



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 2.4G/5G/ wireless AP
Model No. : AT-TQ1402, AT-TQm1402
Trade Name : Allied Telesis
FCC ID : RSL-TQ1402

I HEREBY CERTIFY THAT :

The sample was received on Dec. 12, 2018 and the testing was carried out on Jan. 29, 2019 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 / Supervisor

Tested by:

Spree Yei / Engineer

Laboratory Accreditation:

Cerpass Technology Corporation Test Laboratory



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History of this test report

Report No.	Issue Date	Description
TEFE1804234	Feb. 12, 2019	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 2.4G/5G/ wireless AP
Model No.	AT-TQ1402, AT-TQm1402
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	48V/0.4A
Memo	A1
Frequency Range	802.11b/g/n/ac: 2400-2483.5MHz 802.11a/n/ac: 5150MHz-5250MHz, 5725MHz-5850MHz
Modulation Type	DSSS, OFDM
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 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	2.4GHz: PIFA Antenna / 5GHz: Dipole Antenna
Antenna Gain	2400-2483.5MHz: ANT A: 1.9dBi, ANT B: 1.8dBi 5150-5250MHz: ANT A: 3.7dBi, ANT B: 2.9dBi 5725-5850MHz: ANT A: 3.7dBi, ANT B: 3.7dBi

Note: 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

- During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- The complete test system included remote workstation and EUT for RF test. The remote workstation included Notebook.
- An executive program, "QRCT: Ver 3.0.219.0" was executed to transmit and receive data via WLAN.
- 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, it was reported as the final data.	
Radiation Emissions (1GHz ~ 40GHz)	
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)

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

2.4. Description of Test System

Device	Manufacturer	Model No.	Description
Remote workstation			
Notebook	ASUS	P2430U	Power Cable, Unshielding, 1.8m

Use Cable:

Cable	Quantity	Description
Network	1	Unshielding, 1.2m



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	Uncertainty
Radiated Spurious Emission(9KHz~30MHz)	±5.007dB
Radiated Spurious Emission(30MHz~1GHz)	±5.157dB
Radiated Spurious Emission(1GHz~18GHz)	±6.383dB
Radiated Spurious Emission(18GHz~40GHz)	±6.648dB
Conducted Spurious Emission	±1.253dB
6dB Bandwidth	±6.89%
Power Spectral Density	±0.630dB
26 dB Occupied Bandwidth	±6.10%
Frequency Stability	±375KHz
Channel Frequencies Separation	±6.10%
20dB Bandwidth	±6.12%
Dwell Time	±1.34%
Peak Output Power(Conducted Power Meter)	±0.86dB
Temperature	±1.2°C
Humidity	±2.7%
Channel Move Time	±4.53%
Channel Closing Transmission Time	±6.61%
Threshold	±0.631dB
Non occupancy period	±1.17%



3. Test Equipment and Ancillaries Used for Tests

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Bilog Antenna	Schwarzbeck	VULB9168	275	2018/09/17	2019/09/16
Active Loop Antenna	EMCO	6507	40855	2018/05/22	2019/05/21
Horn Antenna	EMCO	3115	31589	2018/04/02	2019/04/01
Horn Antenna	EMCO	3116	31974	2018/09/07	2019/09/06
EMI Receiver	ROHDE & SCHWARZ	ESCI 3	101402	2018/02/23	2019/02/22
Spectrum Analyzer	ROHDE & SCHWARZ	FSP40	100047	2018/03/20	2019/03/19
Preamplifier	EM Electronics corp.	EM330	60660	2018/03/08	2019/03/07
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2018/09/18	2019/09/17
BLUETOOTH TESTER	ROHDE & SCHWARZ	CBT	101133	2018/04/02	2019/04/01
Cable-3in1-(30M-1G)	HARBOUR INDUSTRIES	LL142	CCE1315	2018/04/20	2019/04/19
Cable-0.5m-(1G-40 G)	Rapidtek	40GHZ 50CM	38MS-38MS50314	2018/03/27	2019/03/26
Cable-1m-(1G-40G)	Rapidtek	40GHZ 300CM	38MS-38MS300314	2018/03/27	2019/03/26
Cable-6m-(1G-40G)	Rapidtek	40GHZ 800CM	38MS-38MS800314	2018/03/27	2019/03/26
E3	AUDIX	v8.2014-8-6	RK-000529	NA	NA
Spectrum Analyzer	ROHDE & SCHWARZ	VULB9168	275	2018/09/17	2019/09/16
BLUETOOTH TESTER	ROHDE & SCHWARZ	6507	40855	2018/05/22	2019/05/21
Attenuator	KEYSIGHT	3115	31589	2018/04/02	2019/04/01
TEMP & HUMID CHAMBER	T-MACHINE	3116	31974	2018/09/07	2019/09/06
Power Sensor	Anritsu	ESCI 3	101402	2018/02/23	2019/02/22
EMI Receiver	ROHDE & SCHWARZ	ESCI 3	100443	2018/03/15	2019/03/14
Line Impedance Stabilization Network	Schwarzbeck	NSLK 8127	8127-740	2018/06/13	2019/06/12
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	101933	2018/09/04	2019/09/03
E3	AUDIX	v8.2014-8-6	RK-000529	NA	NA



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	2.4GHz: PIFA Antenna / 5GHz: Dipole Antenna
Antenna Gain	2400-2483.5MHz: ANT A: 1.9dBi, ANT B: 1.8dBi 5150-5250MHz: ANT A: 3.7dBi, ANT B: 2.9dBi 5725-5850MHz: ANT A: 3.7dBi, ANT B: 3.7dBi

(Non-Beamforming)

2400-2483.5MHz
For Power directional gain= $G_{ant} = 1.90 \text{ dBi}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 4.86 (dBi)
5150-5250MHz
For Power directional gain= $G_{ant} = 3.70 \text{ dBi}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 6.32 (dBi)
5725-5850MHz
For Power directional gain= $G_{ant} = 3.70 \text{ dBi}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT]$ = 6.71 (dBi)

(Beamforming)

5150-5250MHz
For Power directional gain= $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 6.32 \text{ (dBi)}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 6.32 \text{ (dBi)}$
5725-5850MHz
For Power directional gain= $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 6.71 \text{ (dBi)}$ For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / NANT] = 6.71 \text{ (dBi)}$



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

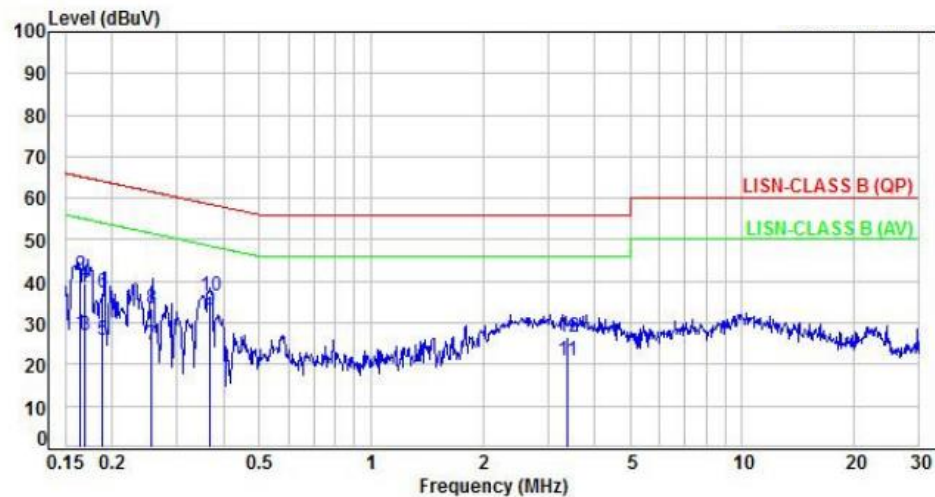
- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- 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.





