FCC Test Report Report No.: FR471572

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 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.

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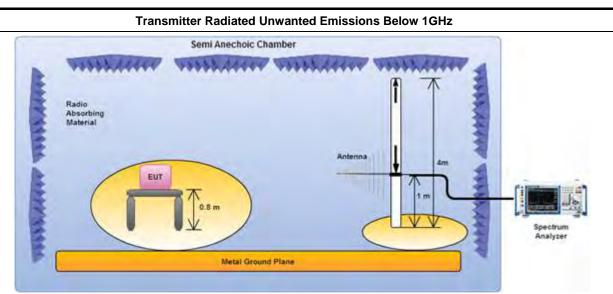


1.1.3 Test Procedures

		Test Method
\boxtimes	perf equi extra dista	issurements may be performed at a distance other than the limit distance provided they are not ormed in the near field and the emissions to be measured can be detected by the measurement ipment. When performing measurements at a distance other than that specified, the results shall be appointed to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear ance for field-strength measurements, inverse of linear distance-squared for power-density issurements).
\boxtimes	The	average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
\boxtimes	For	the transmitter unwanted emissions shall be measured using following options below:
		Refer as FCC KDB 558074, clause 10.1 for unwanted emissions into non-restricted bands.
	\boxtimes	Refer as FCC KDB 558074, clause 10.2 for unwanted emissions into restricted bands.
		Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 1 (spectral trace averaging)
		Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 2 (slow sweep speed).
		Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		Refer as FCC KDB 558074, clause 10.2.3.2 and 8.1.1 measurement procedure peak limit.
		Refer as FCC KDB 558074, clause 10.2.3.1 measurement procedure Quasi-Peak limit.
\boxtimes	For	radiated measurement, refer as FCC KDB 558074, clause 10.2.1.
	\boxtimes	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz. Test distance is 3m.
	\boxtimes	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz. Test distance is $3m$.
	\boxtimes	Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz. Test distance is 3m.
	For	conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 10.2.2.
		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

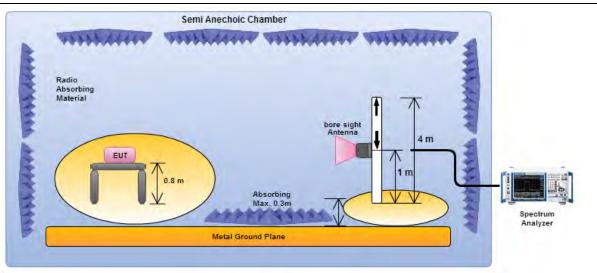
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1.1.4 Test Setup



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.

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.

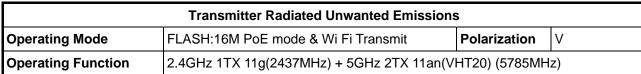
1.1.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

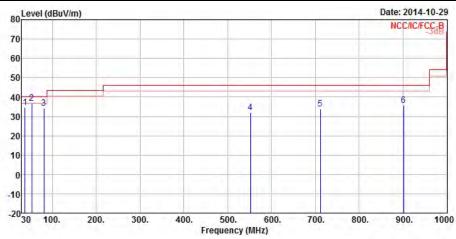
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

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





	Freq	Level	Over Limit			Antenna Factor		The second second		A/Pos	T/Pos
0.	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	-	cm	deg
1	37.76	34.70	-5.30	40.00	47.23	14.34	0.83	27.70	QP	1689	1689
2	53.28	36.99	-3.01	40.00	56.05	7.45	1.01	27.52	QP		
3	80.44	34.31	-5.69	40.00	53.59	7.10	1.28	27.66	Peak	666	684
4	551.86	32.16	-13.84	46.00	38.29	18.80	3.54	28.47	Peak		
5	710.94	34.05	-11.95	46.00	39.18	19.10	4.04	28.27	Peak	10000	
6	901.06	35.79	-10.21	46.00	38.42	20.59	4.55	27.77	Peak	1	

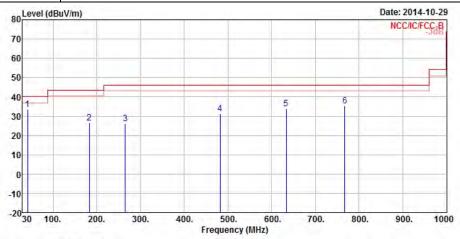
Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

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

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

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Transmitter Radiated Unwanted Emissions								
Operating Mode	FLASH:16M PoE mode & Wi Fi Transmit	Polarization	Н					
Operating Function 2.4GHz 1TX 11g(2437MHz) + 5GHz 2TX 11an(VHT20) (5785MHz)								



	Frea	Level		Limit Line				A THE RESERVE OF THE PARTY OF T		A/Pos	T/Pos
	rreq	rever	LIMIL	LINE	rever	I ac coi	LUSS	lactor	itellar K		
-	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	41.64	33.54	-6.46	40.00	48.53	11.77	0.88	27.64	Peak		
2	183.26	26.52	-16.98	43.50	42.77	9.27	1.96	27.48	Peak		
3	264.74	25.95	-20.05	46.00	37.50	13.31	2.39	27.25	Peak		
4	482.02	31.33	-14.67	46.00	38.88	17.59	3.20	28.34	Peak		
5	633.34	33.95	-12.05	46.00	39.47	19.11	3.80	28.43	Peak		
6	767.20	35.39	-10.61	46.00	39.46	19.85	4.22	28.14	Peak	14991	444

