FCC Test Report

Equipment	:	**Ultra Rugged Tablet PC**
Brand Name	:	**Winmate**
Model No.	:	**M133XXXXXXXXX** **(The "X" can be 0-9, A-Z, a-z, +, or blank for marketing purpose.)**
FCC ID	:	**PX9M133NGW**
Standard	:	**47 CFR FCC Part 15.407**
Operating Band	:	**5150 MHz – 5250 MHz** **5250 MHz – 5350 MHz** **5470 MHz – 5725 MHz** **5725 MHz – 5850 MHz**
FCC Classification	:	**UNII**
Applicant/ Manufacturer	:	**Winmate Communication INC.** 9F, No. 111-6, Shing-De Rd., San-Chung Dist, New Taipei 24158, Taiwan, R.O.C.
Function	:	☐ **Outdoor AP;** ☐ **Indoor AP;** ☐ **Fixed P2P AP** ☒ **Portable Client**

The product sample received on Aug. 17, 2015 and completely tested on Nov. 04, 2015. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

Reviewed by:

Kevin Liang / Assistant Manager

Testing Laboratory
1190

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0	15.203	Antenna Requirement	Complied
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3.2	15.407(a)	Emission Bandwidth	Complied
3.3	15.407(a)	RF Output Power (Maximum Conducted Output Power)	Complied
3.4	15.407(a)	Peak Power Spectral Density	Complied
3.5	15.407(b)	Transmitter Bandedge Emissions	Complied
3.6	15.407(b)	Transmitter Unwanted Emissions	Complied
3.7	15.407(g)	Frequency Stability	Complied

Revision History

Report No.	Version	Description	Issued Date
FR581202AN	Rev. 01	Initial issue of report	Nov. 26, 2015

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information (5150-5250MHz band)					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**RF Output Power (dBm)**
5150-5250	a	5180-5240	36-48 [4]	1	15.02
5150-5250	n (HT20)	5180-5240	36-48 [4]	1	15.25
5150-5250	n (HT40)	5190-5230	38-46 [2]	1	15.59
Note 1: RF output power specifies that Maximum Conducted Output Power. Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.					

RF General Information (5250-5350MHz band)					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**RF Output Power (dBm)**
5250-5350	a	5260-5320	52-64 [4]	1	15.47
5250-5350	n (HT20)	5260-5320	52-64 [4]	1	15.99
5250-5350	n (HT40)	5270-5310	54-62 [2]	1	17.03
Note 1: RF output power specifies that Maximum Conducted Output Power. Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.					

RF General Information (5470-5725MHz band)					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**RF Output Power (dBm)**
5470-5725	a	5500-5700	100-140 [8]	1	14.76
5470-5725	n (HT20)	5500-5700	100-140 [8]	1	14.98
5470-5725	n (HT40)	5510-5670	102-134 [3]	1	15.57
Note 1: RF output power specifies that Maximum Conducted Output Power. Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.					

RF General Information (5725-5850MHz band)					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**RF Output Power (dBm)**
5725-5850	a	5745-5825	149-165 [5]	1	14.73
5725-5850	n (HT20)	5745-5825	149-165 [5]	1	14.66
5725-5850	n (HT40)	5755-5795	151-159 [2]	1	14.82
Note 1: RF output power specifies that Maximum Conducted Output Power. Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.					

1.1.2 Antenna Information

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		
Ant. Cat.	**Ant. Type**	**Gain (dBi)**
Integral	PIFA	3.00

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)**
☒ 100% - IEEE 802.11a	0
☒ 100% - IEEE 802.11n (HT20)	0
☒ 100% - IEEE 802.11n (HT40)	0

1.1.5 EUT Operational Condition

Supply Voltage	☒ AC mains	☒ DC	
Type of DC Source	☒ Internal DC supply	☒ From system	☒ Li-ion Battery
Test Voltage	☒ Vnom (120 V)	☒ Vmax (138 V)	☒ Vmin (102 V)
Test Climatic	☒ Tnom (20°C)	☒ Tmax (60°C)	☒ Tmin (-20°C)

1.1.6 DFS and TPC Information

The DFS Related Operating Mode(s) of the Equipment			
☐ Master			
☐ Cilent with radar detection			
☒ Cilent without radar detection			
Software / Firmware Version		0.0.0.4	
Communication Mode		☒ IP Based (Load Based)	☐ Frame Based
IEEE Std. 802.11	**Frequency Range (MHz)**	**TPC (Transmit Power Control)**	**Passive Scan**
a/n(HT20) / n (HT40)	☒ 5250-5350	No	Yes
	☒ 5470-5725	No	Yes

1.2 Accessories and Support Equipment

Accessories Information				
AC Adapter	Brand Name	EDAC	Model Name	EA10633B-190
	Power Rating	I/P: 100 - 240 Vac, 2000 mA, O/P: 19 Vdc, 3420 mA		
Li-ion Battery 1	Brand Name	Jhih-Hong	Model Name	B5007
	Power Rating	7.4 Vdc, 10280 mAh		
Li-ion Battery 2	Brand Name	Jhih-Hong	Model Name	B5036
	Power Rating	7.4 Vdc, 350 mAh		

Note: Regarding to more detail and other information, please refer to user manual. Reminder: Regarding to more detail and other information, please refer to user manual.

Support Equipment - DFS Site				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	AP (Master)	3COM	WL-605	O9C-WL605
2	NoteBook	Dell	Latitude E5510	-
3	Adapter	Dell	FA90PS0-00	-
4	NoteBook	Dell	Latitude E5560	-
5	Adapter	Dell	LA65NM130	-

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 C63.10-2013
- FCC KDB 789033 D02 v01
- FCC KDB 644545 D03 v01
- FCC-14-30A1-UNII

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
☒	HWA YA	ADD	No.13-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan, R.O.C.
		TEL :	886-3-318-0787 FAX : 886-3-318-0287

Test Condition	Test Site No.	Test Engineer	Test Environment
AC Conduction	CO04-HY	Anthony	21°C / 61%
RF Conducted	TH06-HY	Jason	21°C / 62%
Radiated Emission	03CH09-HY	Terry	24.2°C / 61.8%

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 °C
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
HT20	1	MCS 0-7	MCS 0
HT40	1	MCS 0-7	MCS 0

2.2 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter (5150-5250MHz band)						
Test Software Version	DRTU_1.7.4-1041					
Modulation Mode	**N_{TX}**	**Test Frequency (MHz)**				
		NCB: 20MHz			**NCB: 40MHz**	
		5180	**5200**	**5240**	**5190**	**5230**
11a	1	16	15.5	15	-	-
HT20	1	16	15.5	15.5	-	-
HT40	1	-	-	-	16	16

The Worst Case Power Setting Parameter (5250-5350MHz band)						
Test Software Version	DRTU_1.7.4-1041					
Modulation Mode	**N_{TX}**	**Test Frequency (MHz)**				
		NCB: 20MHz			**NCB: 40MHz**	
		5260	**5300**	**5320**	**5270**	**5310**
11a	1	16	15	16	-	-
HT20	1	16	16	16.5	-	-
HT40	1	-	-	-	17	18

The Worst Case Power Setting Parameter (5470-5725MHz band)							
Test Software Version	DRTU_1.7.4-1041						
Modulation Mode	N_{TX}	Test Frequency (MHz)					
		NCB: 20MHz			NCB: 40MHz		
		5500	5580	5700	5510	5550	5670
11a	1	15	16	14.5	-	-	-
HT20	1	15	16	13.5	-	-	-
HT40	1	-	-	-	15.5	17	16.5

The Worst Case Power Setting Parameter (5725-5850MHz band)						
Test Software Version	DRTU_1.7.4-1041					
Modulation Mode	N_{TX}	Test Frequency (MHz)				
		NCB: 20MHz			NCB: 40MHz	
		5745	5785	5825	5755	5795
11a	1	15.5	15.5	16	-	-
HT20	1	14.5	15.5	16	-	-
HT40	1	-	-	-	16	16

2.3 The Worst Case Measurement Configuration

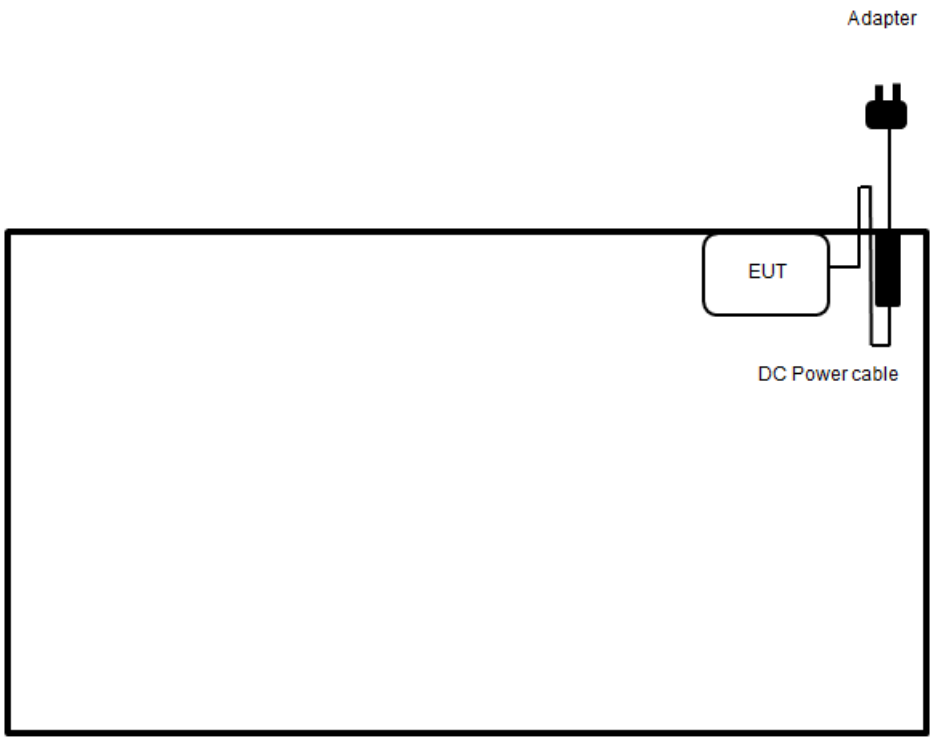
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	Adapter mode and transmit

The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, Peak Power Spectral Density, Emission Bandwidth, Peak Excursion, Transmitter Conducted Unwanted Emissions Transmitter Conducted Bandedge Emissions
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11a, HT20, HT40

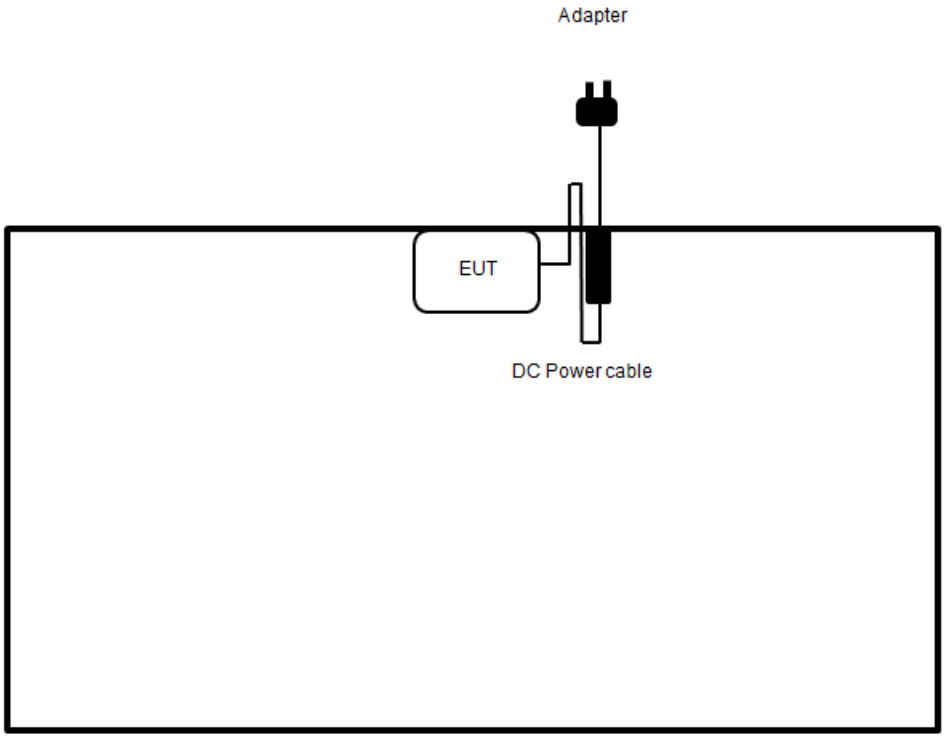
The Worst Case Mode for Following Conformance Tests			
Tests Item	Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO 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 will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed three orthogonal planes.		
Operating Mode	Operating Mode Description		
	Adapter mode and transmit		
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

