FCC Part15, Subpart B
ICES-003

TEST REPORT

IT controller

FCC ID: 2AX5HJRN-340K

MODEL NUMBER: JRN-340K

REPORT NUMBER: 4791380330-2-EMC-1

ISSUE DATE: September 24, 2024

Prepared for

JRC Mobility Inc.
834 Inasatomachi Nagano-shi, Nagano, 381-2289 JP

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	September 24, 2024	Initial Issue	

Summary of Test Results				
Standard	**Test Item**	**Limit**	**Result**	**Remark**
FCC Part15, Subpart B ANSI C63.4-2014 ICES-003 Issue 7	Conducted Disturbance	Class B	N/A	**NOTE (1)** **NOTE (2)**
	Radiated Disturbance below 1 GHz	Class B	PASS	
	Radiated Disturbance above 1 GHz	Class B	PASS	**NOTE (1)** **NOTE (3)**

Note:
(1) “N/A” denotes test is not applicable in this test report.
(2) This test is only applicable for devices which can be charged or powered by AC power cable.
(3) If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less.
(4) This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
(5) The measurement result for the sample received is <Pass> according to < FCC Part15, Subpart B and ICES-003 Issue 7 > when <Accuracy Method> decision rule is applied.

CONTENTS

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	JRC Mobility Inc.
Address:	834 Inasatomachi Nagano-shi, Nagano, 381-2289 JP

Manufacturer Information

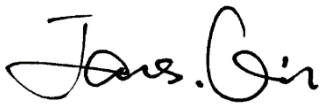
Company Name:	JRC Mobility Inc.
Address:	834 Inasatomachi Nagano-shi, Nagano, 381-2289 JP

EUT Information

EUT Name:	IT controller
Model:	JRN-340K
Brand:	/
Sample Received Date:	June 27, 2024
Sample Status:	Normal
Sample ID:	7350467
Date of Tested:	August 19, 2024 to September 24, 2024

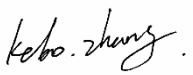
APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC Part15, Subpart B	PASS
ICES-003 Issue 7	PASS

Prepared By:



James Qin
Project Engineer

Checked By:



Kebo Zhang
Senior Project Engineer

Approved By:

Stephen Guo
Operations Manager

2. TEST METHODOLOGY

All tests were performed in accordance with the standard FCC Part15 Subpart B & ICES-003 Issue 7 & ANSI C63.4-2014.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules **ISED (Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046. **VCCI (Registration No.: G-20192, C-20153, T-20155 and R-20202)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20192 and R-20202 Shielding Room B, the VCCI registration No. is C-20153 and T-20155

Note: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, 523808, People's Republic of China.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Measurement Frequency Range	K	U(dB)
Conducted emissions from the AC mains power ports	0.009 MHz ~ 0.15 MHz	2	4.00
Conducted emissions from the AC mains power ports	0.15 MHz ~ 30 MHz	2	3.62
Radiated emissions	30 MHz ~ 1 GHz	2	4.00
Radiated emissions	1 GHz ~ 18 GHz	2	5.78
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.			

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	IT controller
Model	JRN-340K
EUT Classification	Class A
Ratings	DC 12V

5.2. TEST MODE

Test Mode	Description
M01	Stand by
M02	GSM850
M03	WCDMA Band 5
M04	LTE Band 5
M05	LTE Band 12

