
FCC Test Report

Report No.: AGC03776150601FE01

FCC ID : 2ADUTLGPBU40

PRODUCT DESIGNATION : Panda Wireless Bluetooth 4.0 USB Adapter

BRAND NAME : Panda Wireless

MODEL NAME : PBU40

CLIENT : Panda Wireless, Inc.

DATE OF ISSUE : July 29,2015

STANDARD(S) : FCC Part 15 Rules

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	July 29,2015	Valid	Original Report

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1. VERIFICATION OF CONFORMITY

Applicant	Panda Wireless, Inc.
Address	15559 Union Ave, Suite 300, Los Gatos, CA 95032, USA
Manufacturer	Panda Wireless, Inc.
Address	15559 Union Ave, Suite 300, Los Gatos, CA 95032, USA
Product Designation	Panda Wireless Bluetooth 4.0 USB Adapter
Brand Name	Panda Wireless
Test Model	PBU40
Measurement Procedure	ANSI C63.4: 2009
Date of test	Jul 17,2015 to Jul 18,2015
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-IT/AC(2013-03-01)

The above equipment was tested by Compliance Certification Service(Shenzhen) Inc. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2009. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested By 
Time Huang(Huang Nanhui) July 29,2015

Checked By 
Forrest Lei(Lei Yonggang) July 29,2015

Authorized By 
Solger Zhang(Zhang Hongyi) July 29,2015

2. SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	TEST MODE DESCRIPTION	WORST
1	Normal Operation(USB)	V
Note: 1. V means EMI worst mode 2. Only worst mode data recorded in the test report		

3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 2.75dB

Radiated measurement: +/- 3.2dB

4. PRODUCT INFORMATION

Housing Type	Plastic and metal
Power Supply	DC 5V

I/O Port Information (☐Applicable ☒Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Cable Description	Tested With
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5. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
PC	LENOVO	SL410K	--	--	--

6. TEST FACILITY

Site	Compliance Certification Service(Shenzhen) Inc.
Location	No.10-1 Mingkeda Logistics Park, No.18 Huanguan South RD. Guan lan Town,Baoan Distr

Radiated Emission Test Site 966(2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2015	03/01/2016
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2015	03/08/2016
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2015	03/17/2016
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2015	03/17/2016
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	07/10/2015	07/09/2016
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/01/2015	03/01/2016
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/01/2015	03/01/2016
Loop Antenna	COM-POWER	AL-130	121044	09/27/2014	09/26/2015
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2015	02/27/2016
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2015	03/08/2016
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	03/09/2015	03/08/2016
LISN	EMCO	3825/2	8901-1459	03/09/2015	03/08/2016
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	03/04/2015	03/03/2016
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

Note: -- "means it's not applicable.

7. FCCLINE CONDUCTED EMISSION TEST

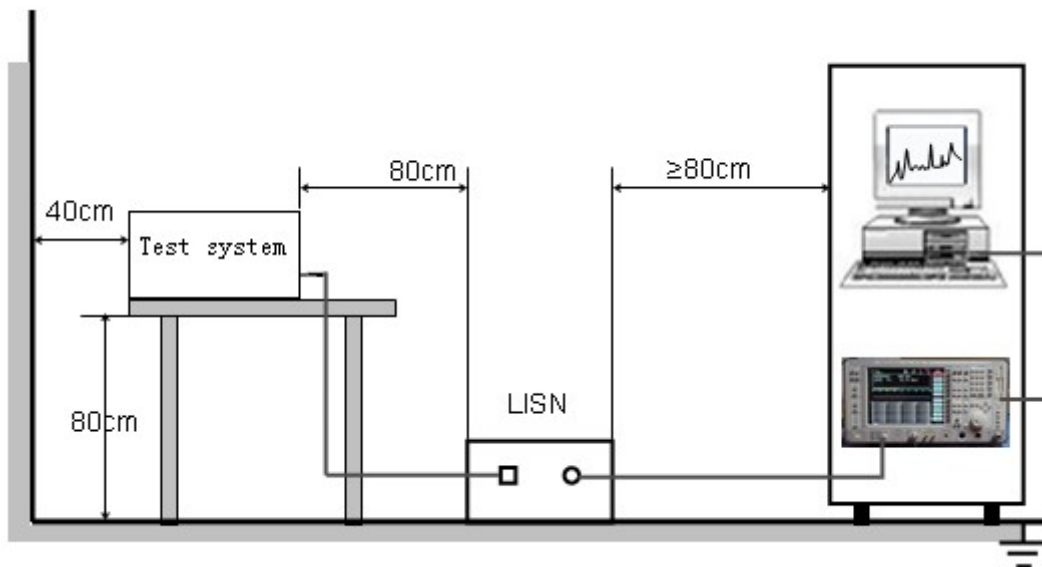
7.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

7.2. BLOCK DIAGRAM OF TEST SETUP



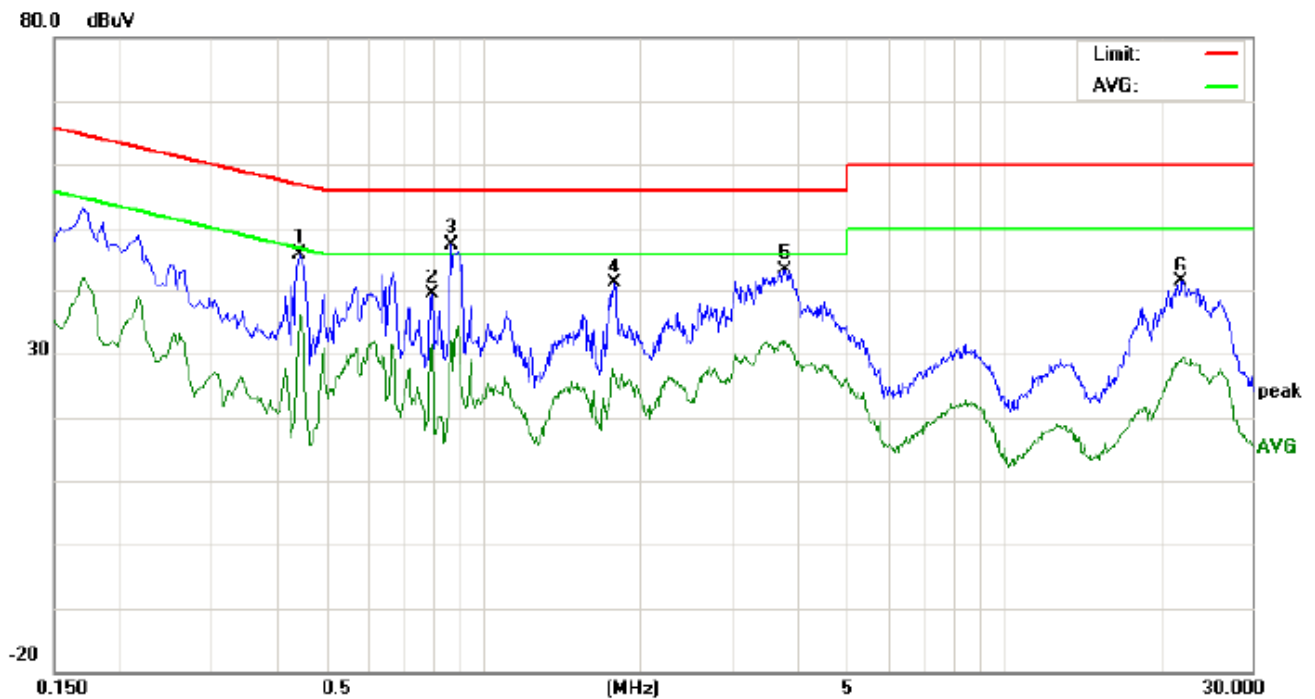
7.3. PROCEDURE OF LINE CONDUCTED EMISSION TEST

- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per ANSI C63.4.
- (3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- (4) The EUT received DC5V power from PC with receive 120V/60Hz power from a LISN.
- (5) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- (6) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- (7) During the above scans, the emissions were maximized by cable manipulation.
- (8) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
- (9) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

The test data of the worst case condition (mode 1) was reported on the Summary Data page.

