



Shenzhen BST Technology Co., Ltd.

Report No.:BST1708781790001Y-ER-2

RADIO TEST REPORT

For

Shenzen SCX Electronics Co.,Ltd

Product Name:	Multi-functional digital signage
Model :	SCX3288/X86---21.5
Series Model:	SCX3288/X86--XX(XX can be 10-98, stand for size)
FCC ID:	2ANET-SCX
Prepared By :	Shenzhen BST Technology Co., Ltd. Building No.23-24, Zhiheng Industrial Park, Guankouer Road, Nantou,Nanshan District,Shenzhen,Guangdong,China
Test Date:	June 25~30, 2017
Date of Report :	June 30, 2017
Test Result	pass
Report No.:	BST1708781790001Y-ER-2



RADIO TEST REPORT	1
1. GENERAL INFORMATION	4
1.1 Product Description for Equipment Under Test (EUT)	4
1.2 Test Standards	5
1.3 Test Methodology	5
1.4 Test Facility	5
1.5 EUT Setup and Test Mode	5
1.6 Measurement Uncertainty	6
2. SUMMARY OF TEST RESULTS	7
3. RF Exposure	8
3.1 Standard Applicable	8
3.2 Test Result	8
4. Antenna Requirement	9
4.1 Standard Applicable	9
4.2 Evaluation Information	9
5. Power Spectral Density	10
5.1 Standard Applicable	10
5.2 Test Procedure	10
5.3 Environmental Conditions	10
5.4 Summary of Test Results/Plots	11
6. 6dB Bandwidth	18
6.1 Standard Applicable	18
6.2 Test Procedure	18
6.3 Environmental Conditions	18
6.4 Summary of Test Results/Plots	18
7. RF Output Power	25
7.1 Standard Applicable	25
7.2 Test Procedure	25
7.3 Environmental Conditions	25
7.4 Summary of Test Results/Plot	26
8. Field Strength of Spurious Emissions	27
8.1 Standard Applicable	27
8.2 Test Procedure	27
8.3 Corrected Amplitude & Margin Calculation	28
8.4 Environmental Conditions	29
8.5 Summary of Test Results/Plots	29
9. Out of Band Emissions	57
9.1 Standard Applicable	57



9.2 Test Procedure	57
9.3 Environmental Conditions	58
9.4 Summary of Test Results/Plots	58
10. Conducted Emissions	62
10.1 Test Procedure	62
10.2 Basic Test Setup Block Diagram	62
10.3 Environmental Conditions	63
10.4 Test Receiver Setup	63
10.5 Summary of Test Results/Plots	63
10.6 Conducted Emissions Test Data	63
11. Test Photo	66



1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Shenzhen SCX Electronics Co.,Ltd
Address of applicant: Four floor,Yuxingsanwei Industrial Park,Sanwei South Road,Xixiang Sub-street, Baoan Area,Shenzhen

Manufacturer: Shenzhen SCX Electronics Co.,Ltd
Address of manufacturer: Four floor,Yuxingsanwei Industrial Park,Sanwei South Road,Xixiang Sub-street, Baoan Area,Shenzhen

General Description of EUT	
Product Name:	Multi-functional digital signage
Trade Name:	SCX
Model No.:	SCX3288/X86---21.5
Adding Model(s):	SCX3288/X86—XX (XX can be 10-98, stand for size)
Rating Voltage:	Input: AC 120V, 60Hz
Battery Capacity:	N/A
Software Version:	V1.0
Hardware Version:	V1.0
<i>Note: The test data is gathered from a production sample provided by the manufacturer. The appearance of others models listed in the report is different from main-test model SCX3288/X86---21.5, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20) 2422-2452MHz for 802.11n(HT40)
RF Output Power:	15.56dBm
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	RP-SMA antenna
Antenna Gain:	1dBi
Lowest Internal Frequency	32.768KHz



1.2 Test Standards

The following report is prepared on behalf of the **Smart Car navigation mirror DVR** . in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. The measurement guide KDB 558074 D01 v03r05 for digital transmission systems shall be performed also.

1.4 Test Facility

Shenzhen Asia Test Technology Co.,Ltd.

7 / F, Xinwei Building, Gushu Village, Xixiang Town, Baoan District, Shenzhen, China

FCC Registration No.: 348715; IC Registration No.: 12198A

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:



Test Mode List		
Test Mode	Description	Remark
TM1	802.11b	2412MHz, 2437MHz, 2462MHz
TM2	802.11g	2412MHz, 2437MHz, 2462MHz
TM3	802.11n-HT20	2412MHz, 2437MHz, 2462MHz
TM4	802.11n-HT40	2422MHz, 2437MHz, 2452MHz
Note: All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.		

Accessories Equipment List and Details			
Description	Manufacturer	Model No.	Serial Number
/	/	/	/
Accessories Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With Core/Without Core
/	/	/	/
EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Power Spectral Density	Conducted	$\pm 1.8\text{dB}$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$



Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-04	2018-06-03
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2017-06-04	2018-06-03
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-04	2018-06-03
Amplifier	Agilent	8447F	3113A06717	2017-06-04	2018-06-03
Amplifier	C&D	PAP-1G18	2002	2017-06-04	2018-06-03
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-04	2018-06-03
Horn Antenna	ETS	3117	00086197	2017-06-04	2018-06-03
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-04	2018-06-03
Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-04	2018-06-03
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-04	2018-06-03
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-04	2018-06-03
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-04	2018-06-03

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 2.1093	RF Exposure	Compliant
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§ 15.205	Restricted Band of Operation	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable



3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.



4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has an internal antenna, fulfill the requirement of this section.



5. Power Spectral Density

5.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2 Test Procedure

According to the KDB 558074 D01 v03r05, such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. The test method of power spectral density as below:

- (g) Set instrument center frequency to DTS channel center frequency.
- (h) Set span to at least 1.5 times the OBW.
- (i) Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- (j) Set VBW $\geq 3 \times \text{RBW}$.
- (k) Detector = power averaging (RMS) or sample detector (when RMS not available).
- (l) Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span/RBW}$.
- (m) Sweep time = auto couple.
- (n) Employ trace averaging (RMS) mode over a minimum of 100 traces.
- (o) Use the peak marker function to determine the maximum amplitude level.
- (p) If measured value exceeds limit, reduce RBW (no less than 3 kHz) 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).

5.3 Environmental Conditions

Temperature:	21°C
Relative Humidity:	50%
ATM Pressure:	101.2



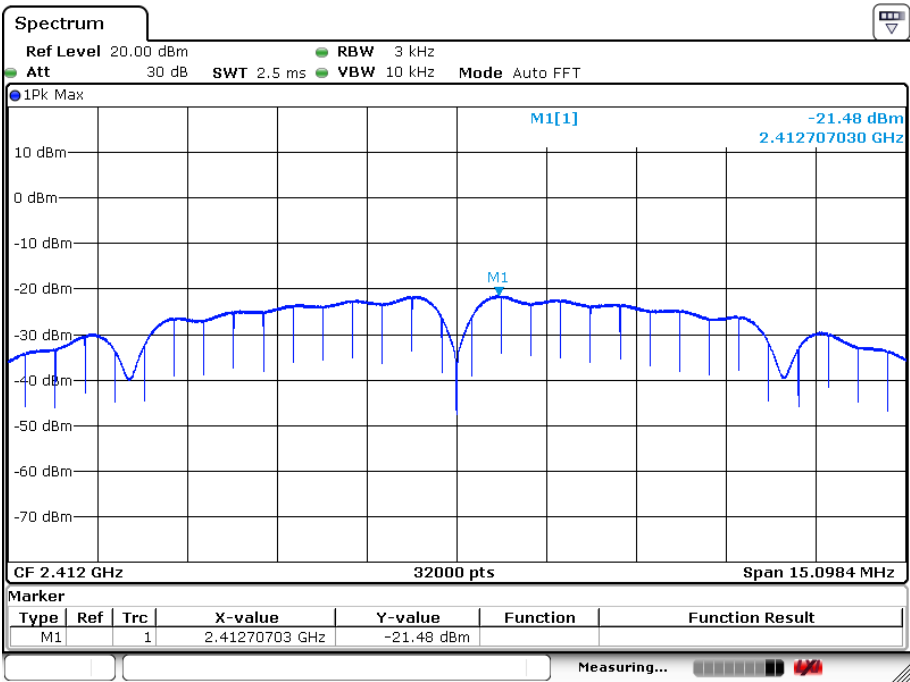
5.4 Summary of Test Results/Plots

Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b	2412	-21.48	8
	2437	-20.70	8
	2462	-20.12	8
802.11g	2412	-23.13	8
	2437	-22.61	8
	2462	-21.96	8
802.11n HT20	2412	-22.50	8
	2437	-22.01	8
	2462	-21.47	8
802.11n HT40	2422	-23.44	8
	2437	-23.24	8
	2452	-22.92	8

Please refer to the following test plots:

