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FCC RADIO TEST REPORT

Applicant's company	**Fortinet Inc.**
Applicant Address	899 Kifer Road Sunnyvale, CA 94086, USA
FCC ID	**TVE-28166022**
Manufacturer's company	**Fortinet Inc.**
Manufacturer Address	899 Kifer Road Sunnyvale, CA 94086, USA

Product Name	Secured Wireless Access Point
Brand Name	FORTINET
Model No.	FORTIAP-S421Exxxxxx, FortiAP S421Exxxxxx, FAP-S421Exxxxxx, FORTIAP-S423Exxxxxx, FortiAP S423Exxxxxx, FAP-S423Exxxxxx (Please refer to section 3.7 for more detail information)
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	Jan. 25, 2016
Final Test Date	Jul. 22, 2016
Submission Type	Original Equipment

Statement

Test result included in this report is for the IEEE 802.11n and IEEE 802.11b/g of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart C**, **KDB558074 D01 v03r05** and **KDB 662911 D01 v02r01.**

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5N2028AA	Rev. 01	Initial issue of report	Jul. 26, 2016
FR5N2028AA	Rev. 02	1. Adding PoE mode for AC Power Line Conducted Emissions Measurement. 2. Adding a note at page 24. 3. Revising the equation of directional gain. 4. Revising the Calibration Date of EMI Receiver.	Aug. 15, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Secured Wireless Access Point
Brand Name	:	FORTINET
Model No.	:	FORTIAP-S421Exxxxxx, FortiAP S421Exxxxxx, FAP-S421Exxxxxx, FORTIAP-S423Exxxxxx, FortiAP S423Exxxxxx, FAP-S423Exxxxxx (Please refer to section 3.7 for more detail information)
Applicant	:	Fortinet Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jan. 25, 2016 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C			
Part	**Rule Section**	**Description of Test**	**Result**
4.1	15.207	AC Power Line Conducted Emissions	Complies
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies
4.3	15.247(e)	Power Spectral Density	Complies
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies
4.5	15.247(d)	Radiated Emissions	Complies
4.6	15.247(d)	Band Edge Emissions	Complies
4.7	15.203	Antenna Requirements	Complies

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From adapter or PoE
Modulation	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n: see the below table
Data Modulation	IEEE 802.11b: DSSS (BPSK / QPSK / CCK) IEEE 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) VHT20/VHT40: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11b: DSSS (1/ 2/ 5.5/11) IEEE 802.11g: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n: see the below table
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Channel Band Width (99%)	For non-beamforming function: IEEE 802.11b: 13.29 MHz IEEE 802.11g: 16.58 MHz MCS0 (VHT20): 17.71 MHz MCS0 (VHT40): 36.32 MHz For beamforming function: MCS0 (VHT20): 17.71 MHz MCS0 (VHT40): 36.18 MHz
Maximum Conducted Output Power	For non-beamforming function: IEEE 802.11b: 25.37 dBm IEEE 802.11g: 26.84 dBm MCS0 (VHT20): 26.72 dBm MCS0 (VHT40): 21.63 dBm For beamforming function: MCS0 (VHT20): 23.88 dBm MCS0 (VHT40): 21.52 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☒ With beamforming	☐ Without beamforming
	The product has beamforming function for HT20, HT40, VHT20,VHT40 in 2.4G and 802.11n/ac in 5GHz.	

Antenna and Band width

Antenna	Four (TX)	
Band width Mode	20 MHz	40 MHz
IEEE 802.11b	V	X
IEEE 802.11g	V	X
IEEE 802.11n	V	V

IEEE 11n Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	4	MCS 0-31
802.11n (HT40)	4	MCS 0-31
(VHT20)	4	MCS 0-31
(VHT40)	4	MCS 0-31
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40. Note 2: Then EUT supports VHT20, VHT40 in 2.4GHz band. Note 3: Modulation modes consist of below configuration: HT20/HT40/VHT20/VHT40.		

3.2. Accessories

Power	Brand	Model No.	Rating
Adapter (Removable plug)	APD	WA-36A12R	Input: 100-240Vac, 50-60Hz, 0.9A Max. Output: 12Vdc, 3A
Other			
Plug*1			

3.3. Table for Filed Antenna

Internal antenna EUT:

Ant.	Brand	Part Number	Type	Connector	Gain (dBi)		
					2.4GHz	5GHz band1	5GHz band4
1	Senao	5718A0167300	PIFA	I-PEX	3.98	-	-
2	Senao	5718A0168300	PIFA	I-PEX	3.98	-	-
3	Senao	5718A0115300	PIFA	I-PEX	3.98	-	-
4	Senao	5718A0116300	PIFA	I-PEX	3.98	-	-
5	Senao	5718A0146300	PIFA	I-PEX	-	4.78	5.84
6	Senao	5718A0118300	PIFA	I-PEX	-	4.78	5.84
7	Senao	5718A0169300	PIFA	I-PEX	-	4.78	5.84
8	Senao	5718A0120300	PIFA	I-PEX	-	4.78	5.84

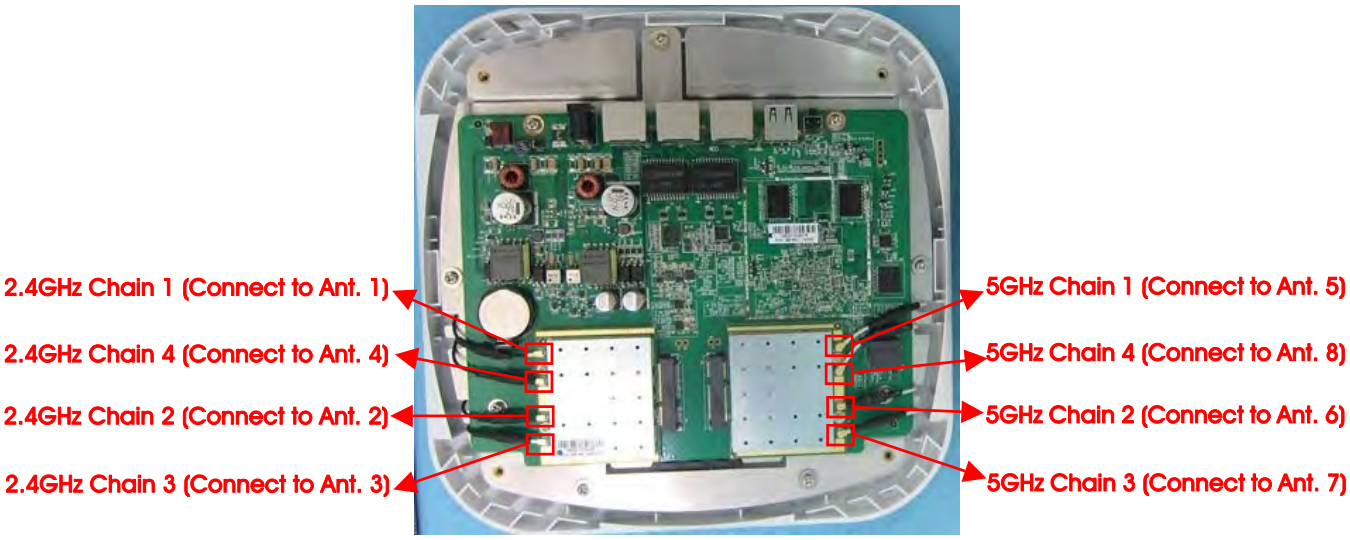
Note: The EUT has eight antennas.

For 2.4GHz WLAN function (4TX/4RX):

Chain 1, Chain 2, Chain 3 and Chain 4 could transmit/receive simultaneously.

For 5GHz WLAN function (4TX/4RX):

Chain 1, Chain 2, Chain 3 and Chain 4 could transmit/receive simultaneously.



External antenna EUT:

Ant.	Brand	Model No.	Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	MASTER WAVE TECHNOLOGY	98152MRSX010	Dipole	Reversed-SMA	4.42	-
2	MASTER WAVE TECHNOLOGY	98152MRSX010	Dipole	Reversed-SMA	4.42	-
3	MASTER WAVE TECHNOLOGY	98152MRSX010	Dipole	Reversed-SMA	4.42	-
4	MASTER WAVE TECHNOLOGY	98152MRSX010	Dipole	Reversed-SMA	4.42	-
5	MASTER WAVE TECHNOLOGY	98152URSX005	Dipole	Reversed-SMA	-	3.18
6	MASTER WAVE TECHNOLOGY	98152URSX005	Dipole	Reversed-SMA	-	3.18
7	MASTER WAVE TECHNOLOGY	98152URSX005	Dipole	Reversed-SMA	-	3.18
8	MASTER WAVE TECHNOLOGY	98152URSX005	Dipole	Reversed-SMA	-	3.18

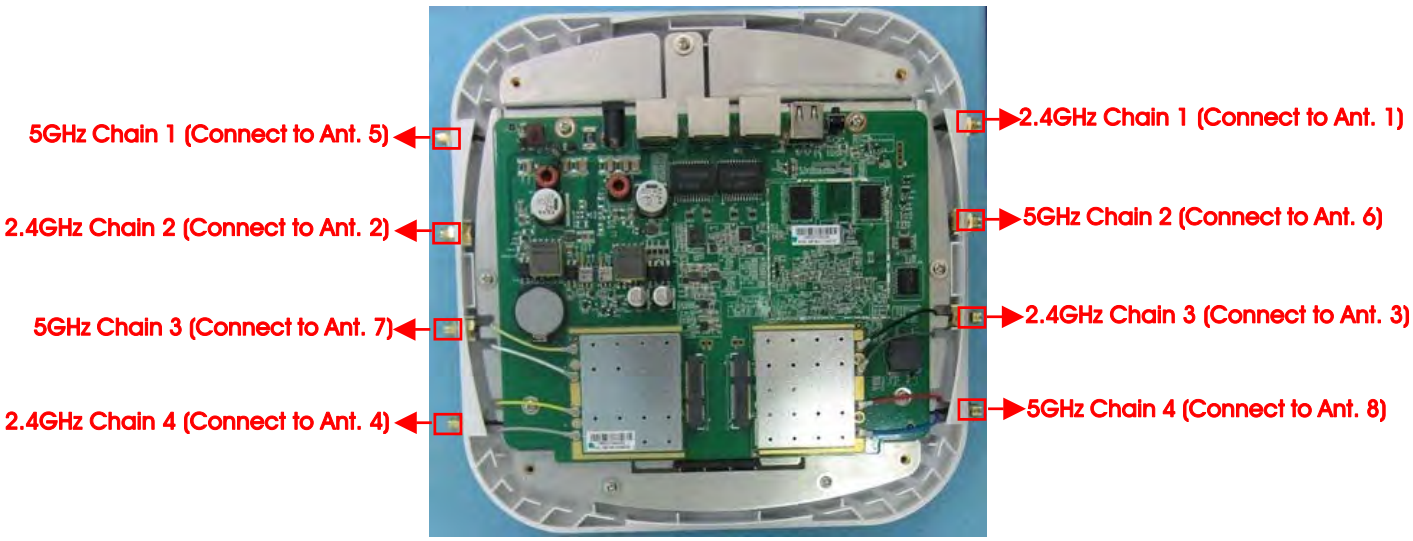
Note: The EUT has eight antennas.

For 2.4GHz WLAN function (4TX/4RX):

Chain 1, Chain 2, Chain 3 and Chain 4 could transmit/receive simultaneously.

For 5GHz WLAN function (4TX/4RX):

Chain 1, Chain 2, Chain 3 and Chain 4 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are two bandwidth systems.

For 20MHz bandwidth systems, use Channel 1~Channel 11.

For 40MHz bandwidth systems, use Channel 3~Channel 9.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz	-	-

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power	For non-beamforming function:			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4
	For beamforming function:			
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4
Power Spectral Density	For non-beamforming function:			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4
	For beamforming function:			
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4
6dB Spectrum Bandwidth	For non-beamforming function:			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4
	For beamforming function:			
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4
Radiated Emissions 9kHz~1GHz	Normal Link	-	-	-

Radiated Emissions 1GHz~10th Harmonic	For non-beamforming function:			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4
	For beamforming function:			
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4
Band Edge Emissions	For non-beamforming function:			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4
	For beamforming function:			
	VHT20	MCS0	1/6/11	1+2+3+4
	VHT40	MCS0	3/6/9	1+2+3+4

Note: 1. The console port can not be used by end user. It is generally used for updating FW.

2. All the specification of test configurations and test modes were based on customer's request.

3. VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for HT20 and HT40 are the same or lower than VHT20 and VHT40.

4. There are two functions of EUT, one is beamforming function, and the other is non-beamforming function HT20, HT40, VHT20, VHT40. All test results were recorded in this report.

4. The PoE is for measurement only, would not be marketed and its information as below:

Support Unit	Brand	Model	FCC ID
PoE	EnGenius	EPA5006GAT	DoC

5. For Normal Link mode:

The External antenna EUT (Model No.: FortiAP S423E) and Internal antenna EUT (Model No.: FortiAP S421E) were selected to perform the test and recorded in this report.

6. For CTX mode:

For Conducted measurement:

For 2.4GHz Band:

Only the External antenna EUT (Model No.: FortiAP S423E) was selected to perform the test and recorded in this report, it matched with the highest gain antenna.

For 5GHz Band:

Only the Internal antenna EUT (Model No.: FortiAP S421E) was selected to perform the test and recorded in this report, it matched with the highest gain antenna.

For Radiated measurement:

The External antenna EUT (Model No.: FortiAP S423E) and Internal antenna EUT (Model No.: FortiAP S421E) were selected to perform the test and recorded in this report.

The following test modes were performed for all tests:

AC Power Line Conducted Emissions test	
Test Mode	Description
1	External antenna EUT (Model No.: FortiAP S423E) + Adapter
2	External antenna EUT (Model No.: FortiAP S423E) + PoE
3	Internal antenna EUT (Model No.: FortiAP S421E) + Adapter
4	Internal antenna EUT (Model No.: FortiAP S421E) + PoE
Mode 3 generated the worst test result, so it was recorded in this report.	

Radiated Emissions 9kHz~1GHz test	
There are four modes as below: 1. External antenna EUT (Model No.: FortiAP S423E) in Y axis 2. External antenna EUT (Model No.: FortiAP S423E) in Z axis 3. Internal antenna EUT (Model No.: FortiAP S421E) in Y axis 4. Internal antenna EUT (Model No.: FortiAP S421E) in Z axis After evaluating, "External antenna EUT (Model No.: FortiAP S423E) in Z axis" and "Internal antenna EUT (Model No.: FortiAP S421E) in Z axis" has been evaluated to be the worst case, so the measurement will follow this same test configuration.	
Test Mode	Description
1	External antenna EUT (Model No.: FortiAP S423E) in Z axis + Adapter
2	External antenna EUT (Model No.: FortiAP S423E) in Z axis + PoE
3	Internal antenna EUT (Model No.: FortiAP S421E) in Z axis + Adapter
4	Internal antenna EUT (Model No.: FortiAP S421E) in Z axis + PoE
Mode 2 generated the worst test result, so it was recorded in this report.	

Radiated Emissions 1GHz~10th Harmonic test	
The EUT can be placed in Y axis and Z axis. After evaluating, Y axis was the worst case, so it's recorded in this report.	
Test Mode	Description
1	External antenna EUT (Model No.: FortiAP S423E) in Y axis
2	Internal antenna EUT (Model No.: FortiAP S421E) in Y axis

Radiated Emission Co-location test	
Test Mode	Description
1	External antenna EUT (Model No.: FortiAP S423E) in Y axis
2	External antenna EUT (Model No.: FortiAP S423E) in Z axis
3	Internal antenna EUT (Model No.: FortiAP S421E) in Y axis
4	Internal antenna EUT (Model No.: FortiAP S421E) in Z axis

Radiated Emission Co-location test
Mode 1 and Mode 4 generated the worst test result, so it was recorded in this report.

Co-location MPE and Radiated Emission Co-location test
The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA5N2028) and Radiated Emission Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

3.6. Table for Testing Locations

Test Site Location				
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.			
TEL:	886-3-656-9065			
FAX:	886-3-656-9085			
Test Site No.	**Site Category**	**Location**	**FCC Designation No.**	**IC File No.**
03CH01-CB	SAC	Hsin Chu	TW0006	IC 4086D
CO01-CB	Conduction	Hsin Chu	TW0006	IC 4086D
TH01-CB	OVEN Room	Hsin Chu	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

3.7. Table for Multiple Listing

The EUT has six model numbers which are identical to each other in all aspects except for the following table:

Model No.	Description	Remark
FORTIAP-S421Exxxxxx	Where "x" can be used as "A-Z", or "-0-9", or "-", or blank for software changes or marketing purposes only.	Internal antenna EUT
FortiAP S421Exxxxxx		
FAP-S421Exxxxxx		
FORTIAP-S423Exxxxxx	Where "x" can be used as "A-Z", or "-0-9", or "-", or blank for software changes or marketing purposes only.	External antenna EUT
FortiAP S423Exxxxxx		
FAP-S423Exxxxxx		

Note: 1. For Normal Link mode:

The External antenna EUT (Model No.: FortiAP S423E) and Internal antenna EUT (Model No.: FortiAP S421E) were selected to perform the test and recorded in this report.

2. For CTX mode:

For Conducted measurement:

For 2.4GHz Band:

Only the External antenna EUT (Model No.: FortiAP S423E) was selected to perform the test and recorded in this report, it matched with the highest gain antenna.

For 5GHz Band:

Only the Internal antenna EUT (Model No.: FortiAP S421E) was selected to perform the test and recorded in this report, it matched with the highest gain antenna.

For Radiated measurement:
The External antenna EUT (Model No.: FortiAP S423E) and Internal antenna EUT (Model No.: FortiAP S421E) were selected to perform the test and recorded in this report.

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB (below 1GHz)

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E6430	DoC
Flash disk	Silicon	I-Series	DoC
PoE	EnGenius	EPA5006GAT	DoC

For Test Site No: 03CH01-CB (above 1GHz)

For non-beamforming function:

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC
PoE	EnGenius	EPA5006GAT	DoC

For beamforming function:

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E6430	DoC
PoE	EnGenius	EPA5006GAT	DoC
RX device	Boardcom	BCM943162ZP	QDS-BRCM1075

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E4300	DoC
Flash disk	Silicon	I-Series	DoC
PoE	EnGenius	EPA5006GAT	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC
PoE	EnGenius	EPA5006GAT	DoC

3.9. Table for Parameters of Test Software Setting

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Function	Non-beamforming function					
Test Software Version	QCAR Version 3.0.144.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11b	18.5	18.5	18.5	-	-	-
802.11g	15	21	14	-	-	-
MCS0 VHT20	13.5	21	13.5	-	-	-
MCS0 VHT40	-	-	-	11.5	14.5	11.5

Test Function	Beamforming function					
Test Software Version	QCAR Version 3.0.144.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
MCS0 VHT20	20	24	20	-	-	-
MCS0 VHT40	-	-	-	16	21.5	18

3.10. EUT Operation during Test

For non-beamforming function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under telnet.
3. Executed "Lantest.exe" to link with the remote workstation to receive and transmit packet by RX device and transmit duty cycle no less 98%.

3.11. Duty Cycle

External antenna EUT (Model No.: FortiAP S423E)

For non-beamforming function:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11b	1.000	1.000	100.00	0.00	0.01
802.11g	2.050	2.130	96.24	0.17	0.49
MCS0 VHT20	5.012	5.068	98.90	0.05	0.01
MCS0 VHT40	2.400	2.510	95.62	0.19	0.42

For beamforming function:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
MCS0 VHT20	1.754	1.922	91.26	0.40	0.57
MCS0 VHT40	1.656	1.872	88.46	0.53	0.60

Internal antenna EUT (Model No.: FortiAP S421E)

For non-beamforming function:

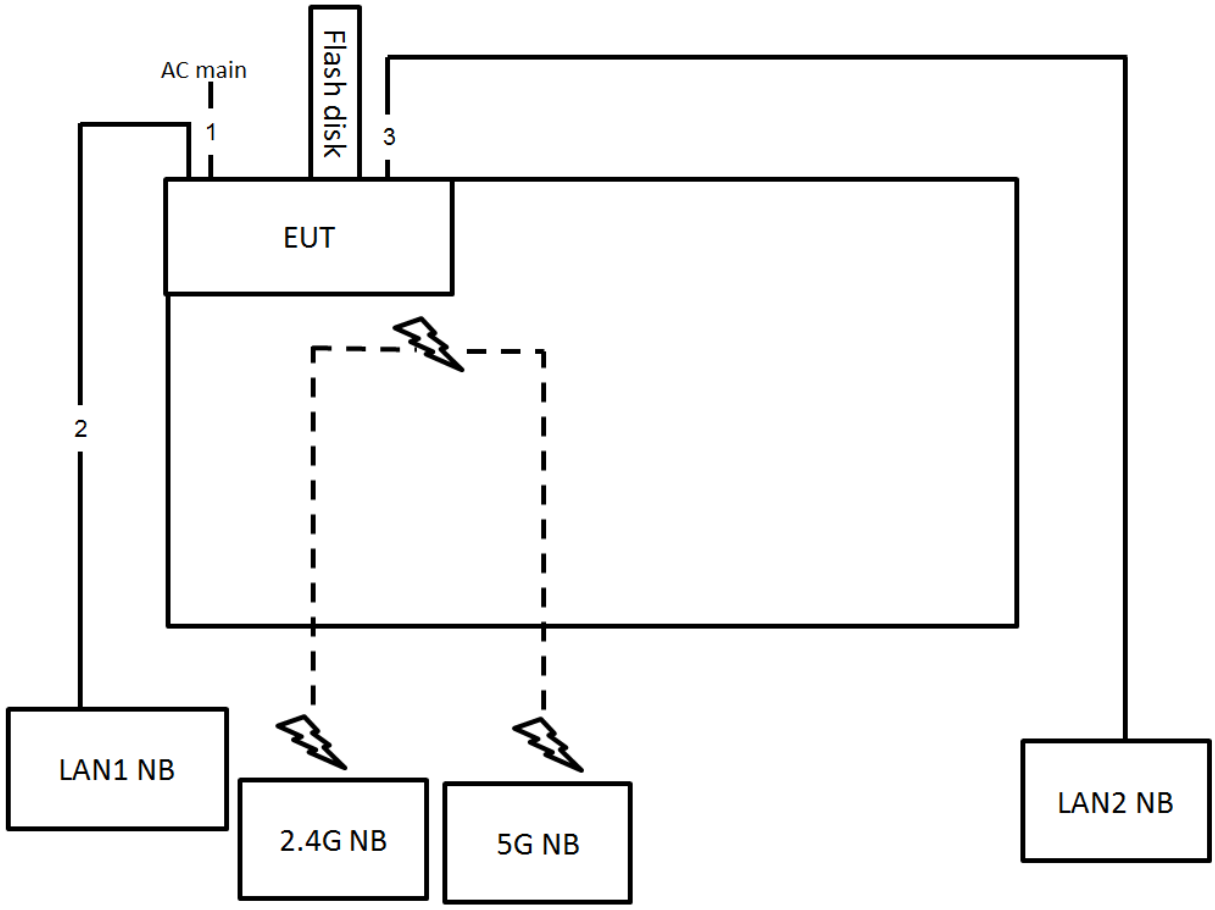
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11b	1.000	1.000	100.00	0.00	0.01
802.11g	2.070	2.140	96.73	0.14	0.48
MCS0 VHT20	5.008	5.088	98.43	0.07	0.01
MCS0 VHT40	2.420	2.510	96.41	0.16	0.41

For beamforming function:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
MCS0 VHT20	1.735	1.925	90.13	0.45	0.58
MCS0 VHT40	1.680	1.890	88.89	0.51	0.60

3.12. Test Configurations

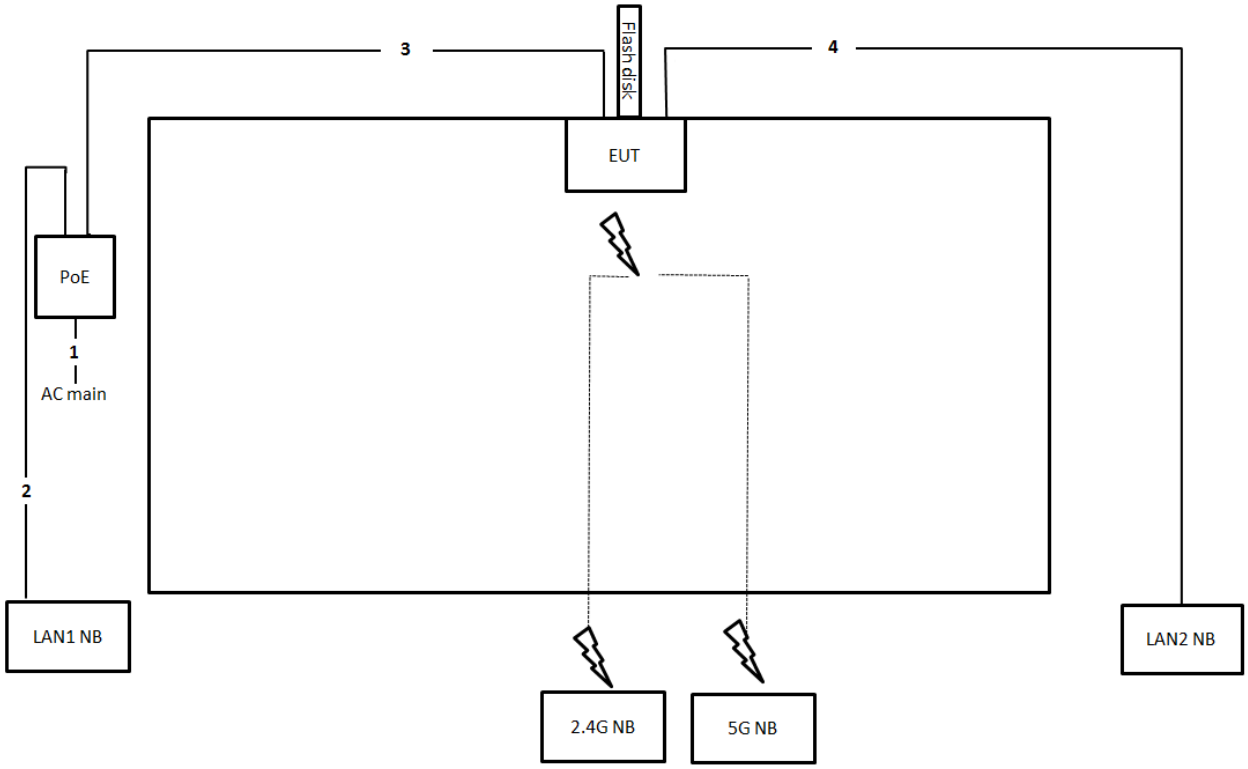
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m

3.12.2. Radiation Emissions Test Configuration

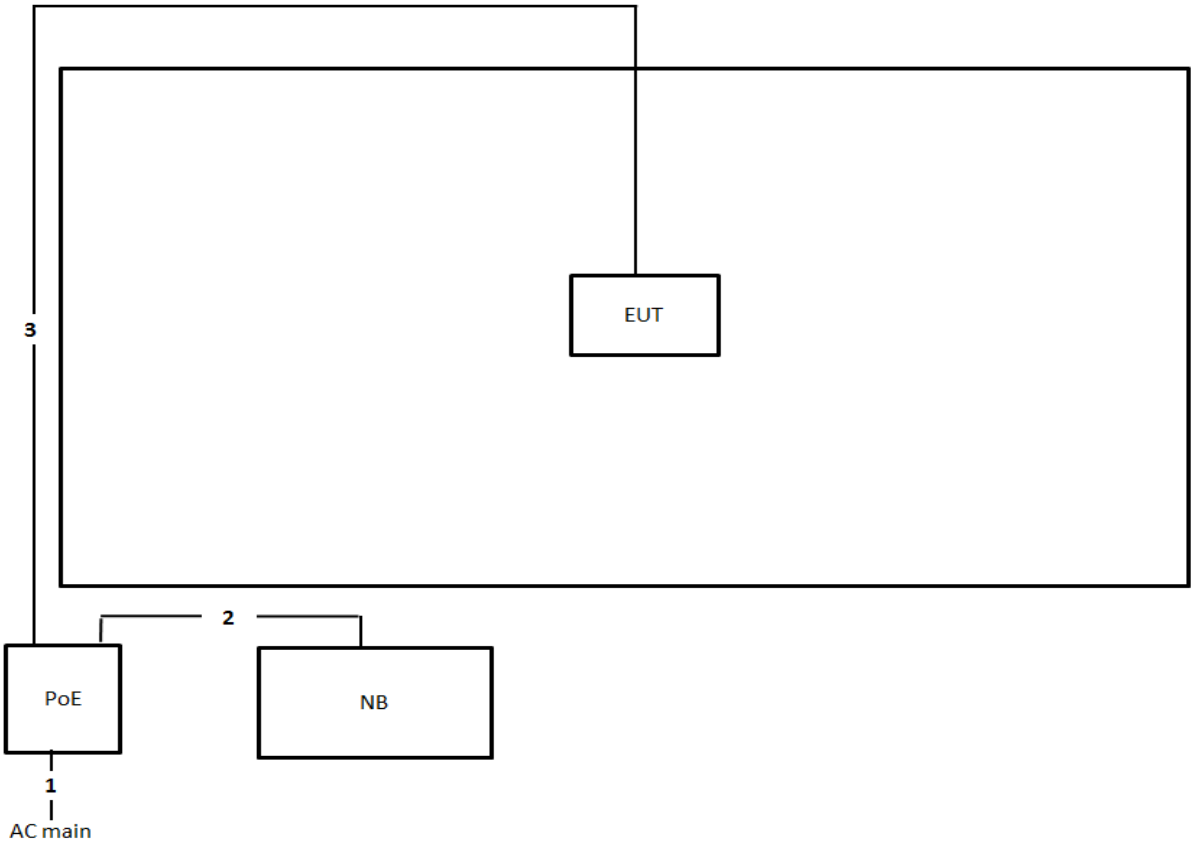
Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	0.8m
2	RJ-45 cable	No	1m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m

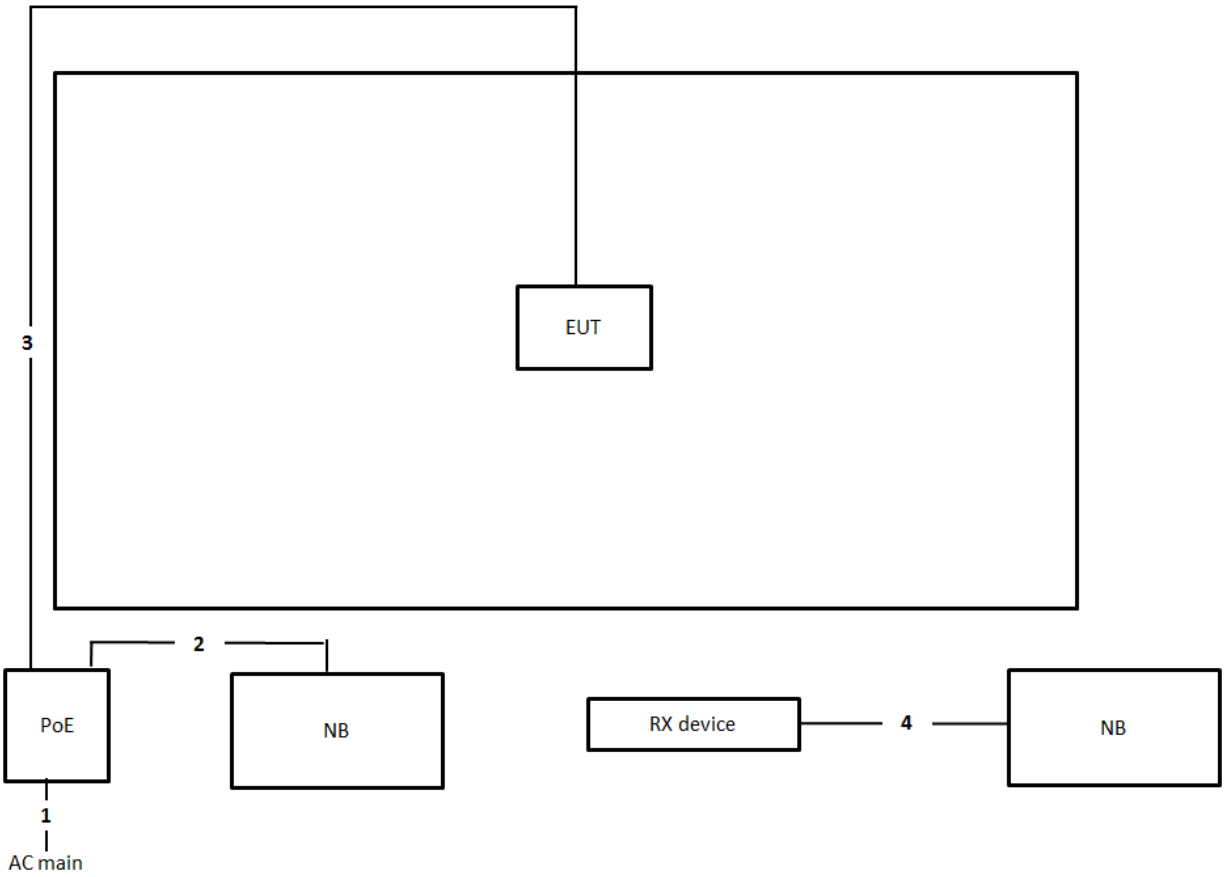
Test Configuration: above 1GHz

For non-beamforming function:



Item	Connection	Shielded	Length
1	Power cable	No	0.8m
2	RJ-45 cable	No	1m
3	RJ-45 cable	No	10m

For beamforming function:



Item	Connection	Shielded	Length
1	Power cable	No	0.8m
2	RJ-45 cable	No	1m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

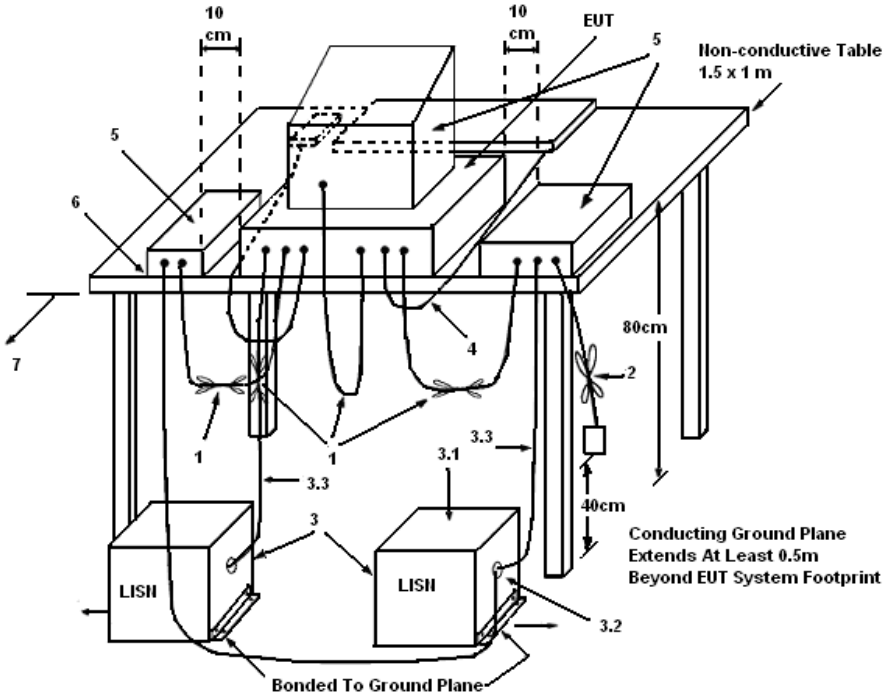
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

(3.1) All other equipment powered from additional LISN(s).

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

(3.3) LISN at least 80 cm from nearest part of EUT chassis.

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

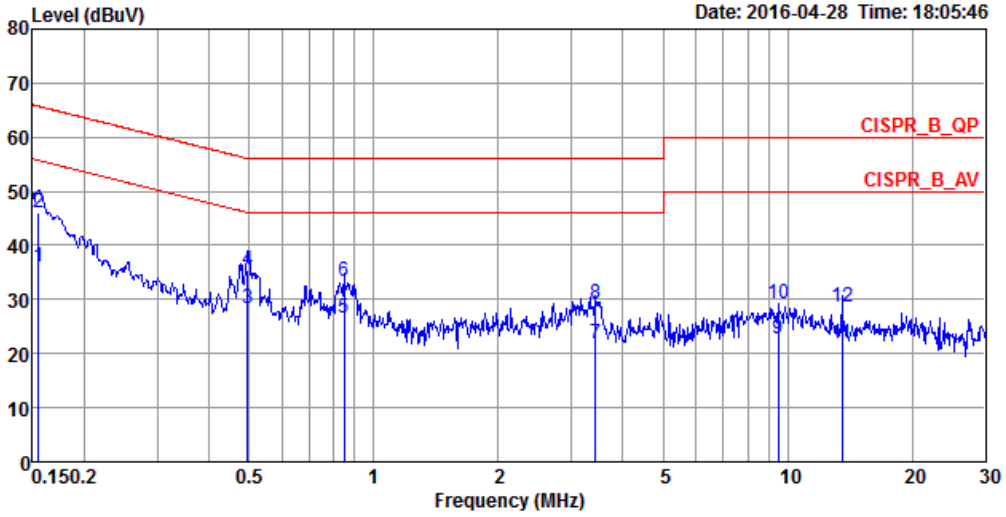
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

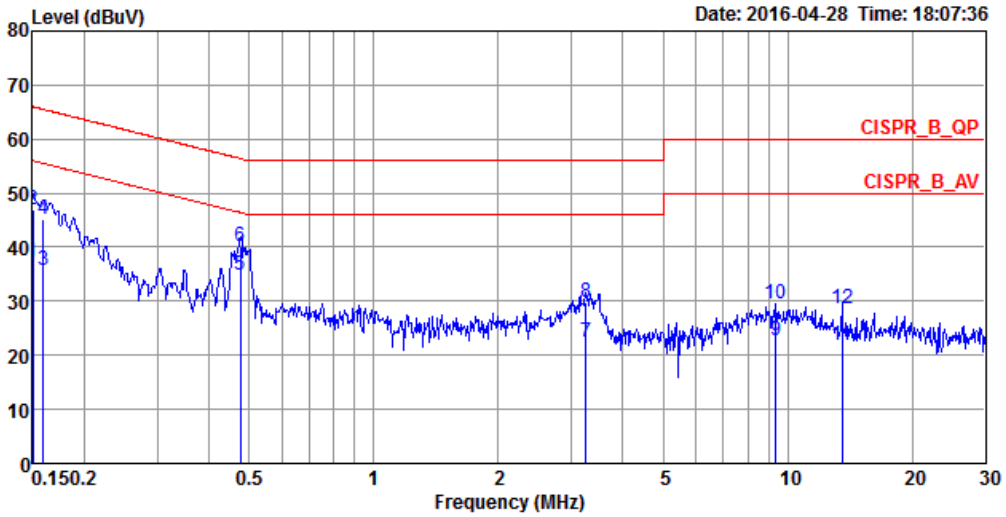
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	58%
Test Engineer	Deven Huang	Phase	Line
Configuration	Normal Link	Test Mode	Mode 3



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1548	36.01	-19.73	55.74	25.97	10.02	0.02	LINE	Average
2	0.1548	46.10	-19.64	65.74	36.06	10.02	0.02	LINE	QP
3	0.4967	28.43	-17.62	46.05	18.47	9.92	0.04	LINE	Average
4	0.4967	35.31	-20.74	56.05	25.35	9.92	0.04	LINE	QP
5	0.8483	26.58	-19.42	46.00	16.61	9.93	0.04	LINE	Average
6	0.8483	33.45	-22.55	56.00	23.48	9.93	0.04	LINE	QP
7	3.4356	21.73	-24.27	46.00	11.69	9.98	0.06	LINE	Average
8	3.4356	29.27	-26.73	56.00	19.23	9.98	0.06	LINE	QP
9	9.5016	22.67	-27.33	50.00	12.30	10.14	0.23	LINE	Average
10	9.5016	29.32	-30.68	60.00	18.95	10.14	0.23	LINE	QP
11	13.5509	21.84	-28.16	50.00	11.38	10.21	0.25	LINE	Average
12	13.5509	28.60	-31.40	60.00	18.14	10.21	0.25	LINE	QP

Temperature	23°C	Humidity	58%
Test Engineer	Deven Huang	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 3



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1500	37.22	-18.78	56.00	27.18	10.02	0.02	NEUTRAL	Average
2	0.1500	47.00	-19.00	66.00	36.96	10.02	0.02	NEUTRAL	QP
3	0.1590	35.78	-19.74	55.52	25.74	10.02	0.02	NEUTRAL	Average
4	0.1590	45.04	-20.48	65.52	35.00	10.02	0.02	NEUTRAL	QP
5	0.4761	34.91	-11.50	46.41	24.95	9.92	0.04	NEUTRAL	Average
6	0.4761	40.04	-16.37	56.41	30.08	9.92	0.04	NEUTRAL	QP
7	3.2583	22.39	-23.61	46.00	12.35	9.98	0.06	NEUTRAL	Average
8	3.2583	29.84	-26.16	56.00	19.80	9.98	0.06	NEUTRAL	QP
9	9.3518	22.70	-27.30	50.00	12.34	10.13	0.23	NEUTRAL	Average
10	9.3518	29.55	-30.45	60.00	19.19	10.13	0.23	NEUTRAL	QP
11	13.5509	21.96	-28.04	50.00	11.50	10.21	0.25	NEUTRAL	Average
12	13.5509	28.70	-31.30	60.00	18.24	10.21	0.25	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

The limit for output power is 30dBm.

4.2.2. Measuring Instruments and Setting

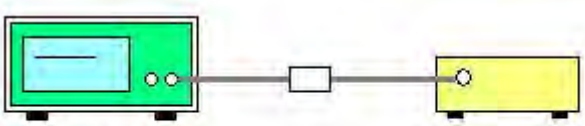
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	Average

4.2.3. Test Procedures

1. Test procedures refer KDB558074 D01 v03r05 section 9.2.3.2 Measurement using a power meter (PM).
2. Multiple antenna systems was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	24°C	Humidity	60%
Test Engineer	Eddie Weng / Clemens Fang	Test Date	Apr. 22, 2016~Apr. 23, 2016
Test Function	Non-beamforming function		

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11b	2412 MHz	19.51	19.02	19.41	19.43	25.37	30.00	Complies
	2437 MHz	19.86	19.46	19.05	18.85	25.34	30.00	Complies
	2462 MHz	19.05	19.12	19.35	19.22	25.21	30.00	Complies
802.11g	2412 MHz	15.21	14.59	14.76	14.74	20.85	30.00	Complies
	2437 MHz	21.05	20.66	20.73	20.84	26.84	30.00	Complies
	2462 MHz	14.14	13.58	13.71	13.74	19.82	30.00	Complies
MCS0 VHT20	2412 MHz	12.74	12.52	12.53	12.73	18.65	30.00	Complies
	2437 MHz	20.9	20.59	20.61	20.69	26.72	30.00	Complies
	2462 MHz	13.69	13.05	13.61	13.21	19.42	30.00	Complies
MCS0 VHT40	2422 MHz	12.53	12.44	12.53	12.72	18.58	30.00	Complies
	2437 MHz	15.56	15.85	15.53	15.49	21.63	30.00	Complies
	2452 MHz	12.48	12.52	12.44	12.36	18.47	30.00	Complies

Note: For CDD mode, in-band power directional gain = antenna gain + array gain, array gain =0 (when Nant<=4)

Temperature	24°C	Humidity	60%
Test Engineer	Eddie Weng / Clemens Fang	Test Date	Apr. 22, 2016~Apr. 23, 2016
Test Function	Beamforming function		

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
MCS0 VHT20	2412 MHz	13.92	13.48	13.45	13.71	19.66	25.56	Complies
	2437 MHz	18.12	17.29	17.32	18.58	23.88	25.56	Complies
	2462 MHz	13.63	13.69	13.19	14.68	19.85	25.56	Complies
MCS0 VHT40	2422 MHz	10.06	9.95	10.12	10.01	16.06	25.56	Complies
	2437 MHz	15.43	15.45	15.62	15.51	21.52	25.56	Complies
	2452 MHz	12.71	11.64	11.8	12.19	18.13	25.56	Complies

Note: Directional Gain=GANT+10 log(NANT)=4.42dBi+10log(4)=10.44dBi >6dBi, so limit=30 – (10.44 – 6)=25.56dBm.