5.3. EUT ACCESSORY

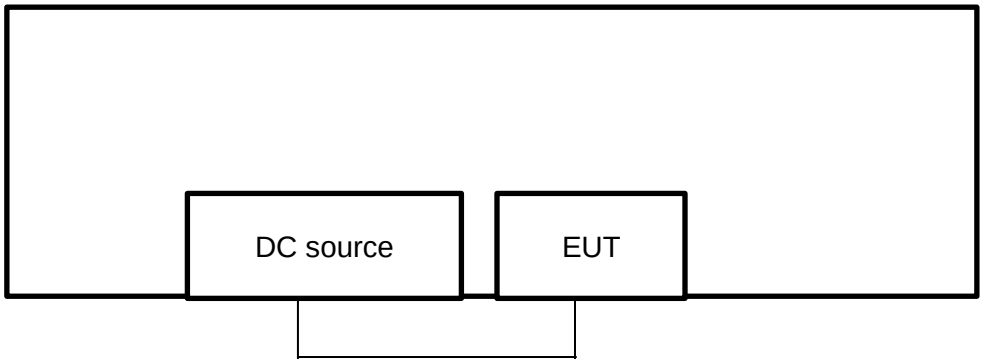
I/O PORTS AND CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	/	/	/	/	/

ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	/	/	/	/

5.4. SETUP DIAGRAM AND SUPPORT UNITS FOR SYSTEM TEST



C-1

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.

Item	Equipment	Mfr/Brand	Model/Type No.	Specification	Series No.	Note
E-1	DC power supply	SophPower	ADC50-10D	50V 10A	/	

The following cables were used to form a representative test configuration during the tests.

Item	Type of cable	Shielded Type	Ferrite Core	Length
C-1	DC cable	no	no	0.5 m

6. MEASURING EQUIPMENT AND SOFTWARE USED

Test Equipment of Radiated emissions below 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jun. 28, 2024	Jun. 27, 2027
Amplifier	HP	8447F	2944A03683	Oct. 12, 2023	Oct. 11, 2024
Test Software for Radiated Emission	Farad	EZ-EMC	Ver.UL-3A1	N/A	N/A

Test Equipment of Radiated emissions above 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
EMI Measurement Receiver	ROHDE & SCHWARZ	ESR26	101377	Oct. 12, 2023	Oct. 11, 2024
Preamplifier	TDK	PA-02-0118	TRS-305-00066	Jun. 18, 2024	Jun. 17, 2025
Horn Antenna	TDK	HRN-0118	130939	Apr. 29, 2022	Apr. 28, 2025
Test Software for Radiated Emission	Farad	EZ-EMC	Ver.UL-3A1	N/A	N/A

Other Instrument					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Temperature humidity probe	OMEGA	ITHX-SD-5	18470007	Oct.21, 2023	Oct.20, 2024
Barometer	Yiyi	Baro	N/A	Oct.19, 2023	Oct.18, 2024

7. EMISSION TEST

7.1. RADIATED EMISSIONS MEASUREMENT

LIMITS

Below 1 GHz

CFR 47 FCC Part 15 Subpart B		
Frequency (MHz)	Class A	Class B
	Field strength (dBuV/m) (at 3 m)	Field strength (dBuV/m) (at 3 m)
30 - 88	49.5	40
88 - 216	53.9	43.5
216 - 960	56.9	46
Above 960	60	54

ICES-003 Issue 7		
Frequency (MHz)	Class A	Class B
	Field strength (dBuV/m) (at 3 m)	Field strength (dBuV/m) (at 3 m)
30 - 88	50	40
88 - 216	54	43.5
216 - 230	56.9	46
230 - 960	57	47
Above 960	60	54

Note: The different between FCC Part 15 Subpart B limit and ICES-003 Issue 7 limit is only in frequency band 230 MHz to 960 MHz, the limit of FCC Part 15 Subpart B is 1 dB smaller than the limit of ICES-003 Issue 7, if the test result complies with FCC Part 15 Subpart B limit, it deemed to comply with ICES-003 Issue 7 limit.

