ETSI EN 301 511 V12.5.1 (2017-03)

TEST REPORT

For

Xiamen Milesight IoT Co., Ltd.

Building C09, Software Park Phase III, Xiamen 361024, Fujian, China

Tested Model: UG67-L04EU-868M
Multiple Models: UG67-L00E-868M, UG67-868M,UG67-L04EU-868M-H32, UG67-L00E-868M-H32, UG67-868M-H32, UG67-868M-H512,UG67-L04EU-868M-H512, UG67-L00E-868M-H512,UG67-868M-H8, UG67-L04EU-868M-H8,UG67-L00E-868M-H8

Report Type: Amended Report	**Product Type:** LoRaWAN Gateway
Report Number:	XMDN220516-20735E-11A1
Report Date:	2022-06-10
Reviewed By:	Rocky Xiao RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RXM210219050-11	Original Report	2021-09-17
1	XMDN220516-20735E-11A1	Amended Report	2022-06-10

Note: This is the first amended report application which was based on the original report. The differences between them as following:

1. Changed the applicant's address to **Building C09, Software Park Phase III, Xiamen 361024, Fujian, China;**

2. Added EUT models: **UG67-868M-H512, UG67-L04EU-868M-H512, UG67-L00E-868M-H512, UG67-868M-H8, UG67-L04EU-868M-H8, UG67-L00E-868M-H8;**

3. Changed the trade name to Milesight**;**

4. Change the **silk screen** on the EUT appearance.

The change between the previous equipment and the current equipment is stated and guaranteed by the applicant. The difference between them will not affect the test results, we will keep the test results, test photos, but updated the related EUT photos.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "△". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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EXHIBIT A – EUT PHOTOGRAPHS

For photos in this section, please refer to report No.: XMDN220516-20735E-02A1 EXHIBIT A.

DECLARATION LETTER

Xiamen Milesight IoT Co., Ltd.
Add:Building C09, Software Park Phase III, Xiamen 361024, Fujian, China
Tel: 0592-5023060
Fax: 0592-5023065
Emal: tongzl@ursalink.com

DECLARATION OF SIMILARITY

Date: 2022-5-9

To whom it may concern

We, Xiamen Milesight IoT Co., Ltd., hereby declare that the product: LoRaWAN Gateway, model:UG67-L00E-868M,UG67-868M ,UG67-L04EU-868M-H32,UG67-L00E-868M-H32, UG67-868M-H32,UG67-868M-H512,UG67-L04EU-868M-H512,UG67-L00E-868M-H512, UG67-868M-H8,UG67-L04EU-868M-H8,UG67-L00E-868M-H8 is electrically identical with the model: UG67-L04EU-868M which was tested by BACL with the same electromagnetic emissions and electromagnetic compatibility characteristics.
A description of the differences between the tested model and those that are declared similar are as follows:
The models have same software.
All the above models share one PCB board. The only difference between models is that some function devices paste or not paste. The below table show differences:
√: paste --: not paste

	LTE module	WiFi	GPS	POE	LoRa	External antenna	Other differences
UG67-L04EU-868M	√ (EC25-EUX)	√	√	√	√ (868)	√	model names
UG67-L00E-868M	√ (EC25-EUX)	√	√	√	√ (868)	√	
UG67-868M	--	√	√	√	√ (868)	√	
UG67-L04EU-868M-H32	√ (EC25-EUX)	√	--	√	√ (868)	√	model names
UG67-L00E-868M-H32	√ (EC25-EUX)	√	--	√	√ (868)	√	
UG67-868M-H32	--	√	--	√	√ (868)	√	
UG67-868M-H512	--	√	--	√	√ (868)	√	
UG67-L04EU-868M-H512	√ (EC25-EUX)	√	--	√	√ (868)	√	model names
UG67-L00E-868M-H512	√ (EC25-EUX)	√	--	√	√ (868)	√	
UG67-868M-H8	--	√	--	√	√ (868)	√	
UG67-L04EU-868M-H8	√ (EC25-EUX)	√	--	√	√ (868)	√	model names

UG67-L00E-868M-H8	√ (EC25-EUX)	√	--	√	√ (868)	√	

Please contact me should there be need for any additional clarification or information.
Best Regards,
Signature: zhenlong Tong

Printed Name: Zhenlong Tong
Title: Manager

BELOW IS THE ORIGINAL REPORT

ETSI EN 301 511 V12.5.1 (2017-03)

TEST REPORT

For

Xiamen Milesight IoT Co., Ltd.

