FCC PART 15C

TEST REPORT

For

INGENICO

9 Avenue de la Gare-Rolvatain TGV, BP 25156, Valence Cedex 9,France

FCC ID: XKB-L2500CLBT

Report Type:	Product Name:
Original Report	Link/2500

Test Engineer:	*Lorin Bian*
Report Number:	RXM160831052B
Report Date:	2016-11-12
Reviewed By:	Henry Ding EMC Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China Tel: 028-65523123, Fax: 028-65525125 www.baclcorp.com

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The ***INGENICO***'s product, model number: ***Link/2500 CL/BT (FCC ID: XKB-L2500CLBT)*** (the "EUT") in this report was a ***Link/2500,*** which was measured approximately: 12.9 cm (L) x 7.0 cm (W) x 1.7 cm (H), rated input voltage: DC3.7V rechargeable Li-ion battery or DC5V charging from adapter.

Adapter Information:
Model : PSAI05R-050QL6
PART NO: 192049533
INPUT :100-240V~0.3A, 50-60Hz,11-15VA
OUTPUT: DC5V, 1.0A MAX

**All measurement and test data in this report was gathered from final production sample, serial number: 160831052 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2016-08-31, and EUT conformed to test requirement.*

Objective

This Type approval report is prepared on behalf of ***INGENICO*** in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of the EUT with FCC rules, sec 15.203, 15.205, 15.207, 15.209 and 15.225.

Related Submittal(s)/Grant(s)

FCC Part15C DSS submissions with FCC ID: XKB-L2500CLBT.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Chengdu). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

The uncertainty of any RF tests which use conducted method measurement is ±3.17 dB, the uncertainty of any radiation on emissions measurement is:

30M~200MHz: ±4.7 dB;
200M~1GHz: ±6.0 dB;
1G~6GHz: ±5.13dB;
6G~25GHz: ±5.47dB;

And the uncertainty will not be taken into consideration for all test data recorded in the report.

Test Facility

The test site used by BACL to collect test data is located in the 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on April 24, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode.

EUT Exercise Software

No software was performed under test.

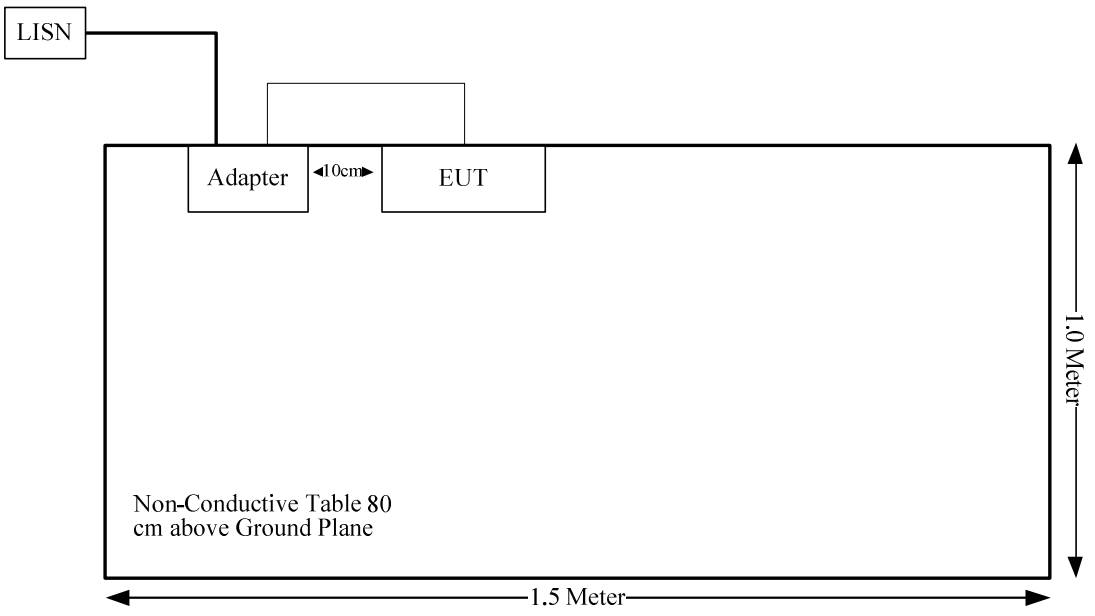
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	no	no	1.08	Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207	AC Line Conducted Emission	Compliance
§15.225 §15.209 §15.205	Radiated Emission Test	Compliance
§15.225(e)	Frequency Stability	Compliance*
§15.215(c)	20 dB Emission Bandwidth	Compliance*

Note:
Compliance*: the device is same PCB Layout with Model:LINK/2500 CL/3G/WiFi/BT, FCC ID: XKB-L2500CL3GWIBT, the differences between the original devices are remove the 2G/3G and Wifi related materials, related circuit and antenna components, SIM card slot , RF cable and depress the Audio function, what's more, battery capacity also change from 1250mAh (model:P0750-LF) to 630mAh (model:EVE285639). The test items Please refer to the report: RXM160823052-00B, which was granted on 2016-09-27 by Bay Area Compliance Laboratories Corp. (Dongguan).