7.4. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



Site: Conduction

Phase: **L1**

Temperature: 25.3

Limit: FCC Class B Conduction(QP)

Power:

Humidity: 51.8 %

EUT: Panda Wireless Bluetooth 4.0 USB Adapter

M/N: PBU40

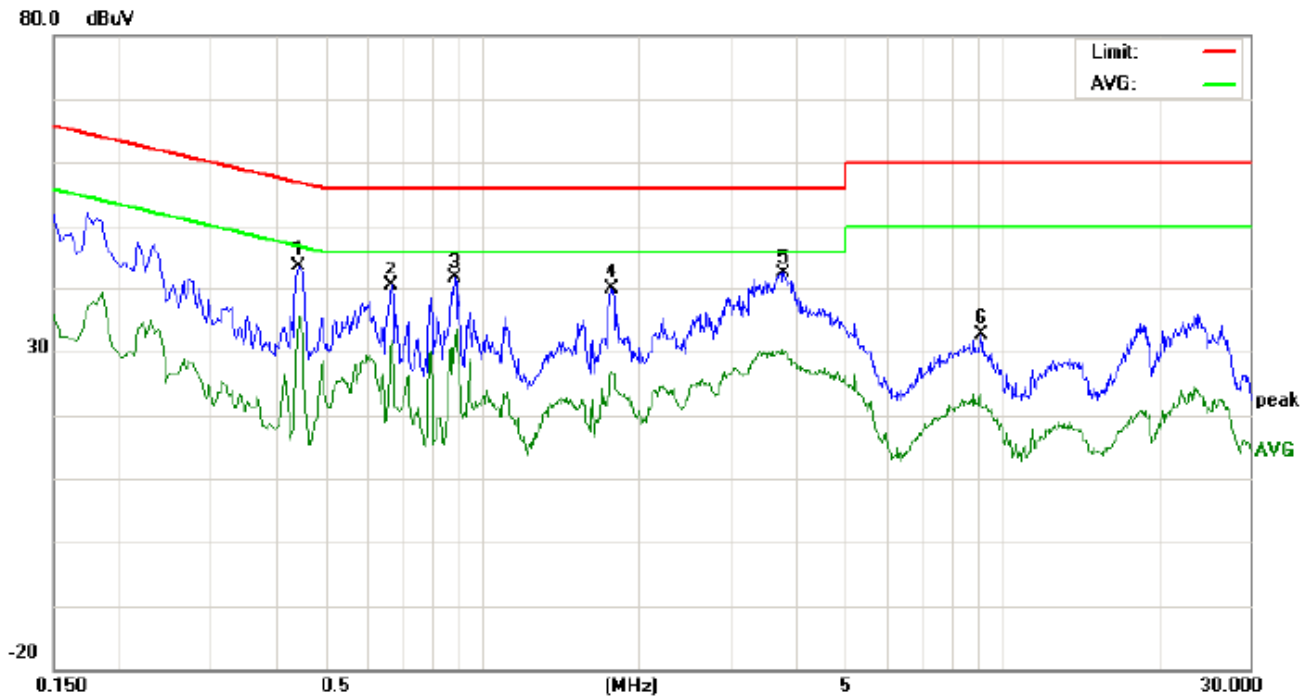
Mode: Normal operation(USB)

Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.4460	35.49		25.77	10.36	45.85		36.13	56.95	46.95	-11.10	-10.82	P	
2	0.7980	29.02		21.00	10.28	39.30		31.28	56.00	46.00	-16.70	-14.72	P	
3	0.8700	37.11		21.70	10.37	47.48		32.07	56.00	46.00	-8.52	-13.93	P	
4	1.7820	30.84		16.34	10.29	41.13		26.63	56.00	46.00	-14.87	-19.37	P	
5	3.8020	32.91		21.45	10.46	43.37		31.91	56.00	46.00	-12.63	-14.09	P	
6	21.9540	31.29		18.88	10.12	41.41		29.00	60.00	50.00	-18.59	-21.00	P	

RESULT: PASS

LINE CONDUCTED EMISSION TEST-N



Site: Conduction

Phase: **N**

Temperature: 25.3

Limit: FCC Class B Conduction(QP)

Power:

Humidity: 51.8 %

EUT: Panda Wireless Bluetooth 4.0 USB Adapter

M/N: PBU40

Mode: Normal operation(USB)

Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.4460	33.20		25.39	10.36	43.56		35.75	56.95	46.95	-13.39	-11.20	P	
2	0.6700	30.06		21.19	10.34	40.40		31.53	56.00	46.00	-15.60	-14.47	P	
3	0.8860	31.15		21.45	10.39	41.54		31.84	56.00	46.00	-14.46	-14.16	P	
4	1.7780	29.51		16.54	10.29	39.80		26.83	56.00	46.00	-16.20	-19.17	P	
5	3.8100	31.85		19.08	10.46	42.31		29.54	56.00	46.00	-13.69	-16.46	P	
6	9.1499	22.27		11.16	10.26	32.53		21.42	60.00	50.00	-27.47	-28.58	P	

RESULT: PASS

8. FCC RADIATED EMISSION TEST

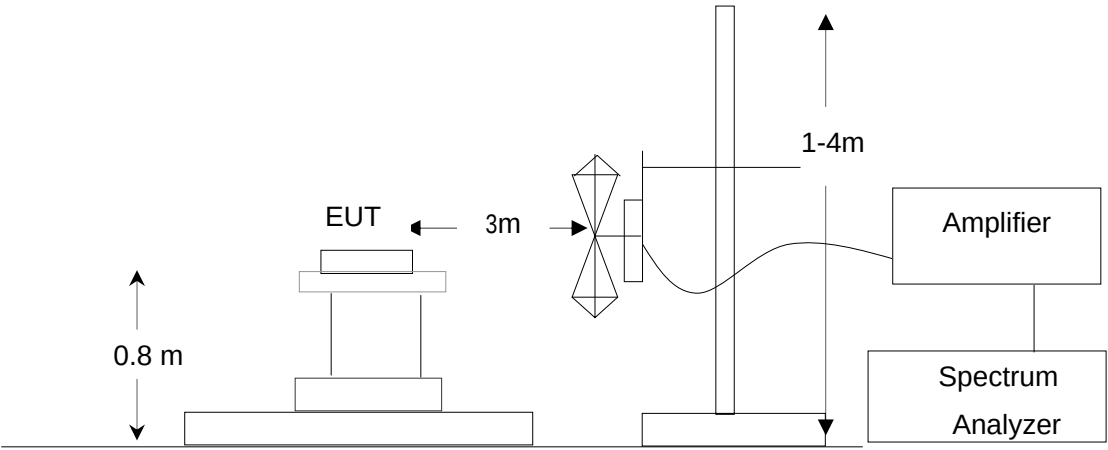
8.1. LIMITS OF RADIATED EMISSION TEST

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m/ Q.P.)
30~88	3	40.0
88~216	3	43.5
216~960	3	46.0
Above 960	3	54.0

Note: The lower limit shall apply at the transition frequency.

