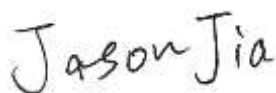


FCC RF Test Report

APPLICANT : Nokia Shanghai Bell Co., Ltd.
EQUIPMENT : FastMile 4G Receiver
BRAND NAME : Nokia
MODEL NAME : 4G01-C
FCC ID : 2ADZR4G01C
STANDARD : 47 CFR Part 2, 96
CLASSIFICATION : Citizens Band Category A and B Devices (CBD)
EQUIPMENT TYPE : CBSD (Category B)

This is a data re-used report which is only valid together with the original test report. 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.



Reviewed by: Jason Jia / Supervisor



Approved by: James Huang / Manager



Sporton International (Kunshan) Inc.

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China**



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 Applicant.....	5
1.2 Manufacturer	5
1.3 Feature of Equipment Under Test.....	5
1.4 Maximum EIRP Power.	6
1.5 Testing Site.....	7
1.6 Test Software	7
1.7 Re-use of Measured Data	8
1.8 Applied Standards	9
2 Test Configuration of Equipment Under Test	10
2.1 Test Mode.....	10
2.2 Connection Diagram of Test System	11
2.3 Support Unit used in test configuration	11
2.4 Frequency List of Low/Middle/High Channels.....	12
3 Conducted Test Items.....	14
3.1 Measuring Instruments.....	14
3.2 Conducted Output Power	15
3.3 EIRP and PSD.....	16
4 Radiated Test Items	18
4.1 Measuring Instruments.....	18
4.2 Test Setup	18
4.3 Test Result of Radiated Test.....	18
4.4 Radiated Spurious Emission	19
5 List of Measuring Equipment.....	20
6 Uncertainty of Evaluation	21
Appendix A. Test Results of Conducted Test	
Appendix B. Test Results of Radiated Test	
Appendix C. Setup Photographs	
Appendix D. Reference Report	



History of this test report

Report No.	Version	Description	Issued Date
FG982810-01	01	Initial issue of report	Dec. 01, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
3.3	§96.41	Maximum E.I.R.P	Pass	-
4.4	§2.1051 §96.41	Radiated Spurious Emission	Pass	Under limit 7.32 dB at 7212.000 MHz

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Applicant

Nokia Shanghai Bell Co., Ltd.

388#, Ningqiao Road, China (Shanghai) Pilot Free Trade Zone, Shanghai 201206, China

1.2 Manufacturer

Nokia Shanghai Bell Co., Ltd.

388#, Ningqiao Road, China (Shanghai) Pilot Free Trade Zone, Shanghai 201206, China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	FastMile 4G Receiver
Brand Name	Nokia
Model Name	4G01-C
POE injector	G1344A-530-030 PSE1000
FCC ID	2ADZR4G01C
Tx Frequency	LTE Band 48: 3552.5 MHz ~ 3697.5 MHz
Rx Frequency	LTE Band 48: 3552.5 MHz ~ 3697.5 MHz
Bandwidth	5MHz / 10MHz / 15MHz / 20MHz
Type of Modulation	QPSK / 16QAM / 64QAM
IMEI Code	Radiation: 359120100027757
Antenna Type / Gain	Patch Antenna with gain 19 dBi
HW Version	3TG 01454 AA
SW Version	FASTMILE2_D020107B65T0101M01E0270S
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 Maximum EIRP Power.

LTE Band 48		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP (W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP (W)
5	3552.5~3697.5	-	-	19.0546	-	-	15.1356
10	3555~3695	-	-	23.0144	-	-	18.6638
15	3557.5~3692.5	-	-	22.9615	-	-	18.7932
20	3560~3690	-	-	22.3872	-	-	18.2390
LTE Band 48		64QAM					
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)		Frequency Tolerance (ppm)		Maximum EIRP (W)	
5	3552.5~3697.5	-		-		14.1906	
10	3555~3695	-		-		13.8995	
15	3557.5~3692.5	-		-		13.1220	
20	3560~3690	-		-		13.7088	

LTE Band 48 CA		QPSK			16QAM		
BW (MHz) Frequency (MHz)		Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
20MHz+20MHz (3560 ~ 3690 MHz)		-	-	15.8855	-	-	15.7761
LTE Band 48 CA		64QAM					
BW (MHz) Frequency (MHz)		Emission Designator (99%OBW)		Frequency Tolerance (ppm)		Maximum EIRP(W)	
20MHz+20MHz (3560 ~ 3690 MHz)		-		-		12.5893	

Note: The maximum EIRP for CA band is calculated from max output power of 20M+20M and antenna gain, only the maximum EIRP is shown on the report.

