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Test Report for FCC

FCC ID : 2ABUYEVB-A100

Report Number		ESTEFC1608-004		
Applicant	Company name	EMW Co., Ltd.		
	Address	80B-4L, 680-3, Gojan-Dong, Namdong-Gu, Incheon, Korea		
	Telephone	02-2107-5615		
Product	Product name	Wireless Video Bridge		
	Model No.	EVB-A100	Manufacturer	EMW Co., Ltd.
	Serial No.	NONE	Country of origin	KOREA
Test date	2016-5-16 ~ 2016-8-22		Date of issue	24-Aug-16
Testing location	ESTECH Co., Ltd. 347-69, Jungbu-daero 147beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do 467-811, R. O. Korea			
Standard	FCC PART 15 Subpart E (15.407):2015 , ANSI C 63.10(2013) , KDB 789033 D02(2016)			
Measurement facility registration number	659627			
Tested by	Engineer S.S.An (Signature)			
Reviewed by	Engineering Manager J.M.Yang (Signature)			
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable			

* Note

- This test report is not permitted to copy partly without our permission
- This test result is dependent on only equipment to be used
- This test result based on a single evaluation of one sample of the above mentioned

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1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.
ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.
ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co., Ltd.

Head Office : Suite 1015 World Meridian II, 123 Gasan Digital 2-ro, Geumcheon-gu, Seoul 153-759, R. O. Korea

EMC Test Lab. : 347-69, Jungbu-daero 147beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do 467-811, R. O. Korea

1.3 Official Qualification(s)

KCC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication
FCC : Conformity Assessment Body(CAB) with registration number 659627 under APEC TEL MRA between the RRA and the FCC
VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test (WLAN)

Modulation Type : WLAN(OFDM)
Rating : INPUT : DC 12 V, 1 A

Receipt Date : 9-Dec-15

X-tal list(s) or Frequencies generated : The highest operating frequency is 5825 MHz(WLAN)
XTAL : 32.768 kHz , OSC : 26 MHz , WLAN : 5700 MHz

2.2 General descriptions of EUT

Item	Specificaions
Model	EVB-A100
Frequency Range	5GHz (5.150 ~ 5.250, 5.735 ~ 5.835 GHz)
Wi-Fi	IEEE 802.11ac
Modulation	OFDM
Bandwidth	40MHz / 80MHZ
RF Commnunications	4x4 MIMO
Data Rates(PHY)	1.7 Gbps Max
Channel Avoidance	Dynamic Smart Channel
Beamforming	Universal Beamforming Supported
Simultaneous Channels	128CH Max (Full HD)
Wireless Coverage	3Km LOS

2.2 General descriptions of EUT

Minimu Sensitivity	-86 dBm (40MHz, MCS0) -63 dBm (40MHz, MCS9) -83 dBm (80MHz, MCS0) -59 dBm (80MHz, MCS9)
Output (Per Chain)	21dBm@5GHz
Antenna	19dBi
IP	IPv4 / IPv6
Security	WPA2 / AES
Ethernet	Gigabit Etherne Portt 10/100/1000 Base-T
Protocol	TCP/ UDP / DHCP
LED	Power / Link / Quality / Mode
RESET	Supported
Power Supply	DC12V / 1A
Power Consumption	7W (Max)
Operation Temperature	Operating : -20°C to 70°C, Storage : -30°C to 85°C
Dimensions	135mm x 82mm x 24.8

3. Test Standards

Test Standard : FCC PART 15 Subpart E (15.407) : 2010

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2009) & KDB 789033 D02 (2016)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain decides that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment These method apply to the measurement of individual units or systems comprised of multiple units

Summary of Test Results

Applied Satandard : 47 CFR Part 15 Subpart E & RSS 210-Part I and II				remark
Standard	Test Type	Result	Remark	
15.407	AC Power Conducted Emission	Pass	Meet the requirement	LINE CONDUCTED
15.205 15.209 15.407(b.1) 15.407(b.2) 15.407(b.3)	Transmitter radiated spurious emissions and Conducted spurious emission	Pass	Meet the requirement	RADIATED
N/A	26 dB Bandwidth	Pass	Meet the requirement	CONDUCTED
15.407(a.1)	6 dB Bandwidth	Pass	Meet the requirement	
15.407(a.1) 15.407(a.2)	Maximum ouput power	Pass	Meet the requirement	
15.407(a.1) 15.407(a.1),(5)	Power Spectral Density	Pass	Meet the requirement	
15.407(g)	Frequency Stability	Pass	Meet the requirement	
15.407(a.6)	Band Edge Measurement	Pass	Meet the requirement	
15.407(h)	DFS - Channel closing transmission time - Channel move time - Non occupied period	N/A	Meet the requirement	

4. Measurement Condition

4.1 EUT Operation(For 802.11ac)

a. Channel

Mode	UNII Band	Channel Bandwidth (MHz)	NII BAND Freq.	Total Average Power(dBm
802.11ac VHT20	1	20	5180 - 5240	17.22
	3	20	5745 - 5825	17.64
802.11ac VHT40	1	40	5190 - 5230	15.40
	3	40	5755 - 5795	19.43
802.11ac VHT80	1	80	5210	14.67
	3	80	5775	18.98

b. Measurement Channel : 802.11ac VHT20 (5745 MHz),(5785 MHz),(5825 MHz)
802.11ac VHT40 (5755 MHz),(5795 MHz)
802.11ac VHT80 (5775 MHz)

c. Test Mode : 802.11ac VHT20,VHT40, VHT80 UNII

d. Test rate : the worst case of rate
802.11ac VHT20:6.5/7.2, 13/14.4, 19.5/21.7, 26/28.9, 39/43.3, 52/57.8, 58.5/65, 65/72.2, 78/86.7
802.11ac VHT40:13.5/15, 27/30, 40.5/45, 54/60, 81/90, 108/120, 121.5/135, 135/150, 162/180, 180/200
802.11ac VHT80:29.3/32.5, 58.5/65, 87.8/97.5, 117/130, 175.5/195, 234/260, 263.3/292.5
292.5/325, 351/390, 390/433.3

