FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Applicant:	**CLAMCASE, LLC**
Address:	**7095 HOLLYWOOD BLVD. , SUITE 444, , HOLLYWOOD, CA 90028 , CA 90028 , USA**
Product Name:	**IPAD ACCESSORY WITH KB AND BT RADIO**
Model Name:	**CM1001**
Brand Name:	**CLAMCASE**
FCC ID:	**YUG-CM1001**
Report No.:	**STS131204F1**
Date of Issue:	**December 10,2013**

Issued by:	**Shenzhen Super Test Service Technology Co., Ltd.**
Address :	**No.5, Langshan 2nd Rd., North Hi-Tech Industrial park, Nanshan, Shenzhen, Guangdong, China**
Tel :	**86-755-2795 8522**
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1. VERIFICATION OF CONFORMITY

Equipment Under Test:	IPAD ACCESSORY WITH KB AND BT RADIO
Brand Name:	CLAMCASE
Model Number:	CM1001
Series Model Difference description:	N/A
FCC ID:	YUG-CM1001
Applicant:	CLAMCASE, LLC 7095 HOLLYWOOD BLVD. , SUITE 444, , HOLLYWOOD, CA 90028 , CA 90028 , USA
Manufacturer:	CLAMCASE, LLC 7095 HOLLYWOOD BLVD. , SUITE 444, , HOLLYWOOD, CA 90028 , CA 90028 , USA
Technical Standards:	47 CFR Part 15 Subpart C
File Number:	STS131204F1
Date of test:	December 2,2013-December 10,2013
Deviation:	None
Condition of Test Sample:	Normal
Test Result:	PASS

The above equipment was tested by STS for compliance with the requirements set forth in FCC rules and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested by (+ signature): Petter Ping

Petter Ping December 10,2013

Review by (+ signature): July Wen

July Wen December 10,2013

Approved by (+ signature): Terry Yang

Terry Yang December 10,2013

2. GENERAL INFORMATION

2.1 Product Information

Product	IPAD ACCESSORY WITH KB AND BT RADIO
Trade Name	CLAMCASE
Model Number	CM1001
Power Supply	DC: 3.7V by Li-ion Battery; DC: 5V by USB Port form AC Adapter (optional);
Frequency Range	2402MHz -2480MHz
Modulation Type	FHSS
Transmit Data Rate	GFSK(1Mbps), II/4-DQPSK(2Mbps), 8-DPSK(3Mbps)
Antenna Type:	Internal Fixed
Channel Spacing:	1MHz
Channel Number	79(CH Low: 2402MHz, CH Mid: 2441MHz, CH High: 2480MHz)
Temperature Range	-20°C ~ 50°C

NOTE:

1. Please refer to Appendix I for the photographs of the EUT. For a more detailed features description about the EUT, please refer to User's Manual.

2.2 Objective

The objective of the report is to perform tests according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 (10-1-11 Edition)	Radio Frequency Devices

2.3 Test Standards and Results

Test items and the results are as bellow:

No.	Section	Description	Result	Date of Test
1	15.249(a)	Spurious Emission	PASS	2013-12-06
2	15.249(a)	Band Edge	PASS	2013-12-06
3	15.207	Power Line Conducted Emission Test	PASS	2013-12-06

Note: 1. The test result judgment is decided by the limit of measurement standard
2. The information of measurement uncertainty is available upon the customer's request.

2.4 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35ºC
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

3. TEST FACILITY

3.1TEST FACILITY

Test Site:	Compliance Certification Services Inc. (Kun shan) Laboratory
Location:	No.10 Weiye Rd, Innovation park, Eco&Tec,Development Zone, Kunshan City, Jiangsu, China
Description:	There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4 and CISPR 16 requirements. The FCC Registration Number is **238958.** The **CNAS** Registration Number is **CNAS L4354.**
Site Filing:	The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.
Instrument Tolerance:	All measuring equipment is in accord with ANSI C63.4:2009 and CISPR 16 requirements that meet industry regulatory agency and accreditation agency requirement.
Ground Plane:	Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna.

3.2 GENERAL TEST PROCEDURES

EUT Function and Test Mode

The EUT has been tested under normal operating（TX）and standby（RX）condition.

The field strength of radiation emission was measured in the following position: EUT stand-up position (Y axis), lie-down position (X, Z axis).

The following data show only with the worst case setup.

The worst case of X axis was reported.

Based on client request, all normal using modes of the normal function were tested but only the worst test data of the worst mode is reported by this report.

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4:2009,Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4:2009.

3.3 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi- peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

4. SETUP OF EQUIPMENT UNDER TEST

4.1 SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Note
Charger	CLAMCASE, LLC	CM1001WS	N/A	N/A	FCC Doc
USB Cable	CLAMCASE, LLC	CM1001WS	N/A	1.0m un-shield	FCC Doc

Remark:

All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2 TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at CCS for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1.0 GHz or above.

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due	calibration interval
Spectrum Analyzer	Agilent	E4446A	MY44020154	2014-5-12	1 year
EMI Test Receiver	R&S	ESCI	1166.5950.03	2014-8-13	1 year
Pre-Amplfier	Miteq	NSP4000-NF	870629	2014-5-12	1 year
Bilog Antenna	Sunol	JB1	A110204-2	2014-5-12	1 year
Horn-antenna	SCHWARZBECK	BBHA9120D	D:266	2014-6-7	1 year
Horn-antenna	SCHWARZBECK	BBHA9170	D:171	2014-4-28	1 year
Loop-antenna	ZHINAN	ZN30900A	N/A	2014-6-7	1 year
Turn Table	CT	CT123	4165	N.C.R	1 year
Antenna Tower	CT	CTERG23	3256	N.C.R	1 year
Controller	CT	CT1OO	95637	N.C.R	1 year
EMI TEST RECEIVER	R&S	ESCI	100781	2014-3-14	1 year
V (V-LISN)	R&S	ENV216	101604	2014-5-21	1 year
Pulse Limiter	R&S	ESH3-Z2	100524	2014-9-24	1 year
Temperature Chamber	Guangzhou Gongwen	GDS-250	N/A	2014-9-24	1 year
Test Software	EZ-EMC				

NOTE: *Equipments listed above have been calibrated and are in the period of validation.*

5. 47 CFR Part 15C 15.249 Requirements

5.1 Spurious Emission Test

5.1.1 Requirement

According to FCC section 15.249(a):

