



# FCC CERTIFICATION TEST REPORT

**REPORT NO.:** FC130527C07B

**MODEL NO.:** Messi-V

**RECEIVED:** Jul. 08, 2013

**TESTED:** Jul. 10, 2013 ~ Jul. 15, 2013

**ISSUED:** Jul. 22, 2013

**APPLICANT:** Universal Scientific Industrial Co., Ltd.

**ADDRESS:** 141, Lane 351, Taiping Road, Sec. 1, Tsao Tuen,  
Nan-Tou, Taiwan

**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)  
Ltd., Taoyuan Branch

**LAB ADDRESS:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei  
Shan Hsiang, Taoyuan Hsien 333, Taiwan

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FC130527C07B	Original release.	Jul. 22, 2013



# 1 CERTIFICATION

**PRODUCT:** LTE Module

**BRAND:** Universal Global Scientific Industrial Co., Ltd.

**MODEL NO.:** Messi-V

**APPLICANT:** Universal Scientific Industrial Co., Ltd.

**TESTED:** Jul. 10, 2013 ~ Jul. 15, 2013

**TEST SAMPLE:** Production Unit

**STANDARD: FCC Part 15, Subpart B, Class B**

ANSI C63.4:2009

The above equipment (Model: Messi-V) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY :** Vera Huang , **DATE :** Jul. 22, 2013  
Vera Huang / Specialist

**APPROVED BY :** Derrick Dai , **DATE :** Jul. 22, 2013  
Derrick Dai / Assistant Manager

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications.

EMISSION			
Standard	Test Type	Result	Remarks
FCC Part 15, Subpart B, Class B	Radiated emission test (30MHz~40GHz)	PASS	Meet the requirement of limit. Minimum passing margin is -8.98dB at 920.30MHz.

### 2.1 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:

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

Measurement	Frequency	Uncertainty
Radiated emission	30MHz ~ 1GHz	4.12 dB
	Above 1GHz	2.26 dB

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	LTE Module
<b>MODEL NO.</b>	Messi-V
<b>POWER SUPPLY</b>	3.3Vdc from power supply
<b>DATA CABLE</b>	Refer to NOTE
<b>ACCESSORY DEVICE</b>	Refer to NOTE

**NOTE:**

1. The above EUT information is declared by manufacturer and for more detailed feature description, please refers to the manufacturer's specifications or user's manual.

#### 3.2 DESCRIPTION OF TEST MODES

Per client's requirement, the EUT was tested with following modes.

Test Result	Test Condition
<b>Radiated Emission Test</b>	
1	LTE Band 4 Idle
2	LTE Band 13 Idle
<b>NOTE:</b> For radiated emission test, test mode 2 was the worst case and only this mode was presented in this report.	

### 3.3 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.

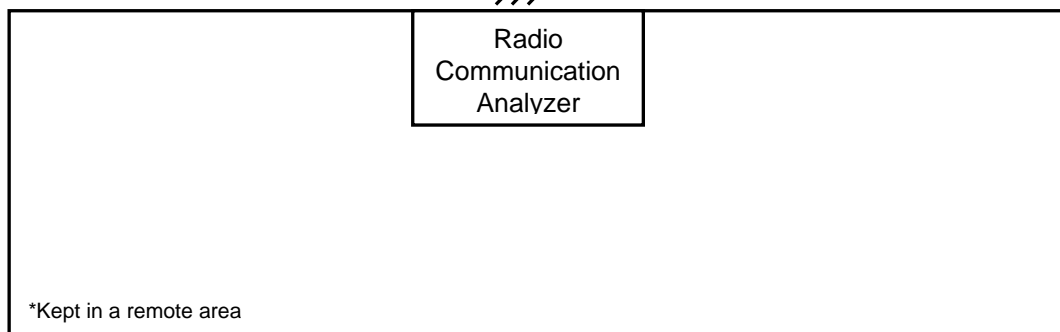
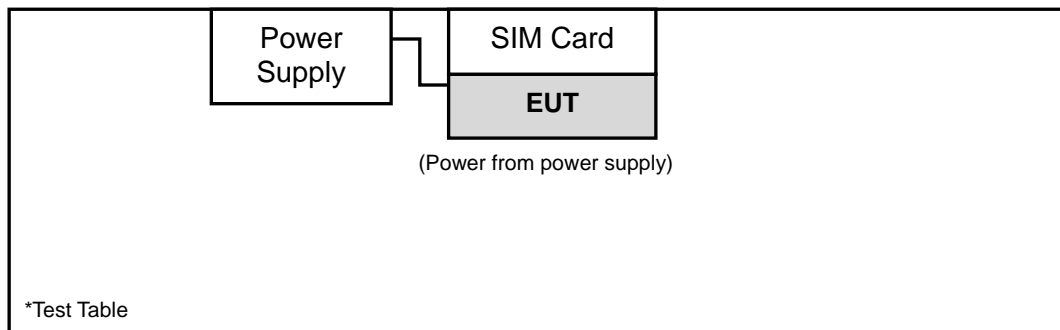
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	POWER SUPPLY	TOP WARD	6306A	713585	N/A
2	Radio Communication Analyzer	Anritsu	MT8820C	6201010284	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	N/A

