



# FCC Test Report

**APPLICANT** : Republic Wireless, Inc.  
**EQUIPMENT** : Cellular Voice Device  
**BRAND NAME** : Relay  
**MODEL NAME** : RW2265  
**FCC ID** : 2AMBHRW2265  
**STANDARD** : FCC 47 CFR FCC Part 15 Subpart B  
**CLASSIFICATION** : Certification

The product was received on Dec. 24, 2018 and testing was completed on Feb. 22, 2019. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.



Approved by: James Huang / Manager

**Sporton International (Kunshan) Inc.**  
**No. 1098, Pengxi North Road, Kunshan Economic Development Zone,**  
**Jiangsu Province 215335, China**



# TABLE OF CONTENTS

**REVISION HISTORY ..... 3**

**SUMMARY OF TEST RESULT ..... 4**

**1. GENERAL DESCRIPTION ..... 5**

    1.1. Applicant.....5

    1.2. Manufacturer .....5

    1.3. Product Feature of Equipment Under Test .....5

    1.4. Product Specification of Equipment Under Test .....6

    1.5. Modification of EUT .....7

    1.6. Test Location .....7

    1.7. Applicable Standards .....7

**2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST ..... 8**

    2.1. Test Mode .....8

    2.2. Connection Diagram of Test System .....9

    2.3. Support Unit used in test configuration and system .....9

    2.4. EUT Operation Test Setup .....10

**3. TEST RESULT ..... 11**

    3.1. Test of Radiated Emission Measurement .....11

**4. LIST OF MEASURING EQUIPMENT ..... 15**

**5. UNCERTAINTY OF EVALUATION ..... 16**

**APPENDIX A. SETUP PHOTOGRAPHS**



## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC8D2406	Rev. 01	Initial issue of report	Feb. 26, 2019



### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
-	15.107	AC Conducted Emission	< 15.107 limits	Not Required	-
3.1	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 2.00 dB at 959.90 MHz for Quasi-Peak

**Remark:** not required means the changes does not affect the test result.



# 1. General Description

## 1.1. Applicant

Republic Wireless, Inc.  
940 Main Campus Drive, Ste 300, Raleigh, NC 27606, United States

## 1.2. Manufacturer

Bluebank Communication Technology Co Ltd  
No.16 Cuiping Road, Yubei District, Chongqing ,P.R.China,401120

## 1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Cellular Voice Device
Brand Name	Relay
Model Name	RW2265
FCC ID	2AMBHRW2265
EUT supports Radios application	CDMA/EV-DO/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/NFC WLAN 2.4GHz 802.11b/g/n HT20/ Bluetooth BR / EDR / LE
HW Version	MP
SW Version	msm8909_BLUEBANK-QC26A-000-01-15-01.20.2018_userd ebug
EUT Stage	Identical Prototype

**Remark:**

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This is a variant report for RW2265. The product equality declaration is exhibit separately. According to the change, only the worst case of RSE is verified from original report (Sporton Report Number FG811212A).



### 1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
<b>Tx Frequency</b>	WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz LTE Band 25 : 1850.7 MHz ~ 1914.3 MHz LTE Band 26 : 814.7 MHz ~ 848.3 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 1710.7 MHz ~ 1779.3 MHz CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz CDMA2000 BC10: 817.9 MHz ~ 823.1 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
<b>Rx Frequency</b>	WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz LTE Band 25 : 1930.7 MHz ~ 1994.3 MHz LTE Band 26 : 859.7 MHz ~ 893.3 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 2110.7 MHz~ 2199.3 MHz CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz CDMA2000 BC10: 862.9 MHz ~ 868.1 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz GPS : 1559 MHz ~ 1610 MHz NFC : 13.56 MHz
<b>Antenna Type</b>	WWAN : LDS Antenna WLAN : LDS Antenna Bluetooth : LDS Antenna GPS: LDS Antenna NFC : FPC Antenna
<b>Type of Modulation</b>	WCDMA : BPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM (16QAM uplink is not supported) DC-HSDPA : 64QAM LTE: QPSK / 16QAM / 64QAM (uplink is not supported) CDMA2000 1xRTT: QPSK CDMA2000 1xEV-DO: QPSK/8PSK



	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GPS : BPSK NFC: ASK
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### 1.5. Modification of EUT

No modifications are made to the EUT during all test items.