4/F,NO. 63-2 Wanghai Road, 2nd Software Park,Xiamen ,China

Tested Model: UG67-L04EU-868M
Multiple Models: UG67-L00E-868M, UG67-L04EU-868M-H32, UG67-L00E-868M-H32

Report Type:	**Product Type:**
Original Report	LoRaWAN Gateway

Report Number:	RXM210219050-11
Report Date:	2021-09-17
Reviewed By:	Rocky Xiao RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	LoRaWAN Gateway
Test Model:	UG67-L04EU-868M
Multiple Models:	UG67-L00E-868M,UG67-L04EU-868M-H32, UG67-L00E-868M-H32
Model Difference:	Refer to Dos
Rated Input Voltage:	DC 56V from POE
Serial Number:	RXM210219050-RF-S1
EUT Received Date:	2021.02.20
EUT Received Status:	Good

Objective

This report is prepared on behalf of ***Xiamen Milesight IoT Co., Ltd.*** in accordance with ETSI EN 301 511 V12.5.1 (2017-03) Global System for Mobile communications (GSM); Mobile Stations (MS) equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU..

The objective is to determine the compliance of EUT with: ETSI EN 301 511 V12.5.1 (2017-03).

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 511 V12.5.1 (2017-03) Global System for Mobile communications (GSM); Mobile Stations (MS) equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU..

Measurement Uncertainty

Parameter	Flab	Maximum allow uncertainty
RF Frequency	$\pm 0.082\times10^{-6}$	$\pm 1\times10^{-7}$
Conducted RF Power	±0.61dB	±0.75dB
Radiated RF Power	±3.58dB	±6dB
Maximum frequency deviation(within 300Hz and 5kHz audio frequency)	4.57%	±5%
Maximum frequency deviation (within 6kHz and 25kHz audio frequency)	±0.53dB	±3dB
Spurious emissions, conducted	±2.47dB	±3dB
Spurious emissions, radiated	±3.62dB	±6dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT and test equipment were configured for testing according to ETSI EN 301 511 V12.5.1 (2017-03).

The normal & extreme conditions as follow:
L.T.: Low Temperature -20℃; N.T.: Normal Temperature +25℃; H.T.: High Temperature +55℃;
L.V.: Low Voltage 203VAC; N.V.: Normal Voltage 230VAC; H.V.: High Voltage 253VAC;

Nominal Voltage: 230Vac.

The extreme conditions are declared by applicant.

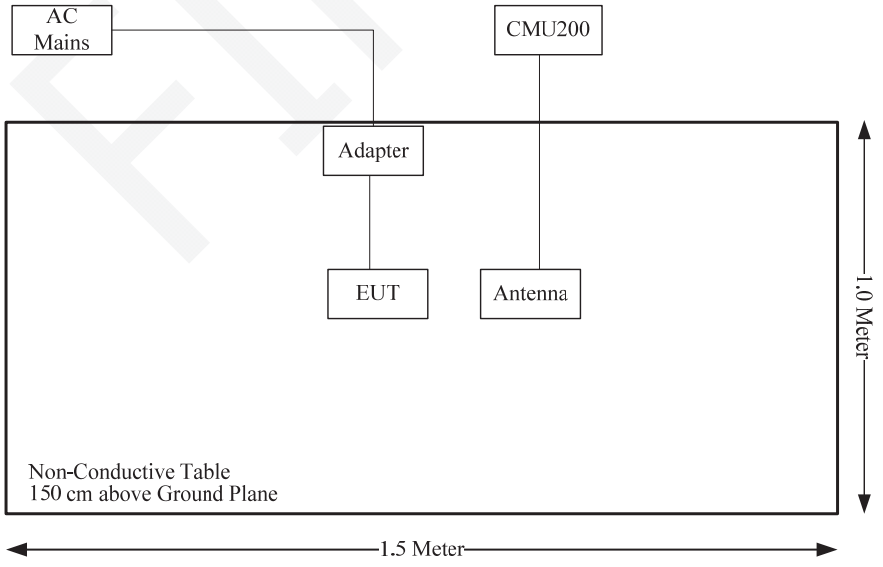
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universal Radio Communication Tester	CMU200	110 822

Support Cable List and Details

Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
AC Line	No	No	1.5	AC main	POE
RJ45	No	No	1.2	POE	EUT

