FCC Test Report

Equipment	:	**Wireless Interactive Whiteboard System - IW2**
Brand Name	:	**IPEVO**
Model No.	:	**CSW2-01IP, CSW2-01IP-A2**
FCC ID	:	**WKP-CSW2-01IP-A2**
Standard	:	**47 CFR FCC Part 15.249**
Operating Band	:	**2400 MHz – 2483.5 MHz**
FCC Classification	:	**DXX**
Applicant **Manufacturer**	:	**IPEVO Corp.** 3F, No.53, Bo-ai Road, Taipei 100, Taiwan

The product sample received on Jan. 22, 2015 and completely tested on Mar. 10, 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:

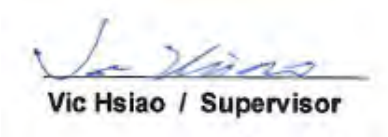


Table of Contents

Summary of Test Result

Conformance Test Specifications					
Report Clause	**Ref. Std. Clause**	**Description**	**Measured**	**Limit**	**Result**
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]: 17.570MHz 40.21 (Margin 19.79dB) - QP 34.01 (Margin 15.99dB) - AV	FCC 15.207	Complied
3.2	15.215(c)	Emission Bandwidth	1.2373 MHz; fall in band	Information only	Complied
3.3	15.249(a)	Fundamental Emissions	[dBuV/m at 3m]: 80.37 (Margin 13.63dB) average	[dBuV/m at 3m]: average: 94	Complied
3.4	15.249 (a)/(d)	Transmitter Radiated Unwanted Emissions	[dBuV/m at 3m]: 30MHz 32.06 (Margin 7.94dB) - PK	Harmonics: 54 dBuV/m@3m Other band: 50 dB or FCC 15.209, whichever is the lesser attenuation.	Complied

Revision History

Report No.	Version	Description	Issued Date
FR4D3129-01	Rev. 01	Initial issue of report	Mar. 30, 2015
FR4D3129-01	Rev. 02	Add one model name	Apr. 07, 2015

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range (MHz)	**Modulation**	**Ch. Frequency (MHz)**	**Channel Number**	**Fundamental Field Strength (dBuV/m)**
2400-2483.5	FSK	2405, 2440, 2475	71	80.37
Note 1: Field strength performed average level at 3m.				

1.1.2 Antenna Information

Antenna Category	
☐	Equipment placed on the market without antennas
☒	Integral antenna (antenna permanently attached)
☐	External antenna (dedicated antennas)

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)	**Duty Cycle Correction Factor [dB] – (20 log x)**
☒ 14.76%	16.61
If worst duty < 100%, average emission = peak emission + 20 log x	

1.1.5 EUT Operational Condition

Supply Voltage	☐ AC mains	☒ DC	- -
Type of DC Source	☐ Internal DC supply	☐ From Adapter	☒ System

1.2 Support Equipment

Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5540	DoC

Support Equipment – AC Conduction and Radiation Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5530	DoC

1.3 Testing Applied Standards

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013

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 Site Registration Number: FCC 636805			
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**
AC Conduction	CO04-HY	Zeus	25°C / 40%
RF Conducted	TH01-HY	Ian	23.4°C / 62%
Radiated Emission	03CH03-HY	Daniel	22.8°C / 48%

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		±2.2 dB
Emission bandwidth, 20dB bandwidth		±1.4 %
RF output power, conducted		±0.6 dB
All emissions, radiated	9 – 150 kHz	±2.4 dB
	0.15 – 30 MHz	±2.2 dB
	30 – 1000 MHz	±2.5 dB
	1 – 18 GHz	±3.5 dB
	18 – 40 GHz	±3.8 dB
	40 – 200 GHz	N/A
Temperature		±0.8 °C
Humidity		±3 %
DC and low frequency voltages		±3 %
Time		±1.4 %
Duty Cycle		±1.4 %

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Modulation Used for Conformance Testing	
Test Mode	**Field Strength (dBuV/m at 3 m)**
Transmit	80.37

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
Test Mode	**Test Channel Frequencies (MHz)**
Transmit	2405, 2440, 2475

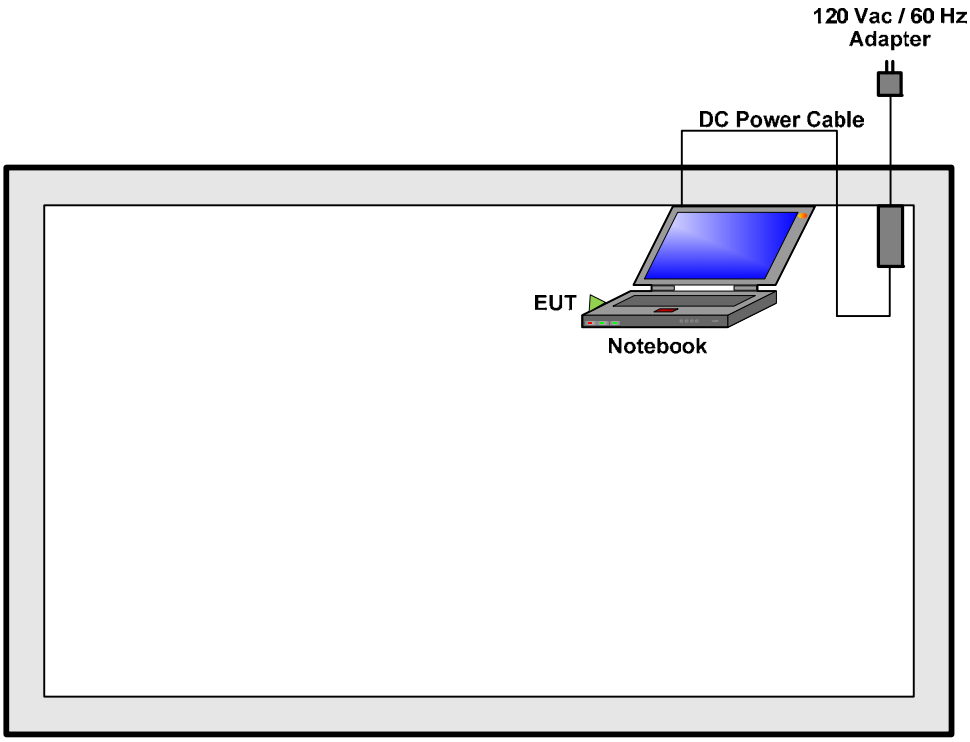
2.3 The Worst Case Measurement Configuration