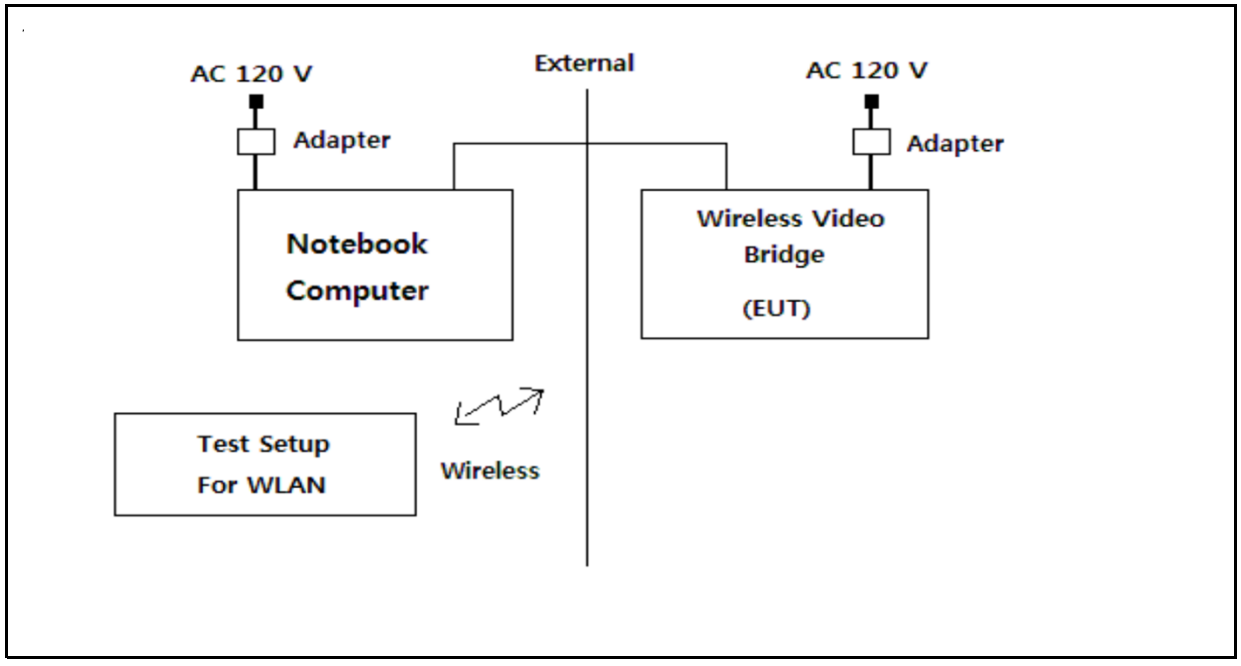
4.2 EUT Operation.

* Execute a RF test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.

* Connect the EUT to Notebook Computer / LAN port of the Notebook Computer.

* Ping Data transmission / receiving.

4.3 Configuration and Peripherals



4.4 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
Wireless Video Bridge	EVB-A100	NONE	EMW Co., Ltd.	EUT
Adapter	PF-120400	NONE	NONE	
Notebook Computer	LG15N54	412NZHH305305	LG Electronics	
Adapter	PA-1900-14	NONE	LITE-ON	

4.5 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
Wireless Video Bridge	Power	Adapter	-	2.0	Shielded	
Wireless Video Bridge	LAN	Notebook Computer	LAN	3.0	Unshielded	
Wireless Video Bridge	WLAN (5.0 GHz)	WLAN SETUP SYSTEM	WLAN (5.0 GHz)	-	-	
Notebook Computer	Power	Adapter	-	2.0	Shielded	

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC PART 15.205, 15.209 & IC RSS-210 (A8.5). The test setup was made according to ANSI C 63.4 (2009) & KDB 789033 D01 Semi-anechoic chamber, which allows a 3 m distance measurement. The EUT was placed in the center of styrofoam turntable. The height of this table was 0.8 m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test setup.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESCI7	ROHDE & SCHWARZ	100916	7-Dec-16
Logbicon Antenna	VULB 9168	SCHWARZBECK	9168-193	30-Sep-16
Turn Table	DT3000-2t	Innco System GmbH	N/A	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-
PREAMPLIFIER	8449B	AGILENT	3008A00581	7-Dec-16
Horn Antenna	BBHA9120D	SCHWARZBECK	469	3-Sep-16
Test Receiver	ESPI7	ROHDE & SCHWARZ	100185	7-Dec-16
Spectrum Analyzer	R3273	ADVANTEST	110600592	19-Oct-16
Turn Table	DT1500-S	Innco System GmbH	N/A	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-
Pyramidal Horn Antenna	3160-09-01	EST-LINDGREN	00102642	3-Sep-16
Antenna Master & Turn table controller	CO2000-P	Innco System GmbH	CO2000/642 /28051111/L	-
Spectrum Analyzer	FSV40	ROHDE & SCHWARZ	100939	12-Jan-17
Broad-Band Horn Antenna	SB AC BBHA	SCHWARZBECK	752	23-Jun-16
AMPLIFIER	TK-PA1840H	TestekCo	N/A	23-Jun-16

5.2 Environmental Condition

Below 1 GHz -Test Place : 10 m Semi-anechoic chamber

Wireless LAN 802.11ac VHT 20
Temperature (°C) : 20.8 ℃
Humidity (% R.H.) : 50.8 % R.H.

Wireless LAN 802.11ac VHT 40
Temperature (°C) : 20.9 ℃
Humidity (% R.H.) : 50.8 % R.H.

Wireless LAN 802.11ac VHT 80
Temperature (°C) : 20.8 ℃
Humidity (% R.H.) : 50.6 % R.H.

Above 1 GHz-Test Place : 3 m Semi-anechoic chamber

Wireless LAN 802.11ac CH - 38.46.151.159
Temperature (°C) : (20.2 ~20.9) ℃
Humidity (% R.H.) : (50.1 ~ 50.2) % R.H.

Wireless LAN 802.11ac CH - 36.42.149.155
Temperature (°C) : (20.3 ~ 20.9) ℃
Humidity (% R.H.) : 50.2 % R.H.