**NOTE:**

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 2 acted as communication partner.

### 3.4 CONFIGURATION OF SYSTEM UNDER TEST



## 4 TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

##### TEST STANDARD:

**FCC Part 15, Subpart B (section: 15.109)**

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dB $\mu$ V/m)				
Frequencies (MHz)	FCC 15B/ ICES-003, Class A	FCC 15B/ ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960			47	37
960-1000	49.5	43.5	Not defined	Not defined
1000-3000	Avg: 49.5	Avg: 43.5		
3000+	Peak: 69.5	Peak: 63.5	Not defined	Not defined

Radiated Emissions Limits at 3 meters (dB $\mu$ V/m)				
Frequencies (MHz)	FCC 15B/ ICES-003, Class A	FCC 15B/ ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40	50.5	40.5
88-216	54	43.5		
216-230	56.9	46		
230-960			57.5	47.5
960-1000	60	54	Avg: 56 Peak: 76	Avg: 50 Peak: 70
1000-3000	Avg: 60	Avg: 54		
3000+	Peak: 80	Peak: 74	Avg: 60 Peak: 80	Avg: 54 Peak: 74

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m).
  3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
  4. QP detector shall be applied if not specified.





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## 4.1.2 TEST INSTRUMENTS

### Frequency range 30MHz~1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ (V)	ESIB7	100187	Dec. 27, 2012	Dec. 26, 2013
Test Receiver ROHDE & SCHWARZ (H)	ESIB7	100186	Nov. 28, 2012	Nov. 27, 2013
BILOG Antenna SCHWARZBECK (V)	VULB9168	9168-148	Mar. 19, 2013	Mar. 18, 2014
BILOG Antenna SCHWARZBECK (H)	VULB9168	9168-149	Mar. 19, 2013	Mar. 18, 2014
Preamplifier Agilent (V)	8447D	2944A10636	Oct. 20, 2012	Oct. 19, 2013
Preamplifier Agilent (H)	8447D	2944A10637	Oct. 20, 2012	Oct. 19, 2013
Preamplifier Agilent	8449B	3008A01959	Oct. 25, 2012	Oct. 24, 2013
RF signal cable Woken (V)	8D-FB	Cable-Hych1-01	Oct. 26, 2012	Oct. 25, 2013
RF signal cable Woken (H)	8D-FB	Cable-Hych1-02	Oct. 26, 2012	Oct. 25, 2013
Software ADT	BV ADT_Radiated_ V 7.7.03.7	NA	NA	NA
Antenna Tower (V)	MFA-440	9707	NA	NA
Antenna Tower (H)	MFA-440	970705	NA	NA
Turn Table	DS430	50303	NA	NA
Controller (V)	MF7802	074	NA	NA
Controller (H)	MF7802	08093	NA	NA

- 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. The test was performed in HwaYa Chamber 1.
  3. The FCC Site Registration No. is 477732.
  4. The IC Site Registration No. is IC 7450F-1.
  5. The VCCI Site Registration No. is R-1893, G-113..