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. USB mode

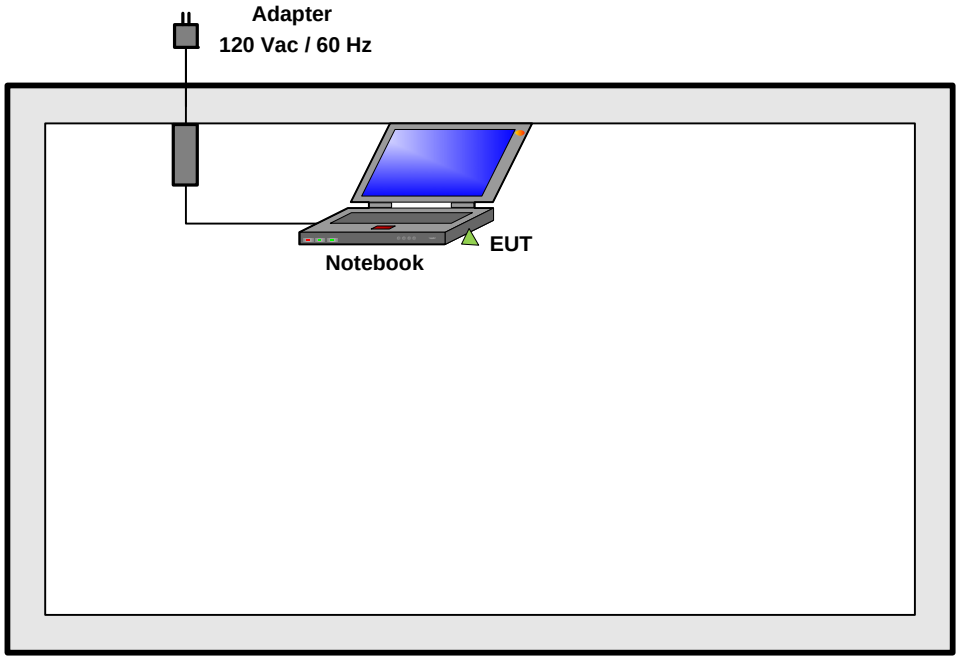
The Worst Case Mode for Following Conformance Tests			
Tests Item	Emission Bandwidth, Fundamental Emissions, Radiated Unwanted Emissions		
Test Condition	Radiated measurement		
User Position	☐ EUT will be placed in fixed position.		
	☒ EUT will be placed in mobile position and operating multiple positions.		
	☐ 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		
	1. USB mode		
Modulation Mode	Transmit		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			
Worst Planes of EUT	V		

2.4 Test Setup Diagram

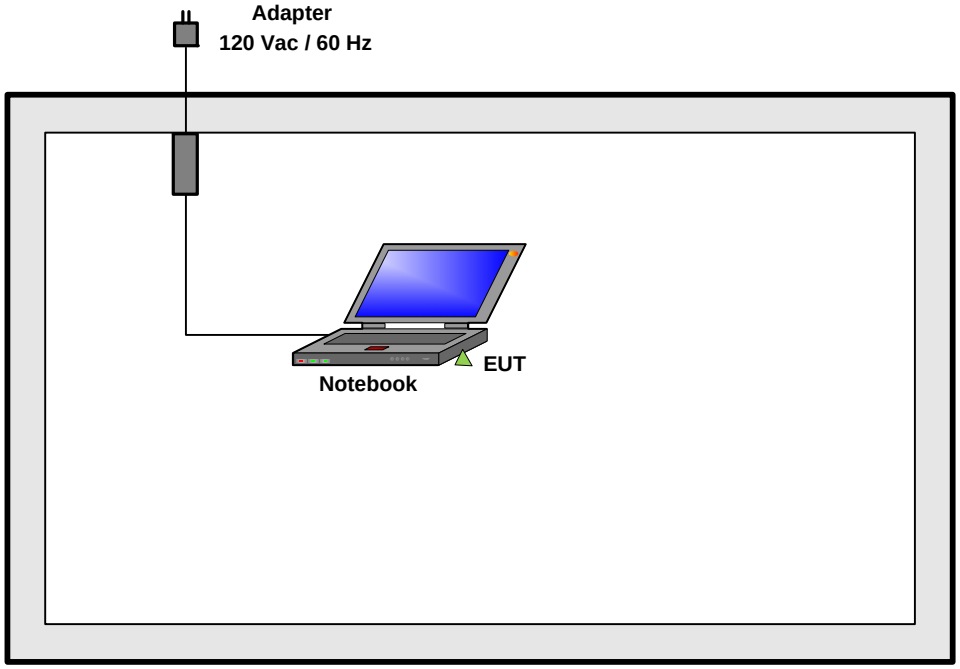
Test Setup Diagram - AC Line Conducted Emission Test



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

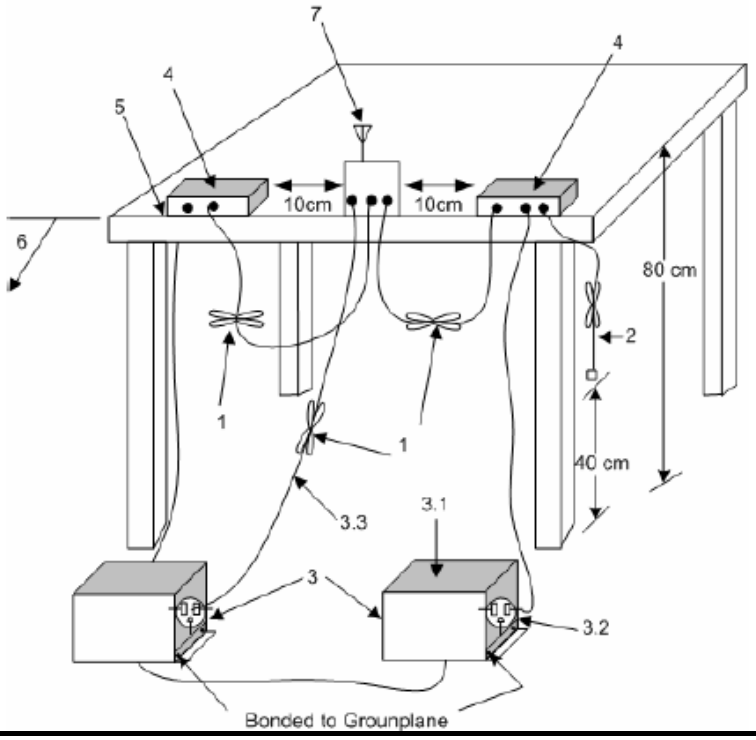
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

