FCC Test Report

Equipment	:	**RF Module**
Brand Name	:	**Chicony**
Model No.	:	**AR5B22**
FCC ID	:	**E8H-AR5B22**
Standard	:	**47 CFR FCC Part 15.247**
Operating Band	:	**5725 MHz – 5850 MHz**
FCC Classification	:	**DTS**
Applicant Manufacturer	:	**Chicony Electronics Co., Ltd.** No.25,Wugong 6th RD.,Wugu Dist., New Taipei City 248 , Taiwan (R.O.C)

The product sample received on Jun. 16, 2015 and completely tested on Jul. 21, 2015. 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:

Vic Hsiao / Supervisor

Testing Laboratory
1190

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APPENDIX A. TEST PHOTOS

APPENDIX B. PHOTOGRAPHS OF EUT

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]:0.2173520MHz 26.02 (Margin26.90dB) - AV 42.15 (Margin20.77dB) - QP	FCC 15.207	Complied
-	15.247(a)	6dB Bandwidth	-	≥500kHz	-
3.2	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm]: 20.32	Power [dBm]:30	Complied
-	15.247(d)	Power Spectral Density	-	PSD [dBm/3kHz]:8	-
3.3	15.247(c)	Transmitter Radiated Bandedge Emissions	Non-Restricted Bands: 5724.970MHz: 27.28dB	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
3.4	15.247(c)	Transmitter Radiated Unwanted Emissions	Restricted Bands **Below 1GHz** [dBuV/m at 3m]: 398.600MHz 42.22 (Margin 3.78dB) – PK **Above 1GHz (Worst)** [dBuV/m at 3m]:11570MHz 70.40 (Margin 3.60dB) - PK 52.75 (Margin 1.25dB) - AV	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied

Note: Standard clause 15.247(a)、15.247(b) have been done module test by Atheros / AR5B22.

Revision History

Report No.	Version	Description	Issued Date
FR561307AI	Rev. 04	Initial issue of report	Jul. 31, 2015

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	20.32	Yes
5725-5850	a	5745-5825	149-165 [5]	2	18.78	Yes
5725-5850	n (HT20)	5745-5825	149-165 [5]	2	18.72	Yes
5725-5850	n (HT40)	5755-5795	151-159 [2]	2	20.09	Yes

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

EUT may match the two group antennas use. The only difference is the antennas. For more detailed features description, please refer to the specifications or user's manual.

Antenna Group	Port. No.	Antenna Model Name
1	1	WPB107-1(Mini 1.13 Antenna with MHF L70mm)
	2	WPB107-1(Mini 1.13 Antenna with MHF L49mm)
2	1	WPB220 (Mini 1.13 Antenna with MHF L70mm)
	2	WPB220 (Mini 1.13 Antenna with MHF L49mm)

Antenna Category	
☒	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.

Antenna General Information				
Group	**Port. No.**	**Ant. Cat.**	**Ant. Type**	**Gain (dBi)**
1	1/2	Integral	PCB	3.01 / 3.01
2	1/2	Integral	PIFA	2.97 /3.08

Remark:
1. In modulation mode 11a, this EUT supports 1TX and diversity. Port 1 is the worst case of the EUT. The test result of Port 1 was recorded in this report.
2. In modulation mode 11a/n, this EUT supports 2TX.
3. Original equipment is PIFA antenna. The additional PIFA antenna not the higher gain and worst configuration that all items didn't retest. Therefore, we tested and recorded PCB antenna in this report.

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 EUT Operational Condition

Supply Voltage	☐ AC mains	☒ DC	
Type of DC Source	☒ From Host System	☐ External AC adapter	☐ Li-ion Battery

1.2 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5540	DoC
2	Test Fixture	NA	NA	NA

Note：The test fixture provides is by customer.

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 District, Tao Yuan City, Taiwan, R.O.C.		
		TEL :	886-3-327-3456	FAX :	886-3-327-0973

Test Condition	Test Site No.	Test Engineer	Test Environment
AC Conduction	CO04-HY	Zeus	23°C / 59%
RF Conducted	TH06-HY	Rory	22.2°C / 65%
Radiated Emission	03CH03-HY	Hunter	25.4°C / 56.1%

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**
AC power-line conducted emissions		±2.3 dB
Emission bandwidth, 26dB bandwidth		±0.5%
RF output power, conducted		±0.1 dB
Power density, conducted		±0.5 dB
Unwanted emissions, conducted	9 – 150 kHz	±0.4 dB
	0.15 – 30 MHz	±0.4 dB
	30 – 1000 MHz	±0.6 dB
	1 – 18 GHz	±0.5 dB
	18 – 40 GHz	±0.5 dB
	40 – 200 GHz	N/A
All emissions, radiated	9 – 150 kHz	±2.5 dB
	0.15 – 30 MHz	±2.3 dB
	30 – 1000 MHz	±2.6 dB
	1 – 18 GHz	±3.6 dB
	18 – 40 GHz	±3.8 dB
	40 – 200 GHz	N/A
Temperature		±0.8 ℃
Humidity		±5 %
DC and low frequency voltages		±0.9%
Time		±1.4 %
Duty Cycle		±0.5 %

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**
11a	1	6-54Mbps	6 Mbps
11a	2	6-54Mbps	6 Mbps
HT20	2	MCS 0-15	MCS 0
HT40	2	MCS 0-15	MCS 0

2.2 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter (5725-5850MHz band)						
Test Software Version	ART2					
Modulation Mode	**N_{TX}**	**Test Frequency (MHz)**				
		NCB: 20MHz			**NCB: 40MHz**	
		5745	**5785**	**5825**	**5755**	**5795**
11a	1	17	16.5	14.5	-	-
11a	2	11.5	11.5	11.5	-	-
HT20	2	11	11.5	11.5	-	-
HT40	2	-	-	-	12.5	13

2.3 The Worst Case Measurement Configuration

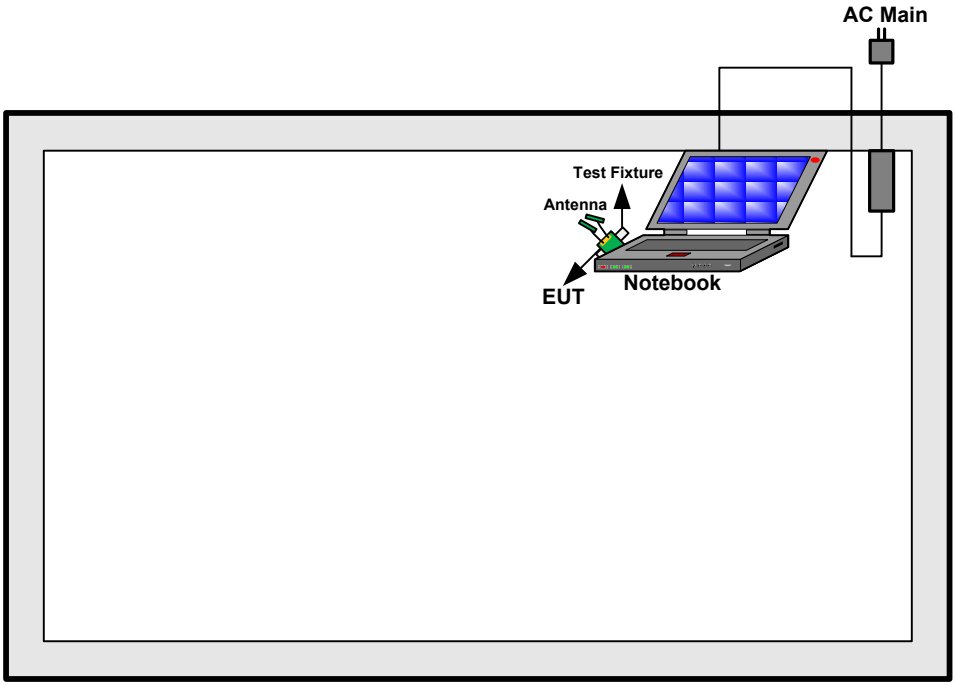
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	Transmit Mode (WLAN)

The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11a, HT20, HT40

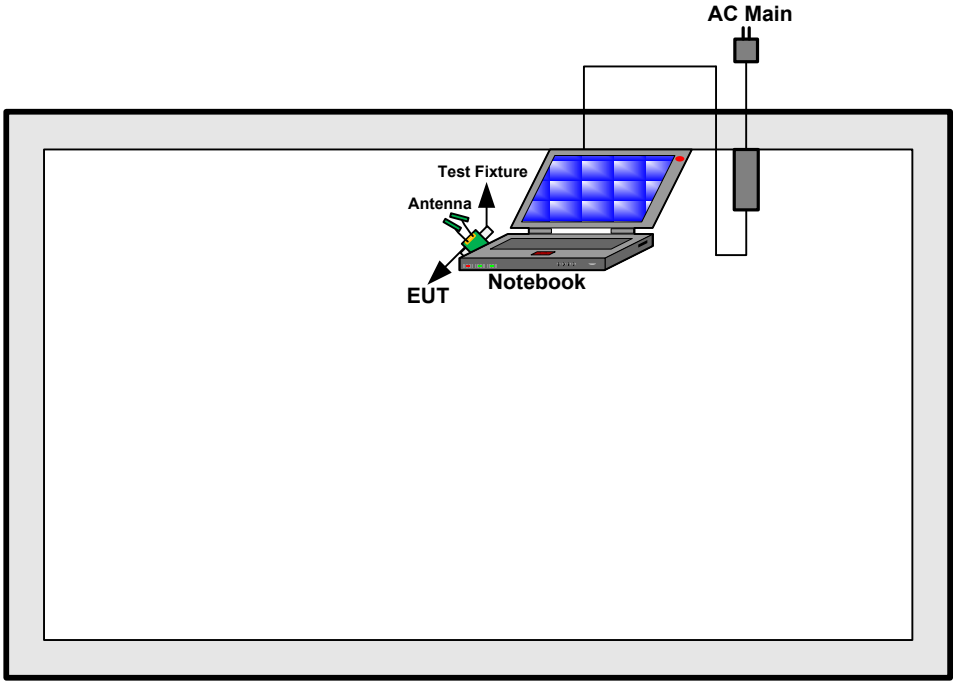
The Worst Case Mode for Following Conformance Tests			
Tests Item	Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO 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.		
	☐ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.		
Operating Mode	1. Transmit Mode (WLAN)		
Modulation Mode	11a, HT20, HT40		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
Worst Planes of EUT	V		

