



FCC 47 CFR PART 15 SUBPART C

for

900MHz Wireless Headphone

MODEL: HP4890A

Brand: ARKON

Test Report Number:

C120924Z03-RP1

Issued for

Uni-Art Precise Products Ltd

**11-12/F, Yue Xiu Industrial Building, 87 Hung To Road, Kowloon,
Hong Kong**

Issued by:

COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.

**No.10-1, Mingkeda Logistics Park, No.18, Huanguan South Rd.,
Guan Lan Town, Baoan District, Shenzhen, China**

TEL: 86-755-28055000

FAX: 86-755-28055221

Issued Date: October 10, 2012



TESTING CERT #2861.01

Note: *This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document. The client should not use it to claim product endorsement by TAF, A2LA, NVLAP, NIST or any government agencies. The test results of this report relate only to the tested sample identified in this report.*



Revision History

Rev.	Issue No.	Revisions	Effect Page	Revised By
00	C120924Z03-RP1	Initial Issue	ALL	Amay Tang



TABLE OF CONTENTS

1 TEST CERTIFICATION	4
2 EUT DESCRIPTION.....	5
3 TEST METHODOLOGY.....	6
3.1. DESCRIPTION OF TEST MODES	6
4 TEST METHODOLOGY.....	7
4.1. EUT EXERCISE	7
4.2. FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS	7
5 INSTRUMENT CALIBRATION	8
6 SETUP OF EQUIPMENT UNDER TEST	8
6.1. DESCRIPTION OF SUPPORT UNITS.....	8
6.2. CONFIGURATION OF SYSTEM UNDER TEST	8
7 FACILITIES AND ACCREDITATIONS	9
7.1. FACILITIES	9
7.2. ACCREDITATIONS	9
7.3. MEASUREMENT UNCERTAINTY	9
8 FCC PART 15.249 REQUIREMENTS	10
8.1. 20DB BANDWIDTH	10
8.2. BAND EDGES MEASUREMENT	13
8.3. POWER LINE CONDUCTED EMISSIONS MEASUREMENT	18
8.4. SPURIOUS EMISSIONS MEASUREMENT.....	22

**1 TEST CERTIFICATION**

Product	900MHz Wireless Headphone
Model	HP4890A
Brand	ARKON
Tested	September 24~October 8, 2012
Applicant	Uni-Art Precise Products Ltd 11-12/F, Yue Xiu Industrial Building, 87 Hung To Road, Kowloon, Hong Kong
Manufacturer	Uni-Art Precise Products Ltd 11-12/F, Yue Xiu Industrial Building, 87 Hung To Road, Kowloon, Hong Kong

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
DEVIATION FROM APPLICABLE STANDARD	
None	

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.249.

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

Approved by:**Reviewed by:**

Tom Gan
Supervisor of EMC Dept.
Compliance Certification Service Inc.

Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Service Inc.



2 EUT DESCRIPTION

Product	900MHz Wireless Headphone
Brand	ARKON
Model	HP4890A
Model Discrepancy	N/A
Identify Number	C120924Z03-RP1
EUT Power Rating	DC8V powered by the adapter Adapter manufacturer/model name Dongguan Yinli Electronics Co., Ltd. / YLS0051A-T080020 AC input: 100-240V,50/60Hz 0.3A DC output: DC8.0V 200mA DC output cable: Un-shielded, 1.80m
Audio Cable	Unshielded 1.10m
Frequency Range	915.5 MHz,916.0MHz, 916.5 MHz
Transmit Power	Peak: 79.93dBuV/m (Max.) AVG: 78.12dBuV/m (Max.)
Modulation Technique	FM
Number of Channels	3 Channels
Antenna Specification	Linear antenna with 0 dBi gain (Max)
Temperature Range	-10°C ~ +55°C

Note: 1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.

2. This submittal(s) (test report) is intended for **FCC ID: MVAHP4891A-001T** filing to comply with Section 15.207, 15.209 and 15.249 of the FCC Part 15, Subpart C Rules.



3 TEST METHODOLOGY

3.1. DESCRIPTION OF TEST MODES

The EUT had been tested under operating condition.

Test Item	Test mode	Worse mode
Conducted Emission	Mode 1: Charge	<input type="checkbox"/>
	Mode 2: Play Audio	<input checked="" type="checkbox"/>
Radiated Emission	Mode 1: TX	<input checked="" type="checkbox"/>

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in TX mode, and power line conducted emission below 30MHz, which worst case was in Play Audio mode only.

Channel 1 (915.5MHz), Channel 2 (916.0MHz) and Channel 2(916.5MHz) were chosen for the final testing.



4 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4:2009 and FCC CFR 47 15.207, 15.209 and 15.249.

4.1. EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209, 15.249 under the FCC Rules Part 15 Subpart C.

4.2. 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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

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.



5 INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

6 SETUP OF EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1	IPOD	A1285	YM08BYU3QX	N/A	IPOD	N/A	N/A
2	900MHz Wireless Headphone (RX)	HP4890A	N/A	MVAHP4892 A-002R	ARKON	N/A	N/A

Note:

- 1) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

6.2. CONFIGURATION OF SYSTEM UNDER TEST

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.



7 FACILITIES AND ACCREDITATIONS

7.1. FACILITIES

All measurement facilities used to collect the measurement data are located at

☒ **No.10-1, Mingkeda Logistics Park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

7.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
China	CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Norway	Nemko
Japan	VCCI(C-3478, R-3135, T-652)
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>

7.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	+/- 3.18dB
Radiated emissions	30MHz ~ 200MHz	+/- 3.79dB
	200MHz ~1000MHz	+/- 3.62dB
	Above 1000MHz	+/- 5.04dB
Band Edges	+/-0.182 dB	

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.



8 FCC PART 15.249 REQUIREMENTS

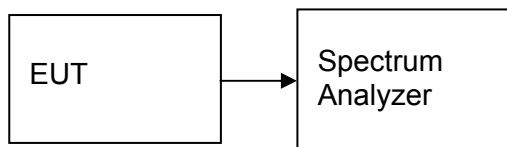
8.1. 20DB BANDWIDTH

None; for reporting purpose only.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013

Remark: Each piece of equipment is scheduled for calibration once a year.



TEST CONFIGURATION

TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT, then connect a low loss RF cable from antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=30kHz, VBW=100kHz, Span=3MHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the test channels are investigated.

