

ICES-003, Issue 6  
TEST REPORT

For

**Jinan USR IOT Technology Limited**

Floor11,Building1,No.1166XinluoStreet,Gaoxin Distric,Jinan,Shandong,250101,China

**Tested Model: USR-WIFI232-Sb**  
**Series Model: USR-C210,USR-C215,**  
**USR-C216,USR-C217**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Serial to WIFI Module
<b>Test Engineer:</b> Poboo Li	Poboo.Li
<b>Report Number:</b> RKS161117003-00A	
<b>Report Date:</b> 2016-11-22	
<b>Reviewed By:</b> EMC Manager	Jesse Huang
<b>Test Laboratory:</b> Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan,Jiangsu province, China Tel: +86-0512-86175000 Fax: +86-0512-88934268 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>	Jesse.Huang

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

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FINAL

## GENERAL INFORMATION

### Product Description for Equipment Under Test (EUT)

Manufacturer	Jinan USR IOT Technology Limited
Model	USR-WIFI232-Sb
Product	Serial to WIFI Module
Rate Voltage	DC 3.3V, rated power :0.0396W, rated current:0.012A
Highest Operating Frequency	2462MHz
Dimension	22 mm (L) × 13.5mm (W) × 3 mm (H)

*Note: The product's series model number: USR-C210, USR-C215, USR-C216, USR-C217. The difference between them was explained in the attached declaration letter.*

*\* All measurement and test data in this report was gathered from production sample serial number: 20161110001 (Assigned by BACL, Kunshan). The EUT was received on 2016-11-10.*

### Objective

This report was prepared on behalf of Jinan USR IOT Technology Limited in accordance with ICES-003 of the Canadian Department of Industry rules.

The objective of the manufacturer was to determine the compliance of the EUT with ICES-003 Class B limits.

### Related Submittal(s)/Grant(s)

No related submittal(s).

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014. Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

**Test Facility**

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

FINAL

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a manufacturer testing fashion.

Test mode1: WiFi mode

### EUT Exercise Software

No exercise software was used.

### Special Accessories

No special accessory

### Equipment Modifications

No modification was made to the EUT tested.

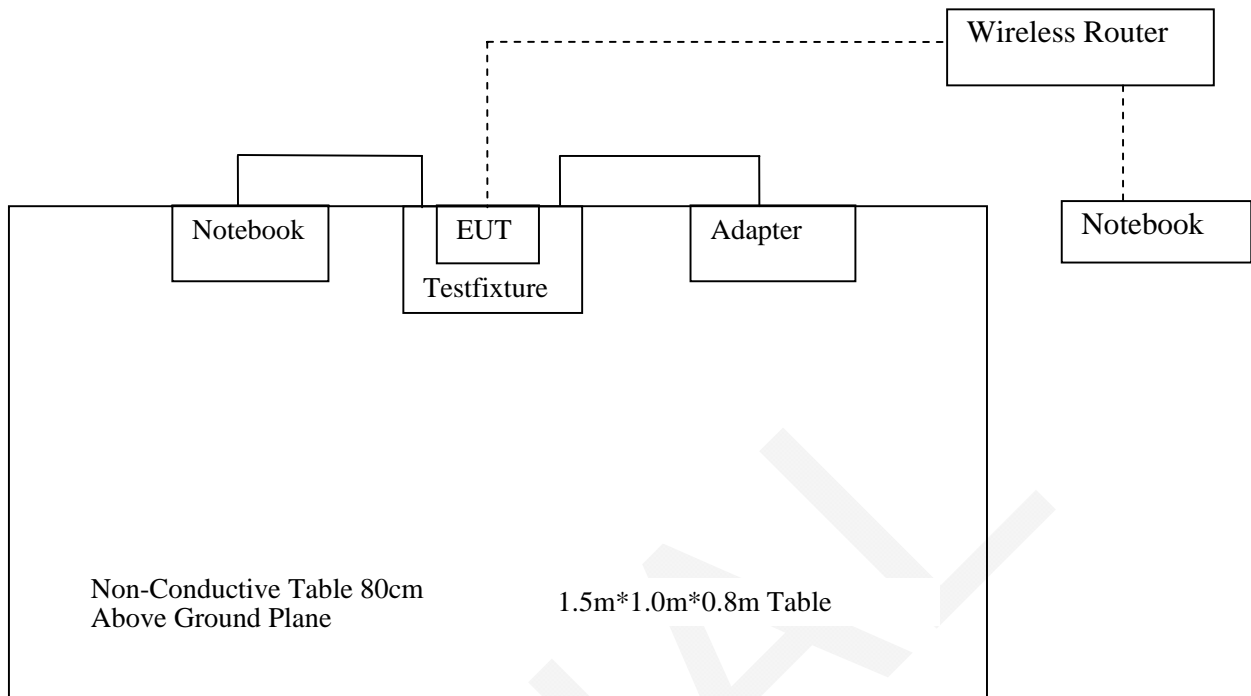
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Notebook	D420	0002530
NA	Testfixture	NA	NA
SAGEM	Wireless ADSL Router	SAGEM F@ST <sup>TM</sup> 2604 White	N/A

### External I/O Cable

Cable Description	Length (m)	From/Port	To
RS232 to USB Cable	0.9	Notebook	EUT

## Block Diagram of Radiated Test Setup



**SUMMARY OF TEST REPORT****ICES-003**

Rule	Description	Results
§ 5	Conducted Emissions	Compliance
§ 5	Radiated Emissions	Compliance



