APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Chuango Security Technology Corporation

K1 SMARTHOME DIY KIT

Model No.: K1

FCC ID: RJY-K1

Prepared for	:	Chuango Security Technology Corporation.
Address	:	Room 6-17, Overseas Students Pioneer Park, No.108, Jiangbin East Road, Economic & Technological Development Zone, Fuzhou 350015, China.
Prepared by	:	ACCURATE TECHNOLOGY CO., LTD
Address	:	F1, Bldg. A&D, Chan Yuan New Material Port, Keyuan Rd. Science & Industry Park, Nan Shan, Shenzhen, Guangdong P.R. China Tel: (0755) 26503290 Fax: (0755) 26503396

Report No.	:	ATE20170747
Date of Test	:	May 12, 2017-May 27, 2017
Date of Report	:	May 27, 2017

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Description Page

Test Report Certification

Applicant	:	Chuango Security Technology Corporation.
Address	:	Room 6-17, Overseas Students Pioneer Park, No.108, Jiangbin East Road, Economic & Technological Development Zone, Fuzhou 350015, China
Manufacturer	:	Chuango Security Technology Corporation
Address	:	Room 6-17, Overseas Students Pioneer Park, No.108, Jiangbin East Road, Economic & Technological Development Zone, Fuzhou 350015, China
Product	:	K1 SMARTHOME DIY KIT
Model No.	:	K1
Trade name	:	smanos

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247: 2016
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 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 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 ACCURATE TECHNOLOGY CO. LTD.

Date of Test : May 12, 2017-May 27, 2017
Date of Report: May 27, 2017

Prepared by : (Tim Zhang, Engineer)

Approved & Authorized Signer : (Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	K1 SMARTHOME DIY KIT
Model Number	:	K1
Frequency Range	:	802.11b/g/n(20MHz): 2412-2462MHz 802.11n(40MHz): 2422-2452MHz
Number of Channels	:	802.11b/g/n (20MHz):11 802.11n (40MHz): 7
Antenna Gain	:	2dBi
Type of Antenna	:	Integral Antenna
Power Supply	:	DC 12V(Powered by Adapter)
Adapter information	:	Model: SA-US12V Input: AC 100-240V～60Hz 0.3A Output: DC 12.0V 0.5A
Data Rate	:	802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: up to 150Mbps
Modulation Type	:	DSSS, OFDM
Applicant	:	Chuango Security Technology Corporation
Address	:	Room 6-17, Overseas Students Pioneer Park, No.108, Jiangbin East Road, Economic & Technological Development Zone, Fuzhou 350015, China.
Manufacturer	:	Chuango Security Technology Corporation
Address	:	Room 6-17, Overseas Students Pioneer Park, No.108, Jiangbin East Road, Economic & Technological Development Zone, Fuzhou 350015, China.
Date of sample received	:	May 12, 2017
Date of Test	:	May 12, 2017-May 27, 2017

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	---	---

802.11n (40MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
03	2422	09	2452
04	2427	---	---
05	2432	---	---
06	2437	---	---

1.3.Accessory and Auxiliary Equipment

PC	Manufacturer: LENOVO M/N: 4290-RT8 S/N: R9-FW93G 11/08

1.4.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen Listed by FCC The Registration Number is 752051 Listed by Industry Canada The Registration Number is 5077A-2 Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
Name of Firm	:	ACCURATE TECHNOLOGY CO. LTD
Site Location	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, 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. 07, 2017	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 07, 2017	1 Year
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 07, 2017	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 07, 2017	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 07, 2017	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 13, 2017	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 13, 2017	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 13, 2017	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 13, 2017	1 Year
Open Switch and Control Unit	Rohde&Schwarz	OSP120 + OSP-B157	101244 + 100866	Jan. 07, 2017	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 07, 2017	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 07, 2017	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 07, 2017	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 07, 2017	1 Year

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

4.802.11n (40MHz) Transmitting mode
Low Channel: 2422MHz
Middle Channel: 2437MHz
High Channel: 2452MHz

3.2.Configuration and peripherals

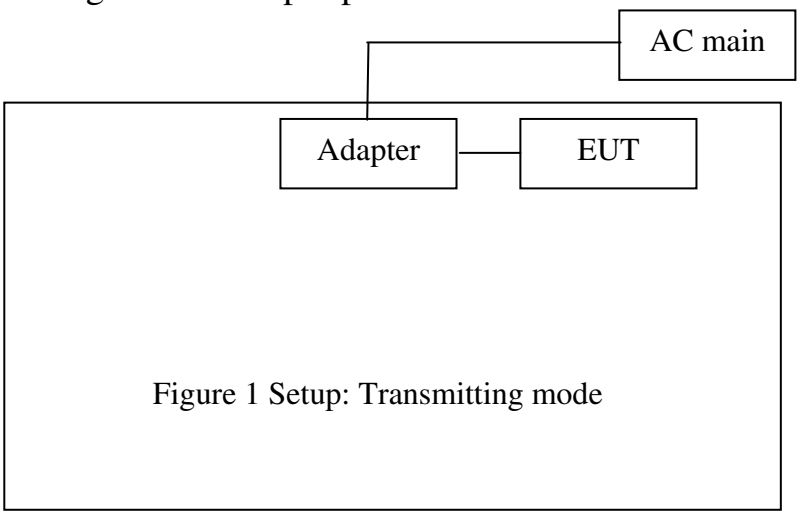


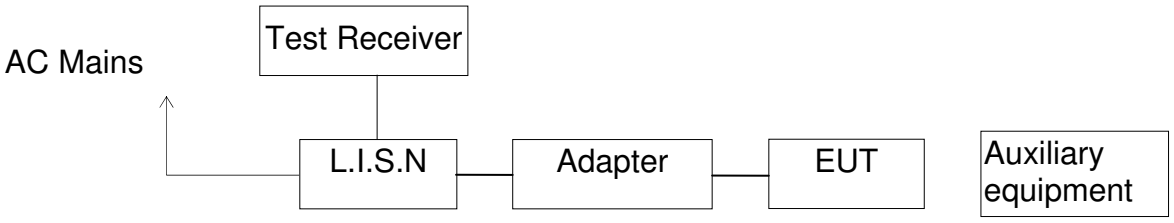
Figure 1 Setup: Transmitting mode

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	OBW	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: K1 SMARTHOME DIY KIT)

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 following 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. Power Line Conducted Emission Measurement Results

PASS.

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

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

The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD

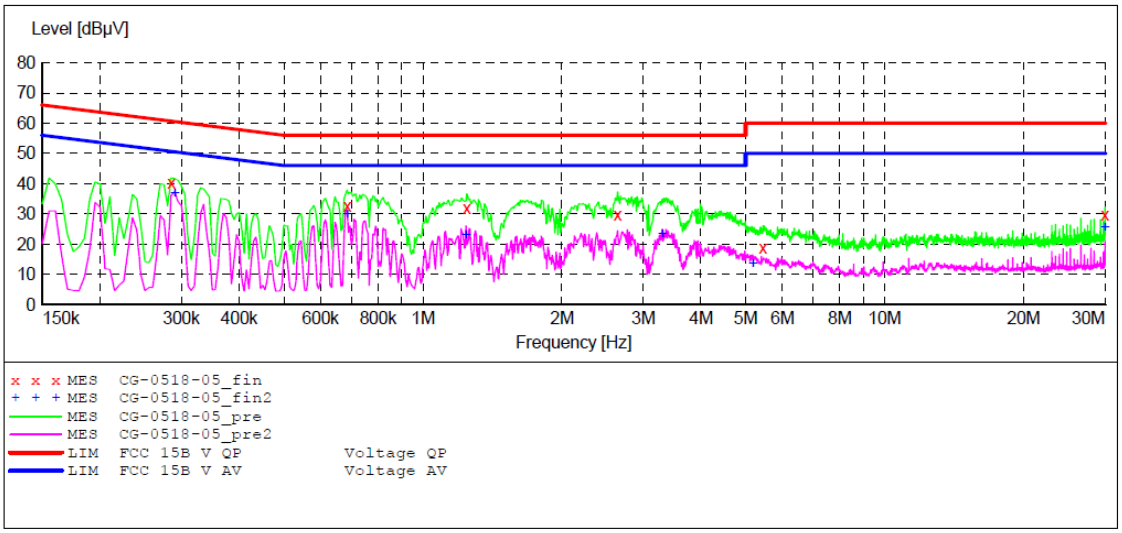
CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                  K1 SMARTHOME DIY KIT M/N:K1
Manufacturer:         CHUANGO
Operating Condition:  WIFI OPERATION
Test Site:            1#Shielding Room
Operator:             DING
Test Specification:   L 240V/60Hz
Comment:              Report NO.:ATE20170747
Start of Test:        5/18/2017 / 5:30:17PM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "CG-0518-05_fin"

5/18/2017 5:33PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.285000	40.10	10.6	60.7	20.6	QP	L1	GND
0.685000	32.50	10.8	56	23.5	QP	L1	GND
1.245000	31.70	10.9	56	24.3	QP	L1	GND
2.640000	29.80	11.0	56	26.2	QP	L1	GND
5.450000	18.90	11.2	60	41.1	QP	L1	GND
30.000000	29.80	11.5	60	30.2	QP	L1	GND

MEASUREMENT RESULT: "CG-0518-05_fin2"

5/18/2017 5:33PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.290000	37.10	10.6	50.5	13.4	AV	L1	GND
0.685000	30.00	10.8	46	16.0	AV	L1	GND
1.240000	23.00	10.9	46	23.0	AV	L1	GND
3.300000	23.60	11.1	46	22.4	AV	L1	GND
5.180000	13.70	11.2	50	36.3	AV	L1	GND
30.000000	25.60	11.5	50	24.4	AV	L1	GND

ACCURATE TECHNOLOGY CO.,LTD

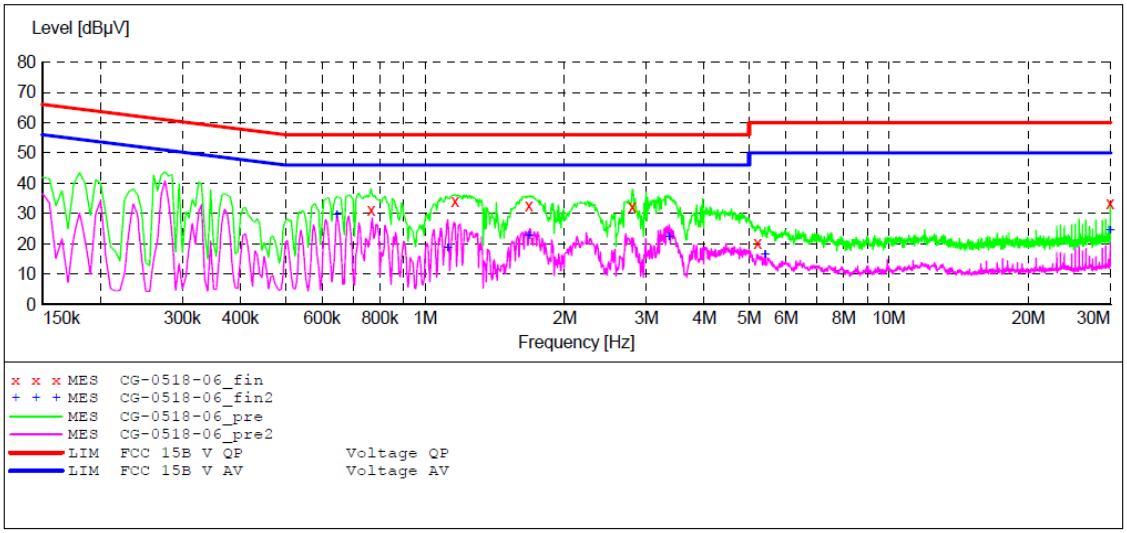
CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                    K1 SMARTHOME DIY KIT M/N:K1
Manufacturer:           CHUANGO
Operating Condition:    WIFI OPERATION
Test Site:              1#Shielding Room
Operator:               DING
Test Specification:     N 240V/60Hz
Comment:                Report NO.:ATE20170747
Start of Test:          5/18/2017 / 5:41:35PM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "CG-0518-06_fin"

5/18/2017 5:42PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.765000	31.00	10.8	56	25.0	QP	N	GND
1.160000	34.00	10.9	56	22.0	QP	N	GND
1.675000	32.70	10.9	56	23.3	QP	N	GND
2.800000	32.20	11.0	56	23.8	QP	N	GND
5.210000	20.20	11.2	60	39.8	QP	N	GND
30.000000	33.30	11.5	60	26.7	QP	N	GND

MEASUREMENT RESULT: "CG-0518-06_fin2"

5/18/2017 5:42PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.645000	29.80	10.8	46	16.2	AV	N	GND
1.120000	18.80	10.9	46	27.2	AV	N	GND
1.675000	22.80	10.9	46	23.2	AV	N	GND
3.360000	22.50	11.1	46	23.5	AV	N	GND
5.410000	16.50	11.2	50	33.5	AV	N	GND
30.000000	24.60	11.5	50	25.4	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

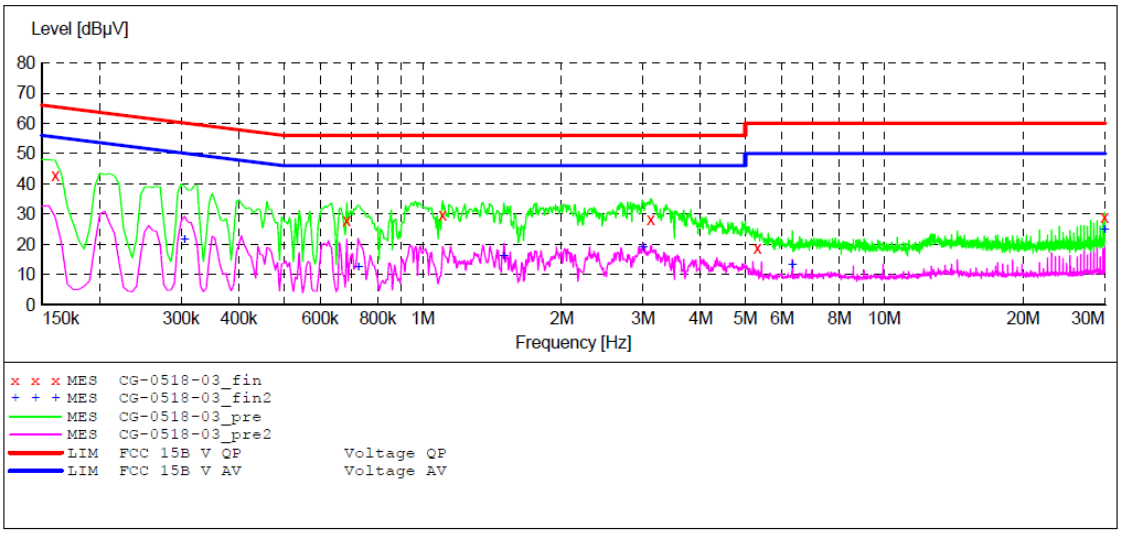
CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                  K1 SMARTHOME DIY KIT M/N:K1
Manufacturer:         CHUANGO
Operating Condition:  WIFI OPERATION
Test Site:            1#Shielding Room
Operator:             DING
Test Specification:   N 120V/60Hz
Comment:              Report NO.:ATE20170747
Start of Test:        5/18/2017 / 5:13:43PM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "CG-0518-03_fin"

5/18/2017 5:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.160000	42.90	10.5	65.5	22.6	QP	N	GND
0.685000	27.90	10.8	56	28.1	QP	N	GND
1.105000	29.80	10.9	56	26.2	QP	N	GND
3.120000	28.20	11.1	56	27.8	QP	N	GND
5.310000	18.90	11.2	60	41.1	QP	N	GND
30.000000	29.00	11.5	60	31.0	QP	N	GND

MEASUREMENT RESULT: "CG-0518-03_fin2"

5/18/2017 5:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.305000	21.80	10.6	50.1	28.3	AV	N	GND
0.725000	12.50	10.8	46	33.5	AV	N	GND
1.500000	16.30	10.9	46	29.7	AV	N	GND
3.000000	19.00	11.1	46	27.0	AV	N	GND
6.320000	13.30	11.2	50	36.7	AV	N	GND
30.000000	25.00	11.5	50	25.0	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

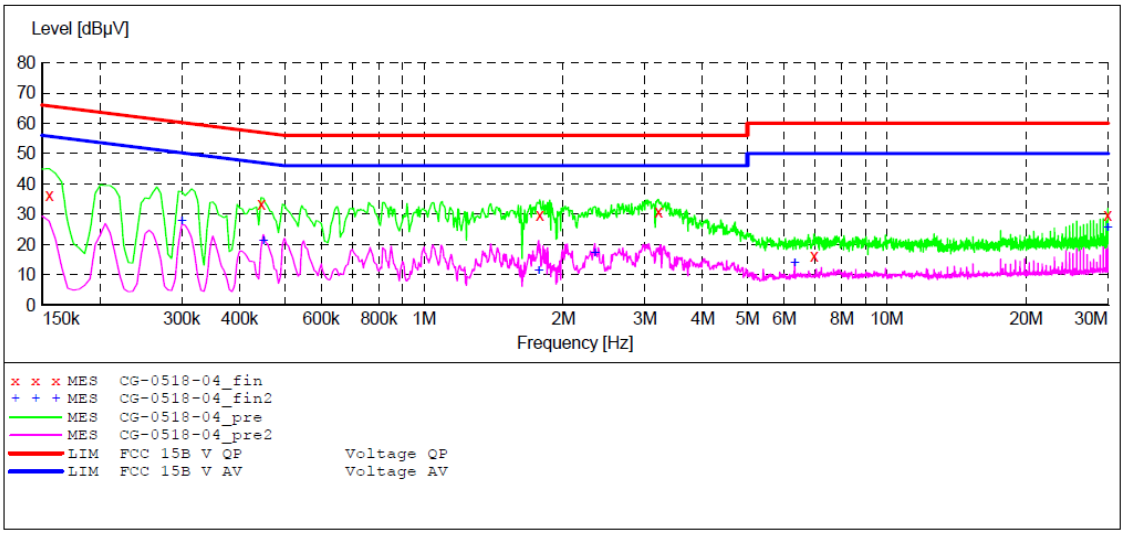
CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                  K1 SMARTHOME DIY KIT M/N:K1
Manufacturer:         CHUANGO
Operating Condition:  WIFI OPERATION
Test Site:            1#Shielding Room
Operator:             DING
Test Specification:   L 120V/60Hz
Comment:              Report NO.:ATE20170747
Start of Test:        5/18/2017 / 5:18:00PM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "CG-0518-04_fin"

5/18/2017 5:21PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.155000	36.10	10.5	65.7	29.6	QP	L1	GND
0.445000	33.40	10.7	57	23.6	QP	L1	GND
1.780000	29.70	11.0	56	26.3	QP	L1	GND
3.210000	30.80	11.1	56	25.2	QP	L1	GND
6.960000	16.40	11.2	60	43.6	QP	L1	GND
30.000000	29.80	11.5	60	30.2	QP	L1	GND

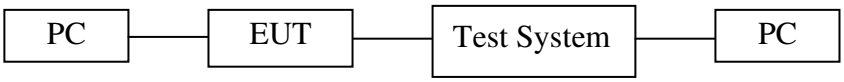
MEASUREMENT RESULT: "CG-0518-04_fin2"

5/18/2017 5:21PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.300000	27.90	10.6	50.2	22.3	AV	L1	GND
0.450000	21.40	10.7	47	25.5	AV	L1	GND
1.770000	11.60	11.0	46	34.4	AV	L1	GND
2.340000	17.40	11.0	46	28.6	AV	L1	GND
6.320000	13.90	11.2	50	36.1	AV	L1	GND
30.000000	25.80	11.5	50	24.2	AV	L1	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 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz 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

The test was performed with 802.11b			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	10.080	> 0.5MHz
Middle	2437	10.070	> 0.5MHz
High	2462	10.075	> 0.5MHz

The test was performed with 802.11g			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	16.560	> 0.5MHz
Middle	2437	16.555	> 0.5MHz
High	2462	16.560	> 0.5MHz

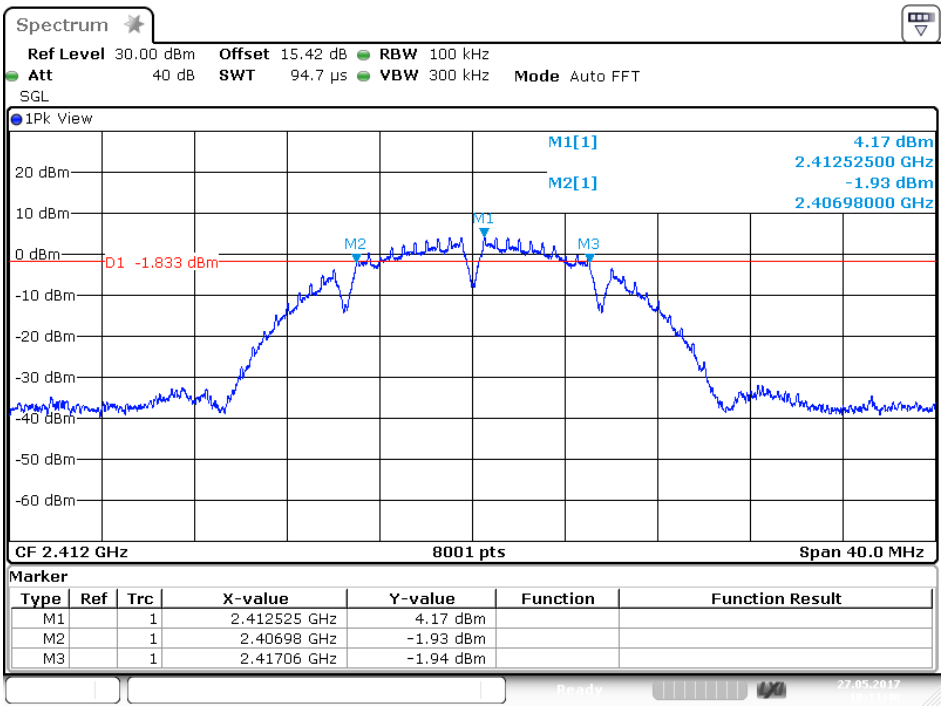
The test was performed with 802.11n (Bandwidth: 20 MHz)			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	17.630	> 0.5MHz
Middle	2437	17.625	> 0.5MHz
High	2462	17.625	> 0.5MHz

The test was performed with 802.11n (Bandwidth: 40 MHz)			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2422	36.410	> 0.5MHz
Middle	2437	36.430	> 0.5MHz
High	2452	36.410	> 0.5MHz

The spectrum analyzer plots are attached as below.

6dB Bandwidth

802.11b Channel Low 2412MHz



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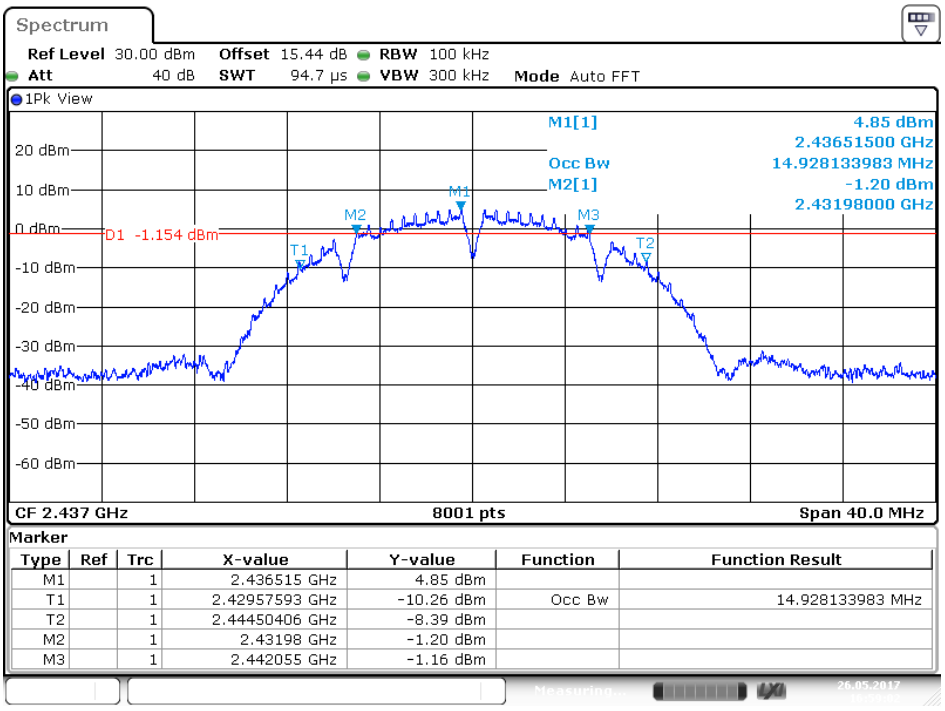
802.11b Channel Middle 2437MHz



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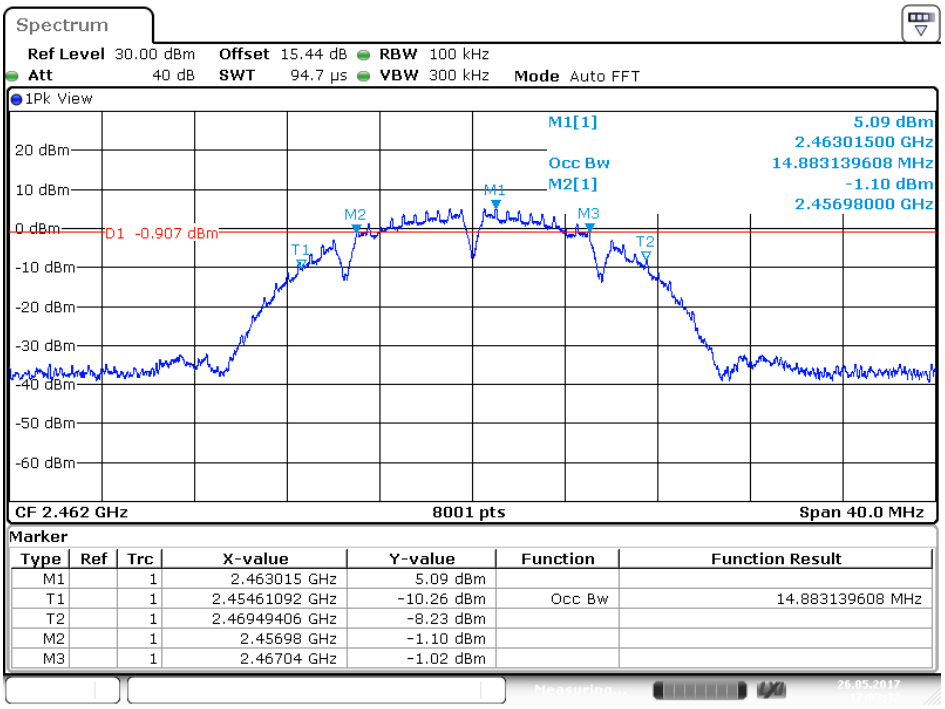
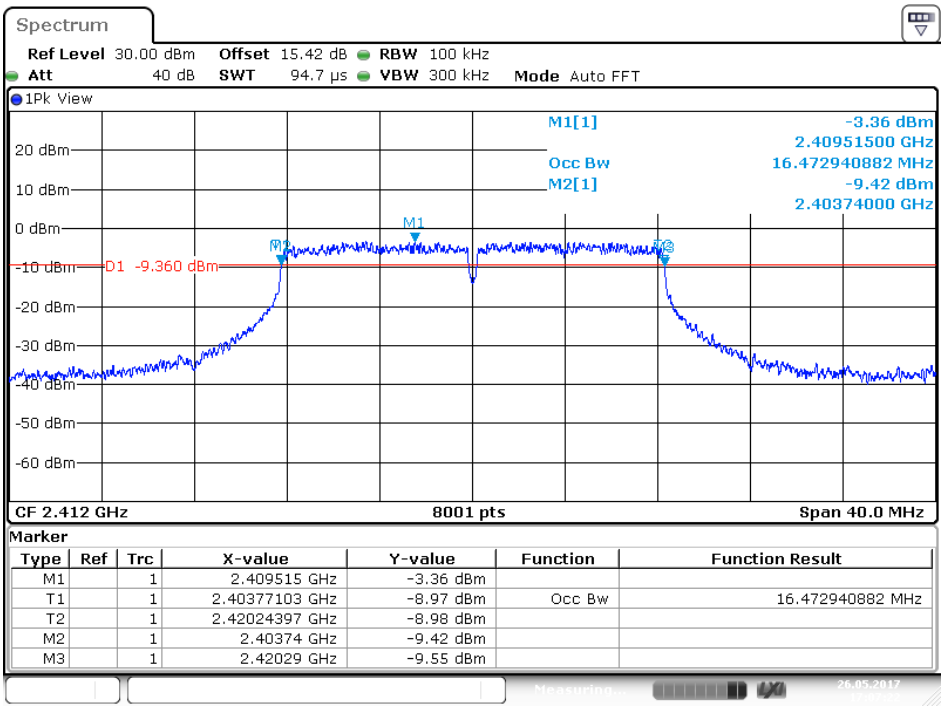
802.11b Channel High 2462MHz