Wireless LAN 802.11ac CH - 44.48.157.165
Temperature (°C) : (20.4 ~ 21.2) ℃
Humidity (% R.H.) : (50.3 ~ 50.8) % R.H.

5.3 Measurement Instrument setting for Radiated Emission

5.3.1 Frequency range below 1 GHz

RBW: 120 kHz , VBW: 3 x RBW , Detector: Quasi Peak

5.3.2 Frequency range above 1 GHz

Peak Power Measurement Procedure (KDB 789033 section H3) 5)

a.RBW: 1 MHz , VBW: 3 MHz
b.Trace mode = max hold
c.Detector: Peak
d.Sweep time = auto

Average Power Measurement Procedures (KDB 789033 section H3) 6)

a.Set analyzer center frequency to the frequency associated with the emission
b.RBW: 1 MHz , VBW: 3 MHz
c.Detector : RMS detector
d.Sweep time = auto

Note

Band	Duty cycle(%)	Ton (ms)	Ton + Toff (ms)	DCF=10*log(1/Duty) (dB)
802.11ac	91.46	0.56	0.61	0.39

*This was applied of duty cycle factor for average value because of measured with the EUT transmitting continuously less than 100% duty cycle at its maximum power control level.

5.4-1 Test Data for wireless LAN (802.11ac) - VHT 20

Test Date : 18-May-16 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
360.00	17.63	H	2.2	14.84	3.05	46.00	35.52	-10.48
376.00	21.01	H	1.5	15.20	3.12	46.00	39.33	-6.67
400.00	16.39	H	2.8	15.74	3.23	46.00	35.36	-10.64
416.00	14.44	V	1.5	16.11	3.29	46.00	33.85	-12.15
500.00	15.71	H	1.8	18.07	3.62	46.00	37.40	-8.60
750.00	10.40	V	2.1	22.01	4.52	46.00	36.92	-9.08

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11ac-VHT 20 *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Result Value = Reading + Ant Factor + Cable loss *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz.

5.4-2 Test Data for wireless LAN (802.11ac) - VHT 40

Test Date : 18-May-16 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
350.00	17.35	H	1.9	14.62	3.00	46.00	34.96	-11.04
375.00	20.13	H	1.6	15.18	3.12	46.00	38.42	-7.58
400.00	16.57	H	2.3	15.74	3.23	46.00	35.54	-10.46
408.00	14.30	H	2.0	15.93	3.26	46.00	33.49	-12.51
415.00	14.64	H	1.7	16.09	3.29	46.00	34.02	-11.98
750.00	9.90	H	2.2	22.01	4.52	46.00	36.42	-9.58

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11ac-VHT 40 *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Result Value = Reading + Ant Factor + Cable loss *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz.

5.4-3 Test Data for wireless LAN (802.11ac) - VHT 80

Test Date : 18-May-16 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
360.00	17.95	V	2.1	14.84	3.05	46.00	35.84	-10.16
375.00	20.95	V	2.4	15.18	3.12	46.00	39.24	-6.76
400.00	16.67	H	3.8	15.74	3.23	46.00	35.64	-10.36
416.00	14.64	H	4.0	16.11	3.29	46.00	34.05	-11.95
500.00	15.19	V	1.8	18.07	3.62	46.00	36.88	-9.12
750.00	9.72	H	2.4	22.01	4.52	46.00	36.24	-9.76

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11ac-VHT 80 *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Result Value = Reading + Ant Factor + Cable loss *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz.

5.5-1 Test Data for wireless LAN (802.11ac) - CH 38, 46

Test Date : 16-May-16 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK (RBW:1 MHz VBW:3 MHz)									
5149.00	47.03	H	1.0	31.52	-25.35	0.00	74.00	53.20	-20.80
5149.00	52.81	V	1.0	31.52	-25.35	0.00	74.00	58.98	-15.02
10380.00	36.08	H	1.0	39.00	-15.34	0.00	74.00	59.74	-14.26
10380.00	37.24	V	1.0	39.00	-15.34	0.00	74.00	60.90	-13.10
Average (RBW:1 MHz VBW:3 MHz)									
5149.00	36.61	H	1.0	31.52	-25.35	0.39	54.00	43.17	-10.83
5149.00	42.46	V	1.0	31.52	-25.35	0.39	54.00	49.02	-4.98
10380.00	22.18	H	1.0	39.00	-15.34	0.39	54.00	46.23	-7.77
10380.00	22.50	V	1.0	39.00	-15.34	0.39	54.00	46.55	-7.45
PEAK (RBW:1 MHz VBW:3 MHz)									
5352.00	44.19	H	1.0	31.60	-25.76	0.00	74.00	50.03	-23.97
5352.00	46.94	V	1.0	31.60	-25.76	0.00	74.00	52.78	-21.22
10460.00	35.24	H	1.0	39.13	-15.34	0.00	74.00	59.03	-14.97
10460.00	34.92	V	1.0	39.13	-15.30	0.00	74.00	58.75	-15.25
Average (RBW:1 MHz VBW:3 MHz)									
5352.00	35.10	H	1.0	31.60	-25.76	0.39	54.00	41.33	-12.67
5352.00	37.14	V	1.0	31.60	-25.76	0.39	54.00	43.37	-10.63
10460.00	21.64	H	1.0	39.13	-15.30	0.39	54.00	45.86	-8.14
10460.00	21.41	V	1.0	39.13	-15.30	0.39	54.00	45.63	-8.37

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11ac-CH 38 (5190 MHz), CH 46 (5230 MHz) *The TX signal wasn't detected from 3th harmonics. *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction FYI a. Ton Time : 0.557 ms b. duty cycle : 91.46 % c. DCF : 0.39 dB

