



CE Radio Test Report

APPLICANT : Quanta Computer Inc.
EQUIPMENT : Laptop Computer
BRAND NAME : OLPC
MODEL NAME : XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS
STANDARD : ETSI EN 301 893 V1.6.1 (2011-11)
TEST DATE(S) : Jan. 28, 2013 ~ Feb. 16, 2013

The measurements shown in this test report were made in accordance with the procedures given in EUROPEAN COUNCIL DIRECTIVE 1999/5/EC and found to be in compliance with ETSI Standard EN 301 893 V1.6.1 (2011-11).

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
ER2D1707B	Rev. 01	Initial issue of report	Feb. 25, 2013



SUMMARY OF TEST RESULT

CLAUSE (EN 301 893)	TEST PARAMETER	PASS/FAIL	REMARK
Transmitter Parameters			
4.2	Centre Frequencies	PASS	-
4.3	Channel Bandwidth	PASS	-
4.4	RF Output Power, Transmit Power Control (TPC)	N/A	Transmit Power Control (TPC) is not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz.
4.4	Power Density	PASS	-
4.5	Transmitter Spurious Emissions	PASS	Under limit 15.06 dB at 6908.000 MHz
4.7	Dynamic Frequency Selection (DFS)	N/A	Only applicable for device supporting DFS feature
4.8	Medium Access Protocol	PASS	-
4.9	Adaptively (Channel Access Mechanism)	N/A	Only applicable for occupied bandwidth greater than 40MHz
4.10	User Access Restrictions	PASS	-
Receiver Parameters			
4.6	Receiver Spurious Emissions	PASS	Under limit 2.80 dB at 34.590 MHz

N/A: Not Applicable



1. General Description

1.1 Applicant

Quanta Computer Inc.

No.188, Wen Hwa 2nd Rd., Kuei Shan Hsiang, Tao Yuan Shien, TaiWan

1.2 Manufacturer

Quanta Computer Inc.

No.188, Wen Hwa 2nd Rd., Kuei Shan Hsiang, Tao Yuan Shien, TaiWan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Laptop Computer
Brand Name	OLPC
Model Name	XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS
WLAN Module	Trade Name: Liteon Model Name: WCBN603MH
Tx / Rx Frequency Range	5150 MHz ~ 5250 MHz
Maximum EIRP Average Power	802.11a : 13.33 dBm 802.11n HT-20 : 14.17 dBm 802.11n HT-40 : 13.38 dBm
Duty Cycle	802.11a : 100.00% 802.11n HT-20 : 100.00% 802.11n HT-40 : 100.00%
Antenna Type	Monopole Antenna with gain 0.05 dBi
Type of Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

Remark:

- There are four models of this project. The differences between them are summary below:

Sample List	Model Name	Configuration
Sample 1	XO-4 Touch	Child Product with touch screen
Sample 2	XO-4 HS Touch	ITE Product with touch screen
Sample 3	XO-4	Child Product without touch screen
Sample 4	XO-4 HS	ITE Product without touch screen

- For other wireless features of this EUT, test report will be issued separately.
- The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



1.4 Testing Facility

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958
Test Site No.	Sporton Site No. : 05CH01-KS ; TH01-KS

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must complies with the requirements of **ETSI EN 301 893 V1.6.1 (2011-11)**.

Note: All test items were verified and recorded according to the standards and without any deviation during the test.

1.6 Description of Test System

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Shielded, 1.8 m

1.7 Test Condition

Normal Voltage	DC 6.5V
Extreme Voltage	DC 5.0V and DC 7.5V
Normal Temperature	25°C
Extreme Temperature	0°C and 45°C

Note:

1. The manufacturer declared that the EUT could work properly between voltage 5.0 V~7.5V.
2. The test temperature was between 0°C ~ 45°C by manufacturer requested.

2. Test Configuration of Equipment under Test

2.1 RF Power

- a. During testing, the interface cables and equipment positions were varied according to European Standard EN 301 893 v1.6.1 (2011-11).
- b. The complete test system included EUT for RF test.
- c. Preliminary tests were performed in different data rate and recorded the RF power output in the following tables:

Channel	Frequency	5GHz 802.11a RF Power (dBm) (Duty cycle 100.00%)							
		Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 36	5180 MHz	11.90	11.84	11.87	11.87	11.84	11.95	11.54	11.57
CH 48	5240 MHz	13.28	13.13	13.24	13.18	13.08	12.68	12.64	12.59

Channel	Frequency	5GHz 802.11 n HT-20 RF Power (dBm) (Duty cycle 100.00%)							
		Data Rate							
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 36	5180 MHz	13.31	13.27	13.04	12.98	13.04	13.09	13.07	13.02
CH 48	5240 MHz	13.08	13.04	12.98	12.88	12.97	12.78	12.68	12.64

Channel	Frequency	5GHz 802.11 n HT-40 RF Power (dBm) (Duty cycle 100.00%)							
		Data Rate							
		13.5 Mbps	27 Mbps	40.5 Mbps	54 Mbps	81 Mbps	108 Mbps	121.5 Mbps	135 Mbps
CH 38	5190 MHz	13.17	13.11	13.12	13.08	13.12	13.11	13.14	13.09
CH 46	5230 MHz	12.98	12.93	12.94	12.84	12.72	12.68	12.64	12.62

- d. All the test data for each data rate were verified, but only the worst case was reported.
- e. The data rates were set in 6Mbps for 802.11a, 6.5Mbps for 802.11n HT-20, and 13.5Mbps for 802.11n HT-40 with both antennas transmit due to the highest RF output power.

2.2 Test Mode

Frequency range of radiated and conducted emission was investigated from 30 MHz to 26.5 GHz.

Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases and recorded in this report.

Test Modes	
RF	802.11a (5150 MHz ~ 5250 MHz) OFDM
Tx	Mode 1: 802.11a CH48 (5240MHz) in Laptop Mode with Adapter 1 for Sample 1
Rx	Mode 1: 802.11a CH48 (5240MHz) in Laptop Mode with Adapter 1 for Sample 1

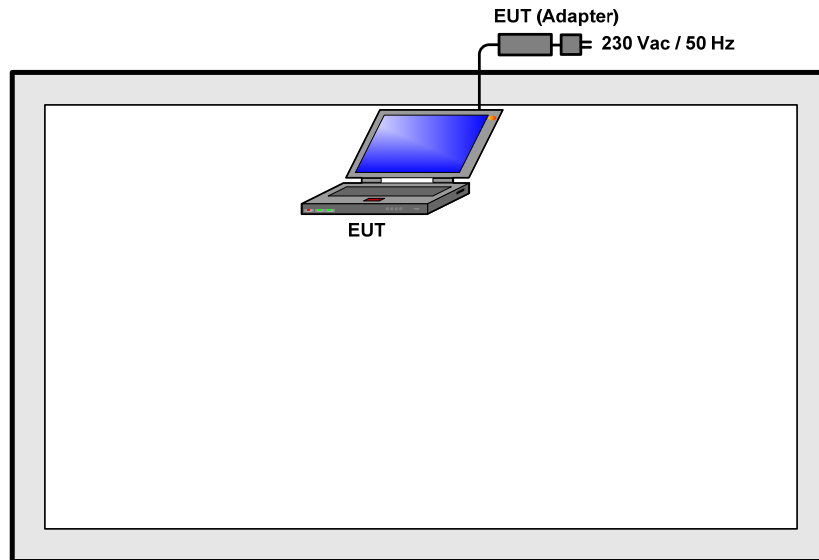
Test Modes	
RF	802.11n HT-20 (5150 MHz ~ 5250 MHz) OFDM
Tx	Mode 2: 802.11n HT-20 CH36 (5180MHz) in Laptop Mode with Adapter 1 for Sample 1 Mode 3: 802.11n HT-20 CH36 (5180MHz) in Tablet Mode with Adapter 1 for Sample 1 Mode 4: 802.11n HT-20 CH36 (5180MHz) in Laptop Mode with Adapter 2 for Sample 2 Mode 5: 802.11n HT-20 CH36 (5180MHz) in Laptop Mode with Adapter 3 for Sample 3 Mode 6: 802.11n HT-20 CH36 (5180MHz) in Laptop Mode with Adapter 4 for Sample 4
Rx	Mode 2: 802.11n HT-20 CH36 (5180MHz) in Laptop Mode with Adapter 1 for Sample 1 Mode 3: 802.11n HT-20 CH36 (5180MHz) in Tablet Mode with Adapter 1 for Sample 1

Test Modes	
RF	802.11n HT-40 (5160 MHz ~ 5240 MHz) OFDM
Tx	Mode 7: 802.11n HT-40 CH38 (5190MHz) in Laptop Mode with Adapter 1 for Sample 1
Rx	Mode 4: 802.11n HT-40 CH38 (5190MHz) in Laptop Mode with Adapter 1 for Sample 1

Remark:

1. The worse cases of the Transmitter Radiated Spurious Emission (RSE) were 802.11a CH48 (in Laptop Mode with Adapter 1 for Sample 1), 802.11n HT-20 CH36 (in Laptop Mode with Adapter 1 for Sample 1), and 802.11n HT-40 CH38 (in Laptop Mode with Adapter 1 for Sample 1); only the test data of these modes were reported.
2. The Receiver Radiated Spurious Emission (RSE) is not obviously related to the different modulation, so only the data of the worst case of 802.11a CH48 (in Laptop Mode with Adapter 1 for Sample 1) was reported.

2.3 Connection Diagram of Test System



2.4 Test Software

Turn on "Terminal" program under Linux system, the EUT will get into the engineering modes; then, entry instruction under cmd program in the notebook, the EUT will contact with WLAN AP for continuous transmitting and receiving signals.

3. Transmitter Parameters

3.1 Centre Frequencies

3.1.1 Limit of Centre Frequencies

SUBCLAUSE 4.2.2	
TEST CONDITION	LIMIT
Under all test conditions	$f_c \pm 20 \text{ ppm.}$

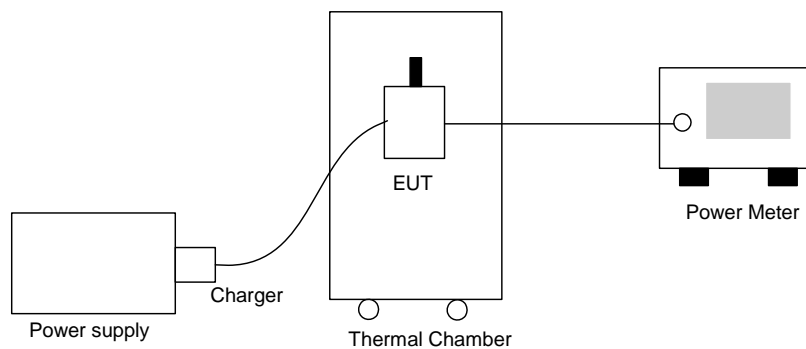
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

1. Placing the EUT in thermal chamber.
2. The transmitter output port was connected to the spectrum analyzer.
3. Connecting the charger to power supply.
4. The settings on spectrum analyzer are 100 KHz RBW and 100 KHz VBW.
5. Setting thermal chamber temperature and power supply voltage at suitable value.
6. Recording f_L or f_H according subclause 5.3.2.
7. Repeating step 5 and 6 at different conditions and different channel.

3.1.4 Test Setup





3.1.5 Test Results

EUT Mode :	802.11a (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%

TEST CONDITIONS				Measured Frequency (MHz)	
				CH 36 5180MHz	CH 48 5240MHz
T nom (°C)	25	V nom (V)	6.5	5179.96	5239.96
T min (°C)	0	V max (V)	7.5	5180.04	5240.04
		V min (V)	5.0	5180.04	5240.04
T max (°C)	45	V max (V)	7.5	5179.96	5239.96
		V min (V)	5.0	5179.96	5239.96
Max. Deviation (MHz)				5180.04	5240.04
Max. Deviation (ppm)				7.72	7.63

EUT Mode :	802.11n HT-20 (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%

TEST CONDITIONS				Measured Frequency (MHz)	
				CH 36 5180MHz	CH 48 5240MHz
T nom (°C)	25	V nom (V)	6.5	5180.00	5240.00
T min (°C)	0	V max (V)	7.5	5180.04	5240.04
		V min (V)	5.0	5180.04	5240.04
T max (°C)	45	V max (V)	7.5	5180.00	5239.96
		V min (V)	5.0	5180.00	5240.00
Max. Deviation (MHz)				5180.04	5240.04
Max. Deviation (ppm)				7.72	7.63



EUT Mode :	802.11n HT-40 (5160 MHz ~ 5240 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%

TEST CONDITIONS				Measured Frequency (MHz)	
				CH 38 5190MHz	CH 46 5230MHz
T nom (°C)	25	V nom (V)	6.5	5190.00	5230.00
T min (°C)	0	V max (V)	7.5	5190.00	5230.08
		V min (V)	5.0	5189.96	5230.00
T max (°C)	45	V max (V)	7.5	5190.00	5229.96
		V min (V)	5.0	5190.00	5229.96
Max. Deviation (MHz)				5190.00	5230.08
Max. Deviation (ppm)				-7.71	15.30

3.2 Nominal Channel Bandwidth and Occupied Channel Bandwidth

3.2.1 Limit of channel bandwidth

SUBCLAUSE 4.3.2	
TEST CONDITION	LIMIT
Under all test conditions	Nominal Channel Bandwidth: shall be at least 5 MHz at all times Occupied Channel Bandwidth: 80%~ 100% of the declared nominal channel bandwidth

Note: The During an established communication, a device is allowed to operate temporarily in a mode where its Occupied Channel Bandwidth may be reduced to as low as 40 % of its Nominal Channel Bandwidth with a minimum of 4 MHz.

3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedure

1. The transmitter output port was connected to the spectrum analyzer.
2. The settings on spectrum analyzer are 100 KHz RBW and 300 KHz VBW.
3. Recording the occupied bandwidth for each channel.

3.2.4 Test Setup



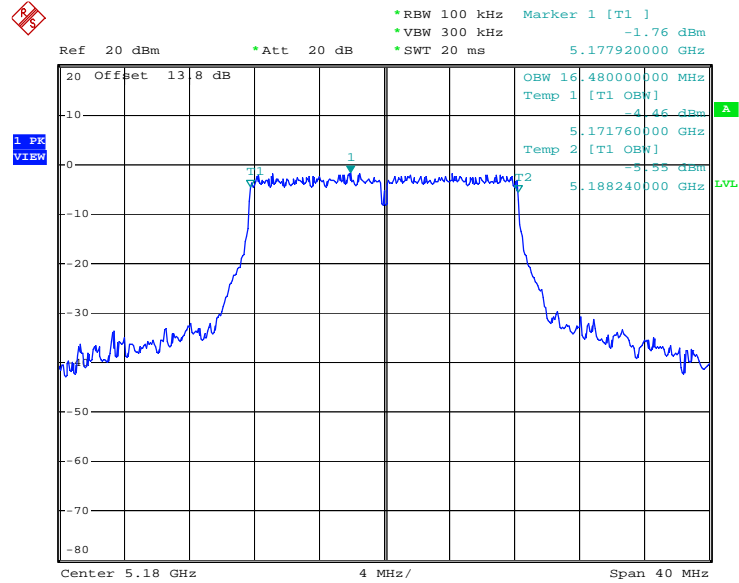


3.2.5 Test Results

EUT Mode :	802.11a (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%

Channel	Measured Frequency (MHz)	Occupied Channel Bandwidth (MHz)	Limit (MHz)
CH 36	5180MHz	16.48	16~20
CH 48	5240MHz	16.48	16~20

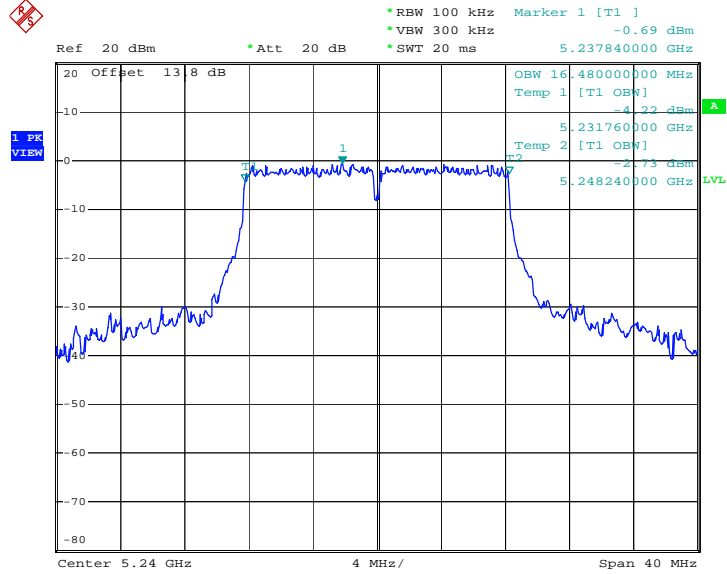
Plot on Channel CH36 5180MHz



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Plot on Channel CH48 5240MHz



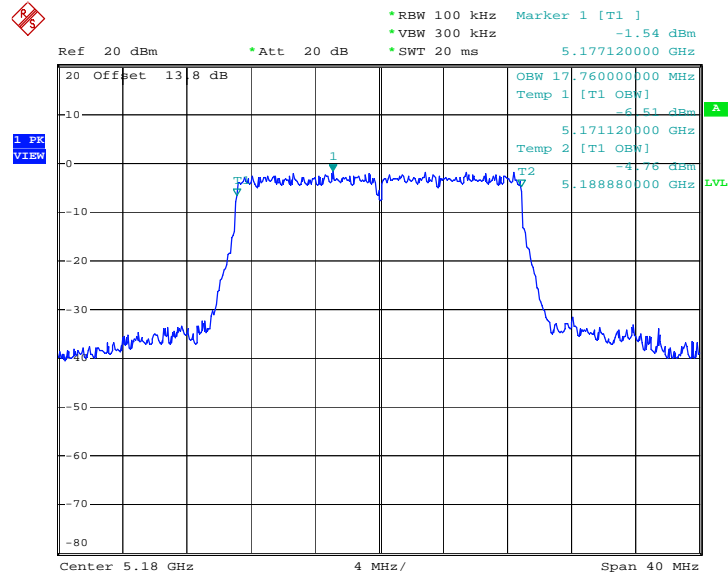
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EUT Mode :	802.11n HT-20 (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%

Channel	Measured Frequency (MHz)	Occupied Channel Bandwidth (MHz)	Limit (MHz)
CH 36	5180MHz	17.76	16~20
CH 48	5240MHz	17.76	16~20

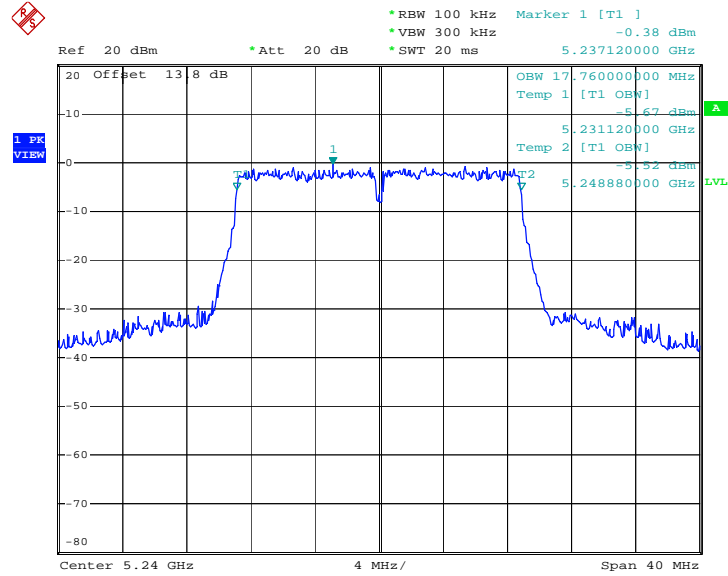
Plot on Channel CH36 5180MHz



Date: 28.JAN.2013 19:53:02



Plot on Channel CH48 5240MHz



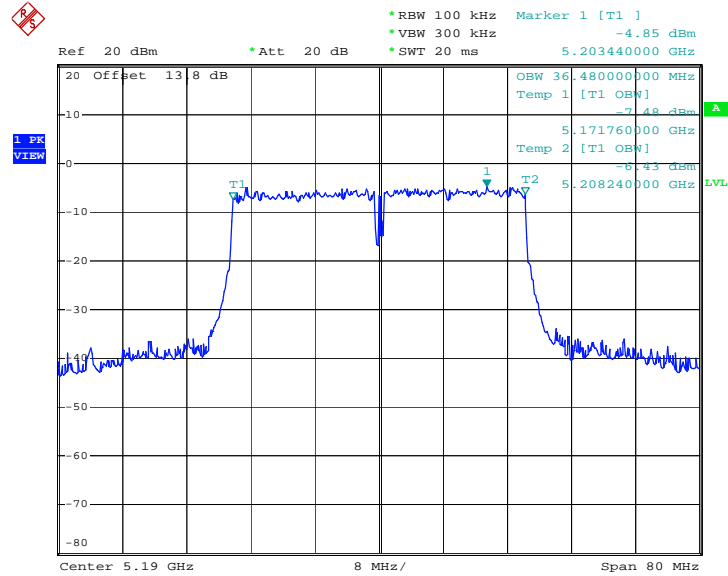
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EUT Mode :	802.11n HT-40 (5160 MHz ~ 5240 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%

Channel	Measured Frequency (MHz)	Occupied Channel Bandwidth (MHz)	Limit (MHz)
CH 38	5190MHz	36.48	32~40
CH 46	5230MHz	36.32	32~40

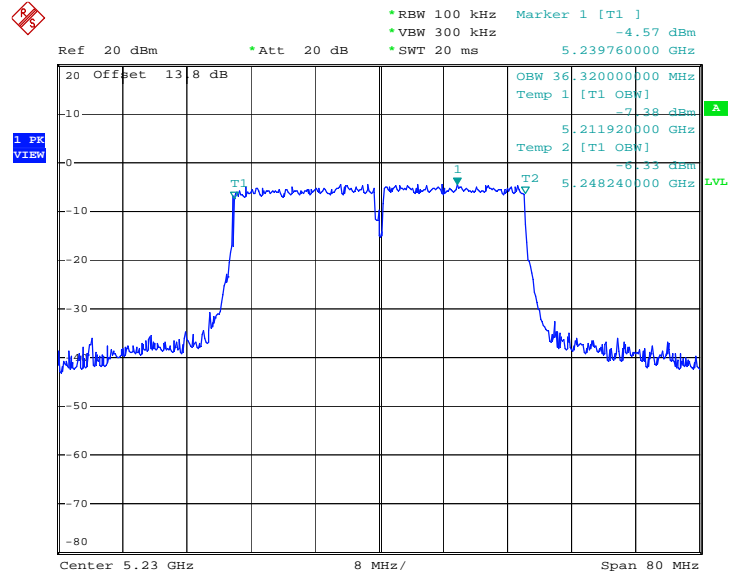
Plot on Channel CH 38 5190MHz



Date: 28.JAN.2013 19:59:02



Plot on Channel CH 46 5230MHz



Date: 28.JAN.2013 20:00:13

3.3 RF Output Power

3.3.1 Limit of RF Output Power

SUBCLAUSE 4.4.2	
FREQUENCY RANGE	LIMIT
5150 MHz to 5350 MHz	20 / 23 dBm (see note)
5470 MHz to 5725 MHz	20 dBm

Note: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 23 dBm.

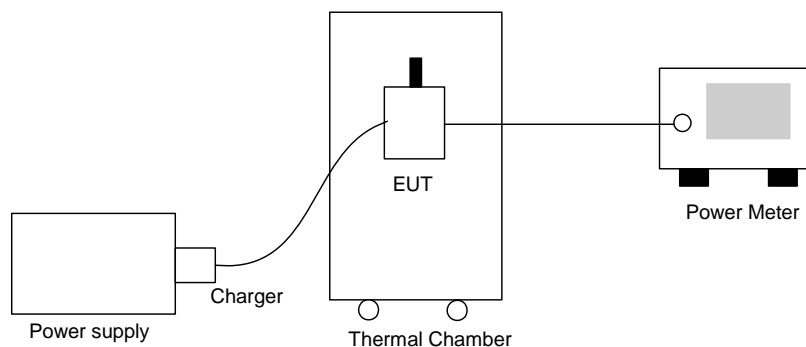
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedure

1. Placing the EUT in thermal chamber.
2. The transmitter output port was connected to the power meter.
3. Connecting the charger to power supply.
4. Setting thermal chamber temperature and power supply voltage at suitable value.
5. The conducted power is equal to the reading on power meter plus cable loss.
6. The EIRP is equal to the conducted power plus the antenna gain.
7. Repeating step 4 to 6 at different condition and different channel.

3.3.4 Test Setup





3.3.5 Test Results

EUT Mode :	802.11a (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05dBi	Duty Cycle :	100.00%
Cable loss	13.80dB	Duty Factor :	0.00dB

TEST CONDITIONS				TRANSMITTER POWER EIRP (AVERAGE)		Limit (dBm)
				(dBm)		
				CH 36 5180MHz	CH48 5240MHz	
T nom (°C)	25	V nom(V)	6.5	11.95	13.33	<23dBm
T min (°C)	0	V max(V)	7.5	12.83	13.19	
		V min(V)	5.0	12.82	13.14	
T max (°C)	45	V max(V)	7.5	12.06	13.26	
		V min(V)	5.0	12.04	13.23	

Note:

Measured average power has offset cable loss and duty factor.

For example: cable loss = 13.80 dB, Duty Factor = 0.00 dB, and antenna gain = 0.05 dBi at Ch36, 5180MHz,
 $EIRP = 11.90 \text{ dBm (measured average power)} + 0.05 \text{ dBi (antenna gain)} = 11.95 \text{ dBm}$

EUT Mode :	802.11n HT-20 (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05dBi	Duty Cycle :	100.00%
Cable loss	13.80dB	Duty Factor :	0.00dB

TEST CONDITIONS				TRANSMITTER POWER EIRP (AVERAGE)		Limit (dBm)
				(dBm)		
				CH 36 5180MHz	CH48 5240MHz	
T nom (°C)	25	V nom(V)	6.5	13.36	13.13	<23dBm
T min (°C)	0	V max(V)	7.5	13.17	14.17	
		V min(V)	5.0	13.13	14.14	
T max (°C)	45	V max(V)	7.5	13.26	13.37	
		V min(V)	5.0	13.23	13.39	



EUT Mode :	802.11n HT-40 (5160 MHz ~ 5240 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05dBi	Duty Cycle :	100.00%
Cable loss	13.80dB	Duty Factor :	0.00dB

TEST CONDITIONS				TRANSMITTER POWER EIRP (AVERAGE)		Limit (dBm)
				(dBm)		
				CH 38 5190MHz	CH 46 5230MHz	
T nom (°C)	25	V nom(V)	6.5	13.22	12.99	<23dBm
T min (°C)	0	V max(V)	7.5	12.56	13.38	
		V min(V)	5.0	12.60	13.33	
T max (°C)	45	V max(V)	7.5	12.94	13.31	
		V min(V)	5.0	12.96	13.29	

3.4 Power Density

3.4.1 Limit of Power Density

SUBCLAUSE 4.4.2	
FREQUENCY RANGE	LIMIT
5150 MHz to 5350 MHz	7 / 10 dBm/MHz (see note)
5470 MHz to 5725 MHz	7 dBm/MHz

Note: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 10 dBm/MHz.

3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

For equipment that can be configured to operate in a continuous transmit mode or with a constant duty cycle(x):

Step 1:

Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test
- Resolution BW: 1 MHz
- Video BW: 3 MHz
- Frequency Span: 2 × Nominal Bandwidth (e.g. 40 MHz for a 20 MHz channel)
- Detector Mode: Peak
- Trace Mode: Max Hold

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

Make the following changes to the settings of the spectrum analyzer:

- Centre Frequency: Equal to the frequency recorded in step 2
- Frequency Span: 3 MHz
- Resolution BW: 1 MHz
- Video BW: 3 MHz
- Sweep Time: 1 minute
- Detector Mode: RMS
- Trace Mode: Max Hold

Step 4:

When the trace is complete, the trace shall be captured using the "Hold" or "View" option on the spectrum analyzer.

Find the peak value of the trace and place the analyzer marker on this peak. This level is recorded as the highest mean power (power density) D in a 1 MHz band.

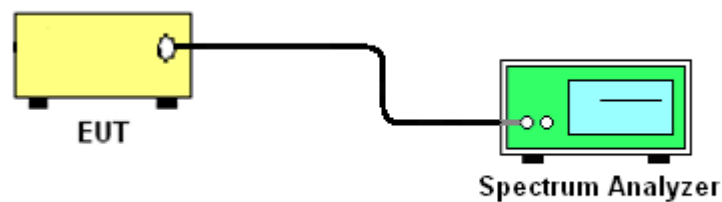
Alternatively, where a spectrum analyzer is equipped with a function to measure spectral power density, this function may be used to display the power density D in dBm/MHz.

In case of conducted measurements on smart antenna systems operating in a mode with multiple transmit chains active simultaneously, the power density of each transmit chain shall be measured separately to calculate the total power density (value "D" in dBm/MHz) for the UUT.

Step 5:

The maximum spectral power density e.i.r.p. is calculated from the above measured power density (D), the observed duty cycle x, the applicable antenna assembly gain "G" in dBi and if applicable the beamforming gain "Y" in dB, according to the formula below. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the highest gain shall be used.

$$PD = D + G + Y + 10 \log (1/x).$$

3.4.4 Test Setup



3.4.5 Test Results

EUT Mode :	802.11a (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05dBi	Duty Cycle :	100.00%
Cable loss	13.80dB	Duty Factor :	0.00dB

Channel	Measured Frequency (MHz)	Conducted Power Density (dBm/MHz)	EIRP Density (dBm/MHz)	Limit (dBm/MHz)
CH 36	5180MHz	0.59	0.64	10
CH 48	5240MHz	1.83	1.88	10

Note:

1. Measured power density (dBm) has offset with cable loss.
2. Maximum Spectral Power Density EIRP(dBm) = Measured power density (dBm) + Antenna gain (dBi) + duty factor.

EUT Mode :	802.11n HT-20 (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%
Cable loss	13.80dB	Duty Factor :	0.00dB

Channel	Measured Frequency (MHz)	Conducted Power Density (dBm/MHz)	EIRP Density (dBm/MHz)	Limit (dBm/MHz)
CH 36	5180MHz	-2.78	-2.73	10
CH 48	5240MHz	0.77	0.82	10

Note:

1. Measured power density (dBm) has offset with cable loss.
2. Maximum Spectral Power Density EIRP(dBm) = Measured power density (dBm) + Antenna gain (dBi) + duty factor.



EUT Mode :	802.11n HT-40 (5160 MHz ~ 5240 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%
Cable loss	13.80dB	Duty Factor :	0.00dB

Channel	Measured Frequency (MHz)	Conducted Power Density (dBm/MHz)	EIRP Density (dBm/MHz)	Limit (dBm/MHz)
CH 38	5190MHz	-2.78	-2.73	10
CH 46	5230MHz	-2.42	-2.37	10

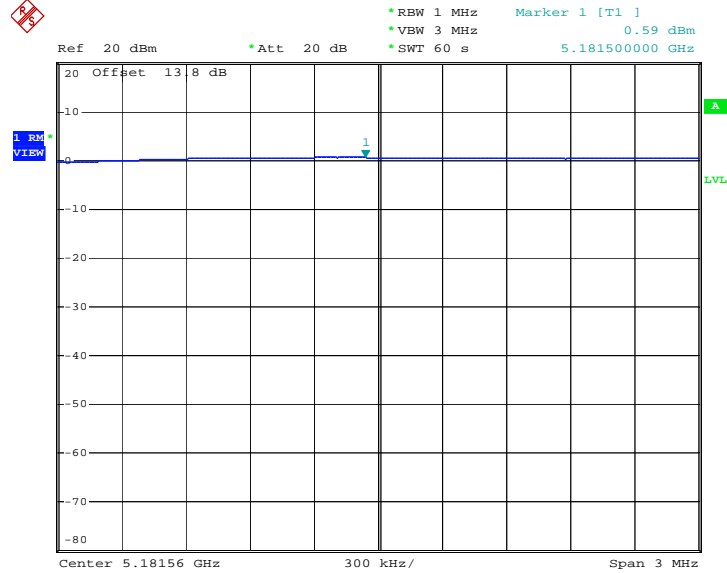
Note:

1. Measured power density (dBm) has offset with cable loss.
2. Maximum Spectral Power Density EIRP(dBm) = Measured power density (dBm) + Antenna gain (dBi) + duty factor.



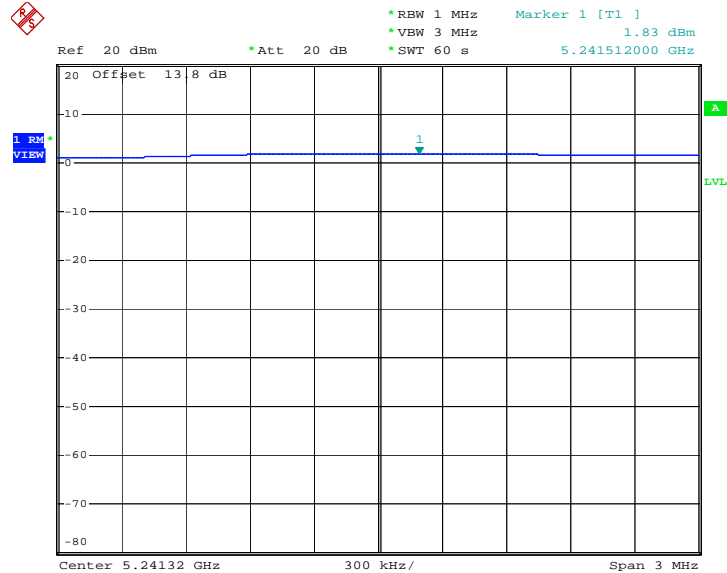
3.4.6 Test Result of Power Spectral Density Plots

PSD Plot on 802.11a Channel 36



Date: 28.JAN.2013 20:43:10

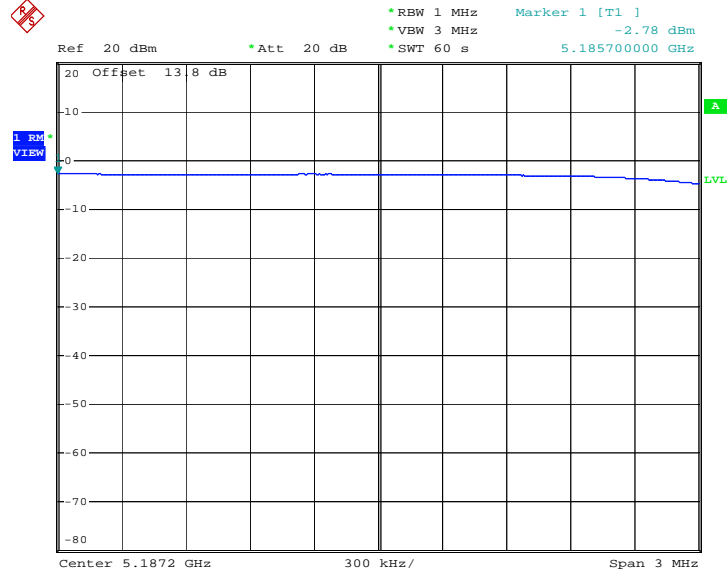
PSD Plot on 802.11a Channel 48



Date: 28.JAN.2013 20:39:54

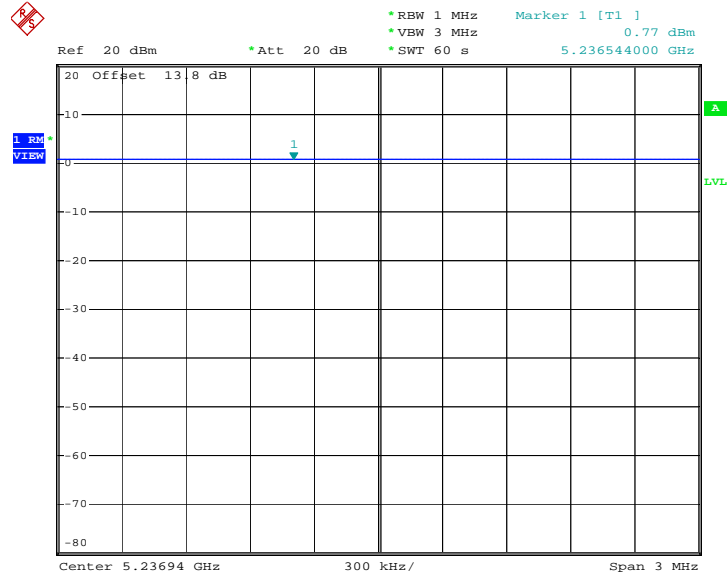


PSD Plot on 5GHz 802.11n HT-20 Channel 36



Date: 28.JAN.2013 20:32:55

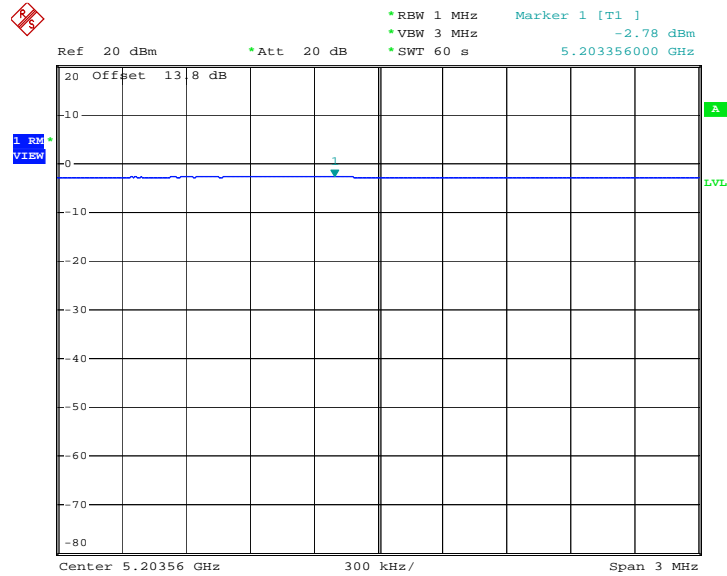
PSD Plot on 5GHz 802.11n HT-20 Channel 48



Date: 28.JAN.2013 20:36:24

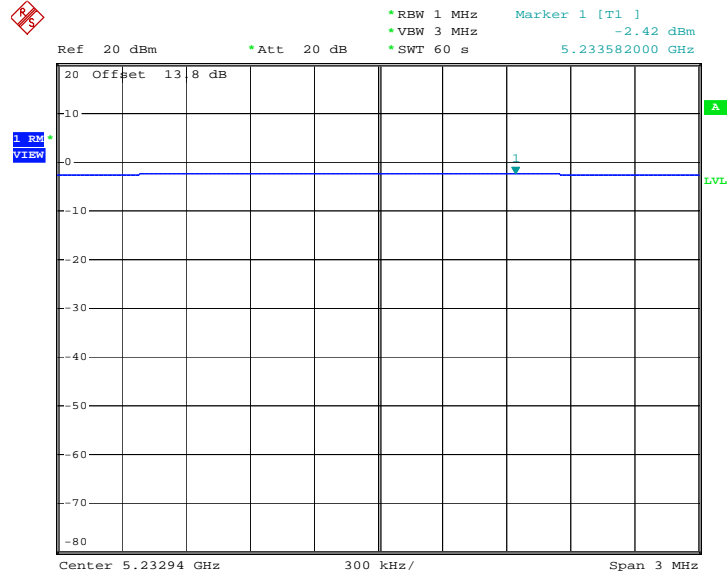


PSD Plot on 5GHz 802.11n HT-40 Channel 38



Date: 28.JAN.2013 20:14:56

PSD Plot on 5GHz 802.11n HT-40 Channel 46



Date: 28.JAN.2013 20:11:14

3.5 Transmitter Unwanted Emissions Outside of Band

3.5.1 Limit of Transmitter Unwanted Emissions Outside of Band

Transmitter unwanted emission limits outside the 5 GHz RLAN bands:

SUBCLAUSE 4.5.1.2		
FREQUENCY RANGE	MAXIMUM POWER ERP (<=1 GHZ) EIRP (>1 GHZ)	BANDWIDTH
30 MHz to 47 MHz	-36 dBm	100 KHz
47 MHz to 74 MHz	-54 dBm	100 KHz
74 MHz to 87,5 MHz	-36 dBm	100 KHz
87,5 MHz to 118 MHz	-54 dBm	100 KHz
118 MHz to 174 MHz	-36 dBm	100 KHz
174 MHz to 230 MHz	-54 dBm	100 KHz
230 MHz to 470 MHz	-36 dBm	100 KHz
470 MHz to 862 MHz	-54 dBm	100 KHz
862 MHz to 1 GHz	-36 dBm	100 KHz
1 GHz to 5,15 GHz	-30 dBm	1 MHz
5,35 GHz to 5,47 GHz	-30 dBm	1 MHz
5,725 GHz to 26 GHz	-30 dBm	1 MHz

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

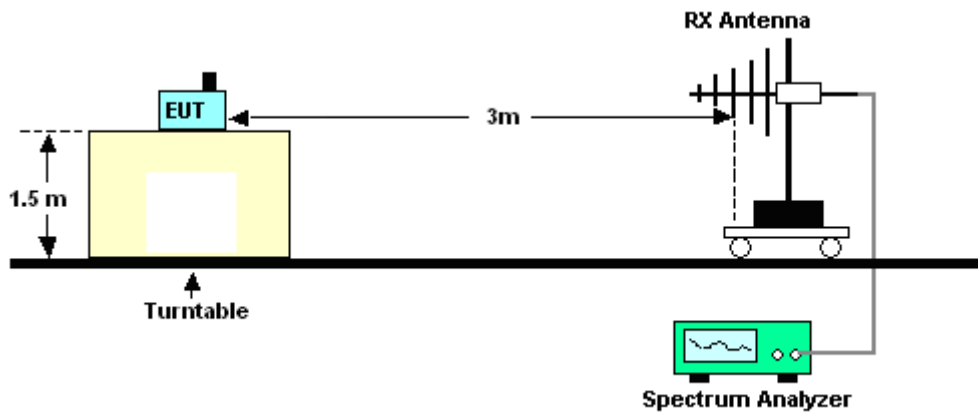
Refer to Section 5.3.5 of ETSI EN 301 893 V1.6.1 (2011-11).

