



# FCC RF Test Report

**APPLICANT** : HMD Global Oy  
**EQUIPMENT** : Smart Phone  
**BRAND NAME** : NOKIA  
**MODEL NAME** : TA-1020  
**FCC ID** : 2AJOTTA-1020  
**STANDARD** : 47 CFR Part 2, 22(H), 24(E), 27  
**CLASSIFICATION** : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Apr. 21, 2017. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-D-2010 and the testing has shown the tested sample to be 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 INC., the test report shall not be reproduced except in full.

---

Reviewed by: Joseph Lin / Supervisor

---

Approved by: Jones Tsai / Manager



## **SPORTON INTERNATIONAL INC.**

**No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.**

---

**SPORTON INTERNATIONAL INC.**

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : 2AJOTTA-1020

Page Number : 1 of 4

Report Issued Date : Jun. 01, 2017

Report Version : Rev. 01

Report Template No.: BU5-FGLTE Version 2.0



## **TABLE OF CONTENTS**

<b>REVISION HISTORY.....</b>	<b>3</b>
<b>1 GENERAL DESCRIPTION .....</b>	<b>4</b>
1.1 Applicant.....	4
1.2 Manufacturer.....	4
1.3 Product Feature of Equipment Under Test.....	4
1.4 Modification of EUT .....	4
<b>APPENDIX A. ORIGINAL REPORT</b>	



## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG742131	Rev. 01	Initial issue of report	Jun. 01, 2017



# 1 General Description

## 1.1 Applicant

**HMD Global Oy**  
Karaportti 2, 02610 Espoo, Finland

## 1.2 Manufacturer

**HMD Global Oy**  
Karaportti 2, 02610 Espoo, Finland

## 1.3 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n, FM Receiver, NFC, and GPS.

Product Specification subjective to this standard	
<b>Antenna Type</b>	WWAN: IFA Antenna WLAN: Loop Antenna Bluetooth: Loop Antenna GPS : Loop Antenna NFC: Loop Antenna

**Remark:** The FG742131 (FCC ID: 2AJOTTA-1020) report test data refer to the FG741916B (FCC ID: 2AJOTTA-1032) report.

## 1.4 Modification of EUT

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



## **Appendix A. Original Report**

Please refer to Sporton report number FG741916B as below.

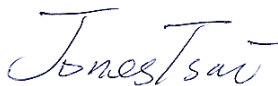
# FCC RF Test Report

APPLICANT : HMD Global Oy  
EQUIPMENT : Smart Phone  
BRAND NAME : NOKIA  
MODEL NAME : TA-1032  
FCC ID : 2AJOTTA-1032  
STANDARD : 47 CFR Part 2, 22(H), 27  
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

This is a variant report which is only valid together with the original test report. The product was received on Apr. 19, 2017 and completely tested on May 02, 2017. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-D-2010 and the testing has shown the tested sample to be 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 INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



## SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : 2AJOTTA-1032

Page Number : 1 of 14

Report Issued Date : May 25, 2017

Report Version : Rev. 01

Report Template No.: BU5-FGLTE Version 2.0



## TABLE OF CONTENTS

<b>REVISION HISTORY.....</b>	<b>3</b>
<b>SUMMARY OF TEST RESULT .....</b>	<b>4</b>
<b>1 GENERAL DESCRIPTION .....</b>	<b>5</b>
1.1 Applicant.....	5
1.2 Manufacturer.....	5
1.3 Product Feature of Equipment Under Test.....	5
1.4 Modification of EUT .....	5
1.5 Testing Location .....	6
1.6 Applicable Standards.....	6
<b>2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST .....</b>	<b>7</b>
2.1 Test Mode.....	7
2.2 Connection Diagram of Test System.....	8
2.3 Support Unit used in test configuration and system .....	8
2.4 Frequency List of Low/Middle/High Channels .....	8
<b>3 CONDUCTED TEST ITEMS .....</b>	<b>9</b>
3.1 Measuring Instruments .....	9
3.2 Test Setup .....	9
3.3 Test Result of Conducted Test .....	9
3.4 Conducted Output Power .....	9
<b>4 RADIATED TEST ITEMS .....</b>	<b>10</b>
4.1 Measuring Instruments .....	10
4.2 Test Setup .....	10
4.3 Test Result of Radiated Test .....	10
4.4 Effective Isotropic Radiated Power.....	11
4.5 Radiated Spurious Emission .....	12
<b>5 LIST OF MEASURING EQUIPMENT .....</b>	<b>13</b>
<b>6 UNCERTAINTY OF EVALUATION .....</b>	<b>14</b>
<b>APPENDIX A. TEST RESULTS OF CONDUCTED TEST</b>	
<b>APPENDIX B. TEST RESULTS OF RADIATED TEST</b>	
<b>APPENDIX C. TEST SETUP PHOTOGRAPHS</b>	



## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG741916B	Rev. 01	Initial issue of report	May 25, 2017



## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
-	N/A	Peak-to-Average Ratio	<13 dB	Not Required	-
-	§2.1049	Occupied Bandwidth	Reporting Only	Not Required	-
-	§2.1051 §22.917(a)	Conducted Band Edge Measurement (Band 5)	$< 43 + 10\log_{10}(P[\text{Watts}])$	Not Required	-
	§27.53(m)(4)	Conducted Band Edge Measurement (Band 7) (Band 38)	§27.53(m)(4)		
-	§2.1051 §22.917(a)	Conducted Spurious Emission (Band 5)	$< 43 + 10\log_{10}(P[\text{Watts}])$	Not Required	-
	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (Band 7) (Band 38)	$< 55 + 10\log_{10}(P[\text{Watts}])$		
-	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	Not Required	-
	§2.1055 §27.54		Within Authorized Band		
4.4	§22.913(a)(2)	Effective Radiated Power (Band 5)	ERP < 7 Watt	Not Required	-
	§27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 7) (Band 38)	EIRP < 2Watt	PASS	-
4.5	§2.1053 §22.917(a)	Radiated Spurious Emission (Band 5)	$< 43 + 10\log_{10}(P[\text{Watts}])$	Not Required	-
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (Band 7) (Band 38)	$< 55 + 10\log_{10}(P[\text{Watts}])$	PASS	Under limit 6.28 dB at 5004.000 MHz

**Note:** Not required means after assessing, test items are not necessary to carry out.

# 1 General Description

## 1.1 Applicant

HMD Global Oy

Karaportti 2, 02610 Espoo, Finland

## 1.2 Manufacturer

HMD Global Oy

Karaportti 2, 02610 Espoo, Finland

## 1.3 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n, FM Receiver, NFC, and GPS.

Product Specification subjective to this standard	
Antenna Type	WWAN: IFA Antenna WLAN: Loop Antenna Bluetooth: Loop Antenna GPS : Loop Antenna NFC: Loop Antenna

**Remark:** This is a variant report which can be referred Product Equality Declaration. All the test cases were performed on original report which can be referred to Sporton Report Number FG711304B. Based on the original report, the conducted output power, equivalent isotropic radiated power, and radiated spurious emission test items were verified.

## 1.4 Modification of EUT

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

## 1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

<b>Test Site</b>	SPORTON INTERNATIONAL INC.	
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	
	TH02-HY	03CH07-HY

## 1.6 Applicable Standards

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

- ♦ 47 CFR Part 2, 22(H), 27
- ♦ ANSI / TIA / EIA-603-D-2010
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

### Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



## 2 Test Configuration of Equipment Under Test

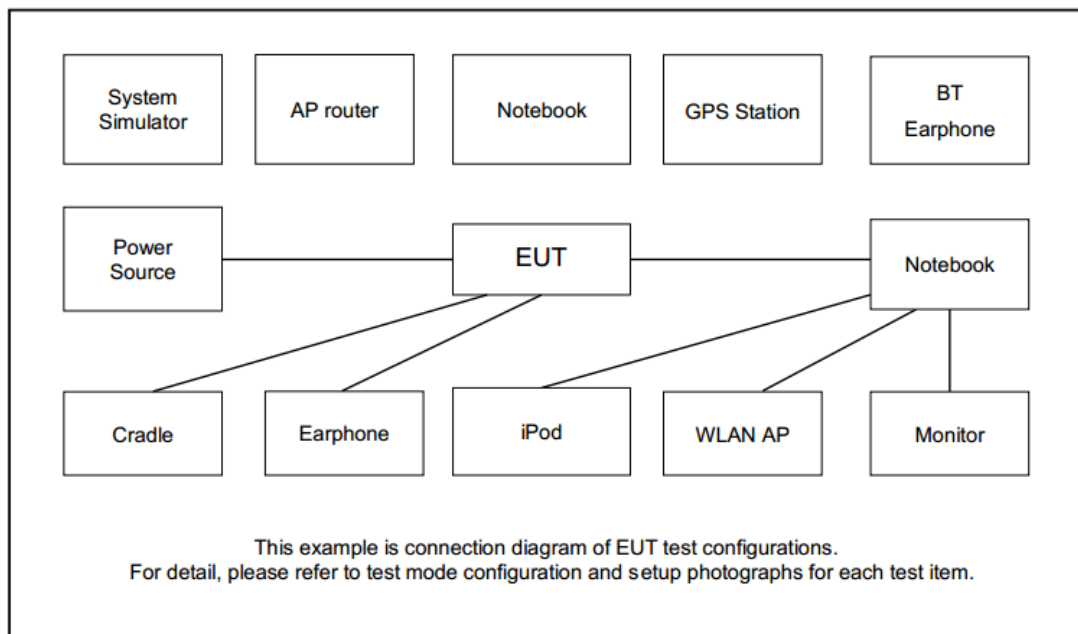
### 2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	7	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
E.I.R.P.	7	-	-	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
Radiated Spurious Emission	7	-	-	✓	✓	✓	✓	✓		✓			✓	✓	
Note	<ol style="list-style-type: none"> <li>The mark "✓" means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.</li> </ol>														

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m

## 2.4 Frequency List of Low/Middle/High Channels

LTE Band 7 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20850	21100	21350
	Frequency	2510	2535	2560
15	Channel	20825	21100	21375
	Frequency	2507.5	2535	2562.5
10	Channel	20800	21100	21400
	Frequency	2505	2535	2565
5	Channel	20775	21100	21425
	Frequency	2502.5	2535	2567.5

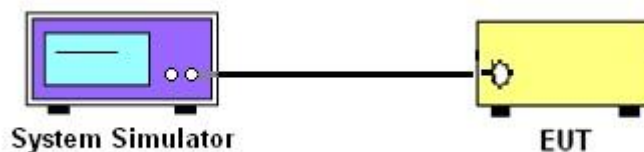
### 3 Conducted Test Items

#### 3.1 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.2 Test Setup

##### 3.2.1 Conducted Output Power



#### 3.3 Test Result of Conducted Test

Please refer to Appendix A.