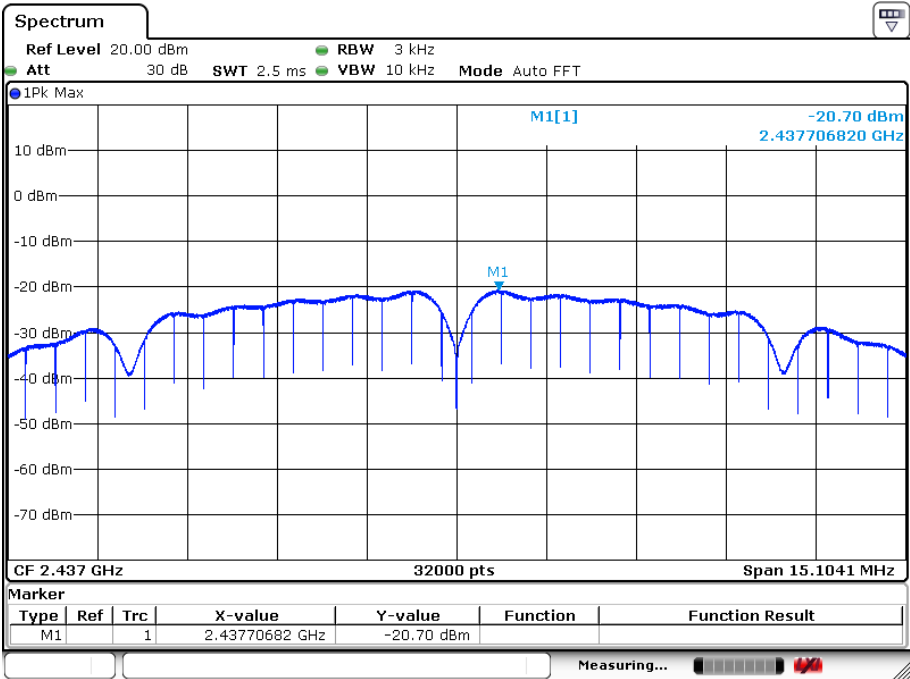


802.11b-Low Channel



Date:24 JUN 2017 16:41:13

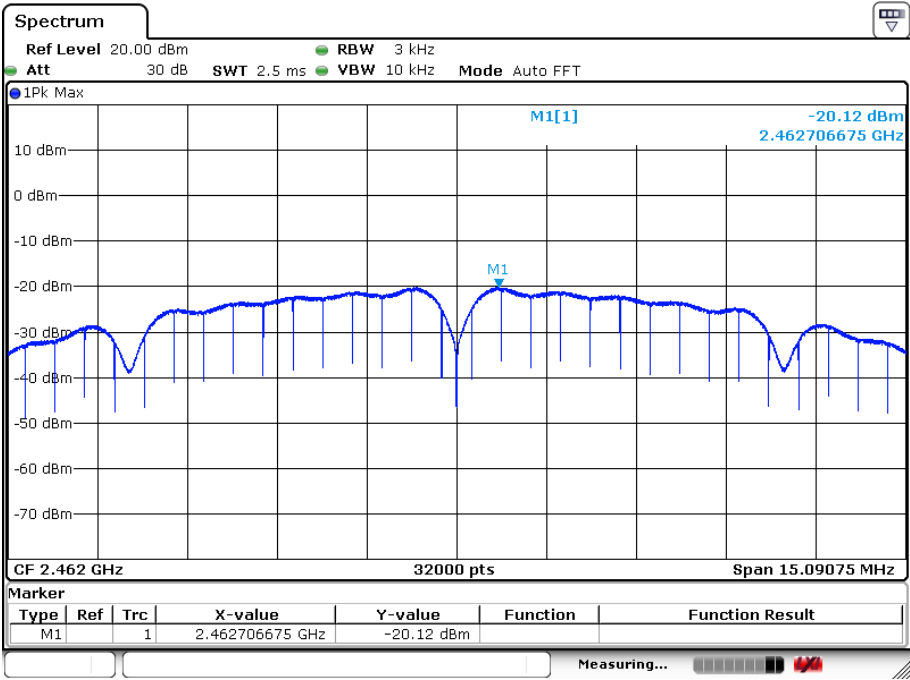
802.11b-Middle Channel



Date:24 JUN 2017 16:41:42

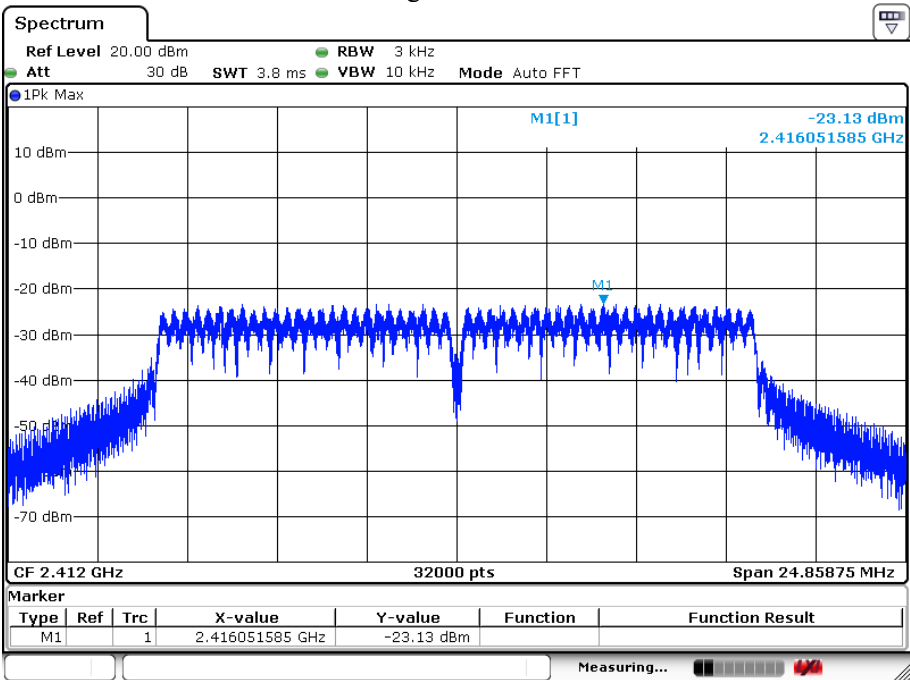


802.11b-High Channel



Date:24 JUN 2017 16:42:04

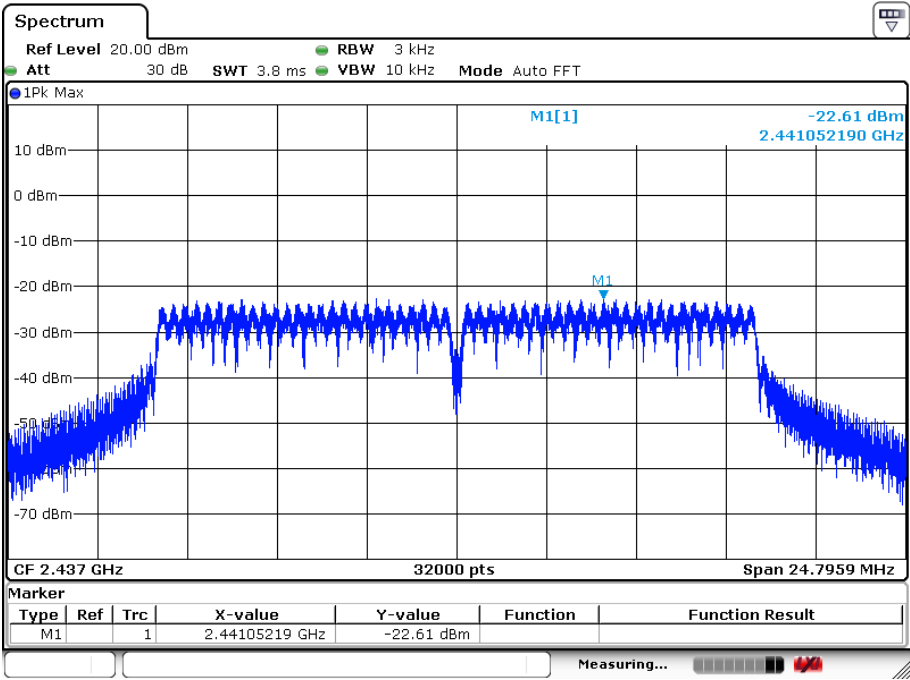
802.11g-Low Channel



Date:24 JUN 2017 16:43:14

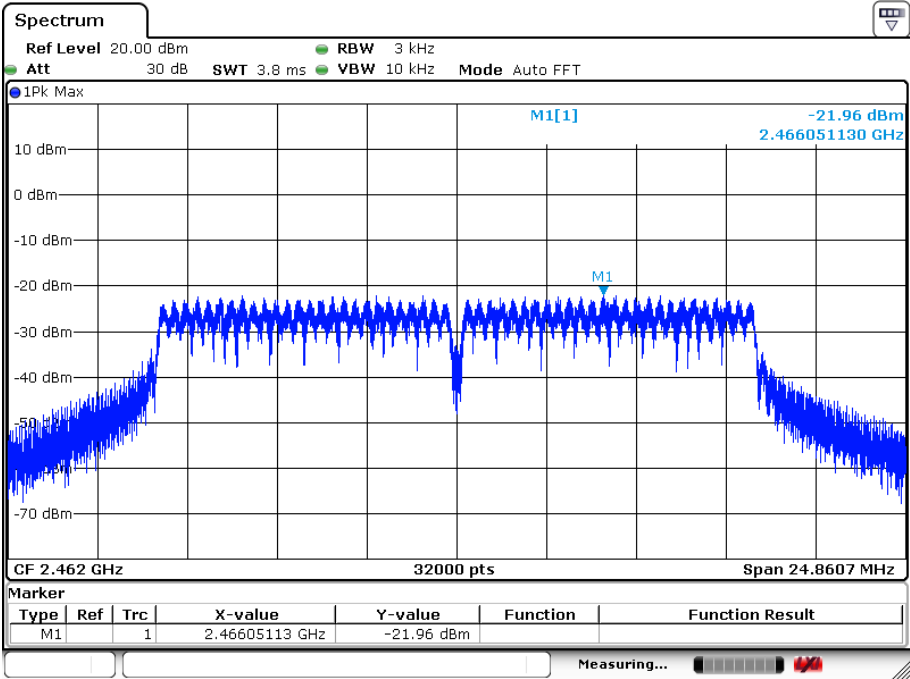


802.11g-Middle Channel



Date:24 JUN 2017 16:42:52

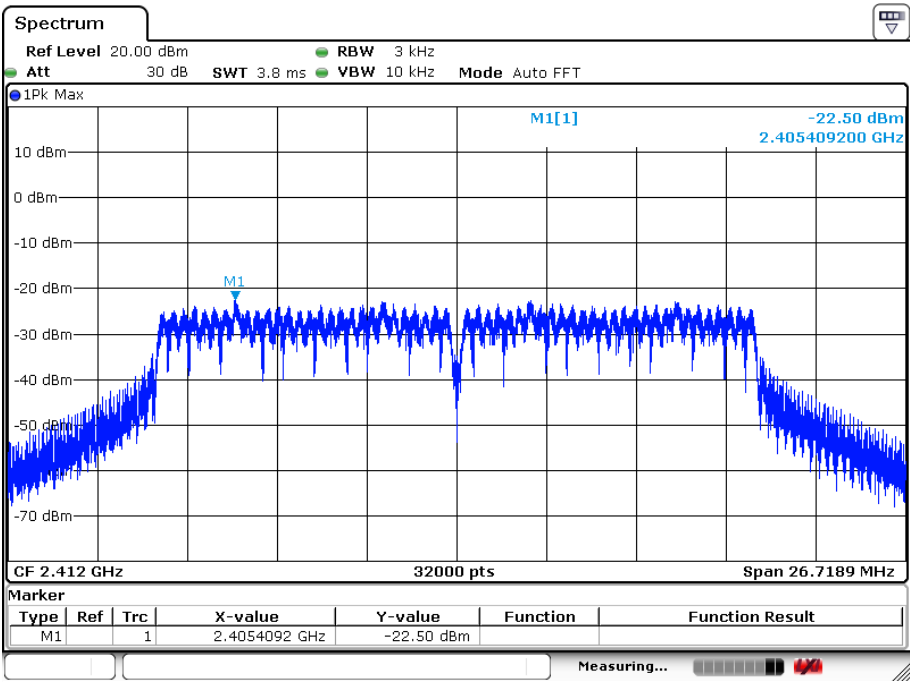
802.11g-High Channel



Date:24 JUN 2017 16:42:27

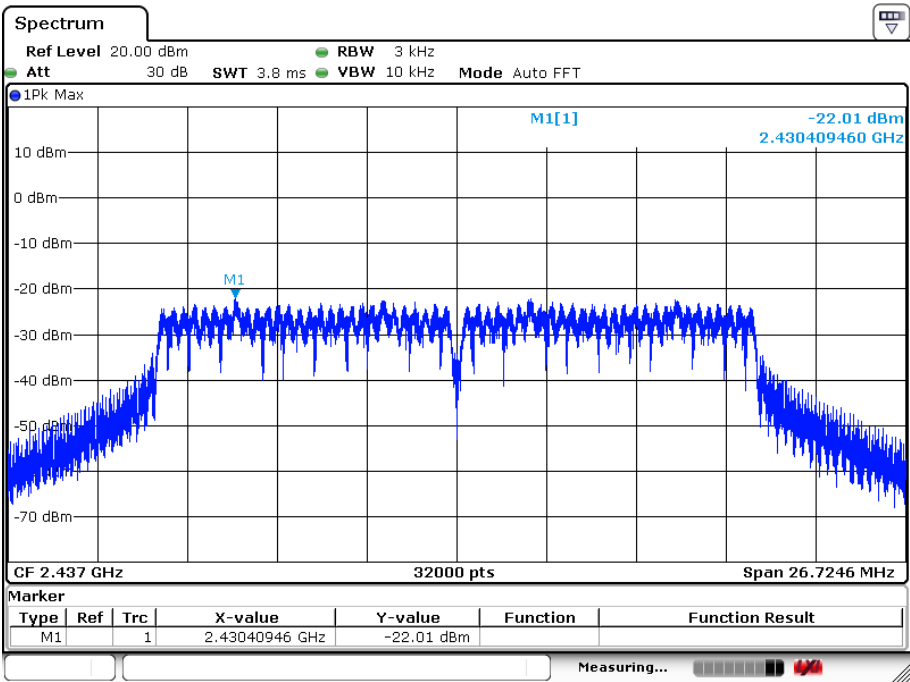


802.11n-HT20-Low Channel



Date:24 JUN 2017 16:43:36

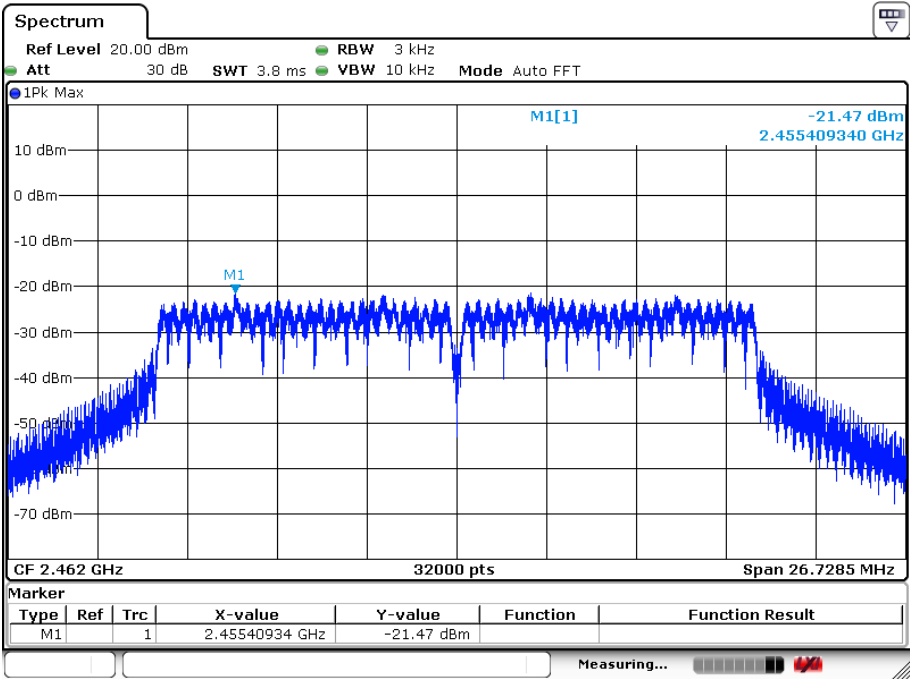
802.11n-HT20-Middle Channel



Date:24 JUN 2017 16:43:56

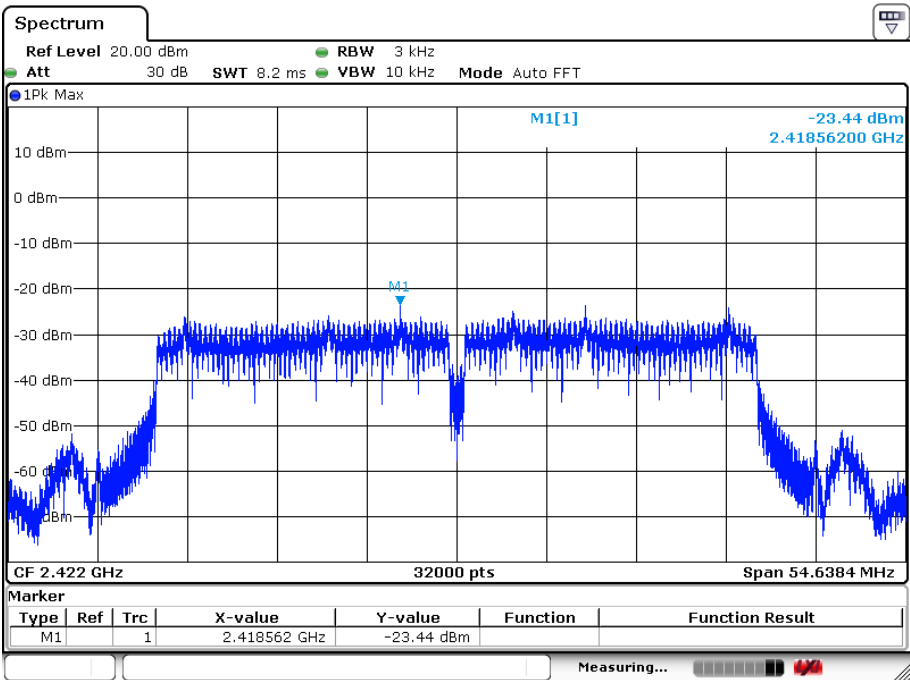


802.11n-HT20-High Channel



Date:24 JUN 2017 16:44:16

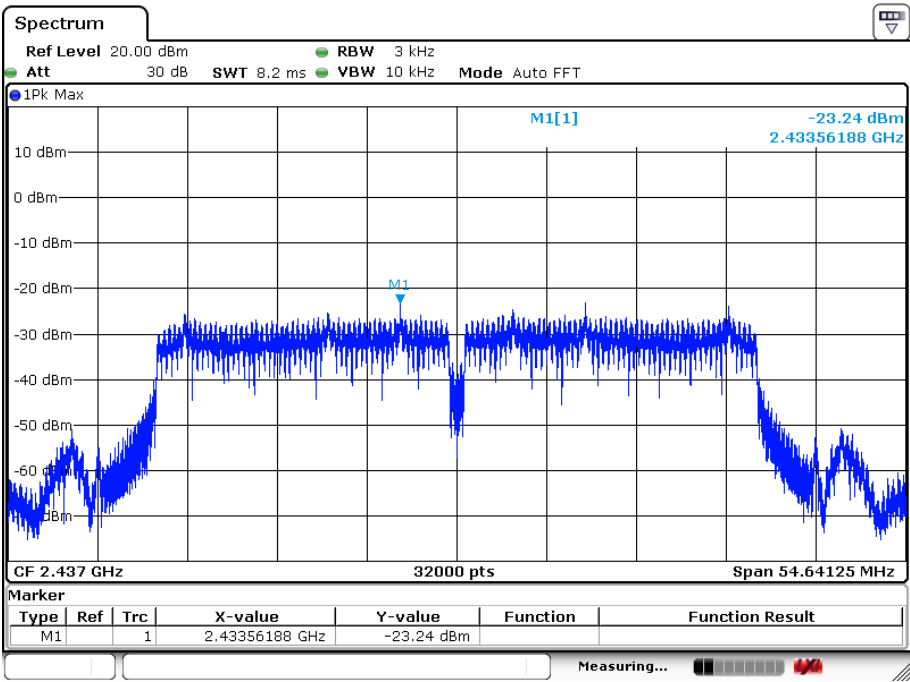
802.11n-HT40-Low Channel



Date:24 JUN 2017 16:44:57

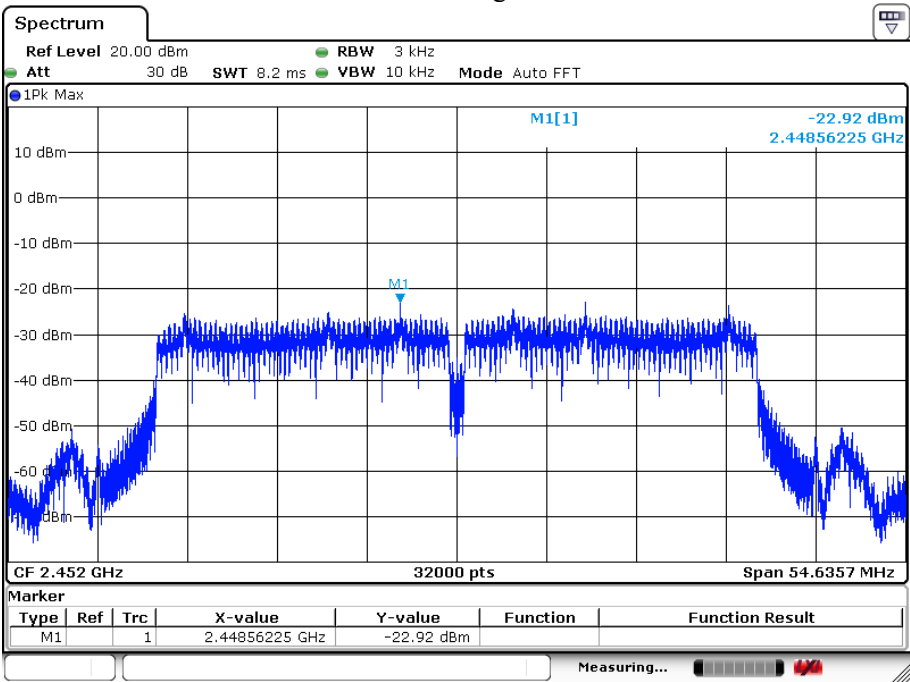


802.11n-HT40-Middle Channel



Date:24 JUN 2017 16:45:22

802.11n-HT40-High Channel



Date:24 JUN 2017 16:46:02



6. 6dB Bandwidth

6.1 Standard Applicable

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

6.2 Test Procedure

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.

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

6.3 Environmental Conditions

Temperature:	21 °C
Relative Humidity:	50%
ATM Pressure:	101.2

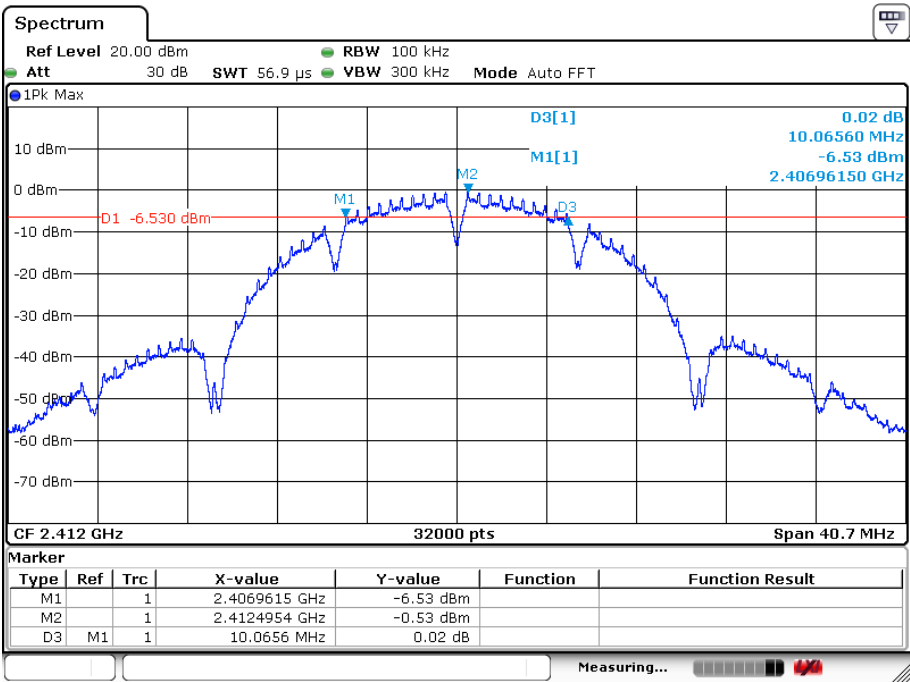
6.4 Summary of Test Results/Plots

Test Mode	Test Channel MHz	6 dB Bandwidth MHz	Limit kHz
802.11b	2412	10.086	≥ 500
	2437	10.069	≥ 500
	2462	10.061	≥ 500
802.11g	2412	16.573	≥ 500
	2437	16.531	≥ 500
	2462	16.574	≥ 500
802.11n-HT20	2412	17.813	≥ 500
	2437	17.816	≥ 500
	2462	17.819	≥ 500
802.11n-HT40	2422	36.426	≥ 500
	2437	36.428	≥ 500
	2452	36.424	≥ 500



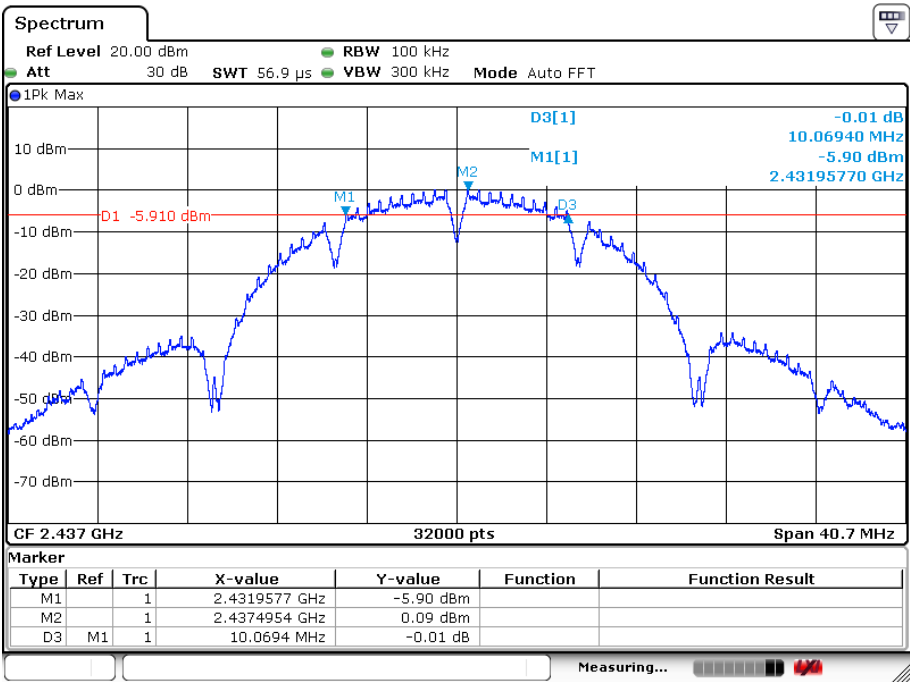
Please refer to the following test plots:

802.11b-Low Channel



Date: 24 JUN 2017 15:12:56

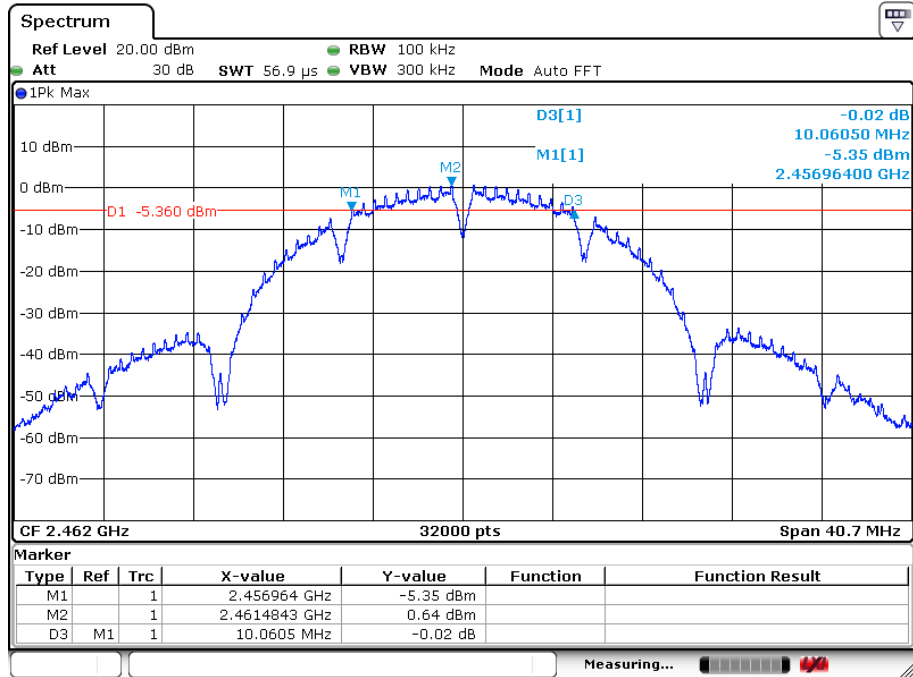
802.11b-Middle Channel



Date: 24 JUN 2017 15:14:34

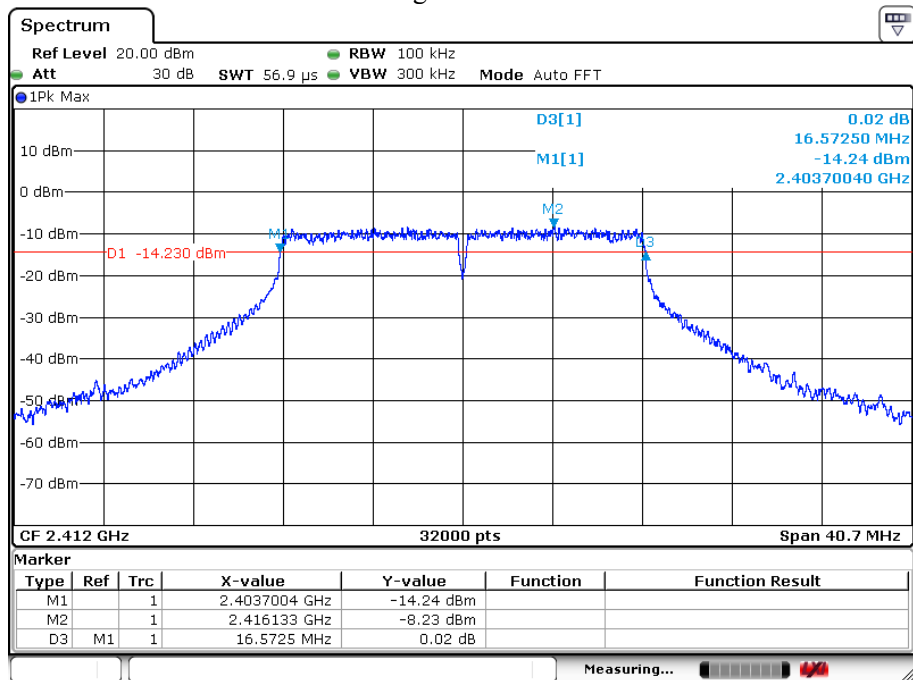


802.11b-High Channel



Date:24 JUN 2017 15:15:35

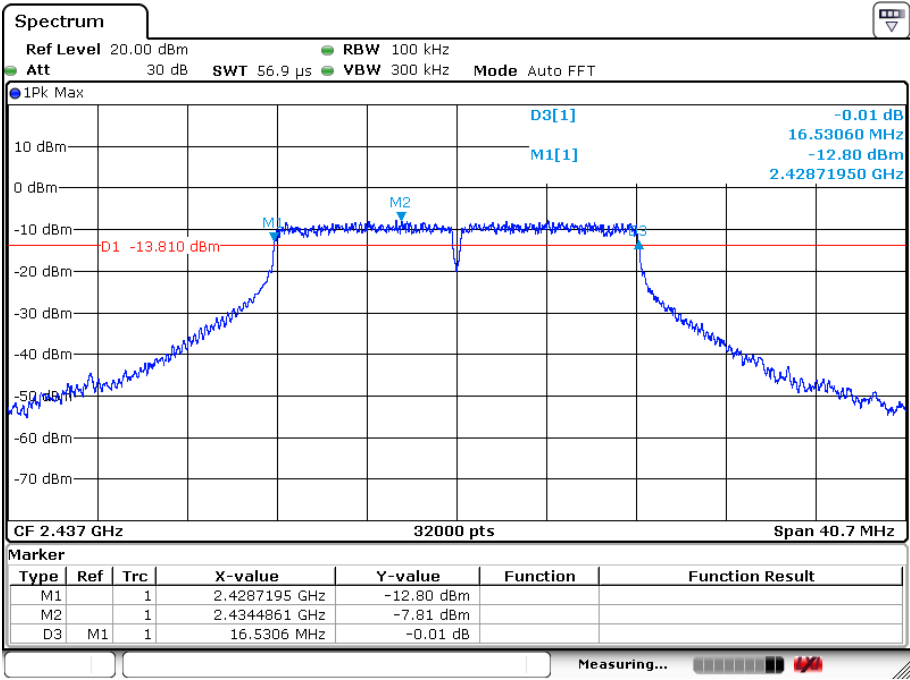
802.11g-Low Channel



Date:24 JUN 2017 15:18:29

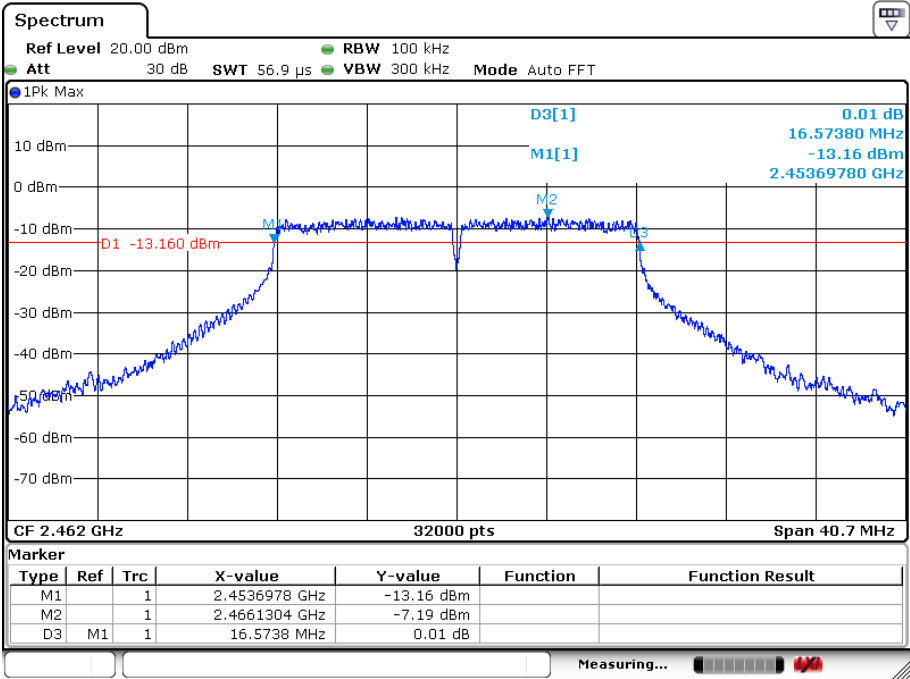


802.11g-Middle Channel



Date:24 JUN 2017 15:17:37

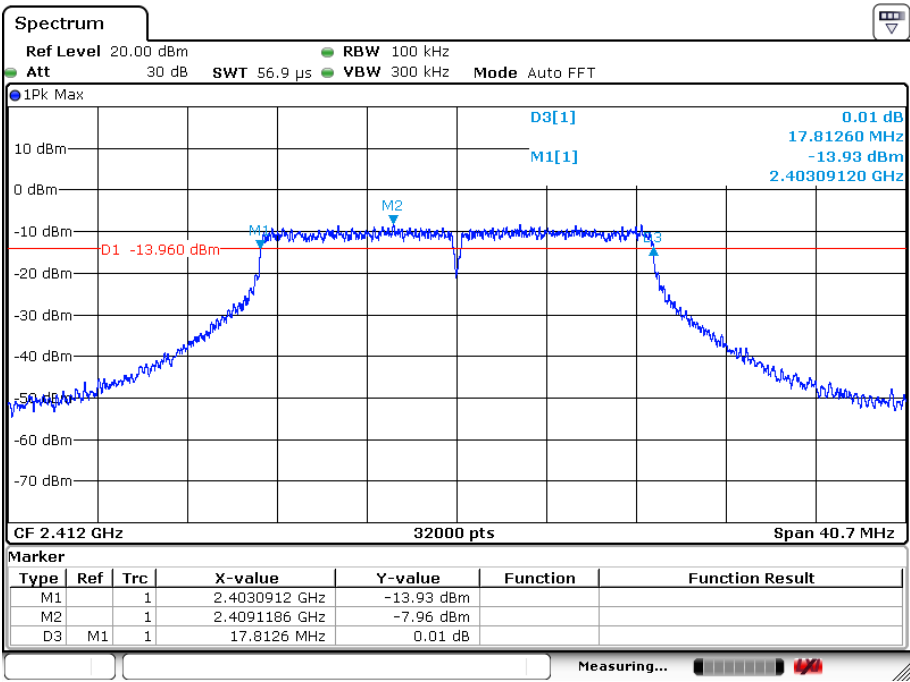
802.11g-High Channel



Date:24 JUN 2017 15:16:37

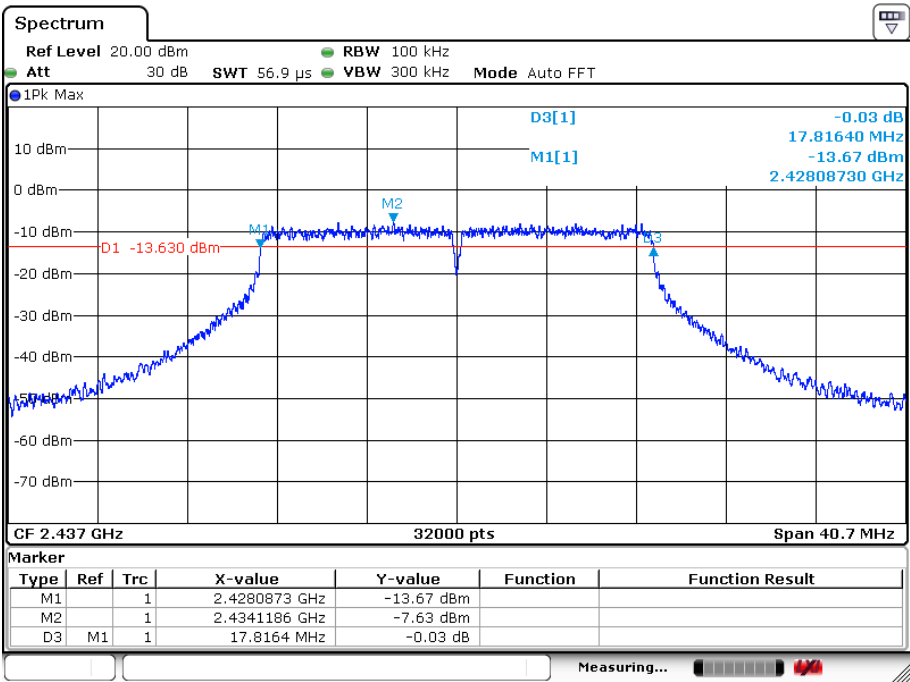


802.11n-HT20-Low Channel



Date:24 JUN 2017 15:19:12

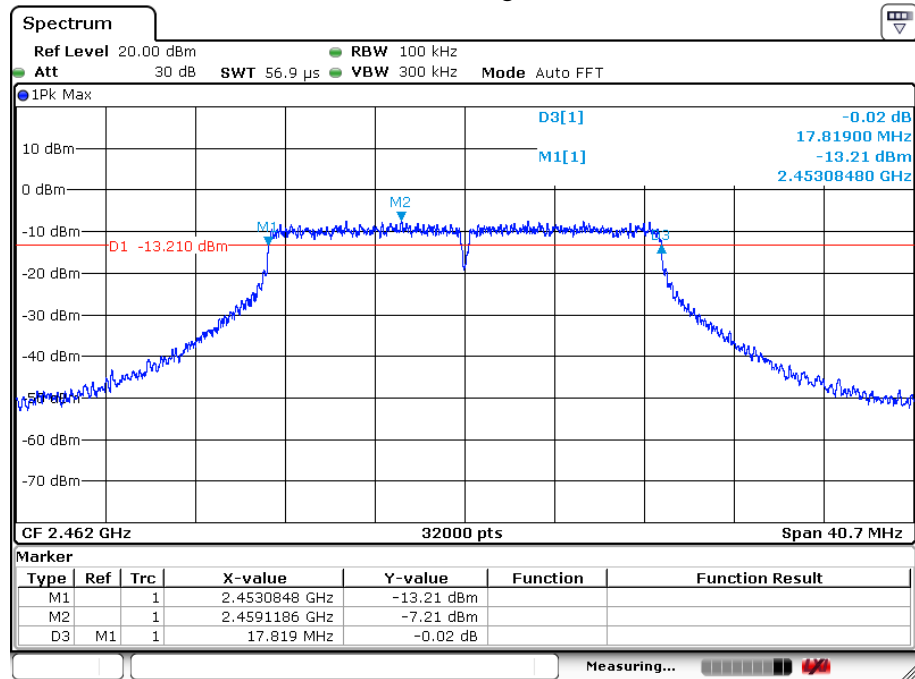
802.11n-HT20-Middle Channel



Date:24 JUN 2017 15:20:04

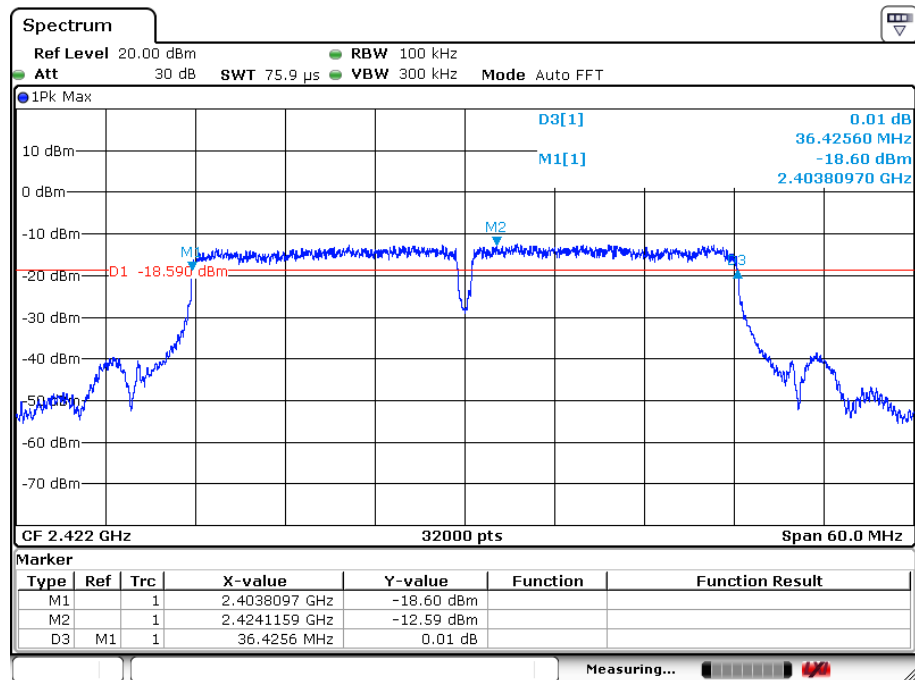


802.11n-HT20-High Channel



Date: 24 JUN 2017 15:20:50

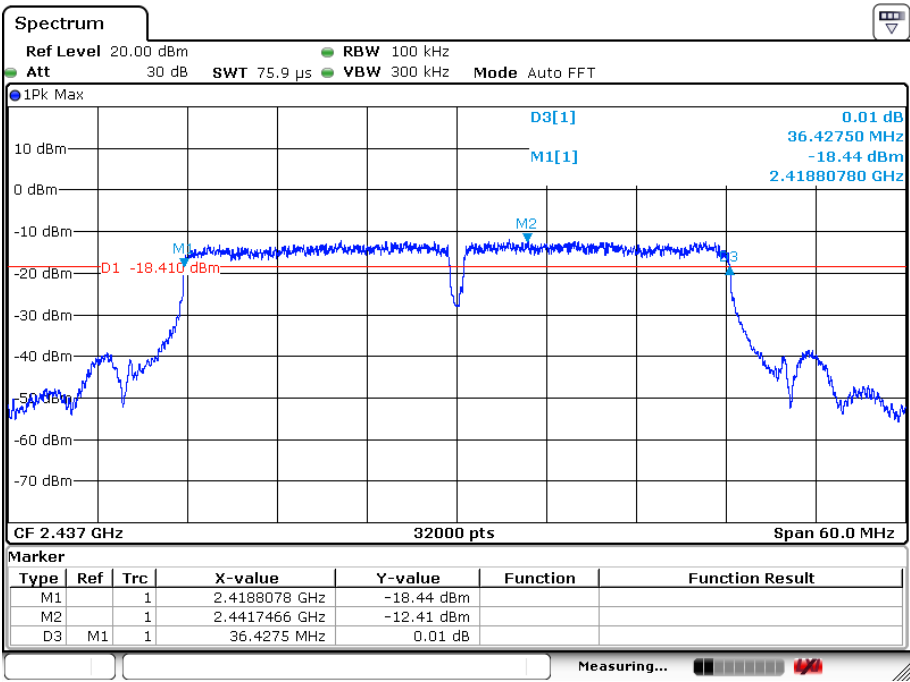
802.11n-HT40-Low Channel



Date: 24 JUN 2017 15:21:41

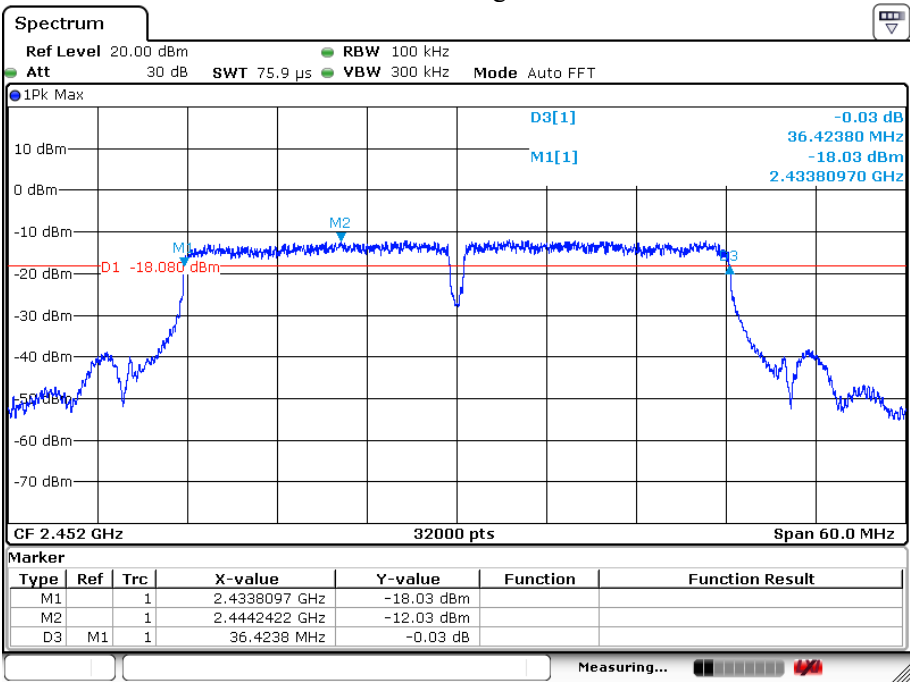


802.11n-HT40-Middle Channel



Date:24 JUN 2017 15:22:53

802.11n-HT40-High Channel



Date:24 JUN 2017 15:23:53

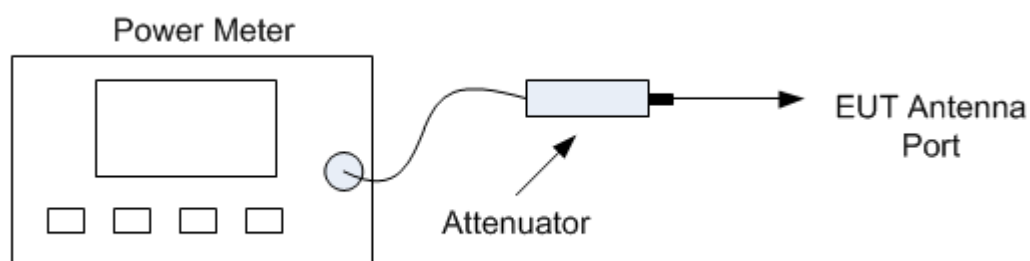
7. RF Output Power

7.1 Standard Applicable

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

7.2 Test Procedure

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.



7.3 Environmental Conditions

Temperature:	21°C
Relative Humidity:	50%
ATM Pressure:	101.2



7.4 Summary of Test Results/Plots

Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b_11Mbps	2412	15.49	35.40	1000
	2437	15.75	37.58	1000
	2462	15.51	35.56	1000
802.11g_54Mbps	2412	13.57	22.75	1000
	2437	13.49	22.34	1000
	2462	13.54	22.59	1000
802.11n HT20_MCS7	2412	12.71	18.66	1000
	2437	12.75	18.84	1000
	2462	12.79	19.01	1000
802.11n HT40_MCS7	2422	11.08	12.82	1000
	2437	11.02	12.65	1000
	2452	11.10	12.88	1000



8. Field Strength of Spurious Emissions

8.1 Standard Applicable

According to §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 §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

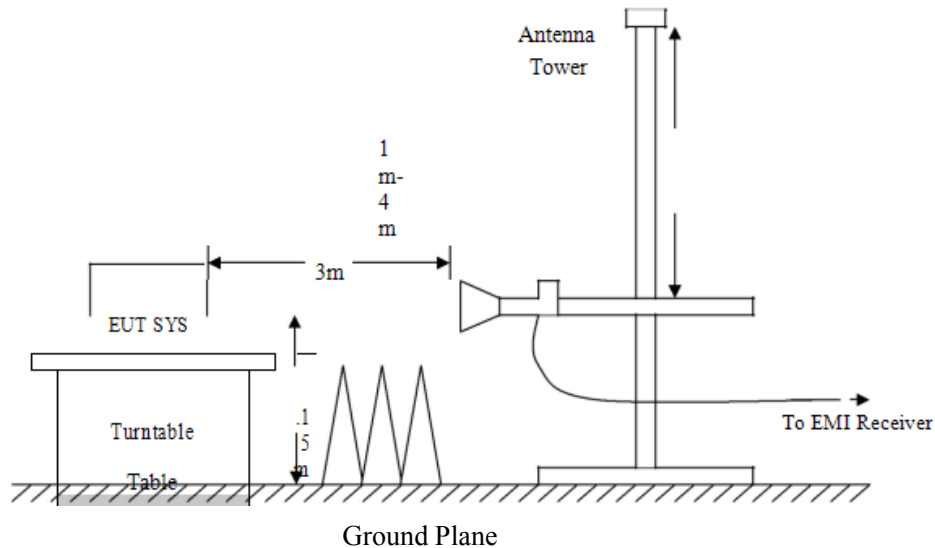
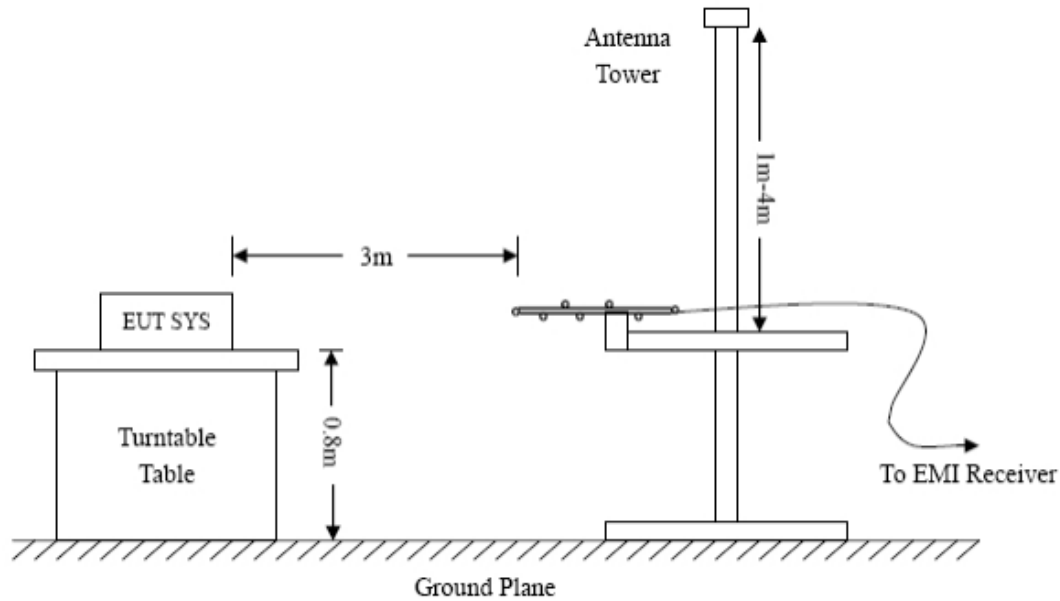
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

8.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$



The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

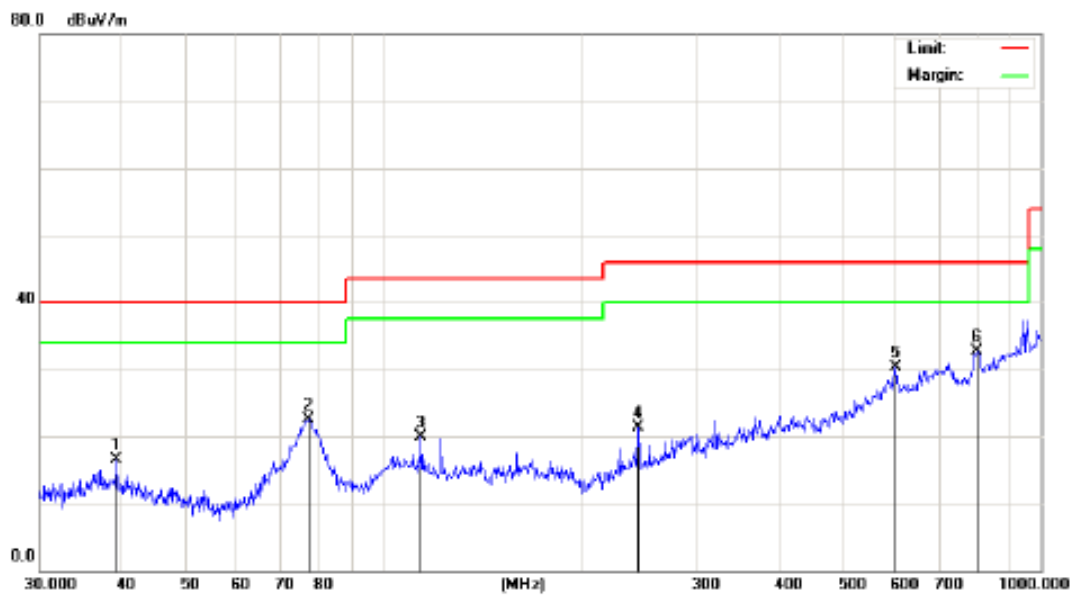
$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

8.4 Environmental Conditions

Temperature:	21 °C
Relative Humidity:	50%
ATM Pressure:	101.2

8.5 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst cases:

**Plot of Radiated Emissions Test Data (30MHz to 1GHz)****Vertical****Radiated Emission Measurement**

Site

Polarization: **Vertical**

Temperature: 25

Limit: FCC_PART15_B_03m_QP_

Power:

Humidity: 50 %

EUT:

Distance: 3m

M/N:

Mode:

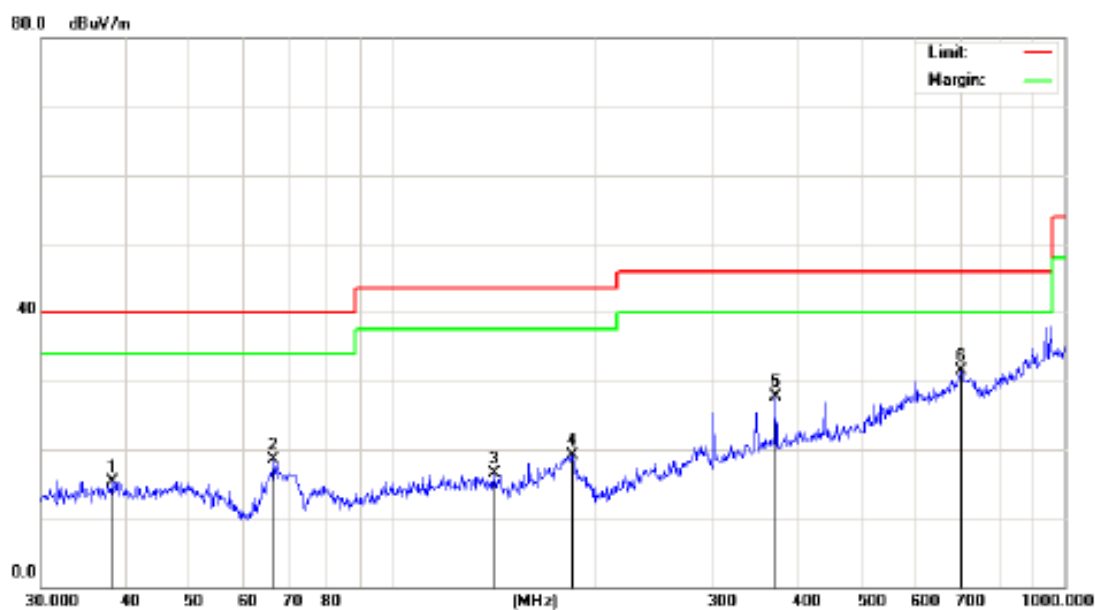
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		39.1616	33.14	-16.64	16.50	40.00	-23.50	QP		
2		77.0505	41.76	-19.16	22.60	40.00	-17.40	QP		
3		114.1138	34.02	-14.02	20.00	43.50	-23.50	QP		
4		244.2321	35.34	-14.00	21.34	46.00	-24.66	QP		
5		601.4265	31.22	-0.89	30.33	46.00	-15.67	QP		
6	*	801.7883	29.36	3.30	32.66	46.00	-13.34	QP		



Horizontal

Radiated Emission Measurement



Site: Polarization: **Horizontal** Temperature: 25
Limit: FCC_PART15_B_03m_QP_ Power: Humidity: 50 %
EUT: Distance: 3m
M/N:
Mode:
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		38.3482	29.80	-14.46	15.34	40.00	-24.66	QP		
2		66.4989	36.39	-17.88	18.51	40.00	-21.49	QP		
3		141.8282	31.60	-15.03	16.57	43.50	-26.93	QP		
4		185.1379	31.49	-12.48	19.01	43.50	-24.49	QP		
5		372.0045	35.27	-7.55	27.72	46.00	-18.28	QP		
6	*	701.7610	31.16	0.32	31.48	46.00	-14.52	QP		



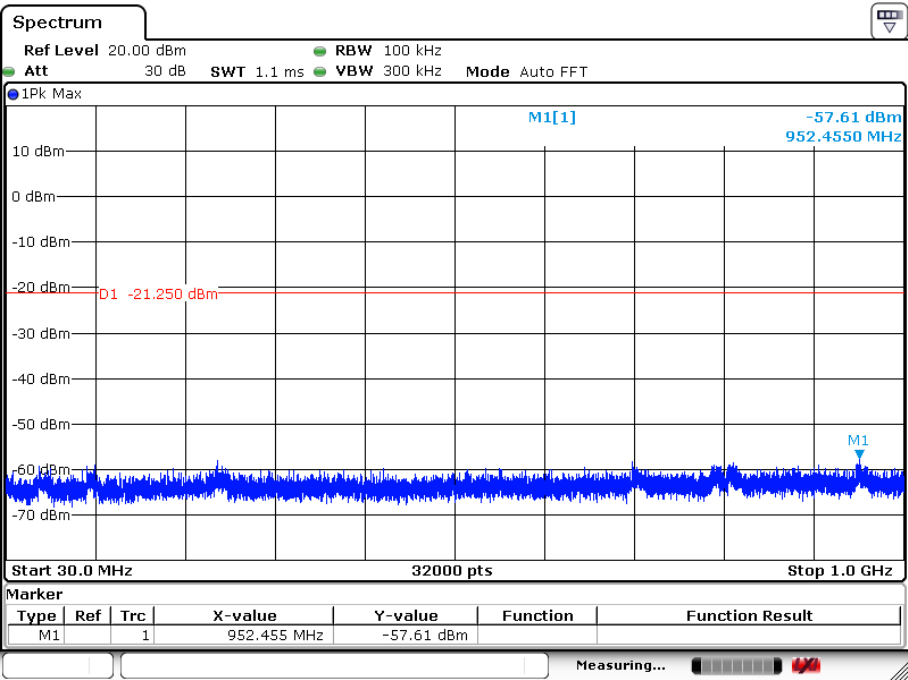
Spurious Emissions Above 1GHz
Test Mode: 802.11b (worst case)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	61.25	-3.81	57.44	74	-16.56	H	PK
4824.000	41.25	-3.81	37.44	54	-16.56	H	AV
7236.000	60.34	1.15	61.49	74	-12.51	H	PK
7236.000	47.61	1.15	48.76	54	-5.24	H	AV
4824.000	60.34	-3.81	56.53	74	-17.47	V	PK
4824.000	45.8	-3.81	41.99	54	-12.01	V	AV
7236.000	61.25	1.15	62.4	74	-12.90	V	PK
7236.000	48.25	1.15	49.4	54	-4.6	V	AV
Middle Channel-2437MHz							
4874.000	56.7	-3.69	53.01	74	-20.99	H	PK
4874.000	48.52	-3.69	44.83	54	-9.17	H	AV
7311.000	56.7	1.52	58.22	74	-15.78	H	PK
7311.000	42.16	1.52	43.68	54	-10.32	H	AV
4874.000	57.61	-3.69	53.92	74	-20.08	V	PK
4874.000	47.61	-3.69	43.92	54	-10.08	V	AV
7311.000	55.8	1.52	57.32	74	-16.68	V	PK
7311.000	48.25	1.52	49.77	54	-4.23	V	AV
High Channel-2462MHz							
4924.000	54.89	-3.58	51.31	74	-22.69	H	PK
4924.000	46.7	-3.58	43.12	54	-10.88	H	AV
7386.000	53.98	1.67	55.65	74	-18.35	H	PK
7386.000	42.16	1.67	43.83	54	-10.17	H	AV
4924.000	61.25	-3.58	57.67	74	-16.33	V	PK
4924.000	46.7	-3.58	43.12	54	-10.88	V	AV
7386.000	57.61	1.67	59.28	74	-14.72	V	PK
7386.000	48.25	1.67	49.92	54	-4.08	V	AV

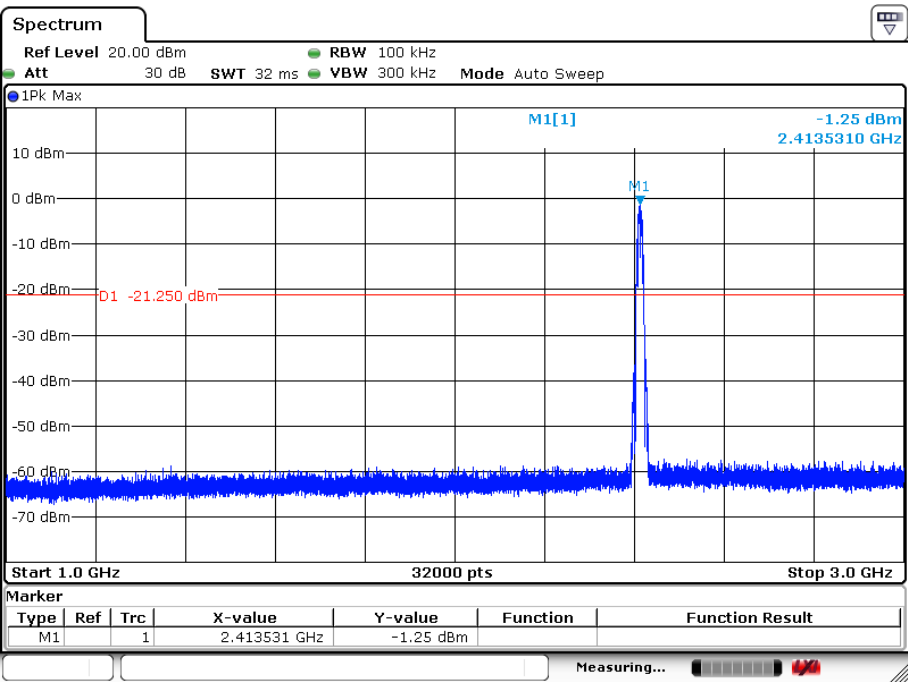
Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength istoo small to be measured.