TEST RESULTS

No non-compliance noted

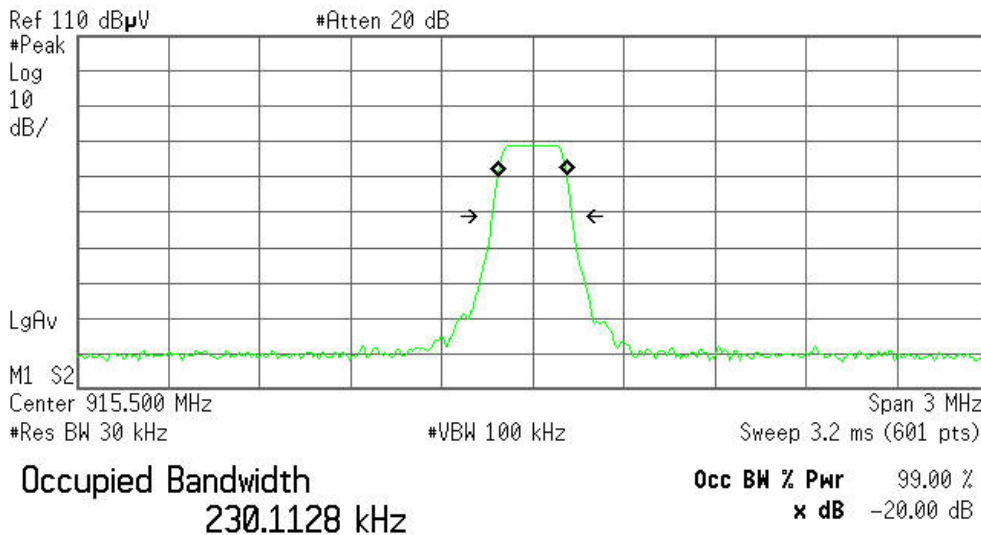


Test plot

20dB Bandwidth (CH 1 915.5MHz)

Agilent

R T

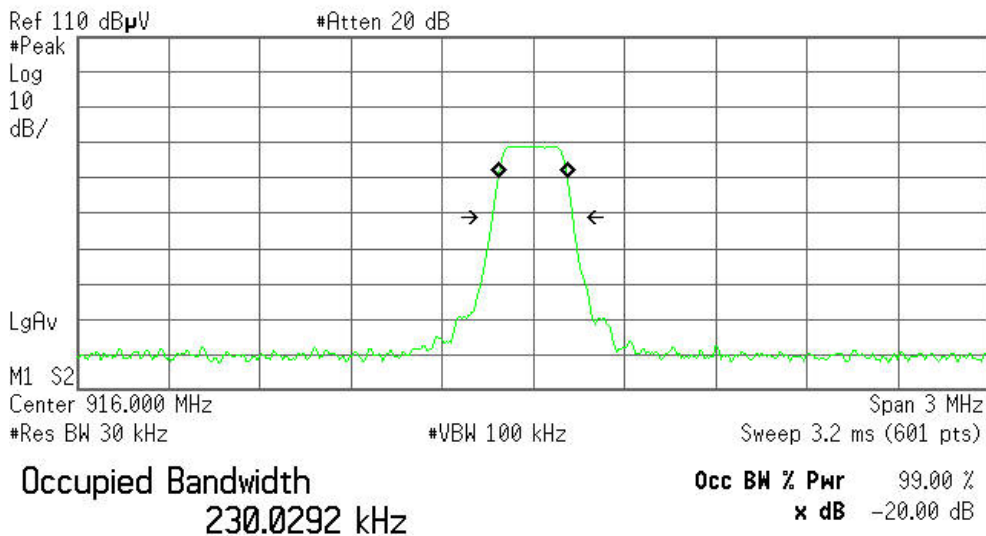


Transmit Freq Error -1.686 kHz
x dB Bandwidth 267.083 kHz

20dB Bandwidth (CH 2 916.0MHz)

Agilent

R T



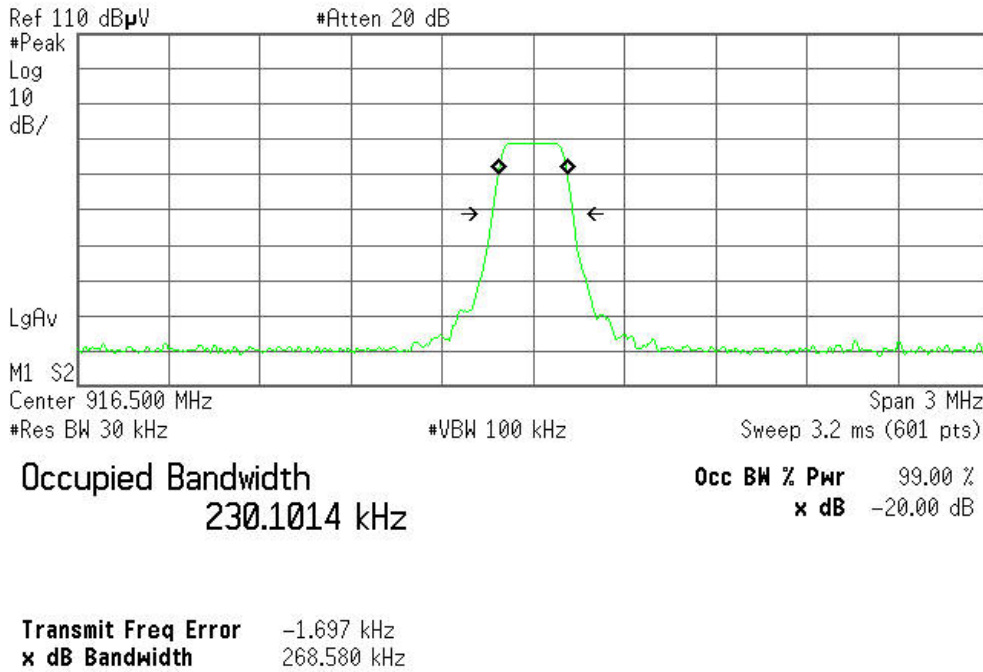
Transmit Freq Error -1.606 kHz
x dB Bandwidth 268.173 kHz



20dB Bandwidth (CH 3 916.5MHz)

Agilent

R T



**8.2. BAND EDGES MEASUREMENT****LIMIT**

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

Frequency (Hz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

2. As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.
3. As shown in Section 15.249(d) 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.