5.4. Test Result and Data

Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: Mode 1, Band 1	Temperature	: 22 °C
Test Date	: Dec. 20, 2018	Humidity	: 49 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.16	9.94	17.26	27.20	55.27	-28.07	Average	P
2	0.16	9.94	31.46	41.40	65.27	-23.87	QP	P
3	0.17	9.94	17.02	26.96	55.00	-28.04	Average	P
4	0.17	9.94	29.53	39.47	65.00	-25.53	QP	P
5	0.19	9.94	16.04	25.98	54.07	-28.09	Average	P
6	0.19	9.94	27.42	37.36	64.07	-26.71	QP	P
7	0.26	9.94	14.77	24.71	51.58	-26.87	Average	P
8	0.26	9.94	23.64	33.58	61.58	-28.00	QP	P
9	0.37	9.95	23.05	33.00	48.55	-15.55	Average	P
10	0.37	9.95	26.54	36.49	58.55	-22.06	QP	P
11	3.38	10.10	10.69	20.79	46.00	-25.21	Average	P
12	3.38	10.10	16.44	26.54	56.00	-29.46	QP	P

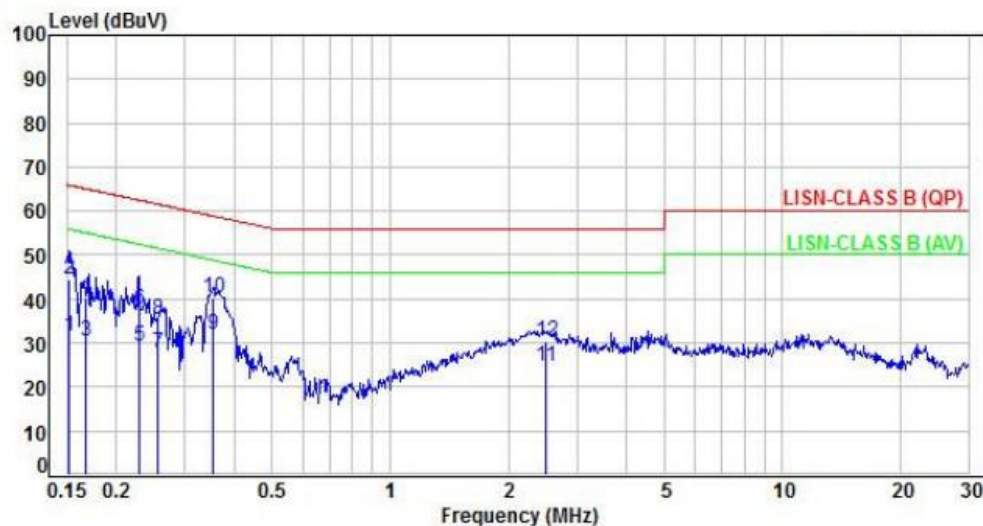
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode	: Mode 1, Band 1	Temperature	: 22 °C
Test Date	: Dec. 20, 2018	Humidity	: 49 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.15	9.94	21.64	31.58	55.88	-24.30	Average	P
2	0.15	9.94	34.66	44.60	65.88	-21.28	QP	P
3	0.17	9.94	20.42	30.36	55.11	-24.75	Average	P
4	0.17	9.94	30.55	40.49	65.11	-24.62	QP	P
5	0.23	9.94	19.46	29.40	52.48	-23.08	Average	P
6	0.23	9.94	27.87	37.81	62.48	-24.67	QP	P
7	0.25	9.94	17.83	27.77	51.61	-23.84	Average	P
8	0.25	9.94	25.46	35.40	61.61	-26.21	QP	P
9	0.35	9.95	21.84	31.79	48.88	-17.09	Average	P
10	0.35	9.95	30.23	40.18	58.88	-18.70	QP	P
11	2.49	10.06	14.79	24.85	46.00	-21.15	Average	P
12	2.49	10.06	20.29	30.35	56.00	-25.65	QP	P

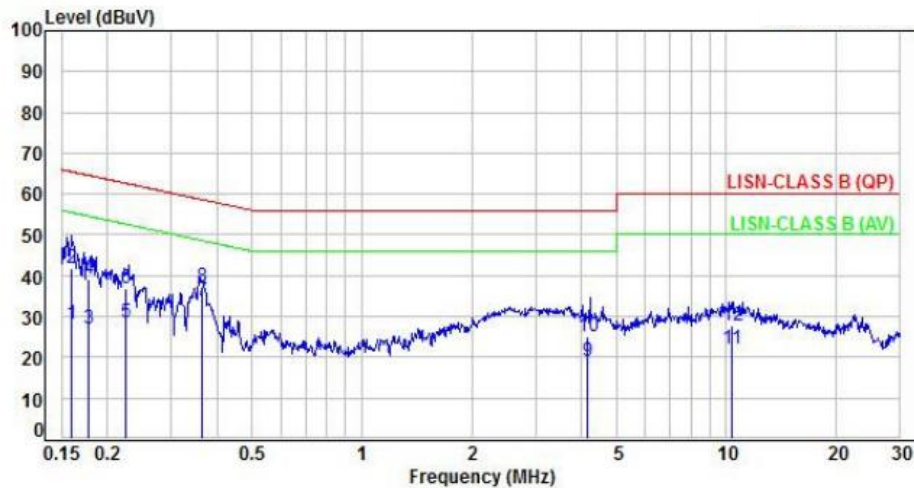
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: Mode 1, Band 4	Temperature	: 22 °C
Test Date	: Dec. 20, 2018	Humidity	: 49 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.16	9.94	18.13	28.07	55.47	-27.40	Average	P
2	0.16	9.94	31.98	41.92	65.47	-23.55	QP	P
3	0.18	9.94	16.88	26.82	54.59	-27.77	Average	P
4	0.18	9.94	29.10	39.04	64.59	-25.55	QP	P
5	0.23	9.94	18.60	28.54	52.60	-24.06	Average	P
6	0.23	9.94	27.11	37.05	62.60	-25.55	QP	P
7	0.36	9.95	23.87	33.82	48.68	-14.86	Average	P
8	0.36	9.95	27.22	37.17	58.68	-21.51	QP	P
9	4.16	10.13	8.87	19.00	46.00	-27.00	Average	P
10	4.16	10.13	14.85	24.98	56.00	-31.02	QP	P
11	10.38	10.29	11.87	22.16	50.00	-27.84	Average	P
12	10.38	10.29	17.36	27.65	60.00	-32.35	QP	P