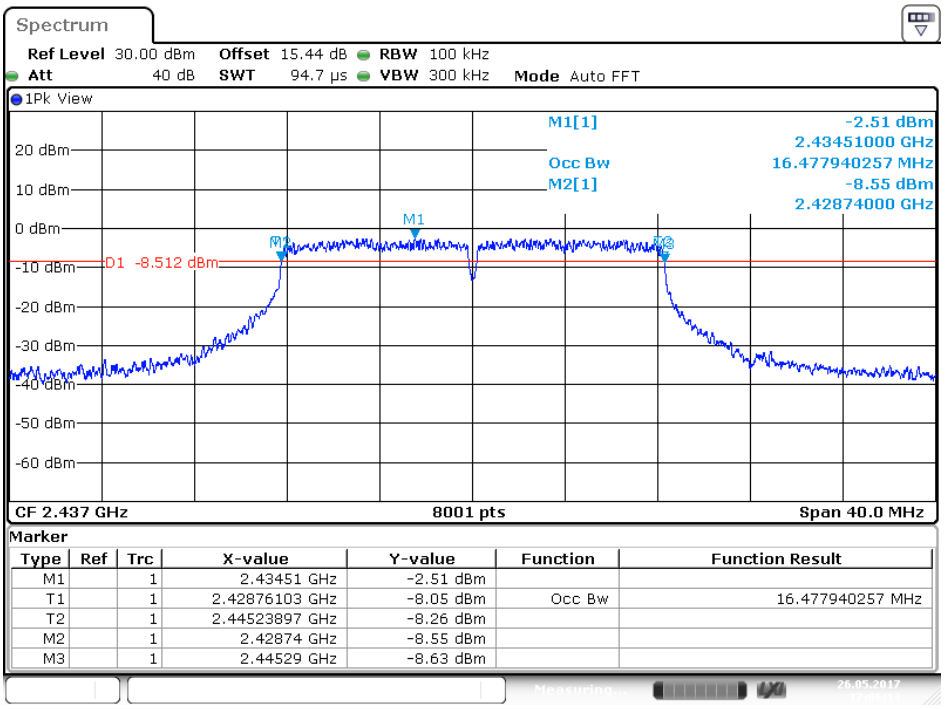
Date: 26.MAY.2017 17:03:32

802.11g Channel Low 2412MHz



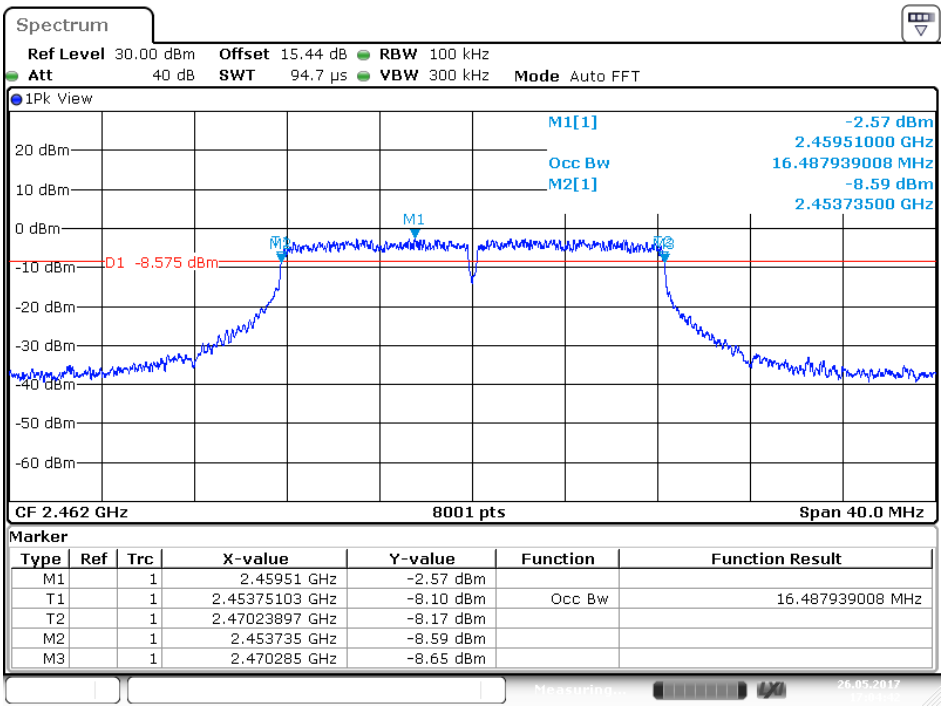
Date: 26.MAY.2017 17:07:22

802.11g Channel Middle 2437MHz



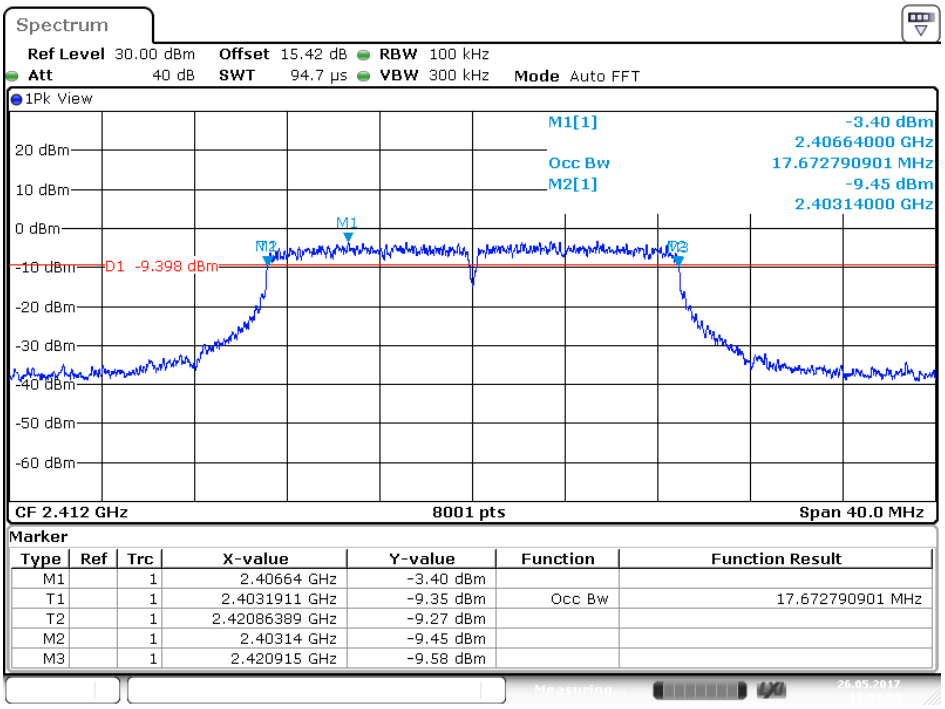
Date: 26.MAY.2017 17:06:13

802.11g Channel High 2462MHz



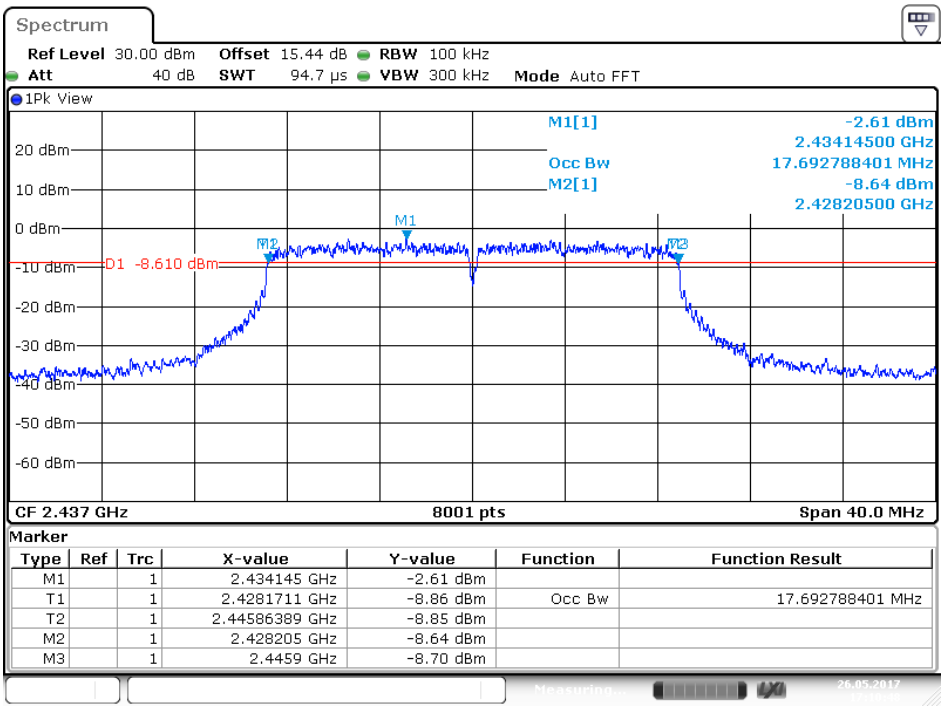
Date: 26.MAY.2017 17:04:42

802.11n Channel Low 2412MHz (20MHz)



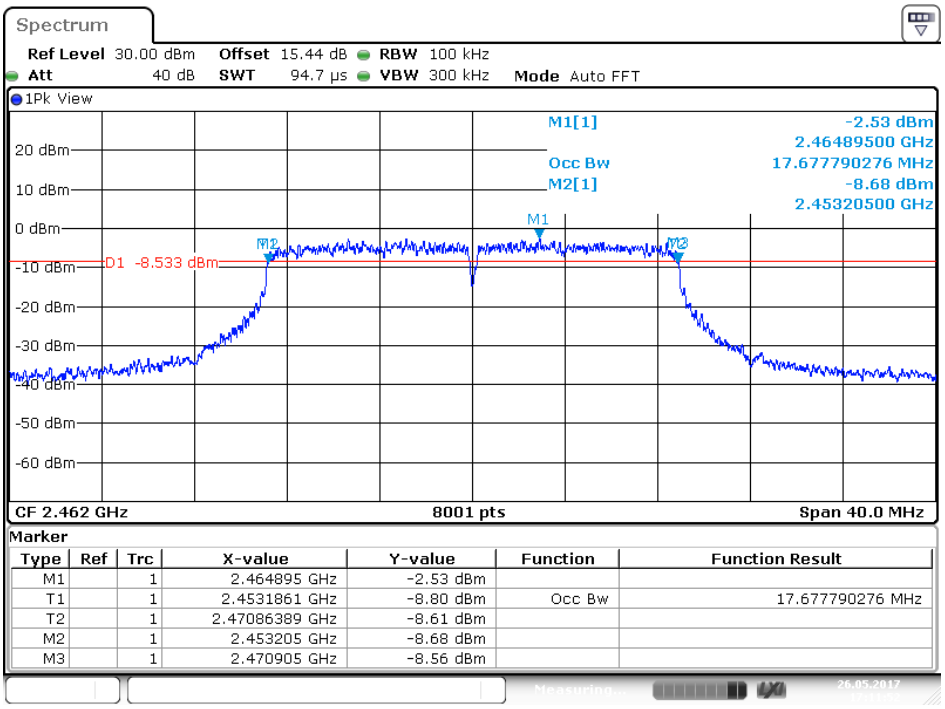
Date: 26.MAY.2017 17:09:34

802.11n Channel Middle 2437MHz(20MHz)



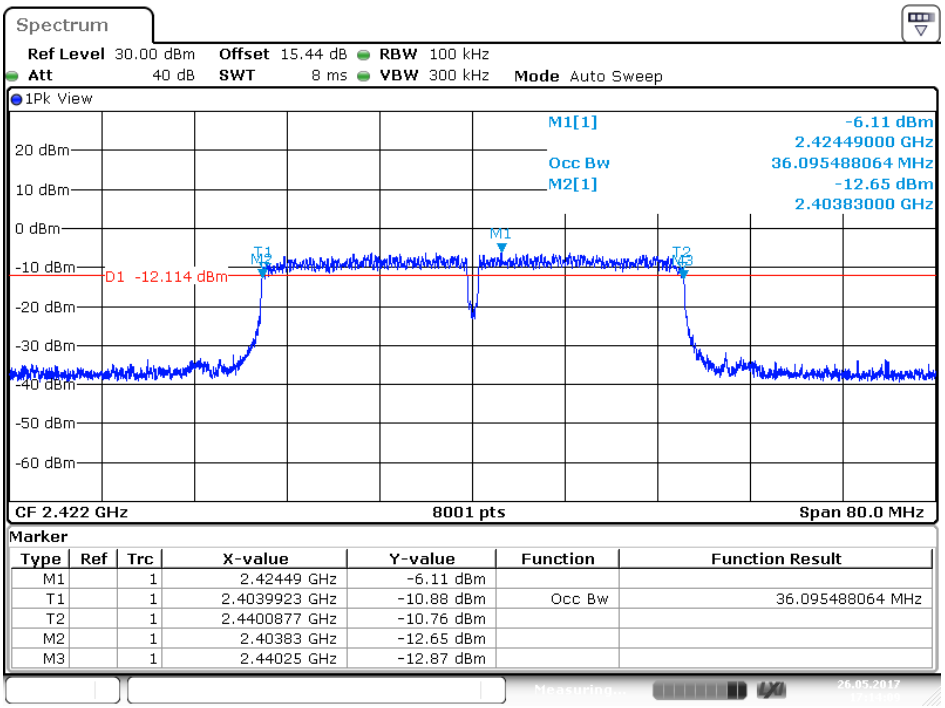
Date: 26.MAY.2017 17:10:48

802.11n Channel High 2462MHz(20MHz)



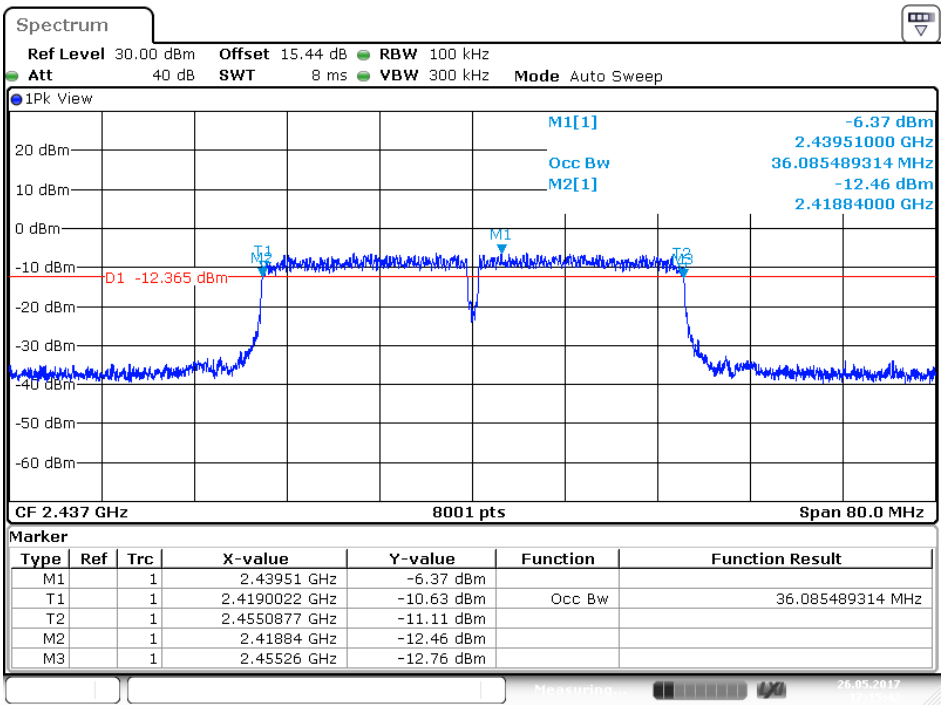
Date: 26.MAY.2017 17:11:52

802.11n Channel Low 2422MHz (40MHz)



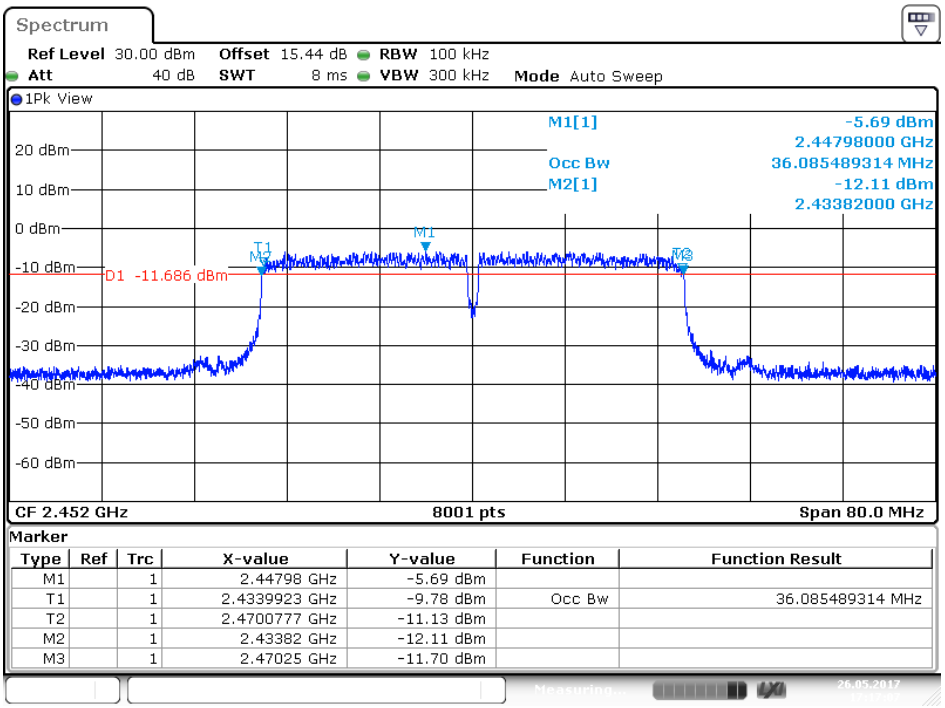
Date: 26.MAY.2017 17:14:09

802.11n Channel Middle 2437MHz(40MHz)



Date: 26.MAY.2017 17:15:42

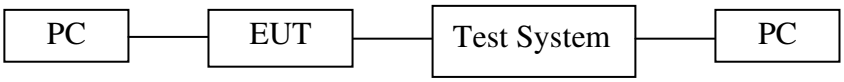
802.11n Channel High 2452MHz(40MHz)



Date: 26.MAY.2017 17:17:07

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 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz 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

The test was performed with 802.11b			
Channel	Frequency (MHz)	duty cycle(x)	10log(1/x)
Low	2412	100%	0
Middle	2437	100%	0
High	2462	100%	0

The test was performed with 802.11g			
Channel	Frequency (MHz)	duty cycle(x)	10log(1/x)
Low	2412	100%	0
Middle	2437	100%	0
High	2462	100%	0

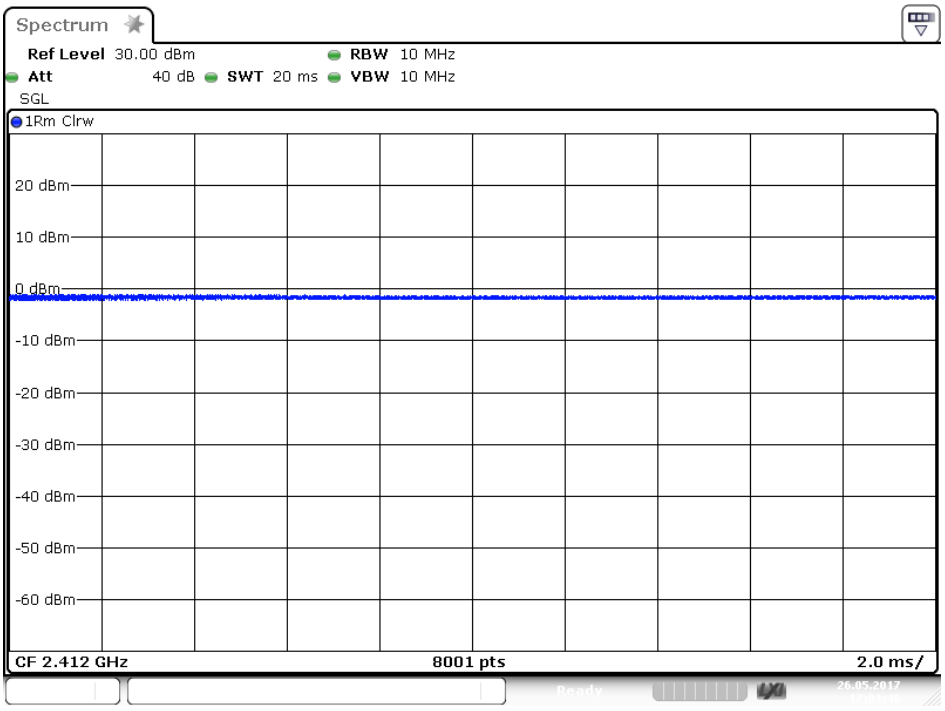
The test was performed with 802.11n (Bandwidth: 20 MHz)			
Channel	Frequency (MHz)	duty cycle(x)	10log(1/x)
Low	2412	100%	0
Middle	2437	100%	0
High	2462	100%	0

The test was performed with 802.11n (Bandwidth: 40 MHz)			
Channel	Frequency (MHz)	duty cycle(x)	10log(1/x)
Low	2422	100%	0
Middle	2437	100%	0
High	2452	100%	0

The spectrum analyzer plots are attached as below.

