

FCC TEST REPORT
for
Shanghai Nine Eagles Electronic Technology Co., Ltd.

WIFI CAMERA
Model No.: NE-OT017, NE-OT019, NE-OT020, NE-OT021,
NE-OT022, NE-OT023, NE-OT024, NE-OT025, NE-OT026,
NE-OT027, NE-OT028, NE-OT029, NE-OT030, NE-OT15M

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Report Number : R011504791I
Date of Test : May 04~ Jun. 11, 2015
Date of Report : Jun. 12, 2015

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TEST REPORT

Applicant : Shanghai Nine Eagles Electronic Technology Co., Ltd.
Manufacturer : Shanghai Nine Eagles Electronic Technology Co., Ltd.
EUT : WIFI CAMERA
Model No. : NE-OT017, NE-OT019, NE-OT020, NE-OT021, NE-OT022,
NE-OT023, NE-OT024, NE-OT025, NE-OT026, NE-OT027,
NE-OT028, NE-OT029, NE-OT030, NE-OT15M
Serial No. : N.A.
Trade Mark : N.A.
Rating : DC 3.7V, 350mAh

Measurement Procedure Used:
FCC Part15 Subpart E 2014, Paragraph 15.407

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart E requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : May 04~ Jun. 11, 2015

Prepared by :

Kebo Zhang

(Tested Engineer / Kebo Zhang)

Reviewer :

Amy Ding

(Project Manager / Amy Ding)

Approved & Authorized Signer :

Tom Chen

(Manager / Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: WIFI CAMERA
Model Number	: NE-OT017, NE-OT019, NE-OT020, NE-OT021, NE-OT022, NE-OT023, NE-OT024, NE-OT025, NE-OT026, NE-OT027, NE-OT028, NE-OT029, NE-OT030, NE-OT15M (Note: All samples are the same except the model number and colour, so we prepare "NE-OT017" for test only.)
Test Power Supply	: DC 3.7V Via Battery
RF Transmission Frequency	: 2412MHz~2462MHz (802.11b/802.11g/802.11n(HT20)) 2422MHz~2452MHz (802.11n(HT40)) 5180MHz~5240MHz (802.11a)
Channels	: 11 For (802.11b/802.11g/802.11n(HT20)) 7 For (802.11n(HT40)) 4 For (802.11a)
Modulation	: 802.11b CCK 802.11g OFDM 802.11n MCS 802.11a OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Gain:	: 2dBi
Applicant Address	: Shanghai Nine Eagles Electronic Technology Co., Ltd. Room 1104, Huaxiang Building, No. 80 Moling Road, Shanghai, 200070, China
Manufacturer Address	: Shanghai Nine Eagles Electronic Technology Co., Ltd. Room 1104, Huaxiang Building, No. 80 Moling Road, Shanghai, 200070, China
Factory Address	: Shanghai Nine Eagles Electronic Technology Co., Ltd. Room 1104, Huaxiang Building, No. 80 Moling Road, Shanghai, 200070, China
Date of receipt	: May 04, 2015
Date of Test	: May 04~ Jun. 11, 2015

1.2. Auxiliary Equipment Used during Test

N/A

1.3. Description of Test Facility

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

CNAS - LAB Code: L3503

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021

Shenzhen Anbotek Compliance Laboratory Limited, 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 752021, July 10, 2013.

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A, February 22, 2013.

Test Location

All Emissions tests were performed at
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.1 dB (Horizontal)
Ur = 4.3 dB (Vertical)

Conduction Uncertainty : Uc = 3.4dB

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC Part 15, Paragraph 15.247.

2.1. Summary of Test Results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result
FCC Part 15, Paragraph 15.207 & 15.407	Conducted Emission	N/A
FCC Part 15, Paragraph 15.407(b)(1)(4)(5)(7)	Undesireable Emission Restricted Band	PASS
FCC Part 15, Paragraph 15.407(a)(1)	26dB Bandwidth	PASS
FCC Part 15, Paragraph 15.407(a)(1)(2)(3)	Maximum Conducted Output Power	PASS
FCC Part 15, Paragraph 15.407(a)(1)(2)(3)	Peak Power Spectrual Density	PASS
FCC Part 15, Paragraph 15.407(a)(6)	Peak Power Excursion	PASS
FCC Part 15, Paragraph 15.407(g)	Frequency Stability	PASS
FCC Part 15, Paragraph 15.203	Antenna Requirement	PASS

2.2. Description of Test Modes

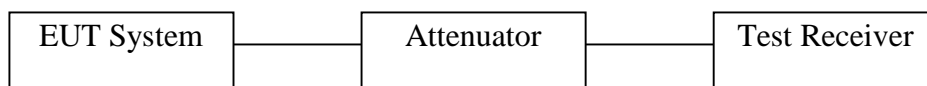
The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

IEEE802.11a: Channel 1(5180MHz), Channel 2(5200MHz) and Channel 4(5240MHz) with 6 Mbps lowest data rate (worst case) are chosen for the final testing.

3. 26dB Bandwidth

3.1. Test Setup



3.2. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
RBW = approximately 1% of the emission bandwidth;
Set the VBW > RBW;
Detector= Peak
Trace mode= Max hold.
Sweep- auto couple.
4. Measure the maximum width of the emission that is 26dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
5. Repeat until all the rest channels are investigated.

3.3. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

3.4. Test Results

Pass.

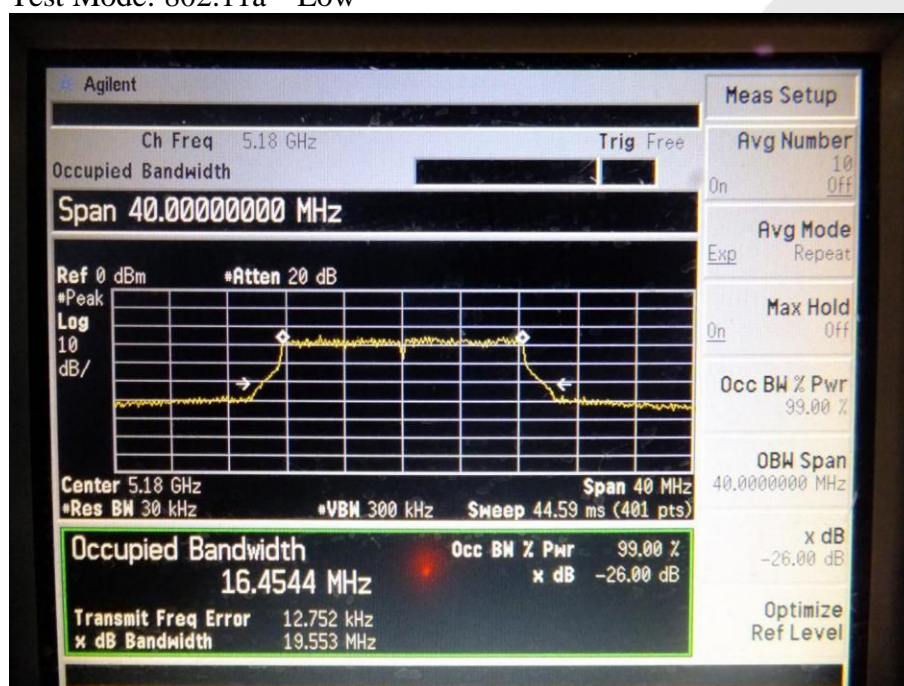
Please refer to the following data.

26dB Bandwidth:

Test mode: IEEE 802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5180	19.553
Mid	5200	19.952
High	5240	19.489

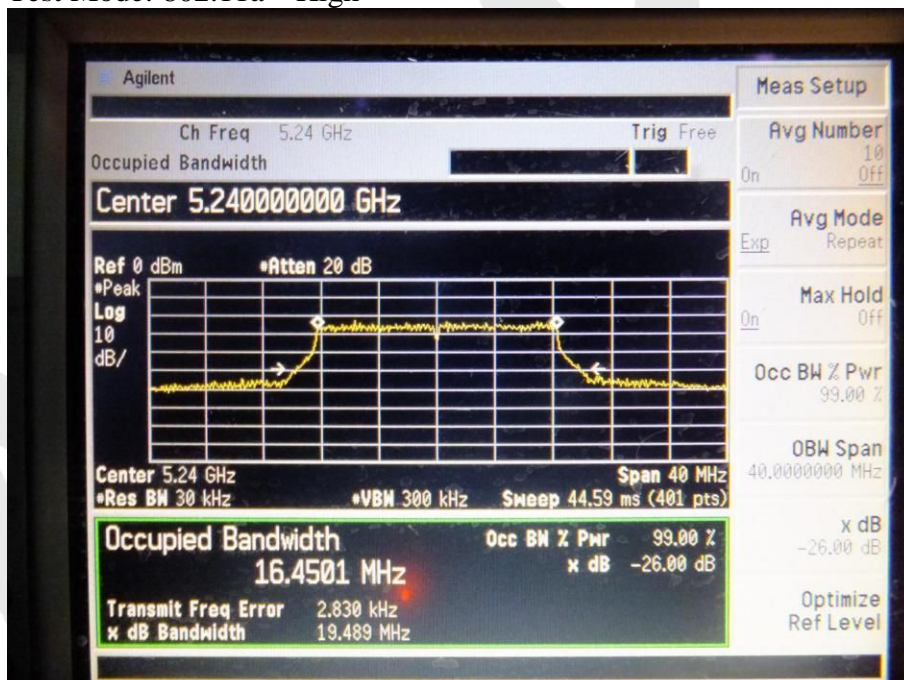
Test Mode: 802.11a---Low



Test Mode: 802.11a---Middle



Test Mode: 802.11a---High



4. Maximum Conducted Output Power Test

4.1. Test Limit

For the band 5.15-5.25GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50mW or $4\text{dBm} + 10\log B$, where B is the 26dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or $11\text{dBm} + 10\log B$, where B is the 26dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

For the band 5.725-5.825GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1W or $17\text{dBm} + 10\log B$, where B is the 26dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2. Test Setup



4.3. Test Procedure

1. The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):
2. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
 - a. The transmitter output (antenna port) was connected to the power meter.
 - b. Turn on the EUT and power meter and then record the power value.
 - c. Repeat above procedures on all channels needed to be tested.

4.4. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	Power Meter	Agilent	E4416A	149951	Apr. 17, 2015	1 Year
8.	Power Sensor	Agilent	8483A	MY50190001	Apr. 17, 2015	1 Year
9.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

4.5. Test Results

Pass.

Please refer to the following data.

Test mode: IEEE 802.11a

Channel	Frequency (MHz)	Maximum transmit power (dBm)	Limit (dBm)	Result
Low	5180	6.15	16.91	Pass
Mid	5200	4.93	17.00	Pass
High	5240	4.16	16.90	Pass

Note: The limit is $4\text{dBm} + 10\log B$ (Where B is the 26dB emission bandwidth in MHz).

5. Peak Power Spectrual Density Test

5.1. Test Limit

For the band 5.15-5.25GHz, the peak power spectrul density shall not exceed 4dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

For the 5.25-5.35GHz and 5.47-5.725GHz bands, the peak power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

For the band 5.725-5.825GHz, the peak power spectrual density shall not exceed 17dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.2. Test Setup



5.3. Test Procedure

1. The EUT is directly connected to the spectrum analyzer;
2. Set the RBW=1MHz;
3. Set the VBW=3MHz;
3. Set the span to encompass the entire emissions bandwidth (EBW) of the signal;
5. Detector=RMS;
6. Sweep time= auto couple;
7. Trace mode=max. hold;
8. Allow trace to fully stabilize;
9. Use the peak marker function to determine the maximum amplitude level.
10. Repeat above procedures on all channels needed to be tested.