## §5-CONDUCTED EMISSIONS

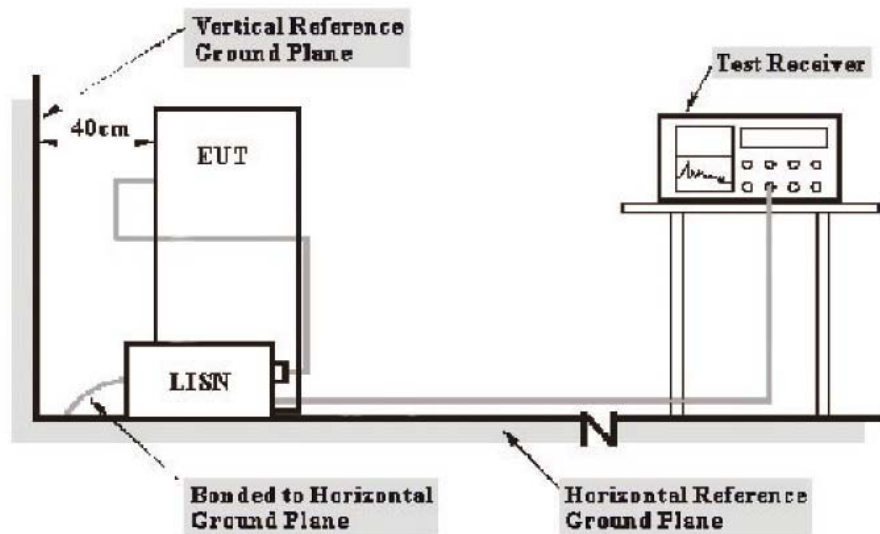
### Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN/ISN and receiver, LISN/ISN voltage division factor, LISN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011+A1-2014, the expanded combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Kunshan) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Expanded Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

### Test System Setup



The setup of EUT is according with ANSI C63.4:2014 measurement procedure. The specification used was the ICES-003 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The EUT was connected to a 120 VAC/60 Hz power source

## EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	934115/007	2016-11-11	2017-11-10
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2016-11-12	2017-11-11
Rohde & Schwarz	LISN	ESH3-Z5	892239/018	2016-06-23	2017-06-22
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2016-09-16	2017-09-15
Rohde & Schwarz	CE Test software	EMC 32	V 09.10.0	--	--
MICRO-COAX	Coaxial line	UFB-293B-1-0480-50X50	97F0173	2016-10-01	2017-10-01

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the first LISN.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the Quasi-peak and average detection mode.

## Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

$V_C$ : corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_C$ : attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table, the EUT complied with the ICES-003 Class B, with the worst margin reading of:

**21.29dB at 0.500000 MHz** in the **Neutral** conducted mode

## Test Data

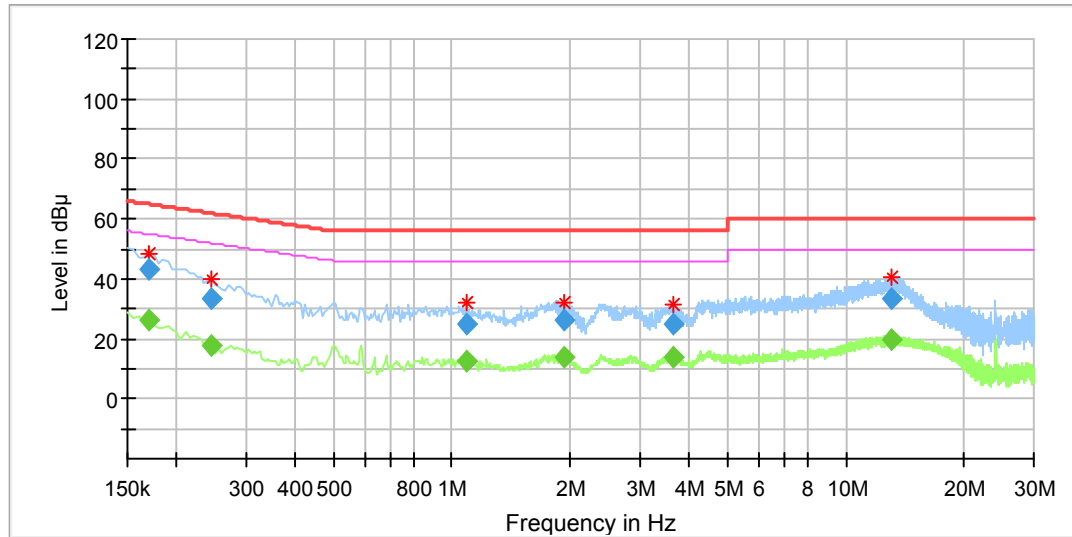
### Environmental Conditions

Temperature:	27.5 °C
Relative Humidity:	50 %
ATM Pressure:	99.7 kPa

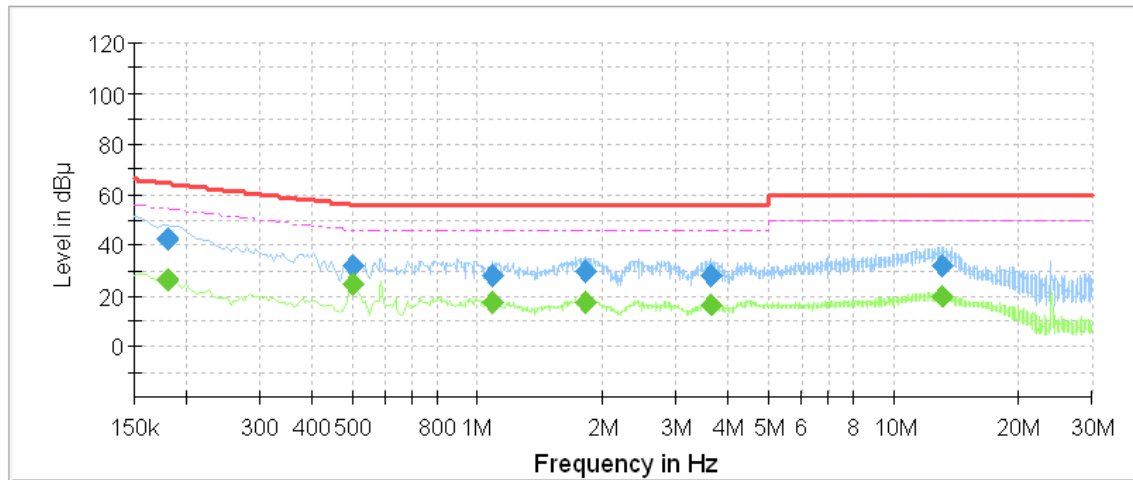
*The testing was performed by Poboo Li on 2016-11-13*

## Test Model

## Line



Frequency (MHz)	Corrected Amplitude		Limit (dB $\mu$ V)	Margin (dB)	Line	Corr. (dB)
	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)				
0.170000	---	26.44	54.96	28.52	L1	10.3
0.170000	42.97	---	64.96	21.99	L1	10.3
0.245000	---	17.63	51.92	34.29	L1	10.3
0.245000	33.65	---	61.92	28.27	L1	10.3
1.090000	---	12.74	46.00	33.26	L1	10.3
1.090000	24.93	---	56.00	31.07	L1	10.3
1.925000	---	13.67	46.00	32.33	L1	10.4
1.925000	26.11	---	56.00	29.89	L1	10.4
3.640000	---	13.57	46.00	32.43	L1	10.5
3.640000	25.19	---	56.00	30.81	L1	10.5
13.000000	---	19.64	50.00	30.36	L1	10.4
13.000000	33.12	---	60.00	26.88	L1	10.4

**Neutral**

Frequency (MHz)	Corrected Amplitude		Limit (dB $\mu$ V)	Margin (dB)	Line	Corr. (dB)
	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)				
0.180000	---	26.29	54.49	28.20	N	10.3
0.180000	42.55	---	64.49	21.94	N	10.3
0.500000	---	24.71	46.00	21.29	N	10.3
0.500000	32.46	---	56.00	23.54	N	10.3
1.095000	---	17.24	46.00	28.76	N	10.3
1.095000	28.03	---	56.00	27.97	N	10.3
1.825000	---	17.77	46.00	28.23	N	10.4
1.825000	29.26	---	56.00	26.74	N	10.4
3.650000	---	16.61	46.00	29.39	N	10.5
3.650000	28.13	---	56.00	27.87	N	10.5
12.990000	---	19.80	50.00	30.20	N	10.5
12.990000	32.09	---	60.00	27.91	N	10.5

## §5-RADIATED EMISSIONS

### Measurement Uncertainty

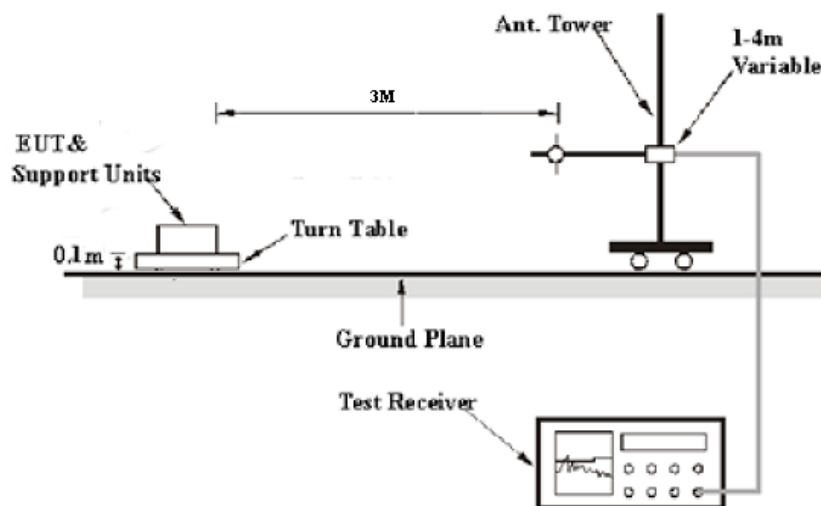
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011+A1-2014, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Kunshan) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

Frequency	Polarity	Measurement uncertainty
30 MHz~200 MHz	Horizontal	4.62 dB (k=2, 95% level of confidence)
	Vertical	4.54 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	Horizontal	4.84 dB (k=2, 95% level of confidence)
	Vertical	5.91 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	Horizontal/Vertical	4.68 dB (k=2, 95% level of confidence)
Above 6 GHz	Horizontal/Vertical	4.92 dB (k=2, 95% level of confidence)

### Test System Setup

Below 1 GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with ANSI C63.4:2014 measurement procedure. The specification used was the ICES-003 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

### EMI Test Receiver Setup

The system was measured from 30 MHz to 1 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP

### Test Procedure

For the radiated emissions test, the adapter was connected to the first AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in Quasi-peak detection mode for 30 MHz to 1 GHz.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrument	Amplifier	330	171377	2016-09-16	2017-09-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2015-11-12	2016-11-11
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2017-01-08
ETS	Horn Antenna	3115	6229	2016-01-11	2017-01-10
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-12	2017-11-11
Mini	Pre-amplifier	ZVA-183-S+	857001418	2016-09-16	2017-09-15
champrotek	Chamber	Chamber A	V 09.10.0	-	-
R&S	Auto test Software	EMC32	V 09.10.0	-	-
MICRO-COAX	Coaxial line	UFB-293B-1-0480-50X50	97F0173	2016-10-01	2017-10-01

**\* Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

### Test Results Summary

According to the data in the following table, the EUT complied with the ICES-003 Class B, with the worst margin reading of:

**2.23 dB at 1536.963928 MHz in the Vertical polarization mode**

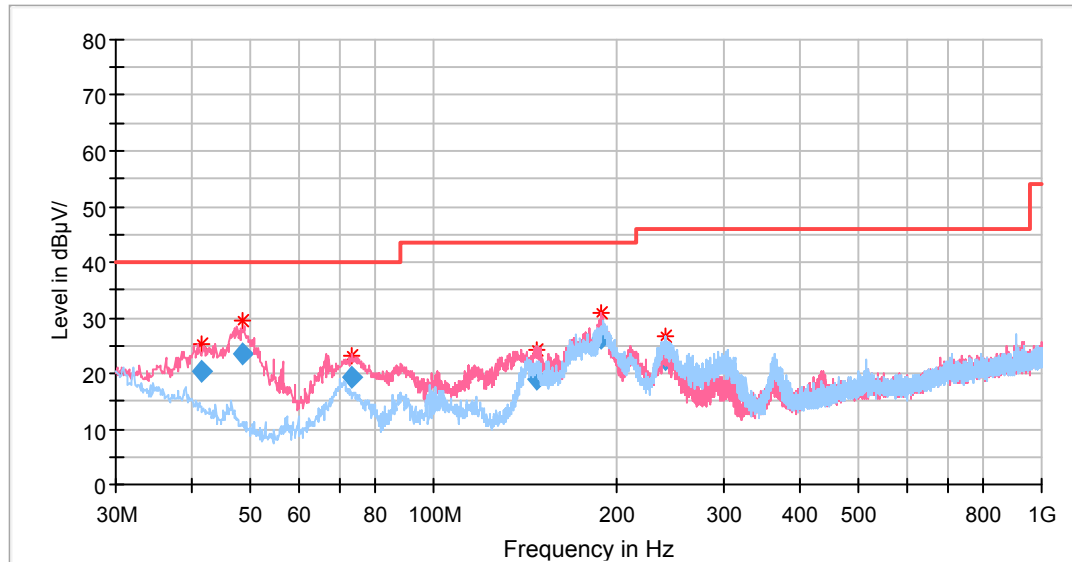
### Test Data

#### Environmental Conditions

<b>Temperature:</b>	25.4 °C
<b>Relative Humidity:</b>	60%
<b>ATM Pressure:</b>	100.2 kPa

*The testing was performed by Poboo Li on 2016-11-13*



*Test Model***1)30MHz ~ 1GHz**

Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Detector	Limit (dB $\mu$ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
41.552150	20.38	QuasiPeak	40.00	19.62	101.0	V	232.0	-11.2
48.347650	23.46	QuasiPeak	40.00	16.54	101.0	V	232.0	-15.5
73.417950	19.29	QuasiPeak	40.00	20.71	101.0	V	192.0	-17.1
148.119150	19.05	QuasiPeak	43.50	24.45	101.0	V	179.0	-12.2
188.047250	26.41	QuasiPeak	43.50	17.09	101.0	V	345.0	-12.1
239.947050	22.58	QuasiPeak	46.00	23.42	199.0	H	44.0	-12.1

**Above 1 GHz:**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1536.963928	---	51.67	53.90	2.23	149.0	V	6.0	-7.4
1536.963928	52.78	---	73.90	21.12	149.0	V	6.0	-7.4
1752.595190	46.60	---	73.90	27.30	149.0	H	117.0	-6.2
1752.595190	---	24.08	53.90	29.82	149.0	H	117.0	-6.2
1845.400802	59.32	---	73.90	14.58	149.0	H	241.0	-5.7
1845.400802	---	37.95	53.90	15.95	149.0	H	241.0	-5.7
2141.192385	48.57	---	73.90	25.33	149.0	H	173.0	-4.4
2141.192385	---	33.98	53.90	19.92	149.0	H	173.0	-4.4
2440.010020	56.31	---	73.90	17.59	149.0	H	236.0	-3.3
2440.010020	---	43.13	53.90	10.77	149.0	H	236.0	-3.3
6654.939880	50.39	---	73.90	23.51	149.0	H	56.0	13.4
6654.939880	---	36.09	53.90	17.81	149.0	H	56.0	13.4

## ICES-003 §8 - Labelling Requirements

### IC Statement

The manufacturer, importer or supplier shall meet the labelling requirements set out in this section for every ITE unit<sup>3</sup>:

- (i) Prior to marketing in Canada, for ITE manufactured in Canada, and;
- (ii) Prior to importation into Canada, for imported ITE.

The presence of the label on the ITE represents the manufacturer's or importer's Self-Declaration of Compliance (SDoC) to Industry Canada ICES-003. Each unit of an ITE model shall bear a label indicating the model's compliance with ICES-003.