3.5.4 Test Setup

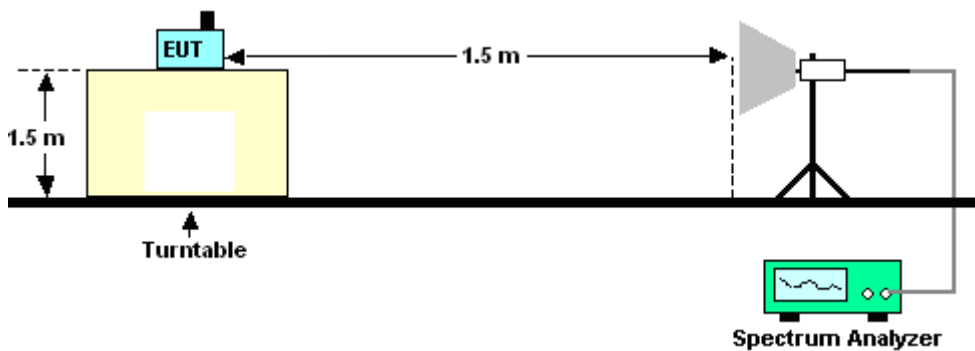
- Test Setup of Conducted Measurement



- Test Setup of Radiated Measurement
<Below 1GHz>



- <Above 1GHz>

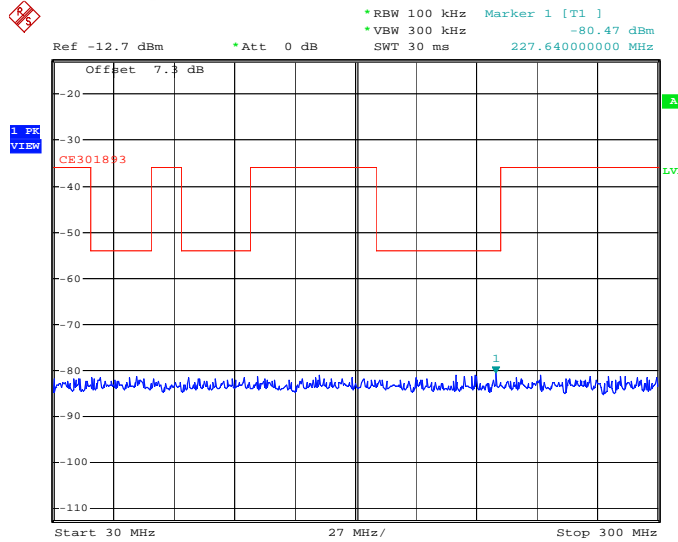




3.5.5 Test Result of Conducted Measurement

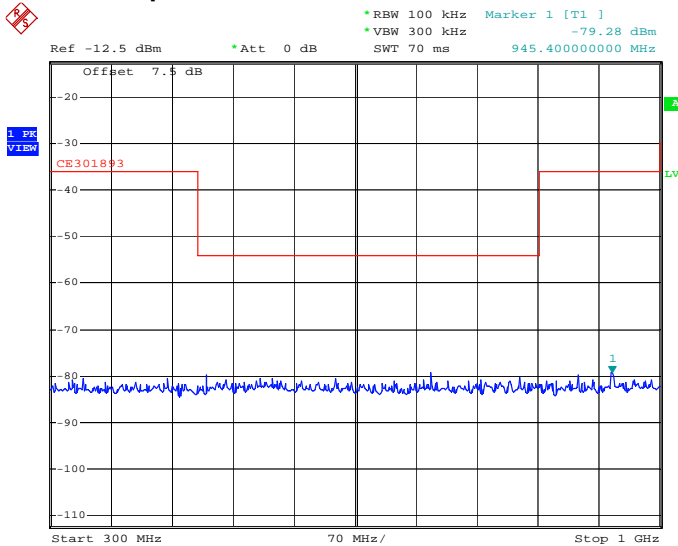
EUT Mode :	802.11a	Temperature :	20~21°C
Channel :	48	Relative Humidity :	40~41%
Test Engineer :	Zhi Lu	Antenna Gain :	0.05dBi

Conducted Spurious Emission Plot between 30 MHz ~ 300 MHz



Date: 28.JAN.2013 23:44:16

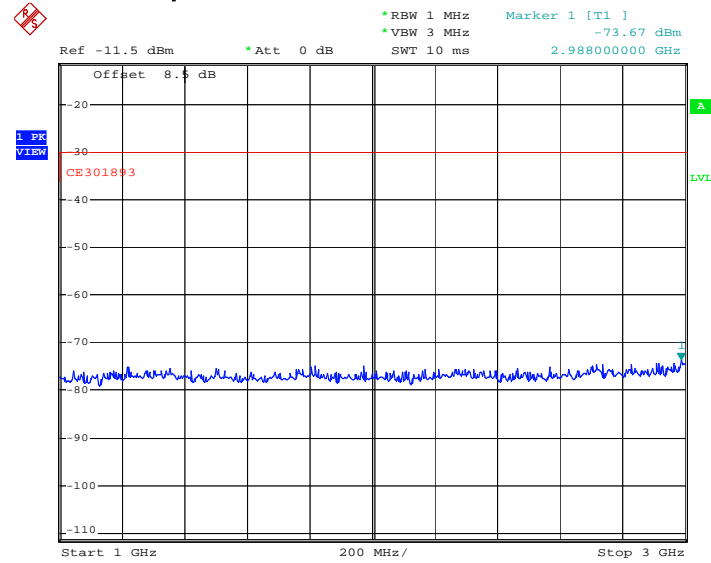
Conducted Spurious Emission Plot between 300 MHz ~ 1 GHz



Date: 28.JAN.2013 23:45:34

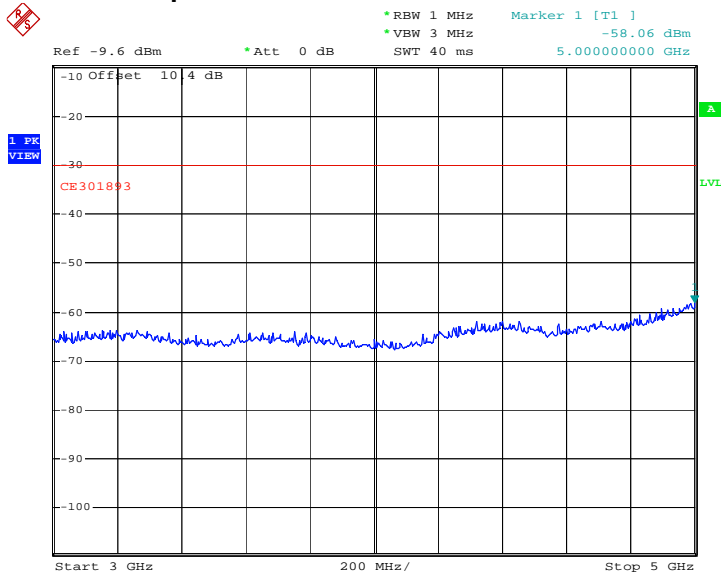


Conducted Spurious Emission Plot between 1 GHz ~ 3 GHz



Date: 28.JAN.2013 23:47:00

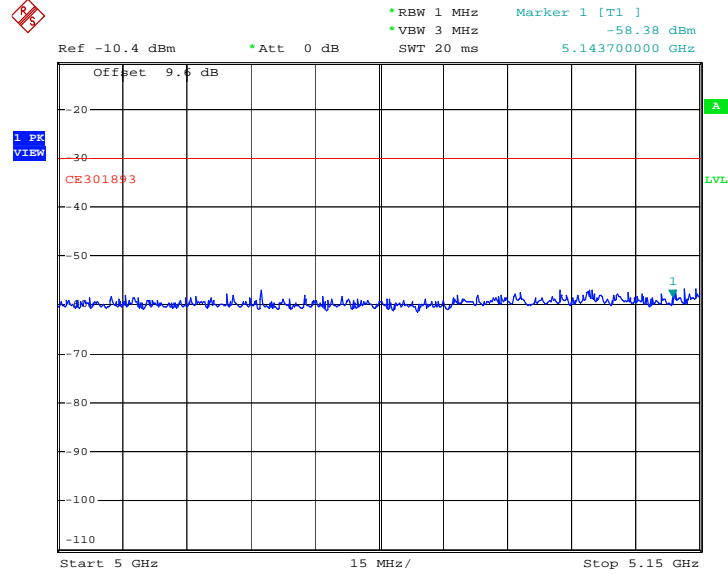
Conducted Spurious Emission Plot between 3 GHz ~ 5 GHz



Date: 28.JAN.2013 23:48:00

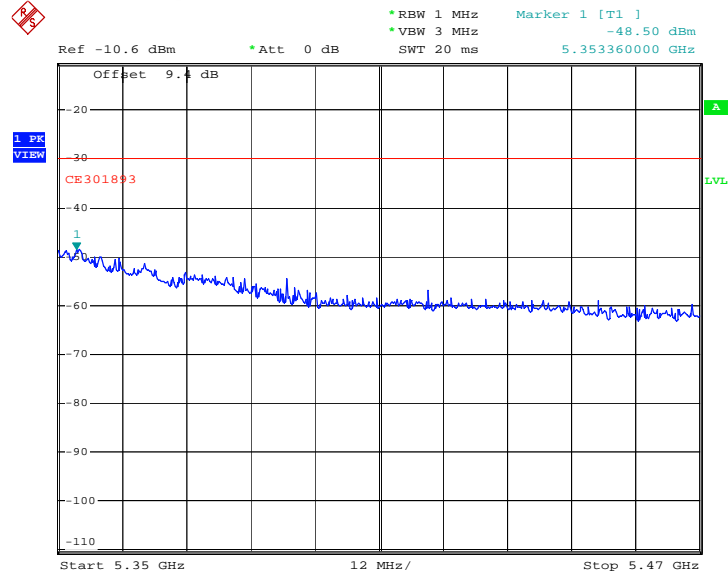


Conducted Spurious Emission Plot between 5 GHz ~ 5.15 GHz



Date: 28.JAN.2013 23:50:54

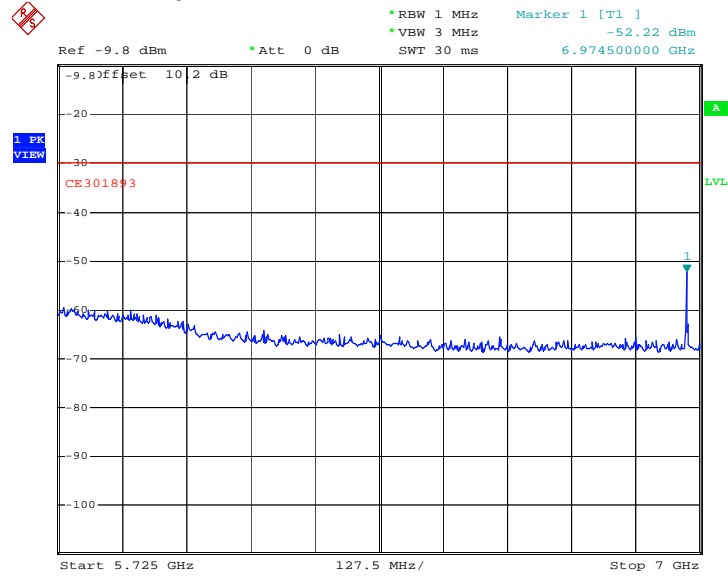
Conducted Spurious Emission Plot between 5.35 GHz ~ 5.47 GHz



Date: 28.JAN.2013 23:52:01

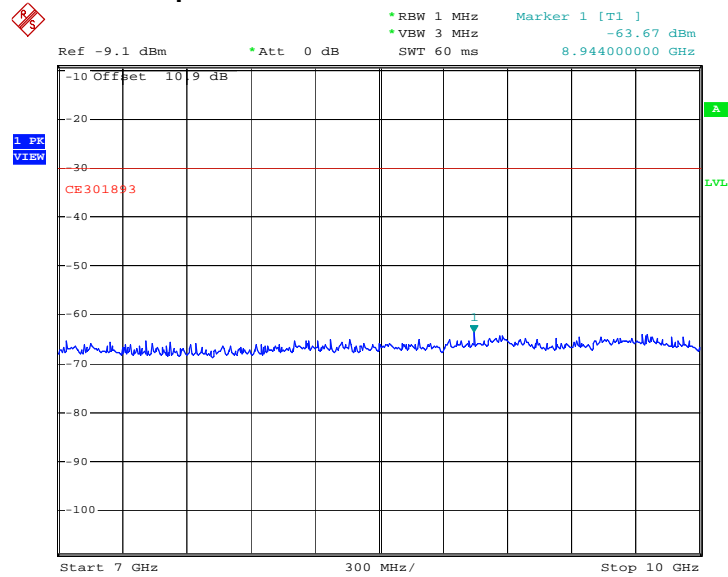


Conducted Spurious Emission Plot between 5.725 GHz ~ 7 GHz



Date: 28.JAN.2013 23:56:21

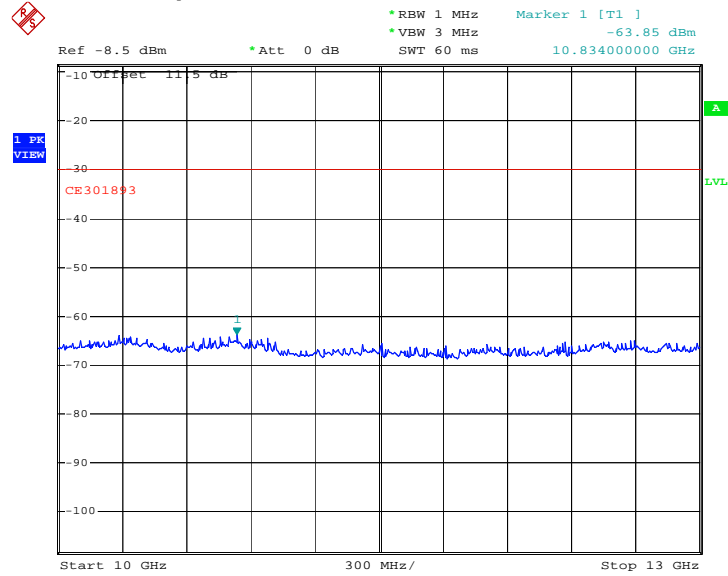
Conducted Spurious Emission Plot between 7 GHz ~ 10 GHz



Date: 28.JAN.2013 23:57:45

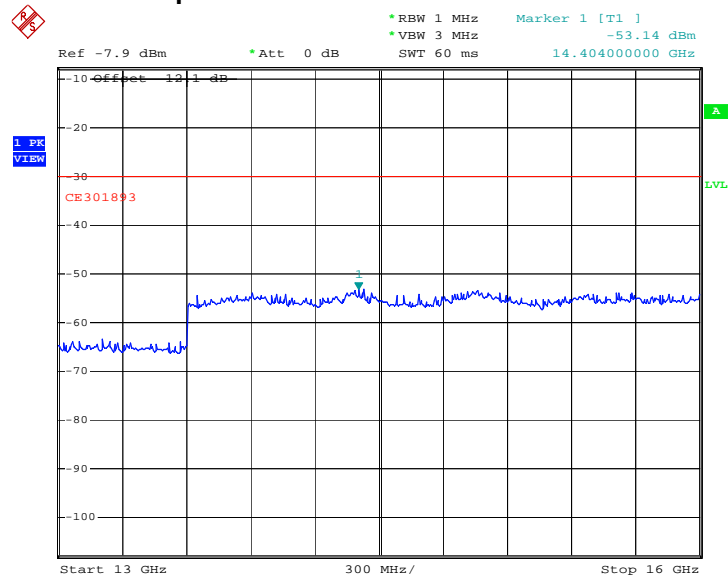


Conducted Spurious Emission Plot between 10 GHz ~ 13 GHz



Date: 28.JAN.2013 23:58:31

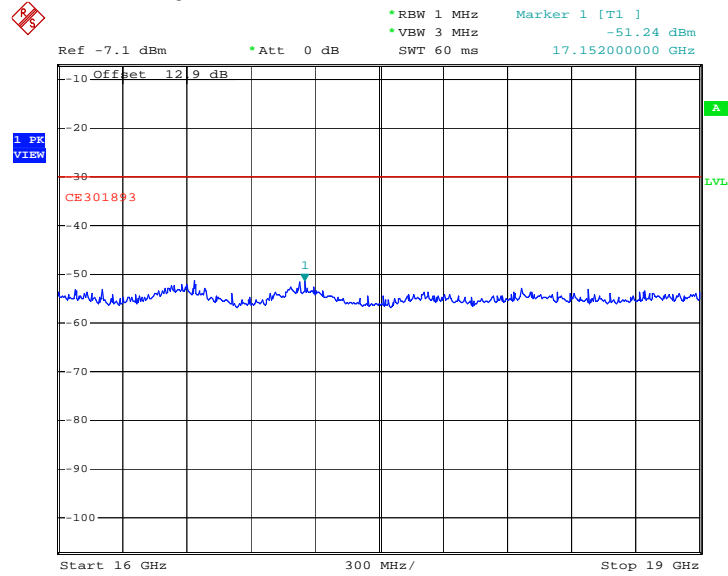
Conducted Spurious Emission Plot between 13 GHz ~ 16 GHz



Date: 28.JAN.2013 23:59:34

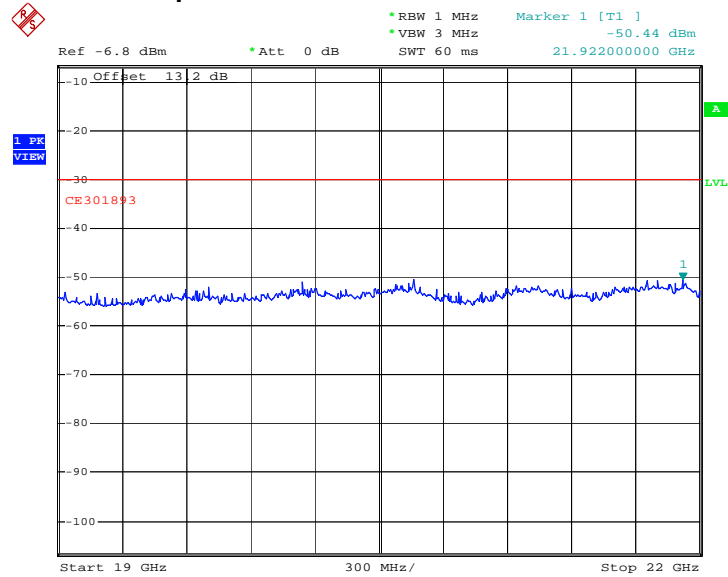


Conducted Spurious Emission Plot between 16 GHz ~ 19 GHz



Date: 29.JAN.2013 00:00:31

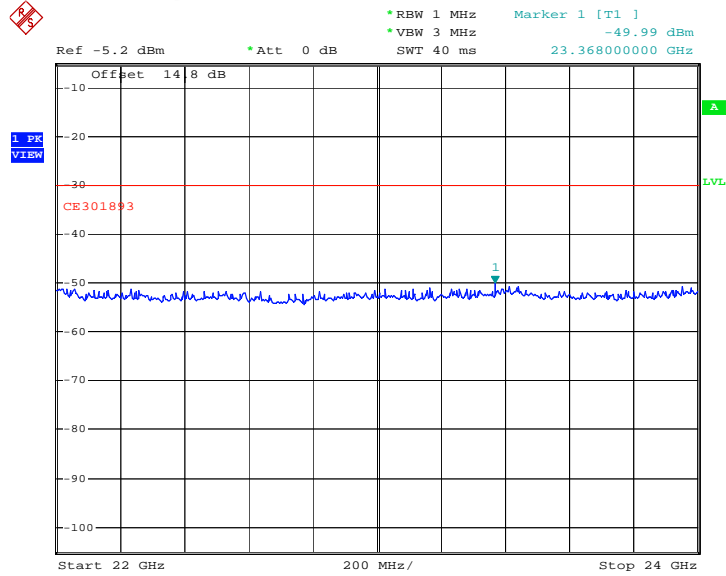
Conducted Spurious Emission Plot between 19 GHz ~ 22 GHz



Date: 29.JAN.2013 00:01:30

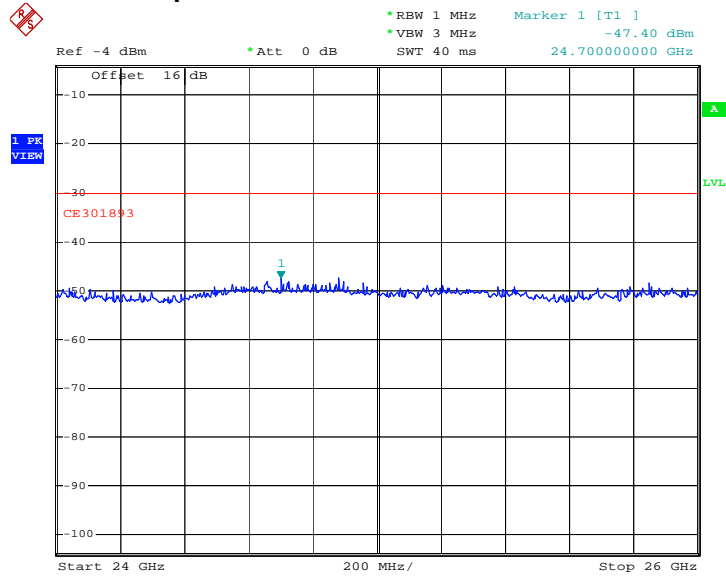


Conducted Spurious Emission Plot between 22 GHz ~ 24 GHz



Date: 29.JAN.2013 00:02:19

Conducted Spurious Emission Plot between 24 GHz ~ 26 GHz

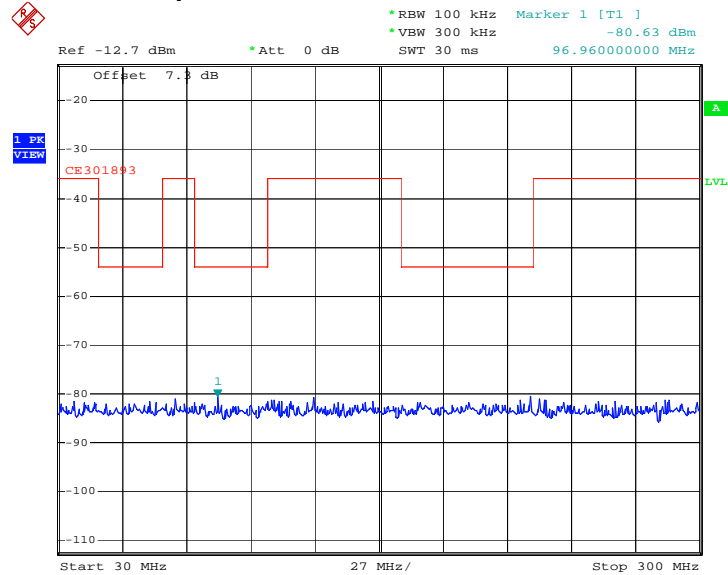


Date: 29.JAN.2013 00:03:16



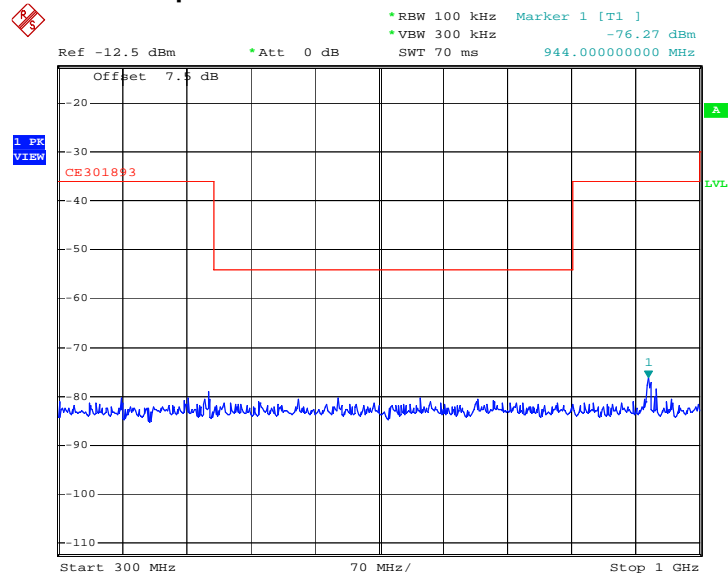
EUT Mode :	802.11n HT-20	Temperature :	20~21°C
Channel :	36	Relative Humidity :	40~41%
Test Engineer :	Zhi Lu	Antenna Gain :	0.05dBi

Conducted Spurious Emission Plot between 30 MHz ~ 300 MHz



Date: 29.JAN.2013 15:55:32

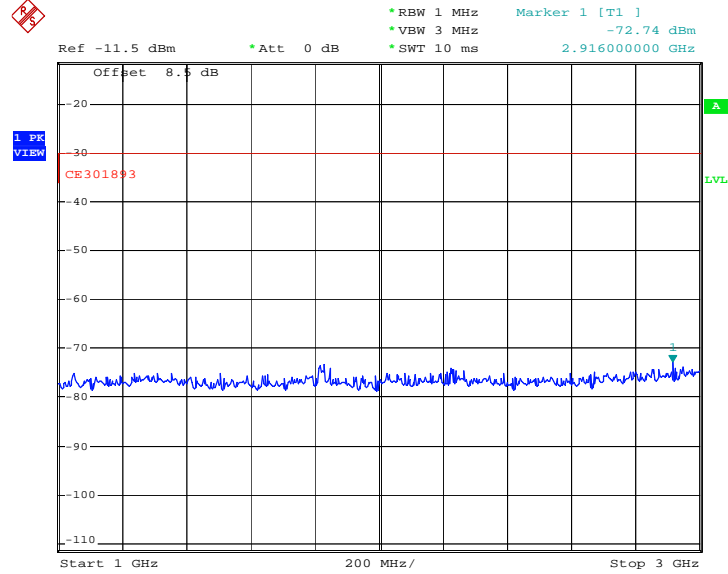
Conducted Spurious Emission Plot between 300 MHz ~ 1 GHz



Date: 29.JAN.2013 15:59:17

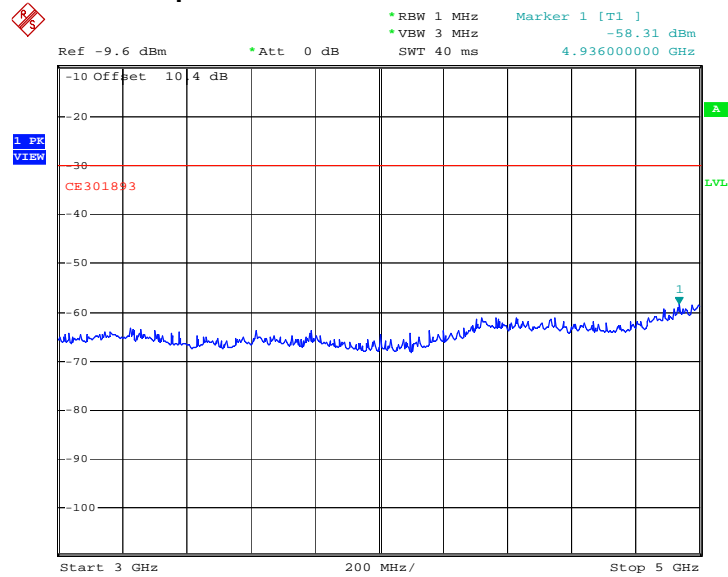


Conducted Spurious Emission Plot between 1 GHz ~ 3 GHz



Date: 29.JAN.2013 16:00:25

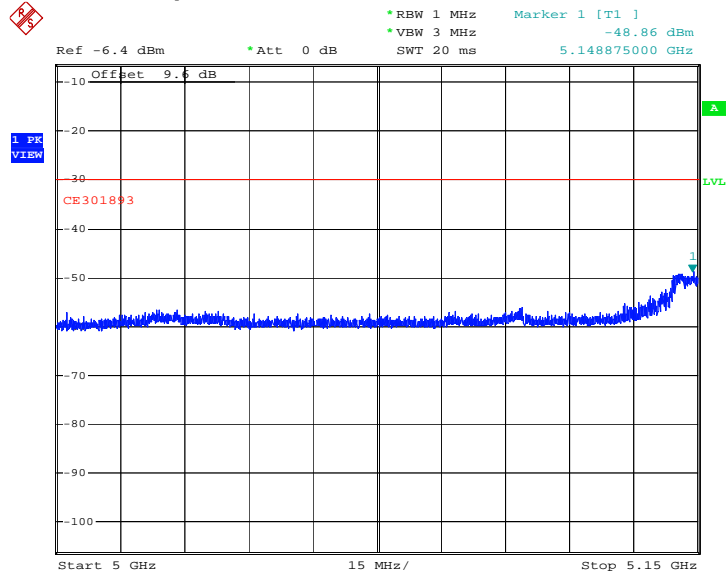
Conducted Spurious Emission Plot between 3 GHz ~ 5 GHz



Date: 29.JAN.2013 16:01:32

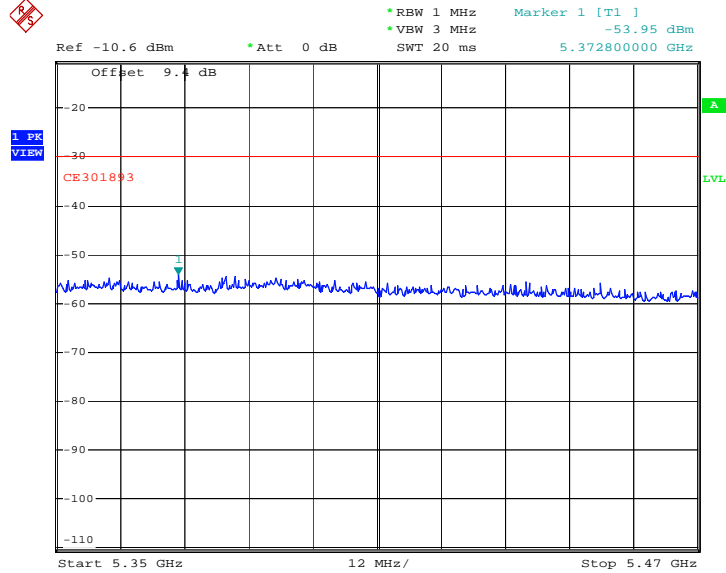


Conducted Spurious Emission Plot between 5 GHz ~ 5.15 GHz



Date: 29.JAN.2013 16:42:24

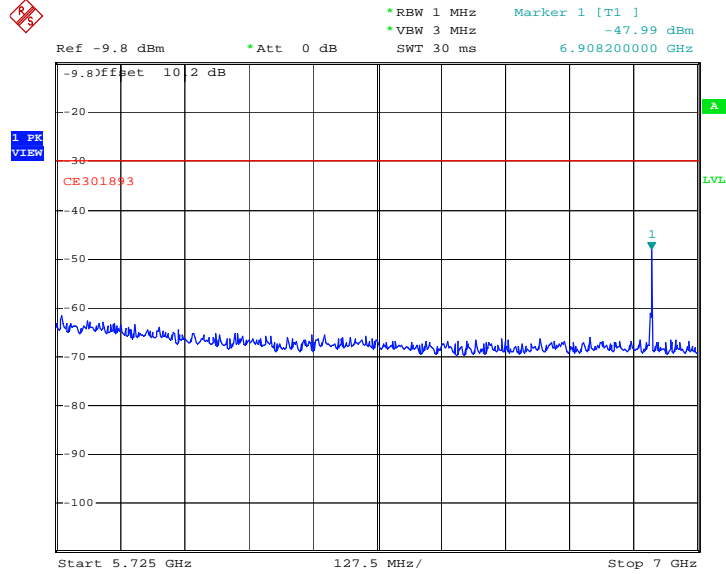
Conducted Spurious Emission Plot between 5.35 GHz ~ 5.47 GHz



Date: 29.JAN.2013 16:03:39

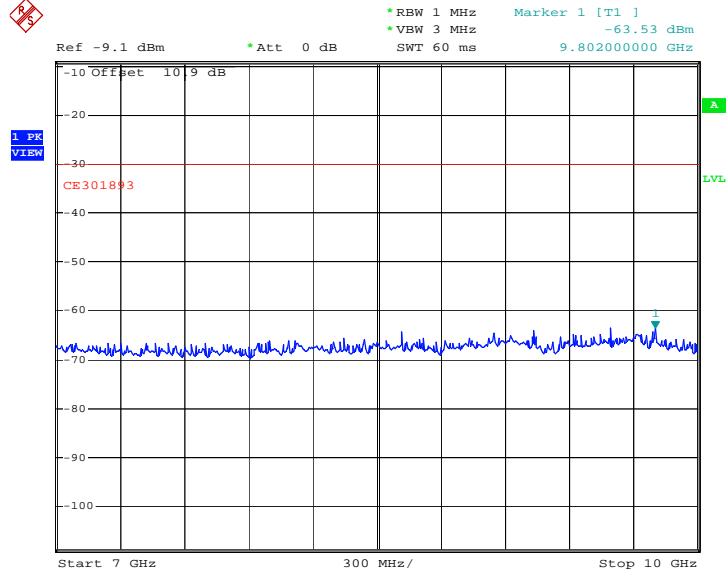


Conducted Spurious Emission Plot between 5.725 GHz ~ 7 GHz



Date: 29.JAN.2013 16:07:24

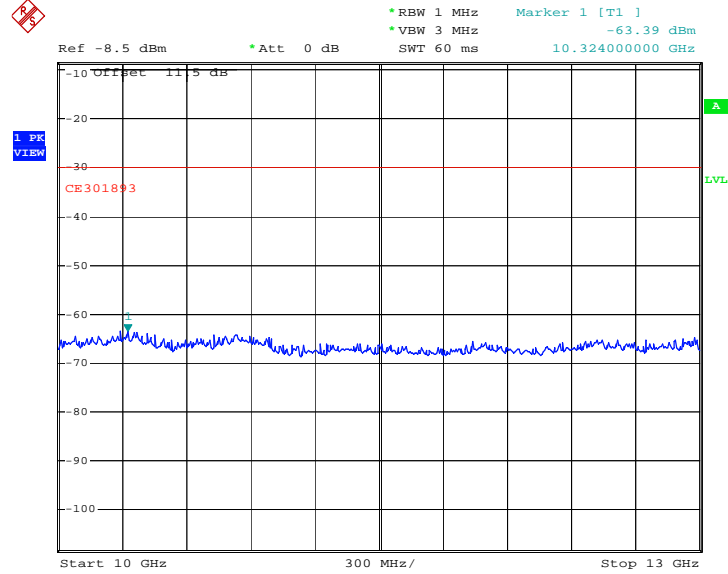
Conducted Spurious Emission Plot between 7 GHz ~ 10 GHz



Date: 29.JAN.2013 16:09:11

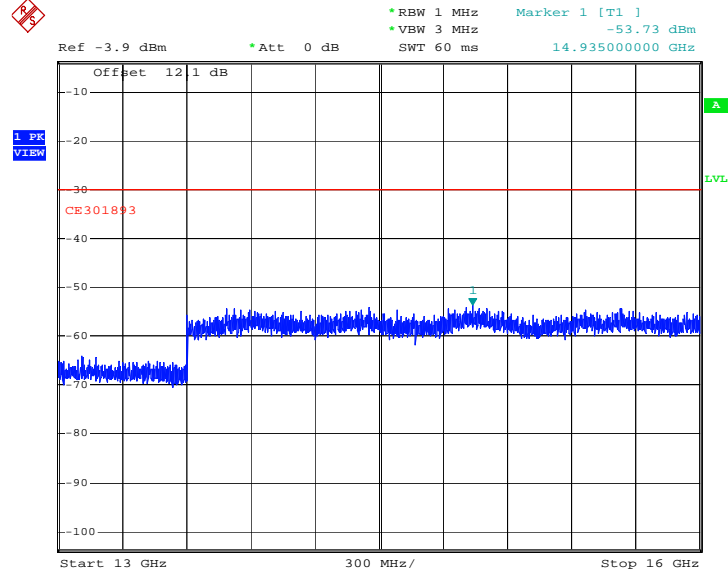


Conducted Spurious Emission Plot between 10 GHz ~ 13 GHz



Date: 29.JAN.2013 16:09:43

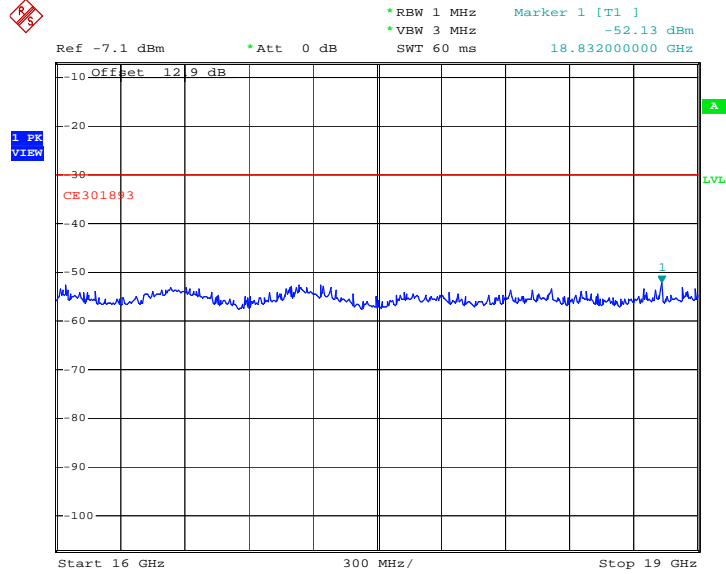
Conducted Spurious Emission Plot between 13 GHz ~ 16 GHz



Date: 29.JAN.2013 16:44:32

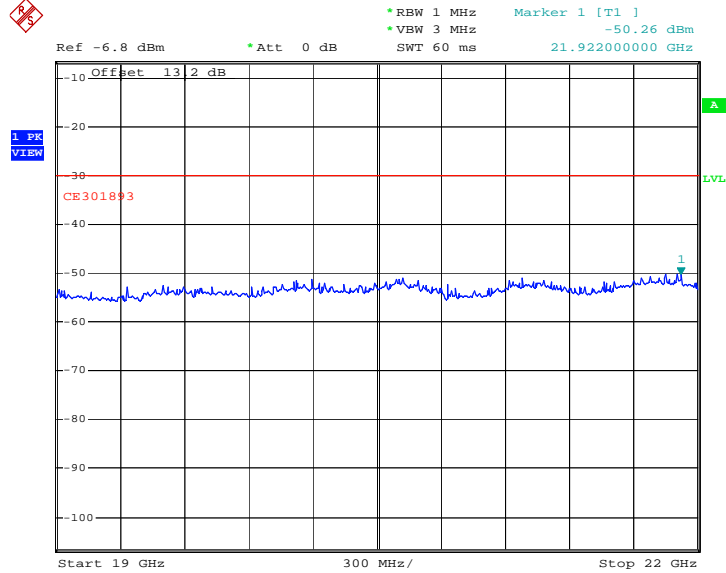


Conducted Spurious Emission Plot between 16 GHz ~ 19 GHz



Date: 29.JAN.2013 16:12:05

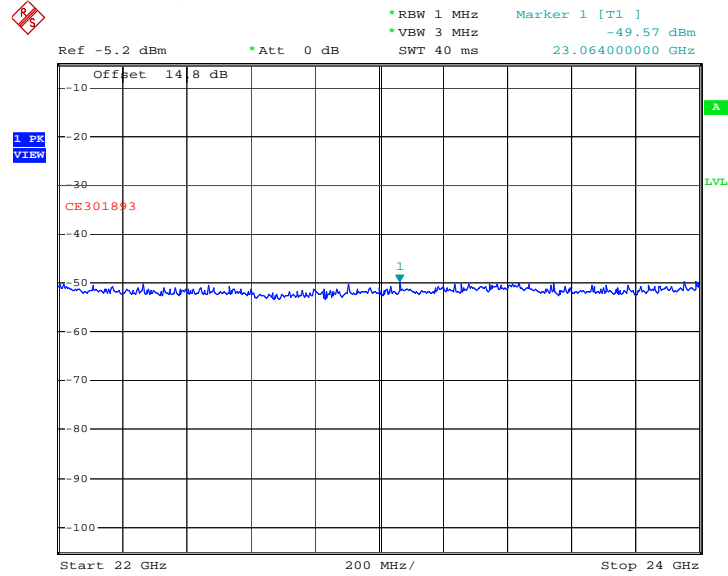
Conducted Spurious Emission Plot between 19 GHz ~ 22 GHz



Date: 29.JAN.2013 16:12:47

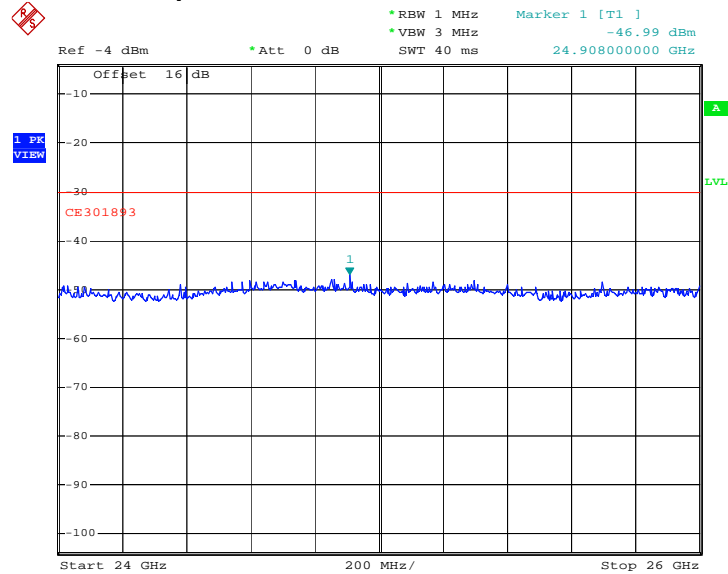


Conducted Spurious Emission Plot between 22 GHz ~ 24 GHz



Date: 29.JAN.2013 16:13:40

Conducted Spurious Emission Plot between 24 GHz ~ 26 GHz

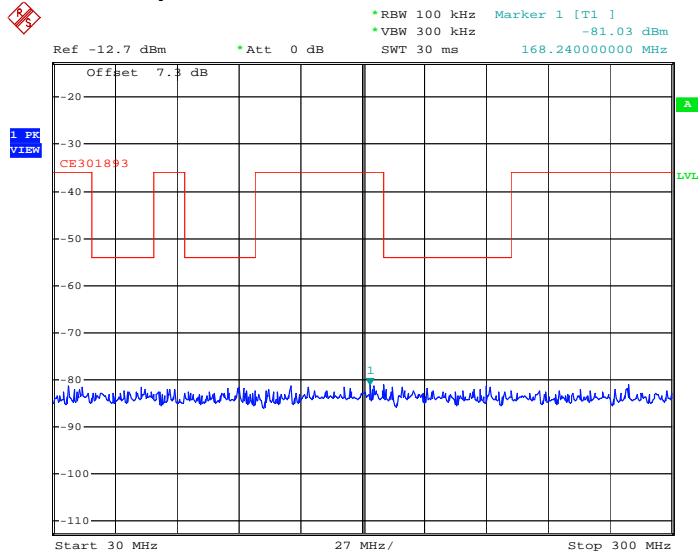


Date: 29.JAN.2013 16:14:22



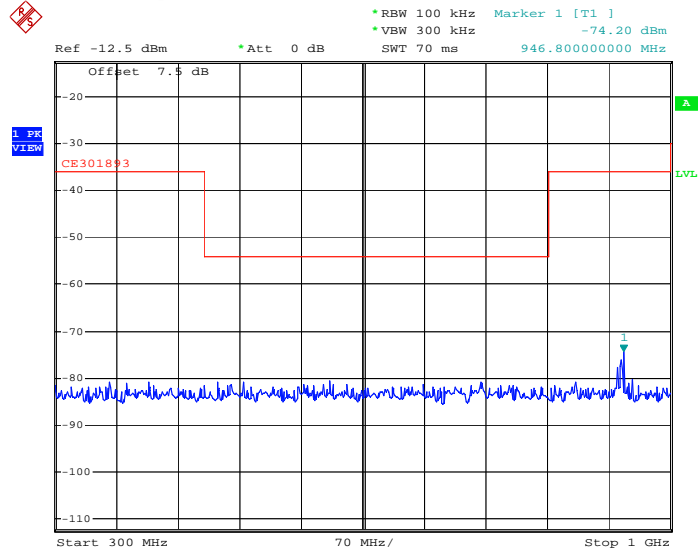
EUT Mode :	802.11n HT-40	Temperature :	20~21°C
Channel :	38	Relative Humidity :	40~41%
Test Engineer :	Zhi Lu	Antenna Gain :	0.05dBi

Conducted Spurious Emission Plot between 30 MHz ~ 300 MHz



Date: 29.JAN.2013 17:07:59

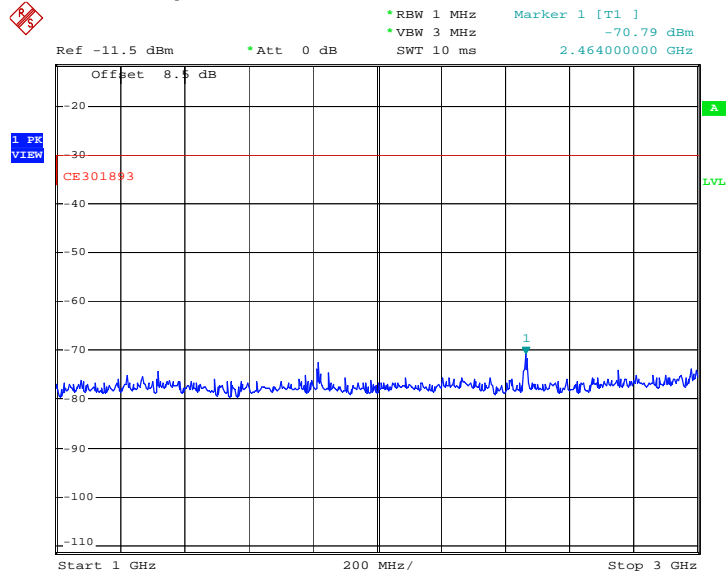
Conducted Spurious Emission Plot between 300 MHz ~ 1 GHz



Date: 29.JAN.2013 17:09:24

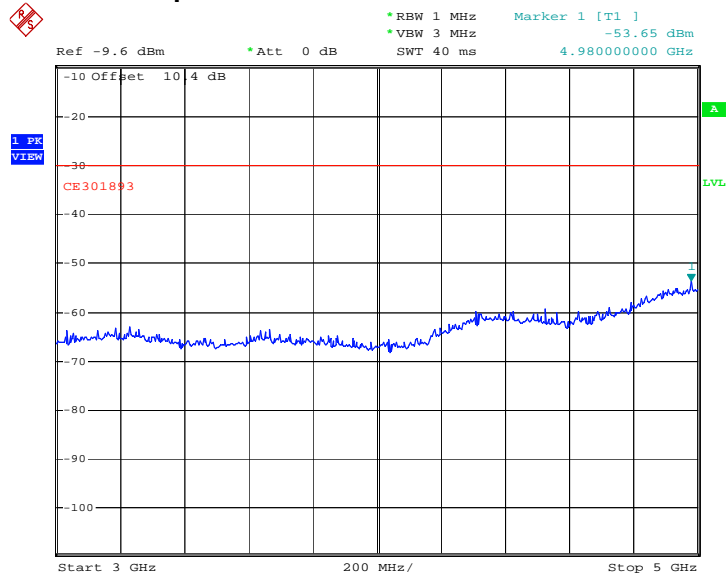


Conducted Spurious Emission Plot between 1 GHz ~ 3 GHz



Date: 29.JAN.2013 17:09:56

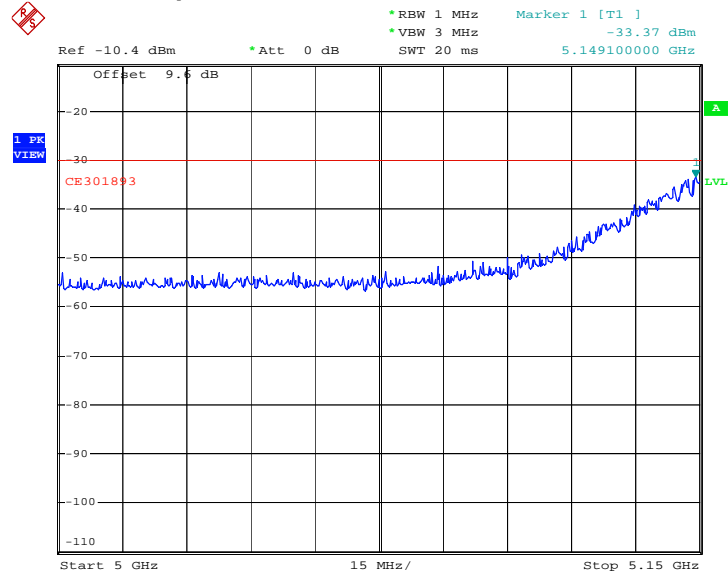
Conducted Spurious Emission Plot between 3 GHz ~ 5 GHz



