FCC / IC Radio Test Report

Applicant **Manufacturer**	:	**Qualcomm Atheros, Inc.** 1700 Technology Drive, San Jose, CA95110
Equipment	:	**1X1 802.11b/g/n-BT4.0 PCIe/USB M.2 Combo Module**
Brand Name	:	**Qualcomm Atheros**
Model No.	:	**QCNFA335**
FCC ID	:	**PPD-QCNFA335**
IC ID	:	**4104A-QCNFA335**
Standard	:	**47 CFR FCC Part 15.247** **RSS-210 Issue 8**
Operating Band	:	**2400 MHz – 2483.5 MHz**

The product sample received on Mar. 13, 2014 and completely tested on Mar. 28, 2014. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

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

Reviewed by:

Testing Laboratory
1190

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Summary of Test Result

Conformance Test Specifications					
Report Clause	**Ref. Std. Clause**	**Description**	**Typical Data**	**Limit**	**Result**
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	According to FCC 15.203	Complied
3.1	15.247(d) / RSS-210 A8.5	Emission in Non-Restricted Frequency Bands	Non Restricted Bands: 2391.50MHz: 45.36dB	Non-Restricted Bands: > 20 dBc	Complied
3.2	15.247(d) / RSS-210 A8.5	Emission in Restricted Frequency Bands	Restricted Bands 800.18 MHz 37.88 dBm - PK	Restricted Bands: According to FCC 15.209 / RSS-Gen 6.1	Complied
3.3	15.207 / RSS-Gen 7.2.4	AC Power-line Conducted Emissions	0.2547970 MHz 35.48 dBuV - AV 47.38 dBuV - QP	According to FCC 15.207 / RSS-Gen 7.2.4	Complied

Revision History

Report No.	Version	Description	Issued Date
FR382432AL	Rev. 02	Initial issue of report	Oct. 01, 2013
FR382432-02AL	Rev. 01	Update information as below: 1. Add Host (Dell) with two antennas. 2. Modulate power close to original power and evaluated AC conduction and radiation. 3. Implemented AC conducted emissions and radiation spurious emission test.	Apr. 07, 2014

1 General Description

1.1 Information

1.1.1 WLAN/ BT coexistence mode

1X1 WLAN + BT: WLAN/BT concurrent at different antenna port and 18MHz separation between WLAN and BT fundamental. The WLAN is transmitted by the Chain 0 and the BT is transmitted by the Chain 1.Record the worst case results in this report.

1.1.2 Modifications

The output power was set using the test utility to be within 0.5dB of the original application for the purposes of evaluating compliance of this device with the proposed changes installed. The proposed changes will not modify the output power from that reported in the original filing.

1.1.3 Antenna Information

Antenna Category		
☒	External antenna (dedicated antennas)	
	☒ RF connector provided	
		☒ Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type…)
		☐ Standard antenna connector. (e.g., SMA, N, BNC, and TNC type…)

Antenna General Information					
No.	**Frequency Band**	**Ant. Type**	**Brand Name**	**Model No.**	**Maximum Gain (dBi)**
Original					
1	2400~2483.5MHz	PIFA	Wistron NeWeb Corporation	EBJ	3.62
2	2400~2483.5MHz	Dipole	INPAQ	DAMA1BM30000402	3.20
Additional					
3	2400~2483.5MHz	PIFA	ACON	APP6P-701144	1.25
4	2400~2483.5MHz	PIFA	WNC	81EAAX15.G01	2.77

The RF conducted performed the worst configuration for higher gain was tested in original test report. This C2PC filing comes with two different antennas (#3 & #4). Antenna 4 was set for Bluetooth final test.

1.1.4 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.: built in Dell Portable Computer P20T
☐	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.:
☐	Other:

1.1.5 EUT Operational Condition

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

Both NB and tablet were been evaluated. Only the test result of worst-case (NB mode), was presented in this test report.

1.2 Accessories

Accessories Information				
AC Adapter	Model Name	DELL	Model Name	LA65NS2-01
	Power Rating	I/P: 100-240Vac~, 1.6A 50-60Hz ; O/P: 19.5V⎓3.34A		
Li-ion Battery	Brand Name	DELL	Model Name	Type GK5KY
	Power Rating	11.1 V⎓3950mAh 43Wh		

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

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 Subpart C 15.247
- RSS-210 Issue 8
- RSS-GEN Issue 3
- ANSI C63.10-2009
- FCC KDB 558074
- FCC KDB 662911

1.4 Testing Location Information

Testing Location					
☒	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.			
		TEL : 886-3-327-3456	FAX : 886-3-327-0973		
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	
AC Conduction		CO04-HY	Zeus	21.5°C / 55%	
Radiated Emission		03CH03-HY	Leo	21.5°C / 55%	

1.5 Measurement Uncertainty

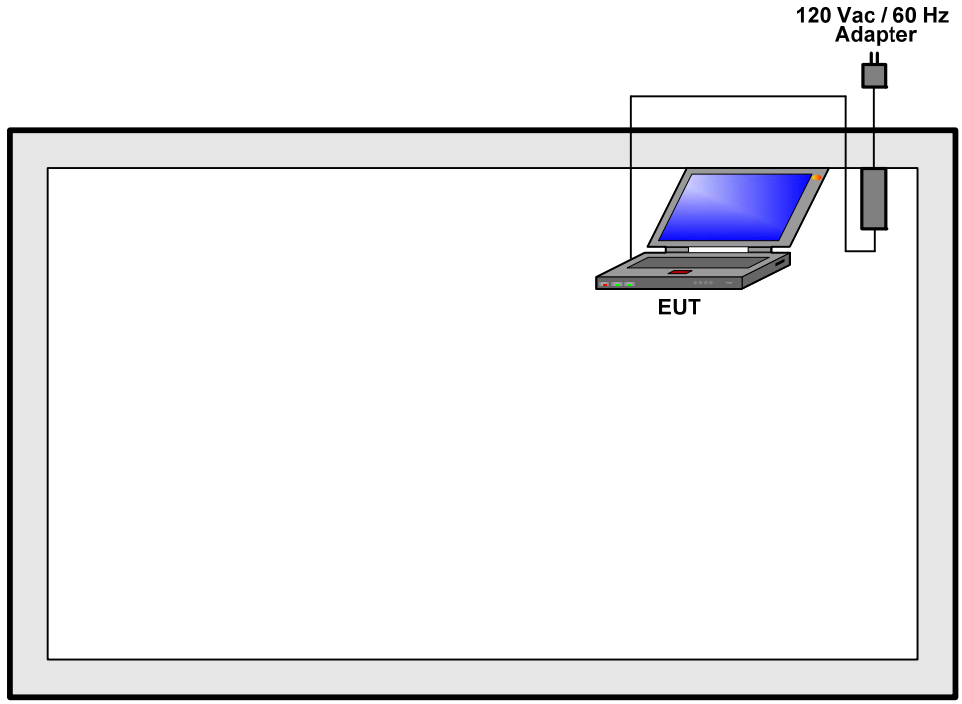
ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