#### 3.4 Conducted Output Power

##### 3.4.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

##### 3.4.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

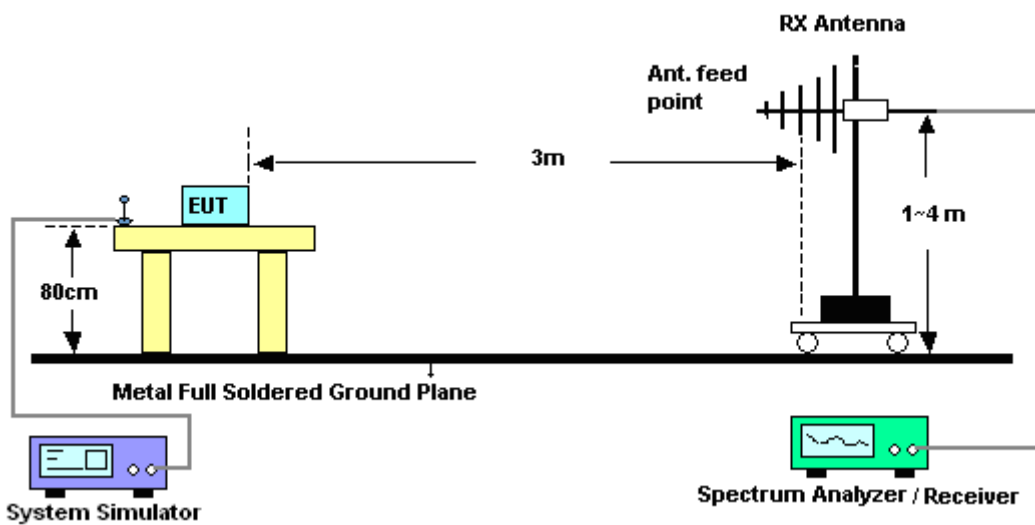
## 4 Radiated Test Items

### 4.1 Measuring Instruments

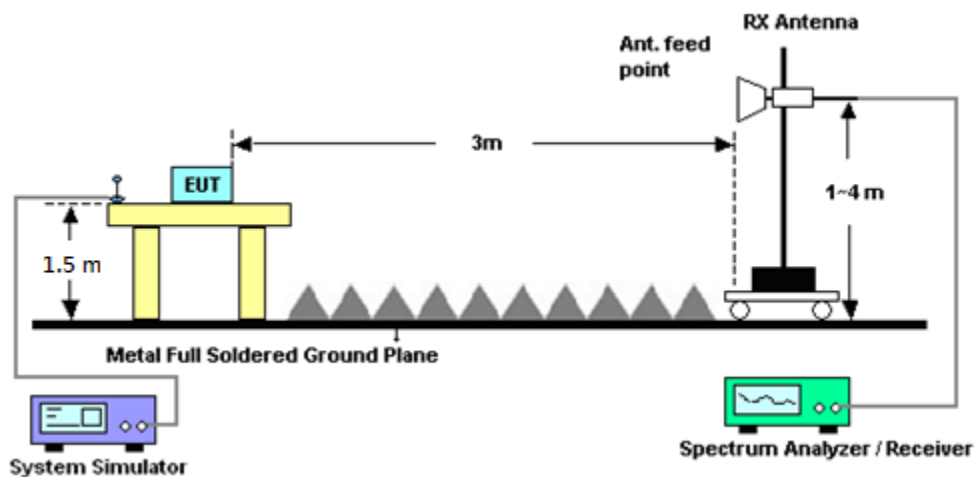
See list of measuring instruments of this test report.

### 4.2 Test Setup

#### 4.2.1 For radiated test from 30MHz to 1GHz



#### 4.2.2 For radiated test above 1GHz



### 4.3 Test Result of Radiated Test

Please refer to Appendix B.



## 4.4 Effective Isotropic Radiated Power

### 4.4.1 Description of the EIRP Measurement

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-D-2010, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 7.

### 4.4.2 Test Procedures

1. The EUT was placed on a non-conductive rotating platform (0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz) in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01.
2. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-D. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor,  $EIRP = LVL + \text{Correction factor}$  and  $ERP = EIRP - 2.15$ . Take the record of the output power at substitution antenna.

	LTE Average					
LTE BW	1.4M	3M	5M	10M	15M	20M
Span	3MHz	6MHz	10MHz	20MHz	30MHz	40MHz
RBW	30kHz	100kHz	100kHz	300kHz	300kHz	300kHz
VBW	100kHz	300kHz	300kHz	1MHz	1MHz	1MHz
Detector	RMS	RMS	RMS	RMS	RMS	RMS
Trace	Average	Average	Average	Average	Average	Average
Average Type	Power	Power	Power	Power	Power	Power
Sweep Count	100	100	100	100	100	100