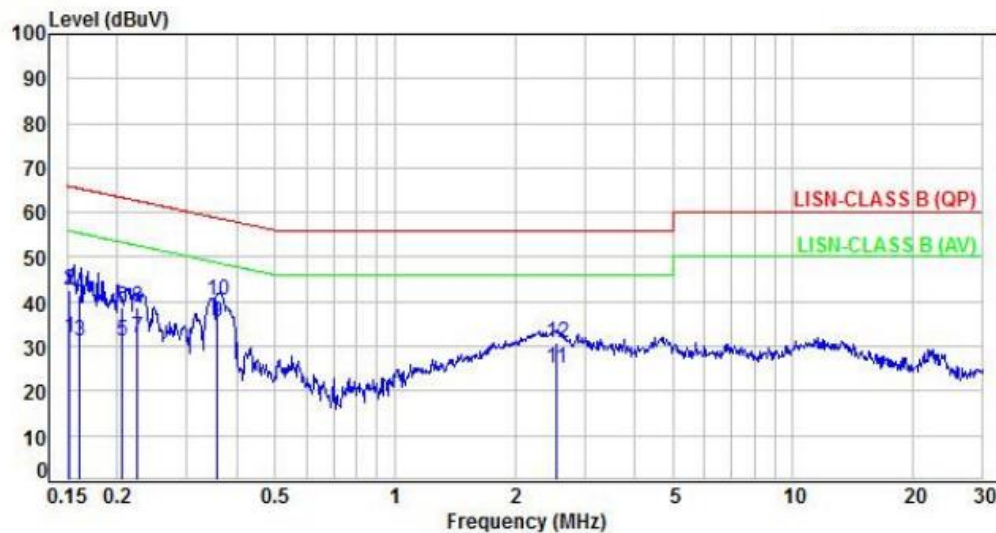
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode	: Mode 1, Band 4	Temperature	: 22 °C
Test Date	: Dec. 20, 2018	Humidity	: 49 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.15	9.94	21.85	31.79	55.93	-24.14	Average	P
2	0.15	9.94	32.73	42.67	65.93	-23.26	QP	P
3	0.16	9.94	21.22	31.16	55.45	-24.29	Average	P
4	0.16	9.94	31.65	41.59	65.45	-23.86	QP	P
5	0.21	9.94	21.06	31.00	53.37	-22.37	Average	P
6	0.21	9.94	28.77	38.71	63.37	-24.66	QP	P
7	0.23	9.94	22.18	32.12	52.61	-20.49	Average	P
8	0.23	9.94	29.02	38.96	62.61	-23.65	QP	P
9	0.36	9.95	25.30	35.25	48.82	-13.57	Average	P
10	0.36	9.95	30.44	40.39	58.82	-18.43	QP	P
11	2.54	10.06	14.94	25.00	46.00	-21.00	Average	P
12	2.54	10.06	20.77	30.83	56.00	-25.17	QP	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



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.

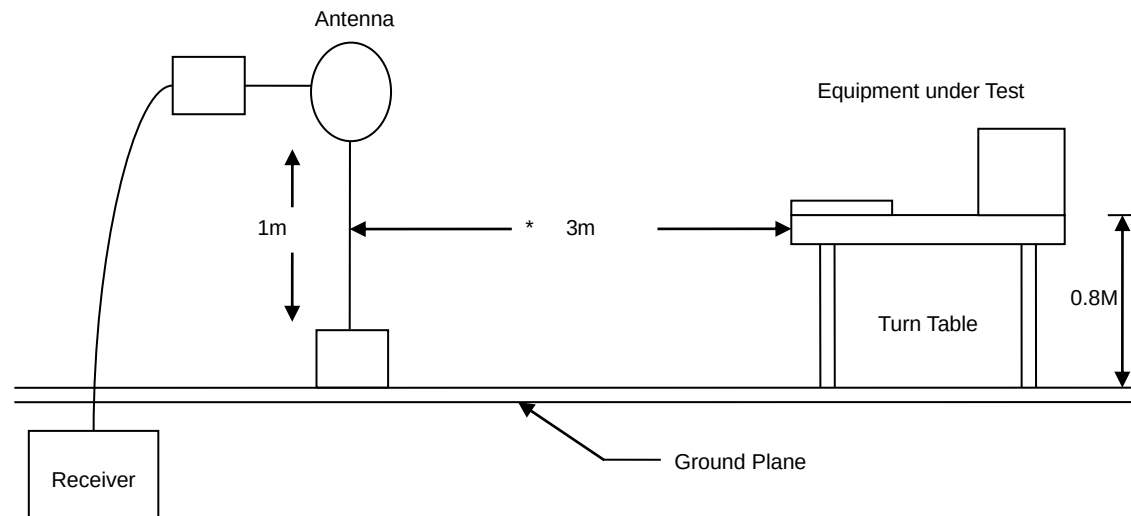
6.2. Test Procedures

- 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.

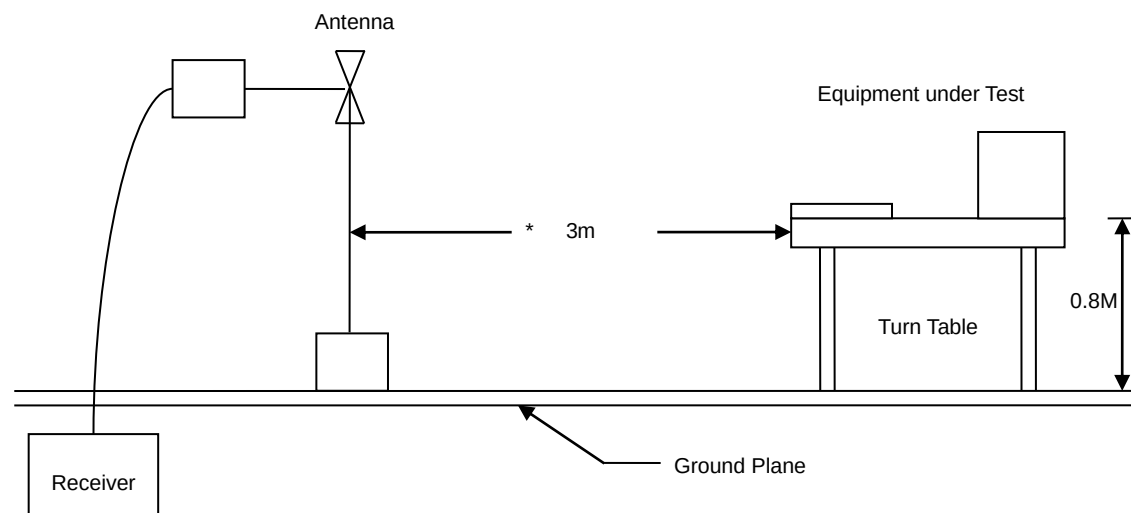


6.3. Typical Test Setup

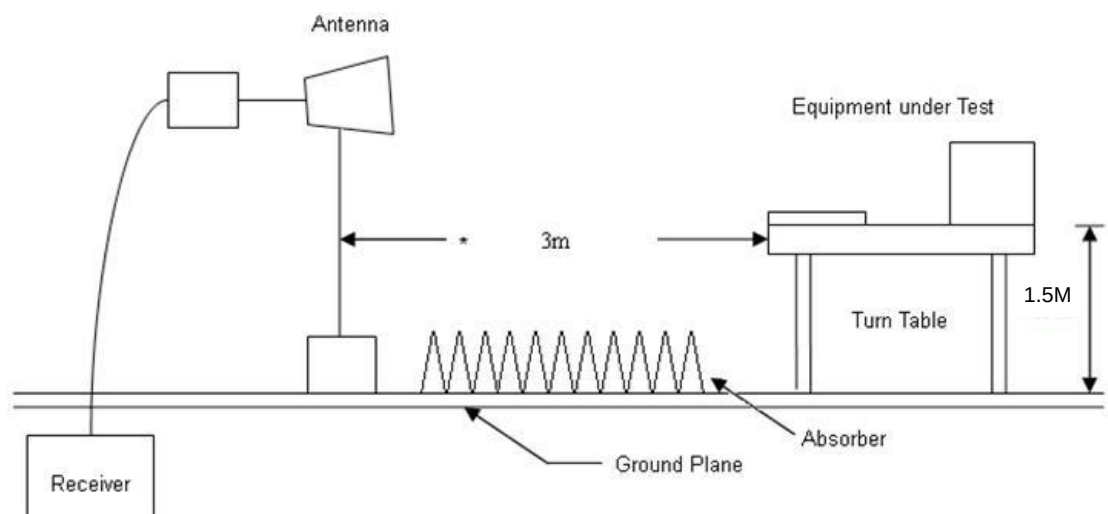
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



