FCC Test Report

Equipment	:	**11abgn 2x2 USB WiFi module**
Brand Name	:	**Panasonic**
Model No.	:	**DNUR-P1**
FCC ID	:	**NKR-P1**
Standard	:	**47 CFR FCC Part 15.247**
Operating Band	:	**5725 MHz – 5850 MHz**
Equipment Class	:	**DTS**
Applicant Manufacturer	:	**Wistron NeWeb Corporation 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308,Taiwan,R.O.C.**

The product sample received on Nov. 27, 2012 and completely tested on Dec. 03, 2012. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 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:

Wayne Hsu / Assistant Manager

Testing Laboratory 1190

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Summary of Test Result

Conformance Test Specifications					
Report Clause	**Ref. Std. Clause**	**Description**	**Measured**	**Limit**	**Result**
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]:17.200MHz 33.81 (Margin 16.19dB) - AV 39.96 (Margin 20.04dB) - QP	FCC 15.207	Complied
3.2	15.247(a)	6dB Bandwidth	6dB Bandwidth [MHz] 20M:17.39 / 40M:35.94	≥500kHz	Complied
3.3	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm]: 29.57	Power [dBm]:30	Complied
3.4	15.247(d)	Power Spectral Density	PSD [dBm/3kHz]:-5.59	PSD [dBm/3kHz]:8	Complied
3.5	15.247(c)	Transmitter Radiated Bandedge Emissions	Non-Restricted Bands: 5721.3MHz:24.69dB	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
3.6	15.247(c)	Transmitter Radiated Unwanted Emissions	Restricted Bands [dBuV/m at 3m]:480.08MHz 44.02 (Margin 1.98dB) - QP	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied

Revision History

Report No.	Version	Description	Issued Date
FR2N2717AI	Rev. 01	Initial issue of report	Dec. 13, 2012

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information						
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**RF Output Power (dBm)**	**Co-location**
5725-5850	a	5745-5825	149-165 [5]	1	29.02	N/A
5725-5850	n (HT-20)	5745-5825	149-165 [5]	1 / 2	29.57	N/A
5725-5850	n (HT-40)	5755-5795	151-159 [2]	1 / 2	29.53	N/A

Note 1: RF output power specifies that Maximum Peak Conducted Output Power.
Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
Note 3: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (i.e., EUT has simultaneously co-transmitting that operating 2.4GHz and 5GHz.)

1.1.2 Antenna Information

Antenna Category	
☐	Equipment placed on the market without antennas
☒	Integral antenna (antenna permanently attached)
	☒ Temporary RF connector provided
	☐ No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
☐	External antenna (dedicated antennas)
	☐ Single power level with corresponding antenna(s).
	☐ Multiple power level and corresponding antenna(s).
	☐ RF connector provided
	☐ Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type…)
	☐ Standard antenna connector. (e.g., SMA, N, BNC, and TNC type…)

Antenna General Information			
No.	**Ant. Cat.**	**Ant. Type**	**Gain (dBi)**
1	Integral	Printed	1.52
2	Integral	Printed	2.15

1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	☐ Production ; ☒ Pre-Production ; ☐ Prototype
Type of EUT	
☒	Stand-alone
☐	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: …
☐	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.: …
☐	Other:

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
☐ Operated normally mode for worst duty cycle	
☒ Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	**Power Duty Factor [dB] – (10 log 1/x)**
☒ 88.82% - IEEE 802.11a	0.52
☒ 79.87% - IEEE 802.11n (HT-20)	0.98
☒ 65.01% - IEEE 802.11n (HT-40)	1.87

Note 1: RF Output Power Plots w/o Duty Factor

1.1.5 EUT Operational Condition

Supply Voltage	☐ AC mains	☒ DC	
Type of DC Source	☐ Internal DC supply	☒ External DC adapter	☐ Battery

1.2 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**Serial No.**
1	Notebook	DELL	E5410	DoC

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2009
- FCC KDB 558074
- FCC KDB 662911
- FCC KDB 412172

1.4 Testing Location Information

Testing Location					
☒	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973			
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
RF Conducted		TH01-HY	Song	23.5°C / 62%	30-Nov-12 ~ 03-Dec-12
AC Conduction		CO01-HY	Sky Huang	23°C / 56%	03-Dec-12
Radiated Emission		03CH05-HY	Yang	24.5°C / 64%	27-Nov-12 ~ 30-Nov-12
Test site registered number [643075] with FCC.					

1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty			
Test Item		**Uncertainty**	**Limit**
AC power-line conducted emissions		±2.26 dB	N/A
Emission bandwidth, 6dB bandwidth		±1.42 %	N/A
RF output power, conducted		±0.63 dB	N/A
Power density, conducted		±0.81 dB	N/A
Unwanted emissions, conducted	30 – 1000 MHz	±0.51 dB	N/A
	1 – 18 GHz	±0.67 dB	N/A
	18 – 40 GHz	±0.83 dB	N/A
	40 – 200 GHz	N/A	N/A
All emissions, radiated	30 – 1000 MHz	±2.56 dB	N/A
	1 – 18 GHz	±3.59 dB	N/A
	18 – 40 GHz	±3.82 dB	N/A
	40 – 200 GHz	N/A	N/A
Temperature		±0.8 °C	N/A
Humidity		±3 %	N/A
DC and low frequency voltages		±3 %	N/A
Time		±1.42 %	N/A
Duty Cycle		±1.42 %	N/A

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing				
Modulation Mode	**Transmit Chains (N_{TX})**	**Data Rate / MCS**	**Worst Data Rate / MCS**	**RF Output Power (dBm)**
11a	1	6-54 Mbps	6 Mbps	29.02
HT-20	2	MCS 0-15	MCS 8	29.57
HT-40	2	MCS 0-15	MCS 8	29.53
Note 1: IEEE Std. 802.11n modulation consists of HT-20 and HT-40 (HT: High Throughput). Then EUT support HT-20 and HT-40. Worst modulation mode of Guard Interval (GI) is 400ns. Note 2: Modulation modes consist below configuration: 11a: IEEE 802.11a, HT-20/HT-40: IEEE 802.11n Note 3: RF output power specifies that Maximum Peak Conducted Output Power.				

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
IEEE Std. 802.11	**Test Channel Frequencies (MHz) – FX (Frequencies Abbreviations)**
a, n (HT-20)	5745-(F1), 5785-(F2), 5825-(F3)
n (HT-40)	5755-(F4), 5795-(F5)

2.3 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter (2400-2483.5MHz band)							
Test Software Version	RT5x7x QA _1.0.3.8						
Modulation Mode	**N_{TX}**	**Test Frequency (MHz)**					
		NCB: 20MHz			**NCB: 40MHz**		
		5745	**5785**	**5825**	**5755**	**5795**	**-**
11a	1	2B	2B	2B	-	-	-
HT-20	2	2B,2B	2A,2B	2A,2B	-	-	-
HT-40	2	-	-	-	2A,2B	2A,2B	-

2.4 The Worst Case Measurement Configuration

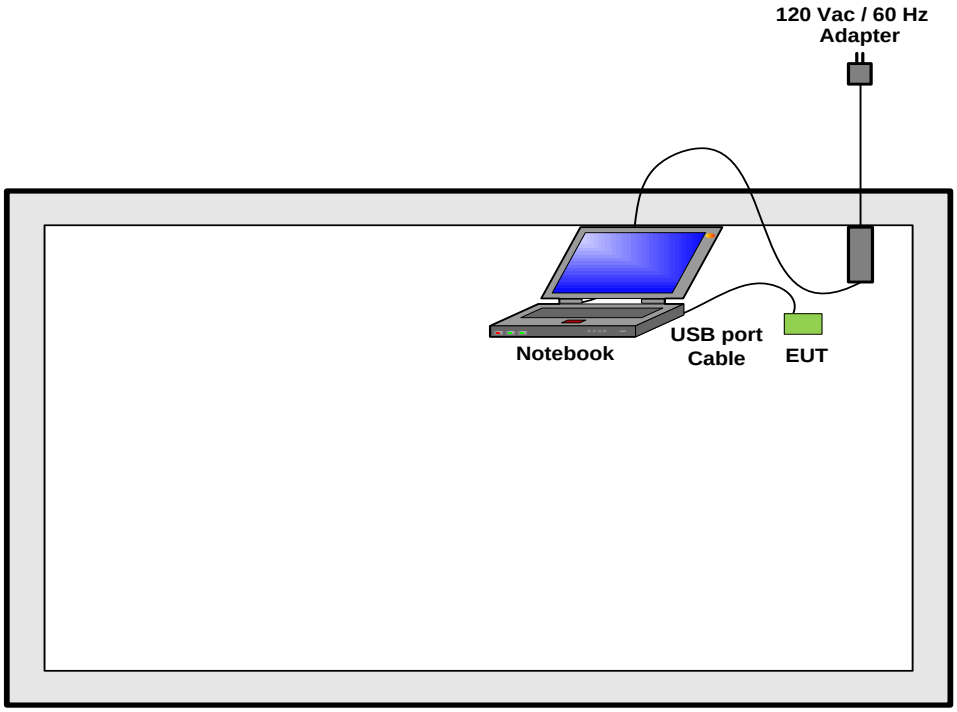
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	DC Power & Radio link (WLAN)

The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, Power Spectral Density, 6 dB Bandwidth
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11a, HT-20, HT-40

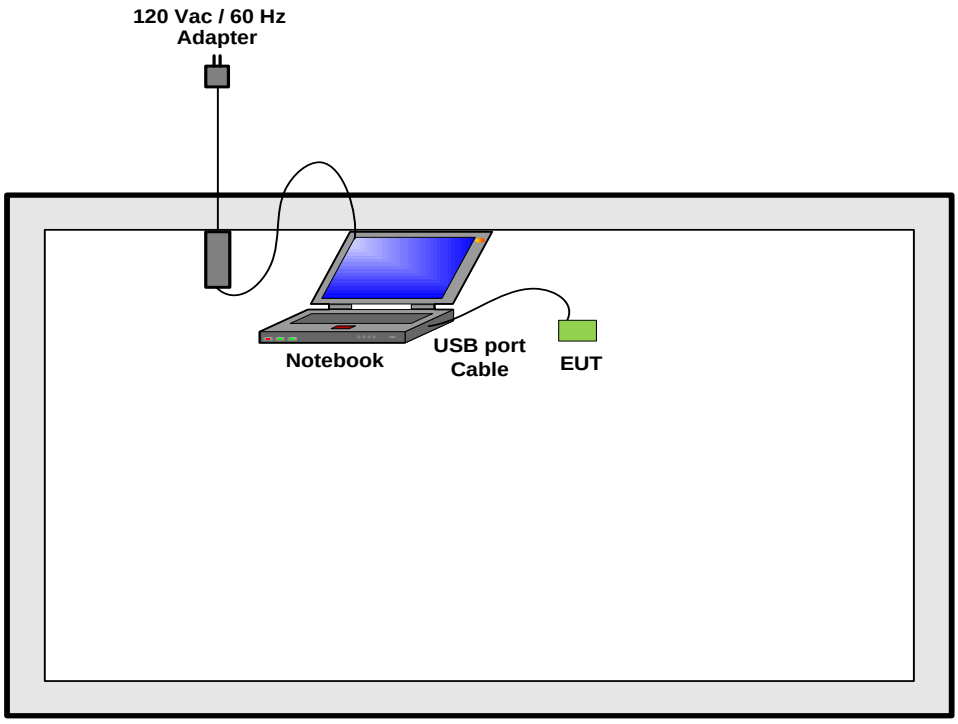
The Worst Case Mode for Following Conformance Tests			
Tests Item	Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
User Position	☐ EUT will be placed in fixed position.		
	☒ EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes. The worst planes is Y.		
	☐ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed two or three orthogonal planes.		
Operating Mode < 1GHz	☒ 1. DC Power & Radio link (WLAN)		
Modulation Mode	11a, HT-20, HT-40		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			

2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test	
Operating Mode 1	DC Power & Radio link (WLAN)



Test Setup Diagram - Radiated Test	
Operating Mode 1	DC Power & Radio link (WLAN)



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

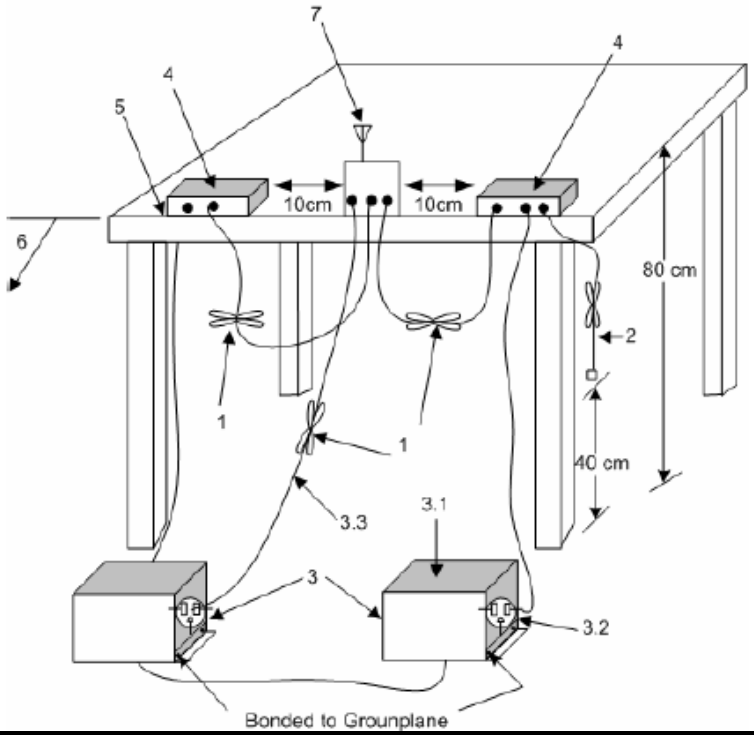
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions.