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### Frequency range above 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	838496/016	Dec. 25, 2012	Dec. 24, 2013
Spectrum Analyzer Agilent	E4446A	MY48250266	Aug. 29, 2012	Aug. 28, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Mar. 20, 2013	Mar. 19, 2014
RF signal cable Woken	8D-FB	NA	Mar. 23, 2013	Mar. 22, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-404	Dec. 22, 2012	Dec. 21, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 25, 2012	Dec. 24, 2013
Preamplifier Agilent (Below 1GHz)	8447D	2944A10629	Oct. 26, 2012	Oct. 25, 2013
Preamplifier Agilent (Above 1GHz)	8449B	3008A01959	Oct. 25, 2012	Oct. 24, 2013
RF signal cable HUBER+SUHNER	SUCOFLEX 104	230132/4	Oct. 26, 2012	Oct. 25, 2013
RF signal cable HUBER+SUHNER	SUCOFLEX 104	309223/4+309 218/4	Oct. 26, 2012	Oct. 25, 2013
Software ADT	BV ADT_Radiated_ V7.6.15.9.3	NA	NA	NA
Antenna Tower ADT	AT100	AT93021702	NA	NA
Turn Table ADT	TT100	TT93021702	NA	NA
Controller ADT	SC100	SC93021702	NA	NA
RF signal cable EAST COST Microwave	HP 160S-29	NA	Oct. 26, 2012	Oct. 25, 2013

- 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. The test was performed in HwaYa Chamber 1.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 686814.
  5. The IC Site Registration No. is IC 7450F-2.
  6. The VCCI Site Registration No. is G-18.

### 4.1.3 TEST PROCEDURES

#### Frequency range 30MHz~1GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

**NOTE:** The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-Peak (QP) detection at frequency below 1GHz.

### Frequency range above 1GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna can be varied from 1 meter to 4 meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.

**NOTE:**

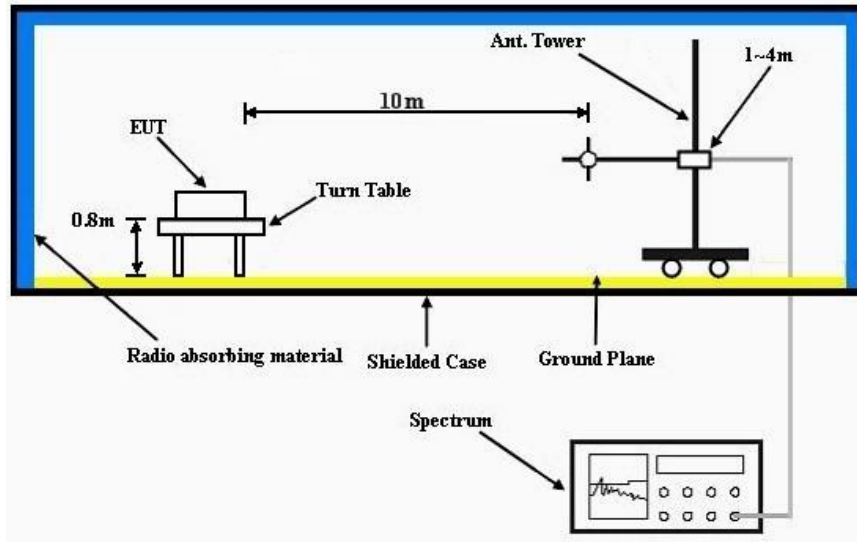
1. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak (PK) detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz for Average (AV) detection at frequency above 1GHz.
2. For measurement of frequency above 1000MHz, the EUT was set 3 meters away from the receiver antenna.

#### 4.1.4 DEVIATION FROM TEST STANDARD

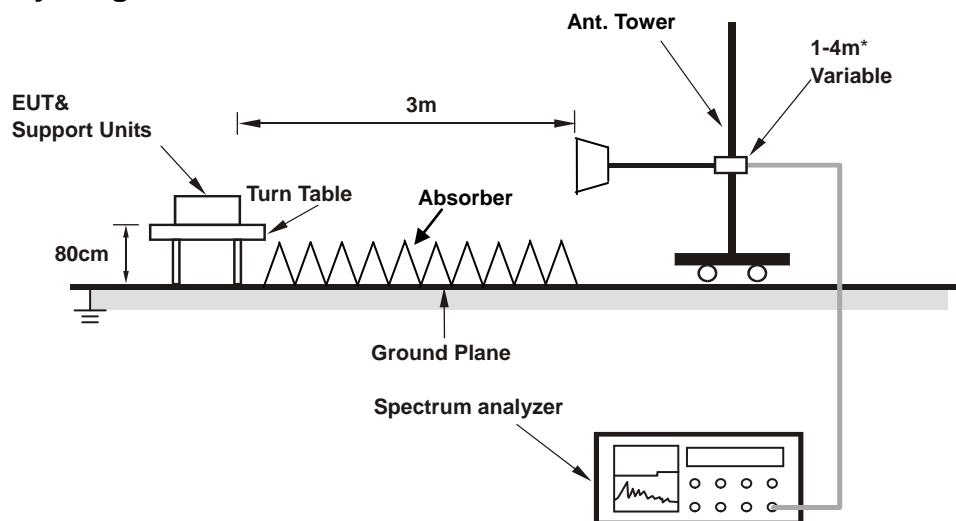
No deviation.