Date: 29.JAN.2013 17:10:43

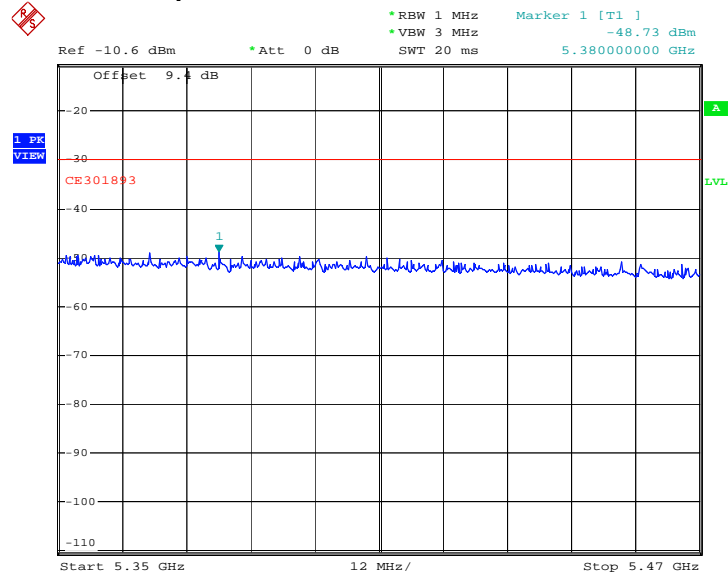


Conducted Spurious Emission Plot between 5 GHz ~ 5.15 GHz



Date: 29.JAN.2013 17:13:33

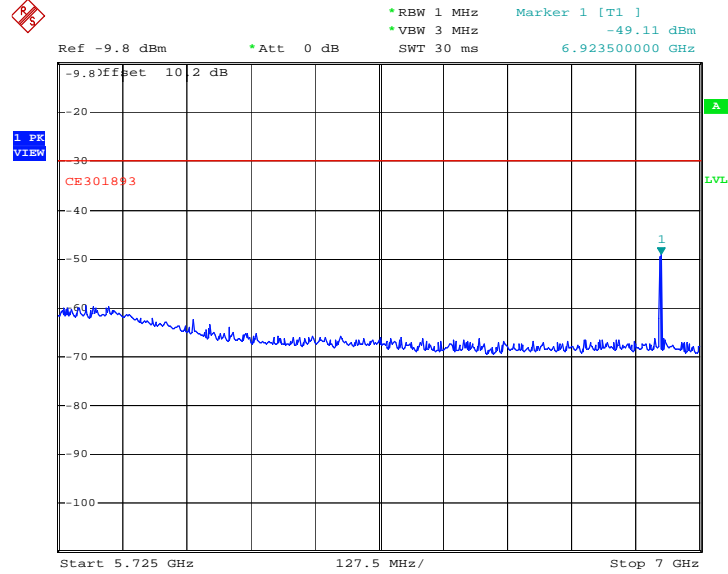
Conducted Spurious Emission Plot between 5.35 GHz ~ 5.47 GHz



Date: 29.JAN.2013 17:14:16

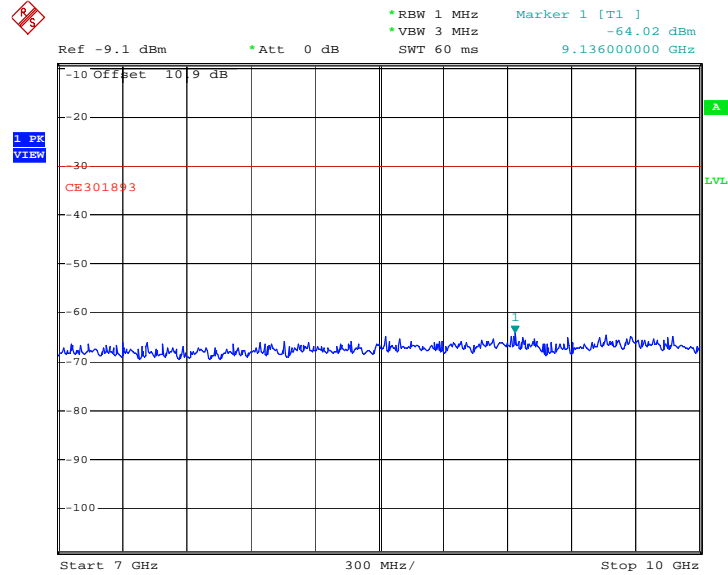


Conducted Spurious Emission Plot between 5.725 GHz ~ 7 GHz



Date: 29.JAN.2013 17:15:21

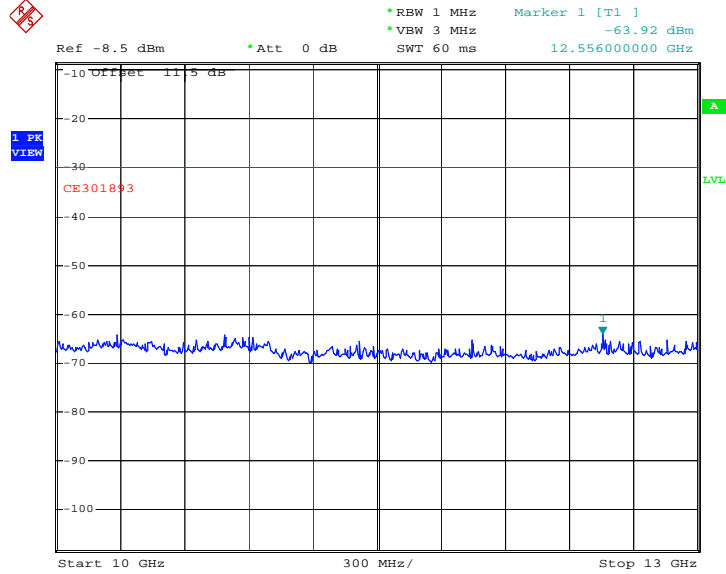
Conducted Spurious Emission Plot between 7 GHz ~ 10 GHz



Date: 29.JAN.2013 17:20:15

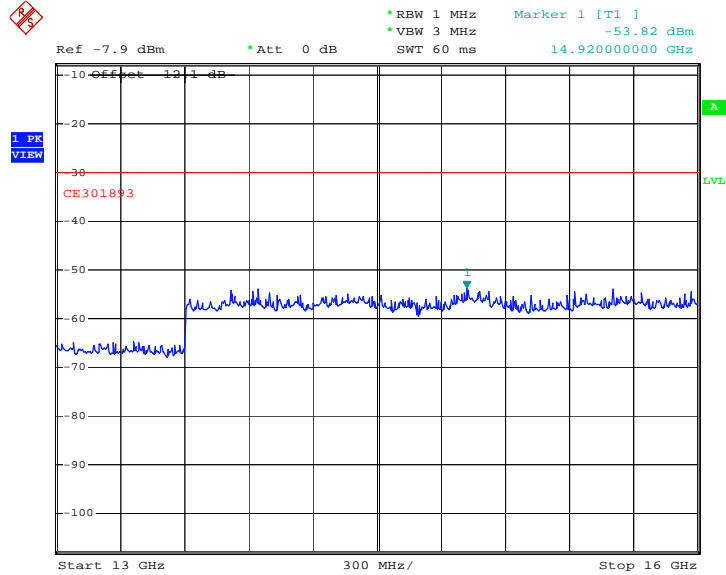


Conducted Spurious Emission Plot between 10 GHz ~ 13 GHz



Date: 29.JAN.2013 17:21:49

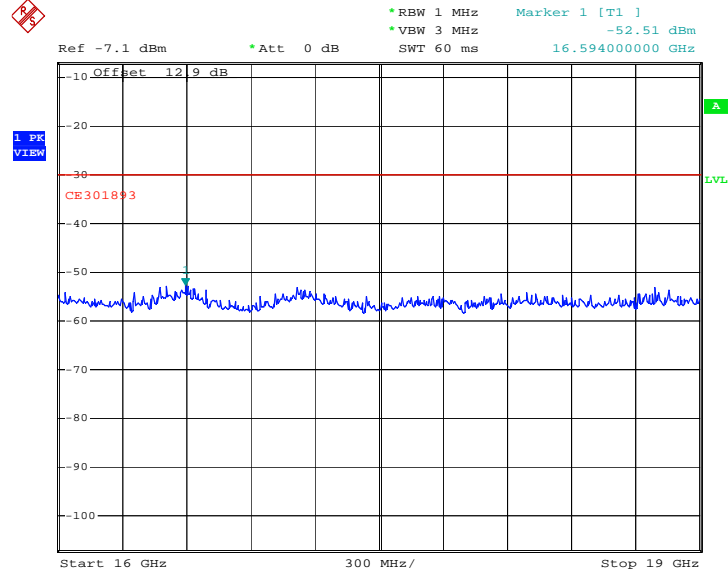
Conducted Spurious Emission Plot between 13 GHz ~ 16 GHz



Date: 29.JAN.2013 17:23:02

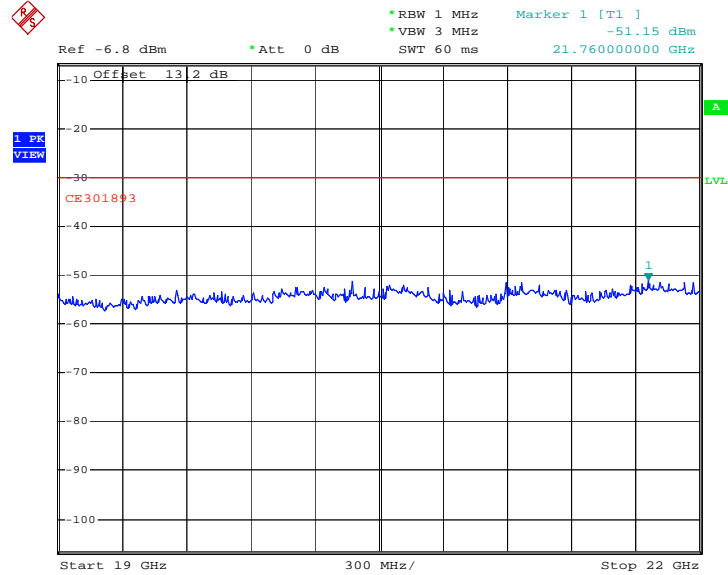


Conducted Spurious Emission Plot between 16 GHz ~ 19 GHz



Date: 29.JAN.2013 17:26:07

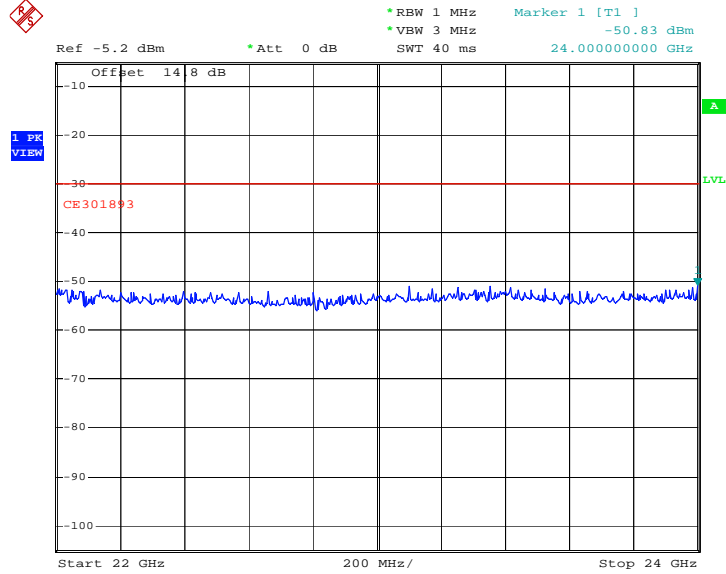
Conducted Spurious Emission Plot between 19 GHz ~ 22 GHz



Date: 29.JAN.2013 17:27:00

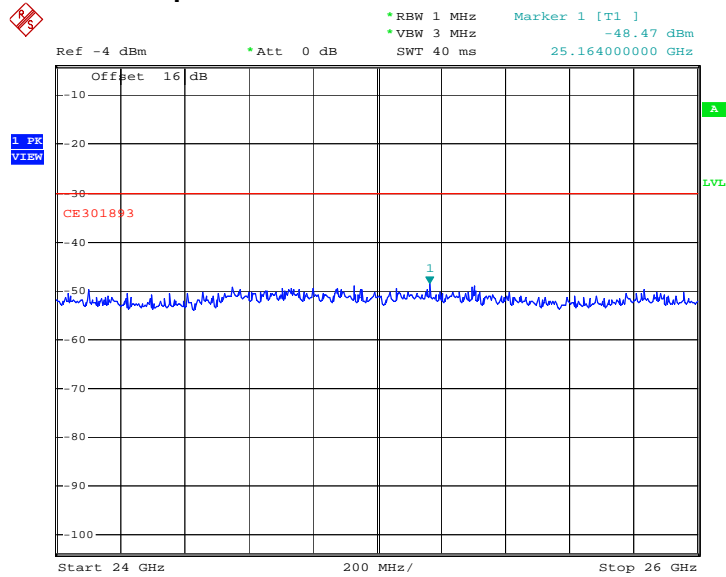


Conducted Spurious Emission Plot between 22 GHz ~ 24 GHz



Date: 29.JAN.2013 17:27:36

Conducted Spurious Emission Plot between 24 GHz ~ 26 GHz

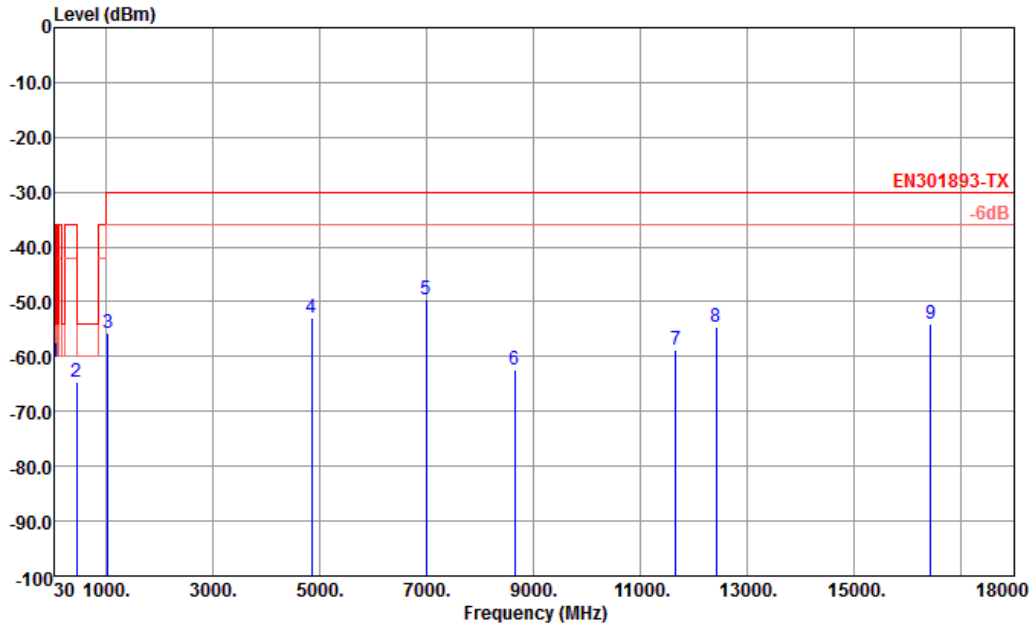


Date: 29.JAN.2013 17:28:14



3.5.6 Test Result of Radiated Measurement

Test Mode :	Mode 1: 802.11a CH48 (5240MHz) in Laptop Mode with Adapter 1 for Sample 1	Temperature :	21~22°C
Test Engineer :	Lucky Pan	Relative Humidity :	41~42%
		Polarization :	Horizontal

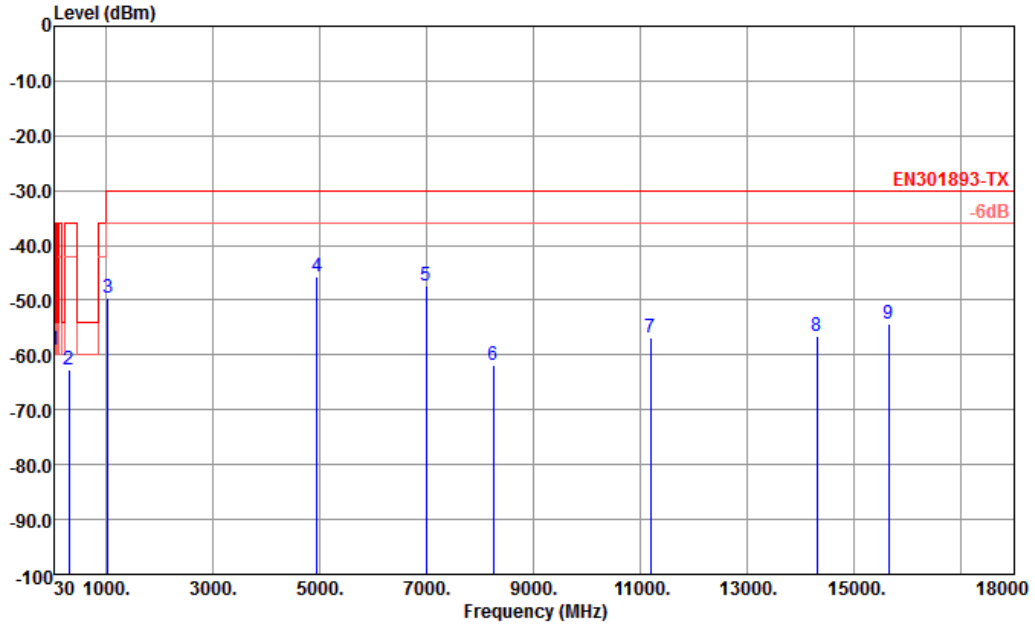


Site : 05CH01-KS
 Condition : EN301893-TX LF EIRP_090504 HORIZONTAL
 Project : (ER) 2D1707

	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	34.59	-61.01	-25.01	-36.00	-64.84	3.83
2	448.40	-64.71	-28.71	-36.00	-66.85	2.14
3	1034.00	-55.73	-25.73	-30.00	-56.27	0.54
4	4856.00	-52.81	-22.81	-30.00	-63.77	10.96
5 p	6988.00	-49.62	-19.62	-30.00	-63.62	14.00
6	8648.00	-62.37	-32.37	-30.00	-77.06	14.69
7	11658.00	-58.78	-28.78	-30.00	-78.28	19.50
8	12420.00	-54.69	-24.69	-30.00	-77.70	23.01
9	16431.00	-54.16	-24.16	-30.00	-77.54	23.38



Test Mode :	Mode 1: 802.11a CH48 (5240MHz) in Laptop Mode with Adapter 1 for Sample 1	Temperature :	21~22°C
Test Engineer :	Lucky Pan	Relative Humidity :	41~42%
		Polarization :	Vertical

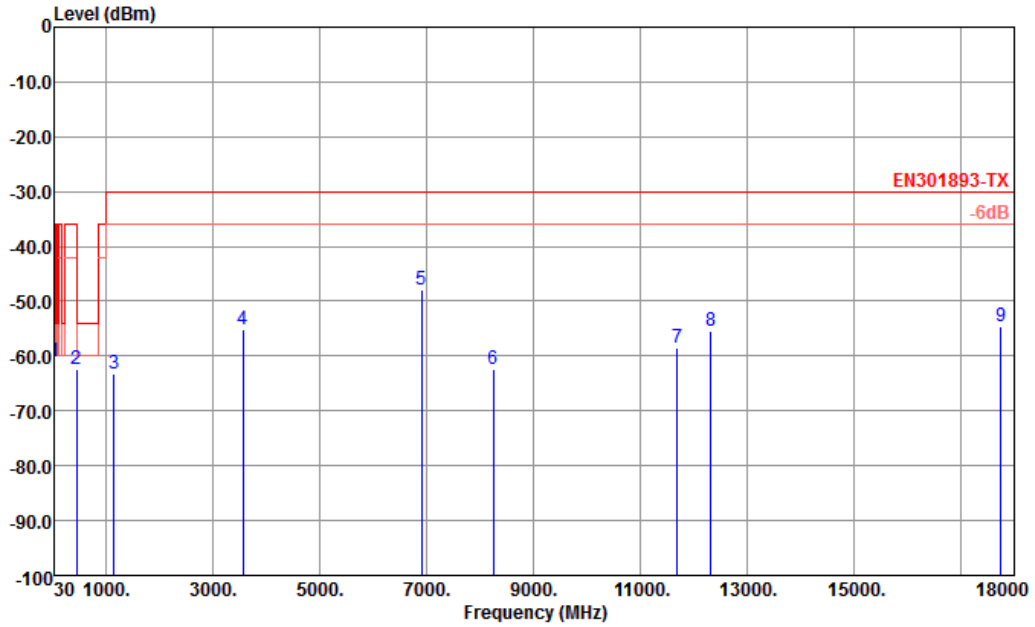


Site : 05CH01-KS
 Condition : EN301893-TX LF EIRP_090504 VERTICAL
 Project : (ER)2D1707

	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	34.59	-59.13	-23.13	-36.00	-62.96	3.83
2	308.40	-62.61	-26.61	-36.00	-61.79	-0.82
3	1034.00	-49.69	-19.69	-30.00	-50.63	0.94
4 p	4958.00	-45.74	-15.74	-30.00	-59.79	14.05
5	6988.00	-47.41	-17.41	-30.00	-61.13	13.72
6	8250.00	-61.95	-31.95	-30.00	-77.28	15.33
7	11196.00	-56.83	-26.83	-30.00	-78.51	21.68
8	14313.00	-56.44	-26.44	-30.00	-78.55	22.11
9	15651.00	-54.43	-24.43	-30.00	-76.69	22.26



Test Mode :	Mode 2: 802.11n HT-20 CH36 (5180MHz) in Laptop Mode with Adapter 1 for Sample 1	Temperature :	21~22°C
Test Engineer :	Lucky Pan	Relative Humidity :	41~42%
		Polarization :	Horizontal

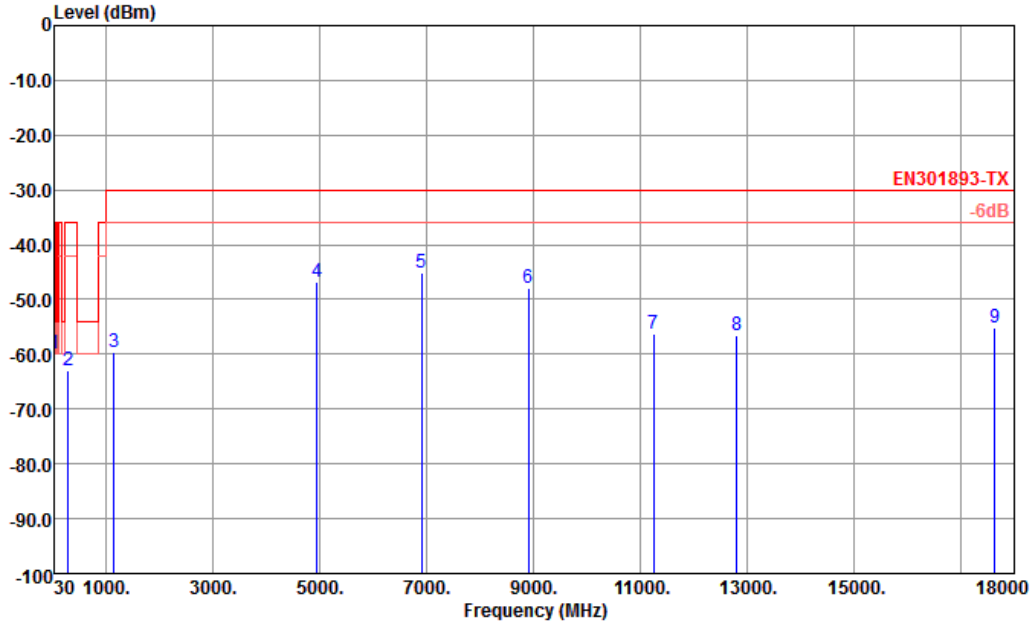


Site : 05CH01-KS
 Condition : EN301893-TX LF EIRP_090504 HORIZONTAL
 Project : (ER)2D1707

	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	34.32	-61.01	-25.01	-36.00	-64.84	3.83
2	448.40	-62.36	-26.36	-36.00	-64.50	2.14
3	1146.00	-63.35	-33.35	-30.00	-65.54	2.19
4	3566.00	-55.07	-25.07	-30.00	-64.64	9.57
5 p	6908.00	-47.84	-17.84	-30.00	-61.68	13.84
6	8244.00	-62.43	-32.43	-30.00	-77.61	15.18
7	11688.00	-58.54	-28.54	-30.00	-78.17	19.63
8	12324.00	-55.41	-25.41	-30.00	-78.14	22.73
9	17754.00	-54.60	-24.60	-30.00	-78.51	23.91



Test Mode :	Mode 2: 802.11n HT-20 CH36 (5180MHz) in Laptop Mode with Adapter 1 for Sample 1	Temperature :	21~22°C
Test Engineer :	Lucky Pan	Relative Humidity :	41~42%
		Polarization :	Vertical

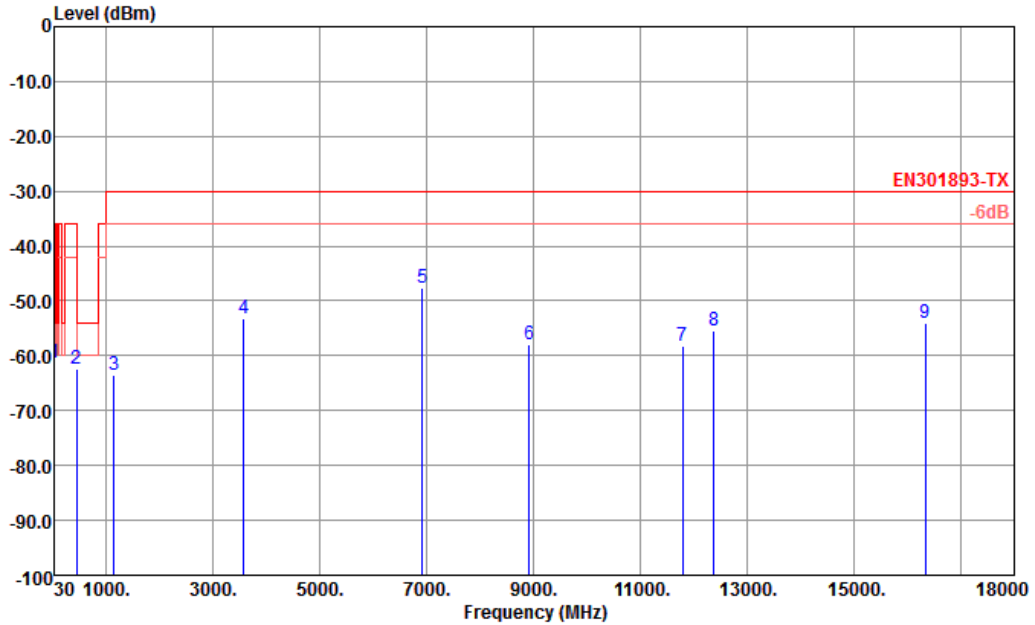


Site : 05CH01-KS
 Condition : EN301893-TX LF EIRP_090504 VERTICAL
 Project : (ER)2D1707

	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	34.32	-59.89	-23.89	-36.00	-63.72	3.83
2	301.40	-63.08	-27.08	-36.00	-62.42	-0.66
3	1146.00	-59.60	-29.60	-30.00	-61.57	1.97
4	4958.00	-46.66	-16.66	-30.00	-60.71	14.05
5 p	6908.00	-45.06	-15.06	-30.00	-58.68	13.62
6	8908.00	-47.81	-17.81	-30.00	-63.08	15.27
7	11244.00	-56.38	-26.38	-30.00	-78.33	21.95
8	12804.00	-56.68	-26.68	-30.00	-77.71	21.03
9	17631.00	-55.24	-25.24	-30.00	-78.16	22.92



Test Mode :	Mode 7: 802.11n HT-40 CH38 (5190MHz) in Laptop Mode with Adapter 1 for Sample 1	Temperature :	21~22°C
Test Engineer :	Lucky Pan	Relative Humidity :	41~42%
		Polarization :	Horizontal

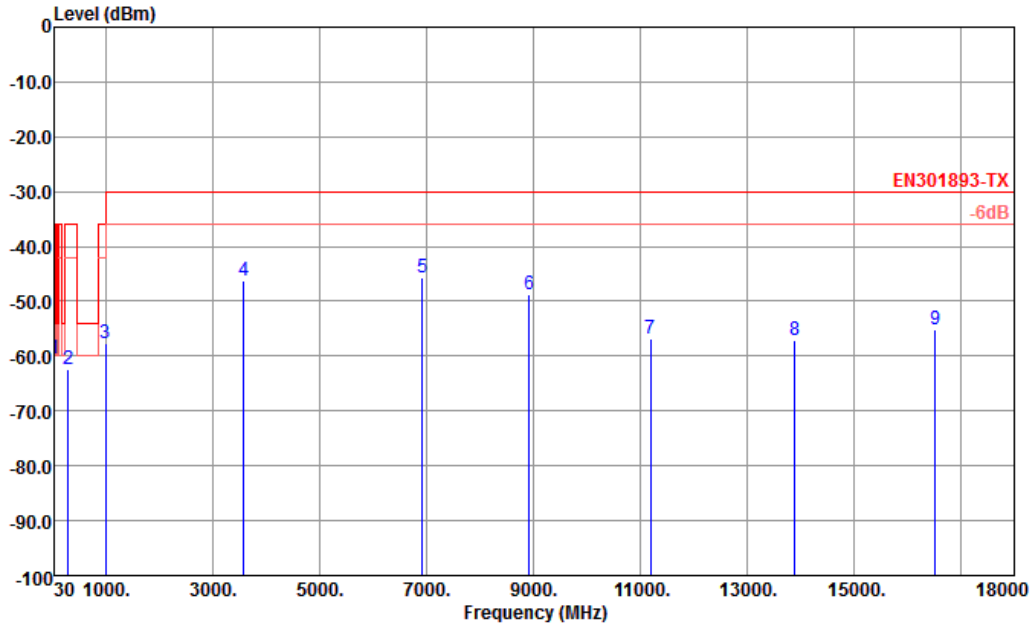


Site : 05CH01-KS
 Condition : EN301893-TX LF EIRP_090504 HORIZONTAL
 Project : (ER)2D1707

	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	34.59	-61.15	-25.15	-36.00	-64.98	3.83
2	448.40	-62.40	-26.40	-36.00	-64.54	2.14
3	1146.00	-63.53	-33.53	-30.00	-65.72	2.19
4	3580.00	-53.16	-23.16	-30.00	-62.61	9.45
5 p	6920.00	-47.54	-17.54	-30.00	-61.38	13.84
6	8920.00	-58.01	-28.01	-30.00	-73.28	15.27
7	11799.00	-58.13	-28.13	-30.00	-78.14	20.01
8	12384.00	-55.34	-25.34	-30.00	-78.29	22.95
9	16338.00	-54.08	-24.08	-30.00	-77.43	23.35



Test Mode :	Mode 7: 802.11n HT-40 CH38 (5190MHz) in Laptop Mode with Adapter 1 for Sample 1	Temperature :	21~22°C
Test Engineer :	Lucky Pan	Relative Humidity :	41~42%
		Polarization :	Vertical

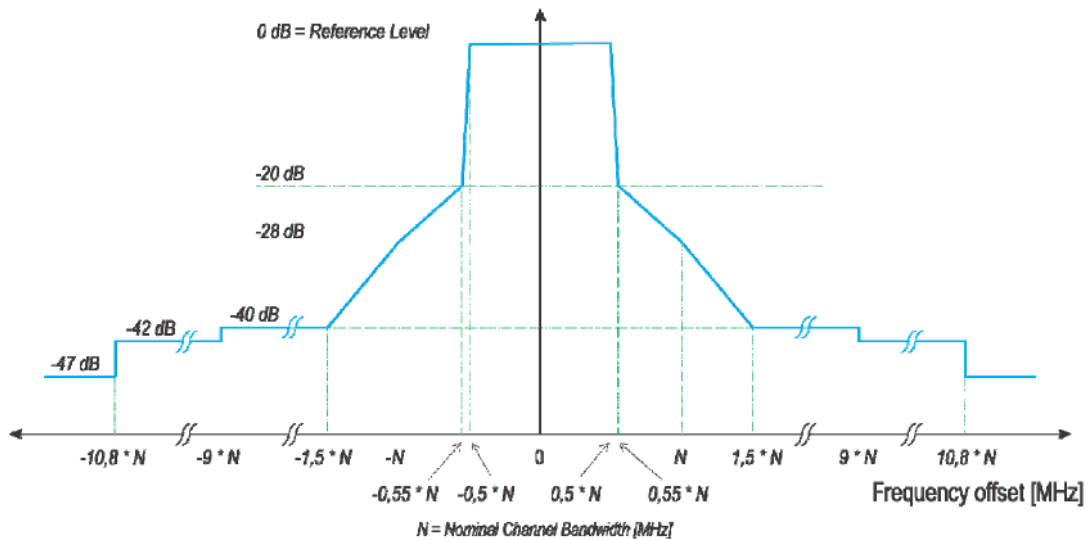


Site : 05CH01-KS
 Condition : EN301893-TX LF EIRP_090504 VERTICAL
 Project : (ER) 2D1707

	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	34.32	-60.33	-24.33	-36.00	-64.16	3.83
2	300.00	-62.40	-26.40	-36.00	-61.79	-0.61
3	1000.00	-57.72	-21.72	-36.00	-58.36	0.64
4	3576.00	-46.17	-16.17	-30.00	-55.54	9.37
5 p	6920.00	-45.77	-15.77	-30.00	-59.39	13.62
6	8920.00	-48.85	-18.85	-30.00	-64.24	15.39
7	11193.00	-56.78	-26.78	-30.00	-78.46	21.68
8	13890.00	-57.05	-27.05	-30.00	-79.41	22.36
9	16515.00	-55.28	-25.28	-30.00	-77.78	22.50

3.6 Transmitter Unwanted Emissions within the 5GHz RLAN Band

3.6.1 Limit of Transmitter Unwanted Emissions within the Band



NOTE: dBc is the spectral density relative to the maximum spectral power density of the transmitted signal.

3.6.1.1 Measuring Instruments

See list of measuring instruments of this test report.

3.6.1.2 Test Procedures

Refer to Section 5.3.6 of ETSI EN 301 893 V1.6.1 (2011-11).

If duty cycle equal to 100 %, the test procedure 5.3.6.2.1 in standard, Option 1: For equipment with continuous transmission capability will be followed.

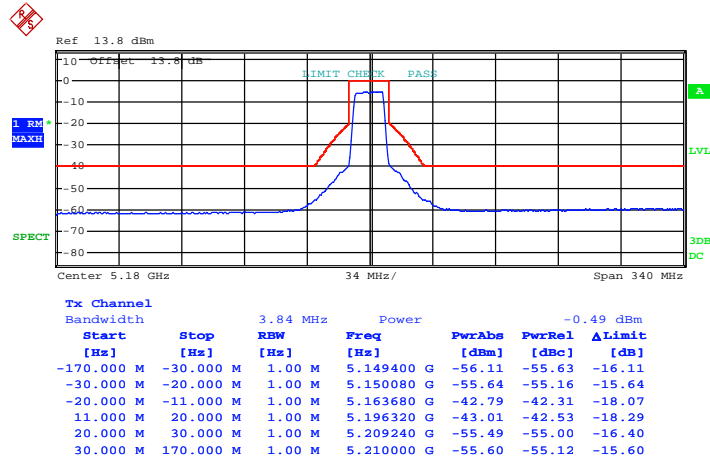
If duty cycle less than 100 %, the test procedure 5.3.6.2.1.2, Option 2: For equipment without continuous transmission capability will be followed.



3.6.1.3 Test Result

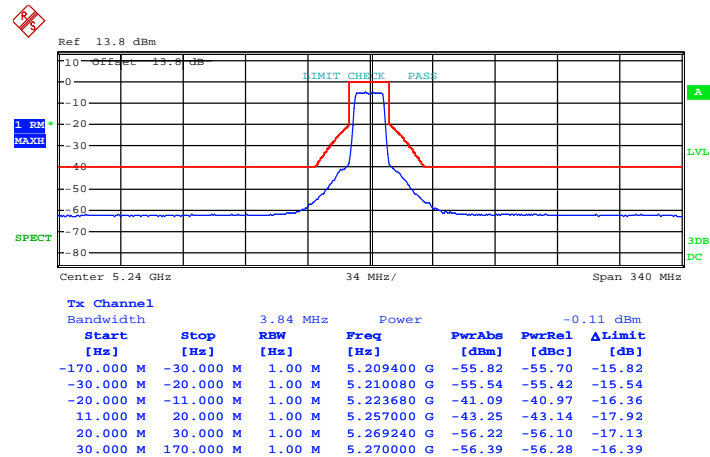
EUT Mode :	802.11a (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%

Plot on Channel CH36 5180MHz



Date: 31.JAN.2013 14:30:21

Plot on Channel CH48 5240MHz

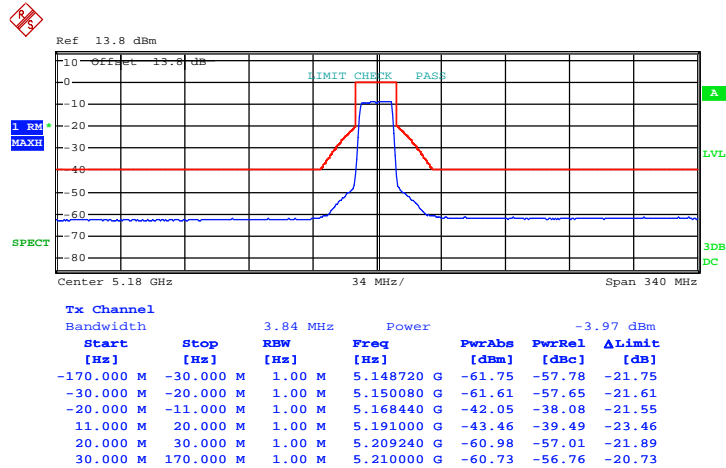


Date: 31.JAN.2013 14:30:50



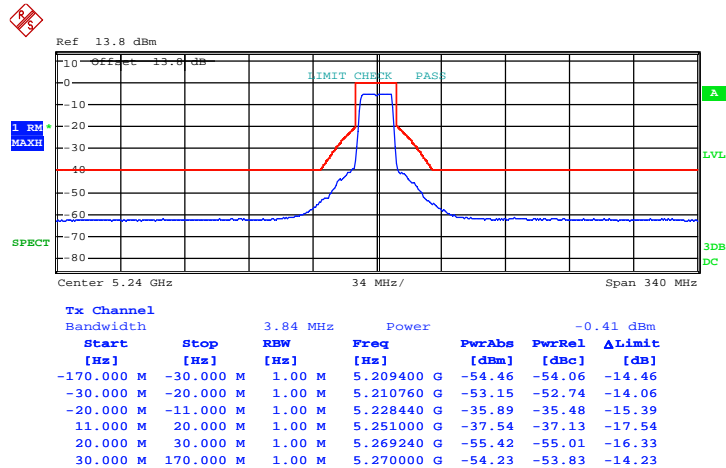
EUT Mode :	802.11n HT-20 (5150 MHz ~ 5250 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%

Plot on Channel CH36 5180MHz



Date: 31.JAN.2013 14:28:54

Plot on Channel CH48 5240MHz

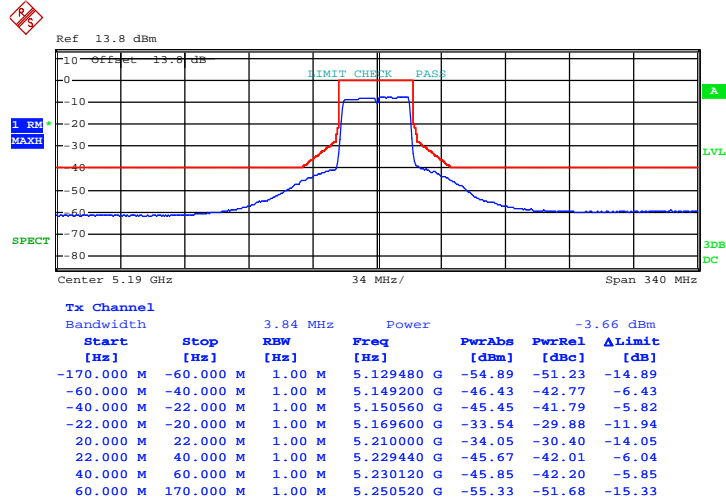


Date: 31.JAN.2013 14:32:12



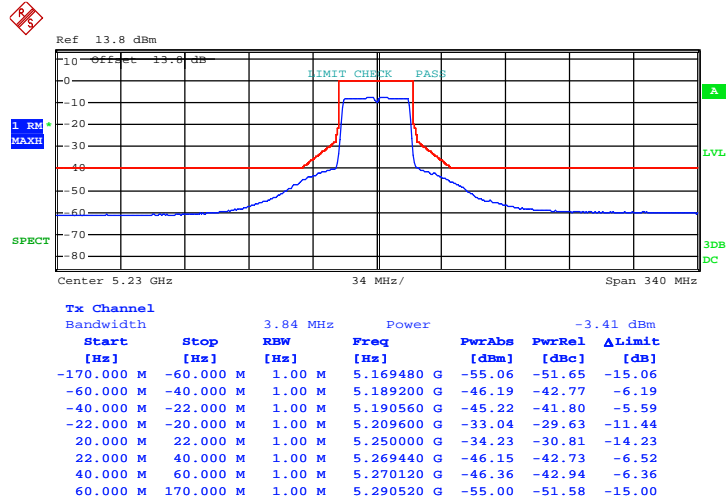
EUT Mode :	802.11n HT-40 (5160 MHz ~ 5240 MHz)	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%
Antenna Gain :	0.05 dBi	Duty Cycle :	100.00%

Plot on Channel CH38 5190MHz



Date: 31.JAN.2013 14:45:23

Plot on Channel CH46 5230MHz



Date: 31.JAN.2013 14:48:20



3.7 Medium Access Protocol

3.7.1 Definition and Requirement

A medium access protocol is a mechanism designed to facilitate spectrum sharing with other devices in a wireless network and the medium access protocol shall be implemented in WiFi 802.11a device.

3.7.2 Description

A medium access protocol is implemented due to 802.11 WLAN Channel Access Mechanism transmissions; this device complies with this test case.

3.8 User Access Restrictions

3.8.1 Definition and Requirement

User Access Restrictions are restraints implemented in the RLAN to restrict access for the user to certain hardware and/or software settings of the equipment.

3.8.2 Description

According to the manufacturer's user manual, this device complies with this test case.



4. Receiver Parameters

4.1 Receiver Spurious Emissions

4.1.1 Limit of Receiver Spurious Emissions

Spurious emission limits for receivers

SUBCLAUSE 4.6.2		
FREQUENCY RANGE	MAXIMUM POWER ERP (<=1 GHZ) EIRP (>1 GHZ)	MEASURED BANDWIDTH
30 MHz to 1 GHz	-57 dBm	100 KHz
1 GHz to 26 GHz	-47 dBm	1 MHz

4.1.2 Measuring Instruments

See list of measuring instruments of this test report.

4.1.3 Test Procedures

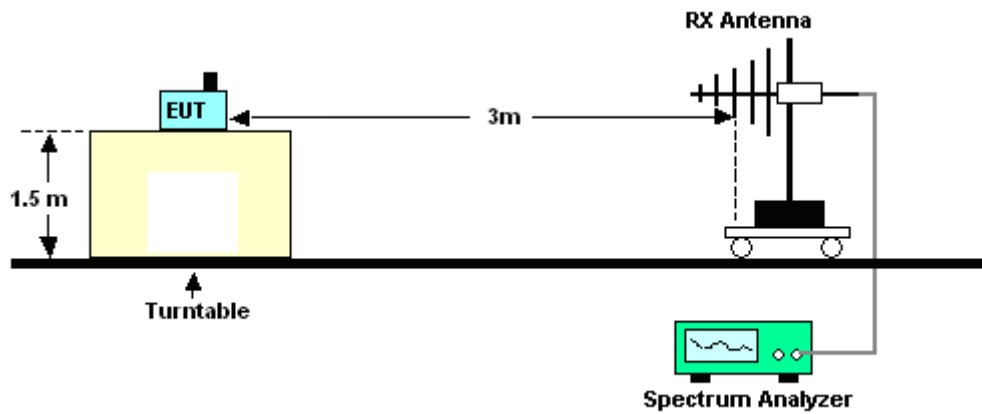
Refer to Section 5.3.7 of ETSI EN 301 893 V1.6.1 (2011-11).