8.2. BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators



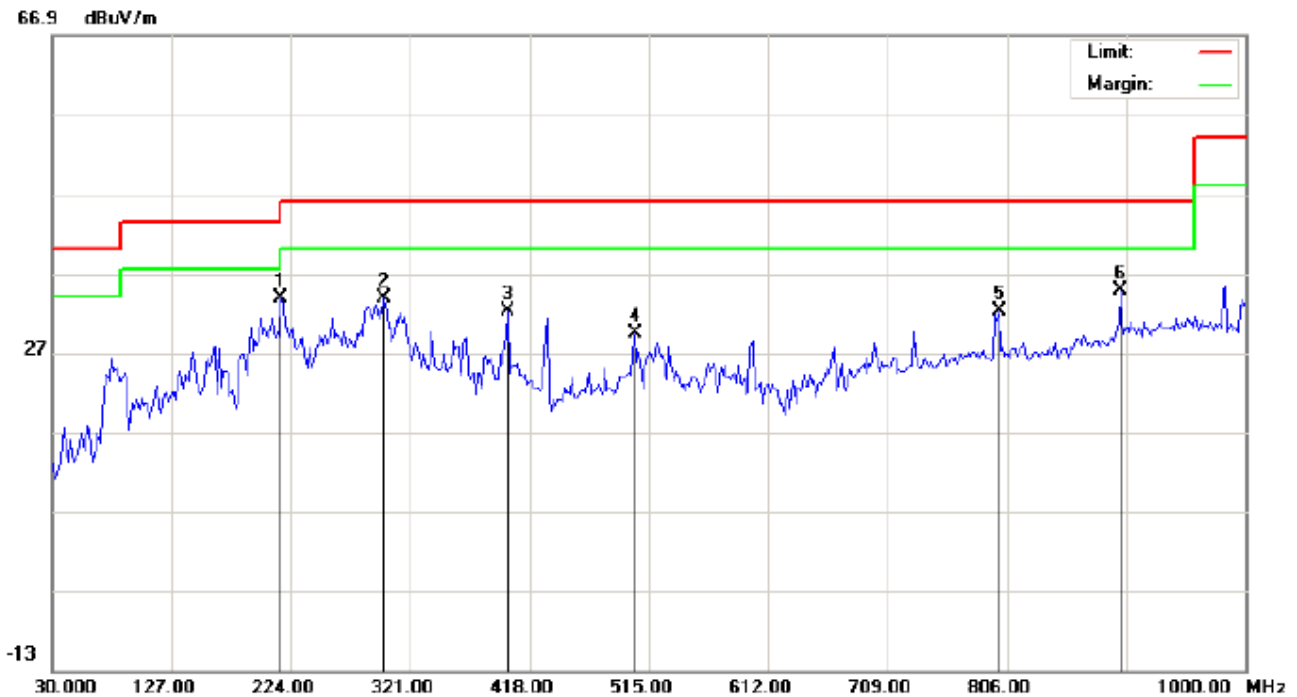
8.3. PROCEDURE OF RADIATED EMISSION TEST

- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per ANSI C63.4.
- (3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- (4) The EUT received DC 5V power from PC with receive 120V/60Hz power from socket under the turntable through a LISN.
- (5) The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- (6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- (7) The test mode(s) were scanned during the test:
- (8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

The test data of the worst case condition (mode 1) was reported on the Summary Data page.

8.4. TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test at 3m Distance-Horizontal



Site: site #1

Polarization: *Horizontal*

Temperature: 23.5

Limit: FCC Class B 3M Radiation

Power:

Humidity: 56.1 %

EUT: Panda Wireless Bluetooth 4.0 USB Adapter

Distance: 3m

M/N: PBU40

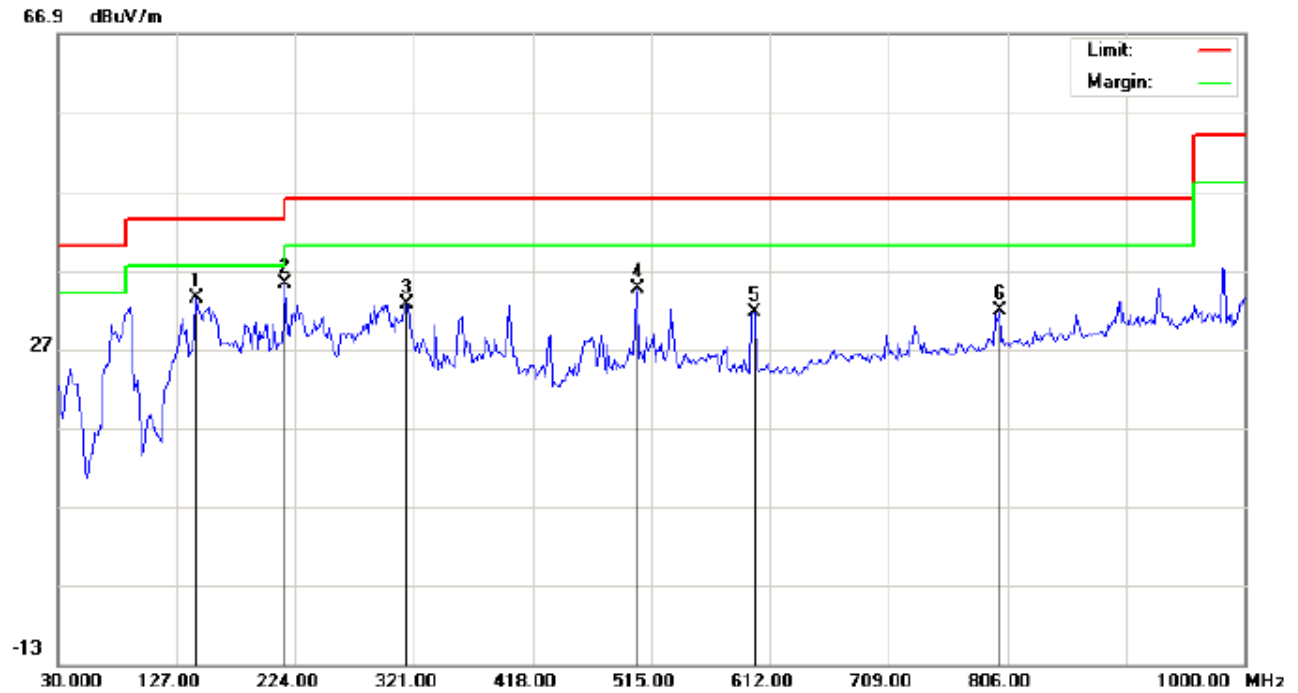
Mode: Normal operation(USB)

