



FCC RF Test Report

APPLICANT : HMD Global Oy
EQUIPMENT : GSM/WCDMA/LTE Mobile Phone
BRAND NAME : Nokia
MODEL NAME : TA-1080
FCC ID : 2AJOTTA-1080
STANDARD : 47 CFR Part 2, 22(H), 27(M)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

This is a data re-used report which is only valid together with the original test report. The product was received on Oct. 29, 2018 and testing was completed on Nov. 15, 2018. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures 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

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	6
1.6	Re-use of Measured Data	7
1.7	Maximum ERP/EIRP Power	9
1.8	Testing Location	10
1.9	Applicable Standards	10
2	TEST CONFIGURATION OF EQUIPMENT UNDER TEST	11
2.1	Test Mode	11
2.2	Connection Diagram of Test System	12
2.3	Support Unit used in test configuration and system	12
2.4	Frequency List of Low/Middle/High Channels	13
3	CONDUCTED TEST ITEMS	14
3.1	Measuring Instruments	14
3.2	Conducted Output Power and ERP/EIRP	14
4	RADIATED TEST ITEMS	15
4.1	Measuring Instruments	15
4.2	Test Setup	15
4.3	Test Result of Radiated Test	15
4.4	Radiated Spurious Emission	16
5	LIST OF MEASURING EQUIPMENT	17
6	UNCERTAINTY OF EVALUATION	18
APPENDIX B. TEST RESULTS OF RADIATED TEST		
APPENDIX C. TEST SETUP PHOTOGRAPHS		
APPENDIX D. REFERENCE REPORT		



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG8O2901B	Rev. 01	Initial issue of report	Dec. 11, 2018



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.2	§2.1046	Conducted Output Power	Reporting Only	PASS	1
	§22.913(a)(5)	Effective Radiated Power (Band 5)	ERP < 7 Watt	PASS	-
	§24.232(c) §27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 7) (Band 38)	EIRP < 2Watt	PASS	-
-	N/A	Peak-to-Average Ratio	<13 dB	-	-
-	§2.1049	Occupied Bandwidth	Reporting Only	PASS	1
-	§2.1051 §22.917(a)	Conducted Band Edge Measurement (Band 5)	< 43+10log10(P[Watts])	PASS	1
	§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+10log10(P[Watts])	PASS	1
	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (Band 7) (Band 38)	< 55+10log ₁₀ (P[Watts])		
-	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22H	PASS	1
	§2.1055 §27.54		Within Authorized Band		
3.4	§2.1053 §22.917(a)	Radiated Spurious Emission (Band 5)	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 8.28 dB at 7577.00 MHz
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (Band 7) (Band 38)	< 55+10log ₁₀ (P[Watts])		
Remark 1: Test items are performed on original report which can be referred to Sporton report number FG832104B.					



1 General Description

1.1 Applicant

HMD Global Oy

Bertel Jungin aukio 9, 02600 Espoo, Finland

1.2 Manufacturer

HMD Global Oy

Bertel Jungin aukio 9, 02600 Espoo, Finland

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM/WCDMA/LTE Mobile Phone
Brand Name	Nokia
Model Name	TA-1080
FCC ID	2AJOTTA-1080
EUT supports Radios application	GSM/GPRS/EGPRS/ WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE WLAN 2.4GHz 802.11b/g/n HT20/HT40 Bluetooth BR/EDR/LE
IMEI Code	Radiation: 356940093897764/356940093977764 for B5 359013091652032 359013091732032 for B7/B38
HW Version	HW0511
SW Version	000C_0_390
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz LTE Band 38 : 2572.5MHz ~ 2617.5MHz
Rx Frequency	LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 7 : 2622.5MHz ~ 2687.5 MHz LTE Band 38 : 2572.5MHz ~ 2617.5MHz
Bandwidth	LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 7 : 5MHz/ 10MHz / 15MHz / 20MHz LTE Band 38 : 5MHz / 10MHz / 15MHz / 20MHz
Antenna Gain	LTE Band 5 : -4.00 dBi LTE Band 7 : -2.00 dBi LTE Band 38 : -2.00 dBi
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

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



1.6 Re-use of Measured Data

1.6.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: TA-1080, FCC ID: 2AJOTTA-1080) is electrically identical to the reference device (Model: TA-1084, FCC ID: 2AJOTTA-1084) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 484596 D01.

1.6.2 Difference Section

For details concerning the similarity with respect to component placement, mechanical/electrical design etc., please refer to the Product Equality Declaration.