4.3. Power Spectral Density Measurement

4.3.1. Limit

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.

4.3.2. Measuring Instruments and Setting

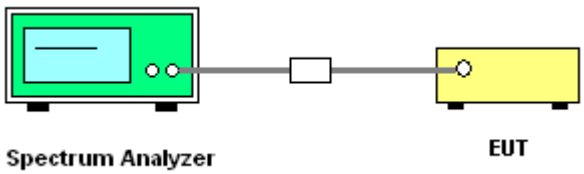
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	3 kHz ≤ RBW ≤ 100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.3.3. Test Procedures

1. Test was performed in accordance with KDB558074 D01 v03r05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 10.2 Method PKPSD (peak PSD) and KDB 662911 D01 v02r01 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	24°C	Humidity	60%
Test Engineer	Eddie Weng / Clemens Fang	Test Function	Non-beamforming function

Mode	Frequency	Power Density (dBm/3kHz)					Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11b	2412 MHz	-8.45	-7.56	-7.28	-6.62	-1.41	3.56	Complies
	2437 MHz	-7.22	-7.92	-6.94	-8.39	-1.56	3.56	Complies
	2462 MHz	-7.27	-7.89	-5.92	-6.99	-0.94	3.56	Complies
802.11g	2412 MHz	-12.76	-12.40	-12.19	-13.05	-6.57	3.56	Complies
	2437 MHz	-5.92	-5.81	-6.83	-6.13	-0.13	3.56	Complies
	2462 MHz	-14.25	-14.44	-13.41	-13.61	-7.89	3.56	Complies
MCS0 VHT20	2412 MHz	-13.88	-14.83	-13.89	-14.74	-8.29	3.56	Complies
	2437 MHz	-6.73	-6.75	-6.98	-6.74	-0.78	3.56	Complies
	2462 MHz	-15.60	-15.67	-15.38	-15.75	-9.58	3.56	Complies
MCS0 VHT40	2422 MHz	-19.34	-18.57	-18.42	-19.11	-12.82	3.56	Complies
	2437 MHz	-15.80	-15.63	-15.89	-16.70	-9.97	3.56	Complies
	2452 MHz	-18.48	-20.19	-18.76	-19.72	-13.21	3.56	Complies

Note: Directional Gain=GANT+10 log(NANT)=4.42dBi+10log(4)=10.44dBi >6dBi, so limit=8 – (10.44 – 6)=3.56dBm/3kHz.

Temperature	24°C	Humidity	60%
Test Engineer	Eddie Weng / Clemens Fang	Test Function	Beamforming function

Mode	Frequency	Power Density (dBm/3kHz)					Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
MCS0 VHT20	2412 MHz	-12.47	-13.20	-13.01	-11.81	-6.57	3.56	Complies
	2437 MHz	-8.15	-7.97	-9.01	-8.60	-2.39	3.56	Complies
	2462 MHz	-13.28	-11.85	-11.54	-12.64	-6.25	3.56	Complies
MCS0 VHT40	2422 MHz	-18.24	-18.19	-18.06	-18.20	-12.15	3.56	Complies
	2437 MHz	-12.47	-13.28	-13.05	-12.76	-6.86	3.56	Complies
	2452 MHz	-15.59	-16.37	-15.81	-16.32	-9.99	3.56	Complies

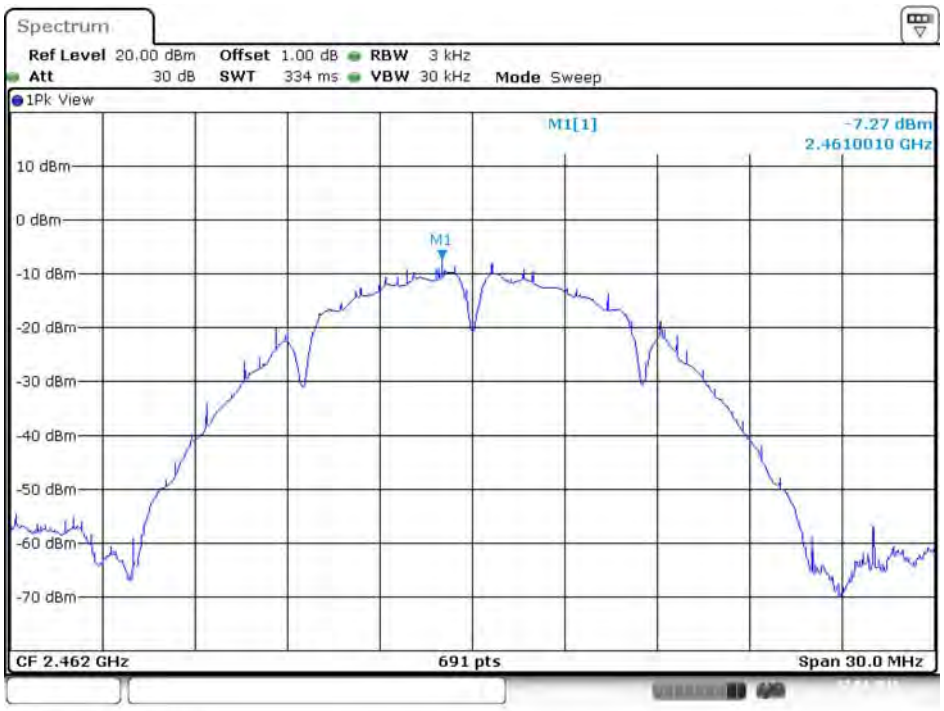
Note: Directional Gain=GANT+10 log(NANT)=4.42dBi+10log(4)=10.44dBi >6dBi, so limit=8 – (10.44 – 6)=3.56dBm/3kHz.

Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

For non-beamforming function:

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 1



Date: 22.APR.2016 11:30:51

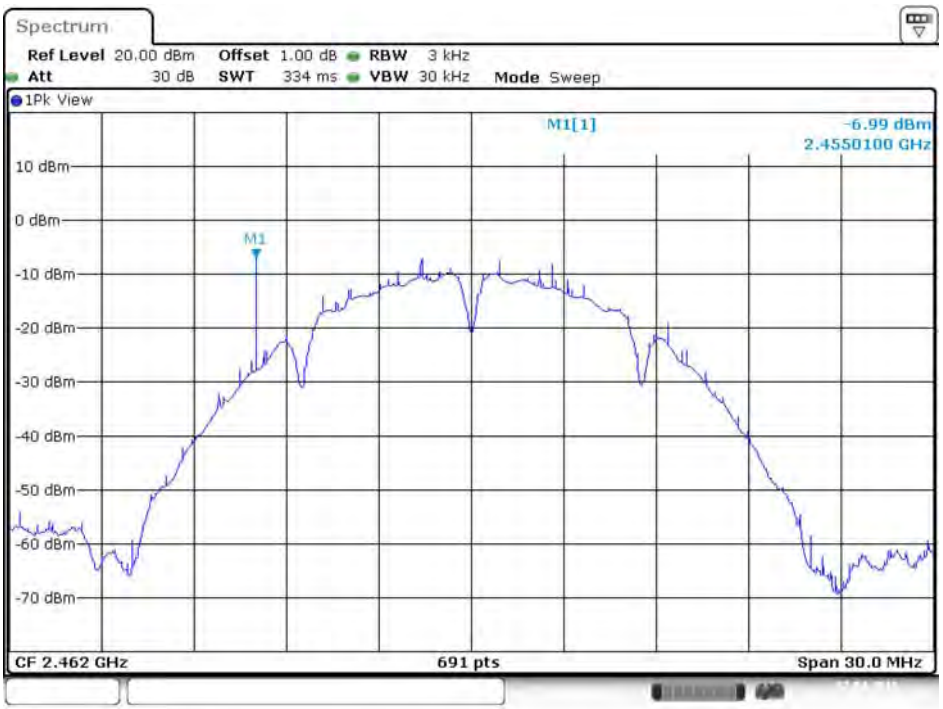
Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 2

Date: 22.APR.2016 11:31:11

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 3

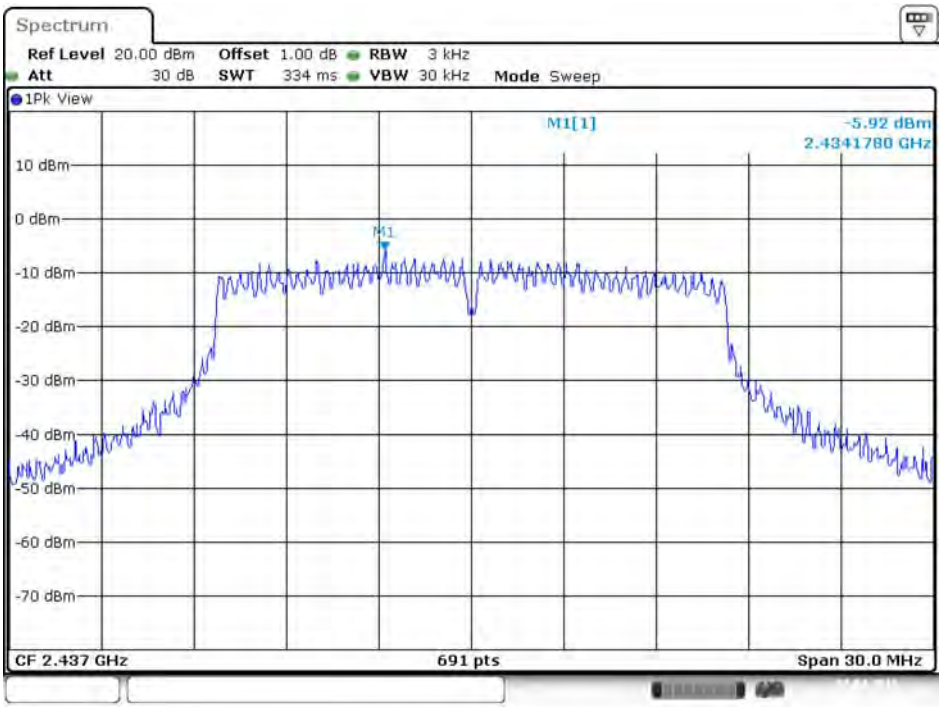
Date: 22.APR.2016 11:31:23

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 4



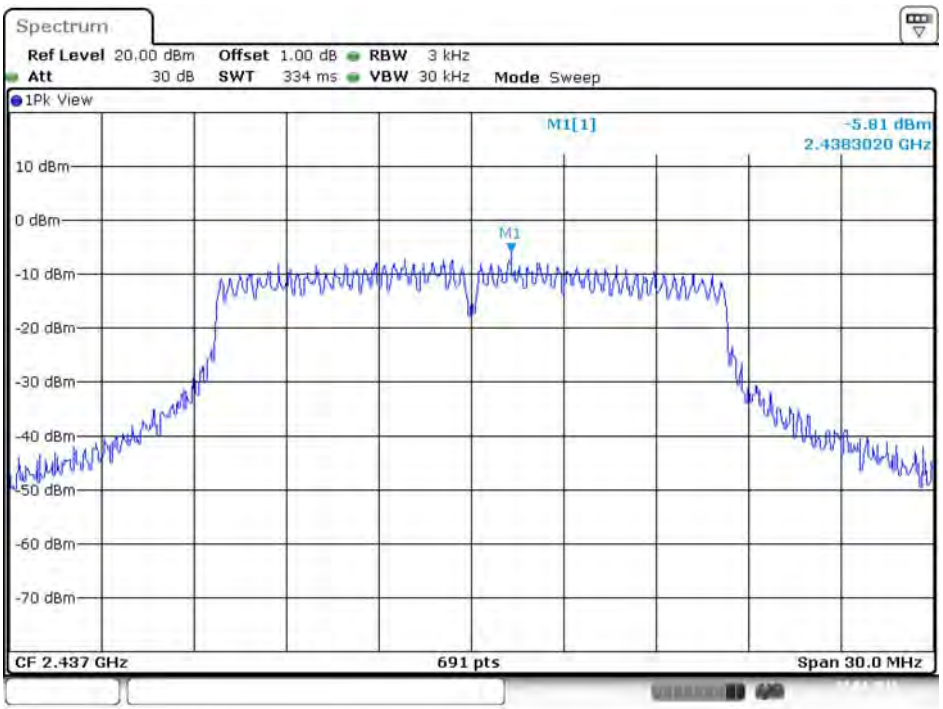
Date: 22.APR.2016 11:31:31

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 1



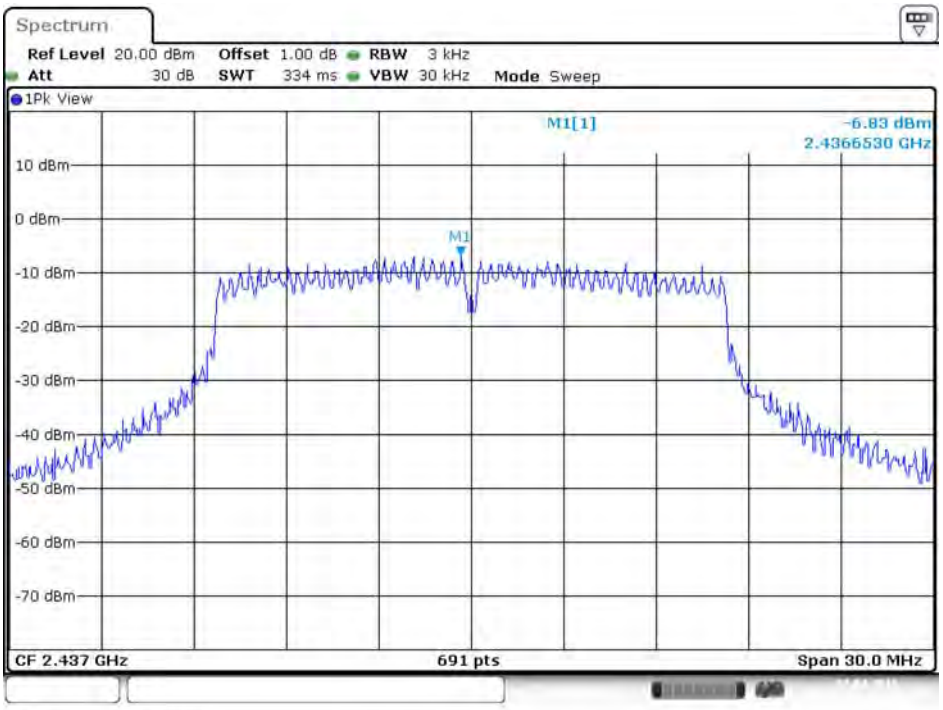
Date: 23.APR.2016 01:29:46

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 2



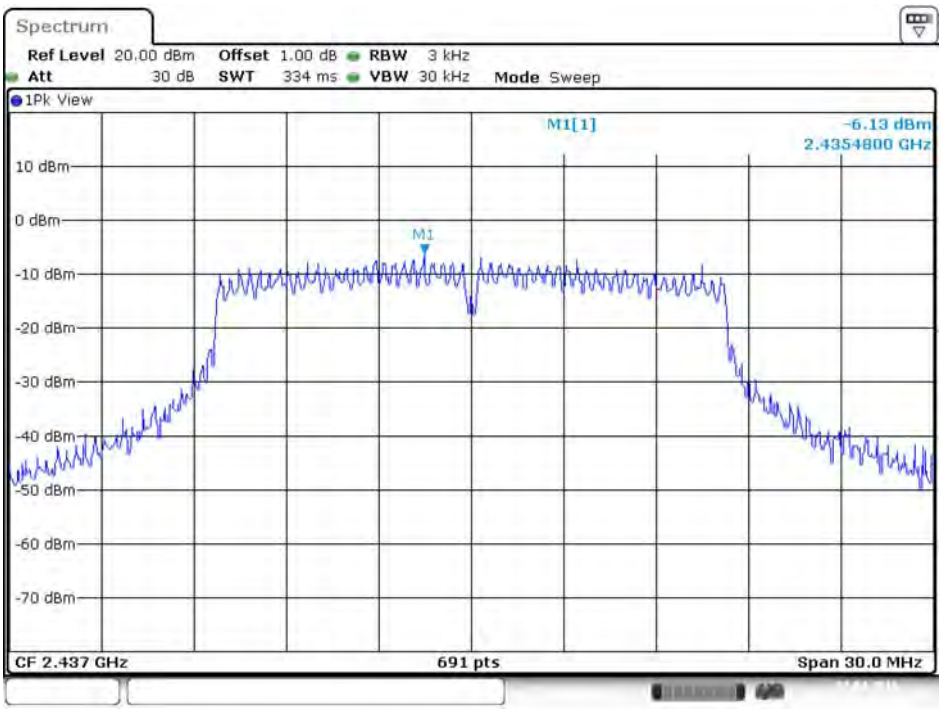
Date: 23.APR.2016 01:30:09

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 3



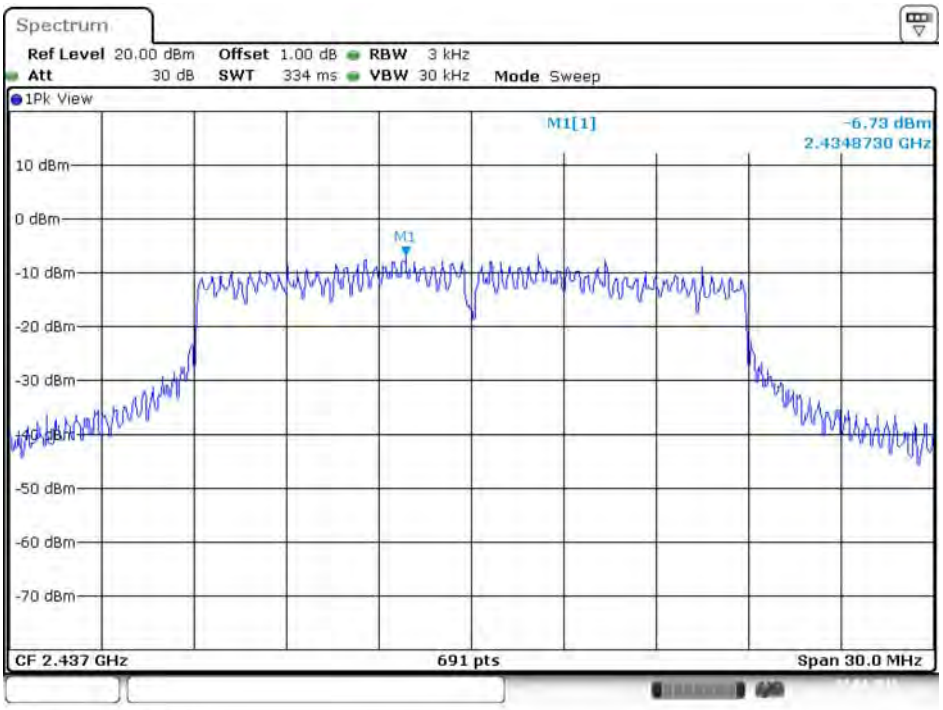
Date: 23.APR.2016 01:30:02

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 4



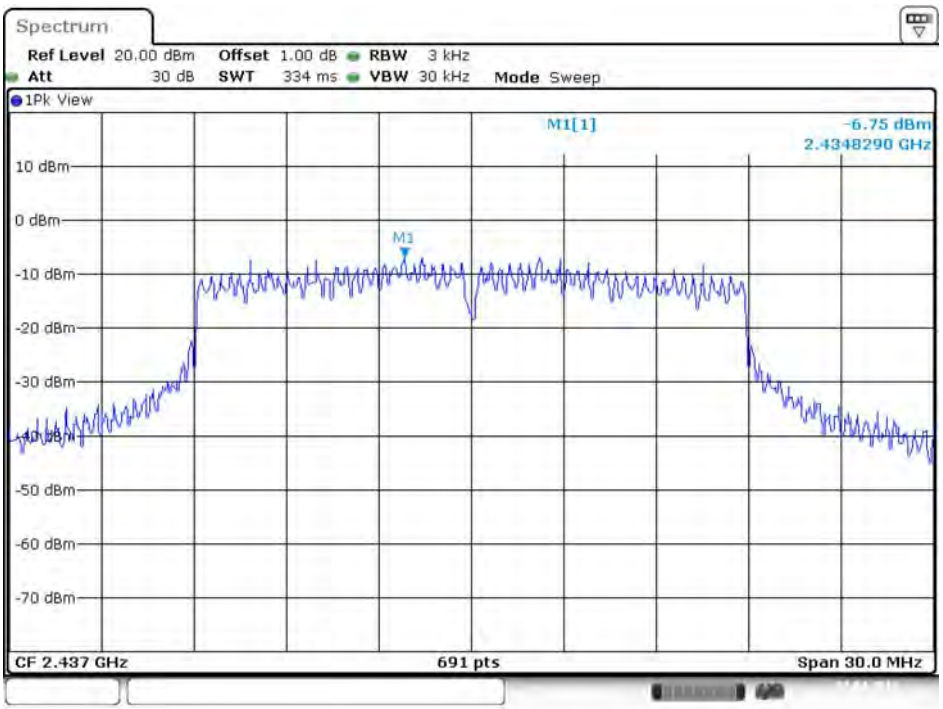
Date: 23.APR.2016 01:30:17

Power Density Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 1



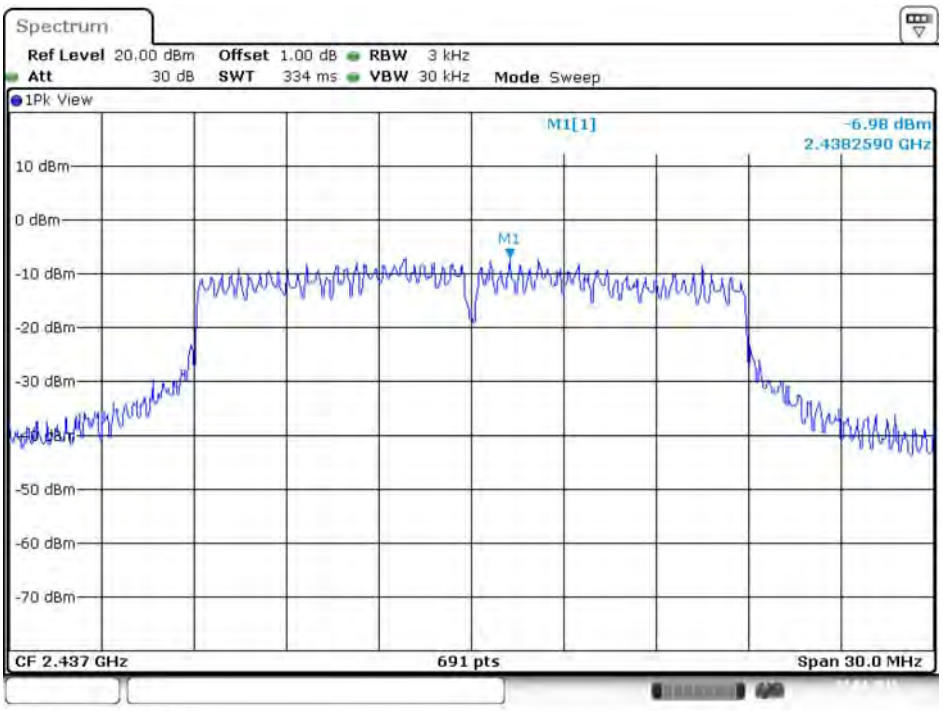
Date: 23.APR.2016 01:35:34

Power Density Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 2



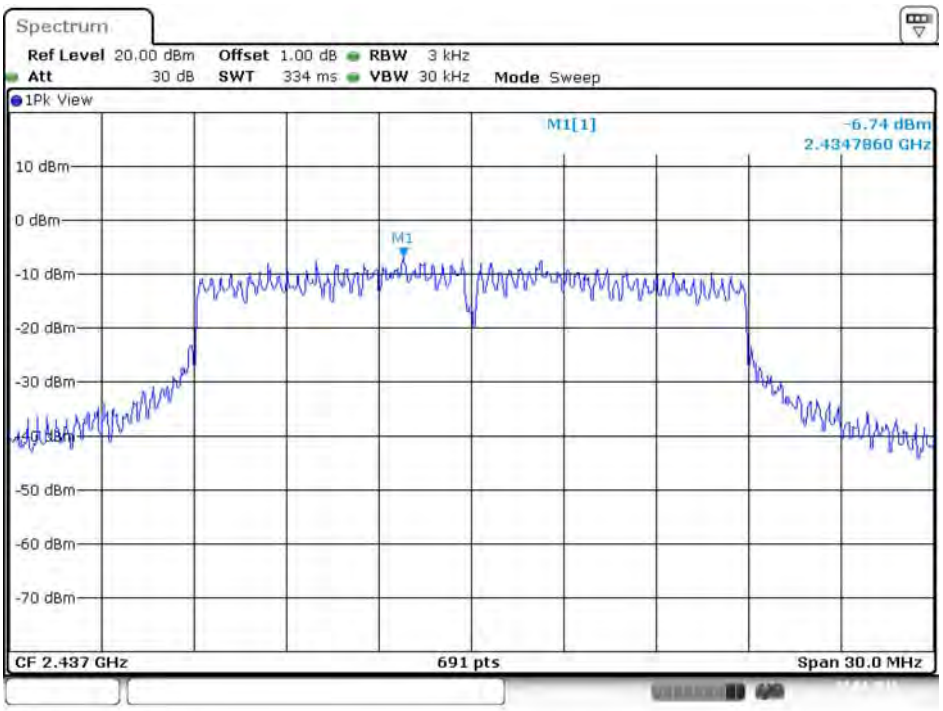
Date: 23.APR.2016 01:35:45

Power Density Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 3



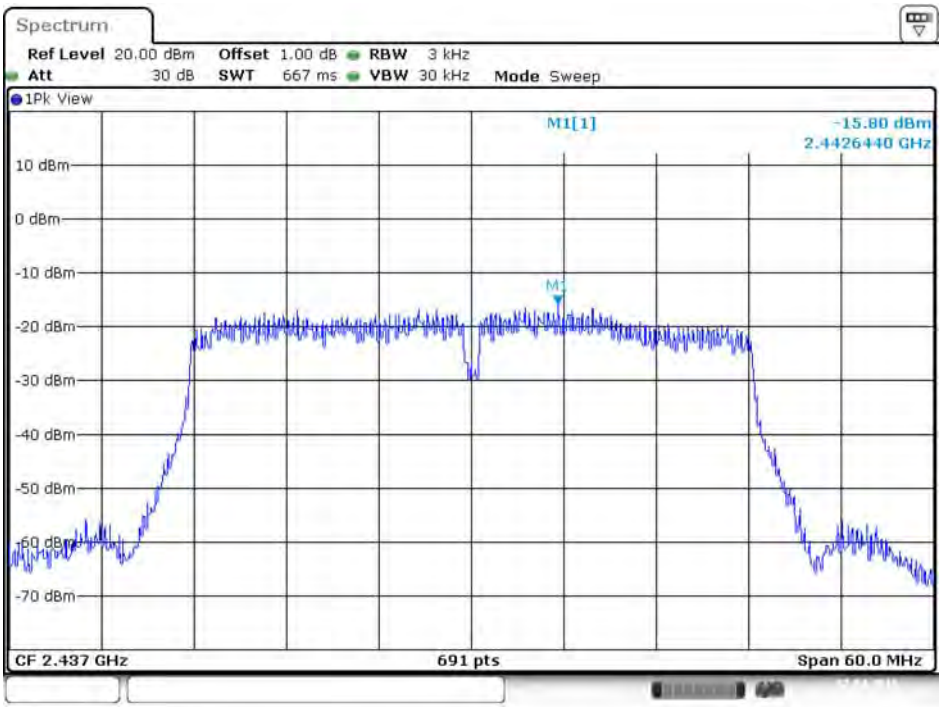
Date: 23.APR.2016 01:35:54

Power Density Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 4



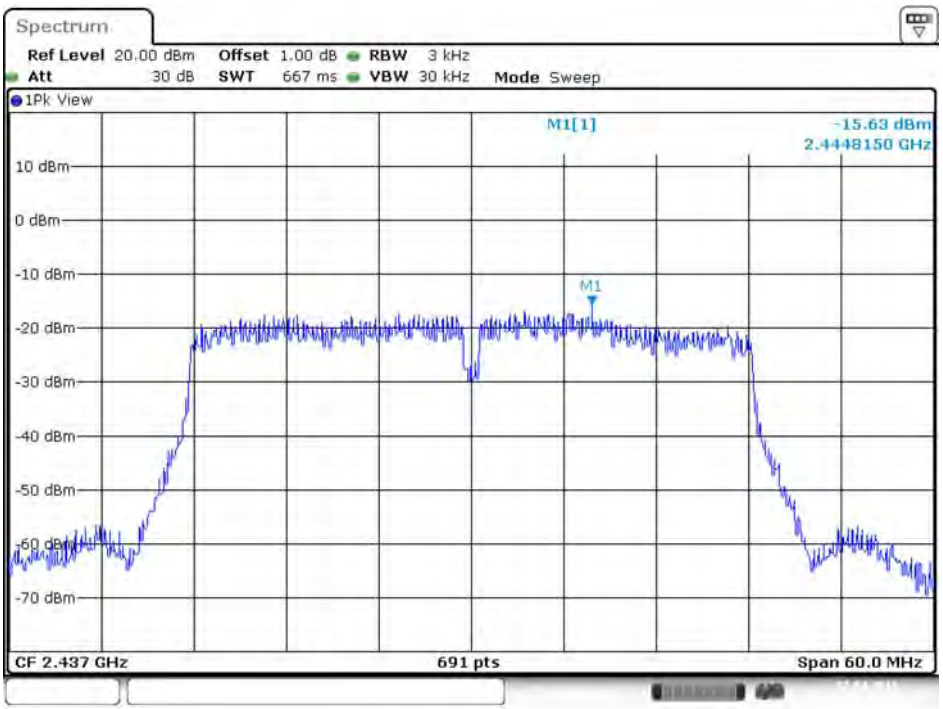
Date: 23.APR.2016 01:36:02

Power Density Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 1



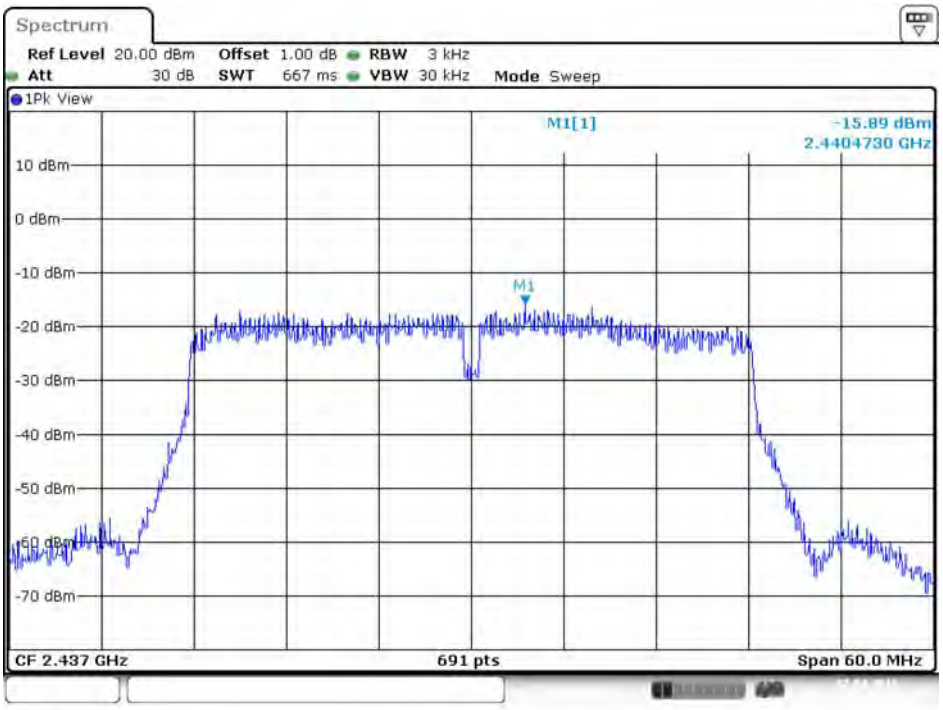
Date: 22.APR.2016 11:57:19

Power Density Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 2



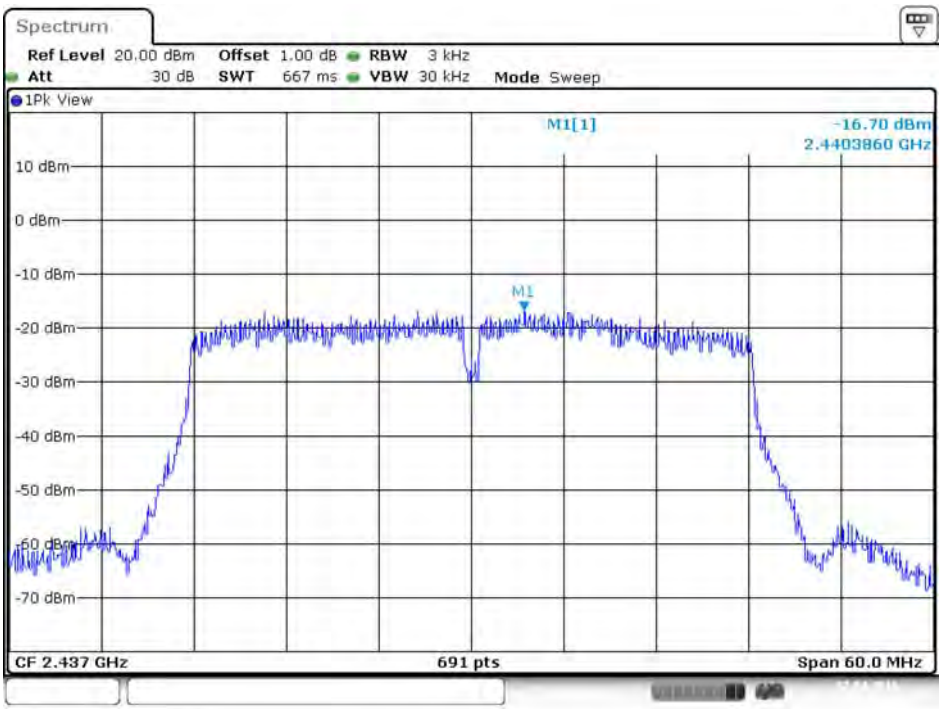
Date: 22.APR.2016 11:57:28

Power Density Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 3



Date: 22.APR.2016 11:57:38

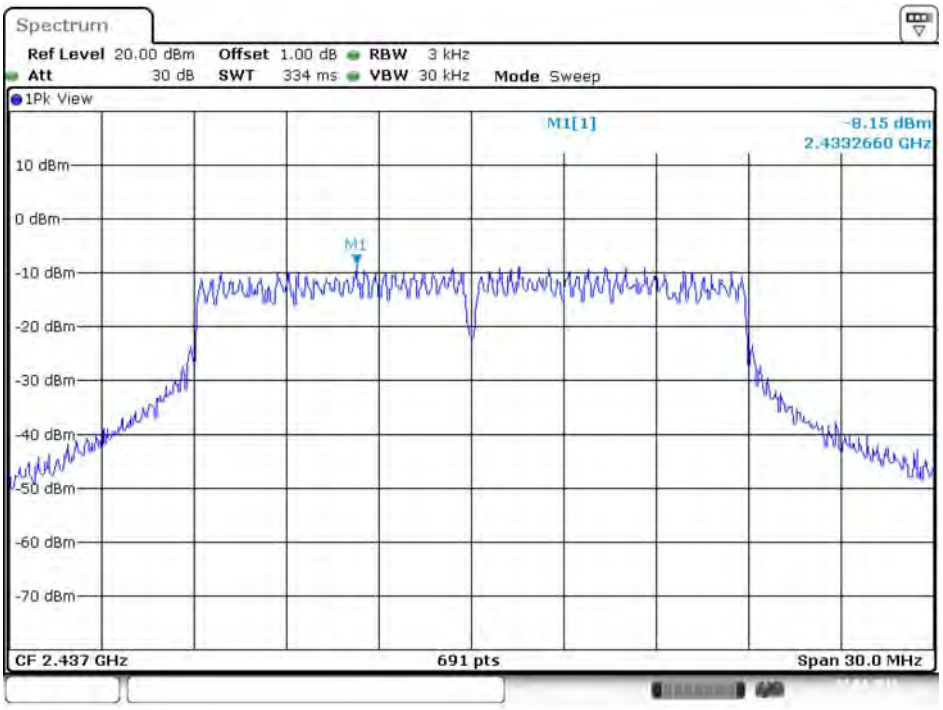
Power Density Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 4



Date: 22.APR.2016 11:57:47

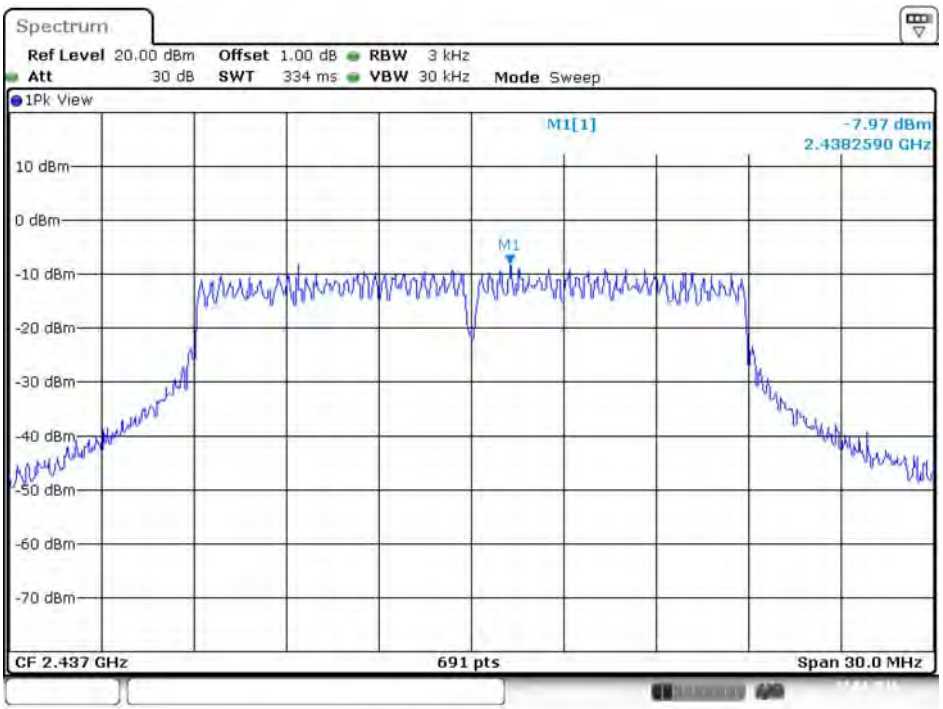
For beamforming function:

