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FCC RADIO TEST REPORT

Applicant's company	**ASUSTeK COMPUTER INC.**
Applicant Address	4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan
FCC ID	**MSQ-RTGZ00**
Manufacturer's company (1)	**ASKEY TECHNOLOGY (JIANG SU) LTD**
Manufacturer Address (1)	NO1388, Jiao Tong Road, Wujiang Economic Technological Development Area Jiangsu Province 215200 China
Manufacturer's company (2)	**Compal Networking (KunShan) Co., LTD.**
Manufacturer Address (2)	No. 520, Nabbang Rd., Economic & Technical Development Zone Kunshan, Jiangsu Province China

Product Name	Wireless-AC5300 Tri-band Gigabit Router, ROG Rapture Tri-band Gaming Router, Extreme Gaming Router
Brand Name	ASUS
Model No.	RT-AC5300, RT-AC5300R, RT-AC5300W, RT-AC5300P, RT-AC95U, RT-AC96U, GT-AC5300, ROG Rapture GT-AC5300
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	Apr. 28, 2015
Final Test Date	Jan. 24, 2017
Submission Type	Class II Change

Statement

Test result included in this report is for the IEEE 802.11n/ac 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

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR532637-11AA	Rev. 01	Initial issue of report	Jan. 26, 2017

1. VERIFICATION OF COMPLIANCE

Product Name	:	Wireless-AC5300 Tri-band Gigabit Router, ROG Rapture Tri-band Gaming Router, Extreme Gaming Router
Brand Name	:	ASUS
Model No.	:	RT-AC5300, RT-AC5300R, RT-AC5300W, RT-AC5300P, RT-AC95U, RT-AC96U, GT-AC5300, ROG Rapture GT-AC5300
Applicant	:	ASUSTeK COMPUTER 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 Apr. 28, 2015 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.

Cliff Chang
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) for verison 1 WLAN (3TX/3RX, 4TX/4RX) for verison 2
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11b: DSSS (BPSK / QPSK / CCK) IEEE 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM, 1024QAM)
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/ac: see the below table
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Channel Bandwidth (99%)	**EUT: Version 2 (4TX4RX)** For Non-beamforming function: IEEE 802.11b: 10.42 MHz IEEE 802.11g: 15.72 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 16.15 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.76 MHz For Beamforming function: IEEE 802.11ac MCS0/Nss1 (VHT20): 17.71 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss2 (VHT20): 17.71 MHz
Maximum Conducted Output Power	**EUT: Version 2 (4TX4RX)** For Non-beamforming function: IEEE 802.11b: 29.98 dBm IEEE 802.11g: 29.72 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 29.84 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 24.91 dBm For Beamforming function: IEEE 802.11ac MCS0/Nss1 (VHT20): 27.50 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.11 dBm IEEE 802.11ac MCS0/Nss2 (VHT20): 29.93 dBm

Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☒ With beamforming	☐ Without beamforming

Note: The product has beamforming function for 802.11 n/ac in 2.4GHz/5GHz.

Antenna and Bandwidth

Antenna	Three (TX)		Four (TX)	
Bandwidth Mode	20 MHz	40 MHz	20 MHz	40 MHz
IEEE 802.11b	V	X	V	X
IEEE 802.11g	V	X	V	X
IEEE 802.11n	V	V	V	V
IEEE 802.11ac	V	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	3, 4	MCS0-23, MCS0-31
802.11n (HT40)	3, 4	MCS0-23, MCS0-31
802.11ac (VHT20)	3, 4	MCS0-11/Nss1-3, MCS0-11/Nss1-4
802.11ac (VHT40)	3, 4	MCS0-11/Nss1-3, MCS0-11/Nss1-4

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40.
Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20 and VHT40 in 2.4GHz
Note 3: Modulation modes consist of below configuration:
HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

3.2. Accessories

Power	Brand	Model No.	Rating
Adapter 1	ASUS	ADP-65DW B	Input: 100-240Vac, 50-60Hz, 1.5A Output: 19Vdc, 3.42A
Adapter 2	ASUS	AD887320	Input: 100-240Vac, 50-60Hz, 1.5A Output: 19Vdc, 3.42A
Adapter 3	ASUS	PA-1650-93	Input: 100-240Vac, 50-60Hz, 1.7A Output: 19Vdc, 3.42A
Adapter 4	ASUS	ADP-65DW B	Input: 100-240Vac, 50-60Hz, 1.5A Output: 19Vdc, 3.42A
Adapter 5	ASUS	PA-1650-63	Input: 100-240Vac, 50-60Hz, 1.7A Output: 19Vdc, 3.42A
Adapter 6	ASUS	AD887320	Input: 100-240Vac, 50-60Hz, 1.5A Output: 19Vdc, 3.42A
Other			
RJ-45 cable*1: Shielded, 1.5m			

Note1: The difference between adapter 1(model: ADP-65DW B) and adapter 4 (model: ADP-65DW B) as below:

Adapter 1			
Design No	MFG TITLE	MFG PART	DESCRIPTION
Q1	AUK	SMK0760F	FET 600V 7A 1.2ohm TO-220F-3P
Q1	ST	STP6NK60ZFP	FET 600V 6A 1.2ohm TO-220FP-3P
Q1	TOSHIBA	TK10A60DR(STA4,X)	FET 600V 10A 750mohm TO-220SIS-3P
D101	ST	STPS20S100CT	DIO SBD 20A 100V TO-220AB-3P C.C.
D101	ST	STPS20SM100ST	DIO SBD 20A 100V TO-220AB-3P
D101	ST	STPS30SM100ST	DIO SBD 30A 100V TO-220AB-3P
IC31	ON	DAP022ASN65T1G	IC ASIC PWM CURRENT MODE TSOP-6P SMD
IC131	TI	TL432BIDBZR	IC VOL REF ADJ 2.495V 100mA 0.5%
IC131	NXP	TL431BMFDT	IC VOL REF ADJ 2.495V 100mA 0.5%
IC131	DIODES	AS431ANTR-G1	IC VOL REF ADJ 2.5V 100mA 0.5% SOT-23-3P
IC32	EVERLIGHT	EL816M(Y)(D)-VG	PHOTO TR 50mA 80V DIP-4P 150%-300%
IC32	SHARP	PC123Y92FZ0F	PHOTO TR 50mA 70V DIP-4P 160%-300%
IC32	Renesas	PS2561DL1-1Y-V-A(G)	EOL PHOTO TR 40mA 80V DIP-4P 150%-300%
CX1	EUROPTRONIC	MPX2224K30B15LXD20	CAP X2 MP PC 305VAC 0.22uF K S15
CX1	OKAYA	LE224-MX-30-C3.2	CAP X2 MP PC 300VAC 0.22uF K S15
CX1	HUA	MKP-224K0275AB115S-G	CAP X2 MP PC 275VAC 0.22uF K S15
FL1	DELTA	HFV-MP13202	LINE FILTER T14 14mH MIN
FL101	DELTA	LFV-MP13303	LINE FILTER T10 17uH MIN

T1	DELTA	MV-MP13167	TRANSFORMER MAIN RM10 1mH +/-5%
C1	NICHICON	UPT2G680MHD3	CAP AL 400V 68uF M 16*25 P7.5
C1	NCC	EKMG401ELL680ML25S	CAP AL 400V 68uF M 16*25 P7.5
C1	L-Tec	TYJ2GM680K25O	CAP AL 400V 68uF M 16*25 P7.5
CY1	MURATA	DE1B3KX221KNHAN99F	CAP Y1/X1 CD 250VAC 220pF K B TP VI10
CY1	TDK	CD70-B2GA221KYVK	CAP Y1/X1 CD 250VAC 220pF K B TP VI10
CY1	WALSIN	YP0AH221K061DASDAB	CAP Y1/X1 CD 250VAC 220pF K B TP VI10
Adapter 4			
Design No	**MFG TITLE**	**MFG PART**	**DESCRIPTION**
Q1	TOSHIBA	TK10A60DR(STA4,X)	FET 600V 10A 750mohm TO-220SIS-3P
Q1	FUJI	FMV11N60ES	FET 600V 11A 750mohm TO-220F-3P
D101	ST	STPS20S100CT	DIO SBD 20A 100V TO-220AB-3P C.C.
D101	ST	STPS20H100CT	DIO SBD 20A 100V TO-220AB-3P C.C.
D101	ST	STPS30H100CT	DIO SBD 30A 100V TO-220AB-3P C.C.
IC31	NeoEnergy	DAP022AT	IC ASIC PWM CURRENT MODE SOT-26-6P SMD
IC131	LITE-ON	LA431OCRPA	IC REGU ADJ 2.495V 100mA 0.4% SOT-23R-3P
IC131	TI	TL432BIDBZR	IC VOL REF ADJ 2.495V 100mA 0.5%
IC131	NXP	TL431BMFDT	IC VOL REF ADJ 2.495V 100mA 0.5%
IC32	EVERLIGHT	EL816M(Y)(D)-VG	PHOTO TR 50mA 80V DIP-4P 150%-300%
IC32	SHARP	PC123Y92FZ0F	PHOTO TR 50mA 70V DIP-4P 160%-300%
IC32	TOSHIBA	TLP785F(D4-GRH,F	PHOTO TR 60mA 80V DIP-4P 150%-300%
CX1	HUA	MKP-334K0275AB115S-G	CAP X2 MP PC 275VAC 0.33uF K S15
CX1	HUA	MKP-334K0275AB115S-P	CAP X2 MP PC 275VAC 0.33uF K S15
CX1	EUROPTRONIC	MPX2334K30B15LXD31	CAP X2 MP PC 305VAC 0.33uF K S15
FL1	DELTA	HFV-MP15027	LINE FILTER T16 12.7mH MIN
FL101	DELTA	LFV-MP13171	LINE FILTER T6 1.55uH MIN
T1	DELTA	MV-MP15037	TRANSFORMER MAIN RM10 1000uH +/-5%
C1	NCC	EKMG401ELL680ML25S	CAP AL 400V 68uF M 16*25 P7.5
CY1	MURATA	DE1B3KX221KNHAN99F	CAP Y1/X1 CD 250VAC 220pF K B TP VI10
CY1	WALSIN	YP0AH221K061DASDAB	CAP Y1/X1 CD 250VAC 220pF K B TP VI10

Note2: The difference between adapter 3 (model: PA-1650-93) and adapter 5 (model: PA-1650-63) as below:

Adapter 3	Adapter 5
Model: PA-1650-93	Model: PA-1650-63

Note3: The difference between adapter 2 (model: AD887320) and new adapter 6 (model: AD887320) as below:

Adapter 2	Adapter 6
Type: 010KLF BAH	Type: 010K-3LF

3.3. Table for Filed Antenna

Set	Brand	Part No.	Antenna Type	Connector
1	PSA	RFDPA131000SBLB805	Dipole Antenna	Reversed-SMA
2	PSA	RFDPA151000SBLB802	Dipole Antenna	Reversed-SMA
3	M.gear	C660-510368-A	Dipole Antenna	Reversed-SMA
4	M.gear	C660-510369-A	Dipole Antenna	Reversed-SMA
5	M.gear	C660-510370-A	Dipole Antenna	Reversed-SMA
6	M.gear	C660-510391-A	Dipole Antenna	Reversed-SMA
7	M.gear	C660-510392-A	Dipole Antenna	Reversed-SMA

Set	Gain (dBi)		Cable Loss		True Gain (dBi)	
	2.4GHz	5GHz	2.4GHz	5GHz	2.4GHz	5GHz
1	2.32	3.47	-	-	2.32	3.47
2	1.98	3.37	-	-	1.98	3.37
3	1.50	3.30	0.39	0.61	1.11	2.69
4	2.00	3.20	0.35	0.55	1.65	2.65
5	2.20	3.20	0.33	0.51	1.87	2.69
6	2.14	2.98	-	-	2.14	2.98
7	1.91	2.97	-	-	1.91	2.97

Note: 1. The EUT has seven set of antenna, and each set contains eight antennas.

2. Antennas above are the same type. Besides, only set 1 antenna was selected to perform the test and written in this report due to the highest gain.

For IEEE 802.11a/b/g/n/ac mode:

For 2.4GHz and 5GHz (3TX/3RX) function:

Chain 1, Chain 2 and Chain 3 can be used as transmitting/receiving antenna.

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

For 2.4GHz and 5GHz (4TX/4RX) function:

Chain 1, Chain 2, Chain 3 and Chain 4 can be used as transmitting/receiving antenna.

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

3. The EUT has two versions theirs measure information as below:

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. 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
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming function			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	11ac VHT20	MCS0/Nss2	6	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
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming function			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	11ac VHT20	MCS0/Nss2	6	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
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming function			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	11ac VHT20	MCS0/Nss2	6	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
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming function			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	11ac VHT20	MCS0/Nss2	6	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
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming function			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	11ac VHT20	MCS0/Nss2	6	1+2+3+4

Note: 1. There are two functions of EUT, one is beamforming function, and the other is non-beamforming function for 802.11n and 802.11ac. All test results were recorded in the report.

2. VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

3. The EUT is used for laying only.

The following test modes were performed for all tests:

For Conducted Emission test:

There are three level 6 Adapters (Adapter 4~6) of original report, after evaluating, Adapter 4 has been evaluated to be the worst case, thus measurement will follow this same test configuration.

Mode 1. EUT 4 (Version 2 - Rev 1.311) + Adapter 4 + SKU A

Mode 2. EUT 5 (Version 2 - Rev 1.411) + Adapter 4 + SKU A

Mode 2 is the worst case, so it was selected to record in this test report.

For Radiated Emission test below 1GHz:

There are three level 6 Adapters (Adapter 4~6) of original report, after evaluating, Adapter 6 has been evaluated to be the worst case, thus measurement will follow this same test configuration.

Mode 1. EUT 3 (Version 2 - Rev 1.33) + Adapter 6 + SKU B

Mode 2. EUT 4 (Version 2 - Rev 1.311) + Adapter 6 + SKU A

Mode 3. EUT 5 (Version 2 - Rev 1.411) + Adapter 6 + SKU A

Mode 2 is the worst case, so it was selected to record in this test report.

For Radiated Emission test above 1GHz:

Mode 1. CTX Mode

For Co-location MPE Test:

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA532637-11) is 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 and Class II Change

The model numbers in the following table are all refer to the identical product.

Model No.	Description
RT-AC5300	The models are identical except for the model numbers as marketing strategy.
RT-AC5300R	
RT-AC5300W	
RT-AC5300P	
RT-AC95U	
RT-AC96U	
GT-AC5300	
ROG Rapture GT-AC5300	

Note: Model: RT-AC5300 was selected as representative model for the test and its data was recorded in this report.

The EUT has five types, which are identical to each other in all aspects except for the following table:

EUT	LAN Port	EUT Version	Transformer	Resistance (Size)	Thickness of Heat sink (mm)	Pad (mm)	Fan
EUT 1	8	Version 1, 2 (Rev 1.30)	SKU A	0402/0201	4.2mm/2mm	1mm/5mm	V
EUT 2	4	Version 1,2 (Rev 1.30)	SKU A	0402/0201	4.2mm/2mm	1mm/5mm	V / X
		Version 2 (Rev 1.30, Rev 1.31)	SKU A ~ SKU C	0402/0201	4.2mm/2mm	1mm/5mm	V / X
EUT 3	4	Version 2 (Rev 1.33)	SKU B	0402/0201	2mm	5mm	X
EUT 4	8	Version 2 (Rev 1.311)	SKU A	0402/0201	2mm	5mm	X
EUT 5	8	Version 2 (Rev1.411)	SKU A	0402/0201	2mm	5mm	X

Note 1: All the specification of test configurations and test modes were based on customer's request.
Note 2: V : With X :Without

The transformer information as below:

Transformer	Brand	LAN	LAN	WAN
SKU A	Mingtek	HN8011VG	HN8011VG	HN18101CG
SKU B	Mingtek	HN8014VG	HN8015VG	HN18101CG
SKU C	FCE	NS777207	NS777208	NS771802

The Version information as below:

Version			Rev 1.31	Rev 1.33	Rev 1.311	Rev 1.411
RF	2G	Mainchip	BCM4366	BCM4366	BCM4366	BCM4366
		TX	PA SE2623L	PA SE2623L	PA SE2623L	PA SE2623L
		RX	RX FEM SKY85201	RX FEM SKY85201	RX FEM SKY85201	Discrete RX BFP842 + RTC6619
	5G Low/ High Band	Mainchip	BCM4366	BCM4366	BCM4366	BCM4366
		TX	PA RFPA5542	PA RFPA5542	PA RFPA5542	PA RFPA5542
		RX	RX FEM SKY85605	RX FEM SKY85605	RX FEM SKY85614	RX FEM SKY85614
BB	CPU		BCM4709C0	BCM4709C0	BCM4908	BCM4908
	DDR		512MBx1	512MBx1	512MBx2	512MBx1
	Gigabit switch		RTL8365MB (Reserved)	RTL8365MB (Reserved)	BCM53134S	BCM53134S
	LAN port		4 (Reserved extra 4)	4 (Reserved extra 4)	8	8
	Flash		128MB	128MB	256MB	256MB
	EMI Filter for low voltage		MURATA/ NFM18PS105R0J3 D	none	none	none
	Power IC		FR9618+ IT76630M	RT8290A	RT8290A+RT6220 +RT6217E	RT8290A+RT6220 +RT6217E
	USB		2.0x1/3.0x1	2.0x1/3.0x1	3.0x2	3.0x2

This product is an extension of original one reported under Sporton project number: FR532637-04AA

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Adding equipment names: ROG Rapture Tri-band Gaming Router and Extreme Gaming Router. 2. Adding model names: GT-AC5300 and ROG Rapture GT-AC5300.	1. It is not necessary to perform for all tests.
3. Adding two sets of antennas with lower gain. (P/N: C660-510391-A& C660-510392-A)	2. After evaluating, it is not necessary to verify.
4. Adding three versions of the device: Rev 1.33 & Rev 1.311 & Rev 1.411.	3. AC Power Line Conducted Emissions for versions Rev 1.311& Rev 1.411 4. Radiated Emissions below 1GHz for versions Rev 1.33 & Rev 1.311 & Rev 1.411.
5. Consider the component with precision and make sure each device in mass production to comply with regulation rule. Test it by mass product, not golden sample for version 2 4TX4RX.	5. Maximum Conducted Output Power 6. Power Spectral Density 7. 6dB Spectrum Bandwidth 8. Radiated Emissions above 1GHz 9. Band Edge and Fundamental Emissions 10. Maximum Permissible Exposure After evaluating, these test items should be tested and recorded in this report.

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB

For Radiated Emissions below 1GHz

Support Unit	Brand	Model	FCC ID
NB*6	DELL	E4300	DoC
Flash disk*2	Silicon Power	I-Series	DoC

For Radiated Emissions above 1GHz

For Non-beamforming function

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

For Beamforming function

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E4300	DoC
Wireless ac AP (Device)	ASUS	RT-AC88U	MSQ-RTGW00

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB*6	DELL	E6430	DoC
Flash disk3.0*2	Transcend	JetFlash-700	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.

For Non-beamforming function:

Test Software Version	MTool_2.0.2.7					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11b	95	96	96	-	-	-
802.11g	86	94	87	-	-	-
802.11ac MCS0/Nss1 VHT20	81	97	82	-	-	-
802.11ac MCS0/Nss1 VHT40	-	-	-	59	77	65

For Beamforming function:

Test Software Version	MTool_2.0.2.7					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11ac MCS0/Nss1 VHT20	73	86	76	-	-	-
802.11ac MCS0/Nss1 VHT40	-	-	-	57	68	63
802.11ac MCS0/Nss2 VHT20	-	96	-	-	-	-

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 XP 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 DOS.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by Wireless ac AP and transmit duty cycle no less 98%

3.11. Duty Cycle

For Non-beamforming function:

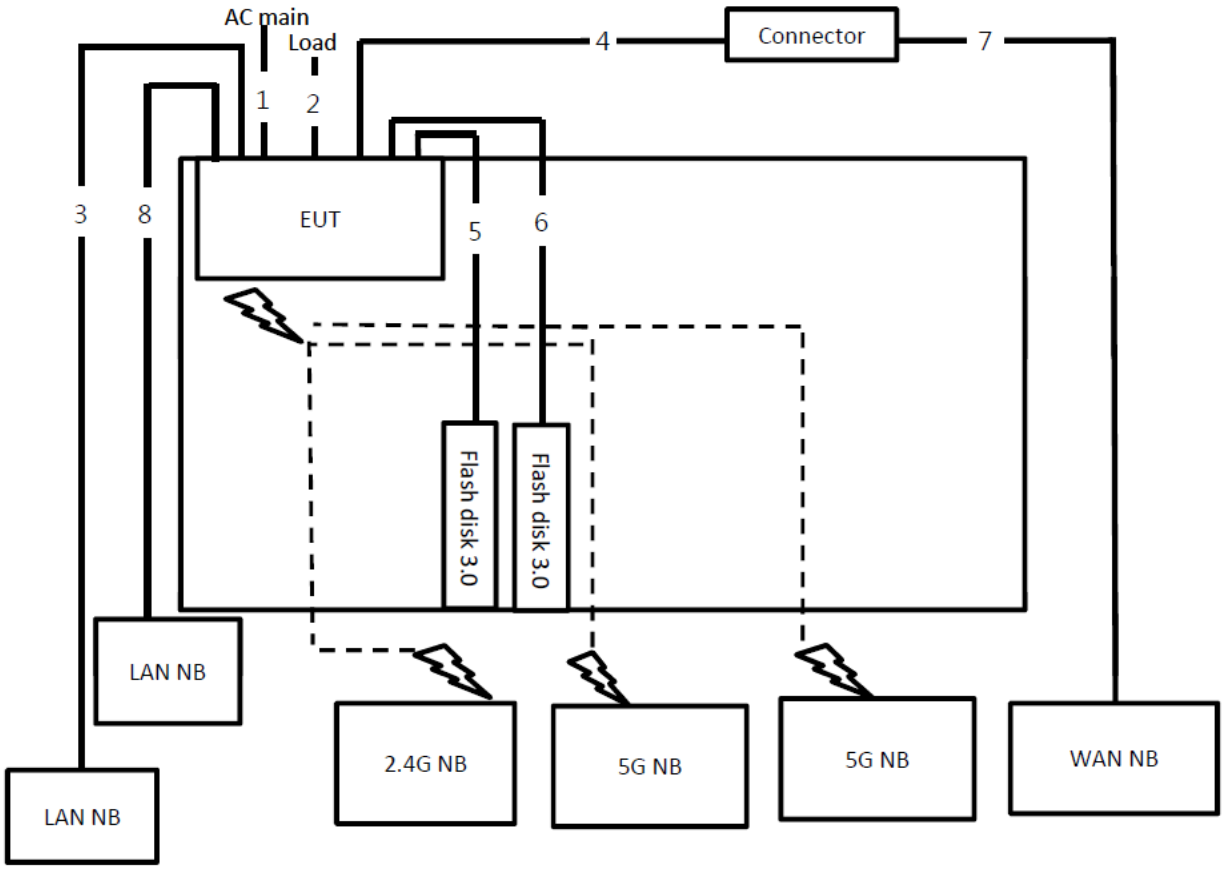
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11b	1.000	1.000	100.00%	0.00	0.01
802.11g	2.040	2.080	98.08%	0.08	0.01
802.11ac MCS0/Nss1 VHT20	1.895	1.955	96.93%	0.14	0.53
802.11ac MCS0/Nss1 VHT40	0.930	0.973	95.58%	0.20	1.08

For Beamforming function:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	3.808	4.102	92.83%	0.32	0.26
802.11ac MCS0/Nss1 VHT40	2.758	3.094	89.14%	0.50	0.36
802.11ac MCS0/Nss2 VHT20	3.808	4.102	92.83%	0.32	0.26

3.12. Test Configurations

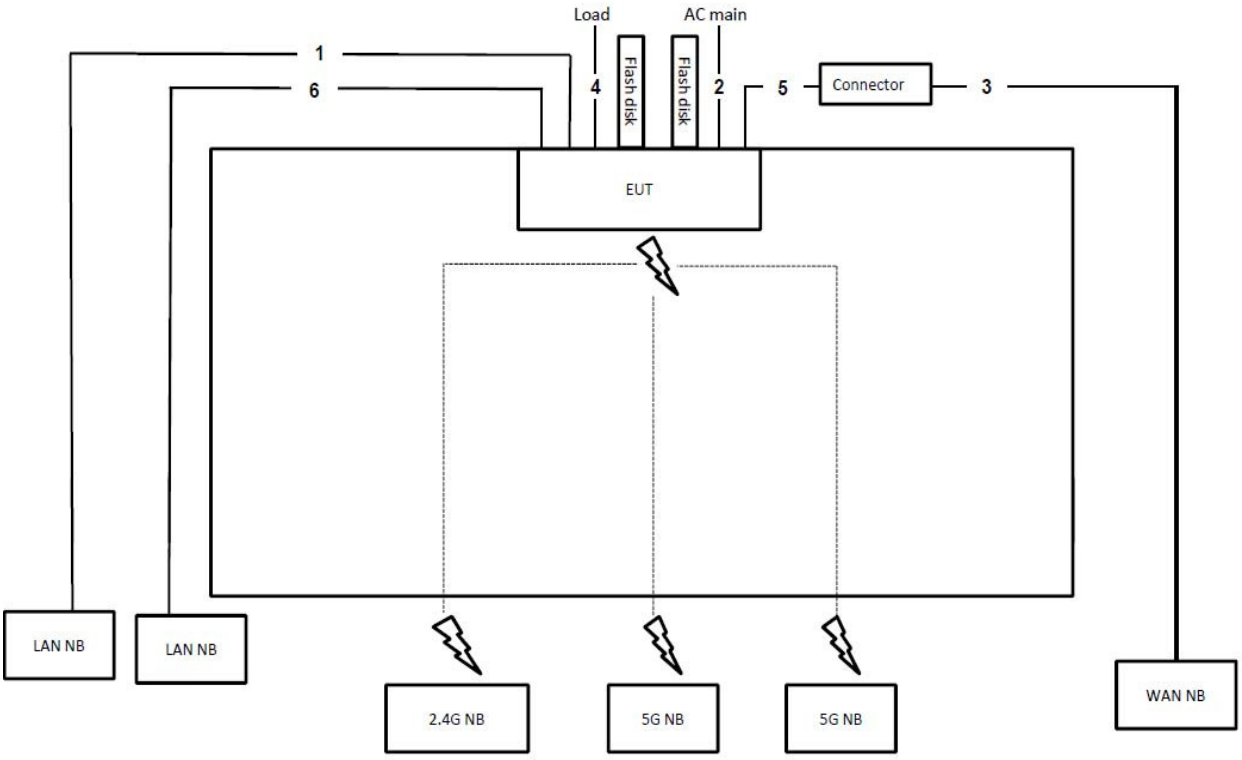
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2.3m
2	RJ-45 cable*6	No	1m
3	RJ-45 cable	No	10m
4	RJ-45 cable	Yes	1.5m
5	USB cable	Yes	1.5m
6	USB cable	Yes	1.5m
7	RJ-45 cable	Yes	10m
8	RJ-45 cable	No	10m

3.12.2. Radiation Emissions Test Configuration

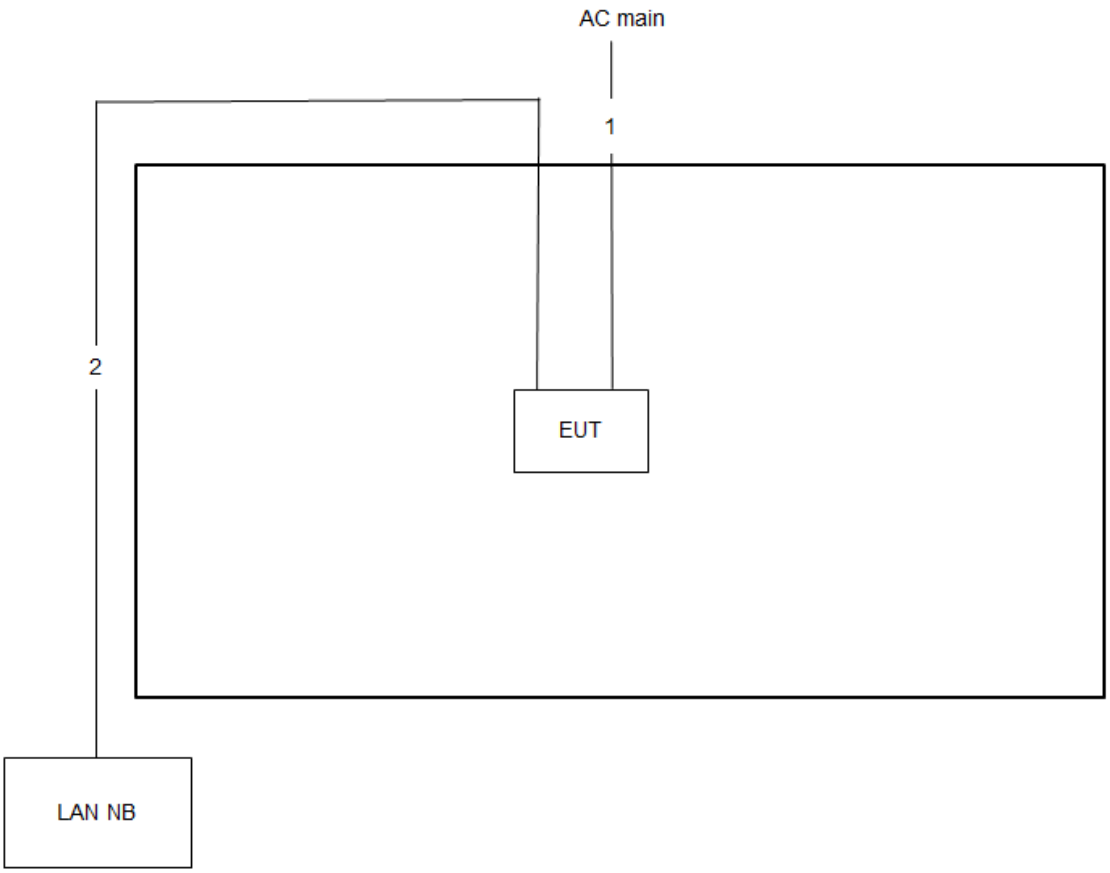
Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	2.3m
3	RJ-45 cable	No	10m
4	RJ-45 cable*6	No	1.5m
5	RJ-45 cable	No	1.5m
6	RJ-45 cable	No	10m

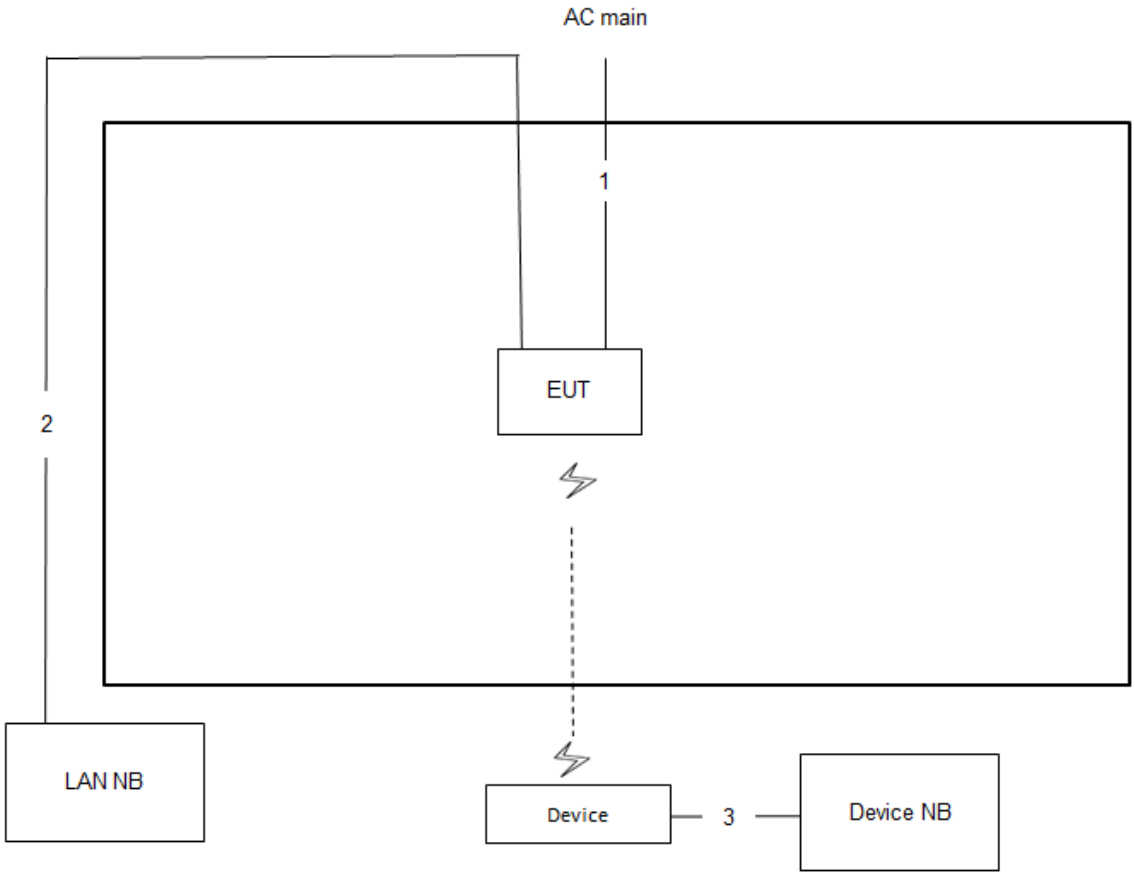
Test Configuration: above 1GHz

For Non-beamforming function:



Item	Connection	Shielded	Length
1	Power cable	No	2.3m
2	RJ-45 cable	No	10m

For Beamforming function:



Item	Connection	Shielded	Length
1	Power cable	No	2.3m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	5m