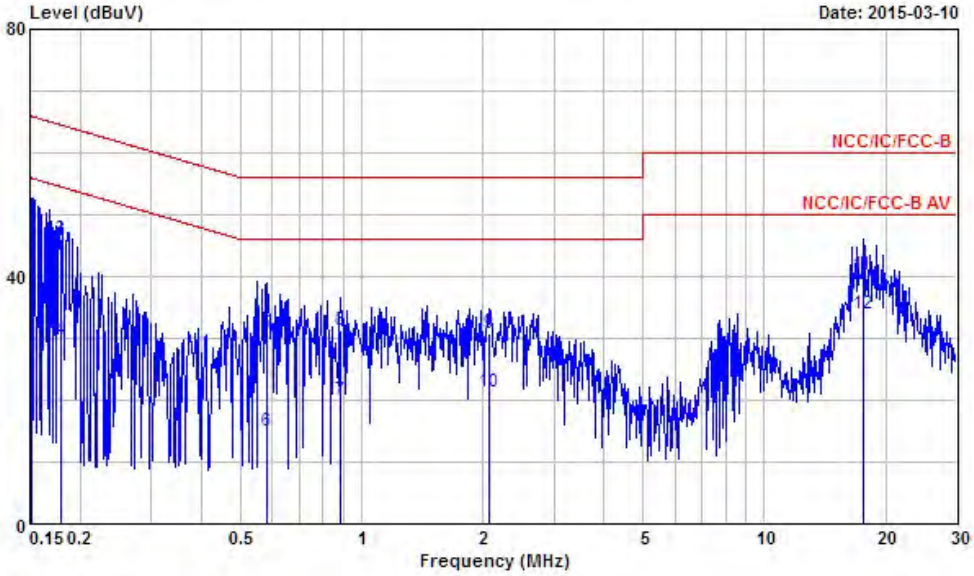
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

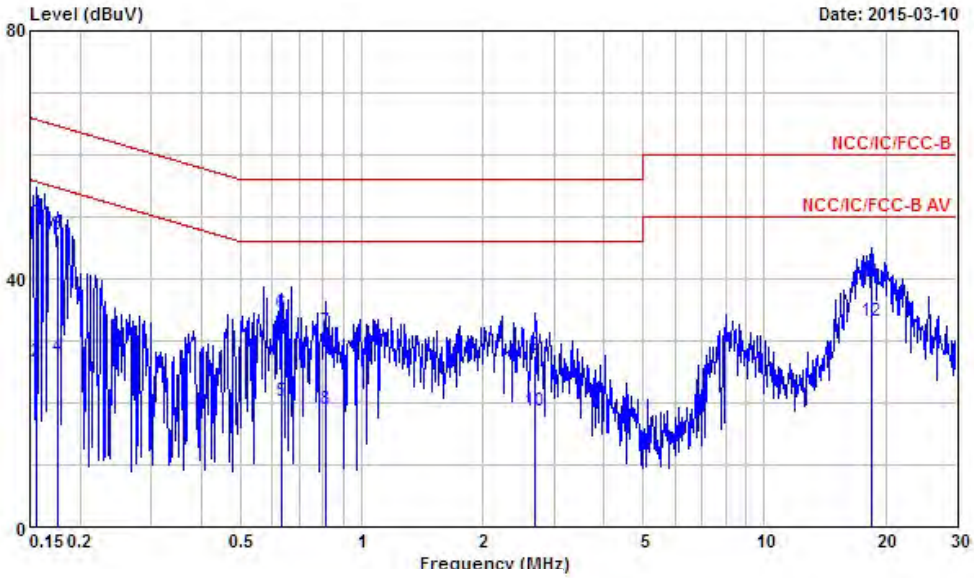
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	USB mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1515980	48.46	-17.45	65.91	48.05	0.07	0.34	QP
2	0.1515980	27.29	-28.62	55.91	26.88	0.07	0.34	Average
3	0.1786590	45.97	-18.58	64.55	45.47	0.07	0.43	QP
4	0.1786590	29.85	-24.70	54.55	29.35	0.07	0.43	Average
5	0.5823110	30.77	-25.23	56.00	30.01	0.08	0.68	QP
6	0.5823110	15.09	-30.91	46.00	14.33	0.08	0.68	Average
7	0.8849860	19.95	-26.05	46.00	19.09	0.09	0.77	Average
8	0.8849860	31.21	-24.79	56.00	30.35	0.09	0.77	QP
9	2.080	30.69	-25.31	56.00	29.80	0.10	0.79	QP
10	2.080	21.28	-24.72	46.00	20.39	0.10	0.79	Average
11	17.570	40.21	-19.79	60.00	39.09	0.37	0.75	QP
12 @	17.570	34.01	-15.99	50.00	32.89	0.37	0.75	Average

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	USB mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1556680	49.10	-16.59	65.69	48.70	0.05	0.35	QP
2	0.1556680	26.60	-29.09	55.69	26.20	0.05	0.35	Average
3	0.1758420	47.22	-17.46	64.68	46.74	0.06	0.42	QP
4	0.1758420	27.27	-27.41	54.68	26.79	0.06	0.42	Average
5	0.6304790	20.38	-25.62	46.00	19.61	0.07	0.70	Average
6	0.6304790	34.39	-21.61	56.00	33.62	0.07	0.70	QP
7	0.8173740	31.50	-24.50	56.00	30.66	0.08	0.76	QP
8	0.8173740	19.04	-26.96	46.00	18.20	0.08	0.76	Average
9	2.690	27.58	-28.42	56.00	26.71	0.11	0.76	QP
10	2.690	18.60	-27.40	46.00	17.73	0.11	0.76	Average
11	18.430	39.50	-20.50	60.00	38.43	0.34	0.73	QP
12	18.430	33.17	-16.83	50.00	32.10	0.34	0.73	Average

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
☒ Emission bandwidth falls completely within authorized band.

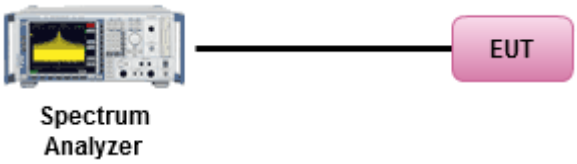
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10, clause 6.9.2for 20 dB emission bandwidth and 99% occupied bandwidth measurement.

