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WIRELESS EQUIPMENT CERTIFICATION
TEST&MEASUREMENT REPORT

On Model Name: Guard Tour Reader

Model Numbers: BP-2012S, BP-2012F

Brand Name: BlueCard

FCC ID Number: 2AIASBP-2012S

Prepared for Bluecard Technologies Corp.

Test Specification: FCC 47 CFR Part 15, Subpart C

Test Procedure(s): ANSI C63.10-2013

Test Report #: BEI-1604-11488-FCC ID

Prepared by:	*Vivi Huang/Assistant*	*ECMG Company Name*
Reviewed by:	*Jawen Yin/Senior Engineer*	*ECMG Company Name*
QC Manager:	*Swall Zhang/QC Manager*	*ECMG Company Name*
Test Report Released by:	*Swall Zhang*	*May 28th, 2016 Date*

Verdict

Test Result :	*Pass**

**:In the configuration,the EUT complied with the standard specified above.*

Revision History

Rev.	Issue date	Revision	Revised by
01	05/20/2016	Initial review	Jawen Yin
/	/	/	/
/	/	/	/

List of Attached Files

Exhibit Type	File Description	File Name
Test Report	Test Report	2AIASBP-2012S _Test report.pdf
Operation Description	Technical Description	2AIASBP-2012S _Operation Description.pdf
External Photos	External Photos	2AIASBP-2012S _External Photos.pdf
Internal Photos	Internal Photos	2AIASBP-2012S _Internal Photos.pdf
Block Diagram	Block Diagram	2AIASBP-2012S _Block Diagram.pdf
Schematics	Circuit Diagram	2AIASBP-2012S _Schematics.pdf
ID Label/Location	Label and Location	2AIASBP-2012S _Label & Location.pdf
User Manual	User Manual	2AIASBP-2012S _User Manual.pdf
Test Setup Photos	Test Setup Photos	2AIASBP-2012S _Test Setup Photos.pdf

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room.

Test Site Location: *Shenzhen General Testing & Inspection Technology Co., Ltd.*

1F, 2 Block,Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong,China.

Tel: *(86)-755- 27559792*

Fax: *(86)-755- 86116468*

Accreditation Bodies

The test facility was recognized, certified, or accredited by the following organizations:

IC Registration No.: 9783A
The 3m alternate test site of Shenzhen GTI Technology Co., Ltd.EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.:9783A on Aug, 2011.

FCC-Registration No.: 214666
Shenzhen GTI Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 214666, Sep 19, 2011

List of Test and Measurement Instruments

The following test and measurement equipment was utilized for the tests documented in this report:

No.#	*Test Equipment*	*Manufacturer*	*Type No.*	*Cal. Interval*	*Cal. Due Date*
01	*EMI Test Receiver*	*R&S*	*ESCI*	*1 year*	*2017/01/04*
02	*Temperature/ Meter Humidity*	*Anymetre*	*TH101B*	*1 year*	*2017/11/15*
03	*Pre-Amplifier*	*HP*	*8447D*	*1 year*	*2017/01/04*
04	*Loop Antenna*	*Schwarzbeck*	*FMZB1519*	*1 years*	*2017/01/07*
05	*LOG-Bicon Antenna*	*Schwarzbeck*	*CBL6141A*	*1 year*	*2017/01/04*
06	*Antenna Mast*	*UC*	*UC3000*	*1 year*	*2017/01/04*
07	*Turn Table*	*UC*	*UC3000*	*1 year*	*2017/01/04*
08	*Cable below 1GHz*	*Schwarzbeck*	*AK9515E*	*1 year*	*2017/01/04*

Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.

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Opinions and Interpretations

This test report relates to the abovementioned equipment under test (EU T).Without the permission of ECMG Electronic Technical Testing Corp (Shenzhen). Test Lab this test report is not permitted to be duplicated in extracts.This test report does not entitle to carry any test mark on this or similar products.The manufacturer has sole responsibility of continu ed compliance of the device.

Statement of Measurement Uncertainty

The data and results referenced in the document are true and accurate.The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may resultin additional deviation.

Administrative Data

Test Sample	*: Guard Tour Reader*
Model Number	*: BP-2012S, BP-2012F*
Model Tested	*: BP-2012S*
Date Of Received	*: May 8th, 2016*
Date Tested	*: May 14th,2016 to May 20th, 2016*
Applicant	*: Bluecard Technologies Corp.*
Address	*A.A306.Information Center. Zhongguancun Software Park 1#.No8 Northeast Prosperous West Road. Beijing. China.*
Telephone	*: (86)- 10-58741880*
Fax	*: (86)- 10-58741927*
Manufacturer	*: Bluecard Technologies Corp.*
Address	*A.A306.Information Center. Zhongguancun Software Park 1#.No8 Northeast Prosperous West Road. Beijing. China.*
Telephone	*: (86)- 10-58741880*
Fax	*: (86)- 10-58741927*
Factory	*: Bluecard Technologies Corp.*
Address	*A.A306.Information Center. Zhongguancun Software Park 1#.No8 Northeast Prosperous West Road. Beijing. China.*
Telephone	*: (86)- 10-58741880*
Fax	*: (86)- 10-58741927*

General Description of E.U.T

Bluecard Technologies Corp. Tested model BP-2012S (referred to as the EUT in this report) is an Guard Tour Reader.

The EUT is an RFID Reader and Technical specifications of the EUT are as belows:

Parameters		Ranges
Basic parameters Of EUT	Power Supply	DC 3V by Lithium Battery
	Operating band	125KHz
	Type Of Modulation	FSK
	Number of Channels:	1CH
	Type of Antenna	Integral Loop Antenna

Note : *For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.*

Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4:Uncertainty in EMC Measurements and is documented in the Shenzhen General Testing &Inspection Technology Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore,component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Test	Range	Measurement Uncertainty	Notes
Conducted Emission	0.15 to 30MHz	/	/
Radiated Emission	9KHz to 30MHz	3.60 dB	(1)
Radiated Emission	30 to 1000MHz	4.70 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

E.U.T Operation Mode

Test Mode	Description of Test mode
Engineering mode	Keep EUT working in continuous transmitting

E.U.T Model Difference

Model BP-2012F is electrically identical to BP-2012S except for appearance, model BP-2012S was selected for final testing.