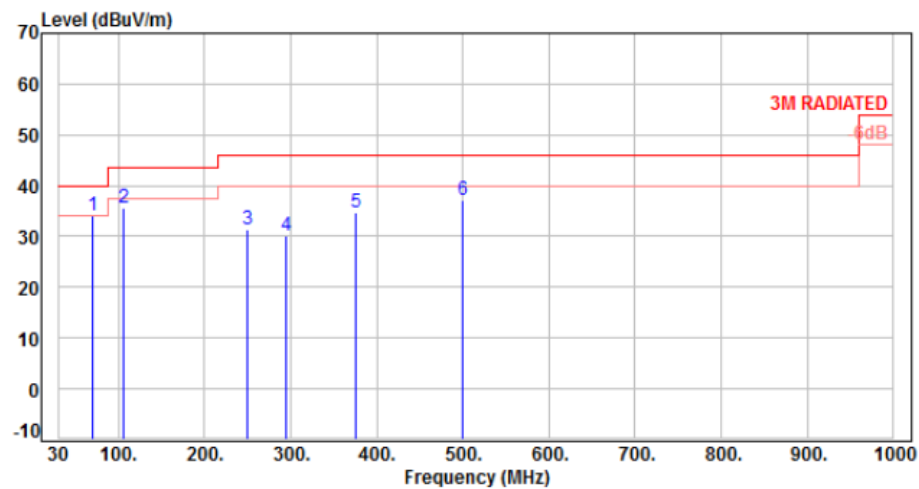


6.4. Test Result and Data (9kHz ~ 30MHz)

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	: 22 °C
Test Date	: Dec. 17, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	69.77	-11.42	45.44	34.02	40.00	-5.98	Peak	400	0	P
2	106.63	-13.26	48.86	35.60	43.50	-7.90	Peak	400	0	P
3	250.19	-10.23	41.56	31.33	46.00	-14.67	Peak	400	0	P
4	294.81	-8.74	38.83	30.09	46.00	-15.91	Peak	400	0	P
5	375.32	-6.35	41.12	34.77	46.00	-11.23	Peak	400	0	P
6	500.45	-3.64	40.68	37.04	46.00	-8.96	Peak	400	0	P

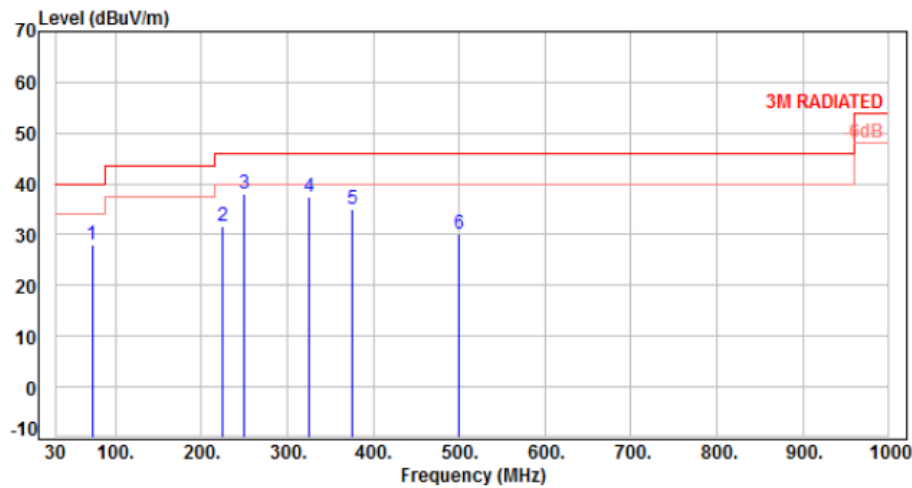
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, Band 1	Temperature	: 22 °C
Test Date	: Dec. 17, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	72.68	-11.90	40.01	28.11	40.00	-11.89	Peak	100	0	P
2	224.00	-11.49	43.24	31.75	46.00	-14.25	Peak	100	0	P
3	250.19	-10.23	48.43	38.20	46.00	-7.80	Peak	100	0	P
4	324.88	-7.89	45.24	37.35	46.00	-8.65	Peak	100	0	P
5	375.32	-6.35	41.40	35.05	46.00	-10.95	Peak	100	0	P
6	500.45	-3.64	33.85	30.21	46.00	-15.79	Peak	100	0	P

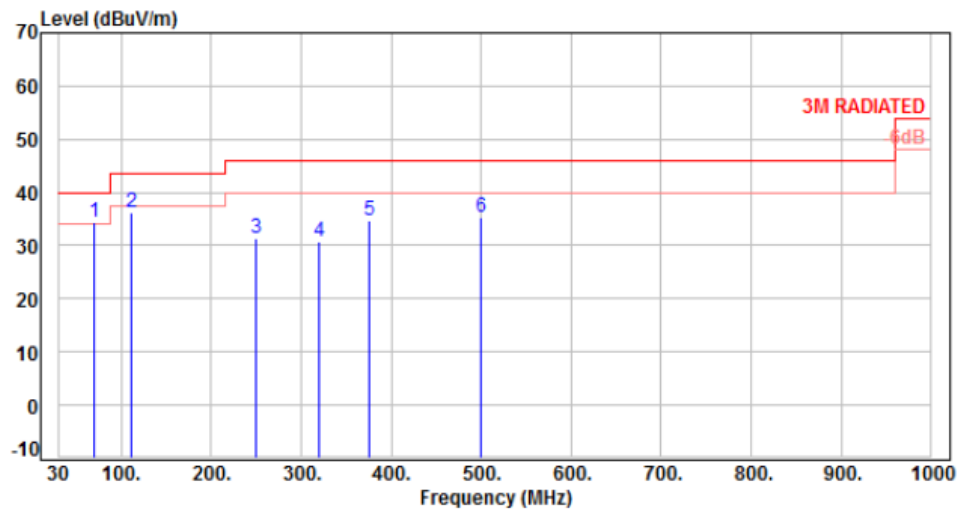
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, Band 4	Temperature	: 22 °C
Test Date	: Dec. 17, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	70.74	-11.62	46.04	34.42	40.00	-5.58	Peak	400	0	P
2	110.51	-12.74	49.08	36.34	43.50	-7.16	Peak	400	0	P
3	250.19	-10.23	41.66	31.43	46.00	-14.57	Peak	400	0	P
4	320.03	-8.12	38.96	30.84	46.00	-15.16	Peak	400	0	P
5	375.32	-6.35	41.03	34.68	46.00	-11.32	Peak	400	0	P
6	500.45	-3.64	39.08	35.44	46.00	-10.56	Peak	400	0	P