2.4 Test Setup Diagram

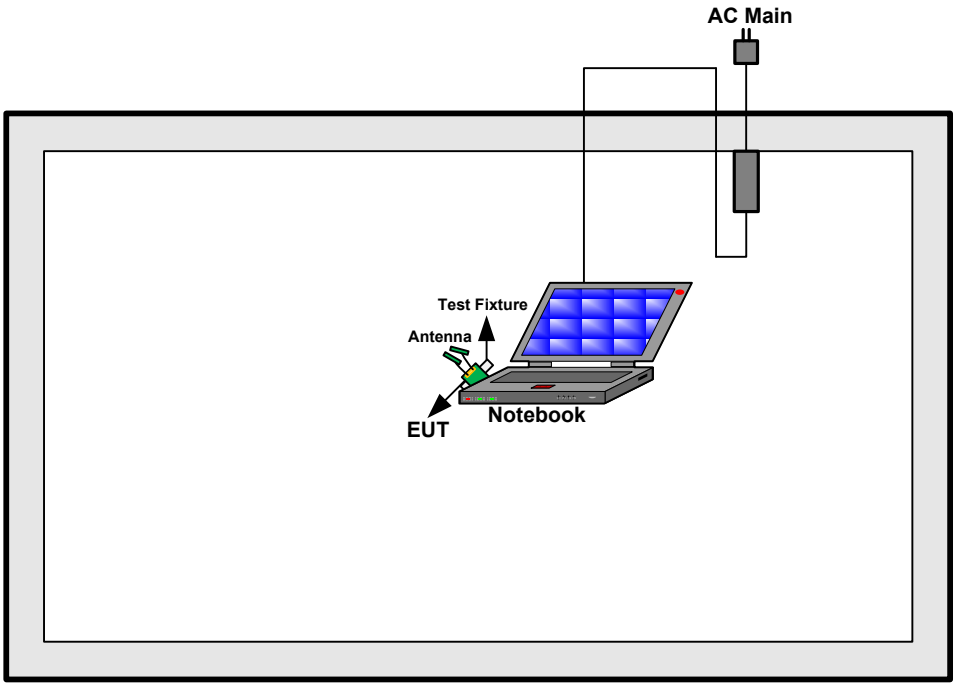
Test Setup Diagram – AC Line Conducted Emission Test



Test Setup Diagram - Radiated Test Below 1GHz



Test Setup Diagram - Radiated Test Above 1GHz



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

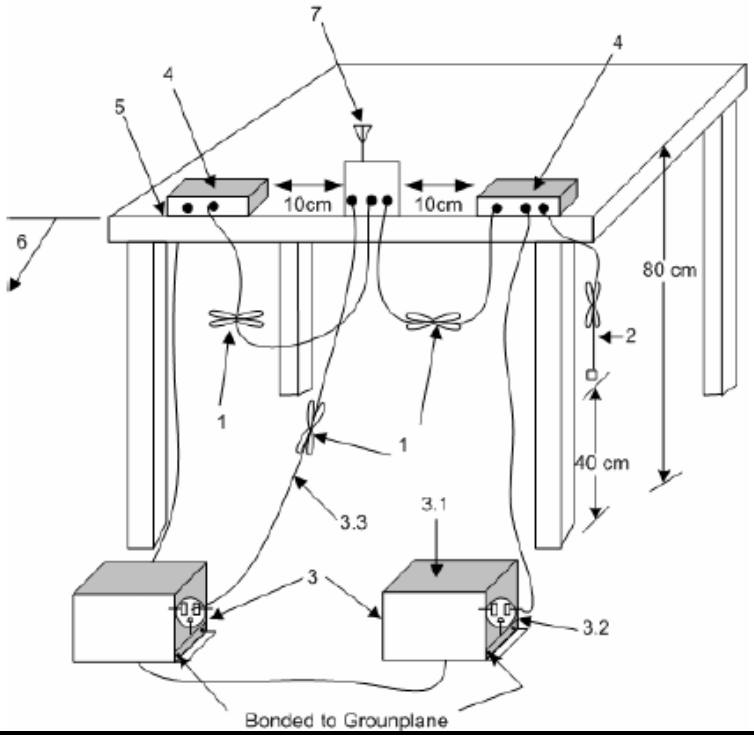
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

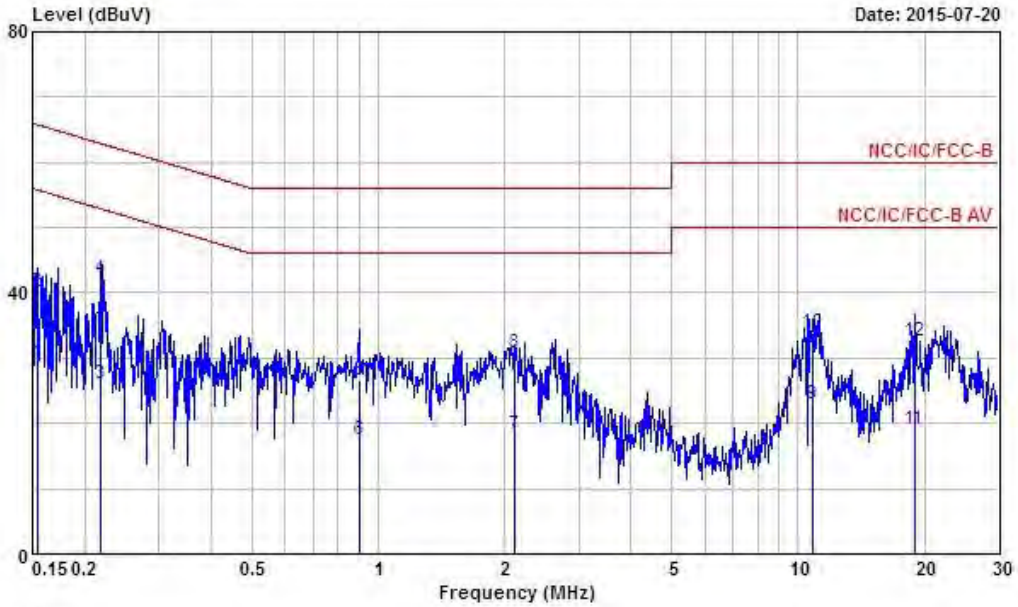
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

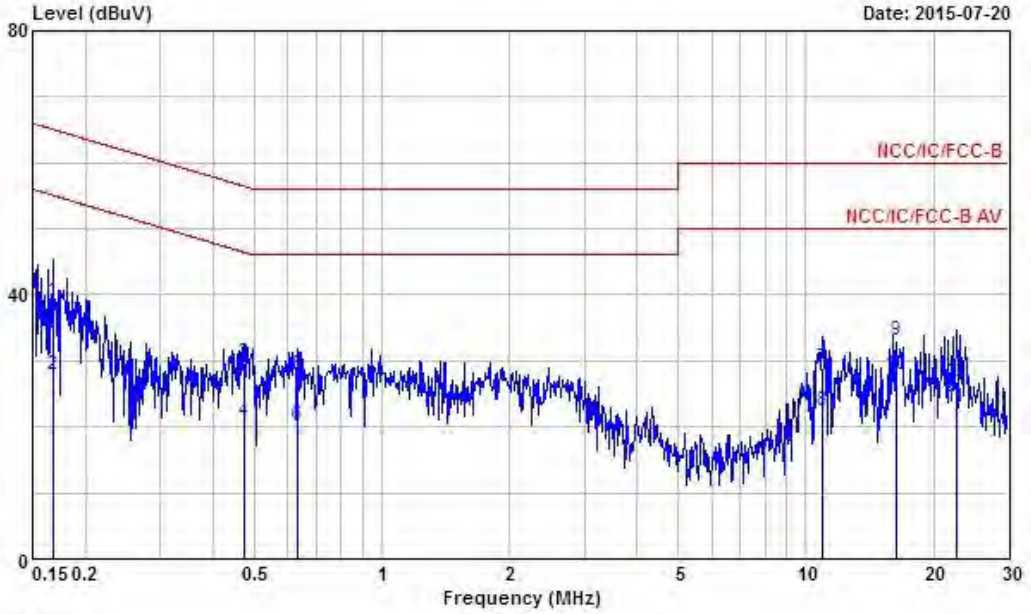
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	Transmit Mode (WLAN)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1540270	29.09	-26.69	55.78	28.67	0.07	0.35	Average
2	0.1540270	40.22	-25.56	65.78	39.80	0.07	0.35	QP
3	0.2173520	26.02	-26.90	52.92	25.44	0.07	0.51	Average
4	0.2173520	42.15	-20.77	62.92	41.57	0.07	0.51	QP
5	0.8991650	26.49	-29.51	56.00	25.62	0.09	0.78	QP
6	0.8991650	17.37	-28.63	46.00	16.50	0.09	0.78	Average
7	2.120	18.11	-27.89	46.00	17.22	0.10	0.79	Average
8	2.120	30.74	-25.26	56.00	29.85	0.10	0.79	QP
9	10.790	23.00	-27.00	50.00	21.94	0.26	0.80	Average
10	10.790	33.90	-26.10	60.00	32.84	0.26	0.80	QP
11	18.920	19.01	-30.99	50.00	17.90	0.39	0.72	Average
12	18.920	32.46	-27.54	60.00	31.35	0.39	0.72	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	Transmit Mode (WLAN)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1676540	39.16	-25.92	65.08	38.71	0.05	0.40	QP
2	0.1676540	27.89	-27.19	55.08	27.44	0.05	0.40	Average
3	0.4736030	29.83	-26.62	56.45	29.12	0.07	0.64	QP
4	0.4736030	20.86	-25.59	46.45	20.15	0.07	0.64	Average
5	0.6304790	27.97	-28.03	56.00	27.20	0.07	0.70	QP
6	0.6304790	20.25	-25.75	46.00	19.48	0.07	0.70	Average
7	10.900	29.03	-30.97	60.00	27.98	0.25	0.80	QP
8	10.900	22.53	-27.47	50.00	21.48	0.25	0.80	Average
9	16.310	33.03	-26.97	60.00	31.94	0.32	0.77	QP
10	16.310	27.96	-22.04	50.00	26.87	0.32	0.77	Average
11	22.660	23.01	-26.99	50.00	21.98	0.38	0.65	Average
12	22.660	26.82	-33.18	60.00	25.79	0.38	0.65	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 RF Output Power

3.2.1 RF Output Power Limit

RF Output Power Limit		
Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit		
☒	5725-5850 MHz Band:	
	☒	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ 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): $P_{eirp} \leq 36$ 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.		

