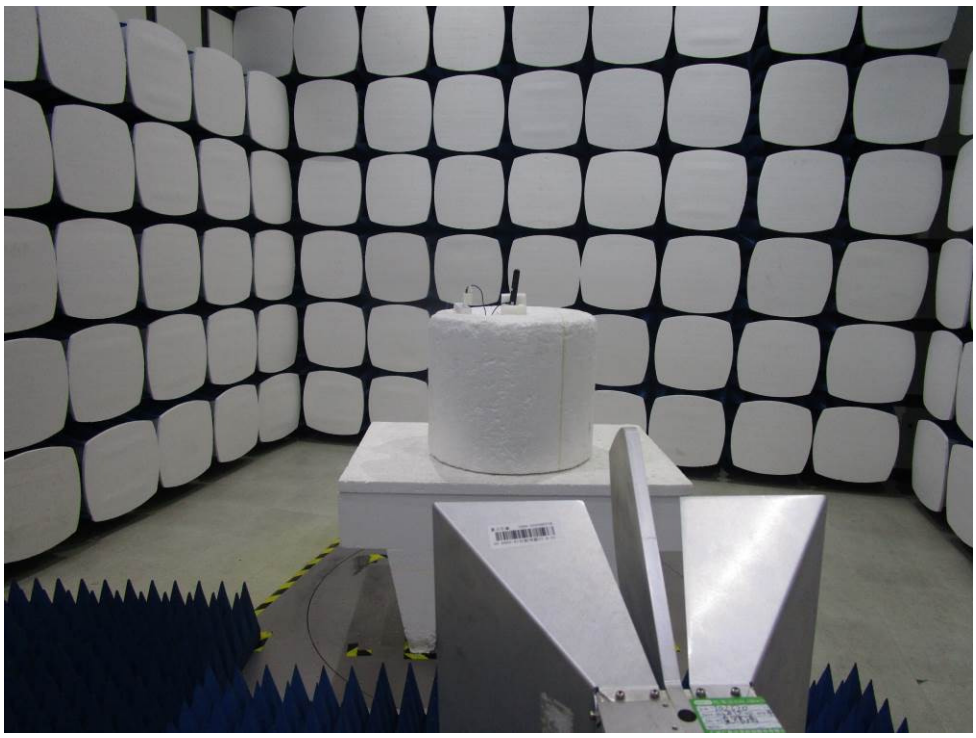
8 Photographs

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

8.2 Radiated Emissions which fall in the restricted bands Test Setup



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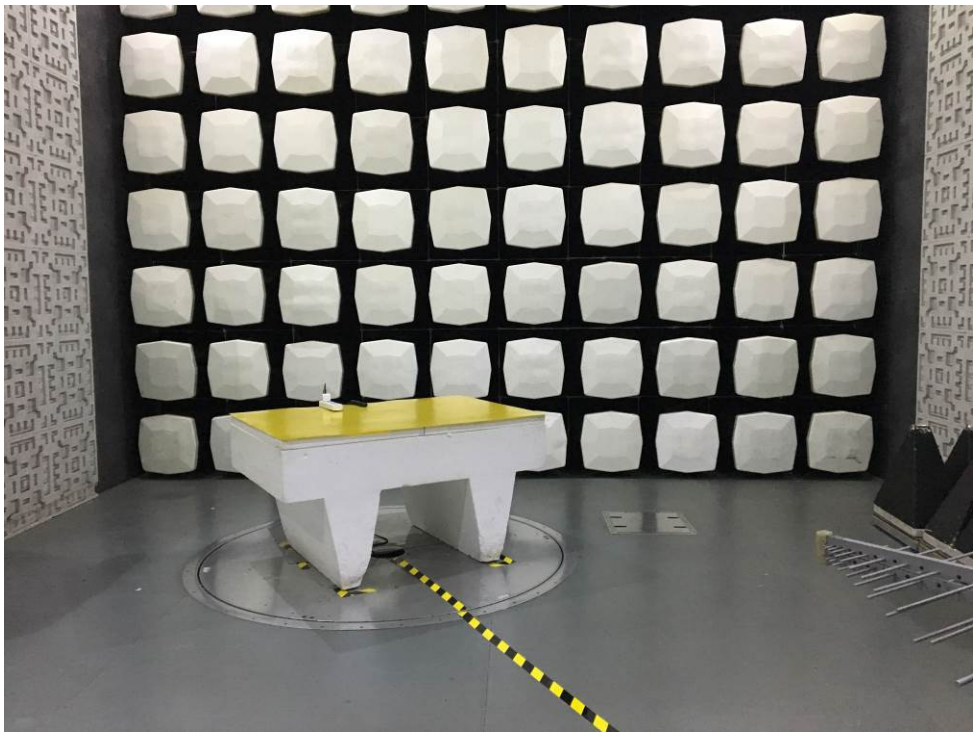
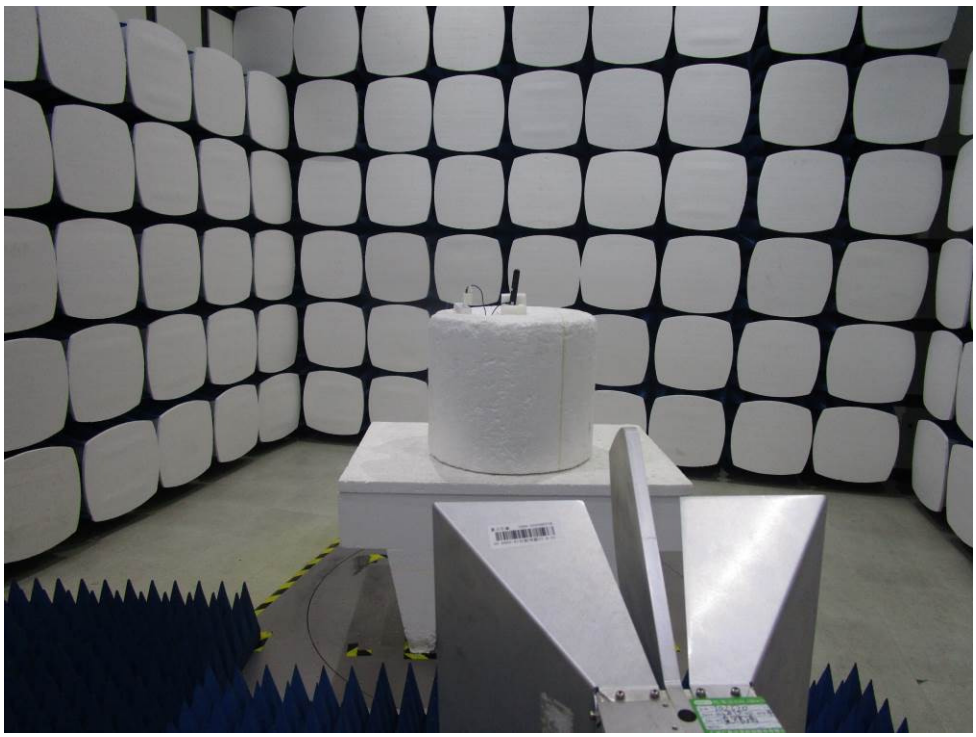
8.3 Radiated Emissions Test Setup





8.4 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

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9 Appendix

9.1 Appendix 15.407

1.Emission Bandwidth Measurement

Test Mode	Test Channel	Ant	EBW[MHz]	Limit[MHz]	Verdict
11A	5180	Ant1	30.000	---	PASS
11A	5220	Ant1	29.100	---	PASS
11A	5240	Ant1	30.000	---	PASS
11N20	5180	Ant1	30.000	---	PASS
11N20	5220	Ant1	29.130	---	PASS
11N20	5240	Ant1	29.610	---	PASS
11N40	5190	Ant1	59.640	---	PASS
11N40	5230	Ant1	57.000	---	PASS
11AC20	5180	Ant1	29.820	---	PASS
11AC20	5220	Ant1	29.640	---	PASS
11AC20	5240	Ant1	29.850	---	PASS
11AC80	5210	Ant1	81.360	---	PASS
11AC40	5190	Ant1	58.680	---	PASS
11AC40	5230	Ant1	59.340	---	PASS

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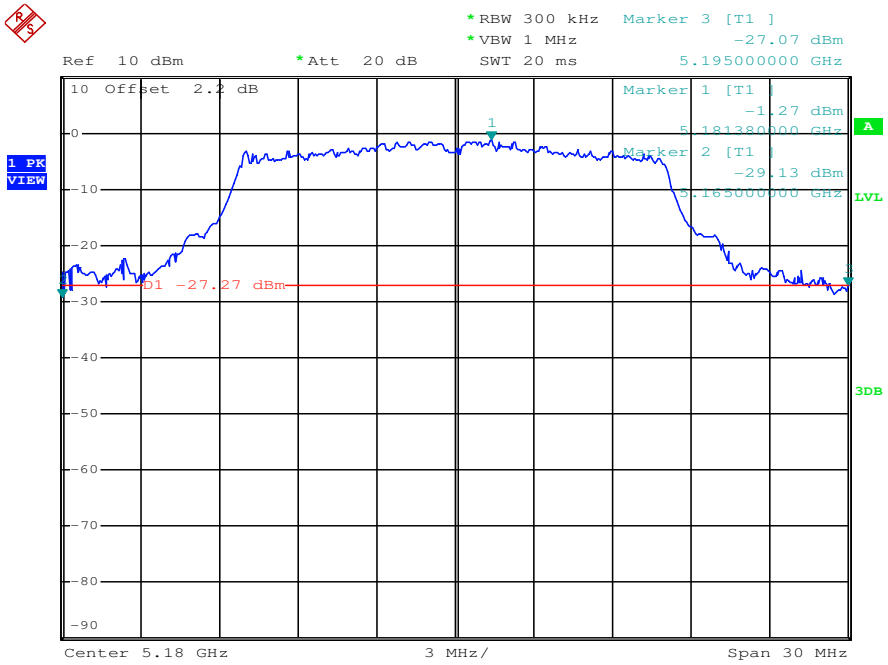
Emission Bandwidth Measurement_11A_5180_Ant1



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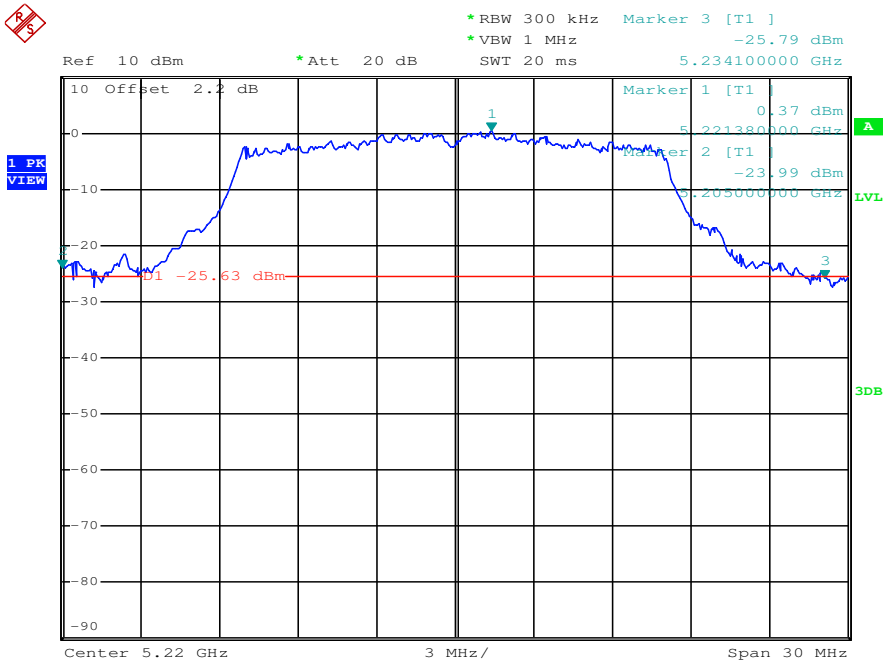

Date: 14.JUN.2018 15:13:44

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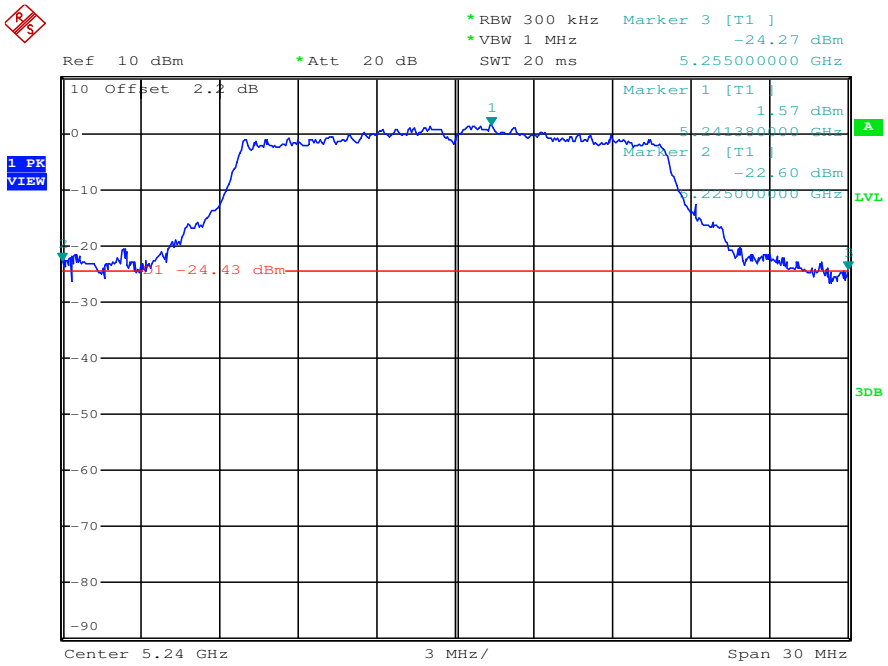
Emission Bandwidth Measurement_11A_5240_Ant1



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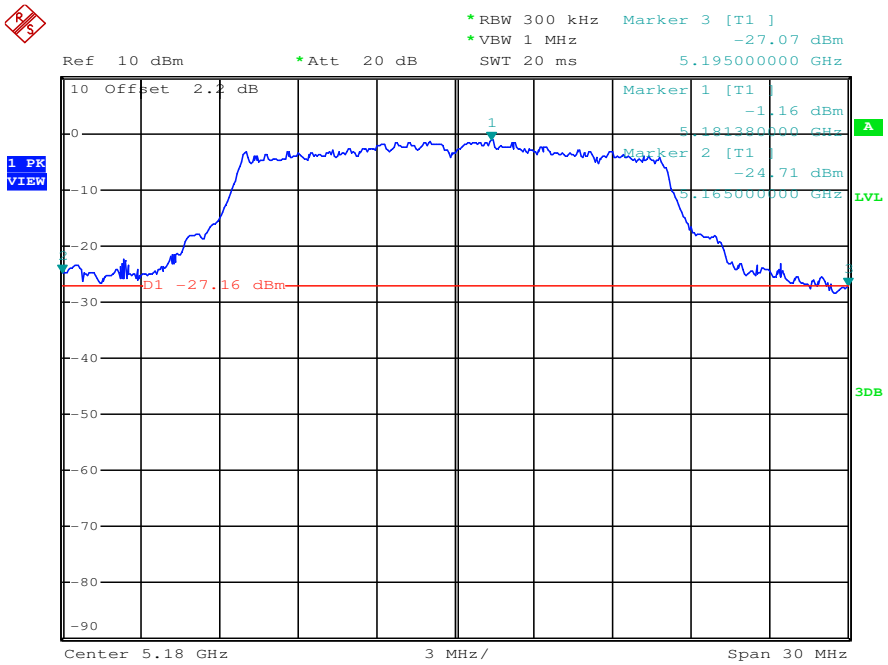