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (μV/m)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009-0.490	2400/F (KHz)	300
0.490-1.705	24000/F (KHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

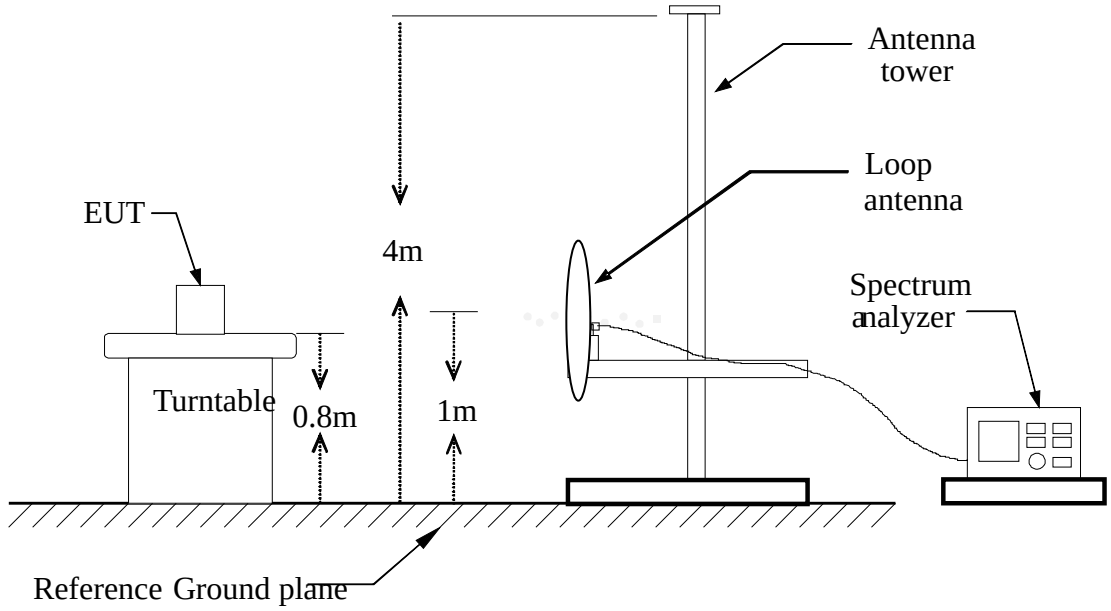
In the above emission table, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

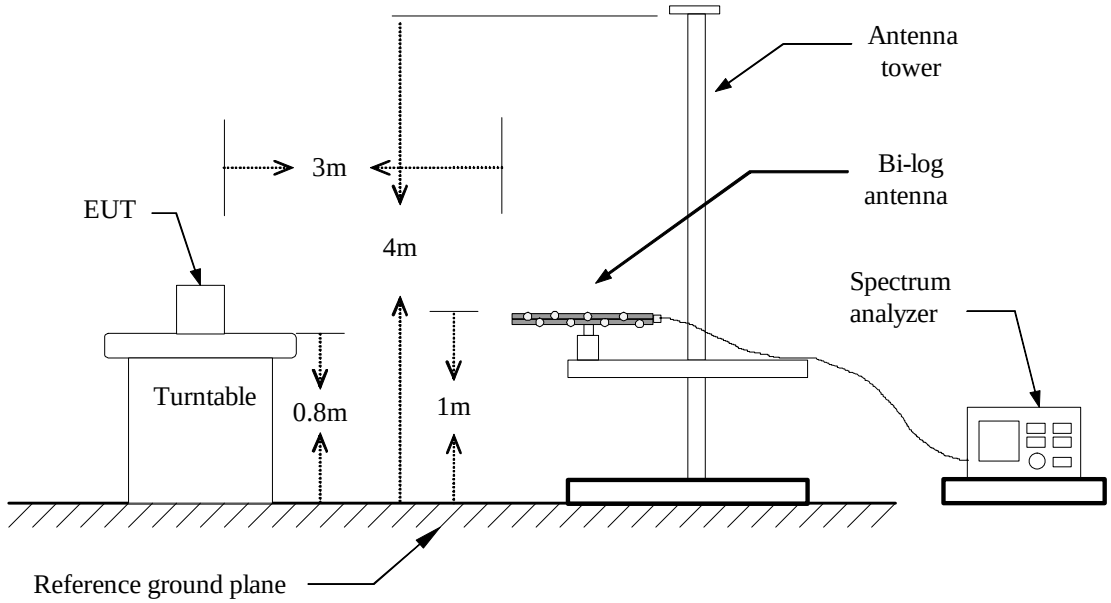
5.1.2 Test Description

Test Setup:

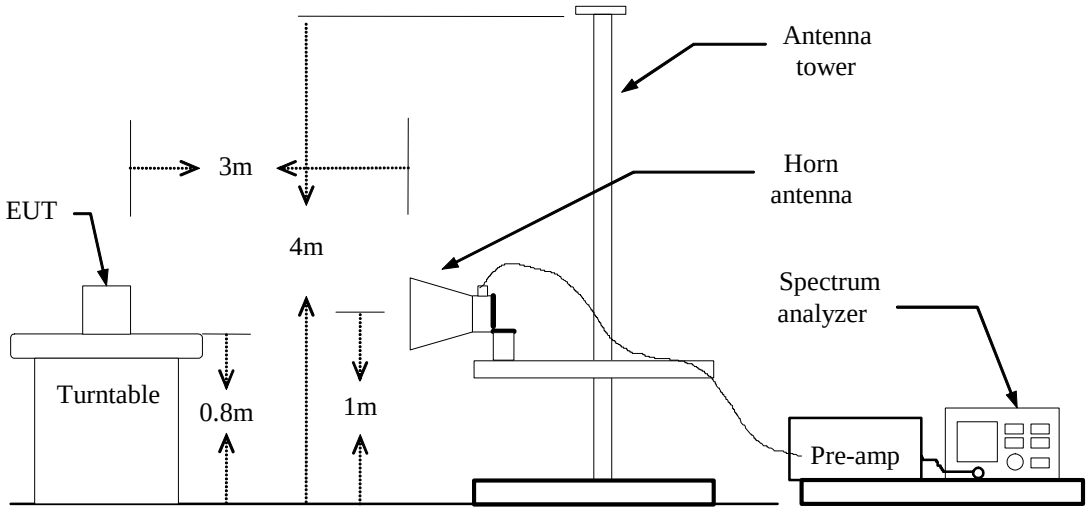
Form 9KHz to 30MHz:



Blow 1GHz:



Above 1GHz:



5.1.3 Test Description

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz: RBW=100 kHz / VBW=300 kHz / Sweep=AUTO

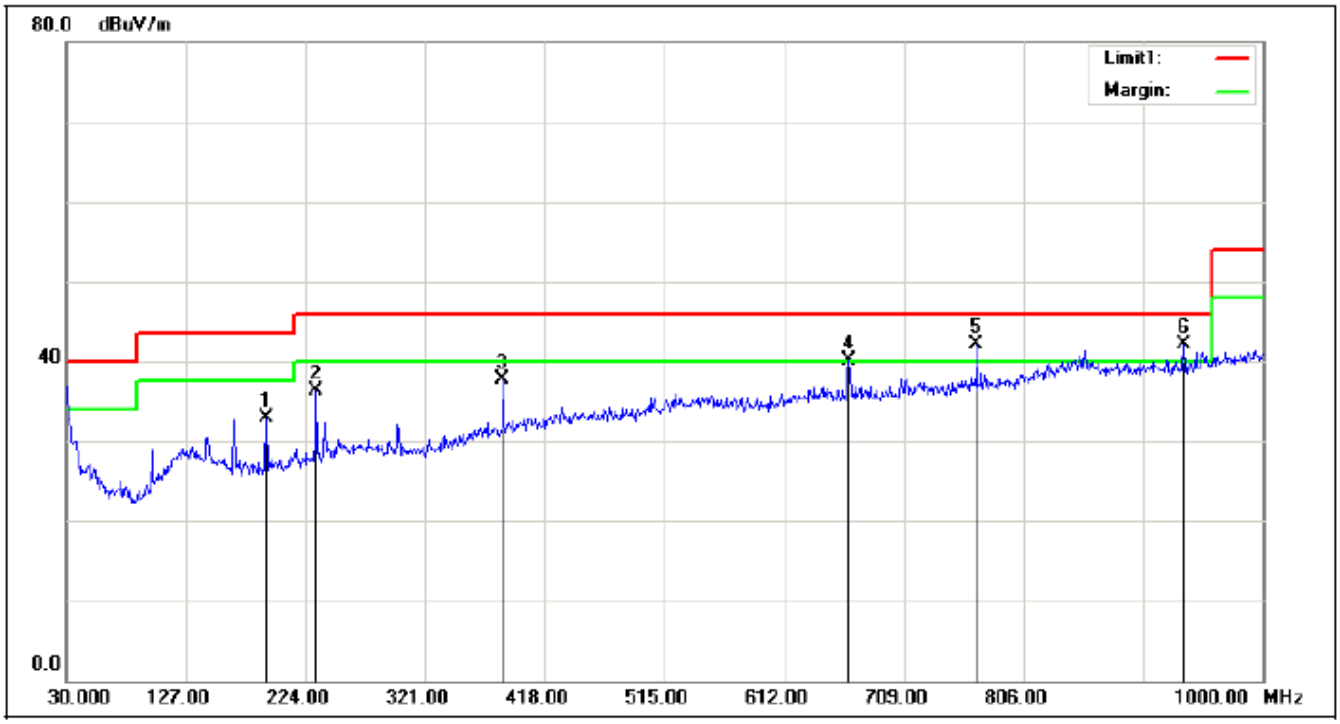
   Above 1GHz :(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

5.1.4 Test Result

Form 9KHz to 30MHz:

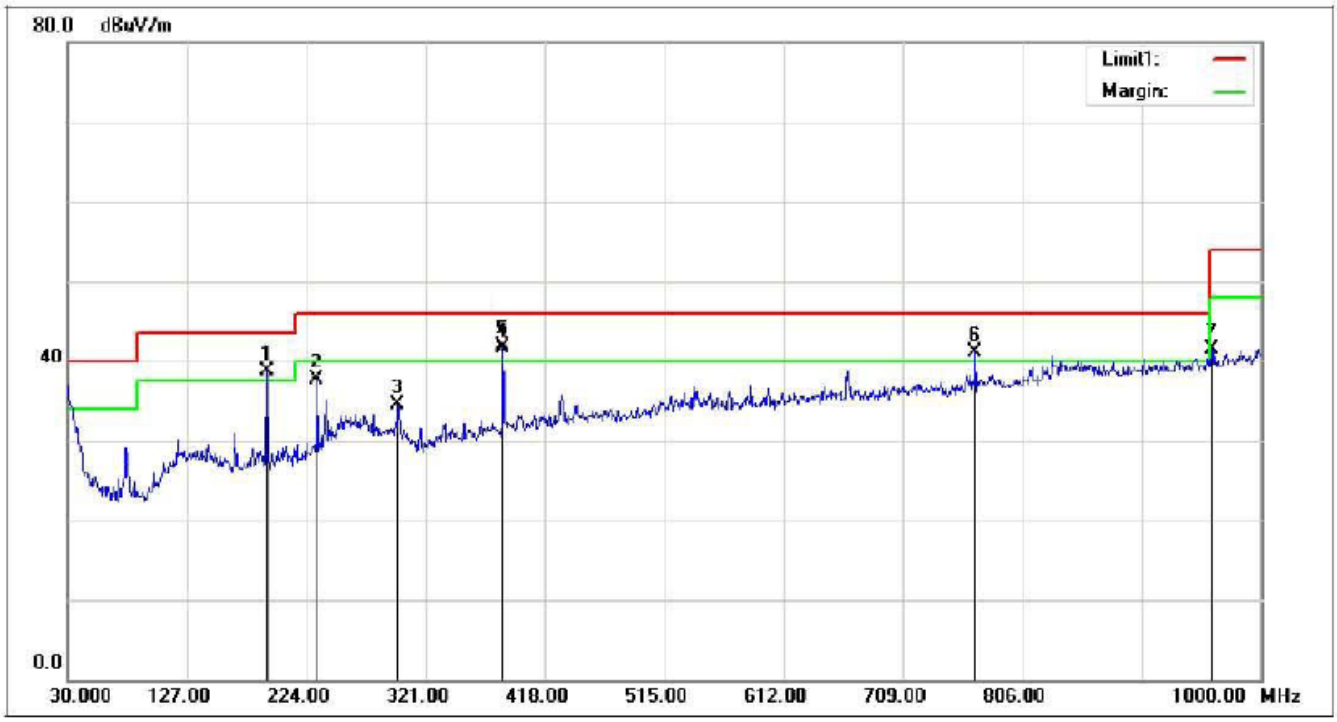
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Form 30MHz to 1000MHz:



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	191.9900	20.12	12.80	32.92	43.50	-10.58	100	3	peak
2	232.7300	22.74	13.53	36.27	46.00	-9.73	203	189	peak
3	384.0500	20.14	17.61	37.75	46.00	-8.25	203	189	peak
4	664.3800	17.83	22.36	40.19	46.00	-5.81	99	360	peak
5	768.1700	18.73	23.39	42.12	46.00	-3.88	100	273	peak
6	935.9800	16.80	25.30	42.10	46.00	-3.90	203	315	peak

(Ant. Polar.: Vertical)



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	191.9900	25.87	12.80	38.67	43.50	-4.83	100	166	peak
2	232.7300	24.26	13.53	37.79	46.00	-8.21	100	95	peak
3	298.6900	19.71	14.76	34.47	46.00	-11.53	100	196	peak
4	384.0100	27.38	17.61	44.99	46.00	-1.01	99	176	QP
5	384.0500	25.65	17.61	42.26	46.00	-2.74	100	176	peak
6	768.1700	17.64	23.39	41.03	46.00	-4.97	100	85	peak
7	960.2300	15.02	26.50	41.52	54.00	-12.48	100	54	peak

(Ant. Polar.: Horizontal)

Above 1 GHz

Operation Mode:	CH Low (GFSK Mode)	**Test Date:**	December 06,2013
Temperature:	20ºC	**Tested by:**	Petter Ping
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2402.01	H	86.38	67.13	19.08	105.46	86.21	114.00	94.00	-7.79
4804.02	H	43.16	25.85	23.08	66.24	48.93	74.00	54.00	-5.07
N/A									>20
2402.01	V	86.59	67.52	19.02	105.61	86.54	114.00	94.00	-7.46
4804.02	V	43.76	26.09	23.03	66.79	49.12	74.00	54.00	-4.88
N/A									>20

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode:	CH Mid (GFSK Mode)	**Test Date:**	December 06,2013
Temperature:	20°C	**Tested by:**	Petter Ping
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2441.02	H	86.26	66.31	19.12	105.38	85.43	114.00	94.00	-8.57
4882.04	H	43.05	24.86	24.09	67.14	48.95	74.00	54.00	-5.05
N/A									>20
2441.02	V	77.55	66.55	19.07	105.61	85.62	114.00	94.00	-8.38
4882.04	V	43.41	25.10	23.94	67.35	49.04	74.00	54.00	-4.96
N/A									>20

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
   b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode:	CH High(GFSK Mode)	**Test Date:**	December 06,2013
Temperature:	20°C	**Tested by:**	Petter Ping
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2480.01	H	82.47	62.69	22.15	104.62	84.84	114.00	94.00	-9.16
4960.05	H	41.60	22.89	24.13	65.73	47.02	74.00	54.00	-6.98
N/A									>20
2480.01	V	82.87	63.09	21.84	104.71	84.93	114.00	94.00	-9.07
4960.05	V	42.00	23.38	24.01	66.01	47.39	74.00	54.00	-6.61
N/A									>20

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
   b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode:	CH Low (II/4-DQPSK Mode)	**Test Date:**	December 06,2013
Temperature:	20°C	**Tested by:**	Petter Ping
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2402.01	H	84.07	65.14	19.08	103.15	84.22	114.00	94.00	-9.78
4804.02	H	42.53	22.42	23.08	65.61	45.50	74.00	54.00	-8.50
N/A									>20
2402.01	V	84.54	65.56	19.02	103.56	84.58	114.00	94.00	-9.42
4804.02	V	42.36	22.30	23.93	66.29	46.23	74.00	54.00	-7.77
N/A									>20

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode:	CH Mid (II/4-DQPSK Mode)	**Test Date:**	December 06,2013
Temperature:	20°C	**Tested by:**	Petter Ping
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2441.02	H	83.99	64.56	19.12	103.11	83.68	114.00	94.00	-10.32
4884.01	H	38.89	23.21	24.09	62.98	47.30	74.00	54.00	-6.70
N/A									>20
2441.02	V	77.55	65.38	19.07	103.54	84.45	114.00	94.00	-9.55
4884.01	V	39.54	23.62	23.94	63.48	47.56	74.00	54.00	-6.44
N/A									>20

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
   b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode:	CH High(II/4-DQPSK Mode)	**Test Date:**	December 06,2013
Temperature:	20°C	**Tested by:**	Petter Ping
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2480.01	H	82.46	65.41	22.15	104.61	87.56	114.00	94.00	-6.44
4960.20	H	41.00	23.45	24.13	65.13	47.58	74.00	54.00	-6.42
N/A									>20
2480.01	V	82.92	65.82	21.84	104.76	87.66	114.00	94.00	-6.34
4960.03	V	41.16	24.09	24.65	65.81	48.74	74.00	54.00	-5.26
N/A									>20

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
   b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode:	CH Low (8-DPSK Mode)	**Test Date:**	December 06,2013
Temperature:	20°C	**Tested by:**	Petter Ping
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2402.01	H	84.06	65.68	19.08	103.14	84.76	114.00	94.00	-9.24
4804.02	H	39.40	22.28	23.08	62.48	45.36	74.00	54.00	-8.64
N/A									>20
2402.01	V	84.33	65.85	19.02	103.35	84.87	114.00	94.00	-9.13
4804.02	V	38.66	21.59	23.93	62.59	45.52	74.00	54.00	-8.48
N/A									>20

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.*
   b. *AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.*

Operation Mode:	CH Mid (8-DPSK Mode)	**Test Date:**	December 06,2013
Temperature:	20°C	**Tested by:**	Petter Ping
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2441.02	H	84.68	65.63	19.12	103.80	84.75	114.00	94.00	-9.25
4884.01	H	38.99	22.42	24.09	63.08	46.51	74.00	54.00	-7.49
N/A									>20
2441.02	V	77.55	65.65	19.07	103.92	84.72	114.00	94.00	-9.28
4884.01	V	39.47	22.63	23.94	63.41	46.57	74.00	54.00	-7.43
N/A									>20

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
   b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode:	CH High (8-DPSK Mode)	**Test Date:**	December 06,2013
Temperature:	20°C	**Tested by:**	Petter Ping
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2480.01	H	81.01	62.67	22.15	103.16	84.82	114.00	94.00	-9.18
4960.20	H	40.30	21.95	24.13	64.43	46.08	74.00	54.00	-7.92
N/A									>20
2480.01	V	81.85	63.40	21.84	103.69	85.24	114.00	94.00	-8.76
4960.03	V	40.20	22.31	24.65	64.85	46.96	74.00	54.00	-7.04
N/A									>20

Notes:

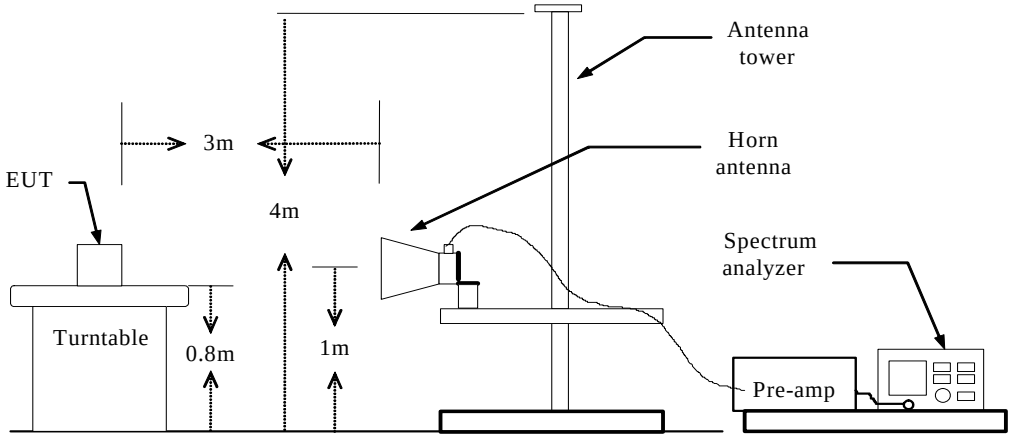
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
   b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

5.2 Band Edge

5.2.1 Requirement

According to FCC section 15.249(a), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.2.2 Test Description