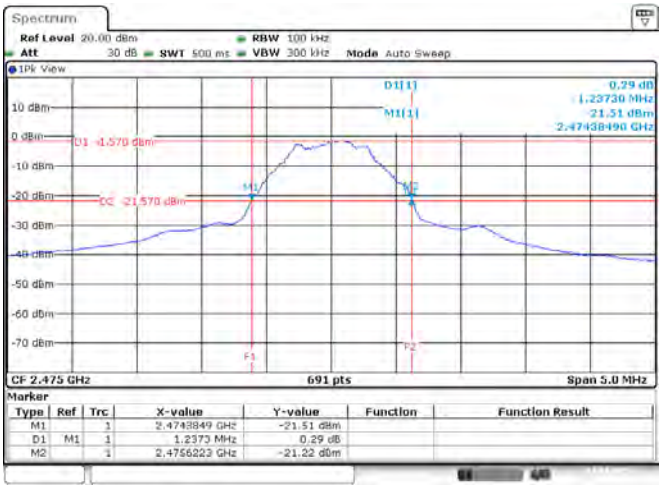
3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Occupied Channel Bandwidth Result					
Modulation Mode	**Frequency (MHz)**	**20dB Bandwidth (kHz)**	**F_L at 20dB BW (MHz)**	**F_H at 20dB BW (MHz)**	**99% Bandwidth (kHz)**
Transmit	2405	1.2229	2404.3849	-	1.0926
Transmit	2440	1.2301	-	-	1.0998
Transmit	2475	1.2373	-	2475.6223	1.0998
Limit		**N/A**	**2400**	**2483.5**	**N/A**
Result		**Complied**			

Worst Emission 20dB Bandwidth Plots



Date: 4.MAR.2015 14:00:59

Worst Emission 99% Bandwidth Plots

Date: 4.MAR.2015 13:59:18

3.3 Fundamental Emissions

3.3.1 Fundamental Emissions Limit

Fundamental Emissions E-Field Strength Limit (3m)	
☐	902-928 MHz Band: 94 dBuV/m (quasi peak)
☒	2400-2483.5 MHz Band: 94 dBuV/m (average)
☐	5725-5785 MHz Band: 94 dBuV/m (average)

3.3.2 Measuring Instruments

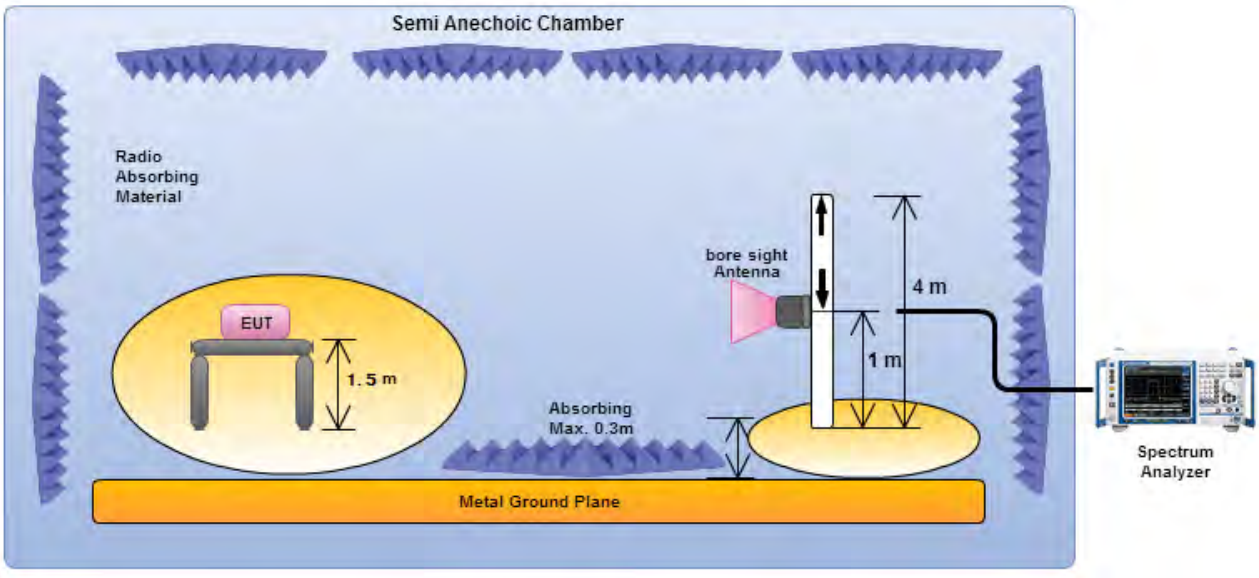
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

☒	The average emission levels shall be measured in [duty cycle ≥ 100 or by duty cycle correction factor].	
☒	For the transmitter emissions shall be measured using following options below:	
	☐	Refer as ANSI C63.10, clause 4.1.2.3 (Reduced VBW) – Duty cycle ≥ 100%.
	☒	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms). Average emission = peak emission + 20 log (duty cycle).
	☒	Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions and test distance is 3m.	

3.3.4 Test Setup

Fundamental Emissions



3.3.5 Test Result of Fundamental Emissions

Field Strength of Fundamental Emissions Result					
Modulation Mode	**Frequency (MHz)**	**Fundamental (dBuV/m)@3m**	**Margin (dB)**	**Limit (dBuV/m)@3m**	**Type**
Transmit	2405	96.98	17.02	114	PK
Transmit	2405	80.37	13.63	94	AV
Transmit	2475	94.83	19.17	114	PK
Transmit	2475	78.22	15.78	94	AV
Result		**Complied**			
Note 1: Measurement worst emissions of receive antenna polarization: Horizontal					

3.4 Transmitter Radiated Unwanted Emissions

3.4.1 Transmitter Radiated Unwanted Emissions Limit

Transmitter Radiated Unwanted Emissions Limit
Harmonics:
☒ 54 dBuV/m (average)
Other Unwanted Emissions:
☒ 50 dB below the level of the fundamental or FCC 15.209, whichever is the lesser attenuation.

3.4.2 Measuring Instruments

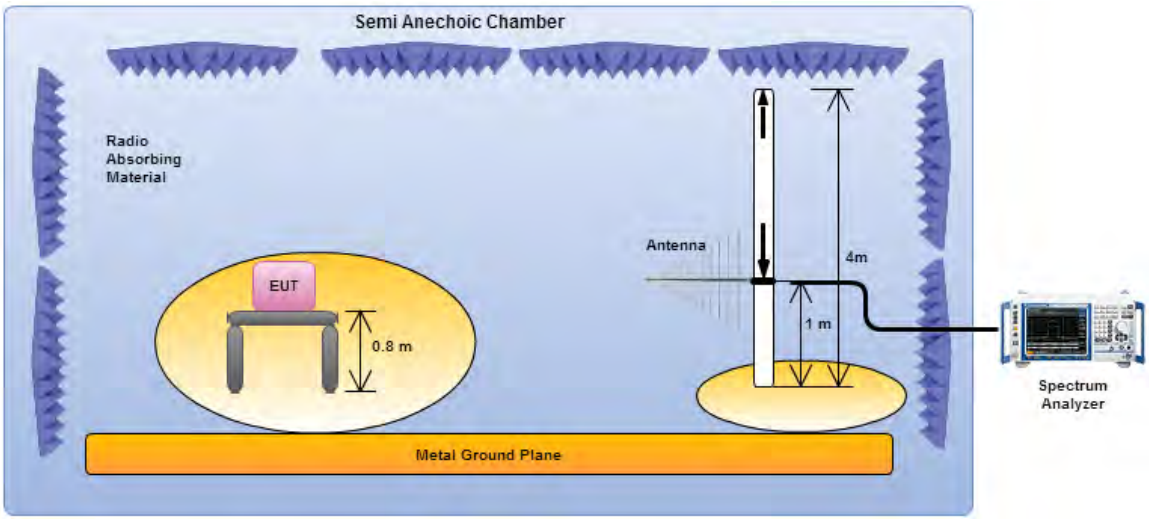
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method – General Information	
☒	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].
☒	Refer as ANSI C63.10, clause 6.10.3 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 ANSI C63.10, clause 4.1.2.3 (Reduced VBW) – Duty cycle ≥ 100%.
☒	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms). Average emission = peak emission + 20 log (duty cycle).
☒	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 ANSI C63.10, clause 6.10 for band-edge testing.
☐	Refer as ANSI C63.10, clause 6.10.6 for marker-delta method for band-edge measurements.
☒	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 1 GHz and 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.