5.4. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	Power Meter	Agilent	E4416A	149951	Apr. 17, 2015	1 Year
8.	Power Sensor	Agilent	8483A	MY50190001	Apr. 17, 2015	1 Year
9.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

5.5. Test Results

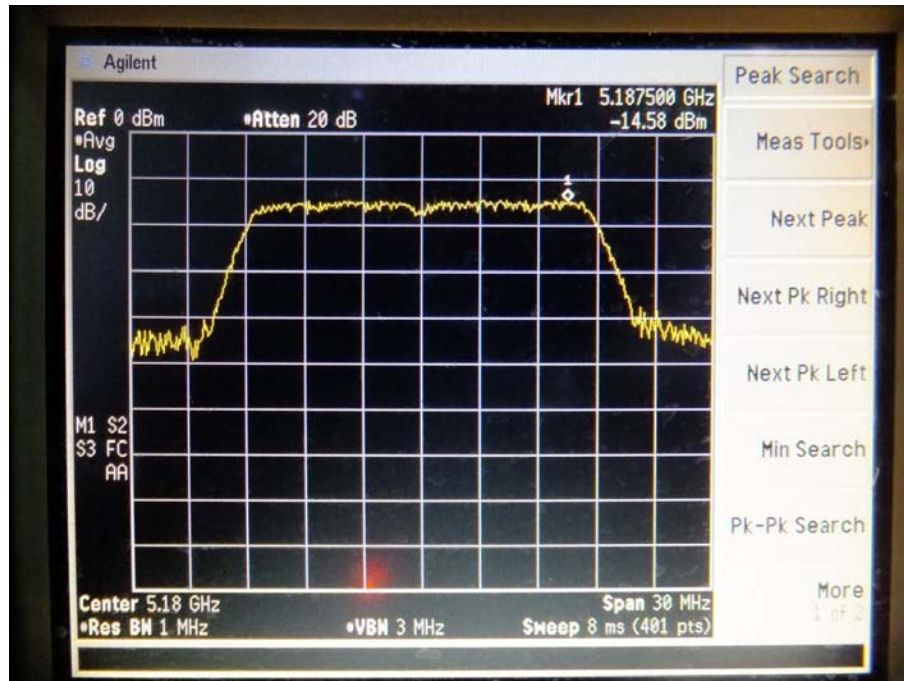
Pass.

Please refer to the following data.

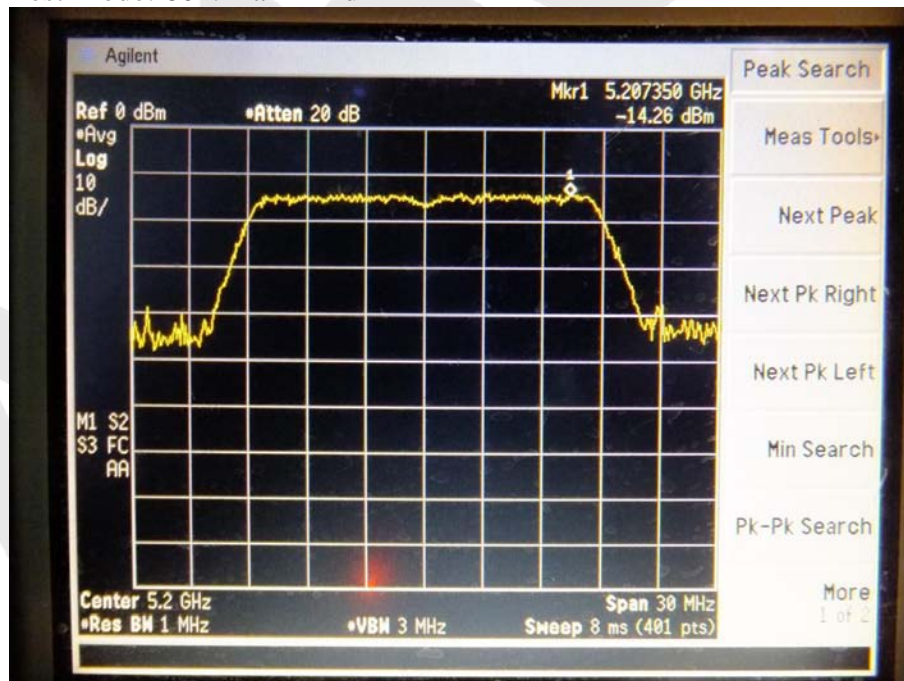
Test mode: IEEE 802.11a

Channel	Frequency (MHz)	Final Power Spectral Density (dBm)	Limit (dBm)	Result
Low	5180	-14.58	4	Pass
Mid	5200	-14.26	4	Pass
High	5240	-11.46	4	Pass

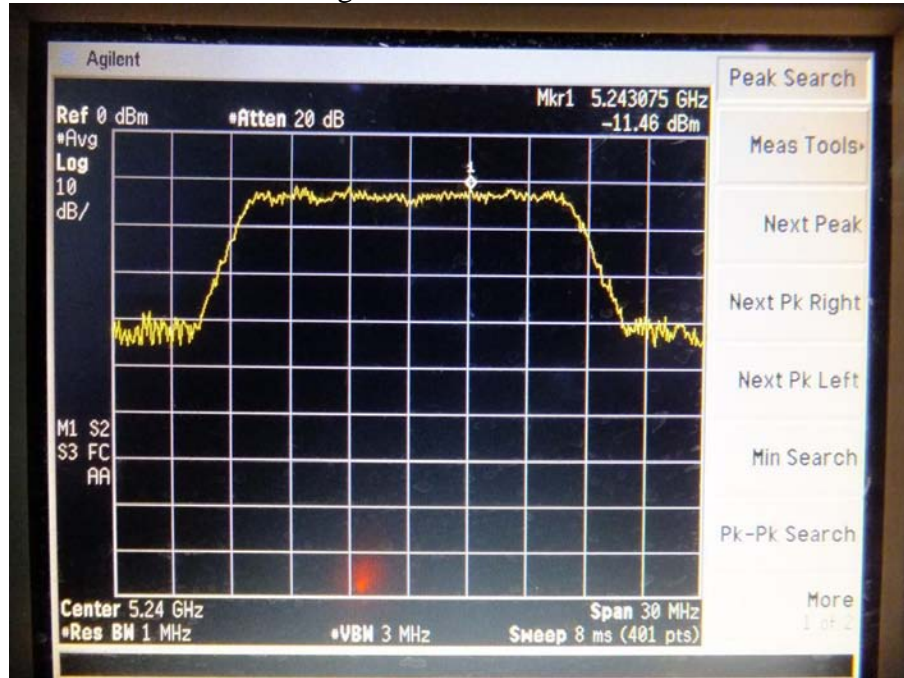
Test Mode: 802.11a ---Low



Test Mode: 802.11a ---Mid



Test Mode: 802.11a ---High

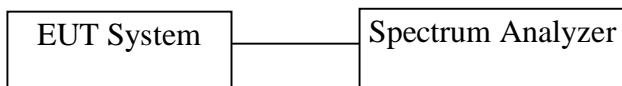


6. Peak Excursion Test

6.1. Test Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13dB across any 1MHz bandwidth or the emission bandwidth whichever is less.

6.2. Test Setup



6.3. Test Procedure

1. The EUT is directly connected to the spectrum analyzer;
2. Set the RBW=1MHz (Peak and Average Trace);
3. Set the VBW=3MHz(Peak and Average Trace);
4. Set the span to encompass the entire emissions bandwidth (EBW) of the signal;
5. Detector=Peak (Peak Trace)/ RMS(Average Trace);
6. Sweep time= auto couple;
7. Trace mode=max. hold;
8. Allow trace to fully stabilize;
9. Repeat above procedures on all channels needed to be tested.

6.4. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	Power Meter	Agilent	E4416A	149951	Apr. 17, 2015	1 Year
8.	Power Sensor	Agilent	8483A	MY50190001	Apr. 17, 2015	1 Year
9.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

6.5. Test Results

Pass.

Please refer to the following data.

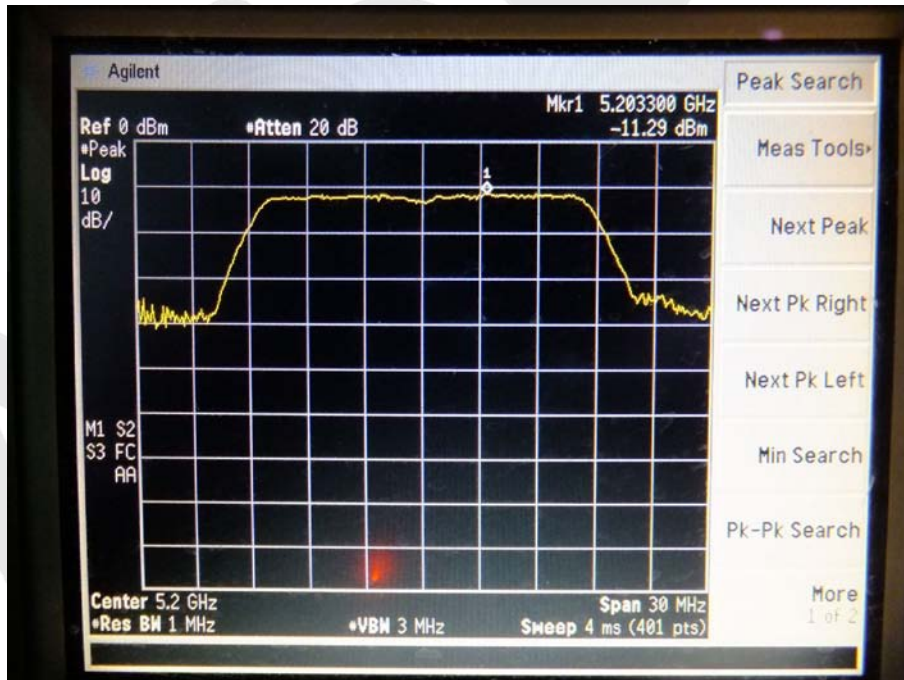
Test mode: IEEE 802.11a

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Result
Low	5180	2.58	13	Pass
Mid	5200	2.97	13	Pass
High	5240	1.59	13	Pass

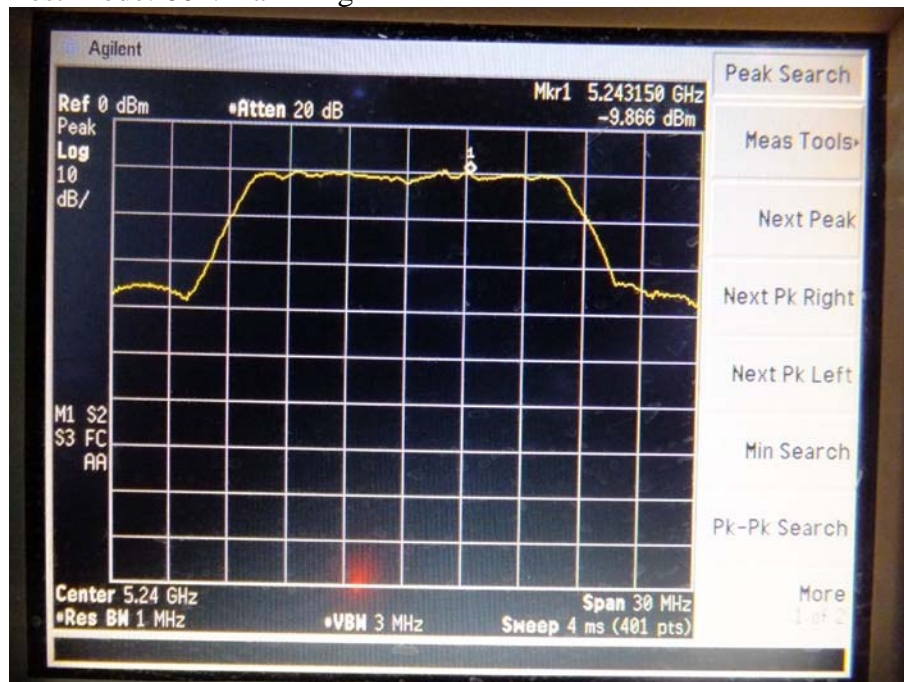
Test Mode: 802.11a ---Low



Test Mode: 802.11a ---Mid



Test Mode: 802.11a ---High



7. Radiated Emission Test

7.1. Test Limit

7.1.1. Test Limits (< 30 MHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

7.1.2. Test Limits (\geq 30 MHz)

FIELD STRENGTH of Fundamental: @3M	FIELD STRENGTH of Harmonics	S15.209 30 - 88 MHz	40 dBuV/m
902-928 MHz		88 - 216 MHz	43.5
2.4-2.4835 GHz		216 - 960 MHz	46
94 dBuV/m @3m	54 dBuV/m @3m	ABOVE 960 MHz	54dBuV/m

