FCC Test Report

FCC EVALUATION REPORT FOR CERTIFICATE	
Project Reference No.	241076
Product	Wireless Studio Headphones
Brand Name	N/A
Model	RF850
Alternate Model	URG-13203
Tested according to	FCC Rules and Regulations Part 15 Subpart C 2013[15.249], ANSI C63.4-2009

Tested in period	2013-07-22 to 2013-07-26	
Issued date	2013-07-29	
Name and address of the Test House	Nemko Nemko Hong Kong Ltd Unit 1-5, 15/F , CCT Telecom Building, 11 Wo Shing Street, FoTan, Shatin, N.T., Hong Kong Phone : (+ 852) 2675 0288 Fax : (+ 852) 2675 0550	
Tested by	Zone Peng	2013-07-29
	Zone Peng	***date***
Verified by	Daria Liu	2013-07-29
	Daria Liu	***date***

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1. Client Information

1.1 Applicant

Company Name:	Camelot SI. LLC
Company Address:	27725 Stansbury Blvd., Ste. 175, Farmington Hills,Michigan,48334,USA

1.2 Manufacturer

Company Name:	Camelot SI. LLC
Company Address:	27725 Stansbury Blvd., Ste. 175, Farmington Hills,Michigan,48334,USA

1.3 Scope

●Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC part 15.249.

2. Equipment under Test (EUT)

2.1 Identification of EUT

Name:	Wireless Studio Headphones
Model Name:	RF850
Alternate model:	URG-13203
Brand name:	N/A
	Model:FD06SU-050-0500
Adapter :	Input;100-240VAC 50-60Hz 0.2A
	Output:5.0VDC 0.5A
Remark:	Charging base

2.2 Detail spec:

Operation Frequency Range : 914-915MHz

Channel Number or List : 3 [914MHz , 914.5MHz , 915MHz]

Modulated Type : FM

Antenna Type :Integral Ant

Antenna Gain : 0.15dBi

Fundamantal field strength : 93.21dBuV/m
Remark: Model RF850 and URG-13203 are electrically identical .

2.3 Additional Information Related to Testing

914.5MHz Keep transmitting mode with(1kHz audio in signal inputed in .)
AE equipment:
IPOD - FCCDOC
Remark: Only the worse case found by prescan is listed

3. General Test Conditions

3.1 Location

Global United Technology Services Co., Ltd. -- Nemko ELA 632

2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China

FCC Registration No.:600491

IC Registration No.9079A-1

Note: all test are witnessed by NEMKO engineer

3.2 Operating Environment

All tests and measurements were performed in a shielded enclosure or a controlled environment suitable for the tests conducted. The climatic conditions in the test area are automatically controlled and recorded continuously.

Parameters	Recording during test	Accepted deviation
Ambient temperature	24-25°C	15 – 35 ºC
Relative humidity	50-55%	30 - 60%
Atmospheric pressure	101.2 kPa -101.3kPa	86-106kPa

3.3 Operating During Test

Test mode

TM1 : 120VAC 60Hz 914.5MHz Keep transmitting mode

Remark : Input voltage have been adjusted from 85% to 115% ,no influence of Fundamental emission found .

3.4 Test Equipment

The test equipments used in testing are calibrated on a regular basis. For most of the testing equipments accredited calibration is conducted once a year. For certain equipment the calibration interval is longer. Between the calibrations all test equipment are controlled and verified on a regular basis. The test equipments used are defined in each test section of this report.

4. Measurement Uncertainty

The Measurement Uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 with the confidence level of 95 %.

Conducted Emission : 0.15~30MHz 3.45dB

Radiated Emission: 30MHz~1000MHz 4.50dB

1GHz-18GHz 4.70dB

5. Radiated Electromagnetic Disturbances

5.1 Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast.

The EUT were rotated 0 to 360 degree and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. The test result are reported as below.

For below 1GHz

RBW=120 kHz; VBW=300KHz.QP detector,The frequency range from 30MHz to 1000MHz is checked.

For above 1GHz. The frequency range from 1GHz to 10GHz(10th harmonics) is checked.

RBW=1MHz ; VBW=1MHz,PK detector for peak emissions measurement above 1GHz

RBW=1MHz ; VBW=10Hz, PK detector for average emissions measure above 1GHz

5.2 Measurement Equipment

	Equipment	Last Calibration	Type	Serial No.	Manufacturer
☒	EMI Test Receiver	Jul. 04 2013	ESU26	GTS203	R&S
☒	BiConiLog Antenna	Feb. 26 2013	VULB9163	GTS214	SCHWARZBECK
☒	Horn Antenna	Feb. 26 2013	BBHA9120D	GTS215	SCHWARZBECK
☒	Horn Antenna	Feb. 26 2013	BBHA9170	GTS216	SCHWARZBECK
☒	Coaxial Cable	Apr. 01 2013	N/A	GTS213	GTS
☒	Coaxial Cable	Apr. 01 2013	N/A	GTS211	GTS
☒	Coaxial cable	Apr. 01 2013	N/A	GTS210	GTS
☒	Coaxial Cable	Apr. 01 2013	N/A	GTS212	GTS
☒	Amplifier	Jul. 04 2013	8347A	GTS204	HP

5.3 Test Result

Remark: If PK value is lower than AV limit , The AV value deem to comply with AV limit too.