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	215.9167	21.13	12.60	33.73	43.50	-9.77	peak			
2		299.9833	18.36	15.41	33.77	46.00	-12.23	peak			
3		400.2167	13.07	19.08	32.15	46.00	-13.85	peak			
4		503.6833	8.11	21.23	29.34	46.00	-16.66	peak			
5		799.5333	4.94	27.31	32.25	46.00	-13.75	peak			
6		898.1500	6.29	28.56	34.85	46.00	-11.15	peak			

RESULT: PASS

Radiated Emission Test at 3m Distance-Vertical



Site: site #1

Polarization: **Vertical**

Temperature: 23.5

Limit: FCC Class B 3M Radiation

Power:

Humidity: 56.1 %

EUT: Panda Wireless Bluetooth 4.0 USB Adapter

Distance: 3m

M/N: PBU40

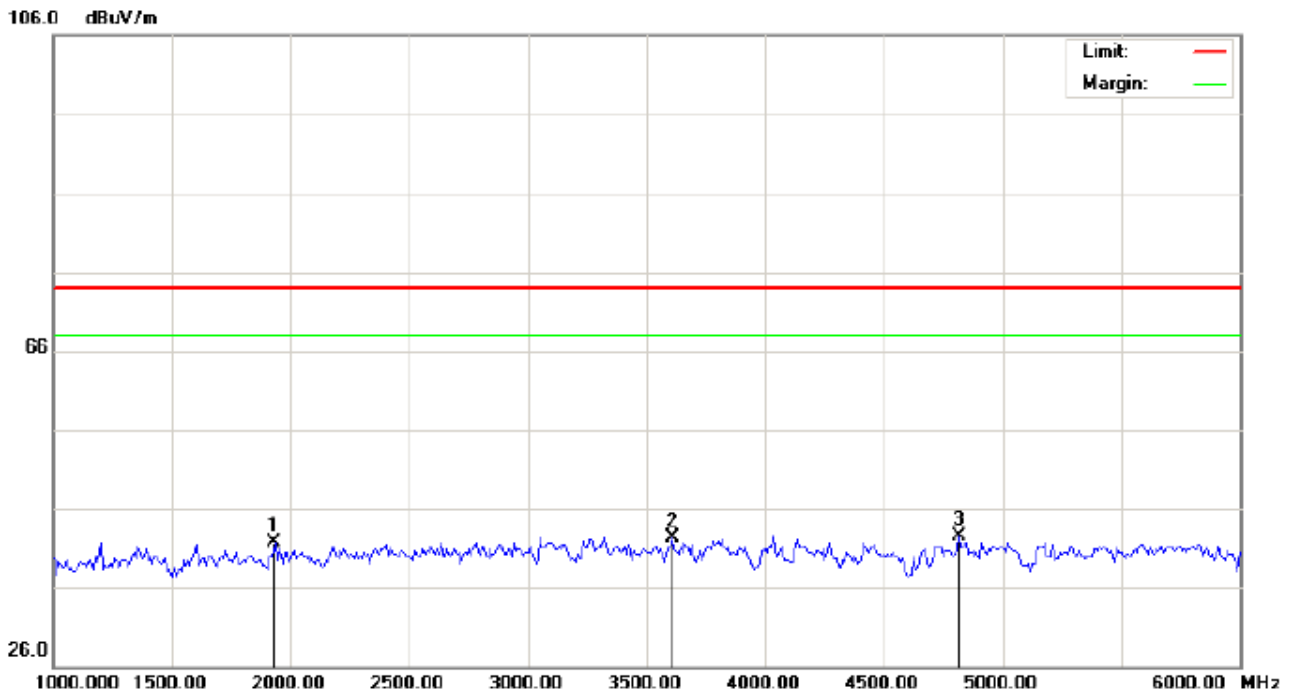
Mode: Normal operation(USB)

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		143.1667	18.11	15.22	33.33	43.50	-10.17	peak			
2	*	215.9167	24.61	10.56	35.17	43.50	-8.33	peak			
3		314.5333	16.25	16.38	32.63	46.00	-13.37	peak			
4		503.6833	13.43	21.23	34.66	46.00	-11.34	peak			
5		599.0667	8.96	22.73	31.69	46.00	-14.31	peak			
6		799.5333	4.58	27.31	31.89	46.00	-14.11	peak			

RESULT: PASS

Radiated Emission Test Above 1GHz-Horizontal



Site: site #1

Polarization: *Horizontal*

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT: Panda Wireless Bluetooth 4.0 USB Adapter

Distance:

M/N: PBU40

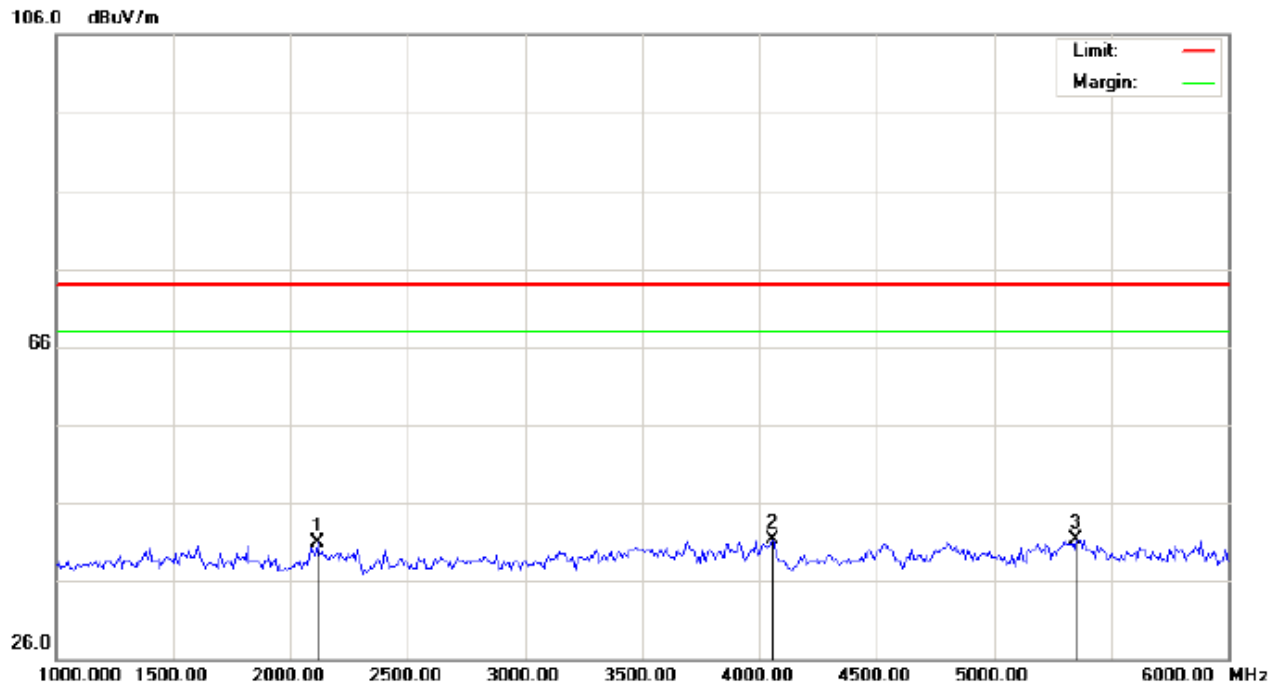
Mode: Normal operation(USB)