Power Density Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 1



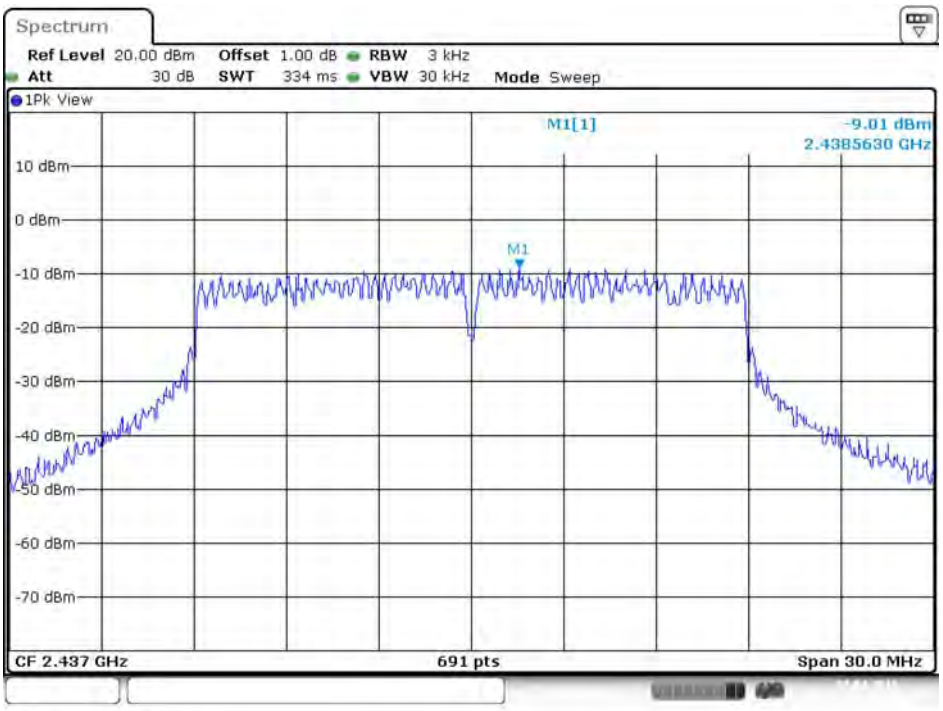
Date: 23.APR.2016 01:53:20

Power Density Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 2



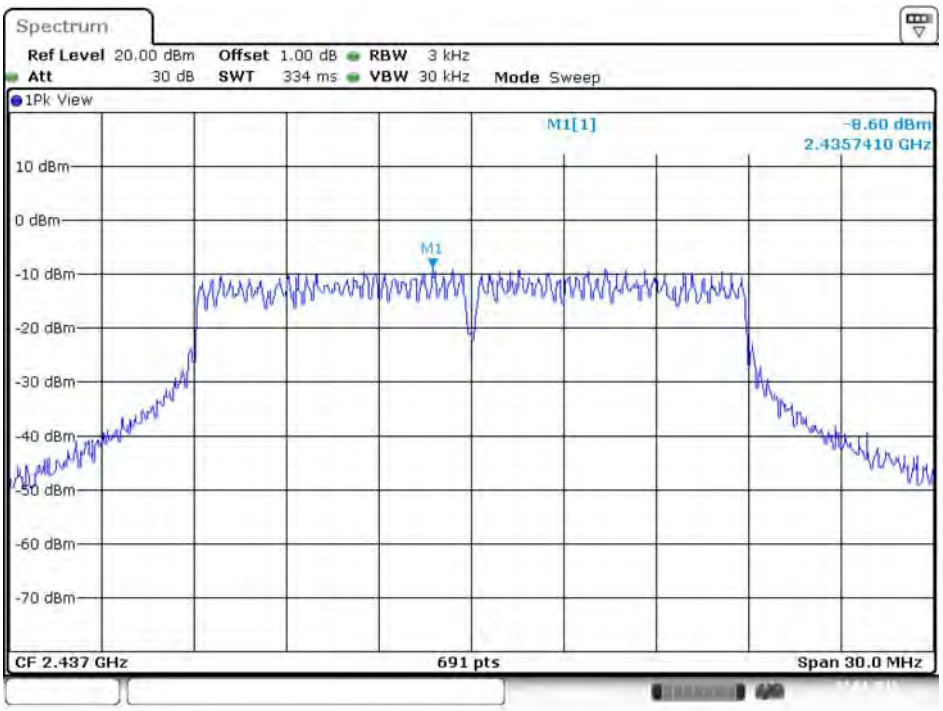
Date: 23.APR.2016 01:53:36

Power Density Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 3



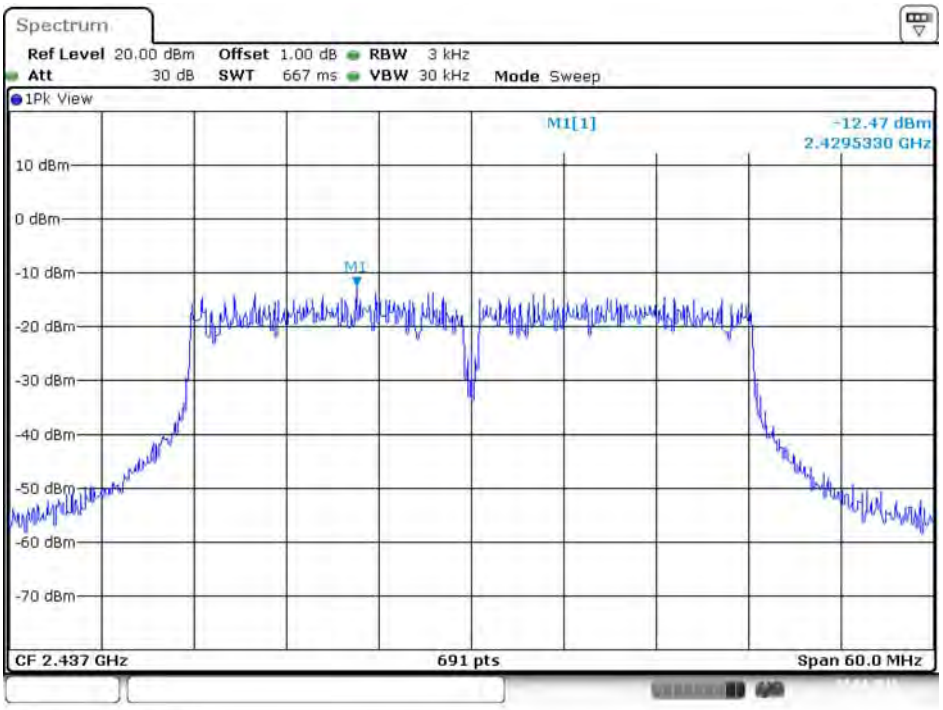
Date: 23.APR.2016 01:53:49

Power Density Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 4



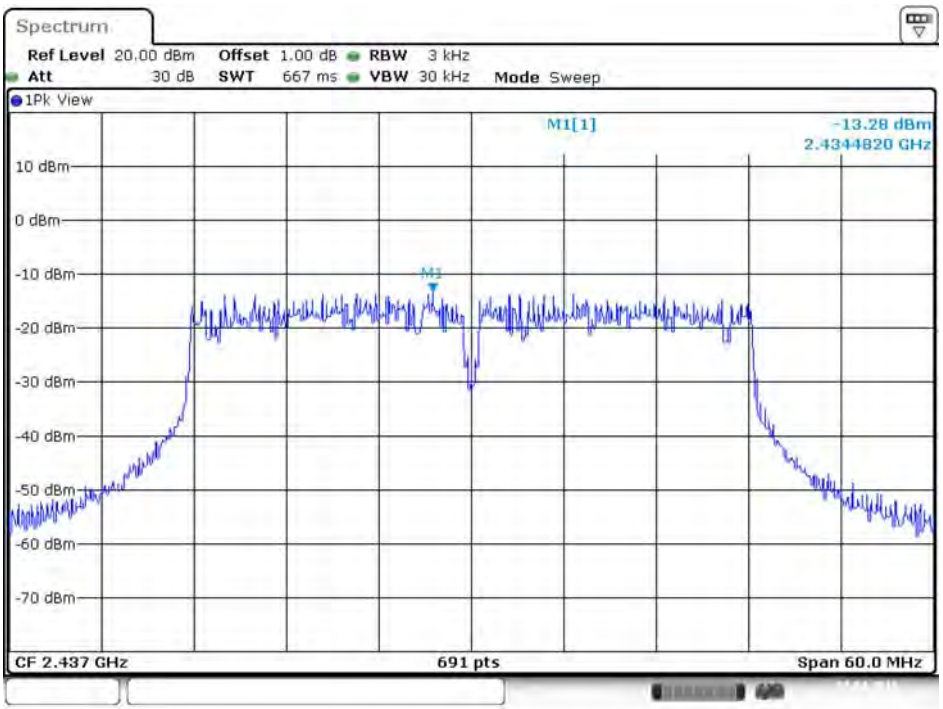
Date: 23.APR.2016 01:53:59

Power Density Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 1



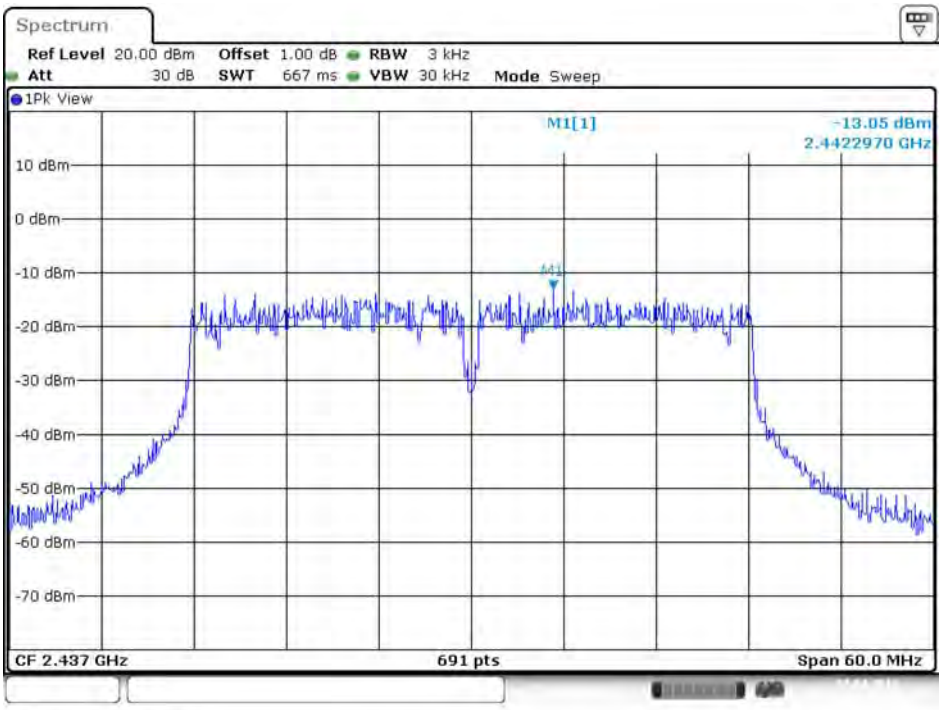
Date: 23.APR.2016 01:47:20

Power Density Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 2



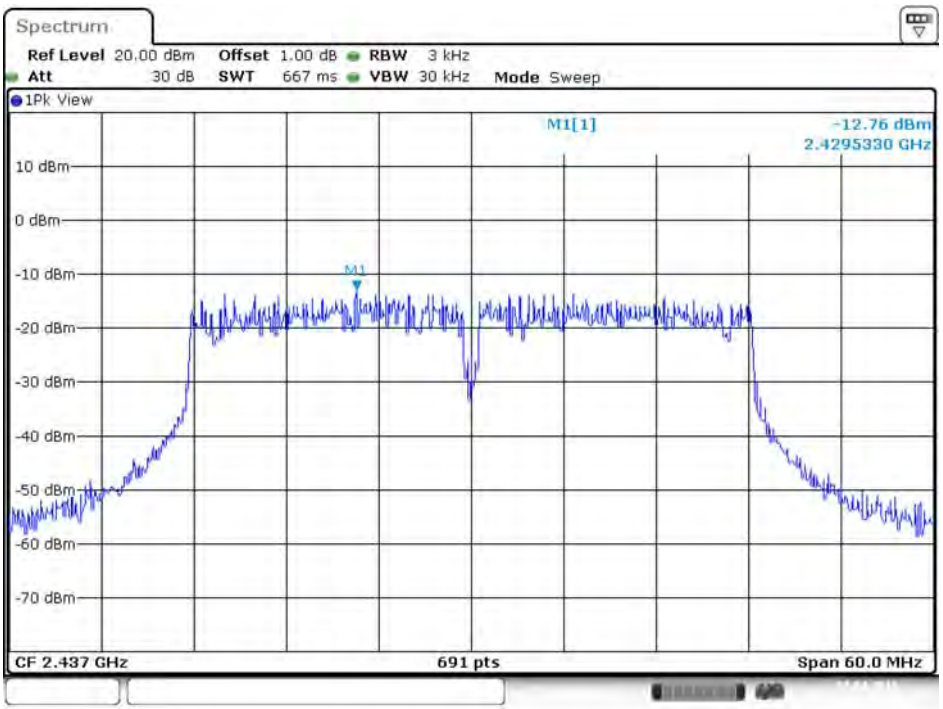
Date: 23.APR.2016 01:47:38

Power Density Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 3



Date: 23.APR.2016 01:47:46

Power Density Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 4



Date: 23.APR.2016 01:47:56

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

4.4.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

6dB Spectrum Bandwidth	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
99% Occupied Bandwidth	
Spectrum Parameters	**Setting**
Span	1.5 times to 5.0 times the OBW
RBW	1 % to 5 % of the OBW
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold

4.4.3. Test Procedures

1. The transmitter was conducted to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB558074 D01 v03r05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8.0 DTS 6-dB signal bandwidth option 1.
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measurement perform conducted of each port.
5. Measured the spectrum width with power higher than 6dB below carrier.

4.4.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.3.4.

4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	24°C	Humidity	60%
Test Engineer	Eddie Weng / Clemens Fang	Test Function	Non-beamforming function

Mode	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
802.11b	2412 MHz	7.13	8.12	13.11	13.11	500	Complies
	2437 MHz	8.06	8.06	12.68	12.94	500	Complies
	2462 MHz	7.54	8.06	13.11	13.11	500	Complies
802.11g	2412 MHz	16.35	16.35	16.41	16.50	500	Complies
	2437 MHz	16.35	16.35	16.58	16.58	500	Complies
	2462 MHz	15.88	15.94	16.50	16.50	500	Complies
MCS0 VHT20	2412 MHz	17.62	17.62	17.63	17.63	500	Complies
	2437 MHz	16.81	16.58	17.63	17.71	500	Complies
	2462 MHz	17.62	17.62	17.63	17.71	500	Complies
MCS0 VHT40	2422 MHz	35.13	33.86	35.89	35.89	500	Complies
	2437 MHz	35.13	32.70	36.03	35.89	500	Complies
	2452 MHz	33.97	32.70	36.18	35.89	500	Complies

Mode	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 3	Chain 4	Chain 3	Chain 4		
802.11b	2412 MHz	7.07	9.04	13.11	12.76	500	Complies
	2437 MHz	7.07	9.10	13.20	13.11	500	Complies
	2462 MHz	8.12	8.06	13.29	13.29	500	Complies
802.11g	2412 MHz	16.41	15.88	16.50	16.41	500	Complies
	2437 MHz	15.25	15.48	16.50	16.41	500	Complies
	2462 MHz	16.35	16.35	16.41	16.41	500	Complies
MCS0 VHT20	2412 MHz	17.62	17.62	17.63	17.63	500	Complies
	2437 MHz	17.62	16.93	17.63	17.63	500	Complies
	2462 MHz	17.62	17.62	17.54	17.63	500	Complies
MCS0 VHT40	2422 MHz	34.09	35.13	36.03	36.18	500	Complies
	2437 MHz	35.13	35.01	36.03	36.18	500	Complies
	2452 MHz	35.13	35.13	36.03	36.32	500	Complies

Temperature	24°C	Humidity	60%
Test Engineer	Eddie Weng / Clemens Fang	Test Function	Beamforming function

Mode	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
MCS0 VHT20	2412 MHz	17.62	17.62	17.63	17.63	500	Complies
	2437 MHz	17.33	15.94	17.63	17.71	500	Complies
	2462 MHz	16.81	15.71	17.63	17.71	500	Complies
MCS0 VHT40	2422 MHz	31.42	33.74	36.18	35.89	500	Complies
	2437 MHz	35.13	33.97	36.03	35.89	500	Complies
	2452 MHz	32.00	32.70	36.03	35.89	500	Complies

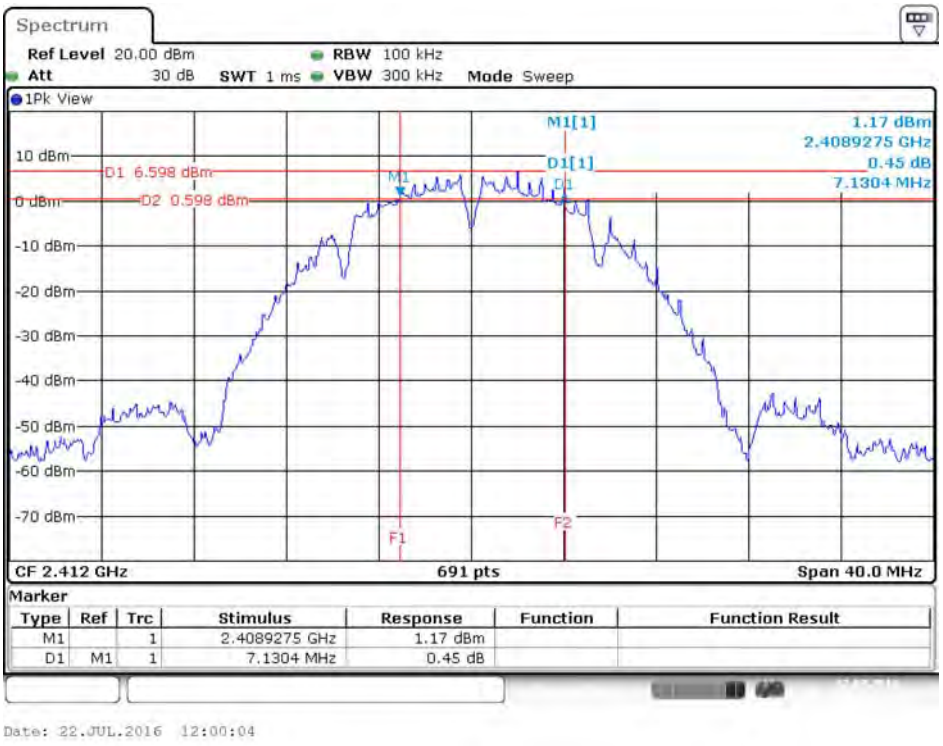
Mode	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 3	Chain 4	Chain 3	Chain 4		
MCS0 VHT20	2412 MHz	17.62	15.30	17.63	17.63	500	Complies
	2437 MHz	16.87	17.62	17.63	17.63	500	Complies
	2462 MHz	15.71	17.62	17.63	17.63	500	Complies
MCS0 VHT40	2422 MHz	31.42	33.74	36.03	36.18	500	Complies
	2437 MHz	33.74	35.13	36.03	36.18	500	Complies
	2452 MHz	35.13	35.71	36.03	36.18	500	Complies

Note: All the test values were listed in the report.

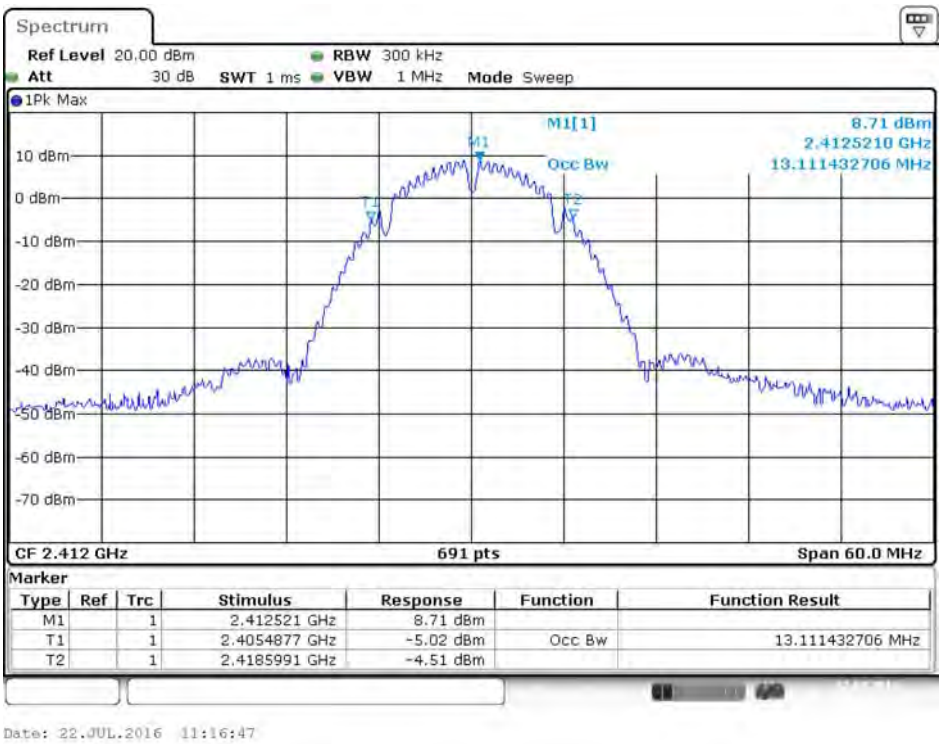
For plots, only the channel with worse result was shown.

For non-beamforming function:

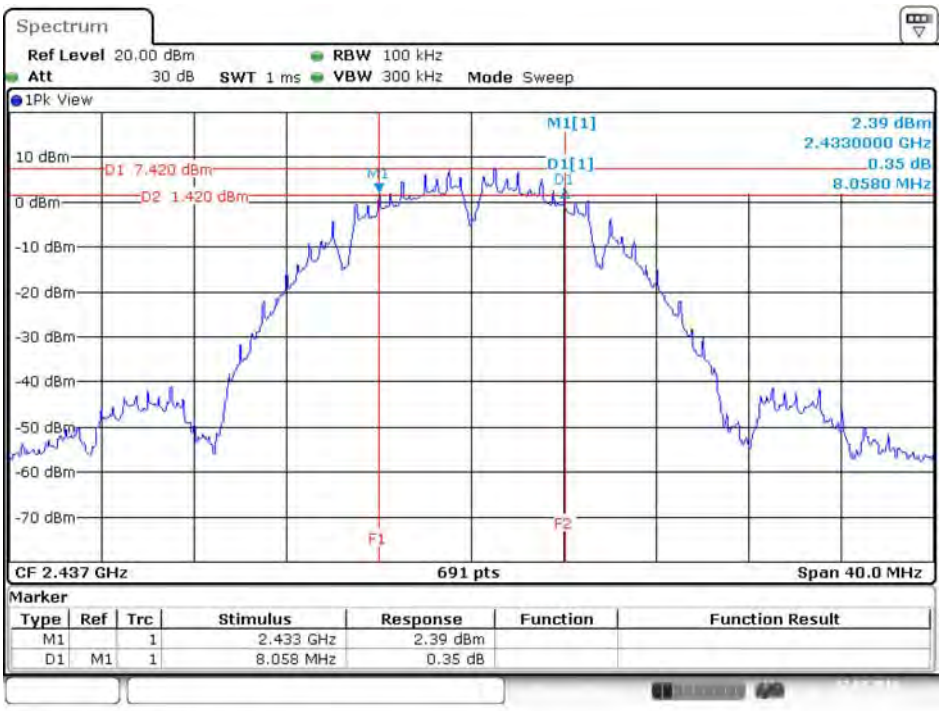
6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 1



99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 1



6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 2



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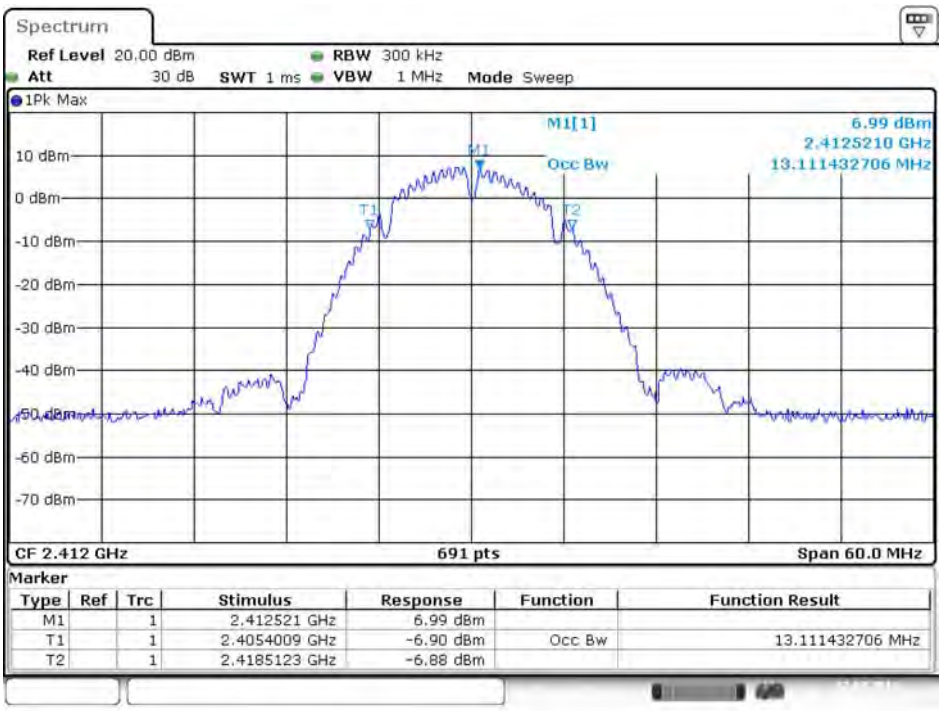
99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 2



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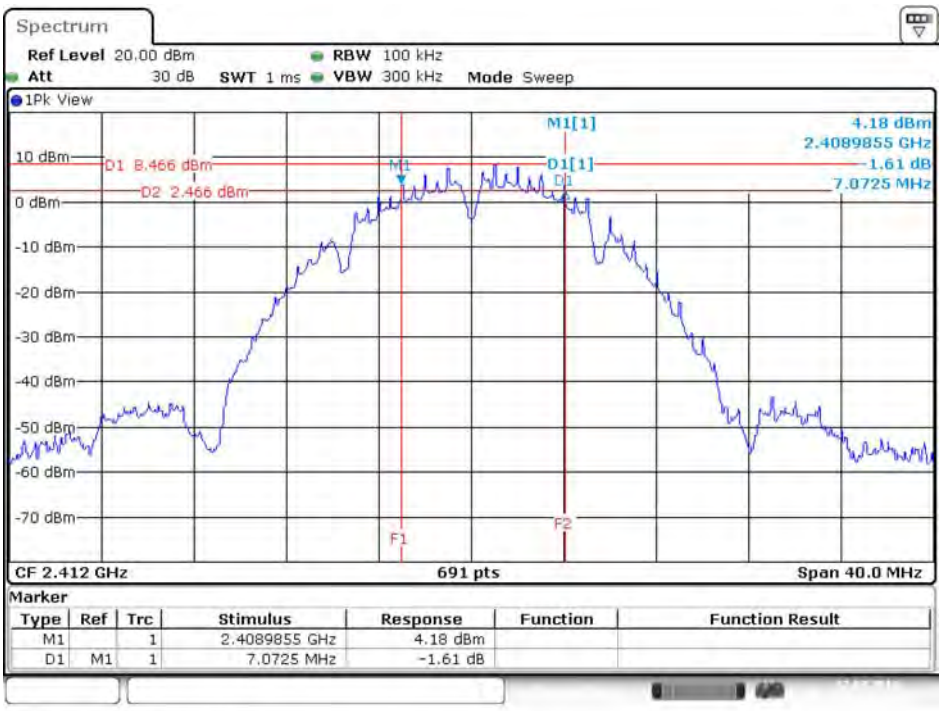
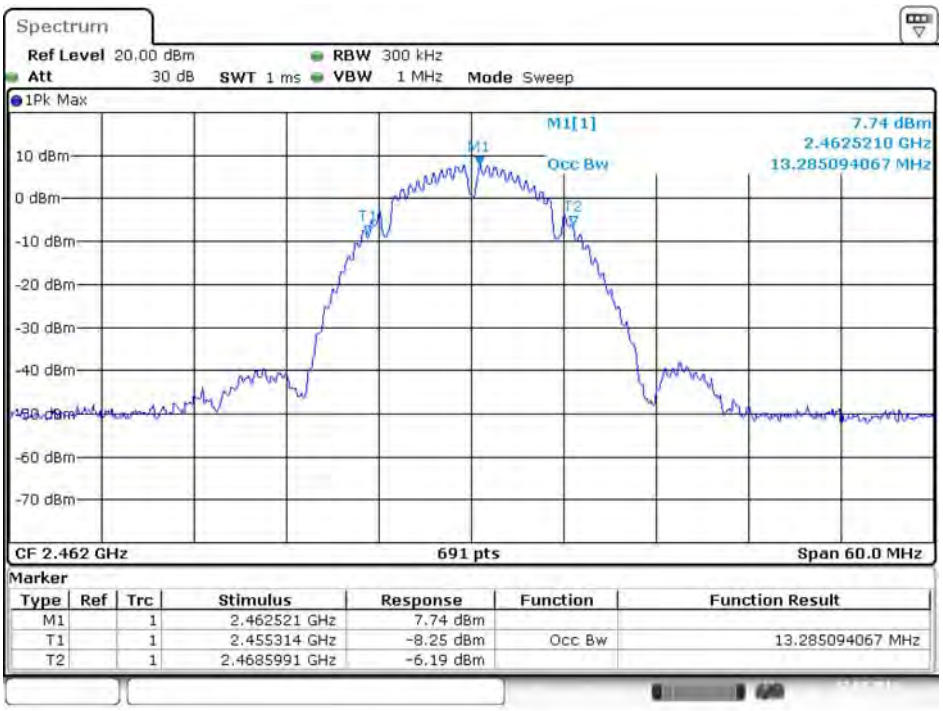
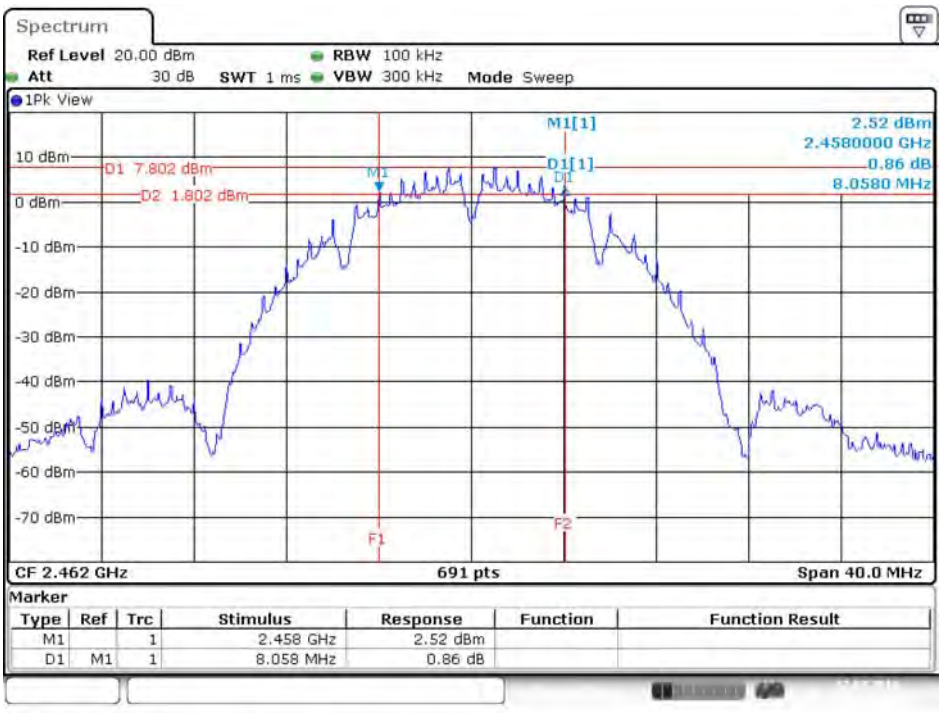
6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 3



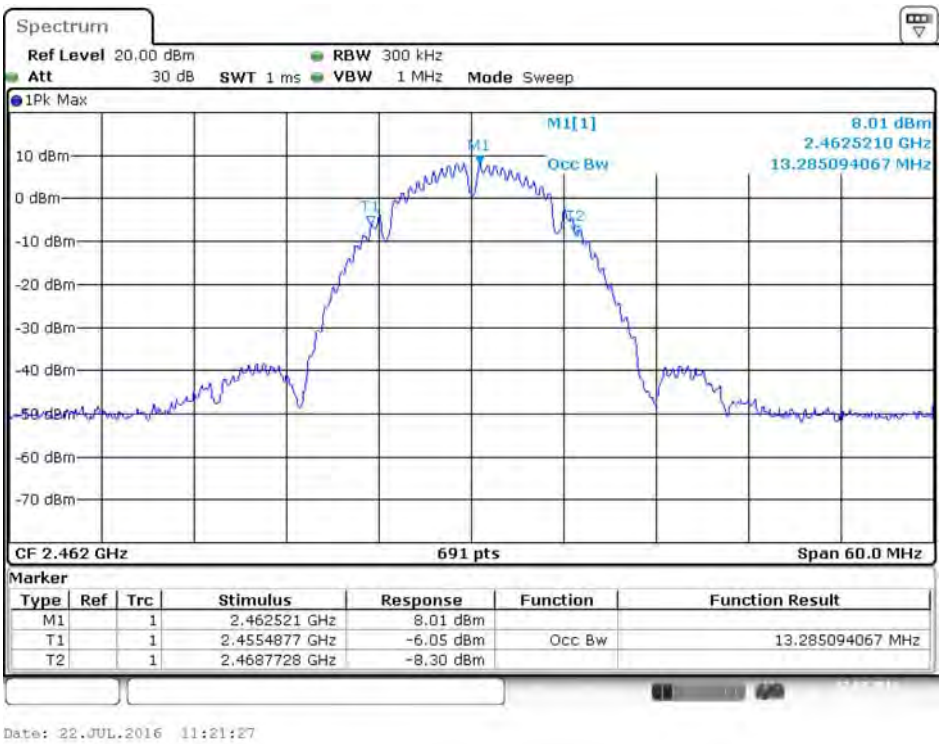
99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 3



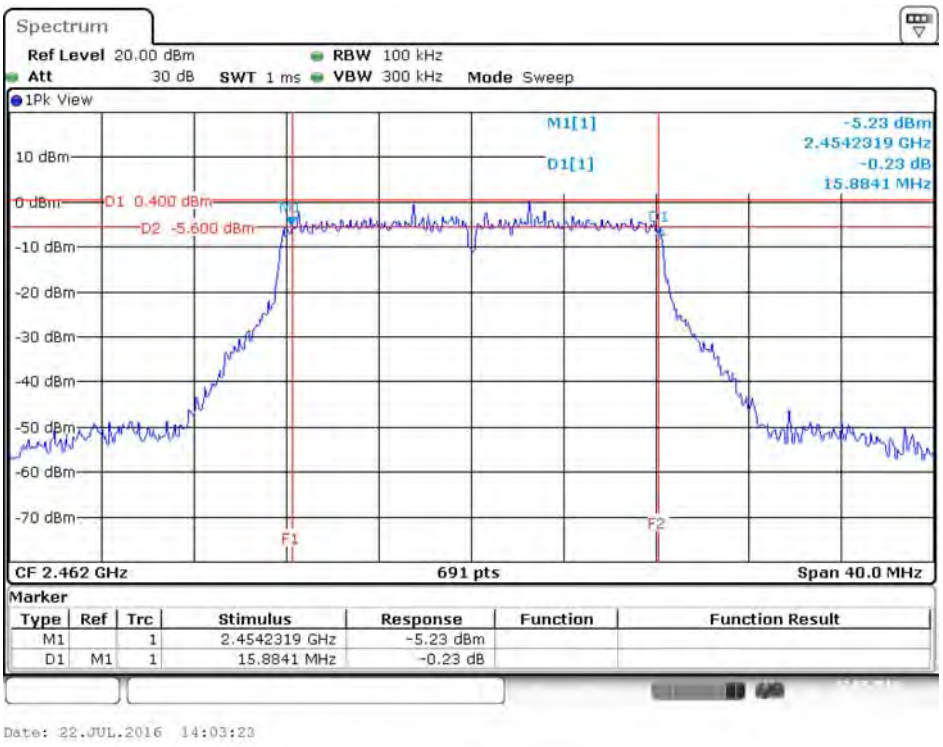
6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 4



99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 4

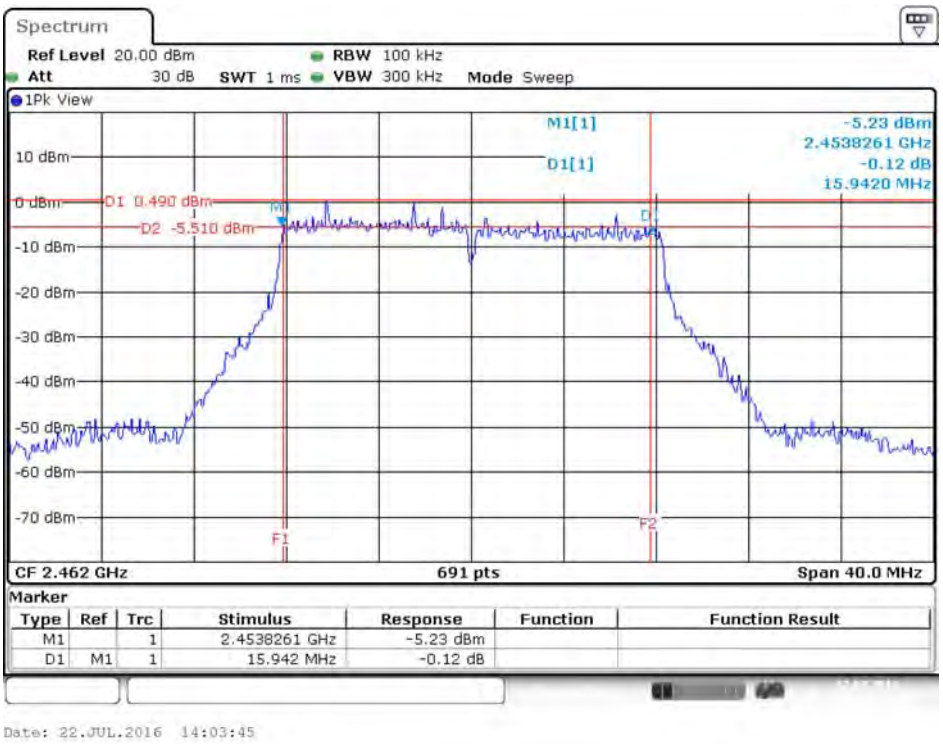


6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2462 MHz / Chain 1

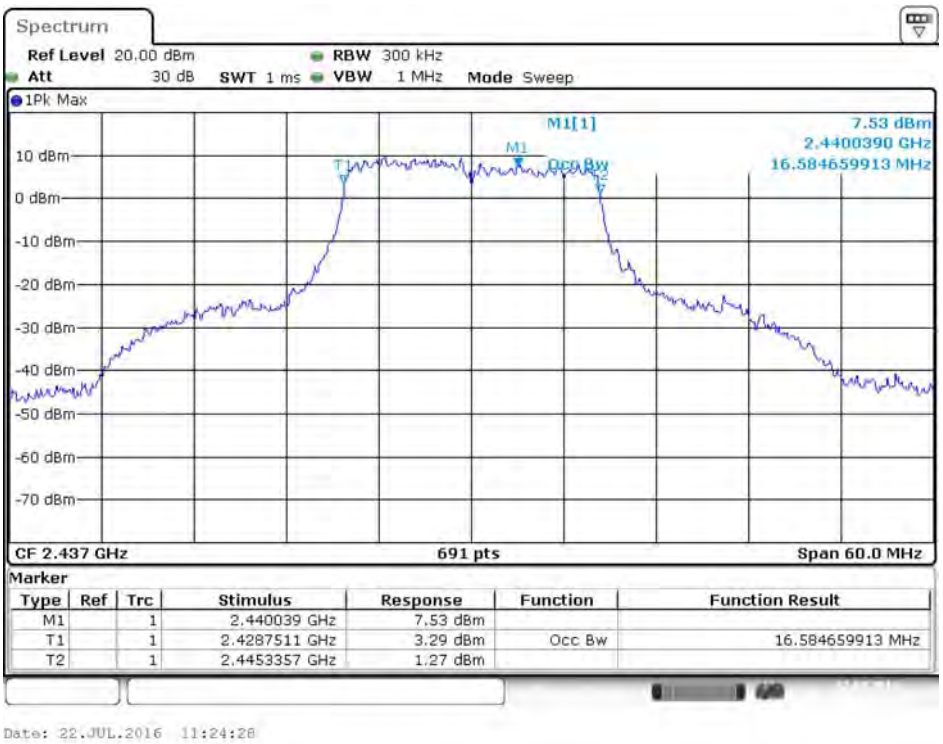


99% Occupied Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 1

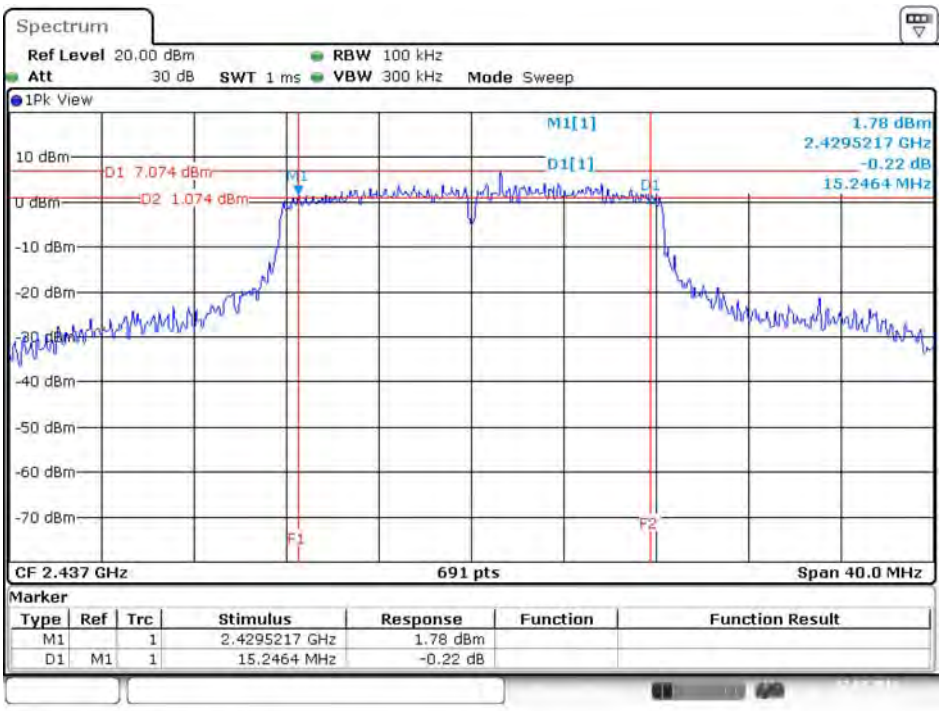
6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2462 MHz / Chain 2



99% Occupied Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 2



6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 3



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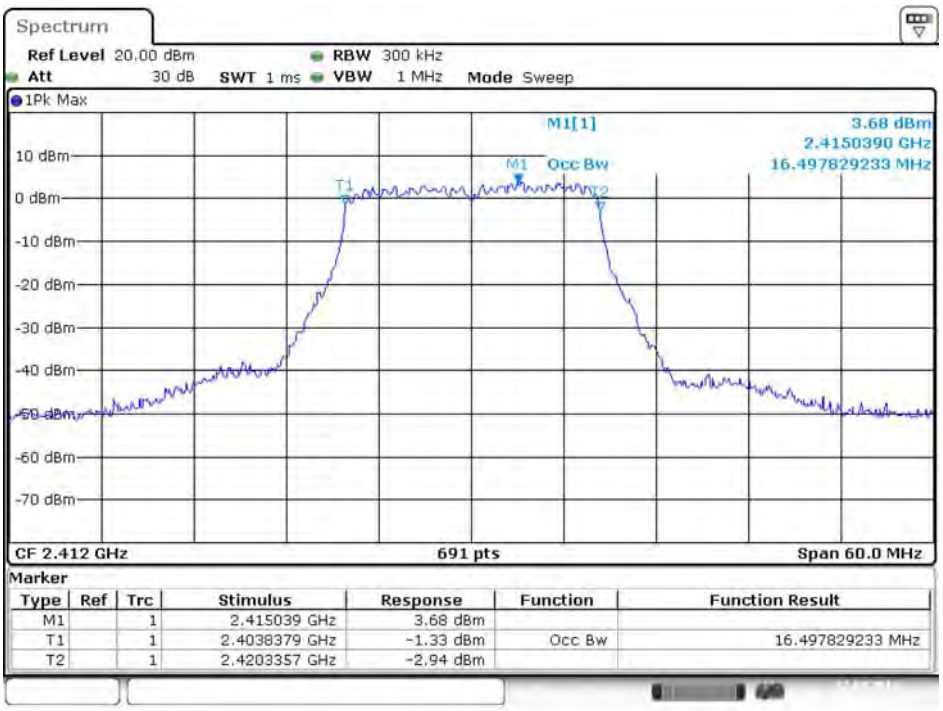
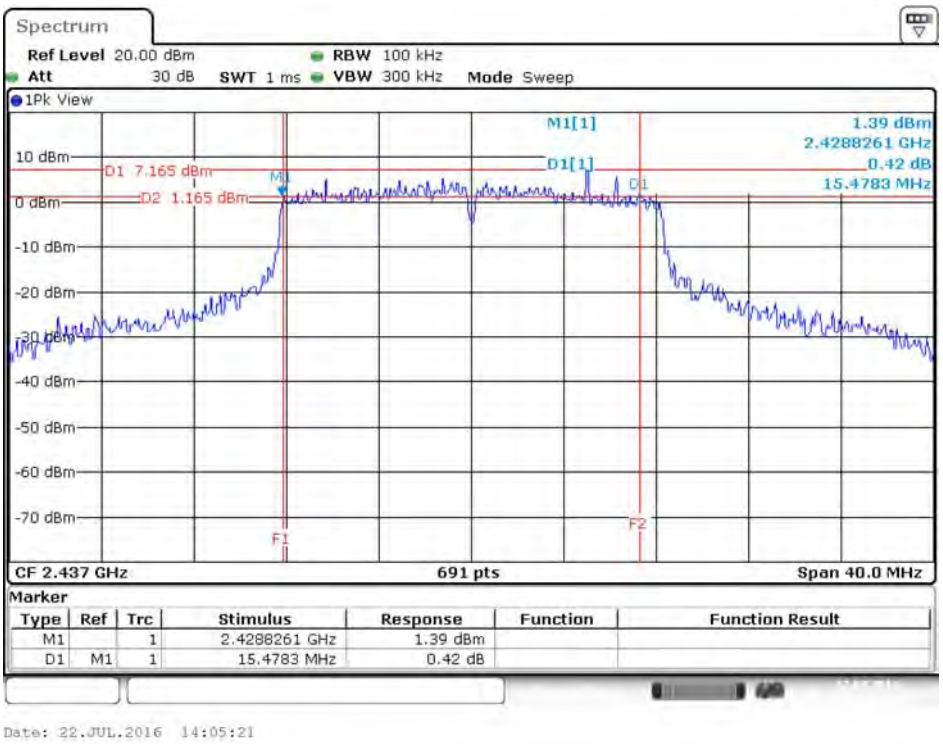
99% Occupied Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 3

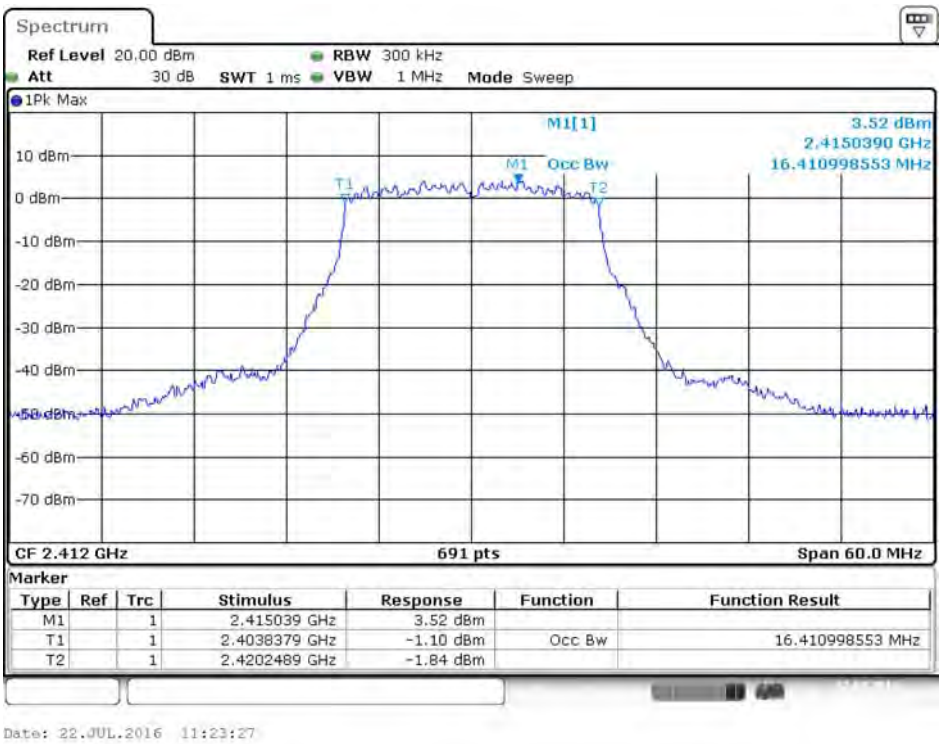


Date: 22.JUL.2016 11:23:22

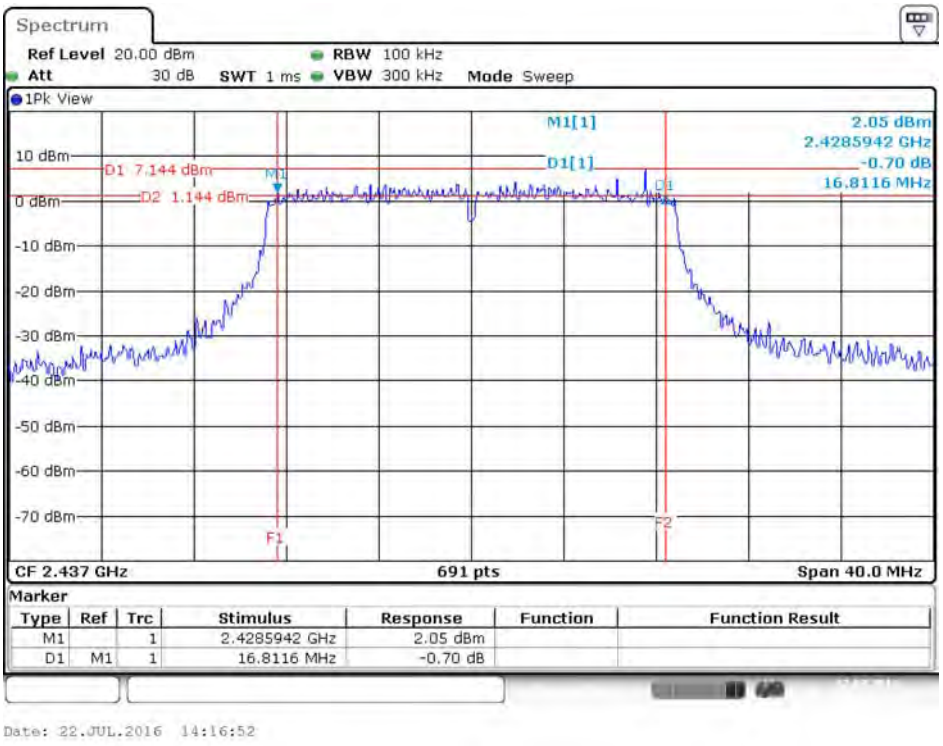
6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 4