### 1.6. Test Location

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0).

<b>Test Site</b>	Sporton International (Kunshan) Inc.		
<b>Test Site Location</b>	No. 1098, Pengxi North Road, Kunshan Economic Development Zone, Jiangsu Province 215335, China TEL : 86-512-57900158 FAX : 86-512-57900958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC Test Firm Registration No.</b>
	CO01-KS	03CH02-KS	630927

### 1.7. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC 47 CFR FCC Part 15 Subpart B
- ♦ ANSI C63.4-2014

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.



## 2. Test Configuration of Equipment Under Test

### 2.1. Test Mode

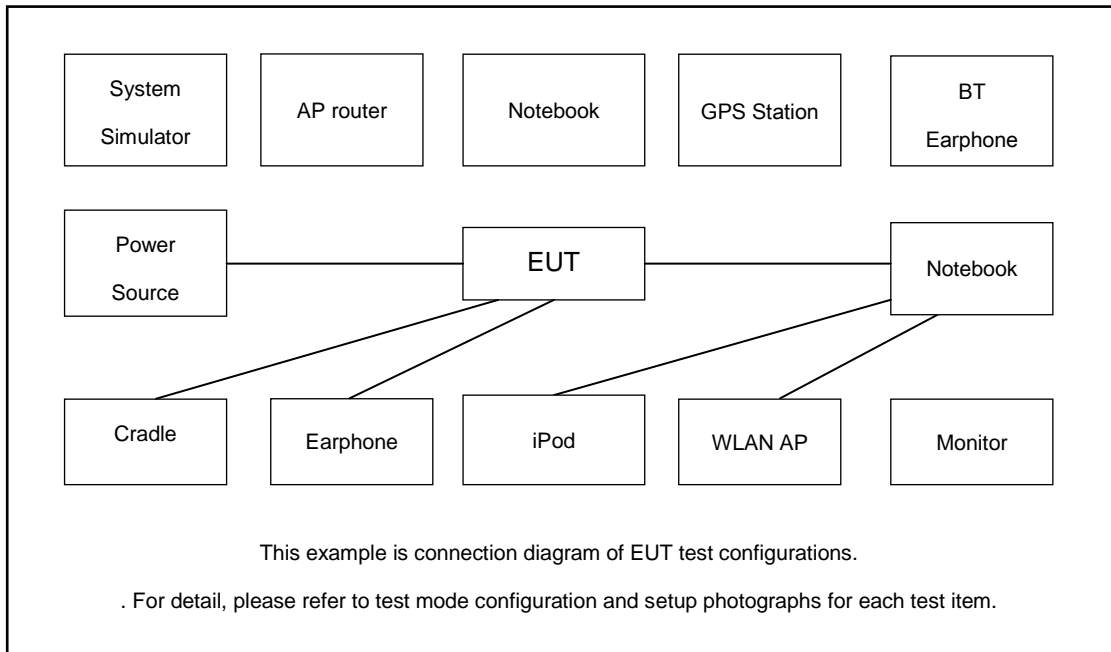
The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
Radiated Emissions	Mode 1 : LTE Band 2 Idle + Bluetooth Idle + WLAN Idle + GNSS Rx + Earphone + Battery + USB Cable (Data Link with Notebook)
<b>Remark:</b> Data Link with Notebook means data application transferred mode between EUT and Notebook.	



## 2.2. Connection Diagram of Test System



## 2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8m
2.	Signal Generator	R&S	GSS7000	NA	NA	Unshielded, 1.8m
3.	WLAN AP	D-link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8m
4.	WLAN AP	TP-LINK	TL-WDR5600	N/A	N/A	Unshielded, 1.8m
5.	Notebook	DELL	MT320	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
6.	Bluetooth Earphone	Lenevo	LYEJ02LM	N/A	N/A	N/A
7.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
8.	iPod	Apple	A1199	DoC	Shielded, 1.2m	N/A



## **2.4. EUT Operation Test Setup**

The EUT was in WCDMA or LTE idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Data application is transferred between Notebook and EUT via USB cable.
2. Turn on GNSS function to make the EUT receive continuous signals from GNSS station.



