APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Shenzhen Leshi Video Technology Co.,Ltd

Eyes-light Camera
Model No.: L910, L900

FCC ID: 2AJPAL910

Prepared for	:	Shenzhen Leshi Video Technology Co.,Ltd
Address	:	5th Floor, 2nd Block, Zhongyuntai Industrial Park, No.1 Road, Tangtou, Shiyan Street, Bao'an District, Shenzhen, China
Prepared by	:	Shenzhen Accurate Technology Co., Ltd.
Address	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China
		Tel: (0755) 26503290 Fax: (0755) 26503396

Report No.	:	ATE20180344
Date of Test	:	March 14-March 15, 2018
Date of Report	:	March 16, 2018

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Test Report Certification

Applicant	:	Shenzhen Leshi Video Technology Co.,Ltd
Address	:	5th Floor, 2nd Block, Zhongyuntai Industrial Park, No.1 Road, Tangtou, Shiyan Street, Bao'an District, Shenzhen, China
Manufacturer	:	Shenzhen Leshi Video Technology Co.,Ltd
Address	:	5th Floor, 2nd Block, Zhongyuntai Industrial Park, No.1 Road, Tangtou, Shiyan Street, Bao'an District, Shenzhen, China
Product	:	Eyes-light Camera
Model No.	:	L910, L900
Trade name	:	Freecam

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247: 2018
ANSI C63.10: 2013

The EUT was tested according to DTS test procedure of Apr 05, 2017 KDB558074 D01 DTS Meas Guidance v04 for compliance to FCC 47CFR 15.247 requirements
The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements. This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test :	March 14-March 15, 2018
Date of Report :	March 16, 2018

Test Engineer : Star Yang

(Star Yang, Engineer)

Prepared by : Star Yang

(Star Yang, Engineer)

Approved & Authorized Signer :

(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Eyes-light Camera
Model Number	:	L910, L900 (Note: We hereby state that these models are identical in interior structure, electrical circuits and components, Just reset key and indictor light is different positions. Therefore, only model L910 is for tests.)
Frequency Range	:	802.11b/g/n(20MHz): 2412-2462MHz
Number of Channels	:	802.11b/g/n (20MHz):11
Antenna Gain	:	4dBi
Type of Antenna	:	FPCB antenna with ipex connector
Power Supply	:	AC 100-240V~50/60Hz
Data Rate	:	802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: 72.2~6.5Mbps
Modulation Type	:	DSSS, OFDM
Hardware version	:	V1.1
Software version	:	V1.07.07

1.2.Carrier Frequency of Channels

802.11b, 802.11g, 802.11n (20MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	---	---

1.3.Accessory and Auxiliary Equipment

PC (provided by laboratory)	:	Manufacturer: LENOVO M/N: 4290-RT8 S/N: R9-FW93G 11/08

1.4.Description of Test Facility

EMC Lab	:	Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358 Listed by Innovation, Science and Economic Development Canada (ISEDC) The Registration Number is 5077A-2 Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193 Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	:	Shenzhen Accurate Technology Co., Ltd.
Site Location	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.5.Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 06, 2018	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 06, 2018	1 Year
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 06, 2018	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 06, 2018	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 06, 2018	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 06, 2018	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 06, 2018	1 Year
Open Switch and Control Unit	Rohde&Schwarz	OSP120 + OSP-B157	101244 + 100866	Jan. 06, 2018	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 06, 2018	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 06, 2018	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 06, 2018	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375 /2510-60/11SS	N/A	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.3	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.4	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.5	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.6	Jan. 06, 2018	1 Year
Temporary antenna connector	NTGS	14AE	N/A	Mar. 13, 2018	N/A

Note: The temporary antenna is connected to the antenna jack on the PCB board, in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **1.802.11b Transmitting mode**
Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

2.802.11g Transmitting mode
Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

3.802.11n (20MHz) Transmitting mode
Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

Note: The WiFi has been tested under continuous transmission mode.
EUT is connected to a computer through the usb-serial controller tool and Use test software to set the test mode.
Test software is DutApiWiFi8801BrdigeUart

output power setting table

Test Mode	Set Tx Output Power	Data rate
802.11b	19dBm	11Mbps
802.11g	17dBm	54Mbps
802.11n(HT20)	15dBm	MCS7

3.2.Configuration and peripherals

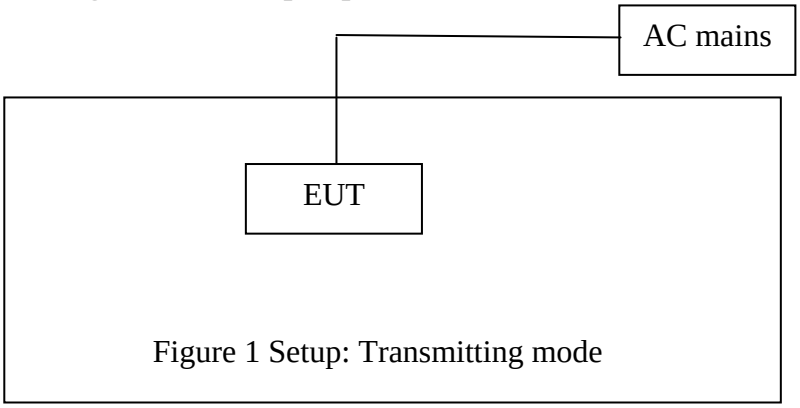


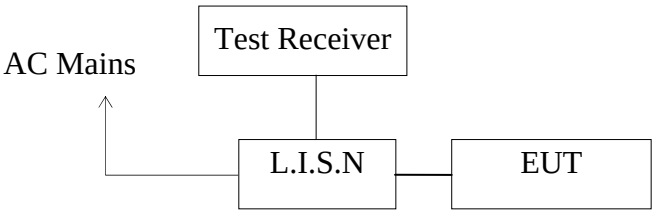
Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Power Line Conducted Emission	Compliant
Section 15.247(a)(2)	6dB Bandwidth Test	Compliant
KDB558074 D01 DTS Meas Guidance v04	Duty cycle	Compliant
KDB558074 D01 DTS Meas Guidance v04	99% occupied Bandwidth	Compliant
Section 15.247(e)	Power Spectral Density Test	Compliant
Section 15.247(b)(3)	Maximum Peak Output Power Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.247(d) Section 15.209	Radiated Spurious Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

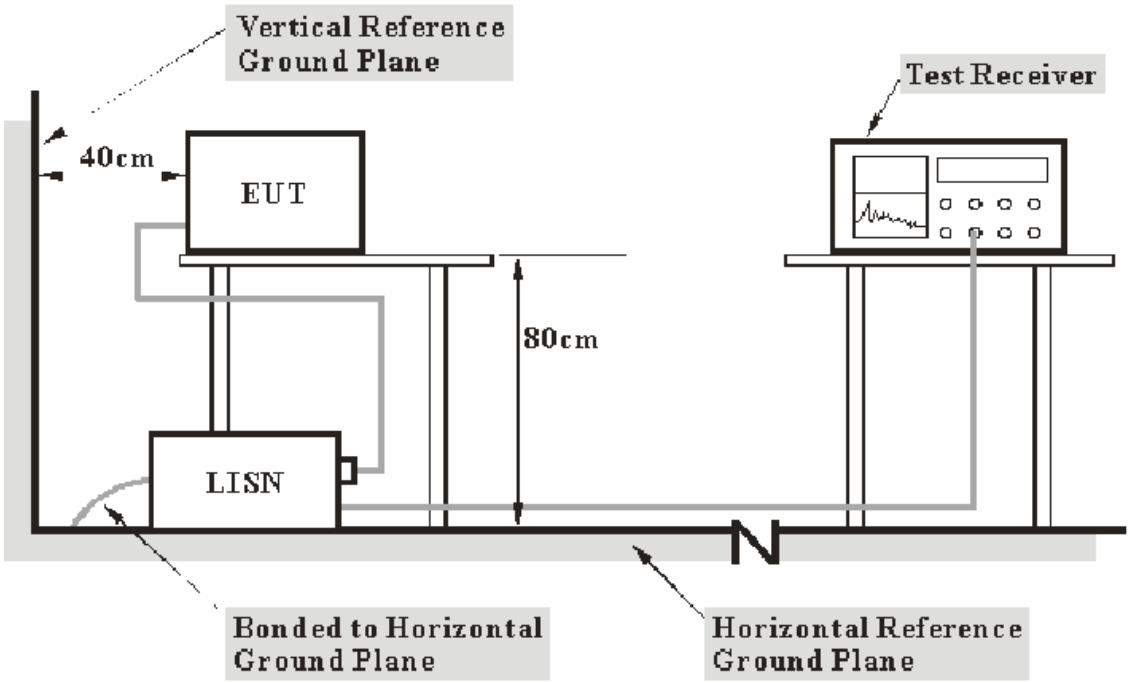
5. POWER LINE CONDUCTED MEASUREMENT

5.1.Block Diagram of Test Setup



(EUT: Eyes-light Camera)

5.1.1. Test System Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

5.2.Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0
NOTE1: The lower limit shall apply at the transition frequencies. NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

5.3.Configuration of EUT on Measurement

The equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

5.4.Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in test mode and measure it.

5.5.Test Procedure

The EUT is put on the plane 0.8 m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

5.6.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dBμV)	Average Level (dBμV)	QuasiPeak Limit (dBμV)	Average Limit (dBμV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	10.5	51.1	34.2	56.0	46.0	4.9	11.8	Pass

Frequency(MHz) = Emission frequency in MHz
Transducer value(dB) = Insertion loss of LISN + Cable Loss
Level(dBμV) = Quasi-peak Reading/Average Reading + Transducer value
Limit (dBμV) = Limit stated in standard
Margin = Limit (dBμV) - Level (dBμV)

Calculation Formula:
Margin = Limit (dBμV) - Level (dBμV)

5.7.Power Line Conducted Emission Measurement Results

PASS.
Test Lab: Shielding room
Test Engineer: Star

The frequency range from 150kHz to 30MHz is checked.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.
Emissions attenuated more than 20 dB below the permissible value are not reported.

All data was recorded in the Quasi-peak and average detection mode.

The spectral diagrams are attached as below.

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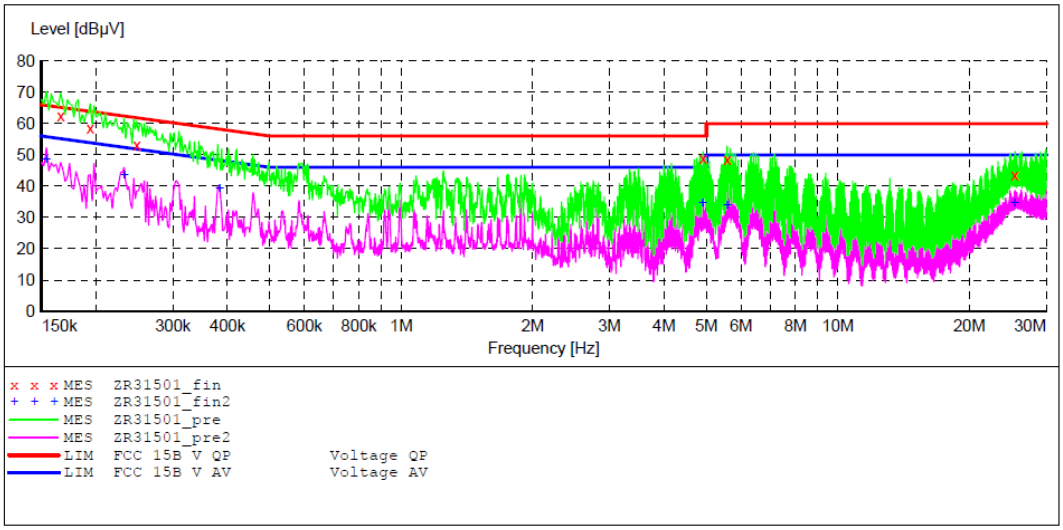
CONDUCTED EMISSION STANDARD FCC PART 15C

```
EUT:                  Eyes-light Camera      M/N:L910
Manufacturer:         Leshi
Operating Condition:  WiFi Communication
Test Site:            1#Shielding Room
Operator:             Star
Test Specification:   N 240V/60Hz
Comment:              Report No.:ATE20180344
Start of Test:        2018-3-15 / 8:58:40
```

SCAN TABLE: "V 150K-30MHz fin"

```
  Short Description:              _SUB_STD_VTERM2 1.70
  Start      Stop       Step      Detector  Meas.     IF      Transducer
  Frequency  Frequency  Width               Time      Bandw.
  150.0 kHz  30.0 MHz   4.5 kHz   QuasiPeak 1.0 s     9 kHz   NSLK8126 2008
                                  Average
```



MEASUREMENT RESULT: "ZR31501_fin"

2018-3-15 9:01

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.166000	62.40	10.8	65	2.8	QP	N	GND
0.194000	58.60	10.8	64	5.3	QP	N	GND
0.248000	53.30	10.9	62	8.5	QP	N	GND
4.910000	49.10	11.4	56	6.9	QP	N	GND
5.580000	48.70	11.5	60	11.3	QP	N	GND
25.380000	43.40	11.7	60	16.6	QP	N	GND

MEASUREMENT RESULT: "ZR31501_fin2"

2018-3-15 9:01

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154000	48.50	10.8	56	7.3	AV	N	GND
0.232000	43.40	10.9	52	9.0	AV	N	GND
0.384000	39.30	10.9	48	8.9	AV	N	GND
4.910000	34.60	11.4	46	11.4	AV	N	GND
5.580000	33.80	11.5	50	16.2	AV	N	GND
25.380000	34.60	11.7	50	15.4	AV	N	GND

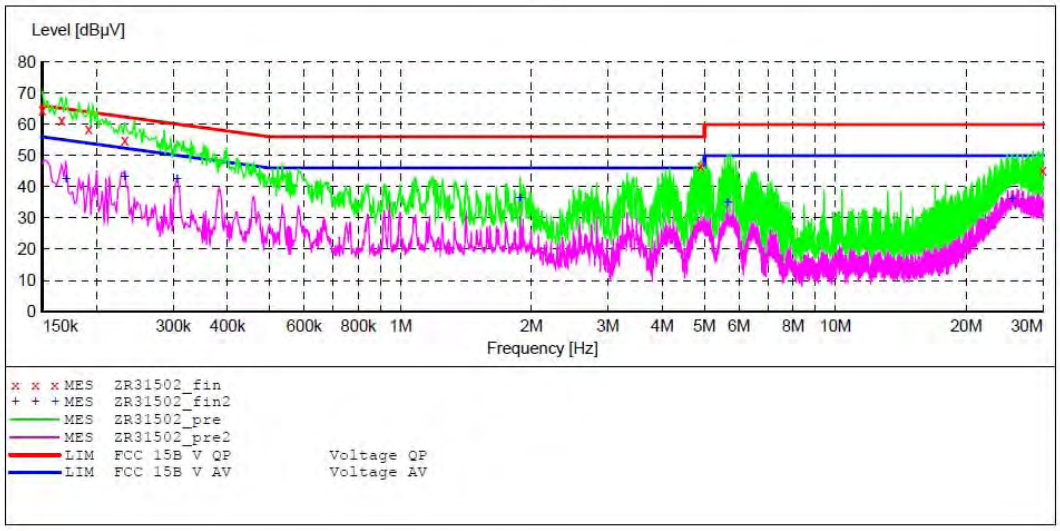
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

```
EUT:                    Eyes-light Camera      M/N:L910
Manufacturer:           Leshi
Operating Condition:    WiFi Communication
Test Site:              1#Shielding Room
Operator:               Star
Test Specification:     L 240V/60Hz
Comment:                Report No.:ATE20180344
Start of Test:          2018-3-15 / 9:02:51
```

SCAN TABLE: "V 150K-30MHz fin"

```
  Short Description:                 _SUB_STD_VTERM2 1.70
  Start      Stop       Step         Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width                  Time      Bandw.
  150.0 kHz  30.0 MHz   4.5 kHz      QuasiPeak 1.0 s     9 kHz    NSLK8126 2008
                                     Average
```



MEASUREMENT RESULT: "ZR31502_fin"

2018-3-15 9:05

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	64.60	10.8	66	1.4	QP	L1	GND
0.166000	61.40	10.8	65	3.8	QP	L1	GND
0.192000	58.50	10.8	64	5.4	QP	L1	GND
0.232000	54.80	10.9	62	7.6	QP	L1	GND
4.900000	46.90	11.4	56	9.1	QP	L1	GND
29.975000	45.40	11.8	60	14.6	QP	L1	GND

MEASUREMENT RESULT: "ZR31502_fin2"

2018-3-15 9:05

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.170000	42.60	10.8	55	12.4	AV	L1	GND
0.232000	43.30	10.9	52	9.1	AV	L1	GND
0.306000	42.50	10.9	50	7.6	AV	L1	GND
1.884000	36.50	11.3	46	9.5	AV	L1	GND
5.650000	35.00	11.5	50	15.0	AV	L1	GND
25.485000	36.10	11.7	50	13.9	AV	L1	GND

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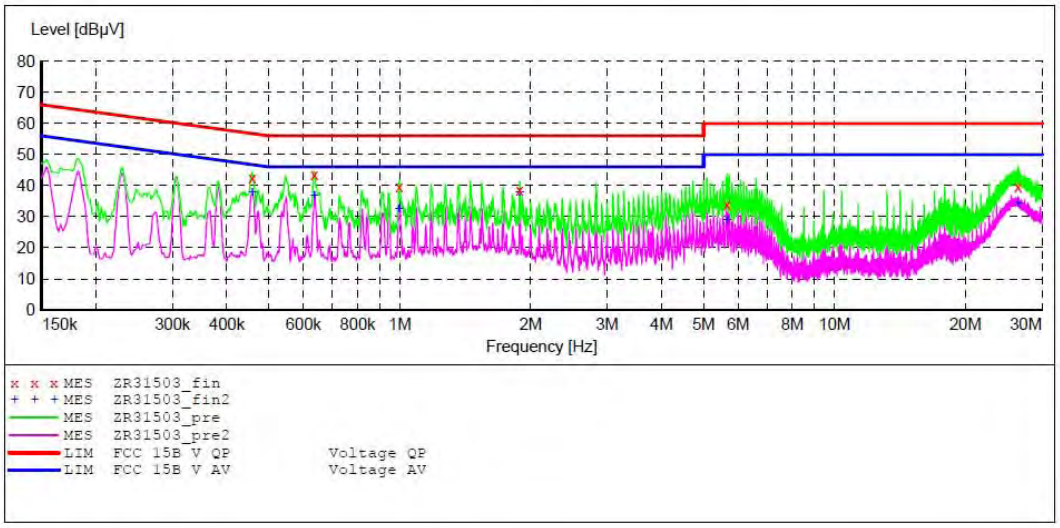
CONDUCTED EMISSION STANDARD FCC PART 15C

```
EUT:                    Eyes-light Camera     M/N:L910
Manufacturer:           Leshi
Operating Condition:    WiFi Communication
Test Site:              1#Shielding Room
Operator:               Star
Test Specification:     L 120V/60Hz
Comment:                Report No.:ATE20180344
Start of Test:          2018-3-15 / 9:07:45
```

SCAN TABLE: "V 150K-30MHz fin"

```
  Short Description:                _SUB_STD_VTERM2 1.70
  Start      Stop       Step        Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width                 Time      Bandw.
  150.0 kHz  30.0 MHz   4.5 kHz     QuasiPeak 1.0 s     9 kHz    NSLK8126 2008
                                    Average
```



MEASUREMENT RESULT: "ZR31503_fin"

2018-3-15 9:10

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.458000	42.50	11.0	57	14.2	QP	L1	GND
0.636000	43.70	11.0	56	12.3	QP	L1	GND
0.998000	39.80	11.1	56	16.2	QP	L1	GND
1.888000	38.50	11.3	56	17.5	QP	L1	GND
5.665000	33.90	11.5	60	26.1	QP	L1	GND
26.445000	39.70	11.8	60	20.3	QP	L1	GND

MEASUREMENT RESULT: "ZR31503_fin2"

2018-3-15 9:10

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.458000	37.90	11.0	47	8.8	AV	L1	GND
0.636000	36.90	11.0	46	9.1	AV	L1	GND
0.996000	32.60	11.1	46	13.4	AV	L1	GND
1.888000	37.90	11.3	46	8.1	AV	L1	GND
5.665000	28.80	11.5	50	21.2	AV	L1	GND
26.445000	34.30	11.8	50	15.7	AV	L1	GND

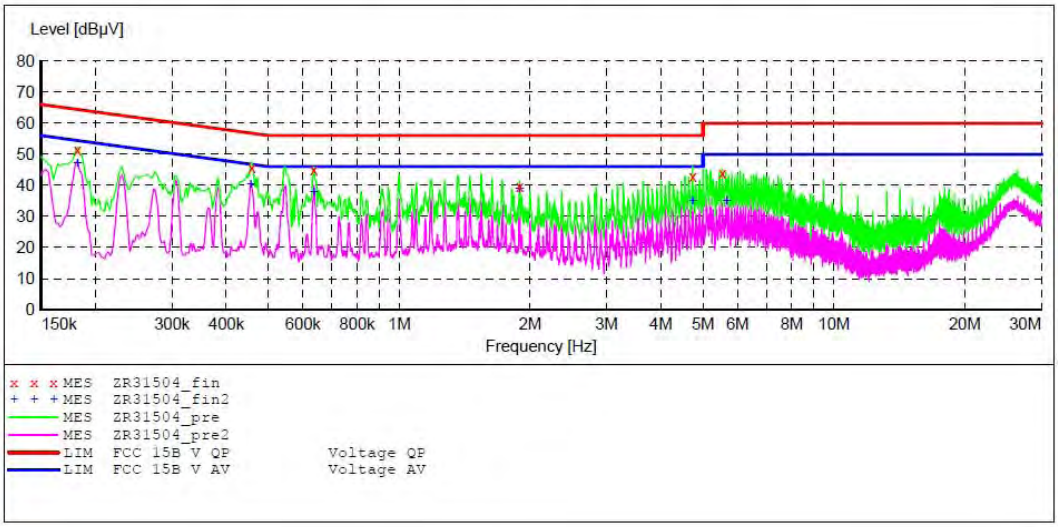
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

```
EUT:                    Eyes-light Camera      M/N:L910
Manufacturer:           Leshi
Operating Condition:    WiFi Communication
Test Site:              1#Shielding Room
Operator:               Star
Test Specification:     N 120V/60Hz
Comment:                Report No.:ATE20180344
Start of Test:          2018-3-15 / 9:10:46
```

SCAN TABLE: "V 150K-30MHz fin"

```
  Short Description:                 _SUB_STD_VTERM2 1.70
  Start      Stop       Step         Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width                  Time      Bandw.
  150.0 kHz  30.0 MHz   4.5 kHz      QuasiPeak 1.0 s     9 kHz    NSLK8126 2008
                                     Average
```



MEASUREMENT RESULT: "ZR31504_fin"

2018-3-15 9:13

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.182000	51.30	10.8	64	13.1	QP	N	GND
0.458000	45.60	11.0	57	11.1	QP	N	GND
0.636000	45.00	11.0	56	11.0	QP	N	GND
1.894000	39.70	11.3	56	16.3	QP	N	GND
4.730000	42.90	11.4	56	13.1	QP	N	GND
5.540000	43.90	11.5	60	16.1	QP	N	GND

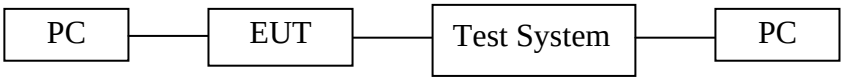
MEASUREMENT RESULT: "ZR31504_fin2"

2018-3-15 9:13

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.182000	47.20	10.8	54	7.2	AV	N	GND
0.456000	40.20	11.0	47	6.6	AV	N	GND
0.636000	37.70	11.0	46	8.3	AV	N	GND
1.892000	39.00	11.3	46	7.0	AV	N	GND
4.730000	34.90	11.4	46	11.1	AV	N	GND
5.675000	35.10	11.5	50	14.9	AV	N	GND

6. 6DB BANDWIDTH MEASUREMENT

6.1.Block Diagram of Test Setup



6.2.The Requirement For Section 15.247(a)(2)

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

6.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4.Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 6.1.

6.4.2.Turn on the power of all equipment.

6.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462. We select 2412MHz, 2437MHz, 2462MHz TX frequency to transmit.