E.U.T Operation Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and ANSI C63.10-2013 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 KHz to 30 MHz), radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases (Y plane) and recorded in this report.

Test Mode	Description of Test mode
Engineering mode	Keep EUT working in continuous transmitting

System Test Configuration:

Justification:

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The worst case data was reported.Only one antenna is used, and all data rate were tested and only the worst case data is shown in the report.The signal is maximized through rotation and placement in the three orthogonal axes.The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.The rear of unit shall be flushed with the rear of the table.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

EUT Exercising Software:

The EUT exercise program (WindowFactory.exe provided by Client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19 The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

Test Summary

The Electromagnetic Compatibility requirements on tested model BP-2012S for this test is stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endors ement upon any other comp onent, host or subsystem used in the test set-up.Tested model BP-2012S has been tested to conform to the following parts of the Part 15, Subpart C as detailed belows:

FCC Rules	Requirement	Result	Remark
§15.203	Antenna Requirement	Compliant	Attachment 1
§15.207	Conducted Emission	Not Applicable	
§15.209(a) &15.205(a)	Radiated Emission	Compliant	Attachment 2
§15.215	20 dB Bandwidth	Compliant	Attachment 3
KDB 447498 D01 v05r02	RF Exposure Compliance Requirement	Not Applicable	

***Notes**:*
All modes of operation and three orthogonal panel were investigated. The test results shown in the following sections represent the worst case emissions.

Equipment Modification

Any modifications installed previous to testing by Bluecard Technologies Corp. will be incorporated in each production model sold or leased in United States.

There were no modifications for this EUT intended for grant.

Test System Details

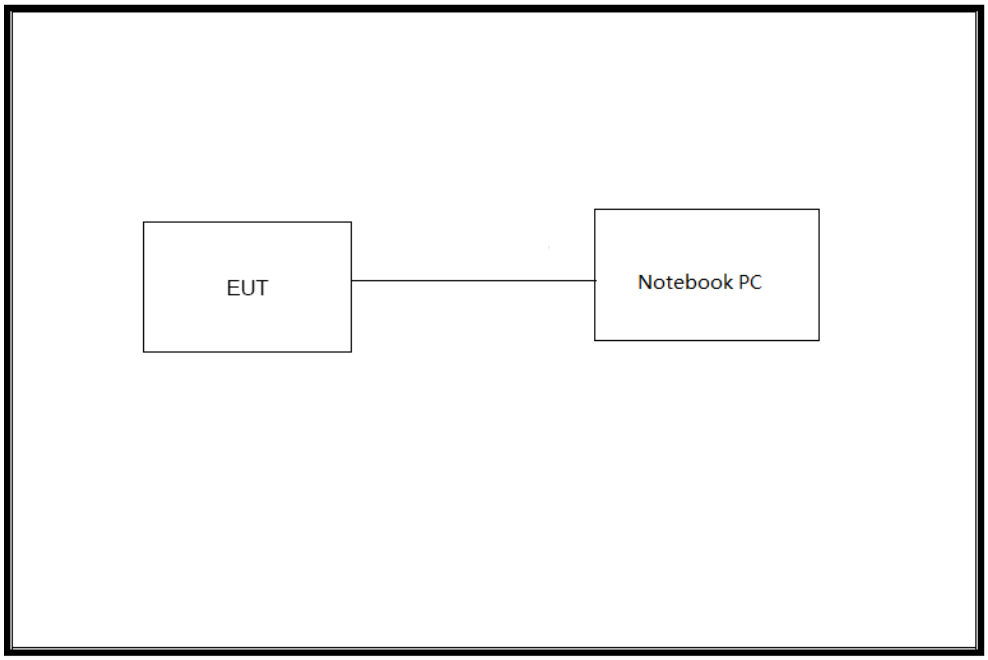
EUT	
Model Number:	BP-2012S, BP-2012F
Description:	Guard Tour Reader
Manufacturer:	Bluecard Technologies Corp.
Input Voltage:	DC 3.0V by Battery (New battery is used during all test)

Support Equipment				
Description	Model Number	Serial Number	Certificate	Manufacturer
Notebook computer	X201	3626AM3	DoC	Lenovo
Communication Station	BS-1000	/	/	Bluecard

Cable Description						
Cable No.	Type of Cable	From	To	Length (Meters)	Shielded (Y/N)	Ferrite (Y/N)
1	USB Cable	Notebook PC	EUT	1.2	N	Y

Note: The EUT has been tested as an independent unit together with other necessary accessories or support units.the above support units or accessories were used to form a representative test configuration during the test tests.