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

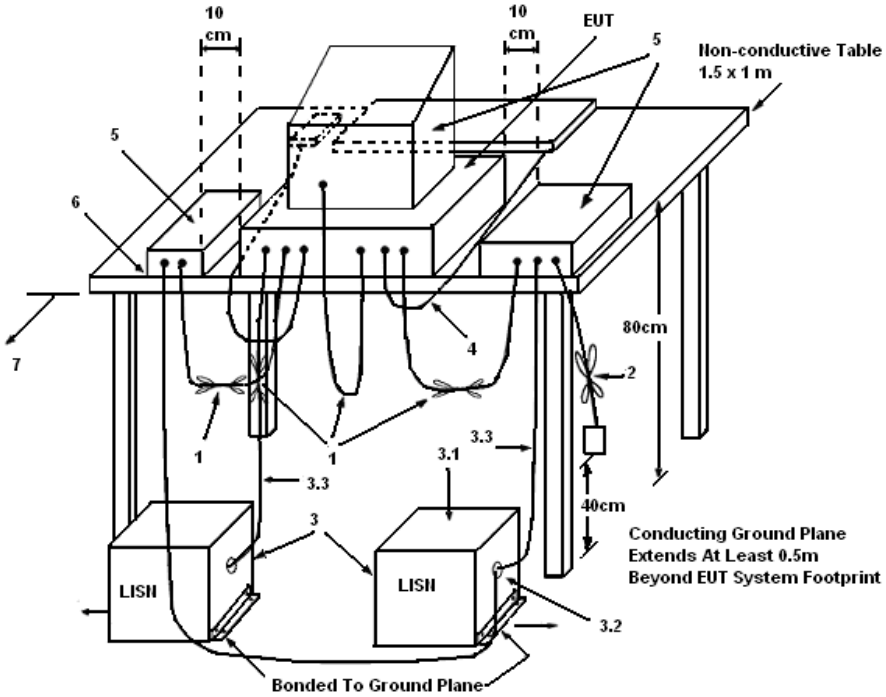
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

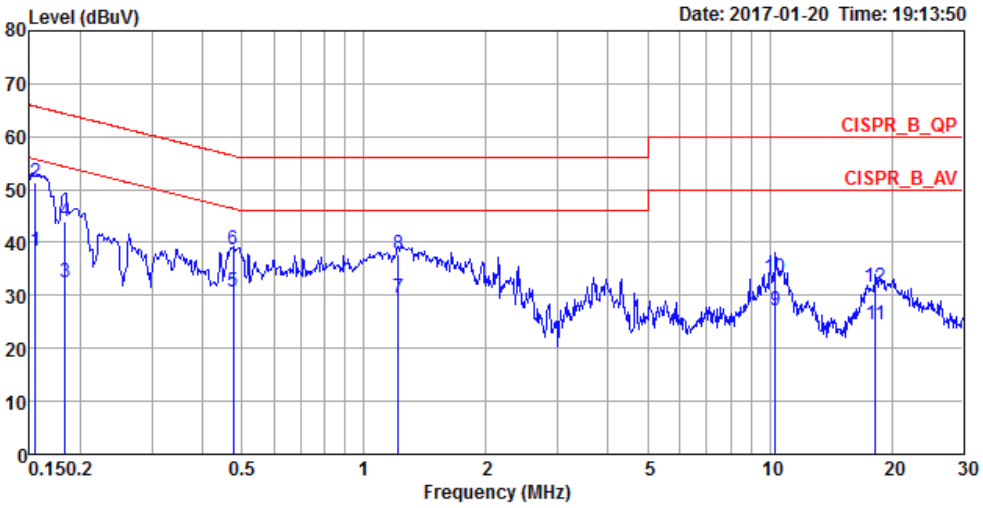
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

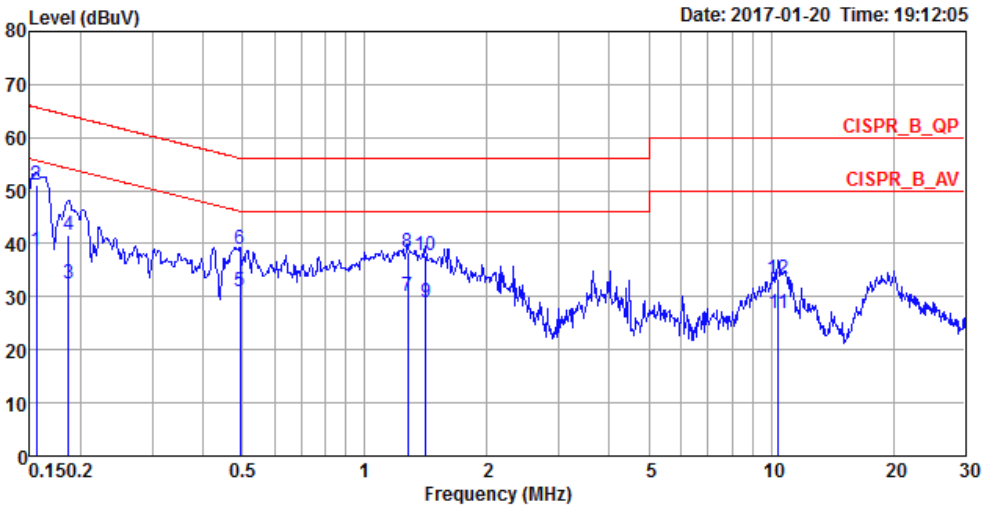
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	55%
Test Engineer	Deven Huang	Phase	Line
Configuration	Normal Link	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1548	38.47	-17.27	55.74	28.48	9.95	0.04	Average	LINE
2	0.1548	51.35	-14.39	65.74	41.36	9.95	0.04	QP	LINE
3	0.1835	32.42	-21.91	54.33	22.43	9.94	0.05	Average	LINE
4	0.1835	44.02	-20.31	64.33	34.03	9.94	0.05	QP	LINE
5	0.4761	30.76	-15.65	46.41	20.82	9.90	0.04	Average	LINE
6	0.4761	38.81	-17.60	56.41	28.87	9.90	0.04	QP	LINE
7	1.2162	29.46	-16.54	46.00	19.42	9.98	0.06	Average	LINE
8	1.2162	37.87	-18.13	56.00	27.83	9.98	0.06	QP	LINE
9	10.3422	27.05	-22.95	50.00	16.79	10.07	0.19	Average	LINE
10	10.3422	33.25	-26.75	60.00	22.99	10.07	0.19	QP	LINE
11	18.2316	24.39	-25.61	50.00	13.95	10.20	0.24	Average	LINE
12	18.2316	31.57	-28.43	60.00	21.13	10.20	0.24	QP	LINE

Temperature	23°C	Humidity	55%
Test Engineer	Deven Huang	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1557	38.67	-17.02	55.69	28.69	9.94	0.04	Average	NEUTRAL
2	0.1557	51.04	-14.65	65.69	41.06	9.94	0.04	QP	NEUTRAL
3	0.1864	32.50	-21.70	54.20	22.48	9.97	0.05	Average	NEUTRAL
4	0.1864	41.59	-22.61	64.20	31.57	9.97	0.05	QP	NEUTRAL
5	0.4941	30.86	-15.24	46.10	20.85	9.97	0.04	Average	NEUTRAL
6	0.4941	39.04	-17.06	56.10	29.03	9.97	0.04	QP	NEUTRAL
7	1.2756	30.12	-15.88	46.00	20.07	9.98	0.07	Average	NEUTRAL
8	1.2756	38.40	-17.60	56.00	28.35	9.98	0.07	QP	NEUTRAL
9	1.4107	28.95	-17.05	46.00	18.90	9.98	0.07	Average	NEUTRAL
10	1.4107	37.82	-18.18	56.00	27.77	9.98	0.07	QP	NEUTRAL
11	10.3972	26.76	-23.24	50.00	16.40	10.17	0.19	Average	NEUTRAL
12	10.3972	33.48	-26.52	60.00	23.12	10.17	0.19	QP	NEUTRAL

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

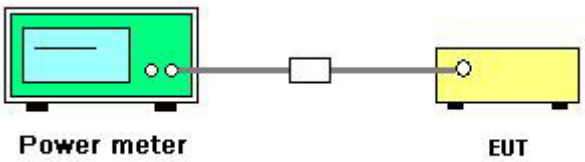
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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	23°C	Humidity	45%
Test Engineer	Wen Chao	Test Date	Apr. 08, 2016~Apr. 09, 2016

For 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	23.83	23.85	23.96	23.77	29.87	30.00	Complies
	2437 MHz	23.88	23.59	23.93	23.85	29.84	30.00	Complies
	2462 MHz	24.01	23.72	24.07	24.01	29.98	30.00	Complies
802.11g	2412 MHz	21.01	20.95	21.16	20.72	26.98	30.00	Complies
	2437 MHz	23.74	23.57	23.72	23.77	29.72	30.00	Complies
	2462 MHz	21.14	21.05	21.49	21.03	27.20	30.00	Complies
802.11ac MCS0/Nss1 VHT20	2412 MHz	20.15	19.79	20.05	20.04	26.03	30.00	Complies
	2437 MHz	24.09	23.63	23.77	23.79	29.84	30.00	Complies
	2462 MHz	19.85	19.63	20.06	19.35	25.75	30.00	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	14.74	14.76	15.12	14.96	20.92	30.00	Complies
	2437 MHz	18.82	18.65	19.09	18.97	24.91	30.00	Complies
	2452 MHz	16.17	16.03	16.43	16.56	22.32	30.00	Complies

For Beamforming function:

For 2.4GHz Band

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	2412 MHz	18.26	18.31	18.32	18.04	24.25	27.66	Complies
	2437 MHz	21.66	21.43	21.54	21.26	27.50	27.66	Complies
	2462 MHz	19.13	18.98	19.14	19.01	25.09	27.66	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	15.15	14.43	14.72	14.33	20.69	27.66	Complies
	2437 MHz	17.01	17.03	17.27	17.06	23.11	27.66	Complies
	2452 MHz	15.88	15.63	15.62	15.56	21.69	27.66	Complies
802.11ac MCS0/Nss2 VHT20	2437 MHz	24.02	23.88	24.13	23.59	29.93	30.00	Complies

Note: 1. 802.11ac MCS0/Nss1 VHT20/40: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.34dBi >6dBi, so limit=30 – (8.34 – 6)=27.66dBm.

2. 802.11ac MCS0/Nss2 VHT20: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.33dBi <6dBi, so the limit doesn't reduce.

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

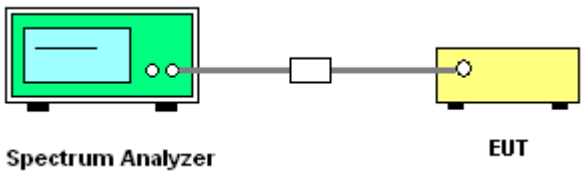
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	23°C	Humidity	45%
Test Engineer	Wen Chao		

For 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	-9.91	-10.18	-9.27	-10.24	-3.86	5.66	Complies
	2437 MHz	-9.81	-10.16	-9.36	-9.82	-3.76	5.66	Complies
	2462 MHz	-9.80	-9.79	-9.38	-9.90	-3.69	5.66	Complies
802.11g	2412 MHz	-3.92	-4.25	-3.33	-4.59	2.02	5.66	Complies
	2437 MHz	-2.25	-2.13	-2.30	-2.03	3.84	5.66	Complies
	2462 MHz	-3.21	-3.89	-4.09	-3.45	2.37	5.66	Complies
802.11n MCS0/Nss1 HT20	2412 MHz	-4.98	-5.86	-5.94	-5.88	0.37	5.66	Complies
	2437 MHz	-1.21	-2.13	-0.40	-1.41	4.78	5.66	Complies
	2462 MHz	-5.64	-4.97	-4.21	-4.84	1.14	5.66	Complies
802.11n MCS0/Nss1 HT40	2422 MHz	-14.33	-14.61	-13.43	-13.82	-8.00	5.66	Complies
	2437 MHz	-9.70	-10.45	-10.50	-10.04	-4.14	5.66	Complies
	2452 MHz	-14.62	-13.46	-12.16	-13.34	-7.29	5.66	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.34dBi >6dBi, so limit=8 – (8.34 – 6)=5.66dBm/3kHz.

For Beamforming function:

Mode	Frequency	Power Density (dBm/3kHz)					Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	2412 MHz	-4.69	-6.12	-5.66	-7.28	0.18	5.66	Complies
	2437 MHz	-3.43	-5.32	-4.51	-4.73	1.58	5.66	Complies
	2462 MHz	-7.31	-7.46	-6.94	-6.08	-0.89	5.66	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	-15.88	-16.15	-15.18	-14.18	-9.26	5.66	Complies
	2437 MHz	-12.40	-12.86	-13.14	-14.40	-7.12	5.66	Complies
	2452 MHz	-13.94	-14.61	-13.75	-14.63	-8.19	5.66	Complies
802.11ac MCS0/Nss2 VHT20	2437 MHz	-11.67	-11.17	-6.45	-6.41	-2.22	8.00	Complies

Note:

1. 802.11ac MCS0/Nss1 VHT20/40: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.34dBi >6dBi,

   so limit=8 – (8.34 – 6)=5.66dBm/3kHz.

2. 802.11ac MCS0/Nss2 VHT20: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.33dBi <6dBi,

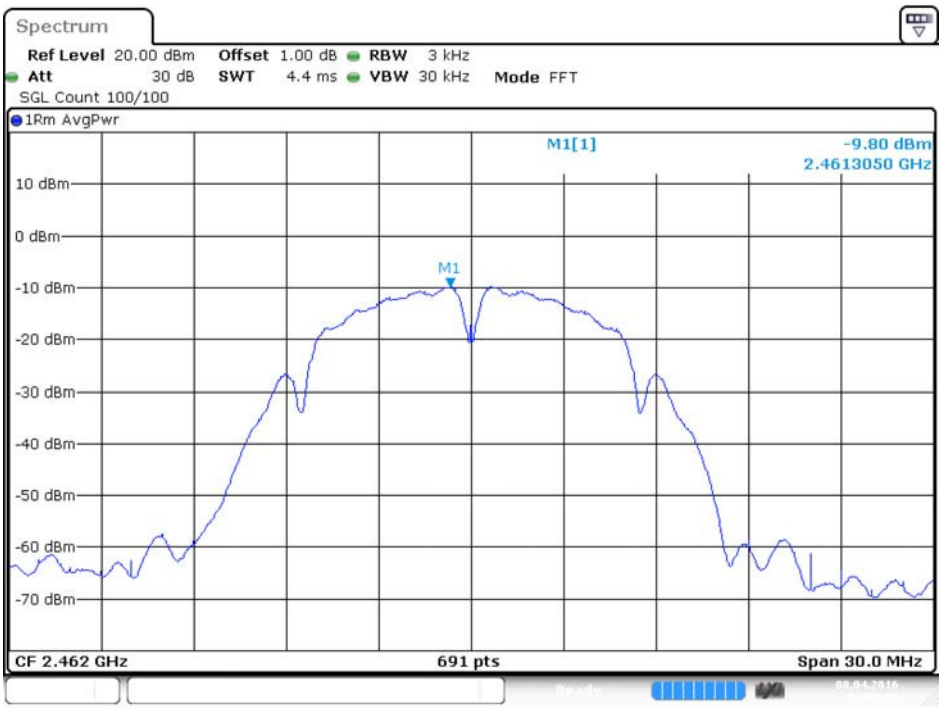
   so the limit doesn't reduce.

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

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

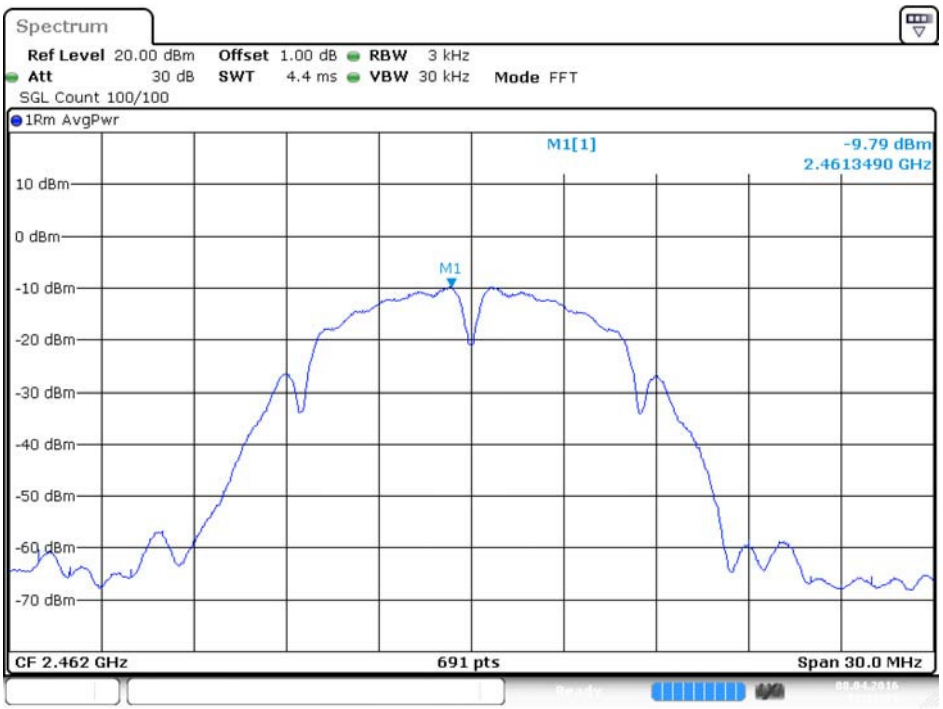
For Non-beamforming function:

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



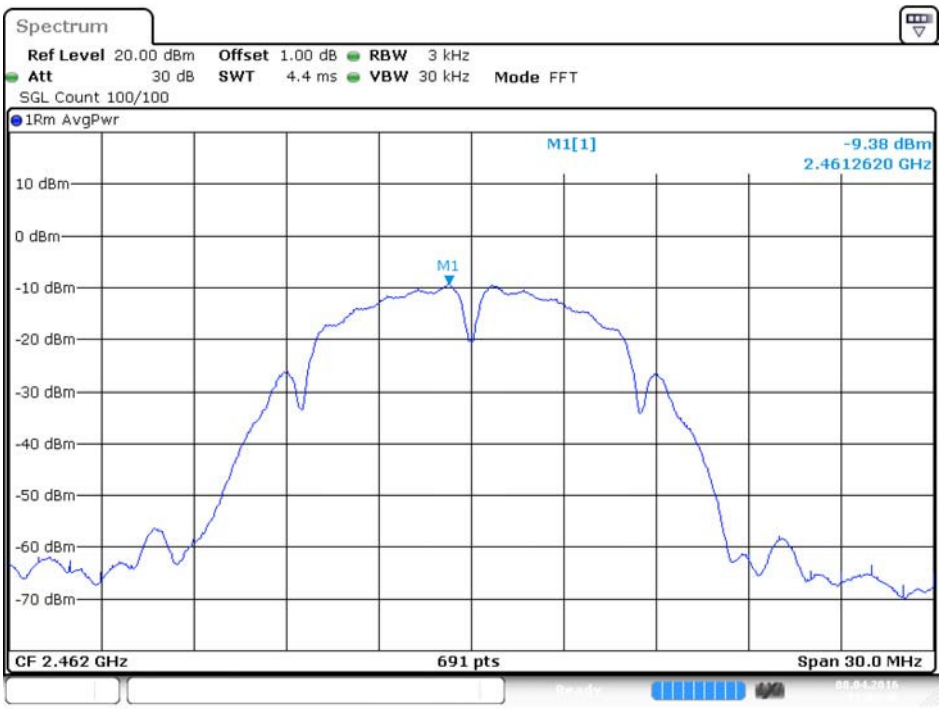
Date: 8.APR.2016 11:02:29

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



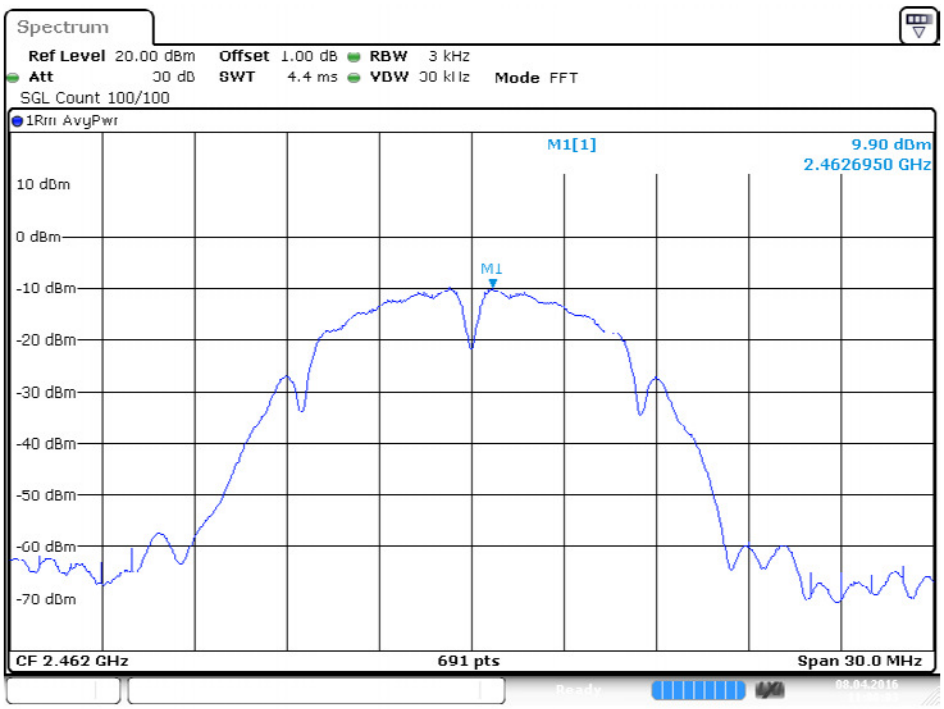
Date: 8.APR.2016 11:01:15

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



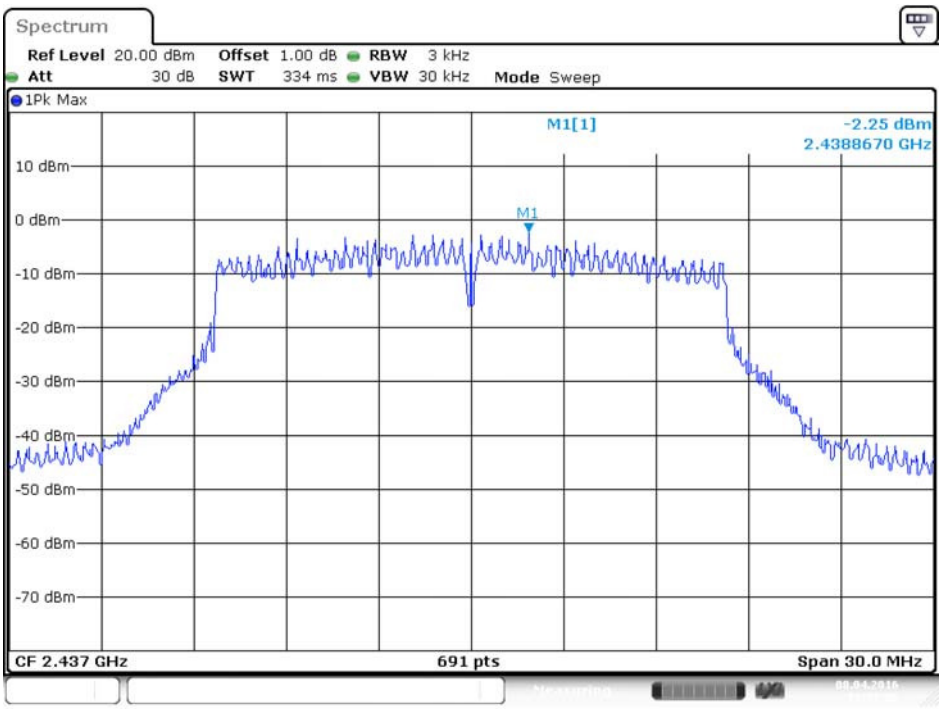
Date: 8.APR.2016 11:00:46

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



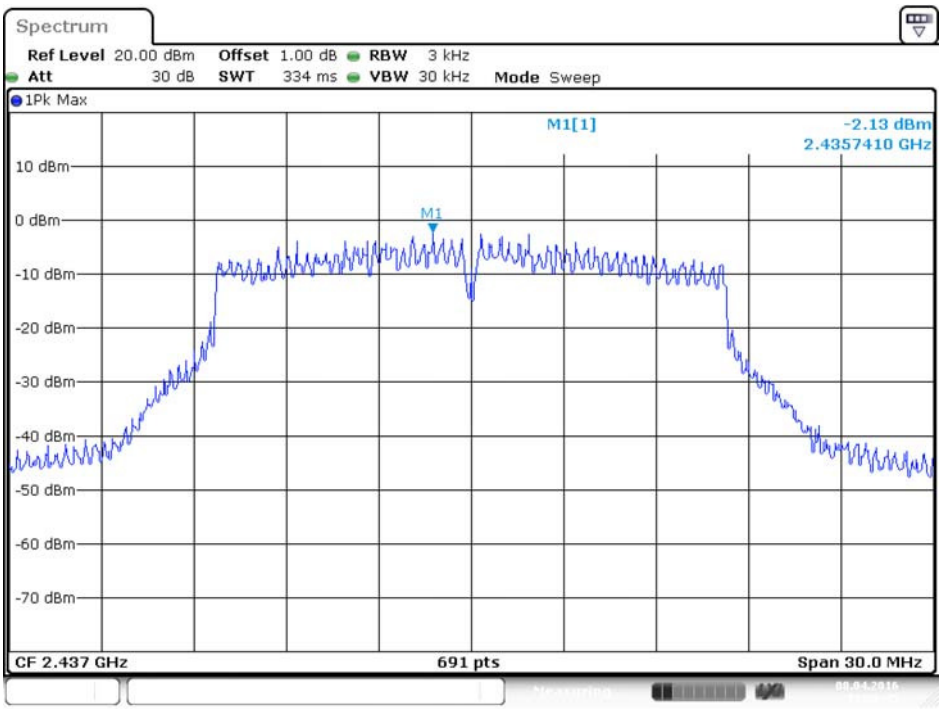
Date: 8.APR.2016 11:00:03

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



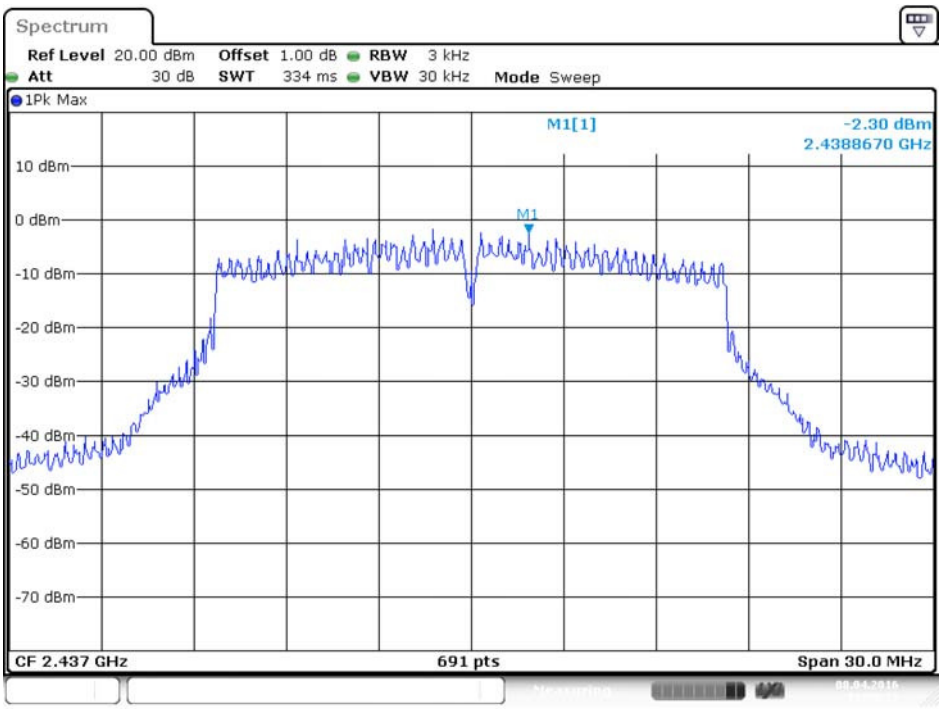
Date: 8.APR.2016 11:57:25

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



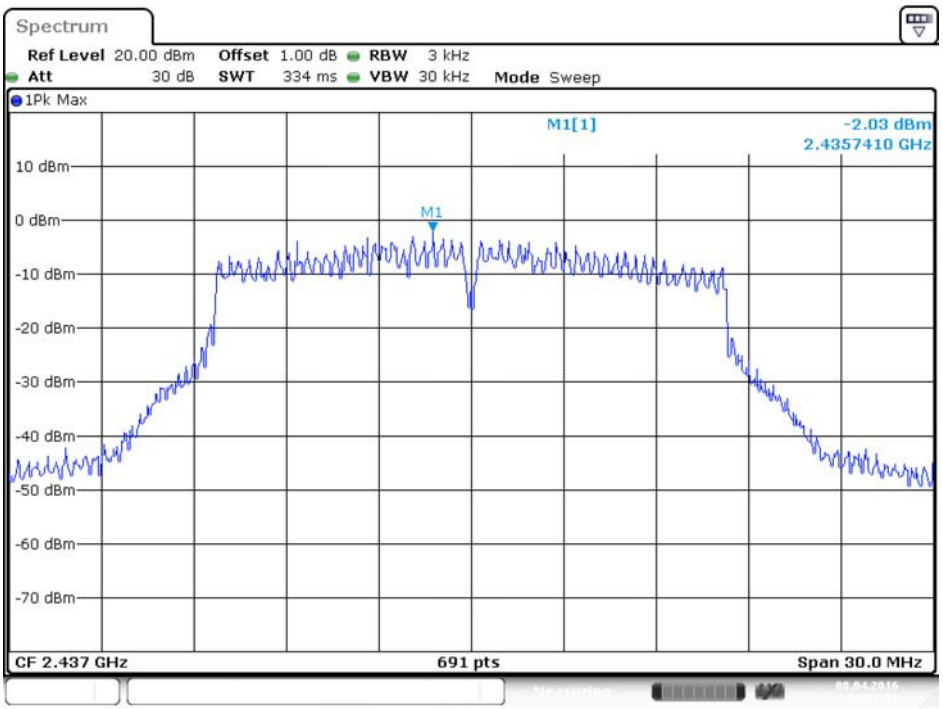
Date: 8.APR.2016 11:56:45

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



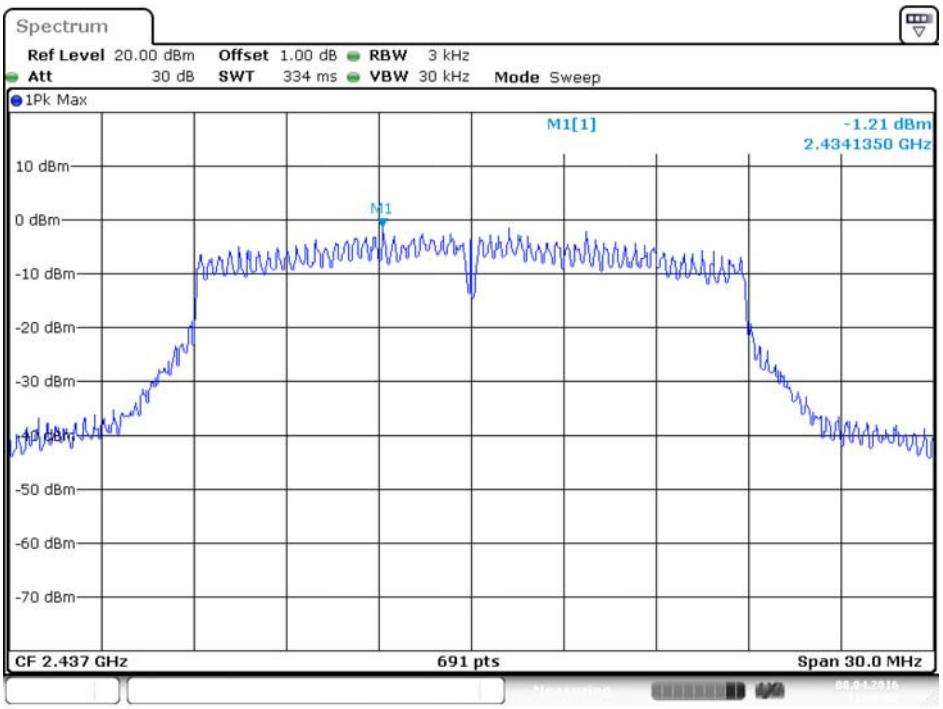
Date: 8.APR.2016 11:55:27

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



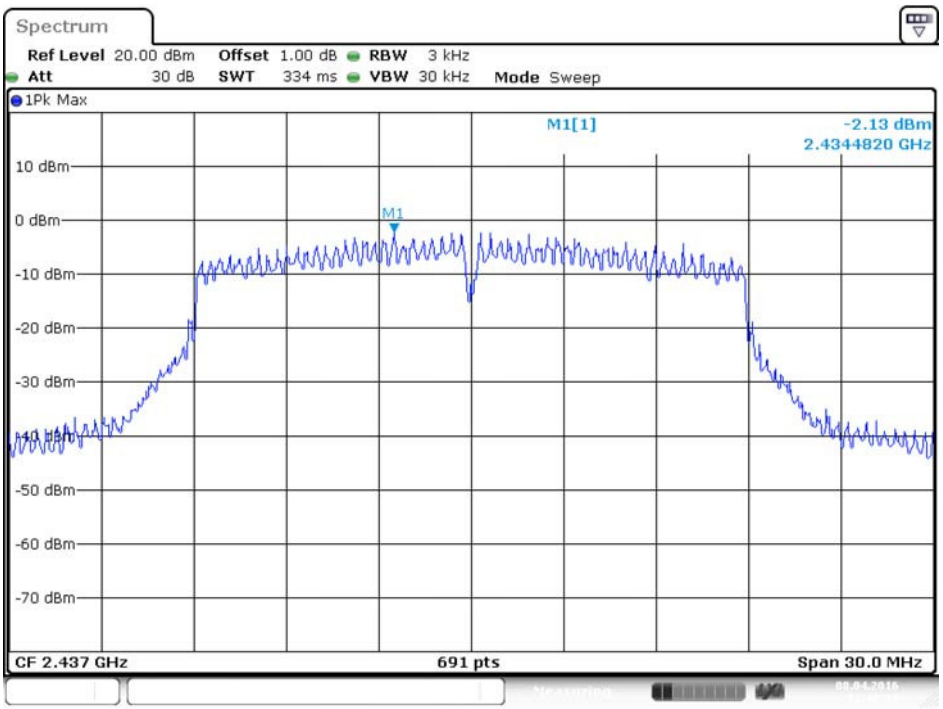
Date: 8.APR.2016 11:52:28

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1



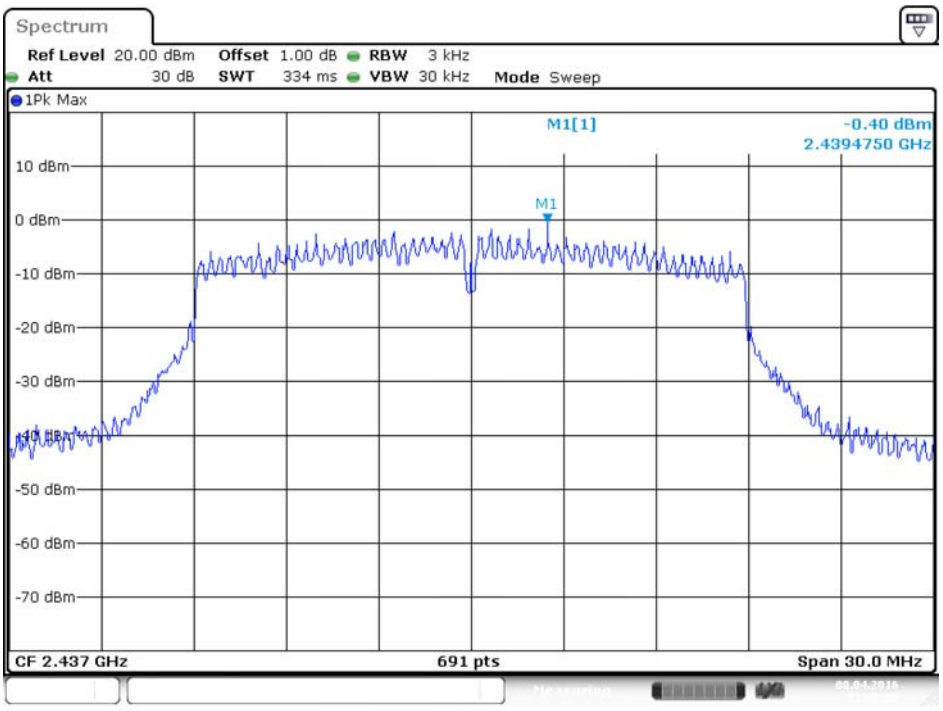
Date: 8.APR.2016 12:46:07

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 2



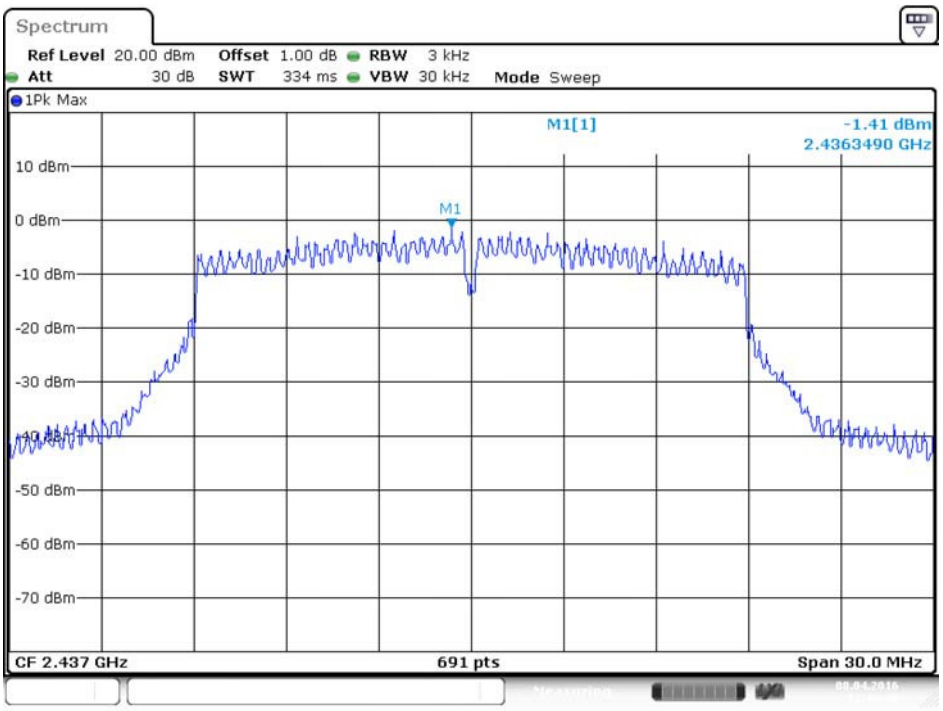
Date: 8.APR.2016 12:47:18

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 3



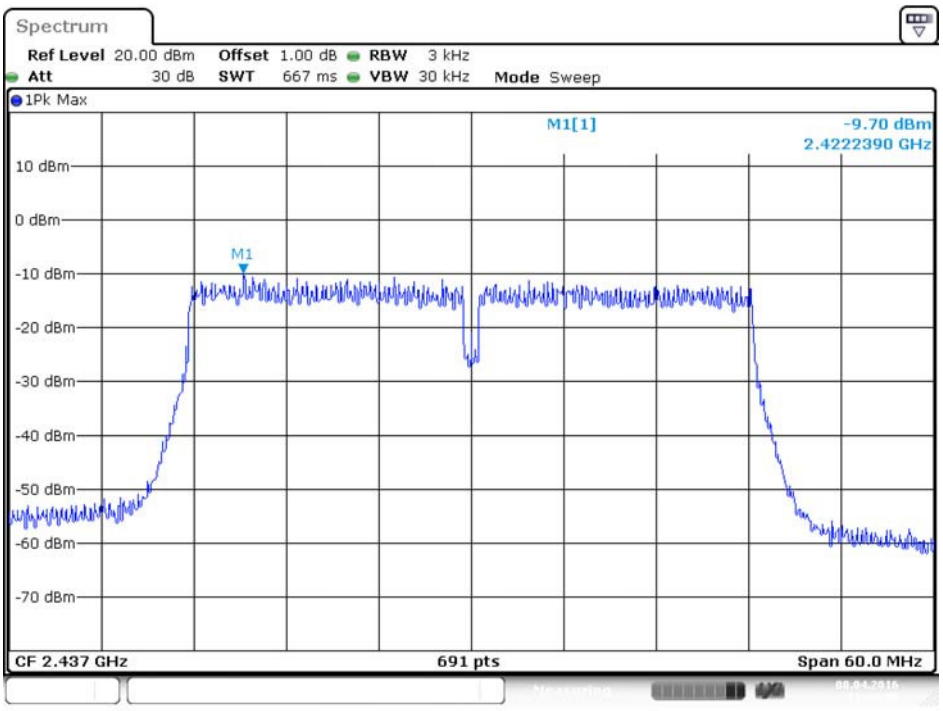
Date: 8.APR.2016 12:48:20

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 4



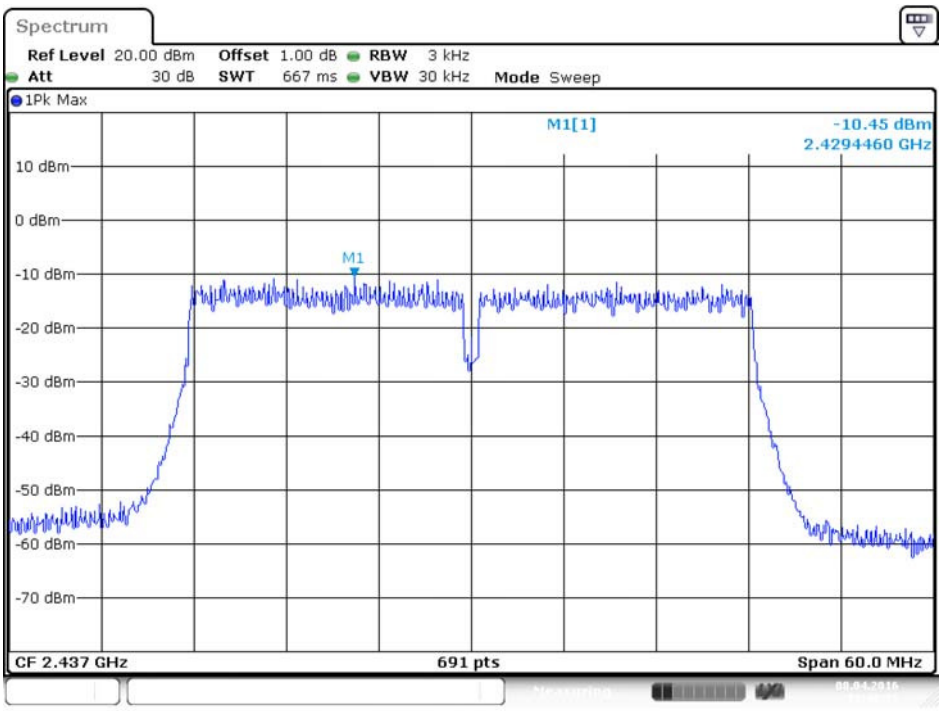
Date: 8.APR.2016 12:49:40

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1



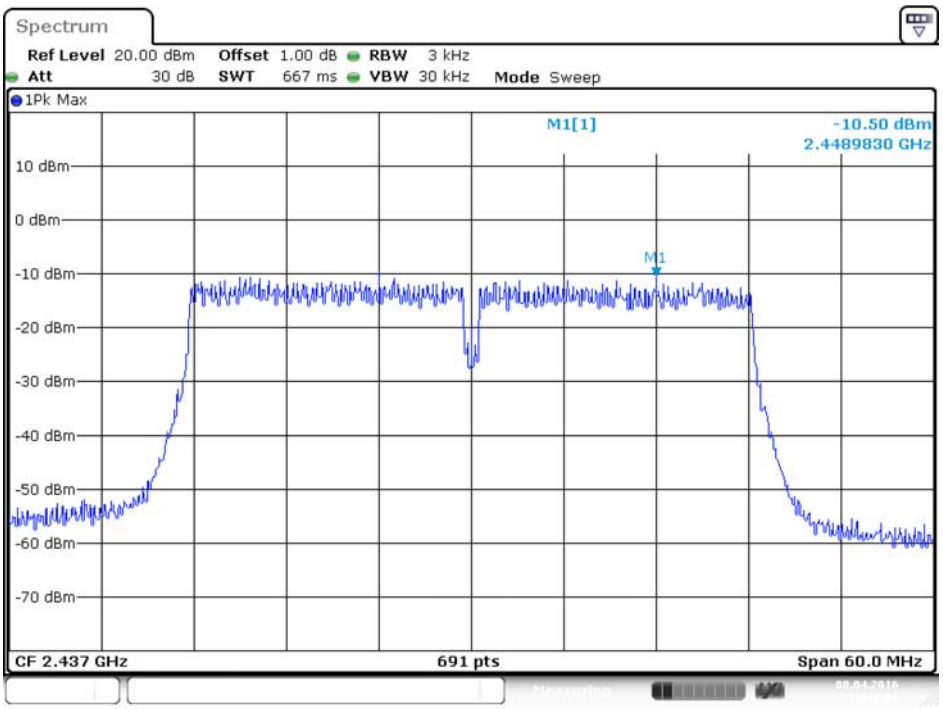
Date: 8.APR.2016 13:43:55

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 2



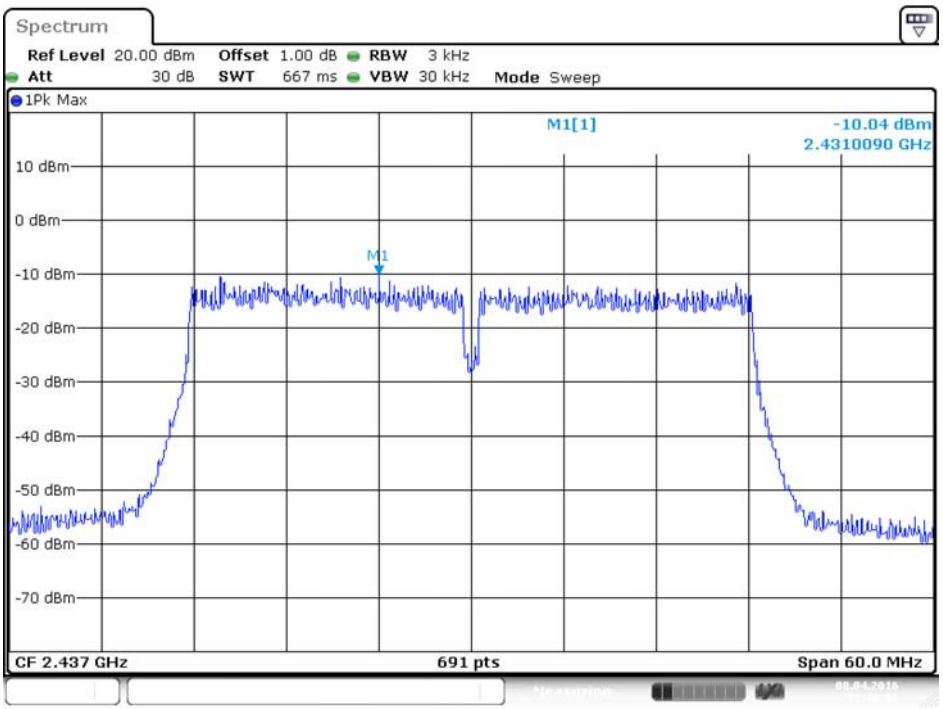
Date: 8.APR.2016 13:42:51

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 3



Date: 8.APR.2016 13:41:01

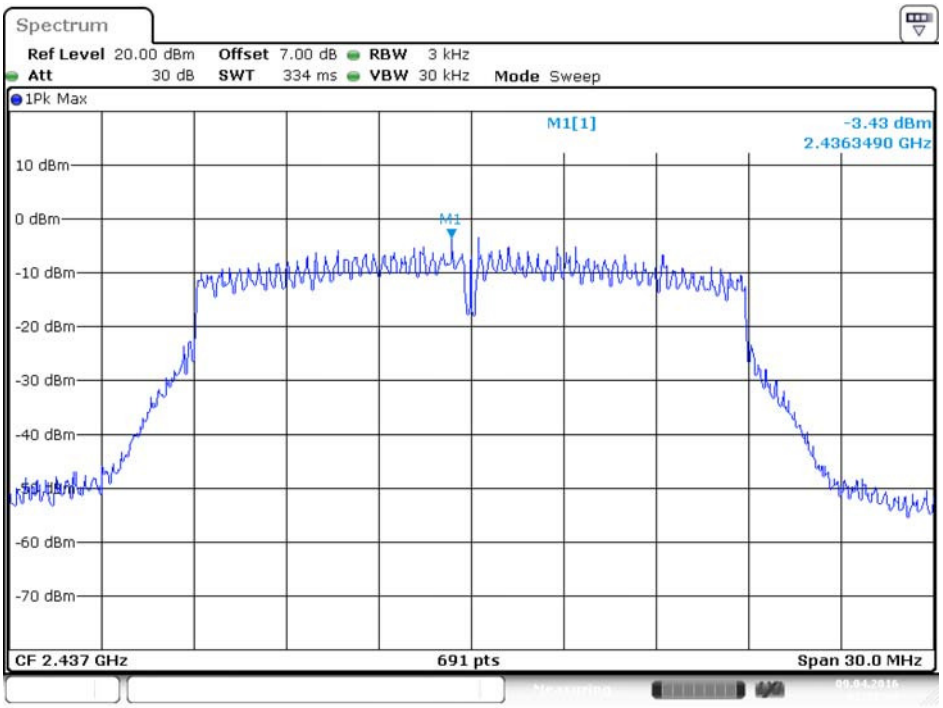
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 4



Date: 8.APR.2016 13:42:01

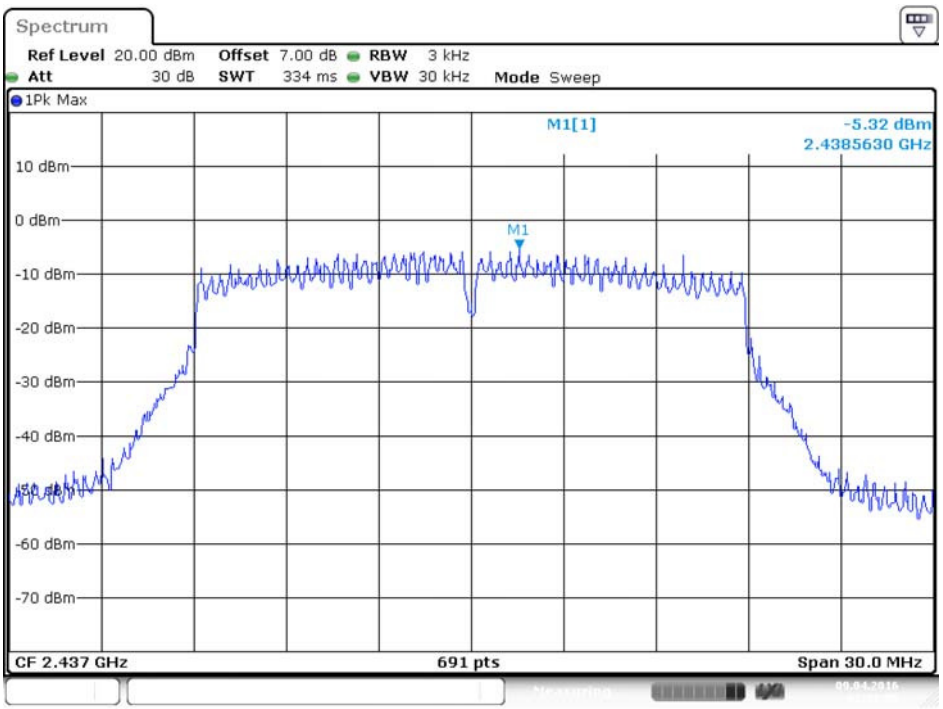
For Beamforming function:

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1



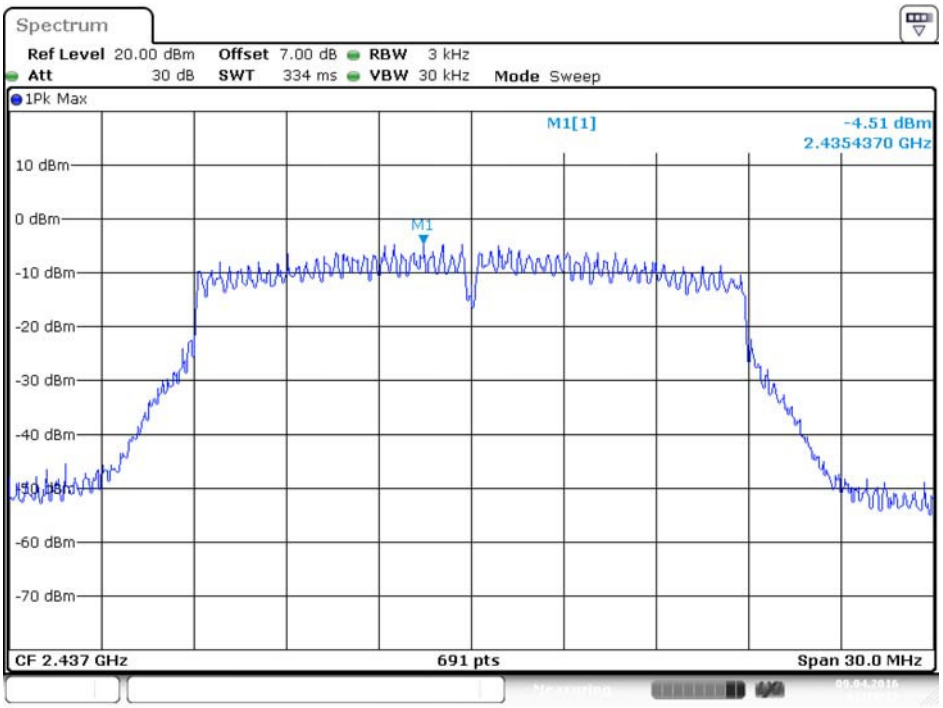
Date: 9.APR.2016 02:11:35

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 2



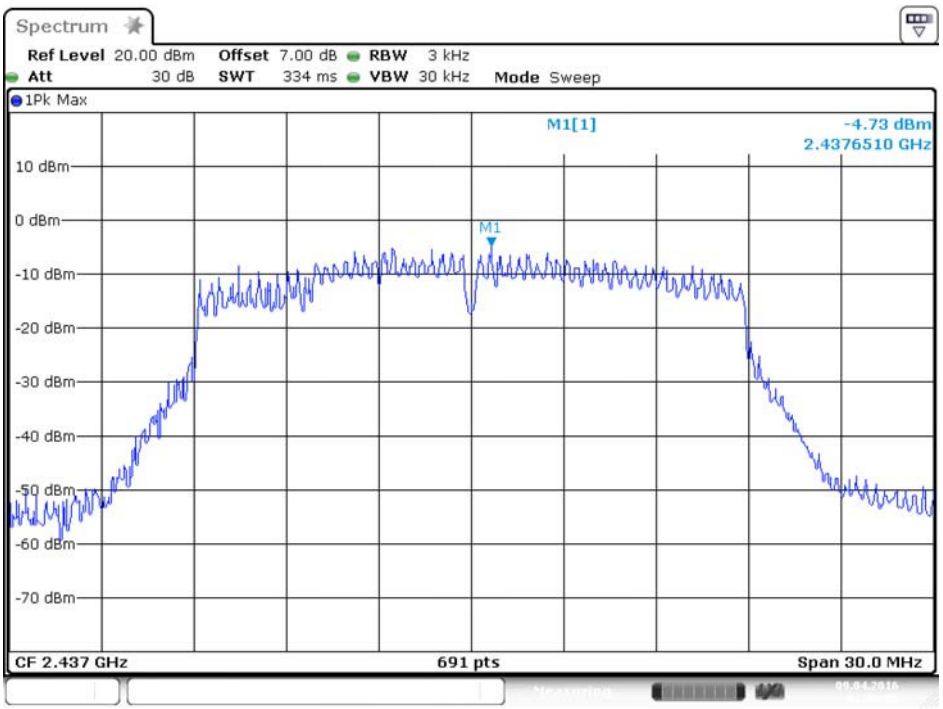
Date: 9.APR.2016 02:11:05

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 3



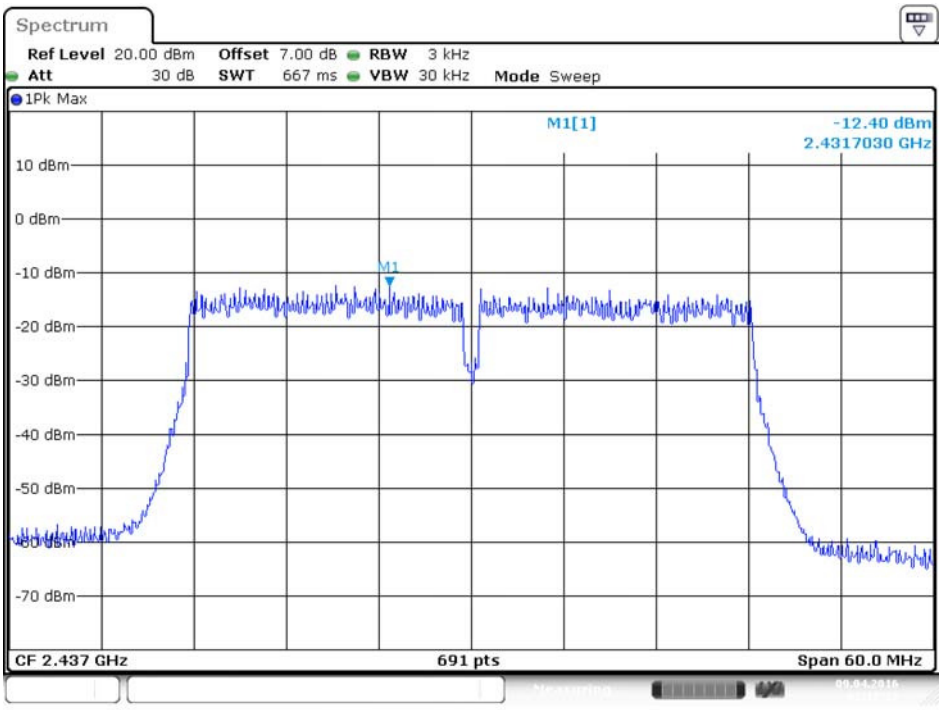
Date: 9.APR.2016 02:10:32

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 4



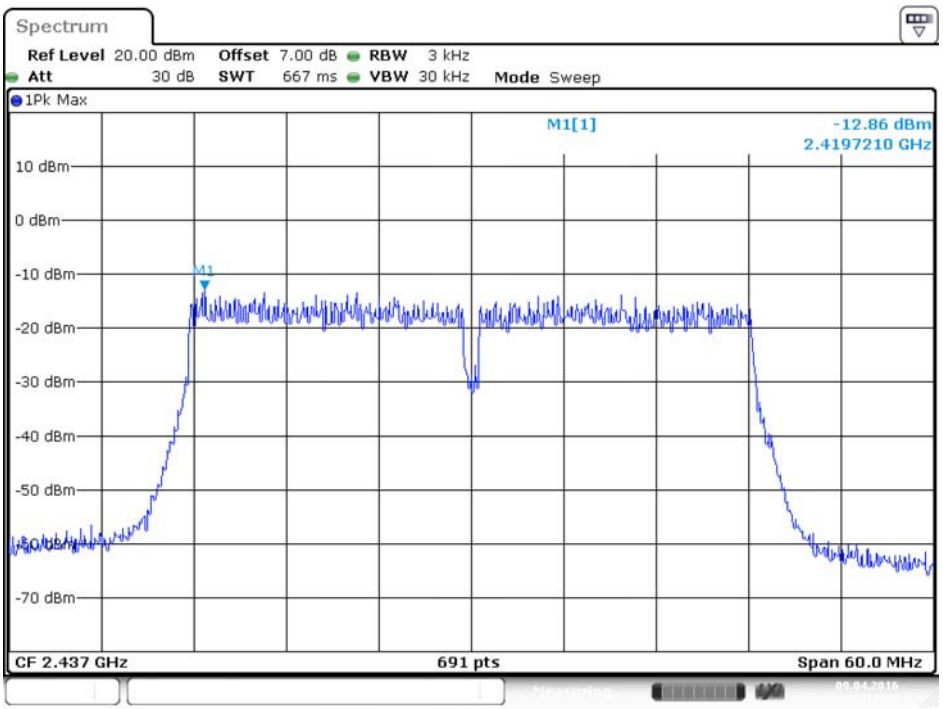
Date: 9.APR.2016 02:09:55

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1



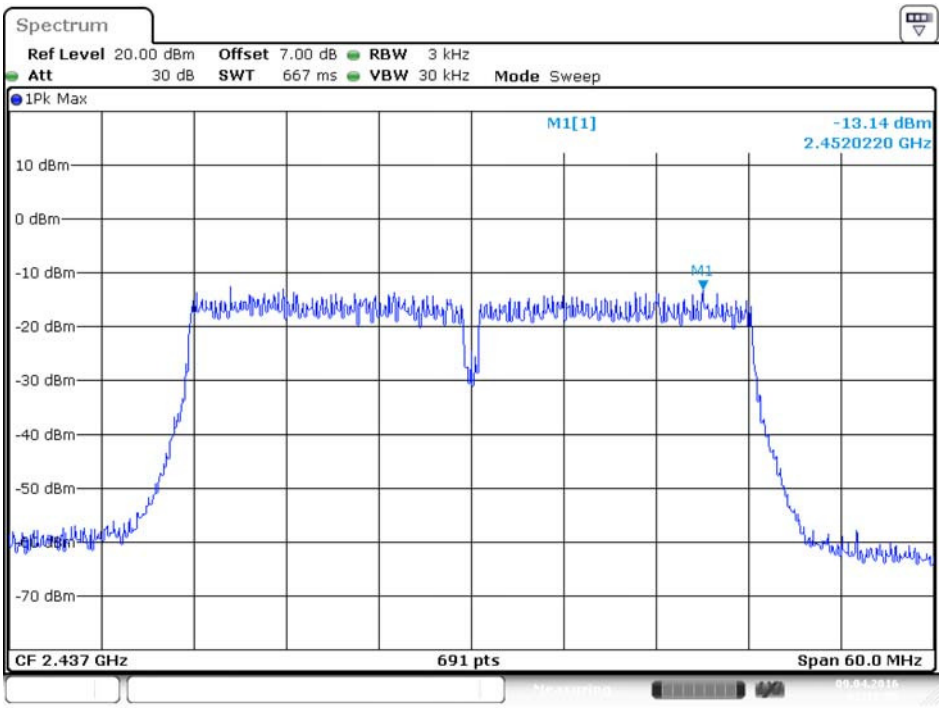
Date: 9.APR.2016 02:17:18

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 2



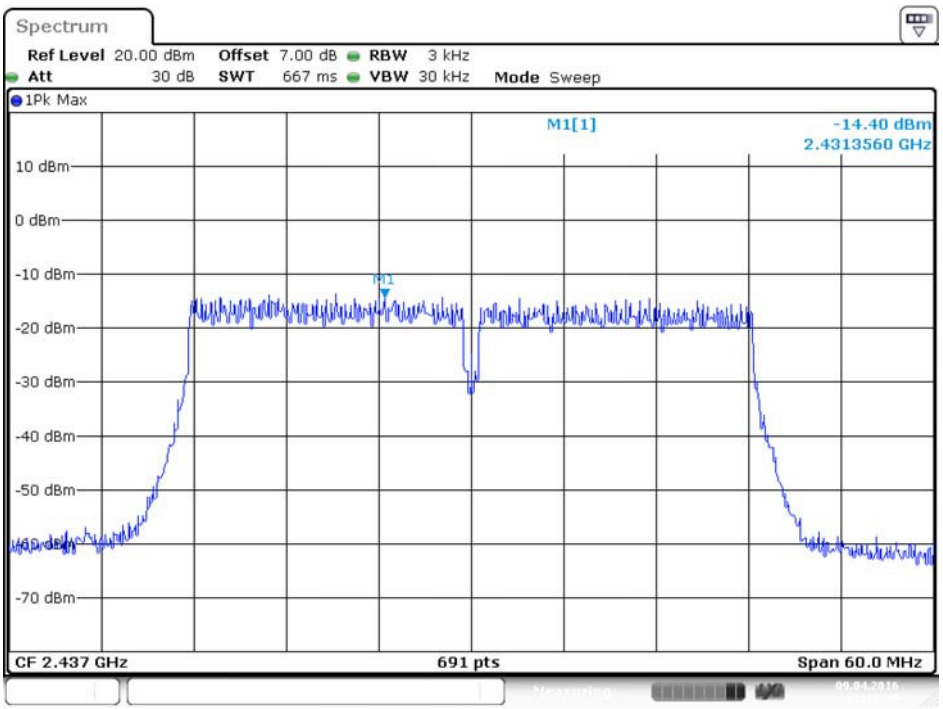
Date: 9.APR.2016 02:17:41

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 3



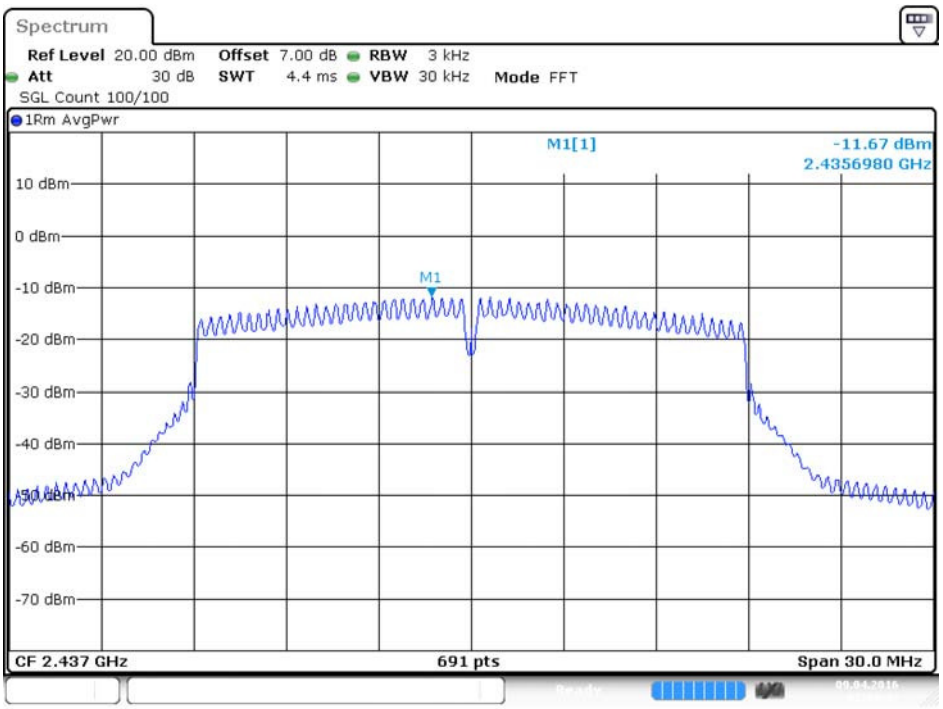
Date: 9.APR.2016 02:18:05

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 4



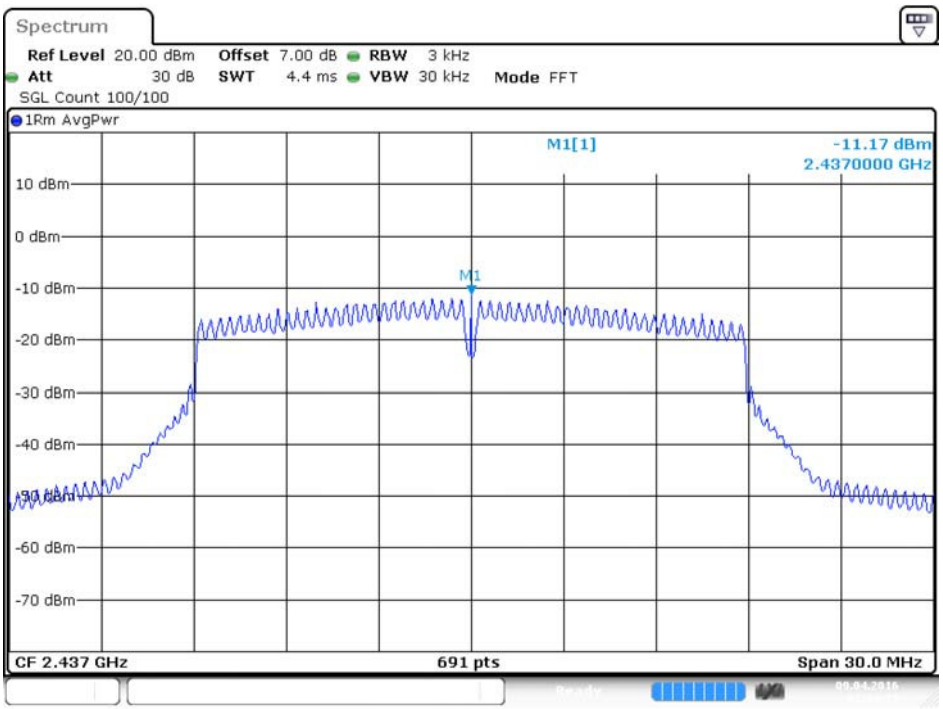
Date: 9.APR.2016 02:18:30

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / 2437 MHz / Chain 1



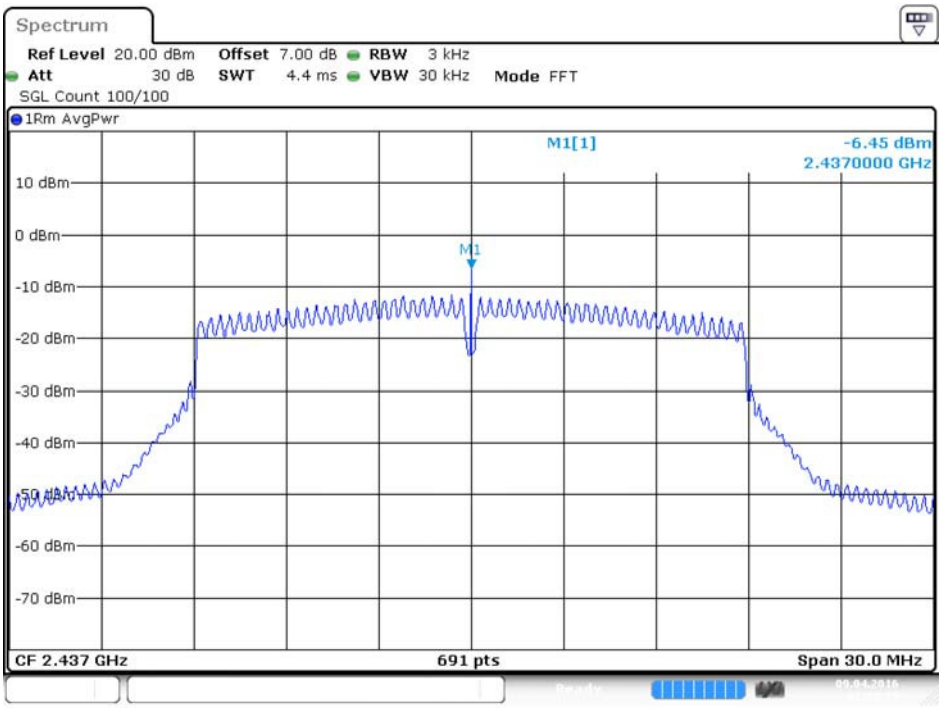
Date: 9.APR.2016 02:04:42

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / 2437 MHz / Chain 2



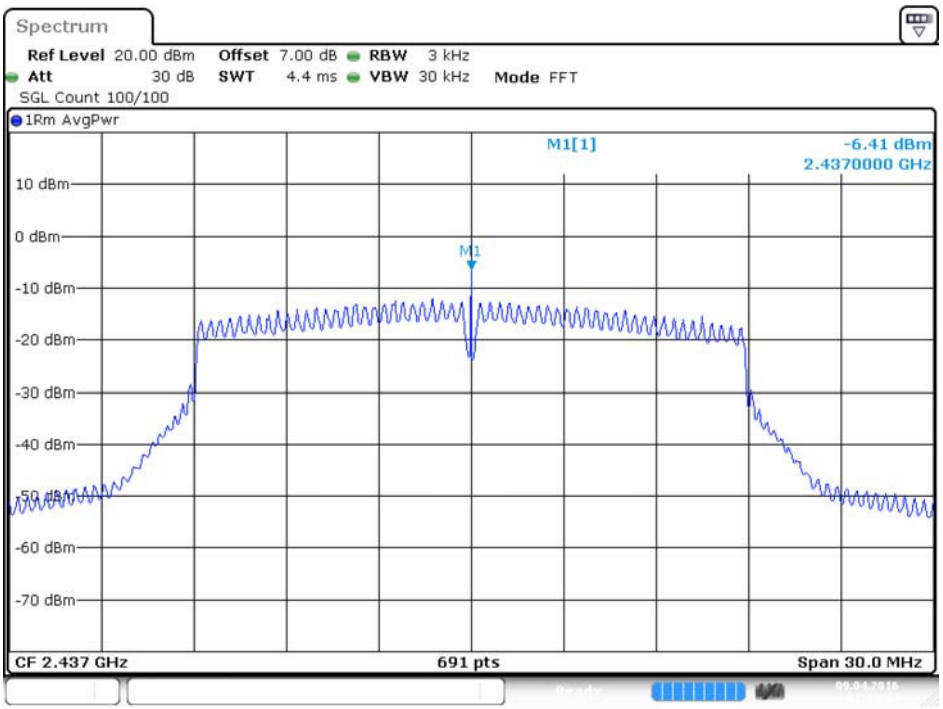
Date: 9.APR.2016 02:04:14

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / 2437 MHz / Chain 3



Date: 9.APR.2016 02:03:13

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / 2437 MHz / Chain 4



Date: 9.APR.2016 02:03:44

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

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated 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) - section 8.0 DTS bandwidth=> 8.1 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. Measured the spectrum width with power higher than 6dB below carrier.

4.4.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

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	23℃	Humidity	45%
Test Engineer	Wen Chao		

For Non-beamforming function:

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11b	2412 MHz	8.00	10.42	500	Complies
	2437 MHz	8.00	10.42	500	Complies
	2462 MHz	7.54	10.33	500	Complies
802.11g	2412 MHz	4.93	15.72	500	Complies
	2437 MHz	4.17	14.85	500	Complies
	2462 MHz	5.39	14.33	500	Complies
802.11ac MCS0/Nss1 VHT20	2412 MHz	10.67	15.54	500	Complies
	2437 MHz	10.78	16.15	500	Complies
	2462 MHz	10.67	15.98	500	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	35.71	36.47	500	Complies
	2437 MHz	35.71	36.76	500	Complies
	2452 MHz	35.71	36.61	500	Complies

For Beamforming function:

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	2412 MHz	12.58	17.63	500	Complies
	2437 MHz	10.38	17.71	500	Complies
	2462 MHz	11.13	17.63	500	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	36.17	36.76	500	Complies
	2437 MHz	36.41	36.90	500	Complies
	2452 MHz	36.41	36.76	500	Complies
802.11ac MCS0/Nss2 VHT20	2437 MHz	17.57	17.71	500	Complies

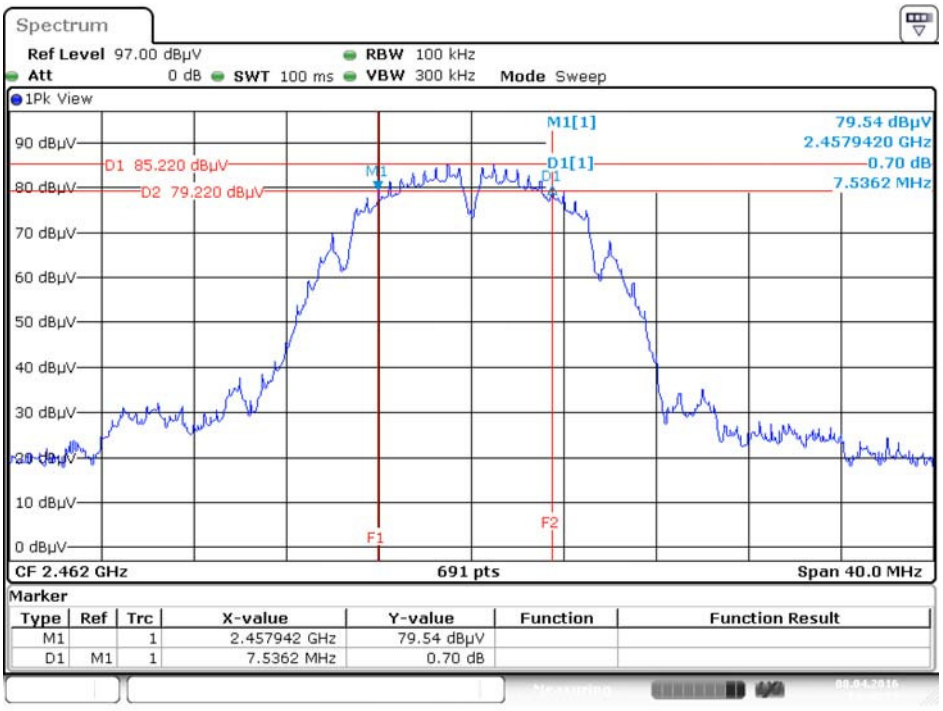
Note: All the test values were listed in the report.

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

For Non-beamforming function:

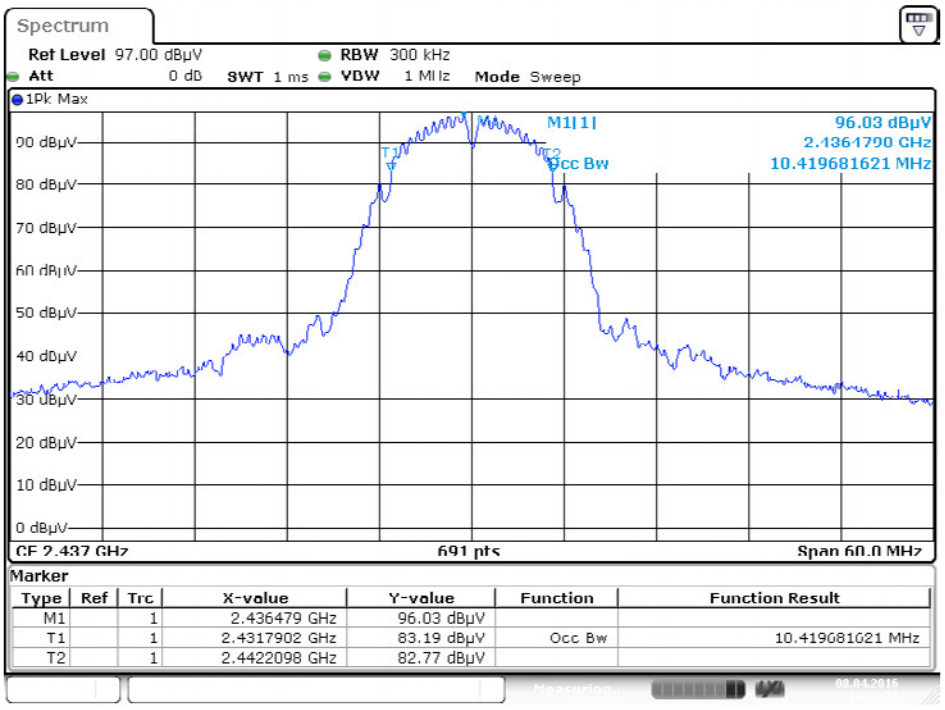
For 2.4GHz Band

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



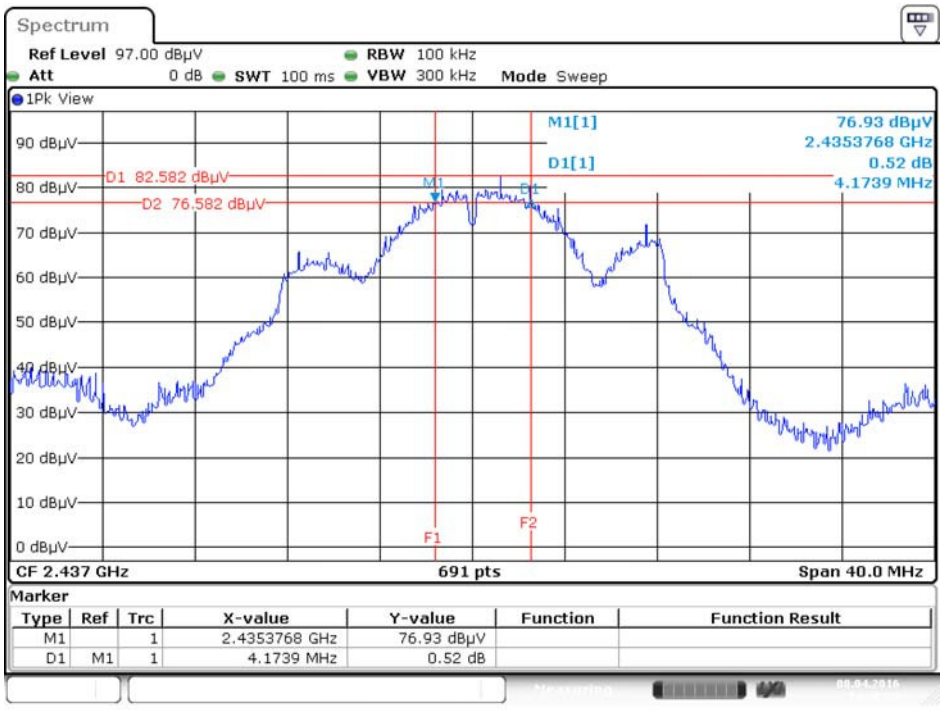
Date: 8.APR.2016 14:45:33

99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



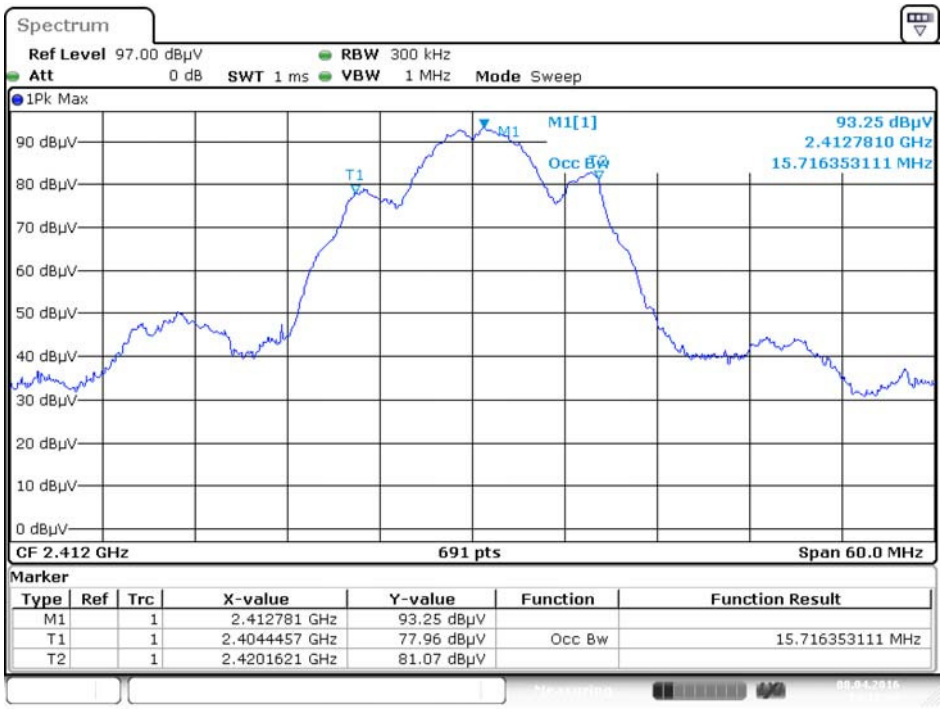
Date: 8.APR.2016 14:14:28

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



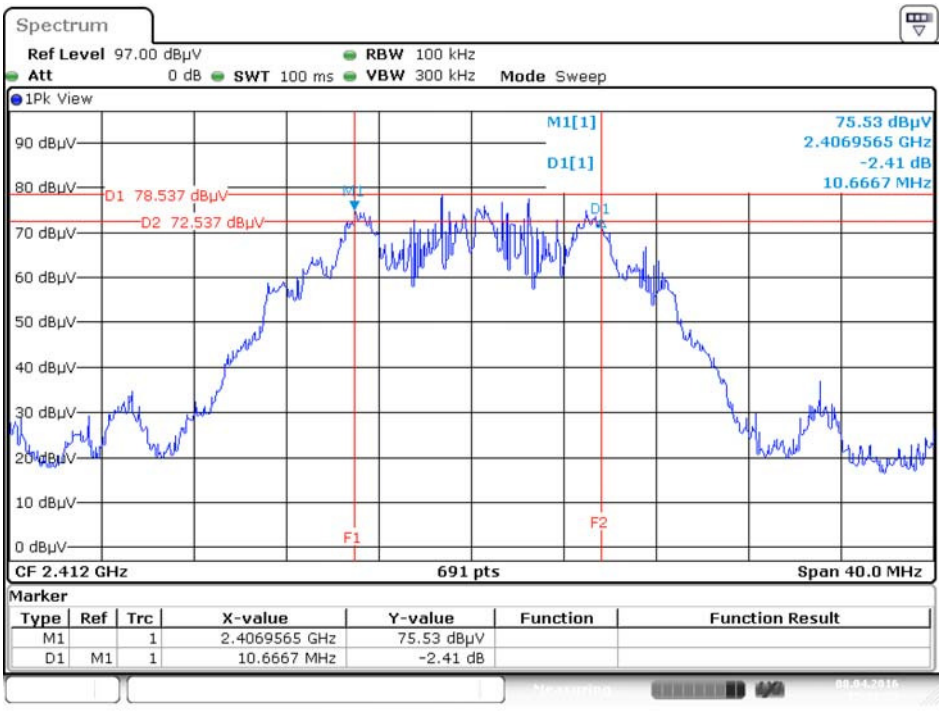
Date: 8.APR.2016 14:48:25

99% Occupied Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



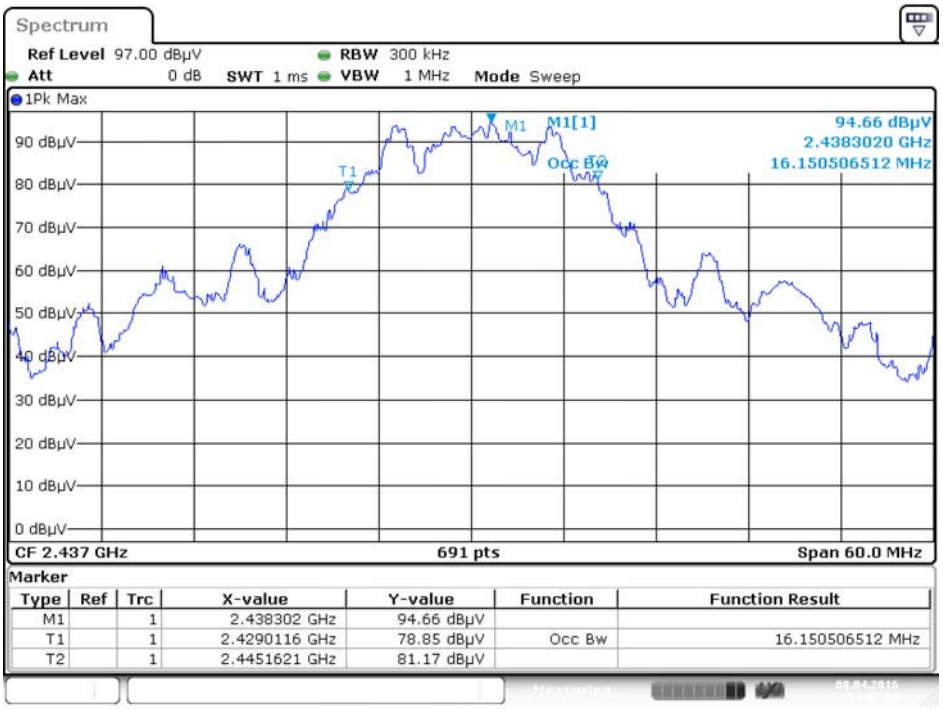
Date: 8.APR.2016 14:12:34

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



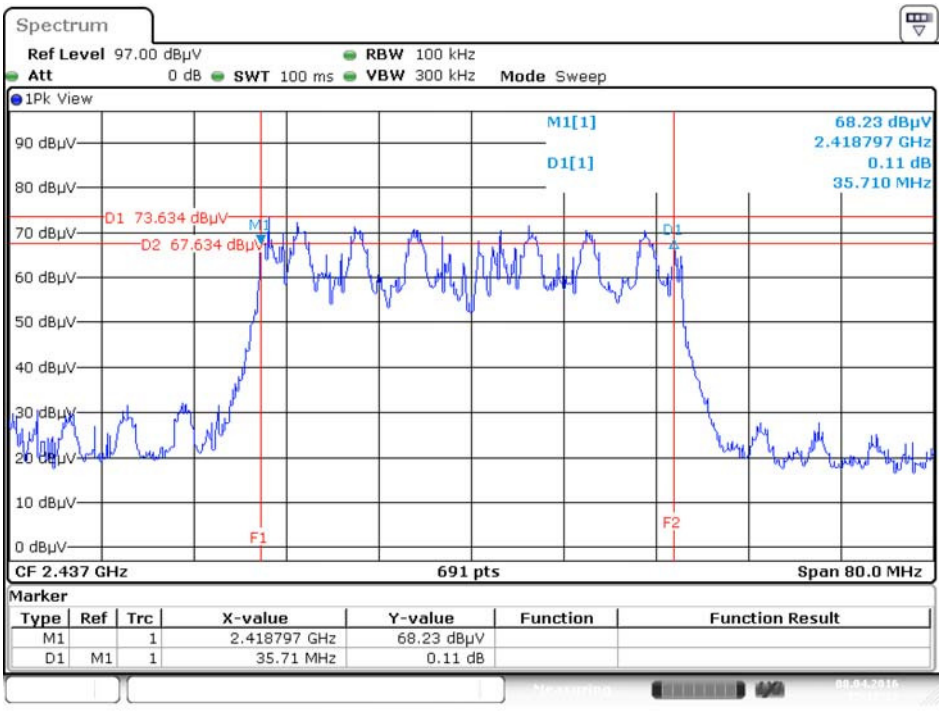
Date: 8.APR.2016 15:01:23

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



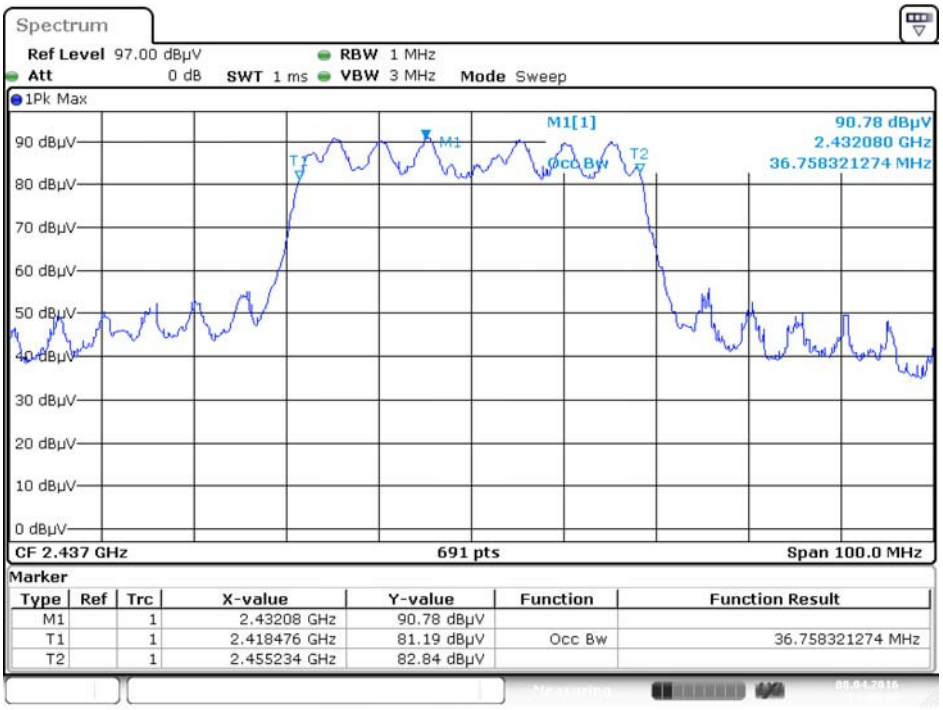
Date: 8.APR.2016 14:07:31

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1 + Chain 2 + Chain 3+ Chain 4



Date: 8.APR.2016 15:17:38

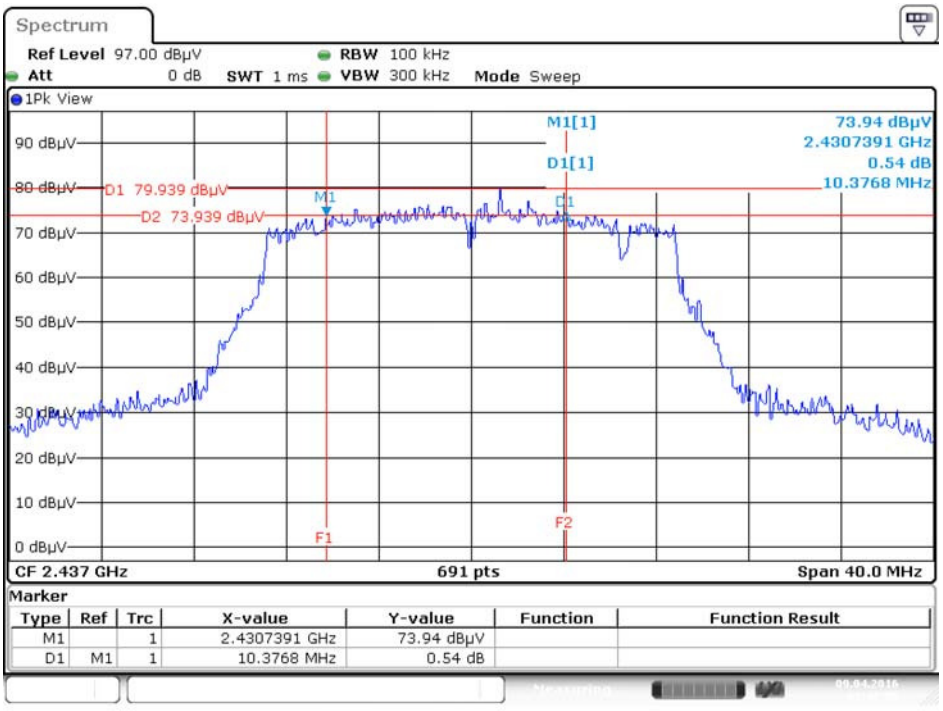
99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



Date: 8.APR.2016 14:00:25

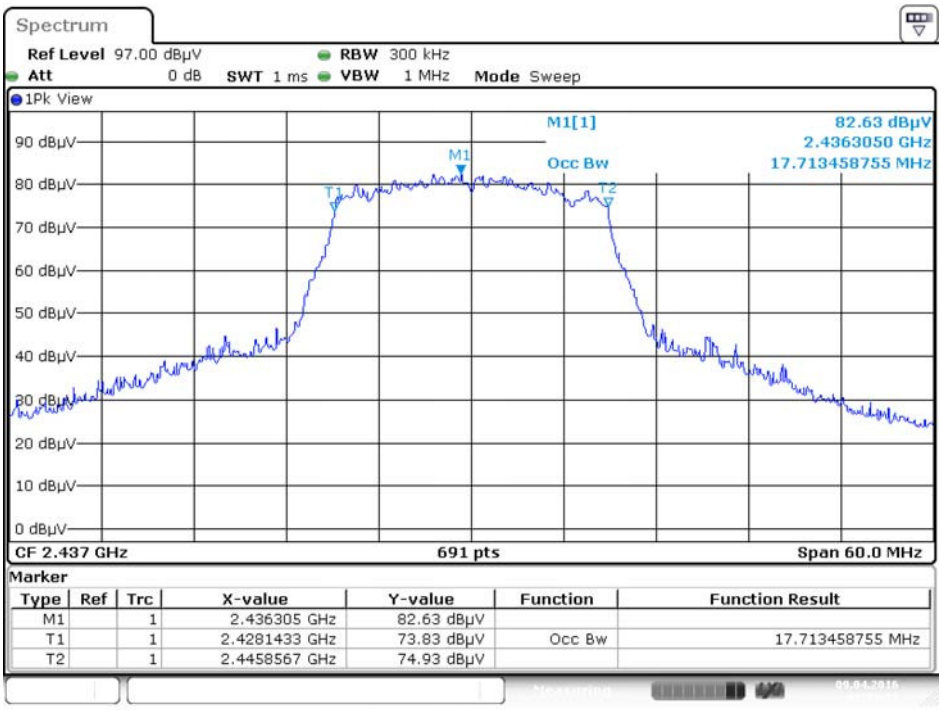
For Beamforming function:

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



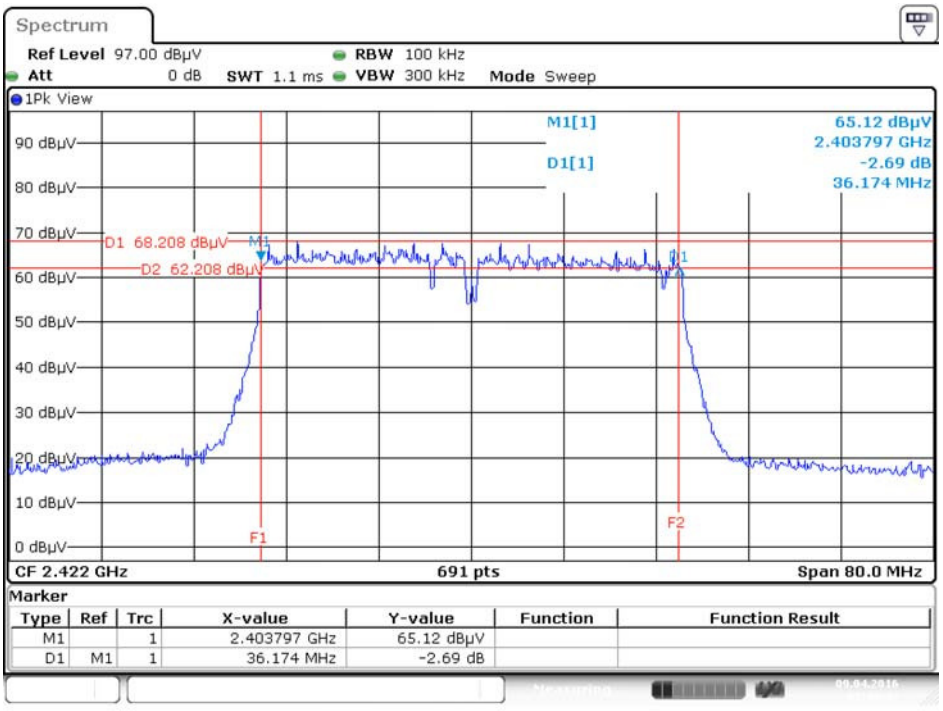
Date: 9.APR.2016 01:47:55

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



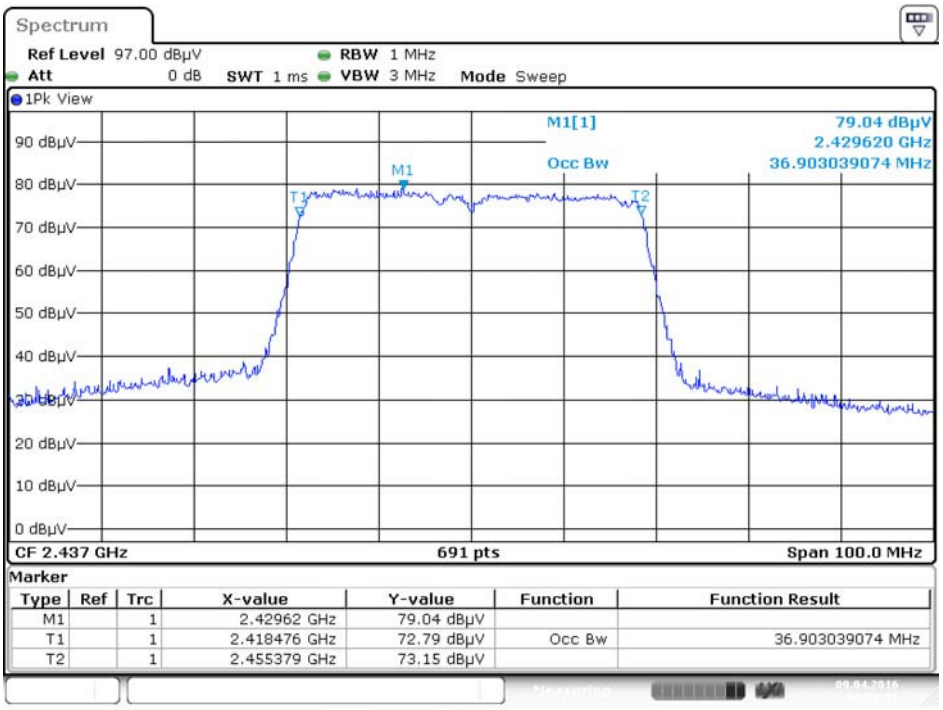
Date: 9.APR.2016 01:54:51

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2422 MHz / Chain 1 + Chain 2 + Chain 3+ Chain 4