1.5 Testing Site

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International (Kunshan) Inc.		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of 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	CN1257	314309

1.6 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a



1.7 Re-use of Measured Data

1.7.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: 4G01-C, FCC ID: 2ADZR4G01C) is electrically identical to the reference device (Model: 4G01-A, FCC ID: 2ADZR34003800FM20) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 484596 D01.

1.7.2 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 D (Band 48 from original test report No. FG9N1515A and Band 48CA from original test report No.FG982810-02 for the reference device Model: 4G01-A, FCC ID: 2ADZR34003800FM20).

1.7.3 Reference detail Section:

Equipment Class	Reference FCC ID	Report Number	Report Title/Section
CBD (LTE)	2ADZR34003800FM20	Part 96 (Report No. FG9N1515A & FG982810-02)	All sections applicable except for Conducted Power/EIRP/RSE

1.7.4 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: 2ADZR34003800FM20.

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	2ADZR34003800FM20 Worst Result	2ADZR4G01C Worst Result	Difference (dB)
Average Conducted Power (dBm)	LTE Band 48	23.60	24.62	1.02
	LTE Band 48 CA	23.28	23.01	0.27



1.8 Applied Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ 47 CFR Part 2, 96
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 940660 D01 Part 96 CBRS v02
- ♦ 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

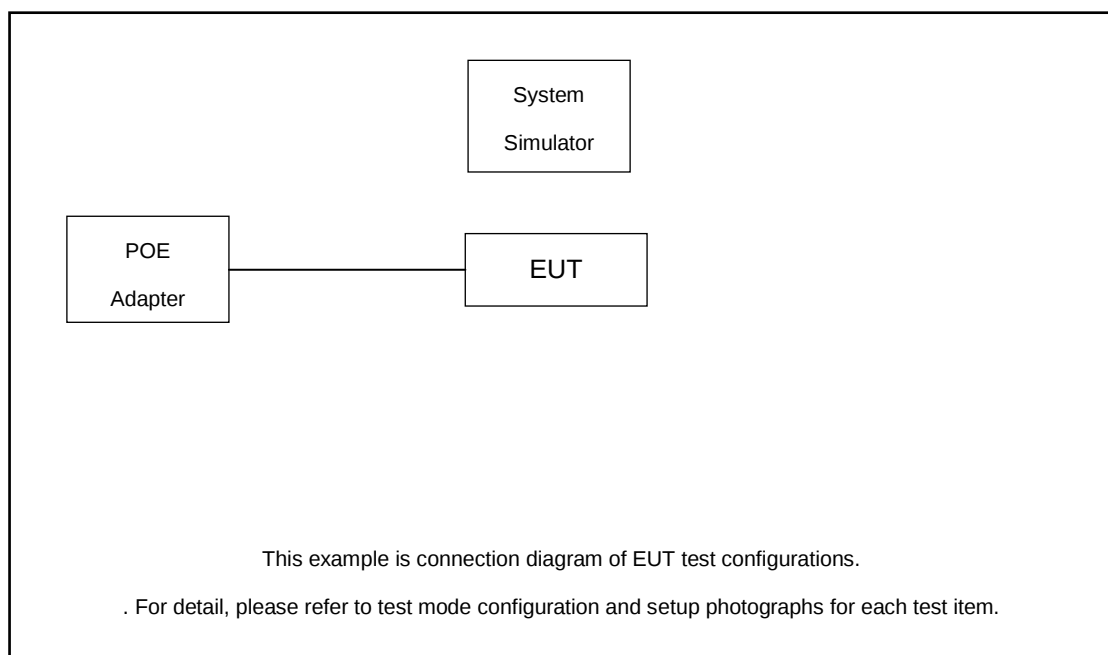
Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

Test Items	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Max. Output Power	48	-	-	v	v	v	v	v	v	v	v	v	v	v	v	v
E.R.P / E.I.R.P	48	-	-	v	v	v	v	v	v	v	v			v	v	v
Radiated Spurious Emission	48	Worst Case													v	
Remark	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.															