The label shall be permanently affixed to the ITE or displayed electronically and its text must be clearly legible. When the dimension of the device is too small or it is otherwise not practical to place the label on the ITE, the label shall be placed in a prominent location in the user manual supplied with the ITE. The user manual may be in an electronic format and must be readily available.

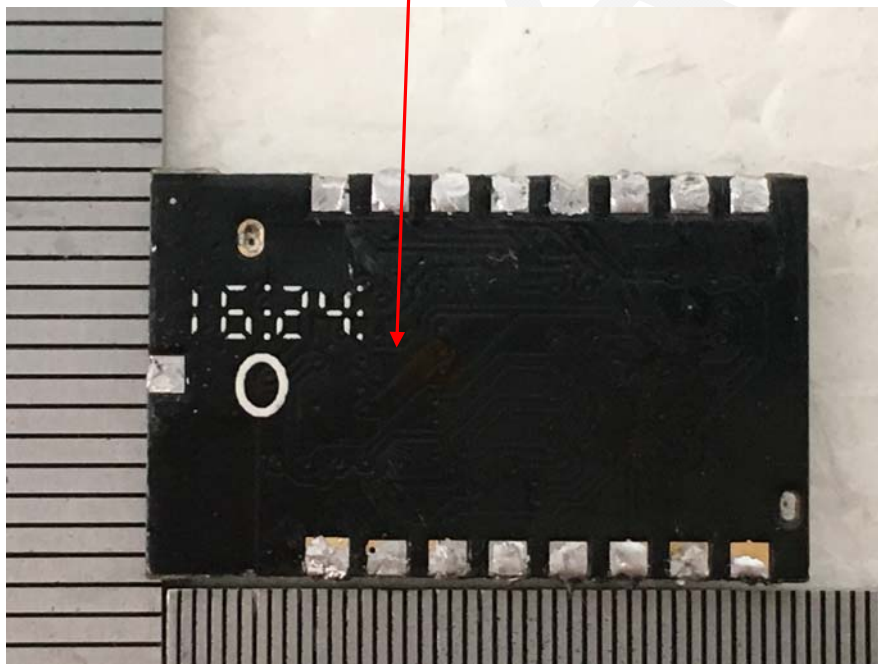
Industry Canada ICES-003 Compliance Label:

CAN ICES-3 (\*)/NMB-3(\*)

\* Insert either "A" or "B" but not both to identify the applicable Class of ITE.