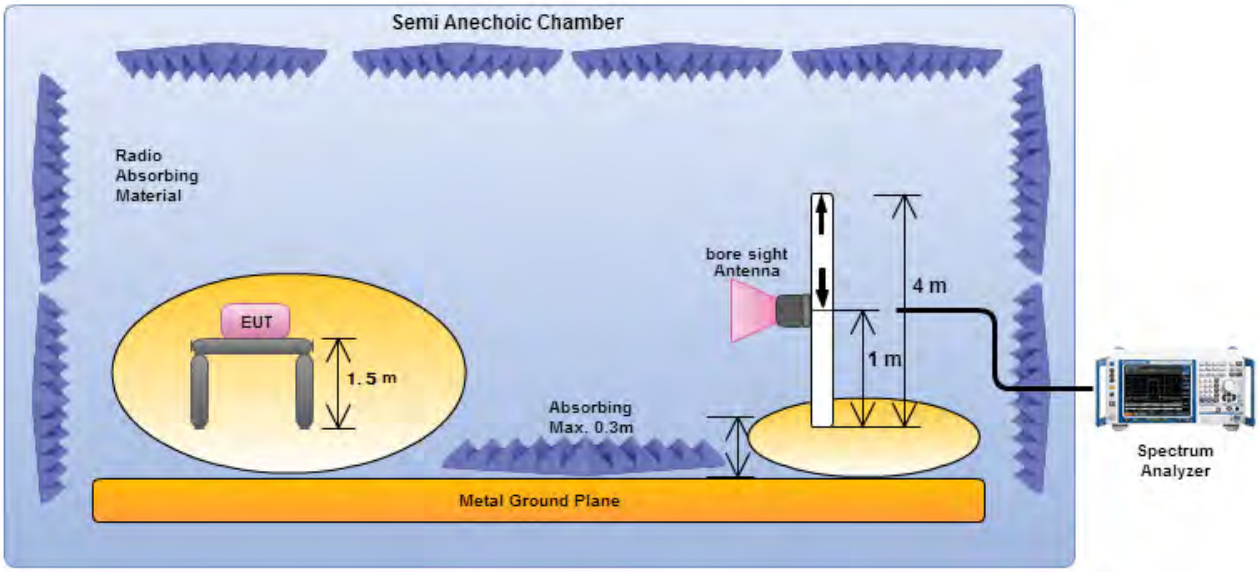
3.4.4 Test Setup

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)



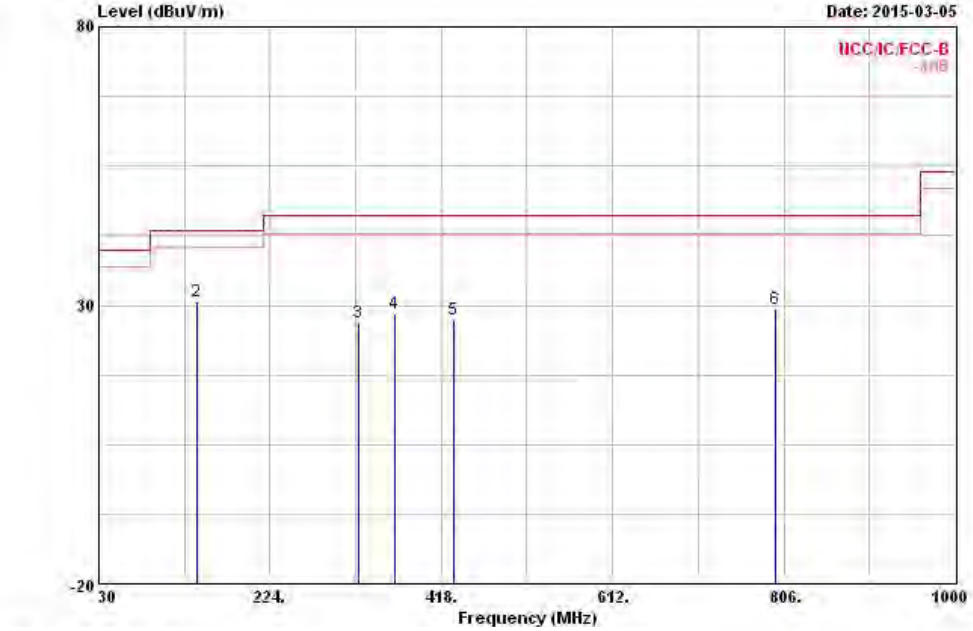
Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

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)

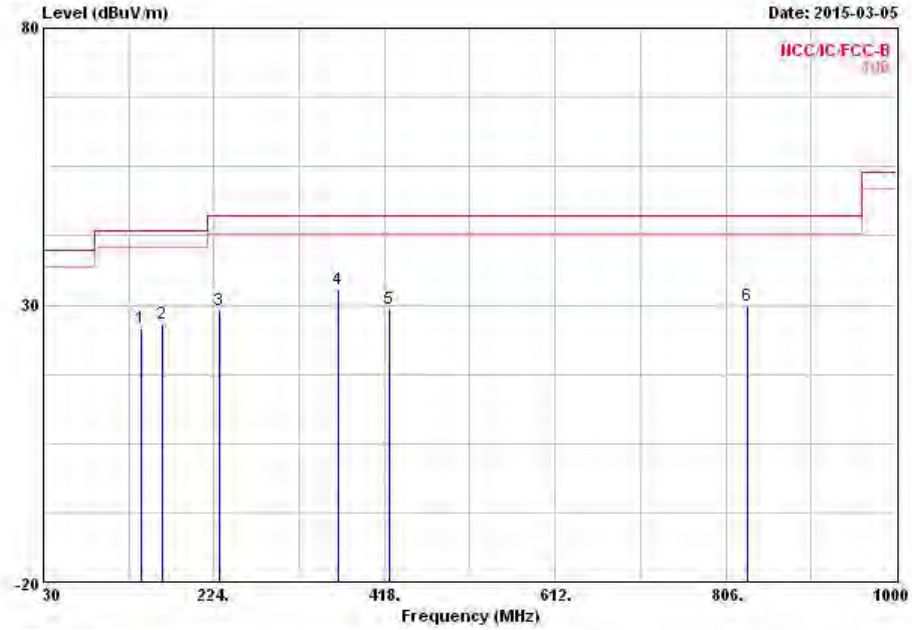
Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Operating Mode	1	**Polarization**	V
Operating Function	USB mode		