Above 1 GHz

CFR 47 FCC Part 15 Subpart B ICES-003 Issue 7				
Frequency (MHz)	Class A		Class B	
	(dBuV/m) (at 3 m)		(dBuV/m) (at 3 m)	
	Peak	Average	Peak	Average
Above 1000	80	60	74	54

Test Frequency Range of Radiated Disturbance Measurement

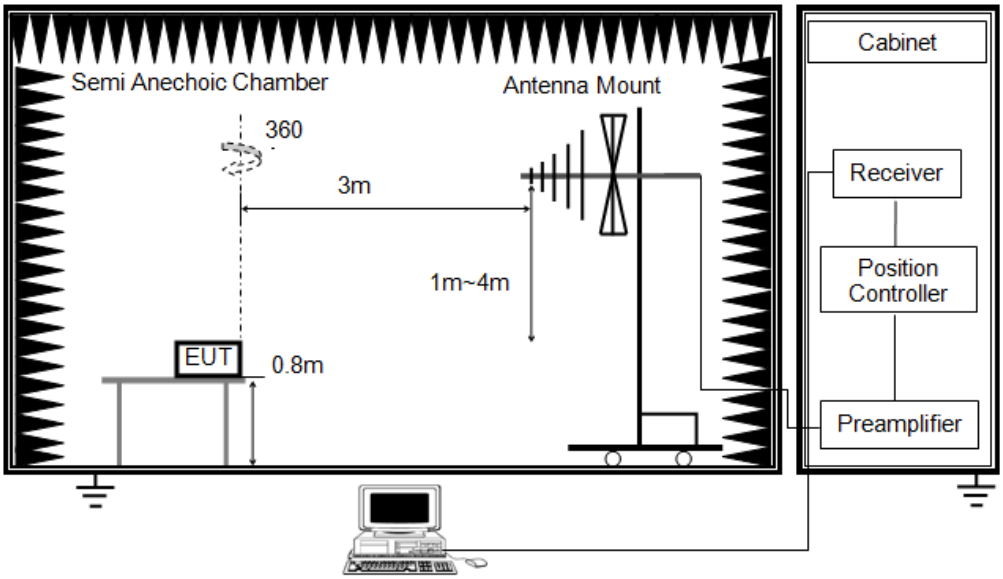
Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

NOTE:

(1) The limit for radiated test was performed according to FCC Part 15, Subpart B;
(2) The tighter limit applies at the band edges;
(3) Emission level (dBuV/m) = 20log Emission level (uV/m),
3m Emission level = 10 m Emission level + 20log(10 m/3 m);

TEST SETUP AND PROCEDURE

Below 1 GHz and above 30 MHz



The setting of the spectrum analyser

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak and QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.4-2014.

2. 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. A pre-amp was used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

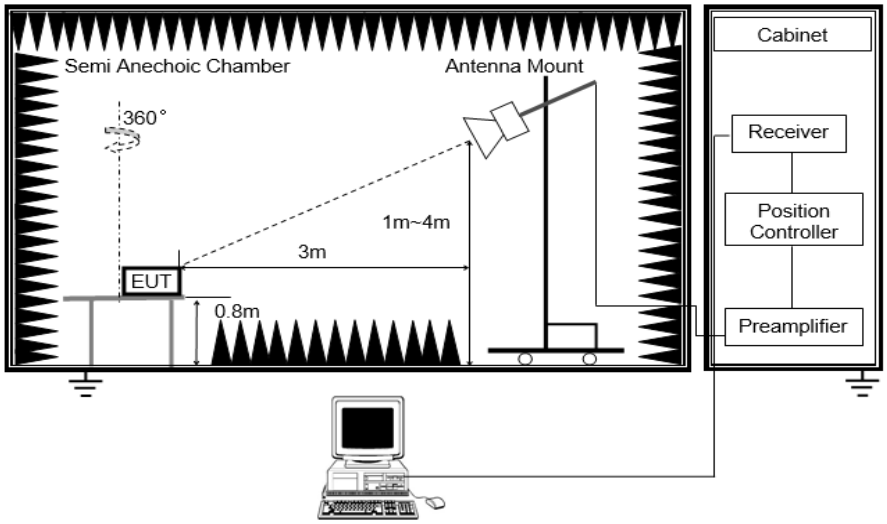
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

6. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.

7. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

8. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

Above 1 GHz



The setting of the spectrum analyser

RBW	1 MHz
VBW	3 MHz
Sweep	Auto
Detector	Peak: Peak AVG: RMS
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.4-2014.

2. 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. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

6. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.

7. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

8. For measurement above 1 GHz, the peak emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the peak limit specified in Section 15.109. If peak result complies with average limit, average result is deemed to comply with average limit.

9. The average emission measurement will be measured by the RMS detector and must comply with the average limit specified in Section 15.109.

TEST ENVIRONMENT

Radiated Emissions - Below 1 GHz		Radiated Emissions - Above 1 GHz	
Temperature:	22.3 °C	Temperature:	23.1 °C
Humidity:	56 %	Humidity:	59 %
Atmosphere Pressure	101 kPa	Atmosphere Pressure	101 kPa

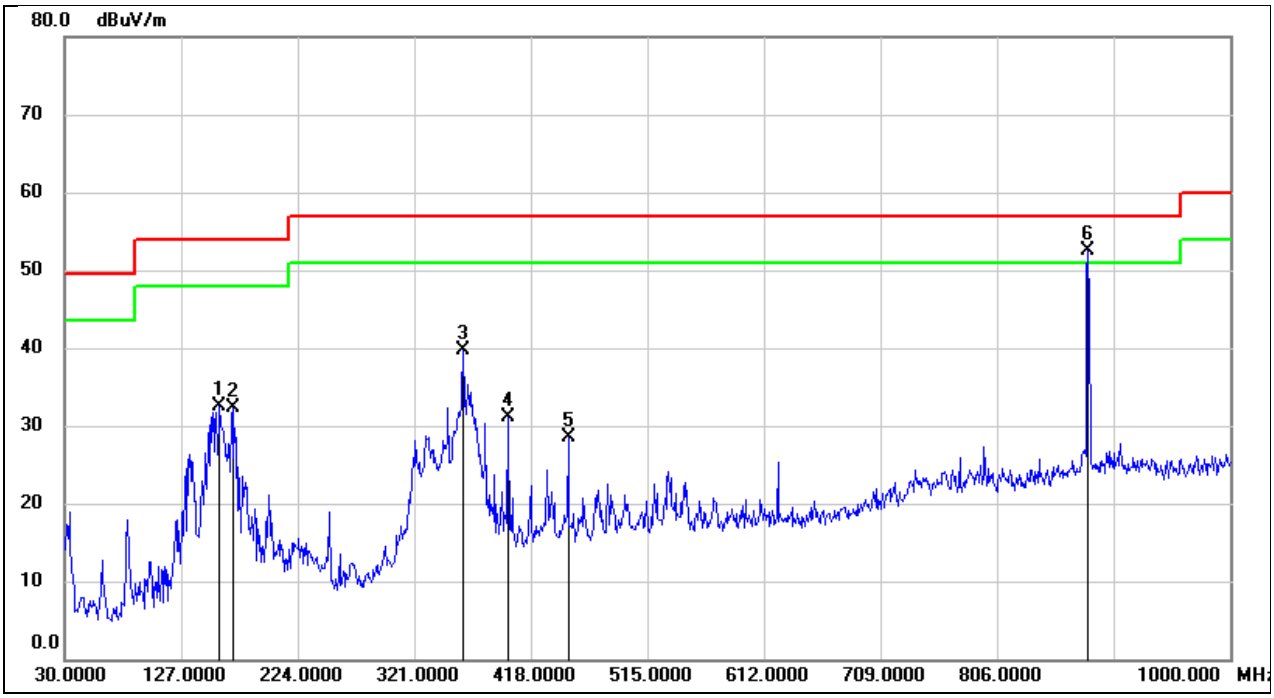
TEST MODE

Radiated Emissions - Below 1 GHz		Radiated Emissions - Above 1 GHz	
Pre-test Mode:	M01 ~ M05	Pre-test Mode:	M01 ~ M05
Final Test Mode:	M04	Final Test Mode:	M04

Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS

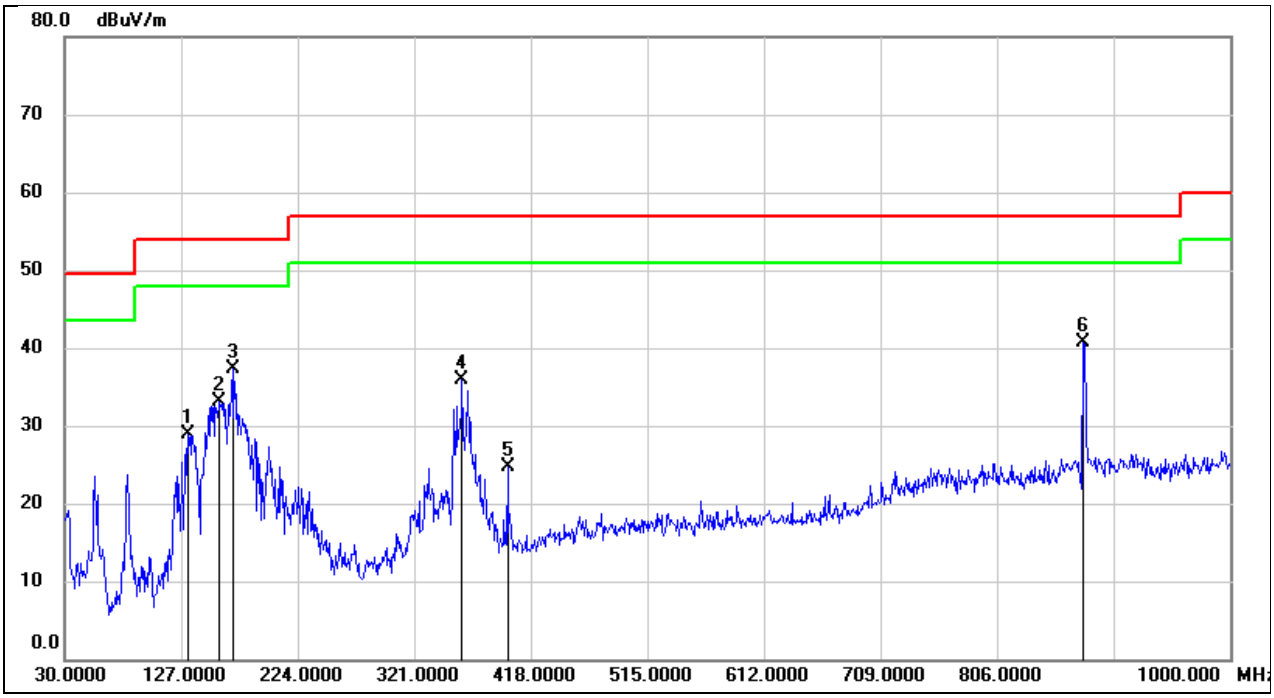
Radiated Emissions – Below 1 GHz			
Measurement Method	Radiated	Polar:	Horizontal
Test Mode:	M04	Test Voltage:	AC 120 V/60 Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	159.0100	44.78	-12.34	32.44	53.90	-21.46	QP
2	169.6799	43.94	-11.57	32.37	53.90	-21.53	QP
3	361.7400	48.88	-9.18	39.70	56.90	-17.20	QP
4	398.6000	40.44	-9.32	31.12	56.90	-25.78	QP
5	449.0400	36.68	-8.17	28.51	56.90	-28.39	QP
6	881.6600	53.81	-1.25	52.56	56.90	-4.34	fundamental

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result - Limit
3. No. 6 is the fundamental frequency. (881.66 MHz_LTE Band 5(Rx))