Set up Diagram For Tests

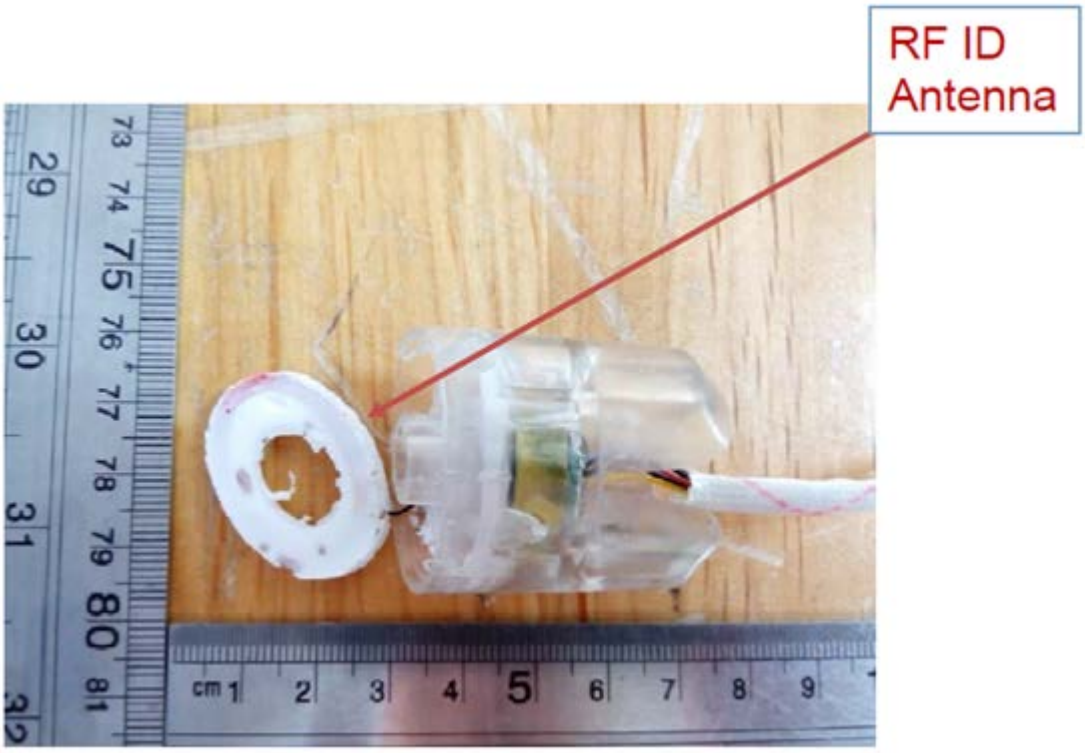


ATTACHMENT 1 - ANTENNA REQUIREMENT

§15.203 Requirements:

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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

FCC Section	*FCC Rules*	*Conclusion*
§15.203	*Described how the EUT complies with the requirements that either its antenna is permanently attached, or that it employ a unique antenna connector,for every antenna proposed for use with the EUT.* *The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed:* *1. The application (or intended use) of the EUT.* *2. The installation requirements of the EUT.* *3. The method by which the EUT will be marketed.*	*The EUT ulilizes an integrated Loop Antenna and no consideration of replacement.* *So the unit do meet requirement.*


RF ID
Antenna

ATTACHMENT 2- RADIATED EMISSION TEST

CLIENT:	Bluecard Technologies Corp.	**TEST STANDERD:**	Section 15.209(a) &15.205(a)
MODEL NUMBERS:	BP-2012S,BP-2012F	**PRODUCT:**	Guard Tour Reader
EUT MODEL:	BP-2012S	**EUT DESIGNATION:**	RFID Reader
TEMPERATURE:	23°C	**HUMIDITY:**	47%RH
ATM PRESSURE:	101.0kPa	**GROUNDING:**	None
TESTED BY:	Thomas Morgan	**DATE OF TEST:**	May 16th , 2016
TEST REFERENCE:	ANSI C63.10: 2013		
TEST PROCEDURE:	The EUT was set up according to the guidelines of ANSI C63.10: 2013 for radiated emissions. An EMI receiver peak scan was made at the frequency measurement range (pre-scan) in an Anechoic chamber. Test procedure as follow: a) The EUT is placed on a turntable, which is 0.8&1.5 m above ground plane.The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. b) The EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. c) Maximum procedure was performed on the six highest emissions to ensure EUT compliance. d) And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. e) Repeat above procedures until the measurements for all frequencies are complete. The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain from the measured reading. The basic equation with a sample calculation is as follows: FS = RA + AF + CL - AG Where FS = Field Strength; AF = Antenna Factor; RA = Reading Amplitude; CL = Cable Attenuation Factor (Cable Loss); AG = Amplifier Gain.		

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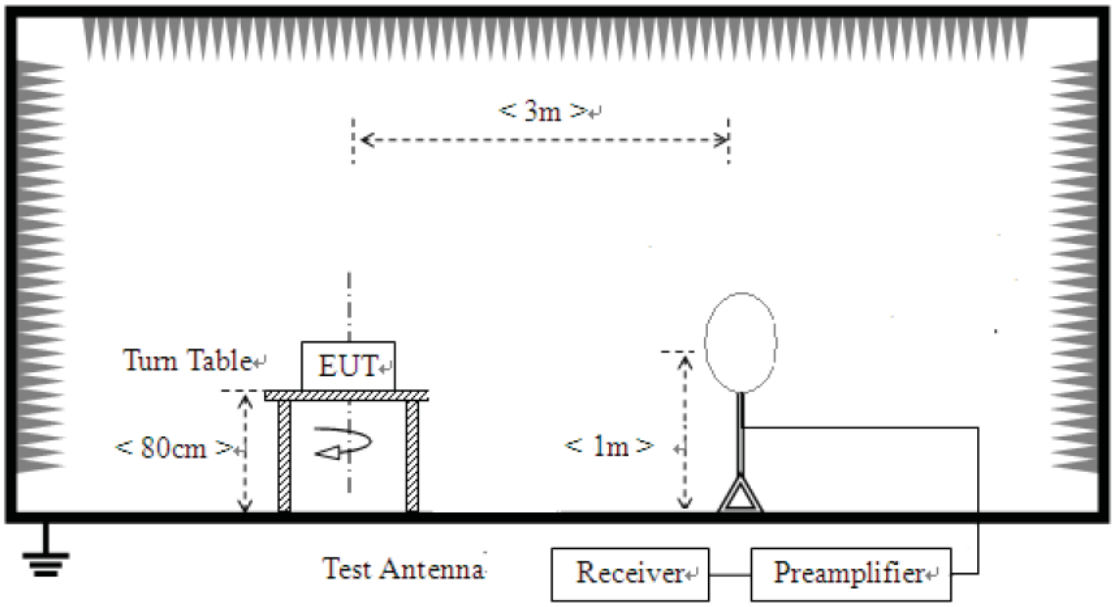
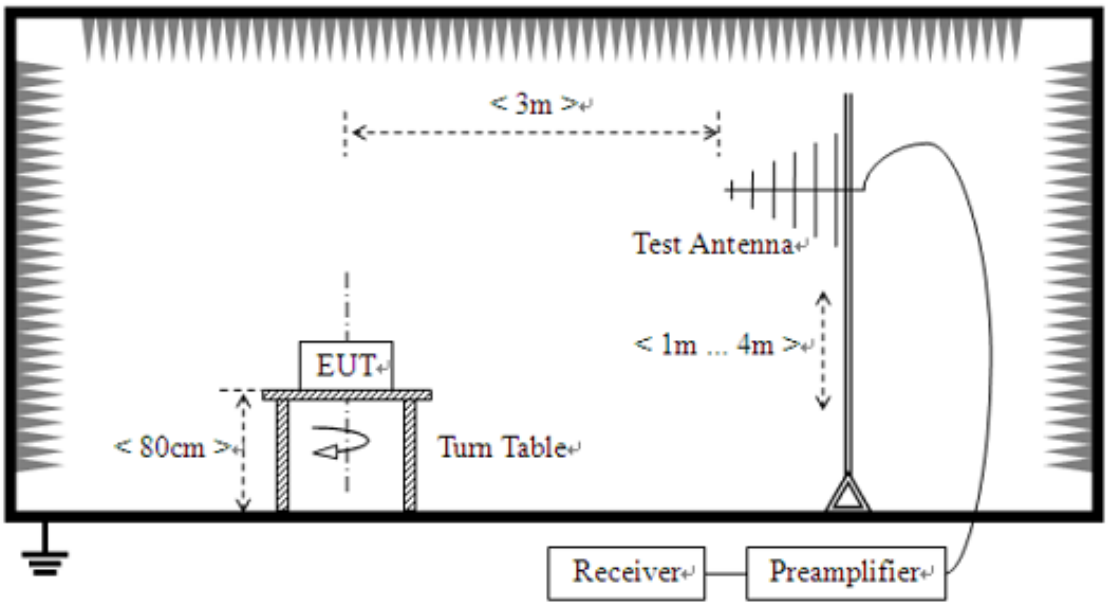
TEST SET UP:

Frequency measured at 9KHz to 30MHz:

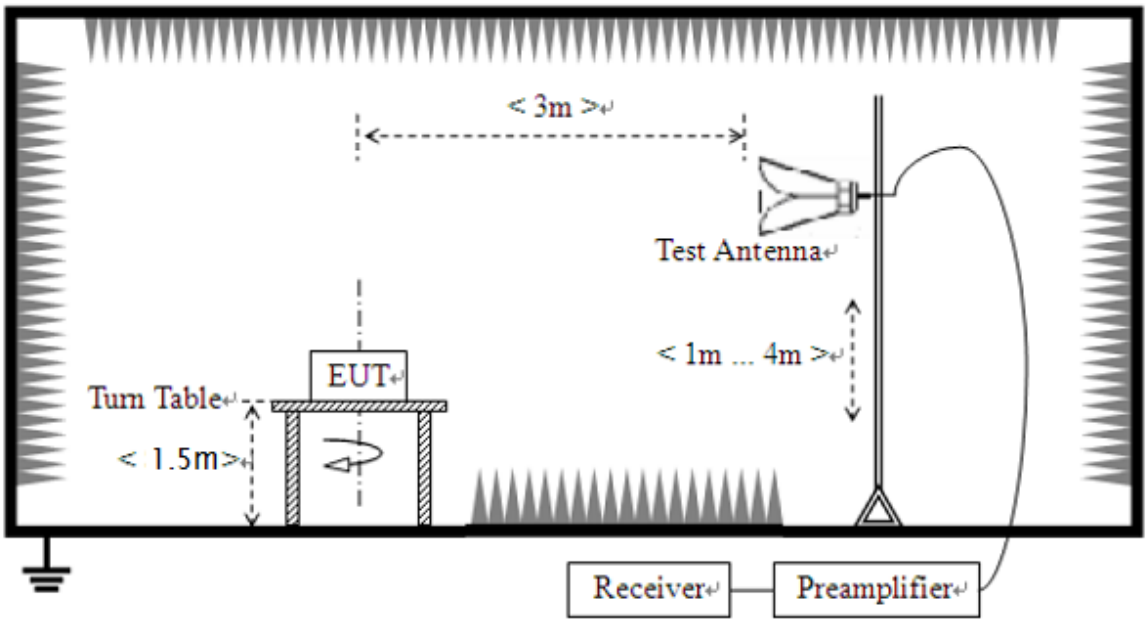


Frequency measured at 30MHz to 1000MHz:



Continue on to next page…

Frequency measured at Above 1GHz:



TESTED RANGE:	9KHz to 1000MHz
TEST VOLTAGE:	DC 3V by Battery
RESULTS:	According to the data in the following,the EUT complied with the FCC Part 15.209 &15.205. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Electronic Technical Testing Corp (Shenzhen) test personnel.

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Receiver Set-up:

Frequency [MHz]	*RBW*	*VBW*	*Detector*
0.009-0.015	*200Hz*	*1KHz*	*Quasi-peak*
0.015-30	*9KHz*	*30KHz*	*Quasi-peak*
30-1000	*120KHz*	*300KHz*	*Quasi-peak*

Note : *The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.*

Radiated Emission Limit:

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

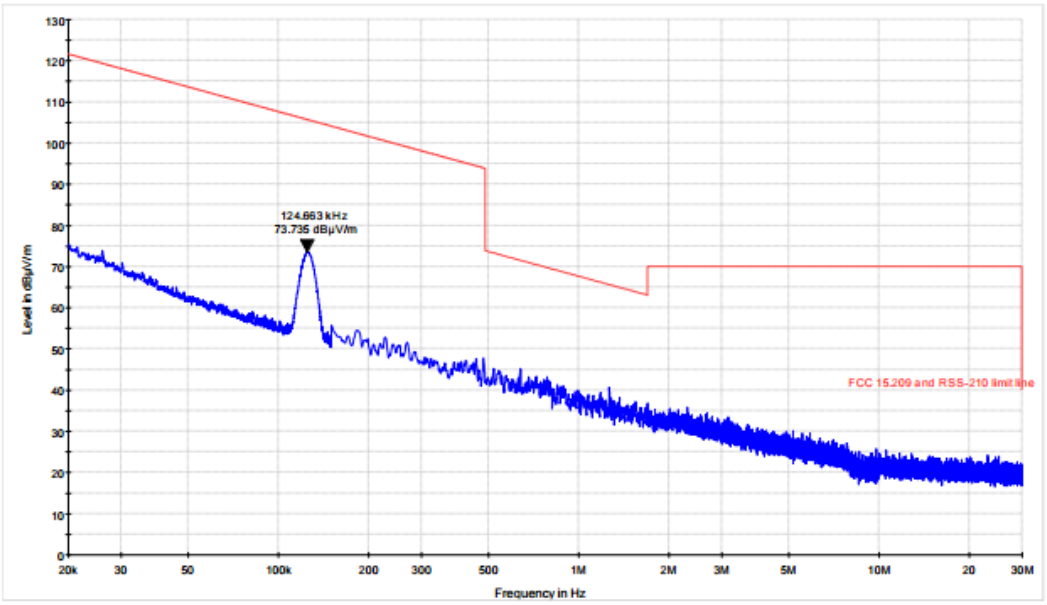
FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	*Field strength [V/m]*	*Distance [Meters]*
0.009-0.490	*2400/F(KHz)*	*300*
0.490-1.705	*24000/F(KHz)*	*30*
1.705-30	*30*	*30*
30-88	*100*	*3*
88-216	*150*	*3*
216-960	*200*	*3*
Above 960	*500*	*3*