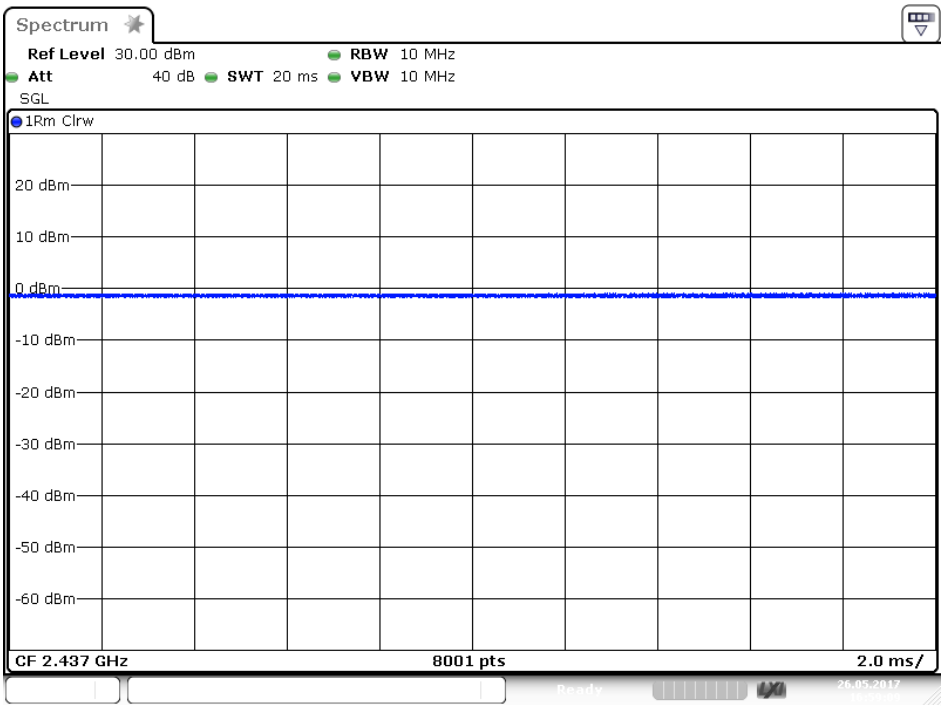
duty cycle

802.11b Channel Low 2412MHz



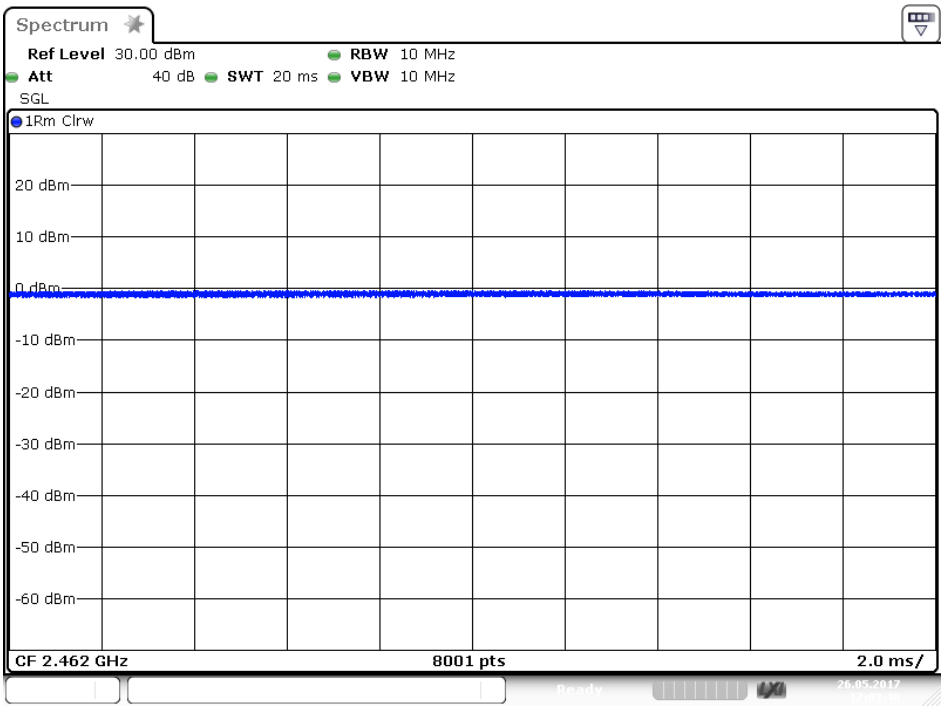
Date: 26.MAY.2017 17:01:46

802.11b Channel Middle 2437MHz



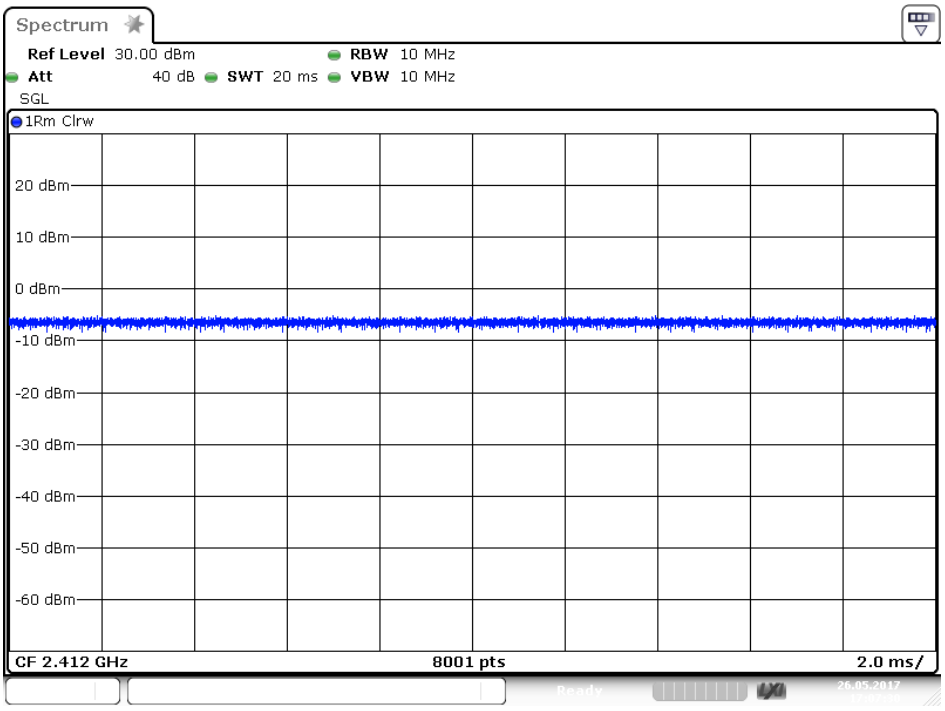
Date: 26.MAY.2017 16:59:10

802.11b Channel High 2462MHz



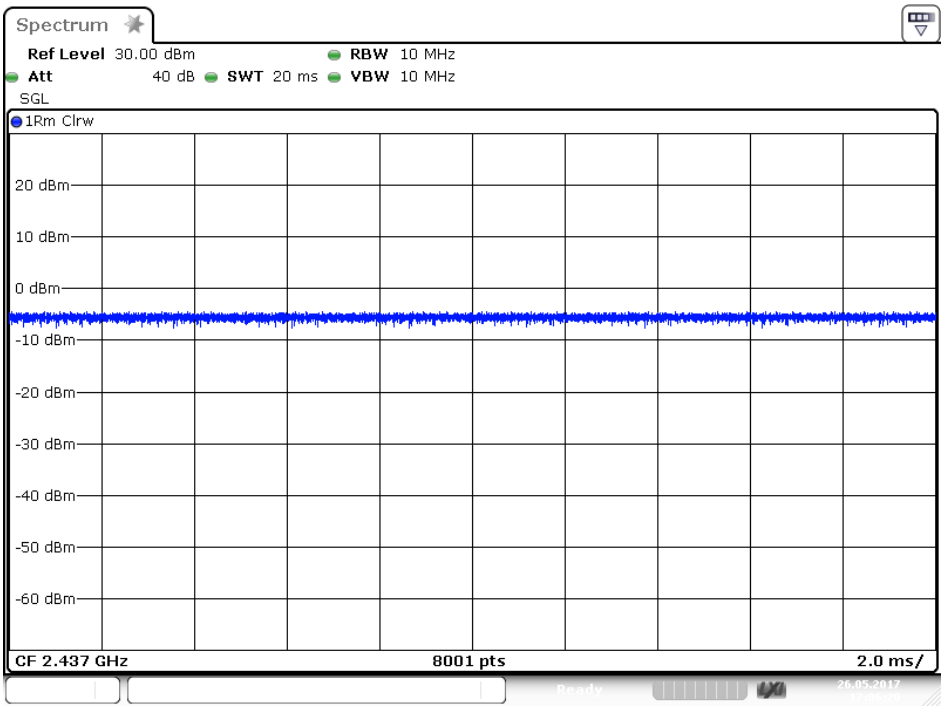
Date: 26.MAY.2017 17:03:40

802.11g Channel Low 2412MHz



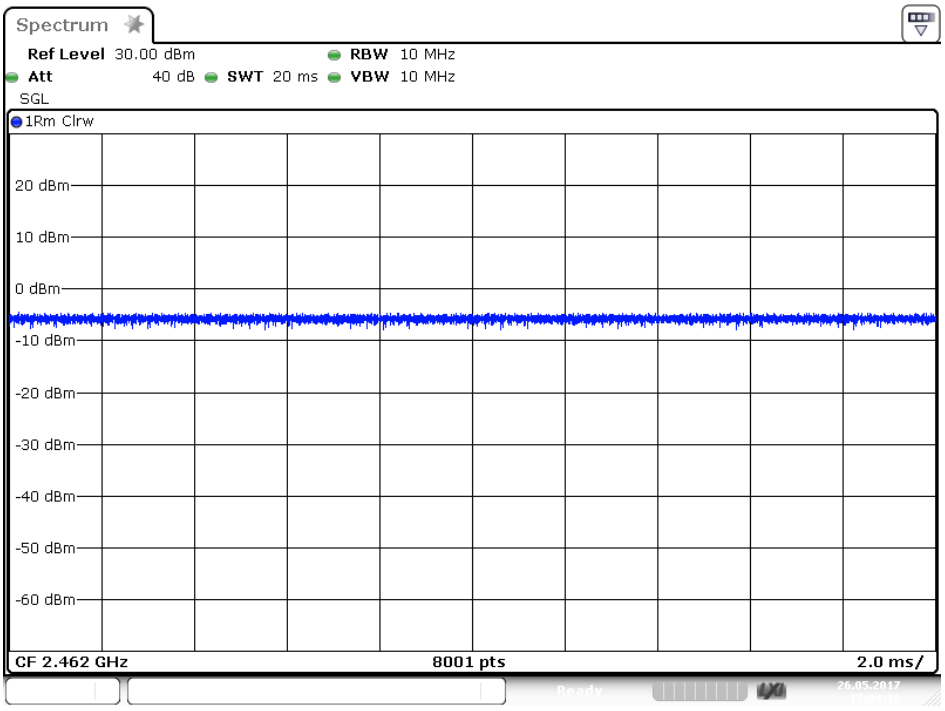
Date: 26.MAY.2017 17:07:30

802.11g Channel Middle 2437MHz



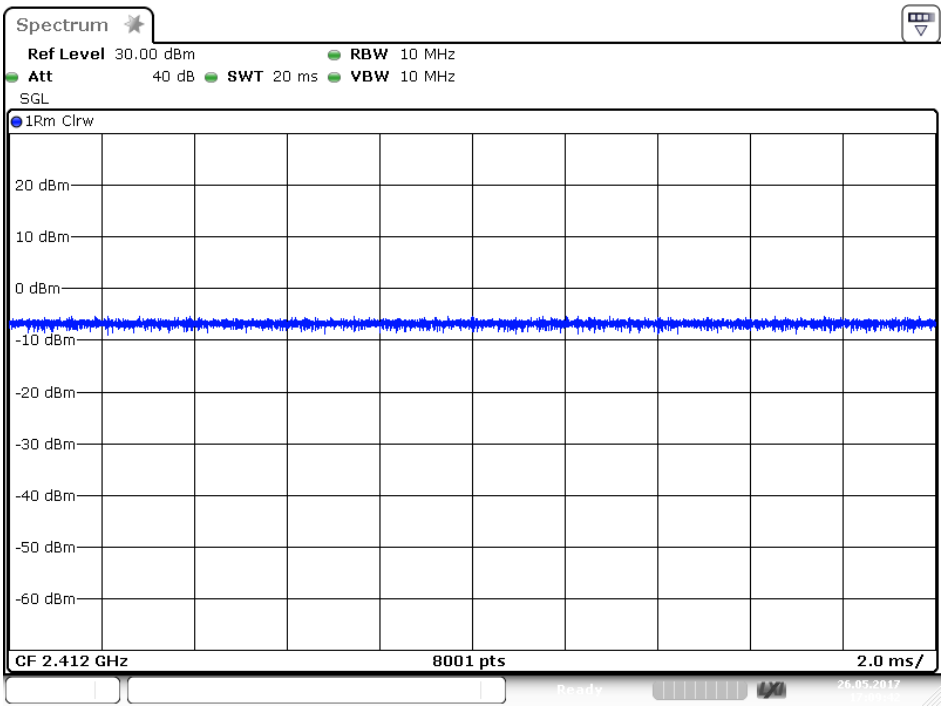
Date: 26.MAY.2017 17:06:20

802.11g Channel High 2462MHz



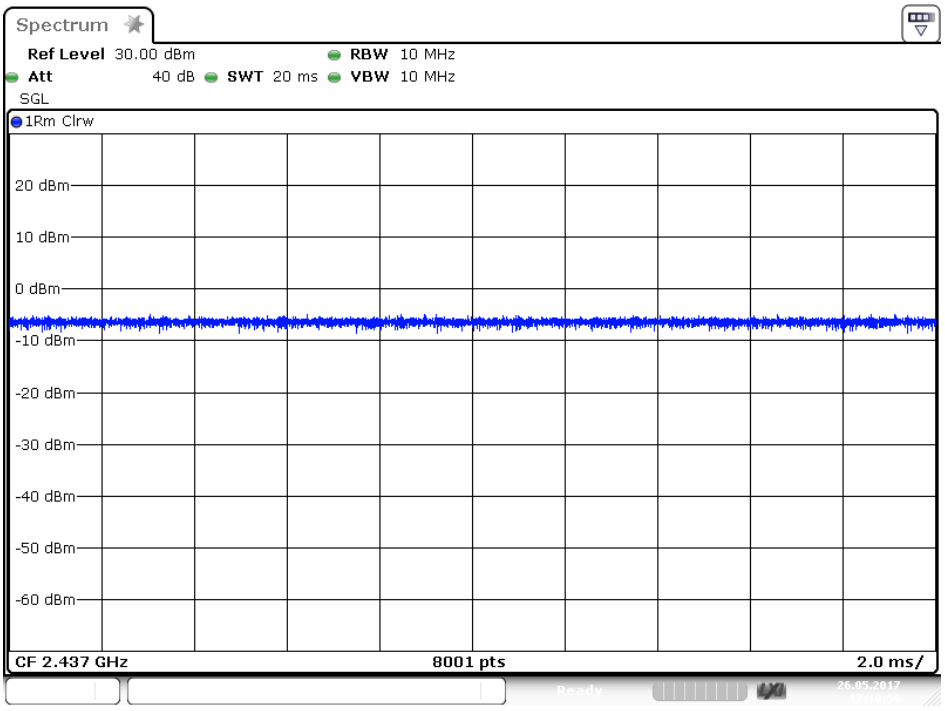
Date: 26.MAY.2017 17:04:50

802.11n Channel Low 2412MHz (20MHz)



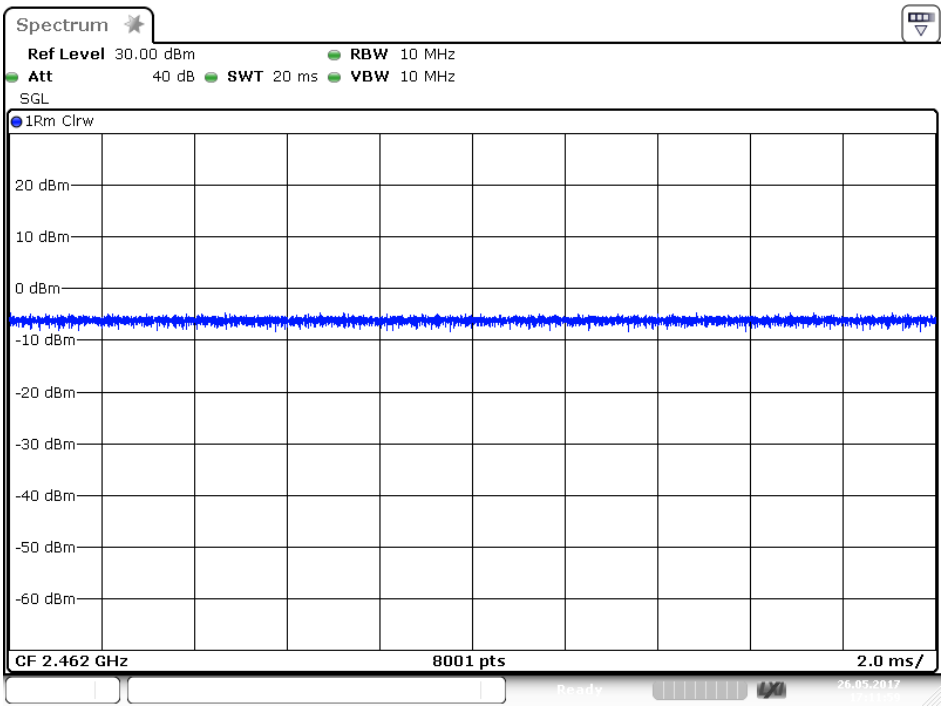
Date: 26.MAY.2017 17:09:42

802.11n Channel Middle 2437MHz(20MHz)



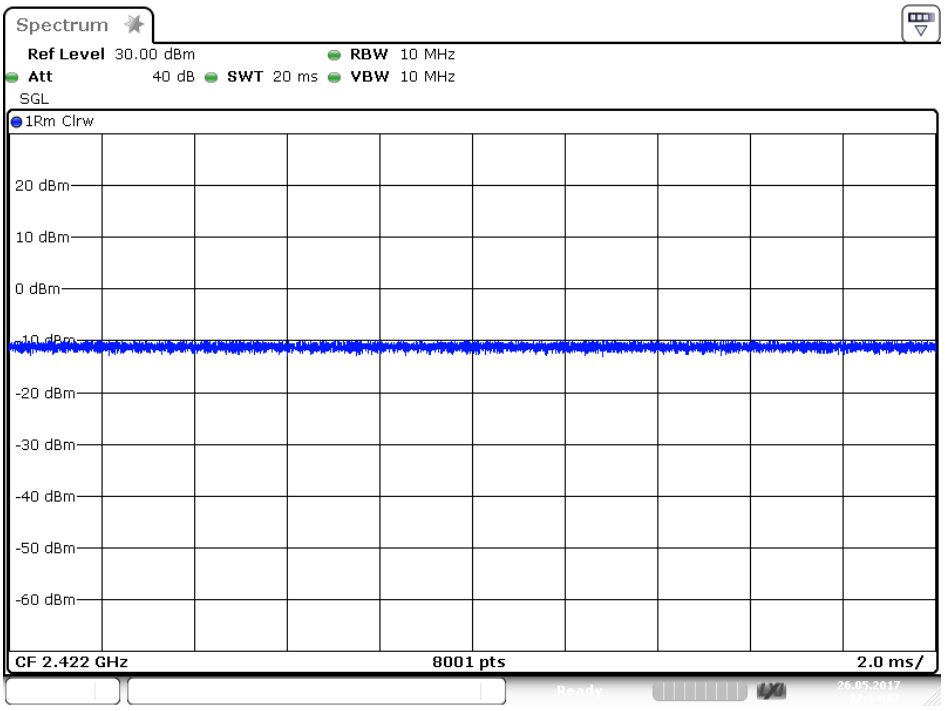
Date: 26.MAY.2017 17:10:56

802.11n Channel High 2462MHz(20MHz)



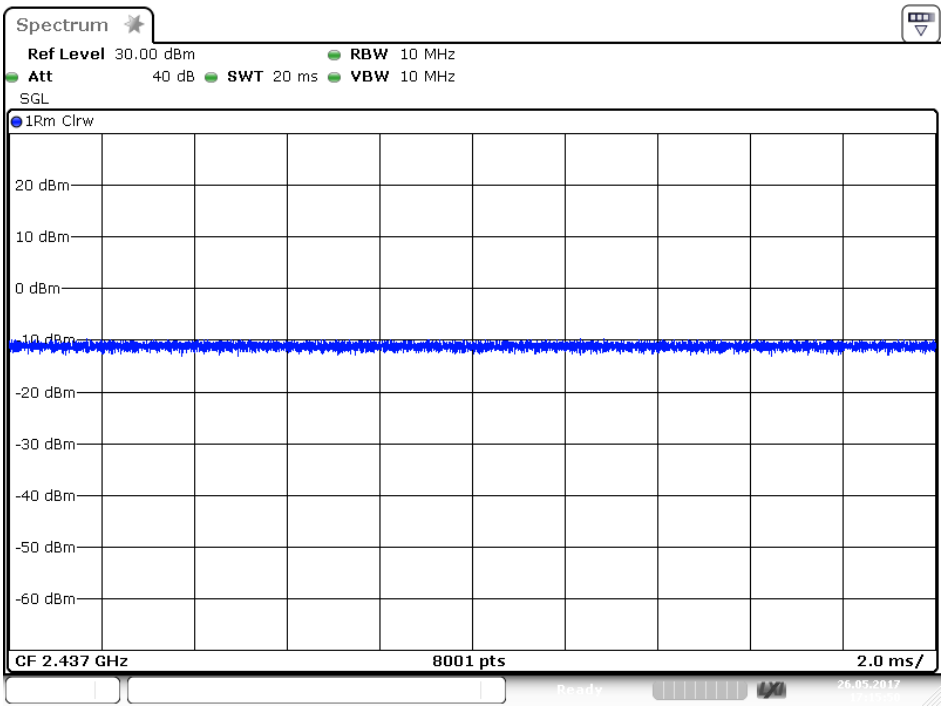
Date: 26.MAY.2017 17:12:00

802.11n Channel Low 2422MHz (40MHz)



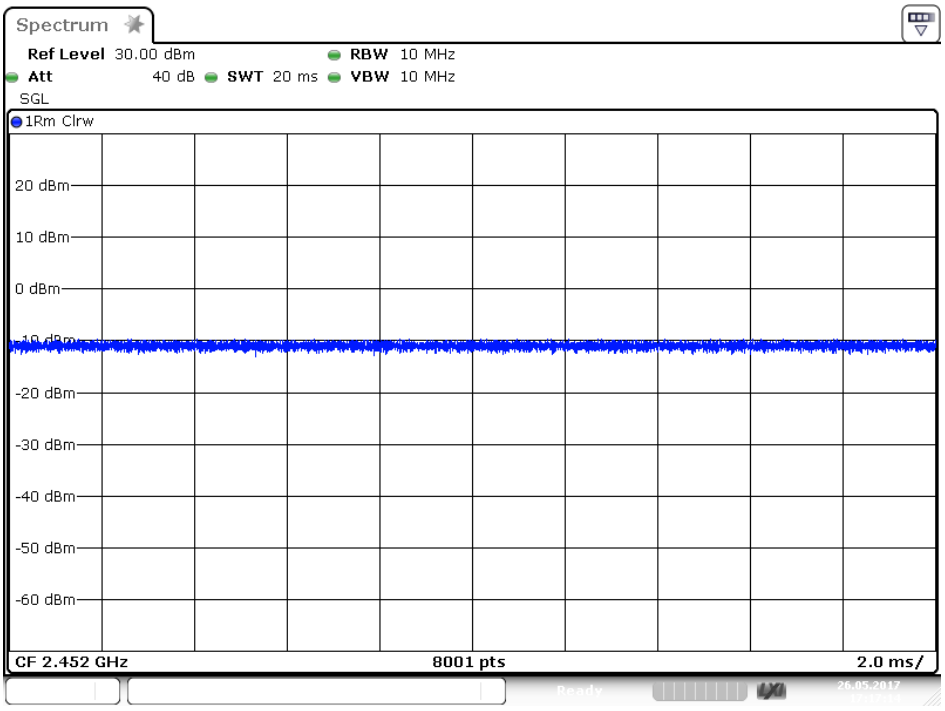
Date: 26.MAY.2017 17:14:17

802.11n Channel Middle 2437MHz(40MHz)



Date: 26.MAY.2017 17:15:50

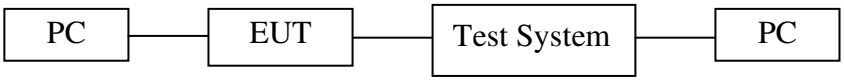
802.11n Channel High 2452MHz(40MHz)



Date: 26.MAY.2017 17:17:14

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 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz 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

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 (mW)	Limits dBm / W
Low	2412	14.80	0	14.80	30.20	30 dBm / 1 W
Middle	2437	15.29	0	15.29	33.81	30 dBm / 1 W
High	2462	15.47	0	15.47	35.24	30 dBm / 1 W

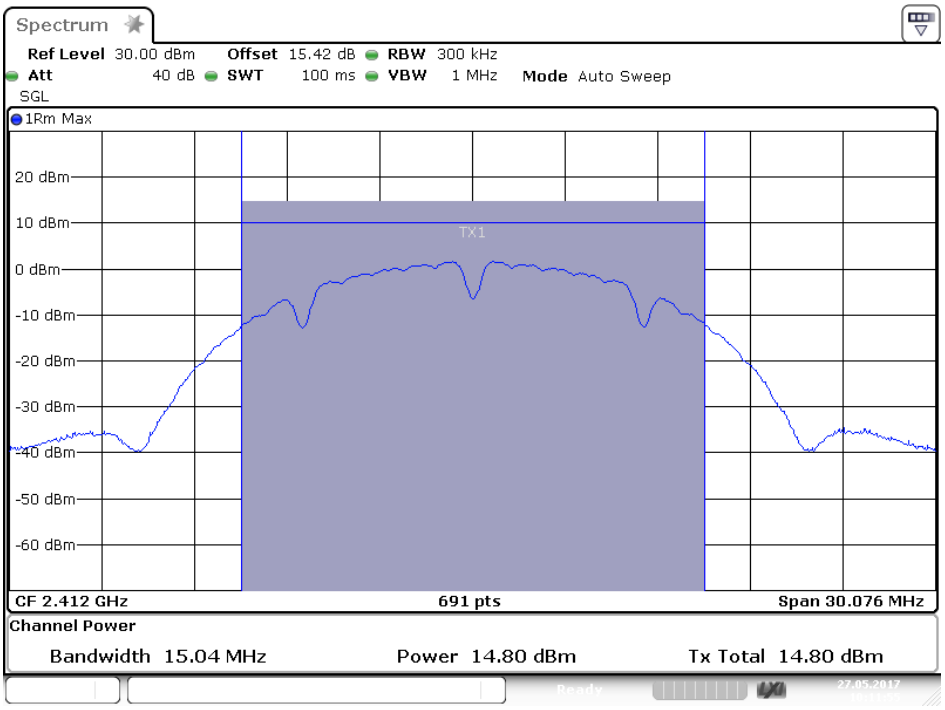
The test was performed with 802.11g						
Channel	Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (mW)	Limits dBm / W
Low	2412	10.67	0	10.67	11.67	30 dBm / 1 W
Middle	2437	11.16	0	11.16	13.06	30 dBm / 1 W
High	2462	11.15	0	11.15	13.03	30 dBm / 1 W

The test was performed with 802.11n (20MHz)						
Channel	Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (mW)	Limits dBm / W
Low	2412	10.67	0	10.67	11.67	30 dBm / 1 W
Middle	2437	11.12	0	11.12	12.94	30 dBm / 1 W
High	2462	11.30	0	11.30	13.49	30 dBm / 1 W

The test was performed with 802.11n (40MHz)						
Channel	Frequency (MHz)	Ave output power (dBm)	10log(1/ duty cycle)	Final power (dBm)	Final power (mW)	Limits dBm / W
Low	2422	9.14	0	9.14	8.20	30 dBm / 1 W
Middle	2437	9.40	0	9.40	8.71	30 dBm / 1 W
High	2452	9.18	0	9.18	8.28	30 dBm / 1 W

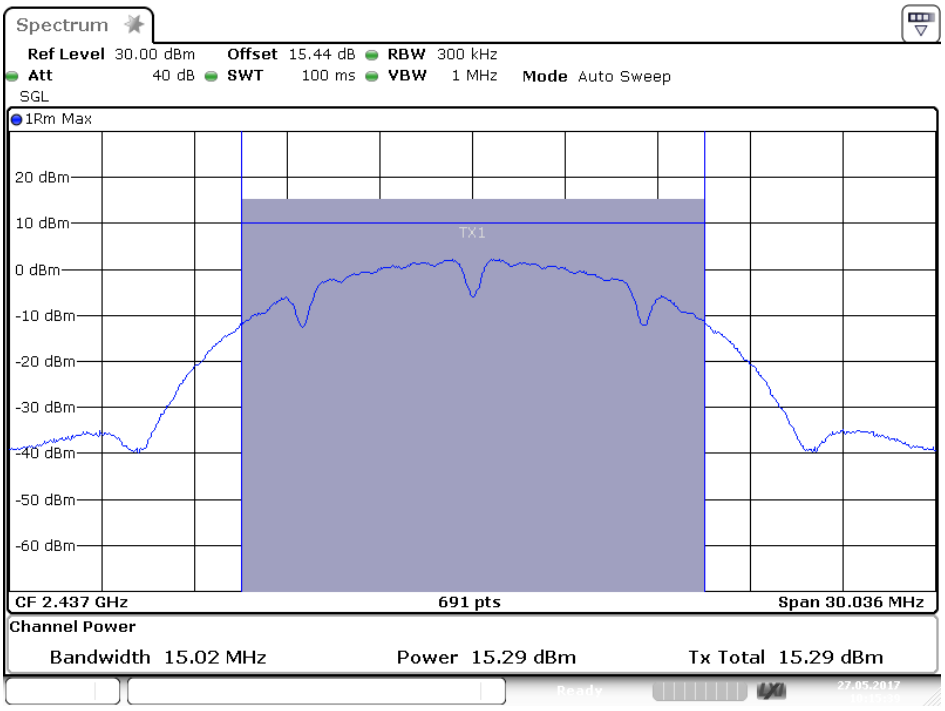
The spectrum analyzer plots are attached as below.