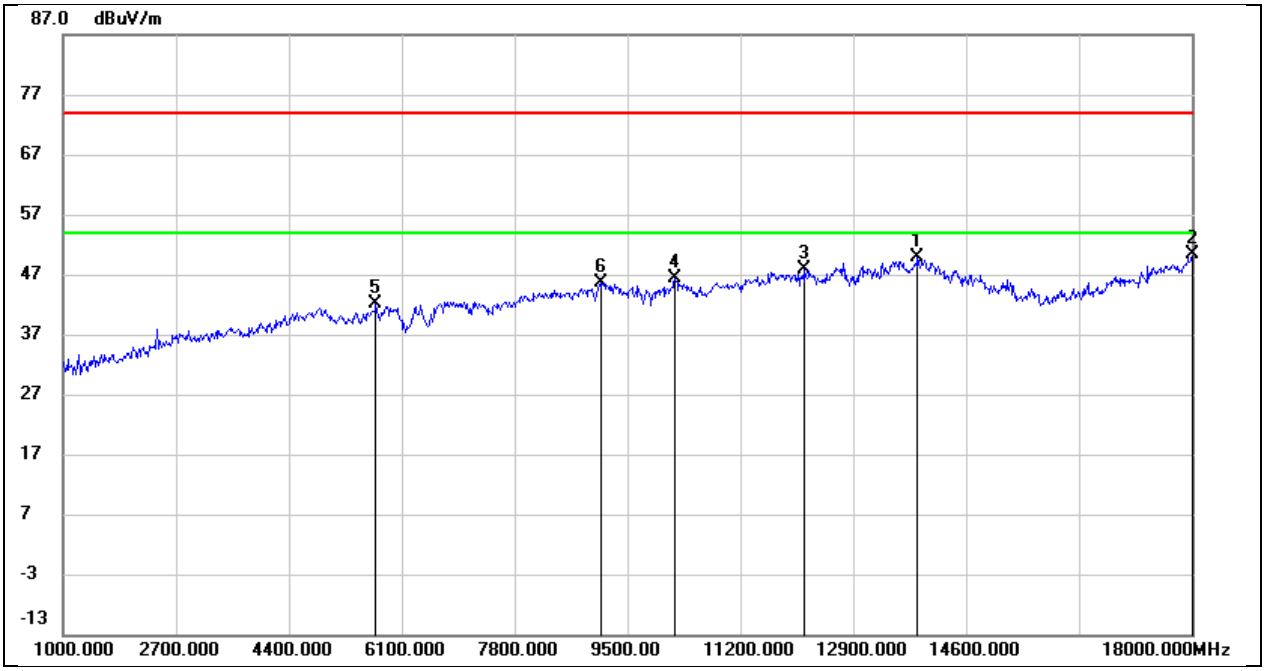
Radiated Emissions – Below 1 GHz			
Measurement Method	Radiated	Polar:	Vertical
Test Mode:	M04	Test Voltage:	AC 120 V/60 Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	132.8200	43.31	-14.36	28.95	53.90	-24.95	QP
2	159.0100	45.48	-12.34	33.14	53.90	-20.76	QP
3	169.6799	48.89	-11.57	37.32	53.90	-16.58	QP
4	360.7700	45.00	-9.17	35.83	56.90	-21.07	QP
5	398.6000	33.97	-9.32	24.65	56.90	-32.25	QP
6	880.7800	41.94	-1.32	40.62	56.90	-16.28	fundamental

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result – Limit
3. No. 6 is the fundamental frequency. (880.78 MHz_LTE Band 5(Rx))