6.5.Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.6.Test Result

Test Lab: Shielding room
Test Engineer: Star

The test was performed with 802.11b			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	10.225	> 0.5MHz
Middle	2437	10.220	> 0.5MHz
High	2462	10.225	> 0.5MHz

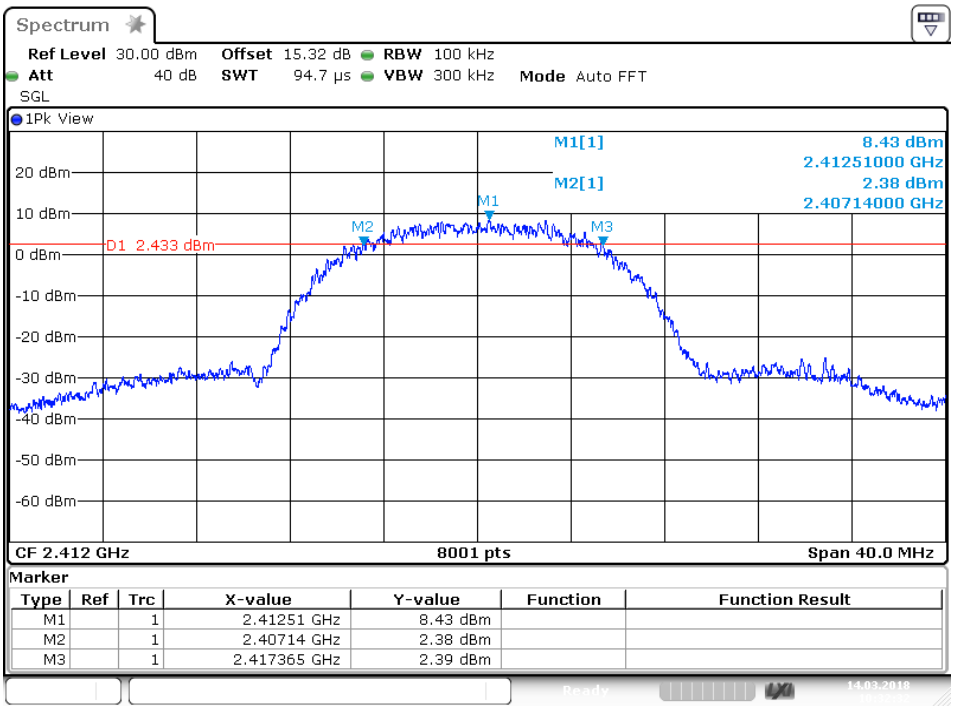
The test was performed with 802.11g			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	16.455	> 0.5MHz
Middle	2437	16.490	> 0.5MHz
High	2462	16.450	> 0.5MHz

The test was performed with 802.11n (Bandwidth: 20 MHz)			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	17.790	> 0.5MHz
Middle	2437	17.795	> 0.5MHz
High	2462	17.765	> 0.5MHz

Note: We tested 802.11b/g/n mode the all data rate and recorded the worst case data for this channel to be 11Mbps for 802.11b mode and 54Mbps for 802.11g mode and MCS7 for 802.11n mode.

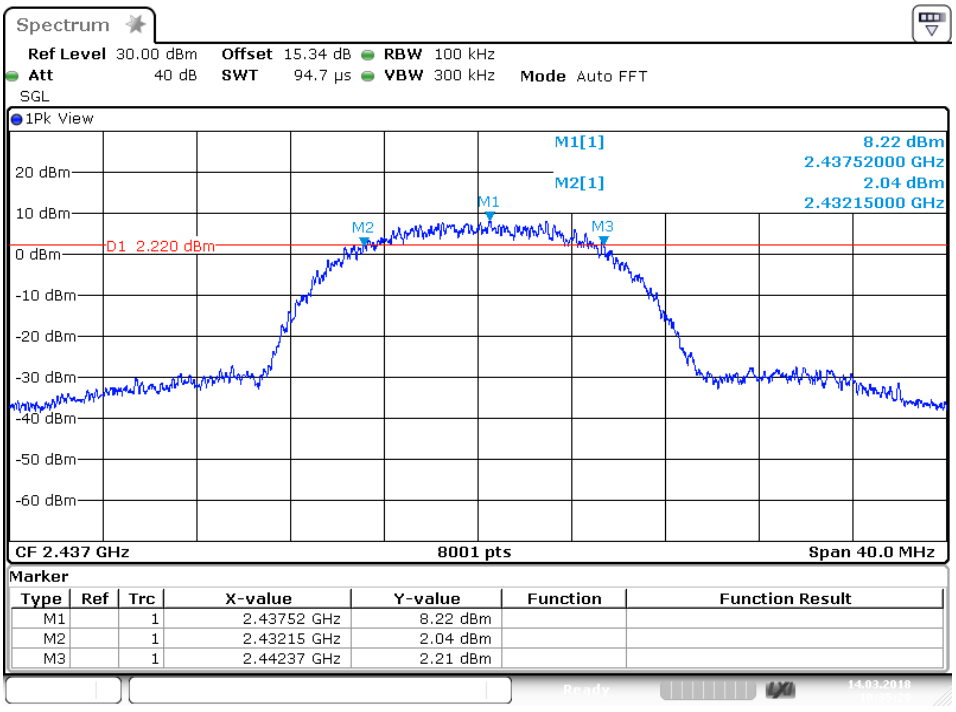
The spectrum analyzer plots are attached as below.

802.11b Channel Low 2412MHz



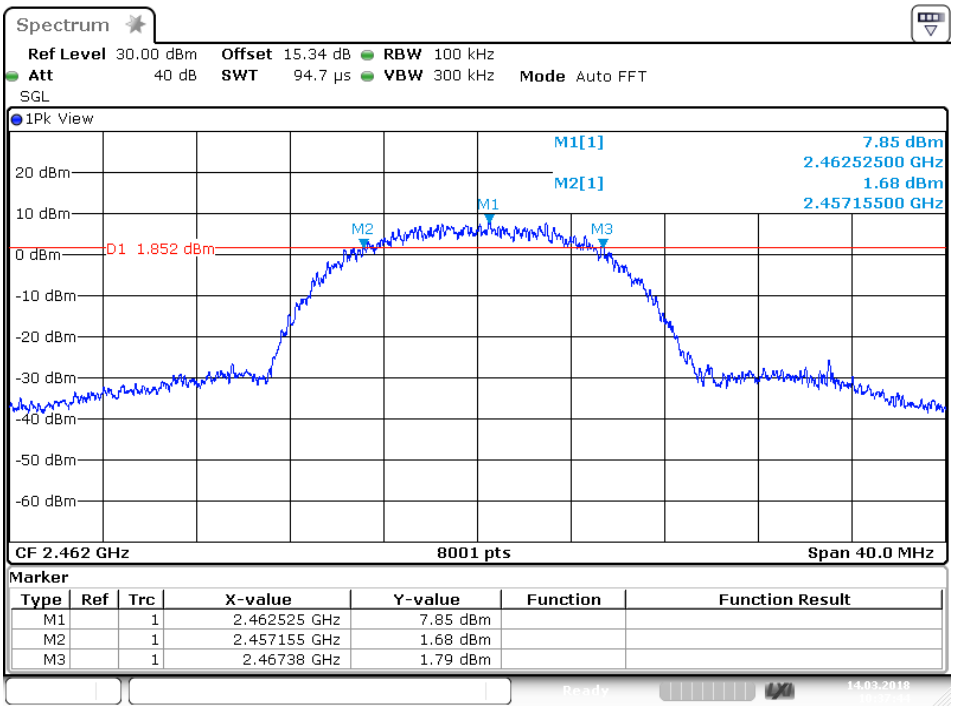
Date: 14.MAR.2018 10:32:33

802.11b Channel Middle 2437MHz



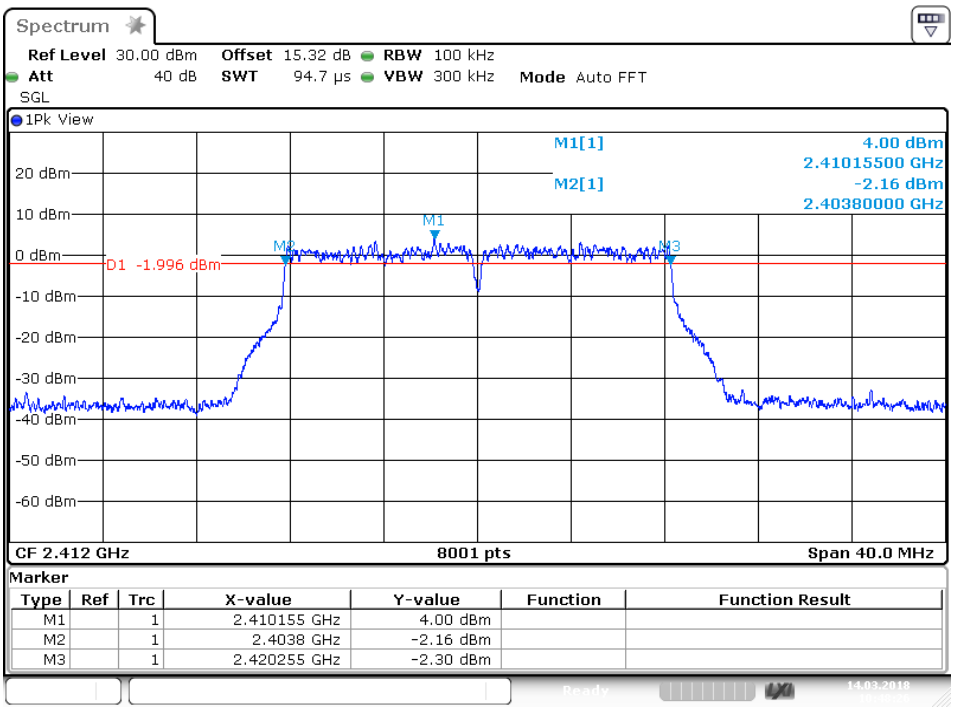
Date: 14.MAR.2018 10:35:30

802.11b Channel High 2462MHz



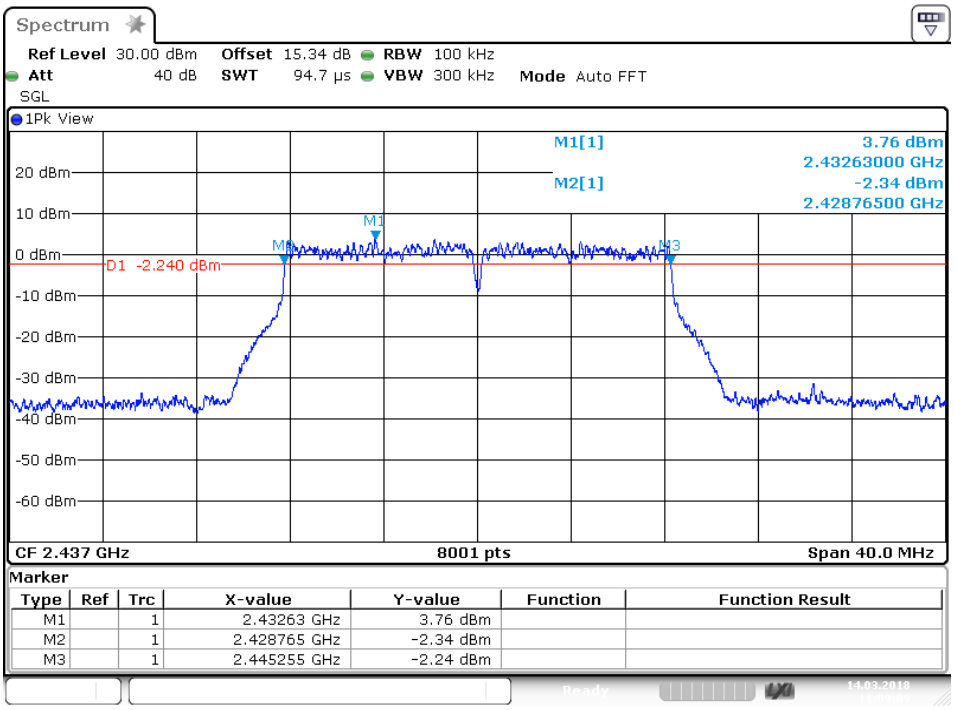
Date: 14.MAR.2018 10:37:44

802.11g Channel Low 2412MHz



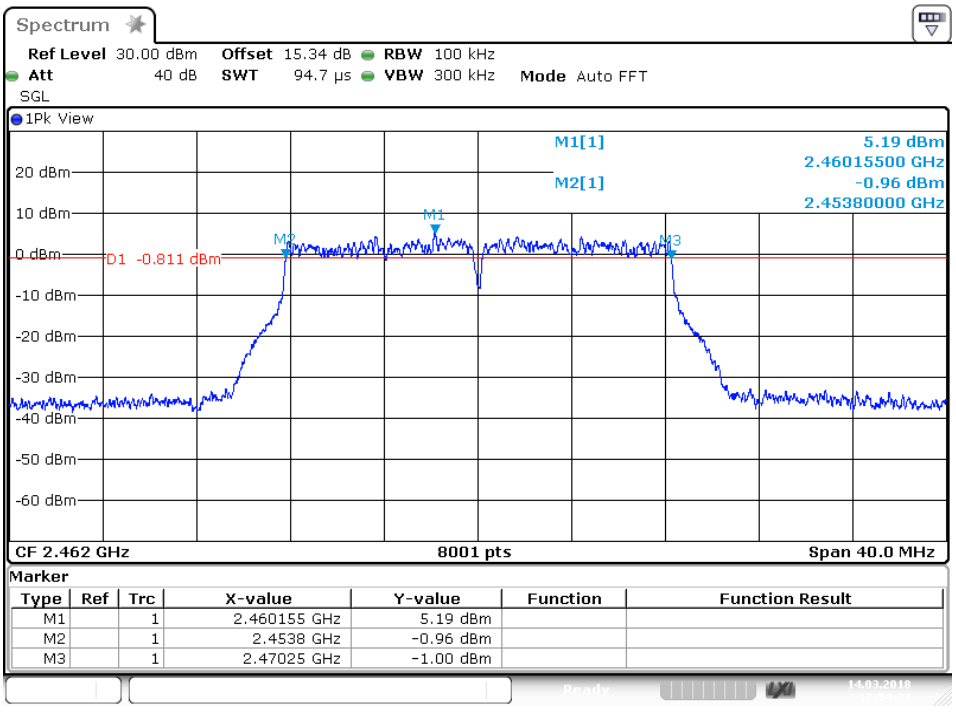
Date: 14.MAR.2018 10:48:27

802.11g Channel Middle 2437MHz



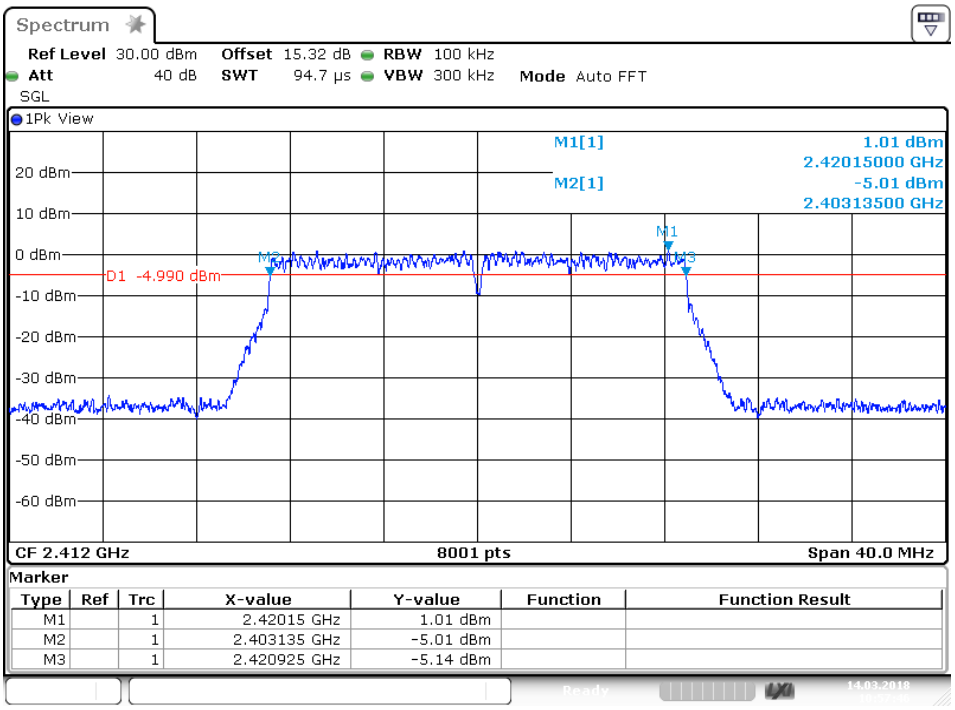
Date: 14.MAR.2018 11:09:10

802.11g Channel High 2462MHz



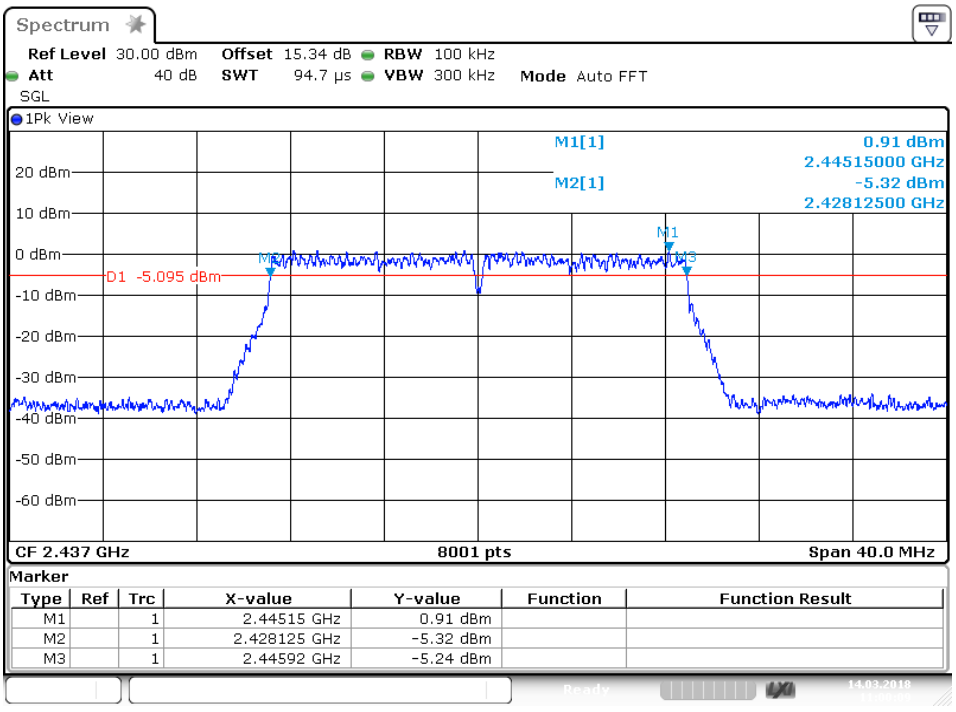
Date: 14.MAR.2018 10:54:33

802.11n Channel Low 2412MHz (20MHz)



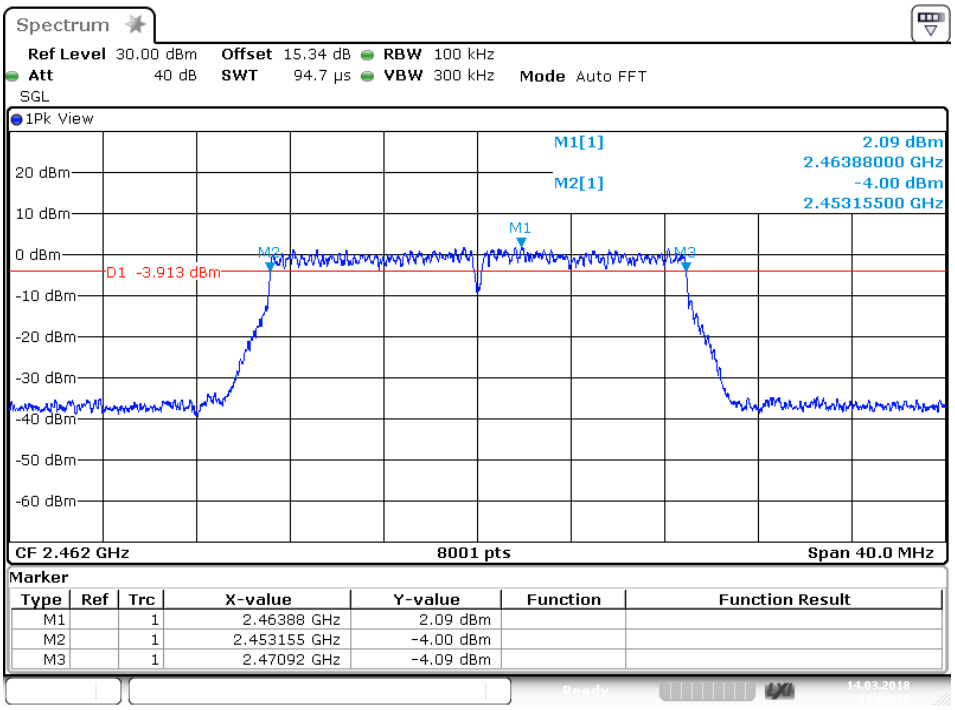
Date: 14.MAR.2018 10:57:46

802.11n Channel Middle 2437MHz(20MHz)



Date: 14.MAR.2018 11:00:10

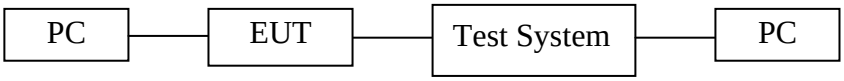
802.11n Channel High 2462MHz(20MHz)



Date: 14.MAR.2018 11:04:18

7. DUTY CYCLE MEASUREMENT

7.1.Block Diagram of Test Setup



7.2.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.3.Operating Condition of EUT

7.3.1.Setup the EUT and simulator as shown as Section 7.1.

7.3.2.Turn on the power of all equipment.

7.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462. We select 2412MHz, 2437MHz, 2462MHz TX frequency to transmit.

7.4.Test Procedure

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:
1. A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on- and off-times of the transmitted signal.
2. The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on- and off-times of the transmitted signal
a. Set the center frequency of the instrument to the centre frequency of the transmission
b. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value(10MHz).
c. Set detector = Peak or average.
d. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100.
(For example, if VBW and/or RBW are limited to 3MHz, then the zero-span method of measuring duty cycle shall not be used if T≤16.7 microseconds.)

7.5. Test Result

Test Lab: Shielding room
Test Engineer: Star

The test was performed with 802.11b			
Channel	Frequency (MHz)	duty cycle(x)	10log(1/x)
Middle	2437	100%	0

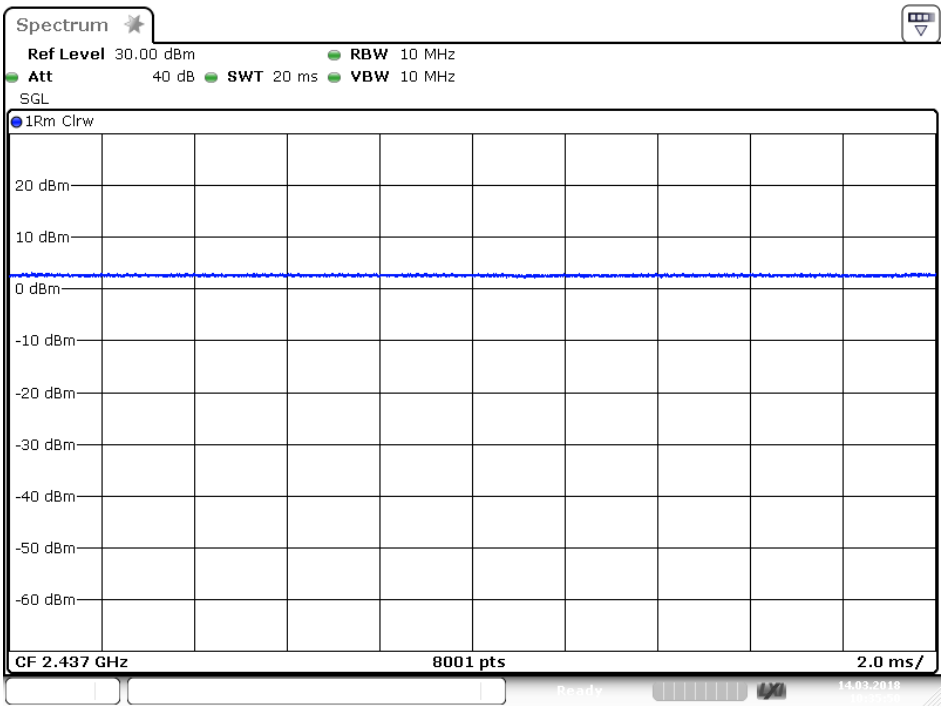
The test was performed with 802.11g			
Channel	Frequency (MHz)	duty cycle(x)	10log(1/x)
Middle	2437	100%	0

The test was performed with 802.11n (Bandwidth: 20 MHz)			
Channel	Frequency (MHz)	duty cycle(x)	10log(1/x)
Middle	2437	100%	0

Note: We tested 802.11b/g/n mode the all data rate and recorded the worst case data for this channel to be 11Mbps for 802.11b mode and 54Mbps for 802.11g mode and MCS7 for 802.11n mode.