Note:

(1) For test distance other than what is specified, but fulfilling the requirements of section 15.31(f) (2) the field strength is calculated by adding additionally an extrapolation factor of 40dB/decade (inverse linear distance for field strength measurements).

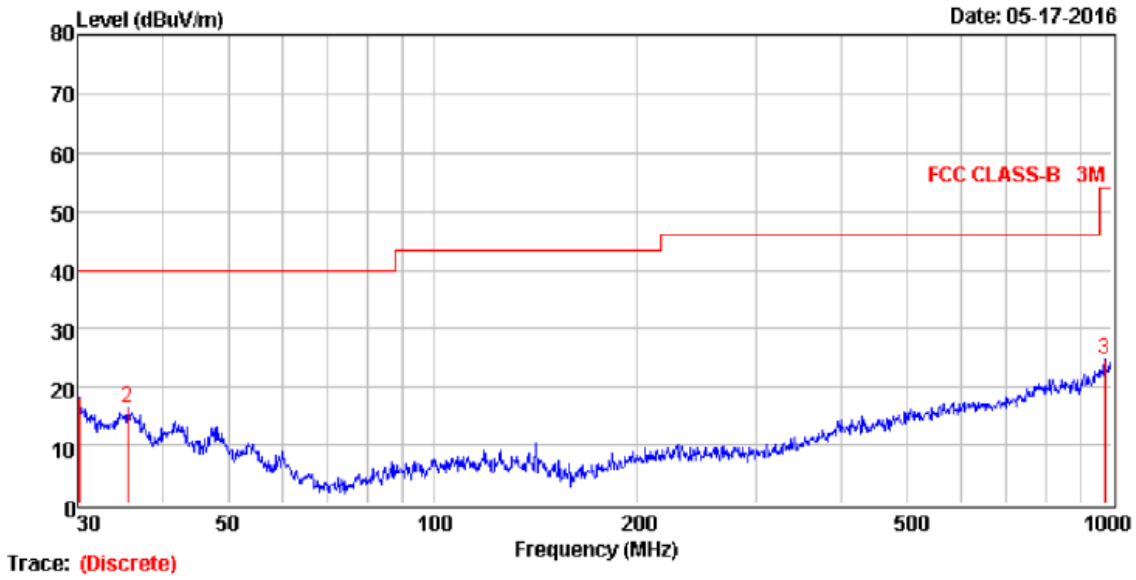
(2) The lower limit shall apply at the transition frequencies.

Radiated Emission Plot From 9KHz to 30MHz:

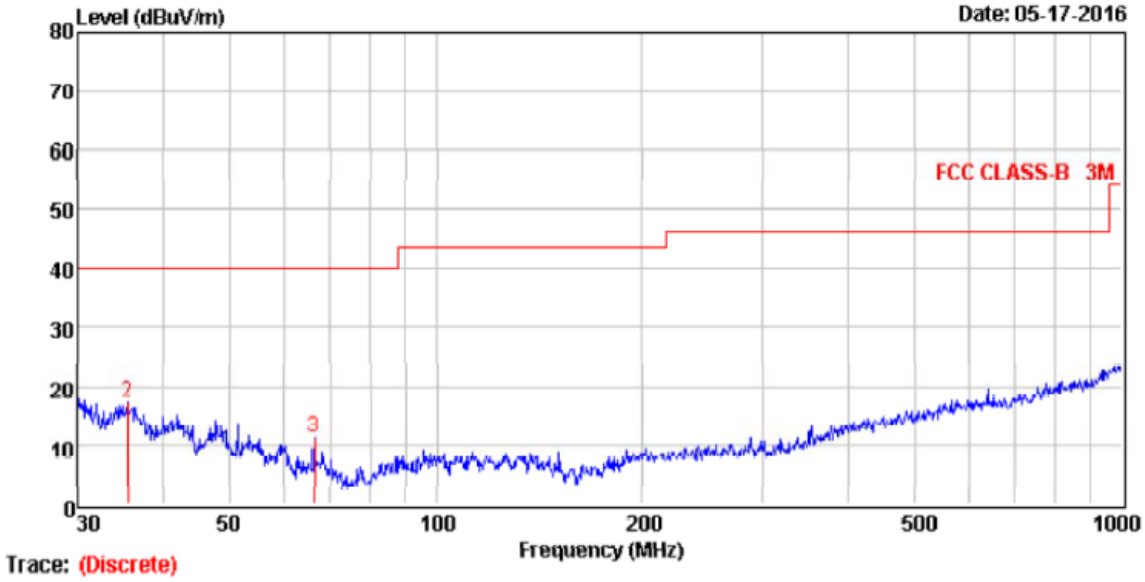


Radiated Emission Plot From 30 to 1000MHz:

Horizontal:



Vertical:



Radiated Emission from 9KHz to 30MHz:
Fundamental:

Test No.#:	Frequency (MHz)	Measured Level @3m (dBuV/m)		Limit@3m (dBuV/m)		Over Limt PK (dB)	Over Limit AV (dB)	Pol./ Ant.
		PK	AV	PK	AV			
1	0.125	84.3	73.7	125.7	105.7	-41.4	-32.0	/
/	/	/	/	/	/	/	/	/

