FCC TEST REPORT

FCC ID : Z5MLUVPLAT2MON
Applicant : Egerium BV
Address : Kleveringweg 25, 2616LZ Delft Netherlands

Equipment Under Test (EUT) :
Product Name : Premium Digital Baby Monitor
Model No. : LUVION PRESTIGE TOUCH

Standards : FCC CFR47 Part 15 Section 15.247:2009

Date of Test : November 1~21, 2011
Date of Issue : November 21, 2011

Test Engineer : Zero Zhou /Engineer

Reviewed By : Philo Zhong/Manager

Test Result	**: PASS**

Prepared By:
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✧ The sample detailed above has been tested to the requirements of Council Directives ANSI C63.4:2009. The test results have been reviewed against the Directives above and found to meet their essential requirements.

2 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions (9kHz to 25GHz)	15.205(a) 15.209 15.247(d)	PASS
Conduct Emission	15.207	PASS
20dB Bandwidth	15.247(a)(1)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Frequency Separation	15.247(a)(1)	PASS
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

3 Contents

4 General Information

4.1 Client Information

Applicant	: Egerium BV
Address of Applicant	: Kleveringweg 25, 2616LZ Delft Netherlands
Manufacturer	: RDI Technology (Shenzhen) Co., Ltd.
Address of Manufacturer	: Building C1 Xingtang Industrial Park, East Baishixia, Fuyong, Baoan, Shenzhen, PRC

4.2 General Description of E.U.T.

Product Name	: Premium Digital Baby Monitor
Model No.	: LUVION PRESTIGE TOUCH

4.3 Details of E.U.T.

Technical Data	: Adapter Input: 100 – 240V, 50/60Hz, 0.5A
	Adapter Output: 5.0VDC, 2.0A
	Internal Battery: 3.7V Li-ion Battery
Operation Frequency	: 2402MHz ~ 2480MHz
Antenna Gain	: -2.39 dBi

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Standards Applicable for Testing

The customer requested FCC tests for a Premium Digital Baby Monitor. The standards used were FCC CFR47 Part 15 Section 15.247, Section 15.207 and Section 15.209.

4.6 Test Facility

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

- **IC – Registration No.: IC7760A**
  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, August 3, 2010.

- **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.

4.7 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

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Uncertainty
EMC Analyzer	Agilent/ E7405A	MY45114943	W2008001	9k-26.5GHz	Aug. 2, 2011	Aug. 1, 2012	±1dB
Trilog Broadband Antenne	SCHWARZBECK MESS-ELEKTROM / VULB9163	336	W2008002	30-3000 MHz	Aug. 2, 2011	Aug. 1, 2012	±1dB
Broad-band Horn Antenna	SCHWARZBECK MESS-ELEKTROM / BBHA 9120D(1201)	667	W2008003	1-18GHz	Aug. 2, 2011	Aug. 1, 2012	f < 10 GHz : ±1dB 10GHz < f < 18 GHz : ±1.5dB
Broadband Preamplifier	SCHWARZBECK MESS-ELEKTROM / BBV 9718	9718-148	W2008004	0.5-18GHz	Aug. 2, 2011	Aug. 1, 2012	±1.2dB
10m Coaxial Cable with N-male Connectors	SCHWARZBECK MESS-ELEKTROM / AK 9515 H	-	-	-	Aug. 2, 2011	Aug. 1, 2012	-
10m 50 Ohm Coaxial Cable	SCHWARZBECK MESS-ELEKTROM / AK 9513	-	-	-	Aug. 2, 2011	Aug. 1, 2012	-
Positioning Controller	C&C LAB/ CC-C-IF	-	-	-	Aug. 2, 2011	Aug. 1, 2012	-
Color Monitor	SUNSPO/ SP-14C	-	-	-	Aug. 2, 2011	Aug. 1, 2012	-
Test Receiver	ROHDE&SCHWARZ/ ESPI	101155	W2005001	9k-3GHz	Aug. 2, 2011	Aug. 1, 2012	±1dB
Two-Line V-Network	ROHDE&SCHWARZ/ ENV216	100115	W2005002	50Ω/50μH	Aug. 2, 2011	Aug. 1, 2012	±10%
RF Generator	TESEQ GmbH/ NSG4070	25781	W2008008	Fraq-range : 9K-1GHz RF voltage : -60 dBm-+10dBm	Aug. 2, 2011	Aug. 1, 2012	Power_freq distinguish0.1Hz RFeletricity distinguish 0.1B
Active Loop Antenna	Beijing Dazhi / ZN30900A	-	-	-	Aug. 2, 2011	Aug. 1, 2012	±1dB

6 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2009
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz 56 dBμV between 0.5MHz & 5MHz 60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

E.U.T. Operation

Operating Environment:

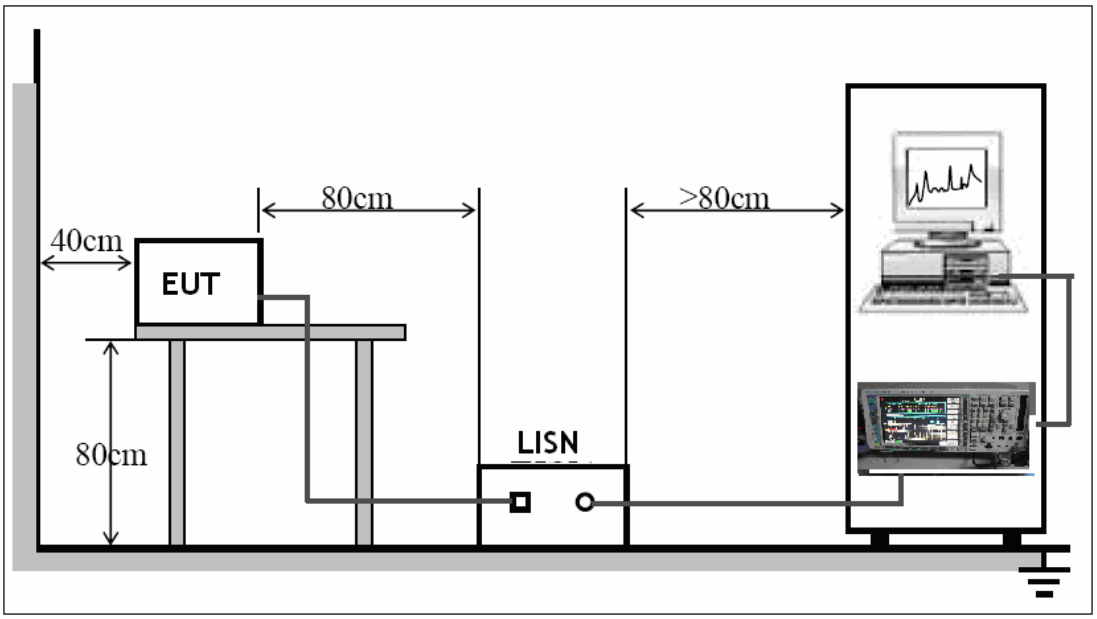
Temperature: 25.5 °C
Humidity: 51 % RH
Atmospheric Pressure: 1012 mbar

EUT Operation:

The pre-test was performance on three working mode: 1. Normal linking and display;
2. Normal linking and display on TV;3.Normal linking and REC. The worst mode is mode 1, so the data show in the report is that mode's only.
The EUT was tested according to ANSI C63.4:2009. The frequency spectrum from 150kHz to 30MHz was investigated.
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2009, The specification used in this report was the FCC Part15 B 15.207 limits.



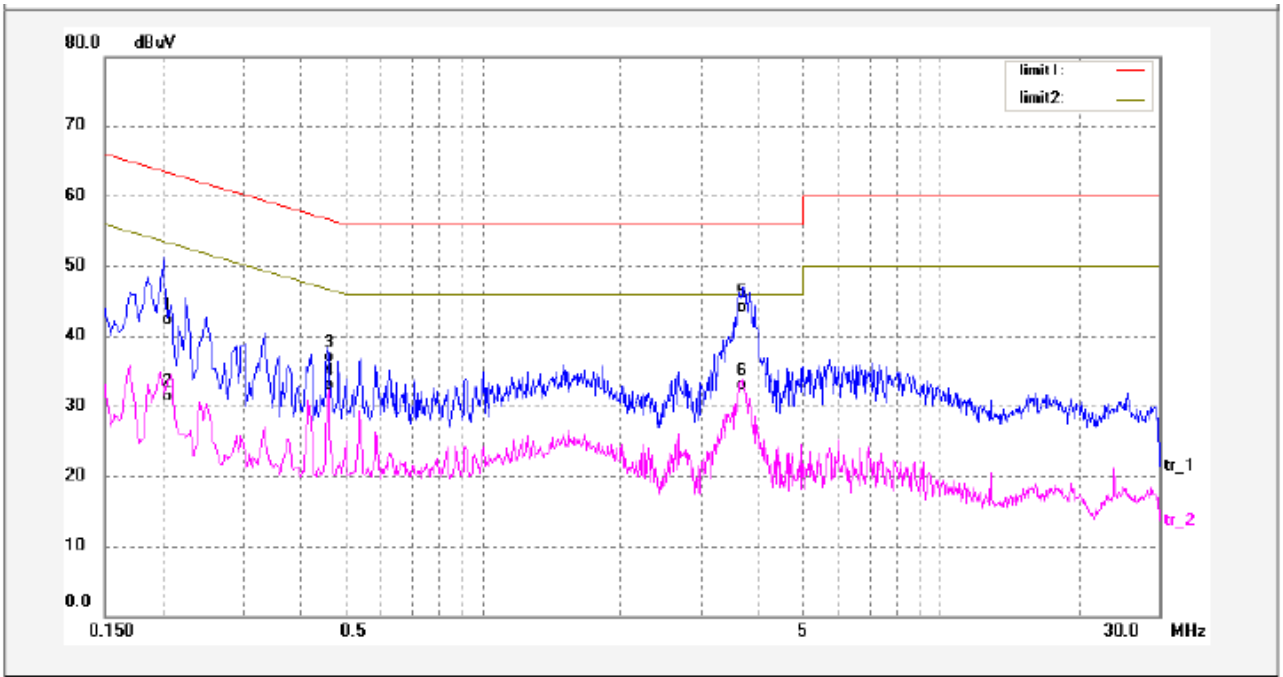
The EUT was placed on the test table in shielding room

Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

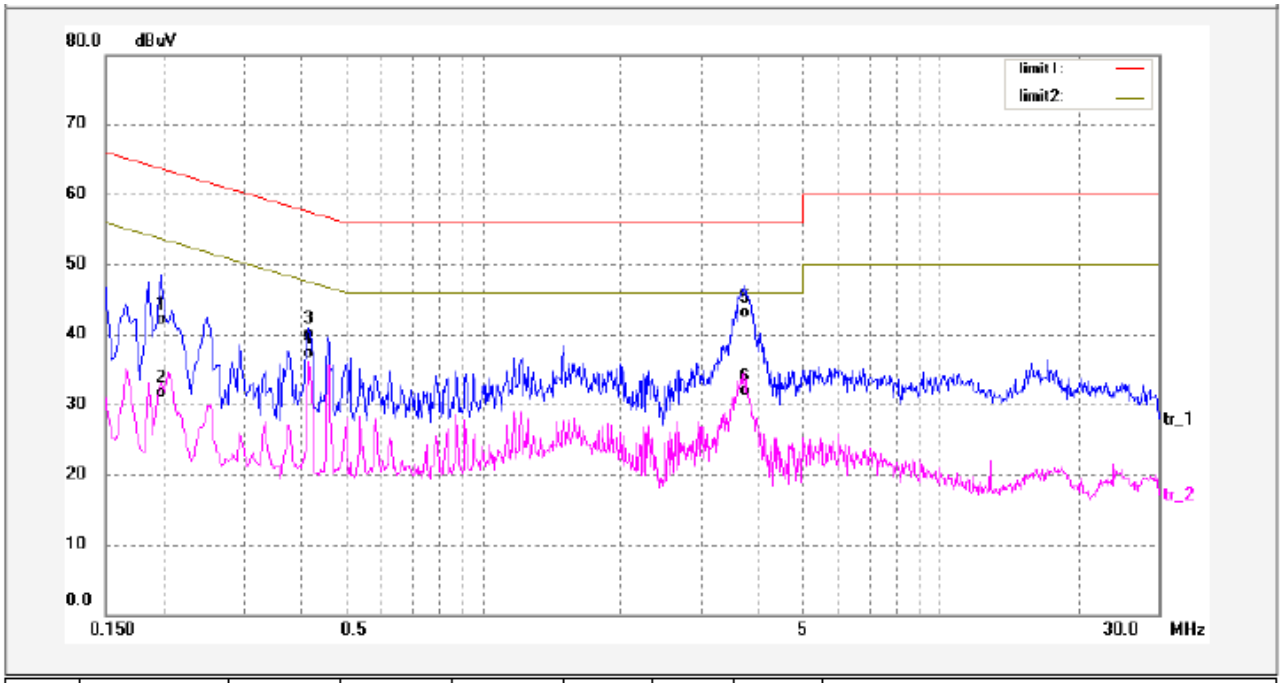
The EUT was tested in Normal Linking and display mode.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2020	30.84	10.67	41.51	63.52	-22.01	QP	
2	0.2020	19.76	10.67	30.43	53.52	-23.09	AVG	
3	0.4580	25.19	10.94	36.13	56.73	-20.60	QP	
4	0.4580	21.22	10.94	32.16	46.73	-14.57	AVG	
5	3.7140	30.83	12.53	43.36	56.00	-12.64	QP	
6	3.7140	19.53	12.53	32.06	46.00	-13.94	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1980	30.67	10.67	41.34	63.69	-22.35	QP	
2	0.1980	20.20	10.67	30.87	53.69	-22.82	AVG	
3	0.4180	28.69	10.71	39.40	57.49	-18.09	QP	
4	0.4180	25.72	10.71	36.43	47.49	-11.06	AVG	
5	3.7460	29.86	12.53	42.39	56.00	-13.61	QP	
6	3.7460	18.52	12.53	31.05	46.00	-14.95	AVG	

Photograph – Conducted Emission Test Setup

7 Radiated Spurious Emissions

Test Requirement:	FCC CFR47 Part 15 Section 15.209 & 15.247
Test Method:	Base on ANSI C63.4:2009
Test Result:	PASS
Frequency Range:	9kHz to 25GHz
Measurement Distance:	3m
15.209 Limit:	40.0 dBuV/m between 30MHz & 88MHz 43.5 dBuV/m between 88MHz & 216MHz 46.0 dBuV/m between 216MHz & 960MHz 54.0 dBuV/m above 960MHz
15.247 (d) Limit:	(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that Contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.
Test mode:	The EUT was tested in continuously Transmit mode.

EUT Operation :

Operating Environment:

Temperature: 25.5 °C
Humidity: 51 % RH
Atmospheric Pressure: 1012 mbar

Measurement Uncertainty

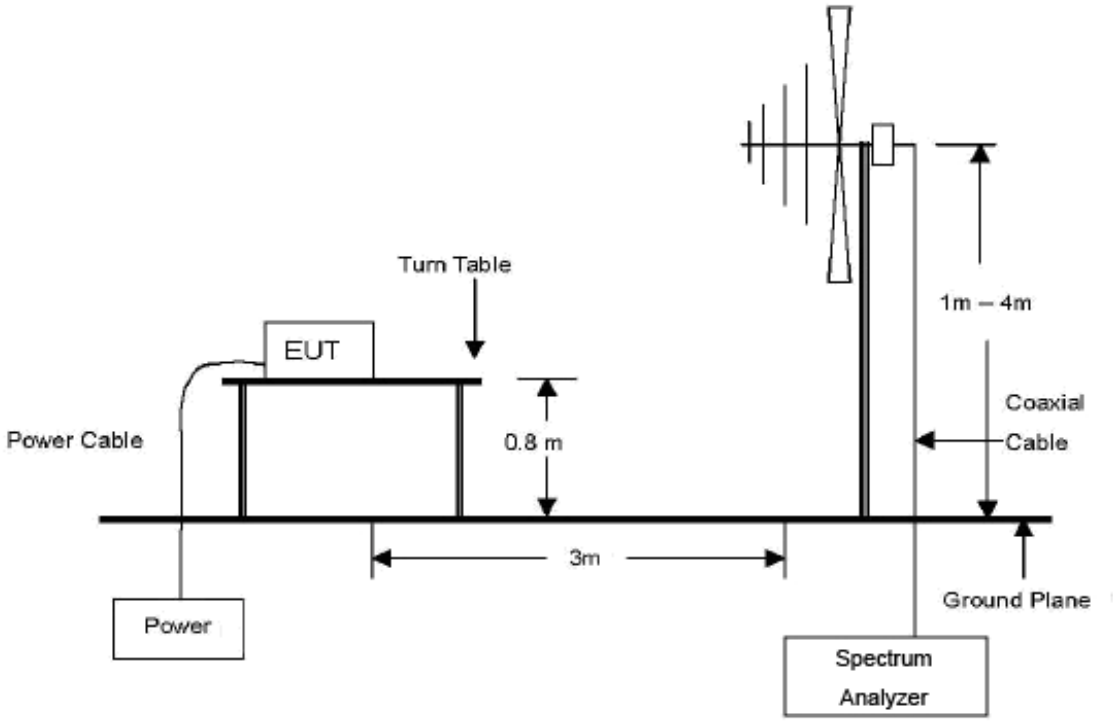
All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek EMC Lab is ±5.03dB.

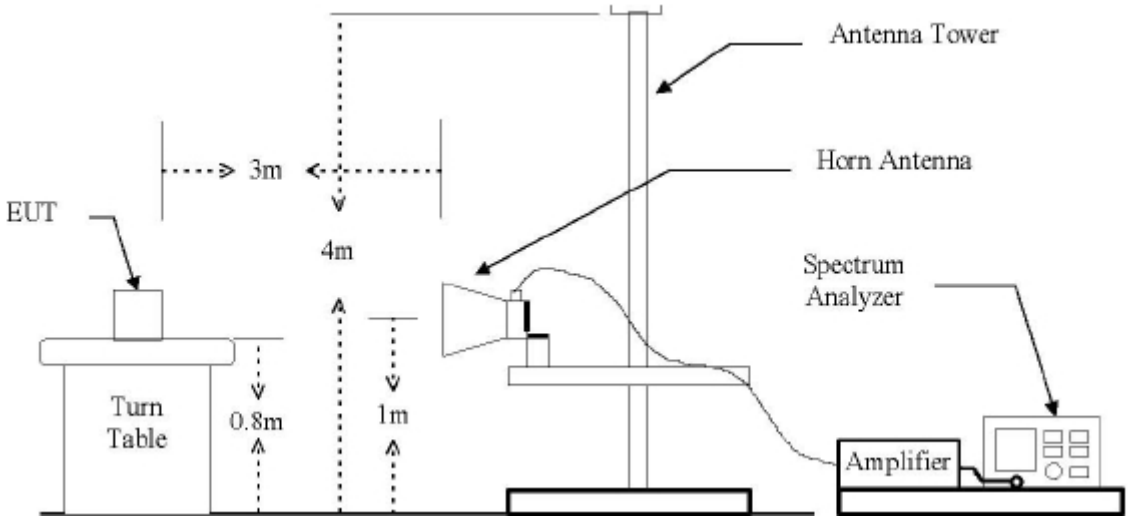
Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2009.

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 25 GHz Emissions.



Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested 9kHz to 25000MHz.

9kHz ~ 30MHz

Start Frequency	9kHz
Stop Frequency	30MHz
Sweep Speed	Auto
IF Bandwidth	10KHz
Video Bandwidth	10KHz
Resolution Bandwidth	10KHz

30MHz ~ 1GHz

Start Frequency	30 MHz
Stop Frequency	1000MHz
Sweep Speed	Auto
IF Bandwidth	120 KHz
Video Bandwidth	100KHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	100KHz

Above 1GHz

Start Frequency	1000 MHz
Stop Frequency	25000MHz
Sweep Speed	Auto
IF Bandwidth	120 KHz
Video Bandwidth	1MHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	1MHz

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 performed in X(normal uses) axis positioning. And all the modes was tested in the report.Only the worst case is shown in the report.

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:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

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

Margin = Corr. Ampl. – Limit

Summary of Test Results

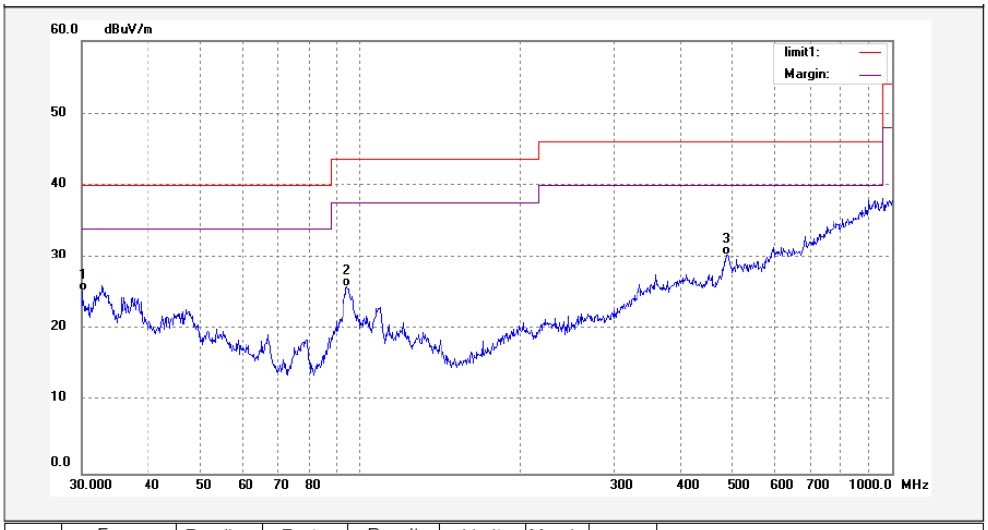
According to the data in this section, the EUT complied with the FCC CFR47 Part 15 Section 15.209 & 15.247 standards.

Test mode: continuously recevie mode

Remark: the EUT was pre-tested at the high, middle and low channel, and the worse case was the low Channel, so the data show was the low channel's only. Because the emissions below 30MHz are more than 20dB below the limit, the data is not show in the report.

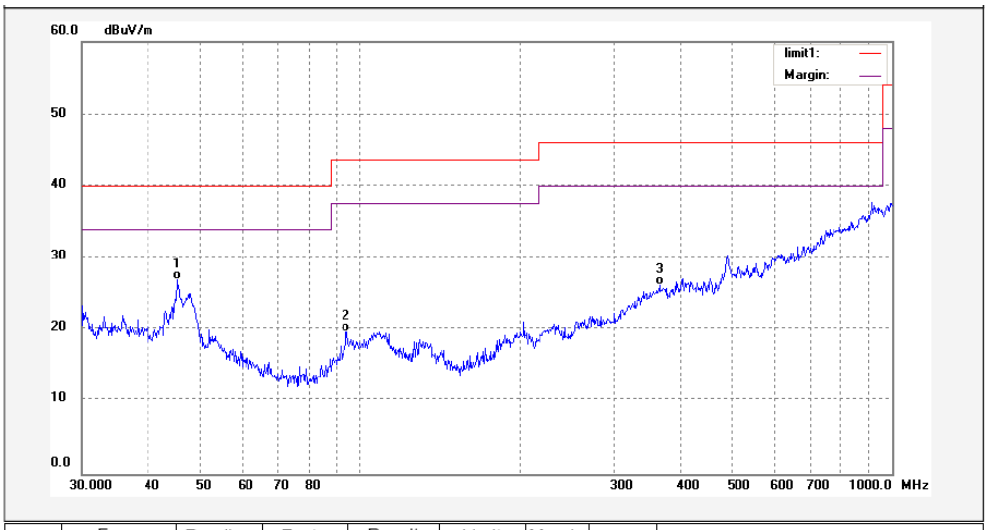
Test Frequency : 30MHz ~ 1000MHz

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.0000	9.16	16.15	25.31	40.00	-14.69	QP	
2	94.6456	12.85	13.05	25.90	43.50	-17.60	QP	
3	488.3263	5.18	25.25	30.43	46.00	-15.57	QP	

Antenna polarization: Horizontal

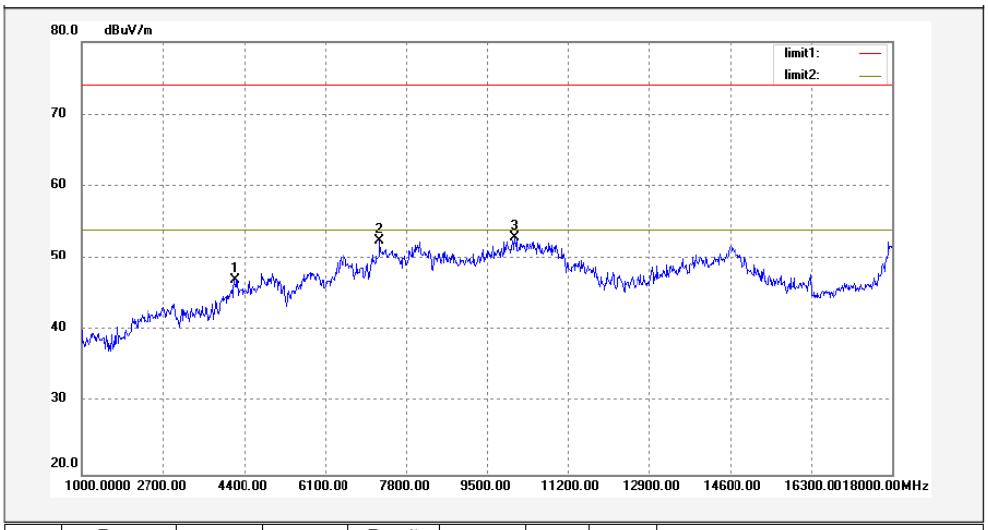


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	45.4130	12.24	14.66	26.90	40.00	-13.10	QP	
2	94.3137	6.83	12.96	19.79	43.50	-23.71	QP	
3	366.0866	5.60	20.64	26.24	46.00	-19.76	QP	

Test Frequency: Above 1GHz radiation test data:

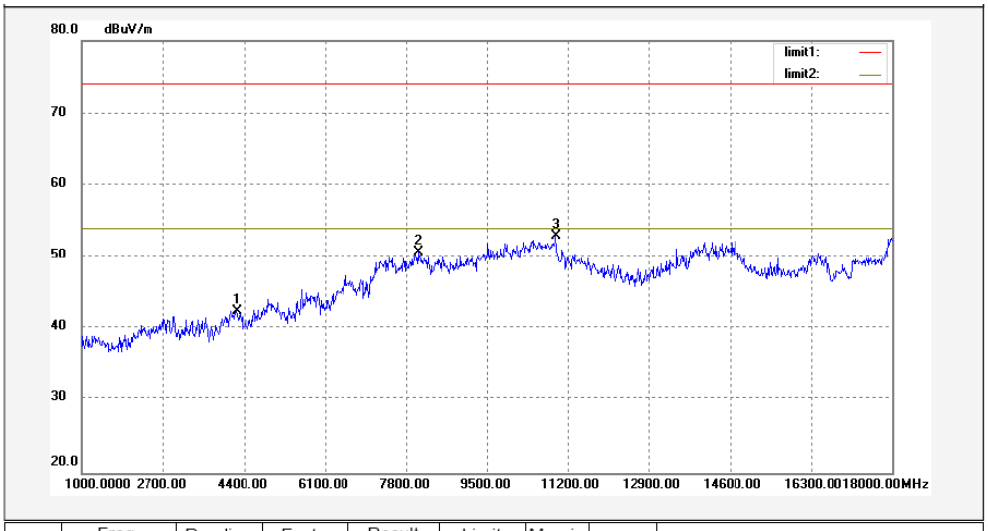
Remark: above 18GHz, the test signal below the noise level, so the data was not perfromed.

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4185.371	40.52	6.46	46.98	74.00	-27.02	peak	
2	7251.503	36.63	15.85	52.48	74.00	-21.52	peak	
3	10079.158	32.27	20.58	52.85	74.00	-21.15	peak	

Antenna polarization: Horizontal



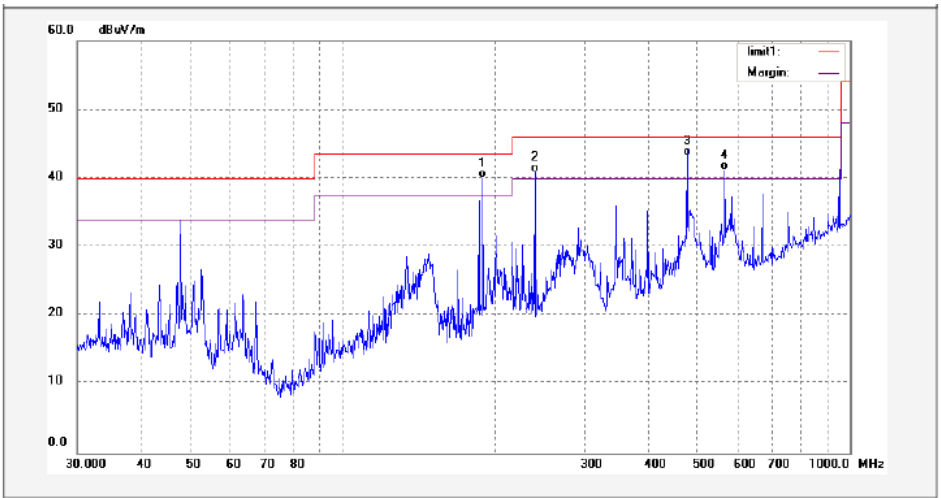
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4236.473	39.30	3.10	42.40	74.00	-31.60	peak	
2	8052.104	35.75	14.91	50.66	74.00	-23.34	peak	
3	10947.896	33.63	19.31	52.94	74.00	-21.06	peak	

Test mode: Normal working and Transmit mode

Test Frequency : 30MHz ~ 1000MHz

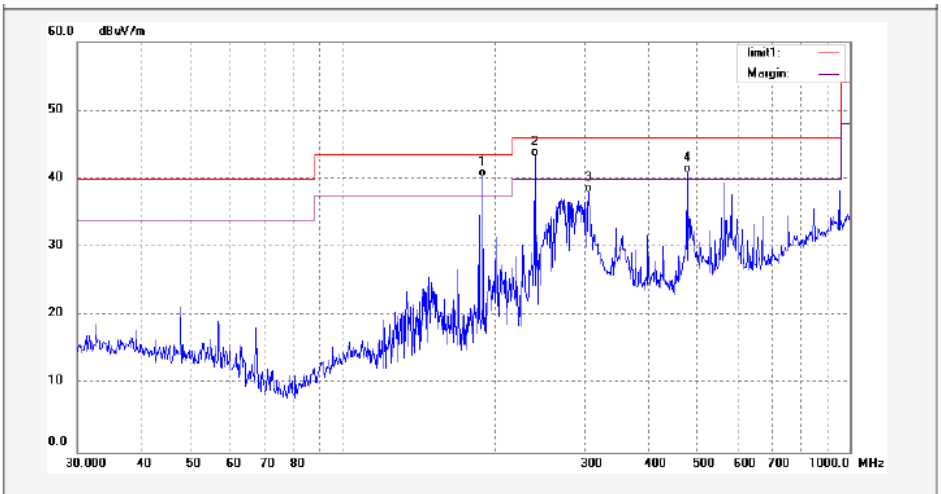
Remark: the EUT was pretested at continuously transmit mode, normal link and display mode, normal link and REC mode, and the worst mode is normal link and display mode, so the data showing was that mode's only. Because the emissions below 30MHz are more than 20dB below the limit, the data is not show in the report.

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	189.1075	25.93	14.02	39.95	43.50	-3.55	QP	
2	239.3019	25.28	15.53	40.81	46.00	-5.19	QP	
3	478.1394	20.79	22.52	43.31	46.00	-2.69	QP	
4	565.9776	17.64	23.48	41.12	46.00	-4.88	QP	

Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	189.1076	26.26	14.02	40.28	43.50	-3.22	QP	
2	239.3020	27.82	15.53	43.35	46.00	-2.65	QP	
3	306.0282	20.29	17.69	37.98	46.00	-8.02	QP	
4	478.1394	18.38	22.52	40.90	46.00	-5.10	QP	

Test Frequency: 1GHz ~ 25GHz

And the below is the Fundamental and Harmonic

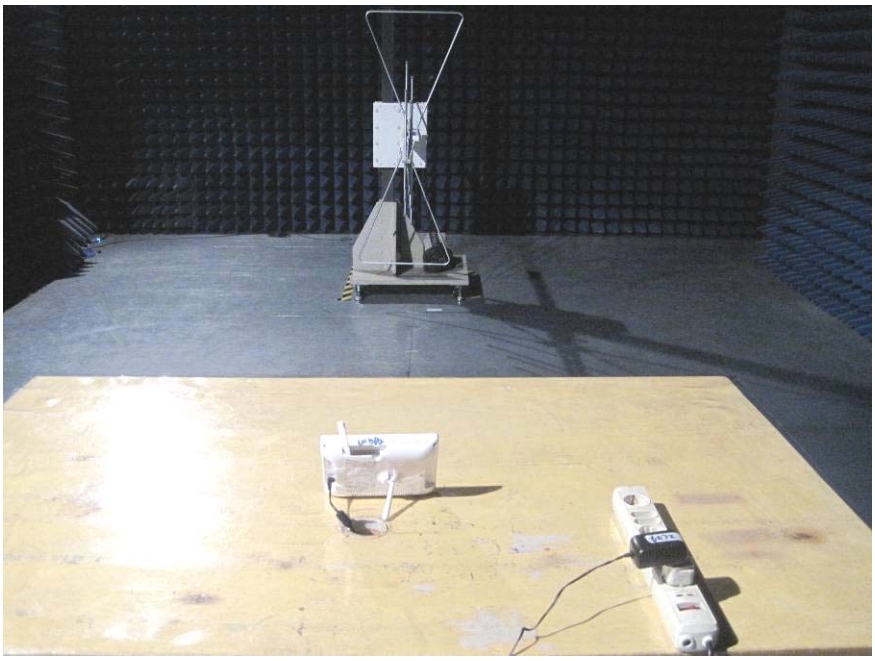
Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
Low frequency							
2402.00	AV	Vertical	97.33		(Fund.)	1.2	30
4804.00	AV	Vertical	42.25	54.00	-11.75	1.2	75
7206.00	AV	Vertical	43.31	54.00	-10.69	1.5	150
9608.00	AV	Vertical	42.40	54.00	-11.6	1.8	90
12010.00	AV	Vertical	36.58	54.00	-17.42	1.6	165
14412.00	AV	Vertical	39.79	54.00	-14.21	1.4	150
16814.00	AV	Vertical	36.52	54.00	-17.48	1.7	130
19216.00	AV	Vertical	34.61	54.00	-19.39	1.5	90
21618.00	AV	Vertical	32.36	54.00	-21.64	1.6	30
24020.00	AV	Vertical	33.55	54.00	-20.45	1.2	90
2402.00	AV	Horizontal	91.53		(Fund.)	2.3	30
4804.00	AV	Horizontal	43.54	54.00	-10.46	2.0	150
7206.00	AV	Horizontal	40.35	54.00	-13.65	2.1	90
9608.00	AV	Horizontal	38.28	54.00	-15.72	2.5	130
12010.00	AV	Horizontal	40.82	54.00	-13.18	1.8	90
14412.00	AV	Horizonta	34.96	54.00	-19.04	2.2	150
16814.00	AV	Horizontal	41.18	54.00	-12.82	1.9	130
19216.00	AV	Horizontal	32.45	54.00	-21.55	1.6	130
21618.00	AV	Horizontal	34.89	54.00	-19.11	2.6	130
24020.00	AV	Horizontal	36.05	54.00	-17.95	2.0	40
2402.00	PK	Vertical	112.47		(Fund.)	1.5	30
4804.00	PK	Vertical	56.632	74.00	-17.368	1.8	90
7206.00	PK	Vertical	57.28	74.00	-16.72	1.6	120
9608.00	PK	Vertical	54.91	74.00	-19.09	1.4	210
12010.00	PK	Vertical	50.77	74.00	-23.23	1.2	90
14412.00	PK	Vertical	52.64	74.00	-21.36	1.2	90
16814.00	PK	Vertical	49.56	74.00	-24.44	1.4	165
19216.00	PK	Vertical	47.96	74.00	-26.04	1.2	150
21618.00	PK	Vertical	45.28	74.00	-28.72	1.7	90
24020.00	PK	Vertical	46.16	74.00	-27.84	1.4	120
2402.00	PK	Horizontal	106.55		(Fund.)	2.1	90
4804.00	PK	Horizontal	43.46	74.00	-30.54	2.3	120
7206.00	PK	Horizontal	40.63	74.00	-33.37	2.6	90
9608.00	PK	Horizontal	38.09	74.00	-35.91	1.8	30
12010.00	PK	Horizontal	40.37	74.00	-33.63	2.0	165
14412.00	PK	Horizontal	34.67	74.00	-39.33	1.5	30
16814.00	PK	Horizontal	41.83	74.00	-32.17	2.2	210
19216.00	PK	Horizontal	32.35	74.00	-41.65	2.5	90

21618.00	PK	Horizontal	34.75	74.00	-39.25	1.9	150
24020.00	PK	Horizontal	36.26	74.00	-37.74	2.4	90
Middle frequency							
2440.00	AV	Vertical	96.48		(Fund.)	1.1	30
4880.00	AV	Vertical	46.34	54.00	-7.66	1.1	120
7320.00	AV	Vertical	44.53	54.00	-9.47	1.4	120
9760.00	AV	Vertical	40.61	54.00	-13.39	1.7	30
12200.00	AV	Vertical	42.03	54.00	-11.97	1.5	50
14640.00	AV	Vertical	35.97	54.00	-18.03	1.3	180
17080.00	AV	Vertical	38.46	54.00	-15.54	1.6	220
19520.00	AV	Vertical	33.28	54.00	-20.72	1.4	60
21960.00	AV	Vertical	39.77	54.00	-14.23	1.5	210
24400.00	AV	Vertical	30.83	54.00	-23.17	1.1	120
2440.00	AV	Horizontal	90.78		(Fund.)	2.2	150
4880.00	AV	Horizontal	40.54	54.00	-13.46	1.9	120
7320.00	AV	Horizontal	41.32	54.00	-12.68	2.0	300
9760.00	AV	Horizontal	36.27	54.00	-17.73	2.4	150
12200.00	AV	Horizontal	38.88	54.00	-15.12	1.7	180
14640.00	AV	Horizontal	34.54	54.00	-19.46	2.1	210
17080.00	AV	Horizontal	33.82	54.00	-20.18	1.8	165
19520.00	AV	Horizontal	34.17	54.00	-19.83	1.5	120
21960.00	AV	Horizontal	35.91	54.00	-18.09	2.5	180
24400.00	AV	Horizontal	30.04	54.00	-23.96	1.9	150
2440.00	PK	Vertical	112.63		(Fund.)	1.4	30
4880.00	PK	Vertical	58.83	74.00	-15.17	1.7	120
7320.00	PK	Vertical	56.26	74.00	-17.74	1.5	130
9760.00	PK	Vertical	52.78	74.00	-21.22	1.3	150
12200.00	PK	Vertical	55.36	74.00	-18.64	1.1	210
14640.00	PK	Vertical	48.28	74.00	-25.72	1.1	270
17080.00	PK	Vertical	51.54	74.00	-22.46	1.3	30
19520.00	PK	Vertical	46.66	74.00	-27.34	1.1	150
21960.00	PK	Vertical	50.72	74.00	-23.28	1.6	165
24400.00	PK	Vertical	43.43	74.00	-30.57	1.3	150
2440.00	PK	Horizontal	107.12		(Fund.)	2.0	30
4880.00	PK	Horizontal	53.69	74.00	-20.31	2.2	75
7320.00	PK	Horizontal	54.41	74.00	-19.59	2.5	120
9760.00	PK	Horizontal	49.33	74.00	-24.67	1.7	90
12200.00	PK	Horizontal	51.79	74.00	-22.21	1.9	180
14640.00	PK	Horizontal	47.85	74.00	-26.15	1.4	180
17080.00	PK	Horizontal	44.45	74.00	-29.55	2.1	150
19520.00	PK	Horizontal	47.61	74.00	-26.39	2.4	180
21960.00	PK	Horizontal	48.27	74.00	-25.73	1.8	30
24400.00	PK	Horizontal	45.34	74.00	-28.66	2.3	165

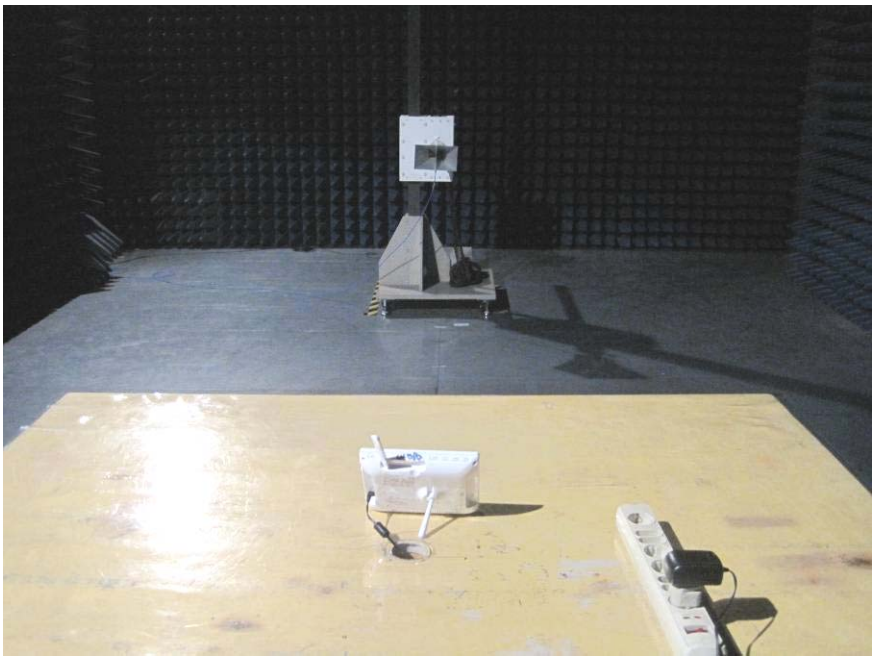
High frequency							
2480.00	AV	Vertical	97.84		(Fund.)	1.3	160
4960.00	AV	Vertical	44.45	54.00	-9.55	1.3	10
7440.00	AV	Vertical	41.64	54.00	-12.36	1.6	130
9920.00	AV	Vertical	43.27	54.00	-10.73	1.9	70
12400.00	AV	Vertical	38.87	54.00	-15.13	1.7	100
14880.00	AV	Vertical	45.24	54.00	-8.76	1.5	130
17360.00	AV	Vertical	39.57	54.00	-14.43	1.8	110
19840.00	AV	Vertical	40.68	54.00	-13.32	1.6	190
22320.00	AV	Vertical	38.72	54.00	-15.28	1.7	130
24800.00	AV	Vertical	31.19	54.00	-22.81	1.3	145
2480.00	AV	Horizontal	91.33		(Fund.)	2.4	130
4960.00	AV	Horizontal	42.62	54.00	-11.38	2.1	160
7440.00	AV	Horizontal	39.56	54.00	-14.44	2.2	130
9920.00	AV	Horizontal	41.04	54.00	-12.96	2.6	190
12400.00	AV	Horizontal	38.65	54.00	-15.35	1.9	145
14880.00	AV	Horizontal	32.34	54.00	-21.66	2.3	130
17360.00	AV	Horizontal	36.21	54.00	-17.79	2.0	190
19840.00	AV	Horizontal	31.45	54.00	-22.55	1.7	70
22320.00	AV	Horizontal	34.38	54.00	-19.62	2.7	100
24800.00	AV	Horizontal	29.72	54.00	-24.28	2.1	100
2480.00	PK	Vertical	112.31		(Fund.)	1.6	190
4960.00	PK	Vertical	57.67	74.00	-16.33	1.9	40
7440.00	PK	Vertical	54.58	74.00	-19.42	1.7	120
9920.00	PK	Vertical	56.27	74.00	-17.73	1.5	110
12400.00	PK	Vertical	51.16	74.00	-22.84	1.3	100
14880.00	PK	Vertical	58.52	74.00	-15.48	1.3	70
17360.00	PK	Vertical	52.37	74.00	-21.63	1.5	100
19840.00	PK	Vertical	53.54	74.00	-20.46	1.3	130
22320.00	PK	Vertical	51.91	74.00	-22.09	1.8	130
24800.00	PK	Vertical	45.73	74.00	-28.27	1.5	145
2480.00	PK	Horizontal	95.68		(Fund.)	2.2	190
4960.00	PK	Horizontal	54.57	74.00	-19.43	2.4	70
7440.00	PK	Horizontal	52.51	74.00	-21.49	2.7	130
9920.00	PK	Horizontal	53.08	74.00	-20.92	1.9	190
12400.00	PK	Horizontal	51.22	74.00	-22.78	2.1	100
14880.00	PK	Horizontal	45.64	74.00	-28.36	1.6	100
17360.00	PK	Horizontal	49.73	74.00	-24.27	2.3	160
19840.00	PK	Horizontal	44.08	74.00	-29.92	2.6	160
22320.00	PK	Horizontal	47.91	74.00	-26.09	2.0	130
24800.00	PK	Horizontal	42.73	74.00	-31.27	2.5	190

Photograph – Radiation Spurious Emission Test Setup

Below 1GHz



Above 1GHz

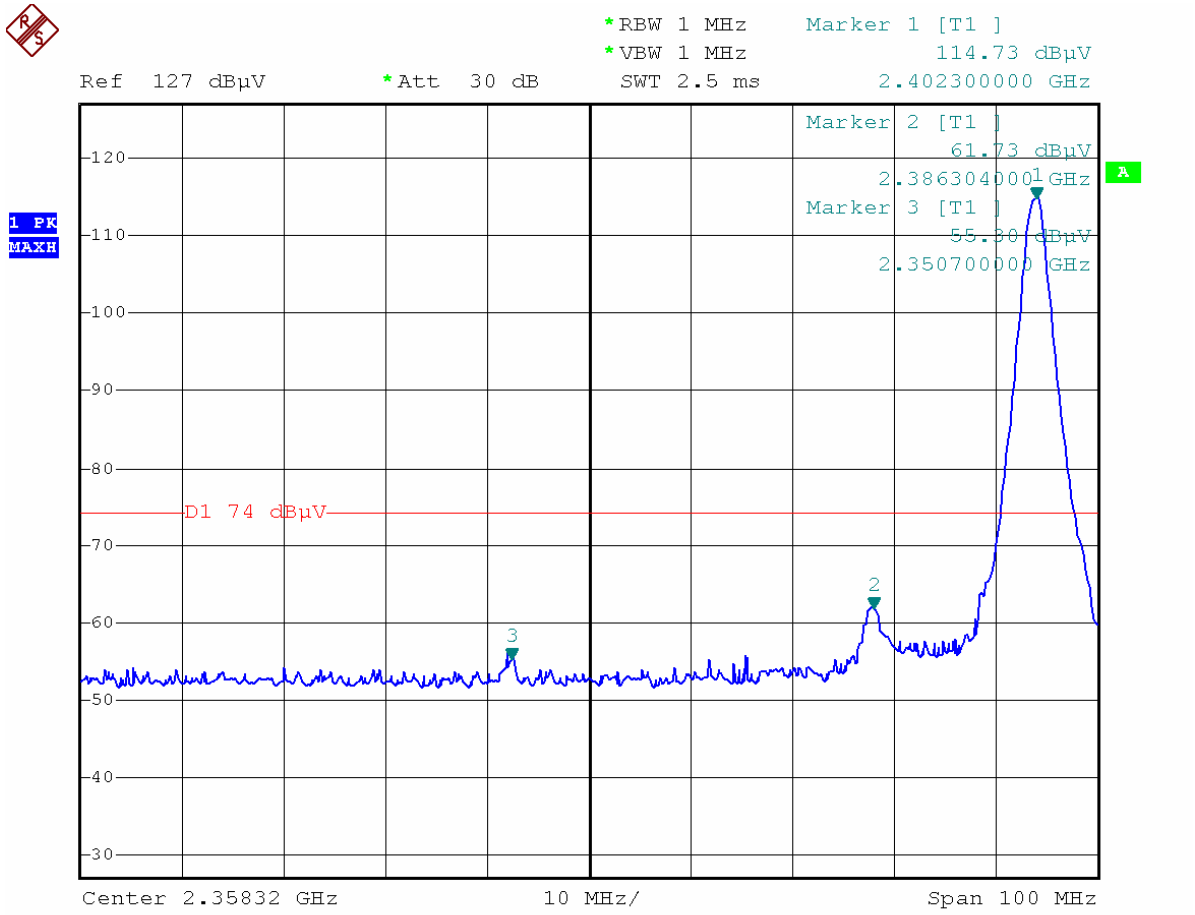


8 Radiated Emissions which fall in the restricted bands

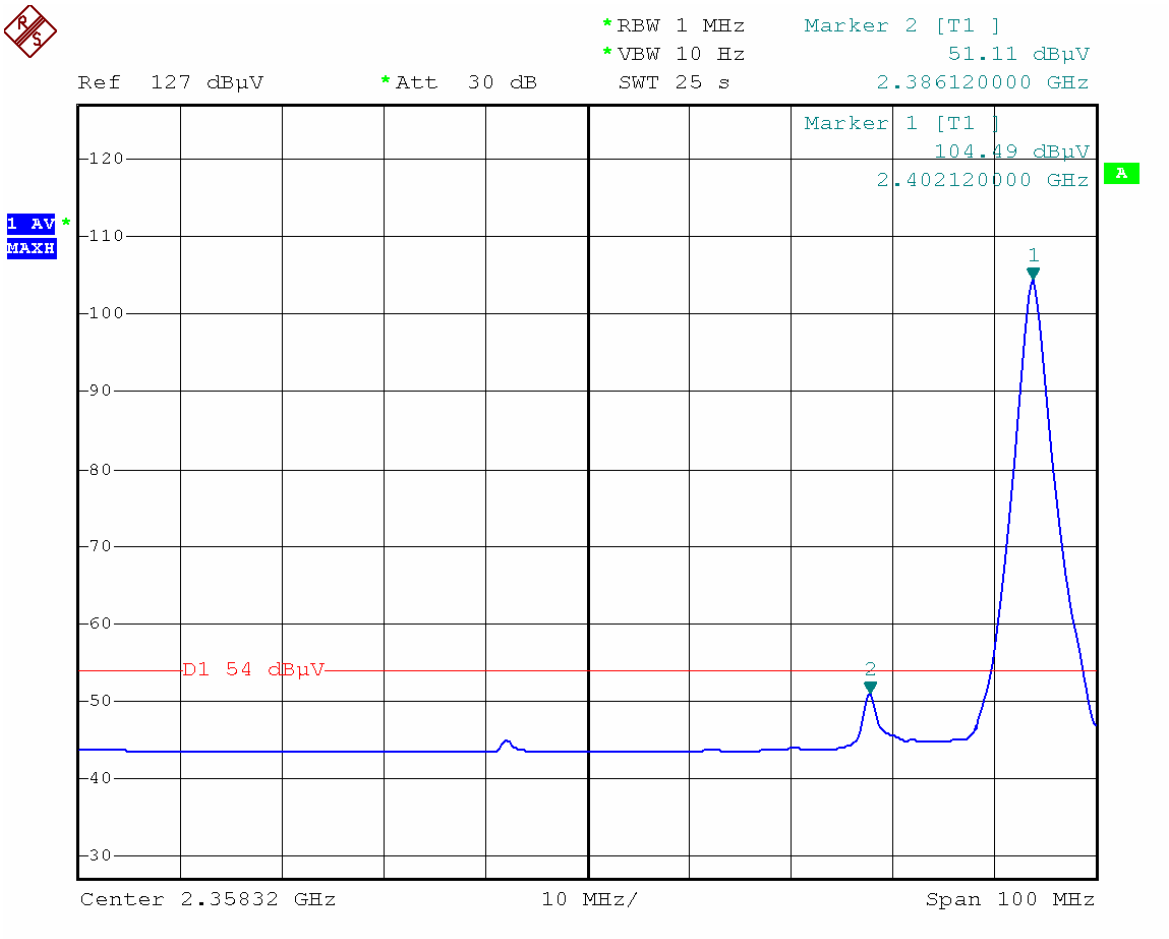
Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	Base on ANSI C63.4:2009
Measurement Distance:	3m
Limit:	40.0 dBuV/m between 30MHz & 88MHz; 43.5 dBuV/m between 88MHz & 216MHz; 46.0 dBuV/m between 216MHz & 960MHz; 54.0 dBuV/m above 960MHz. 74.0 dBuV/m for peak above 1GHz 54.0 dBuV/m for AVG above 1GHz
Detector:	For Peak value: RBW = 1 MHz for f ≥ 1 GHz VBW ≥ RBW; Sweep = auto Detector function = peak Trace = max hold For AVG value: RBW = 1 MHz for f ≥ 1 GHz VBW = 10Hz; Sweep = auto Detector function = AVG Trace = max hold

Test Result:

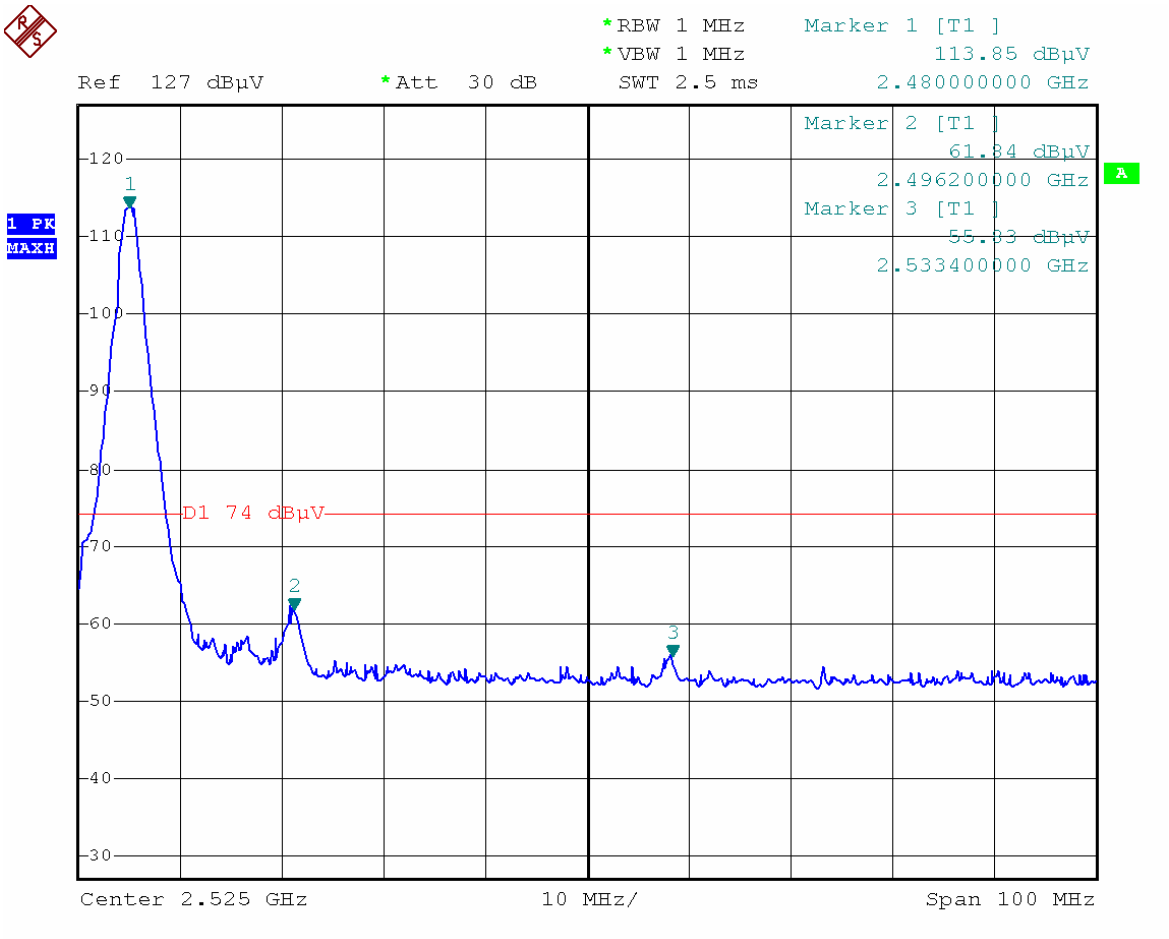
Low Channel – Peak



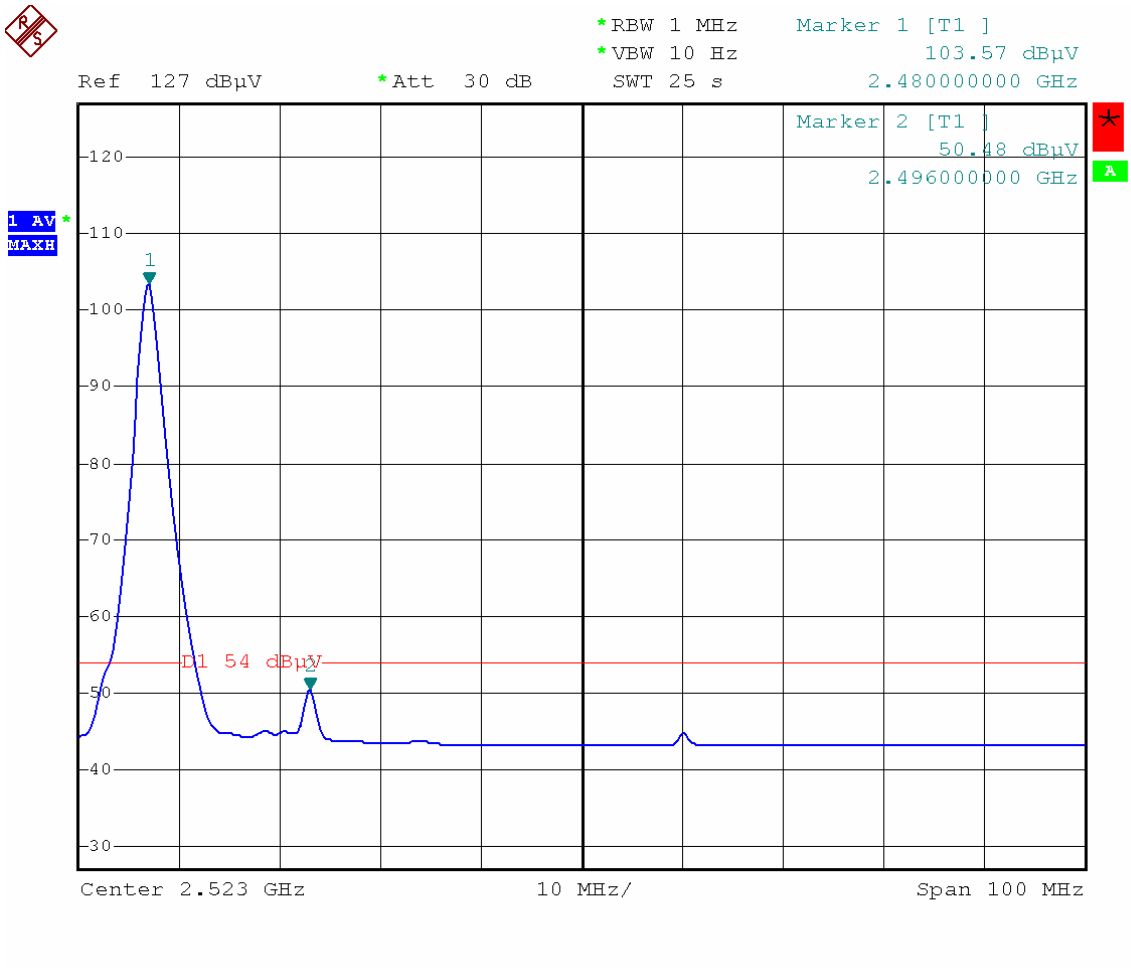
Low Channel – AV



High Channel – Peak



High Channel – AV



9 20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247
Test Method: Based on FCC Part 15.247
Test Mode: Test in fixing operating frequency at low, Middle, high channel.

Test Procedure:

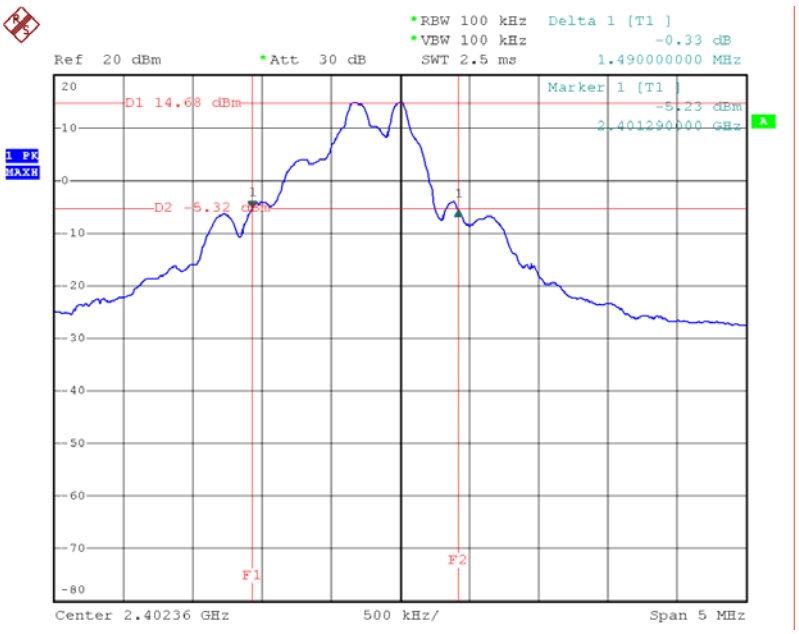
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 100kHz

Test Result:

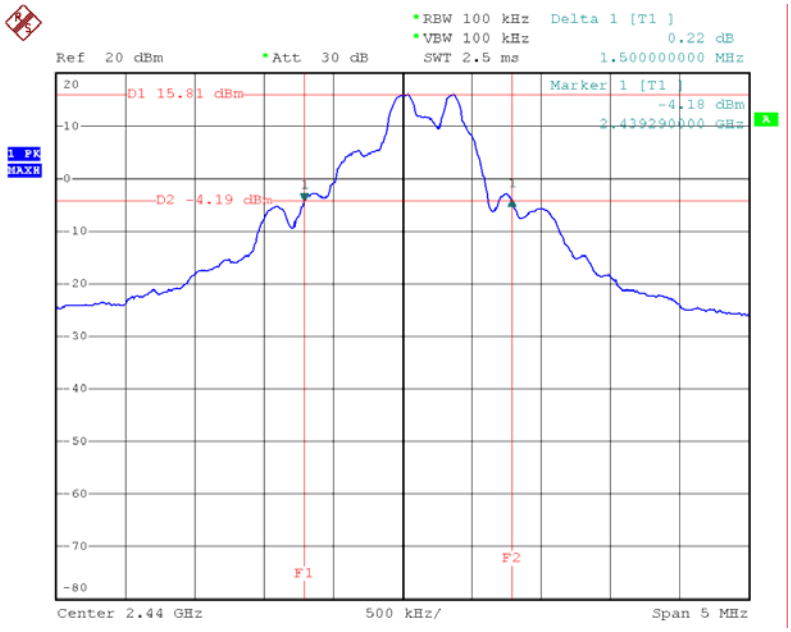
Test Channel	Bandwidth
Low	1.490MHz
Middle	1.500MHz
High	1.470MHz

Test result plot as follows:

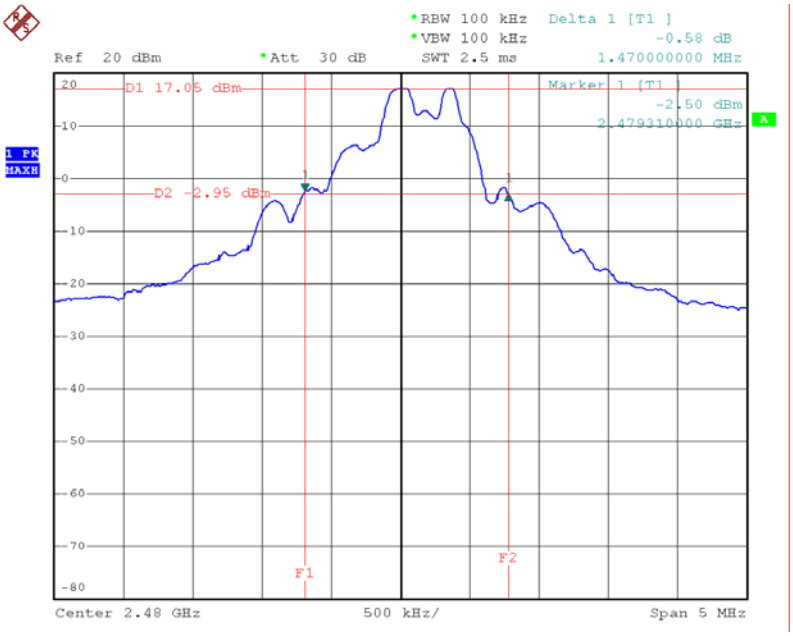
Low Channel



Middle Channel



High Channel



10 Maximum Peak Output Power

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	Based on ANSI C63.4:2009
Test Limit:	Regulation 15.247 (b)(1)For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. Refer to the result "Number of Hopping Frequency" of this document. The 0.125watts (20.97 dBm) limit applies.
Test mode:	Test in fixing frequency transmitting mode.

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 = 1 MHz. VBW = 1 MHz. Sweep = auto; Detector Function = Peak.

3． Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

Test Result:

Test Channel	Output Power (dBm)	Limit (dBm)
Low	14.86	20.97
Middle	14.73	20.97
High	14.92	20.97

11 Hopping Channel Separation

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: Based on FCC Part 15.247

Test Limit: Regulation 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Test Mode: Test in hopping transmitting operating mode.

Test Procedure:

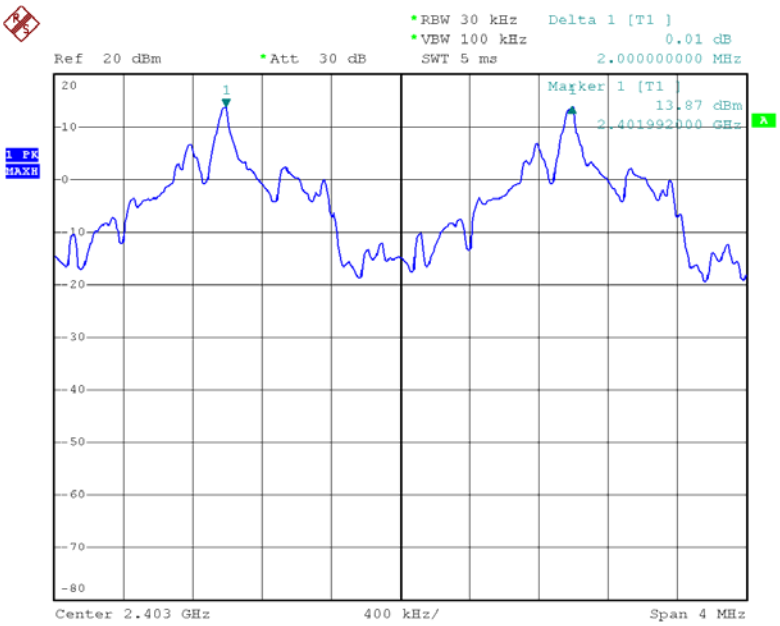
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 4MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

Test Result:

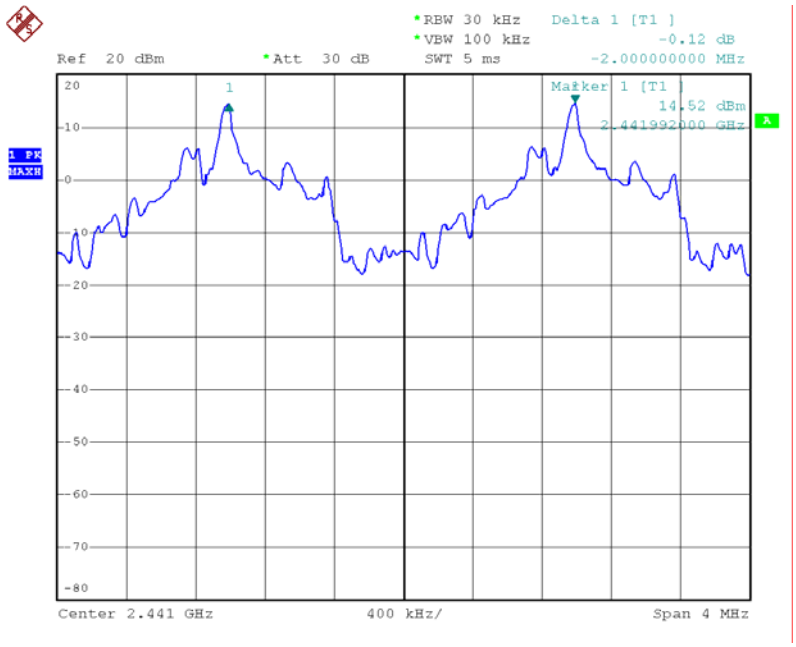
Test Channel	Separation (MHz)	Result
Low	2.000	PASS
Middle	2.000	PASS
High	2.000	PASS

Test result plot as follows:

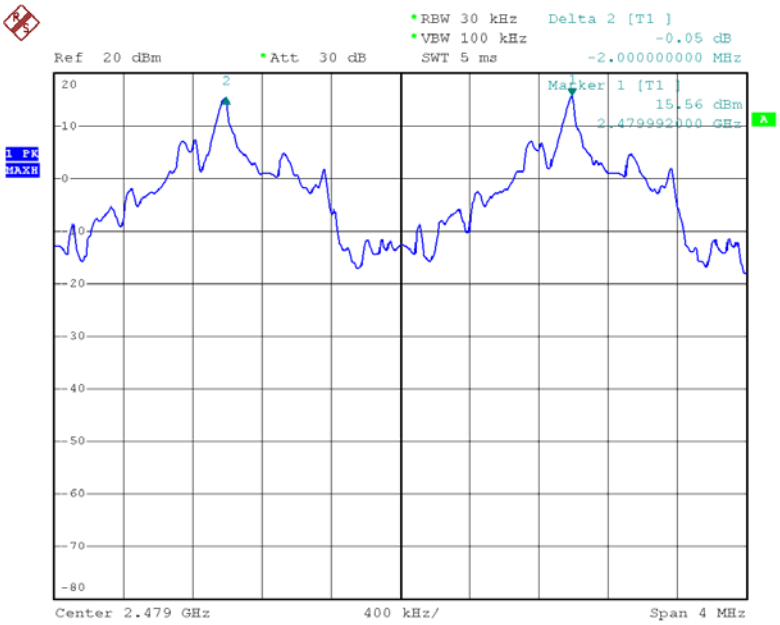
Low Channel:



Middle Channel



High Channel



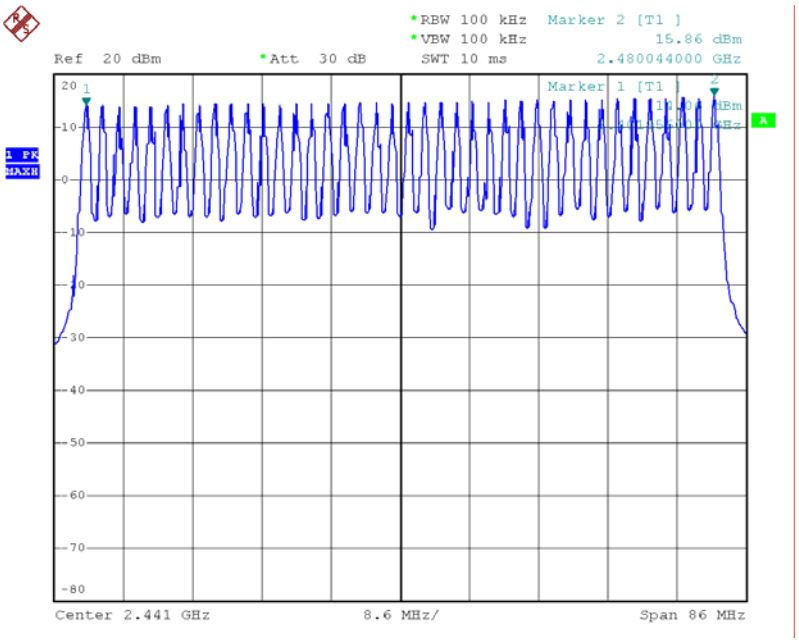
12 Number of Hopping Frequency

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	Based on FCC Part 15.247
Test Limit:	Regulation 15.247 (a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Mode:	Test in hopping transmitting operating mode.

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 = 100 kHz. VBW = 100 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2398MHz, Stop Frequency = 2483MHz. Submit the test result graph.

Test Result: Total Channels are 40 Channels.



13 Dwell Time

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	Based on FCC Part 15.247
Test Limit:	Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.
Test Mode:	Test in hopping transmitting operating mode.

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 spectrum analyzer span = 0. centered on a hopping channel;

3.Set RBW = 1MHz and VBW = 1MHz.Sweep = as necessary to capture the entire dwell time per hopping channel.

4.Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

Test Result:

Dwell time = Pulse wide x (Hopping rate / Number of channels) x Period

The test period: T= 0.4(s) * 40 = 16 (s)

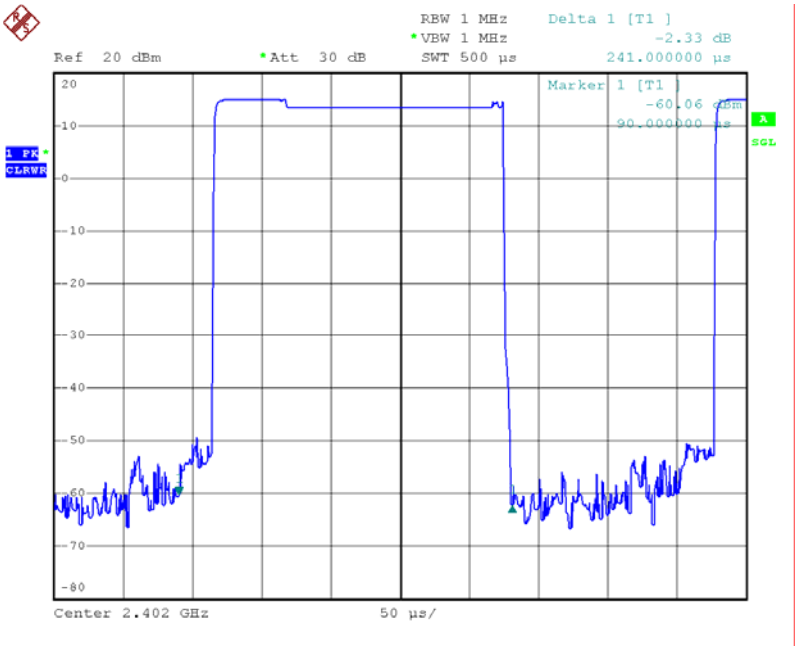
So, the Dwell Time can be calculated as follows:

Dwell time = 68 * 16 * (MkrDelta) / 1000

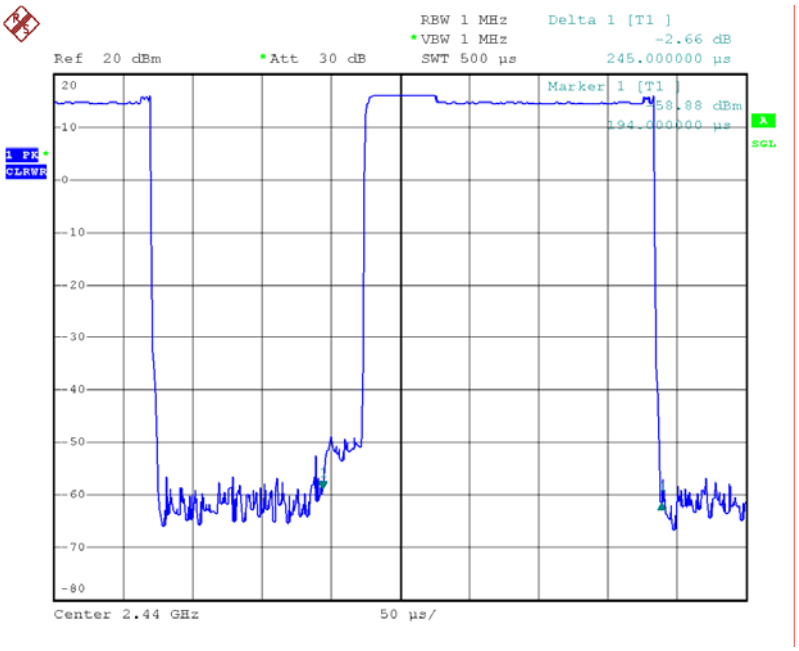
Note : Mkr Delta is once pulse time.

Frequency	Mkr Delta(s)	Dwell Time(s)	Limits(s)	Result
2402 MHz	0.000241	0.2622	0.400	Pass
2440 MHz	0.000245	0.2665	0.400	Pass
2480 MHz	0.000253	0.2753	0.400	Pass

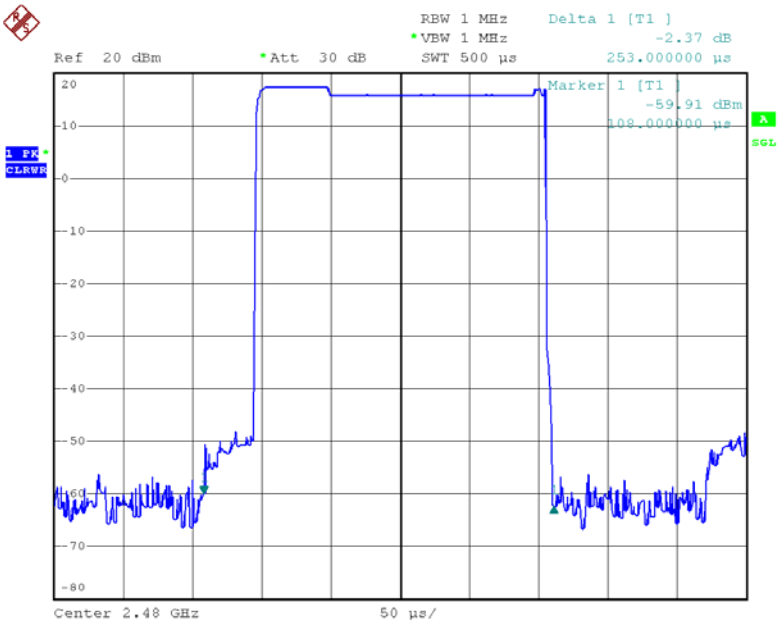
Low Channel: 2402MHz



Middle Channel: 2440MHz



High Channel: 2480MHz



14 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product has a permanent antenna, fulfill the requirement of this section.

15 RF Exposure

Test Requirement: FCC Part 1.1307
Test Method: Based on FCC Part 15.247
Test Mode: The EUT work in test mode(Tx).

Requiments:

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

MPE Calculation Method

$$E\ (V/m) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd\ (W/m^2) = \frac{E^2}{377}$$

E = Electric field (V/m)
P = Peak RF output power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)
The formula can be changed to

$$\boldsymbol{Pd} = \frac{30 \times P \times G}{377 \times d^2}$$

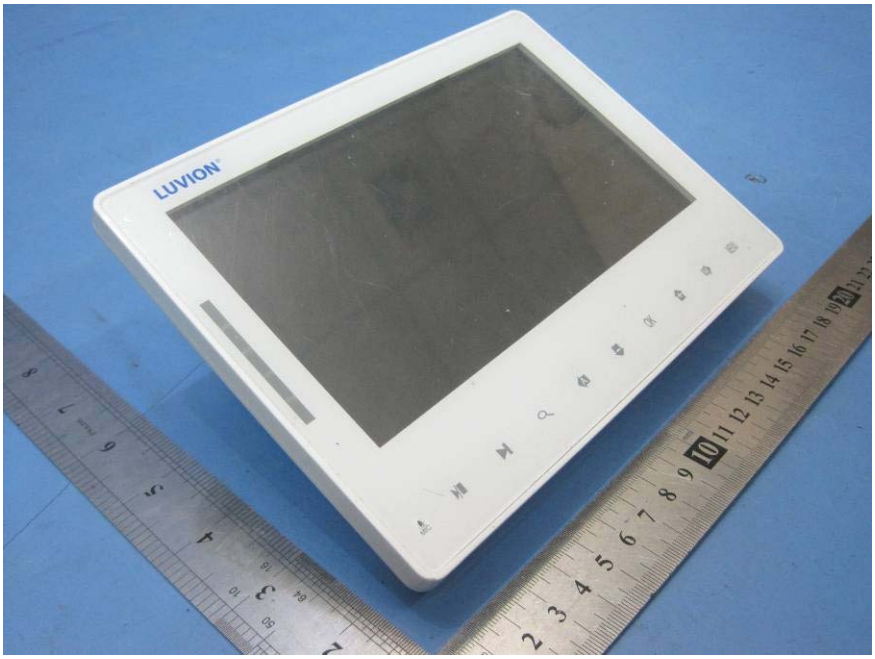
From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm2)	Limit of Power Density (S) (mW/cm2)	Test Result
-2.39	0.58	14.86	30.619634	0.003533	1	Complies
-2.39	0.58	14.73	29.716660	0.003429	1	Complies
-2.39	0.58	14.92	31.045595	0.003582	1	Complies

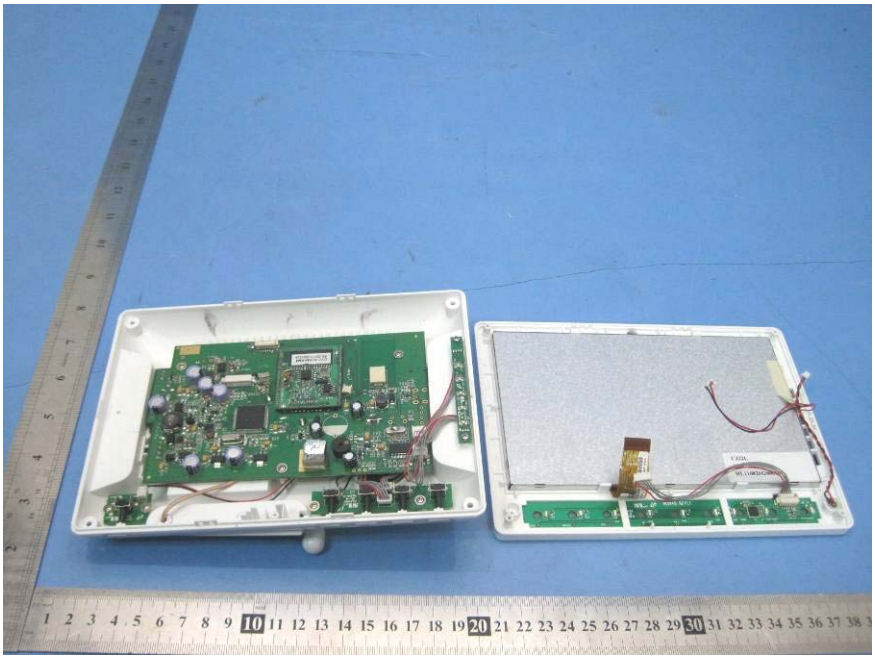
16 Photographs - Constructional Details

16.1 Product View

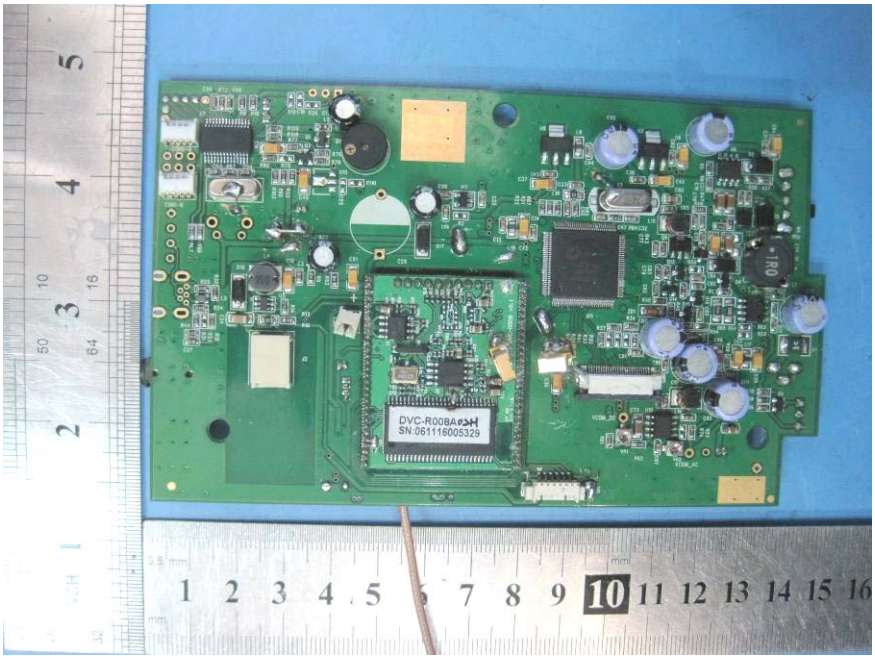
16.2 EUT – Appearence View

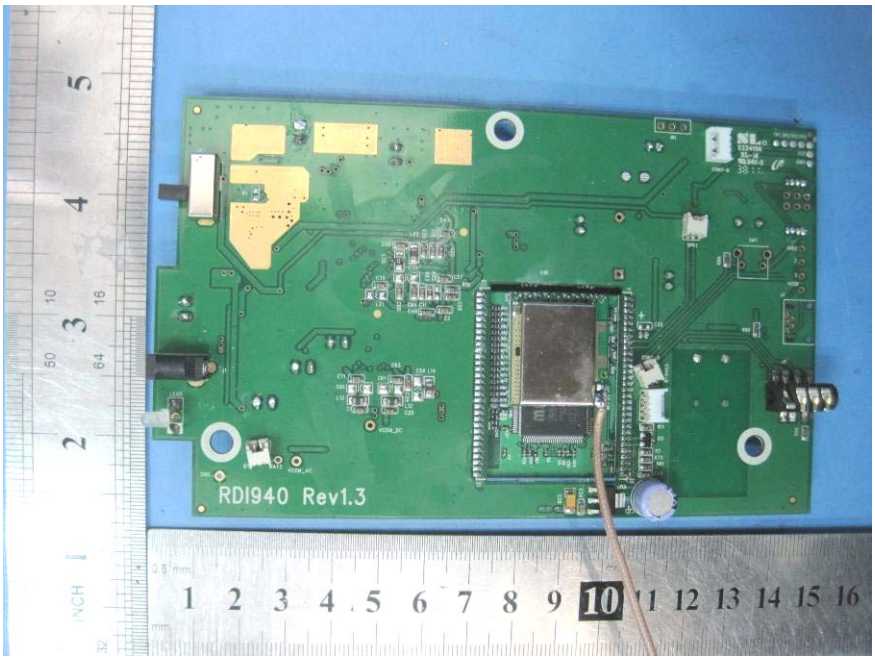


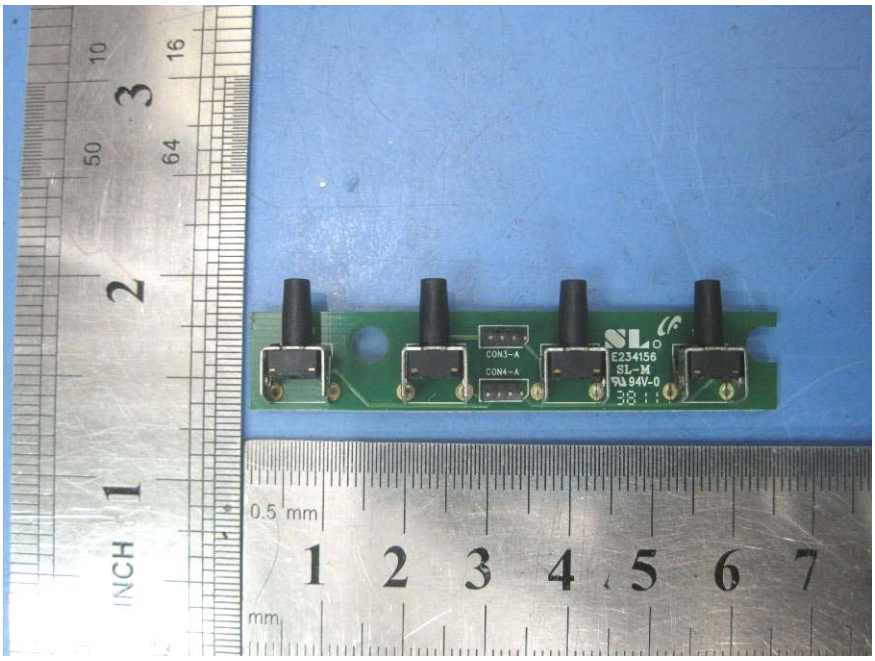
16.3 EUT – Open View

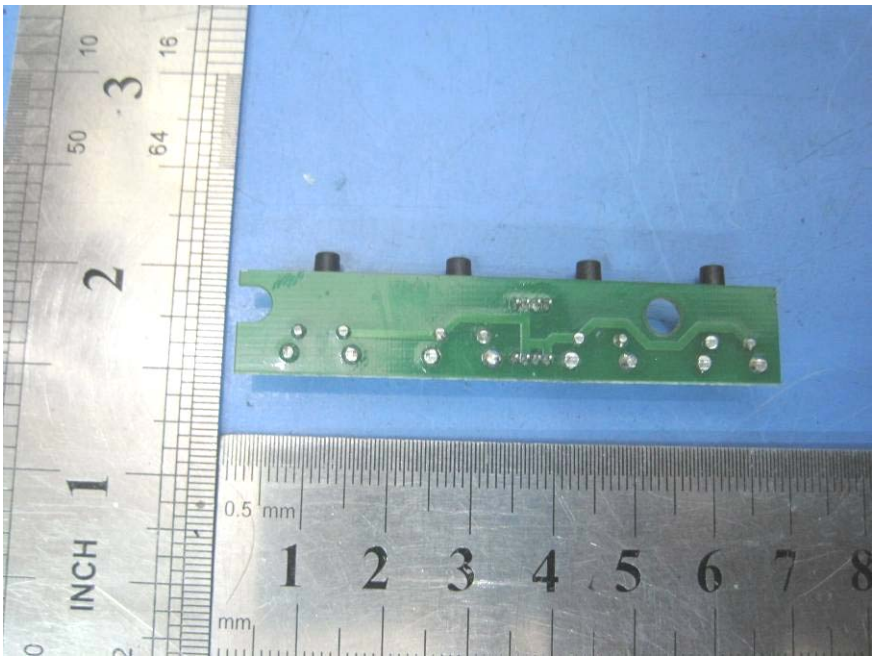


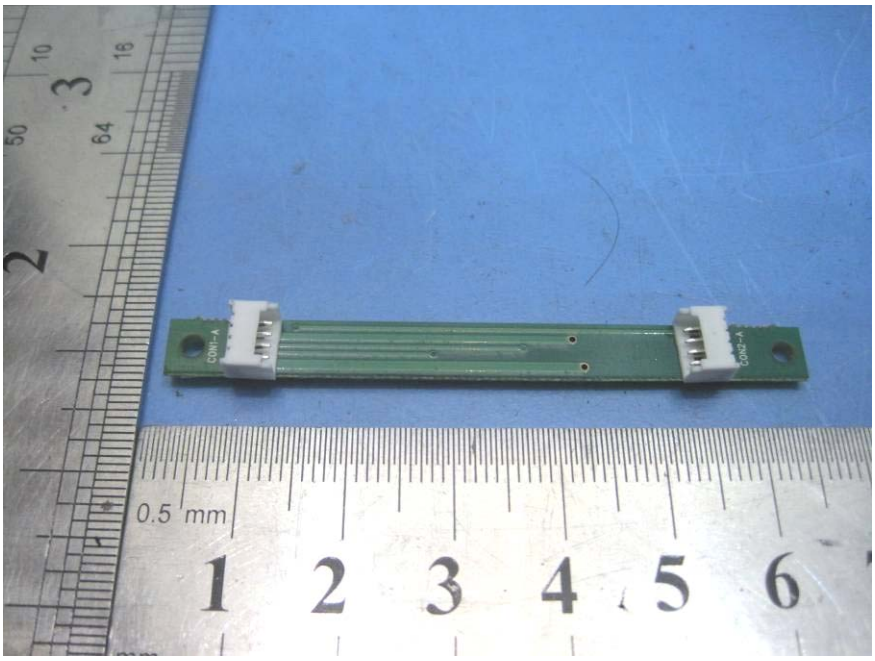
16.4 EUT - PCB View

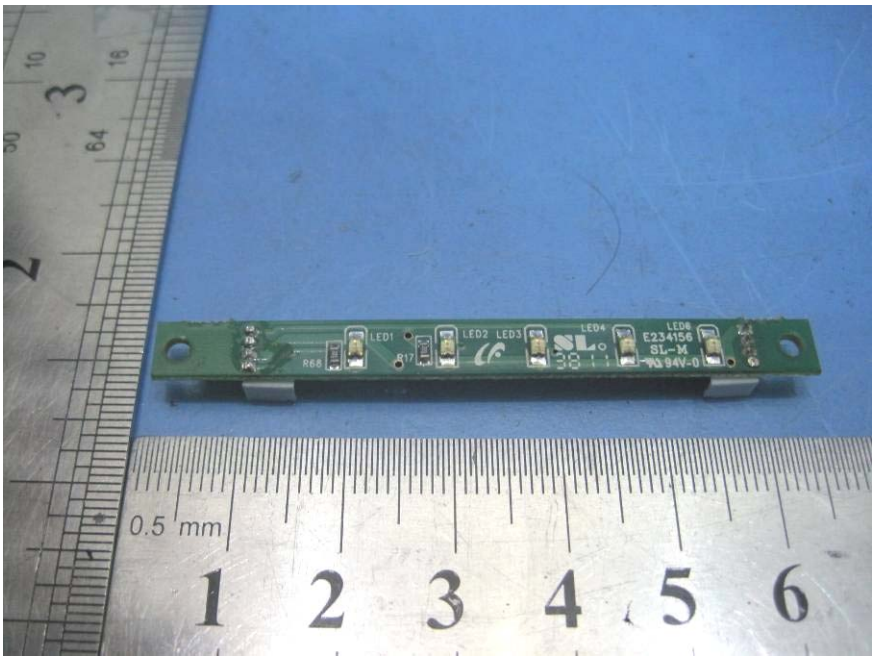


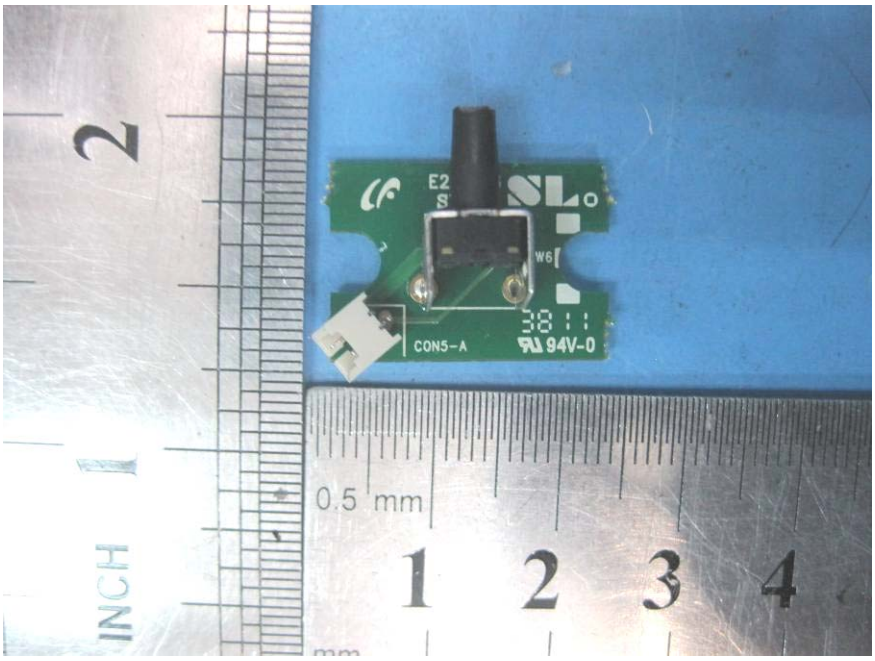


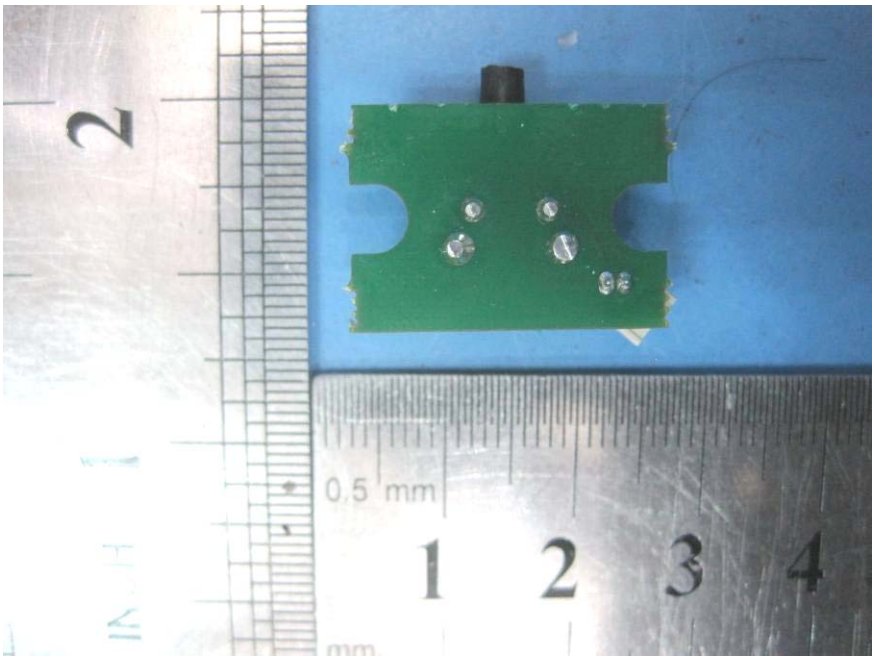


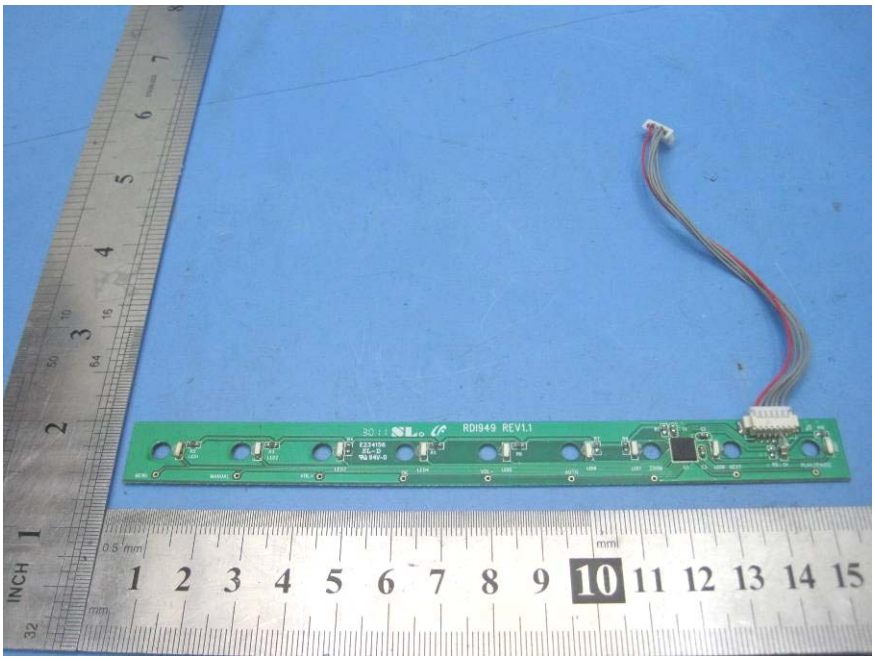


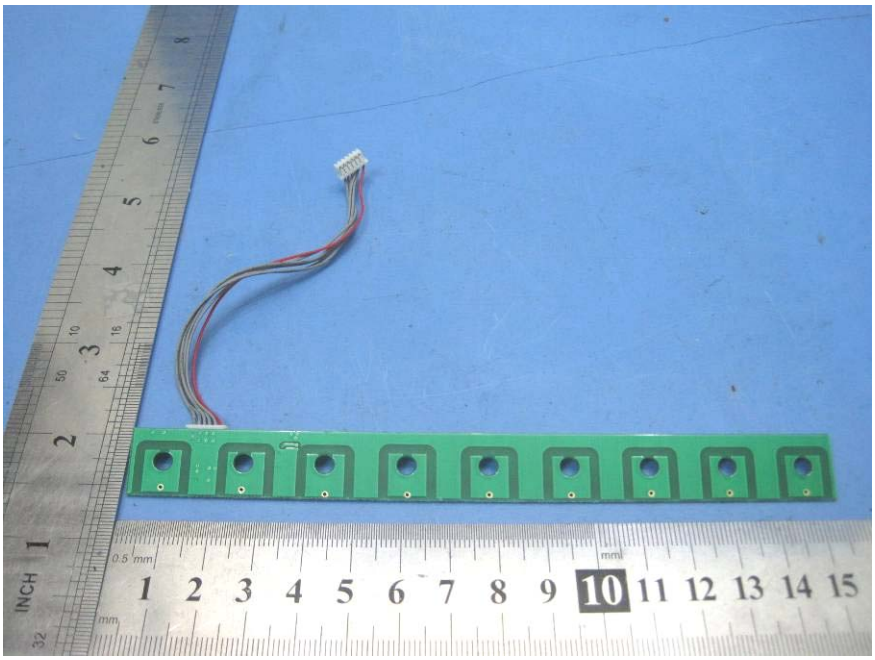




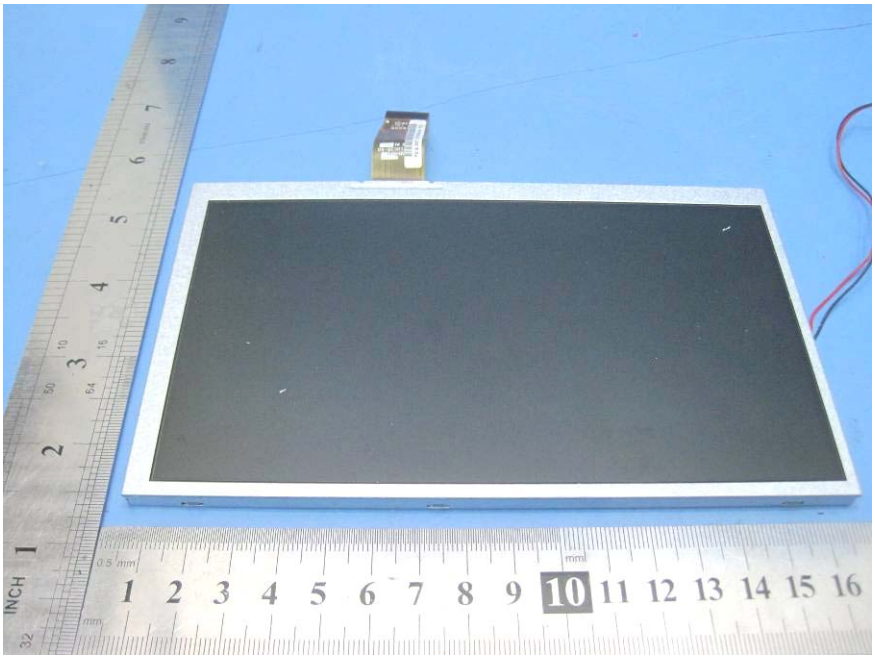


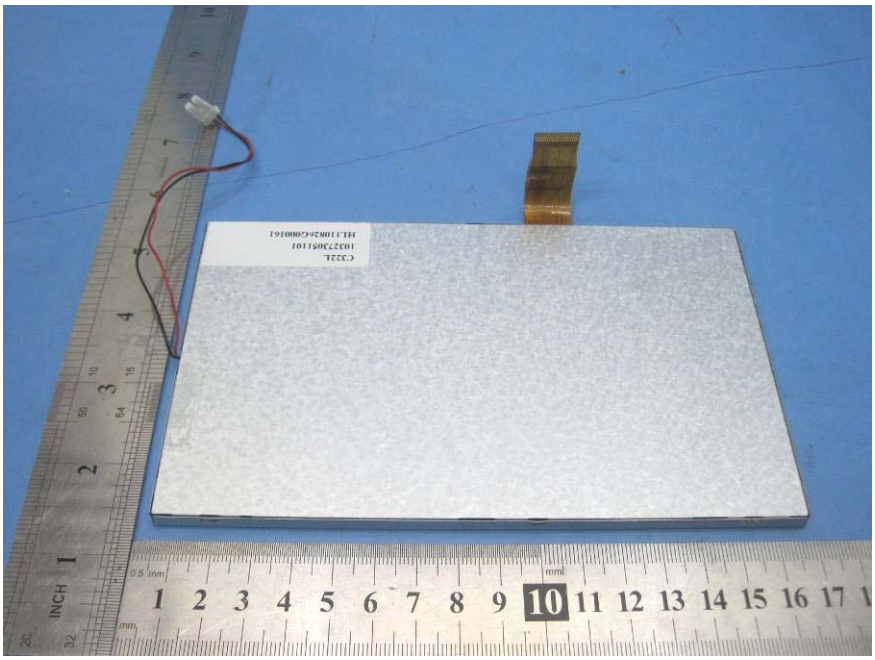




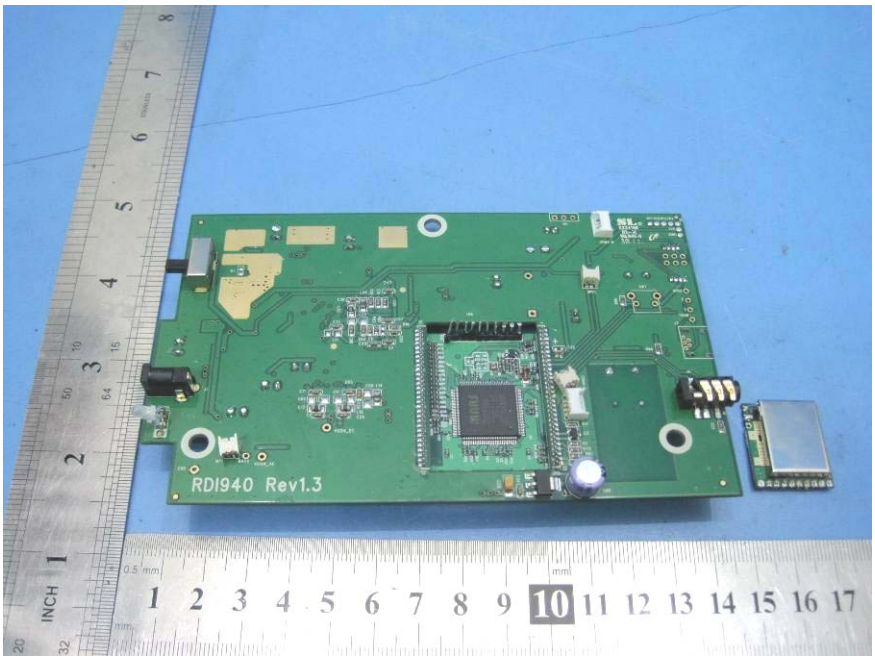


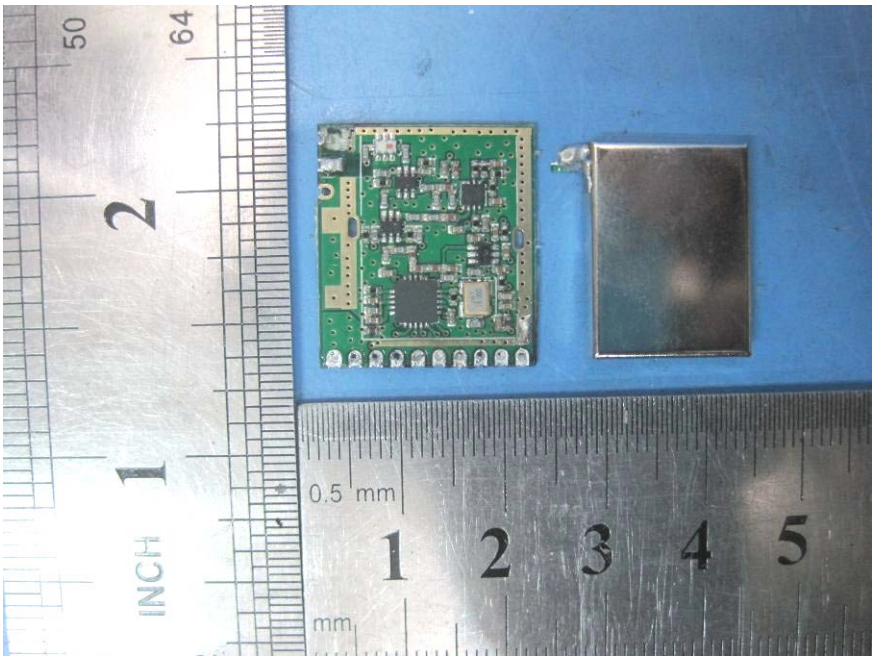
16.5Screen – View

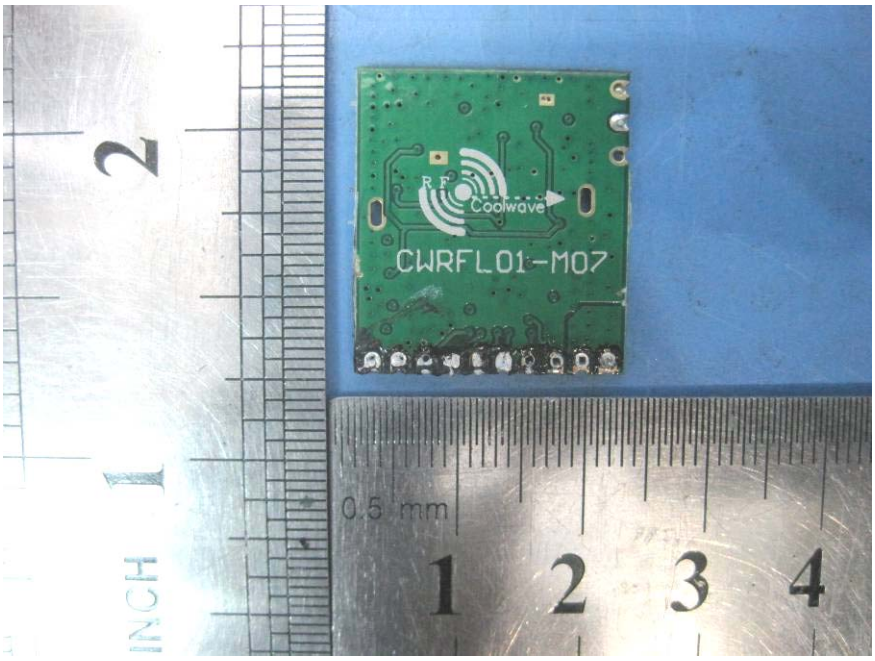




16.6 RF Module – View

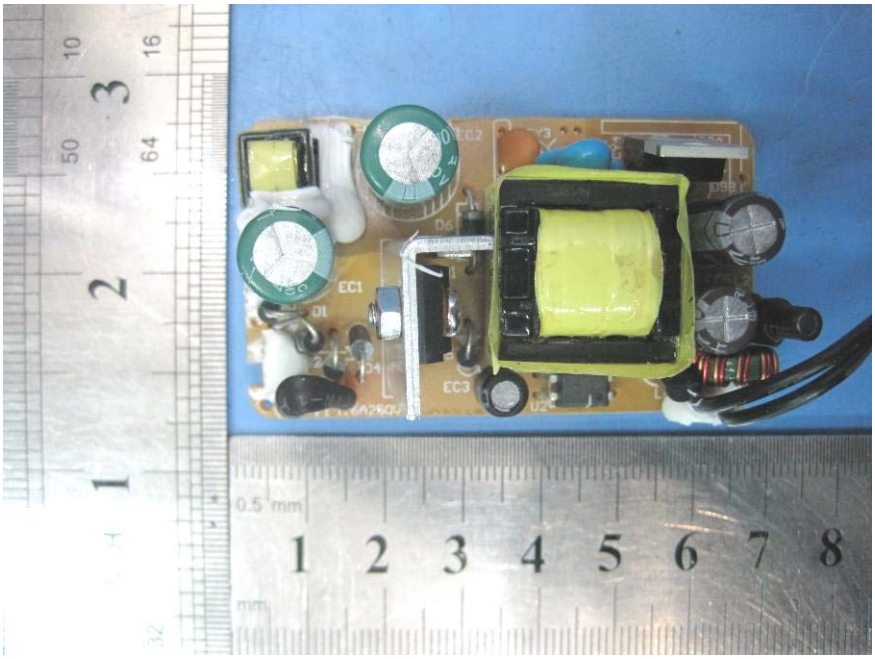


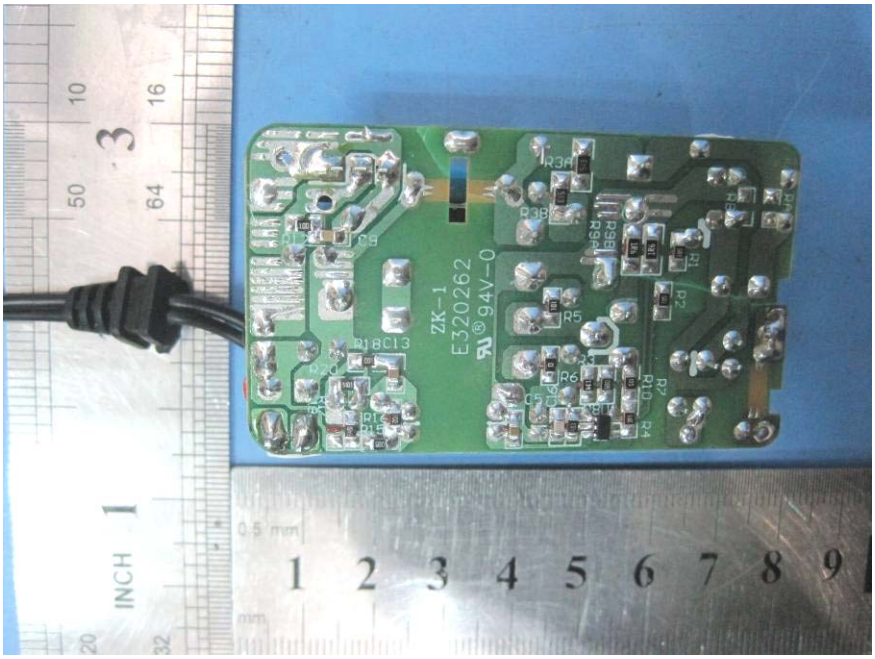




16.7 Adapter – Open View

16.8 Adapter – PCB View





17 FCC Label

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.

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.

Proposed Label Location on EUT

EUT Bottom View/ proposed FCC Label Location