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated emissions below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-08-19	2021-08-18
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-08-19	2021-08-18
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-08-19	2021-08-18
Sonoma	Amplifier	310N	185914	2020-08-19	2021-08-18
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2020-09-04	2021-09-03
Agilent	Signal Generator	E8247C	MY43321350	2021-04-25	2022-04-24
Radiated emissions above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-22	2021-07-21
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-04	2021-09-03
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-04	2021-09-03
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2020-09-04	2021-09-03
Agilent	Signal Generator	E8247C	MY43321350	2021-04-25	2022-04-24
RF conducted					
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	2021-05-06	2022-05-05
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	2020-09-06	2021-09-06
narda	Attenuator	6dB	04270	2020-09-06	2021-09-06
R&S	Wideband Radio Communication Tester	CMW500	147473	2020-09-23	2021-09-22
R&S	Universal Radio Communication Tester	CMU200	110 822	2020-09-23	2021-09-22
Agilent	MXG Vector Signal Generator	N5182B	MY51350142	2021-04-25	2022-04-24
UNI-T	Multimeter	UT39A	M130199938	2020-08-25	2021-08-24
BACL	TEMP&HUMI Test Chamber	BTH-150	30022	2021-02-24	2022-02-23
Agilent	USB Wideband Power Sensor	U2021XA	MY5425009	2021-07-22	2022-07-21

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

Temperature:	27.2~28.8°C
Relative Humidity:	44-60 %
ATM Pressure:	101.1-101.7 kPa
Tester:	Jeremy Liang, Burt Hu, Theshy Xie
Test Date:	2021.06.15~2021.06.21

SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	EN 301 511 Clause 4.2.1	Transmitter - frequency error and phase error	Not applicable
2	EN 301 511 Clause 4.2.2	Transmitter - frequency error under multi path and interference conditions	Compliance*
3	EN 301 511 Clause 4.2.3	Transmitter - Frequency error and Phase Error in HSCSD Multi slot Configuration	Not applicable
4	EN 301 511 Clause 4.2.4	Frequency error and phase error in GPRS multi slot configuration	Compliance*
5	EN 301 511 Clause 4.2.5	Transmitter output power and burst timing	Not applicable
6	EN 301 511 Clause 4.2.6	Transmitter - output RF spectrum	Not applicable
7	EN 301 511 Clause 4.2.7	Transmitter output power and burst timing in HSCSD multi slot configuration	Not applicable
8	EN 301 511 Clause 4.2.8	Transmitter - Output RF spectrum in HSCSD multi slot configuration	Not applicable
9	EN 301 511 Clause 4.2.9	Transmitter - Output RF spectrum for MS supporting the R-GSM or ER-GSM frequency band	Not applicable
10	EN 301 511 Clause 4.2.10	Transmitter output power in GPRS multi slot configuration	Compliance*
11	EN 301 511 Clause 4.2.11	Output RF spectrum in GPRS multi slot configuration	Compliance*
12	EN 301 511 Clause 4.2.12	Conducted spurious emissions - MS allocated a channel	Compliance*
13	EN 301 511 Clause 4.2.13	Conducted spurious emission - MS in idle mode	Compliance*
14	EN 301 511 Clause 4.2.14	Conducted spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS allocated a channel	Not applicable
15	EN 301 511 Clause 4.2.15	Conducted spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS in idle mode	Not applicable
16	EN 301 511 Clause 4.2.16	Radiated spurious emissions - MS allocated a channel	Compliance
17	EN 301 511 Clause 4.2.17	Radiated spurious emissions - MS in idle mode	Compliance
18	EN 301 511 Clause 4.2.18	Radiated spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS allocated a channel	Not applicable
19	EN 301 511 Clause 4.2.19	Radiated spurious emissions for MS supporting the R-GSM or ER-GSM frequency band - MS in idle mode	Not applicable
20	EN 301 511 Clause 4.2.20	Receiver blocking and spurious responses - speech channels	Not applicable
21	EN 301 511 Clause 4.2.21	Receiver Blocking and spurious response - speech channels for MS supporting the R-GSM or ER-GSM frequency band	Not applicable
22	EN 301 511 Clause 4.2.22	Improved Receiver Blocking and spurious response - speech channels for 8W MS supporting the R-GSM or ER-GSM frequency band	Not applicable
23	EN 301 511 Clause 4.2.23	Improved Receiver Blocking and spurious response - speech channels for 2W MS supporting the R-GSM or ER-GSM frequency band	Not applicable
24	EN 301 511 Clause 4.2.24	Improved Receiver Blocking and spurious response - control channels for 8W MS supporting the R-GSM or ER-GSM frequency band not supporting speech	Not applicable
25	EN 301 511 Clause 4.2.25	Improved Receiver Blocking and spurious response - control channels for 2W MS supporting the R-GSM or ER-GSM frequency band not supporting speech	Not applicable
26	EN 301 511 Clause 4.2.26	Frequency error and modulation accuracy in EGPRS configuration	Compliance*
27	EN 301 511 Clause 4.2.27	Frequency error under multi path and interference conditions in EGPRS configuration	Compliance*
28	EN 301 511 Clause 4.2.28	EGPRS Transmitter output power	Compliance*
29	EN 301 511 Clause 4.2.29	Output RF spectrum in EGPRS configuration	Compliance*
30	EN 301 511 Clause 4.2.30	Blocking and spurious response in EGPRS configuration	Compliance*