The re-used RF data includes the following bands provided in Appendix A (Sporton RF Report No. FG832104B for the reference device Model: TA-1084, FCC ID: 2AJOTTA-1084).

1.6.3 Reference detail Section:

Equipment Class	Reference FCC ID	Folder Test	Report Title/Section
PCE (2G/3G)	2AJOTTA-1084	Part22H.24E (FG832104A)	All sections applicable except ERP/EIRP and RSE
PCE (LTE)	2AJOTTA-1084	Part22H. 27M (FG832104B)	All sections applicable except ERP/EIRP and RSE

**1.6.4 Spot Check Verification Data Section**

In order to confirm hardware similarity of the subject device with the reference device, spot check measurements were performed on the subject device for the following test items, the test result were consistent with FCC ID: 2AJOTTA-1084.

Assertions concerning the similarity of these devices are based on representations by the applicant. The applicant accepts full responsibility for the validity of the similarity claim, and for the determination that verification test data are sufficient to support it.

Test Item	Mode	2AJOTTA-1084 Worst Result	2AJOTTA-1080 Worst Result	Difference (dB)
Average Conducted Power (dBm)	GSM 850	32.67	32.34	-0.33
	GSM 1900	30.10	30.44	0.34
	WCDMA Band V	23.21	23.44	0.23
	LTE Band 5	23.21	23.40	0.19
	LTE Band 7	22.70	23.29	0.59
	LTE Band 38	22.95	23.25	0.30

1.7 Maximum ERP/EIRP Power

LTE Band 5		QPSK	16QAM
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Maximum ERP(W)
1.4	824.7 ~ 848.3	0.0530	0.0433
3	825.5 ~ 847.5	0.0505	0.0417
5	826.5 ~ 846.5	0.0526	0.0379
10	829.0 ~ 844.0	0.0531	0.0430
LTE Band 7			
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Maximum EIRP(W)
5	2502.5 ~ 2567.5	0.1343	0.1091
10	2505.0 ~ 2565.0	0.1300	0.1102
15	2507.5 ~ 2562.5	0.1268	0.1019
20	2510.0 ~ 2560.0	0.1346	0.0906
LTE Band 38			
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Maximum EIRP(W)
5	2572.5 ~ 2617.5	0.1291	0.0951
10	2575.0 ~ 2615.0	0.1274	0.0962
15	2577.5 ~ 2612.5	0.1318	0.1104
20	2580.0 ~ 2610.0	0.1334	0.0993



1.8 Testing Location

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

Test Site	Sporton International (Kunshan) Inc.		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone, Jiangsu Province 215335, China TEL : 86-512-57900158 FAX : 86-512-57900958		
Test Site No.	Sporton Site No.	FCC designation No.	FCC Test Firm Registration No.
	03CH04-KS 03CH06-KS	CN5013	630927

1.9 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(M)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

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

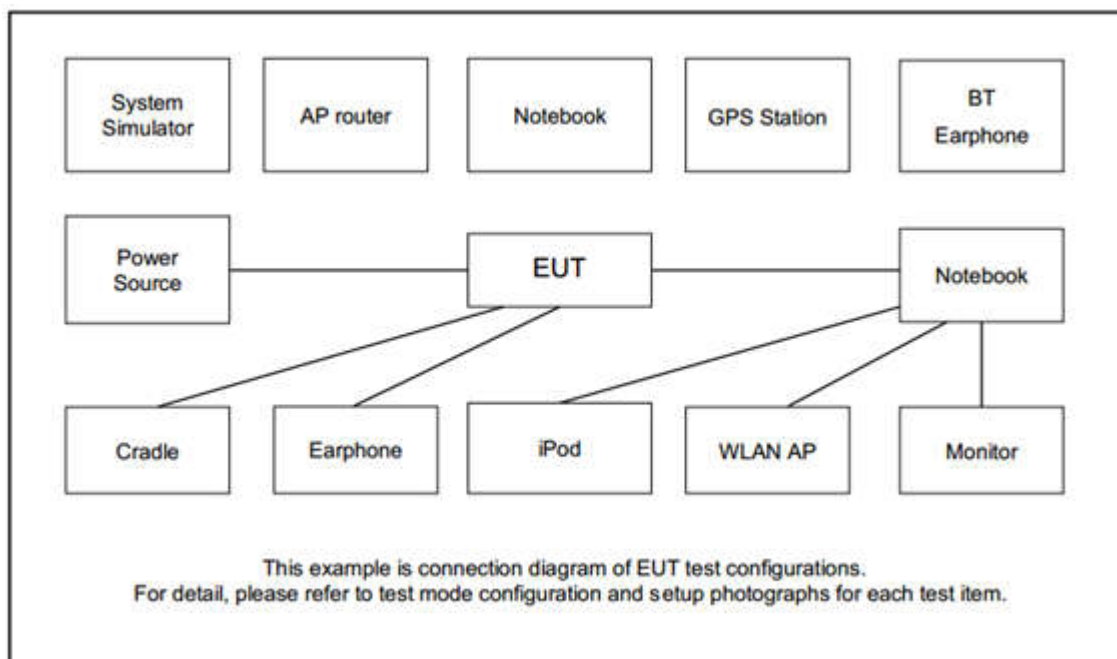
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 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
E.R.P / E.I.R.P	5	v	v	v	v	-	-	v	v	v			v	v	v
	7	-	-	v	v	v	v	v	v	v			v	v	v
	38	-	-	v	v	v	v	v	v	v			v	v	v
Radiated Spurious Emission	5	Worst Case												v	
	7	Worst Case												v	
	38	Worst Case												v	
Note	1. The mark “v ” means that this configuration is chosen for testing 2. The mark “-“ means that this bandwidth is not supported. 3. 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.														

