

FCC Co-location Test Report

Equipment : Mini PC
Brand Name : **BIOSTAR**
Model No. : RACING XXXX , IDEQ XXXX (X=A-Z ,a-z,0-9 or BLANK)
FCC ID : I27IZ83APBSR01000
Standard : 47 CFR FCC Part 15
Applicant / Manufacturer : Biostar Microtech Int'l Corp
2F. No. 108-2 Min Chuan Road, Hsin Tien District, New
Taipei City 231, Taiwan, R.O.C.

The product sample received on Apr. 31, 2016 and completely tested on Sep. 29, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

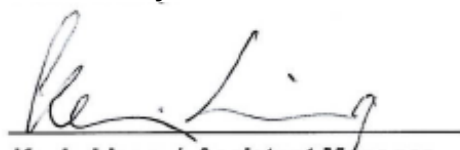

Kevin Liang / Assistant Manager



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Revision History

[illegible]

1 CO-LOCATION

1.1 Transmitter Radiated Unwanted Emissions

1.1.1 Transmitter Radiated Unwanted Emissions Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 30 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

1.1.2 Measuring Instruments

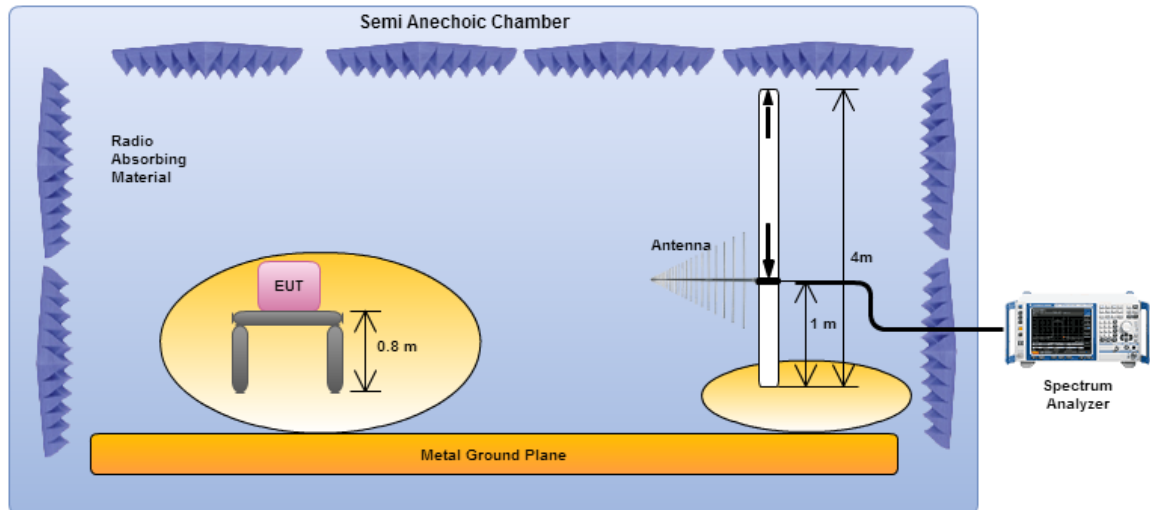
Refer a test equipment and calibration data table in this test report.

1.1.3 Test Procedures

Test Method	
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
☒	The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].
☒	For the transmitter unwanted emissions shall be measured using following options below:
☒	Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.
☒	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
☐	Refer as FCC KDB 558074, clause 12.2.5.1 and 9.2.1 Option 1 (spectral trace averaging)
☐	Refer as FCC KDB 558074, clause 12.2.5.2 and 9.2.1 Option 2 (slow sweep speed).
☒	Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW). VBW $\geq$ 1/T, where T is pulse time.
☐	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
☒	Refer as FCC KDB 558074, clause 12.2.4 and 9.1.1 measurement procedure peak limit.
☐	Refer as FCC KDB 558074, clause 12.2.3 measurement procedure Quasi-Peak limit.
☒	For radiated measurement, refer as FCC KDB 558074, clause 12.1.
☐	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.
☐	For conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 12.2.2.
☐	For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
☐	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB

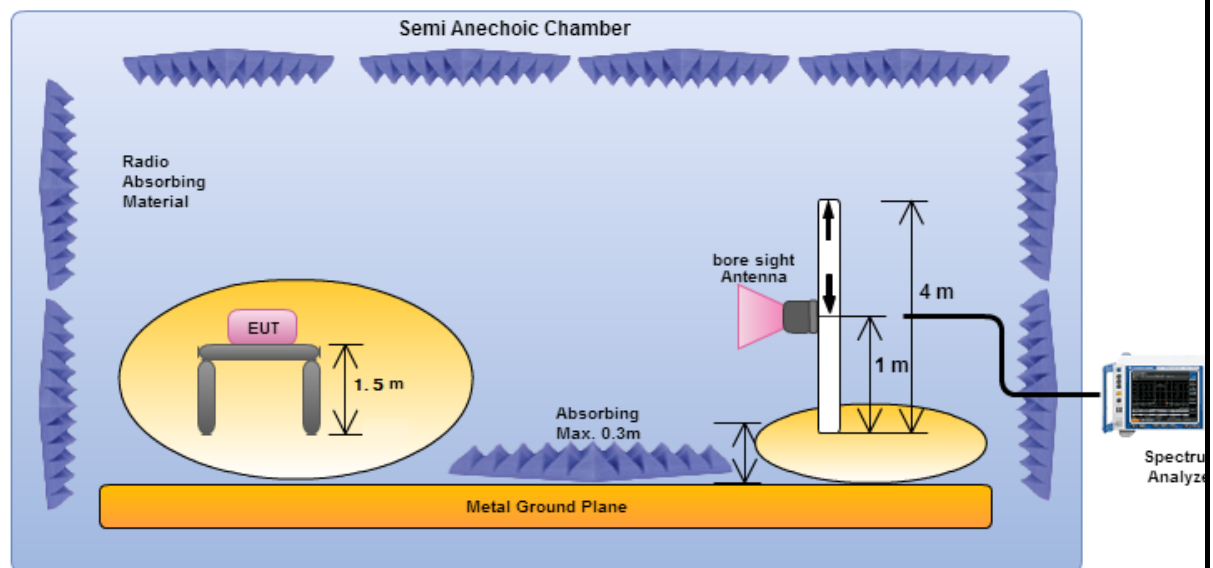
1.1.4 Test Setup

Transmitter Radiated Unwanted Emissions (below 1GHz)