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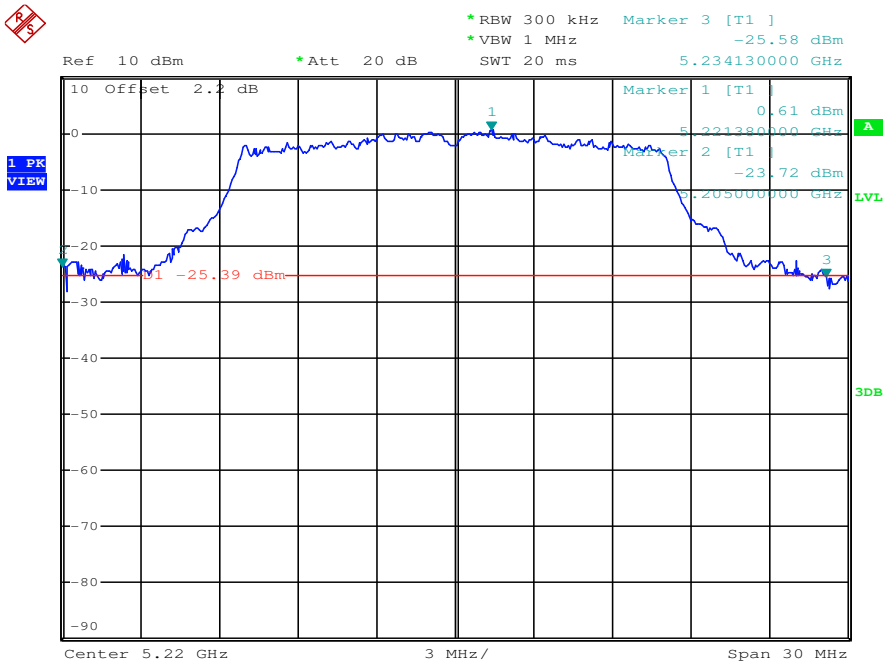
Emission Bandwidth Measurement_11N20_5220_Ant1



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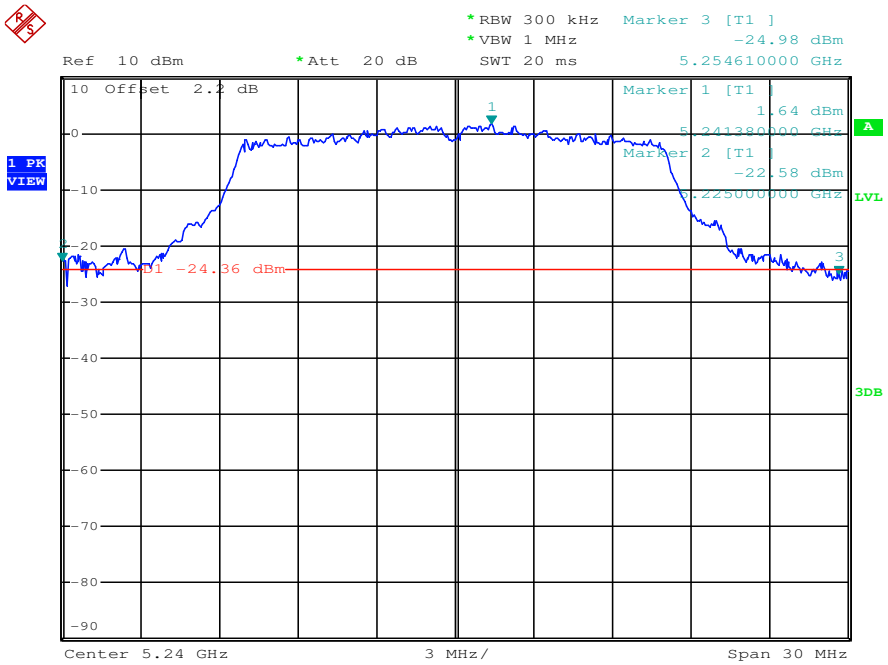

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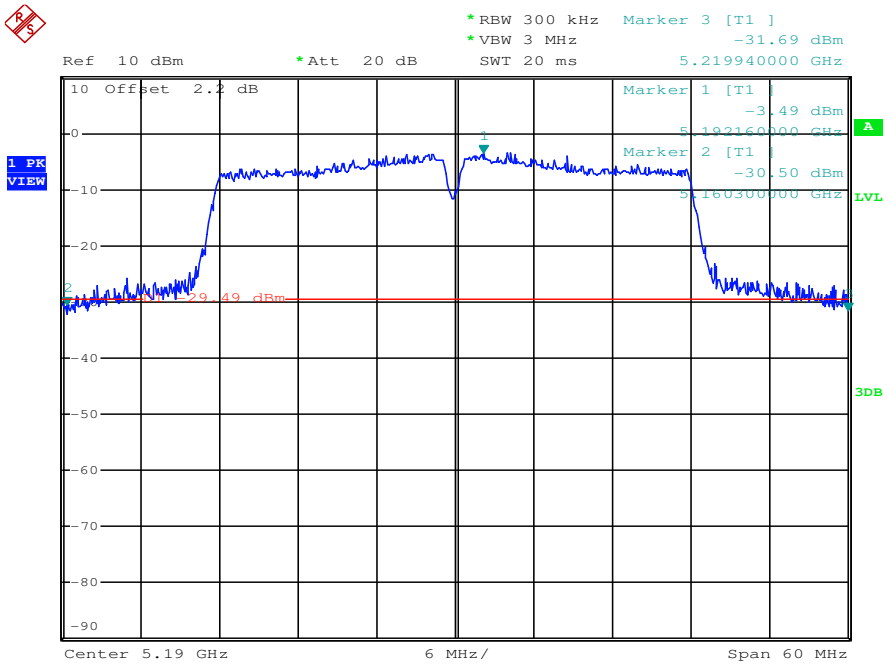

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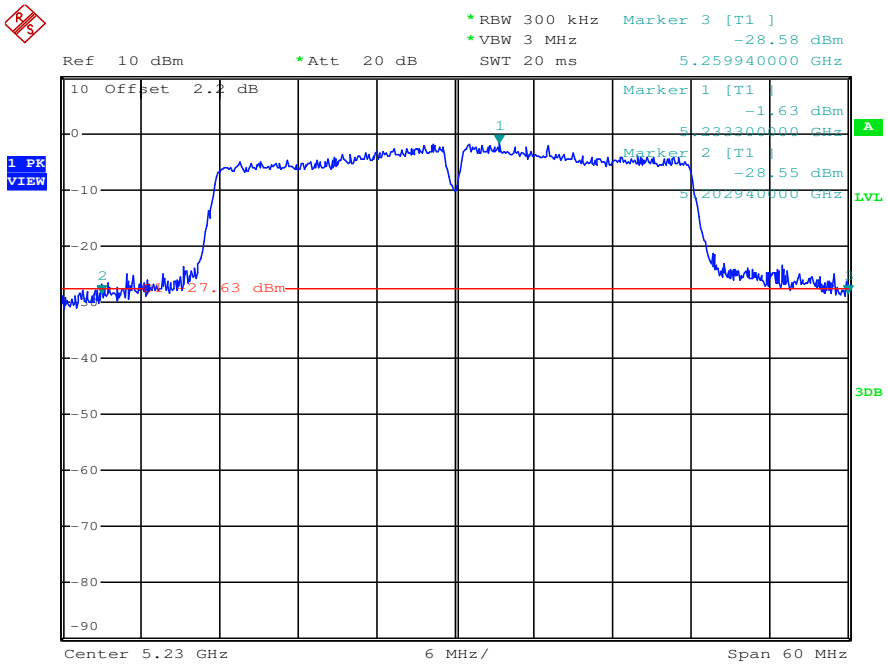

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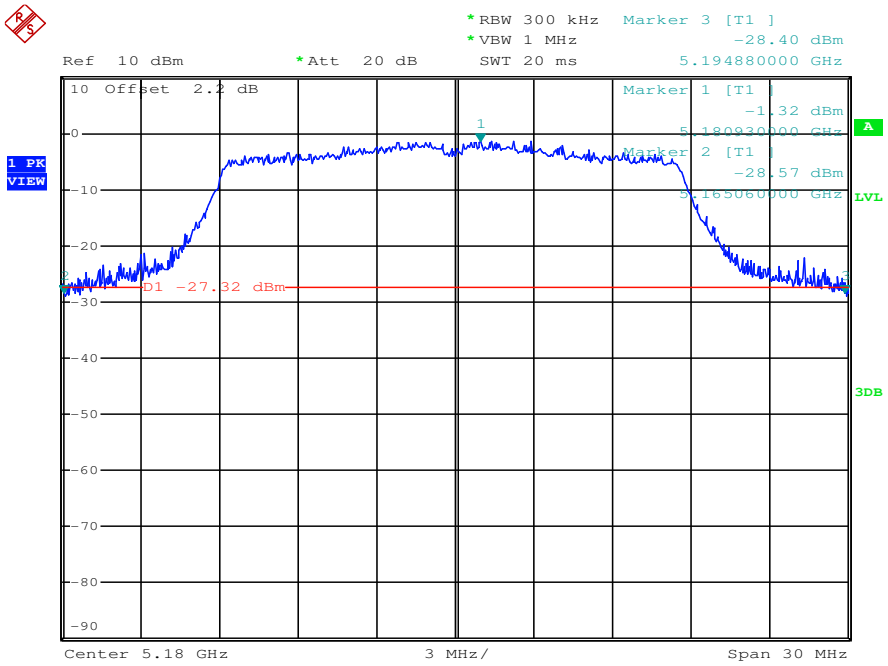
Emission Bandwidth Measurement_11AC20_5180_Ant1



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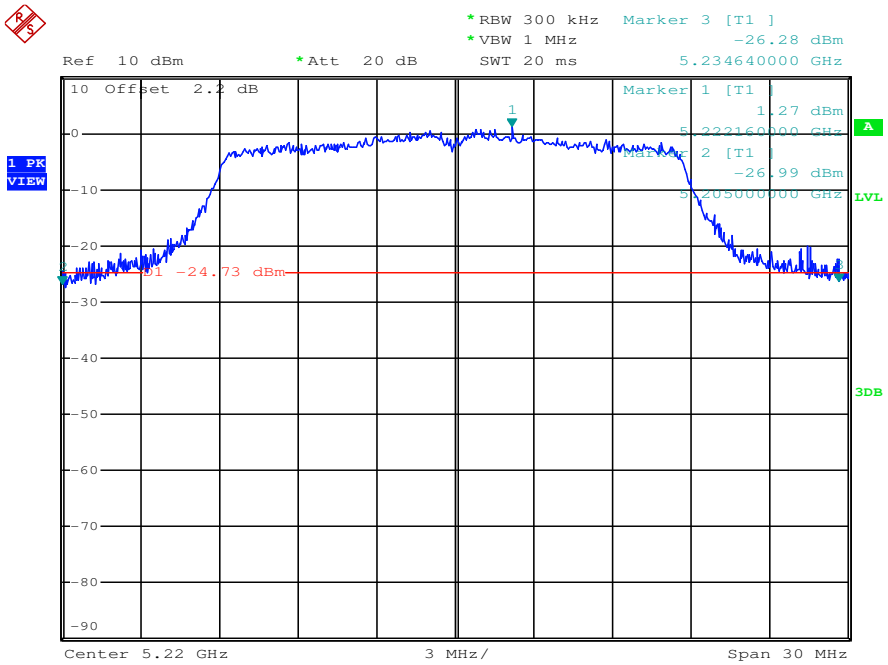

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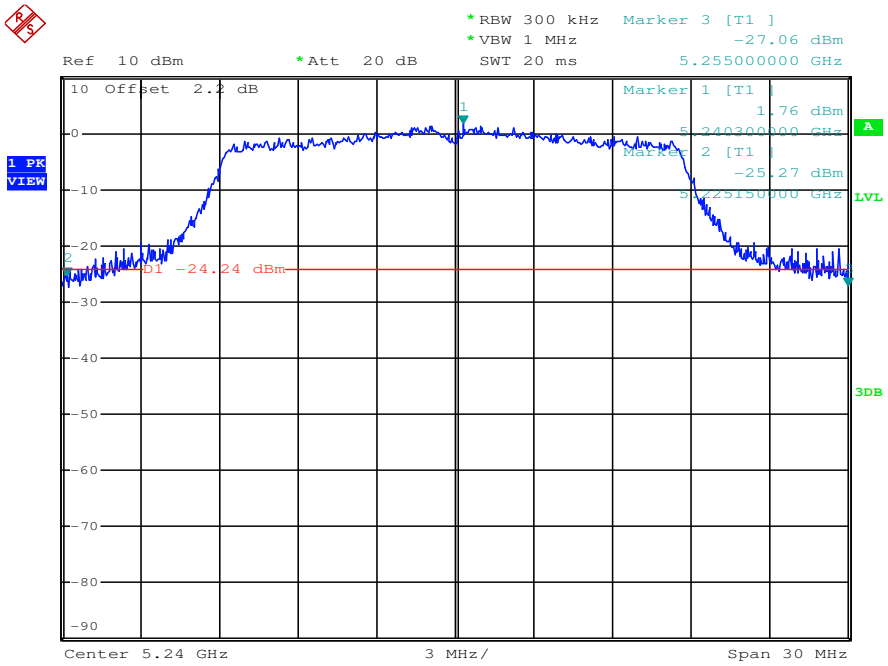
Emission Bandwidth Measurement_11AC20_5240_Ant1



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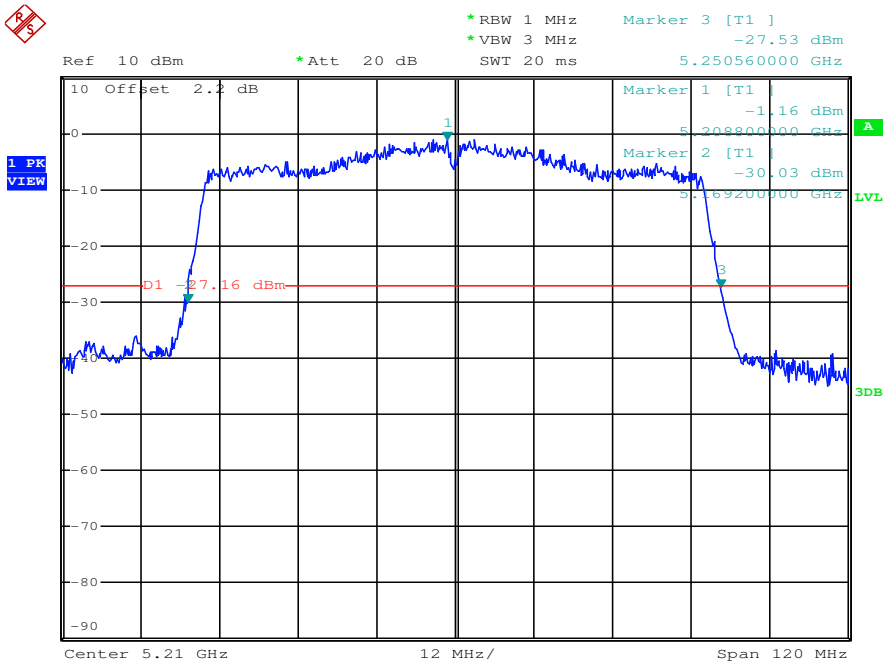