All restriction bands and non restriction bands have been tested ,Only the worse case are listed.

NOTES:

1.All modes were measured and only the worst case emission was reported.

2. H =Horizontal V=Vertical

3. Emission = Reading +Antenna Factor + Cable Loss –Amp Factor

4. Emission level dB μ V = 20 log Emission level μ V/m

5. The lower limit shall apply at the transition frequencies

6. All the emissions appearing within 15.205 Restricted bands shall not exceed the limits shown in (15.209 limit)#.

7. Unwanted emissions not falling within restricted frequency bands shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits;

Remark :

The limit of " # "of 3 meter distance is

Frequency MHz	Distance m	Field strength		Distance m	Field strength
		μV/m	dBμV/m(QP)		dBμV/m(QP)
30-88	3	100	40.0	10	30.0
88-216	3	150	43.5	10	33.5
216-960	3	200	46.0	10	36.0
960-1000	3	500	54.0	10	44.0
Above 1000	3	74.0 dBμV/m (PK) 54.0 dBμV/m (AV)		/	/

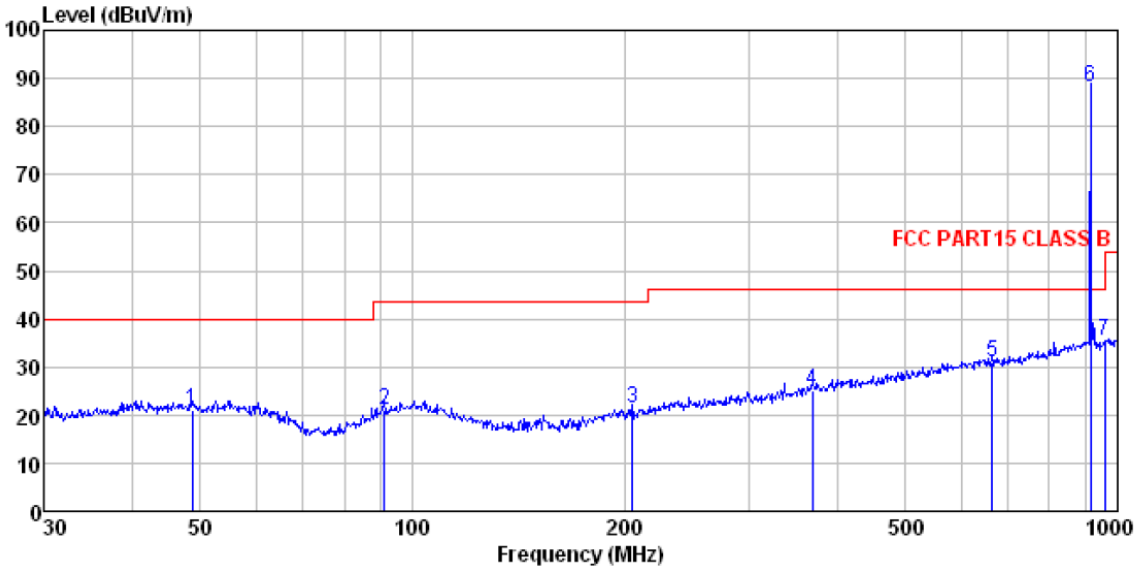
15.205 Restricted bands:

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	2690–2900	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

Mode	Freq range	Test ANT polarity	Diagram	Test Result
914.5MHz	30MHz-1GHz:	H	5-1	Pass
	30MHz-1GHz:	V	5-2	Pass
	1GHz-10GHz:	H	5-3	Pass
	1GHz-10GHz:	V	5-4	Pass