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

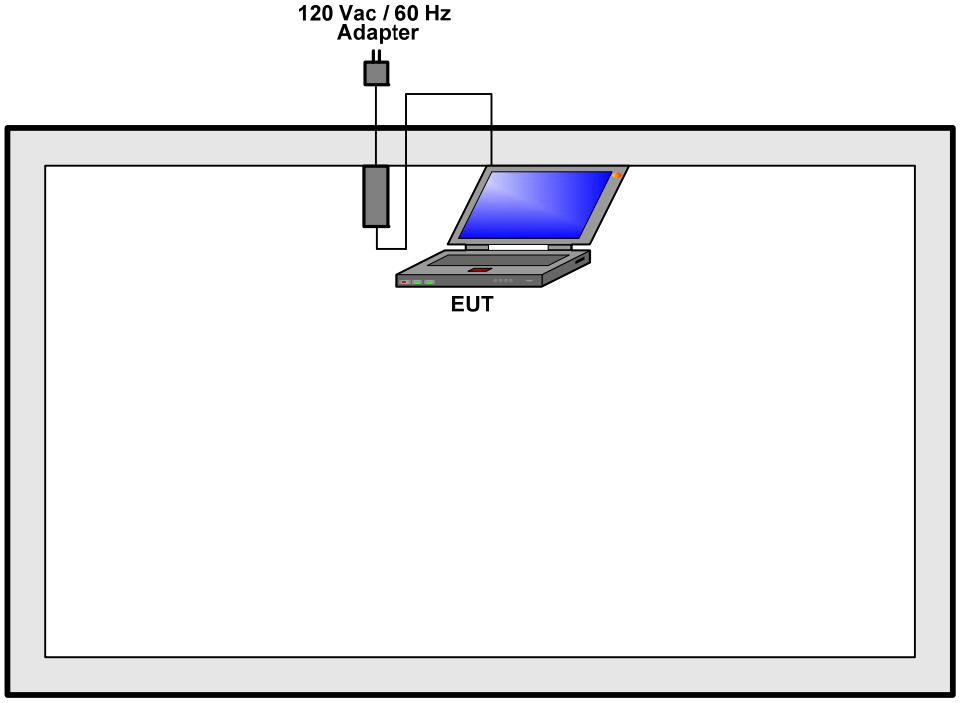
2 Test Configuration of EUT

2.1 Test Setup Diagram

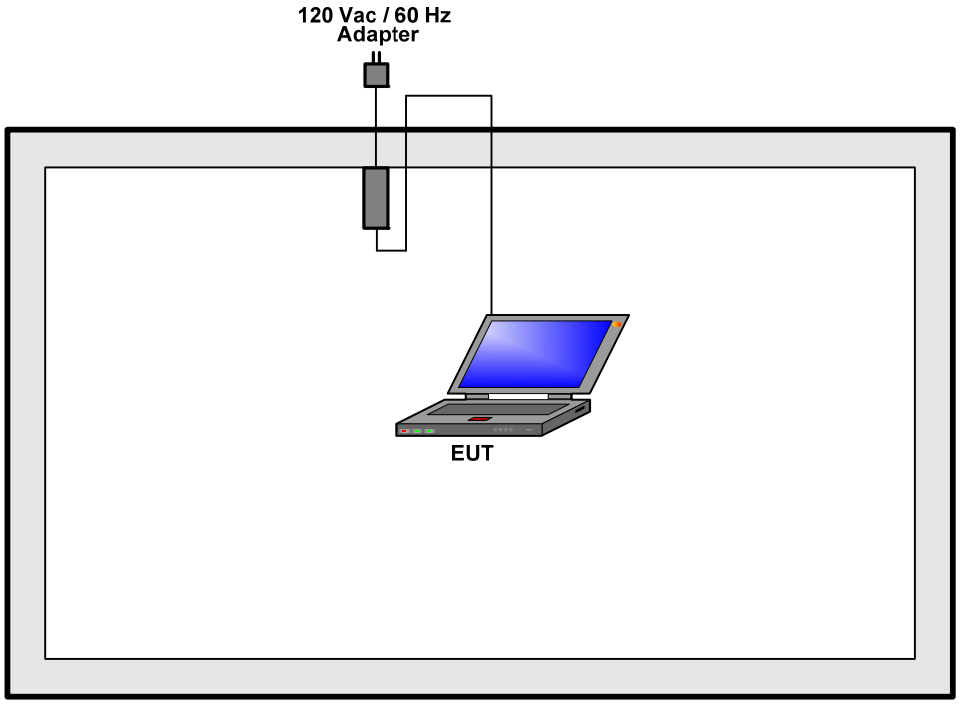
Test Setup Diagram – AC Line Conducted Emission Test



Test Setup Diagram - Radiated Emission Below 1GHz Test



Test Setup Diagram - Radiated Emission Above 1GHz Test



3 Transmitter Test Result

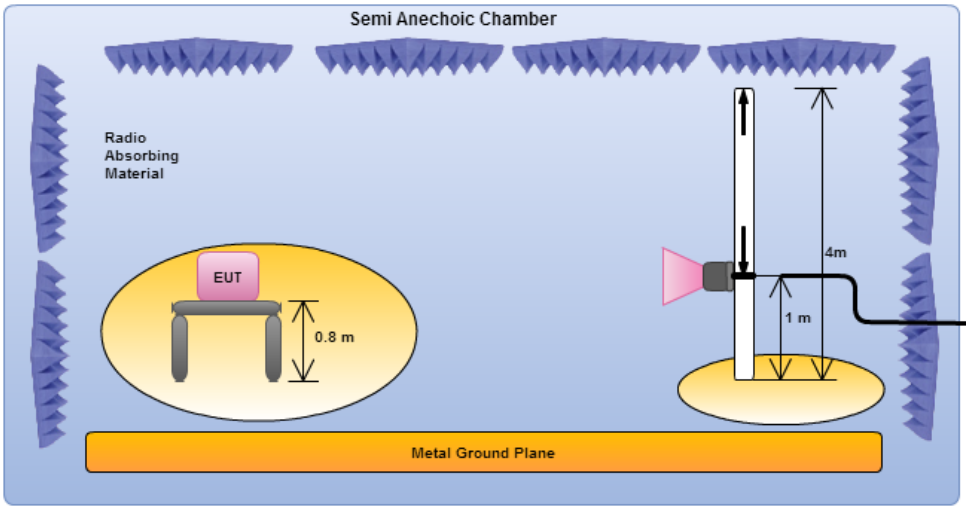
3.1 Emission in Non-Restricted Frequency Bands

3.1.1 Test Procedures

Test Method		
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].	
☒	Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
☒	For the transmitter unwanted emissions shall be measured using following options below:	
	☒	Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.
	☐	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
		☐ Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle ≥98%)
		☐ Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
		☐ Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW≥1/T).
		☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		☐ Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit.
☒	For the transmitter bandedge emissions shall be measured using following options below:	
	☒	Refer as FCC KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
	☐	Refer as ANSI C63.10, clause 6.9.2 for band-edge testing.
	☐	Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.
☒	For radiated measurement, refer as FCC KDB 558074, clause 12.2.7 and ANSI C63.10, clause 6.6. Test distance is 3m.	
☐	For conducted measurement, refer as FCC KDB 558074, clause 12.2.2.	