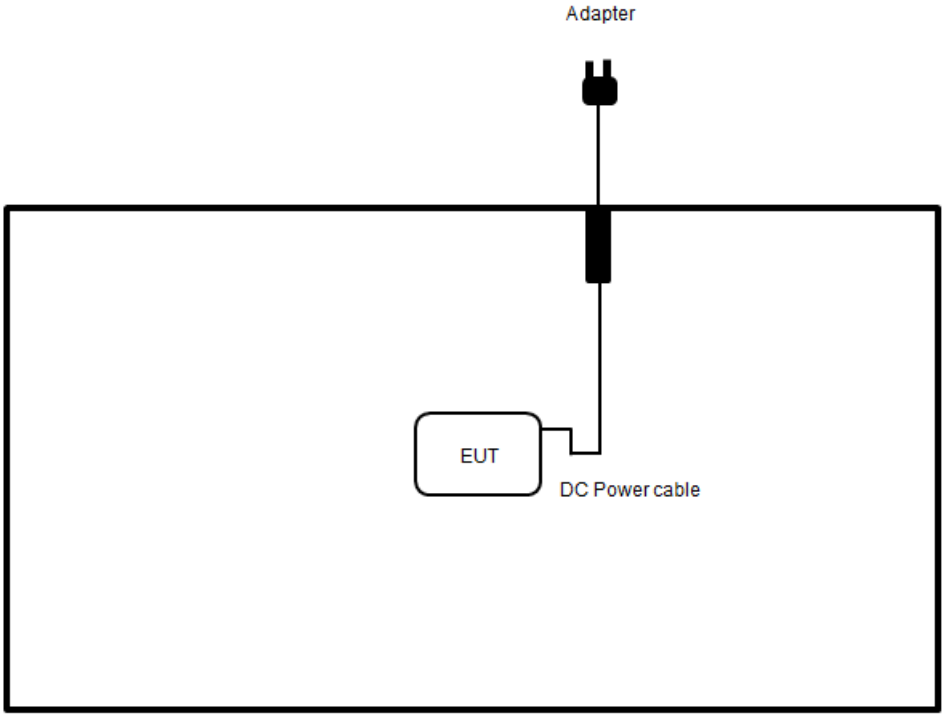
Test Setup Diagram - AC Line Conducted Emission Test



Test Setup Diagram - Radiated Below 1GHz Test



Test Setup Diagram - Radiated Above 1GHz Test



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

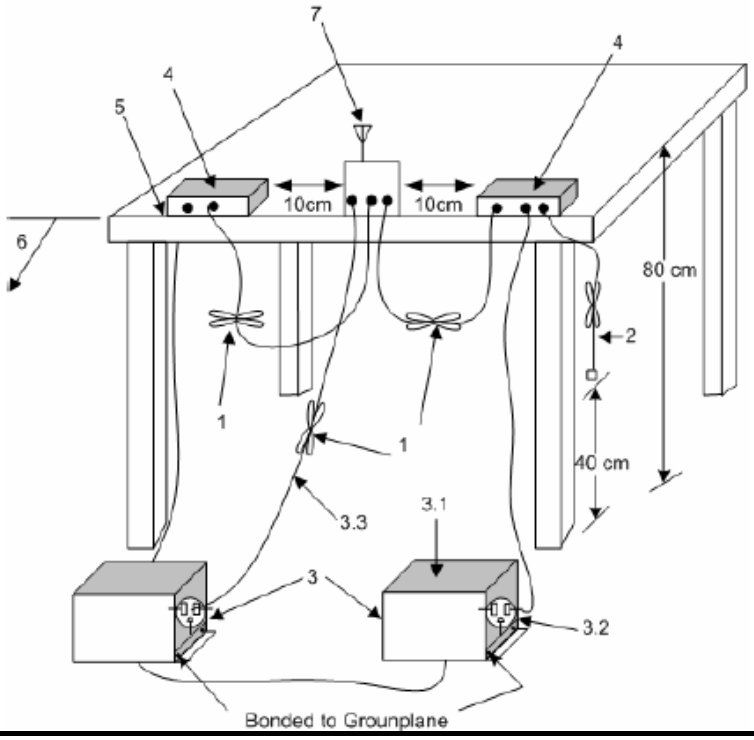
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

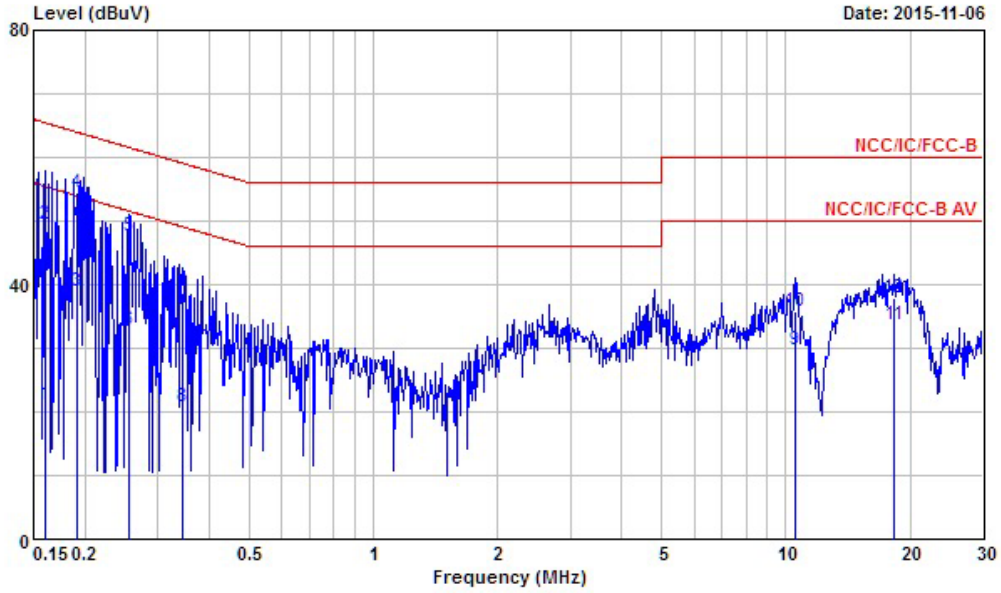
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

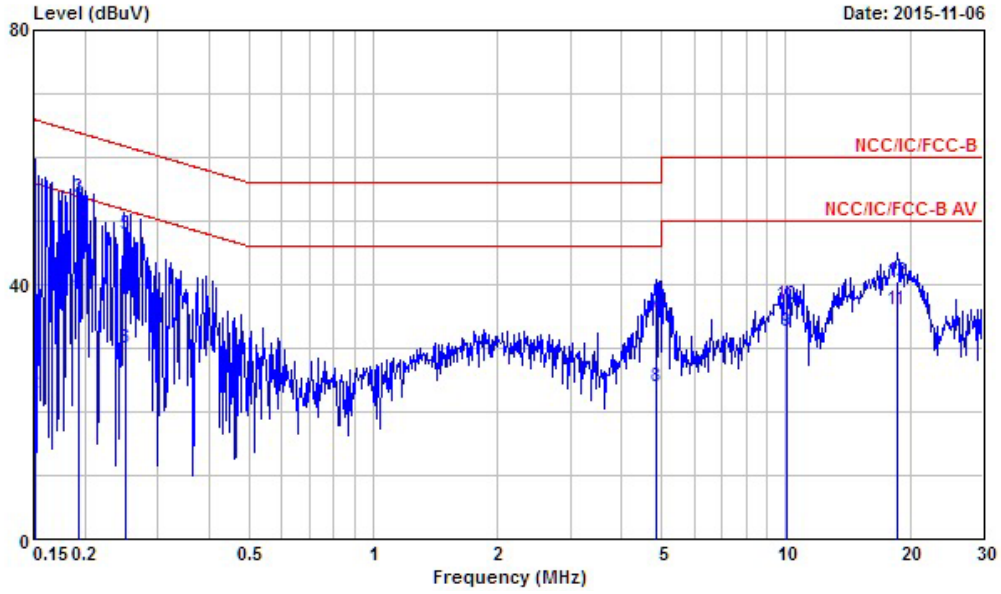
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	Adapter mode and transmit		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1598470	21.10	-34.37	55.47	20.79	0.07	0.24	Average
2	0.1598470	49.39	-16.08	65.47	49.08	0.07	0.24	QP
3	0.1914470	38.82	-15.15	53.97	38.46	0.07	0.29	Average
4	0.1914470	54.36	-9.61	63.97	54.00	0.07	0.29	QP
5	0.2547970	47.70	-13.90	61.60	47.40	0.07	0.23	QP
6	0.2547970	32.98	-18.62	51.60	32.68	0.07	0.23	Average
7	0.3446300	38.74	-20.35	59.09	38.53	0.07	0.14	QP
8	0.3446300	20.89	-28.20	49.09	20.68	0.07	0.14	Average
9	10.510	29.69	-20.31	50.00	29.24	0.25	0.20	Average
10	10.510	35.90	-24.10	60.00	35.45	0.25	0.20	QP
11	18.330	33.59	-16.41	50.00	33.01	0.38	0.20	Average
12	18.330	37.85	-22.15	60.00	37.27	0.38	0.20	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	Adapter mode and transmit		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1515980	50.71	-15.20	65.91	50.44	0.05	0.22	QP
2	0.1515980	22.94	-32.97	55.91	22.67	0.05	0.22	Average
3	@0.1938850	53.64	-10.23	63.87	53.29	0.06	0.29	QP
4	0.1938850	38.95	-14.92	53.87	38.60	0.06	0.29	Average
5	0.2506540	47.90	-13.84	61.74	47.61	0.06	0.23	QP
6	0.2506540	30.00	-21.74	51.74	29.71	0.06	0.23	Average
7	4.850	35.41	-20.59	56.00	35.14	0.15	0.12	QP
8	4.850	23.90	-22.10	46.00	23.63	0.15	0.12	Average
9	10.020	32.68	-17.32	50.00	32.25	0.23	0.20	Average
10	10.020	36.91	-23.09	60.00	36.48	0.23	0.20	QP
11	18.620	36.10	-13.90	50.00	35.55	0.35	0.20	Average
12	18.620	40.43	-19.57	60.00	39.88	0.35	0.20	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 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit
UNII Devices
☒ For the 5.15-5.25 GHz band, N/A
☒ For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
☒ For the 5.47-5.725 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
☒ For the 5.725-5.85 GHz band, 6 dB emission bandwidth ≥ 500kHz.