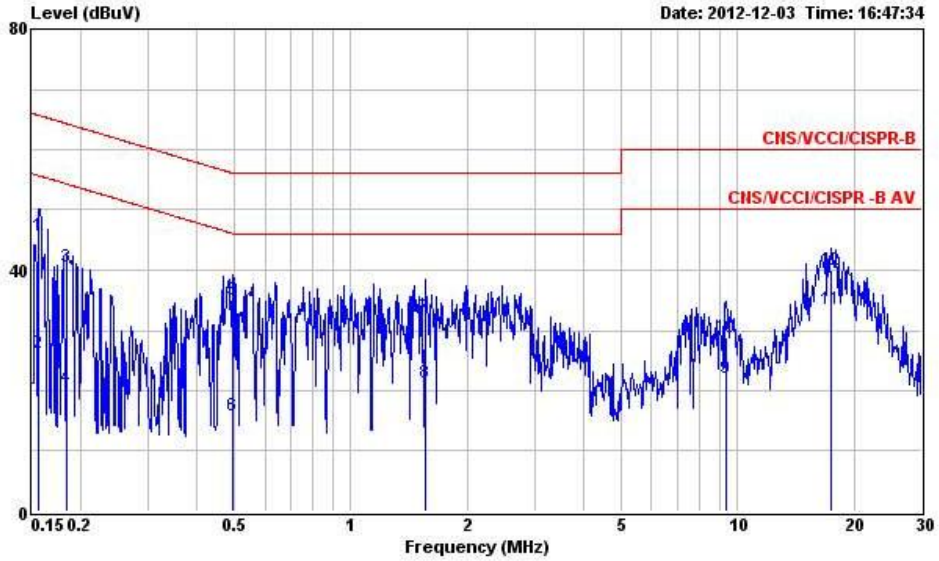
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

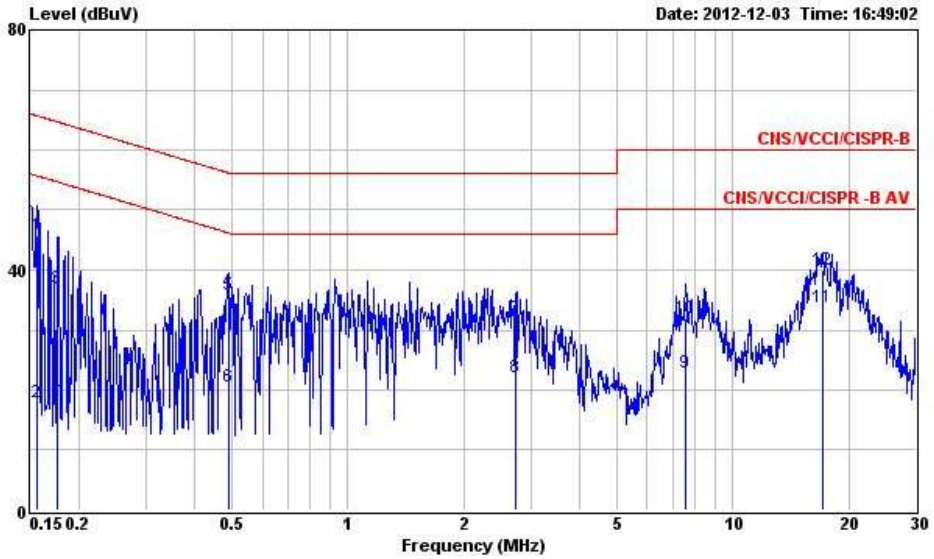
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	DC Power & Radio link (WLAN)		



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.156	45.59	-20.08	65.67	45.37	0.12	0.10	QP
2	0.156	26.11	-29.56	55.67	25.89	0.12	0.10	Average
3	0.184	40.44	-23.86	64.30	40.22	0.12	0.10	QP
4	0.184	20.41	-33.89	54.30	20.19	0.12	0.10	Average
5	0.494	34.98	-21.12	56.10	34.67	0.13	0.18	QP
6	0.494	15.94	-30.16	46.10	15.63	0.13	0.18	Average
7	1.560	32.28	-23.72	56.00	32.02	0.16	0.10	QP
8	1.560	21.20	-24.80	46.00	20.94	0.16	0.10	Average
9	9.350	22.13	-27.87	50.00	21.63	0.31	0.19	Average
10	9.350	28.90	-31.10	60.00	28.40	0.31	0.19	QP
11	17.470	33.59	-16.41	50.00	32.98	0.42	0.19	Average
12	17.470	39.91	-20.09	60.00	39.30	0.42	0.19	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	DC Power & Radio link (WLAN)		



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.156	45.74	-19.93	65.67	45.55	0.09	0.10	QP
2	0.156	17.92	-37.75	55.67	17.73	0.09	0.10	Average
3	0.176	36.77	-27.90	64.67	36.59	0.08	0.10	QP
4	0.176	19.18	-35.49	54.67	19.00	0.08	0.10	Average
5	0.489	35.71	-20.47	56.18	35.43	0.10	0.18	QP
6	0.489	20.51	-25.67	46.18	20.23	0.10	0.18	Average
7	2.740	31.89	-24.11	56.00	31.63	0.16	0.10	QP
8	2.740	22.04	-23.96	46.00	21.78	0.16	0.10	Average
9	7.570	22.93	-27.07	50.00	22.51	0.25	0.17	Average
10	7.570	31.82	-28.18	60.00	31.40	0.25	0.17	QP
11	17.200	33.81	-16.19	50.00	33.25	0.35	0.21	Average
12	17.200	39.96	-20.04	60.00	39.40	0.35	0.21	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

3.2 6dB Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
☒ 6 dB bandwidth ≥ 500 kHz.

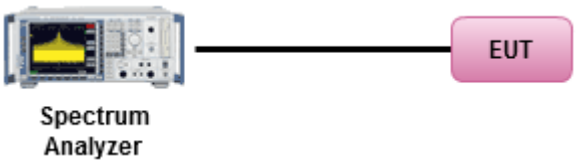
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method		
☒	For the emission bandwidth shall be measured using one of the options below:	
	☒	Refer as FCC KDB 558074, clause 7.1 Option 1 for 6 dB bandwidth measurement.
	☐	Refer as FCC KDB 558074, clause 7.2 Option 2 for 6 dB bandwidth measurement.
	☐	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
☒	For conducted measurement.	
	☒	The EUT supports single transmit chain and measurements performed on this transmit chain.
	☒	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
	☒	The EUT supports multiple transmit chains using options given below:
		☐ Option 1: Multiple transmit chains measurements need to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1.
		☒ Option 2: Multiple transmit chains measurements need to be performed on each transmit chains individually (antenna outputs). All measurement had be performed on all transmit chains.

3.2.4 Test Setup

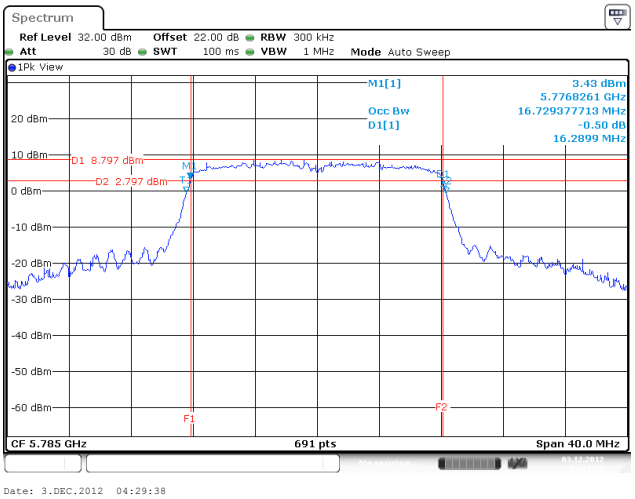
Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

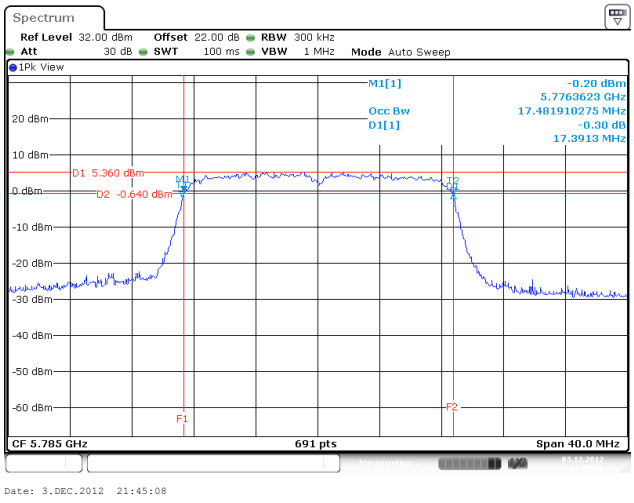
Emission Bandwidth Result										
Condition			Emission Bandwidth (MHz)							
Modulation Mode	N_{TX}	Freq. (MHz)	99% Bandwidth				6dB Bandwidth			
			Chain-Port 1	Chain-Port 2	Chain-Port 3	Chain-Port 4	Chain-Port 1	Chain-Port 2	Chain-Port 3	Chain-Port 4
11a	1	5745	-	16.73	-	-	-	16.29	-	-
11a	1	5785	-	16.73	-	-	-	16.29	-	-
11a	1	5825	-	16.73	-	-	-	16.29	-	-
HT-20	2	5745	17.37	17.37	-	-	17.10	16.75	-	-
HT-20	2	5785	17.48	17.48	-	-	17.39	17.22	-	-
HT-20	2	5825	17.48	17.48	-	-	17.16	17.04	-	-
HT-40	2	5755	36.12	36.12	-	-	35.71	35.59	-	-
HT-40	2	5795	36.47	36.47	-	-	35.83	35.94	-	-
Limit			N/A				≥500 kHz			
Result			Complied							
Note 1: N_{TX} = Number of Transmit Chains										

Worst Emission Bandwidth Plots

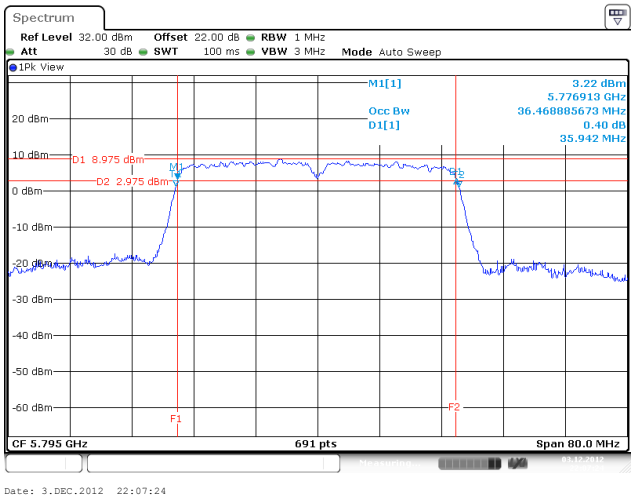
11a



HT-20



HT-40



3.3 RF Output Power

3.3.1 RF Output Power Limit

RF Output Power Limit	
Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit	
☒	5725-5850 MHz Band:
☒	If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 30 dBm (1 W)
☒	Point-to-multipoint systems (P2M): If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6) dBm
☐	Point-to-point systems (P2P): If G_{TX} > 6 dBi, then P_{Out} = 30 dBm
e.i.r.p. Power Limit:	
☒	5725-5850 MHz Band
☒	Point-to-multipoint systems (P2M): P_{eirp} ≤ 36 dBm (4 W)
☐	Point-to-point systems (P2P): N/A
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, **G_{TX}** = the maximum transmitting antenna directional gain in dBi. **P_{eirp}** = e.i.r.p. Power in dBm.	

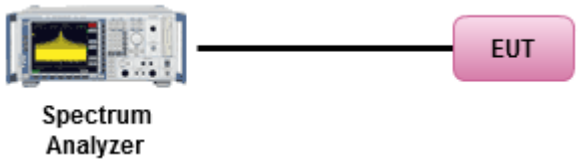
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
☒	Maximum Peak Conducted Output Power
☐	Refer as FCC KDB 558074, clause 8.1.1 Option 1 (RBW ≥ EBW method).
☒	Refer as FCC KDB 558074, clause 8.1.2 Option 2 (integrated band power method).
☐	Refer as FCC KDB 558074, clause 8.1.3 Option 2 (peak power meter for VBW ≥ DTS BW)
☒	Maximum Conducted (Average) Output Power
☐	Refer as FCC KDB 558074, clause 8.2.1 Option 1 (spectral trace averaging).
☒	Refer as FCC KDB 558074, clause 8.2.2 Option 2 (slow sweep speed).
☐	Refer as FCC KDB 558074, clause 8.2.3 Option 3 (average power meter).
☒	For conducted measurement.
☒	The EUT supports single transmit chain and measurements performed on this transmit chain.
☒	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
☒	The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
☒	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

RF Output Power (Spectrum Analyzer)


3.3.5 Directional Gain for Power Measurement

Directional Gain (DG) Result					
Transmit Chains No.		1	2	**-**	-
Maximum G_{ANT} (dBi)		1.52	2.15	**-**	-
Modulation Mode	**DG (dBi)**	**N_{TX}**	**N_{SS}**	**STBC**	**Array Gain (dB)**
11a,6-54Mbps	2.15	1	1	-	-
HT-20,M0-15	1.85*	2	1	-	-
HT-40,M0-15	1.85*	2	1	-	-

Note 1: For all transmitter outputs with equal antenna gains, directional gain is to be computed as follows:
Any transmit signals are correlated, Directional Gain = G_{ANT} + 10 log(N_{TX})
All transmit signals are completely uncorrelated, Directional Gain = G_{ANT}
Note 2: For all transmitter outputs with unequal antenna gains, directional gain is to be computed as follows:
Any transmit signals are correlated, Directional Gain =10 log[($10^{G1/20}$ +… + $10^{GN/20}$)^2 /N_{TX}]
All transmit signals are completely uncorrelated, Directional Gain = 10 log[($10^{G1/10}$ +… + $10^{GN/10)}$/N_{TX}]
Note 3: For Spatial Multiplexing, Directional Gain (DG) = G_{ANT} + 10 log(N_{TX}/N_{SS}),
where Nss = the number of independent spatial streams data.
Note 4: For CDD transmissions, directional gain is calculated as power measurements:
Directional Gain (DG) = G_{ANT} + Array Gain, where Array Gain is as follows:
Array Gain = 0 dB (i.e., no array gain) for $N_{TX} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{TX};
Note 5: * Direction gain = 10 log[($10^{1.52/10}$ + $10^{2.15/10)}$/2]=1.85dBi