5.5-1 Test Data for wireless LAN (802.11ac) - CH 151, 159

Test Date : 16-May-16 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK (RBW:1 MHz VBW:3 MHz)									
5402.00	45.26	H	1.0	31.62	-26.28	0.00	74.00	50.60	-23.40
5402.00	47.44	V	1.0	31.62	-26.28	0.00	74.00	52.78	-21.22
11510.00	38.82	H	1.0	39.49	-19.90	0.00	74.00	58.41	-15.59
11510.00	38.87	V	1.0	39.49	-19.90	0.00	74.00	58.46	-15.54
Average (RBW:1 MHz VBW:3 MHz)									
5402.00	36.72	H	1.0	31.62	-26.28	0.39	54.00	42.34	-11.66
5402.00	36.82	V	1.0	31.62	-26.28	0.39	54.00	42.44	-11.56
11510.00	24.30	H	1.0	39.49	-19.90	0.39	54.00	44.17	-9.83
11510.00	24.84	V	1.0	39.49	-19.90	0.39	54.00	44.71	-9.29
PEAK (RBW:1 MHz VBW:3 MHz)									
5450.00	43.06	H	1.0	31.64	-26.09	0.00	74.00	48.62	-25.38
5450.00	45.92	V	1.0	31.64	-26.09	0.00	74.00	51.48	-22.52
11590.00	37.76	H	1.0	39.41	-19.84	0.00	74.00	57.33	-16.67
11590.00	37.94	V	1.0	39.41	-19.84	0.00	74.00	57.51	-16.49
Average (RBW:1 MHz VBW:3 MHz)									
5450.00	36.76	H	1.0	31.64	-26.09	0.39	54.00	42.60	-11.40
5450.00	38.33	V	1.0	31.64	-26.09	0.39	54.00	44.17	-9.83
11590.00	24.62	H	1.0	39.41	-19.84	0.39	54.00	44.47	-9.53
11590.00	25.21	V	1.0	39.41	-19.84	0.39	54.00	45.06	-8.94

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11ac-CH 151 (5755 MHz), CH 159 (5795 MHz) *The TX signal wasn't detected from 3th harmonics. *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction FYI a. Ton Time : 0.557 ms b. duty cycle : 91.46 % c. DCF : 0.39 dB

5.5-2 Test Data for wireless LAN (802.11ac) - CH 36, 42

Test Date : 16-May-16 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK (RBW:1 MHz VBW:3 MHz)									
5141.00	47.68	H	1.0	31.52	-25.43	0.00	74.00	53.77	-20.23
5141.00	49.23	V	1.0	31.52	-25.43	0.00	74.00	55.32	-18.68
10360.00	35.92	H	1.0	38.96	-15.34	0.00	74.00	59.54	-14.46
10360.00	36.78	V	1.0	38.96	-15.34	0.00	74.00	60.40	-13.60
Average (RBW:1 MHz VBW:3 MHz)									
5141.00	37.49	H	1.0	31.52	-25.43	0.39	54.00	43.97	-10.03
5141.00	38.15	V	1.0	31.52	-25.43	0.39	54.00	44.63	-9.37
10360.00	23.97	H	1.0	38.96	-15.34	0.39	54.00	47.98	-6.02
10360.00	23.92	V	1.0	38.96	-15.34	0.39	54.00	47.93	-6.07
PEAK (RBW:1 MHz VBW:3 MHz)									
5148.00	47.27	H	1.0	31.52	-25.37	0.00	74.00	53.42	-20.58
5148.00	53.86	V	1.0	31.52	-25.37	0.00	74.00	60.01	-13.99
10420.00	36.88	H	1.0	39.06	-15.34	0.00	74.00	60.60	-13.40
10420.00	36.77	V	1.0	39.06	-15.30	0.00	74.00	60.53	-13.47
Average (RBW:1 MHz VBW:3 MHz)									
5148.00	36.41	H	1.0	31.52	-25.37	0.39	54.00	42.95	-11.05
5148.00	41.91	V	1.0	31.52	-25.37	0.39	54.00	48.45	-5.55
10420.00	22.42	H	1.0	39.06	-15.30	0.39	54.00	46.57	-7.43
10420.00	22.86	V	1.0	39.06	-15.30	0.39	54.00	47.01	-6.99

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11ac-CH 36 (5180 MHz), CH 42 (5210 MHz) *The TX signal wasn't detected from 3th harmonics. *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction FYI a. Ton Time : 0.557 ms b. duty cycle : 91.46 % c. DCF : 0.39 dB

5.5-2 Test Data for wireless LAN (802.11ac) - CH 149, 155

Test Date : 16-May-16 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK (RBW:1 MHz VBW:3 MHz)									
5447.00	44.41	H	1.0	31.64	-26.10	0.00	74.00	49.95	-24.05
5447.00	46.01	V	1.0	31.64	-26.10	0.00	74.00	51.55	-22.45
11490.00	37.79	H	1.0	39.52	-19.90	0.00	74.00	57.41	-16.59
11490.00	37.31	V	1.0	39.52	-19.90	0.00	74.00	56.92	-17.08
Average (RBW:1 MHz VBW:3 MHz)									
5447.00	34.60	H	1.0	31.64	-26.10	0.39	54.00	40.42	-13.58
5447.00	36.26	V	1.0	31.64	-26.10	0.39	54.00	42.08	-11.92
11490.00	26.12	H	1.0	39.52	-19.90	0.39	54.00	46.01	-7.99
11490.00	26.30	V	1.0	39.52	-19.90	0.39	54.00	46.19	-7.81
PEAK (RBW:1 MHz VBW:3 MHz)									
5451.00	44.37	H	1.0	31.64	-26.10	0.00	74.00	49.93	-24.07
5451.00	46.17	V	1.0	31.64	-26.10	0.00	74.00	51.73	-22.27
11650.00	35.21	H	1.0	39.35	-19.80	0.00	74.00	54.76	-19.24
11650.00	35.94	V	1.0	39.35	-19.80	0.00	74.00	55.49	-18.51
Average (RBW:1 MHz VBW:3 MHz)									
5451.00	35.70	H	1.0	31.64	-26.08	0.39	54.00	41.54	-12.46
5451.00	37.69	V	1.0	31.64	-26.08	0.39	54.00	43.53	-10.47
11650.00	25.42	H	1.0	39.35	-19.80	0.39	54.00	45.25	-8.75
11650.00	25.88	V	1.0	39.35	-19.80	0.39	54.00	45.71	-8.29