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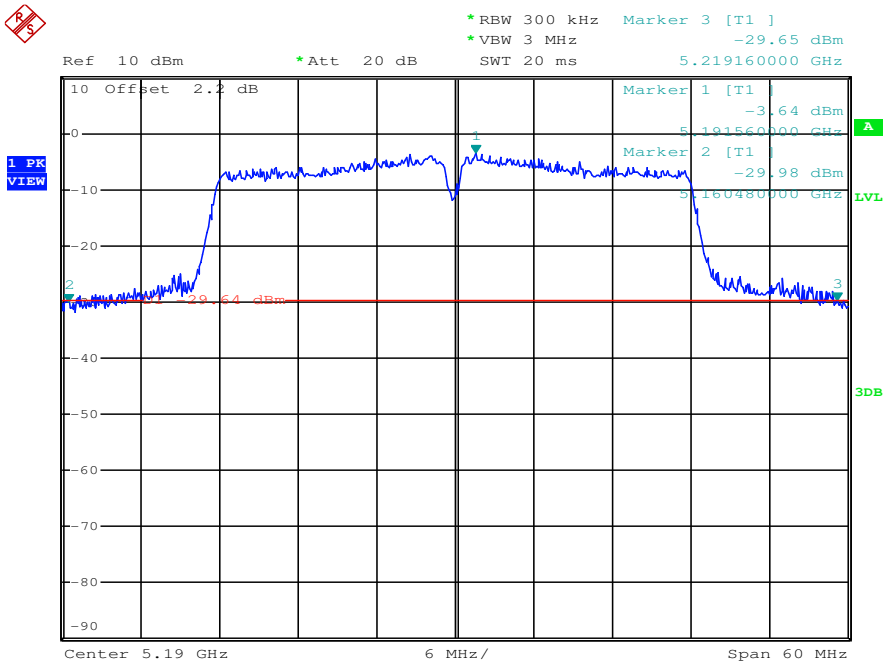
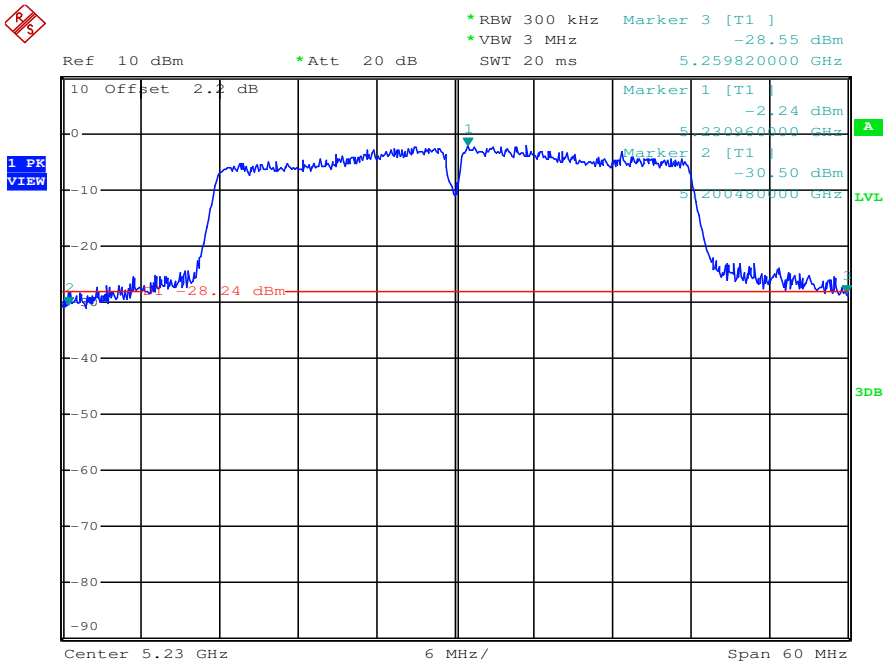
Emission Bandwidth Measurement_11AC40_5190_Ant1



Date: 14.JUN.2018 15:27:07

Emission Bandwidth Measurement_11AC40_5230_Ant1



Date: 14.JUN.2018 15:28:42

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2.Occupied Bandwidth Measurement

Test Mode	Test Channel	Ant	OBW[MHz]	Limit[MHz]	Verdict
11A	5180	Ant1	17.760	---	PASS
11A	5220	Ant1	17.640	---	PASS
11A	5240	Ant1	17.640	---	PASS
11N20	5180	Ant1	17.790	---	PASS
11N20	5220	Ant1	17.640	---	PASS
11N20	5240	Ant1	17.610	---	PASS
11N40	5190	Ant1	36.420	---	PASS
11N40	5230	Ant1	36.480	---	PASS
11AC20	5180	Ant1	18.510	---	PASS
11AC20	5220	Ant1	18.570	---	PASS
11AC20	5240	Ant1	18.510	---	PASS
11AC80	5210	Ant1	75.360	---	PASS
11AC40	5190	Ant1	36.480	---	PASS
11AC40	5230	Ant1	36.480	---	PASS

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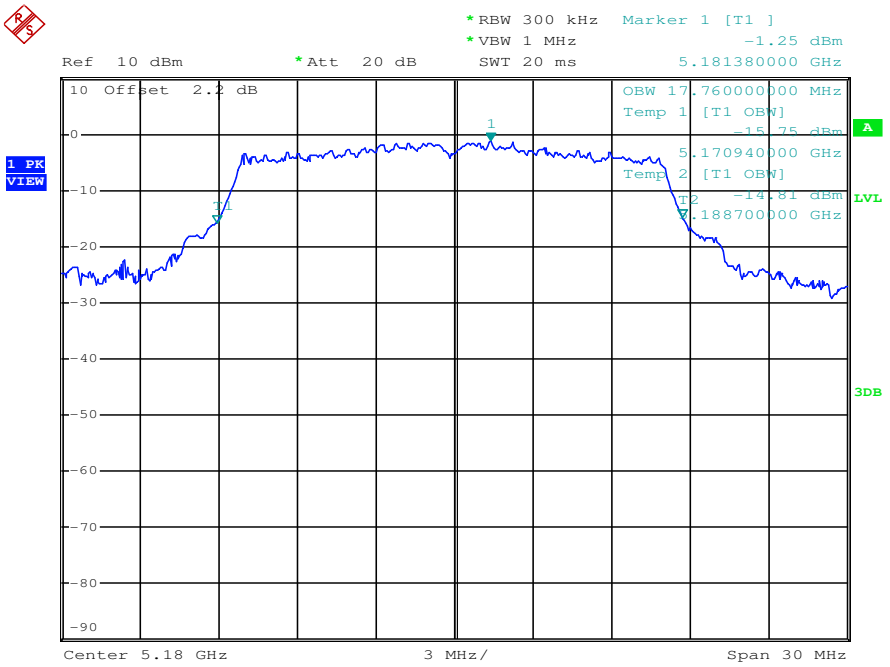
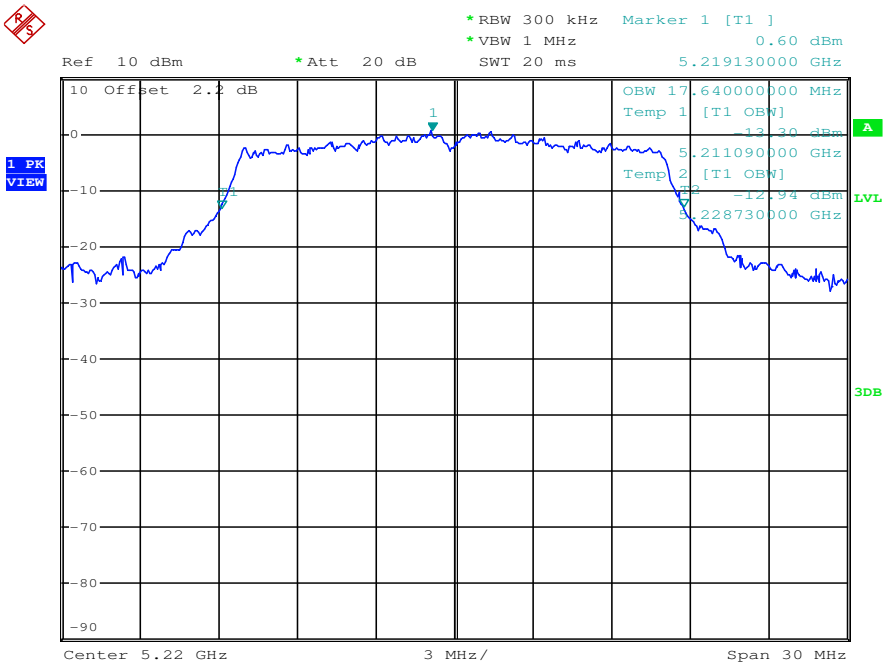
Occupied Bandwidth Measurement_11A_5180_Ant1



Date: 14.JUN.2018 15:12:21

Occupied Bandwidth Measurement_11A_5220_Ant1



Date: 14.JUN.2018 15:13:32

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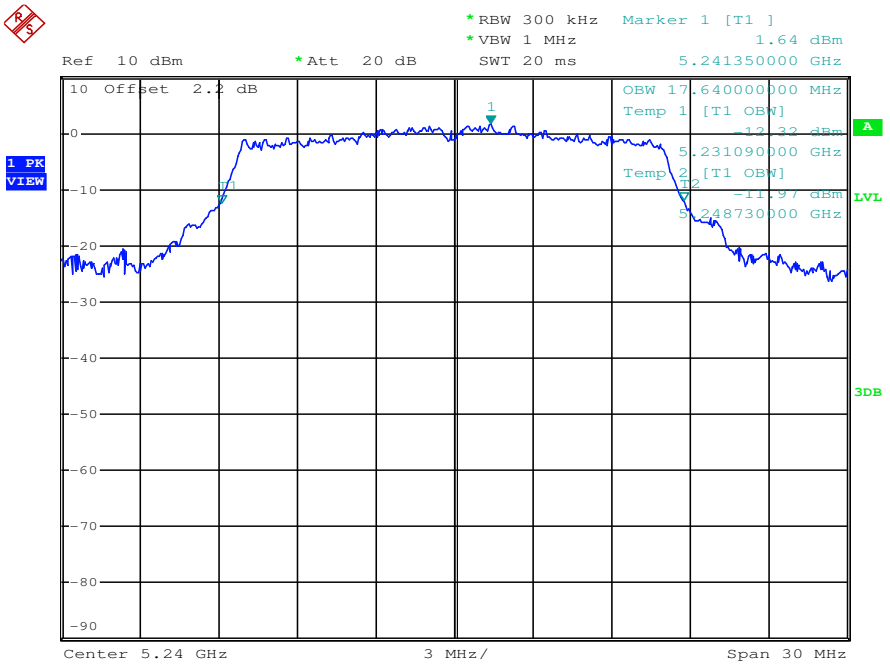
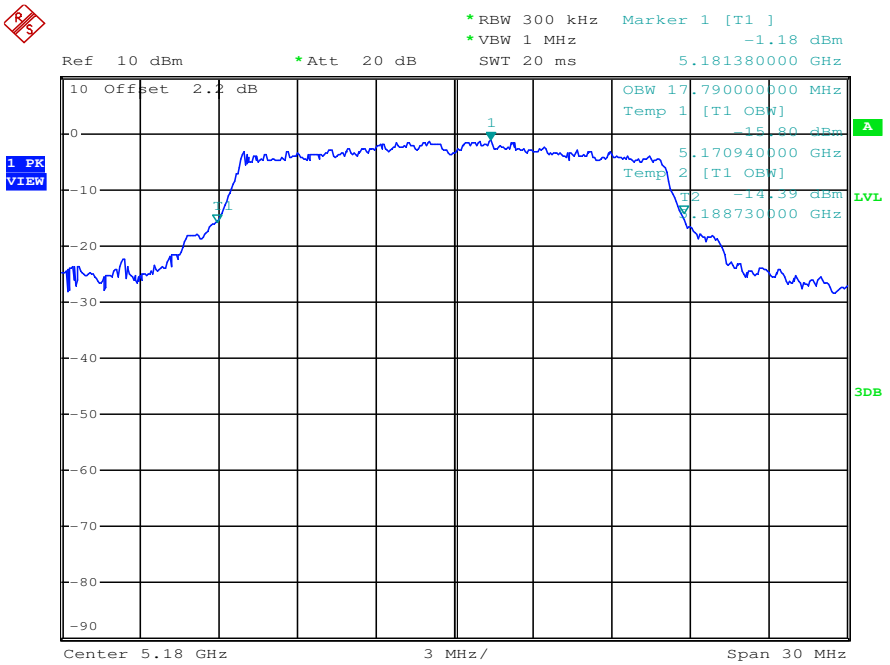
Occupied Bandwidth Measurement_11A_5240_Ant1



Date: 14.JUN.2018 15:14:42

Occupied Bandwidth Measurement_11N20_5180_Ant1



Date: 14.JUN.2018 15:15:55

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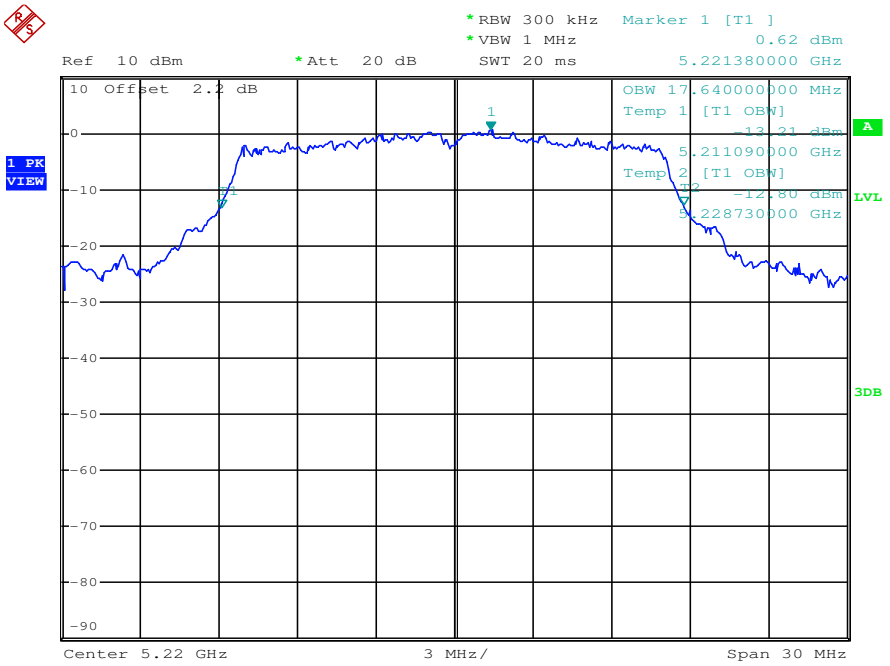
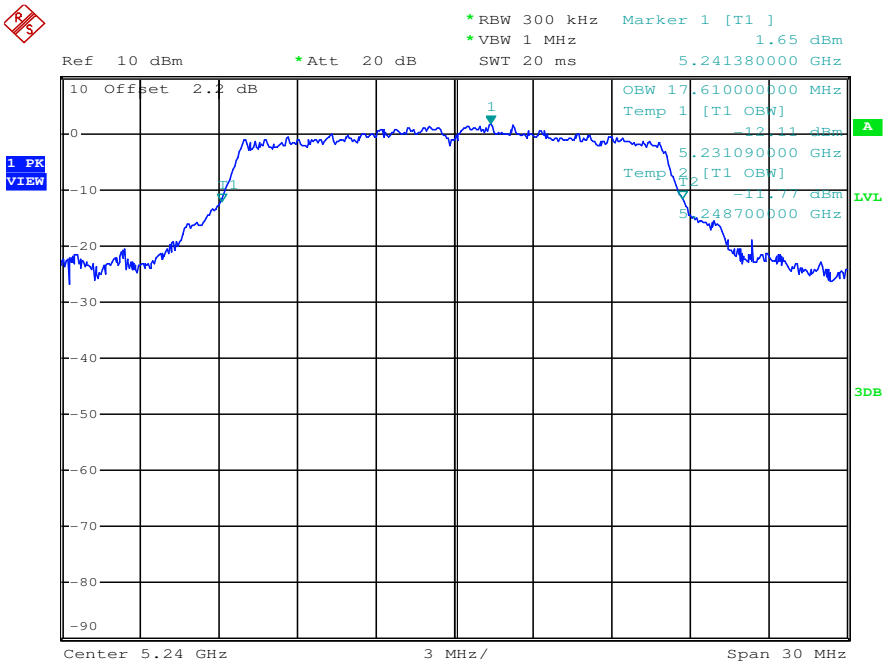
Occupied Bandwidth Measurement_11N20_5220_Ant1