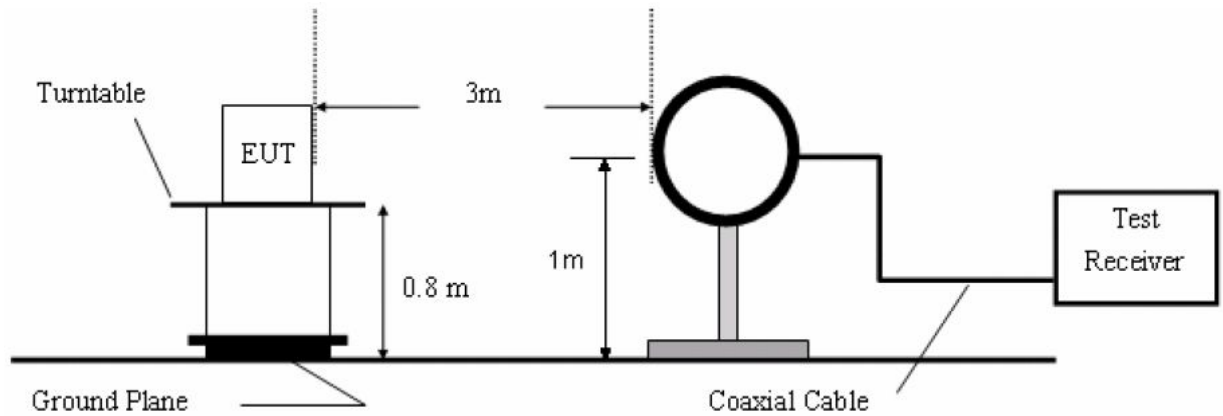
7.1.3. Restriction Band of Operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8

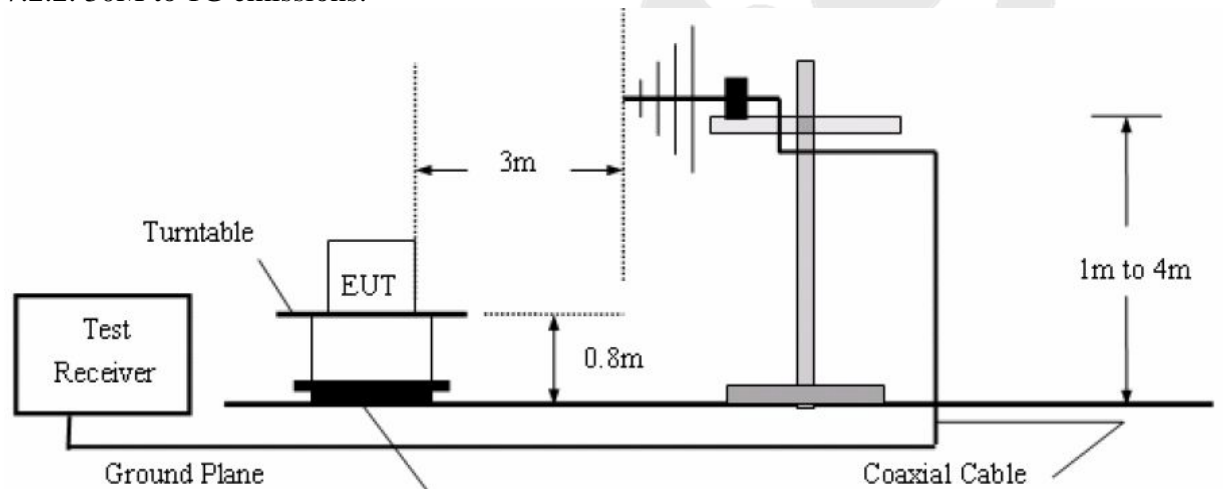
All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

7.2. Test Setup

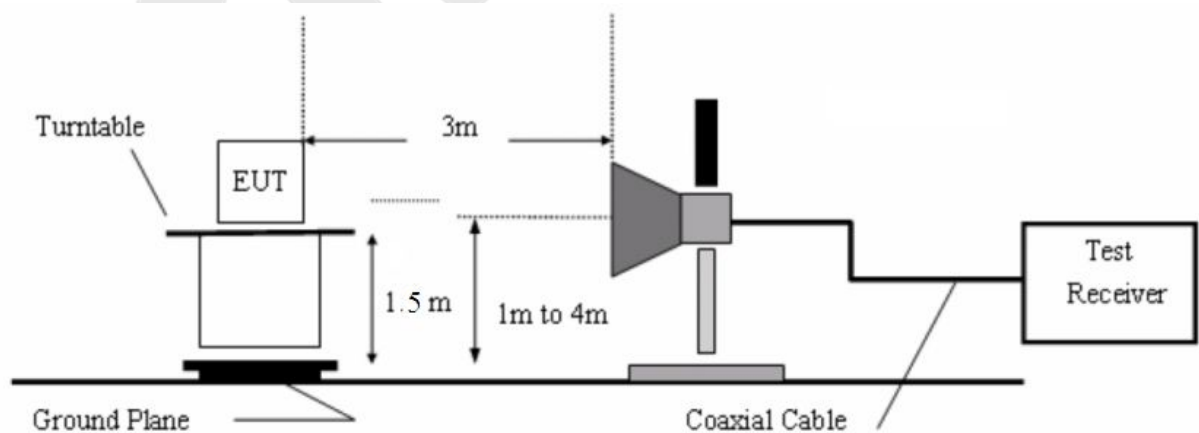
7.2.1. 9k to 30MHz emissions:



7.2.2. 30M to 1G emissions:



7.2.3. 1G to 40G emissions:



7.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turntable shall be rotated 360 degrees to determine the position of max. emission level.
EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

Measurements are made on 9KHz to 30MHz and 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz.

The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

The test results are listed in Section 7.5.

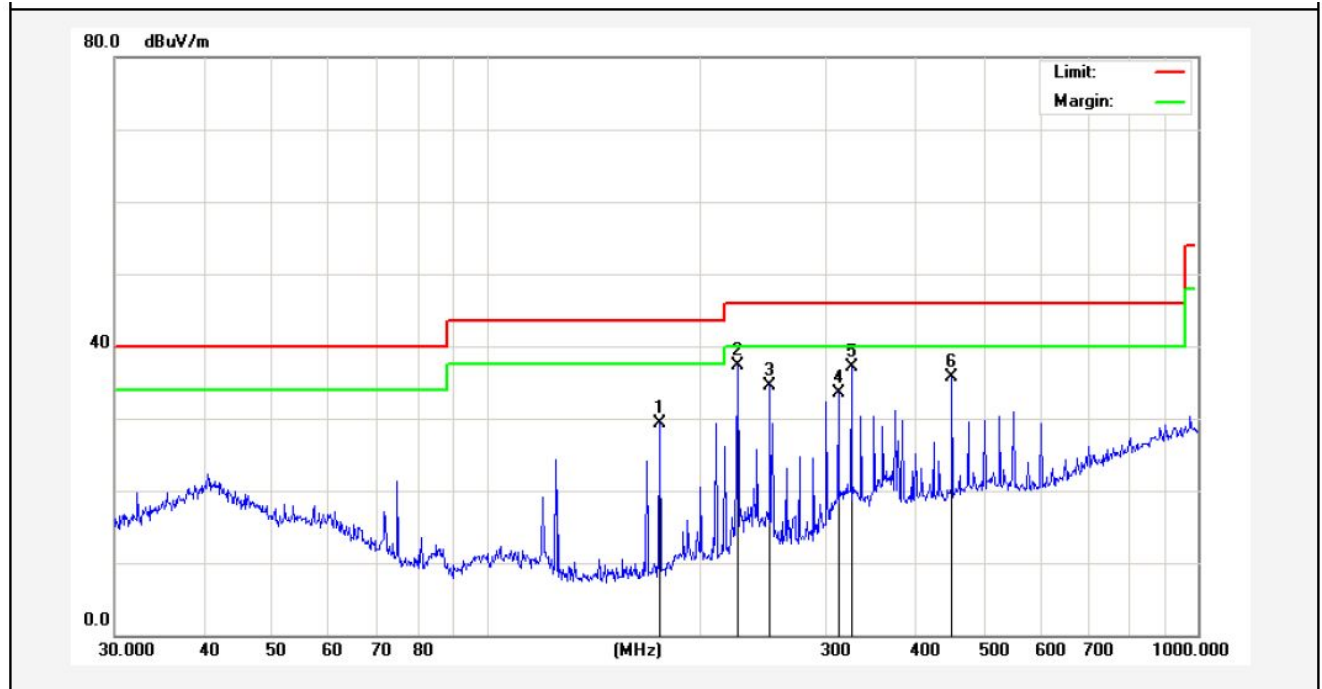
7.4. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
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6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

7.5. Test Results

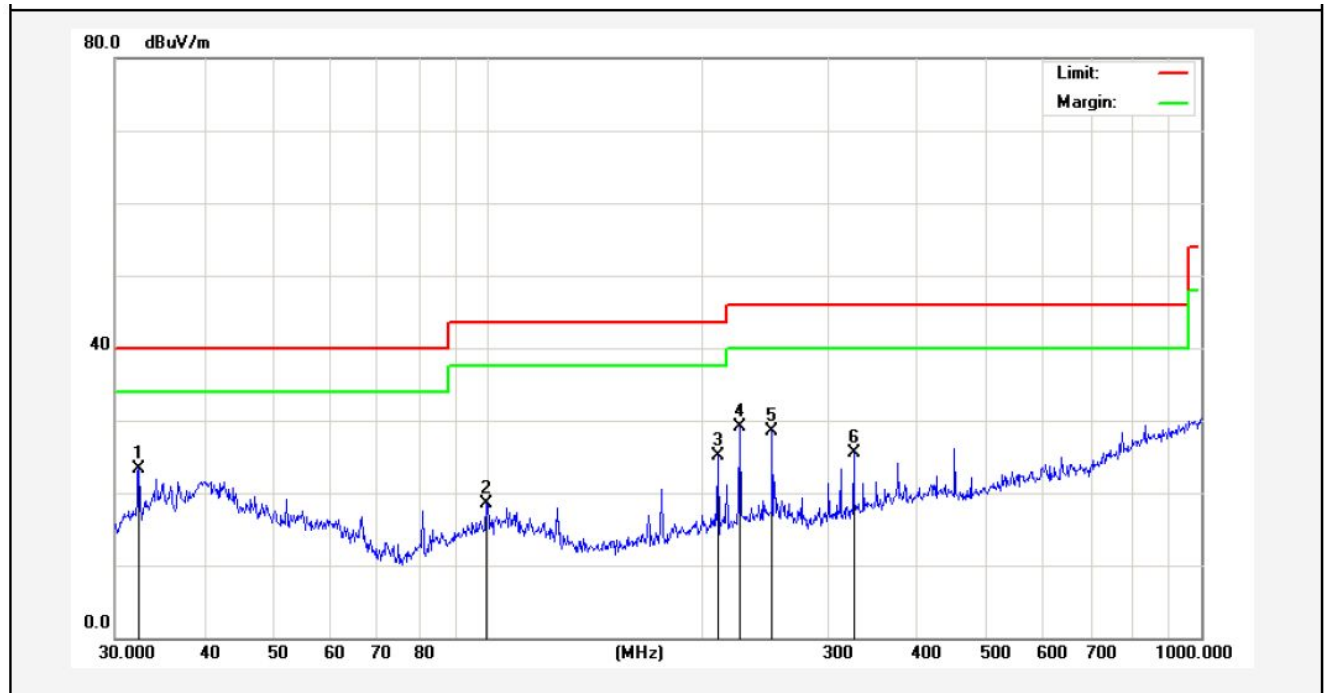
Please refer to the following pages. Only the worst case (x orientation).