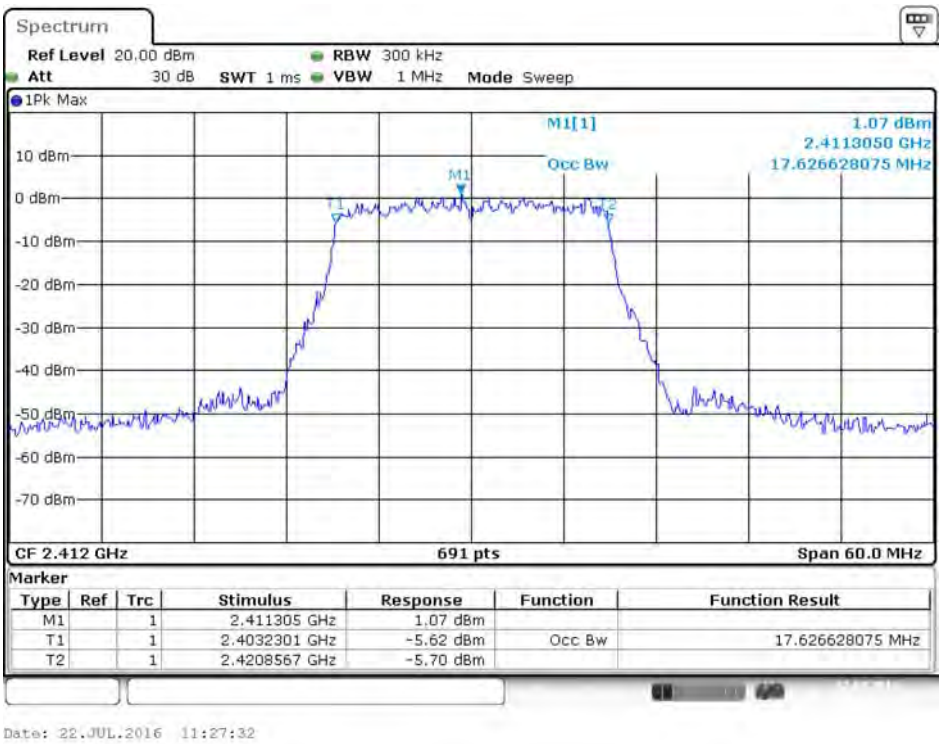
99% Occupied Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 4



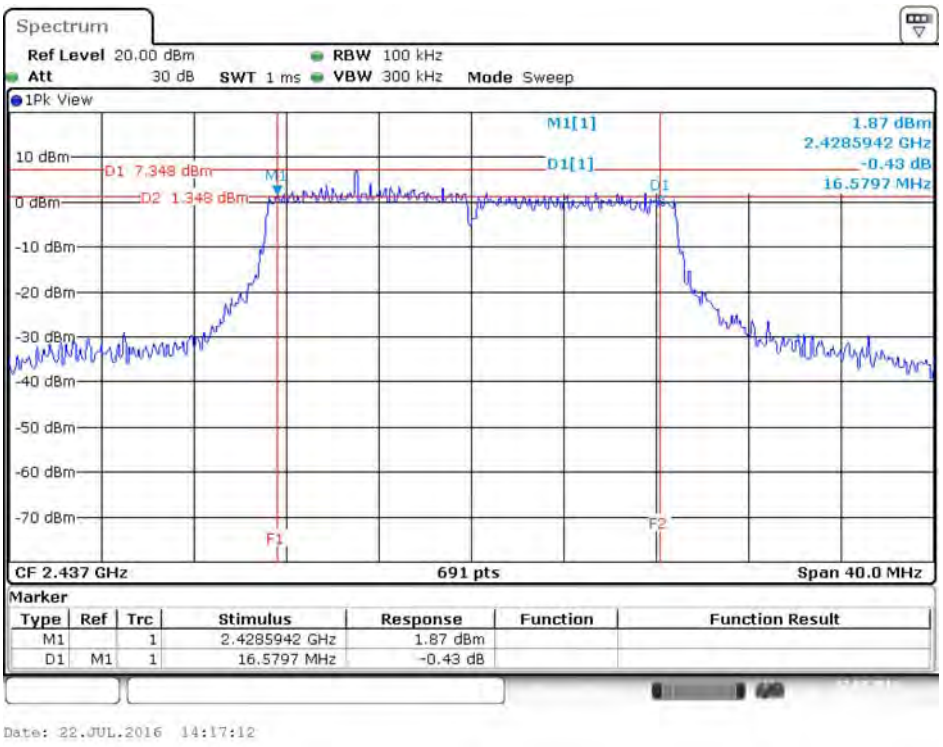
6 dB Bandwidth Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 1



99% Occupied Bandwidth Plot on Configuration MCS0 VHT20 / 2412 MHz / Chain 1



6 dB Bandwidth Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 2



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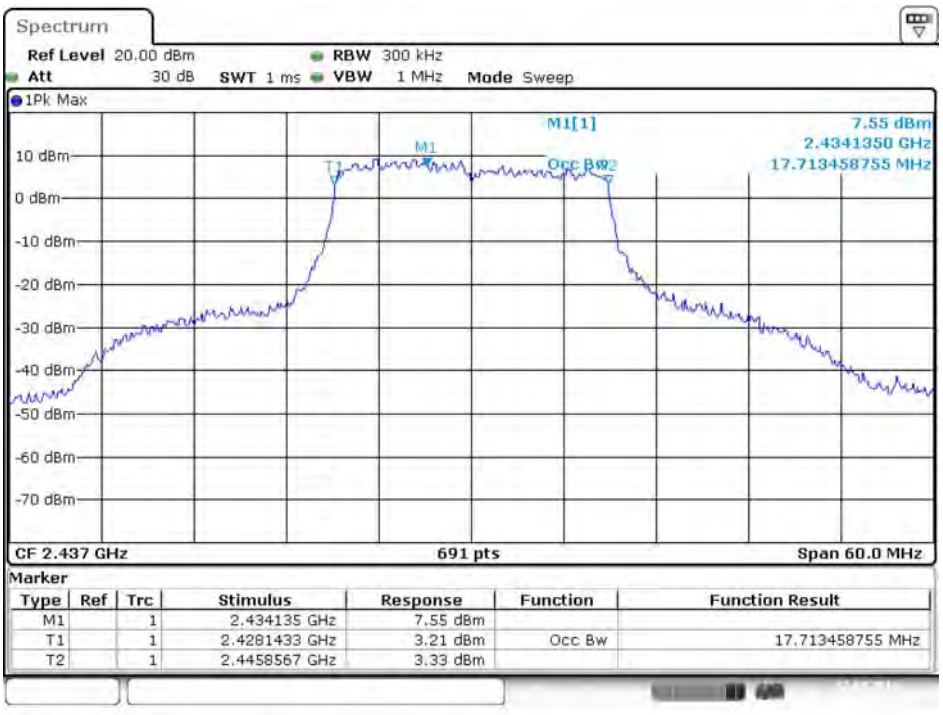
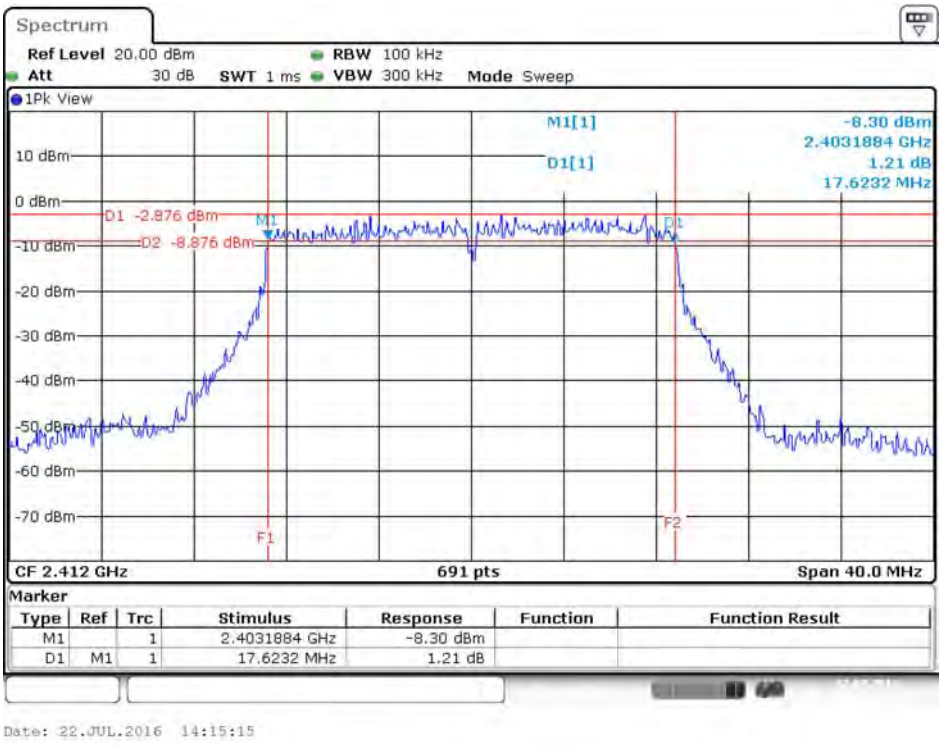
99% Occupied Bandwidth Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 2

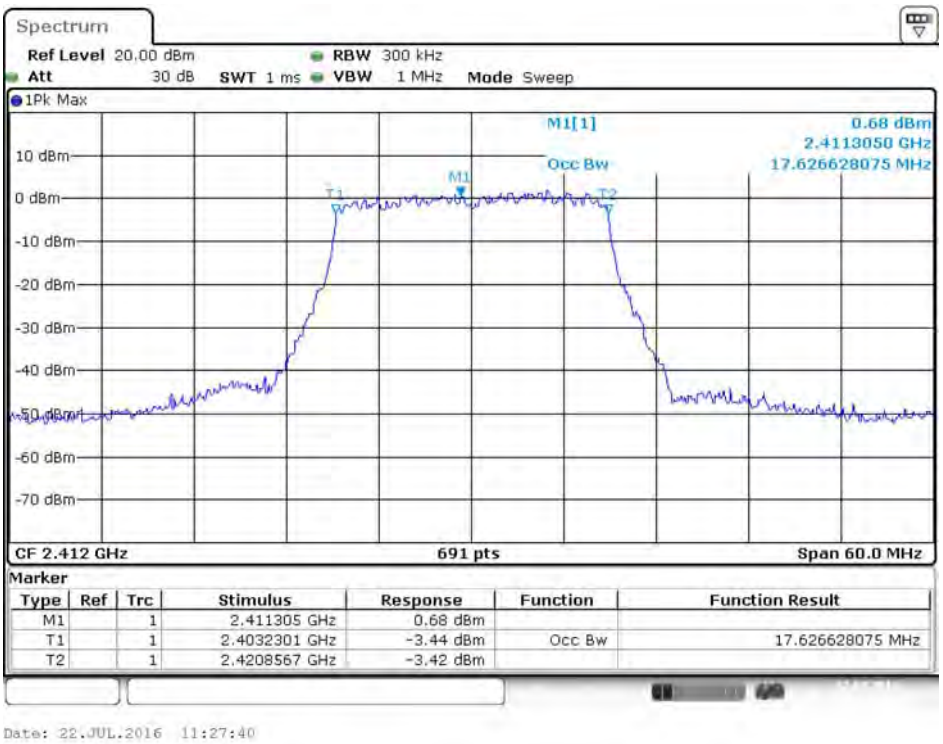


Date: 22.JUL.2016 11:28:54

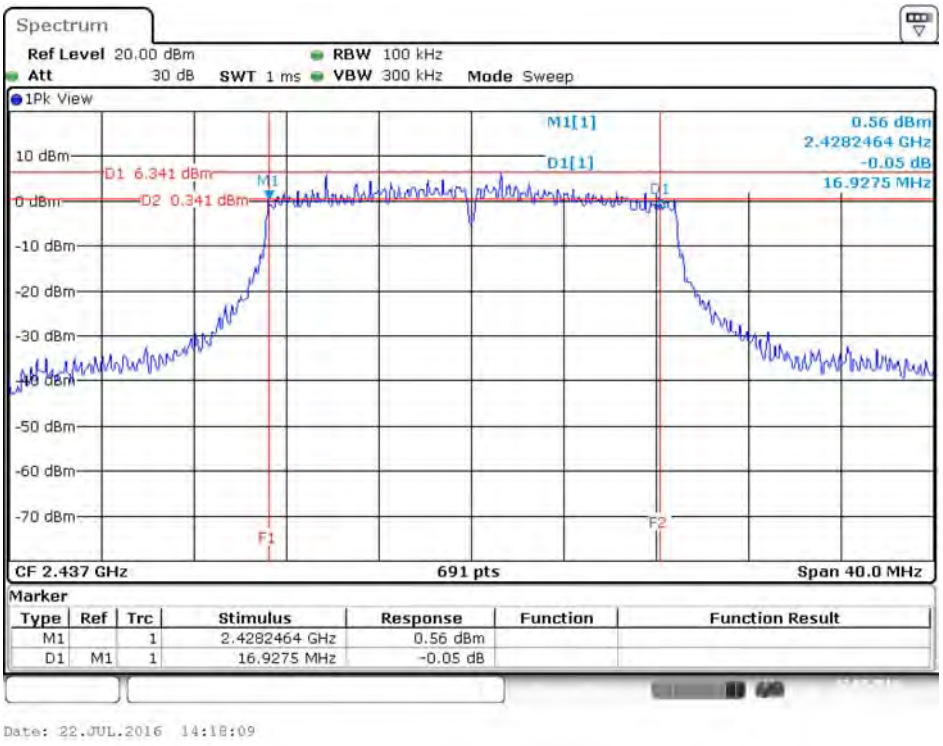
6 dB Bandwidth Plot on Configuration MCS0 VHT20 / 2412 MHz / Chain 3



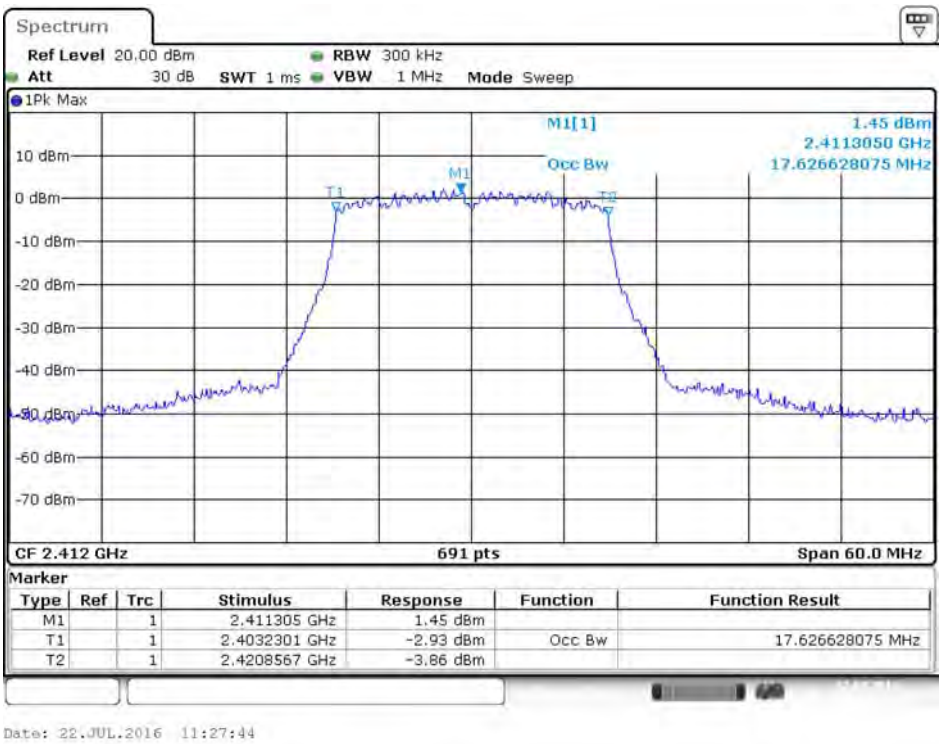
99% Occupied Bandwidth Plot on Configuration MCS0 VHT20 / 2412 MHz / Chain 3



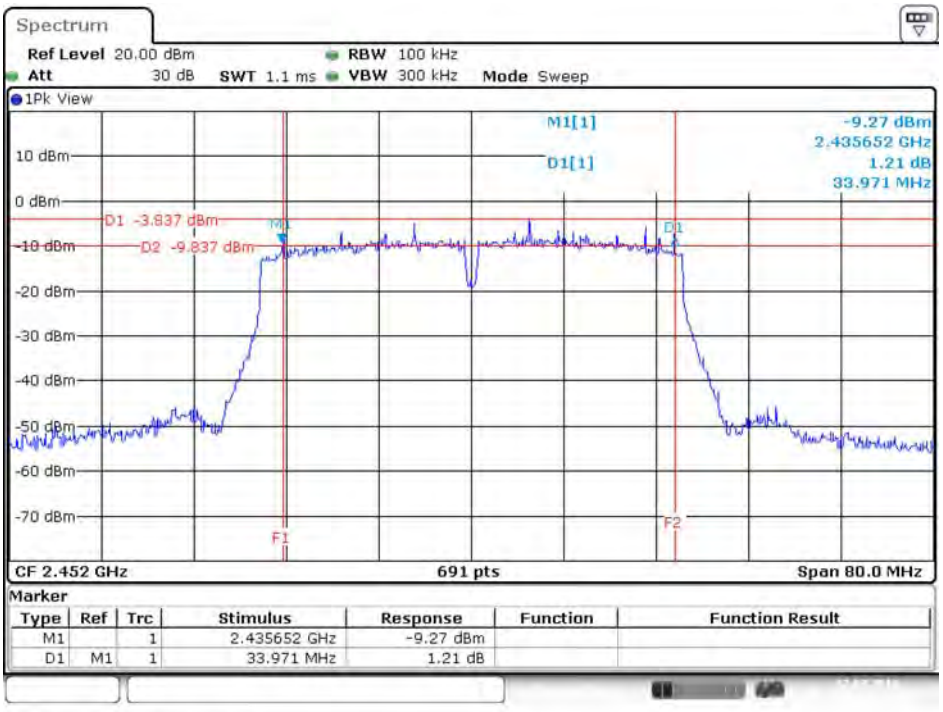
6 dB Bandwidth Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 4



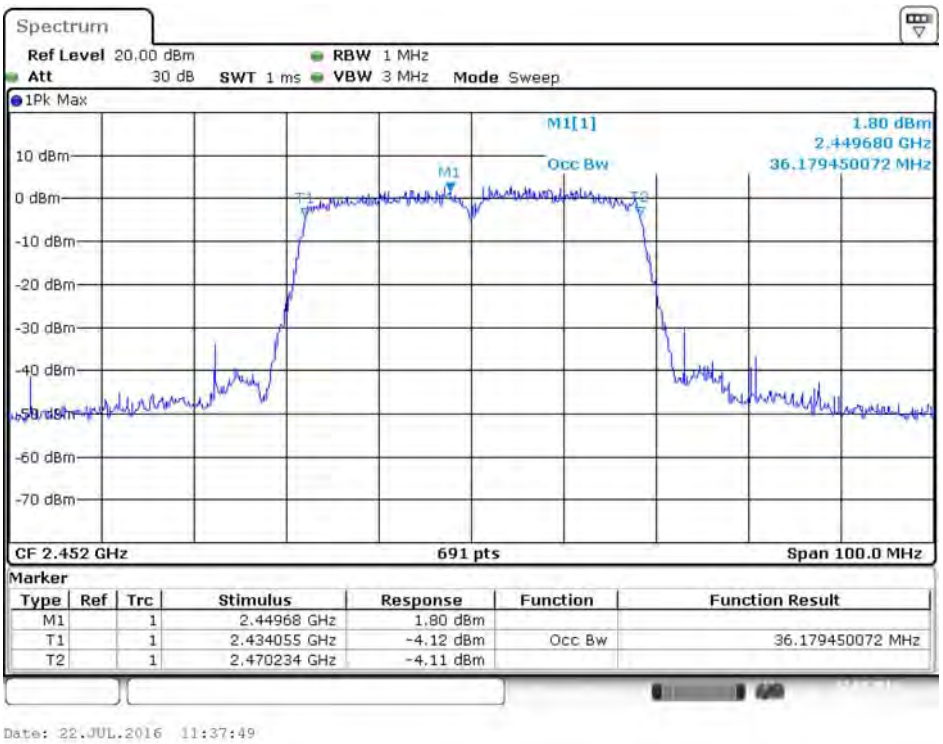
99% Occupied Bandwidth Plot on Configuration MCS0 VHT20 / 2412 MHz / Chain 4



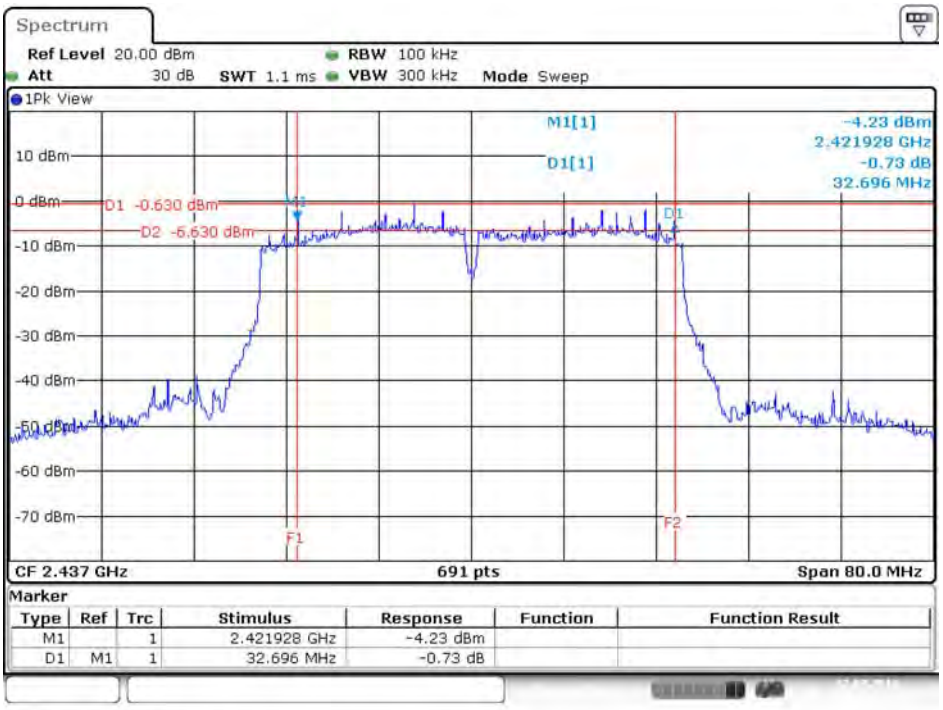
6 dB Bandwidth Plot on Configuration MCS0 VHT40 / 2452 MHz / Chain 1



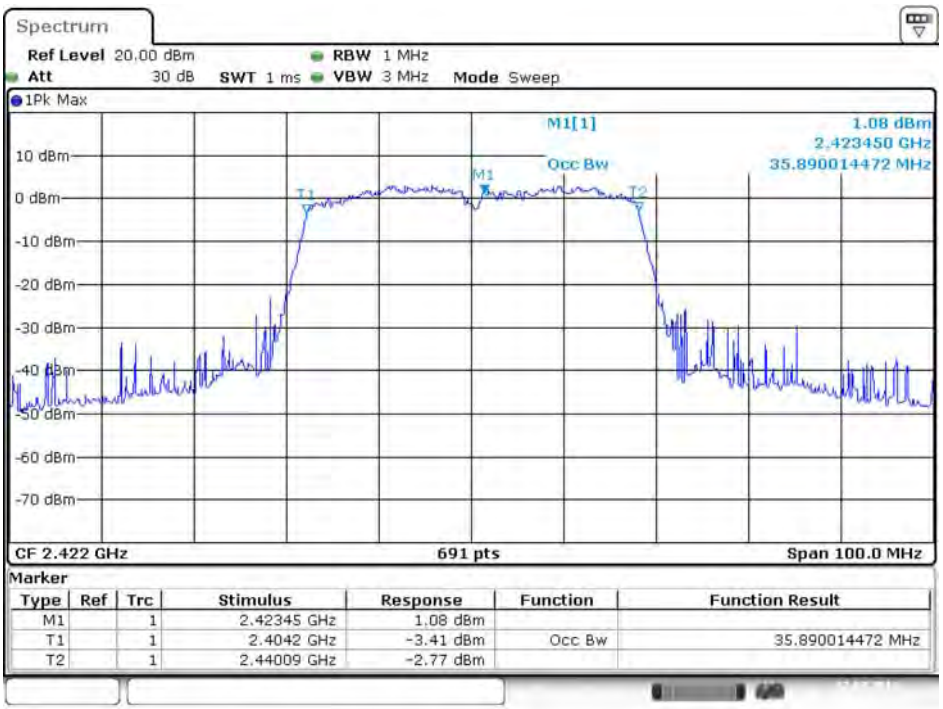
99% Occupied Bandwidth Plot on Configuration MCS0 VHT40 / 2452 MHz / Chain 1



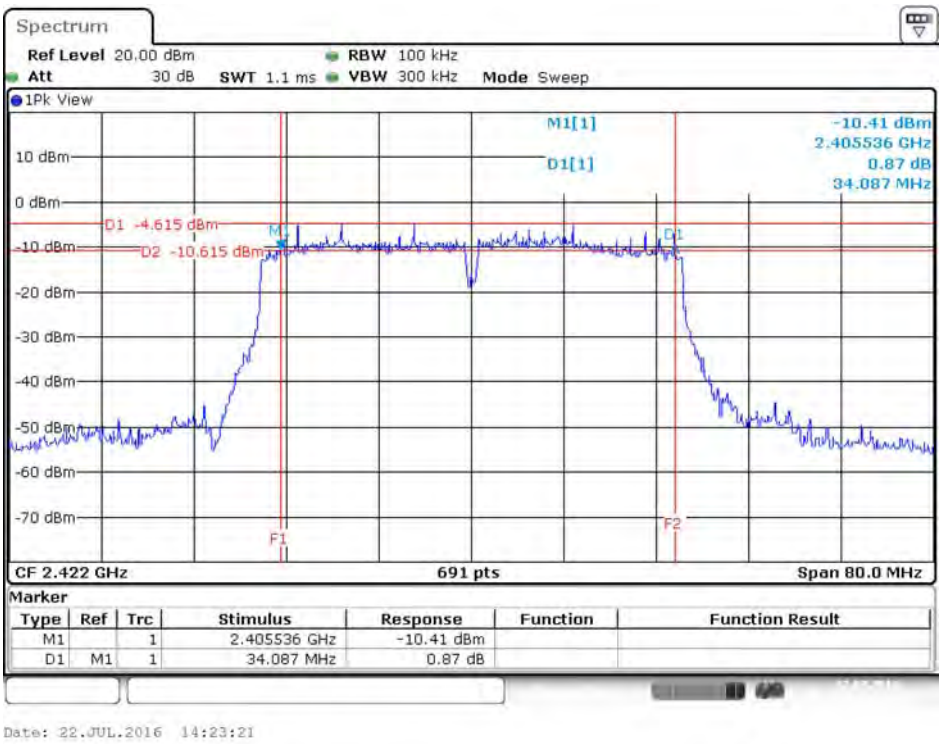
6 dB Bandwidth Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 2



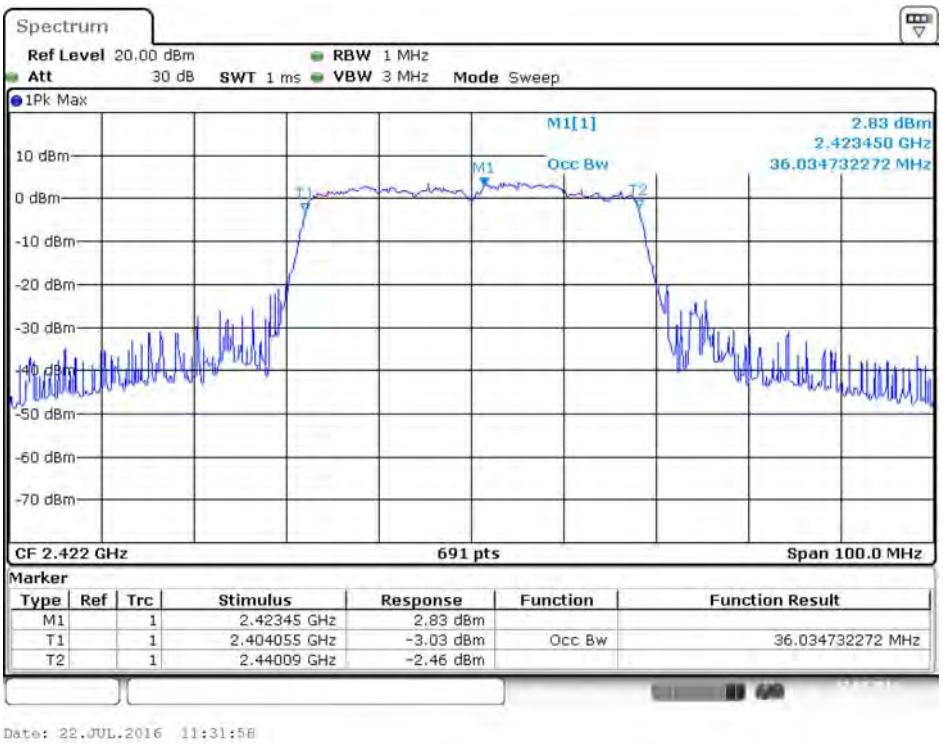
99% Occupied Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 2



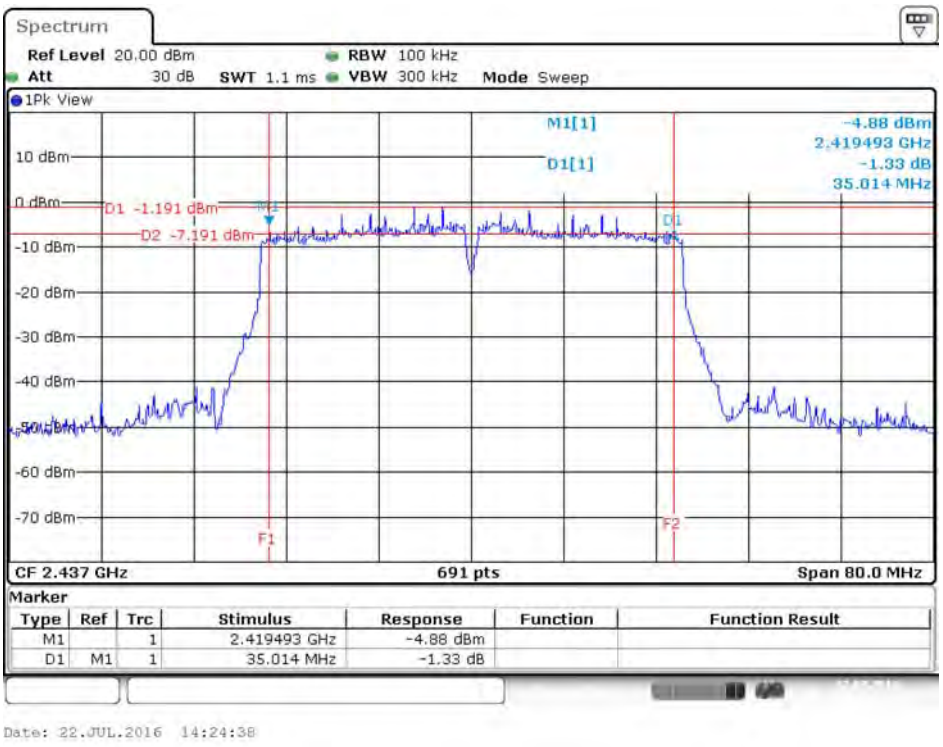
6 dB Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 3



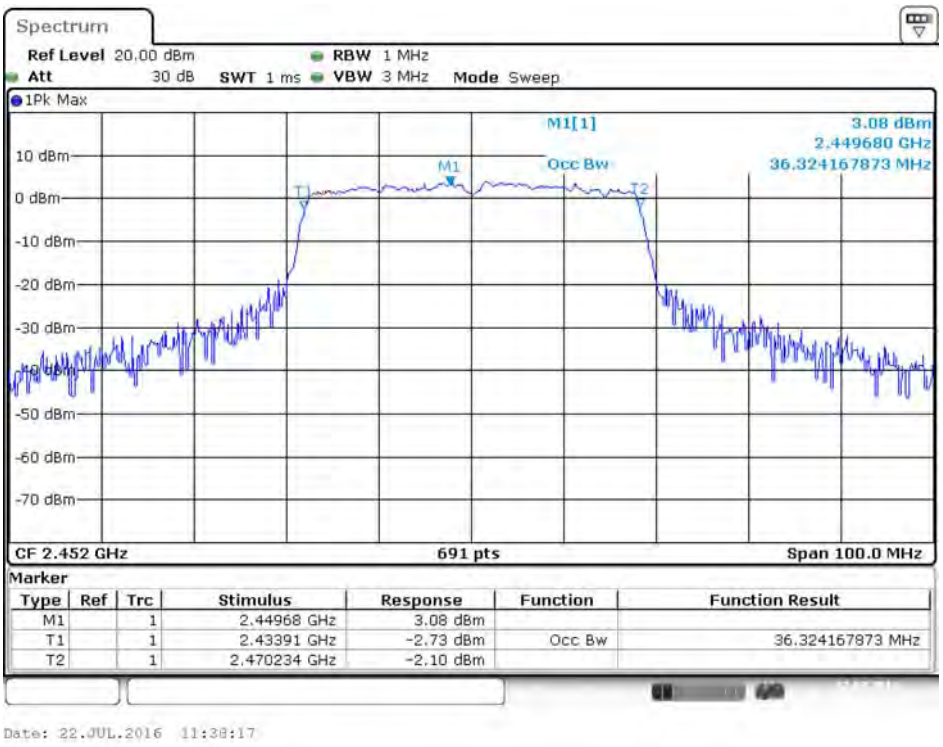
99% Occupied Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 3



6 dB Bandwidth Plot on Configuration MCS0 VHT40 / 2437 MHz / Chain 4

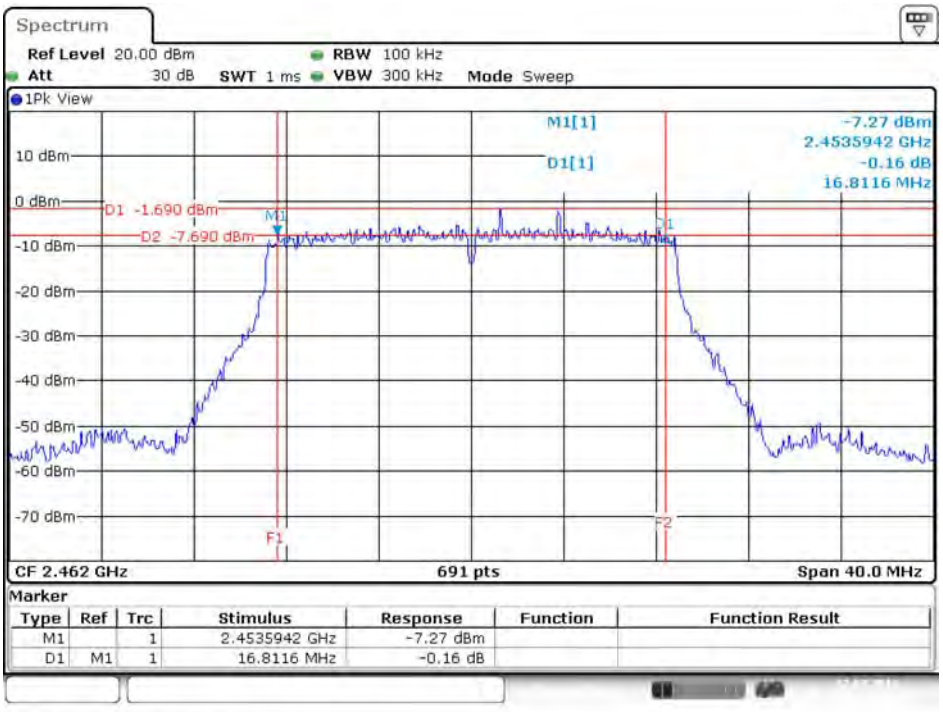


99% Occupied Bandwidth Plot on Configuration MCS0 VHT40 / 2452 MHz / Chain 4



For beamforming function:

6 dB Bandwidth Plot on Configuration MCS0 VHT20 / 2462 MHz / Chain 1



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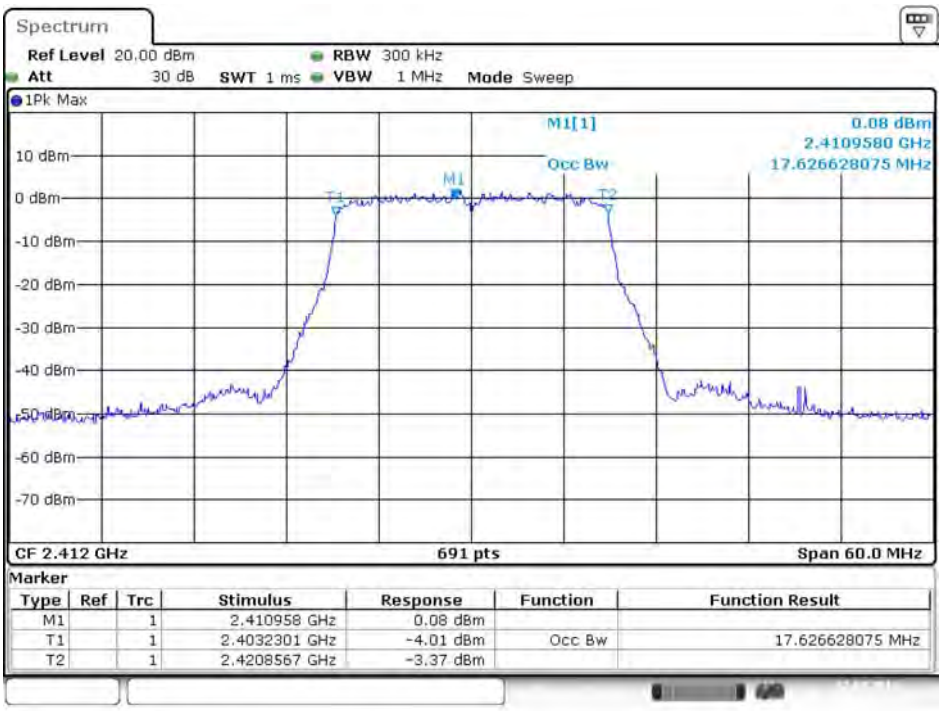
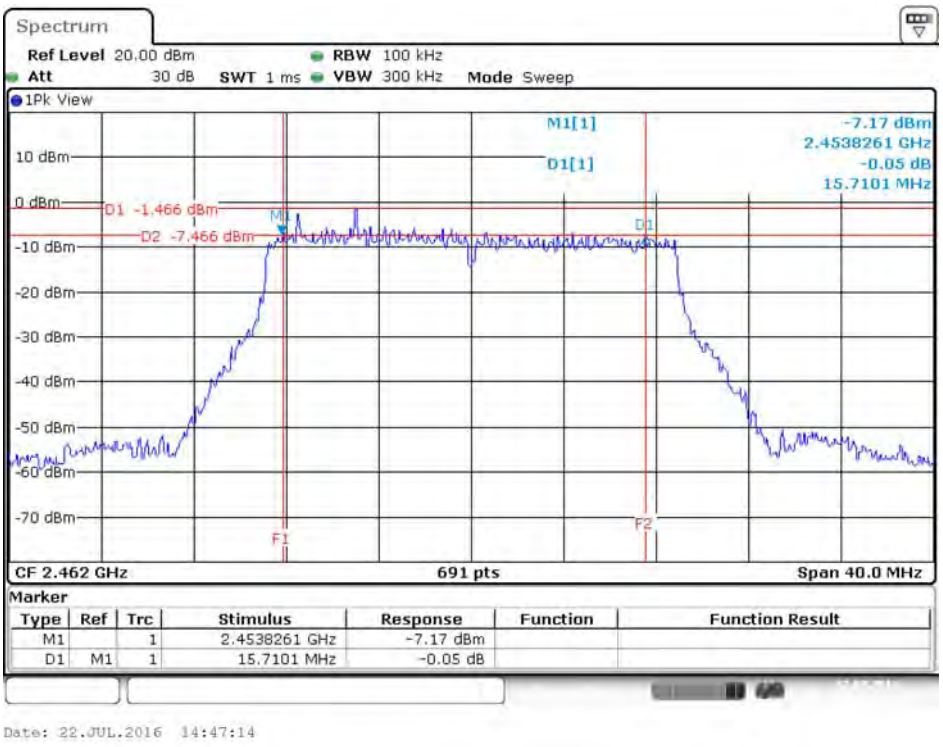
99% Occupied Bandwidth Plot on Configuration MCS0 VHT20 / 2412 MHz / Chain 1