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

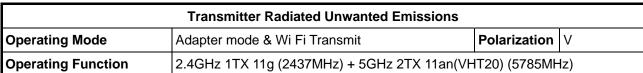
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

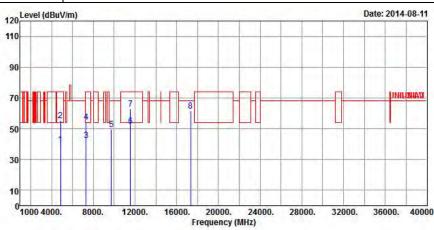
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

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





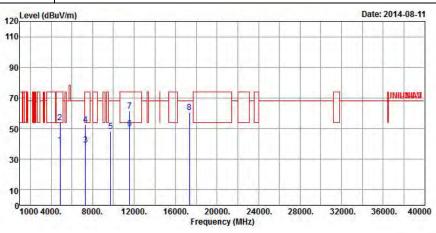
	Freq	Level	Over Limit	Limit Line		Antenna Factor		Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	-	cm	deg
1	4874.00	39.91	-14.09	54.00	35.53	34.32	4.73	34.67	Average	1499	(444)
2	4874.00	55.20	-18.80	74.00	50.82	34.32	4.73	34.67	Peak		
3	7311.00	42.46	-11.54	54.00	36.06	35.88	5.47	34.95	Average	255	
4	7311.00	54.44	-19.56	74.00	48.04	35.88	5.47	34.95	Peak	nee-	
5	9748.00	49.66	-18.54	68.20	41.90	36.71	6.41	35.36	Peak		
6	11570.00	51.75	-2.25	54.00	41.54	38.30	6.44	34.53	Average		
7	11570.00	62.79	-11.21	74.00	52.58	38.30	6.44	34.53	Peak	555	555
8	17355.00	61.68	-6.52	68.20	45.13	41.42	8.94	33.81	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.

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	Transmitter Radiated Unwanted Emissions								
Operating Mode	Adapter mode & Wi Fi Transmit	Polarization	Н						
Operating Function	2.4GHz 1TX 11g (2437MHz) + 5GHz 2TX 11an(VHT	20) (5785MHz	:)						



	Freq	Level	Over Limit	Limit Line		Antenna Factor		The second second	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	-		deg
1	4874.00	39.49	-14.51	54.00	35.11	34.32	4.73	34.67	Average	+44	422
2	4874.00	53.93	-20.07	74.00	49.55	34.32	4.73	34.67	Peak		
3	7311.00	39.50	-14.50	54.00	33.10	35.88	5.47	34.95	Average	955	
4	7311.00	52.50	-21.50	74.00	46.10	35.88	5.47	34.95	Peak	inan.	HAR
5	9748.00	48.27	-19.93	68.20	40.51	36.71	6.41	35.36	Peak		
6	11570.00	49.83	-4.17	54.00	39.62	38.30	6.44	34.53	Average		
7	11570.00	61.51	-12.49	74.00	51.30	38.30	6.44	34.53	Peak		444
8	17355.00	60.69	-7.51	68.20	44.14	41.42	8.94	33.81	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.

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2 TEST EQUIPMENT AND CALIBRATION DATA

Radiated Emission

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100593	9kHz ~ 40GHz	Oct. 03, 2013	Radiation
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	May 11, 2014	Radiation
Amplifier	Agilent	8447D	2944A11149	100kHz ~ 1.3GHz	Jul. 18, 2013	Radiation
Amplifier	Agilent	8447D	2944A11149	100kHz ~ 1.3GHz	Jul. 22, 2014	Radiation
Amplifier	Agilent	8449B	3008A02373	1GHz ~ 26.5GHz	Aug. 28, 2013	Radiation
Horn Antenna	ETS-LINDGREN	3117	00091920	1GHz ~ 18GHz	Nov. 25, 2013	Radiation
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz ~ 40GHz	Jan. 10, 2014	Radiation
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 09, 2013	Radiation
RF Cable-high	SUHNER	SUCOFLEX106	03CH02-HY	1GHz ~ 40GHz	Mar. 05, 2014	Radiation
Bilog Antenna	SCHAFFNER	CBL61128	2723	30MHz ~ 2GHz	Oct. 10, 2013	Radiation
Bilog Antenna	SCHAFFNER	CBL61128	2723	30MHz ~ 2GHz	Sep. 20, 2014	Radiation
Turn Table	Chaintek Instruments	3000	MF7802058	0 ~ 360 degree	N/A	Radiation
Antenna Mast	MF	MF7802	MF780208205	1 ~ 4 m	N/A	Radiation

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz ~ 40GHz	Apr. 19, 2013	Radiation
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz ~ 30 MHz	Dec. 02, 2012	Radiation

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

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