Test Items	Band	Bandwidth (MHz)							Modulation			RB #			Test Channel			
		20+20	20+15	15+20	20+10	10+20	20+5	5+20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H	
Max. Output Power	48C	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v	
E.R.P / E.I.R.P	48C	v	v	v	v	v	v	v	v	v	v	v			v	v	v	
Radiated Spurious Emission	48C	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

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m



2.4 Frequency List of Low/Middle/High Channels

LTE Band 48 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	55340	55990	56640
	Frequency	3560.0	3625.0	3690.0
15	Channel	55315	55990	56665
	Frequency	3557.5	3625.0	3692.5
10	Channel	55290	55990	56690
	Frequency	3555.0	3625.0	3695.0
5	Channel	55265	55990	56715
	Frequency	3552.5	3625.0	3697.5



LTE Band 48C_CA Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
5 + 20	PCC	Channel	55273	55898	56523
		Frequency	3553.3	3615.8	3678.3
	SCC	Channel	55390	56015	56640
		Frequency	3565	3627.5	3690
20 + 5	PCC	Channel	55340	55965	56590
		Frequency	3560	3622.5	3685
	SCC	Channel	55457	56082	56707
		Frequency	3571.7	3634.2	3696.7
10 + 20	PCC	Channel	55295	55896	56496
		Frequency	3555.5	3615.6	3675.6
	SCC	Channel	55439	56040	56640
		Frequency	3569.9	3630	3690
20 + 10	PCC	Channel	55340	55941	56541
		Frequency	3560	3620.1	3680.1
	SCC	Channel	55484	56085	56685
		Frequency	3574.4	3634.5	3694.5
15 + 20	PCC	Channel	55318	55893	56469
		Frequency	3557.8	3615.3	3672.9
	SCC	Channel	55489	56064	56640
		Frequency	3574.9	3632.4	3690
20 + 15	PCC	Channel	55340	55916	56491
		Frequency	3560	3617.6	3675.1
	SCC	Channel	55511	56087	56662
		Frequency	3577.1	3634.7	3692.2
20 + 20	PCC	Channel	55340	55891	56442
		Frequency	3560	3615.1	3670.2
	SCC	Channel	55538	56089	56640
		Frequency	3579.8	3634.9	3690

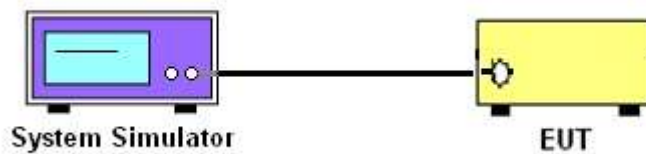
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 Test Result of Conducted Test

Please refer to Appendix A.



3.2 Conducted Output Power

3.2.1 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.

3.2.2 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.

3.3 EIRP and PSD

3.3.1 Description of the EIRP Measurement

EIRP and PSD limits for CBRS equipment as below table:

Device		Maximum EIRP (dBm/10 MHz)	Maximum PSD (dBm/MHz)
☐	End User Device	23	n/a
☐	Category A CBSD	30	20
☒	Category B CBSD	47	37

Remark: Maximum PSD values are radiated. Measurements can be done conducted and add antenna gain back in.

3.3.2 Test Procedures for EIRP

The testing follows ANSI C63.26-2015 Section 5.2.5.5

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, 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



3.3.3 Test Procedures for EIRP PSD

1. Set instrument center frequency to OBW center frequency.
2. Set span to at least 2 times the OBW.
3. Set the RBW to the specified reference bandwidth (often 1 MHz).
4. Set VBW $\geq 3 \times$ RBW.
5. Detector = RMS (power averaging).
6. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
7. Sweep time = auto couple.
8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).
10. Determine the EIRP by adding the effective antenna gain to the adjusted power level.
11. Add 10 log (1/duty cycle) to the measured power level to compute the average power during continuous transmission.