Date: 14.JUN.2018 15:17:04

Occupied Bandwidth Measurement_11N20_5240_Ant1



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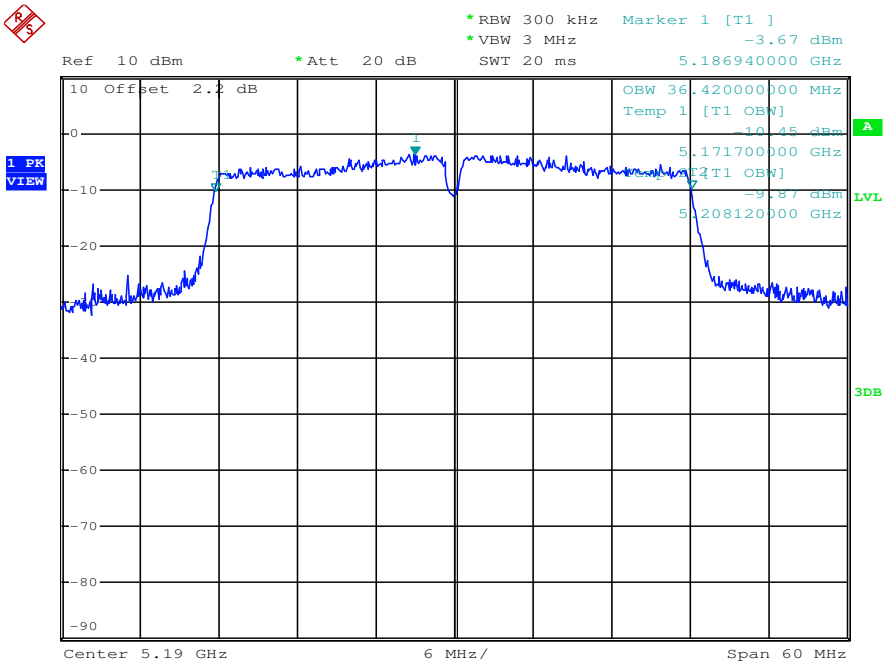
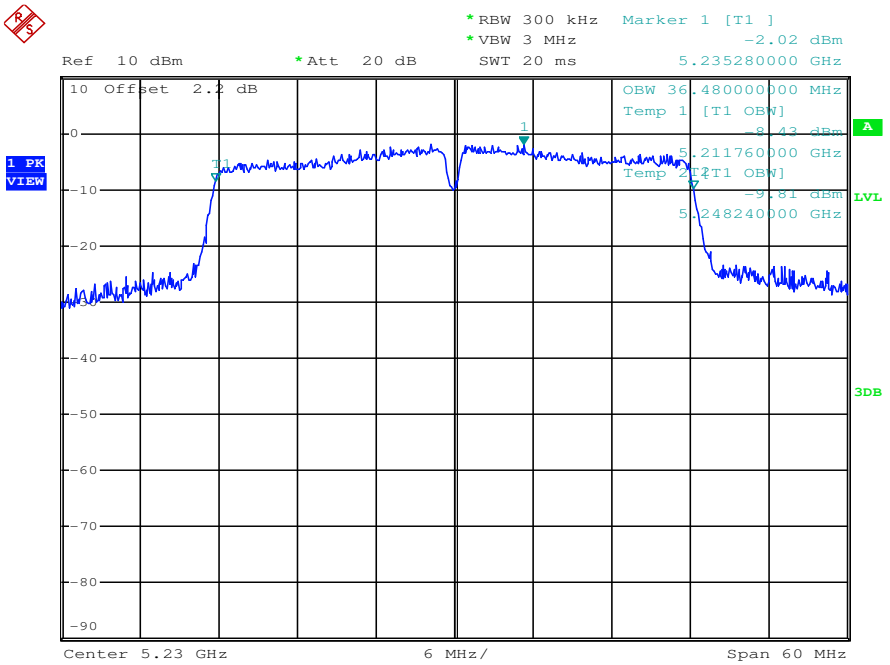
Occupied Bandwidth Measurement_11N40_5190_Ant1



Date: 14.JUN.2018 15:19:26

Occupied Bandwidth Measurement_11N40_5230_Ant1



Date: 14.JUN.2018 15:21:24

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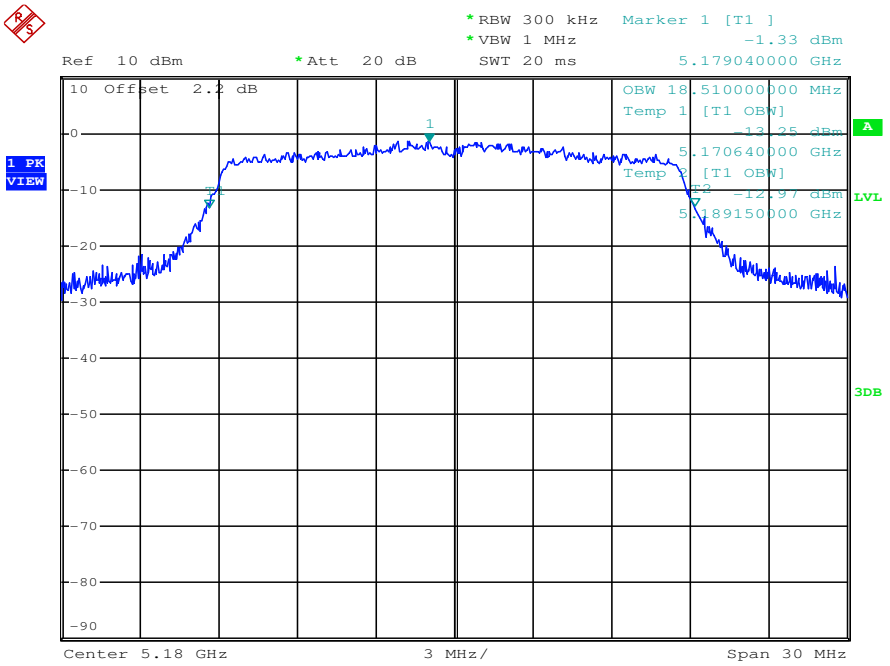
Occupied Bandwidth Measurement_11AC20_5180_Ant1



Date: 14.JUN.2018 15:22:35

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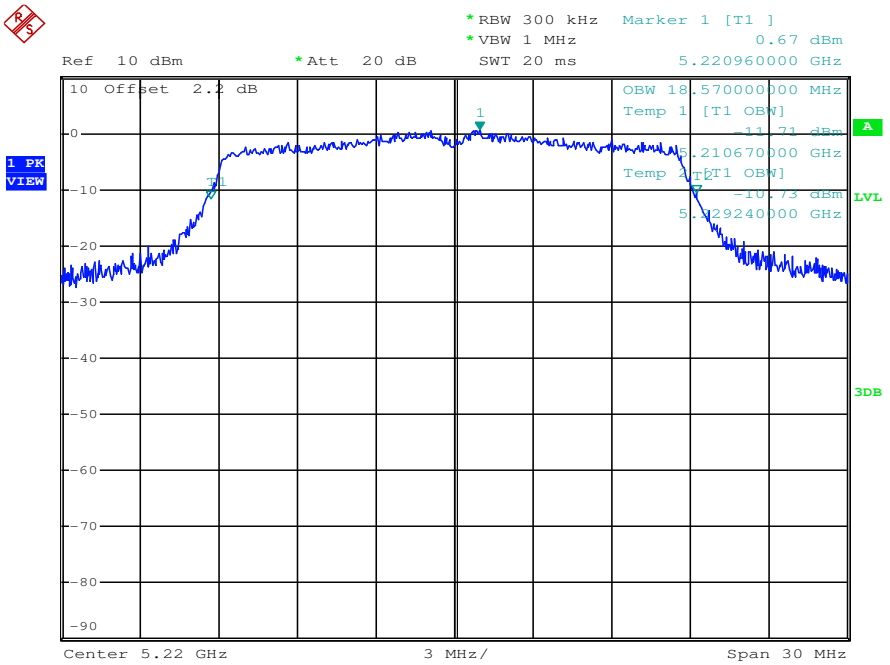

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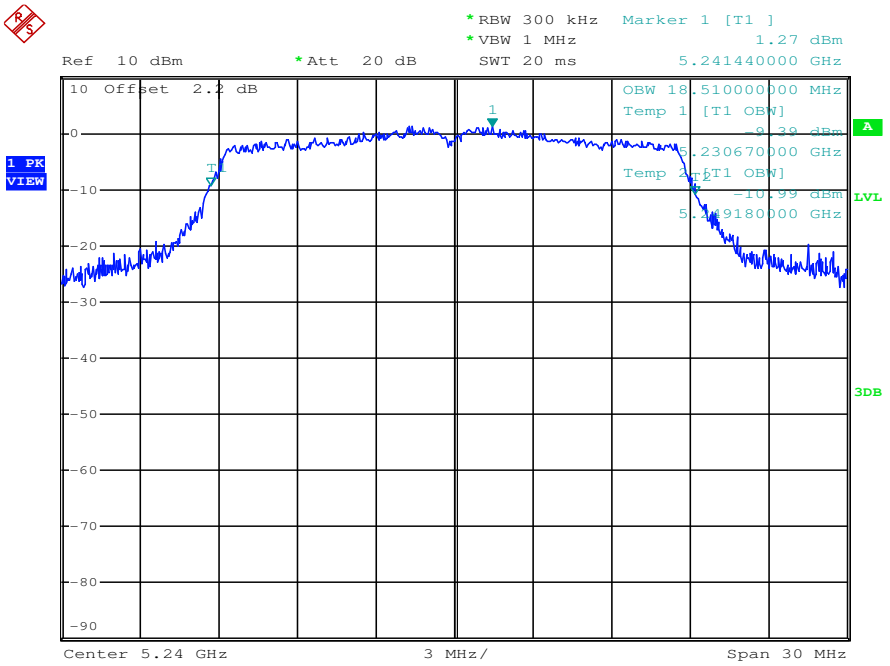
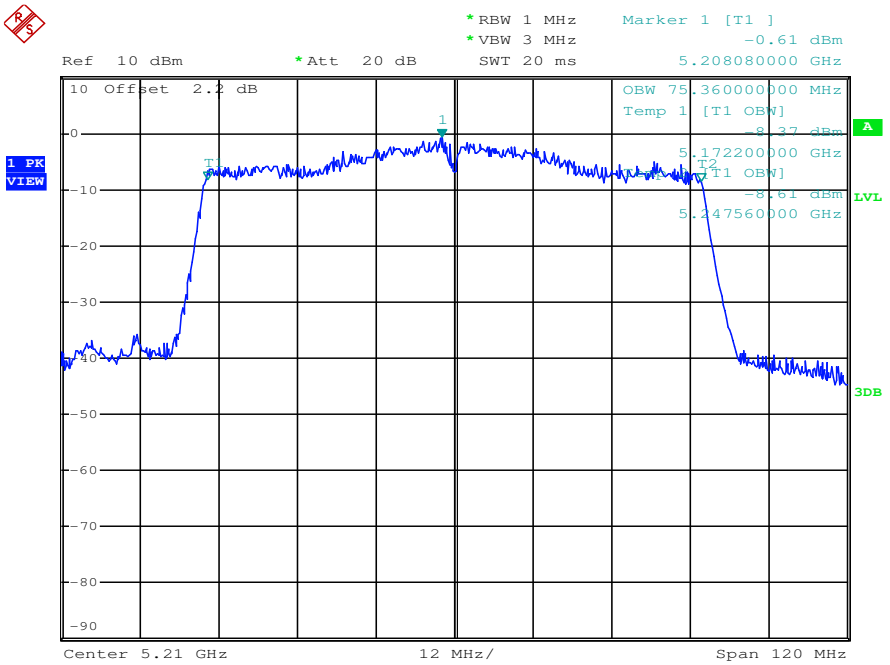
Occupied Bandwidth Measurement_11AC20_5240_Ant1