31	EN 301 511 Clause 4.2.31	Blocking and spurious response in DLMC configuration	Not applicable
32	EN 301 511 Clause 4.2.32	Intermodulation rejection - speech channels	Not applicable
33	EN 301 511 Clause 4.2.33	Intermodulation rejection - control channels	Compliance
34	EN 301 511 Clause 4.2.34	Intermodulation rejection - EGPRS	Compliance*
35	EN 301 511 Clause 4.2.35	AM suppression - speech channels	Not applicable
36	EN 301 511 Clause 4.2.36	AM suppression - control channels	Compliance
37	EN 301 511 Clause 4.2.37	AM suppression - packet channels	Compliance
38	EN 301 511 Clause 4.2.38	Adjacent channel rejection - speech channels (TCH/FS)	Not applicable
39	EN 301 511 Clause 4.2.39	Adjacent channel rejection - control channels	Compliance
40	EN 301 511 Clause 4.2.40	Adjacent channel rejection - EGPRS	Compliance*
41	EN 301 511 Clause 4.2.41	Adjacent channel rejection in DLMC configuration	Not applicable
42	EN 301 511 Clause 4.2.42	Reference sensitivity - TCH/FS	Not applicable
43	EN 301 511 Clause 4.2.43	Reference sensitivity - FACCH/F	Not applicable
44	EN 301 511 Clause 4.2.44	Minimum input level for Reference Performance - GPRS	Compliance*
45	EN 301 511 Clause 4.2.45	Minimum input level for Reference Performance - EGPRS	Compliance*
46	EN 301 511 Clause 4.2.46	Reference sensitivity - TCH/FS for MS supporting the R-GSM or ER-GSM band	Not applicable

Note:
Compliance*: This device contains module (model No.: EC25-EUX, EC25-EUX MINIPCIE), please refer to the module test report No.: GCA210112W004.

16 – RADIATED SPURIOUS EMISSIONS - MS ALLOCATED A CHANNEL

Applicable Standard

Requirements: According to ETSI EN 301 511 V12.5.1 (2017-03), section 4.2.16, the radiated spurious power emitted by the MS, when allocated channel, shall be no more than the levels in table 5 under normal and extreme voltage conditions.

Table 5

Frequency range		Power level in dBm		
		GSM 400, GSM 700, GSM 850, GSM 900	DCS 1 800	PCS 1 900
30 MHz to	1 GHz	-36	-36	-36
1 GHz to	4 GHz	-30		-30
1 GHz to	1 710 MHz		-30	
1 710 MHz to	1 785 MHz		-36	
1 785 MHz to	4 GHz		-30	

Test Procedure

a) Initially the test antenna is closely coupled to the MS and any spurious emission radiated by the MS is detected by the test antenna and receiver in the range 30 MHz to 4 GHz.

NOTE 1: This is a qualitative step to identify the frequency and presence of spurious emissions which are to be measured in subsequent steps.

b) The test antenna separation is set to the appropriate measurement distance and at each frequency at which an emission has been detected, the MS shall be rotated to obtain maximum response and the effective radiated power of the emission determined by a substitution measurement. In case of an anechoic shielded chamber pre-calibration may be used instead of a substitution measurement.

c) The measurement bandwidth, based on a 5 pole synchronously tuned filter, is set according to table 6. The power indication is the peak power detected by the measuring system.
The measurement on any frequency shall be performed for at least one TDMA frame period, with the exception of the idle frame.

NOTE 2: This ensures that both the active times (MS transmitting) and the quiet times are measured.