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.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m



2.4 Frequency List of Low/Middle/High Channels

LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

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

LTE Band 38 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	37850	38000	38150
	Frequency	2580	2595	2610
15	Channel	37825	38000	38175
	Frequency	2577.5	2595	2612.5
10	Channel	37800	38000	38200
	Frequency	2575	2595	2615
5	Channel	37775	38000	38225
	Frequency	2572.5	2595	2617.5

3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.2 Conducted Output Power and ERP/EIRP

3.2.1 Description of the Conducted Output Power Measurement and ERP/EIRP 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.

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 5.

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 7 and Band 38.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.2.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

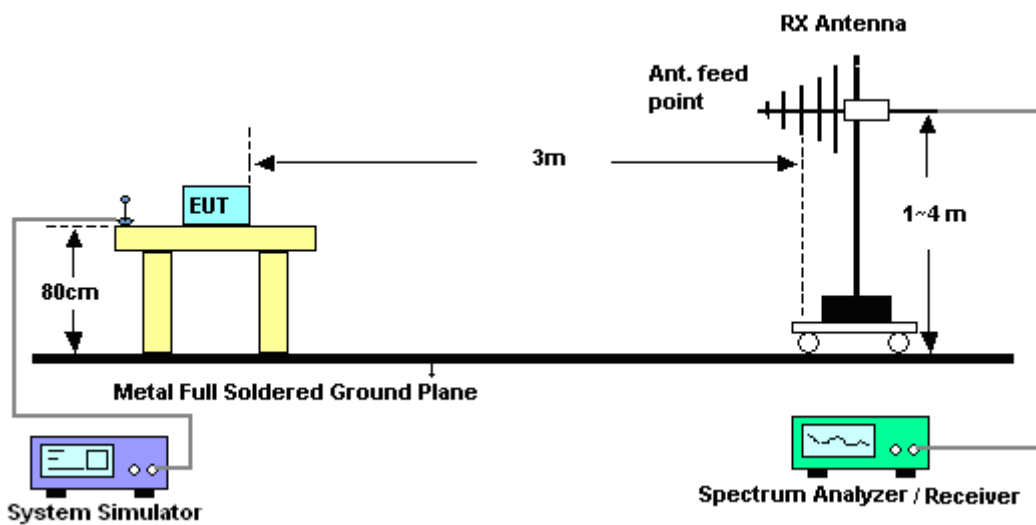
4 Radiated Test Items

4.1 Measuring Instruments

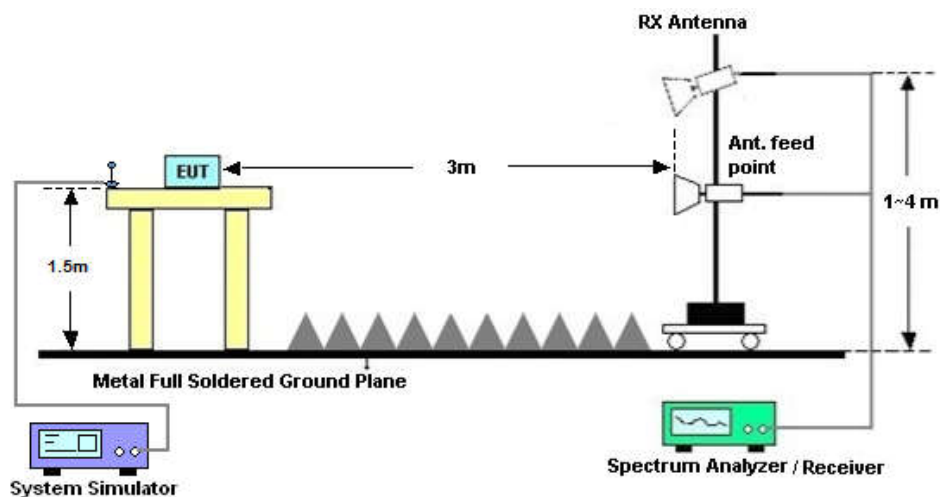
See list of measuring instruments of this test report.

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 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. 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, 38

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.

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna 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 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
12. 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)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

13. For Band 7, 38:

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



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44GHz	Oct. 09, 2018	Nov. 15, 2018	Oct. 08, 2019	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Jan. 29, 2018	Nov. 15, 2018	Jan 28, 2019	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1648	1GHz~18GHz	Dec. 16, 2017	Nov. 15, 2018	Dec 15, 2018	Radiation (03CH04-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 07, 2018	Nov. 15, 2018	Feb. 06, 2019	Radiation (03CH04-KS)
Amplifier	Burgeon	BPA-530	102219	0.01MHz~3000MHz	Dec. 16, 2017	Nov. 15, 2018	Dec 15, 2018	Radiation (03CH04-KS)
Amplifier	MITEQ	TTA1840-35-HG	2014749	18~40GHz	Feb. 08, 2018	Nov. 15, 2018	Feb. 07, 2019	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-10P	2025788	1Ghz-18Ghz	Apr.17.2018	Nov. 15, 2018	Apr. 16,2019	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY53270203	500MHz~26.5GHz	Dec. 16, 2017	Nov. 15, 2018	Dec. 15, 2018	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Nov. 15, 2018	