



FCC RADIO TEST REPORT

Applicant : Allied Telesis K.K.
Address : 2nd. TOC Bldg. 721-11 Nishi-Gotanda, Shinagawa-ku,
Tokyo Japan, 141-0031
Equipment : 802.11ac wave2 2x2 tri-radio 2.4G/5G/5G wireless AP
Model No. : AT-TQ5403
Trade Name : Allied Telesis
FCC ID : RSL-TQ5403

I HEREBY CERTIFY THAT :

The sample was received on Jan. 18, 2018 and the testing was carried out on Feb. 11, 2018 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Mark Liao / Assistant Manager

Tested by:

Spree Yei / Engineer

Laboratory Accreditation:

Cerpass Technology Corporation Test Laboratory



**CONTENTS**

1.	Summary of Test Procedure and Test Results	5
1.1.	Applicable Standards	5
2.	Test Configuration of Equipment under Test	6
2.1.	Feature of Equipment under Test	6
2.2.	Carrier Frequency of Channels	7
2.3.	Test Mode and Test Software	8
2.4.	Description of Test System	8
2.5.	General Information of Test	9
2.6.	Measurement Uncertainty	9
3.	Test Equipment and Ancillaries Used for Tests	10
4.	Antenna Requirements	11
4.1.	Standard Applicable	11
4.2.	Antenna Construction and Directional Gain	11
5.	Test of AC Power Line Conducted Emission	12
5.1.	Test Limit	12
5.2.	Test Procedures	12
5.3.	Typical Test Setup	13
5.4.	Test Result and Data	14
5.5.	Test Photographs	18
6.	Test of Spurious Emission (Radiated)	19
6.1.	Test Limit	19
6.2.	Test Procedures	19
6.3.	Typical Test Setup	20
6.4.	Test Result and Data (9kHz ~ 30MHz)	21
6.5.	Test Result and Data (30MHz ~ 1GHz)	21
6.6.	Test Result and Data (1GHz ~ 40GHz)	29
6.7.	Restricted Bands of Operation	65
6.8.	Test Photographs (30MHz ~ 1GHz)	66
6.9.	Test Photographs (1GHz ~ 40GHz)	68
7.	On Time, Duty Cycle and Measurement methods	69
7.1.	Test Limit	69
7.2.	Test Procedure	69
7.3.	Test Setup Layout	69
7.4.	Test Result and Data	69
7.5.	Measurement Methods	69
8.	6dB Bandwidth & 99% Bandwidth	71
8.1.	Test Limit	71
8.2.	Test Procedure	71
8.3.	Test Setup Layout	71
8.4.	Test Result and Data (6dB Bandwidth)	71
8.5.	Test Result and Data (99% Bandwidth)	72
9.	26dB Bandwidth & 99% Bandwidth	81
9.1.	Test Limit	81
9.2.	Test Procedure	81



9.3.	Test Setup Layout	81
9.4.	Test Result and Data (26dB Bandwidth)	81
9.5.	Test Result and Data (99% Bandwidth)	82
10.	Average Power.....	91
10.1.	Test Limit	91
10.2.	Test Procedure	92
10.3.	Test Setup Layout	92
10.4.	Test Result and Data	93
11.	PPSD	95
11.1.	Test Limit	95
11.2.	Test Procedure	95
11.3.	Test Setup Layout	95
11.4.	Test Result and Data	96
12.	Frequency Stability.....	105
12.1.	Test Procedure	105
12.2.	Test Setup Layout	105
12.3.	Test Result and Data	106
13.	Automatically Discontinue Transmission	107
13.1.	Limit of Automatically Discontinue Transmission	107
13.2.	Test Result of Automatically Discontinue Transmission	107
14.	Radio Frequency Exposure	108
14.1.	Applicable Standards	108
14.2.	EUT Specification	108
14.3.	Test Results	108
14.4.	Calculation.....	109
14.5.	Maximum Permissible Exposure.....	110



History of this test report

Report No.	Issue Date	Description
TEFE1801057	Feb. 13, 2018	Original



1. Summary of Test Procedure and Test Results

1.1. Applicable Standards

ANSI C63.4:2014

ANSI C63.10:2013

FCC Rules and Regulations Part 15 Subpart E §15.407

First R&O 14-30

KDB662911

KDB789033

KDB644545

FCC Rule	Description of Test	Result
15.203	Antenna Requirement	Pass
15.207(a)	AC Power Line Conducted Emission	Pass
15.407(b) 15.209	Radiated Spurious Emission	Pass
15.407(a)	26 dB Occupied Bandwidth	Pass
15.407	6 dB Bandwidth	Pass
15.407 (a) & (a)(3)	Average Power	Pass
15.407(a)	Output and PPSD	Pass
15.407(g)	Frequency Stability	Pass
15.407(c)	Automatically Discontinue Transmission	Pass
2.1091	Radio Frequency Exposure	Pass



2. Test Configuration of Equipment under Test

2.1. Feature of Equipment under Test

Equipment	802.11ac wave2 2x2 tri-radio 2.4G/5G/5G wireless AP
Model No.	AT-TQ5403
Brand Name	Allied Telesis
Product Description	Please refer to User's Manual.
Connecting I/O Port(s)	Please refer to User's Manual.
AC ADAPTER	Adapter Brand: APD Model No.: WA-24Q12R I/P: AC 100-240V~, 50-60Hz, 0.7A MAX. ; O/P: DC 12V, 2.0A
PoE	48Vdc/0.67A
Memo	A1
Frequency Range	802.11b/g/n: 2400~2483.5 MHz 802.11a/n/ac: 5150~5250 MHz, 5725~5850 MHz
Modulation Type	OFDM, DSSS
Data Rate	2.4GHz: 802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS15, HT20/40, VHT20/40 5GHz: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS15, HT20/40 802.11ac: MCS0 – MCS9, VHT20/40/80
Antenna Type	PCB Antenna
Antenna Gain	2.4GHz: ANT A: 4.85 dBi ; ANT B: 4.4 dBi 5150MHz-5250MHz: ANT A: 4.18 dBi ; ANT B: 4.81 dBi 5725MHz-5850MHz: ANT A: 4.9 dBi ; ANT B: 4.18 dBi

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2.2. Carrier Frequency of Channels

Band 1: 5150MHz-5250MHz

802.11a, 802.11n HT20, 802.11ac VHT20

Channel	Frequency(MHz)	Channel	Frequency(MHz)
*36	5180	*44	5220
40	5200	*48	5240

802.11n HT40, 802.11ac VHT40

Channel	Frequency(MHz)	Channel	Frequency(MHz)
*38	5190	*46	5230

802.11ac VHT80

Channel	Frequency(MHz)
*42	5210

Band 4: 5725MHz -5850MHz

802.11a, 802.11n HT20, 802.11ac VHT20

Channel	Frequency(MHz)	Channel	Frequency(MHz)
*149	5745	161	5805
153	5765	*165	5825
*157	5785		

802.11n HT40, 802.11ac VHT40

Channel	Frequency(MHz)	Channel	Frequency(MHz)
*151	5755	*159	5795

802.11ac VHT80

Channel	Frequency(MHz)
*155	5775

Note: Channels remarked * are selected to perform test.



2.3. Test Mode and Test Software

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- b. The complete test system included remote workstation and EUT for RF test. The remote workstation included Notebook.
- An executive program, "QDART_CONN.WIN.1.0 Installer-00039.1" under WIN 7 was executed to transmit and receive data via WLAN.
- c. The following test modes were performed for the test:

Conducted Emissions from the AC mains power ports	
Test Mode	Operating Description
1	802.11a (6Mbps)
2	802.11ac VHT20 (6.5Mbps)
3	802.11ac VHT40 (13.5Mbps)
4	802.11ac VHT80 (29.3Mbps)
caused "Test Mode 1" generated the worst case, it was reported as the final data.	
Radiation Emissions (30MHz ~ 1GHz)	
Test Mode	Operating Description
1	802.11a (6Mbps), Power from Adapter
2	802.11ac VHT20 (6.5Mbps), Power from Adapter
3	802.11ac VHT40 (13.5Mbps), Power from Adapter
4	802.11ac VHT80 (29.3Mbps), Power from Adapter
5	802.11a (6Mbps), Power from PoE
6	802.11ac VHT20 (6.5Mbps), Power from PoE
7	802.11ac VHT40 (13.5Mbps), Power from PoE
8	802.11ac VHT80 (29.3Mbps), Power from PoE
caused "Test Mode 1,5" generated the worst case, they were reported as the final data.	
Radiation Emissions (1GHz ~ 40GHz)	
Test Mode	Operating Description
1	802.11a (6Mbps), Power from Adapter
2	802.11ac VHT20 (6.5Mbps), Power from Adapter
3	802.11ac VHT40 (13.5Mbps), Power from Adapter
4	802.11ac VHT80 (29.3Mbps), Power from Adapter
caused "Test Mode 1~4" generated the worst case, they were reported as the final data.	

Note: Non-Beamforming was used for the test result.

2.4. Description of Test System

Device	Manufacturer	Model No.	Description
Remote workstation			
Notebook	DELL	LatitudeE5450/5450	Power Cable, Unshielding, 1.8m



2.5. General Information of Test

Test Site	Cerpass Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582	
	FCC	TW1079, TW1061, TW1439
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-4399, R-4218 for Radiated emission test G-10812, G-10813 for radiated disturbance above 1GHz
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 40,000MHz	
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.	

2.6. Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	Line / Neutral	±2.9076 dB
Radiated Emission	9 kHz ~ 25,000 MHz	Vertical / Horizontal	±0.948 dB
Spurious Emission (Conducted)	-	-	±4.011 dB
Maximum Peak and Average Output Power	-	-	±0.322 dB
Power Spectral Density	-	-	±0.322 dB
Bandwidth	-	-	74.224Hz



3. Test Equipment and Ancillaries Used for Tests

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Receiver	R&S	ESCI3	100443	2017/03/07	2018/03/06
LISN	Schwarzbeck	NSLK 8127	8127-568	2017/02/15	2018/02/14
Pulse Limiter	R&S	ESH3-Z2	101934	2017/02/14	2018/02/13
Bilog Antenna	Schwarzbeck	VULB9168	369	2017/03/15	2018/03/14
Active Loop Antenna	EMCO	6507	40855	2017/05/15	2018/05/14
Horn Antenna	EMCO	3115	31589	2017/02/18	2018/02/17
Horn Antenna	EMCO	3116	31970	2017/03/29	2018/03/28
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200207	2017/03/17	2018/03/16
Preamplifier	EM	EM330	60660	2017/02/25	2018/02/24
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2017/09/20	2018/09/19
Preamplifier	Agilent	8449B	3008A01954	2017/02/09	2018/02/08
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2017/11/10	2018/11/09
MXG MW Analog Signal Generator	KEYSIGHT	N5183A	MY50142931	2017/03/17	2018/03/16
Spectrum Analyzer	R&S	FSP40	100219	2017/07/01	2018/06/30
BLUETOOTH TESTER	R&S	CBT	101133	2017/03/10	2018/03/09
Attenuator	KEYSIGHT	8491B	MY39250703	2017/03/07	2018/03/06
Rotary Attenuator	Agilent	8495B	MY42146680	2017/03/13	2018/03/12
Temp & Humi chamber	T-MACHINE	TMJ-9712	T-12-040111	2017/09/04	2018/09/03
Series Power Meter	Anritsu	ML2495A	1224005	2017/03/01	2018/02/28
Power Sensor	Anritsu	MA2411B	1207295	2017/03/01	2018/02/28
Cable	HUBER SUHNER	SUCOFLEX 102	28422/2	2017/02/25	2018/02/24
Cable	HUBER SUHNER	SUCOFLEX 102	28418/2	2017/02/25	2018/02/24
Software	Farad	Ez-EMC	ver.ct3a1	N/A	N/A
Software	AUDIX	E3	V8.2014-8-6	N/A	N/A
Software	Keysight	N7607B Signal Studio	v2.0.0.1	N/A	N/A
Software	Keysight	Inservice MonitorUtility	N/A	N/A	N/A



4. Antenna Requirements

4.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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.

And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2. Antenna Construction and Directional Gain

Antenna Type	PCB Antenna
Antenna Gain	2.4GHz: ANT A: 4.85 dBi ; ANT B: 4.4 dBi 5150MHz-5250MHz: ANT A: 4.18 dBi ; ANT B: 4.81 dBi 5725MHz-5850MHz: ANT A: 4.9 dBi ; ANT B: 4.18 dBi

(Non-Beamforming)

2412-2462MHz
For Power directional gain= $G_{ant} = 4.85 \text{ dBi}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 7.64 (dBi)
5150MHz -5250MHz
For Power directional gain= $G_{ant} = 4.81 \text{ dBi}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 7.51 (dBi)
5725MHz -5850MHz
For Power directional gain= $G_{ant} = 4.9 \text{ dBi}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 7.56 (dBi)

(Beamforming)

2412-2462MHz
For Power directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 7.64 \text{ dBi}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 7.64 \text{ (dBi)}$
5150MHz -5250MHz
For Power directional gain= $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 7.51 \text{ (dBi)}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 7.51 \text{ (dBi)}$
5725MHz -5850MHz
For Power directional gain= $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 7.56 \text{ (dBi)}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 7.56 \text{ (dBi)}$



5. Test of AC Power Line Conducted Emission

5.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz, according to the methods defined in ANSI C63.4-2014. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

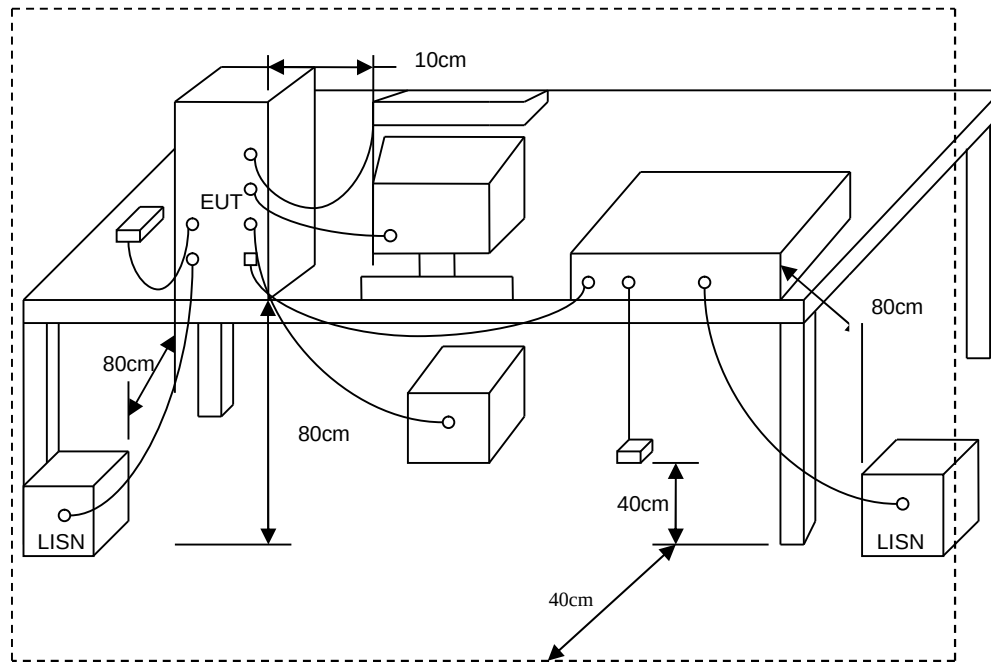
*Decreases with the logarithm of the frequency.

5.2. Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



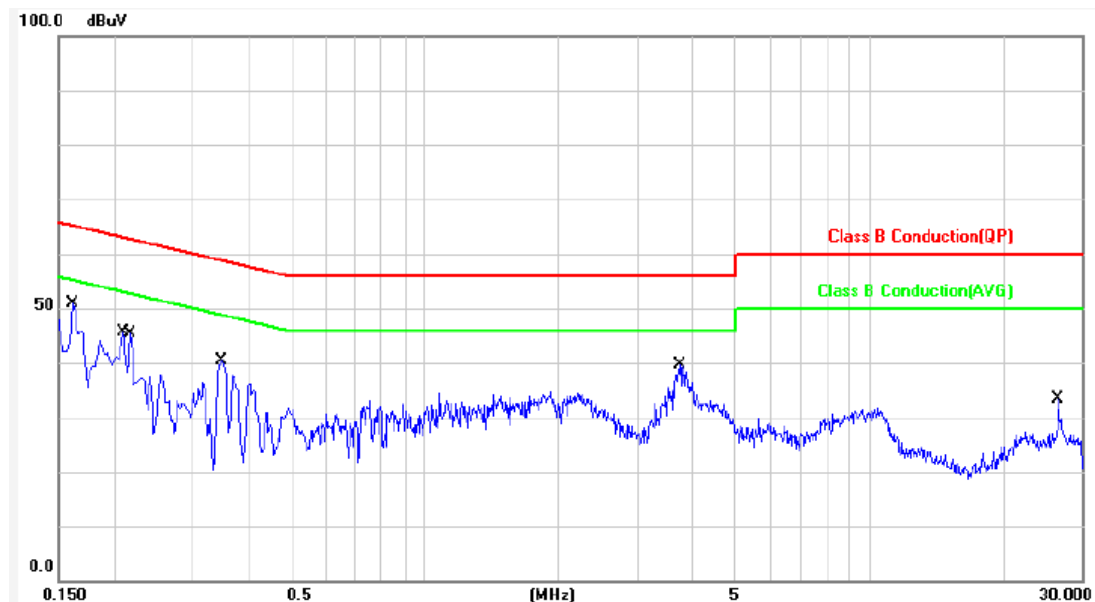
5.3. Typical Test Setup





5.4. Test Result and Data

Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: Mode 1, Band 1	Temperature	: 20 °C
Test Date	: Feb. 09, 2018	Humidity	: 40 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1620	9.91	35.76	45.67	65.36	-19.69	QP	P
2	0.1620	9.91	26.14	36.05	55.36	-19.31	AVG	P
3	0.2100	9.91	30.68	40.59	63.20	-22.61	QP	P
4	0.2100	9.91	23.32	33.23	53.20	-19.97	AVG	P
5	0.2180	9.91	30.01	39.92	62.89	-22.97	QP	P
6	0.2180	9.91	22.27	32.18	52.89	-20.71	AVG	P
7	0.3500	9.92	29.76	39.68	58.96	-19.28	QP	P
8	0.3500	9.92	26.07	35.99	48.96	-12.97	AVG	P
9	3.7580	10.08	23.19	33.27	56.00	-22.73	QP	P
10	3.7580	10.08	14.82	24.90	46.00	-21.10	AVG	P
11	26.6220	10.57	19.92	30.49	60.00	-29.51	QP	P
12	26.6220	10.57	16.28	26.85	50.00	-23.15	AVG	P

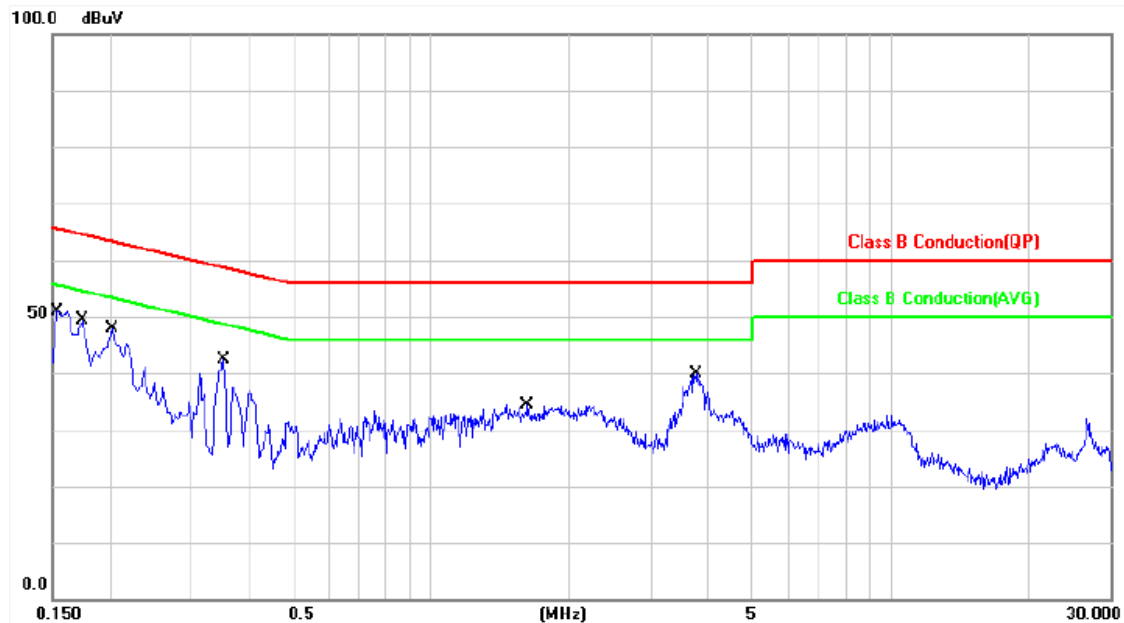
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss+ Attenuator



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode	: Mode 1, Band 1	Temperature	: 20 °C
Test Date	: Feb. 09, 2018	Humidity	: 40 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1539	9.91	37.87	47.78	65.78	-18.00	QP	P
2	0.1539	9.91	27.21	37.12	55.78	-18.66	AVG	P
3	0.1740	9.91	34.12	44.03	64.76	-20.73	QP	P
4	0.1740	9.91	23.08	32.99	54.76	-21.77	AVG	P
5	0.2020	9.91	32.45	42.36	63.52	-21.16	QP	P
6	0.2020	9.91	24.46	34.37	53.52	-19.15	AVG	P
7	0.3540	9.93	29.04	38.97	58.87	-19.90	QP	P
8	0.3540	9.93	19.87	29.80	48.87	-19.07	AVG	P
9	1.6260	10.00	20.18	30.18	56.00	-25.82	QP	P
10	1.6260	10.00	14.59	24.59	46.00	-21.41	AVG	P
11	3.7980	10.09	24.40	34.49	56.00	-21.51	QP	P
12	3.7980	10.09	15.56	25.65	46.00	-20.35	AVG	P

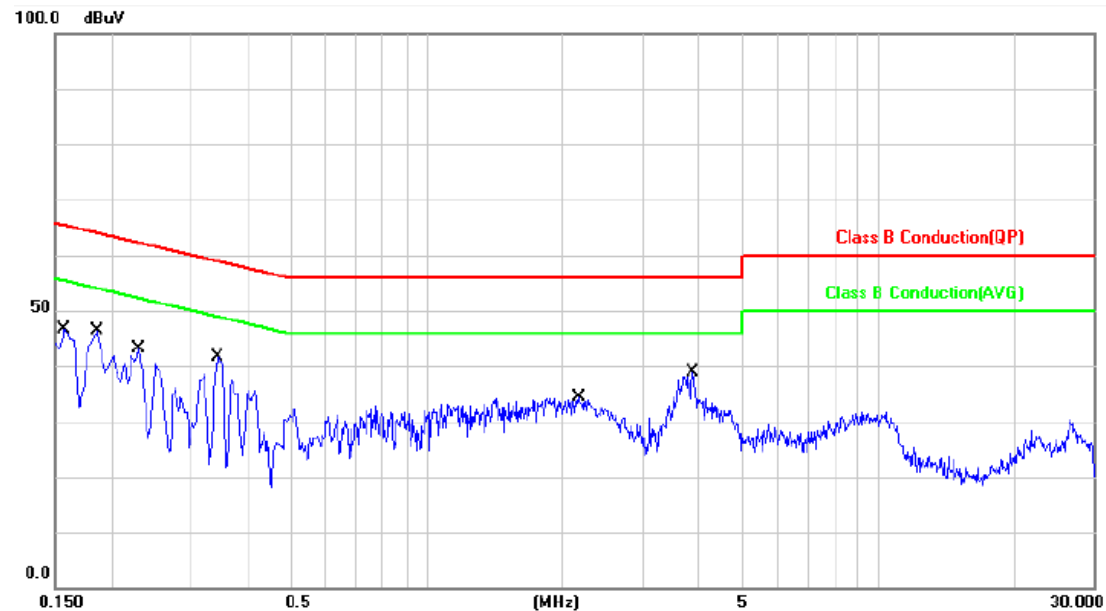
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss+ Attenuator



Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: Mode 1, Band 4	Temperature	: 20 °C
Test Date	: Feb. 09, 2018	Humidity	: 40 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1580	9.91	36.54	46.45	65.56	-19.11	QP	P
2	0.1580	9.91	26.17	36.08	55.56	-19.48	AVG	P
3	0.1860	9.91	32.03	41.94	64.21	-22.27	QP	P
4	0.1860	9.91	24.61	34.52	54.21	-19.69	AVG	P
5	0.2300	9.91	27.34	37.25	62.45	-25.20	QP	P
6	0.2300	9.91	19.04	28.95	52.45	-23.50	AVG	P
7	0.3460	9.92	30.39	40.31	59.06	-18.75	QP	P
8	0.3460	9.92	27.72	37.64	49.06	-11.42	AVG	P
9	2.1780	10.02	21.26	31.28	56.00	-24.72	QP	P
10	2.1780	10.02	14.16	24.18	46.00	-21.82	AVG	P
11	3.8940	10.08	22.79	32.87	56.00	-23.13	QP	P
12	3.8940	10.08	15.23	25.31	46.00	-20.69	AVG	P

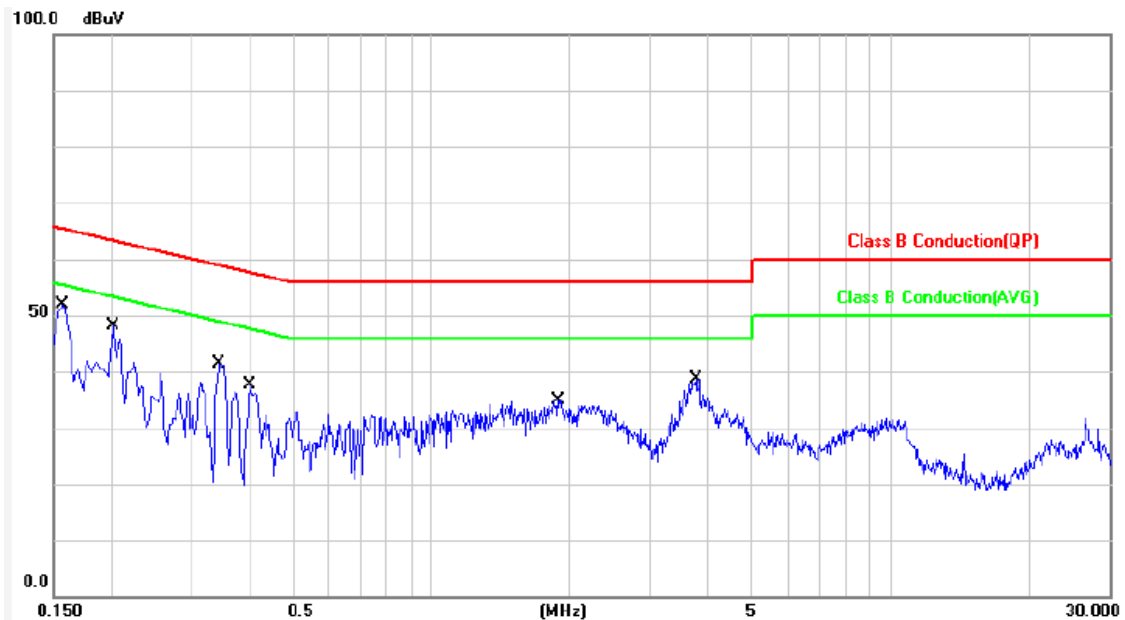
Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss+ Attenuator



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode	: Mode 1, Band 4	Temperature	: 20 °C
Test Date	: Feb. 09, 2018	Humidity	: 40 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1580	9.91	37.22	47.13	65.56	-18.43	QP	P
2	0.1580	9.91	25.97	35.88	55.56	-19.68	AVG	P
3	0.2020	9.91	30.99	40.90	63.52	-22.62	QP	P
4	0.2020	9.91	23.25	33.16	53.52	-20.36	AVG	P
5	0.3460	9.92	30.41	40.33	59.06	-18.73	QP	P
6	0.3460	9.92	27.81	37.73	49.06	-11.33	AVG	P
7	0.4020	9.93	26.00	35.93	57.81	-21.88	QP	P
8	0.4020	9.93	19.92	29.85	47.81	-17.96	AVG	P
9	1.8900	10.02	20.74	30.76	56.00	-25.24	QP	P
10	1.8900	10.02	13.71	23.73	46.00	-22.27	AVG	P
11	3.7740	10.09	24.71	34.80	56.00	-21.20	QP	P
12	3.7740	10.09	15.47	25.56	46.00	-20.44	AVG	P

Note: Level = Reading + Factor

Margin = Level – Limit

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss+ Attenuator



6. Test of Spurious Emission (Radiated)

6.1. Test Limit

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.
- (5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

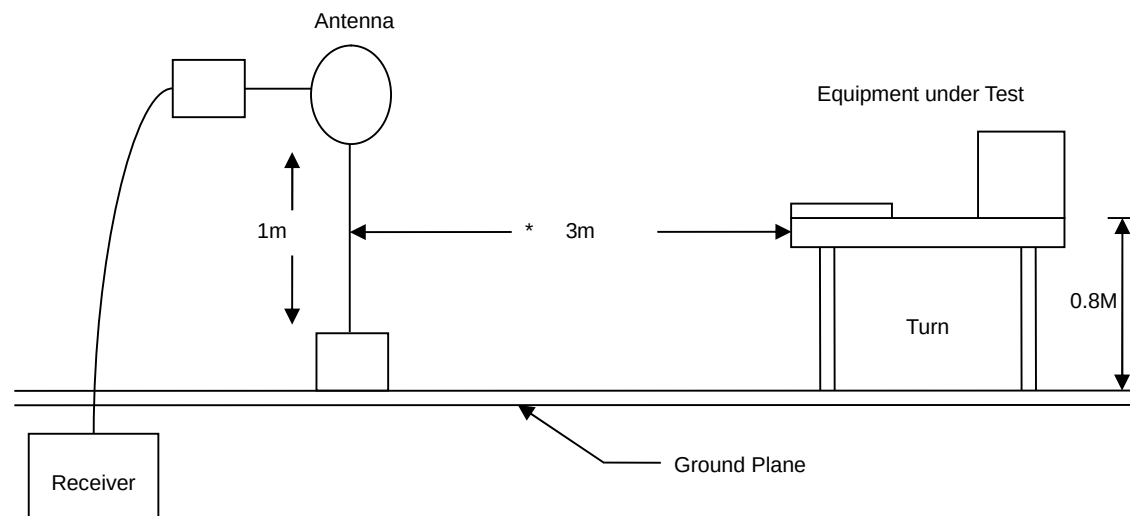
6.2. Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- i. "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