NOTE 3: For these filter bandwidths some difficulties may be experienced with noise floor above required measurement limit. This will depend on the gain of the test antenna, and adjustment of the measuring system bandwidth is permissible. Alternatively, for test frequencies above 900 MHz, the test antenna separation from the MS may be reduced to 1 meter.

d) The measurements are repeated with the test antenna in the orthogonal polarization plane.

e) The test is repeated under extreme voltage test conditions (see [annex 1, TC2.2]).

Table 6

Frequency range	Frequency offset	Filter bandwidth	Approx video bandwidth
30 MHz to 50 MHz	-	10 kHz	30 kHz
50 MHz to 500 MHz	-	100 kHz	300 kHz
excl. relevant TX band:			
GSM 450: 450,4 MHz to 457,6 MHz;			
GSM 480: 478,8 MHz to 486 MHz			
500 MHz to 4 GHz,	0 to 10 MHz	100 kHz	300 kHz
	>= 10 MHz	300 kHz	1 MHz
Excl. relevant TX band:	>= 20 MHz	1 MHz	3 MHz
GSM 750: 777 MHz to 792 MHz	>= 30 MHz	3 MHz	3 MHz
GSM 850: 824 MHz to 849 MHz			
P-GSM: 890 MHz to 915 MHz;	(offset from edge of		
E-GSM: 880 MHz to 915 MHz;	relevant TX band)		
DCS: 1 710 MHz to 1 785 MHz.			
PCS 1 900: 1 850 MHz to 1 910 MHz			
Relevant TX band:			
GSM 450: 450,4 MHz to 457,6 MHz	1,8 MHz to 6,0 MHz	30 kHz	100 kHz
GSM 480: 478,8 MHz to 486 MHz	> 6,0 MHz	100 kHz	300 kHz
GSM 750: 777 MHz to 792 MHz			
GSM 850: 824 MHz to 849 MHz	(offset from carrier)		
P-GSM: 890 MHz to 915 MHz			
E-GSM: 880 MHz to 915 MHz			
DCS: 1 710 MHz to 1 785 MHz			
PCS 1 900: 1 850 MHz to 1 910 MHz			
NOTE 1: The filter and video bandwidths, and frequency offsets are only correct for measurements on an MS transmitting on a channel in the Mid ARFCN range.			
NOTE 2: Due to practical implementation of a SS, the video bandwidth is restricted to a maximum of 3 MHz.			

Test Data

Pre-scan normal/low/high voltage condition, and the worst case as below.

Please refer to following table:

GSM900_middle channel **902 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1804.00	H	39.54	-64.69	11.13	0.69	-54.25	-30.00	24.25
1804.00	V	40.64	-64.18	11.13	0.69	-53.74	-30.00	23.74
2706.00	H	44.09	-57.85	13.10	1.26	-46.01	-30.00	16.01
2706.00	V	46.21	-55.83	13.10	1.26	-43.99	-30.00	13.99
3608.00	H	36.33	-62.62	14.09	1.53	-50.06	-30.00	20.06
3608.00	V	35.27	-63.68	14.09	1.53	-51.12	-30.00	21.12
119.58	H	46.54	-63.11	0.00	0.21	-63.32	-36.00	27.32
208.74	V	48.18	-58.56	0.00	0.20	-58.76	-36.00	22.76

DCS1800_middle channel **1747.8 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
3495.60	H	39.17	-59.86	13.81	1.61	-47.66	-30.00	17.66
3495.60	V	39.59	-59.45	13.81	1.61	-47.25	-30.00	17.25
119.54	H	47.51	-62.14	0.00	0.21	-62.35	-36.00	26.35
212.35	V	50.21	-56.64	0.00	0.20	-56.84	-36.00	20.84

Note 1:The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.
Note 2:
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

17 – RADIATED SPURIOUS EMISSIONS - MS IN IDLE MODE

Applicable Standard

Requirements: According to ETSI EN 301 511 V12.5.1 (2017-03), section 4.2.17, the radiated spurious power emitted by the MS, when in idle mode, shall be no more than the levels in table 7 under normal and extreme voltage conditions.

Table 7

Frequency range		Power level in dBm	
		GSM 400, GSM 900, DCS 1 800	GSM 700, GSM 850, PCS 1 900
30 MHz to	880 MHz	-57	-57
880 MHz to	915 MHz	-59	-57
915 MHz to	1 000 MHz	-57	-57
1 GHz to	1 710 MHz	-47	
1 710 MHz to	1 785 MHz	-53	
1 785 MHz to	4 GHz	-47	
1 GHz to	1 850 MHz		-47
1 850 MHz to	1 910 MHz		-53
1 910 MHz to	4GHz		-47

Test Procedure

a) Initially the test antenna is closely coupled to the MS and any spurious emission radiated by the MS is detected by the test antenna and receiver in the range 30 MHz to 4 GHz.