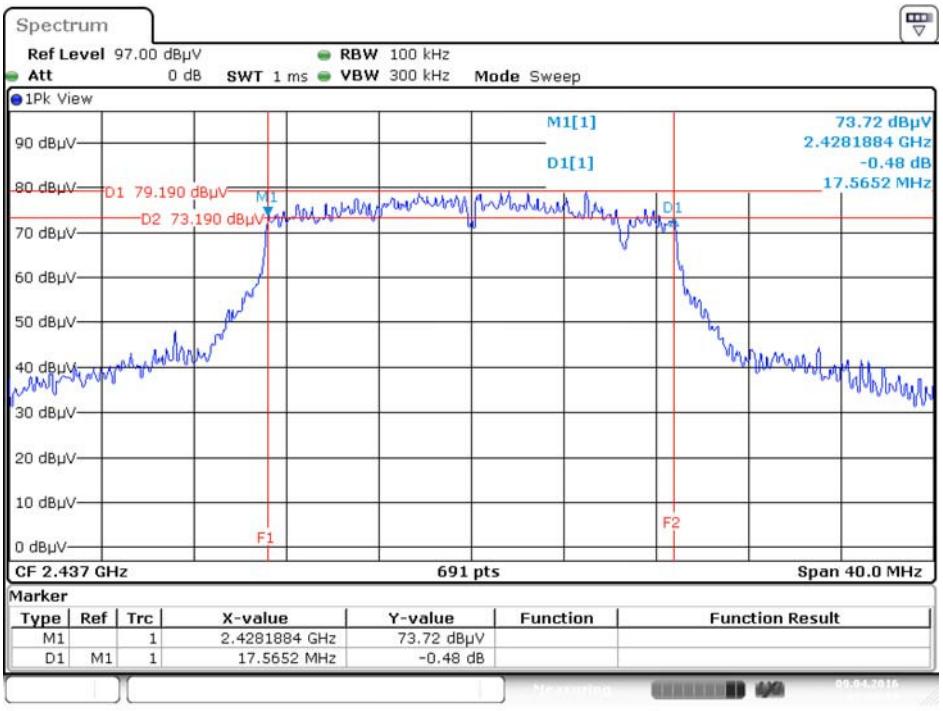
Date: 9.APR.2016 01:49:42

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



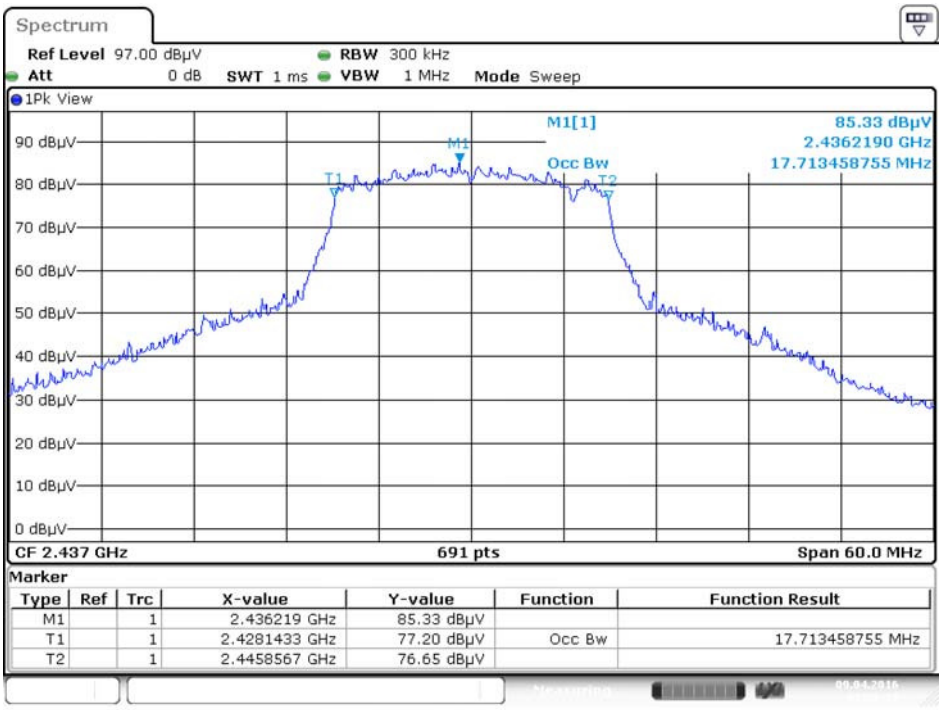
Date: 9.APR.2016 01:52:51

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



Date: 9.APR.2016 01:44:18

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



Date: 9.APR.2016 01:56:18

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

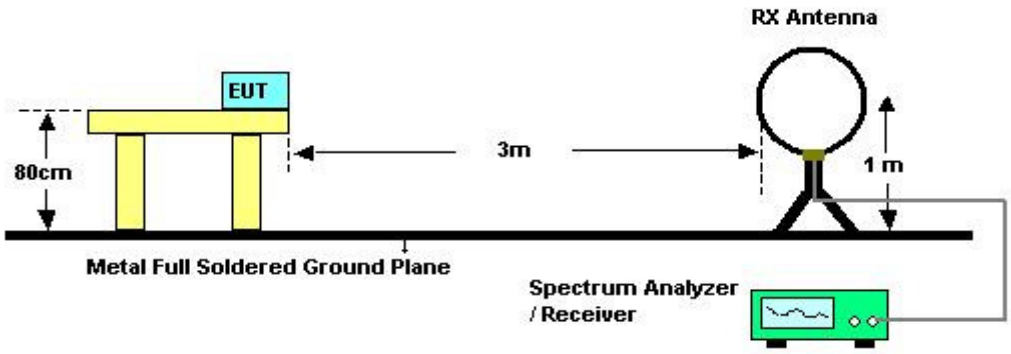
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. Test Procedures

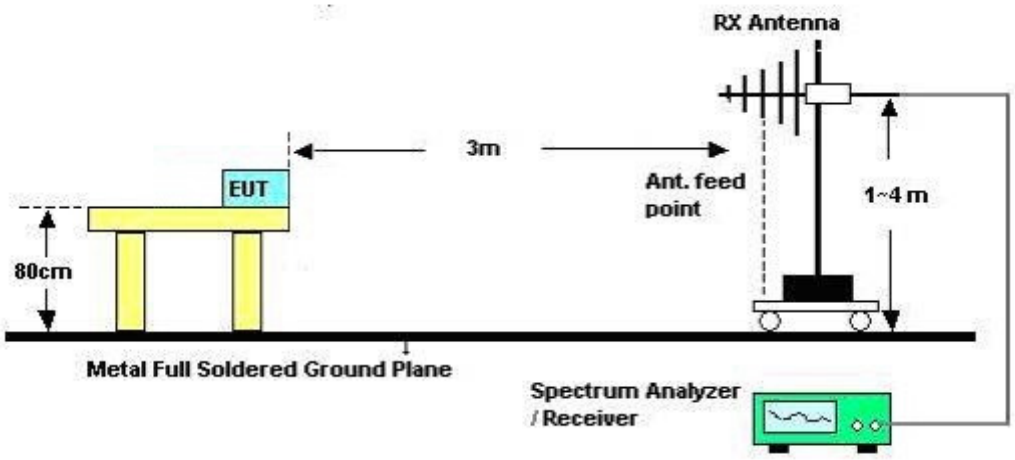
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting 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.

4.5.4. Test Setup Layout

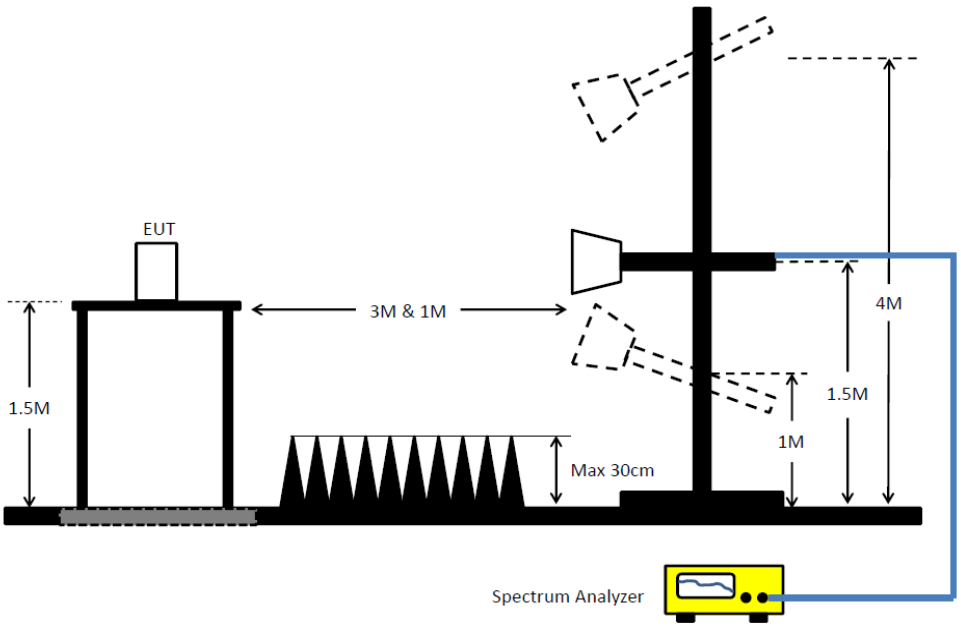
For Radiated Emissions: 9kHz ~30MHz



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 mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	22°C	Humidity	54%
Test Engineer	Steven Liang & Welson Chen	Configurations	Normal Link
Test Date	Jan. 24, 2017	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.

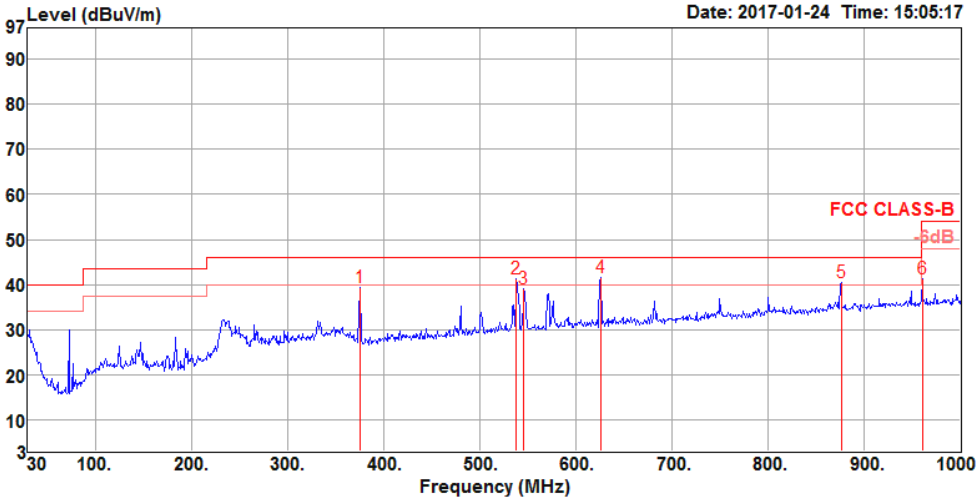
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

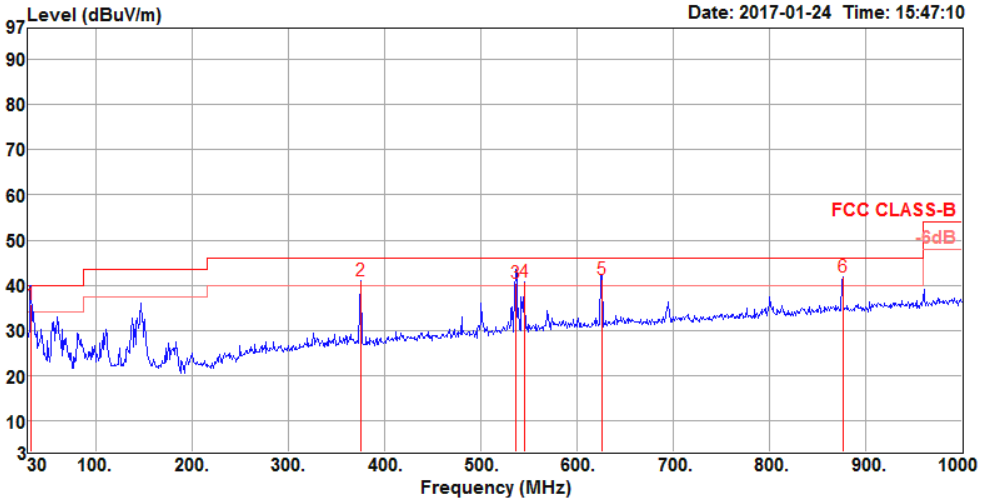
Temperature	22℃	Humidity	54%
Test Engineer	Steven Liang & Welson Chen	Configurations	Normal Link
Test Mode	Mode 2		

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	375.32	39.41	46.00	-6.59	46.51	3.40	21.78	32.28	100	264	Peak	HORIZONTAL
2	538.28	41.17	46.00	-4.83	45.12	4.09	24.33	32.37	200	124	Peak	HORIZONTAL
3	546.04	39.10	46.00	-6.90	42.93	4.12	24.42	32.37	200	172	Peak	HORIZONTAL
4	625.58	41.59	46.00	-4.41	44.37	4.44	25.16	32.38	175	243	Peak	HORIZONTAL
5	875.84	40.58	46.00	-5.42	39.88	5.30	27.20	31.80	125	329	Peak	HORIZONTAL
6	960.23	41.27	54.00	-12.73	39.11	5.55	27.74	31.13	100	74	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	32.91	35.86	40.00	-4.14	43.31	0.92	24.03	32.40	100	155	QP	VERTICAL
2	375.32	41.07	46.00	-4.93	48.17	3.40	21.78	32.28	200	28	Peak	VERTICAL
3	536.34	40.53	46.00	-5.47	44.50	4.09	24.30	32.36	175	205	QP	VERTICAL
4	545.07	40.67	46.00	-5.33	44.50	4.12	24.42	32.37	125	227	Peak	VERTICAL
5	625.58	41.33	46.00	-4.67	44.11	4.44	25.16	32.38	125	342	QP	VERTICAL
6	875.84	41.79	46.00	-4.21	41.09	5.30	27.20	31.80	100	353	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)

For Non-beamforming function:

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4823.80	48.45	74.00	-25.55	43.97	6.18	32.82	34.52	223	100	Peak	HORIZONTAL
2	4823.97	41.43	54.00	-12.57	36.95	6.18	32.82	34.52	223	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4823.92	48.72	54.00	-5.28	44.24	6.18	32.82	34.52	66	139	Average	VERTICAL
2	4824.00	52.67	74.00	-21.33	48.19	6.18	32.82	34.52	66	139	Peak	VERTICAL

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.98	45.83	54.00	-8.17	41.37	6.06	32.91	34.51	220	100	Average	HORIZONTAL
2	4874.06	50.84	74.00	-23.16	46.38	6.06	32.91	34.51	220	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.87	50.30	74.00	-23.70	45.84	6.06	32.91	34.51	71	130	Peak	VERTICAL
2	4873.93	44.27	54.00	-9.73	39.81	6.06	32.91	34.51	71	130	Average	VERTICAL

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4923.85	50.70	74.00	-23.30	46.26	5.94	32.99	34.49	218	128	Peak	HORIZONTAL
2	4923.95	45.60	54.00	-8.40	41.16	5.94	32.99	34.49	218	128	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4923.96	45.41	54.00	-8.59	40.97	5.94	32.99	34.49	69	155	Average	VERTICAL
2	4924.03	52.54	74.00	-21.46	48.10	5.94	32.99	34.49	69	155	Peak	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4815.08	32.64	54.00	-21.36	28.16	6.18	32.82	34.52	189	200	Average	HORIZONTAL
2	4825.20	44.97	74.00	-29.03	40.50	6.15	32.84	34.52	189	200	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4819.60	45.04	74.00	-28.96	40.56	6.18	32.82	34.52	227	164	Peak	VERTICAL
2	4820.80	32.63	54.00	-21.37	28.15	6.18	32.82	34.52	227	164	Average	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4865.24	33.76	54.00	-20.24	29.30	6.09	32.88	34.51	340	154	Average	HORIZONTAL
2	4875.52	45.15	74.00	-28.85	40.69	6.06	32.91	34.51	340	154	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4865.52	33.40	54.00	-20.60	28.94	6.09	32.88	34.51	296	132	Average	VERTICAL
2	4865.88	46.34	74.00	-27.66	41.88	6.09	32.88	34.51	296	132	Peak	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4914.04	44.62	74.00	-29.38	40.17	5.97	32.97	34.49	52	193	Peak	HORIZONTAL
2	4918.80	32.82	54.00	-21.18	28.37	5.97	32.97	34.49	52	193	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4918.00	32.94	54.00	-21.06	28.49	5.97	32.97	34.49	109	197	Average	VERTICAL
2	4922.40	45.40	74.00	-28.60	40.95	5.97	32.97	34.49	109	197	Peak	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4820.44	46.46	74.00	-27.54	41.98	6.18	32.82	34.52	295	202	Peak	HORIZONTAL
2	4823.26	33.00	54.00	-21.00	28.52	6.18	32.82	34.52	295	202	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4820.12	32.91	54.00	-21.09	28.43	6.18	32.82	34.52	284	184	Average	VERTICAL
2	4827.46	46.33	74.00	-27.67	41.86	6.15	32.84	34.52	284	184	Peak	VERTICAL

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4867.24	45.53	74.00	-28.47	41.07	6.06	32.91	34.51	258	140	Peak	HORIZONTAL
2	4872.64	34.99	54.00	-19.01	30.53	6.06	32.91	34.51	258	140	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4869.68	47.60	74.00	-26.40	43.14	6.06	32.91	34.51	211	181	Peak	VERTICAL
2	4872.60	34.81	54.00	-19.19	30.35	6.06	32.91	34.51	211	181	Average	VERTICAL

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4922.72	33.00	54.00	-21.00	28.55	5.97	32.97	34.49	231	169	Average	HORIZONTAL
2	4922.92	45.51	74.00	-28.49	41.06	5.97	32.97	34.49	231	169	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4917.16	45.49	74.00	-28.51	41.04	5.97	32.97	34.49	201	197	Peak	VERTICAL
2	4925.28	33.41	54.00	-20.59	28.97	5.94	32.99	34.49	201	197	Average	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4846.18	32.69	54.00	-21.31	28.22	6.12	32.86	34.51	143	149	Average	HORIZONTAL
2	4847.28	46.78	74.00	-27.22	42.31	6.12	32.86	34.51	143	149	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4843.16	45.64	74.00	-28.36	41.18	6.12	32.86	34.52	85	194	Peak	VERTICAL
2	4848.26	32.74	54.00	-21.26	28.27	6.12	32.86	34.51	85	194	Average	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4870.20	33.10	54.00	-20.90	28.64	6.06	32.91	34.51	176	102	Average	HORIZONTAL
2	4877.52	46.29	74.00	-27.71	41.82	6.06	32.91	34.50	176	102	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4869.72	33.36	54.00	-20.64	28.90	6.06	32.91	34.51	88	164	Average	VERTICAL
2	4870.70	46.23	74.00	-27.77	41.77	6.06	32.91	34.51	88	164	Peak	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 22, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4908.08	46.26	74.00	-27.74	41.81	6.00	32.95	34.50	14	130	Peak	HORIZONTAL
2	4908.10	32.76	54.00	-21.24	28.31	6.00	32.95	34.50	14	130	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4903.95	45.24	74.00	-28.76	40.79	6.00	32.95	34.50	98	207	Peak	VERTICAL
2	4904.01	32.60	54.00	-21.40	28.15	6.00	32.95	34.50	98	207	Average	VERTICAL

For Beamforming function:

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 23, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4820.80	33.71	54.00	-20.29	29.23	6.18	32.82	34.52	72	261	Average	HORIZONTAL
2	4824.52	46.54	74.00	-27.46	42.06	6.18	32.82	34.52	72	261	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4820.62	32.71	54.00	-21.29	28.23	6.18	32.82	34.52	166	230	Average	VERTICAL
2	4824.94	45.47	74.00	-28.53	40.99	6.18	32.82	34.52	166	230	Peak	VERTICAL

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 23, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4871.64	47.81	74.00	-26.19	43.35	6.06	32.91	34.51	216	244	Peak	HORIZONTAL
2	4873.84	34.35	54.00	-19.65	29.89	6.06	32.91	34.51	216	244	Average	HORIZONTAL
3	7306.24	42.73	54.00	-11.27	32.82	7.50	37.17	34.76	306	241	Average	HORIZONTAL
4	7307.64	58.16	74.00	-15.84	48.25	7.50	37.17	34.76	306	241	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4869.84	34.76	54.00	-19.24	30.30	6.06	32.91	34.51	125	256	Average	VERTICAL
2	4870.86	48.31	74.00	-25.69	43.85	6.06	32.91	34.51	125	256	Peak	VERTICAL
3	7306.90	40.14	54.00	-13.86	30.23	7.50	37.17	34.76	176	270	Average	VERTICAL
4	7309.08	53.54	74.00	-20.46	43.63	7.50	37.17	34.76	176	270	Peak	VERTICAL

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 23, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4923.54	33.15	54.00	-20.85	28.70	5.97	32.97	34.49	14	190	Average	HORIZONTAL
2	4923.60	46.17	74.00	-27.83	41.72	5.97	32.97	34.49	14	190	Peak	HORIZONTAL
3	7381.28	52.11	74.00	-21.89	41.82	7.78	37.28	34.77	92	201	Peak	HORIZONTAL
4	7383.40	39.41	54.00	-14.59	29.12	7.78	37.28	34.77	92	201	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4923.18	46.13	74.00	-27.87	41.68	5.97	32.97	34.49	245	165	Peak	VERTICAL
2	4923.68	33.50	54.00	-20.50	29.06	5.94	32.99	34.49	245	165	Average	VERTICAL
3	7384.80	52.19	74.00	-21.81	41.90	7.78	37.28	34.77	154	182	Peak	VERTICAL
4	7385.90	40.14	54.00	-13.86	29.85	7.78	37.28	34.77	154	182	Average	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 23, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4820.12	32.79	54.00	-21.21	28.31	6.18	32.82	34.52	204	175	Average	HORIZONTAL
2	4823.32	45.46	74.00	-28.54	40.98	6.18	32.82	34.52	204	175	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4822.16	45.50	74.00	-28.50	41.02	6.18	32.82	34.52	342	180	Peak	VERTICAL
2	4822.70	32.80	54.00	-21.20	28.32	6.18	32.82	34.52	342	180	Average	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 23, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4872.62	45.48	74.00	-28.52	41.02	6.06	32.91	34.51	217	187	Peak	HORIZONTAL
2	4875.92	32.65	54.00	-21.35	28.19	6.06	32.91	34.51	217	187	Average	HORIZONTAL
3	7310.82	38.53	54.00	-15.47	28.62	7.50	37.17	34.76	144	219	Average	HORIZONTAL
4	7312.60	51.62	74.00	-22.38	41.71	7.50	37.17	34.76	144	219	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4869.44	45.36	74.00	-28.64	40.90	6.06	32.91	34.51	172	195	Peak	VERTICAL
2	4869.68	32.63	54.00	-21.37	28.17	6.06	32.91	34.51	172	195	Average	VERTICAL
3	7310.92	52.03	74.00	-21.97	42.12	7.50	37.17	34.76	233	233	Peak	VERTICAL
4	7310.98	40.86	54.00	-13.14	30.95	7.50	37.17	34.76	233	233	Average	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 23, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4900.14	46.14	74.00	-27.86	41.69	6.00	32.95	34.50	355	201	Peak	HORIZONTAL
2	4908.16	32.90	54.00	-21.10	28.45	6.00	32.95	34.50	355	201	Average	HORIZONTAL
3	7351.04	51.68	74.00	-22.32	41.58	7.64	37.23	34.77	172	244	Peak	HORIZONTAL
4	7355.84	39.31	54.00	-14.69	29.21	7.64	37.23	34.77	172	244	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4901.50	44.77	74.00	-29.23	40.32	6.00	32.95	34.50	296	183	Peak	VERTICAL
2	4901.50	33.57	54.00	-20.43	29.12	6.00	32.95	34.50	296	183	Average	VERTICAL
3	7355.06	52.31	74.00	-21.69	42.21	7.64	37.23	34.77	50	209	Peak	VERTICAL
4	7355.98	39.93	54.00	-14.07	29.83	7.64	37.23	34.77	50	209	Average	VERTICAL

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Feb. 25, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4874.36	43.75	54.00	-10.25	39.29	6.06	32.91	34.51	215	103	Average	HORIZONTAL
2	4875.44	59.09	74.00	-14.91	54.63	6.06	32.91	34.51	215	103	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.80	57.54	74.00	-16.46	53.08	6.06	32.91	34.51	212	229	Peak	VERTICAL
2	4873.96	42.14	54.00	-11.86	37.68	6.06	32.91	34.51	212	229	Average	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.

For Radiated Out of Band Emission Measurement:

1. 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 mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

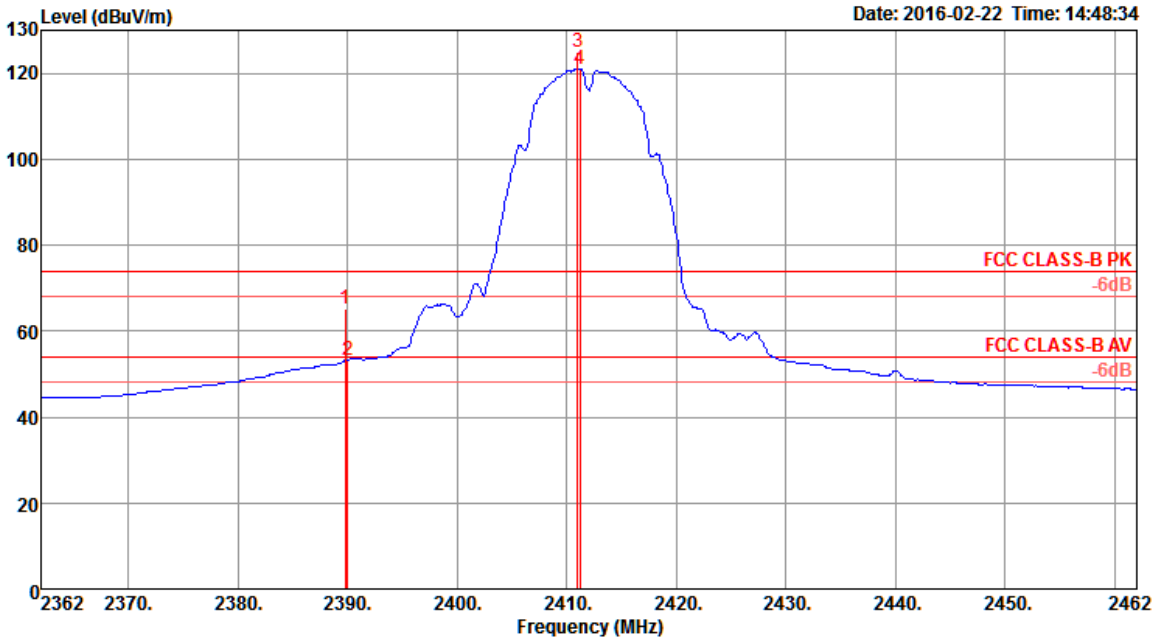
The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

For Non-beamforming function:

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4

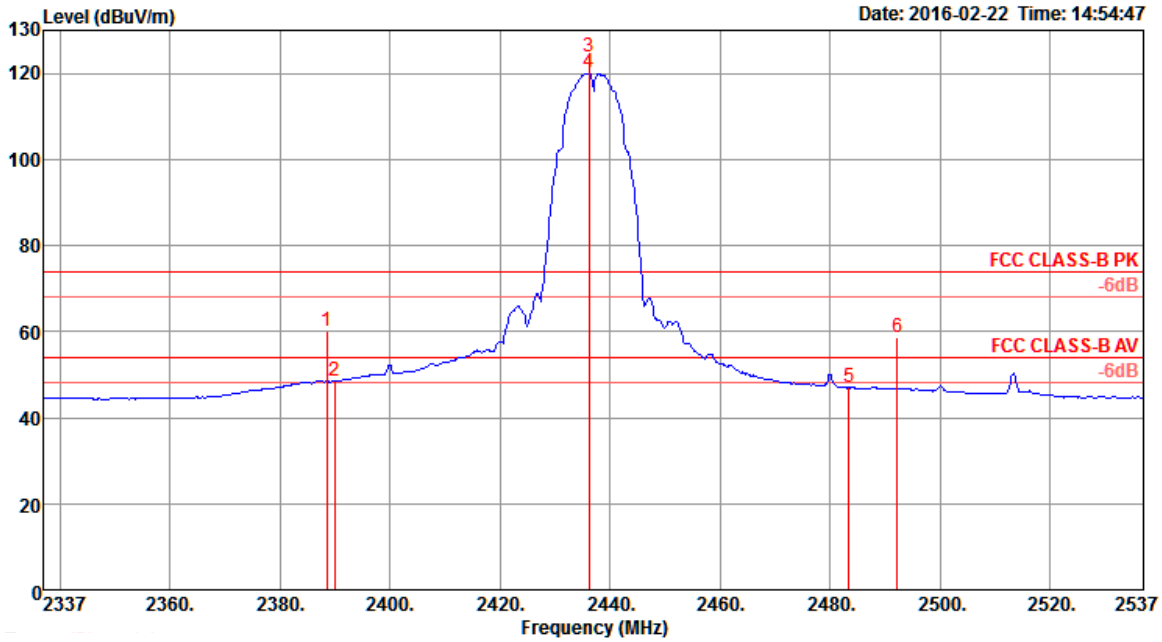
Channel 1



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.80	65.07	74.00	-8.93	33.32	3.73	28.02	0.00	171	320	Peak	VERTICAL
2	2390.00	53.31	54.00	-0.69	21.56	3.73	28.02	0.00	171	320	Average	VERTICAL
3	2411.00	124.89			93.14	3.75	28.00	0.00	171	320	Peak	VERTICAL
4	2411.20	120.97			89.23	3.75	27.99	0.00	171	320	Average	VERTICAL

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

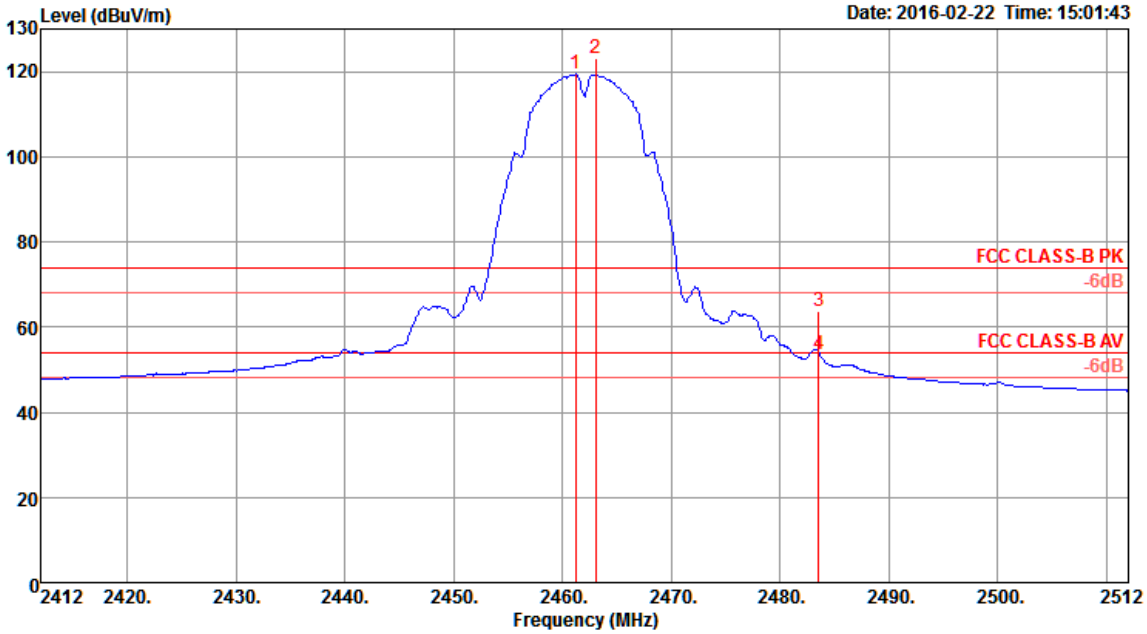
Channel 6



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2388.60	60.09	74.00	-13.91	28.34	3.73	28.02	0.00	172	319	Peak	VERTICAL
2	2390.00	48.57	54.00	-5.43	16.82	3.73	28.02	0.00	172	319	Average	VERTICAL
3	2436.20	123.75			92.01	3.77	27.97	0.00	172	319	Peak	VERTICAL
4	2436.20	120.17			88.43	3.77	27.97	0.00	172	319	Average	VERTICAL
5	2483.50	46.96	54.00	-7.04	15.23	3.81	27.92	0.00	172	319	Average	VERTICAL
6	2492.20	58.68	74.00	-15.32	26.95	3.82	27.91	0.00	172	319	Peak	VERTICAL

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

Channel 11

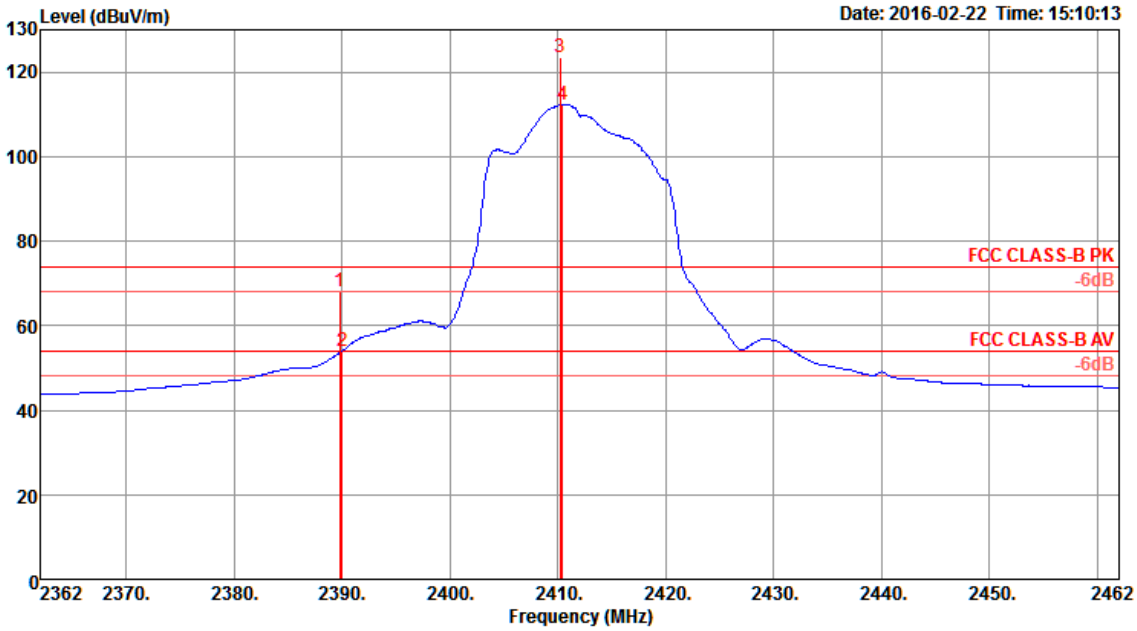


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2461.20	119.33			87.60	3.79	27.94	0.00	174	306	Average	VERTICAL
2	2463.00	123.28			91.55	3.79	27.94	0.00	174	306	Peak	VERTICAL
3	2483.50	63.57	74.00	-10.43	31.84	3.81	27.92	0.00	174	306	Peak	VERTICAL
4	2483.50	53.53	54.00	-0.47	21.80	3.81	27.92	0.00	174	306	Average	VERTICAL

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

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4

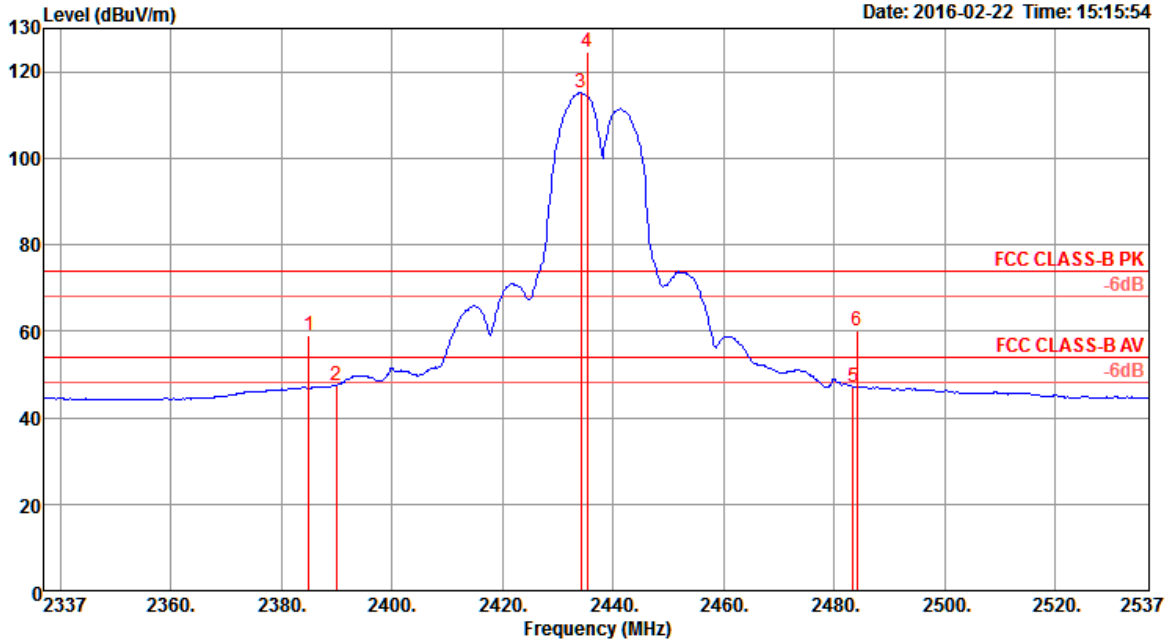
Channel 1



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.80	68.13	74.00	-5.87	36.38	3.73	28.02	0.00	177	316	Peak	VERTICAL
2	2390.00	53.86	54.00	-0.14	22.11	3.73	28.02	0.00	177	316	Average	VERTICAL
3	2410.20	123.34			91.59	3.75	28.00	0.00	177	316	Peak	VERTICAL
4	2410.40	112.26			80.51	3.75	28.00	0.00	177	316	Average	VERTICAL

Item 1, 2 are the fundamental frequency at 2412 MHz.

