

FCC Part 15B TEST REPORT

Product Name : ELS61-US
Model Name : ELS61-US

Prepared for:
Gemalto M2M GmbH
Siemensdamm 50, 13629 Berlin, Germany

Prepared by:
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Report Number : UL05420151102FCC/IC042-3
Date of Report : 01-21-2016
Date of Test : 11-17-2015~11-20-2015

Notes :

The test results only relate to these samples which have been tested.
Partly using this report will not be admitted unless been allowed by Unilab.
Unilab is only responsible for the complete report with the reported stamp of Unilab.

Applicant: Gemalto M2M GmbH
Siemensdamm 50, 13629 Berlin, Germany

Manufacturer: Gemalto M2M GmbH
Siemensdamm 50, 13629 Berlin, Germany

Product Name: ELS61-US

Model Name: ELS61-US

FCC ID: QIPELS61-US

IC ID: 7830A-ELS61US

EUT Voltage: DC input:
Extreme Low: 3.0V
Nominal: 3.8V
Extreme High: 4.5V

Date of Receipt: 11-02-2015

Test Standard: FCC CFR Title 47 Part 15 Subpart B
ICES-003 Issue 6

Test Result: Complied

Date of Test: 11-17-2015~11-20-2015

Performed Location : Unilab (Shanghai) Co., Ltd.
FCC 2.948 register number is 714465
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Prepared by :



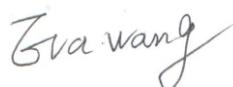
(Technical Engineer: Wayne Wu)

Reviewed by :



(Senior Engineer: Forest Cao)

Approved by :



(Supervisor: Eva Wang)

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1. TECHNICAL SUMMARY

1.1 SUMMARY OF STANDARDS AND TEST RESULTS

The EUT have been tested according to the applicable standards as referenced below:

EMISSION			
Test Item	FCC	IC	Result
Conducted disturbance	FCC 15.107	ICES-003	N/A ^{1 & 2}
Radiated disturbance	FCC 15.109	ICES-003	P

Note 1 : P means pass, F means failure, N/A means not applicable

Note 2 : The EUT is only employ battery power for operation, so this test is not applicable for this EUT.

1.2 TEST UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted disturbance	3.4
Radiated disturbance	4.2

1.3 TEST EQUIPMENT LIST

Shielding Room No. 3 - Conducted disturbance Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	Agilent	N9038A	MY51210142	11/05/2016
LISN	R&S	ENV216	100069	06/08/2016

3m Semi-anechoic Chamber - Radiated disturbance Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
3m Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	CT-0000336	07/27/2016
Receiver	Agilent	N9038A	MY51210142	11/05/2016
Biconilog Antenna	SCHWARZBECK	VULB 9160	3316	09/19/2016
Horn Antenna	SCHWARZBECK	BBHA9120D	942	09/19/2016
Microwave Preamplifier	EM Electronics	EM30180	3008A02425	02/27/2016

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and has been calibrated by accredited calibration laboratories.

1.4 SUPPORT EQUIPMENT AND CABLE

N/A

1.5 CABLE OF TEST

No.	Cable Type	Quantity	Provider	Length(m)	Specification	Note
1	DC Cable	2	Unilab	1.5	Unshielded	None

1.6 TEST MODE

Test mode	Idle
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1.7 TEST FACILITY

All test facilities used to collect the test data are located at No. 1350, Lianxi Rd. Pudong New District, Shanghai, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4: 2014, CISPR 16-1-1 and other equivalent standards. The laboratory is compliance with the requirements of the ISO/IEC/EN17025.