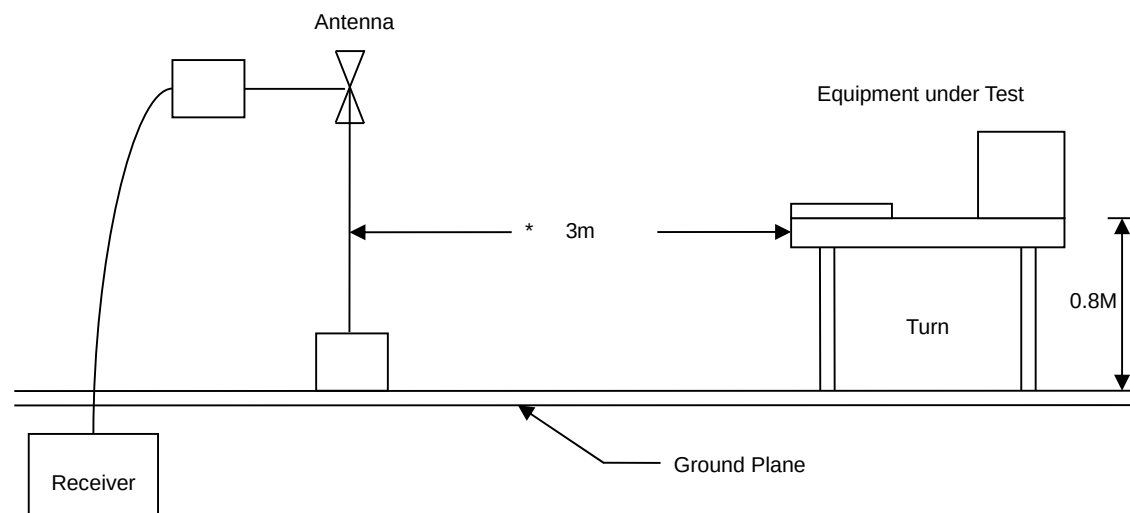


6.3. Typical Test Setup

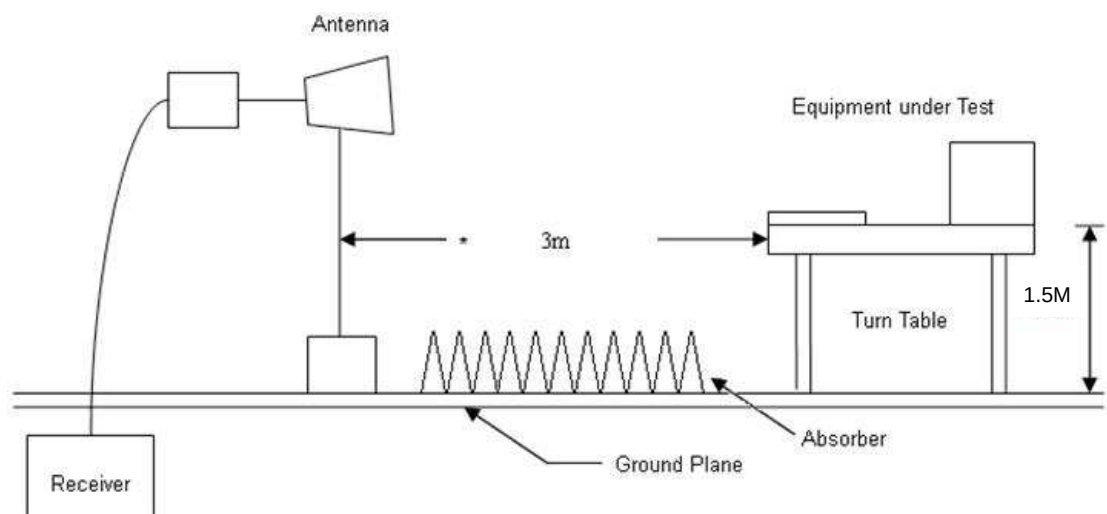
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



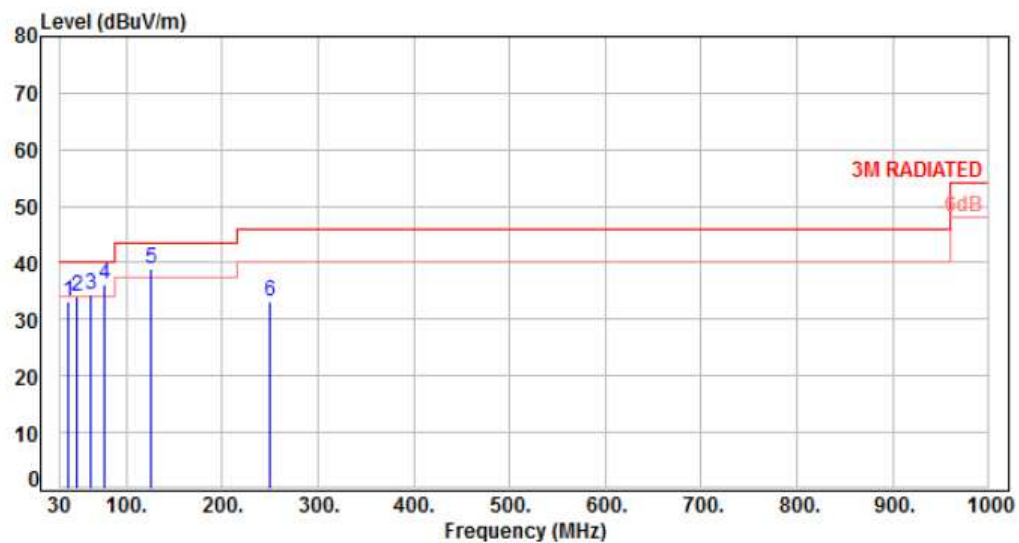


6.4. Test Result and Data (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

6.5. Test Result and Data (30MHz ~ 1GHz)

Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, Band 1	Temperature	: 24 °C
Test Date	: Feb. 11, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	39.67	-10.38	43.54	33.16	40.00	-6.84	QP	100	122	P
2	48.49	-9.76	43.88	34.12	40.00	-5.88	QP	100	214	P
3	63.49	-10.86	45.28	34.42	40.00	-5.58	QP	100	136	P
4	77.49	-13.67	49.87	36.20	40.00	-3.80	Peak	400	0	P
5	125.06	-11.93	50.78	38.85	43.50	-4.65	QP	104	99	P
6	250.20	-10.63	43.70	33.07	46.00	-12.93	Peak	400	0	P

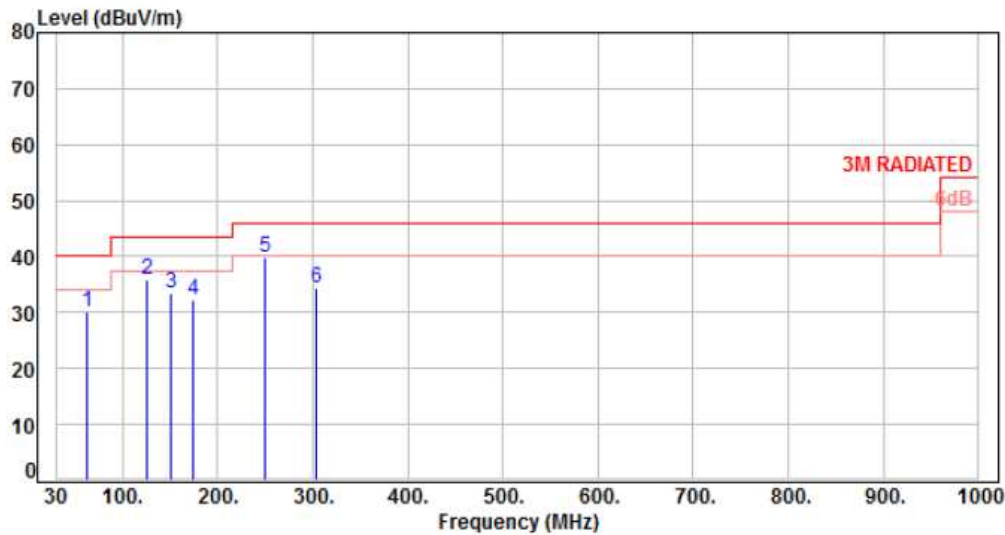
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, Band 1	Temperature	: 24 °C
Test Date	: Feb. 11, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	62.44	-10.67	40.88	30.21	40.00	-9.79	Peak	100	0	P
2	125.10	-11.93	47.68	35.75	43.50	-7.75	Peak	100	0	P
3	150.44	-10.07	43.59	33.52	43.50	-9.98	Peak	100	0	P
4	173.46	-10.45	42.82	32.37	43.50	-11.13	Peak	100	0	P
5	250.20	-10.63	50.40	39.77	46.00	-6.23	Peak	100	0	P
6	303.66	-8.71	43.12	34.41	46.00	-11.59	Peak	100	0	P

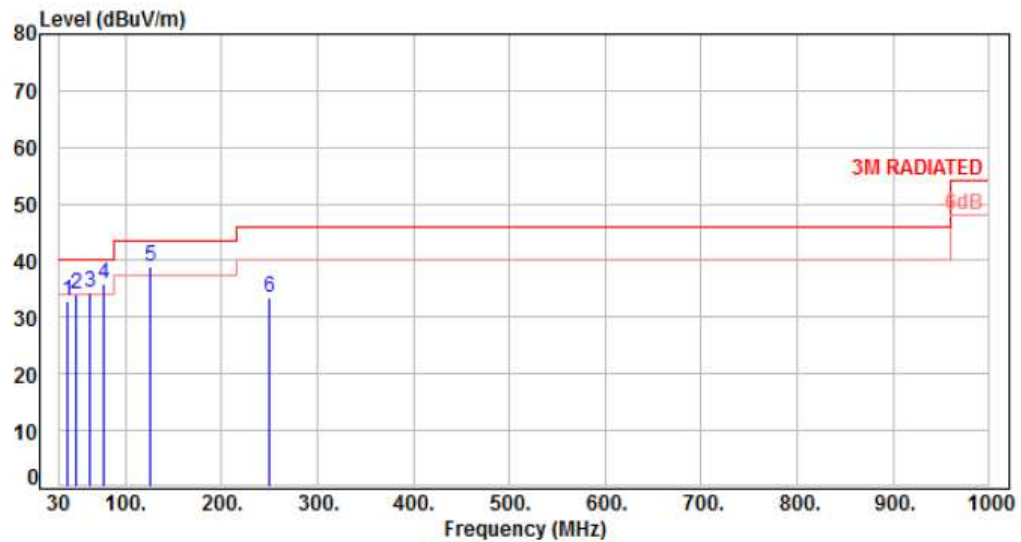
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, Band 4	Temperature	: 24 °C
Test Date	: Feb. 11, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	39.47	-10.41	43.19	32.78	40.00	-7.22	QP	103	132	P
2	48.22	-9.77	43.71	33.94	40.00	-6.06	QP	100	201	P
3	63.55	-10.87	45.33	34.46	40.00	-5.54	QP	100	128	P
4	77.82	-13.75	49.66	35.91	40.00	-4.09	Peak	400	0	P
5	125.05	-11.94	50.72	38.78	43.50	-4.72	QP	100	92	P
6	250.11	-10.63	44.03	33.40	46.00	-12.60	Peak	400	0	P

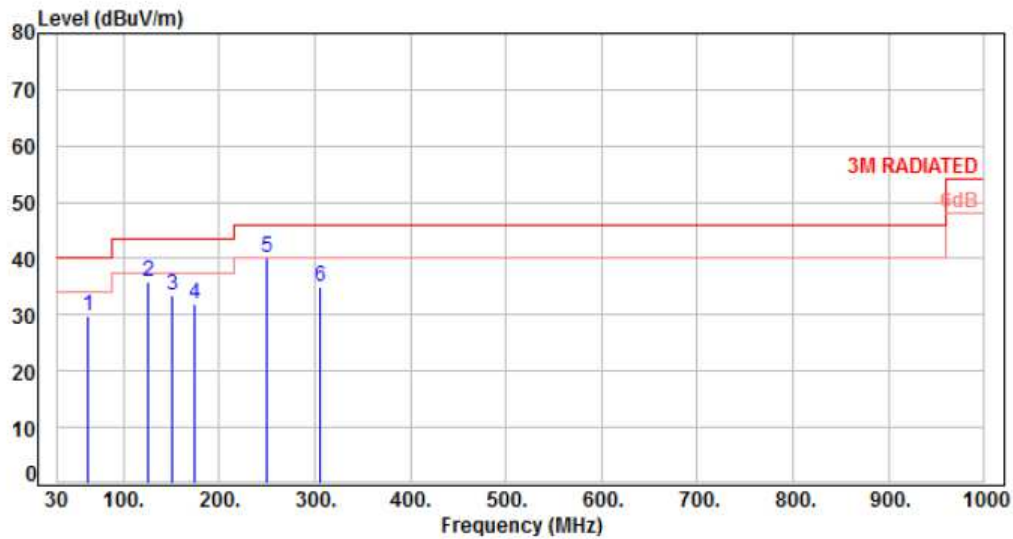
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, Band 4	Temperature	: 24 °C
Test Date	: Feb. 11, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	62.36	-10.65	40.56	29.91	40.00	-10.09	Peak	100	0	P
2	125.06	-11.93	47.84	35.91	43.50	-7.59	Peak	100	0	P
3	150.74	-10.07	43.67	33.60	43.50	-9.90	Peak	100	0	P
4	173.88	-10.49	42.36	31.87	43.50	-11.63	Peak	100	0	P
5	250.25	-10.63	50.68	40.05	46.00	-5.95	Peak	100	0	P
6	305.44	-8.65	43.50	34.85	46.00	-11.15	Peak	100	0	P

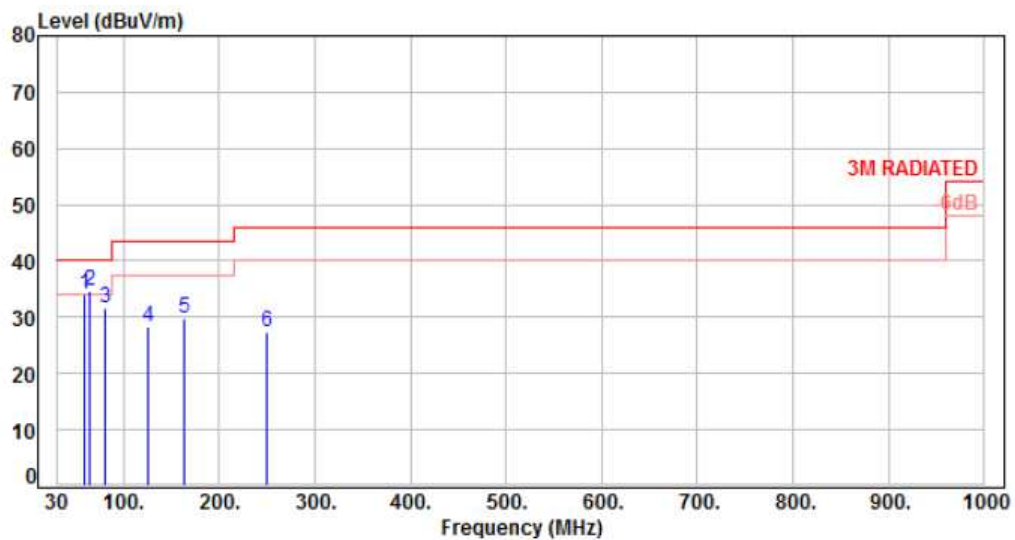
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: PoE	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, Band 1	Temperature	: 24 °C
Test Date	: Feb. 11, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	59.58	-10.22	44.15	33.93	40.00	-6.07	Peak	400	0	P
2	65.03	-11.13	45.77	34.64	40.00	-5.36	Peak	400	0	P
3	80.36	-14.30	45.85	31.55	40.00	-8.45	Peak	400	0	P
4	125.11	-11.93	40.35	28.42	43.50	-15.08	Peak	400	0	P
5	163.47	-9.92	39.66	29.74	43.50	-13.76	Peak	400	0	P
6	250.44	-10.62	37.88	27.26	46.00	-18.74	Peak	400	0	P

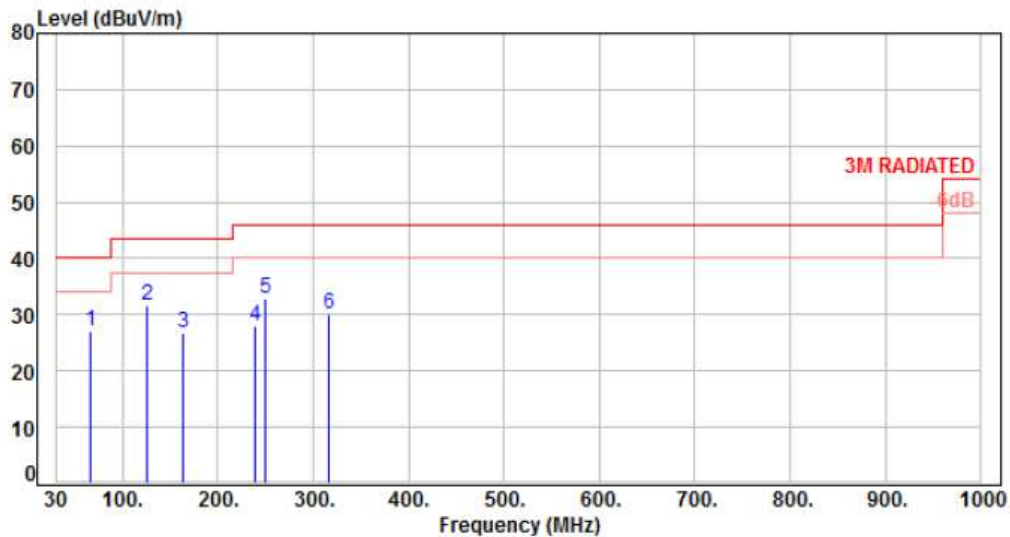
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	PoE	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 5, Band 1	Temperature	:	24 °C
Test Date	:	Feb. 11, 2018	Humidity	:	59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	65.99	-11.30	38.45	27.15	40.00	-12.85	Peak	100	0	P
2	125.05	-11.94	43.66	31.72	43.50	-11.78	Peak	100	0	P
3	163.11	-9.91	36.77	26.86	43.50	-16.64	Peak	100	0	P
4	238.65	-10.91	38.89	27.98	46.00	-18.02	Peak	100	0	P
5	250.25	-10.63	43.54	32.91	46.00	-13.09	Peak	100	0	P
6	315.66	-8.39	38.49	30.10	46.00	-15.90	Peak	100	0	P

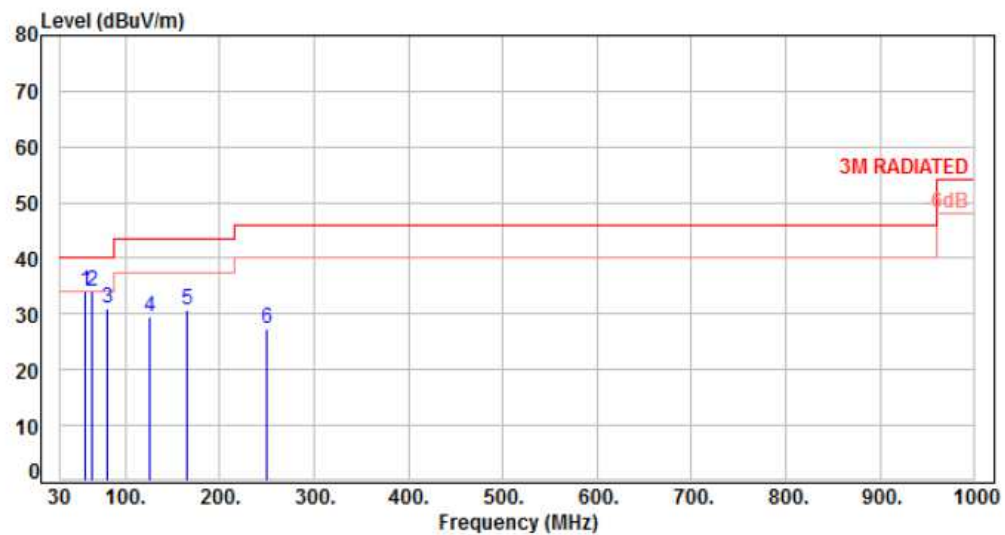
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: PoE	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, Band 4	Temperature	: 24 °C
Test Date	: Feb. 11, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	57.51	-10.11	44.06	33.95	40.00	-6.05	Peak	400	0	P
2	65.44	-11.20	45.39	34.19	40.00	-5.81	Peak	400	0	P
3	80.44	-14.31	45.46	31.15	40.00	-8.85	Peak	400	0	P
4	125.05	-11.94	41.43	29.49	43.50	-14.01	Peak	400	0	P
5	165.71	-9.98	40.63	30.65	43.50	-12.85	Peak	400	0	P
6	250.50	-10.62	37.93	27.31	46.00	-18.69	Peak	400	0	P

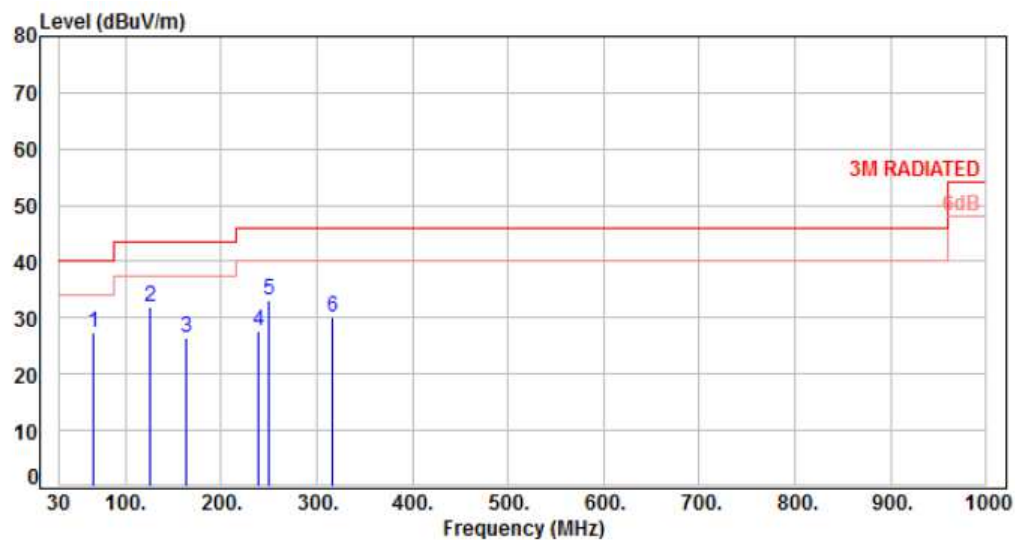
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	PoE	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 5, Band 4	Temperature	:	24 °C
Test Date	:	Feb. 11, 2018	Humidity	:	59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	66.43	-11.37	38.61	27.24	40.00	-12.76	Peak	100	0	P
2	125.00	-11.96	43.82	31.86	43.50	-11.64	Peak	100	0	P
3	163.44	-9.92	36.49	26.57	43.50	-16.93	Peak	100	0	P
4	238.43	-10.93	38.56	27.63	46.00	-18.37	Peak	100	0	P
5	250.53	-10.62	43.65	33.03	46.00	-12.97	Peak	100	0	P
6	316.71	-8.36	38.55	30.19	46.00	-15.81	Peak	100	0	P

Note: Level=Reading+Factor

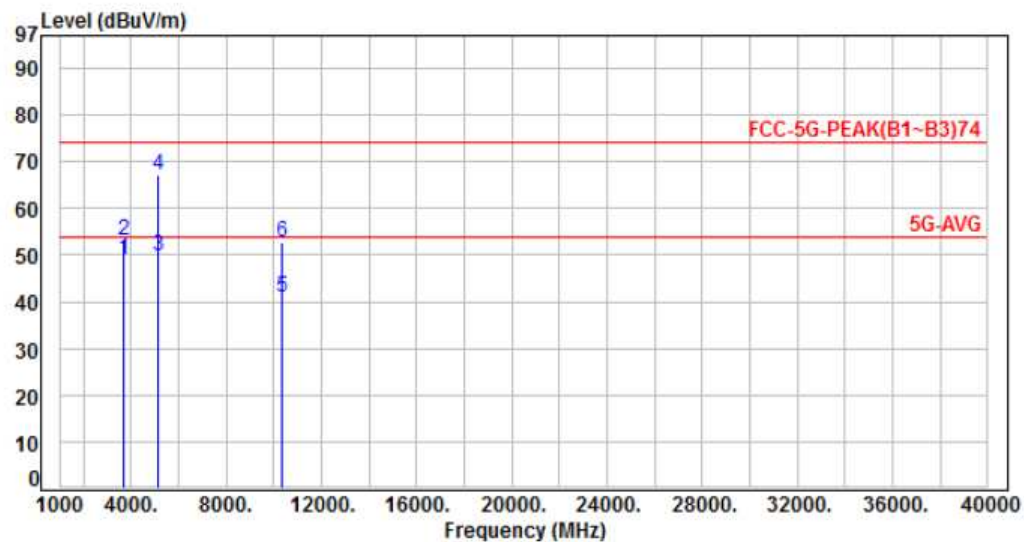
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



6.6. Test Result and Data (1GHz ~ 40GHz)

Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH36, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.00	-9.40	58.48	49.08	54.00	-4.92	Average	128	163	P
2	3666.00	-9.40	62.48	53.08	74.00	-20.92	Peak	128	163	P
3	5150.00	-5.71	55.60	49.89	54.00	-4.11	Average	348	0	P
4	5150.00	-5.71	72.90	67.19	74.00	-6.81	Peak	348	0	P
5	10360.00	2.54	38.50	41.04	54.00	-12.96	Average	183	184	P
6	10360.00	2.54	50.20	52.74	74.00	-21.26	Peak	183	184	P

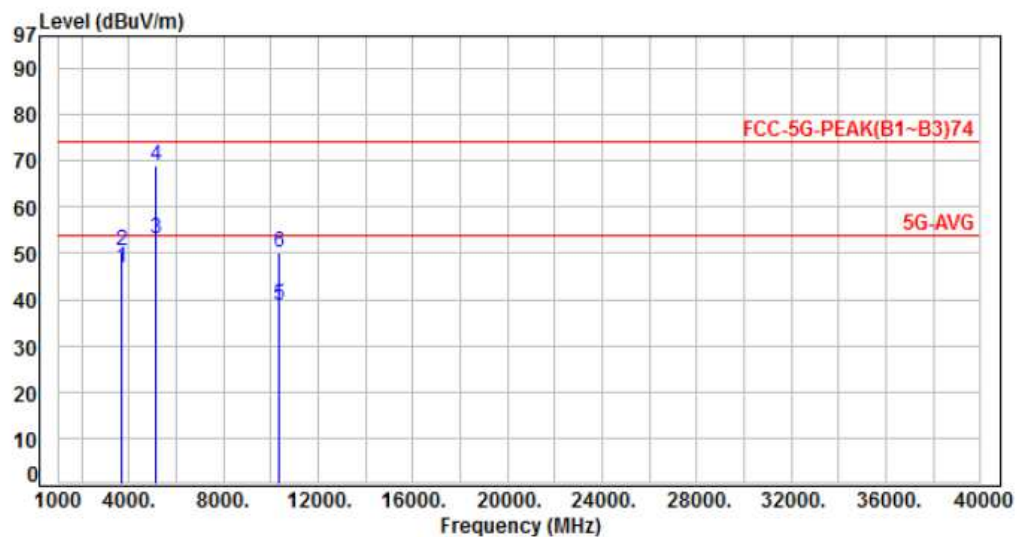
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH36, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.00	-9.40	56.23	46.83	54.00	-7.17	Average	152	148	P
2	3666.00	-9.40	59.89	50.49	74.00	-23.51	Peak	152	148	P
3	5150.00	-5.71	58.70	52.99	54.00	-1.01	Average	100	292	P
4	5150.00	-5.71	74.80	69.09	74.00	-4.91	Peak	100	292	P
5	10360.00	2.54	36.20	38.74	54.00	-15.26	Average	305	272	P
6	10360.00	2.54	47.50	50.04	74.00	-23.96	Peak	305	272	P

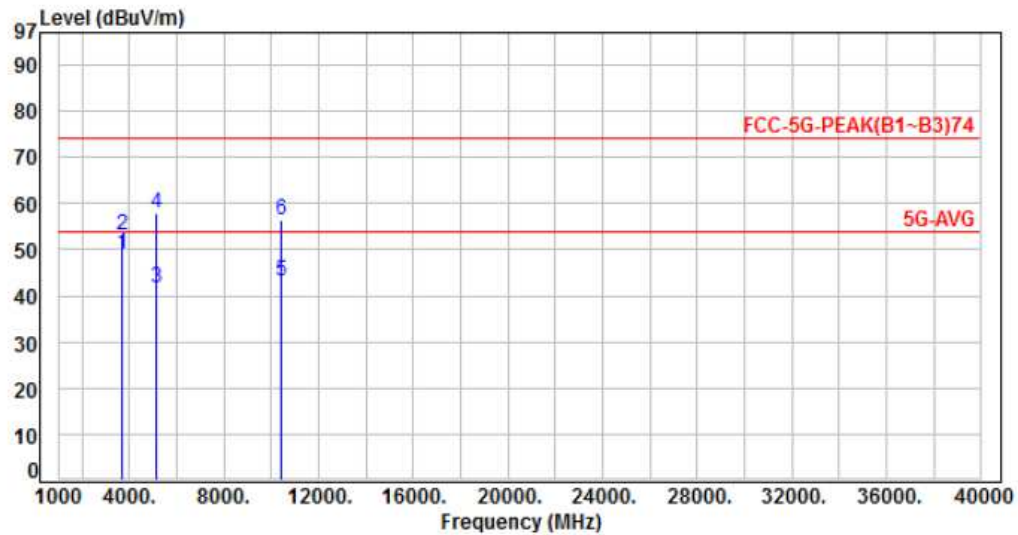
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH44, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.35	-9.39	58.46	49.07	54.00	-4.93	Average	133	152	P
2	3666.35	-9.39	62.43	53.04	74.00	-20.96	Peak	133	152	P
3	5150.00	-5.71	47.36	41.65	54.00	-12.35	Average	314	50	P
4	5150.00	-5.71	63.48	57.77	74.00	-16.23	Peak	314	50	P
5	10440.00	2.63	40.48	43.11	54.00	-10.89	Average	224	259	P
6	10440.00	2.63	53.63	56.26	74.00	-17.74	Peak	224	259	P

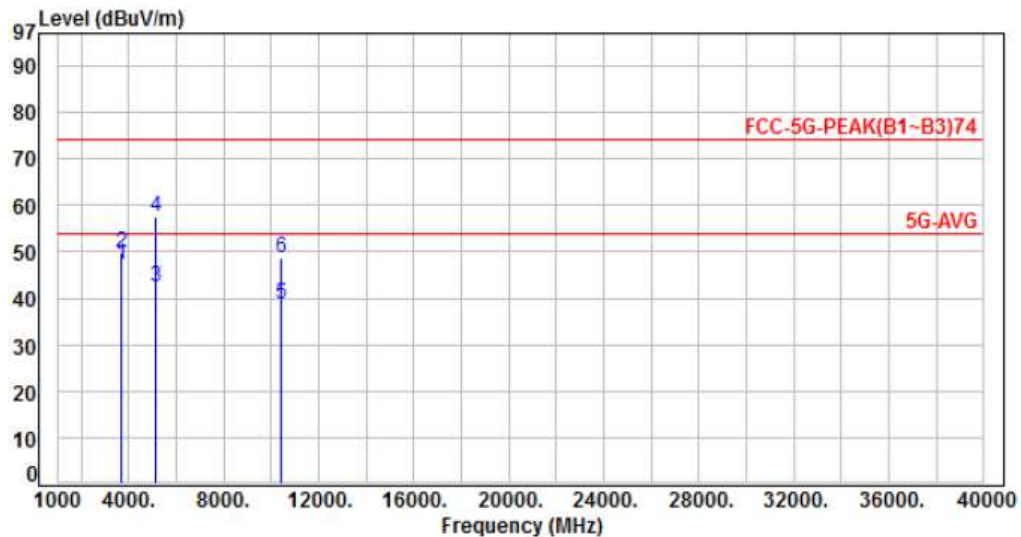
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH44, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.35	-9.39	56.47	47.08	54.00	-6.92	Average	163	178	P
2	3666.35	-9.39	59.22	49.83	74.00	-24.17	Peak	163	178	P
3	5150.00	-5.71	48.10	42.39	54.00	-11.61	Average	359	300	P
4	5150.00	-5.71	63.10	57.39	74.00	-16.61	Peak	359	300	P
5	10440.00	2.63	36.00	38.63	54.00	-15.37	Average	167	232	P
6	10440.00	2.63	46.10	48.73	74.00	-25.27	Peak	167	232	P

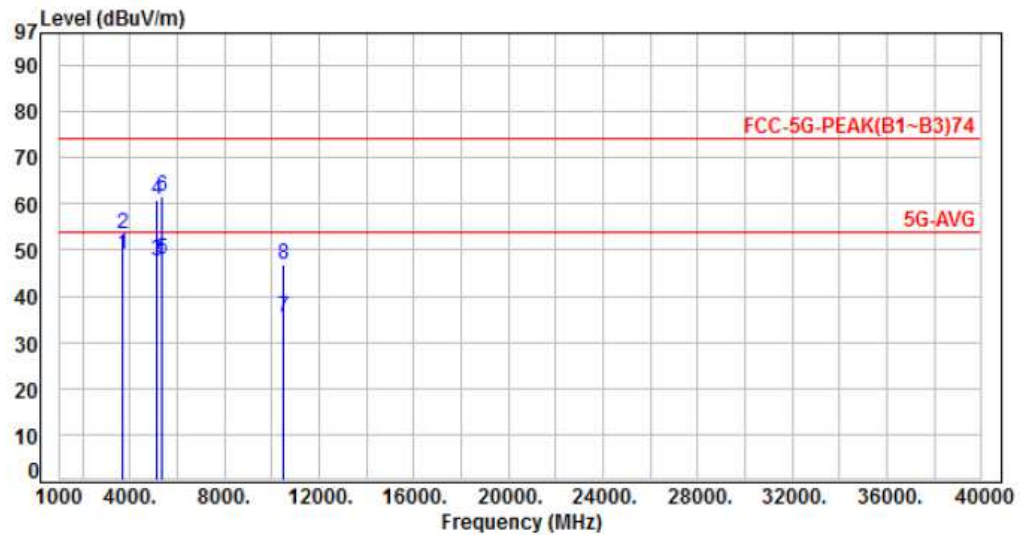
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH48, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.00	-9.40	58.56	49.16	54.00	-4.84	Average	142	166	P
2	3666.00	-9.40	62.75	53.35	74.00	-20.65	Peak	142	166	P
3	5150.00	-5.71	53.26	47.55	54.00	-6.45	Average	347	55	P
4	5150.00	-5.71	66.48	60.77	74.00	-13.23	Peak	347	55	P
5	5350.00	-5.33	53.45	48.12	54.00	-5.88	Average	347	55	P
6	5350.00	-5.33	66.90	61.57	74.00	-12.43	Peak	347	55	P
7	10480.00	2.67	32.88	35.55	54.00	-18.45	Average	210	348	P
8	10480.00	2.67	44.25	46.92	74.00	-27.08	Peak	210	348	P