Date: 14.JUN.2018 15:24:53

Occupied Bandwidth Measurement_11AC80_5210_Ant1



Date: 11.JUL.2018 13:30:23

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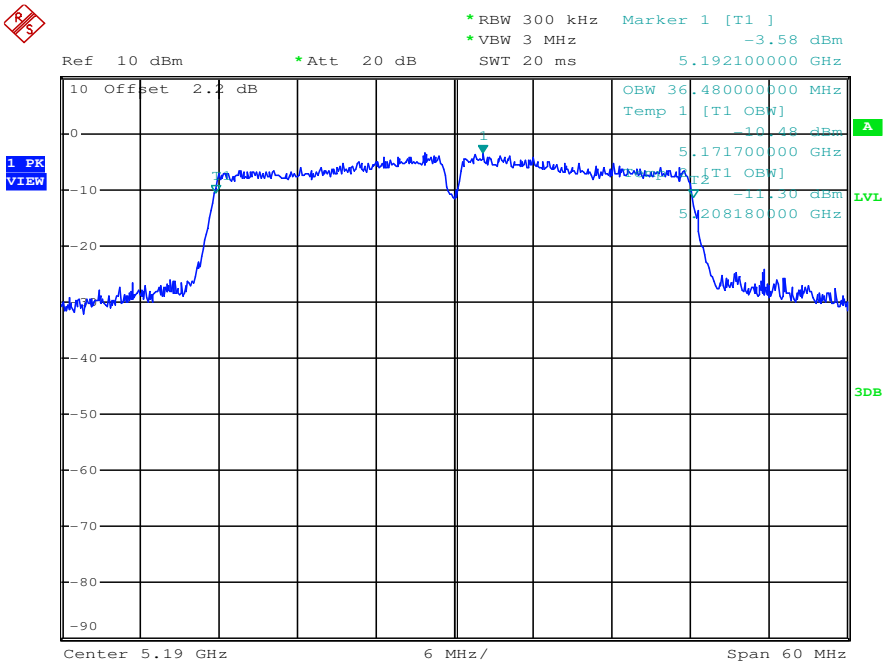
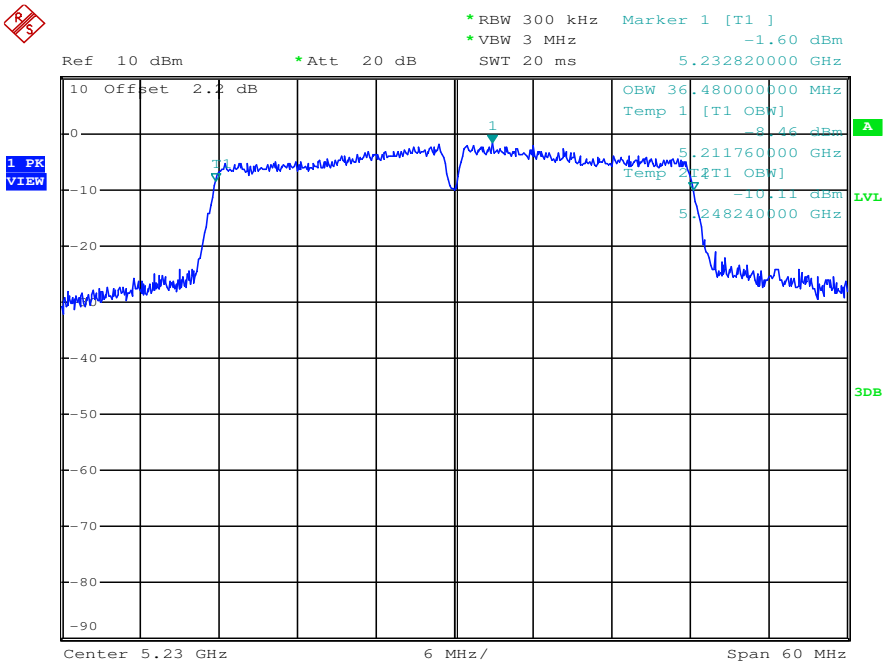
Occupied Bandwidth Measurement_11AC40_5190_Ant1



Date: 14.JUN.2018 15:26:56

Occupied Bandwidth Measurement_11AC40_5230_Ant1



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3.Maximum Conduct Output Power

Test Mode	Test Channel	Ant	Level [dBm]	10log(1/x) Factor [dB]	Power [dBm]	Limit [dBm]	Verdict
11A	5180	Ant1	6.77	0.43	7.20	<23.98	PASS
11A	5220	Ant1	8.25	0.49	8.74	<23.98	PASS
11A	5240	Ant1	9.44	0.49	9.93	<23.98	PASS
11N20	5180	Ant1	6.8	0.43	7.23	<23.98	PASS
11N20	5220	Ant1	8.45	0.43	8.88	<23.98	PASS
11N20	5240	Ant1	9.44	0.43	9.87	<23.98	PASS
11N40	5190	Ant1	7	0.91	7.91	<23.98	PASS
11N40	5230	Ant1	8.49	1.03	9.52	<23.98	PASS
11AC20	5180	Ant1	6.54	0.45	6.99	<23.98	PASS
11AC20	5220	Ant1	8.35	0.45	8.80	<23.98	PASS
11AC20	5240	Ant1	9.16	0.45	9.61	<23.98	PASS
11AC80	5210	Ant1	1.90	6.99	**8.89**	<23.98	PASS
11AC40	5190	Ant1	6.81	0.88	7.69	<23.98	PASS
11AC40	5230	Ant1	8.51	1.03	9.54	<23.98	PASS

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4.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	-2.82	0.43	-2.39	<11.00	PASS
11A	5220	Ant1	-1.3	0.49	-0.81	<11.00	PASS
11A	5240	Ant1	-0.16	0.49	0.33	<11.00	PASS
11N20	5180	Ant1	-2.82	0.43	-2.39	<11.00	PASS
11N20	5220	Ant1	-0.98	0.43	-0.55	<11.00	PASS
11N20	5240	Ant1	-0.12	0.43	0.31	<11.00	PASS
11N40	5190	Ant1	-5.6	0.91	-4.69	<11.00	PASS
11N40	5230	Ant1	-4.36	1.03	-3.33	<11.00	PASS
11AC20	5180	Ant1	-3.35	0.45	-2.9	<11.00	PASS
11AC20	5220	Ant1	-1.29	0.45	-0.84	<11.00	PASS
11AC20	5240	Ant1	-0.63	0.45	-0.18	<11.00	PASS
11AC80	5210	Ant1	-9	6.99	-2.01	<11.00	PASS
11AC40	5190	Ant1	-6.02	0.88	-5.14	<11.00	PASS
11AC40	5230	Ant1	-4.2	1.03	-3.17	<11.00	PASS

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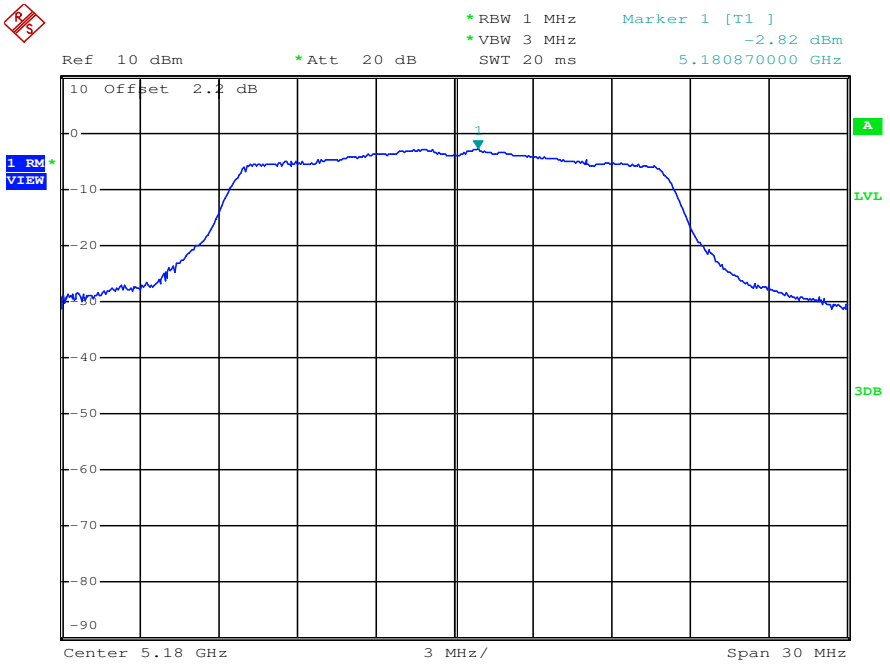
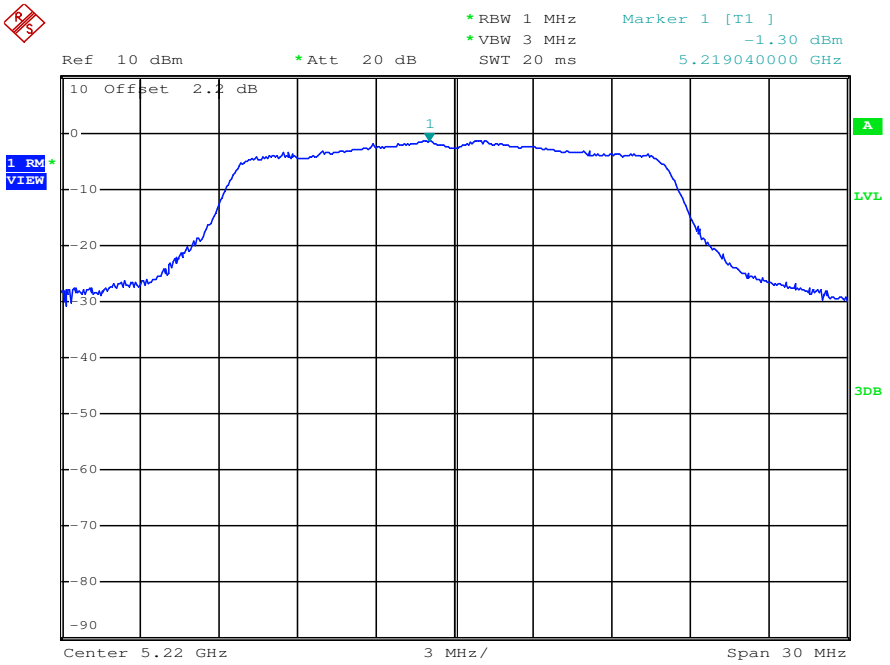
Maximum Power Spectral Density_TNVN_11A_5180_Ant1



Date: 14.JUN.2018 15:12:58

Maximum Power Spectral Density_TNVN_11A_5220_Ant1



Date: 14.JUN.2018 15:14:09

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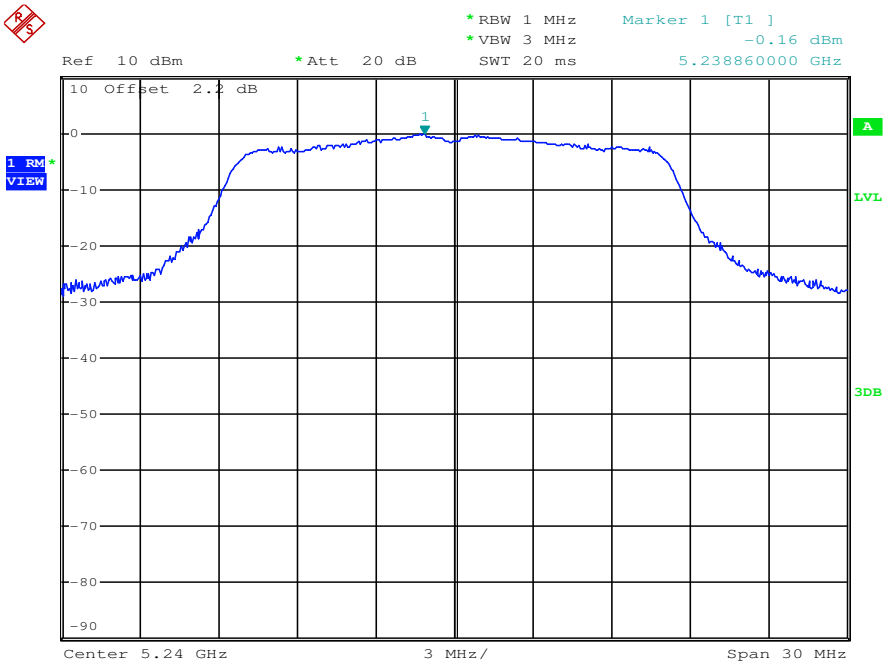
Maximum Power Spectral Density_TNVN_11A_5240_Ant1



Date: 14.JUN.2018 15:15:19

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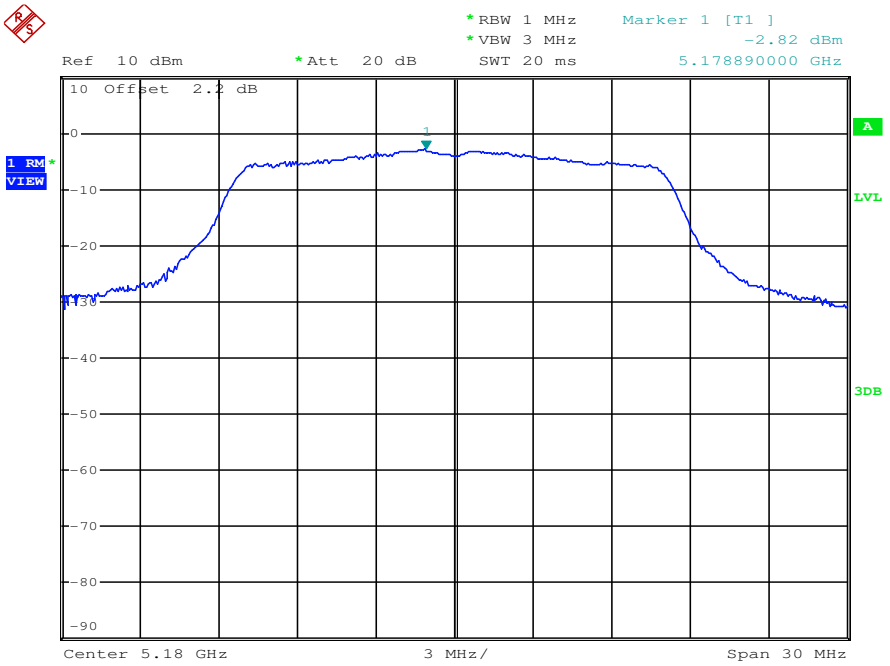

Date: 14.JUN.2018 15:16:33

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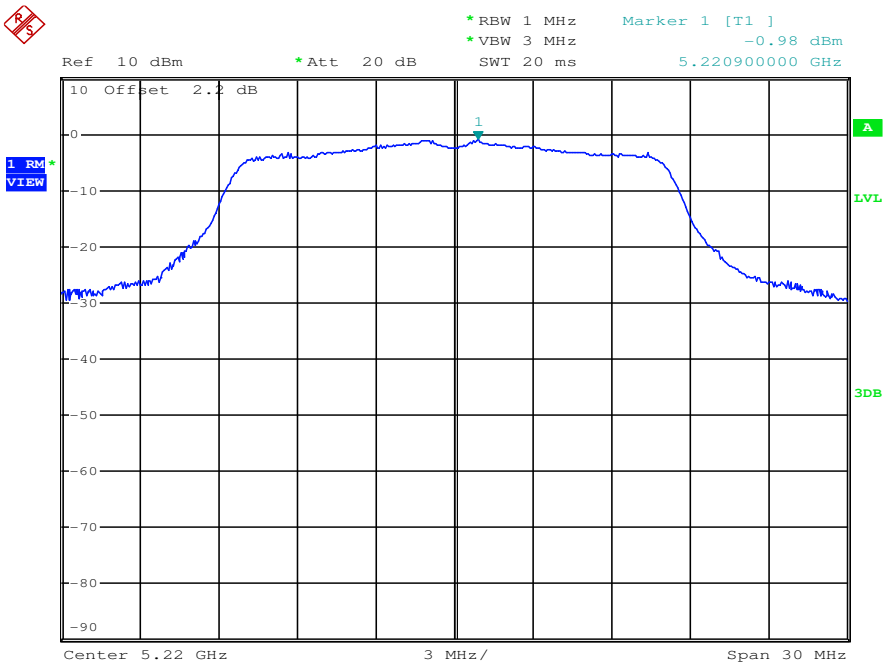
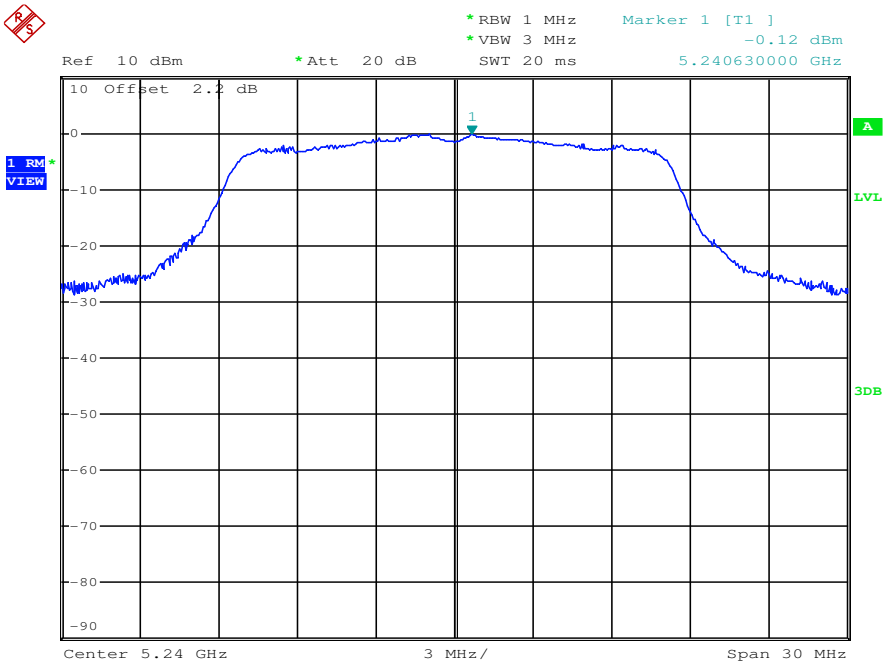
Maximum Power Spectral Density_TNVN_11N20_5220_Ant1