3.1.2 Test Setup

Transmitter Radiated Bandedge Emissions



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

3.1.3 Test Result of Emission in Non-Restricted Frequency Bands

2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Non-restricted Band)								
Modulation	**N_{TX}**	**Test Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Pol.**
LE-1Mbps	1	2402	94.28	2391.500	48.92	45.36	20	H
LE-1Mbps	1	2480	96.79	2527.920	50.70	46.09	20	H
Note 1: Measurement worst emissions of receive antenna polarization								

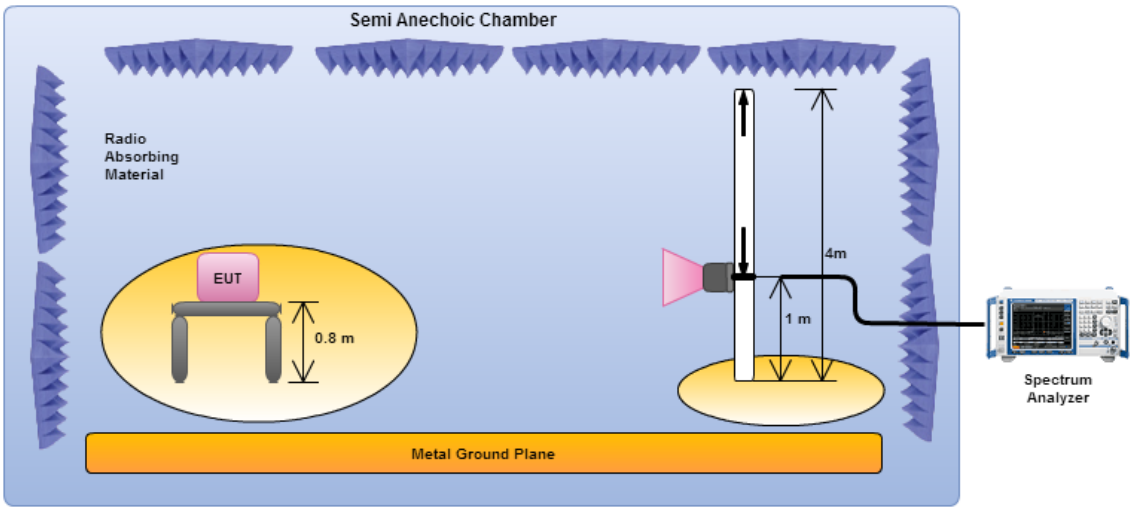
3.2 Emission in Restricted Frequency Bands

3.2.1 Test Procedures

Test Method		
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).	
	☒	Measurements in the frequency range 10 GHz - 18GHz are typically made at a closer distance 1m, because the instrumentation noise floor is typically close to the radiated emission limit.
	☒	Measurements in the frequency range above 18 GHz - 25GHz are typically made at a closer distance 0.5m, because the instrumentation noise floor is typically close to the radiated emission limit.
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].	
☒	For the transmitter unwanted emissions shall be measured using following options below:	
	☒	Refer as FCC KDB 558074, clause 11 for unwanted emissions into non-restricted bands.
	☒	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
		☐ Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle ≥98%)
		☐ Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
		☒ Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW≥1/T).
		☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		☒ Refer as FCC KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit.
		☒ Refer as FCC KDB 558074, clause 12.2.3 measurement procedure Quasi-Peak limit.
☒	For radiated measurement, refer as FCC KDB 558074, clause 12.2.7.	
	☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz and test distance is 3m.
	☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz and test distance is 3m.
	☒	Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz and test distance is 3m.
☐	For conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 12.2.2.	
	☐	For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
	☐	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
	☐	For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

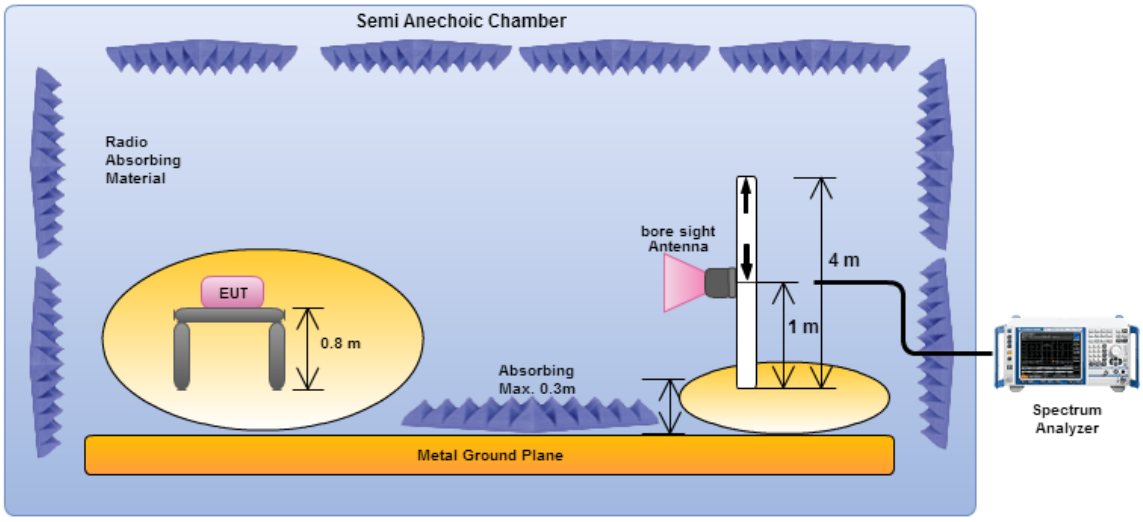
3.2.2 Test Setup

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)



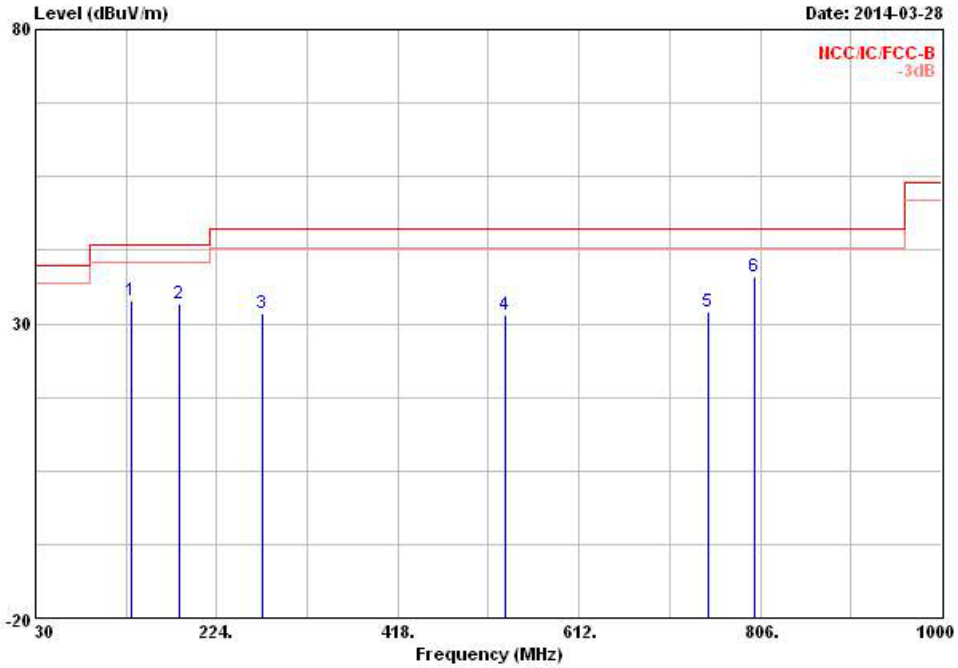
Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

