1 CO-LOCATION

1.1 Transmitter Unwanted Emissions

1.1.1 Transmitter 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 20 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

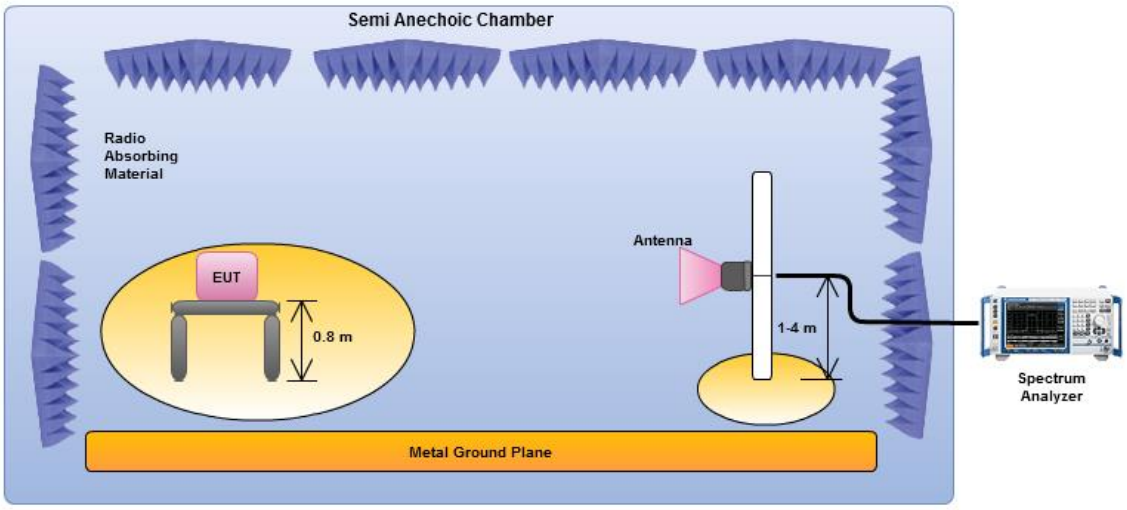
Refer a test equipment and calibration data table in this test report.

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).
☒	For the transmitter unwanted emissions shall be measured using following options below:
	☒ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
	☒ Refer as KDB 558074, clause 12.2.3 measurement procedure peak limit.
☒	For radiated measurement, refer as ANSI C63.10,
	☒ Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
	☒ Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
	☒ Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz.

1.1.4 Test Setup

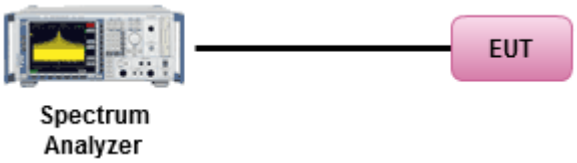
Transmitter Radiated Unwanted Emissions



Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn antenna.

Note: Test distance is 3m.