Date: 14.JUN.2018 15:17:41

Maximum Power Spectral Density_TNVN_11N20_5240_Ant1



Date: 14.JUN.2018 15:18:50

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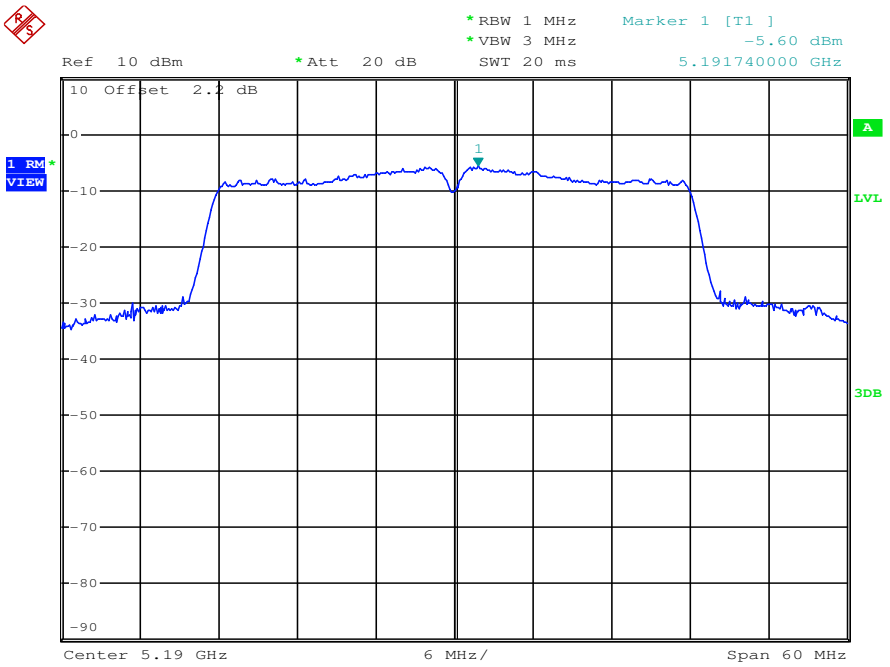
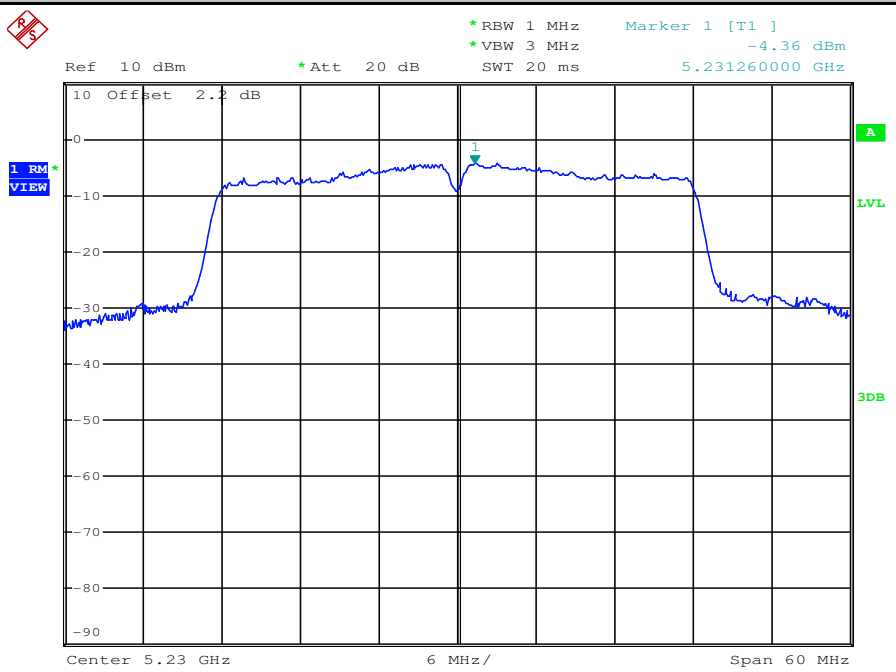
Maximum Power Spectral Density_TNVN_11N40_5190_Ant1



Date: 14.JUN.2018 15:20:03

Maximum Power Spectral Density_TNVN_11N40_5230_Ant1



Date: 14.JUN.2018 15:22:02

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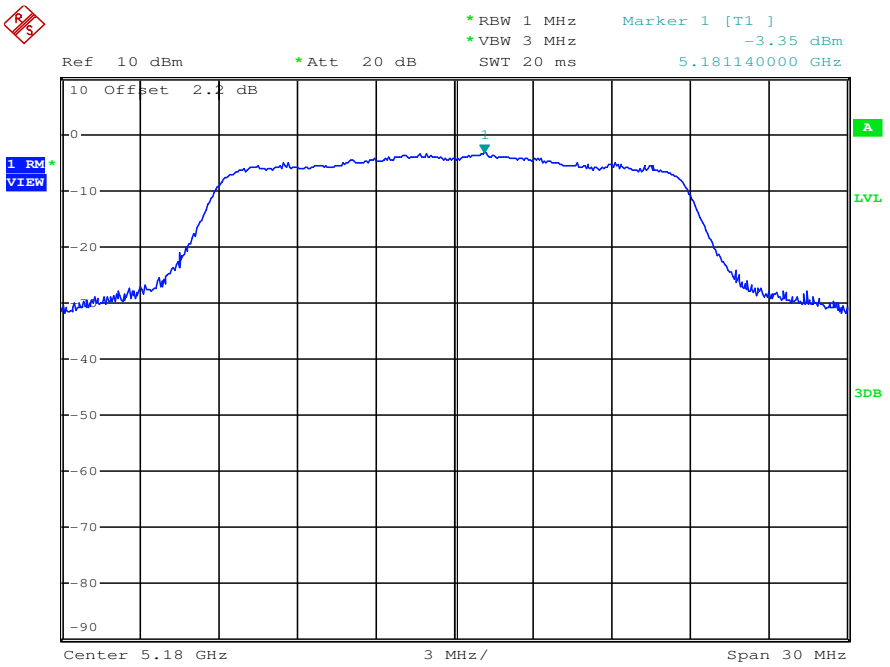
Maximum Power Spectral Density_TNVN_11AC20_5180_Ant1



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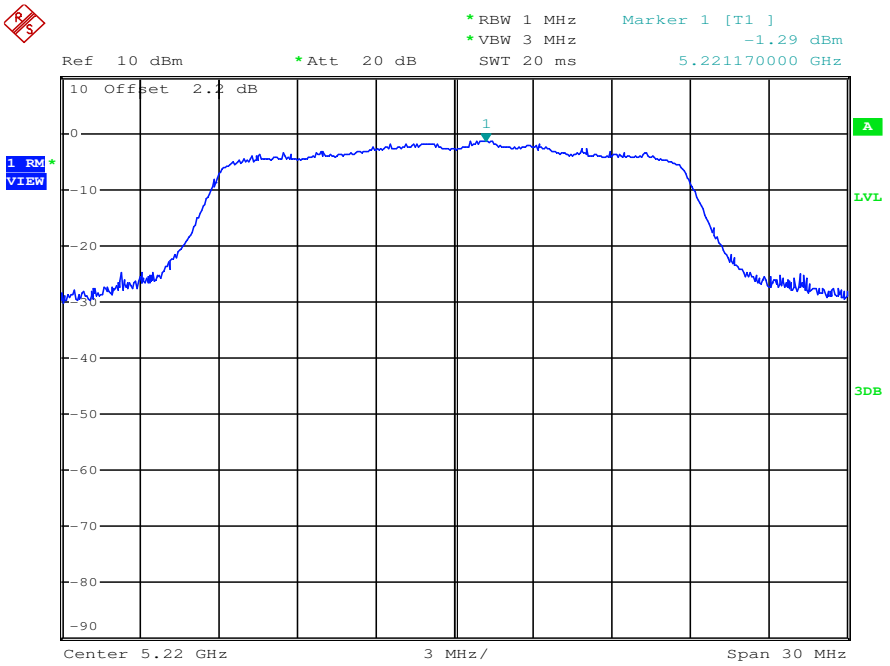

Date: 14.JUN.2018 15:24:21

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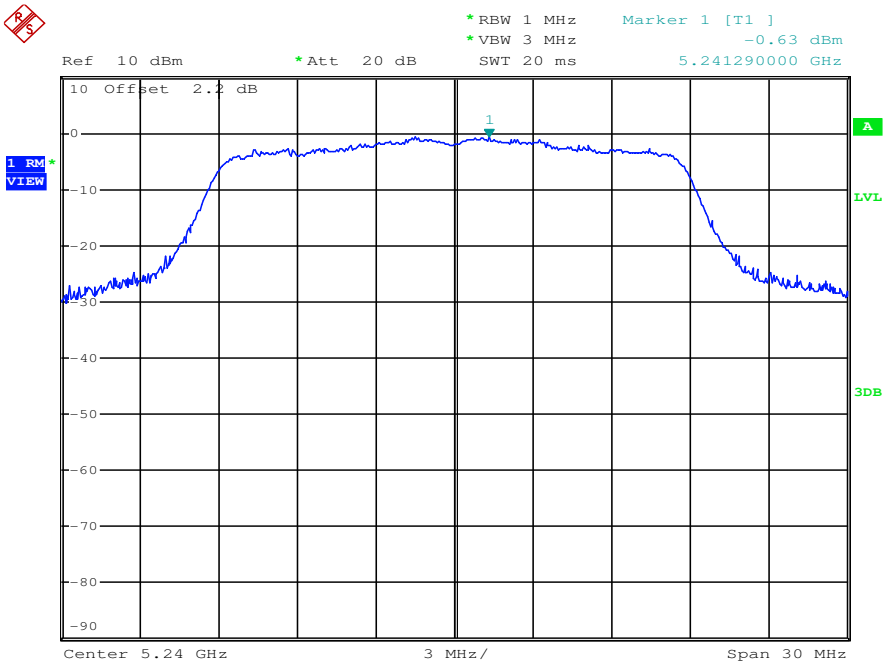
Maximum Power Spectral Density_TNVN_11AC20_5240_Ant1



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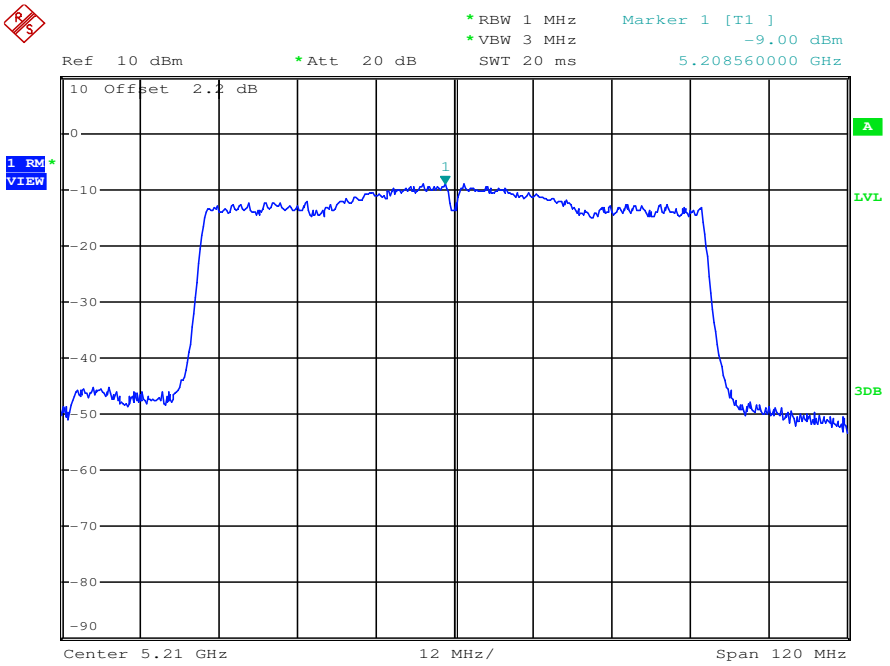
Maximum Power Spectral Density_TNVN_11AC80_5210_Ant1



Date: 11.JUL.2018 13:31:00

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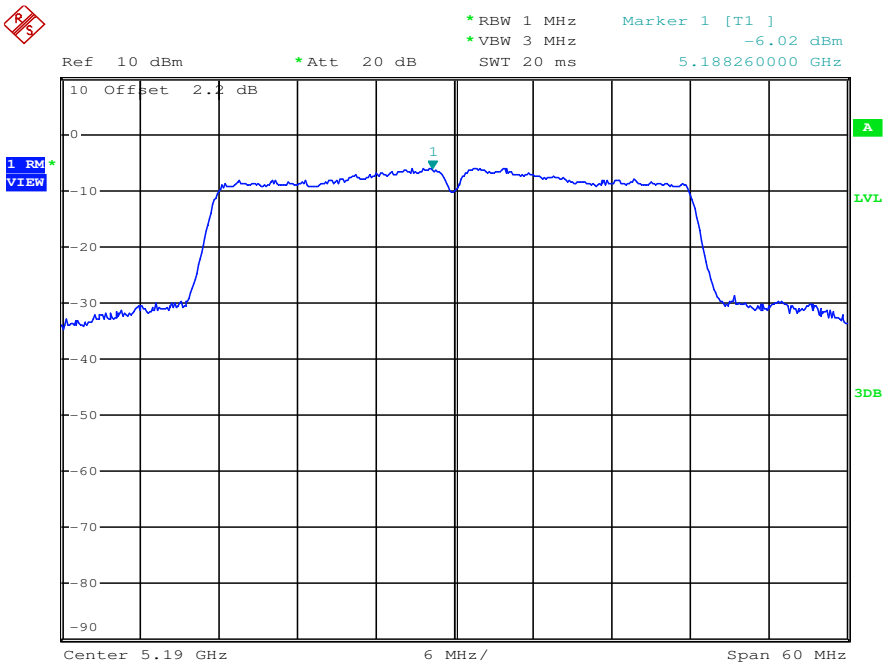
Maximum Power Spectral Density_TNVN_11AC40_5190_Ant1