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	30.000	32.06	-7.94	40.00	40.69	17.94	0.82	27.39	Peak	---	---
2 @	141.550	30.68	-12.82	43.50	44.94	10.94	1.97	27.17	Peak	---	---
3	323.910	26.95	-19.05	46.00	37.44	13.33	3.01	26.83	Peak	---	---
4	365.620	28.46	-17.54	46.00	38.05	14.32	3.19	27.10	Peak	---	---
5	431.580	27.33	-18.67	46.00	35.43	15.98	3.44	27.52	Peak	---	---
6	796.300	29.37	-16.63	46.00	32.64	19.46	4.90	27.63	Peak	---	---

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

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

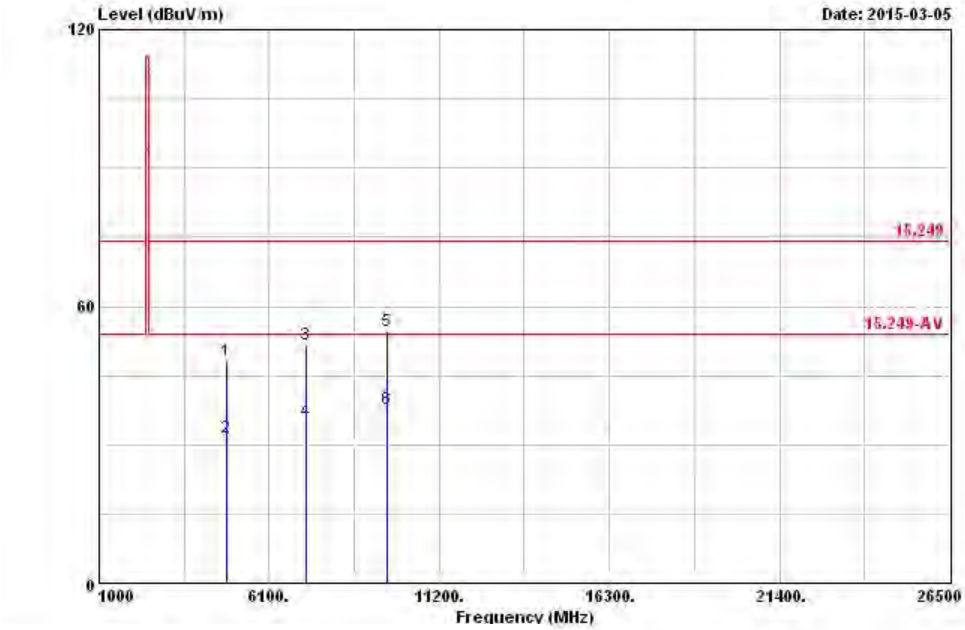


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	141.550	25.81	-17.69	43.50	40.07	10.94	1.97	27.17	Peak	---	---
2	164.830	26.48	-17.02	43.50	41.92	9.59	2.12	27.15	Peak	---	---
3	230.790	28.99	-17.01	46.00	43.57	9.92	2.50	27.00	Peak	---	---
4 @	365.620	32.81	-13.19	46.00	42.40	14.32	3.19	27.10	Peak	---	---
5	423.820	29.28	-16.72	46.00	37.36	15.97	3.42	27.47	Peak	---	---
6	831.220	29.90	-16.10	46.00	32.66	19.83	4.93	27.52	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)

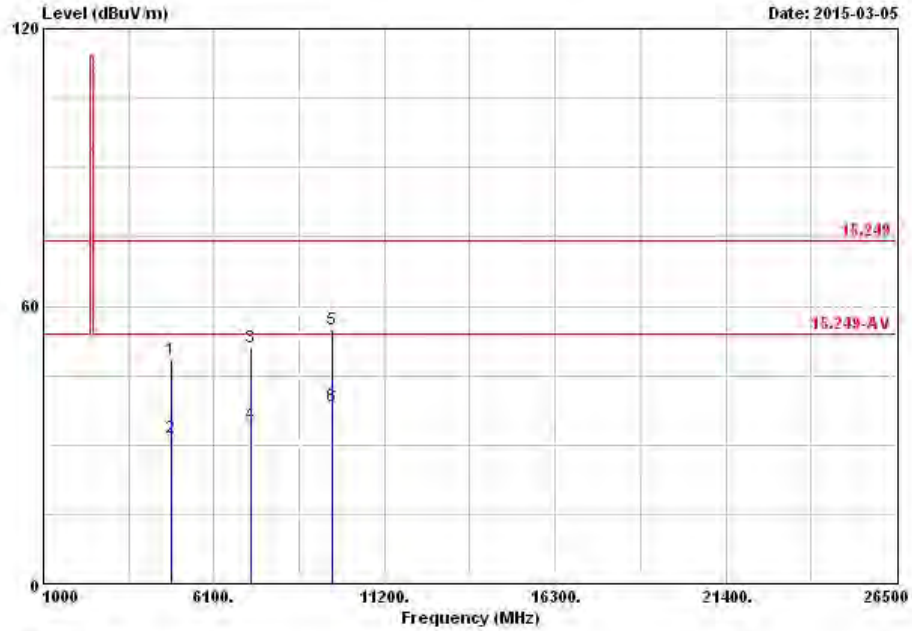
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	Transmit	**Test Freq. (MHz)**	2405	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4810.000	48.03	-25.97	74.00	42.80	33.20	4.49	32.46	Peak	---	---
2	4810.000	31.42	-22.58	54.00	26.19	33.20	4.49	32.46	Average	---	---
3	7215.000	51.71	-22.29	74.00	42.75	35.88	5.71	32.63	Peak	---	---
4	7215.000	35.10	-18.90	54.00	26.14	35.88	5.71	32.63	Average	---	---
5	9620.000	54.49	-19.51	74.00	42.58	38.39	6.66	33.14	Peak	---	---
6	9620.000	37.88	-16.12	54.00	25.97	38.39	6.66	33.14	Average	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 3: For 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 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