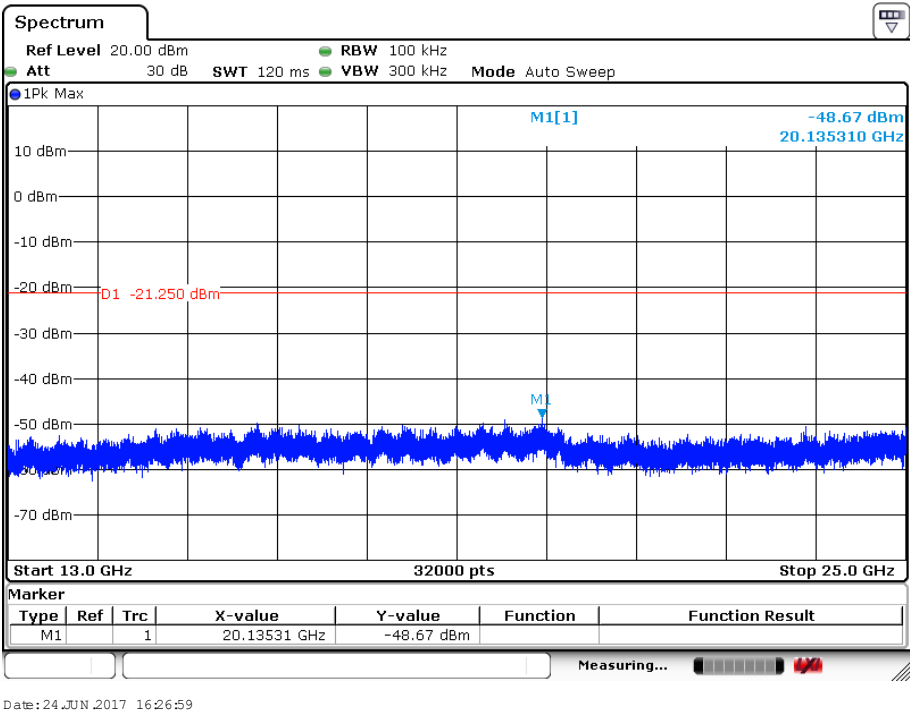
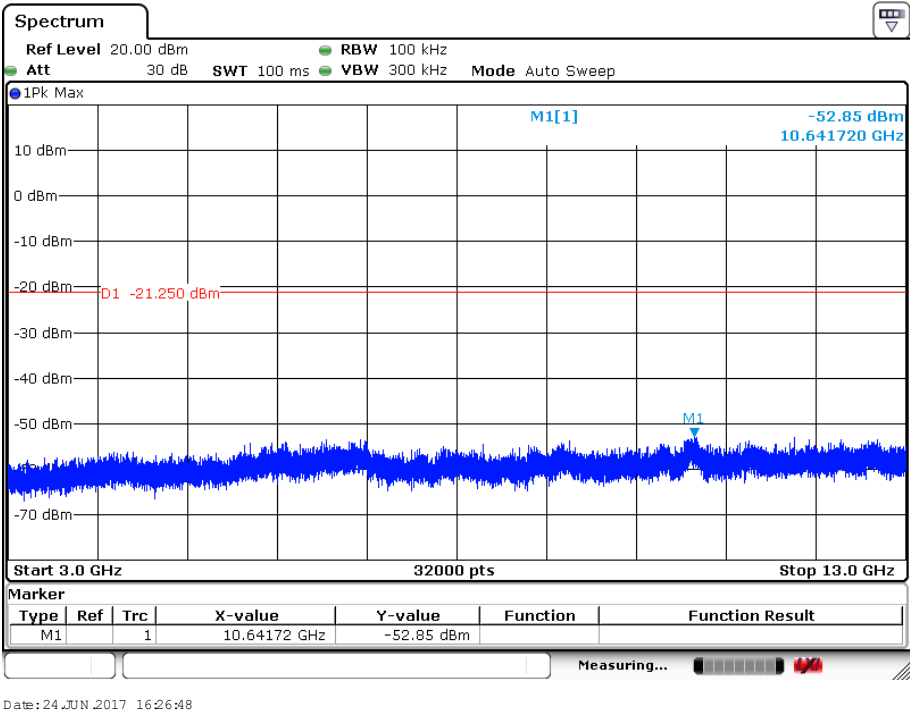
Spurious(conducted)
802.11b-Lowest



Date:24 JUN 2017 16:26:38

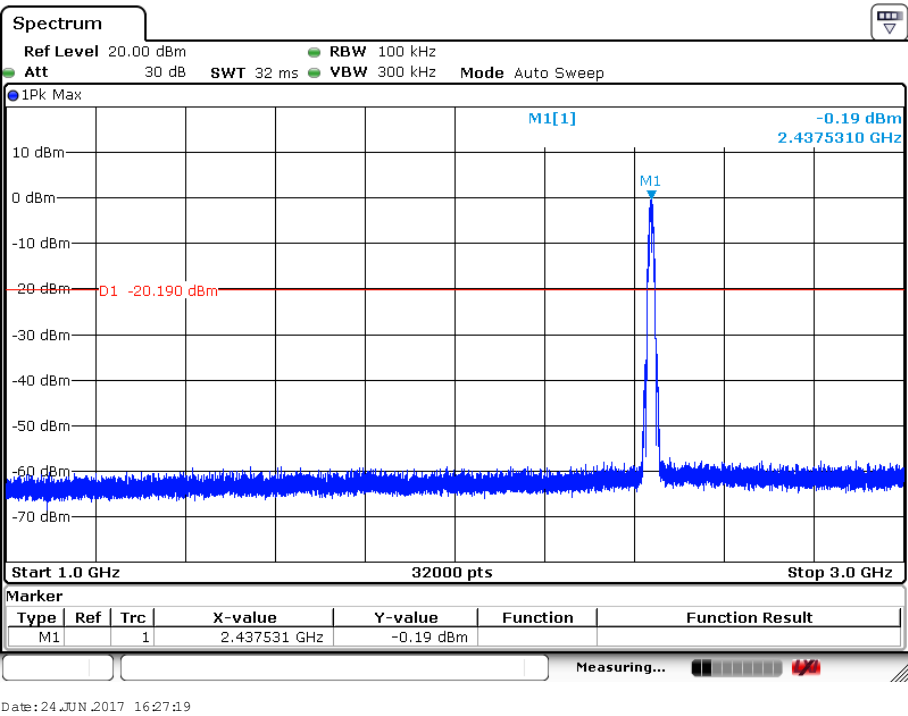
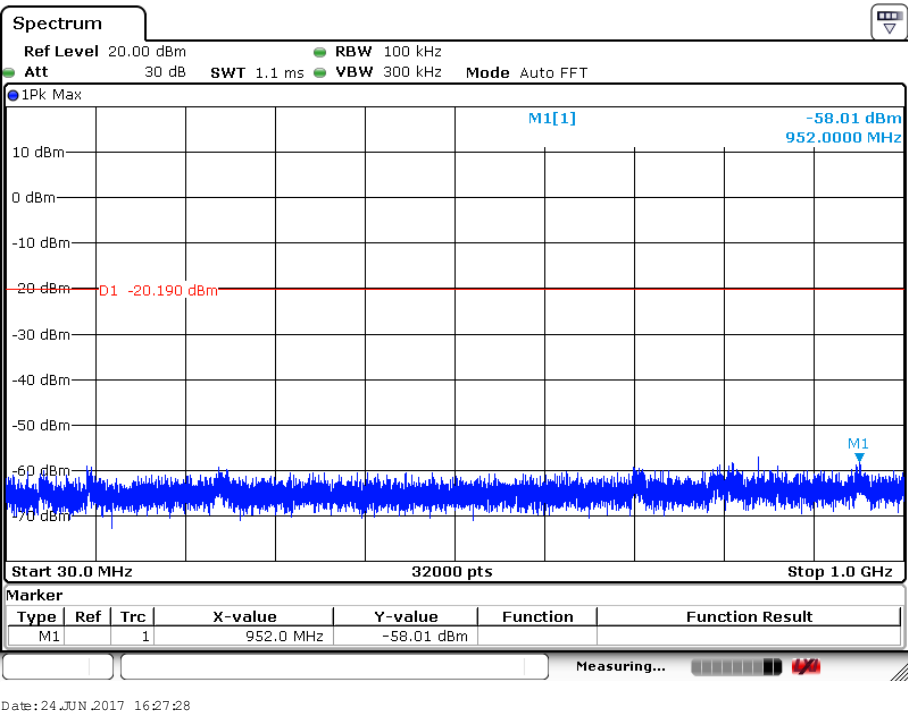


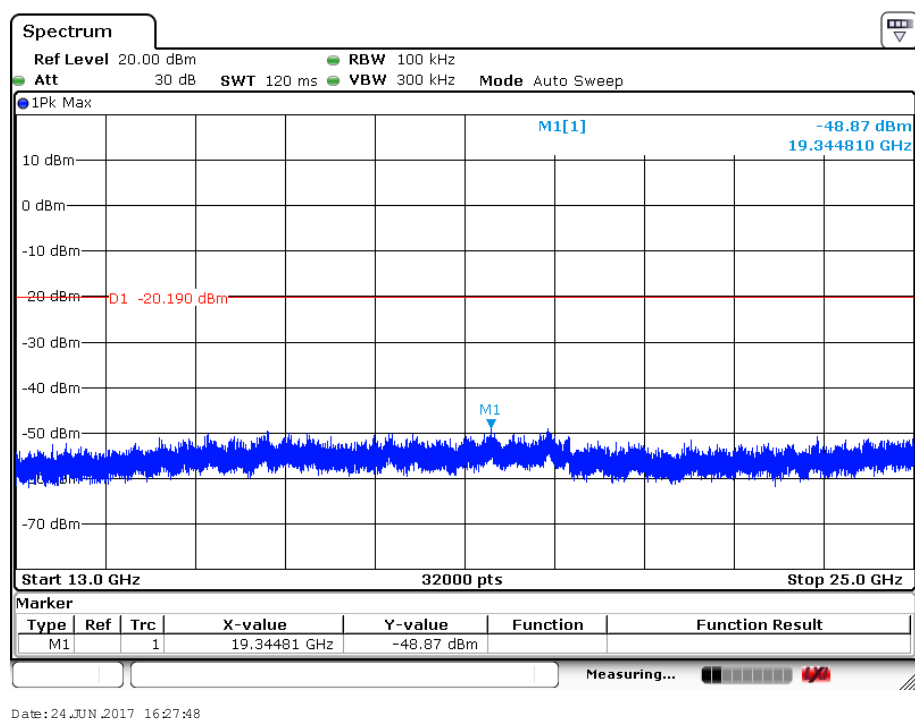
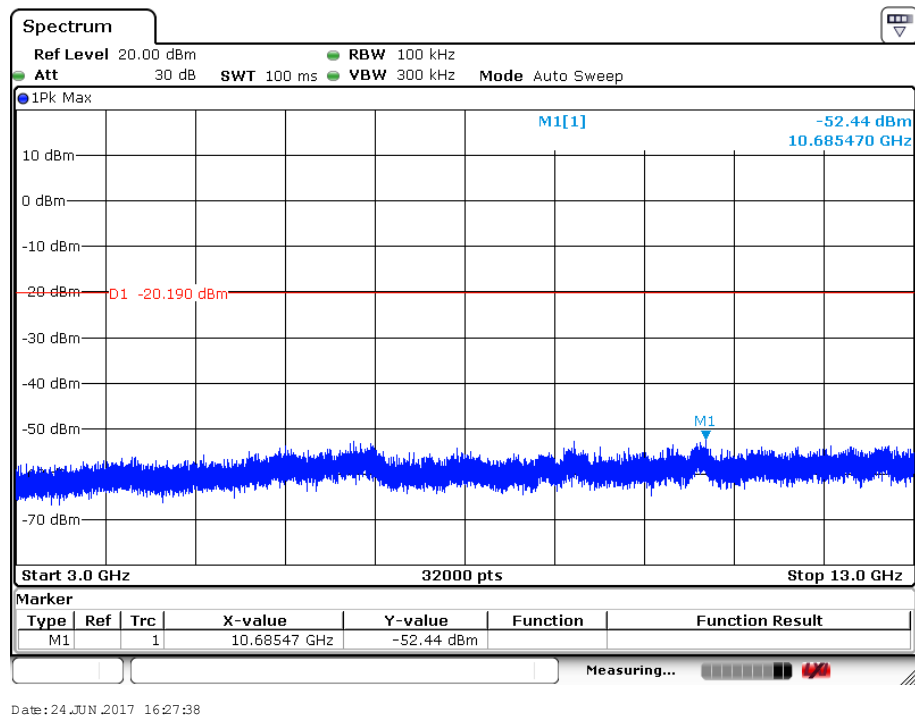
Date:24 JUN 2017 16:26:25