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
☒	Maximum Peak Conducted Output Power
	☐ Refer as FCC KDB 558074, clause 9.1.1 Option 1 (RBW ≥ EBW method).
	☒ Refer as FCC KDB 558074, clause 9.1.2 Option 2 (peak power meter for VBW ≥ DTS BW)
☒	Maximum Conducted Output Power
	[duty cycle ≥ 98% or external video / power trigger]
	☐ Refer as FCC KDB 558074, clause 9.2.2.2 Method AVGSA-1 (spectral trace averaging).
	☐ Refer as FCC KDB 558074, clause 9.2.2.3 Method AVGSA-1 Alt. (slow sweep speed)
	duty cycle < 98% and average over on/off periods with duty factor
	☐ Refer as FCC KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
	☐ Refer as FCC KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
	☒ Refer as FCC KDB 558074, clause 9.2.3 Method AVGPM (using an RF 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]) $EIRP_{total} = P_{total} + DG$

3.2.4 Test Setup

RF Output Power (Power Meter)

3.2.5 Directional Gain for Power Measurement

Directional Gain (DG) Result					
Transmit Chains No.		1	2	-	-
Maximum G_{ANT} (dBi)		3.01	3.01	-	-
Modulation Mode	**DG (dBi)**	**N_{TX}**	**N_{SS} (Min.)**	**STBC**	**Array Gain (dB)**
a	3.01	1	1		0
a	6.02	2	1	-	3.01 (Note1)
n (HT20)	6.02	2	1	-	3.01 (Note1)
n (HT40)	6.02	2	1	-	3.01 (Note1)

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}) = 3.01+10 log(2)= 6.02
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[$(10^{G1/20} + \ldots + 10^{GN/20})^2 / N_{TX}$]
All transmit signals are completely uncorrelated, Directional Gain = 10 log[$(10^{G1/10} + \ldots + 10^{GN/10})/N_{TX}$]
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};

3.2.6 Test Result of Maximum Peak Conducted Output Power

Maximum Peak Conducted Output Power Result									
Test Date: Jul. 21, 2015			RF Output Power (dBm)						
Condition									
Modulation Mode	N_{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11a	1	5745	20.32	-	20.32	30	3.01	23.33	36
11a	1	5785	19.51	-	19.51	30	3.01	22.52	36
11a	1	5825	17.72	-	17.72	30	3.01	20.73	36
11a	2	5745	15.43	16.08	18.78	29.98	6.02	24.80	36
11a	2	5785	15.36	16.12	18.77	29.98	6.02	24.79	36
11a	2	5825	15.10	15.70	18.42	29.98	6.02	24.44	36
HT20	2	5745	15.22	15.55	18.40	29.98	6.02	24.42	36
HT20	2	5785	15.09	16.26	18.72	29.98	6.02	24.74	36
HT20	2	5825	15.03	15.40	18.23	29.98	6.02	24.25	36
HT40	2	5755	16.14	16.67	19.42	29.98	6.02	25.44	36
HT40	2	5795	16.75	17.38	20.09	29.98	6.02	26.11	36
Result			Complied						

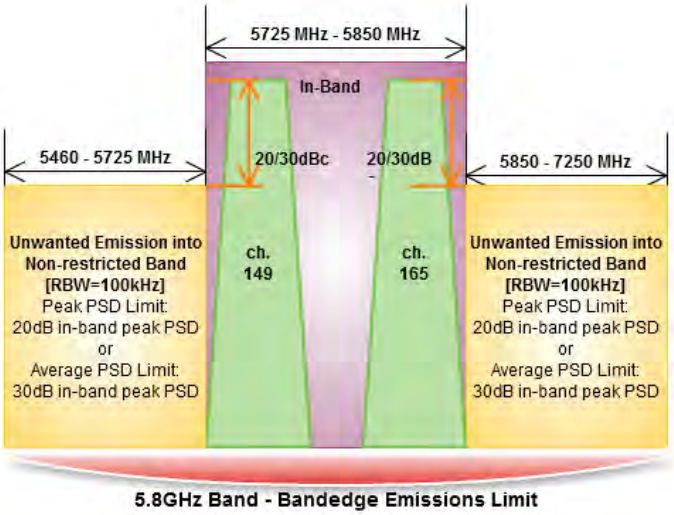
3.2.7 Test Result of Maximum Conducted Output Power

Maximum Conducted Output Power									
Test Date: Jul. 21, 2015			RF Output Power (dBm)						
Condition									
Modulation Mode	N_{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11a	1	5745	15.41	-	15.41	30	3.01	18.42	36
11a	1	5785	14.71	-	14.71	30	3.01	17.72	36
11a	1	5825	12.82	-	12.82	30	3.01	15.83	36
11a	2	5745	10.55	11.01	13.80	29.98	6.02	19.82	36
11a	2	5785	10.63	11.19	13.93	29.98	6.02	19.95	36
11a	2	5825	10.24	10.56	13.41	29.98	6.02	19.43	36
HT20	2	5745	10.21	10.45	13.34	29.98	6.02	19.36	36
HT20	2	5785	10.27	11.33	13.85	29.98	6.02	19.87	36
HT20	2	5825	10.04	10.53	13.30	29.98	6.02	19.32	36
HT40	2	5755	11.41	11.59	14.51	29.98	6.02	20.53	36
HT40	2	5795	11.71	12.34	15.04	29.98	6.02	21.06	36
Result			**Complied**						

3.3 Transmitter Radiated Bandedge Emissions

3.3.1 Transmitter Radiated Bandedge Emissions Limit

Transmitter Radiated Bandedge Emissions Limit



3.3.2 Measuring Instruments

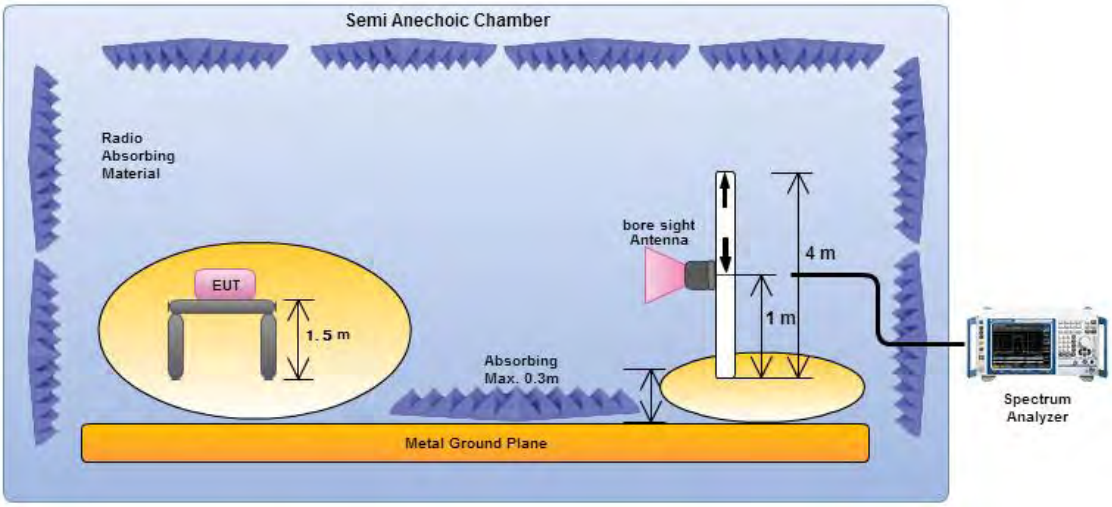
Refer a test equipment and calibration data table in this test report.

3.3.3 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 11 for unwanted emissions into non-restricted bands.	
	☒	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.	
		☒	Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle ≥98%)
		☐	Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
		☐	Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW≥1/T).
		☒	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 11.3 and 12.2.4 measurement procedure peak limit.
☒	For the transmitter bandedge emissions shall be measured using following options below:		
	☐	Refer as FCC KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 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.	
☒	For radiated measurement, refer as FCC KDB 558074, clause 12.2.7.		
☒	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 3m, because the instrumentation noise floor is typically close to the radiated emission limit.		

3.3.4 Test Setup

Transmitter Radiated Bandedge Emissions



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

Note: FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 02, 2014.

3.3.5 Test Result of Transmitter Radiated Bandedge Emissions

5725-5850MHz Transmitter Radiated Bandedge Emissions (Non-restricted Band)								
Modulation	N_{TX}	Test Freq. (MHz)	In-band PSD [i] (dBuV/100kHz)	Freq. (MHz)	Out-band PSD [o] (dBuV/100kHz)	[i] – [o] (dB)	Limit (dB)	Pol.
11a	1	5745	101.30	5724.970	74.02	27.28	20	H
11a	1	5825	97.45	5852.590	56.51	40.94	20	H
11a	2	5745	102.36	5724.970	66.05	36.31	20	H
11a	2	5825	101.28	5891.860	56.92	44.36	20	H
HT20	2	5745	100.54	5724.970	65.04	35.50	20	H
HT20	2	5825	99.86	5850.070	57.67	42.19	20	H
HT40	2	5755	100.94	5723.840	72.41	28.53	20	H
HT40	2	5795	100.33	5863.600	56.47	43.86	20	H
Note 1: Measurement worst emissions of receive antenna polarization								

3.4 Transmitter Radiated Unwanted Emissions

3.4.1 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.

3.4.2 Measuring Instruments

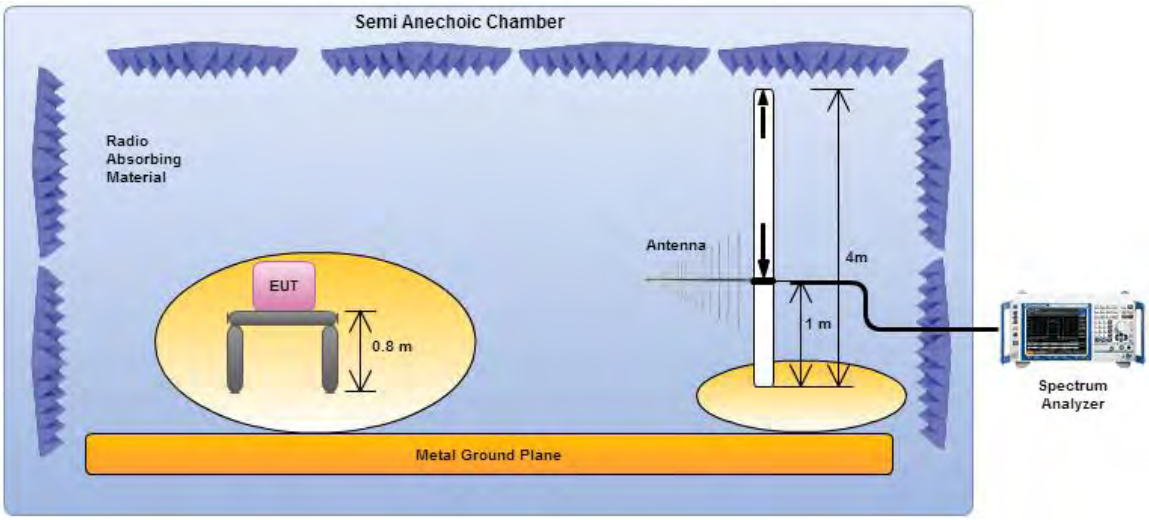
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method			
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).		
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
☒	For the transmitter unwanted emissions shall be measured using following options below:		
	☒	Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.	
	☒	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.	
		☐	Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle ≥98%)
		☐	Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
		☐	Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW≥1/T).
		☒	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 11.3 and 12.2.4 measurement procedure peak limit.
		☐	Refer as FCC KDB 558074, clause 12.2.3 measurement procedure Quasi-Peak limit.
☒	For radiated measurement, refer as FCC KDB 558074, clause 12.2.7.		
	☒	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.	