Harmonics and Others:

Test No.#:	Mark	Frequency (MHz)	Measured Level (dBuV/m)		Over Limit (dB)		Limit (dBuV/m)		Factor (dB)
			PK	AV	PK	AV	PK	AV	
1	*	0.110	47.8	34.3	-79.0	-72.5	126.8	106.8	/
2	/	0.250	/	/	/	/	/	/	/
3	/	0.375	/	/	/	/	/	/	/
4	/	0.500	/	/	/	/	/	/	/
5	/	0.625	/	/	/	/	/	/	/
6	/	0.750	/	/	/	/	/	/	/

Note:

1. *Measure Level(dBuV/m) =Reading Level(dBuV/m) + Factor(dB);*
2. *Factor(dB)= Cable Loss(dB)+ Antenna Factor(dB).*
3. *Mark "*" means that measured level is falled in restricted band.*
4. *All other emission levels are too low aginst limits are not reported.*

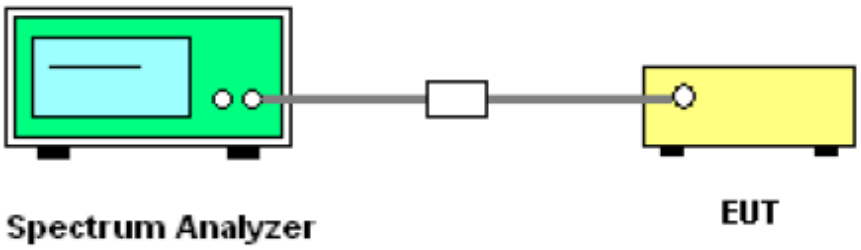
Radiated Emission from 30MHz to 1GHz:

Frequency (MHz)	Antenna Polarity	Reading Level (dBuV/m)	Ant./CL/ Amp. CF	Emission Level (dBuV/m)	QP Limit (dBuV/m)	Over Limit(dB)	Pass/Fail
30.11	H	26.65	-8.49	18.16	40	-21.84	Pass
35.50	H	27.10	-10.88	16.22	40	-23.78	Pass
975.75	H	28.52	-3.96	24.56	46	-29.44	Pass
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
30.00	V	26.71	-8.49	18.22	40	-21.78	Pass
35.50	V	28.15	-10.88	17.27	40	-22.73	Pass
66.27	V	32.88	-21.65	11.23	40	-28.77	Pass
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

Note:

1. *The field strength is calculated by adding the Antenna Factor, Cable Loss& Preamplifier. The basic equation with a sample calculation is as follows: Emission Level =Reading Level + Antenna Factor + Cable Loss –Preamplifier Factor.*
2. *Other emission levels are too low against official limits that are not recorded.*

ATTACHMENT 3 – 20dB BANDWIDTH

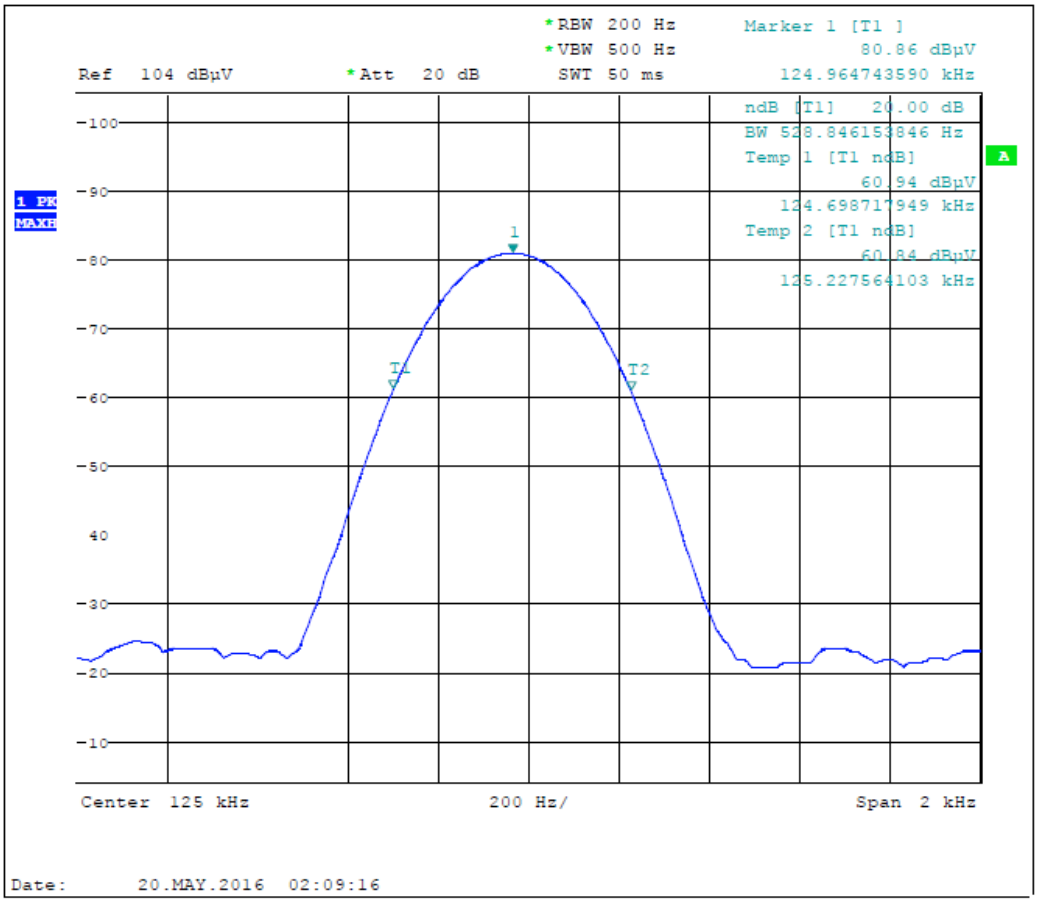
CLIENT:	Bluecard Technologies Corp.	**TEST STANDERD:**	Section 15.215
MODEL NUMBERS:	BP-2012S,BP-2012F	**PRODUCT:**	Guard Tour Reader
EUT MODEL:	BP-2012S	**EUT DESIGNATION:**	RFID Reader
TEMPERATURE:	23°C	**HUMIDITY:**	47%RH
ATM PRESSURE:	101.0kPa	**GROUNDING:**	None
TESTED BY:	Thomas Morgan	**DATE OF TEST:**	May 20th, 2016
TEST REFERENCE:	ANSI C63.10:2013		
REQUIREMENTS	Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.		
TEST PROCEDURE	The transmitter output was connected to the spectrum analyzer through a low loss RF cable. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 200Hz RBW and 500Hz VBW.The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.		
TEST SETUP:			
TEST VOLTAGE:	DC 3V		
RESULTS:	The EUT meet the requirements of test reference for 20dB bandwidth.The test results relate only to the equipment under test provided by client.		
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Electronic Technical Testing Corp (Shenzhen) test personnel.		
M. UNCERTAINTY:	±5 %		