802.11b Channel Low 2412MHz



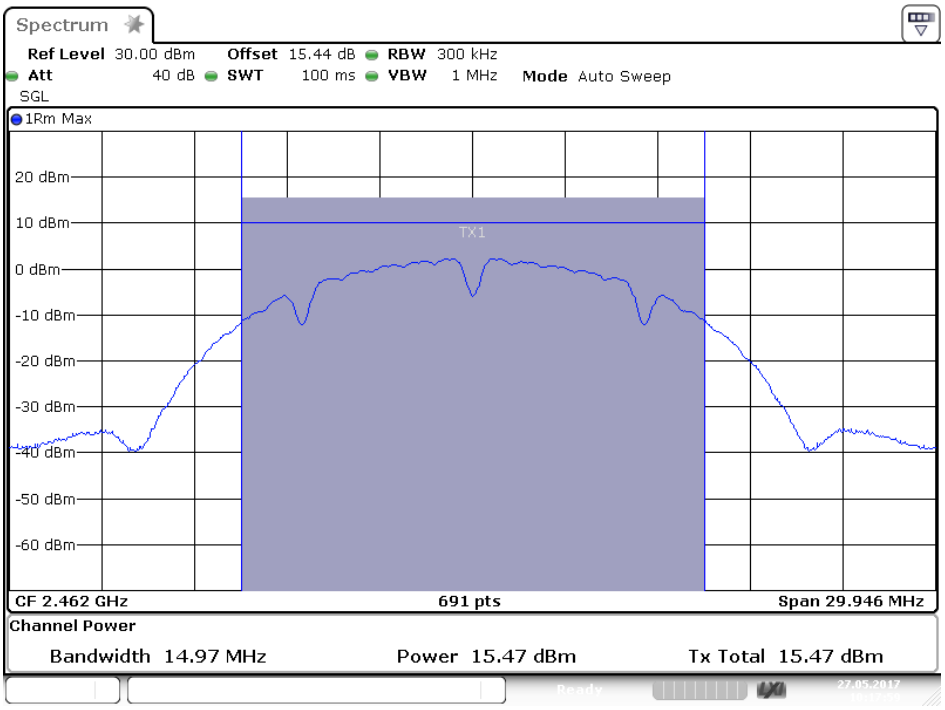
Date: 27.MAY.2017 10:11:56

802.11b Channel Middle 2437MHz



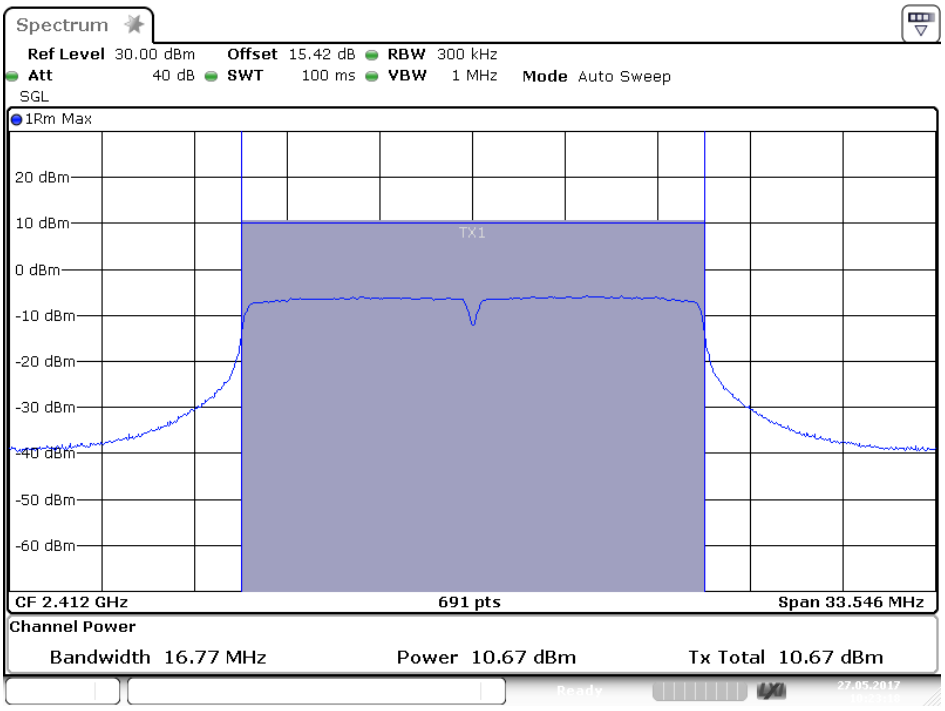
Date: 27.MAY.2017 10:15:39

802.11b Channel High 2462MHz



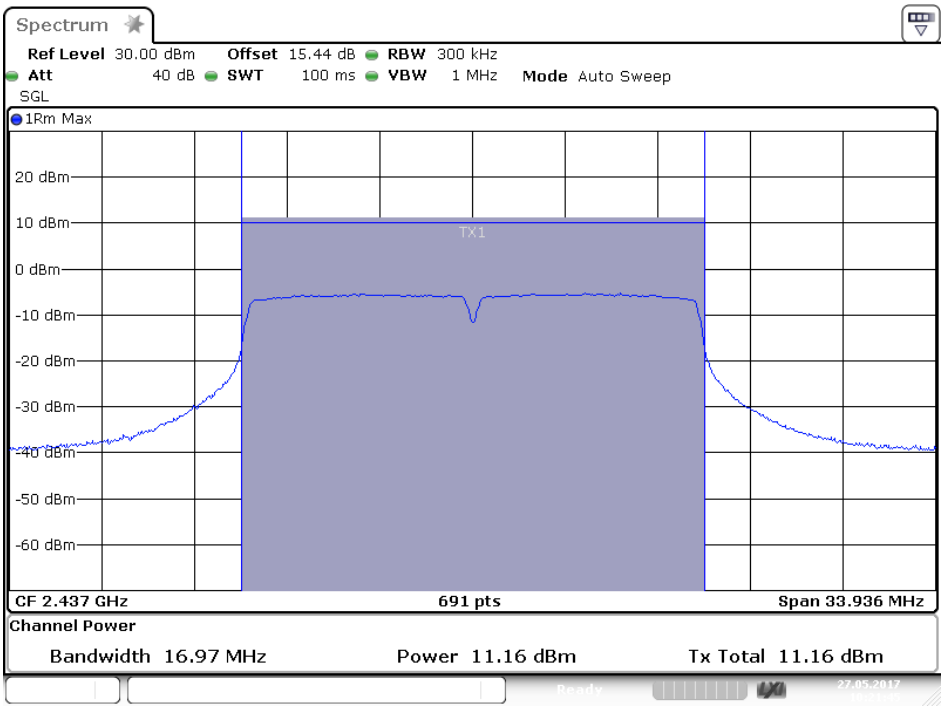
Date: 27.MAY.2017 10:18:00

802.11g Channel Low 2412MHz



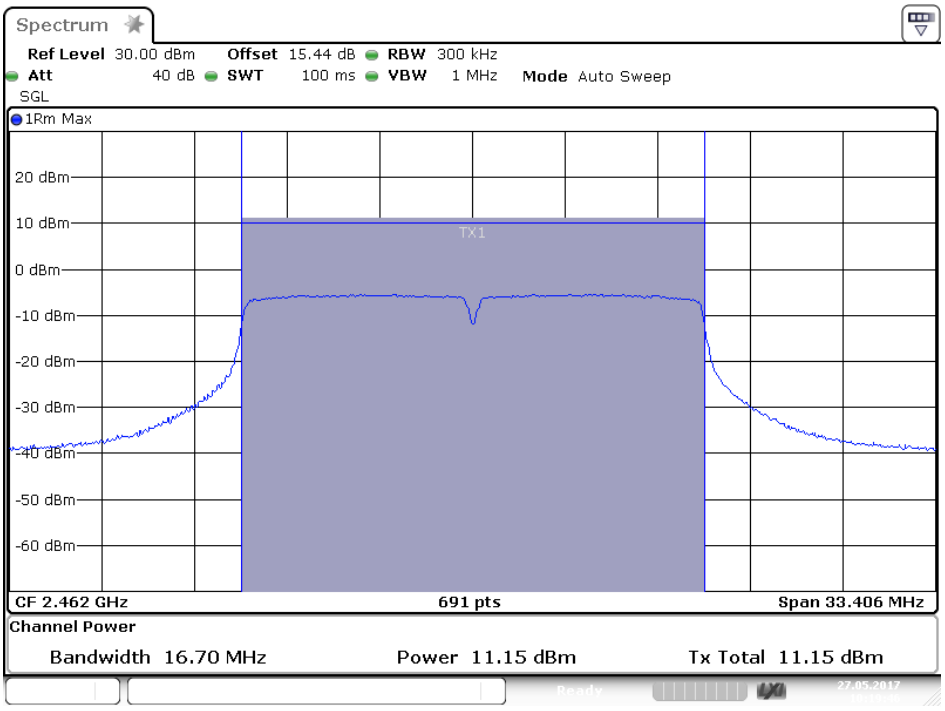
Date: 27.MAY.2017 10:23:19

802.11g Channel Middle 2437MHz



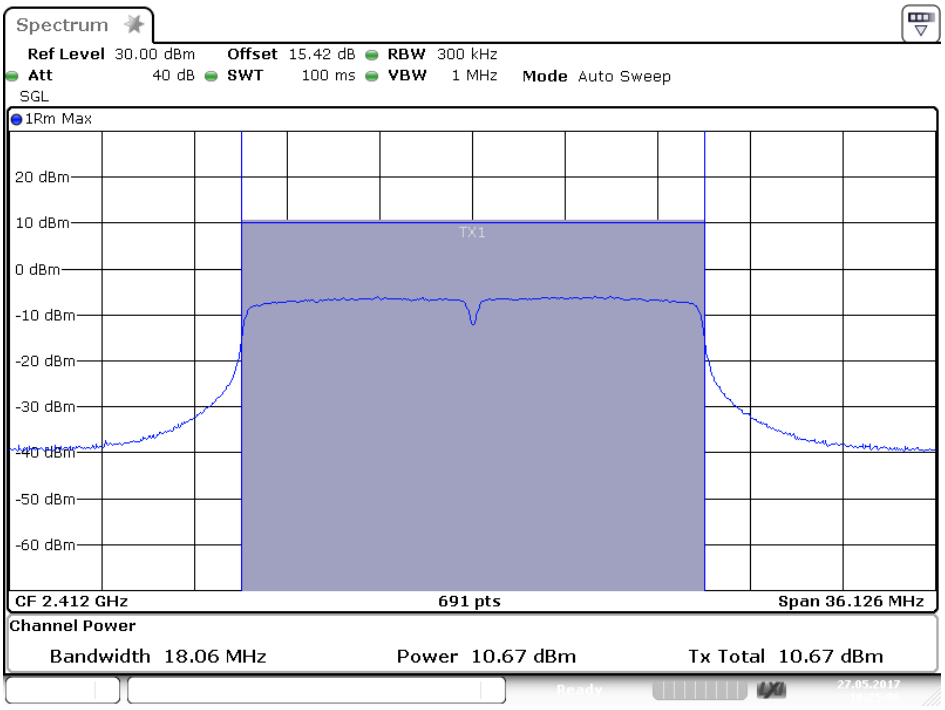
Date: 27.MAY.2017 10:21:45

802.11g Channel High 2462MHz



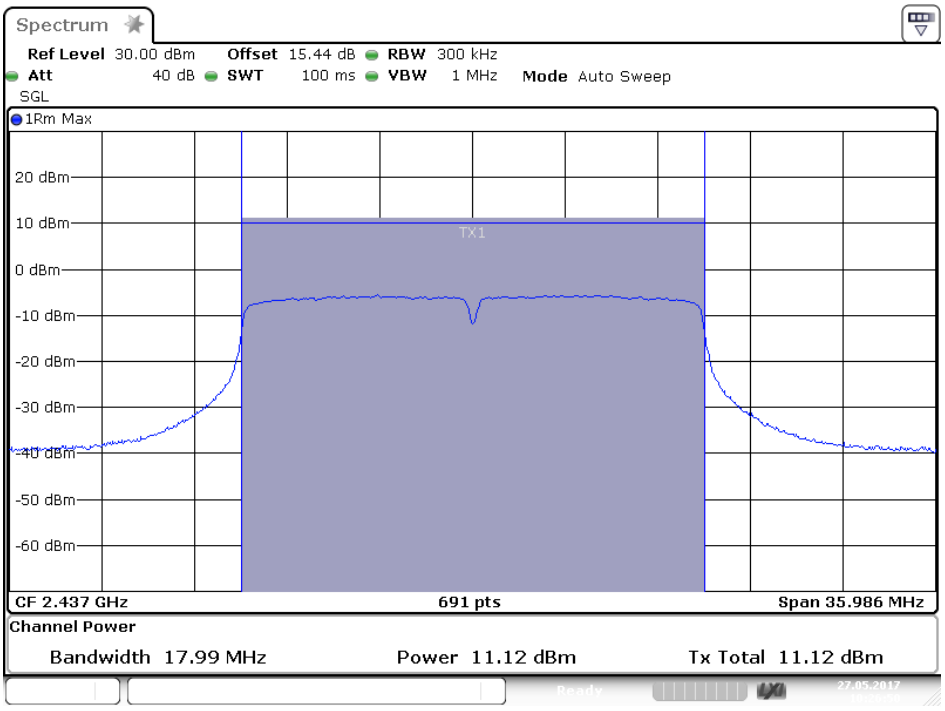
Date: 27.MAY.2017 10:19:46

802.11n Channel Low 2412MHz (20MHz)



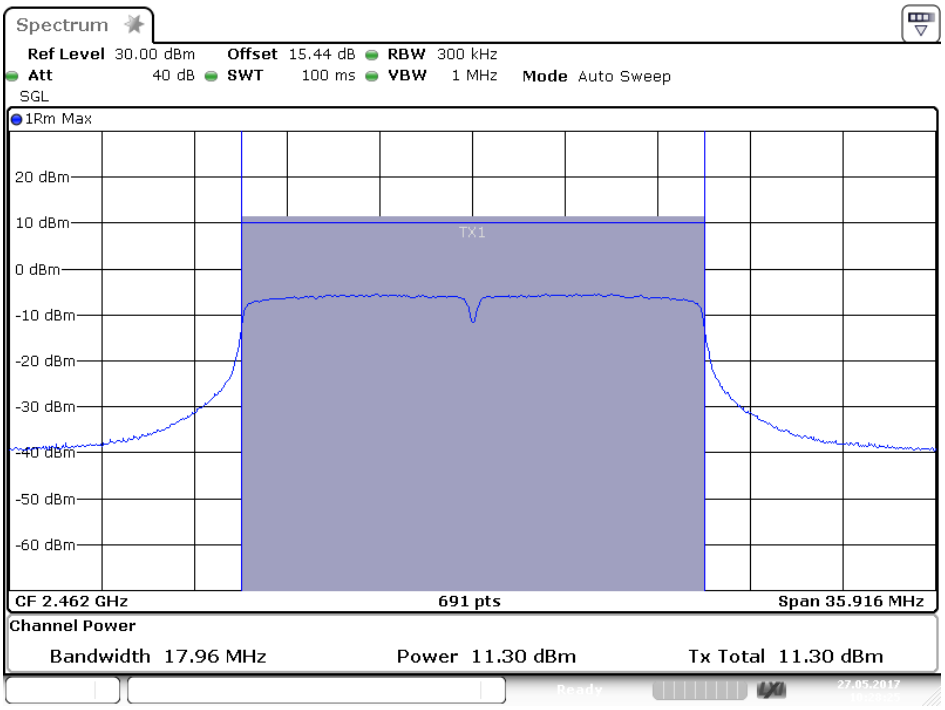
Date: 27.MAY.2017 10:25:06

802.11n Channel Middle 2437MHz (20MHz)



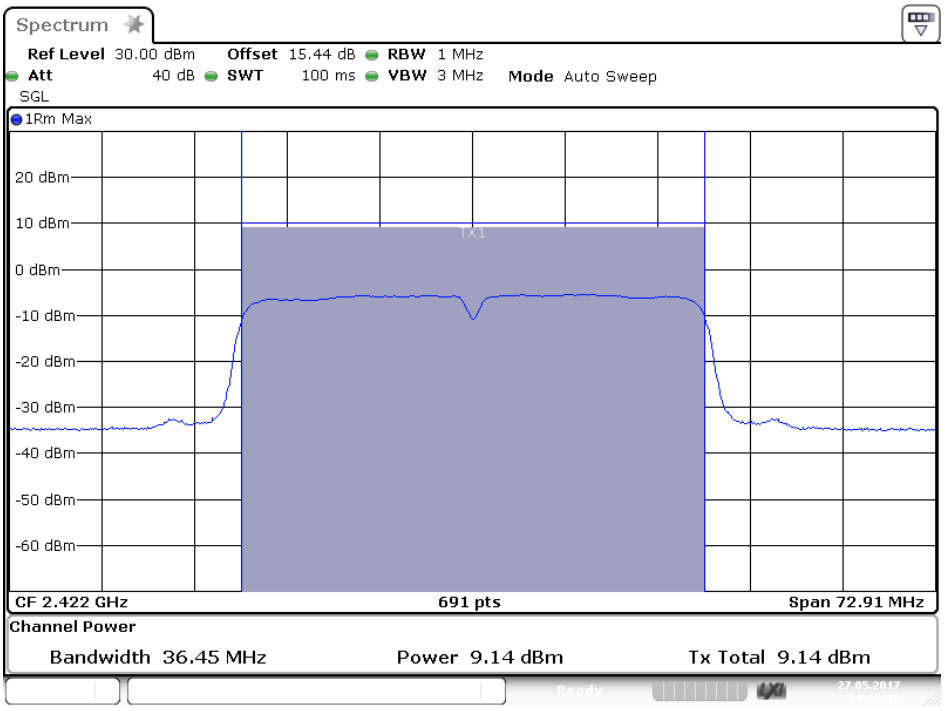
Date: 27.MAY.2017 10:26:50

802.11n Channel High 2462MHz (20MHz)



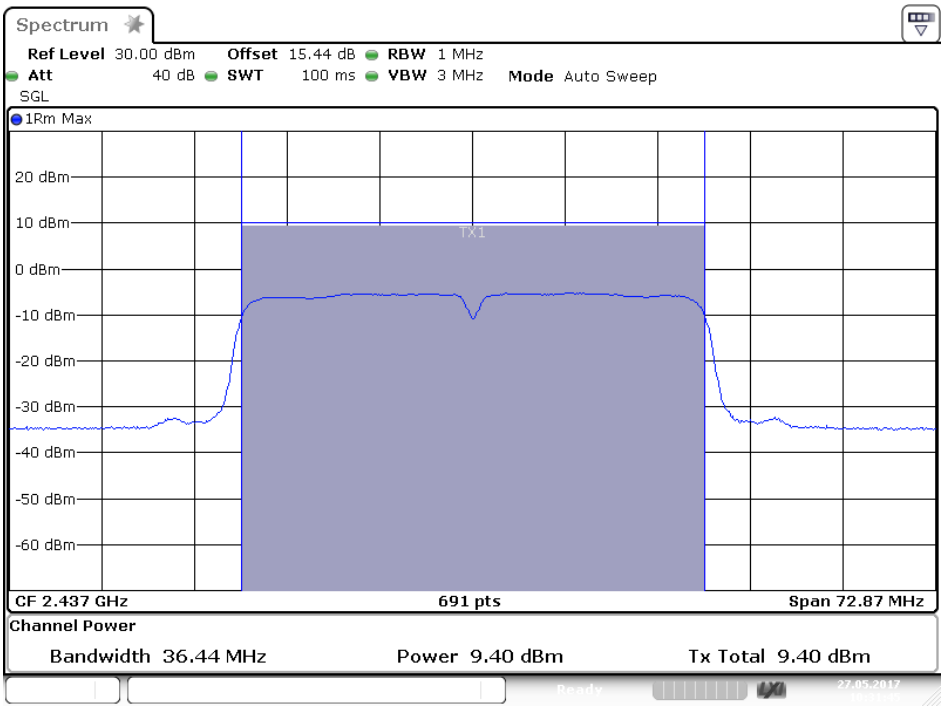
Date: 27.MAY.2017 10:28:26

802.11n Channel Low 2422MHz (40MHz)



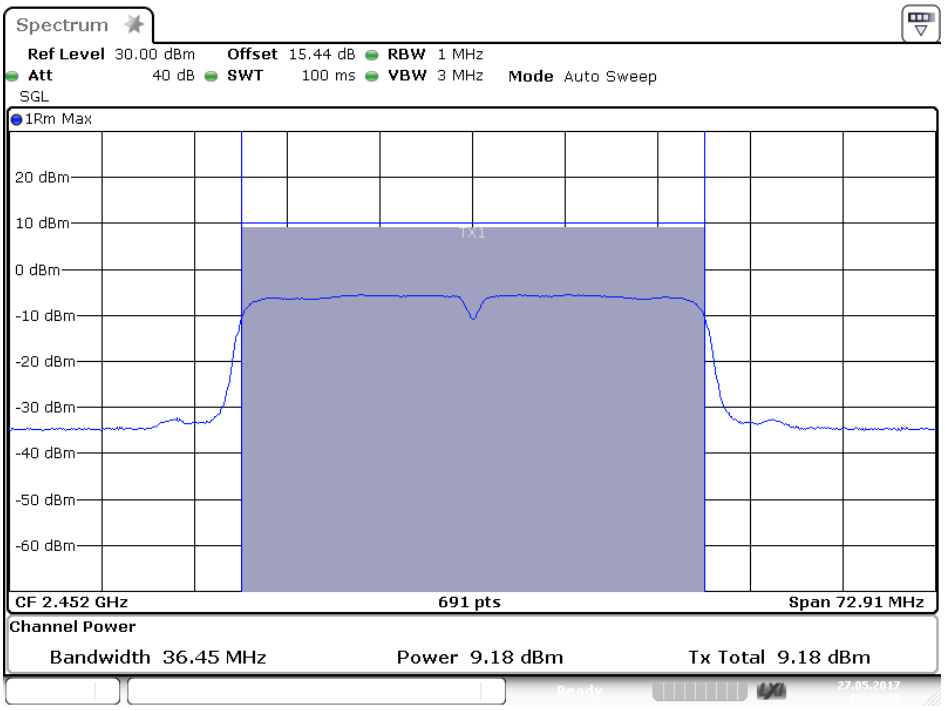
Date: 27.MAY.2017 10:33:36

802.11n Channel Middle 2437MHz (40MHz)



Date: 27.MAY.2017 10:31:45

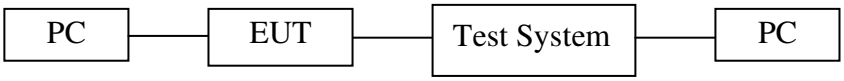
802.11n Channel High 2452MHz (40MHz)



Date: 27.MAY.2017 10:30:28

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 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz 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

The test was performed with 802.11b					
Channel	Frequency (MHz)	AVG Power Spectral Density (dBm)	10log(1/ duty cycle)	Final Power Spectral Density (dBm)	Limits (dBm)
Low	2412	-16.55	0	-16.55	8 dBm
Middle	2437	-15.98	0	-15.98	8 dBm
High	2462	-15.84	0	-15.84	8 dBm

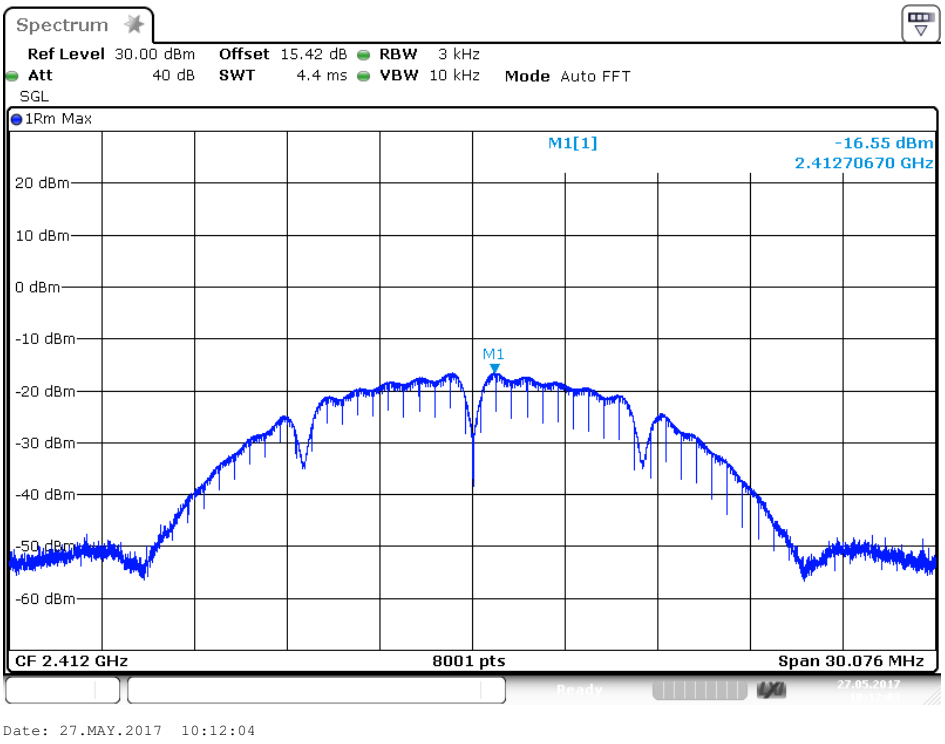
The test was performed with 802.11g					
Channel	Frequency (MHz)	AVG Power Spectral Density (dBm)	10log(1/ duty cycle)	Final Power Spectral Density (dBm)	Limits (dBm)
Low	2412	-19.19	0	-19.19	8 dBm
Middle	2437	-18.78	0	-18.78	8 dBm
High	2462	-18.66	0	-18.66	8 dBm

The test was performed with 802.11n (20MHz)					
Channel	Frequency (MHz)	AVG Power Spectral Density (dBm)	10log(1/ duty cycle)	Final Power Spectral Density (dBm)	Limits (dBm)
Low	2412	-18.88	0	-18.88	8 dBm
Middle	2437	-18.45	0	-18.45	8 dBm
High	2462	-18.55	0	-18.55	8 dBm

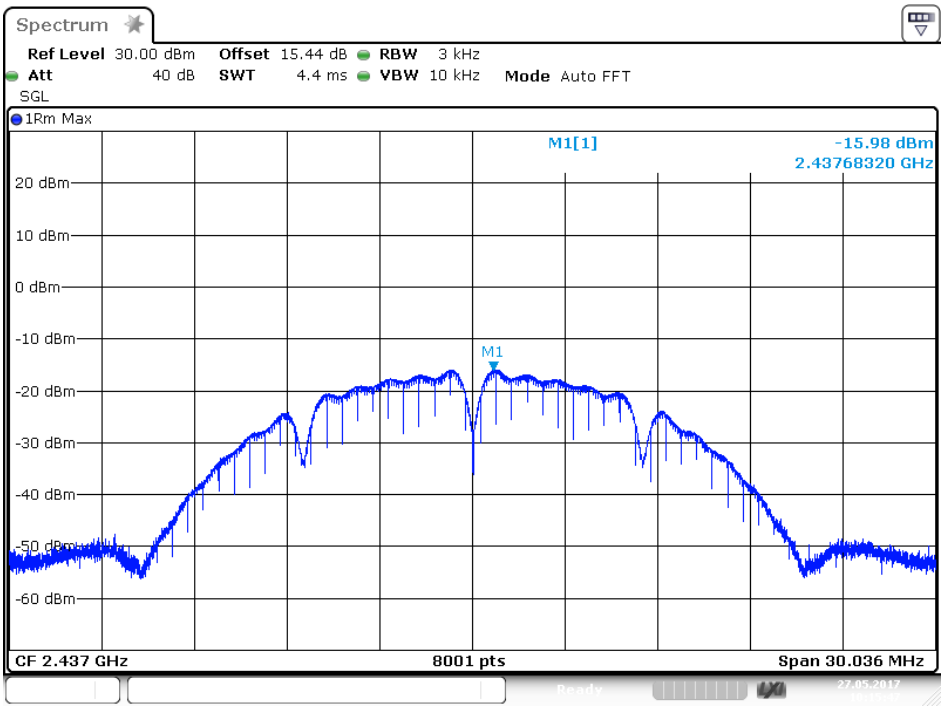
The test was performed with 802.11n (40MHz)					
Channel	Frequency (MHz)	AVG Power Spectral Density (dBm)	10log(1/ duty cycle)	Final Power Spectral Density (dBm)	Limits (dBm)
Low	2422	-23.45	0	-23.45	8 dBm
Middle	2437	-23.09	0	-23.09	8 dBm
High	2452	-23.68	0	-23.68	8 dBm

The spectrum analyzer plots are attached as below.