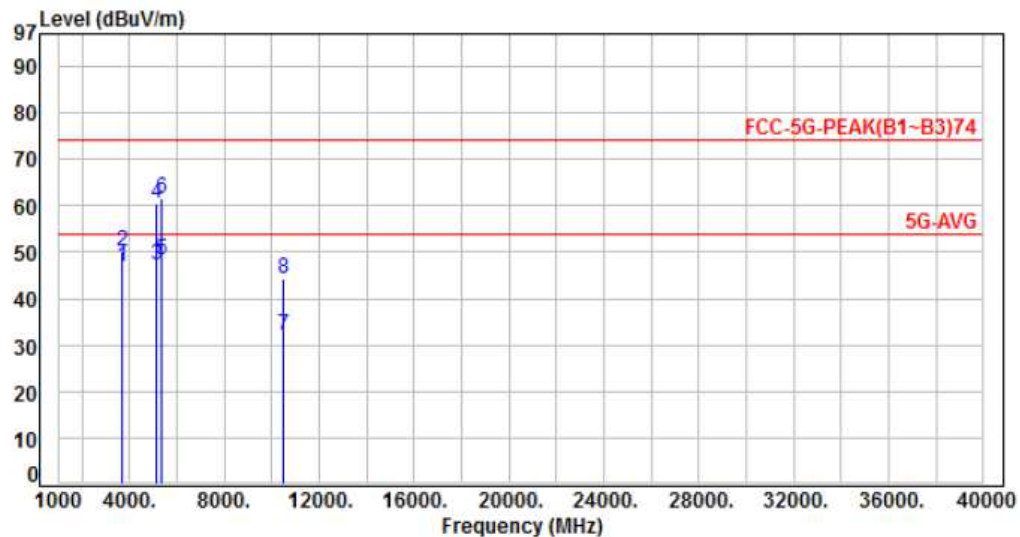
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH48, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.00	-9.40	56.26	46.86	54.00	-7.14	Average	148	185	P
2	3666.00	-9.40	59.62	50.22	74.00	-23.78	Peak	148	185	P
3	5150.00	-5.71	53.10	47.39	54.00	-6.61	Average	359	300	P
4	5150.00	-5.71	66.10	60.39	74.00	-13.61	Peak	359	300	P
5	5350.00	-5.33	53.60	48.27	54.00	-5.73	Average	359	300	P
6	5350.00	-5.33	66.90	61.57	74.00	-12.43	Peak	359	300	P
7	10480.00	2.67	29.33	32.00	54.00	-22.00	Average	122	357	P
8	10480.00	2.67	41.48	44.15	74.00	-29.85	Peak	122	357	P

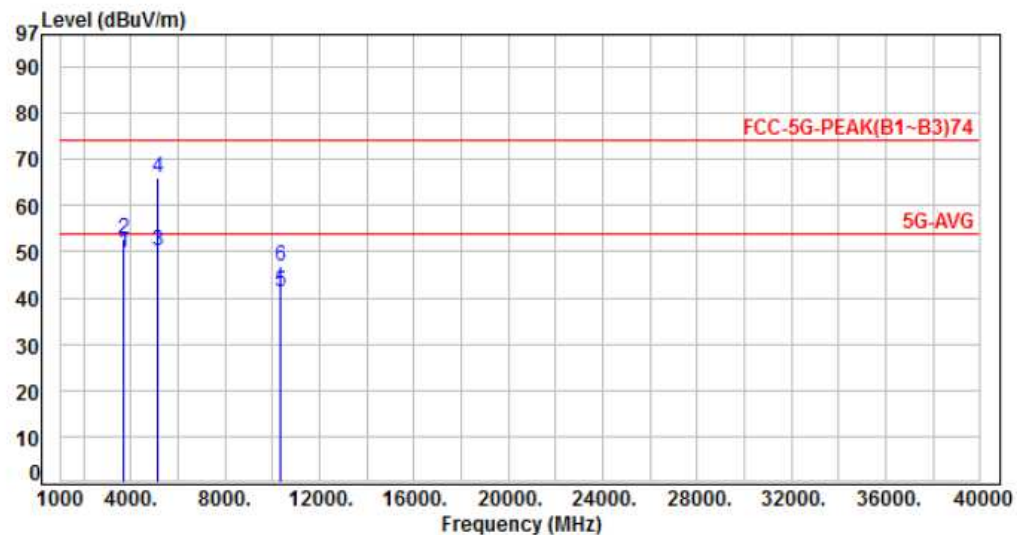
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH36, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.10	-9.39	59.15	49.76	54.00	-4.24	Average	150	147	P
2	3666.10	-9.39	62.11	52.72	74.00	-21.28	Peak	150	147	P
3	5150.00	-5.71	55.77	50.06	54.00	-3.94	Average	247	158	P
4	5150.00	-5.71	71.88	66.17	74.00	-7.83	Peak	247	158	P
5	10360.00	2.54	38.66	41.20	54.00	-12.80	Average	122	47	P
6	10360.00	2.54	44.15	46.69	74.00	-27.31	Peak	122	47	P

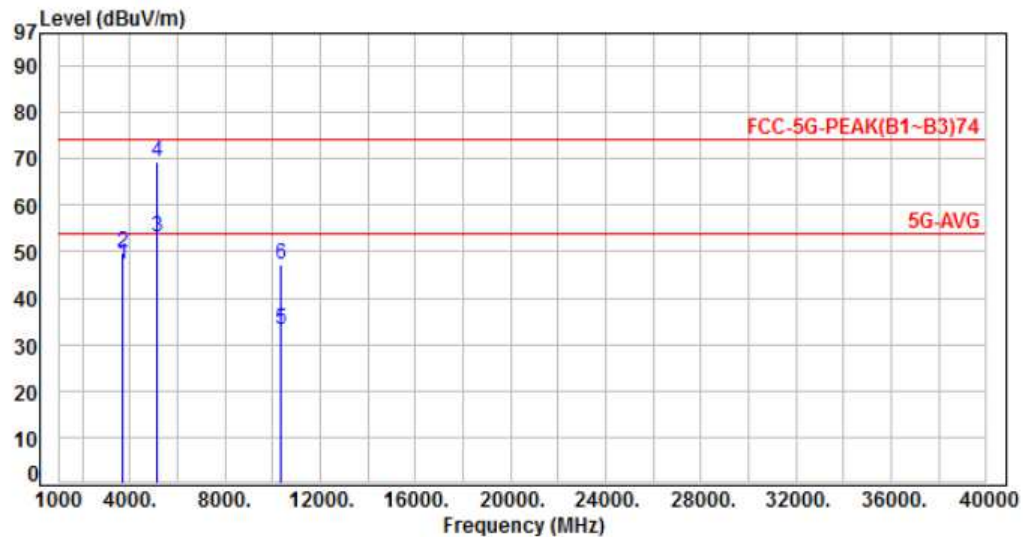
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH36, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.10	-9.39	56.44	47.05	54.00	-6.95	Average	156	185	P
2	3666.10	-9.39	59.34	49.95	74.00	-24.05	Peak	156	185	P
3	5150.00	-5.71	58.68	52.97	54.00	-1.03	Average	120	307	P
4	5150.00	-5.71	75.10	69.39	74.00	-4.61	Peak	120	307	P
5	10360.00	2.54	30.50	33.04	54.00	-20.96	Average	136	84	P
6	10360.00	2.54	44.50	47.04	74.00	-26.96	Peak	136	84	P

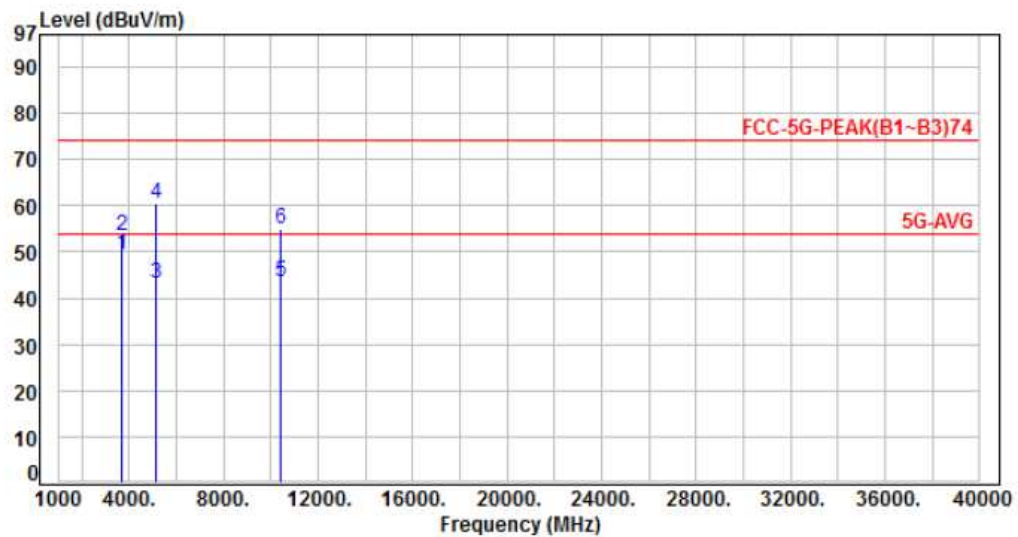
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH44, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.00	-9.40	58.78	49.38	54.00	-4.62	Average	136	187	P
2	3666.00	-9.40	62.78	53.38	74.00	-20.62	Peak	136	187	P
3	5150.00	-5.71	48.82	43.11	54.00	-10.89	Average	359	11	P
4	5150.00	-5.71	66.11	60.40	74.00	-13.60	Peak	359	11	P
5	10440.00	2.63	40.73	43.36	54.00	-10.64	Average	200	5	P
6	10440.00	2.63	52.44	55.07	74.00	-18.93	Peak	200	5	P

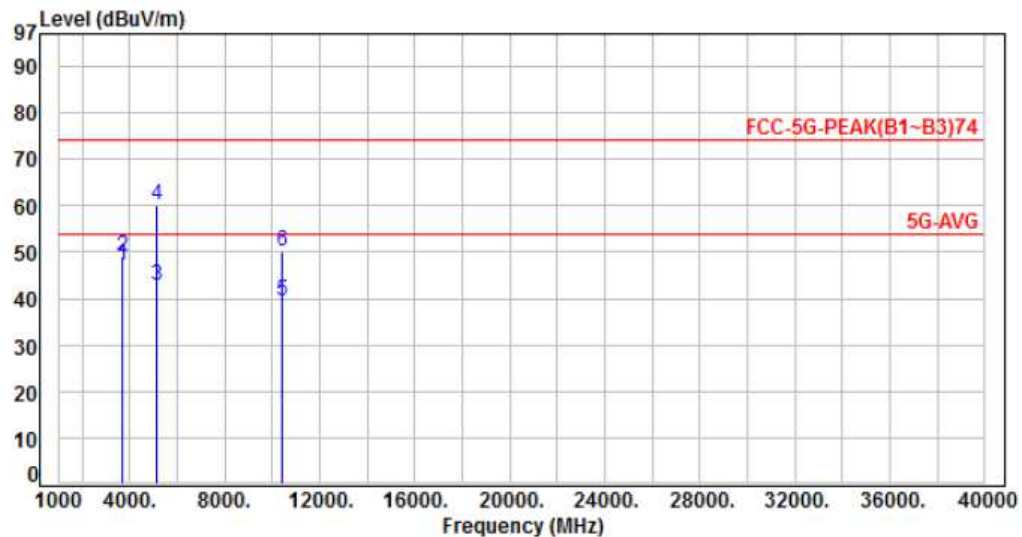
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH44, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.00	-9.40	56.59	47.19	54.00	-6.81	Average	144	158	P
2	3666.00	-9.40	58.48	49.08	74.00	-24.92	Peak	144	158	P
3	5150.00	-5.71	48.54	42.83	54.00	-11.17	Average	360	297	P
4	5150.00	-5.71	65.90	60.19	74.00	-13.81	Peak	360	297	P
5	10440.00	2.63	36.90	39.53	54.00	-14.47	Average	250	80	P
6	10440.00	2.63	47.60	50.23	74.00	-23.77	Peak	250	80	P

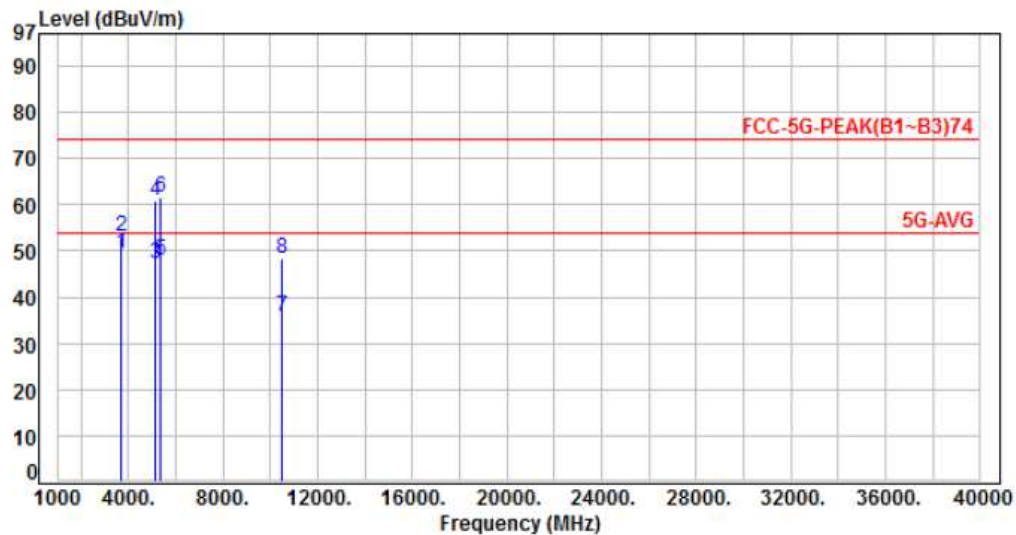
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH48, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.00	-9.40	58.78	49.38	54.00	-4.62	Average	135	182	P
2	3666.00	-9.40	62.48	53.08	74.00	-20.92	Peak	135	182	P
3	5150.00	-5.71	53.05	47.34	54.00	-6.66	Average	352	47	P
4	5150.00	-5.71	66.62	60.91	74.00	-13.09	Peak	352	47	P
5	5350.00	-5.33	53.16	47.83	54.00	-6.17	Average	352	47	P
6	5350.00	-5.33	66.77	61.44	74.00	-12.56	Peak	352	47	P
7	10480.00	2.67	33.25	35.92	54.00	-18.08	Average	221	285	P
8	10480.00	2.67	45.78	48.45	74.00	-25.55	Peak	221	285	P

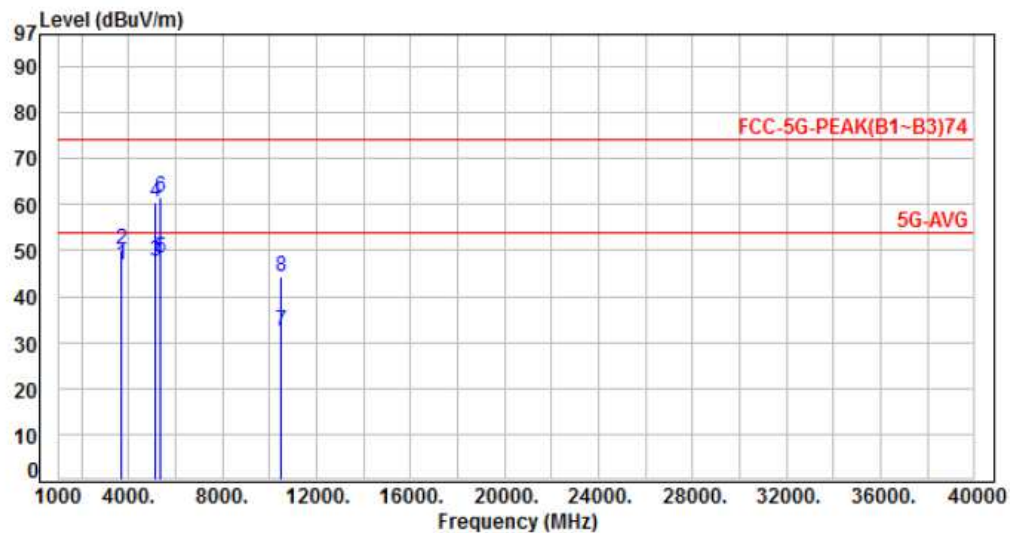
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH48, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.00	-9.40	56.26	46.86	54.00	-7.14	Average	148	185	P
2	3666.00	-9.40	59.62	50.22	74.00	-23.78	Peak	148	185	P
3	5150.00	-5.71	53.36	47.65	54.00	-6.35	Average	347	285	P
4	5150.00	-5.71	66.25	60.54	74.00	-13.46	Peak	347	285	P
5	5350.00	-5.33	53.78	48.45	54.00	-5.55	Average	347	285	P
6	5350.00	-5.33	67.10	61.77	74.00	-12.23	Peak	347	285	P
7	10480.00	2.67	29.93	32.60	54.00	-21.40	Average	143	347	P
8	10480.00	2.67	41.77	44.44	74.00	-29.56	Peak	143	347	P

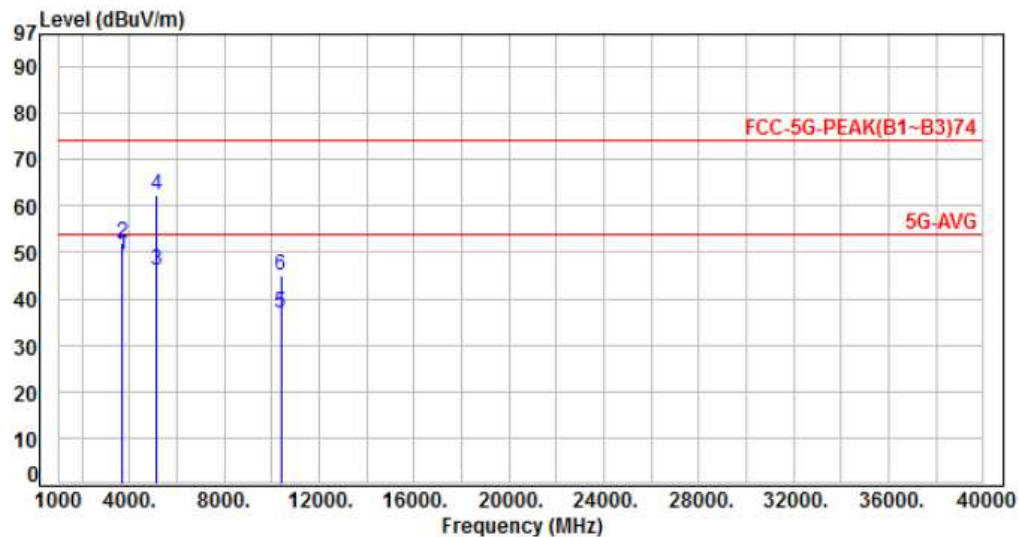
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH38, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.35	-9.39	58.64	49.25	54.00	-4.75	Average	133	158	P
2	3666.35	-9.39	61.52	52.13	74.00	-21.87	Peak	133	158	P
3	5150.00	-5.71	51.64	45.93	54.00	-8.07	Average	300	47	P
4	5150.00	-5.71	68.22	62.51	74.00	-11.49	Peak	300	47	P
5	10380.00	2.57	34.25	36.82	54.00	-17.18	Average	100	45	P
6	10380.00	2.57	42.26	44.83	74.00	-29.17	Peak	100	45	P

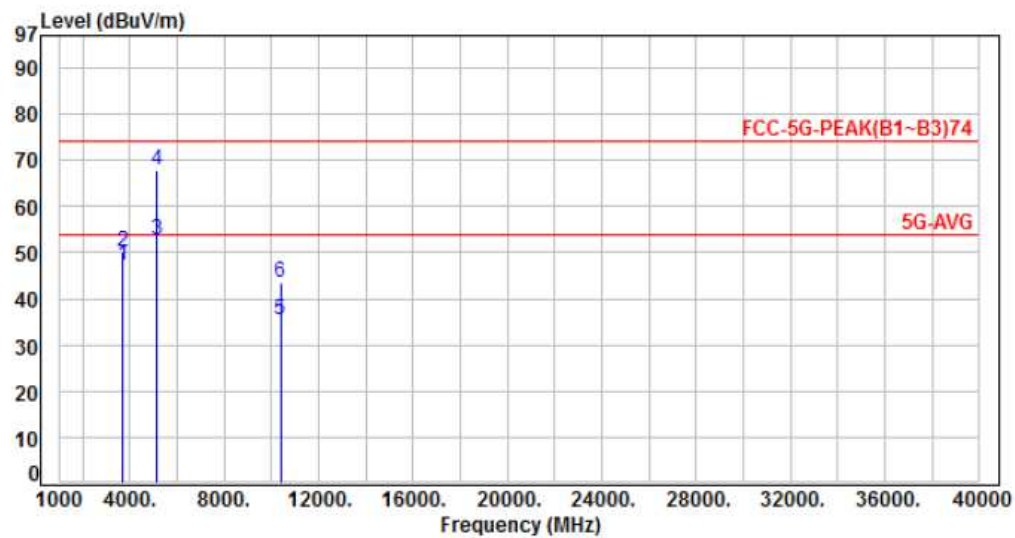
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH38, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	3666.35	-9.39	56.44	47.05	54.00	-6.95	Average	144	152	P
2	3666.35	-9.39	59.41	50.02	74.00	-23.98	Peak	144	152	P
3	5150.00	-5.71	58.30	52.59	54.00	-1.41	Average	197	281	P
4	5150.00	-5.71	73.50	67.79	74.00	-6.21	Peak	197	281	P
5	10380.00	2.57	32.70	35.27	54.00	-18.73	Average	115	281	P
6	10380.00	2.57	41.00	43.57	74.00	-30.43	Peak	115	281	P

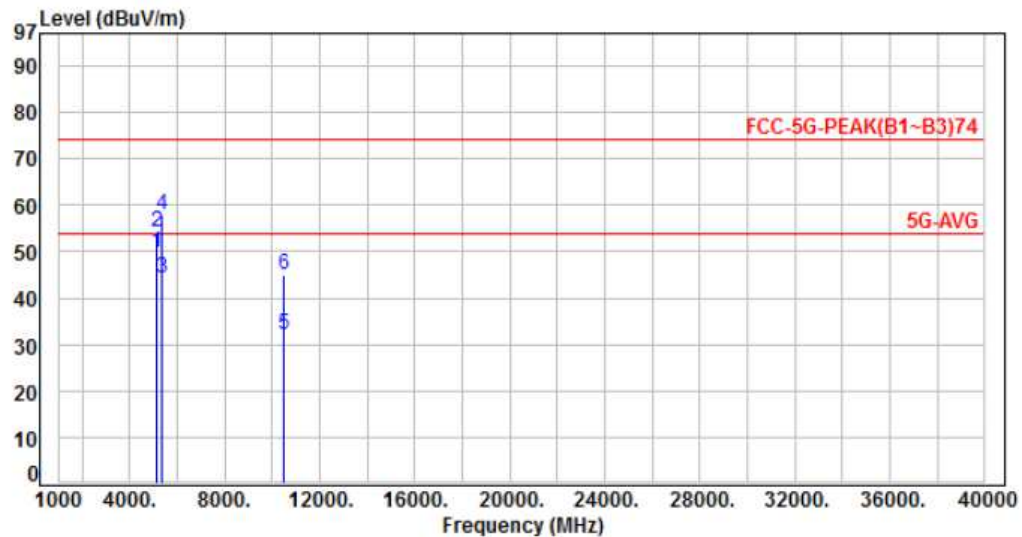
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH46, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5150.00	-5.71	55.32	49.61	54.00	-4.39	Average	116	279	P
2	5150.00	-5.71	60.00	54.29	74.00	-19.71	Peak	116	279	P
3	5350.00	-5.33	49.51	44.18	54.00	-9.82	Average	116	279	P
4	5350.00	-5.33	63.21	57.88	74.00	-16.12	Peak	116	279	P
5	10460.00	2.65	29.60	32.25	54.00	-21.75	Average	120	211	P
6	10460.00	2.65	42.38	45.03	74.00	-28.97	Peak	120	211	P

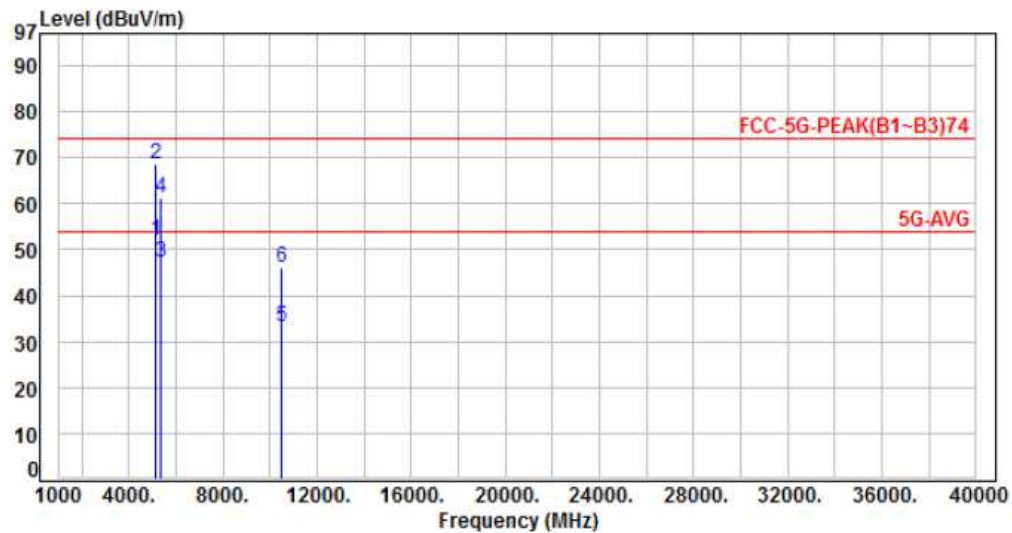
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH46, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5150.00	-12.60	64.70	52.10	54.00	-1.90	Average	100	355	P
2	5150.00	-12.60	81.10	68.50	74.00	-5.50	Peak	100	355	P
3	5350.00	-12.33	59.58	47.25	54.00	-6.75	Average	100	355	P
4	5350.00	-12.33	73.62	61.29	74.00	-12.71	Peak	100	355	P
5	10460.00	-7.44	40.50	33.06	54.00	-20.94	Average	100	42	P
6	10460.00	-7.44	53.70	46.26	74.00	-27.74	Peak	100	42	P

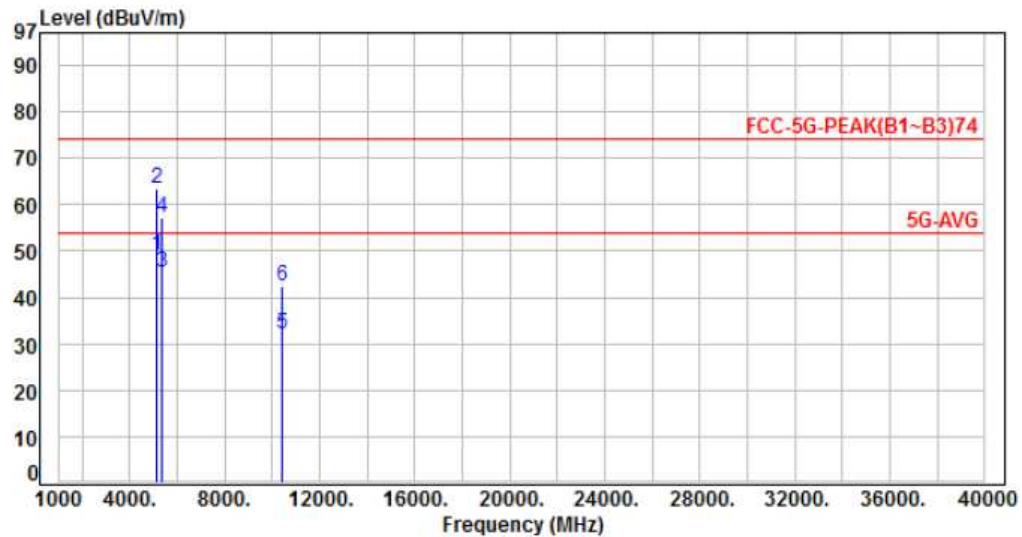
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH42, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5150.00	-12.60	61.50	48.90	54.00	-5.10	Average	383	0	P
2	5150.00	-12.60	75.91	63.31	74.00	-10.69	Peak	383	0	P
3	5350.00	-12.33	57.59	45.26	54.00	-8.74	Average	383	0	P
4	5350.00	-12.33	69.39	57.06	74.00	-16.94	Peak	383	0	P
5	10420.00	-7.47	39.71	32.24	54.00	-21.76	Average	100	353	P
6	10420.00	-7.47	49.71	42.24	74.00	-31.76	Peak	100	353	P

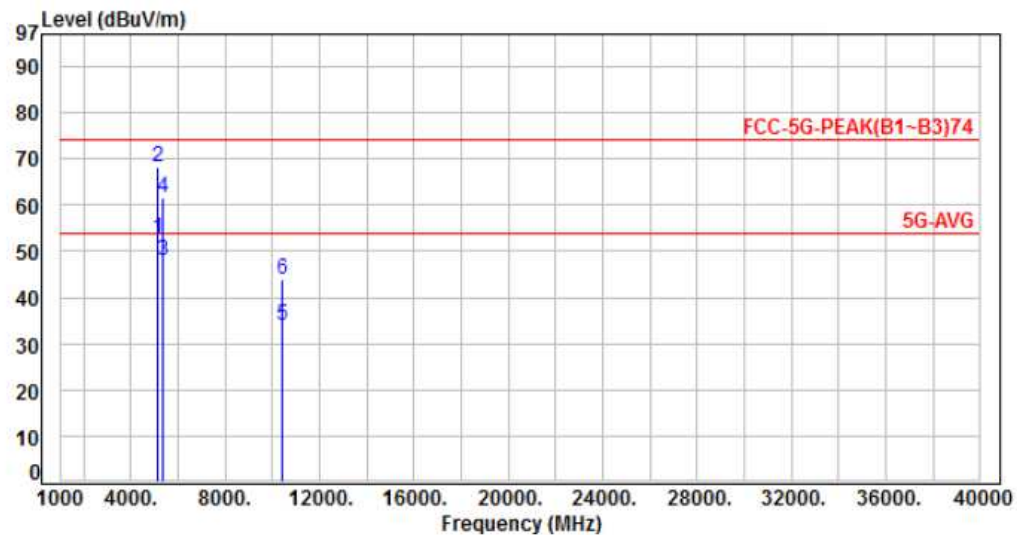
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH42, Band 1	Temperature	: 24 °C
Test Date	: Feb. 08, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5150.00	-5.71	58.30	52.59	54.00	-1.41	Average	220	280	P
2	5150.00	-5.71	74.10	68.39	74.00	-5.61	Peak	220	280	P
3	5350.00	-5.33	53.35	48.02	54.00	-5.98	Average	220	280	P
4	5350.00	-5.33	66.90	61.57	74.00	-12.43	Peak	220	280	P
5	10420.00	2.60	31.51	34.11	54.00	-19.89	Average	144	277	P
6	10420.00	2.60	41.36	43.96	74.00	-30.04	Peak	144	277	P