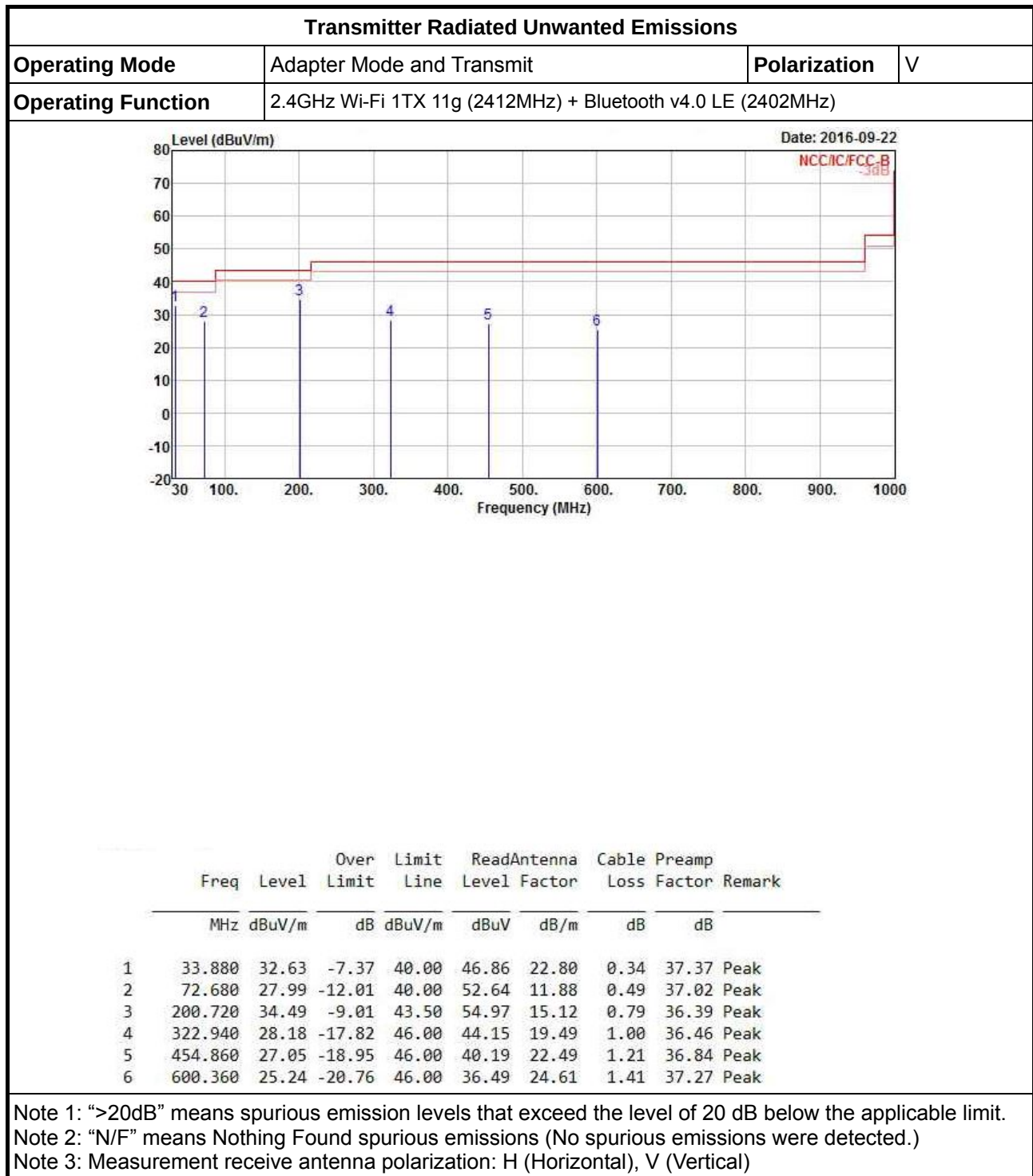


Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna.

Transmitter Radiated Unwanted Emissions (Above 1GHz)

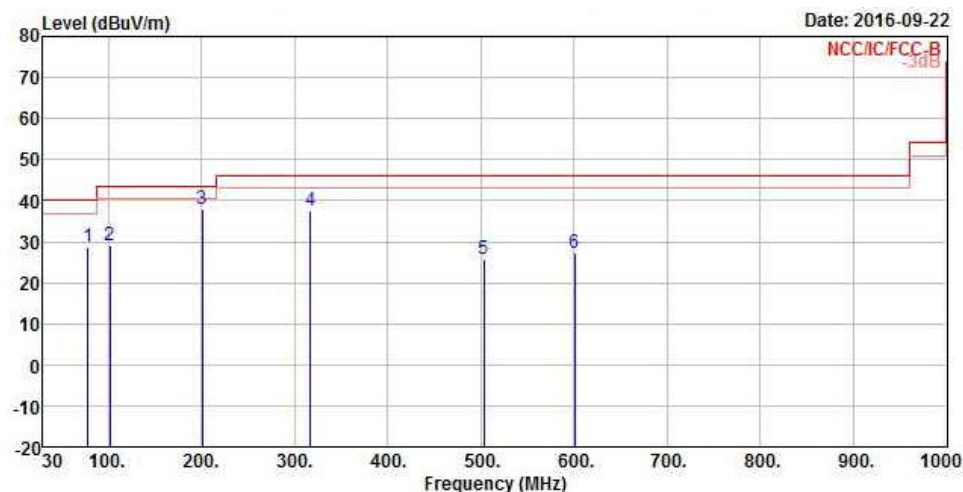


Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

1.1.5 Results of Radiated Emissions (Blow 1GHz)


Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	H
Operating Function	2.4GHz Wi-Fi 1TX 11g (2412MHz) + Bluetooth v4.0 LE (2402MHz)		



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	78.500	28.63	-11.37	40.00	52.41	12.69	0.51	36.98 Peak
2	101.780	29.08	-14.42	43.50	49.85	15.48	0.56	36.81 Peak
3	200.720	37.87	-5.63	43.50	58.35	15.12	0.79	36.39 Peak
4	317.120	37.65	-8.35	46.00	53.78	19.31	1.00	36.44 Peak
5	503.360	25.91	-20.09	46.00	38.27	23.34	1.29	36.99 Peak
6	600.360	27.31	-18.69	46.00	38.56	24.61	1.41	37.27 Peak

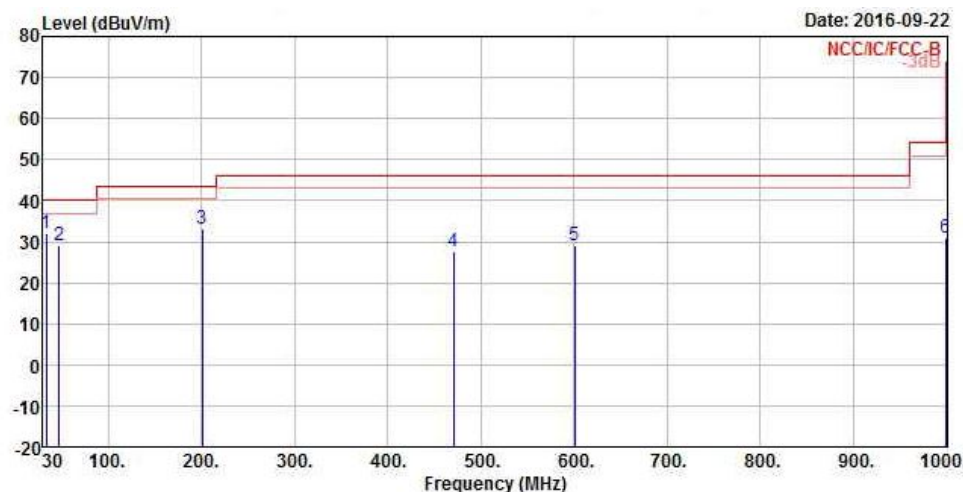
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	V
Operating Function	5GHz Wi-Fi 1TX 11ac20M U-NII-2A (5300MHz) + Bluetooth v4.0 LE (2402MHz)		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp	Loss Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	33.880	31.99	-8.01	40.00	46.22	22.80	0.34	37.37 Peak
2	47.460	29.09	-10.91	40.00	50.54	15.37	0.40	37.22 Peak
3	200.720	32.97	-10.53	43.50	53.45	15.12	0.79	36.39 Peak
4	470.380	27.71	-18.29	46.00	40.58	22.77	1.24	36.88 Peak
5	600.360	29.14	-16.86	46.00	40.39	24.61	1.41	37.27 Peak
6	999.300	31.06	-22.94	54.00	36.71	29.70	1.90	37.25 Peak

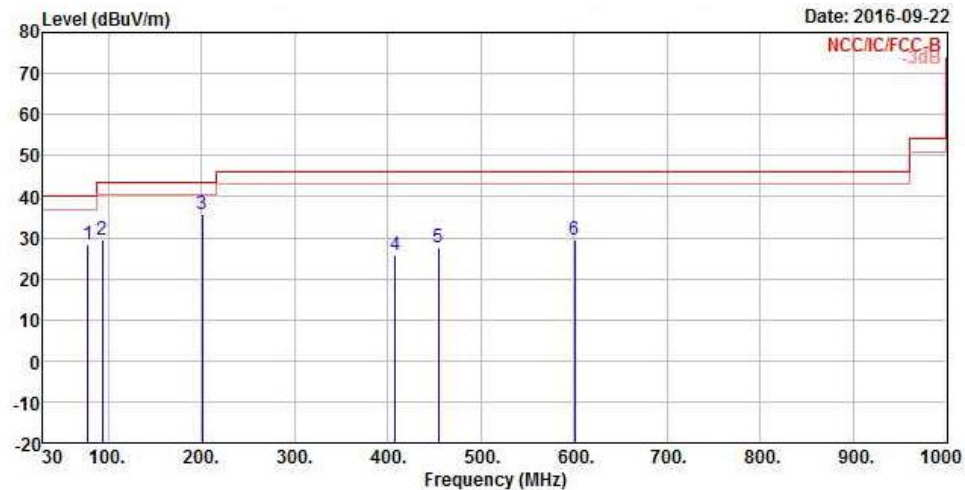
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	H
Operating Function	5GHz Wi-Fi 1TX 11ac20M U-NII-2A (5300MHz) + Bluetooth v4.0 LE (2402MHz)		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp	Loss Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	78.500	28.20	-11.80	40.00	51.98	12.69	0.51	36.98 Peak
2	94.020	29.60	-13.90	43.50	51.33	14.58	0.55	36.86 Peak
3	200.720	35.58	-7.92	43.50	56.06	15.12	0.79	36.39 Peak
4	408.300	25.65	-20.35	46.00	39.56	21.65	1.13	36.69 Peak
5	454.860	27.61	-18.39	46.00	40.75	22.49	1.21	36.84 Peak
6	600.360	29.35	-16.65	46.00	40.60	24.61	1.41	37.27 Peak