The testing follows ANSI C63.26-2015 Section 5.2.5.5

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, 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

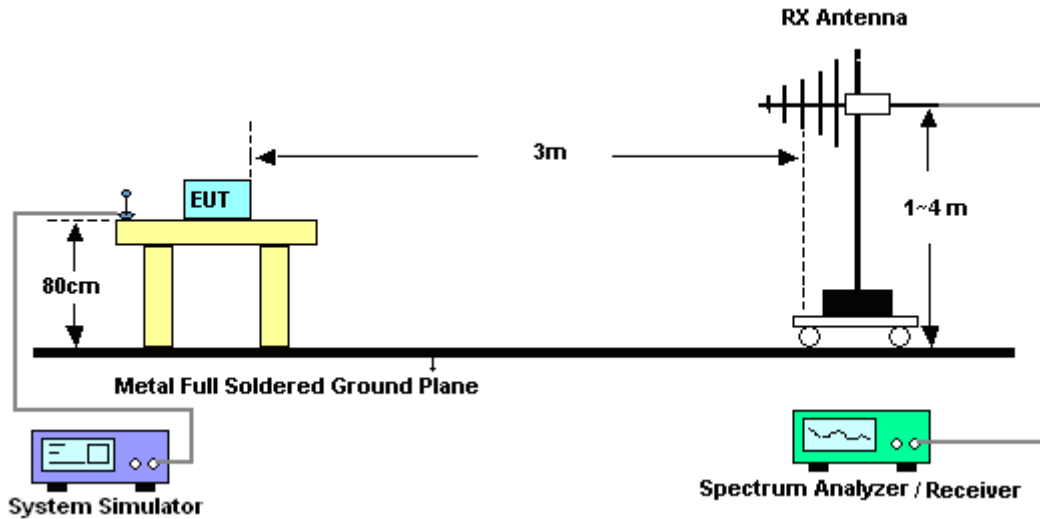
4 Radiated Test Items

4.1 Measuring Instruments

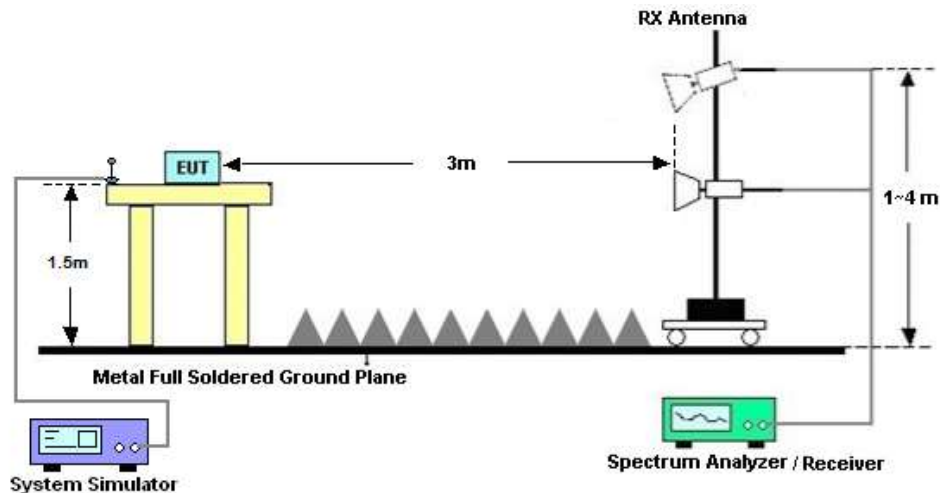
See list of measuring instruments of this test report.

4.2 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions 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 Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. 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 -40dBm / MHz. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

1. 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.
2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
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. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
$$\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$$
$$\text{ERP (dBm)} = \text{EIRP} - 2.15$$
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
The limit line is -40dBm/MHz



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 15, 2020	Sep. 28, 2020	Apr. 14, 2021	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jan. 03, 2020	Sep. 28, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 20, 2020	Sep. 28, 2020	Apr. 19, 2021	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 10, 2019	Sep. 28, 2020	Nov. 09, 2020	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 03, 2020	Sep. 28, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GG A	060728	18~40GHz	Jan. 08, 2020	Sep. 28, 2020	Jan. 07, 2021	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	2025788	1Ghz-18Ghz	Jan. 03, 2020	Sep. 28, 2020	Jan. 02, 2021	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5G Hz	Oct. 15, 2019	Sep. 28, 2020	Oct. 14, 2020	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Sep. 28, 2020	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Sep. 28, 2020	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Sep. 28, 2020	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Uncertainty of Evaluation