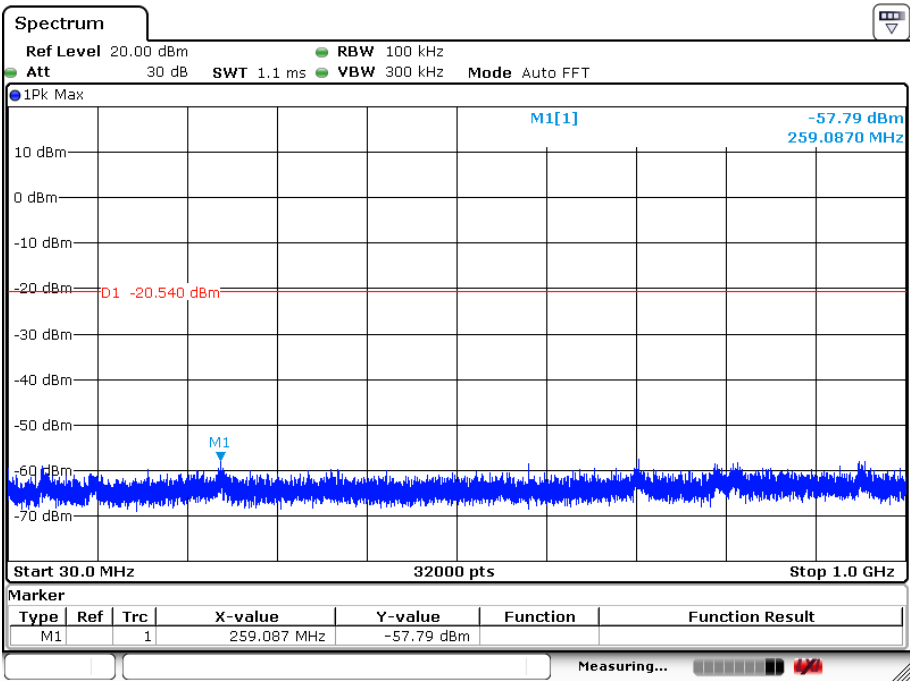
Middle



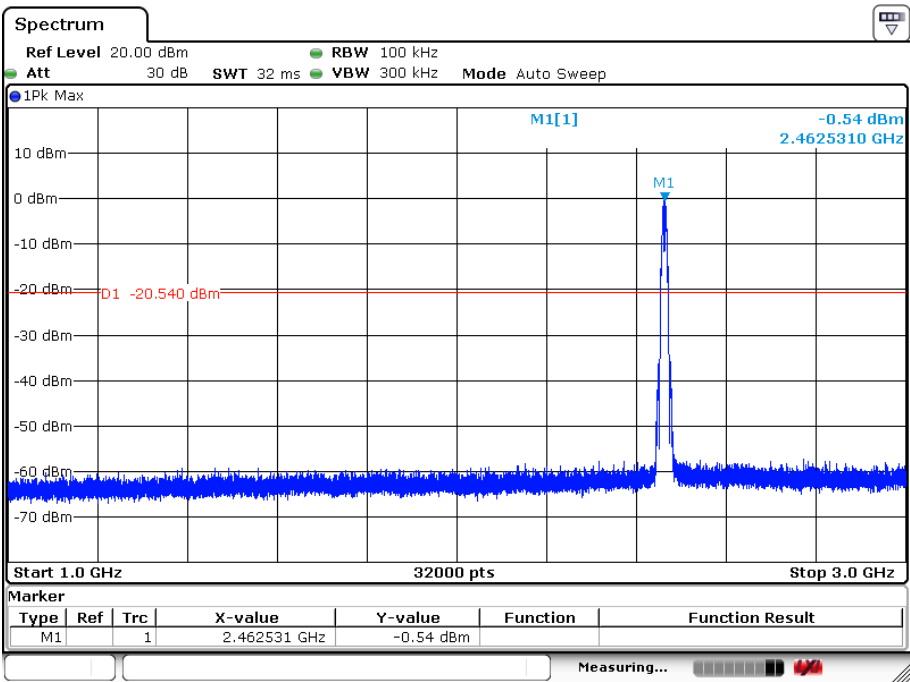




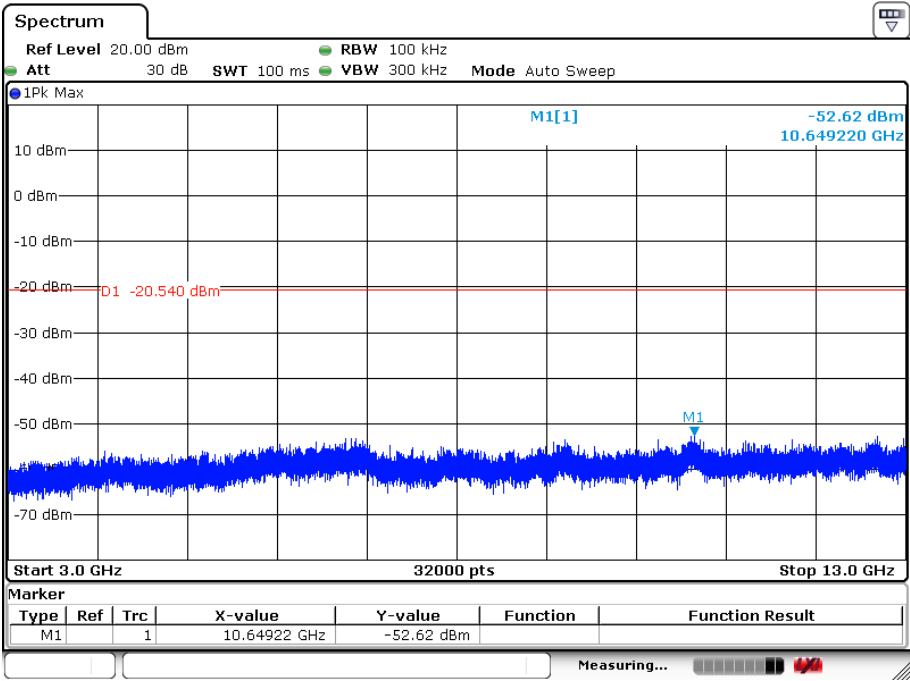
Highest



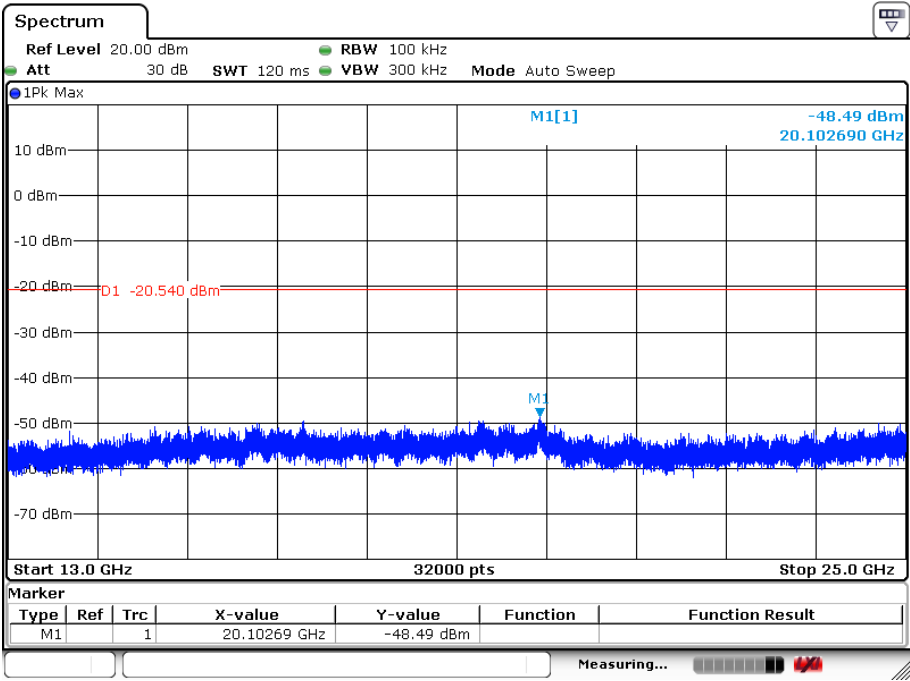
Date: 24 JUN 2017 16:28:22



Date: 24 JUN 2017 16:28:11



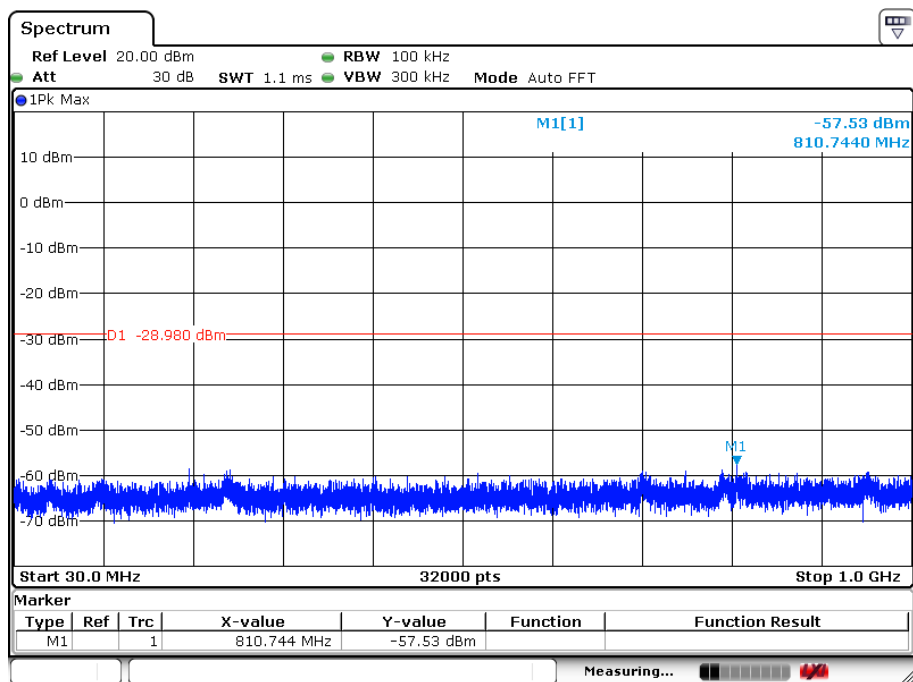
Date:24 JUN 2017 16:28:36



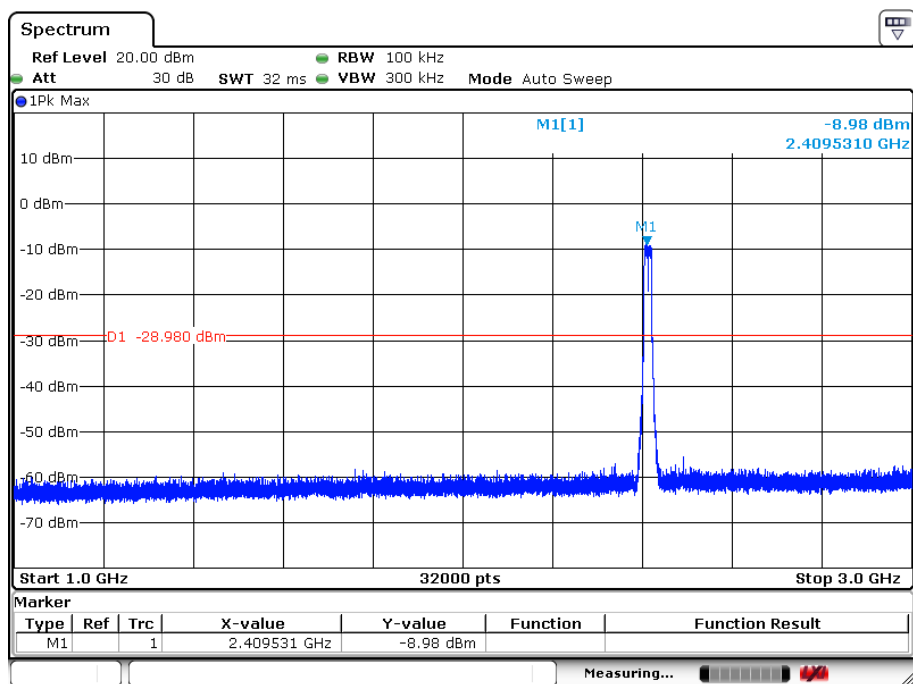
Date:24 JUN 2017 16:28:47



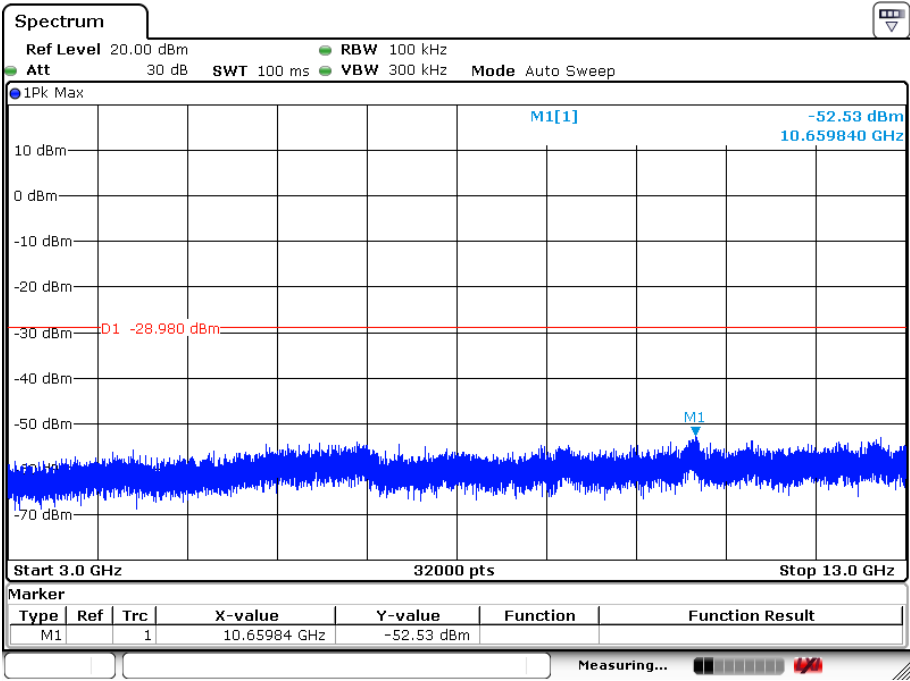
802.11g-Lowest



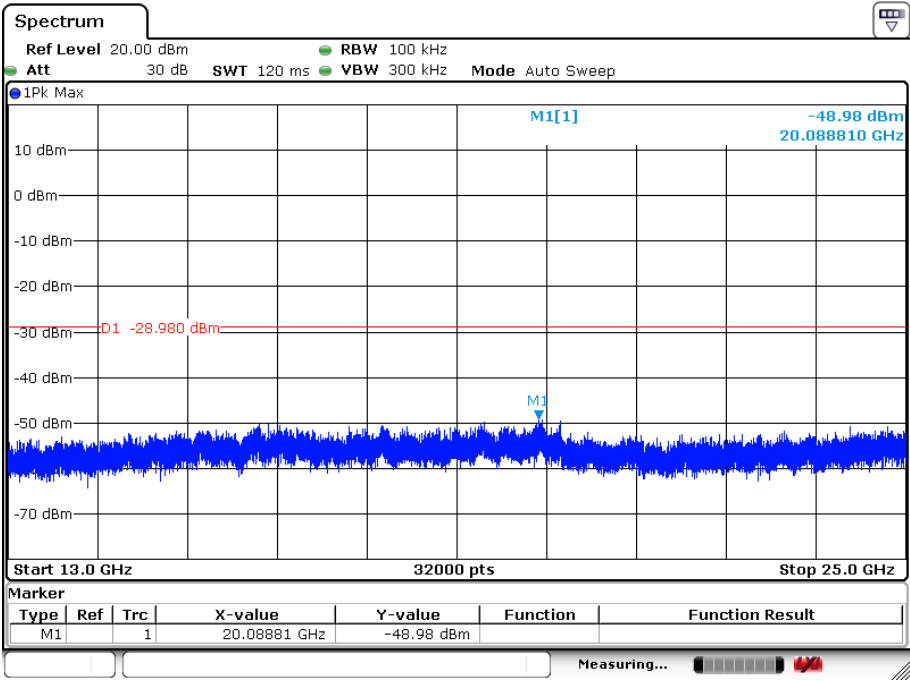
Date:24 JUN 2017 16:25:31



Date:24 JUN 2017 16:25:20



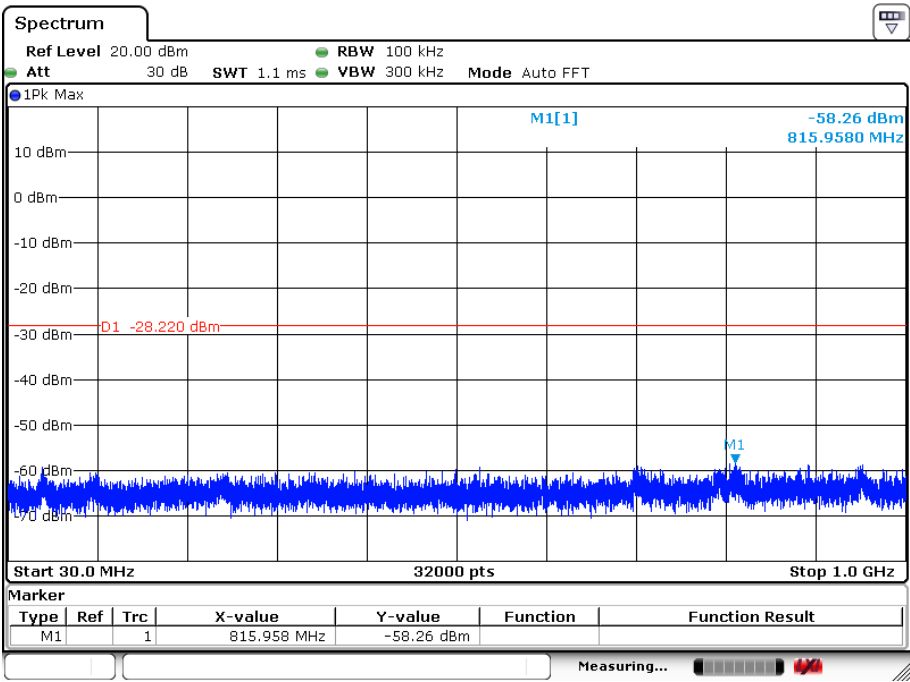
Date:24 JUN 2017 16:25:42



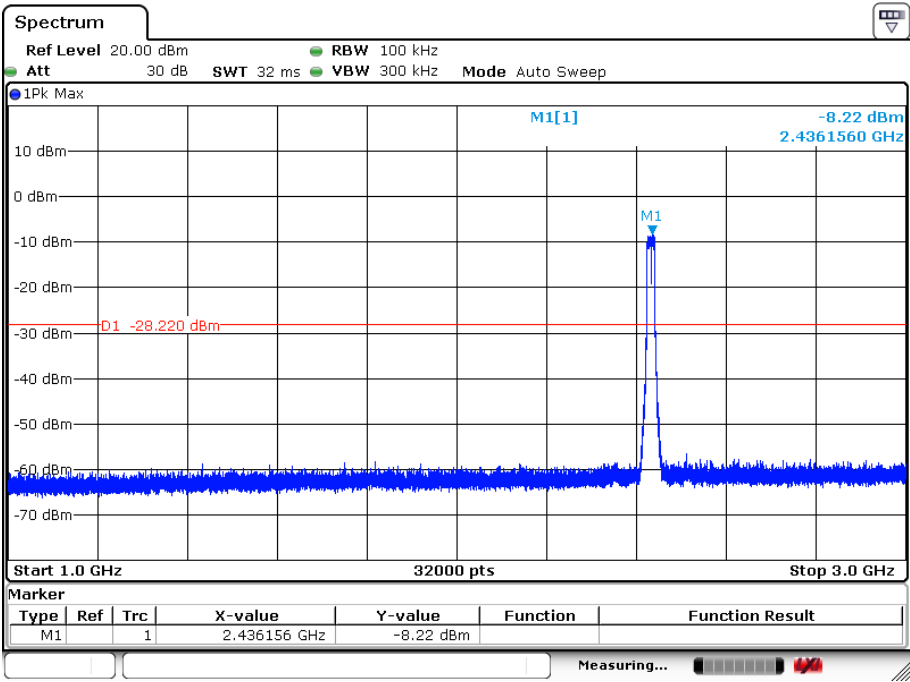
Date:24 JUN 2017 16:25:55



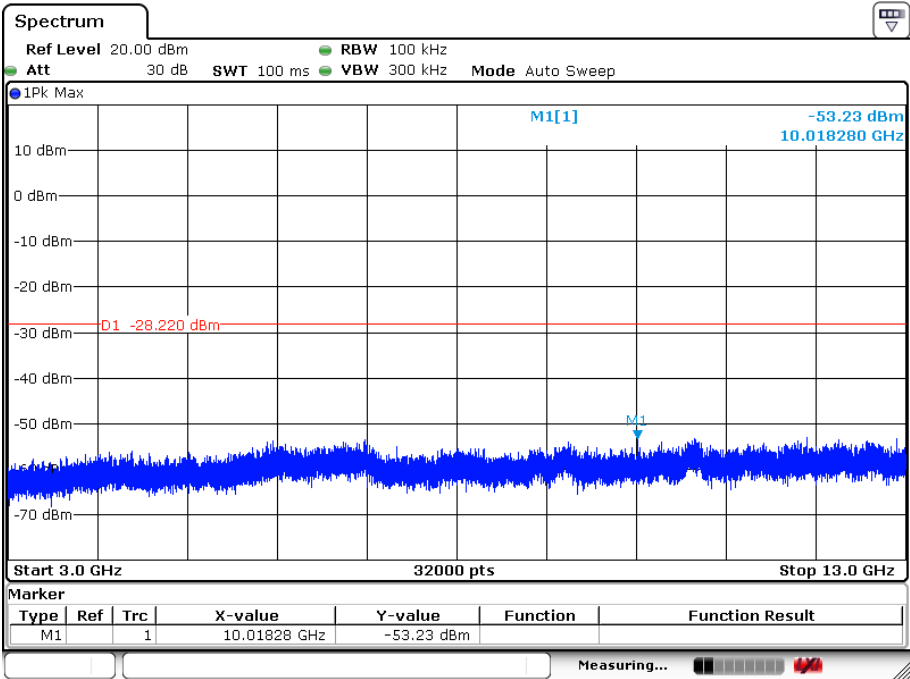
middle



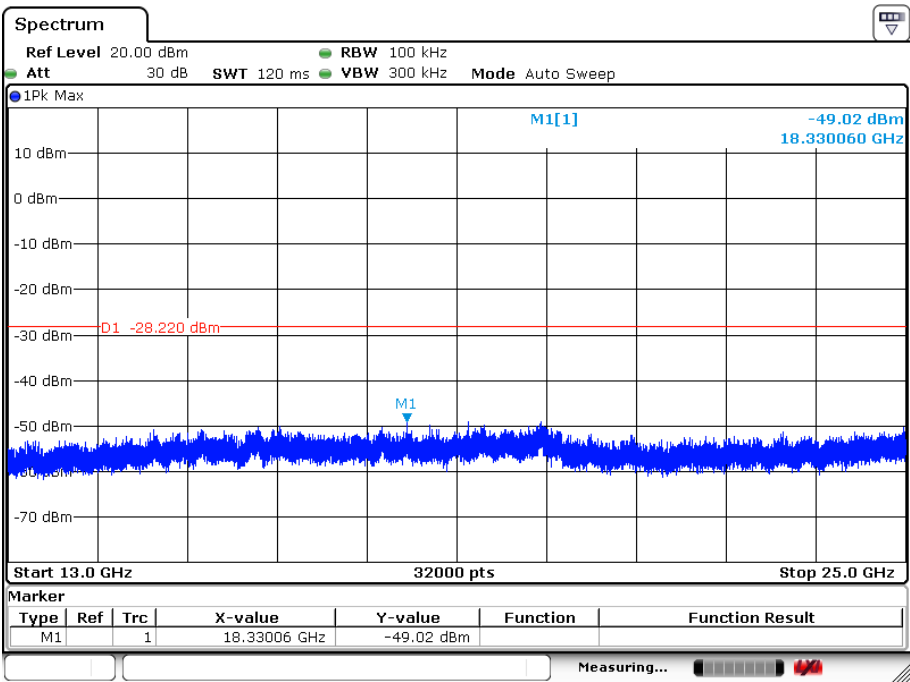
Date: 24 JUN 2017 16:24:24



Date: 24 JUN 2017 16:24:13



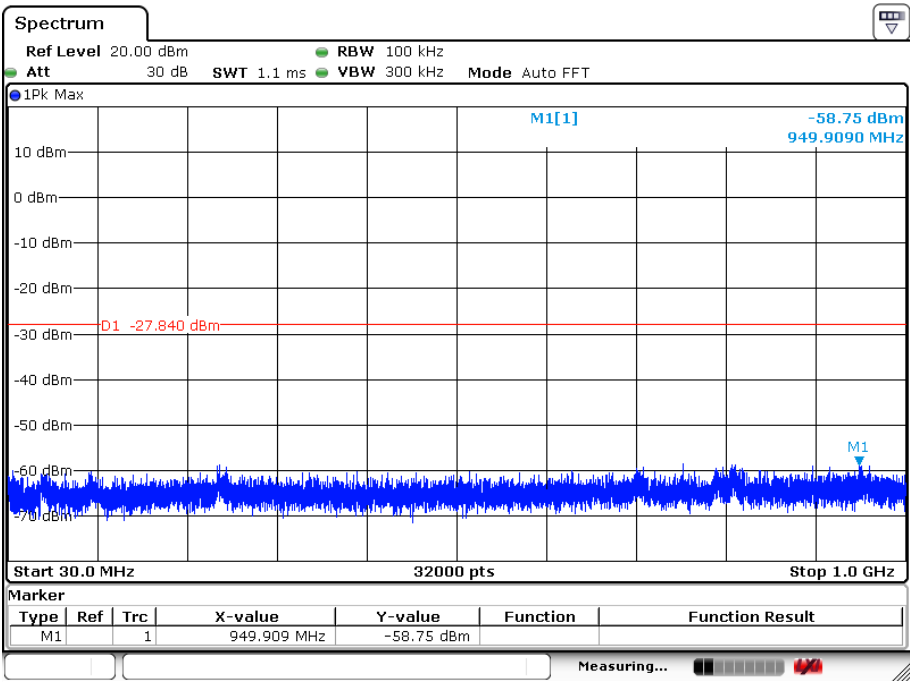
Date:24 JUN 2017 16:24:39



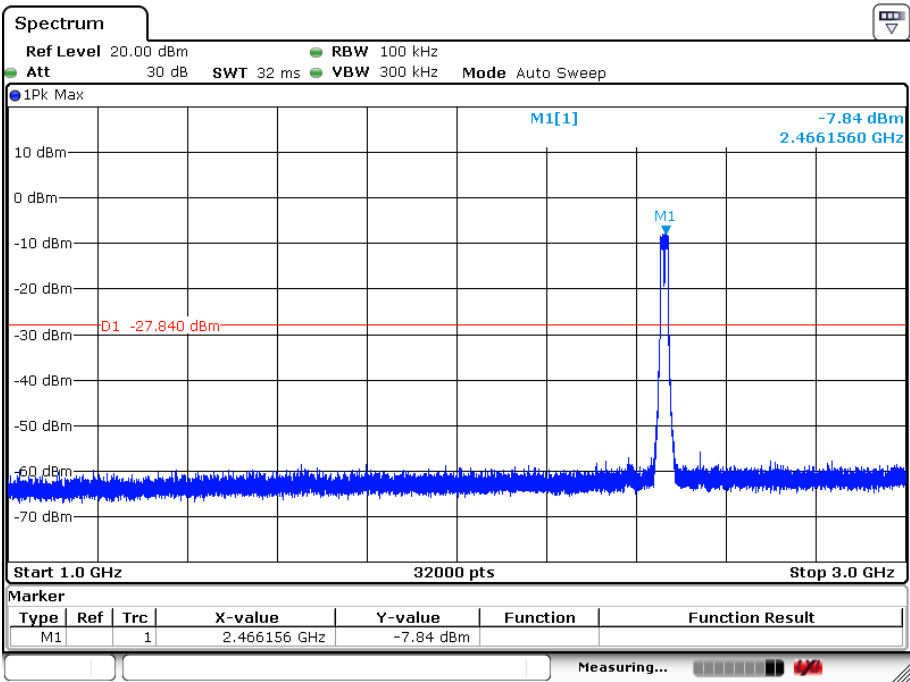
Date:24 JUN 2017 16:24:50



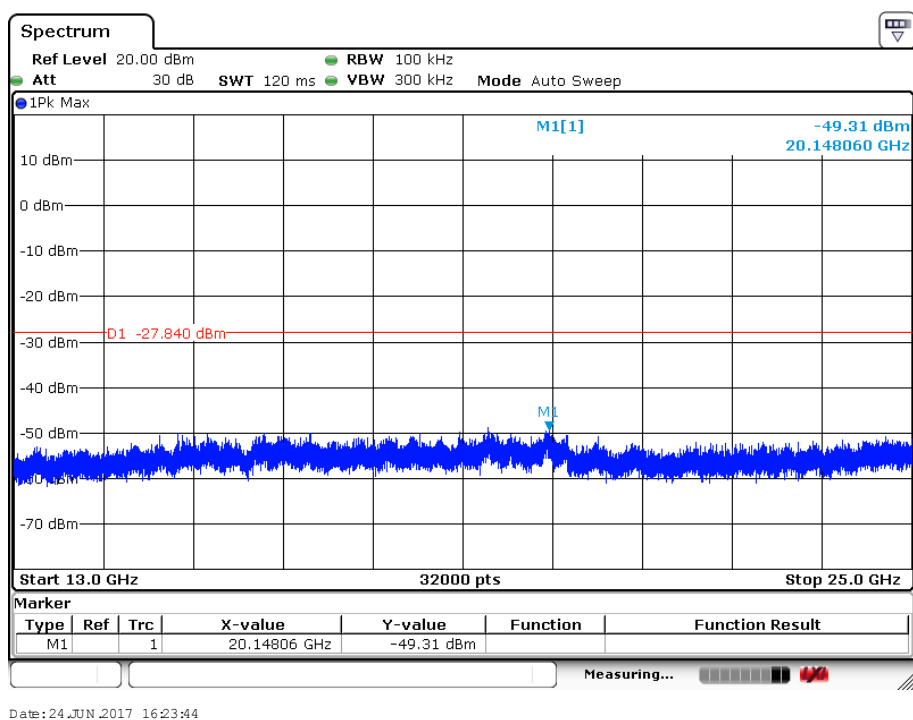
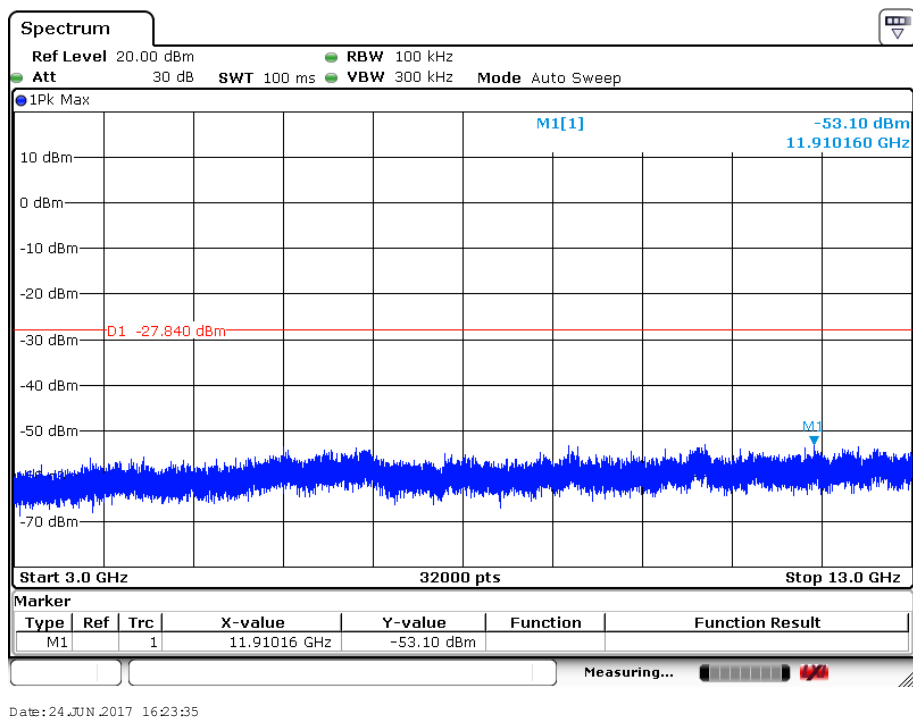
Highest