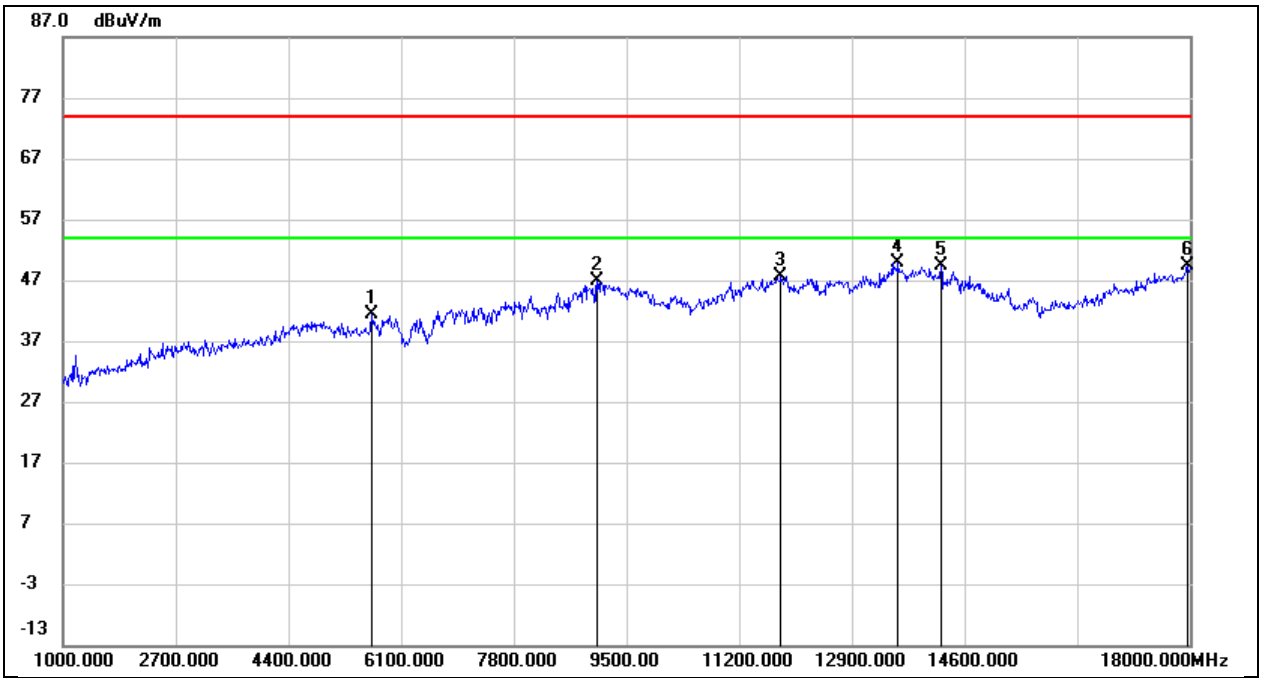
Radiated Emissions – Above 1 GHz			
Measurement Method	Radiated	Polar:	Horizontal
Test Mode:	M04	Test Voltage:	AC 120 V/60 Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	13869.000	29.33	20.44	49.77	74.00	-24.23	peak
2	18000.000	25.95	24.35	50.30	74.00	-23.70	peak
3	12169.000	31.04	16.74	47.78	74.00	-26.22	peak
4	10214.000	34.90	11.55	46.45	74.00	-27.55	peak
5	5709.000	40.99	1.02	42.01	74.00	-31.99	peak
6	9109.000	35.78	9.78	45.56	74.00	-28.44	peak

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result - Limit

Radiated Emissions – Above 1 GHz			
Measurement Method	Radiated	Polar:	Vertical
Test Mode:	M04	Test Voltage:	AC 120 V/60 Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5658.000	40.43	0.88	41.31	74.00	-32.69	peak
2	9058.000	37.01	9.76	46.77	74.00	-27.23	peak
3	11829.000	31.26	16.40	47.66	74.00	-26.34	peak
4	13597.000	30.01	19.89	49.90	74.00	-24.10	peak
5	14243.000	29.64	19.67	49.31	74.00	-24.69	peak
6	17966.000	25.13	24.13	49.26	74.00	-24.74	peak

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result - Limit

APPENDIX I: PHOTOGRAPHS OF TEST CONFIGURATION

Referred to 4791380330-2_Appendix_SetupPhoto

APPENDIX II: PHOTOGRAPHS OF THE EUT

Referred to 4791380330-2_Appendix_EUTPhoto_Externa

Referred to 4791380330-2_Appendix_EUTPhoto_Internal

END OF REPORT