### 3. Test Result

#### 3.1. Test of Radiated Emission Measurement

##### 3.1.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

##### 3.1.2. Measuring Instruments

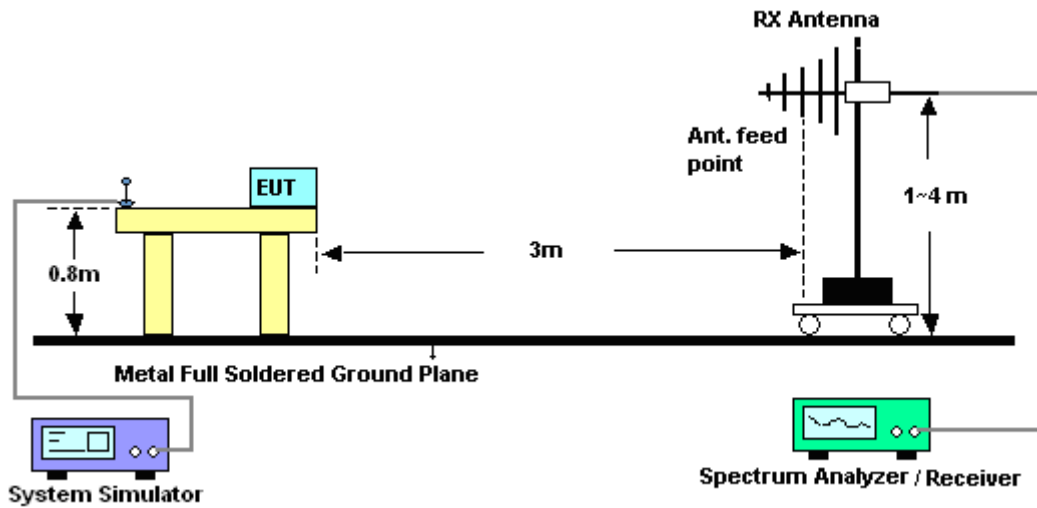
The measuring equipment is listed in the section 4 of this test report.

##### 3.1.3. Test Procedures

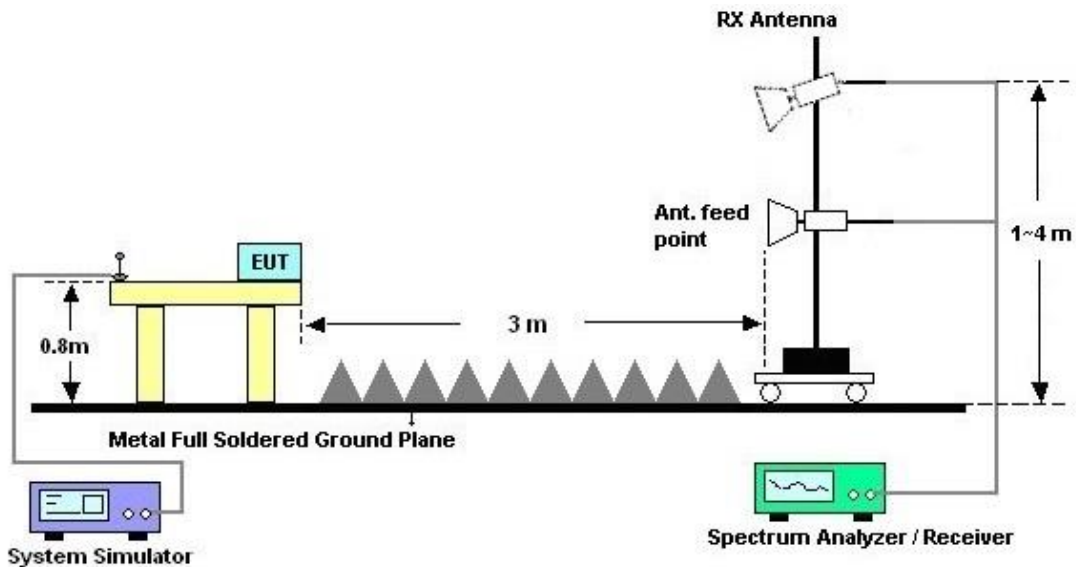
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBµV/m) = 20 log Emission level (µV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

