

FCC TEST REPORT

FCC ID : ZBW-YPSIDE4
Applicant : SAFRAN MORPHO
Address : 18, chaussée Jules Cesar OSNY France 95520
Manufacturer : Taiguen Technology (ShenZhen) Co., Ltd.
Address : NO.23, The Third Industrial Park of Xia village, Gongming, Guangming new District, Shenzhen City, Guangdong Province, P.R.China

Equipment Under Test (EUT) :

Product Name : ypsID Token
Model No. : ypsID E4

Standards : FCC CFR47 Part 15 Section 15.225:2010

Date of sample reception : May 06, 2013
Date of Test : May 08~10, 2013
Date of Issue : May 22, 2013

Test Result : **PASS**

Remark:

* The sample described above has been tested to be in compliance with the requirements of ANSI C63.4:2003. The test results have been reviewed and comply with the rules listed above and found to meet their essential requirements.

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District,

Shenzhen 518105, China

Tel: +86-755-83551033

Fax: +86-755-83552400

Compiled by:

Maikou.zhang

Approved by:

Philo Zhong

Maikou.zhang / Project Engineer

Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.205(a) 15.209 15.225	PASS
Conduct Emission	15.207	N/A
Frequency Stability	15.225	PASS
Antenna Requirement	15.203	PASS

3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY.....	2
3 CONTENTS.....	3
4 GENERAL INFORMATION	4
4.1 GENERAL DESCRIPTION OF E.U.T.....	4
4.2 DETAILS OF E.U.T.....	4
4.3 DESCRIPTION OF SUPPORT UNITS.....	4
4.4 TEST FACILITY	4
4.5 TEST LOCATION.....	4
5 EQUIPMENT USED DURING TEST.....	5
5.1 EQUIPMENTS LIST	5
5.2 MEASUREMENT UNCERTAINTY.....	5
5.3 TEST EQUIPMENT CALIBRATION	5
6 RADIATED SPURIOUS EMISSIONS	6
6.1 EUT OPERATION :	6
6.2 TEST SETUP	7
6.3 SPECTRUM ANALYZER SETUP	8
6.4 TEST PROCEDURE.....	8
6.5 CORRECTED AMPLITUDE & MARGIN CALCULATION	8
6.6 SUMMARY OF TEST RESULTS	9
7 FREQUENCY STABILITY MEASUREMENT.....	11
7.1 TEST PROCEDURE.....	11
7.2 TEST RESULT	11
8 20 DB BANDWIDTH MEASUREMENT	12
8.1 TEST PROCEDURE:.....	12
8.2 TEST RESULT:	12
9 ANTENNA REQUIREMENT.....	13
10 PHOTOGRAPHS – TEST SETUP	14
10.1 PHOTOGRAPH – RADIATION SPURIOUS EMISSION TEST SETUP.....	14
11 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS.....	16
11.1 EUT-EXTERNAL VIEW	16
11.2 EUT - INTERNAL VIEW.....	20
12 FCC LABEL	22

4 General Information

4.1 General Description of E.U.T.

Product Name	: ypsID Token
Model No.	: ypsID E4
Operation Frequency	: 13.56MHz
Type of Modulation	: ASK
Oscillator	:Crystal 8MHz
Antenna installation	: PCB Printed Antenna

4.2 Details of E.U.T.

Technical Data	: DC 5V
Adapter	: N/A

4.3 Description of Support Units

No.	Equipment	Manufacturer	Model No.	Serial No
1	Notebook	IBM	2672-39C	99-8D3W4

4.4 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.
Registration 7760A, July 12, 2012.

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) 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 880581, May 26, 2011.

4.5 Test Location

All the tests were performed at:
Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd.,Songgang Street, Baoan District, Shenzhen, China

5 Equipment Used during Test

5.1 Equipments List

3m Semi-anechoic Chamber for Radiation(TDK)						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	Aug.09,2012	Aug.082013
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Aug. 13,2012	Aug. 12,2013
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Apr.20,2013	Apr.19,2014
4	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Apr.07,2013	Apr.06,2014
5	Cable	HUBER+SUHNE R	CBL2	525178	Sep.15,2012	Sep.14,2013

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (9KHz~1000MHz)
	± 4.74 dB (1000M~25000MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.225

Test Method: ANSI C63.4:2003

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
13.553 – 13.567	15,848	30	15,848*100	124
13.567 – 13.710	334	30	334*100	90.5
13.110 – 13.410 13.710 – 14.010	106	30	106*100	80.5

Notes:

- (1) The tighter limit shall apply at the boundary between two frequency range.
- (2) Limitation expressed in dBuV/m is calculated by $20\log$ Emission Level (uV/m).
- (3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $Ld1 = Ld2 * (d2/d1)^2$.