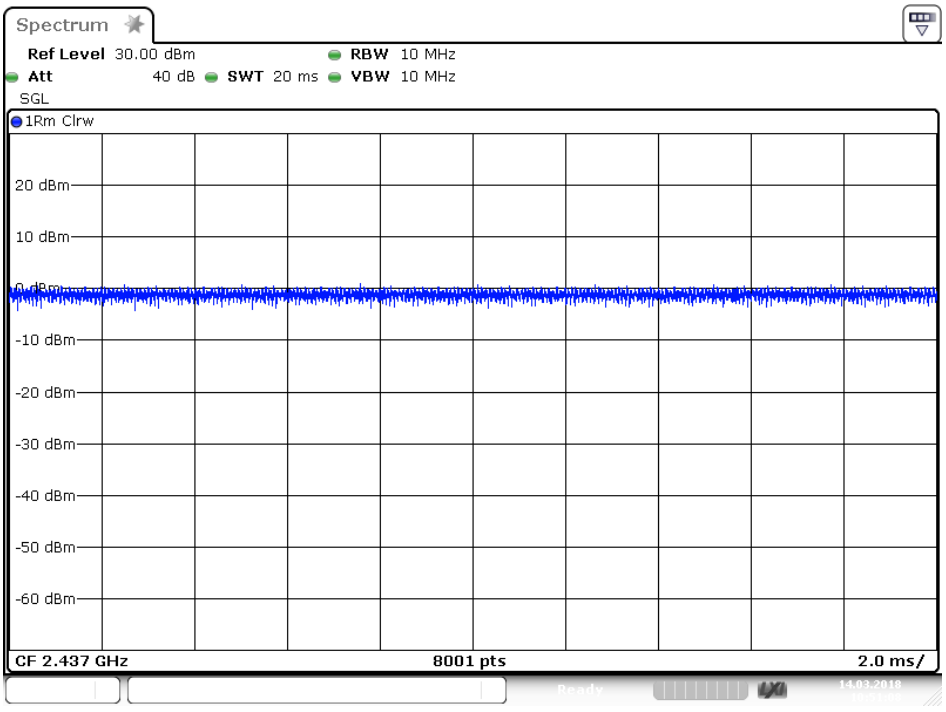
The spectrum analyzer plots are attached as below.

802.11b Channel Middle 2437MHz



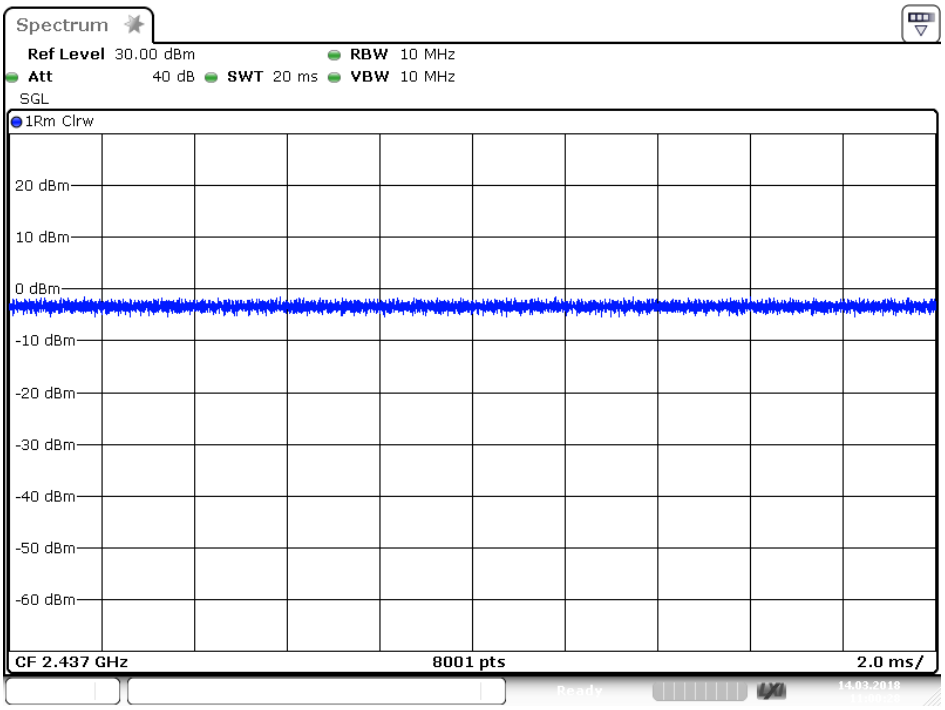
Date: 14.MAR.2018 10:35:49

802.11g Channel Middle 2437MHz



Date: 14.MAR.2018 10:51:09

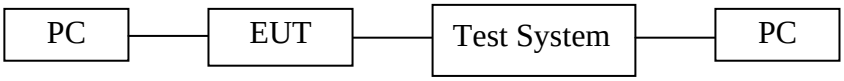
802.11n Channel Middle 2437MHz(20MHz)



Date: 14.MAR.2018 11:00:29

8. MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER

8.1.Block Diagram of Test Setup



8.2.The Requirement For Section 15.247(b)(3)

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

8.3.EUT Configuration on Measurement

The equipment is installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4.Operating Condition of EUT

8.4.1.Setup the EUT and simulator as shown as Section 8.1.

8.4.2.Turn on the power of all equipment.

8.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462. We select 2412MHz, 2437MHz, 2462MHz TX frequency to transmit.

8.5.Test Procedure

8.5.1.The EUT was tested according to DTS test procedure of Apr 05, 2017 KDB5580 74 D01 DTS Meas Guidance v04 for compliance to FCC 47CFR 15.247 requirements.

8.5.2.The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.3.Set RBW = 1-5% of the OBW, not to exceed 1 MHz, VBW $\geqslant$ 3 x RBW, Sweep time = auto, Set span to at least 1.5 times the OBW, Detector = RMS.

8.5.4.Measurement the Maximum conducted (average) output power.

8.6. Test Result

Test Lab: Shielding room
Test Engineer: Star

Final power= Ave output power+10log(1/ duty cycle)

The test was performed with 802.11b						
Channel	Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (W)	Limits dBm / W
Low	2412	18.66	0	18.66	0.0735	30 dBm / 1 W
Middle	2437	19.16	0	19.16	0.0824	30 dBm / 1 W
High	2462	18.77	0	18.77	0.0753	30 dBm / 1 W

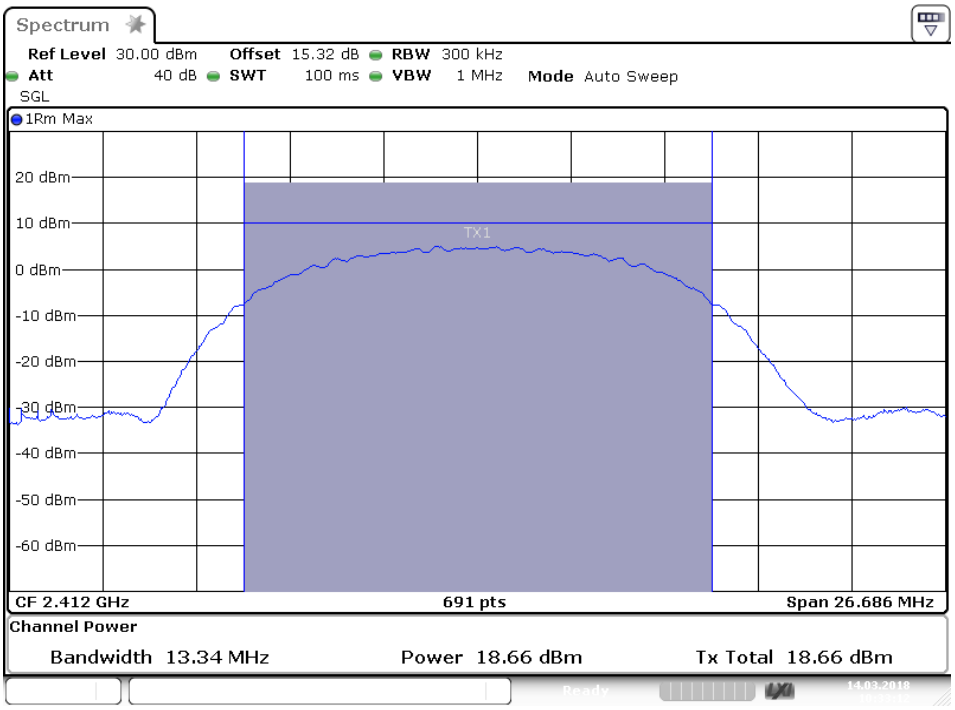
The test was performed with 802.11g						
Channel	Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (W)	Limits dBm / W
Low	2412	16.45	0	16.45	0.0442	30 dBm / 1 W
Middle	2437	16.76	0	16.76	0.0474	30 dBm / 1 W
High	2462	17.39	0	17.39	0.0548	30 dBm / 1 W

The test was performed with 802.11n (20MHz)						
Channel	Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (W)	Limits dBm / W
Low	2412	14.85	0	14.85	0.0305	30 dBm / 1 W
Middle	2437	14.91	0	14.91	0.0310	30 dBm / 1 W
High	2462	15.38	0	15.38	0.0345	30 dBm / 1 W

Note: We tested 802.11b/g/n mode the all data rate and recorded the worst case data for this channel to be 11Mbps for 802.11b mode and 54Mbps for 802.11g mode and MCS7 for 802.11n mode.

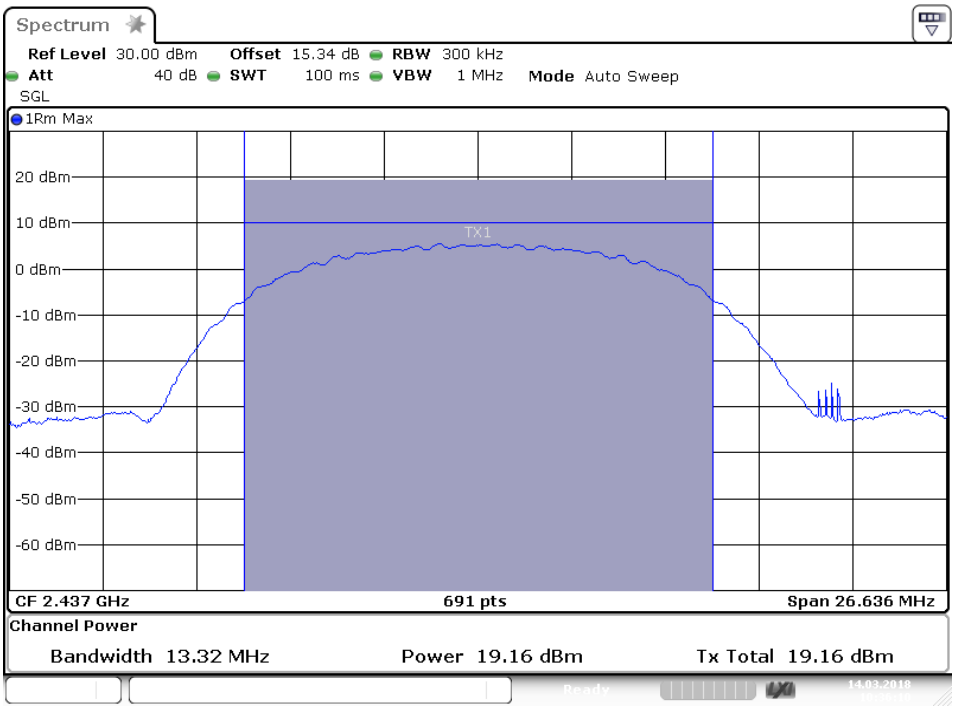
The spectrum analyzer plots are attached as below.

802.11b Channel Low 2412MHz



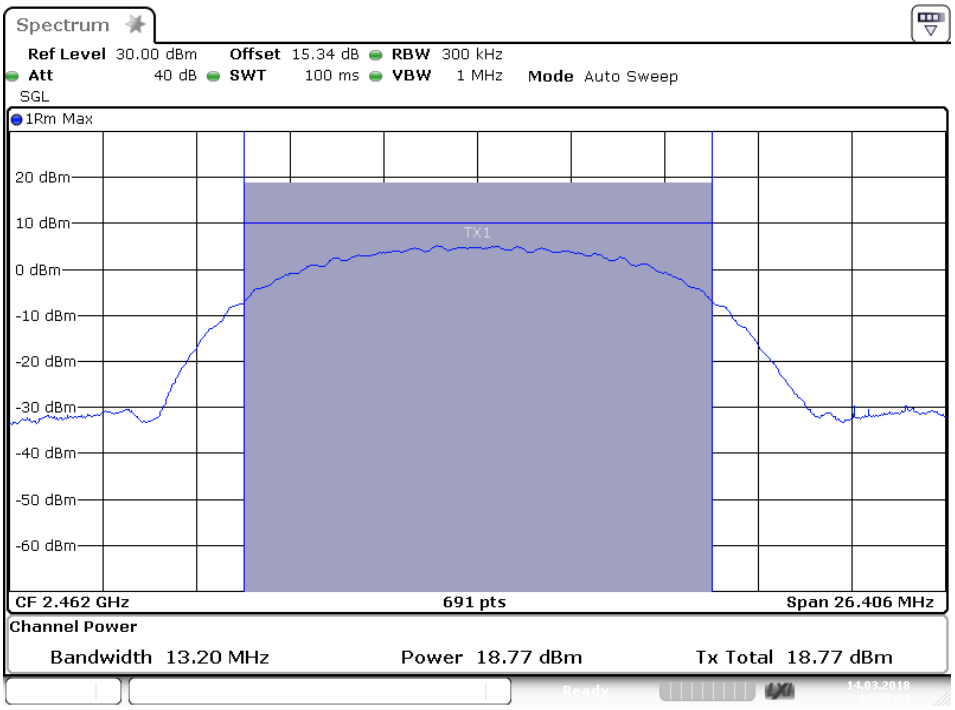
Date: 14.MAR.2018 10:33:13

802.11b Channel Middle 2437MHz



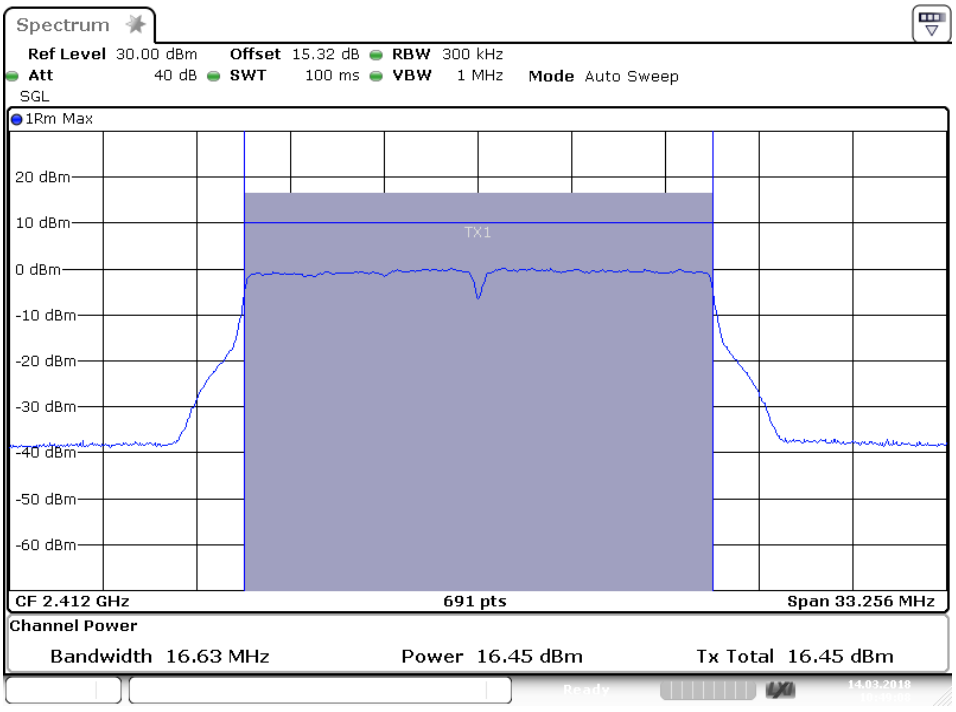
Date: 14.MAR.2018 10:36:11

802.11b Channel High 2462MHz



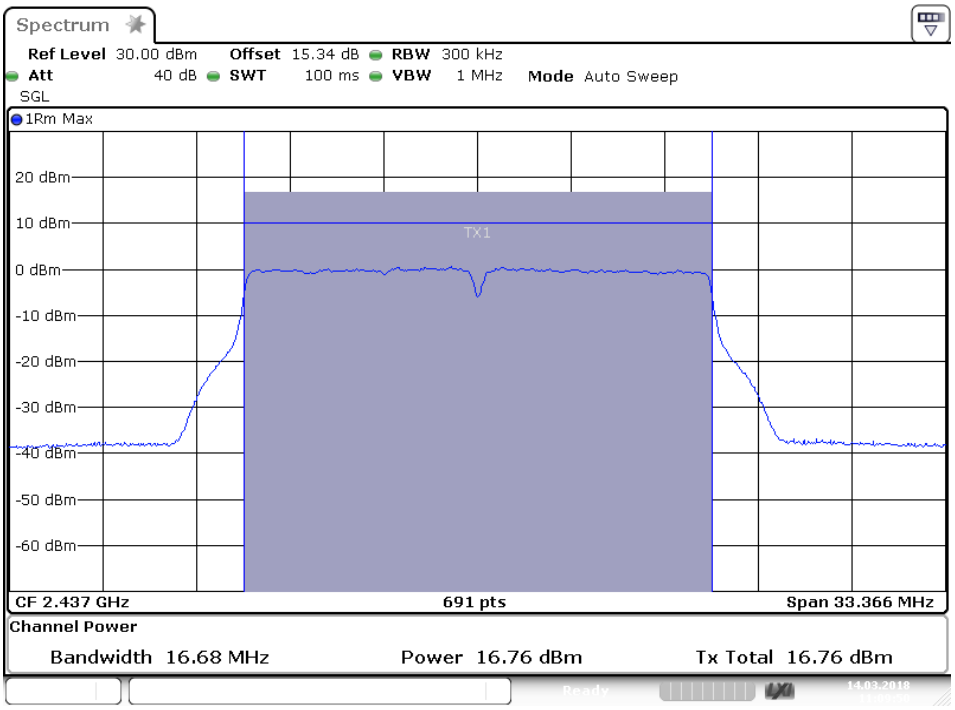
Date: 14.MAR.2018 10:38:25

802.11g Channel Low 2412MHz



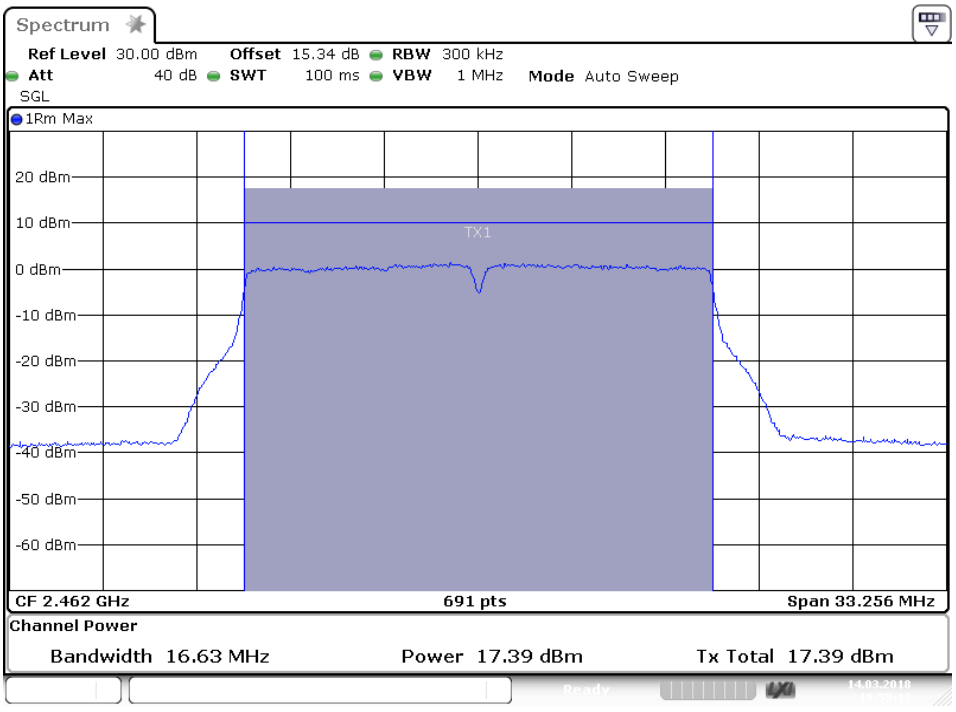
Date: 14.MAR.2018 10:49:07

802.11g Channel Middle 2437MHz



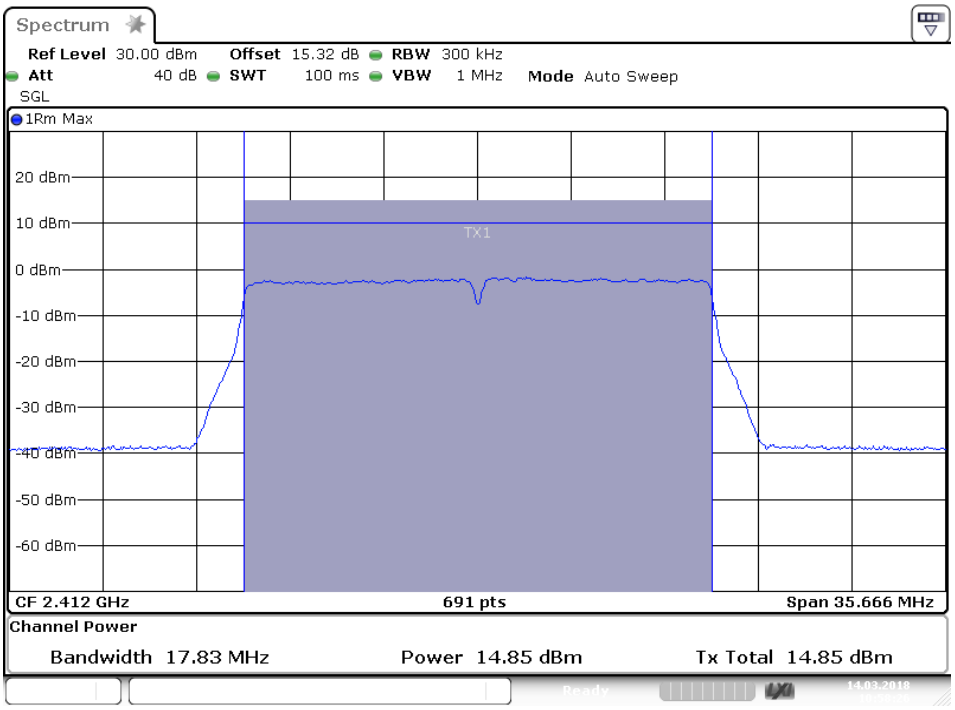
Date: 14.MAR.2018 11:09:50

802.11g Channel High 2462MHz



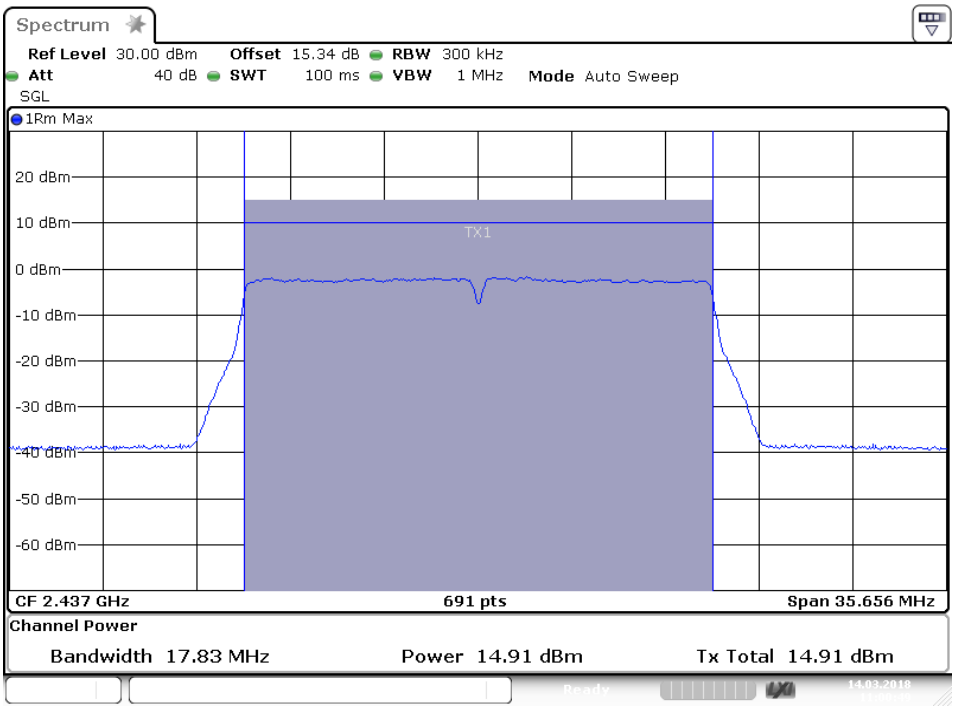
Date: 14.MAR.2018 10:55:14

802.11n Channel Low 2412MHz (20MHz)



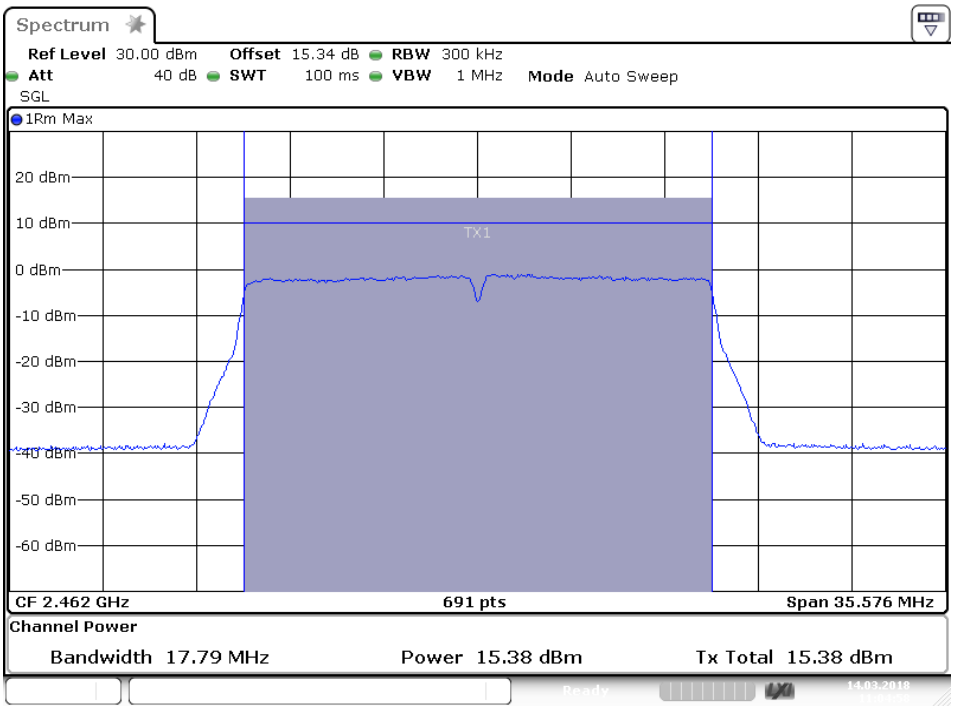
Date: 14.MAR.2018 10:58:27

802.11n Channel Middle 2437MHz (20MHz)



Date: 14.MAR.2018 11:00:50

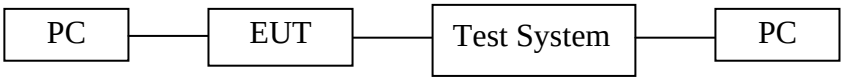
802.11n Channel High 2462MHz (20MHz)



Date: 14.MAR.2018 11:04:58

9. POWER SPECTRAL DENSITY MEASUREMENT

9.1.Block Diagram of Test Setup



9.2.The Requirement For Section 15.247(e)

Section 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.