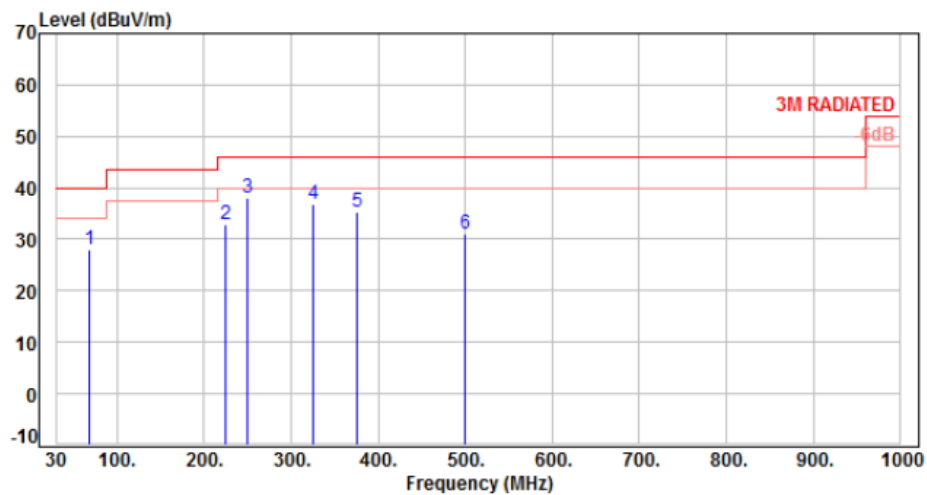
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, Band 4	Temperature	: 22 °C
Test Date	: Dec. 17, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	67.83	-11.05	38.97	27.92	40.00	-12.08	Peak	100	0	P
2	224.97	-11.49	44.27	32.78	46.00	-13.22	Peak	100	0	P
3	250.19	-10.23	48.21	37.98	46.00	-8.02	Peak	100	0	P
4	324.88	-7.89	44.61	36.72	46.00	-9.28	Peak	100	0	P
5	375.32	-6.35	41.62	35.27	46.00	-10.73	Peak	100	0	P
6	500.45	-3.64	34.72	31.08	46.00	-14.92	Peak	100	0	P

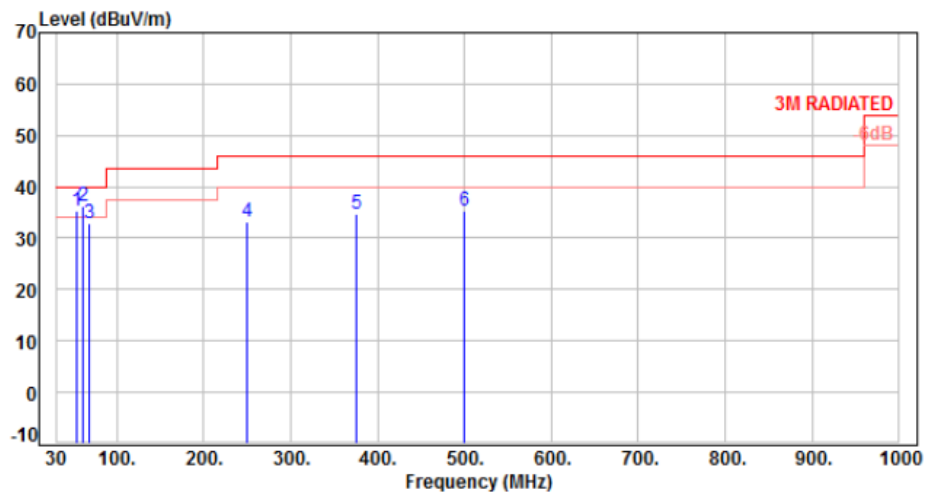
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	From PoE	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 4, Band 1	Temperature	:	22 °C
Test Date	:	Dec. 17, 2018	Humidity	:	59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	53.28	-9.57	44.93	35.36	40.00	-4.64	Peak	400	0	P
2	61.04	-10.17	46.50	36.33	40.00	-3.67	Peak	400	0	P
3	68.80	-11.23	44.27	33.04	40.00	-6.96	QP	102	317	P
4	250.19	-10.23	43.38	33.15	46.00	-12.85	Peak	400	0	P
5	375.32	-6.35	40.92	34.57	46.00	-11.43	Peak	400	0	P
6	500.45	-3.64	39.07	35.43	46.00	-10.57	Peak	400	0	P

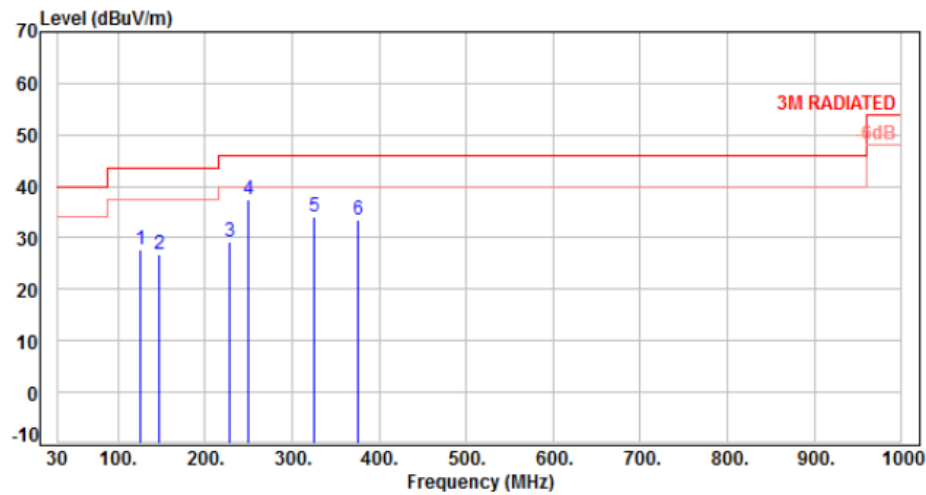
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	From PoE	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 4, Band 1	Temperature	:	22 °C
Test Date	:	Dec. 17, 2018	Humidity	:	59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	125.06	-11.24	38.98	27.74	43.50	-15.76	Peak	100	0	P
2	147.37	-9.58	36.31	26.73	43.50	-16.77	Peak	100	0	P
3	227.88	-11.49	40.58	29.09	46.00	-16.91	Peak	100	0	P
4	250.19	-10.23	47.74	37.51	46.00	-8.49	Peak	100	0	P
5	324.88	-7.89	42.00	34.11	46.00	-11.89	Peak	100	0	P
6	375.32	-6.35	39.82	33.47	46.00	-12.53	Peak	100	0	P

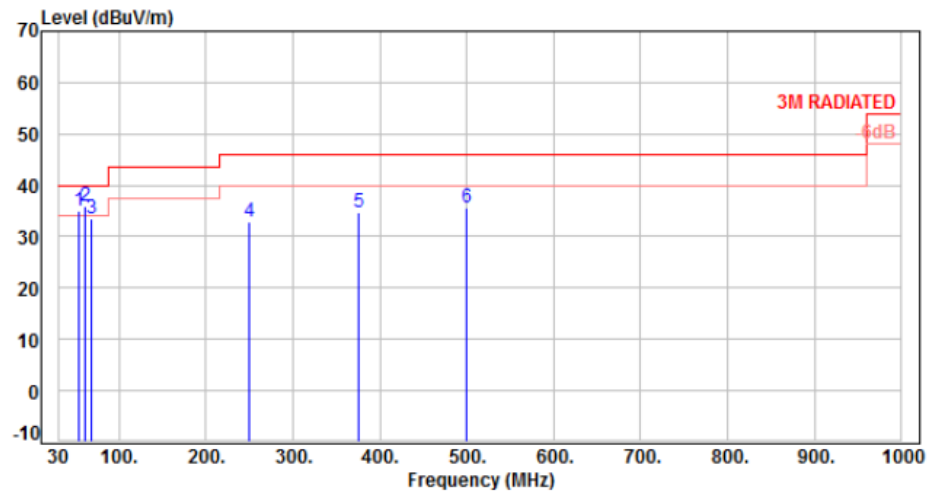
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: From PoE	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, Band 4	Temperature	: 22 °C
Test Date	: Dec. 17, 2018	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	53.28	-9.57	44.71	35.14	40.00	-4.86	Peak	400	0	P
2	61.04	-10.17	46.07	35.90	40.00	-4.10	Peak	400	0	P
3	68.80	-11.23	44.70	33.47	40.00	-6.53	QP	100	324	P
4	250.19	-10.23	43.14	32.91	46.00	-13.09	Peak	400	0	P
5	375.32	-6.35	40.99	34.64	46.00	-11.36	Peak	400	0	P
6	500.45	-3.64	39.14	35.50	46.00	-10.50	Peak	400	0	P