3.2.3 Emission in Restricted Frequency Bands (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.

3.2.4 Emission in Restricted Frequency Bands (Below 1GHz)

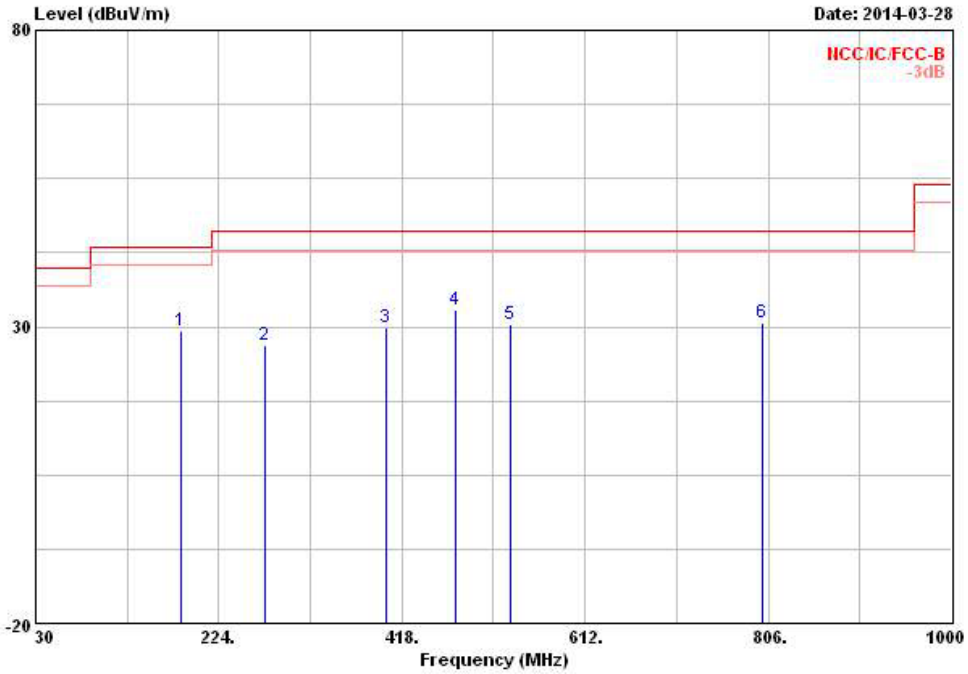
Modulation Mode	LE-1Mbps	Test Freq. (MHz)	2440
		Polarization	H



	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	132.820	33.80	-9.70	43.50	47.32	11.84	1.90	27.26	Peak	---	---
2	183.260	33.29	-10.21	43.50	48.90	9.23	2.22	27.06	Peak	---	---
3	273.470	31.83	-14.17	46.00	42.92	12.92	2.74	26.75	Peak	---	---
4	532.460	31.46	-14.54	46.00	37.58	17.93	3.87	27.92	Peak	---	---
5	749.740	32.02	-13.98	46.00	35.69	19.54	4.66	27.87	Peak	---	---
6	800.180	37.88	-8.12	46.00	41.12	19.64	4.92	27.80	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)

Modulation Mode	LE-1Mbps	Test Freq. (MHz)	2440
		Polarization	V



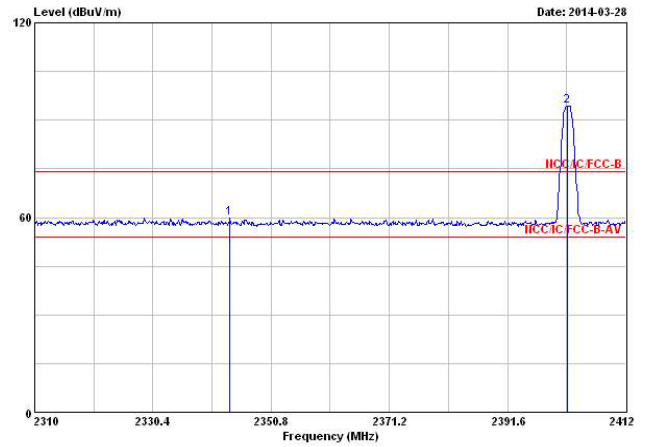
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	184.230	29.43	-14.07	43.50	45.08	9.18	2.23	27.06	Peak	---	---
2	273.470	26.94	-19.06	46.00	38.03	12.92	2.74	26.75	Peak	---	---
3	400.540	29.76	-16.24	46.00	38.06	15.70	3.34	27.34	Peak	---	---
4	474.260	32.84	-13.16	46.00	39.97	16.98	3.63	27.74	Peak	---	---
5	532.460	30.33	-15.67	46.00	36.45	17.93	3.87	27.92	Peak	---	---
6	800.180	30.68	-15.32	46.00	33.92	19.64	4.92	27.80	Peak	---	---

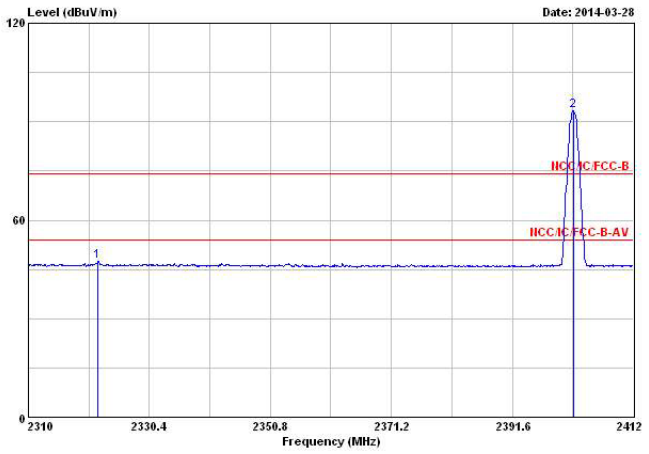
Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