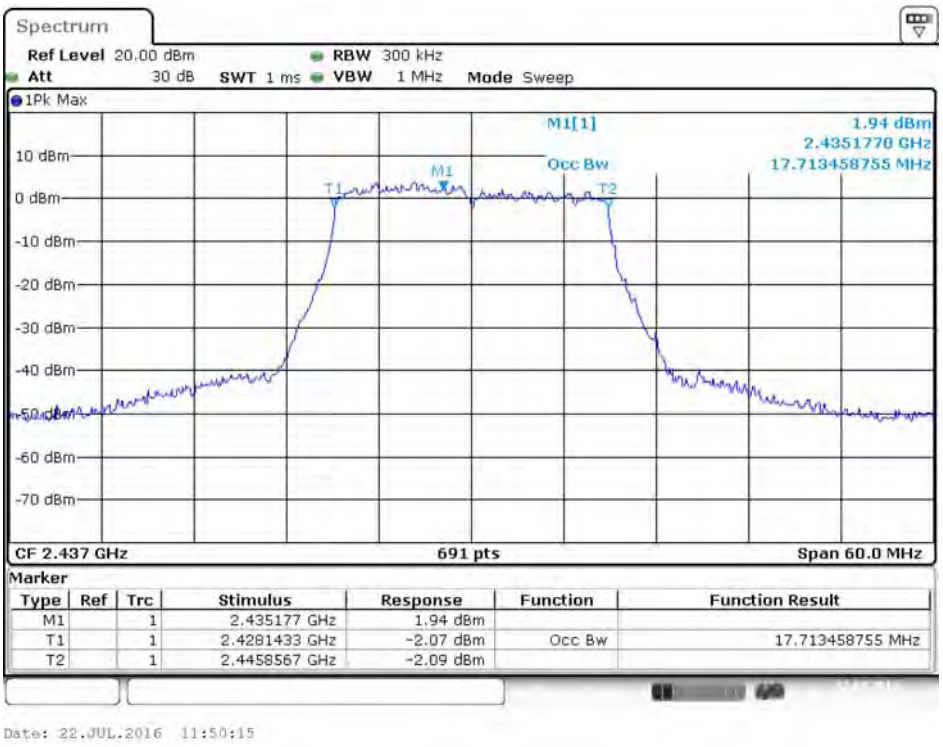


Date: 22.JUL.2016 11:48:24

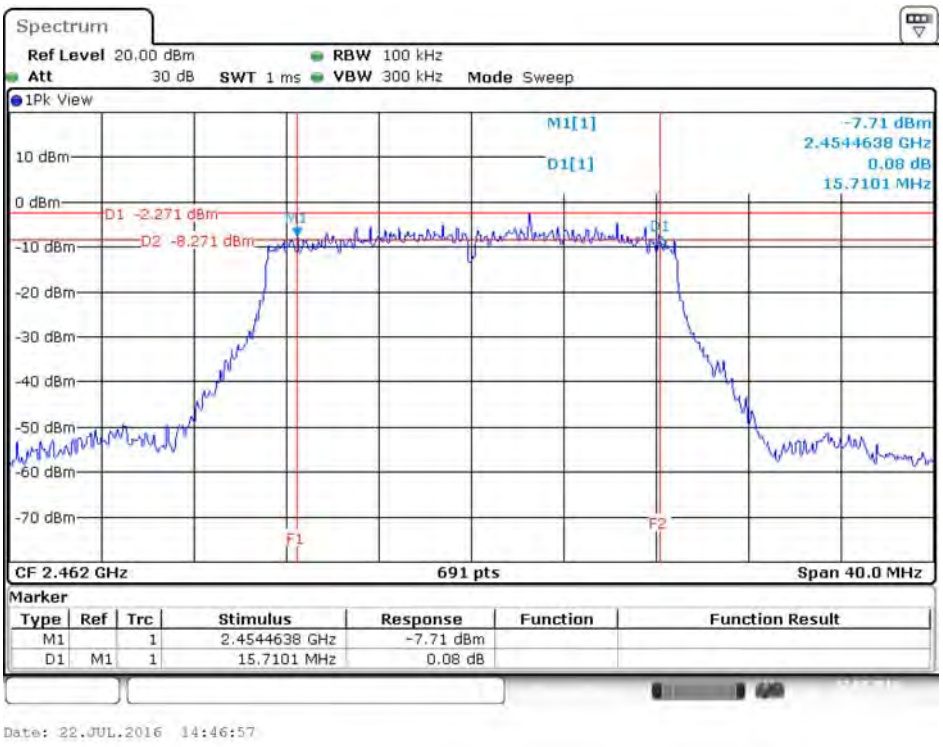
6 dB Bandwidth Plot on Configuration MCS0 VHT20 / 2462 MHz / Chain 2



99% Occupied Bandwidth Plot on Configuration MCS0 VHT20 / 2437 MHz / Chain 2

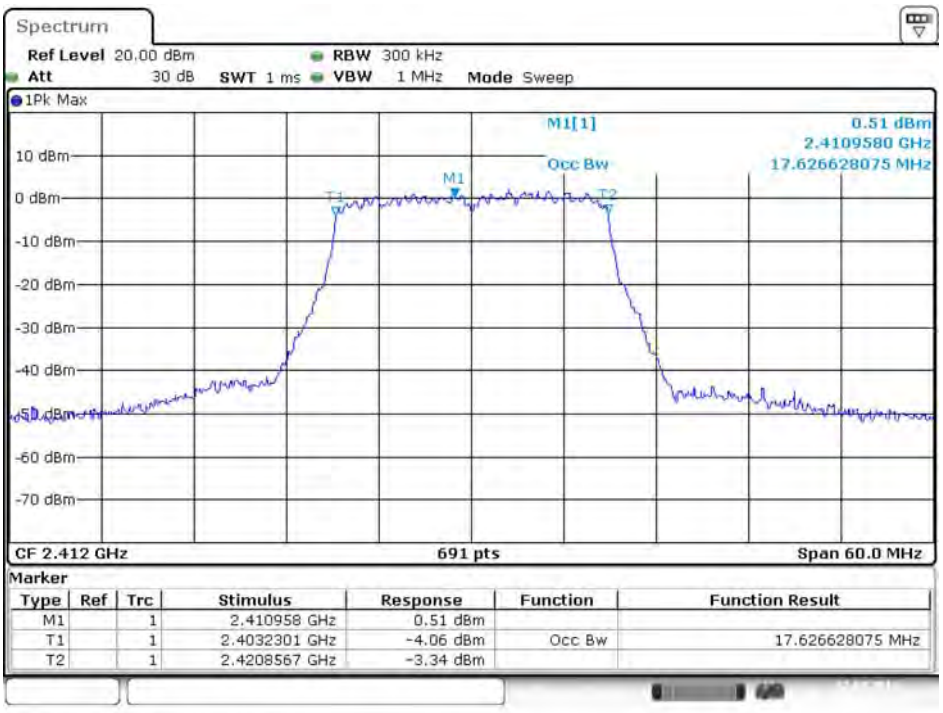


6 dB Bandwidth Plot on Configuration MCS0 VHT20 / 2462 MHz / Chain 3



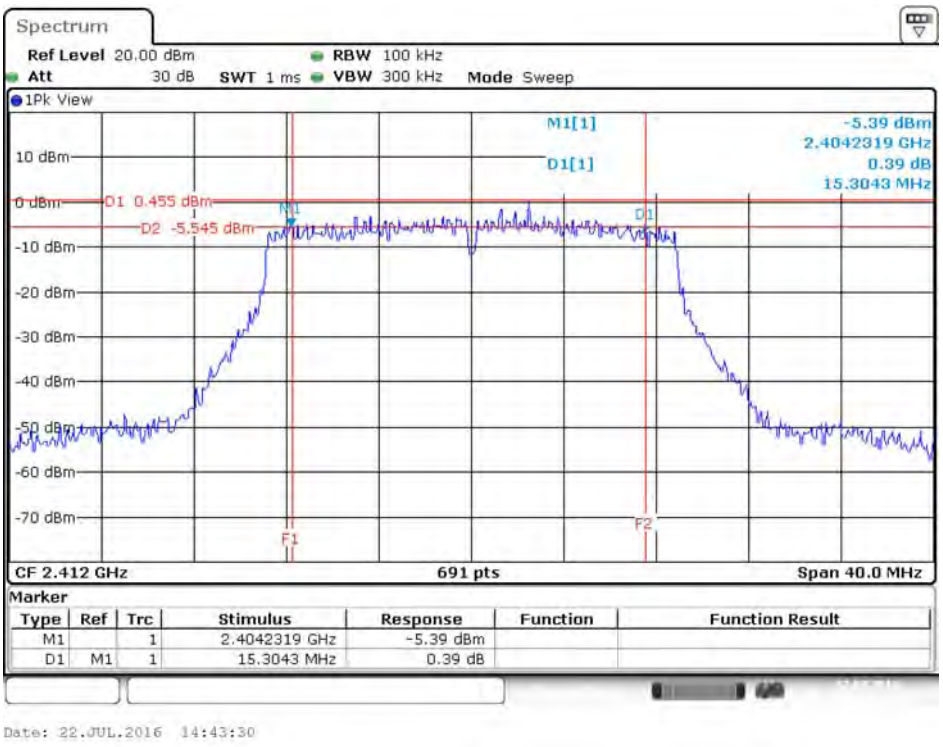
Date: 22.JUL.2016 14:46:57

99% Occupied Bandwidth Plot on Configuration MCS0 VHT20 / 2412 MHz / Chain 3

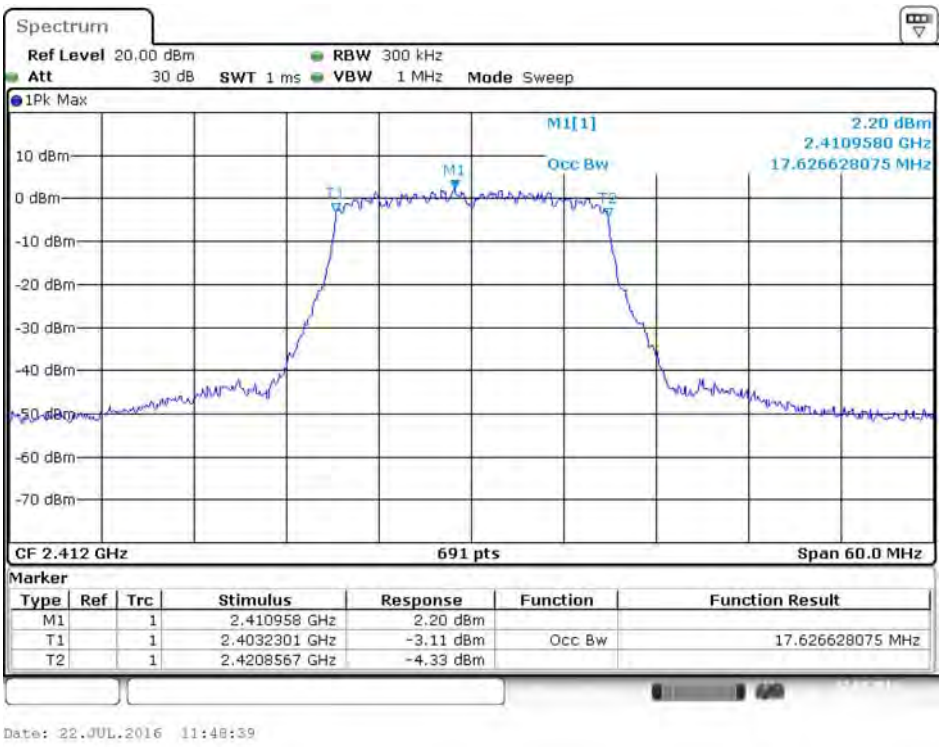


Date: 22.JUL.2016 11:48:33

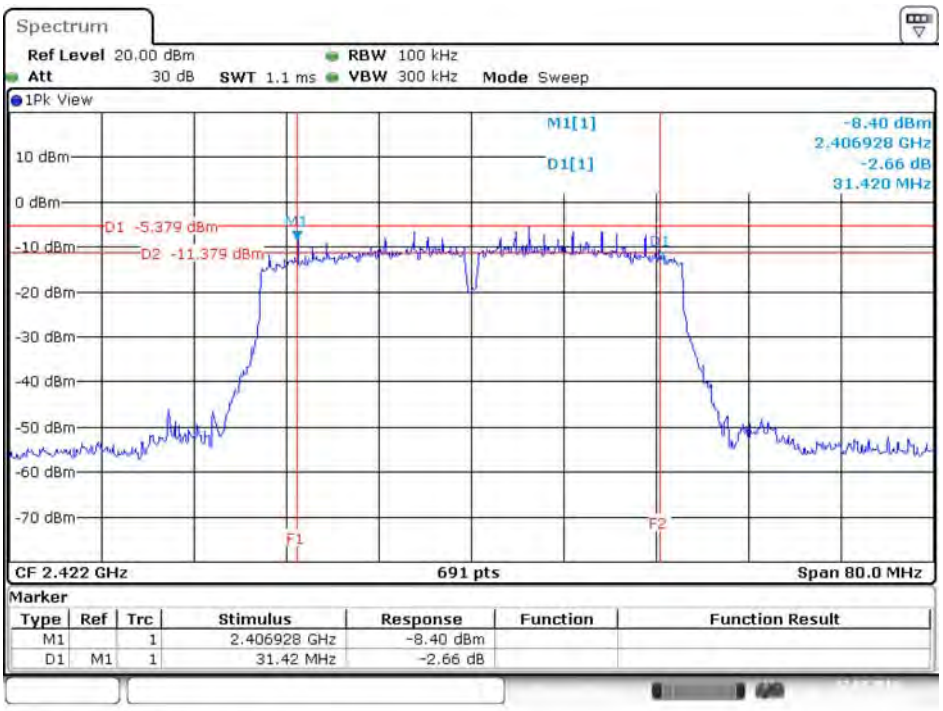
6 dB Bandwidth Plot on Configuration MCS0 VHT20 / 2412 MHz / Chain 4



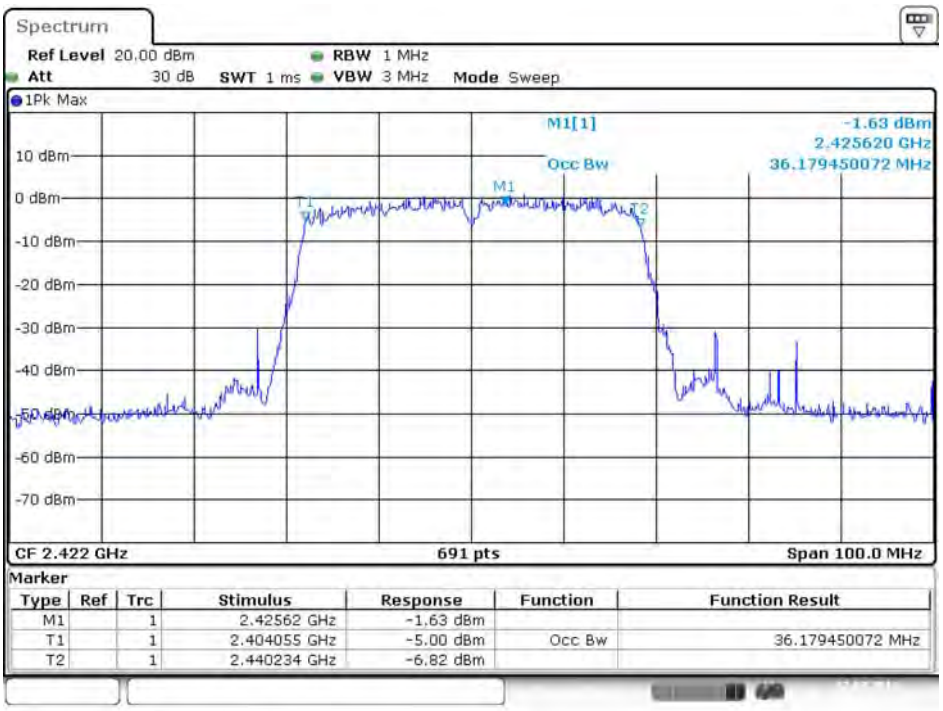
99% Occupied Bandwidth Plot on Configuration MCS0 VHT20 / 2412 MHz / Chain 4



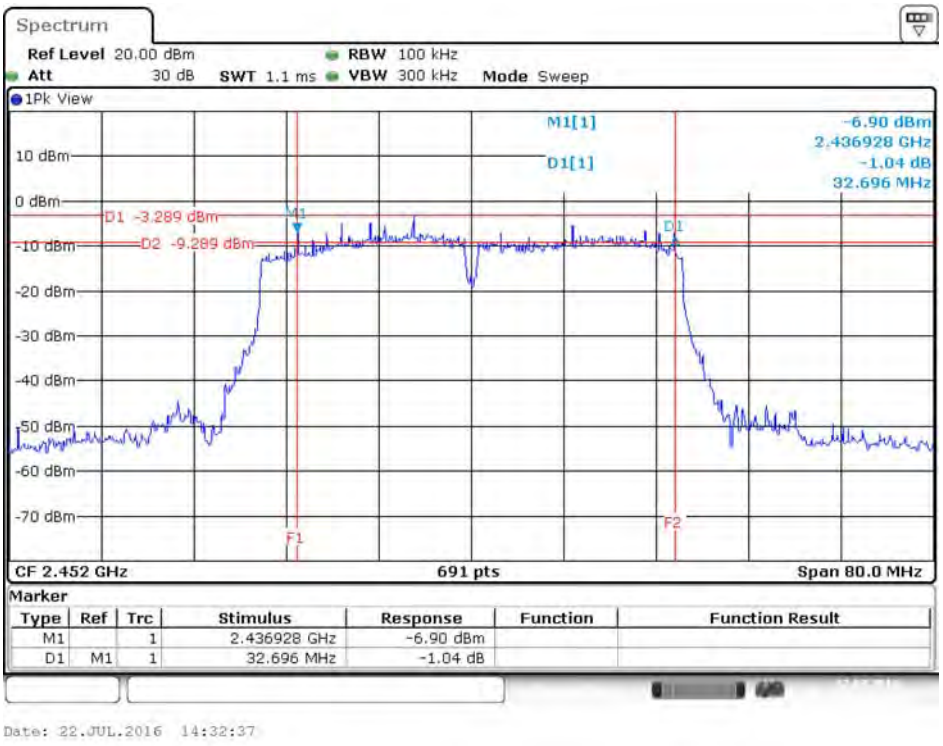
6 dB Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 1



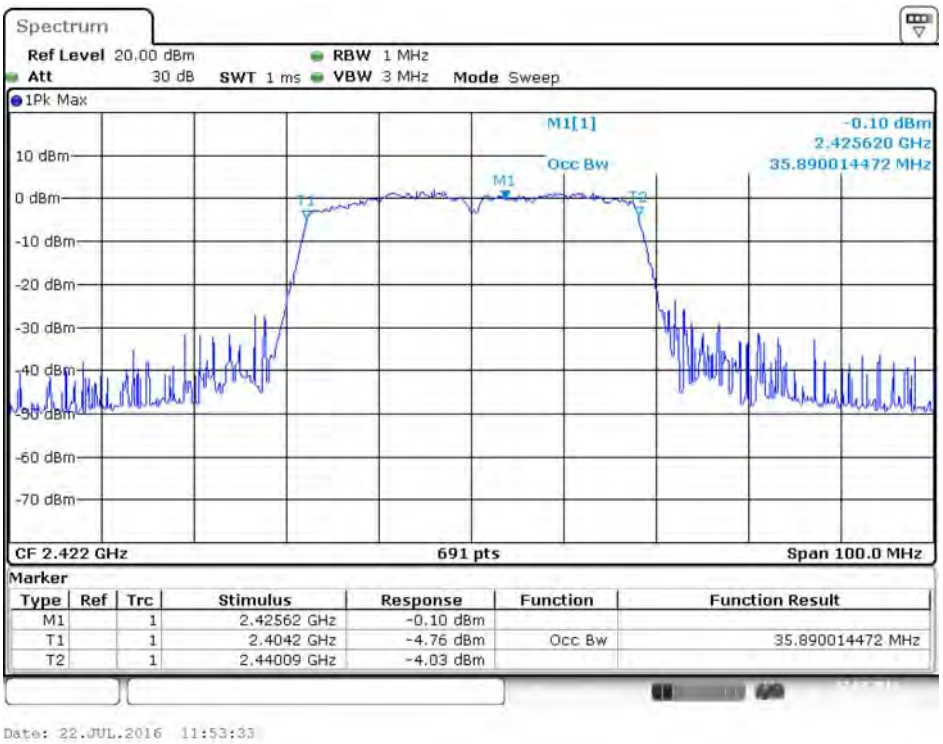
99% Occupied Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 1



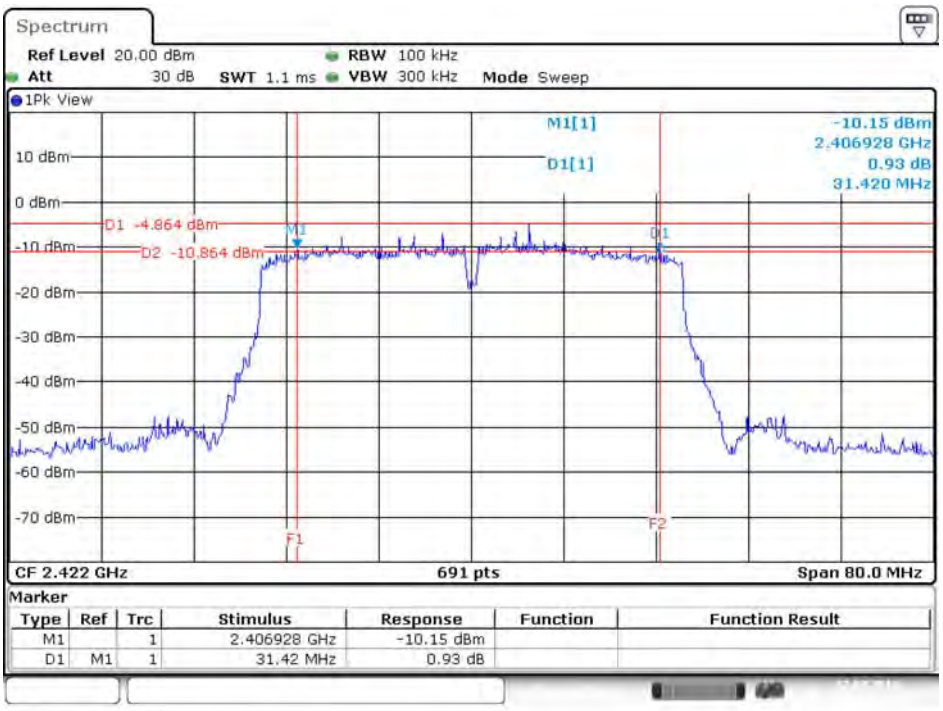
6 dB Bandwidth Plot on Configuration MCS0 VHT40 / 2452 MHz / Chain 2



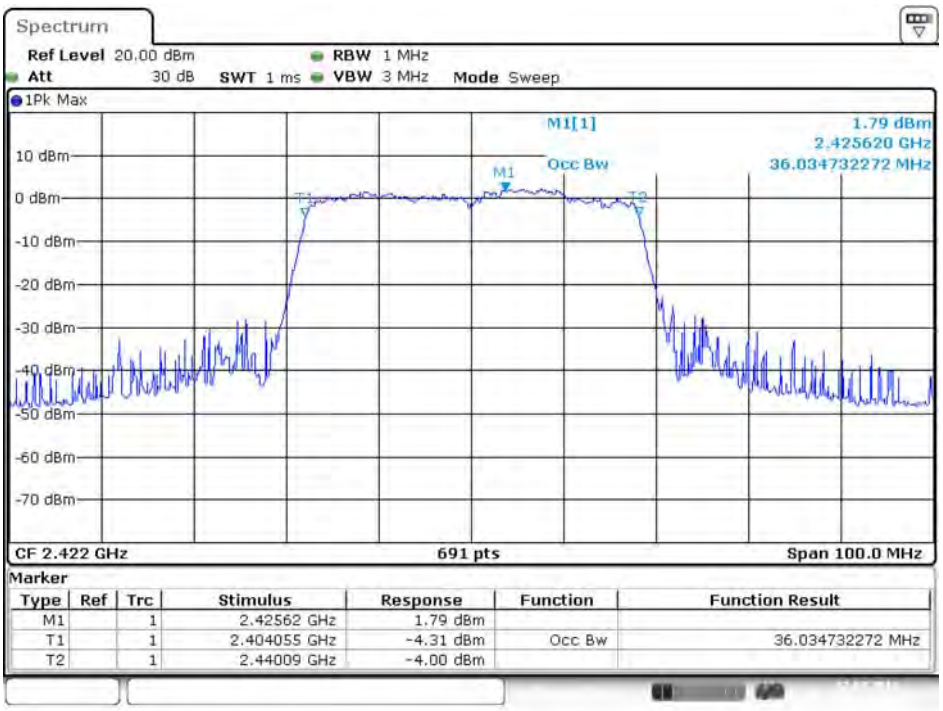
99% Occupied Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 2



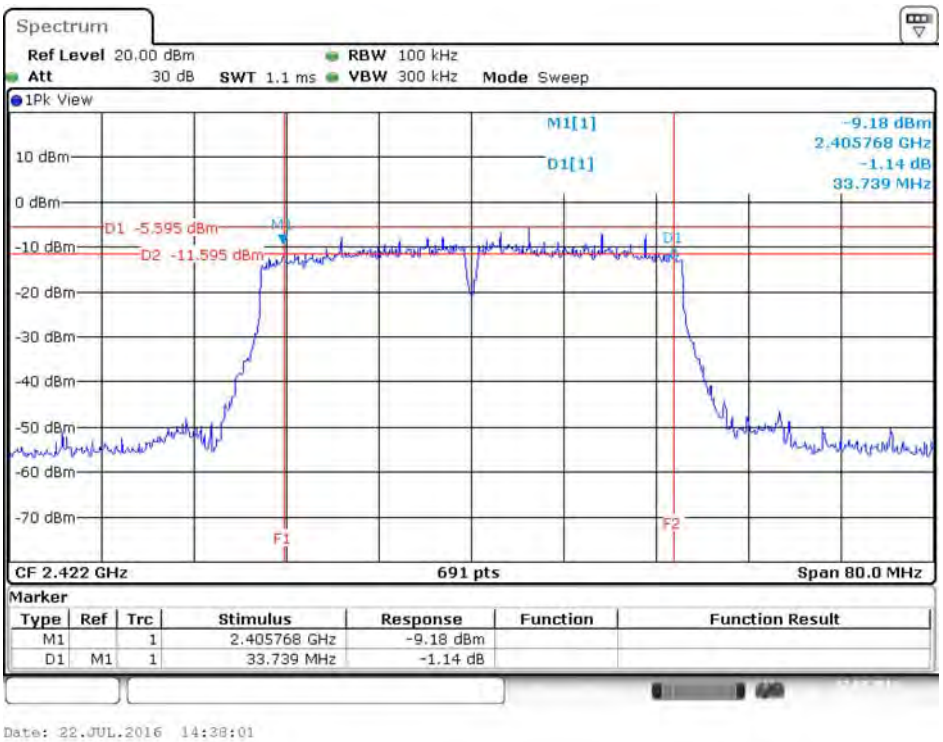
6 dB Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 3



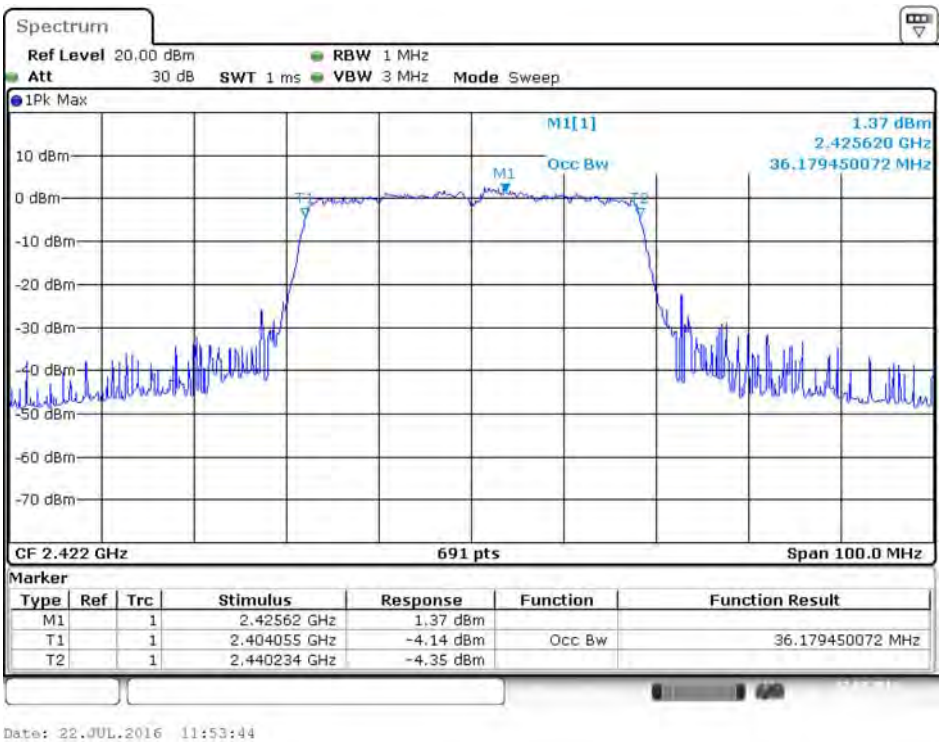
99% Occupied Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 3



6 dB Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 4



99% Occupied Bandwidth Plot on Configuration MCS0 VHT40 / 2422 MHz / Chain 4



4.5. Radiated Emissions Measurement

4.5.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.5.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

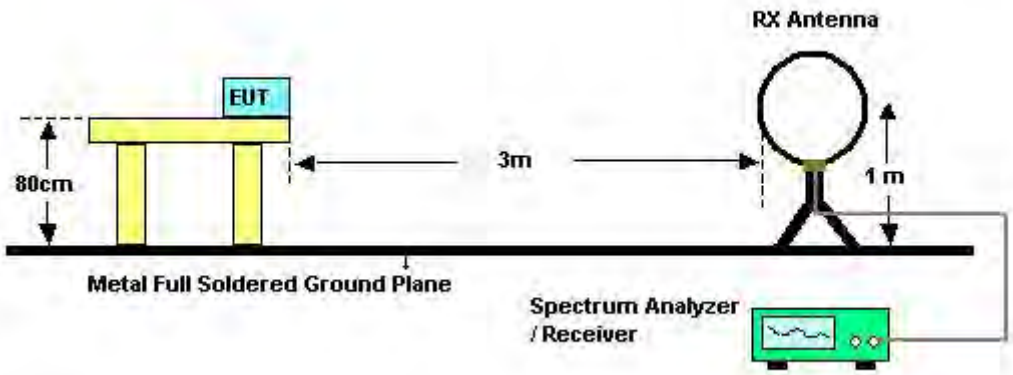
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. Test Procedures

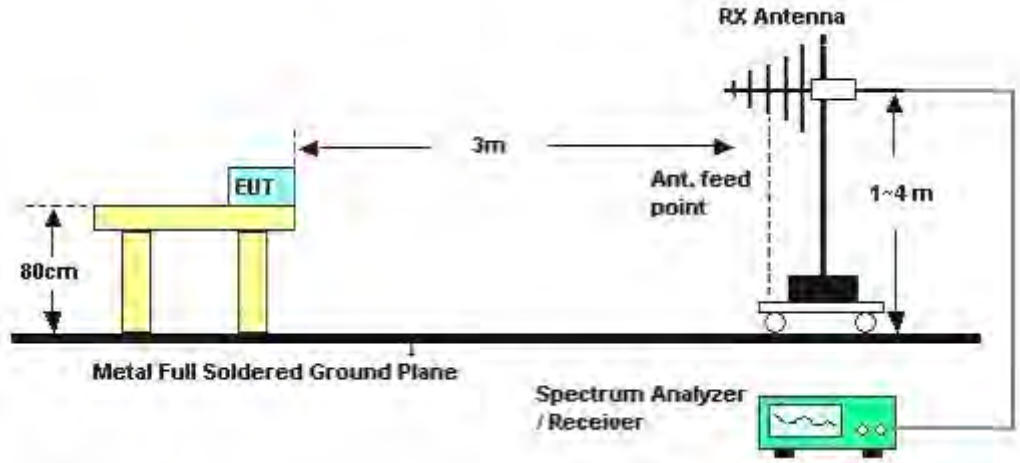
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.
10. The measurement distance for 1 to 18GHz is 3m, and above 18GHz is 1m.

4.5.4. Test Setup Layout

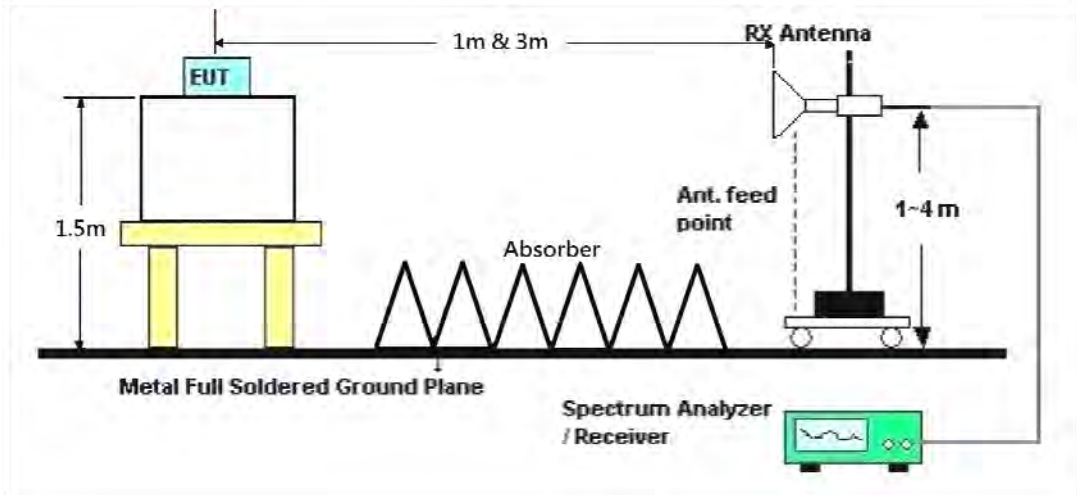
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

For non-beamforming function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	Normal Link
Test Date	May 06, 2016	Test Mode	Mode 2

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

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

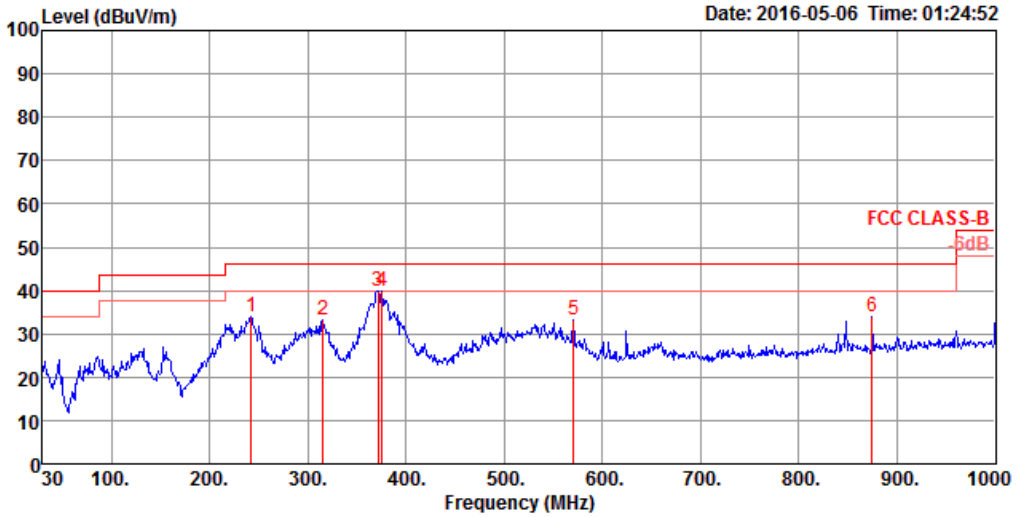
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

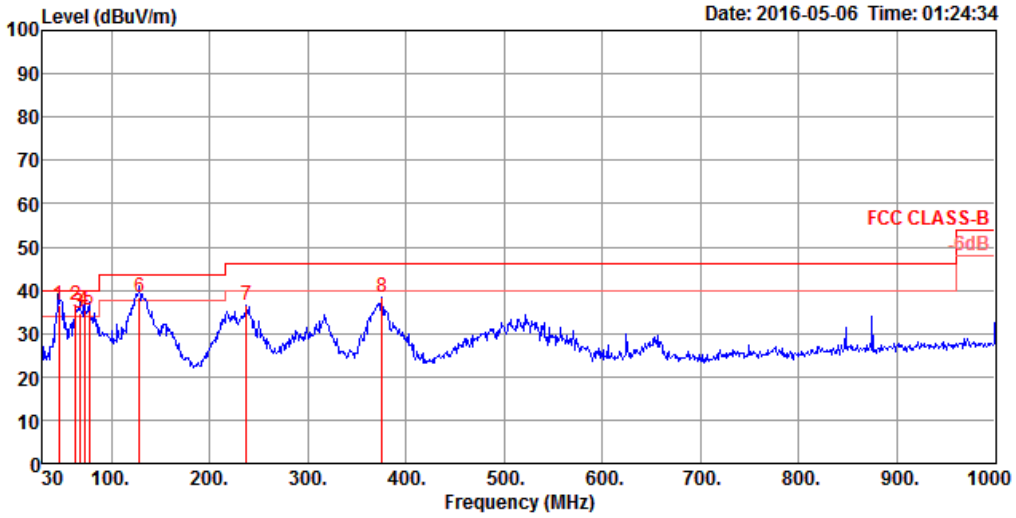
Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	Normal Link
Test Mode	Mode 2		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	242.43	34.02	46.00	-11.98	46.43	1.32	18.58	32.31	125	271	Peak	HORIZONTAL
2	315.18	33.32	46.00	-12.68	43.64	1.52	20.45	32.29	100	84	Peak	HORIZONTAL
3	371.44	39.94	46.00	-6.06	48.62	1.66	21.98	32.32	100	166	Peak	HORIZONTAL
4	375.32	39.95	46.00	-6.05	48.52	1.67	22.08	32.32	100	193	Peak	HORIZONTAL
5	570.29	33.28	46.00	-12.72	38.55	2.07	25.05	32.39	200	306	Peak	HORIZONTAL
6	874.87	33.91	46.00	-12.09	35.67	2.55	27.55	31.86	125	48	Peak	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	46.49	36.43	40.00	-3.57	51.80	0.60	16.44	32.41	125	132	QP	VERTICAL
2	63.95	36.53	40.00	-3.47	54.86	0.70	13.37	32.40	100	360	Peak	VERTICAL
3	67.83	34.57	40.00	-5.43	53.20	0.71	13.06	32.40	150	299	QP	VERTICAL
4	72.68	35.52	40.00	-4.48	54.10	0.74	13.08	32.40	150	212	QP	VERTICAL
5	77.53	35.30	40.00	-4.70	53.50	0.77	13.43	32.40	150	206	QP	VERTICAL
6	128.94	38.54	43.50	-4.96	51.10	0.98	18.83	32.37	200	159	QP	VERTICAL
7	237.58	36.38	46.00	-9.62	49.21	1.31	18.17	32.31	100	2	Peak	VERTICAL
8	375.32	38.24	46.00	-7.76	46.81	1.67	22.08	32.32	150	105	Peak	VERTICAL