3.3.6 Test Result of Maximum Peak Conducted Output Power

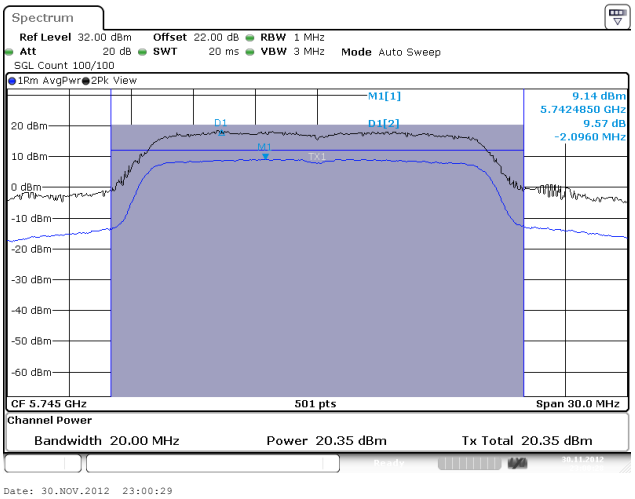
Maximum Peak Conducted Output Power Result											
Condition			RF Output Power (dBm)								
Modulation Mode	N_{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Chain Port 3	Chain Port 4	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11a	1	5745	-	29.02	-	-	29.02	30	2.15	31.17	36
11a	1	5785	-	28.76	-	-	28.76	30	2.15	30.91	36
11a	1	5825	-	28.43	-	-	28.43	30	2.15	30.58	36
HT-20	2	5745	26.73	26.38	-	-	29.57	30	1.85	31.42	36
HT-20	2	5785	25.90	26.10	-	-	29.01	30	1.85	30.86	36
HT-20	2	5825	25.70	25.82	-	-	28.77	30	1.85	30.62	36
HT-40	2	5755	26.49	26.55	-	-	29.53	30	1.85	31.38	36
HT-40	2	5795	26.01	25.88	-	-	28.96	30	1.85	30.80	36
Result			Complied								

3.3.7 Test Result of Maximum Conducted Output Power

Maximum Conducted Output Power											
Condition			RF Output Power (dBm)								
Modulation Mode	N_{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Chain Port 3	Chain Port 4	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11a	1	5745	-	20.35	-	-	20.87	30	2.15	23.02	36
11a	1	5785	-	20.05	-	-	20.57	30	2.15	22.72	36
11a	1	5825	-	19.71	-	-	20.23	30	2.15	22.38	36
HT-20	2	5745	17.29	17.17	-	-	21.22	30	1.85	23.06	36
HT-20	2	5785	16.82	16.91	-	-	20.85	30	1.85	22.70	36
HT-20	2	5825	16.16	16.25	-	-	20.19	30	1.85	22.04	36
HT-40	2	5755	18.05	18.19	-	-	23.00	30	1.85	24.85	36
HT-40	2	5795	17.24	17.51	-	-	22.26	30	1.85	24.10	36
Result			Complied								

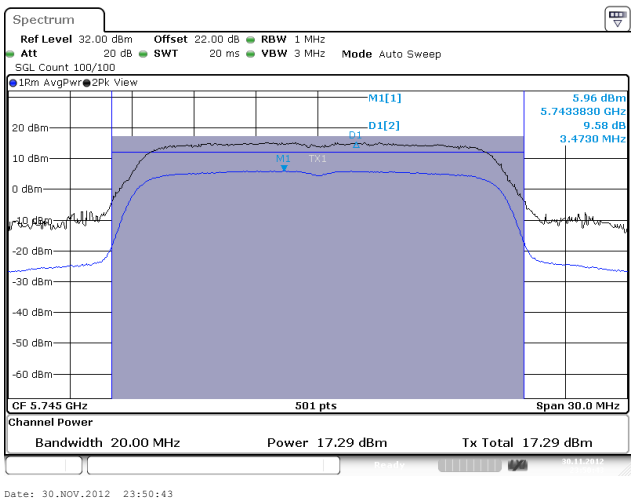
Note 1: RF Output Power Plots w/o Duty Factor

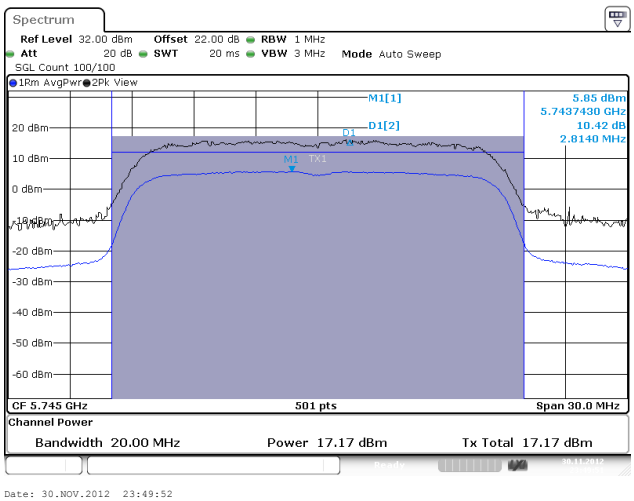
Worst RF Output Power Plots
11a [Port 1]



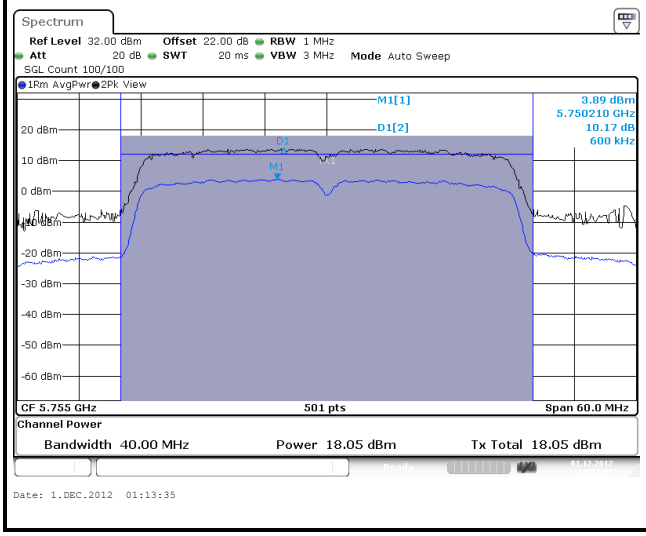
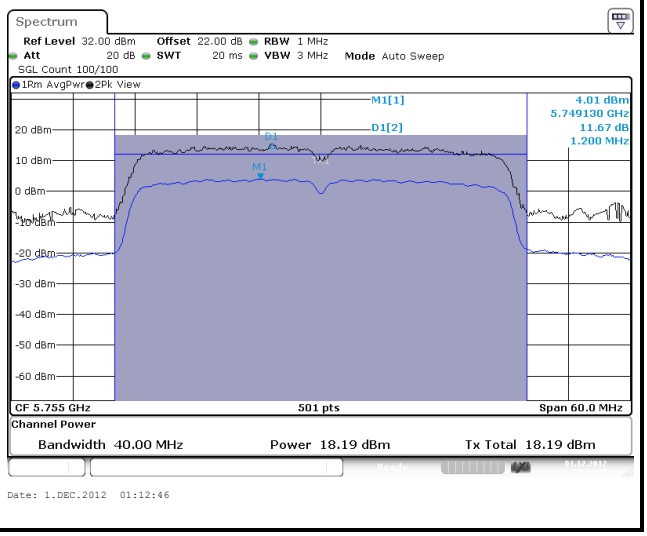
Note 1: RF Output Power Plots w/o Duty Factor

Worst RF Output Power Plots	
HT-20 [Port 1]	HT-20 [Port 2]





Note 1: RF Output Power Plots w/o Duty Factor

Worst RF Output Power Plots	
HT-40 [Port 1]	**HT-40 [Port 2]**
	

Note 1: RF Output Power Plots w/o Duty Factor

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
☒ Power Spectral Density (PSD) ≤ 8 dBm/3kHz

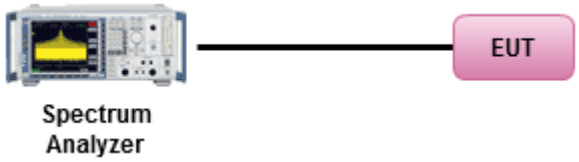
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

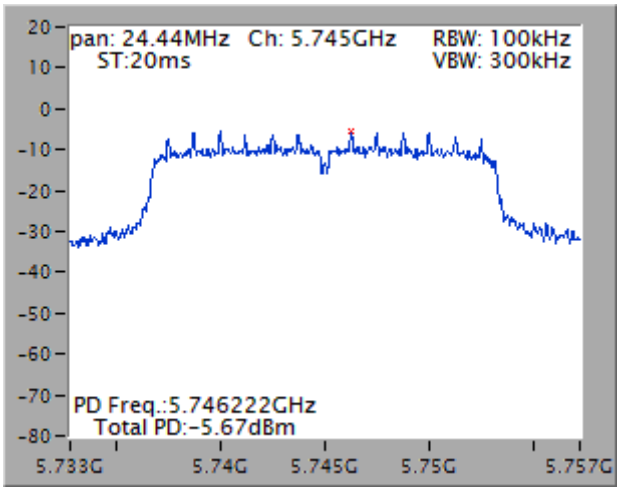
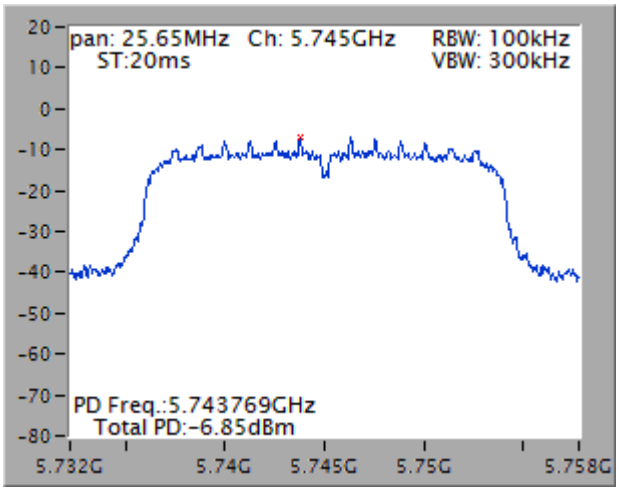
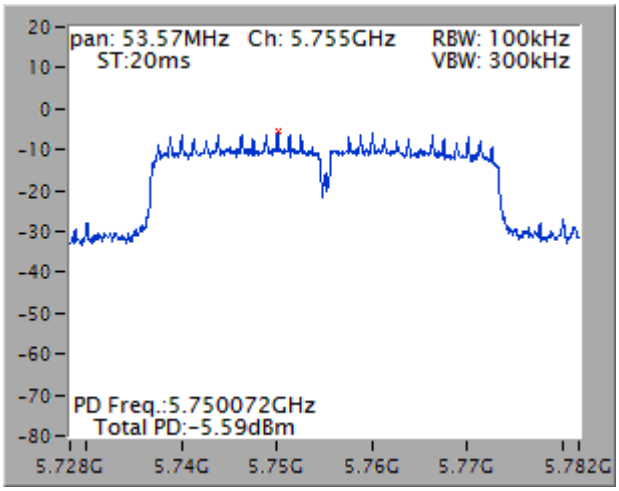
Test Method			
☒	Power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the power spectral density. In addition, the use of a peak PSD procedure will always result in a “worst-case” measured level for comparison to the limit. Therefore, whenever the DTS bandwidth exceeds 500 kHz, it is acceptable to utilize the peak PSD procedure to demonstrate compliance to the PSD limit, regardless of how the fundamental output power was measured. For the power spectral density shall be measured using below options:		
	☒	Refer as FCC KDB 558074, clause 9.1 Option 1 - (RBW≥3kHz; sweep=auto, detector=peak).	
	☐	Refer as FCC KDB 558074, clause 9.2 Option 2 - (RBW≥3kHz; sweep=auto, average=100).	
	☐	Refer as FCC KDB 558074, clause 9.3 Option 3 - (RBW≥3kHz; slow sweep speed).	
	☐	Refer as FCC KDB 558074, clause 9.4 Alternative 1 (average PSD; Add 10log (1/duty cycle).	
	☒	RBW>3kHz, add the bandwidth correction factor (BWCF) adjusting in PSD per 3kHz.	
☒	For conducted measurement.		
	☒	The EUT supports single transmit chain and measurements performed on this transmit chain.	
	☒	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.	
	☒	The EUT supports multiple transmit chains using options given below:	
		☒	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the N_{TX} output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
		☐	Option 2: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

3.4.4 Test Setup

Power Spectral Density


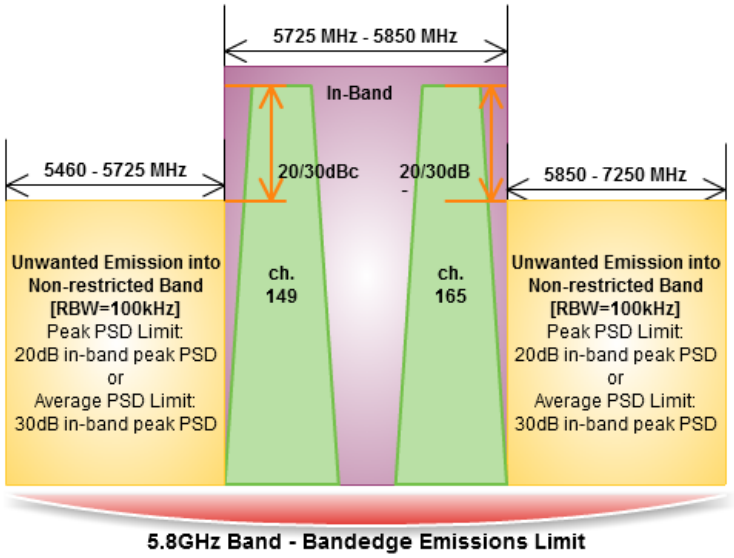
3.4.5 Test Result of Power Spectral Density

Power Spectral Density Result								
Condition			Power Spectral Density (dBm/3kHz)					
Modulation Mode	N_{TX}	Freq. (MHz)	-	-	-	-	Sum Chain	Power Limit
11a	1	5745	-	-	-	-	-5.67	8
11a	1	5785	-	-	-	-	-6.23	8
11a	1	5825	-	-	-	-	-6.90	8
HT-20	2	5745	-	-	-	-	-6.85	8
HT-20	2	5785	-	-	-	-	-7.52	8
HT-20	2	5825	-	-	-	-	-7.65	8
HT-40	2	5755	-	-	-	-	-5.59	8
HT-40	2	5795	-	-	-	-	-6.06	8
Result			Complied					
Note 1: PSD [dBm/3kHz] = sum each transmit chains by bin-to-bin PSD [dBm/100kHz] + BWFC [-15.2 dB]								

Worst Power Spectral Density Plots	
11a [Sum All Chains]	
	
HT-20 [Sum All Chains]	HT-40 [Sum All Chains]
	