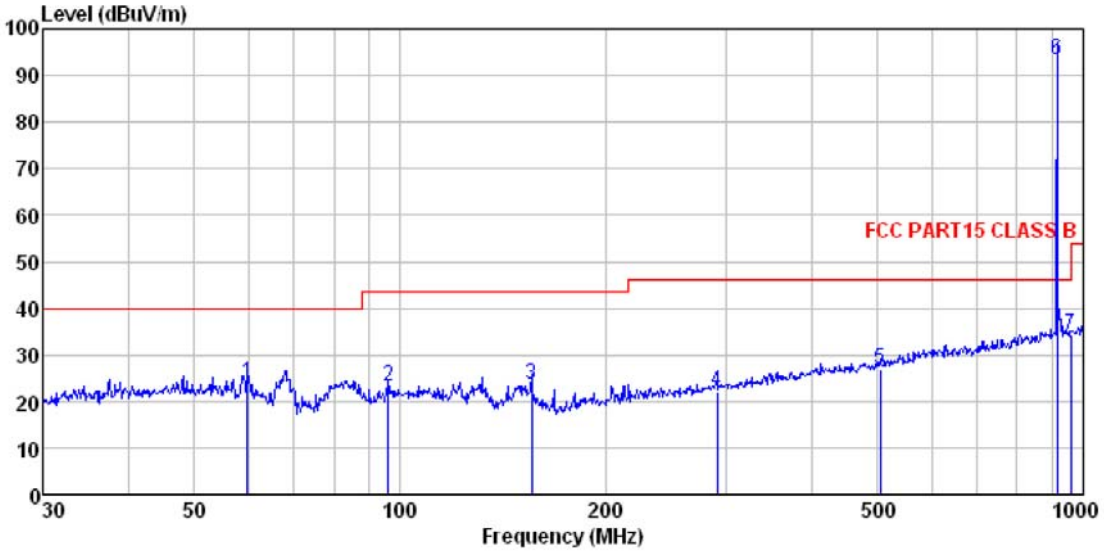
5.3.1 Diagram 5-1



		Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1		48.672	36.87	15.34	0.76	31.97	21.00	40.00	-19.00	QP
2		91.175	37.32	14.16	1.12	31.72	20.88	43.50	-22.62	QP
3		204.955	38.77	12.74	1.87	32.14	21.24	43.50	-22.26	QP
4		369.405	37.71	16.51	2.72	31.97	24.97	46.00	-21.03	QP
5		663.473	37.44	20.68	3.96	31.13	30.95	46.00	-15.05	QP
6	*	914.500	91.28	23.18	4.91	31.19	88.18			QP
7		960.000	38.00	23.49	5.08	31.22	35.35	46.00	-10.65	QP

Remark : Fundamental field strength of Horizontal is 88.18dBuV/m < limit 94dBuV/m

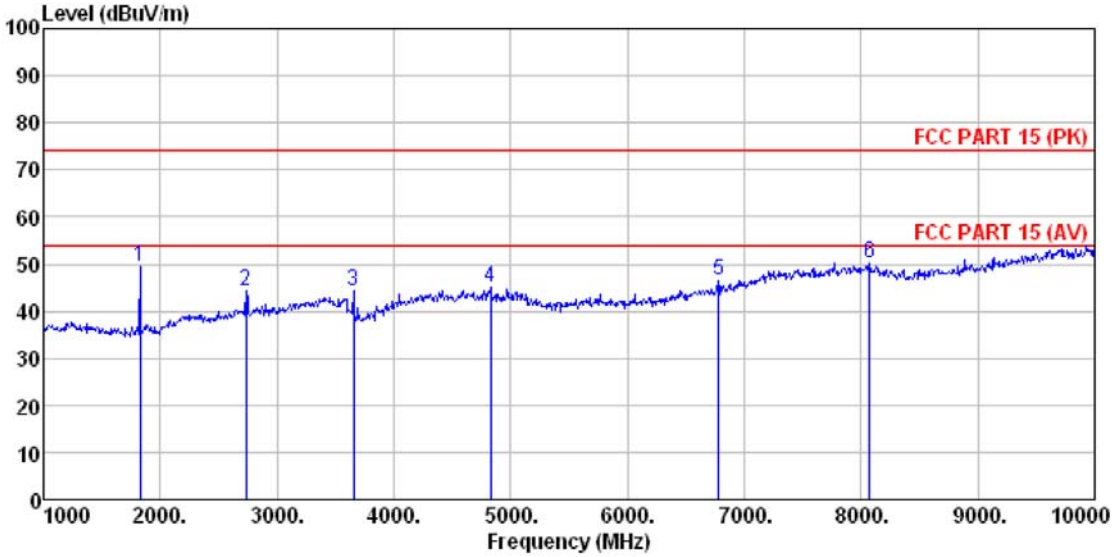
5.3.2 Diagram 5-2



		Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1		59.859	40.46	14.71	0.86	31.94	24.09	40.00	-15.91	QP
2		96.099	39.05	14.90	1.16	31.75	23.36	43.50	-20.14	QP
3		155.910	43.55	10.51	1.60	32.00	23.66	43.50	-19.84	QP
4		291.036	37.25	14.89	2.32	32.18	22.28	46.00	-23.72	QP
5		504.706	36.52	18.68	3.33	31.53	27.00	46.00	-19.00	QP
6	*	914.500	96.31	23.18	4.91	31.19	93.21			QP
7		960.000	36.96	23.49	5.08	31.22	34.31	46.00	-11.69	QP

Remark : Fundamental field strength of Horizontal is 93.21dBuV/m < limit 94dBuV/m