Test Data:

Modulation	*20Db Bandwidth(KHz)*	*Pass/Fail*
FSK	*0.529*	*Pass*

Test result: The unit does meet the requirements.

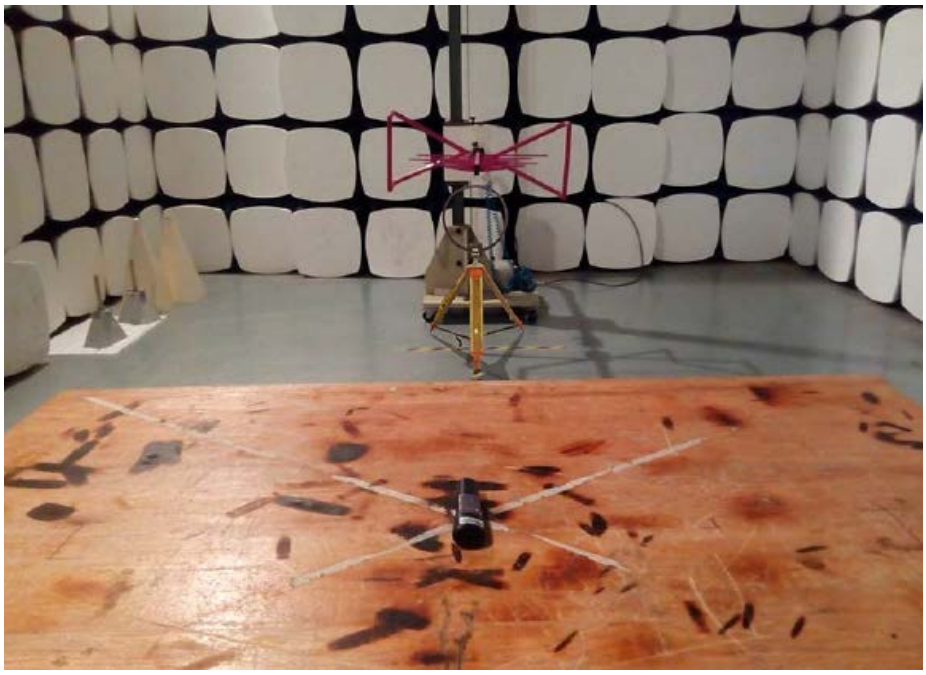
Test Plot As Below:



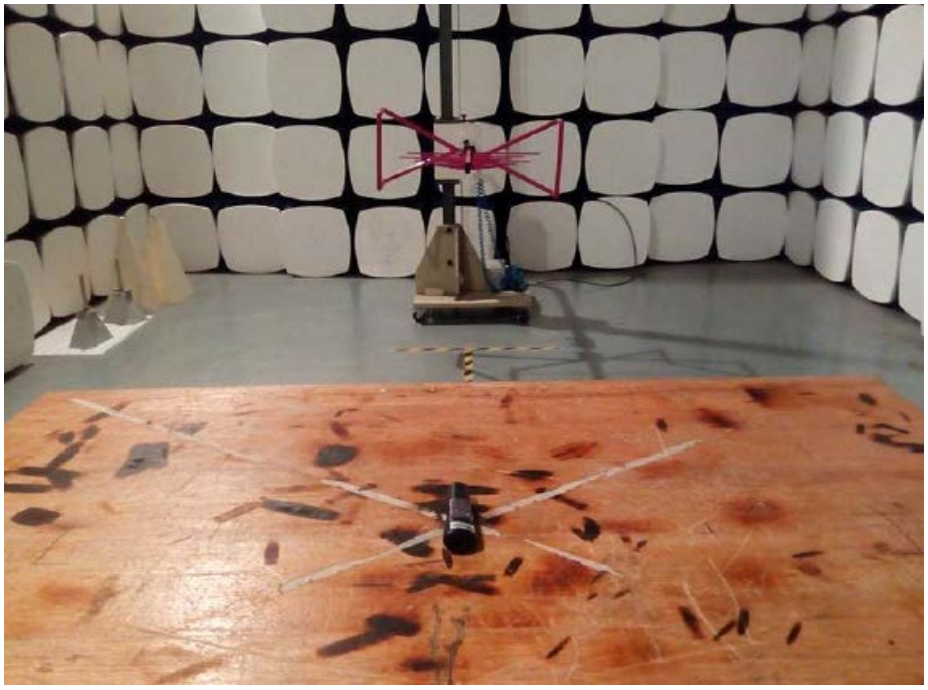
ATTACHMENT 4-TEST SET-UP PHOTOGRAPH

Radiated Emission Test Set-up :