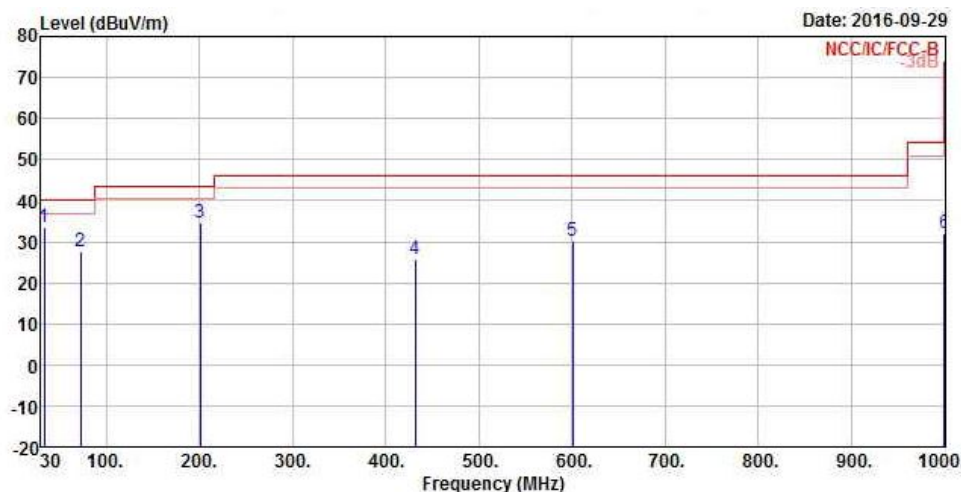
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	V
Operating Function	5GHz Wi-Fi 1TX 11a U-NII-3 (5785MHz) + Bluetooth v4.0 LE (2402MHz)		



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB
1	33.880	33.54	-6.46	40.00	47.77	22.80	0.34	37.37 Peak
2	72.680	27.66	-12.34	40.00	52.31	11.88	0.49	37.02 Peak
3	200.720	34.69	-8.81	43.50	55.17	15.12	0.79	36.39 Peak
4	431.580	25.84	-20.16	46.00	39.36	22.07	1.17	36.76 Peak
5	600.360	30.02	-15.98	46.00	41.27	24.61	1.41	37.27 Peak
6	999.610	31.93	-22.07	54.00	37.58	29.70	1.90	37.25 Peak

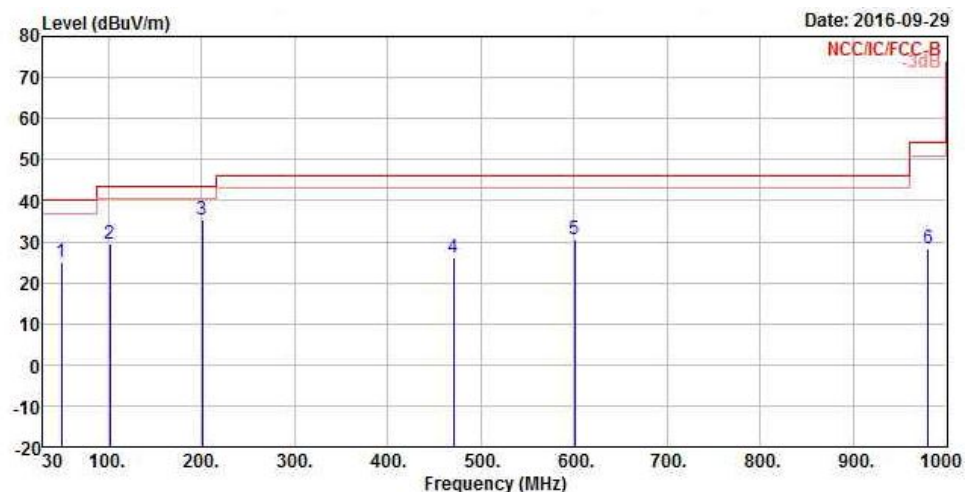
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	H
Operating Function	5GHz Wi-Fi 1TX 11a U-NII-3 (5785MHz) + Bluetooth v4.0 LE (2402MHz)		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	49.400	24.99	-15.01	40.00	47.37	14.40	0.42	37.20 Peak
2	101.780	29.55	-13.95	43.50	50.32	15.48	0.56	36.81 Peak
3	200.720	35.36	-8.14	43.50	55.84	15.12	0.79	36.39 Peak
4	470.380	26.05	-19.95	46.00	38.92	22.77	1.24	36.88 Peak
5	600.360	30.52	-15.48	46.00	41.77	24.61	1.41	37.27 Peak
6	980.600	28.24	-25.76	54.00	33.84	29.85	1.88	37.33 Peak

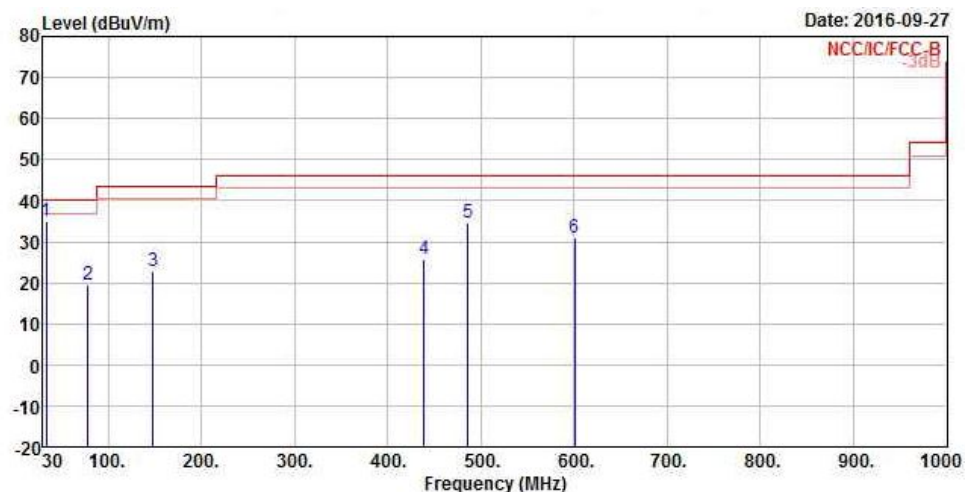
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	V
Operating Function	2.4GHz Wi-Fi 1TX 11g (2412MHz) + Bluetooth v2.1 BR + EDR (2402MHz)		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	33.880	34.96	-5.04	40.00	49.19	22.80	0.34	37.37 Peak
2	78.500	19.56	-20.44	40.00	43.34	12.69	0.51	36.98 Peak
3	148.340	22.72	-20.78	43.50	41.98	16.67	0.68	36.61 Peak
4	439.340	25.59	-20.41	46.00	38.97	22.21	1.19	36.78 Peak
5	485.900	34.78	-11.22	46.00	47.40	23.05	1.27	36.94 Peak
6	600.360	31.06	-14.94	46.00	42.31	24.61	1.41	37.27 Peak