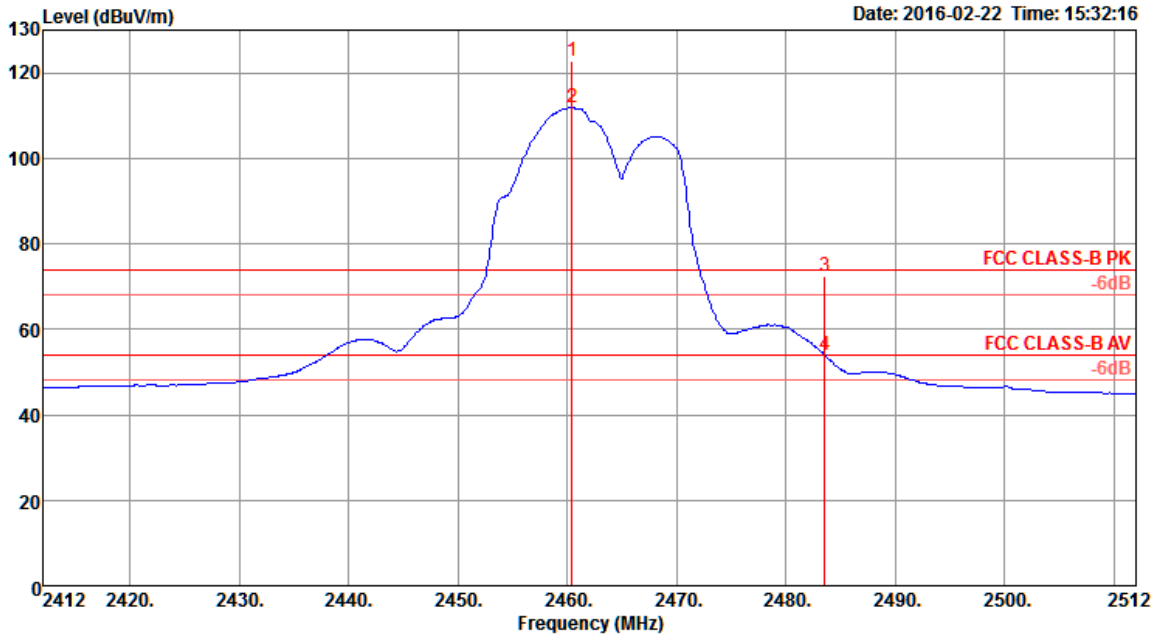
Channel 6



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2385.00	58.94	74.00	-15.06	27.19	3.73	28.02	0.00	57	257	Peak	VERTICAL
2	2390.00	47.51	54.00	-6.49	15.76	3.73	28.02	0.00	57	257	Average	VERTICAL
3	2434.20	115.27			83.53	3.77	27.97	0.00	57	257	Average	VERTICAL
4	2435.40	124.67			92.93	3.77	27.97	0.00	57	257	Peak	VERTICAL
5	2483.50	47.25	54.00	-6.75	15.52	3.81	27.92	0.00	57	257	Average	VERTICAL
6	2484.20	60.28	74.00	-13.72	28.55	3.81	27.92	0.00	57	257	Peak	VERTICAL

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

Channel 11

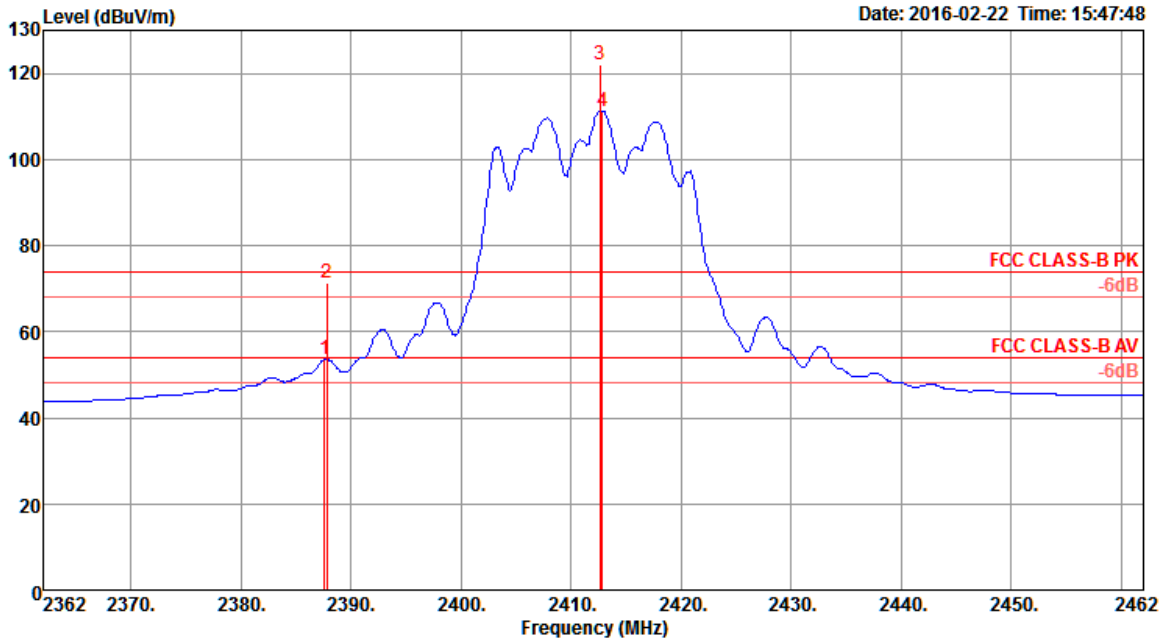


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2460.40	122.91			91.17	3.79	27.95	0.00	58	165	Peak	VERTICAL
2	2460.40	111.82			80.08	3.79	27.95	0.00	58	165	Average	VERTICAL
3	2483.50	72.43	74.00	-1.57	40.70	3.81	27.92	0.00	58	165	Peak	VERTICAL
4	2483.50	53.84	54.00	-0.16	22.11	3.81	27.92	0.00	58	165	Average	VERTICAL

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

Temperature	22.9℃	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4

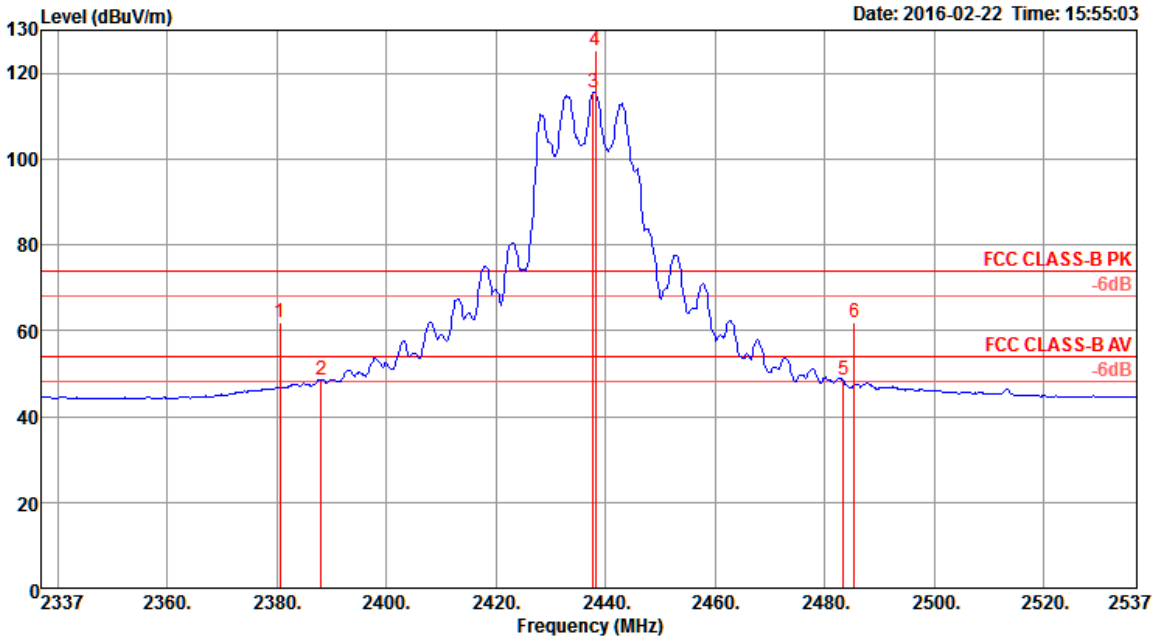
Channel 1



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2387.60	53.56	54.00	-0.44	21.81	3.73	28.02	0.00	350	246	Average	VERTICAL
2	2387.80	71.23	74.00	-2.77	39.48	3.73	28.02	0.00	350	246	Peak	VERTICAL
3	2412.60	122.11			90.37	3.75	27.99	0.00	350	246	Peak	VERTICAL
4	2412.80	111.29			79.55	3.75	27.99	0.00	350	246	Average	VERTICAL

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

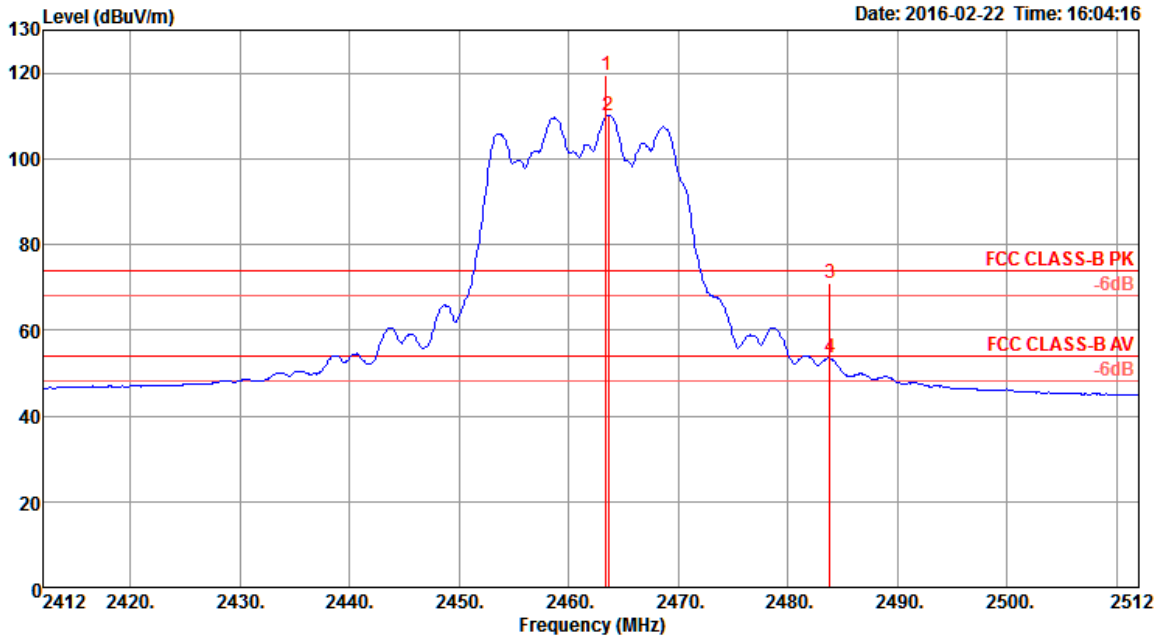
Channel 6



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2380.60	61.76	74.00	-12.24	30.01	3.72	28.03	0.00	354	236	Peak	VERTICAL
2	2388.20	48.47	54.00	-5.53	16.72	3.73	28.02	0.00	354	236	Average	VERTICAL
3	2437.80	115.68			83.94	3.77	27.97	0.00	354	236	Average	VERTICAL
4	2438.20	125.20			93.46	3.77	27.97	0.00	354	236	Peak	VERTICAL
5	2483.50	48.45	54.00	-5.55	16.72	3.81	27.92	0.00	354	236	Average	VERTICAL
6	2485.40	62.09	74.00	-11.91	30.36	3.81	27.92	0.00	354	236	Peak	VERTICAL

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

Channel 11

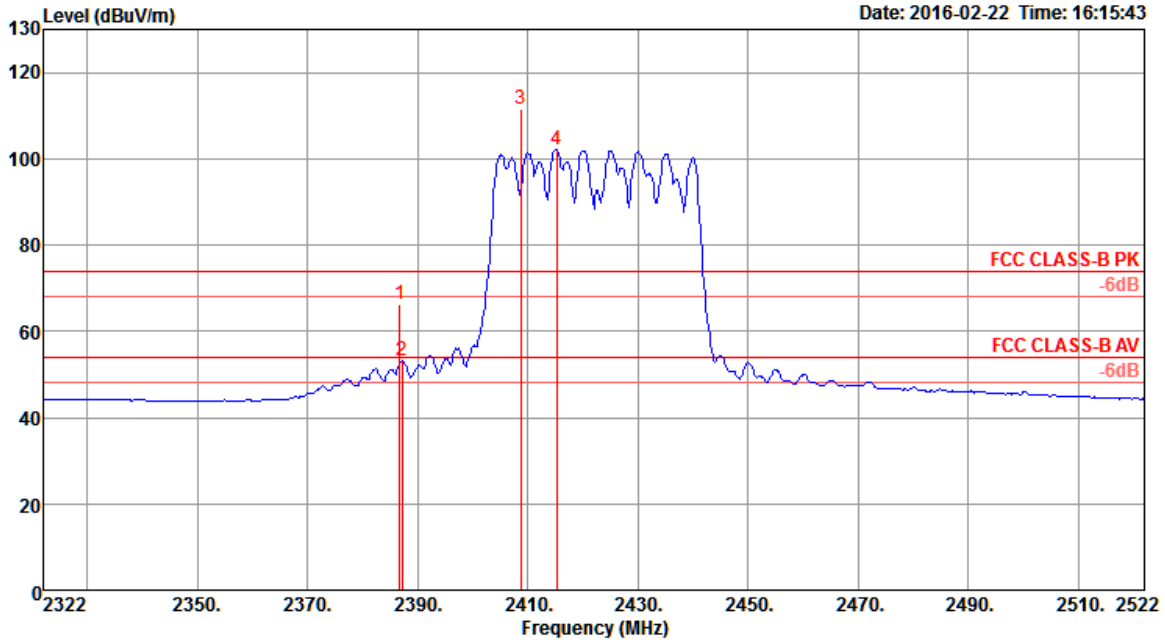


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2463.40	119.56			87.83	3.79	27.94	0.00	125	292	Peak	VERTICAL
2	2463.60	110.17			78.44	3.79	27.94	0.00	125	292	Average	VERTICAL
3	2483.80	71.14	74.00	-2.86	39.41	3.81	27.92	0.00	125	292	Peak	VERTICAL
4	2483.80	53.42	54.00	-0.58	21.69	3.81	27.92	0.00	125	292	Average	VERTICAL

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

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4

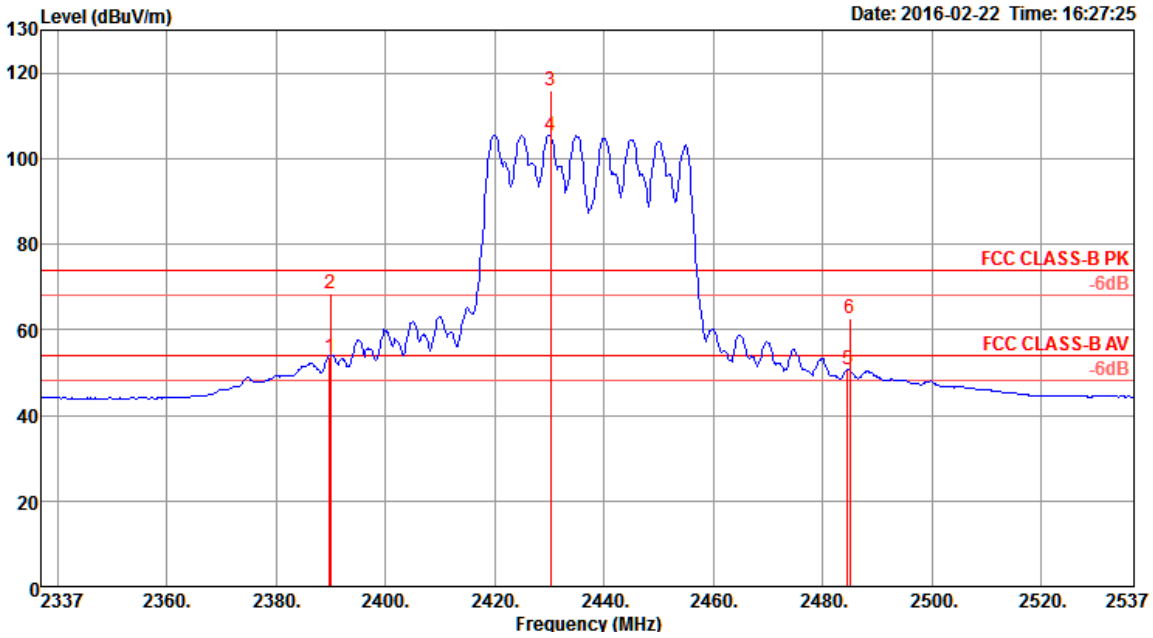
Channel 3



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2386.80	66.17	74.00	-7.83	34.42	3.73	28.02	0.00	336	169	Peak	VERTICAL
2	2387.20	53.19	54.00	-0.81	21.44	3.73	28.02	0.00	336	169	Average	VERTICAL
3	2408.80	111.57			79.82	3.75	28.00	0.00	336	169	Peak	VERTICAL
4	2415.20	102.00			70.26	3.75	27.99	0.00	336	169	Average	VERTICAL

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

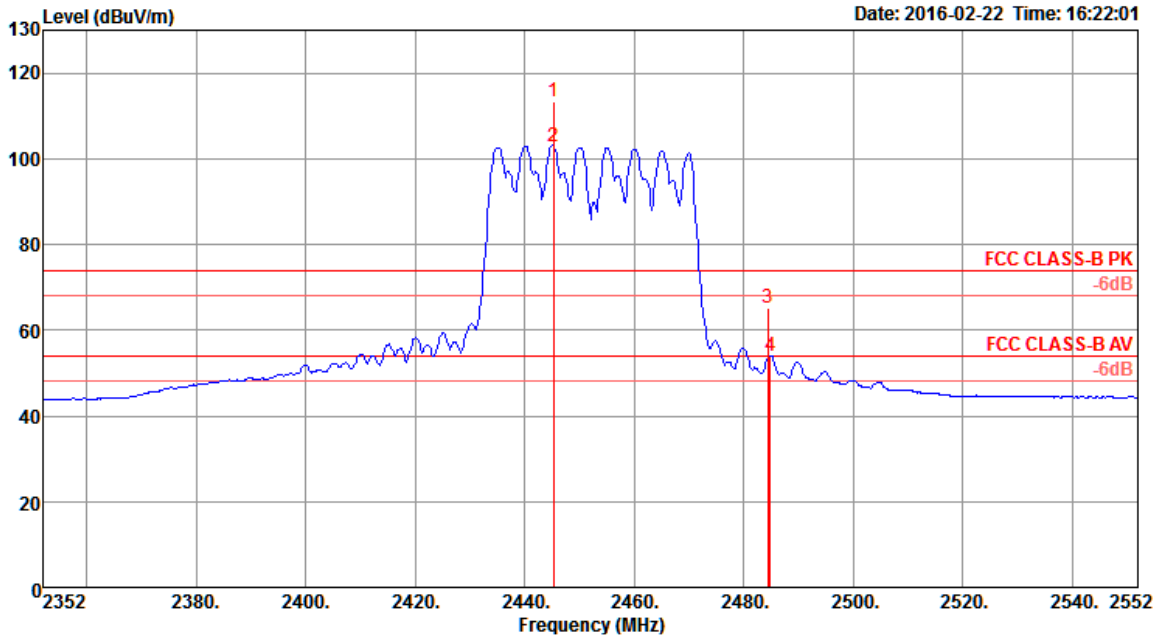
Channel 6



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.80	53.72	54.00	-0.28	21.97	3.73	28.02	0.00	331	170	Average	VERTICAL
2	2390.00	68.29	74.00	-5.71	36.54	3.73	28.02	0.00	331	170	Peak	VERTICAL
3	2430.20	115.88			84.14	3.76	27.98	0.00	331	170	Peak	VERTICAL
4	2430.20	105.40			73.66	3.76	27.98	0.00	331	170	Average	VERTICAL
5	2484.60	50.70	54.00	-3.30	18.97	3.81	27.92	0.00	331	170	Average	VERTICAL
6	2485.00	62.75	74.00	-11.25	31.02	3.81	27.92	0.00	331	170	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2445.20	113.20			81.46	3.78	27.96	0.00	332	193	Peak	VERTICAL
2	2445.20	102.98			71.24	3.78	27.96	0.00	332	193	Average	VERTICAL
3	2484.40	65.05	74.00	-8.95	33.32	3.81	27.92	0.00	332	193	Peak	VERTICAL
4	2484.80	53.80	54.00	-0.20	22.07	3.81	27.92	0.00	332	193	Average	VERTICAL

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

Note:

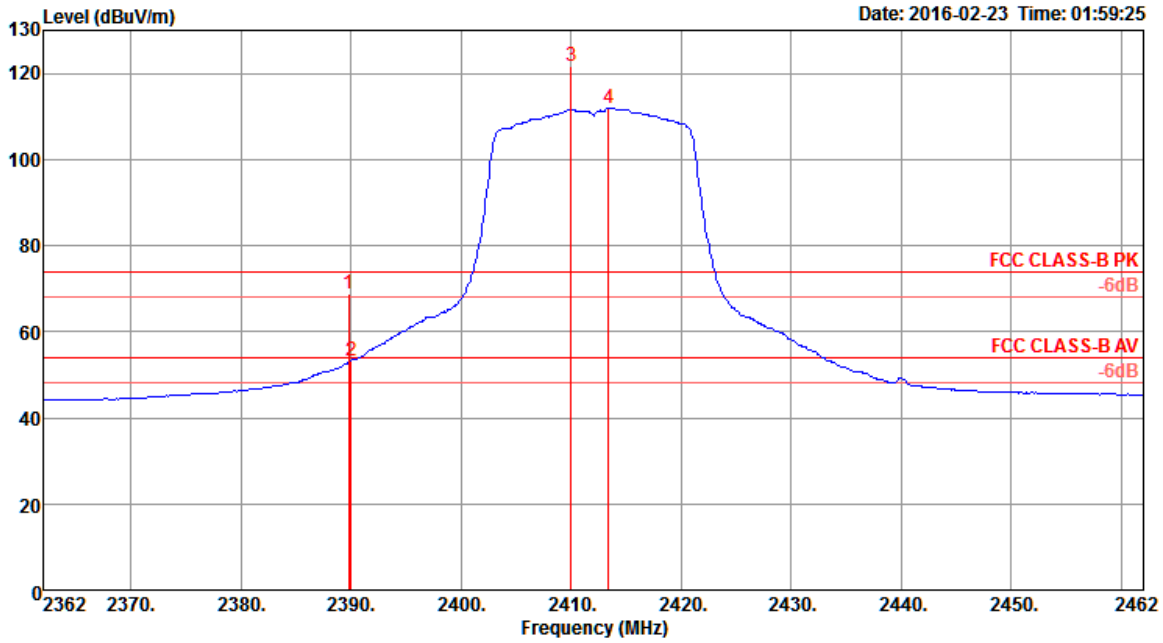
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

For Beamforming function:

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4

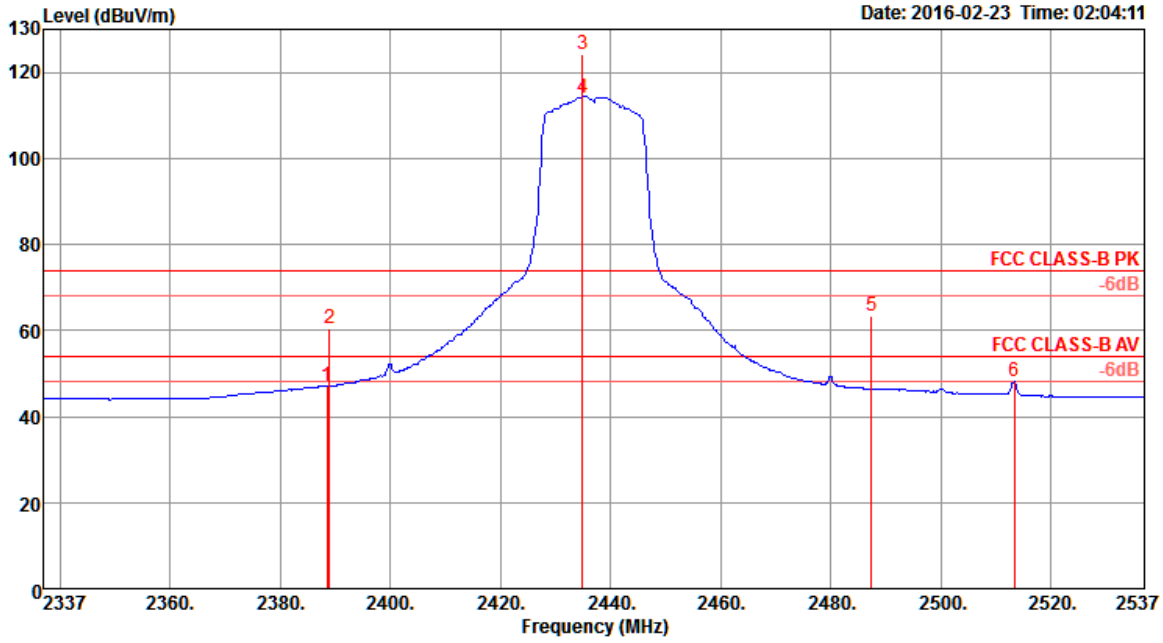
Channel 1



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.80	68.66	74.00	-5.34	36.79	3.85	28.02	0.00	48	232	Peak	VERTICAL
2	2390.00	53.30	54.00	-0.70	21.43	3.85	28.02	0.00	48	232	Average	VERTICAL
3	2410.00	121.68			89.82	3.86	28.00	0.00	48	232	Peak	VERTICAL
4	2413.40	111.95			80.09	3.87	27.99	0.00	48	232	Average	VERTICAL

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

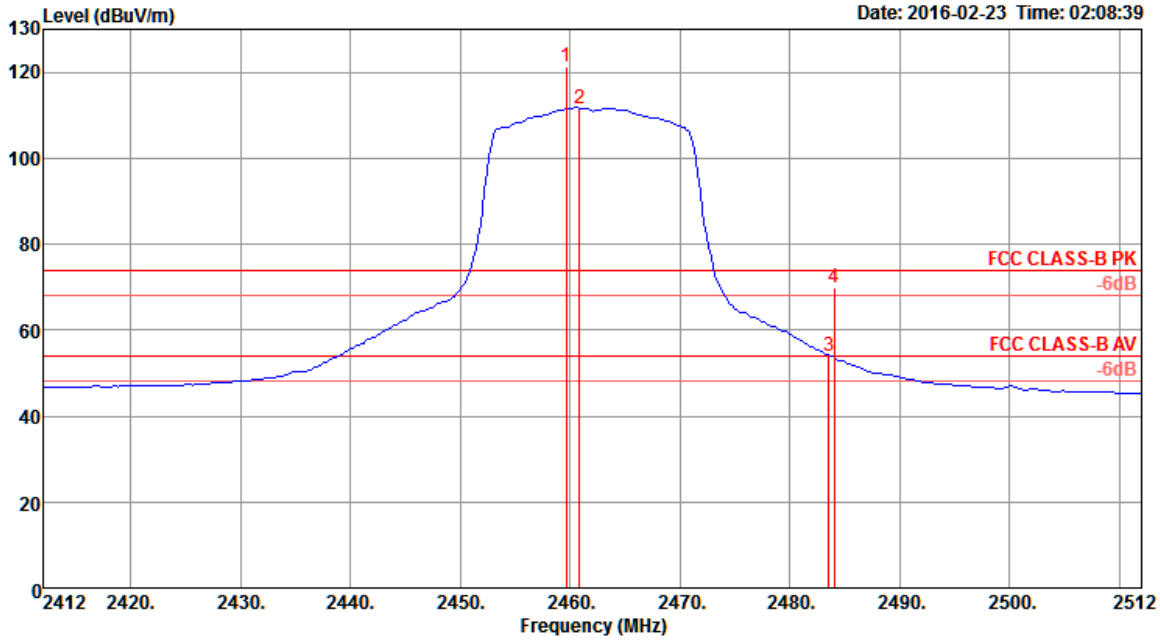
Channel 6



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2388.60	47.21	54.00	-6.79	15.34	3.85	28.02	0.00	337	234	Average	VERTICAL
2	2389.00	60.45	74.00	-13.55	28.58	3.85	28.02	0.00	337	234	Peak	VERTICAL
3	2435.00	124.26			92.41	3.88	27.97	0.00	337	234	Peak	VERTICAL
4	2435.00	114.24			82.39	3.88	27.97	0.00	337	234	Average	VERTICAL
5	2487.40	63.42	74.00	-10.58	31.58	3.92	27.92	0.00	337	234	Peak	VERTICAL
6	2513.40	48.17	54.00	-5.83	16.29	3.93	27.95	0.00	337	234	Average	VERTICAL

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

Channel 11

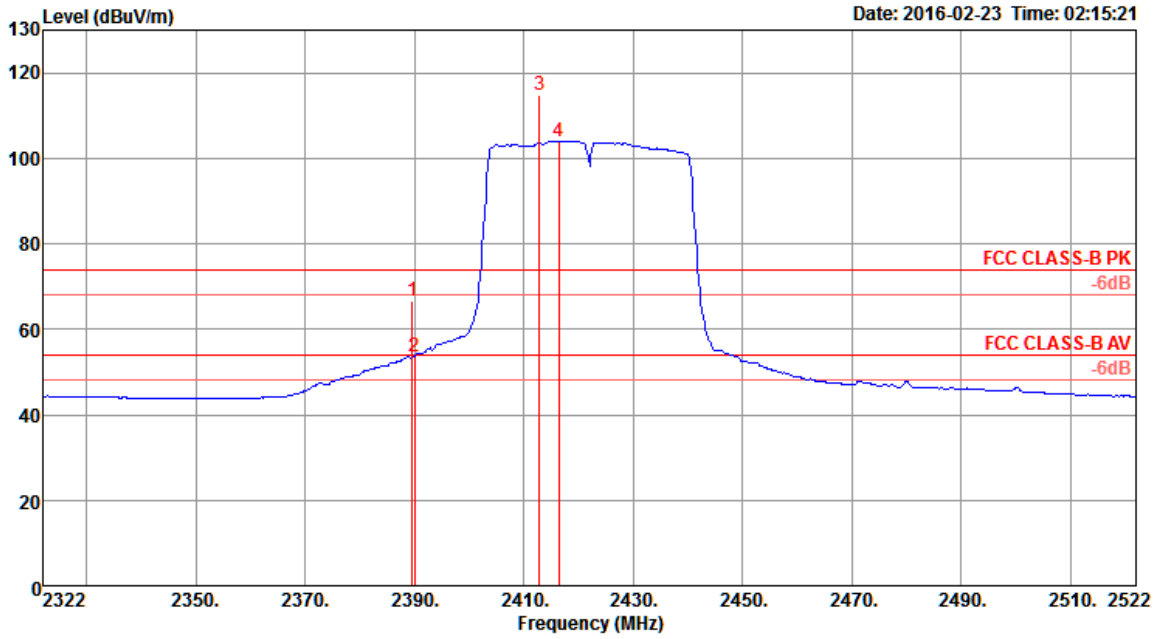


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2459.60	121.47			89.62	3.90	27.95	0.00	61	204	Peak	VERTICAL
2	2460.80	111.67			79.83	3.90	27.94	0.00	61	204	Average	VERTICAL
3	2483.50	53.80	54.00	-0.20	21.96	3.92	27.92	0.00	61	204	Average	VERTICAL
4	2484.00	70.04	74.00	-3.96	38.20	3.92	27.92	0.00	61	204	Peak	VERTICAL