1.8 TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

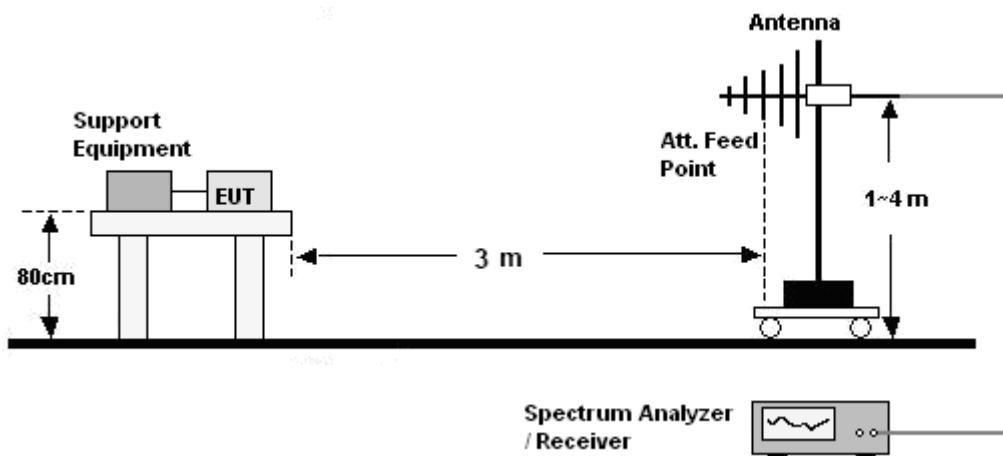
Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. All the tests were carried out with the EUT in normal operation. Which was shown in this test report is the worst test mode.

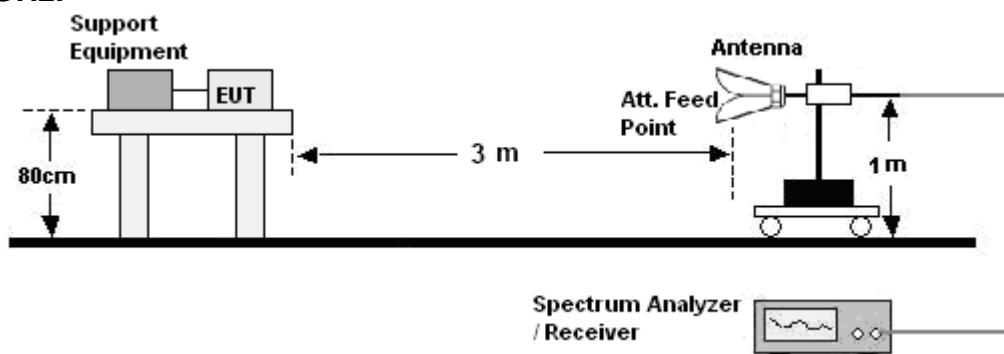
2. RADIATED DISTURBANCE (RE)

2.1 TEST SETUP

30MHz ~ 1GHz:



Above 1GHz:



2.2 LIMITS

Limits for Class B digital devices

Frequency (MHz)	limits at 3m dB(μ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

NOTE: 1. The lower limit shall apply at the transition frequency.

2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.

3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

2.3 TEST PROCEDURE

30MHz ~ 1GHz:

- a. The EUT and support equipment were placed on the non-conductive turntable 0.8m above the horizontal metal ground plane at a chamber. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna.
- b. The frequency range from 30MHz to 1GHz was checked. The RBW of the receiver was set at 120kHz. Set the receiver in Peak detector, Max Hold mode. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency receiver to QP Detector and record the maximum value.

Above 1GHz:

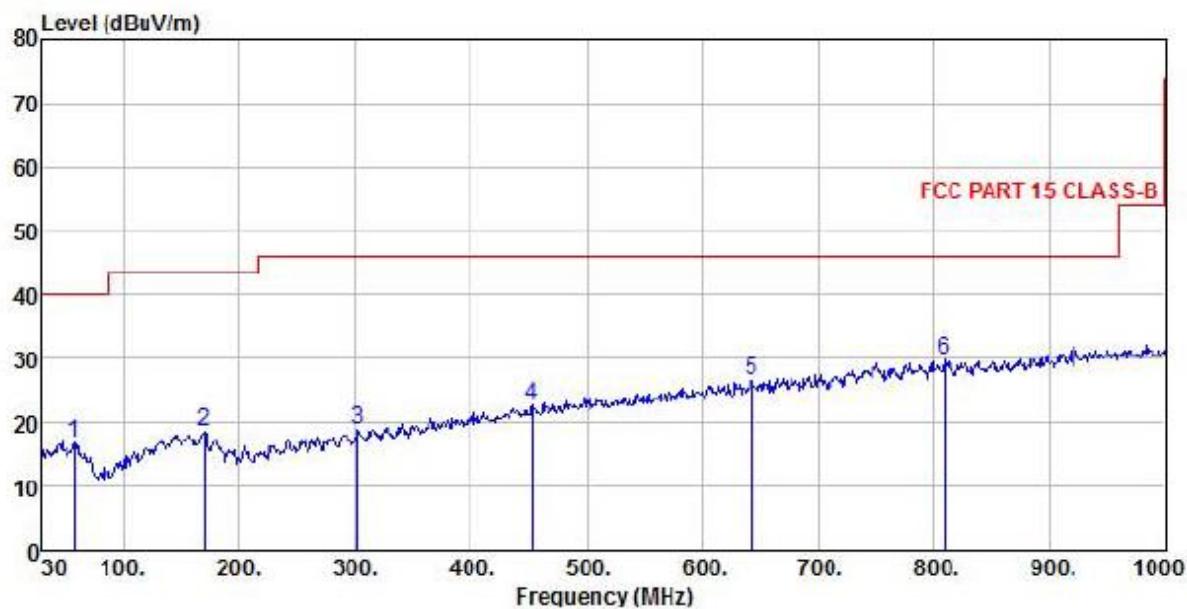
- a. The EUT and support equipment were placed on the non-conductive turntable 0.8m above the ground at a chamber. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Horn antenna was used as receiving antenna.
- b. The frequency range above 1GHz was checked. The RBW of the receiver was set at 1MHz. Set the receiver in Peak detector, Max Hold mode. Record the maximum field strength of all the pre-scan process in the full band when the antenna is 1m and varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its Average value: rotate the turntable from 0 to 360 degrees to find the degree where EUT radiated the maximum emission, then set the test frequency receiver to EMI Average Detector and record the maximum value.