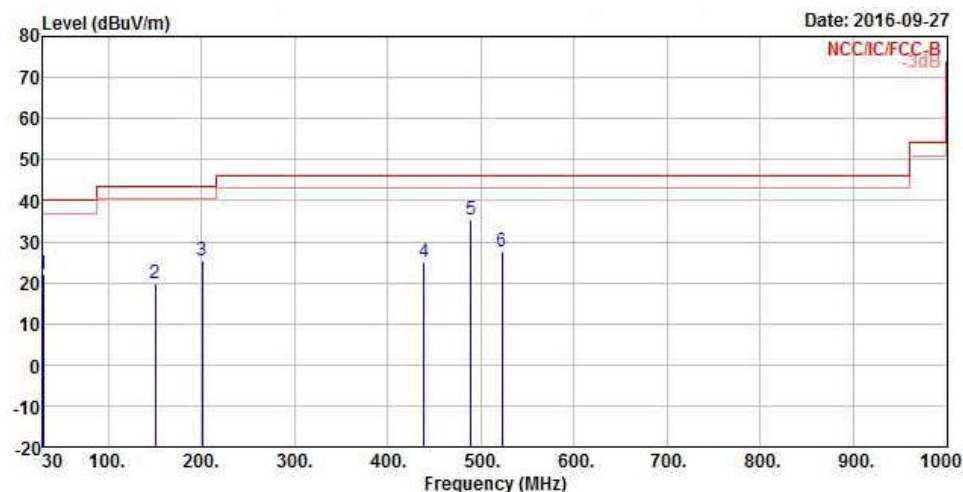
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	H
Operating Function	2.4GHz Wi-Fi 1TX 11g (2412MHz) + Bluetooth v2.1 BR + EDR (2402MHz)		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	30.000	22.22	-17.78	40.00	34.42	24.90	0.32	37.42 Peak
2	150.280	19.88	-23.62	43.50	39.20	16.59	0.69	36.60 Peak
3	200.720	25.43	-18.07	43.50	45.91	15.12	0.79	36.39 Peak
4	439.340	24.99	-21.01	46.00	38.37	22.21	1.19	36.78 Peak
5	489.780	35.23	-10.77	46.00	47.79	23.12	1.27	36.95 Peak
6	522.760	27.69	-18.31	46.00	39.85	23.57	1.32	37.05 Peak

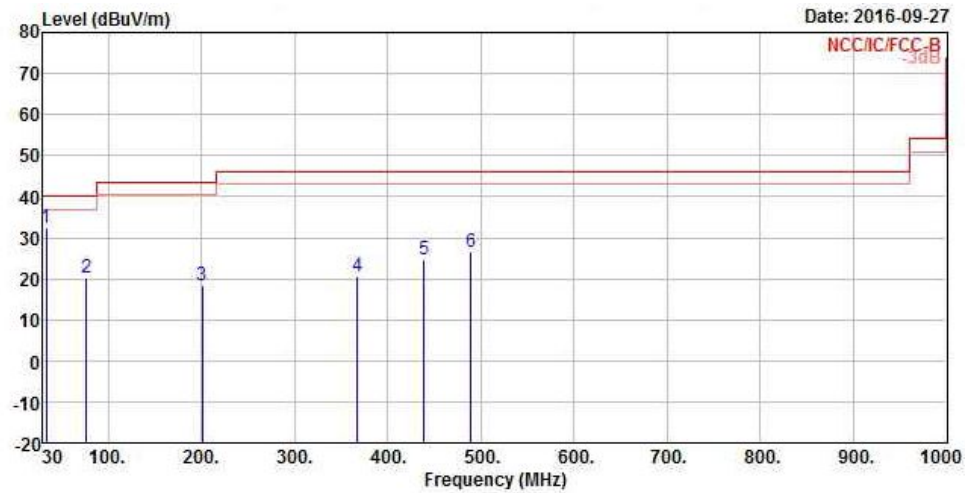
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	V
Operating Function	5GHz Wi-Fi 1TX 11ac20 U-NII-2A (5300MHz) + Bluetooth v2.1 BR + EDR (2402MHz)		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	33.880	32.48	-7.52	40.00	46.71	22.80	0.34	37.37 Peak
2	76.560	20.07	-19.93	40.00	44.15	12.42	0.50	37.00 Peak
3	200.720	18.48	-25.02	43.50	38.96	15.12	0.79	36.39 Peak
4	367.560	20.53	-25.47	46.00	35.31	20.72	1.07	36.57 Peak
5	439.340	24.63	-21.37	46.00	38.01	22.21	1.19	36.78 Peak
6	489.780	26.64	-19.36	46.00	39.20	23.12	1.27	36.95 Peak

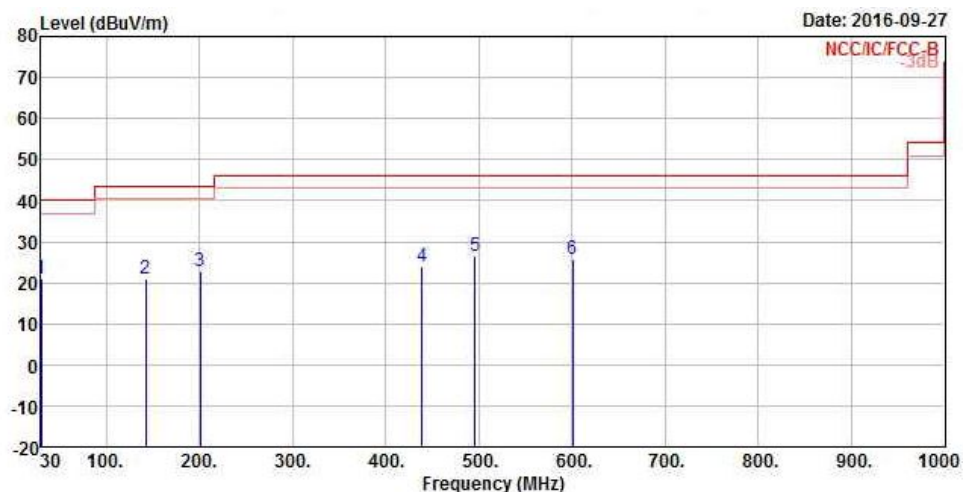
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	H
Operating Function	5GHz Wi-Fi 1TX 11ac20 U-NII-2A (5300MHz) + Bluetooth v2.1 BR + EDR (2402MHz)		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	30.000	21.11	-18.89	40.00	33.31	24.90	0.32	37.42 Peak
2	142.520	21.08	-22.42	43.50	40.16	16.90	0.66	36.64 Peak
3	200.720	22.83	-20.67	43.50	43.31	15.12	0.79	36.39 Peak
4	439.340	23.94	-22.06	46.00	37.32	22.21	1.19	36.78 Peak
5	495.600	26.56	-19.44	46.00	39.03	23.22	1.28	36.97 Peak
6	600.360	25.64	-20.36	46.00	36.89	24.61	1.41	37.27 Peak

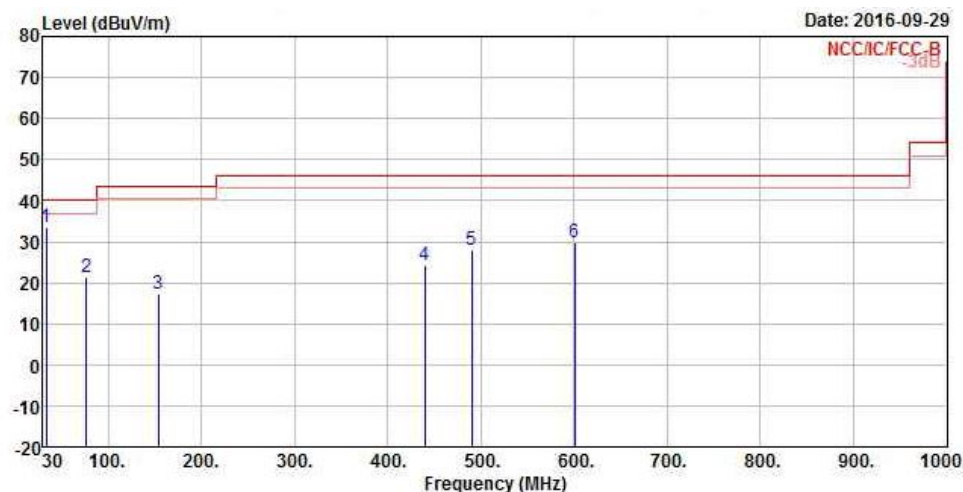
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	V
Operating Function	5GHz Wi-Fi 1TX 11a U-NII-3 (5785MHz) + Bluetooth v2.1 BR + EDR (2402MHz)		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	33.880	33.67	-6.33	40.00	47.90	22.80	0.34	37.37	Peak
2	76.380	21.15	-18.85	40.00	45.26	12.39	0.50	37.00	Peak
3	154.160	17.40	-26.10	43.50	36.90	16.39	0.70	36.59	Peak
4	440.030	24.43	-21.57	46.00	37.81	22.22	1.19	36.79	Peak
5	490.180	28.04	-17.96	46.00	40.60	23.12	1.27	36.95	Peak
6	600.360	30.00	-16.00	46.00	41.25	24.61	1.41	37.27	Peak