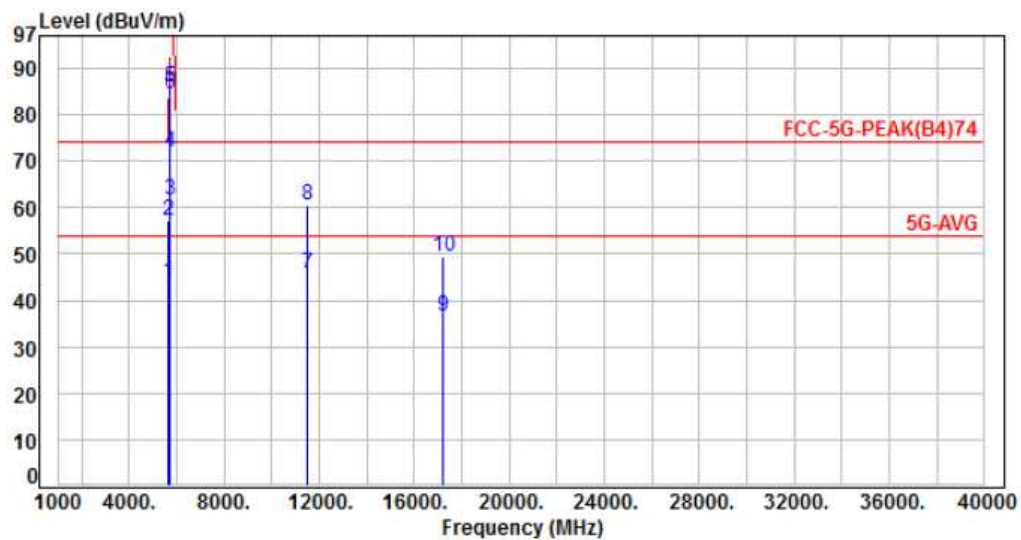
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH149, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-12.16	55.90	43.74	54.00	-10.26	Average	100	330	P
2	5650.00	-12.16	69.20	57.04	74.00	-16.96	Peak	100	330	P
3	5700.00	-12.17	73.80	61.63	105.20	-43.57	Peak	100	330	P
4	5720.00	-12.18	84.11	71.93	110.80	-38.87	Peak	100	330	P
5	5722.00	-12.18	97.96	85.78	115.36	-29.58	Peak	100	330	P
6	5725.00	-12.18	96.61	84.43	122.20	-37.77	Peak	100	330	P
7	11490.00	-6.17	51.96	45.79	54.00	-8.21	Average	233	120	P
8	11490.00	-6.17	66.79	60.62	74.00	-13.38	Peak	233	120	P
9	17235.00	1.38	35.21	36.59	54.00	-17.41	Average	345	360	P
10	17235.00	1.38	48.21	49.59	74.00	-24.41	Peak	345	360	P

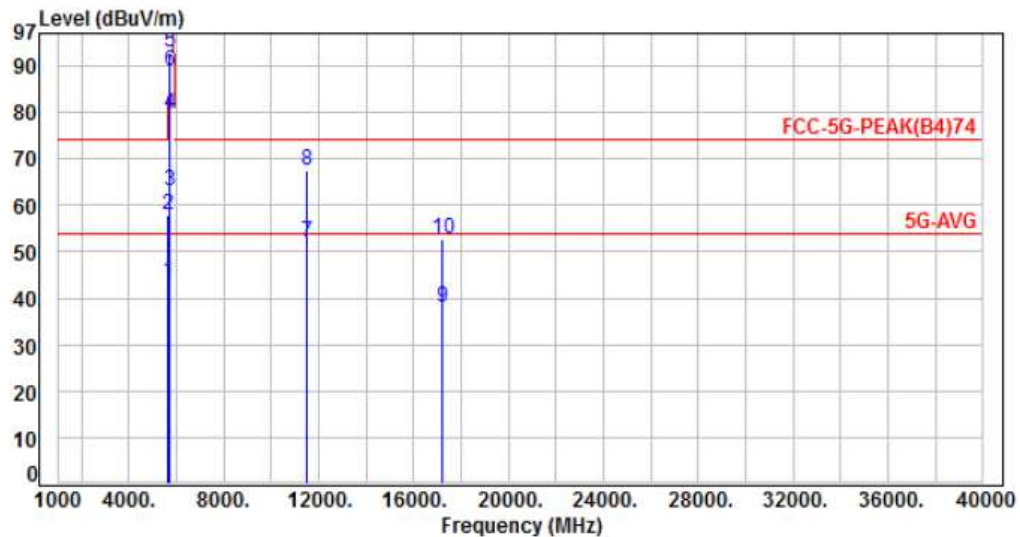
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH149, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-12.16	55.60	43.44	54.00	-10.56	Average	105	29	P
2	5650.00	-12.16	70.20	58.04	74.00	-15.96	Peak	105	29	P
3	5700.00	-12.17	75.30	63.13	105.20	-42.07	Peak	105	29	P
4	5720.00	-12.18	91.81	79.63	110.80	-31.17	Peak	105	29	P
5	5722.00	-12.18	105.11	92.93	115.36	-22.43	Peak	105	29	P
6	5725.00	-12.18	101.21	89.03	122.20	-33.17	Peak	105	29	P
7	11490.00	-6.17	58.29	52.12	54.00	-1.88	Average	200	67	P
8	11490.00	-6.17	73.59	67.42	74.00	-6.58	Peak	200	67	P
9	17235.00	1.38	36.56	37.94	54.00	-16.06	Average	100	115	P
10	17235.00	1.38	51.51	52.89	74.00	-21.11	Peak	100	115	P

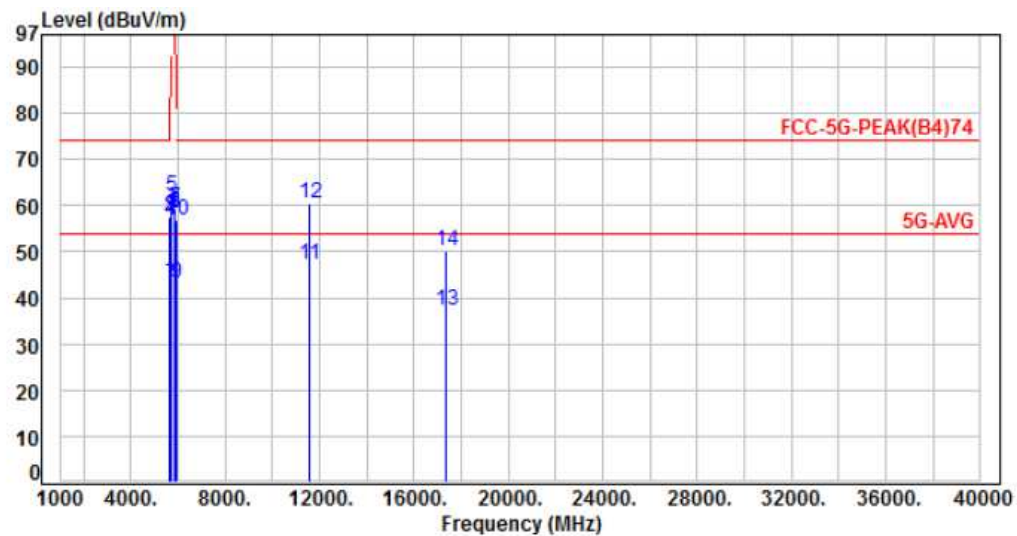
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH157, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-12.16	55.70	43.54	54.00	-10.46	Average	391	323	P
2	5650.00	-12.16	69.70	57.54	74.00	-16.46	Peak	391	323	P
3	5700.00	-12.17	70.00	57.83	105.20	-47.37	Peak	391	323	P
4	5720.00	-12.18	70.91	58.73	110.80	-52.07	Peak	391	323	P
5	5725.00	-12.18	74.31	62.13	122.20	-60.07	Peak	391	323	P
6	5850.00	-12.19	70.80	58.61	122.20	-63.59	Peak	391	323	P
7	5855.00	-12.19	71.50	59.31	110.80	-51.49	Peak	391	323	P
8	5875.00	-12.20	70.31	58.11	105.20	-47.09	Peak	391	323	P
9	5925.00	-12.20	55.50	43.30	54.00	-10.70	Average	391	323	P
10	5925.00	-12.20	69.10	56.90	74.00	-17.10	Peak	391	323	P
11	11570.00	-6.13	53.20	47.07	54.00	-6.93	Average	132	120	P
12	11570.00	-6.13	66.80	60.67	74.00	-13.33	Peak	132	120	P
13	17355.00	2.01	35.22	37.23	54.00	-16.77	Average	286	325	P
14	17355.00	2.01	47.99	50.00	74.00	-24.00	Peak	286	325	P

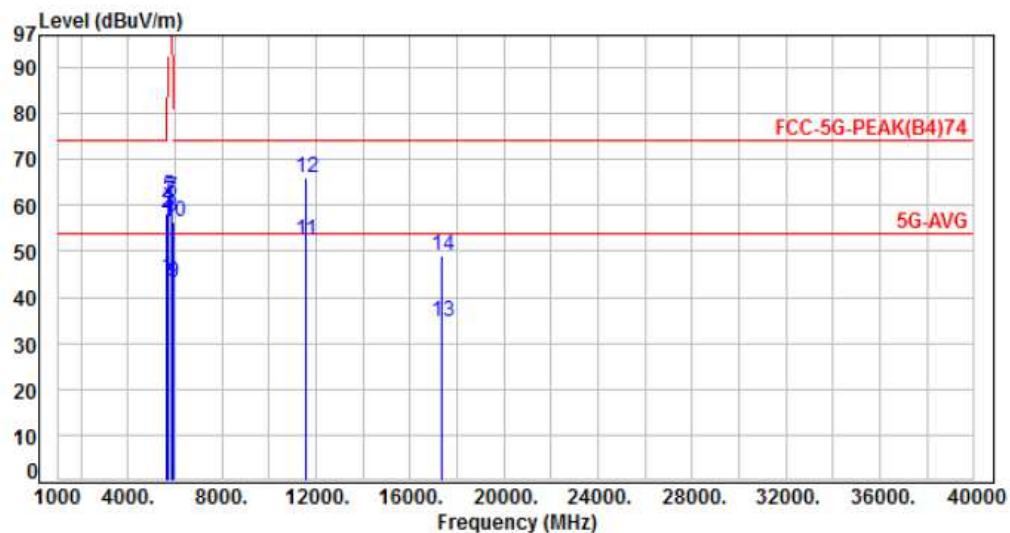
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH157, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-12.16	56.30	44.14	54.00	-9.86	Average	400	23	P
2	5650.00	-12.16	70.50	58.34	74.00	-15.66	Peak	400	23	P
3	5700.00	-12.17	70.90	58.73	105.20	-46.47	Peak	400	23	P
4	5720.00	-12.18	72.11	59.93	110.80	-50.87	Peak	400	23	P
5	5725.00	-12.18	74.31	62.13	122.20	-60.07	Peak	400	23	P
6	5850.00	-12.19	72.90	60.71	122.20	-61.49	Peak	400	23	P
7	5855.00	-12.19	73.60	61.41	110.80	-49.39	Peak	400	23	P
8	5875.00	-12.20	69.71	57.51	105.20	-47.69	Peak	400	23	P
9	5925.00	-12.20	55.20	43.00	54.00	-11.00	Average	400	23	P
10	5925.00	-12.20	68.60	56.40	74.00	-17.60	Peak	400	23	P
11	11570.00	-6.13	58.50	52.37	54.00	-1.63	Average	168	81	P
12	11570.00	-6.13	72.20	66.07	74.00	-7.93	Peak	168	81	P
13	17355.00	2.01	32.80	34.81	54.00	-19.19	Average	107	44	P
14	17355.00	2.01	47.20	49.21	74.00	-24.79	Peak	107	44	P

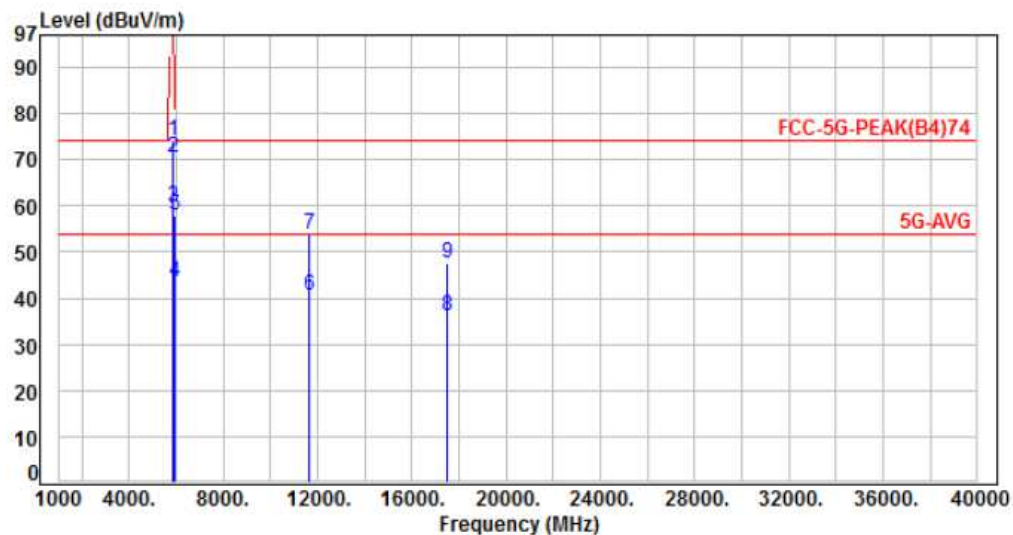
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH165, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5850.00	-12.19	86.22	74.03	122.20	-48.17	Peak	147	335	P
2	5855.00	-12.19	82.60	70.41	110.80	-40.39	Peak	147	335	P
3	5875.00	-12.20	72.11	59.91	105.20	-45.29	Peak	147	335	P
4	5925.00	-12.20	55.70	43.50	54.00	-10.50	Average	147	335	P
5	5925.00	-12.20	70.20	58.00	74.00	-16.00	Peak	147	335	P
6	11650.00	-6.11	46.83	40.72	54.00	-13.28	Average	400	25	P
7	11650.00	-6.11	59.80	53.69	74.00	-20.31	Peak	400	25	P
8	17475.00	2.63	33.52	36.15	54.00	-17.85	Average	375	318	P
9	17475.00	2.63	44.85	47.48	74.00	-26.52	Peak	375	318	P

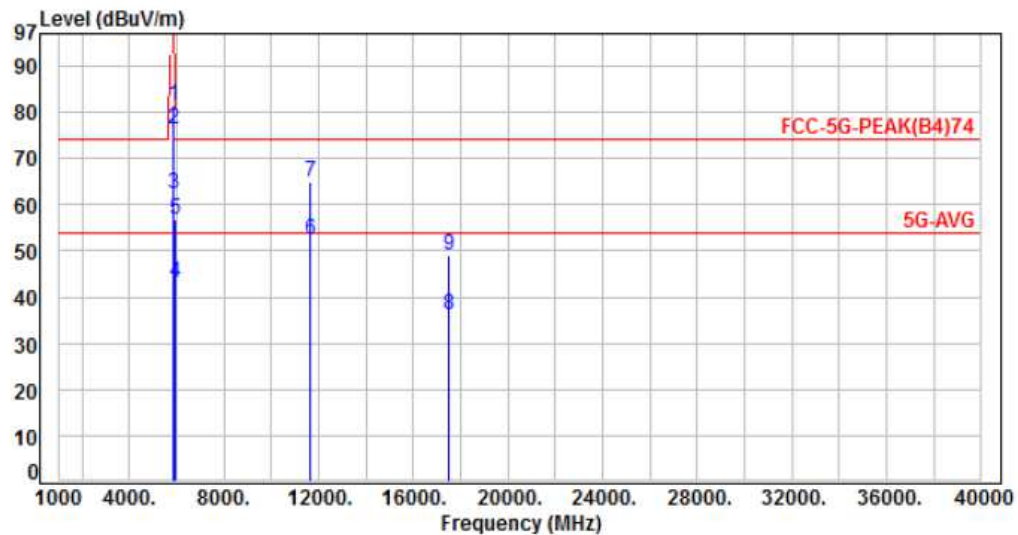
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH165, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5850.00	-12.19	93.80	81.61	122.20	-40.59	Peak	150	352	P
2	5855.00	-12.19	88.60	76.41	110.80	-34.39	Peak	150	352	P
3	5875.00	-12.20	74.71	62.51	105.20	-42.69	Peak	150	352	P
4	5925.00	-12.20	55.20	43.00	54.00	-11.00	Average	150	352	P
5	5925.00	-12.20	68.90	56.70	74.00	-17.30	Peak	150	352	P
6	11650.00	-6.11	58.48	52.37	54.00	-1.63	Average	192	80	P
7	11650.00	-6.11	71.20	65.09	74.00	-8.91	Peak	192	80	P
8	17475.00	2.63	33.50	36.13	54.00	-17.87	Average	100	51	P
9	17475.00	2.63	46.40	49.03	74.00	-24.97	Peak	100	51	P

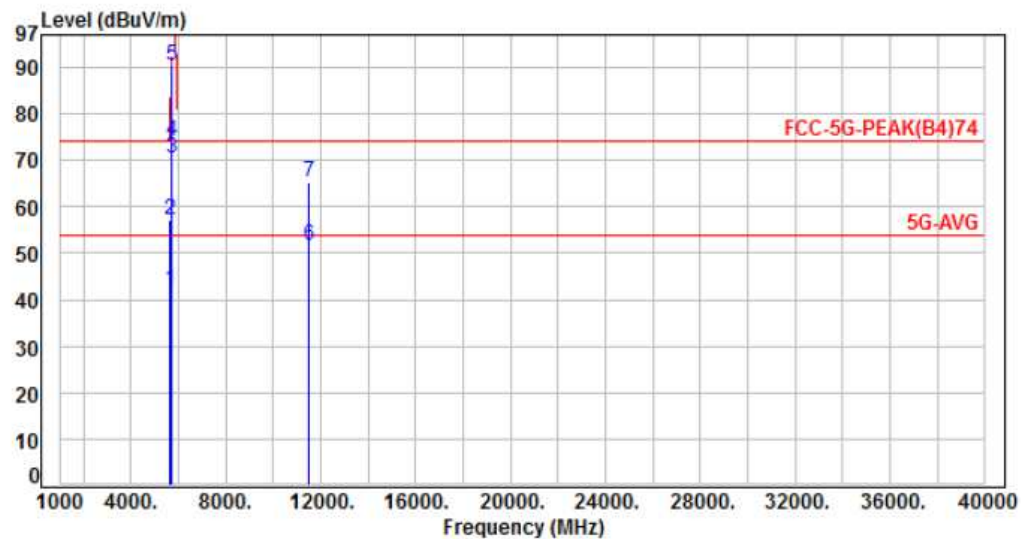
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH149, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-4.95	47.06	42.11	54.00	-11.89	Average	108	221	P
2	5650.00	-4.95	62.27	57.32	74.00	-16.68	Peak	108	221	P
3	5700.00	-4.92	75.20	70.28	105.20	-34.92	Peak	108	221	P
4	5720.00	-4.92	79.20	74.28	110.80	-36.52	Peak	108	221	P
5	5725.00	-4.91	95.18	90.27	122.20	-31.93	Peak	108	221	P
6	11490.00	4.48	47.10	51.58	54.00	-2.42	Average	100	187	P
7	11490.00	4.48	60.80	65.28	74.00	-8.72	Peak	100	187	P

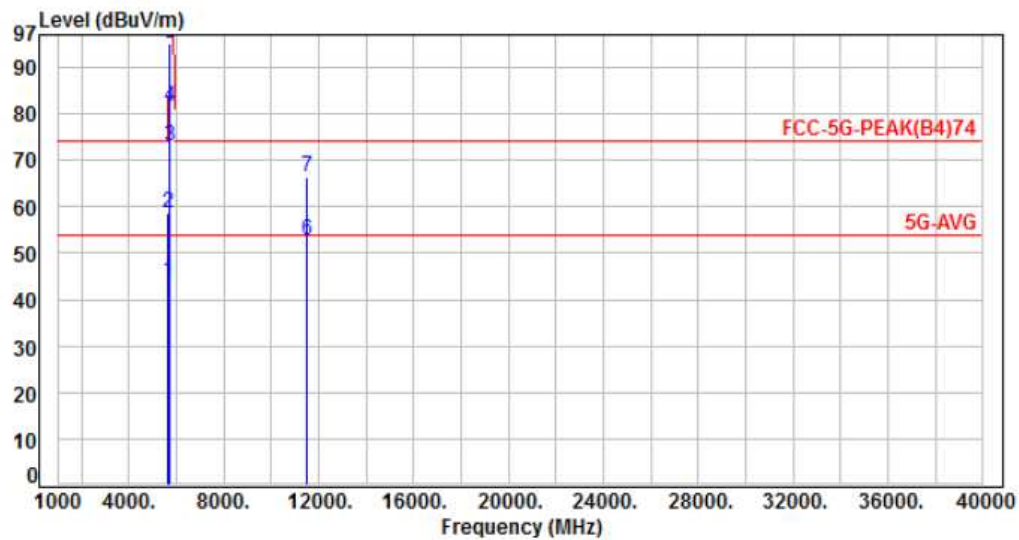
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH149, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-4.95	48.70	43.75	54.00	-10.25	Average	395	283	P
2	5650.00	-4.95	63.50	58.55	74.00	-15.45	Peak	395	283	P
3	5700.00	-4.92	78.10	73.18	105.20	-32.02	Peak	395	283	P
4	5720.00	-4.92	86.51	81.59	110.80	-29.21	Peak	395	283	P
5	5725.00	-4.91	100.20	95.29	122.20	-26.91	Peak	395	283	P
6	11490.00	4.48	48.30	52.78	54.00	-1.22	Average	100	75	P
7	11490.00	4.48	62.00	66.48	74.00	-7.52	Peak	100	75	P

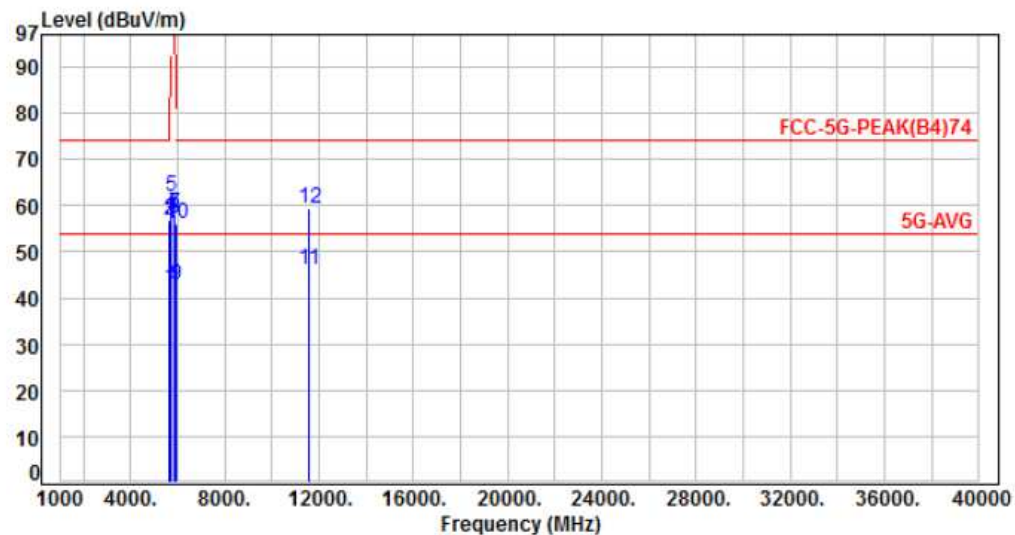
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH157, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-12.16	54.20	42.04	54.00	-11.96	Average	151	337	P
2	5650.00	-12.16	68.88	56.72	74.00	-17.28	Peak	151	337	P
3	5700.00	-12.17	68.92	56.75	105.20	-48.45	Peak	151	337	P
4	5720.00	-12.18	70.41	58.23	110.80	-52.57	Peak	151	337	P
5	5725.00	-12.18	73.99	61.81	122.20	-60.39	Peak	151	337	P
6	5850.00	-12.19	70.61	58.42	122.20	-63.78	Peak	151	337	P
7	5855.00	-12.19	70.41	58.22	110.80	-52.58	Peak	151	337	P
8	5875.00	-12.20	69.22	57.02	105.20	-48.18	Peak	151	337	P
9	5925.00	-12.20	55.03	42.83	54.00	-11.17	Average	151	337	P
10	5925.00	-12.20	68.22	56.02	74.00	-17.98	Peak	151	337	P
11	11570.00	-6.13	52.36	46.23	54.00	-7.77	Average	121	199	P
12	11570.00	-6.13	65.60	59.47	74.00	-14.53	Peak	121	199	P

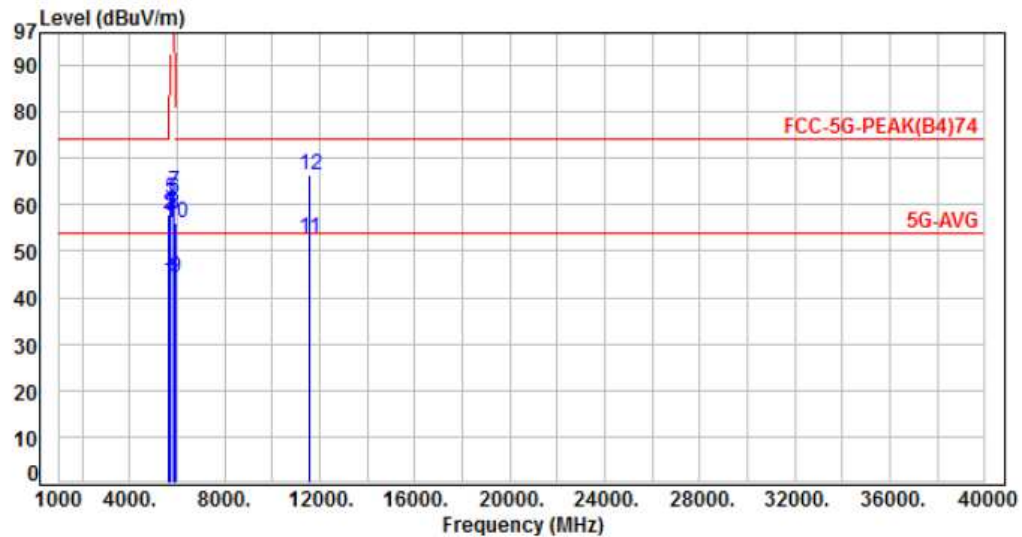
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH157, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-12.16	55.74	43.58	54.00	-10.42	Average	166	227	P
2	5650.00	-12.16	70.19	58.03	74.00	-15.97	Peak	166	227	P
3	5700.00	-12.17	69.59	57.42	105.20	-47.78	Peak	166	227	P
4	5720.00	-12.18	71.37	59.19	110.80	-51.61	Peak	166	227	P
5	5725.00	-12.18	73.39	61.21	122.20	-60.99	Peak	166	227	P
6	5850.00	-12.19	73.41	61.22	122.20	-60.98	Peak	166	227	P
7	5855.00	-12.19	74.82	62.63	110.80	-48.17	Peak	166	227	P
8	5875.00	-12.20	70.13	57.93	105.20	-47.27	Peak	166	227	P
9	5925.00	-12.20	56.42	44.22	54.00	-9.78	Average	166	227	P
10	5925.00	-12.20	68.11	55.91	74.00	-18.09	Peak	166	227	P
11	11570.00	-6.13	58.90	52.77	54.00	-1.23	Average	144	191	P
12	11570.00	-6.13	72.36	66.23	74.00	-7.77	Peak	144	191	P

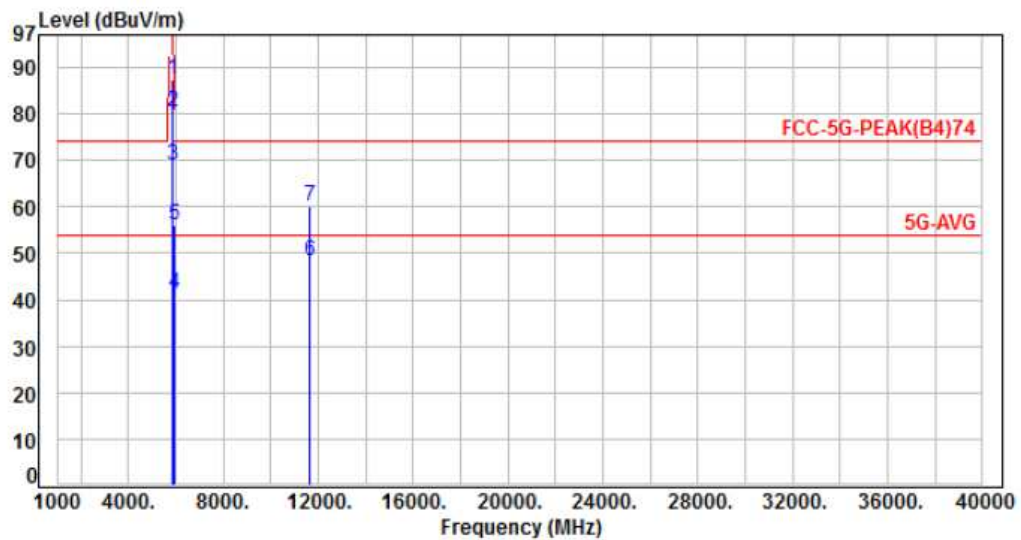
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH165, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5850.00	-4.83	92.30	87.47	122.20	-34.73	Peak	144	210	P
2	5855.00	-4.82	85.11	80.29	110.80	-30.51	Peak	144	210	P
3	5875.00	-4.82	73.96	69.14	105.20	-36.06	Peak	144	210	P
4	5925.00	-4.79	46.00	41.21	54.00	-12.79	Average	144	210	P
5	5925.00	-4.79	60.92	56.13	74.00	-17.87	Peak	144	210	P
6	11650.00	4.63	43.70	48.33	54.00	-5.67	Average	119	274	P
7	11650.00	4.63	55.38	60.01	74.00	-13.99	Peak	119	274	P

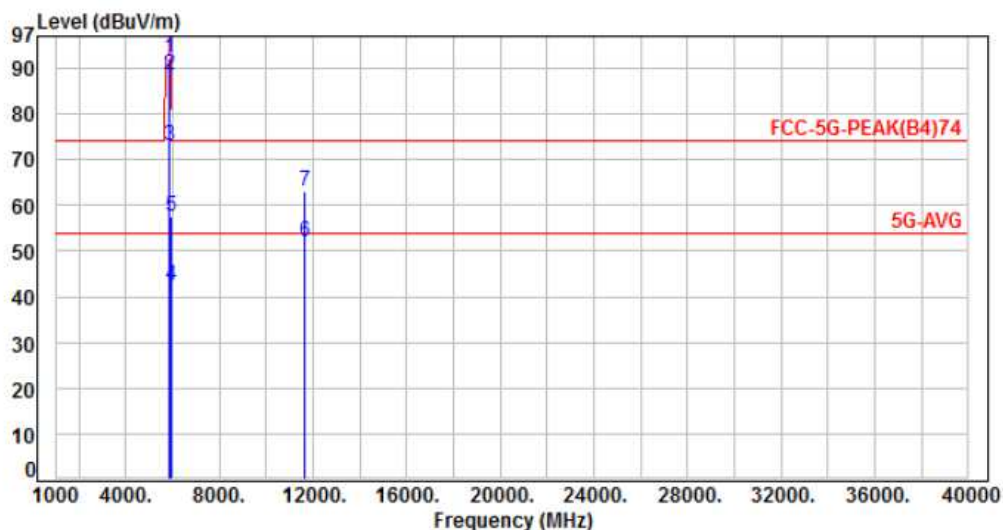
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH165, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5850.00	-4.83	97.00	92.17	122.20	-30.03	Peak	152	270	P
2	5855.00	-4.82	93.19	88.37	110.80	-22.43	Peak	152	270	P
3	5875.00	-4.82	77.81	72.99	105.20	-32.21	Peak	152	270	P
4	5925.00	-4.79	47.20	42.41	54.00	-11.59	Average	152	270	P
5	5925.00	-4.79	62.20	57.41	74.00	-16.59	Peak	152	270	P
6	11650.00	4.63	47.40	52.03	54.00	-1.97	Average	108	44	P
7	11650.00	4.63	58.60	63.23	74.00	-10.77	Peak	108	44	P