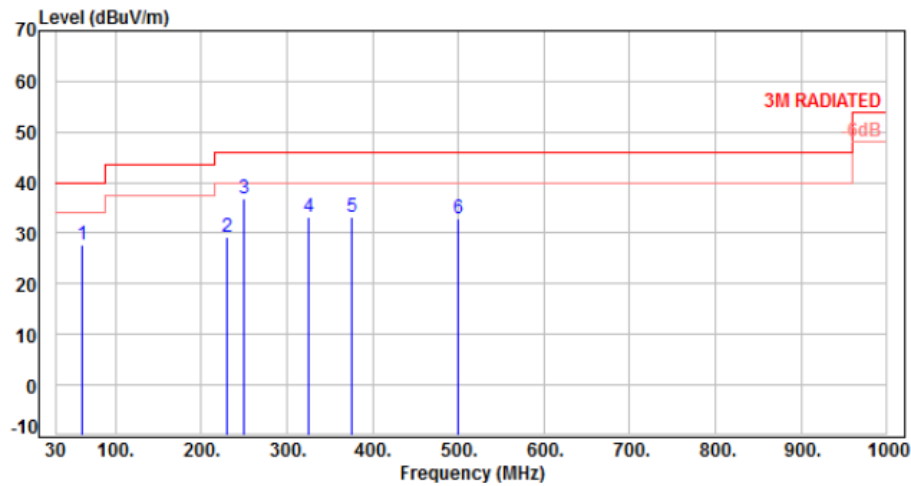
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	From PoE	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 4, Band 4	Temperature	:	22 °C
Test Date	:	Dec. 17, 2018	Humidity	:	59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	61.04	-10.17	37.94	27.77	40.00	-12.23	Peak	100	0	P
2	229.82	-11.49	40.85	29.36	46.00	-16.64	Peak	100	0	P
3	250.19	-10.23	47.07	36.84	46.00	-9.16	Peak	100	0	P
4	324.88	-7.89	41.19	33.30	46.00	-12.70	Peak	100	0	P
5	375.32	-6.35	39.60	33.25	46.00	-12.75	Peak	100	0	P
6	500.45	-3.64	36.49	32.85	46.00	-13.15	Peak	100	0	P

Note: Level=Reading+Factor

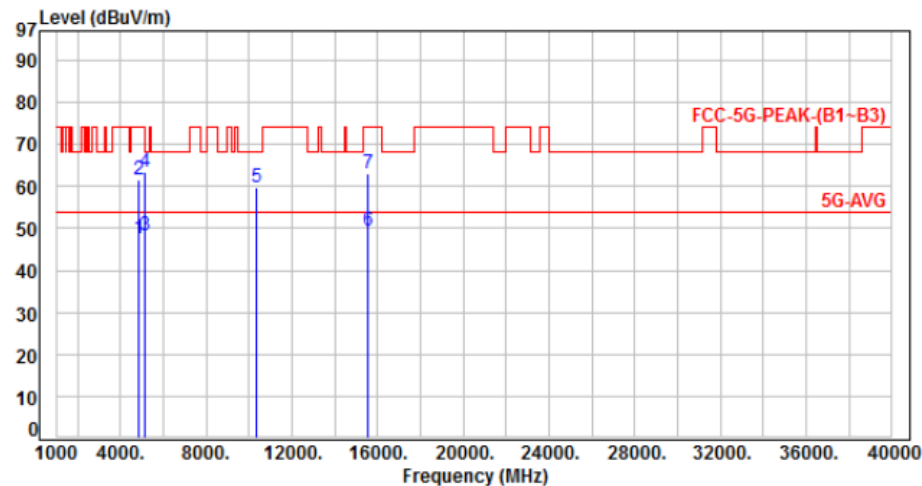
Margin=Level-Limit

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	: 23 °C
Test Date	: Sep. 28, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4860.00	-8.36	56.09	47.73	54.00	-6.27	Average	400	15	P
2	4860.00	-8.36	69.79	61.43	74.00	-12.57	Peak	400	15	P
3	5150.00	-7.68	56.00	48.32	54.00	-5.68	Average	377	15	P
4	5150.00	-7.68	71.20	63.52	74.00	-10.48	Peak	377	15	P
5	10360.00	-0.12	59.80	59.68	68.20	-8.52	Peak	188	10	P
6	15540.00	5.24	44.00	49.24	54.00	-4.76	Average	100	338	P
7	15540.00	5.24	57.90	63.14	74.00	-10.86	Peak	100	338	P

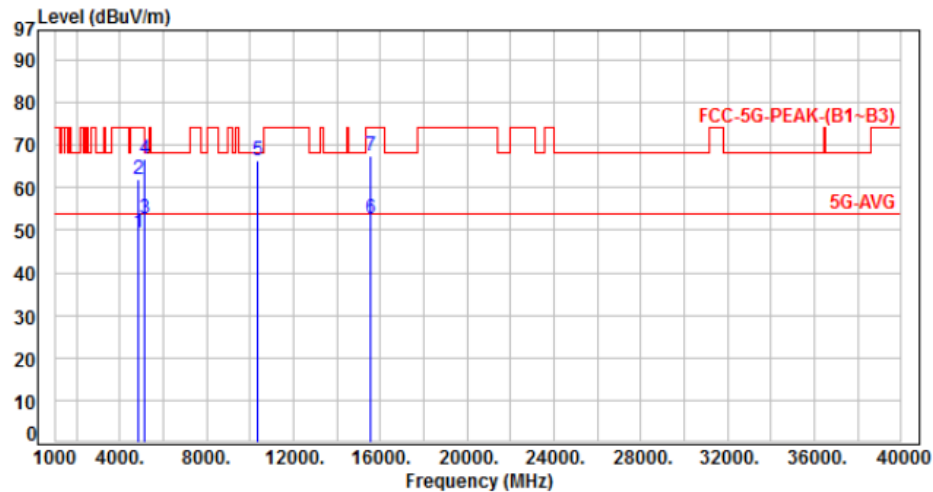
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH36, Band 1	Temperature	: 23 °C
Test Date	: Sep. 28, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4860.00	-8.36	57.69	49.33	54.00	-4.67	Average	110	110	P
2	4860.00	-8.36	70.49	62.13	74.00	-11.87	Peak	110	110	P
3	5150.00	-7.68	60.40	52.72	54.00	-1.28	Average	244	75	P
4	5150.00	-7.68	74.30	66.62	74.00	-7.38	Peak	244	75	P
5	10360.00	-0.12	66.50	66.38	68.20	-1.82	Peak	180	350	P
6	15540.00	5.24	47.40	52.64	54.00	-1.36	Average	286	40	P
7	15540.00	5.24	62.20	67.44	74.00	-6.56	Peak	286	40	P