### 4.1.5 TEST SETUP

#### Frequency range 30MHz~1GHz



#### Frequency range above 1GHz



\* : depends on the EUT height and the antenna 3dB beamwidth both.

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

### 4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT with SIM card on a testing table.
- b. The EUT communicated data with the Radio Communication Analyzer, which acted as communication partner.

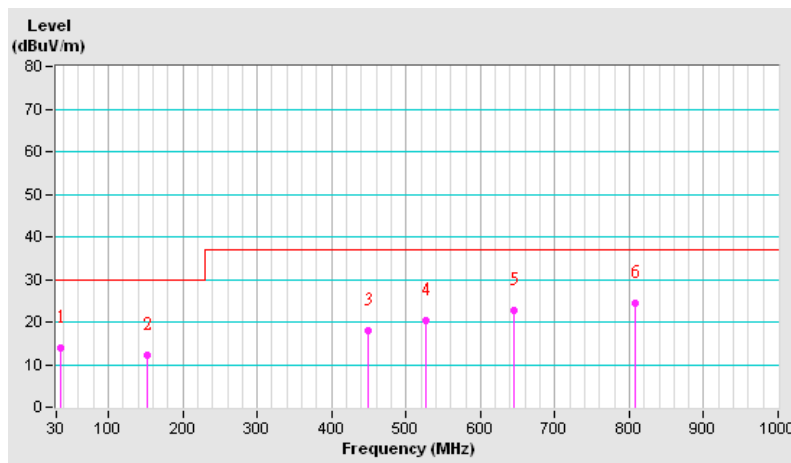
### 4.1.7 TEST RESULTS

<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 69% RH	<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>TESTED BY</b>	Fox Chang	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Quasi-Peak , 120 kHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.83	13.98 QP	30.00	-16.02	4.00 H	6	28.86	-14.88
2	152.46	12.23 QP	30.00	-17.77	1.50 H	19	25.38	-13.15
3	449.88	18.10 QP	37.00	-18.90	3.00 H	332	26.25	-8.15
4	525.69	20.23 QP	37.00	-16.77	2.00 H	38	27.23	-7.00
5	644.27	22.61 QP	37.00	-14.39	1.00 H	293	26.86	-4.25
6	807.56	24.38 QP	37.00	-12.62	2.50 H	97	25.78	-1.40

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

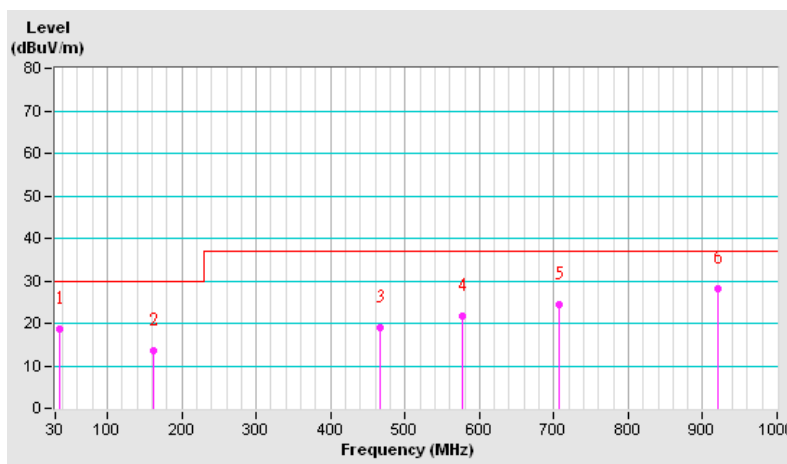


<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 69% RH	<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>TESTED BY</b>	Fox Chang	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Quasi-Peak , 120 kHz

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.83	18.80 QP	30.00	-11.20	1.50 V	203	33.41	-14.61
2	162.18	13.67 QP	30.00	-16.33	1.50 V	7	26.61	-12.94
3	467.37	19.14 QP	37.00	-17.86	2.50 V	190	26.63	-7.49
4	576.23	21.83 QP	37.00	-15.17	3.50 V	154	26.94	-5.11
5	706.47	24.33 QP	37.00	-12.67	2.50 V	342	26.89	-2.56
6	920.30	28.02 QP	37.00	-8.98	1.00 V	36	26.06	1.96