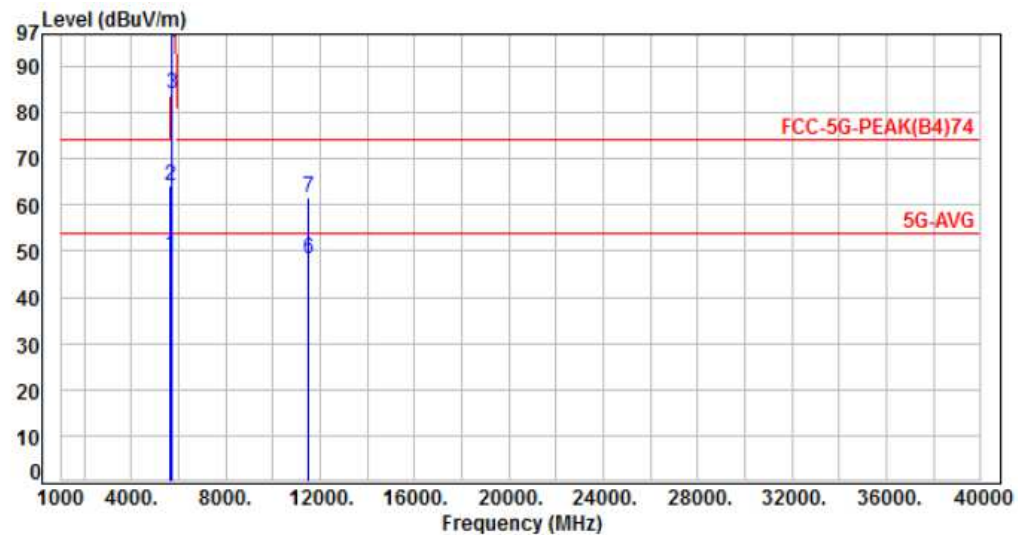
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH151, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-4.95	54.17	49.22	54.00	-4.78	Average	121	205	P
2	5650.00	-4.95	69.07	64.12	74.00	-9.88	Peak	121	205	P
3	5700.00	-4.92	89.14	84.22	105.20	-20.98	Peak	121	205	P
4	5720.00	-4.92	100.11	95.19	110.80	-15.61	Peak	121	205	P
5	5725.00	-4.91	102.37	97.46	122.20	-24.74	Peak	121	205	P
6	11510.00	4.51	43.70	48.21	54.00	-5.79	Average	144	183	P
7	11510.00	4.51	57.21	61.72	74.00	-12.28	Peak	144	183	P

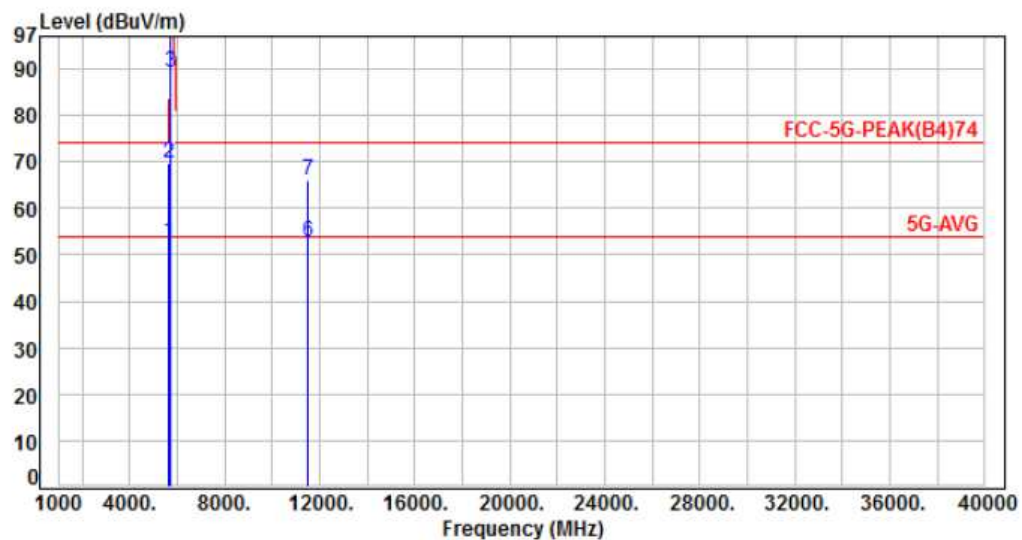
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH151, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-4.95	57.60	52.65	54.00	-1.35	Average	140	280	P
2	5650.00	-4.95	74.50	69.55	74.00	-4.45	Peak	140	280	P
3	5700.00	-4.92	94.00	89.08	105.20	-16.12	Peak	140	280	P
4	5720.00	-4.92	103.61	98.69	110.80	-12.11	Peak	140	280	P
5	5725.00	-4.91	106.80	101.89	122.20	-20.31	Peak	140	280	P
6	11510.00	4.51	48.20	52.71	54.00	-1.29	Average	100	73	P
7	11510.00	4.51	61.60	66.11	74.00	-7.89	Peak	100	73	P

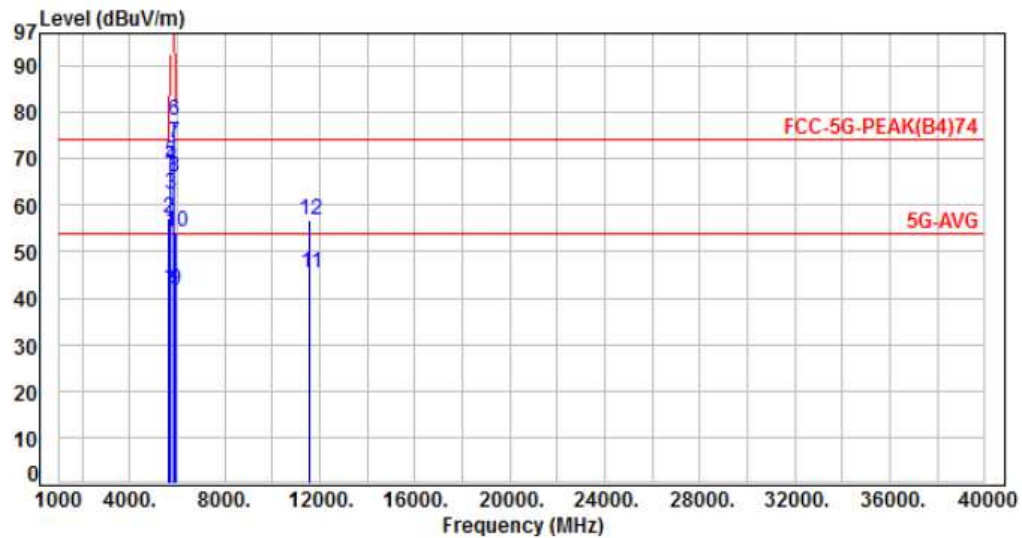
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH159, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-4.95	47.06	42.11	54.00	-11.89	Average	127	155	P
2	5650.00	-4.95	62.07	57.12	74.00	-16.88	Peak	127	155	P
3	5700.00	-4.92	67.18	62.26	105.20	-42.94	Peak	127	155	P
4	5720.00	-4.92	73.20	68.28	110.80	-42.52	Peak	127	155	P
5	5725.00	-4.91	74.17	69.26	122.20	-52.94	Peak	127	155	P
6	5850.00	-4.83	83.18	78.35	122.20	-43.85	Peak	127	155	P
7	5855.00	-4.82	78.19	73.37	110.80	-37.43	Peak	127	155	P
8	5875.00	-4.82	71.02	66.20	105.20	-39.00	Peak	127	155	P
9	5925.00	-4.79	46.30	41.51	54.00	-12.49	Average	127	155	P
10	5925.00	-4.79	59.07	54.28	74.00	-19.72	Peak	127	155	P
11	11590.00	4.58	40.90	45.48	54.00	-8.52	Average	110	193	P
12	11590.00	4.58	52.40	56.98	74.00	-17.02	Peak	110	193	P

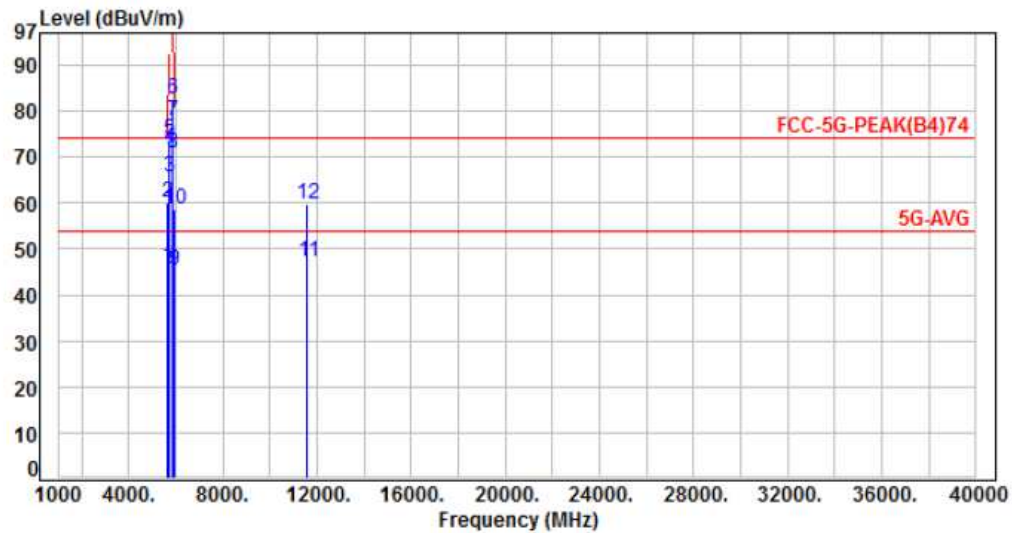
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH159, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-4.95	50.90	45.95	54.00	-8.05	Average	105	25	P
2	5650.00	-4.95	65.20	60.25	74.00	-13.75	Peak	105	25	P
3	5700.00	-4.92	70.50	65.58	105.20	-39.62	Peak	105	25	P
4	5720.00	-4.92	76.71	71.79	110.80	-39.01	Peak	105	25	P
5	5725.00	-4.91	78.51	73.60	122.20	-48.60	Peak	105	25	P
6	5850.00	-4.83	87.30	82.47	122.20	-39.73	Peak	105	25	P
7	5855.00	-4.82	82.59	77.77	110.80	-33.03	Peak	105	25	P
8	5875.00	-4.82	75.81	70.99	105.20	-34.21	Peak	105	25	P
9	5925.00	-4.79	50.10	45.31	54.00	-8.69	Average	105	25	P
10	5925.00	-4.79	63.60	58.81	74.00	-15.19	Peak	105	25	P
11	11590.00	4.58	42.50	47.08	54.00	-6.92	Average	100	67	P
12	11590.00	4.58	55.20	59.78	74.00	-14.22	Peak	100	67	P

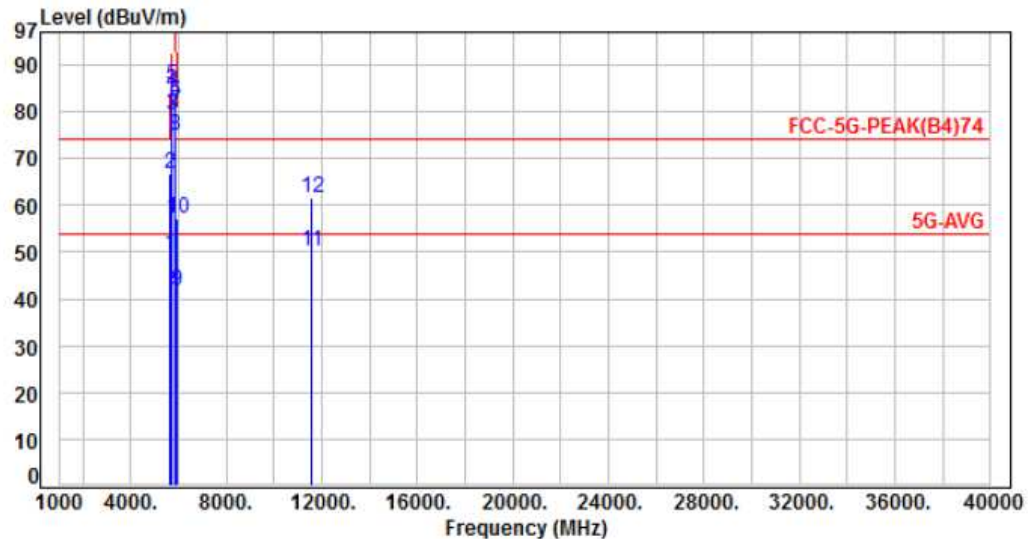
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH155, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-4.95	54.28	49.33	54.00	-4.67	Average	166	227	P
2	5650.00	-4.95	71.67	66.72	74.00	-7.28	Peak	166	227	P
3	5700.00	-4.92	84.04	79.12	105.20	-26.08	Peak	166	227	P
4	5720.00	-4.92	89.09	84.17	110.80	-26.63	Peak	166	227	P
5	5725.00	-4.91	90.58	85.67	122.20	-36.53	Peak	166	227	P
6	5850.00	-4.83	87.16	82.33	122.20	-39.87	Peak	166	227	P
7	5855.00	-4.82	84.75	79.93	110.80	-30.87	Peak	166	227	P
8	5875.00	-4.82	79.53	74.71	105.20	-30.49	Peak	166	227	P
9	5925.00	-4.79	46.51	41.72	54.00	-12.28	Average	166	227	P
10	5925.00	-4.79	61.91	57.12	74.00	-16.88	Peak	166	227	P
11	11550.00	4.54	45.60	50.14	54.00	-3.86	Average	100	72	P
12	11550.00	4.54	57.20	61.74	74.00	-12.26	Peak	100	72	P

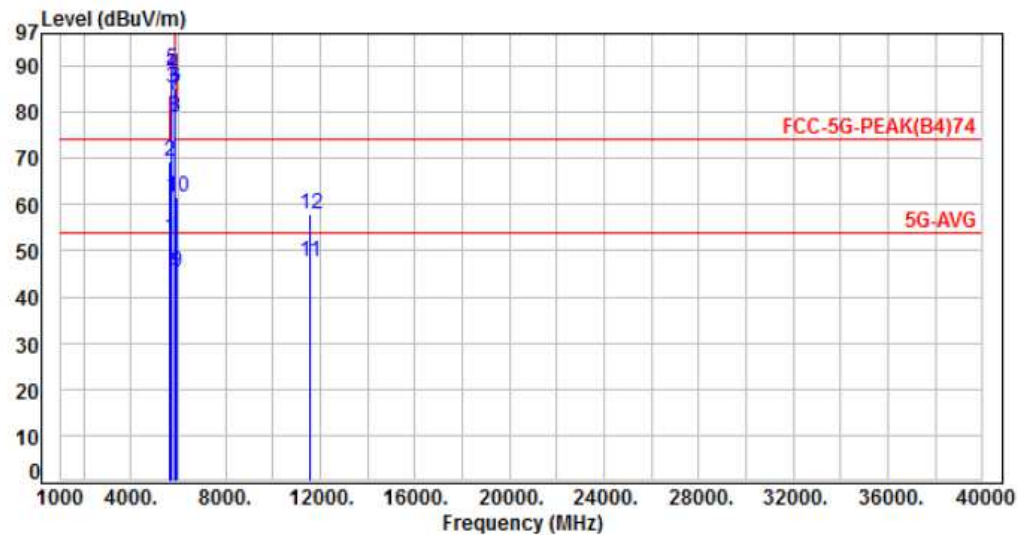
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH155, Band 4	Temperature	: 22 °C
Test Date	: Jan. 18, 2018	Humidity	: 58 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-4.95	57.60	52.65	54.00	-1.35	Average	140	283	P
2	5650.00	-4.95	74.40	69.45	74.00	-4.55	Peak	140	283	P
3	5700.00	-4.92	90.20	85.28	105.20	-19.92	Peak	140	283	P
4	5720.00	-4.92	93.21	88.29	110.80	-22.51	Peak	140	283	P
5	5725.00	-4.91	94.01	89.10	122.20	-33.10	Peak	140	283	P
6	5850.00	-4.83	90.20	85.37	122.20	-36.83	Peak	140	283	P
7	5855.00	-4.82	88.59	83.77	110.80	-27.03	Peak	140	283	P
8	5875.00	-4.82	83.60	78.78	105.20	-26.42	Peak	140	283	P
9	5925.00	-4.79	50.20	45.41	54.00	-8.59	Average	140	283	P
10	5925.00	-4.79	66.20	61.41	74.00	-12.59	Peak	140	283	P
11	11550.00	4.54	43.20	47.74	54.00	-6.26	Average	100	72	P
12	11550.00	4.54	53.50	58.04	74.00	-15.96	Peak	100	72	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



6.7. Restricted Bands of Operation

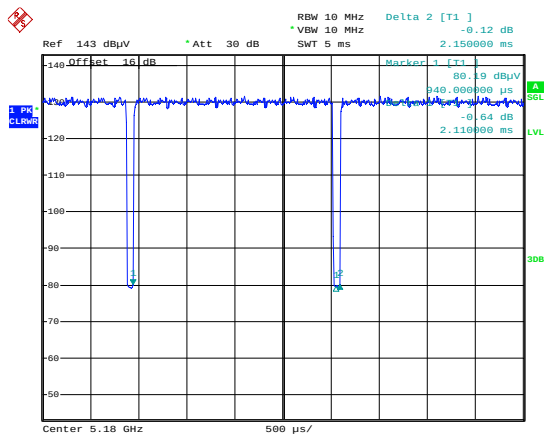
Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

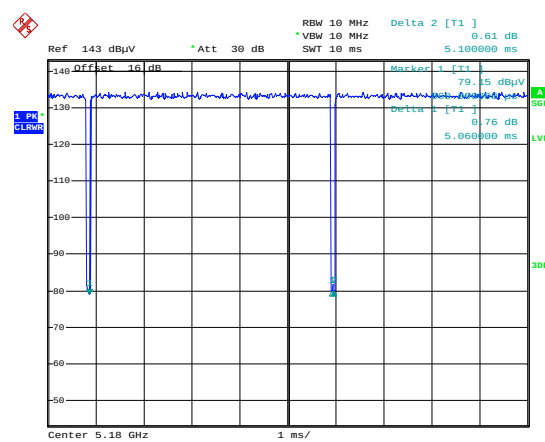
** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz



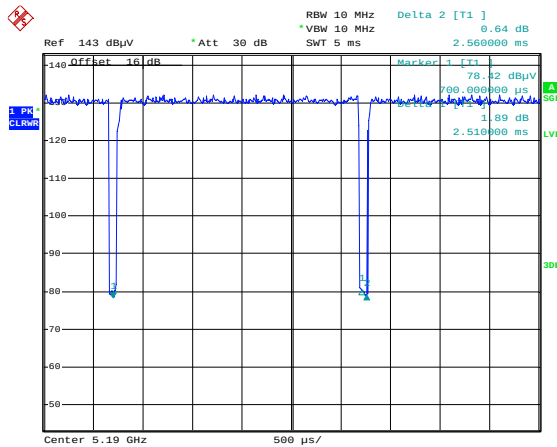
Modulation Standard: 802.11a (6Mbps)



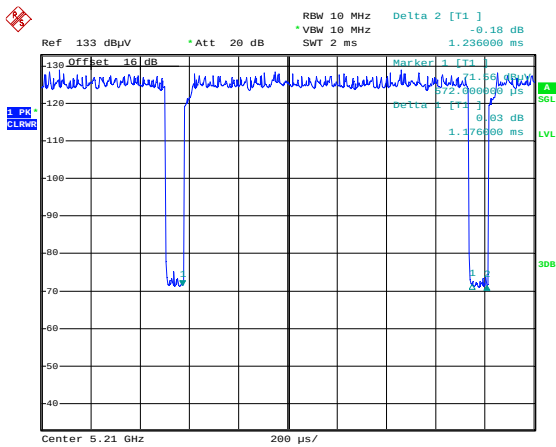
Modulation Standard: 802.11ac VHT20 (6.5Mbps)



Modulation Standard: 802.11ac VHT40 (13.5Mbps)



Modulation Standard: 802.11ac VHT80 (29.3Mbps)





8. 6dB Bandwidth & 99% Bandwidth

8.1. Test Limit

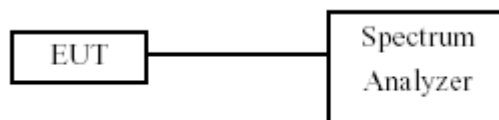
FCC §15.407

The minimum 6 dB bandwidth shall be at least 500 kHz.

8.2. Test Procedure

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW set to 100KHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

8.3. Test Setup Layout



8.4. Test Result and Data (6dB Bandwidth)

Temperature: 21°C

Humidity: 64%

Test Date: Feb. 08, 2018

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)
			ANT A	ANT B	
802.11a	149	5745	16.40	16.40	0.50
	157	5785	15.50	16.30	0.50
	165	5825	16.30	16.30	0.50
802.11ac VHT20	149	5745	17.30	17.60	0.50
	157	5785	16.60	16.30	0.50
	165	5825	17.30	16.30	0.50
802.11ac VHT40	155	5755	35.00	33.80	0.50
	159	5795	32.60	32.60	0.50
802.11ac VHT80	155	5775	76.00	76.00	0.50



8.5. Test Result and Data (99% Bandwidth)

Temperature: 21°C

Humidity: 64%

Test Date: Feb. 08, 2018

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth (MHz)	
			ANT A	ANT B
802.11a	149	5745	16.60	16.60
	157	5785	16.40	16.50
	165	5825	16.50	16.60
802.11ac VHT20	149	5745	17.80	17.80
	157	5785	17.80	17.80
	165	5825	17.60	17.70
802.11ac VHT40	155	5755	36.20	36.20
	159	5795	36.20	36.20
802.11ac VHT80	155	5775	76.00	75.60

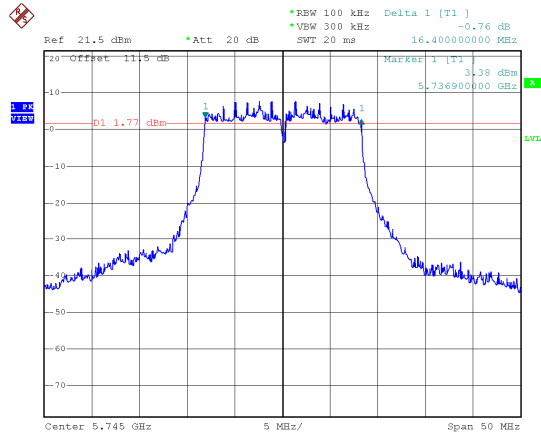


6dB Bandwidth

ANT A

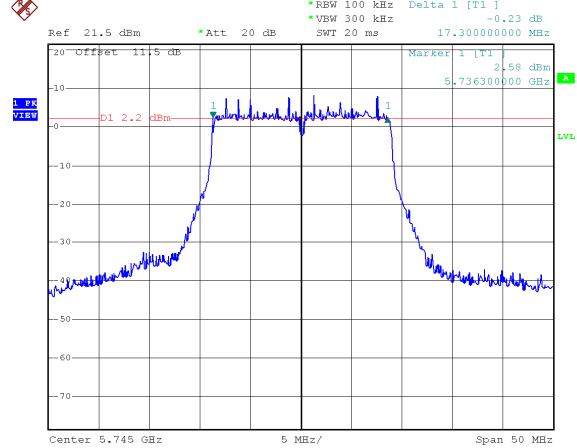
Modulation Standard: 802.11a (6Mbps)

CH149

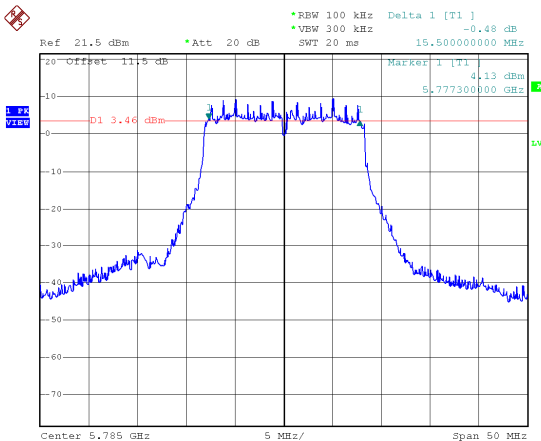


Modulation Standard: 802.11ac, VHT20 (6.5Mbps)

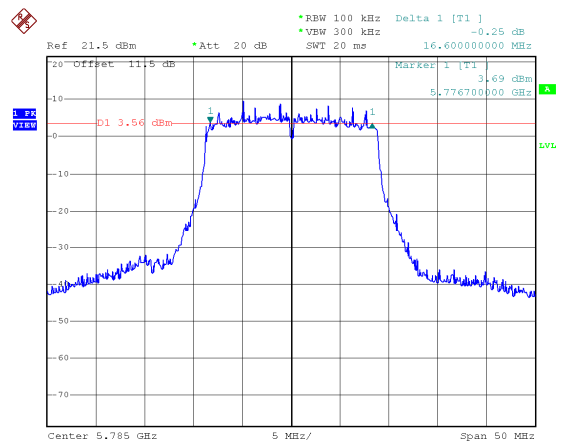
CH149



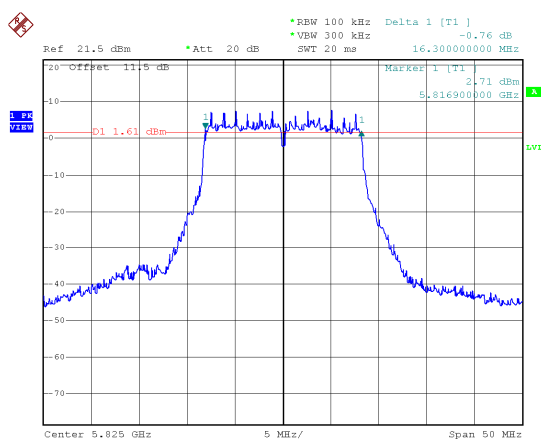
CH157



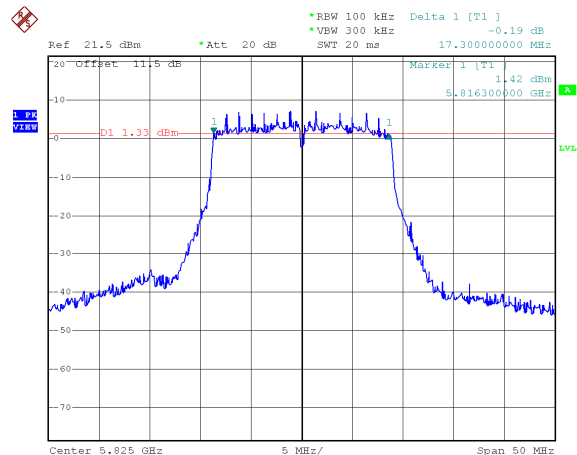
CH157



CH165

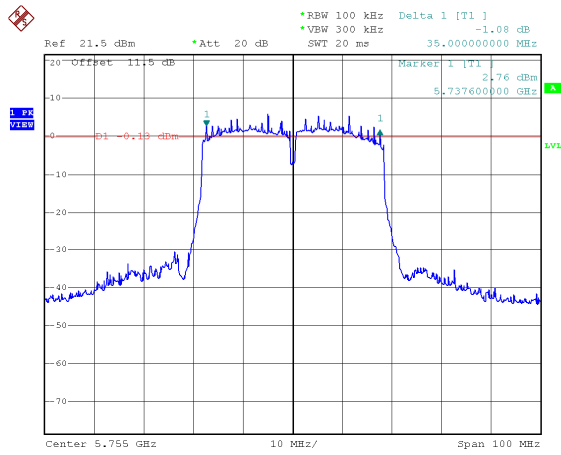


CH165

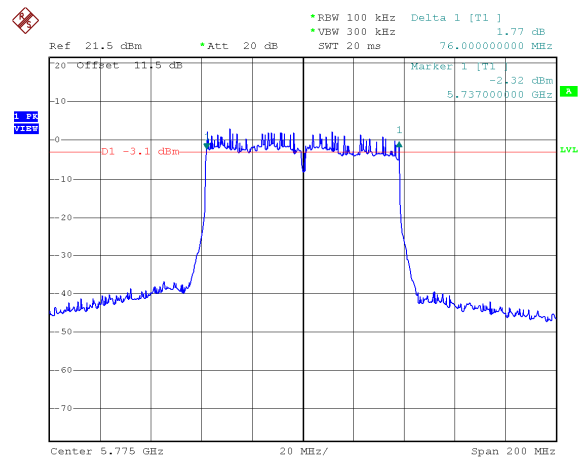




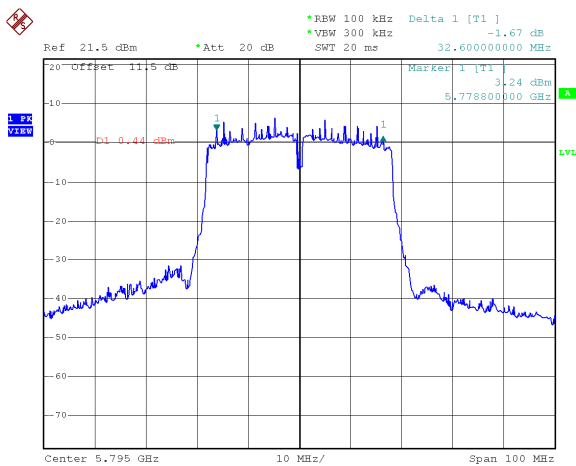
Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151



Modulation Standard: 802.11ac, VHT80 (29.3Mbps)
CH155

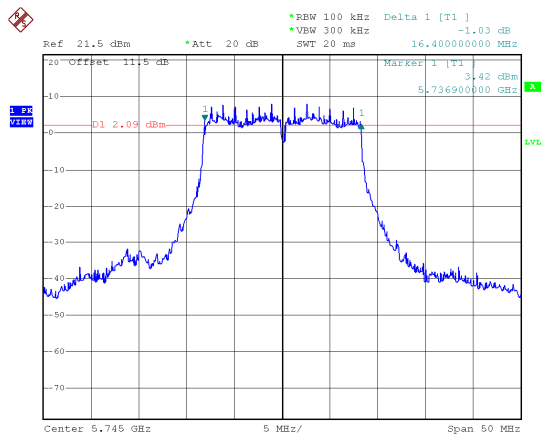


CH159

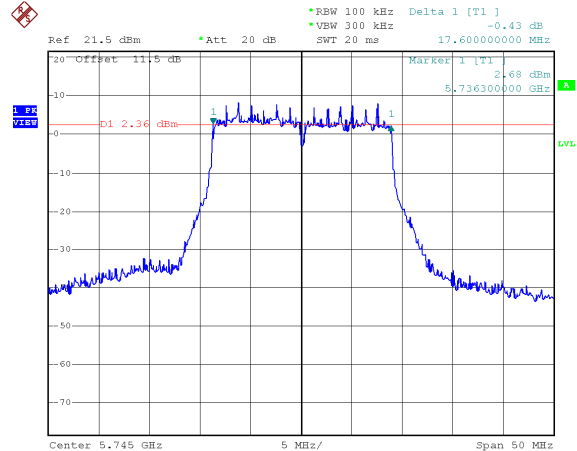




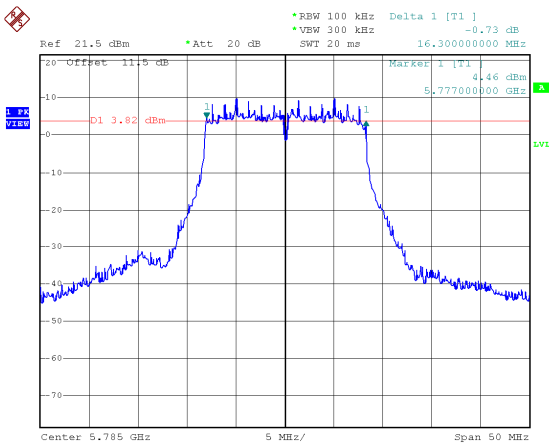
ANT B
Modulation Standard: 802.11a (6Mbps)
CH149



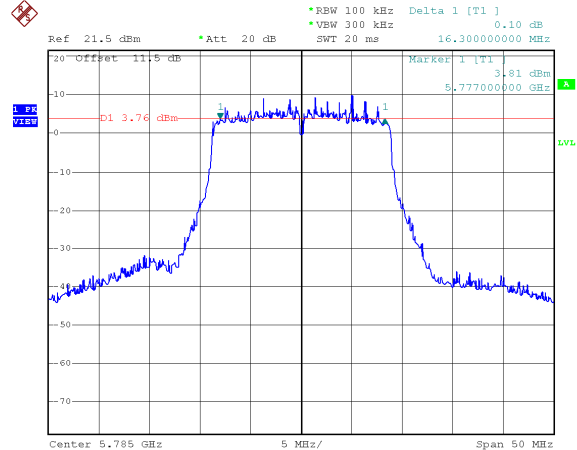
Modulation Standard: 802.11ac, VHT20 (6.5Mbps)
CH149