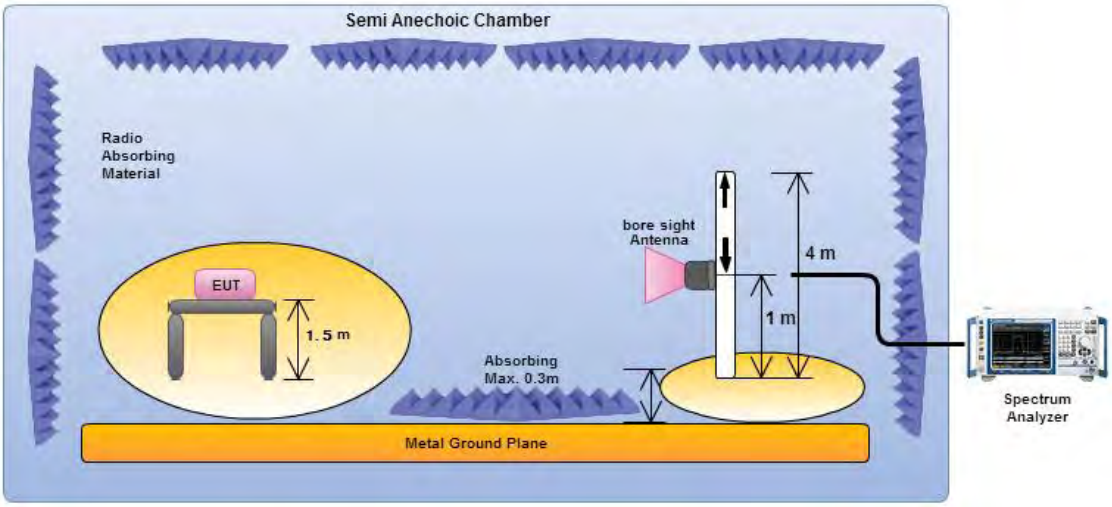
3.4.4 Test Setup

Transmitter Radiated Unwanted Emissions Below 1GHz



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.

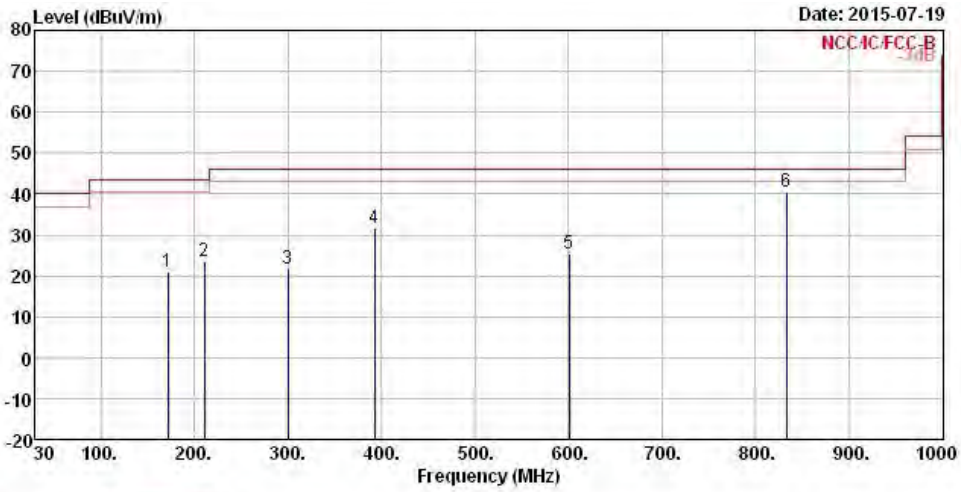
Note: FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 02, 2014.

3.4.5 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.

3.4.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

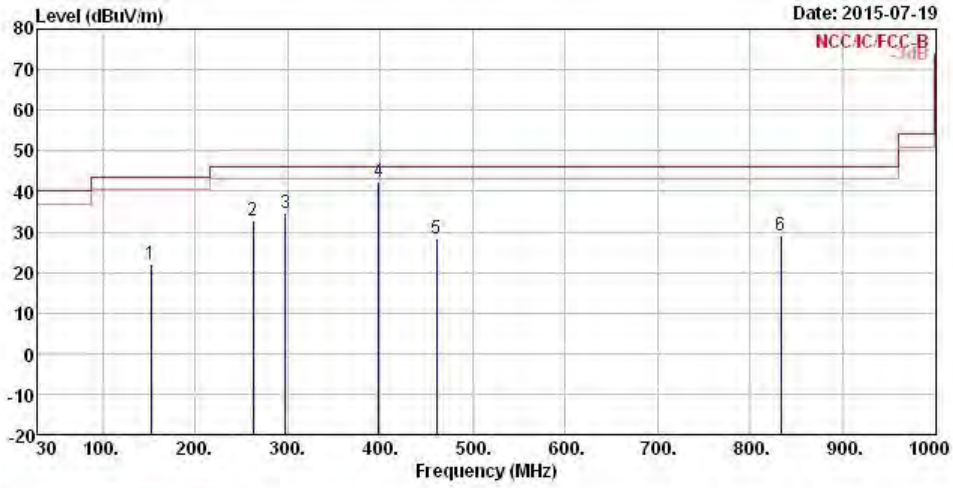
Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Modulation Mode	HT40	**Test Freq. (MHz)**	5795
N_{TX}	1	**Polarization**	V
Operating Function	Transmit Mode (WLAN)		



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	171.620	21.01	-22.49	43.50	36.73	9.19	2.16	27.07	Peak
2	210.420	23.61	-19.89	43.50	39.37	8.78	2.39	26.93	Peak
3	299.660	21.60	-24.40	46.00	32.49	12.87	2.90	26.66	Peak
4	392.780	31.78	-14.22	46.00	40.73	15.02	3.31	27.28	Peak
5	600.360	25.46	-20.54	46.00	31.12	18.18	4.15	27.99	Peak
6	833.160	40.49	-5.51	46.00	43.45	19.84	4.93	27.73	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)			
Modulation Mode	HT40	**Test Freq. (MHz)**	5795
N_{TX}	1	**Polarization**	H
Operating Function	Transmit Mode (WLAN)		

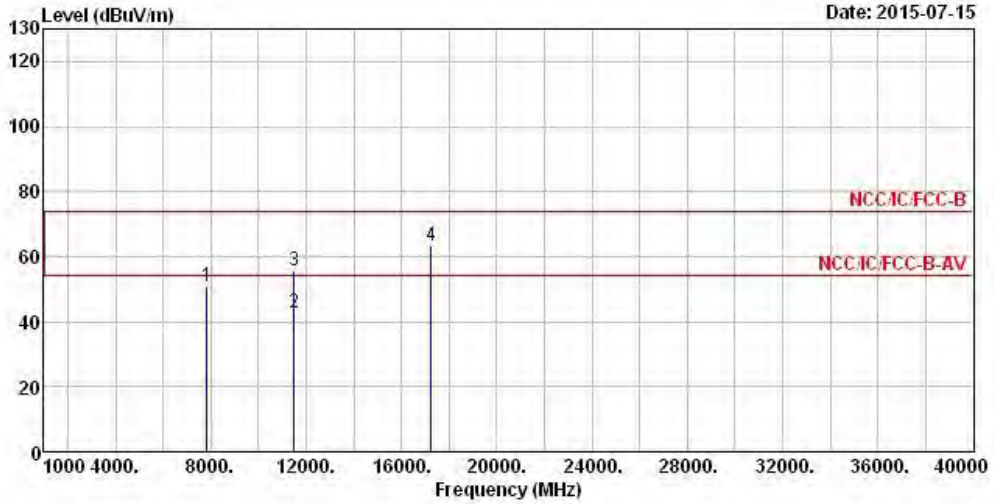


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	152.220	22.21	-21.29	43.50	37.25	10.06	2.04	27.14	Peak
2	262.800	32.93	-13.07	46.00	43.99	13.02	2.69	26.77	Peak
3	297.720	34.49	-11.51	46.00	45.44	12.83	2.89	26.67	Peak
4	398.600	42.22	-3.78	46.00	50.96	15.24	3.34	27.32	Peak
5	460.680	28.19	-17.81	46.00	35.82	16.45	3.56	27.64	Peak
6	833.160	28.91	-17.09	46.00	31.87	19.84	4.93	27.73	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)

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

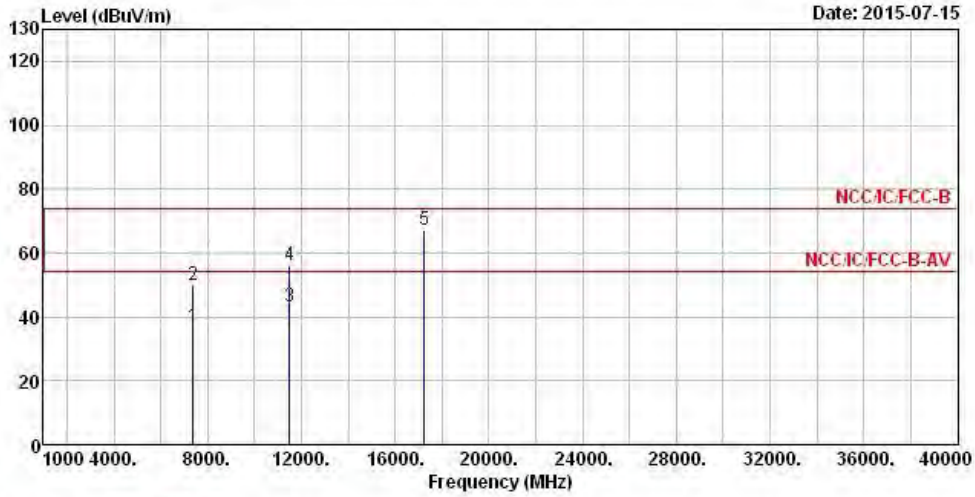
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5745
N_{TX}	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7836.000	50.69			40.79	36.80	5.94	32.84	Peak
2	11490.000	42.78	-11.22	54.00	29.19	38.49	7.52	32.42	Average
3	11490.000	55.60	-18.40	74.00	42.01	38.49	7.52	32.42	Peak
4	17235.000	63.28			44.00	41.24	9.49	31.45	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 (107.47 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