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11ac-CH 149 (5745 MHz), CH 155 (5775 MHz) *The TX signal wasn't detected from 3th harmonics. *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction FYI a. Ton Time : 0.557 ms b. duty cycle : 91.46 % c. DCF : 0.39 dB

5.5-2 Test Data for wireless LAN (802.11ac) - CH 44, 48

Test Date : 17-May-16 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK (RBW:1 MHz VBW:3 MHz)									
5147.00	46.15	H	1.0	31.52	-25.38	0.00	74.00	52.29	-21.71
5147.00	48.01	V	1.0	31.52	-25.38	0.00	74.00	54.15	-19.85
10440.00	36.82	H	1.0	39.10	-15.34	0.00	74.00	60.58	-13.42
10440.00	37.04	V	1.0	39.10	-15.34	0.00	74.00	60.80	-13.20
Average (RBW:1 MHz VBW:3 MHz)									
5147.00	36.71	H	1.0	31.52	-25.38	0.39	54.00	43.24	-10.76
5147.00	37.59	V	1.0	31.52	-25.38	0.39	54.00	44.12	-9.88
10440.00	24.05	H	1.0	39.10	-15.34	0.39	54.00	48.20	-5.80
10440.00	24.10	V	1.0	39.10	-15.34	0.39	54.00	48.25	-5.75
PEAK (RBW:1 MHz VBW:3 MHz)									
5362.00	45.10	H	1.0	31.61	-25.81	0.00	74.00	50.90	-23.10
5362.00	46.96	V	1.0	31.61	-25.81	0.00	74.00	52.76	-21.24
10440.00	37.08	H	1.0	39.10	-15.34	0.00	74.00	60.84	-13.16
10440.00	37.87	V	1.0	39.10	-15.30	0.00	74.00	61.67	-12.33
Average (RBW:1 MHz VBW:3 MHz)									
5362.00	35.35	H	1.0	31.61	-25.81	0.39	54.00	41.54	-12.46
5362.00	36.94	V	1.0	31.61	-25.81	0.39	54.00	43.13	-10.87
10440.00	23.08	H	1.0	39.10	-15.30	0.39	54.00	47.27	-6.73
10440.00	23.22	V	1.0	39.10	-15.30	0.39	54.00	47.41	-6.59

Remark

H : Horizontal, V : Vertical TEST MODE : 802.11ac-CH 44 (5220 MHz), CH 48 (5240 MHz)

*The TX signal wasn't detected from 3th harmonics.
*Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position)
*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction

FYI
a. Ton Time : 0.557 ms
b. duty cycle : 91.46 %
c. DCF : 0.39 dB

5.5-2 Test Data for wireless LAN (802.11ac) - CH 157, 165

Test Date : 17-May-16 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK (RBW:1 MHz VBW:3 MHz)									
5455.00	44.24	H	1.0	31.65	-26.07	0.00	74.00	49.82	-24.18
5455.00	45.58	V	1.0	31.65	-26.07	0.00	74.00	51.16	-22.84
11570.00	37.50	H	1.0	39.43	-19.86	0.00	74.00	57.08	-16.92
11570.00	37.82	V	1.0	39.43	-19.86	0.00	74.00	57.40	-16.60
Average (RBW:1 MHz VBW:3 MHz)									
5455.00	34.40	H	1.0	31.65	-26.07	0.39	54.00	40.26	-13.74
5455.00	36.15	V	1.0	31.65	-26.07	0.39	54.00	42.01	-11.99
10570.00	25.06	H	1.0	39.43	-19.86	0.39	54.00	44.92	-9.08
10570.00	25.40	V	1.0	39.43	-19.86	0.39	54.00	45.26	-8.74
PEAK (RBW:1 MHz VBW:3 MHz)									
5453.00	44.79	H	1.0	31.65	-26.08	0.00	74.00	50.36	-23.64
5453.00	45.63	V	1.0	31.65	-26.08	0.00	74.00	51.20	-22.80
11650.00	37.79	H	1.0	39.35	-19.80	0.00	74.00	57.34	-16.66
11650.00	37.31	V	1.0	39.35	-19.80	0.00	74.00	56.86	-17.14
Average (RBW:1 MHz VBW:3 MHz)									
5453.00	34.62	H	1.0	31.65	-26.08	0.39	54.00	40.47	-13.53
5453.00	36.19	V	1.0	31.65	-26.08	0.39	54.00	42.04	-11.96
11650.00	25.16	H	1.0	39.35	-19.80	0.39	54.00	44.99	-9.01
11650.00	25.68	V	1.0	39.35	-19.80	0.39	54.00	45.51	-8.49

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11ac-CH 157 (5785 MHz), CH 165 (5825 MHz) *The TX signal wasn't detected from 3th harmonics. *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction FYI a. Ton Time : 0.557 ms b. duty cycle : 91.46 % c. DCF : 0.39 dB

6. Unwanted Emission

Above 30 MHz Electric Field strength was measured in accordance with FCC PART 15.205, 15.209 The test setup was made according to ANSI C 63.4 (2009) & KDB 789033 D02 Semi-anechoic chamber, which allows a 3 m distance measurement. The EUT was placed in the center of styrofoam turntable. The height of this table was 0.8 m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test setup.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESCI7	ROHDE & SCHWARZ	100916	7-Dec-16
Logbicon Antenna	VULB 9168	SCHWARZBECK	9168-193	30-Sep-16
Turn Table	DT3000-2t	Innco System GmbH	N/A	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-
PREAMPLIFIER	8449B	AGILENT	3008A00581	7-Dec-16
Horn Antenna	BBHA9120D	SCHWARZBECK	469	3-Sep-16
Test Receiver	ESPI7	ROHDE & SCHWARZ	100185	7-Dec-16
Spectrum Analyzer	R3273	ADVANTEST	110600592	19-Oct-16
Turn Table	DT1500-S	Innco System GmbH	N/A	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-
Pyramidal Horn Antenna	3160-09-01	EST-LINDGREN	00102642	3-Sep-16
Antenna Master & Turn table controller	CO2000-P	Innco System GmbH	CO2000/642 /28051111/L	-
Spectrum Analyzer	FSV40	ROHDE & SCHWARZ	100939	12-Jan-17
Broad-Band Horn Antenna	SB AC BBHA	SCHWARZBECK	752	23-Jun-16
AMPLIFIER	TK-PA1840H	TestekCo	N/A	23-Jun-16

6.2 Environmental Condition

Above 1 GHz -Test Place : 3 m Semi-anechoic chamber

Wireless LAN 802.11ac CH - 38.46.151.159

Temperature (°C) : (20.2 ~ 20.9) ℃
Humidity (% R.H.) : (50.1 ~ 50.2) % R.H.