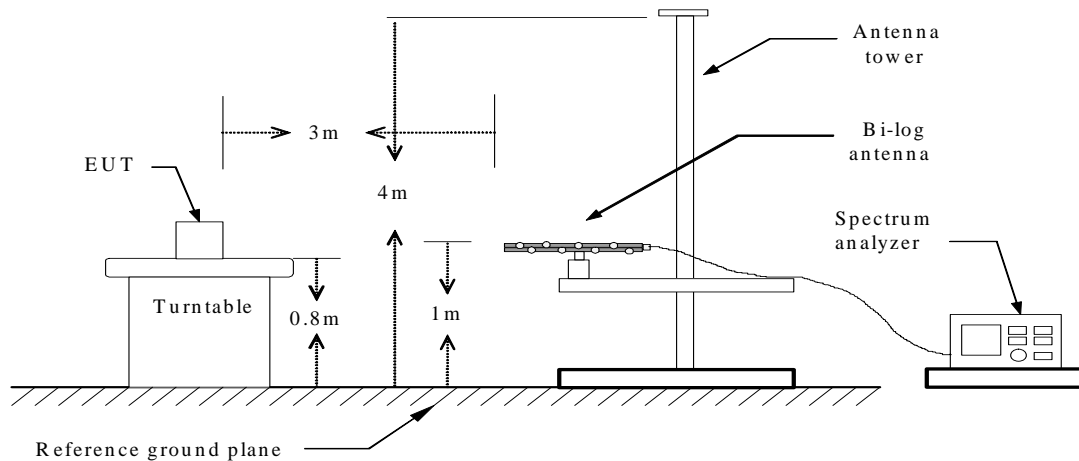
MEASUREMENT EQUIPMENT USED

Radiated Emission Test Site 966 (2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2012	03/18/2013
Turn Table	EMCO	2081-1.21	N/A	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2012	03/18/2013
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/17/2012	03/17/2013
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/17/2012	03/17/2013
Loop Antenna	A、R、A	PLA-1030/B	1029	03/23/2012	03/23/2013
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/19/2012	03/19/2013
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

Remark: Each piece of equipment is scheduled for calibration once a year.



TEST CONFIGURATION



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the 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 emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
(a) PEAK: RBW100kHz / VBW=300kHz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

Refer to attach spectrum analyzer data chart.



Test Data

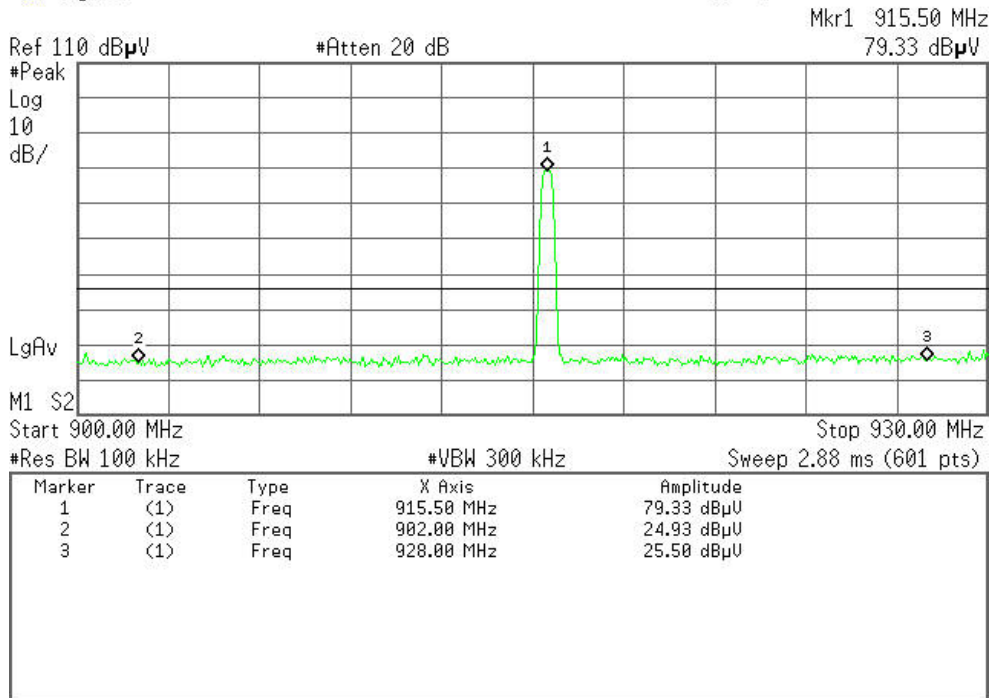
Band Edges (TX / CH 1 915.5MHz)