802.11b Channel Low 2412MHz

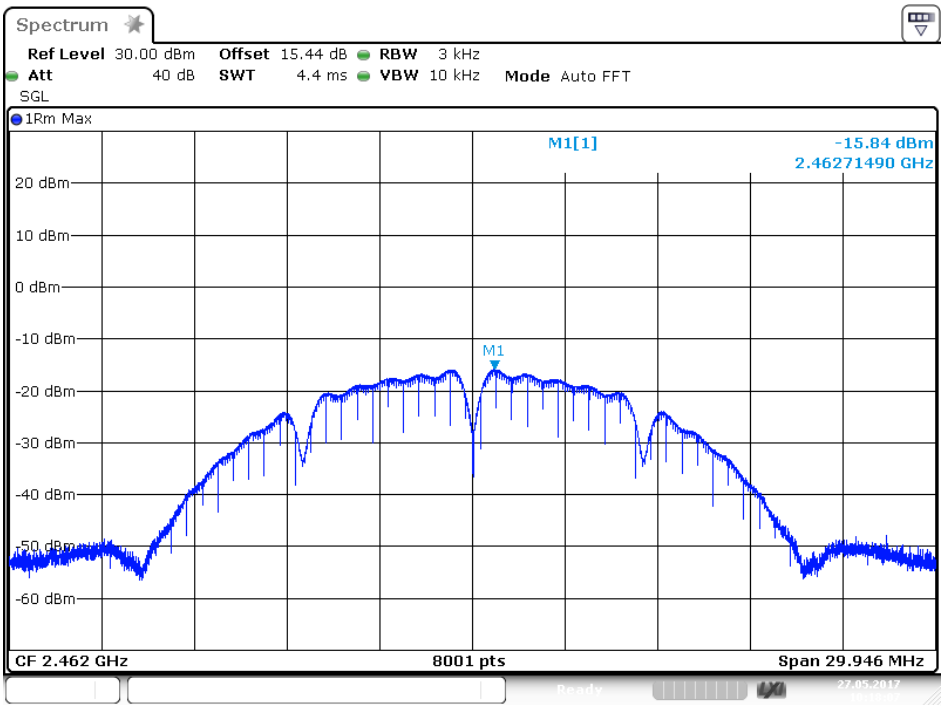


802.11b Channel Middle 2437MHz



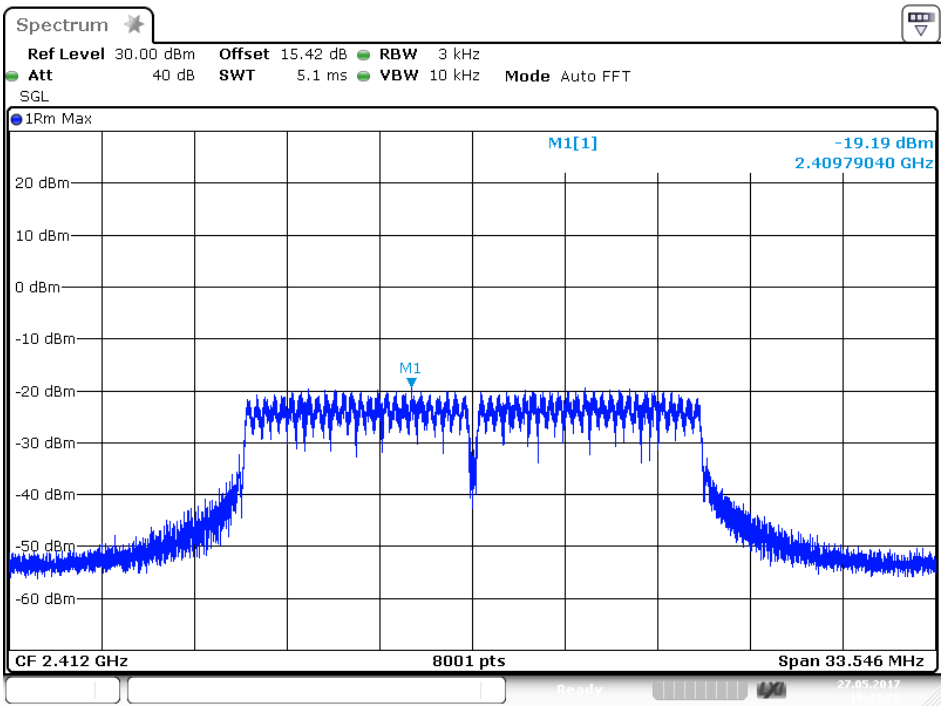
Date: 27.MAY.2017 10:15:47

802.11b Channel High 2462MHz



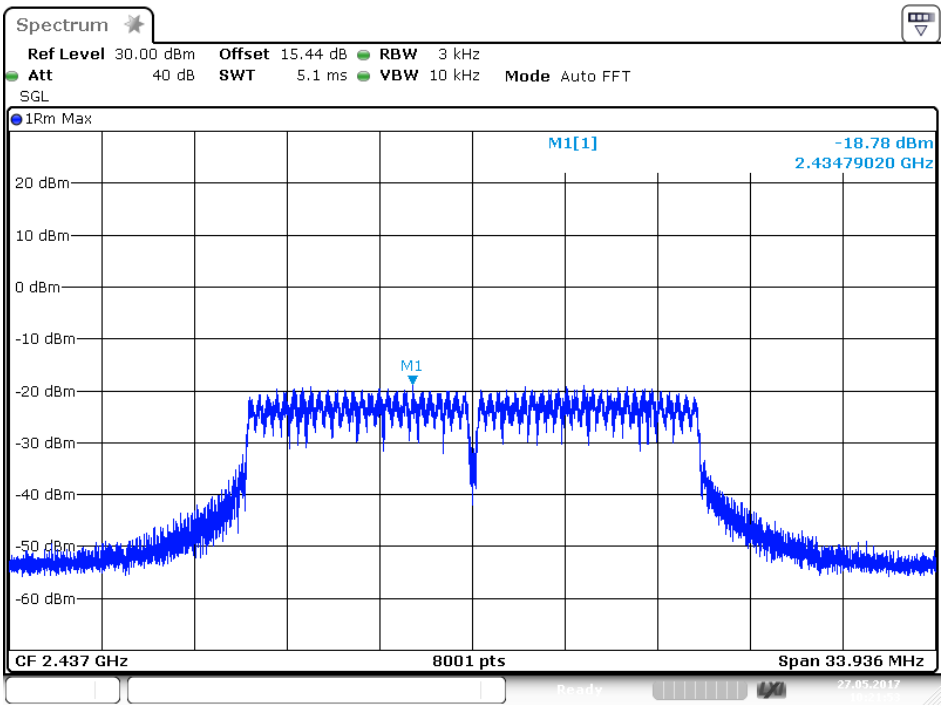
Date: 27.MAY.2017 10:18:07

802.11g Channel Low 2412MHz



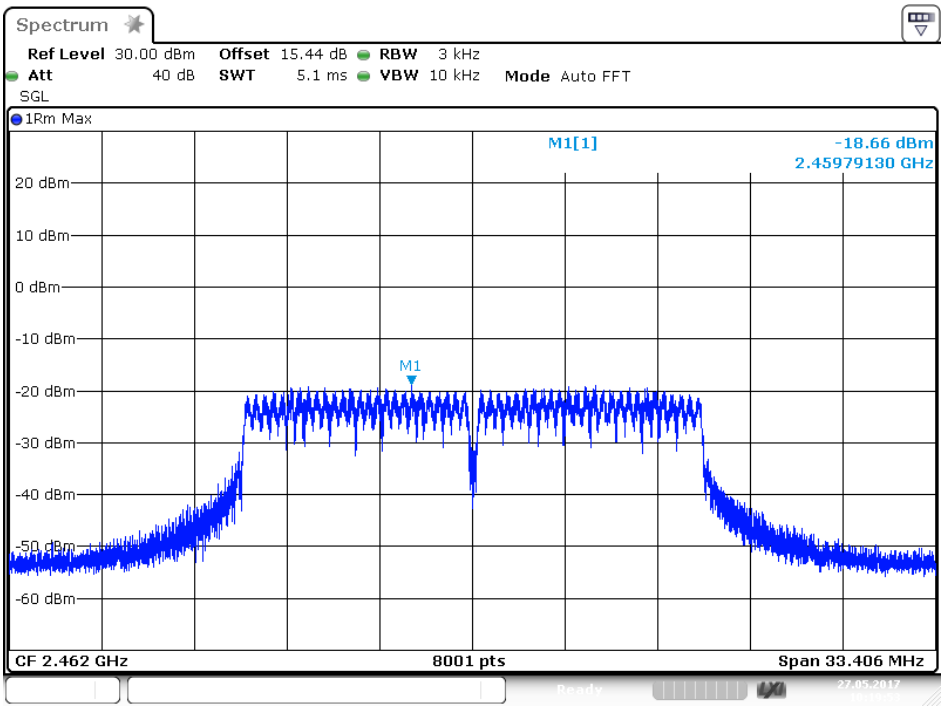
Date: 27.MAY.2017 10:23:26

802.11g Channel Middle 2437MHz



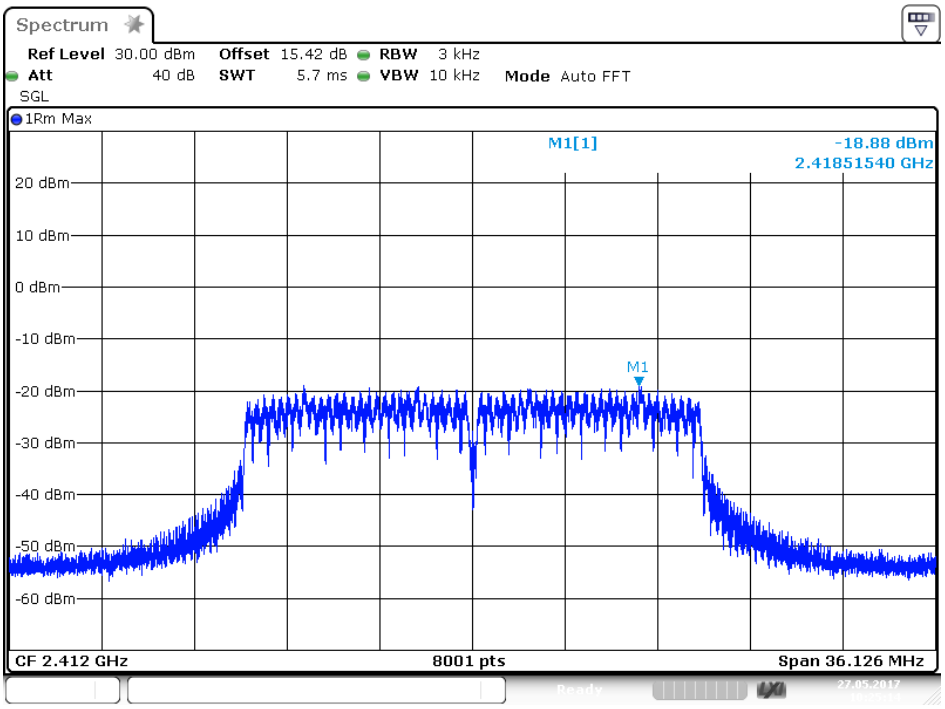
Date: 27.MAY.2017 10:21:53

802.11g Channel High 2462MHz



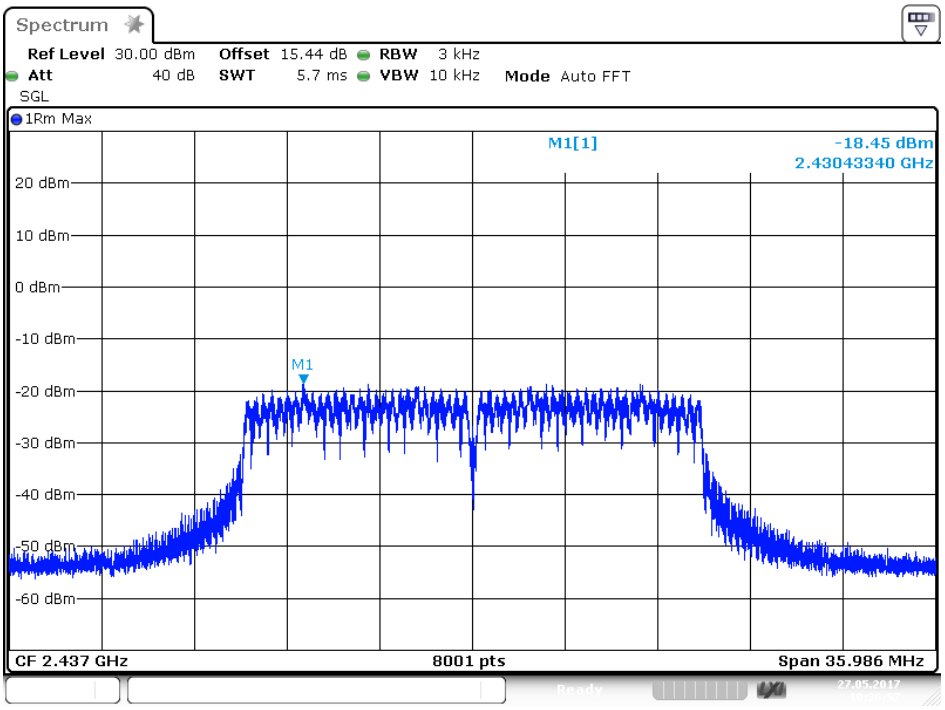
Date: 27.MAY.2017 10:19:54

802.11n Channel Low 2412MHz (20MHz)



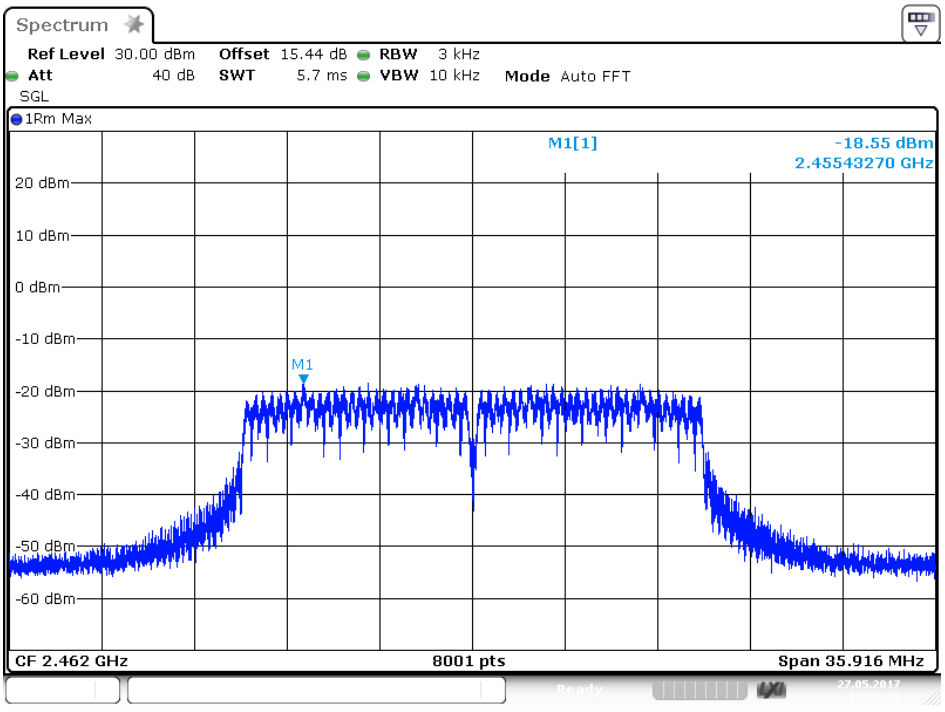
Date: 27.MAY.2017 10:25:14

802.11n Channel Middle 2437MHz (20MHz)



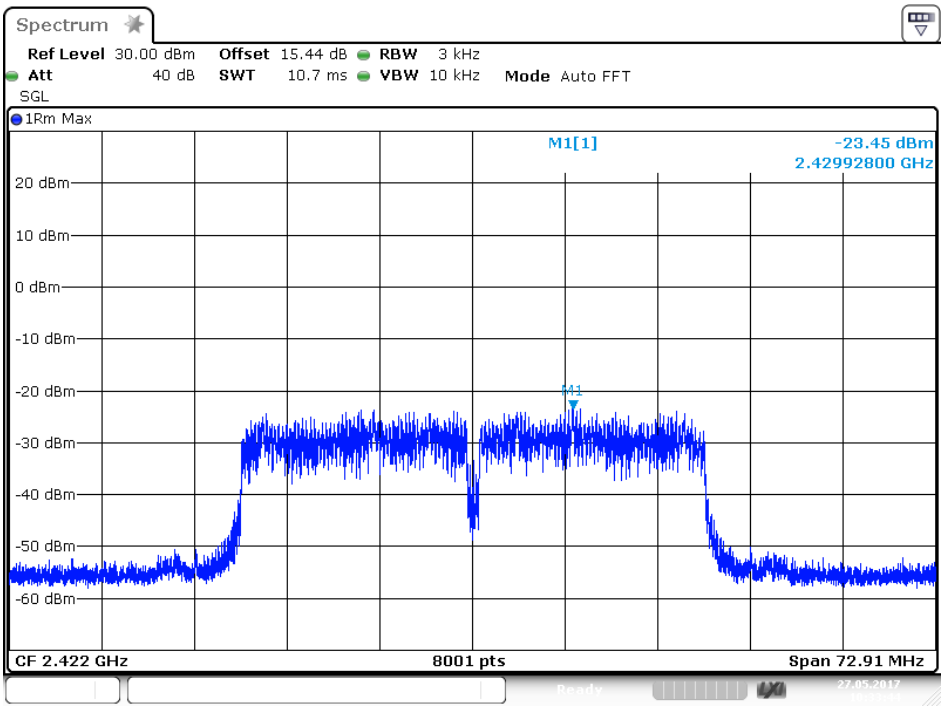
Date: 27.MAY.2017 10:26:58

802.11n Channel High 2462MHz(20MHz)



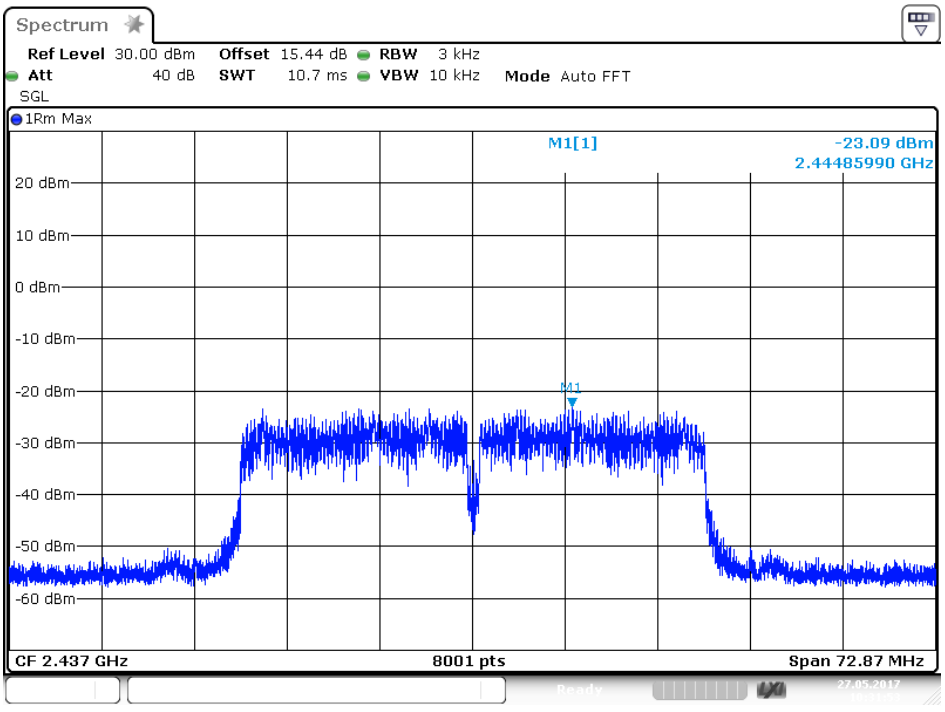
Date: 27.MAY.2017 10:28:33

802.11n Channel Low 2422MHz (40MHz)



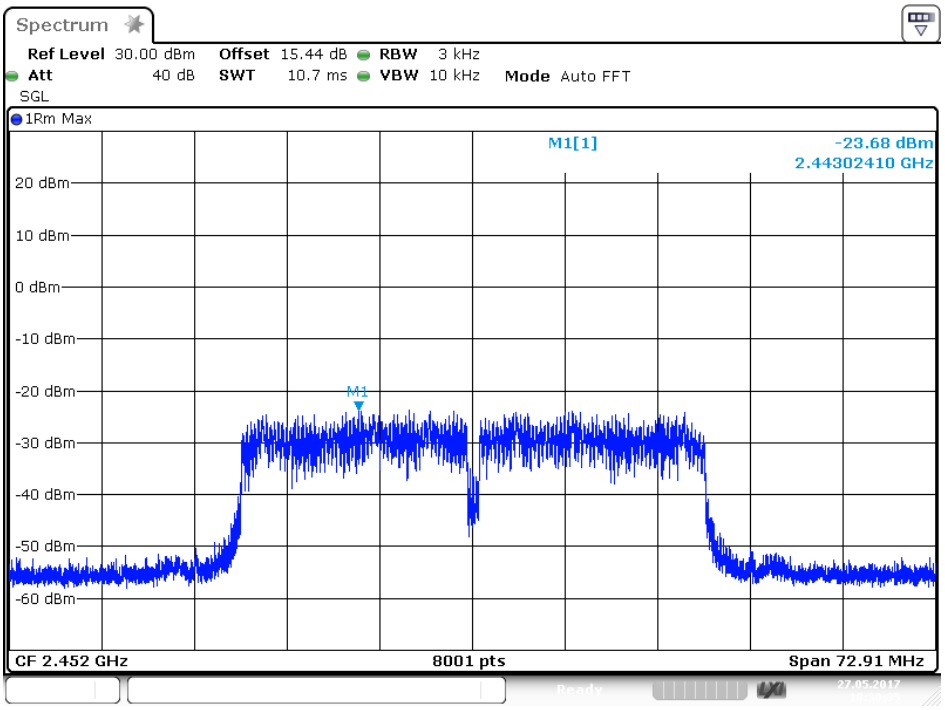
Date: 27.MAY.2017 10:33:44

802.11n Channel Middle 2437MHz(40MHz)



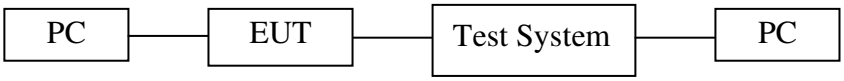
Date: 27.MAY.2017 10:31:53

802.11n Channel High 2452MHz(40MHz)



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 and 2422-2452MHzMHz. We select 2412MHz, 2462MHz and 2422MHz, 2452MHz 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 0.8m 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

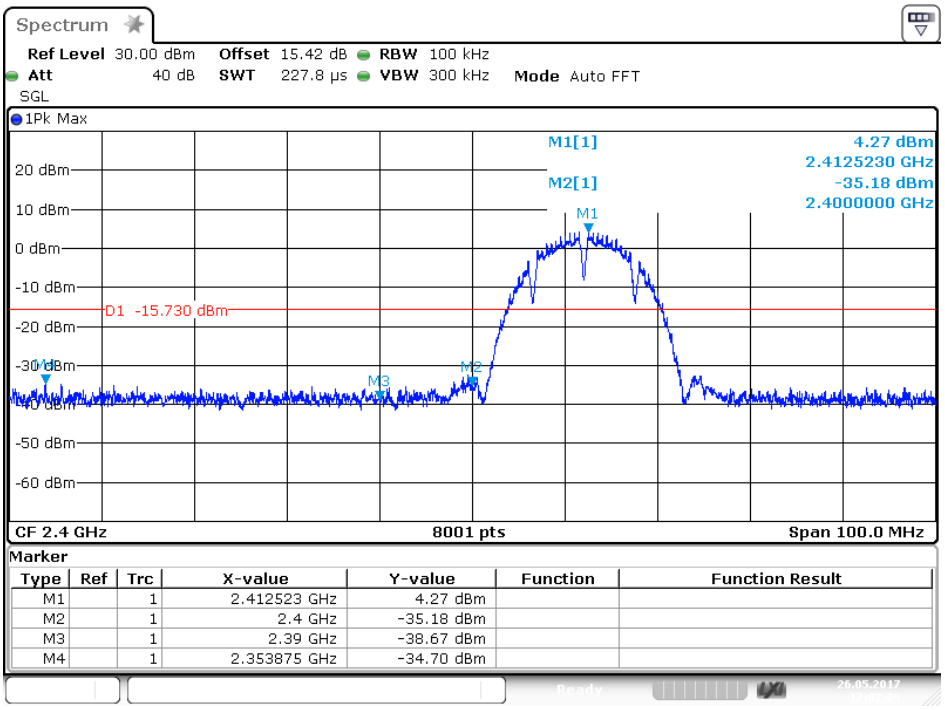
The test was performed with 802.11b		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400	39.45	> 20dBc
2483.5	45.19	> 20dBc

The test was performed with 802.11g		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400	34.94	> 20dBc
2483.5	35.06	> 20dBc

The test was performed with 802.11n (20MHz)		
34.94	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
35.06	31.03	> 20dBc
2483.5	38.55	> 20dBc

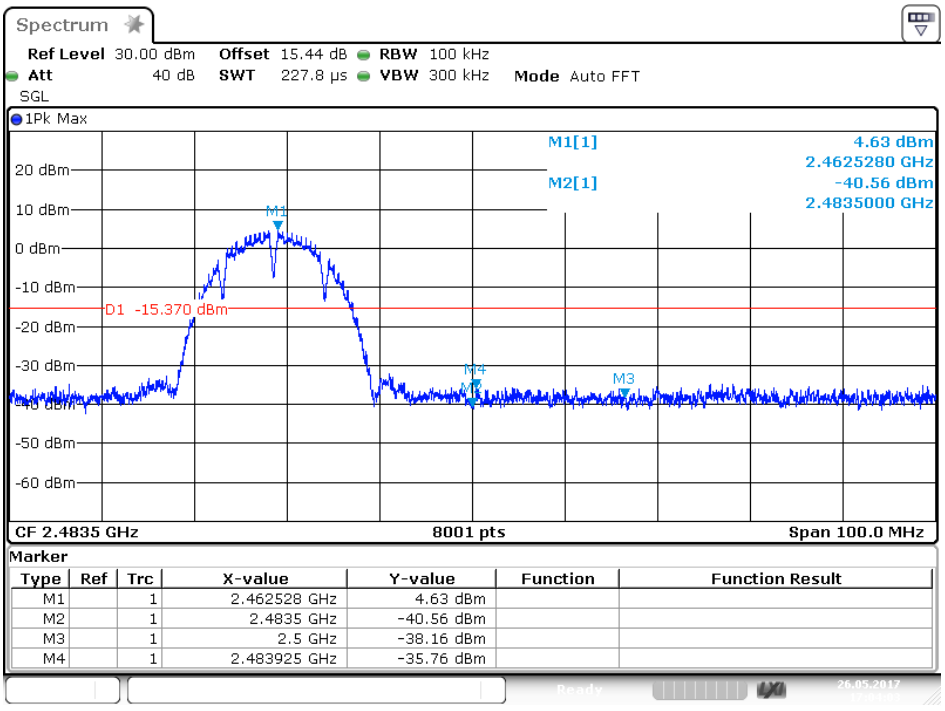
The test was performed with 802.11n (40MHz)		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2400	31.40	> 20dBc
2483.5	32.46	> 20dBc