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

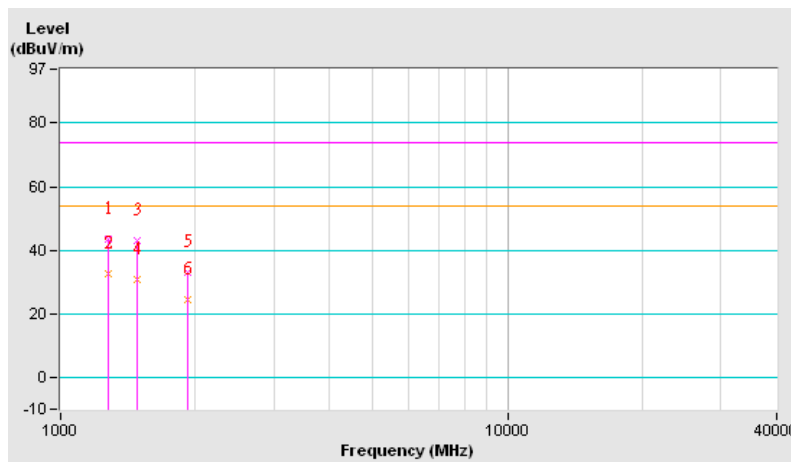


<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65% RH	<b>FREQUENCY RANGE</b>	1-40 GHz
<b>TESTED BY</b>	Felix Chen	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak/Average, 1 MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1279.45	43.65 PK	74.00	-30.35	1.00 H	55	49.55	-5.90
2	1279.45	32.70 AV	54.00	-21.30	1.00 H	55	38.60	-5.90
3	1482.13	43.22 PK	74.00	-30.78	1.48 H	2	47.99	-4.77
4	1482.13	30.99 AV	54.00	-23.01	1.48 H	2	35.76	-4.77
5	1930.00	33.21 PK	74.00	-40.79	1.49 H	165	36.04	-2.83
6	1930.00	24.35 AV	54.00	-29.65	1.49 H	165	27.18	-2.83

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



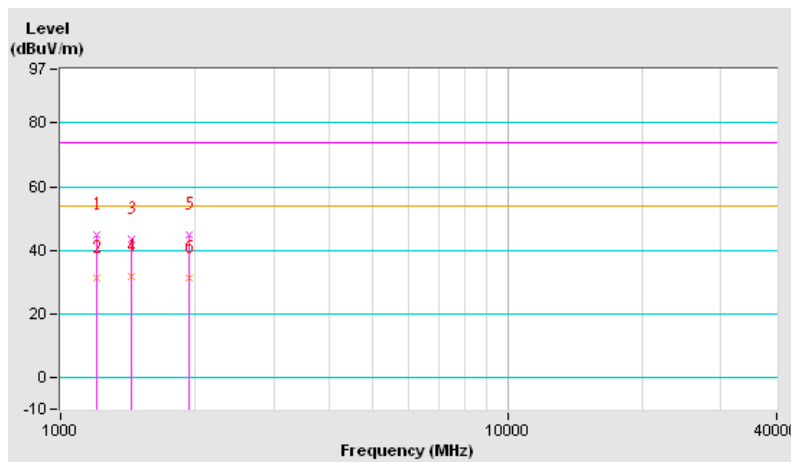


<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 65% RH	<b>FREQUENCY RANGE</b>	1-40 GHz
<b>TESTED BY</b>	Felix Chen	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak/Average, 1 MHz

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1204.08	45.04 PK	74.00	-28.96	1.50 V	116	51.45	-6.41
2	1204.08	31.39 AV	54.00	-22.61	1.50 V	116	37.80	-6.41
3	1437.63	43.63 PK	74.00	-30.37	1.00 V	338	48.64	-5.01
4	1437.63	31.59 AV	54.00	-22.41	1.00 V	338	36.60	-5.01
5	1938.90	44.70 PK	74.00	-29.30	1.00 V	152	47.50	-2.80
6	1938.90	31.12 AV	54.00	-22.88	1.00 V	152	33.92	-2.80

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value





## 6 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab**

Tel: 886-3-5935343

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**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

The address and road map of all our labs can be found in our web site also.



## **7 APPENDIX A – MODIFICATION RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No modifications were made to the EUT by the lab during the test.

**--- END ---**