Detector mode: Peak

Polarity: Vertical

Agilent

R T

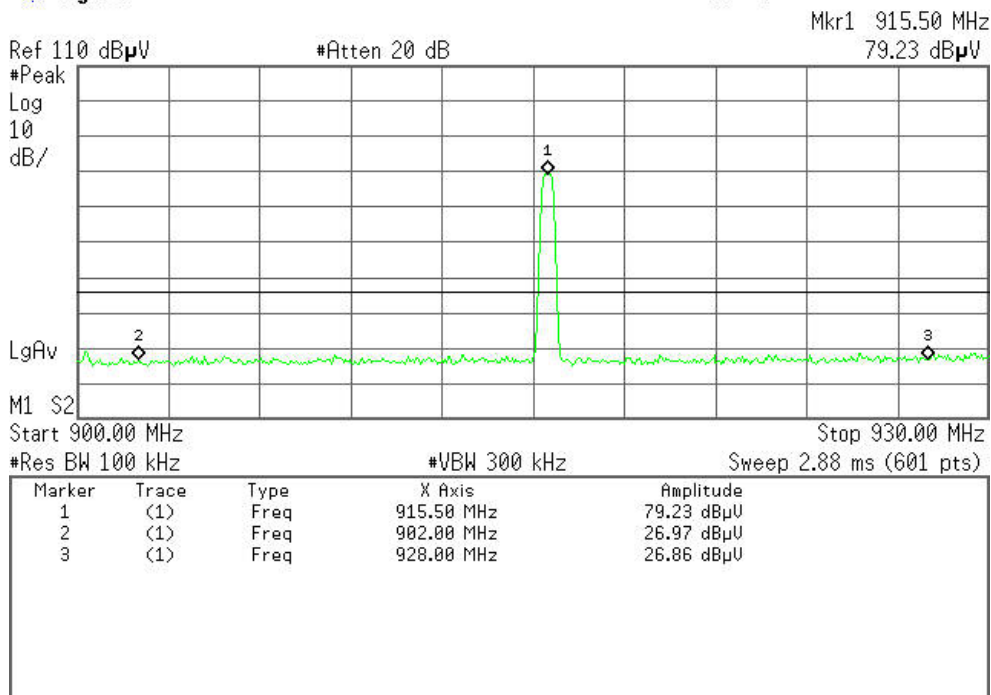


Detector mode: Peak

Polarity: Horizontal

Agilent

R T





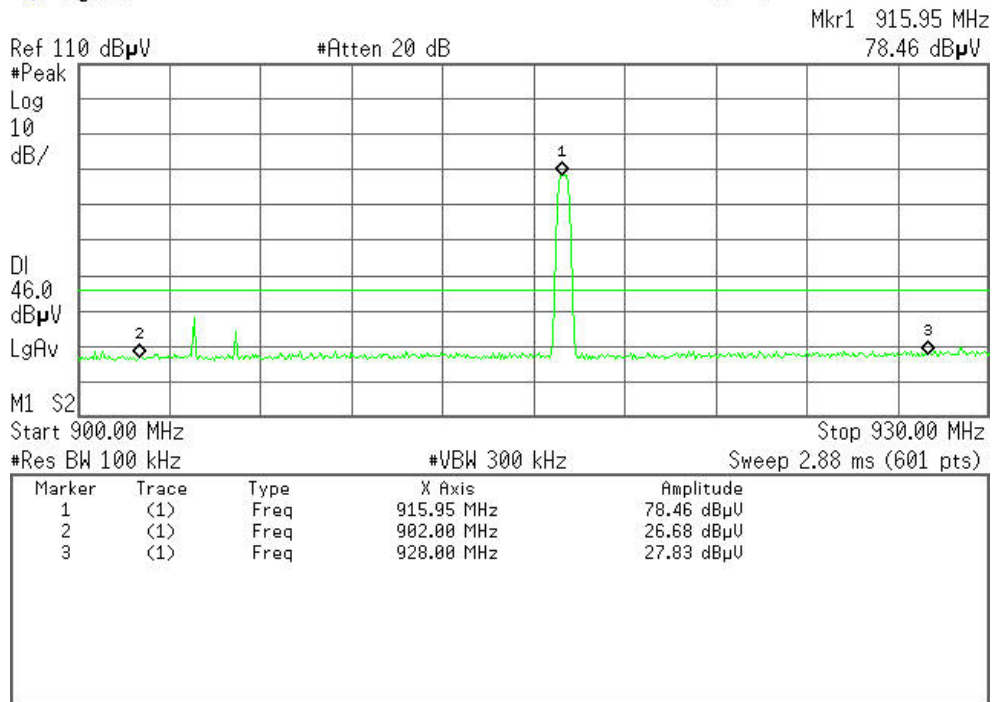
Band Edges (TX / CH 2 916.0MHz)