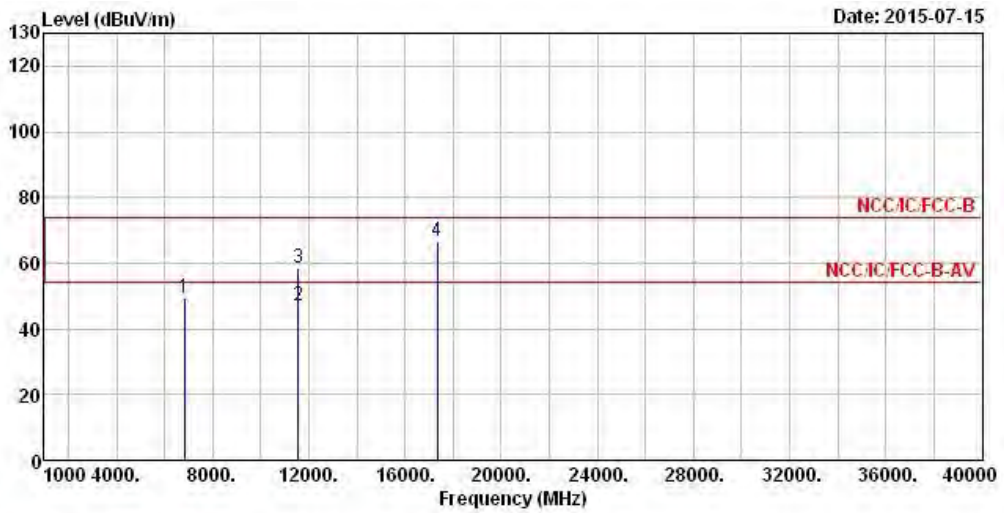
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5745
N_{TX}	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7392.000	36.97	-17.03	54.00	27.43	36.46	5.78	32.70	Average
2	7392.000	49.82	-24.18	74.00	40.28	36.46	5.78	32.70	Peak
3	11490.000	43.28	-10.72	54.00	29.69	38.49	7.52	32.42	Average
4	11490.000	55.92	-18.08	74.00	42.33	38.49	7.52	32.42	Peak
5	17235.000	66.99			47.71	41.24	9.49	31.45	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 (107.47 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

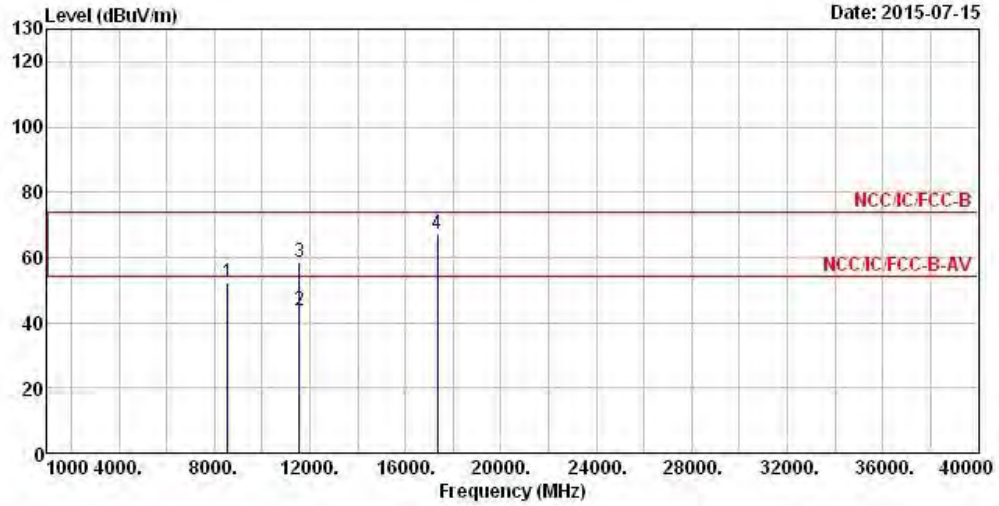
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5785
N_{TX}	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	6840.000	49.64			40.97	35.65	5.54	32.52	Peak
2	11570.000	46.82	-7.18	54.00	33.08	38.61	7.55	32.42	Average
3	11570.000	58.76	-15.24	74.00	45.02	38.61	7.55	32.42	Peak
4	17355.000	66.76			47.02	41.66	9.54	31.46	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 (105.60 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

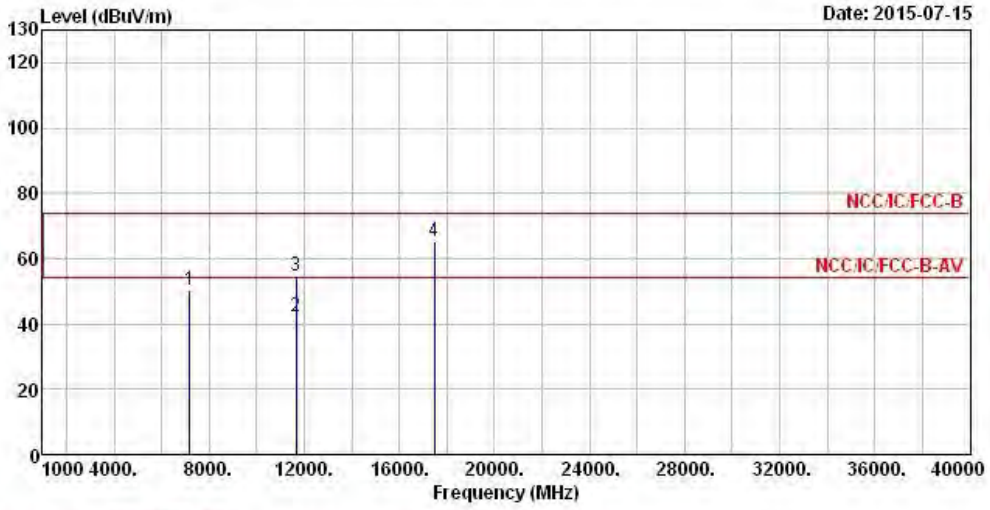
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5785
N_{TX}	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8562.000	52.47			41.81	37.33	6.26	32.93	Peak
2	11570.000	43.49	-10.51	54.00	29.75	38.61	7.55	32.42	Average
3	11570.000	58.68	-15.32	74.00	44.94	38.61	7.55	32.42	Peak
4	17355.000	67.09			47.35	41.66	9.54	31.46	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 (105.60 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

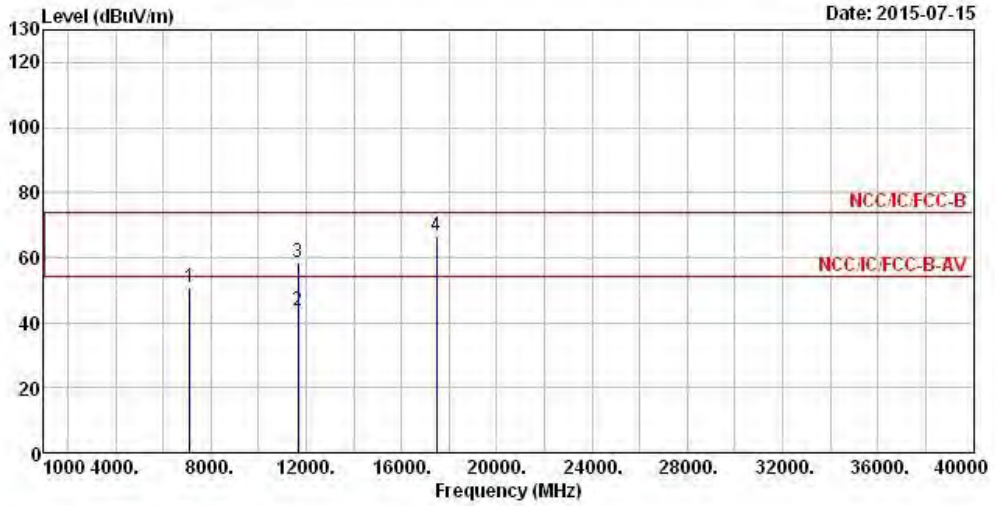
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5825
N_{TX}	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7186.000	50.19			40.93	36.17	5.71	32.62	Peak
2	11650.000	42.04	-11.96	54.00	28.16	38.72	7.58	32.42	Average
3	11650.000	54.85	-19.15	74.00	40.97	38.72	7.58	32.42	Peak
4	17475.000	65.41			45.22	42.08	9.58	31.47	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 (104.06 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

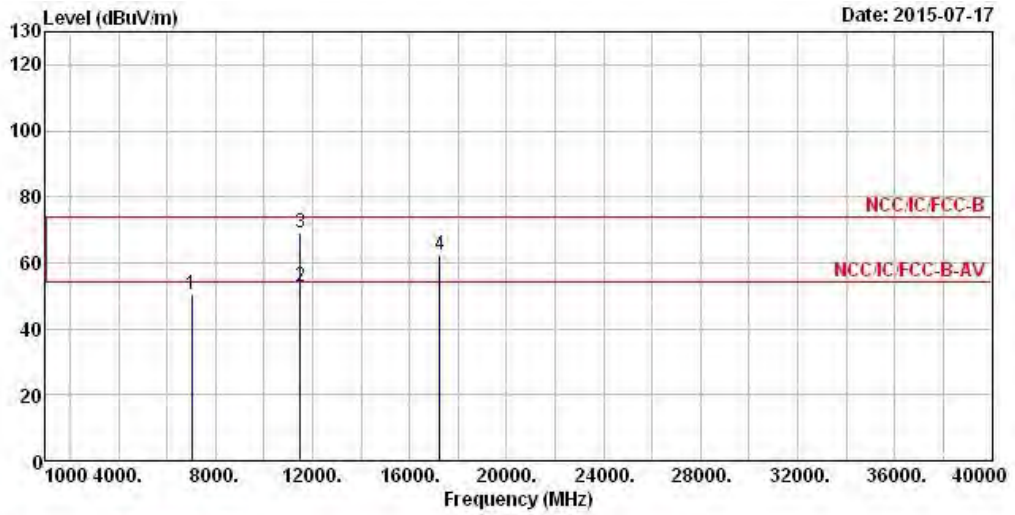
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5825
N_{TX}	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7116.000	51.05			41.89	36.07	5.68	32.59	Peak
2	11650.000	43.53	-10.47	54.00	29.65	38.72	7.58	32.42	Average
3	11650.000	58.56	-15.44	74.00	44.68	38.72	7.58	32.42	Peak
4	17475.000	66.85			46.66	42.08	9.58	31.47	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 (104.06 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