Transmitter Conducted Unwanted Emissions

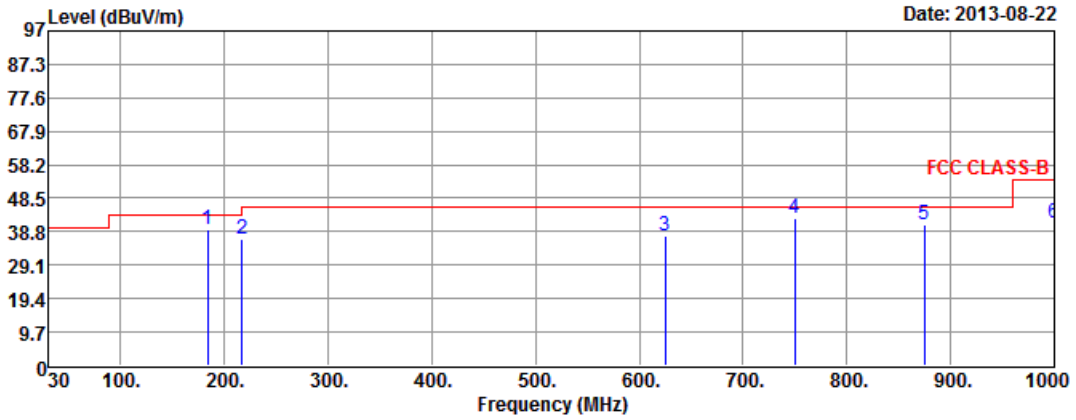


1.1.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

1.1.6 Results of Radiated Emissions (30MHz~1GHz)

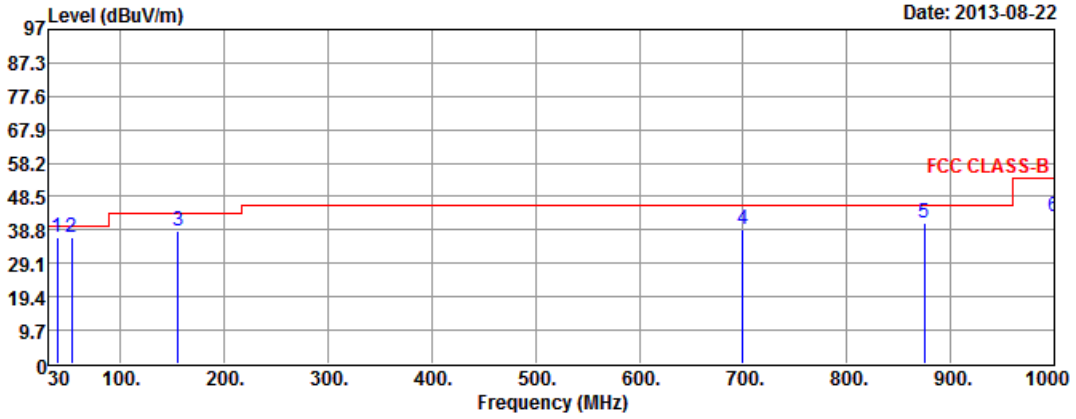
Transmitter Radiated Unwanted Emissions			
Operating Mode	AC Power & Radio link (WLAN), Adapter 1	**Polarization**	H
Operating Function	WLAN 5GHz and 2.4GHz		



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	183.49	39.46	-4.04	43.50	57.93	11.59	1.50	31.56	---	---	Peak
2	217.36	36.49	-9.51	46.00	55.16	11.15	1.68	31.50	---	---	Peak
3	624.78	37.58	-8.42	46.00	46.17	20.35	2.36	31.30	---	---	Peak
4	749.95	42.65	-3.35	46.00	49.27	22.10	2.50	31.22	---	---	QP
5	874.93	40.66	-5.34	46.00	45.82	23.45	2.54	31.15	---	---	Peak
6	1000.00	41.20	-12.80	54.00	44.66	24.70	2.88	31.04	---	---	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	AC Power & Radio link (WLAN), Adapter 1	**Polarization**	V
Operating Function	WLAN 5GHz and 2.4GHz		