Example:

F.S Limit at 30m distance is 30uV/m , then F.S Limitation at 3m distance is adjusted as $Ld1 = L1 = 30uV/m * (10)^2 = 100 * 30 uV/m$

6.1 EUT Operation :

Operating Environment:

Temperature: 25.5 °C

Humidity: 51 % RH

Atmospheric Pressure:1012 mbar

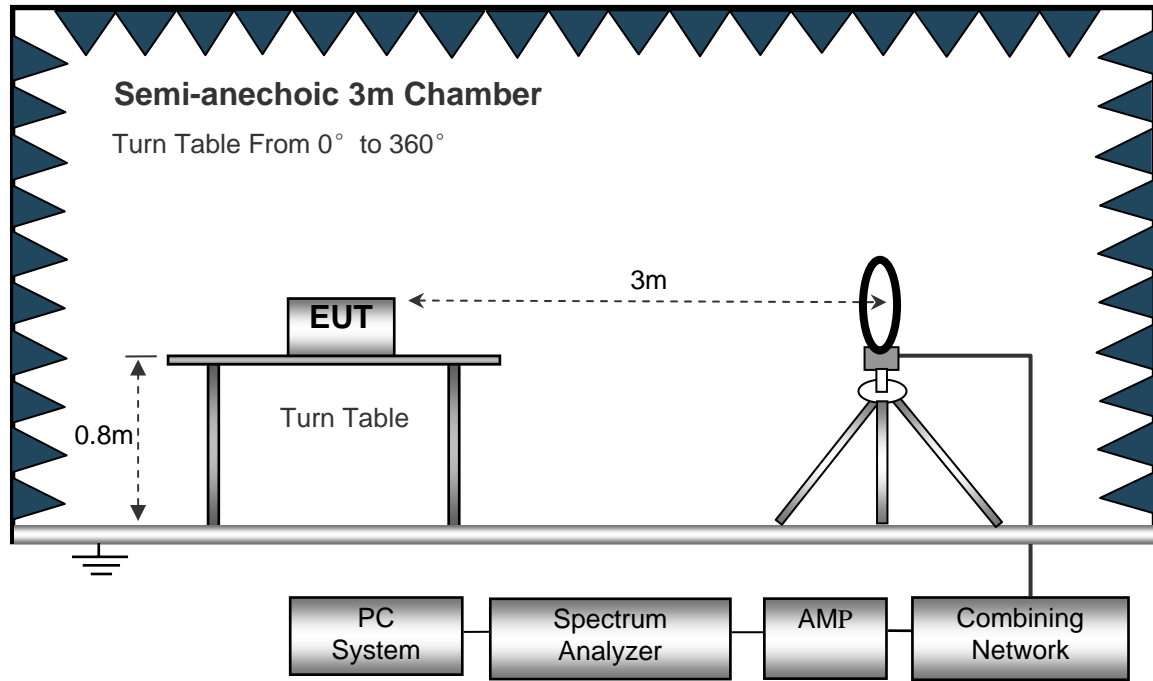
Waltek Services (Shenzhen) Co.,Ltd.