Job No.:	011504791I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Test Mode:	On	Distance:	3m



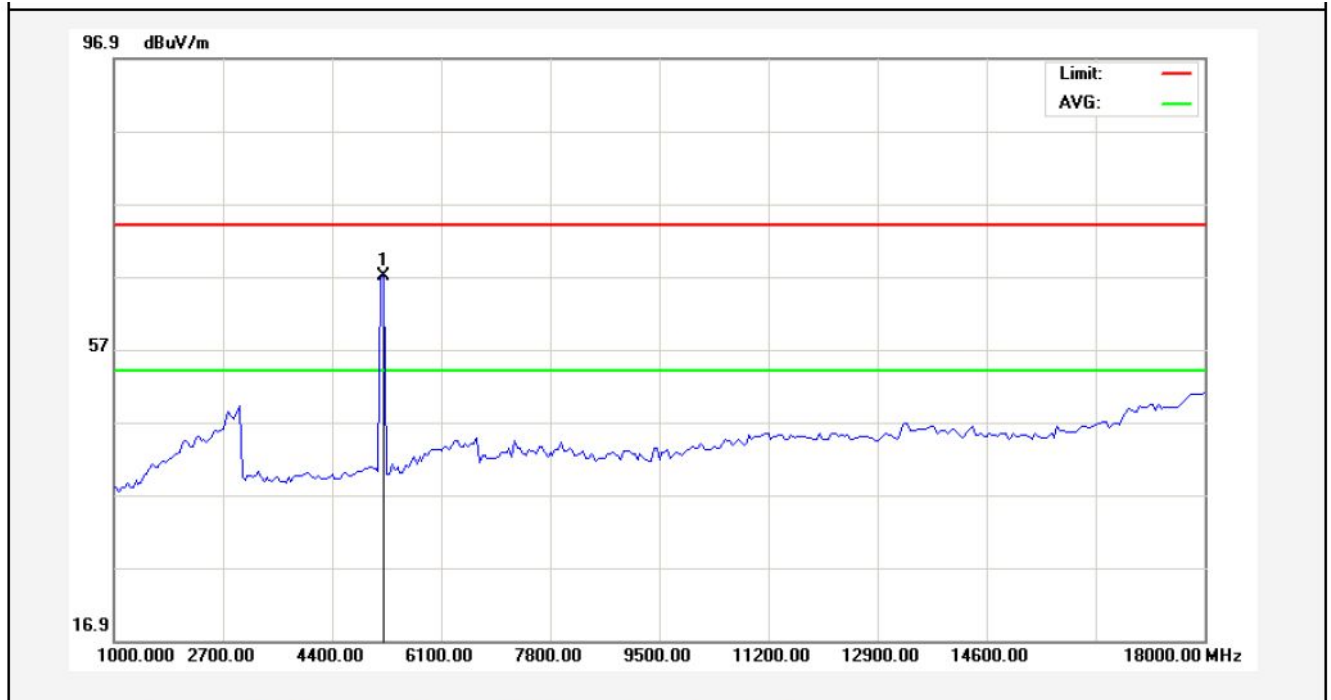
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	175.0368	51.58	-22.20	29.38	43.50	-14.12	peak			
2	225.3080	56.86	-19.57	37.29	46.00	-8.71	peak			
3	250.3012	53.15	-18.56	34.59	46.00	-11.41	peak			
4	312.1794	49.77	-16.21	33.56	46.00	-12.44	peak			
5	325.5958	52.00	-14.99	37.01	46.00	-8.99	peak			
6	451.1350	47.78	-12.15	35.63	46.00	-10.37	peak			

Job No.:	011504791I	Polarization:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Test Mode:	On	Distance:	3m



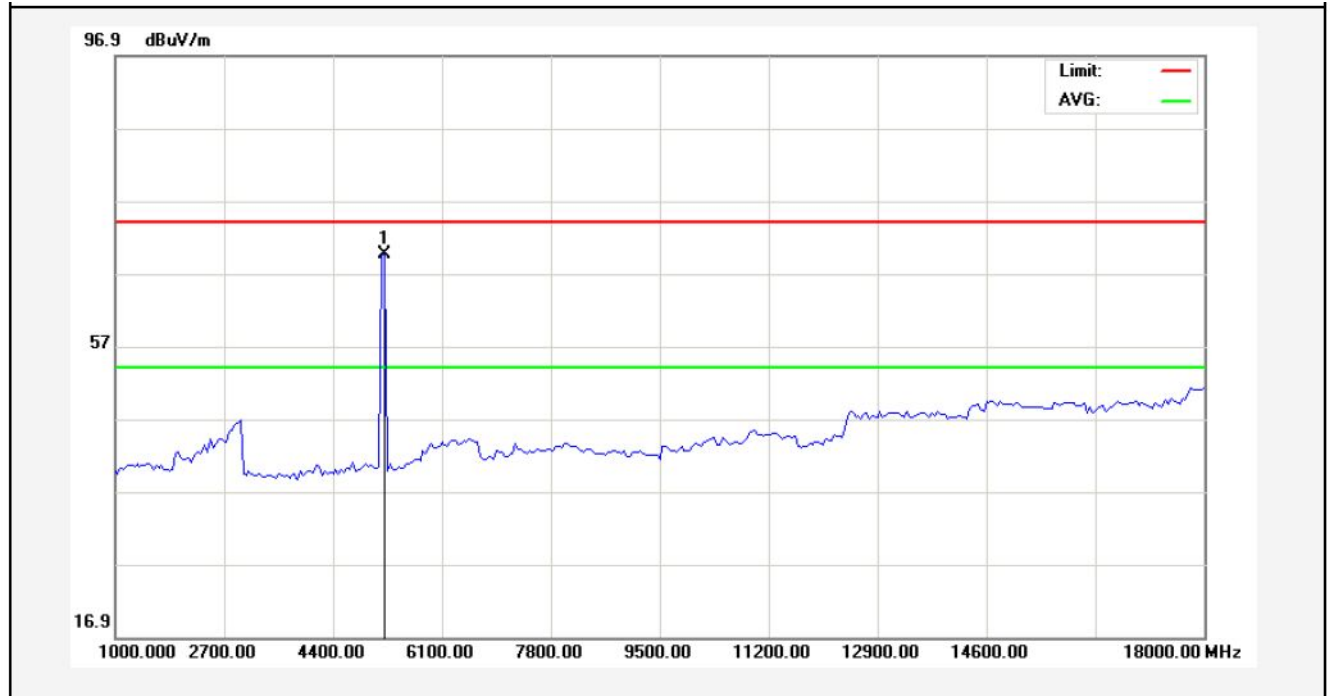
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	32.4059	38.91	-15.67	23.24	40.00	-16.76	peak			
2	99.5281	34.26	-15.79	18.47	43.50	-25.03	peak			
3	210.0482	40.51	-15.48	25.03	43.50	-18.47	peak			
4	225.3080	44.01	-14.83	29.18	46.00	-16.82	peak			
5	250.3012	42.56	-14.04	28.52	46.00	-17.48	peak			
6	325.5958	39.51	-13.99	25.52	46.00	-20.48	peak			

Job No.:	011504791I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 E _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Test Mode:	ON (5180MHz)	Distance:	3m



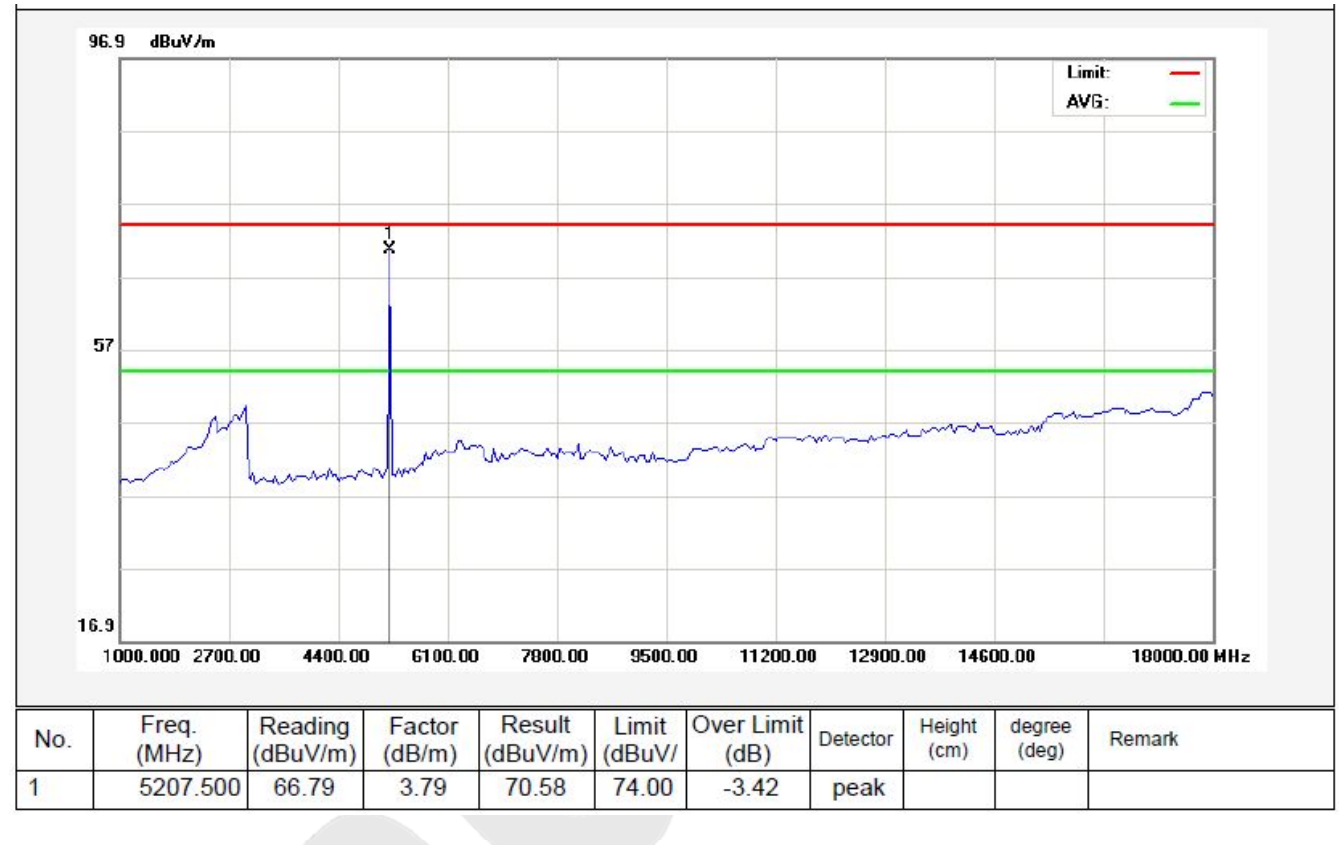
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	5184.500	63.15	3.79	66.94	74.00	-7.06	peak			