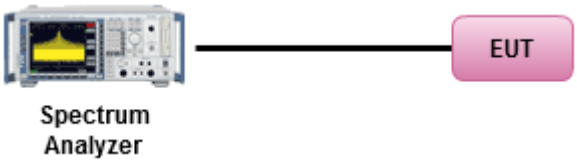
3.2.2 Measuring Instruments

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 789033 D02 v01, clause C for EBW and clause D for OBW measurement.	
	☐	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.	
	☐	Refer as IC RSS-Gen, clause 6.6 for 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

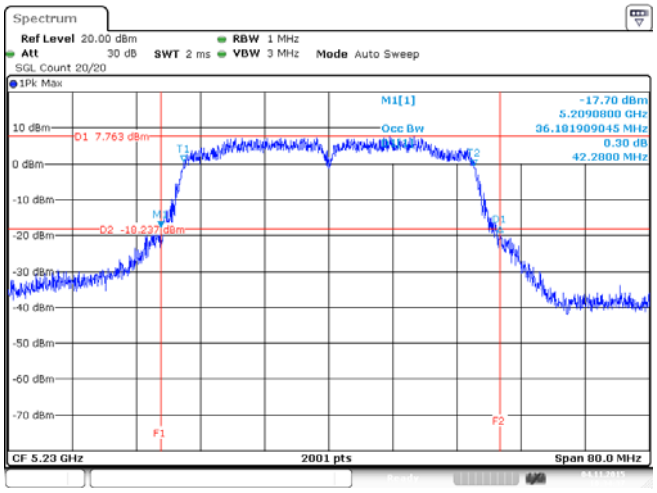
UNII Emission Bandwidth Result (5150-5250MHz band)				
Condition			Emission Bandwidth (MHz)	
Modulation Mode	N_{TX}	Freq. (MHz)	99% Bandwidth	26dB Bandwidth
11a	1	5180	16.41	19.97
11a	1	5200	16.51	20.80
11a	1	5240	16.36	19.85
HT20	1	5180	17.66	22.15
HT20	1	5200	17.74	21.92
HT20	1	5240	17.64	20.05
HT40	1	5190	36.10	41.56
HT40	1	5230	36.18	42.28
Result			Complied	

UNII Emission Bandwidth Result (5250-5350MHz band)				
Condition			Emission Bandwidth (MHz)	
Modulation Mode	N_{TX}	Freq. (MHz)	99% Bandwidth	26dB Bandwidth
11a	1	5260	16.39	20.20
11a	1	5300	16.49	20.97
11a	1	5320	16.86	21.92
HT20	1	5260	17.61	22.12
HT20	1	5300	17.61	22.02
HT20	1	5320	17.76	23.65
HT40	1	5270	36.22	43.88
HT40	1	5310	36.22	45.20
Result			Complied	

UNII Emission Bandwidth Result (5470-5725MHz band)				
Condition			Emission Bandwidth (MHz)	
Modulation Mode	N_{TX}	Freq. (MHz)	99% Bandwidth	26dB Bandwidth
11a	1	5500	16.41	20.40
11a	1	5580	16.54	20.70
11a	1	5700	16.49	20.92
HT20	1	5500	17.66	19.90
HT20	1	5580	17.56	22.85
HT20	1	5700	17.81	20.70
HT40	1	5510	36.18	43.24
HT40	1	5550	36.22	42.56
HT40	1	5670	36.18	42.76
Result			Complied	

UNII Emission Bandwidth Result (5725-5850MHz band)				
Condition			Emission Bandwidth (MHz)	
Modulation Mode	N_{TX}	Freq. (MHz)	99% Bandwidth	6dB Bandwidth
11a	1	5745	16.37	16.36
11a	1	5785	16.34	16.32
11a	1	5825	16.43	16.30
HT20	1	5745	17.60	17.56
HT20	1	5785	17.67	15.39
HT20	1	5825	17.60	17.59
HT40	1	5755	35.98	35.24
HT40	1	5795	35.98	29.20
Limit			-	≥ 500 kHz
Result			Complied	

5150-5250MHz - Worst Emission 26Bandwidth Plots



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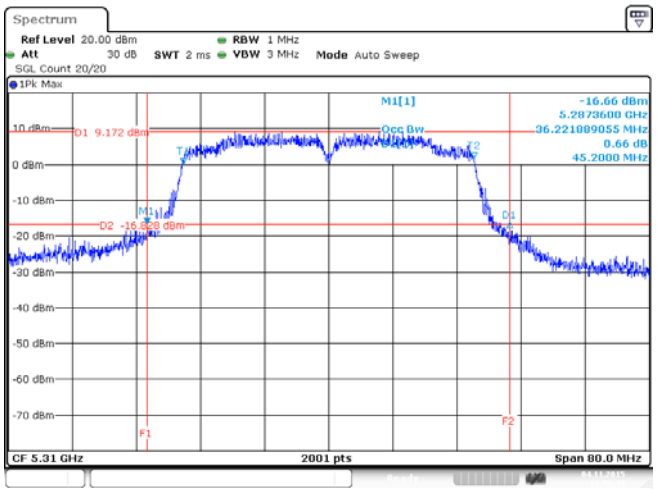
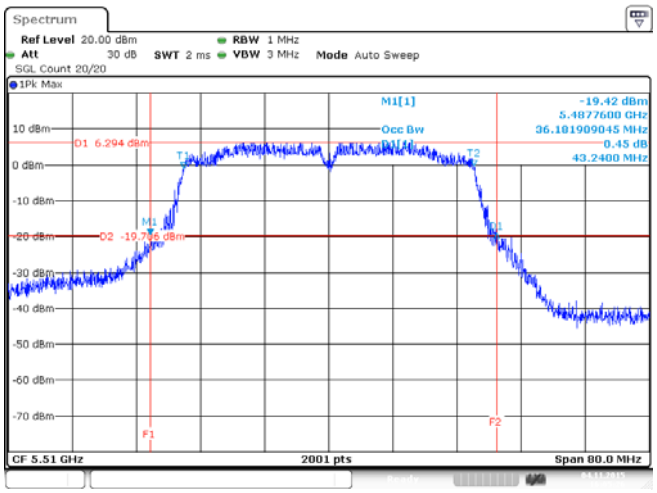
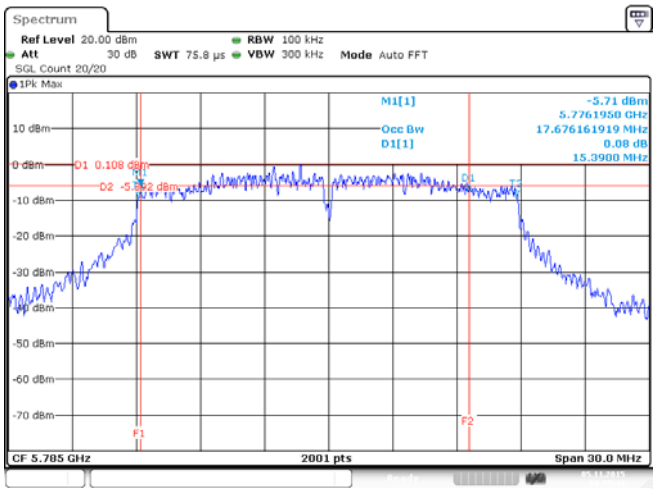
5250-5350MHz - Worst Emission 26Bandwidth Plots



Date: 4.NOV.2015 13:55:40

5470-5725MHz - Worst Emission 26Bandwidth Plots
 Date: 4.NOV.2015 16:05:26
5725-5850MHz - Worst Emission 6Bandwidth Plots
 Date: 5.NOV.2015 09:55:48

3.3 RF Output Power

3.3.1 RF Output Power Limit

Maximum Conducted Output Power Limit	
UNII Devices	
☒	For the 5.15-5.25 GHz band:
☐	Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6). e.i.r.p. at any elevation angle above 30 degrees ≤ 125mW [21dBm]
☐	Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)
☐	Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W If G_{TX} > 23 dBi, then P_{Out} = 30 – (G_{TX} – 23).
☒	Mobile or Portable Client: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW. If G_{TX} > 6 dBi, then P_{Out} = 24 – (G_{TX} – 6).
☒	For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If G_{TX} > 6 dBi, then P_{Out} = 24 – (G_{TX} – 6).
☒	For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If G_{TX} > 6 dBi, then P_{Out} = 24 – (G_{TX} – 6).
☒	For the 5.725-5.85 GHz band:
☒	Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6).
☐	Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
P_{Out} = maximum conducted output power in dBm, **G_{TX}** = the maximum transmitting antenna directional gain in dBi.	

3.3.2 Measuring Instruments

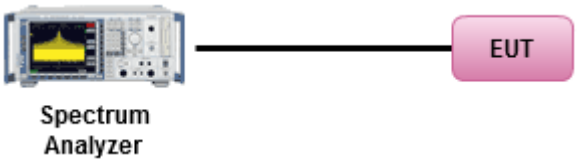
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
☒	Maximum Conducted Output Power
	[duty cycle ≥ 98% or external video / power trigger]
☒	Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 (spectral trace averaging).
☐	Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)
	duty cycle < 98% and average over on/off periods with duty factor
☐	Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 (spectral trace averaging).
☐	Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
	Wideband RF power meter and average over on/off periods with duty factor
☐	Refer as FCC KDB 789033 D02 v01, clause E Method PM (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]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

RF Output Power (Spectrum Analyzer)



3.3.5 Directional Gain for Power Measurement

Directional Gain (DG) Result					
Transmit Chains No.		1		-	-
Maximum G_{ANT} (dBi)		3.00		-	-
Modulation Mode	**DG (dBi)**	**N_{TX}**	**N_{SS} (Min.)**	**STBC**	**Array Gain (dB)**
11a	3.00	1	1	-	0.00
HT20,M0-7	3.00	1	1	-	0.00
HT40,M0-7	3.00	1	1	-	0.00

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};

3.3.6 Test Result of Maximum Conducted Output Power

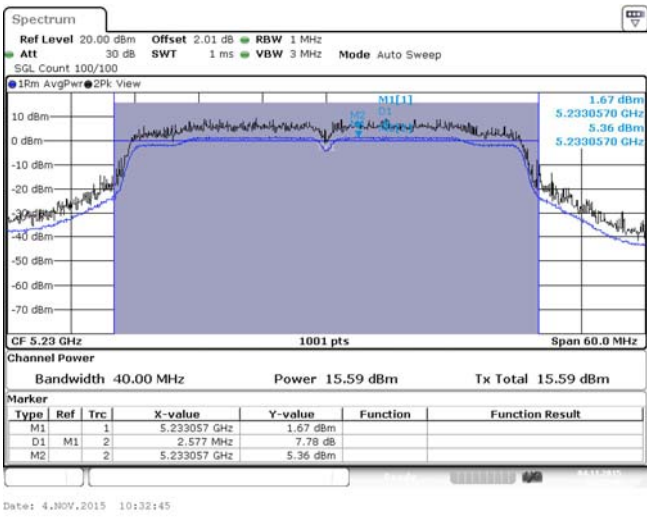
Maximum Conducted Output Power (5150-5250MHz band)					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Output Power (dBm)**	**Antenna Gain (dBi)**	**Power Limit**
11a	1	5180	15.02	3.00	24.00
11a	1	5200	14.93	3.00	24.00
11a	1	5240	15.00	3.00	24.00
HT20	1	5180	15.00	3.00	24.00
HT20	1	5200	14.95	3.00	24.00
HT20	1	5240	15.25	3.00	24.00
HT40	1	5190	15.40	3.00	24.00
HT40	1	5230	15.59	3.00	24.00
Result			**Complied**		

Maximum Conducted Output Power (5250-5350MHz band)					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Output Power (dBm)**	**Antenna Gain (dBi)**	**Power Limit**
11a	1	5260	15.36	3.00	24.00
11a	1	5300	14.68	3.00	24.00
11a	1	5320	15.47	3.00	24.00
HT20	1	5260	15.37	3.00	24.00
HT20	1	5300	15.29	3.00	24.00
HT20	1	5320	15.99	3.00	24.00
HT40	1	5270	15.86	3.00	24.00
HT40	1	5310	17.03	3.00	24.00
Result			**Complied**		