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Nov. 15, 2018	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Nov. 15, 2018	NCR	Radiation (03CH04-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471084	10Hz-44GHz	Jun. 25, 2018	Nov. 15, 2018	Jun. 24, 2019	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Jan. 29, 2018	Nov. 15, 2018	Jan. 28, 2019	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 20, 2018	Nov. 15, 2018	Oct. 19, 2019	Radiation (03CH06-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 07, 2018	Nov. 15, 2018	Feb. 06, 2019	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	187289	9KHz ~1GHZ	Aug. 06, 2018	Nov. 15, 2018	Aug. 05, 2019	Radiation (03CH06-KS)
Amplifier	MITEQ	TTA1840-35-HG	2014749	18~40GHz	Feb. 08, 2018	Nov. 15, 2018	Feb. 07, 2019	Radiation (03CH06-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-10P	2025788	1Ghz-18Ghz	Apr.17, 2018	Nov. 15, 2018	Apr.16, 2019	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY53270203	500MHz~26.5GHz	Dec. 16, 2017	Nov. 15, 2018	Dec. 15, 2018	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Nov. 15, 2018	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Nov. 15, 2018	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Nov. 15, 2018	NCR	Radiation (03CH06-KS)

NCR: No Calibration Required

6 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) for 03CH04-KS

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.3dB
--	-------

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz) for 03CH04-KS

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.8dB
--	-------

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz) for 03CH04-KS

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.8dB
--	-------

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) for 03CH06-KS

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.5dB
--	-------

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz) for 03CH06-KS

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.0dB
--	-------

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz) for 03CH06-KS

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.0dB
--	-------

Appendix A. Test Results of Conducted Test

ERP/EIRP

LTE Band 5 (GT - LC = -4.00 dB) QPSK									
Bandwidth	1.4M			3M			5M		
Channel	20407	20525	20643	20415	20525	20635	20425	20525	20625
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency	824.7	836.5	848.3	825.5	836.5	847.5	826.5	836.5	846.5
(MHz)									
Conducted Power (dBm)	23.39	23.32	23.09	23.16	23.18	22.85	23.36	23.14	23.27
Conducted Power (Watts)	0.2183	0.2148	0.2037	0.2070	0.2080	0.1928	0.2168	0.2061	0.2123
ERP(dBm)	17.24	17.17	16.94	17.01	17.03	16.70	17.21	16.99	17.12
ERP(Watts)	0.0530	0.0521	0.0494	0.0502	0.0505	0.0468	0.0526	0.0500	0.0515