Job No.:	011504791I	Polarization:	Vertical
Standard:	(RE)FCC PART15 E _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Test Mode:	ON (5180MHz)	Distance:	3m

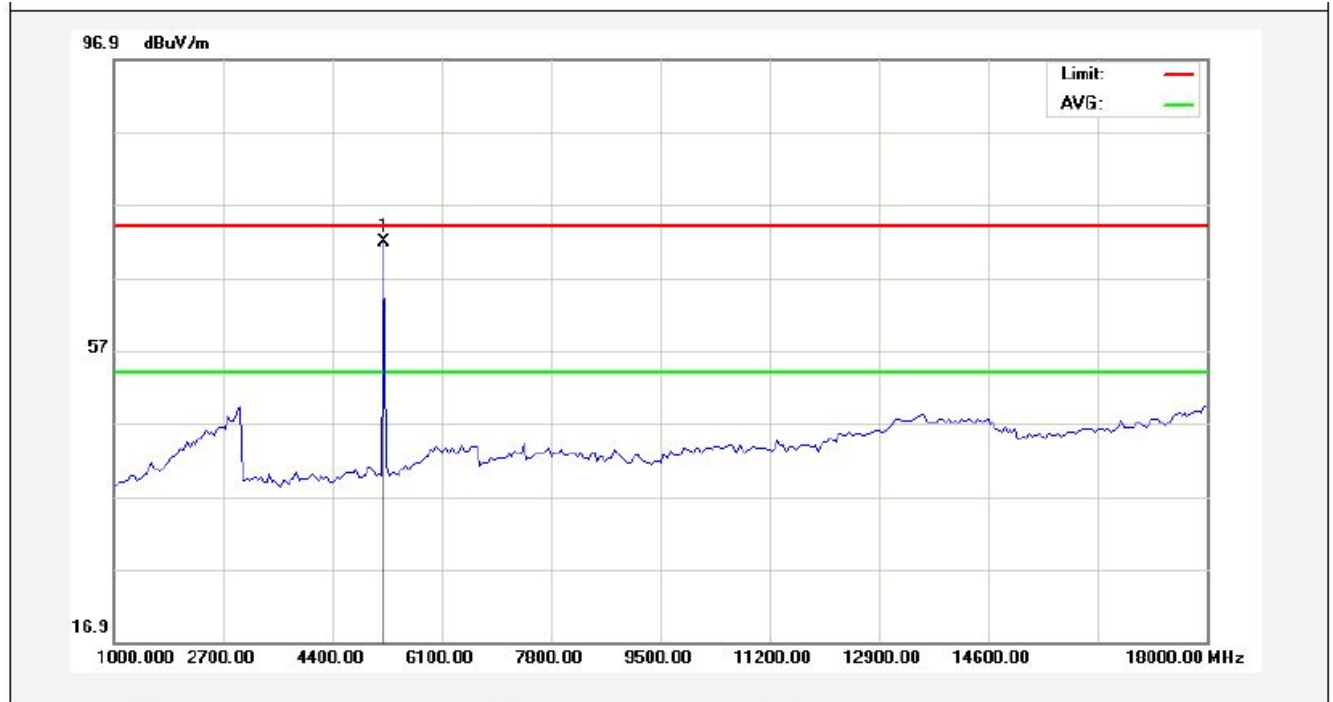


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	5184.500	65.79	3.79	69.58	74.00	-4.42	peak			

Job No.:	011504791I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 E _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Note:	ON (5200MHz)	Distance:	3m

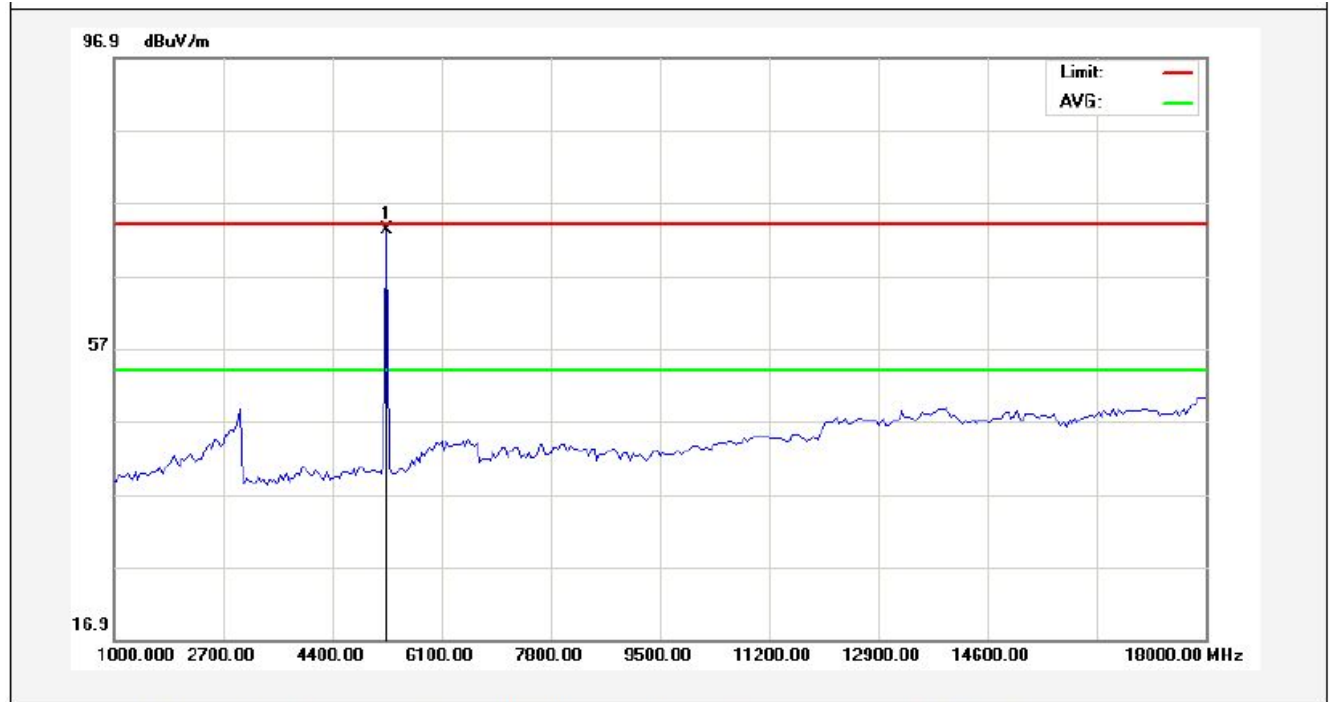


Job No.:	011504791I	Polarization:	Vertical
Standard:	(RE)FCC PART15 E_3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Note:	ON (5200MHz)	Distance:	3m



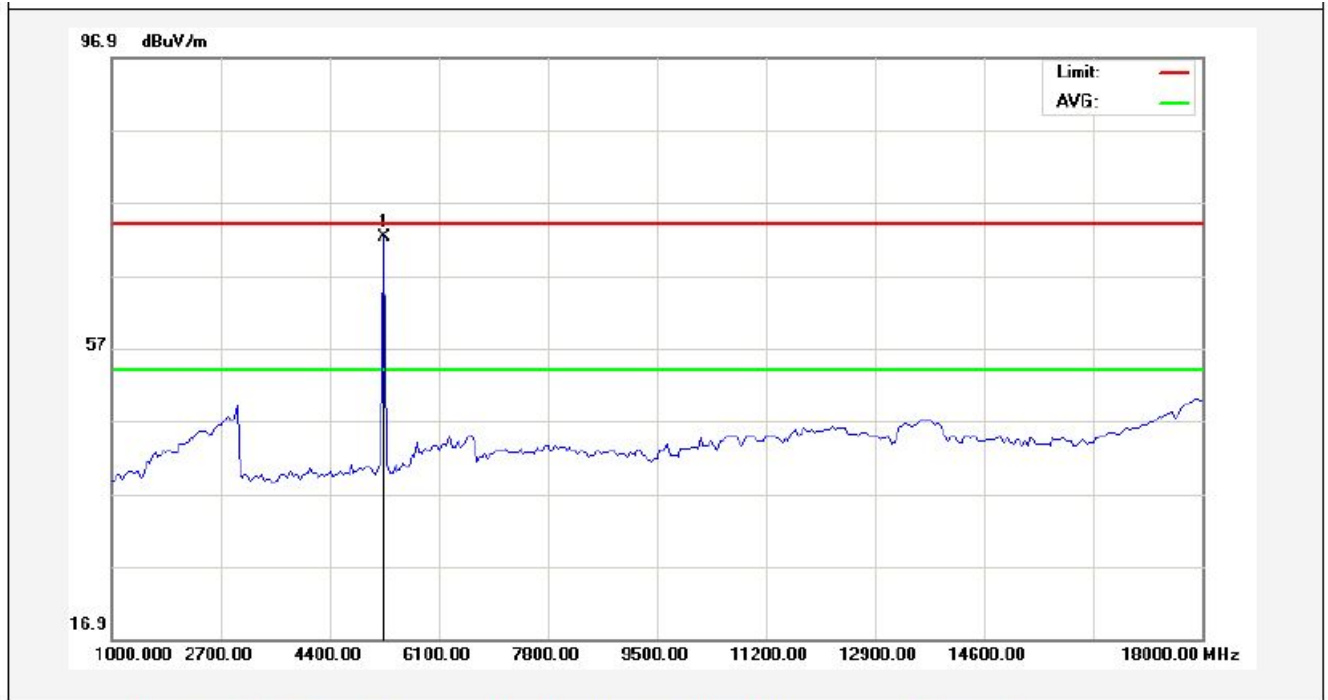
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	5207.500	67.95	3.79	71.74	74.00	-2.26	peak			

Job No.:	011504791I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 E _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Note:	ON (5240MHz)	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	5250.000	69.47	3.81	73.28	74.00	-0.72	peak			

Job No.:	011504791I	Polarization:	Vertical
Standard:	(RE)FCC PART15 E _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Note:	ON (5240MHz)	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	5250.000	68.44	3.81	72.25	74.00	-1.75	peak			

8. Band Edge Test

8.1. Test Limit

For transmitter operating in the 5.15-5.25GHz band: all emissions outside of the 5.15-5.35GHz band shall not exceed an EIRP of -27dBm/MHz.

For transmitters operating in the 5.25-5.35GHz band: all emissions outside of the 5.15-5.35GHz band shall not exceed an EIRP of -27dBm/MHz. Devices operating in the 5.25-5.35GHz band that generate emissions in the 5.15-5.25GHz band must meet all applicable technical requirements for operation in the 5.15-5.25GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27dBm/MHz in the 5.15-5.25GHz band.

For transmitters operating in the 5.45-5.725GHz band: all emissions outside of the 5.47-5.725GHz band shall not exceed an EIRP of -27dBm/MHz.

For transmitters operating in the 5.725-5.825GHz band: all emissions within the frequency range from the band edge to 10MHz above or below the band edge shall not exceed an EIRP of -17dBm/MHz; for frequencies 10MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27dBm/MHz.

8.2. Test Setup

Same as clause 7.2.

8.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turntable shall be rotated 360 degrees to determine the position of max. emission level. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

Measurements are made on 9KHz to 30MHz and 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz.

The EUT is tested in 9*6*6 Chamber.