Detector mode: Peak

Polarity: Vertical

Agilent

R T

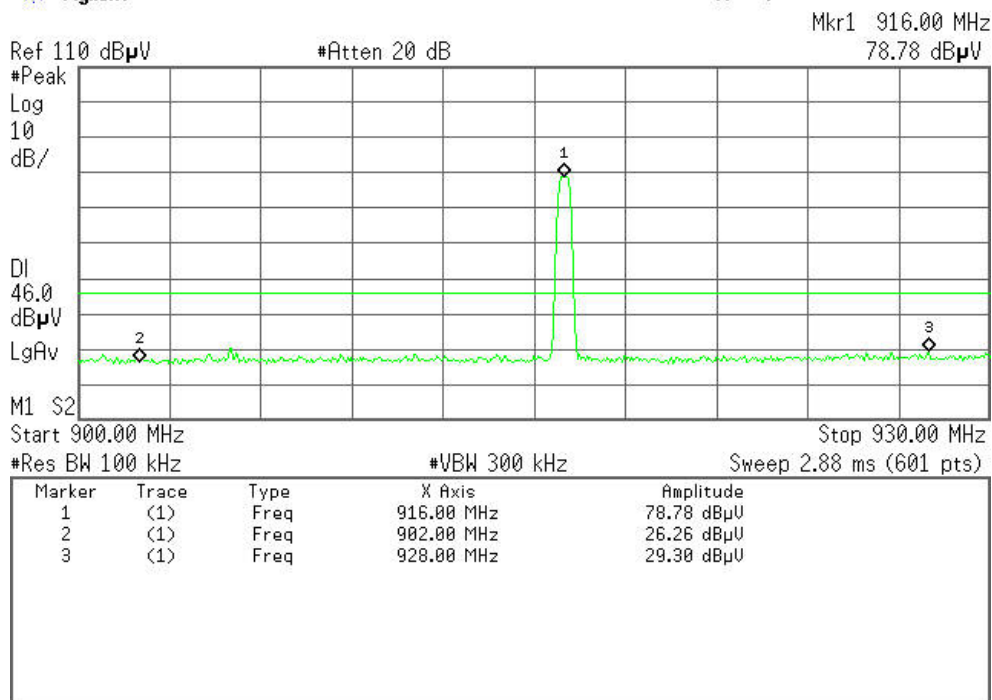


Detector mode: Peak

Polarity: Horizontal

Agilent

R T





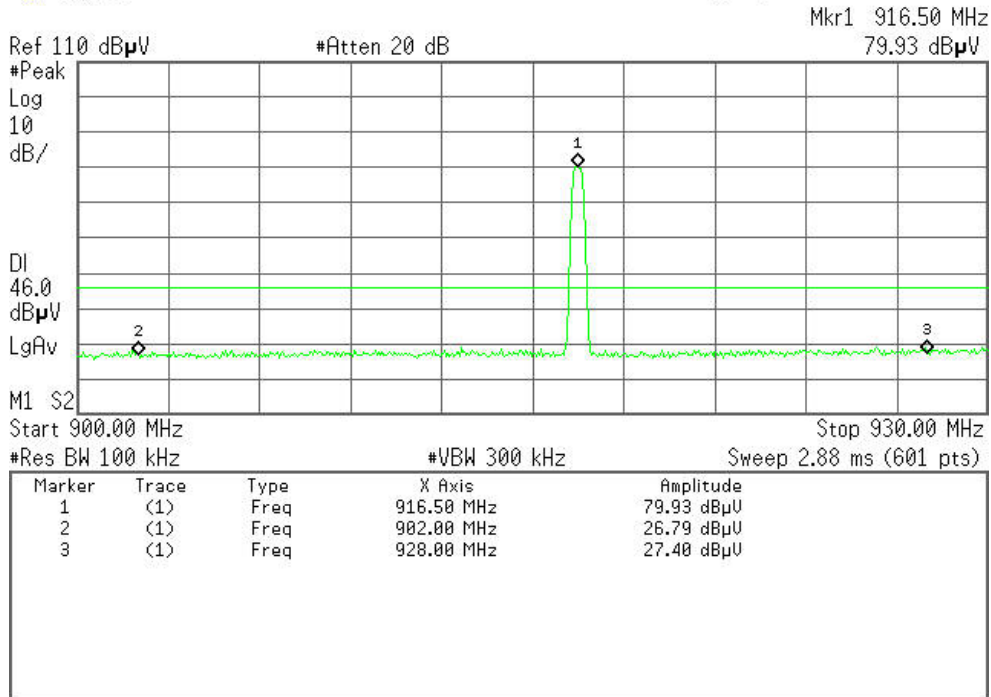
Band Edges (TX / CH 3 916.5MHz)

Detector mode: Peak

Polarity: Vertical

Agilent

R T

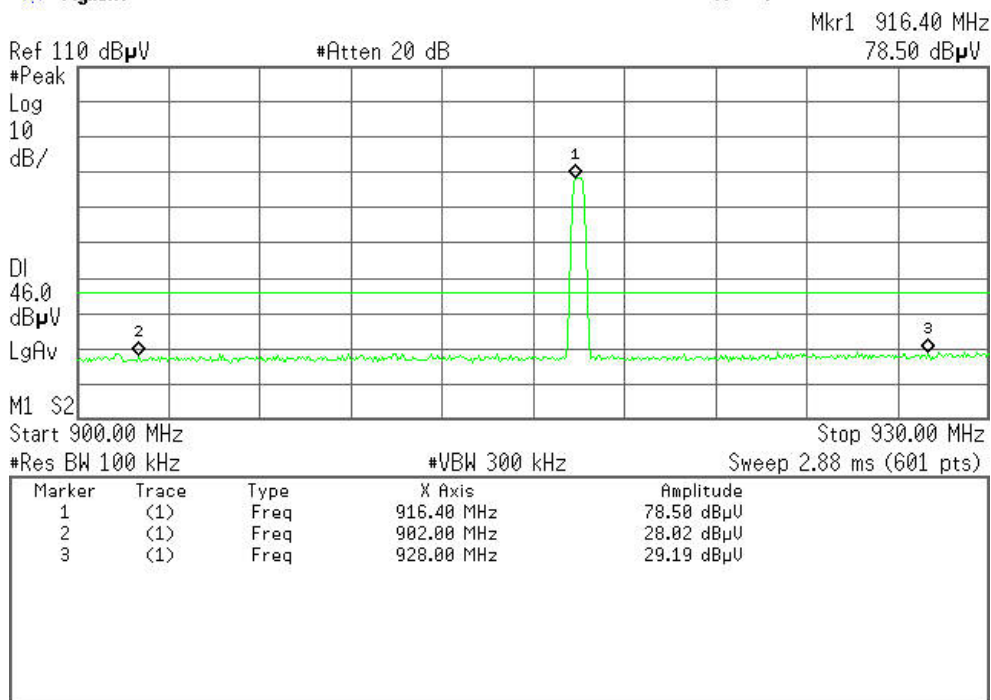


Detector mode: Peak

Polarity: Horizontal

Agilent

R T





8.3. POWER LINE CONDUCTED EMISSIONS MEASUREMENT

8.3.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for 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 μ H/50 ohms 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 Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

NOTE:

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
- (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

TEST INSTRUMENTS

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
ESCI EMI TEST RECEIVER.ESCI	ROHDE&SCHWARZ	ESCI	100783	03/17/2012	03/17/2013
LISN(EUT)	SCHAFFNER	NNB42	2001/001	03/19/2012	03/19/2013
LISN	EMCO	3825/2	8901-1459	03/19/2012	03/19/2013
Temp. / Humidity Meter	VICTOR	HTC-1	2	03/20/2012	03/20/2013
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

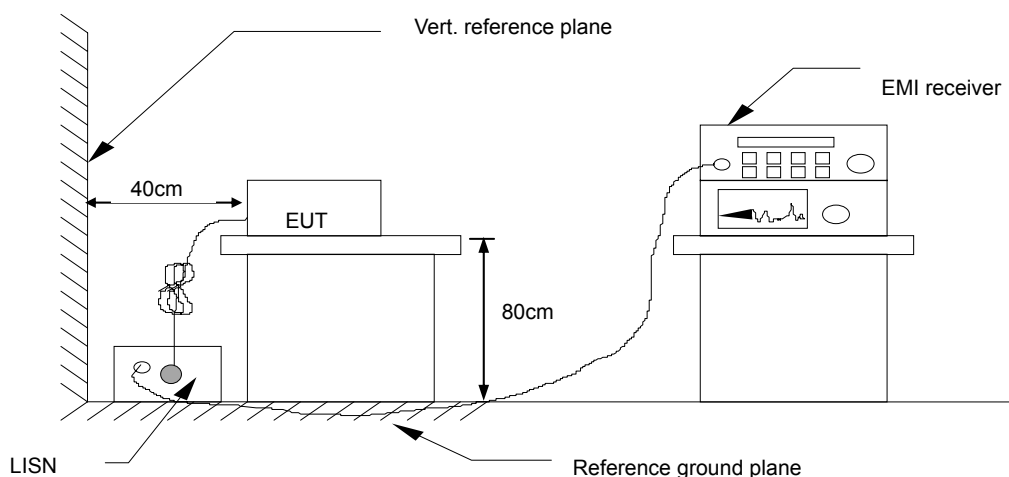


8.3.2. TEST PROCEDURES (please refer to measurement standard)

- The EUT and Support equipment, if needed, was placed on a non-conducted table, which is 0.8m above the ground plane and 0.4m away from the conducted wall.
- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane. All support equipment power received from a second LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The frequency range from 150 kHz to 30 MHz was searched. The test data of the worst-case condition(s) was recorded. Emission levels under limit 20dB were not recorded.