3.2.5 Emission in Restricted Frequency Bands (Above 1GHz)

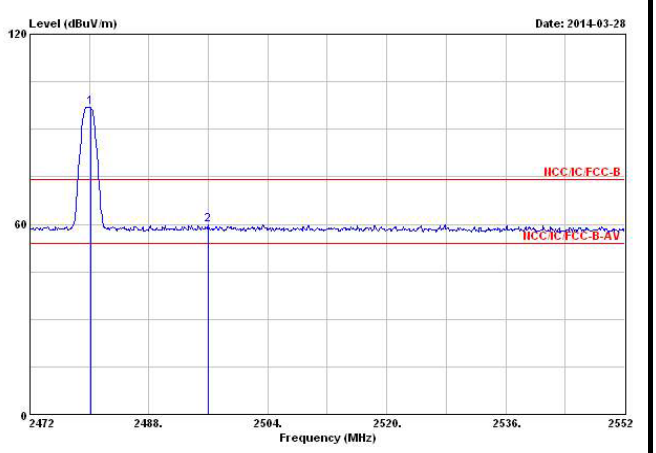
LE-1Mbps

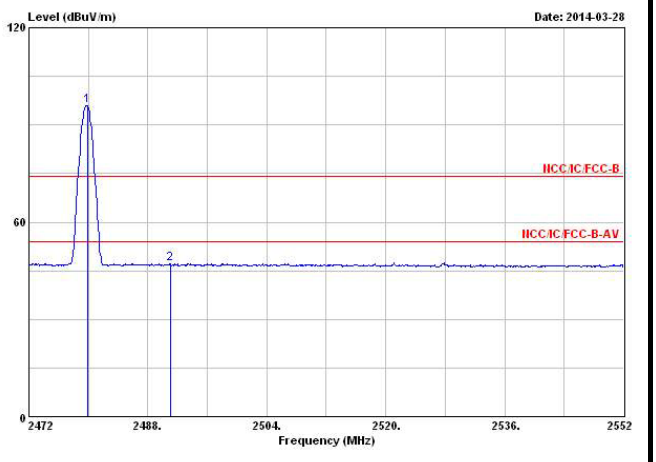
2402 MHz





2480 MHz

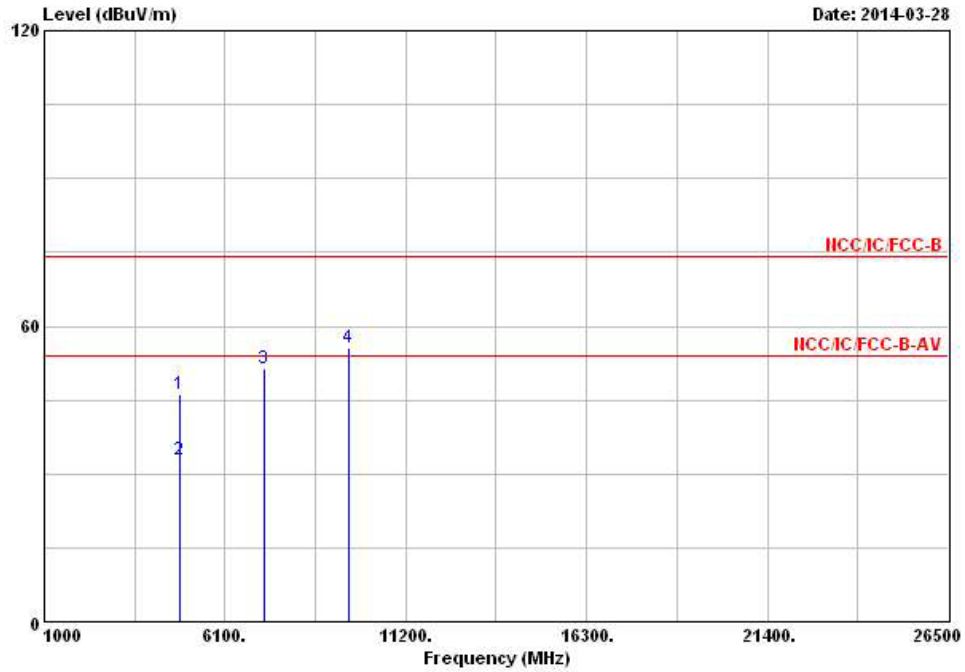




Freq. (MHz)	Measure Distance (m)	Freq. (MHz) PK	Level (dBuV/m) PK	Limit (dBuV/m) PK	Freq. (MHz) AV	Level (dBuV/m) AV	Limit (dBuV/m) AV	Pol.
2402	3	2343.660	59.77	74	2321.730	47.56	54	H
2480	3	2495.920	59.86	74	2491.040	47.24	54	H

Note 1: Measurement worst emissions of receive antenna polarization.
Note 2: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is “Pulse On Time”, e.g., LE VBW≥1/625us, VBW=3kHz.

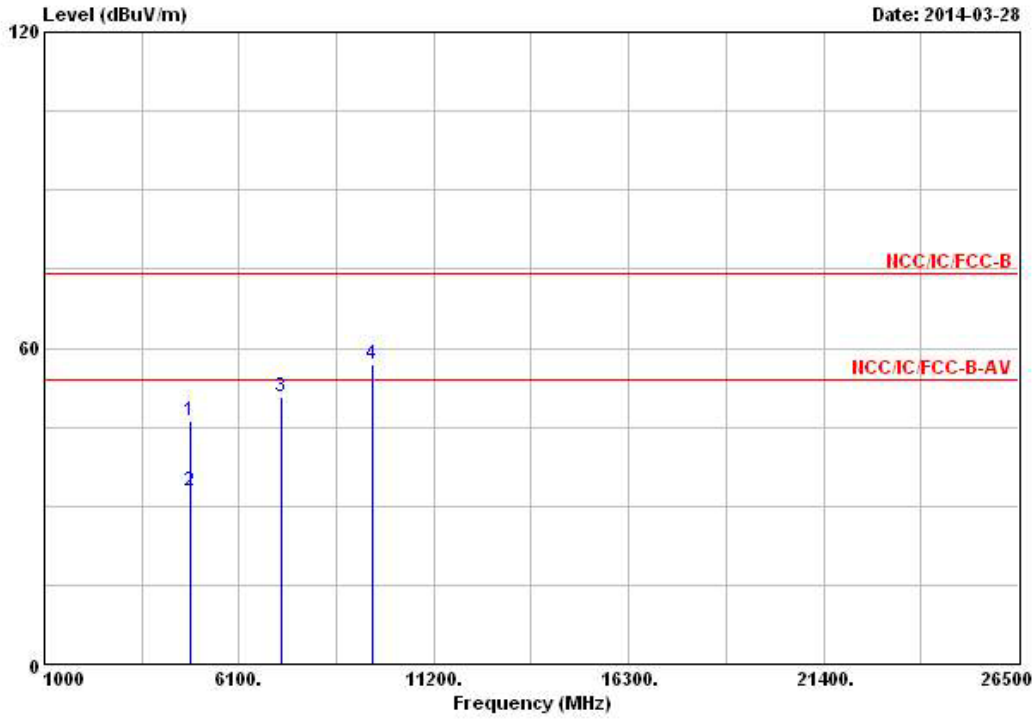
Modulation Mode	LE-1Mbps	Test Freq. (MHz)	2402
		Polarization	H



	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	4808.000	46.24	-27.76	74.00	39.91	33.06	5.71	32.44	Peak	---	---
2	4808.000	32.79	-21.21	54.00	26.46	33.06	5.71	32.44	Average	---	---
3	7206.000	51.50			41.14	35.80	7.20	32.64	Peak	---	---
4	9608.000	55.51			41.57	38.23	8.81	33.10	Peak	---	---