4.1.4 Test Setup

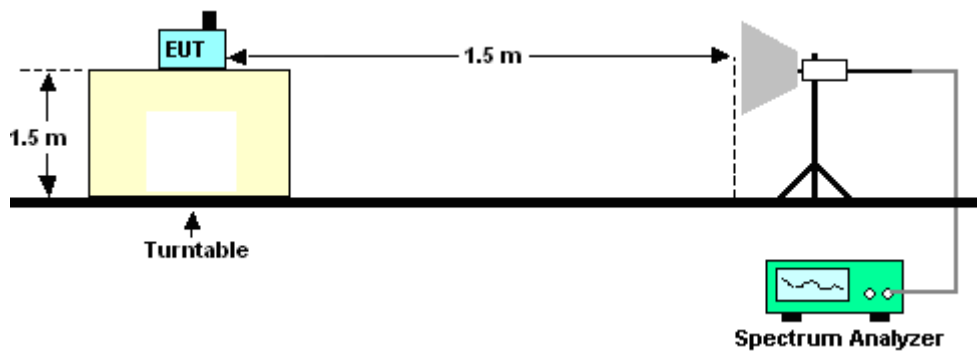
- Test Setup of Conducted Measurement



- Test Setup of Radiated Measurement
<Below 1GHz>



- <Above 1GHz>

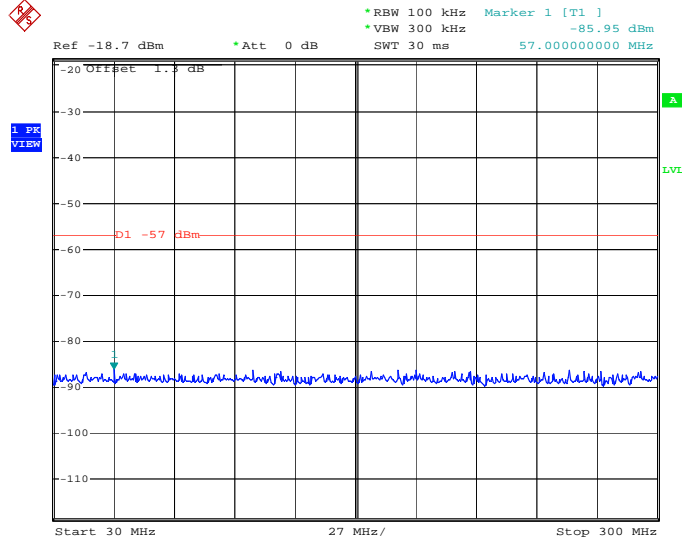




4.1.5 Test Result of Conducted Measurement

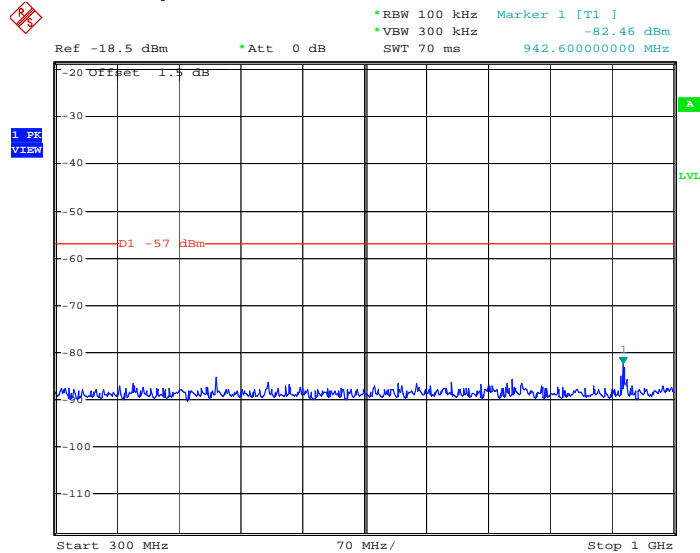
EUT Mode :	802.11a	Temperature :	20~21°C
Channel :	48	Relative Humidity :	40~41%
Test Engineer :	Zhi Lu	Antenna Gain :	0.05dBi

Conducted Spurious Emission Plot between 30 MHz ~ 300 MHz



Date: 29.JAN.2013 17:55:05

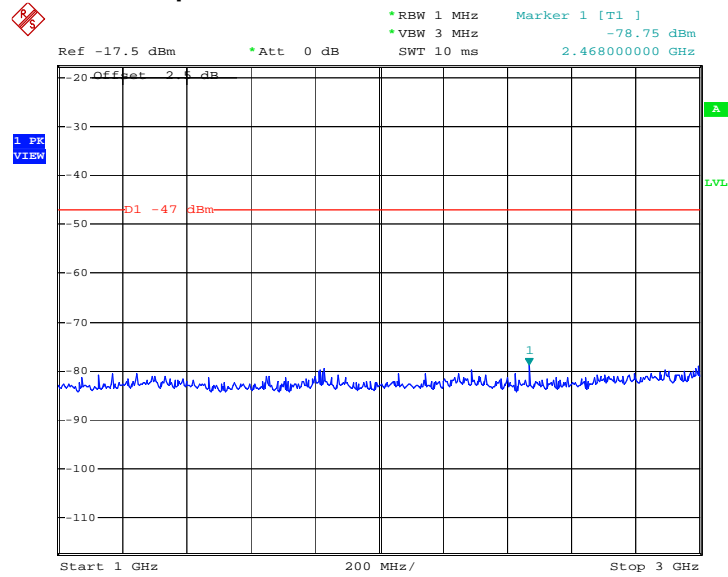
Conducted Spurious Emission Plot between 300 MHz ~ 1 GHz



Date: 29.JAN.2013 17:59:20

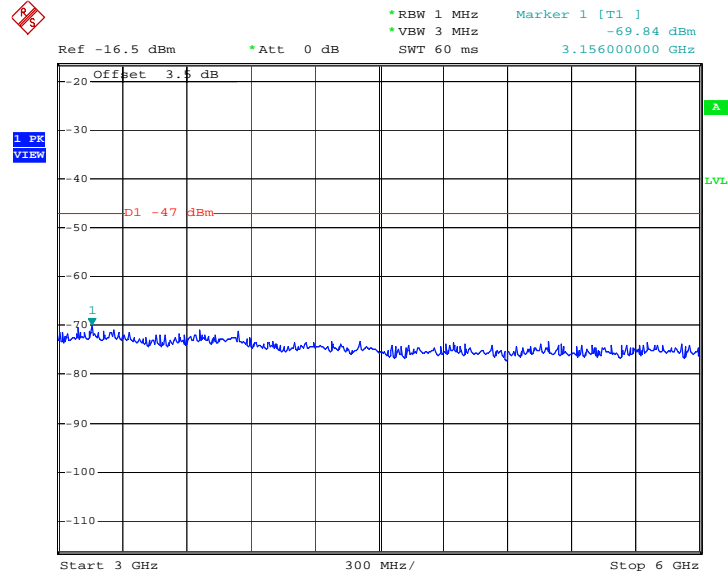


Conducted Spurious Emission Plot between 1 GHz ~ 3 GHz



Date: 29.JAN.2013 17:57:59

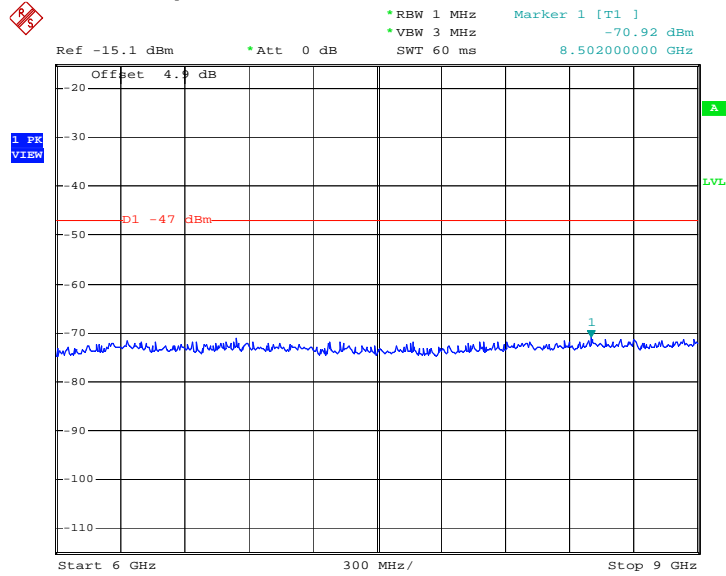
Conducted Spurious Emission Plot between 3 GHz ~ 6 GHz



Date: 29.JAN.2013 18:09:08

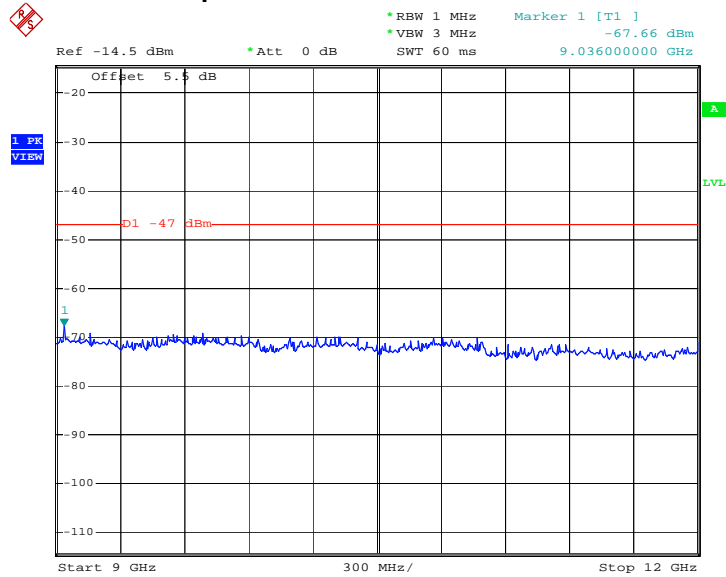


Conducted Spurious Emission Plot between 6 GHz ~ 9 GHz



Date: 29.JAN.2013 18:10:37

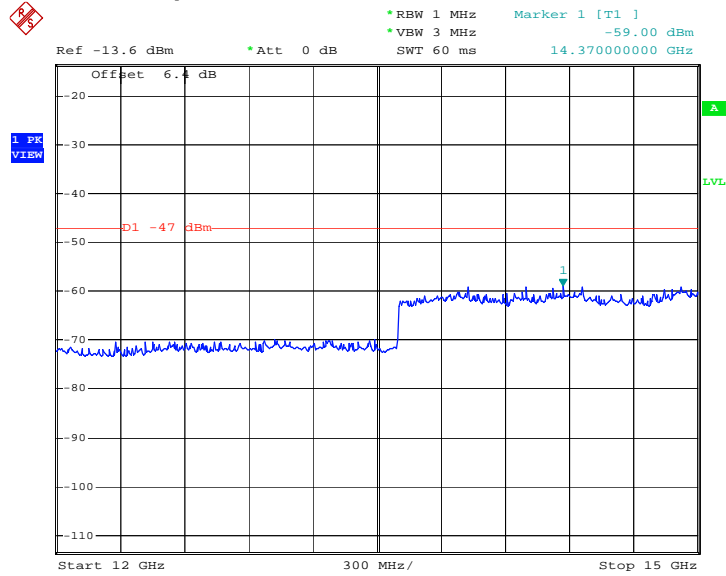
Conducted Spurious Emission Plot between 9 GHz ~ 12 GHz



Date: 29.JAN.2013 18:12:08

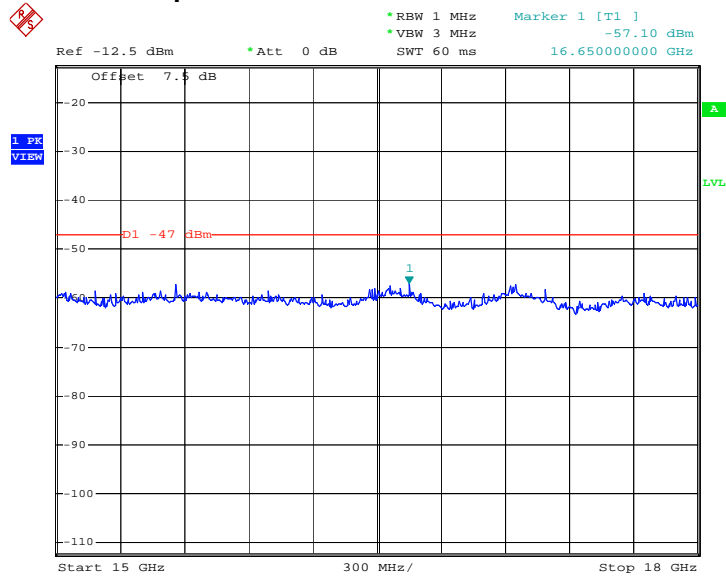


Conducted Spurious Emission Plot between 12 GHz ~ 15 GHz



Date: 29.JAN.2013 18:14:32

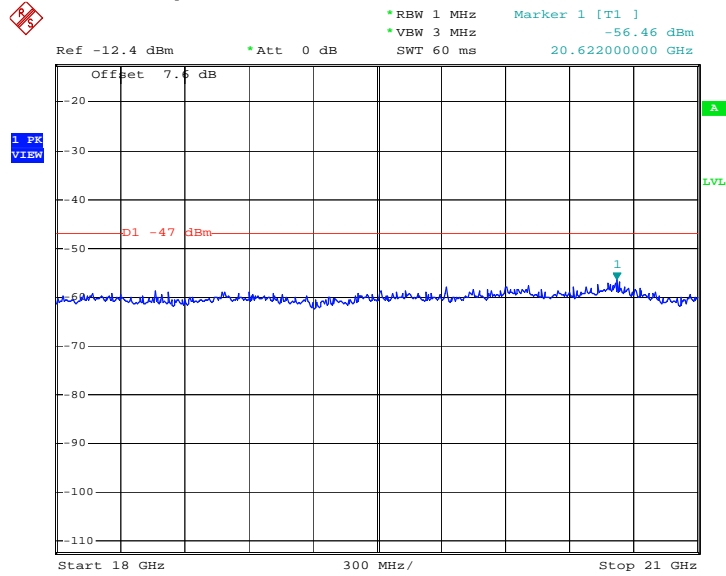
Conducted Spurious Emission Plot between 15 GHz ~ 18 GHz



Date: 29.JAN.2013 18:15:47

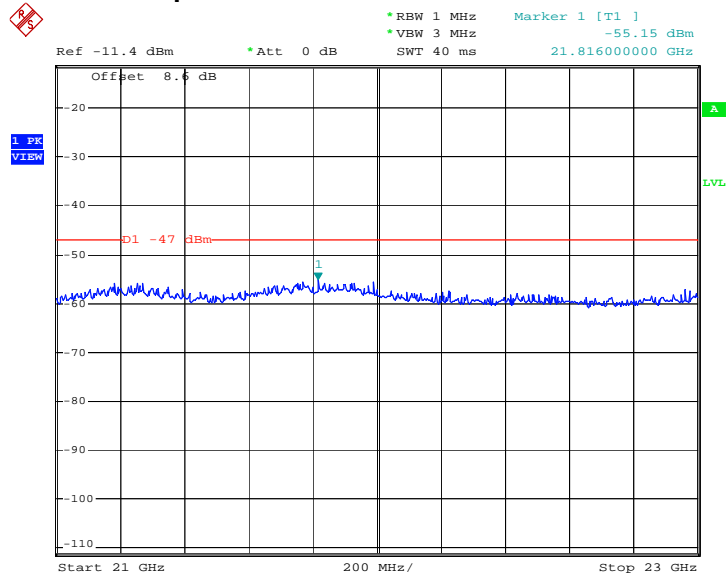


Conducted Spurious Emission Plot between 18 GHz ~ 21 GHz



Date: 29.JAN.2013 18:17:56

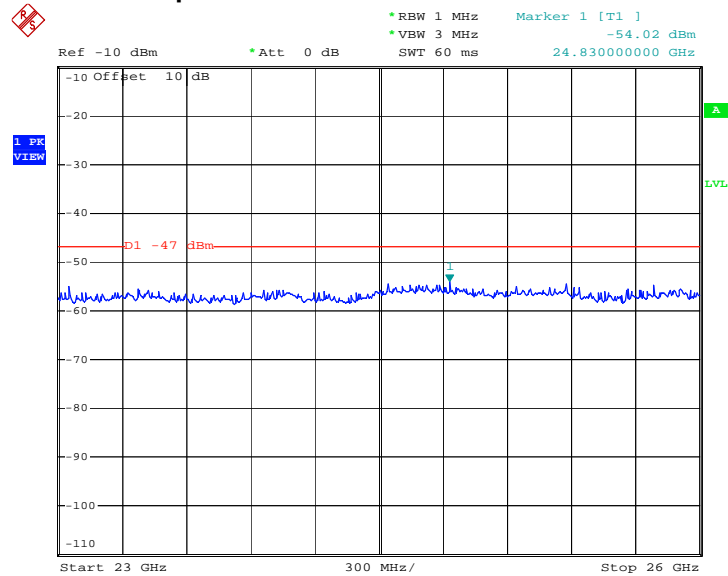
Conducted Spurious Emission Plot between 21 GHz ~ 23 GHz



Date: 29.JAN.2013 18:19:27



Conducted Spurious Emission Plot between 23 GHz ~ 26 GHz

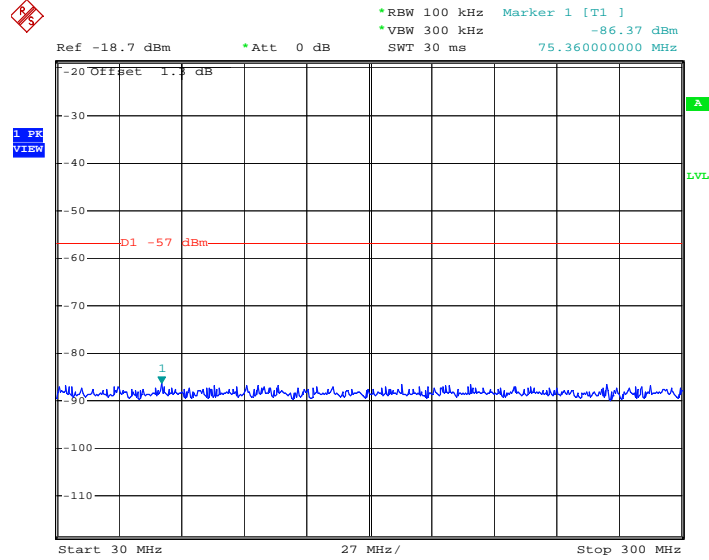


Date: 29.JAN.2013 18:20:56



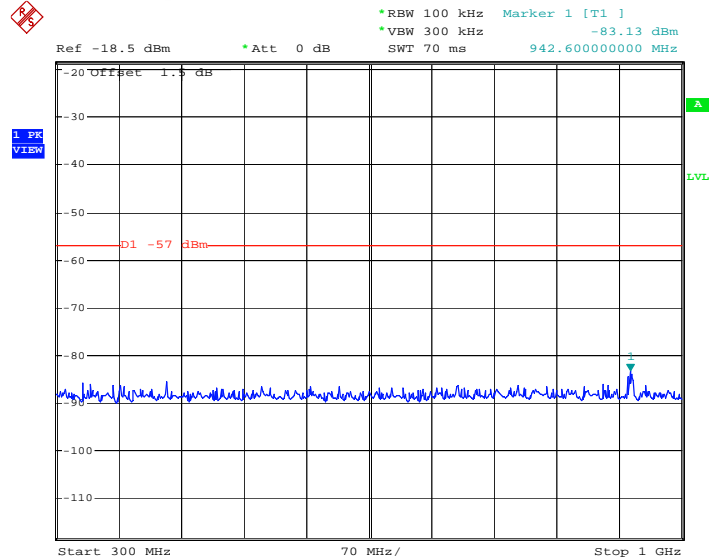
EUT Mode :	802.11n HT-20	Temperature :	20~21°C
Channel :	36	Relative Humidity :	40~41%
Test Engineer :	Zhi Lu	Antenna Gain :	0.05dBi

Conducted Spurious Emission Plot between 30 MHz ~ 300 MHz



Date: 29.JAN.2013 17:55:29

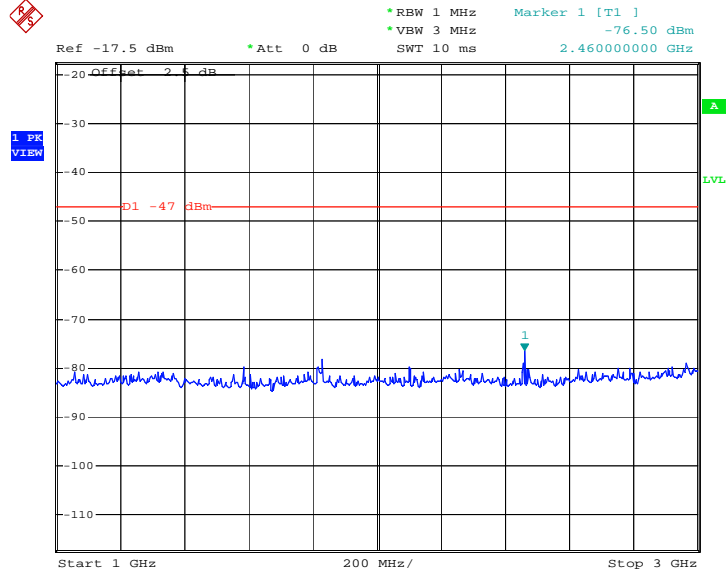
Conducted Spurious Emission Plot between 300 MHz ~ 1 GHz



Date: 29.JAN.2013 17:59:44

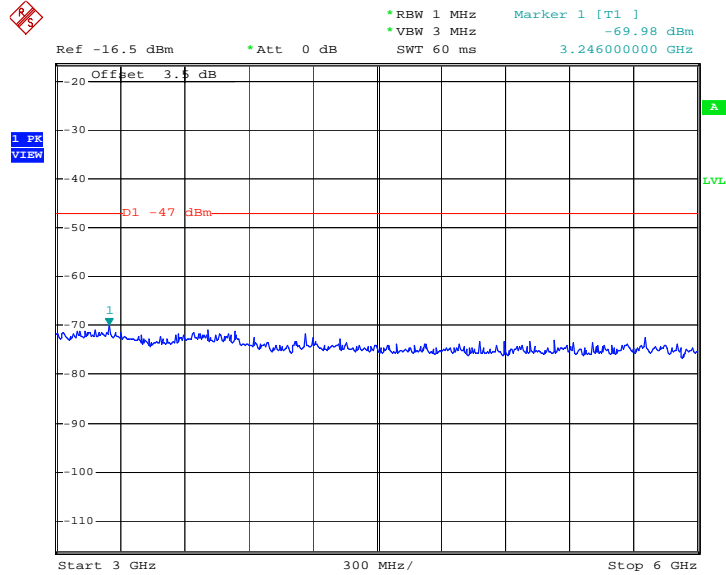


Conducted Spurious Emission Plot between 1 GHz ~ 3 GHz



Date: 29.JAN.2013 17:58:35

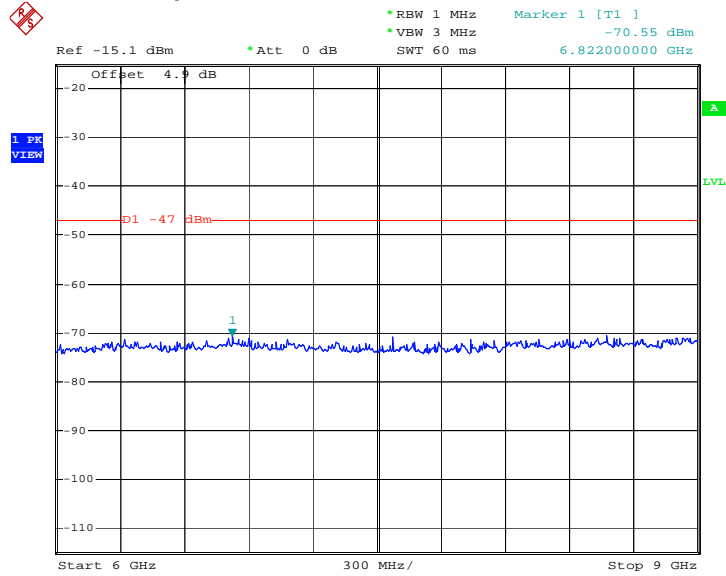
Conducted Spurious Emission Plot between 3 GHz ~ 6 GHz



Date: 29.JAN.2013 18:09:30

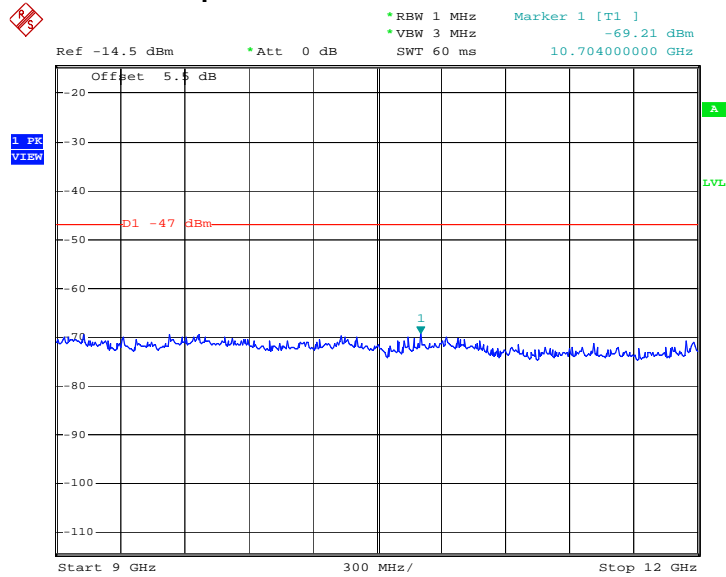


Conducted Spurious Emission Plot between 6 GHz ~ 9 GHz



Date: 29.JAN.2013 18:11:05

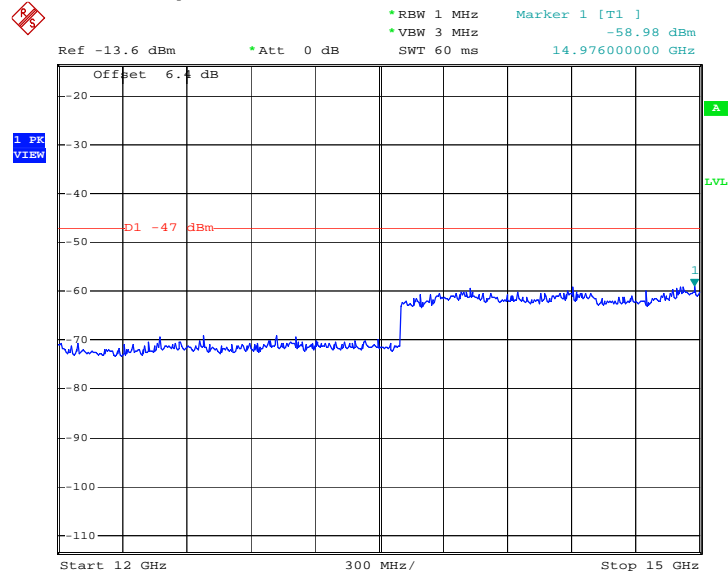
Conducted Spurious Emission Plot between 9 GHz ~ 12 GHz



Date: 29.JAN.2013 18:12:34

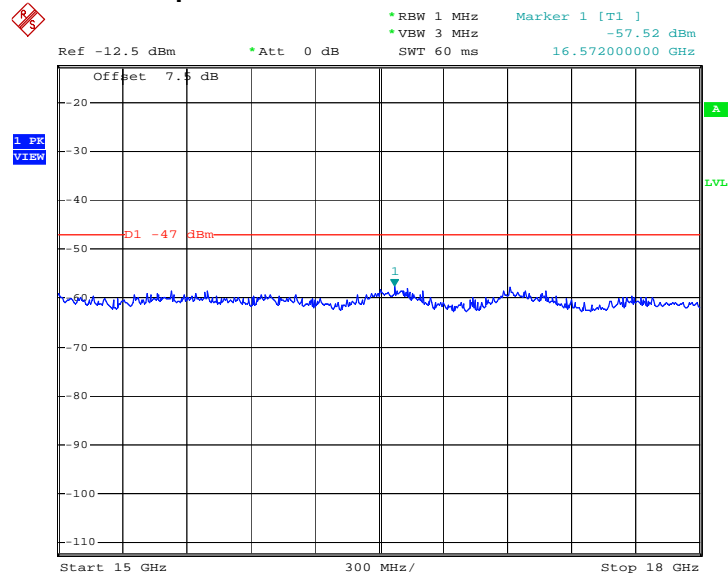


Conducted Spurious Emission Plot between 12 GHz ~ 15 GHz



Date: 29.JAN.2013 18:14:50

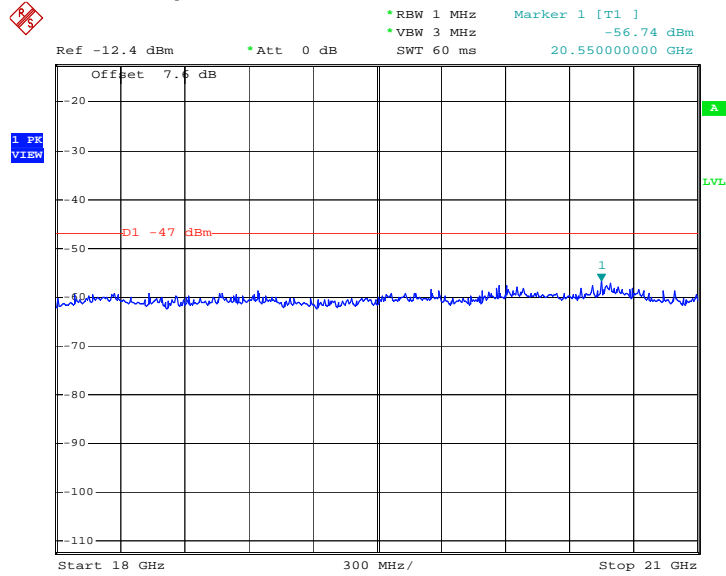
Conducted Spurious Emission Plot between 15 GHz ~ 18 GHz



Date: 29.JAN.2013 18:16:08

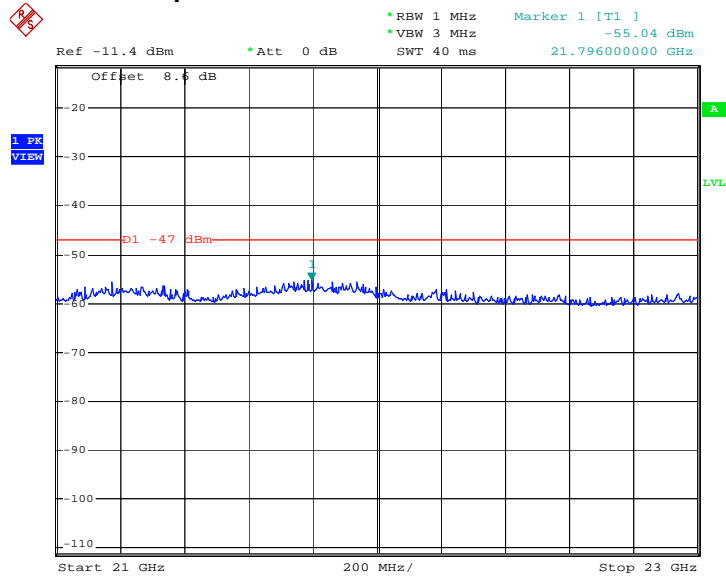


Conducted Spurious Emission Plot between 18 GHz ~ 21 GHz



Date: 29.JAN.2013 18:18:18

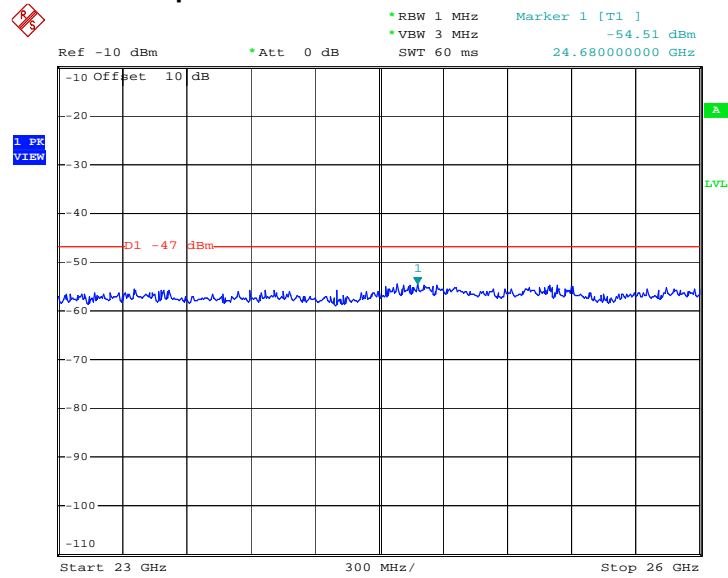
Conducted Spurious Emission Plot between 21 GHz ~ 23 GHz



Date: 29.JAN.2013 18:19:50



Conducted Spurious Emission Plot between 23 GHz ~ 26 GHz

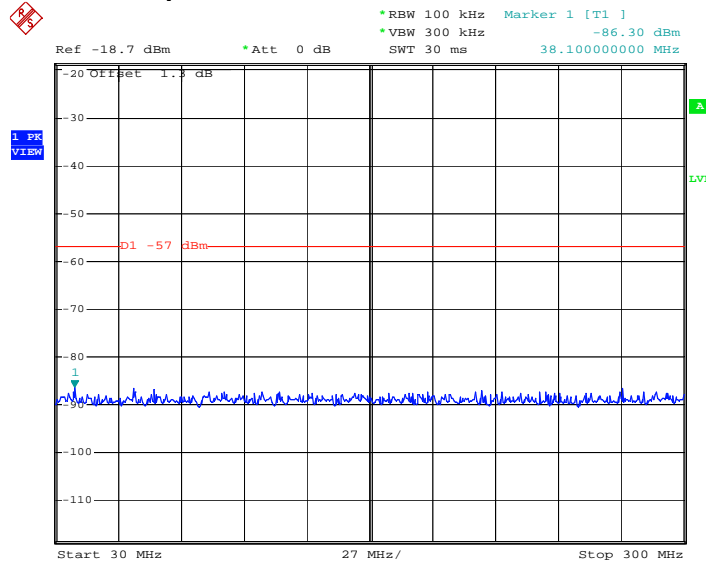


Date: 29.JAN.2013 18:21:16



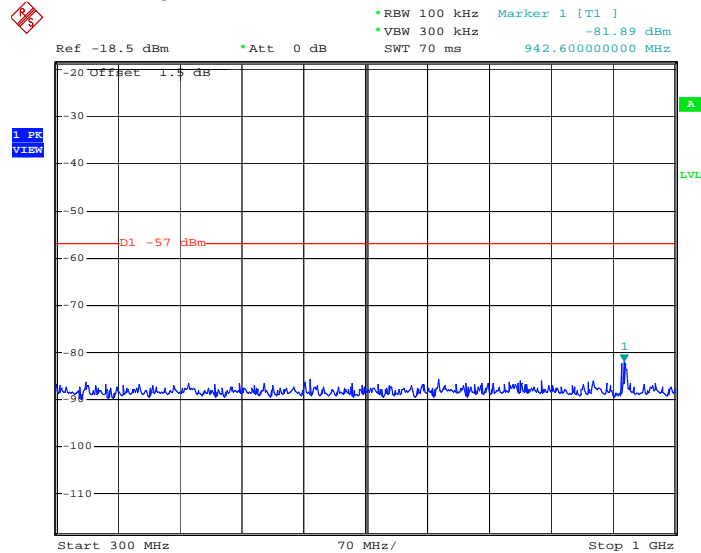
EUT Mode :	802.11n HT-40	Temperature :	20~21°C
Channel :	38	Relative Humidity :	40~41%
Test Engineer :	Zhi Lu	Antenna Gain :	0.05dBi

Conducted Spurious Emission Plot between 30 MHz ~ 300 MHz



Date: 29.JAN.2013 18:01:49

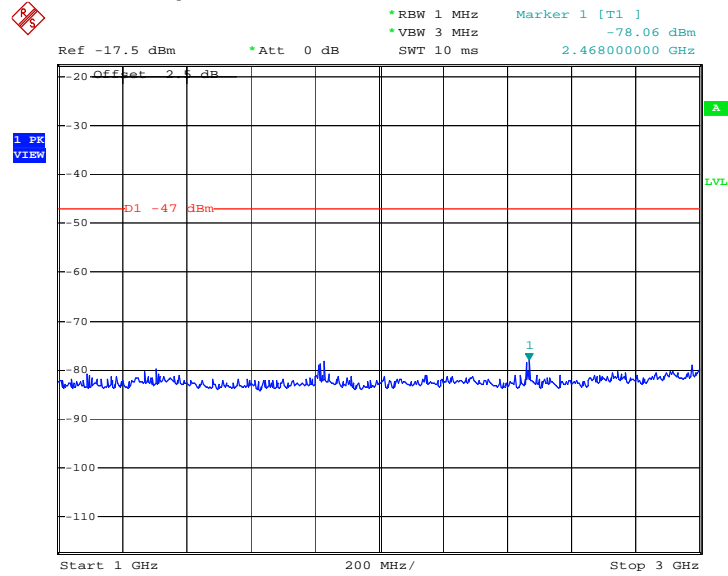
Conducted Spurious Emission Plot between 300 MHz ~ 1 GHz



Date: 29.JAN.2013 18:00:40

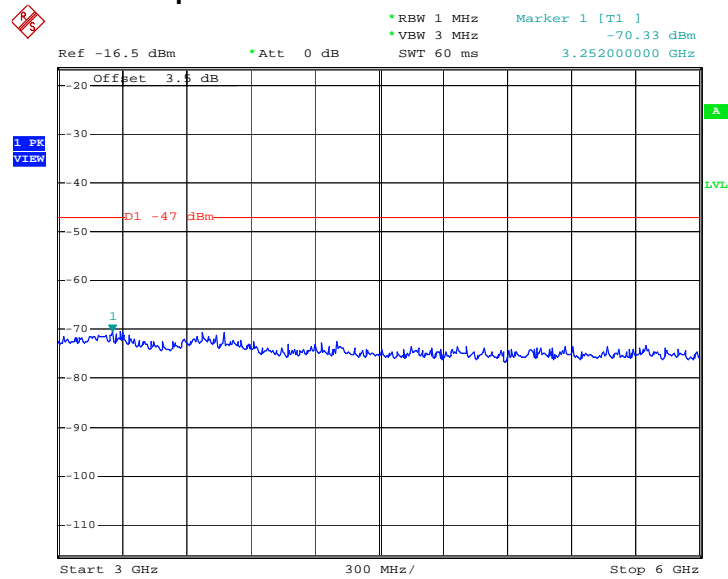


Conducted Spurious Emission Plot between 1 GHz ~ 3 GHz



Date: 29.JAN.2013 18:02:28

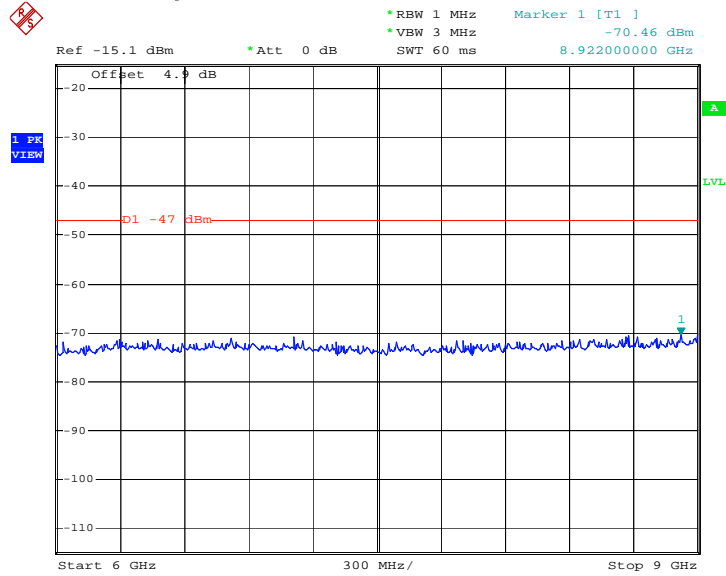
Conducted Spurious Emission Plot between 3 GHz ~ 6 GHz



Date: 29.JAN.2013 18:09:59

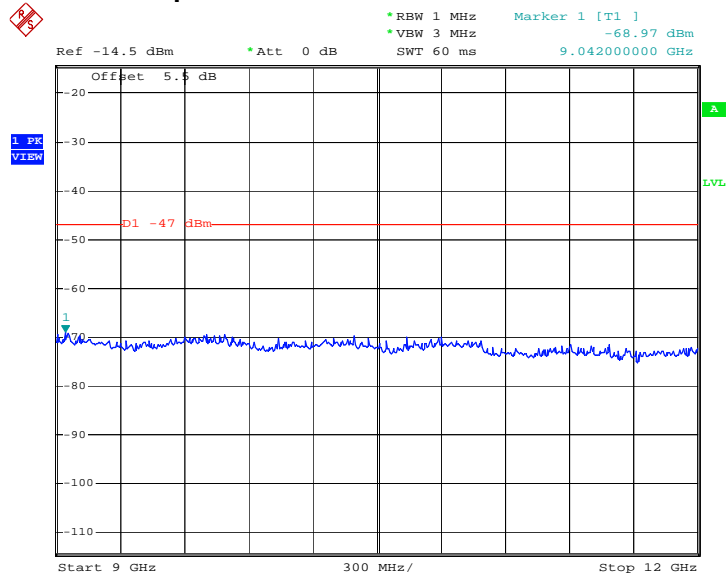


Conducted Spurious Emission Plot between 6 GHz ~ 9 GHz



Date: 29.JAN.2013 18:11:28

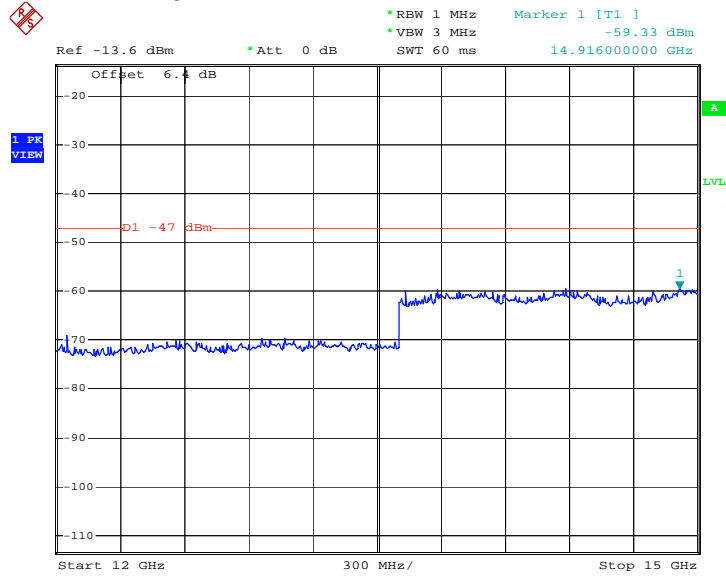
Conducted Spurious Emission Plot between 9 GHz ~ 12 GHz



Date: 29.JAN.2013 18:13:22

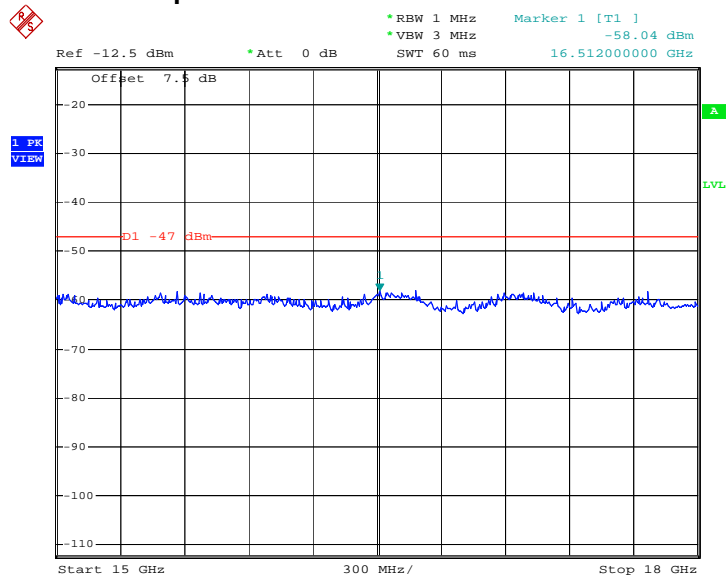


Conducted Spurious Emission Plot between 12 GHz ~ 15 GHz



Date: 29.JAN.2013 18:15:09

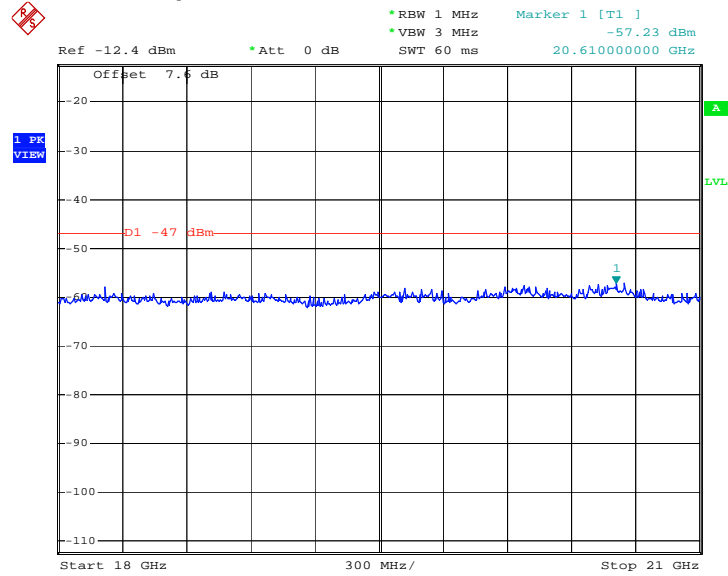
Conducted Spurious Emission Plot between 15 GHz ~ 18 GHz



Date: 29.JAN.2013 18:17:19

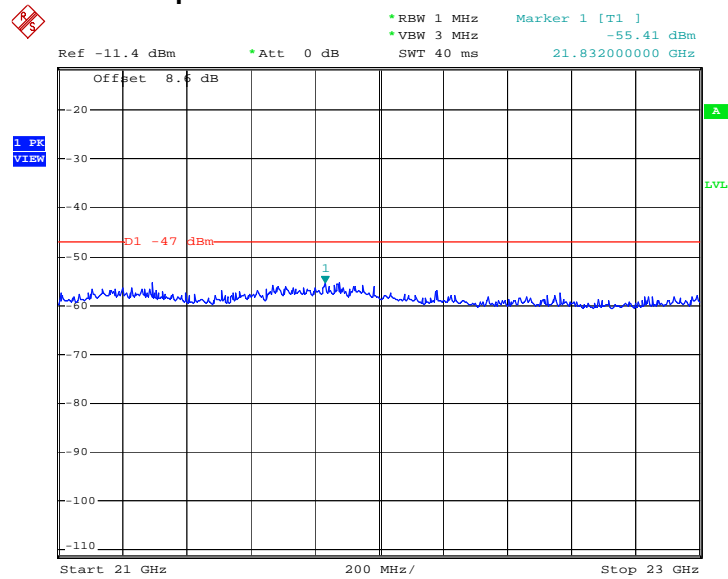


Conducted Spurious Emission Plot between 18 GHz ~ 21 GHz



Date: 29.JAN.2013 18:18:47

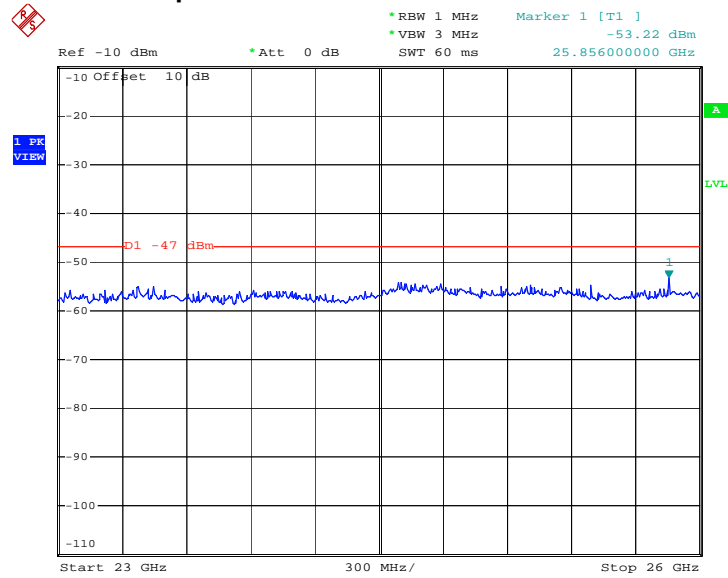
Conducted Spurious Emission Plot between 21 GHz ~ 23 GHz