NOTE 1: This is a qualitative step to identify the frequency and presence of spurious emissions which are to be measured in subsequent steps.

b) The test antenna separation is set to the appropriate measurement distance and at each frequency at which a spurious emission has been detected the MS is rotated to obtain a maximum response. The effective radiated power of the emission is determined by a substitution measurement. In case of an anechoic shielded chamber pre-calibration may be used instead of a substitution measurement.

c) The measurement bandwidth based on a 5 pole synchronously tuned filter shall be according to table 8. The power indication is the peak power detected by the measuring system.

The measurement time on any frequency shall be such that it includes the time during which the MS receives a TDMA frame containing the paging channel.

NOTE 2: For these filter bandwidths some difficulties may be experienced with noise floor above required measurement limit. This will depend on the gain of the test antenna, and adjustment of the measuring system bandwidth is permissible. Alternatively, for test frequencies above 900 MHz, the test antenna separation from the MS may be reduced to 1 meter.

Table 8

Frequency range	Filter bandwidth	Video bandwidth
30 MHz to 50 MHz	10 kHz	30 kHz
50 MHz to 4 GHz	100 kHz	300 kHz

d) The measurements are repeated with the test antenna in the orthogonal polarization plane.
e) The test is repeated under extreme voltage test conditions (see [Annex 1, TC2.2]).

Test Data

Pre-scan normal/low/high voltage condition, and the worst case as below.

Please refer to following table:

GSM900_idle mode **902 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1125.00	H	45.17	-58.46	7.38	1.04	-52.12	-47.00	5.12
1125.00	V	42.86	-61.34	7.38	1.04	-55.00	-47.00	8.00
119.58	H	47.26	-62.39	0.00	0.21	-62.60	-57.00	5.60
203.33	V	45.56	-61.02	0.00	0.19	-61.21	-57.00	4.21

DCS1800_idle mode **1747.8 MHz**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1125.00	H	44.63	-59.00	7.38	1.04	-52.66	-47.00	5.66
1125.00	V	41.12	-63.08	7.38	1.04	-56.74	-47.00	9.74
119.58	H	46.86	-62.79	0.00	0.21	-63.00	-57.00	6.00
208.25	V	44.26	-62.47	0.00	0.19	-62.66	-57.00	5.66

Note 1:The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.
Note 2:
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

33-INTERMODULATION REJECTION – CONTROL CHANNELS

Applicable Standard

The intermodulation rejection is a measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given degradation due to the presence of two or more unwanted signals with a specific frequency relationship to the wanted signal frequency.

For E-GSM 900, R-GSM 900 and ER-GSM 900 MS this test is only performed in the P-GSM band.

Test Procedure

According to ETSI TS 151 010-1sub-clause 14.6.2.4.2.

Test Data

Test Results: Compliance

Mode	Test Frequency (MHz)	Test Condition					Result
EGSM 900	890.2	Normal	L.V. L.T.	L.V. H.T.	H.V L.T.	H.V. H.T.	Compliance
	902	Normal	L.V. L.T.	L.V. H.T.	H.V L.T.	H.V. H.T.	Compliance
	914.8	Normal	L.V. L.T.	L.V. H.T.	H.V L.T.	H.V. H.T.	Compliance
DCS 1800	1710.4	Normal	L.V. L.T.	L.V. H.T.	H.V L.T.	H.V. H.T.	Compliance
	1747.8	Normal	L.V. L.T.	L.V. H.T.	H.V L.T.	H.V. H.T.	Compliance
	1784.6	Normal	L.V. L.T.	L.V. H.T.	H.V L.T.	H.V. H.T.	Compliance

Mode	Frequency (MHz)	Type of Channel	FER (%)	Number of test samples	Limit (%)
EGSM 900	890.2	FACCH/F	1.11	8200	2.439
	902	FACCH/F	1.02	8200	2.439
	914.8	FACCH/F	1.11	8200	2.439
DCS 1800	1710.4	FACCH/F	1.12	8200	2.439
	1747.8	FACCH/F	1.11	8200	2.439
	1784.6	FACCH/F	1.11	8200	2.439

36 – AM SUPPRESSION - CONTROL CHANNELS

Applicable Standard

AM suppression is a measure of the ability of the receiver to receive a modulated wanted input signal in the presence ofan unwanted TDMA modulated interferer.