9.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4.Operating Condition of EUT

9.4.1.Setup the EUT and simulator as shown as Section 9.1.

9.4.2.Turn on the power of all equipment.

9.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462. We select 2412MHz, 2437MHz, 2462MHz TX frequency to transmit.

9.5.Test Procedure

9.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2.Measurement Procedure AVGPSD-2:

This procedure is applicable when the EUT cannot be configured to transmit continuously(i.e., duty cycle<98%), and when sweep triggering/signal gating cannot be used to measure only when the EUT is transmitting at its maximum power control level, and when the transmission duty is constant(i.e., duty cycle variations are less than ±2%):

Measure the dyty cycle(x) of the transmitter output signal as described in Section 6.0.

Set instrument center frequency to DTS channel center frequency.
Set span to at least 1.5×OBW.
Set RBW to: 3kHz≤ RBW≤100kHz.
Set VBW≥ 3×RBW
Detector=power averaging(RMS) or sample detector(when RMS not available).
Ensure that the number of measurement points in sweep≥2×span/RBW.
Sweep time=auto couple.
Do not use sweep triggering. Allow sweep to “free run”.
Employ trace averaging(RMS) mode over a minimum of 100 traces.
Use the peak maker function to determine the maximum amplitude level.
Add 10log(1/x), where x is the duty cycle measured in step(a, to the measured PSD to compute the average PSD during the actual transmission time.
If resultant value exceeds the limit, then reduce RBW(no less than 3kHz) and repeat(note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

9.6.Test Result

Test Lab: Shielding room
Test Engineer: Star

The test was performed with 802.11b					
Channel	Frequency (MHz)	AVG Power Spectral Density (dBm/3KHz)	10log(1/ duty cycle)	Final Power Spectral Density (dBm/3KHz)	Limits (dBm/3KHz)
Low	2412	-7.60	0	-7.60	8 dBm
Middle	2437	-6.76	0	-6.76	8 dBm
High	2462	-7.57	0	-7.57	8 dBm

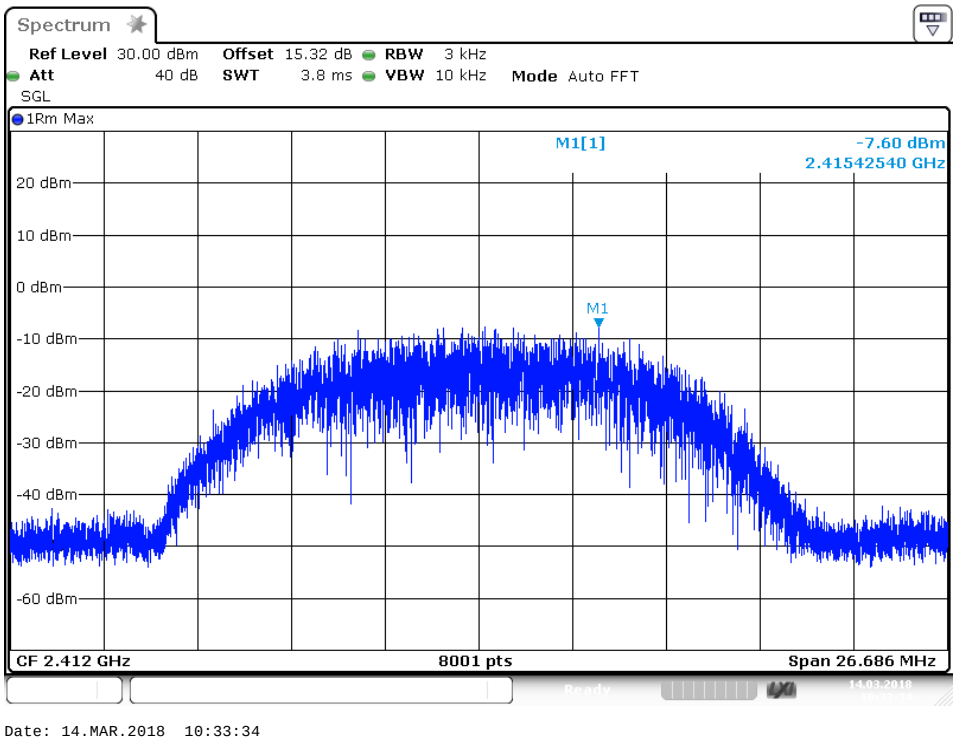
The test was performed with 802.11g					
Channel	Frequency (MHz)	AVG Power Spectral Density (dBm/3KHz)	10log(1/ duty cycle)	Final Power Spectral Density (dBm/3KHz)	Limits (dBm/3KHz)
Low	2412	-11.31	0	-11.31	8 dBm
Middle	2437	-12.12	0	-12.12	8 dBm
High	2462	-10.42	0	-10.42	8 dBm

The test was performed with 802.11n (20MHz)					
Channel	Frequency (MHz)	AVG Power Spectral Density (dBm/3KHz)	10log(1/ duty cycle)	Final Power Spectral Density (dBm/3KHz)	Limits (dBm/3KHz)
Low	2412	-12.20	0	-12.20	8 dBm
Middle	2437	-12.16	0	-12.16	8 dBm
High	2462	-11.70	0	-11.70	8 dBm

Note: We tested 802.11b/g/n mode the all data rate and recorded the worst case data for this channel to be 11Mbps for 802.11b mode and 54Mbps for 802.11g mode and MCS7 for 802.11n mode.

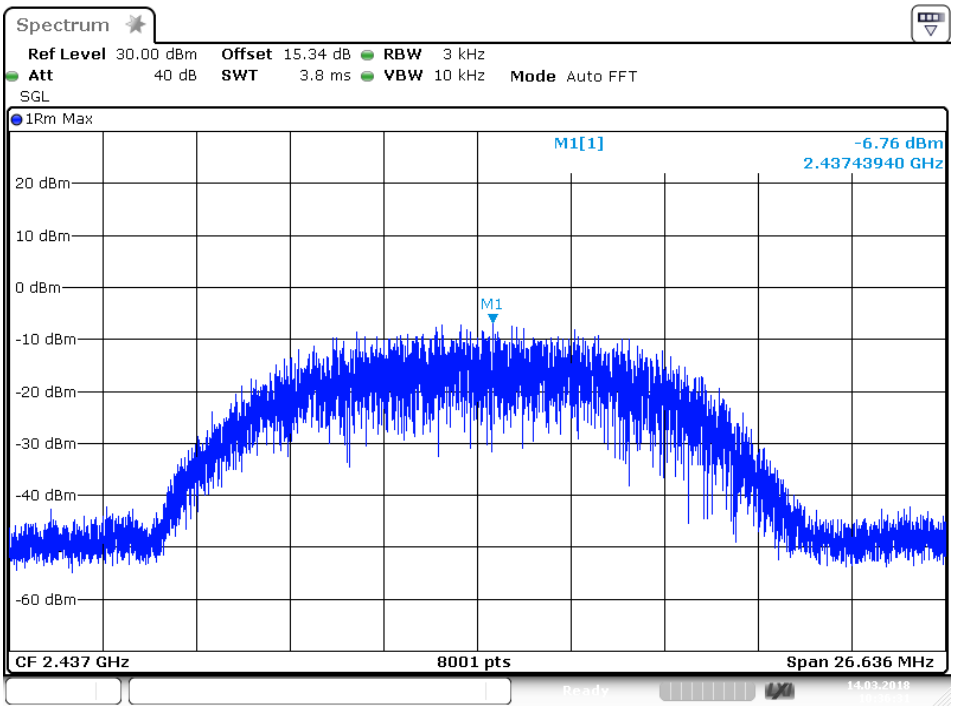
The spectrum analyzer plots are attached as below.

802.11b Channel Low 2412MHz



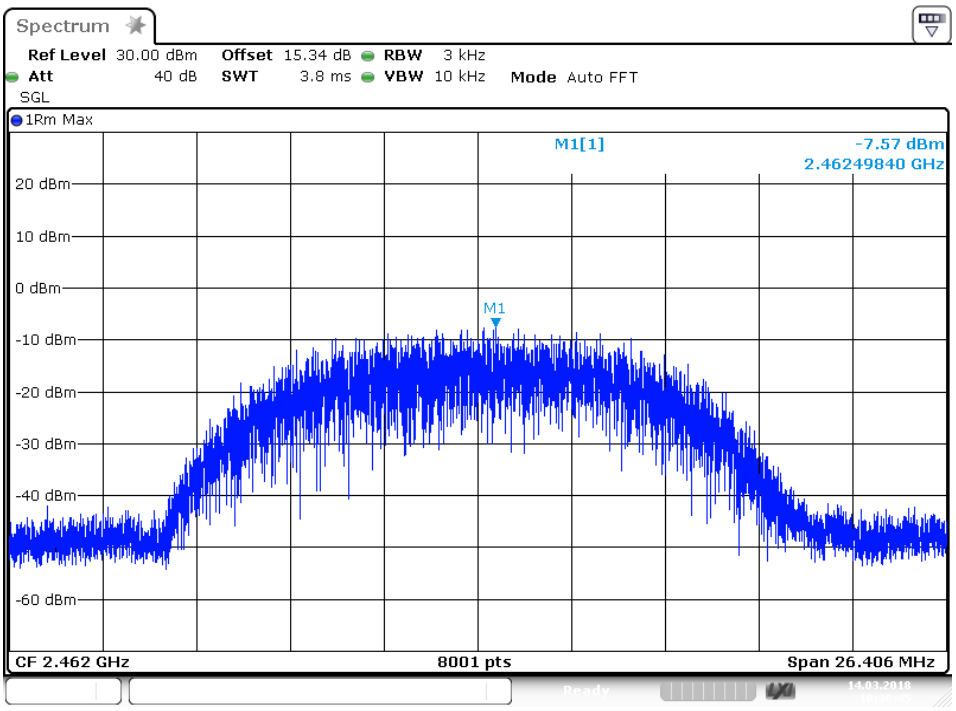
Date: 14.MAR.2018 10:33:34

802.11b Channel Middle 2437MHz



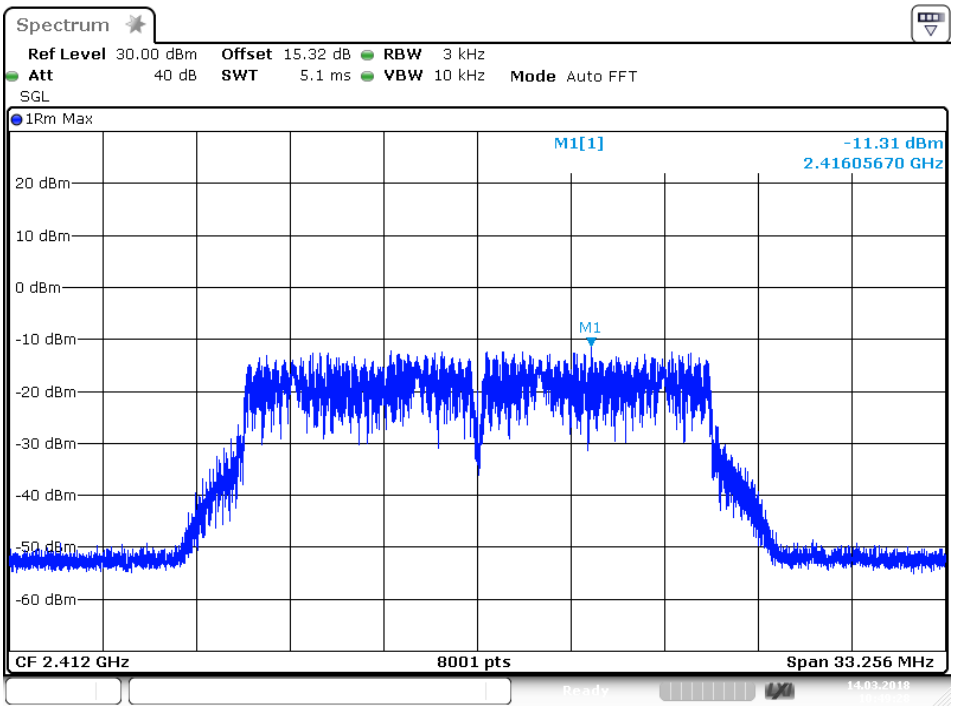
Date: 14.MAR.2018 10:36:32

802.11b Channel High 2462MHz



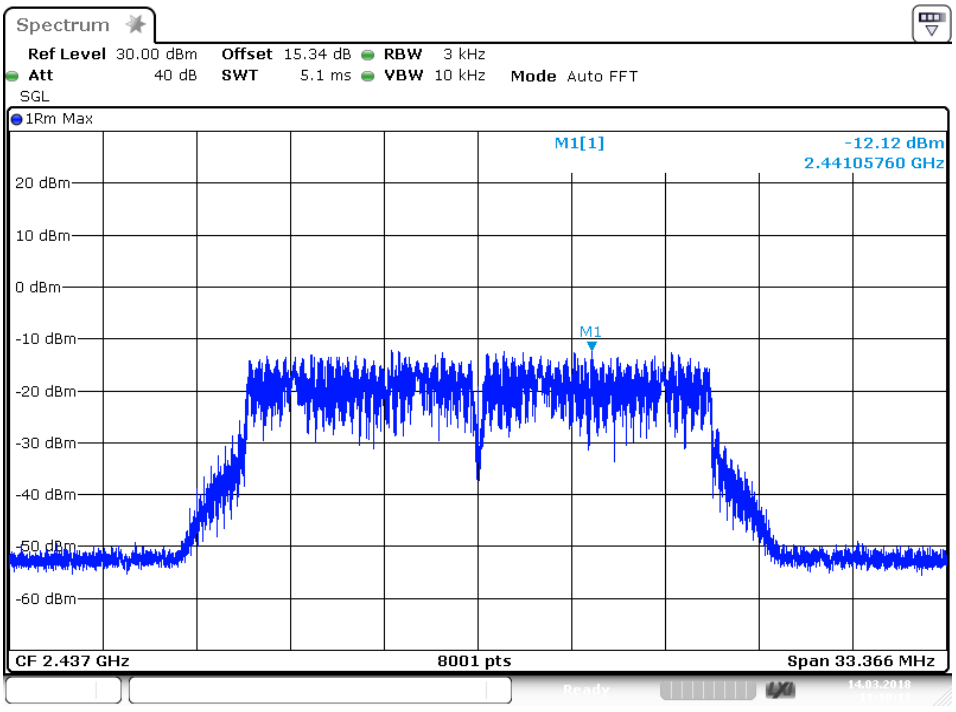
Date: 14.MAR.2018 10:38:46

802.11g Channel Low 2412MHz



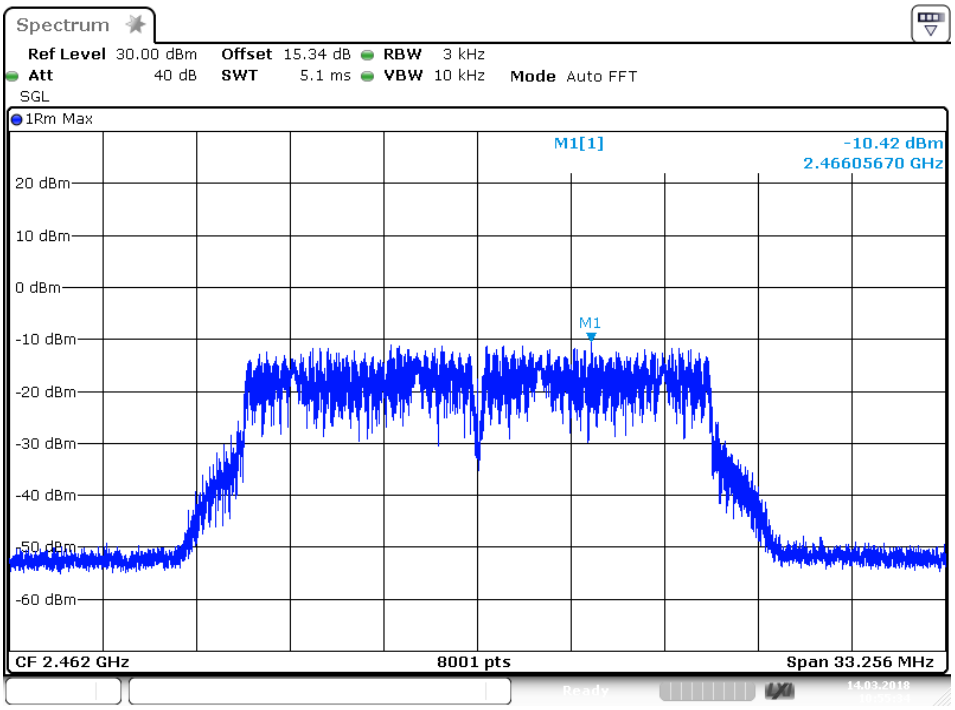
Date: 14.MAR.2018 10:49:29

802.11g Channel Middle 2437MHz



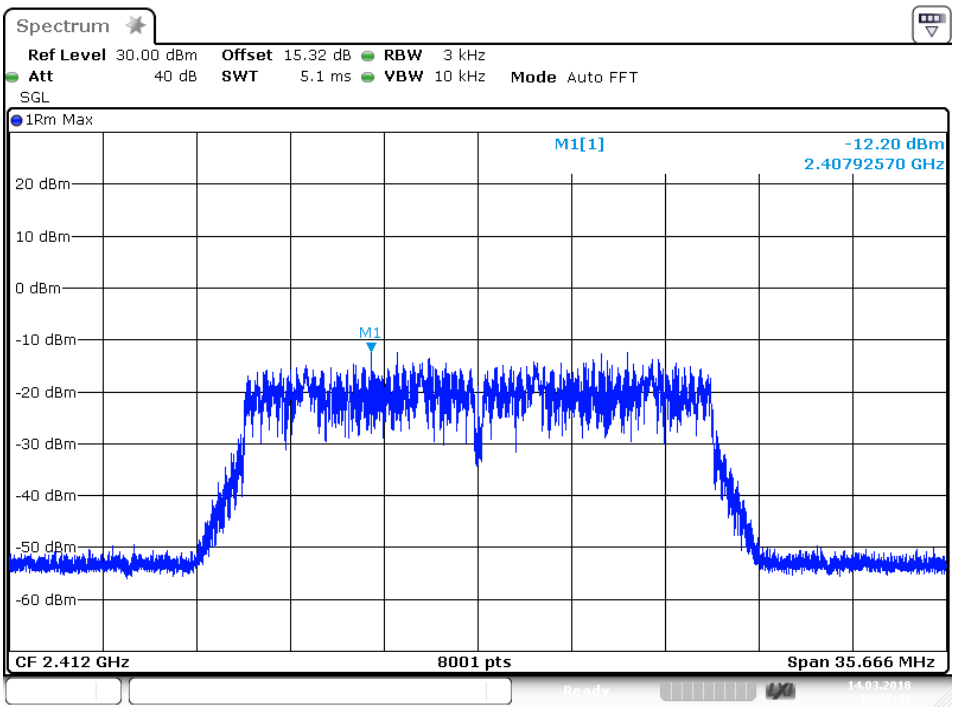
Date: 14.MAR.2018 11:10:12

802.11g Channel High 2462MHz



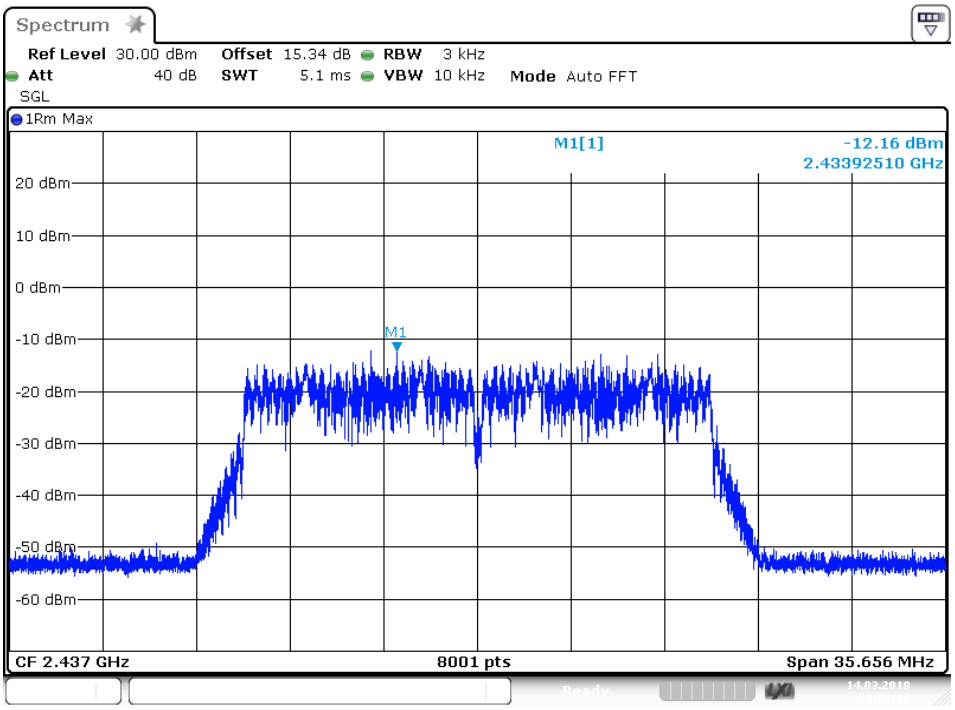
Date: 14.MAR.2018 10:55:35

802.11n Channel Low 2412MHz (20MHz)



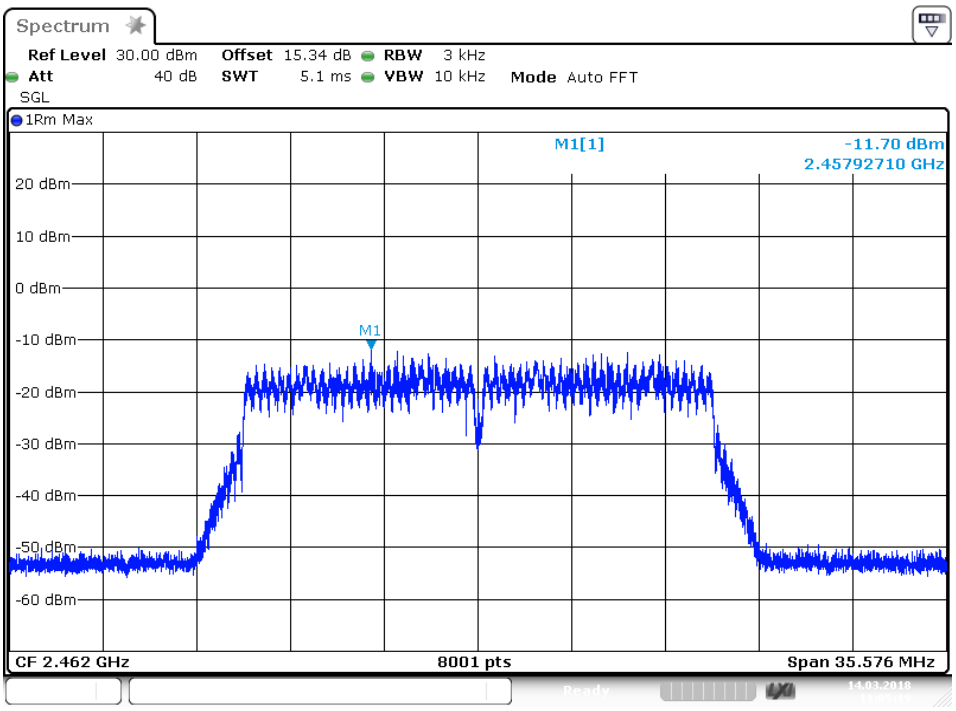
Date: 14.MAR.2018 10:58:48

802.11n Channel Middle 2437MHz (20MHz)



Date: 14.MAR.2018 11:01:11

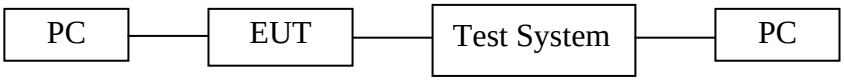
802.11n Channel High 2462MHz(20MHz)



Date: 14.MAR.2018 11:05:20

10.BAND EDGE COMPLIANCE TEST

10.1.Block Diagram of Test Setup



10.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

10.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.4.Operating Condition of EUT

10.4.1.Setup the EUT and simulator as shown as Section 9.1.