8.3.3. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

8.3.4. DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

**8.3.5. TEST RESULTS**

Model No.	HP4890A	RBW,VBW	9 kHz
Environmental Conditions	26°C, 60% RH	Test Mode	Mode 2
Tested by	Leevin Li	Line	L1/L2

(The chart below shows the highest readings taken from the final data.)

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Line (L1/L2)
0.3460	40.36	33.53	0.34	40.70	33.87	59.06	49.06	-18.36	-15.19	L1
0.5540	33.58	22.60	0.39	33.97	22.99	56.00	46.00	-22.03	-23.01	L1
1.0140	30.44	21.29	0.36	30.80	21.65	56.00	46.00	-25.20	-24.35	L1
2.8060	33.46	22.77	0.47	33.93	23.24	56.00	46.00	-22.07	-22.76	L1
4.8060	34.87	22.07	0.52	35.39	22.59	56.00	46.00	-20.61	-23.41	L1
8.8300	34.96	23.40	0.79	35.75	24.19	60.00	50.00	-24.25	-25.81	L1
0.3420	37.34	29.47	0.54	37.88	30.01	59.15	49.15	-21.27	-19.14	L2
0.5620	32.16	21.26	0.59	32.75	21.85	56.00	46.00	-23.25	-24.15	L2
0.9860	29.17	15.42	0.54	29.71	15.96	56.00	46.00	-26.29	-30.04	L2
4.0500	32.54	20.16	0.54	33.08	20.70	56.00	46.00	-22.92	-25.30	L2
9.7500	33.49	22.32	0.57	34.06	22.89	60.00	50.00	-25.94	-27.11	L2
17.6940	33.88	19.71	0.67	34.55	20.38	60.00	50.00	-25.45	-29.62	L2

REMARKS: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

2. Those frequencies only show peak emission level because that was below the Average limit, so no need to check average anymore.

**8.4. SPURIOUS EMISSIONS MEASUREMENT****8.4.1. LIMITS OF RADIATED EMISSIONS MEASUREMENT**

1. In the section 15.249(a):

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

Fundamental Frequency	Field Strength of Fundamental Field Strength (mV/m)	Field Strength of Harmonics (μV/m)
902-928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

2. 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)
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.

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

Frequency (Hz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

**8.4.2. TEST INSTRUMENTS**

Radiated Emission Test Site 966 (2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2012	03/18/2013
Turn Table	EMCO	2081-1.21	N/A	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2012	03/18/2013
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/17/2012	03/17/2013
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/17/2012	03/17/2013
Loop Antenna	A、R、A	PLA-1030/B	1029	03/23/2012	03/23/2013
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/19/2012	03/19/2013
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Required.

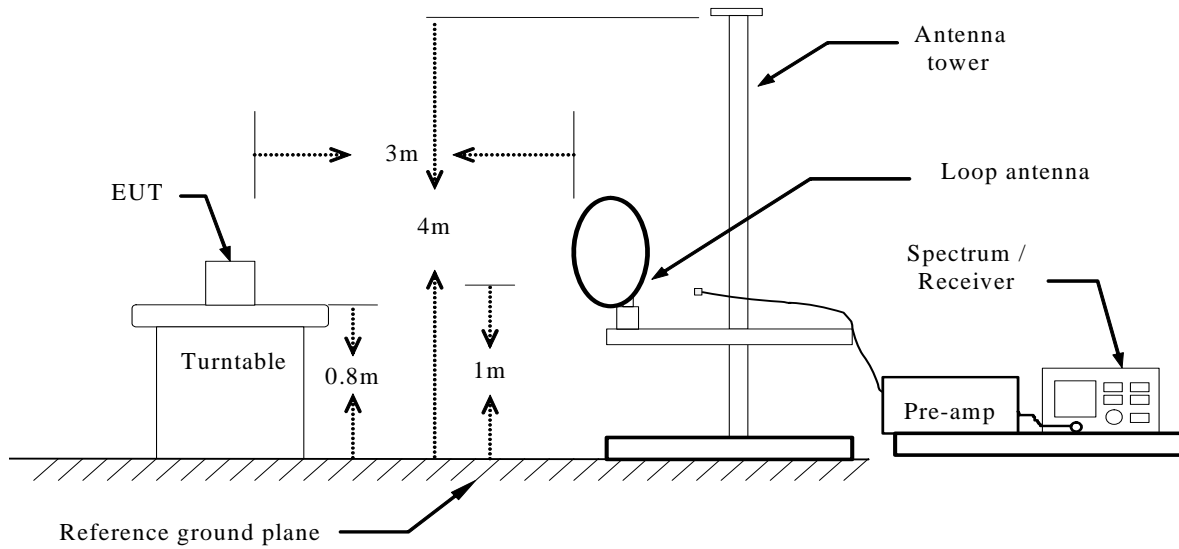
8.3.3 TEST PROCEDURE (please refer to measurement standard)

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=100kHz / VBW=300kHz / 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.