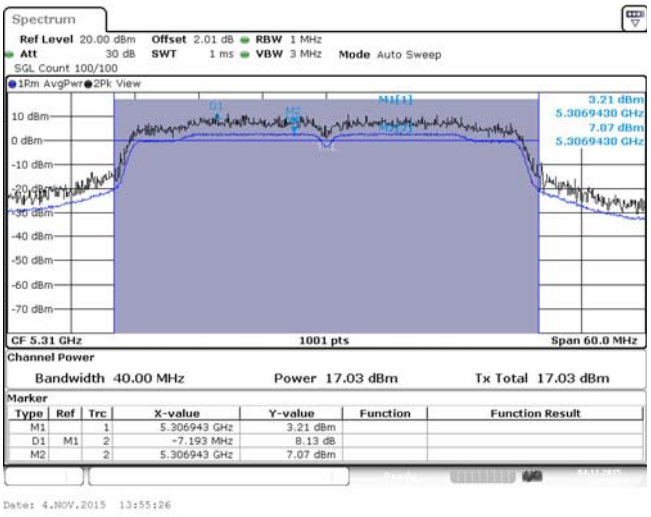
Maximum Conducted Output Power (5470-5725MHz band)					
Modulation Mode	N_{TX}	Freq. (MHz)	Output Power (dBm)	Antenna Gain (dBi)	Power Limit
11a	1	5500	13.83	3.00	21.00
11a	1	5580	14.76	3.00	21.00
11a	1	5700	13.63	3.00	21.00
HT20	1	5500	13.85	3.00	21.00
HT20	1	5580	14.98	3.00	21.00
HT20	1	5700	12.88	3.00	21.00
HT40	1	5510	14.57	3.00	21.00
HT40	1	5550	15.57	3.00	21.00
HT40	1	5670	15.45	3.00	21.00
Result			Complied		

Maximum Conducted Output Power (5725-5850MHz band)					
Modulation Mode	N_{TX}	Freq. (MHz)	Output Power (dBm)	Antenna Gain (dBi)	Power Limit
11a	1	5745	14.62	3.00	30.00
11a	1	5785	14.71	3.00	30.00
11a	1	5825	14.73	3.00	30.00
HT20	1	5745	13.46	3.00	30.00
HT20	1	5785	14.66	3.00	30.00
HT20	1	5825	14.63	3.00	30.00
HT40	1	5755	14.76	3.00	30.00
HT40	1	5795	14.82	3.00	30.00
Result			Complied		

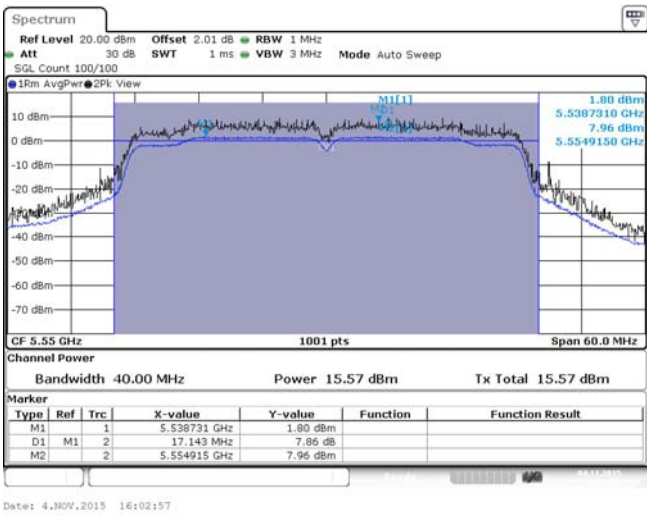
5150-5250MHz - Worst RF Output Power Plots



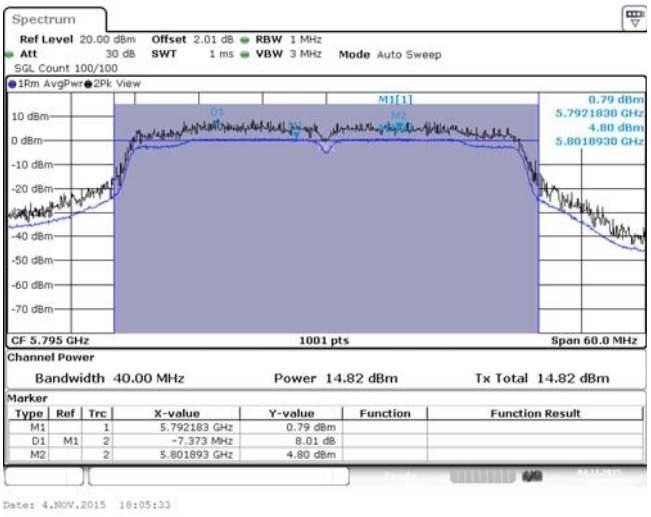
5250-5350MHz - Worst RF Output Power Plots



5470-5725MHz - Worst RF Output Power Plots



5725-5850MHz - Worst RF Output Power Plots



3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

Peak Power Spectral Density Limit	
UNII Devices	
☒	For the 5.15-5.25 GHz band:
☐	Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If G_{TX} > 6 dBi, then P_{Out} = 17 – (G_{TX} – 6).
☐	Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If G_{TX} > 6 dBi, then P_{Out} = 17 – (G_{TX} – 6).
☐	Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If G_{TX} > 23 dBi, then P_{Out} = 17 – (G_{TX} – 23).
☒	Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If G_{TX} > 6 dBi, then PPSD= 11 – (G_{TX} – 6)..
☒	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If G_{TX} > 6 dBi, then PPSD= 11 – (G_{TX} – 6).
☒	For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If G_{TX} > 6 dBi, then PPSD= 11 – (G_{TX} – 6).
☒	For the 5.725-5.85 GHz band:
☒	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If G_{TX} > 6 dBi, then PPSD= 30 – (G_{TX} – 6).
☐	Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
PPSD = peak power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz **G_{TX}** = the maximum transmitting antenna directional gain in dBi.	

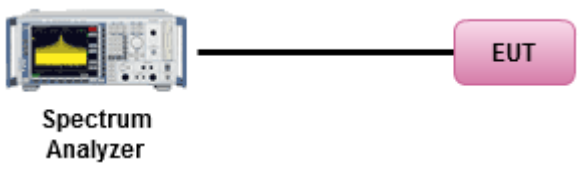
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method		
☒	Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options:	
	☐	Refer as FCC KDB 789033 D02 v01, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth
	[duty cycle ≥ 98% or external video / power trigger]	
	☒	Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 (spectral trace averaging).
	☐	Refer as FCC KDB 789033 D02 v01, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)
	duty cycle < 98% and average over on/off periods with duty factor	
	☐	Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 (spectral trace averaging).
	☐	Refer as FCC KDB 789033 D02 v01, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
☒	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 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.
		☐ 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.
	☐	If multiple transmit chains, EIRP PPSD calculation could be following as methods: $PPSD_{total} = PPSD_1 + PPSD_2 + \ldots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$
	☐	Each individually PPSD plots refer as test report clause 3.3.5 with each individually PPSD plots.

3.4.4 Test Setup

Power Spectral Density


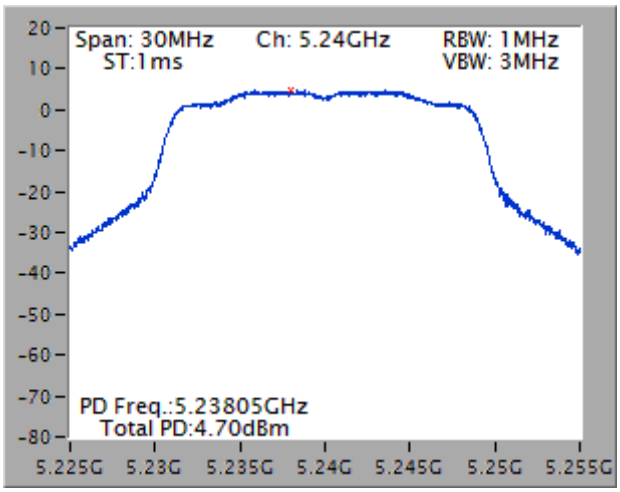
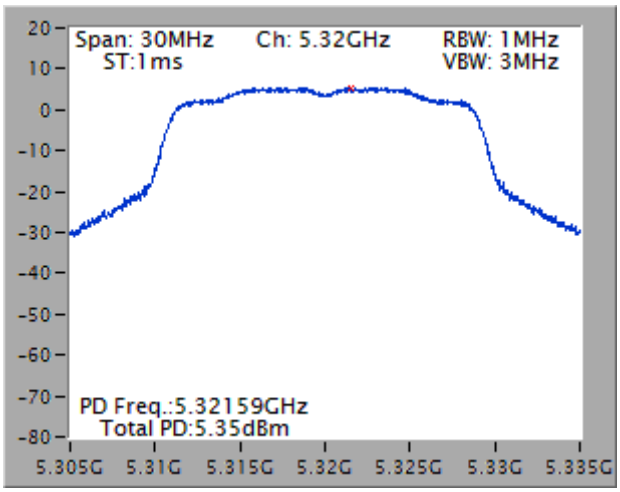
3.4.5 Test Result of Peak Power Spectral Density

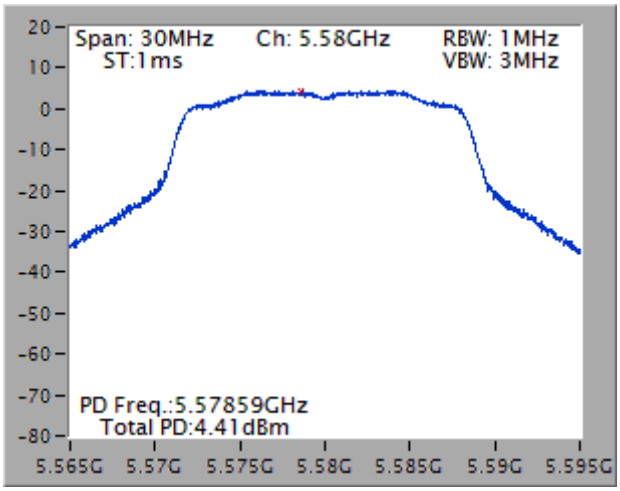
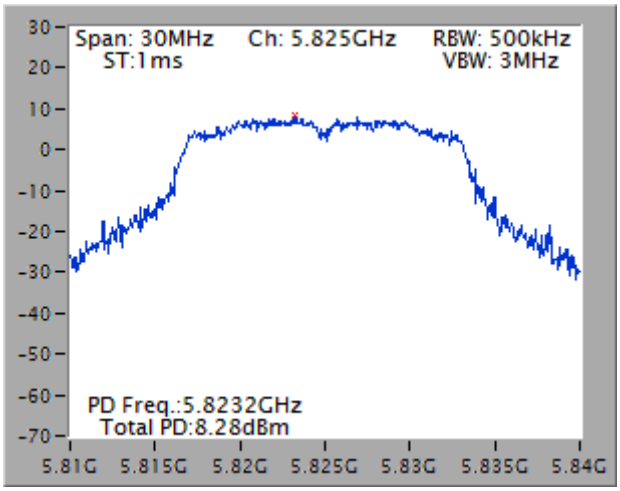
Peak Power Spectral Density Result (5150-5250MHz band)					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Peak Power Spectral Density (dBm)**	**PSD Limit**	**Antenna Gain (dBi)**
11a	1	5180	4.62	11.00	3.00
11a	1	5200	4.55	11.00	3.00
11a	1	5240	4.62	11.00	3.00
HT20	1	5180	4.40	11.00	3.00
HT20	1	5200	4.58	11.00	3.00
HT20	1	5240	4.70	11.00	3.00
HT40	1	5190	1.56	11.00	3.00
HT40	1	5230	1.67	11.00	3.00
Result			**Complied**		

Peak Power Spectral Density Result (5250-5350MHz band)					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Peak Power Spectral Density (dBm)**	**PSD Limit**	**Antenna Gain (dBi)**
11a	1	5260	5.00	11.00	3.00
11a	1	5300	4.41	11.00	3.00
11a	1	5320	5.21	11.00	3.00
HT20	1	5260	4.72	11.00	3.00
HT20	1	5300	4.82	11.00	3.00
HT20	1	5320	5.35	11.00	3.00
HT40	1	5270	2.28	11.00	3.00
HT40	1	5310	3.21	11.00	3.00
Result			**Complied**		

Peak Power Spectral Density Result (5470-5725MHz band)					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Peak Power Spectral Density (dBm)**	**PSD Limit**	**Antenna Gain (dBi)**
11a	1	5500	3.44	11.00	3.00
11a	1	5580	4.41	11.00	3.00
11a	1	5700	3.48	11.00	3.00
HT20	1	5500	3.32	11.00	3.00
HT20	1	5580	4.35	11.00	3.00
HT20	1	5700	2.43	11.00	3.00
HT40	1	5510	0.97	11.00	3.00
HT40	1	5550	1.80	11.00	3.00
HT40	1	5670	1.66	11.00	3.00
Result			**Complied**		