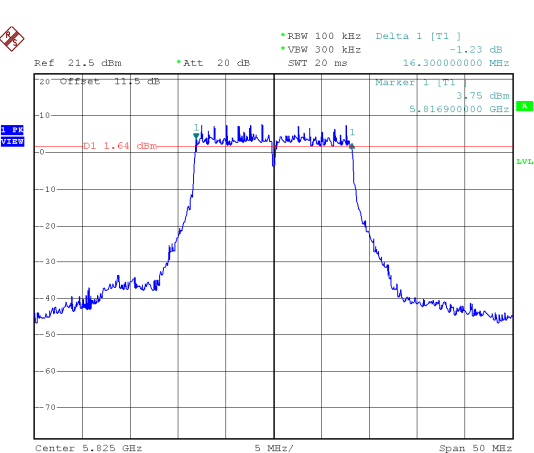
CH157



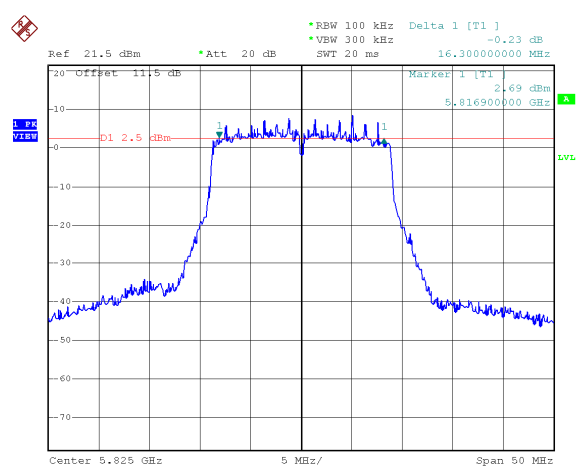
CH157



CH165

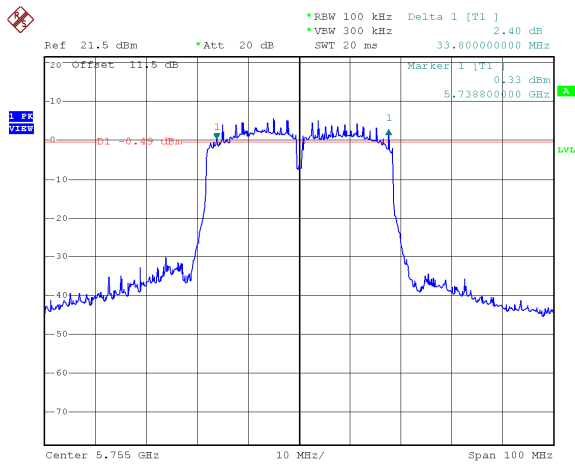


CH165

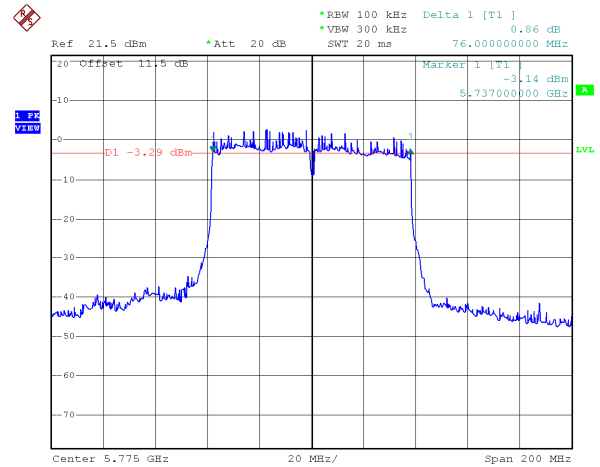




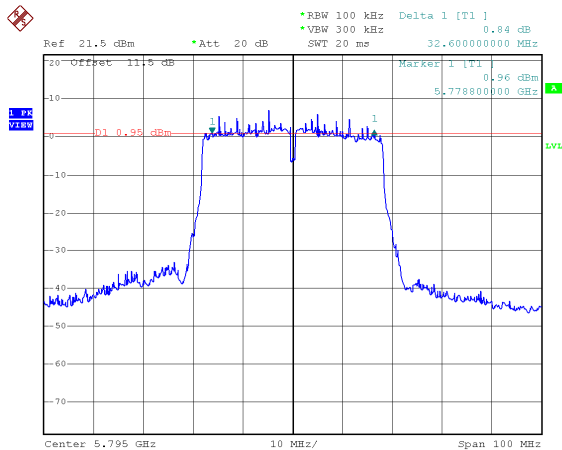
Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151



Modulation Standard: 802.11ac, VHT80 (29.3Mbps)
CH155



CH159



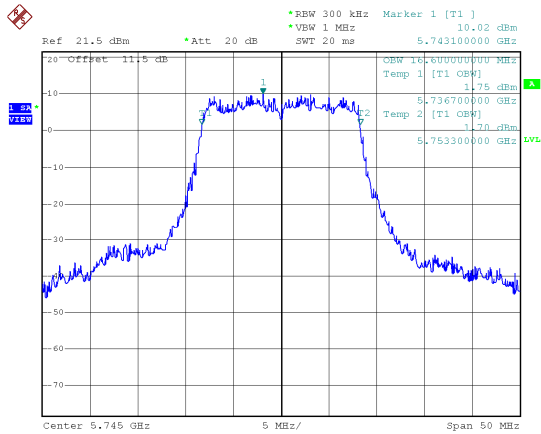


99% Bandwidth

ANT A

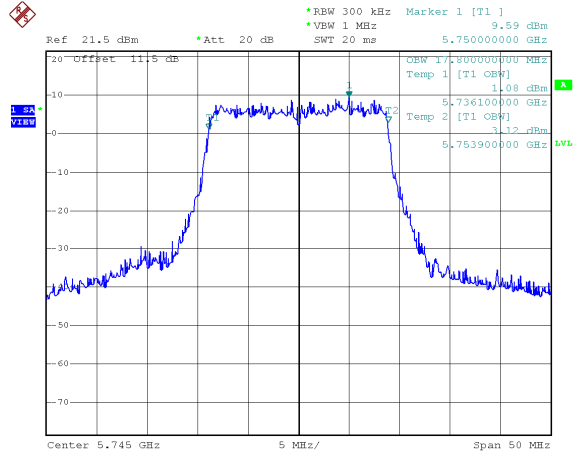
Modulation Standard: 802.11a (6Mbps)

CH149

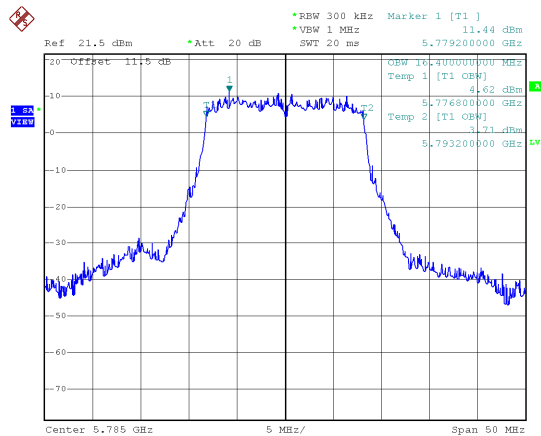


Modulation Standard: 802.11ac, VHT20 (6.5Mbps)

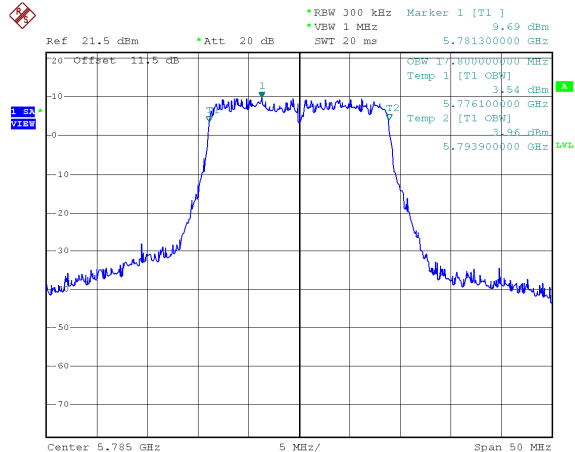
CH149



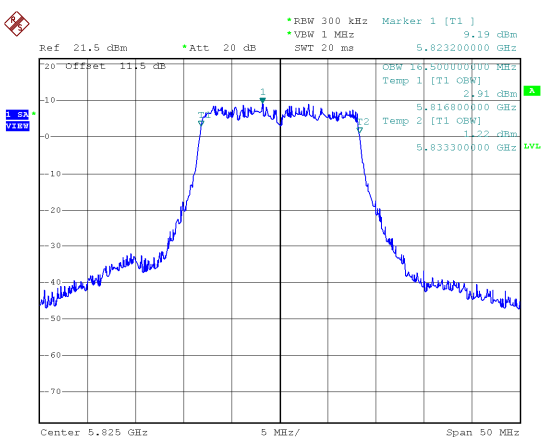
CH157



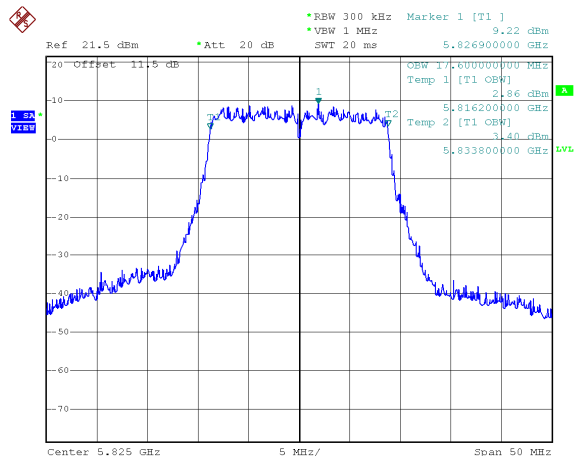
CH157



CH165

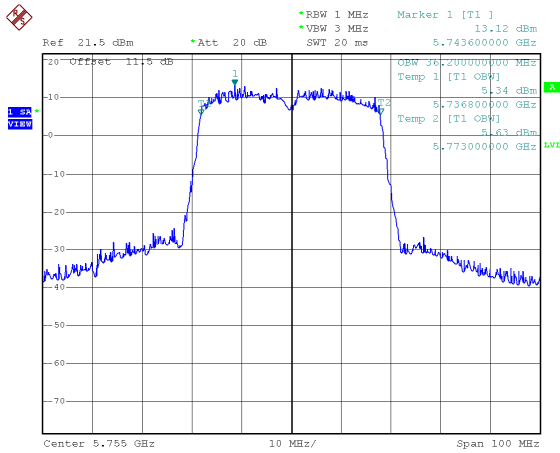


CH165

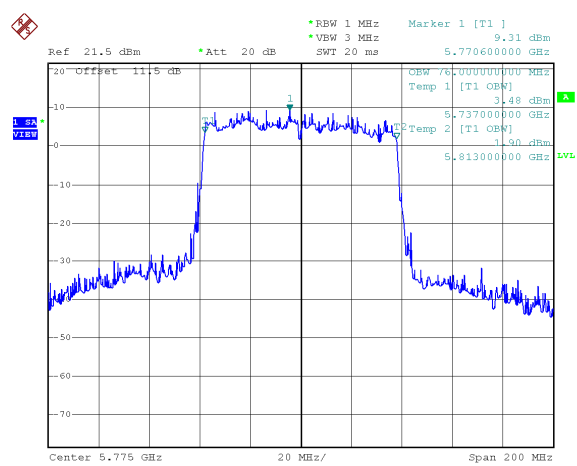




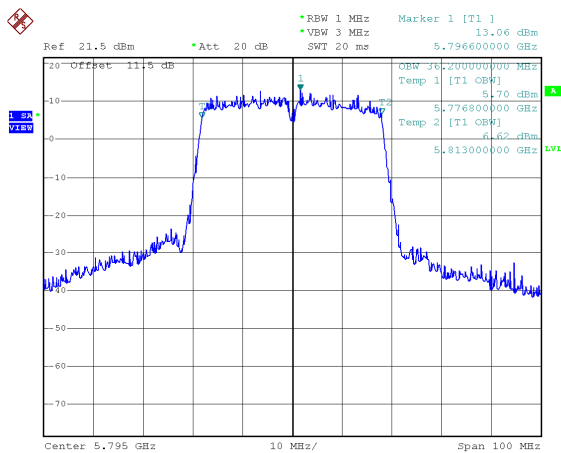
Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151



Modulation Standard: 802.11ac, VHT80 (29.3Mbps)
CH155



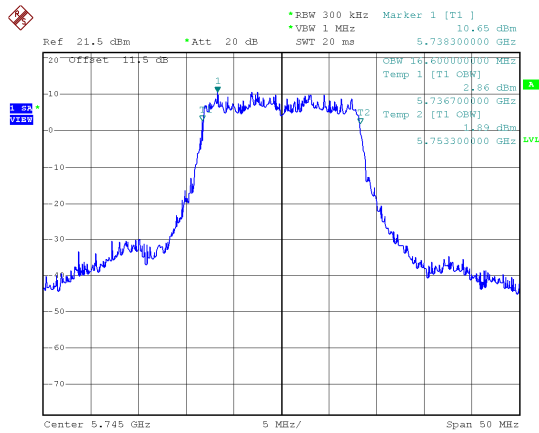
CH159



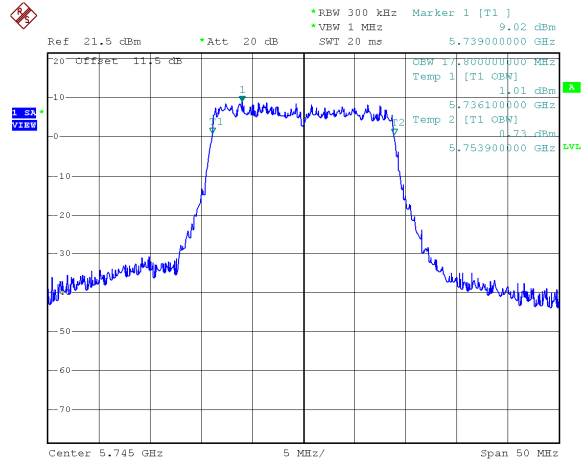


ANT B

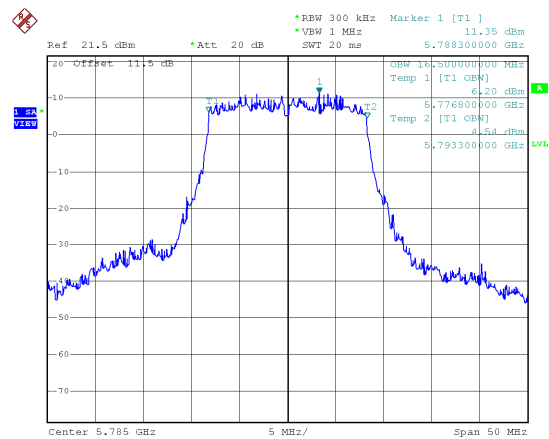
Modulation Standard: 802.11a (6Mbps)
CH149



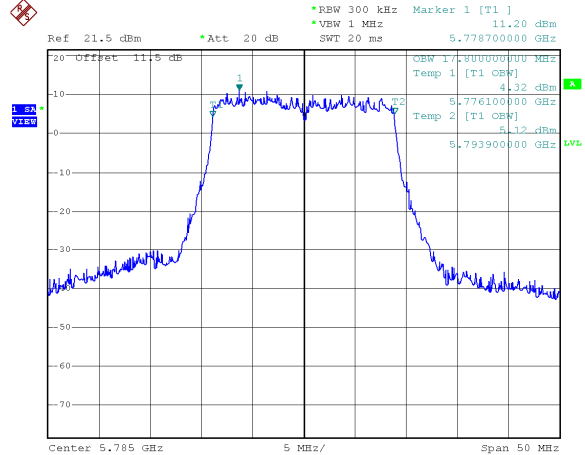
Modulation Standard: 802.11ac, VHT20 (6.5Mbps)
CH149



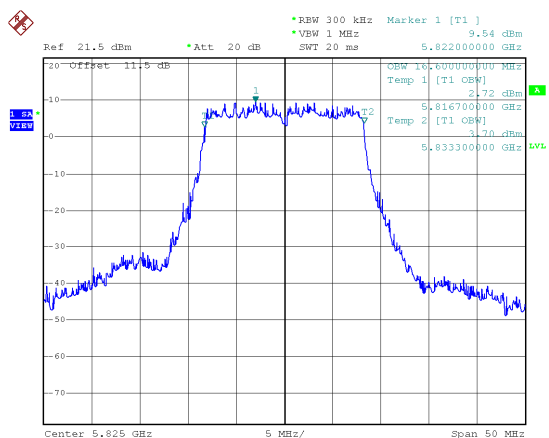
CH157



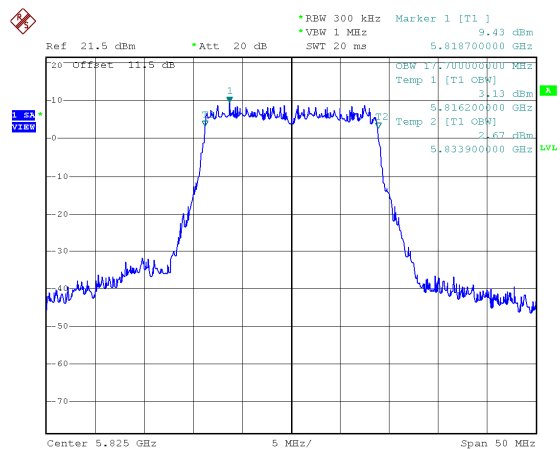
CH157



CH165



CH165







9. 26dB Bandwidth & 99% Bandwidth

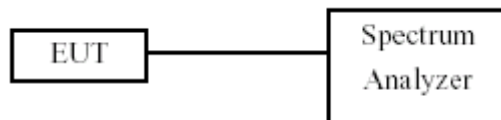
9.1. Test Limit

None; for reporting purposes only.

9.2. Test Procedure

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW = approximately 1% of the emission bandwidth, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

9.3. Test Setup Layout



9.4. Test Result and Data (26dB Bandwidth)

Temperature: 21°C

Humidity: 64%

Test Date: Feb. 08, 2018

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
			ANT A	ANT B
802.11a	36	5180	19.50	19.30
	44	5220	19.50	19.20
	48	5240	19.60	19.20
802.11ac VHT20	36	5180	20.40	20.50
	44	5220	20.40	20.30
	48	5240	20.50	20.30
802.11ac VHT40	38	5190	41.00	41.00
	46	5230	40.80	41.00
802.11ac VHT80	42	5210	83.60	84.00

**9.5. Test Result and Data (99% Bandwidth)**

Temperature: 21°C

Humidity: 64%

Test Date: Feb. 08, 2018

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth (MHz)	
			ANT A	ANT B
802.11a	36	5180	16.50	16.50
	44	5220	16.50	16.60
	48	5240	16.60	16.50
802.11ac VHT20	36	5180	17.80	17.60
	44	5220	17.60	17.60
	48	5240	17.60	17.60
802.11ac VHT40	38	5190	36.20	36.20
	46	5230	36.20	36.20
802.11ac VHT80	42	5210	76.00	76.00

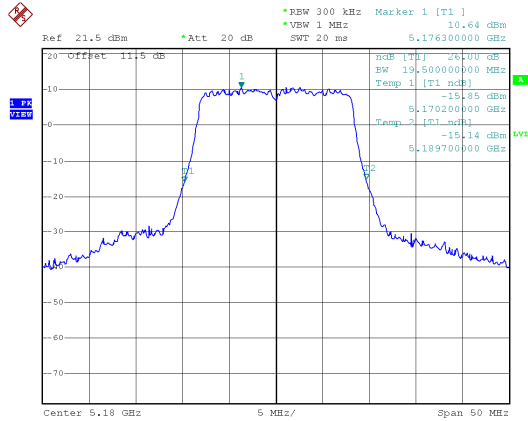


26dB Bandwidth

ANT A

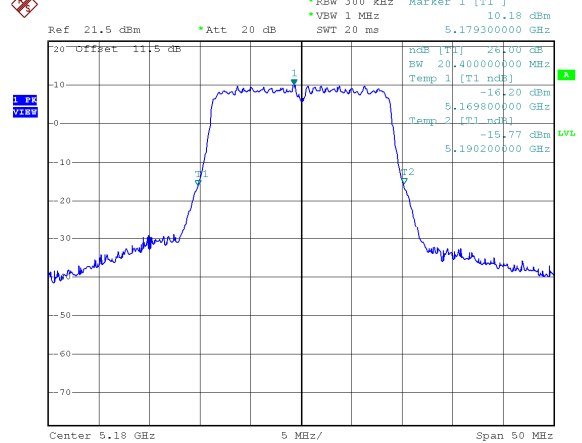
Modulation Standard: 802.11a (6Mbps)

CH36

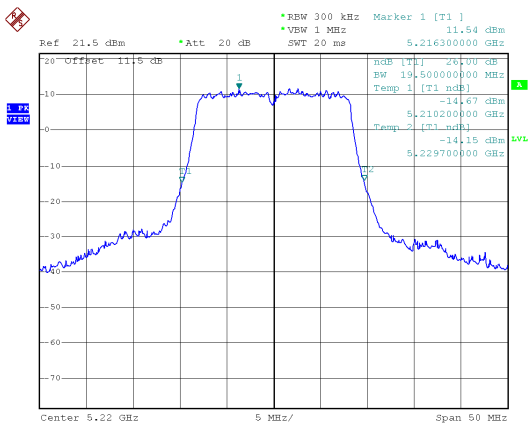


802.11ac VHT20 (6.5Mbps)

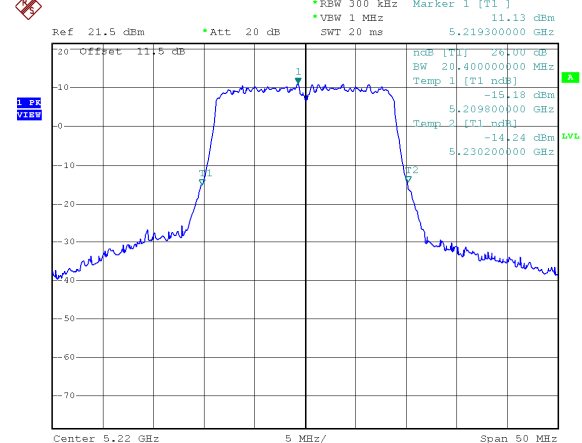
CH36



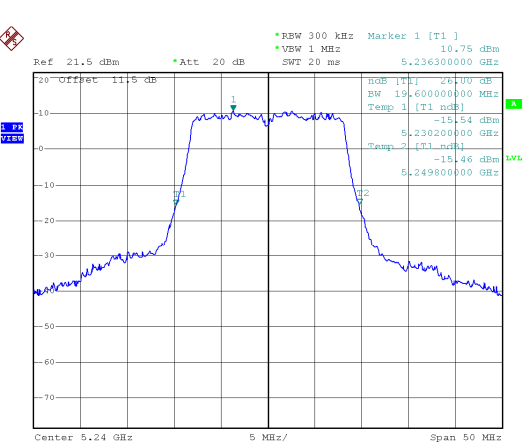
CH44



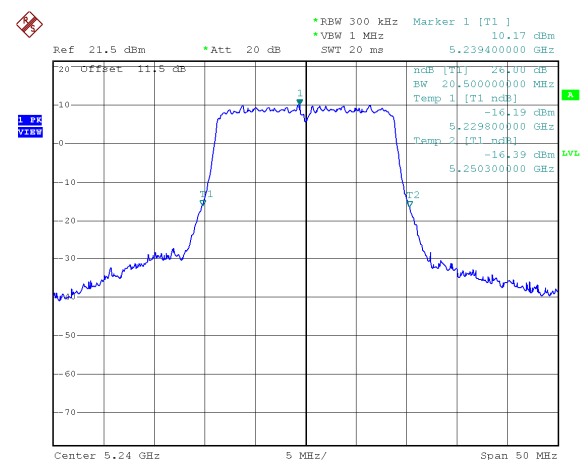
CH44

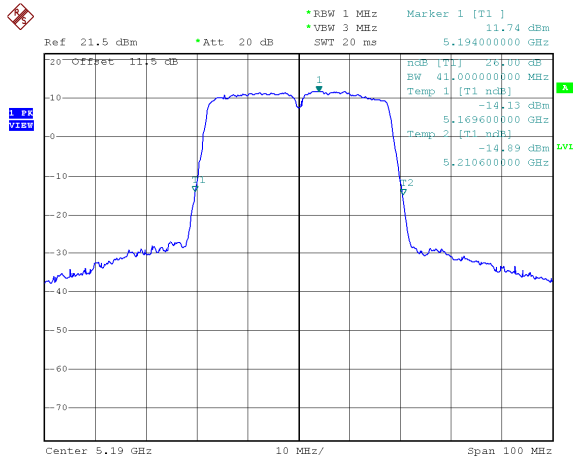
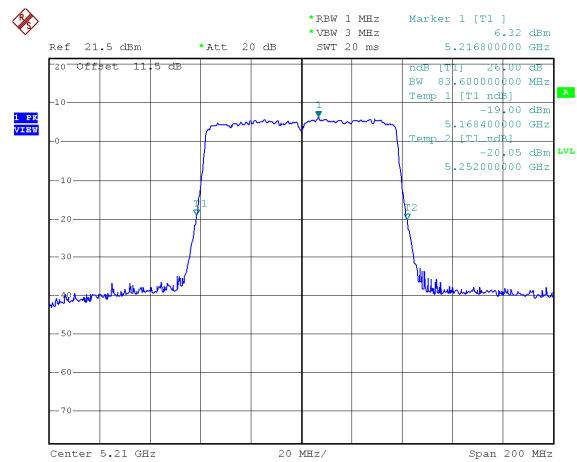


CH48

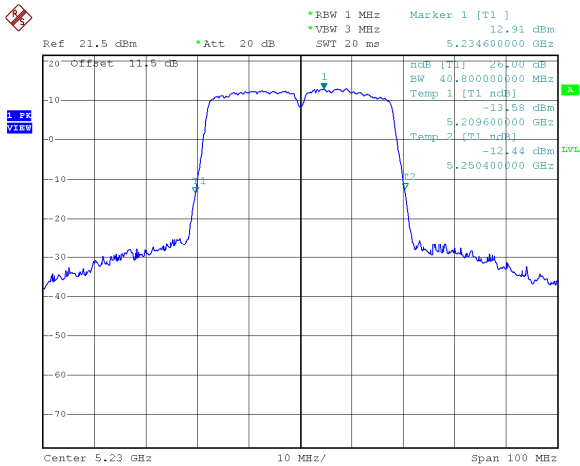


CH48



Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42

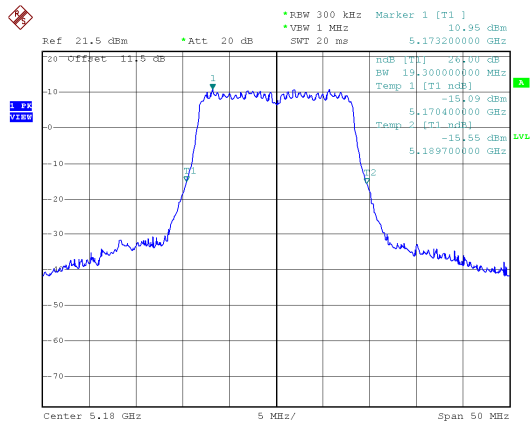
CH46



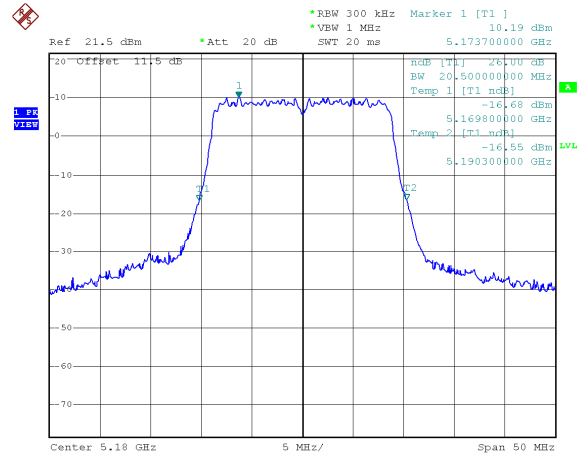


ANT B

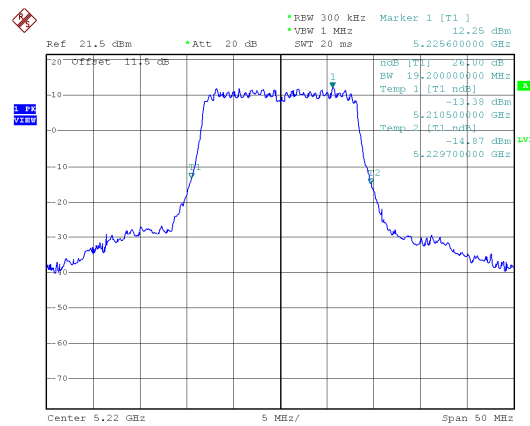
Modulation Standard: 802.11a (6Mbps)
CH36



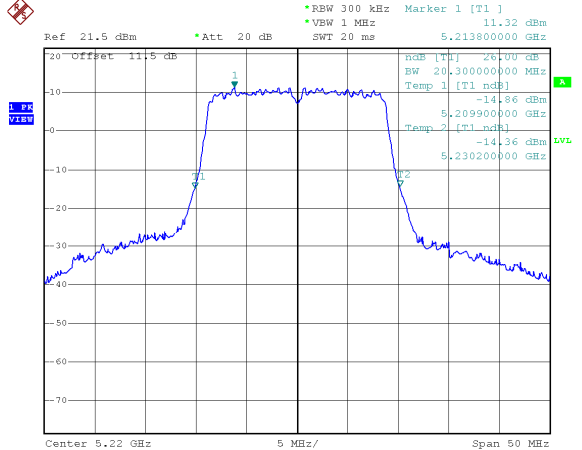
802.11ac VHT20 (6.5Mbps)
CH36



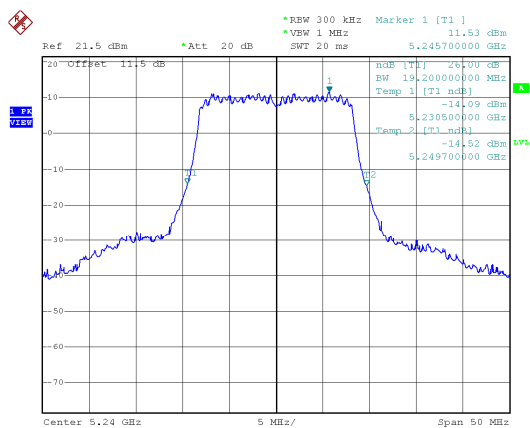
CH44



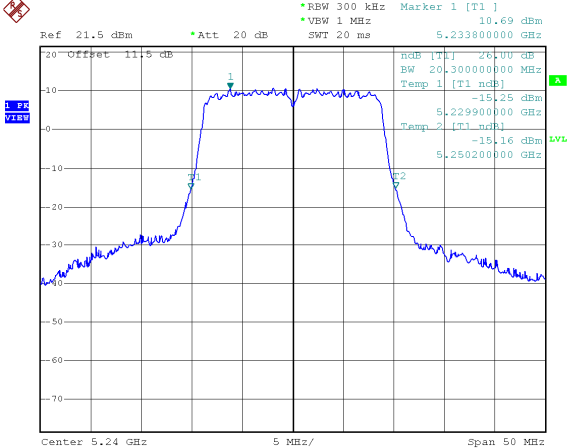
CH44



CH48

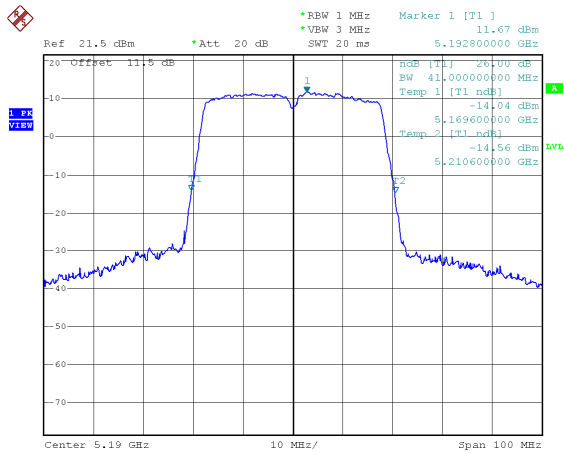


CH48

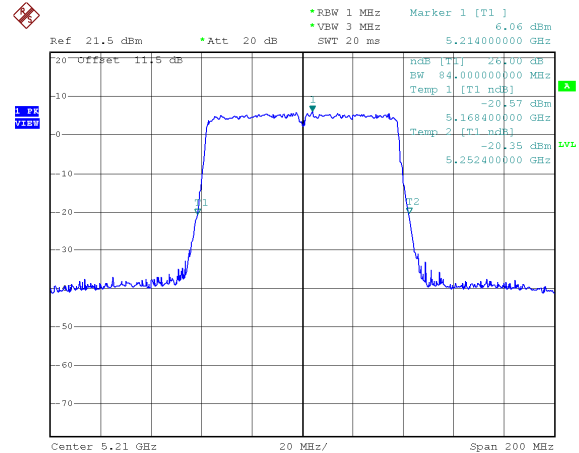




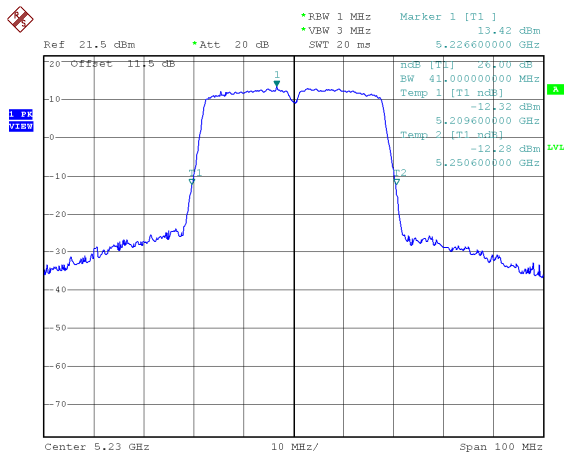
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42