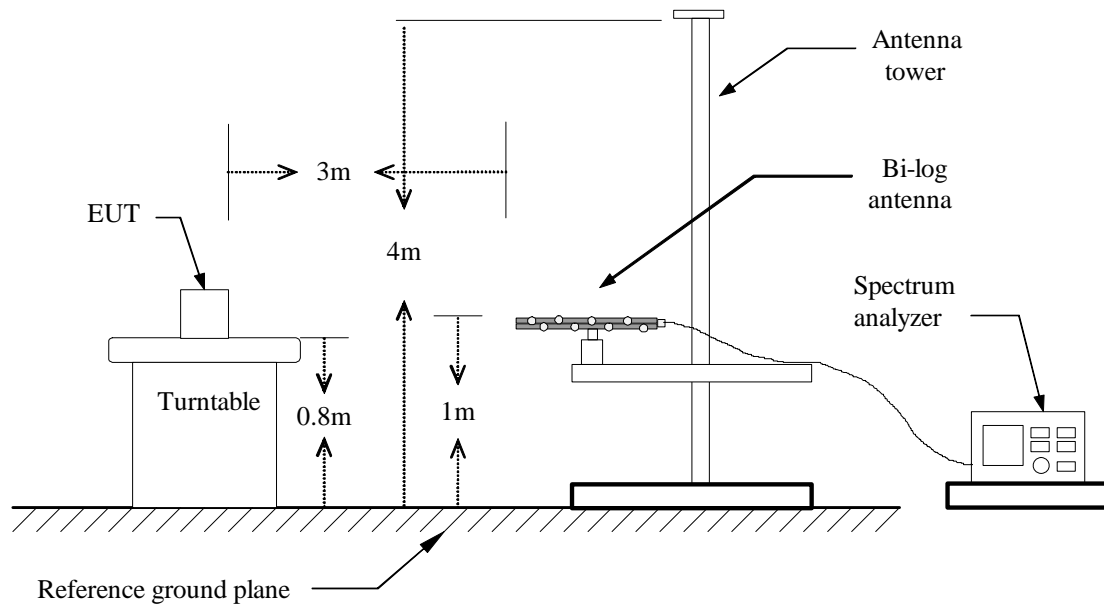


8.4.2.1. TEST SETUP

Below 30 MHz

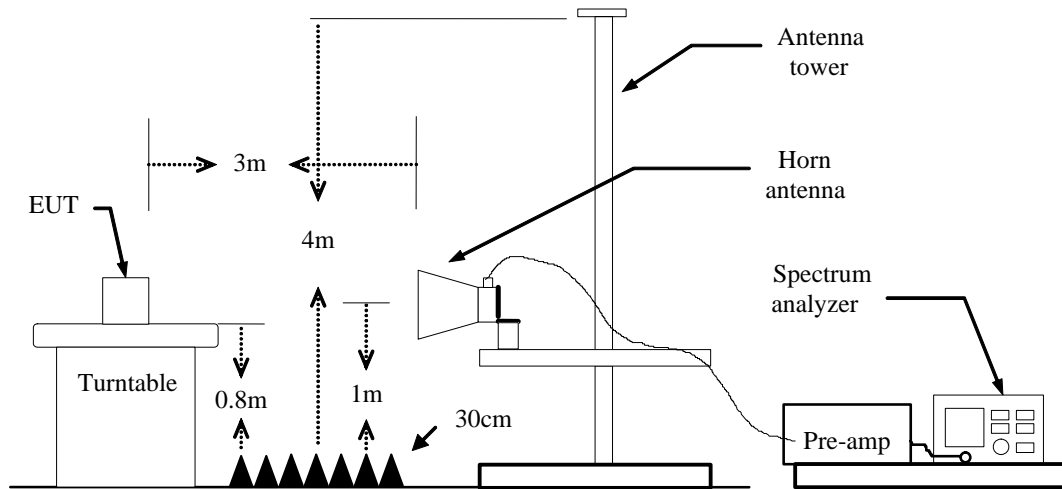


Below 1 GHz





Above 1 GHz



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**8.4.2.2. DATA SAMPLE****Below 1GHz**

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXX.XXXX	37.47	-16.41	21.06	40.00	-18.94	V	QP

Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXXX.XXXX	55.54	4.56	60.10	74.00	-13.90	V	Peak
XXXX.XXXX	29.66	4.56	34.22	54.00	-19.78	V	AVG

Frequency (MHz)

= Emission frequency in MHz

Reading (dBuV)

= Uncorrected Analyzer / Receiver reading

Correction Factor (dB/m)

= Antenna factor + Cable loss – Amplifier gain

Result (dBuV/m)

= Reading (dBuV) + Corr. Factor (dB/m)

Limit (dBuV/m)

= Limit stated in standard

Margin (dB)

= Result (dBuV/m) – Limit (dBuV/m)

Q.P.

= Quasi-peak Reading

Peak

= Peak Reading

AVG

= Average Reading

**8.4.2.3. TEST RESULTS****Below 1 GHz****Operation Mode:** TX / CH 1 (915.5MHz)**Test Date:** September 25, 2012**Temperature:** 24°C**Tested by:** Sunday Hu**Humidity:** 52 % RH**Polarity:** Ver. / Hor.***Fundamental***

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
915.5000	89.05	-9.72	79.33	114.00	-34.67	V	Peak
915.5000	85.78	-9.72	76.06	94.00	-17.94	V	AVG
915.5000	89.65	-9.72	79.93	114.00	-34.07	H	Peak
915.5000	85.61	-9.72	75.89	94.00	-18.11	H	AVG

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
109.2167	44.59	-20.95	23.64	43.50	-19.86	V	QP
246.6333	36.10	-17.43	18.67	46.00	-27.33	V	QP
408.3000	32.16	-15.40	16.76	46.00	-29.24	V	QP
474.5833	32.49	-14.59	17.90	46.00	-28.10	V	QP
608.7667	32.60	-12.35	20.25	46.00	-25.75	V	QP
720.3167	33.56	-10.81	22.75	46.00	-23.25	V	QP
173.8833	52.58	-18.73	33.85	43.50	-9.65	H	QP
215.9167	45.69	-17.80	27.89	43.50	-15.61	H	QP
266.0333	46.35	-18.44	27.91	46.00	-18.09	H	QP
372.7333	42.99	-16.73	26.26	46.00	-19.74	H	QP
426.0833	41.85	-14.92	26.93	46.00	-19.07	H	QP
437.4000	42.01	-14.96	27.05	46.00	-18.95	H	QP

****Note:** No emission found between lowest internal used/generated frequency to 30 MHz.**REMARKS:**

1. Radiated emissions measured in frequency range from 9kHz to 1GHz were made with an instrument using peak/quasi-peak detector mode.
2. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, 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.
4. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Quasi-peak limit (dBuV/m)}$

**Operation Mode:** TX / CH 2 (916.0MHz)**Test Date:** September 25, 2012**Temperature:** 24°C**Tested by:** Sunday Hu**Humidity:** 52 % RH**Polarity:** Ver. / Hor.***Fundamental***

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
916.0000	88.18	-9.72	78.46	114.00	-35.54	V	Peak
916.0000	87.58	-9.72	77.86	94.00	-16.14	V	AVG
916.0000	88.50	-9.72	78.78	114.00	-35.22	H	Peak
916.0000	86.93	-9.72	77.21	94.00	-16.79	H	AVG