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

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

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

4.5.9. Results for Radiated Emissions (1GHz~10th Harmonic)

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 29, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4823.91	53.27	74.00	-20.73	42.95	10.29	33.11	33.08	156	355	Peak	HORIZONTAL
2	4823.98	47.63	54.00	-6.37	37.31	10.29	33.11	33.08	156	355	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4823.93	48.98	54.00	-5.02	38.66	10.29	33.11	33.08	153	2	Average	VERTICAL
2	4824.01	53.63	74.00	-20.37	43.31	10.29	33.11	33.08	153	2	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 29, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4874.00	41.18	54.00	-12.82	30.75	10.28	33.23	33.08	162	40	Average	HORIZONTAL
2	4874.20	47.51	74.00	-26.49	37.08	10.28	33.23	33.08	162	40	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4873.96	47.46	54.00	-6.54	37.03	10.28	33.23	33.08	155	360	Average	VERTICAL
2	4874.00	51.01	74.00	-22.99	40.58	10.28	33.23	33.08	155	360	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 29, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4920.96	42.57	54.00	-11.43	32.04	10.28	33.32	33.07	152	167	Average	HORIZONTAL
2	4920.96	51.03	74.00	-22.97	40.50	10.28	33.32	33.07	152	167	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4921.00	45.63	54.00	-8.37	35.10	10.28	33.32	33.07	136	52	Average	VERTICAL
2	4921.00	51.77	74.00	-22.23	41.24	10.28	33.32	33.07	136	52	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 30, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4825.62	37.72	54.00	-16.28	27.37	10.29	33.14	33.08	155	195	Average	HORIZONTAL
2	4828.84	51.01	74.00	-22.99	40.66	10.29	33.14	33.08	155	195	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4826.90	51.16	74.00	-22.84	40.81	10.29	33.14	33.08	201	63	Peak	VERTICAL
2	4827.06	38.24	54.00	-15.76	27.89	10.29	33.14	33.08	201	63	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 30, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4870.00	38.28	54.00	-15.72	27.85	10.28	33.23	33.08	162	151	Average	HORIZONTAL
2	4870.40	50.85	74.00	-23.15	40.42	10.28	33.23	33.08	162	151	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4869.50	52.69	74.00	-21.31	42.26	10.28	33.23	33.08	199	53	Peak	VERTICAL
2	4870.00	39.49	54.00	-14.51	29.06	10.28	33.23	33.08	199	53	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 30, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4900.00	36.88	54.00	-17.12	26.38	10.28	33.29	33.07	160	158	Average	HORIZONTAL
2	4927.50	50.05	74.00	-23.95	39.48	10.28	33.35	33.06	160	158	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4899.70	38.07	54.00	-15.93	27.57	10.28	33.29	33.07	204	60	Average	VERTICAL
2	4937.70	50.72	74.00	-23.28	40.15	10.28	33.35	33.06	204	60	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 30, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4801.10	36.36	54.00	-17.64	26.08	10.29	33.08	33.09	164	119	Average	HORIZONTAL
2	4836.90	48.80	74.00	-25.20	38.45	10.29	33.14	33.08	164	119	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4812.40	37.57	54.00	-16.43	27.26	10.29	33.11	33.09	199	57	Average	VERTICAL
2	4814.10	50.25	74.00	-23.75	39.93	10.29	33.11	33.08	199	57	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 30, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4893.70	49.55	74.00	-24.45	39.08	10.28	33.26	33.07	167	46	Peak	HORIZONTAL
2	4897.40	36.44	54.00	-17.56	25.94	10.28	33.29	33.07	167	46	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4892.80	49.72	74.00	-24.28	39.25	10.28	33.26	33.07	210	73	Peak	VERTICAL
2	4898.40	37.53	54.00	-16.47	27.03	10.28	33.29	33.07	210	73	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 30, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4899.80	36.73	54.00	-17.27	26.23	10.28	33.29	33.07	148	166	Average	HORIZONTAL
2	4908.60	49.32	74.00	-24.68	38.82	10.28	33.29	33.07	148	166	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4908.70	37.83	54.00	-16.17	27.33	10.28	33.29	33.07	203	58	Average	VERTICAL
2	4920.00	50.36	74.00	-23.64	39.83	10.28	33.32	33.07	203	58	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 30, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4837.00	36.04	54.00	-17.96	25.69	10.29	33.14	33.08	154	108	Average	HORIZONTAL
2	4838.80	49.44	74.00	-24.56	39.09	10.29	33.14	33.08	154	108	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4834.24	37.29	54.00	-16.71	26.94	10.29	33.14	33.08	221	55	Average	VERTICAL
2	4836.52	49.53	74.00	-24.47	39.18	10.29	33.14	33.08	221	55	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 30, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4868.68	48.04	74.00	-25.96	37.61	10.28	33.23	33.08	148	119	Peak	HORIZONTAL
2	4872.08	35.98	54.00	-18.02	25.55	10.28	33.23	33.08	148	119	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4876.96	37.03	54.00	-16.97	26.59	10.28	33.23	33.07	195	54	Average	VERTICAL
2	4879.52	49.51	74.00	-24.49	39.07	10.28	33.23	33.07	195	54	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 30, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4901.88	35.68	54.00	-18.32	25.18	10.28	33.29	33.07	143	129	Average	HORIZONTAL
2	4908.76	48.43	74.00	-25.57	37.93	10.28	33.29	33.07	143	129	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4894.28	37.61	54.00	-16.39	27.14	10.28	33.26	33.07	221	51	Average	VERTICAL
2	4899.52	50.57	74.00	-23.43	40.07	10.28	33.29	33.07	221	51	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 31, 2016	Test Mode	Mode 1
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4820.68	51.56	74.00	-22.44	41.24	10.29	33.11	33.08	150	243	Peak	HORIZONTAL
2	4827.04	38.27	54.00	-15.73	27.92	10.29	33.14	33.08	150	243	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4825.10	51.49	74.00	-22.51	41.14	10.29	33.14	33.08	150	77	Peak	VERTICAL
2	4825.52	38.11	54.00	-15.89	27.76	10.29	33.14	33.08	150	77	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 31, 2016	Test Mode	Mode 1
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4875.84	37.72	54.00	-16.28	27.29	10.28	33.23	33.08	150	279	Average	HORIZONTAL
2	4877.02	50.39	74.00	-23.61	39.95	10.28	33.23	33.07	150	279	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4870.46	50.91	74.00	-23.09	40.48	10.28	33.23	33.08	150	79	Peak	VERTICAL
2	4879.00	37.82	54.00	-16.18	27.38	10.28	33.23	33.07	150	79	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 31, 2016	Test Mode	Mode 1
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4922.52	50.09	74.00	-23.91	39.56	10.28	33.32	33.07	150	361	Peak	HORIZONTAL
2	4923.36	37.65	54.00	-16.35	27.12	10.28	33.32	33.07	150	361	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4923.62	37.91	54.00	-16.09	27.35	10.28	33.35	33.07	150	361	Average	VERTICAL
2	4923.90	50.55	74.00	-23.45	39.99	10.28	33.35	33.07	150	361	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 31, 2016	Test Mode	Mode 1
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4840.70	37.92	54.00	-16.08	27.54	10.29	33.17	33.08	150	254	Average	HORIZONTAL
2	4843.06	51.21	74.00	-22.79	40.83	10.29	33.17	33.08	150	254	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4840.96	37.98	54.00	-16.02	27.60	10.29	33.17	33.08	150	59	Average	VERTICAL
2	4843.94	50.61	74.00	-23.39	40.23	10.29	33.17	33.08	150	59	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 31, 2016	Test Mode	Mode 1
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4873.22	37.62	54.00	-16.38	27.19	10.28	33.23	33.08	150	286	Average	HORIZONTAL
2	4873.64	50.38	74.00	-23.62	39.95	10.28	33.23	33.08	150	286	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4874.36	49.95	74.00	-24.05	39.52	10.28	33.23	33.08	150	95	Peak	VERTICAL
2	4877.80	37.59	54.00	-16.41	27.15	10.28	33.23	33.07	150	95	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 31, 2016	Test Mode	Mode 1
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4900.28	51.13	74.00	-22.87	40.63	10.28	33.29	33.07	150	248	Peak	HORIZONTAL
2	4907.94	38.05	54.00	-15.95	27.55	10.28	33.29	33.07	150	248	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4902.70	50.69	74.00	-23.31	40.19	10.28	33.29	33.07	150	91	Peak	VERTICAL
2	4904.18	38.04	54.00	-15.96	27.54	10.28	33.29	33.07	150	91	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 01, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4823.96	52.98	54.00	-1.02	42.66	10.29	33.11	33.08	210	313	Average	HORIZONTAL
2	4823.98	57.53	74.00	-16.47	47.21	10.29	33.11	33.08	210	313	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4823.92	47.62	54.00	-6.38	37.30	10.29	33.11	33.08	204	274	Average	VERTICAL
2	4824.12	54.36	74.00	-19.64	44.04	10.29	33.11	33.08	204	274	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 01, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4873.94	56.97	74.00	-17.03	46.54	10.28	33.23	33.08	210	313	Peak	HORIZONTAL
2	4873.96	52.55	54.00	-1.45	42.12	10.28	33.23	33.08	210	313	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4873.87	54.30	74.00	-19.70	43.87	10.28	33.23	33.08	197	279	Peak	VERTICAL
2	4873.95	47.03	54.00	-6.97	36.60	10.28	33.23	33.08	197	279	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 01, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4923.96	52.71	54.00	-1.29	42.15	10.28	33.35	33.07	195	278	Average	HORIZONTAL
2	4924.00	57.78	74.00	-16.22	47.22	10.28	33.35	33.07	195	278	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4923.96	50.57	54.00	-3.43	40.01	10.28	33.35	33.07	261	275	Average	VERTICAL
2	4924.00	55.66	74.00	-18.34	45.10	10.28	33.35	33.07	261	275	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4811.60	51.05	74.00	-22.95	40.74	10.29	33.11	33.09	200	257	Peak	HORIZONTAL
2	4819.00	38.81	54.00	-15.19	28.49	10.29	33.11	33.08	200	257	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4805.50	38.28	54.00	-15.72	28.00	10.29	33.08	33.09	200	144	Average	VERTICAL
2	4814.30	51.24	74.00	-22.76	40.92	10.29	33.11	33.08	200	144	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4859.40	51.08	74.00	-22.92	40.68	10.28	33.20	33.08	200	289	Peak	HORIZONTAL
2	4887.00	39.51	54.00	-14.49	29.04	10.28	33.26	33.07	200	289	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4874.60	50.88	74.00	-23.12	40.45	10.28	33.23	33.08	200	174	Peak	VERTICAL
2	4898.00	38.19	54.00	-15.81	27.69	10.28	33.29	33.07	200	174	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4904.00	50.99	74.00	-23.01	40.49	10.28	33.29	33.07	200	245	Peak	HORIZONTAL
2	4905.50	39.29	54.00	-14.71	28.79	10.28	33.29	33.07	200	245	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4901.80	38.25	54.00	-15.75	27.75	10.28	33.29	33.07	200	148	Average	VERTICAL
2	4909.00	50.62	74.00	-23.38	40.12	10.28	33.29	33.07	200	148	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4820.12	39.03	54.00	-14.97	28.71	10.29	33.11	33.08	200	279	Average	HORIZONTAL
2	4829.04	51.67	74.00	-22.33	41.32	10.29	33.14	33.08	200	279	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4814.84	51.63	74.00	-22.37	41.31	10.29	33.11	33.08	200	174	Peak	VERTICAL
2	4829.20	38.10	54.00	-15.90	27.75	10.29	33.14	33.08	200	174	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4873.56	51.33	74.00	-22.67	40.90	10.28	33.23	33.08	200	267	Peak	HORIZONTAL
2	4882.28	38.52	54.00	-15.48	28.05	10.28	33.26	33.07	200	267	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4868.80	50.68	74.00	-23.32	40.25	10.28	33.23	33.08	200	136	Peak	VERTICAL
2	4882.92	37.79	54.00	-16.21	27.32	10.28	33.26	33.07	200	136	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4922.28	50.28	74.00	-23.72	39.75	10.28	33.32	33.07	200	272	Peak	HORIZONTAL
2	4924.28	38.18	54.00	-15.82	27.62	10.28	33.35	33.07	200	272	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4925.16	50.78	74.00	-23.22	40.21	10.28	33.35	33.06	200	196	Peak	VERTICAL
2	4926.96	37.97	54.00	-16.03	27.40	10.28	33.35	33.06	200	196	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4834.20	38.17	54.00	-15.83	27.82	10.29	33.14	33.08	200	204	Average	HORIZONTAL
2	4838.36	50.39	74.00	-23.61	40.04	10.29	33.14	33.08	200	204	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4836.60	37.81	54.00	-16.19	27.46	10.29	33.14	33.08	200	132	Average	VERTICAL
2	4840.24	51.14	74.00	-22.86	40.76	10.29	33.17	33.08	200	132	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4882.84	38.82	54.00	-15.18	28.35	10.28	33.26	33.07	200	223	Average	HORIZONTAL
2	4883.24	50.39	74.00	-23.61	39.92	10.28	33.26	33.07	200	223	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4877.96	50.61	74.00	-23.39	40.17	10.28	33.23	33.07	200	211	Peak	VERTICAL
2	4880.28	37.61	54.00	-16.39	27.17	10.28	33.23	33.07	200	211	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4895.36	50.70	74.00	-23.30	40.20	10.28	33.29	33.07	200	236	Peak	HORIZONTAL
2	4900.88	38.24	54.00	-15.76	27.74	10.28	33.29	33.07	200	236	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4899.40	50.93	74.00	-23.07	40.43	10.28	33.29	33.07	200	176	Peak	VERTICAL
2	4906.40	38.04	54.00	-15.96	27.54	10.28	33.29	33.07	200	176	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 09, 2016	Test Mode	Mode 2
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4824.92	50.62	74.00	-23.38	40.30	10.29	33.11	33.08	213	221	Peak	HORIZONTAL
2	4829.20	37.33	54.00	-16.67	26.98	10.29	33.14	33.08	213	221	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4819.12	49.78	74.00	-24.22	39.46	10.29	33.11	33.08	223	332	Peak	VERTICAL
2	4824.08	35.42	54.00	-18.58	25.10	10.29	33.11	33.08	223	332	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 09, 2016	Test Mode	Mode 2
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4870.00	50.53	74.00	-23.47	40.10	10.28	33.23	33.08	166	205	Peak	HORIZONTAL
2	4879.88	36.94	54.00	-17.06	26.50	10.28	33.23	33.07	166	205	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4871.64	50.43	74.00	-23.57	40.00	10.28	33.23	33.08	194	120	Peak	VERTICAL
2	4877.84	37.16	54.00	-16.84	26.72	10.28	33.23	33.07	194	120	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 09, 2016	Test Mode	Mode 2
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4915.00	37.07	54.00	-16.93	26.54	10.28	33.32	33.07	176	117	Average	HORIZONTAL
2	4917.48	50.36	74.00	-23.64	39.83	10.28	33.32	33.07	176	117	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4914.56	37.08	54.00	-16.92	26.55	10.28	33.32	33.07	160	171	Average	VERTICAL
2	4915.12	50.32	74.00	-23.68	39.79	10.28	33.32	33.07	160	171	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 09, 2016	Test Mode	Mode 2
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4834.76	37.19	54.00	-16.81	26.84	10.29	33.14	33.08	176	174	Average	HORIZONTAL
2	4851.88	50.19	74.00	-23.81	39.81	10.29	33.17	33.08	176	174	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4834.52	37.26	54.00	-16.74	26.91	10.29	33.14	33.08	189	192	Average	VERTICAL
2	4851.76	50.76	74.00	-23.24	40.38	10.29	33.17	33.08	189	192	Peak	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 09, 2016	Test Mode	Mode 2
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4865.44	50.29	74.00	-23.71	39.89	10.28	33.20	33.08	167	186	Peak	HORIZONTAL
2	4882.64	36.89	54.00	-17.11	26.42	10.28	33.26	33.07	167	186	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4881.48	50.67	74.00	-23.33	40.20	10.28	33.26	33.07	190	142	Peak	VERTICAL
2	4882.92	36.98	54.00	-17.02	26.51	10.28	33.26	33.07	190	142	Average	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 09, 2016	Test Mode	Mode 2
Test Function	Beamforming function		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4894.20	37.36	54.00	-16.64	26.89	10.28	33.26	33.07	178	186	Average	HORIZONTAL
2	4904.40	50.82	74.00	-23.18	40.32	10.28	33.29	33.07	178	186	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4900.40	37.34	54.00	-16.66	26.84	10.28	33.29	33.07	188	131	Average	VERTICAL
2	4906.00	50.93	74.00	-23.07	40.43	10.28	33.29	33.07	188	131	Peak	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

4.6. Emissions Measurement

4.6.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.6.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (30dBc in any 100 kHz bandwidth emission)	100 kHz / 300 kHz for Peak

4.6.3. Test Procedures

For Radiated band edges Measurement:

1. The test procedure is the same as section 4.5.3.
2. The measurement distance for 1 to 18GHz is 3m, and above 18GHz is 1m.

For Radiated Out of Band Emission Measurement:

Test was performed in accordance with KDB558074 D01 v03r05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 11.0 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure.

4.6.4. Test Setup Layout

For Radiated band edges Measurement:

This test setup layout is the same as that shown in section 4.5.4.

For Radiated Out of Band Emission Measurement:

This test setup layout is the same as that shown in section 4.5.4.

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

For non-beamforming function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 29, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2368.00	62.61	74.00	-11.39	28.11	6.22	28.28	0.00	257	5	Peak	HORIZONTAL
2	2385.60	52.87	54.00	-1.13	18.30	6.26	28.31	0.00	257	5	Average	HORIZONTAL
3	2412.80	122.46			87.78	6.32	28.36	0.00	257	5	Peak	HORIZONTAL
4	2413.20	118.45			83.77	6.32	28.36	0.00	257	5	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2386.60	62.62	74.00	-11.38	28.05	6.26	28.31	0.00	254	184	Peak	HORIZONTAL
2	2389.60	52.00	54.00	-2.00	17.43	6.26	28.31	0.00	254	184	Average	HORIZONTAL
3	2439.40	115.63			80.86	6.36	28.41	0.00	254	184	Average	HORIZONTAL
4	2439.40	119.65			84.88	6.36	28.41	0.00	254	184	Peak	HORIZONTAL
5	2483.50	64.66	74.00	-9.34	29.74	6.44	28.48	0.00	254	184	Peak	HORIZONTAL
6	2484.40	52.99	54.00	-1.01	18.07	6.44	28.48	0.00	254	184	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2459.60	116.04			81.22	6.39	28.43	0.00	224	178	Average	HORIZONTAL
2	2459.60	120.13			85.31	6.39	28.43	0.00	224	178	Peak	HORIZONTAL
3	2484.00	64.09	74.00	-9.91	29.17	6.44	28.48	0.00	224	178	Peak	HORIZONTAL
4	2508.40	52.93	54.00	-1.07	17.92	6.48	28.53	0.00	224	178	Average	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 29, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2390.00	52.42	54.00	-1.58	17.85	6.26	28.31	0.00	220	180	Average	HORIZONTAL
2	2390.00	64.70	74.00	-9.30	30.13	6.26	28.31	0.00	220	180	Peak	HORIZONTAL
3	2410.80	110.09			75.44	6.30	28.35	0.00	220	180	Average	HORIZONTAL
4	2411.20	120.38			85.70	6.32	28.36	0.00	220	180	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2385.40	63.04	74.00	-10.96	28.47	6.26	28.31	0.00	241	182	Peak	HORIZONTAL
2	2390.00	52.70	54.00	-1.30	18.13	6.26	28.31	0.00	241	182	Average	HORIZONTAL
3	2435.20	126.80			92.06	6.35	28.39	0.00	241	182	Peak	HORIZONTAL
4	2435.80	117.09			82.35	6.35	28.39	0.00	241	182	Average	HORIZONTAL
5	2485.60	52.83	54.00	-1.17	17.91	6.44	28.48	0.00	241	182	Average	HORIZONTAL
6	2489.20	64.20	74.00	-9.80	29.26	6.45	28.49	0.00	241	182	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2461.20	109.35			74.51	6.40	28.44	0.00	235	181	Average	HORIZONTAL
2	2461.20	119.75			84.91	6.40	28.44	0.00	235	181	Peak	HORIZONTAL
3	2483.50	52.87	54.00	-1.13	17.95	6.44	28.48	0.00	235	181	Average	HORIZONTAL
4	2483.50	66.11	74.00	-7.89	31.19	6.44	28.48	0.00	235	181	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 29, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2389.60	64.19	74.00	-9.81	29.62	6.26	28.31	0.00	244	181	Peak	HORIZONTAL
2	2390.00	52.57	54.00	-1.43	18.00	6.26	28.31	0.00	244	181	Average	HORIZONTAL
3	2410.40	108.04			73.39	6.30	28.35	0.00	244	181	Average	HORIZONTAL
4	2411.20	118.85			84.17	6.32	28.36	0.00	244	181	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2390.00	52.25	54.00	-1.75	17.68	6.26	28.31	0.00	241	180	Average	HORIZONTAL
2	2390.00	63.66	74.00	-10.34	29.09	6.26	28.31	0.00	241	180	Peak	HORIZONTAL
3	2435.20	116.59			81.85	6.35	28.39	0.00	241	180	Average	HORIZONTAL
4	2436.40	126.54			91.80	6.35	28.39	0.00	241	180	Peak	HORIZONTAL
5	2485.60	52.42	54.00	-1.58	17.50	6.44	28.48	0.00	241	180	Average	HORIZONTAL
6	2486.20	64.34	74.00	-9.66	29.42	6.44	28.48	0.00	241	180	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2461.60	107.38			72.54	6.40	28.44	0.00	236	183	Average	HORIZONTAL
2	2461.60	118.48			83.64	6.40	28.44	0.00	236	183	Peak	HORIZONTAL
3	2483.50	52.72	54.00	-1.28	17.80	6.44	28.48	0.00	236	183	Average	HORIZONTAL
4	2483.50	64.51	74.00	-9.49	29.59	6.44	28.48	0.00	236	183	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 29, 2016	Test Mode	Mode 1
Test Function	Non-beamforming function		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2381.80	52.89	54.00	-1.11	18.34	6.25	28.30	0.00	267	181	Average	HORIZONTAL
2	2389.00	68.78	74.00	-5.22	34.21	6.26	28.31	0.00	267	181	Peak	HORIZONTAL
3	2420.20	106.11			71.41	6.33	28.37	0.00	267	181	Average	HORIZONTAL
4	2420.80	115.63			80.93	6.33	28.37	0.00	267	181	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2422 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2387.20	51.87	54.00	-2.13	17.30	6.26	28.31	0.00	218	191	Average	HORIZONTAL
2	2387.80	63.64	74.00	-10.36	29.07	6.26	28.31	0.00	218	191	Peak	HORIZONTAL
3	2426.20	117.65			82.93	6.34	28.38	0.00	218	191	Peak	HORIZONTAL
4	2446.60	107.60			72.80	6.38	28.42	0.00	218	191	Average	HORIZONTAL
5	2484.40	52.56	54.00	-1.44	17.64	6.44	28.48	0.00	218	191	Average	HORIZONTAL
6	2492.20	70.96	74.00	-3.04	36.02	6.45	28.49	0.00	218	191	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2450.20	105.04			70.24	6.38	28.42	0.00	238	182	Average	HORIZONTAL
2	2450.80	115.29			80.49	6.38	28.42	0.00	238	182	Peak	HORIZONTAL
3	2484.40	68.94	74.00	-5.06	34.02	6.44	28.48	0.00	238	182	Peak	HORIZONTAL
4	2490.40	52.58	54.00	-1.42	17.64	6.45	28.49	0.00	238	182	Average	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2452 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 31, 2016	Test Mode	Mode 1
Test Function	Beamforming function		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2389.60	63.85	74.00	-10.15	29.28	6.26	28.31	0.00	194	200	Peak	HORIZONTAL
2	2390.00	52.21	54.00	-1.79	17.64	6.26	28.31	0.00	194	200	Average	HORIZONTAL
3	2405.20	110.74			76.09	6.30	28.35	0.00	194	200	Average	HORIZONTAL
4	2406.80	120.67			86.02	6.30	28.35	0.00	194	200	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2385.00	62.69	74.00	-11.31	28.12	6.26	28.31	0.00	207	29	Peak	HORIZONTAL
2	2390.00	50.58	54.00	-3.42	16.01	6.26	28.31	0.00	207	29	Average	HORIZONTAL
3	2436.60	116.46			81.72	6.35	28.39	0.00	207	29	Average	HORIZONTAL
4	2440.60	125.99			91.22	6.36	28.41	0.00	207	29	Peak	HORIZONTAL
5	2487.80	64.66	74.00	-9.34	29.74	6.44	28.48	0.00	207	29	Peak	HORIZONTAL
6	2496.30	51.05	54.00	-2.95	16.08	6.47	28.50	0.00	207	29	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2458.00	120.28			85.46	6.39	28.43	0.00	232	212	Peak	HORIZONTAL
2	2464.00	109.01			74.17	6.40	28.44	0.00	232	212	Average	HORIZONTAL
3	2483.50	52.97	54.00	-1.03	18.05	6.44	28.48	0.00	232	212	Average	HORIZONTAL
4	2484.00	64.36	74.00	-9.64	29.44	6.44	28.48	0.00	232	212	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Mar. 31, 2016	Test Mode	Mode 1
Test Function	Beamforming function		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2389.00	63.13	74.00	-10.87	28.56	6.26	28.31	0.00	221	217	Peak	HORIZONTAL
2	2390.00	52.67	54.00	-1.33	18.10	6.26	28.31	0.00	221	217	Average	HORIZONTAL
3	2411.80	113.38			78.70	6.32	28.36	0.00	221	217	Peak	HORIZONTAL
4	2431.60	101.70			66.98	6.34	28.38	0.00	221	217	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2422 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2385.40	63.25	74.00	-10.75	28.68	6.26	28.31	0.00	213	215	Peak	HORIZONTAL
2	2387.20	51.56	54.00	-2.44	16.99	6.26	28.31	0.00	213	215	Average	HORIZONTAL
3	2423.80	110.82			76.12	6.33	28.37	0.00	213	215	Average	HORIZONTAL
4	2426.80	118.39			83.67	6.34	28.38	0.00	213	215	Peak	HORIZONTAL
5	2485.60	52.22	54.00	-1.78	17.30	6.44	28.48	0.00	213	215	Average	HORIZONTAL
6	2486.20	67.56	74.00	-6.44	32.64	6.44	28.48	0.00	213	215	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2443.60	116.97			82.20	6.36	28.41	0.00	226	224	Peak	HORIZONTAL
2	2444.80	110.83			76.06	6.36	28.41	0.00	226	224	Average	HORIZONTAL
3	2485.00	71.98	74.00	-2.02	37.06	6.44	28.48	0.00	226	224	Peak	HORIZONTAL
4	2490.40	52.66	54.00	-1.34	17.72	6.45	28.49	0.00	226	224	Average	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2452 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 01, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2382.40	61.47	74.00	-12.53	26.92	6.25	28.30	0.00	205	218	Peak	HORIZONTAL
2	2383.60	52.64	54.00	-1.36	18.07	6.26	28.31	0.00	205	218	Average	HORIZONTAL
3	2413.60	118.09			83.41	6.32	28.36	0.00	205	218	Average	HORIZONTAL
4	2414.00	121.63			86.95	6.32	28.36	0.00	205	218	Peak	HORIZONTAL
5	2492.80	52.88	54.00	-1.12	17.94	6.45	28.49	0.00	205	218	Average	HORIZONTAL
6	2493.60	62.82	74.00	-11.18	27.88	6.45	28.49	0.00	205	218	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2356.00	49.22	54.00	-4.78	14.78	6.19	28.25	0.00	207	206	Average	HORIZONTAL
2	2356.00	52.83	74.00	-21.17	18.39	6.19	28.25	0.00	207	206	Peak	HORIZONTAL
3	2437.60	114.70			79.96	6.35	28.39	0.00	207	206	Average	HORIZONTAL
4	2438.20	116.37			81.63	6.35	28.39	0.00	207	206	Peak	HORIZONTAL
5	2477.80	49.63	54.00	-4.37	14.74	6.43	28.46	0.00	207	206	Average	HORIZONTAL
6	2477.80	59.63	74.00	-14.37	24.74	6.43	28.46	0.00	207	206	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2466.00	109.67			74.83	6.40	28.44	0.00	202	269	Peak	HORIZONTAL
2	2466.40	105.97			71.13	6.40	28.44	0.00	202	269	Average	HORIZONTAL
3	2487.60	52.33	54.00	-1.67	17.41	6.44	28.48	0.00	202	269	Average	HORIZONTAL
4	2487.60	61.62	74.00	-12.38	26.70	6.44	28.48	0.00	202	269	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 01, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2390.00	52.96	54.00	-1.04	18.39	6.26	28.31	0.00	257	244	Average	HORIZONTAL
2	2390.00	66.05	74.00	-7.95	31.48	6.26	28.31	0.00	257	244	Peak	HORIZONTAL
3	2410.20	118.25			83.60	6.30	28.35	0.00	257	244	Peak	HORIZONTAL
4	2410.80	106.54			71.89	6.30	28.35	0.00	257	244	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2390.00	51.97	54.00	-2.03	17.40	6.26	28.31	0.00	208	220	Average	HORIZONTAL
2	2390.00	63.64	74.00	-10.36	29.07	6.26	28.31	0.00	208	220	Peak	HORIZONTAL
3	2429.80	111.07			76.35	6.34	28.38	0.00	208	220	Average	HORIZONTAL
4	2431.00	123.90			89.18	6.34	28.38	0.00	208	220	Peak	HORIZONTAL
5	2483.50	52.40	54.00	-1.60	17.48	6.44	28.48	0.00	208	220	Average	HORIZONTAL
6	2484.40	65.39	74.00	-8.61	30.47	6.44	28.48	0.00	208	220	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2460.20	115.96			81.14	6.39	28.43	0.00	274	246	Peak	HORIZONTAL
2	2460.80	105.72			70.88	6.40	28.44	0.00	274	246	Average	HORIZONTAL
3	2483.50	52.82	54.00	-1.18	17.90	6.44	28.48	0.00	274	246	Average	HORIZONTAL
4	2483.50	64.50	74.00	-9.50	29.58	6.44	28.48	0.00	274	246	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 01, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2390.00	52.92	54.00	-1.08	18.35	6.26	28.31	0.00	254	245	Average	HORIZONTAL
2	2390.00	64.61	74.00	-9.39	30.04	6.26	28.31	0.00	254	245	Peak	HORIZONTAL
3	2410.00	116.93			82.28	6.30	28.35	0.00	254	245	Peak	HORIZONTAL
4	2410.40	105.96			71.31	6.30	28.35	0.00	254	245	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2389.60	64.36	74.00	-9.64	29.79	6.26	28.31	0.00	279	218	Peak	HORIZONTAL
2	2390.00	52.18	54.00	-1.82	17.61	6.26	28.31	0.00	279	218	Average	HORIZONTAL
3	2436.40	112.56			77.82	6.35	28.39	0.00	279	218	Average	HORIZONTAL
4	2438.20	123.23			88.49	6.35	28.39	0.00	279	218	Peak	HORIZONTAL
5	2485.60	51.88	54.00	-2.12	16.96	6.44	28.48	0.00	279	218	Average	HORIZONTAL
6	2485.60	65.24	74.00	-8.76	30.32	6.44	28.48	0.00	279	218	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2460.80	105.92			71.08	6.40	28.44	0.00	274	246	Average	HORIZONTAL
2	2461.40	115.30			80.46	6.40	28.44	0.00	274	246	Peak	HORIZONTAL
3	2483.50	52.36	54.00	-1.64	17.44	6.44	28.48	0.00	274	246	Average	HORIZONTAL
4	2484.20	62.40	74.00	-11.60	27.48	6.44	28.48	0.00	274	246	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 02, 2016	Test Mode	Mode 2
Test Function	Non-beamforming function		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2381.80	52.56	54.00	-1.44	18.01	6.25	28.30	0.00	279	223	Average	HORIZONTAL
2	2382.40	64.74	74.00	-9.26	30.19	6.25	28.30	0.00	279	223	Peak	HORIZONTAL
3	2420.80	111.88			77.18	6.33	28.37	0.00	279	223	Peak	HORIZONTAL
4	2422.60	101.95			67.25	6.33	28.37	0.00	279	223	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2422 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2390.00	51.40	54.00	-2.60	16.83	6.26	28.31	0.00	207	220	Average	HORIZONTAL
2	2390.00	62.03	74.00	-11.97	27.46	6.26	28.31	0.00	207	220	Peak	HORIZONTAL
3	2430.00	104.67			69.95	6.34	28.38	0.00	207	220	Average	HORIZONTAL
4	2430.00	115.05			80.33	6.34	28.38	0.00	207	220	Peak	HORIZONTAL
5	2483.50	52.73	54.00	-1.27	17.81	6.44	28.48	0.00	207	220	Average	HORIZONTAL
6	2483.50	65.81	74.00	-8.19	30.89	6.44	28.48	0.00	207	220	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2450.80	101.17			66.37	6.38	28.42	0.00	276	243	Average	HORIZONTAL
2	2450.80	111.32			76.52	6.38	28.42	0.00	276	243	Peak	HORIZONTAL
3	2489.80	64.24	74.00	-9.76	29.30	6.45	28.49	0.00	276	243	Peak	HORIZONTAL
4	2490.40	52.57	54.00	-1.43	17.63	6.45	28.49	0.00	276	243	Average	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2452 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 09, 2016	Test Mode	Mode 2
Test Function	Beamforming function		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2390.00	52.91	54.00	-1.09	18.95	5.65	28.31	0.00	275	0	Average	VERTICAL
2	2390.00	63.94	74.00	-10.06	29.98	5.65	28.31	0.00	275	0	Peak	VERTICAL
3	2414.60	117.15			83.10	5.69	28.36	0.00	275	0	Peak	VERTICAL
4	2415.80	104.73			70.68	5.69	28.36	0.00	275	0	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2351.80	49.06	54.00	-4.94	15.22	5.59	28.25	0.00	180	316	Average	HORIZONTAL
2	2352.60	60.22	74.00	-13.78	26.38	5.59	28.25	0.00	180	316	Peak	HORIZONTAL
3	2432.20	108.50			74.38	5.73	28.39	0.00	180	316	Average	HORIZONTAL
4	2438.20	119.40			85.28	5.73	28.39	0.00	180	316	Peak	HORIZONTAL
5	2489.00	61.87	74.00	-12.13	27.59	5.80	28.48	0.00	180	316	Peak	HORIZONTAL
6	2499.80	47.65	54.00	-6.35	13.33	5.82	28.50	0.00	180	316	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2463.80	103.64			69.43	5.77	28.44	0.00	231	44	Average	VERTICAL
2	2465.80	109.20			74.99	5.77	28.44	0.00	231	44	Peak	VERTICAL
3	2483.50	52.56	54.00	-1.44	18.28	5.80	28.48	0.00	231	44	Average	VERTICAL
4	2485.10	58.92	74.00	-15.08	24.64	5.80	28.48	0.00	231	44	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	25°C	Humidity	62%
Test Engineer	Andy Tsai, Peter Wu	Configurations	MCS0 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	Apr. 09, 2016	Test Mode	Mode 2
Test Function	Beamforming function		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2384.80	52.88	54.00	-1.12	18.92	5.65	28.31	0.00	193	312	Average	HORIZONTAL
2	2389.60	72.11	74.00	-1.89	38.15	5.65	28.31	0.00	193	312	Peak	HORIZONTAL
3	2411.20	99.62			65.57	5.69	28.36	0.00	193	312	Average	HORIZONTAL
4	2424.80	114.45			80.38	5.70	28.37	0.00	193	312	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2422 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2389.40	66.86	74.00	-7.14	32.90	5.65	28.31	0.00	204	360	Peak	VERTICAL
2	2390.00	52.61	54.00	-1.39	18.65	5.65	28.31	0.00	204	360	Average	VERTICAL
3	2427.80	104.77			70.68	5.71	28.38	0.00	204	360	Average	VERTICAL
4	2433.80	112.67			78.55	5.73	28.39	0.00	204	360	Peak	VERTICAL
5	2483.50	50.02	54.00	-3.98	15.74	5.80	28.48	0.00	204	360	Average	VERTICAL
6	2483.50	61.50	74.00	-12.50	27.22	5.80	28.48	0.00	204	360	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2448.40	109.57			75.40	5.75	28.42	0.00	205	354	Peak	VERTICAL
2	2449.20	97.23			63.06	5.75	28.42	0.00	205	354	Average	VERTICAL
3	2486.00	66.22	74.00	-7.78	31.94	5.80	28.48	0.00	205	354	Peak	VERTICAL
4	2487.60	52.60	54.00	-1.40	18.32	5.80	28.48	0.00	205	354	Average	VERTICAL

Item 1, 2 are the fundamental frequency at 2452 MHz.

Note:

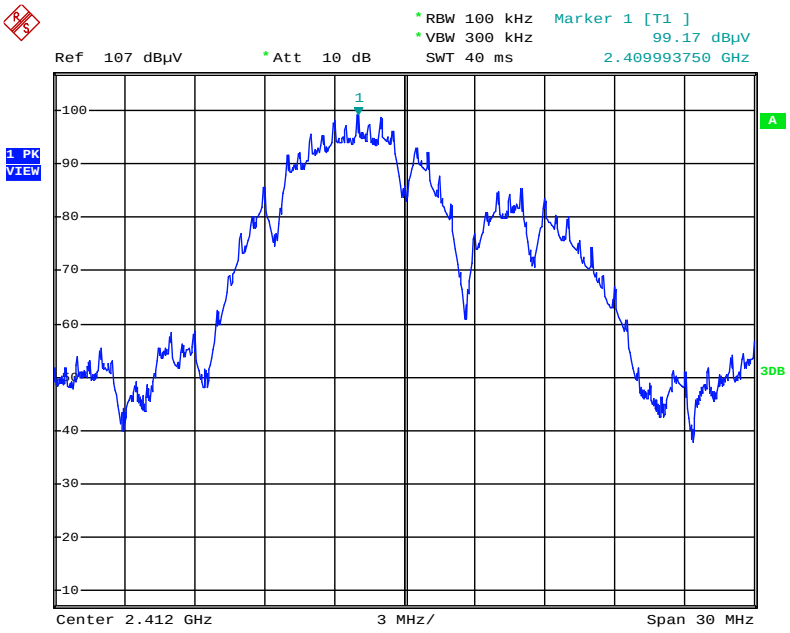
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

For Emission not in Restricted Band

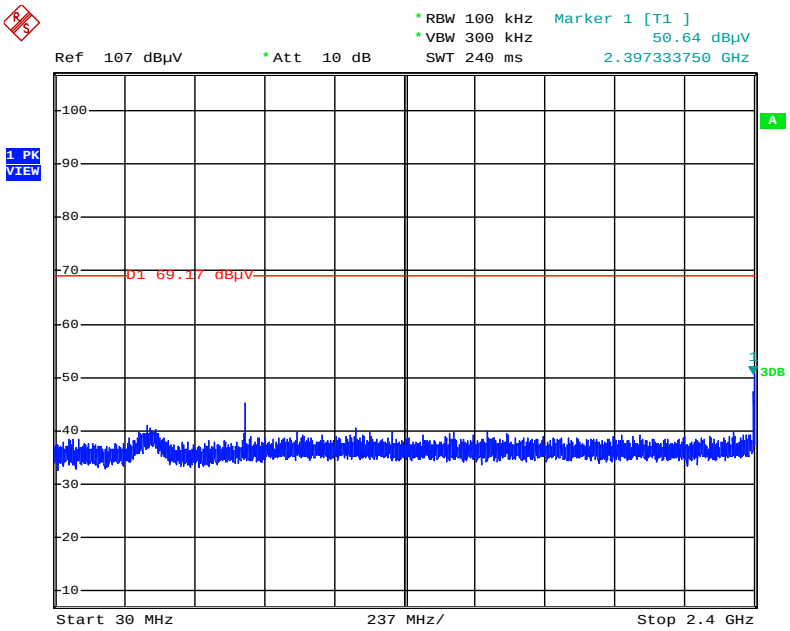
For non-beamforming function:

Plot on Configuration IEEE 802.11b / Reference Level / Test Mode: Mode 1



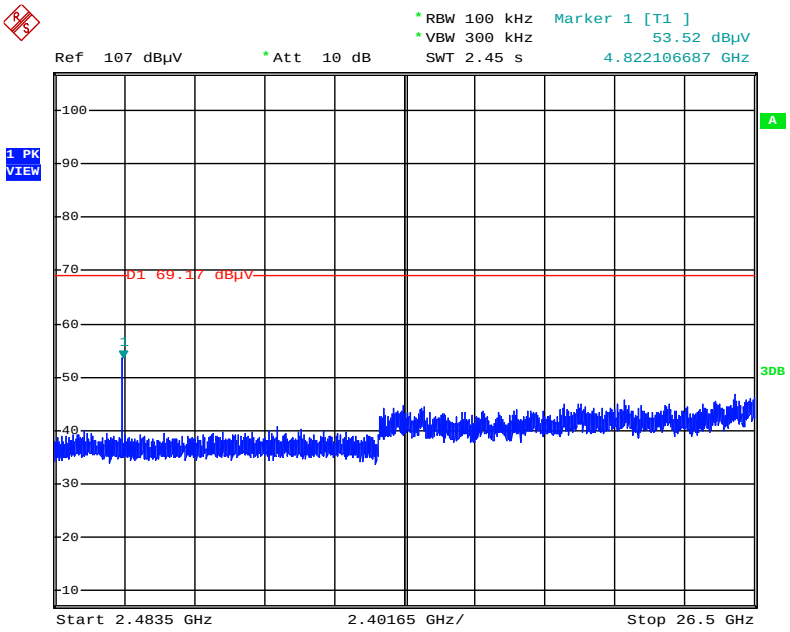
Date: 30.MAR.2016 01:48:18

Plot on Configuration IEEE 802.11b / CH 1 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



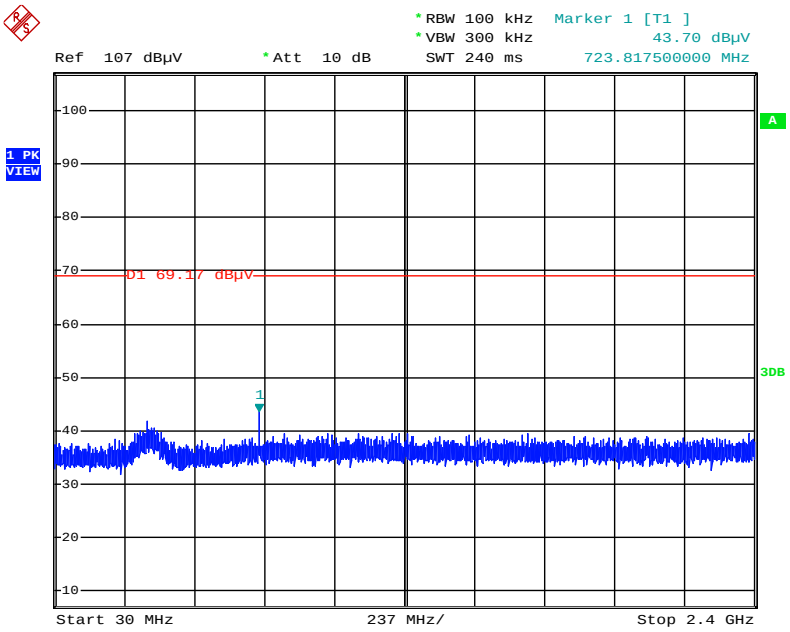
Date: 30.MAR.2016 01:51:30

Plot on Configuration IEEE 802.11b / CH 1 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



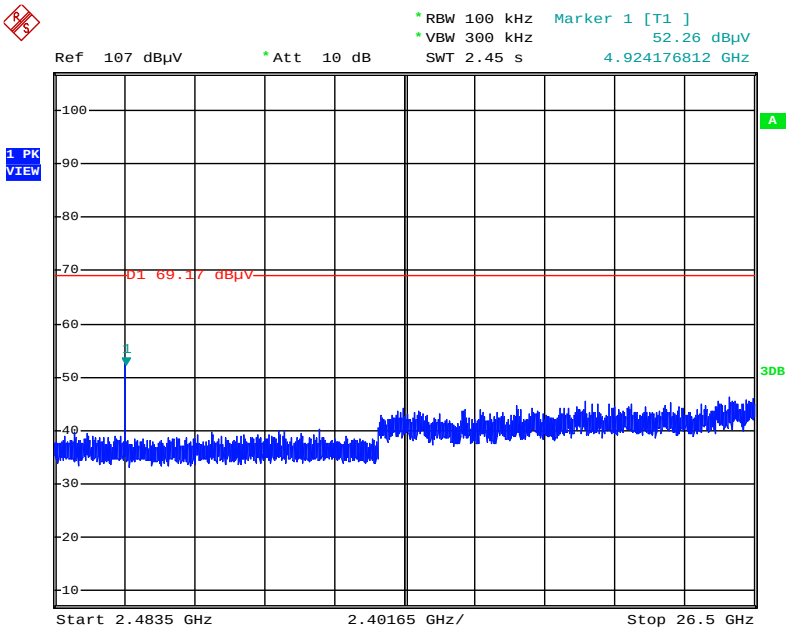
Date: 30.MAR.2016 01:51:57

Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



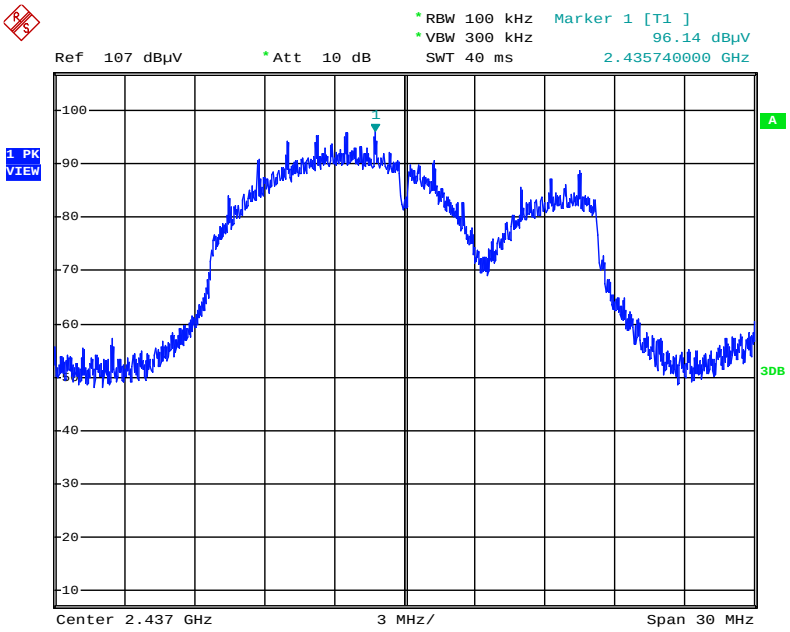
Date: 30.MAR.2016 01:53:08

Plot on Configuration IEEE 802.11b / CH 11 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



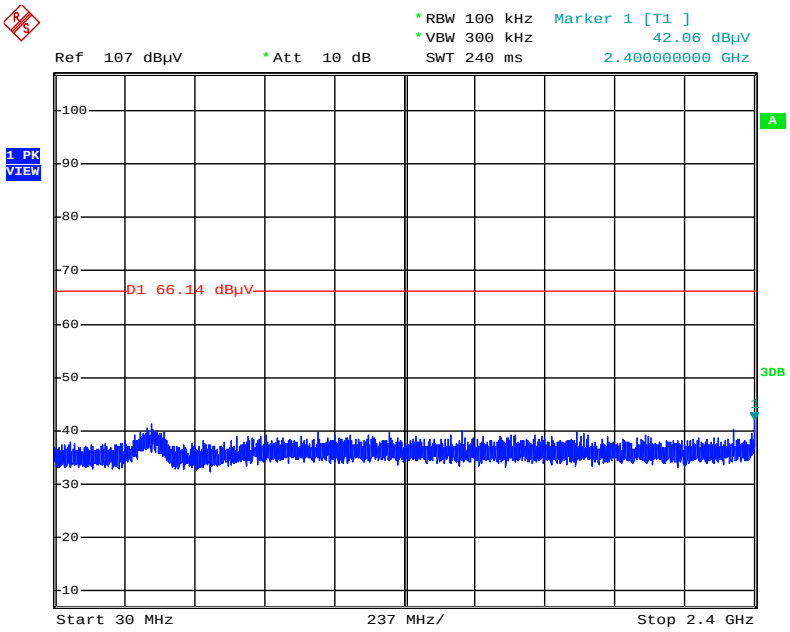
Date: 30.MAR.2016 01:52:42

Plot on Configuration IEEE 802.11g / Reference Level / Test Mode: Mode 1



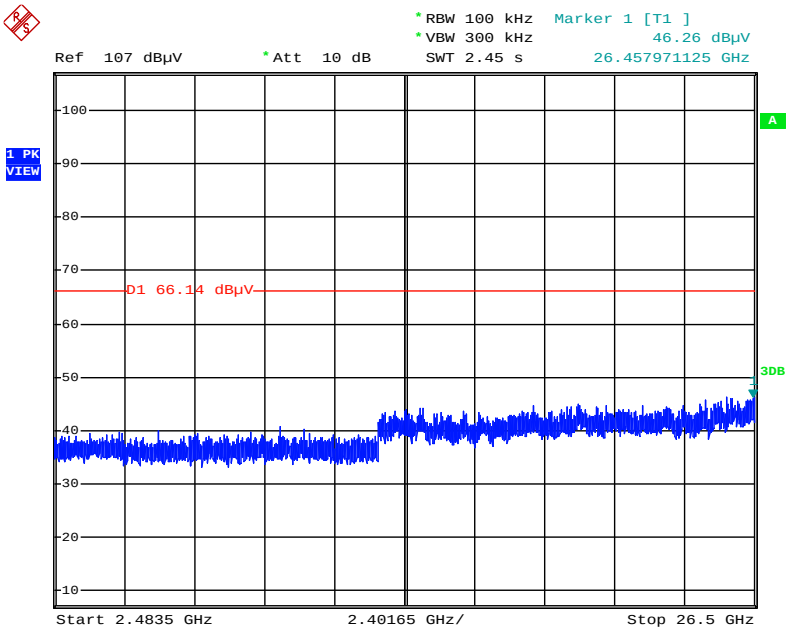
Date: 30.MAR.2016 01:54:20

Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



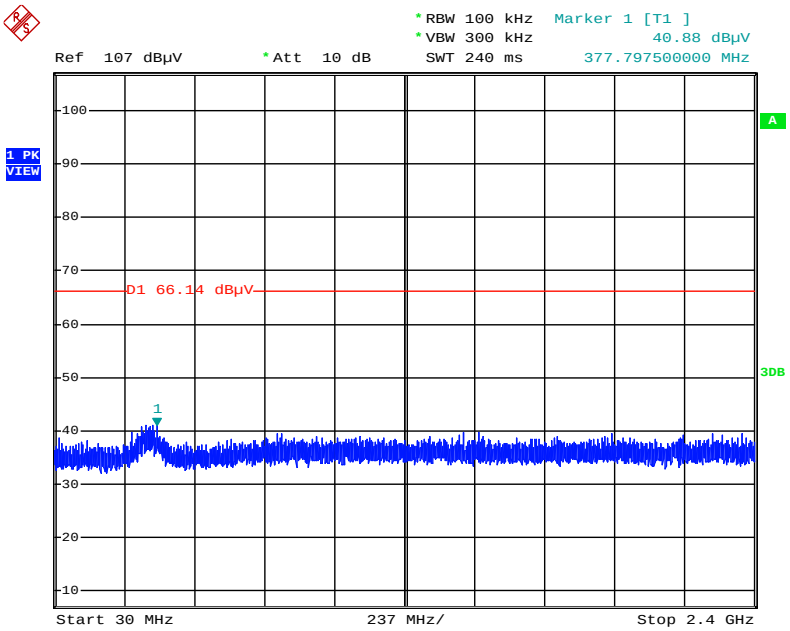
Date: 30.MAR.2016 01:55:22

Plot on Configuration IEEE 802.11g / CH 1 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