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

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4

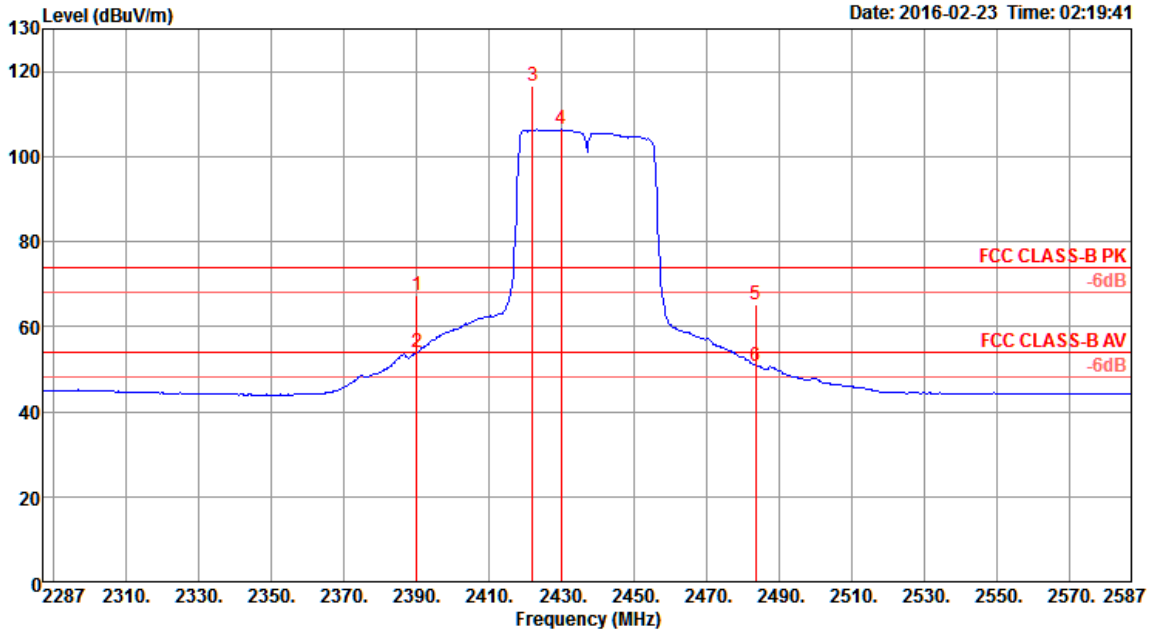
Channel 3



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.60	66.61	74.00	-7.39	34.74	3.85	28.02	0.00	43	232	Peak	VERTICAL
2	2390.00	53.61	54.00	-0.39	21.74	3.85	28.02	0.00	43	232	Average	VERTICAL
3	2412.80	114.97			83.11	3.87	27.99	0.00	43	232	Peak	VERTICAL
4	2416.40	104.07			72.21	3.87	27.99	0.00	43	232	Average	VERTICAL

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

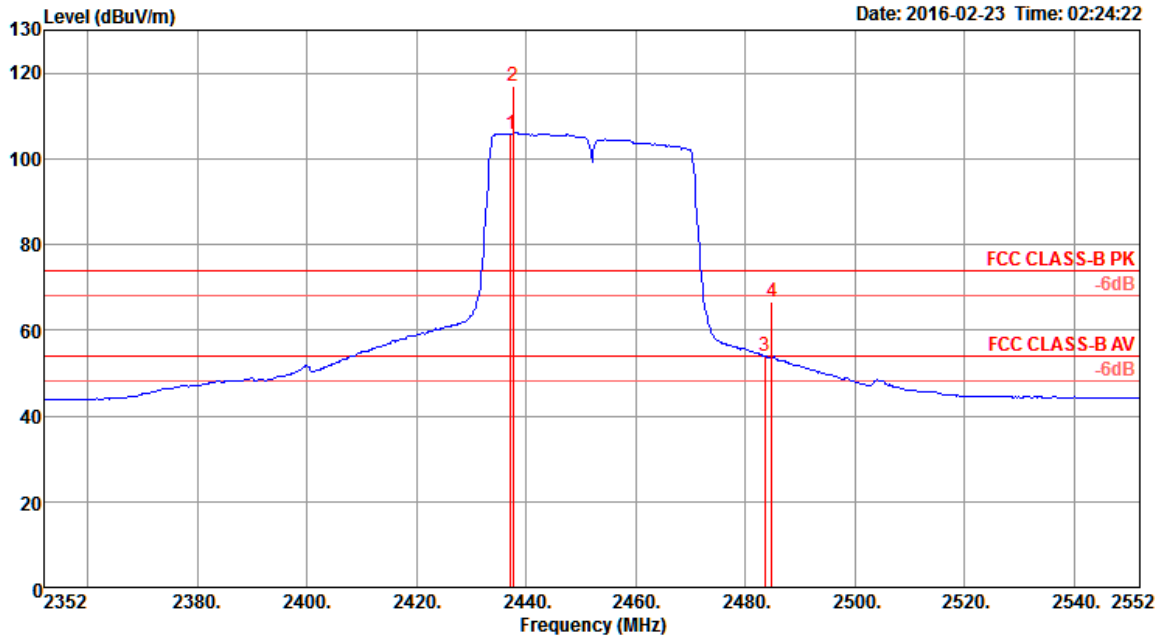
Channel 6



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2390.00	67.27	74.00	-6.73	35.40	3.85	28.02	0.00	340	216	Peak	VERTICAL
2	2390.00	53.79	54.00	-0.21	21.92	3.85	28.02	0.00	340	216	Average	VERTICAL
3	2422.00	116.69			84.83	3.87	27.99	0.00	340	216	Peak	VERTICAL
4	2429.80	106.42			74.56	3.88	27.98	0.00	340	216	Average	VERTICAL
5	2483.50	65.20	74.00	-8.80	33.36	3.92	27.92	0.00	340	216	Peak	VERTICAL
6	2483.50	50.82	54.00	-3.18	18.98	3.92	27.92	0.00	340	216	Average	VERTICAL

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

Channel 9

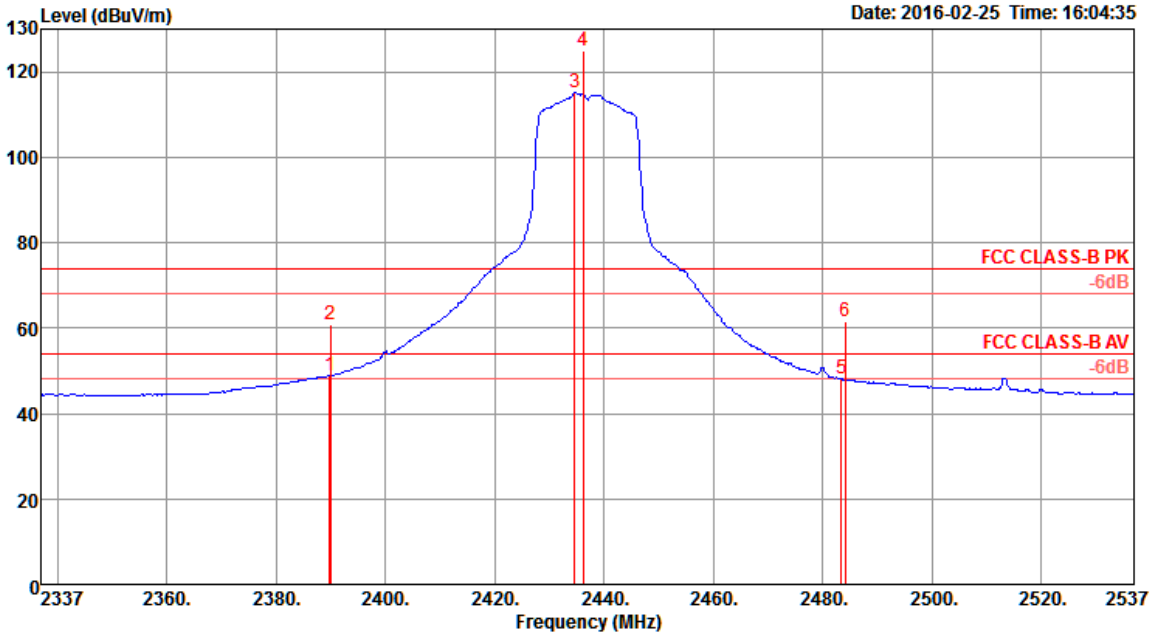


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2437.20	105.87			74.02	3.88	27.97	0.00	53	258	Average	VERTICAL
2	2437.60	116.79			84.94	3.88	27.97	0.00	53	258	Peak	VERTICAL
3	2483.50	53.95	54.00	-0.05	22.11	3.92	27.92	0.00	53	258	Average	VERTICAL
4	2484.80	66.72	74.00	-7.28	34.88	3.92	27.92	0.00	53	258	Peak	VERTICAL

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

Temperature	22.9°C	Humidity	57%
Test Engineer	Charlie Cheng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel 6



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.80	48.75	54.00	-5.25	17.00	3.73	28.02	0.00	259	279	Average	VERTICAL
2	2390.00	60.99	74.00	-13.01	29.24	3.73	28.02	0.00	259	279	Peak	VERTICAL
3	2434.60	115.10			83.36	3.77	27.97	0.00	259	279	Average	VERTICAL
4	2436.20	124.97			93.23	3.77	27.97	0.00	259	279	Peak	VERTICAL
5	2483.50	48.11	54.00	-5.89	16.38	3.81	27.92	0.00	259	279	Average	VERTICAL
6	2484.20	61.58	74.00	-12.42	29.85	3.81	27.92	0.00	259	279	Peak	VERTICAL

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

Note:

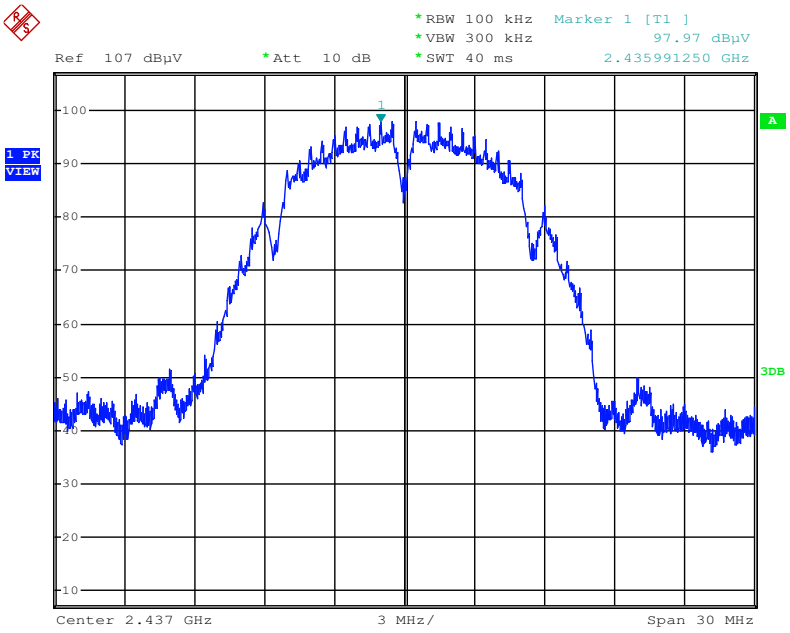
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

For Emission not in Restricted Band

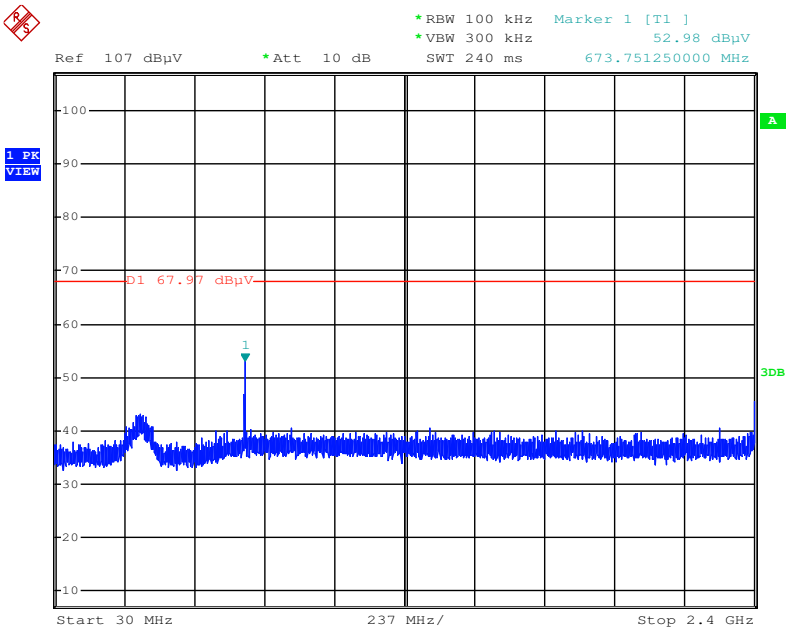
For Non-beamforming function:

Plot on Configuration IEEE 802.11b / Reference Level



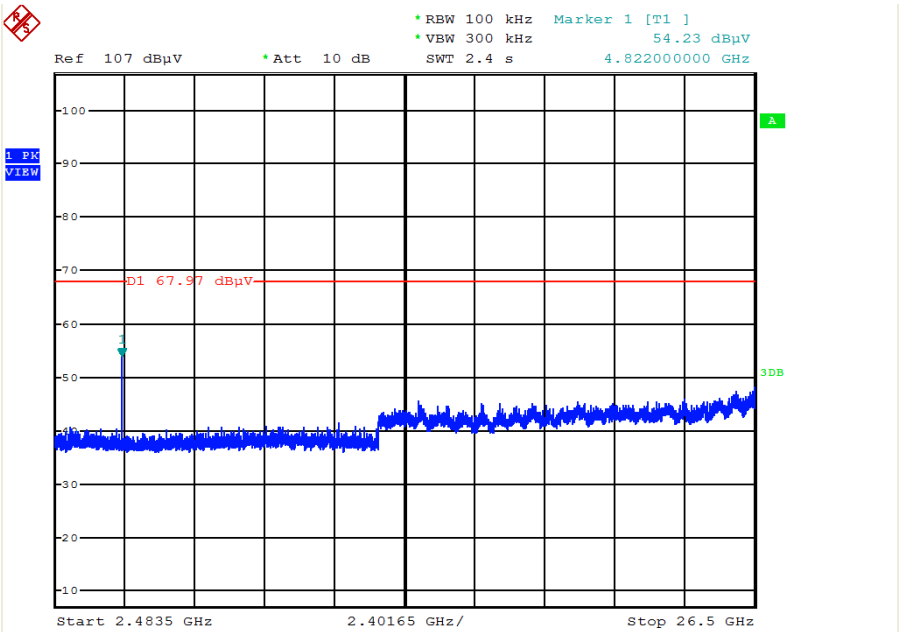
Date: 22.FEB.2016 17:06:24

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



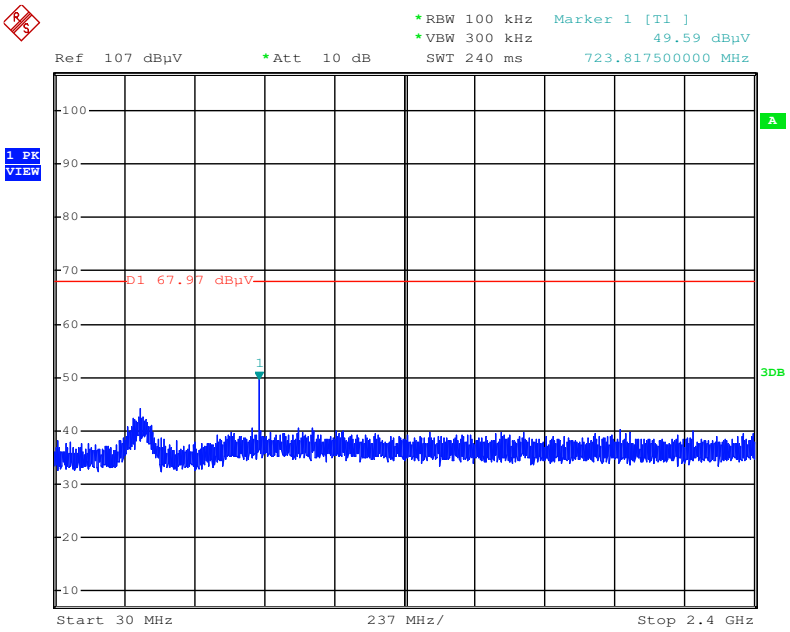
Date: 22.FEB.2016 17:08:50

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



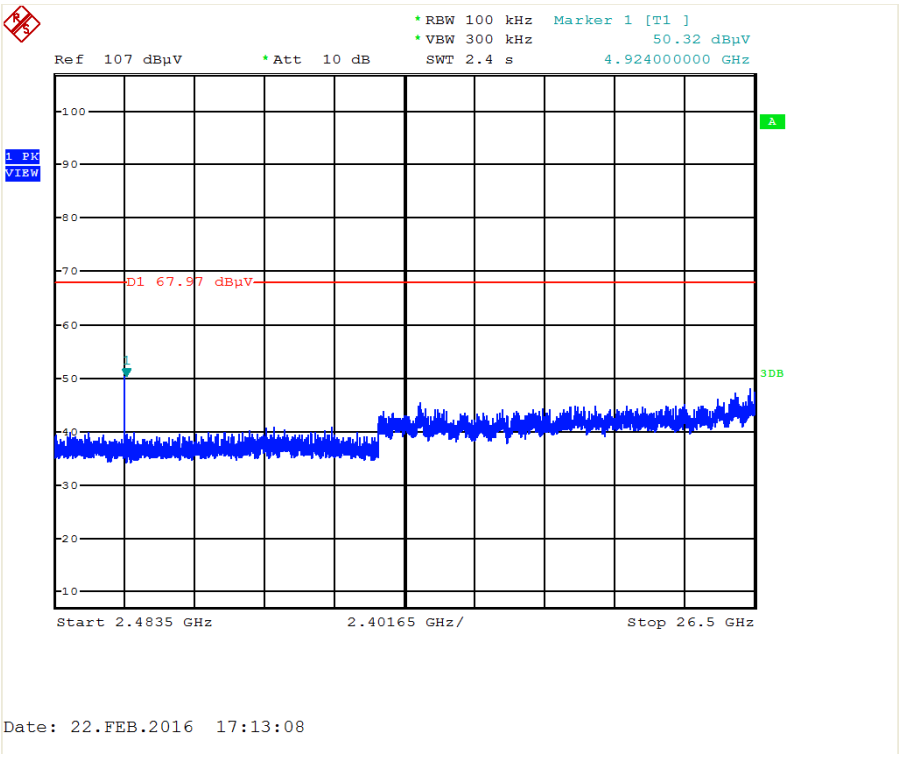
Date: 22.FEB.2016 17:10:50

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

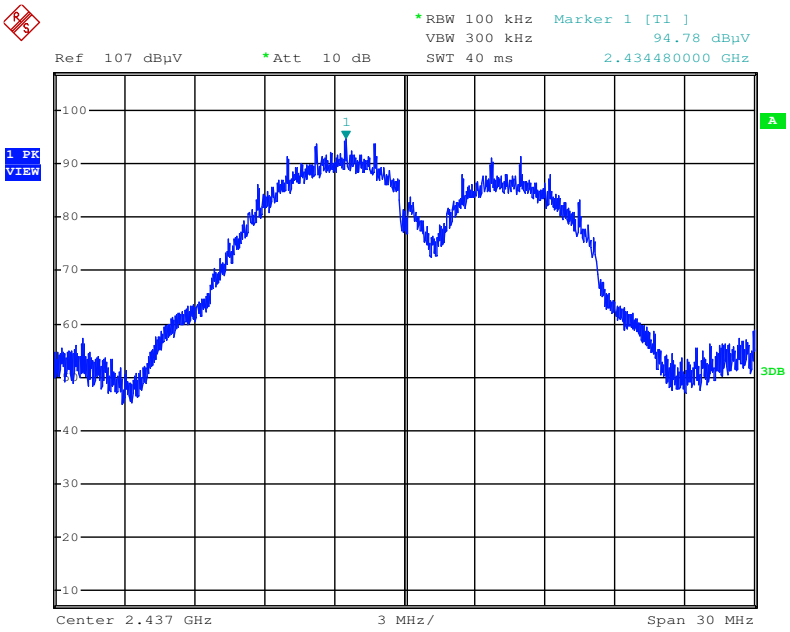


Date: 22.FEB.2016 17:14:19

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

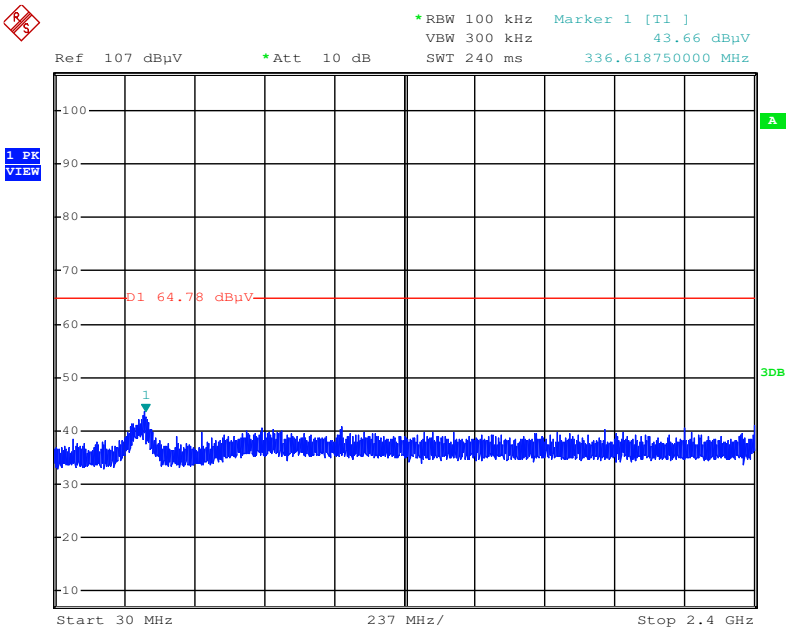


Plot on Configuration IEEE 802.11g / Reference Level



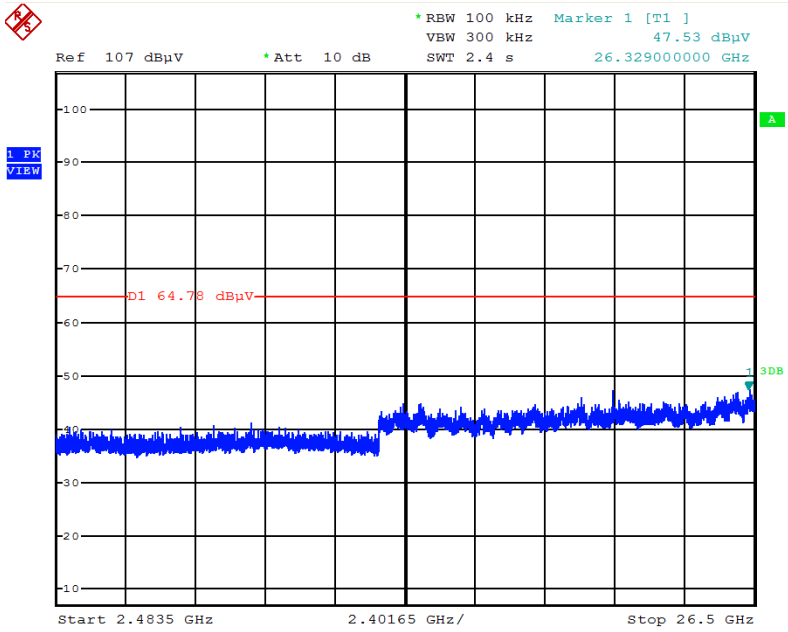
Date: 22.FEB.2016 17:20:14

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



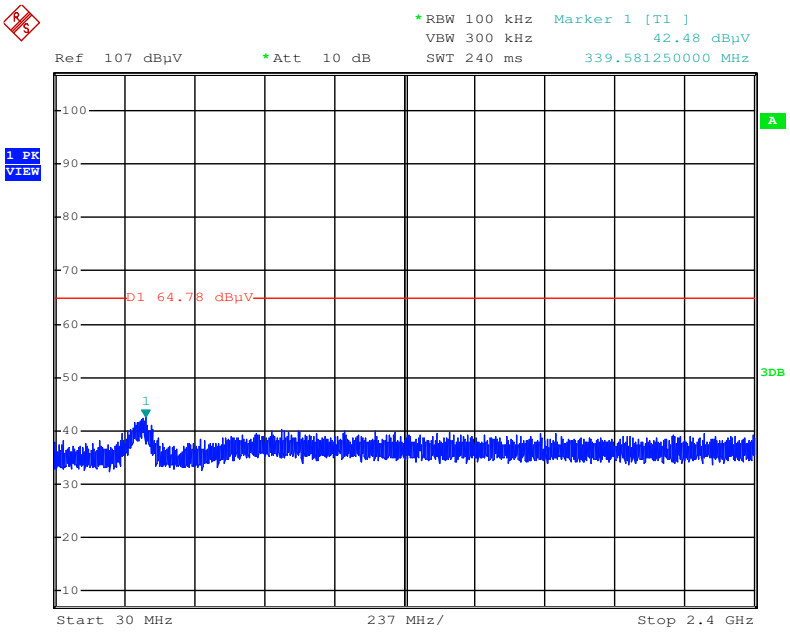
Date: 22.FEB.2016 17:22:02

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



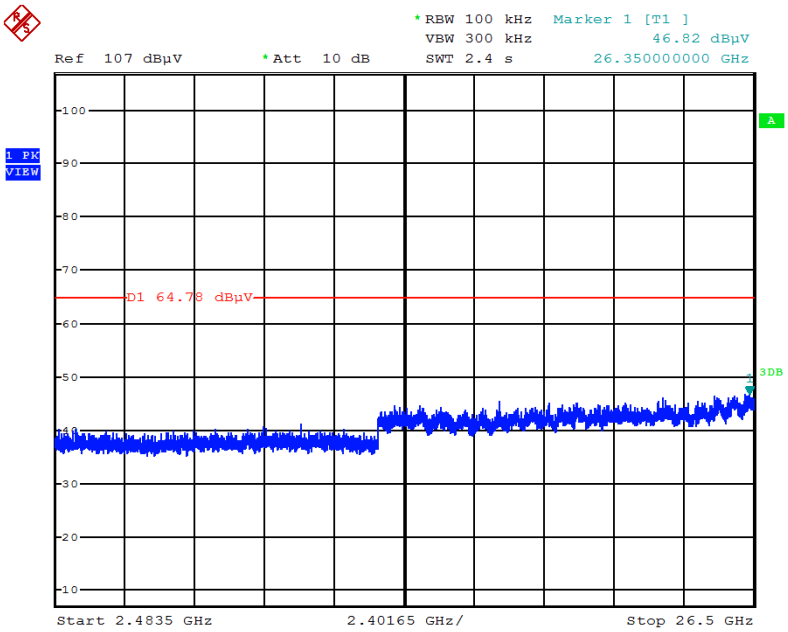
Date: 22.FEB.2016 17:24:50

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



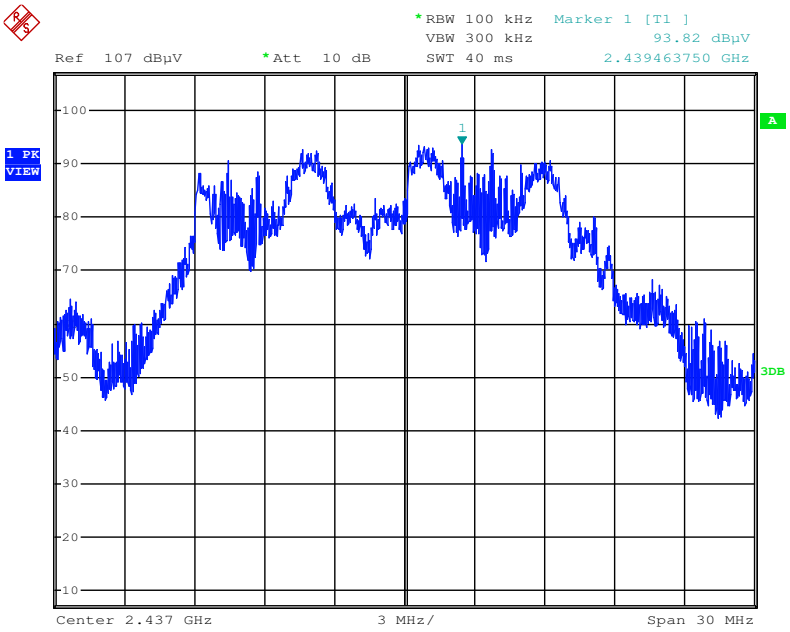
Date: 22.FEB.2016 17:27:11

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



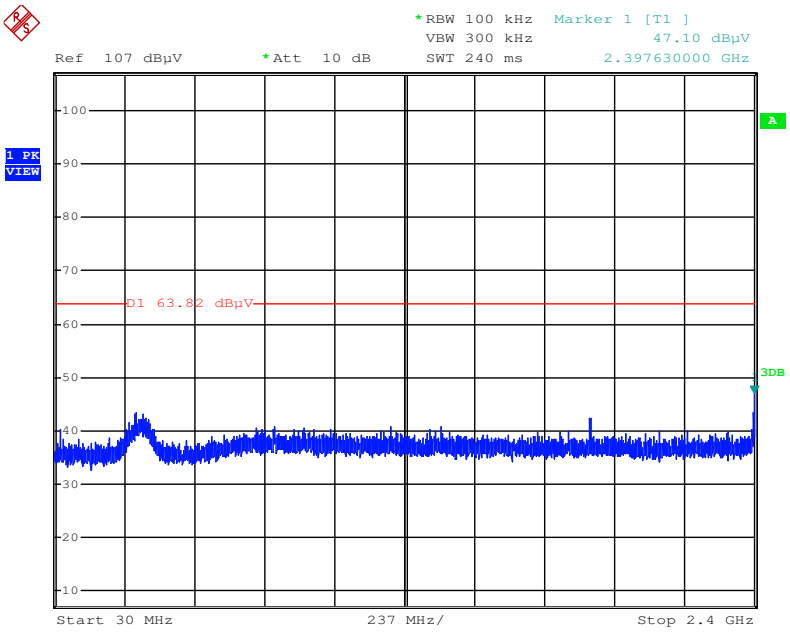
Date: 22.FEB.2016 17:26:20

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



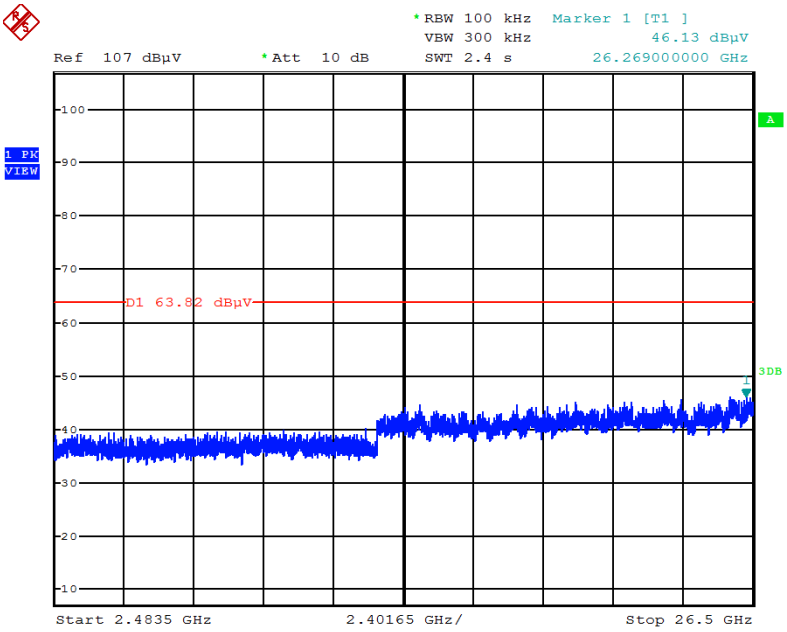
Date: 22.FEB.2016 17:41:03

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



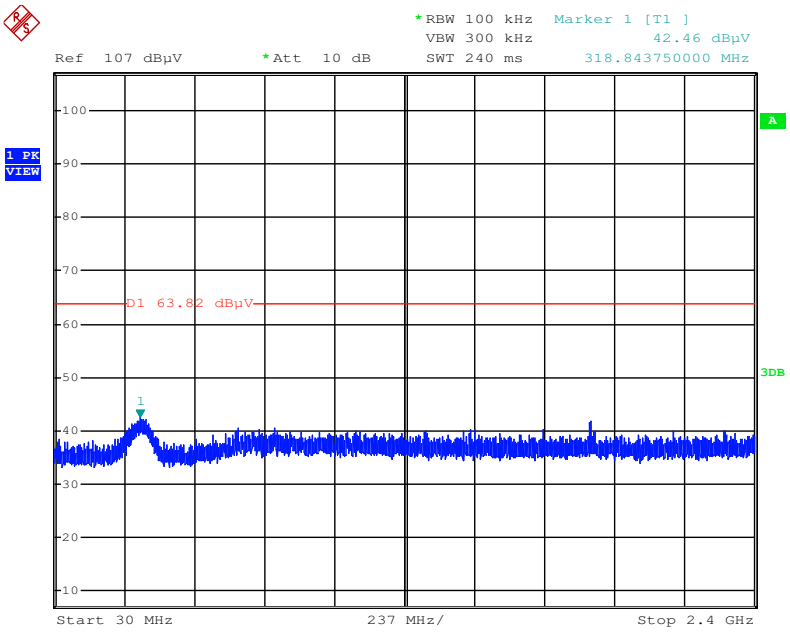
Date: 22.FEB.2016 17:44:44

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



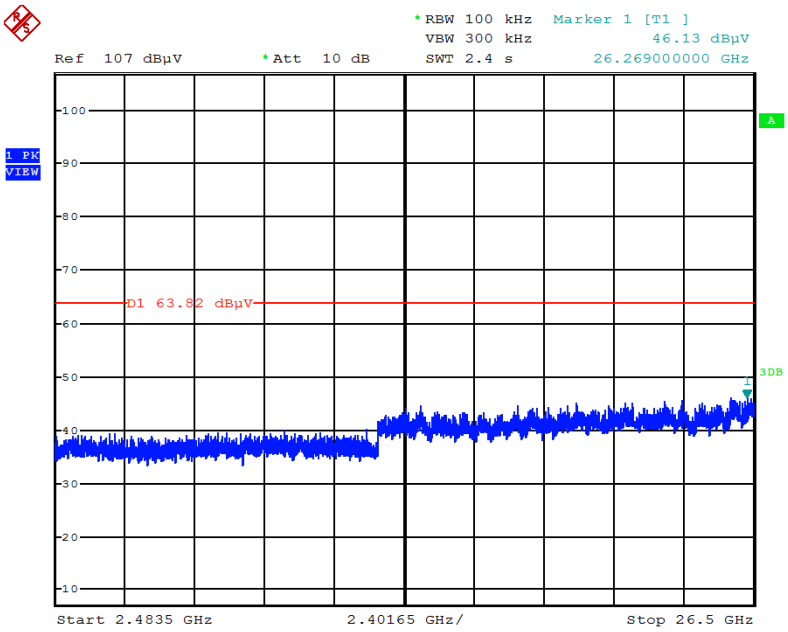
Date: 22.FEB.2016 17:45:32

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



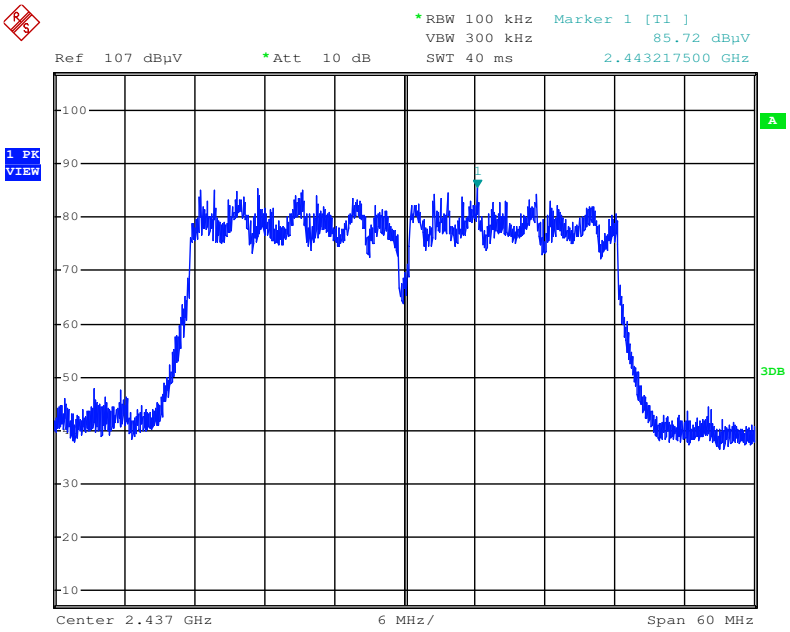
Date: 22.FEB.2016 17:47:36

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc)