10.4.2.Turn on the power of all equipment.

10.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462. We select 2412MHz, 2462MHz TX frequency to transmit.

10.5.Test Procedure

Conducted Band Edge:

10.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.

10.5.2.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.

Radiate Band Edge:

10.5.3.The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.

10.5.4.The turntable was rotated for 360 degrees to determine the position of maximum emission level.

10.5.5.EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

10.5.6.Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

10.5.7.RBW=1MHz, VBW=1MHz

10.5.8.The band edges was measured and recorded.

10.6.Test Result

Test Lab: Shielding room
Test Engineer: Star

The test was performed with 802.11b		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400	41.52	> 30dBc
2483.5	48.04	> 30dBc

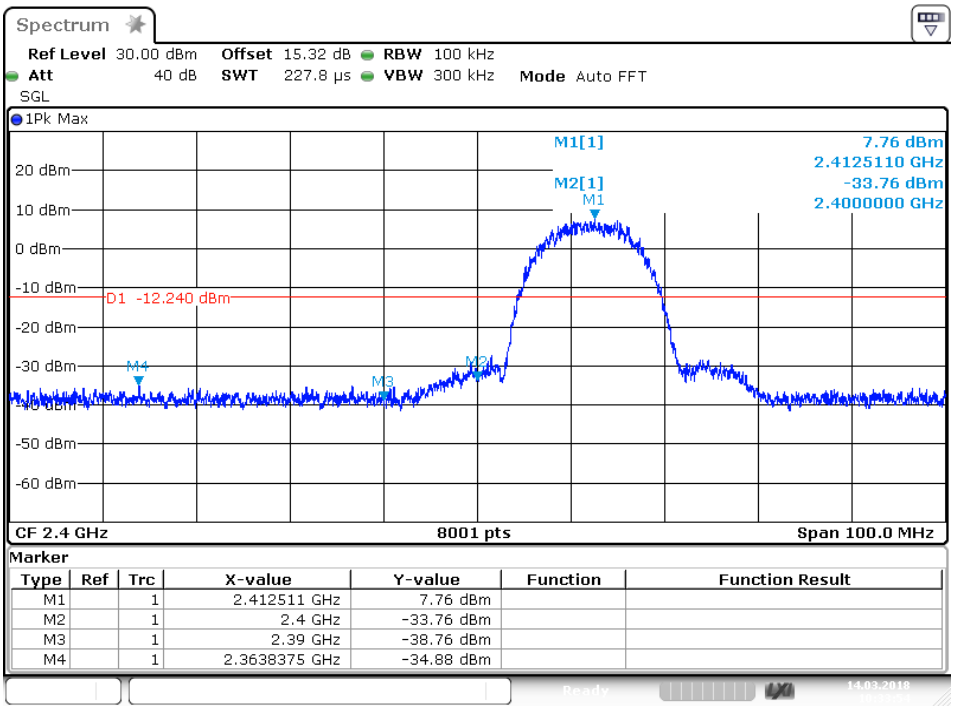
The test was performed with 802.11g		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400	43.52	> 30dBc
2483.5	44.99	> 30dBc

The test was performed with 802.11n (20MHz)		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400	41.33	> 30dBc
2483.5	41.51	> 30dBc

Note: We tested 802.11b/g/n mode the all data rate and recorded the worst case data for this channel to be 11Mbps for 802.11b mode and 54Mbps for 802.11g mode and MCS7 for 802.11n mode.

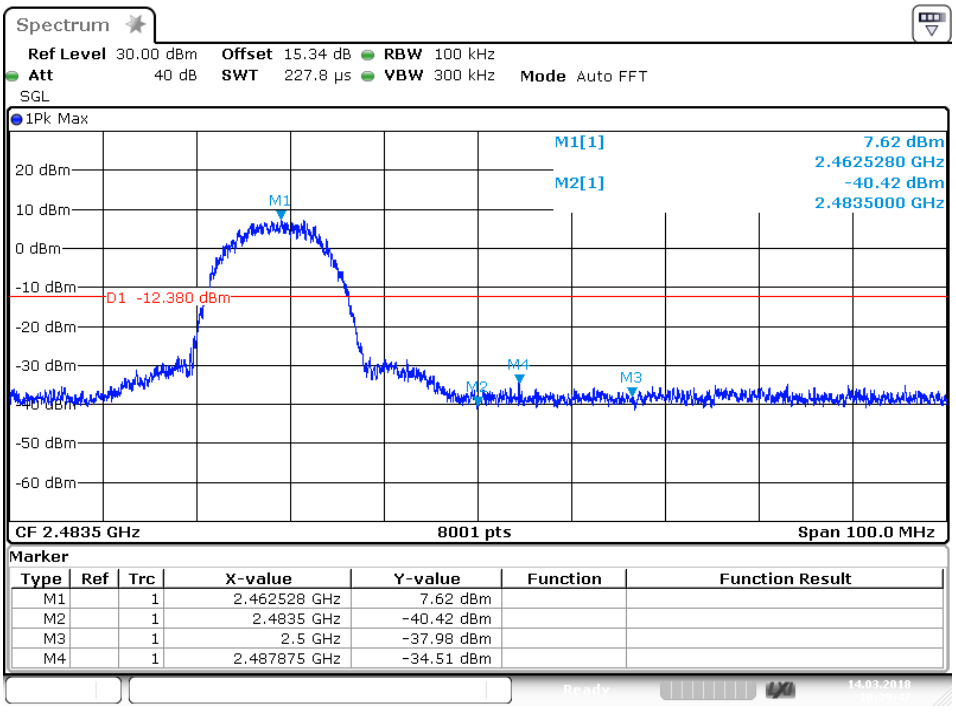
The spectrum analyzer plots are attached as below.

802.11b Channel Low 2412MHz



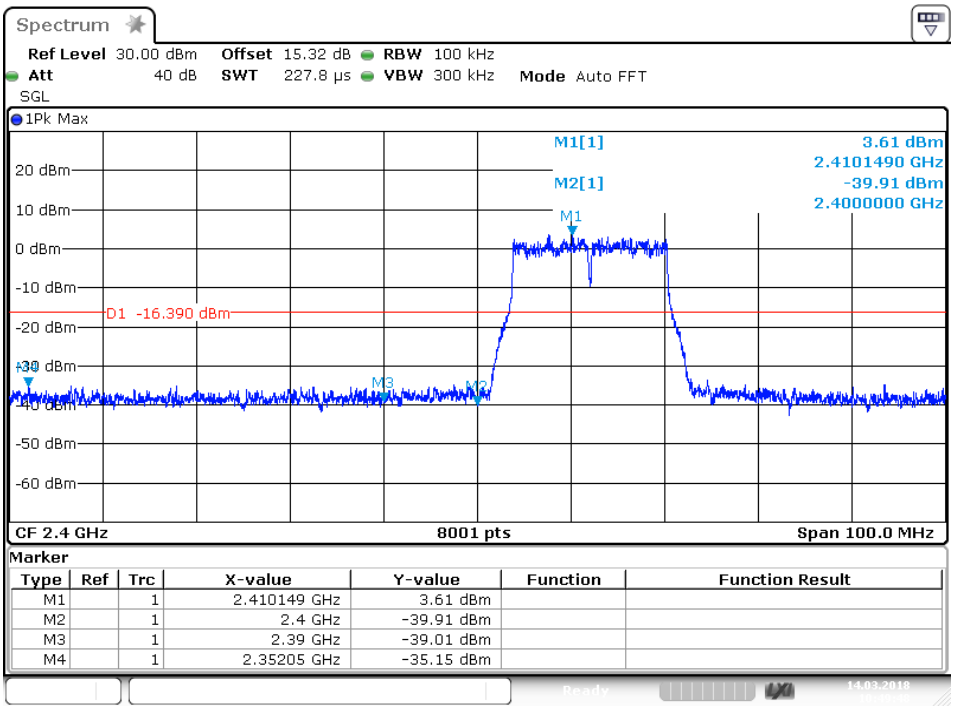
Date: 14.MAR.2018 10:33:54

802.11b Channel High 2462MHz



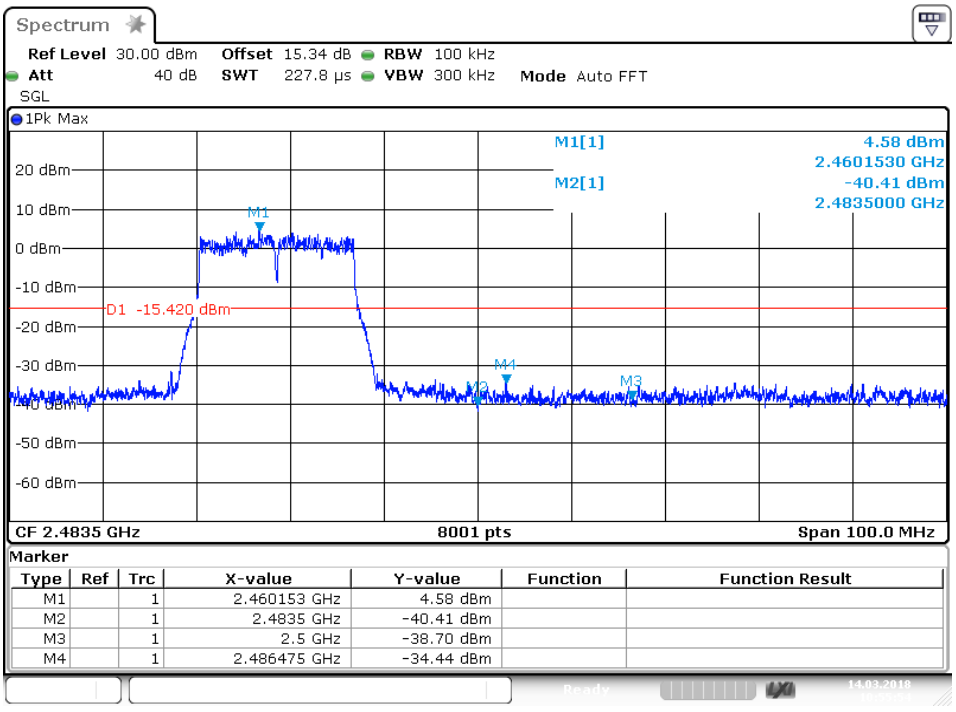
Date: 14.MAR.2018 10:39:48

802.11g Channel Low 2412MHz



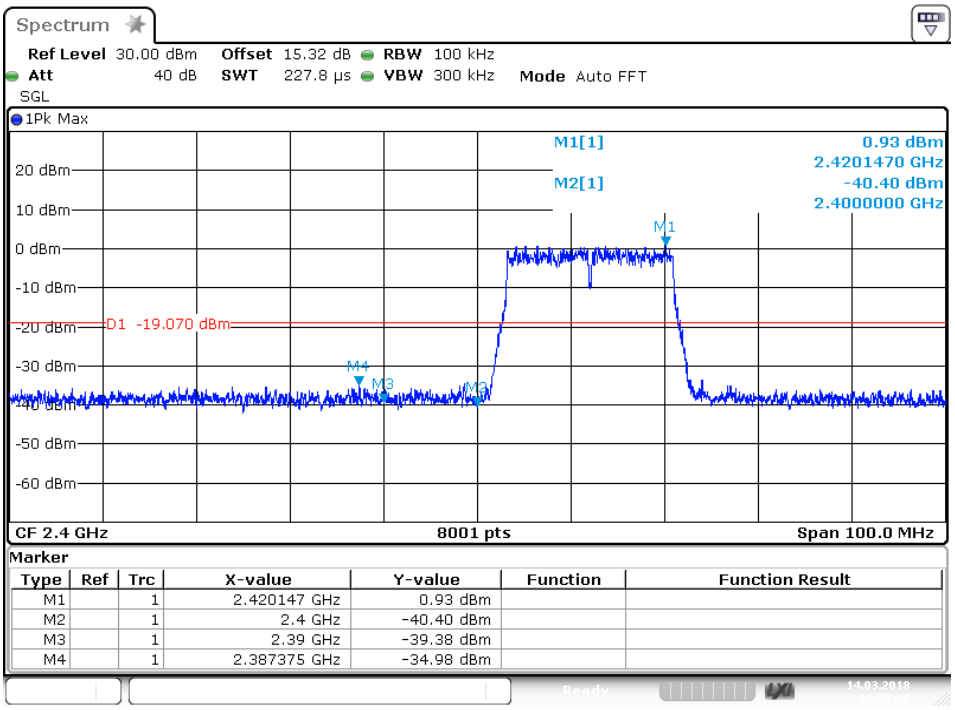
Date: 14.MAR.2018 10:49:49

802.11g Channel High 2462MHz



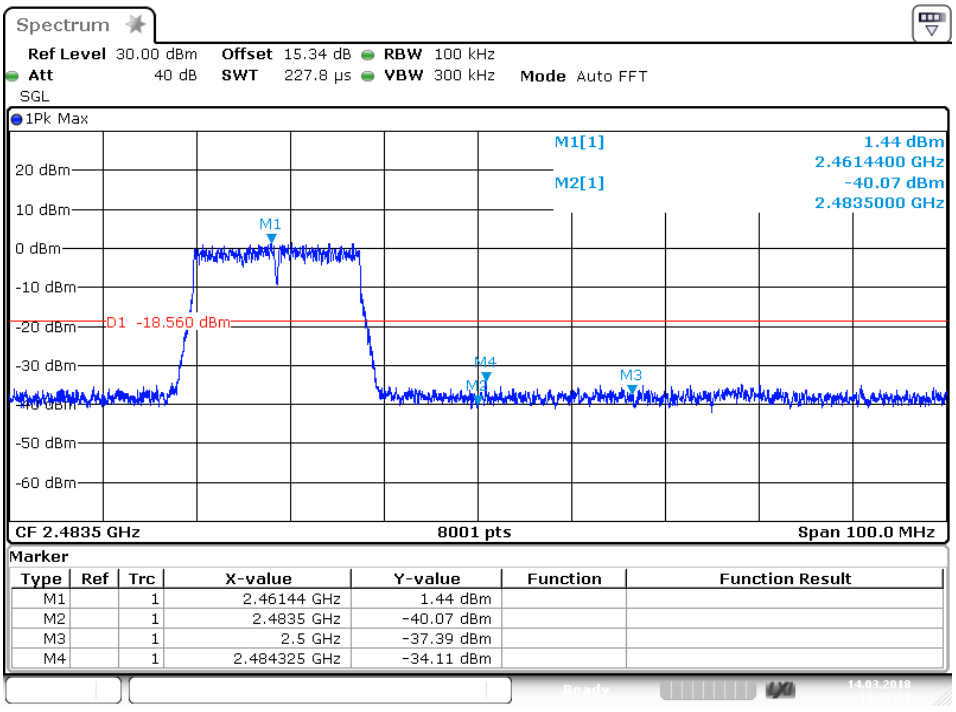
Date: 14.MAR.2018 10:55:55

802.11n Channel Low 2412MHz (20MHz)



Date: 14.MAR.2018 10:59:08

802.11n Channel High 2462MHz (20MHz)



Date: 14.MAR.2018 11:05:40

Radiated Band Edge Result

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

   Result = Reading + Corrected Factor
3. Display the measurement of peak values.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Let the EUT work in TX modes then measure it.
We select 2412MHz, 2462MHz TX frequency to transmit(802.11b/g/n20 mode).

During the radiated emission test, the spectrum analyzer was set with the following configurations:
1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
3.We tested 802.11b/g/n mode the all and the worst-case(802.11b) emissions are reported.

Test Lab: 3m Anechoic chamber
Test Engineer: Star

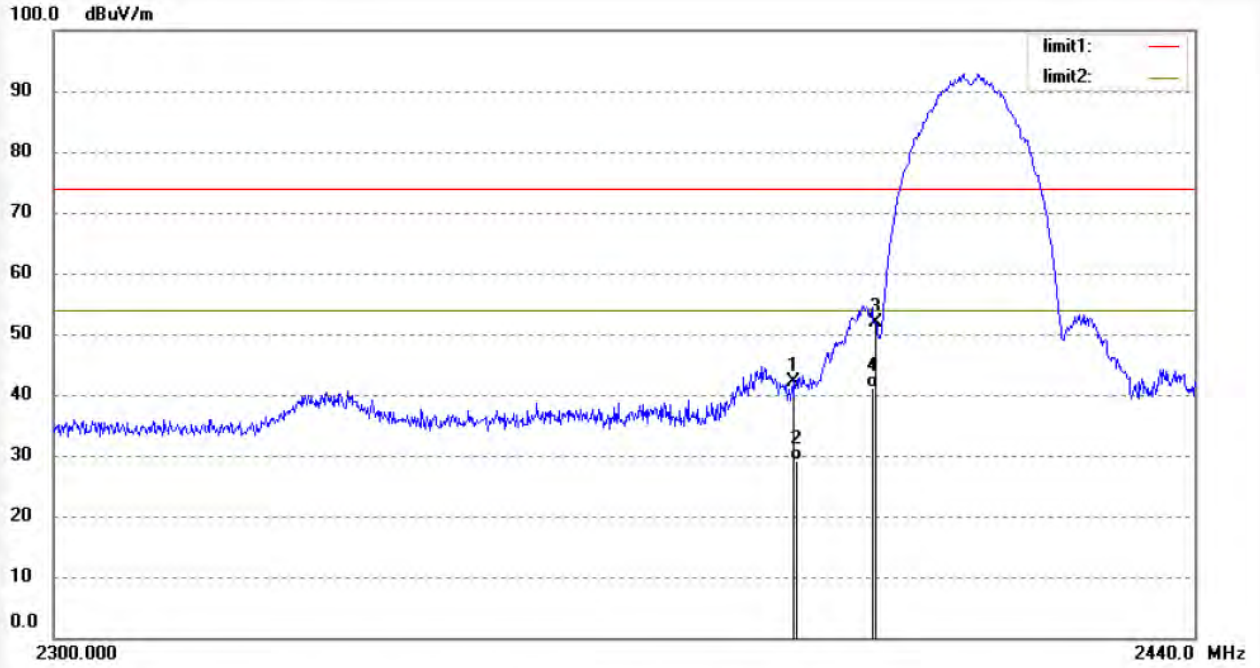
Note: We tested 802.11b/g/n mode the all data rate and the worst case data for this channel to be 11Mbps for 802.11b mode.

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #31
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 1(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 16/07/12
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	48.12	-5.89	42.23	74.00	-31.77	peak			
2	2390.000	35.14	-5.89	29.25	54.00	-24.75	AVG			
3	2400.000	57.74	-5.80	51.94	74.00	-22.06	peak			
4	2400.000	46.97	-5.80	41.17	54.00	-12.83	AVG			

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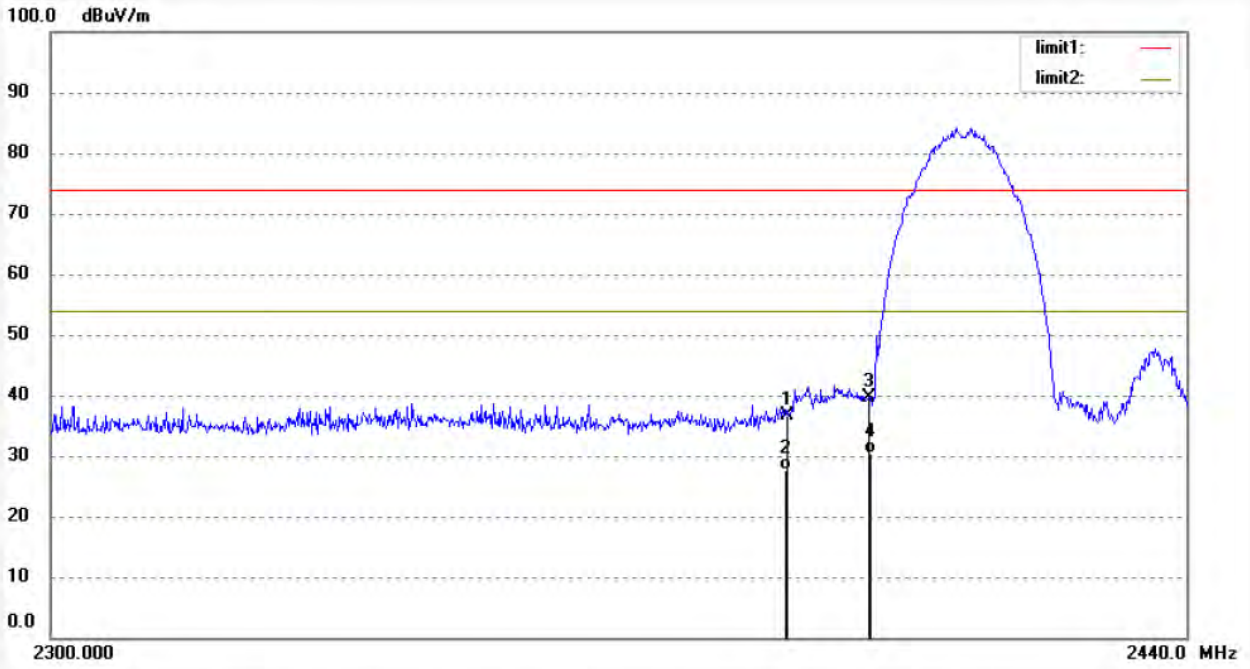
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #32
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 1(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 16/08/41
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	42.58	-5.89	36.69	74.00	-37.31	peak			
2	2390.000	33.57	-5.89	27.68	54.00	-26.32	AVG			
3	2400.000	45.36	-5.80	39.56	74.00	-34.44	peak			
4	2400.000	36.17	-5.80	30.37	54.00	-23.63	AVG			