<http://www.waltek.com.cn>

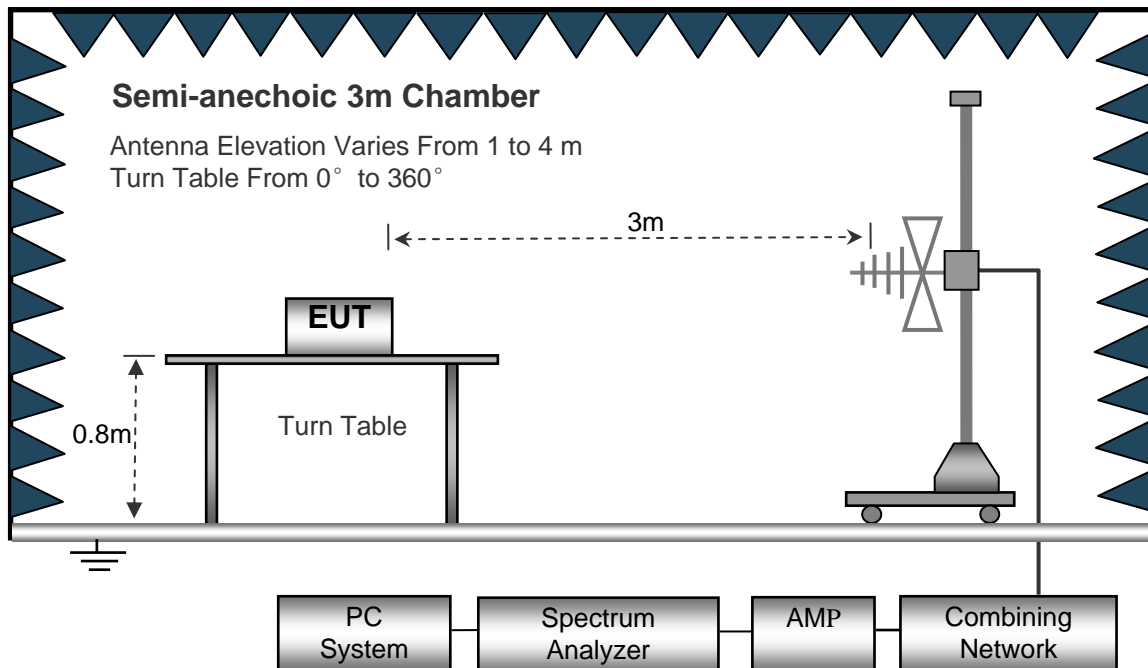
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.

The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



6.3 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested 8MHz to 1000MHz.

Below 30MHz

Sweep SpeedAuto
 IF Bandwidth10KHz
 Video Bandwidth10KHz
 Resolution Bandwidth10KHz

30MHz ~ 1GHz

Sweep SpeedAuto
 IF Bandwidth120 KHz
 Video Bandwidth100KHz
 Quasi-Peak Adapter Bandwidth120 KHz
 Quasi-Peak Adapter ModeNormal
 Resolution Bandwidth100KHz

6.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

6.5 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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 for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