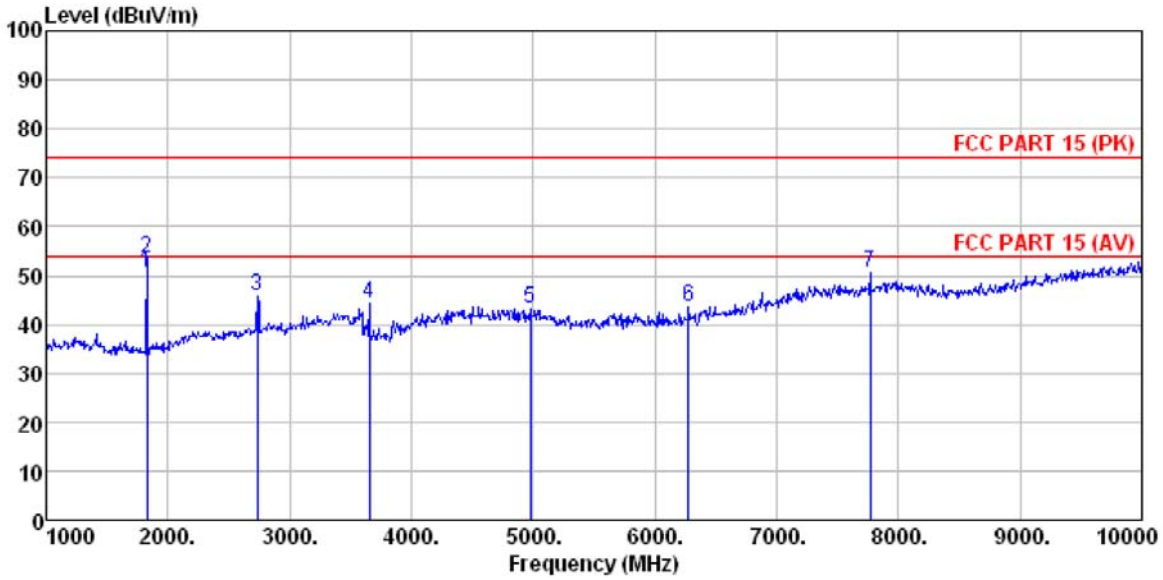
5.3.3 Diagram 5-3



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1829.000	53.30	25.42	4.87	34.17	49.42	74.00	-24.58	Peak
2	2737.000	43.98	28.23	5.70	33.63	44.28	74.00	-29.72	Peak
3	3655.000	40.37	29.19	7.25	32.58	44.23	74.00	-29.77	Peak
4	4825.000	36.55	31.79	8.62	32.10	44.86	74.00	-29.14	Peak
5	6778.000	33.15	34.45	11.25	32.30	46.55	74.00	-27.45	Peak
6	8074.000	32.27	37.23	12.24	31.39	50.35	74.00	-23.65	Peak

Remark : When Pk value are lower than AV limit 54dBuV/m, so AV value deem to comply with AV limit too .

5.3.4 Diagram 5-4



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1829.000	54.30	25.42	4.87	34.17	50.42	54.00	-3.58	Average
2	1829.000	57.39	25.42	4.87	34.17	53.51	74.00	-20.49	Peak
3	2737.000	45.43	28.23	5.70	33.63	45.73	74.00	-28.27	Peak
4	3655.000	40.26	29.19	7.25	32.58	44.12	74.00	-29.88	Peak
5	4978.000	34.75	31.94	8.74	32.17	43.26	74.00	-30.74	Peak
6	6274.000	31.67	33.24	10.58	32.04	43.45	74.00	-30.55	Peak
7	7768.000	33.11	37.02	11.97	31.47	50.63	74.00	-23.37	Peak

Remark : When Pk value are lower than AV limit 54dBuV/m, so AV value deem to comply with AV limit too .

6. 20dB Bandwidth test

6.1 Test Procedure

Clause 15.215(c) 20dB Bandwidth:

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

6.2 Measurement Equipment

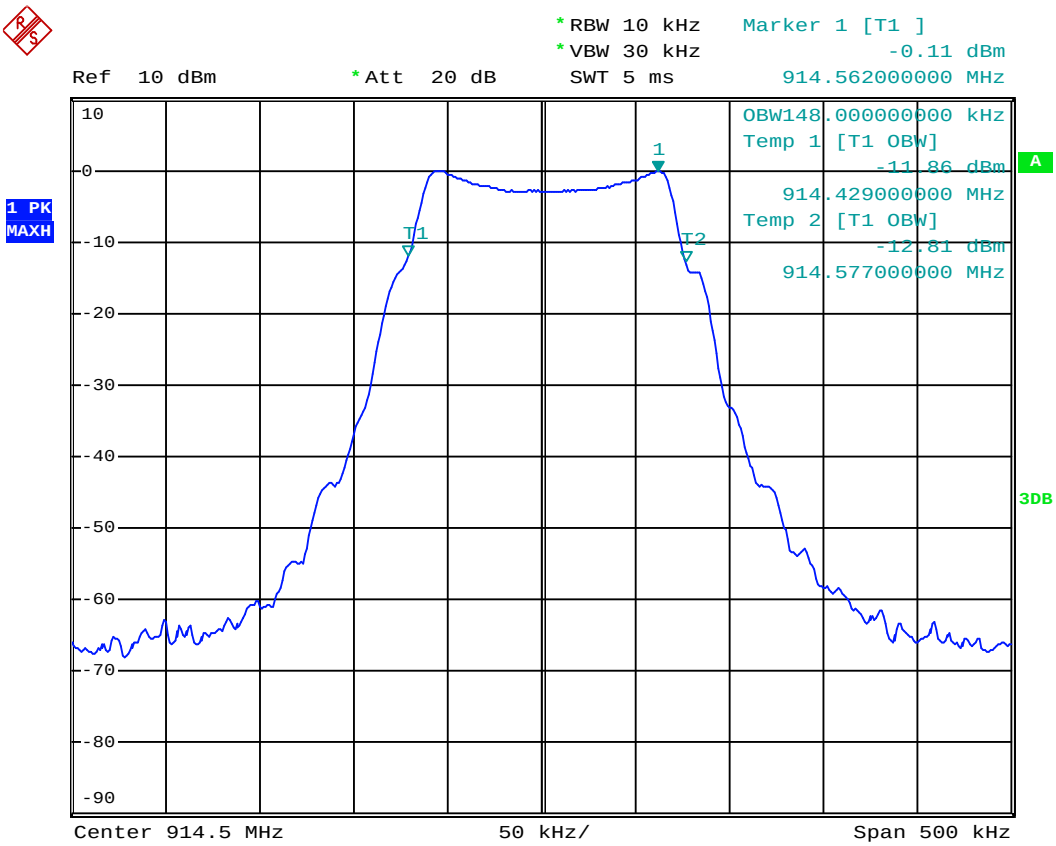
	Equipment	Last Calibration	Type	Serial No.	Manufacturer
☒	Spectrum	Jul. 04 2013	ESU26	GTS203	R&S