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 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

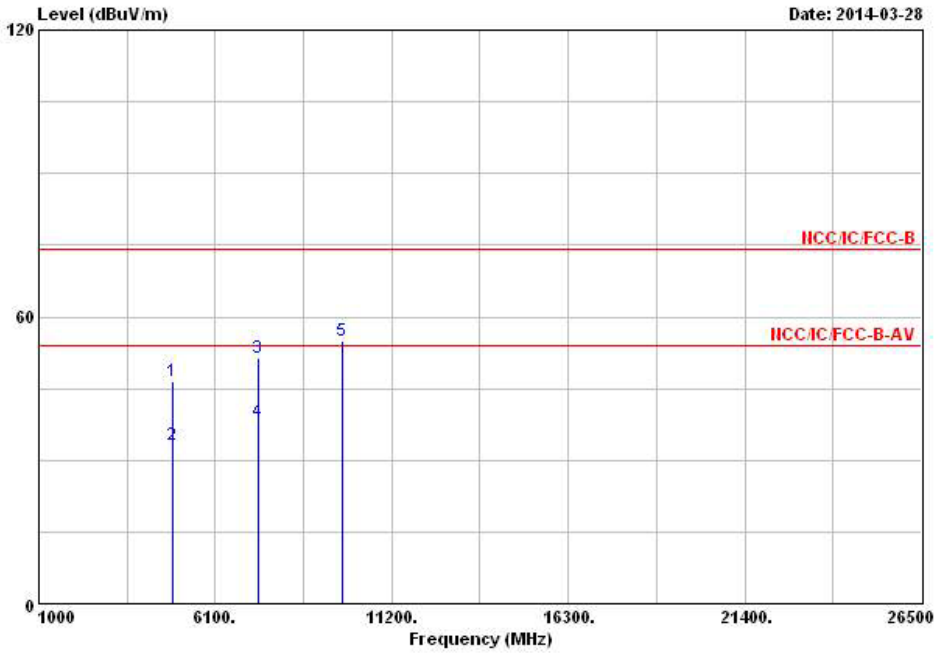
Modulation Mode	LE-1Mbps	Test Freq. (MHz)	2402
		Polarization	V



	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	4804.000	46.20	-27.80	74.00	39.87	33.06	5.71	32.44	Peak	---	---
2	4804.000	32.73	-21.27	54.00	26.40	33.06	5.71	32.44	Average	---	---
3	7206.000	50.76			40.40	35.80	7.20	32.64	Peak	---	---
4	9608.000	56.80			42.86	38.23	8.81	33.10	Peak	---	---

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 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

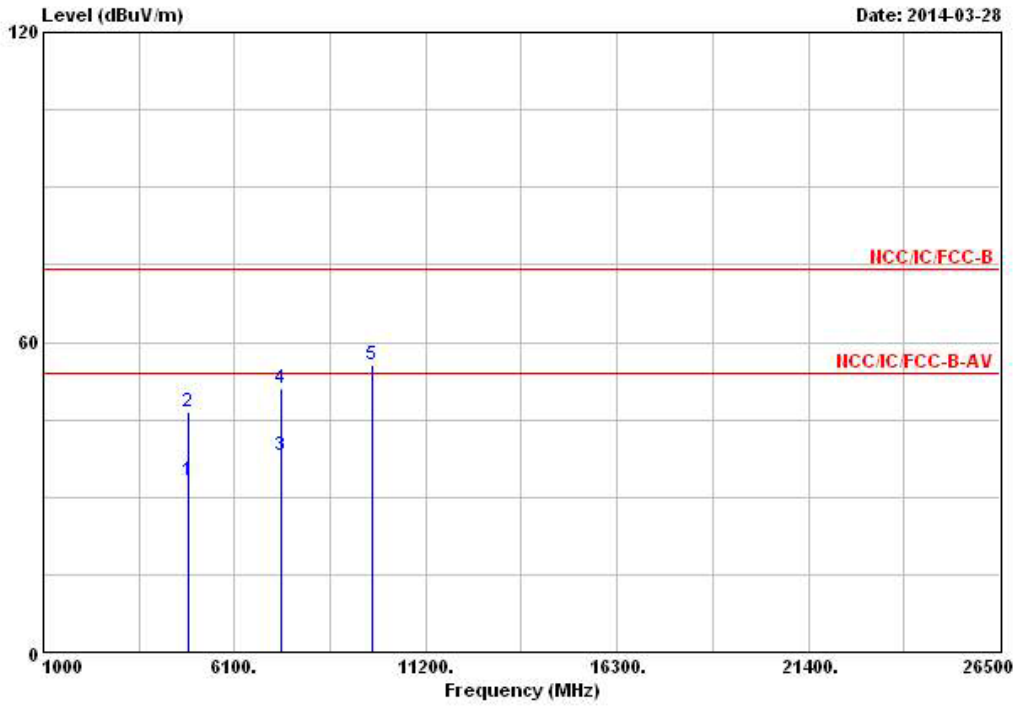
Modulation Mode	LE-1Mbps	Test Freq. (MHz)	2440
		Polarization	H



	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	46.55	-27.45	74.00	40.07	33.18	5.72	32.42	Peak	---	---
2	4880.000	33.15	-20.85	54.00	26.67	33.18	5.72	32.42	Average	---	---
3	7320.000	51.45	-22.55	74.00	40.75	36.09	7.28	32.67	Peak	---	---
4 @	7320.000	38.00	-16.00	54.00	27.30	36.09	7.28	32.67	Average	---	---
5	9764.000	55.10			40.81	38.61	8.76	33.08	Peak	---	---

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 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

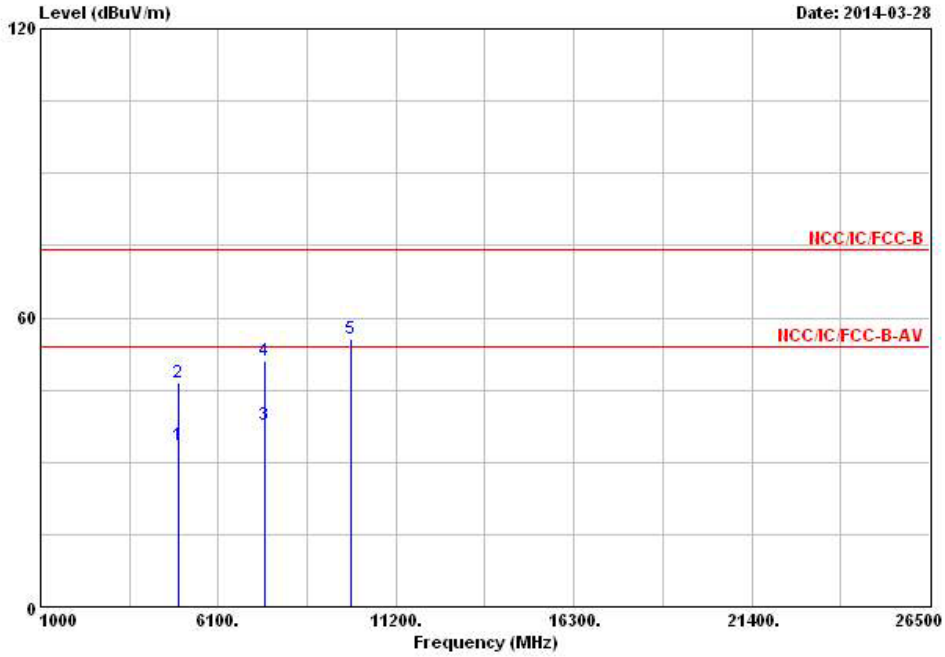
Modulation Mode	LE-1Mbps	Test Freq. (MHz)	2440
		Polarization	V