6.6 Summary of Test Results

Test Frequency :Below 30MHz

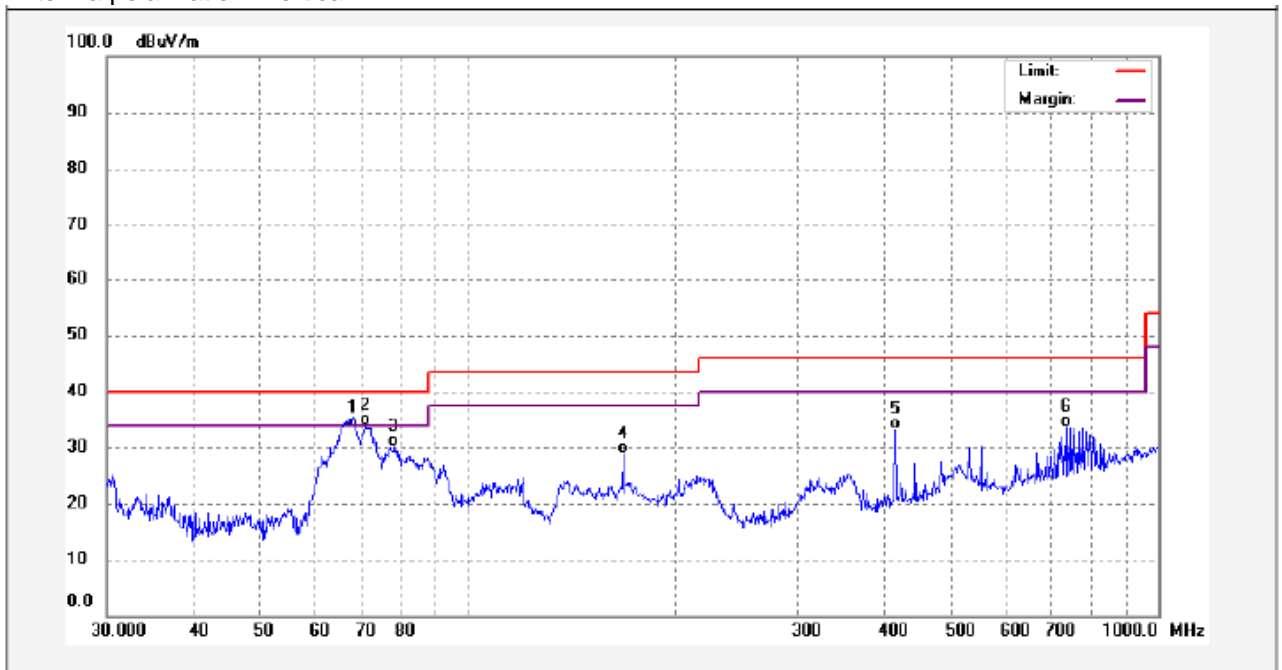
Test mode: continuous transmitting mode

No.	Freq. (MHz)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	0.06	25.25	47.73	112.80	-65.07	Peak	
2	0.27	21.36	40.11	98.99	-58.88	Peak	
3	0.87	19.33	42.57	68.85	-26.28	Peak	
4	1.76	18.68	39.41	68.85	-29.44	Peak	
5	13.56	17.88	53.56	124.00	-70.44	Peak	
6	26.34	16.17	38.86	69.54	-30.68	Peak	