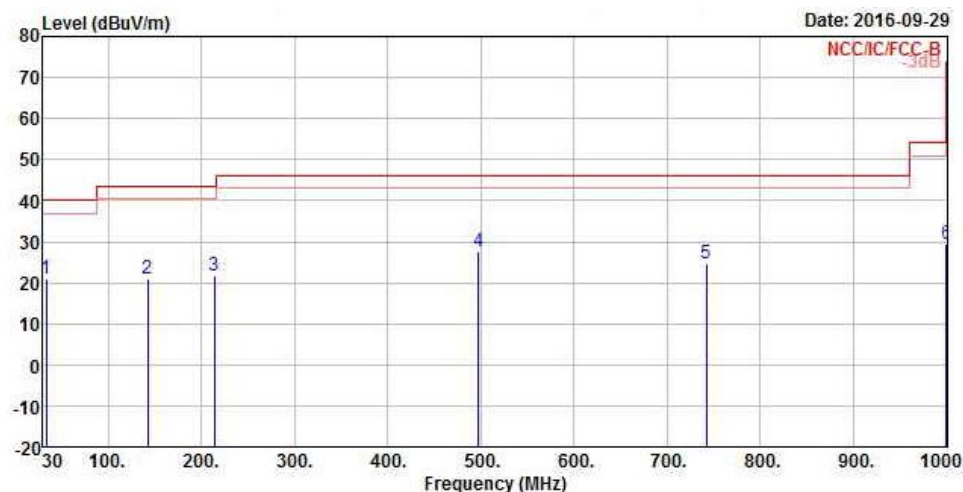
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions

Operating Mode	Adapter Mode and Transmit	Polarization	H
Operating Function	5GHz Wi-Fi 1TX 11a U-NII-3 (5785MHz) + Bluetooth v2.1 BR + EDR (2402MHz)		

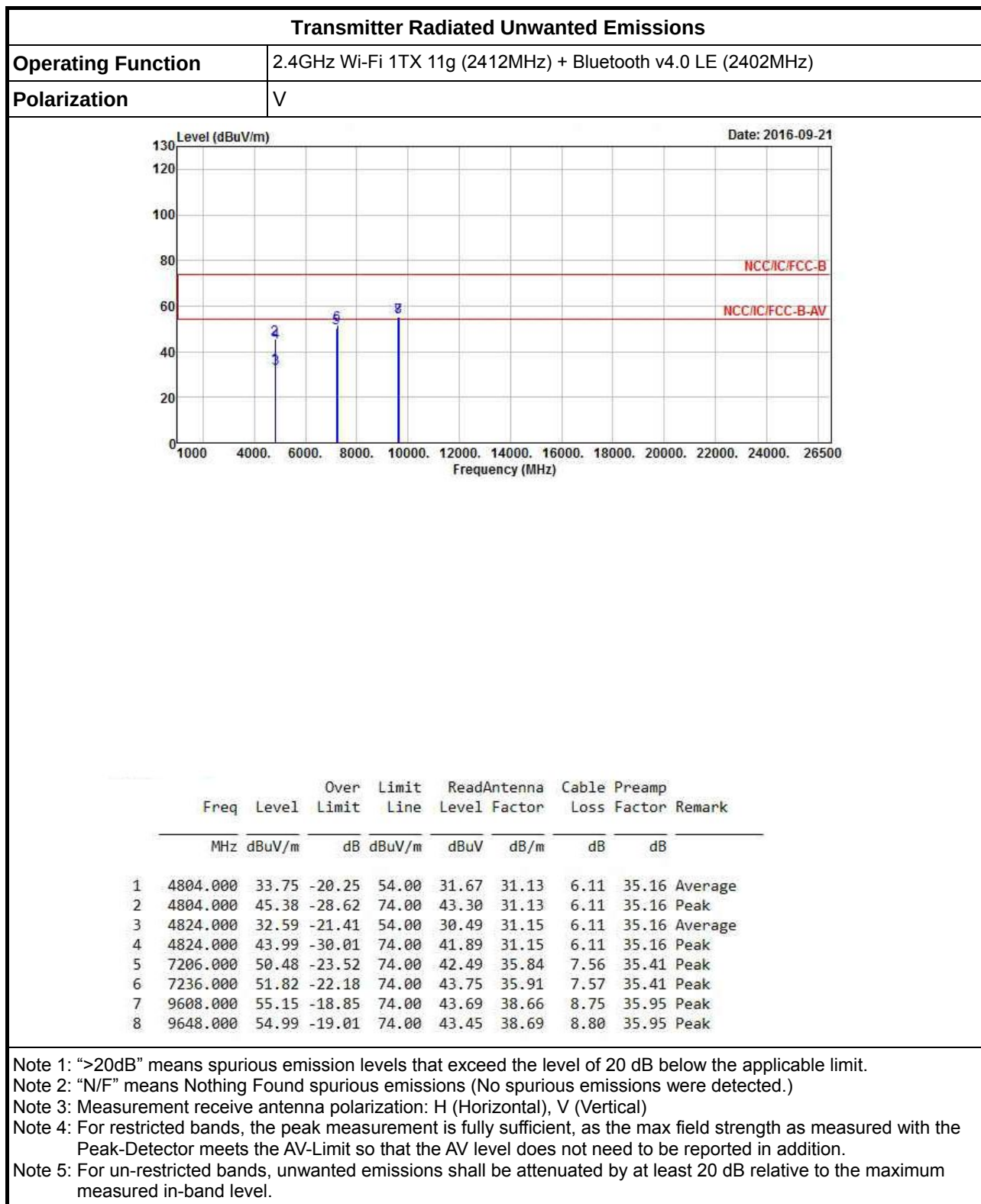


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	33.880	20.97	-19.03	40.00	35.20	22.80	0.34	37.37 Peak
2	142.520	21.08	-22.42	43.50	40.16	16.90	0.66	36.64 Peak
3	214.300	21.82	-21.68	43.50	42.08	15.31	0.82	36.39 Peak
4	497.310	27.78	-18.22	46.00	40.21	23.25	1.29	36.97 Peak
5	741.980	24.65	-21.35	46.00	33.81	26.76	1.59	37.51 Peak
6	999.820	29.42	-24.58	54.00	35.07	29.70	1.90	37.25 Peak

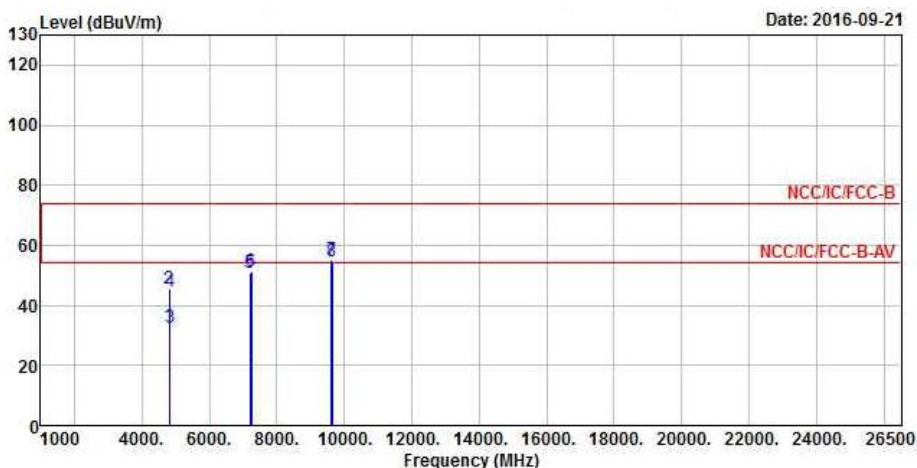
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