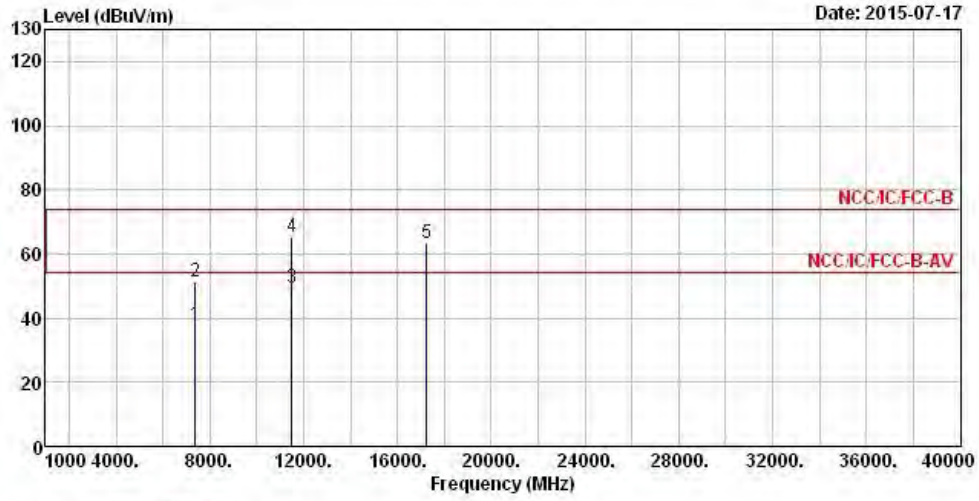
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5745
N_{TX}	2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7011.000	50.13			41.11	35.92	5.64	32.54	Peak
2	11490.000	52.70	-1.30	54.00	39.11	38.49	7.52	32.42	Average
3	11490.000	69.31	-4.69	74.00	55.72	38.49	7.52	32.42	Peak
4	17235.000	62.43			43.15	41.24	9.49	31.45	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 (107.96 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

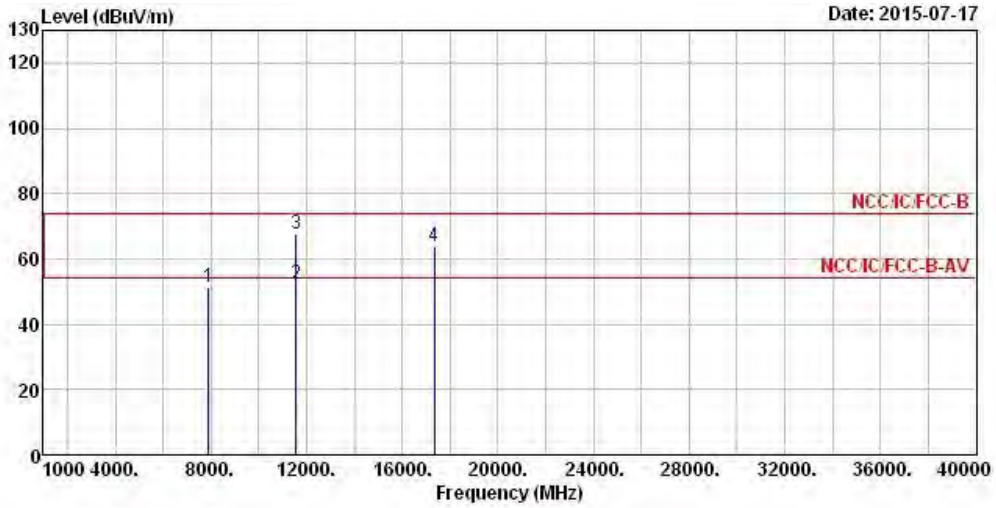
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5745
N_{TX}	2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7392.000	37.69	-16.31	54.00	28.15	36.46	5.78	32.70	Average
2	7392.000	51.12	-22.88	74.00	41.58	36.46	5.78	32.70	Peak
3	11490.000	49.31	-4.69	54.00	35.72	38.49	7.52	32.42	Average
4	11490.000	65.42	-8.58	74.00	51.83	38.49	7.52	32.42	Peak
5	17235.000	63.49			44.21	41.24	9.49	31.45	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 (107.96 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

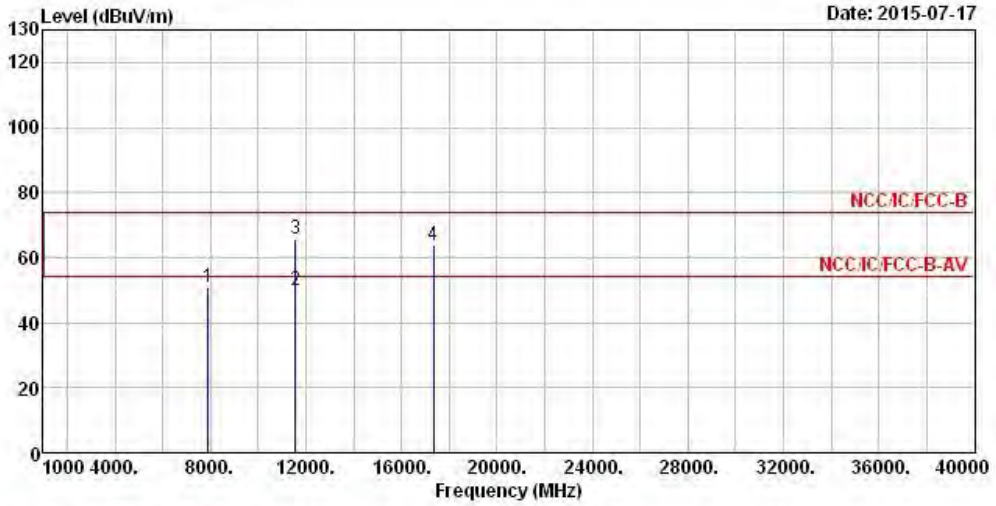
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5785
N_{TX}	2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7890.000	51.15			41.20	36.83	5.97	32.85	Peak
2	11570.000	52.43	-1.57	54.00	38.69	38.61	7.55	32.42	Average
3	11570.000	67.84	-6.16	74.00	54.10	38.61	7.55	32.42	Peak
4	17355.000	64.00			44.26	41.66	9.54	31.46	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 (108.64 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

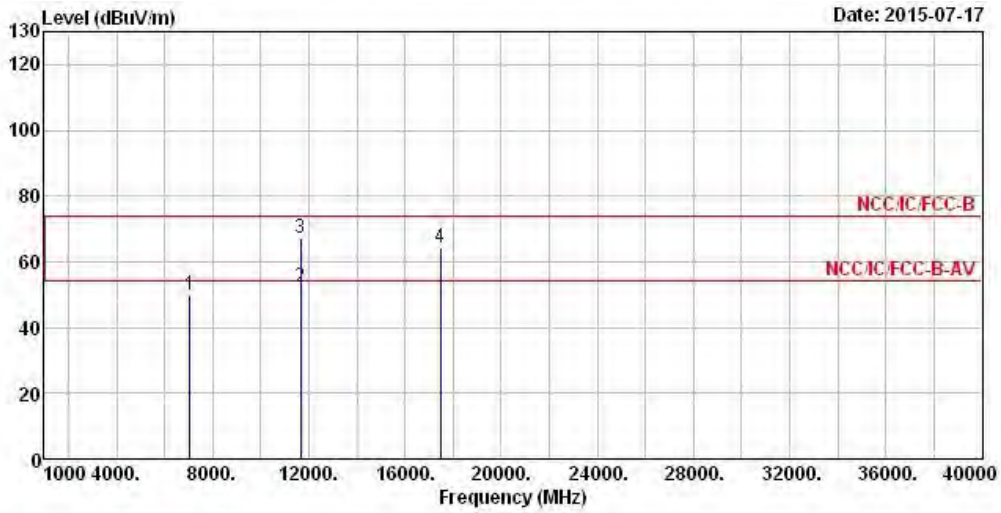
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5785
N_{TX}	2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7902.000	50.76			40.80	36.84	5.97	32.85	Peak
2	11570.000	49.70	-4.30	54.00	35.96	38.61	7.55	32.42	Average
3	11570.000	65.95	-8.05	74.00	52.21	38.61	7.55	32.42	Peak
4	17355.000	63.61			43.87	41.66	9.54	31.46	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 (108.64 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

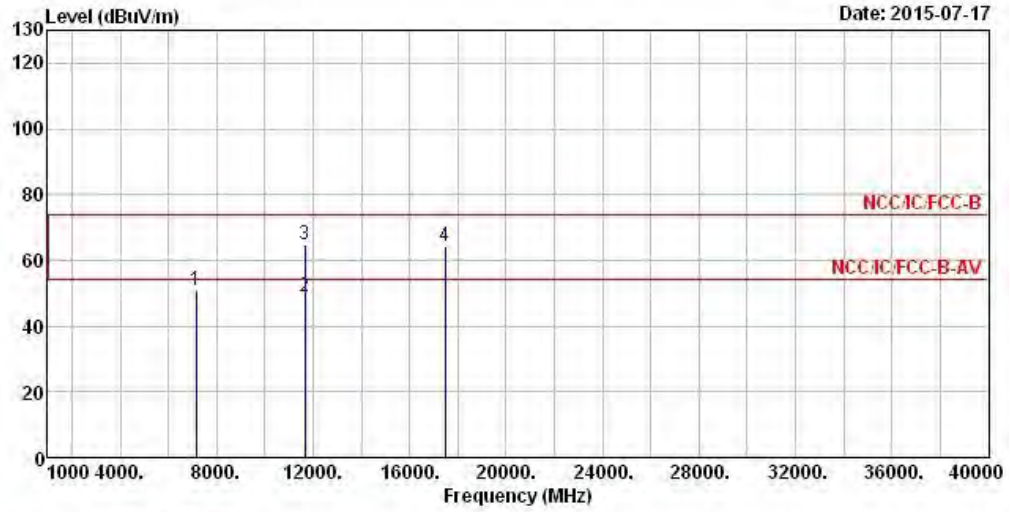
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5825
N_{TX}	2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7042.000	50.10			41.06	35.95	5.65	32.56	Peak
2	11650.000	52.26	-1.74	54.00	38.38	38.72	7.58	32.42	Average
3	11650.000	67.25	-6.75	74.00	53.37	38.72	7.58	32.42	Peak
4	17475.000	64.38			44.19	42.08	9.58	31.47	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 (107.52 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5825
N_{TX}	2	**Polarization**	H

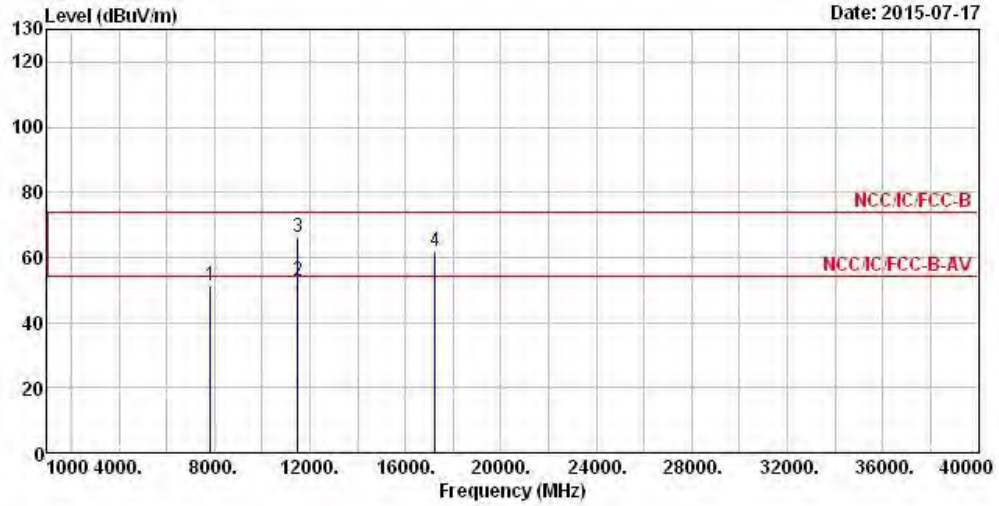


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7154.000	50.84			41.62	36.12	5.70	32.60	Peak
2	11650.000	49.15	-4.85	54.00	35.27	38.72	7.58	32.42	Average
3	11650.000	64.73	-9.27	74.00	50.85	38.72	7.58	32.42	Peak
4	17475.000	64.39			44.20	42.08	9.58	31.47	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 (107.52 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