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Antenna Connected Construction

The EUT has one integral antenna arrangement, which was permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207 – AC LINE CONDUCTED EMISSION

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner：

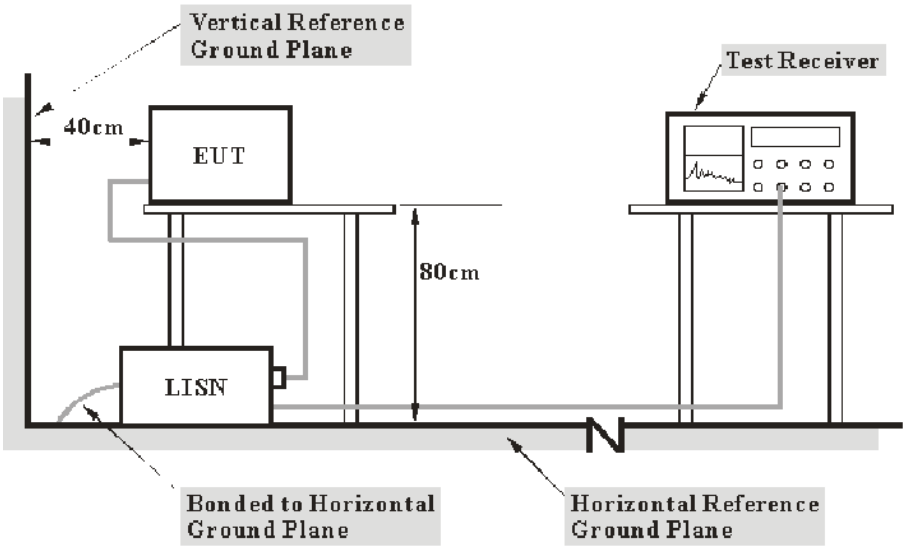
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by (U_{lab} − U_{cispr}), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by (U_{lab} − U_{cispr}), exceeds the disturbance limit.

Based on CISPR 16-4-2:2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Chengdu) is ±3.17 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 V/60 Hz AC power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2015-12-02	2016-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.06	2015-12-02	2016-12-01
N/A	Conducted Cable	NO.5	N/A	2015-11-10	2016-11-09
Rohde & Schwarz	PULSE LIMITER	ESH3Z2	357.8810.52	2016-10-31	2017-10-30
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

According FCC publication number 174176,for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,
V_C: corrected voltage amplitude
V_R: reading voltage amplitude

A_c: attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

Test Data

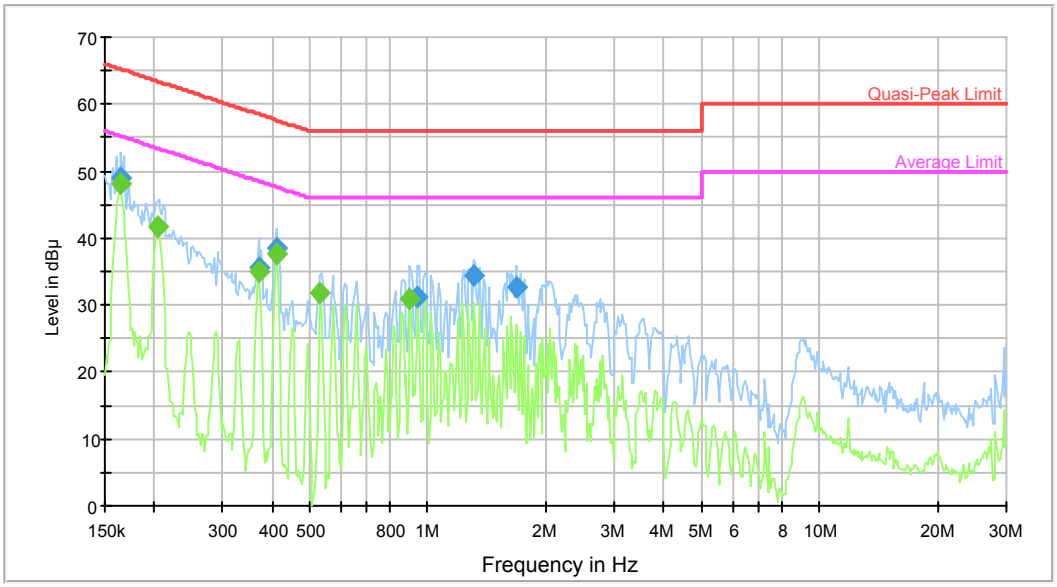
Environmental Conditions

Temperature:	25.8 °C
Relative Humidity:	38 %
ATM Pressure:	101.1 kPa

The testing was performed by Lorin Bian on 2016-10-26.