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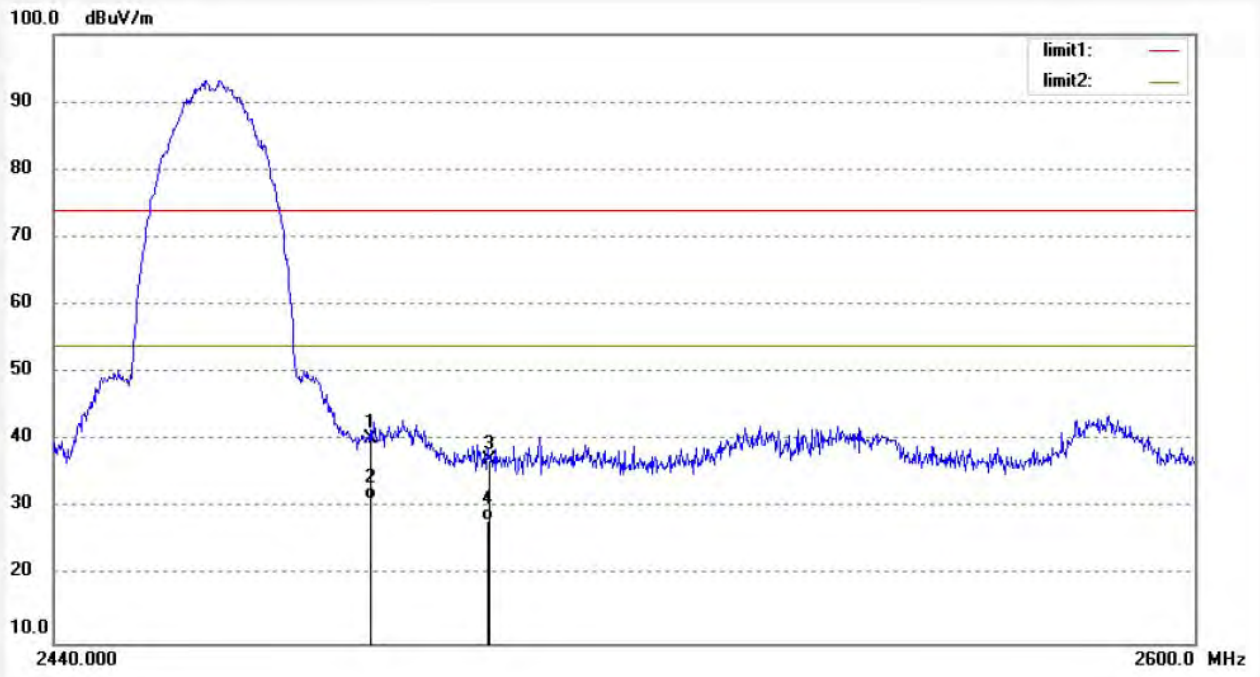
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #34
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 11(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 16/12/06
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	45.69	-5.51	40.18	74.00	-33.82	peak			
2	2483.500	36.70	-5.51	31.19	54.00	-22.81	AVG			
3	2500.000	42.71	-5.50	37.21	74.00	-36.79	peak			
4	2500.000	33.69	-5.50	28.19	54.00	-25.81	AVG			

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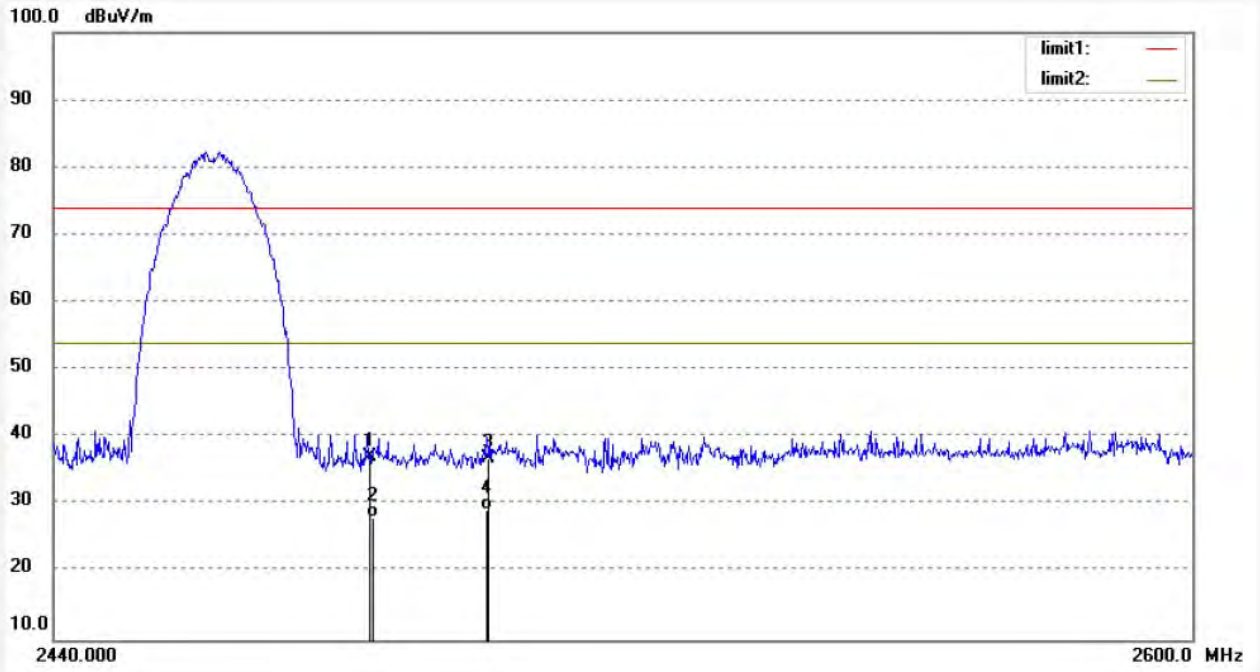
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #33
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 11(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 16/10/41
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	42.64	-5.51	37.13	74.00	-36.87	peak			
2	2483.500	33.70	-5.51	28.19	54.00	-25.81	AVG			
3	2500.000	42.45	-5.50	36.95	74.00	-37.05	peak			
4	2500.000	34.72	-5.50	29.22	54.00	-24.78	AVG			

11.RADIATED SPURIOUS EMISSION TEST

11.1.Block Diagram of Test Setup

11.1.1.Block diagram of connection between the EUT and peripherals

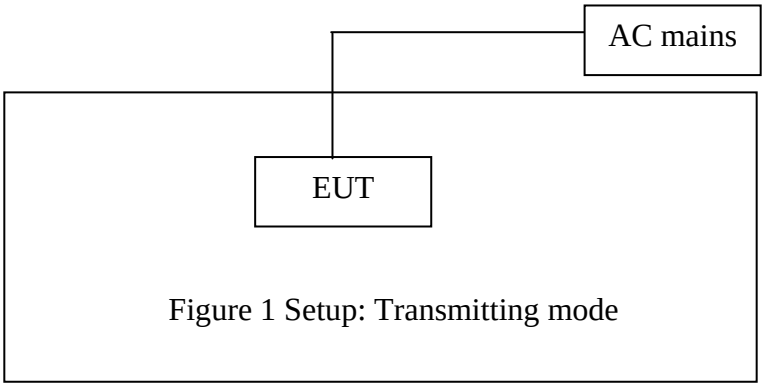
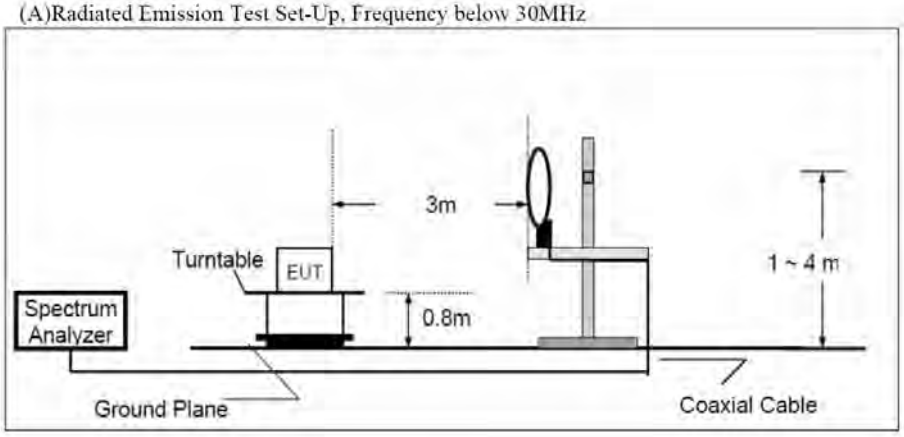


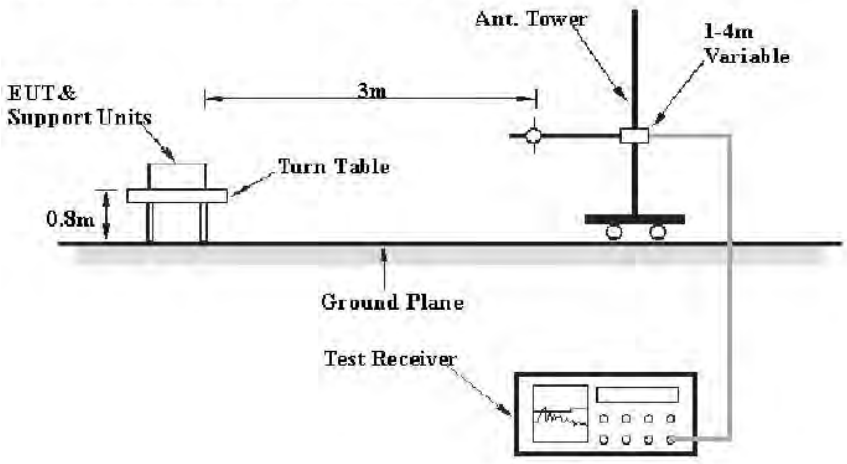
Figure 1 Setup: Transmitting mode

11.1.2.Semi-Anechoic Chamber Test Setup Diagram

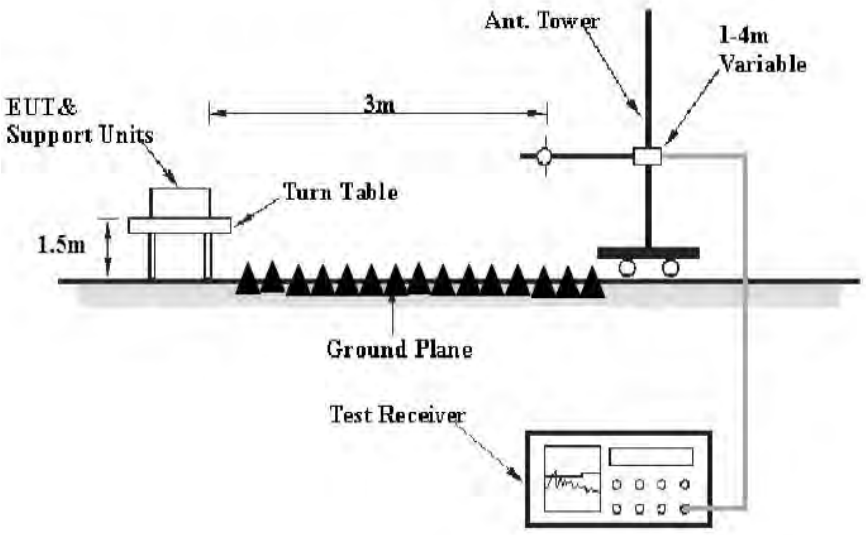
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(B)Radiated Emission Test Set-Up, Frequency 30MHz-1GHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



11.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

11.3.Restricted bands of operation

11.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	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
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

11.4.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.5.Operating Condition of EUT

11.5.1.Setup the EUT and simulator as shown as Section 10.1.

11.5.2.Turn on the power of all equipment.

11.5.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462. We select 2412MHz, 2437MHz, 2462MHz TX frequency to transmit.

11.6.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground(Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement.

The frequency range from 30MHz to 26500MHz is checked.
Result = Reading + Corrected Factor
Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain
During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

11.7.Data Sample

Frequency (MHz)	Reading (dBμv)	Factor (dB/m)	Result (dBμv/m)	Limit (dBμv/m)	Margin (dB)	Remark
X.XX	48.69	-13.35	35.34	46	-10.66	QP

Frequency(MHz) = Emission frequency in MHz
Reading(dBμv) = Uncorrected Analyzer/Receiver reading
Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain
Result(dBμv/m) = Reading(dBμv) + Factor(dB/m)
Limit (dBμv/m) = Limit stated in standard
Margin (dB) = Result(dBμv/m) - Limit (dBμv/m)
QP = Quasi-peak Reading

Calculation Formula:
Margin(dB) = Result (dBμV/m)–Limit(dBμV/m)
Result(dBμV/m)= Reading(dBμV)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

11.8.The Field Strength of Radiation Emission Measurement Results

Test Lab: 3m Anechoic chamber
Test Engineer: Star

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. *: Denotes restricted band of operation.

3. The radiation emissions from 18-26.5GHz and 9KHz-30MHz are not reported, because the test values lower than the limits of 20dB.

4. We tested 802.11b/g/n mode the all data rate and the worst case data for this channel to be 11Mbps for 802.11b mode.

Below 1G

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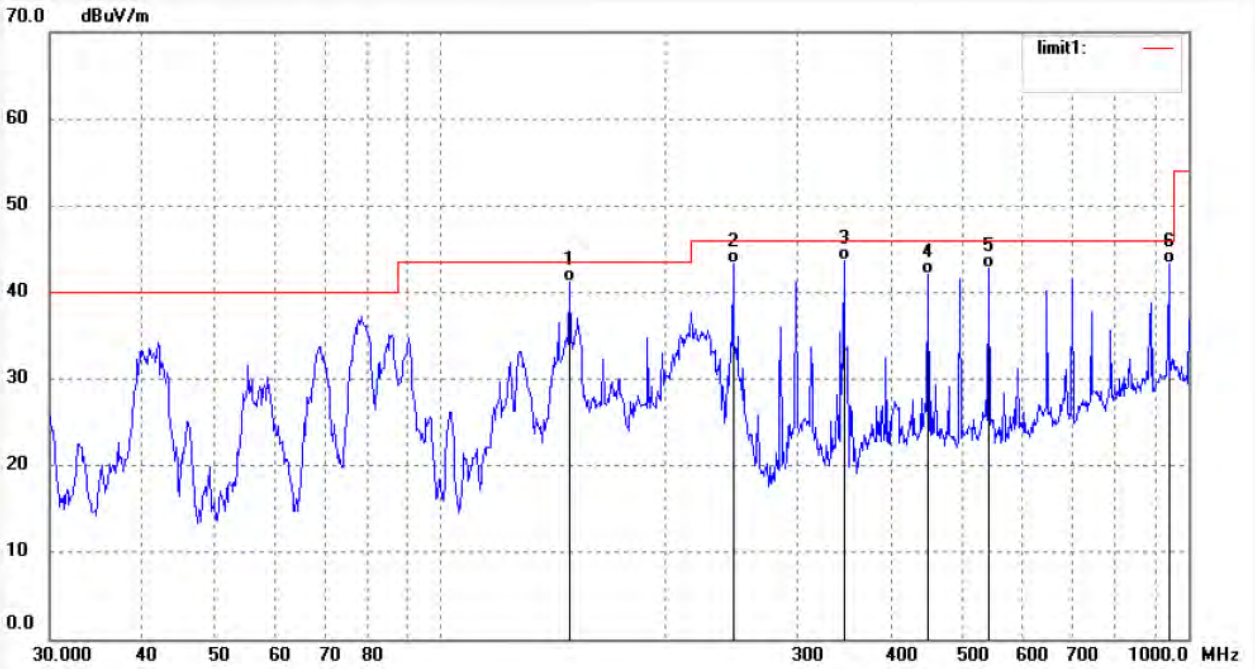
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2018 #50
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 1 (802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/03/15/
Time: 8/45/46
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



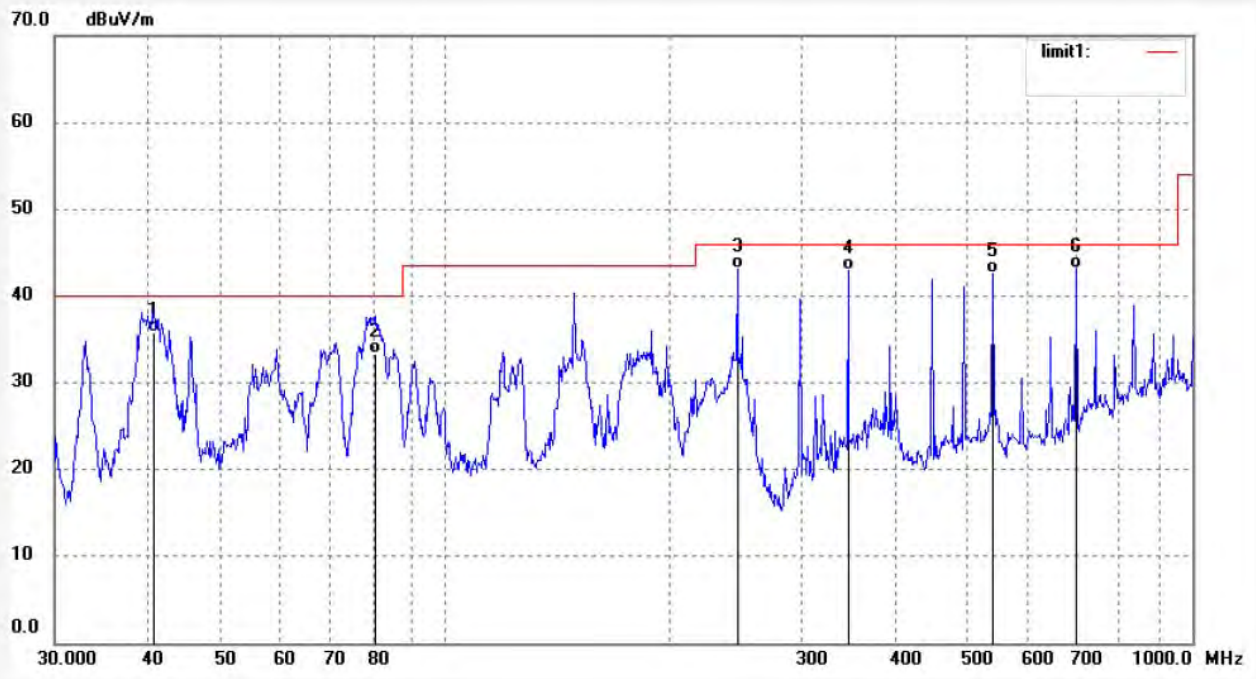
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	148.9175	63.44	-22.30	41.14	43.50	-2.36	QP			
2	246.1238	61.59	-18.20	43.39	46.00	-2.61	QP			
3	346.0740	58.41	-14.76	43.65	46.00	-2.35	QP			
4	448.8361	55.13	-13.02	42.11	46.00	-3.89	QP			
5	540.7072	54.16	-11.32	42.84	46.00	-3.16	QP			
6	942.0180	46.93	-3.55	43.38	46.00	-2.62	QP			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2018 #49
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 1 (802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/03/15/
Time: 8/44/05
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	40.7265	54.92	-19.15	35.77	40.00	-4.23	QP			
2	80.8042	56.09	-22.80	33.29	40.00	-6.71	QP			
3	246.1238	61.36	-18.20	43.16	46.00	-2.84	QP			
4	346.0740	57.75	-14.76	42.99	46.00	-3.01	QP			
5	540.7072	53.85	-11.32	42.53	46.00	-3.47	QP			
6	698.8035	51.07	-8.01	43.06	46.00	-2.94	QP			

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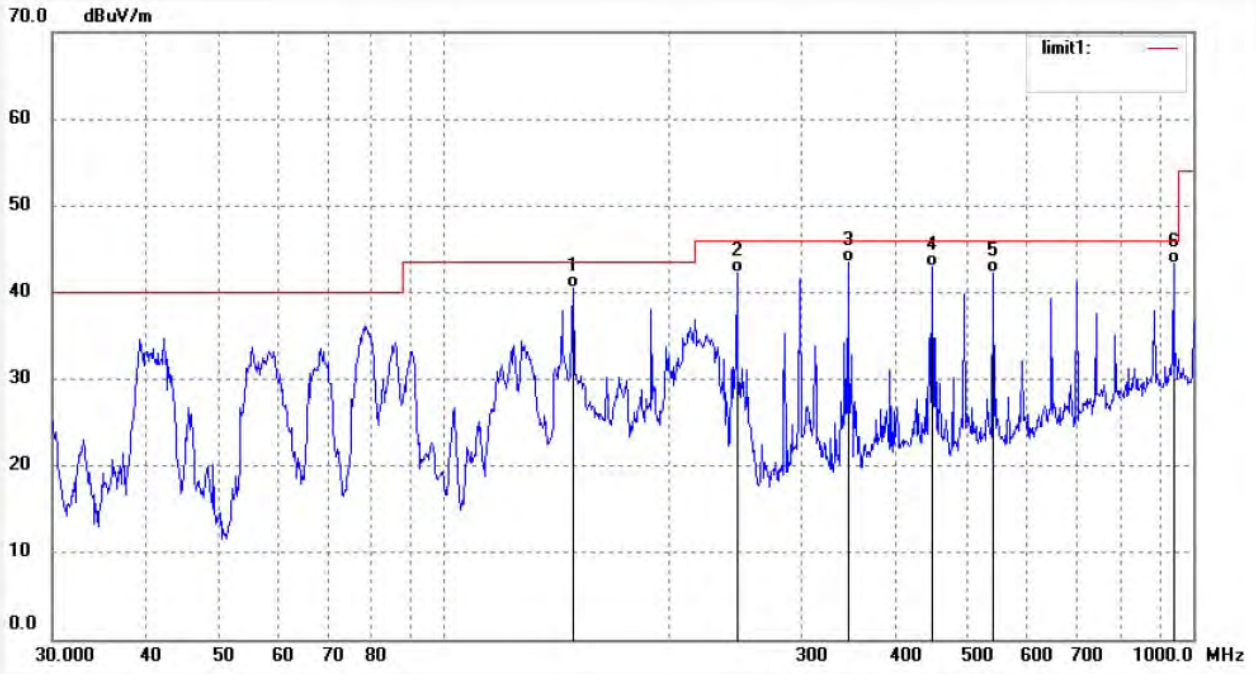
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2018 #51
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 6 (802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/03/15/
Time: 8/47/17
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	148.9173	62.79	-22.30	40.49	43.50	-3.01	QP			
2	246.1237	60.43	-18.20	42.23	46.00	-3.77	QP			
3	346.0740	58.25	-14.76	43.49	46.00	-2.51	QP			
4	448.8360	56.04	-13.02	43.02	46.00	-2.98	QP			
5	540.7071	53.66	-11.32	42.34	46.00	-3.66	QP			
6	942.0180	46.78	-3.54	43.24	46.00	-2.76	QP			

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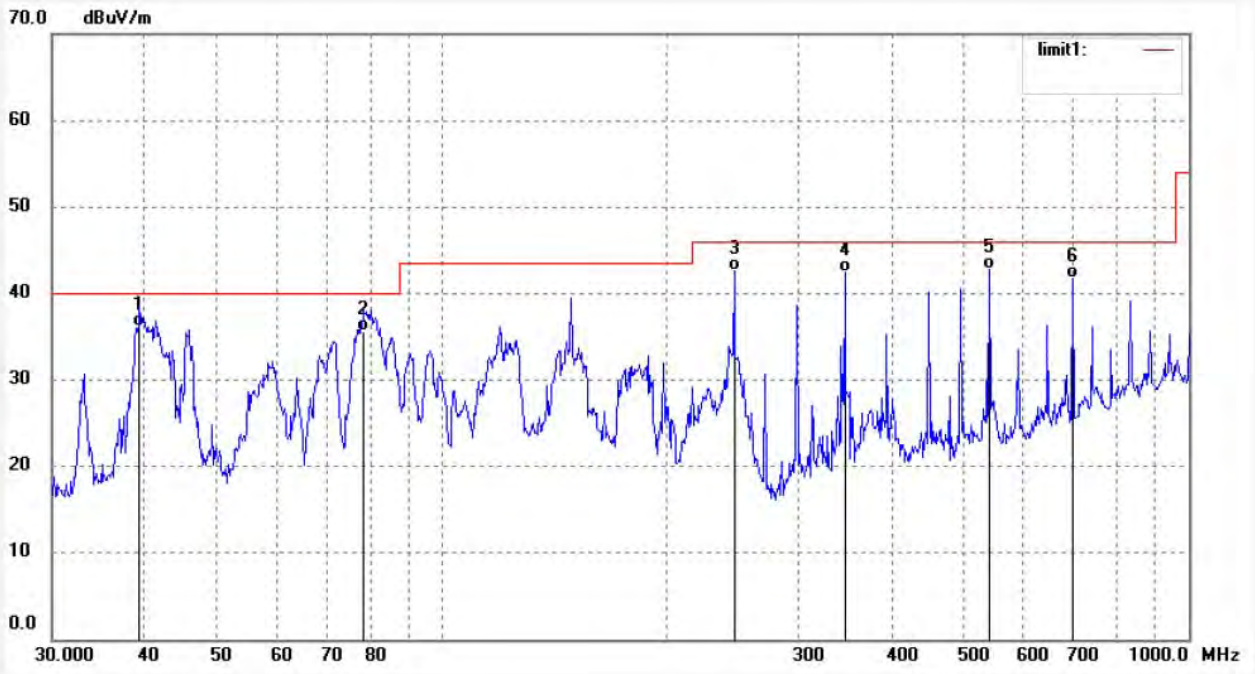
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2018 #52
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 6 (802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/03/15/
Time: 8/48/53
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	39.3204	55.03	-18.88	36.15	40.00	-3.85	QP			
2	78.5645	58.61	-22.95	35.66	40.00	-4.34	QP			
3	246.1238	60.73	-18.20	42.53	46.00	-3.47	QP			
4	346.0740	57.20	-14.76	42.44	46.00	-3.56	QP			
5	540.7072	54.13	-11.32	42.81	46.00	-3.19	QP			
6	698.8035	49.83	-8.01	41.82	46.00	-4.18	QP			