Test Procedure

According to ETSI TS 151 010-1sub-clause 14.8.2.4.

Test Data

Test Results: Compliance

Mode	Frequency (MHz)	FER (%)	Number of test samples	Limit (%)
EGSM 900	902	1.21	8200	2.439
DCS 1800	1747.8	1.12	8200	2.439

37 – AM SUPPRESSION - PACKET CHANNELS

Applicable Standard

AM suppression is a measure of the ability of the receiver to receive a modulated wanted input signal in the presence ofan unwanted TDMA modulated interferer.

Test Procedure

According to ETSI TS 151 010-1sub-clause 14.8.3.4.

Test Data

Test Results: Compliance

Mode	Test Frequency (MHz)	Type of Channel	RBER (%)	Number of test samples	Limit (%)
E-GSM 900	902	TCH/FS Class II	1.12	8200	2.439
DCS 1800	1747.8	TCH/FS Class II	1.12	8200	2.439

39 - ADJACENT CHANNEL REJECTION - CONTROL CHANNELS

Applicable Standard

The adjacent channel selectivity is a measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given degradation due to the presence of an unwanted signal in the adjacent channel.

The adjacent channel can be the adjacent in the RF spectrum or in time. There are therefore two types of adjacent channel selectivity:

1) Adjacent RF channel selectivity which is specifically tested in this subclause.

2) Adjacent Time Slot selectivity, which is implicitly tested in test 14.2.1.

Test Procedure

According to ETSI TS 151 010-1sub-clause 14.5.2.4.

Test Data

Test Results: Compliance

Mode	Test Frequency (MHz)	Test Condition					Result
EGSM 900	902	Normal	L.V. L.T.	L.V. H.T.	H.V L.T.	H.V. H.T.	Compliance
DCS 1800	1747.8	Normal	L.V. L.T.	L.V. H.T.	H.V L.T.	H.V. H.T.	Compliance

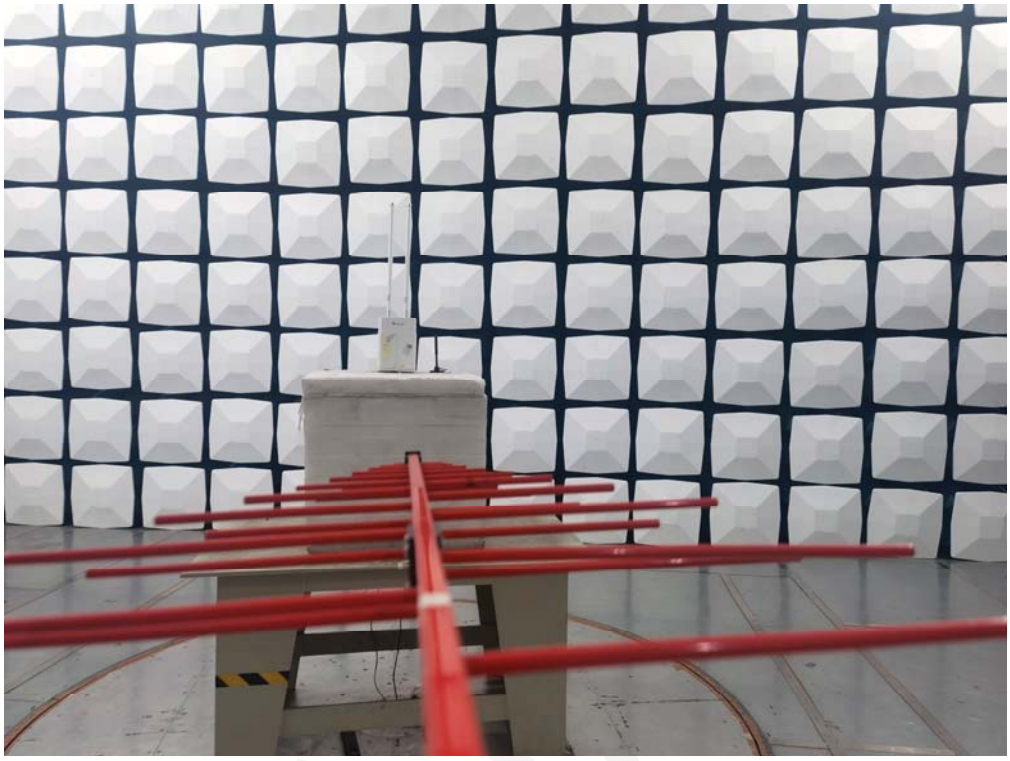
Mode	Test Frequency (MHz)	Interference at	Type of Channel	FER/RBER (%)	Number of test samples	Limit (%)
E-GSM 900	902	200 kHz	TCH/FS FER	2.21	8900	6.742
			TCH/FS Class Ib	0.11	1000000	0.42
			TCH/FS Class II	4.34	600000	8.333
		400 kHz Interferer TUhight	TCH/FS FER	2.34	8900	6.742
			TCH/FS Class Ib	0.12	1000000	0.42
			TCH/FS Class II	6.42	600000	8.333
		400 kHz Interferer Static	TCH/FS FER	4.25	8900	11.461
			TCH/FS Class Ib	0.431	1000000	0.756
			TCH/FS Class II	7.15	600000	9.167
DCS 1800	1747.8	200 kHz	TCH/FS FER	1.51	18000	3.371
			TCH/FS Class Ib	0.01	2000000	0.27
			TCH/FS Class II	2.54	1200000	8.333
		400 kHz Interferer TUhight	TCH/FS FER	1.21	18000	3.371
			TCH/FS Class Ib	0.01	2000000	0.27
			TCH/FS Class II	4.32	1200000	8.333
		400 kHz Interferer Static	TCH/FS FER	3.12	12000	5.714
			TCH/FS Class Ib	0.12	1200000	0.483
			TCH/FS Class II	0.24	750000	9.167