Peak Power Spectral Density Result (5725-5850MHz band)					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Peak Power Spectral Density (dBm)**	**PSD Limit (500kHz)**	**Antenna Gain (dBi)**
11a	1	5745	7.62	30.00	3.00
11a	1	5785	8.24	30.00	3.00
11a	1	5825	8.28	30.00	3.00
HT20	1	5745	6.38	30.00	3.00
HT20	1	5785	5.88	30.00	3.00
HT20	1	5825	6.91	30.00	3.00
HT40	1	5755	4.37	30.00	3.00
HT40	1	5795	4.23	30.00	3.00
Result			**Complied**		

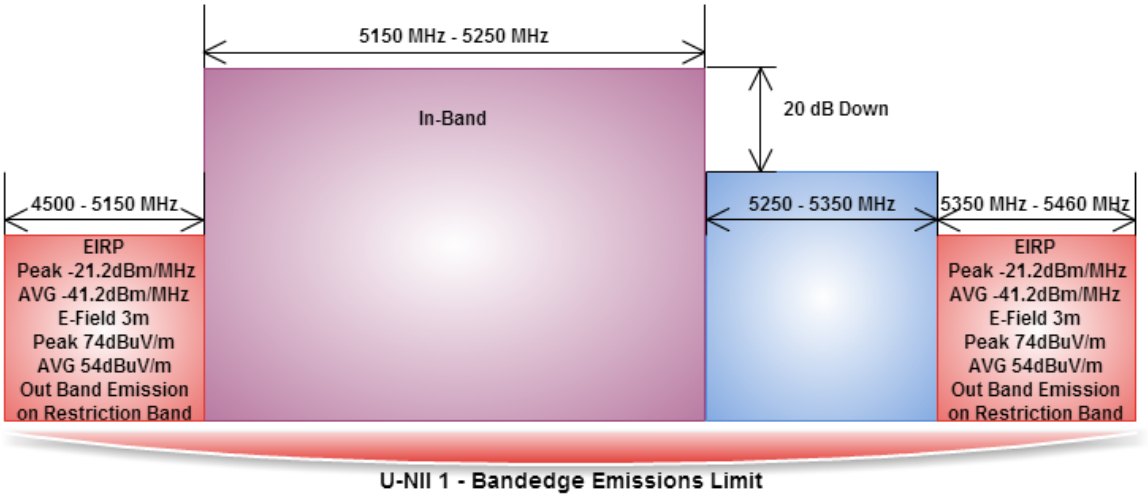
5150-5250MHz - Worst Power Spectral Density Plots

5250-5350MHz - Worst Power Spectral Density Plots


5470-5725MHz - Worst Power Spectral Density Plots

5725-5850MHz - Worst Power Spectral Density Plots


3.5 Transmitter Bandedge Emissions

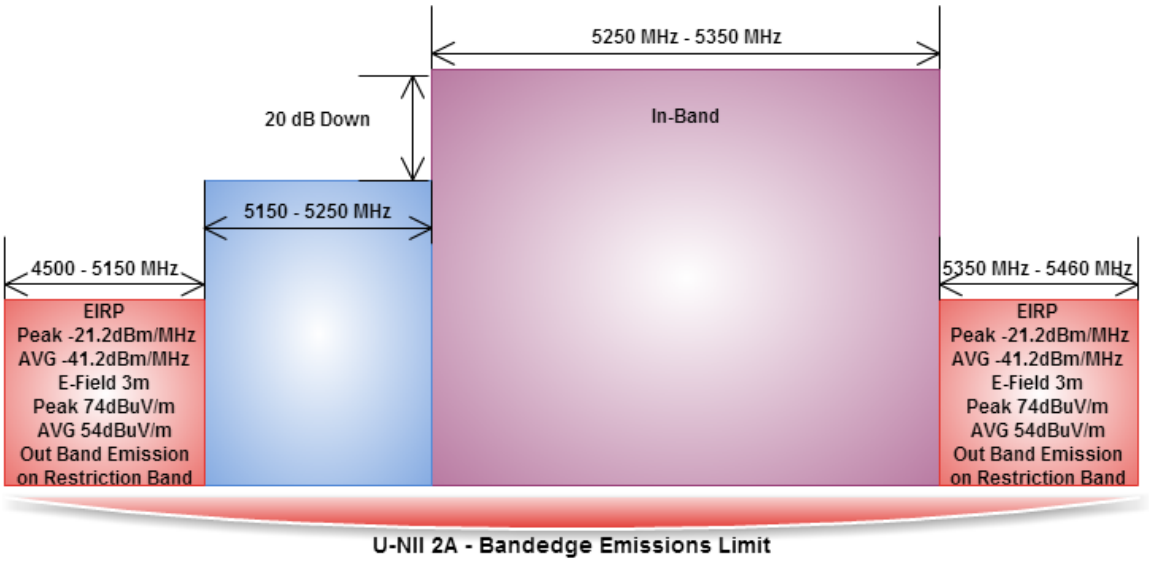
3.5.1 Transmitter Radiated Bandedge Emissions Limit

Transmitter Radiated Bandedge Emissions Limit: 5.15-5.25 GHz band



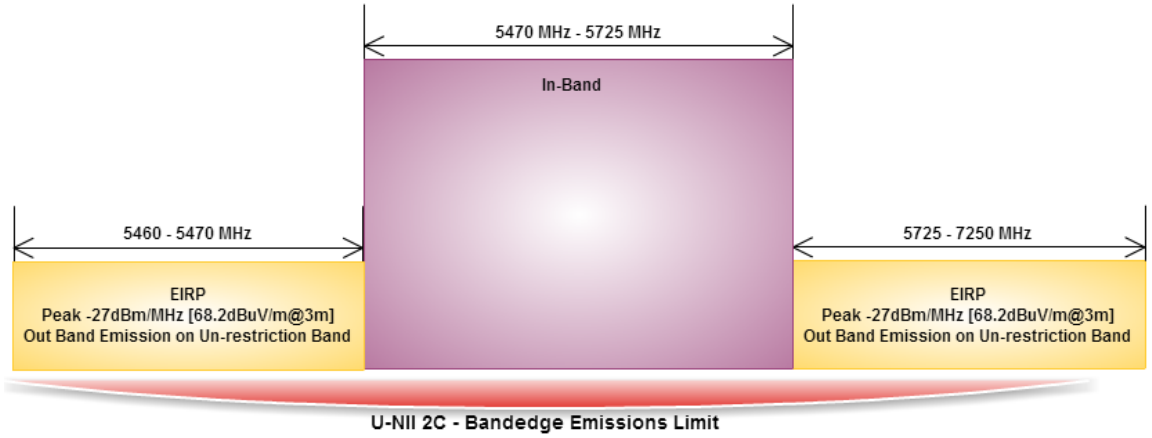
Refer as FCC KDB 789033 D02 v01, G)2)c)(i) specifying that if a non-restricted-band out-of-band emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm or -17 dBm peak emission limit. Reason for change: to ensure that emission requirements in the non-restricted bands are not more stringent than those in the restricted bands.

Transmitter Radiated Bandedge Emissions Limit: 5.25-5.35 GHz band



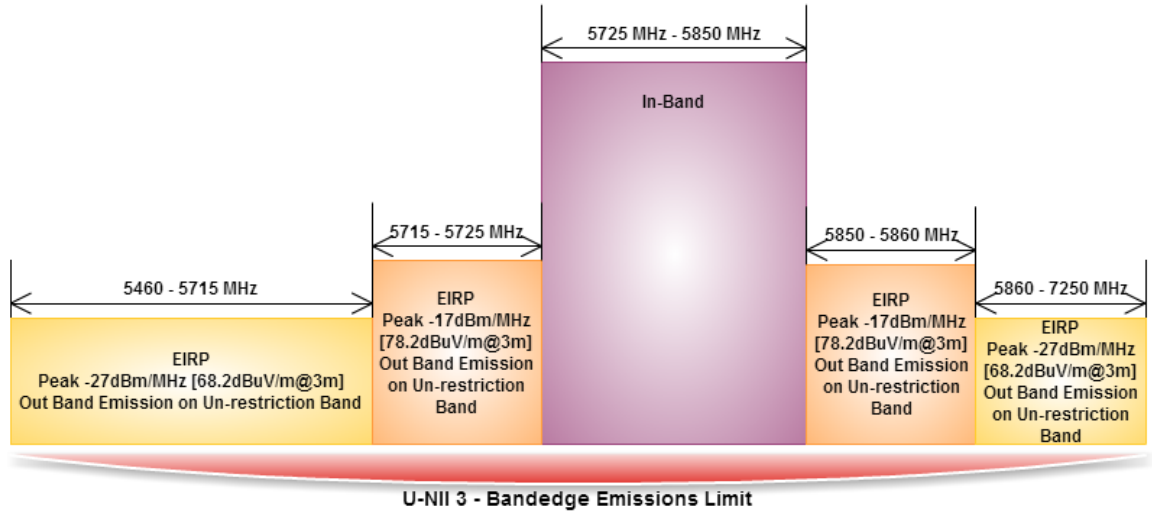
Refer as FCC KDB 789033 D02 v01, G)2)c)(i) specifying that if a non-restricted-band out-of-band emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm or -17 dBm peak emission limit. Reason for change: to ensure that emission requirements in the non-restricted bands are not more stringent than those in the restricted bands.

Transmitter Radiated Bandedge Emissions Limit: 5.47-5.725 GHz band



Refer as FCC KDB 789033 D02 v01, G)2)c)(i) specifying that if a non-restricted-band out-of-band emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm or -17 dBm peak emission limit. Reason for change: to ensure that emission requirements in the non-restricted bands are not more stringent than those in the restricted bands.

Transmitter Radiated Bandedge Emissions Limit for 5.8GHz band: 5.725-5.85 GHz band



Refer as FCC KDB 789033 D02 v01, G)2)c)(i) specifying that if a non-restricted-band out-of-band emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm or -17 dBm peak emission limit. Reason for change: to ensure that emission requirements in the non-restricted bands are not more stringent than those in the restricted bands.

3.5.2 Measuring Instruments

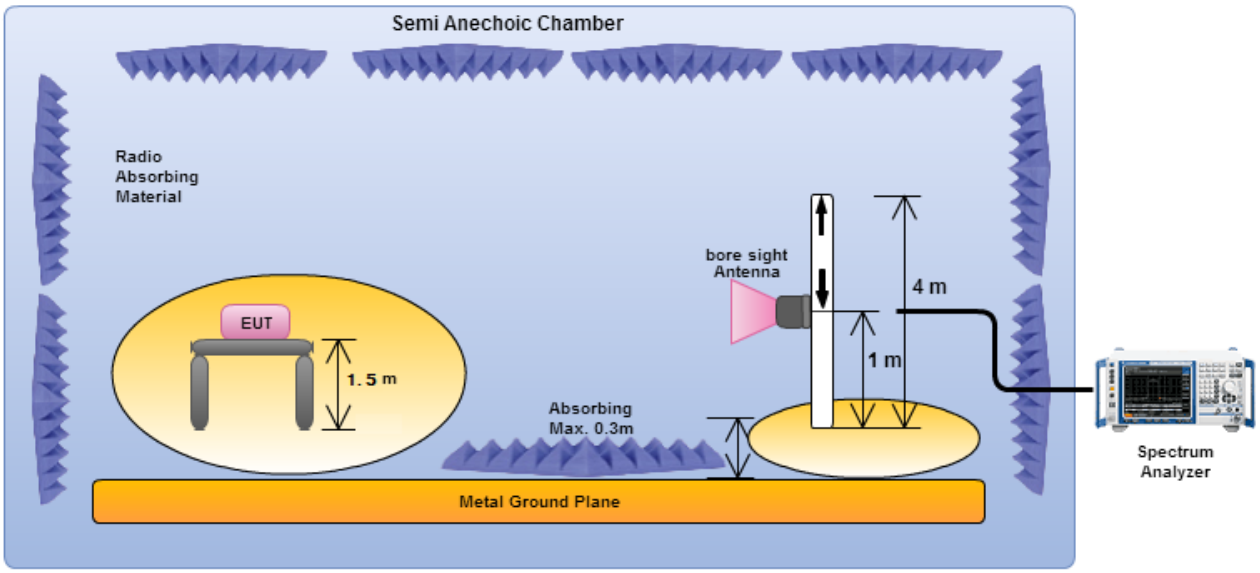
Refer a test equipment and calibration data table in this test report.