3.5 Transmitter Radiated Bandedge Emissions

3.5.1 Transmitter Radiated Bandedge Emissions Limit

Transmitter Radiated Bandedge Emissions Limit


3.5.2 Measuring Instruments

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

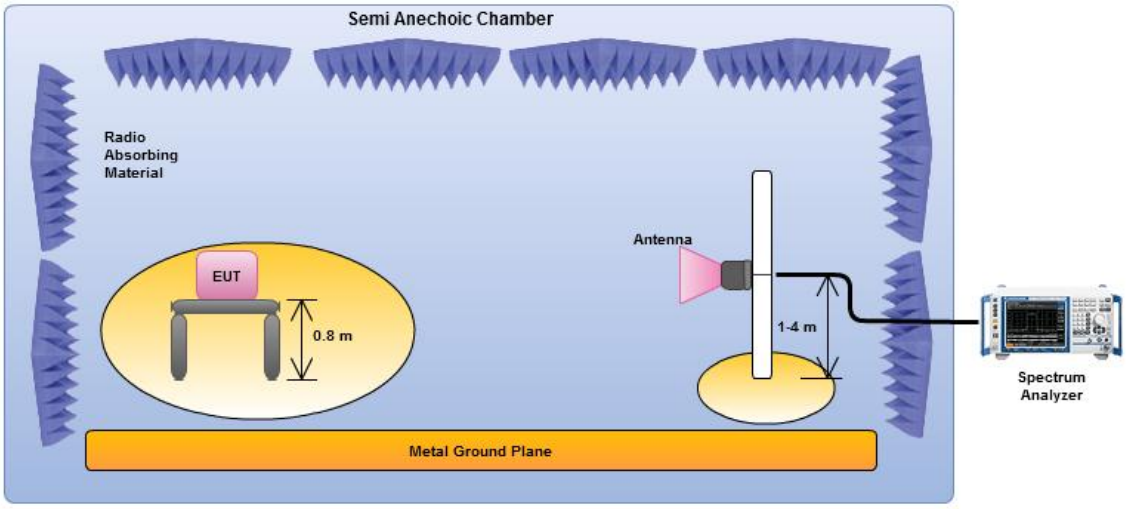
3.5.3 Test Procedures

Test Method			
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
☒	Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.		
☒	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.	
	☒	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).
		☐	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.
☒	For the transmitter bandedge emissions shall be measured using following options below:		
	☐	Refer as FCC KDB 558074, clause 10.2.5.2 for narrower resolution bandwidth using the band power and summing the spectral levels (i.e., 100 kHz or 1 MHz).	
	☒	Refer as ANSI C63.10, clause 6.9.2 for band-edge testing.	
	☐	Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.	

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). Measurements in the bandedge are typically made at a closer distance 1.0m, because the instrumentation noise floor is typically close to the radiated emission limit.
☒ For radiated measurement, refer as FCC KDB 558074, clause 10.2.1.
☒ For conducted measurement, refer as FCC KDB 558074, clause 10.2.2.

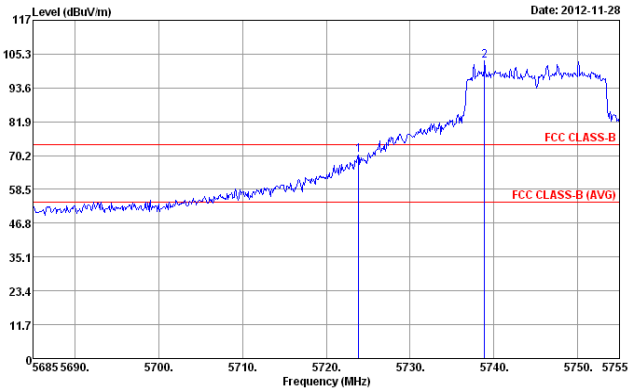
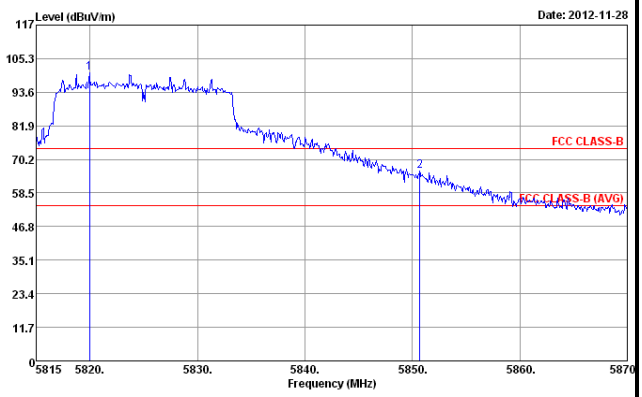
3.5.4 Test Setup

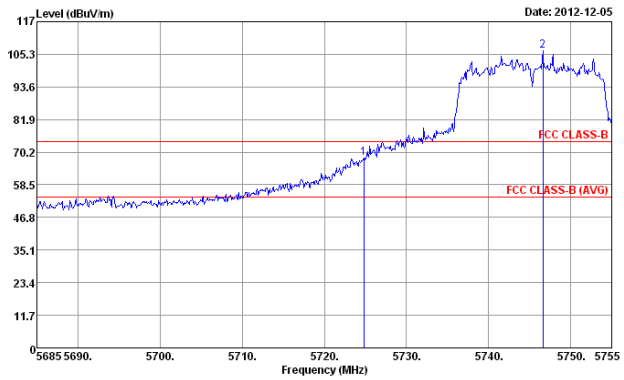
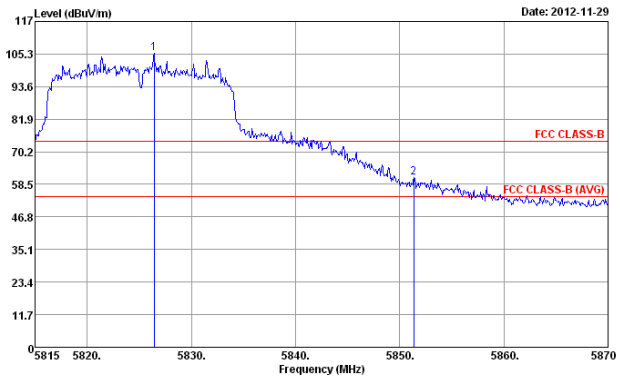
Transmitter Radiated Bandedge Emissions



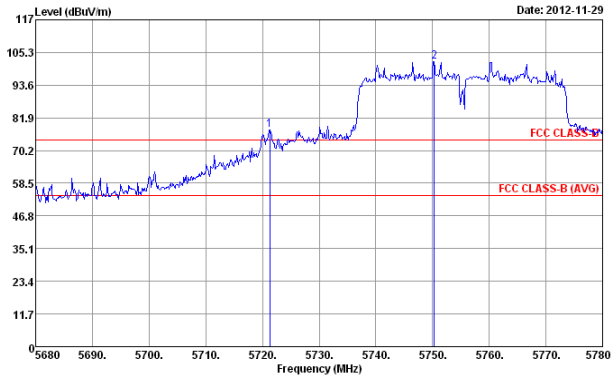
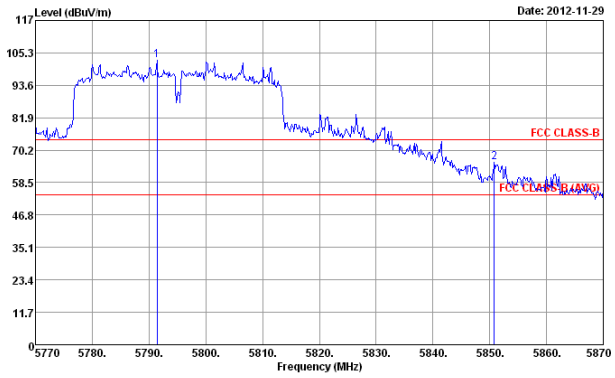
Electric field tests shall be performed in transmitter bandedge emissions using a calibrated horn antenna.

3.5.5 Test Result of Transmitter Radiated Bandedge Emissions

Transmitter Radiated Bandedge Emissions Result								
Modulation	11a			**N_{TX}**	1			
Non-restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
5460-5725	5745	102.97	5723.85	70.37	32.60	20	PK	V
5850-7250	5825	100.43	5850.70	66.17	34.26	20	PK	V
Low Bandedge				**Up Bandedge**				
								
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)								

Transmitter Radiated Bandedge Emissions Result								
Modulation	HT-20			**N_{TX}**	2			
Non-restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
5460-5725	5745	106.64	5724.83	68.05	38.59	20	PK	V
5850-7250	5825	105.58	5851.36	60.81	44.77	20	PK	V
Low Bandedge				**Up Bandedge**				
								

Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)

Transmitter Radiated Bandedge Emissions Result								
Modulation	HT-40			**N_{TX}**	2			
Non-restricted Band (MHz)	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
5460-5725	5755	102.10	5721.30	77.41	24.69	20	PK	V
5850-7250	5795	102.71	5850.80	65.70	37.01	20	PK	V
Low Bandedge				**Up Bandedge**				
								

Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)

3.6 Transmitter Radiated Unwanted Emissions

3.6.1 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.

3.6.2 Measuring Instruments

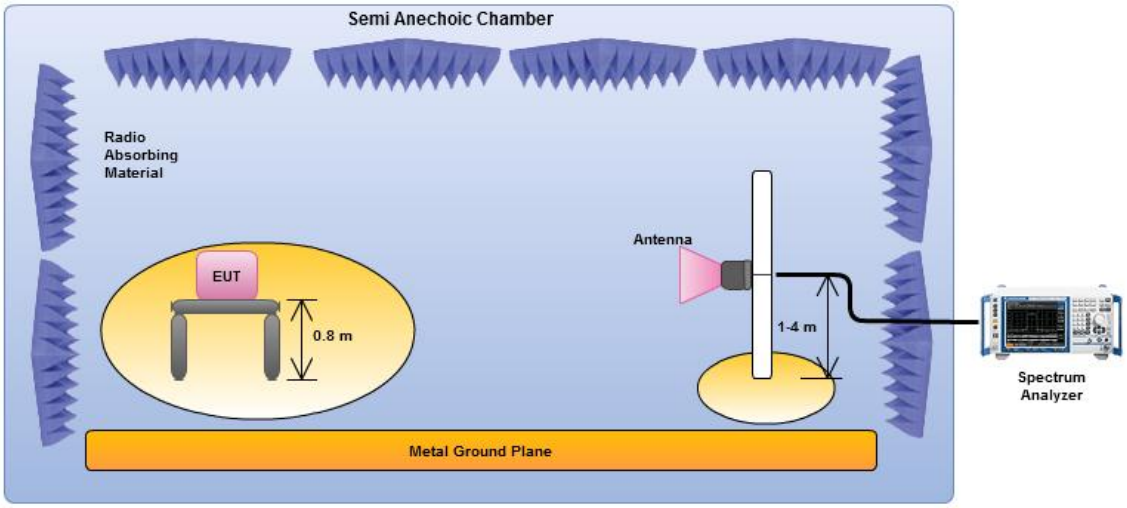
Refer a test equipment and calibration data table in this test report.

3.6.3 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).		
	☒	Measurements in the frequency range 5 GHz - 10GHz are typically made at a closer distance 1.0m, because the instrumentation noise floor is typically close to the radiated emission limit.	
	☒	Measurements in the frequency range 10 GHz - 18GHz are typically made at a closer distance 1m, because the instrumentation noise floor is typically close to the radiated emission limit.	
	☒	Measurements in the frequency range above 18 GHz - 40GHz are typically made at a closer distance 0.5m, because the instrumentation noise floor is typically close to the radiated emission limit.	
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
☒	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.	
	☒	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) – Duty cycle ≥ 98%.
		☐	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.
☒	For radiated measurement, refer as FCC KDB 558074, clause 10.2.1.		
	☒	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.	
☒	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	

3.6.4 Test Setup

Transmitter Radiated Unwanted Emissions



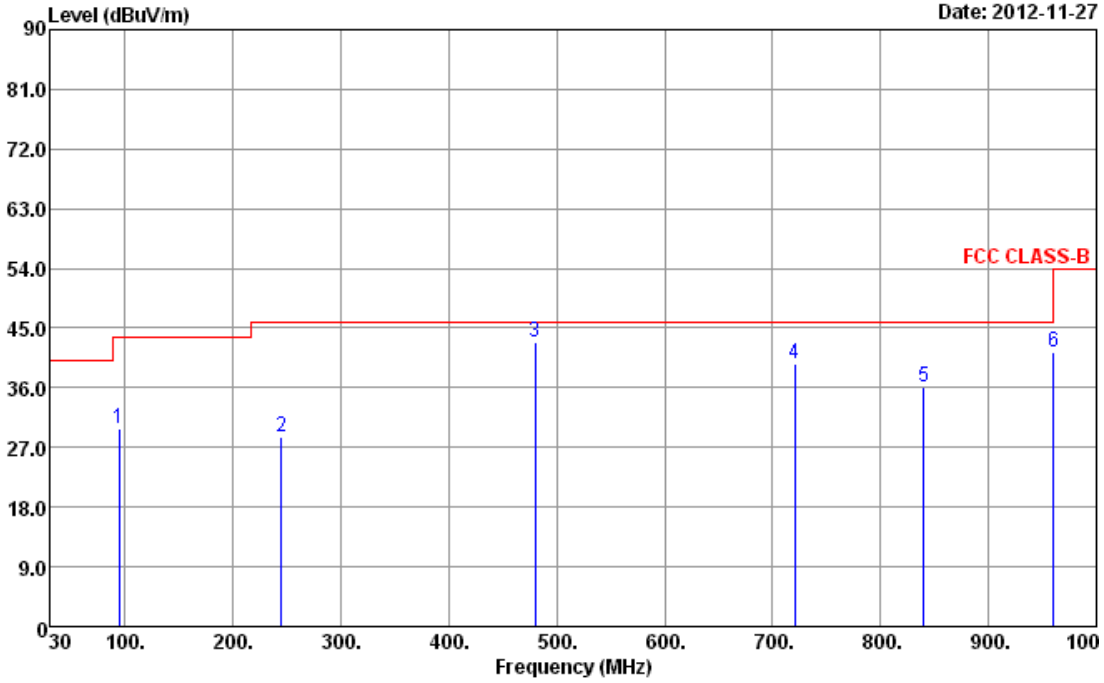
Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn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

3.6.5 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.