### 3.1.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



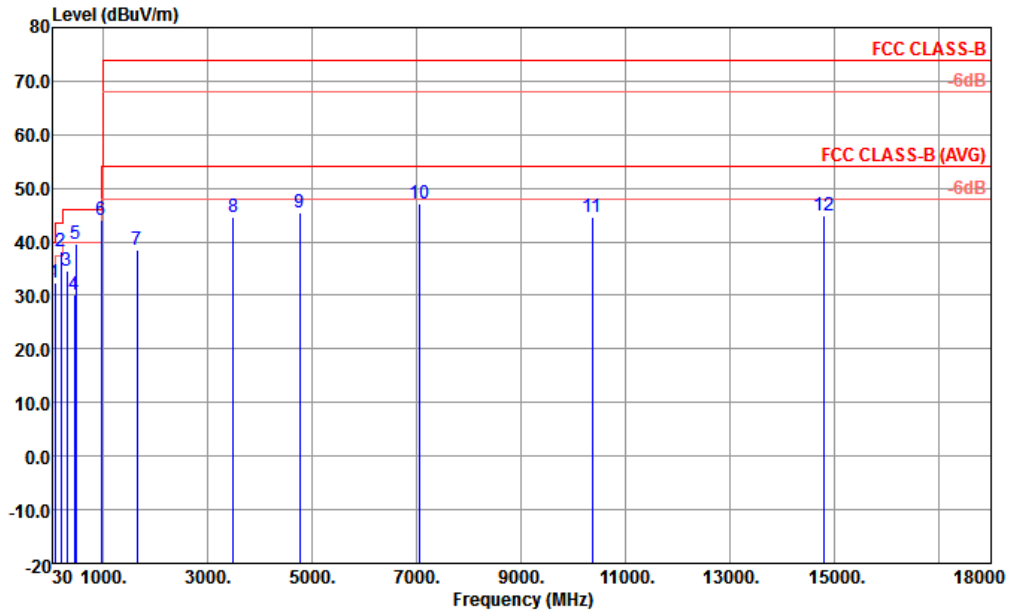
For radiated emissions above 1GHz





3.1.5. Test Result of Radiated Emission

Test Engineer :	Imp Xu	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal

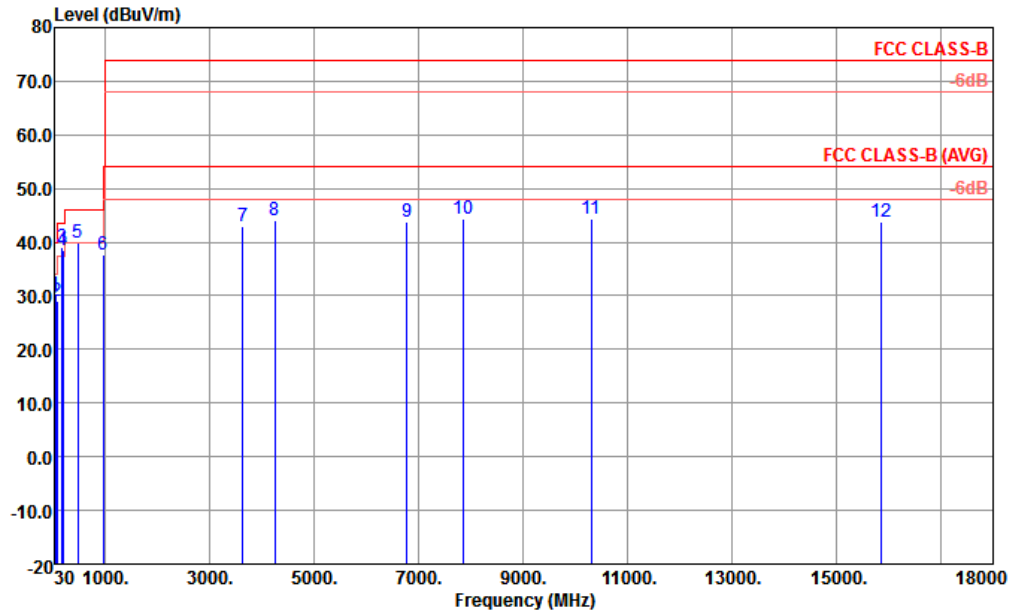


Site : 03CH02-KS  
 Condition : FCC CLASS-B 3m LF 23182-3M HORIZONTAL  
 Project : (FC)8D2406