Date: 29.JAN.2013 18:20:12



Conducted Spurious Emission Plot between 23 GHz ~ 26 GHz

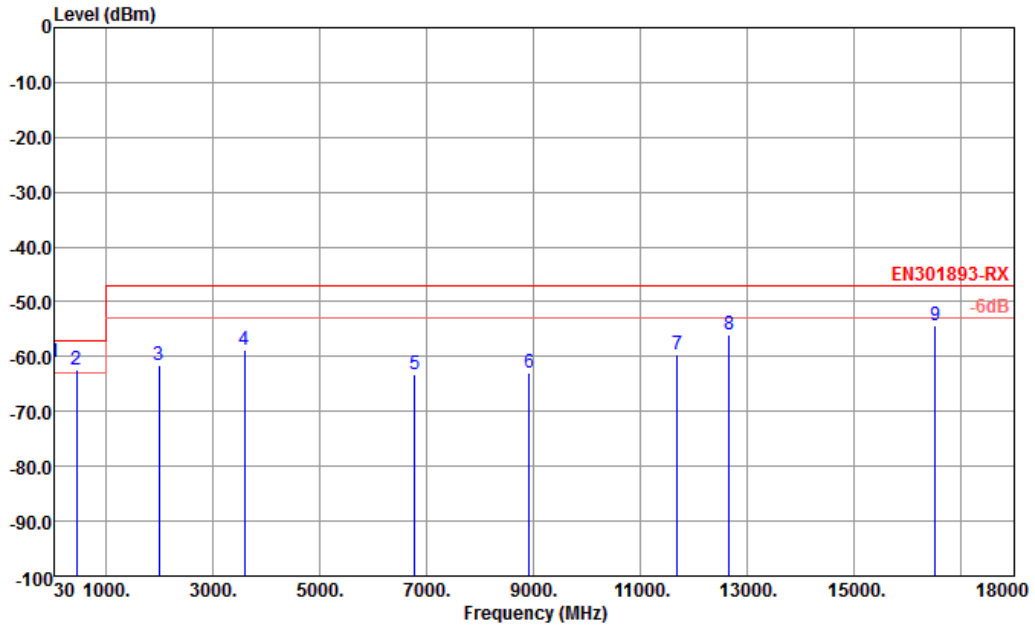


Date: 29.JAN.2013 18:21:36



4.1.6 Test Result of Radiated Measurement

Test Mode :	Mode 1: 802.11a CH48 (5240MHz) in Laptop Mode with Adapter 1 for Sample 1	Temperature :	21~22°C
Test Engineer :	Lucky Pan	Relative Humidity :	41~42%
		Polarization :	Horizontal

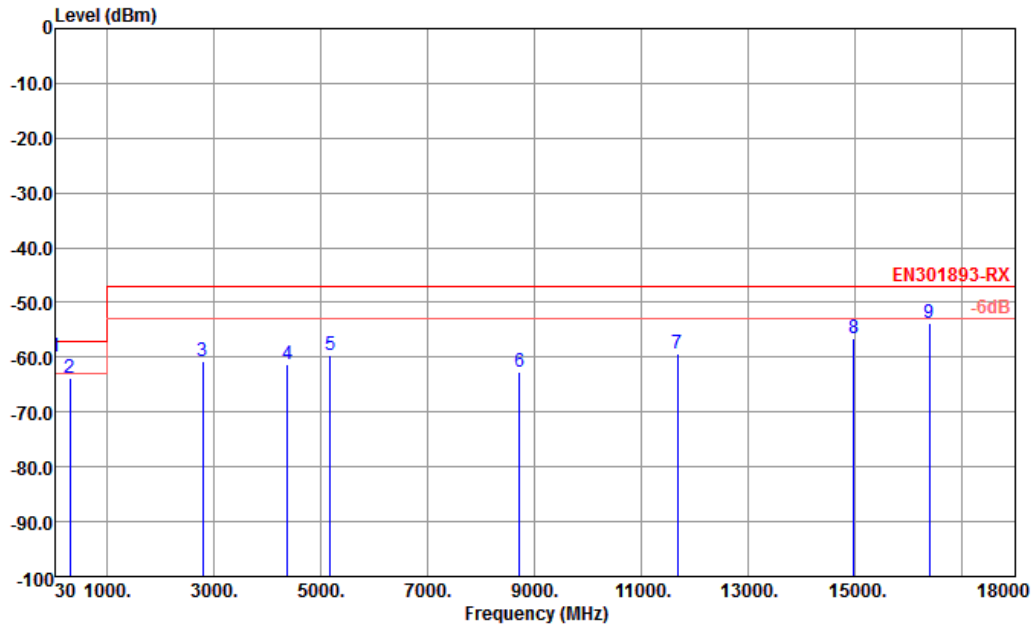


Site : 05CH01-KS
 Condition : EN301893-RX LF EIRP_090504 HORIZONTAL
 Project : (ER) 2D1707

	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1 p	34.59	-61.04	-4.04	-57.00	-64.87	3.83
2 !	448.40	-62.52	-5.52	-57.00	-64.66	2.14
3	1994.00	-61.69	-14.69	-47.00	-69.67	7.98
4	3588.00	-58.72	-11.72	-47.00	-68.17	9.45
5	6778.00	-63.33	-16.33	-47.00	-76.87	13.54
6	8920.00	-63.07	-16.07	-47.00	-78.29	15.22
7	11688.00	-59.60	-12.60	-47.00	-78.29	18.69
8	12669.00	-55.95	-8.95	-47.00	-78.55	22.60
9	16515.00	-54.29	-7.29	-47.00	-77.87	23.58



Test Mode :	Mode 1: 802.11a CH48 (5240MHz) in Laptop Mode with Adapter 1 for Sample 1	Temperature :	21~22°C
Test Engineer :	Lucky Pan	Relative Humidity :	41~42%
		Polarization :	Vertical



Site : 05CH01-KS
 Condition : EN301893-RX LF EIRP_090504 VERTICAL
 Project : (ER)2D1707

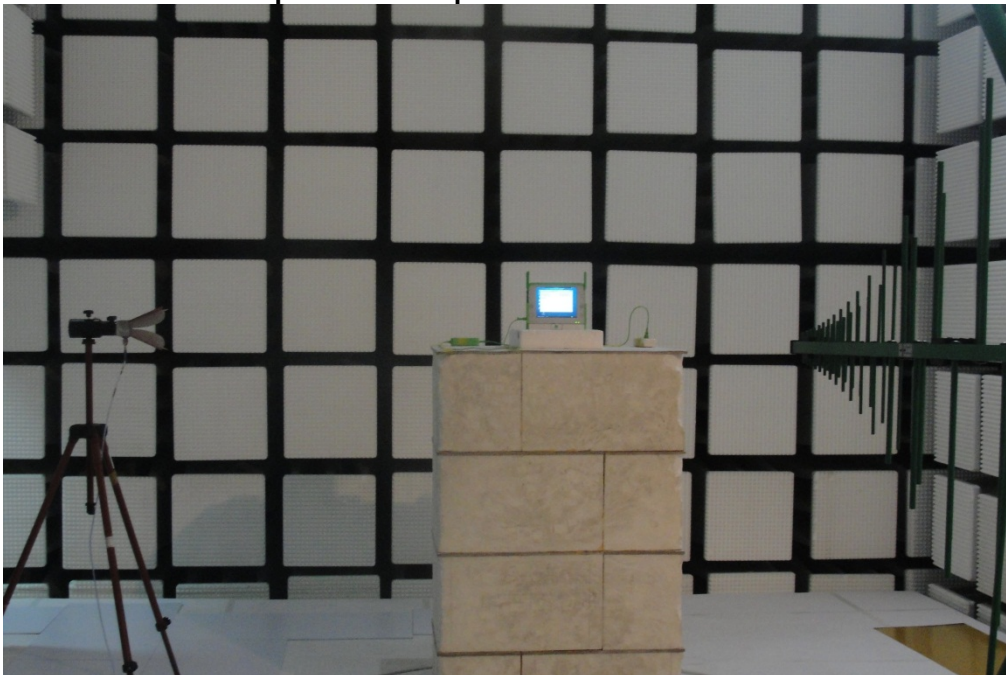
	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1 p	34.59	-59.80	-2.80	-57.00	-63.63	3.83
2	307.70	-63.67	-6.67	-57.00	-62.85	-0.82
3	2792.00	-60.71	-13.71	-47.00	-69.71	9.00
4	4386.00	-61.39	-14.39	-47.00	-73.02	11.63
5	5182.00	-59.52	-12.52	-47.00	-74.12	14.60
6	8724.00	-62.72	-15.72	-47.00	-77.85	15.13
7	11679.00	-59.24	-12.24	-47.00	-77.94	18.70
8	14985.00	-56.41	-9.41	-47.00	-79.03	22.62
9	16386.00	-53.71	-6.71	-47.00	-77.38	23.67

5. Photographs of Radiated Emission Test Configuration

Laptop Mode with Adapter 1 for Sample 1



Tablet Mode with Adapter 1 for Sample 1



Laptop Mode with Adapter 2 for Sample 2



Laptop Mode with Adapter 3 for Sample 3



Laptop Mode with Adapter 4 for Sample 4



6. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 29, 2012	Jan. 28, 2013~ Jan. 31, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	Jan. 28, 2013~ Jan. 31, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	Jan. 28, 2013~ Jan. 31, 2013	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Jan. 28, 2013~ Jan. 31, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Jan. 28, 2013~ Jan. 31, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSV30	100845	9kHz – 30GHz	Nov. 06, 2012	Feb. 16,2013	Nov. 05, 2013	Radiation (05CH01-KS)
Bilog Antenna	TESEQ	CBL6112D	23183	25MHz~2GHz	Dec. 07, 2012	Feb. 16,2013	Dec. 06, 2013	Radiation (05CH01-KS)
DRG	ETS-Lindgren	1908/07/13	00075957	1GHz~18GHz	Dec. 07, 2012	Feb. 16,2013	Dec. 06, 2013	Radiation (05CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	9kHz~2GHz	Dec. 29, 2012	Feb. 16,2013	Dec. 28, 2013	Radiation (05CH01-KS)
Amplifier	Agilent	8449B	3008A02371	1GHz~26.5GHz	Dec. 07, 2012	Feb. 16,2013	Dec. 06, 2013	Radiation (05CH01-KS)



7. Uncertainty Evaluation

Uncertainty of Radiated Emission Evaluation (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.16
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Uncertainty of Radiated Emission Evaluation (1GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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Appendix A. Photographs of EUT

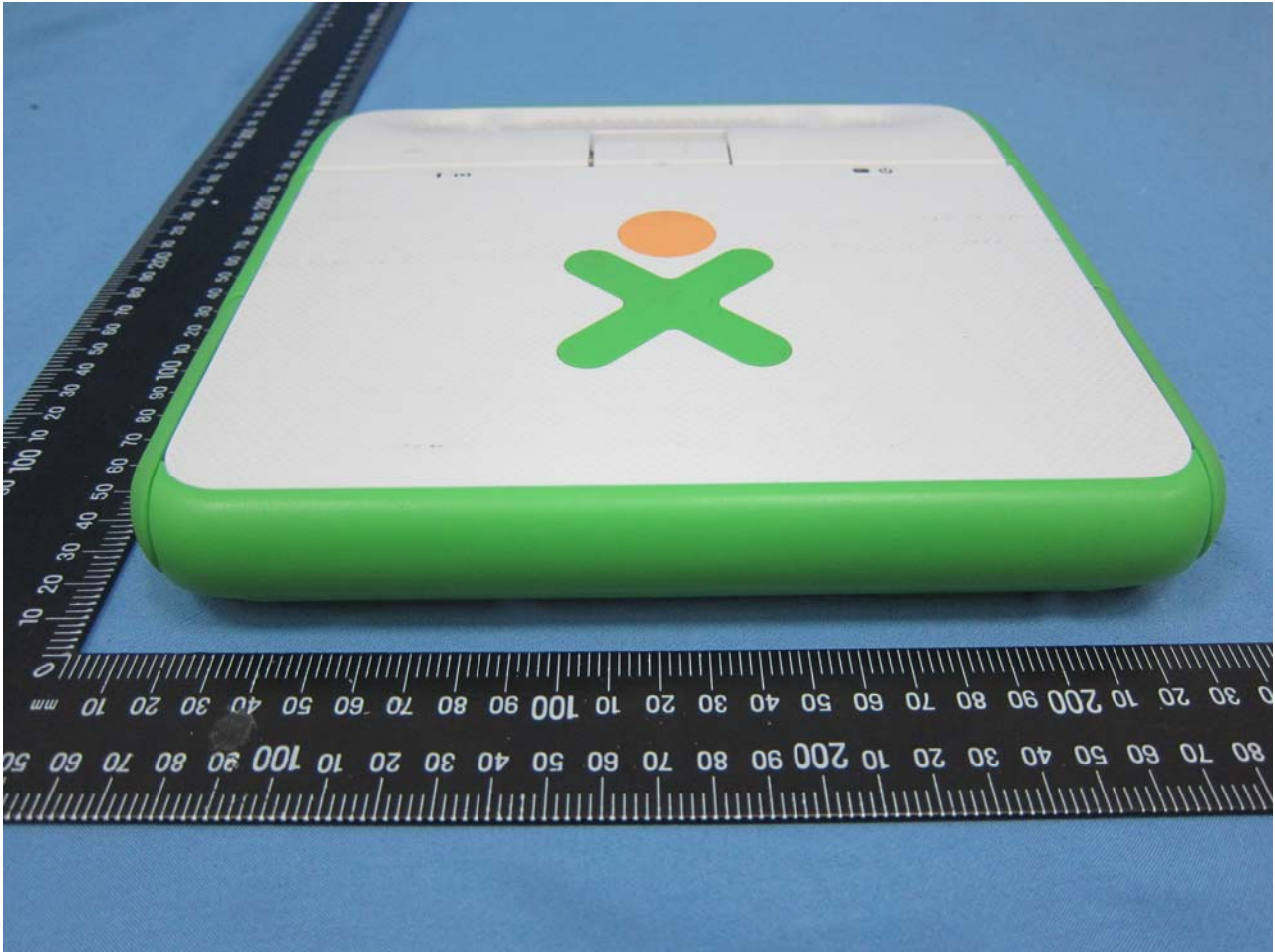
Please refer to Sporton report number EP2D1707 as below.

1. External Photograph of EUT

Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



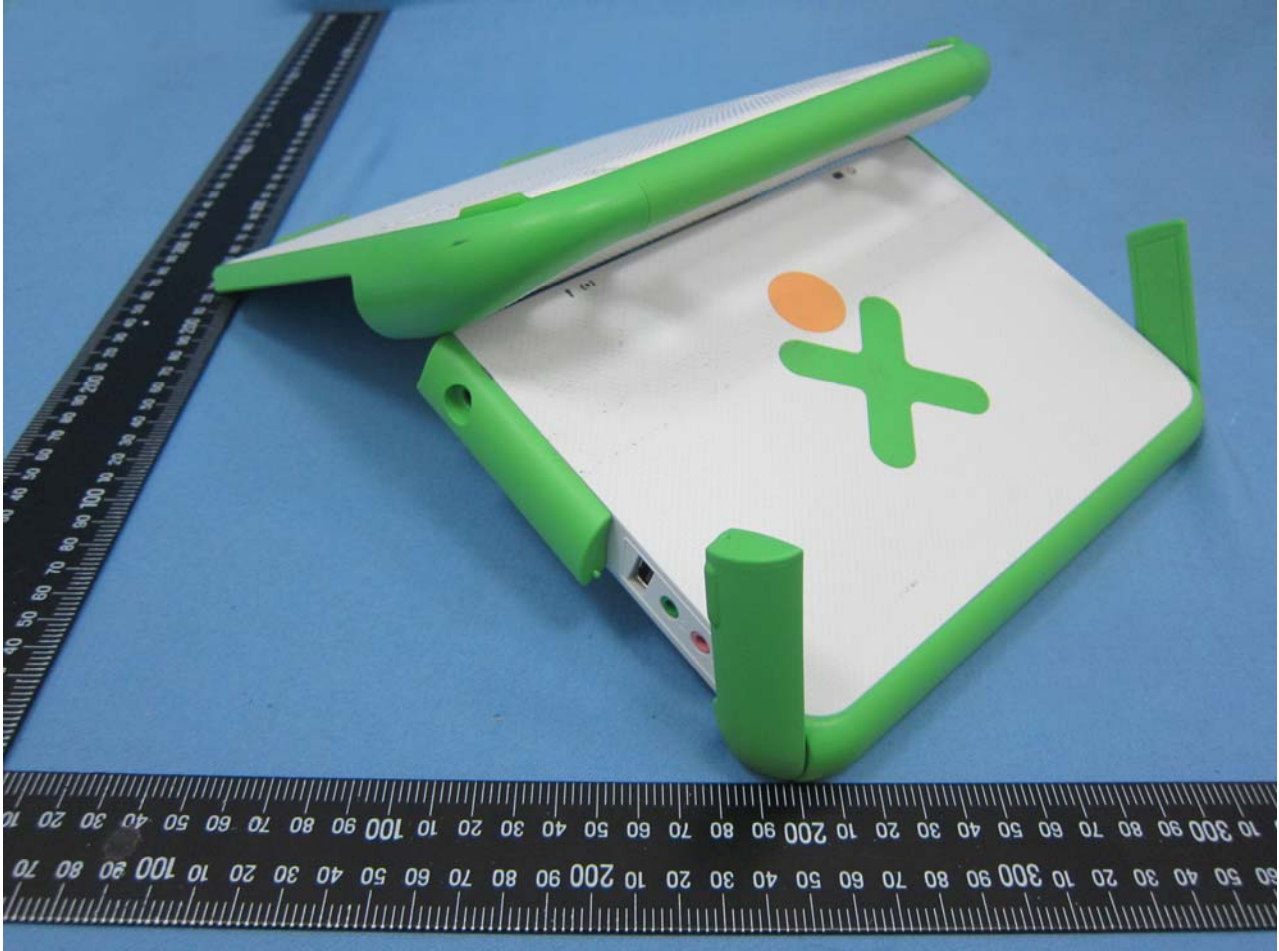
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



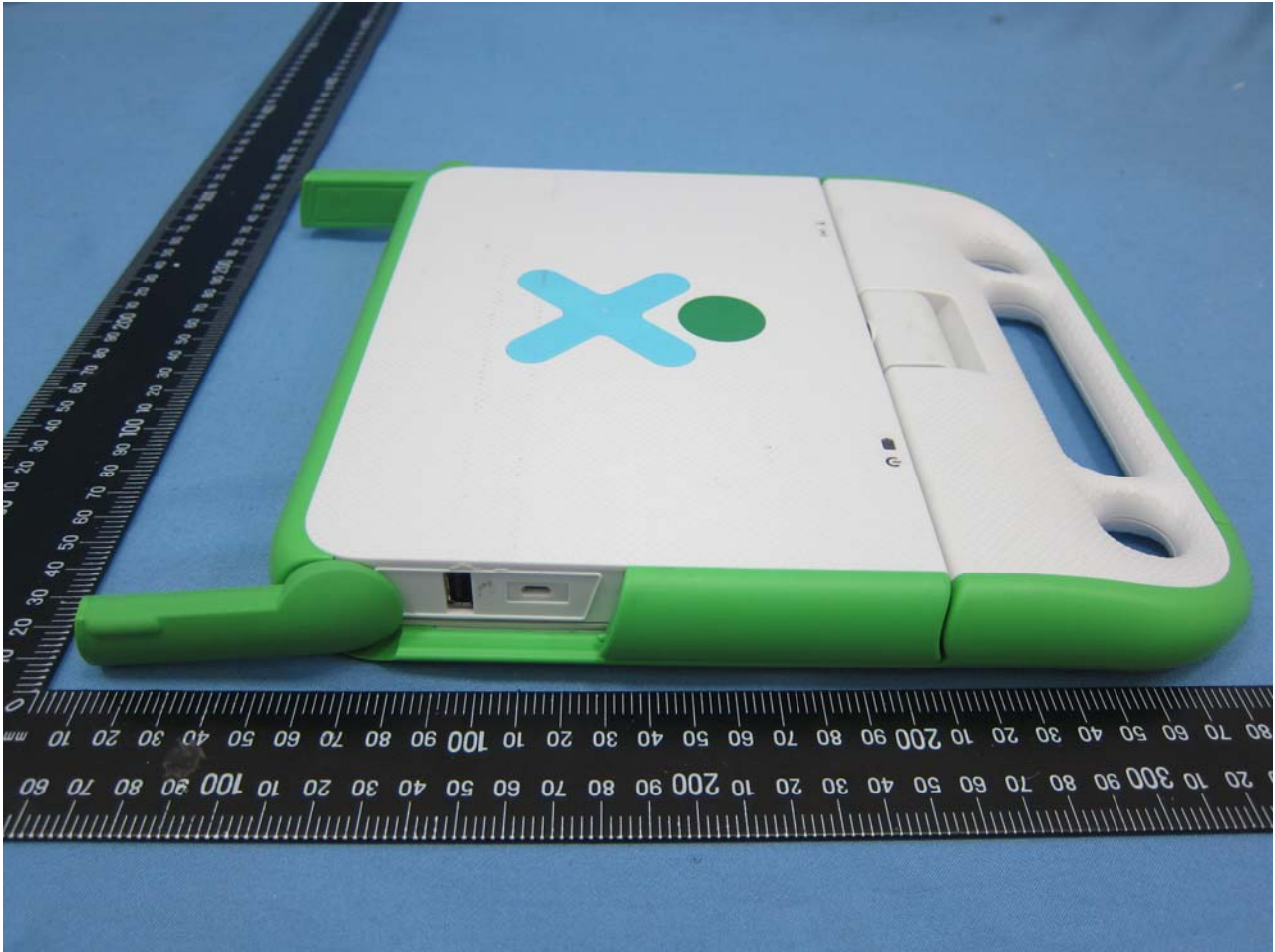
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



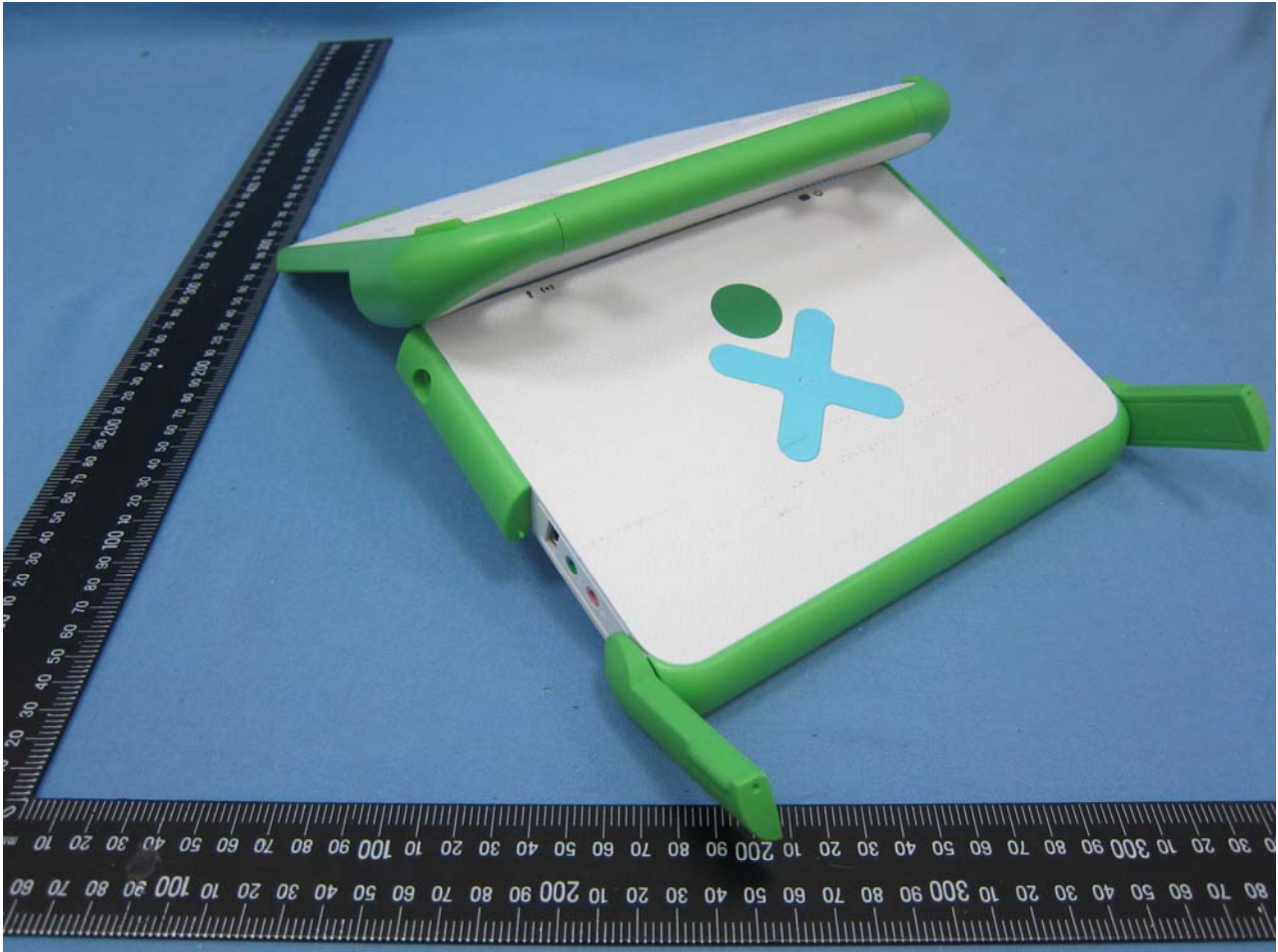
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



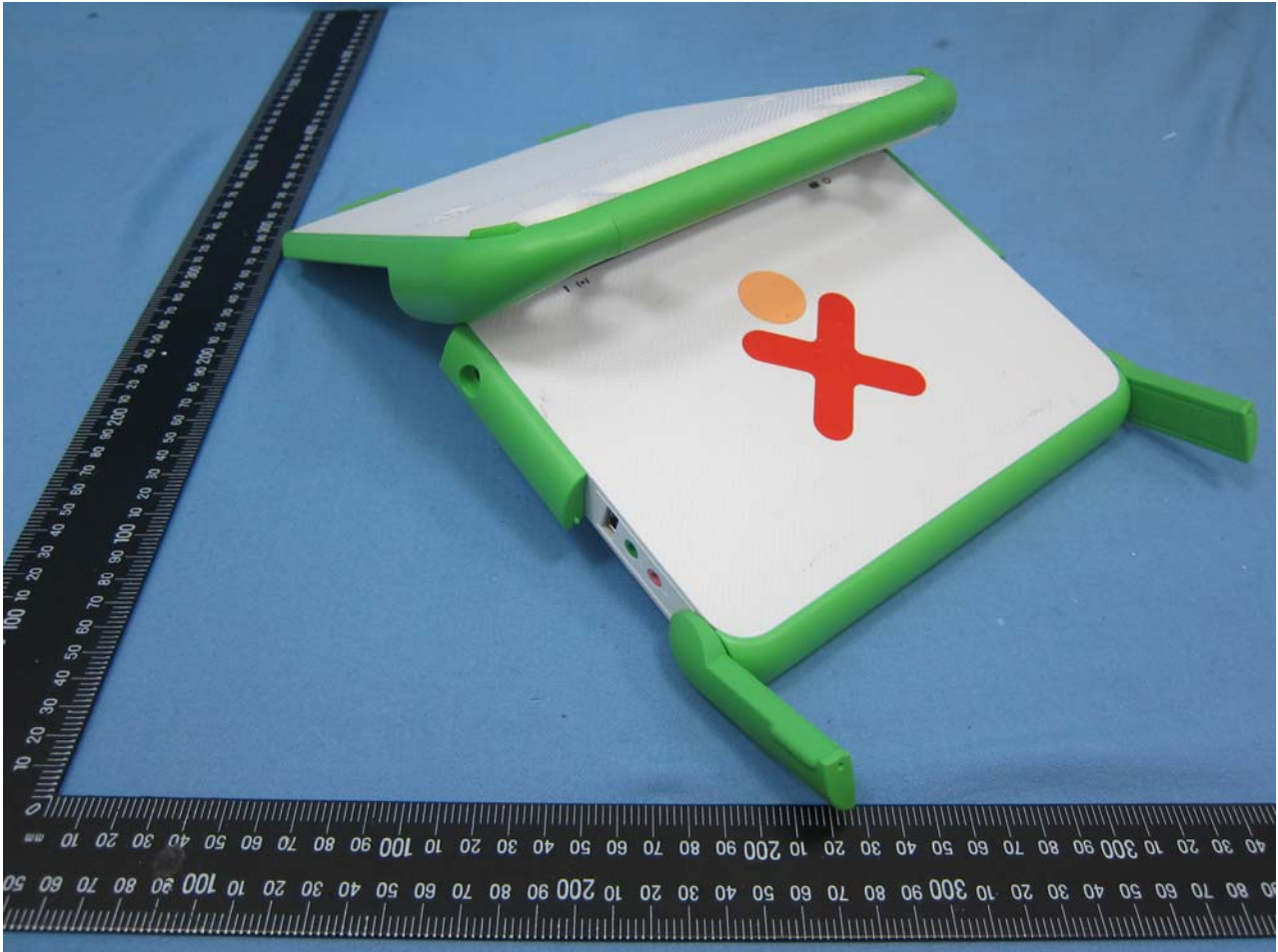
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

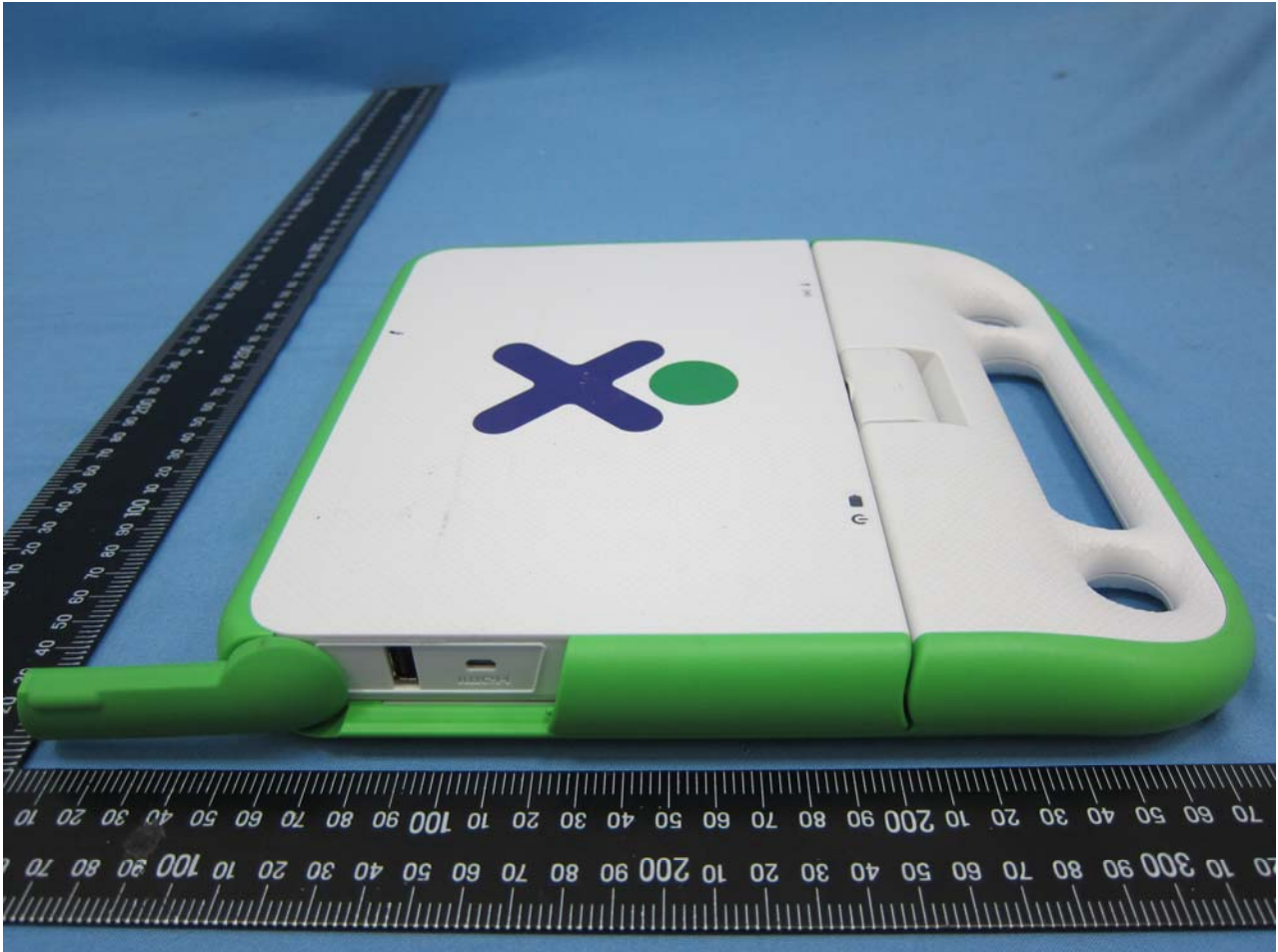
Sample 4 for XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



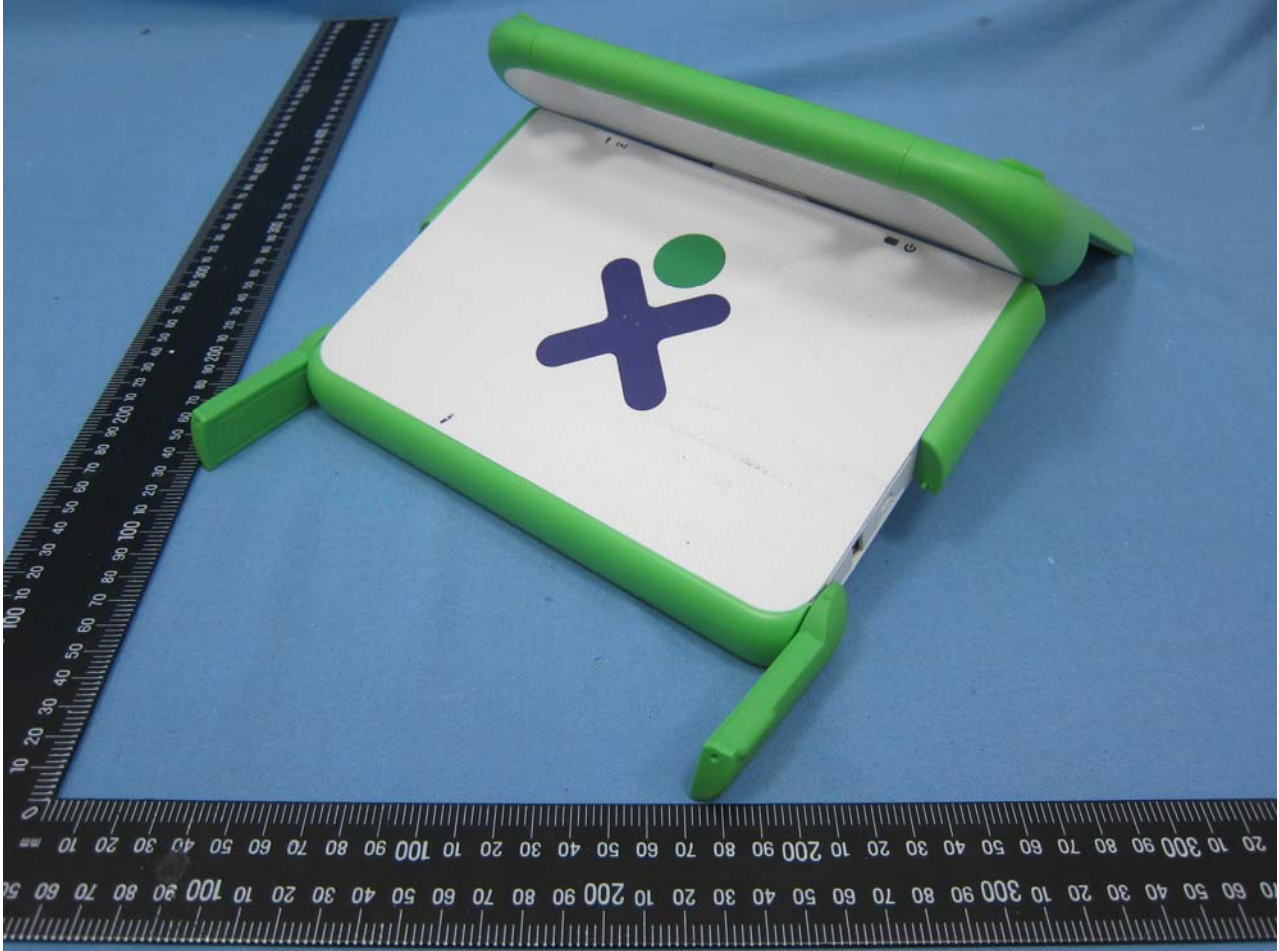
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



2. Photograph of Accessory

Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

List of Accessory:

Specification of Accessory		
AC Adapter 1	Brand Name	DARFON
	Model Name	BB0J-C
AC Adapter 2	Brand Name	Bestec
	Model Name	NA0241WAA
AC Adapter 3	Brand Name	DARFON
	Model Name	BX24-1203(X=U or P)
AC Adapter 4	Brand Name	Bestec
	Model Name	BT-AG250SDF
Battery	Brand Name	OLPC
	Model Name	CL1

Remark: For accessories equipped with this EUT, please refer to the following photos.

Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

Sample 2 for XO-4 HS Touch with All Adapters



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

Sample 3 for XO-4 with All Adapters



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

Sample 4 for XO-4 HS with All Adapters



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

AC Adapter 1



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

AC Adapter 2



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

AC Adapter 3



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

AC Adapter 4



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



3. Internal Photograph of EUT

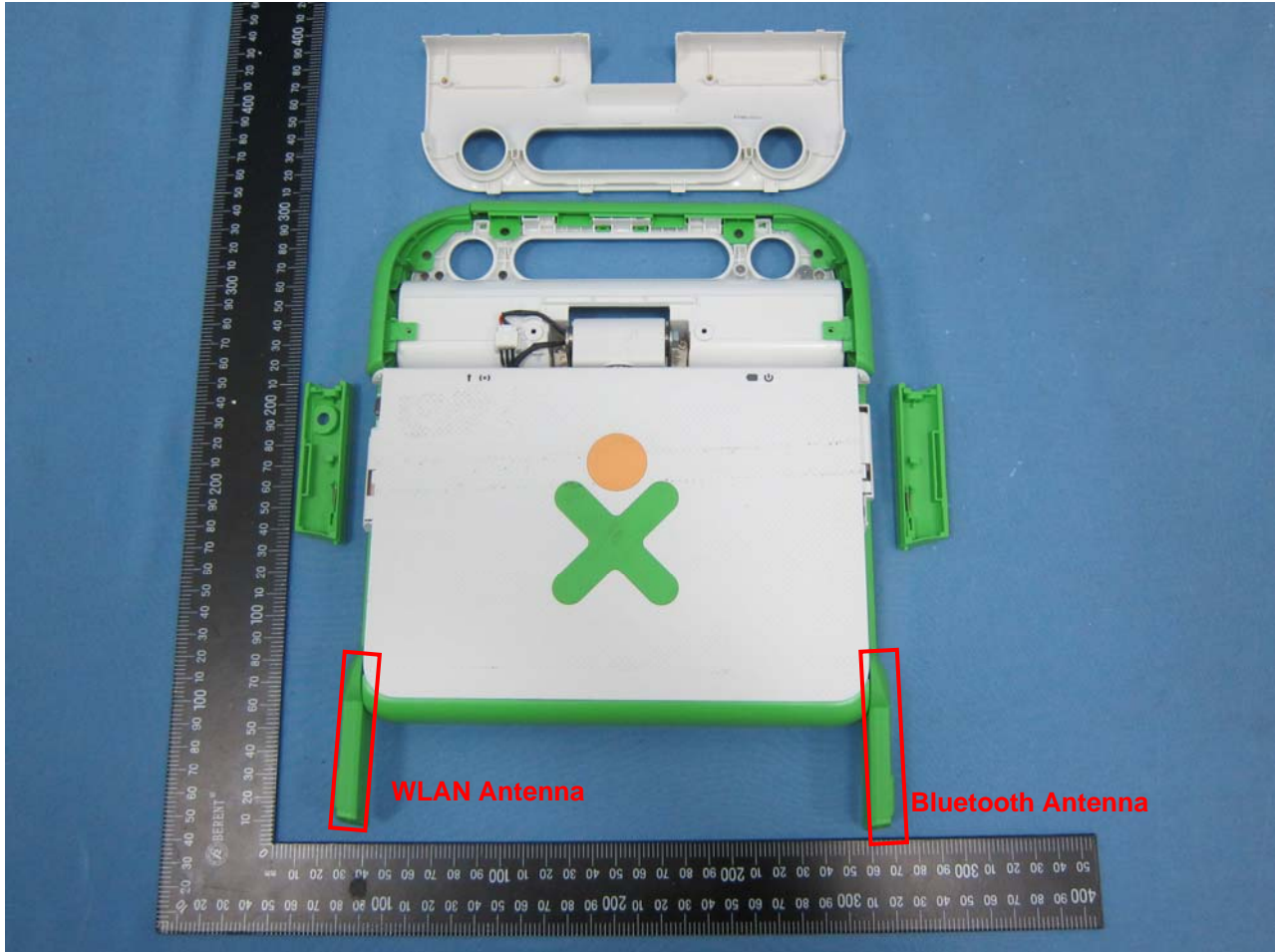
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



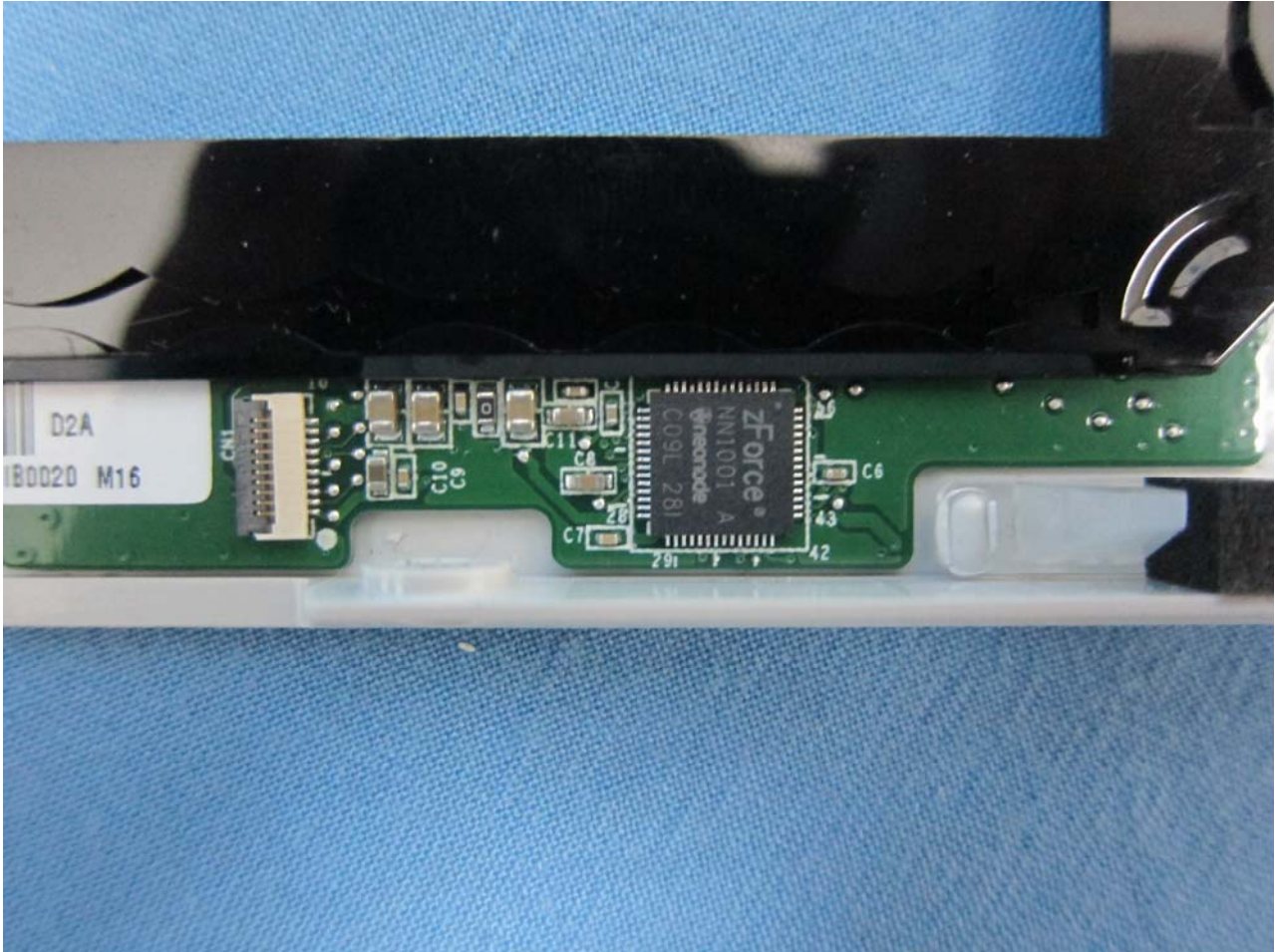
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