3.4.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

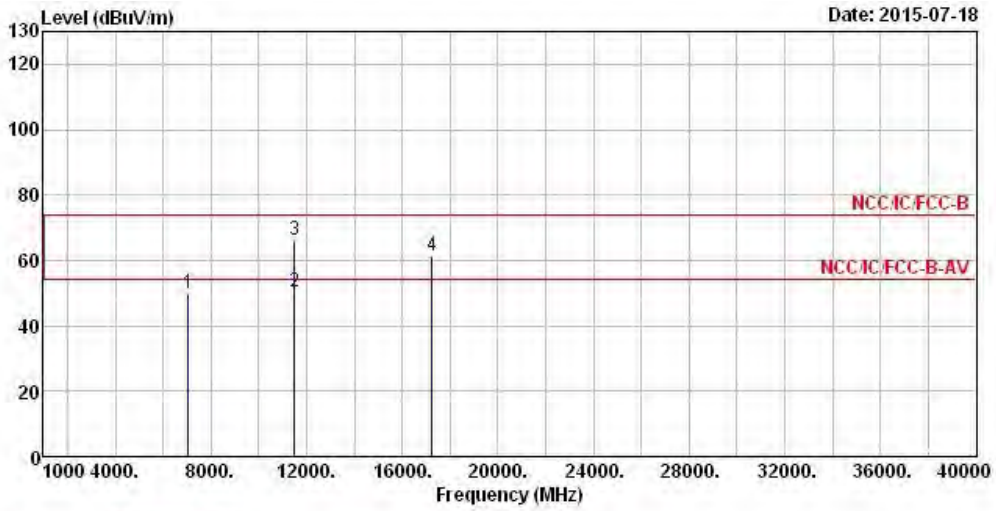
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT20	**Test Freq. (MHz)**	5745
N_{TX}	2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7836.000	51.36			41.46	36.80	5.94	32.84	Peak
2	11490.000	52.57	-1.43	54.00	38.98	38.49	7.52	32.42	Average
3	11490.000	66.09	-7.91	74.00	52.50	38.49	7.52	32.42	Peak
4	17235.000	61.67			42.39	41.24	9.49	31.45	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 (106.44 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

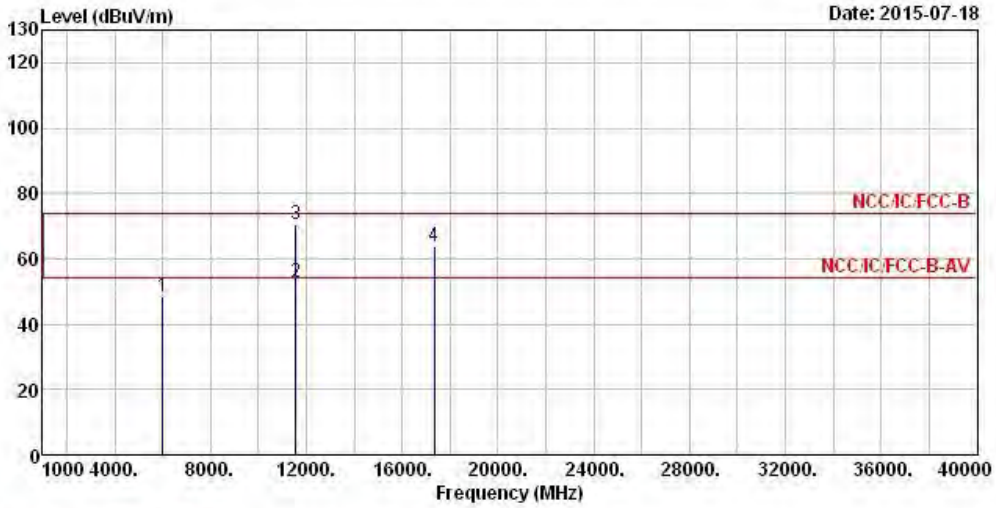
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT20	**Test Freq. (MHz)**	5745
N_{TX}	2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7044.000	49.98			40.92	35.97	5.65	32.56	Peak
2	11490.000	50.26	-3.74	54.00	36.67	38.49	7.52	32.42	Average
3	11490.000	66.16	-7.84	74.00	52.57	38.49	7.52	32.42	Peak
4	*17235.000	61.48			42.20	41.24	9.49	31.45	Average

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 (106.44 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

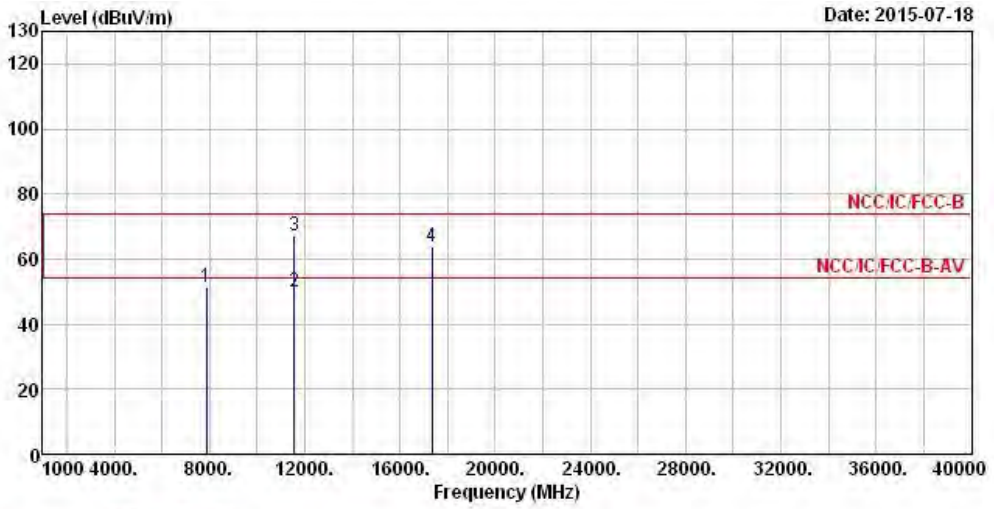
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT20	**Test Freq. (MHz)**	5785
N_{TX}	2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	6018.000	48.34			41.29	34.42	5.09	32.46	Peak
2	11570.000	52.75	-1.25	54.00	39.01	38.61	7.55	32.42	Average
3	11570.000	70.40	-3.60	74.00	56.66	38.61	7.55	32.42	Peak
4	17355.000	63.68			43.94	41.66	9.54	31.46	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 (107.43 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

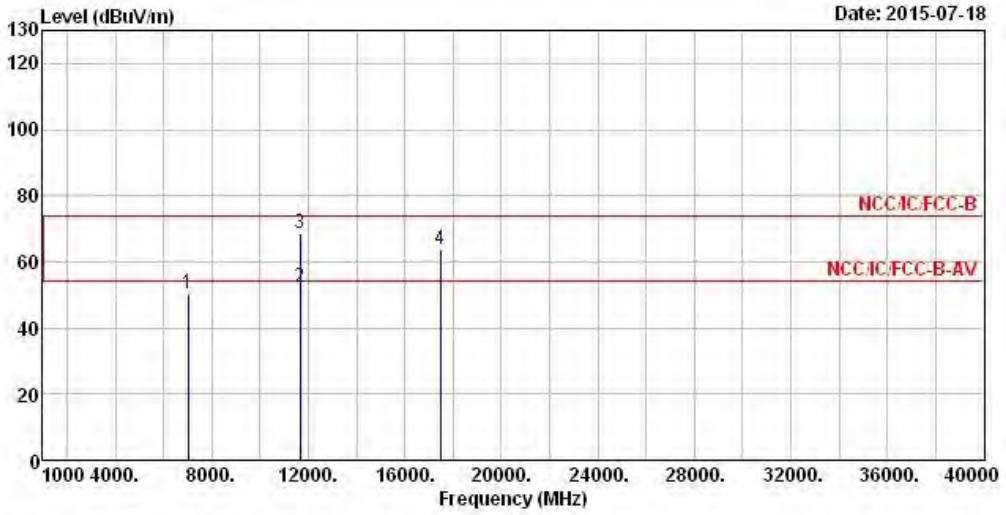
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT20	**Test Freq. (MHz)**	5785
N_{TX}	2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7878.000	51.34			41.41	36.83	5.95	32.85	Peak
2	11570.000	49.95	-4.05	54.00	36.21	38.61	7.55	32.42	Average
3	11570.000	67.02	-6.98	74.00	53.28	38.61	7.55	32.42	Peak
4	17355.000	63.80			44.06	41.66	9.54	31.46	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 (107.43 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

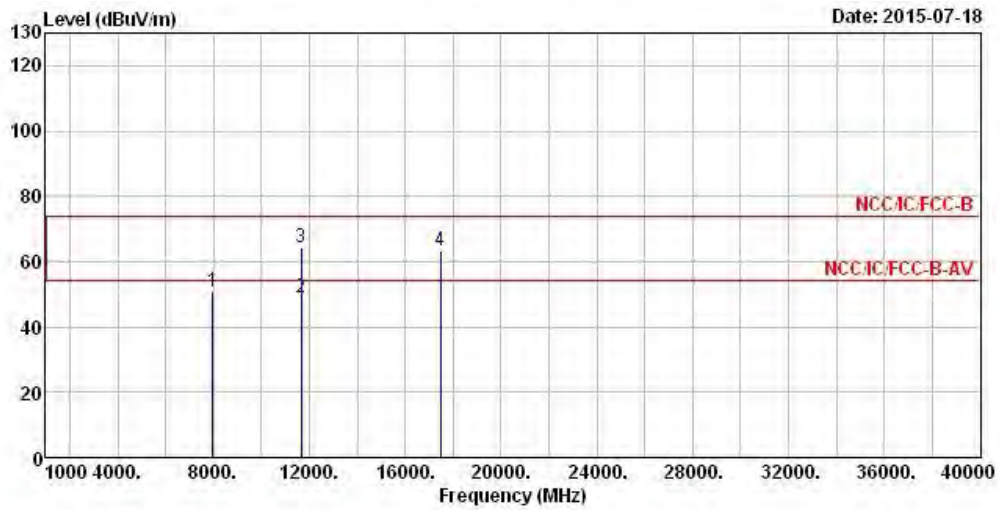
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT20	**Test Freq. (MHz)**	5825
N_{TX}	2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7025.000	50.30			41.29	35.92	5.64	32.55	Peak
2	11650.000	52.52	-1.48	54.00	38.64	38.72	7.58	32.42	Average
3	11650.000	68.47	-5.53	74.00	54.59	38.72	7.58	32.42	Peak
4	17475.000	63.78			43.59	42.08	9.58	31.47	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 (106.53 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT20	**Test Freq. (MHz)**	5825
N_{TX}	2	**Polarization**	H