LTE Band 5 (GT - LC = -4.00 dB) QPSK			
Bandwidth	10M		
Channel	20450	20525	20600
	(Low)	(Mid)	(High)
Frequency	829	836.5	844
(MHz)			
Conducted Power (dBm)	22.95	23.04	23.40
Conducted Power (Watts)	0.1972	0.2014	0.2188
ERP(dBm)	16.80	16.89	17.25
ERP(Watts)	0.0479	0.0489	0.0531



LTE Band 5 (GT - LC = -4.00 dB) 16QAM									
Bandwidth	1.4M			3M			5M		
Channel	20407	20525	20643	20415	20525	20635	20425	20525	20625
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency	824.7	836.5	848.3	825.5	836.5	847.5	826.5	836.5	846.5
(MHz)									
Conducted Power (dBm)	22.51	21.66	21.78	22.35	22.22	21.81	21.94	21.83	21.89
Conducted Power (Watts)	0.1782	0.1466	0.1507	0.1718	0.1667	0.1517	0.1563	0.1524	0.1545
ERP(dBm)	16.36	15.51	15.63	16.20	16.07	15.66	15.79	15.68	15.74
ERP(Watts)	0.0433	0.0356	0.0366	0.0417	0.0405	0.0368	0.0379	0.0370	0.0375

LTE Band 5 (GT - LC = -4.00 dB) 16QAM			
Bandwidth	10M		
Channel	20450	20525	20600
	(Low)	(Mid)	(High)
Frequency	829	836.5	844
(MHz)			
Conducted Power (dBm)	22.48	22.28	21.90
Conducted Power (Watts)	0.1770	0.1690	0.1549
ERP(dBm)	16.33	16.13	15.75
ERP(Watts)	0.0430	0.0410	0.0376



LTE Band 7 (GT - LC = -2.00dB) QPSK			
Bandwidth	5M		
Channel	20775	21100	21425
	(Low)	(Mid)	(High)
Frequency	2502.5	2535	2567.5
(MHz)			
Conducted Power (dBm)	22.84	22.93	23.28
Conducted Power (Watts)	0.1923	0.1963	0.2128
EIRP(dBm)	20.84	20.93	21.28
EIRP(Watts)	0.1213	0.1239	0.1343

LTE Band 7 (GT - LC = -2.00dB) QPSK									
Bandwidth	10M			15M			20M		
Channel	20800	21100	21400	20825	21100	21375	20850	21100	21350
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency	2505	2535	2565	2507.5	2535	2562.5	2510	2535	2560
(MHz)									
Conducted Power (dBm)	23.03	22.93	23.14	22.60	22.91	23.03	23.09	22.92	23.29
Conducted Power (Watts)	0.2009	0.1963	0.2061	0.1820	0.1954	0.2009	0.2037	0.1959	0.2133
EIRP(dBm)	21.03	20.93	21.14	20.60	20.91	21.03	21.09	20.92	21.29
EIRP(Watts)	0.1268	0.1239	0.1300	0.1148	0.1233	0.1268	0.1285	0.1236	0.1346



LTE Band 7 (GT - LC = -2.00dB) 16QAM			
Bandwidth	5M		
Channel	20775	21100	21425
	(Low)	(Mid)	(High)
Frequency	2502.5	2535	2567.5
(MHz)			
Conducted Power (dBm)	21.72	21.63	22.38
Conducted Power (Watts)	0.1486	0.1455	0.1730
EIRP(dBm)	19.72	19.63	20.38
EIRP(Watts)	0.0938	0.0918	0.1091

LTE Band 7 (GT - LC = -2.00dB) 16QAM									
Bandwidth	10M			15M			20M		
Channel	20800	21100	21400	20825	21100	21375	20850	21100	21350
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Frequency	2505	2535	2565	2507.5	2535	2562.5	2510	2535	2560
(MHz)									
Conducted Power (dBm)	21.76	21.78	22.42	22.08	21.43	21.47	21.57	21.43	21.53
Conducted Power (Watts)	0.1500	0.1507	0.1746	0.1614	0.1390	0.1403	0.1435	0.1390	0.1422
EIRP(dBm)	19.76	19.78	20.42	20.08	19.43	19.47	19.57	19.43	19.53
EIRP(Watts)	0.0946	0.0951	0.1102	0.1019	0.0877	0.0885	0.0906	0.0877	0.0897