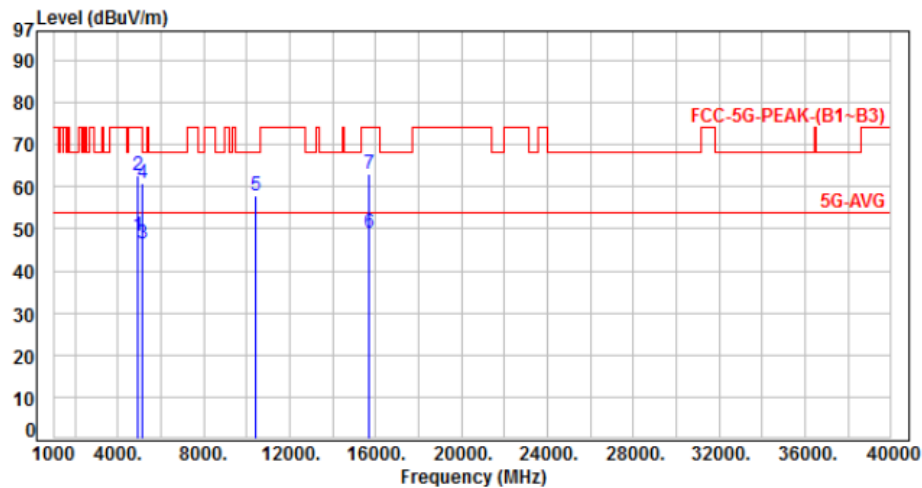
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH44, Band 1	Temperature	: 23 °C
Test Date	: Sep. 28, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4900.00	-8.25	56.52	48.27	54.00	-5.73	Average	355	28	P
2	4900.00	-8.25	71.10	62.85	74.00	-11.15	Peak	355	28	P
3	5150.00	-7.68	54.30	46.62	54.00	-7.38	Average	381	140	P
4	5150.00	-7.68	68.50	60.82	74.00	-13.18	Peak	381	140	P
5	10440.00	-0.03	57.80	57.77	68.20	-10.43	Peak	100	100	P
6	15660.00	5.32	43.90	49.22	54.00	-4.78	Average	100	340	P
7	15660.00	5.32	57.80	63.12	74.00	-10.88	Peak	100	340	P

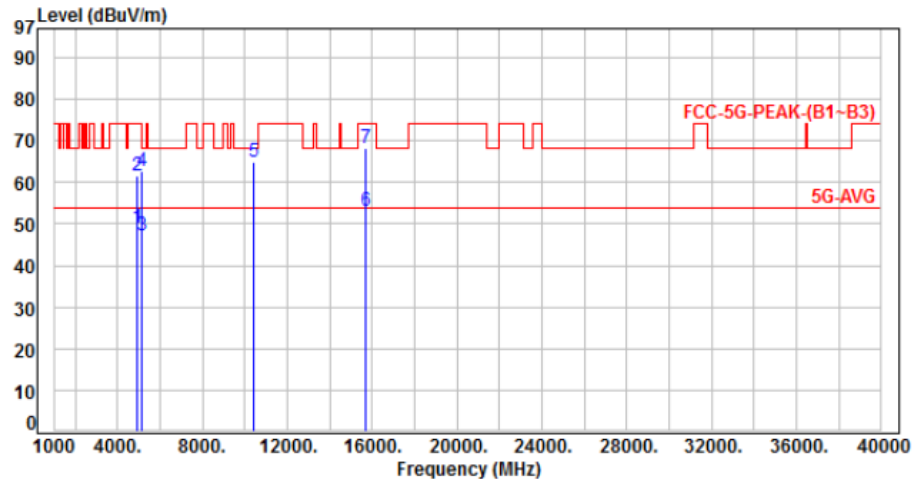
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH44, Band 1	Temperature	: 23 °C
Test Date	: Sep. 28, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4900.00	-8.25	57.43	49.18	54.00	-4.82	Average	120	166	P
2	4900.00	-8.25	69.92	61.67	74.00	-12.33	Peak	120	166	P
3	5150.00	-7.68	54.80	47.12	54.00	-6.88	Average	220	70	P
4	5150.00	-7.68	70.20	62.52	74.00	-11.48	Peak	220	70	P
5	10440.00	-0.03	64.80	64.77	68.20	-3.43	Peak	188	346	P
6	15660.00	5.32	47.65	52.97	54.00	-1.03	Average	289	44	P
7	15660.00	5.32	62.90	68.22	74.00	-5.78	Peak	289	44	P

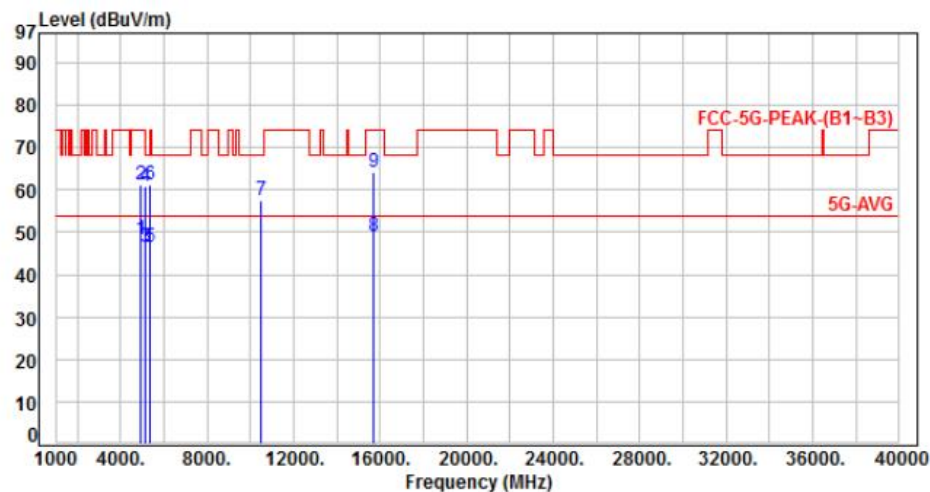
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH48, Band 1	Temperature	: 23 °C
Test Date	: Sep. 28, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4920.00	-8.20	56.44	48.24	54.00	-5.76	Average	366	100	P
2	4920.00	-8.20	69.42	61.22	74.00	-12.78	Peak	366	100	P
3	5150.00	-7.68	54.20	46.52	54.00	-7.48	Average	384	140	P
4	5150.00	-7.68	68.70	61.02	74.00	-12.98	Peak	384	140	P
5	5350.00	-7.30	53.80	46.50	54.00	-7.50	Average	384	140	P
6	5350.00	-7.30	68.50	61.20	74.00	-12.80	Peak	384	140	P
7	10480.00	0.01	57.60	57.61	68.20	-10.59	Peak	200	357	P
8	15720.00	5.36	43.80	49.16	54.00	-4.84	Average	100	339	P
9	15720.00	5.36	58.70	64.06	74.00	-9.94	Peak	100	339	P

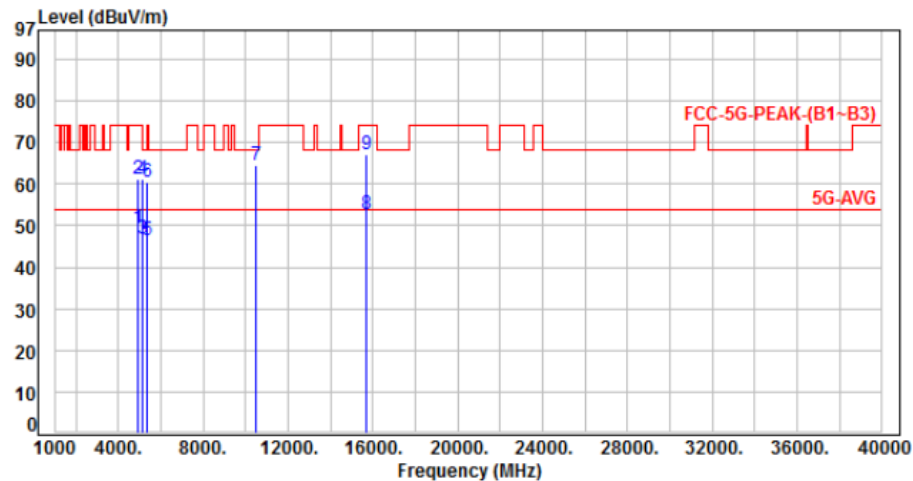
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH48, Band 1	Temperature	: 23 °C
Test Date	: Sep. 28, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4920.00	-8.20	57.47	49.27	54.00	-4.73	Average	100	201	P
2	4920.00	-8.20	69.49	61.29	74.00	-12.71	Peak	100	201	P
3	5150.00	-7.68	54.50	46.82	54.00	-7.18	Average	266	249	P
4	5150.00	-7.68	68.90	61.22	74.00	-12.78	Peak	266	249	P
5	5350.00	-7.30	53.90	46.60	54.00	-7.40	Average	266	249	P
6	5350.00	-7.30	67.80	60.50	74.00	-13.50	Peak	266	249	P
7	10480.00	0.01	64.70	64.71	68.20	-3.49	Peak	190	339	P
8	15720.00	5.36	47.30	52.66	54.00	-1.34	Average	250	27	P
9	15720.00	5.36	61.60	66.96	74.00	-7.04	Peak	250	27	P