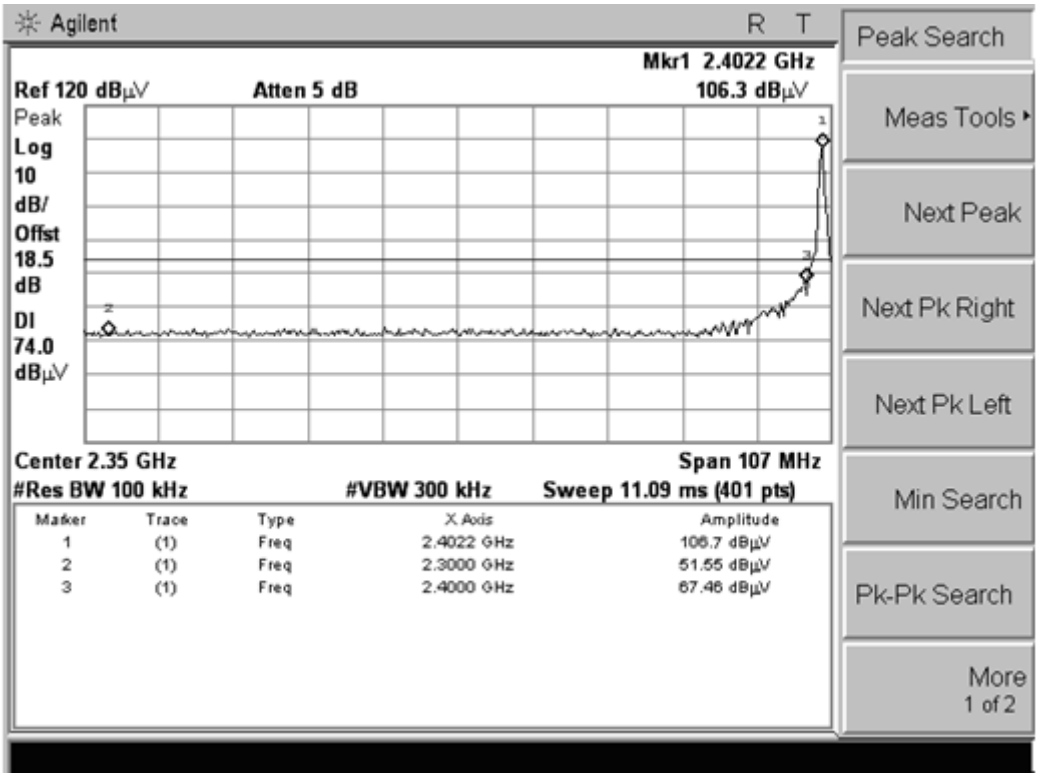


5.2.3Test Result

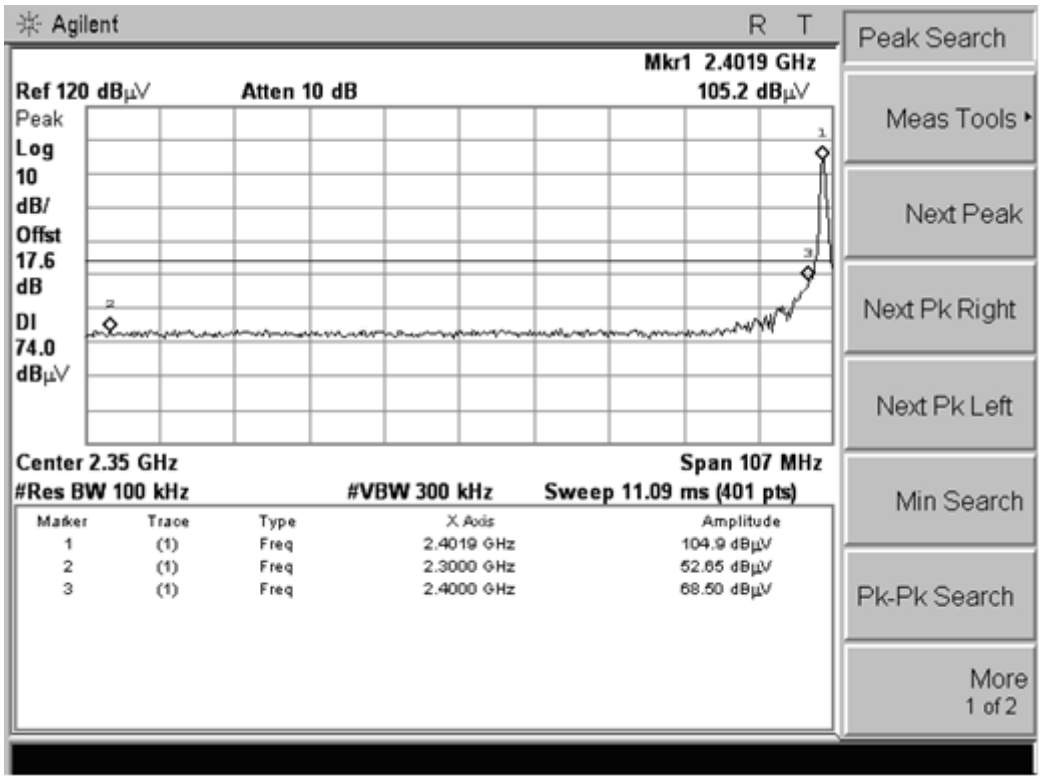
Test Mode		Channel Marked Frequency	Limit (dBuv/m)	Test Result Highest Emission (dBuv/m)			
				Horizontal		Vertical	
				Peak	Average	Peak	Average
8-DPSK	Low Channel	2300MHz	74(Peak) 54(Average)	51.55	32.61	52.65	33.69
		2400MHz		67.46	48.32	68.50	48.48
	High Channel	2483.5MHz		63.44	33.64	62.72	33.86
		2500MHz		52.89	33.86	52.95	34.05
II/4-DQPSK	Low Channel	2300MHz	74(Peak) 54(Average)	50.36	32.19	50.56	32.46
		2400MHz		66.62	47.12	66.74	47.45
	High Channel	2483.5MHz		51.28	32.56	51.58	32.71
		2500MHz		56.43	33.22	56.69	33.62
GFSK	Low Channel	2300MHz	74(Peak) 54(Average)	50.24	32.25	50.62	32.40
		2400MHz		66.19	47.39	66.35	47.56
	High Channel	2483.5MHz		50.25	32.11	50.72	32.43
		2500MHz		55.84	33.46	55.95	33.52

Note: All the modulations type were testing according to the different transmitting data rate, but only the worst Test data and plots (8-DPSK) were display in the report.

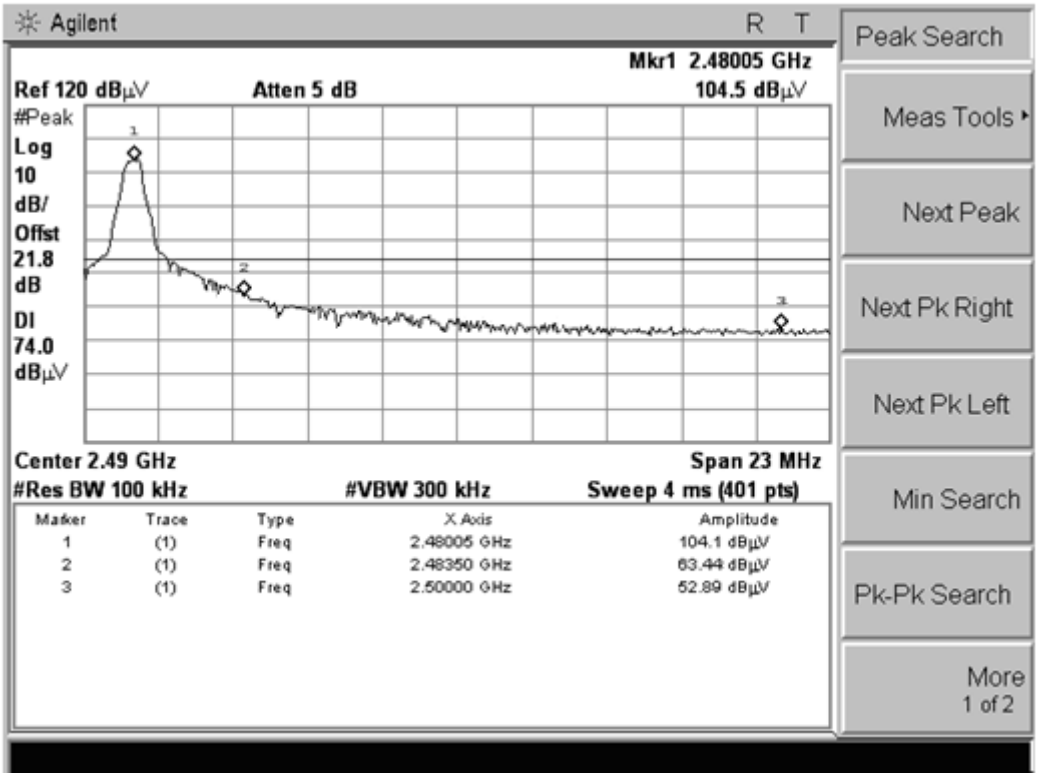
Test Plot:



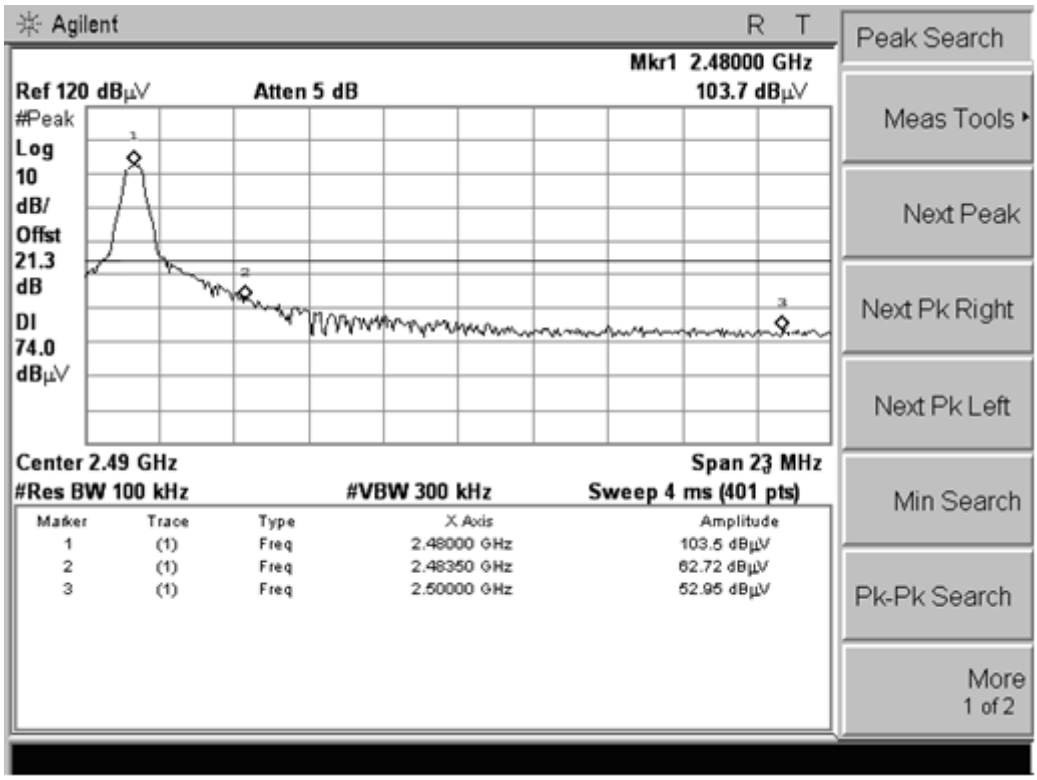
(CH Low, Horizontal, Peak)



(CH Low, Vertical, Peak)



(CH High, Horizontal, Peak)



(CH High, Vertical, Peak)

5.3 LINE CONDUCTED EMISSION TEST

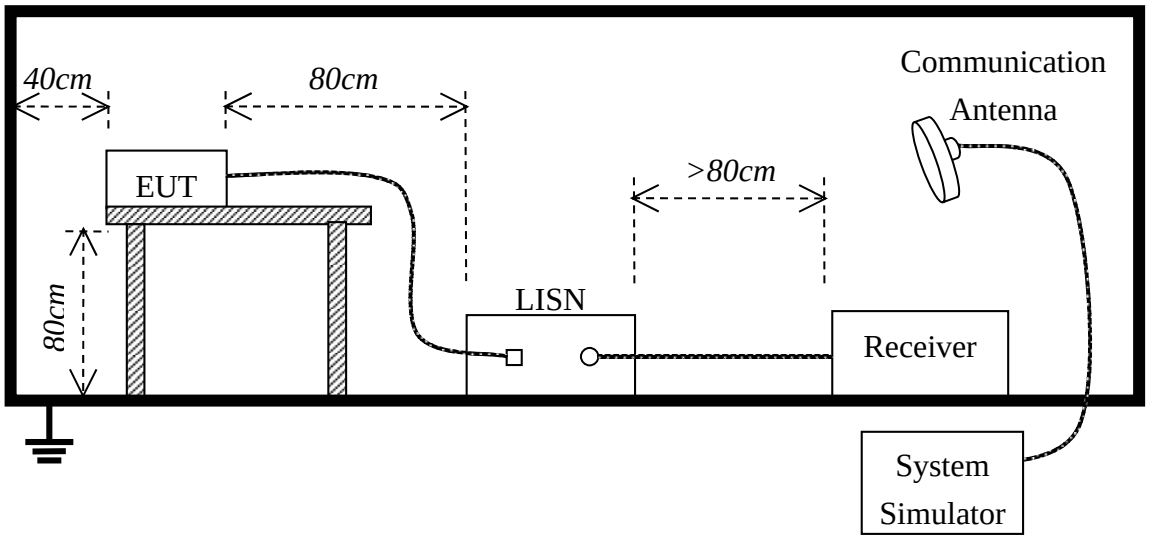
5.3.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

***Note:** 1. the lower limit shall apply at the transition frequency.*

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

5.3.2. BLOCK DIAGRAM OF TEST SETUP



5.3.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per FCC Part 15 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per FCC Part 15.
3) All I/O cables were positioned to simulate typical actual usage as per FCC Part 15.
4) The EUT received DC 5V by AC/DC adapter or USB port of the notebook which received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5) All support equipments received power from a second LISN supplying power of AC 120V/60Hz, if any.
6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7) Analyzer / Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.
8) During the above scans, the emissions were maximized by cable manipulation.
9) The following test mode(s) were scanned during the preliminary test:

Preliminary Conducted Emission Test				
Frequency Range Investigated		150KHz TO 30 MHz		
Mode of operation	Date	Report No.	Data#	Worst Mode
Bluetooth Mode	2013-12-06	STS131204F1	1_(L, N)	☒

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

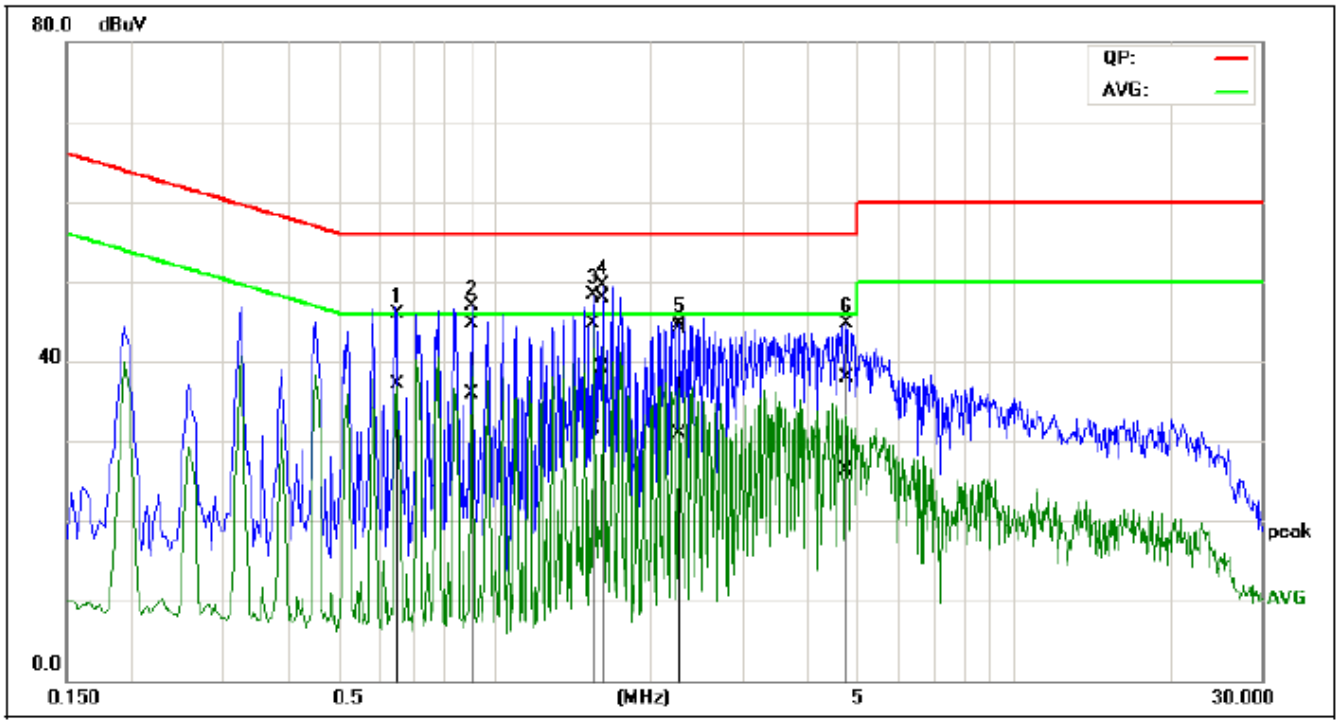
5.3.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