Test Frequency : 30MHz ~ 1000MHz

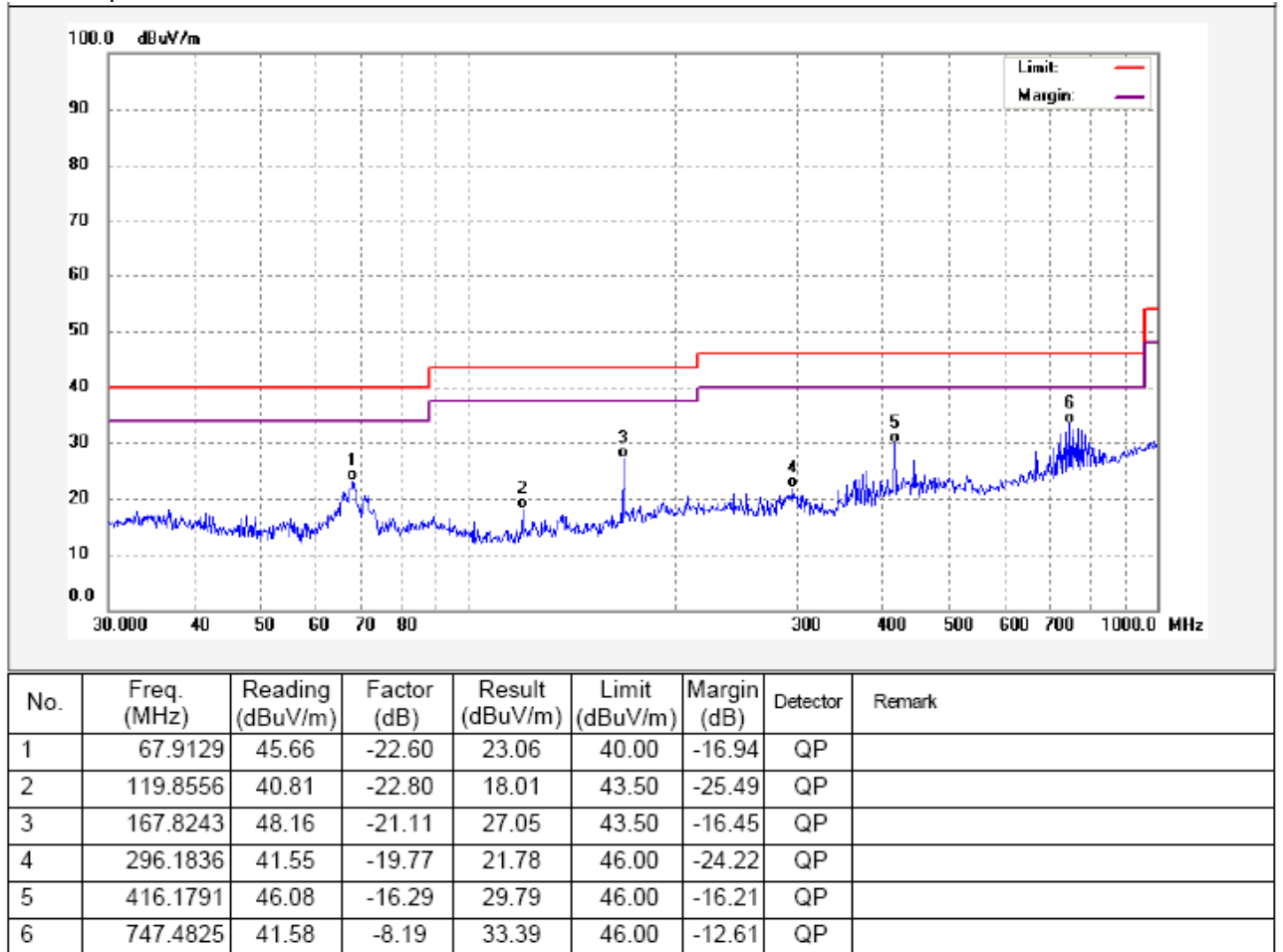
Test mode: continuous transmitting mode

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	68.1514	56.50	-23.22	33.28	40.00	-6.72	QP	
2	71.0803	57.05	-23.26	33.79	40.00	-6.21	QP	
3	78.1389	53.84	-23.60	30.24	40.00	-9.76	QP	
4	167.8243	50.80	-21.83	28.97	43.50	-14.53	QP	
5	416.1791	49.56	-16.32	33.24	46.00	-12.76	QP	
6	737.0714	42.48	-8.81	33.67	46.00	-12.33	QP	

Antenna polarization: Horizontal



7 FREQUENCY STABILITY MEASUREMENT

Test Requirement: FCC Part 15.225

Test Method: ANSI C63.4:2003

Test Status: TX mode.

7.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 10kHz, VBW = 10kHz
3. Put EUT into Humidity Chamber, RF antenna port connect to spectrum.

7.2 Test Result

Frequency Stability Versus Environmental Temperature						
	Temperature (°C)	Voltage (Vac)	Frequency (MHz)	Freq Error (KHz)	Limit (KHz)	Results
	20	120V	13.56160			
0 min	50	120V	13.56168	0.080	+/- 1.356	PASS
	-20	120V	13.56150	-0.100	+/- 1.356	PASS
2 min	50	120V	13.56250	0.900	+/- 1.356	PASS
	-20	120V	13.56070	-0.900	+/- 1.356	PASS
5 min	50	120V	13.56170	0.100	+/- 1.356	PASS
	-20	120V	13.56144	-0.160	+/- 1.356	PASS
10 min	50	120V	13.56165	0.050	+/- 1.356	PASS
	-20	120V	13.56141	-0.190	+/- 1.356	PASS
Frequency Stability Versus Input Voltage						
Temperature (°C)	Voltage (Vac)		Frequency (MHz)	Freq Error (KHz)	Limit (KHz)	Results
20	V-nom	120	13.56160			
20	V-min	102	13.5616	0.003	+/- 1.356	PASS
20	V-max	138	13.5616	0.003	+/- 1.356	PASS

8 20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215
 Test Method: ANSI C63.4:2003
 Test Mode: Test in fixing operating frequency at low, Middle, high channel.

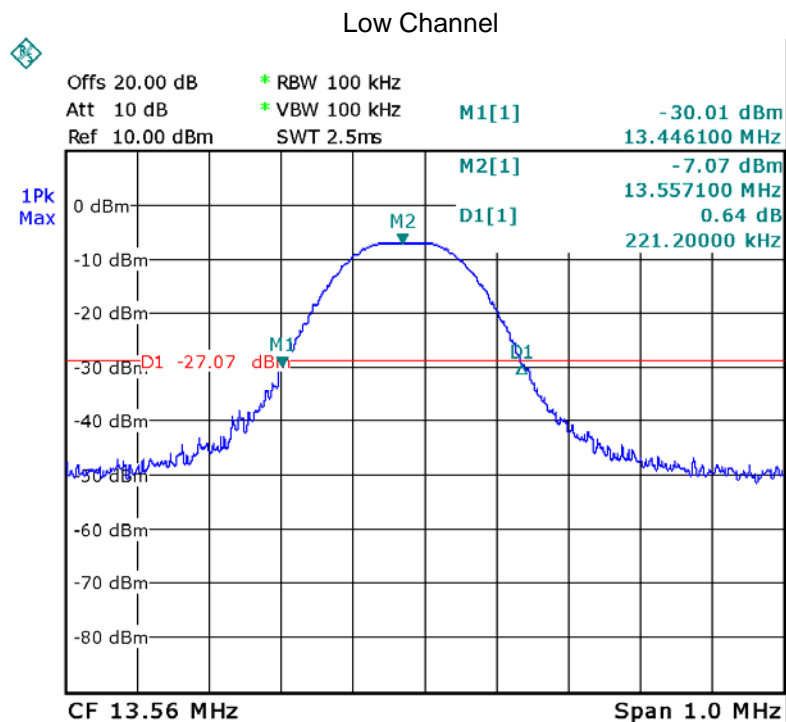
8.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 100kHz

8.2 Test Result:

Test Channel	Bandwidth (kHz)
Centre Channel	221.2kHz

Test result plot as follows:



9 Antenna Requirement

According to the FCC Part 15 Paragraph 15.203, 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. This product has a PCB printed antenna, fulfill the requirement of this section.