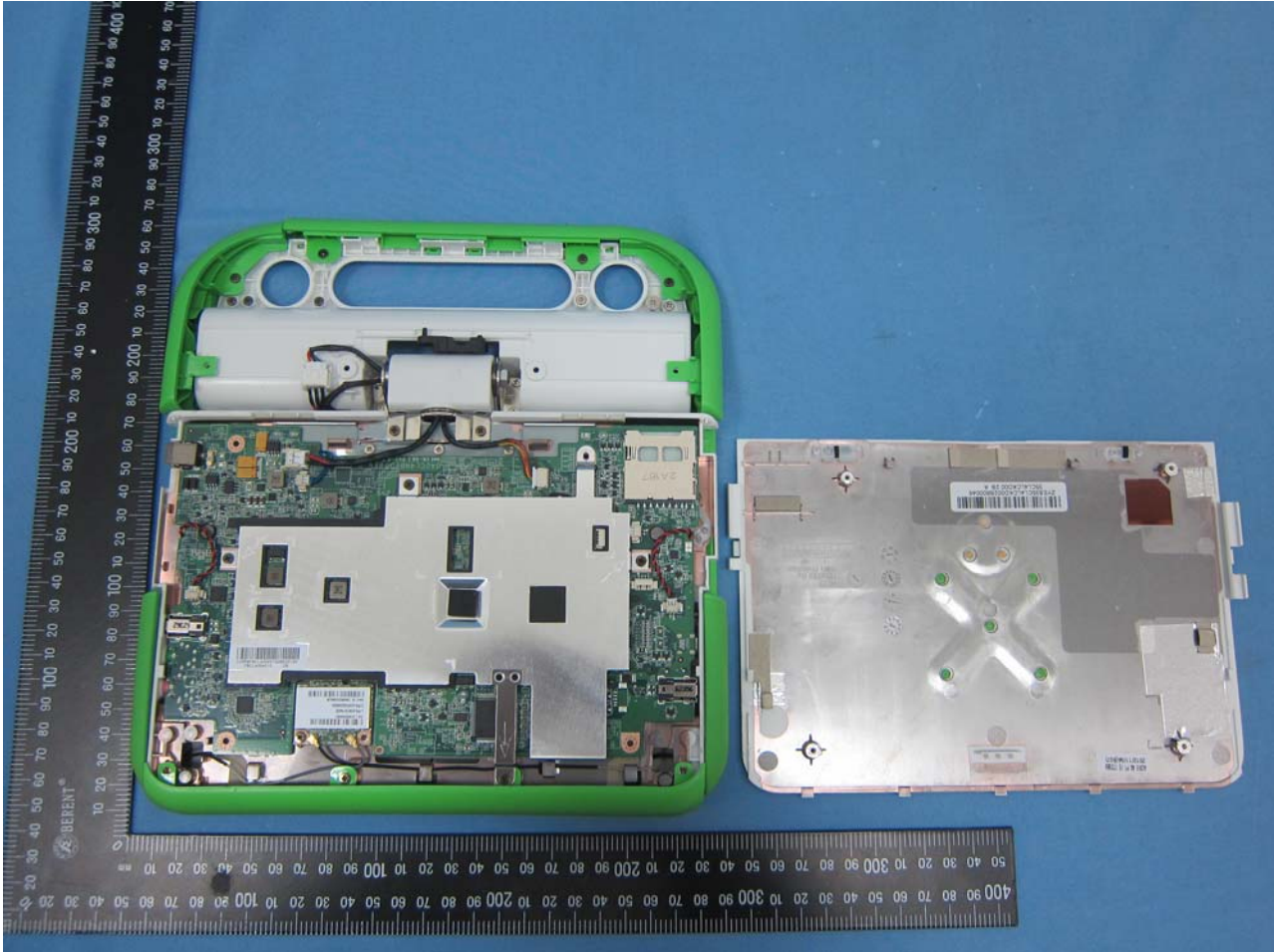
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



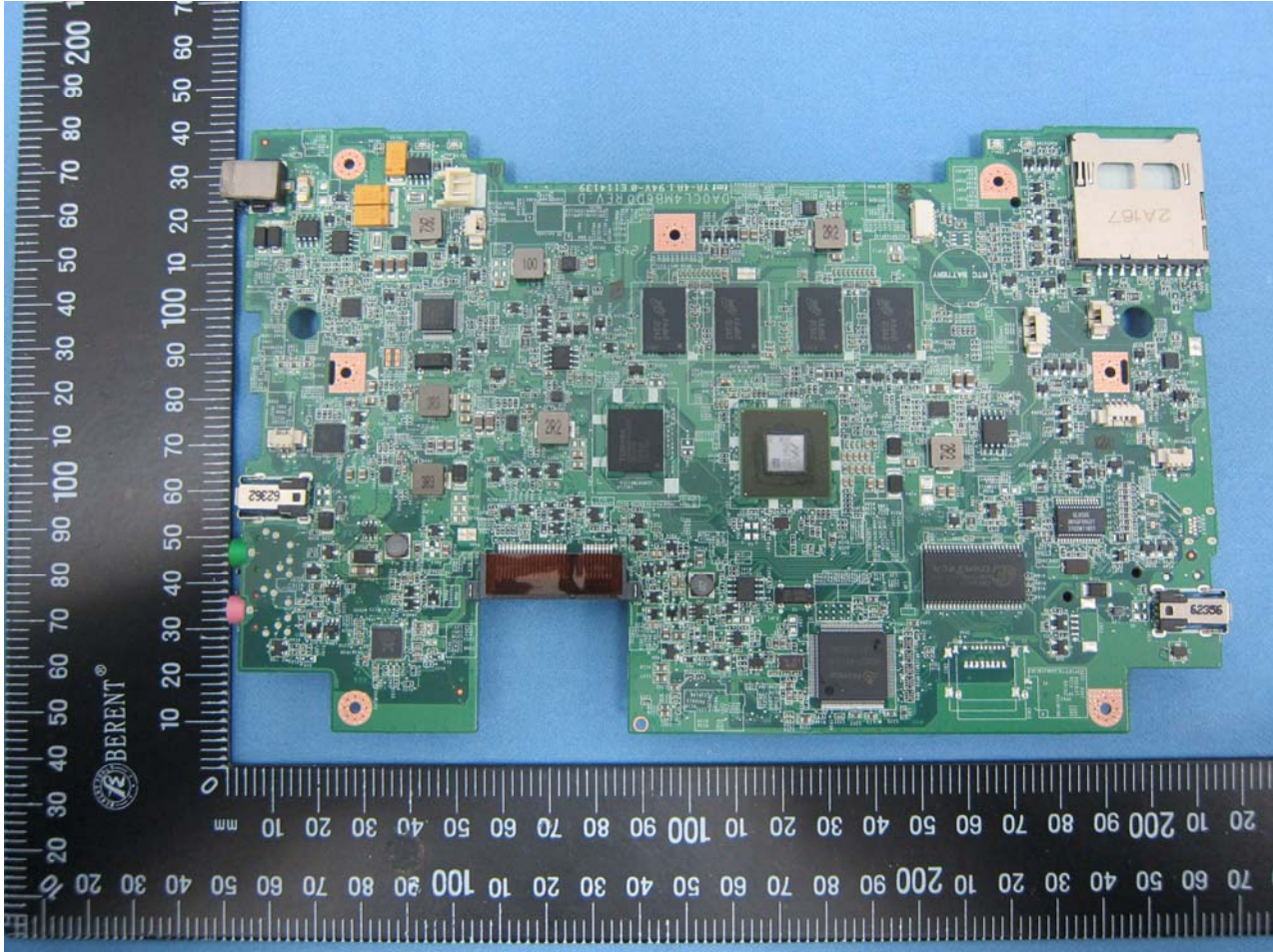
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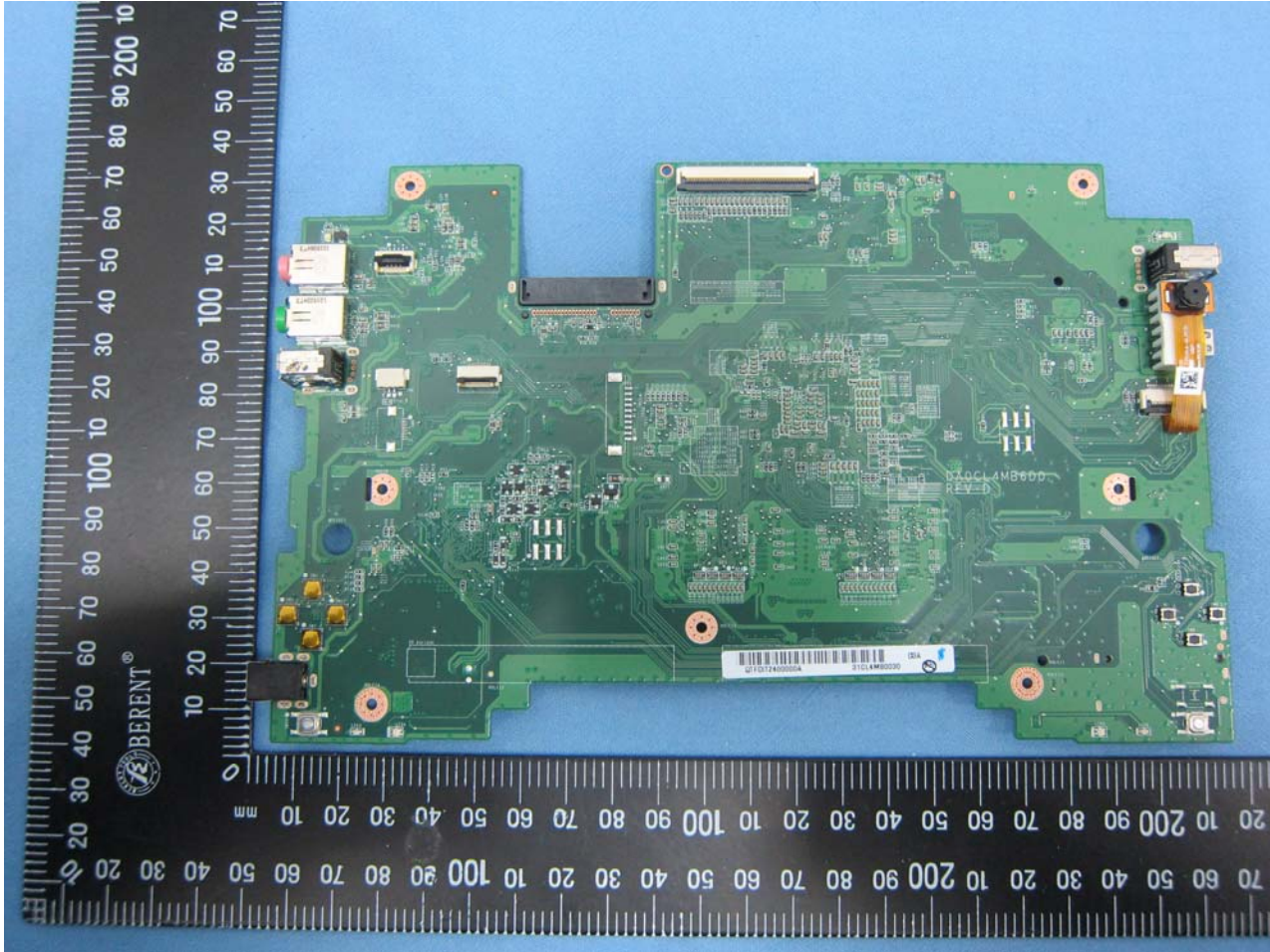
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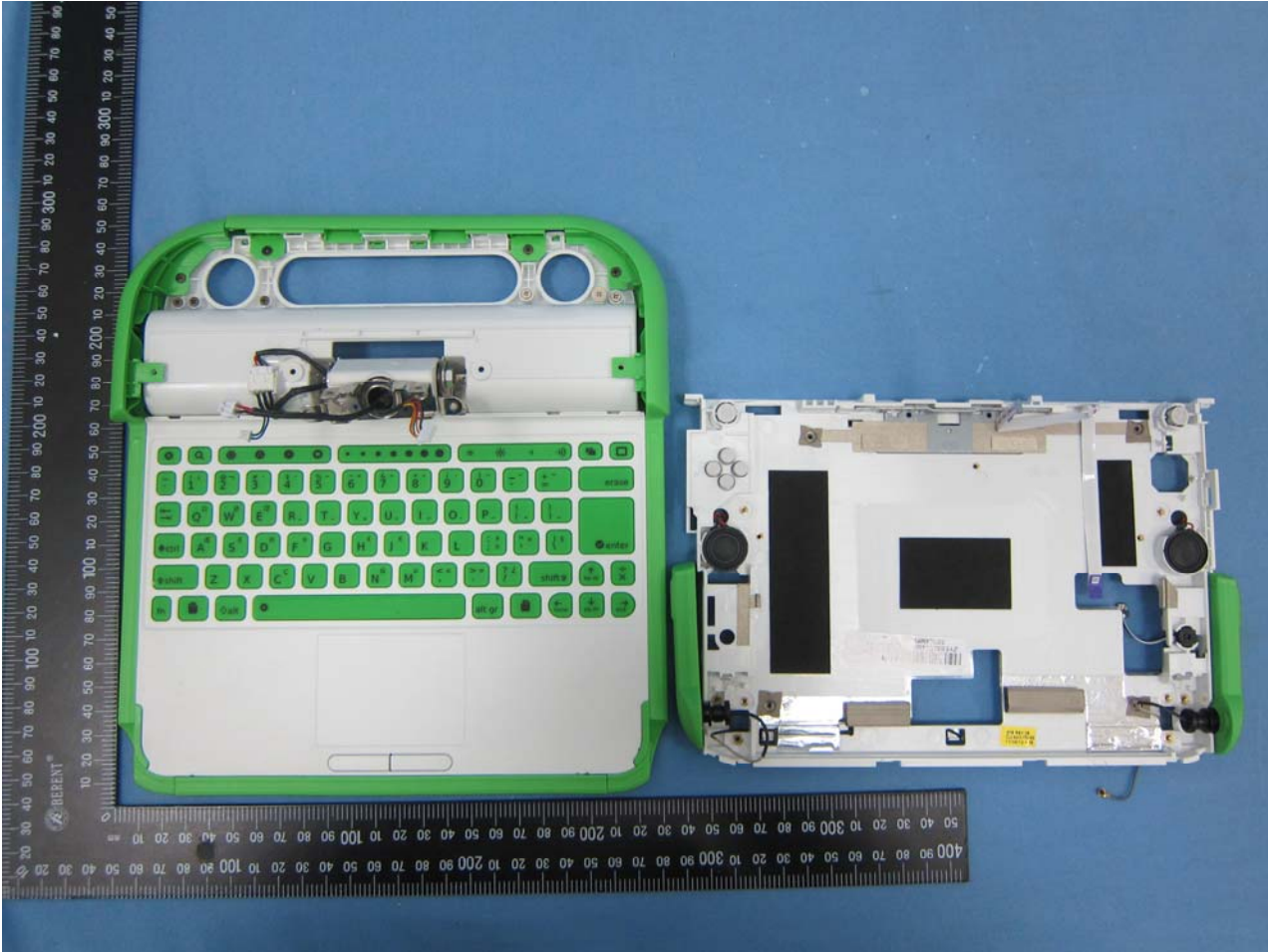
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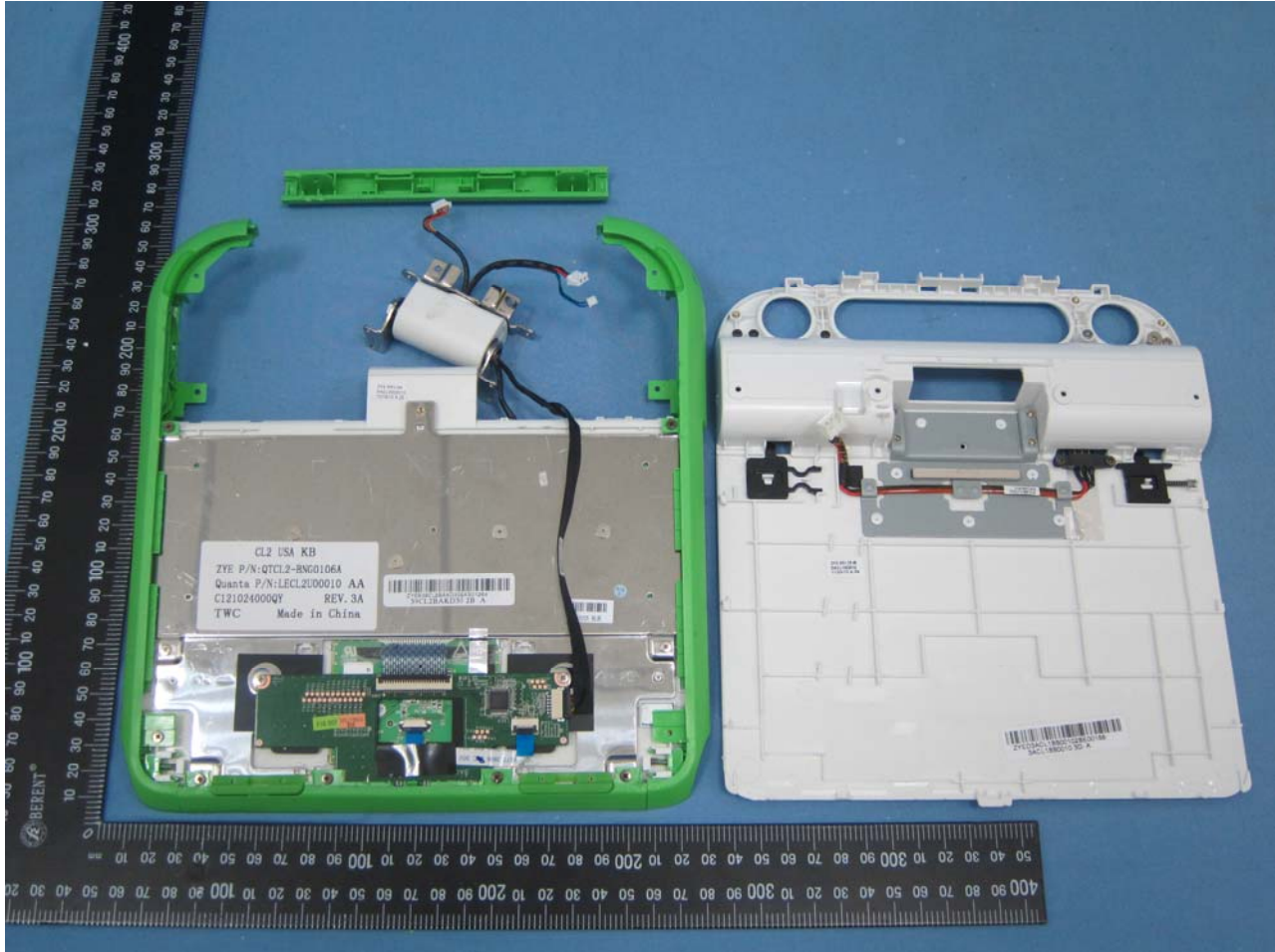
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



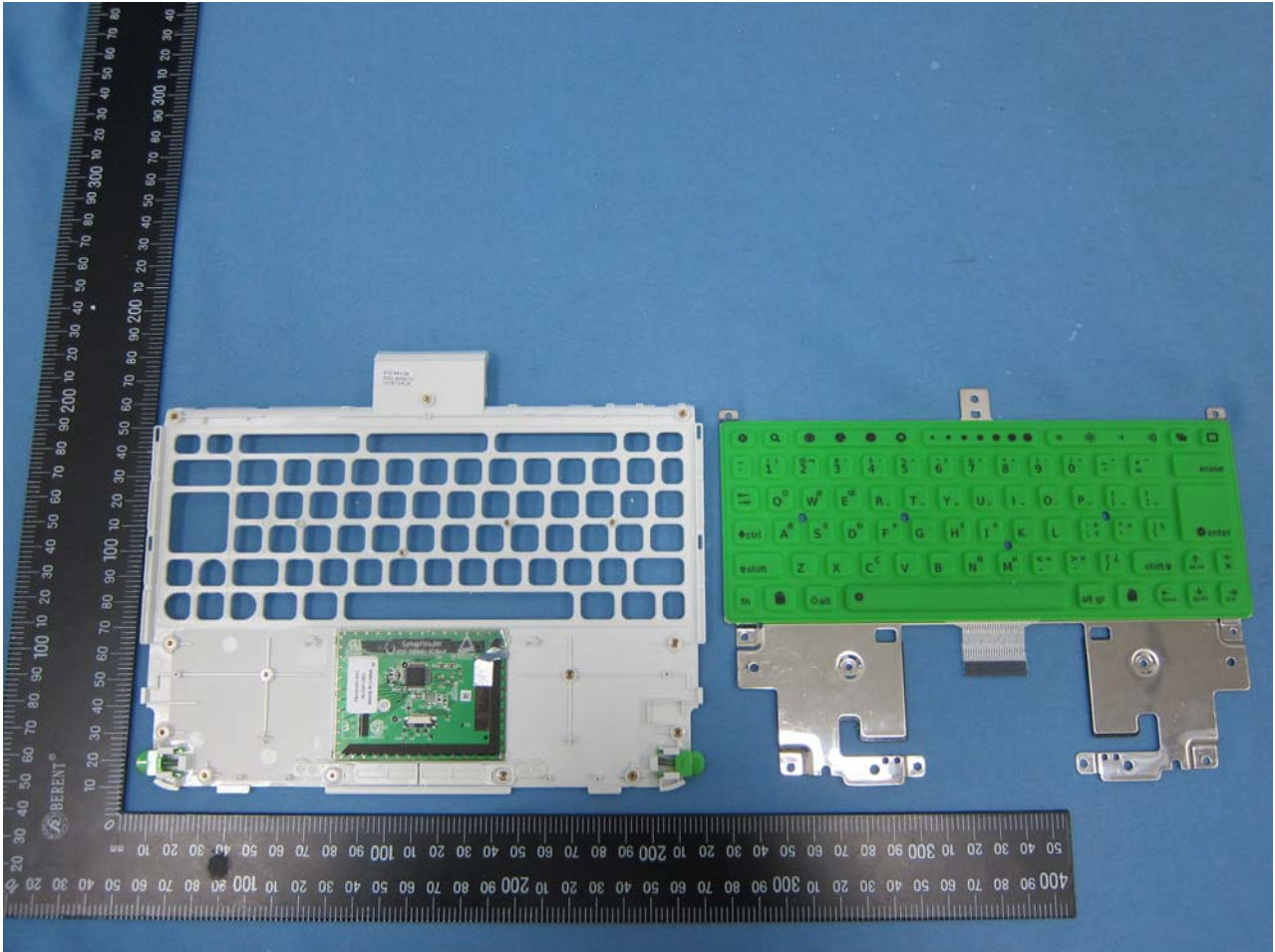
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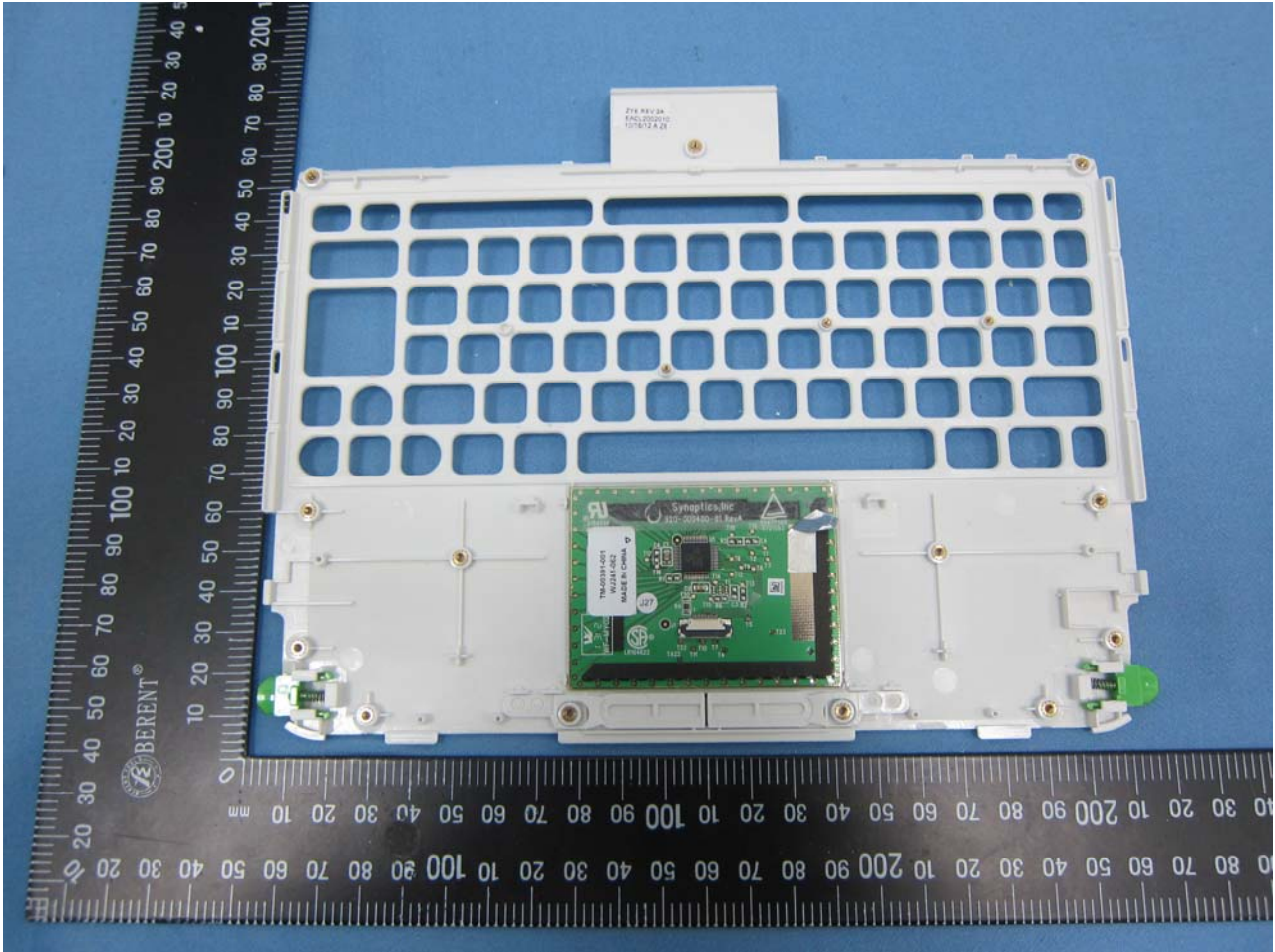
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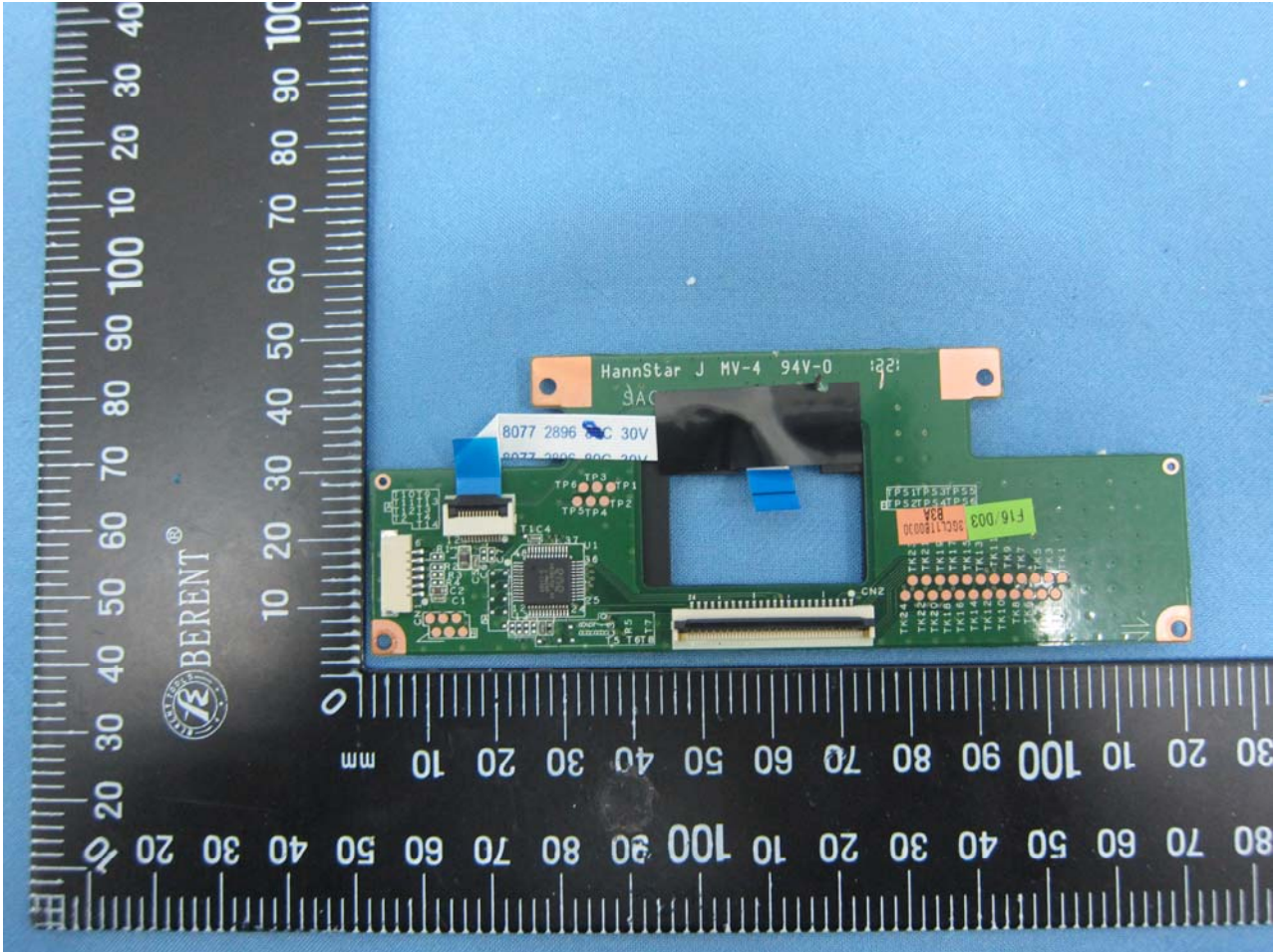
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



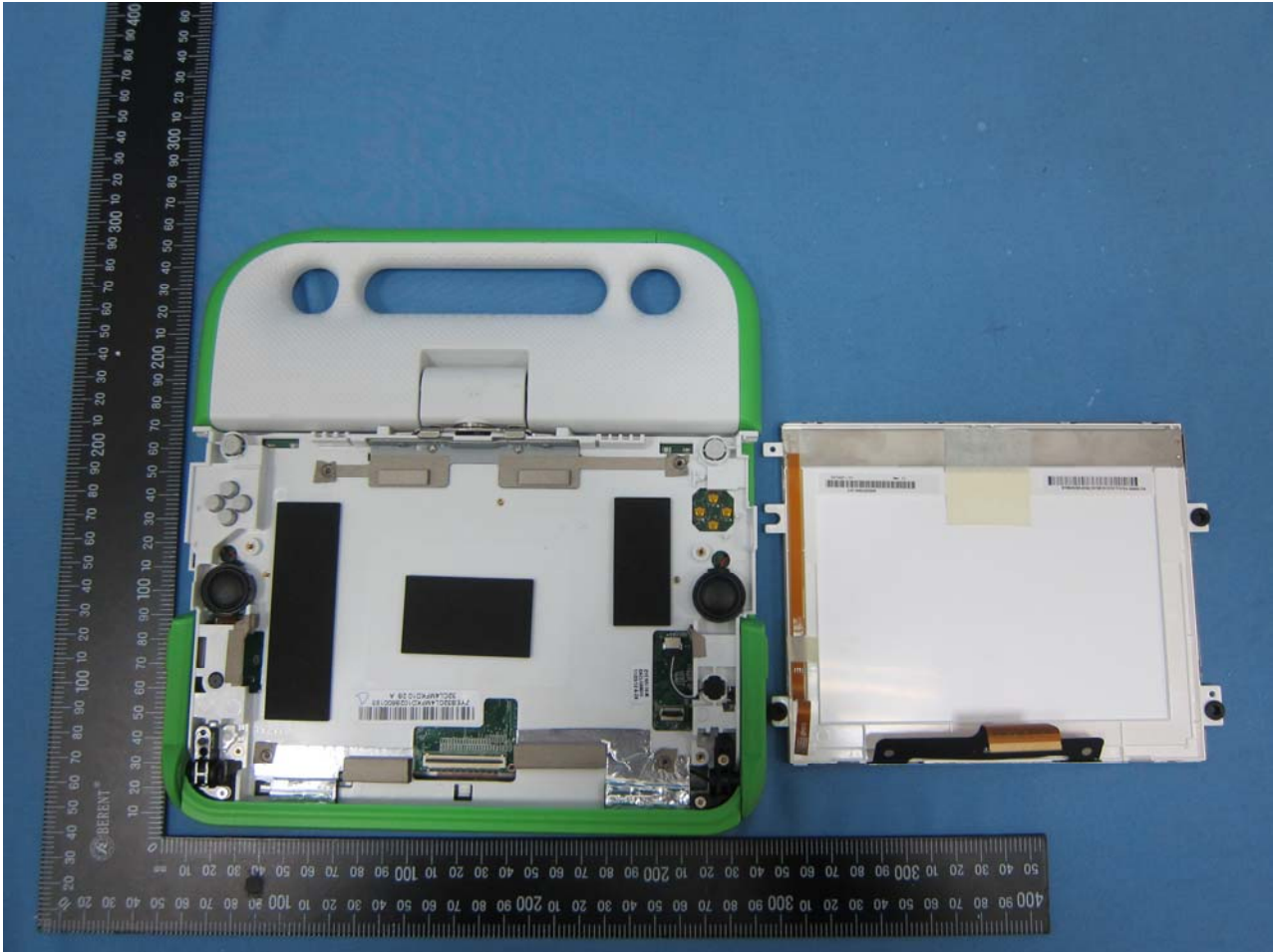
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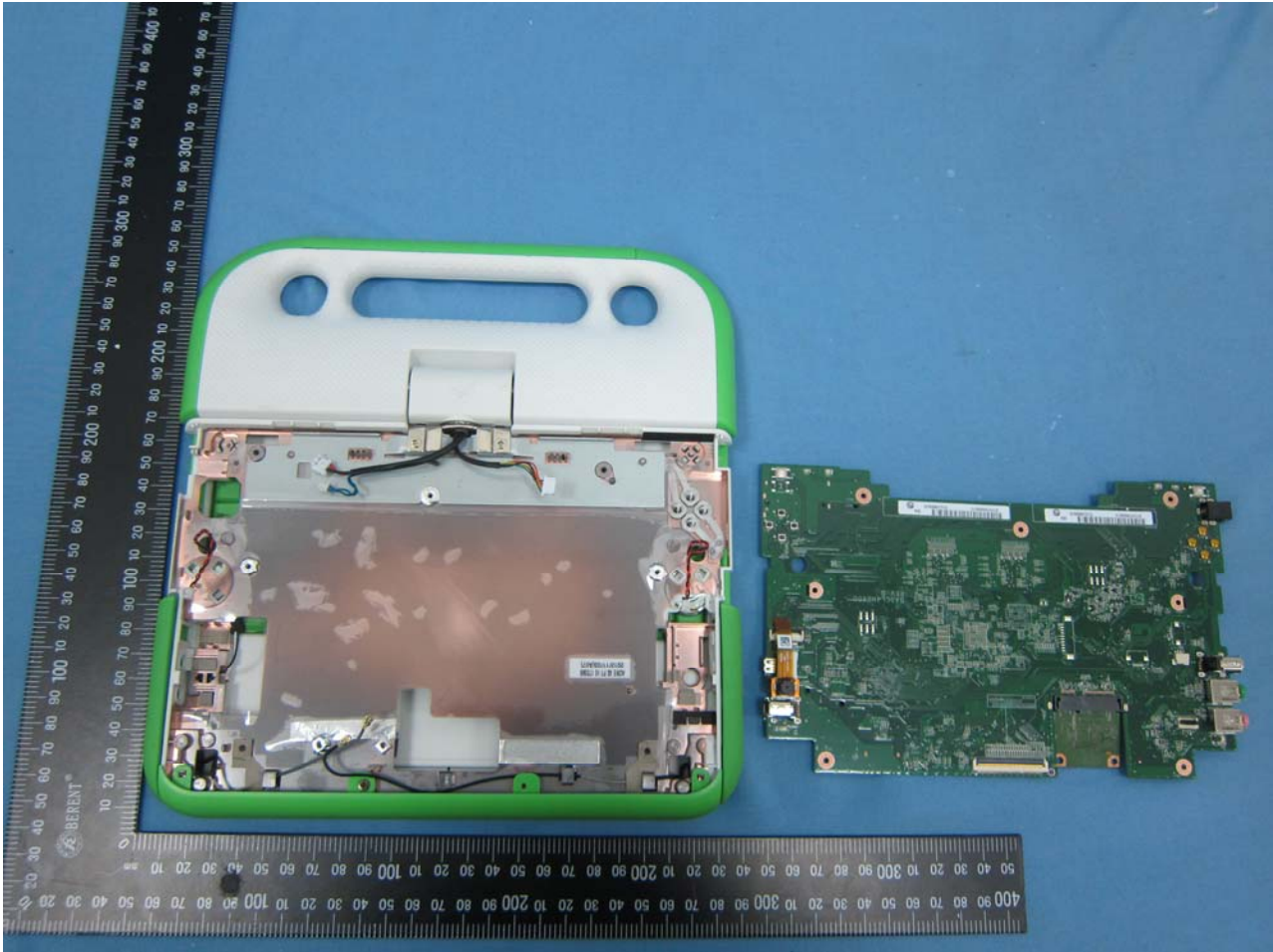
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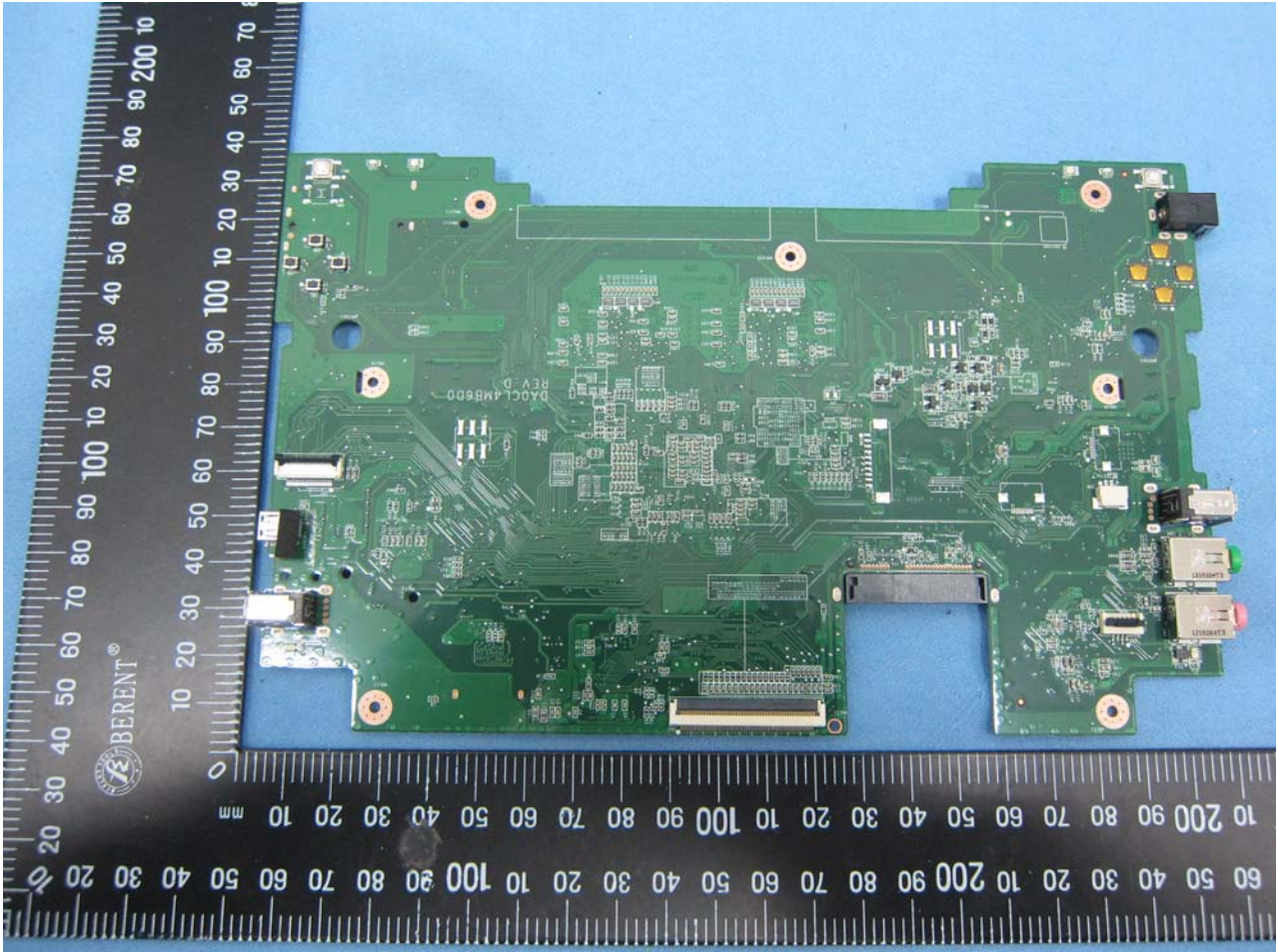
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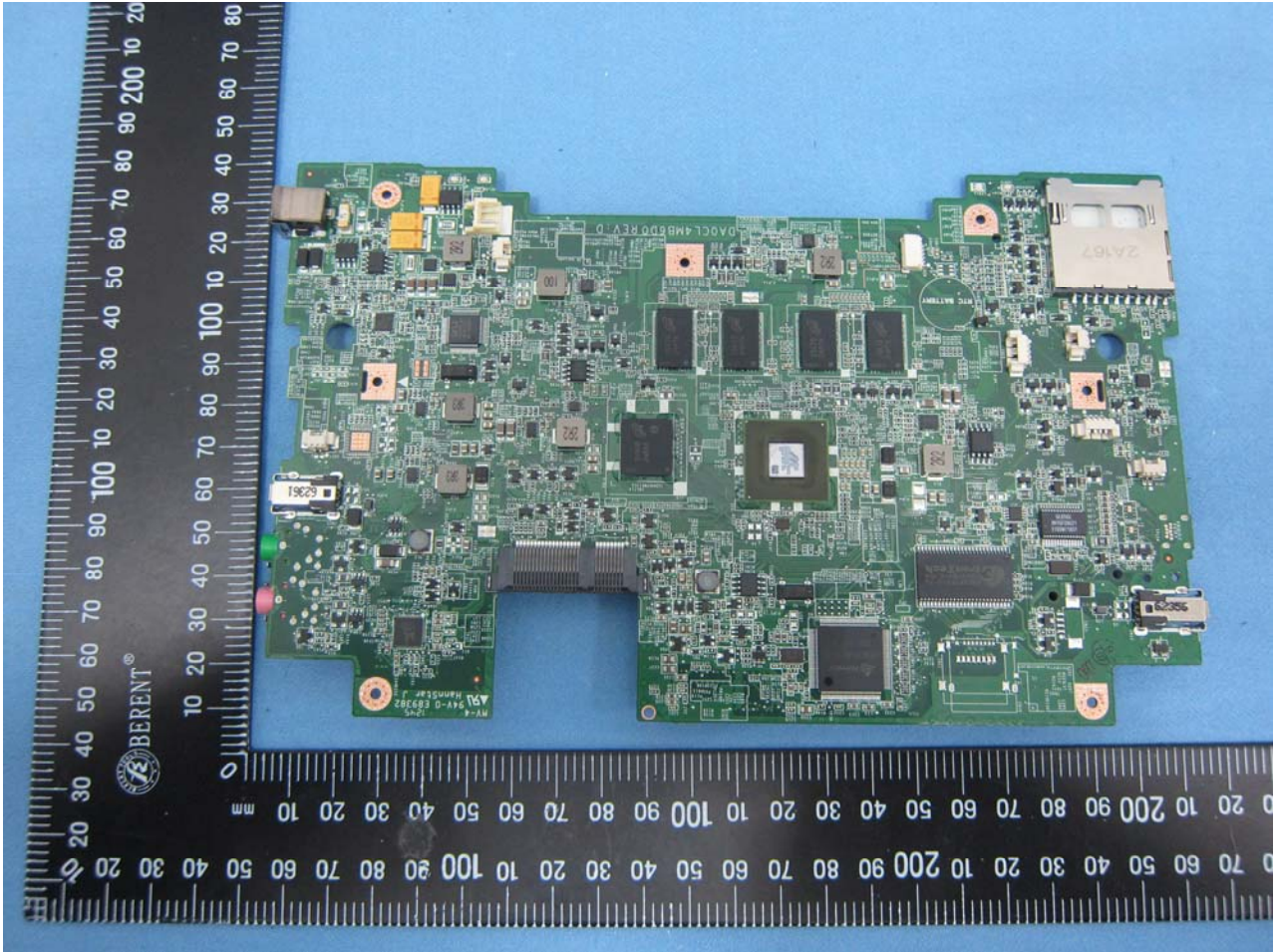
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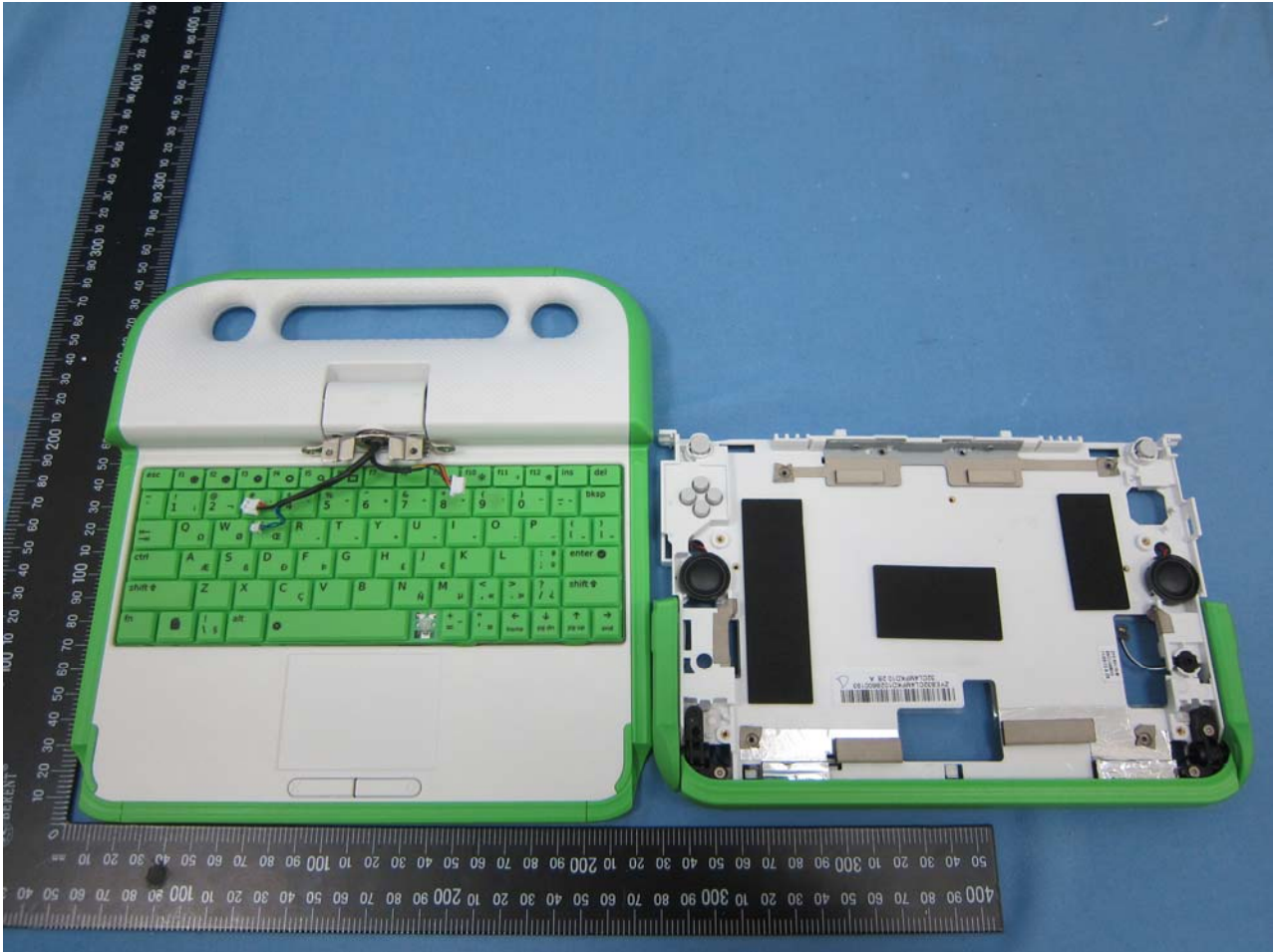
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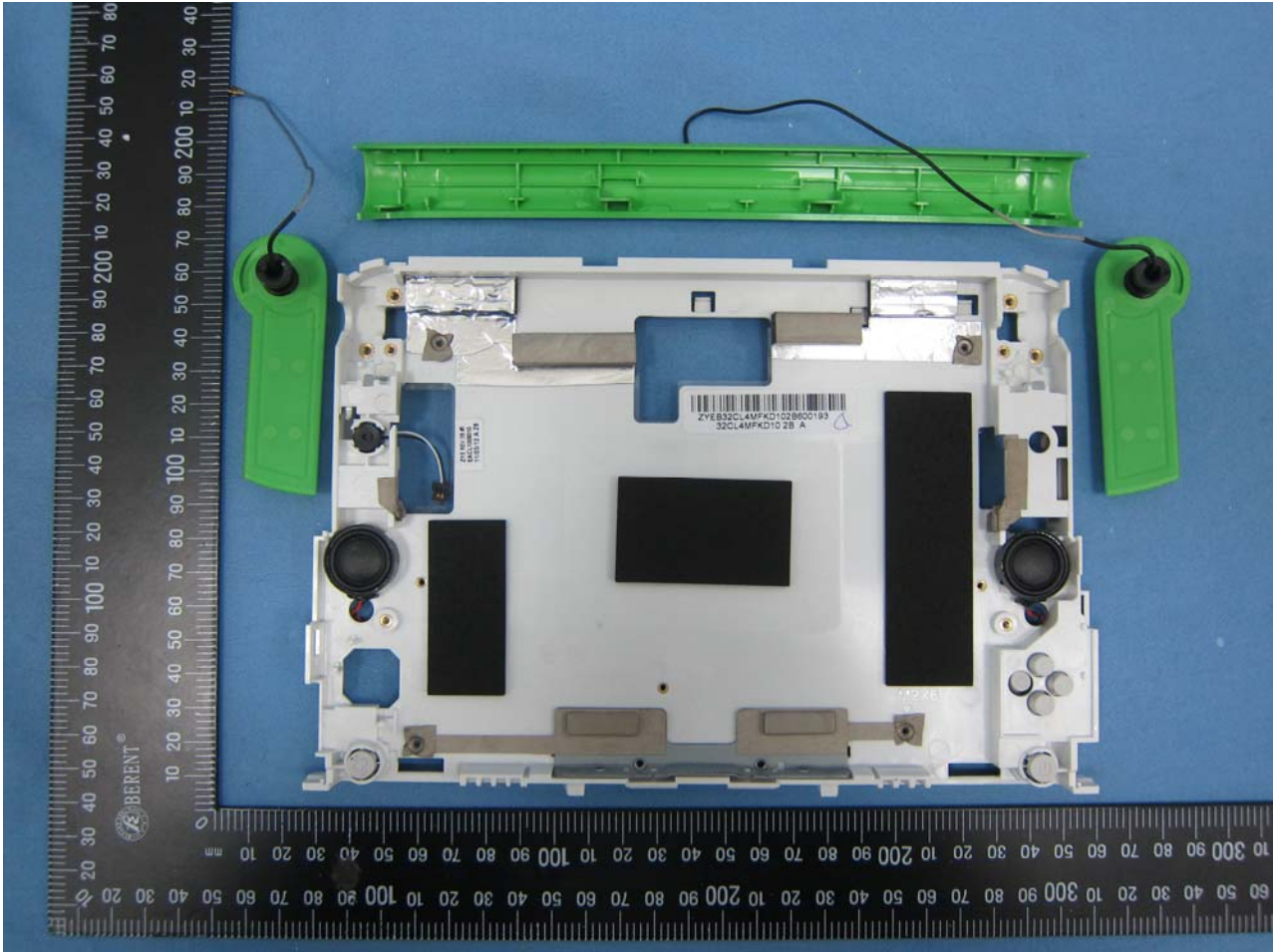
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



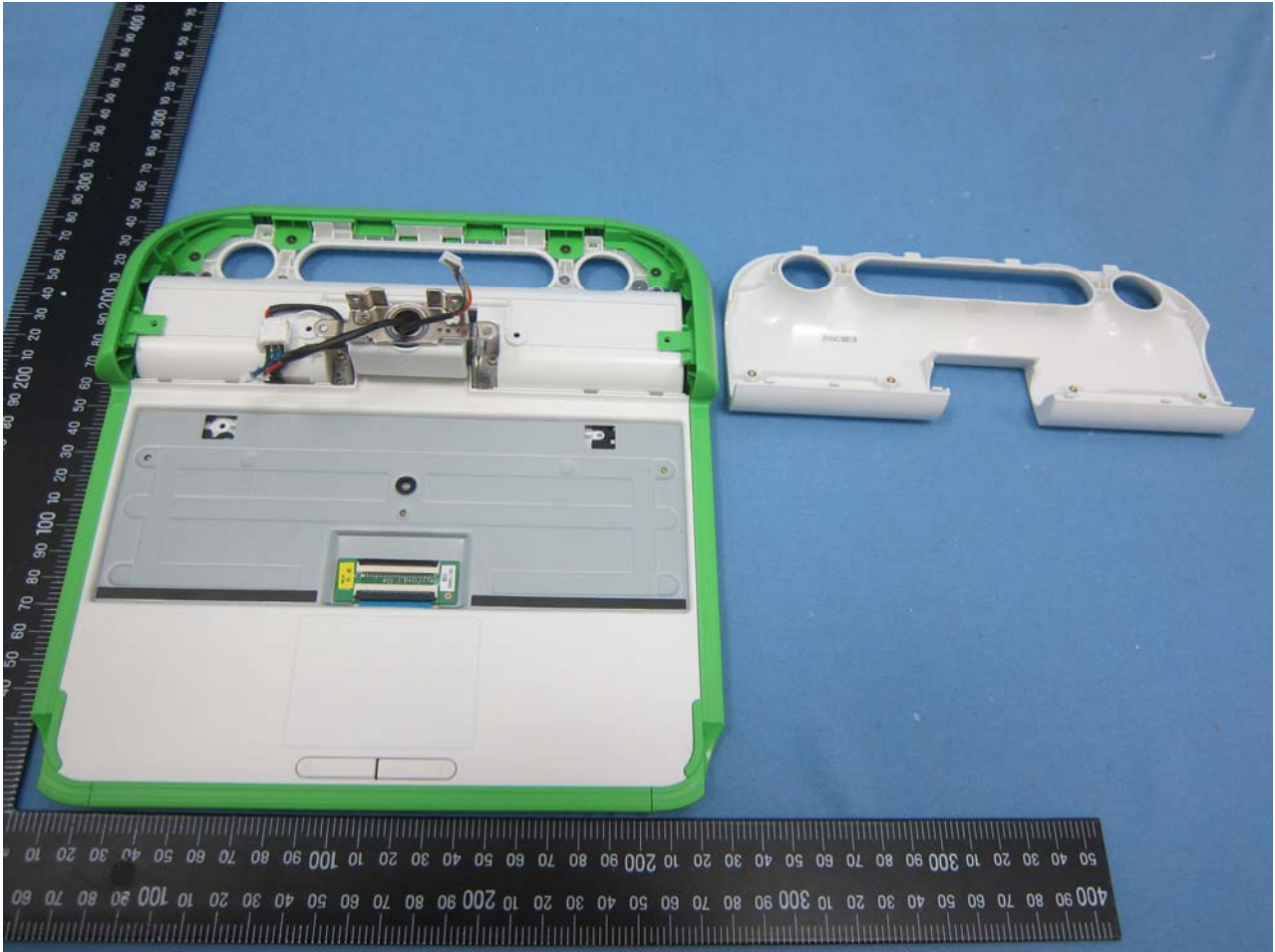
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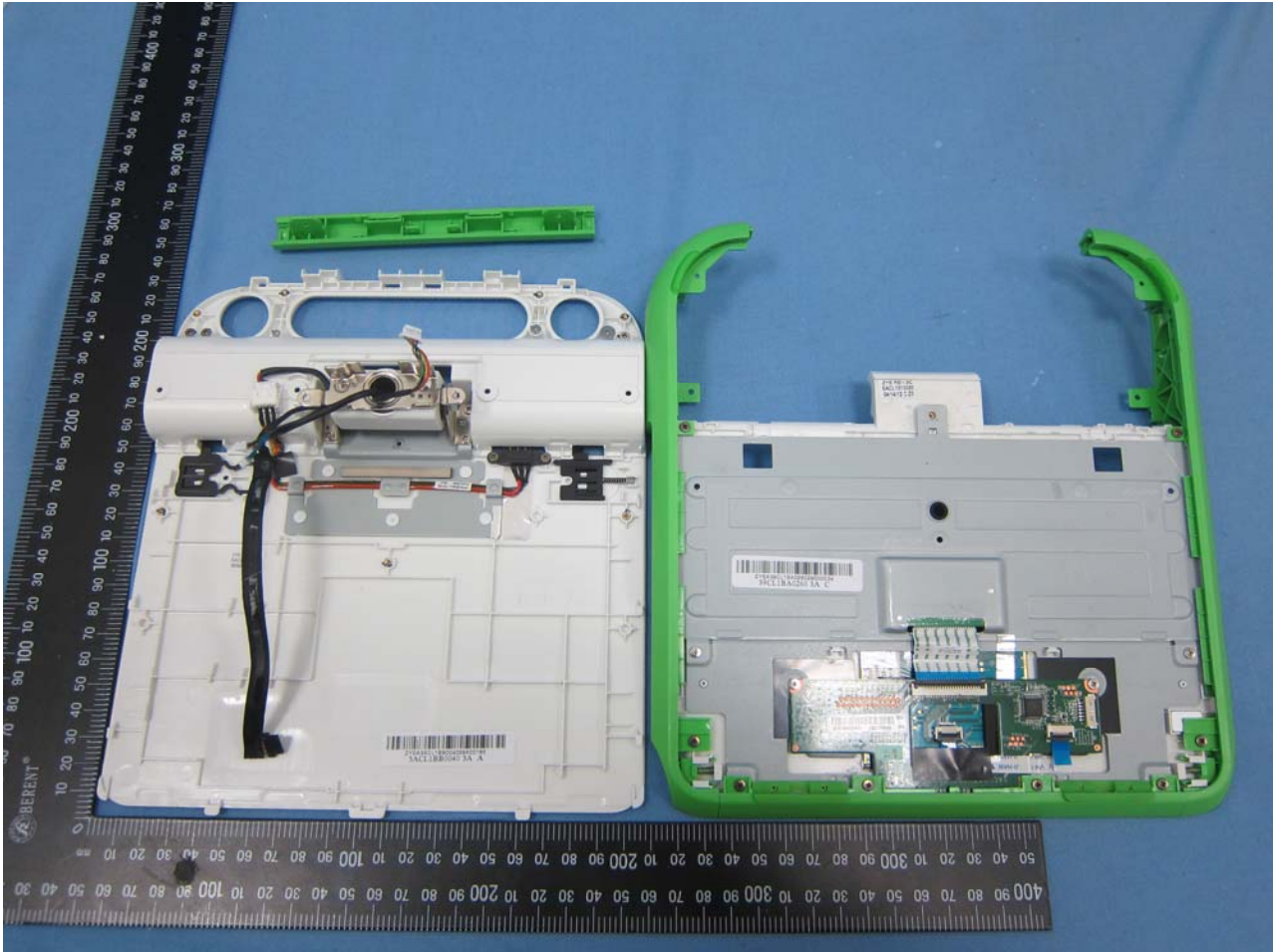
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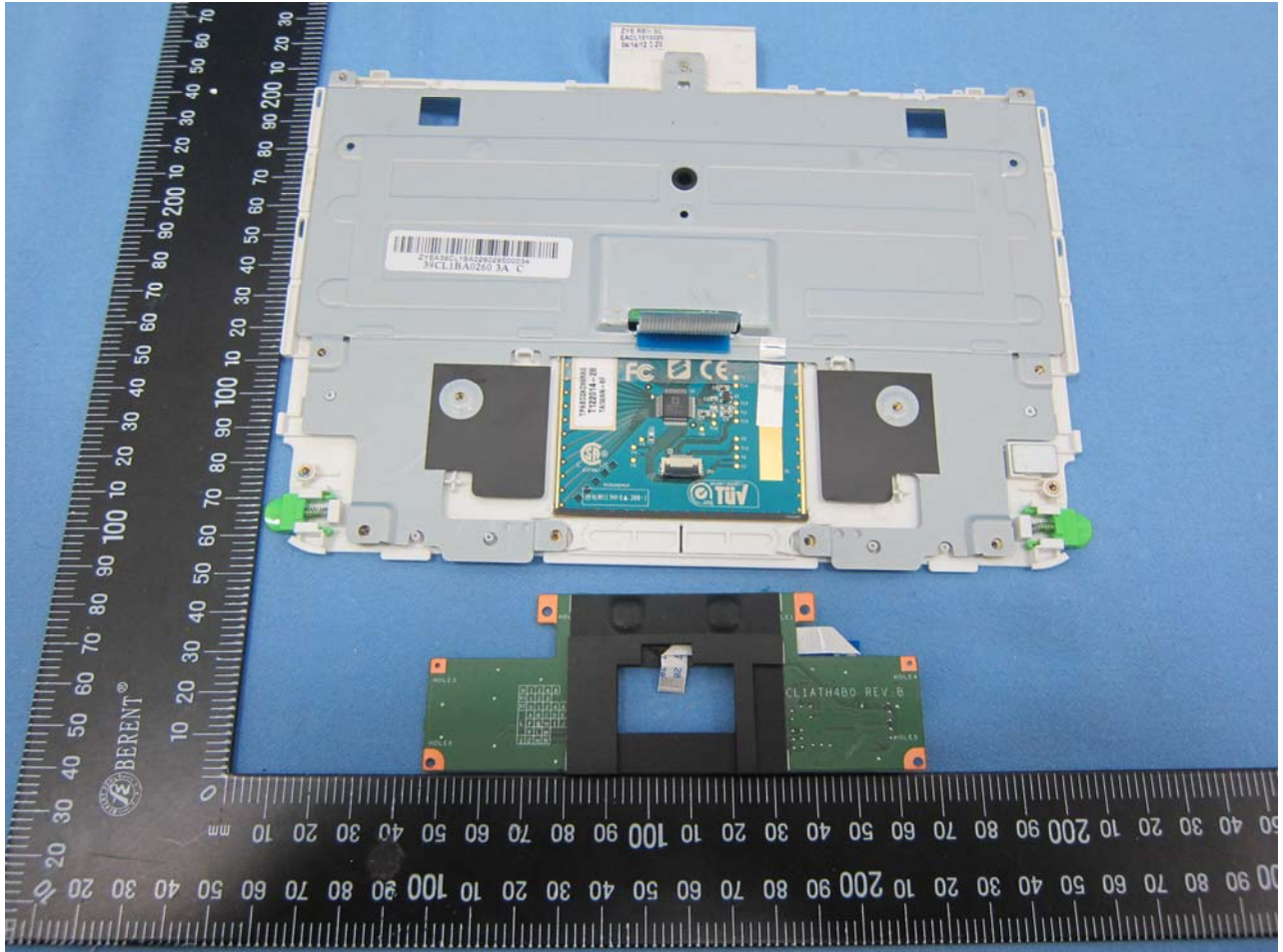
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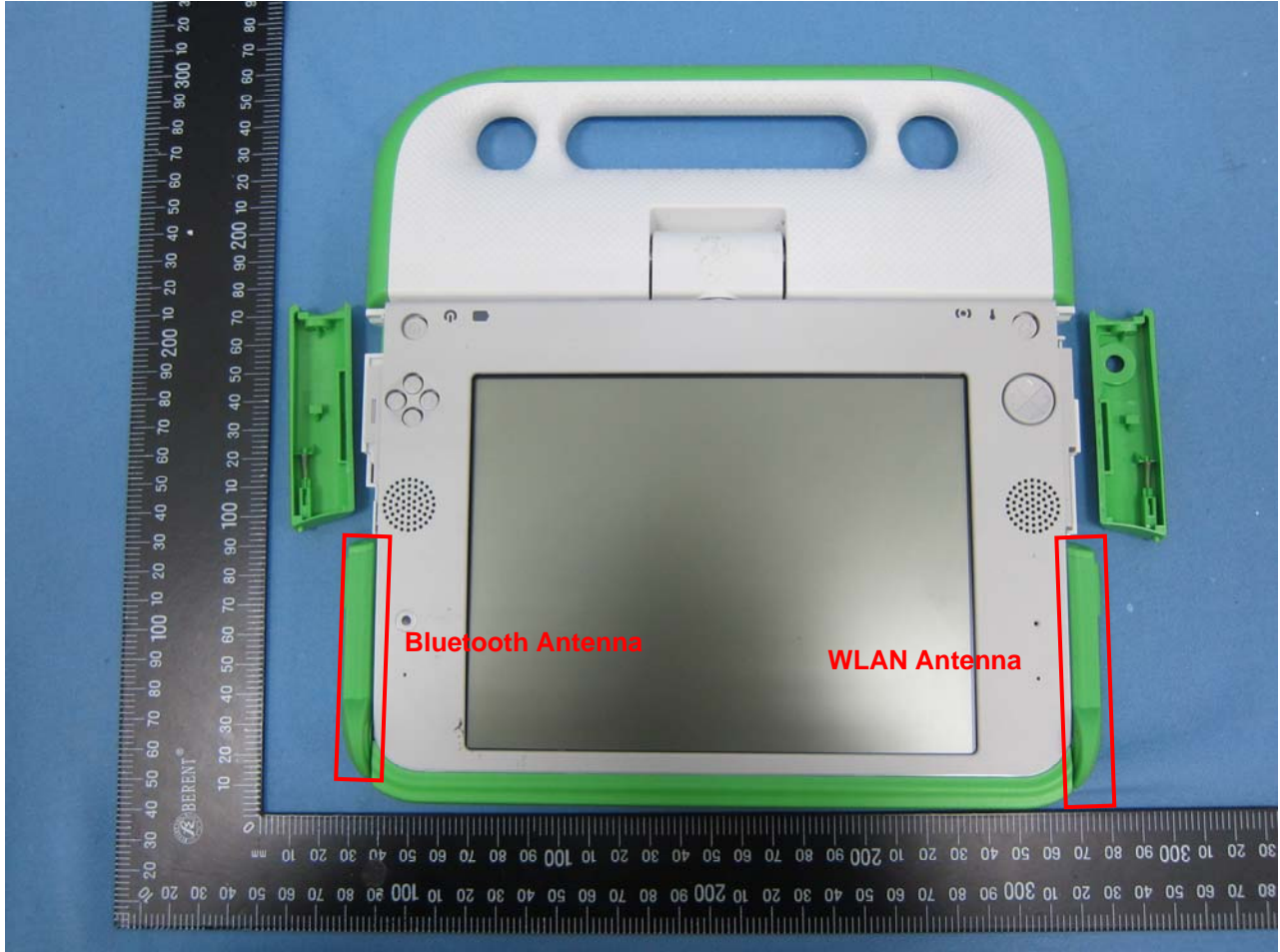
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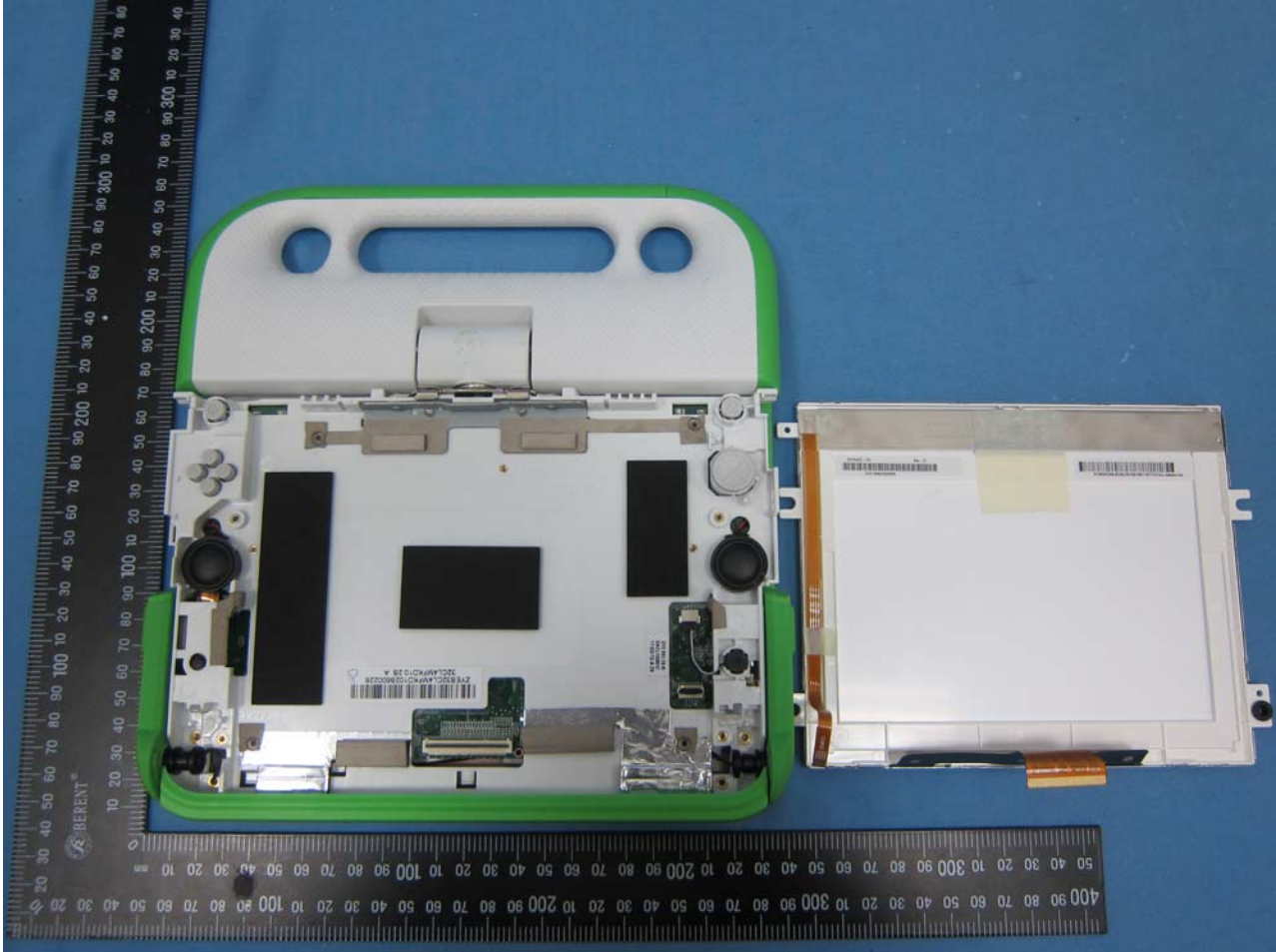
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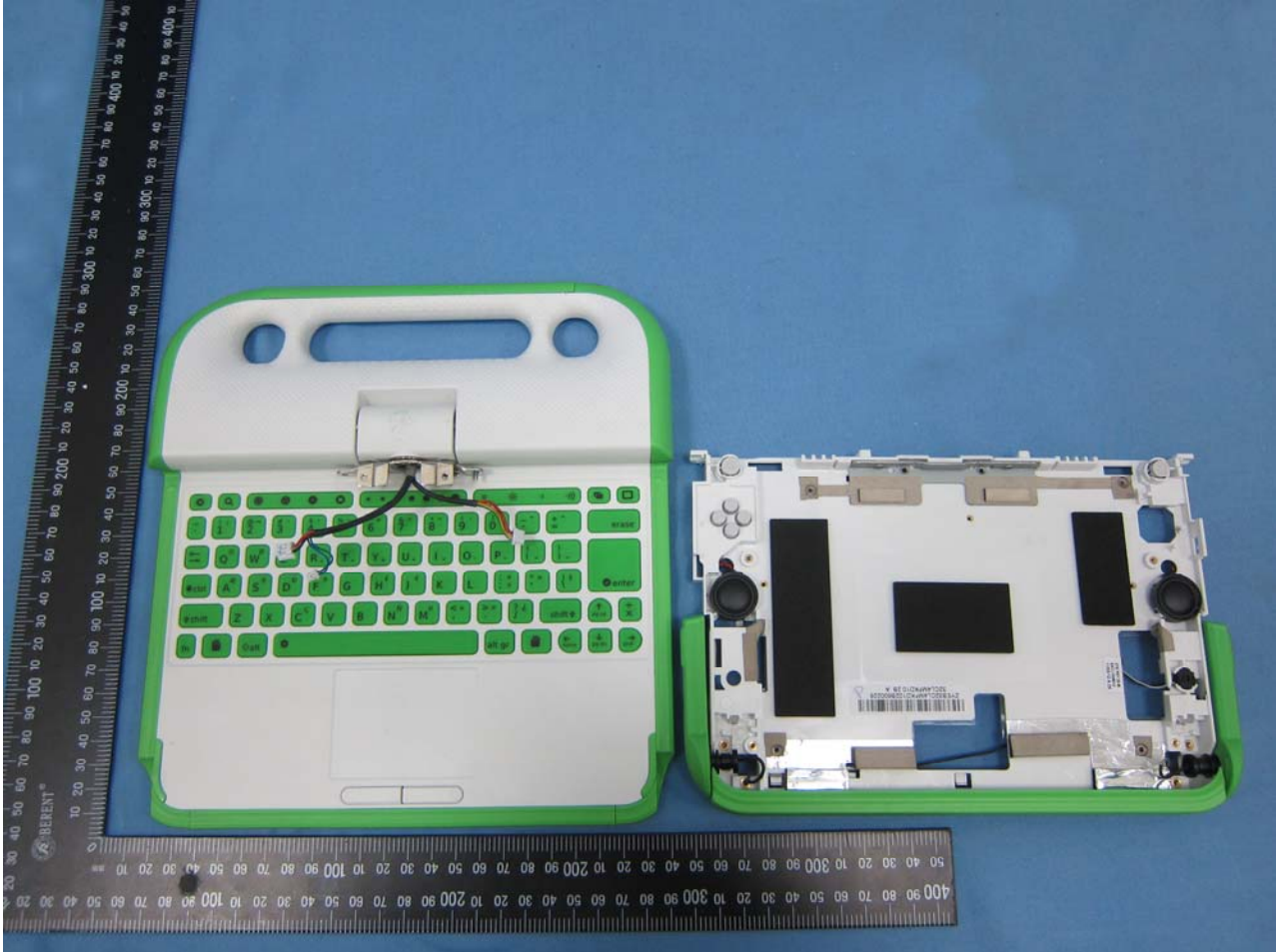
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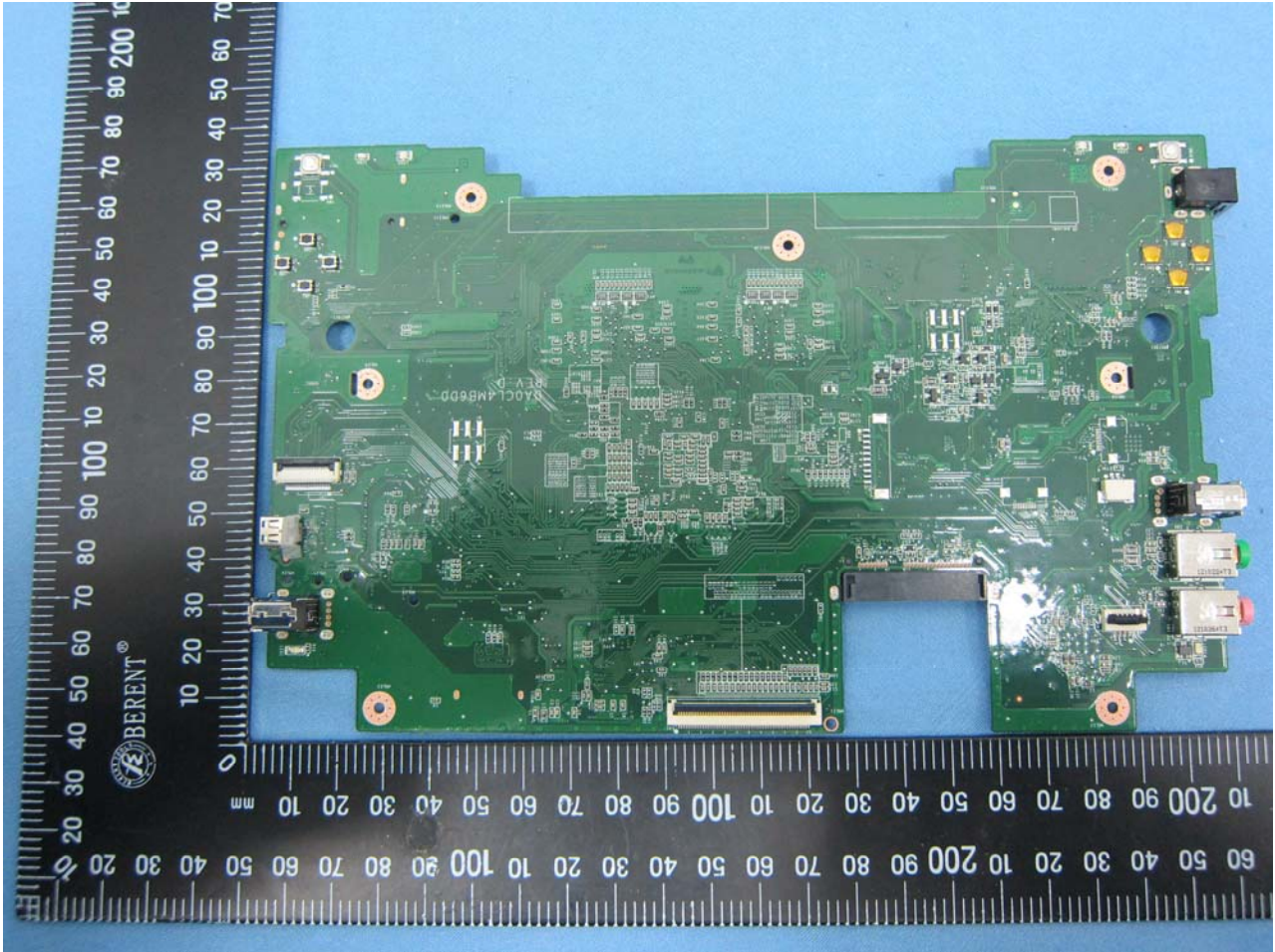
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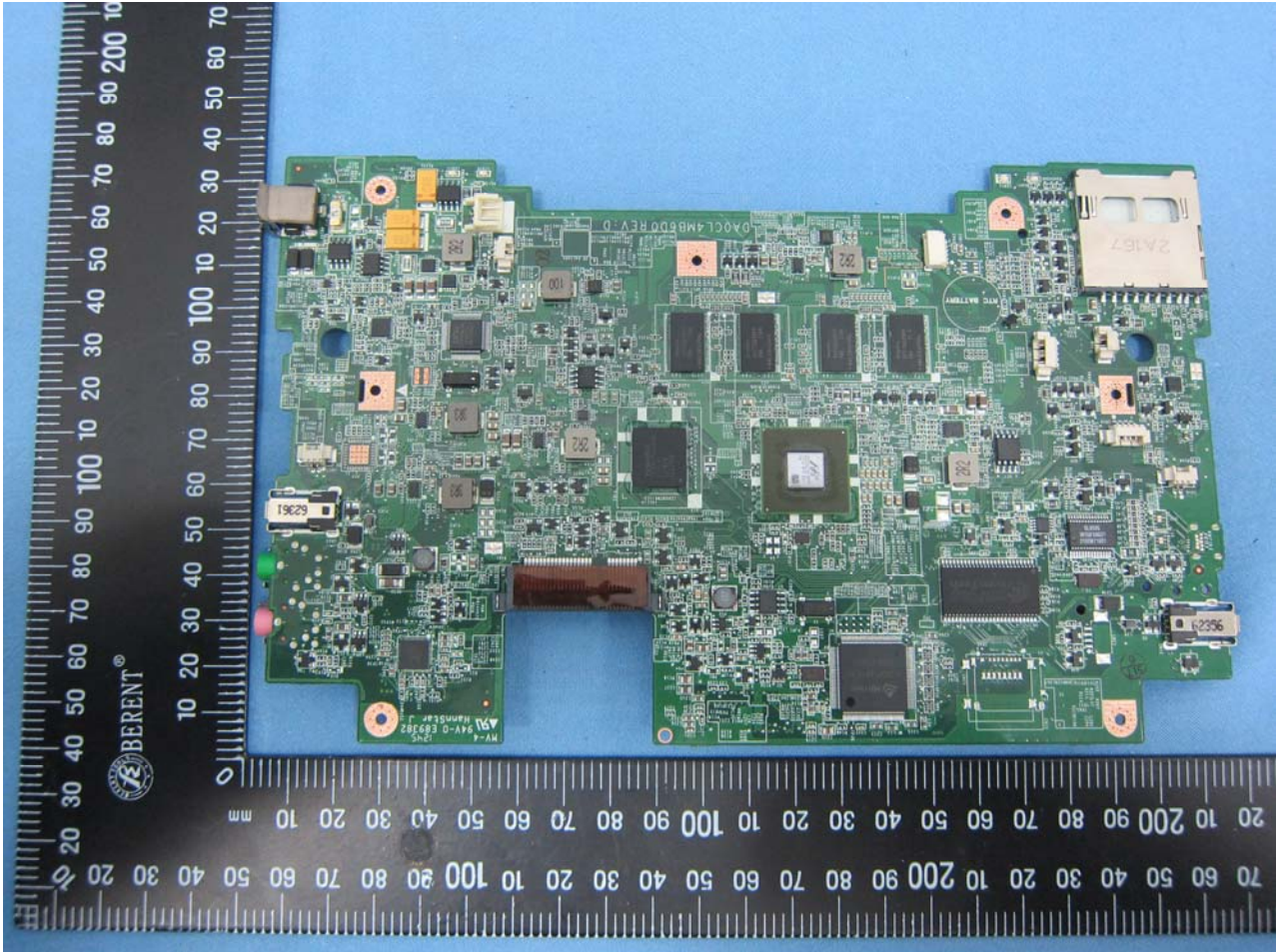
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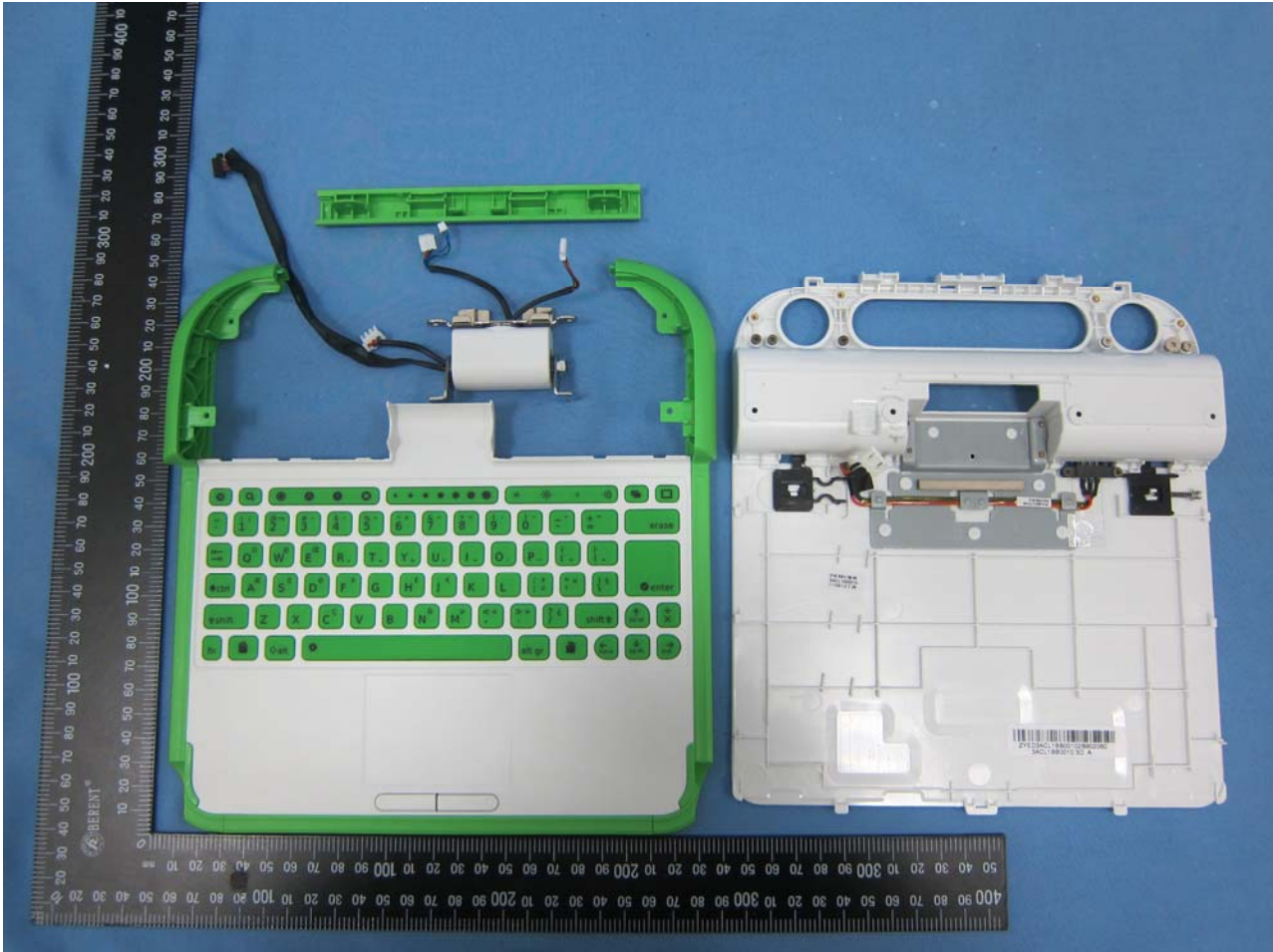
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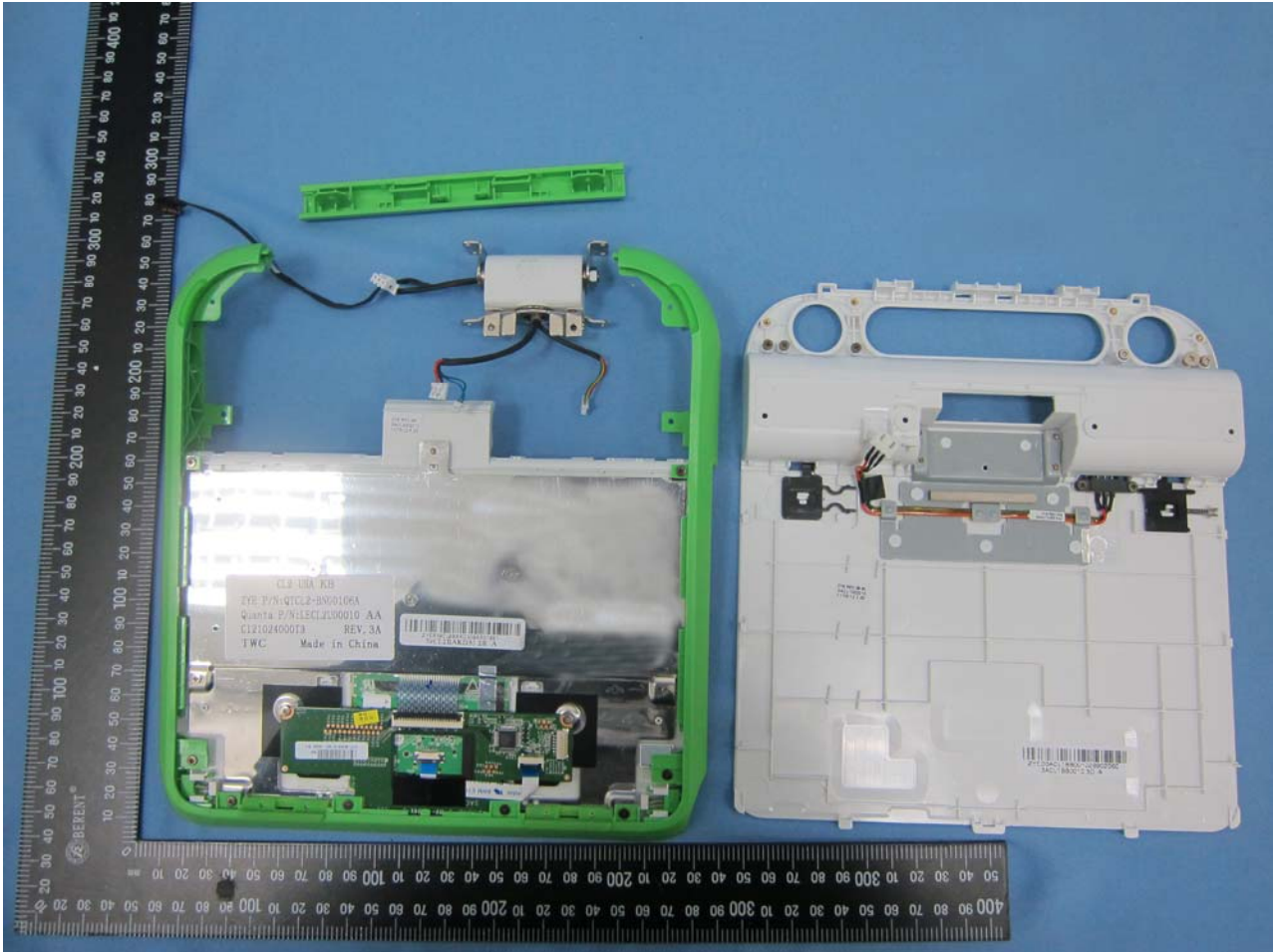
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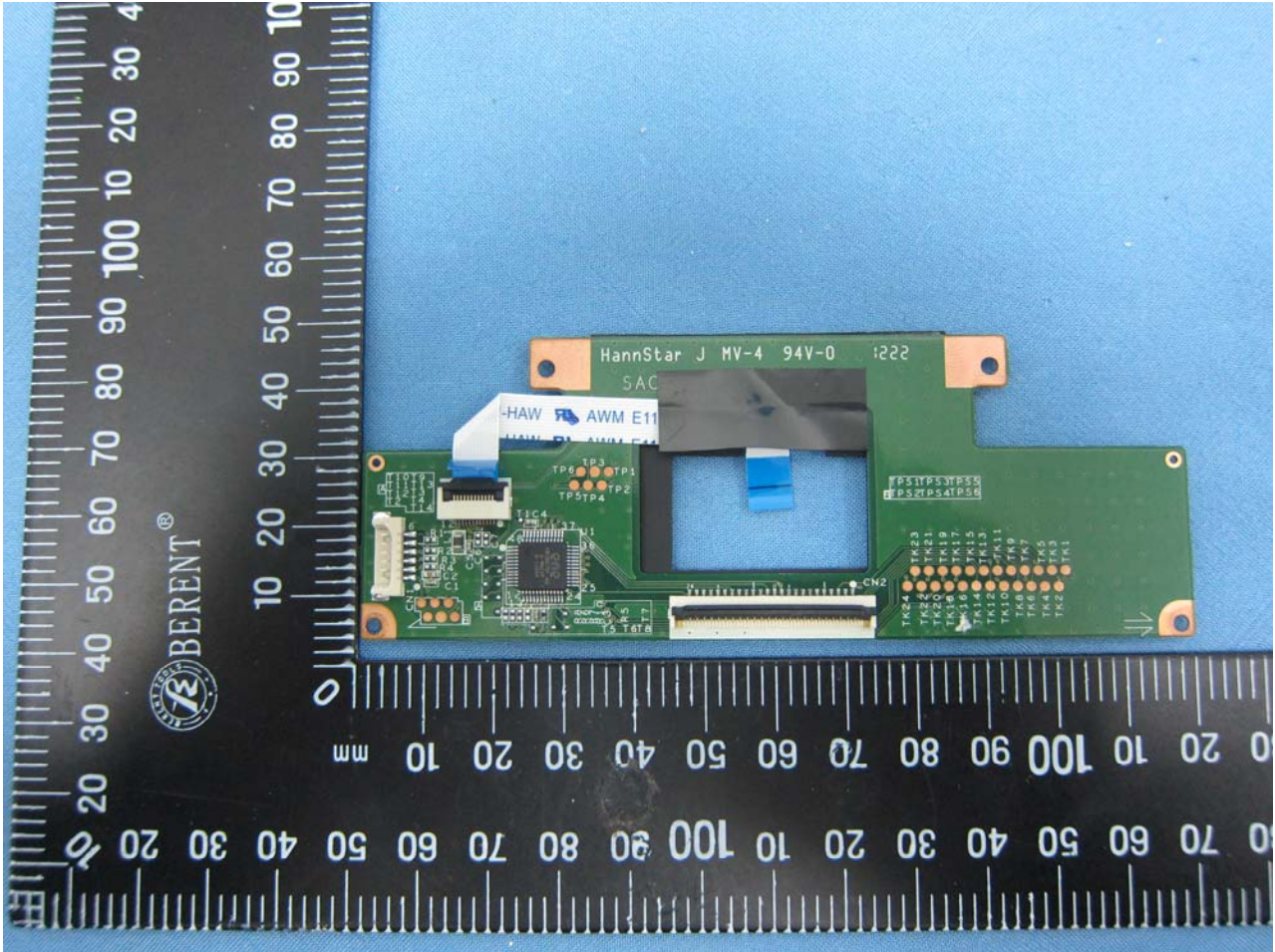
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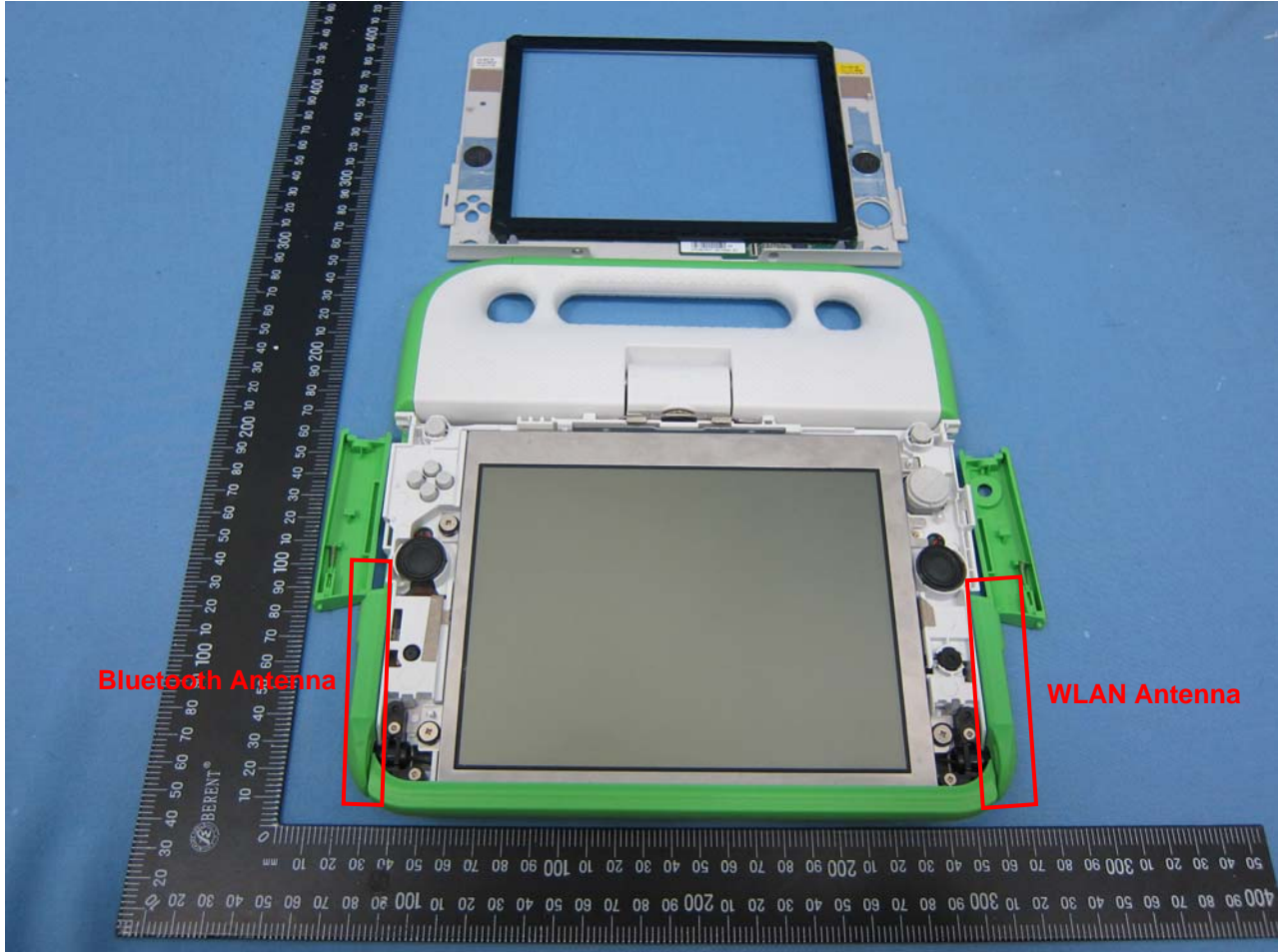
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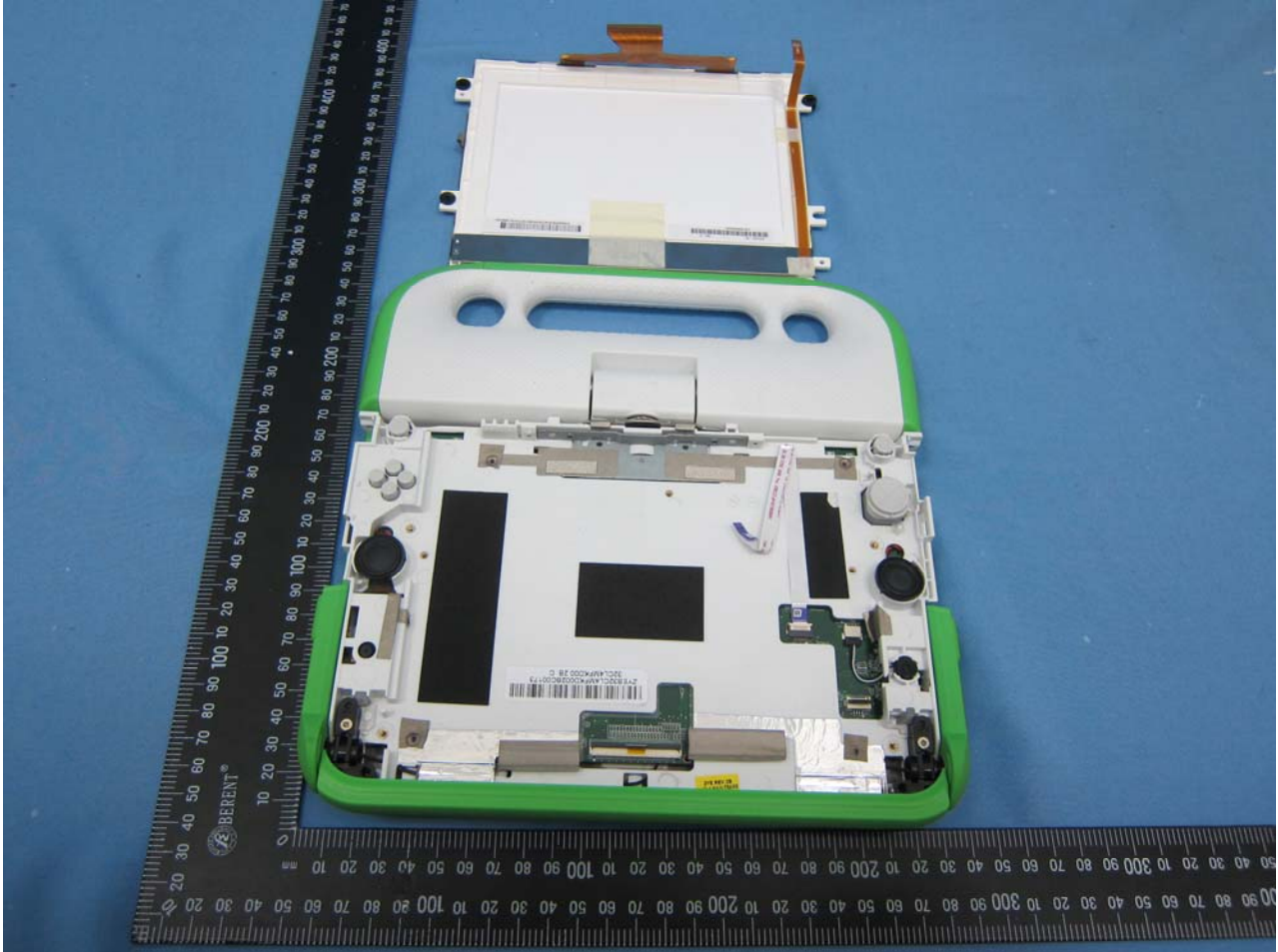
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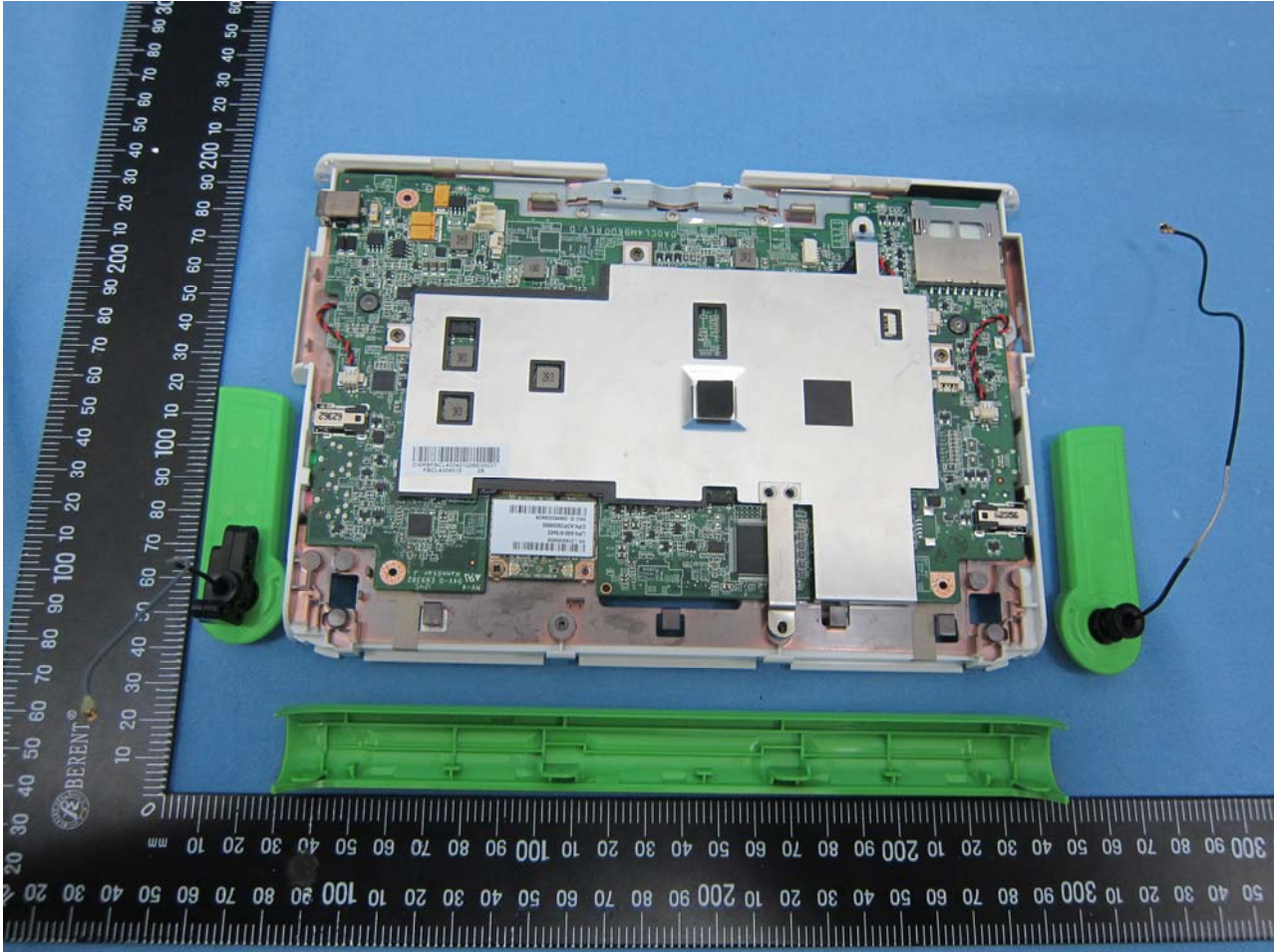
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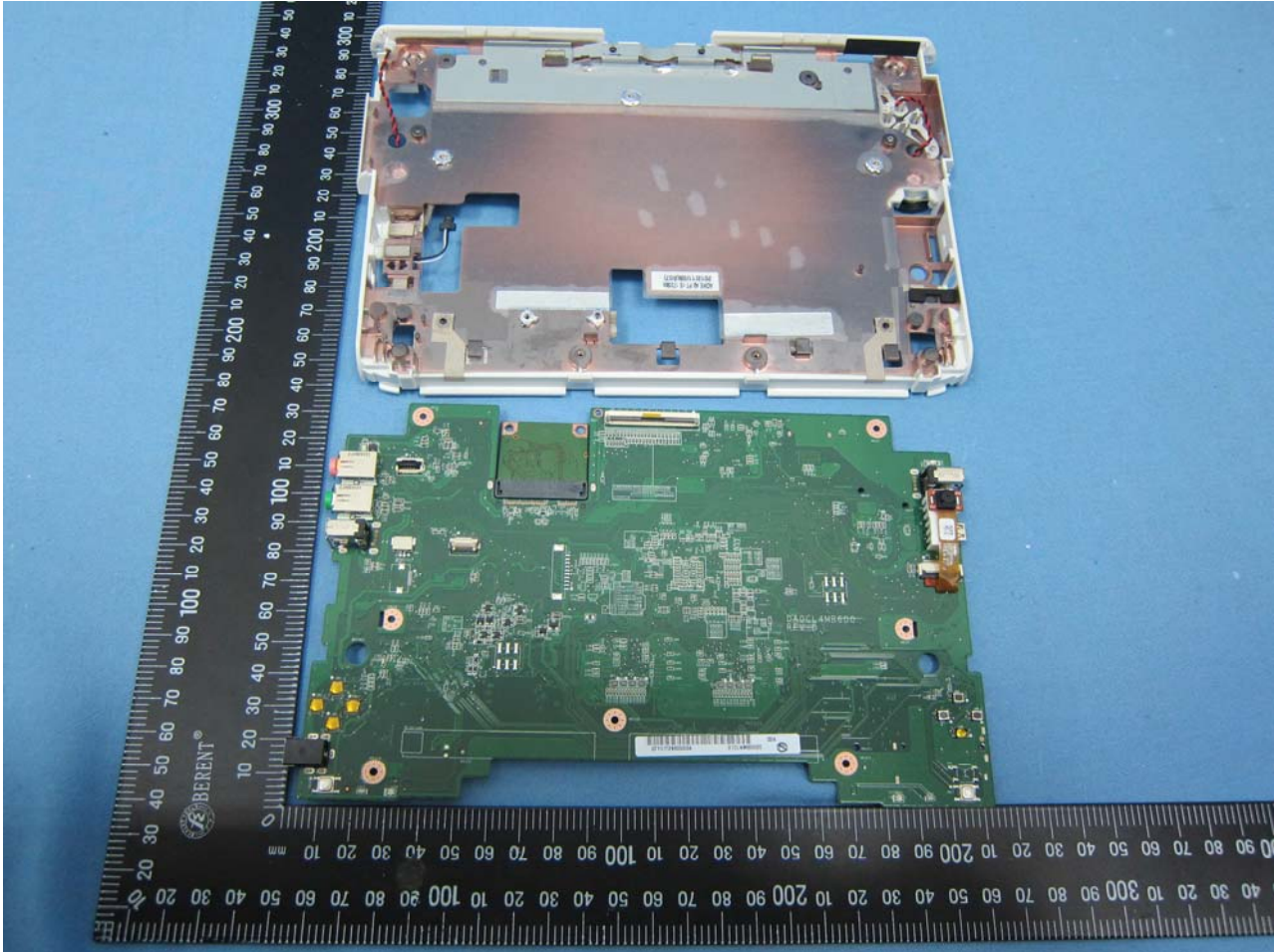
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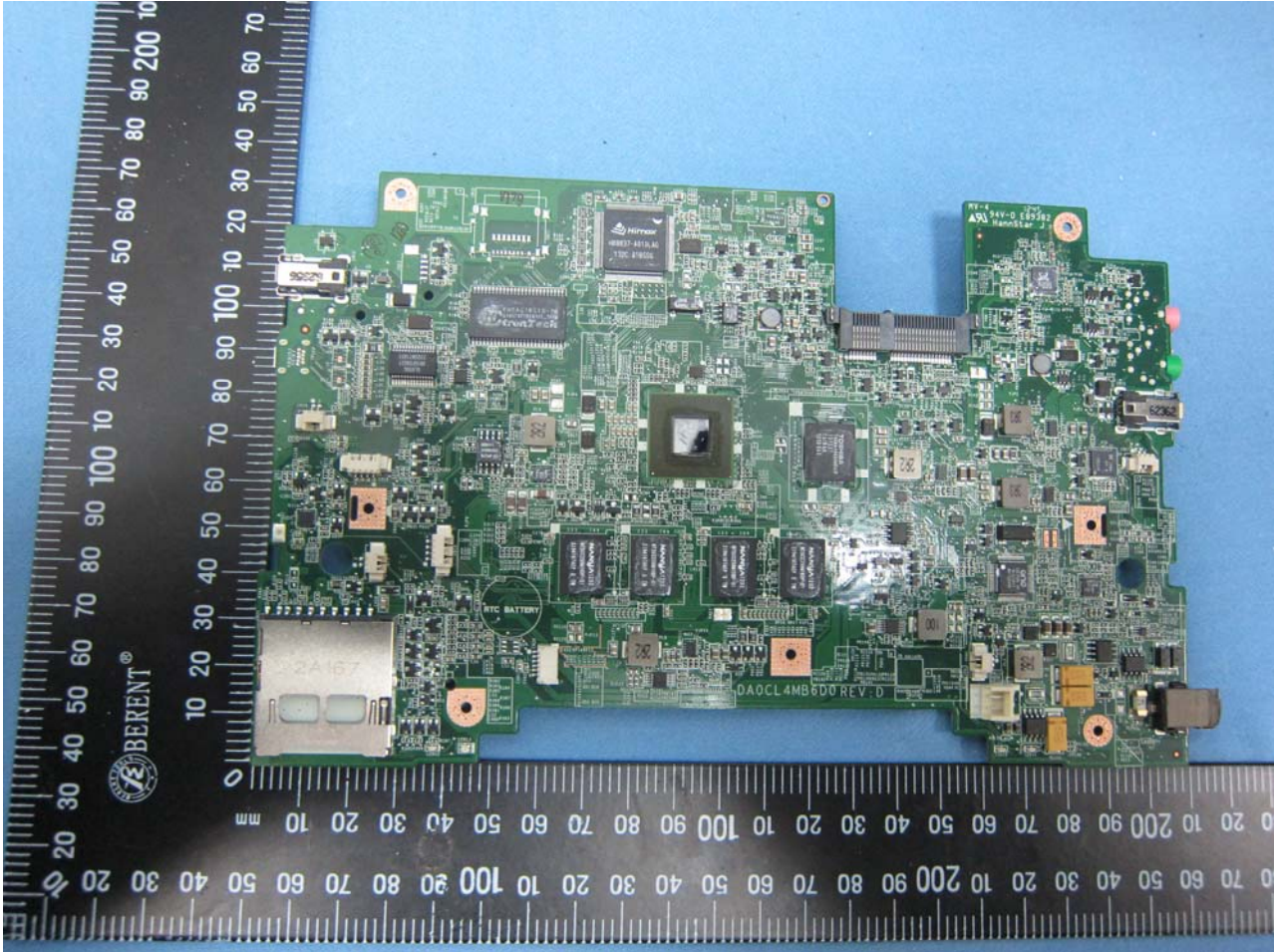
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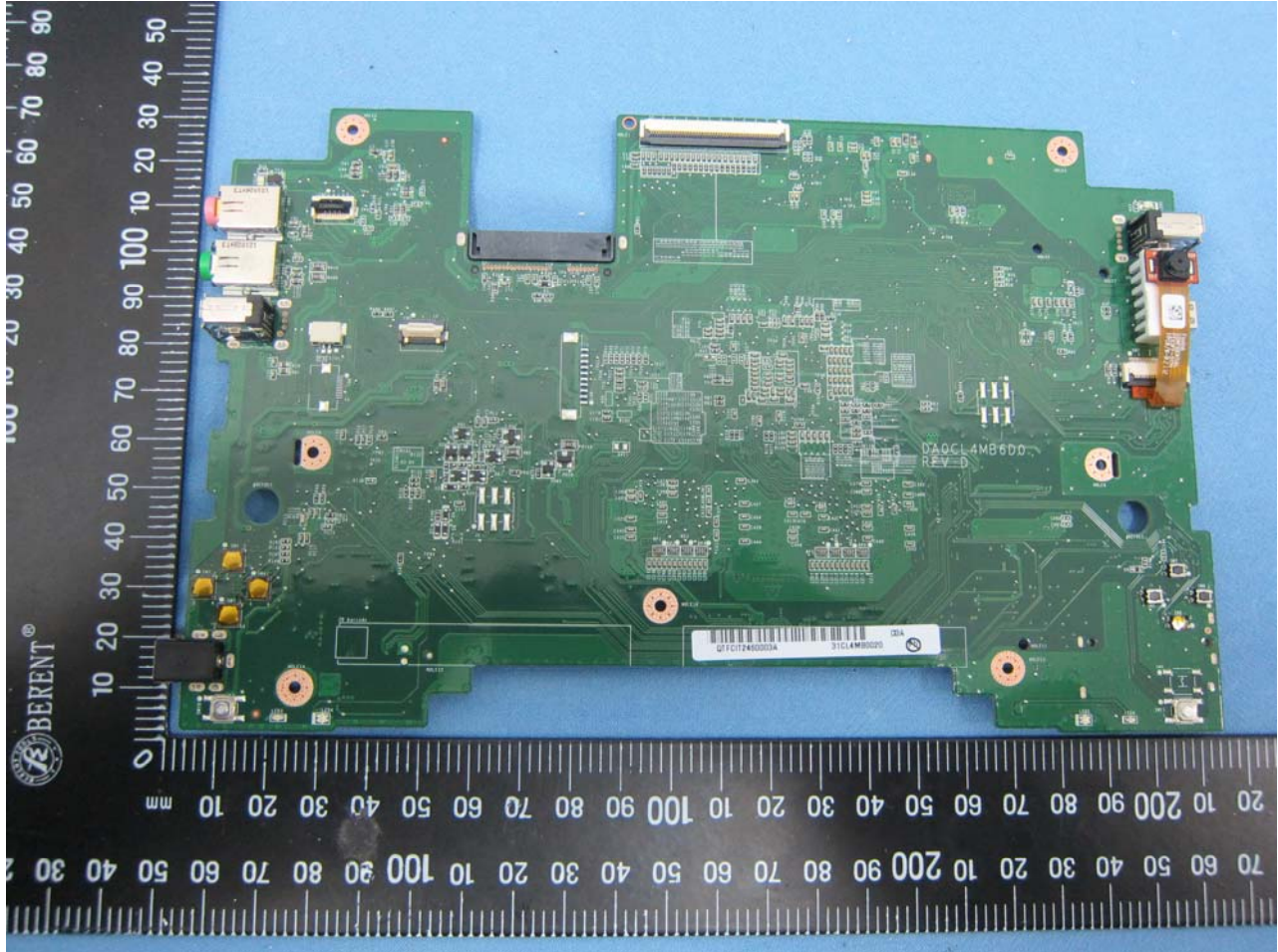
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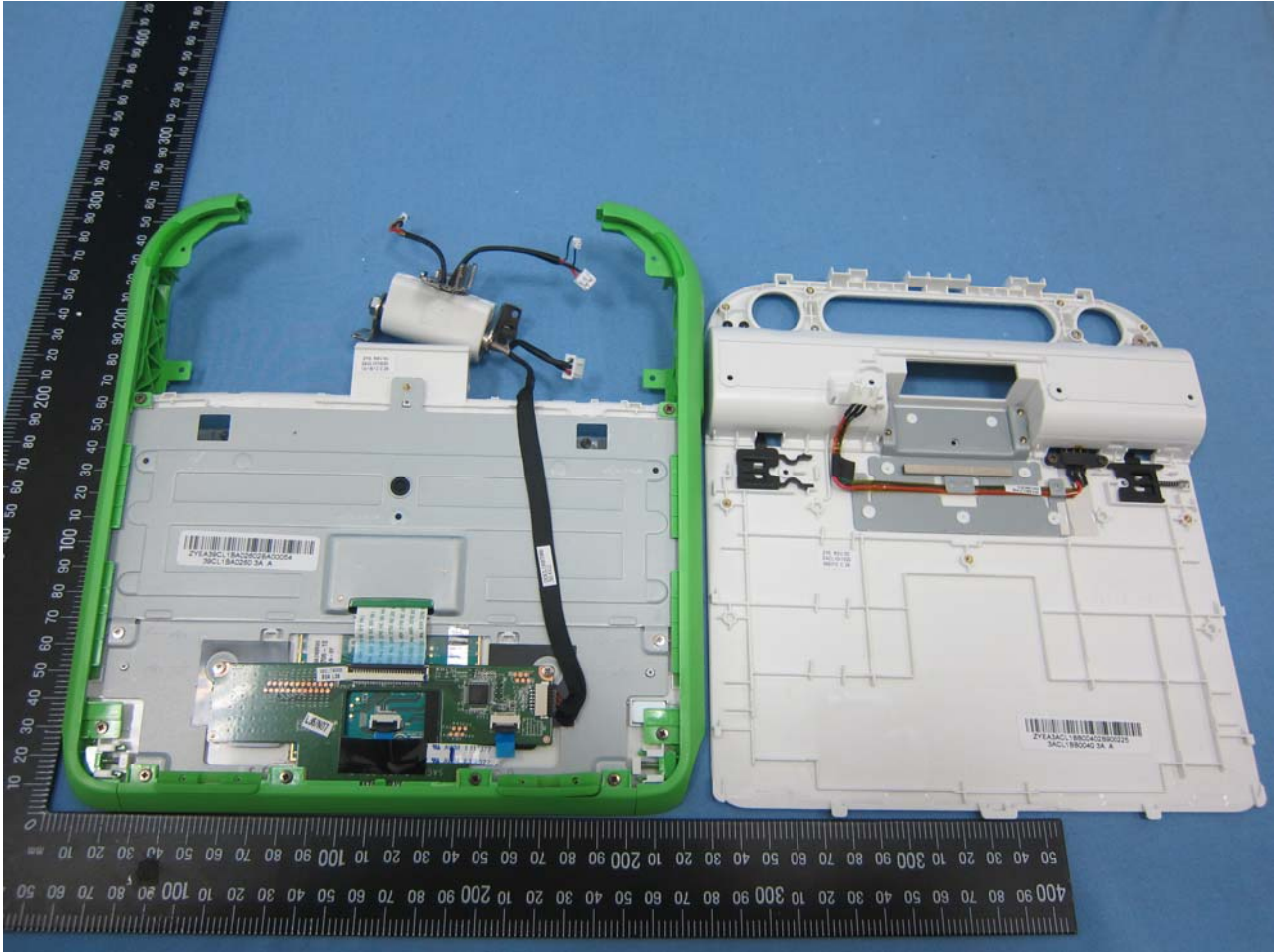
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