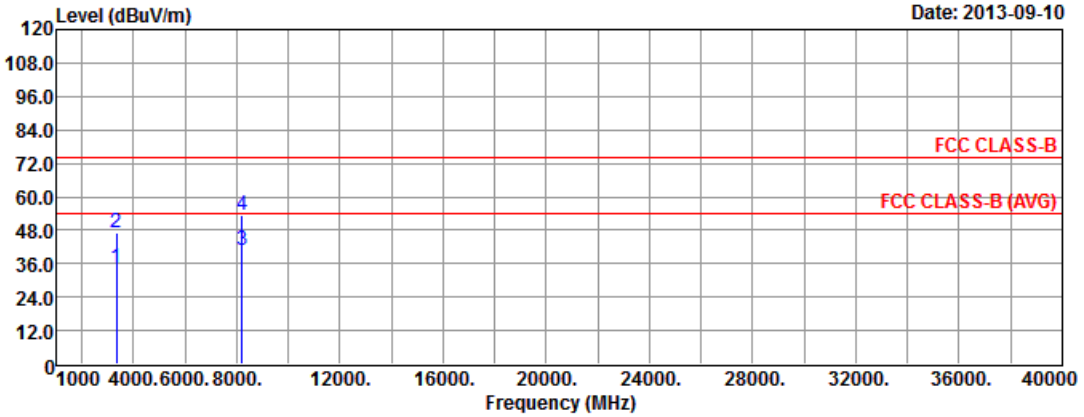


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	38.75	36.54	-3.46	40.00	53.03	14.10	1.22	31.81	---	---	QP
2	52.49	36.61	-3.39	40.00	52.73	14.43	1.24	31.79	---	---	QP
3	155.22	38.49	-5.01	43.50	54.82	13.75	1.50	31.58	---	---	Peak
4	699.43	39.00	-7.00	46.00	46.51	21.19	2.52	31.22	---	---	Peak
5	874.92	40.73	-5.27	46.00	45.89	23.45	2.54	31.15	---	---	Peak
6	1000.00	42.93	-11.07	54.00	46.39	24.70	2.88	31.04	---	---	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)

1.1.7 Results for Radiated Emissions (1GHz~10th Harmonic)

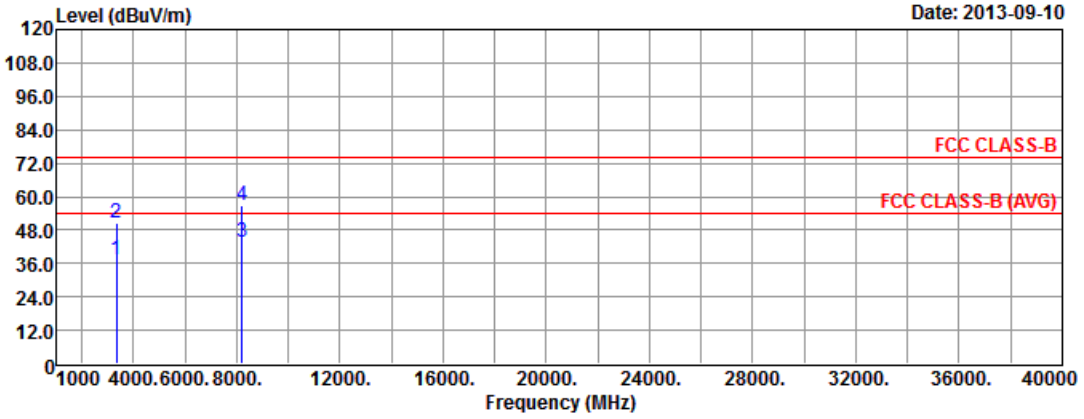
Transmitter Radiated Unwanted Emissions			
Operating Mode	AC Power & Radio link (WLAN), Adapter 1	**Polarization**	H
Operating Function	WLAN 5GHz and 2.4GHz		



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	3338.00	34.28	-19.72	54.00	33.76	28.74	5.68	33.90	---	---	Average
2	3338.00	47.35	-26.65	74.00	46.83	28.74	5.68	33.90	---	---	Peak
3	8212.00	40.55	-13.45	54.00	30.30	36.60	8.51	34.86	---	---	Average
4	8212.00	53.45	-20.55	74.00	43.20	36.60	8.51	34.86	---	---	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	AC Power & Radio link (WLAN), Adapter 1	**Polarization**	V
Operating Function	WLAN 5GHz and 2.4GHz		