Wireless LAN 802.11ac CH - 36.42.149.155

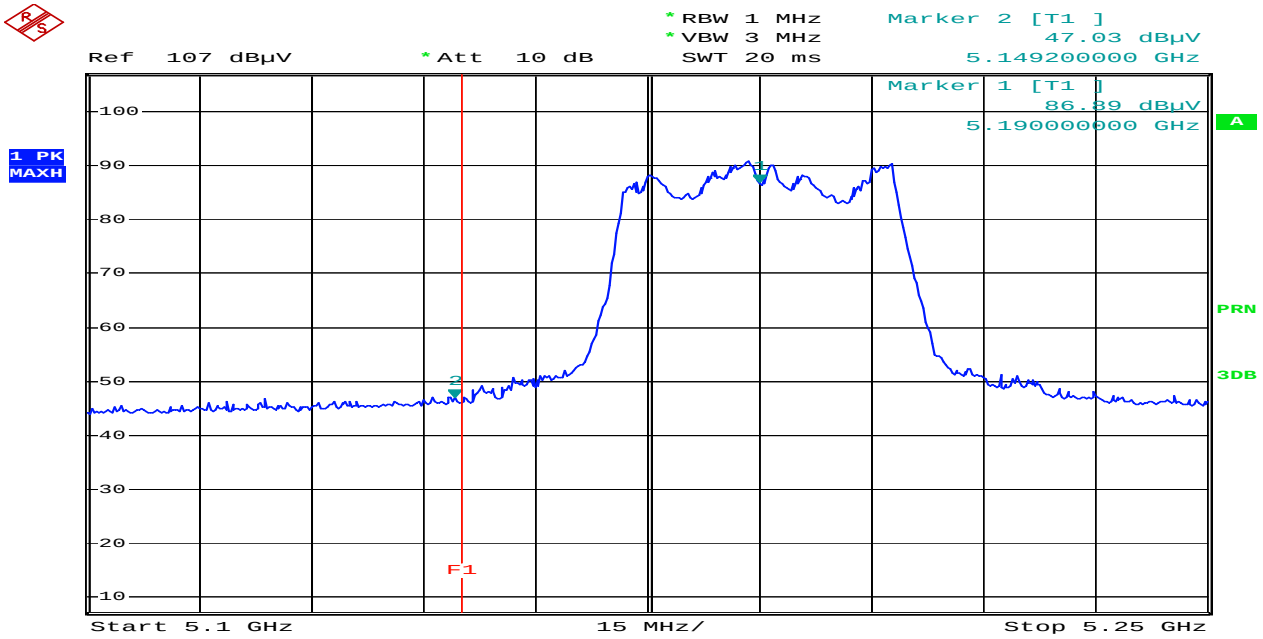
Temperature (°C) : (20.3 ~ 20.9) ℃
Humidity (% R.H.) : 50.2 % R.H.

Wireless LAN 802.11ac CH - 44.48.157.165

Temperature (°C) : (20.4 ~ 21.2) ℃
Humidity (% R.H.) : (50.3 ~ 50.8) % R.H.

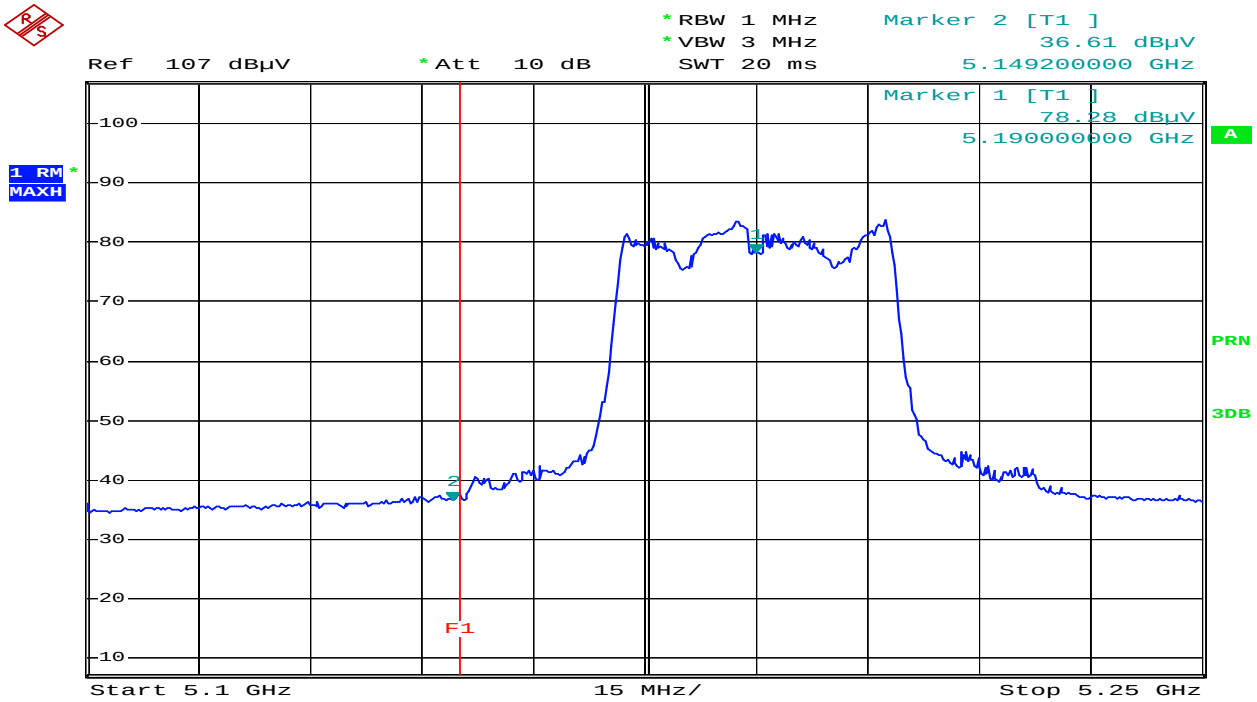
6.3 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_38 CH_5190MHz)_VHT 40
Date: 16.MAY.2016 13:13:10