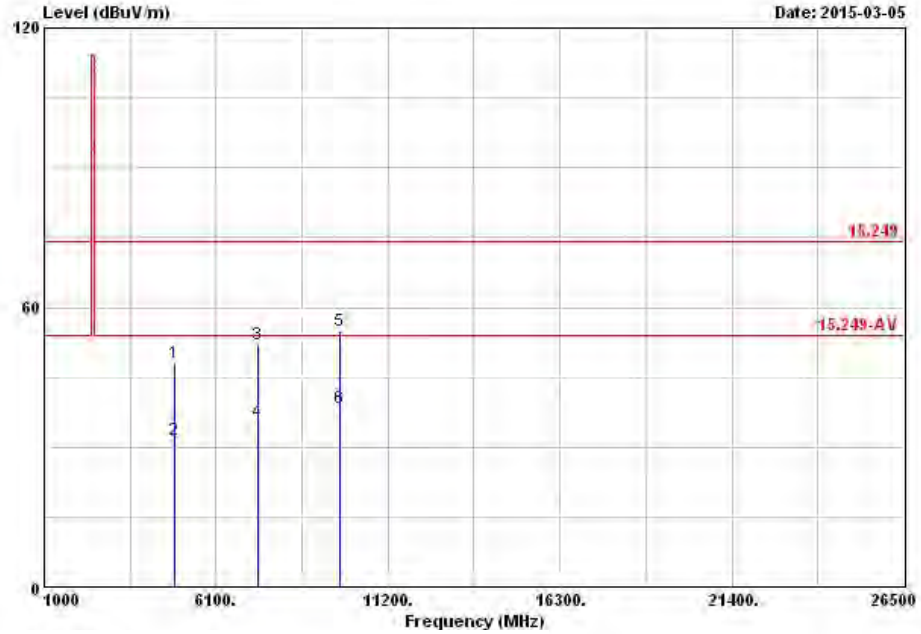
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	Transmit	**Test Freq. (MHz)**	2405	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4810.000	48.31	-25.69	74.00	43.08	33.20	4.49	32.46	Peak	---	---
2	4810.000	31.70	-22.30	54.00	26.47	33.20	4.49	32.46	Average	---	---
3	7215.000	51.16	-22.84	74.00	42.20	35.88	5.71	32.63	Peak	---	---
4	7215.000	34.55	-19.45	54.00	25.59	35.88	5.71	32.63	Average	---	---
5	9620.000	55.01	-18.99	74.00	43.10	38.39	6.66	33.14	Peak	---	---
6	9620.000	38.40	-15.60	54.00	26.49	38.39	6.66	33.14	Average	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 3: For 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 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

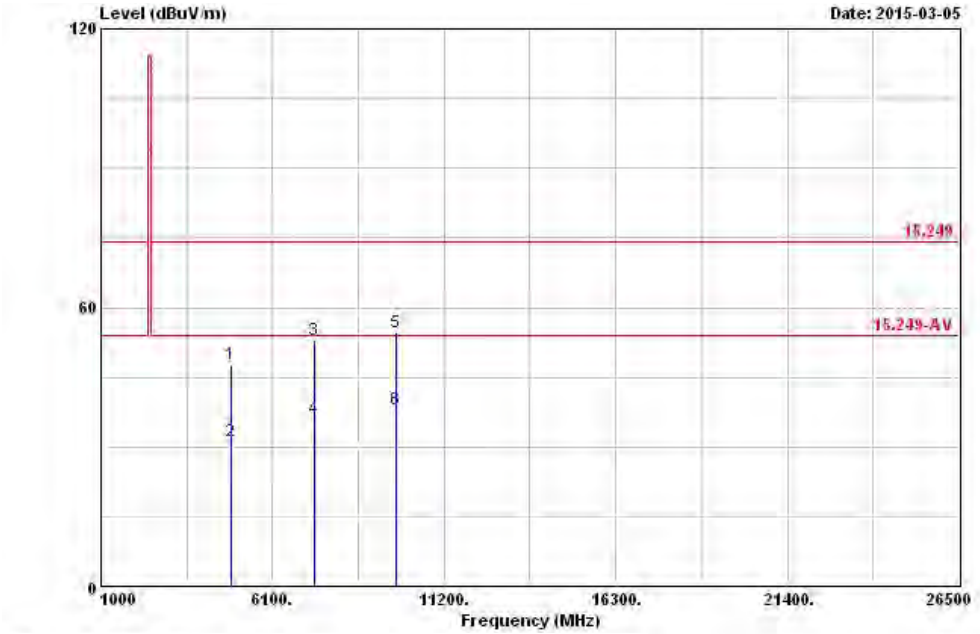
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	Transmit	**Test Freq. (MHz)**	2440	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4880.000	48.11	-25.89	74.00	42.74	33.31	4.51	32.45	Peak	---	---
2	4880.000	31.50	-22.50	54.00	26.13	33.31	4.51	32.45	Average	---	---
3	7320.000	51.92	-22.08	74.00	42.69	36.15	5.75	32.67	Peak	---	---
4	7320.000	35.31	-18.69	54.00	26.08	36.15	5.75	32.67	Average	---	---
5	9760.000	54.95	-19.05	74.00	42.74	38.61	6.73	33.13	Peak	---	---
6 @	9760.000	38.34	-15.66	54.00	26.13	38.61	6.73	33.13	Average	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 3: For 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 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

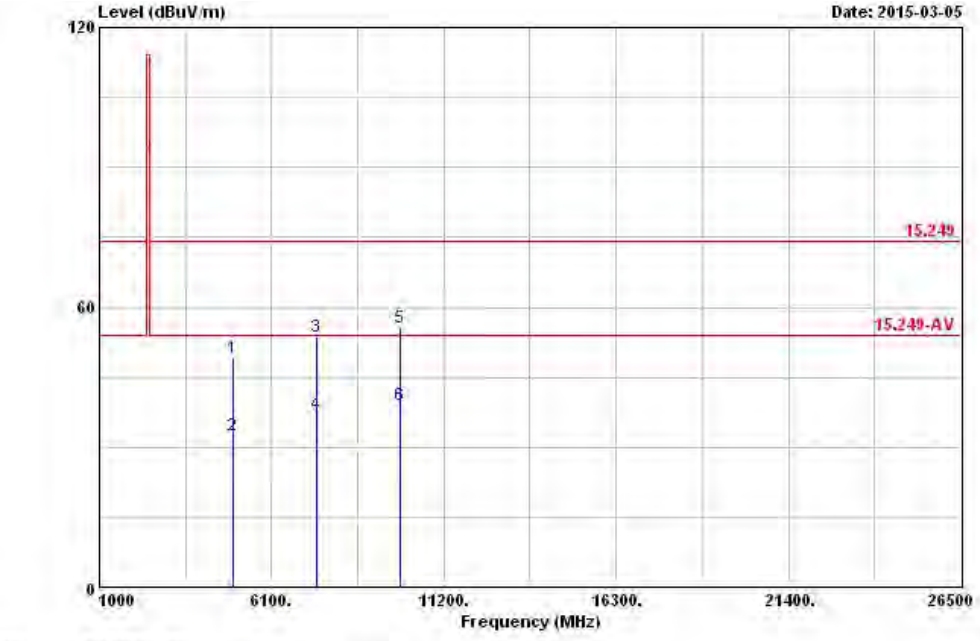
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	Transmit	**Test Freq. (MHz)**	2440	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4880.000	47.88	-26.12	74.00	42.51	33.31	4.51	32.45	Peak	---	---
2	4880.000	31.27	-22.73	54.00	25.90	33.31	4.51	32.45	Average	---	---
3	7320.000	52.85	-21.15	74.00	43.62	36.15	5.75	32.67	Peak	---	---
4	7320.000	36.24	-17.76	54.00	27.01	36.15	5.75	32.67	Average	---	---
5	9760.000	54.59	-19.41	74.00	42.38	38.61	6.73	33.13	Peak	---	---
6	9760.000	37.98	-16.02	54.00	25.77	38.61	6.73	33.13	Average	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 3: For 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 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