3.6.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

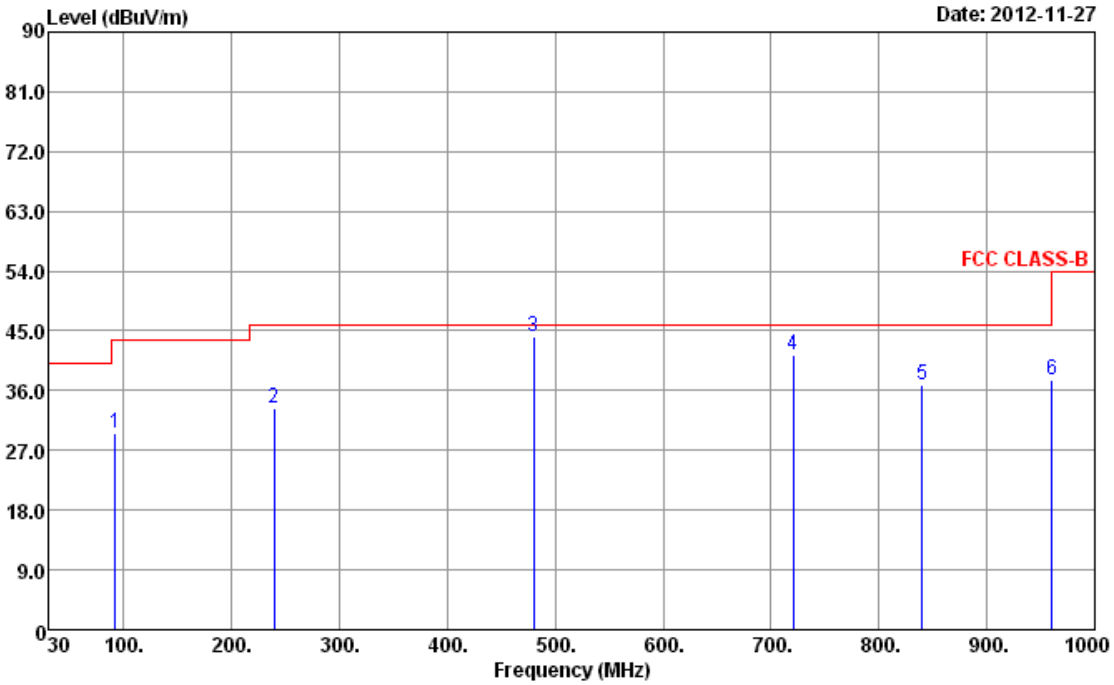
Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Operating Mode	1	**Polarization**	V
Operating Function	DC Power & Radio link (WLAN)		



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remar
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	94.02	29.86	-13.64	43.50	51.14	9.10	1.04	31.42	---	---	Peak
2	244.37	28.55	-17.45	46.00	45.92	11.92	1.64	30.93	---	---	Peak
3	480.08	42.96	-3.04	46.00	53.72	17.70	2.24	30.70	---	---	QP
4	720.64	39.55	-6.45	46.00	45.47	21.63	2.65	30.20	---	---	Peak
5	839.95	36.02	-9.98	46.00	39.57	23.30	2.86	29.71	---	---	Peak
6	960.23	41.26	-12.74	54.00	43.58	24.90	2.83	30.05	---	---	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 (Below 1GHz)			
Operating Mode	1	**Polarization**	H
Operating Function	DC Power & Radio link (WLAN)		

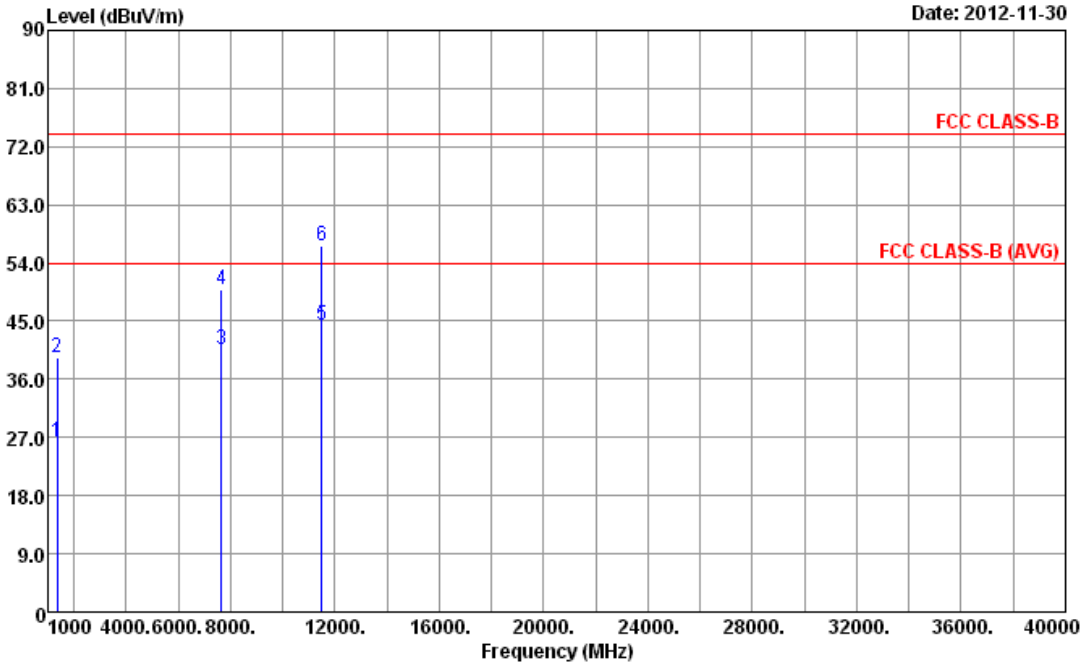


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	92.08	29.55	-13.95	43.50	51.00	8.91	1.05	31.41	---	---	Peak
2	239.52	33.24	-12.76	46.00	51.18	11.34	1.67	30.95	---	---	Peak
3	480.08	44.02	-1.98	46.00	54.78	17.70	2.24	30.70	---	---	QP
4	720.64	41.35	-4.65	46.00	47.27	21.63	2.65	30.20	---	---	QP
5	839.95	36.78	-9.22	46.00	40.33	23.30	2.86	29.71	---	---	Peak
6	960.23	37.53	-16.47	54.00	39.85	24.90	2.83	30.05	---	---	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)

3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11a

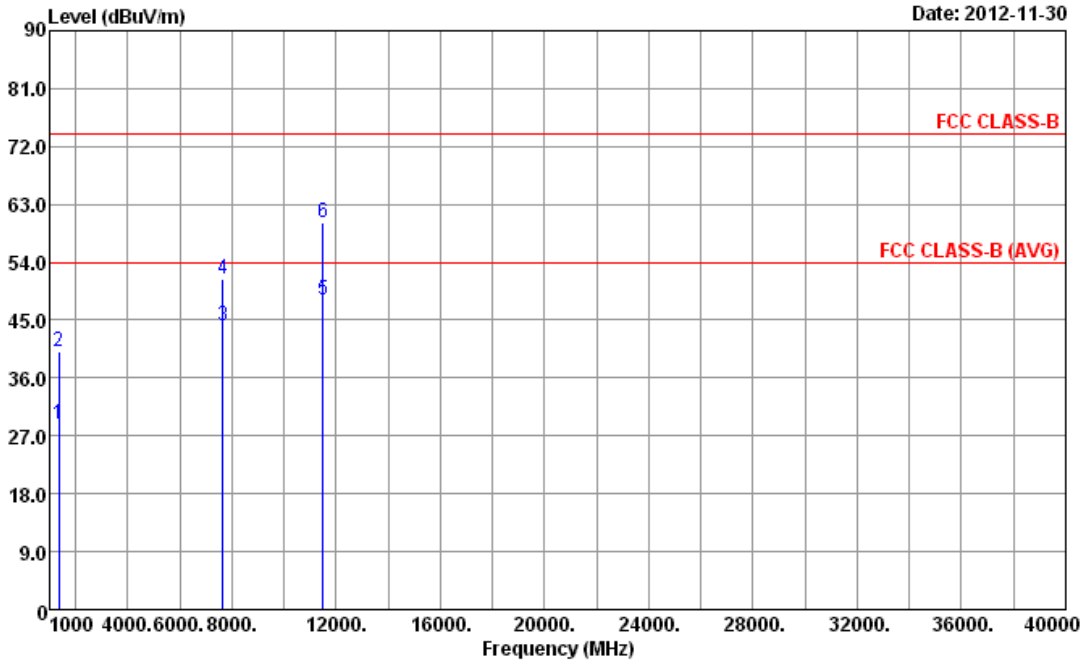
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Polarization**	V



	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	1370.00	26.43	-27.57	54.00	32.24	27.97	3.38	37.16	---	---	Average
2	1370.00	39.26	-34.74	74.00	45.07	27.97	3.38	37.16	---	---	Peak
3	7660.00	40.68	-13.32	54.00	30.93	36.03	8.79	35.07	---	---	Average
4	7660.00	49.86	-24.14	74.00	40.11	36.03	8.79	35.07	---	---	Peak
5	11490.00	44.37	-9.63	54.00	30.43	38.49	10.35	34.90	---	---	Average
6	11490.00	56.55	-17.45	74.00	42.61	38.49	10.35	34.90	---	---	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.

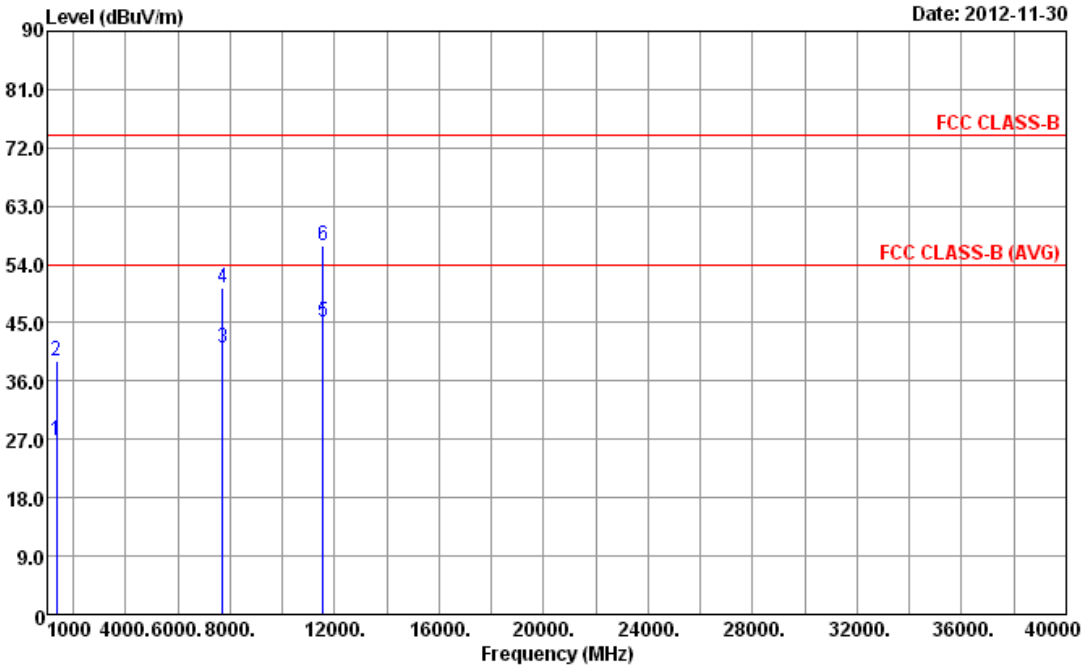
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Polarization**	H



	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	1370.00	28.81	-25.19	54.00	34.62	27.97	3.38	37.16	---	---	Average
2	1370.00	40.22	-33.78	74.00	46.03	27.97	3.38	37.16	---	---	Peak
3	7660.00	44.06	-9.94	54.00	34.31	36.03	8.79	35.07	---	---	Average
4	7660.00	51.49	-22.51	74.00	41.74	36.03	8.79	35.07	---	---	Peak
5	11490.00	48.18	-5.82	54.00	34.24	38.49	10.35	34.90	---	---	Average
6	11490.00	60.21	-13.79	74.00	46.27	38.49	10.35	34.90	---	---	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.

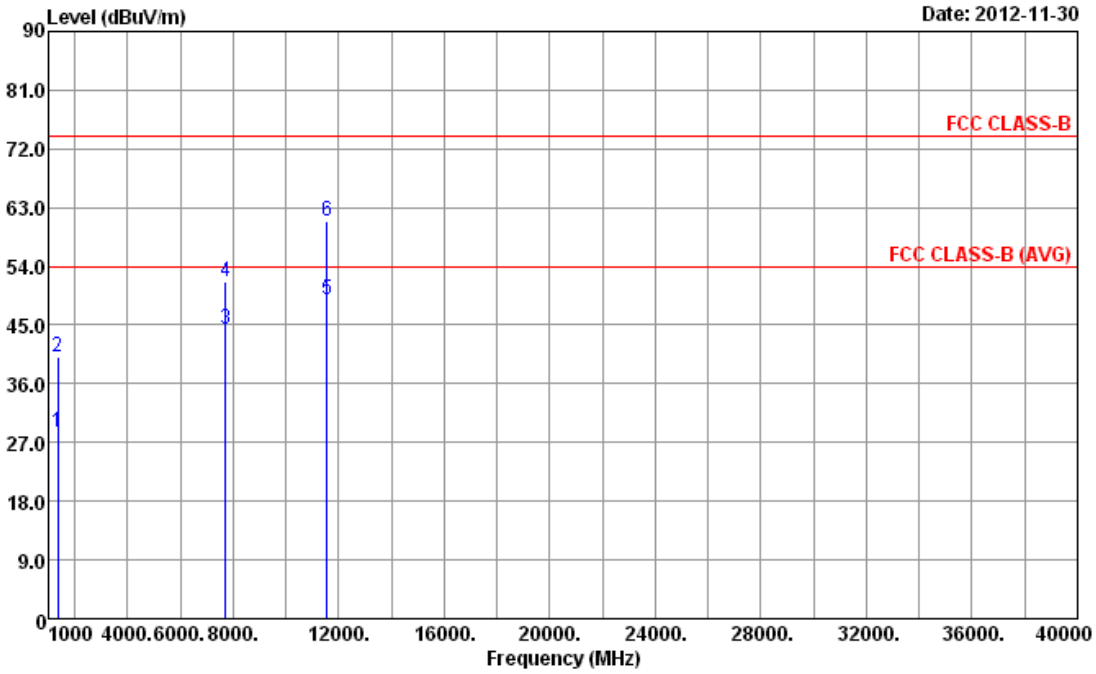
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Polarization**	V



	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	1370.00	26.74	-27.26	54.00	32.55	27.97	3.38	37.16	---	---	Average
2	1370.00	39.17	-34.83	74.00	44.98	27.97	3.38	37.16	---	---	Peak
3	7713.00	41.03	-12.97	54.00	31.25	36.04	8.80	35.06	---	---	Average
4	7713.00	50.37	-23.63	74.00	40.59	36.04	8.80	35.06	---	---	Peak
5	11570.00	45.01	-8.99	54.00	30.96	38.56	10.39	34.90	---	---	Average
6	11570.00	56.88	-17.12	74.00	42.83	38.56	10.39	34.90	---	---	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.