6.3 Test Result

Remark : Conducted measurement .

Result : 20dB bandwidth is 148kHz.

6.3.1 Diagram 6-1



Date: 26.JUL.2013 17:44:36

7. Band Edge Compliance Test

7.1 Test Procedure

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

7.2 Measurement Equipment

	Equipment	Last Calibration	Type	Serial No.	Manufacturer
☒	Spectrum	Jul. 04 2013	ESU26	GTS203	R&S

7.3 Test Result

Conducted measurement

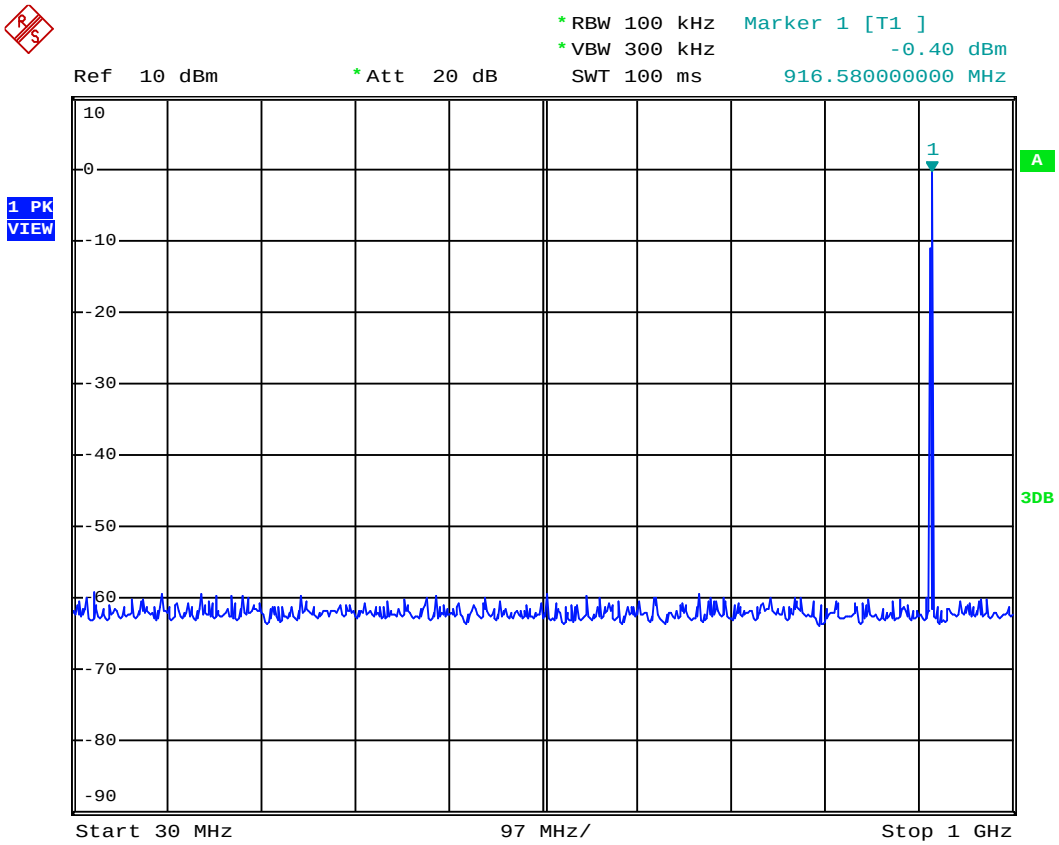
PK detector

Max hold

RMB100kHz VBW 300kHz

Result : Emissions radiated outside of the specified frequency bands, except for harmonics,is attenuated by at least 50 dB below the level of the fundamental .