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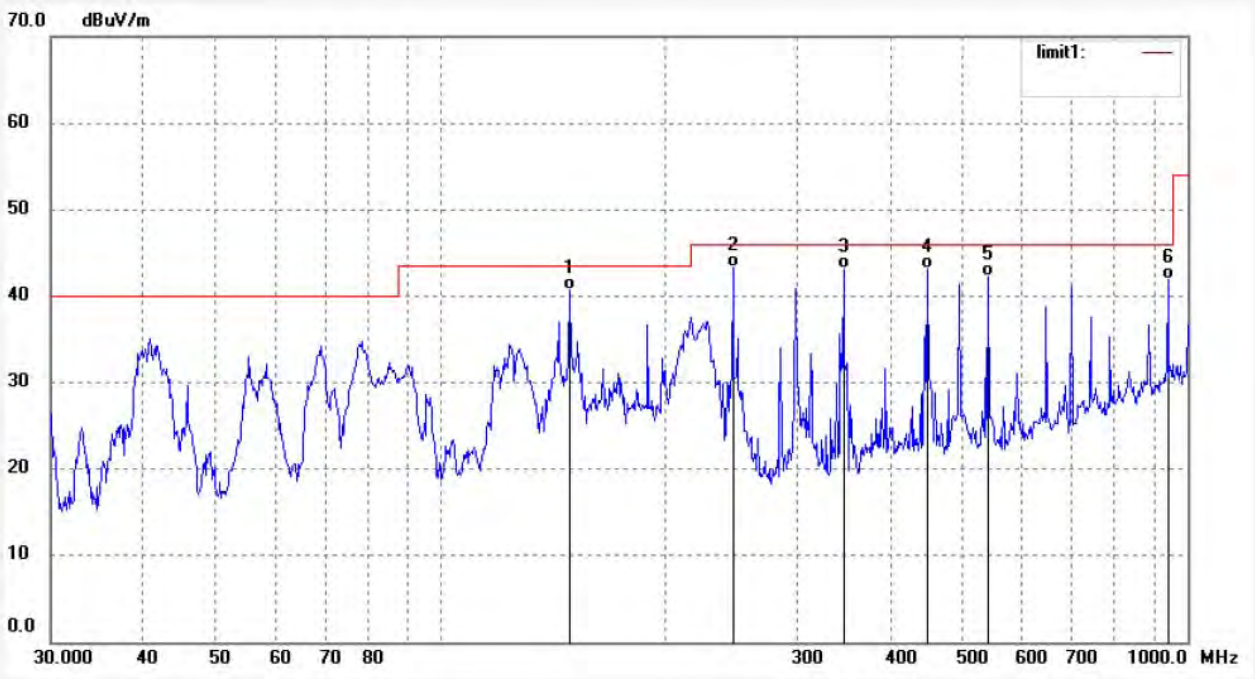
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2018 #54
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 11 (802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/03/15/
Time: 8/52/43
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	148.9175	63.06	-22.30	40.76	43.50	-2.74	QP			
2	246.1238	61.57	-18.20	43.37	46.00	-2.63	QP			
3	346.0740	57.83	-14.76	43.07	46.00	-2.93	QP			
4	448.8361	56.20	-13.02	43.18	46.00	-2.82	QP			
5	540.7072	53.55	-11.32	42.23	46.00	-3.77	QP			
6	942.0180	45.53	-3.55	41.98	46.00	-4.02	QP			

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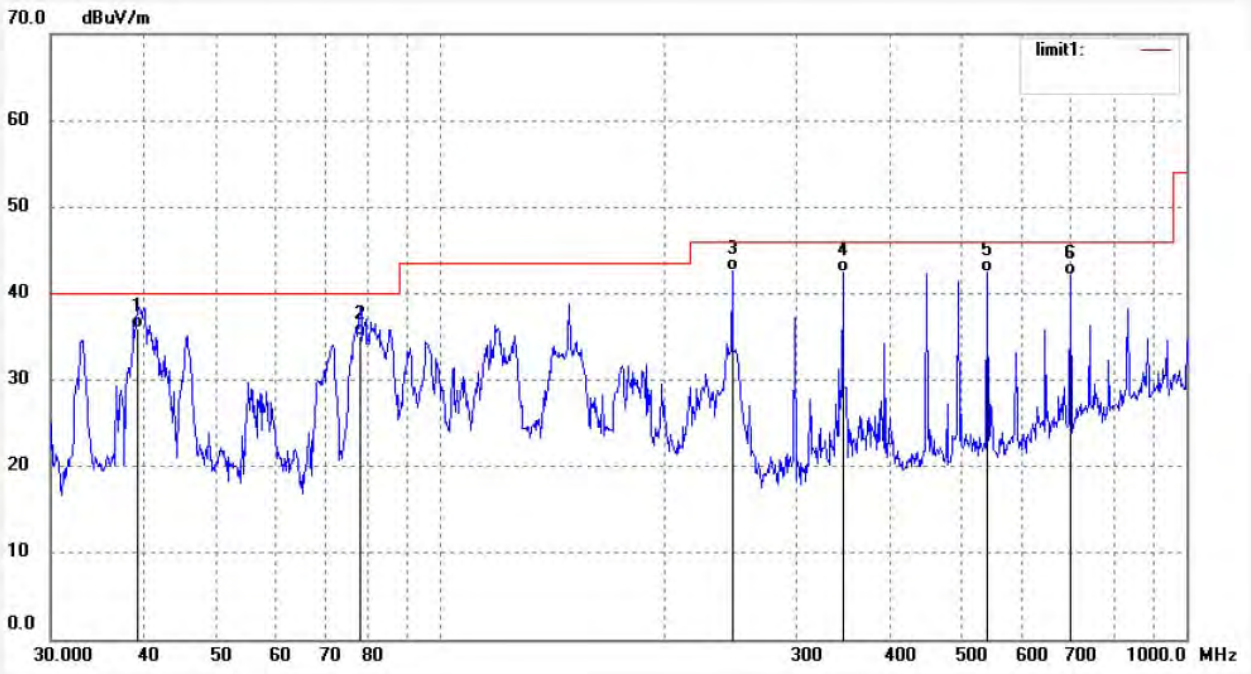
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2018 #53
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 11 (802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/03/15/
Time: 8/51/12
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	39.3204	54.92	-18.88	36.04	40.00	-3.96	QP			
2	78.0143	58.06	-22.98	35.08	40.00	-4.92	QP			
3	246.1238	60.86	-18.20	42.66	46.00	-3.34	QP			
4	346.0740	57.20	-14.76	42.44	46.00	-3.56	QP			
5	540.7072	53.80	-11.32	42.48	46.00	-3.52	QP			
6	698.8035	50.16	-8.01	42.15	46.00	-3.85	QP			

Above 1G

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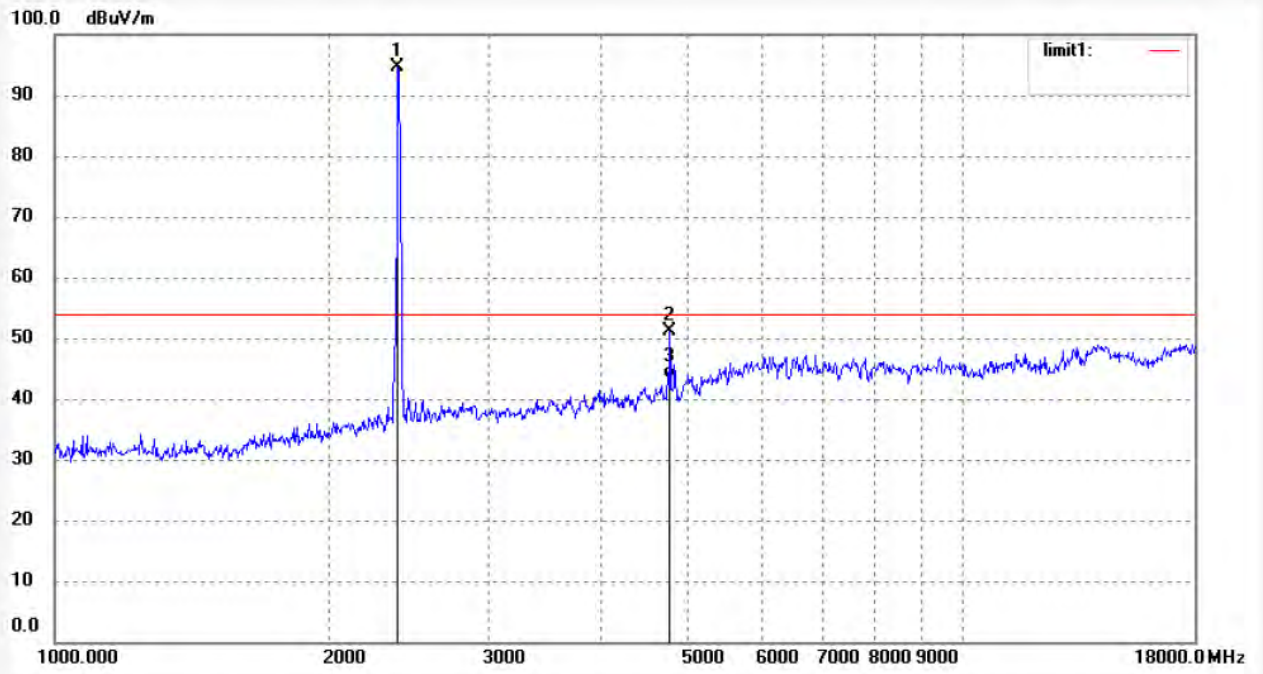
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #8
Standard: FCC Class C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 1(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 14/52/37
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2412.059	100.45	-5.91	94.54			peak			
2	4824.084	47.95	3.30	51.25	74.00	-22.75	peak			
3	4824.084	40.15	3.30	43.45	54.00	-10.55	AVG			

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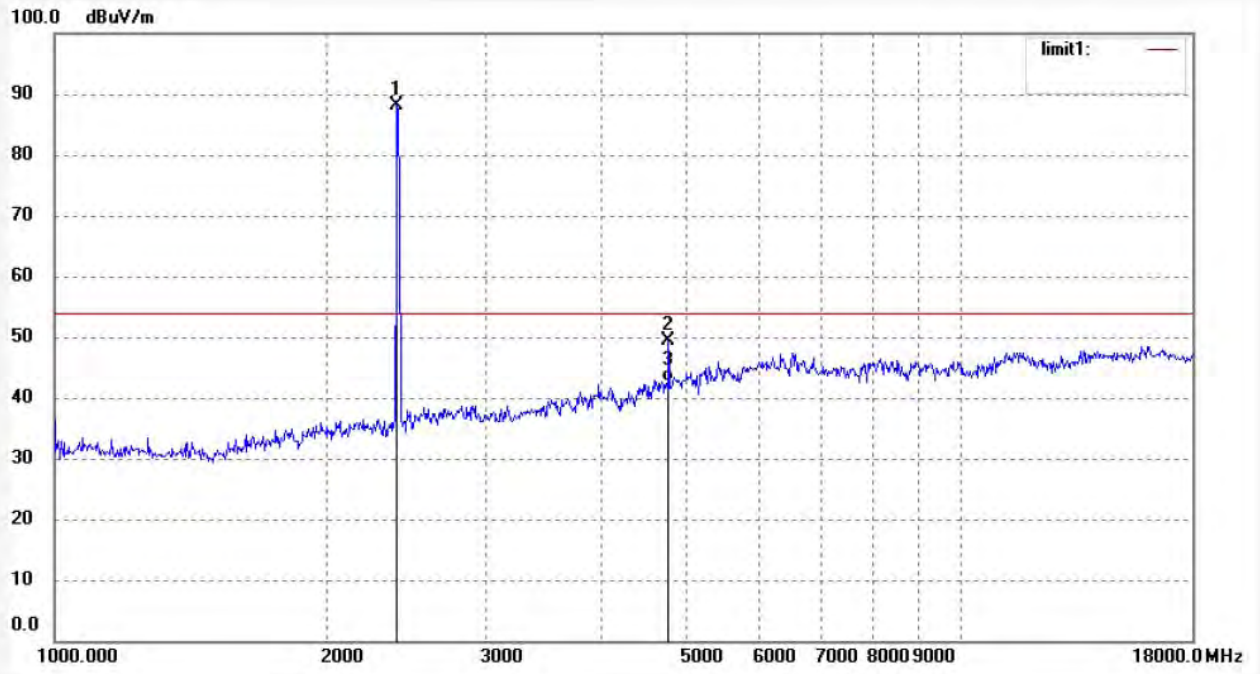
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #7
Standard: FCC Class C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 1(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 14/51/11
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2412.059	93.93	-5.91	88.02			peak			
2	4824.084	46.20	3.30	49.50	74.00	-24.50	peak			
3	4824.084	39.25	3.30	42.55	54.00	-11.45	AVG			

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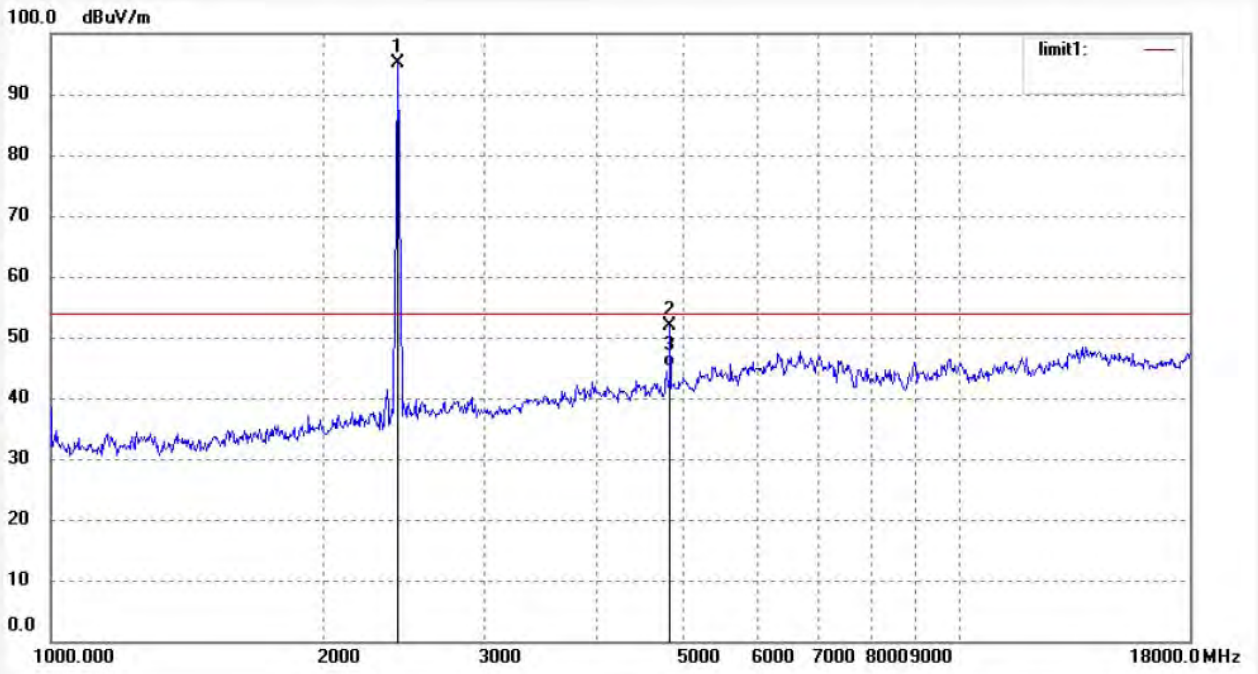
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #9
Standard: FCC Class C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 6(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 14/55/35
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.100	100.96	-5.76	95.20			peak			
2	4874.024	48.32	3.67	51.99	74.00	-22.01	peak			
3	4874.024	41.45	3.67	45.12	54.00	-8.88	AVG			

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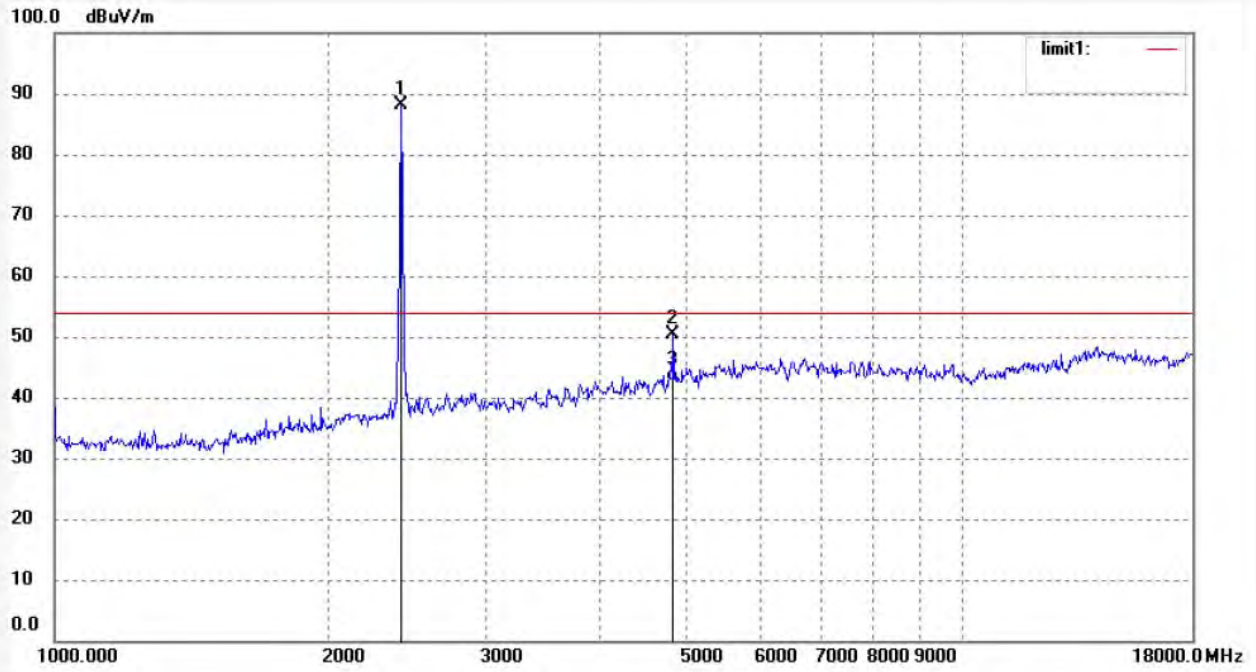
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #10
Standard: FCC Class C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 6(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 14/58/09
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2437.100	93.96	-5.76	88.20			peak			
2	4874.124	46.82	3.67	50.49	74.00	-23.51	peak			
3	4874.124	38.97	3.67	42.64	54.00	-11.36	AVG			

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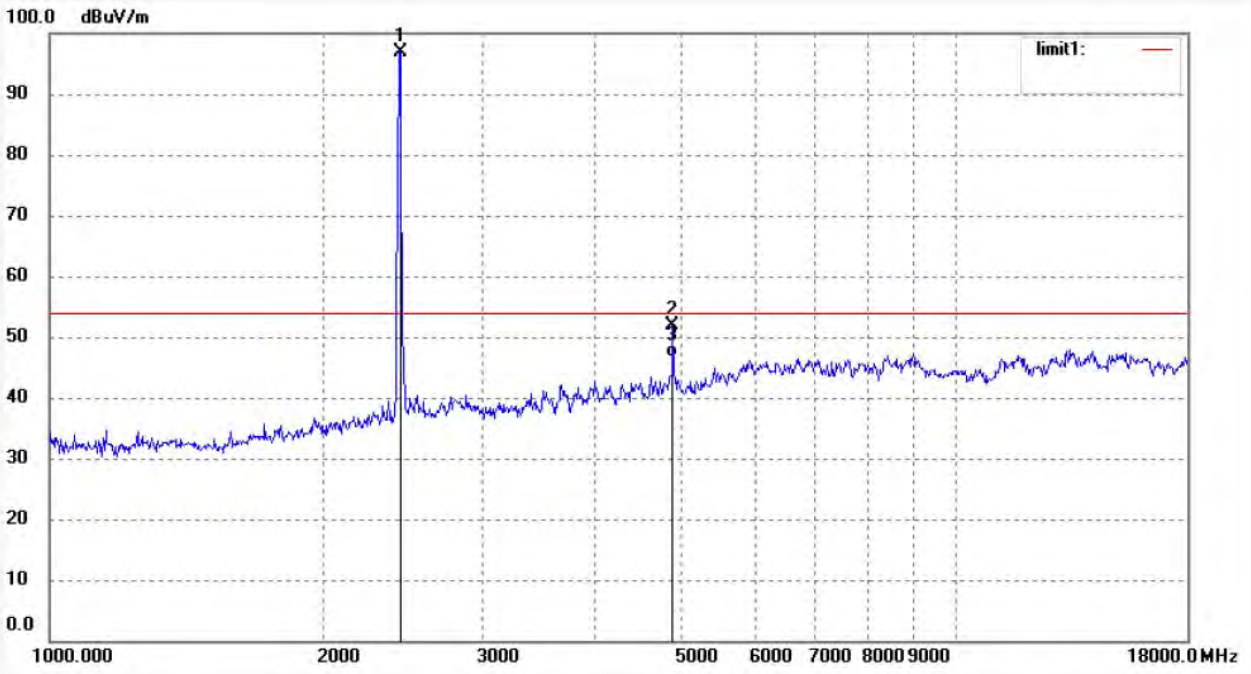
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #12
Standard: FCC Class C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 11(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 15/05/20
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2462.007	102.59	-5.61	96.98			peak			
2	4924.117	47.65	4.20	51.85	74.00	-22.15	peak			
3	4924.117	42.45	4.20	46.65	54.00	-7.35	AVG			

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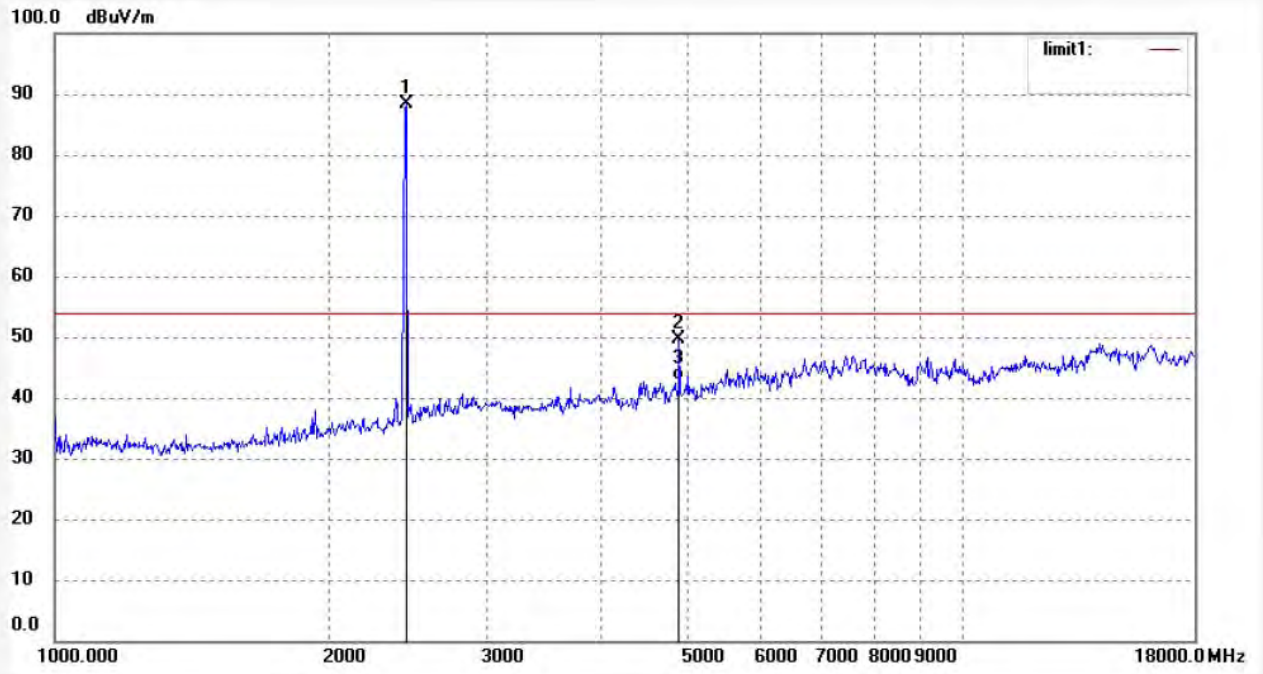
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR2017 #11
Standard: FCC Class C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Eyes-light Camera
Mode: TX Channel 11(802.11b)
Model: L910
Manufacturer: Leshi

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/03/14/
Time: 15/03/30
Engineer Signature: star
Distance: 3m

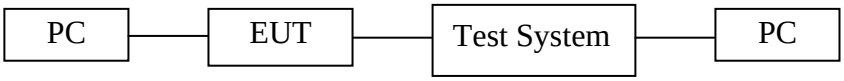
Note: Report No.:ATE20180344



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2462.007	94.10	-5.61	88.49			peak			
2	4924.017	45.37	4.20	49.57	74.00	-24.43	peak			
3	4924.017	38.67	4.20	42.87	54.00	-11.13	AVG			

12.99% OCCUPIED BANDWIDTH

12.1.Block Diagram of Test Setup



12.2.EUT Configuration on Measurement

The following equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

12.3.Operating Condition of EUT

12.3.1.Setup the EUT and simulator as shown as Section 12.1.