1.1.6 Results for Radiated Emissions (Above 1GHz)


Transmitter Radiated Unwanted Emissions
Operating Function 2.4GHz Wi-Fi 1TX 11g (2412MHz) + Bluetooth v4.0 LE (2402MHz)

Polarization H


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	33.13	-20.87	54.00	31.05	31.13	6.11	35.16 Average
2	4804.000	45.39	-28.61	74.00	43.31	31.13	6.11	35.16 Peak
3	4824.000	32.78	-21.22	54.00	30.68	31.15	6.11	35.16 Average
4	4824.000	44.59	-29.41	74.00	42.49	31.15	6.11	35.16 Peak
5	7206.000	50.83	-23.17	74.00	42.84	35.84	7.56	35.41 Peak
6	7236.000	51.18	-22.82	74.00	43.11	35.91	7.57	35.41 Peak
7	9608.000	55.17	-18.83	74.00	43.71	38.66	8.75	35.95 Peak
8	9648.000	54.83	-19.17	74.00	43.29	38.69	8.80	35.95 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

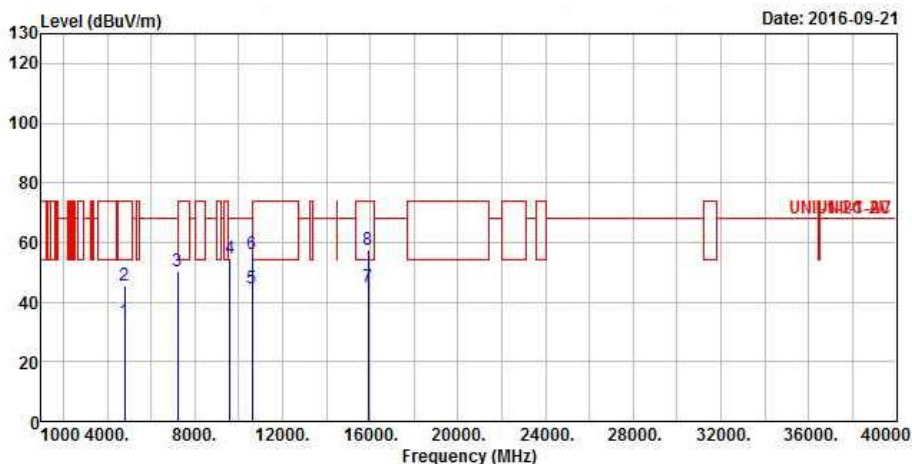
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	5GHz Wi-Fi 1TX 11ac20M U-NII-2A (5300MHz) + Bluetooth v4.0 LE (2402MHz)
Polarization	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	33.77	-20.23	54.00	31.69	31.13	6.11	35.16 Average
2	4804.000	45.77	-28.23	74.00	43.69	31.13	6.11	35.16 Peak
3	7206.000	50.29	-18.01	68.30	42.30	35.84	7.56	35.41 Peak
4	9608.000	54.73	-13.57	68.30	43.27	38.66	8.75	35.95 Peak
5	10600.000	44.68	-9.32	54.00	30.79	39.82	9.52	35.45 Average
6	10600.000	56.19	-17.81	74.00	42.30	39.82	9.52	35.45 Peak
7	15900.000	45.31	-8.69	54.00	32.29	37.62	11.23	35.83 Average
8	15900.000	57.52	-16.48	74.00	44.50	37.62	11.23	35.83 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

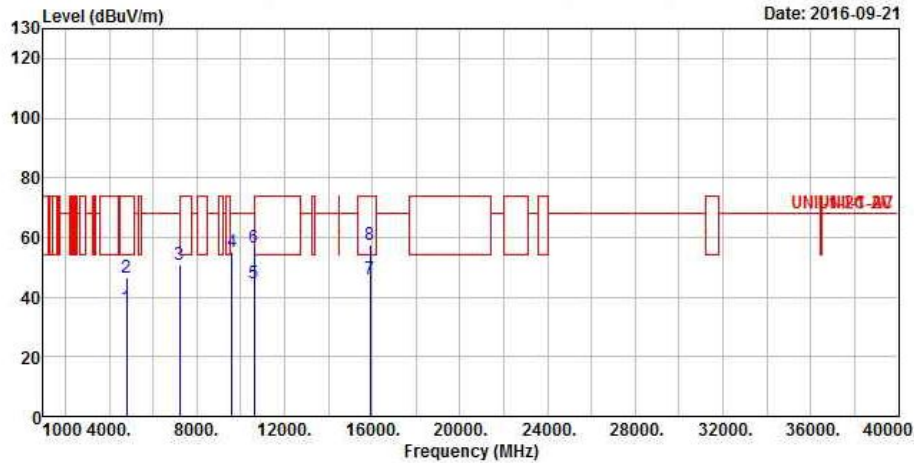
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	5GHz Wi-Fi 1TX 11ac20M U-NII-2A (5300MHz) + Bluetooth v4.0 LE (2402MHz)
Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	36.57	-17.43	54.00	34.49	31.13	6.11	35.16 Average
2	4804.000	46.38	-27.62	74.00	44.30	31.13	6.11	35.16 Peak
3	7206.000	50.71	-17.59	68.30	42.72	35.84	7.56	35.41 Peak
4	9608.000	55.06	-13.24	68.30	43.60	38.66	8.75	35.95 Peak
5	10600.000	44.84	-9.16	54.00	30.95	39.82	9.52	35.45 Average
6	10600.000	56.69	-17.31	74.00	42.80	39.82	9.52	35.45 Peak
7	15900.000	45.89	-8.11	54.00	32.87	37.62	11.23	35.83 Average
8	15900.000	57.62	-16.38	74.00	44.60	37.62	11.23	35.83 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

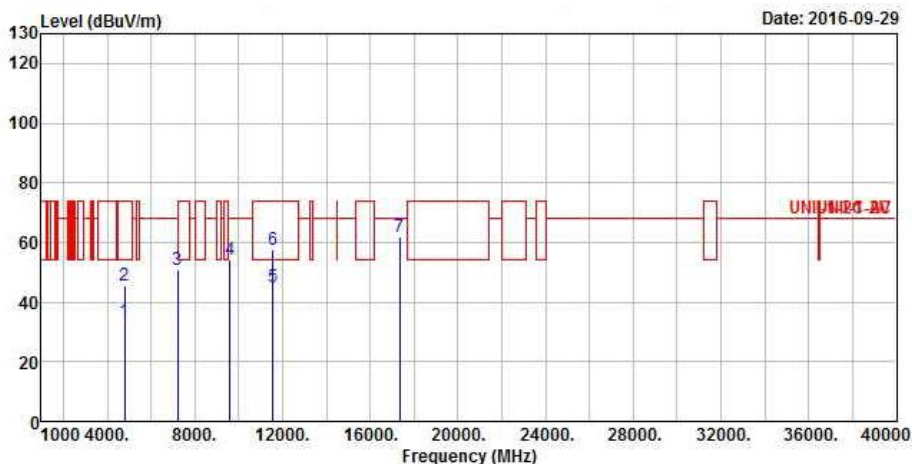
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	5GHz Wi-Fi 1TX 11a U-NII-3 (5785MHz) + Bluetooth v4.0 LE (2402MHz)
Polarization	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	33.56	-20.44	54.00	31.48	31.13	6.11	35.16 Average
2	4804.000	45.68	-28.32	74.00	43.60	31.13	6.11	35.16 Peak
3	7206.000	50.66	-17.54	68.20	42.67	35.84	7.56	35.41 Peak
4	9608.000	54.35	-13.85	68.20	42.89	38.66	8.75	35.95 Peak
5	11570.000	45.30	-8.70	54.00	30.89	39.93	9.79	35.31 Average
6	11570.000	57.59	-16.41	74.00	43.18	39.93	9.79	35.31 Peak
7	17355.000	61.79	-6.41	68.20	43.57	41.44	11.92	35.14 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