7.3.1 Diagram 7-1



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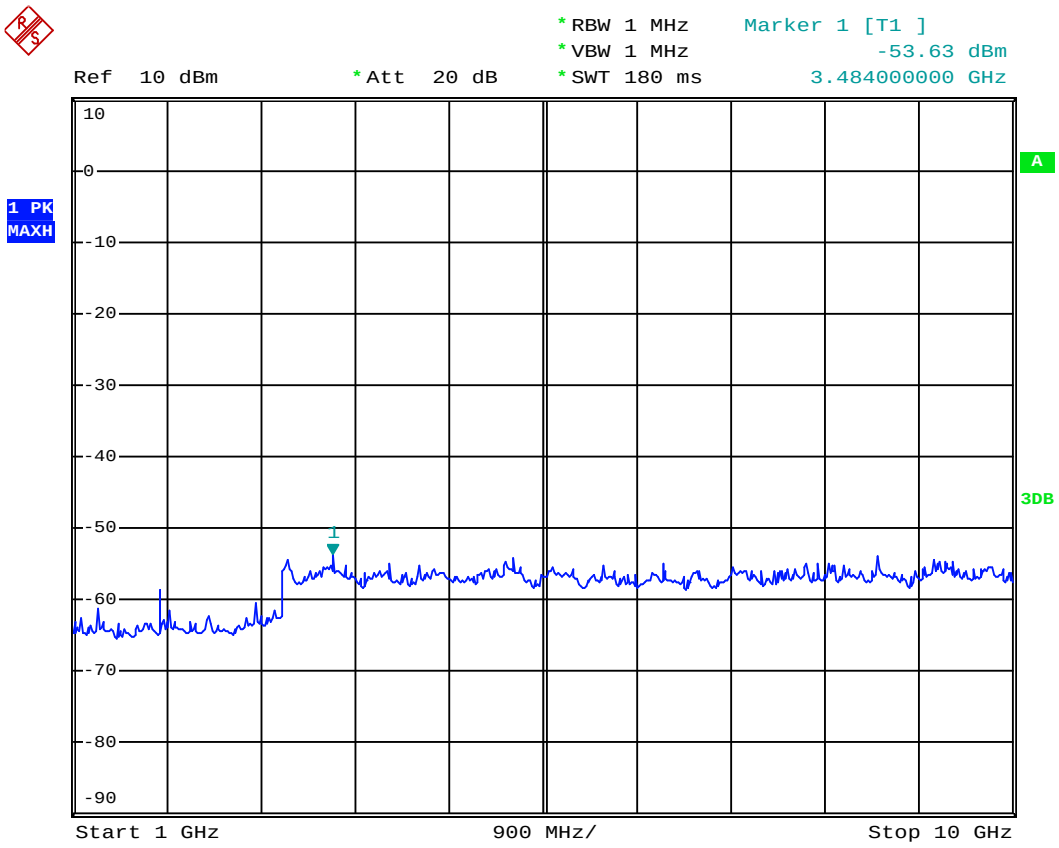
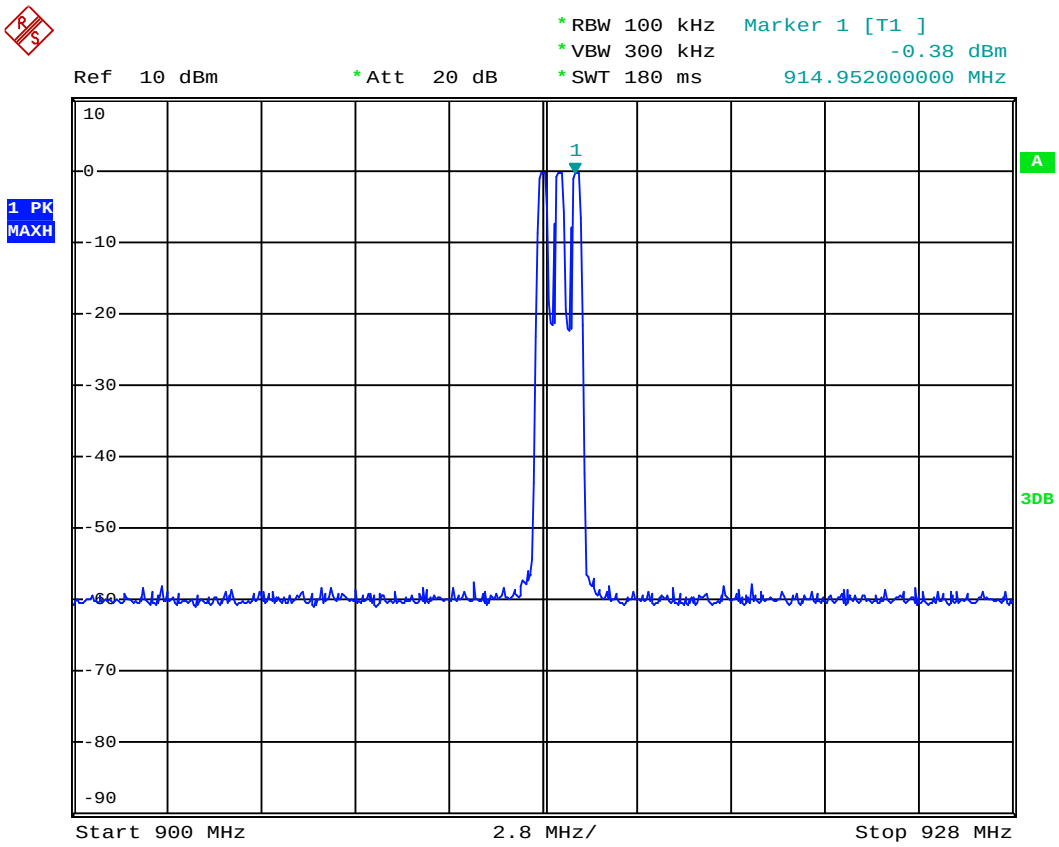
7.3.2 Diagram 7-2