Test Mode: Transmitting

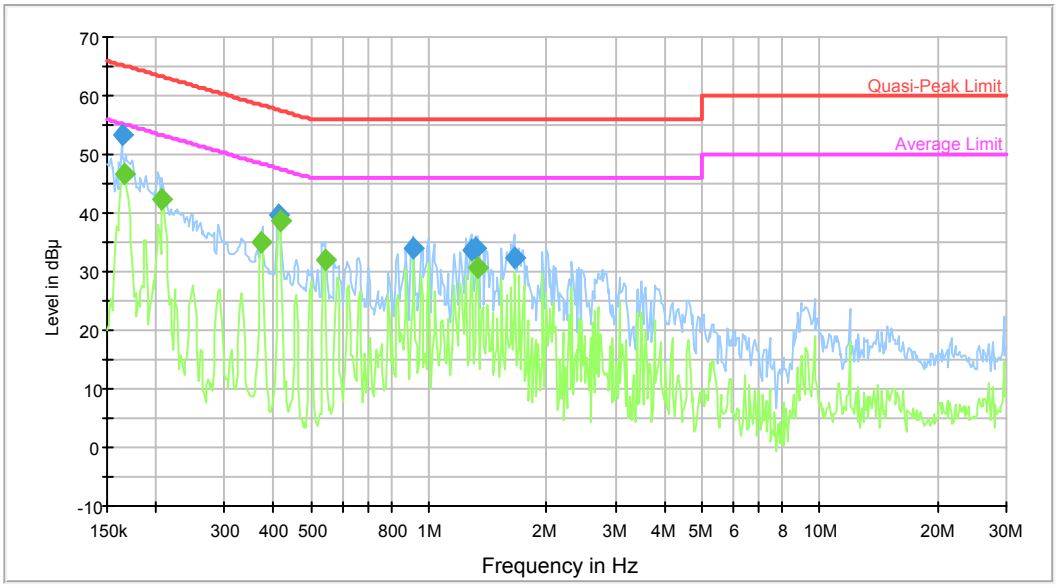
AC 120V, 60 Hz, Line:



Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.165051	48.9	9.000	L1	10.1	16.3	65.2	Compliance
0.369089	35.5	9.000	L1	10.3	23.0	58.5	Compliance
0.409372	38.6	9.000	L1	10.2	19.1	57.7	Compliance
0.945093	31.1	9.000	L1	10.4	24.9	56.0	Compliance
1.310256	34.5	9.000	L1	10.4	21.5	56.0	Compliance
1.677385	32.7	9.000	L1	10.4	23.3	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.165051	48.0	9.000	L1	10.1	7.2	55.2	Compliance
0.204669	41.8	9.000	L1	10.2	11.6	53.4	Compliance
0.369089	35.0	9.000	L1	10.3	13.5	48.5	Compliance
0.409372	37.7	9.000	L1	10.2	10.0	47.7	Compliance
0.532496	31.8	9.000	L1	10.1	14.2	46.0	Compliance
0.900972	30.9	9.000	L1	10.4	15.1	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.163741	53.5	9.000	N	10.1	11.8	65.3	Compliance
0.412647	39.5	9.000	N	10.2	18.1	57.6	Compliance
0.915445	33.8	9.000	N	10.4	22.2	56.0	Compliance
1.289541	33.7	9.000	N	10.4	22.3	56.0	Compliance
1.320738	33.9	9.000	N	10.4	22.1	56.0	Compliance
1.650866	32.4	9.000	N	10.4	23.6	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.166371	46.6	9.000	N	10.1	8.5	55.1	Compliance
0.207957	42.3	9.000	N	10.2	11.0	53.3	Compliance
0.372042	34.9	9.000	N	10.2	13.6	48.5	Compliance
0.415949	38.5	9.000	N	10.2	9.0	47.5	Compliance
0.541050	32.0	9.000	N	10.1	14.0	46.0	Compliance
1.331304	30.6	9.000	N	10.4	15.4	46.0	Compliance