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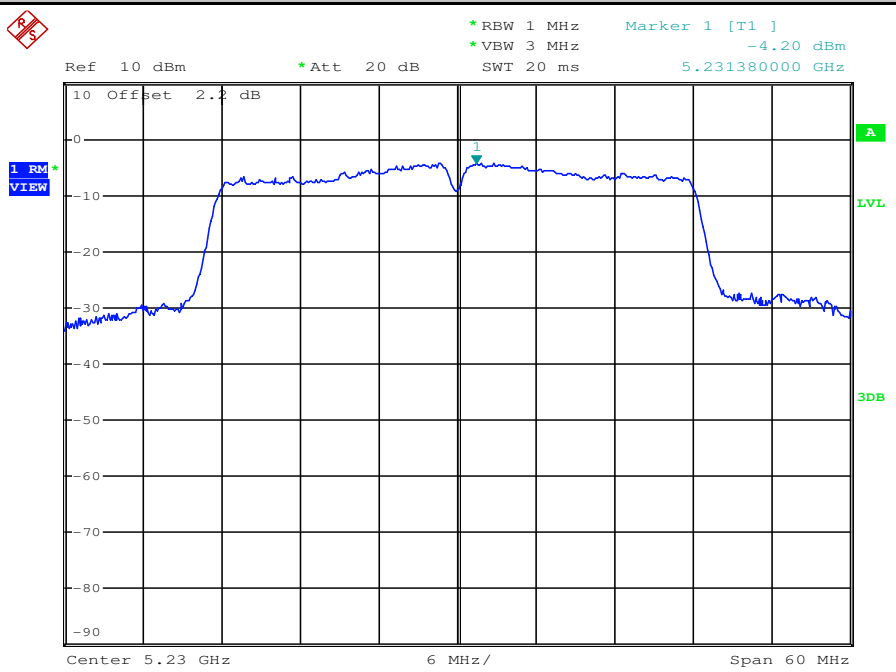
Maximum Power Spectral Density_TNVN_11AC40_5230_Ant1



Date: 14.JUN.2018 15:29:07

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7.Duty Cycle (x)

Test Mode	Test Channel	Ant	Duty Cycle[%]	10log(1/x) Factor[dB]
11A	5180	Ant1	90.67	0.43
11A	5220	Ant1	89.33	0.49
11A	5240	Ant1	89.33	0.49
11N20	5180	Ant1	90.67	0.43
11N20	5220	Ant1	90.67	0.43
11N20	5240	Ant1	90.67	0.43
11N40	5190	Ant1	81.08	0.91
11N40	5230	Ant1	78.95	1.03
11AC20	5180	Ant1	90.14	0.45
11AC20	5220	Ant1	90.14	0.45
11AC20	5240	Ant1	90.14	0.45
11AC80	5210	Ant1	20.0	6.99
11AC40	5190	Ant1	81.58	0.88
11AC40	5230	Ant1	78.95	1.03

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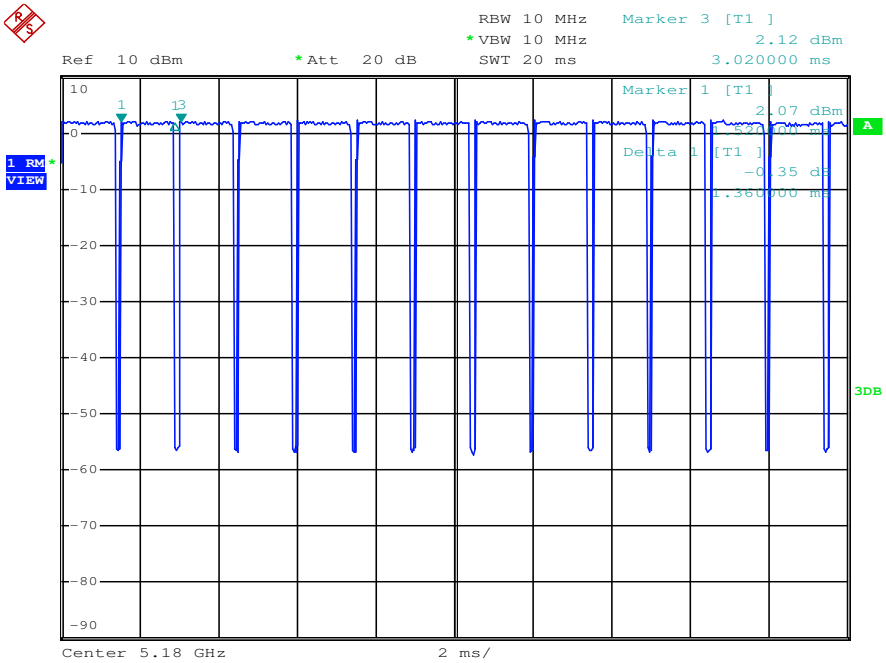
Duty Cycle_11A_5180_Ant1



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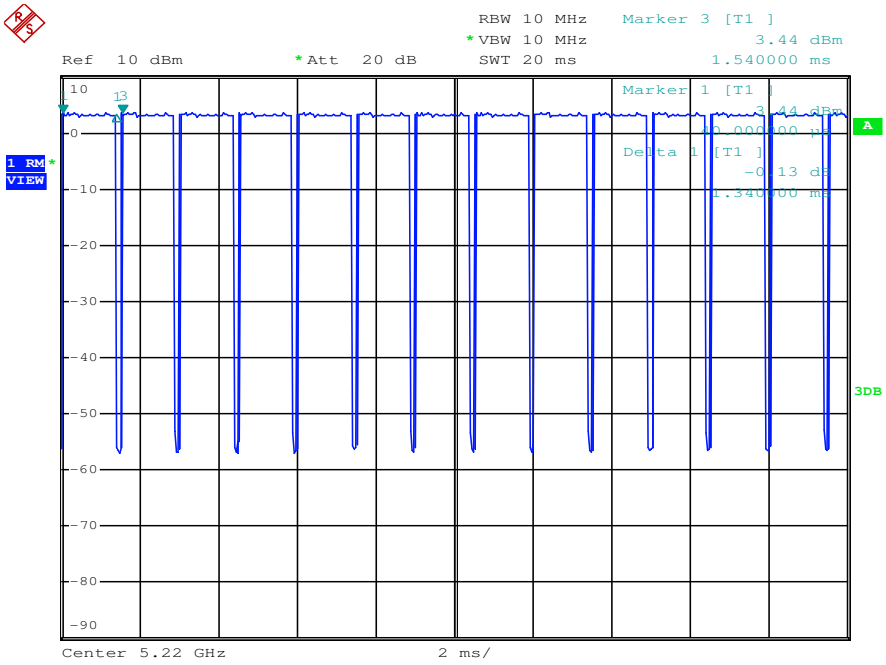
Duty Cycle_11A_5220_Ant1



Date: 14.JUN.2018 15:13:17

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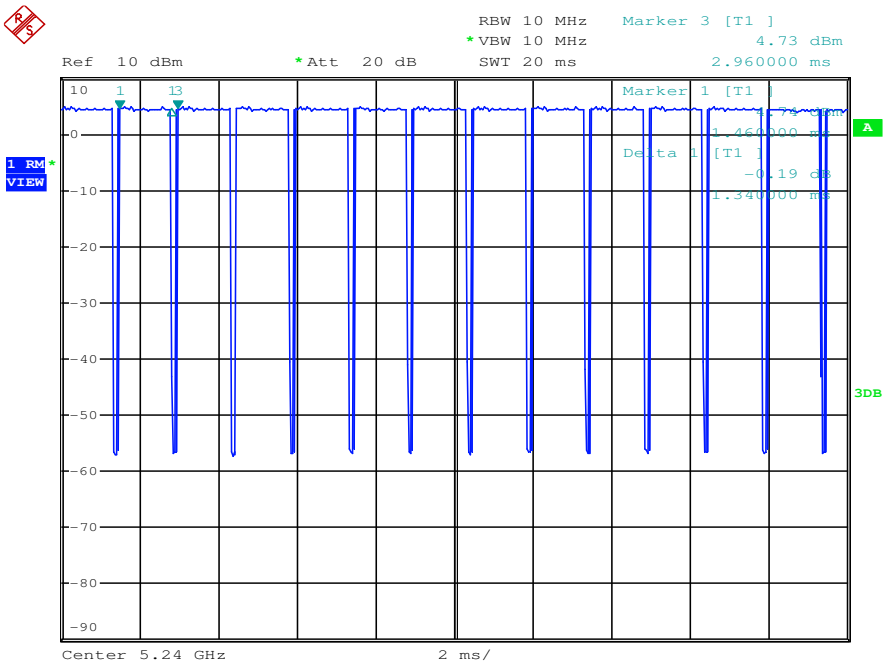
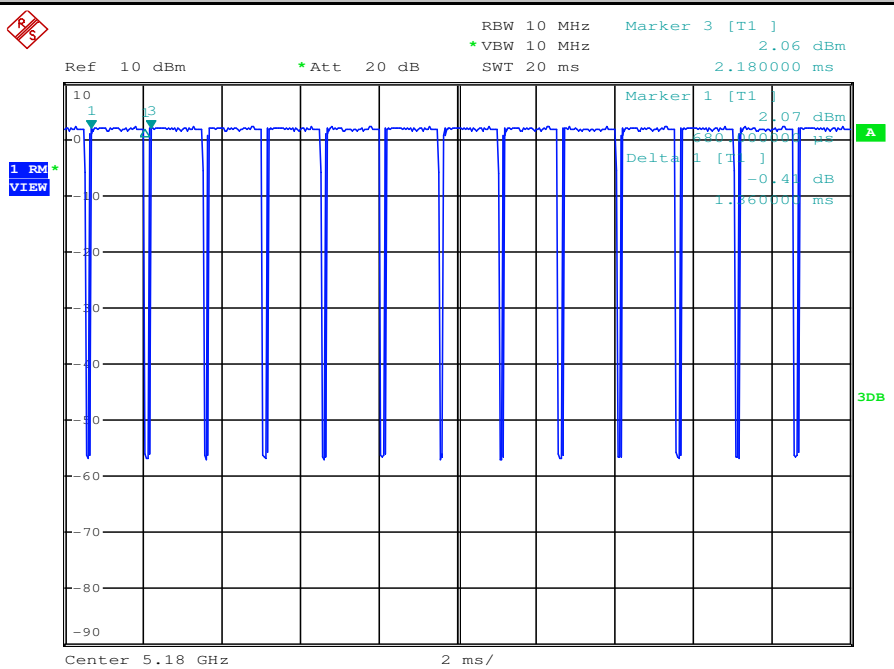
Duty Cycle_11A_5240_Ant1



Date: 14.JUN.2018 15:14:27

Duty Cycle_11N20_5180_Ant1



Date: 14.JUN.2018 15:15:40

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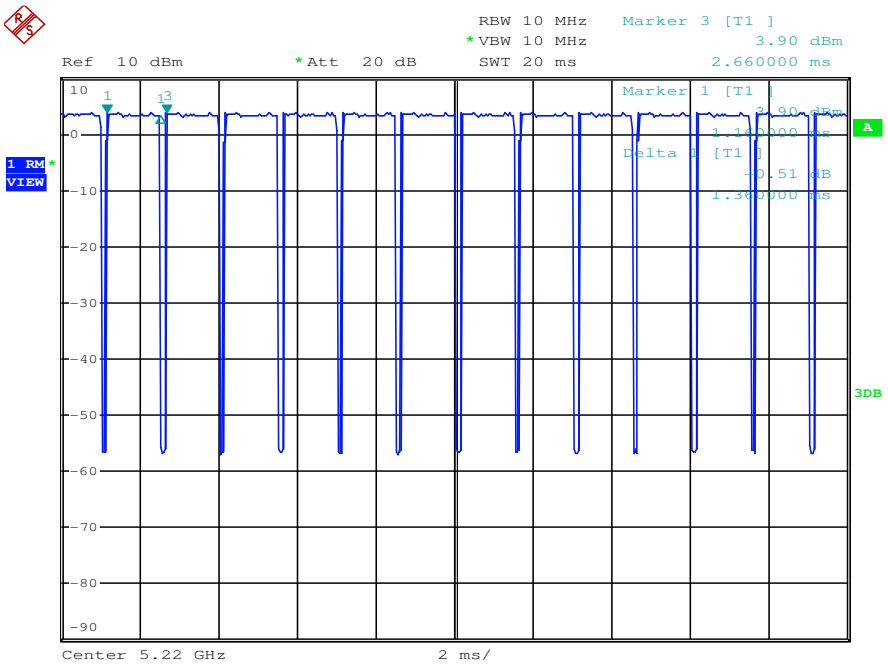
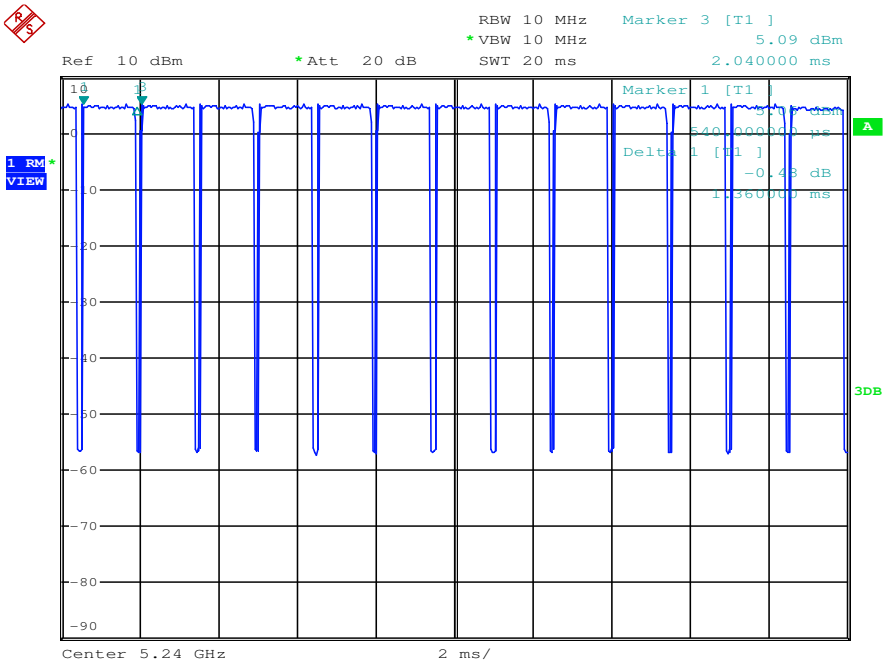
Duty Cycle_11N20_5220_Ant1