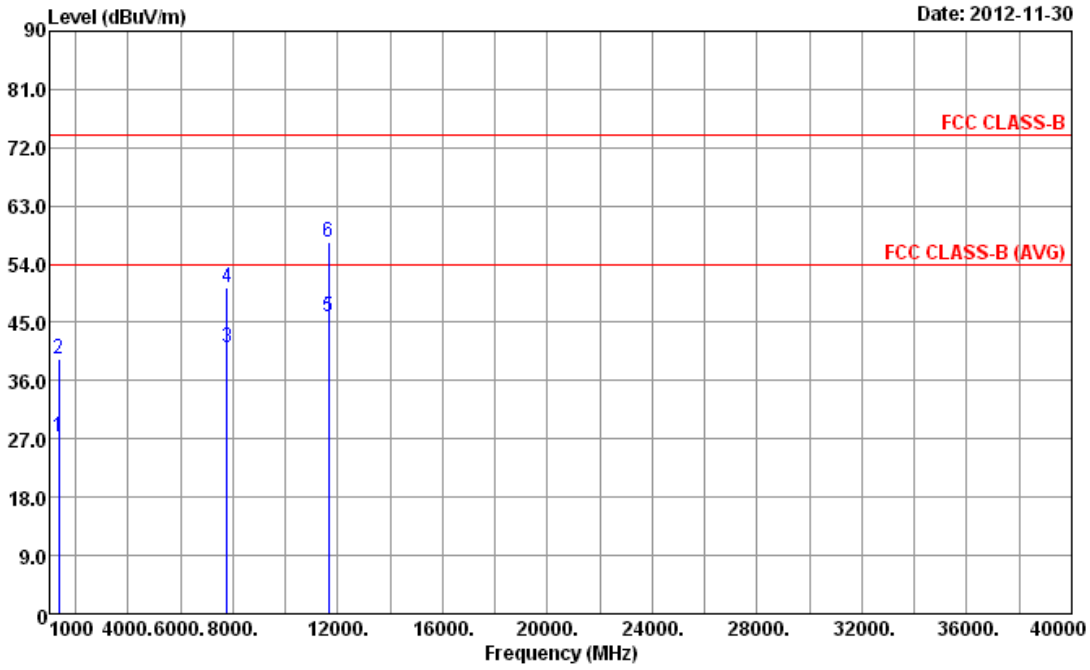
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Polarization**	H



	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	1370.00	28.69	-25.31	54.00	34.50	27.97	3.38	37.16	---	---	Average
2	1370.00	40.01	-33.99	74.00	45.82	27.97	3.38	37.16	---	---	Peak
3	7713.00	44.41	-9.59	54.00	34.63	36.04	8.80	35.06	---	---	Average
4	7713.00	51.75	-22.25	74.00	41.97	36.04	8.80	35.06	---	---	Peak
5	11570.00	48.89	-5.11	54.00	34.84	38.56	10.39	34.90	---	---	Average
6	11570.00	60.80	-13.20	74.00	46.75	38.56	10.39	34.90	---	---	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.

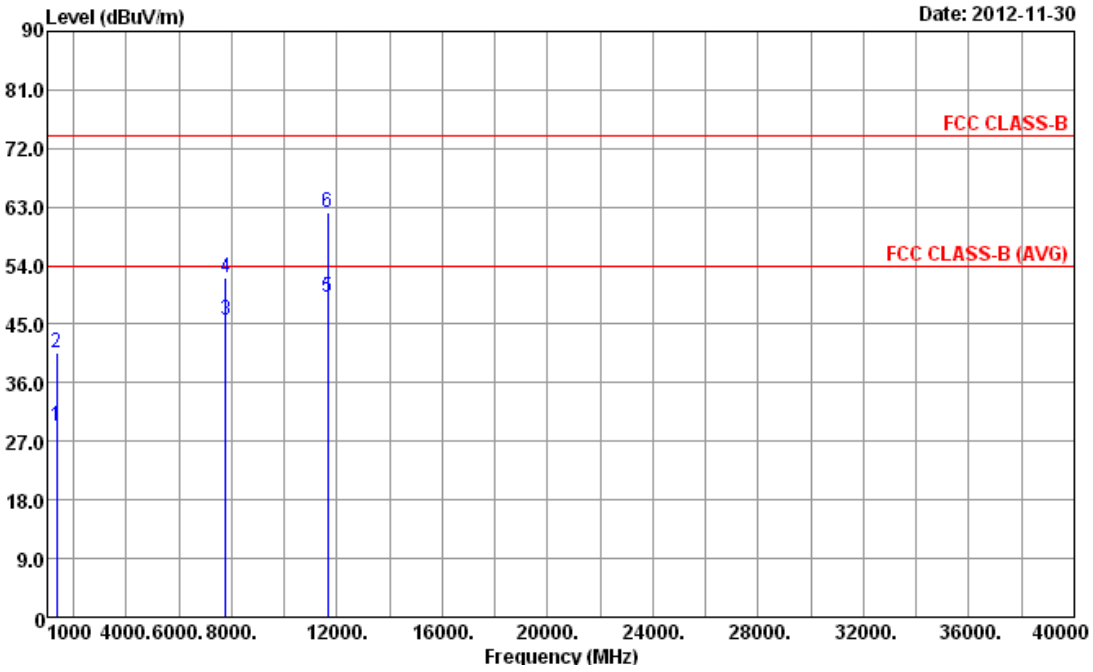
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Polarization**	V



	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	1370.00	27.25	-26.75	54.00	33.06	27.97	3.38	37.16	---	---	Average
2	1370.00	39.37	-34.63	74.00	45.18	27.97	3.38	37.16	---	---	Peak
3	7766.00	41.07	-12.93	54.00	31.26	36.05	8.81	35.05	---	---	Average
4	7766.00	50.41	-23.59	74.00	40.60	36.05	8.81	35.05	---	---	Peak
5	11650.00	45.77	-8.23	54.00	31.62	38.62	10.43	34.90	---	---	Average
6	11650.00	57.32	-16.68	74.00	43.17	38.62	10.43	34.90	---	---	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 (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Polarization**	H

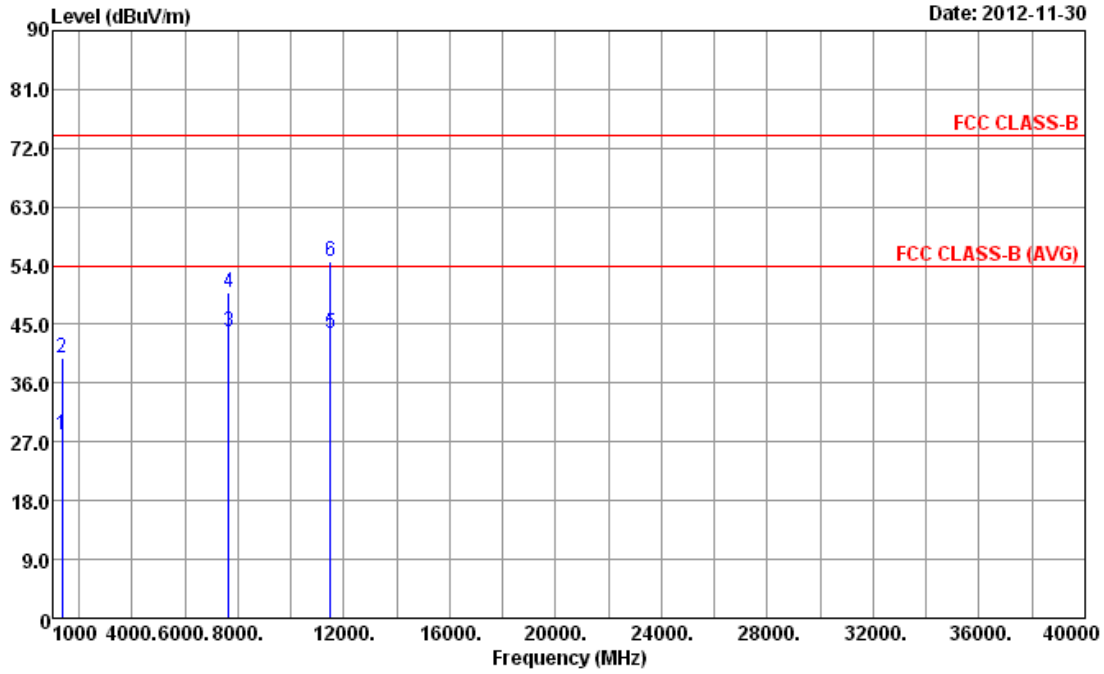


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1370.00	29.30	-24.70	54.00	35.11	27.97	3.38	37.16	---	---	Average
2	1370.00	40.58	-33.42	74.00	46.39	27.97	3.38	37.16	---	---	Peak
3	7766.00	45.65	-8.35	54.00	35.84	36.05	8.81	35.05	---	---	Average
4	7766.00	52.27	-21.73	74.00	42.46	36.05	8.81	35.05	---	---	Peak
5	11650.00	49.23	-4.77	54.00	35.08	38.62	10.43	34.90	---	---	Average
6	11650.00	62.11	-11.89	74.00	47.96	38.62	10.43	34.90	---	---	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.

3.6.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT-20

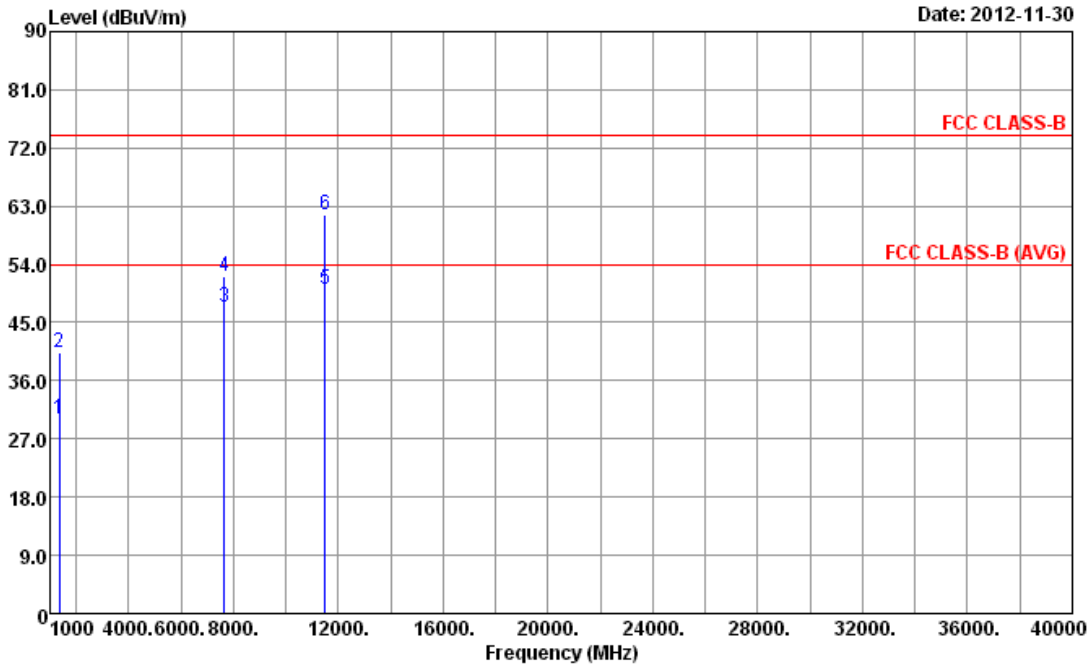
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT-20	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Polarization**	V



	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	1370.00	28.14	-25.86	54.00	33.95	27.97	3.38	37.16	---	---	Average
2	1370.00	39.85	-34.15	74.00	45.66	27.97	3.38	37.16	---	---	Peak
3	7660.00	43.92	-10.08	54.00	34.17	36.03	8.79	35.07	---	---	Average
4	7660.00	49.79	-24.21	74.00	40.04	36.03	8.79	35.07	---	---	Peak
5	11490.00	43.72	-10.28	54.00	29.78	38.49	10.35	34.90	---	---	Average
6	11490.00	54.77	-19.23	74.00	40.83	38.49	10.35	34.90	---	---	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.

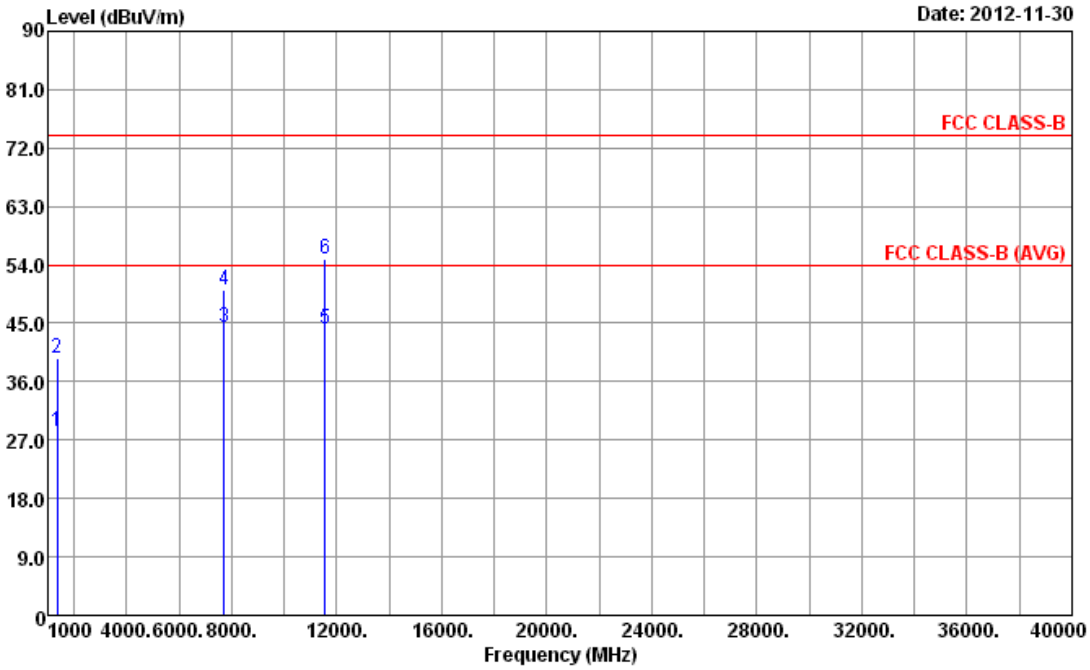
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT-20	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Polarization**	H



	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	1370.00	30.08	-23.92	54.00	35.89	27.97	3.38	37.16	---	---	Average
2	1370.00	40.40	-33.60	74.00	46.21	27.97	3.38	37.16	---	---	Peak
3	7660.00	47.46	-6.54	54.00	37.71	36.03	8.79	35.07	---	---	Average
4	7660.00	52.06	-21.94	74.00	42.31	36.03	8.79	35.07	---	---	Peak
5	11490.00	50.17	-3.83	54.00	36.23	38.49	10.35	34.90	---	---	Average
6	11490.00	61.69	-12.31	74.00	47.75	38.49	10.35	34.90	---	---	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.