The test results are listed in Section 8.5.

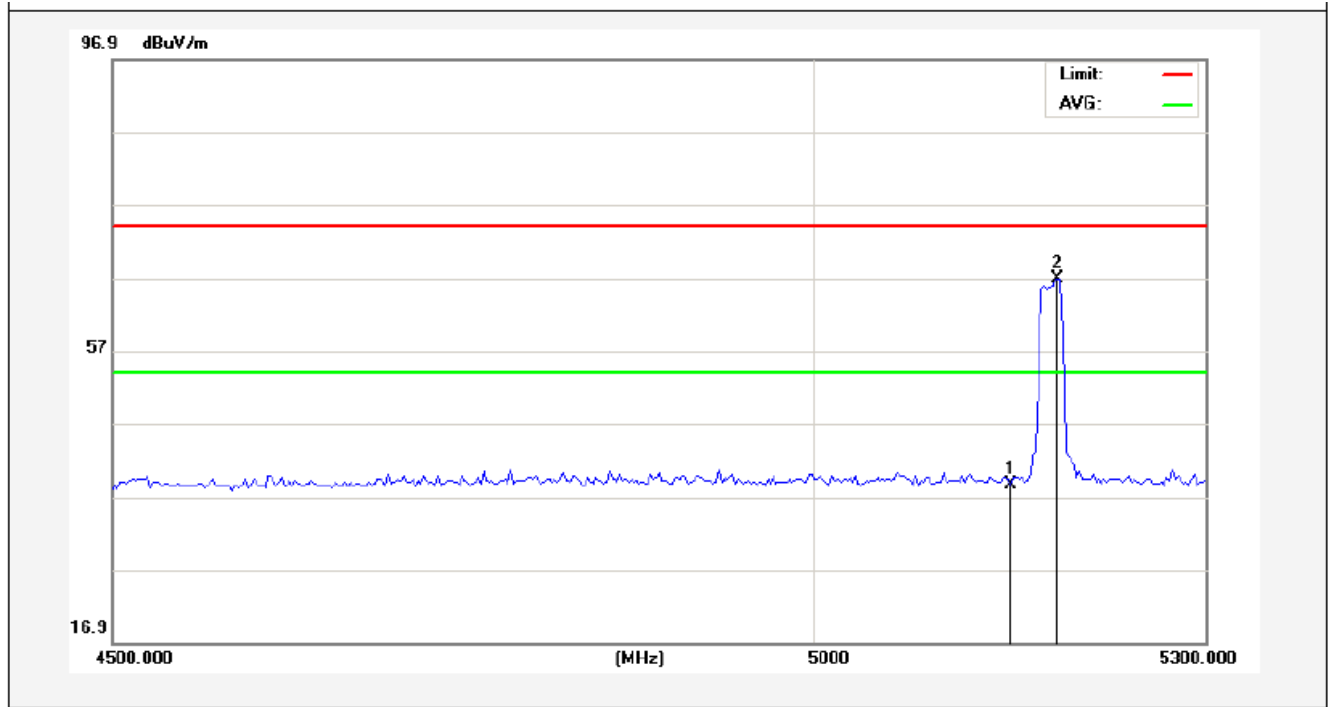
8.4. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

8.5. Test Results

Please refer to the following pages.

Job No.:	011504791I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 E _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Test Mode:	ON (5180MHz)	Distance:	3m



Remark:

1. According to KDB 789033 section H) d) (iii), for measurement above 1000MHz @3m distance, the limit of EIRP is calculated as follows:

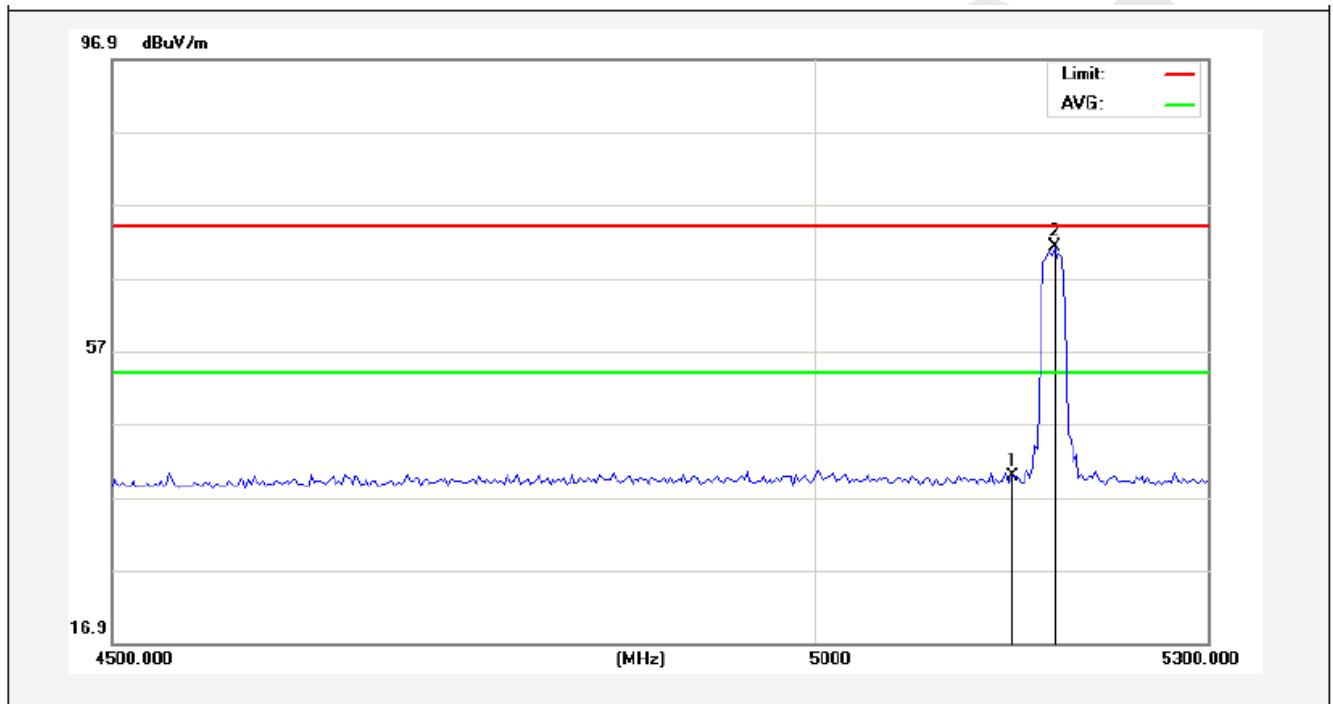
$$\text{EIRP[dBm]} = \text{E[dBuV/m]} - 95.2$$

There the frequency 5150MHz, $\text{E[dBuV/m]} = 38.57 \text{ dBuV/m}$

$$\text{EIRP[dBm]} = \text{E[dBuV/m]} - 95.2 = 38.57 - 95.2 = -56.5 \text{ dBm}$$

The limit is -27dBm/MHz

Job No.:	011504791I	Polarization:	Vertical
Standard:	(RE)FCC PART15 E _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Test Mode:	ON (5180MHz)	Distance:	3m



Remark:

1. According to KDB 789033 section H) d) (iii), for measurement above 1000MHz @3m distance, the limit of EIRP is calculated as follows:

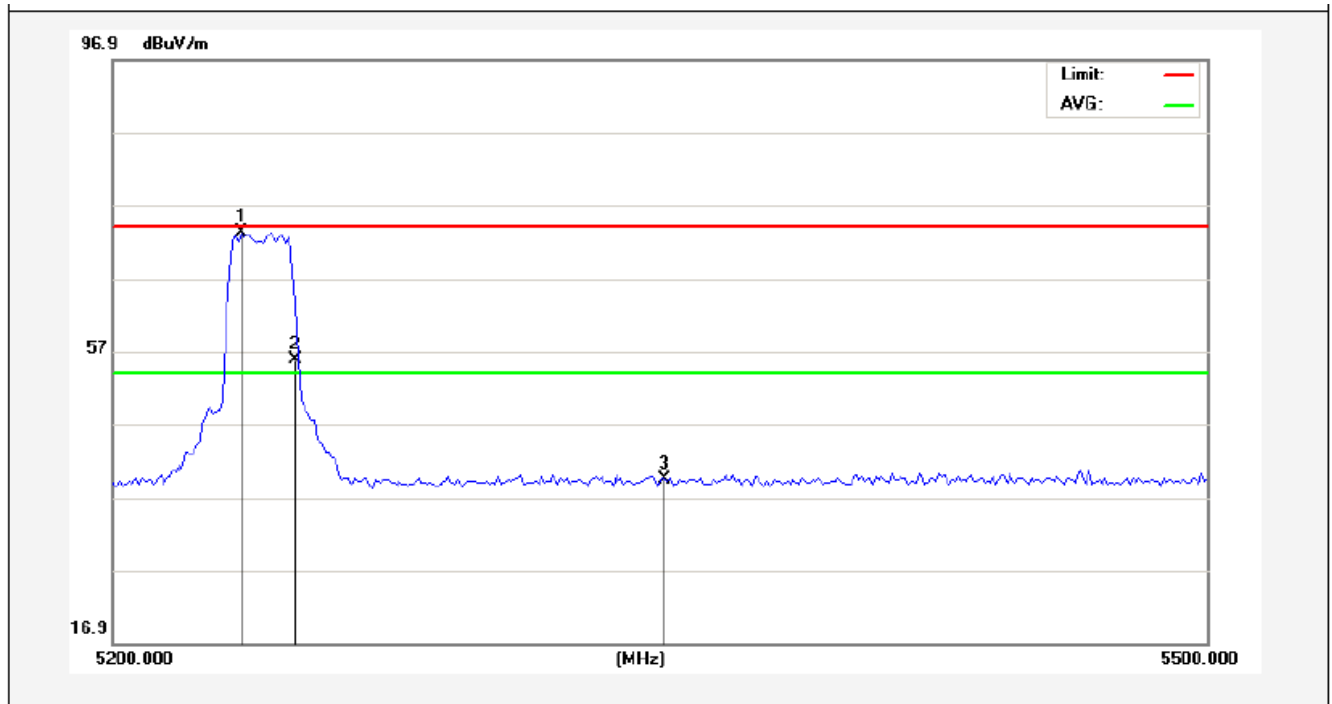
$$\text{EIRP[dBm]} = \text{E[dBuV/m]} - 95.2$$

There the frequency 5150MHz, $\text{E[dBuV/m]} = 39.84 \text{ dBuV/m}$

$$\text{EIRP[dBm]} = \text{E[dBuV/m]} - 95.2 = 38.57 - 95.2 = -55.36 \text{ dBm}$$

The limit is -27dBm/MHz

Job No.:	011504791I	Polarization:	Horizontal
Standard:	(RE)FCC PART15 E _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Test Mode:	ON (5240MHz)	Distance:	3m



Remark:

1. According to KDB 789033 section H) d) (iii), for measurement above 1000MHz @3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dBuV/m]} - 95.2$$

There the frequency 5250MHz, $\text{E1[dBuV/m]} = 55.88\text{dBuV/m}$;