Date: 14.JUN.2018 15:16:49

Duty Cycle_11N20_5240_Ant1



Date: 14.JUN.2018 15:17:58

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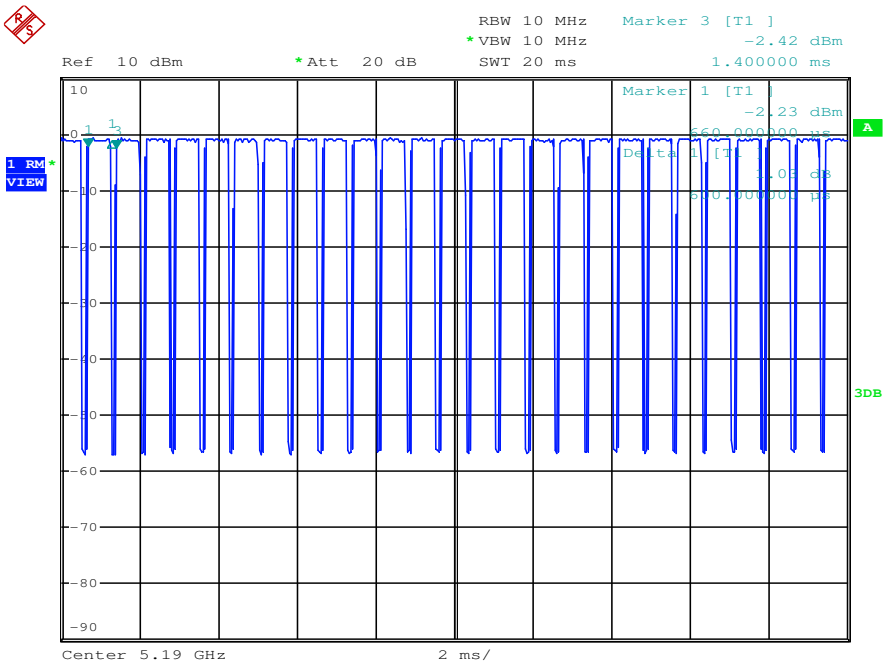
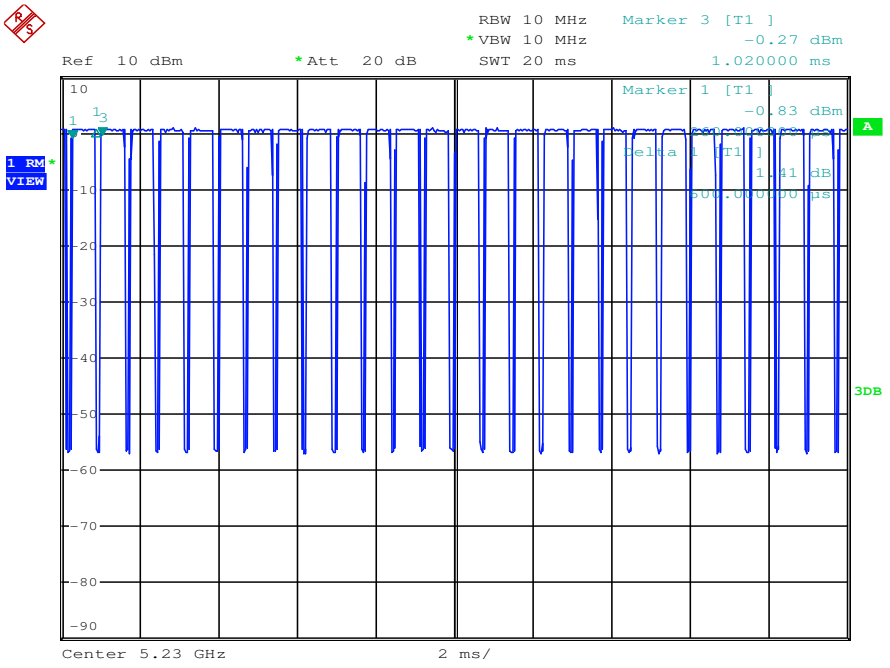
Duty Cycle_11N40_5190_Ant1



Date: 14.JUN.2018 15:19:10

Duty Cycle_11N40_5230_Ant1



Date: 14.JUN.2018 15:21:09

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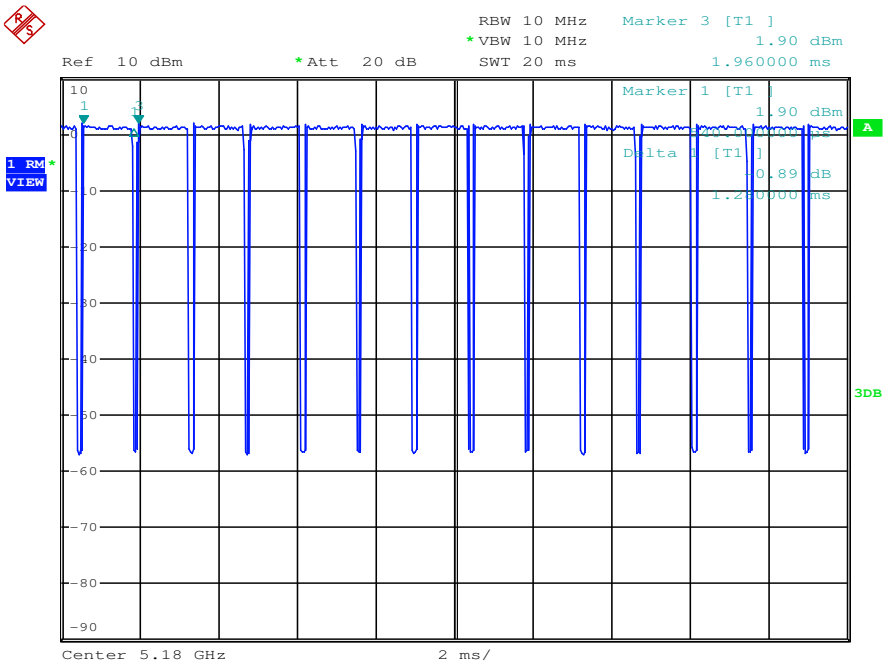
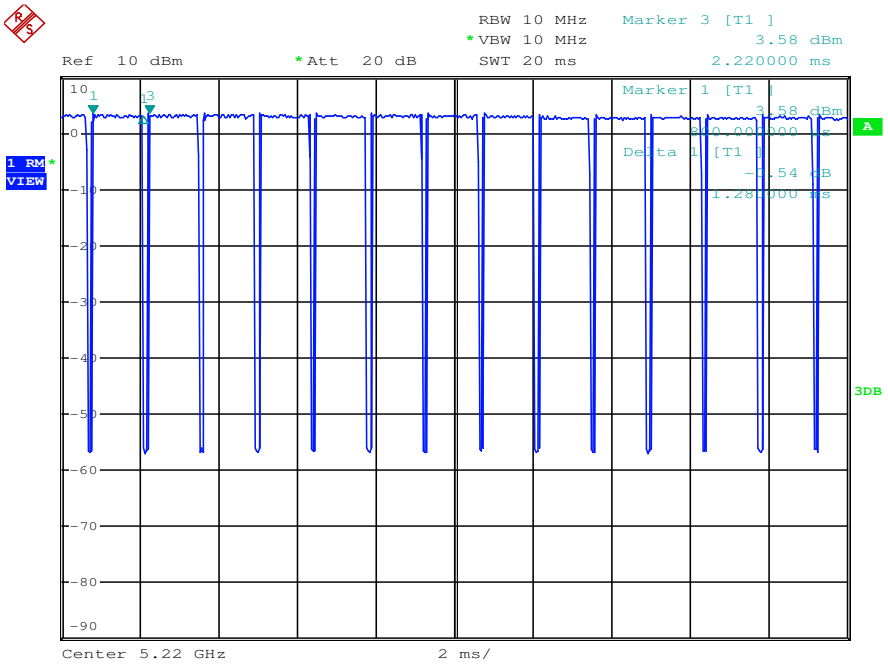
Duty Cycle_11AC20_5180_Ant1



Date: 14.JUN.2018 15:22:19

Duty Cycle_11AC20_5220_Ant1



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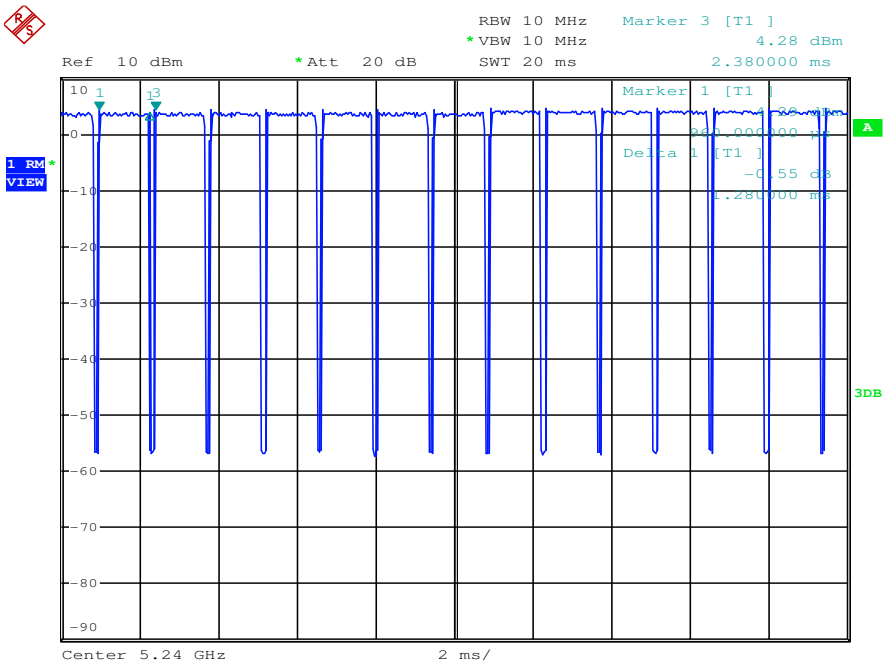
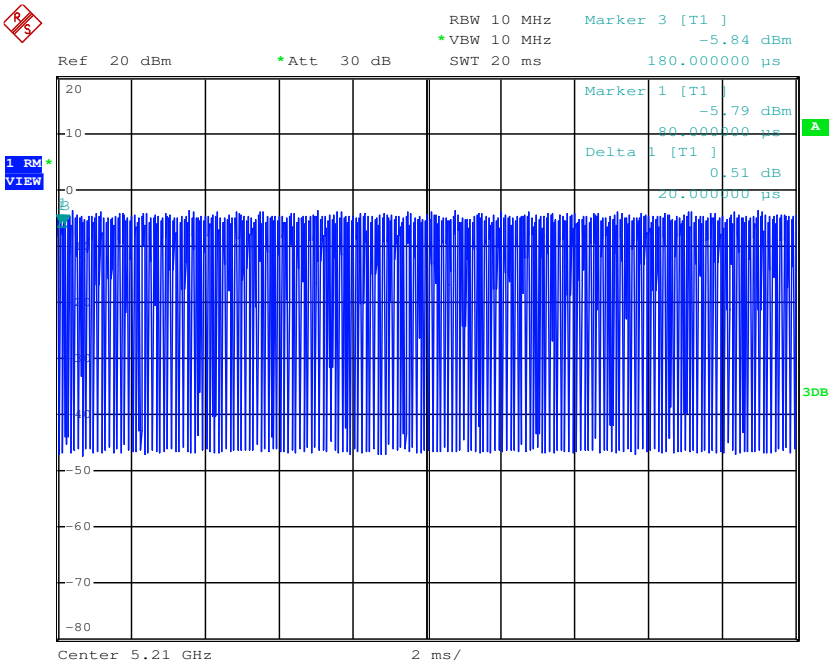
Duty Cycle_11AC20_5240_Ant1



Date: 14.JUN.2018 15:24:37

Duty Cycle_11AC80_5210_Ant1



Date: 5.JUN.2018 18:02:28

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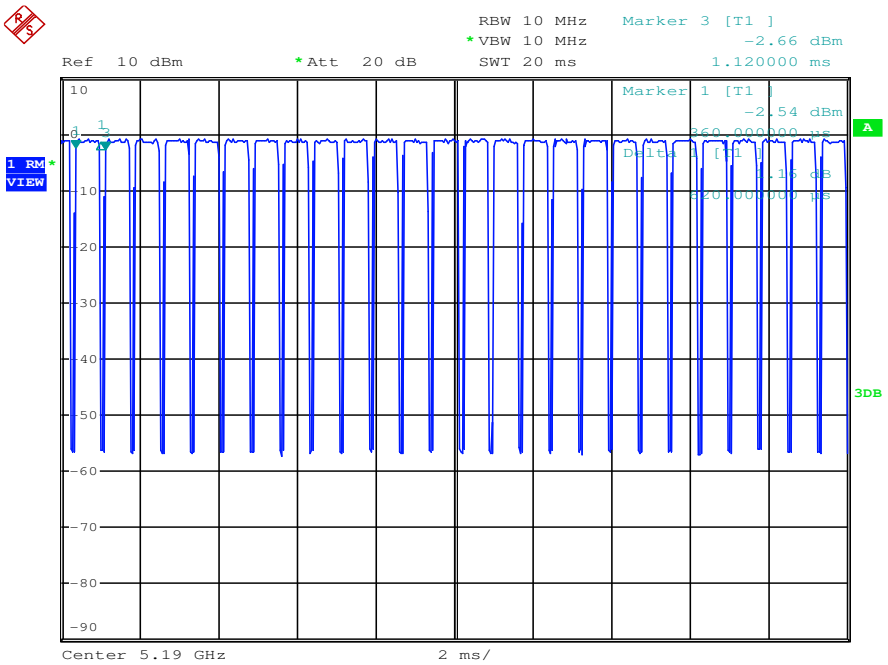
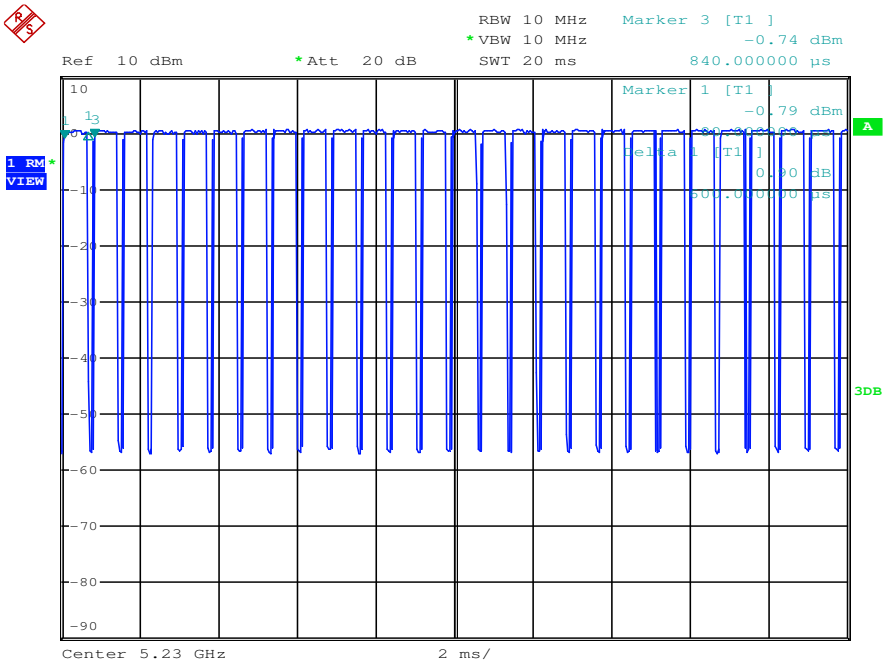
Duty Cycle_11AC40_5190_Ant1



Date: 14.JUN.2018 15:26:41

Duty Cycle_11AC40_5230_Ant1



Date: 14.JUN.2018 15:28:16

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- End of the Report -

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