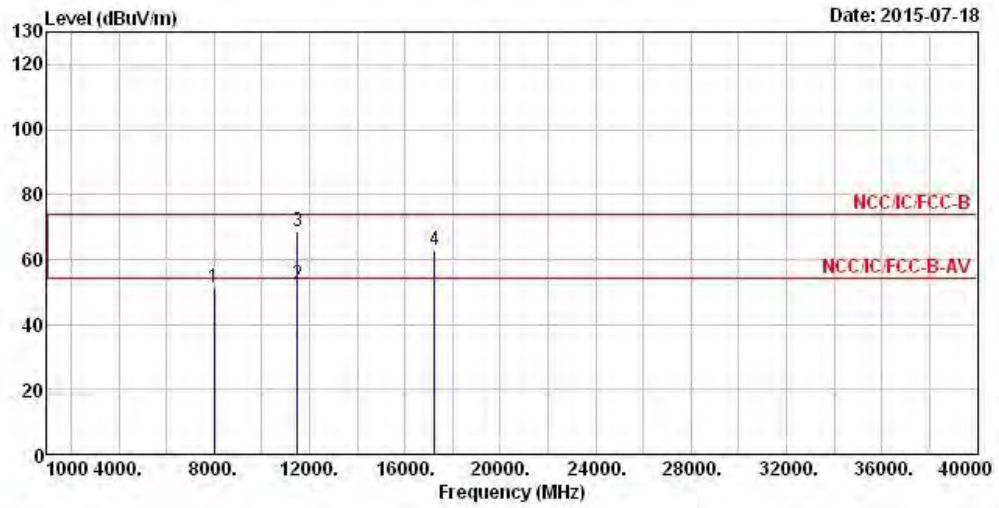


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7956.000	51.06			41.07	36.87	5.99	32.87	Peak
2	11650.000	48.99	-5.01	54.00	35.11	38.72	7.58	32.42	Average
3	11650.000	64.42	-9.58	74.00	50.54	38.72	7.58	32.42	Peak
4	17475.000	63.24			43.05	42.08	9.58	31.47	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 (106.53 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

3.4.9 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40

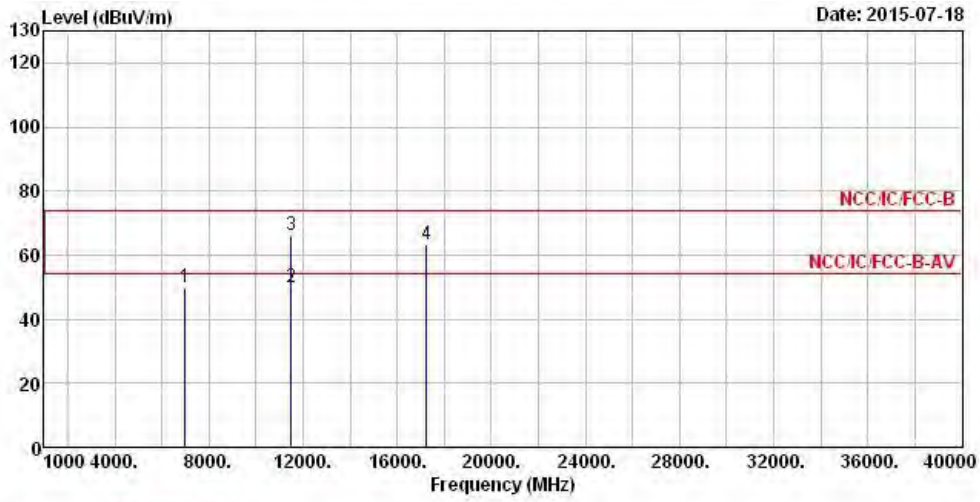
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT40	**Test Freq. (MHz)**	5755
N_{TX}	2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	8004.000	51.13			41.09	36.90	6.02	32.88	Peak
2	11510.000	52.14	-1.86	54.00	38.54	38.50	7.52	32.42	Average
3	11510.000	68.44	-5.56	74.00	54.84	38.50	7.52	32.42	Peak
4	17265.000	62.70			43.29	41.36	9.50	31.45	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 (107.90 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

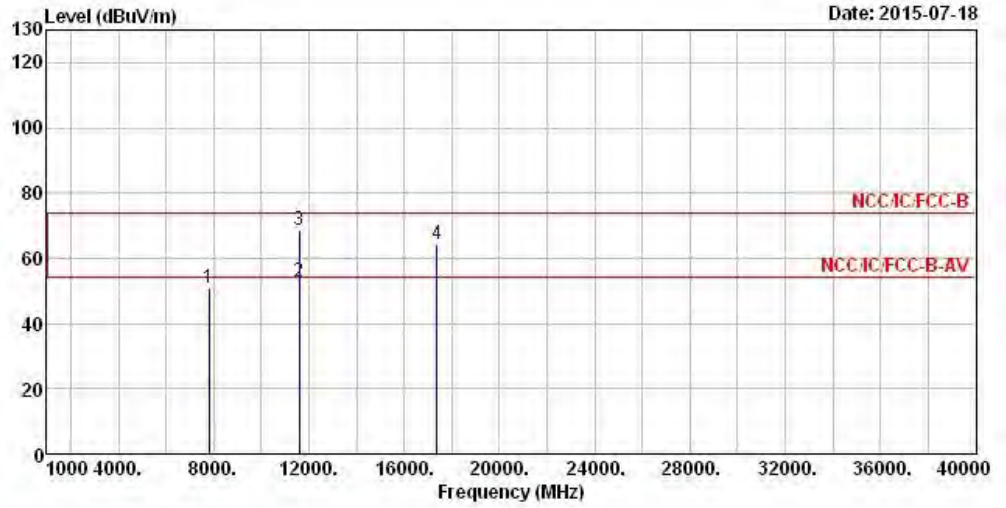
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT40	**Test Freq. (MHz)**	5755
N_{TX}	2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	6974.000	49.79			40.88	35.84	5.61	32.54	Peak
2	11510.000	49.99	-4.01	54.00	36.39	38.50	7.52	32.42	Average
3	11510.000	66.29	-7.71	74.00	52.69	38.50	7.52	32.42	Peak
4	17265.000	63.20			43.79	41.36	9.50	31.45	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 (107.90 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

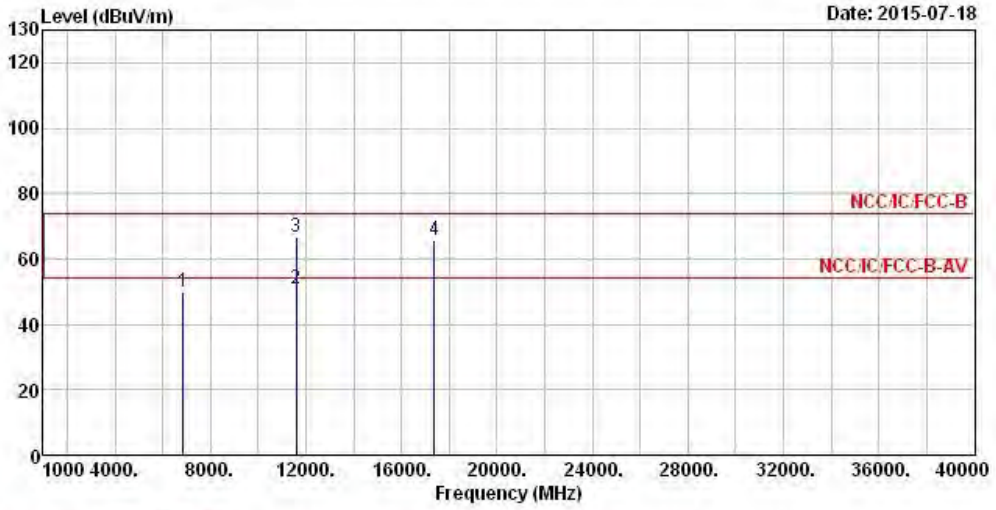
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT40	**Test Freq. (MHz)**	5795
N_{TX}	2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	7794.000	51.06			41.18	36.78	5.93	32.83	Peak
2	11590.000	52.69	-1.31	54.00	38.91	38.64	7.56	32.42	Average
3	11590.000	68.65	-5.35	74.00	54.87	38.64	7.56	32.42	Peak
4	17385.000	64.36			44.49	41.78	9.55	31.46	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 (107.51 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT40	**Test Freq. (MHz)**	5795
N_{TX}	2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	6874.000	49.81			41.06	35.71	5.56	32.52	Peak
2	11590.000	51.07	-2.93	54.00	37.29	38.64	7.56	32.42	Average
3	11590.000	66.67	-7.33	74.00	52.89	38.64	7.56	32.42	Peak
4	17385.000	65.48			45.61	41.78	9.55	31.46	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 (107.51 dBuV/m).
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz ~ 2.75GHz	Apr. 15. 2015	AC Conduction
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 22, 2015	AC Conduction
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	Oct. 31, 2014	AC Conduction
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	AC Conduction

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jul. 31, 2014	RF Conducted
Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	Jan. 29, 2015	RF Conducted
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	Jan. 29, 2015	RF Conducted

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Nov. 29, 2014	Radiated Emission
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	May 11, 2015	Radiated Emission
Amplifier	Agilent	8449B	3008A02120	1GHz ~ 26.5GHz	Sep. 01, 2014	Radiated Emission
Spectrum	R&S	FSP40	100004	9kHz ~ 40GHz	Apr. 02, 2015	Radiated Emission
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30MHz ~ 1GHz	Sep. 20, 2014	Radiated Emission
Horn Antenna	AARONIA AG	POWERLOG 70180	05192	1GHz ~ 18GHz	May 01, 2015	Radiated Emission
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	18GHz ~ 40GHz	Jan. 27, 2015	Radiated Emission
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 15, 2014	Radiated Emission
RF Cable-high	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz ~ 40GHz	Dec. 12, 2014	Radiated Emission
Turn Table	EM Electronics	EM Electronics	060615	0 ~ 360 degree	N/A	Radiated Emission
Antenna Mast	MF	MF-7802	MF780208179	1 ~ 4 m	N/A	Radiated Emission

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amplifier	EMC INSTRUMENTS	EMC184045B	980192	18GHz ~ 40GHz	Aug. 25.2014	Radiated Emission
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Feb. 02, 2015	Radiated Emission

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