FCC§15.225, §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

As per FCC Part 15.225

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner：

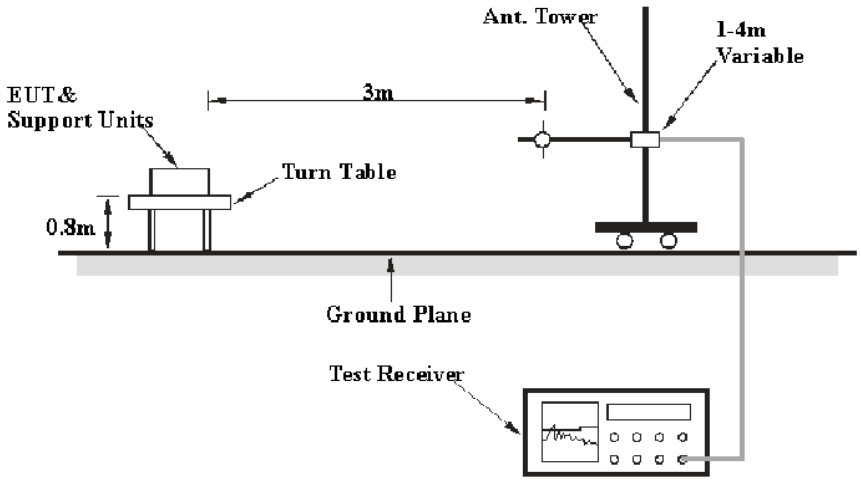
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Chengdu) is:
30M~200MHz: ±4.7 dB ;
200M~1GHz: ±6.0 dB ;
1G~6GHz: ±5.13dB;
6G~25GHz: ±5.47 dB;

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup



The radiated emission tests were performed in the 3-meter chamber a test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 1 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Detector
9 kHz – 150 kHz	300 Hz	1 kHz	QP
150 kHz – 30 MHz	10 kHz	30 kHz	QP
30 MHz – 1000 MHz	100 kHz	300 kHz	QP

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Meter Reading + Antenna Loss+ Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit - Corr. Ampl.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2015-12-02	2016-12-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2015-12-02	2016-12-01
Sunol Sciences	Broadband Antenna	JB3	A101808	2016-04-10	2019-04-09
N/A	RF Cable (below 1GHz)	NO.1	N/A	2015-11-10	2016-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2015-11-10	2016-11-09
The Electro-Mechanics Company	Passive Loop Antenna	6512	9706-1224	2014-11-30	2017-11-29

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209&15.225.

Test Data

Environmental Conditions

Temperature:	25.8 °C
Relative Humidity:	38 %
ATM Pressure:	101.1 kPa

** The testing was performed by Lorin Bian on 2016-10-26.*

Test mode: Transmitting

1) Fundamental (9 kHz~30 MHz):

Frequency	Receiver		Rx Antenna Factor	Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Detector						
MHz	dBµV	PK/QP/AV	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
13.56	58.5	QP	32.08	0.35	21.44	69.49	124.00	54.51
8.91	30.7	QP	32.63	0.28	21.42	42.19	69.54	27.35
27.12	28.9	QP	30.48	0.44	21.45	38.37	69.54	31.17
13.553	32.1	QP	32.08	0.35	21.44	43.09	90.50	47.41
13.567	32.7	QP	32.08	0.35	21.44	43.69	90.50	46.81
13.121	28.4	QP	32.06	0.35	21.43	39.38	80.50	41.12
13.956	27.9	QP	32.10	0.35	21.44	38.91	80.50	41.59

2) Spurious Emissions (30 MHz ~1 GHz):

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Detector	Polar	Factor					
MHz	dBµV	PK/QP/AV	H/V	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
40.6	38.5	QP	H	14.76	0.34	28.52	25.08	40.00	14.92
67.8	37.2	QP	H	7.70	0.50	28.40	17.00	40.00	23.00
108.48	36.6	QP	H	12.93	0.48	28.22	21.79	43.50	21.71
122.04	36.1	QP	H	15.90	0.85	28.12	24.73	43.50	18.77
162.72	35.7	QP	H	12.28	0.96	28.00	20.94	43.50	22.56
203.4	36	QP	H	12.75	0.93	27.75	21.93	43.50	21.57
366.12	35.4	QP	H	15.70	1.45	27.95	24.60	46.00	21.40
40.6	40.6	QP	V	14.76	0.34	28.52	27.18	40.00	12.82
108.48	38.1	QP	V	12.93	0.48	28.22	23.29	43.50	20.21
149.16	35.8	QP	V	12.82	0.74	28.07	21.29	43.50	22.21
203.4	34.3	QP	V	12.75	0.93	27.75	20.23	43.50	23.27
257.56	34.7	QP	V	12.68	1.16	27.51	21.03	46.00	24.97
325.4	34	QP	V	14.65	1.20	27.64	22.21	46.00	23.79
366.12	33.6	QP	V	15.70	1.45	27.95	22.80	46.00	23.20

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