802.11b Channel Low 2412MHz



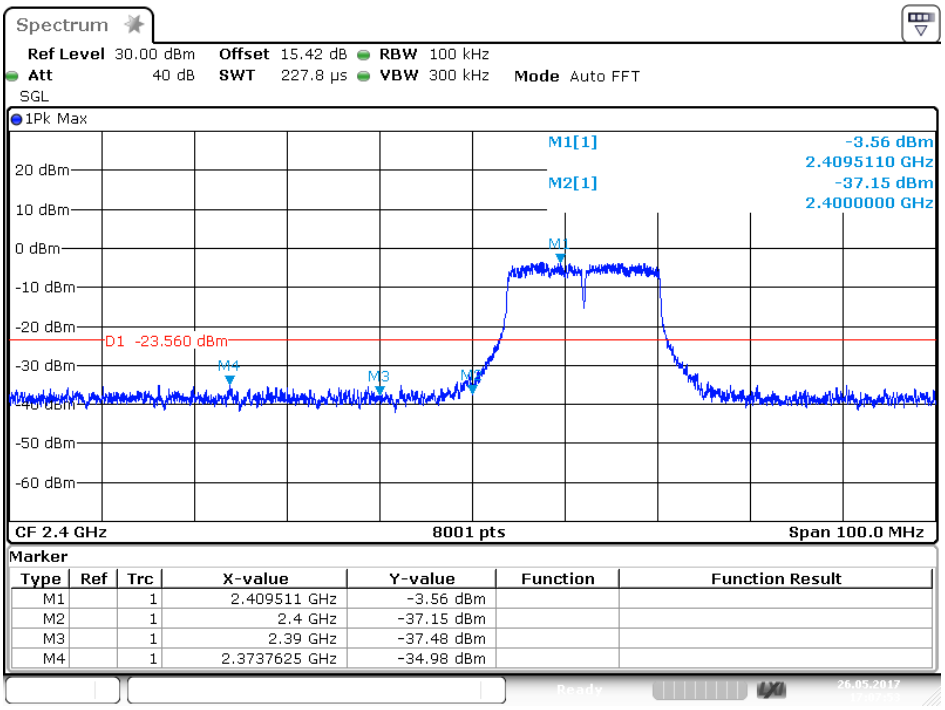
Date: 26.MAY.2017 17:02:09

802.11b Channel High 2462MHz



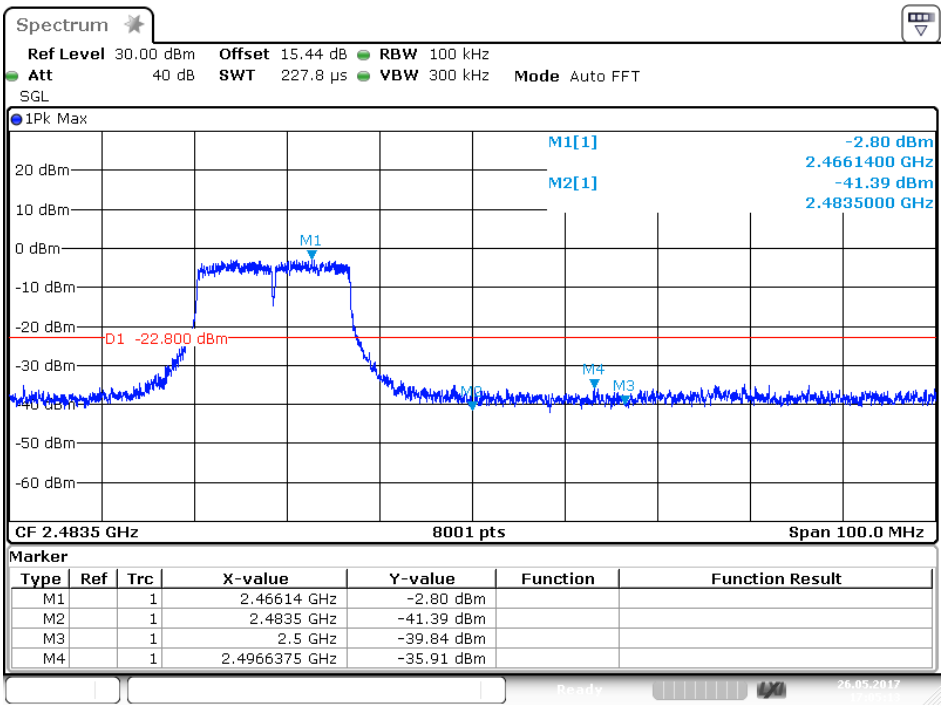
Date: 26.MAY.2017 17:04:03

802.11g Channel Low 2412MHz



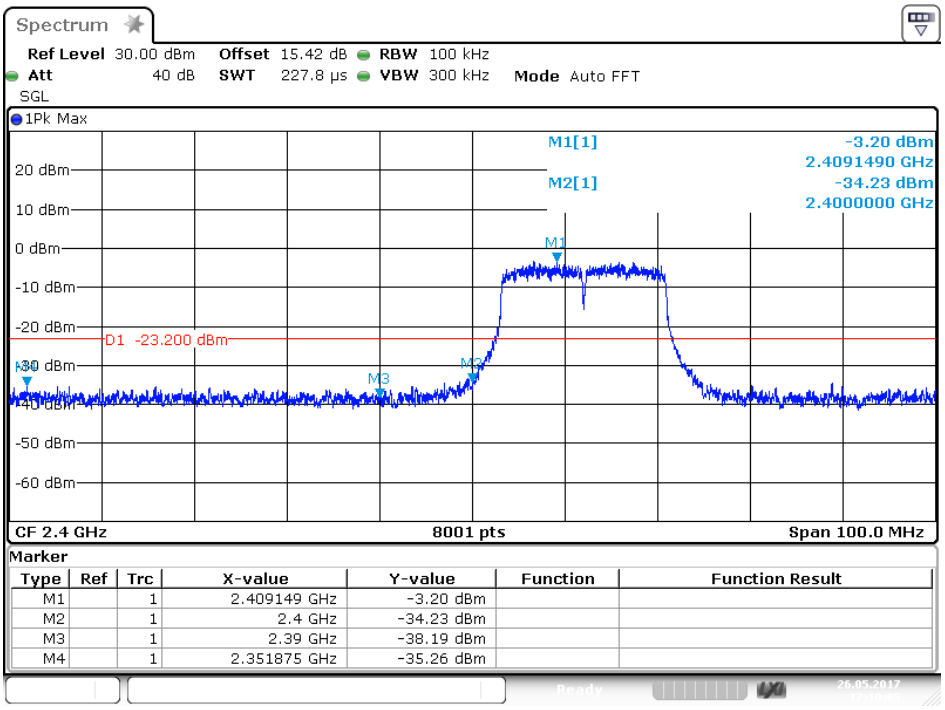
Date: 26.MAY.2017 17:07:53

802.11g Channel High 2462MHz



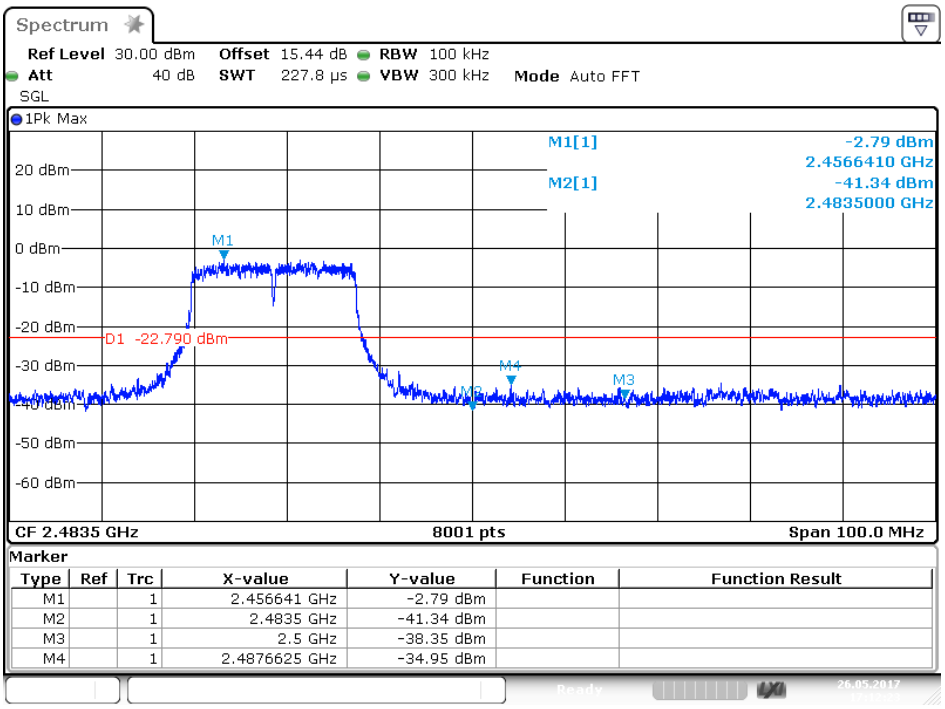
Date: 26.MAY.2017 17:05:13

802.11n Channel Low 2412MHz (20MHz)



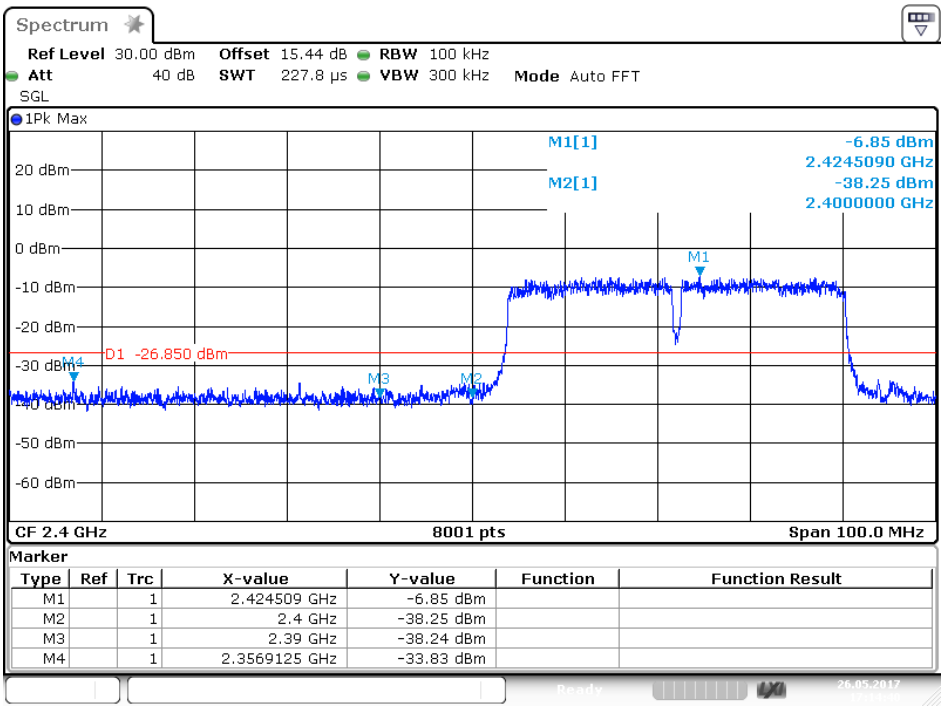
Date: 26.MAY.2017 17:10:05

802.11n Channel High 2462MHz (20MHz)



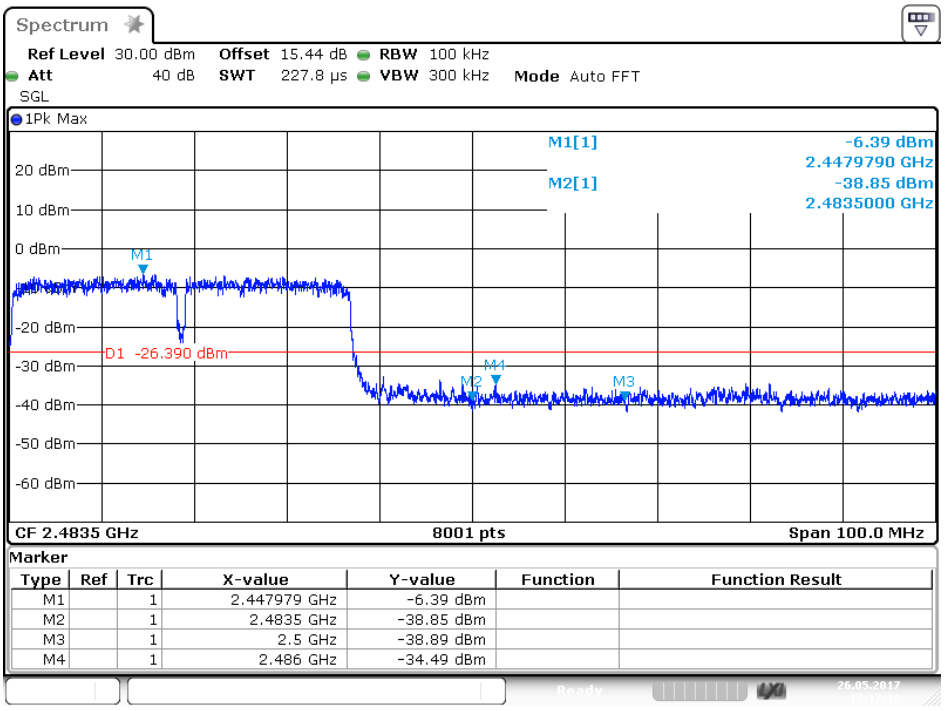
Date: 26.MAY.2017 17:12:23

802.11n Channel Low 2422MHz (40MHz)



Date: 26.MAY.2017 17:14:40

802.11n Channel High 2452MHz (40MHz)



Date: 26.MAY.2017 17:17:38

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. The EUT was tested in 3 orthogonal planes.

Let the EUT work in TX modes then measure it.
We select 2412MHz, 2462MHz TX frequency to transmit(802.11b/g/n20 mode).
We select 2422MHz, 2452MHz TX frequency to transmit(802.11n40 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.All modes of operation were investigated and the worst-case emissions are reported.

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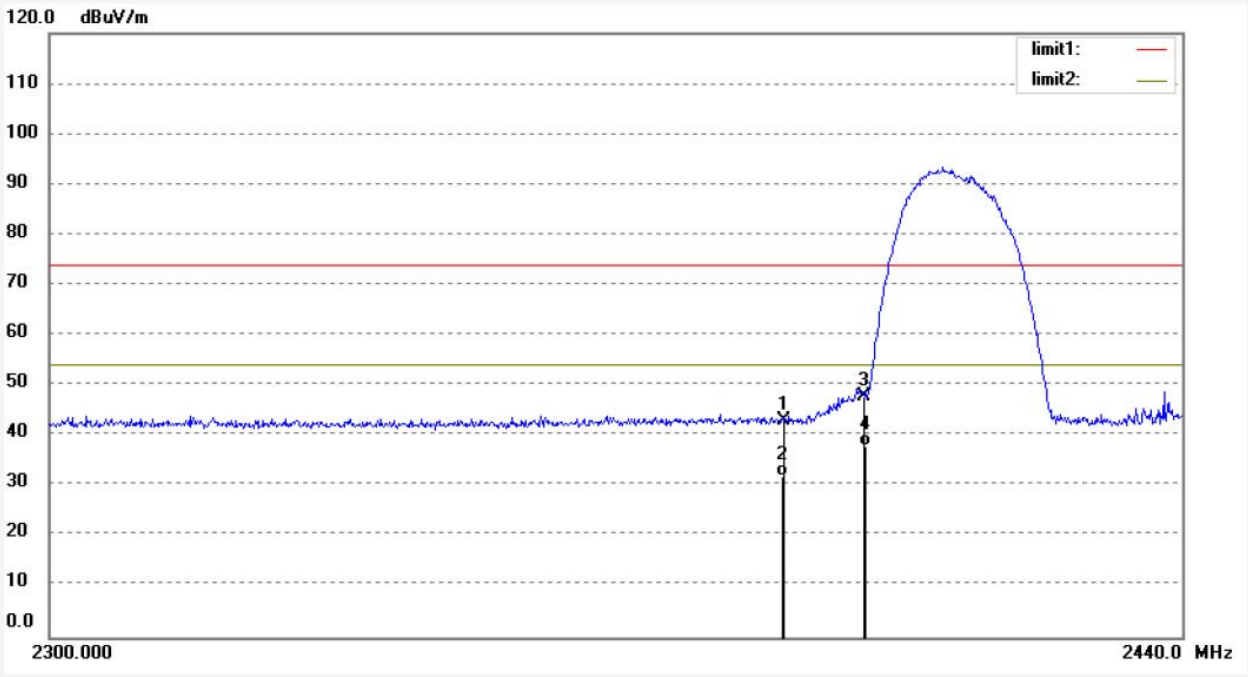
Fax:+86-0755-26503396

Job No.: star2016 #2044
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 1(802.11b)
Model: K1
Manufacturer: Chuango

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/10/14
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	6.26	36.73	42.99	74.00	-31.01	peak			
2	2390.000	-4.68	36.73	32.05	54.00	-21.95	AVG			
3	2400.000	10.99	36.78	47.77	74.00	-26.23	peak			
4	2400.000	1.27	36.78	38.05	54.00	-15.95	AVG			

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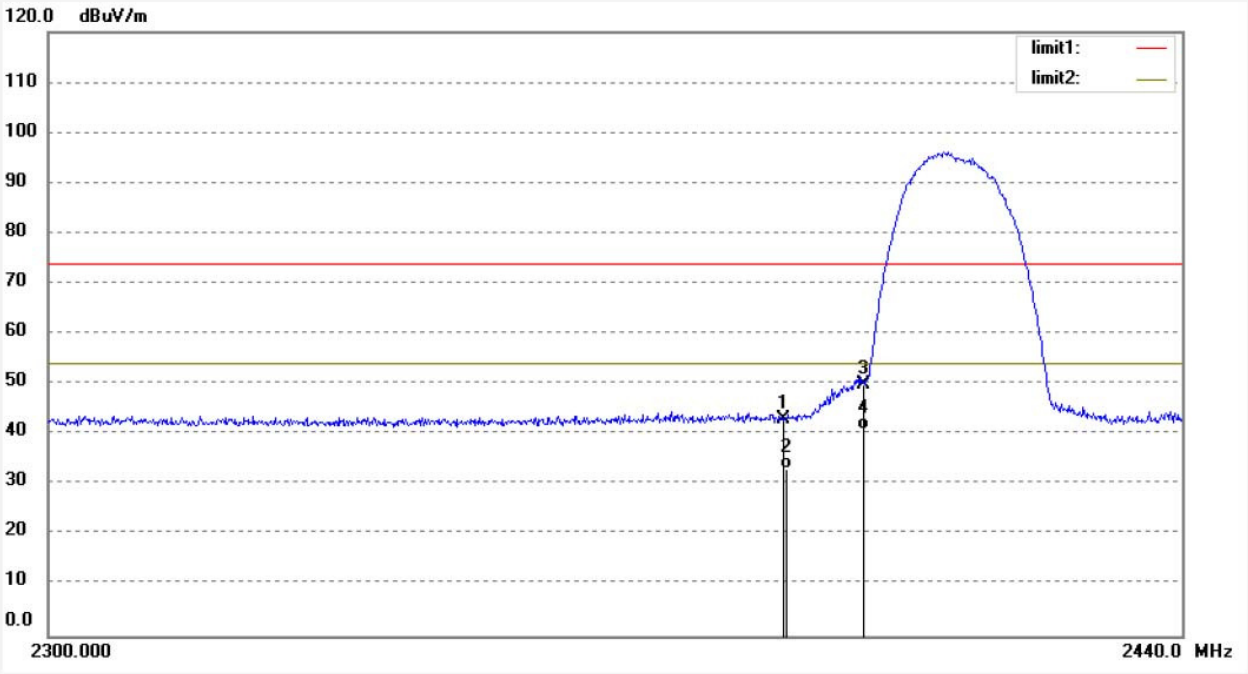
Job No.: star2016 #2045
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 1(802.11b)
Model: K1
Manufacturer: Chuango

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/11/14
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	6.33	36.73	43.06	74.00	-30.94	peak			
2	2390.000	-3.49	36.73	33.24	54.00	-20.76	AVG			
3	2400.000	13.24	36.78	50.02	74.00	-23.98	peak			
4	2400.000	4.27	36.78	41.05	54.00	-12.95	AVG			

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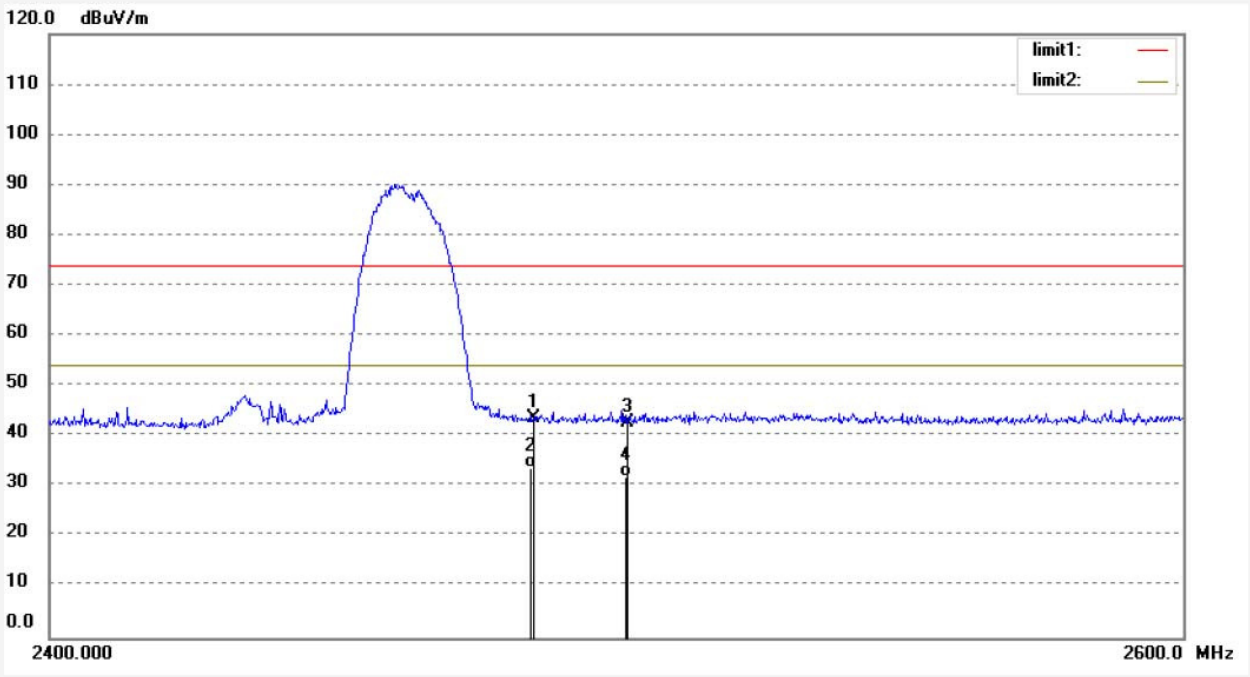
Job No.: star2016 #2043
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 11(802.11b)
Model: K1
Manufacturer: Chuango

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/08/32
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	6.66	37.13	43.79	74.00	-30.21	peak			
2	2483.500	-3.27	37.13	33.86	54.00	-20.14	AVG			
3	2500.000	5.68	37.20	42.88	74.00	-31.12	peak			
4	2500.000	-5.28	37.20	31.92	54.00	-22.08	AVG			

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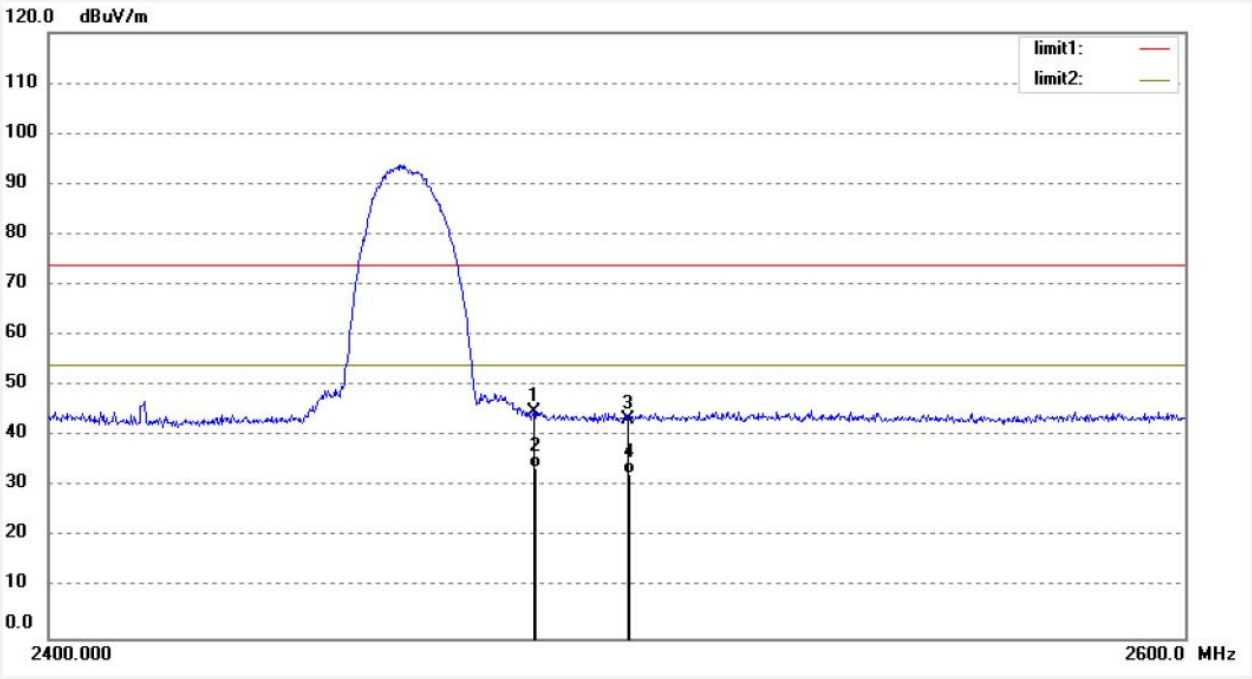
Job No.: star2016 #2042
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 11(802.11b)
Model: K1
Manufacturer: Chuango

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/07/33
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	7.65	37.13	44.78	74.00	-29.22	peak			
2	2483.500	-3.40	37.13	33.73	54.00	-20.27	AVG			
3	2500.000	6.04	37.20	43.24	74.00	-30.76	peak			
4	2500.000	-4.59	37.20	32.61	54.00	-21.39	AVG			