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 6.10 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
☐	If EUT operate in adjacent contiguous bands, bandedge testing performed at the lowest frequency channel at lower-band and highest frequency channel at higher-band. Transmitter in-band emissions will consist of adjacent contiguous bands (e.g., IEEE 802.11ac VHT160 The lowest frequency channel at lower-band and highest frequency channel at higher-band in-band emissions will consist of two adjacent contiguous bands.)
	☐ Operating in 5.15-5.25 GHz band (lower-band) and 5.25-5.35 GHz band (higher-band).
	☐ Operating in 5.47-5.725 GHz band (lower-band) and 5.725-5.85 GHz band (higher-band).
☐	If EUT operate in individual non-contiguous bands, bandedge testing performed at the lowest frequency channel and highest frequency channel within lower-band and higher-band. (e.g., (e.g., IEEE 802.11ac VHT160)
	☐ Operating in 5.25-5.35 GHz band (lower-band) and 5.47-5.725 GHz band (higher-band).
	☐ Operating in 5.15-5.25 GHz band (lower-band) and 5.725-5.85 GHz band (higher-band).
☒	For the transmitter unwanted emissions shall be measured using following options below:
	☒ Refer as FCC KDB 789033 D02 v01, clause H)2) for unwanted emissions into non-restricted bands.
	☒ Refer as FCC KDB 789033 D02 v01, clause H)1) for unwanted emissions into restricted bands.
	☐ Refer as FCC KDB 789033 D02 v01, H)6) Method AD (Trace Averaging).
	☐ Refer as FCC KDB 789033 D02 v01, H)6) Method VB (Reduced VBW).
	☒ Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
	☐ Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
	☒ Refer as FCC KDB 789033 D02 v01, clause H)5) measurement procedure peak limit.
	☐ Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
☒	For the transmitter bandedge emissions shall be measured using following options below:
	☐ Refer as FCC KDB 789033 D02 v01, clause H)3)d) for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
	☒ Refer as ANSI C63.10, clause 6.10 for band-edge testing.
	☐ Refer as ANSI C63.10, clause 6.10.6.2 for marker-delta method for band-edge measurements.
☒	For radiated measurement, refer as ANSI C63.10, clause 6.6. Test distance is 3m.
☒	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.

3.5.4 Test Setup

Transmitter Radiated Bandedge Emissions



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

3.5.5 Transmitter Radiated Bandedge Emissions (with Antenna)

U-NII 5150-5250MHz Transmitter Radiated Bandedge (with Antenna)										
Modulation Mode	N_{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Freq. (MHz) AV	Level (dBuV/m) AV	Limit (dBuV/m) AV	Pol.
11a	1	5180	3	5149.90	63.09	74	5150.00	49.33	54	V
11a	1	5240	3	5123.40	58.98	74	5133.60	46.91	54	V
HT20	1	5180	3	5149.80	64.44	74	5149.80	48.88	54	V
HT20	1	5240	3	5107.20	60.36	74	5145.00	46.10	54	V
HT40	1	5190	3	5148.62	66.29	74	5149.94	52.63	54	V
HT40	1	5230	3	5148.60	62.66	74	5149.80	48.35	54	V
Note 1: Measurement worst emissions of receive antenna polarization.										

U-NII 5250-5350MHz Transmitter Radiated Bandedge (with Antenna)										
Modulation Mode	N_{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Freq. (MHz) AV	Level (dBuV/m) AV	Limit (dBuV/m) AV	Pol.
11a	1	5260	3	5113.20	59.31	74	5106.00	46.94	54	V
11a	1	5320	3	5356.90	58.47	74	5350.74	44.34	54	V
HT20	1	5260	3	5149.20	60.26	74	5105.40	46.14	54	V
HT20	1	5320	3	5351.02	60.86	74	5351.02	46.16	54	V
HT40	1	5270	3	5109.00	60.51	74	5103.60	46.31	54	V
HT40	1	5310	3	5350.48	66.00	74	5350.84	52.04	54	V
Note 1: Measurement worst emissions of receive antenna polarization.										

U-NII 5470-5725MHz Transmitter Radiated Bandedge (with Antenna)							
Modulation Mode	N_{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Pol.
11a	1	5500	3	5470.00	58.94	68.2	V
11a	1	5700	3	5727.80	62.26	68.2	V
HT20	1	5500	3	5469.52	60.85	68.2	V
HT20	1	5700	3	5731.88	61.20	68.2	V
HT40	1	5510	3	5470.00	66.65	68.2	V
HT40	1	5670	3	5745.20	61.49	68.2	V
Note 1: Measurement worst emissions of receive antenna polarization.							

U-NII 5725-5850MHz Transmitter Radiated Bandedge (with Antenna)							
Modulation Mode	N_{TX}	Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Pol.
11a	1	5745	3	5709.64	62.22	68.2	V
11a	1	5825	3	5862.25	61.76	68.2	V
HT20	1	5745	3	5672.68	61.05	68.2	V
HT20	1	5825	3	5860.36	61.90	68.2	V
HT40	1	5755	3	5714.48	66.77	68.2	V
HT40	1	5795	3	5860.30	61.60	68.2	V
Note 1: Measurement worst emissions of receive antenna polarization.							

3.6 Transmitter Unwanted Emissions

3.6.1 Transmitter Radiated Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz 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 above 1GHz Limit	
Operating Band	**Limit**
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.85 GHz	5.715 5.725 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] 5.85 5.86 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] Other un-restricted band: e.i.r.p. -27 dBm [68.2 dBuV/m@3m]

Note 1: 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).

3.6.2 Measuring Instruments

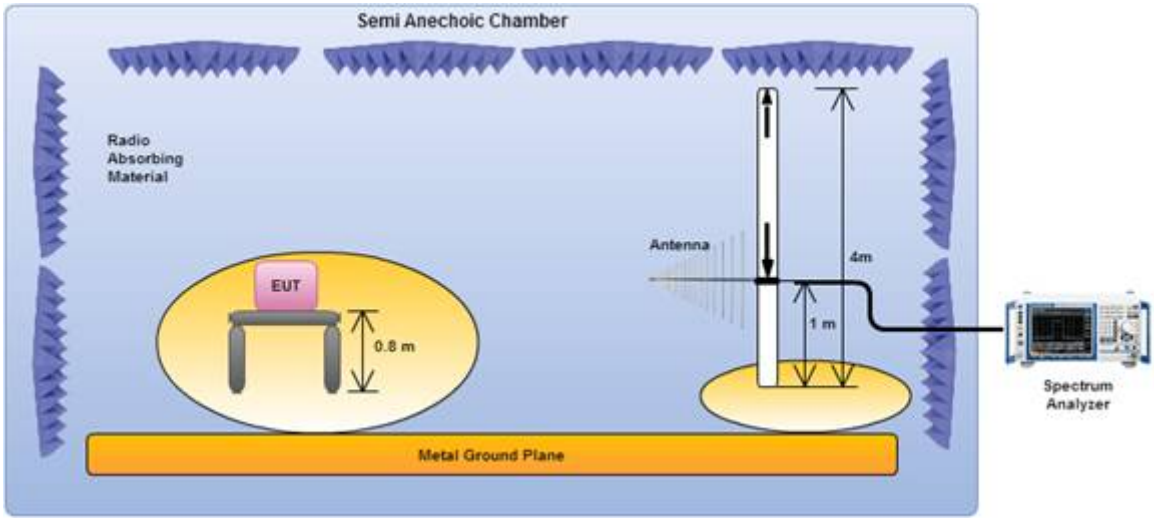
Refer a test equipment and calibration data table in this test report.

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. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. 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 789033 D02 v01, clause G)2) for unwanted emissions into non-restricted bands.	
	☒	Refer as FCC KDB 789033 D02 v01, clause G)1) for unwanted emissions into restricted bands.	
		☐	Refer as FCC KDB 789033 D02 v01, G)6) Method AD (Trace Averaging).
		☐	Refer as FCC KDB 789033 D02 v01, G)6) Method VB (Reduced VBW).
		☒	Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
		☒	Refer as FCC KDB 789033 D02 v01, clause G)5) measurement procedure peak limit.
		☐	Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
☒	For radiated measurement.		
	☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.	
	☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.	
	☒	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz. For 1 GHz to 5 GHz, test distance is 3m; For 5 GHz to 40 GHz, test distance is 3m.	
☒	The any unwanted emissions level shall not exceed the fundamental emission level.		
☒	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.		

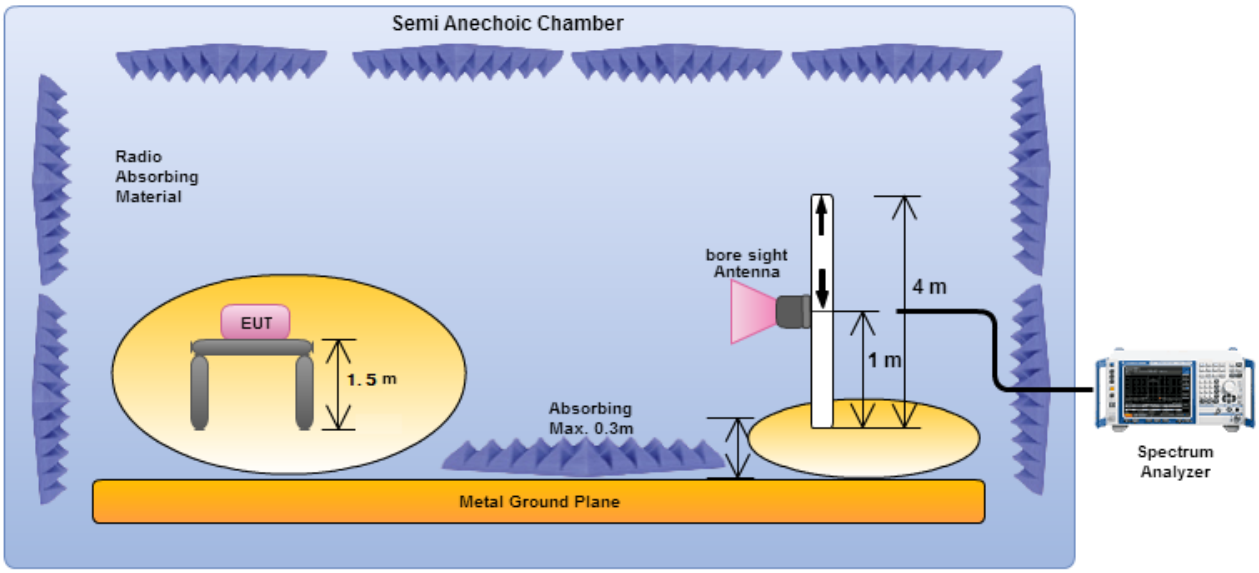
3.6.4 Test Setup

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



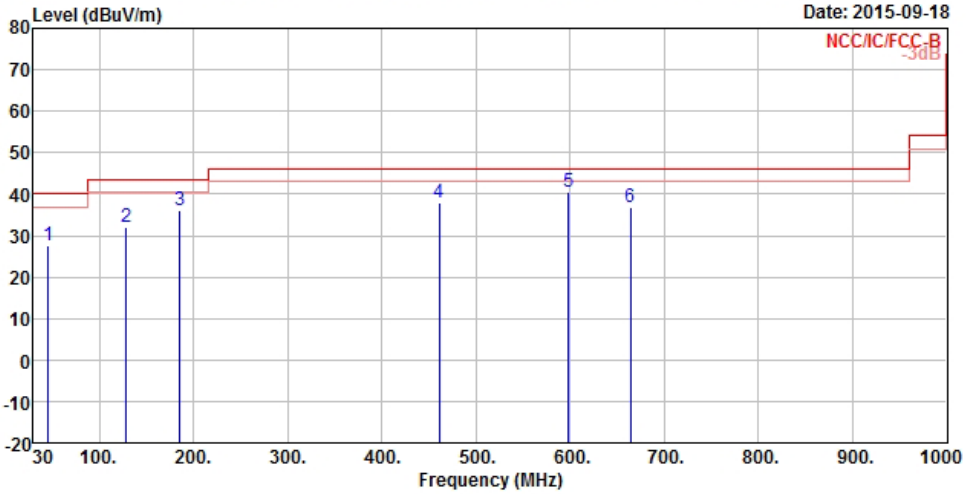
Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