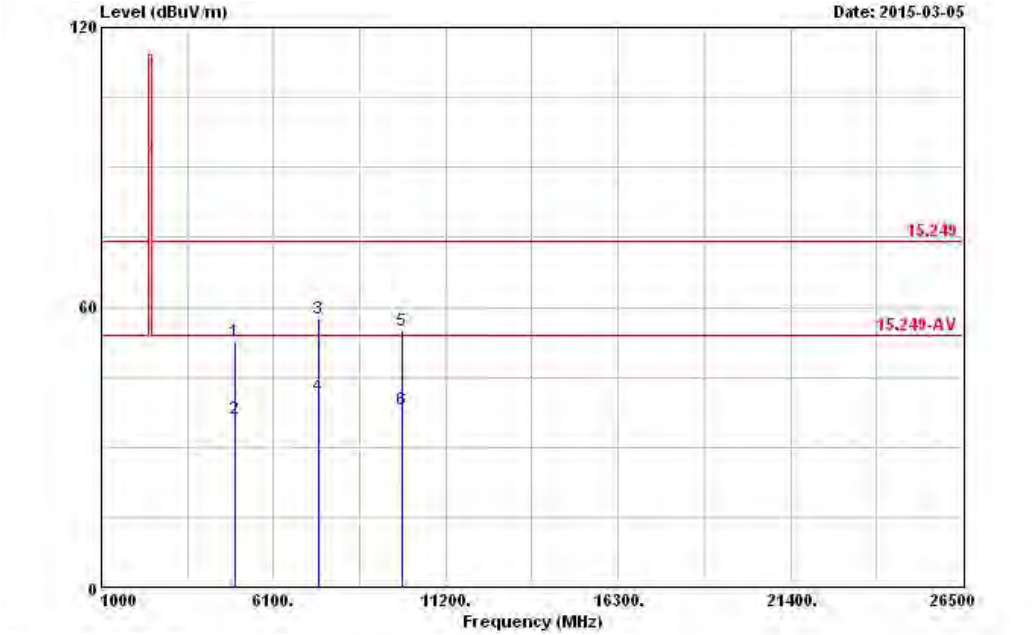
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	Transmit	**Test Freq. (MHz)**	2475	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4950.000	49.07	-24.93	74.00	43.54	33.42	4.55	32.44	Peak	---	---
2	4950.000	32.46	-21.54	54.00	26.93	33.42	4.55	32.44	Average	---	---
3	7425.000	53.60	-20.40	74.00	44.11	36.42	5.79	32.72	Peak	---	---
4	7425.000	36.99	-17.01	54.00	27.50	36.42	5.79	32.72	Average	---	---
5	9900.000	55.59	-18.41	74.00	43.08	38.86	6.78	33.13	Peak	---	---
6	9900.000	38.98	-15.02	54.00	26.47	38.86	6.78	33.13	Average	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 3: For 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 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	Transmit	**Test Freq. (MHz)**	2475	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4950.000	52.84	-21.16	74.00	47.31	33.42	4.55	32.44	Peak	---	---
2	4950.000	36.23	-17.77	54.00	30.70	33.42	4.55	32.44	Average	---	---
3	7425.000	57.71	-16.29	74.00	48.22	36.42	5.79	32.72	Peak	---	---
4 @	7425.000	41.10	-12.90	54.00	31.61	36.42	5.79	32.72	Average	---	---
5	9900.000	54.80	-19.20	74.00	42.29	38.86	6.78	33.13	Peak	---	---
6	9900.000	38.19	-15.81	54.00	25.68	38.86	6.78	33.13	Average	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 3: For 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 4: If duty cycle < 100%, average emission = peak emission + 20 log (duty cycle).
Note 5: No level of unwanted emissions exceeds the level of the fundamental emission.

3.4.8 Transmitter Radiated Bandedge Emissions

2400-2483.5 MHz Transmitter Radiated Bandedge Emissions									
Modulation Mode	**Test Freq. (MHz)**	**Measure Distance (m)**	**Freq. (MHz) PK**	**Level (dBuV/m) PK**	**Limit (dBuV/m) QPK**	**Freq. (MHz) AV**	**Level (dBuV/m) AV**	**Limit (dBuV/m) AV**	**Pol.**
Transmit	2405	3	2399.820	71.03	74	2399.940	44.54	54	H
Transmit	2475	3	2483.530	65.81	74	2490.820	45.04	54	H
Note 1: Measurement worst emissions of receive antenna polarization.									

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. 14. 2014	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
Spectrum Analyzer	R&S	FSV 40	101500	9kHz ~ 40GHz	Apr. 28, 2014	RF Conducted
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jul. 31, 2014	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	Radiation
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	May 05, 2014	Radiation
Amplifier	Agilent	8449B	3008A02120	1GHz ~ 26.5GHz	Sep. 01, 2014	Radiation
Spectrum	R&S	FSP40	100004	9kHz ~ 40GHz	Mar. 27, 2014	Radiation
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30MHz ~ 1GHz	Sep. 20, 2014	Radiation
Horn Antenna	ETS・LINDGREN	3115	6741	1GHz ~ 18GHz	Jul. 11, 2014	Radiation
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	18GHz ~ 40GHz	Jan. 27, 2015	Radiation
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 15, 2014	Radiation
RF Cable-high	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz ~ 40GHz	Dec. 12, 2014	Radiation
Turn Table	EM Electronics	EM Electronics	060615	0 ~ 360 degree	N/A	Radiation
Antenna Mast	MF	MF-7802	MF780208179	1 ~ 4 m	N/A	Radiation

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9kHz ~ 30MHz	Jul. 28, 2014	Radiation

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