2.4 TEST RESULT

30MHz ~ 1GHz:

Test Mode: Idle

Antenna Polarity: Horizontal

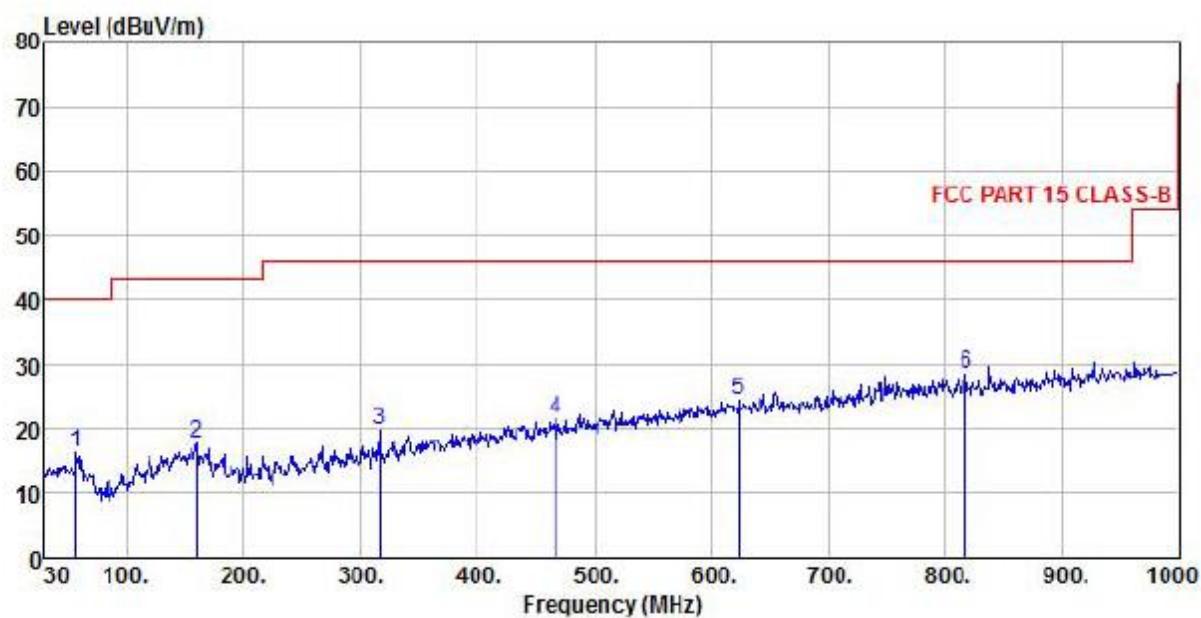


Site : chamber
Condition : FCC PART 15 CLASS-B 3m VULB9160 HORIZONTAL
EUT :
Model Name :
Temp/Humi : °C / %
Power Rating:
Mode : IDLE
Memo :