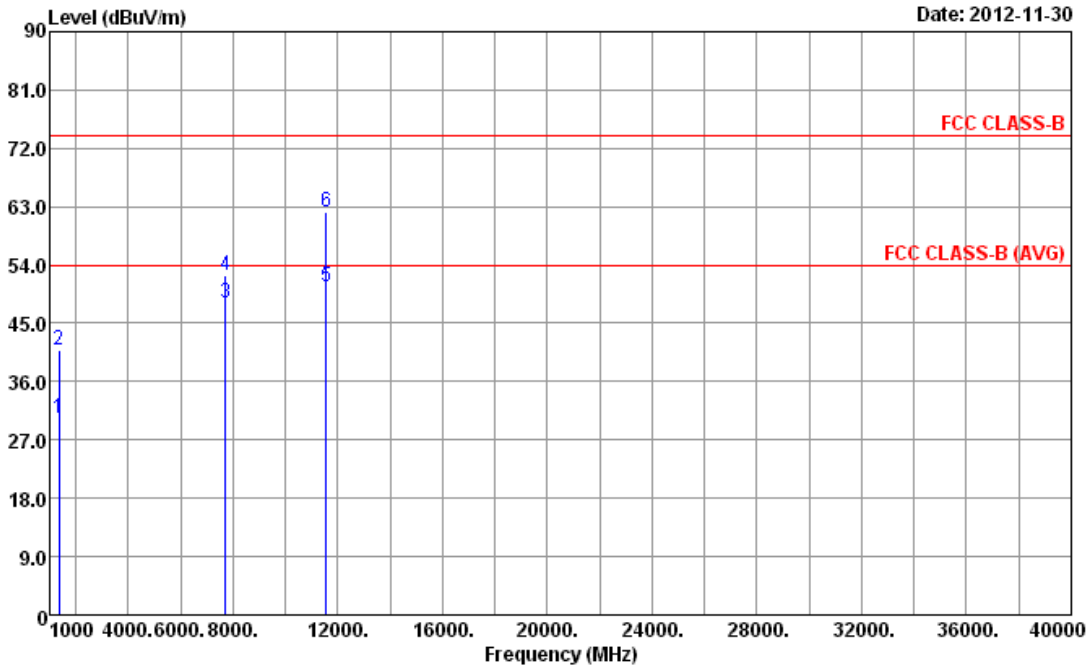
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT-20	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Polarization**	V



	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	1370.00	28.20	-25.80	54.00	34.01	27.97	3.38	37.16	---	---	Average
2	1370.00	39.72	-34.28	74.00	45.53	27.97	3.38	37.16	---	---	Peak
3	7713.00	44.35	-9.65	54.00	34.57	36.04	8.80	35.06	---	---	Average
4	7713.00	50.06	-23.94	74.00	40.28	36.04	8.80	35.06	---	---	Peak
5	11570.00	44.16	-9.84	54.00	30.11	38.56	10.39	34.90	---	---	Average
6	11570.00	54.99	-19.01	74.00	40.94	38.56	10.39	34.90	---	---	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.

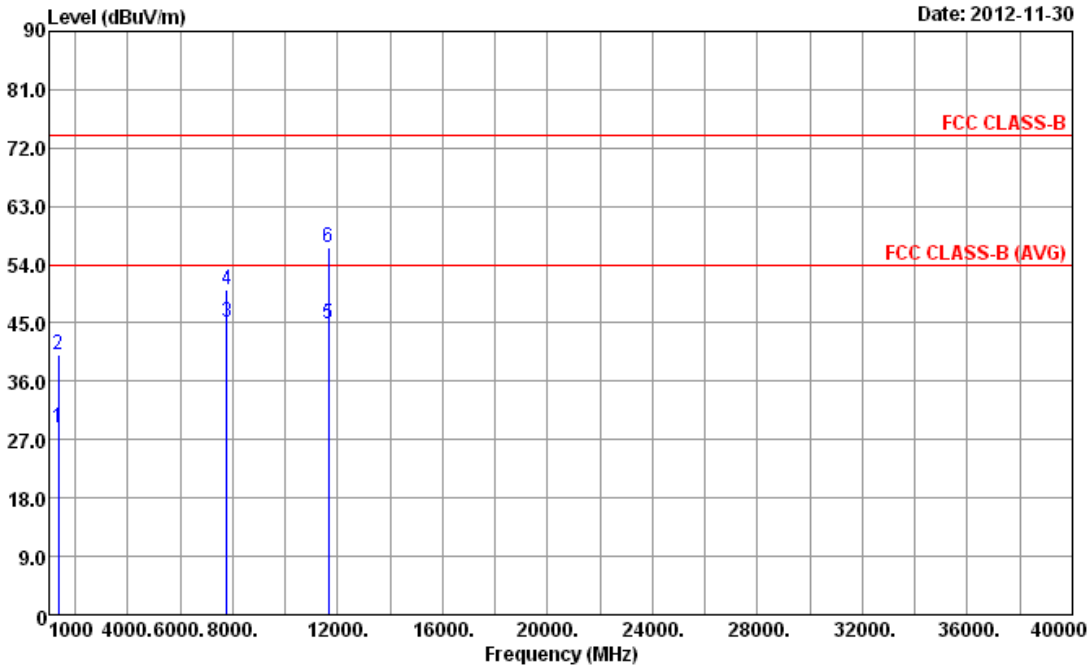
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT-20	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Polarization**	H



	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	1370.00	30.43	-23.57	54.00	36.24	27.97	3.38	37.16	---	---	Average
2	1370.00	40.76	-33.24	74.00	46.57	27.97	3.38	37.16	---	---	Peak
3	7713.00	48.03	-5.97	54.00	38.25	36.04	8.80	35.06	---	---	Average
4	7713.00	52.35	-21.65	74.00	42.57	36.04	8.80	35.06	---	---	Peak
5	11570.00	50.64	-3.36	54.00	36.59	38.56	10.39	34.90	---	---	Average
6	11570.00	62.10	-11.90	74.00	48.05	38.56	10.39	34.90	---	---	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.

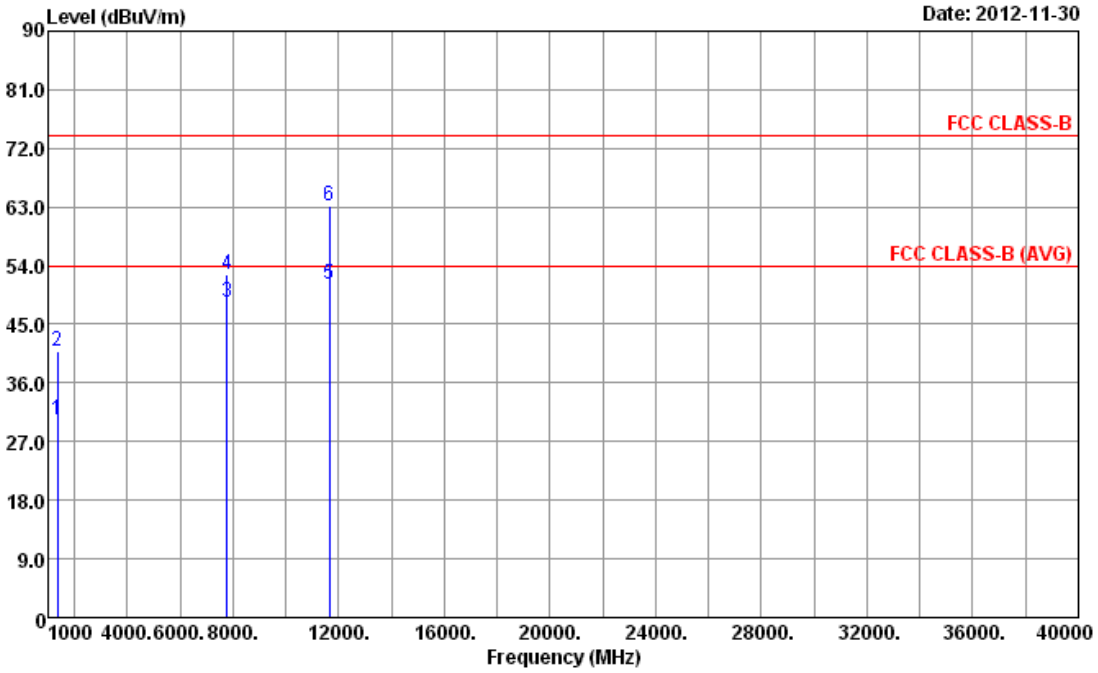
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT-20	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Polarization**	V



	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	1370.00	28.70	-25.30	54.00	34.51	27.97	3.38	37.16	---	---	Average
2	1370.00	40.06	-33.94	74.00	45.87	27.97	3.38	37.16	---	---	Peak
3	7766.00	45.04	-8.96	54.00	35.23	36.05	8.81	35.05	---	---	Average
4	7766.00	50.17	-23.83	74.00	40.36	36.05	8.81	35.05	---	---	Peak
5	11650.00	44.99	-9.01	54.00	30.84	38.62	10.43	34.90	---	---	Average
6	11650.00	56.70	-17.30	74.00	42.55	38.62	10.43	34.90	---	---	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 (Above 1GHz)			
Modulation Mode	HT-20	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Polarization**	H

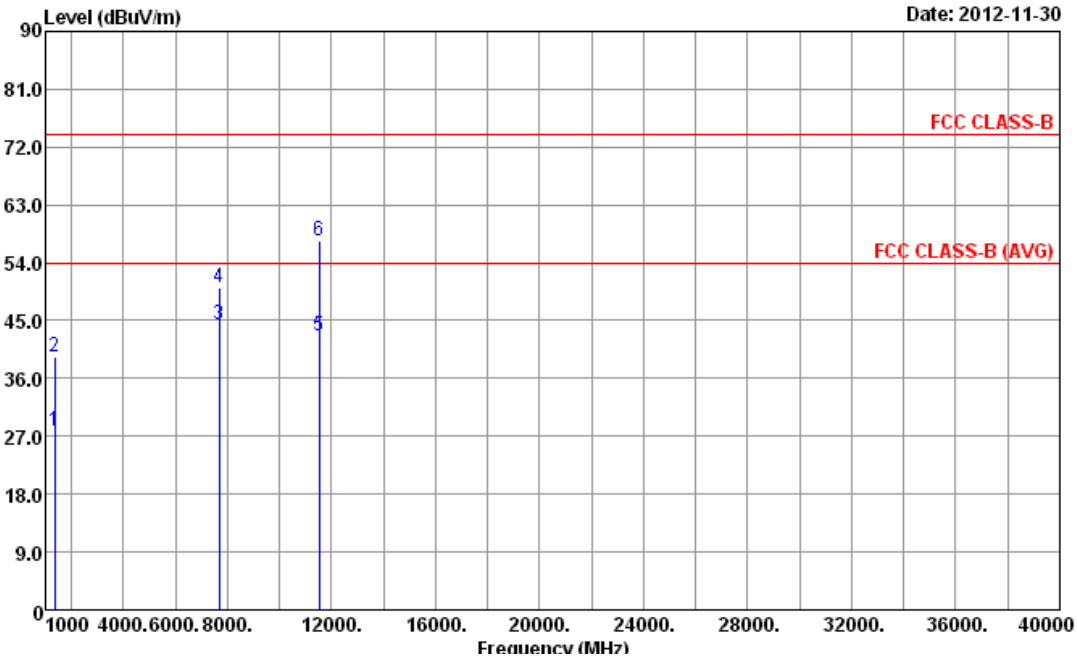


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1370.00	30.33	-23.67	54.00	36.14	27.97	3.38	37.16	---	---	Average
2	1370.00	40.87	-33.13	74.00	46.68	27.97	3.38	37.16	---	---	Peak
3	7766.00	48.49	-5.51	54.00	38.68	36.05	8.81	35.05	---	---	Average
4	7766.00	52.76	-21.24	74.00	42.95	36.05	8.81	35.05	---	---	Peak
5	11650.00	51.21	-2.79	54.00	37.06	38.62	10.43	34.90	---	---	Average
6	11650.00	63.28	-10.72	74.00	49.13	38.62	10.43	34.90	---	---	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.

3.6.9 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT-40

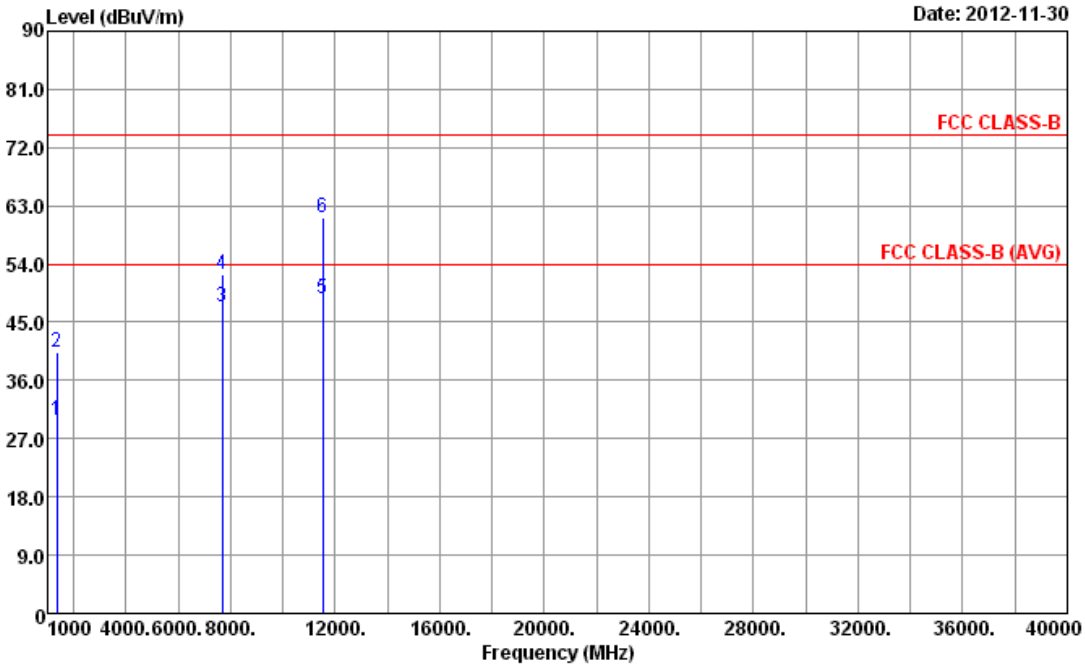
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT-40	**Test Freq. (FX)**	F4
Operating Function	Transmit	**Polarization**	V



	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	1370.00	27.83	-26.17	54.00	33.64	27.97	3.38	37.16	---	---	Average
2	1370.00	39.47	-34.53	74.00	45.28	27.97	3.38	37.16	---	---	Peak
3	7673.00	44.28	-9.72	54.00	34.53	36.03	8.79	35.07	---	---	Average
4	7673.00	50.02	-23.98	74.00	40.27	36.03	8.79	35.07	---	---	Peak
5	11510.00	42.71	-11.29	54.00	28.74	38.51	10.36	34.90	---	---	Average
6	11510.00	57.53	-16.47	74.00	43.56	38.51	10.36	34.90	---	---	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.