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		1933.333	32.59	9.18	41.77	74.00	-32.23	peak			
2		3608.333	29.50	12.78	42.28	74.00	-31.72	peak			
3	*	4816.667	34.70	7.72	42.42	74.00	-31.58	peak			

RESULT: PASS

Radiated Emission Test Above 1GHz-Vertical



Site: site #1

Polarization: *Vertical*

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT: Panda Wireless Bluetooth 4.0 USB Adapter

Distance:

M/N: PBU40

Mode: Normal operation(USB)

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2116.667	30.92	10.01	40.93	74.00	-33.07	peak			
2		4058.333	27.01	14.22	41.23	74.00	-32.77	peak			
3	*	5350.000	40.12	1.19	41.31	74.00	-32.69	peak			

RESULT: PASS

Note: 6~25GHz at least have 20dB margin. No recording in the test report.

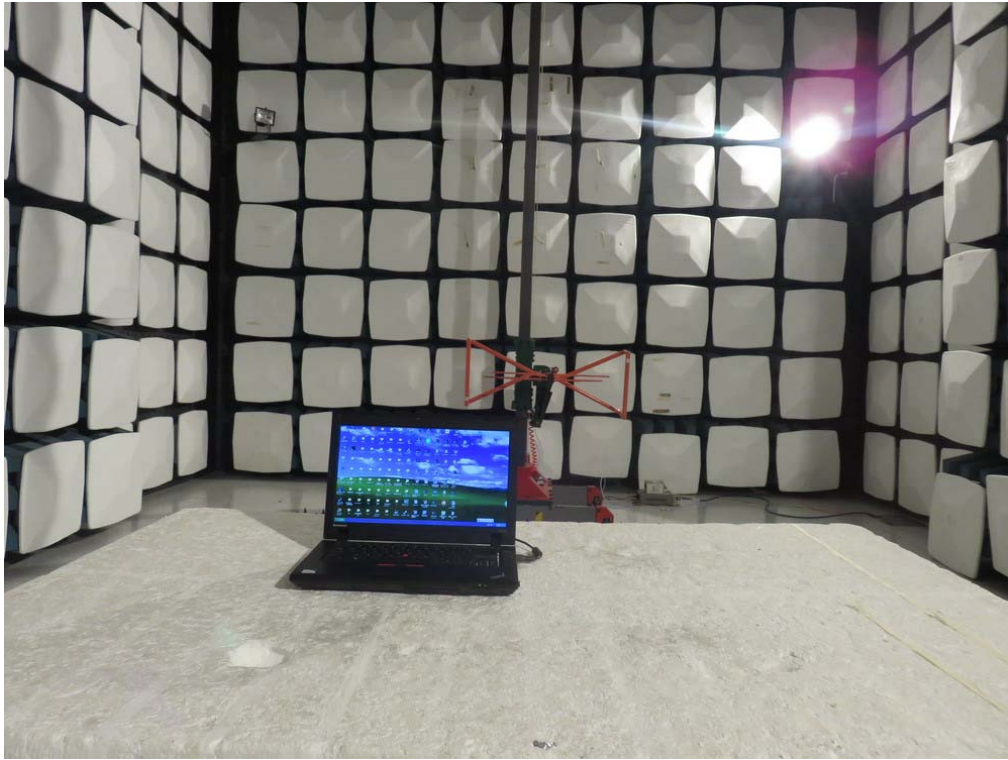
Measurement = Reading + Factor, Over = Measurement – Limit.