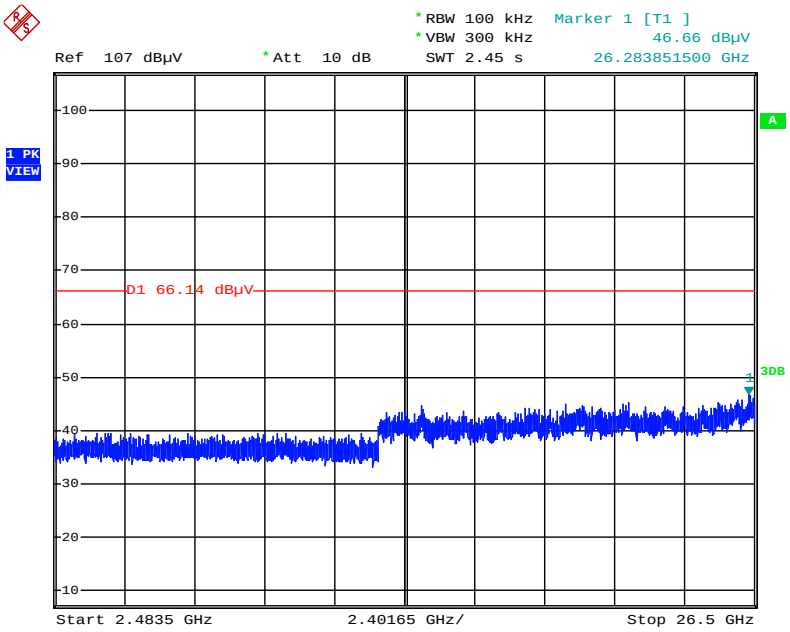
Date: 30.MAR.2016 01:55:50

Plot on Configuration IEEE 802.11g / CH 11 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



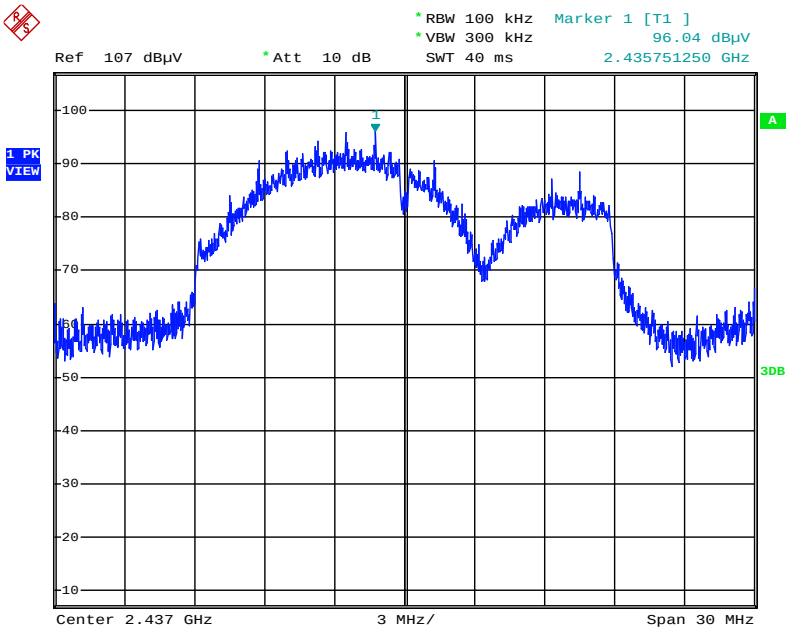
Date: 30.MAR.2016 01:57:00

Plot on Configuration IEEE 802.11g / CH 11 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



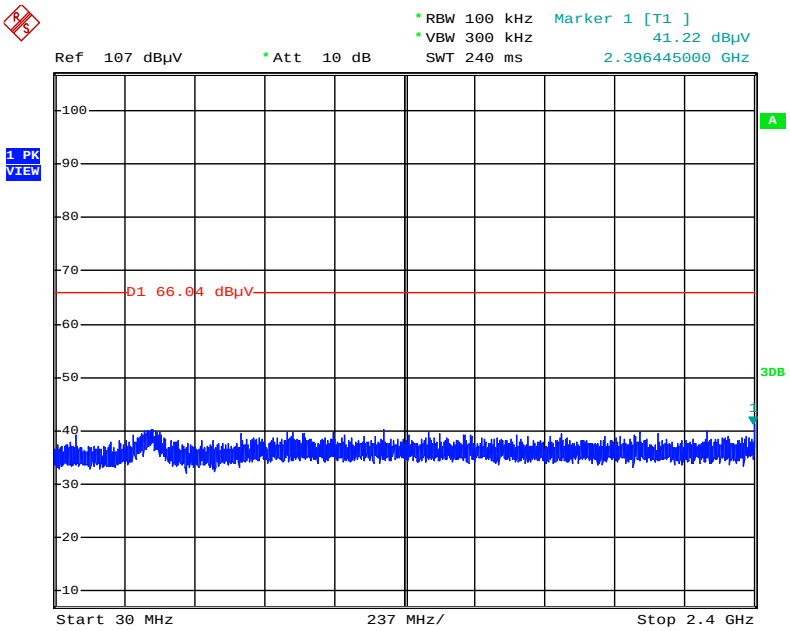
Date: 30.MAR.2016 01:56:19

Plot on Configuration MCS0 VHT20 / Reference Level / Test Mode: Mode 1



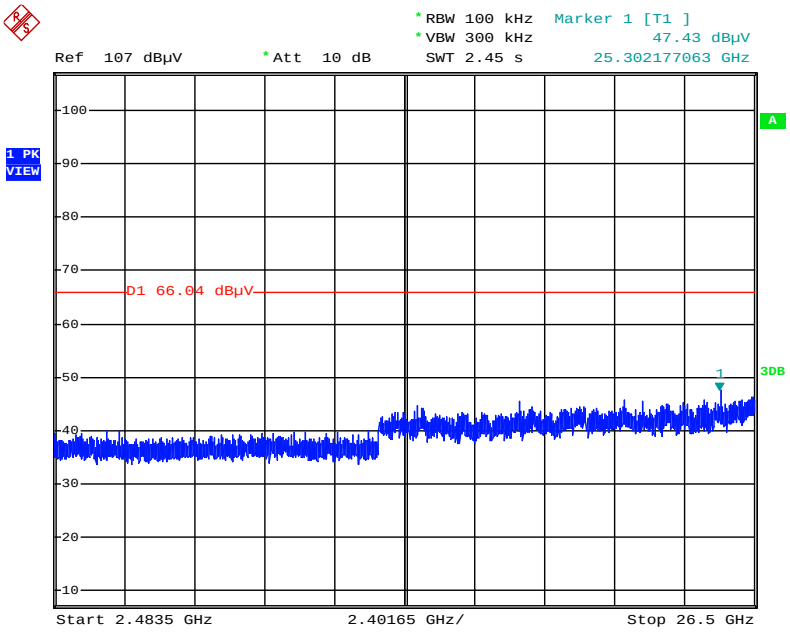
Date: 30.MAR.2016 01:57:51

Plot on Configuration MCS0 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



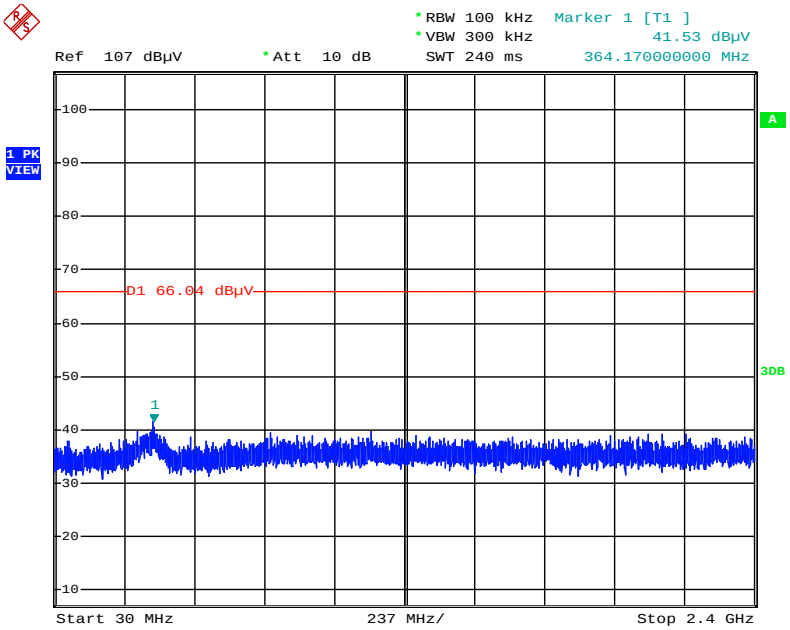
Date: 30.MAR.2016 01:58:53

Plot on Configuration MCS0 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



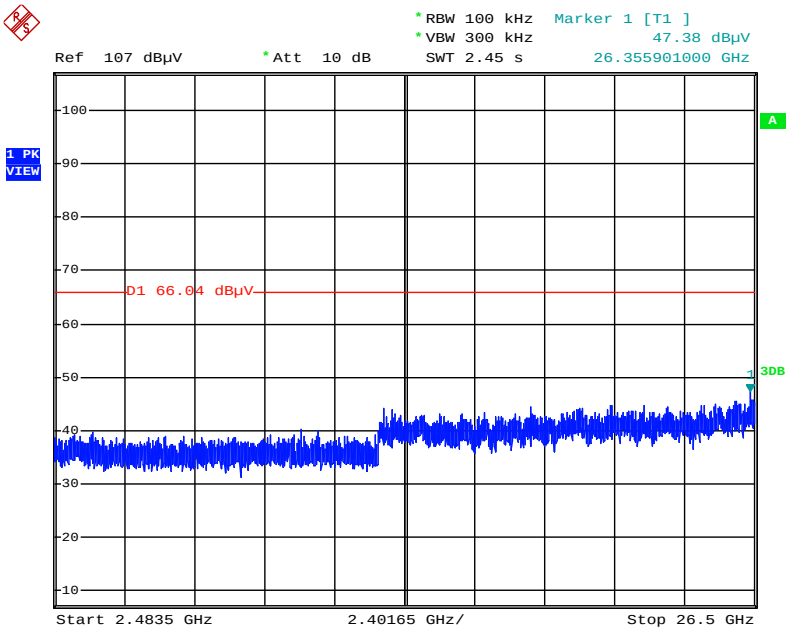
Date: 30.MAR.2016 01:59:26

Plot on Configuration MCS0 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



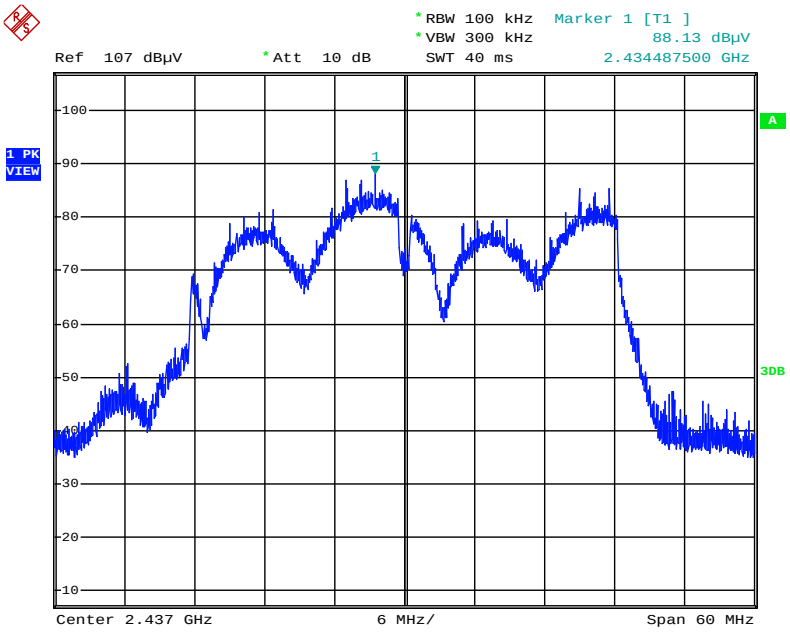
Date: 30.MAR.2016 02:00:24

Plot on Configuration MCS0 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



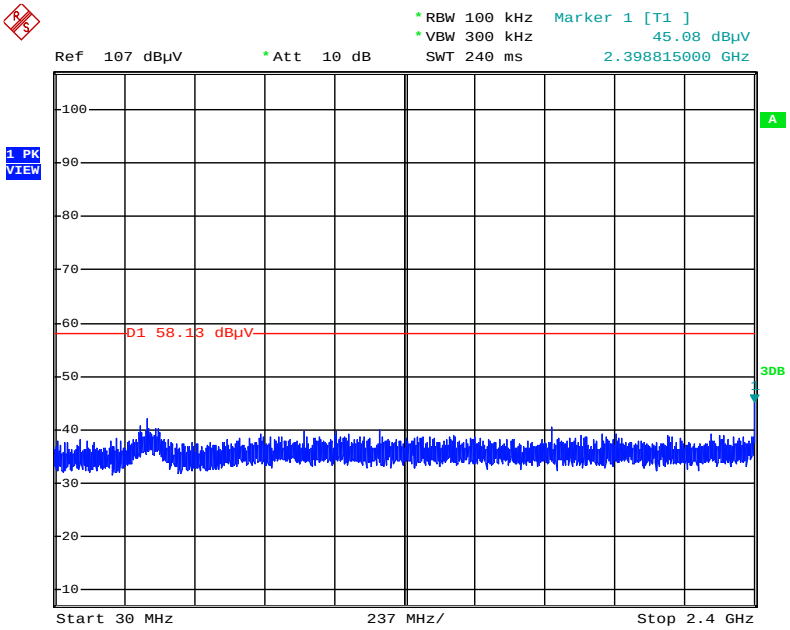
Date: 30.MAR.2016 02:00:03

Plot on Configuration MCS0 VHT40 / Reference Level / Test Mode: Mode 1



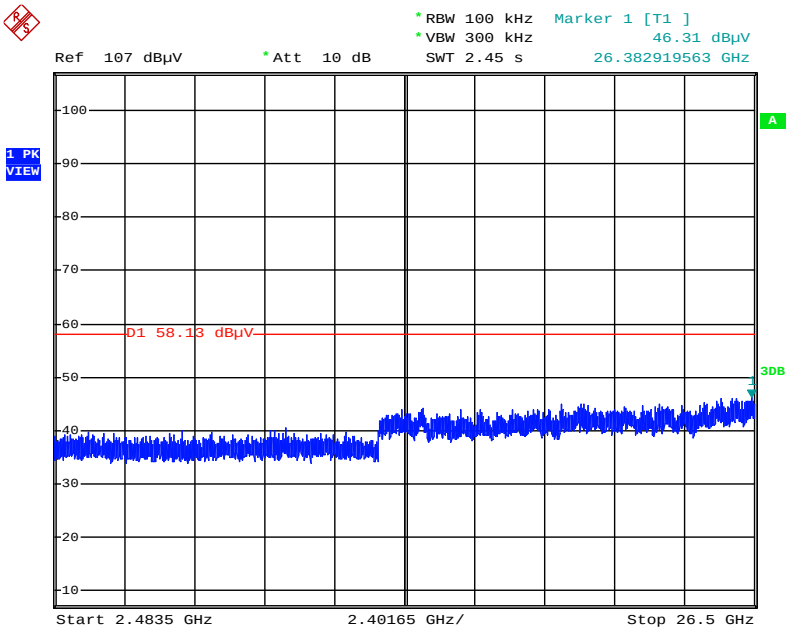
Date: 30.MAR.2016 02:01:04

Plot on Configuration MCS0 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



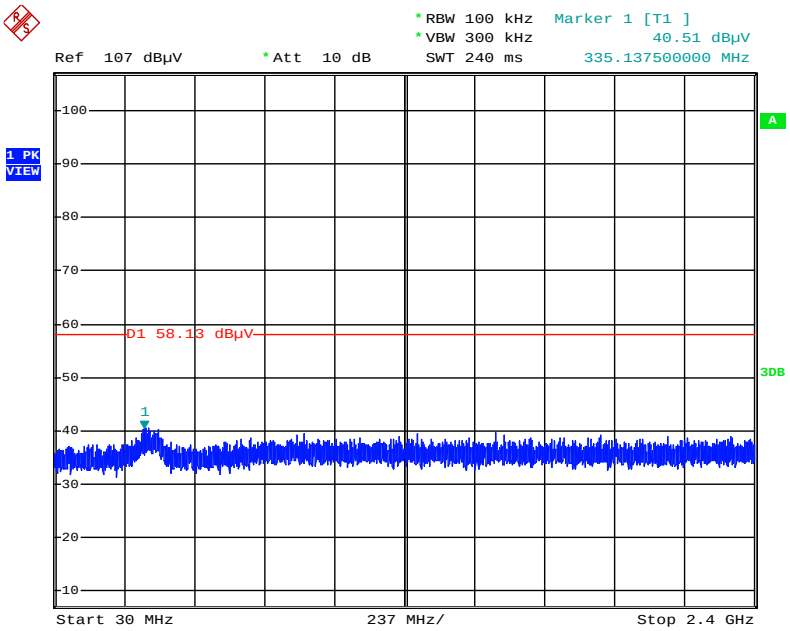
Date: 30.MAR.2016 02:01:47

Plot on Configuration MCS0 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



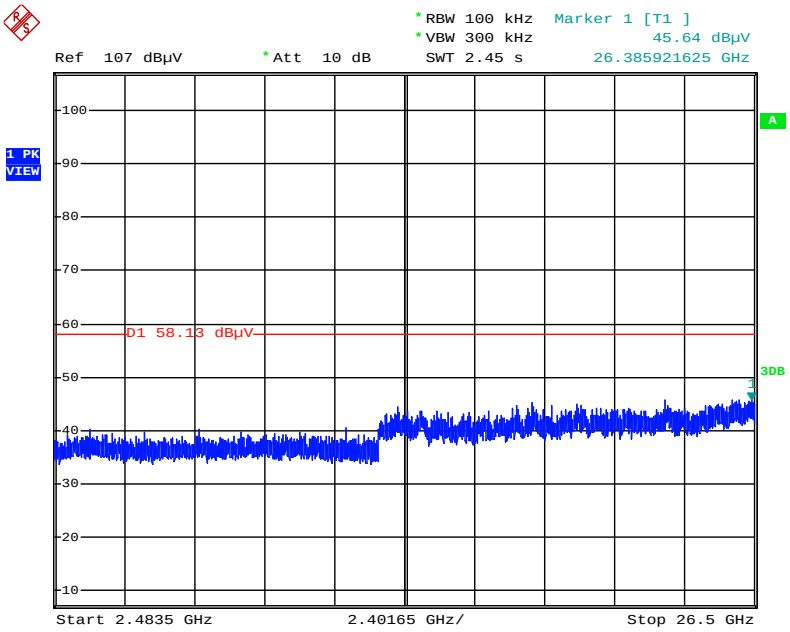
Date: 30.MAR.2016 02:02:13

Plot on Configuration MCS0 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



Date: 30.MAR.2016 02:03:10

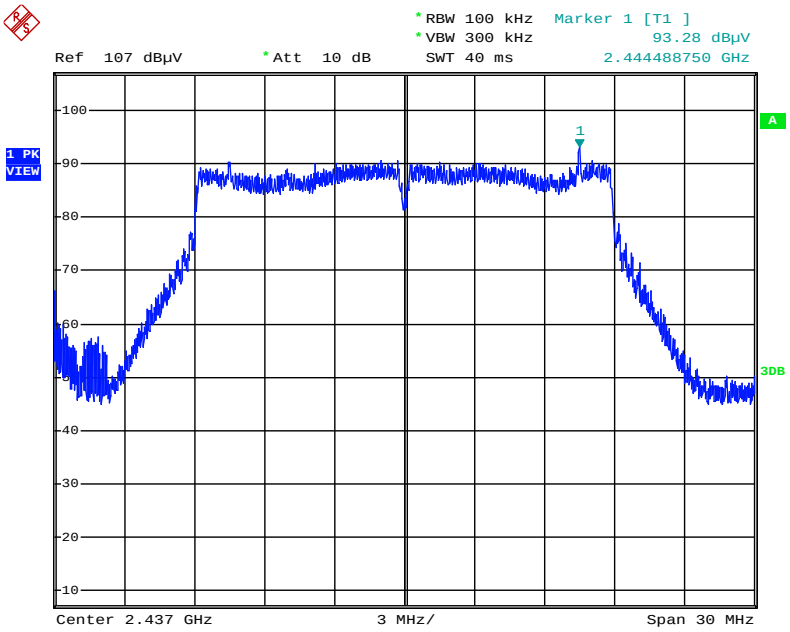
Plot on Configuration MCS0 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



Date: 30.MAR.2016 02:02:49

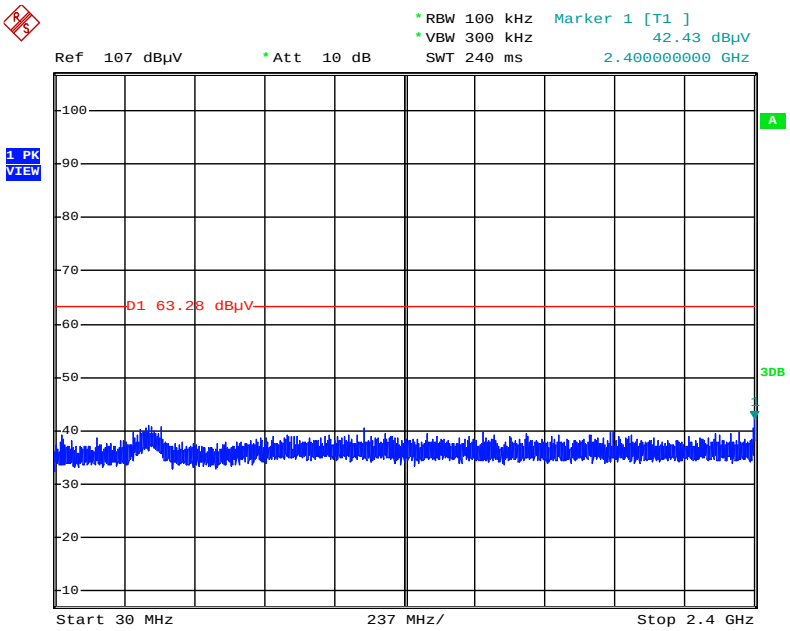
For beamforming function:

Plot on Configuration MCS0 VHT20 / Reference Level / Test Mode: Mode 1



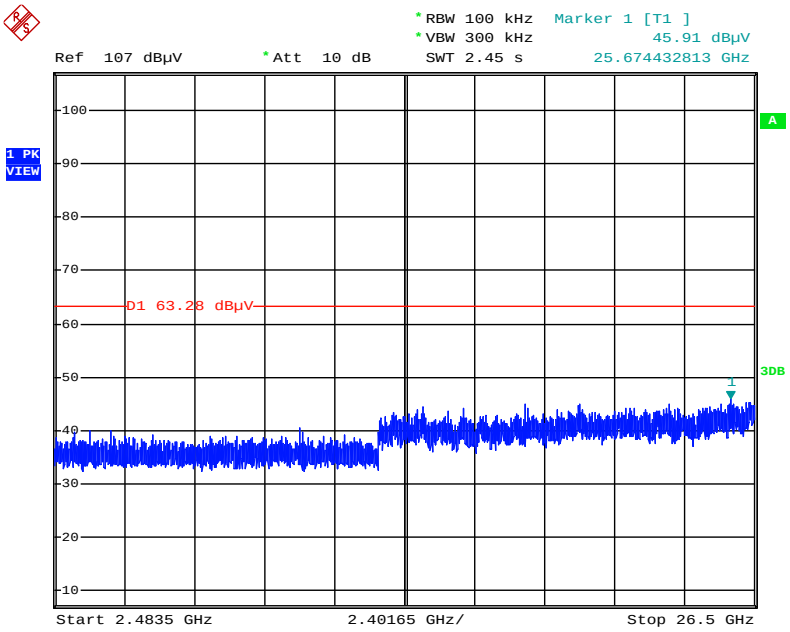
Date: 1.APR.2016 00:55:41

Plot on Configuration MCS0 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



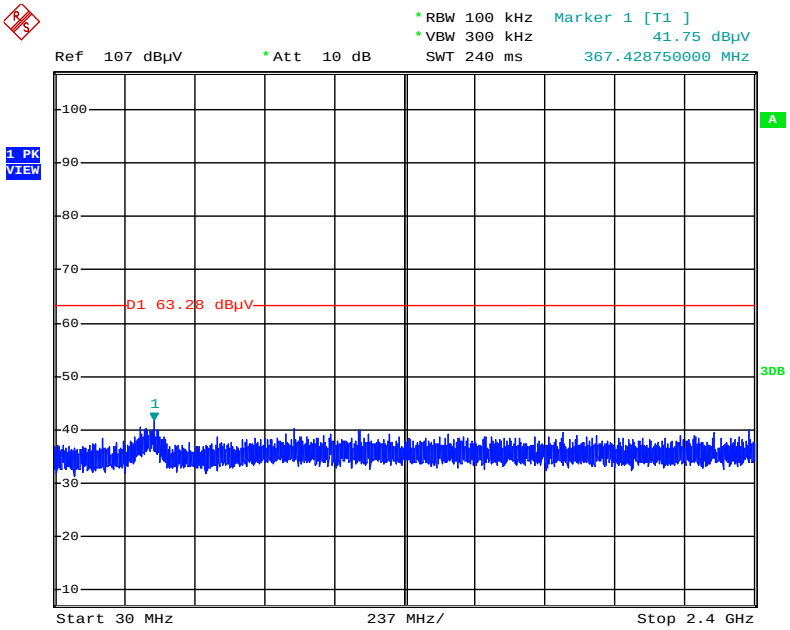
Date: 1.APR.2016 00:56:28

Plot on Configuration MCS0 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



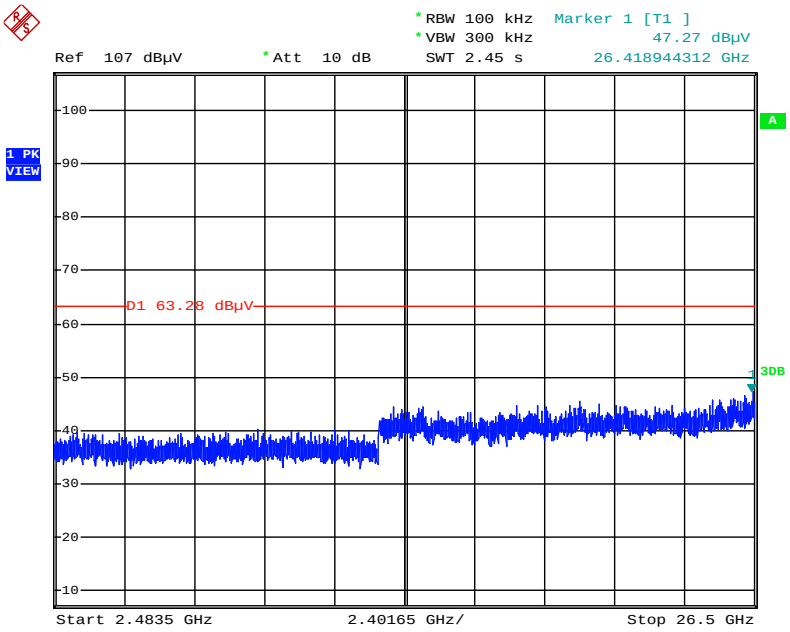
Date: 1.APR.2016 00:56:59

Plot on Configuration MCS0 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



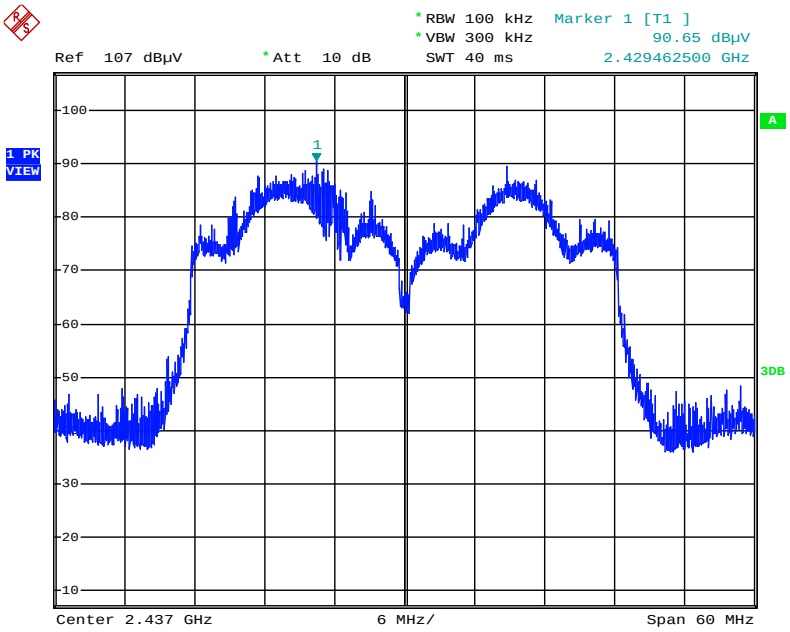
Date: 1.APR.2016 00:58:31

Plot on Configuration MCS0 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



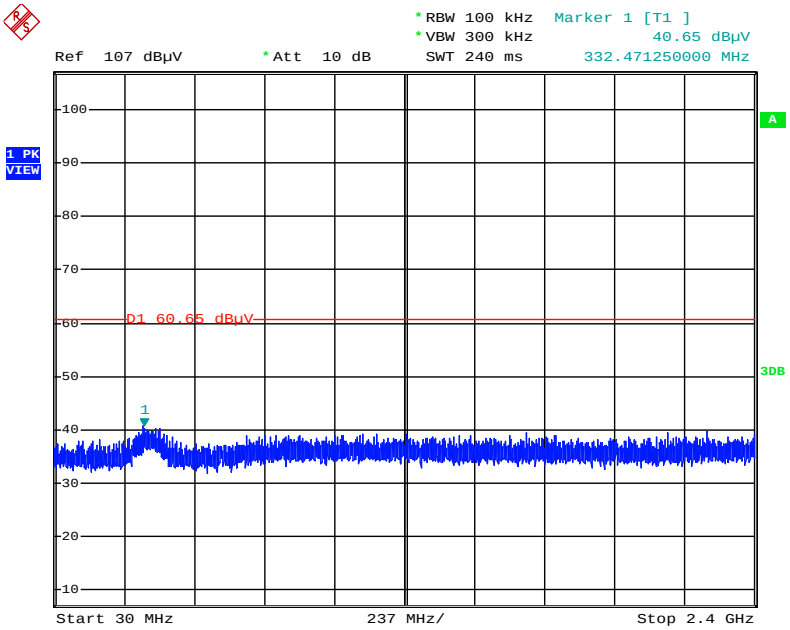
Date: 1.APR.2016 00:58:05

Plot on Configuration MCS0 VHT40 / Reference Level / Test Mode: Mode 1



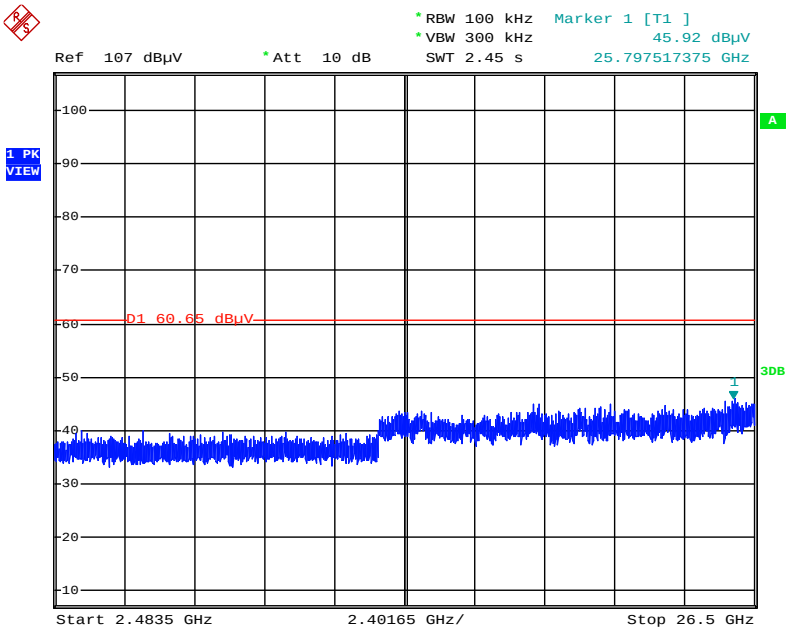
Date: 1.APR.2016 00:59:58

Plot on Configuration MCS0 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



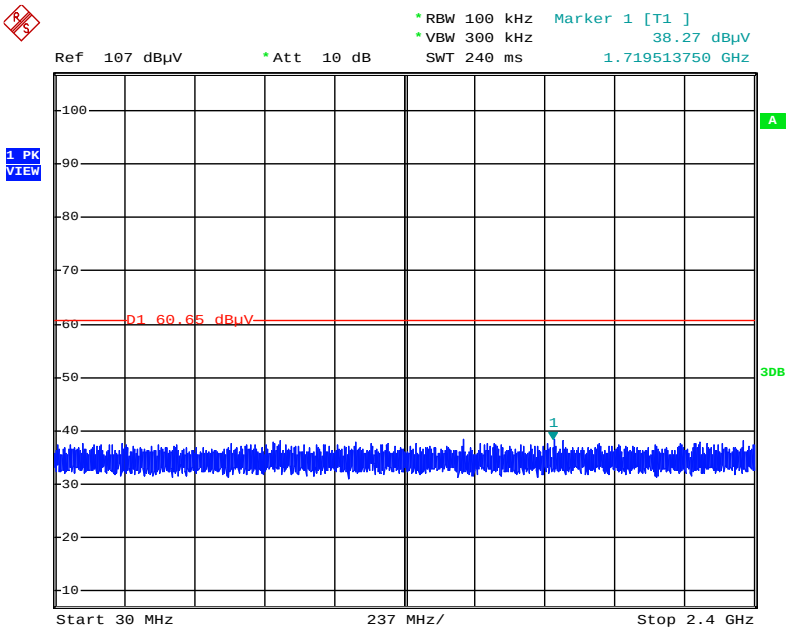
Date: 1.APR.2016 01:00:56

Plot on Configuration MCS0 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



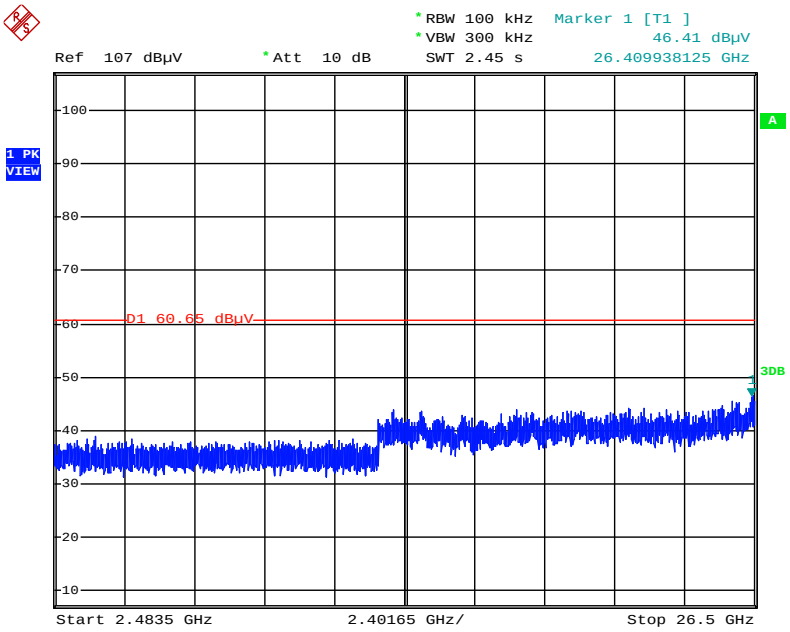
Date: 1.APR.2016 01:01:19

Plot on Configuration MCS0 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 1



Date: 1.APR.2016 01:42:45

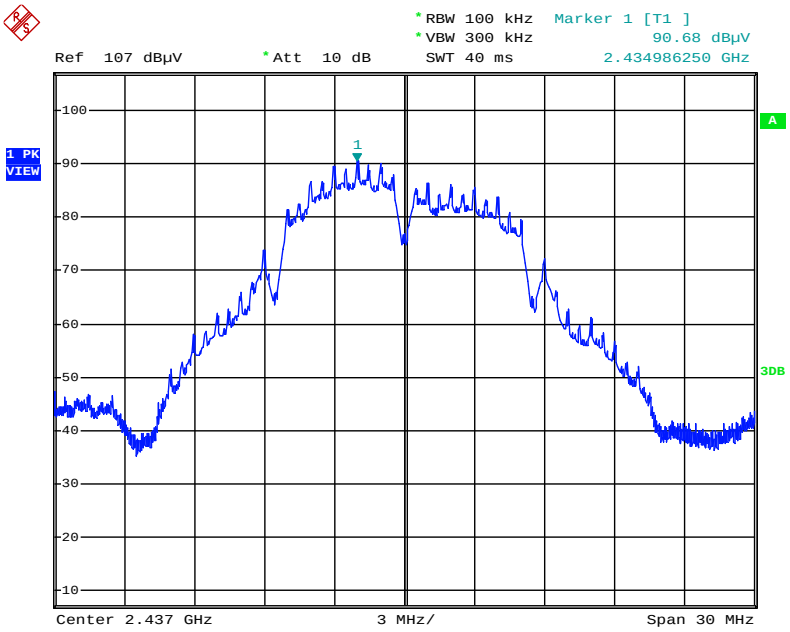
Plot on Configuration MCS0 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 1



Date: 1.APR.2016 01:42:25

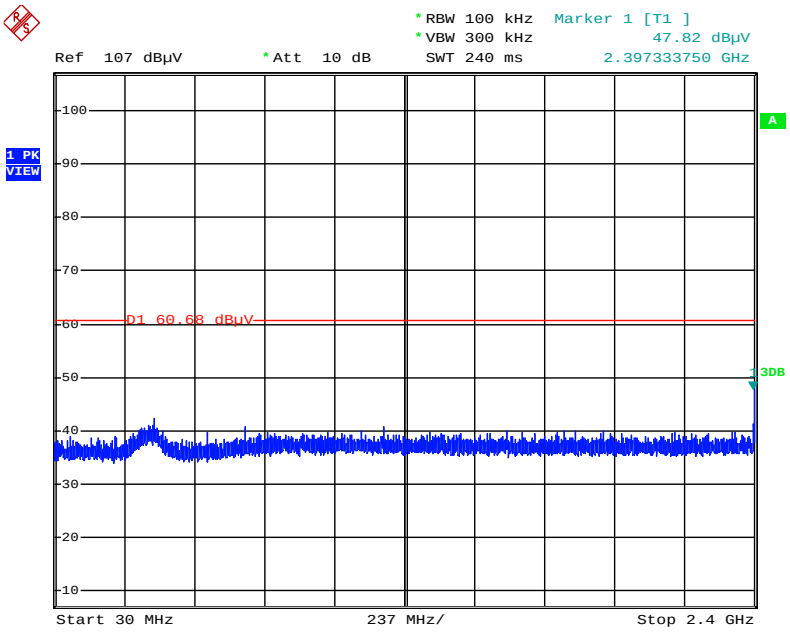
For non-beamforming function:

Plot on Configuration IEEE 802.11b / Reference Level / Test Mode: Mode 2



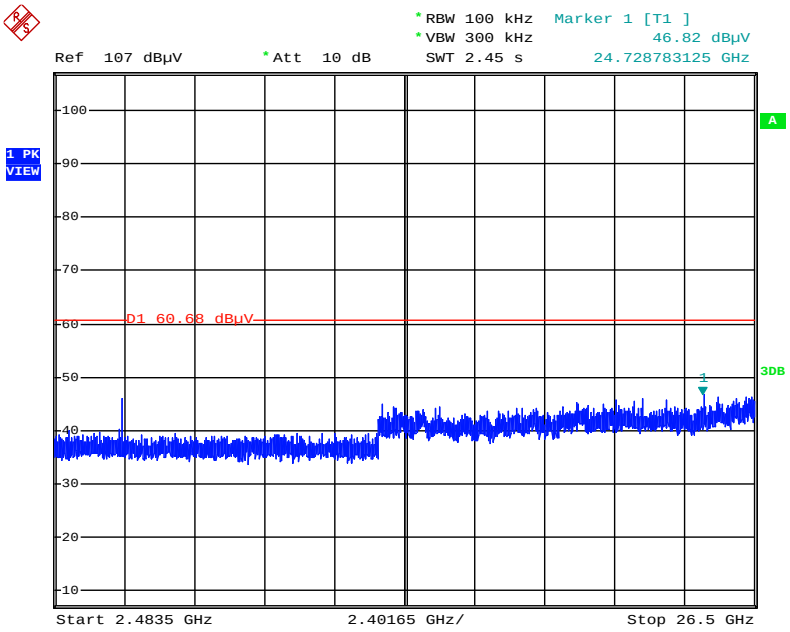
Date: 2.APR.2016 01:48:31

Plot on Configuration IEEE 802.11b / CH 1 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



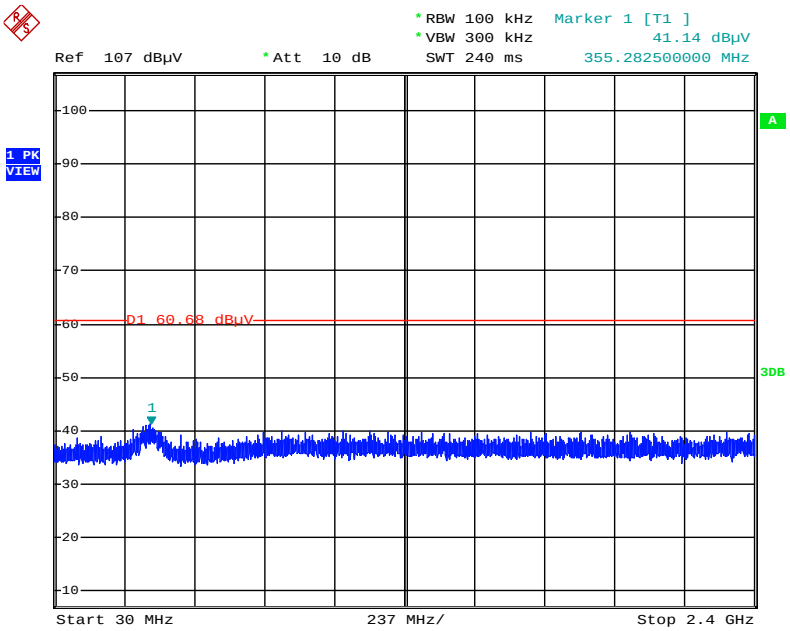
Date: 2.APR.2016 01:49:52

Plot on Configuration IEEE 802.11b / CH 1 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