CH46



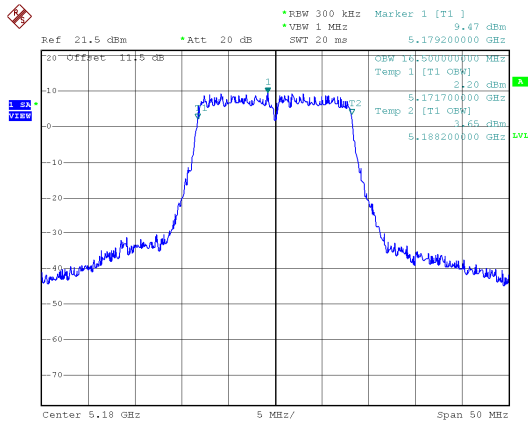


99% Bandwidth

ANT A

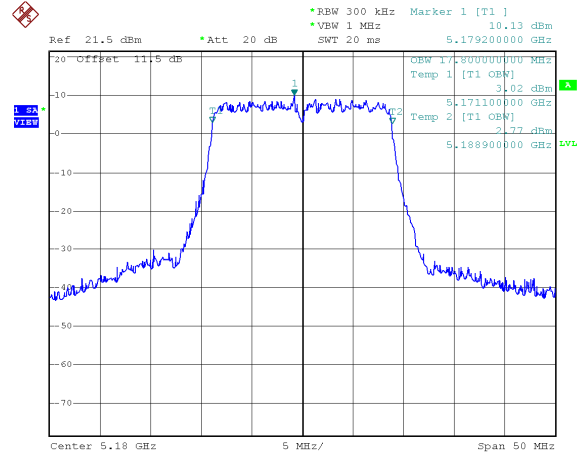
Modulation Standard: 802.11a (6Mbps)

CH36

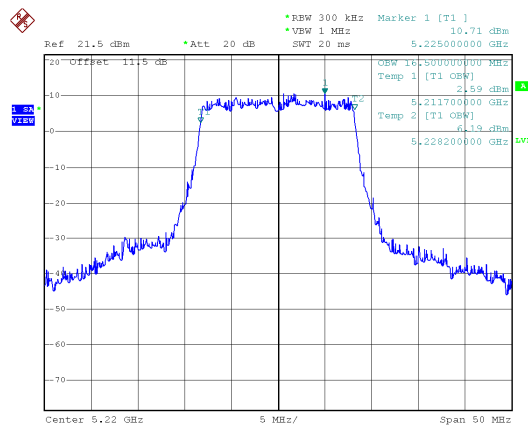


802.11ac VHT20 (6.5Mbps)

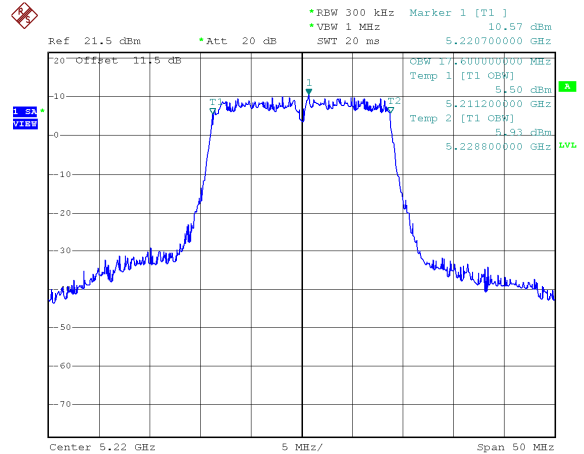
CH36



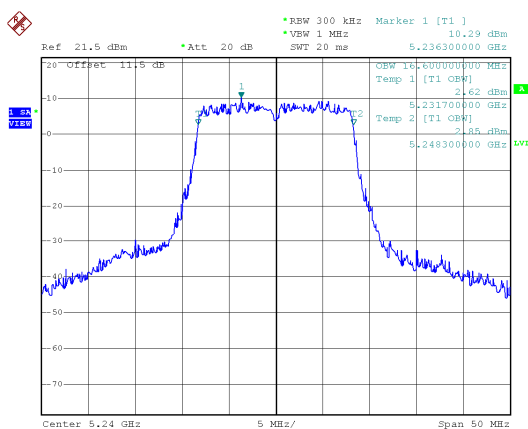
CH44



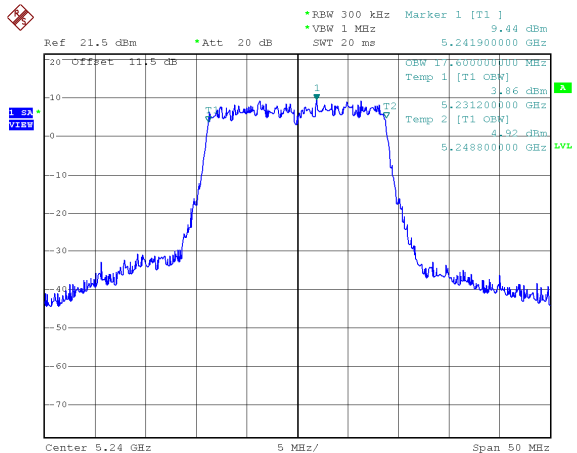
CH44



CH48

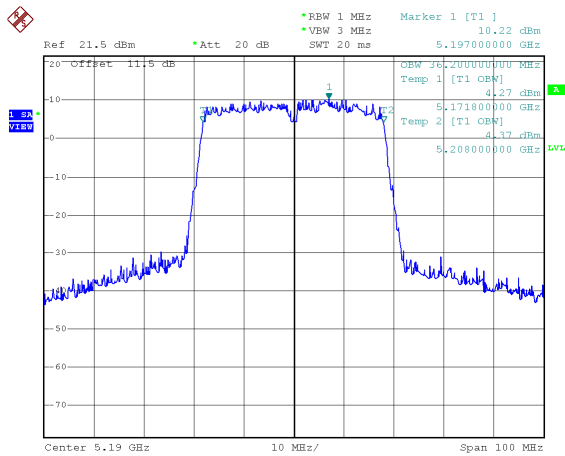


CH48

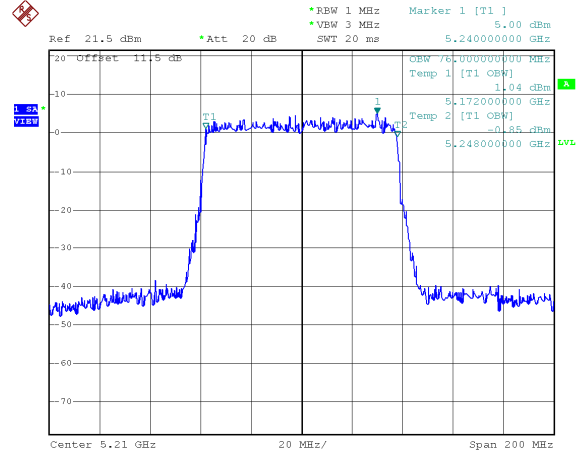




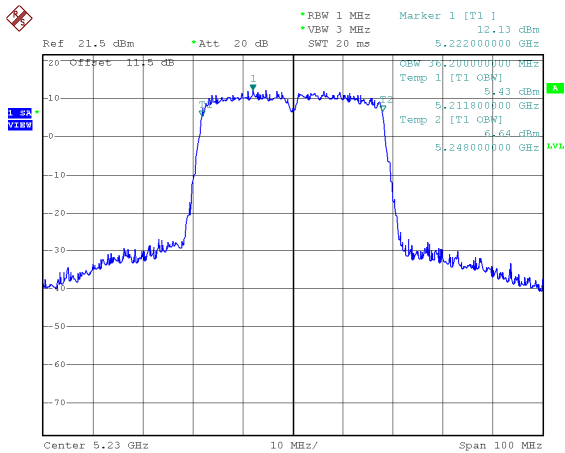
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42



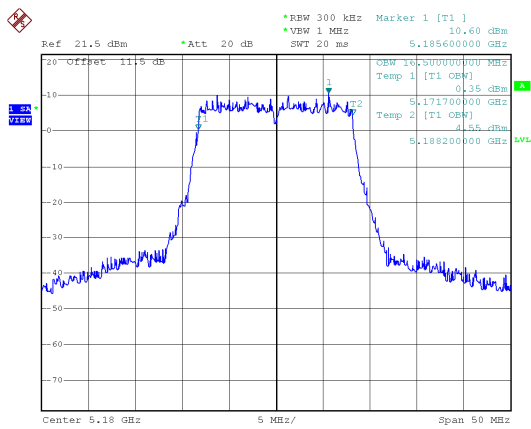
CH46



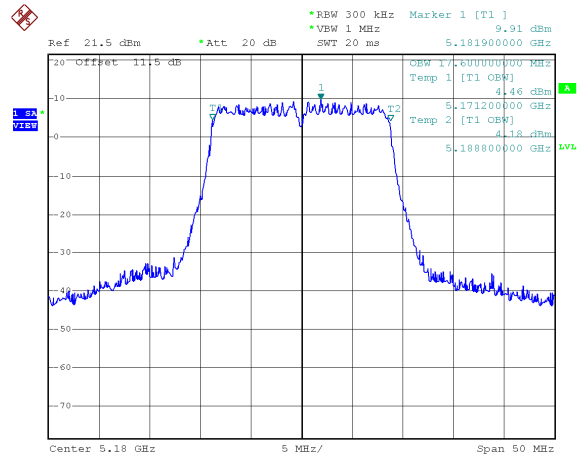


ANT B

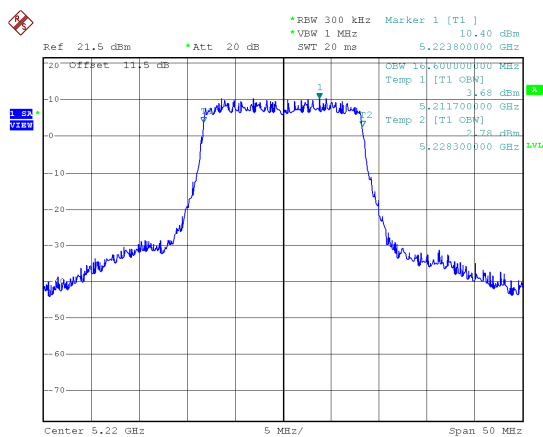
Modulation Standard: 802.11a (6Mbps)
CH36



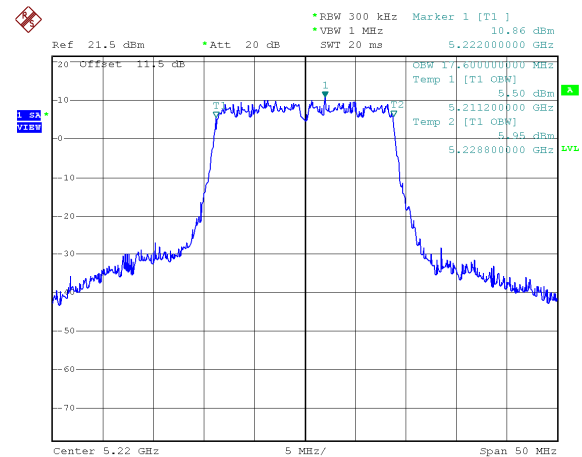
802.11ac VHT20 (6.5Mbps)
CH36



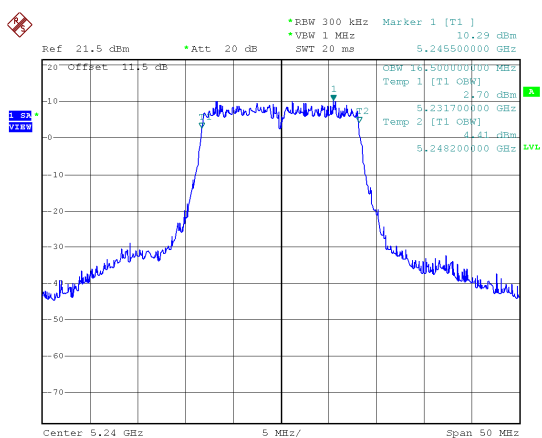
CH44



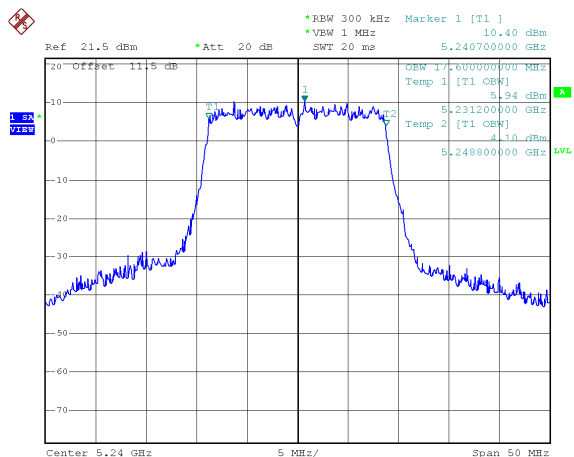
CH44

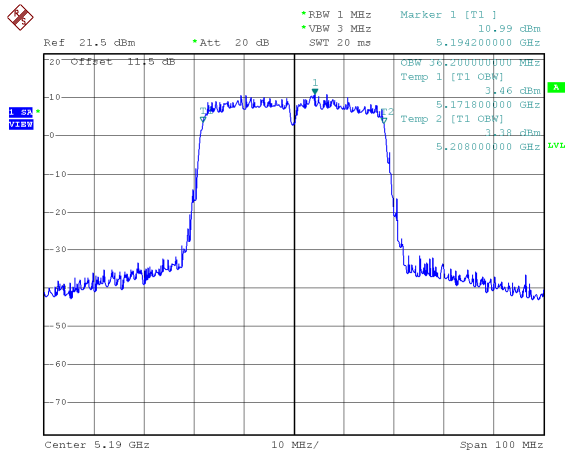
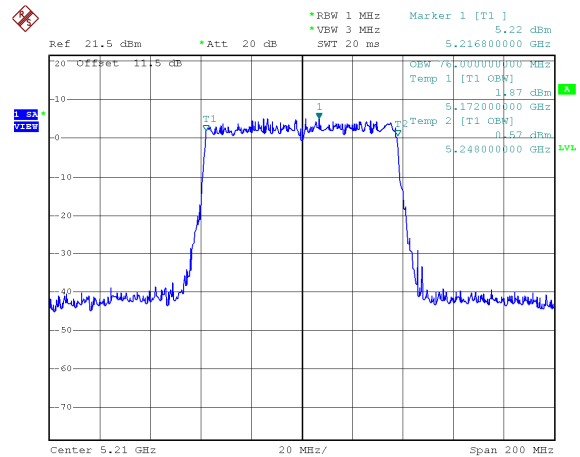


CH48

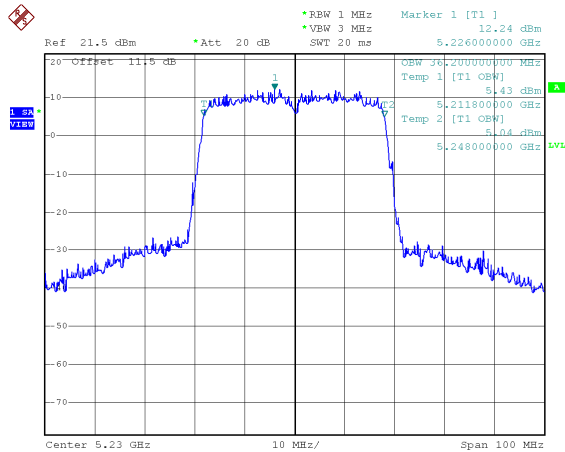


CH48



Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42

CH46





10. Average Power

10.1. Test Limit

Output Power:

Frequency Band		Limit
☒	5.15~5.25GHz	
	Operating Mode	
☐	Outdoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30degrees as measured from the horizon must not exceed 125 mW (21 dBm).
☒	Indoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☐	Fixed point-to-point access points	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
☐	client devices	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



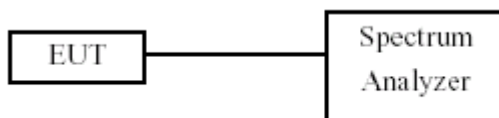
Frequency Band		Limit
☐	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☐	5.470-5.725 GHz	
☒	5.725~5.85 GHz	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

10.2.Test Procedure

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

10.3.Test Setup Layout





10.4. Test Result and Data

Temperature: 21°C
Test Date: Feb. 08, 2018

Humidity: 64%
Test Mode: Non-Beamforming

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B			
802.11a	36	5180	18.76	18.73	21.76	149.81	30.00
	44	5220	19.95	19.93	22.95	197.26	30.00
	48	5240	18.96	19.23	22.11	162.46	30.00
802.11an HT20	36	5180	18.71	18.62	21.68	147.08	30.00
	44	5220	19.82	19.88	22.86	193.21	30.00
	48	5240	18.75	19.03	21.90	154.97	30.00
802.11an HT40	38	5190	17.71	17.79	20.76	119.14	30.00
	46	5230	19.01	19.03	22.03	159.60	30.00
802.11ac VHT20	36	5180	18.74	18.66	21.71	148.27	30.00
	44	5220	19.86	19.98	22.93	196.37	30.00
	48	5240	18.83	19.12	21.99	158.04	30.00
802.11ac VHT40	38	5190	17.79	17.85	20.83	121.07	30.00
	46	5230	19.07	19.11	22.10	162.19	30.00
802.11ac VHT80	42	5210	15.22	15.18	18.21	66.23	30.00

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B			
802.11a	149	5745	18.51	18.27	21.40	138.10	30.00
	157	5785	19.67	19.97	22.83	191.99	30.00
	165	5825	19.11	18.61	21.88	154.08	30.00
802.11an HT20	149	5745	17.91	18.15	21.04	127.11	30.00
	157	5785	19.36	19.71	22.55	179.84	30.00
	165	5825	18.48	18.99	21.75	149.72	30.00
802.11an HT40	151	5755	19.03	19.25	22.15	164.12	30.00
	159	5795	19.13	19.54	22.35	171.80	30.00
802.11ac VHT20	149	5745	17.97	18.23	21.11	129.19	30.00
	157	5785	19.44	19.78	22.62	182.96	30.00
	165	5825	18.53	19.05	21.81	151.64	30.00
802.11ac VHT40	151	5755	19.13	19.33	22.24	167.55	30.00
	159	5795	19.21	19.62	22.43	174.99	30.00
802.11ac VHT80	155	5775	18.99	19.1	22.06	160.53	30.00



Temperature: 21°C
Test Date: Feb. 08, 2018

Humidity: 64%
Test Mode: Beamforming

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B			
802.11a	36	5180	15.75	15.72	18.75	74.91	28.49
	44	5220	16.94	16.92	19.94	98.64	28.49
	48	5240	15.95	16.22	19.10	81.23	28.49
802.11an HT20	36	5180	15.7	15.61	18.67	73.55	28.49
	44	5220	16.81	16.87	19.85	96.61	28.49
	48	5240	15.74	16.02	18.89	77.49	28.49
802.11an HT40	38	5190	14.7	14.78	17.75	59.57	28.49
	46	5230	16	16.02	19.02	79.81	28.49
802.11ac VHT20	36	5180	15.73	15.65	18.70	74.14	28.49
	44	5220	16.85	16.97	19.92	98.19	28.49
	48	5240	15.82	16.11	18.98	79.03	28.49
802.11ac VHT40	38	5190	14.78	14.84	17.82	60.54	28.49
	46	5230	16.06	16.1	19.09	81.10	28.49
802.11ac VHT80	42	5210	12.21	12.17	15.20	33.12	28.49

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B			
802.11a	149	5745	15.5	15.26	18.39	69.06	28.44
	157	5785	16.66	16.96	19.82	96.00	28.44
	165	5825	16.1	15.6	18.87	77.05	28.44
802.11an HT20	149	5745	14.9	15.14	18.03	63.56	28.44
	157	5785	16.35	16.7	19.54	89.93	28.44
	165	5825	15.47	15.98	18.74	74.86	28.44
802.11an HT40	151	5755	16.02	16.24	19.14	82.07	28.44
	159	5795	16.12	16.53	19.34	85.90	28.44
802.11ac VHT20	149	5745	14.96	15.22	18.10	64.60	28.44
	157	5785	16.43	16.77	19.61	91.49	28.44
	165	5825	15.52	16.04	18.80	75.82	28.44
802.11ac VHT40	151	5755	16.12	16.32	19.23	83.78	28.44
	159	5795	16.2	16.61	19.42	87.50	28.44
802.11ac VHT80	155	5775	15.98	16.09	19.05	80.27	28.44



11. PPSD

11.1. Test Limit

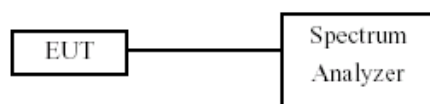
PSD:

Frequency Band		Limit
☒	5.15~5.25GHz	
	Operating Mode	
☐	Outdoor access point	17 dBm/MHz
☒	Indoor access point	17 dBm/MHz
☐	Fixed point-to-point access points	17 dBm/MHz
☐	client devices	11 dBm/MHz
☐	5.725~5.85 GHz	11 dBm/MHz
☐	5.470-5.725 GHz	11 dBm/MHz
☒	5.725~5.85 GHz	30 dBm/500kHz

11.2. Test Procedure

Reference to KDB789033 D02 General UNII Test Procedures New Rules v02r01

11.3. Test Setup Layout



**11.4. Test Result and Data**

Temperature: 21°C

Humidity: 64%

Test Date: Feb. 08, 2018

In the 5.2G Band

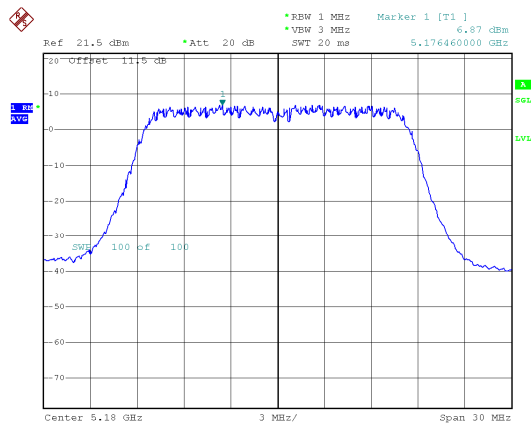
Modulation Type	CH	Freq. (MHz)	Meas PPSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PPSD (dBm/MHz)	PPSD Limit (dBm/MHz)
			ANT A	ANT B				
802.11a	36	5180	6.87	6.86	9.88	0.00	9.88	15.49
	44	5220	8.02	7.74	10.89	0.00	10.89	15.49
	48	5240	7.12	7.16	10.15	0.00	10.15	15.49
802.11ac VHT20	36	5180	6.68	6.55	9.63	0.00	9.63	15.49
	44	5220	7.67	7.80	10.75	0.00	10.75	15.49
	48	5240	6.71	7.08	9.91	0.00	9.91	15.49
802.11ac VHT40	38	5190	2.93	2.77	5.86	0.00	5.86	15.49
	46	5230	4.08	4.22	7.16	0.00	7.16	15.49
802.11ac VHT80	42	5210	-2.97	-3.55	-0.24	0.22	-0.02	15.49

In the 5.8G Band

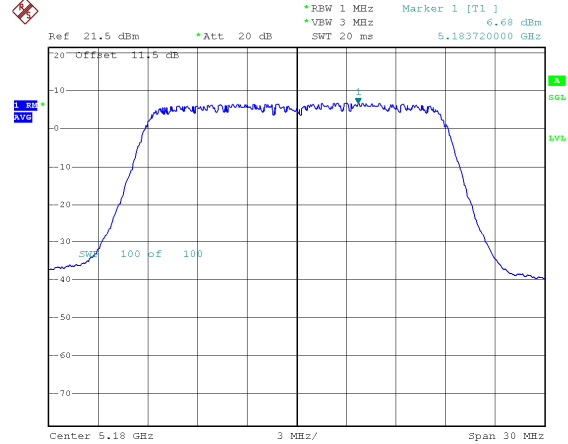
Modulation Type	CH	Freq. (MHz)	Meas PPSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	10log(500K Hz/RBW) CF (dB)	Total Corr'd PPSD (dBm/500kHz)	PPSD Limit (dBm/500kHz)
			ANT A	ANT B					
802.11a	149	5745	7.23	7.36	10.31	0.00	-3.01	7.30	28.44
	157	5785	8.12	8.53	11.34	0.00	-3.01	8.33	28.44
	165	5825	6.98	7.45	10.23	0.00	-3.01	7.22	28.44
802.11ac VHT20	149	5745	7.22	6.85	10.05	0.00	-3.01	7.04	28.44
	157	5785	7.99	8.21	11.11	0.00	-3.01	8.10	28.44
	165	5825	6.41	6.99	9.72	0.00	-3.01	6.71	28.44
802.11ac VHT40	155	5755	5.18	5.02	8.11	0.00	-3.01	5.10	28.44
	159	5795	4.84	4.95	7.91	0.00	-3.01	4.90	28.44
802.11ac VHT80	155	5775	1.72	1.65	4.70	0.22	-3.01	1.91	28.44



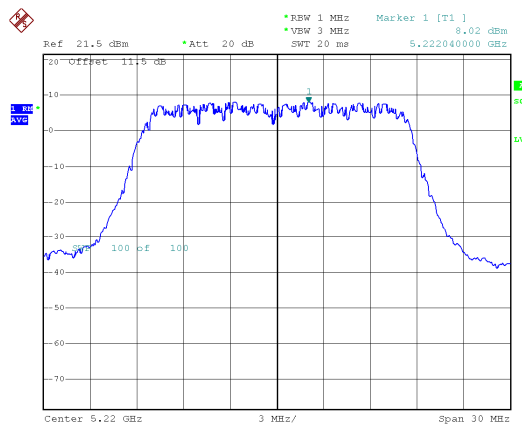
5.2G Band 1, ANT A
Modulation Standard: 802.11a (6Mbps)
CH36



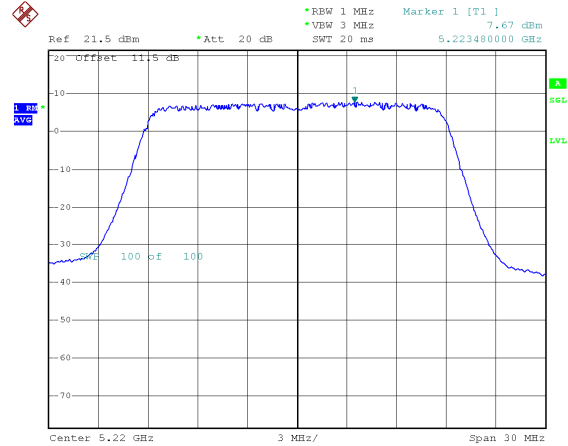
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH36



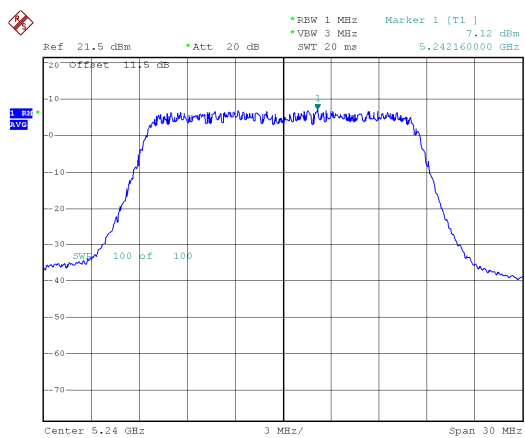
CH44



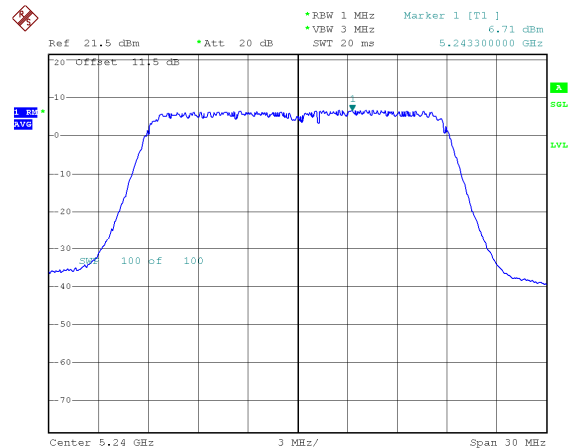
CH44



CH48

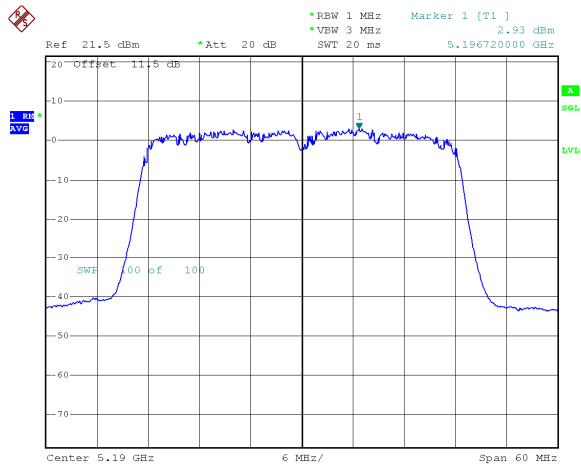


CH48

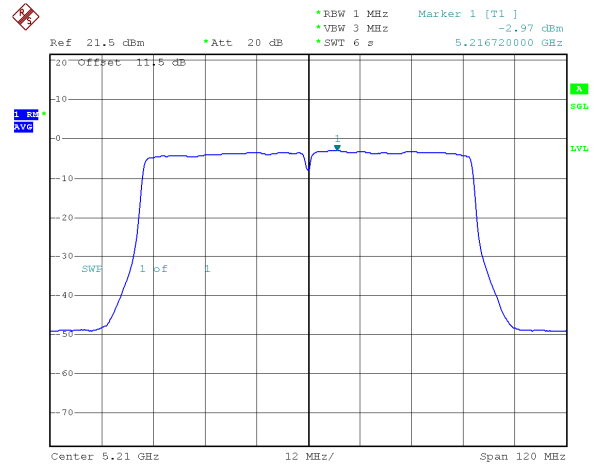




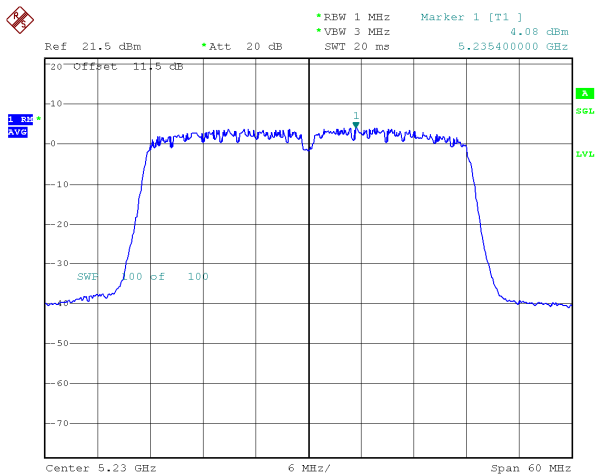
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42