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

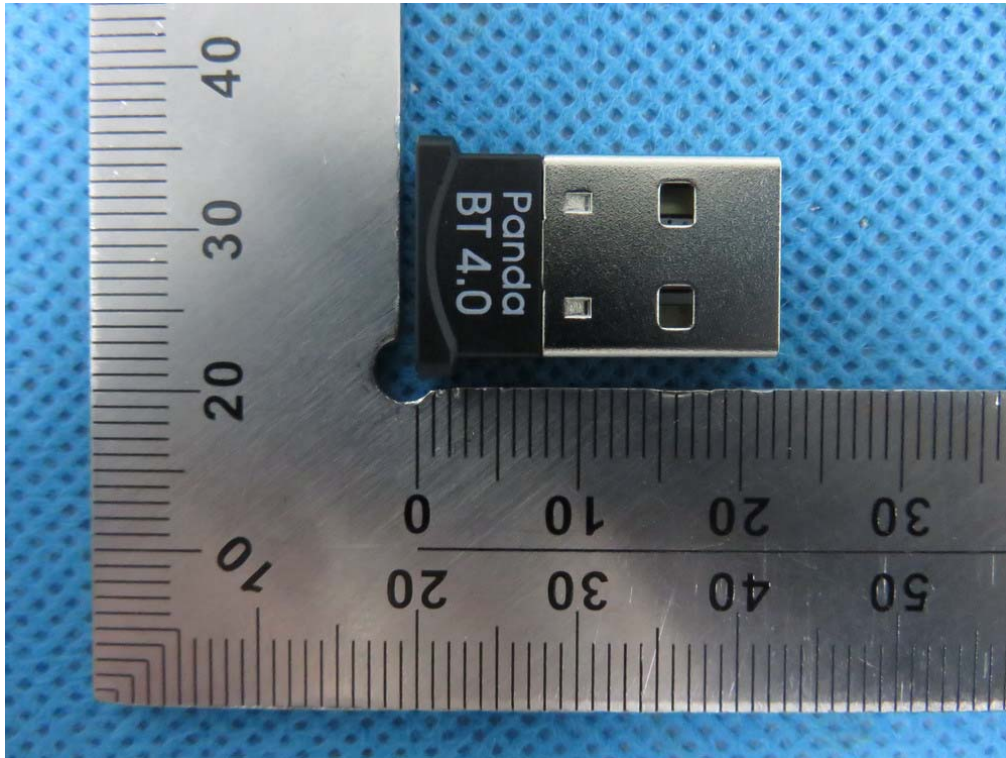


FCC RADIATED EMISSION TEST SETUP

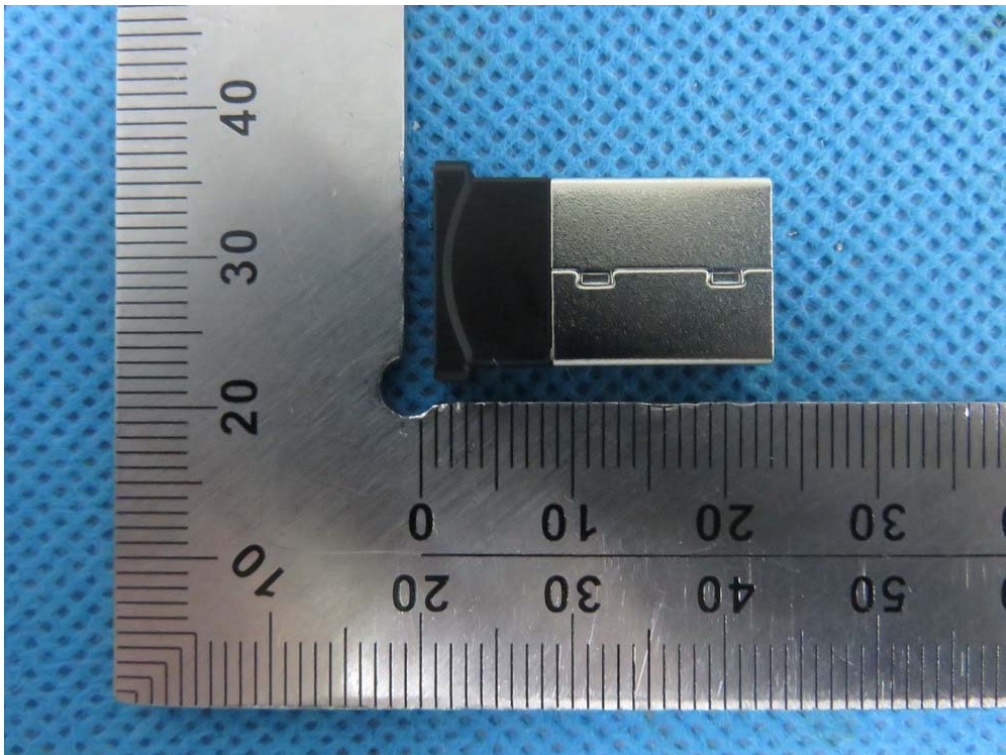


APPENDIX B: PHOTOGRAPHS OF EUT

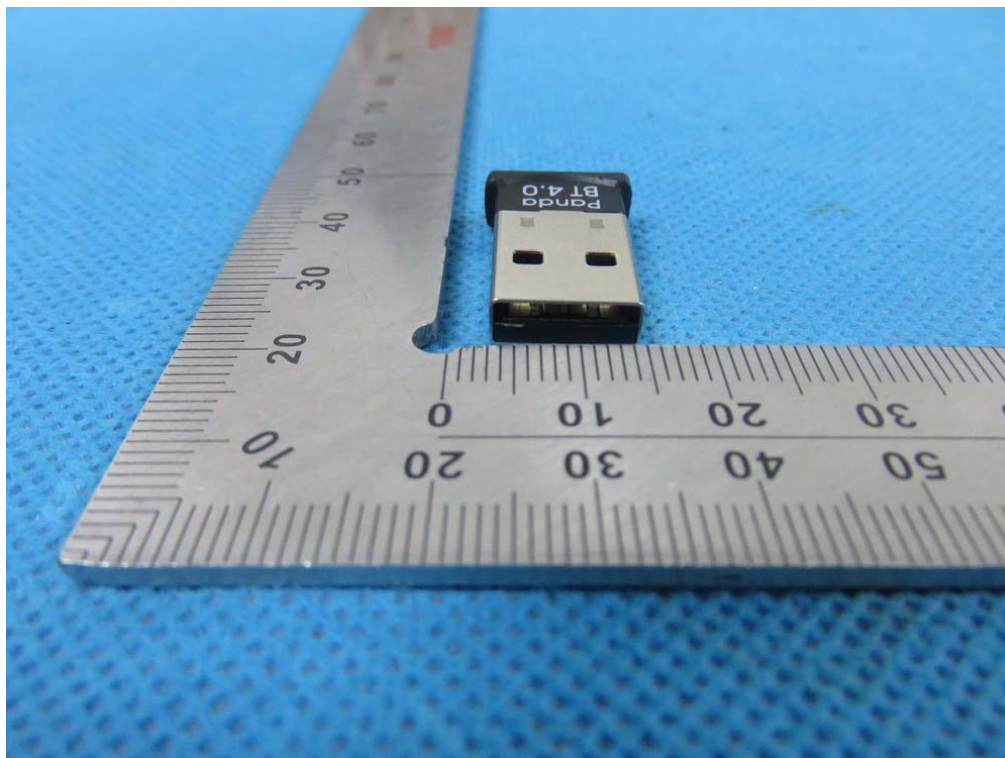