Date: 26.JUL.2013 17:46:29

7.3.3 Diagram 7-3



Date: 26.JUL.2013 17:49:29

Remark :3 channel's keeping TX mode can be changed by pressing turning button, so using Maxhold method to keep 3 channel in one plot as above.

10 POWER LINE CONDUCTED EMISSION TEST

10.1 Test Procedure

An intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50
*-Decreases with the logarithm of the frequency.		

10.2 Measurement Equipment

	Equipment	Last Calibration	Type	Serial No.	Manufacturer
☒	Shielding Room	Jul. 04 2013	7.0(L)x3.0(W)x3.0(H)	GTS252	ZhongYu Electron
☒	EMI Test Receiver	Jul. 04 2013	ESCS30	1102.4500K30	Rohde & Schwarz
☒	10dB Pulse Limita	Jul. 04 2013	N/A	GTS224	Rohde & Schwarz
☒	LISN	Jul. 04 2013	NSLK 8127	8127549	SCHWARZBECK MESS-ELEKTRONIK
☒	Coaxial Cable	Apr. 01 2013	N/A	N/A	GTS

10.3 Test Result

The EUT was placed on a non-metallic table, 80cm above the ground plane. The other peripheral devices power cord connected to the power mains through another line impedance stabilization network.In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4-2009 on conducted Emission test.

Preview measurements:
0.15 MHz to 30 MHz
Receiver settings: PK&AV detector
RBW:9 kHz

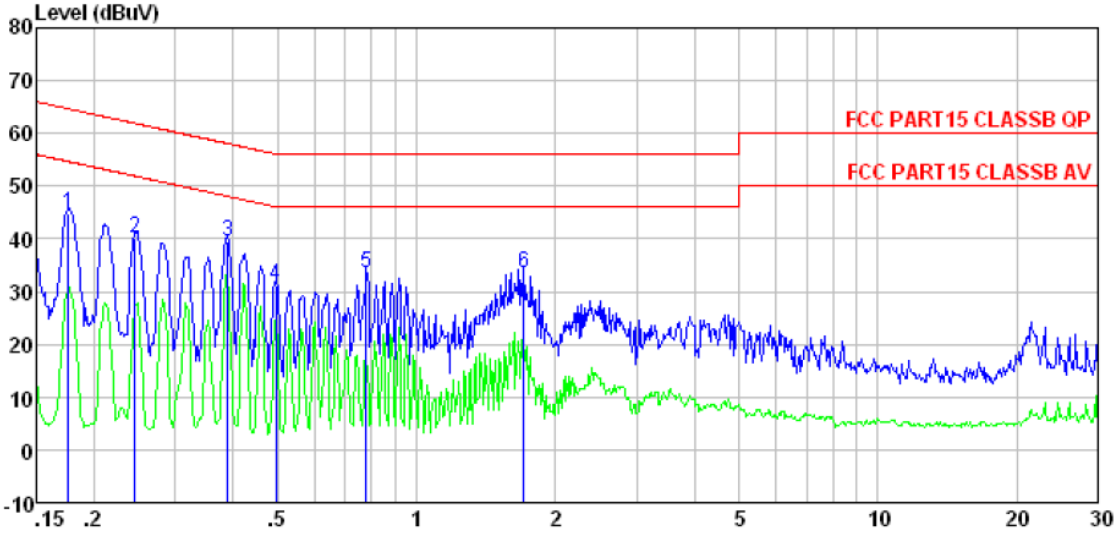
Final measurement:
0.15 MHz to 30 MHz
Receiver settings:QP&AV detector

Test mode	Power Line	Test Data	Test Result
TM1	Line	Diagram 10-1	Pass
	Neutral	Diagram 10-2	Pass

NOTES:

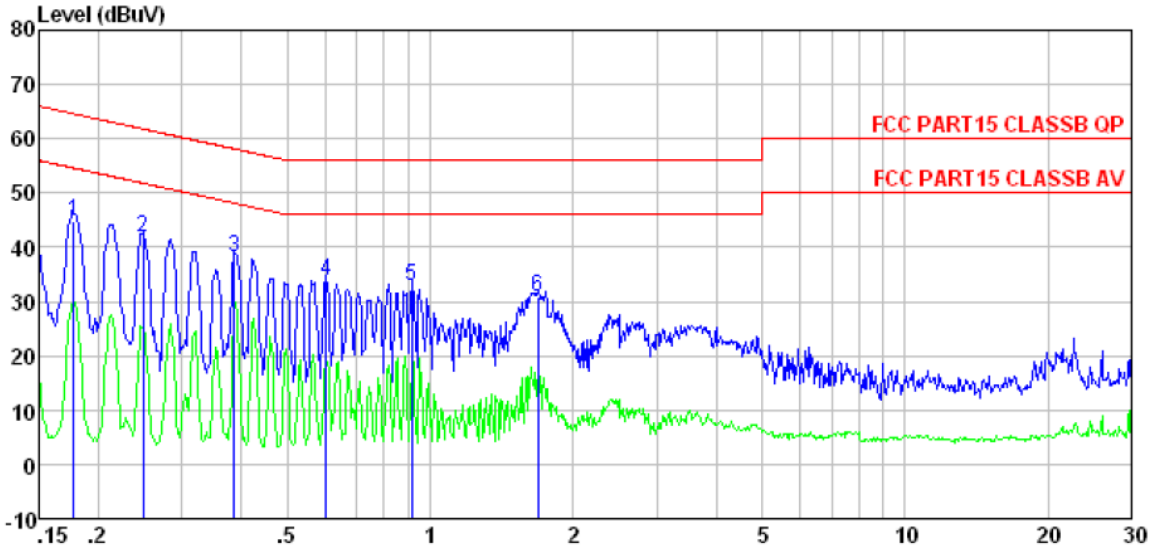
1. Measurements using CISPR quasi-peak mode & average mode.
2. All modes of operation were investigated and the worst -case emission are reported. See attached Plots.
3: If PK value is lower than AV limit then QP and AV value are deemed to be complied with rules and only diagram will be shown as below..

10.3.1 Diagram 10-1



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.176	44.83	-0.23	0.10	44.70	64.68	-19.98	QP
2	0.246	40.20	-0.23	0.10	40.07	61.91	-21.84	QP
3	0.389	39.70	-0.22	0.10	39.58	58.08	-18.50	QP
4	0.497	31.20	-0.21	0.10	31.09	56.05	-24.96	QP
5	0.779	33.46	-0.20	0.10	33.36	56.00	-22.64	QP
6	1.707	33.79	-0.23	0.10	33.66	56.00	-22.34	QP

10.3.2 Diagram 10-2



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.178	44.76	-0.09	0.10	44.77	64.59	-19.82	QP
2	0.248	41.64	-0.09	0.10	41.65	61.82	-20.17	QP
3	0.387	37.99	-0.08	0.10	38.01	58.12	-20.11	QP
4	0.604	33.95	-0.08	0.10	33.97	56.00	-22.03	QP
5	0.914	32.89	-0.09	0.10	32.90	56.00	-23.10	QP
6	1.689	30.99	-0.10	0.10	30.99	56.00	-25.01	QP

11. Antenna requirement

11.1 Requirement

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2 Result

The antenna used for this product is Internal Patch antenna that no antenna other than that furnished by the responsible party shall be used with the device, The maximum peak gain of this antenna is 0.15dBi.

Appendix A Sample Label

Labelling Requirements

The sample label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.

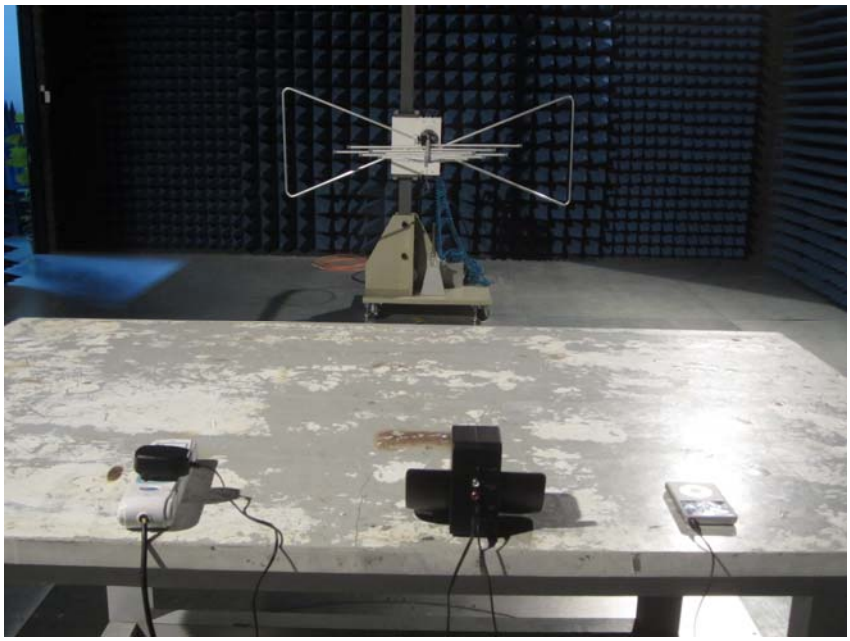
*** The following paragraph specified in the label.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Appendix B Test Setup Photographs of EUT

B.1 Conducted Emission Test Setup Photographs

B.2 Radiated Emission Test Setup Photographs



END OF REPORT