EUT and support equipment was set up on the test bench as per step 9 of the preliminary test.

A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

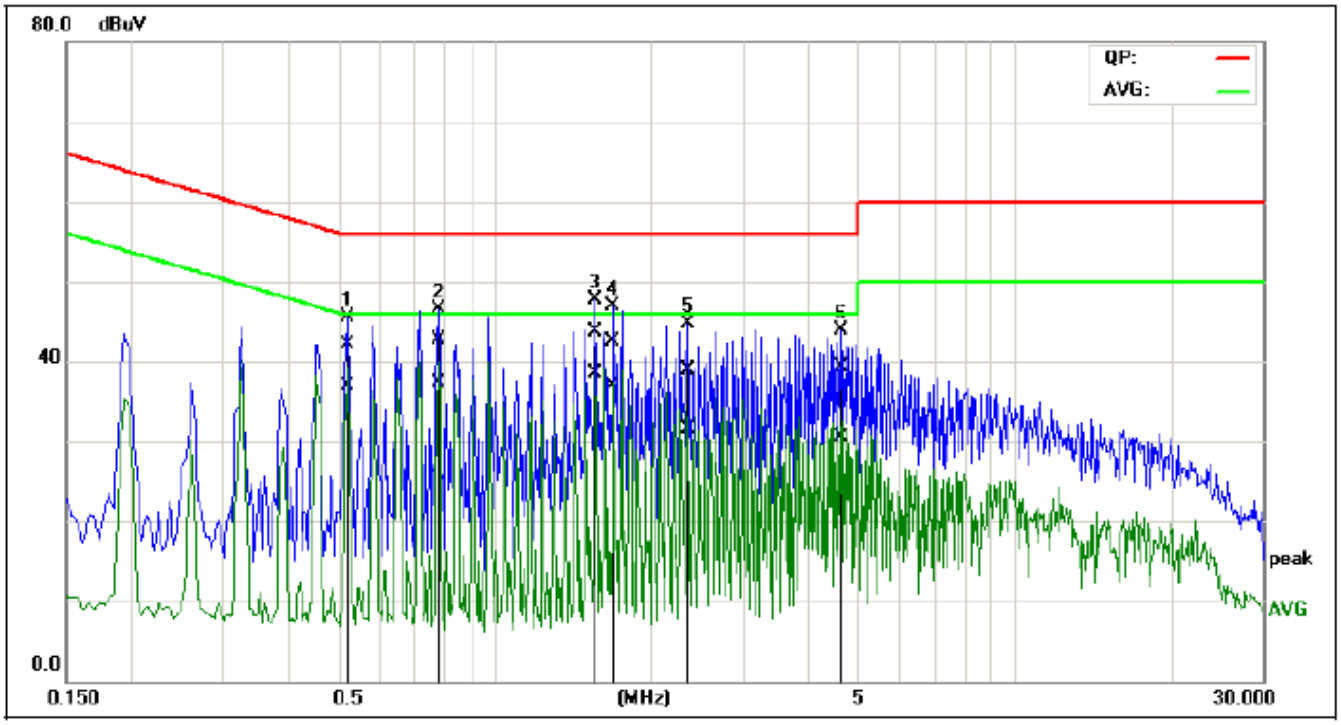
The test data of the worst case condition(s) was reported on the Summary Data page.

5.3.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.6513	26.15	17.18	19.83	45.98	37.01	56.00	46.00	-10.02	-8.99	Pass
2	0.9098	24.89	16.01	19.84	44.73	35.85	56.00	46.00	-11.27	-10.15	Pass
3	1.5572	24.89	11.56	19.89	44.78	31.45	56.00	46.00	-11.22	-14.55	Pass
4*	1.6252	28.02	19.11	19.90	47.92	39.01	56.00	46.00	-8.08	-6.99	Pass
5	2.2764	24.14	10.89	19.96	44.10	30.85	56.00	46.00	-11.90	-15.15	Pass
6	4.7493	17.57	5.95	20.27	37.84	26.22	56.00	46.00	-18.16	-19.78	Pass

Test Line: Line 1



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.5218	22.22	17.11	19.85	42.07	36.96	56.00	46.00	-13.93	-9.04	Pass
2	0.7830	22.85	17.39	19.83	42.68	37.22	56.00	46.00	-13.32	-8.78	Pass
3*	1.5632	23.84	18.54	19.90	43.74	38.44	56.00	46.00	-12.26	-7.56	Pass
4	1.6924	22.60	17.04	19.92	42.52	36.96	56.00	46.00	-13.48	-9.04	Pass
5	2.3467	18.90	11.54	20.01	38.91	31.55	56.00	46.00	-17.09	-14.45	Pass
6	4.6287	19.08	10.21	20.26	39.34	30.47	56.00	46.00	-16.66	-15.53	Pass

Test Line: Line 2

------END OF REPORT------