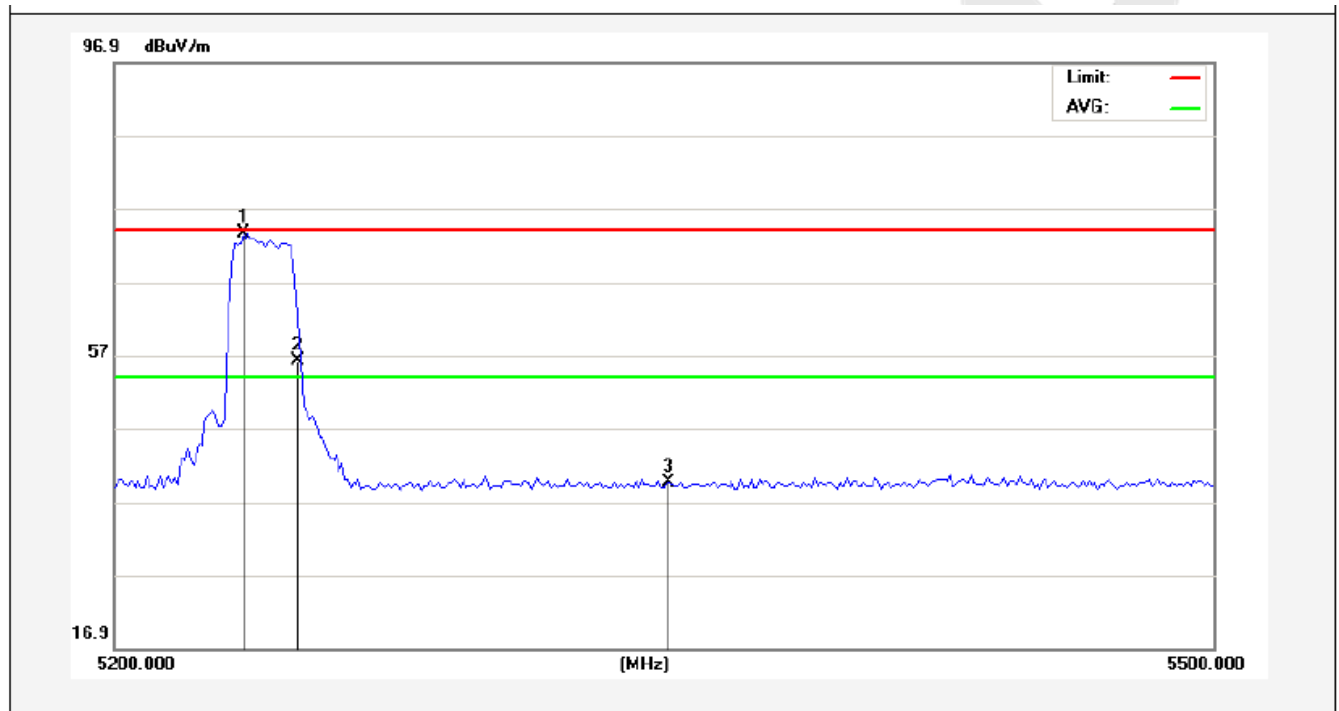
There the frequency 5350MHz, $\text{E2[dBuV/m]} = 39.40\text{ dBuV/m}$

$$\text{EIRP1[dBm]} = \text{E[dBuV/m]} - 95.2 = 55.88 - 95.2 = -39.32\text{dBm}$$

$$\text{EIRP2[dBm]} = \text{E[dBuV/m]} - 95.2 = 39.40 - 95.2 = -55.80\text{dBm}$$

The limit is -27dBm/MHz

Job No.:	011504791I	Polarization:	Vertical
Standard:	(RE)FCC PART15 E_3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3(C)/55%RH
Test Mode:	ON (5240MHz)	Distance:	3m



Remark:

1. According to KDB 789033 section H) d) (iii), for measurement above 1000MHz @3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dBuV/m]} - 95.2$$

There the frequency 5250MHz, $\text{E1[dBuV/m]} = 56.28\text{dBuV/m}$;

There the frequency 5350MHz, $\text{E2[dBuV/m]} = 39.52\text{dBuV/m}$

$$\text{EIRP1[dBm]} = \text{E[dBuV/m]} - 95.2 = 56.28 - 95.2 = -38.92\text{dBm}$$

$$\text{EIRP2[dBm]} = \text{E[dBuV/m]} - 95.2 = 39.52 - 95.2 = -55.68\text{dBm}$$

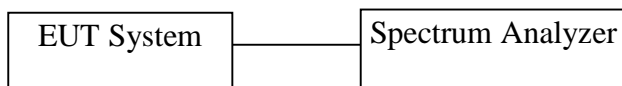
The limit is -27dBm/MHz

9. Frequency Stability Test

9.1. Test Limit

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.02\%$ of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees.

9.2. Test Setup



9.3. Test Procedure

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat steps 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at $+20$ degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

9.4. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	Temp. / Humidity Chamber	Kingson	THS-M1	335960	Apr. 17, 2015	1 Year
8.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

9.5. Test Results

Please refer to the following pages.

Test Mode: IEEE 802.11a--Low

Voltage	Measurement Frequency (MHz)
DC 3.145V	5179.9729
DC 3.700V	5179.9792
DC4.070V	5179.9805
Max. Deviation (MHz)	0.0271
Max. Deviation (%)	0.00052%

Temperature (°C)	Measurement Frequency (MHz)
-20	5179.9762
-10	5179.9770
0	5179.9833
10	5179.9739
20	5179.9812
30	5179.9766
40	5179.9802
50	5179.9813
Max. Deviation (MHz)	0.0261
Max. Deviation (ppm)	0.0005%

Test Mode: IEEE 802.11a--Mid

Voltage	Measurement Frequency (MHz)
DC 3.145V	5199.9629
DC 3.700V	5199.9712
DC4.070V	5199.9775
Max. Deviation (MHz)	0.0371
Max. Deviation (%)	0.00071%

Temperature (°C)	Measurement Frequency (MHz)
-20	5199.9655
-10	5199.9709
0	5199.9728
10	5199.9815
20	5199.9752
30	5199.9738
40	51..9690
50	5199.9718
Max. Deviation (MHz)	0.0345
Max. Deviation (ppm)	0.00066%

Test Mode: IEEE 802.11a--High

Voltage	Measurement Frequency (MHz)
DC 3.145V	5239.9772
DC 3.700V	5239.9825
DC4.070V	5239.9811
Max. Deviation (MHz)	0.0168
Max. Deviation (%)	0.00044%

Temperature (°C)	Measurement Frequency (MHz)
-20	5239.9726
-10	5239.9758
0	5239.9793
10	5239.9803
20	5239.9779
30	5239.9804
40	5239.9769
50	5239.9757
Max. Deviation (MHz)	0.0274
Max. Deviation (ppm)	0.00052%

10. ANTENNA APPLICATION

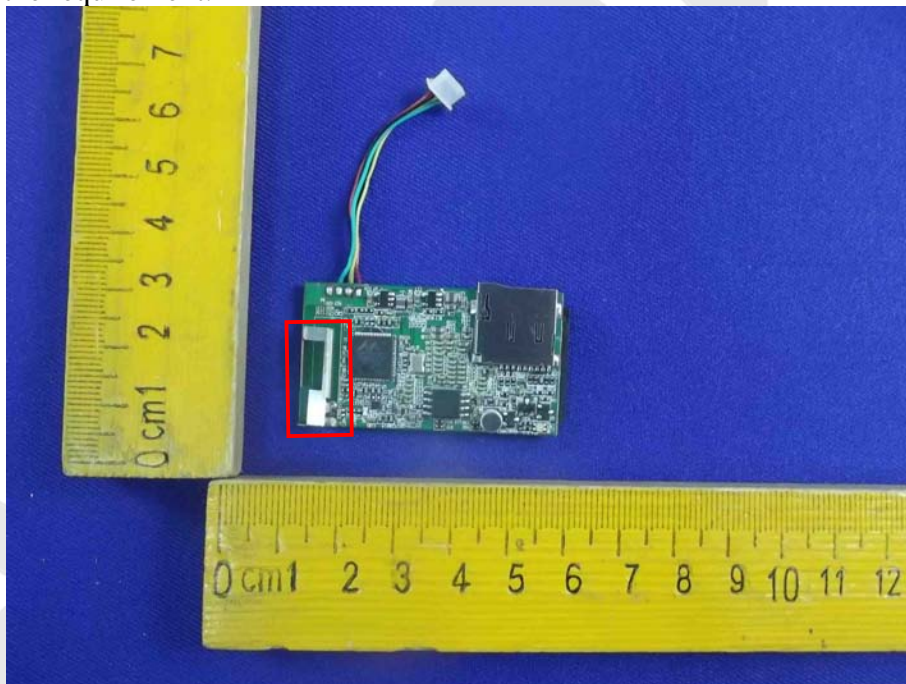
10.1. Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C section 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

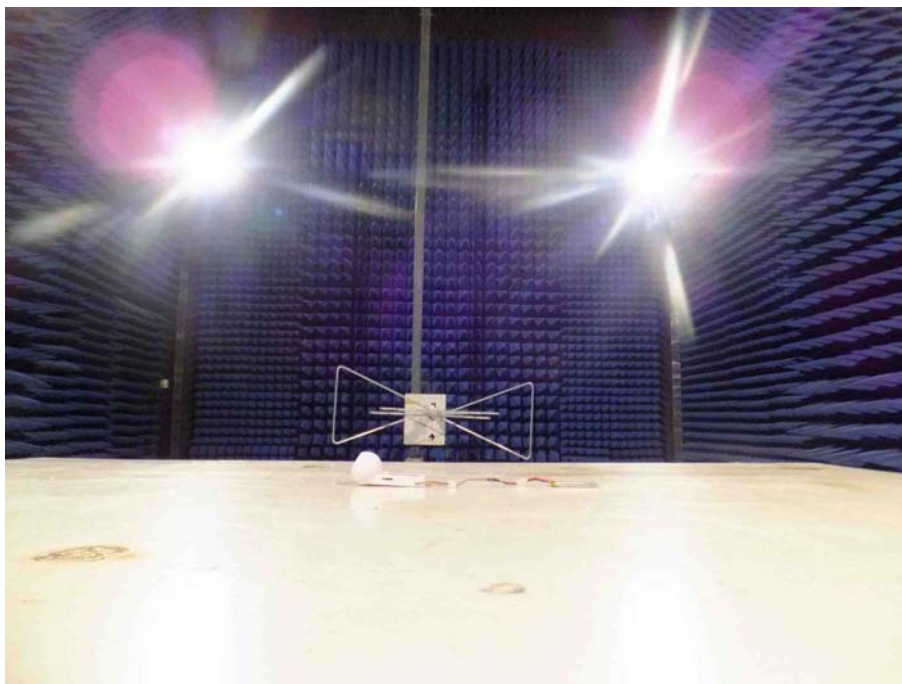
10.2. Result

The EUT's antenna used a integrated antenna which is permanently attached, The antenna's gain is 2dBi and meets the requirement.