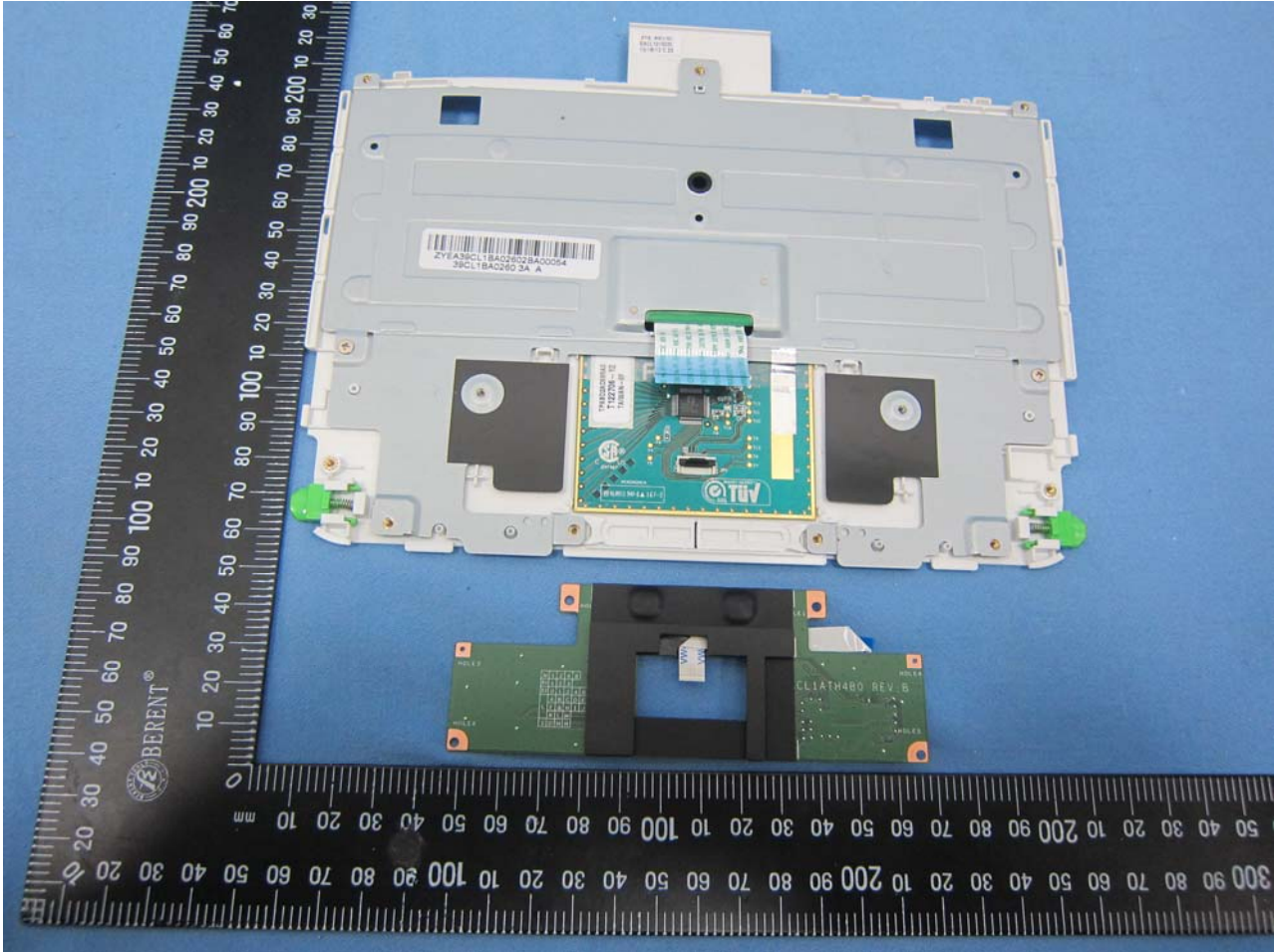
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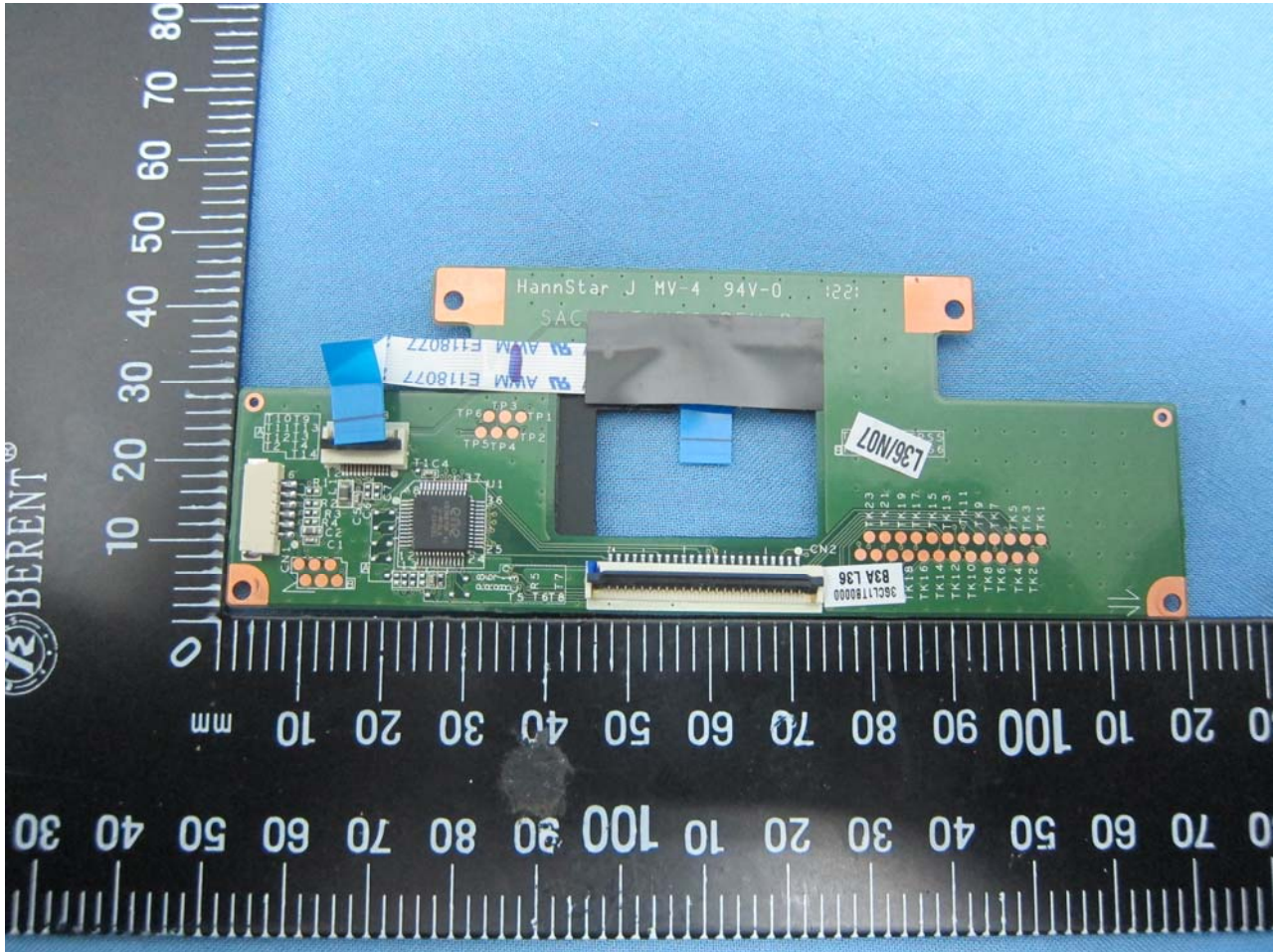
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



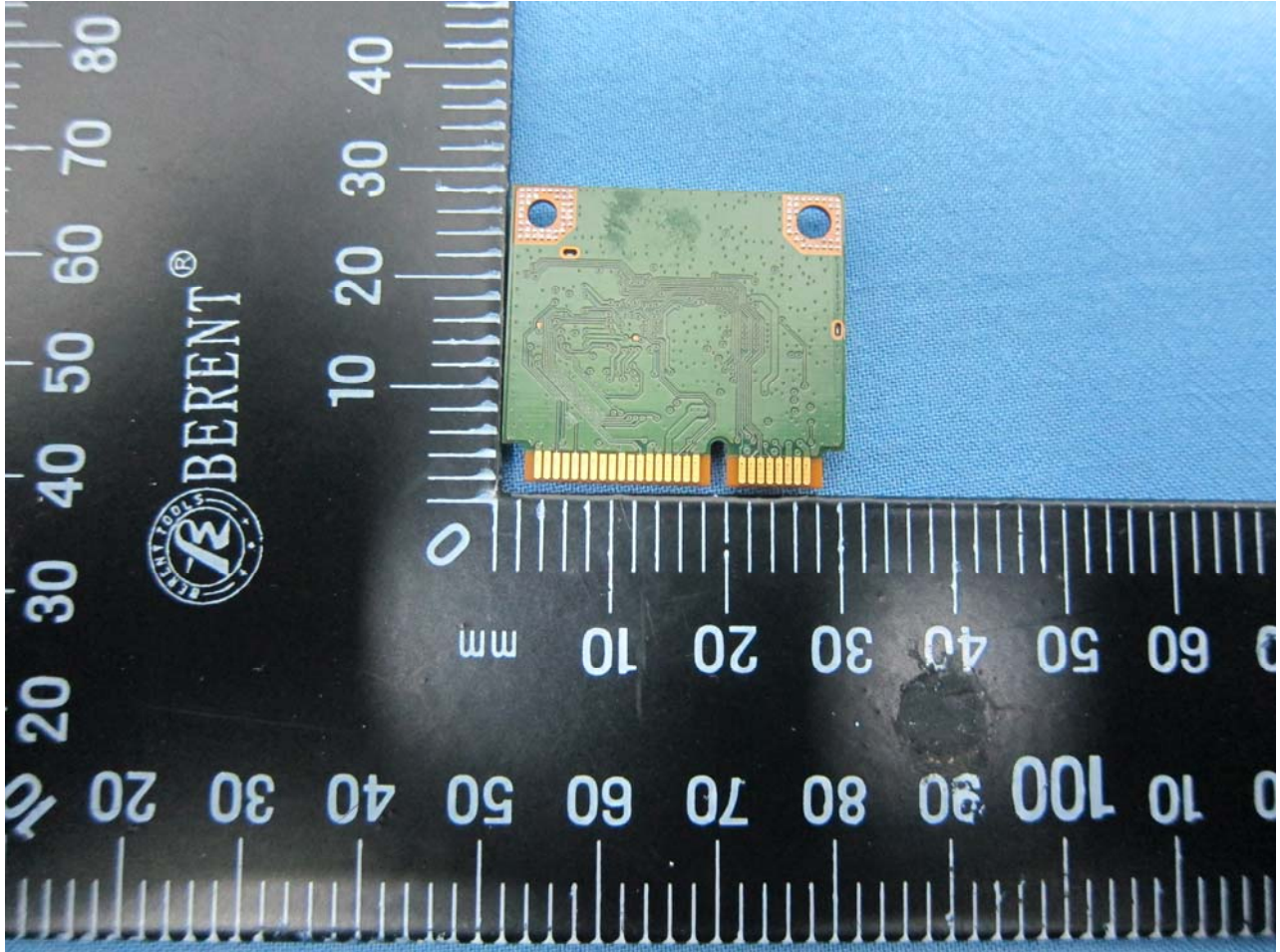
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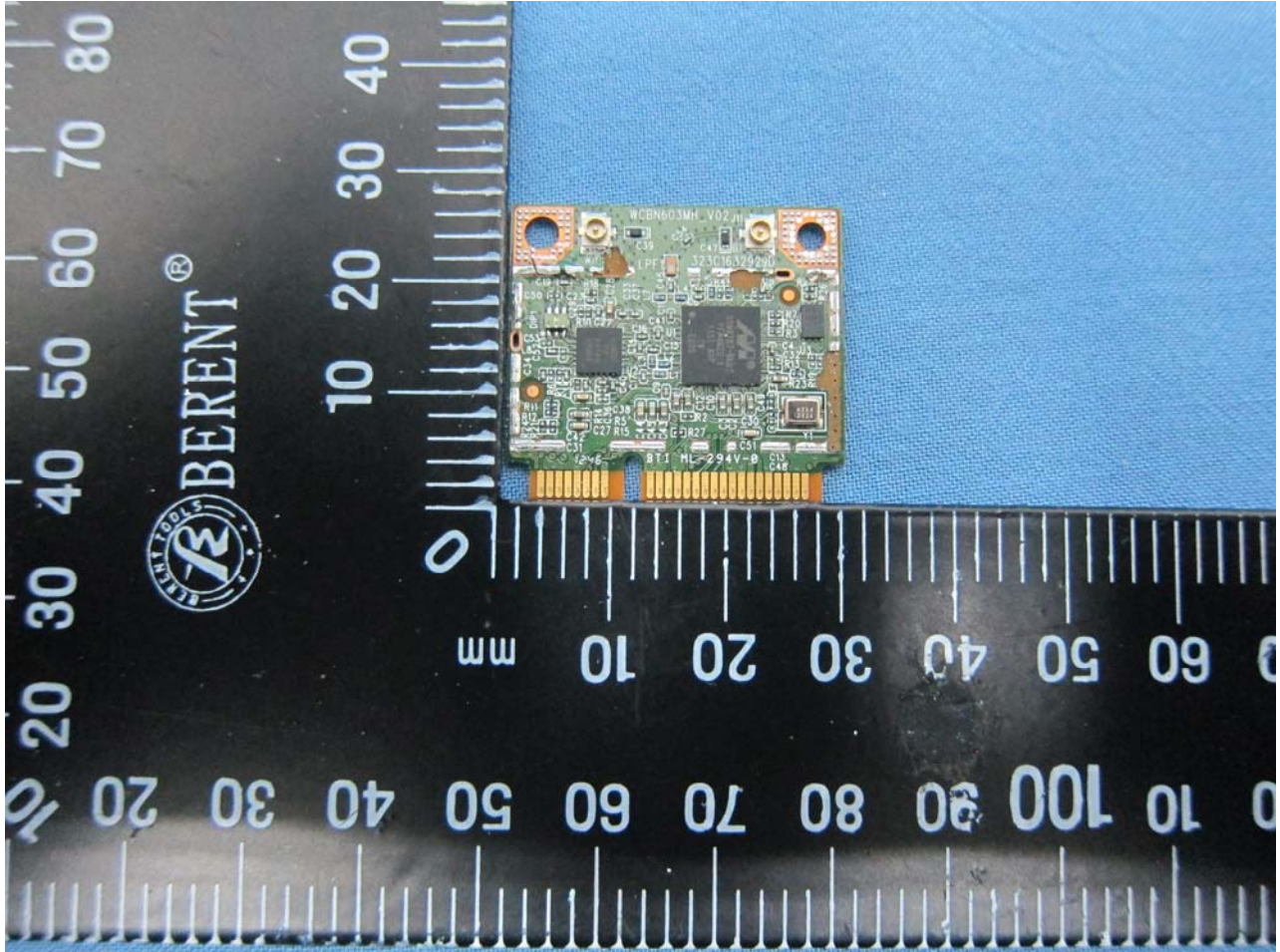
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Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

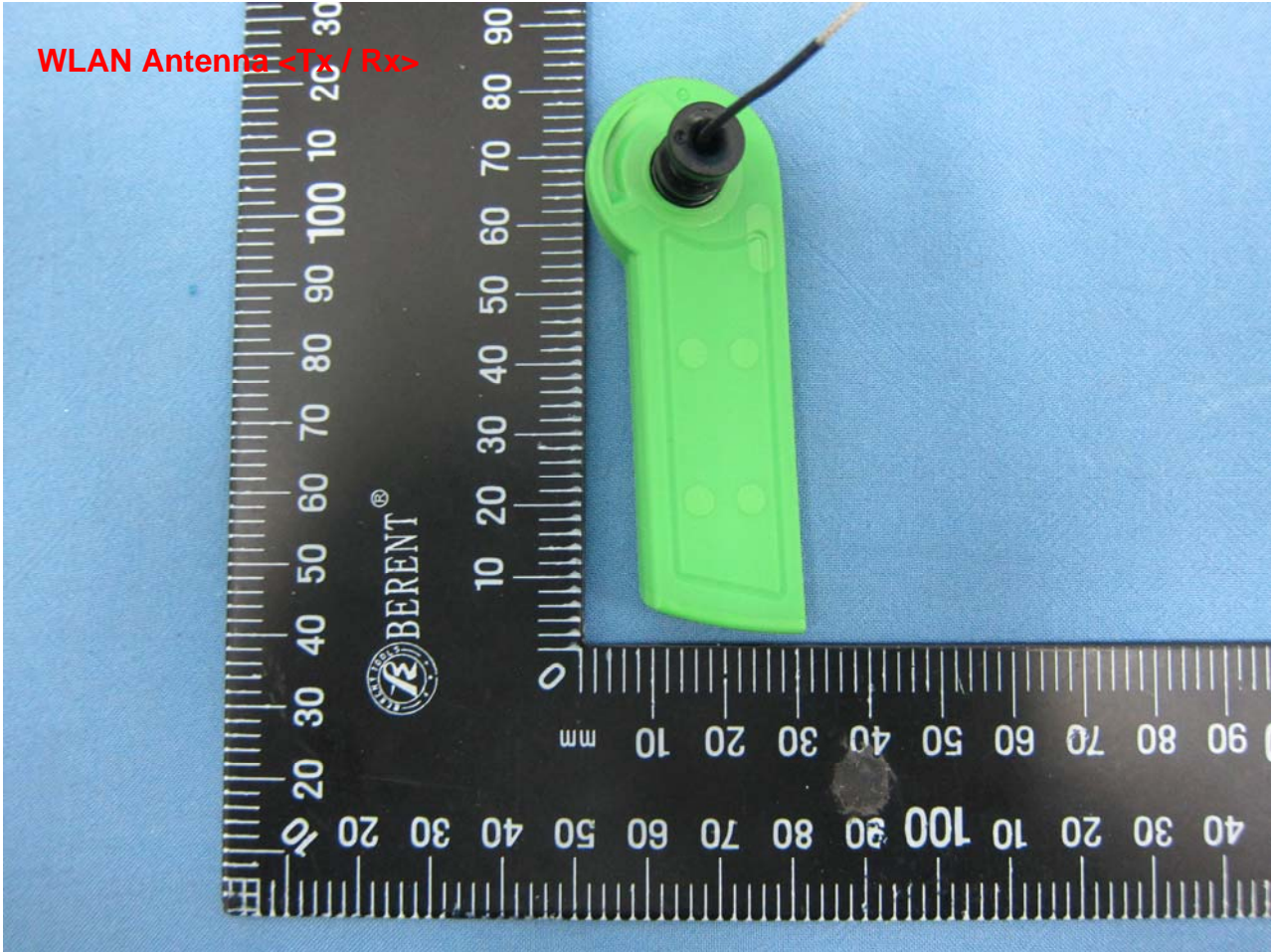


Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

WLAN Antenna <Tx / Rx>



Brand Name: OLPC; Model Name: XO-4 Touch, XO-4 HS Touch, XO-4, XO-4 HS