Freq	Read		Antenna		Cable		Preamp	Limit	Over	Limit	Remark
	Level	Factor	Loss	Factor	Level	dBuV/m	dBuV/m				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB				
1	58.13	3.35	12.58	1.03	0.00	16.96	40.00	-23.04	Peak		
2	169.68	3.50	13.33	1.84	0.00	18.67	43.50	-24.83	Peak		
3	302.57	2.99	13.28	2.52	0.00	18.79	46.00	-27.21	Peak		
4	452.92	3.42	16.42	2.88	0.00	22.72	46.00	-23.28	Peak		
5	643.04	3.53	19.50	3.53	0.00	26.56	46.00	-19.44	Peak		
6 pp	808.91	4.23	21.83	3.85	0.00	29.91	46.00	-16.09	Peak		

Test Mode: Idle

Antenna Polarity: Vertical



Site : chamber

Condition : FCC PART 15 CLASS-B 3m VULB9160 VERTICAL

EUT :

Model Name :

Temp/Humi : °C / %

Power Rating:

Mode : IDLE

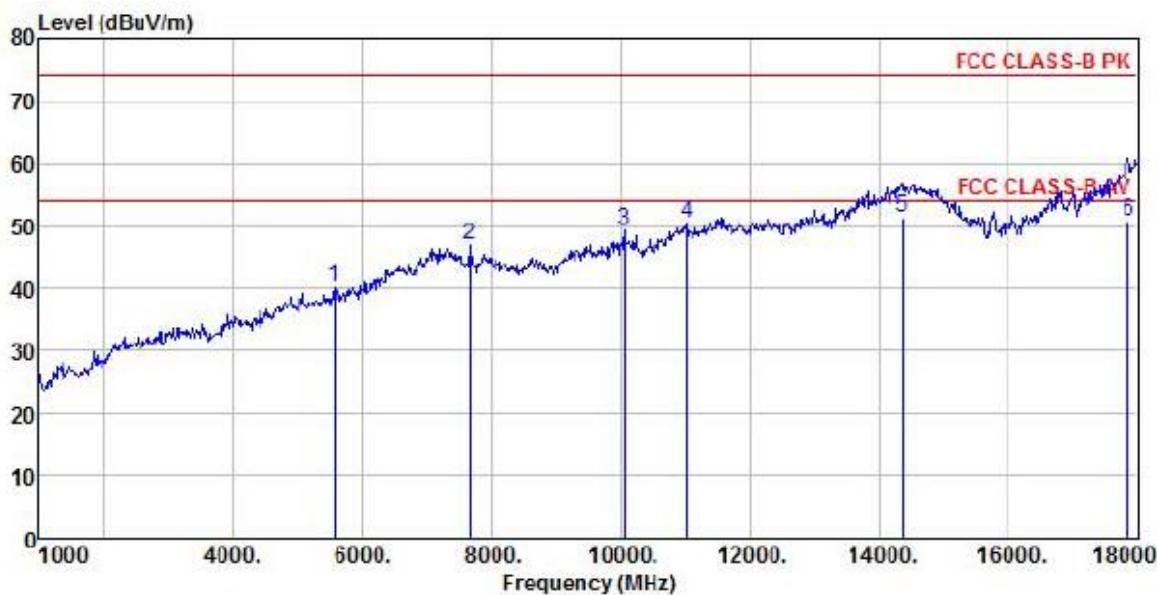
Memo :

Freq	ReadAntenna		Cable Preamp		Limit	Over	Over	
	MHz	dBuV	dB/m	dB	dBuV/m	Line	Limit	Remark
1	57.16	2.87	12.49	1.02	0.00	16.38	40.00	-23.62 Peak
2	159.98	2.19	13.88	1.68	0.00	17.75	43.50	-25.75 Peak
3	316.15	3.56	13.56	2.52	0.00	19.64	46.00	-26.36 Peak
4	466.50	1.87	16.66	2.90	0.00	21.43	46.00	-24.57 Peak
5	623.64	1.94	19.22	3.44	0.00	24.60	46.00	-21.40 Peak
6 pp	817.64	2.99	21.88	3.75	0.00	28.62	46.00	-17.38 Peak

Above 1GHz:

Test Mode: Idle

Antenna Polarity: Horizontal



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(942) HORIZONTAL

EUT :

Model Name :

Temp/Humi : °C / %

Power Rating:

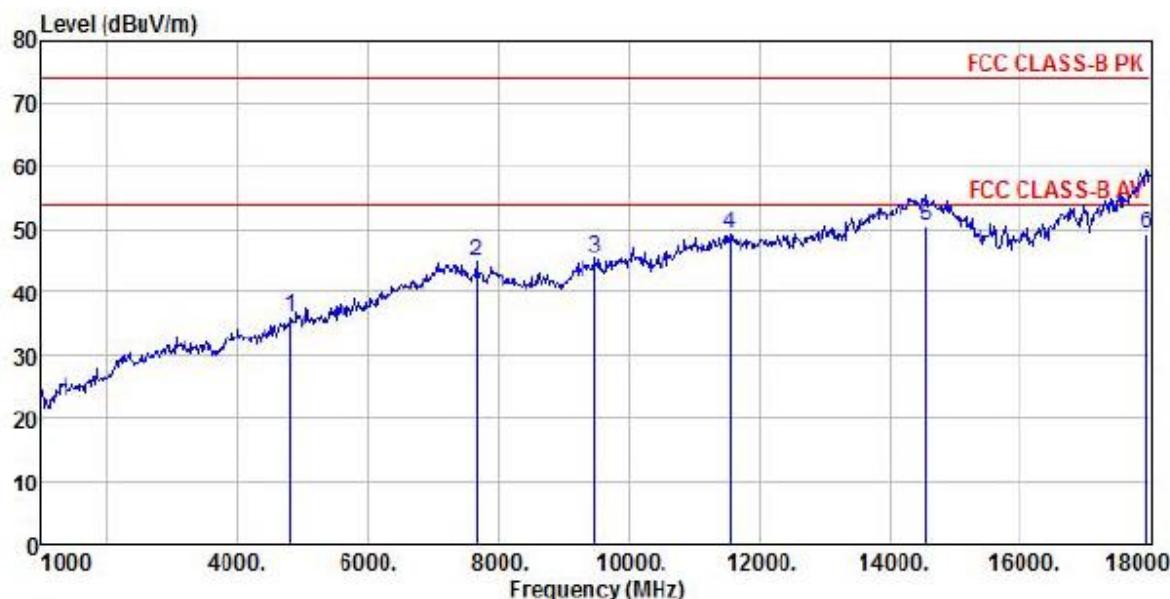
Mode : IDLE

Memo :

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark	
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit
1	5556.00	33.91	32.09	10.98	36.93	40.05	74.00	-33.95 Peak
2	7664.00	36.14	36.49	12.81	38.61	46.83	74.00	-27.17 Peak
3	10061.00	34.86	38.56	15.15	39.37	49.20	74.00	-24.80 Peak
4	pk 11013.00	33.40	40.25	15.84	38.91	50.58	74.00	-23.42 Peak
5	pp 14362.00	28.24	42.43	19.06	38.34	51.39	54.00	-2.61 Average
6	17847.00	22.15	45.97	19.50	36.96	50.66	54.00	-3.34 Average

Test Mode: Idle

Antenna Polarity: Vertical



Site : chamber

Condition : FCC CLASS-B PK 3m BBHA9120D(942) VERTICAL

EUT :

Model Name :

Temp/Humi : °C / %

Power Rating:

Mode : IDLE

Memo :

Freq	ReadAntenna		Cable		Preamp	Limit	Over	Limit	Remark
	Level	Factor	Loss	Factor	Level				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 4808.00	31.32	31.53	10.40	37.17	36.08	74.00	-37.92	Peak	
2 7664.00	34.14	36.49	12.81	38.61	44.83	74.00	-29.17	Peak	
3 9483.00	33.37	38.00	14.38	40.33	45.42	74.00	-28.58	Peak	
4 pk 11540.00	31.97	40.21	16.26	39.17	49.27	74.00	-24.73	Peak	
5 pp 14549.00	27.50	42.51	18.71	38.16	50.56	54.00	-3.44	Average	
6 17932.00	20.36	47.05	18.74	36.82	49.33	54.00	-4.67	Average	

APPENDIX 1 PHOTOGRAHPS OF TEST SETUP

Please refer to the file named “EMC Setup Photos”.

APPENDIX 2 PHOTOGRAHPS OF EUT

Please refer to the two files named “External Photos” and “ Internal Photos” .

----End of the report----