LTE Band 38 (GT - LC = -2.00 dB) QPSK			
Bandwidth	5M		
Channel	37775	38000	38225
	(Low)	(Mid)	(High)
Frequency	2572.5	2595	2617.5
(MHz)			
Conducted Power (dBm)	22.79	22.76	23.11
Conducted Power (Watts)	0.1901	0.1888	0.2046
EIRP(dBm)	20.79	20.76	21.11
EIRP(Watts)	0.1199	0.1191	0.1291

LTE Band 38 (GT - LC = -2.00 dB) QPSK									
Bandwidth	10M			15M			20M		
Channel	37800	38000	38200	37825	38000	38175	37850	38000	38150
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(Mid)
Frequency	2575	2595	2615	2577.5	2595	2612.5	2580	2595	2610
(MHz)									
Conducted Power (dBm)	22.78	22.71	23.05	22.87	22.73	23.20	22.97	22.90	23.25
Conducted Power (Watts)	0.1897	0.1866	0.2018	0.1936	0.1875	0.2089	0.1982	0.1950	0.2113
EIRP(dBm)	20.78	20.71	21.05	20.87	20.73	21.20	20.97	20.90	21.25
EIRP(Watts)	0.1197	0.1178	0.1274	0.1222	0.1183	0.1318	0.1250	0.1230	0.1334



LTE Band 38 (GT - LC = -2.00 dB) 16QAM			
Bandwidth	5M		
Channel	37775	38000	38225
	(Low)	(Mid)	(High)
Frequency	2572.5	2595	2617.5
(MHz)			
Conducted Power (dBm)	21.61	21.53	21.78
Conducted Power (Watts)	0.1449	0.1422	0.1507
EIRP(dBm)	19.61	19.53	19.78
EIRP(Watts)	0.0914	0.0897	0.0951

LTE Band 38 (GT - LC = -2.00 dB) 16QAM									
Bandwidth	10M			15M			20M		
Channel	37800	38000	38200	37825	38000	38175	37850	38000	38150
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(Mid)
Frequency	2575	2595	2615	2577.5	2595	2612.5	2580	2595	2610
(MHz)									
Conducted Power (dBm)	21.68	21.69	21.83	21.77	21.68	22.43	21.61	21.53	21.97
Conducted Power (Watts)	0.1472	0.1476	0.1524	0.1503	0.1472	0.1750	0.1449	0.1422	0.1574
EIRP(dBm)	19.68	19.69	19.83	19.77	19.68	20.43	19.61	19.53	19.97
EIRP(Watts)	0.0929	0.0931	0.0962	0.0948	0.0929	0.1104	0.0914	0.0897	0.0993

Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

LTE Band 5 / 10MHz / QPSK								
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1664	-60.49	-13	-47.49	-61.70	2.32	5.68	H
	2496	-43.76	-13	-30.76	-44.39	3.02	5.80	H
	3327	-64.10	-13	-51.10	-66.56	3.27	7.88	H
	1664	-59.98	-13	-46.98	-61.19	2.32	5.68	V
	2496	-39.84	-13	-26.84	-40.47	3.02	5.80	V
	3327	-64.19	-13	-51.19	-66.65	3.27	7.88	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)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	5051	-48.02	-25	-23.02	-58.23	3.03	13.24	H
	7577	-41.65	-25	-16.65	-51.10	3.56	13.01	H
	10100	-54.41	-25	-29.41	-63.93	3.92	13.44	H
	12630	-55.36	-25	-30.36	-65.28	4.44	14.36	H
	5051	-45.36	-25	-20.36	-55.57	3.03	13.24	V
	7577	-33.28	-25	-8.28	-42.73	3.56	13.01	V
	10100	-46.77	-25	-21.77	-56.29	3.92	13.44	V
	12630	-50.57	-25	-25.57	-60.49	4.44	14.36	V

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



LTE Band 38 / 20MHz / QPSK								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	5171	-41.38	-25	-16.38	-51.59	3.03	13.24	H
	7757	-40.64	-25	-15.64	-50.09	3.56	13.01	H
	10343	-52.21	-25	-27.21	-61.73	3.92	13.44	H
	12928	-48.92	-25	-23.92	-58.84	4.44	14.36	H
	5171	-44.45	-25	-19.45	-54.66	3.03	13.24	V
	7757	-41.59	-25	-16.59	-51.04	3.56	13.01	V
	10343	-50.80	-25	-25.80	-60.32	3.92	13.44	V
	12928	-46.25	-25	-21.25	-56.17	4.44	14.36	V

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



Appendix D. Reference Report

Please refer to Sporton report number FG8O2901B which is issued separately.