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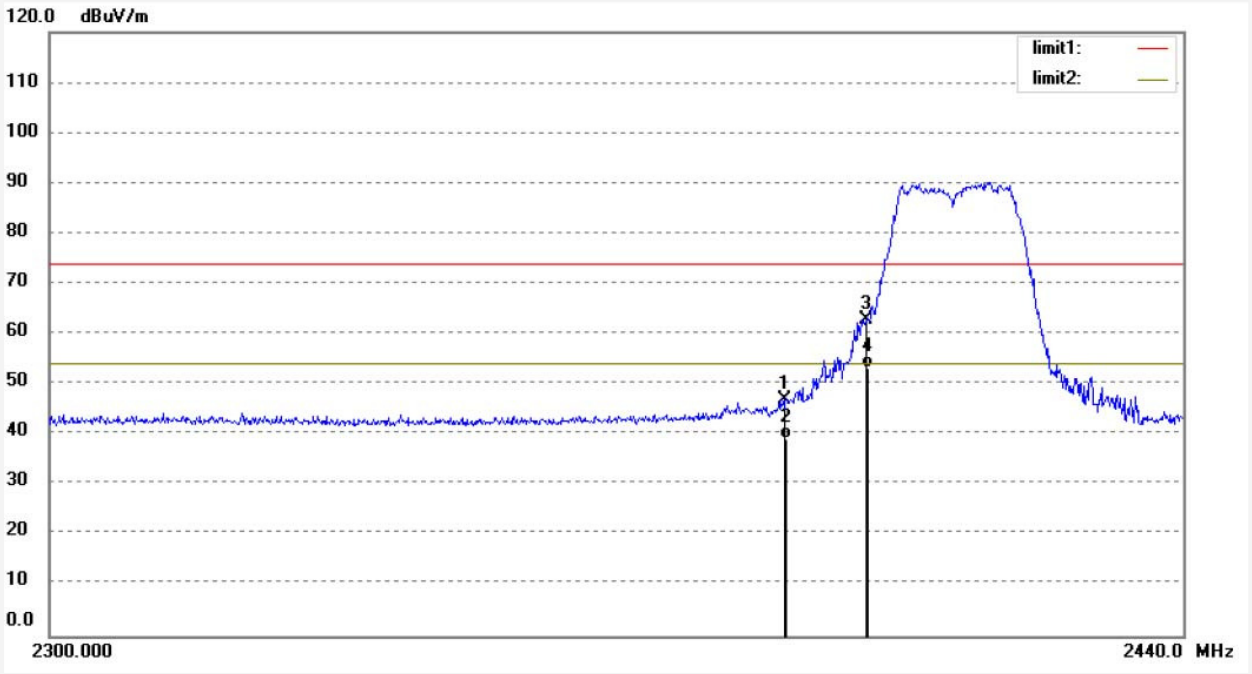
Fax:+86-0755-26503396

Job No.: star2016 #2038	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/05/18
Temp.(C)/Hum.(%) 23 C / 48 %	Time: 8/58/43
EUT: K1 SMARTHOME DIY KIT	Engineer Signature: star
Mode: TX Channel 1(802.11g)	Distance: 3m
Model: K1	
Manufacturer: Chuango	

Note: Report No.:ATE20170747



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	10.32	36.73	47.05	74.00	-26.95	peak			
2	2390.000	2.39	36.73	39.12	54.00	-14.88	AVG			
3	2400.000	26.06	36.78	62.84	74.00	-11.16	peak			
4	2400.000	16.34	36.78	53.12	54.00	-0.88	AVG			

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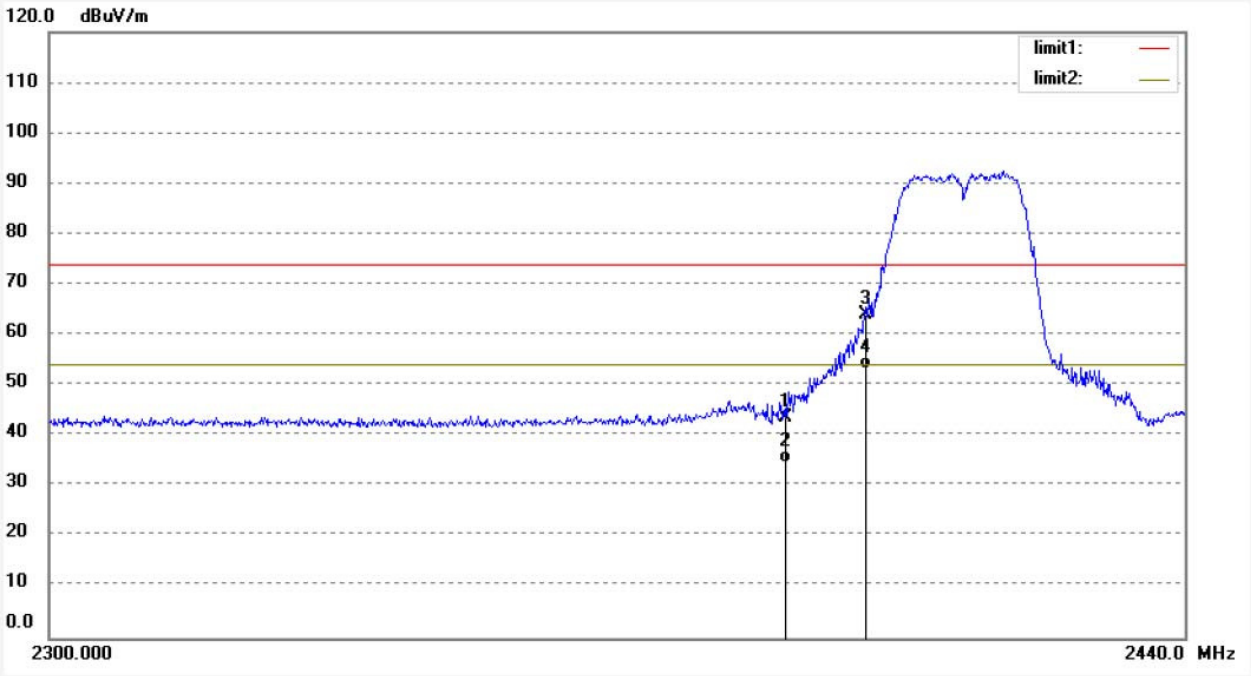
Job No.: star2016 #2037
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 1(802.11g)
Model: K1
Manufacturer: Chuango

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 8/57/41
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	6.88	36.73	43.61	74.00	-30.39	peak			
2	2390.000	-2.00	36.73	34.73	54.00	-19.27	AVG			
3	2400.000	27.35	36.78	64.13	74.00	-9.87	peak			
4	2400.000	16.47	36.78	53.25	54.00	-0.75	AVG			

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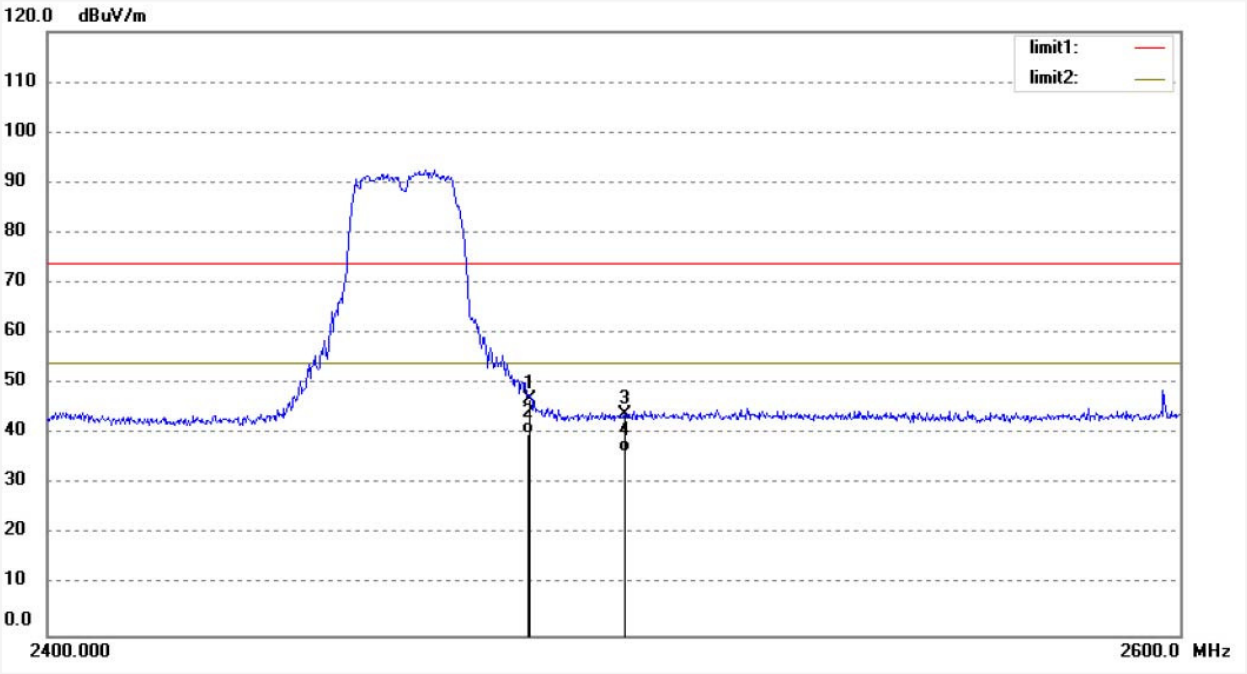
Fax:+86-0755-26503396

Job No.: star2016 #2040	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/05/18
Temp.(C)/Hum.(%) 23 C / 48 %	Time: 9/03/09
EUT: K1 SMARTHOME DIY KIT	Engineer Signature: star
Mode: TX Channel 11(802.11g)	Distance: 3m
Model: K1	
Manufacturer: Chuango	

Note: Report No.:ATE20170747



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	9.88	37.13	47.01	74.00	-26.99	peak			
2	2483.500	2.81	37.13	39.94	54.00	-14.06	AVG			
3	2500.000	6.78	37.20	43.98	74.00	-30.02	peak			
4	2500.000	-0.83	37.20	36.37	54.00	-17.63	AVG			

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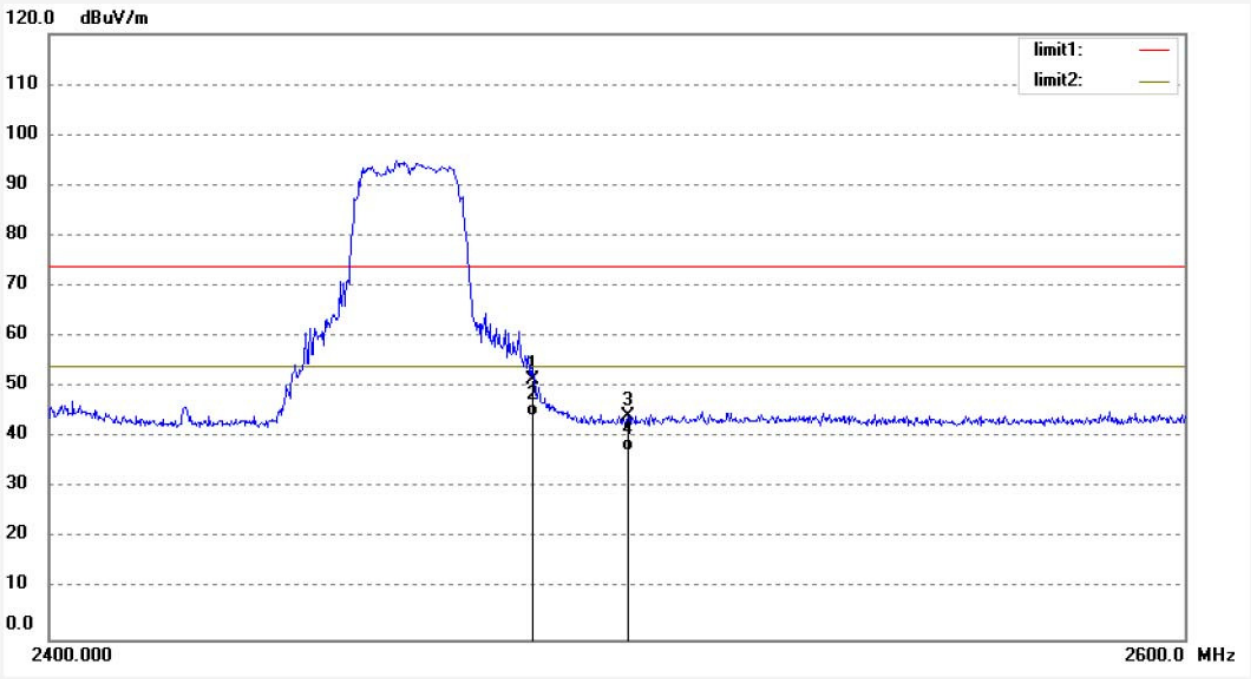
Job No.: star2016 #2041
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 11(802.11g)
Model: K1
Manufacturer: Chuango

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/04/10
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	14.31	37.13	51.44	74.00	-22.56	peak			
2	2483.500	7.14	37.13	44.27	54.00	-9.73	AVG			
3	2500.000	7.20	37.20	44.40	74.00	-29.60	peak			
4	2500.000	0.00	37.20	37.20	54.00	-16.80	AVG			

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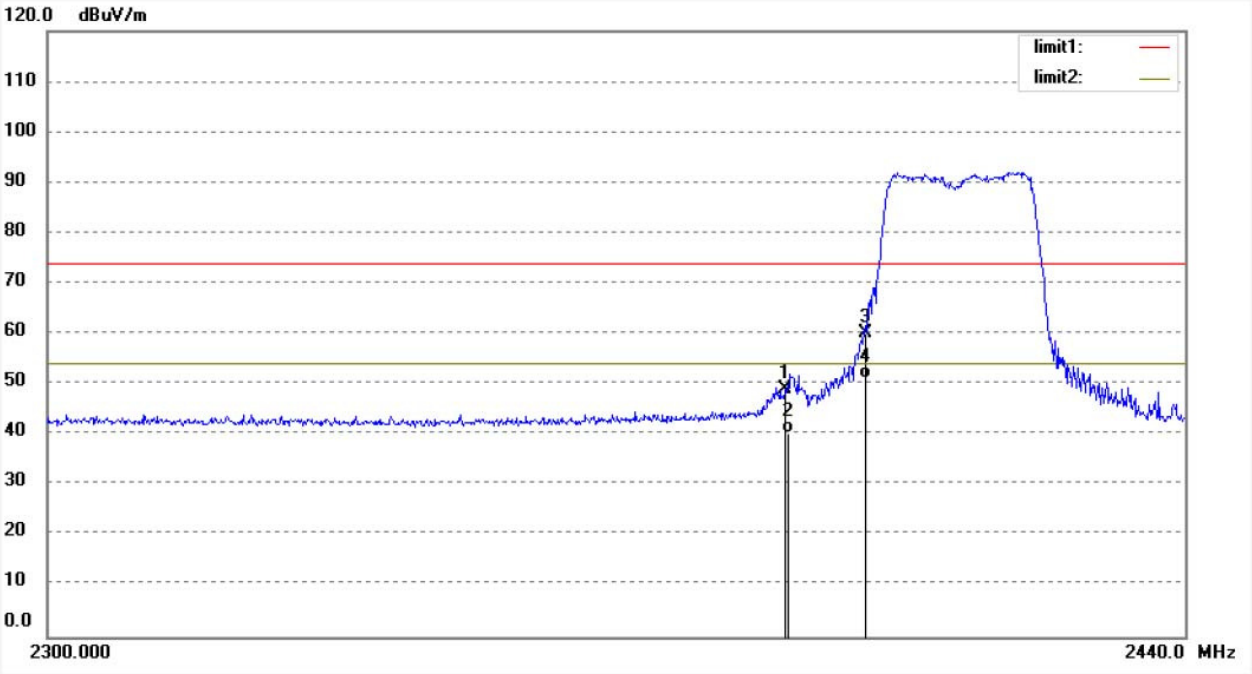
Job No.: star2016 #2047
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 1(802.11n) 20MHz
Model: K1
Manufacturer: Chuango

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/14/55
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	12.31	36.73	49.04	74.00	-24.96	peak			
2	2390.000	3.59	36.73	40.32	54.00	-13.68	AVG			
3	2400.000	23.29	36.78	60.07	74.00	-13.93	peak			
4	2400.000	14.27	36.78	51.05	54.00	-2.95	AVG			

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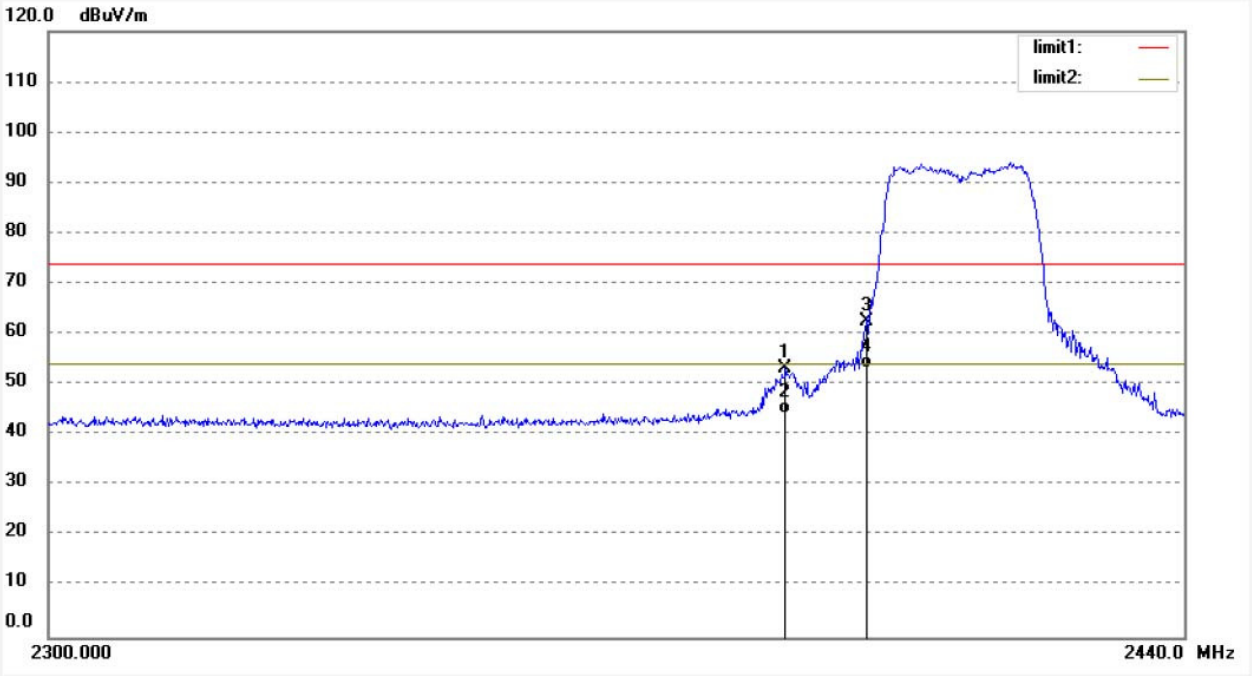
Job No.: star2016 #2046
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 1(802.11n) 20MHz
Model: K1
Manufacturer: Chuango

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/13/23
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	16.67	36.73	53.40	74.00	-20.60	peak			
2	2390.000	7.41	36.73	44.14	54.00	-9.86	AVG			
3	2400.000	25.64	36.78	62.42	74.00	-11.58	peak			
4	2400.000	16.47	36.78	53.25	54.00	-0.75	AVG			

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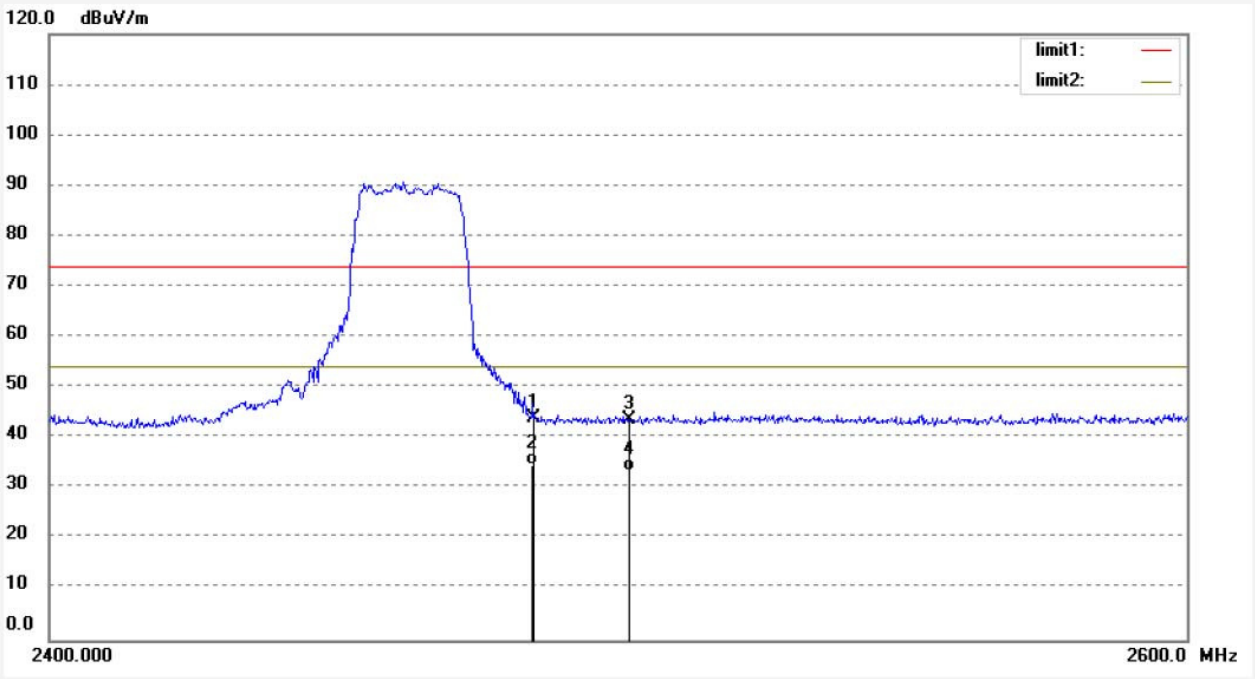
Job No.: star2016 #2048
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 11(802.11n) 20MHz
Model: K1
Manufacturer: Chuango

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/17/20
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	6.68	37.13	43.81	74.00	-30.19	peak			
2	2483.500	-2.47	37.13	34.66	54.00	-19.34	AVG			
3	2500.000	6.53	37.20	43.73	74.00	-30.27	peak			
4	2500.000	-3.71	37.20	33.49	54.00	-20.51	AVG			

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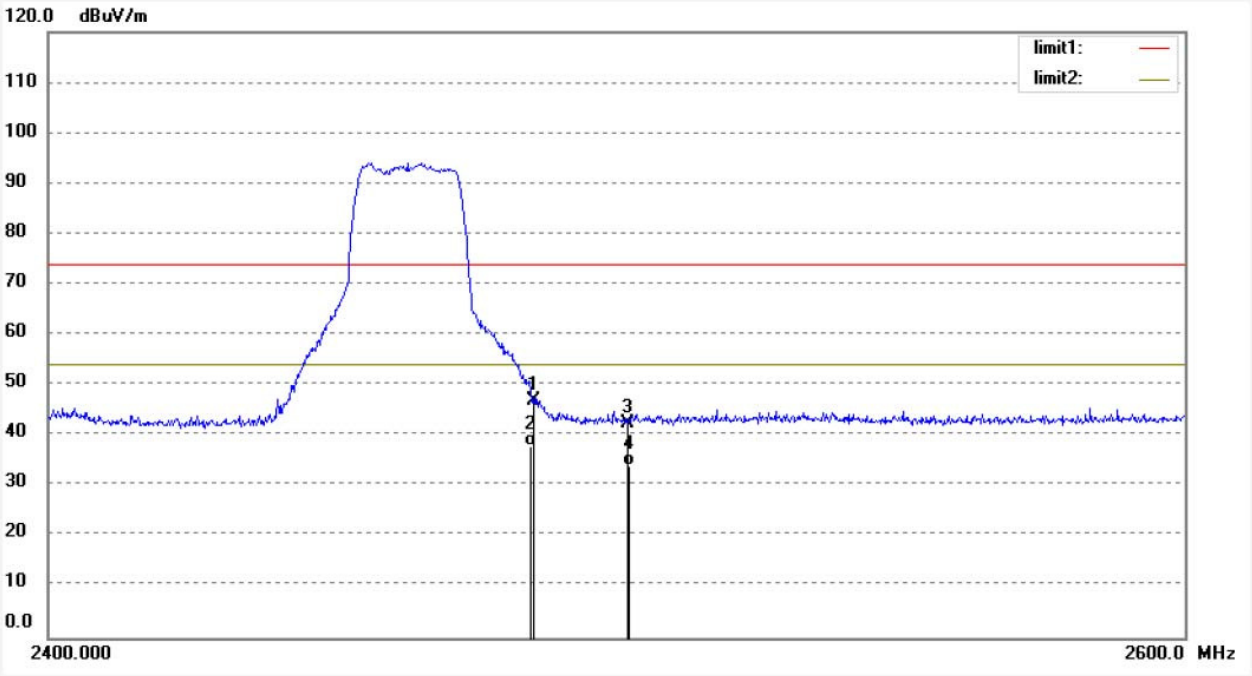
Job No.: star2016 #2049
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 11(802.11n) 20MHz
Model: K1
Manufacturer: Chuango

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/18/04
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	9.81	37.13	46.94	74.00	-27.06	peak			
2	2483.500	0.71	37.13	37.84	54.00	-16.16	AVG			
3	2500.000	5.33	37.20	42.53	74.00	-31.47	peak			
4	2500.000	-3.03	37.20	34.17	54.00	-19.83	AVG			

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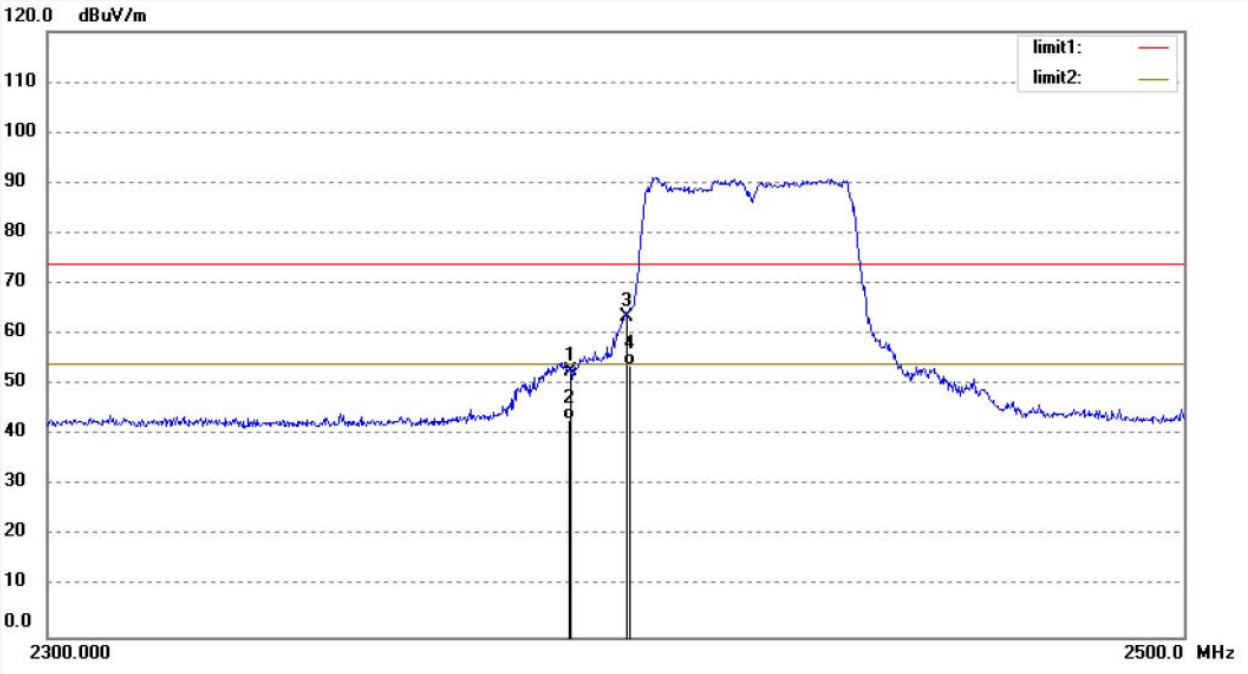
Job No.: star2016 #2052
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 3(802.11n)40MHz
Model: K1
Manufacturer: Chuango