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
109.2167	43.59	-20.95	22.64	43.50	-20.86	V	QP
246.6331	34.10	-17.43	16.67	46.00	-29.33	V	QP
374.3500	33.27	-16.77	16.50	46.00	-29.50	V	QP
531.1666	33.43	-14.62	18.81	46.00	-27.19	V	QP
678.2833	31.86	-10.96	20.90	46.00	-25.10	V	QP
820.5500	33.23	-10.87	22.36	46.00	-23.64	V	QP
173.8831	51.08	-18.73	32.35	43.50	-11.15	H	QP
266.0332	45.35	-18.44	26.91	46.00	-19.09	H	QP
372.7332	39.99	-16.73	23.26	46.00	-22.74	H	QP
437.4000	41.01	-14.96	26.05	46.00	-19.95	H	QP
492.3666	39.33	-14.69	24.64	46.00	-21.36	H	QP
841.5665	35.66	-10.03	25.63	46.00	-20.37	H	QP

****Note:** No emission found between lowest internal used/generated frequency to 30 MHz.**REMARKS:**

1. Radiated emissions measured in frequency range from 9kHz to 1GHz were made with an instrument using peak/quasi-peak detector mode.
2. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, 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.
4. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m)

**Operation Mode:** TX / CH 3 (916.5MHz)**Test Date:** September 25, 2012**Temperature:** 24°C**Tested by:** Sunday Hu**Humidity:** 52 % RH**Polarity:** Ver. / Hor.**Fundamental**

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
916.5000	89.65	-9.72	79.93	114.00	-34.07	V	Peak
916.5000	87.84	-9.72	78.12	94.00	-15.88	V	AVG
916.5000	88.22	-9.72	78.50	114.00	-35.50	H	Peak
916.5000	86.65	-9.72	76.93	94.00	-17.07	H	AVG

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
99.5167	46.18	-22.64	23.54	43.50	-19.96	V	QP
254.7167	38.34	-17.78	20.56	46.00	-25.44	V	QP
387.2832	37.87	-16.54	21.33	46.00	-24.67	V	QP
474.5833	32.49	-14.59	17.90	46.00	-28.10	V	QP
668.5833	31.85	-11.22	20.63	46.00	-25.37	V	QP
802.7667	32.58	-10.58	22.00	46.00	-24.00	V	QP
173.8831	50.08	-18.73	31.35	43.50	-12.15	H	QP
215.9165	48.69	-17.80	30.89	43.50	-12.61	H	QP
266.0332	44.35	-18.44	25.91	46.00	-20.09	H	QP
372.7332	42.99	-16.73	26.26	46.00	-19.74	H	QP
426.0833	41.85	-14.92	26.93	46.00	-19.07	H	QP
532.7833	37.74	-14.53	23.21	46.00	-22.79	H	QP

****Note:** No emission found between lowest internal used/generated frequency to 30 MHz.**REMARKS:**

1. Radiated emissions measured in frequency range from 9kHz to 1GHz were made with an instrument using peak/quasi-peak detector mode.
2. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, 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.
4. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m)

**Above 1 GHz****Operation Mode:** TX / CH 1 (915.5MHz)**Test Date:** September 25, 2012**Temperature:** 24°C**Tested by:** Sunday Hu**Humidity:** 52 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBUV)	Correction Factor (dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1330.0000	49.41	-8.14	41.27	74.00	-32.73	V	Peak
2740.0000	48.36	-5.28	43.08	74.00	-30.92	V	Peak
3655.0000	46.23	-2.87	43.36	74.00	-30.64	V	Peak
4150.0000	46.67	-1.82	44.85	74.00	-29.15	V	Peak
5080.0000	45.48	1.41	46.89	74.00	-27.11	V	Peak
5755.0000	45.47	2.59	48.06	74.00	-25.94	V	Peak
1300.0000	49.29	-8.28	41.01	74.00	-32.99	H	Peak
1825.0000	51.28	-9.67	41.61	74.00	-32.39	H	Peak
2950.0000	47.58	-4.44	43.14	74.00	-30.86	H	Peak
3865.0000	46.44	-2.50	43.94	74.00	-30.06	H	Peak
4900.0000	44.93	0.86	45.79	74.00	-28.21	H	Peak
5620.0000	45.38	2.02	47.40	74.00	-26.60	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, 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.
6. Margin (dB) = Remark result (dBUV/m) – Average limit (dBUV/m).



Operation Mode: TX / CH 2 (916.0MHz) **Test Date:** September 25, 2012
Temperature: 24°C **Tested by:** Sunday Hu
Humidity: 52 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1825.0000	50.59	-9.67	40.92	74.00	-33.08	V	Peak
2755.0000	48.00	-5.22	42.78	74.00	-31.22	V	Peak
3670.0000	47.18	-2.83	44.35	74.00	-29.65	V	Peak
4135.0000	46.64	-1.89	44.75	74.00	-29.25	V	Peak
4960.0000	45.22	1.14	46.36	74.00	-27.64	V	Peak
5170.0000	45.52	1.52	47.04	74.00	-26.96	V	Peak
1135.0000	50.48	-9.25	41.23	74.00	-32.77	H	Peak
3115.0000	47.55	-4.15	43.40	74.00	-30.60	H	Peak
3670.0000	46.33	-2.83	43.50	74.00	-30.50	H	Peak
4675.0000	45.98	-0.13	45.85	74.00	-28.15	H	Peak
4885.0000	45.28	0.80	46.08	74.00	-27.92	H	Peak
5830.0000	45.03	2.83	47.86	74.00	-26.14	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** TX / CH 3 (916.5MHz)**Test Date:** September 25, 2012**Temperature:** 24°C**Tested by:** Sunday Hu**Humidity:** 52 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1210.0000	49.83	-8.69	41.14	74.00	-32.86	V	Peak
1840.0000	50.19	-9.81	40.38	74.00	-33.62	V	Peak
2515.0000	47.14	-6.13	41.01	74.00	-32.99	V	Peak
3025.0000	46.88	-4.22	42.66	74.00	-31.34	V	Peak
3670.0000	46.74	-2.83	43.91	74.00	-30.09	V	Peak
4435.0000	45.91	-0.76	45.15	74.00	-28.85	V	Peak
1840.0000	51.79	-9.81	41.98	74.00	-32.02	H	Peak
3370.0000	47.11	-4.01	43.10	74.00	-30.90	H	Peak
4030.0000	46.69	-2.39	44.30	74.00	-29.70	H	Peak
4600.0000	45.08	-0.46	44.62	74.00	-29.38	H	Peak
5095.0000	45.59	1.43	47.02	74.00	-26.98	H	Peak
5755.0000	46.71	2.59	49.30	74.00	-24.70	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).