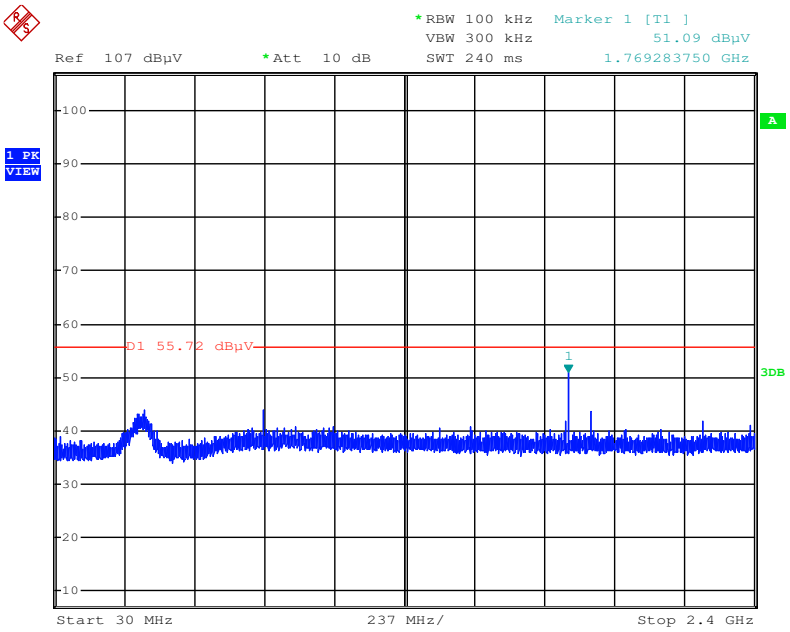
Date: 22.FEB.2016 17:45:32

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



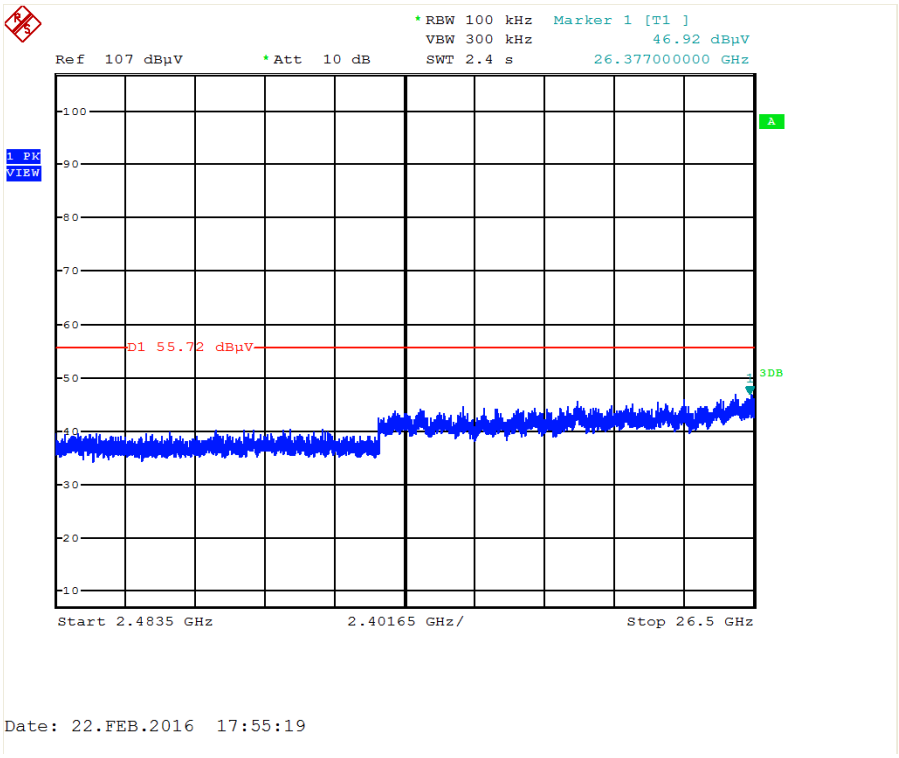
Date: 22.FEB.2016 17:50:40

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)

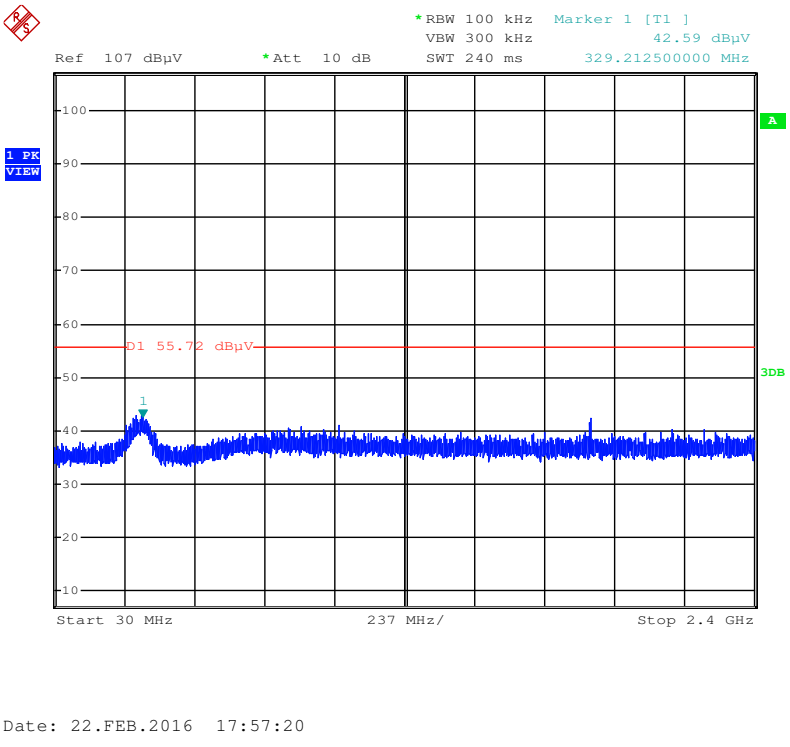


Date: 22.FEB.2016 17:53:53

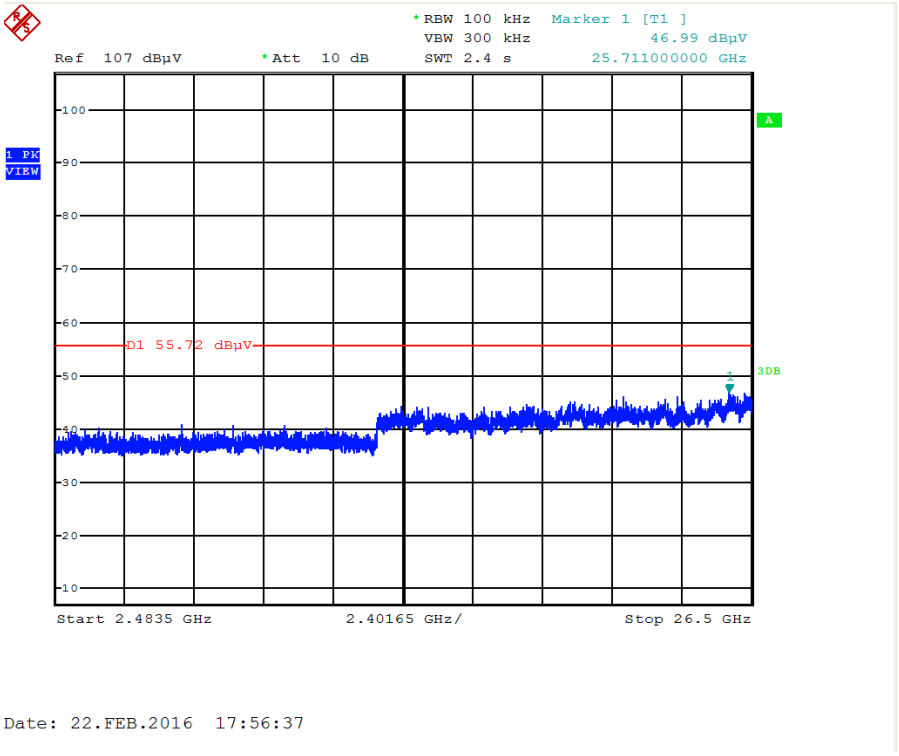
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc)



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)

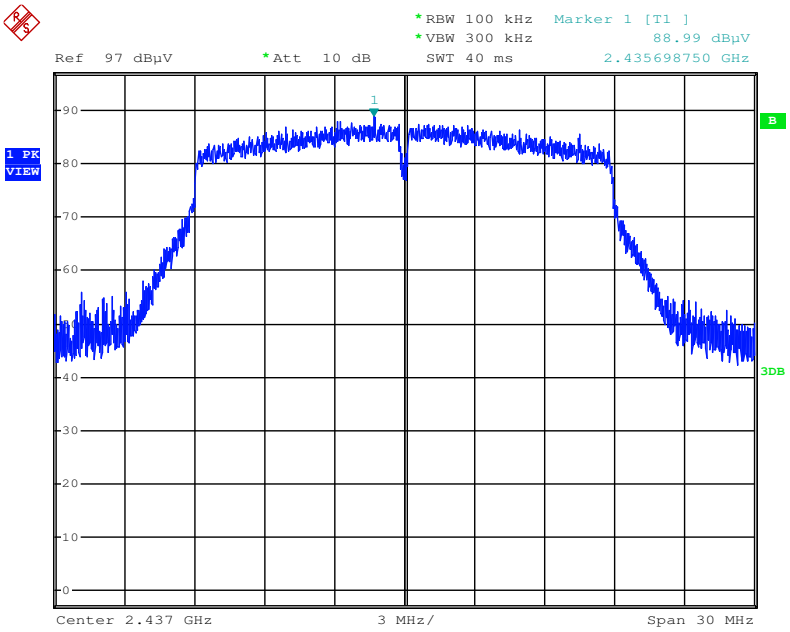


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc)



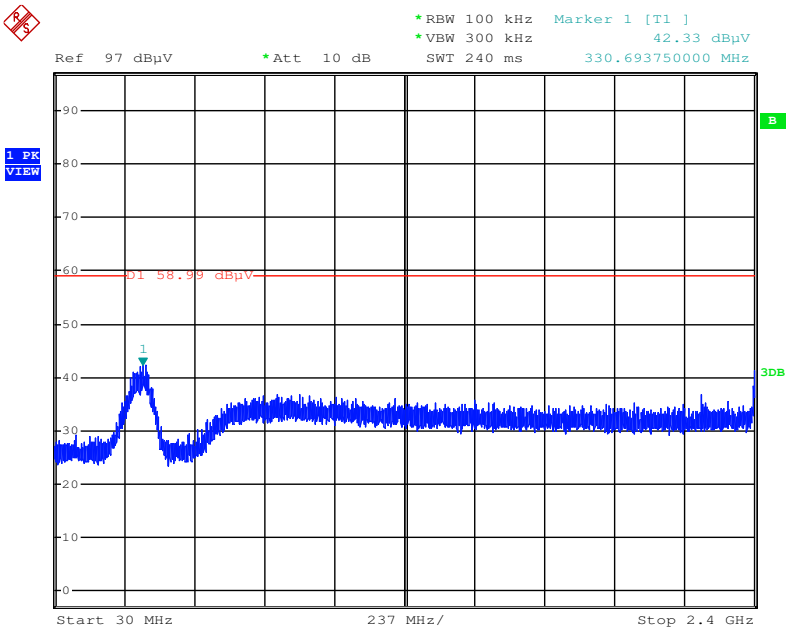
For Beamforming function:

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



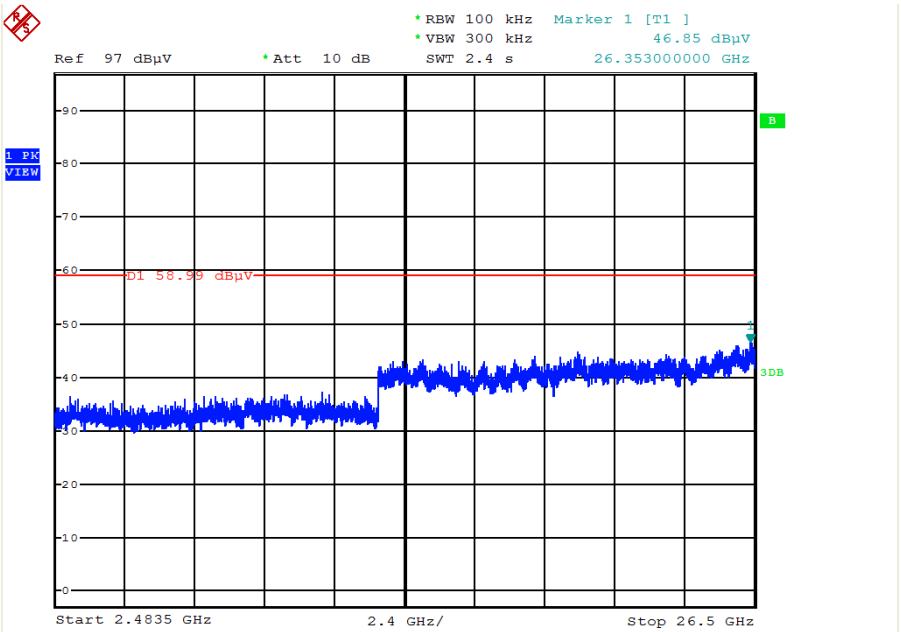
Date: 23.FEB.2016 02:54:48

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



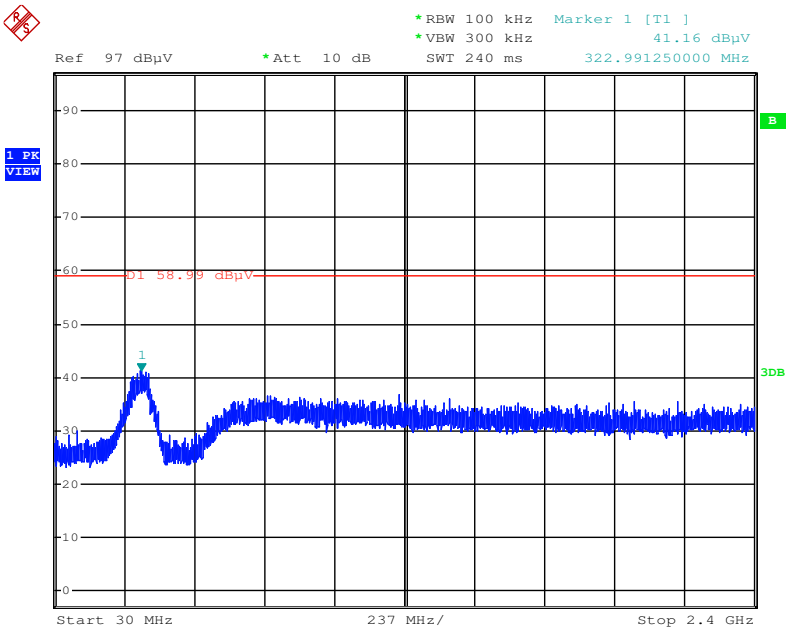
Date: 23.FEB.2016 02:59:21

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



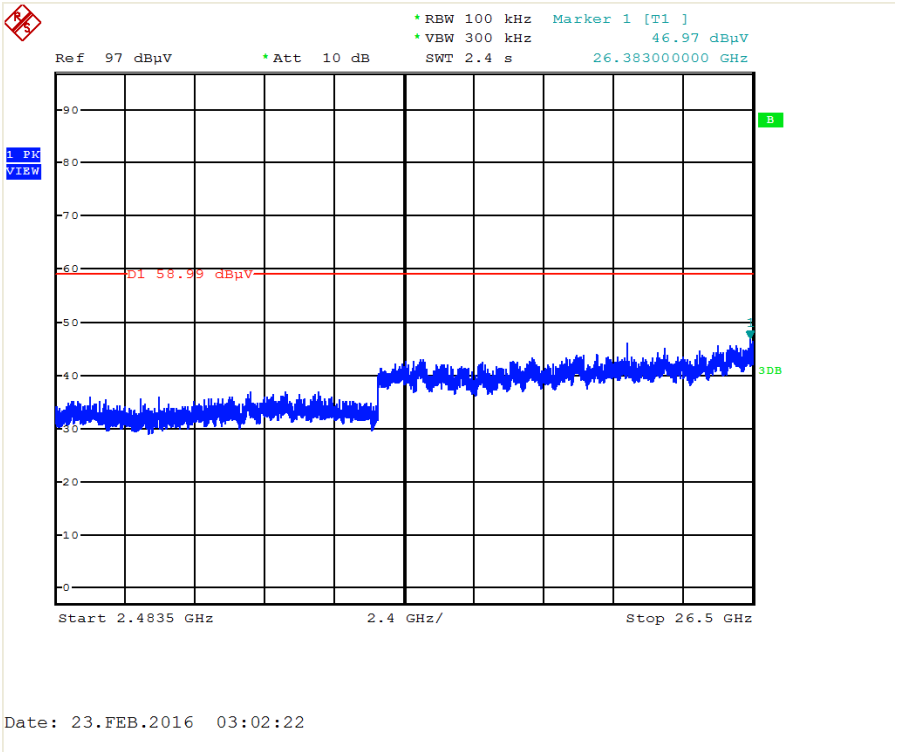
Date: 23.FEB.2016 03:00:31

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc)

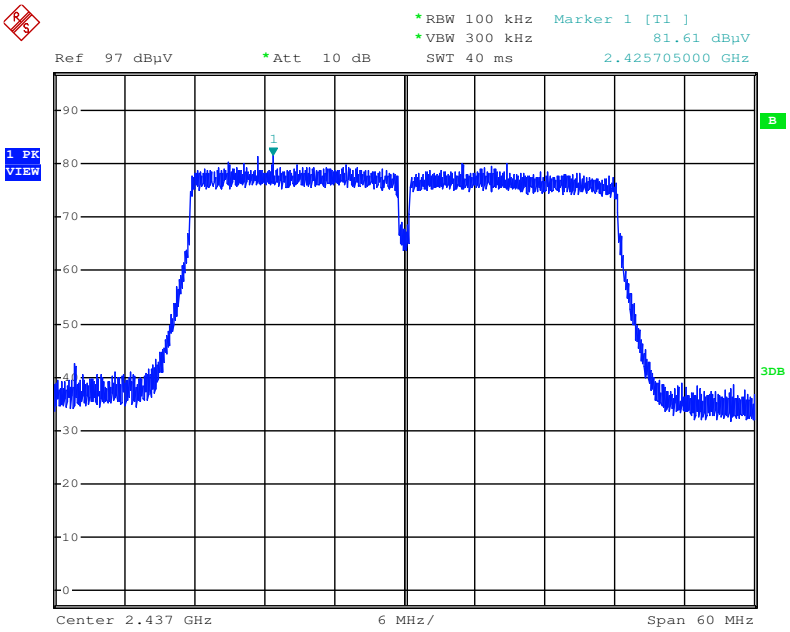


Date: 23.FEB.2016 03:02:50

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc)

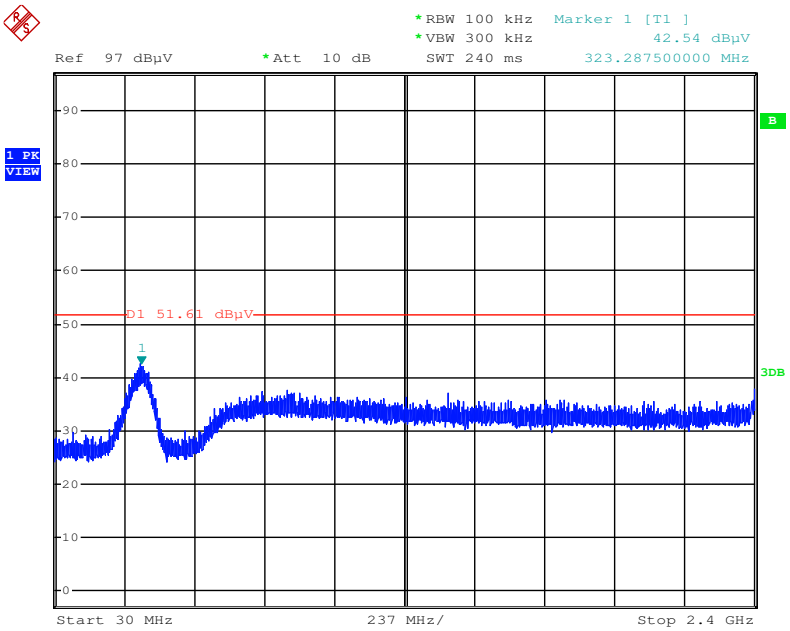


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



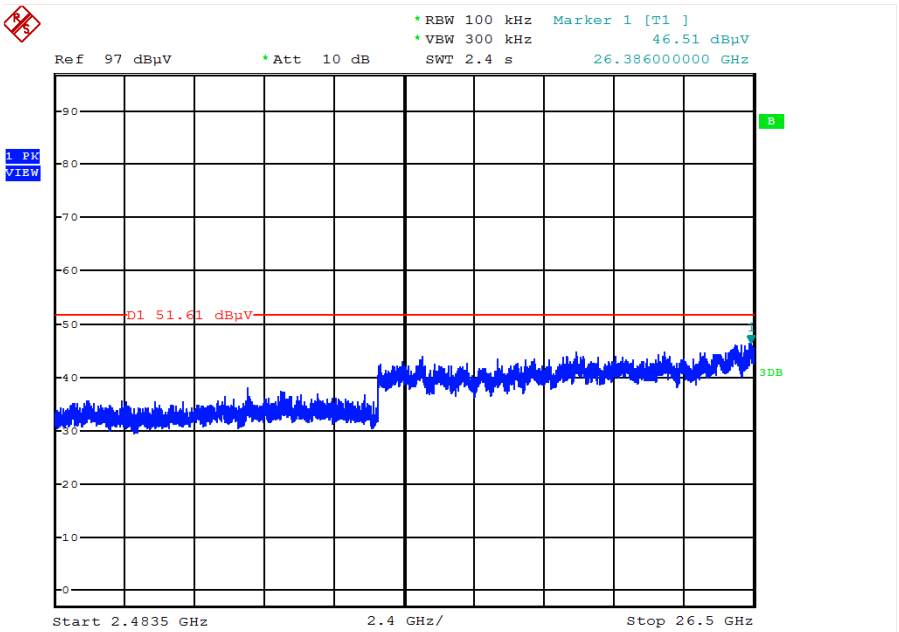
Date: 23.FEB.2016 03:05:03

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



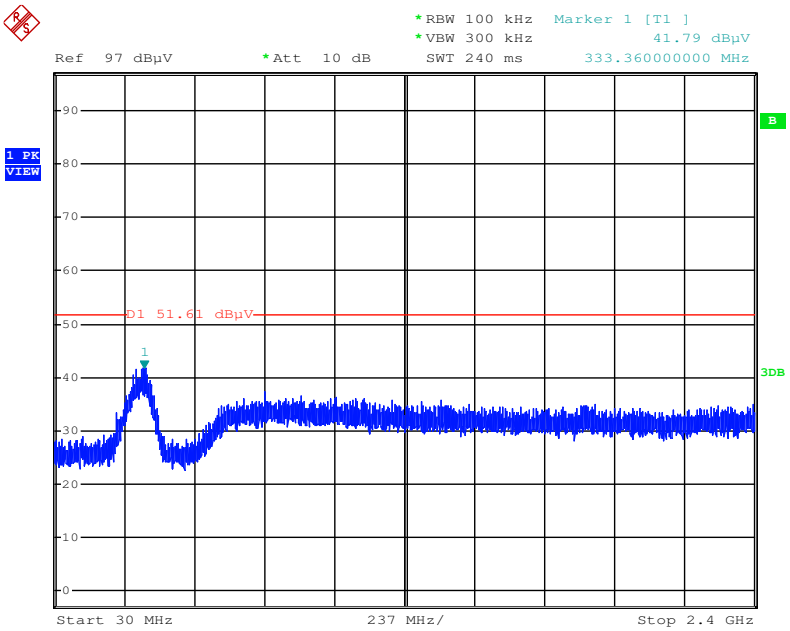
Date: 23.FEB.2016 03:06:42

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc)



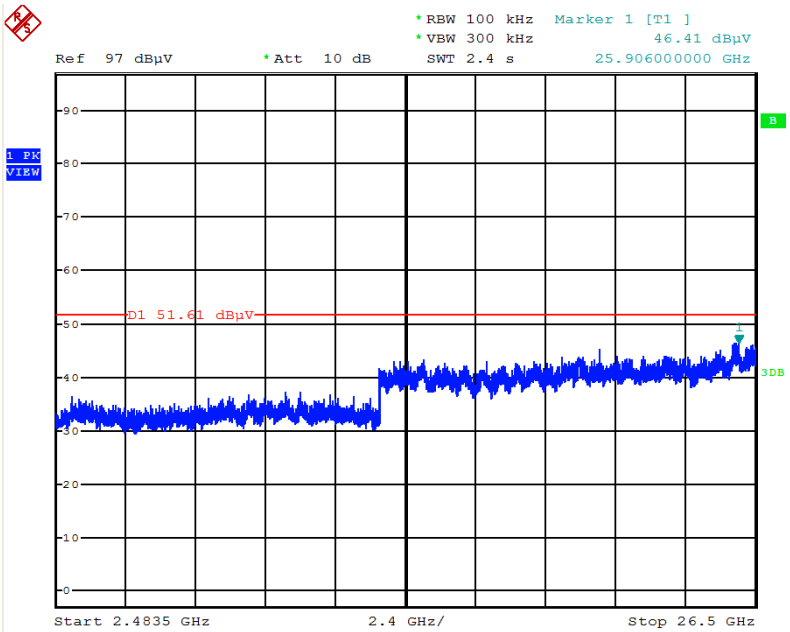
Date: 23.FEB.2016 03:07:19

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



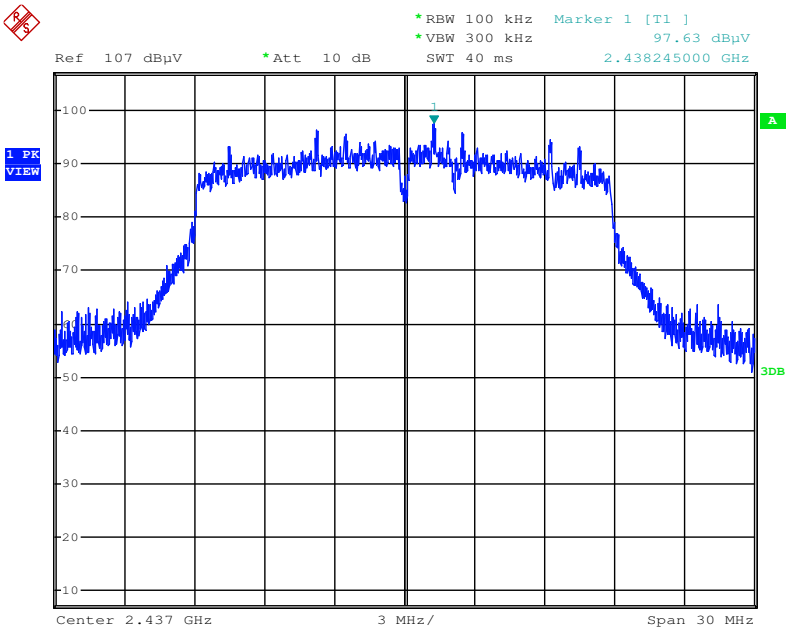
Date: 23.FEB.2016 03:10:00

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc)



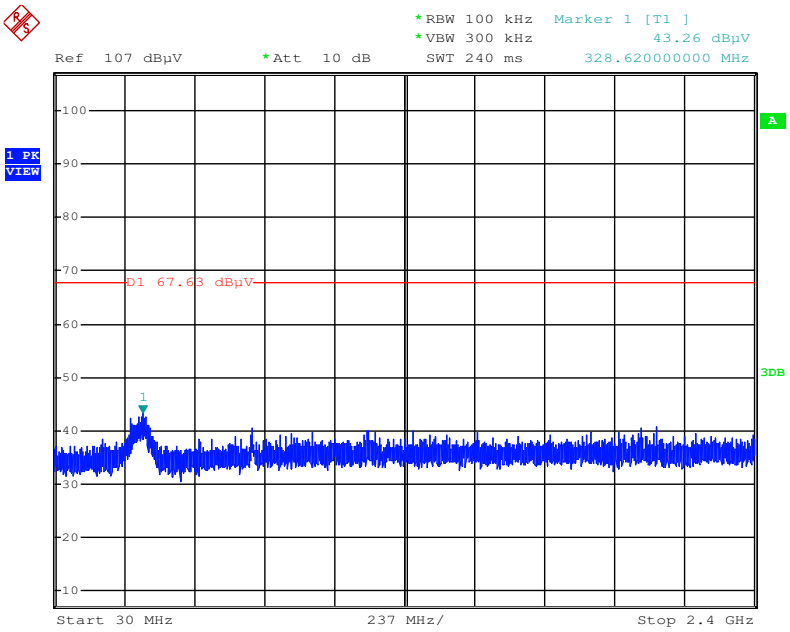
Date: 23.FEB.2016 03:09:00

Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Reference Level



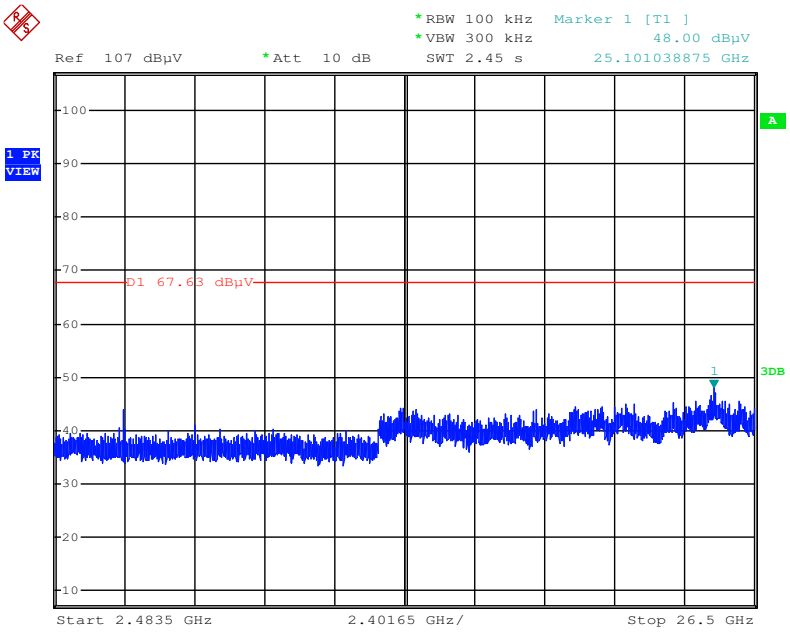
Date: 18.APR.2016 20:30:07

Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / CH 6 / 30MHz~2400MHz (down 30dBc)



Date: 18.APR.2016 20:31:56

Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / CH 6 / 2483.5MHz~26500MHz (down 30dBc)



Date: 18.APR.2016 20:32:52

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.

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. 14, 2016	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 21, 2016	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 24, 2016	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA with 6dB Attenator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2016	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	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)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 21, 2016	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 16, 2016	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 27, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 24, 2016	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)
Test Software	Audix	E3	6.2009-l0-7	N/A	N/A	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%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%
Bandwidth Measurement	9.74×10^{-8}	Confidence levels of 95%