TOP VIEW OF EUT



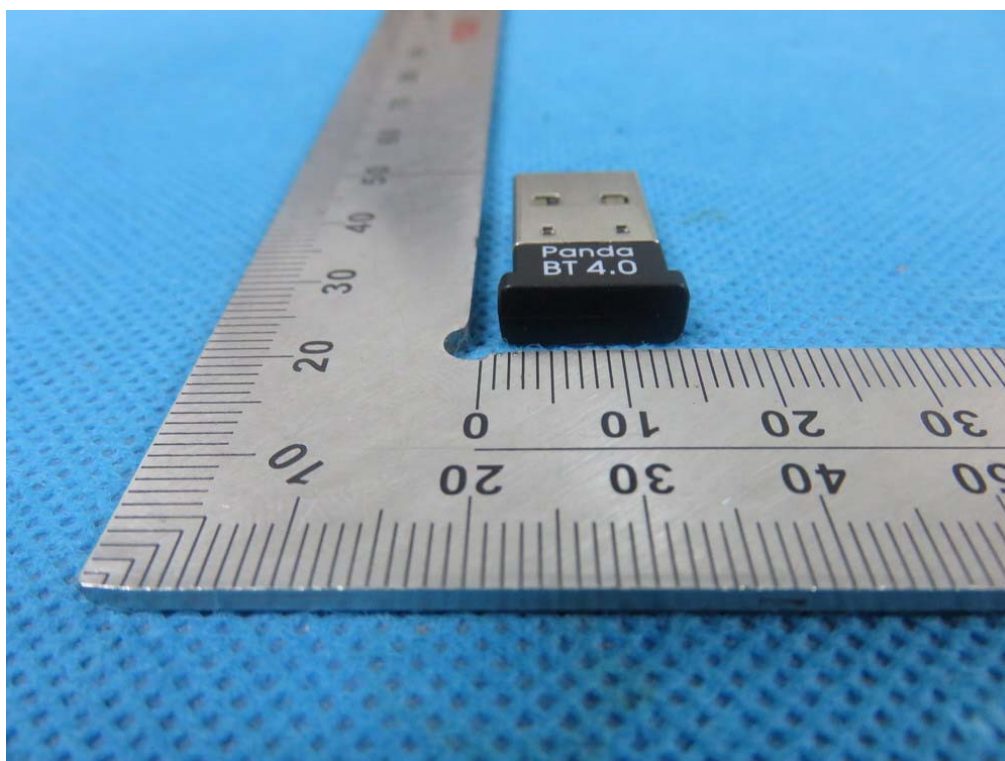
BOTTOM VIEW OF EUT



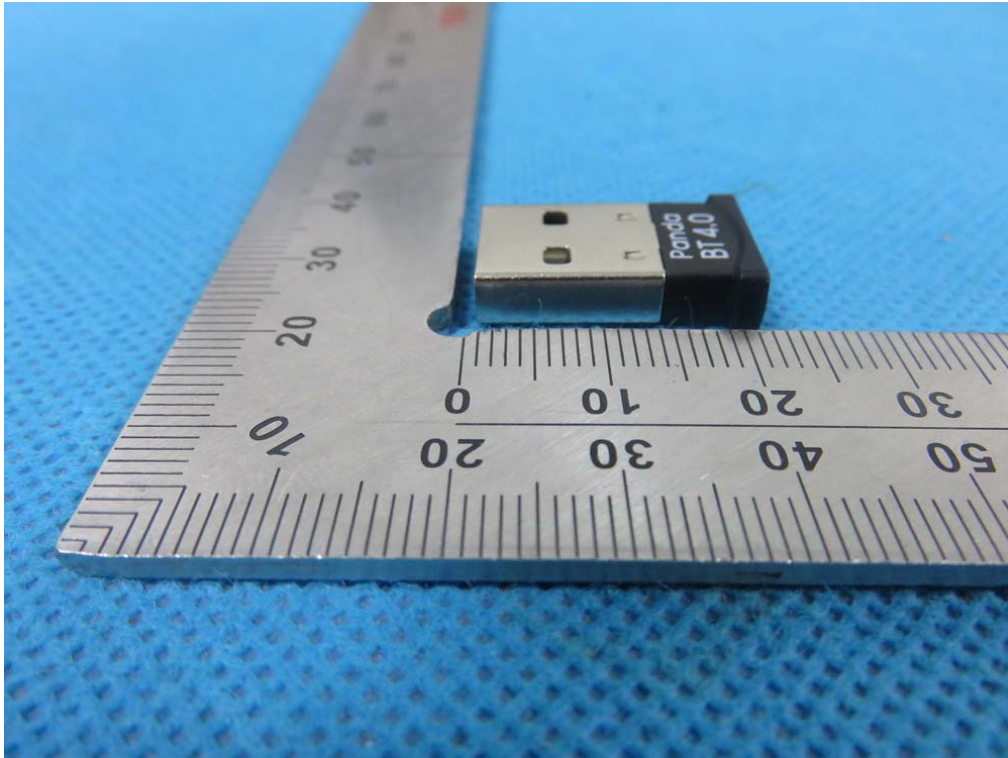
FRONT VIEW OF EUT



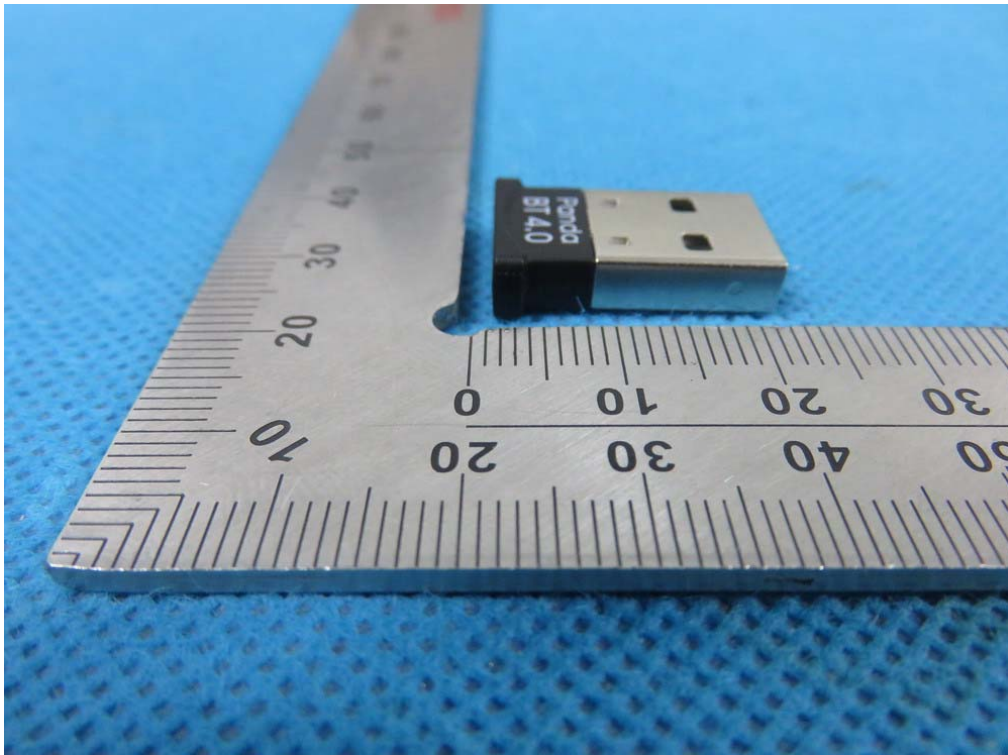
BACK VIEW OF EUT



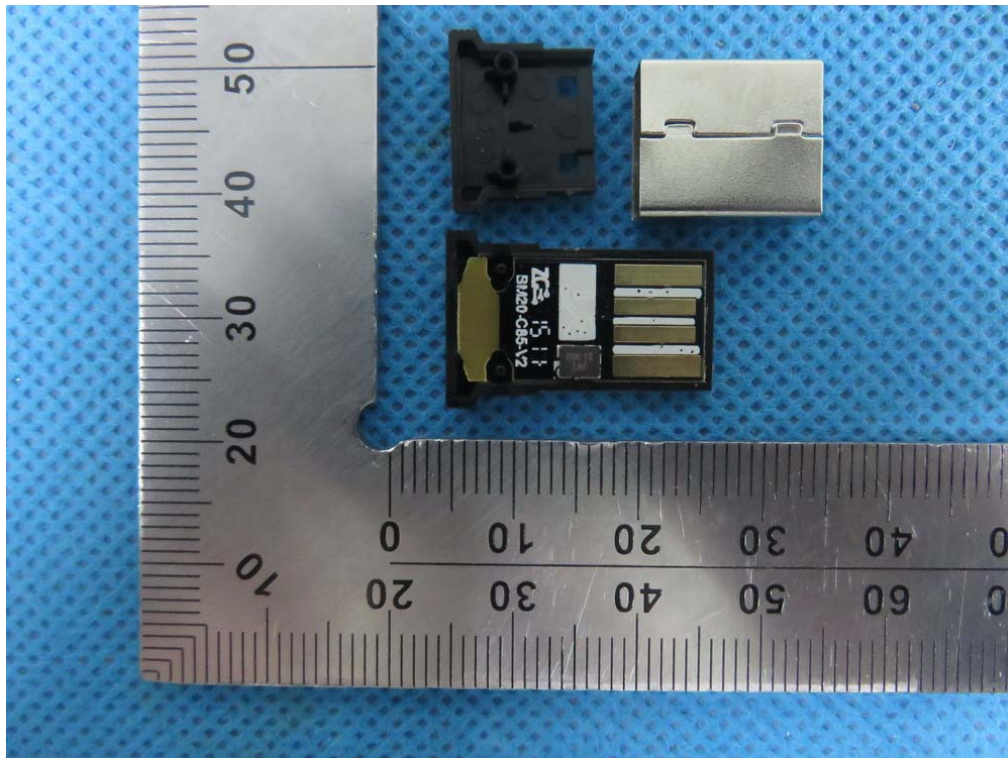