	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	33.20	-20.80	54.00	26.72	33.18	5.72	32.42	Average	---	---
2	4880.000	46.36	-27.64	74.00	39.88	33.18	5.72	32.42	Peak	---	---
3	7320.000	38.07	-15.93	54.00	27.37	36.09	7.28	32.67	Average	---	---
4	7320.000	51.11	-22.89	74.00	40.41	36.09	7.28	32.67	Peak	---	---
5	9760.000	55.62			41.37	38.57	8.76	33.08	Peak	---	---

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 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

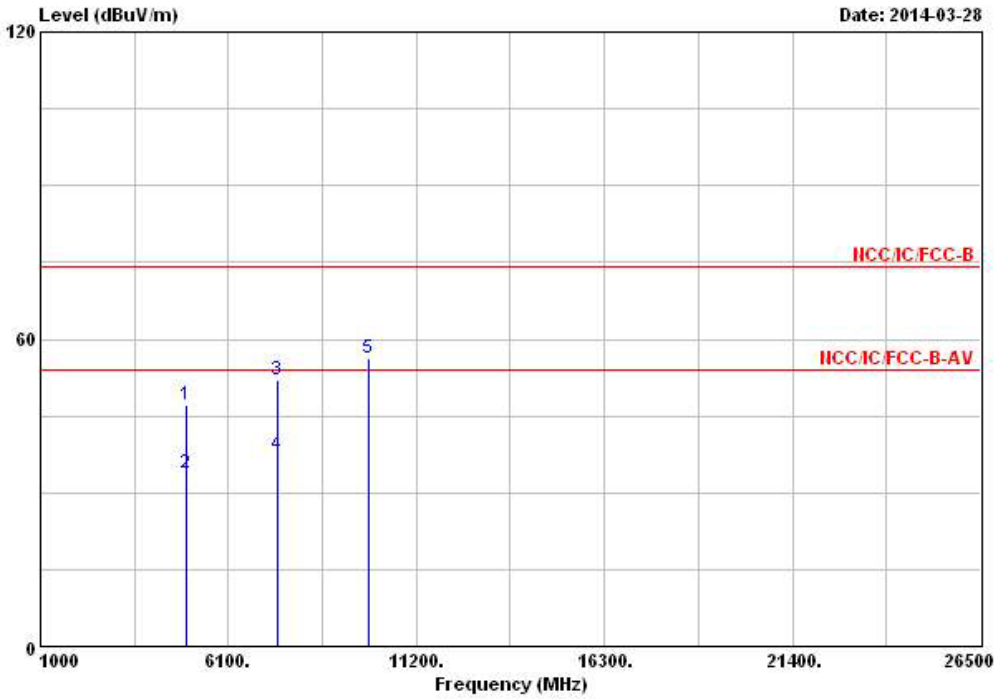
Modulation Mode	LE-1Mbps	Test Freq. (MHz)	2480
		Polarization	H



	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	4960.000	33.59	-20.41	54.00	26.91	33.34	5.75	32.41	Average	---	---
2	4960.000	46.62	-27.38	74.00	39.94	33.34	5.75	32.41	Peak	---	---
3	7440.000	37.63	-16.37	54.00	26.59	36.38	7.37	32.71	Average	---	---
4	7440.000	51.16	-22.84	74.00	40.12	36.38	7.37	32.71	Peak	---	---
5	9920.000	55.48			40.89	38.95	8.71	33.07	Peak	---	---

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 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Modulation Mode	LE-1Mbps	Test Freq. (MHz)	2480
		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	4960.000	47.15	-26.85	74.00	40.47	33.34	5.75	32.41	Peak	---	---
2	4960.000	33.68	-20.32	54.00	27.00	33.34	5.75	32.41	Average	---	---
3	7440.000	51.97	-22.03	74.00	40.93	36.38	7.37	32.71	Peak	---	---
4	7440.000	37.50	-16.50	54.00	26.46	36.38	7.37	32.71	Average	---	---
5	9920.000	56.32			41.73	38.95	8.71	33.07	Peak	---	---

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 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 4: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