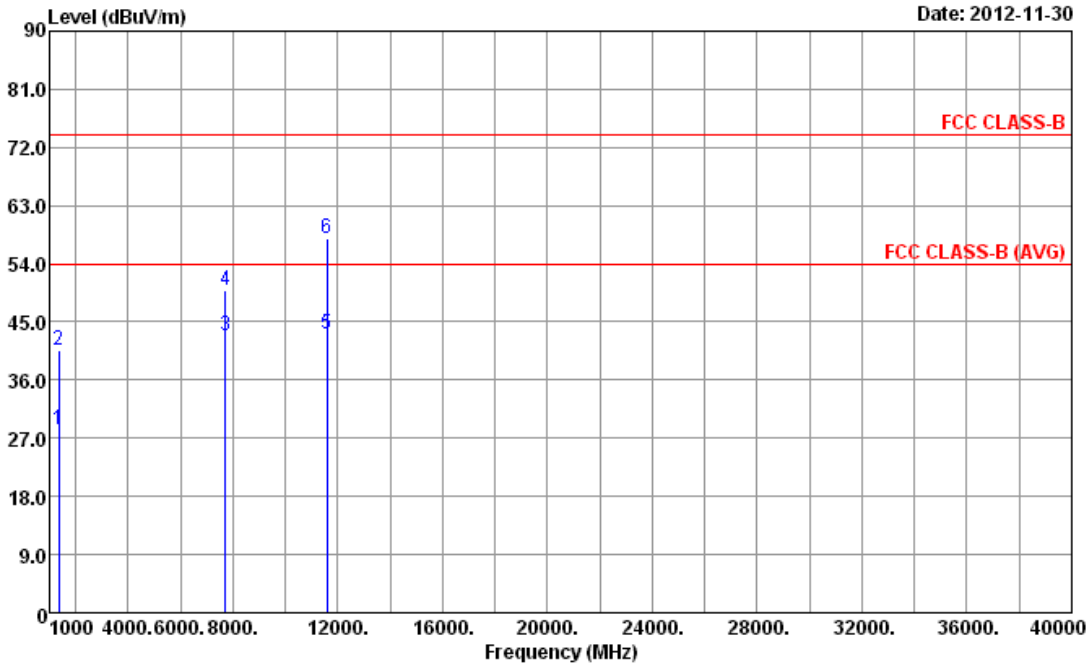
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT-40	**Test Freq. (FX)**	F4
Operating Function	Transmit	**Polarization**	H



	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	1370.00	29.86	-24.14	54.00	35.67	27.97	3.38	37.16	---	---	Average
2	1370.00	40.35	-33.65	74.00	46.16	27.97	3.38	37.16	---	---	Peak
3	7673.00	47.35	-6.65	54.00	37.60	36.03	8.79	35.07	---	---	Average
4	7673.00	52.44	-21.56	74.00	42.69	36.03	8.79	35.07	---	---	Peak
5	11510.00	48.64	-5.36	54.00	34.67	38.51	10.36	34.90	---	---	Average
6	11510.00	61.19	-12.81	74.00	47.22	38.51	10.36	34.90	---	---	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.

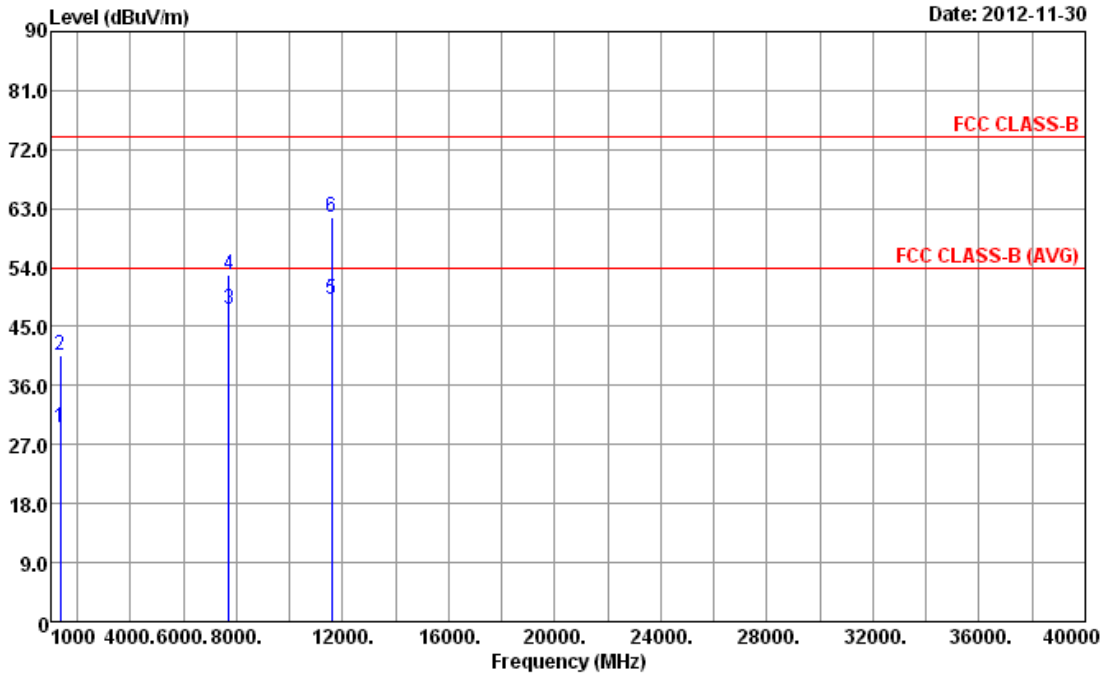
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT-40	**Test Freq. (FX)**	F5
Operating Function	Transmit	**Polarization**	V



	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	1370.00	28.43	-25.57	54.00	34.24	27.97	3.38	37.16	---	---	Average
2	1370.00	40.49	-33.51	74.00	46.30	27.97	3.38	37.16	---	---	Peak
3	7726.00	42.97	-11.03	54.00	33.16	36.05	8.81	35.05	---	---	Average
4	7726.00	49.83	-24.17	74.00	40.02	36.05	8.81	35.05	---	---	Peak
5	11590.00	43.20	-10.80	54.00	29.13	38.57	10.40	34.90	---	---	Average
6	11590.00	57.96	-16.04	74.00	43.89	38.57	10.40	34.90	---	---	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 (Above 1GHz)			
Modulation Mode	HT-40	**Test Freq. (FX)**	F5
Operating Function	Transmit	**Polarization**	H



	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	1370.00	29.47	-24.53	54.00	35.28	27.97	3.38	37.16	---	---	Average
2	1370.00	40.51	-33.49	74.00	46.32	27.97	3.38	37.16	---	---	Peak
3	7726.00	47.71	-6.29	54.00	37.90	36.05	8.81	35.05	---	---	Average
4	7726.00	52.95	-21.05	74.00	43.14	36.05	8.81	35.05	---	---	Peak
5	11590.00	49.23	-4.77	54.00	35.16	38.57	10.40	34.90	---	---	Average
6	11590.00	61.65	-12.35	74.00	47.58	38.57	10.40	34.90	---	---	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.

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9kHz ~ 2.75GHz	Nov. 14, 2012	Conduction (CO01-HY)
LISN	TESEQ	NNB-52	27380	9kHz ~ 30MHz	Apr. 09, 2012	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9kHz ~ 30MHz	Feb. 20, 2012	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450Hz	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60Hz	N/A	Conduction (CO01-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	FSP 40	100305	9KHz ~ 40GHz	Feb. 21, 2012	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Jun. 19, 2012	Conducted (TH01-HY)
AC Power Source	G.W	APS-9102	EL920581	AC 0V ~ 300V	Jul. 02, 2012	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100℃	Nov. 21, 2012	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jun. 26, 2012	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	Jan. 12, 2012	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	Jan. 12, 2012	Conducted (TH01-HY)
RF Cable-2m	HUBER+SUHNER	SUCOFLEX_104	SN 345675/4	1GHz ~ 26.5GHz	NA	Conducted (TH01-HY)
RF Cable-3m	HUBER+SUHNER	SUCOFLEX_104	SN 345669/4	1GHz ~ 26.5GHz	NA	Conducted (TH01-HY)

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

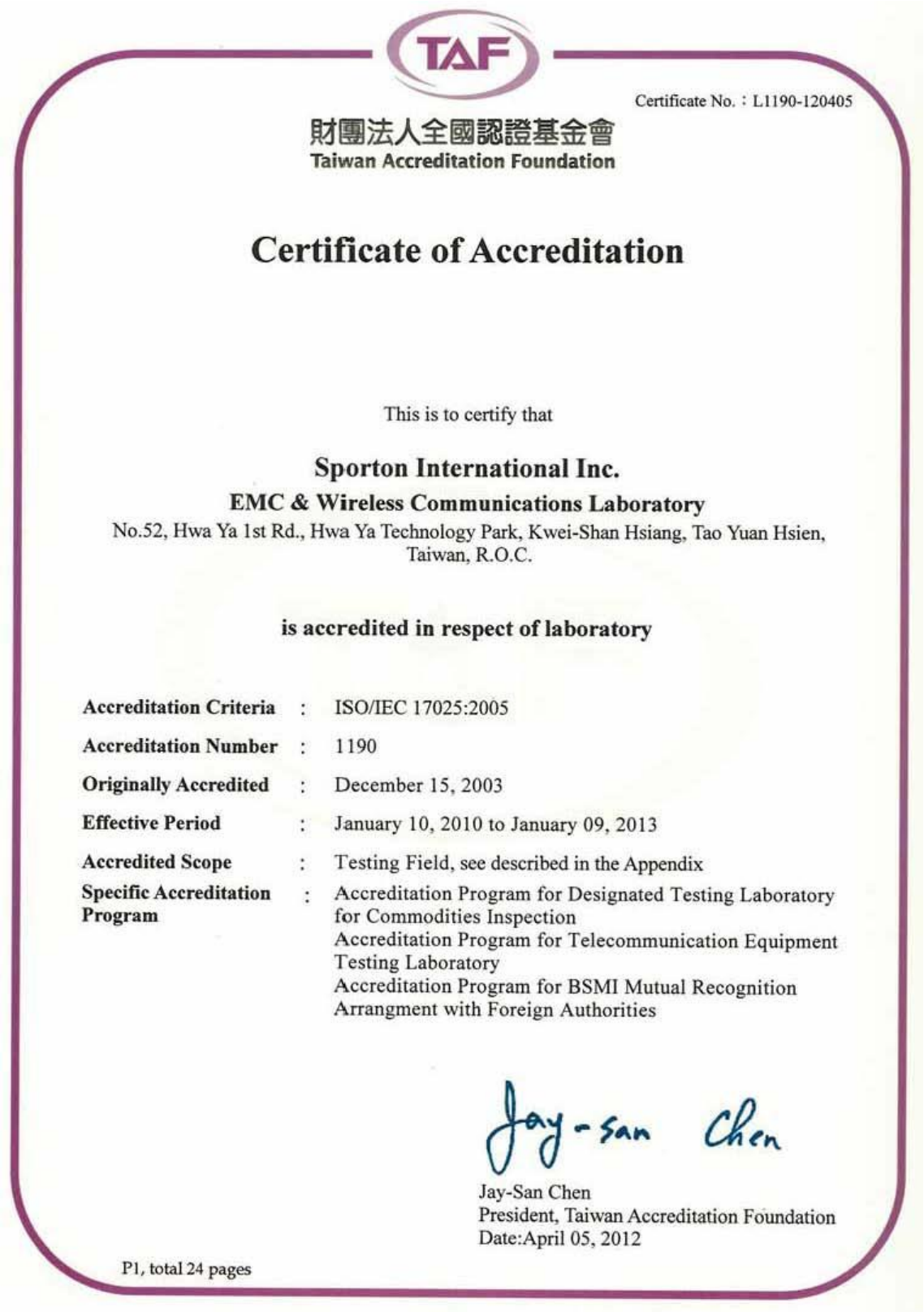
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP	100055	9Kz – 40GHz	Jun. 06, 2012	Radiation (03CH05-HY)
Receiver	R&S	ESIB26	100337	20Hz – 26.5GHz	Jun. 21, 2012	Radiation (03CH05-HY)
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH05-HY	30 MHz - 1 GHz 3m	N/A	Radiation (03CH05-HY)
Amplifier	COM-POWER	PA-103	161075	1KHz - 1GHz	Feb. 27, 2012	Radiation (03CH05-HY)
Amplifier	Agilent	8449B	3008A02665	1GHz – 26.5 GHz	Aug. 28, 2012	Radiation (03CH05-HY)
Horn Antenna	ETS-LINDGREN	3117	66584	1GHz~18GHz	Aug. 09, 2012	Radiation (03CH05-HY)
RF Cable-R03m	Jye Bao	RG142	03CH05-HY	30 MHz - 1 GHz	Oct. 14, 2012	Radiation (03CH05-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX104	03CH05-HY	1GHz~40GHz	Oct. 14, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30 MHz - 1 GHz	Oct. 06, 2012	Radiation (03CH05-HY)
Turn Table	HD	HD100	420/611	0 - 360 degree	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	HD100	240/666	1 m - 4 m	N/A	Radiation (03CH05-HY)

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, 2011	Radiation (03CH02-HY)
Loop Antenna	R&S	HFH2-Z2	860004/0001	9 kHz - 30 MHz	Jul. 03, 2012	Radiation (03CH02-HY)

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

5 Certification of TAF Accreditation



Certificate No. : L1190-120405

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2010 to January 09, 2013
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date:April 05, 2012

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