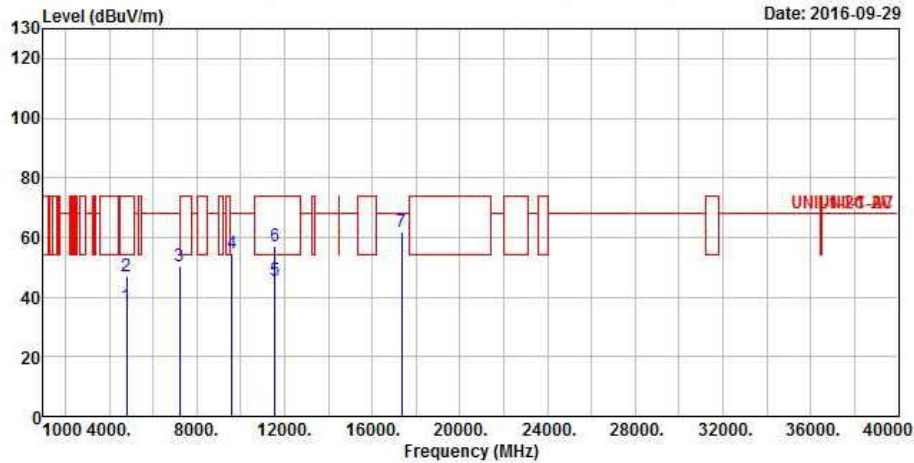
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	5GHz Wi-Fi 1TX 11a U-NII-3 (5785MHz) + Bluetooth v4.0 LE (2402MHz)
Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	37.08	-16.92	54.00	35.00	31.13	6.11	35.16 Average
2	4804.000	46.82	-27.18	74.00	44.74	31.13	6.11	35.16 Peak
3	7206.000	50.44	-17.76	68.20	42.45	35.84	7.56	35.41 Peak
4	9608.000	54.83	-13.37	68.20	43.37	38.66	8.75	35.95 Peak
5	11570.000	45.61	-8.39	54.00	31.20	39.93	9.79	35.31 Average
6	11570.000	57.09	-16.91	74.00	42.68	39.93	9.79	35.31 Peak
7	17355.000	61.76	-6.44	68.20	43.54	41.44	11.92	35.14 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

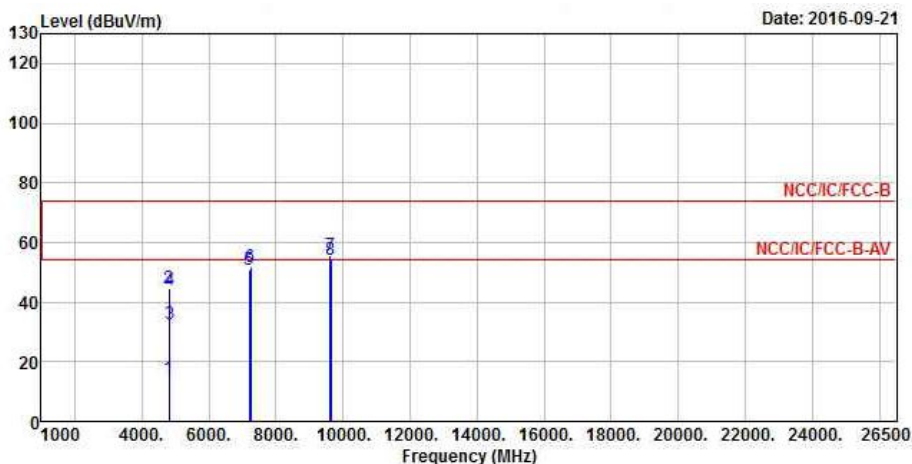
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	2.4GHz Wi-Fi 1TX 11g (2412MHz) + Bluetooth v2.1 BR + EDR (2402MHz)
Polarization	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	14.44	-39.56	54.00	12.36	31.13	6.11	35.16 Average
2	4804.000	44.54	-29.46	74.00	42.46	31.13	6.11	35.16 Peak
3	4824.000	32.72	-21.28	54.00	30.62	31.15	6.11	35.16 Average
4	4824.000	44.30	-29.70	74.00	42.20	31.15	6.11	35.16 Peak
5	7206.000	50.72	-23.28	74.00	42.73	35.84	7.56	35.41 Peak
6	7236.000	51.66	-22.34	74.00	43.59	35.91	7.57	35.41 Peak
7	9608.000	55.53	-18.47	74.00	44.07	38.66	8.75	35.95 Peak
8	9648.000	54.26	-19.74	74.00	42.72	38.69	8.80	35.95 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

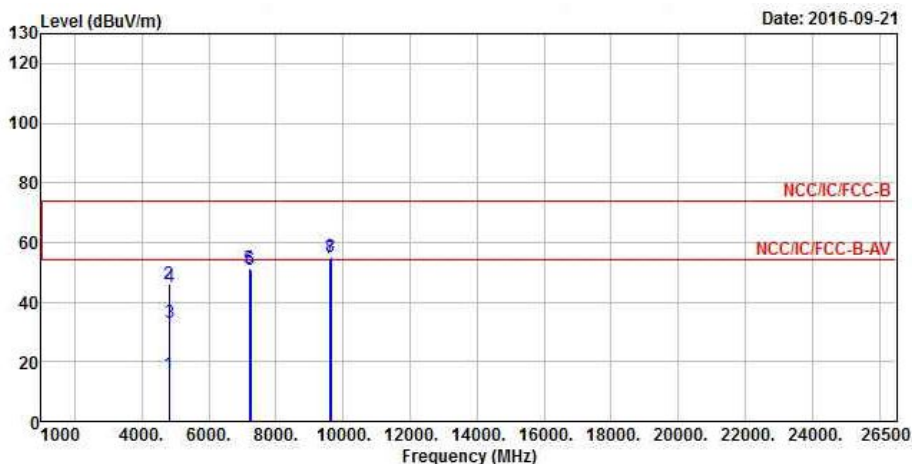
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	2.4GHz Wi-Fi 1TX 11g (2412MHz) + Bluetooth v2.1 BR + EDR (2402MHz)
Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	15.74	-38.26	54.00	13.66	31.13	6.11	35.16 Average
2	4804.000	45.84	-28.16	74.00	43.76	31.13	6.11	35.16 Peak
3	4824.000	33.33	-20.67	54.00	31.23	31.15	6.11	35.16 Average
4	4824.000	44.89	-29.11	74.00	42.79	31.15	6.11	35.16 Peak
5	7206.000	51.30	-22.70	74.00	43.31	35.84	7.56	35.41 Peak
6	7236.000	50.91	-23.09	74.00	42.84	35.91	7.57	35.41 Peak
7	9608.000	54.71	-19.29	74.00	43.25	38.66	8.75	35.95 Peak
8	9648.000	55.19	-18.81	74.00	43.65	38.69	8.80	35.95 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

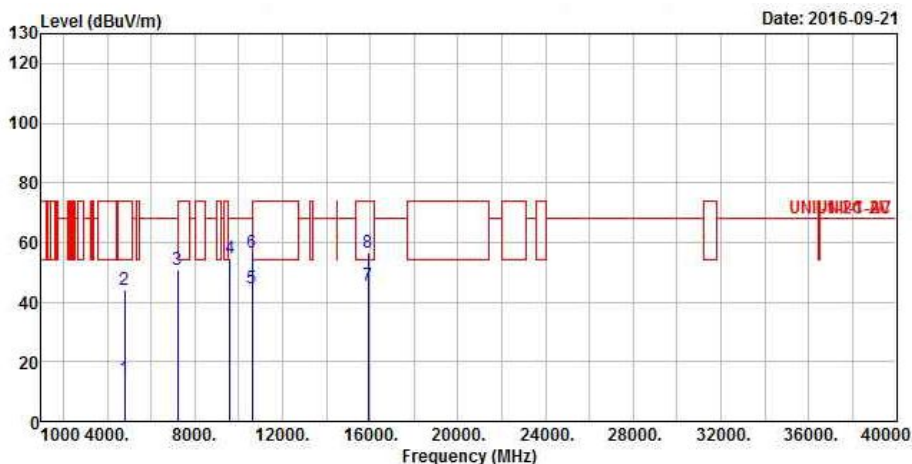
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	5GHz Wi-Fi 1TX 11ac20 U-NII-2A (5300MHz) + Bluetooth v2.1 BR + EDR (2402MHz)
Polarization	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	14.23	-39.77	54.00	12.15	31.13	6.11	35.16 Average
2	4804.000	44.33	-29.67	74.00	42.25	31.13	6.11	35.16 Peak
3	7206.000	50.61	-17.69	68.30	42.62	35.84	7.56	35.41 Peak
4	9608.000	54.81	-13.49	68.30	43.35	38.66	8.75	35.95 Peak
5	10600.000	44.81	-9.19	54.00	30.92	39.82	9.52	35.45 Average
6	10600.000	56.40	-17.60	74.00	42.51	39.82	9.52	35.45 Peak
7	15900.000	45.53	-8.47	54.00	32.51	37.62	11.23	35.83 Average
8	15900.000	56.81	-17.19	74.00	43.79	37.62	11.23	35.83 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