Date:24 JUN 2017 16:23:22

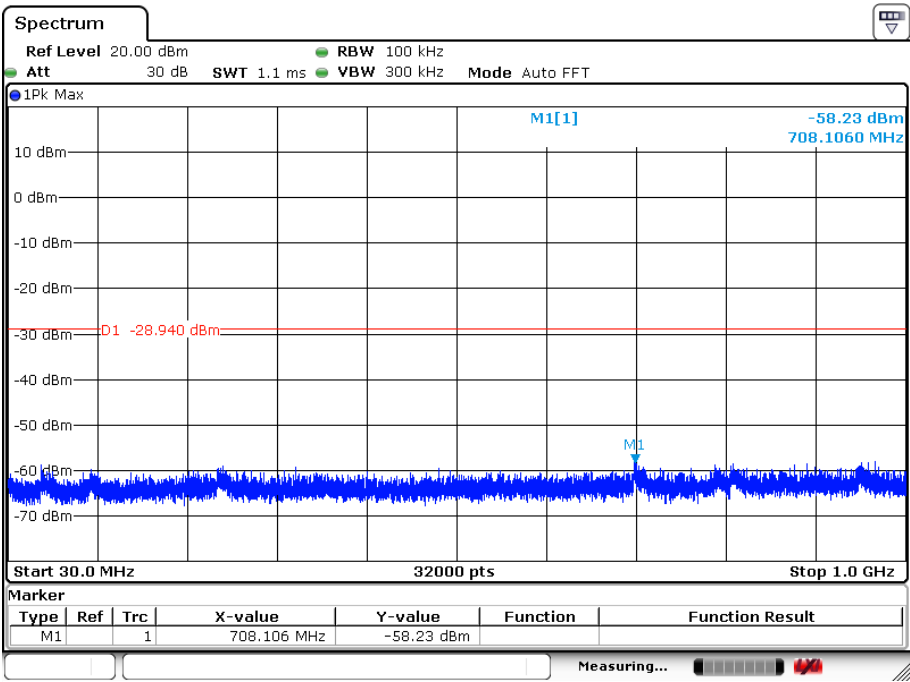


Date:24 JUN 2017 16:23:12

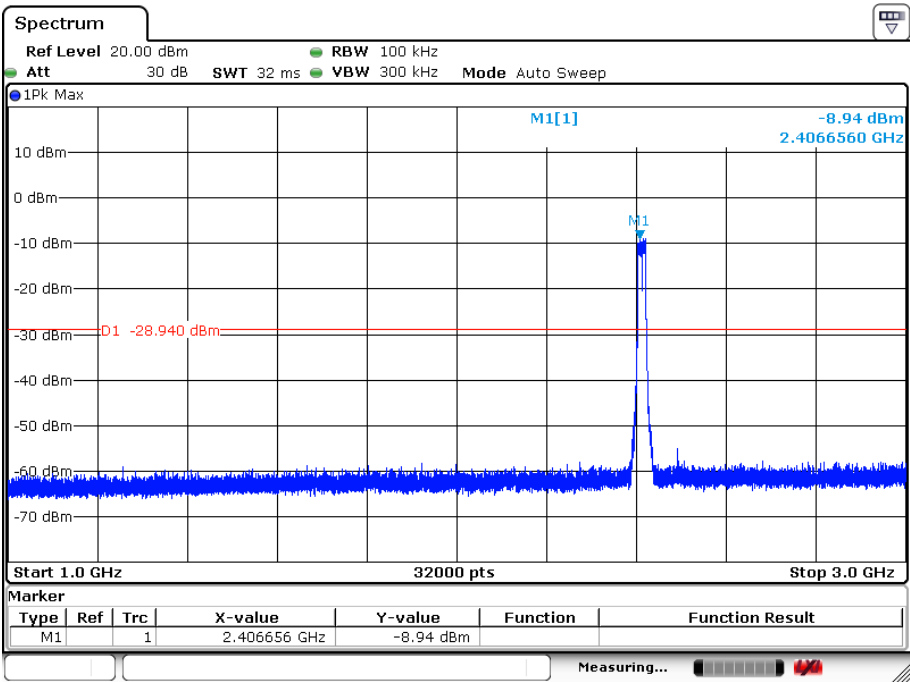




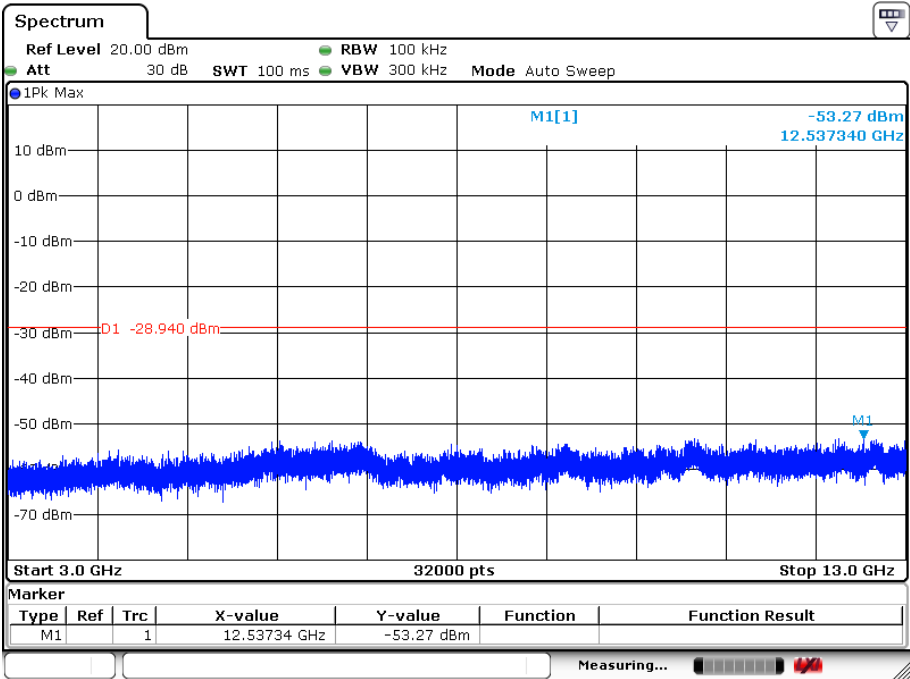
802.11n-20-Lowest



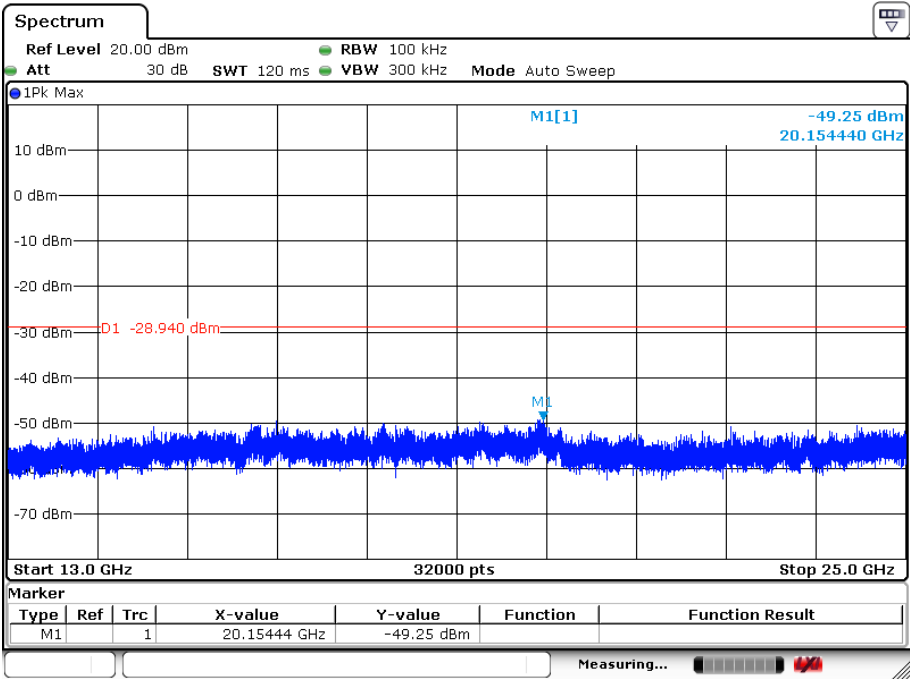
Date:24 JUN 2017 16:16:22



Date:24 JUN 2017 16:16:07



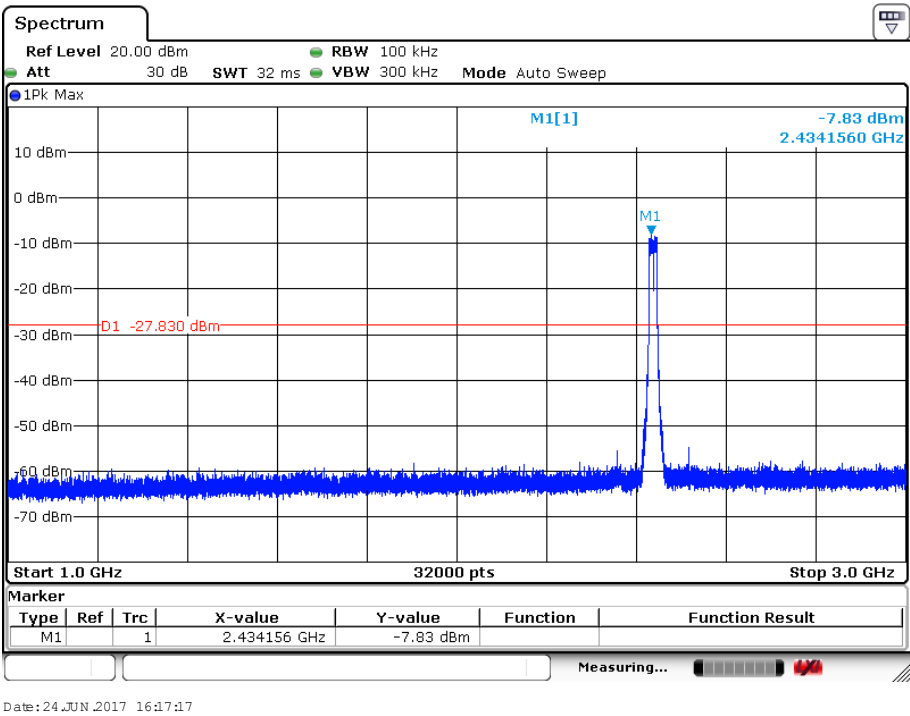
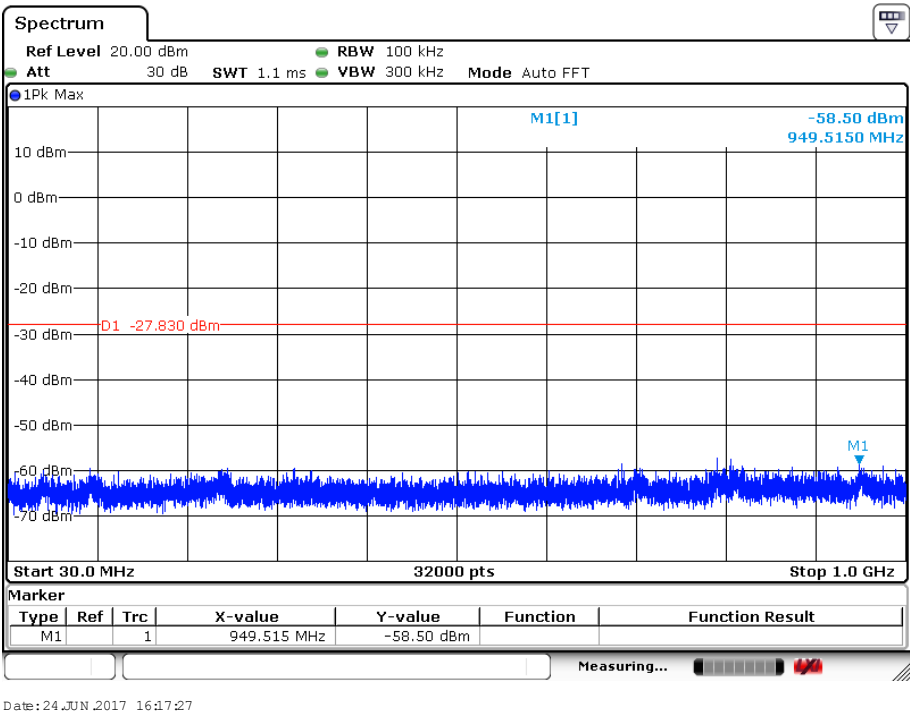
Date:24 JUN 2017 16:16:41

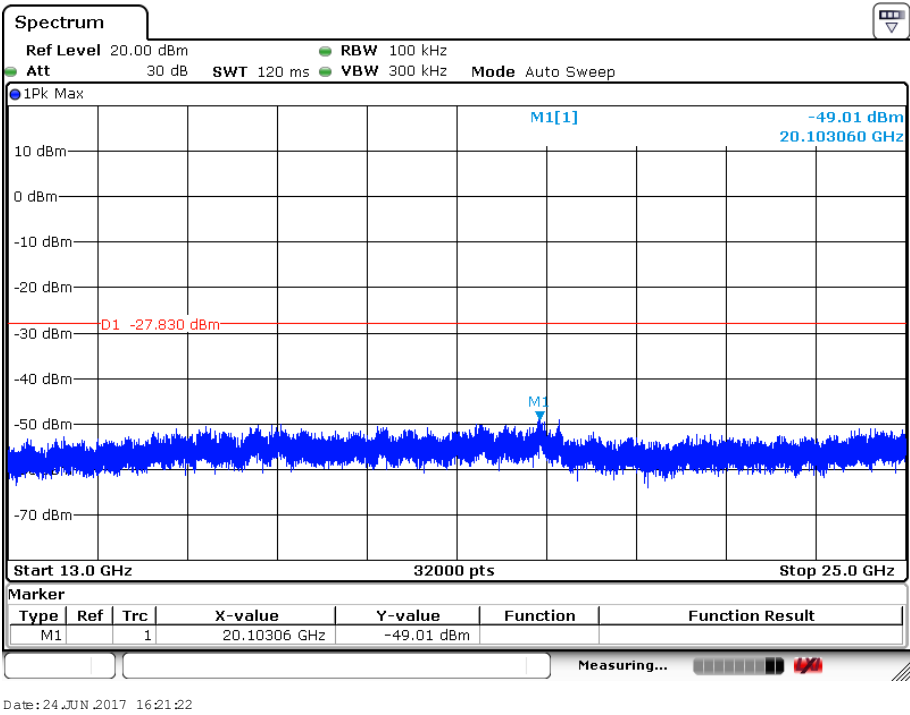
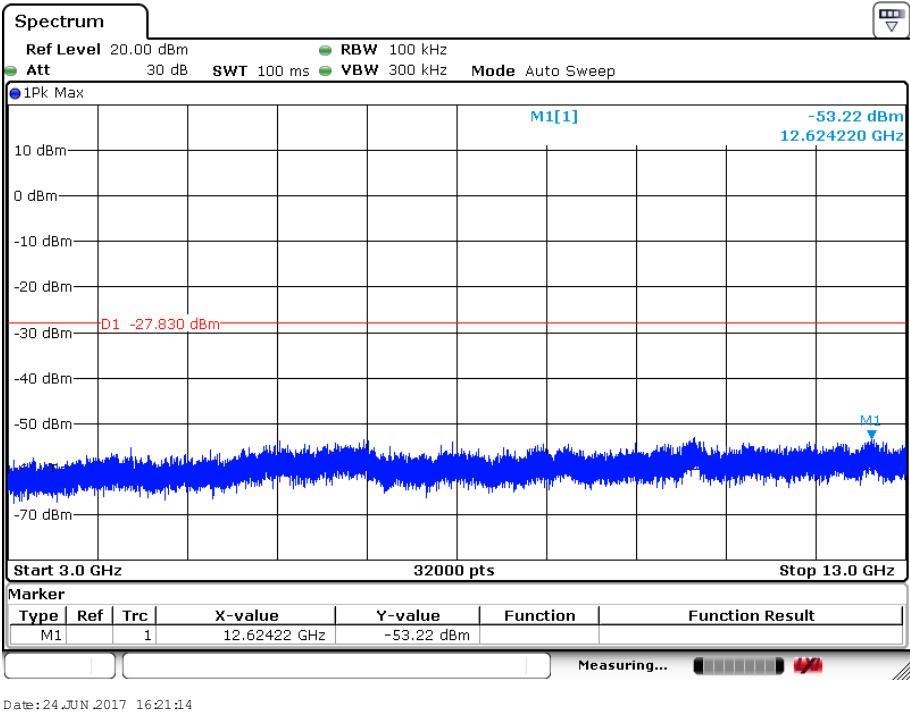


Date:24 JUN 2017 16:16:55



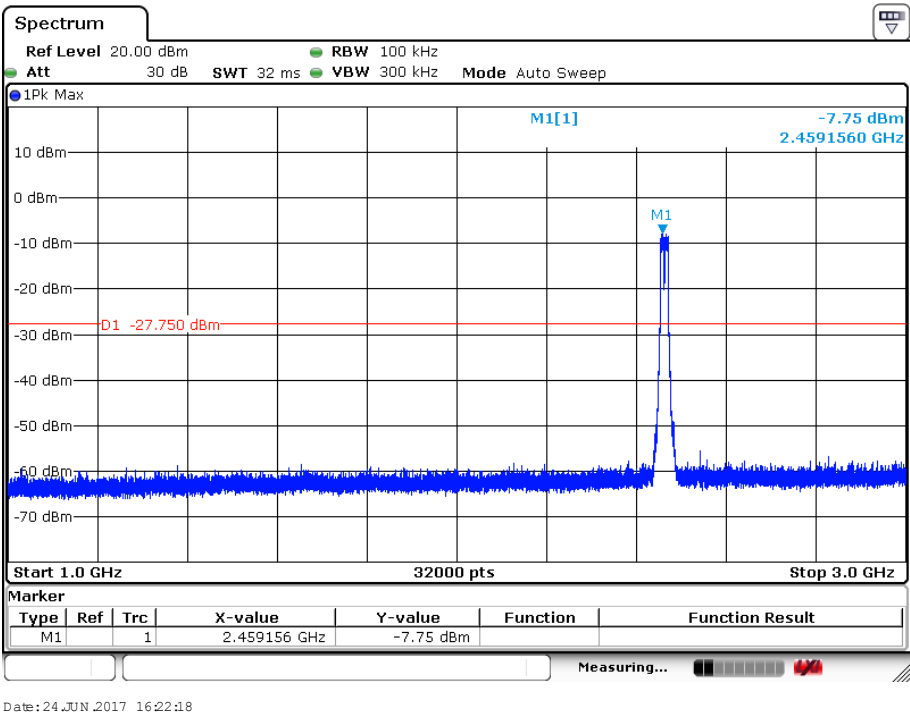
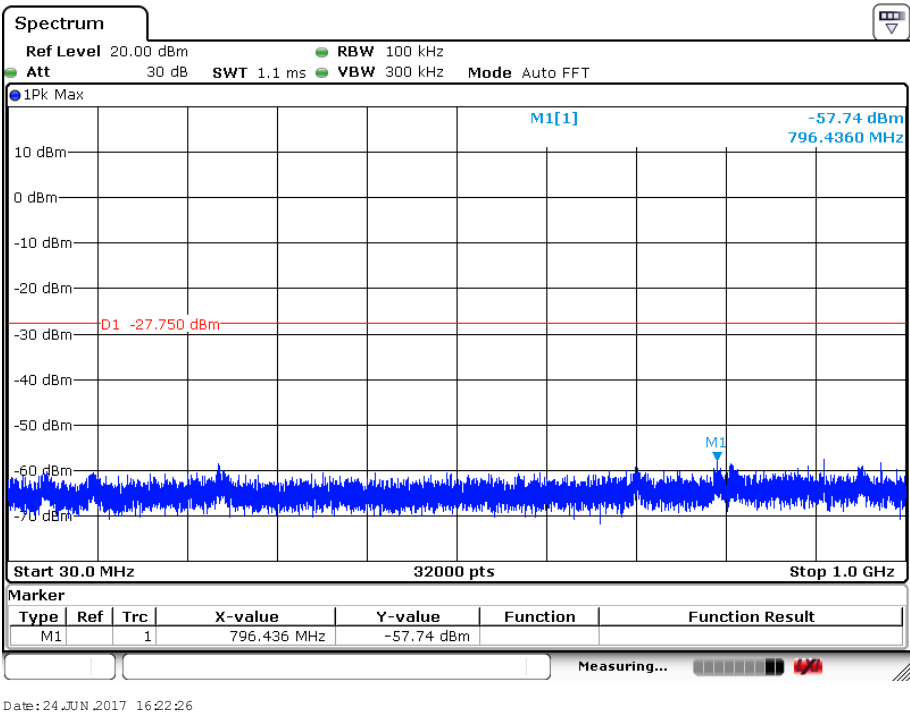
Middle

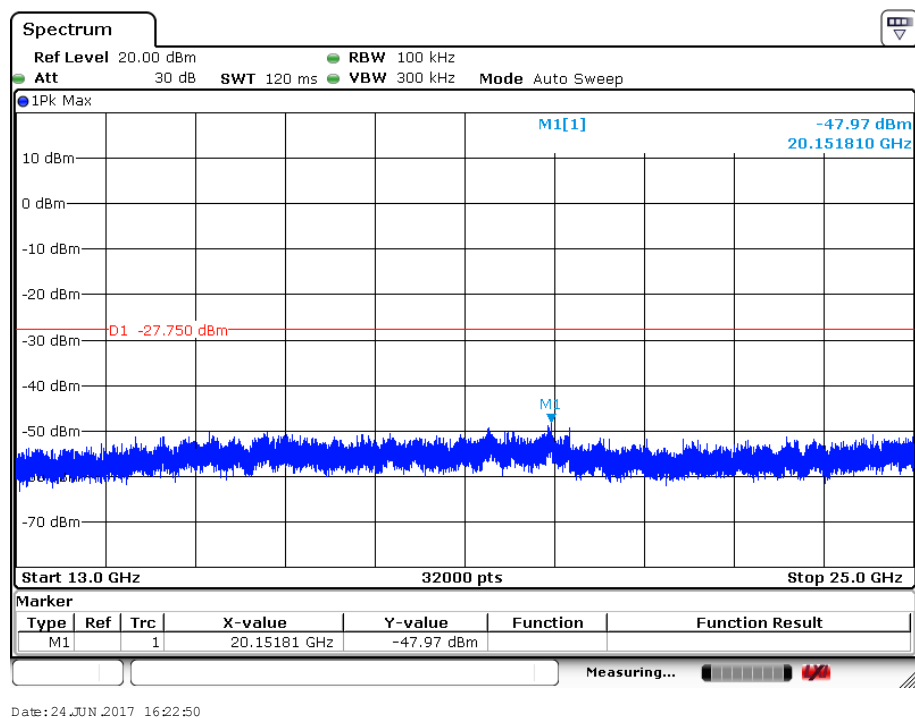
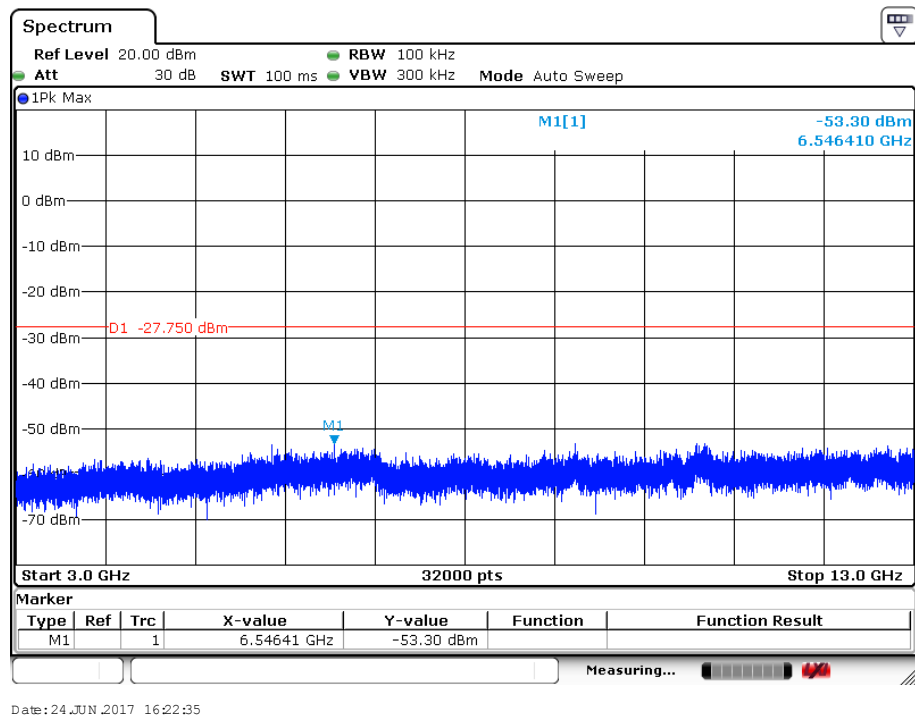