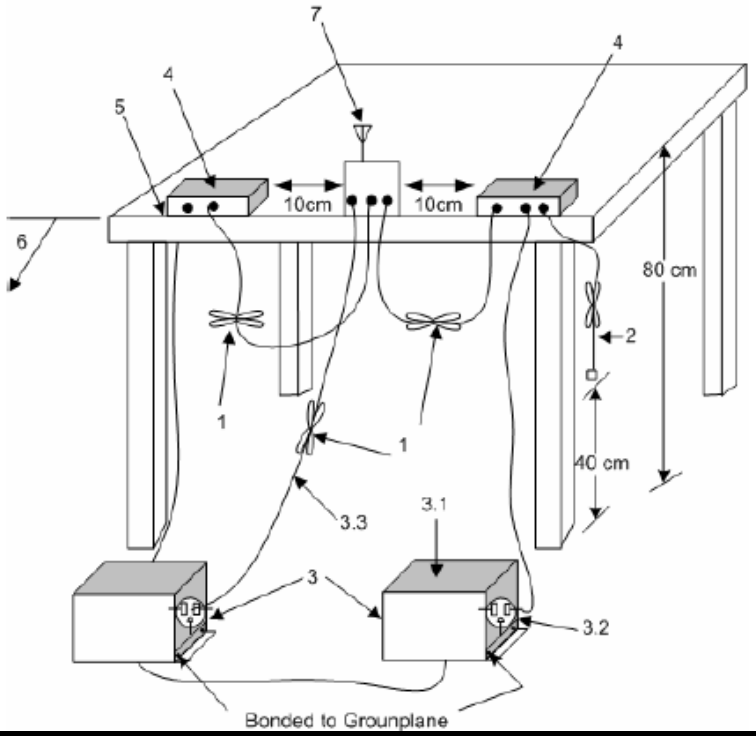
3.3 AC Power-line Conducted Emissions

3.3.1 Test Procedures

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

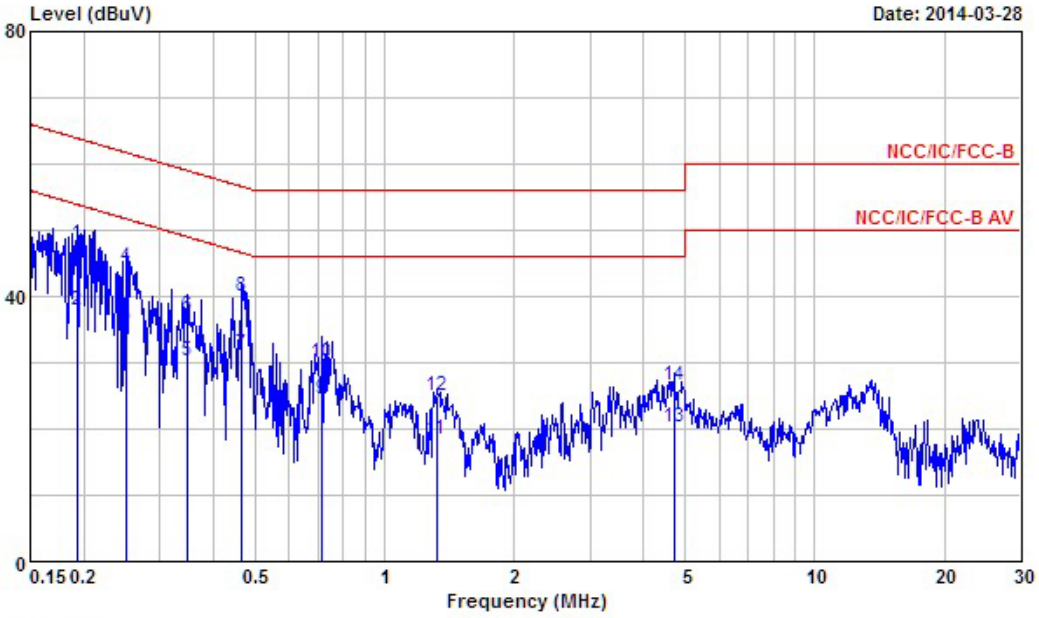
3.3.2 Test Setup

AC Power-line Conducted Emissions



3.3.3 Test Result of AC Power-line Conducted Emissions

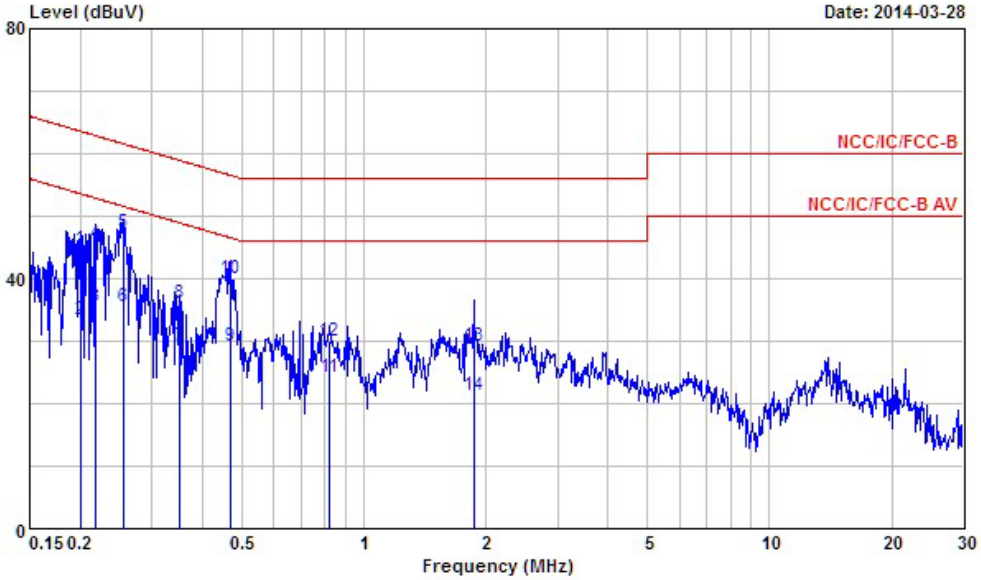
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	Normal link Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1934380	47.77	-16.12	63.89	47.27	0.02	0.48	QP
2	0.1934380	37.82	-16.07	53.89	37.32	0.02	0.48	Average
3	0.2507790	35.48	-16.25	51.73	34.93	0.02	0.53	Average
4	0.2507790	44.46	-17.27	61.73	43.91	0.02	0.53	QP
5	0.3483010	30.33	-18.67	49.00	29.72	0.03	0.58	Average
6	0.3483010	37.04	-21.96	59.00	36.43	0.03	0.58	QP
7	0.4661350	31.27	-15.31	46.58	30.61	0.03	0.63	Average
8	0.4661350	39.97	-16.61	56.58	39.31	0.03	0.63	QP
9	0.7159710	24.37	-21.63	46.00	23.60	0.04	0.73	Average
10	0.7159710	30.09	-25.91	56.00	29.32	0.04	0.73	QP
11	1.320	18.36	-27.64	46.00	17.51	0.05	0.80	Average
12	1.320	25.02	-30.98	56.00	24.17	0.05	0.80	QP
13	4.700	20.36	-25.64	46.00	19.53	0.11	0.72	Average
14	4.700	26.58	-29.42	56.00	25.75	0.11	0.72	QP

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

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	Normal link Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1996860	44.64	-18.98	63.62	44.11	0.03	0.50	QP
2	0.1996860	33.52	-20.10	53.62	32.99	0.03	0.50	Average
3	0.2173520	35.45	-17.47	52.92	34.91	0.03	0.51	Average
4	0.2173520	45.49	-17.43	62.92	44.95	0.03	0.51	QP
5	0.2547970	47.38	-14.22	61.60	46.82	0.03	0.53	QP
6	0.2547970	35.48	-16.12	51.60	34.92	0.03	0.53	Average
7	0.3501520	29.31	-19.65	48.96	28.70	0.03	0.58	Average
8	0.3501520	36.11	-22.85	58.96	35.50	0.03	0.58	QP
9	0.4711010	29.32	-17.17	46.49	28.64	0.04	0.64	Average
10	0.4711010	39.96	-16.53	56.49	39.28	0.04	0.64	QP
11	0.8217160	24.34	-21.66	46.00	23.53	0.05	0.76	Average
12	0.8217160	30.06	-25.94	56.00	29.25	0.05	0.76	QP
13	1.870	29.19	-26.81	56.00	28.32	0.07	0.80	QP
14	1.870	21.43	-24.57	46.00	20.56	0.07	0.80	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.)

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	Mar. 26, 2014	Conduction
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	JAN. 21, 2014	Conduction
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	Oct. 30, 2013	Conduction
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction

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. 30, 2013	Radiation
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	May 03, 2013	Radiation
Amplifier	Agilent	8449B	3008A02120	1GHz ~ 26.5GHz	Aug. 20, 2013	Radiation
Spectrum	R&S	FSV40	101514	10Hz ~ 40GHz	Apr. 15, 2013	Radiation
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30MHz ~ 1GHz	Sep. 21, 2013	Radiation
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 31, 2013	Radiation
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz ~ 40GHz	Jan. 10, 2014	Radiation
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 16, 2013	Radiation
RF Cable-high	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz ~ 40GHz	Dec. 11, 2013	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	TESEQ	HLA 6120	31244	9 kHz - 30 MHz	Dec. 02, 2012	Radiation

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