LEFT VIEW OF EUT



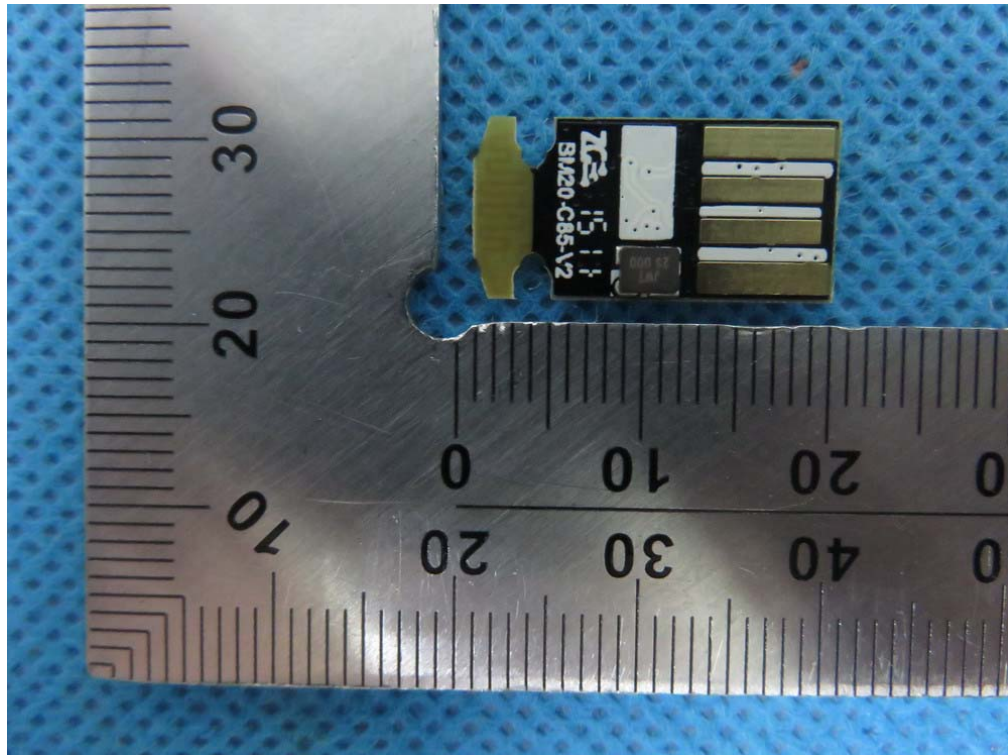
RIGHT VIEW OF EUT



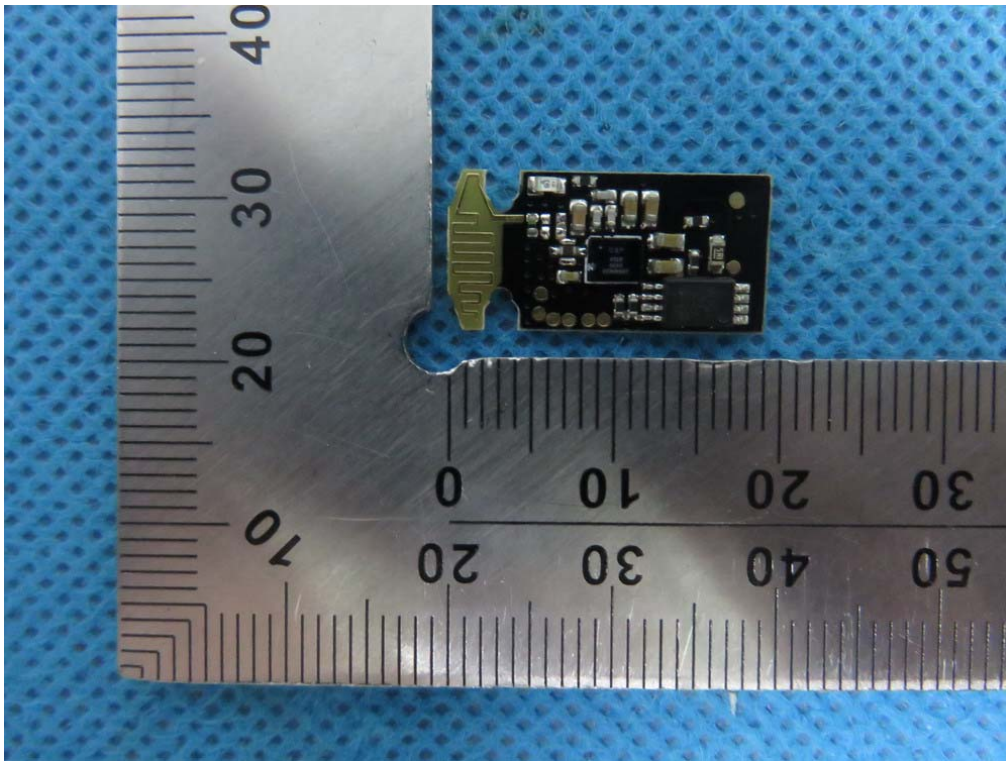
OPEN VIEW OF EUT



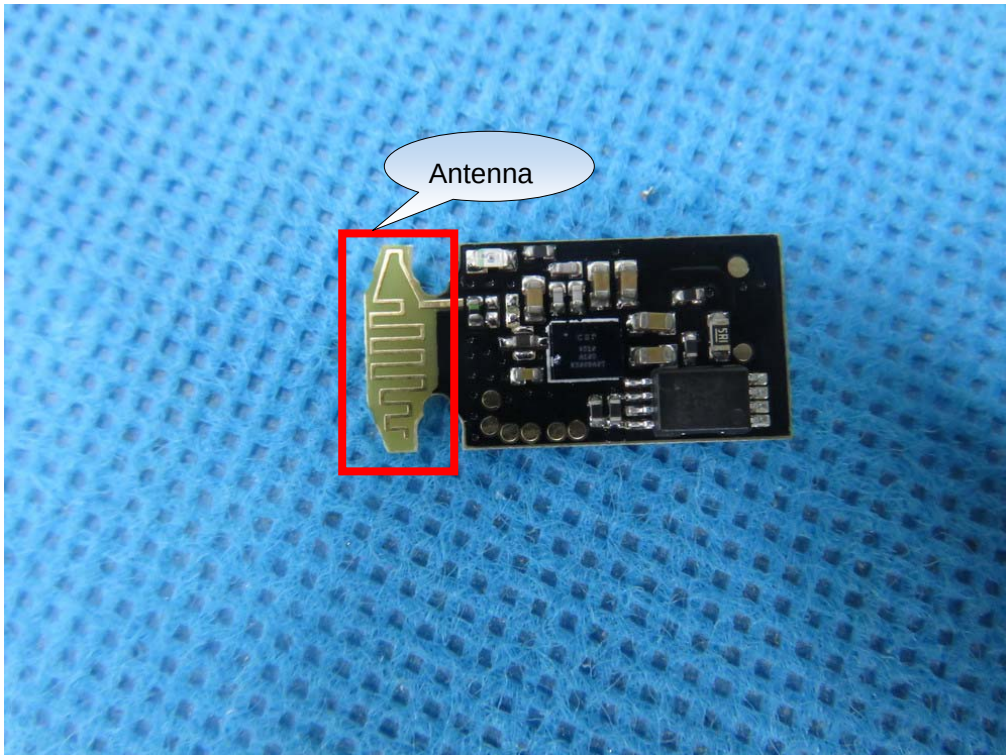
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



----END OF REPORT----