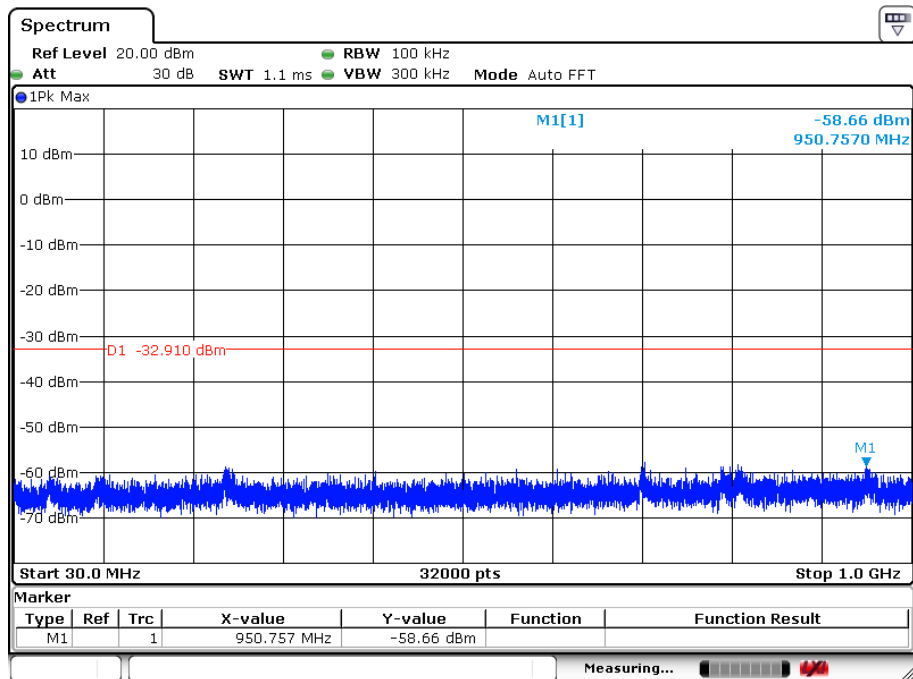
Highest



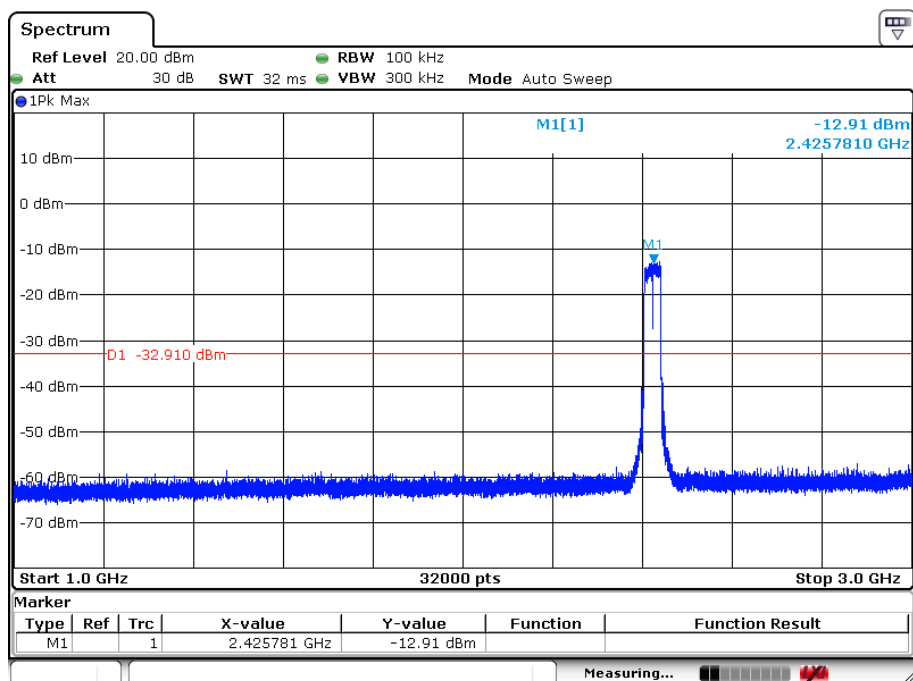




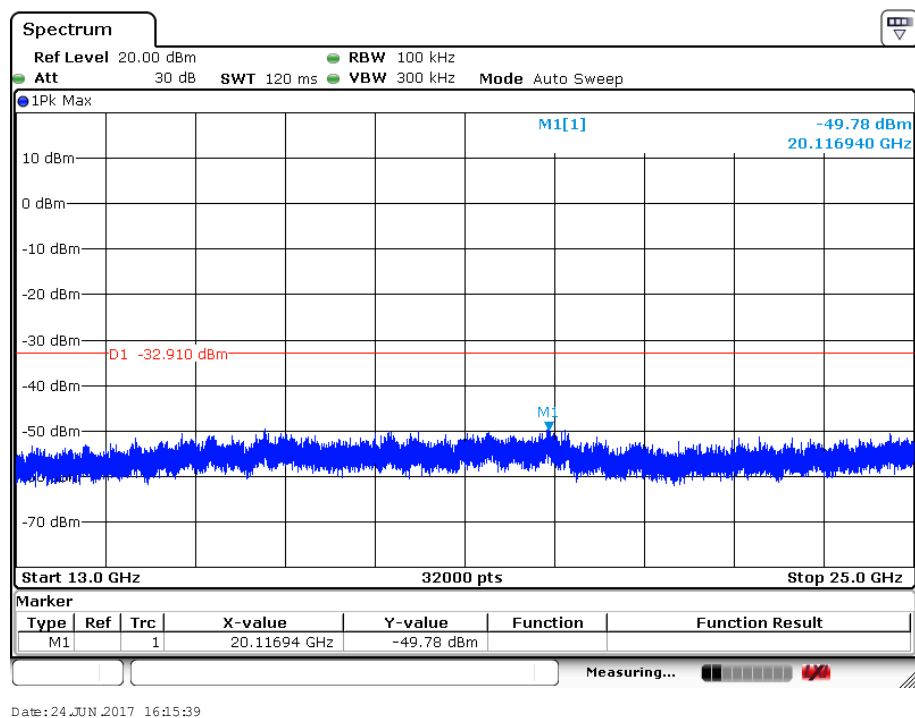
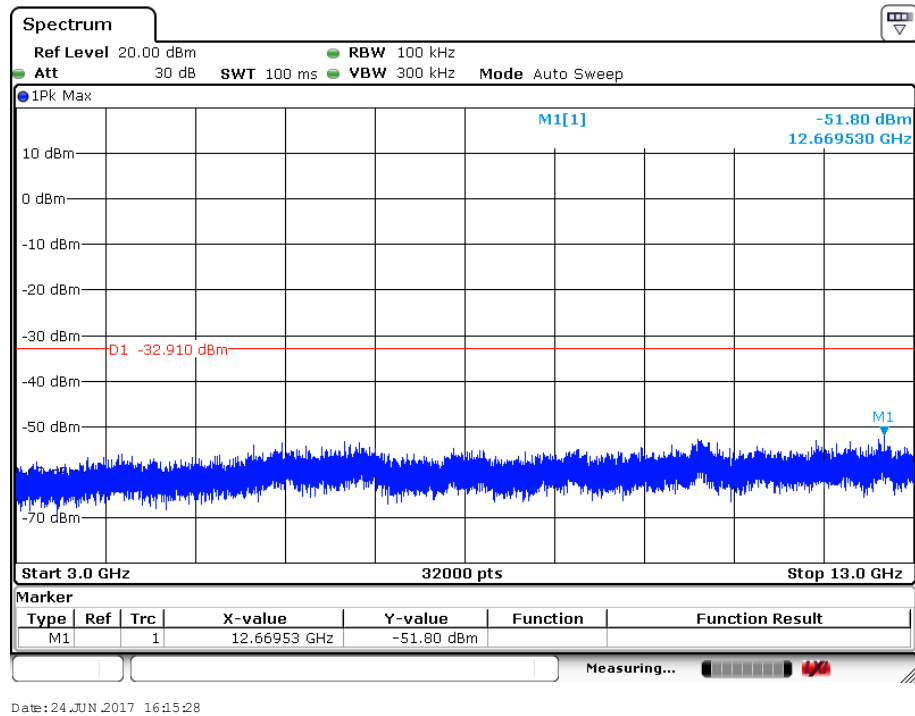
802.11-40-lowest



Date:24 JUN 2017 16:15:18

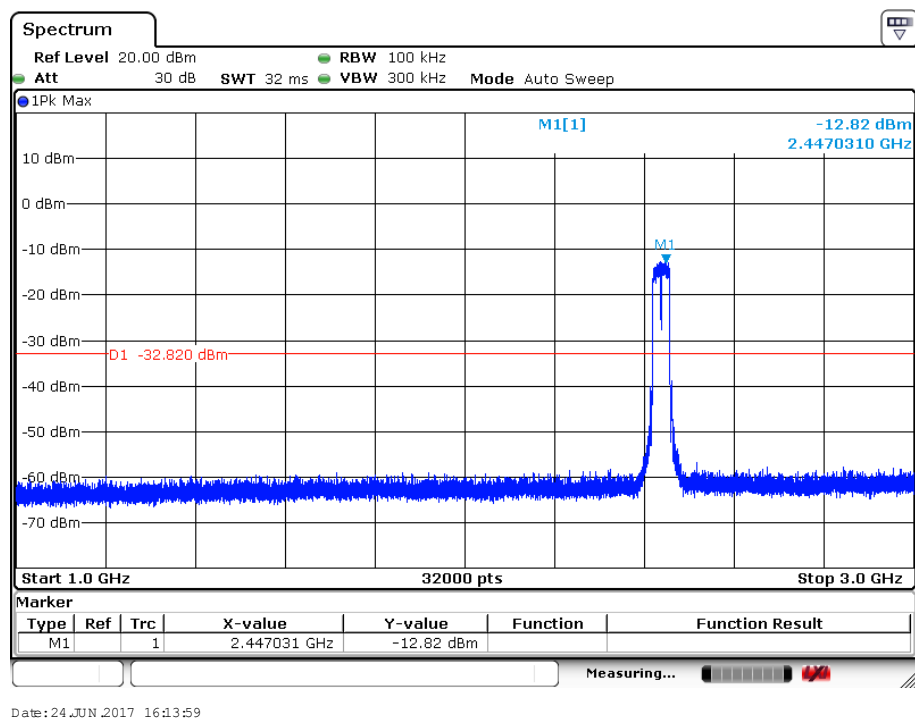
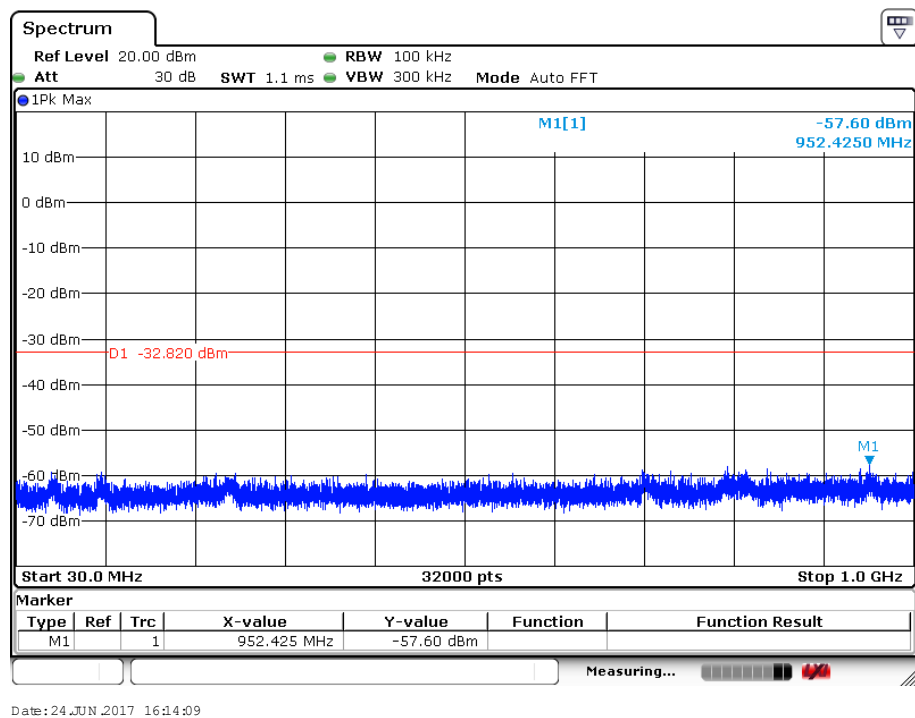


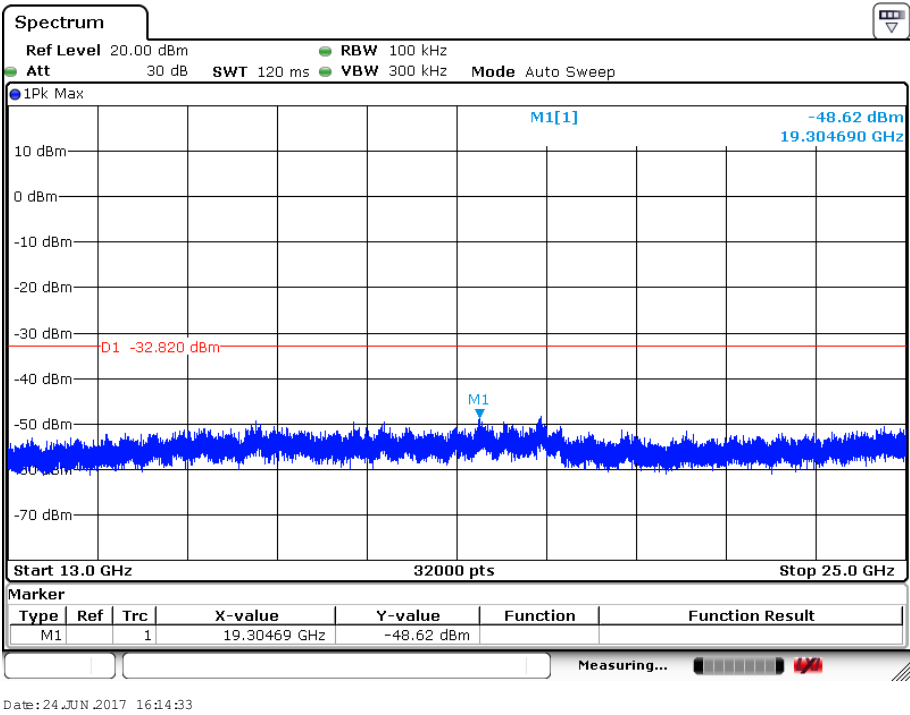
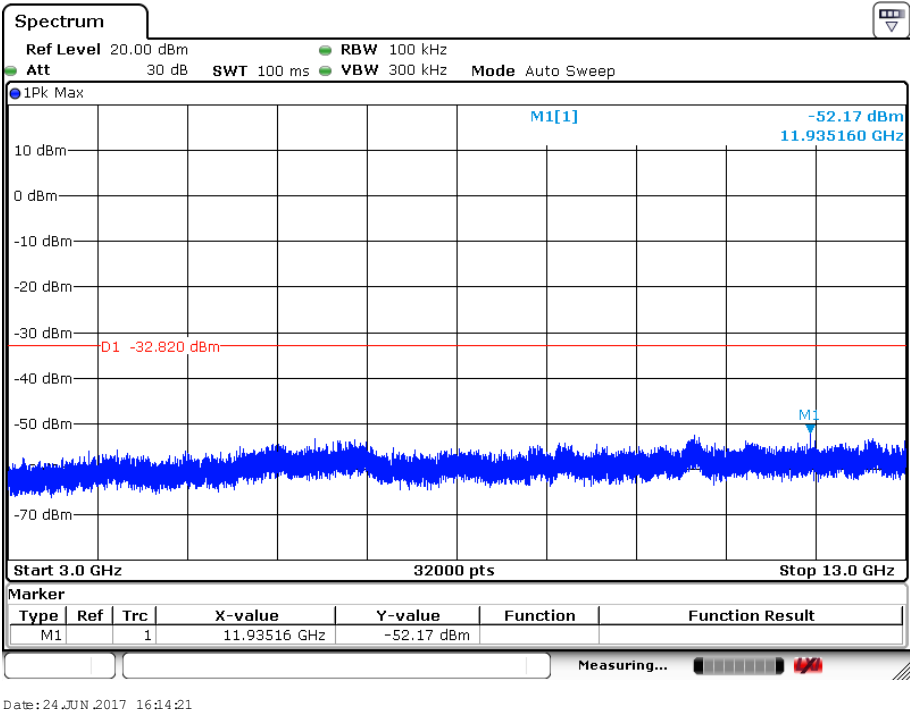
Date:24 JUN 2017 16:15:07





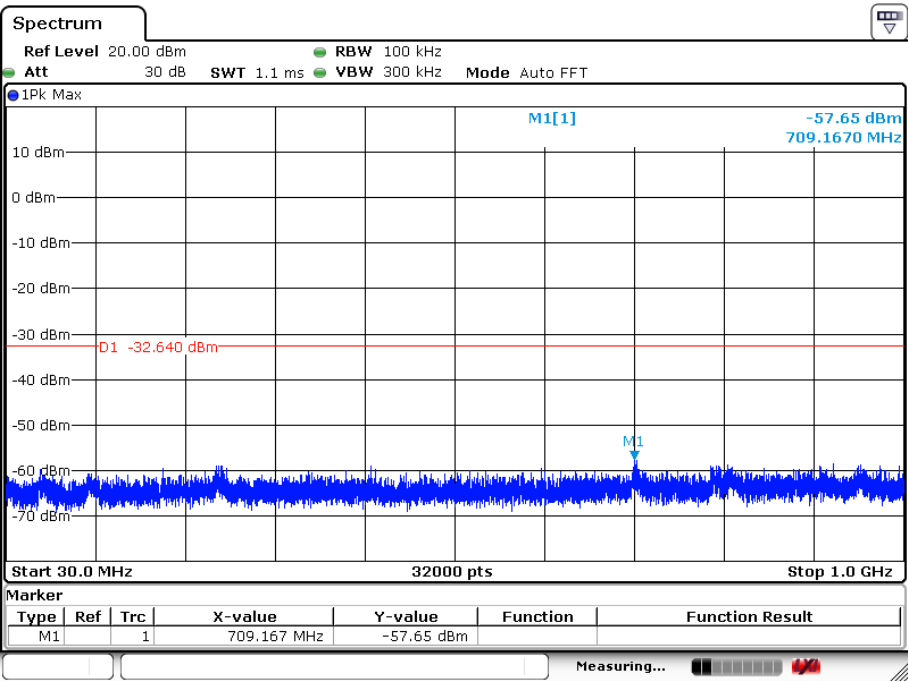
Middle



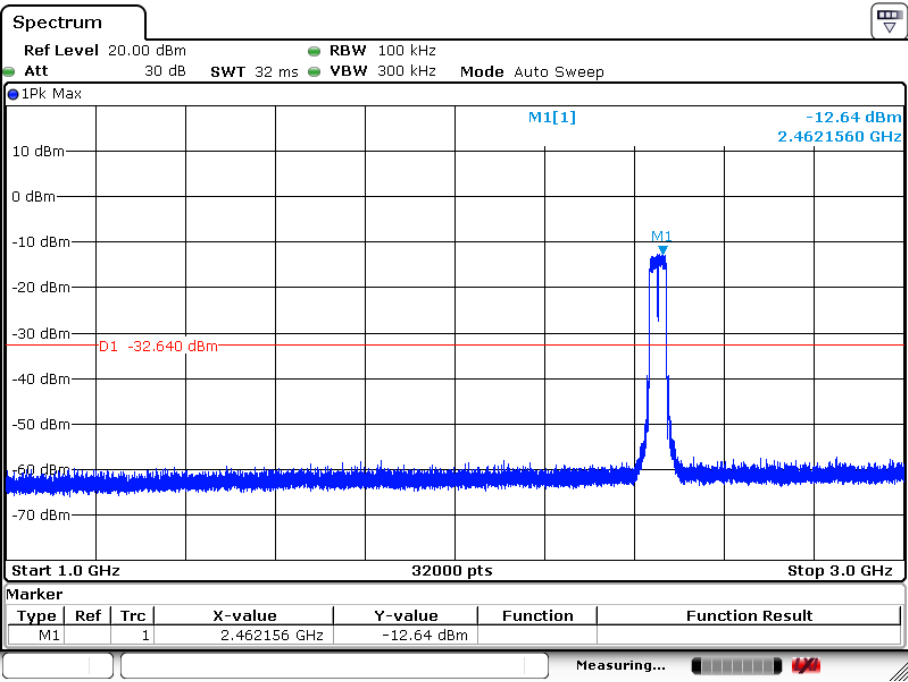




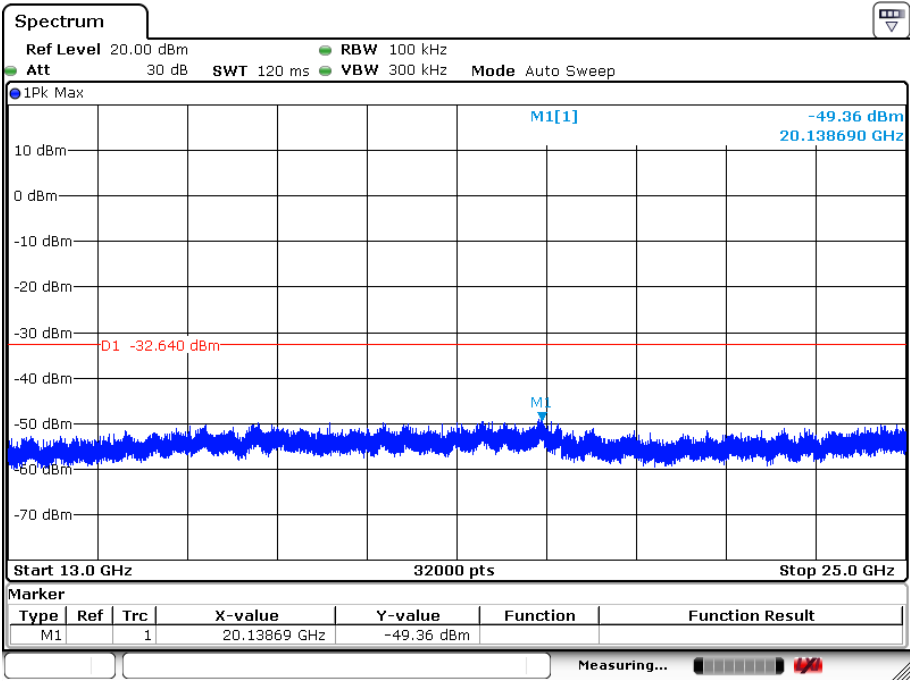
Highest



Date: 24 JUN 2017 16:13:09



Date: 24 JUN 2017 16:12:51



Date:24 JUN 2017 16:13:37



9. Out of Band Emissions

9.1 Standard Applicable

According to §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 §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

9.2 Test Procedure

According to the KDB 558074D01 v03r05, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)

RBW = 1MHz, VBW = 1MHz for peak value measured

RBW = 1MHz, VBW = 10Hz for average value measured

Sweep = auto; Detector function = peak/average; Trace = max hold

All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

According to the KDB 558074 D01 v03r05, the conducted spurious emissions test method as follows:

1. Set start frequency to DTS channel edge frequency.
2. Set stop frequency so as to encompass the spectrum to be examined.
3. Set RBW = 100 kHz.
4. Set VBW $\geq$ 300 kHz.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

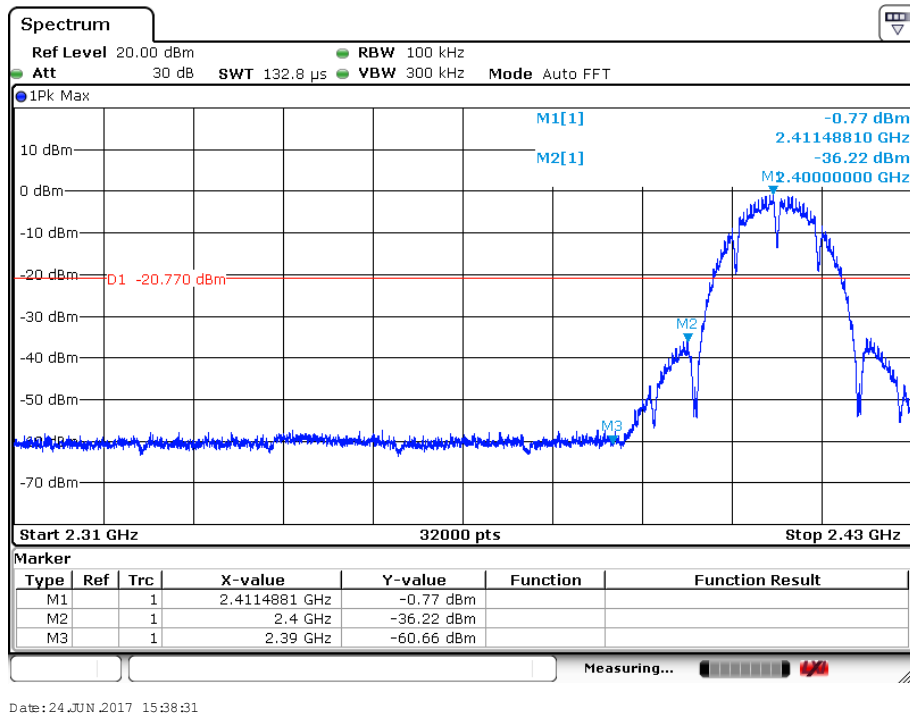


9.3 Environmental Conditions

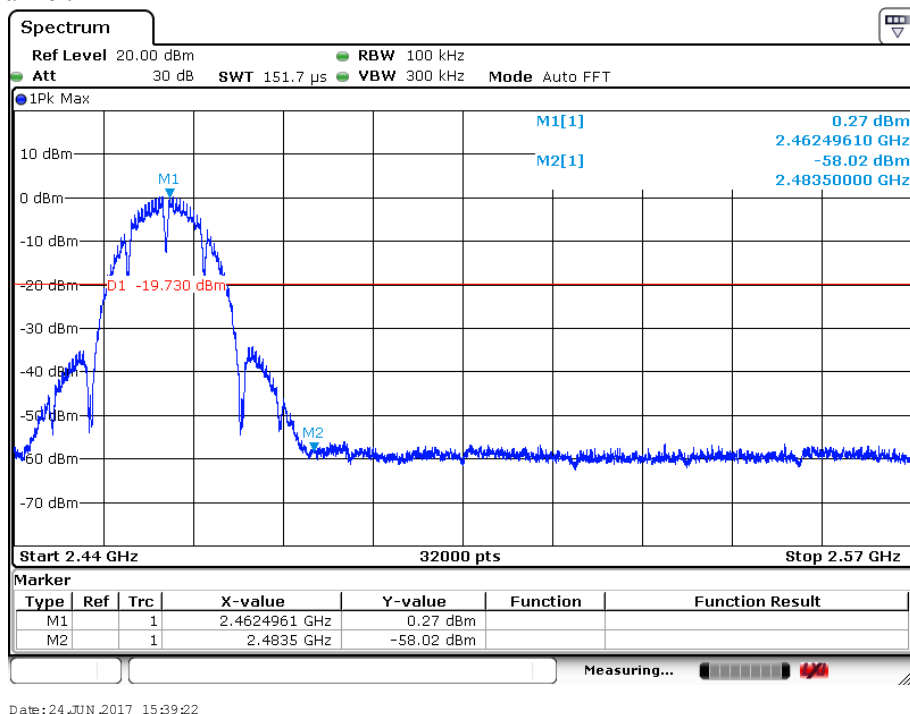
Temperature:	21°C
Relative Humidity:	50%
ATM Pressure:	101.2