12.3.2.Turn on the power of all equipment.

12.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462. We select 2412MHz, 2437MHz, 2462MHz TX frequency to transmit.

12.4.Test Procedure

12.4.1.The transmitter output was connected to the spectrum analyzer through a low loss cable. The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

12.4.2.The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

12.4.3.A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

12.4.4.Set SPA “Meas” function, Select “Occupied Bandwidth” function, Select “99% Power Bandwidth”. The frequency of the upper and lower markers indicating the edges of the transmitters “99% Power” emission bandwidth shall be recorded to automate by SPA.

12.5.Measurement Result

Test Lab: Shielding room
Test Engineer: Star

The test was performed with 802.11b		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	2412	13.343
Middle	2437	13.318
High	2462	13.203

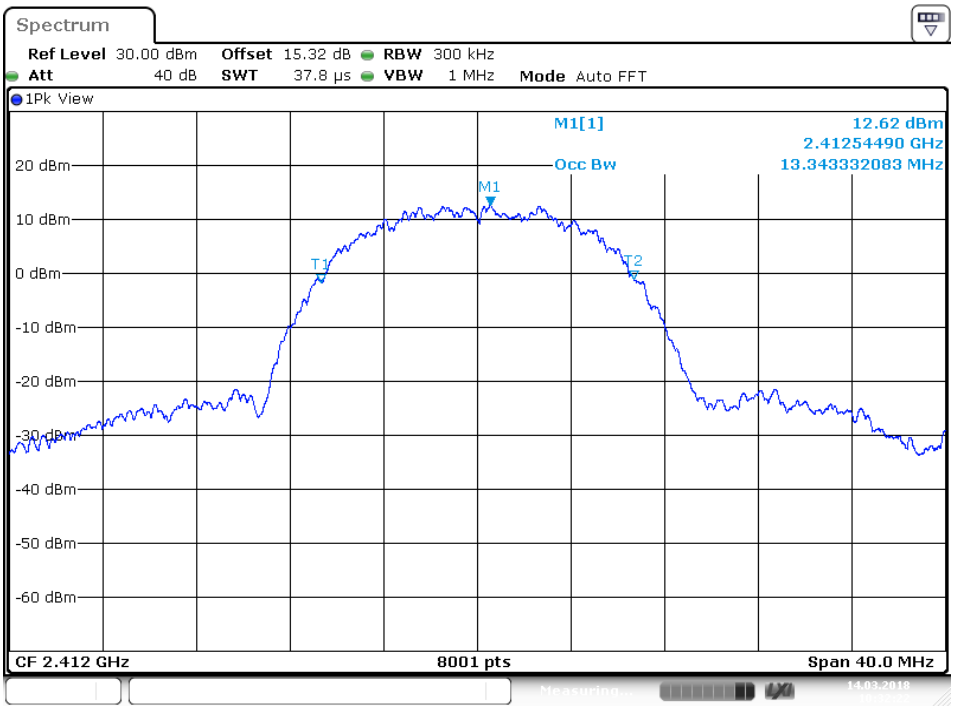
The test was performed with 802.11g		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	2412	16.628
Middle	2437	16.683
High	2462	16.628

The test was performed with 802.11n (Bandwidth: 20 MHz)		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
Low	2412	17.833
Middle	2437	17.828
High	2462	17.788

Note: We tested 802.11b/g/n mode the all data rate and recorded the worst case data for this channel to be 11Mbps for 802.11b mode and 54Mbps for 802.11g mode and MCS7 for 802.11n mode.

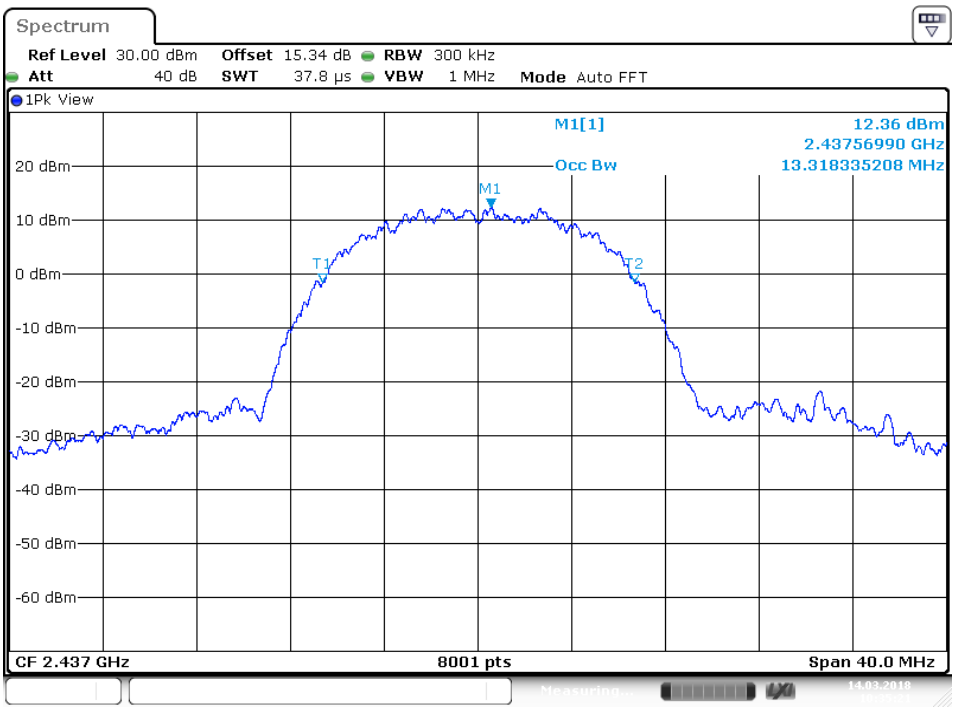
The spectrum analyzer plots are attached as below.

802.11b Channel Low 2412MHz



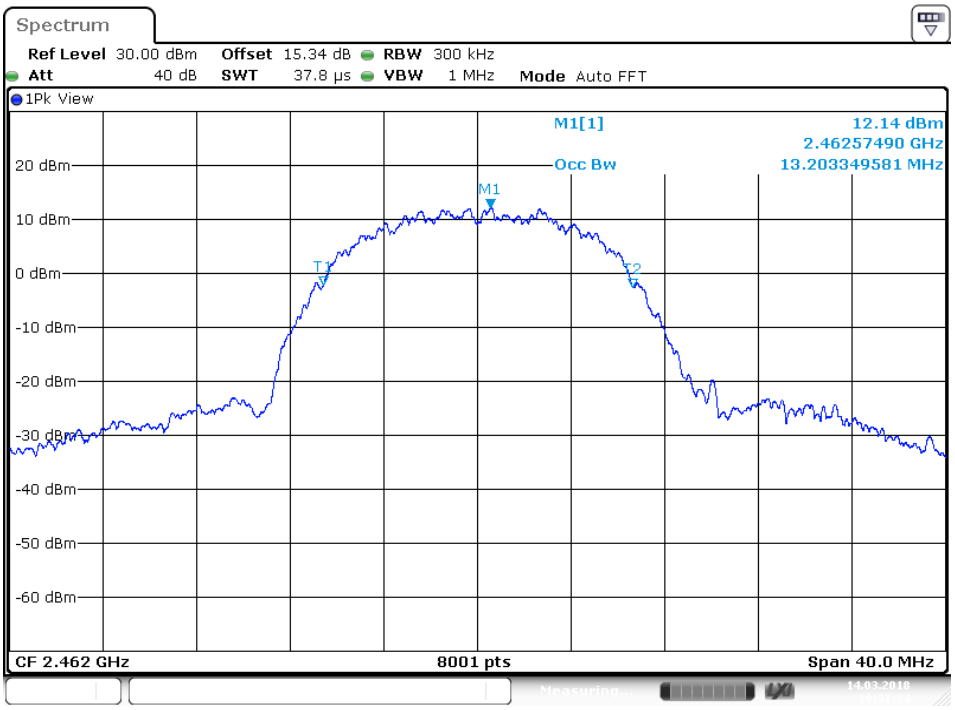
Date: 14.MAR.2018 10:32:23

802.11b Channel Middle 2437MHz



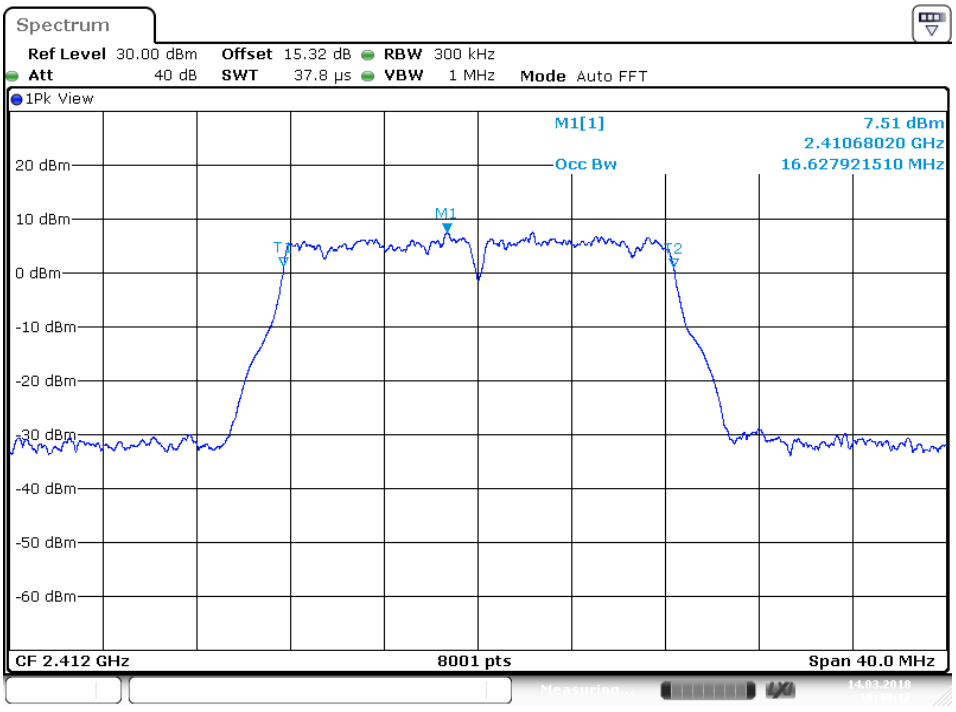
Date: 14.MAR.2018 10:35:20

802.11b Channel High 2462MHz



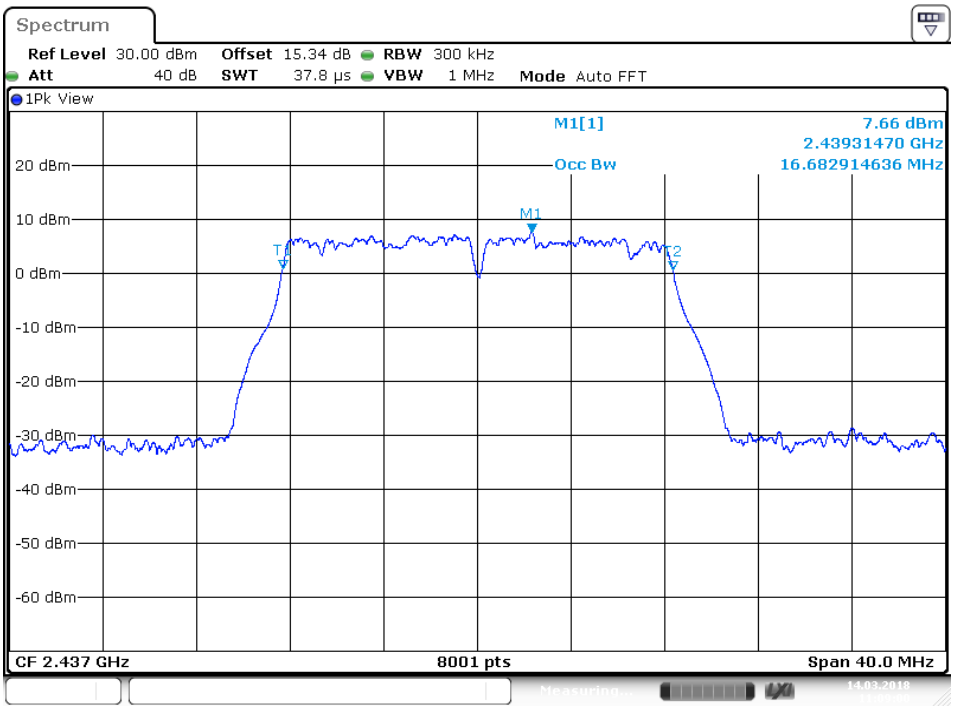
Date: 14.MAR.2018 10:37:35

802.11g Channel Low 2412MHz



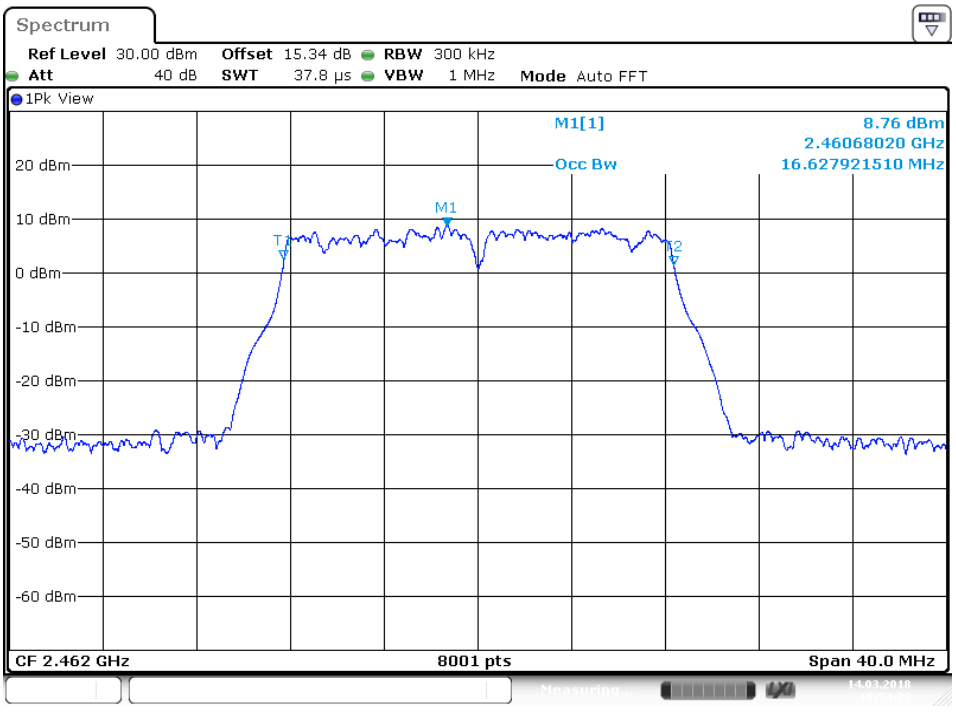
Date: 14.MAR.2018 10:48:18

802.11g Channel Middle 2437MHz



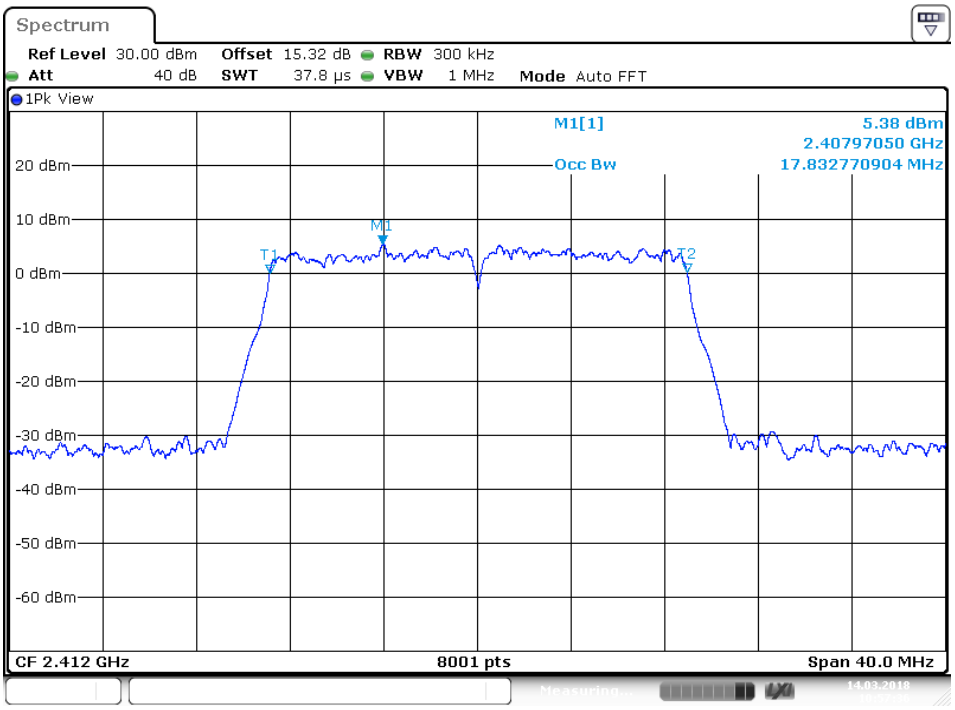
Date: 14.MAR.2018 11:09:01

802.11g Channel High 2462MHz



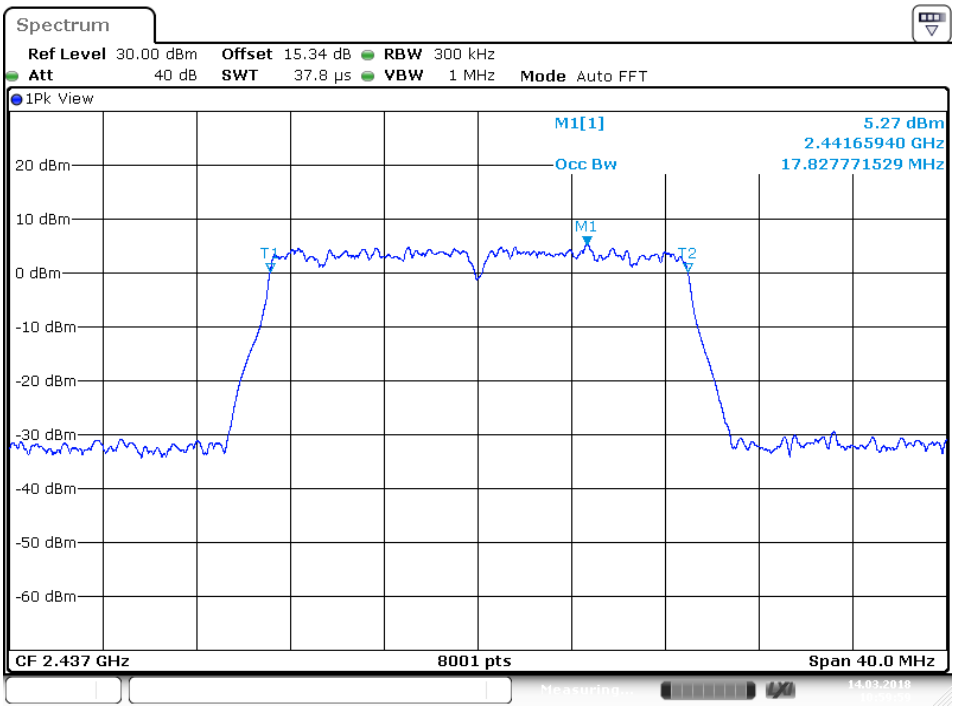
Date: 14.MAR.2018 10:54:24

802.11n Channel Low 2412MHz (20MHz)



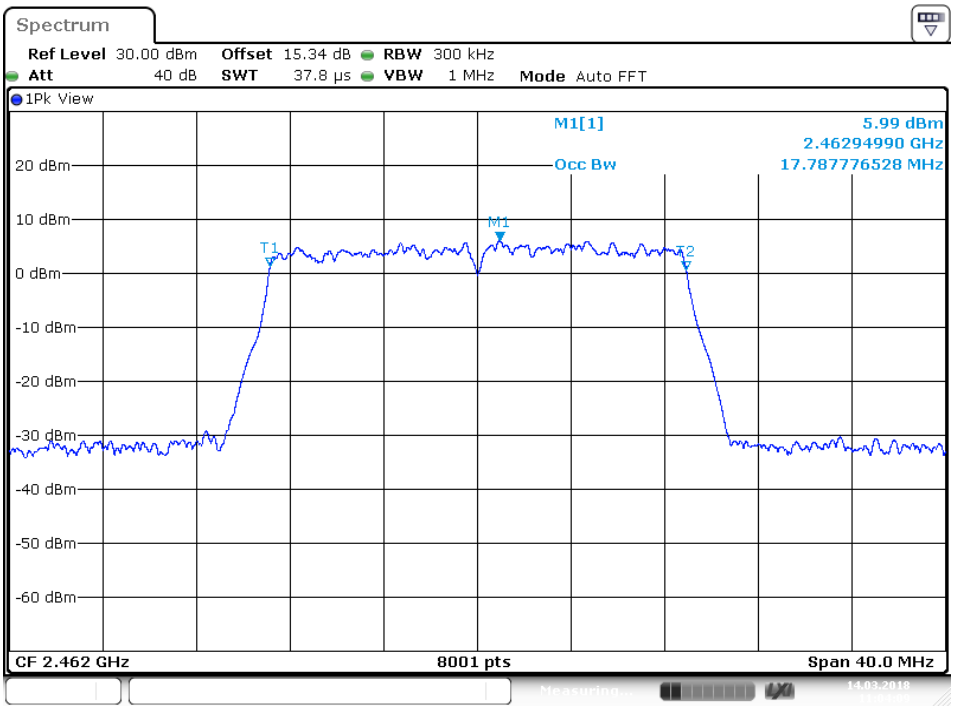
Date: 14.MAR.2018 10:57:37

802.11n Channel Middle 2437MHz(20MHz)



Date: 14.MAR.2018 11:00:00

802.11n Channel High 2462MHz(20MHz)



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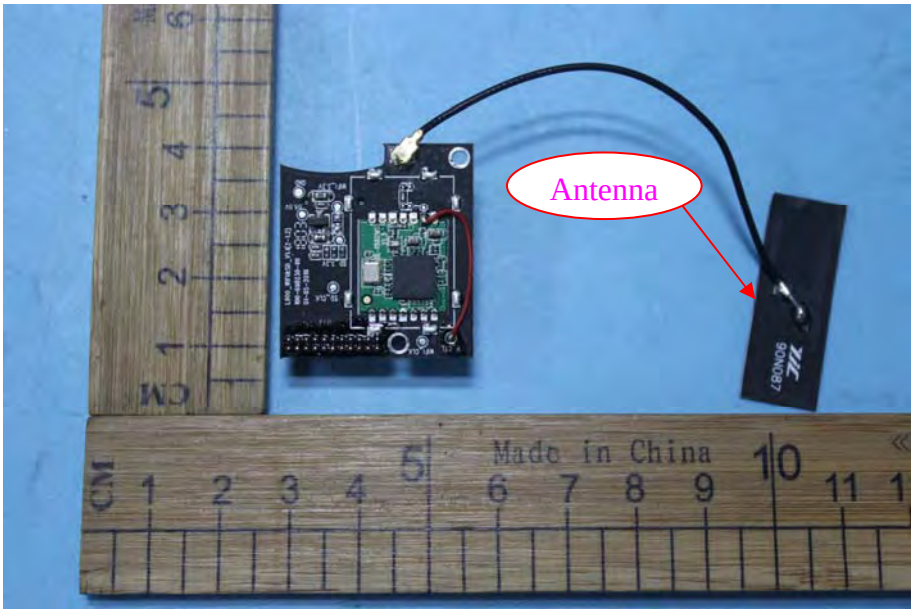
13. ANTENNA REQUIREMENT

13.1. The Requirement

According to 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.

13.2. Antenna Construction

The antenna use 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. The antenna connector used in this product is the ipex connector. The Antenna gain of EUT is 4dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



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