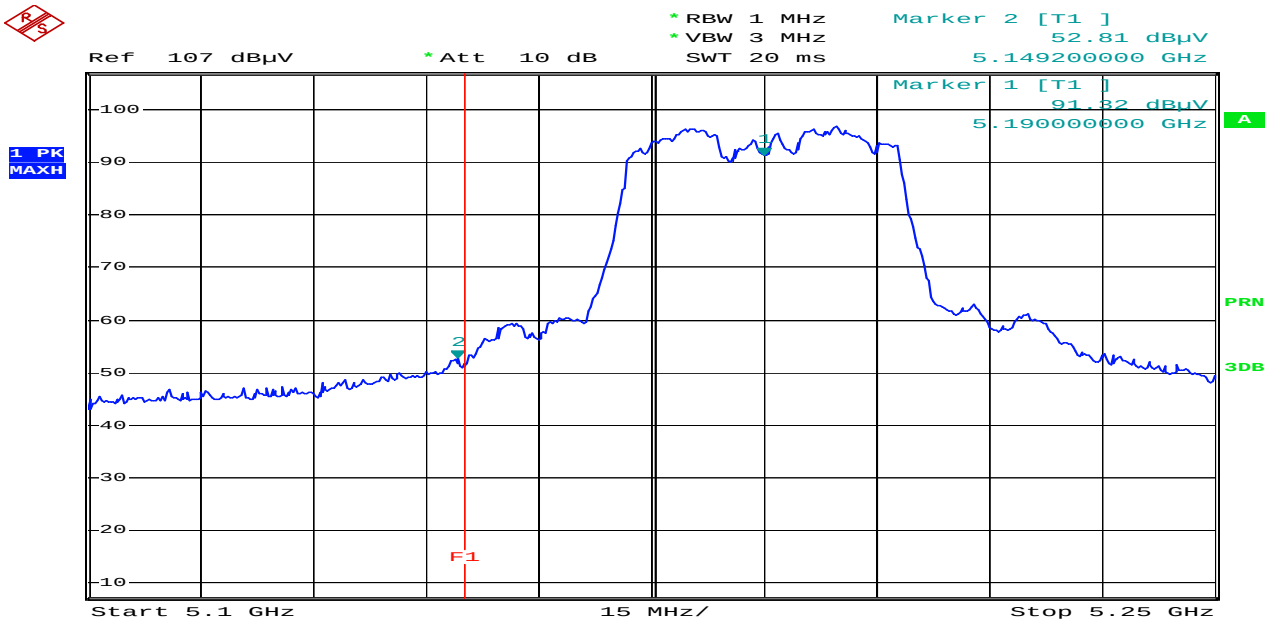
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_38 CH_5190MHz)_VHT 40
Date: 16.MAY.2016 13:14:47

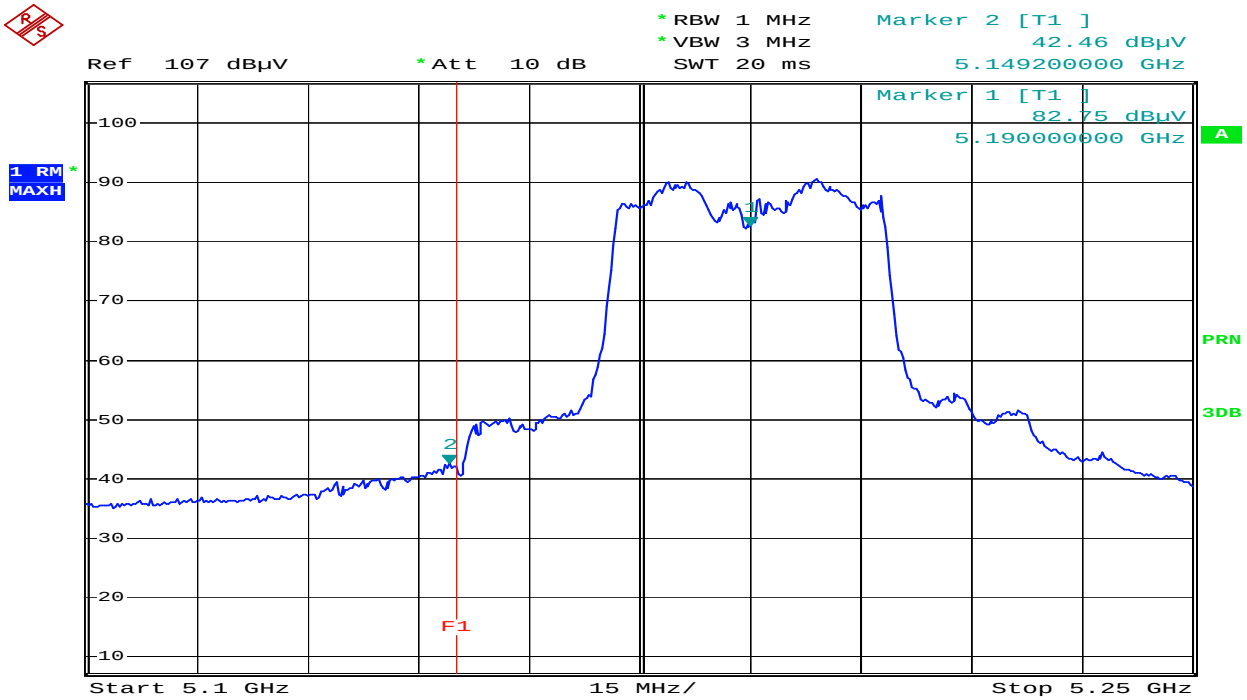
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_VER(PK_38 CH_5190MHz)_VHT 40
Date: 16.MAY.2016 13:17:55