3.6.5 Transmitter Radiated Unwanted Emissions-with Antenna (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)

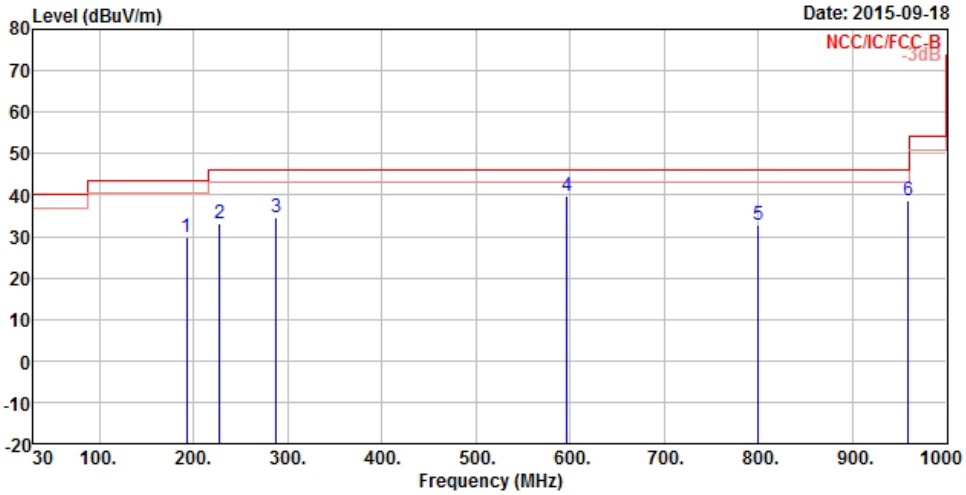
Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Operating Mode	1	**Polarization**	V
Operating Function	Adapter mode and transmit		



	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	45.52	27.62	-12.38	40.00	53.42	10.97	0.41	37.18	Peak
2	128.94	32.17	-11.33	43.50	56.04	12.07	0.70	36.64	Peak
3	185.20	36.27	-7.23	43.50	62.50	9.40	0.80	36.43	Peak
4	460.68	38.09	-7.91	46.00	56.05	17.47	1.37	36.80	Peak
5	598.42	40.68	-5.32	46.00	56.61	19.67	1.63	37.23	Peak
6	664.38	36.91	-9.09	46.00	52.14	20.34	1.70	37.27	Peak

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical).
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Operating Mode	1	**Polarization**	H
Operating Function	Adapter mode and transmit		

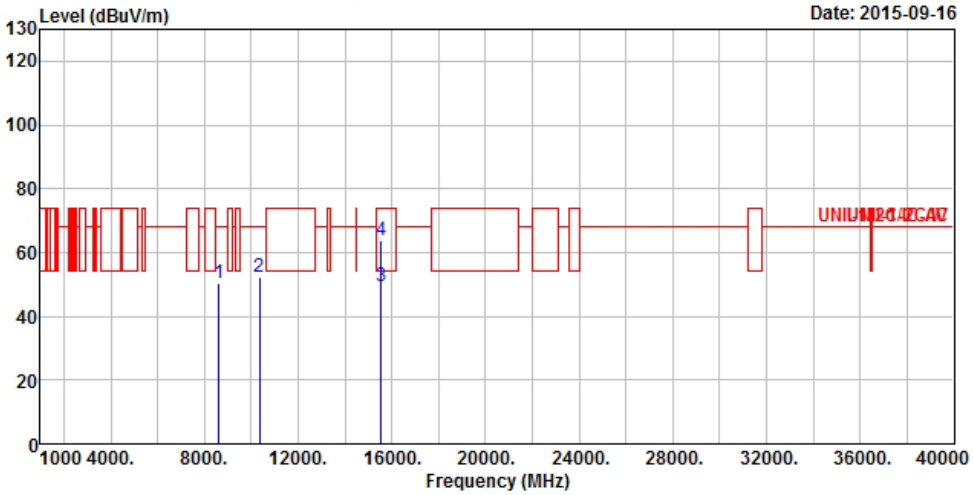


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	192.96	29.71	-13.79	43.50	55.63	9.65	0.83	36.40	Peak
2	227.88	33.17	-12.83	46.00	57.78	10.84	0.93	36.38	Peak
3	288.02	34.58	-11.42	46.00	56.38	13.54	1.07	36.41	Peak
4	596.48	39.76	-6.24	46.00	55.74	19.63	1.62	37.23	Peak
5	800.18	32.91	-13.09	46.00	46.44	22.10	1.83	37.46	Peak
6	959.26	38.58	-7.42	46.00	49.23	24.68	2.05	37.38	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: No level of unwanted emissions exceeds the level of the fundamental emission.

3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 5150-5250MHz

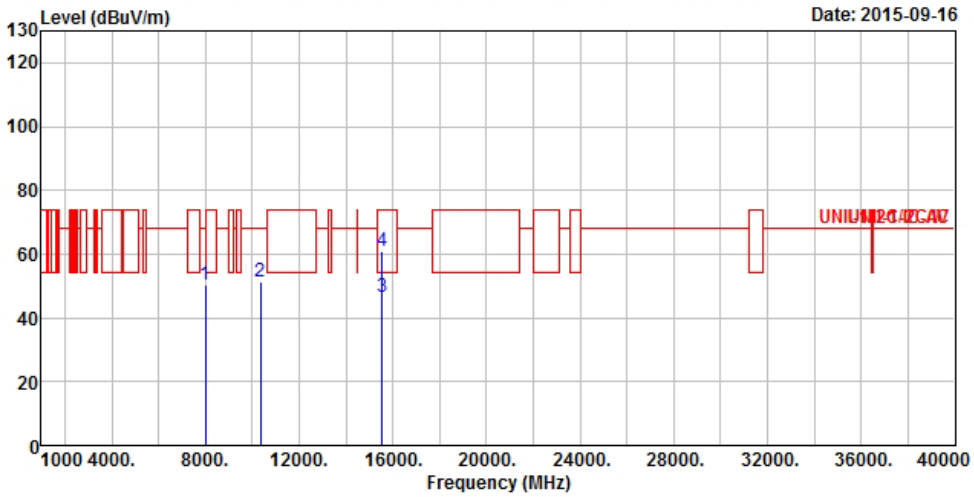
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5180
N_{TX}	1	**Polarization**	V



	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	8622.00	50.58	-17.62	68.20	59.43	37.35	7.79	53.99	Peak
2	10360.00	52.15	-16.05	68.20	60.00	37.72	8.61	54.18	Peak
3	15540.00	49.28	-4.72	54.00	52.10	38.88	10.96	52.66	Average
4	15540.00	63.84	-10.16	74.00	66.66	38.88	10.96	52.66	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

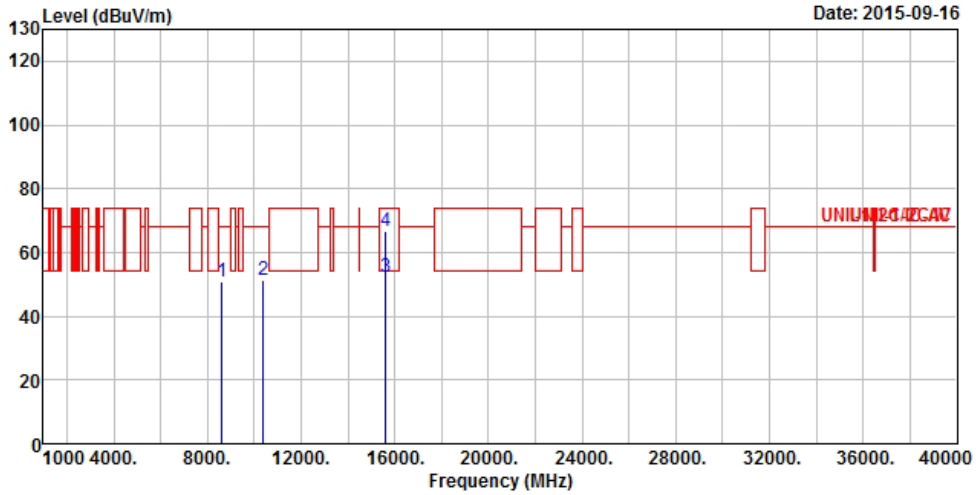
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5180
N_{TX}	1	**Polarization**	H



	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	7992.00	50.34	-17.86	68.20	59.91	36.89	7.47	53.93	Peak
2	10360.00	51.26	-16.94	68.20	59.11	37.72	8.61	54.18	Peak
3	15540.00	46.66	-7.34	54.00	49.48	38.88	10.96	52.66	Average
4	15540.00	60.81	-13.19	74.00	63.63	38.88	10.96	52.66	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

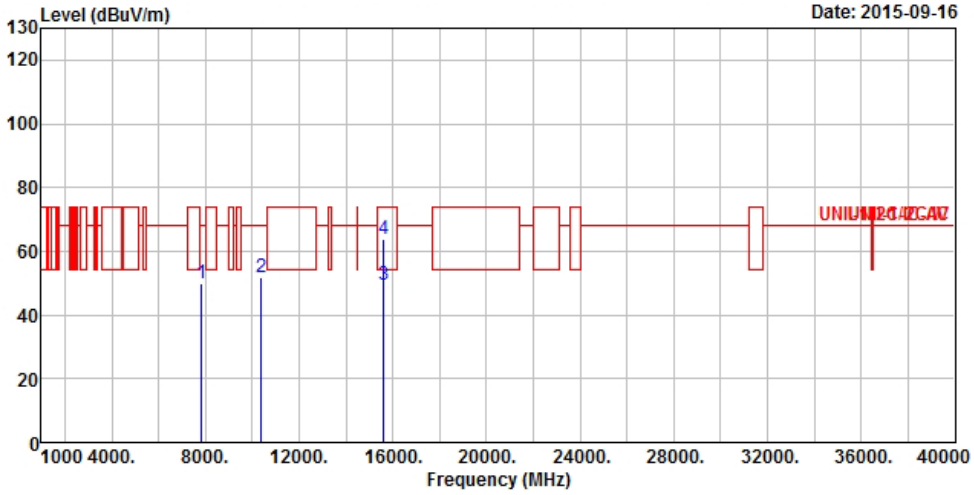
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5200
N_{TX}	1	**Polarization**	V



	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	8638.00	50.79	-17.41	68.20	59.64	37.35	7.80	54.00	Peak
2	10400.00	51.44	-16.76	68.20	59.23	37.74	8.63	54.16	Peak
3	15600.00	52.49	-1.51	54.00	55.23	38.84	10.99	52.57	Average
4	15600.00	66.80	-7.20	74.00	69.54	38.84	10.99	52.57	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