9KHz to 30MHz



30 to 1000MHz



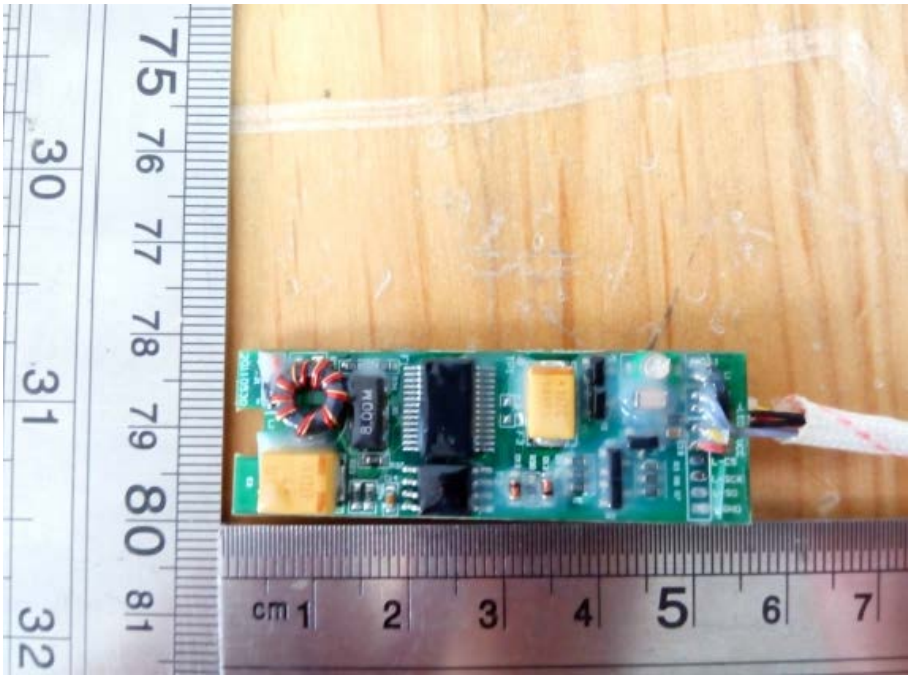
ATTACHMENT 5 –EUT SAMPLE PHOTOGRAPH

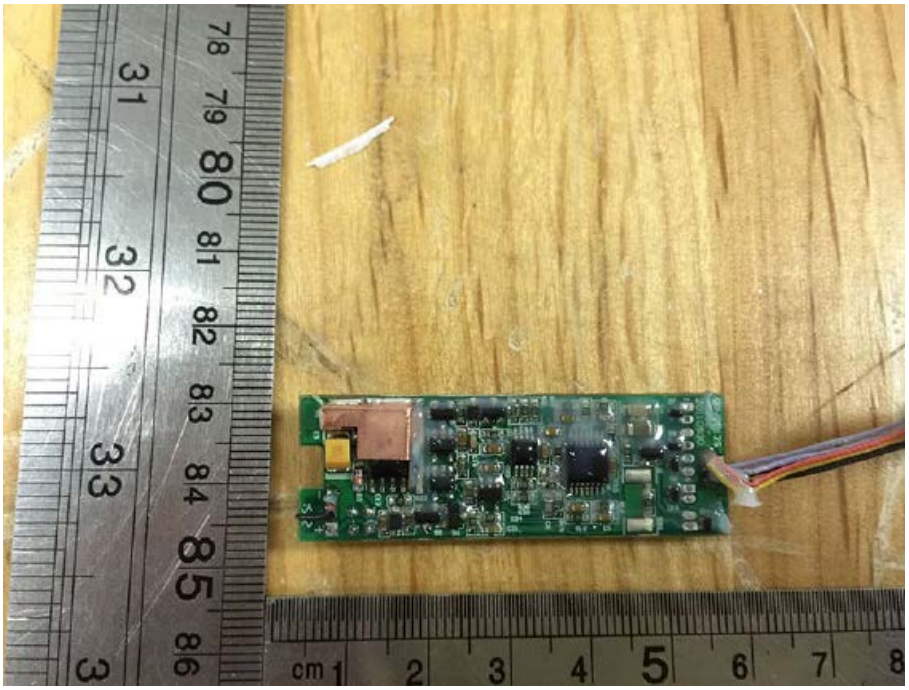
EUT Model:BP-2012S
EUT-External Photo:

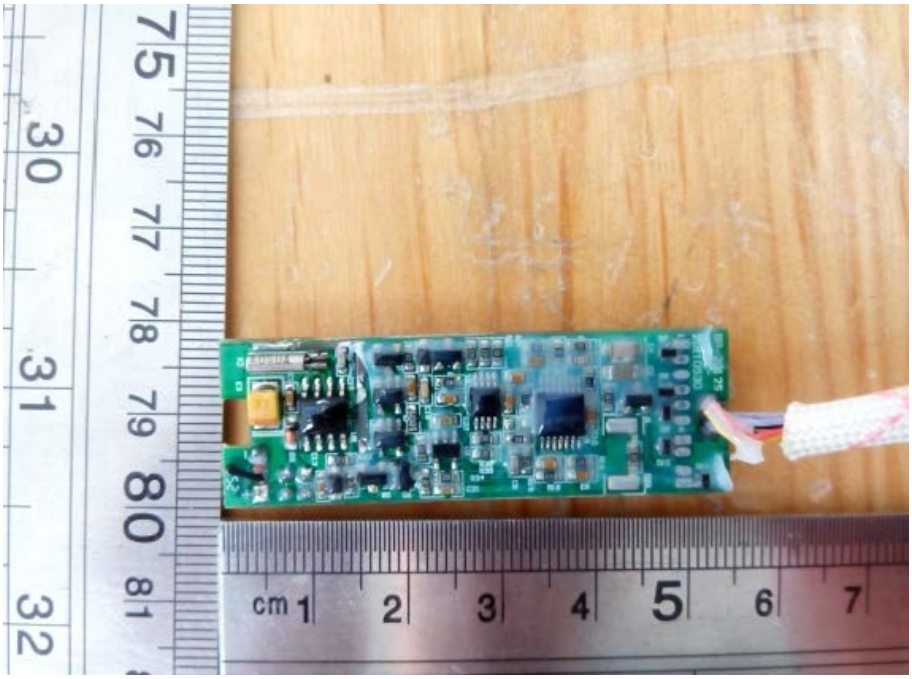

BP-2012S
cm 1 2 3 4 5 6 7
32 INCH 1 2


cm 1 2 3 4 5 6 7
32 INCH 1 2

EUT- Internal Photos:







※※※ End Of Report ※※※