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

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

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

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

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

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



Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 48						
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				55340	55990	56640
Frequency (MHz)				3560	3625	3690
20	QPSK	1	0	23.22	24.01	23.84
20	QPSK	1	49	22.98	23.63	23.86
20	QPSK	1	99	23.24	23.95	24.50
20	QPSK	50	0	22.42	23.08	23.11
20	QPSK	50	24	22.12	22.95	23.12
20	QPSK	50	50	22.39	23.03	23.60
20	QPSK	100	0	22.40	22.91	23.25
20	16QAM	1	0	22.39	23.15	23.25
20	16QAM	1	49	21.97	22.56	23.07
20	16QAM	1	99	22.22	22.81	23.61
20	16QAM	50	0	21.21	21.87	22.09
20	16QAM	50	24	21.06	21.75	22.12
20	16QAM	50	50	21.24	22.16	22.67
20	16QAM	100	0	21.21	21.86	22.25
20	64QAM	1	0	21.08	21.69	21.70
20	64QAM	1	49	20.68	21.26	21.74
20	64QAM	1	99	21.04	21.63	22.37
20	64QAM	50	0	20.15	20.71	21.08
20	64QAM	50	24	19.99	20.56	21.10
20	64QAM	50	50	20.13	20.82	21.56
20	64QAM	100	0	20.15	20.77	21.30
Channel				55315	55990	56665
Frequency (MHz)				3557.5	3625	3692.5
15	QPSK	1	0	23.30	24.11	24.03
15	QPSK	1	37	23.06	23.89	24.33



15	QPSK	1	74	23.22	24.02	24.61
15	QPSK	36	0	22.18	23.03	23.22
15	QPSK	36	20	22.13	23.11	23.50
15	QPSK	36	39	22.32	23.25	23.46
15	QPSK	75	0	22.37	23.18	23.62
15	16QAM	1	0	22.41	23.16	23.17
15	16QAM	1	37	22.22	23.00	23.52
15	16QAM	1	74	22.35	23.18	23.74
15	16QAM	36	0	21.01	21.75	22.10
15	16QAM	36	20	21.08	21.58	22.41
15	16QAM	36	39	21.14	21.87	22.53
15	16QAM	75	0	21.21	21.84	22.63
15	64QAM	1	0	21.14	21.56	21.90
15	64QAM	1	37	20.75	21.50	22.18
15	64QAM	1	74	21.04	21.59	22.12
15	64QAM	36	0	19.99	20.62	21.16
15	64QAM	36	20	20.01	20.63	21.51
15	64QAM	36	39	20.04	20.74	21.68
15	64QAM	75	0	20.18	20.83	21.54
Channel				55290	55990	56690
Frequency (MHz)				3555	3625	3695
10	QPSK	1	0	23.11	23.77	23.69
10	QPSK	1	25	22.98	23.55	24.28
10	QPSK	1	49	23.17	23.69	24.62
10	QPSK	25	0	22.33	22.98	23.61
10	QPSK	25	12	22.29	22.89	23.62
10	QPSK	25	25	22.27	22.95	23.59
10	QPSK	50	0	22.35	22.96	23.69
10	16QAM	1	0	22.28	22.84	23.39
10	16QAM	1	25	21.99	22.65	23.52
10	16QAM	1	49	22.40	22.79	23.71
10	16QAM	25	0	21.19	21.86	22.53
10	16QAM	25	12	21.19	21.77	22.56
10	16QAM	25	25	21.15	21.79	22.51
10	16QAM	50	0	21.25	21.85	22.66
10	64QAM	1	0	20.87	21.39	22.06