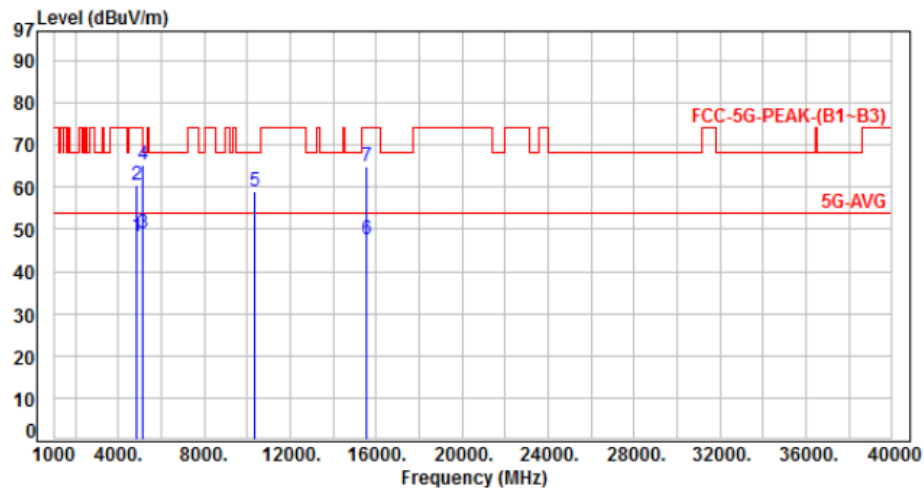
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH36, Band 1	Temperature	: 23 °C
Test Date	: Sep. 28, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4860.00	-8.36	56.57	48.21	54.00	-5.79	Average	392	101	P
2	4860.00	-8.36	68.98	60.62	74.00	-13.38	Peak	392	101	P
3	5150.00	-7.68	56.80	49.12	54.00	-4.88	Average	100	133	P
4	5150.00	-7.68	72.80	65.12	74.00	-8.88	Peak	100	133	P
5	10360.00	-0.12	59.10	58.98	68.20	-9.22	Peak	106	160	P
6	15540.00	5.24	42.20	47.44	54.00	-6.56	Average	100	338	P
7	15540.00	5.24	59.50	64.74	74.00	-9.26	Peak	100	338	P

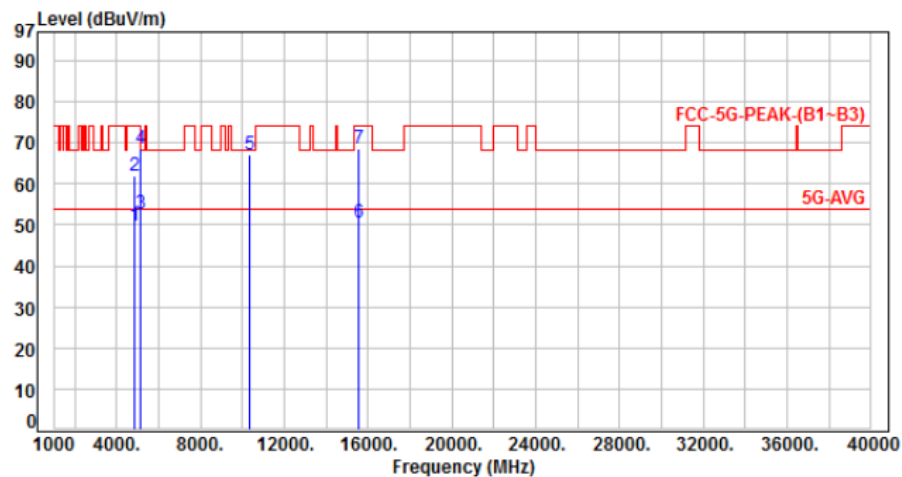
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH36, Band 1	Temperature	: 23 °C
Test Date	: Sep. 28, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4860.00	-8.36	58.10	49.74	54.00	-4.26	Average	100	133	P
2	4860.00	-8.36	70.31	61.95	74.00	-12.05	Peak	100	133	P
3	5150.00	-7.68	60.60	52.92	54.00	-1.08	Average	240	60	P
4	5150.00	-7.68	76.40	68.72	74.00	-5.28	Peak	240	60	P
5	10360.00	-0.12	67.20	67.08	68.20	-1.12	Peak	166	345	P
6	15540.00	5.24	45.30	50.54	54.00	-3.46	Average	330	44	P
7	15540.00	5.24	63.50	68.74	74.00	-5.26	Peak	330	44	P

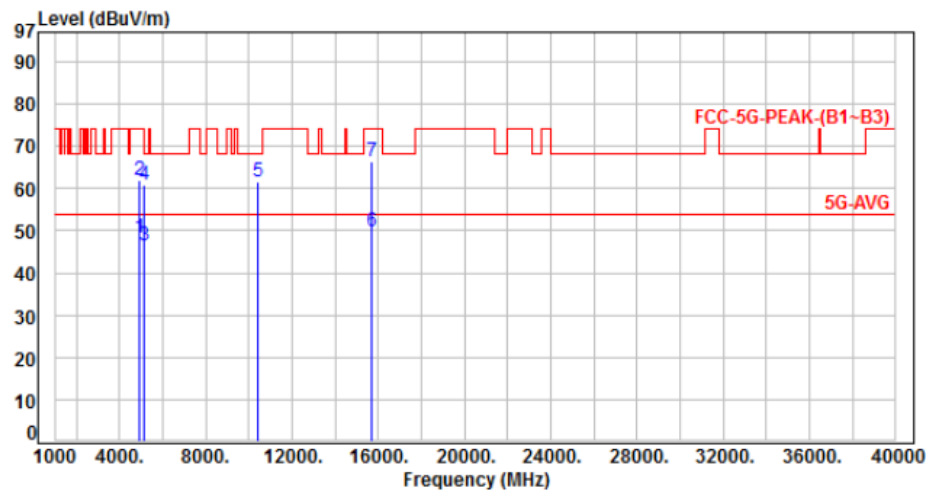
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH44, Band 1	Temperature	: 23 °C
Test Date	: Sep. 28, 2018	Humidity	: 62 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4900.00	-8.25	56.66	48.41	54.00	-5.59	Average	296	45	P
2	4900.00	-8.25	70.33	62.08	74.00	-11.92	Peak	296	45	P
3	5150.00	-7.68	54.20	46.52	54.00	-7.48	Average	155	137	P
4	5150.00	-7.68	68.40	60.72	74.00	-13.28	Peak	155	137	P
5	10440.00	-0.03	61.60	61.57	68.20	-6.63	Peak	300	350	P
6	15660.00	5.32	44.50	49.82	54.00	-4.18	Average	100	339	P
7	15660.00	5.32	60.90	66.22	74.00	-7.78	Peak	100	339	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor