FCC TEST REPORT

For

USTECH(Beijing)Technology Co., Ltd.

WIPET Panoramic camera

Test Model: WIPET

Additional Model No.: WIPET_S1, WIPET_S2, WIPET_S3, WIPET_D1, WIPET_D2, WIPET_D3, WIPET_V1, WIPET_V2, WIPET_V3

Prepared for	:	USTECH(Beijing)Technology Co., Ltd.
Address	:	Room1720, HaiTai Building, No.229 North 4th Ring Road, HaiDian District, Beijing, China
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Date of receipt of test sample	:	November 30, 2015
Number of tested samples	:	1
Sample number	:	15112426
Date of Test	:	November 30, 2015 - December 05, 2015
Date of Report	:	December 05, 2015

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FCC TEST REPORT

FCC CFR 47 PART 15 C(15.247): 2014

Report Reference No.	**:**	**LCS1511272453E**
Date of Issue	:	December 05, 2015
Testing Laboratory Name.....	**:**	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure.....	:	Full application of Harmonised standards ■ Partial application of Harmonised standards ☐ Other standard testing method ☐
Applicant's Name.....	**:**	**USTECH(Beijing)Technology Co., Ltd.**
Address	:	Room1720, HaiTai Building, No.229 North 4th Ring Road, HaiDian District, Beijing, China
Test Specification		
Standard	:	FCC CFR 47 PART 15 C(15.247): 2014 / ANSI C63.10: 2013
Test Report Form No.....	**:**	LCSEMC-1.0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03

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Test Item Description.	**:**	**WIPET Panoramic camera**
Trade Mark	:	N/A
Test Model	:	WIPET
Ratings	:	DC 3.7V by Li-ion battery(1430mAh) Recharge Voltage: DC 5V/1A
Result	:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Leo Lee/ File administrators	Glin Lu/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS1511272453E	December 05, 2015 Date of issue

Test Model.....	: WIPET
EUT.....	: WIPET Panoramic camera
Applicant.....	**: USTECH(Beijing)Technology Co., Ltd.**
Address.....	: Room1720, HaiTai Building, No.229 North 4th Ring Road, HaiDian District, Beijing, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: USTECH(Beijing)Technology Co., Ltd.**
Address.....	: Room1720, HaiTai Building, No.229 North 4th Ring Road, HaiDian District, Beijing, China
Telephone.....	: /
Fax.....	: /
Factory.....	**: USTECH(Beijing)Technology Co., Ltd.**
Address.....	: Room1720, HaiTai Building, No.229 North 4th Ring Road, HaiDian District, Beijing, China
Telephone.....	: /
Fax.....	: /

Test Result	**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	WIPET Panoramic camera
Model Number	:	WIPET, WIPET_S1, WIPET_S2, WIPET_S3, WIPET_D1, WIPET_D2, WIPET_D3, WIPET_V1, WIPET_V2, WIPET_V3
Model Declaration	:	PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Test Model	:	WIPET
Hardware Version	:	HD88_Main_A1, HD88_Power- _A2, HD88_SENSOR_A0, HD88__Wifi_A1
Software Version	:	V1.0
Power Supply	:	DC 3.7V by Li-ion battery(1430mAh) Recharge Voltage: DC 5V/1A
Operating Frequency	:	2412.00-2462.00MHz
Channel Spacing	:	5MHz
Channel Number	:	11 Channels for 20MHz Bandwidth 7 Channels for 40MHz Bandwidth
Modulation Type	:	802.11b: DSSS(CCK,DQPSK,DBPSK) 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK)
Antenna Description	:	Integral Antenna, 2.0dBi(Max.)

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
Lenovo	Notebook	B470	WB05067151	DOC
Lenovo	AC/DC ADAPTER	ADP-90DD B	36001941	VOC

1.3. External I/O

I/O Port Description	Quantity	Cable
USB Port	1	N/A
Mini HDMI Port	1	N/A
TF Card Slot	1	N/A

1.4. Description of Test Facility

CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

1.5. List Of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18,2015	June 17,2016
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16,2015	July 15,2016
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18,2015	June 17,2016
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18,2015	June 17,2016
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18,2015	June 17,2016
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18,2015	June 17,2016
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 18,2015	June 17,2016
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHzz	June 18,2015	June 17,2016
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16,2015	July 15,2016
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16,2015	July 15,2016
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	July 16,2015	July 15,2016
MAX Signal Analyzer	Agilent	N9020A	MY50510140	20Hz~26.5GHz	Oct. 27, 2015	Oct. 26, 2016
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18,2015	June 17,2016
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	30MHz-1GHz	June 10,2015	June 09,2016
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10,2015	June 09,2016
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	June 10,2015	June 09,2016
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18,2015	June 17,2016
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18,2015	June 17,2016
Spectrum Meter	R&S	FSP 30	100023	9kHz-30GHz	July 16,2015	July 15,2016
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18,2015	June 17,2016
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18,2015	June 17,2016
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18,2015	June 17,2016
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18,2015	June 17,2016
RF CABLE-2m	JYE Bao	RG142	CB035-2m	20MHz-1GHz	June 18,2015	June 17,2016
Note: All equipment through GRGTEST calibration						

1.6. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.7. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
		200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
		26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.8. Description Of Test Modes

The EUT has been tested under operating condition.

The EUT was set to transmit at 100% duty cycle.

For pre-testing, when performed line conducted emissions measurement, the input Voltage/Frequency AC 120V/60Hz and AC 240V/60Hz were used. Only recorded the worst case in this report.

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power, that was determined to be 802.11b mode(Middle Channel).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be 802.11b mode(Middle Channel).

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:
802.11b Mode : 1 Mbps, DSSS.
802.11g Mode : 6 Mbps, OFDM.
802.11n Mode HT20:.MCS0, OFDM.
802.11n Mode HT40:.MCS0, OFDM.

***Note: Using a temporary antenna connector for the EUT when the conducted measurements are performed.

Channel List & Frequency

802.11b/g/n(HT20):

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
2412~2462MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437	--	--

802.11n(HT40):

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
2422~2452MHz	1	--	7	2442
	2	--	8	2447
	3	2422	9	2452
	4	2427	10	--
	5	2432	11	--
	6	2437	--	--

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2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to FCC's request, Test Procedure KDB558074 D01 DTS Meas Guidance v03r02 is required to be used for this kind of FCC 15.247 digital modulation device.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

2.3. General Test Procedures

2.3.1 Conducted Emissions

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

N/A

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

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4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart C		
FCC Rules	**Description of Test**	**Result**
§15.247(b)(3)	Maximum Conducted Output Power	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	Compliant
§15.205	Emissions at Restricted Band	Compliant
§15.207(a)	Line Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant

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5. TEST RESULT

5.1. Maximum Conducted Output Power Measurement

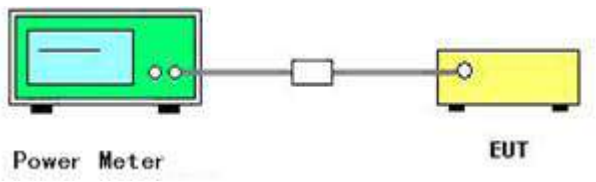
5.1.1. Standard Applicable

According to § 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz bands: 1 Watt.

5.1.2. Test Procedures

The transmitter output (antenna port) was connected to the power meter.

5.1.3. Test Setup Layout



5.1.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.1.5. Test Result of Maximum Conducted Output Power

Temperature	25℃	Humidity	60%
Test Engineer	Leo	Configurations	802.11b/g/n

802.11b

Channel	Frequency (MHz)	Conducted Power (dBm, Average)	Max. Limit (dBm)	Result
1	2412	7.40	30	Complies
6	2437	7.68	30	Complies
11	2462	7.78	30	Complies

802.11g

Channel	Frequency (MHz)	Conducted Power (dBm, Average)	Max. Limit (dBm)	Result
1	2412	7.11	30	Complies
6	2437	7.36	30	Complies
11	2462	7.43	30	Complies

802.11n HT20

Channel	Frequency (MHz)	Conducted Power (dBm, Average)	Max. Limit (dBm)	Result
1	2412	6.57	30	Complies
6	2437	6.81	30	Complies
11	2462	6.94	30	Complies

802.11n HT40

Channel	Frequency (MHz)	Conducted Power (dBm, Average)	Max. Limit (dBm)	Result
3	2422	4.59	30	Complies
6	2437	4.77	30	Complies
9	2452	4.73	30	Complies

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5.2. Power Spectral Density Measurement

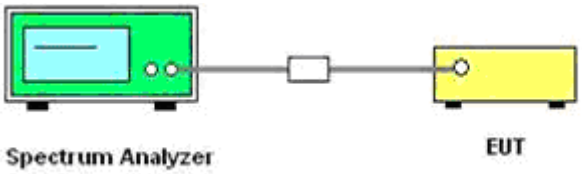
5.2.1. Standard Applicable

According to §15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2.2. Test Procedures

1) The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
2) The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
3) Set the RBW = 3 kHz.
4) Set the VBW ≥ 3*RBW
5) Set the span to 1.5 times the DTS channel bandwidth.
6) Detector = peak.
7) Sweep time = auto couple.
8) Trace mode = max hold.
9) Allow trace to fully stabilize.
10) Use the peak marker function to determine the maximum power level in any 3 kHz band segment within the fundamental EBW.

5.2.3. Test Setup Layout



5.2.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.5. Test Result of Power Spectral Density

Temperature	25℃	Humidity	60%
Test Engineer	Leo	Configurations	802.11b/g/n

802.11b

Channel	Frequency (MHz)	Power Density (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2412	-13.619	8	Complies
6	2437	-13.047	8	Complies
11	2462	-13.259	8	Complies

802.11g

Channel	Frequency (MHz)	Power Density (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2412	-17.369	8	Complies
6	2437	-16.482	8	Complies
11	2462	-15.766	8	Complies

802.11n HT20

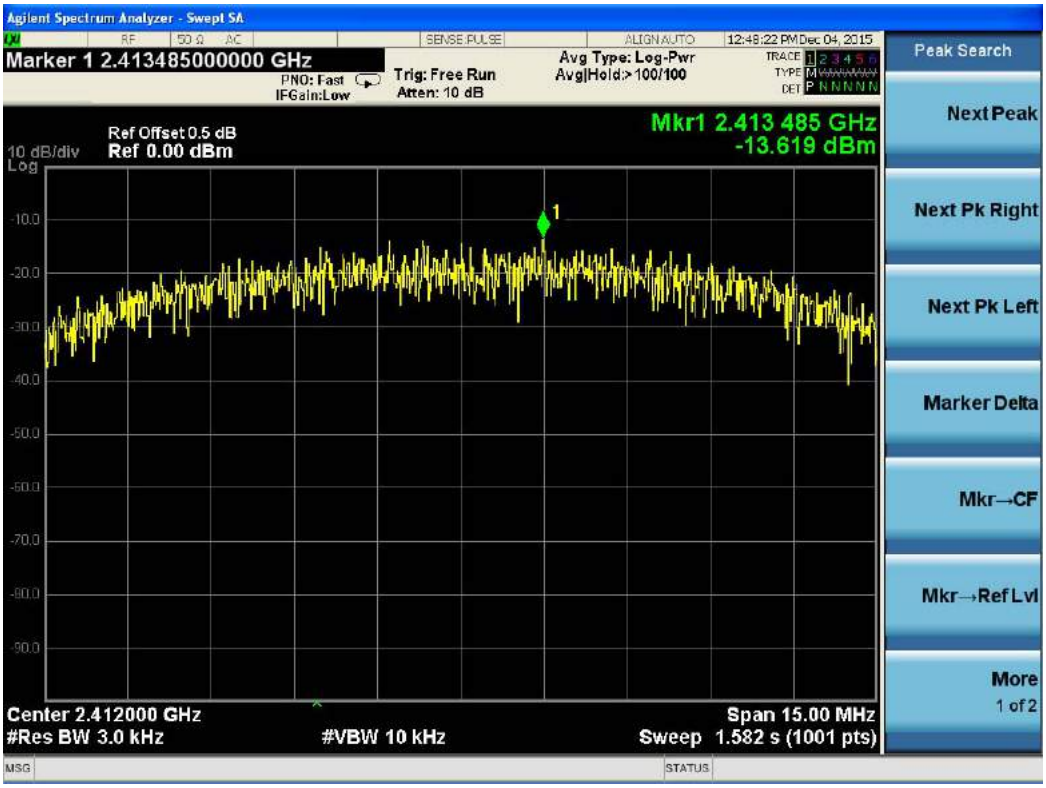
Channel	Frequency (MHz)	Power Density (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2412	-16.508	8	Complies
6	2437	-15.916	8	Complies
11	2462	-16.205	8	Complies

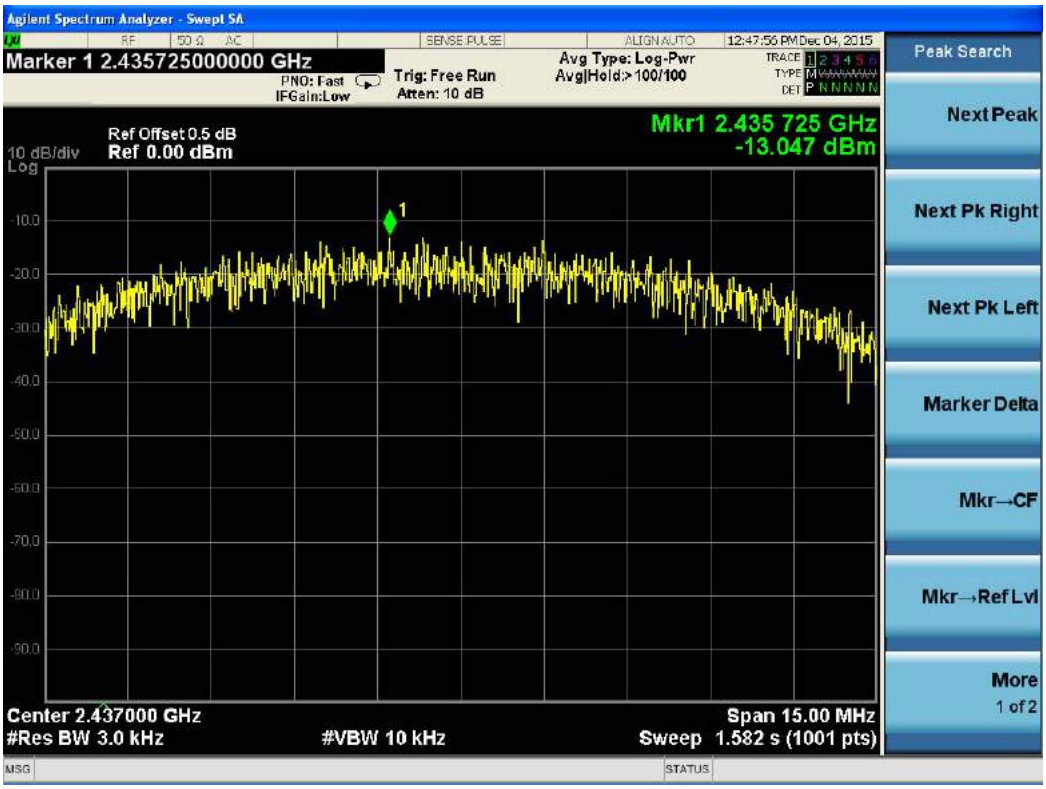
802.11n HT40

Channel	Frequency (MHz)	Power Density (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
3	2422	-18.369	8	Complies
6	2437	-19.341	8	Complies
9	2452	-18.087	8	Complies

Note: The measured power density (dBm) has the offset with cable loss already.

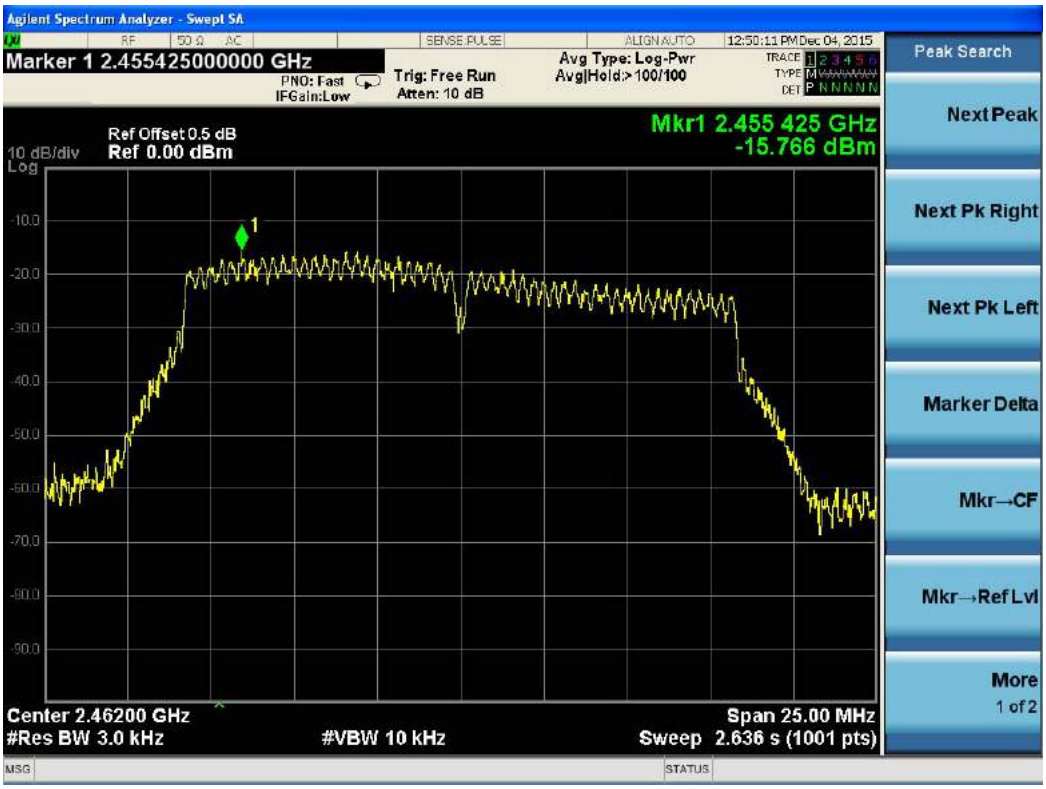
802.11b power density



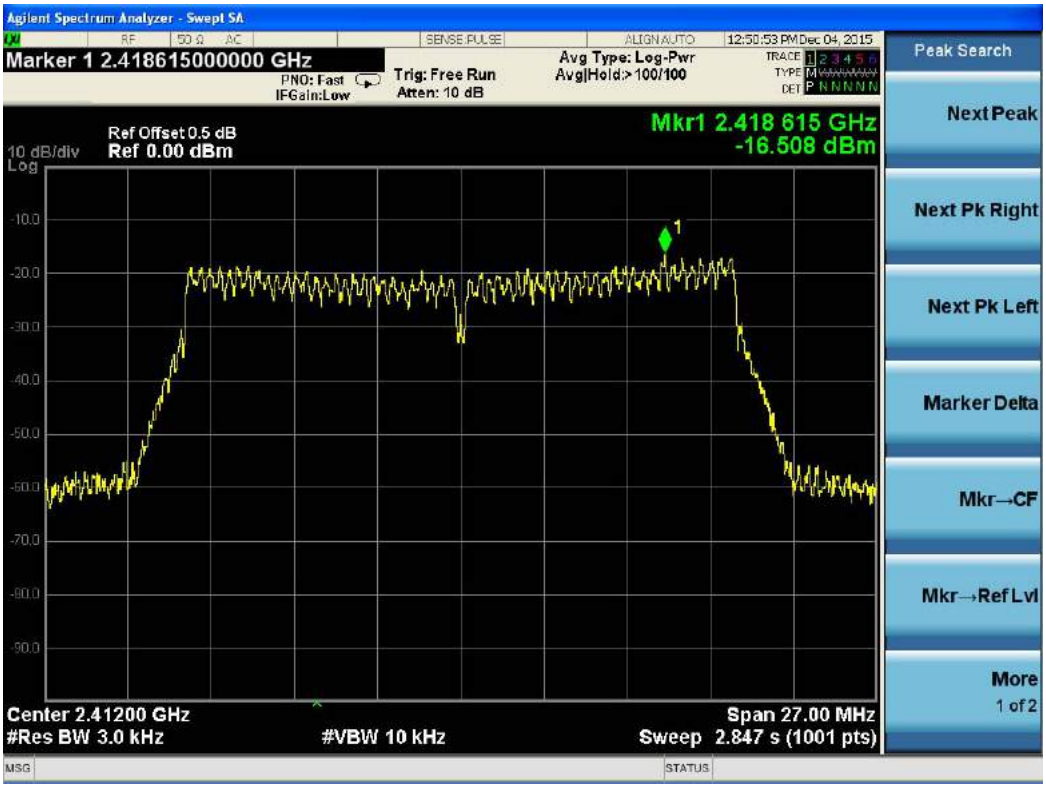


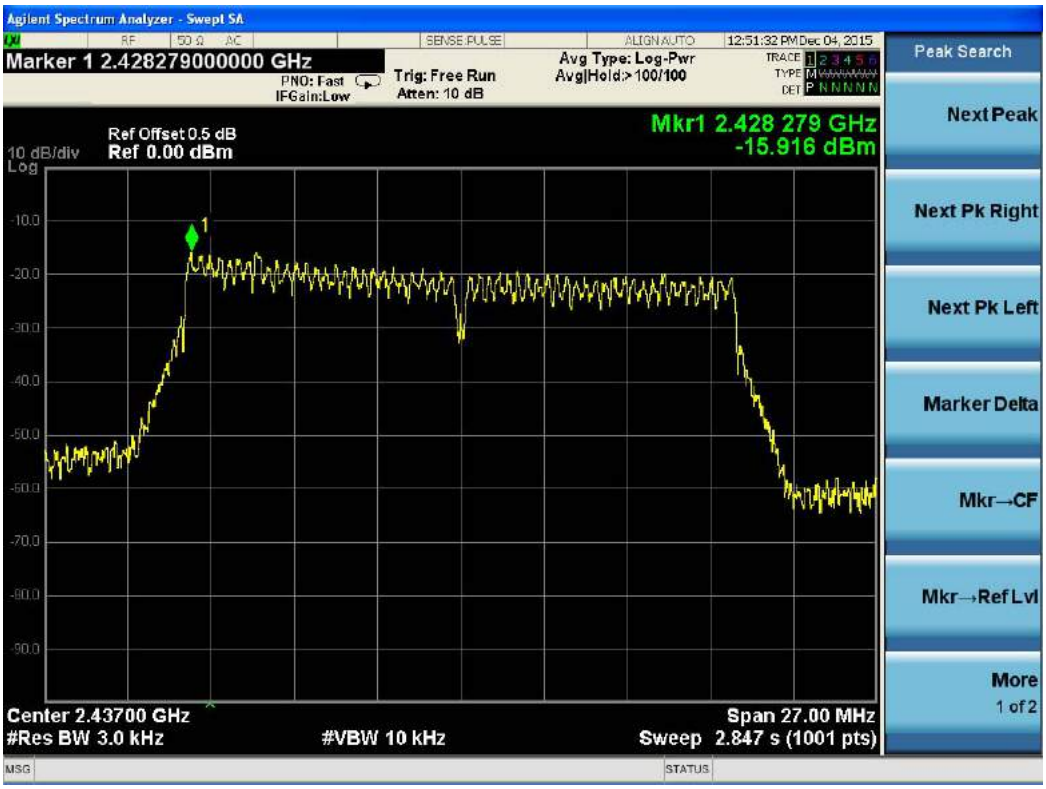
802.11g power density

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.430075000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
12:49:41 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 0.00 dBm
Log
Mkr1 2.430 075 GHz
-16.482 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 25.00 MHz
Sweep 2.636 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

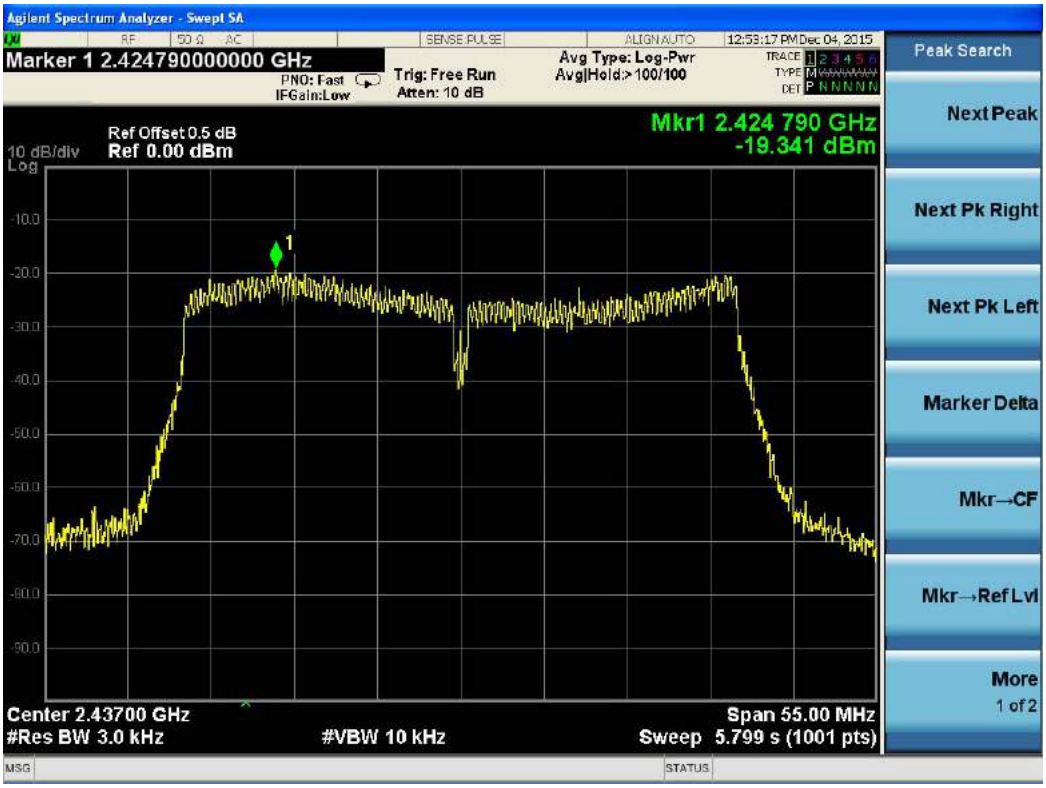

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.455425000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
12:50:11 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 0.00 dBm
Log
Mkr1 2.455 425 GHz
-15.766 dBm
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 25.00 MHz
Sweep 2.636 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

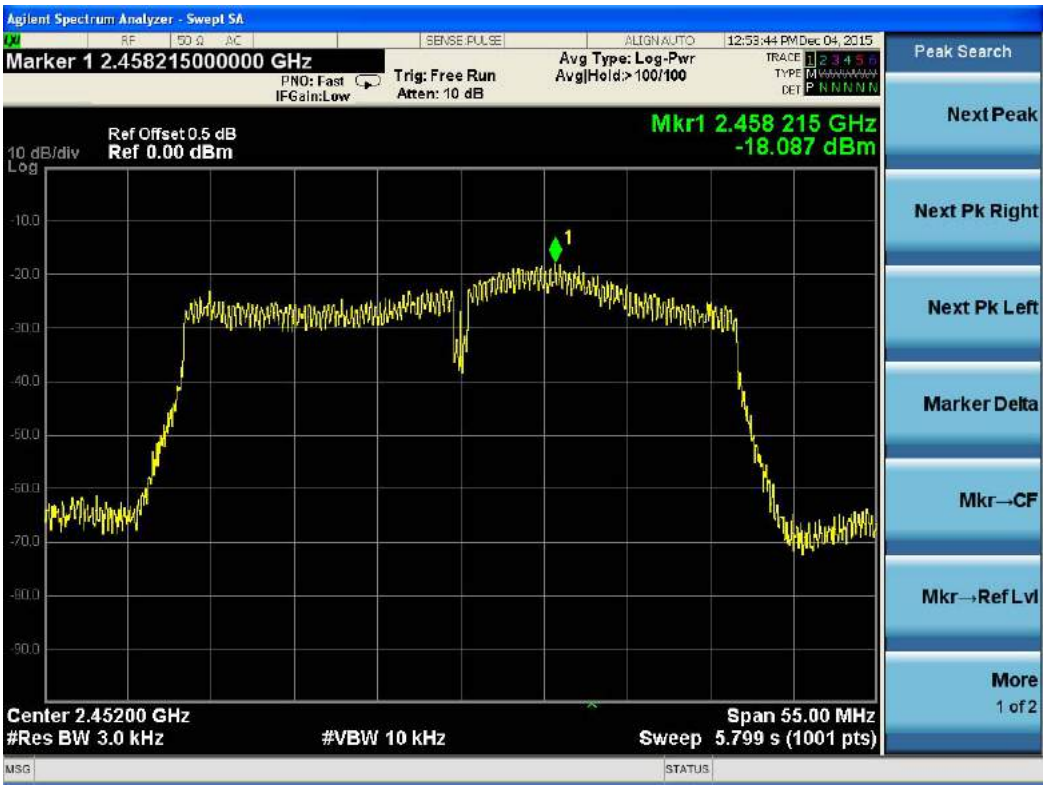
802.11n HT20 power density





802.11n HT40 power density


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.424790000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
12:53:17 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 0.00 dBm
Log
Mkr1 2.424 790 GHz
-19.341 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 55.00 MHz
Sweep 5.799 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.458215000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
12:53:44 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 0.00 dBm
Log
Mkr1 2.458 215 GHz
-18.087 dBm
Center 2.45200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 55.00 MHz
Sweep 5.799 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

5.3. 6 dB Spectrum Bandwidth Measurement

5.3.1. Standard Applicable

According to §15.247(a)(2): Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.3.2. Instruments Setting

The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> RBW
Detector	Peak
Trace	Max Hold
Sweep Time	100ms

5.3.3. Test Procedures

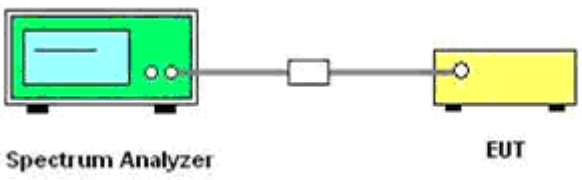
1) The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.

2) The resolution bandwidth and the video bandwidth were set according to KDB558074 D01 DTS Meas. Guidance v03r02.

3) Measured the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

4) Measured the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20dB relative to the maximum level measured in the fundamental emission.

5.3.4. Test Setup Layout



5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.6. Test Result of Spectrum Bandwidth

Temperature	25℃	Humidity	60%
Test Engineer	Leo	Configurations	802.11b/g/n

802.11b

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	9.97	500	Complies
6	2437	9.28	500	Complies
11	2462	8.59	500	Complies

802.11g

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	16.58	500	Complies
6	2437	16.51	500	Complies
11	2462	15.36	500	Complies

802.11n HT20

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	17.80	500	Complies
6	2437	17.75	500	Complies
11	2462	16.26	500	Complies

802.11n HT40

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
3	2422	34.83	500	Complies
6	2437	36.48	500	Complies
9	2452	34.73	500	Complies

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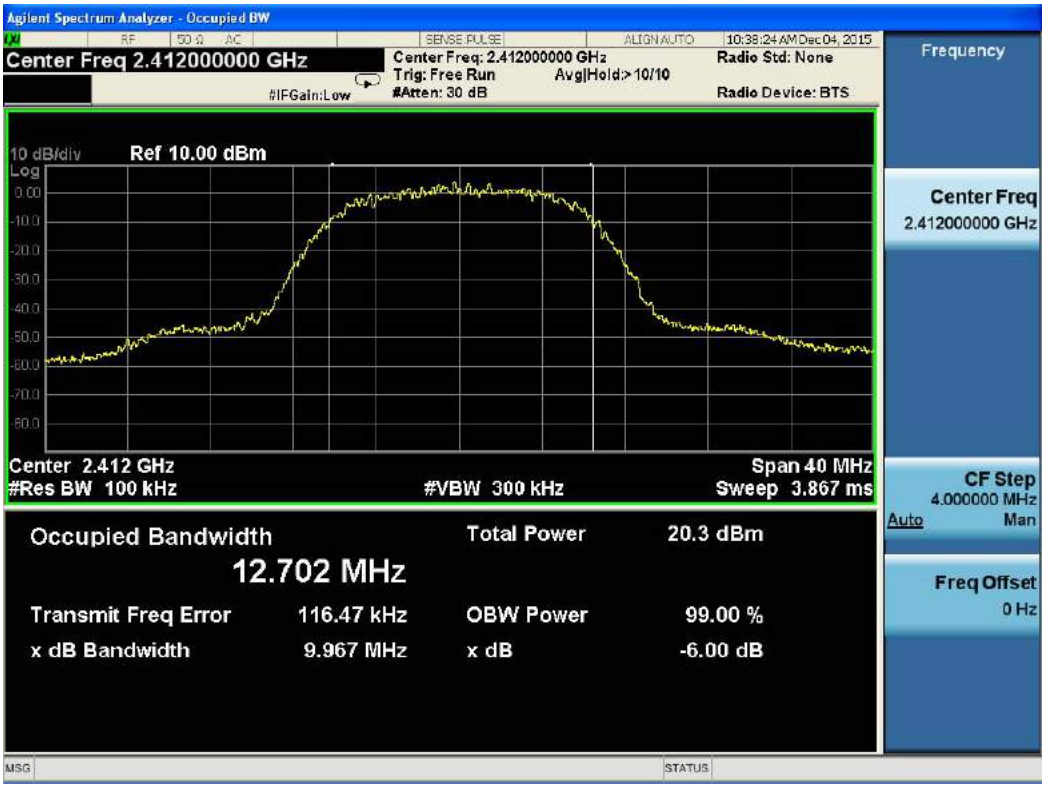
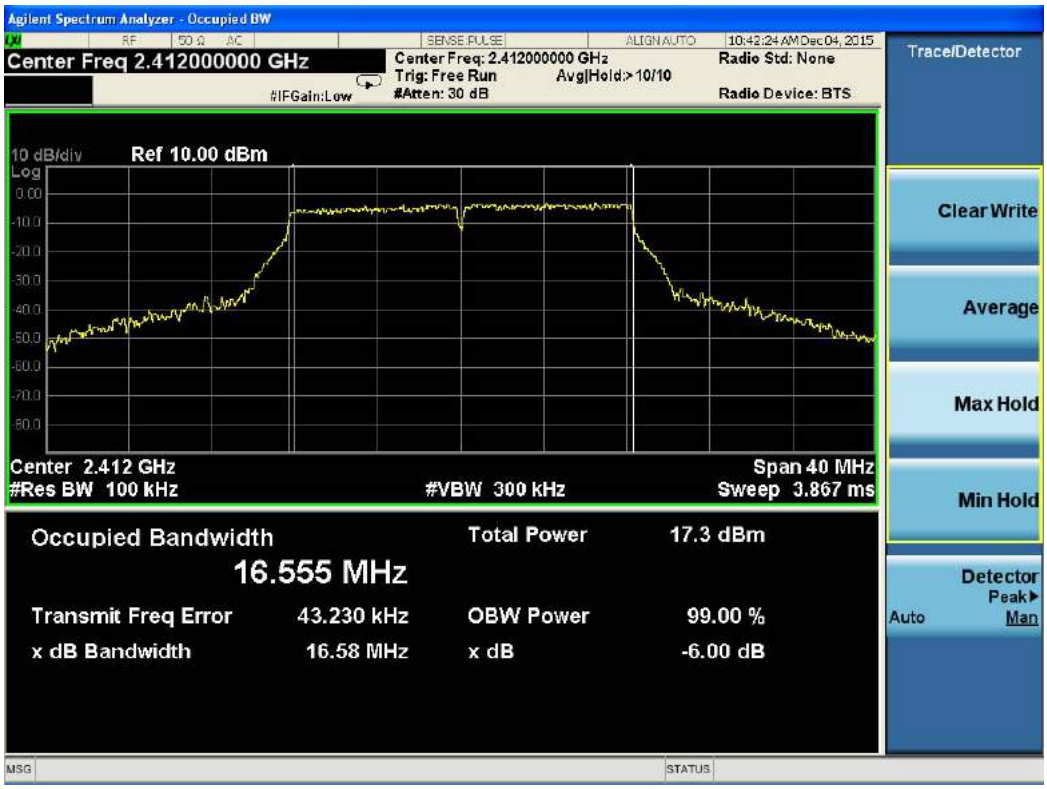
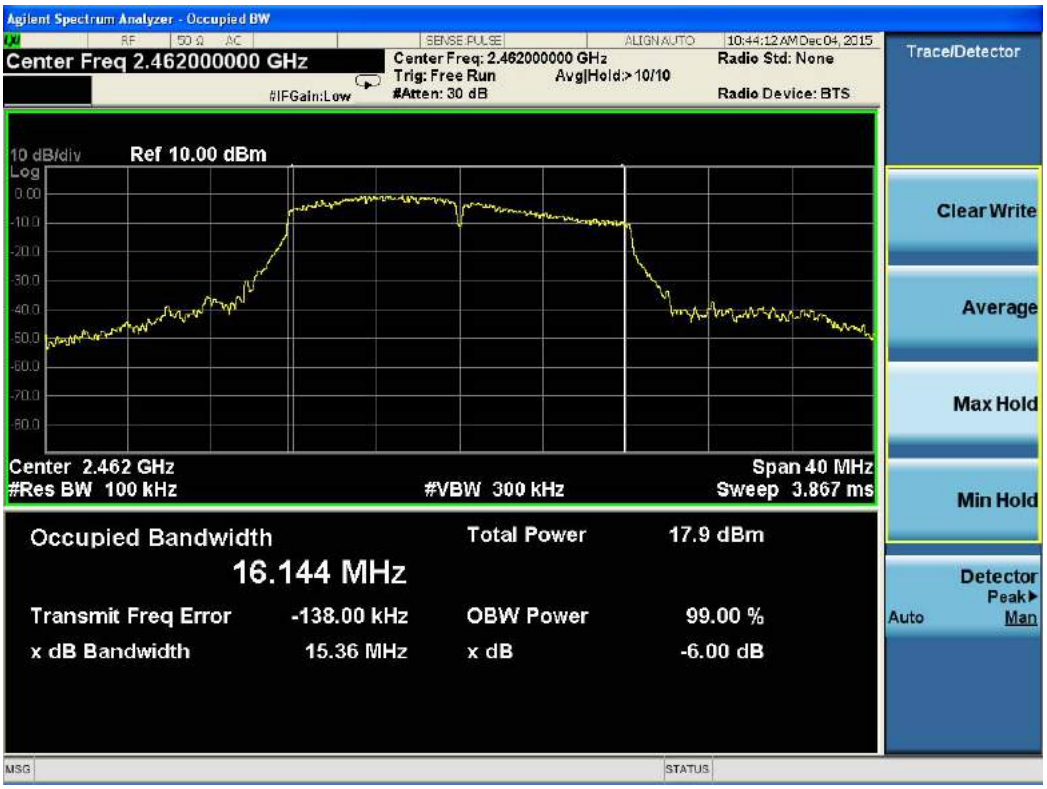
802.11b channel, 6dB bandwidth



802.11g channel, 6dB bandwidth



Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
10 dB/div
Ref 10.00 dBm
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
16.514 MHz
Total Power 19.2 dBm
Transmit Freq Error -93.961 kHz
OBW Power 99.00 %
x dB Bandwidth 16.51 MHz
x dB -6.00 dB
Trace/Detector
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
10 dB/div
Ref 10.00 dBm
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
16.144 MHz
Total Power 17.9 dBm
Transmit Freq Error -138.00 kHz
OBW Power 99.00 %
x dB Bandwidth 15.36 MHz
x dB -6.00 dB
Trace/Detector
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man

802.11n HT20 channel, 6dB bandwidth

802.11n HT40 channel, 6dB bandwidth

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
10:52:05 AM Dec 04, 2015
Trace/Detector
10 dB/div
Ref 10.00 dBm
Log
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 5.8 ms
Occupied Bandwidth
36.199 MHz
Total Power 16.0 dBm
Transmit Freq Error 102.63 kHz
OBW Power 99.00 %
x dB Bandwidth 36.48 MHz
x dB -6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.452000000 GHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
10:53:06 AM Dec 04, 2015
Trace/Detector
10 dB/div
Ref 10.00 dBm
Log
Center 2.452 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 5.8 ms
Occupied Bandwidth
35.787 MHz
Total Power 15.8 dBm
Transmit Freq Error -55.345 kHz
OBW Power 99.00 %
x dB Bandwidth 34.73 MHz
x dB -6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

802.11b

Channel	Frequency	20dB Bandwidth (MHz)	Limit
1	2412	14.71	Non-specified
6	2437	14.40	
11	2462	13.51	

802.11g

Channel	Frequency	20dB Bandwidth (MHz)	Limit
1	2412	19.43	Non-specified
6	2437	18.89	
11	2462	18.05	

802.11n HT20

Channel	Frequency	20dB Bandwidth (MHz)	Limit
1	2412	19.52	Non-specified
6	2437	19.19	
11	2462	18.62	

802.11n HT40

Channel	Frequency	20dB Bandwidth (MHz)	Limit
3	2422	39.00	Non-specified
6	2437	39.64	
9	2452	38.81	

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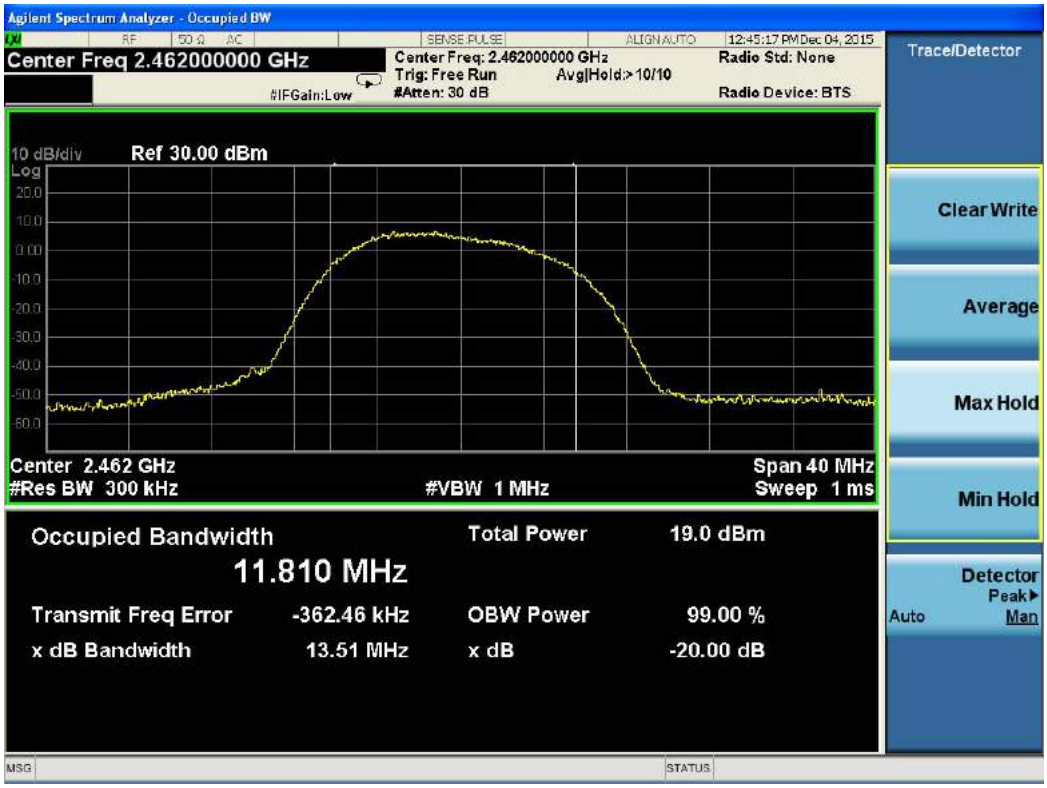
802.11b channel, 20dB bandwidth



802.11g channel, 20dB bandwidth

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
12:43:47 PM Dec 04, 2015
Trace/Detector
10 dB/div
Ref 30.00 dBm
Log
Center 2.437 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 40 MHz
Sweep 1 ms
Clear Write
Average
Max Hold
Min Hold
Occupied Bandwidth
16.899 MHz
Total Power 17.9 dBm
Transmit Freq Error -243.16 kHz
OBW Power 99.00 %
x dB Bandwidth 18.89 MHz
x dB -20.00 dB
Detector
Peak
Auto
Man
MSG
STATUS

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
12:44:10 PM Dec 04, 2015
Trace/Detector
10 dB/div
Ref 30.00 dBm
Log
Center 2.462 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 40 MHz
Sweep 1 ms
Clear Write
Average
Max Hold
Min Hold
Occupied Bandwidth
16.358 MHz
Total Power 18.0 dBm
Transmit Freq Error -206.21 kHz
OBW Power 99.00 %
x dB Bandwidth 18.05 MHz
x dB -20.00 dB
Detector
Peak
Auto
Man
MSG
STATUS

802.11n HT20 channel, 20dB bandwidth

802.11n HT40 channel, 20dB bandwidth

Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
12:40:52 PM Dec 04, 2015
Trace/Detector
10 dB/div
Ref 30.00 dBm
Log
Center 2.437 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Clear Write
Average
Max Hold
Min Hold
Occupied Bandwidth
36.809 MHz
Total Power 17.3 dBm
Transmit Freq Error 358.40 kHz
OBW Power 99.00 %
x dB Bandwidth 39.64 MHz
x dB -20.00 dB
Detector
Peak
Auto
Man
MSG
STATUS

Agilent Spectrum Analyzer - Occupied BW
VBW 3.0000 MHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
12:40:16 PM Dec 04, 2015
Trace/Detector
10 dB/div
Ref 30.00 dBm
Log
Center 2.452 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Clear Write
Average
Max Hold
Min Hold
Occupied Bandwidth
36.002 MHz
Total Power 17.4 dBm
Transmit Freq Error -67.773 kHz
OBW Power 99.00 %
x dB Bandwidth 38.81 MHz
x dB -20.00 dB
Detector
Peak
Auto
Man
MSG
STATUS

5.4. Radiated Emissions Measurement

5.4.1. Standard Applicable

According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies(MHz)	Field Strength(microvolts/meter)	Measurement Distance(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

5.4.2. Instruments Setting

The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

5.4.3. Test Procedures

1) **Sequence of testing 9 kHz to 30 MHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna height is 0.8 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

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2) **Sequence of testing 30 MHz to 1 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) **Sequence of testing 1 GHz to 18 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) **Sequence of testing above 18 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Premeasurement:

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

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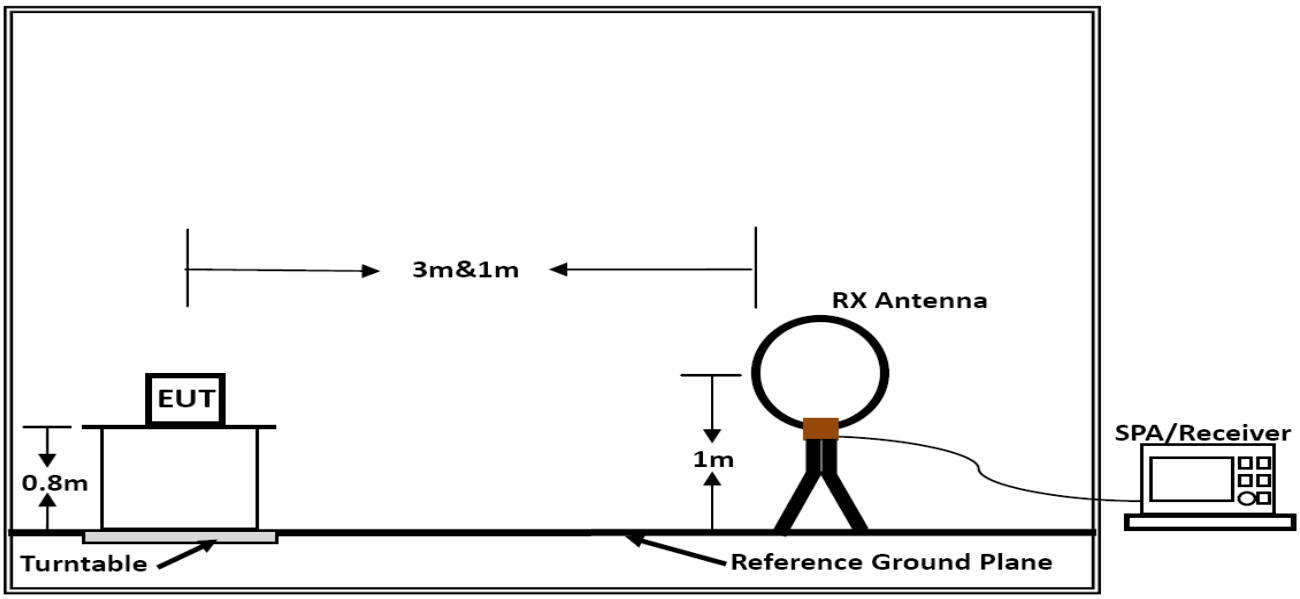
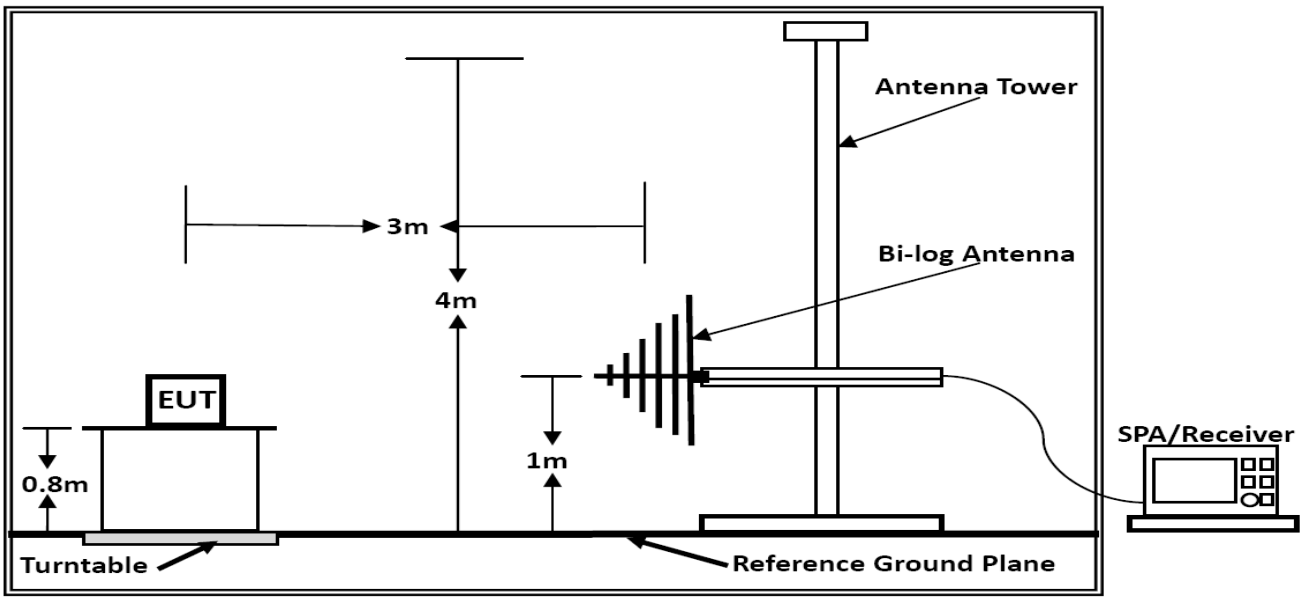
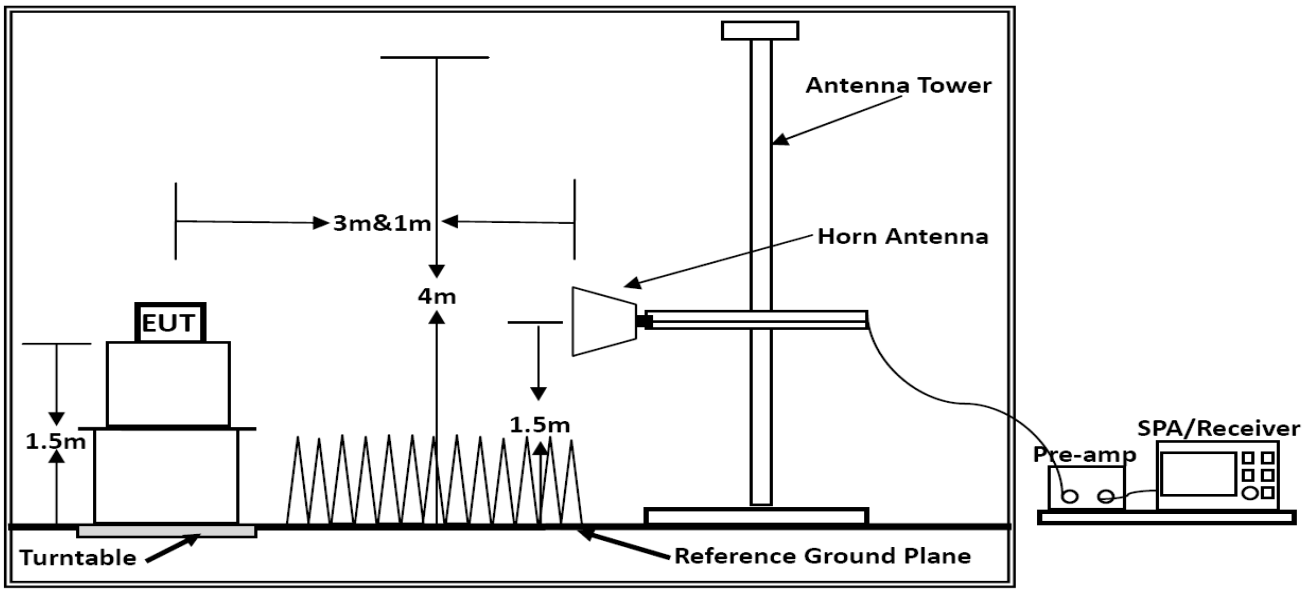
5.4.4. Test Setup Layout



Below 30MHz



Below 1GHz



Above 1GHz

Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.6. Results of Radiated Emissions (9kHz~30MHz)

Temperature	25℃	Humidity	60%
Test Engineer	Leo	Configurations	802.11b/g/n

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:

The radiated emissions from 9kHz to 30MHz are at least 20dB below the official limit and no need to report.

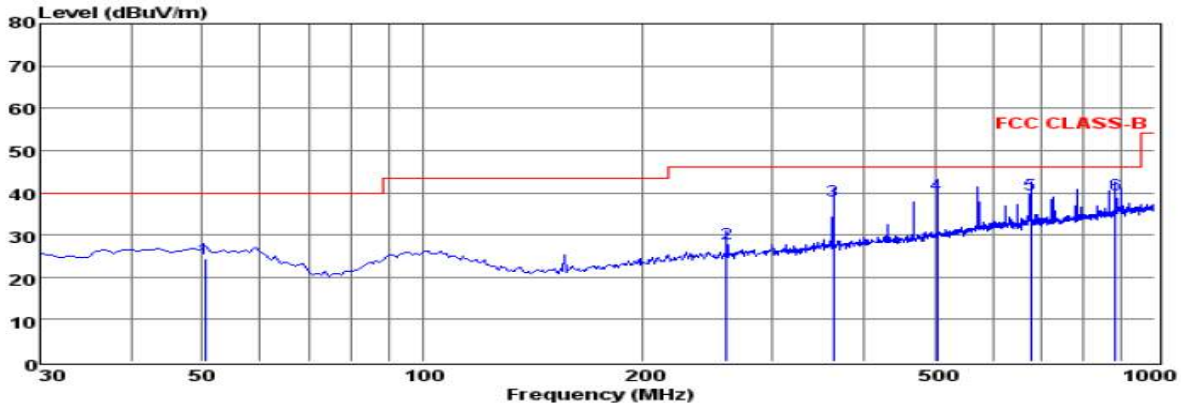
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

5.4.7. Results of Radiated Emissions (30MHz~1GHz)

Temperature	25℃	Humidity	60%
Test Engineer	Leo	Configurations	802.11b(Middle Channel)

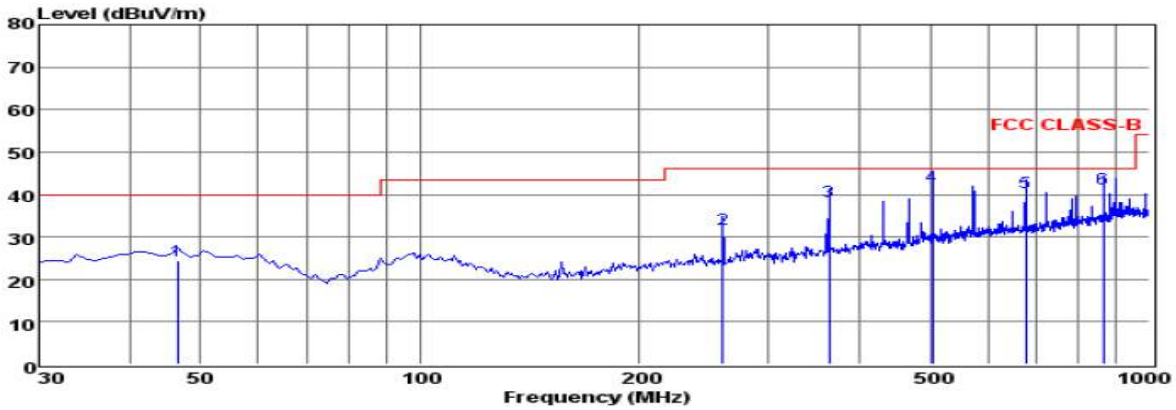
Test result for 802.11b (Middle Channel)



Env./Ins: 24℃/56%
EUT: WIPET Panoramic camera
M/N: WIPET
Power Rating: DC 3.7V
Test Mode: TX-Middle Channel(802.11b)
Operator: Leo
Memo:
pol: HORIZONTAL

	Freq MHz	Reading dBuV	CabLos dB	Antfac dB/m	Measured dBuV/m	Limit dBuV/m	Over dB	Remark
1	50.37	10.66	0.54	13.23	24.43	40.00	-15.57	QP
2	259.89	14.96	1.01	12.05	28.02	46.00	-17.98	QP
3	363.68	22.53	1.17	14.46	38.16	46.00	-7.84	QP
4	504.33	21.62	1.29	16.66	39.57	46.00	-6.43	QP
5	676.99	19.09	1.73	18.73	39.55	46.00	-6.45	QP
6	884.57	16.80	1.87	20.93	39.60	46.00	-6.40	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported



Env./Ins: 24℃/56%
EUT: WIPET Panoramic camera
M/N: WIPET
Power Rating: DC 3.7V
Test Mode: TX-Middle Channel(802.11b)
Operator: Leo
Memo:
pol: VERTICAL

	Freq MHz	Reading dBuV	CabLos dB	Antfac dB/m	Measured dBuV/m	Limit dBuV/m	Over dB	Remark
1	46.49	10.59	0.35	13.46	24.40	40.00	-15.60	QP
2	259.89	18.86	1.01	12.05	31.92	46.00	-14.08	QP
3	363.68	22.81	1.17	14.46	38.44	46.00	-7.56	QP
4	504.33	24.03	1.29	16.66	41.98	46.00	-4.02	QP
5	676.02	19.85	1.73	18.72	40.30	46.00	-5.70	QP
6	864.20	18.72	1.80	20.72	41.24	46.00	-4.76	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

Note:

Pre-scan all mode and recorded the worst case results in this report (802.11b (Middle Channel)).

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

5.4.8. Results for Radiated Emissions (Above 1GHz)

802.11b

Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.13	51.47	33.06	35.04	3.94	53.43	74	-20.57	Peak	Horizontal
4824.16	41.66	33.06	35.04	3.94	43.62	54	-10.38	Average	Horizontal
4824.13	53.71	33.06	35.04	3.94	55.67	74	-18.33	Peak	Vertical
4824.16	43.87	33.06	35.04	3.94	45.83	54	-8.17	Average	Vertical

Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.21	51.69	33.16	35.15	3.96	53.66	74	-20.34	Peak	Horizontal
4874.24	41.84	33.16	35.15	3.96	43.81	54	-10.19	Average	Horizontal
4874.21	54.83	33.16	35.15	3.96	56.80	74	-17.20	Peak	Vertical
4874.24	43.96	33.16	35.15	3.96	45.93	54	-8.07	Average	Vertical

Channel 11

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.34	48.71	33.26	35.14	3.98	50.81	74	-23.19	Peak	Horizontal
4924.37	39.06	33.26	35.14	3.98	41.16	54	-12.84	Average	Horizontal
4924.34	50.67	33.26	35.14	3.98	52.77	74	-21.23	Peak	Vertical
4924.37	40.83	33.26	35.14	3.98	42.93	54	-11.07	Average	Vertical

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802.11g

Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.15	49.64	33.06	35.04	3.94	51.60	74	-22.40	Peak	Horizontal
4824.18	38.71	33.06	35.04	3.94	40.67	54	-13.33	Average	Horizontal
4824.15	51.26	33.06	35.04	3.94	53.22	74	-20.78	Peak	Vertical
4824.18	41.38	33.06	35.04	3.94	43.34	54	-10.66	Average	Vertical

Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.23	48.79	33.16	35.15	3.96	50.76	74	-23.24	Peak	Horizontal
4874.25	38.51	33.16	35.15	3.96	40.48	54	-13.52	Average	Horizontal
4874.23	51.11	33.16	35.15	3.96	53.08	74	-20.92	Peak	Vertical
4874.25	41.53	33.16	35.15	3.96	43.50	54	-10.50	Average	Vertical

Channel 11

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.37	47.64	33.26	35.14	3.98	49.74	74	-24.26	Peak	Horizontal
4924.40	37.81	33.26	35.14	3.98	39.91	54	-14.09	Average	Horizontal
4924.37	50.16	33.26	35.14	3.98	52.26	74	-21.74	Peak	Vertical
4924.40	40.58	33.26	35.14	3.98	42.68	54	-11.32	Average	Vertical

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802.11n HT20

Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.18	47.16	33.06	35.04	3.94	49.12	74	-24.88	Peak	Horizontal
4824.20	38.01	33.06	35.04	3.94	39.97	54	-14.03	Average	Horizontal
4824.18	49.87	33.06	35.04	3.94	51.83	74	-22.17	Peak	Vertical
4824.20	40.16	33.06	35.04	3.94	42.12	54	-11.88	Average	Vertical

Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.27	47.67	33.16	35.15	3.96	49.64	74	-24.36	Peak	Horizontal
4874.30	38.19	33.16	35.15	3.96	40.16	54	-13.84	Average	Horizontal
4874.27	50.11	33.16	35.15	3.96	52.08	74	-21.92	Peak	Vertical
4874.30	40.53	33.16	35.15	3.96	42.50	54	-11.50	Average	Vertical

Channel 11

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.33	48.67	33.26	35.14	3.98	50.77	74	-23.23	Peak	Horizontal
4924.36	38.85	33.26	35.14	3.98	40.95	54	-13.05	Average	Horizontal
4924.33	50.47	33.26	35.14	3.98	52.57	74	-21.43	Peak	Vertical
4924.36	40.63	33.26	35.14	3.98	42.73	54	-11.27	Average	Vertical

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802.11n HT40

Channel 3

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4844.31	48.04	33.06	35.04	3.94	50.00	74	-24.00	Peak	Horizontal
4844.34	37.72	33.06	35.04	3.94	39.68	54	-14.32	Average	Horizontal
4844.31	48.86	33.06	35.04	3.94	50.82	74	-23.18	Peak	Vertical
4844.34	39.08	33.06	35.04	3.94	41.04	54	-12.96	Average	Vertical

Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.27	48.17	33.16	35.15	3.96	50.14	74	-23.86	Peak	Horizontal
4874.30	38.37	33.16	35.15	3.96	40.34	54	-13.66	Average	Horizontal
4874.27	48.71	33.16	35.15	3.96	50.68	74	-23.32	Peak	Vertical
4874.30	38.75	33.16	35.15	3.96	40.72	54	-13.28	Average	Vertical

Channel 9

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4904.42	48.15	33.26	35.14	3.98	50.25	74	-23.75	Peak	Horizontal
4904.45	38.79	33.26	35.14	3.98	40.89	54	-13.11	Average	Horizontal
4904.42	49.44	33.26	35.14	3.98	51.54	74	-22.46	Peak	Vertical
4904.45	39.94	33.26	35.14	3.98	42.04	54	-11.96	Average	Vertical

Notes:

1. *Measuring frequencies from 9k~10th harmonic or 26.5GHz (which is less), No emission found between lowest internal used/generated frequency to 30MHz.*
2. *Radiated emissions measured in frequency range from 30MHz~10th harmonic or 26.5GHz (which is less) were made with an instrument using Peak detector mode.*
3. *The radiated emissions from 18GHz to 25GHz are at least 20dB below the official limit and no need to report.*

5.4.9. Results of Band Edges Test (Radiated)

802.11b

Tx-2412

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2376.13	42.95	32.89	35.16	3.51	44.19	74	-29.81	Peak	Horizontal
2376.16	33.07	32.90	35.16	3.51	34.32	54	-19.68	Average	Horizontal
2390.00	51.00	32.92	35.16	3.54	52.30	74	-21.70	Peak	Horizontal
2389.97	41.85	32.92	35.16	3.54	43.15	54	-10.85	Average	Horizontal
2400.00	54.64	32.92	35.16	3.54	55.94	74	-18.06	Peak	Horizontal
2399.97	44.54	32.92	35.16	3.54	45.84	54	-8.16	Average	Horizontal
2376.13	42.66	32.89	35.16	3.51	43.90	74	-30.10	Peak	Vertical
2376.16	32.86	32.90	35.16	3.51	34.11	54	-19.89	Average	Vertical
2390.00	52.01	32.92	35.16	3.54	53.31	74	-20.69	Peak	Vertical
2389.97	42.74	32.92	35.16	3.54	44.04	54	-9.96	Average	Vertical
2400.00	55.56	32.92	35.16	3.54	56.86	74	-17.14	Peak	Vertical
2399.97	45.38	32.92	35.16	3.54	46.68	54	-7.32	Average	Vertical

Tx-2462

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2483.50	49.26	33.06	35.18	3.60	50.74	74	-23.26	Peak	Horizontal
2483.53	39.76	33.08	35.18	3.60	41.26	54	-12.74	Average	Horizontal
2488.17	46.87	33.08	35.18	3.62	48.39	74	-25.61	Peak	Horizontal
2488.20	38.55	33.08	35.18	3.62	40.07	54	-13.93	Average	Horizontal
2483.50	48.89	33.06	35.18	3.60	50.37	74	-23.63	Peak	Vertical
2483.53	38.76	33.08	35.18	3.60	40.26	54	-13.74	Average	Vertical
2488.17	47.44	33.08	35.18	3.62	48.96	74	-25.04	Peak	Vertical
2488.20	35.19	33.08	35.18	3.62	36.71	54	-17.29	Average	Vertical

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802.11g

Tx-2412

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2378.65	44.91	32.89	35.16	3.51	46.15	74	-27.85	Peak	Horizontal
2378.68	37.66	32.90	35.16	3.51	38.91	54	-15.09	Average	Horizontal
2390.00	51.03	32.92	35.16	3.54	52.33	74	-21.67	Peak	Horizontal
2389.97	41.64	32.92	35.16	3.54	42.94	54	-11.06	Average	Horizontal
2400.00	56.49	32.92	35.16	3.54	57.79	74	-16.21	Peak	Horizontal
2399.97	47.38	32.92	35.16	3.54	48.68	54	-5.32	Average	Horizontal
2378.65	46.25	32.89	35.16	3.51	47.49	74	-26.51	Peak	Vertical
2378.68	35.88	32.90	35.16	3.51	37.13	54	-16.87	Average	Vertical
2390.00	52.32	32.92	35.16	3.54	53.62	74	-20.38	Peak	Vertical
2389.97	42.44	32.92	35.16	3.54	43.74	54	-10.26	Average	Vertical
2400.00	55.22	32.92	35.16	3.54	56.52	74	-17.48	Peak	Vertical
2399.97	45.49	32.92	35.16	3.54	46.79	54	-7.21	Average	Vertical

Tx-2462

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2483.50	49.90	33.06	35.18	3.60	51.38	74	-22.62	Peak	Horizontal
2483.51	40.91	33.08	35.18	3.60	42.41	54	-11.59	Average	Horizontal
2487.33	48.42	33.08	35.18	3.62	49.94	74	-24.06	Peak	Horizontal
2487.36	38.72	33.08	35.18	3.62	40.24	54	-13.76	Average	Horizontal
2483.50	50.00	33.06	35.18	3.60	51.48	74	-22.52	Peak	Vertical
2483.51	40.60	33.08	35.18	3.60	42.10	54	-11.90	Average	Vertical
2487.33	48.49	33.08	35.18	3.62	50.01	74	-23.99	Peak	Vertical
2487.36	39.29	33.08	35.18	3.62	40.81	54	-13.19	Average	Vertical

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802.11n(HT20)

Tx-2412

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2375.44	49.36	32.89	35.16	3.51	50.60	74	-23.40	Peak	Horizontal
2375.47	39.77	32.90	35.16	3.51	41.02	54	-12.98	Average	Horizontal
2390.00	52.27	32.92	35.16	3.54	53.57	74	-20.43	Peak	Horizontal
2389.97	43.07	32.92	35.16	3.54	44.37	54	-9.63	Average	Horizontal
2400.00	56.79	32.92	35.16	3.54	58.09	74	-15.91	Peak	Horizontal
2399.97	46.94	32.92	35.16	3.54	48.24	54	-5.76	Average	Horizontal
2375.44	46.63	32.89	35.16	3.51	47.87	74	-26.13	Peak	Vertical
2375.47	40.23	32.90	35.16	3.51	41.48	54	-12.52	Average	Vertical
2390.00	63.48	32.92	35.16	3.54	64.78	74	-9.22	Peak	Vertical
2389.99	43.63	32.92	35.16	3.54	44.93	54	-9.07	Average	Vertical
2400.00	56.31	32.92	35.16	3.54	57.61	74	-16.39	Peak	Vertical
2399.97	47.02	32.92	35.16	3.54	48.32	54	-5.68	Average	Vertical

Tx-2462

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2483.50	51.10	33.06	35.18	3.60	52.58	74	-21.42	Peak	Horizontal
2483.51	42.11	33.08	35.18	3.60	43.61	54	-10.39	Average	Horizontal
2486.87	49.70	33.08	35.18	3.62	51.22	74	-22.78	Peak	Horizontal
2486.90	39.94	33.08	35.18	3.62	41.46	54	-12.54	Average	Horizontal
2483.50	51.00	33.06	35.18	3.60	52.48	74	-21.52	Peak	Vertical
2483.51	41.87	33.08	35.18	3.60	43.37	54	-10.63	Average	Vertical
2486.87	50.09	33.08	35.18	3.62	51.61	74	-22.39	Peak	Vertical
2486.90	40.47	33.08	35.18	3.62	41.99	54	-12.01	Average	Vertical

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802.11n(HT40)

Tx-2422

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2376.81	48.40	32.89	35.16	3.51	49.64	74	-24.36	Peak	Horizontal
2376.84	37.54	32.90	35.16	3.51	38.79	54	-15.21	Average	Horizontal
2390.00	54.01	32.92	35.16	3.54	55.31	74	-18.69	Peak	Horizontal
2389.97	44.59	32.92	35.16	3.54	45.89	54	-8.11	Average	Horizontal
2400.00	54.25	32.92	35.16	3.54	55.55	74	-18.45	Peak	Horizontal
2399.97	44.98	32.92	35.16	3.54	46.28	54	-7.72	Average	Horizontal
2376.81	47.26	32.89	35.16	3.51	48.50	74	-25.50	Peak	Vertical
2376.84	38.75	32.90	35.16	3.51	40.00	54	-14.00	Average	Vertical
2390.00	55.33	32.92	35.16	3.54	56.63	74	-17.37	Peak	Vertical
2389.97	46.28	32.92	35.16	3.54	47.58	54	-6.42	Average	Vertical
2400.00	59.74	32.92	35.16	3.54	61.04	74	-12.96	Peak	Vertical
2399.97	48.44	32.92	35.16	3.54	49.74	54	-4.26	Average	Vertical

Tx-2452

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
2483.50	52.37	33.06	35.18	3.60	53.85	74	-20.15	Peak	Horizontal
2483.51	42.83	33.08	35.18	3.60	44.33	54	-9.67	Average	Horizontal
2488.16	49.01	33.08	35.18	3.62	50.53	74	-23.47	Peak	Horizontal
2488.19	38.89	33.08	35.18	3.62	40.41	54	-13.59	Average	Horizontal
2483.50	55.17	33.06	35.18	3.60	56.65	74	-17.35	Peak	Vertical
2483.51	45.83	33.08	35.18	3.60	47.33	54	-6.67	Average	Vertical
2488.16	49.94	33.08	35.18	3.62	51.46	74	-22.54	Peak	Vertical
2488.19	39.77	33.08	35.18	3.62	41.29	54	-12.71	Average	Vertical

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5.5. Conducted Spurious Emissions and Band Edges Test

5.5.1. Standard Applicable

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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a)is not required. In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see§15.205(c)).

5.5.2. Instruments Setting

The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
RB / VB (Emission in restricted band)	100KHz/300KHz
RB / VB (Emission in non-restricted band)	100KHz/300KHz

5.5.3. Test Procedures

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz

The spectrum from 9kHz to 26.5GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

5.5.4. Test Setup Layout

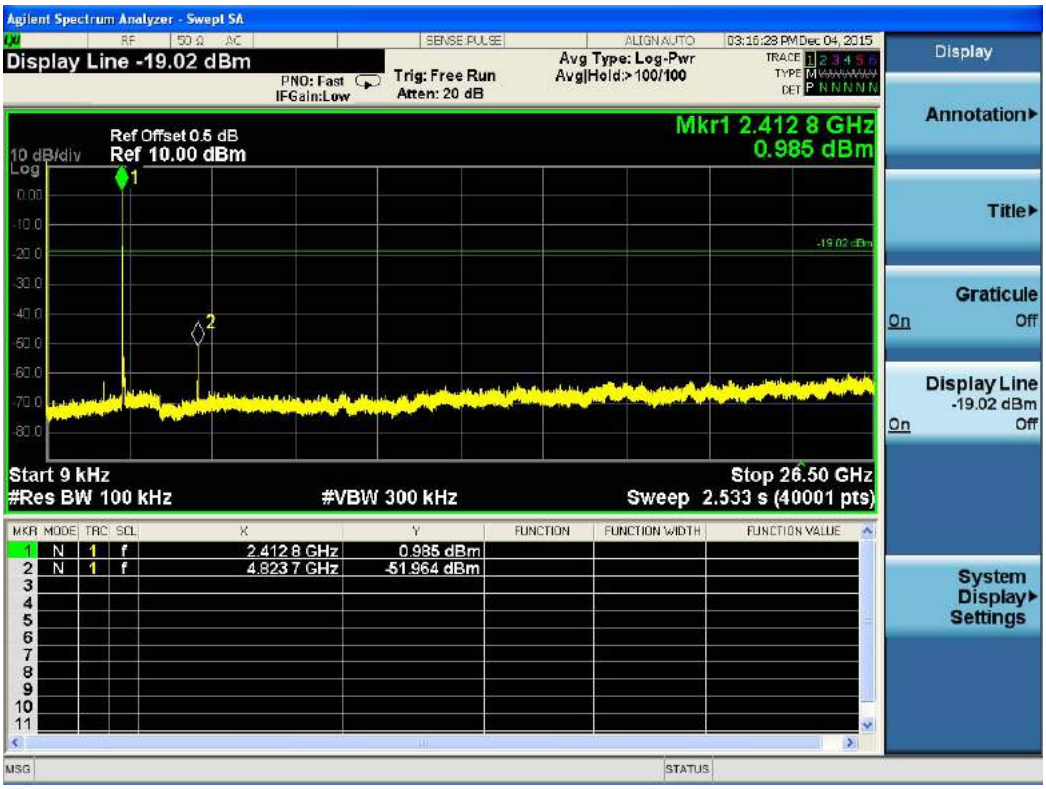
This test setup layout is the same as that shown in section 5.3.4.

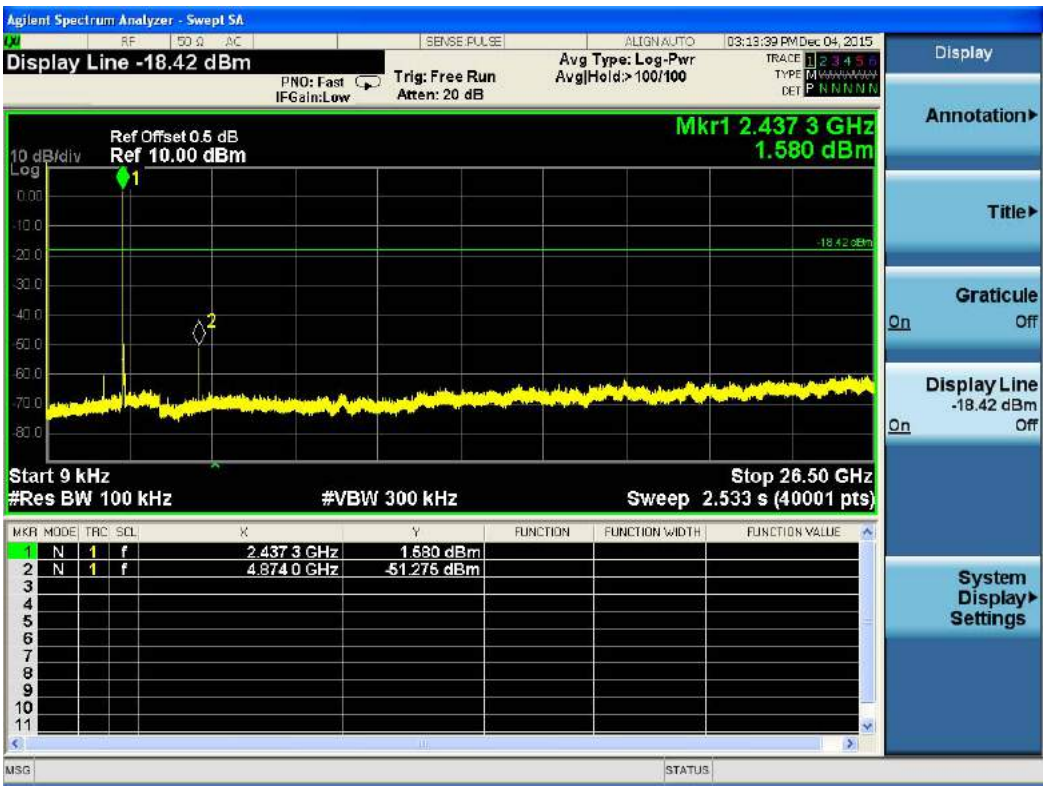
5.5.5. EUT Operation during Test

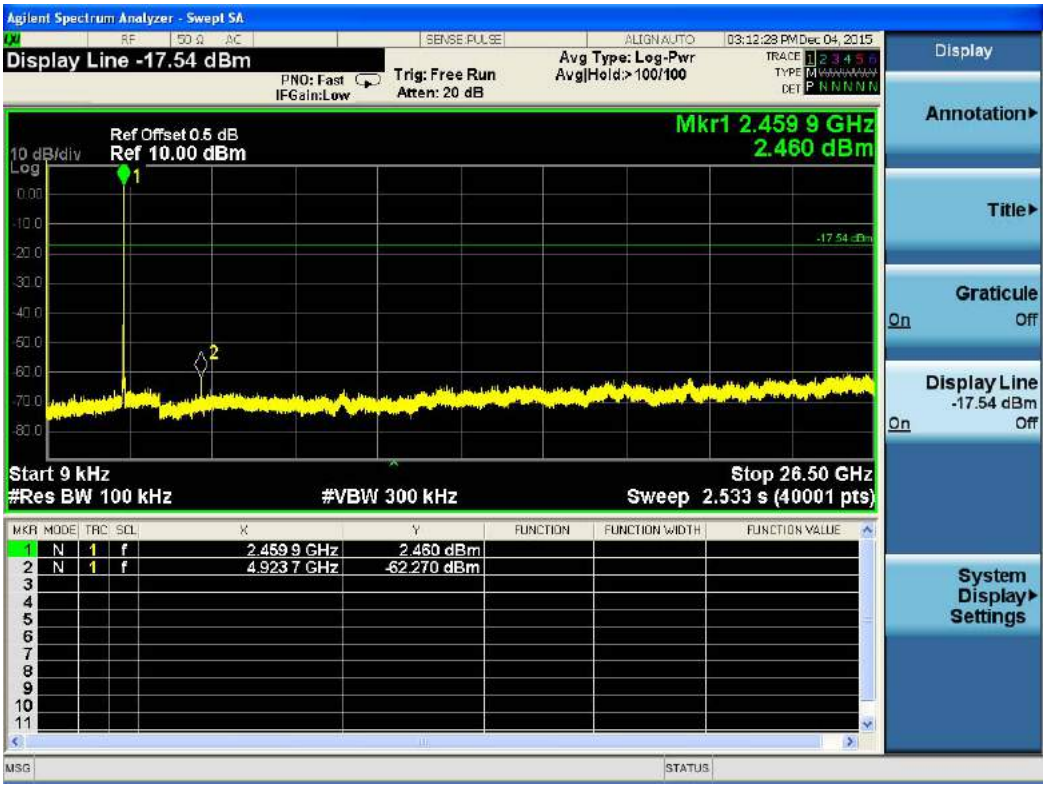
The EUT was programmed to be in continuously transmitting mode.

5.5.6. Test Results of Conducted Spurious Emissions

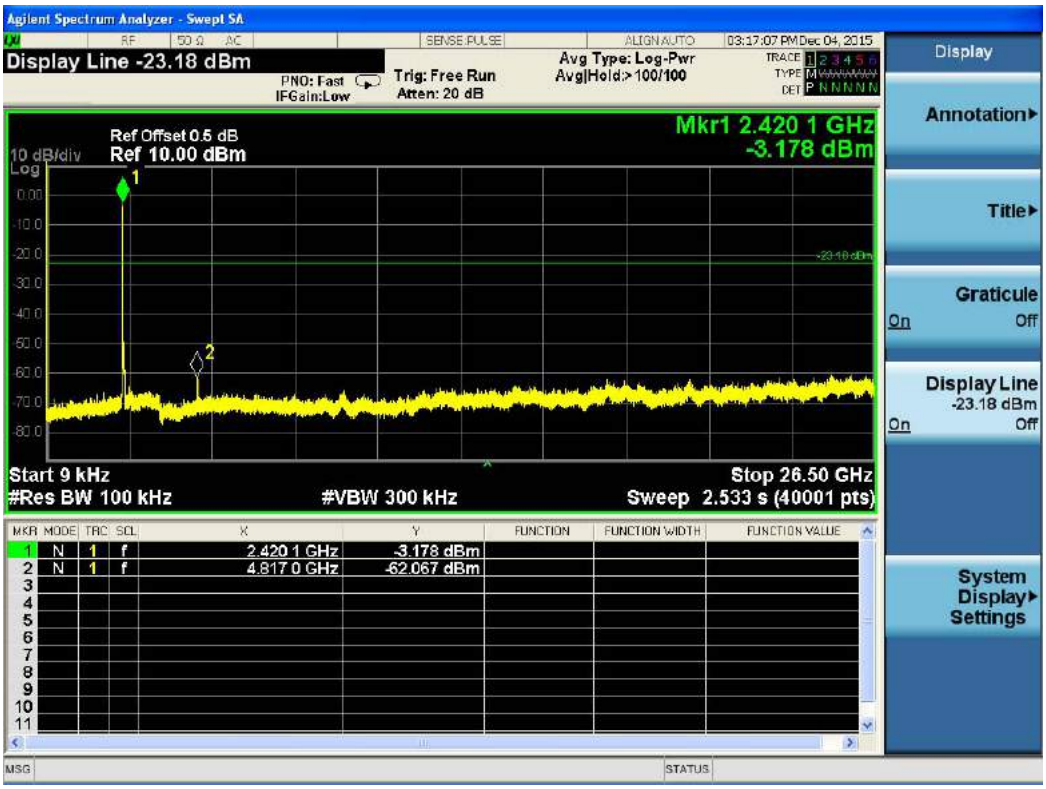
802.11b

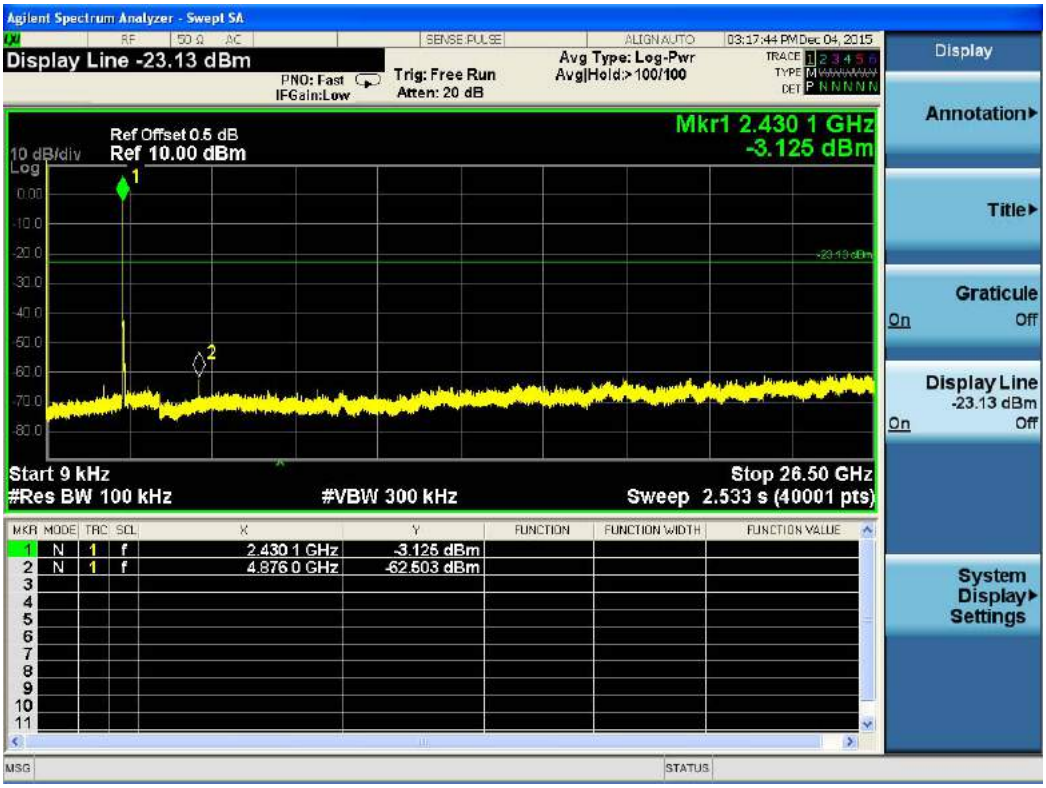


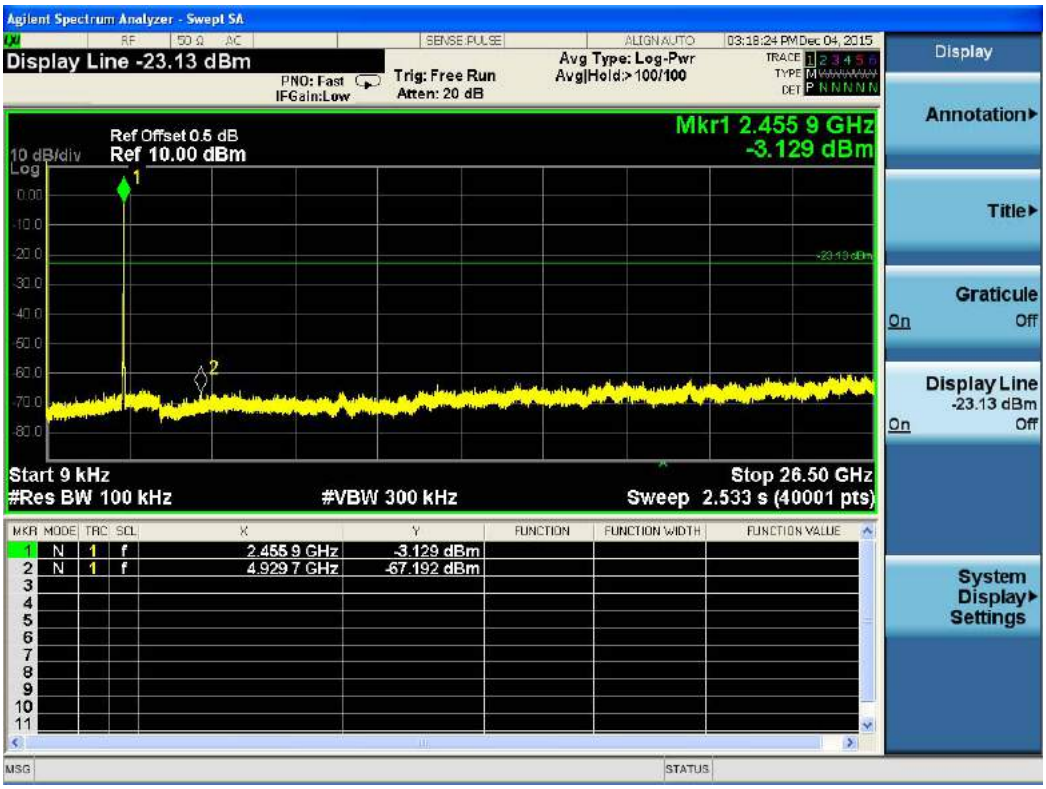



Agilent Spectrum Analyzer - Swept SA
Display Line -17.54 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.459 9 GHz
2.460 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.459 9 GHz 2.460 dBm
2 N 1 f 4.923 7 GHz -62.270 dBm
Display
Annotation
Title
Graticule
Display Line
-17.54 dBm
System Display Settings

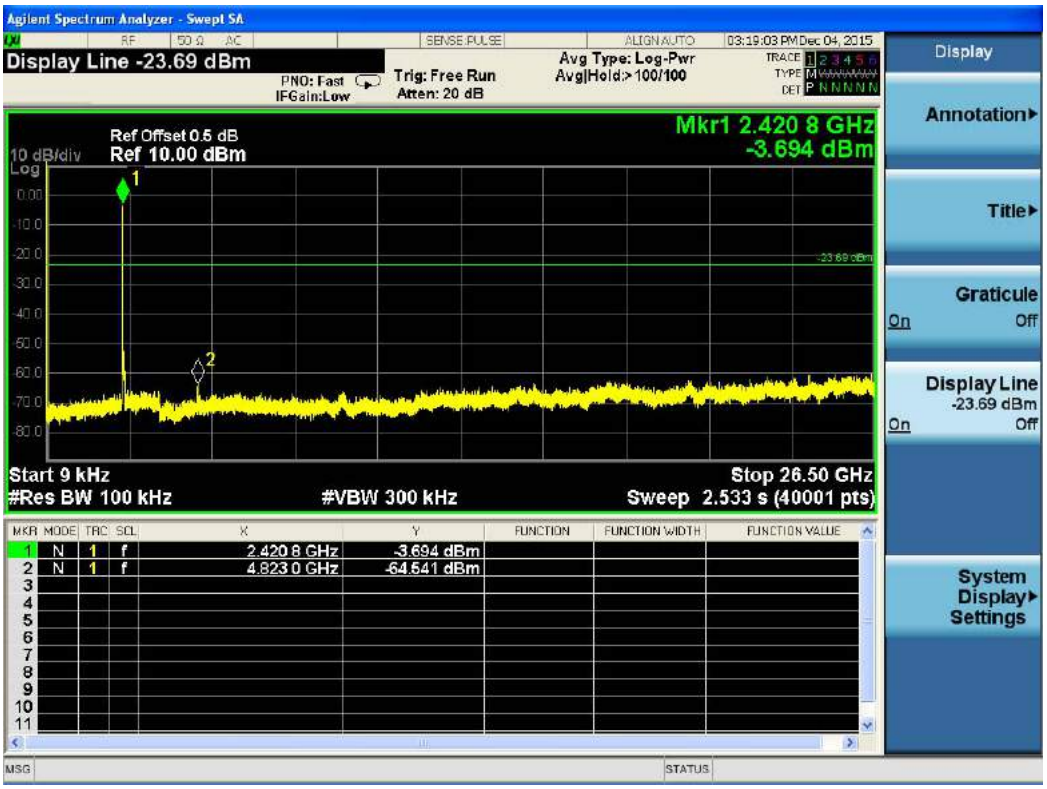
802.11g

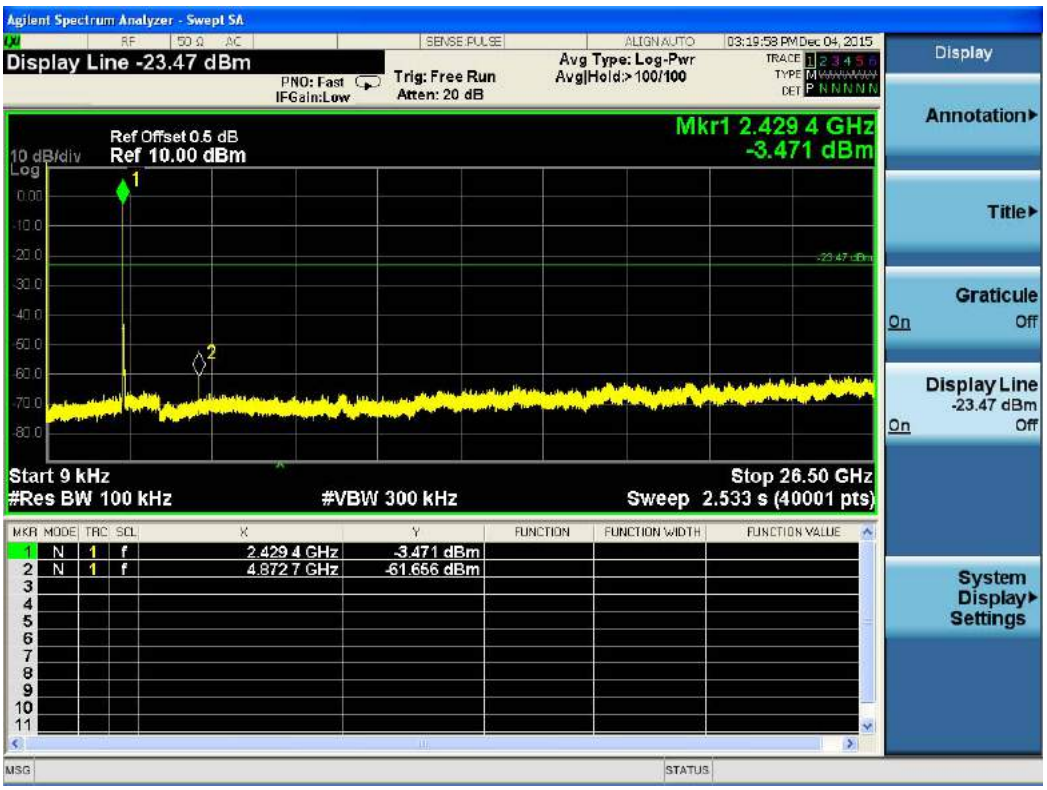

Agilent Spectrum Analyzer - Swept SA
Display Line -23.18 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.420 1 GHz
-3.178 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.420 1 GHz -3.178 dBm
2 N 1 f 4.817 0 GHz -62.067 dBm
Display
Annotation
Title
Graticule
Display Line
-23.18 dBm
System Display Settings

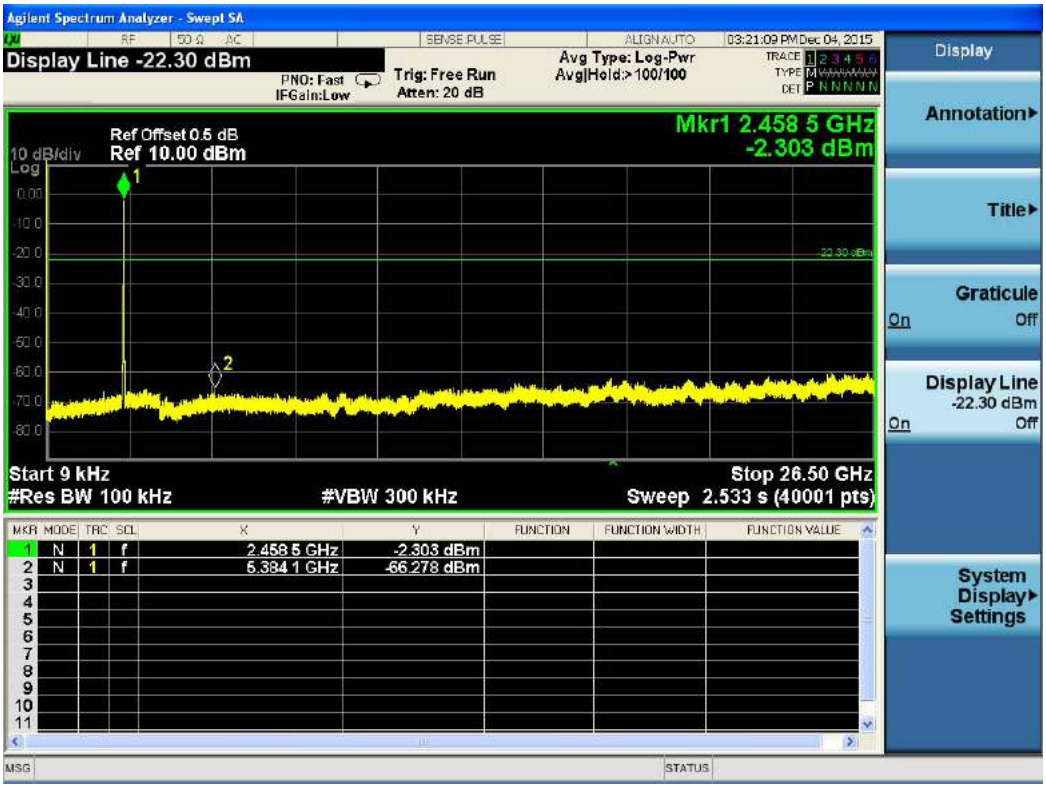

Agilent Spectrum Analyzer - Swept SA
Display Line -23.13 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:17:44 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.430 1 GHz
-3.125 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.430 1 GHz -3.125 dBm
2 N 1 f 4.876 0 GHz -62.503 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-23.13 dBm
On Off
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -23.13 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:18:24 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.455 9 GHz
-3.129 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.455 9 GHz -3.129 dBm
2 N 1 f 4.929 7 GHz -67.192 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-23.13 dBm
On Off
System Display Settings

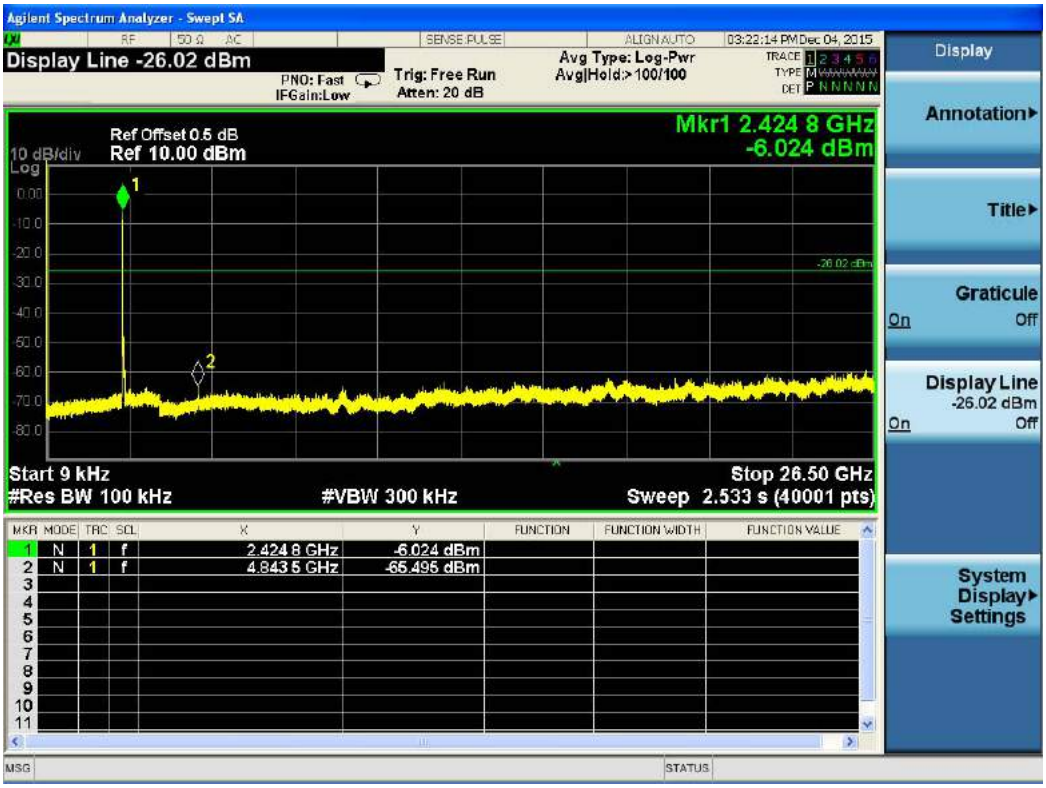
802.11n HT20

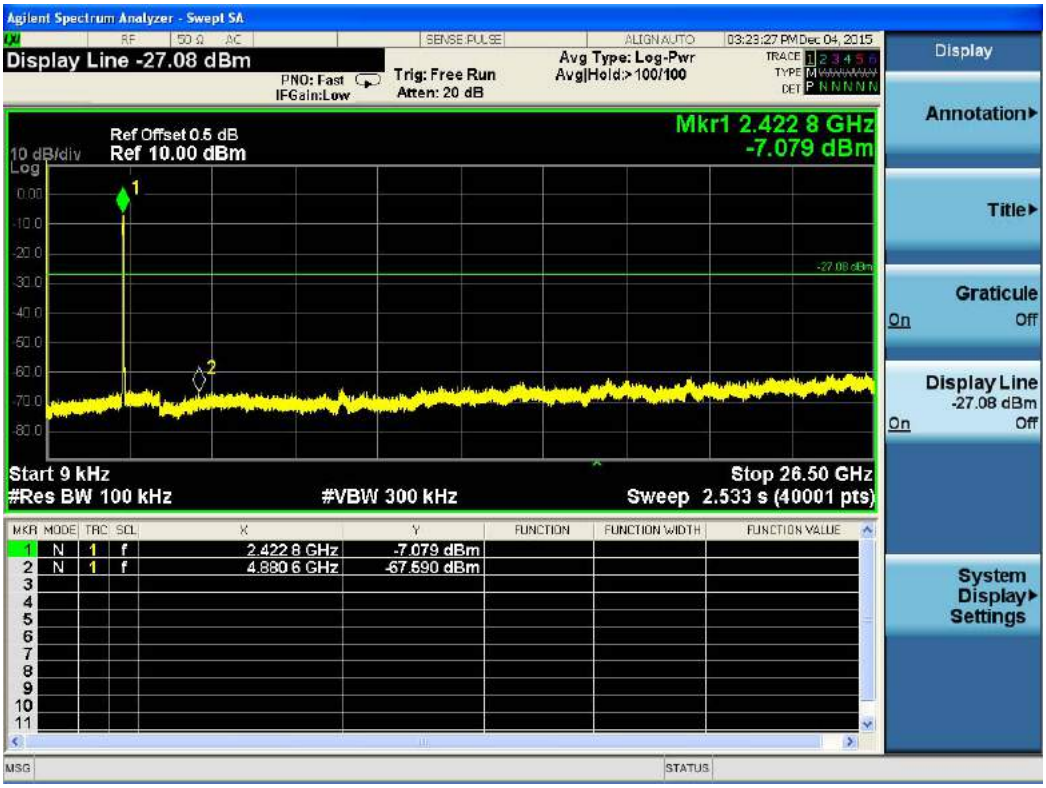

Agilent Spectrum Analyzer - Swept SA
Display Line -23.69 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:19:03 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.420 8 GHz
-3.694 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.420 8 GHz -3.694 dBm
2 N 1 f 4.823 0 GHz -64.541 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-23.69 dBm
On Off
System Display Settings

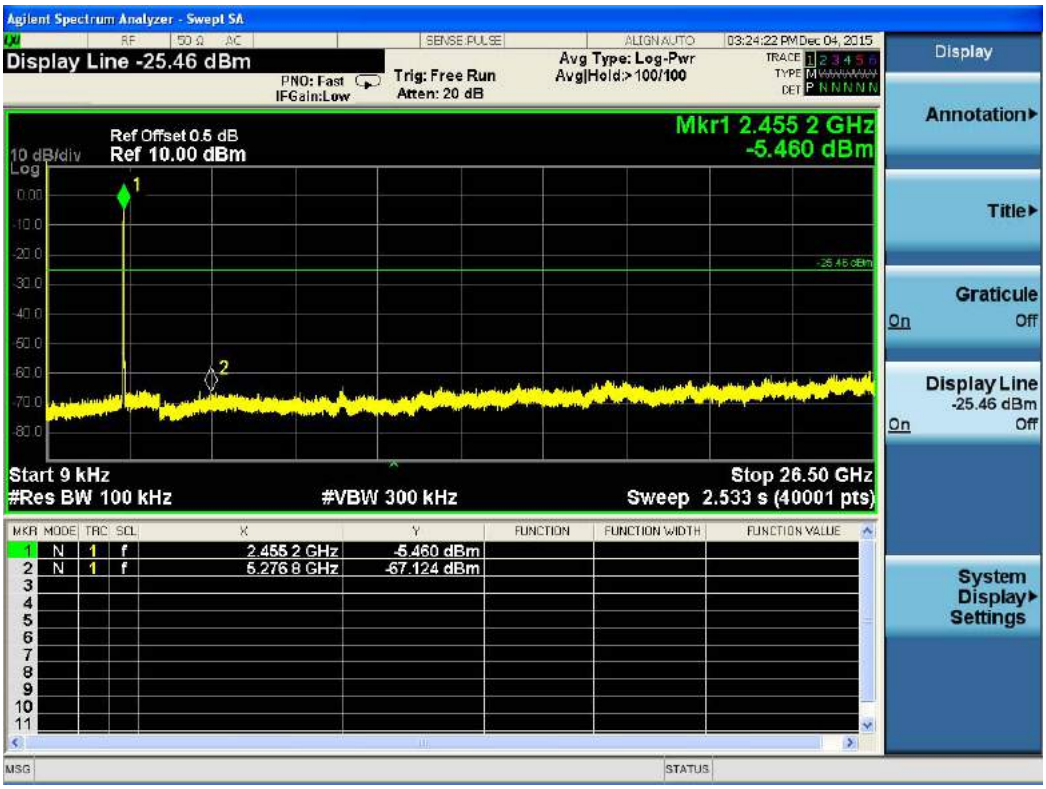

Agilent Spectrum Analyzer - Swept SA
Display Line -23.47 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:19:58 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.429 4 GHz
-3.471 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.429 4 GHz -3.471 dBm
2 N 1 f 4.872 7 GHz -61.656 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-23.47 dBm
On Off
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -22.30 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:21:09 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.458 5 GHz
-2.303 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.458 5 GHz -2.303 dBm
2 N 1 f 5.384 1 GHz -66.278 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

802.11n HT40


Agilent Spectrum Analyzer - Swept SA
Display Line -26.02 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:22:14 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.424 8 GHz
-6.024 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.424 8 GHz -6.024 dBm
2 N 1 f 4.843 5 GHz -65.495 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -27.08 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:23:27 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.422 8 GHz
-7.079 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.422 8 GHz -7.079 dBm
2 N 1 f 4.880 6 GHz -67.590 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-27.08 dBm
On Off
System Display Settings


Agilent Spectrum Analyzer - Swept SA
Display Line -25.46 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:24:22 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.455 2 GHz
-5.460 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.533 s (40001 pts)
1 N 1 f 2.455 2 GHz -5.460 dBm
2 N 1 f 5.276 8 GHz -67.124 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-25.46 dBm
On Off
System Display Settings

5.5.7. Test Results of Band Edges Test

802.11b

802.11g

Agilent Spectrum Analyzer - Swept SA
Display Line -22.51 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:05:10 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.419 87 GHz
-2.506 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.42200 GHz
Sweep 10.73 ms (1001 pts)
1 N 1 f 2.419 87 GHz -2.506 dBm
2 N 1 f 2.400 00 GHz -39.783 dBm
3 N 1 f 2.390 00 GHz -56.221 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

Agilent Spectrum Analyzer - Swept SA
Display Line -21.90 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:10:26 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.457 424 GHz
-1.897 dBm
Start 2.45200 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 4.600 ms (1001 pts)
1 N 1 f 2.457 424 GHz -1.897 dBm
2 N 1 f 2.483 600 GHz -54.712 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

802.11n HT20

Agilent Spectrum Analyzer - Swept SA
Display Line -22.12 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:06:00 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.420 32 GHz
-2.119 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.42200 GHz
Sweep 10.73 ms (1001 pts)
1 N 1 f 2.420 32 GHz -2.119 dBm
2 N 1 f 2.400 00 GHz -41.478 dBm
3 N 1 f 2.390 00 GHz -55.473 dBm
Display
Annotation
Title
Graticule
Display Line
-22.12 dBm
System Display Settings

Agilent Spectrum Analyzer - Swept SA
Display Line -21.75 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:08:51 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.456 608 GHz
-1.748 dBm
Start 2.45200 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 4.600 ms (1001 pts)
1 N 1 f 2.456 608 GHz -1.748 dBm
2 N 1 f 2.483 500 GHz -55.077 dBm
Display
Annotation
Title
Graticule
Display Line
-21.75 dBm
System Display Settings

802.11n HT40

Agilent Spectrum Analyzer - Swept SA
Display Line -24.67 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:06:51 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.424 18 GHz
-4.665 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.44200 GHz
Sweep 12.67 ms (1001 pts)
1 N 1 f 2.424 18 GHz -4.665 dBm
2 N 1 f 2.400 00 GHz -50.679 dBm
3 N 1 f 2.390 00 GHz -60.281 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

Agilent Spectrum Analyzer - Swept SA
Display Line -25.00 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:09:44 PM Dec 04, 2015
Ref Offset 0.5 dB
10 dB/div
Ref 10.00 dBm
Mkr1 2.456 820 GHz
-4.997 dBm
Start 2.43200 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 6.533 ms (1001 pts)
1 N 1 f 2.456 820 GHz -4.997 dBm
2 N 1 f 2.483 500 GHz -54.116 dBm
Display
Annotation
Title
Graticule
Display Line
System Display Settings

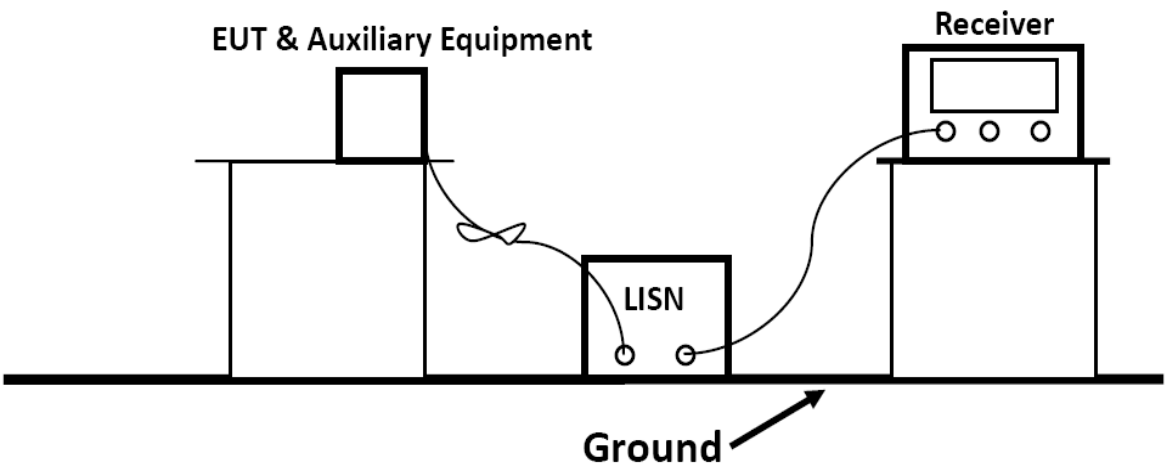
5.6. Power line conducted emissions

5.6.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

5.6.2 Block Diagram of Test Setup

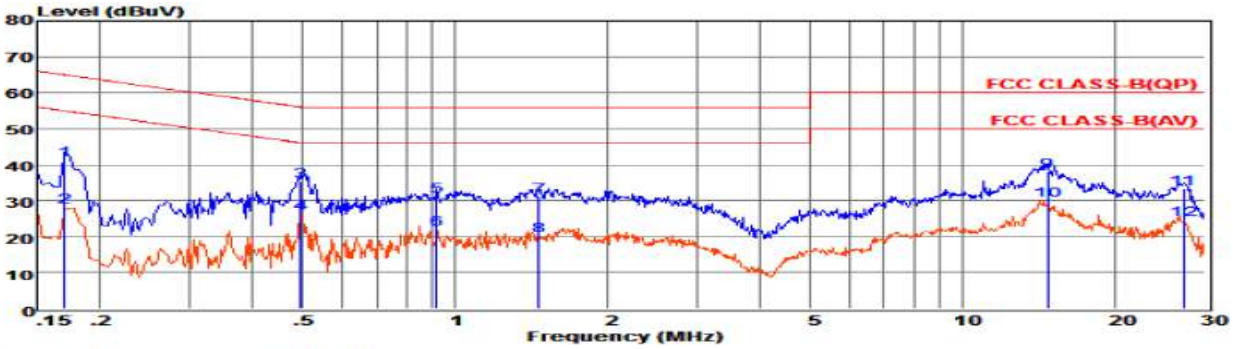


5.6.3 Test Results

PASS.

The test data please refer to following page.

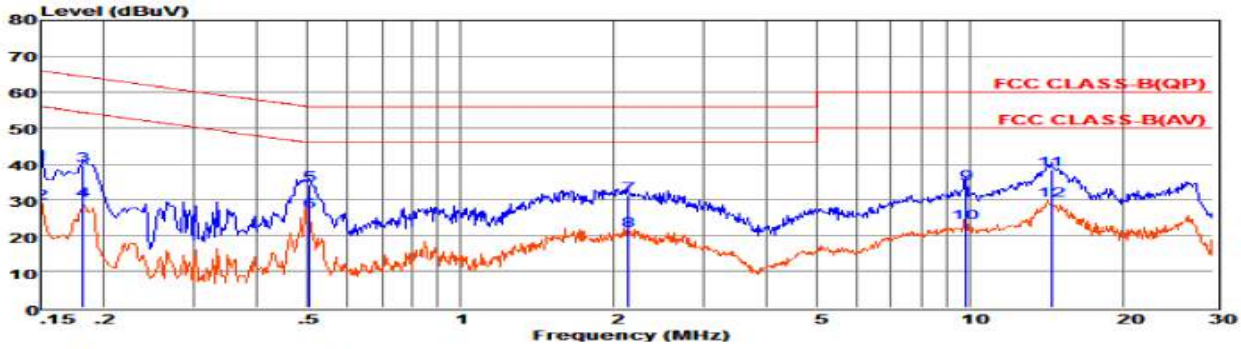
Test Result For Line Power Input AC 240V/60Hz



Env. Ins: 24*/56%
EUT: WIPET Panoramic camera
M/N: WIPET
Power Rating: AC 240V/60Hz
Test Mode: TX-Middle Channel(802.11b)
Operator: Leo
Memo:
Pol: LINE

	Freq MHz	Reading dBuV	LisnFac dB	CabLos dB	Atten_Fac dB	Measured dBuV	Limit dBuV	Over dB	Remark
1	0.17034	21.77	9.60	0.02	10.00	41.39	64.94	-23.55	QP
2	0.17035	8.57	9.60	0.02	10.00	28.19	54.94	-26.75	Average
3	0.49673	15.67	9.62	0.04	10.00	35.33	56.05	-20.72	QP
4	0.49674	6.73	9.62	0.04	10.00	26.39	46.05	-19.66	Average
5	0.91842	11.53	9.63	0.05	10.00	31.21	56.00	-24.79	QP
6	0.91843	2.34	9.63	0.05	10.00	22.02	46.00	-23.98	Average
7	1.46398	11.66	9.64	0.05	10.00	31.35	56.00	-24.65	QP
8	1.46468	0.56	9.64	0.05	10.00	20.25	46.00	-25.75	Average
	914.67176	18.32	9.71	0.10	10.00	38.13	60.00	-21.87	QP
	1014.67256	10.17	9.71	0.10	10.00	29.98	50.00	-20.02	Average
	1127.27110	13.39	9.71	0.13	10.00	33.23	60.00	-26.77	QP
	1227.27160	4.89	9.71	0.13	10.00	24.73	50.00	-25.27	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

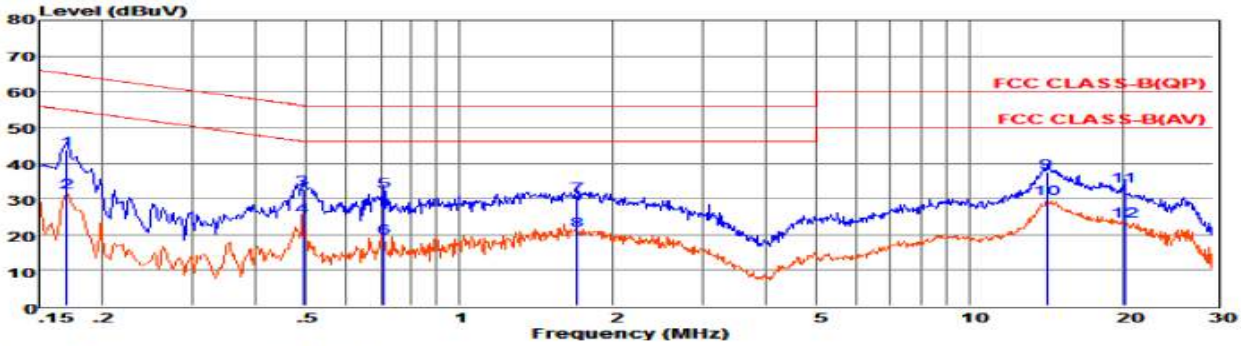


Env. Ins: 24*/56%
EUT: WIPET Panoramic camera
M/N: WIPET
Power Rating: AC 240V/60Hz
Test Mode: TX-Middle Channel(802.11b)
Operator: Leo
Memo:
Pol: NEUTRAL

	Freq MHz	Reading dBuV	LisnFac dB	CabLos dB	Atten_Fac dB	Measured dBuV	Limit dBuV	Over dB	Remark
1	0.15000	20.54	9.70	0.02	10.00	40.26	66.00	-25.74	QP
2	0.15010	9.37	9.70	0.02	10.00	29.09	55.99	-26.90	Average
3	0.18152	19.81	9.63	0.02	10.00	39.46	64.42	-24.96	QP
4	0.18162	9.95	9.63	0.02	10.00	29.60	54.41	-24.81	Average
5	0.50469	14.42	9.62	0.04	10.00	34.08	56.00	-21.92	QP
6	0.50470	7.21	9.62	0.04	10.00	26.87	46.00	-19.13	Average
7	2.13259	11.48	9.63	0.05	10.00	31.16	56.00	-24.84	QP
8	2.13359	1.72	9.63	0.05	10.00	21.40	46.00	-24.60	Average
9	9.80853	14.73	9.72	0.08	10.00	34.53	60.00	-25.47	QP
10	9.80953	3.57	9.72	0.08	10.00	23.37	50.00	-26.63	Average
	1114.44040	18.49	9.74	0.10	10.00	38.33	60.00	-21.67	QP
	1214.44140	9.95	9.74	0.10	10.00	29.79	50.00	-20.21	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

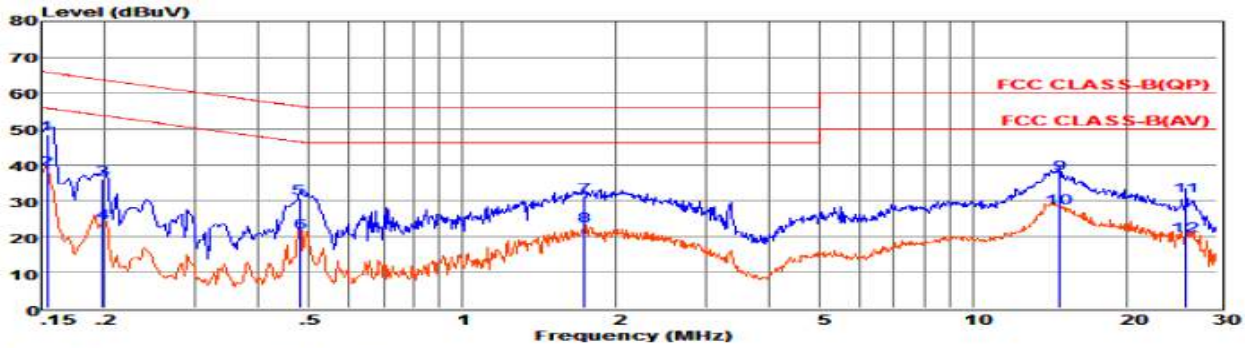
Test Result For Line Power Input AC 120V/60Hz



Env. Ins: 24*/56%
EUT: WIPET Panoramic camera
M/N: WIPET
Power Rating: AC 120V/60Hz
Test Mode: TX-Middle Channel(802.11b)
Operator: Leo
Memo:
Pol: LINE

	Freq MHz	Reading dBuV	LisnFac dB	CabLos dB	Atten_Fac dB	Measured dBuV	Limit dBuV	Over dB	Remark
1	0.17034	24.20	9.60	0.02	10.00	43.82	64.94	-21.12	QP
2	0.17044	12.23	9.60	0.02	10.00	31.85	54.94	-23.09	Average
3	0.49411	12.99	9.62	0.04	10.00	32.65	56.10	-23.45	QP
4	0.49421	5.35	9.62	0.04	10.00	25.01	46.10	-21.09	Average
5	0.71219	12.33	9.64	0.04	10.00	32.01	56.00	-23.99	QP
6	0.71229	-0.79	9.64	0.04	10.00	18.89	46.00	-27.11	Average
7	1.69810	11.16	9.64	0.05	10.00	30.85	56.00	-25.15	QP
8	1.69910	1.33	9.64	0.05	10.00	21.02	46.00	-24.98	Average
	914.13758	17.63	9.71	0.10	10.00	37.44	60.00	-22.56	QP
	1014.13858	10.27	9.71	0.10	10.00	30.08	50.00	-19.92	Average
	1120.05594	13.63	9.76	0.12	10.00	33.51	60.00	-26.49	QP
	1220.05694	3.98	9.76	0.12	10.00	23.86	50.00	-26.14	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: 24*/56%
EUT: WIPET Panoramic camera
M/N: WIPET
Power Rating: AC 120V/60Hz
Test Mode: TX-Middle Channel(802.11b)
Operator: Leo
Memo:
Pol: NEUTRAL

	Freq MHz	Reading dBuV	LisnFac dB	CabLos dB	Atten_Fac dB	Measured dBuV	Limit dBuV	Over dB	Remark
1	0.15403	28.84	9.69	0.02	10.00	48.55	65.78	-17.23	QP
2	0.15413	18.97	9.69	0.02	10.00	38.68	55.77	-17.09	Average
3	0.19758	16.47	9.59	0.02	10.00	36.08	63.71	-27.63	QP
4	0.19768	4.28	9.59	0.02	10.00	23.89	53.71	-29.82	Average
5	0.48119	11.04	9.62	0.04	10.00	30.70	56.32	-25.62	QP
6	0.48129	1.60	9.62	0.04	10.00	21.26	46.32	-25.06	Average
7	1.73447	11.49	9.63	0.05	10.00	31.17	56.00	-24.83	QP
8	1.73547	3.25	9.63	0.05	10.00	22.93	46.00	-23.07	Average
	914.74970	17.61	9.74	0.10	10.00	37.45	60.00	-22.55	QP
	1014.75070	8.25	9.74	0.10	10.00	28.09	50.00	-21.91	Average
	1126.13933	11.21	9.83	0.13	10.00	31.17	60.00	-28.83	QP
	1226.14033	0.32	9.83	0.13	10.00	20.28	50.00	-29.72	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

****Note: Pre-scan all mode and recorded the worst case results in this report (802.11b (Middle Channel)).*

5.7. Antenna Requirements

5.7.1. Standard Applicable

According to § 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.

5.7.2. Antenna Connector Construction

The antenna used for transmitting is permanently attached and no consideration of replacement. Please see EUT photo for details.

5.7.3. Results: Compliance.

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6. PHOTOGRAPHS OF TEST SETUP

6.1. Photo of Radiated Emissions Measurement

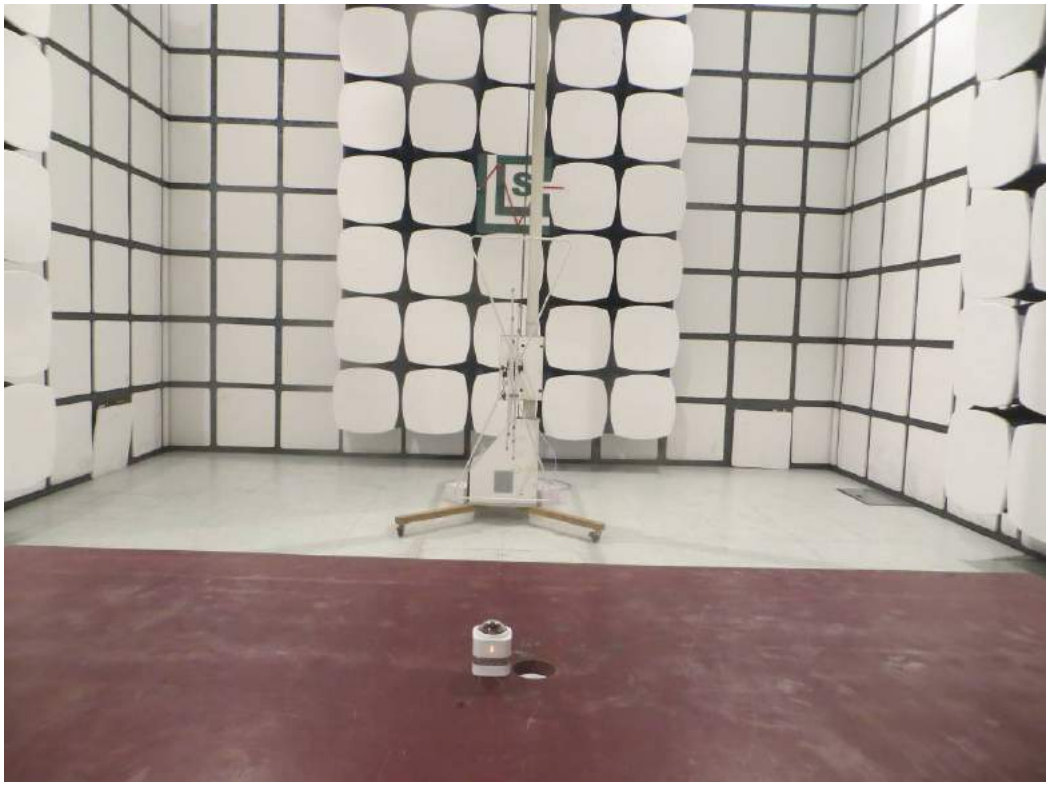


Fig.1

Fig.2

6.2. Photo of Line Conducted Emissions Measurement

7. PHOTOGRAPHS OF THE EUT

Fig.1

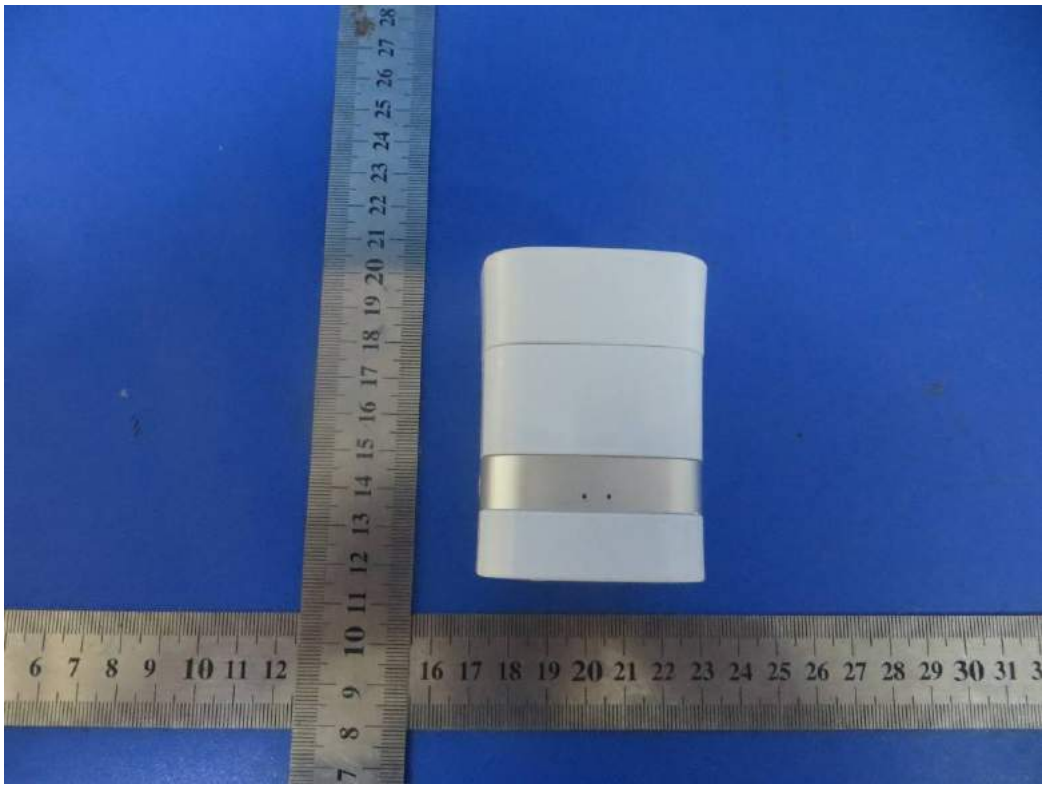


Fig.2

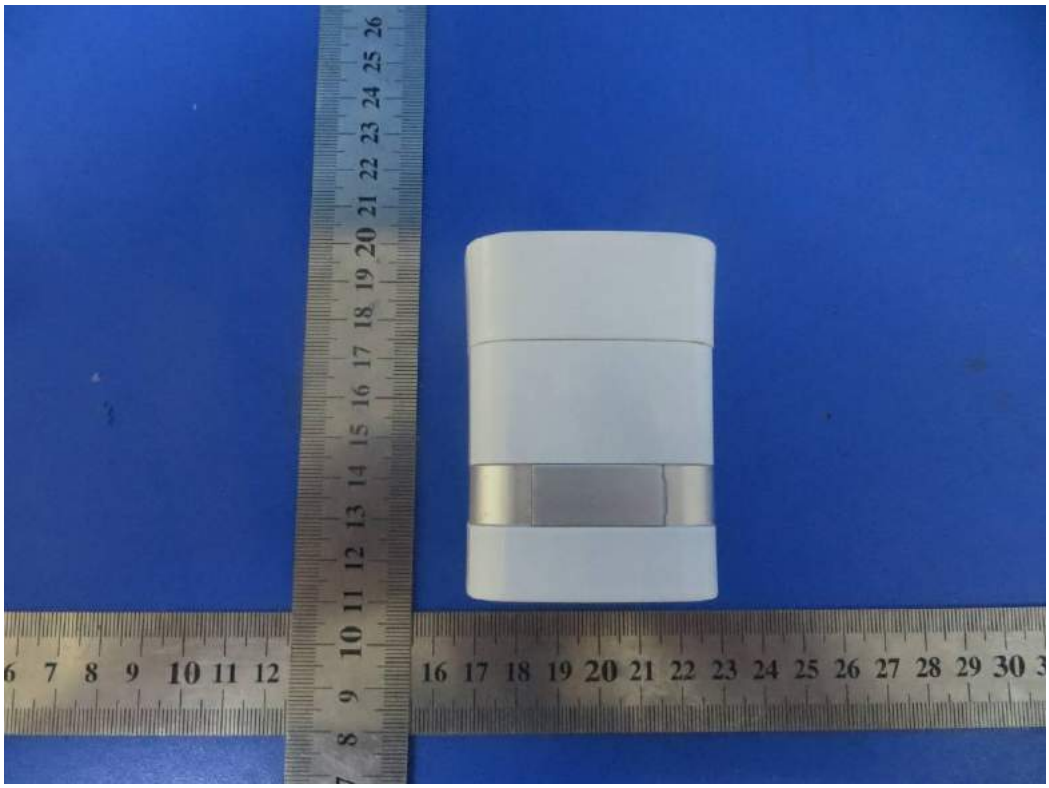


Fig.3

Fig.4

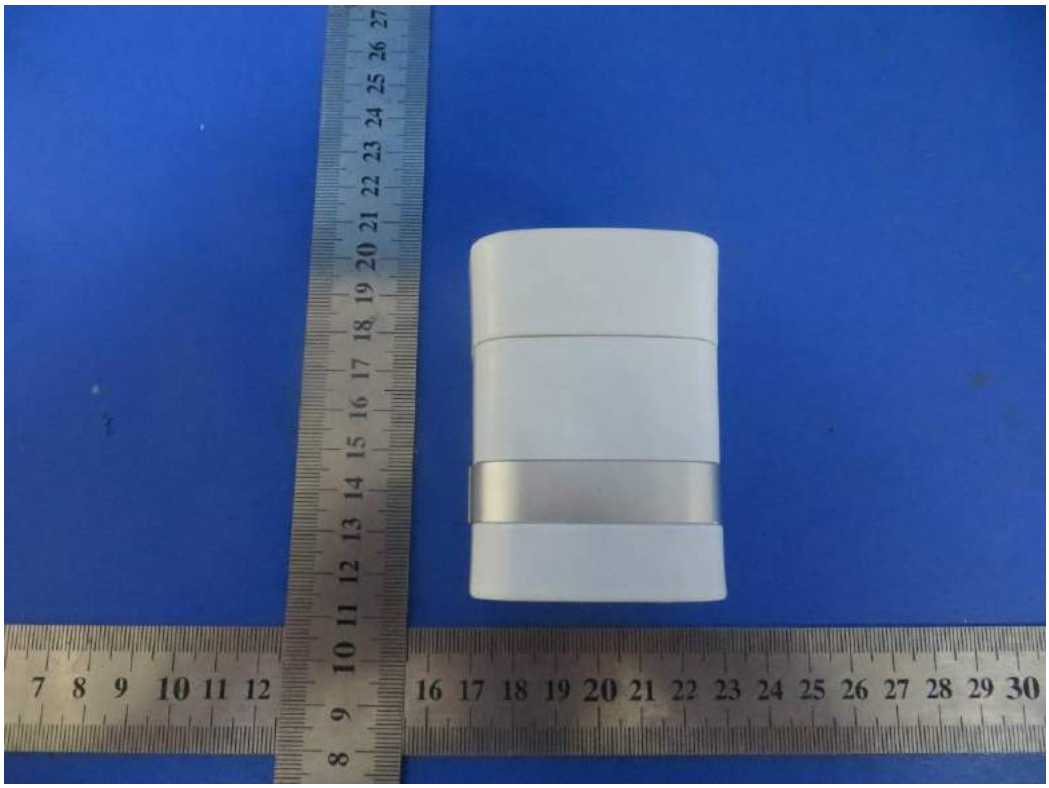
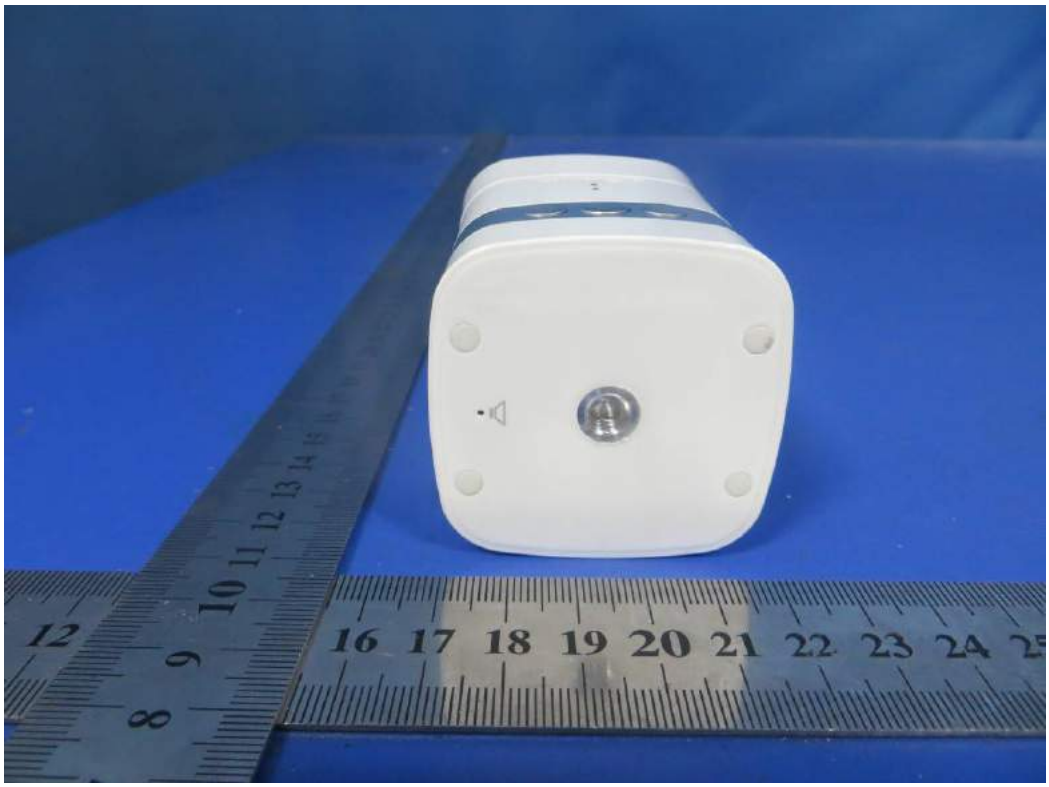


Fig.5



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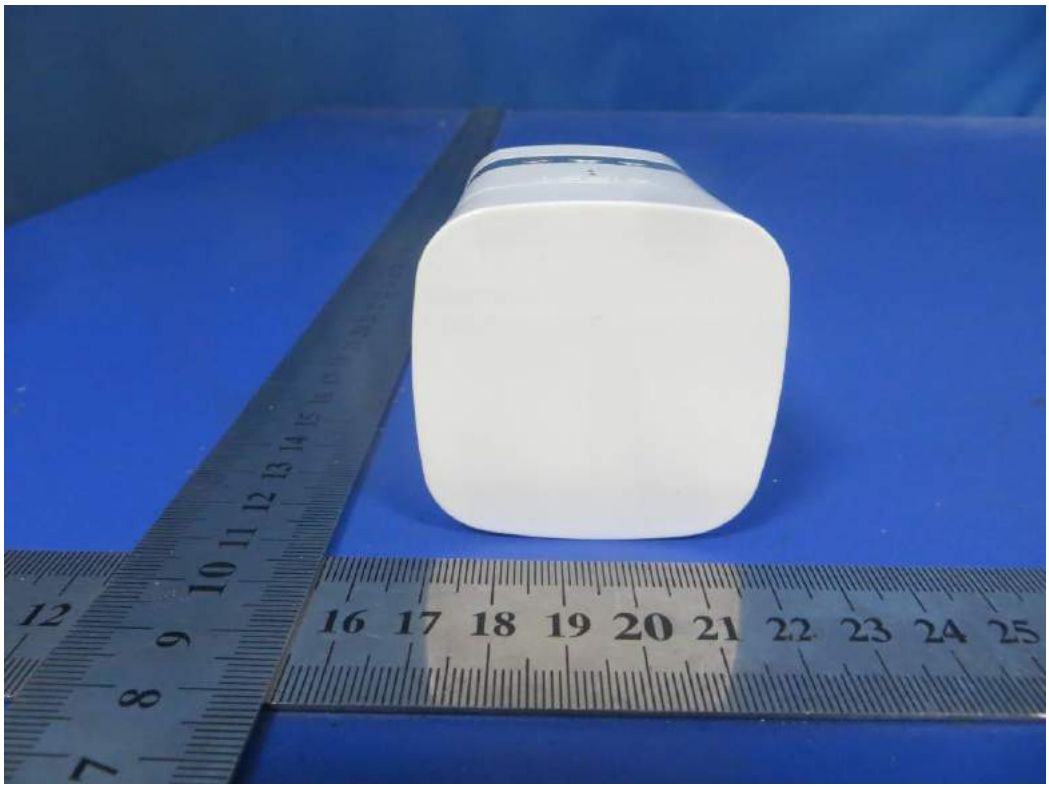

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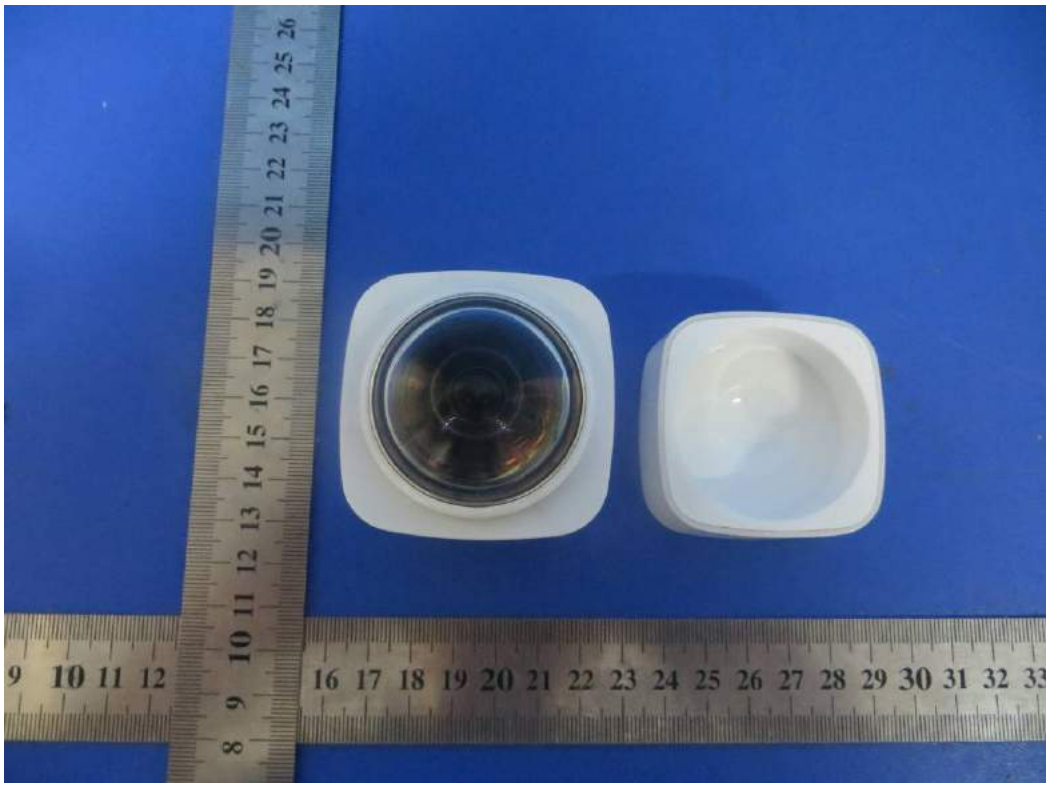

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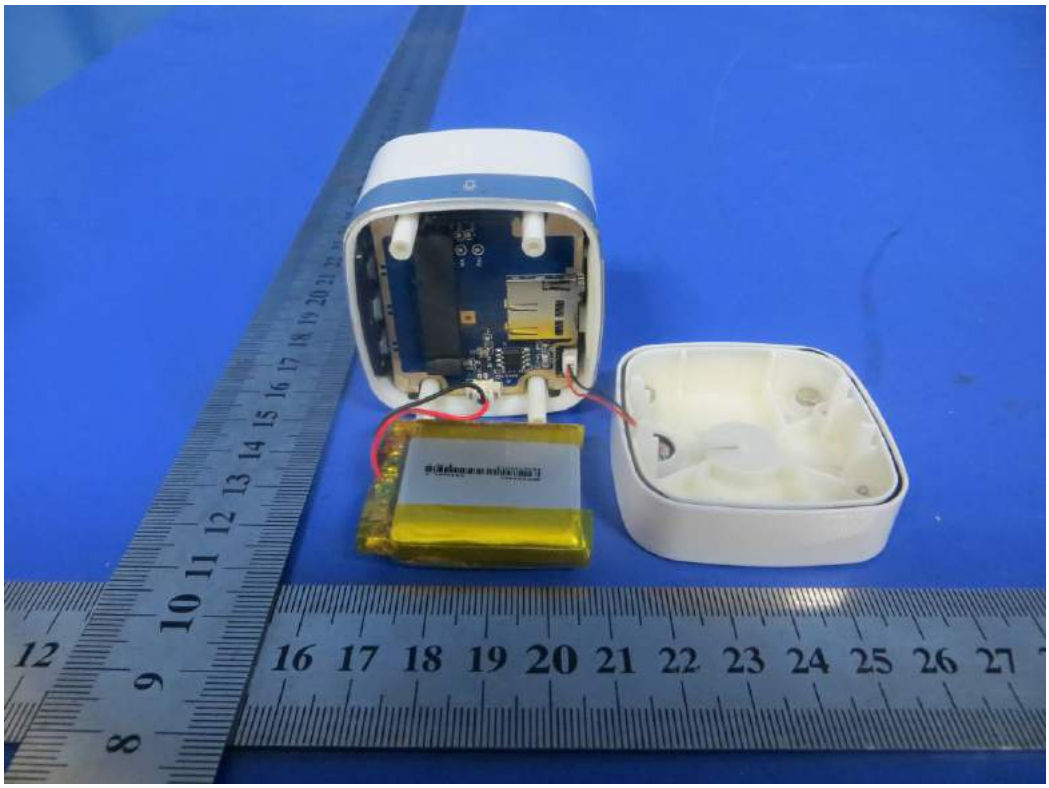

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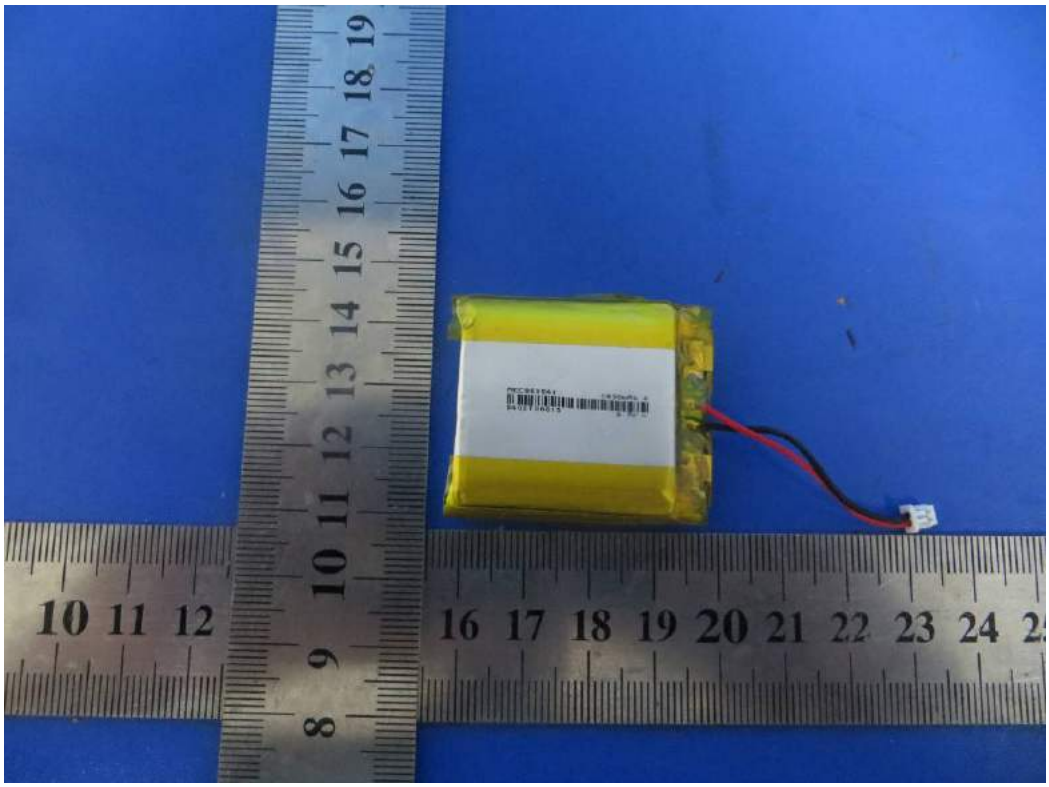

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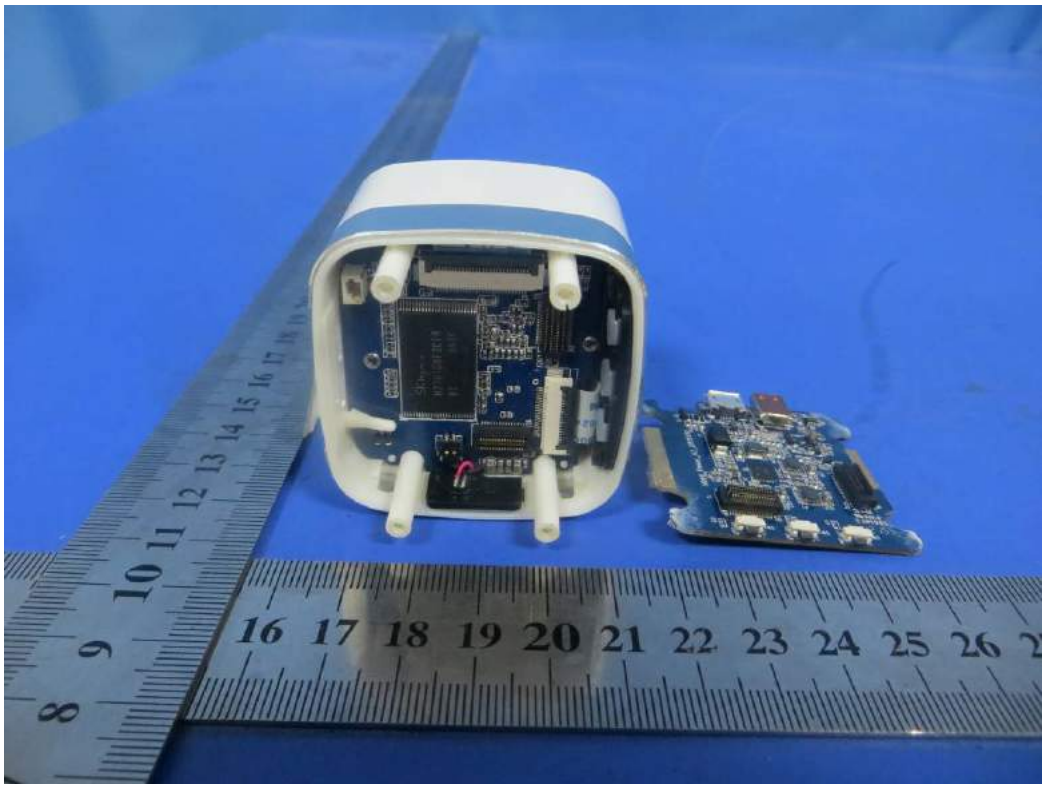


Fig.11

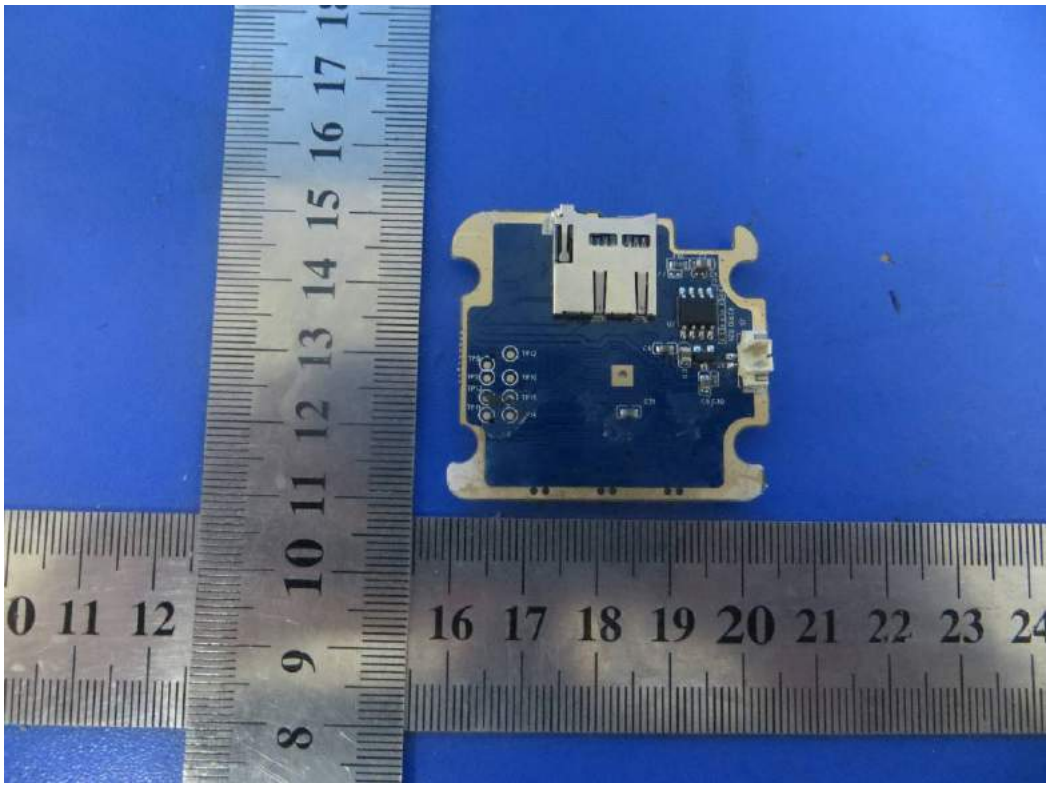
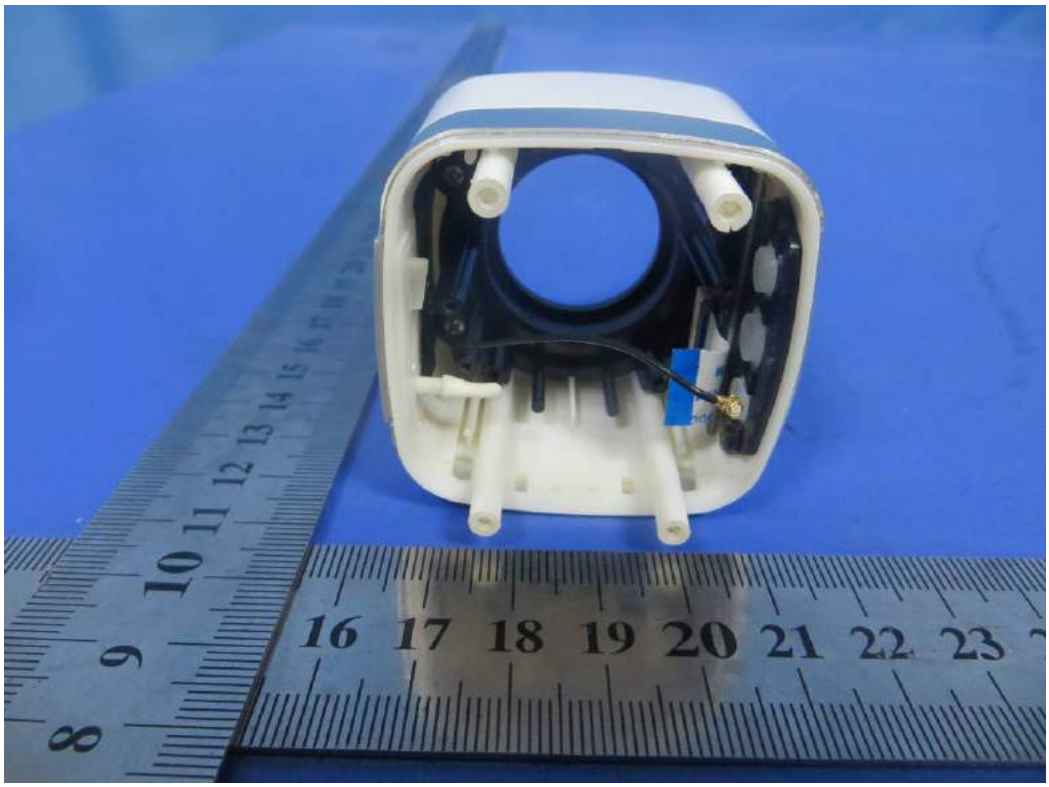


Fig.12

Fig.13



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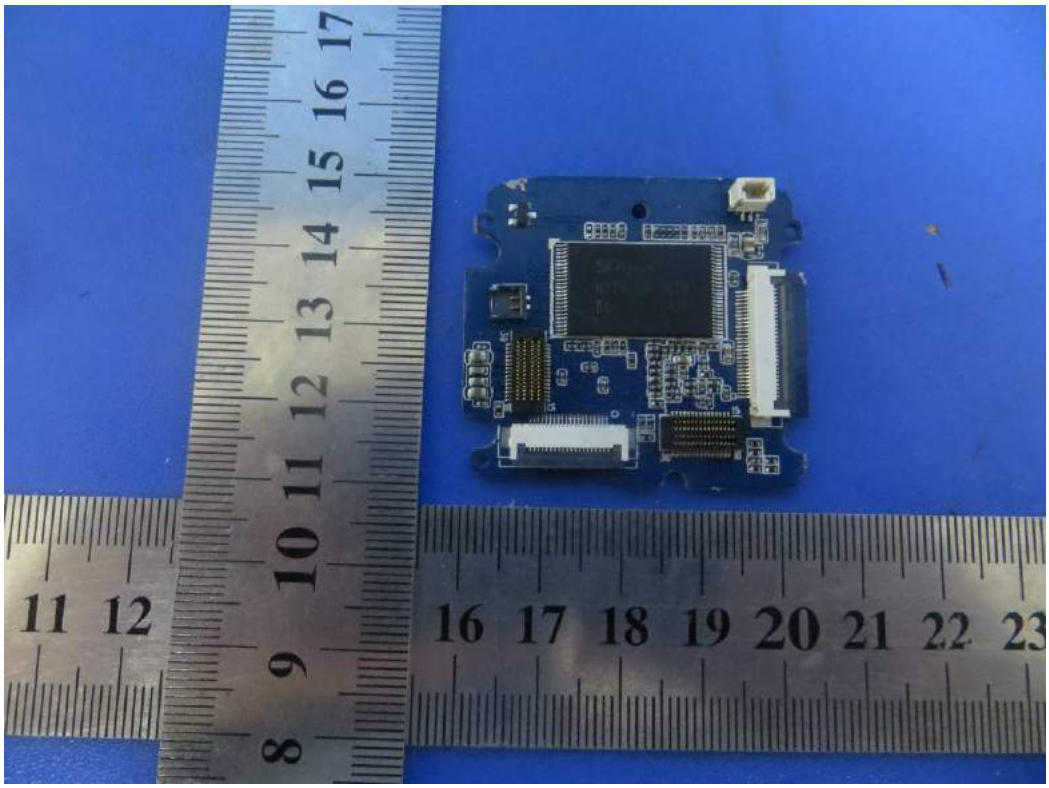


Fig.15

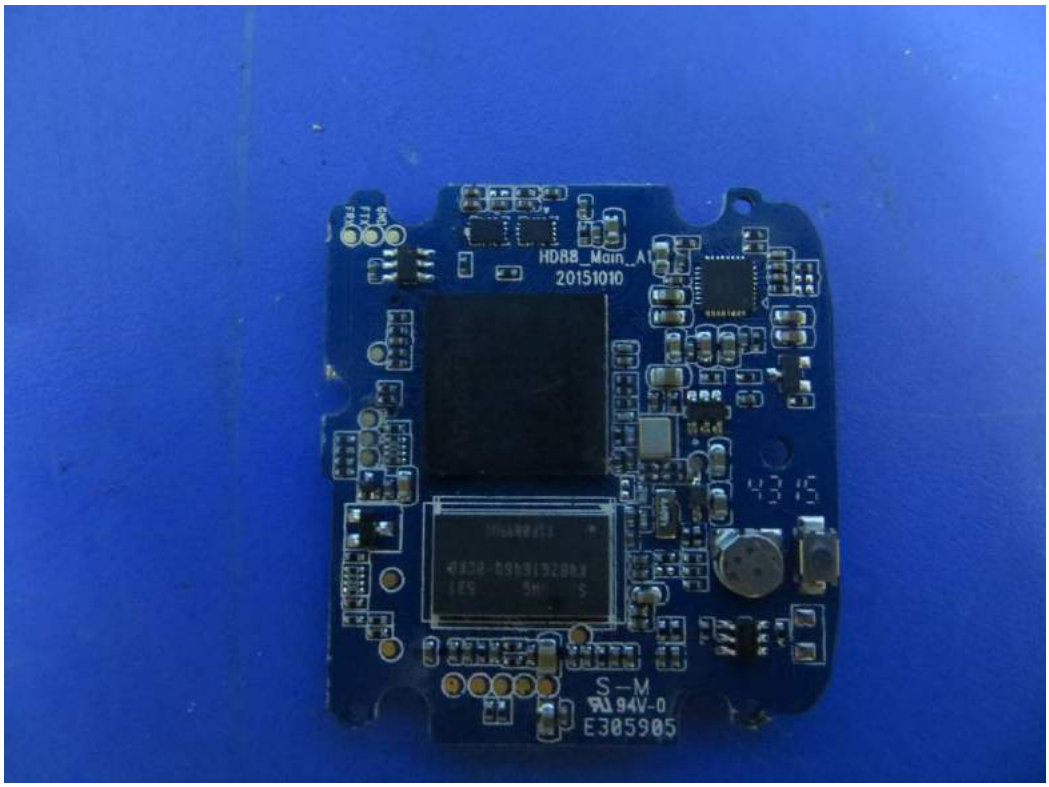


Fig.16

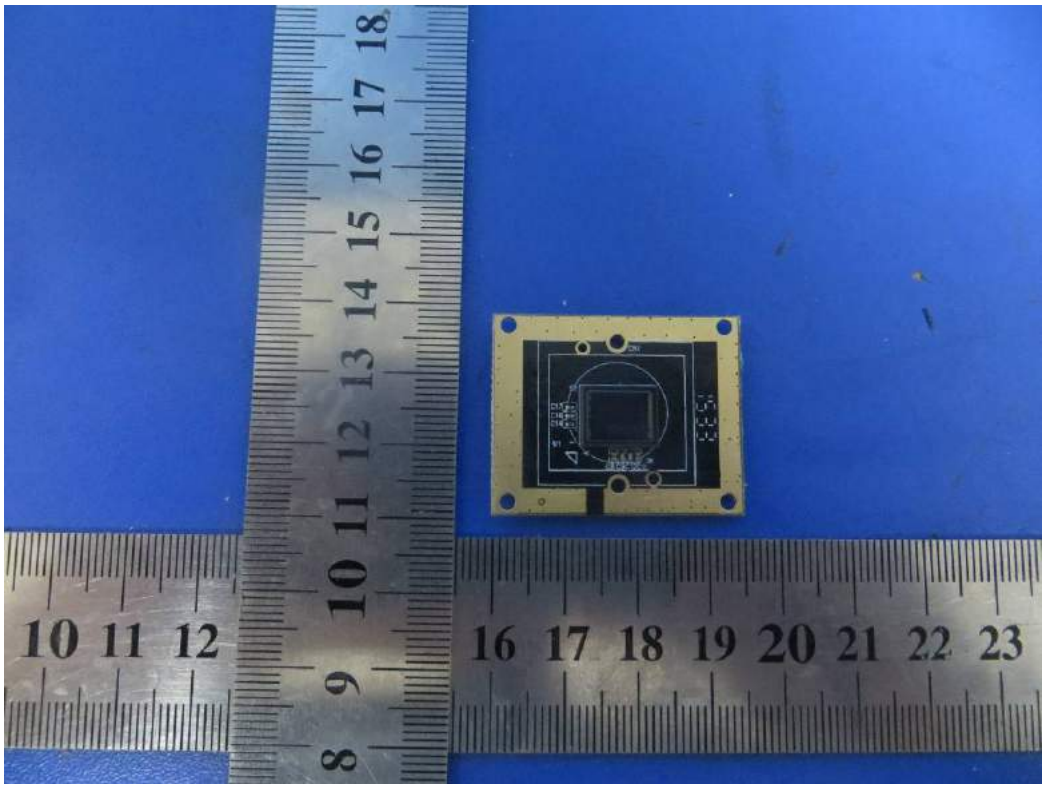
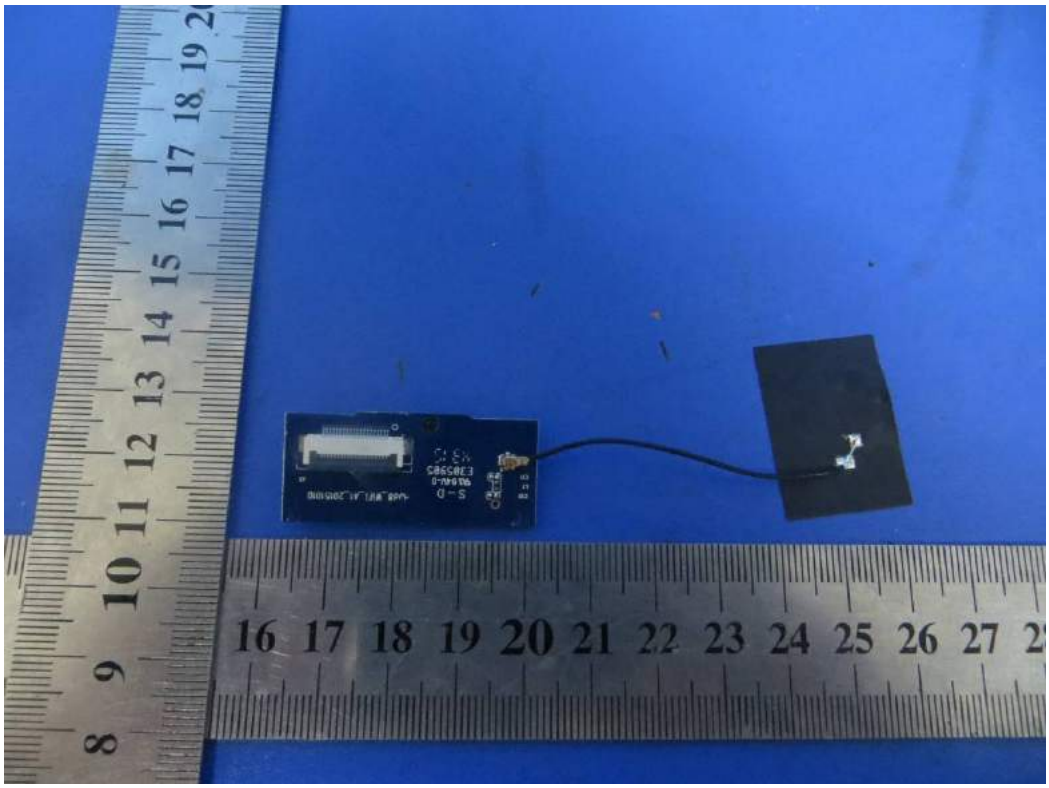


Fig.17

Fig.18



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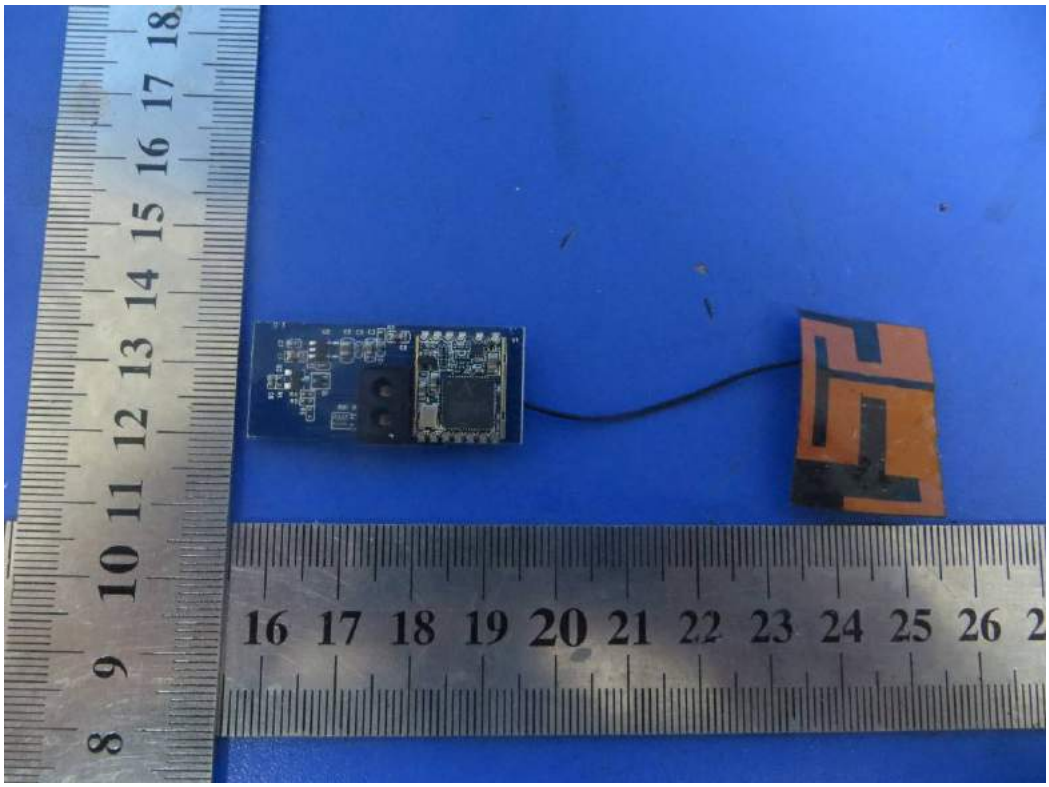

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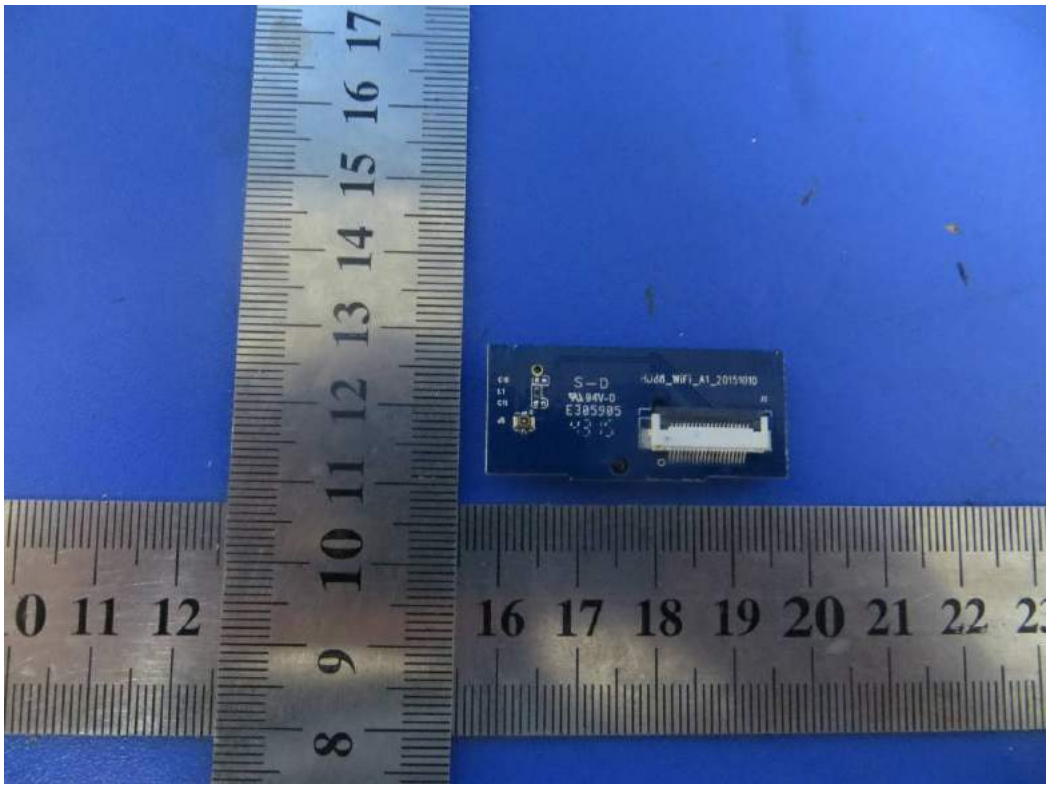
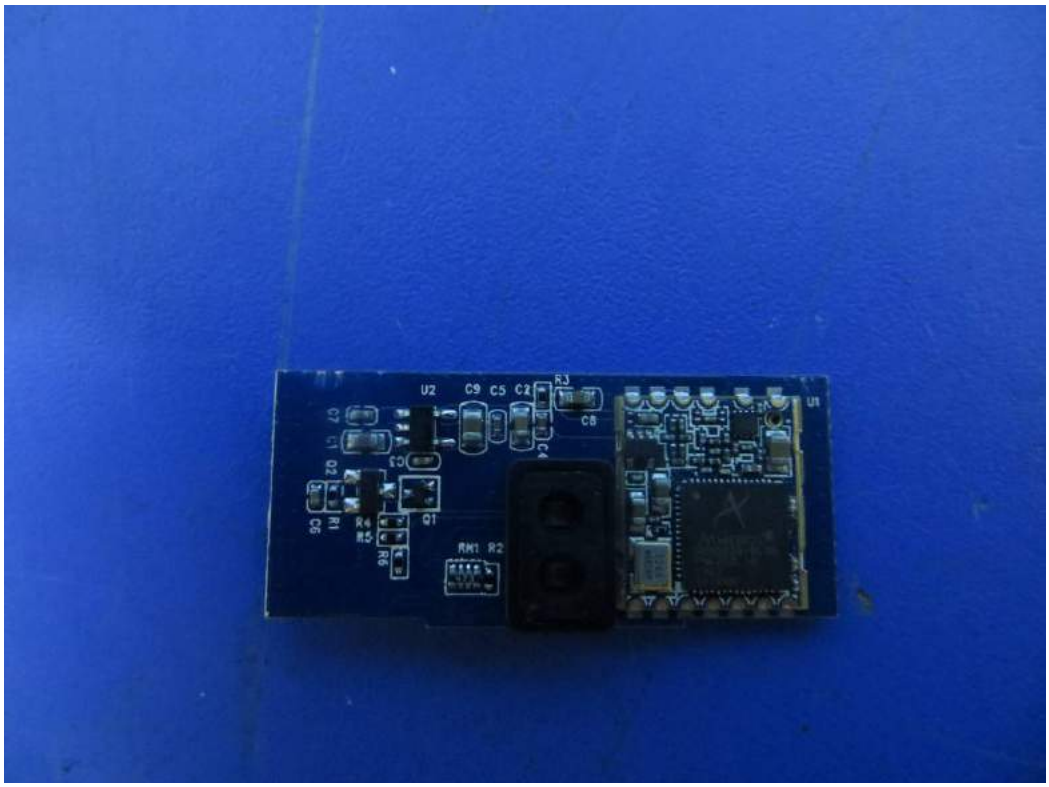


Fig.21



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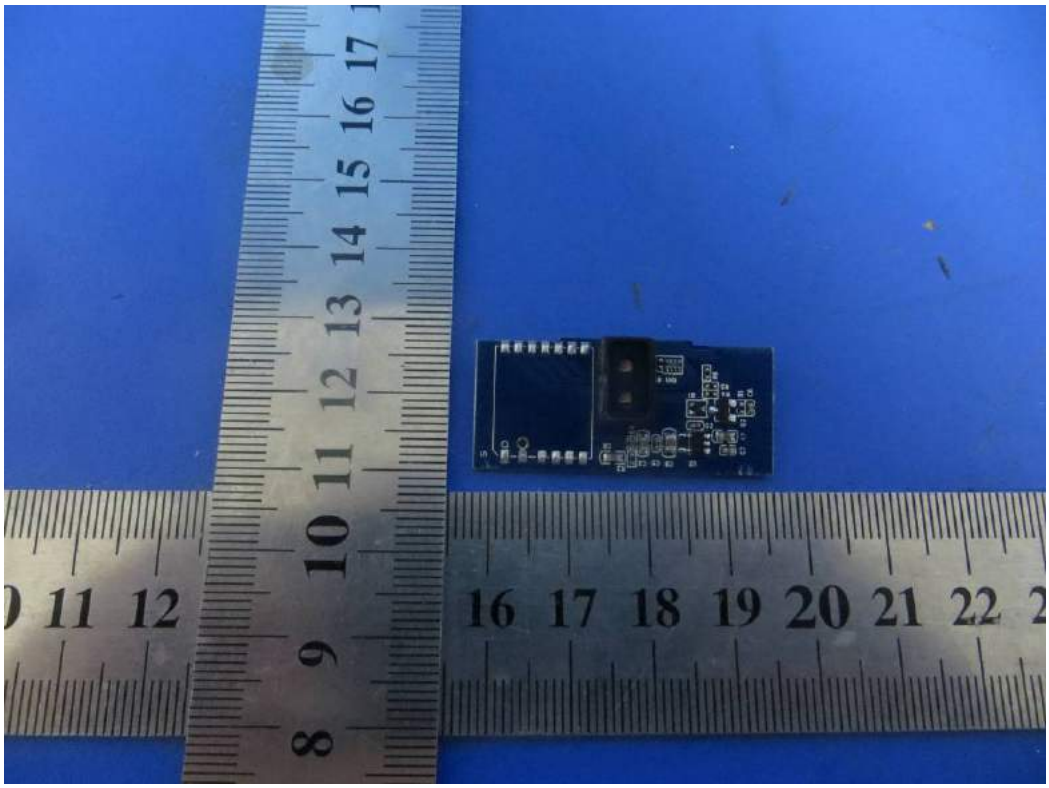

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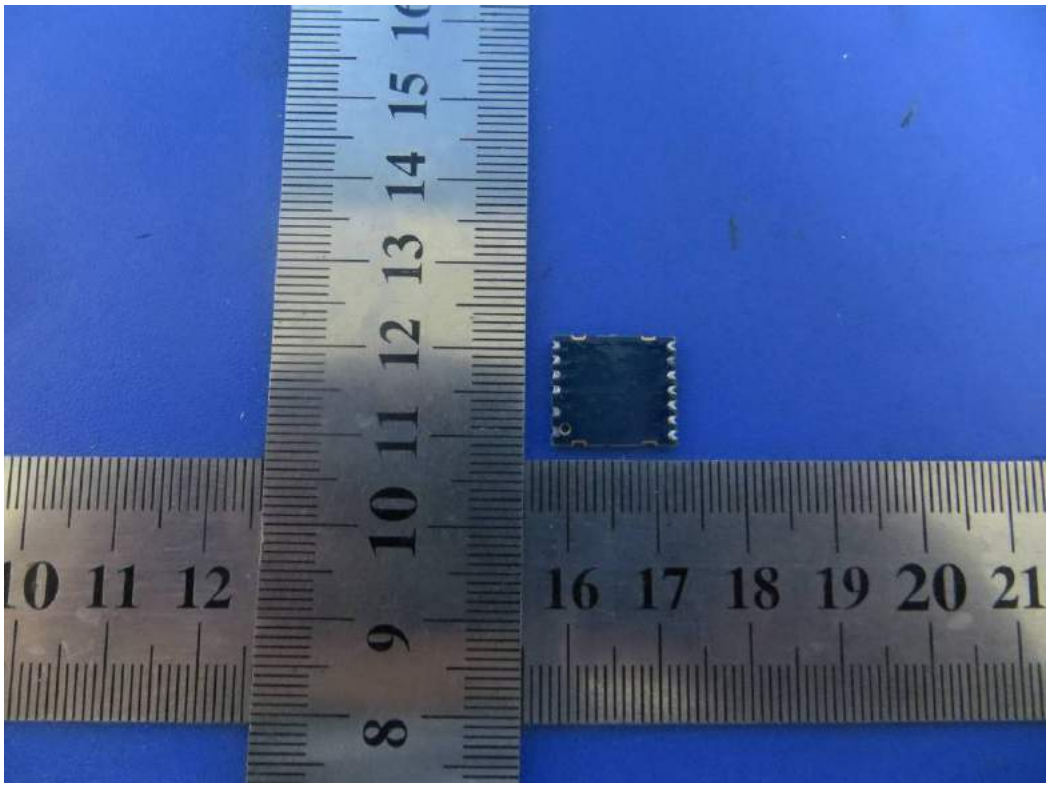

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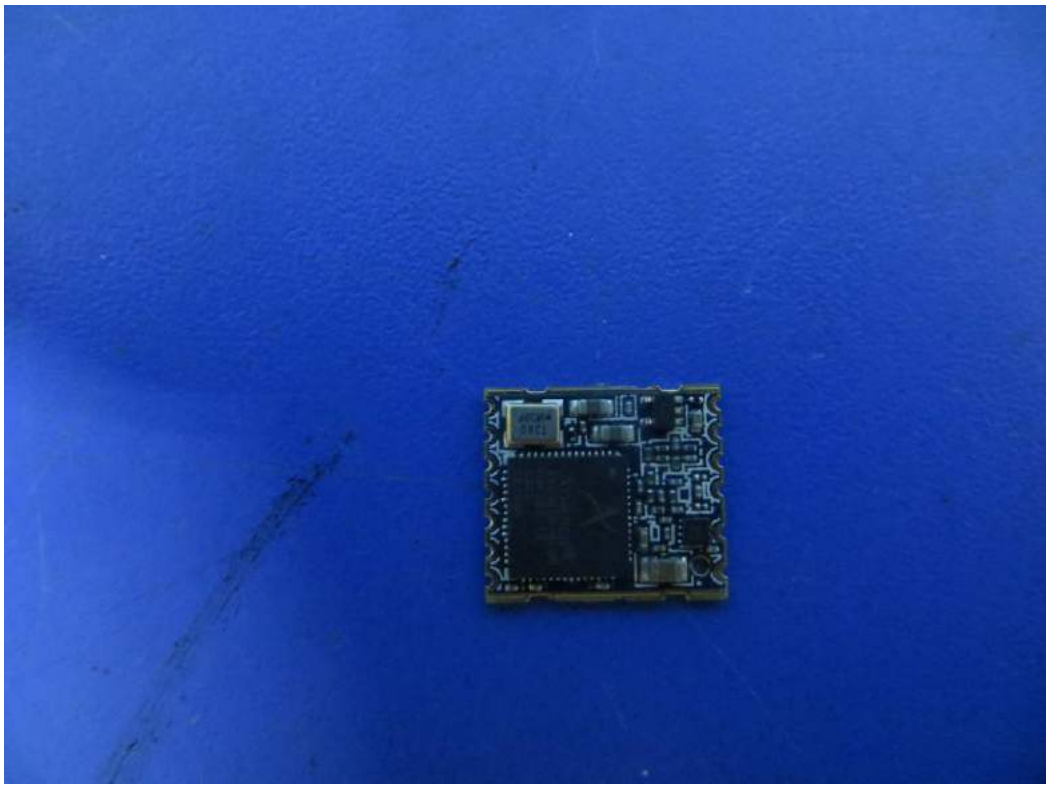

Fig.25

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