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	77.530	32.39	-7.61	40.00	50.50	12.89	0.92	31.92	---	---	Peak
2 !	195.870	38.10	-5.40	43.50	53.29	15.28	1.43	31.90	---	---	Peak
3	314.210	34.69	-11.31	46.00	45.49	19.38	1.84	32.02	---	---	Peak
4	450.980	30.10	-15.90	46.00	37.77	22.42	2.13	32.22	---	---	Peak
5	480.080	39.64	-6.36	46.00	46.75	22.88	2.25	32.24	---	---	Peak
6 !	959.900	44.00	-2.00	46.00	44.71	27.06	3.12	30.89	100	334	QP
7	1648.000	38.48	-35.52	74.00	42.41	29.05	4.19	37.17	---	---	Peak
8	3488.000	44.60	-29.40	74.00	41.27	33.51	6.22	36.40	---	---	Peak
9	4768.000	45.57	-28.43	74.00	38.56	35.69	8.09	36.77	---	---	Peak
10	7048.000	47.22	-26.78	74.00	39.10	35.73	9.20	36.81	---	---	Peak
11	10359.000	44.73	-29.27	74.00	32.87	38.47	11.26	37.87	---	---	Peak
12	14814.000	44.92	-29.08	74.00	27.52	41.13	12.86	36.59	---	---	Peak



Test Engineer :	Imp Xu	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical



Site : 03CH02-KS  
 Condition : FCC CLASS-B 3m LF 23182-3M VERTICAL  
 Project : (FC)8D2406

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	47.460	30.06	-9.94	40.00	46.11	15.16	0.73	31.94	---	---	Peak
2	75.590	29.03	-10.97	40.00	47.21	12.82	0.91	31.91	---	---	Peak
3 !	180.350	39.09	-4.41	43.50	54.45	15.20	1.36	31.92	---	---	Peak
4 !	195.870	38.48	-5.02	43.50	53.67	15.28	1.43	31.90	100	100	QP
5 !	480.080	40.00	-6.00	46.00	47.11	22.88	2.25	32.24	---	---	Peak
6	960.230	37.73	-16.27	54.00	38.43	27.06	3.13	30.89	---	---	Peak
7	3632.000	43.05	-30.95	74.00	39.07	33.92	6.50	36.44	---	---	Peak
8	4256.000	43.93	-30.07	74.00	37.91	35.53	7.34	36.85	---	---	Peak
9	6776.000	43.73	-30.27	74.00	36.60	35.12	8.65	36.64	---	---	Peak
10	7848.000	44.34	-29.66	74.00	36.37	35.65	9.48	37.16	---	---	Peak
11	10305.000	44.31	-29.69	74.00	32.53	38.42	11.25	37.89	---	---	Peak
12	15867.000	43.71	-30.29	74.00	27.86	40.60	13.21	37.96	---	---	Peak



## 4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Aug. 06, 2018	Feb. 22, 2019	Aug. 05, 2019	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz-44G,MAX 30dB	Apr. 17, 2018	Feb. 22, 2019	Apr. 16, 2019	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz-2GHz	Dec. 29, 2018	Feb. 22, 2019	Dec. 28, 2019	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 27, 2019	Feb. 22, 2019	Jan. 26, 2020	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Aug. 06, 2018	Feb. 22, 2019	Aug. 05, 2019	Radiation (03CH02-KS)
Amplifier	Keysight	83017A	MY53270203	500MHz~26.5G Hz	Apr. 18, 2018	Feb. 22, 2019	Apr. 17, 2019	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Feb. 22, 2019	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Feb. 22, 2019	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Feb. 22, 2019	NCR	Radiation (03CH02-KS)

NCR: No Calibration Required



## 5. Uncertainty of Evaluation

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.8dB
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### Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.2dB
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