10	64QAM	1	25	20.69	21.36	22.13
10	64QAM	1	49	20.93	21.52	22.43
10	64QAM	25	0	20.20	20.82	21.56
10	64QAM	25	12	20.18	20.86	21.59
10	64QAM	25	25	20.21	20.89	21.62
10	64QAM	50	0	20.18	20.92	21.70
Channel				55265	55990	56715
Frequency (MHz)				3552.5	3625	3697.5
5	QPSK	1	0	22.09	22.11	23.48
5	QPSK	1	12	23.03	23.06	23.46
5	QPSK	1	24	22.16	22.12	23.54
5	QPSK	12	0	22.35	22.38	23.80
5	QPSK	12	7	21.88	21.89	23.49
5	QPSK	12	13	21.96	21.98	23.52
5	QPSK	25	0	21.99	22.03	23.48
5	16QAM	1	0	21.21	21.23	22.75
5	16QAM	1	12	22.13	22.14	22.72
5	16QAM	1	24	21.18	21.17	22.68
5	16QAM	12	0	21.28	21.26	22.80
5	16QAM	12	7	20.90	20.89	22.47
5	16QAM	12	13	20.86	20.84	22.48
5	16QAM	25	0	20.89	20.85	22.44
5	64QAM	1	0	19.85	19.87	21.35
5	64QAM	1	12	20.84	20.86	22.52
5	64QAM	1	24	19.89	19.98	21.53
5	64QAM	12	0	20.26	20.29	21.93
5	64QAM	12	7	20.02	20.08	21.62
5	64QAM	12	13	20.03	20.01	21.63
5	64QAM	25	0	20.00	20.02	21.58



CA_48C							
Combination 20MHz+20MHz (100RB+100RB)							
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)
			RB Size	RB offset	RB Size	RB offset	
55340	55538	QPSK	100	0	100	0	20.43
			1	0	1	99	14.49
			1	99	1	0	22.38
			100	0	100	0	20.4
		16QAM	1	0	1	99	14.4
			1	99	1	0	22.39
			100	0	100	0	19.56
			1	0	1	99	14.45
		64QAM	1	99	1	0	21.47
			100	0	100	0	20.9
			1	0	1	99	14.89
			1	99	1	0	22.68
55891	56089	QPSK	100	0	100	0	20.9
			1	0	1	99	14.87
			1	99	1	0	22.49
			100	0	100	0	19.87
		16QAM	1	0	1	99	14.65
			1	99	1	0	21.66
			100	0	100	0	21.03
			1	0	1	99	14.93
		64QAM	1	99	1	0	23.01
			100	0	100	0	21.06
			1	0	1	99	14.91
			1	99	1	0	22.98
56442	56640	QPSK	100	0	100	0	20.14
			1	0	1	99	14.9
			1	99	1	0	22
			100	0	100	0	20.43
		16QAM	1	0	1	99	14.49
			1	99	1	0	22.38
			100	0	100	0	20.4
			1	0	1	99	14.4



		64QAM	1	99	1	0	22.39
			100	0	100	0	19.56
			1	0	1	99	14.45
			1	99	1	0	21.47

**EIRP**

The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths for LTE Band 48 (i.e. 5, 10, 15, 20MHz)

LTE Band 48 (GT - LC = 19 dB) QPSK									
Bandwidth	5M			10M			15M		
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Conducted Power (dBm/10MHz)	22.35	22.38	23.80	23.17	23.69	24.62	23.22	24.02	24.61
Conducted Power (Watts/10MHz)	0.1718	0.1730	0.2399	0.2075	0.2339	0.2897	0.2099	0.2523	0.2891
EIRP (dBm/10MHz)	41.35	41.38	42.80	42.17	42.69	43.62	42.22	43.02	43.61
EIRP (Watts/10MHz)	13.6458	13.7404	19.0546	16.4816	18.5780	23.0144	16.6725	20.0447	22.9615

LTE Band 48 (GT - LC = 19 dB) QPSK			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm/10MHz)	23.24	23.95	24.50
Conducted Power (Watts/10MHz)	0.2109	0.2483	0.2818
ERP (dBm/10MHz)	42.24	42.95	43.50
ERP (Watts/10MHz)	16.7494	19.7242	22.3872



LTE Band 48 (GT - LC = 19 dB) 16QAM									
Bandwidth	5M			10M			15M		
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Conducted Power (dBm/10MHz)	21.28	21.26	22.80	22.40	22.79	23.71	22.35	23.18	23.74
Conducted Power (Watts/10MHz)	0.1343	0.1337	0.1905	0.1738	0.1901	0.2350	0.1718	0.2080	0.2366
EIRP (dBm/10MHz)	40.28	40.26	41.80	41.40	41.79	42.71	41.35	42.18	42.74
EIRP (Watts/10MHz)	10.6660	10.6170	15.1356	13.8038	15.1008	18.6638	13.6458	16.5196	18.7932