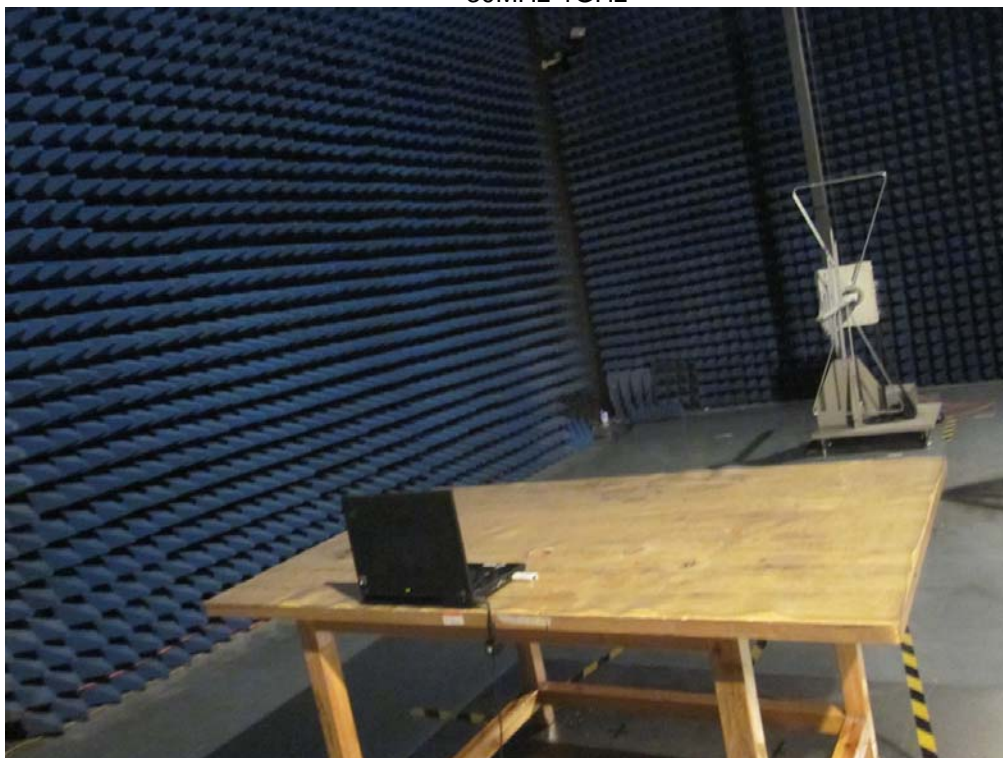
10 Photographs – Test Setup

10.1 Photograph – Radiation Spurious Emission Test Setup

Below 30MHz



30MHz-1GHz



11 Photographs - Constructional Details

11.1 EUT-External View

Green:



Blue:



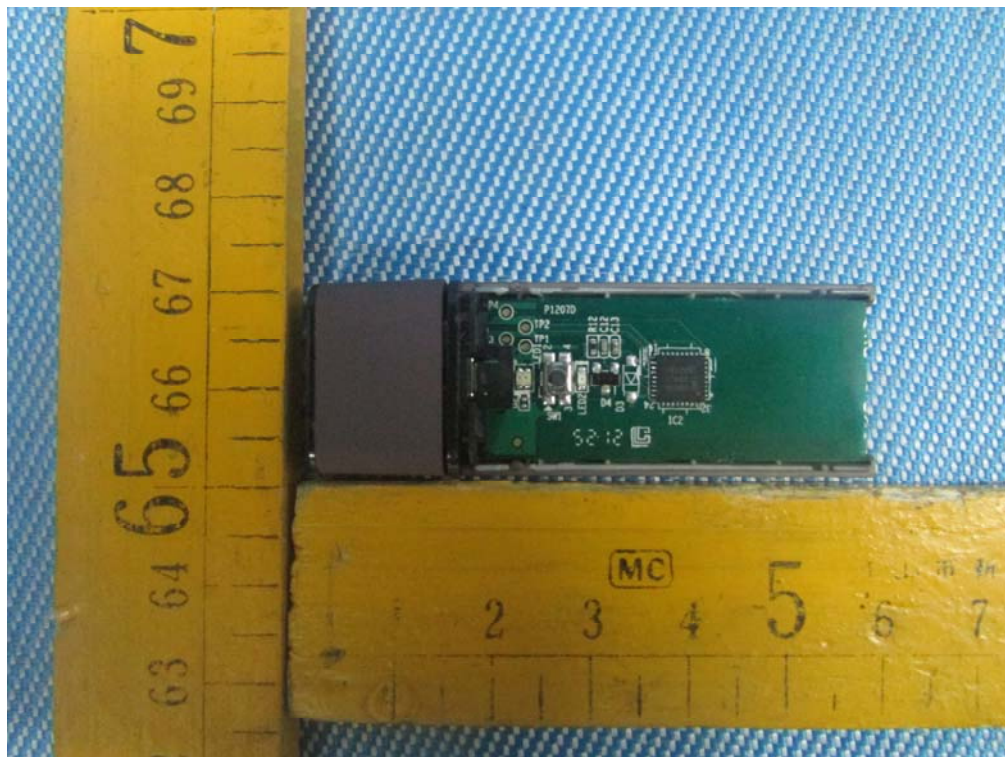
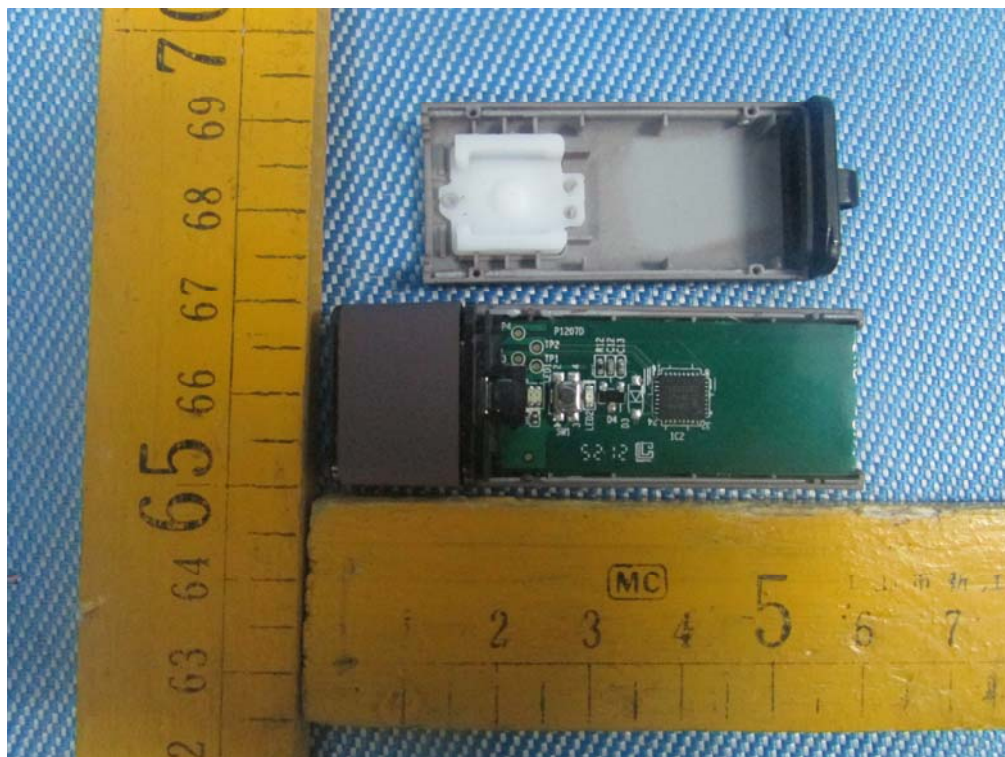
Gray:

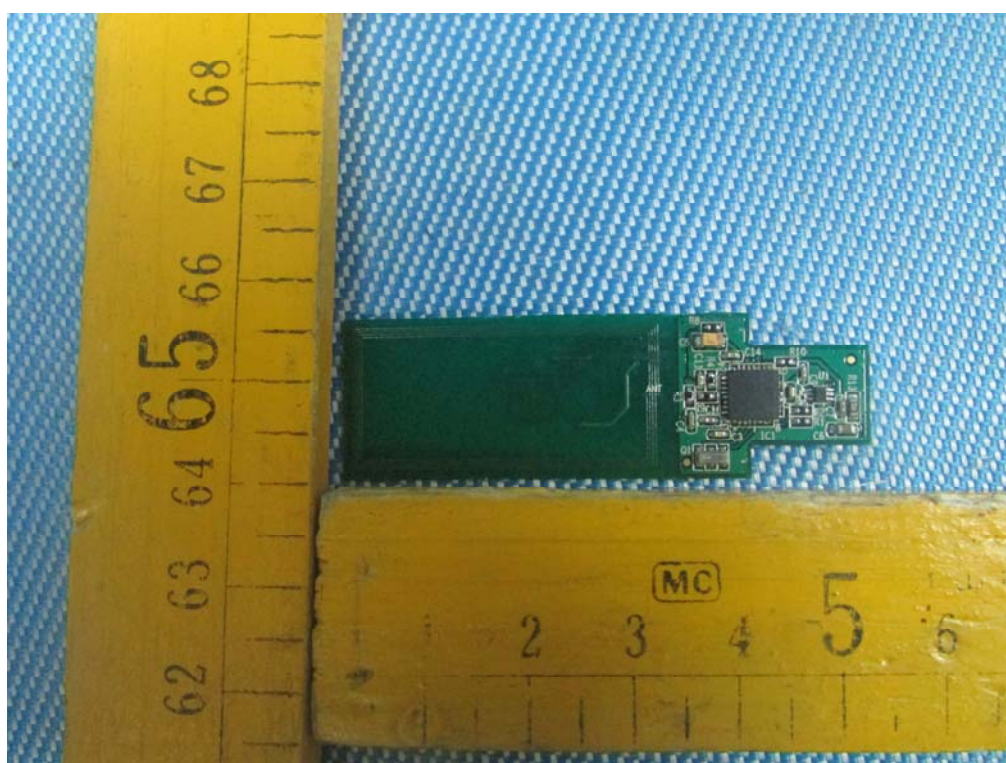
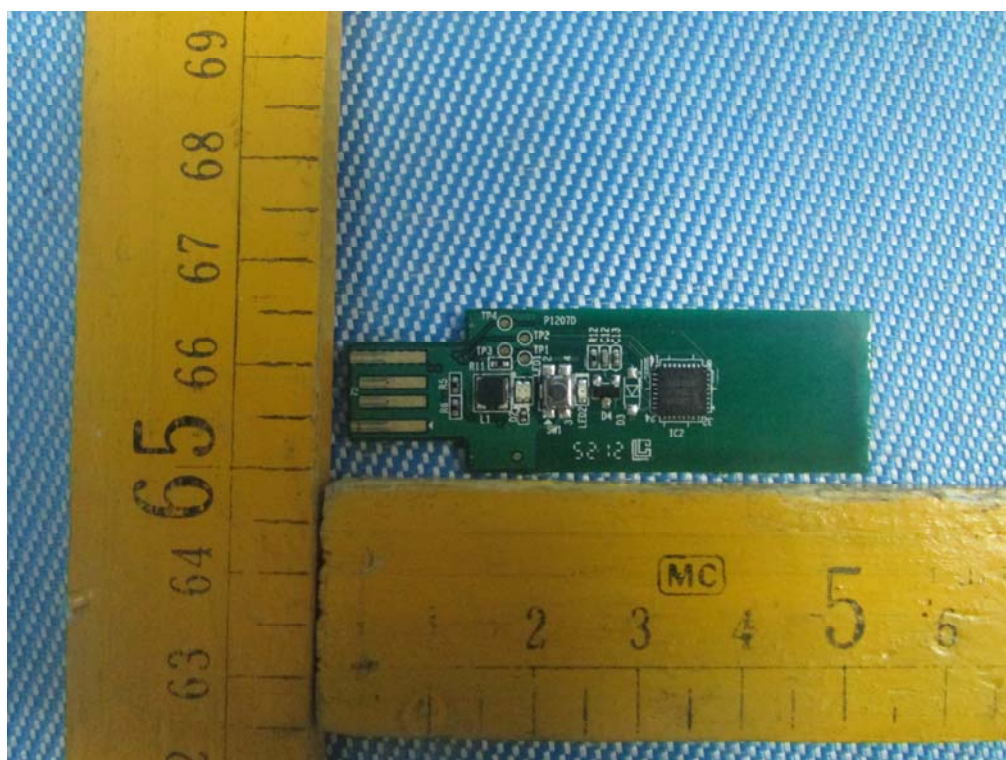






11.2 EUT - Internal View





12 FCC Label

FCC Label Sample for model: ypsID E4

FCC ID: ZBW-YPSIDE4

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

FCC Label Location for model: ypsID E4

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.



=End of report=