EXHIBIT A – EUT PHOTOGRAPHS

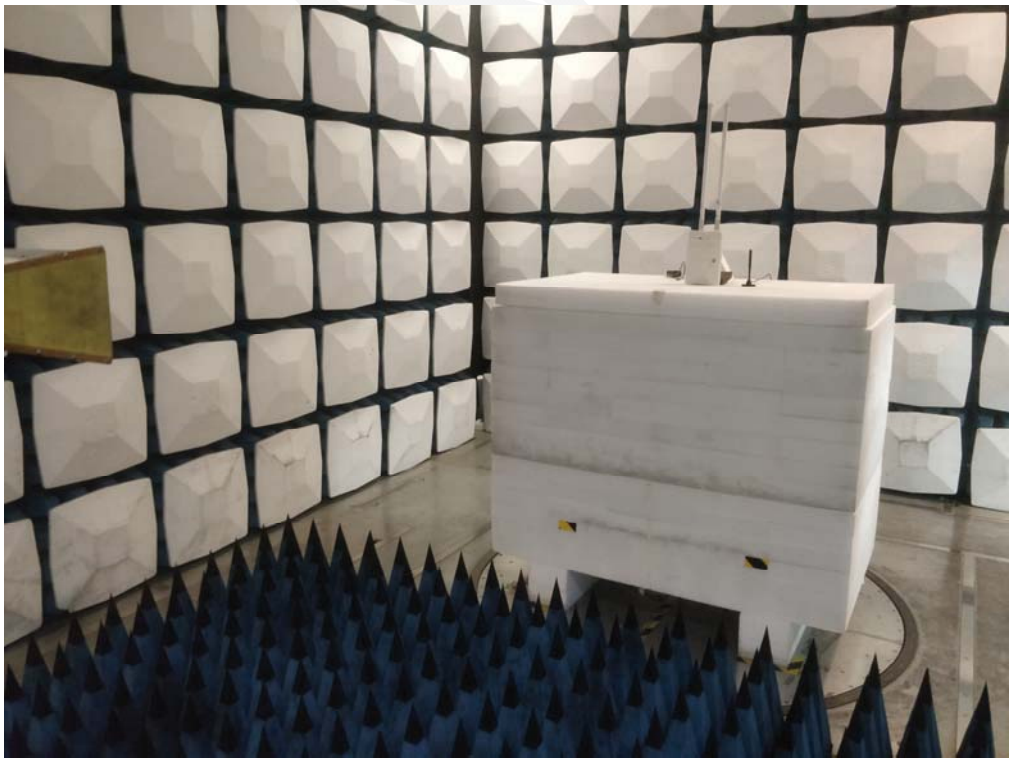
For photos in this section, please refer to report No.: RXM210219050-02 EXHIBIT A.

EXHIBIT B – TEST SETUP PHOTOGRAPHS

RE Below 1GHz View



RE Above 1GHz View



*******END OF REPORT*******