LTE Band 48 (GT - LC = 19 dB) 16QAM			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm/10MHz)	22.22	22.81	23.61
Conducted Power (Watts/10MHz)	0.1667	0.1910	0.2296
ERP (dBm/10MHz)	41.22	41.81	42.61
ERP (Watts/10MHz)	13.2434	15.1705	18.2390



LTE Band 48 (GT - LC = 19 dB) 64QAM									
Bandwidth	5M			10M			15M		
Channel	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)
Conducted Power (dBm/10MHz)	20.84	20.86	22.52	20.93	21.52	22.43	20.75	21.50	22.18
Conducted Power (Watts/10MHz)	0.1213	0.1219	0.1786	0.1239	0.1419	0.1750	0.1189	0.1413	0.1652
EIRP (dBm/10MHz)	39.84	39.86	41.52	39.93	40.52	41.43	39.75	40.50	41.18
EIRP (Watts/10MHz)	9.6383	9.6828	14.1906	9.8401	11.2720	13.8995	9.4406	11.2202	13.1220

LTE Band 48 (GT - LC = 19 dB) 64QAM			
Bandwidth	20M		
Channel	(Low)	(Mid)	(High)
Conducted Power (dBm/10MHz)	21.04	21.63	22.37
Conducted Power (Watts/10MHz)	0.1271	0.1455	0.1726
ERP (dBm/10MHz)	40.04	40.63	41.37
ERP (Watts/10MHz)	10.0925	11.5611	13.7088

**CA EIRP**

LTE Band 48 CA (GT - LC = 19.00 dB) QPSK			
Bandwidth	20M+20M		
Channel PCC	55340	55891	56442
	(Low)	(Mid)	(High)
Channel SCC	55538	56089	56640
	(Low)	(Mid)	(High)
Conducted Power (dBm)	22.38	22.68	23.01
Conducted Power (Watts)	0.1730	0.1854	0.2000
EIRP(dBm)	41.38	41.68	42.01
EIRP(Watts)	13.7404	14.7231	15.8855

LTE Band 48 CA (GT - LC = 19.00 dB) 16QAM			
Bandwidth	20M+20M		
Channel PCC	55340	55891	56442
	(Low)	(Mid)	(High)
Channel SCC	55538	56089	56640
	(Low)	(Mid)	(High)
Conducted Power (dBm)	22.39	22.49	22.98
Conducted Power (Watts)	0.1734	0.1774	0.1986
EIRP(dBm)	41.39	41.49	41.98
EIRP(Watts)	13.7721	14.0929	15.7761



LTE Band 48 CA (GT - LC = 19.00 dB) 64QAM			
Bandwidth	20M+20M		
Channel PCC	55340	55891	56442
	(Low)	(Mid)	(High)
Channel SCC	55538	56089	56640
	(Low)	(Mid)	(High)
Conducted Power (dBm)	21.47	21.66	22
Conducted Power (Watts)	0.1403	0.1466	0.1585
EIRP(dBm)	40.47	40.66	41.00
EIRP(Watts)	11.1429	11.6413	12.5893



Appendix B. Test Results of Radiated Test

LTE Band 48 / 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	7230	-47.37	-40	-7.37	-58.83	2.84	14.30	H
	10848	-54.48	-40	-14.48	-64.42	3.49	13.43	H
	14466	-53.17	-40	-13.17	-63.41	3.85	14.09	H
	7230	-48.24	-40	-8.24	-59.70	2.84	14.30	V
	10848	-53.79	-40	-13.79	-63.73	3.49	13.43	V
	14466	-52.24	-40	-12.24	-62.48	3.85	14.09	V

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

LTE Band 48C_CA / 20MHz+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	7212	-47.32	-40	-7.32	-58.78	2.84	14.30	H
	10818	-54.19	-40	-14.19	-64.13	3.49	13.43	H
	14424	-53.34	-40	-13.34	-63.58	3.85	14.09	H
	7212	-51.82	-40	-11.82	-63.28	2.84	14.30	V
	10818	-55.27	-40	-15.27	-65.21	3.49	13.43	V
	14424	-52.74	-40	-12.74	-62.98	3.85	14.09	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 FG9N1515A & FG982810-02 which is issued separately.