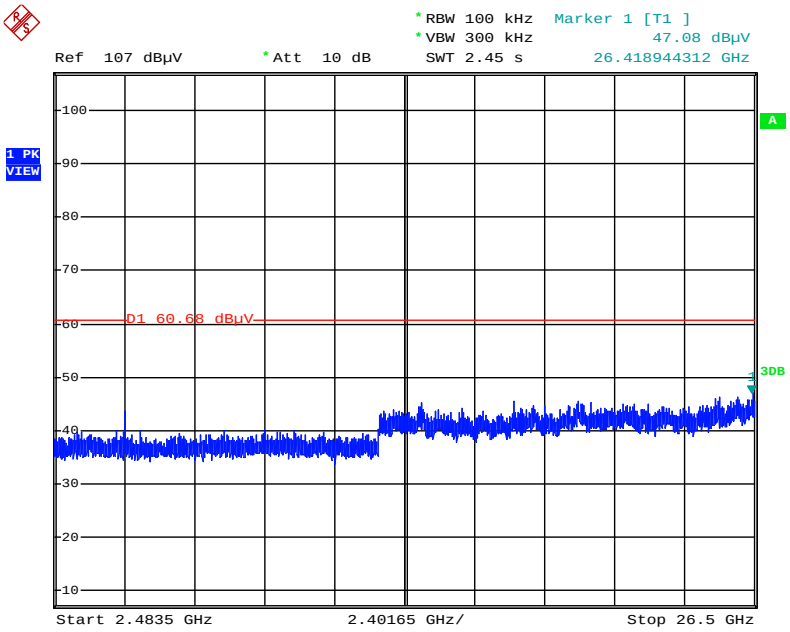
Date: 2.APR.2016 01:50:25

Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



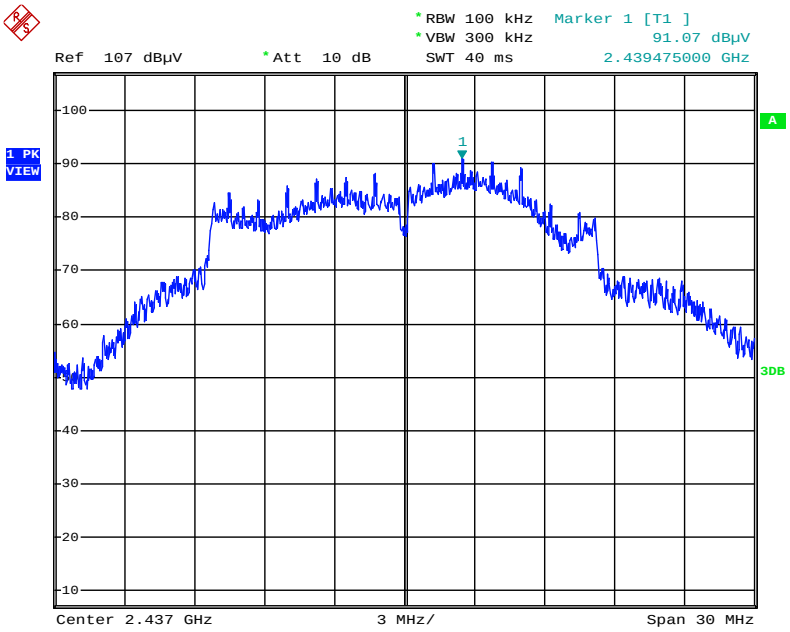
Date: 2.APR.2016 01:51:41

Plot on Configuration IEEE 802.11b / CH 11 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



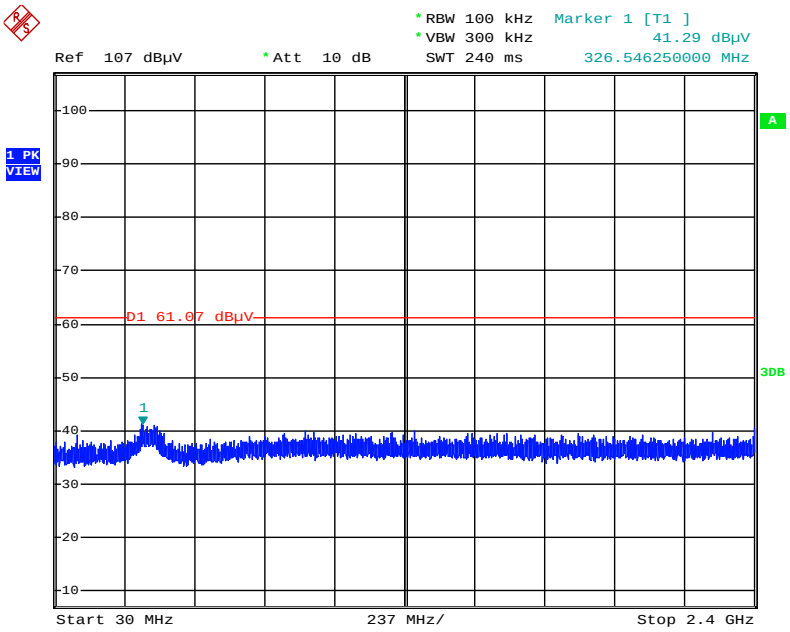
Date: 2.APR.2016 01:50:57

Plot on Configuration IEEE 802.11g / Reference Level / Test Mode: Mode 2



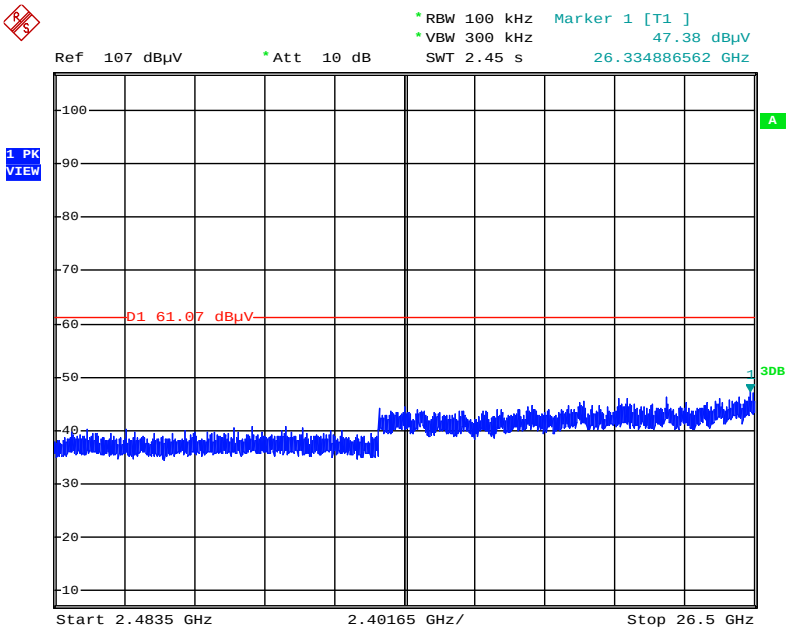
Date: 2.APR.2016 01:53:39

Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



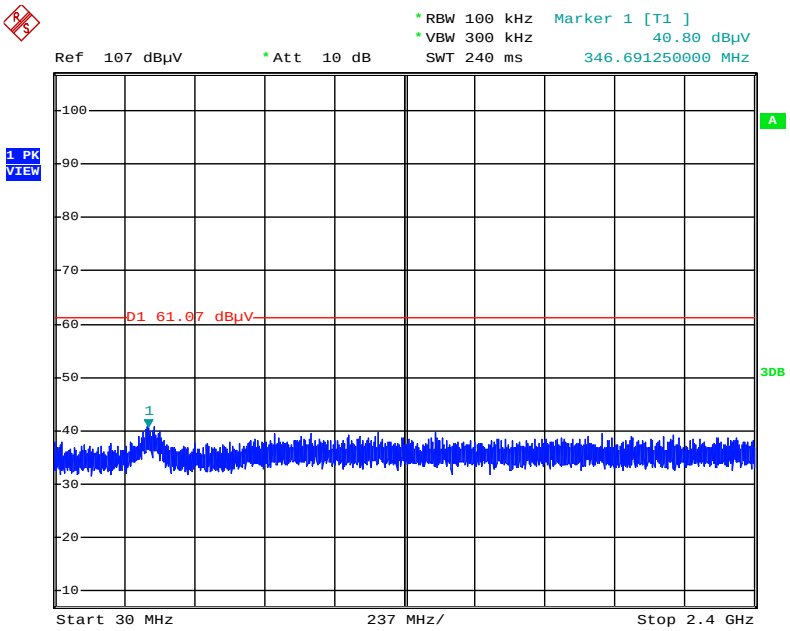
Date: 2.APR.2016 01:54:49

Plot on Configuration IEEE 802.11g / CH 1 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



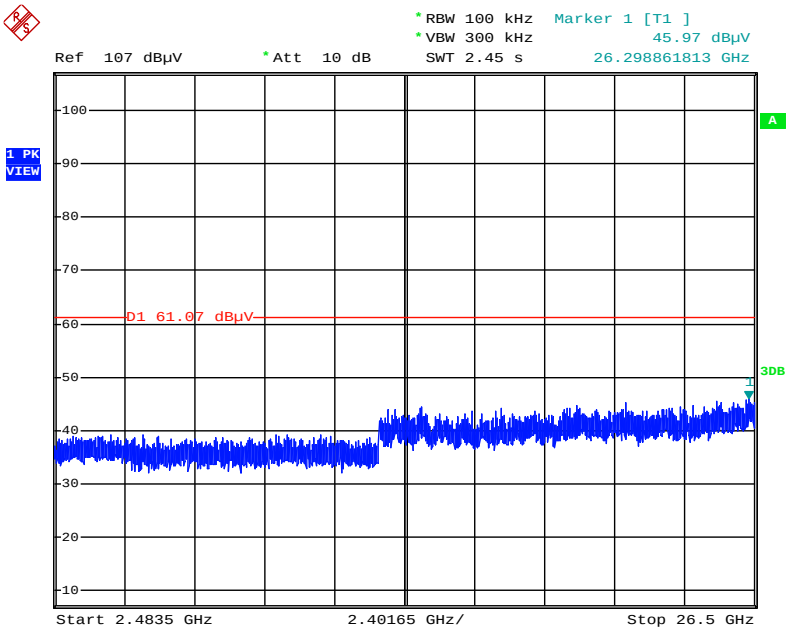
Date: 2.APR.2016 01:55:36

Plot on Configuration IEEE 802.11g / CH 11 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



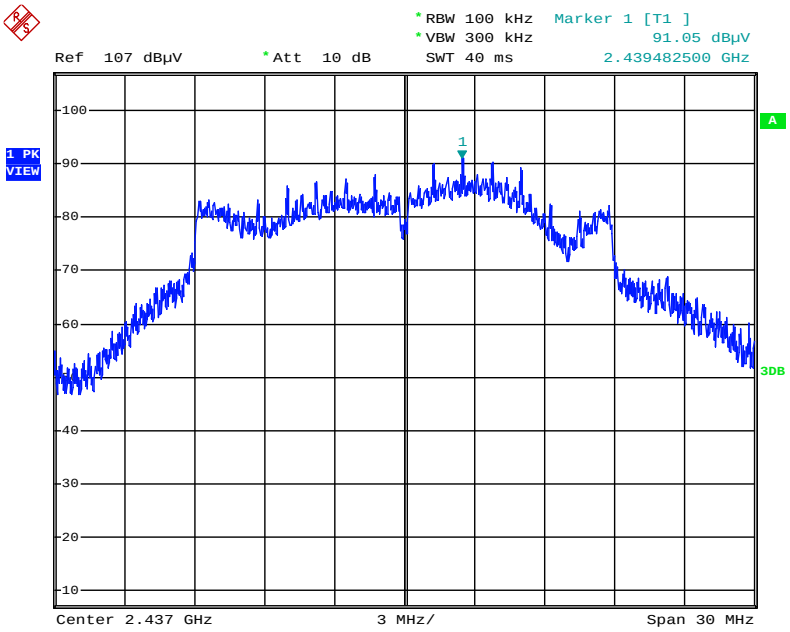
Date: 2.APR.2016 01:56:35

Plot on Configuration IEEE 802.11g / CH 11 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



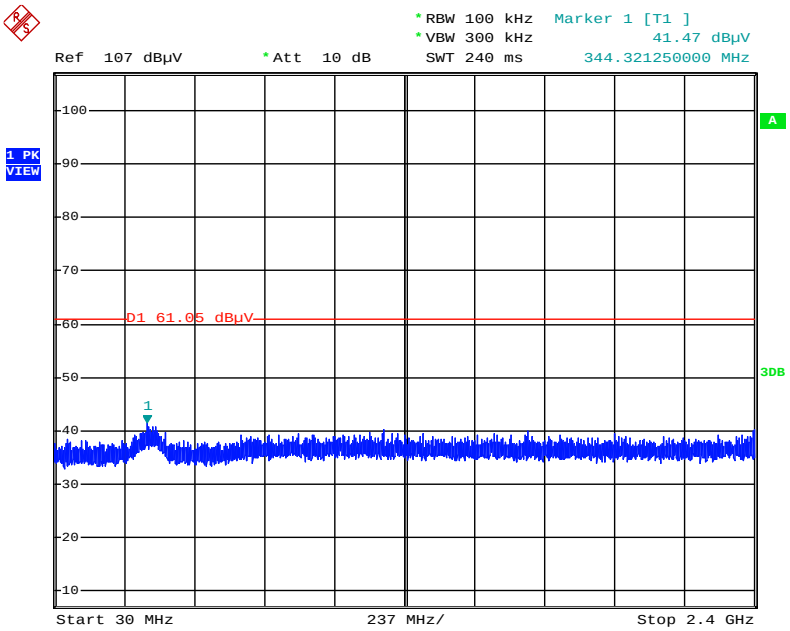
Date: 2.APR.2016 01:56:17

Plot on Configuration MCS0 VHT20 / Reference Level / Test Mode: Mode 2



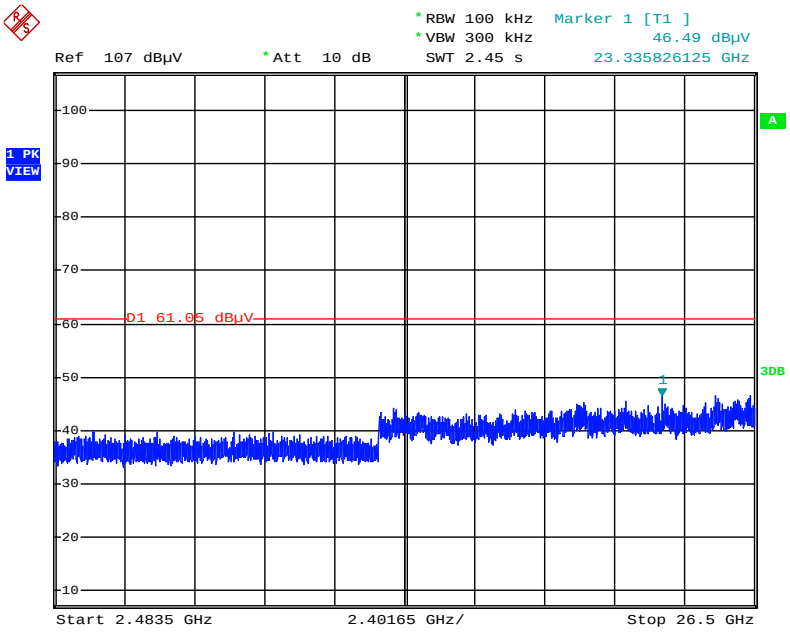
Date: 2.APR.2016 01:57:33

Plot on Configuration MCS0 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



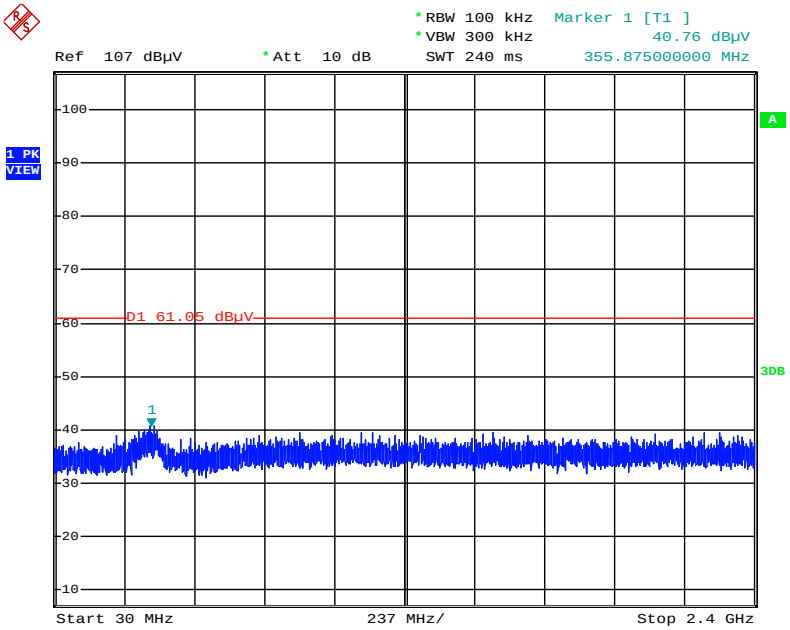
Date: 2.APR.2016 01:58:49

Plot on Configuration MCS0 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



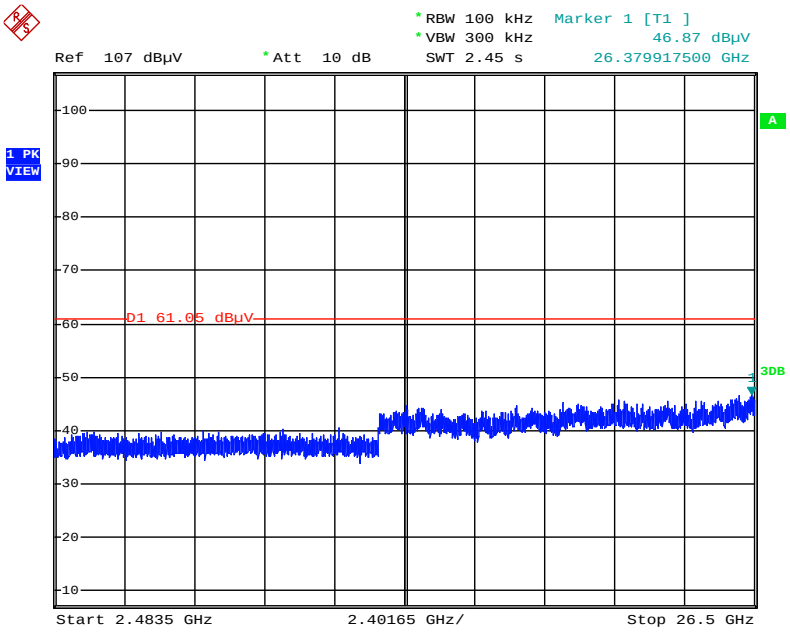
Date: 2.APR.2016 01:59:24

Plot on Configuration MCS0 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



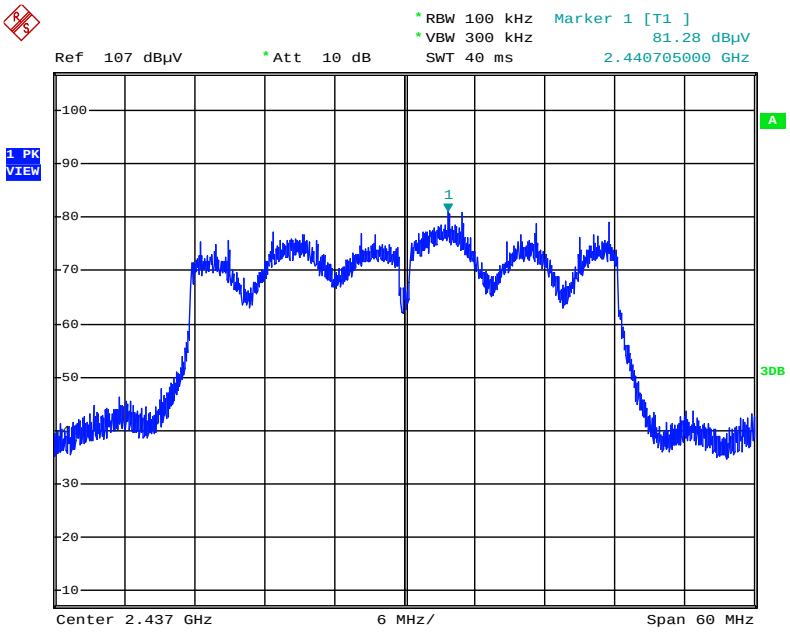
Date: 2.APR.2016 02:00:46

Plot on Configuration MCS0 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



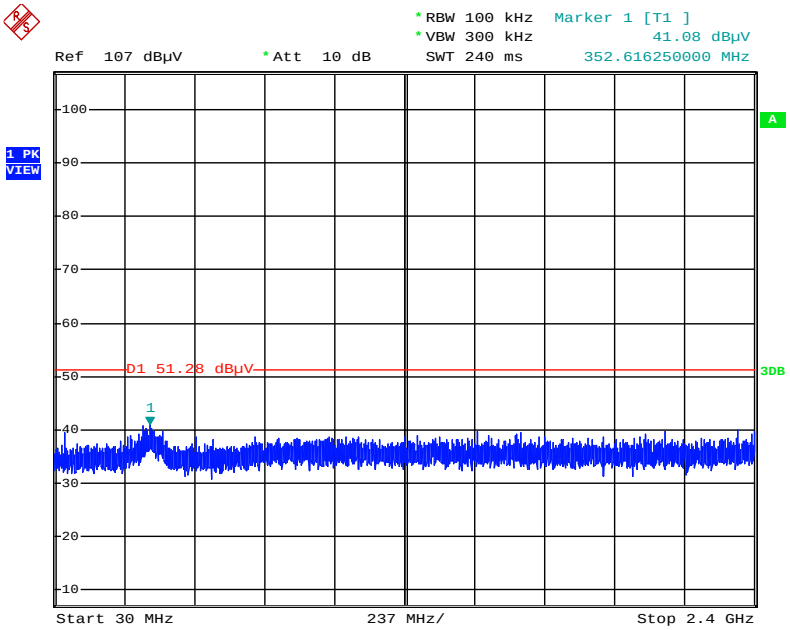
Date: 2.APR.2016 02:00:27

Plot on Configuration MCS0 VHT40 / Reference Level / Test Mode: Mode 2



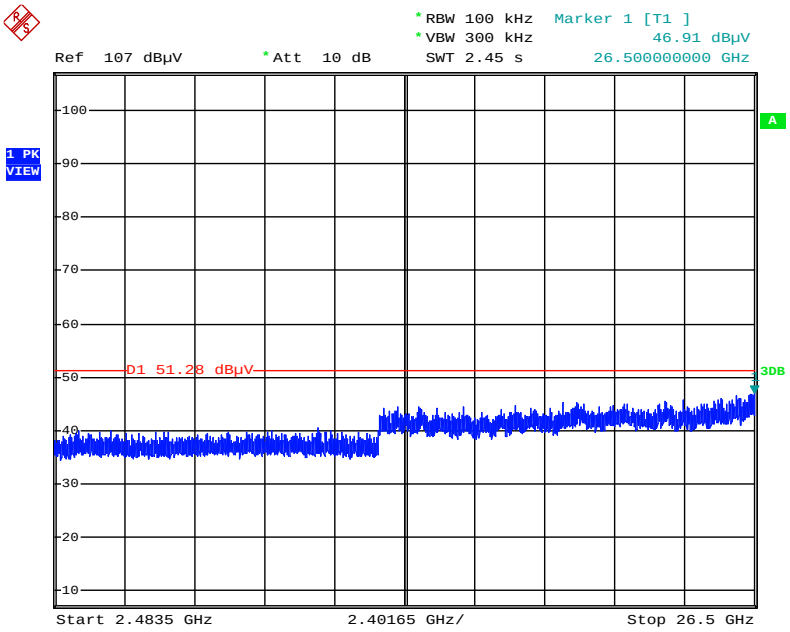
Date: 2.APR.2016 02:01:25

Plot on Configuration MCS0 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



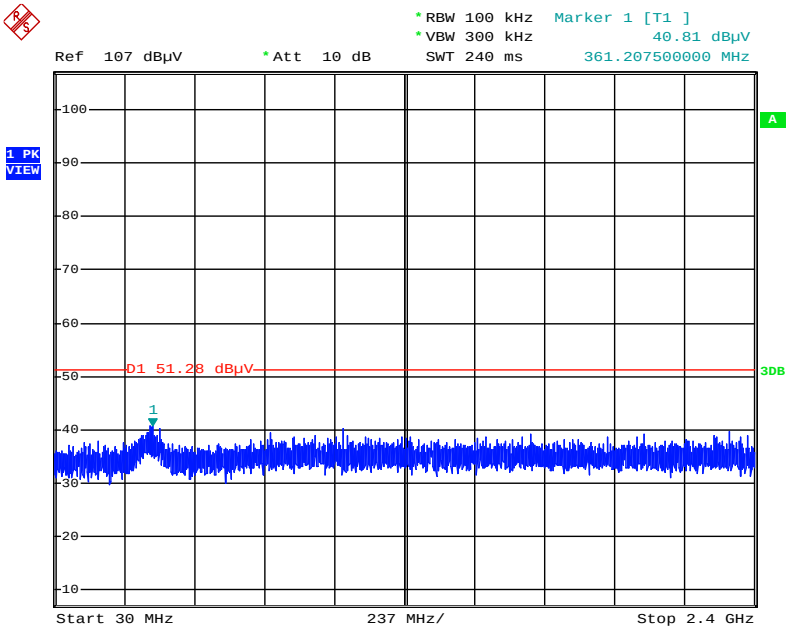
Date: 2.APR.2016 02:02:09

Plot on Configuration MCS0 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



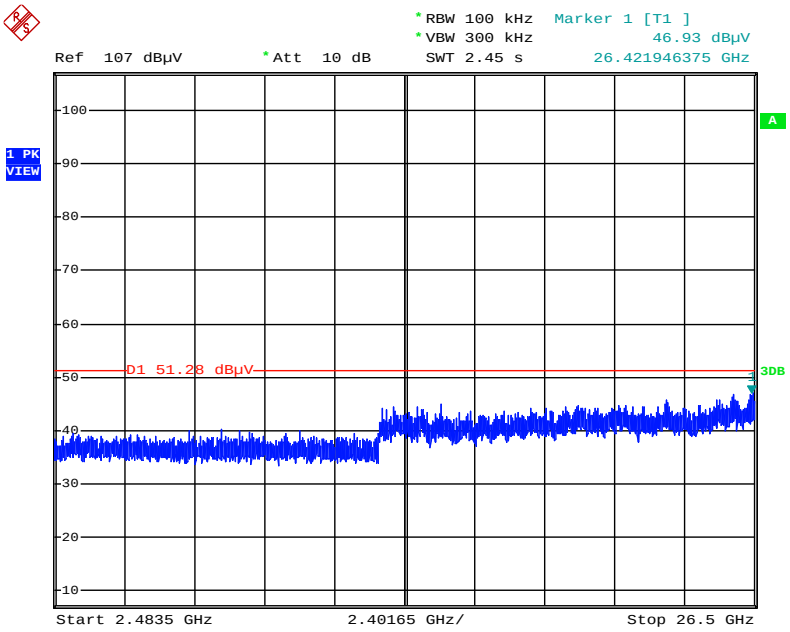
Date: 2.APR.2016 02:02:44

Plot on Configuration MCS0 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



Date: 2.APR.2016 02:03:40

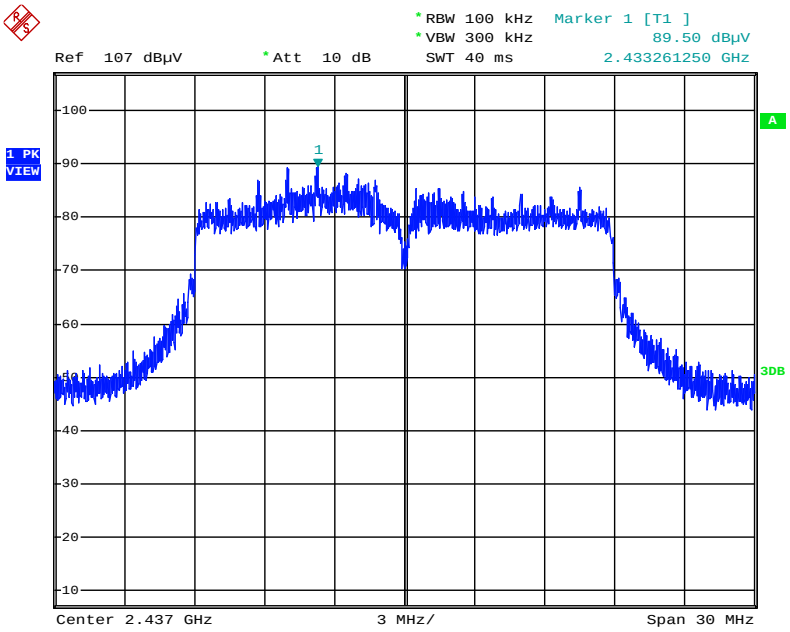
Plot on Configuration MCS0 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



Date: 2.APR.2016 02:03:25

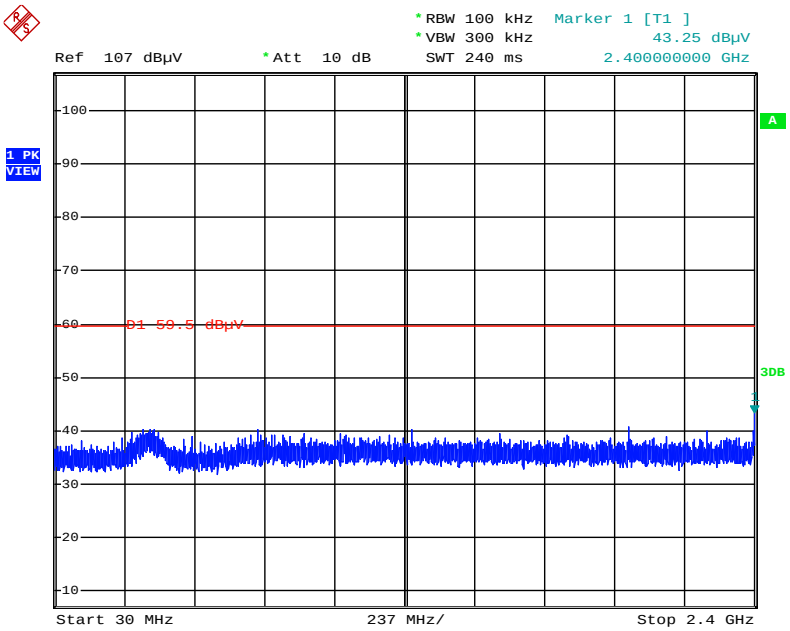
For beamforming function:

Plot on Configuration MCS0 VHT20 / Reference Level / Test Mode: Mode 2



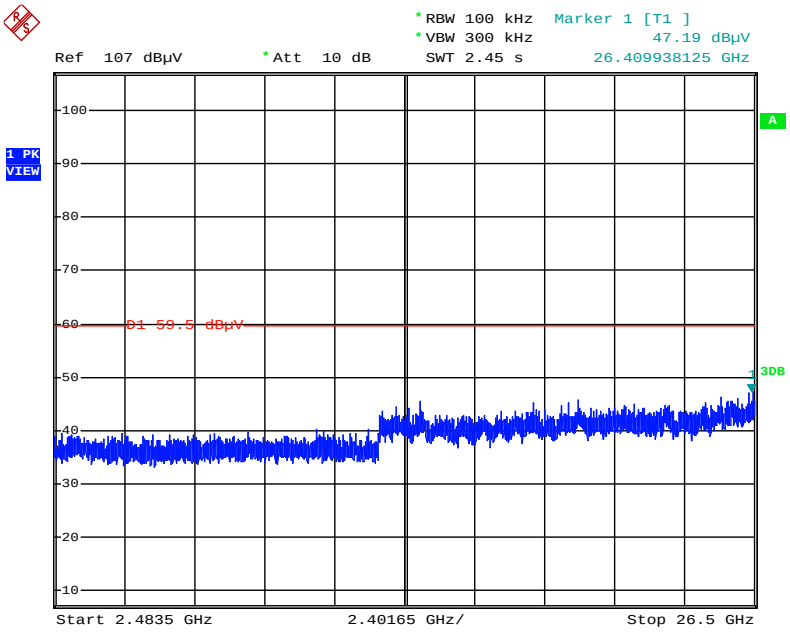
Date: 9.APR.2016 22:52:26

Plot on Configuration MCS0 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



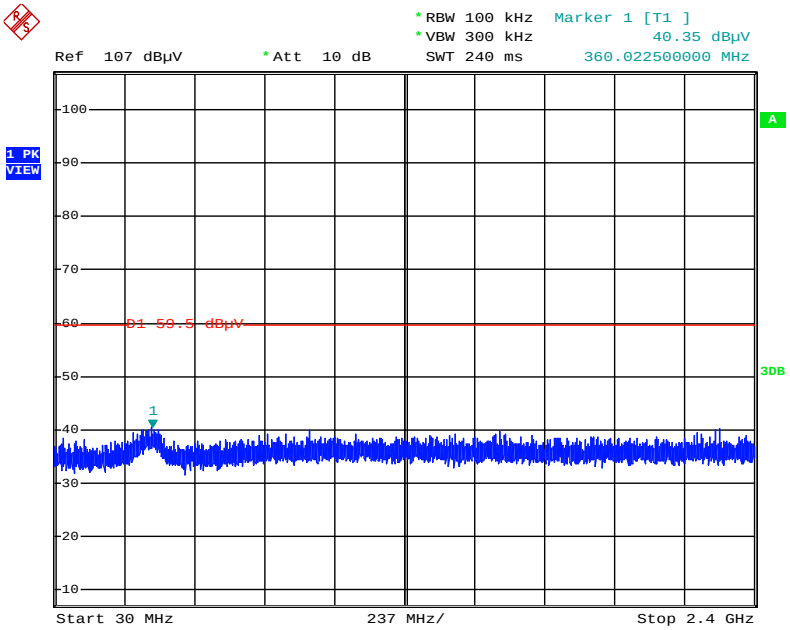
Date: 9.APR.2016 22:54:00

Plot on Configuration MCS0 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



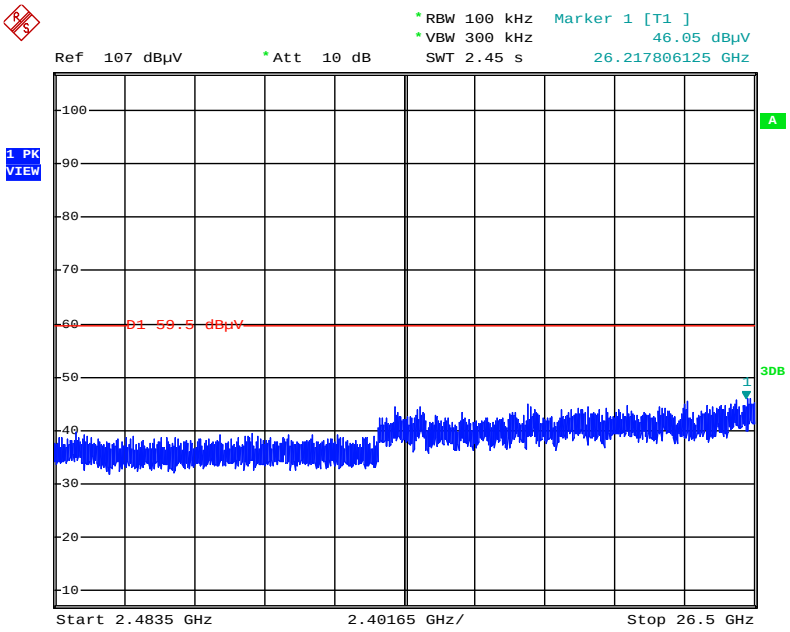
Date: 9.APR.2016 22:54:38

Plot on Configuration MCS0 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



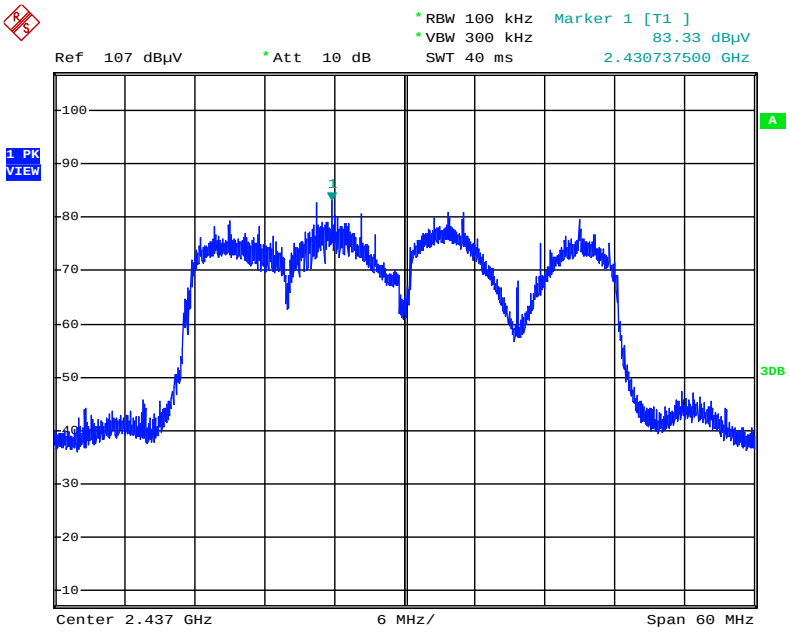
Date: 9.APR.2016 22:55:31

Plot on Configuration MCS0 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



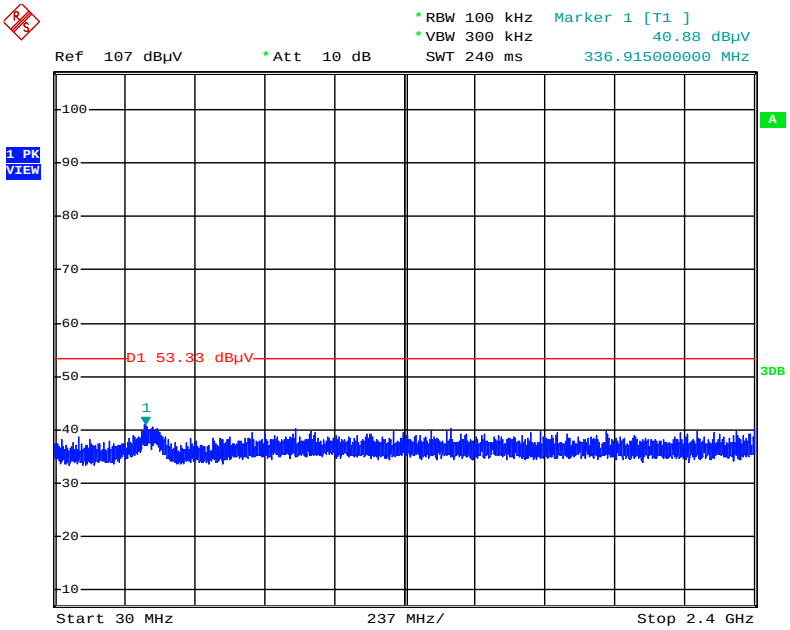
Date: 9.APR.2016 22:56:04

Plot on Configuration MCS0 VHT40 / Reference Level / Test Mode: Mode 2



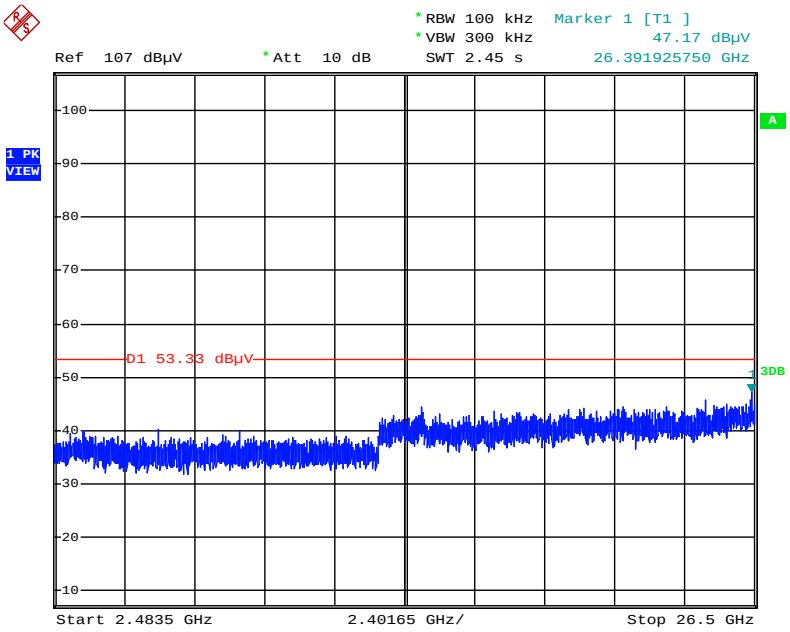
Date: 9.APR.2016 22:45:46

Plot on Configuration MCS0 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



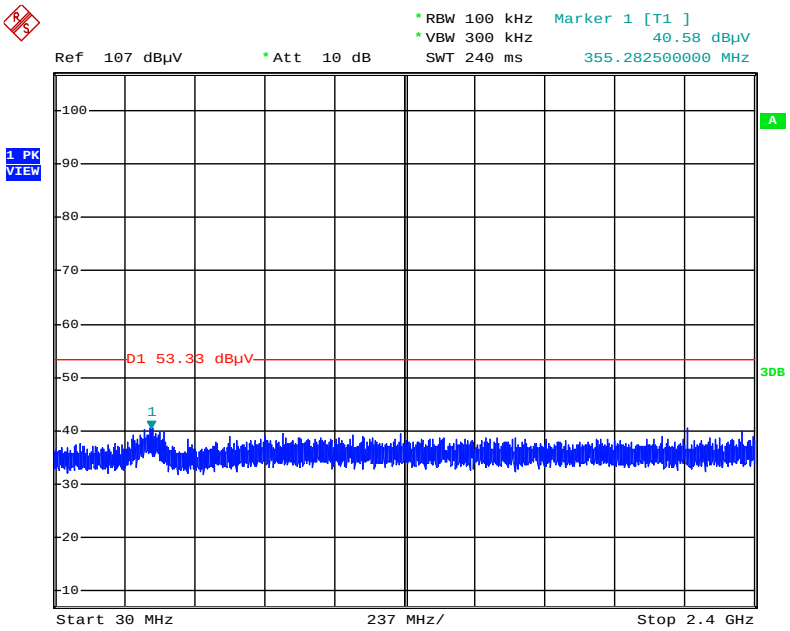
Date: 9.APR.2016 22:47:55

Plot on Configuration MCS0 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



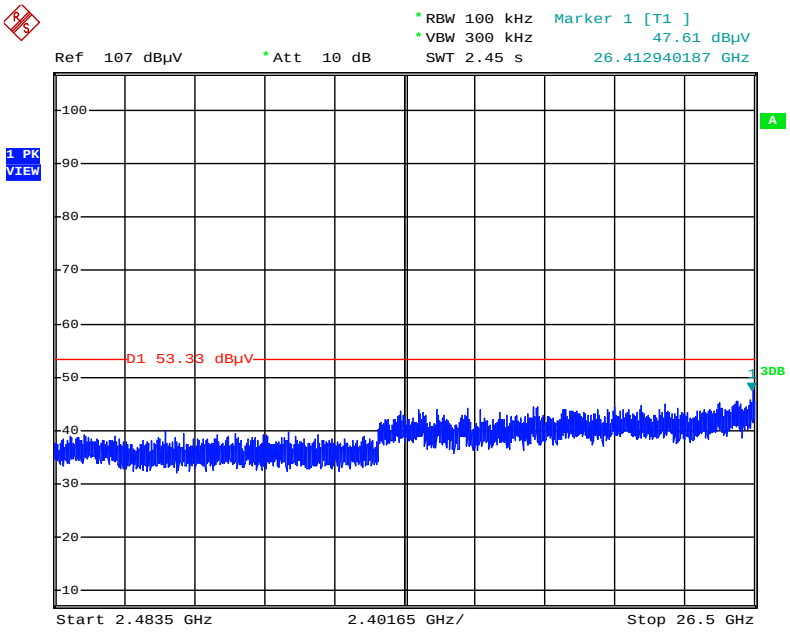
Date: 9.APR.2016 22:48:26

Plot on Configuration MCS0 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc) / Test Mode: Mode 2



Date: 9.APR.2016 22:49:25

Plot on Configuration MCS0 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc) / Test Mode: Mode 2



Date: 9.APR.2016 22:50:04

4.7. Antenna Requirements

4.7.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.7.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 27, 2016	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Mar. 15, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 13, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	Apr. 22, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

"*" Calibration Interval of instruments listed above is two years.

N.C.R. means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%