## **4.5 Radiated Spurious Emission**

### **4.5.1 Description of Radiated Spurious Emission**

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-D-2010. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

For Band 7

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $55 + 10 \log (P)$  dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### **4.5.2 Test Procedures**

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-D-2010 Section 2.2.12.
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from  $43 + 10\log(P)$ dB below the transmitter power P(Watts)

12. For Band 7:

The limit line is derived from  $55 + 10\log(P)$ dB below the transmitter power P(Watts)

EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain

ERP (dBm) = EIRP - 2.15



## 5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Radio Communication Analyzer	Anritsu	MT8820C	6201381760	GSM/LTE FDD/LTE TDD/W-CDMA	May 10, 2016	May 02, 2017	May 09, 2017	Conducted (TH02-HY)
Wireless Communication Test Set(DTM)	Agilent	E5515C	MY50266977	GSM/DTM/WCDMA/DC-HSDPA/HSUPA-16QAM、CDMA	May 17, 2016	May 02, 2017	May 16, 2017	Conducted (TH02-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	35419&03	30MHz to 1GHz	Jan. 07, 2017	Apr. 27, 2017	Jan. 06, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2016	Apr. 27, 2017	Aug. 18, 2017	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Apr. 27, 2017	Sep. 01, 2017	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz ~ 18GHz	Apr. 17, 2017	Apr. 27, 2017	Apr. 16, 2018	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	Mar. 14, 2017	Apr. 27, 2017	Mar. 13, 2018	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Apr. 17, 2017	Apr. 27, 2017	Apr. 16, 2018	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Apr. 27, 2017	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Apr. 27, 2017	N/A	Radiation (03CH07-HY)
Preamplifier	MITEQ	JS44-180040 00-33-8P	1840917	18GHz ~ 40GHz	Jun. 14, 2016	Apr. 27, 2017	Jun. 13, 2017	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Nov. 08, 2016	Apr. 27, 2017	Nov. 07, 2017	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 08, 2016	Apr. 27, 2017	Nov. 07, 2017	Radiation (03CH07-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	May 19, 2016	Apr. 27, 2017	May 18, 2017	Radiation (03CH07-HY)
Horn Antenna	ESCO	3117	00066584	1GHz~18GHz	Sep. 02, 2016	Apr. 27, 2017	Sep. 01, 2017	Radiation (03CH07-HY)



## 6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ )	5.7
--	-----

### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ )	5.5
--	-----

### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

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



## Appendix A. Test Results of Conducted Test

### Conducted Output Power(Average power)

LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	0	QPSK	23.20	23.27	23.16
20	1	49		23.19	23.25	23.16
20	1	99		23.25	23.26	23.23
20	50	0		22.33	22.39	22.30
20	50	24		22.32	22.38	22.30
20	50	50		22.37	22.39	22.34
20	100	0		22.32	22.37	22.29
20	1	0	16-QAM	22.36	22.43	22.39
20	1	49		22.42	22.45	22.36
20	1	99		22.48	22.47	22.37
20	50	0		21.30	21.35	21.29
20	50	24		21.28	21.37	21.30
20	50	50		21.30	21.37	21.32
20	100	0		21.27	21.35	21.27
15	1	0	QPSK	23.11	23.23	23.16
15	1	37		23.26	23.25	23.17
15	1	74		23.21	23.20	23.23
15	36	0		22.39	22.43	22.31
15	36	20		22.42	22.45	22.31
15	36	39		22.42	22.43	22.33
15	75	0		22.39	22.42	22.32
15	1	0	16-QAM	22.37	22.43	22.37
15	1	37		22.43	22.46	22.36
15	1	74		22.51	22.51	22.33
15	36	0		21.37	21.40	21.29
15	36	20		21.36	21.43	21.32
15	36	39		21.37	21.42	21.30
15	75	0		21.34	21.40	21.30



LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	22.85	22.95	23.09
10	1	25		23.22	23.18	23.11
10	1	49		23.26	23.23	23.16
10	25	0		22.33	22.35	22.25
10	25	12		22.35	22.39	22.26
10	25	25		22.36	22.37	22.28
10	50	0		22.40	22.41	22.31
10	1	0	16-QAM	22.26	22.32	22.31
10	1	25		22.44	22.46	22.31
10	1	49		22.46	22.47	22.27
10	25	0		21.33	21.36	21.24
10	25	12		21.34	21.38	21.25
10	25	25		21.34	21.34	21.25
10	50	0		21.35	21.39	21.27
5	1	0	QPSK	23.15	23.27	23.15
5	1	12		22.86	23.03	23.02
5	1	24		23.23	23.23	23.14
5	12	0		22.20	22.37	22.27
5	12	7		22.23	22.39	22.27
5	12	13		22.39	22.38	22.26
5	25	0		22.30	22.37	22.24
5	1	0	16-QAM	22.37	22.42	22.26
5	1	12		22.31	22.44	22.27
5	1	24		22.37	22.39	22.21
5	12	0		21.36	21.41	21.25
5	12	7		21.37	21.41	21.25
5	12	13		21.38	21.39	21.26
5	25	0		21.33	21.36	21.21



## Appendix B. Test Results of EIRP and Radiated Test

### EIRP

LTE Band 7 / 5MHz (Average)							
Channel	Mode	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	18.24	0.0667	23.61	0.2296
Middle		1	0	18.52	0.0711	23.56	0.2270
Highest		1	0	18.56	0.0718	23.51	0.2244
Lowest	16QAM	1	12	17.31	0.0538	22.65	0.1841
Middle		1	12	17.61	0.0577	22.58	0.1811
Highest		1	12	17.36	0.0545	22.28	0.1690
Limit	EIRP < 2W			Result		PASS	

LTE Band 7 / 10MHz (Average)							
Channel	Mode	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	49	18.36	0.0685	23.27	0.2123
Middle		1	49	18.14	0.0652	22.57	0.1807
Highest		1	49	17.36	0.0545	22.35	0.1718
Lowest	16QAM	1	49	16.85	0.0484	22.05	0.1603
Middle		1	49	16.85	0.0484	21.69	0.1476
Highest		1	49	16.86	0.0485	21.69	0.1476
Limit	EIRP < 2W			Result		PASS	

LTE Band 7 / 15MHz (Average)							
Channel	Mode	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	37	17.30	0.0537	22.40	0.1738
Middle		1	37	17.70	0.0589	22.65	0.1841
Highest		1	37	18.16	0.0655	23.05	0.2018
Lowest	16QAM	1	74	17.30	0.0537	22.34	0.1714
Middle		1	74	16.77	0.0475	21.64	0.1459
Highest		1	74	16.90	0.0490	21.71	0.1483
Limit	EIRP < 2W			Result		PASS	

LTE Band 7 / 20MHz (Average)							
Channel	Mode	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	18.45	0.0700	23.67	0.2328
Middle		1	0	18.60	0.0724	23.65	0.2317
Highest		1	0	18.82	0.0762	23.78	0.2388
Lowest	16QAM	1	99	17.83	0.0607	22.89	0.1945
Middle		1	99	17.17	0.0521	22.00	0.1585
Highest		1	99	17.05	0.0507	21.90	0.1549
Limit	EIRP < 2W			Result		PASS	