11. PHOTOGRAPH

11.1. Photo of Radiation Emission Test



APPENDIX I (EXTERNAL PHOTOS)

Figure 1
The EUT-Top View



Figure 2
The EUT-Bottom View



Figure 3
The EUT-Right View



Figure 4
The EUT-Left View

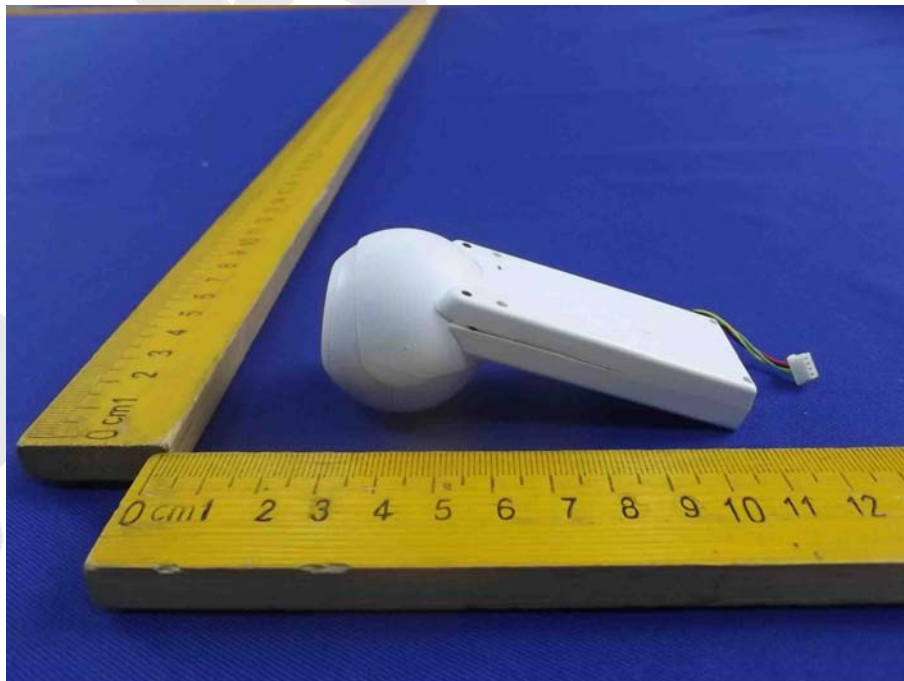
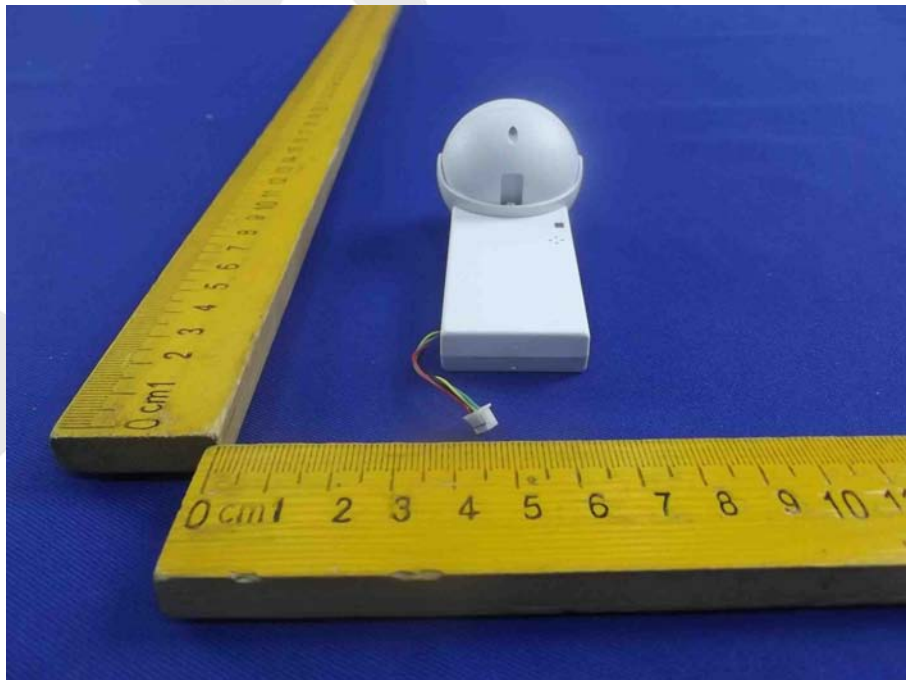


Figure 5
The EUT-Front View



Figure 6
The EUT-Back View



APPENDIX II (INTERNAL PHOTOS)

Figure 7
The EUT-Inside View

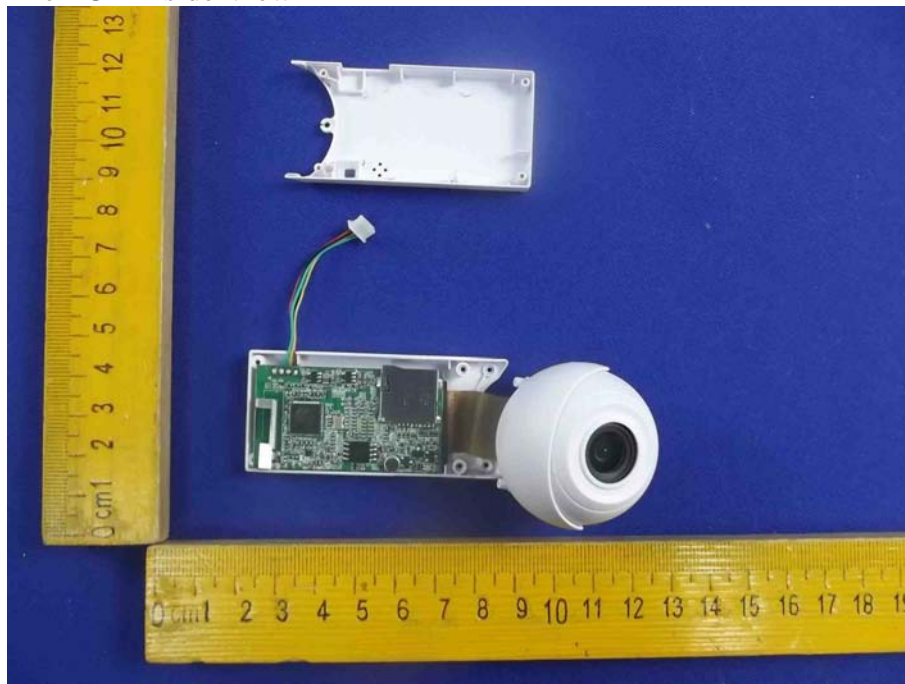


Figure 8
The EUT-Inside View

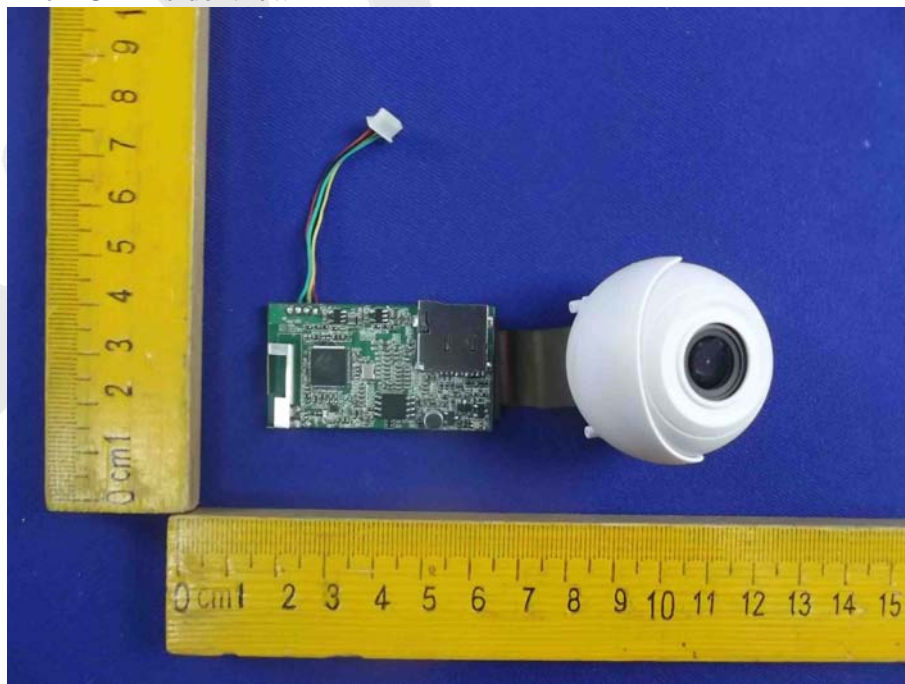


Figure 9
PCB of the EUT-Front View

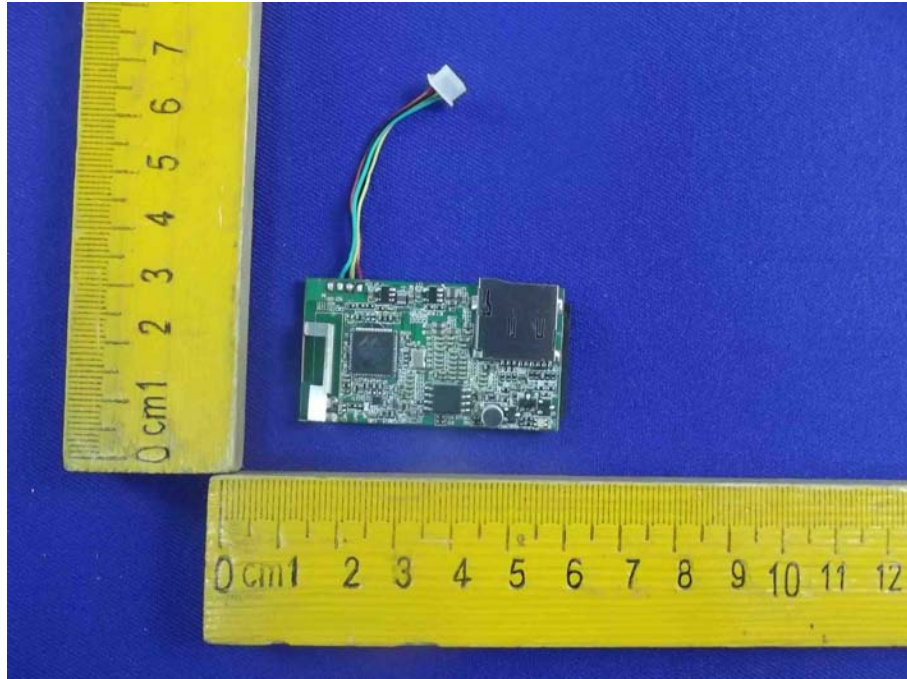


Figure 10
PCB of the EUT-Back View

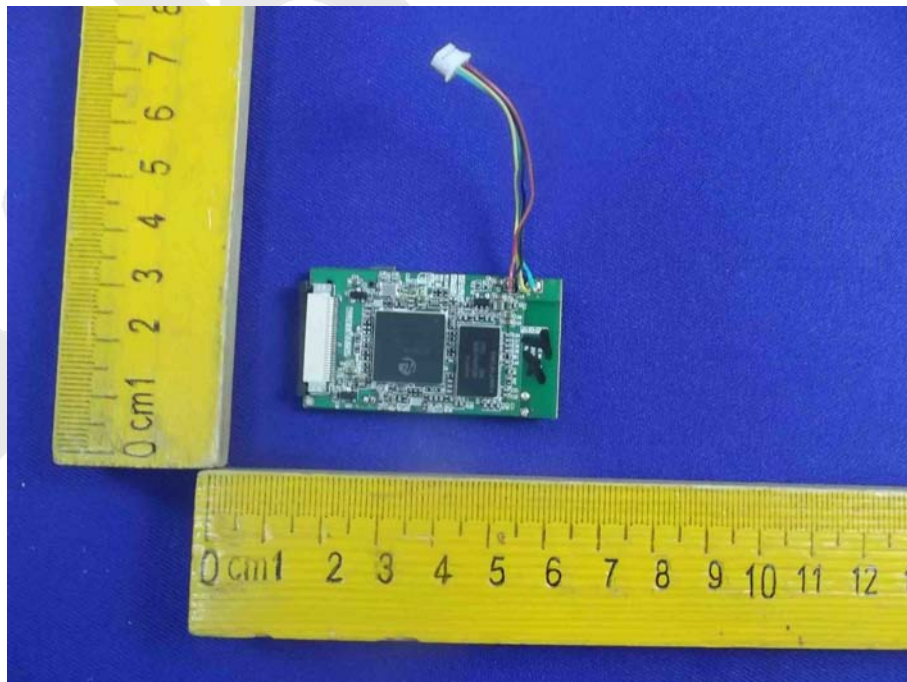


Figure 11
PCB of the EUT-Front View



Figure 12
PCB of the EUT-Back View