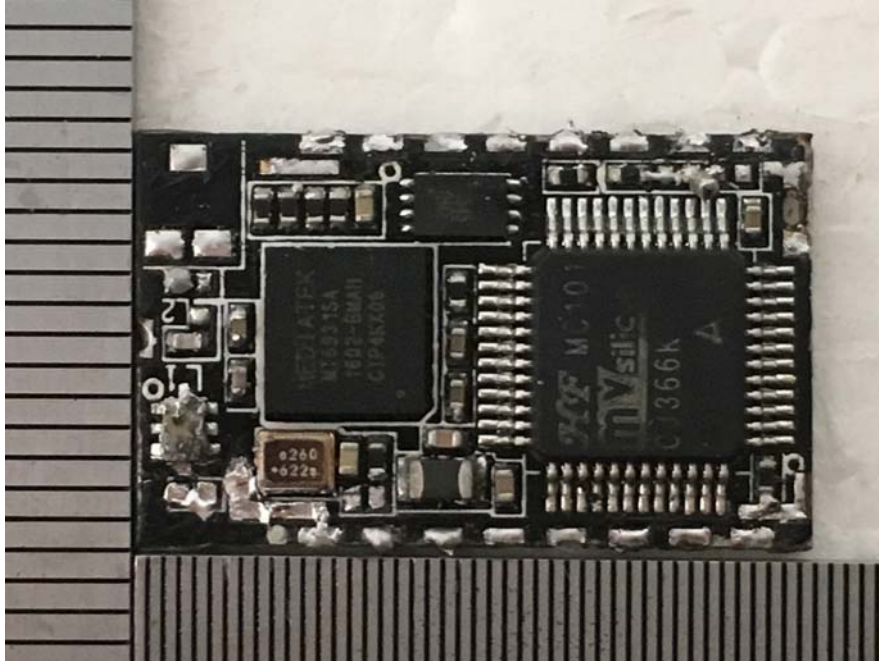
### Proposed Location of Label on EUT

IC Label Location

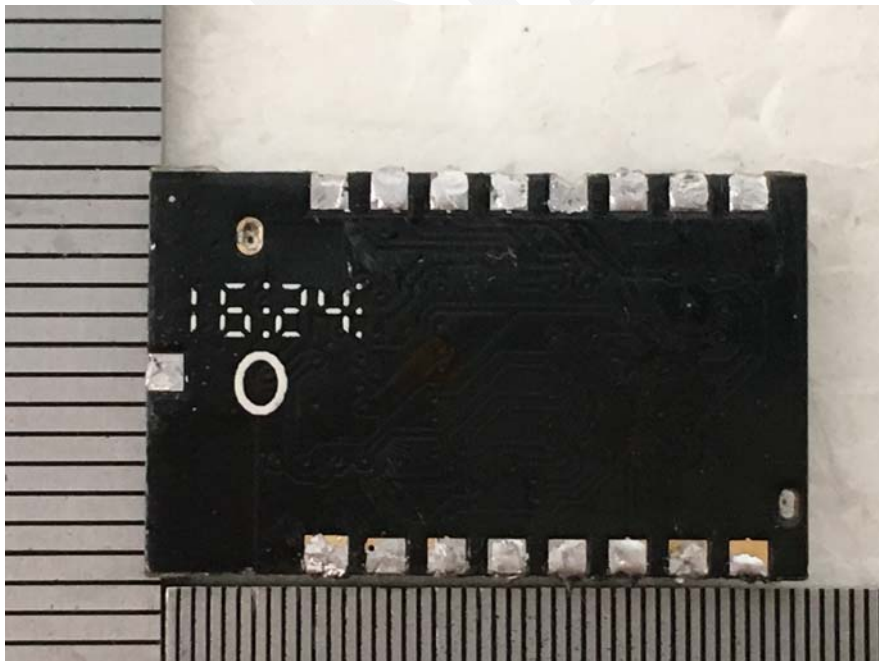


## EXHIBIT C - EUT PHOTOGRAPHS

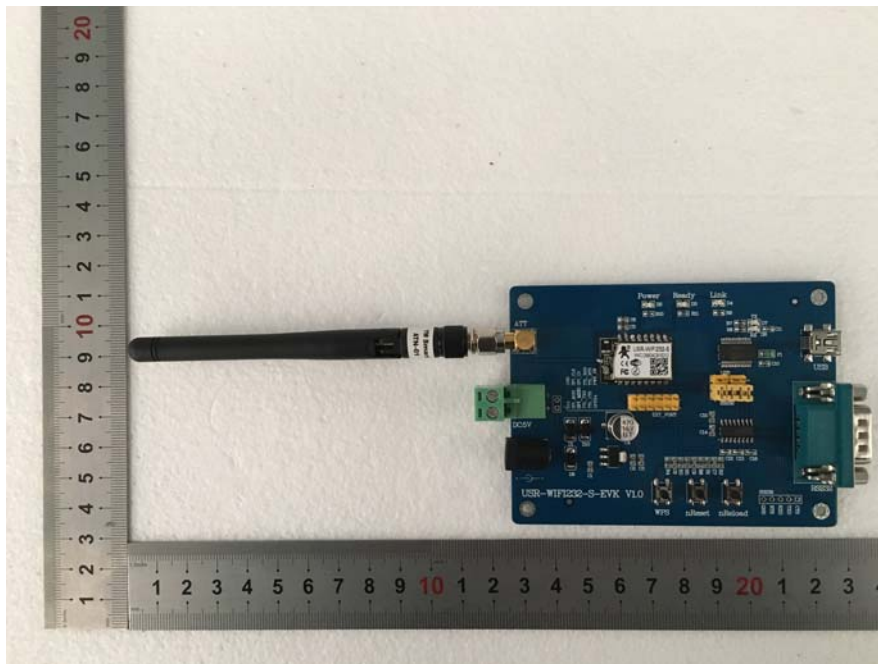
**EUT – Top View**



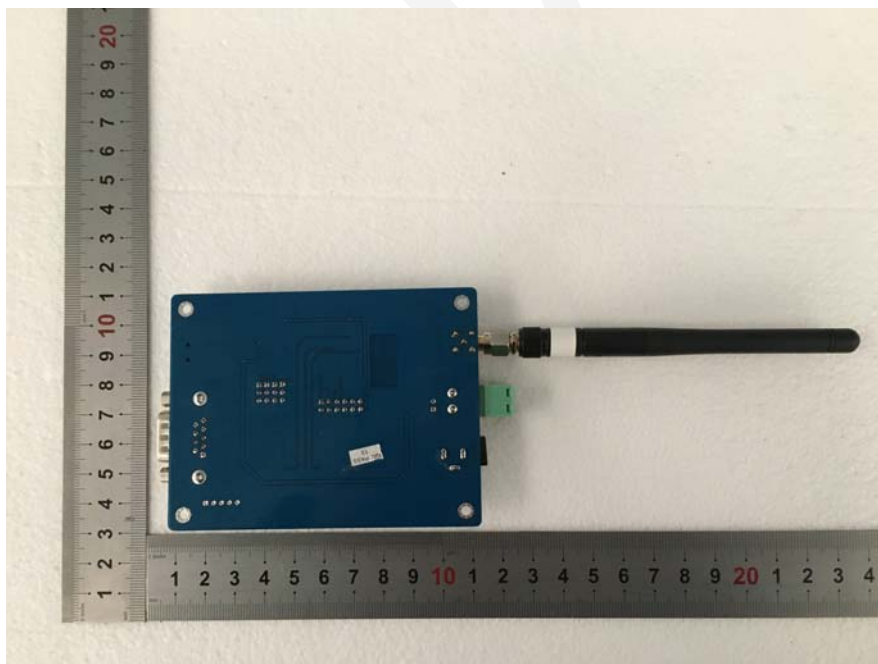
**EUT – Bottom View**



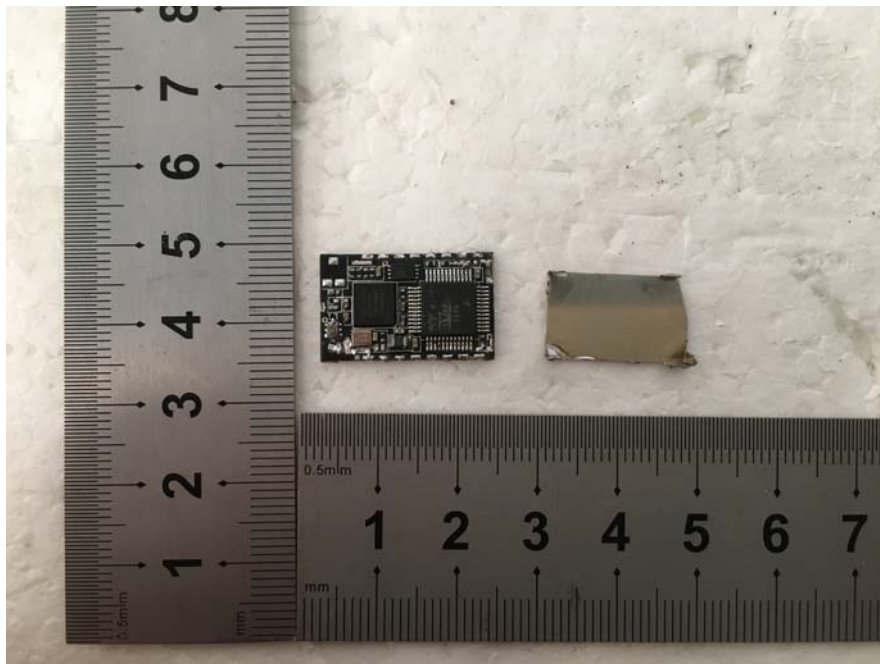
### EUT –Control Board Top View



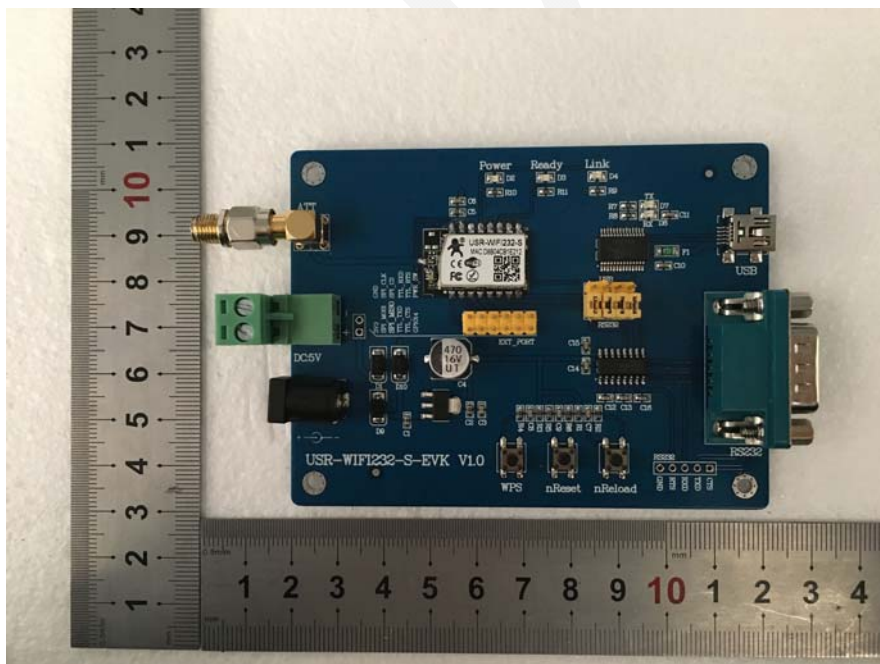
### EUT –Control Board Bottom View



**EUT –Cover Off View -1**

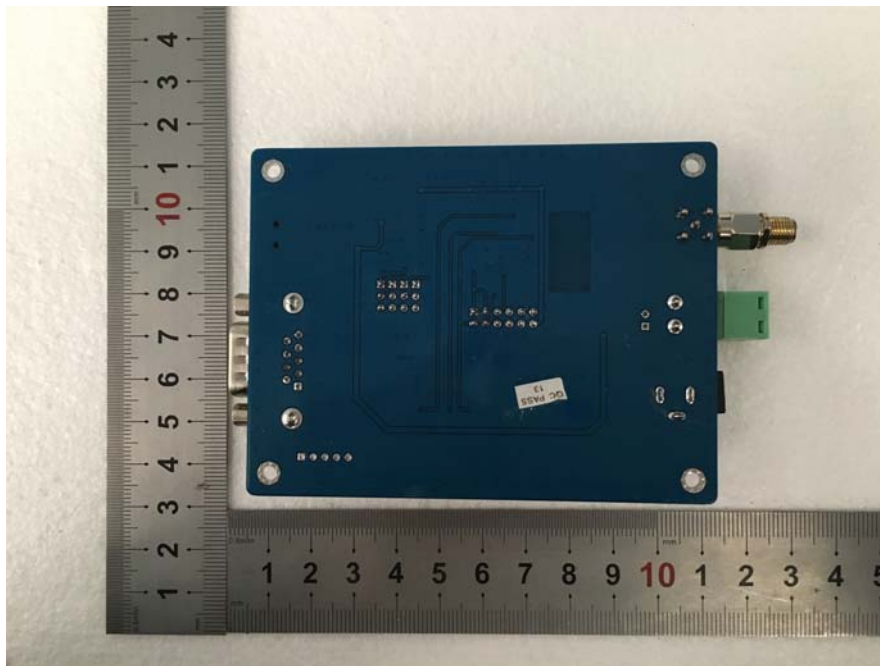


**EUT –Cover Off View -2**





**EUT –Cover Off View -3**

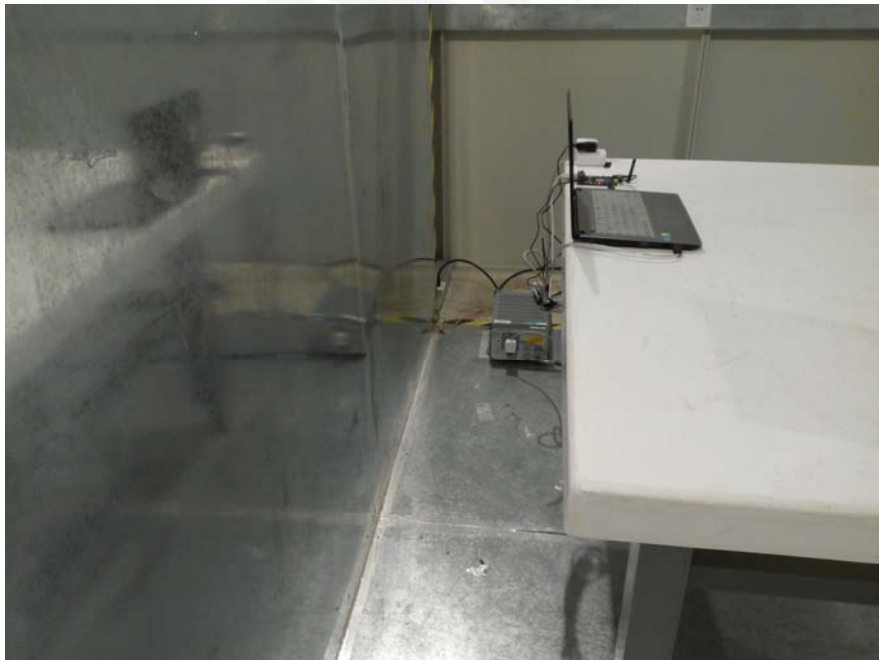