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/30/29
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	15.91	36.73	52.64	74.00	-21.36	peak			
2	2390.000	6.29	36.73	43.02	54.00	-10.98	AVG			
3	2400.000	26.81	36.78	63.59	74.00	-10.41	peak			
4	2400.000	17.14	36.78	53.92	54.00	-0.08	AVG			

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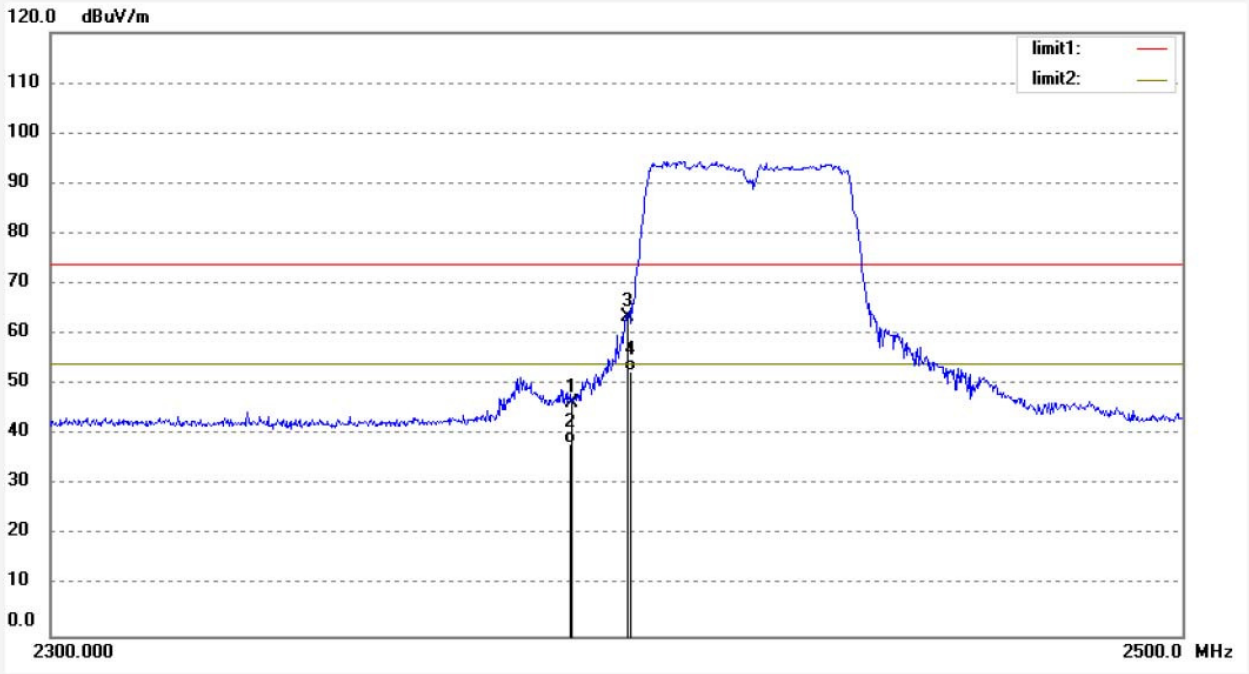
Job No.: star2016 #2053
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 3(802.11n)40MHz
Model: K1
Manufacturer: Chuango

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/31/24
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	9.58	36.73	46.31	74.00	-27.69	peak			
2	2390.000	1.55	36.73	38.28	54.00	-15.72	AVG			
3	2400.000	26.58	36.78	63.36	74.00	-10.64	peak			
4	2400.000	16.00	36.78	52.78	54.00	-1.22	AVG			

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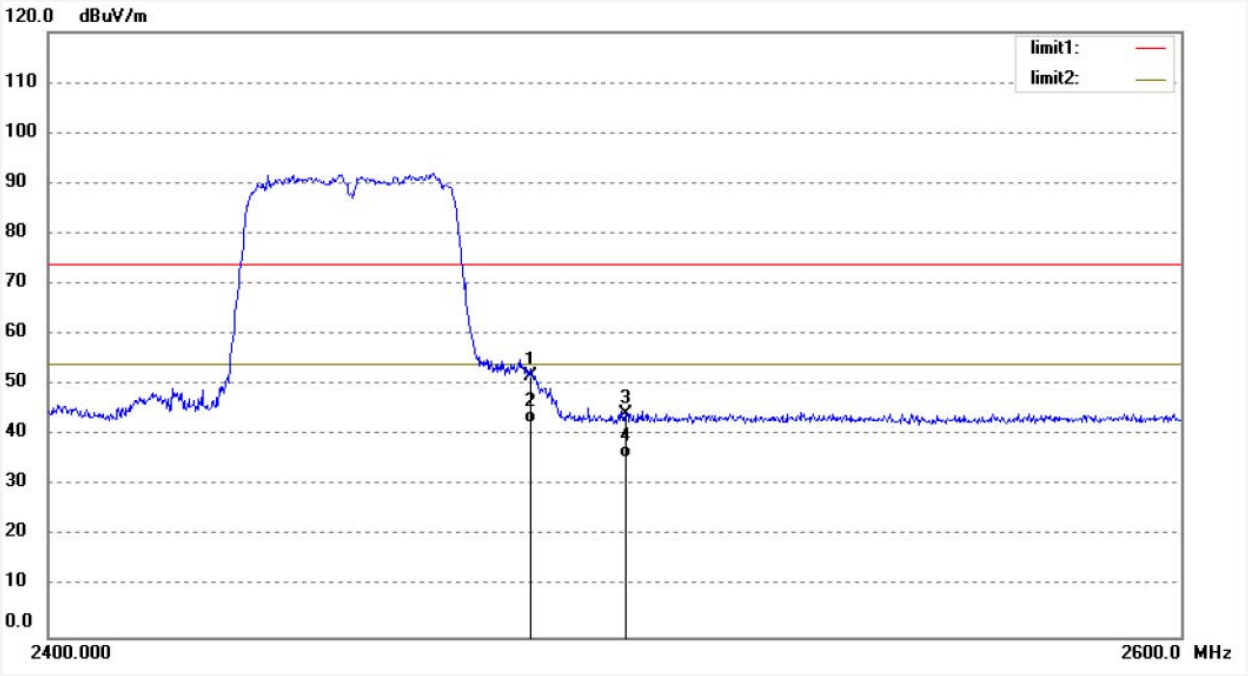
Job No.: star2016 #2055
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 9(802.11n)40MHz
Model: K1
Manufacturer: Chuango

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/34/01
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	14.58	37.13	51.71	74.00	-22.29	peak			
2	2483.500	5.28	37.13	42.41	54.00	-11.59	AVG			
3	2500.000	7.01	37.20	44.21	74.00	-29.79	peak			
4	2500.000	-1.61	37.20	35.59	54.00	-18.41	AVG			

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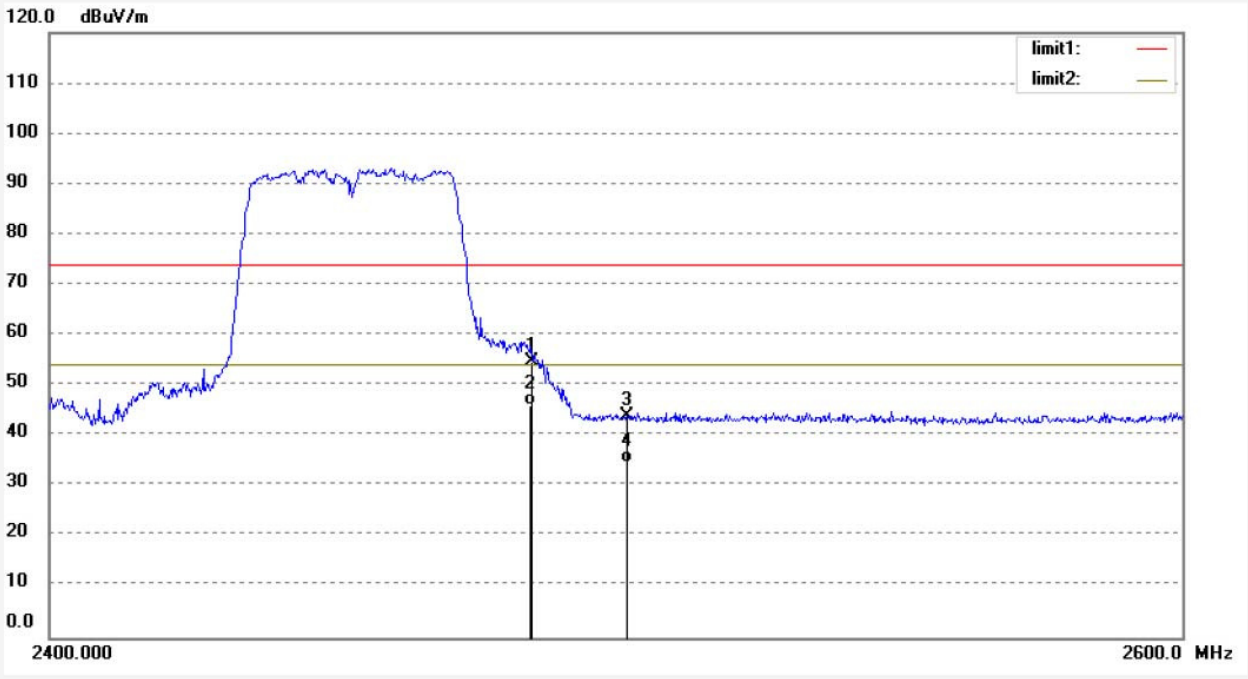
Job No.: star2016 #2054
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX Channel 9(802.11n)40MHz
Model: K1
Manufacturer: Chuango

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 9/33/04
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20170747



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	17.54	37.13	54.67	74.00	-19.33	peak			
2	2483.500	8.91	37.13	46.04	54.00	-7.96	AVG			
3	2500.000	6.84	37.20	44.04	74.00	-29.96	peak			
4	2500.000	-2.54	37.20	34.66	54.00	-19.34	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

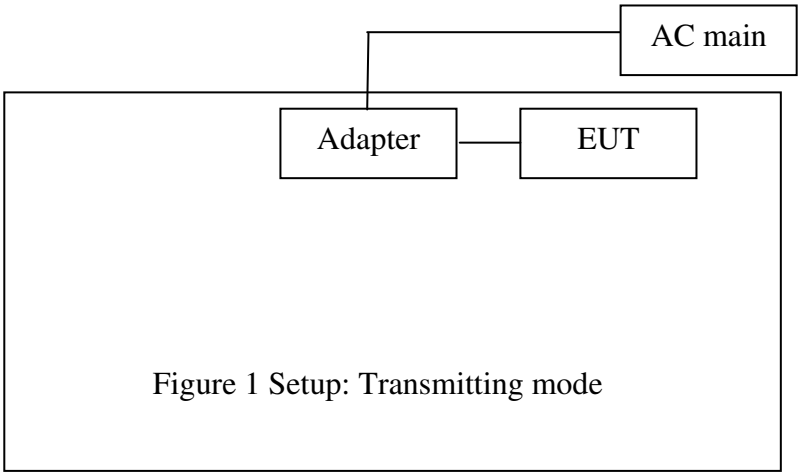
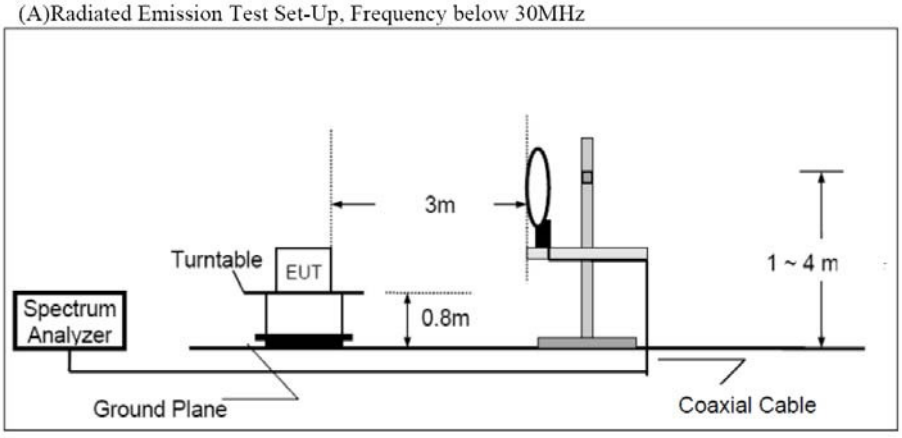


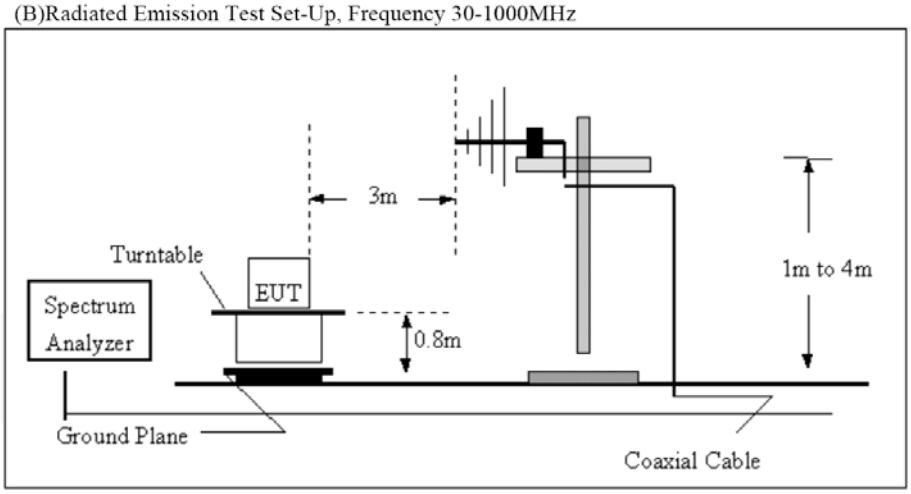
Figure 1 Setup: Transmitting mode

11.1.2.Semi-Anechoic Chamber Test Setup Diagram

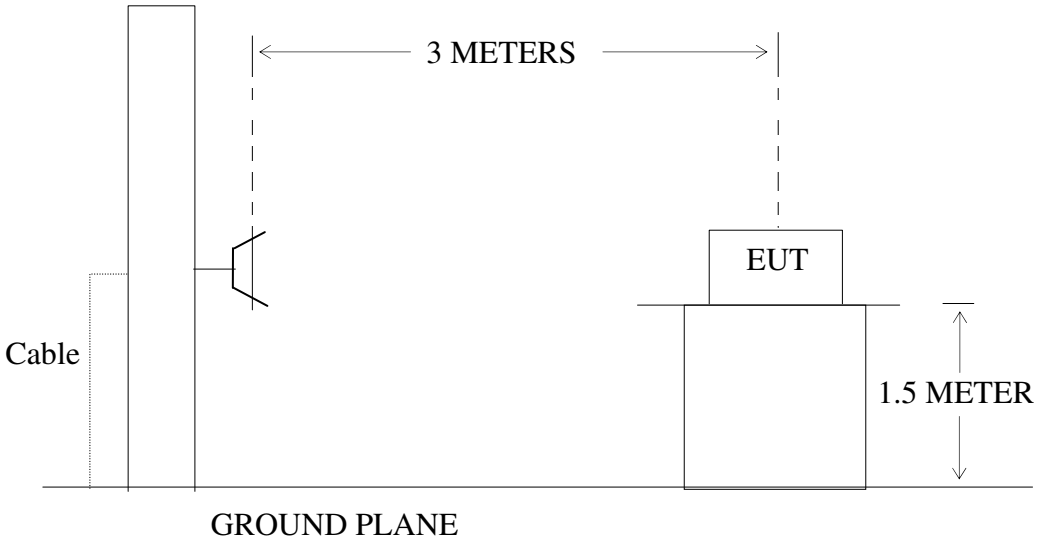
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(B)Radiated Emission Test Set-Up, Frequency 30-1000MHz



(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 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz 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 EUT was tested in 3 orthogonal planes.

The worst-case data rate for this channel to be 1Mbps for 802.11b mode and 6Mbps for 802.11g mode and 150Mbps for 802.11n mode, based on previous with 802.11 WLAN product design architectures.

The frequency range from 30MHz to 25000MHz 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.The Field Strength of Radiation Emission Measurement Results

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

2. *: Denotes restricted band of operation.

3. The EUT is tested radiation emission at each test mode (802.11 b/g/n) in three axes. The worst emissions are reported in all test mode and channels.

4. The radiation emissions from 18-25GHz and 9KHz-30MHz are not reported, because the test values lower than the limits of 20dB.

5. We tested 802.11b,g,n mode and recorded the worst case data(802.11b) for radiated emission test below 1GHz.

Below 1G

ACCURATE TECHNOLOGY CO., LTD.
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Site: 1# Chamber
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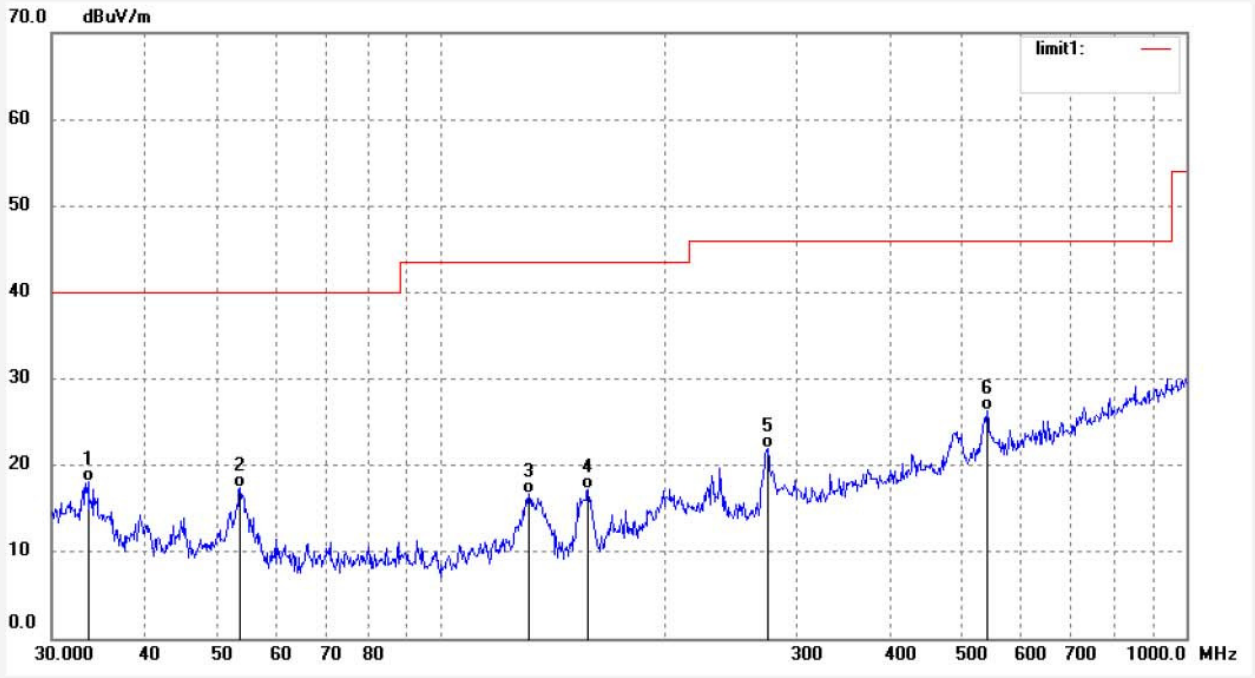
Fax:+86-0755-26503396

Job No.: DING #3620
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: K1 SMARTHOME DIY KIT
Mode: TX 2412MHz
Model: K1
Manufacturer: CHUANGO

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/05/18
Time: 18:51:24
Engineer Signature: DING
Distance: 3m

Note: Report NO.:ATE20170747



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.5700	33.75	-15.59	18.16	40.00	-21.84	QP			
2	53.7559	38.80	-21.41	17.39	40.00	-22.61	QP			
3	131.2235	38.87	-22.16	16.71	43.50	-26.79	QP			
4	157.5290	38.93	-21.64	17.29	43.50	-26.21	QP			
5	274.4464	38.83	-16.92	21.91	46.00	-24.09	QP			
6	540.7072	36.35	-9.93	26.42	46.00	-19.58	QP			

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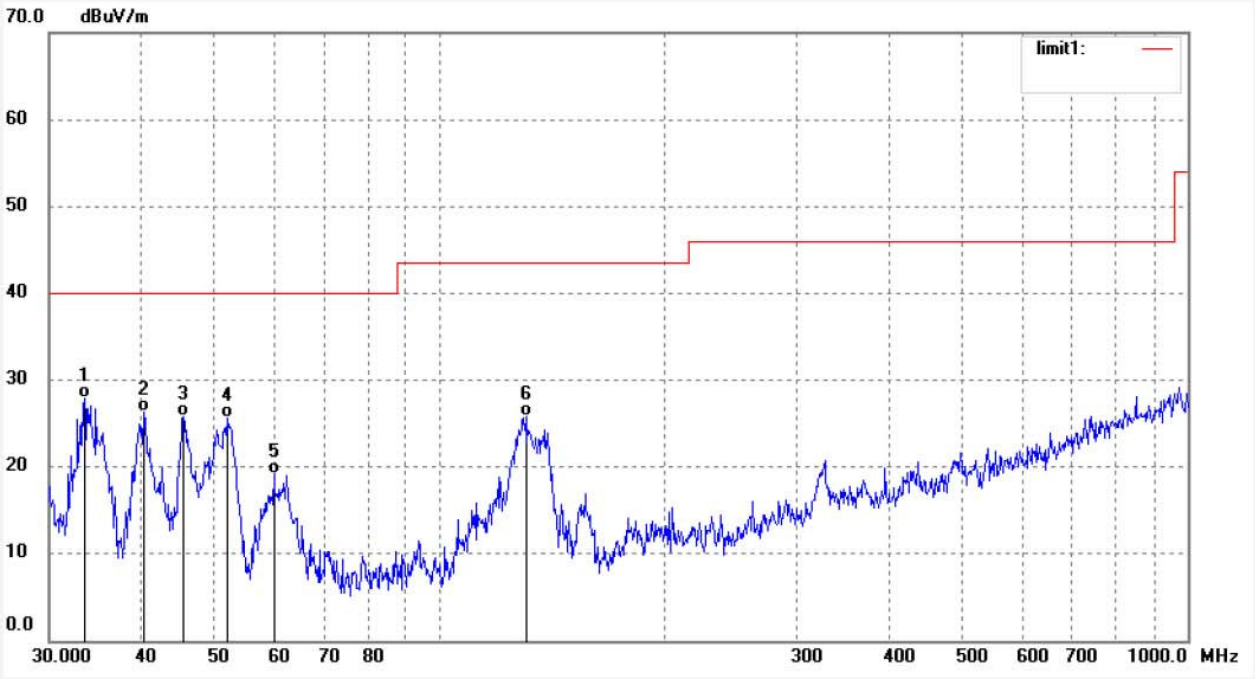
Fax:+86-0755-26503396

Job No.: DING #3621	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/05/18
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 18:52:22
EUT: K1 SMARTHOME DIY KIT	Engineer Signature: DING
Mode: TX 2412MHz	Distance: 3m
Model: K1	
Manufacturer: CHUANGO	

Note: Report NO.:ATE20170747



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.4522	43.50	-15.56	27.94	40.00	-12.06	QP			
2	40.1581	44.41	-18.13	26.28	40.00	-13.72	QP			
3	45.4130	44.81	-19.07	25.74	40.00	-14.26	QP			
4	51.8998	46.68	-21.11	25.57	40.00	-14.43	QP			
5	59.9418	40.92	-21.80	19.12	40.00	-20.88	QP			
6	130.3048	47.94	-22.14	25.80	43.50	-17.70	QP			

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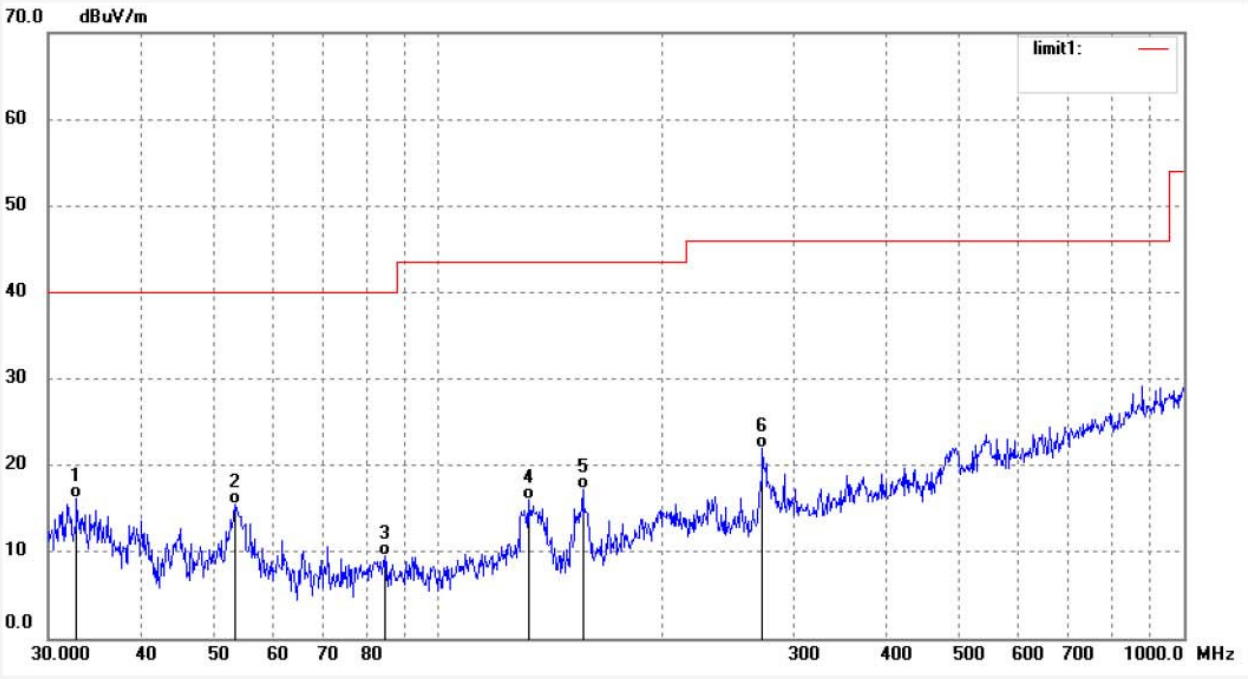
Job No.: DING #3623	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/05/18
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 18:54:55
EUT: K1 SMARTHOME DIY KIT	Engineer Signature: DING
Mode: TX 2437MHz	Distance: 3m
Model: K1	
Manufacturer: CHUANGO	

Note: Report NO.:ATE20170747



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	32.7544	31.59	-15.39	16.20	40.00	-23.80	QP			
2	53.3794	36.80	-21.36	15.44	40.00	-24.56	QP			
3	84.8783	31.48	-21.96	9.52	40.00	-30.48	QP			
4	132.1489	38.23	-22.18	16.05	43.50	-27.45	QP			
5	156.4259	39.04	-21.76	17.28	43.50	-26.22	QP			
6	272.5246	38.92	-16.98	21.94	46.00	-24.06	QP			