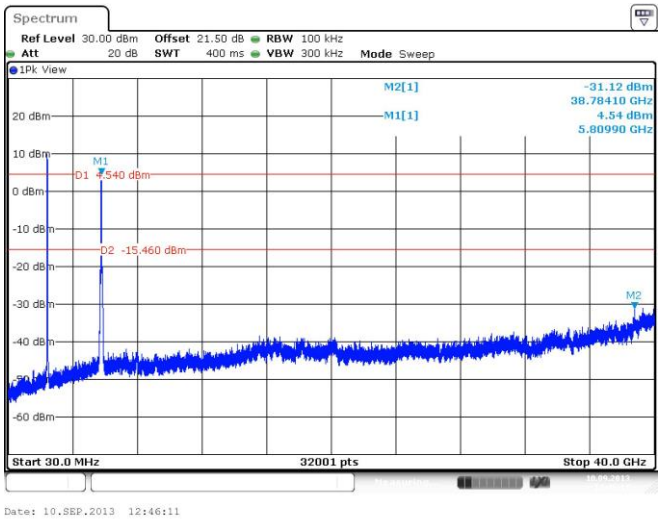


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	3338.00	37.22	-16.78	54.00	36.70	28.74	5.68	33.90	---	---	Average
2	3338.00	50.42	-23.58	74.00	49.90	28.74	5.68	33.90	---	---	Peak
3	8212.00	43.65	-10.35	54.00	33.40	36.60	8.51	34.86	---	---	Average
4	8212.00	56.95	-17.05	74.00	46.70	36.60	8.51	34.86	---	---	Peak

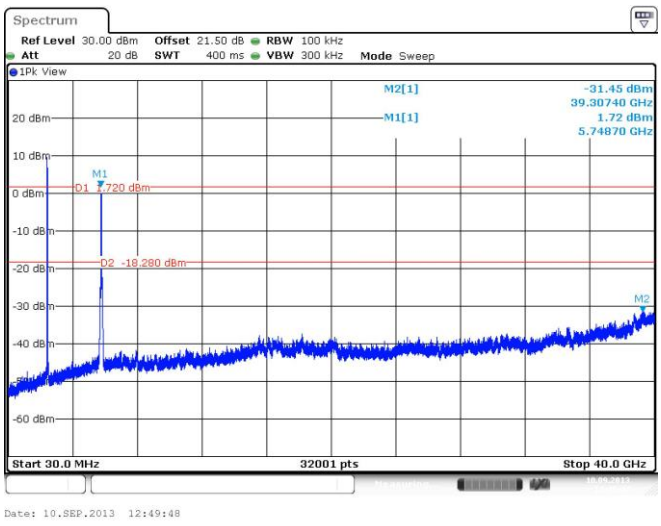
Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

1.1.8 Results for Conducted Emissions (30MHz~40GHz)

Conducted Emission Plots of Antenna port 1



Conducted Emission Plots of Antenna port 2



2 TEST EQUIPMENT AND CALIBRATION DATA

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9 kHz ~ 2.75 GHz	Mar. 26, 2013	Conduction (CO04-HY)
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz – 30MHz	Jan. 21, 2013	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9 kHz ~ 30 MHz	Apr. 18, 2013	Conduction (CO04-HY)
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832010001	9 kHz ~ 30 MHz	Nov. 09, 2012	Conduction (CO04-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSV40	101499	9Kz – 40GHz	Jan. 28, 2013	Radiation (03CH08-HY)
Receiver	R&S	ESR3	101657	9KHz – 3GHz	Jan. 30,2013	Radiation (03CH08-HY)
Amplifier	COM-POWER	PA-103	161241	10MHz ~ 1000MHz	Feb. 26, 2013	Radiation (03CH08-HY)
Amplifier	Agilent	83017A	MY39501308	1GHz – 26.5 GHz	Dec. 18, 2012	Radiation (03CH08-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	1GHz~18GHz	Feb. 18, 2013	Radiation (03CH08-HY)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170517	18GHz~40GHz	Jan. 14, 2013	Radiation (03CH08-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170517	15GHz~40GHz	Sep. 28, 2012	Radiation (03CH08-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30 MHz - 1 GHz	Oct. 06, 2012	Radiation (03CH08-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amplifier	MITEQ	AMF-7D-00101800-30-10P	9121372	26.5GHz ~ 40GHz	Feb. 27, 2013	Radiation (03CH08-HY)
Loop Antenna	R&S	HFH2-Z2	860004/0001	9 kHz - 30 MHz	Jul. 03, 2012	Radiation (03CH08-HY)

Note: Calibration Interval of instruments listed above is two year.