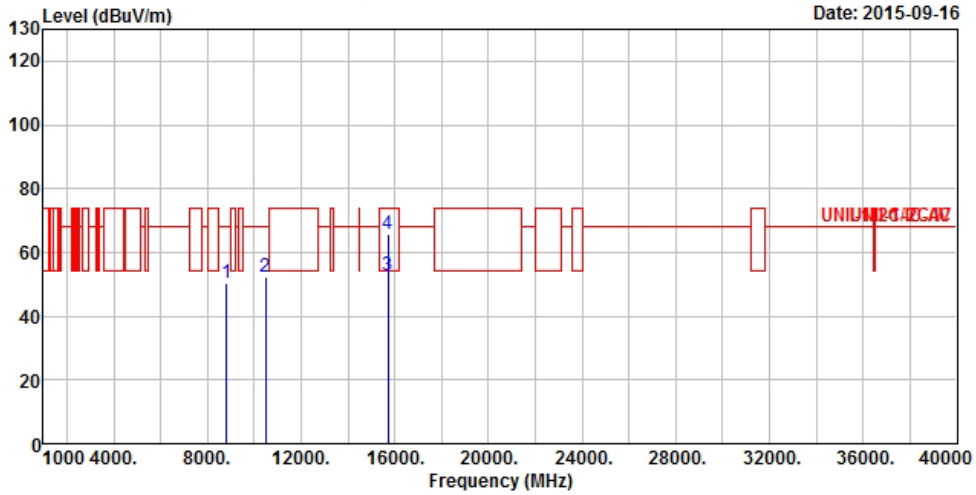
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5200
N_{TX}	1	**Polarization**	H



	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	7826.00	49.85	-18.35	68.20	59.47	36.80	7.40	53.82	Peak
2	10400.00	52.02	-16.18	68.20	59.81	37.74	8.63	54.16	Peak
3	15600.00	49.21	-4.79	54.00	51.95	38.84	10.99	52.57	Average
4	15600.00	63.77	-10.23	74.00	66.51	38.84	10.99	52.57	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

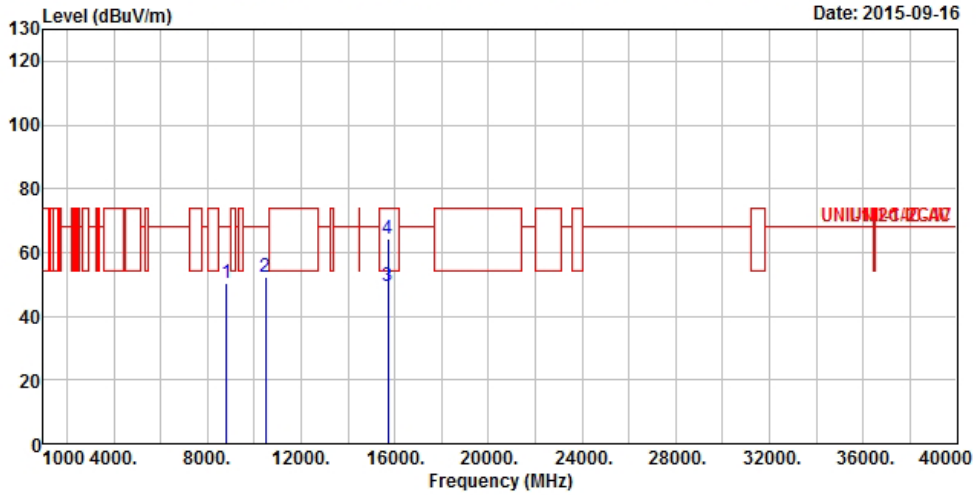
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5240
N_{TX}	1	**Polarization**	V



	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	8814.00	50.37	-17.83	68.20	59.12	37.43	7.88	54.06	Peak
2	10480.00	52.23	-15.97	68.20	59.91	37.79	8.67	54.14	Peak
3	15720.00	52.75	-1.25	54.00	55.32	38.77	11.09	52.43	Average
4	15720.00	65.70	-8.30	74.00	68.27	38.77	11.09	52.43	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

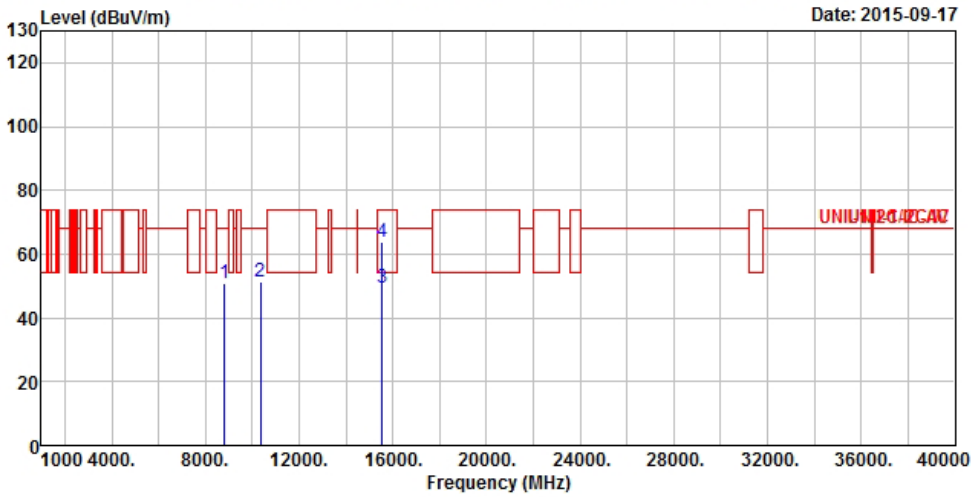
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	11a	**Test Freq. (MHz)**	5240
N_{TX}	1	**Polarization**	H



	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	8808.00	50.57	-17.63	68.20	59.32	37.42	7.88	54.05	Peak
2	10480.00	52.21	-15.99	68.20	59.89	37.79	8.67	54.14	Peak
3	15720.00	49.32	-4.68	54.00	51.89	38.77	11.09	52.43	Average
4	15720.00	64.12	-9.88	74.00	66.69	38.77	11.09	52.43	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

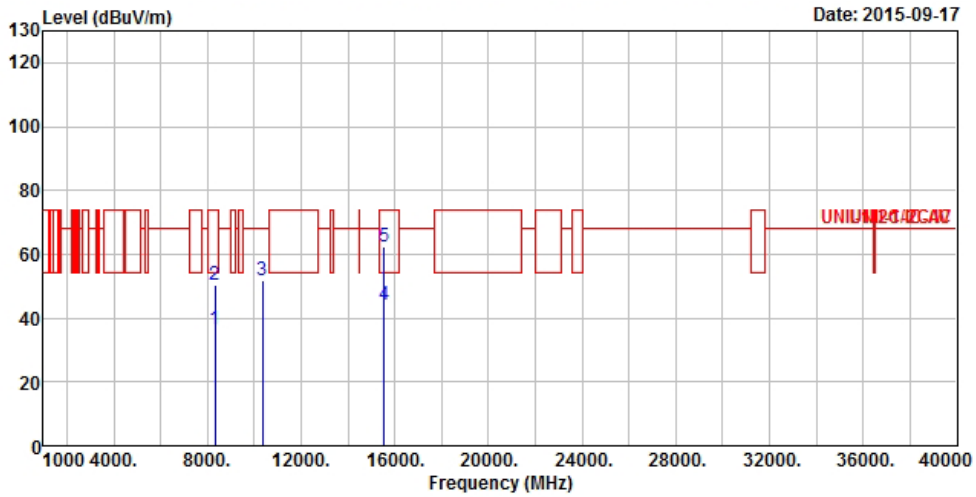
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT20	**Test Freq. (MHz)**	5180
N_{TX}	1	**Polarization**	V



	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	8808.00	50.88	-17.32	68.20	59.63	37.42	7.88	54.05	Peak
2	10360.00	51.25	-16.95	68.20	59.10	37.72	8.61	54.18	Peak
3	15540.20	49.30	-4.70	54.00	52.12	38.88	10.96	52.66	Average
4	15540.20	63.60	-10.40	74.00	66.42	38.88	10.96	52.66	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

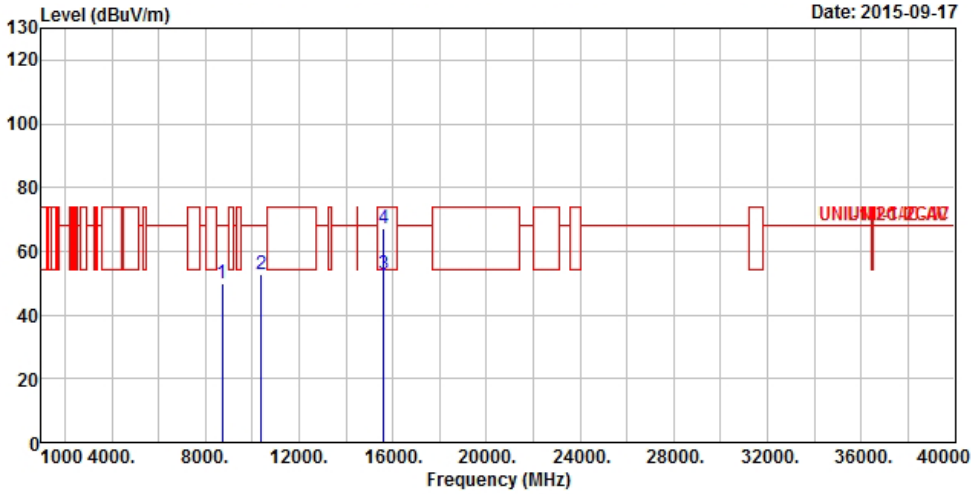
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT20	**Test Freq. (MHz)**	5180
N_{TX}	1	**Polarization**	H



	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	8328.00	36.49	-17.51	54.00	45.63	37.16	7.65	53.95	Average
2	8328.00	50.21	-23.79	74.00	59.35	37.16	7.65	53.95	Peak
3	10360.00	51.73	-16.47	68.20	59.58	37.72	8.61	54.18	Peak
4	15540.00	44.02	-9.98	54.00	46.84	38.88	10.96	52.66	Average
5	15540.00	62.52	-11.48	74.00	65.34	38.88	10.96	52.66	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.

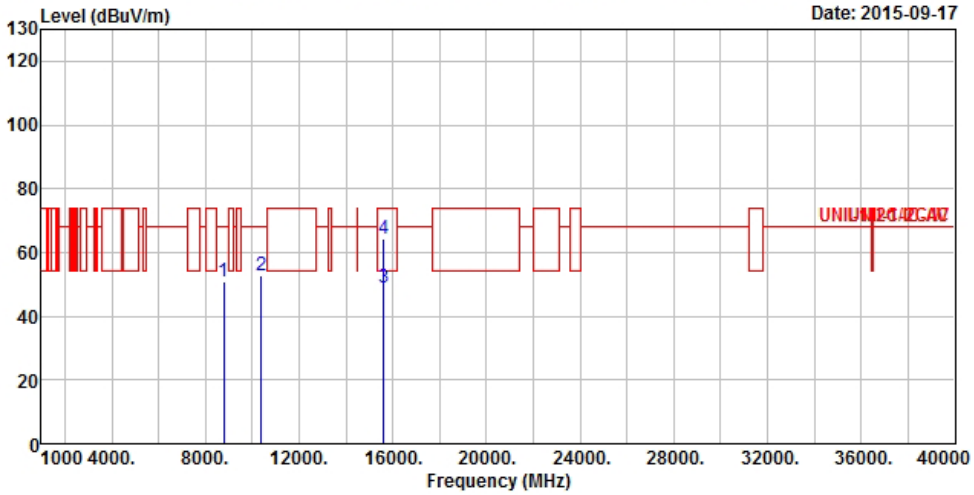
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Modulation Mode	HT20	**Test Freq. (MHz)**	5200
N_{TX}	1	**Polarization**	V



	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	8734.00	50.05	-18.15	68.20	58.85	37.39	7.84	54.03	Peak
2	10400.00	52.77	-15.43	68.20	60.56	37.74	8.63	54.16	Peak
3	15600.00	52.73	-1.27	54.00	55.47	38.84	10.99	52.57	Average
4	15600.00	67.25	-6.75	74.00	69.99	38.84	10.99	52.57	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
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)**	5200
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	8790.00	50.65	-17.55	68.20	59.40	37.41	7.88	54.04	Peak
2	10400.00	52.60	-15.60	68.20	60.39	37.74	8.63	54.16	Peak
3	15600.00	49.08	-4.92	54.00	51.82	38.84	10.99	52.57	Average
4	15600.00	64.51	-9.49	74.00	67.25	38.84	10.99	52.57	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 emission satisfies both the average and peak limits of 15.209, it is not required to satisfy the -27 dBm peak emission limit of 15.407.
Note 6: No level of unwanted emissions exceeds the level of the fundamental emission.