9.4 Summary of Test Results/Plots

802.11b Low channel:

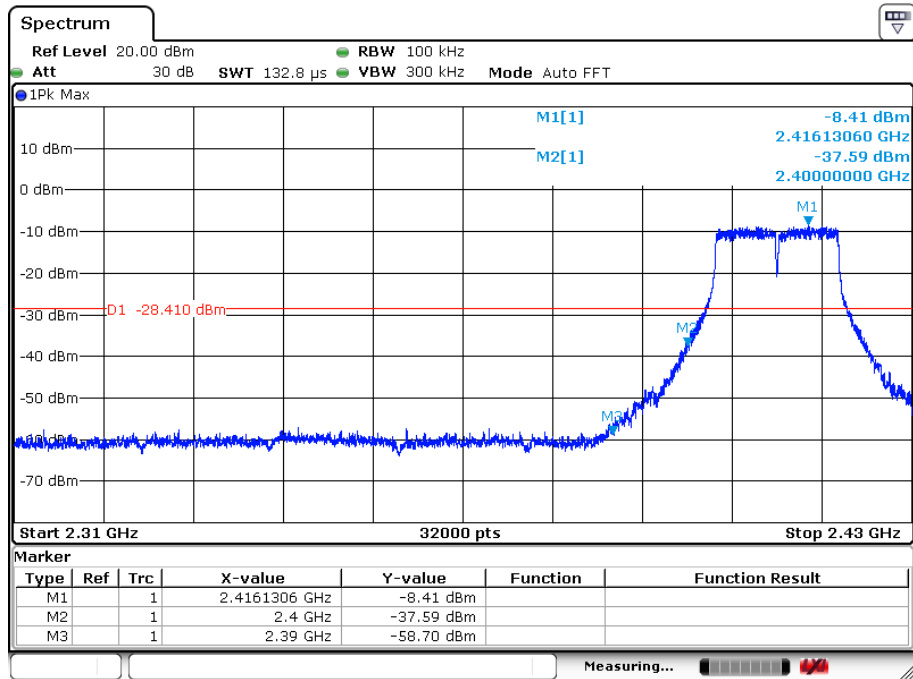


802.11b High channel:



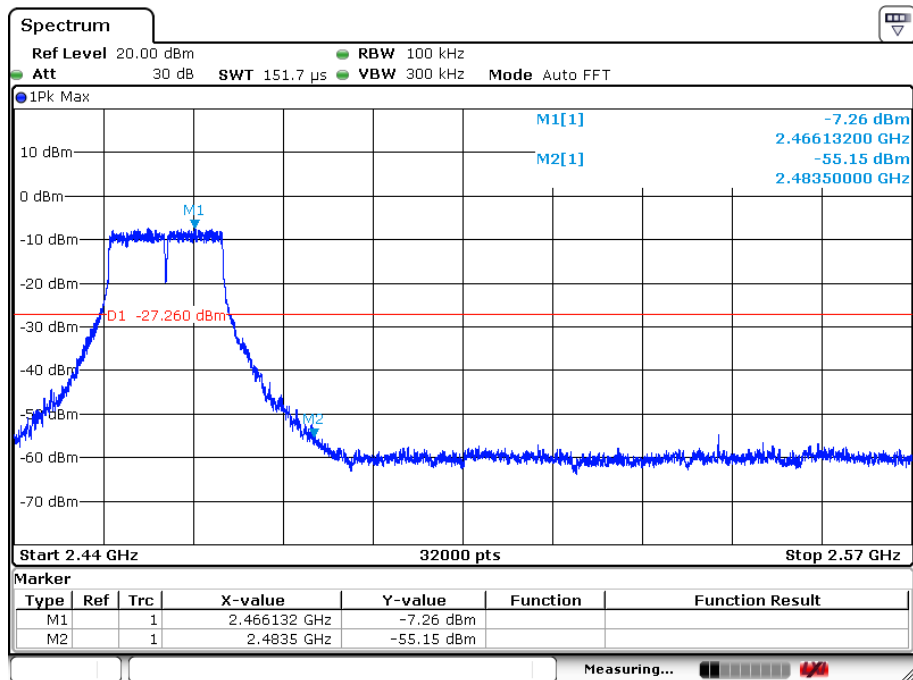


802.11g Low channel:



Date: 24 JUN 2017 15:38:04

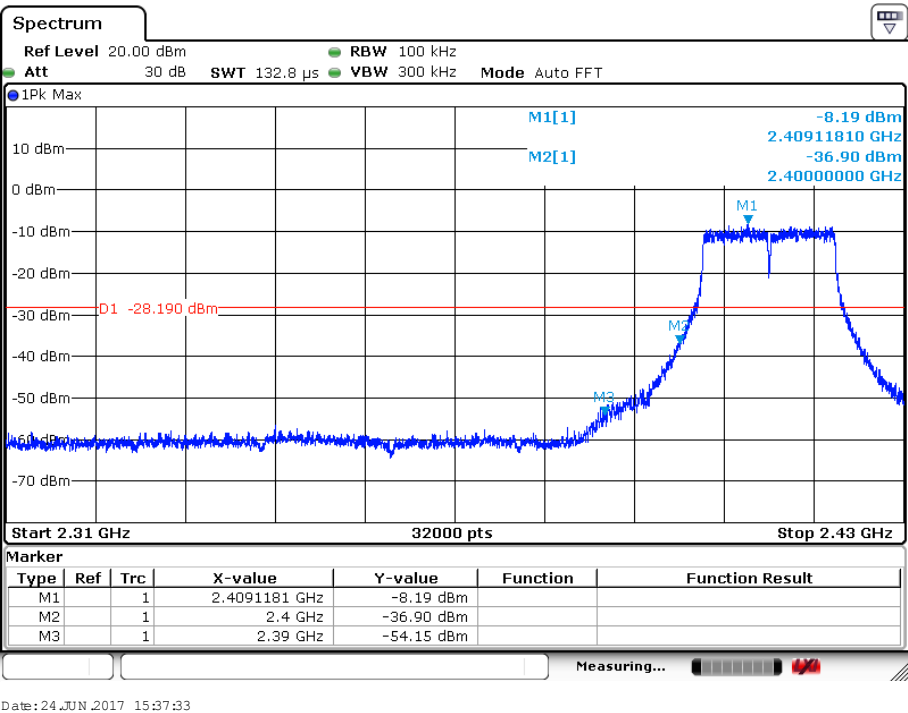
802.11g High channel:



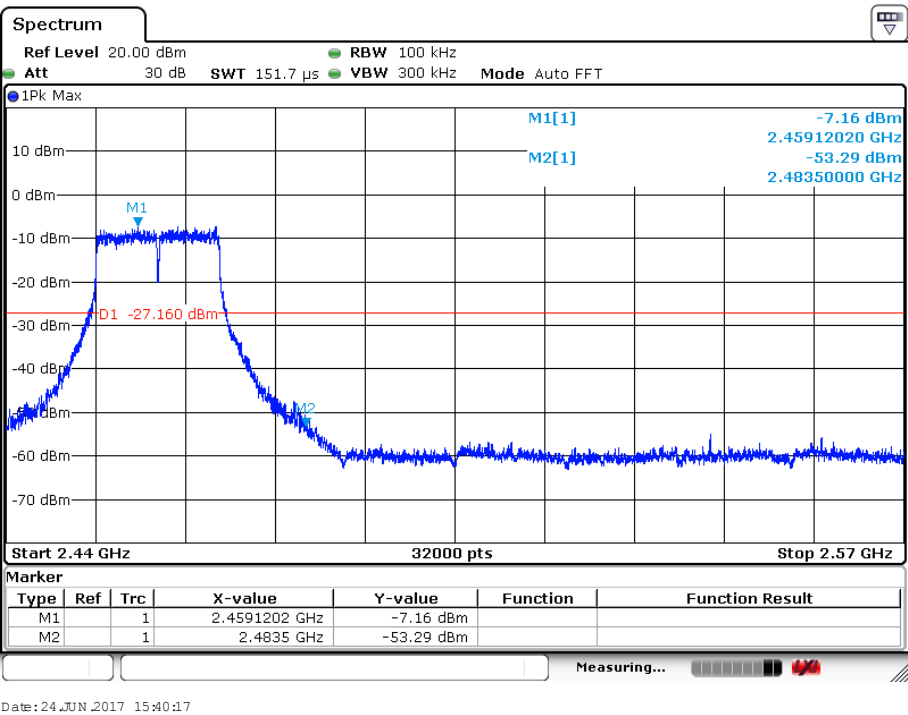
Date: 24 JUN 2017 15:39:51



802.11n HT20 Low channel:

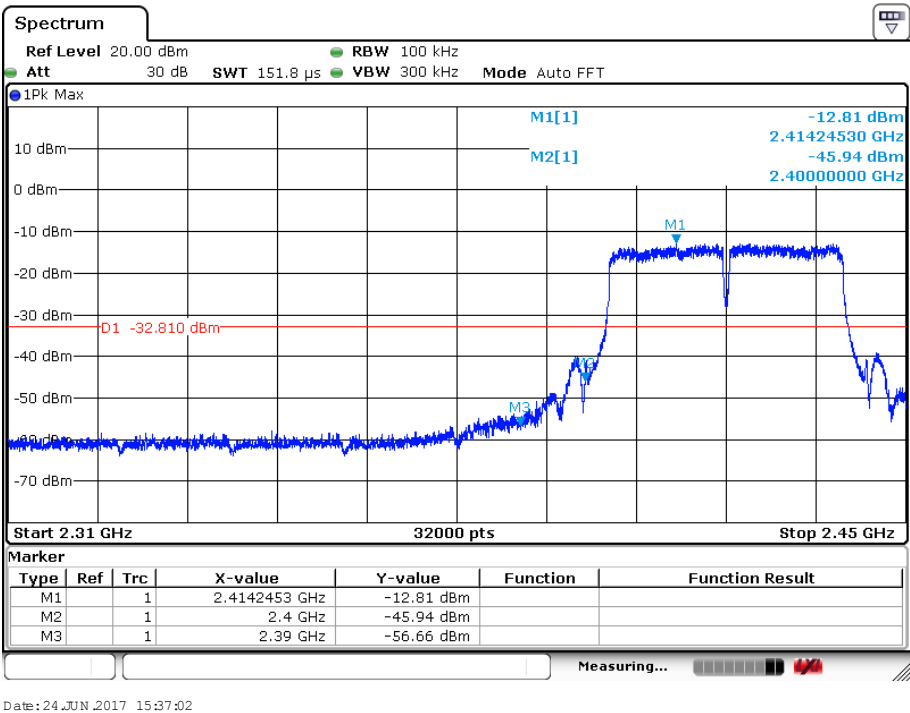


802.11n HT20 High channel:

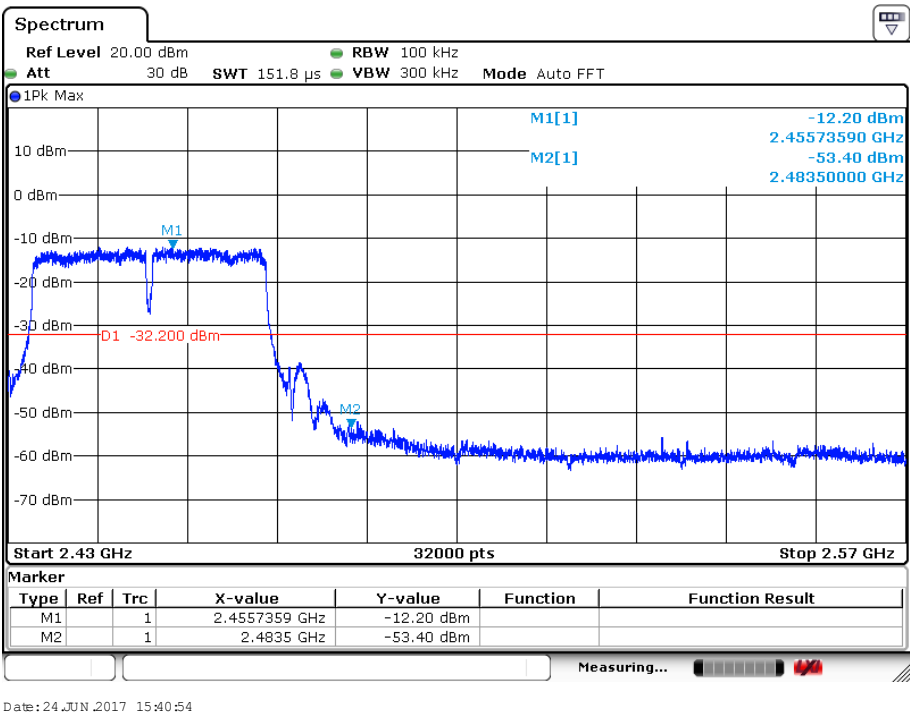




802.11n HT40 Low channel:



802.11n HT40 High channel:



10. Conducted Emissions

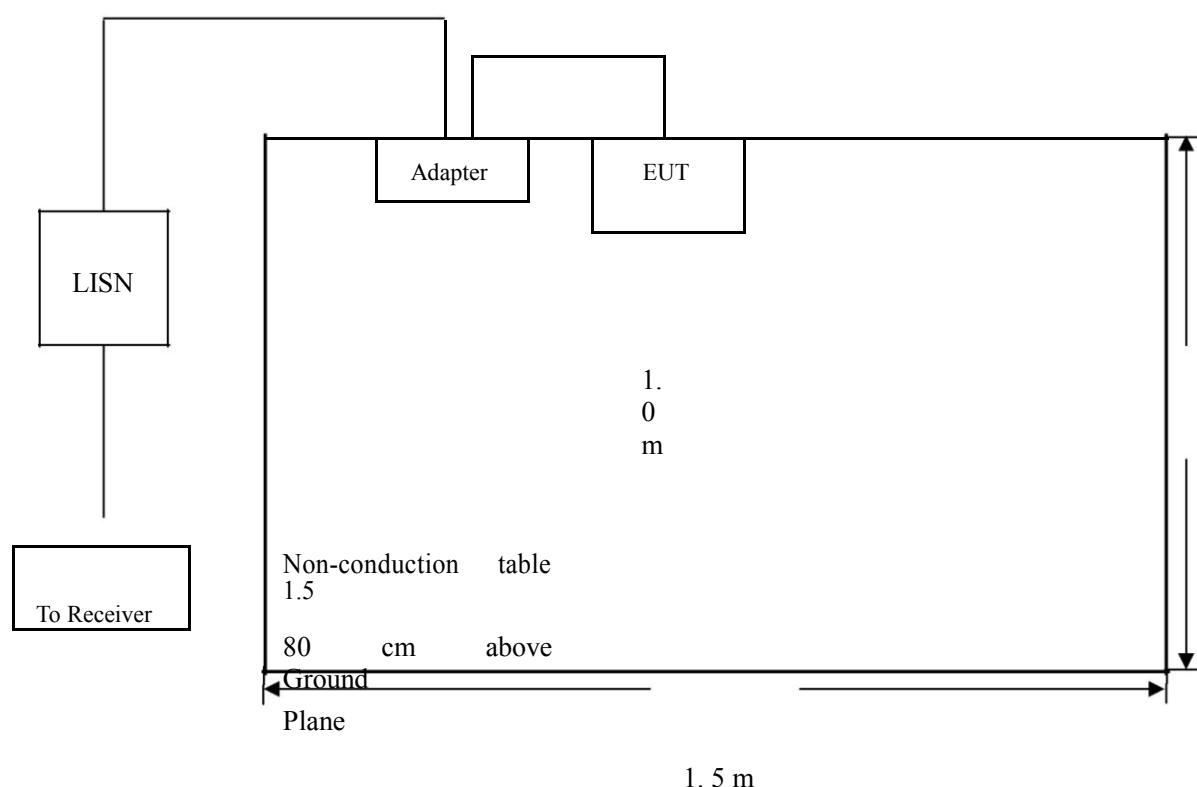
10.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

10.2 Basic Test Setup Block Diagram





10.3 Environmental Conditions

Temperature:	22°C
Relative Humidity:	53%
ATM Pressure:	101.1 mbar

10.4 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed Auto
IF Bandwidth 10 kHz
Quasi-Peak Adapter Bandwidth 9 kHz
Quasi-Peak Adapter Mode Normal

10.5 Summary of Test Results/Plots

According to the data in section 12.6, the EUT complied with the FCC Part 15.207 Conducted margin for this device, with the *worst* margin reading of:

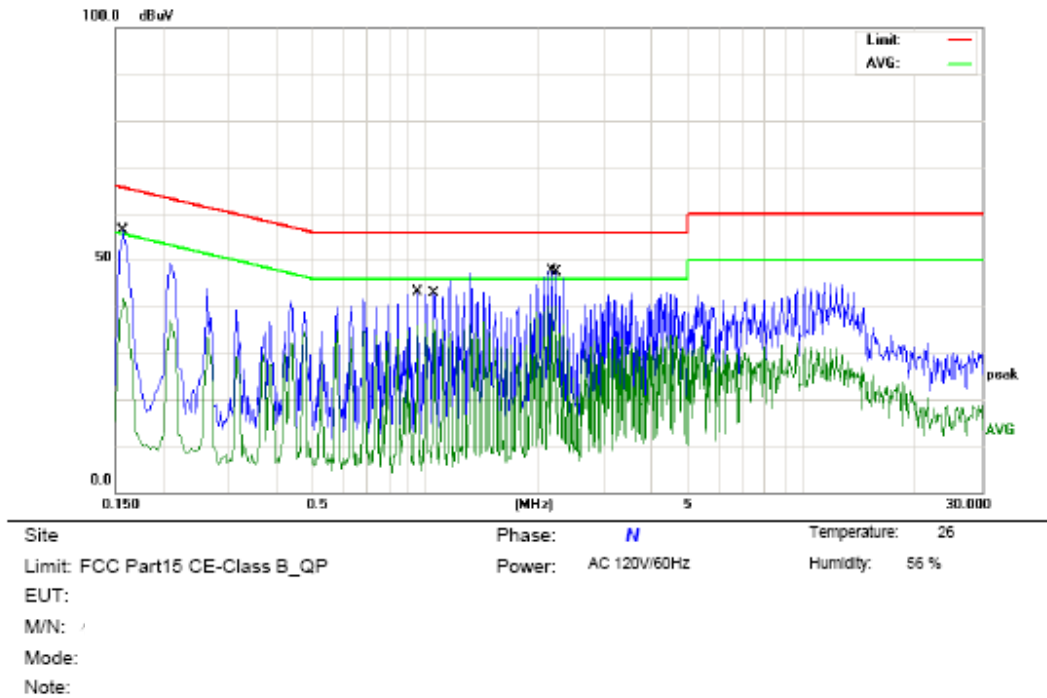
-3.80 dB at 2.19MHz in the L mode,AVG detector, 0.15-30MHz

10.6 Conducted Emissions Test Data



N

Conducted Emission Measurement

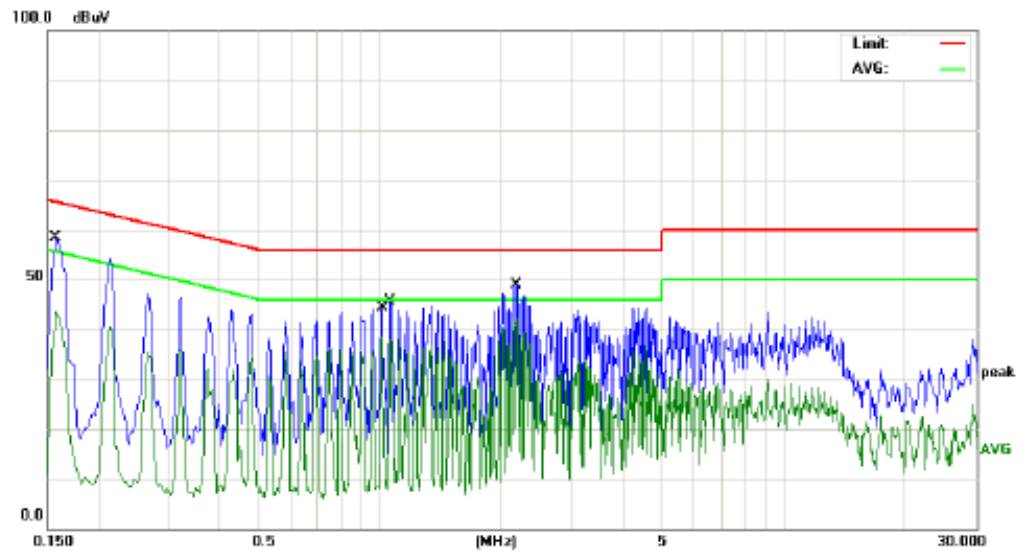


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1580	44.83	11.75	56.38	65.56	-9.18	QP	
2		0.1580	30.11	11.75	41.86	55.56	-13.70	AVG	
3		0.9500	33.16	9.94	43.10	56.00	-12.90	QP	
4		1.0540	26.93	9.94	36.87	46.00	-9.13	AVG	
5		2.1619	37.72	10.00	47.72	56.00	-8.28	QP	
6	*	2.2180	30.16	10.00	40.16	48.00	-5.84	AVG	



L

Conducted Emission Measurement

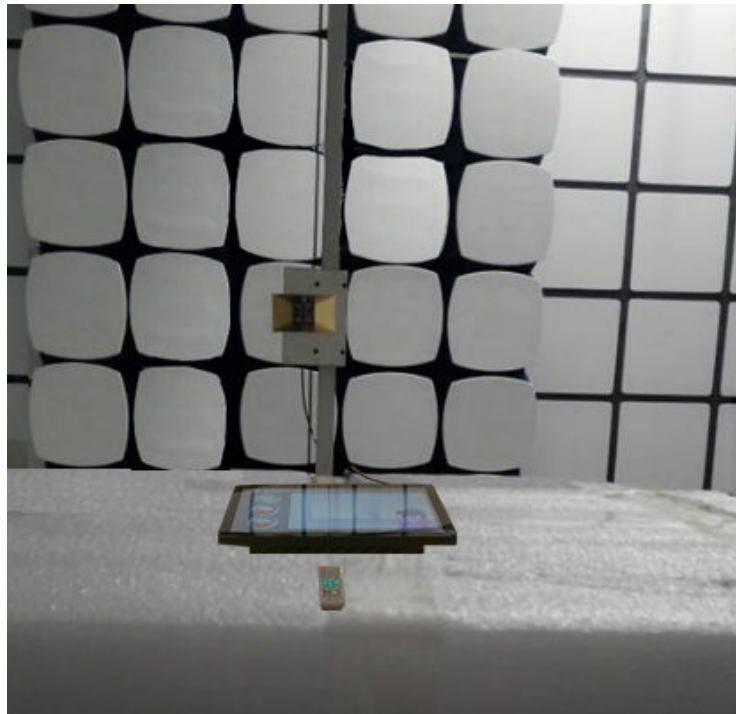


Site: Phase: **L1** Temperature: 26
Limit: FCC Part15 CE-Class B_QP Power: AC 120V/60Hz Humidity: 56 %
EUT:
M/N:
Mode:
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1580	46.50	11.75	58.25	65.56	-7.31	QP	
2		0.1580	31.78	11.75	43.53	55.56	-12.03	AVG	
3		1.0140	28.80	9.94	38.54	48.00	-7.46	AVG	
4		1.0620	35.58	9.94	45.52	58.00	-10.48	QP	
5		2.1780	38.99	10.00	48.99	58.00	-7.01	QP	
6	*	2.1900	32.20	10.00	42.20	48.00	-3.80	AVG	



11.Test Photo



Test report