## **EXHIBIT C – TEST SETUP PHOTOGRAPHS**

**Conducted Emissions - Front View**



**Conducted Emissions - Side View**





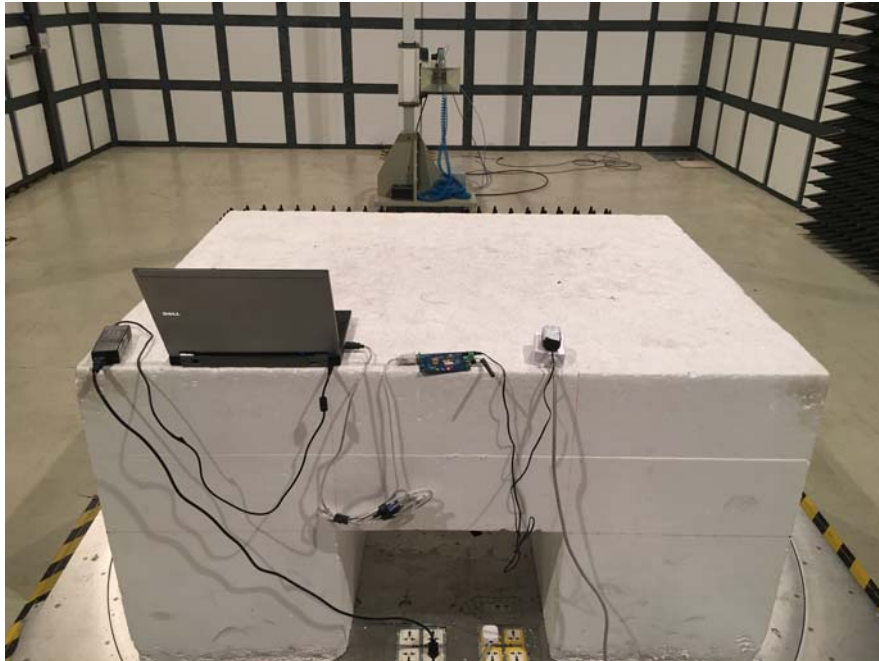
**Radiated Emissions- Front View (Below 1G)**



**Radiated Emissions- Rear View (Below 1G)**



**Radiated Emissions- Front View (Above 1G)**



**Radiated Emissions- Rear View (Above 1G)**



## PRODUCT SIMILARITY DECLARATION LETTER

Company: Jinan USR IOT Technology Limited

Add: Floor 11,Building 1,No.1166 Xinluo Street,Gaoxin Distric, Jinan,Shandong, 250101, China

Tel: +86-531-88826739-811

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### DECLARATION

Date : 2016-11-17

To:

Bay Area Compliance Laboratories Corp. (Kunshan)

No. 248, ChengHu Road, Kunshan Economical & Development Zone,  
Jiangsu Province, China.

<http://www.baclcorp.com>

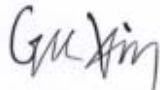
Dear Sir or Madam:

We Jinan USR IOT Technology Limited. states that USR-WIFI232-Sb and USR-C210, USR-C215, USR-C216, USR-C217, are identical in interior structure, only difference being the model no., exported countries.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Signature:



Printed Name:

Email: [sales@usr.cn](mailto:sales@usr.cn)

Add: Floor 11,Building 1,No.1166 Xinluo Street,Gaoxin Distric, Jinan,Shandong, 250101, China

Tel: +86-531-88826739-811

Fax: +86-531-88826739-808

\*\*\*\*\* END OF REPORT \*\*\*\*\*