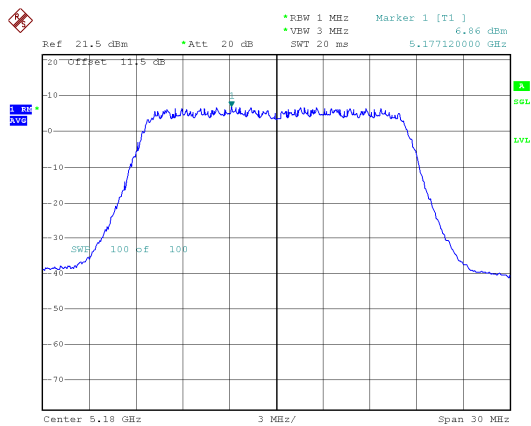


CH46

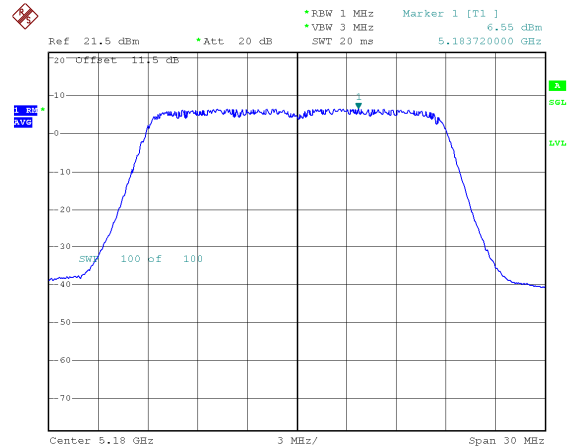




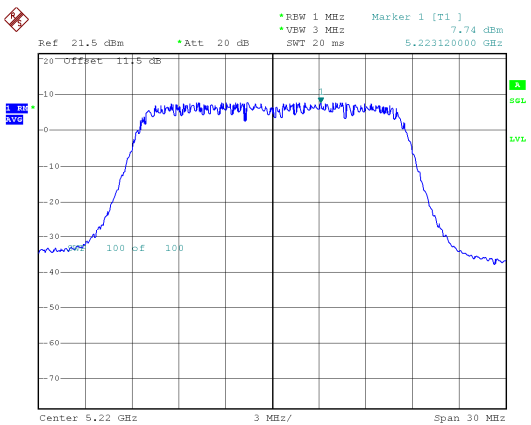
5.2G Band 1, ANT B
Modulation Standard: 802.11a (6Mbps)
CH36



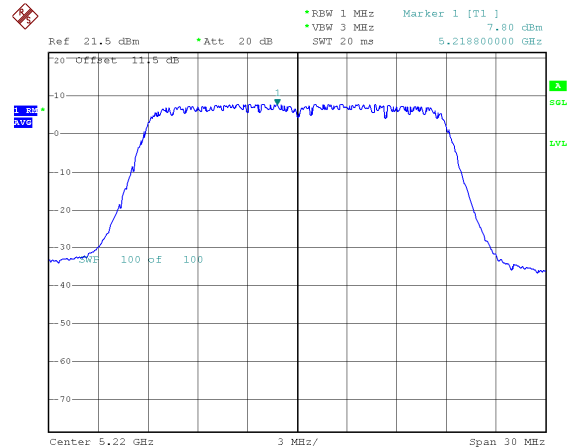
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH36



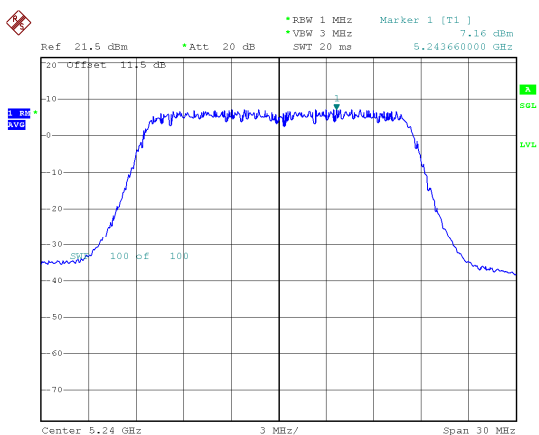
CH44



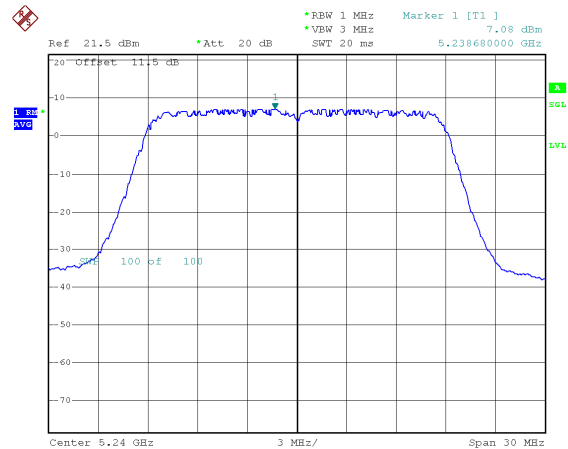
CH44



CH48

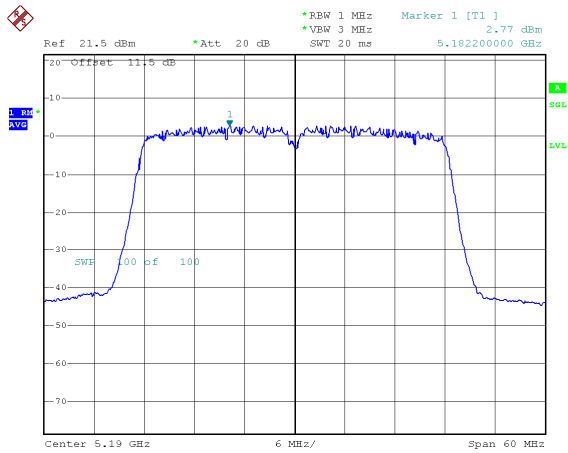


CH48

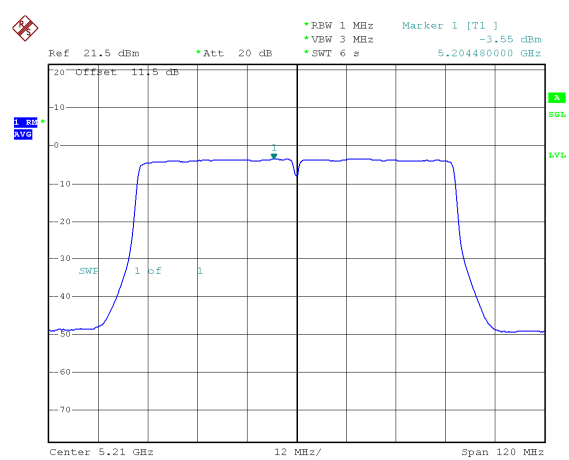




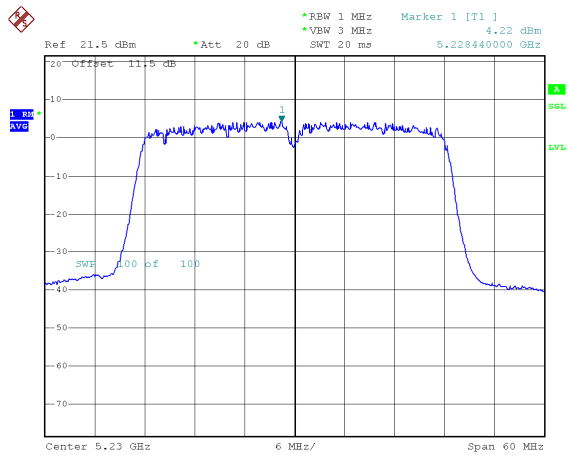
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42

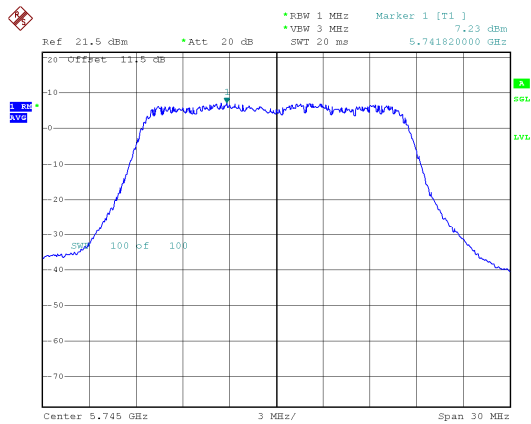


CH46

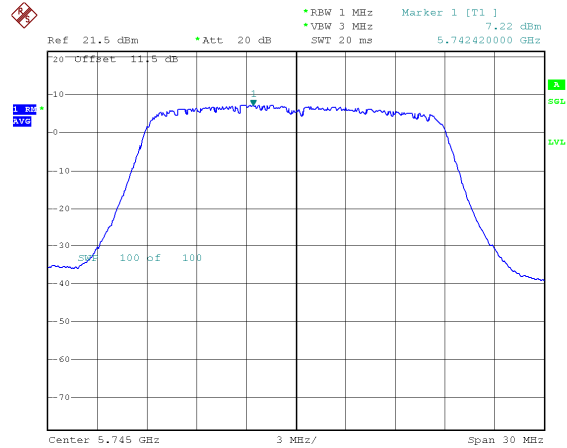




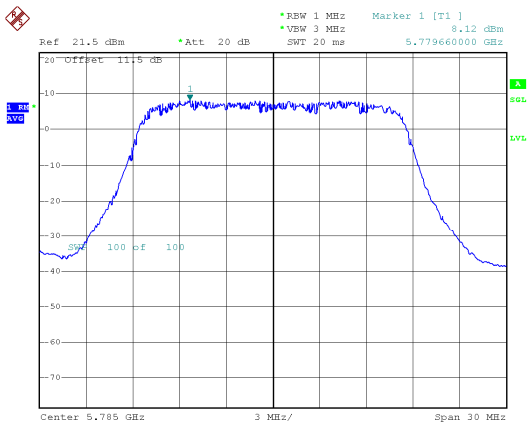
5.8G Band 4, ANT A
Modulation Standard: 802.11a (6Mbps)
CH149



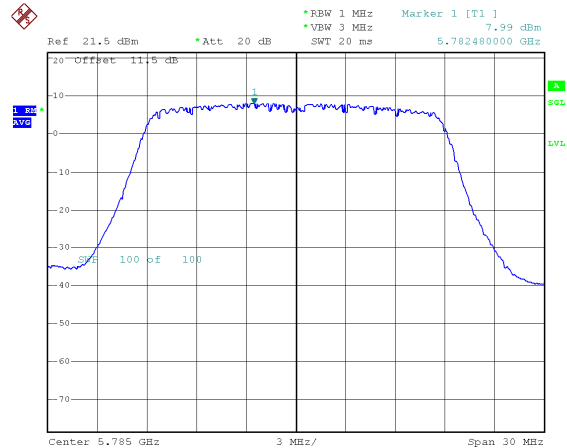
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH149



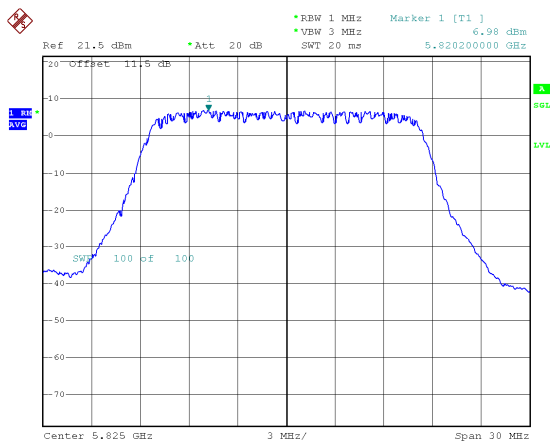
CH157



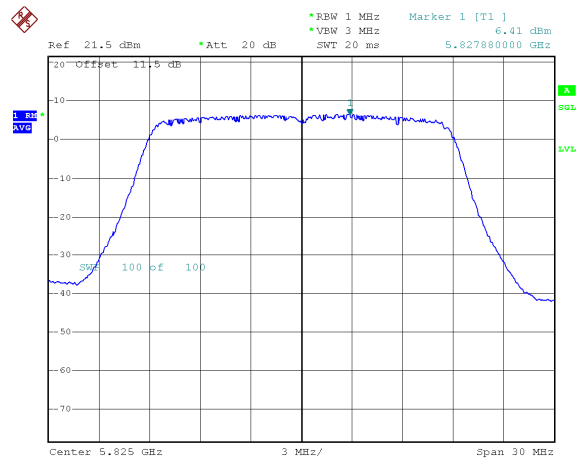
CH157



CH165

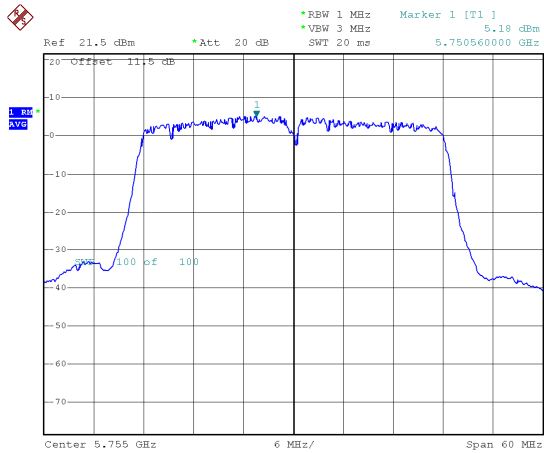


CH165

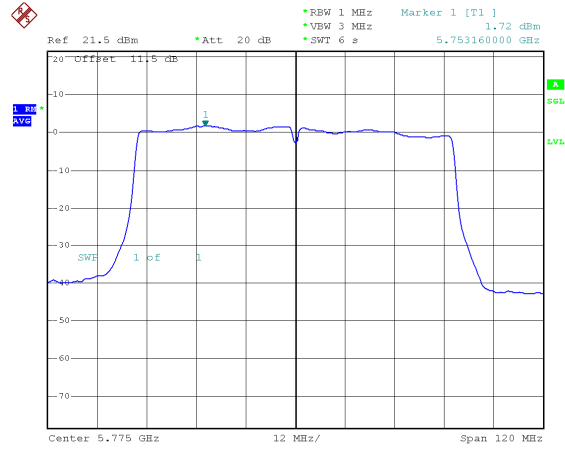




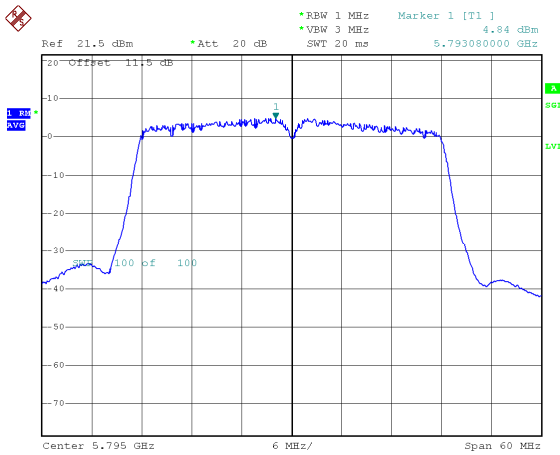
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH151



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH155

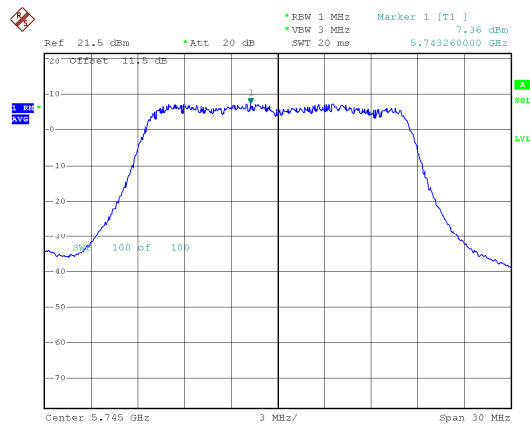


CH159

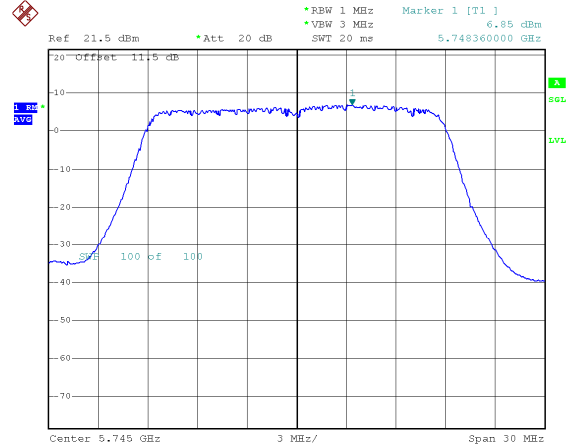




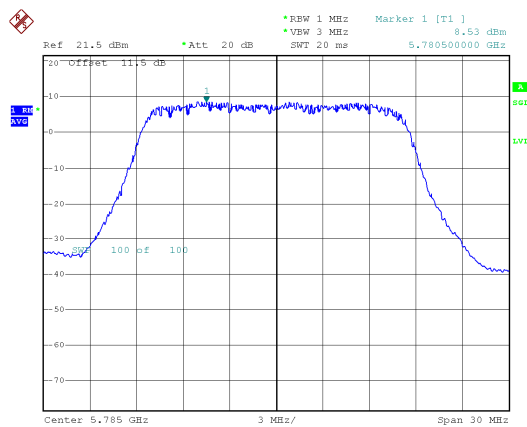
5.8G Band 4, ANT B
Modulation Standard: 802.11a (6Mbps)
CH149



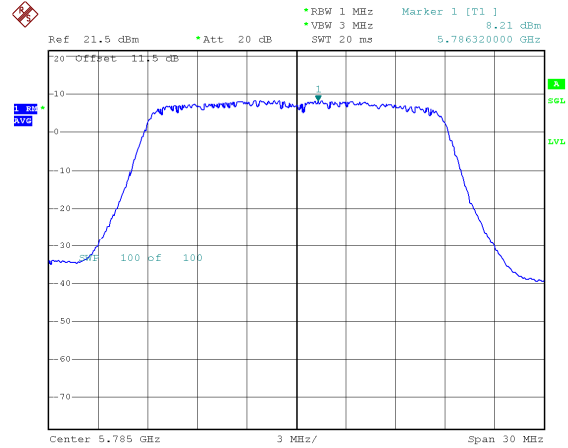
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH149



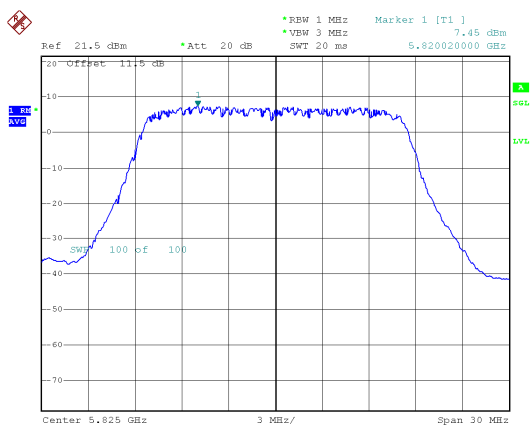
CH157



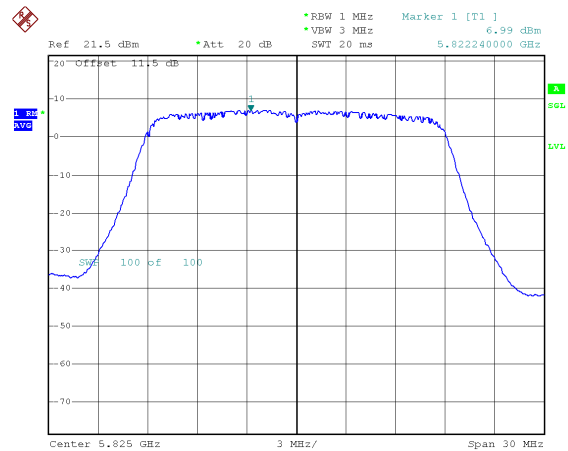
CH157



CH165

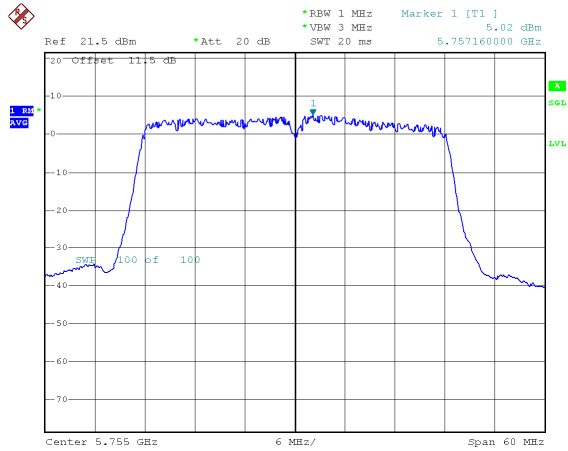


CH165

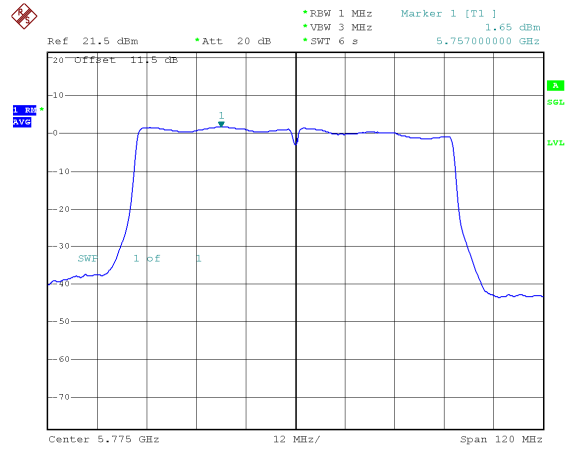




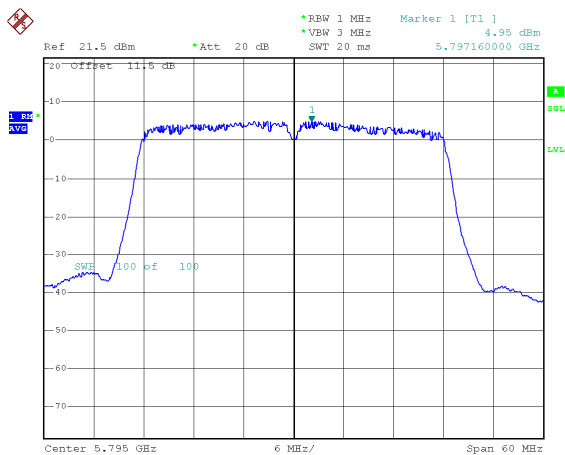
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH151



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH155



CH159



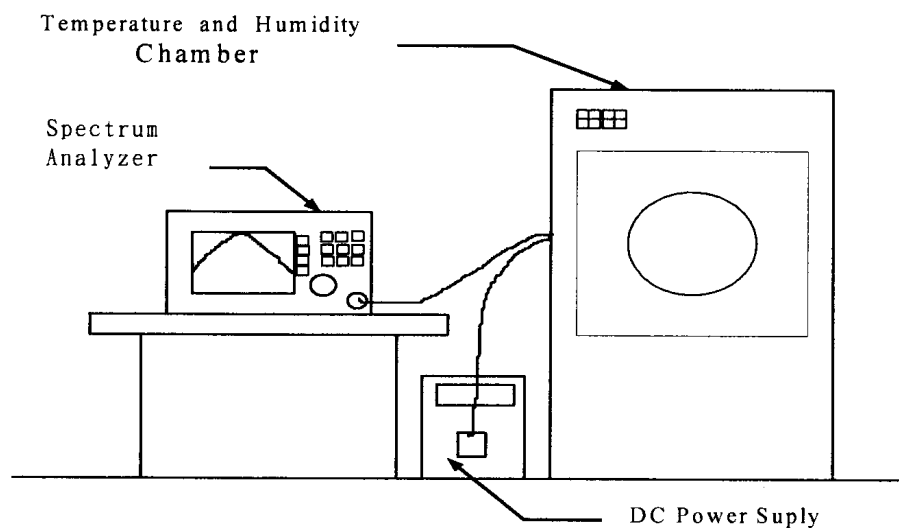


12. Frequency Stability

12.1. Test Procedure

1. The EUT was placed inside the Temperature and Humidity chamber.
2. The transmitter output was connected to spectrum analyzer.
3. Turn the EUT on and couple its output to a spectrum analyzer.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
6. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
7. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

12.2. Test Setup Layout



**12.3. Test Result and Data**

Temperature: 21°C

Humidity: 64%

Test Date: Feb. 09, 2018

Operating frequency: 5220 MHz							
Temp	Power supply	2 minute		5 minute		10 minute	
(°C)	(V)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	102	5220.0042	0.000080	5220.0039	0.000075	5220.0038	0.000732
	120	5220.0071	0.000136	5220.0069	0.000133	5220.0068	0.001309
	138	5220.0045	0.000086	5220.0043	0.000083	5220.0043	0.000827
40	102	5220.0052	0.000099	5220.0052	0.000100	5220.0056	0.001069
	120	5220.0036	0.000069	5220.0038	0.000073	5220.0042	0.000802
	138	5220.0073	0.000139	5220.0075	0.000143	5220.0077	0.001480
30	102	5220.0076	0.000146	5220.0077	0.000148	5220.0076	0.001453
	120	5220.0061	0.000117	5220.0060	0.000114	5220.0059	0.001128
	138	5220.0086	0.000165	5220.0086	0.000165	5220.0086	0.001645
20	102	5220.0074	0.000141	5220.0074	0.000142	5220.0075	0.001432
	120	5220.0052	0.000099	5220.0049	0.000093	5220.0053	0.001007
	138	5220.0077	0.000148	5220.0076	0.000146	5220.0076	0.001452
10	102	5220.0047	0.000091	5220.0045	0.000086	5220.0046	0.000873
	120	5220.0054	0.000104	5220.0058	0.000112	5220.0062	0.001178
	138	5220.0050	0.000096	5220.0051	0.000097	5220.0053	0.001020
0	102	5220.0073	0.000140	5220.0073	0.000140	5220.0075	0.001432
	120	5220.0073	0.000140	5220.0071	0.000135	5220.0076	0.001447
	138	5220.0059	0.000113	5220.0057	0.000109	5220.0056	0.001080
-10	102	5220.0079	0.000152	5220.0082	0.000158	5220.0084	0.001613
	120	5220.0076	0.000146	5220.0078	0.000149	5220.0082	0.001570
	138	5220.0075	0.000143	5220.0073	0.000139	5220.0076	0.001453
-20	102	5220.0085	0.000162	5220.0087	0.000167	5220.0092	0.001770
	120	5220.0076	0.000146	5220.0074	0.000141	5220.0077	0.001479
	138	5220.0078	0.000150	5220.0079	0.000151	5220.0084	0.001602
-30	102	5220.0085	0.000162	5220.0086	0.000165	5220.0090	0.001732
	120	5220.0080	0.000153	5220.0079	0.000151	5220.0080	0.001541
	138	5220.0086	0.000165	5220.0084	0.000161	5220.0085	0.001619

Limit:

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.



13. Automatically Discontinue Transmission

13.1.Limit of Automatically Discontinue Transmission

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 signaling 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 to describe how this requirement is met.

13.2.Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.



14. Radio Frequency Exposure

14.1.Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in FCC Part 2 (Section 2.1091)

KDB 447498

14.2.EUT Specification

Frequency band (Operating)	☒ WLAN: 2412MHz ~ 2462MHz ☒ WLAN: 5150MHz ~ 5250MHz ☐ WLAN: 5250MHz ~ 5350MHz ☐ WLAN: 5470MHz ~ 5725MHz ☒ WLAN: 5725MHz ~ 5850MHz ☐ Bluetooth: 2402MHz ~ 2480MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:

1. The maximum output power is 22.95dBm (197.26mW) at 5220MHz (with numeric 4.81 antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.

14.3.Test Results

No non-compliance noted.



14.4.Calculation

$$\text{Given } E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$P \text{ (mW)} = P \text{ (W)} / 1000$ and

$d \text{ (cm)} = d \text{ (m)} / 100$

Yields

$$S = \frac{30 \times (P / 1000) \times G}{3770 \times (d / 100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²



14.5. Maximum Permissible Exposure

Max. output power	Non-Beamforming Band: 5150MHz ~ 5250MHz 802.11a: 22.95 dBm (197.26mW) 802.11an HT20: 22.86 dBm (193.21mW) 802.11an HT40: 22.03 dBm (159.60mW) 802.11ac VHT20: 22.93 dBm (196.37mW) 802.11ac VHT40: 22.10 dBm (162.19mW) 802.11ac VHT80: 18.21 dBm (66.23mW)
	Band: 5725MHz ~ 5850MHz 802.11a: 22.83 dBm (191.99mW) 802.11an HT20: 22.55 dBm (179.84mW) 802.11an HT40: 22.35 dBm (171.80mW) 802.11ac VHT20: 22.62 dBm (182.96mW) 802.11ac VHT40: 22.43 dBm (174.99mW) 802.11ac VHT80: 22.06 dBm (160.53mW)
	Beamforming Band: 5150MHz ~ 5250MHz 802.11a: 19.94 dBm (98.64mW) 802.11an HT20: 19.85 dBm (96.61mW) 802.11an HT40: 19.34 dBm (79.81mW) 802.11ac VHT20: 19.92 dBm (98.19mW) 802.11ac VHT40: 19.09 dBm (81.10mW) 802.11ac VHT80: 15.20 dBm (33.12mW)
Antenna gain (Max)	Band: 5725MHz ~ 5850MHz 802.11a: 19.82 dBm (96.00mW) 802.11an HT20: 19.54 dBm (89.93mW) 802.11an HT40: 19.34 dBm (85.90mW) 802.11ac VHT20: 19.61 dBm (91.49mW) 802.11ac VHT40: 19.42 dBm (87.50mW) 802.11ac VHT80: 19.05 dBm (80.27mW)
	5150MHz-5250MHz: ANT A: 4.18 dBi ; ANT B: 4.81 dBi 5725MHz-5850MHz: ANT A: 4.9 dBi ; ANT B: 4.18 dBi

**Maximum Permissible Exposure (Non-Beamforming)**

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm ²)	Limit (mW/cm ²)
802.11a	5150-5250	22.95	4.81	20	0.1188	1
802.11a	5725-5850	22.83	4.9	20	0.1180	1
802.11an HT20	5150-5250	22.86	4.81	20	0.1164	1
802.11an HT20	5725-5850	22.55	4.9	20	0.1106	1
802.11an HT40	5150-5250	22.03	4.81	20	0.0961	1
802.11an HT40	5725-5850	22.35	4.9	20	0.1056	1
802.11ac VHT20	5150-5250	22.93	4.81	20	0.1183	1
802.11ac VHT20	5725-5850	22.62	4.9	20	0.1125	1
802.11ac VHT40	5150-5250	22.10	4.81	20	0.0977	1
802.11ac VHT40	5725-5850	22.43	4.9	20	0.1076	1
802.11ac VHT80	5150-5250	18.21	4.81	20	0.0399	1
802.11ac VHT80	5725-5850	22.06	4.9	20	0.0987	1

Maximum Permissible Exposure (Beamforming)

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm ²)	Limit (mW/cm ²)
802.11a	5150-5250	19.94	7.51	20	0.1106	1
802.11a	5725-5850	19.82	7.56	20	0.1089	1
802.11an HT20	5150-5250	19.85	7.51	20	0.1083	1
802.11an HT20	5725-5850	19.54	7.56	20	0.1020	1
802.11an HT40	5150-5250	19.02	7.51	20	0.0895	1
802.11an HT40	5725-5850	19.34	7.56	20	0.0974	1
802.11ac VHT20	5150-5250	19.92	7.51	20	0.1101	1
802.11ac VHT20	5725-5850	19.61	7.56	20	0.1038	1
802.11ac VHT40	5150-5250	19.09	7.51	20	0.0909	1
802.11ac VHT40	5725-5850	19.42	7.56	20	0.0993	1
802.11ac VHT80	5150-5250	15.20	7.51	20	0.0371	1
802.11ac VHT80	5725-5850	19.05	7.56	20	0.0911	1

**Maximum Permissible Exposure (Co-location)****(Non-Beamforming)**

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)
2.4G 11b	2412-2462	24.37	4.85	20	0.1661
5G 11a	5150-5250	22.95	4.81	20	0.1188
5G 11a	5725-5850	22.83	4.90	20	0.1180
Co-location Total					0.4029
Maximum Permissible Exposure Limit					1

(Beamforming)

Modulation Mode	Frequency band (MHz)	Max. Conducted output power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)
11ac VHT20	2412-2462	20.77	7.64	20	0.1381
802.11a	5150-5250	19.94	7.51	20	0.1106
802.11a	5725-5850	19.82	7.56	20	0.1089
Co-location Total					0.3576
Maximum Permissible Exposure Limit					1