**Radiated Spurious Emission****LTE Band 7**

LTE Band 7 / 5MHz / QPSK									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	5064	-33.58	-25	-8.58	-33.6	-40.91	2.37	9.70	H
	7596	-32.01	-25	-7.01	-36.33	-41.47	2.40	11.86	H
	10134	-44.28	-25	-19.28	-52.16	-53.84	2.70	12.25	H
	12672	-53.86	-25	-28.86	-66.49	-63.62	2.85	12.61	H
	15192	-43.66	-25	-18.66	-57.08	-53.85	3.68	13.87	H
	17730	-57.32	-25	-32.32	-74.09	-67.6	3.78	14.06	H
									H
	5064	-35.36	-25	-10.36	-35.15	-42.69	2.37	9.70	V
	7596	-41.47	-25	-16.47	-45.95	-50.93	2.40	11.86	V
	10134	-48.98	-25	-23.98	-56.83	-58.54	2.70	12.25	V
	12672	-53.51	-25	-28.51	-65.43	-63.27	2.85	12.61	V
	15192	-50.03	-25	-25.03	-63.62	-60.22	3.68	13.87	V
	17730	-59.36	-25	-34.36	-76.24	-69.64	3.78	14.06	V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 7 / 10MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	5004	-31.68	-25	-6.68	-31.34	-39.04	2.34	9.70	H
	7500	-32.35	-25	-7.35	-36.26	-41.72	2.43	11.80	H
	10008	-45.31	-25	-20.31	-52.91	-54.82	2.70	12.20	H
	12510	-52.98	-25	-27.98	-65.58	-62.59	2.81	12.41	H
	15012	-43.56	-25	-18.56	-56.16	-53.57	3.60	13.62	H
	17514	-54.68	-25	-29.68	-71.2	-65.06	3.81	14.19	H
									H
	5004	-34.71	-25	-9.71	-34.26	-42.07	2.34	9.70	V
	7500	-38.96	-25	-13.96	-43.14	-48.33	2.43	11.80	V
	10008	-49.68	-25	-24.68	-57.25	-59.19	2.70	12.20	V
	12510	-52.76	-25	-27.76	-64.58	-62.37	2.81	12.41	V
	15012	-49.31	-25	-24.31	-62.22	-59.32	3.60	13.62	V
	17514	-58.53	-25	-33.53	-75.19	-68.91	3.81	14.19	V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 7 / 15MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	5004	-31.28	-25	-6.28	-30.99	-38.64	2.34	9.70	H
	7500	-32.36	-25	-7.36	-36.21	-41.73	2.43	11.80	H
	10008	-42.66	-25	-17.66	-50.29	-52.17	2.70	12.20	H
	12510	-54.42	-25	-29.42	-66.95	-64.03	2.81	12.41	H
	15012	-43.32	-25	-18.32	-55.91	-53.33	3.60	13.62	H
	17514	-56.81	-25	-31.81	-73.29	-67.19	3.81	14.19	H
									H
	5004	-33.56	-25	-8.56	-33.14	-40.92	2.34	9.70	V
	7500	-39.71	-25	-14.71	-43.73	-49.08	2.43	11.80	V
	10008	-47.27	-25	-22.27	-54.78	-56.78	2.70	12.20	V
	12510	-52.45	-25	-27.45	-64.21	-62.06	2.81	12.41	V
	15012	-49.47	-25	-24.47	-62.43	-59.48	3.60	13.62	V
	17514	-58.18	-25	-33.18	-74.84	-68.56	3.81	14.19	V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 7 / 20MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	5052	-33.96	-25	-8.96	-33.86	-41.29	2.37	9.70	H
	7578	-33.21	-25	-8.21	-37.37	-42.65	2.40	11.85	H
	10098	-44.57	-25	-19.57	-52.36	-54.11	2.70	12.24	H
	12636	-55.56	-25	-30.56	-68.12	-65.28	2.84	12.56	H
	15156	-44.33	-25	-19.33	-57.61	-54.49	3.66	13.82	H
	17676	-55.42	-25	-30.42	-72.15	-65.73	3.79	14.09	H
									H
	5052	-36.41	-25	-11.41	-36.12	-43.74	2.37	9.70	V
	7578	-41.34	-25	-16.34	-45.76	-50.78	2.40	11.85	V
	10098	-47.34	-25	-22.34	-55.03	-56.88	2.70	12.24	V
	12636	-54.07	-25	-29.07	-65.99	-63.79	2.84	12.56	V
	15156	-49.36	-25	-24.36	-62.79	-59.52	3.66	13.82	V
	17676	-59.48	-25	-34.48	-76.35	-69.79	3.79	14.09	V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.