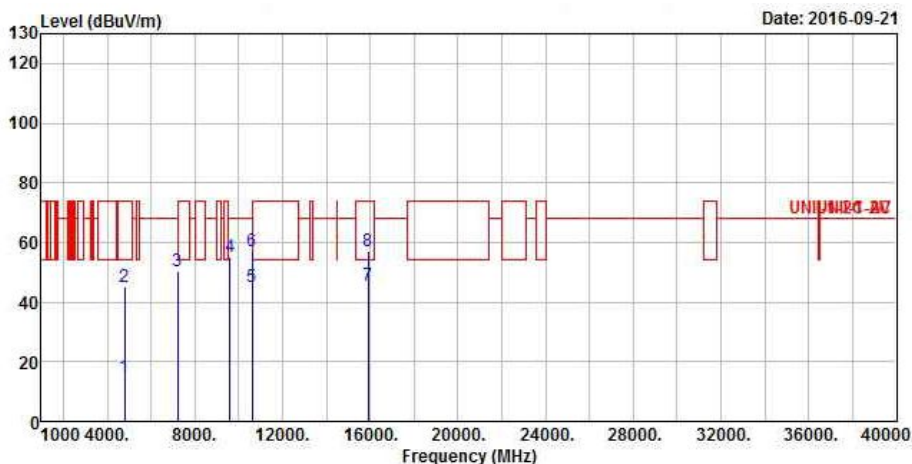
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	5GHz Wi-Fi 1TX 11ac20 U-NII-2A (5300MHz) + Bluetooth v2.1 BR + EDR (2402MHz)
Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	14.94	-39.06	54.00	12.86	31.13	6.11	35.16 Average
2	4804.000	45.04	-28.96	74.00	42.96	31.13	6.11	35.16 Peak
3	7206.000	50.36	-17.94	68.30	42.37	35.84	7.56	35.41 Peak
4	9608.000	55.17	-13.13	68.30	43.71	38.66	8.75	35.95 Peak
5	10600.000	44.97	-9.03	54.00	31.08	39.82	9.52	35.45 Average
6	10600.000	57.14	-16.86	74.00	43.25	39.82	9.52	35.45 Peak
7	15900.000	45.79	-8.21	54.00	32.77	37.62	11.23	35.83 Average
8	15900.000	56.96	-17.04	74.00	43.94	37.62	11.23	35.83 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

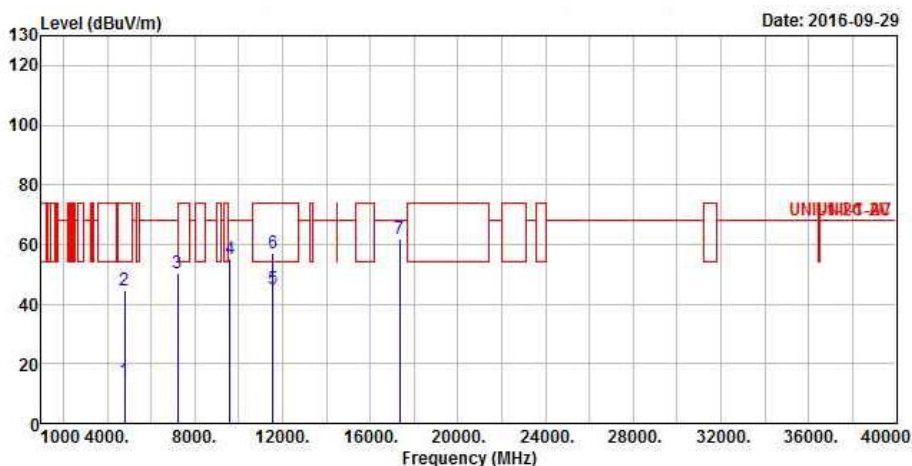
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	5GHz Wi-Fi 1TX 11a U-NII-3 (5785MHz) + Bluetooth v2.1 BR + EDR (2402MHz)
Polarization	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Factor	Loss Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	14.44	-39.56	54.00	12.36	31.13	6.11	35.16 Average
2	4804.000	44.54	-29.46	74.00	42.46	31.13	6.11	35.16 Peak
3	7206.000	50.46	-17.74	68.20	42.47	35.84	7.56	35.41 Peak
4	9608.000	54.97	-13.23	68.20	43.51	38.66	8.75	35.95 Peak
5	11570.000	45.19	-8.81	54.00	30.78	39.93	9.79	35.31 Average
6	11570.000	57.12	-16.88	74.00	42.71	39.93	9.79	35.31 Peak
7	17355.000	61.78	-6.42	68.20	43.56	41.44	11.92	35.14 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

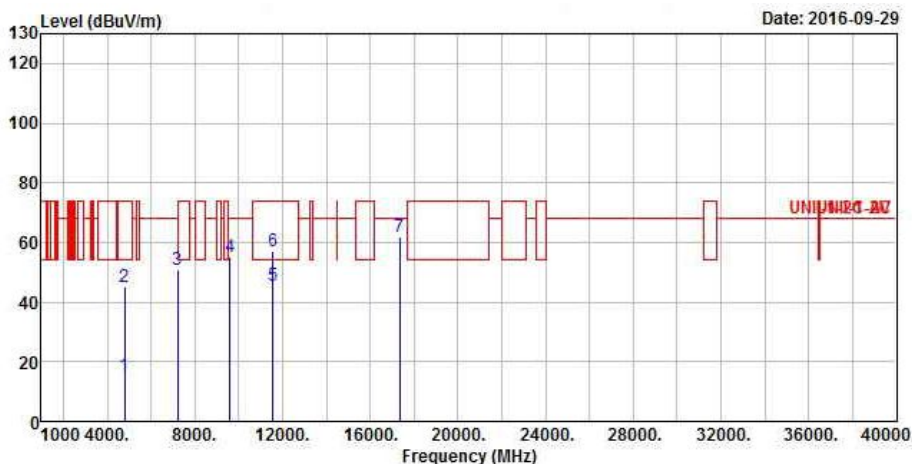
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Transmitter Radiated Unwanted Emissions

Operating Function	5GHz Wi-Fi 1TX 11a U-NII-3 (5785MHz) + Bluetooth v2.1 BR + EDR (2402MHz)
Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Factor	Loss Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	4804.000	15.18	-38.82	54.00	13.10	31.13	6.11	35.16 Average
2	4804.000	45.28	-28.72	74.00	43.20	31.13	6.11	35.16 Peak
3	7206.000	50.64	-17.56	68.20	42.65	35.84	7.56	35.41 Peak
4	9608.000	55.10	-13.10	68.20	43.64	38.66	8.75	35.95 Peak
5	11570.000	45.50	-8.50	54.00	31.09	39.93	9.79	35.31 Average
6	11570.000	57.18	-16.82	74.00	42.77	39.93	9.79	35.31 Peak
7	17355.000	61.93	-6.27	68.20	43.71	41.44	11.92	35.14 Peak

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Note 5: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

2 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz 3m	25/04/2016	24/04/2017
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz 3m	30/06/2016	29/06/2017
Amplifier	EMC	EMC9135	980232	9kHz ~ 1.0GHz	29/01/2016	28/01/2017
Amplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	11/04/2016	10/04/2017
Spectrum	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	04/07/2016	03/07/2017
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL 6111D & MTJ6102	35418	30MHz ~ 1GHz	31/03/2016	30/03/2017
Horn Antenna	SCHWARZBECK	BBHA 9120D	BBHA 9120D 1534	1GHz ~ 18GHz	22/04/2016	21/04/2017
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170614	18GHz ~ 40GHz	04/01/2016	03/01/2017
Amplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	02/06/2015	01/06/2017