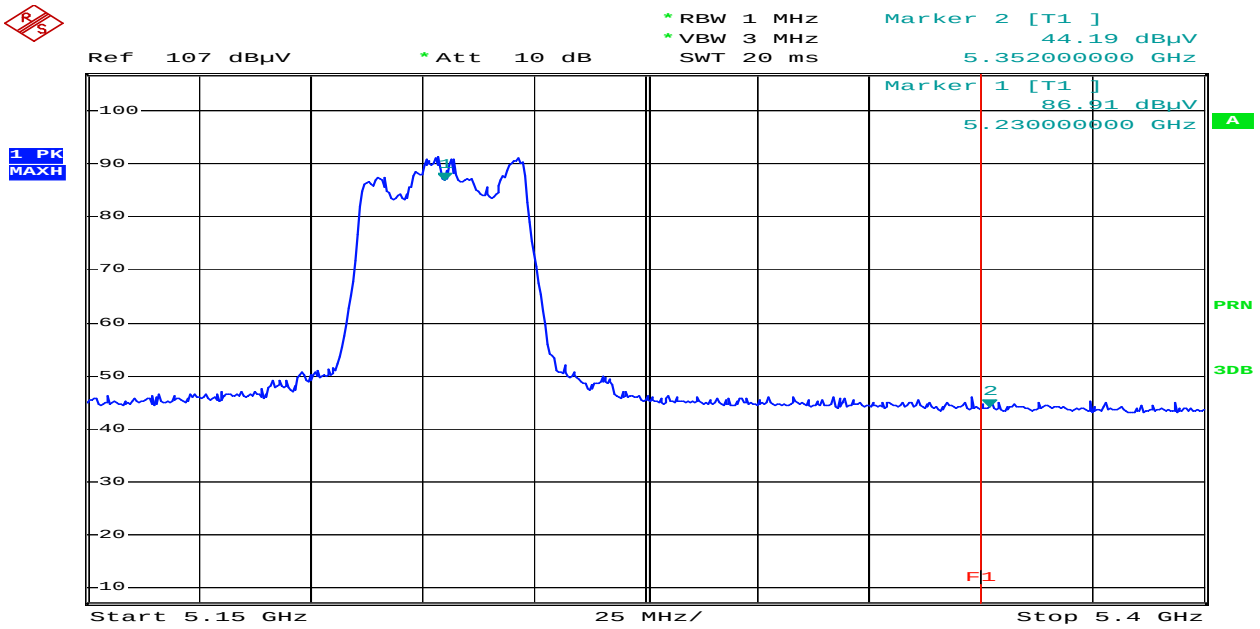
Detector mode:Average Polarity:Vertical



Comment: 15-02519_VER(RM_38 CH_5190MHz)_VHT 40
Date: 16.MAY.2016 13:16:17

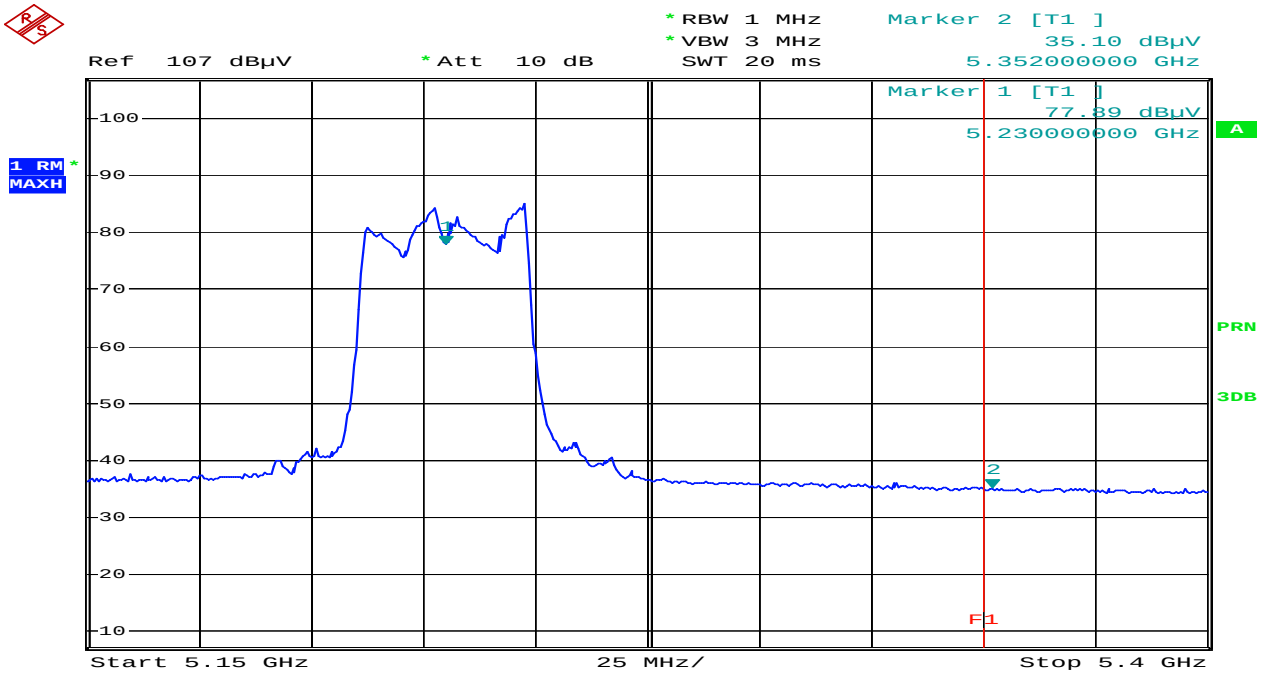
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_46 CH_5230MHz)_VHT 40
Date: 16.MAY.2016 13:41:17

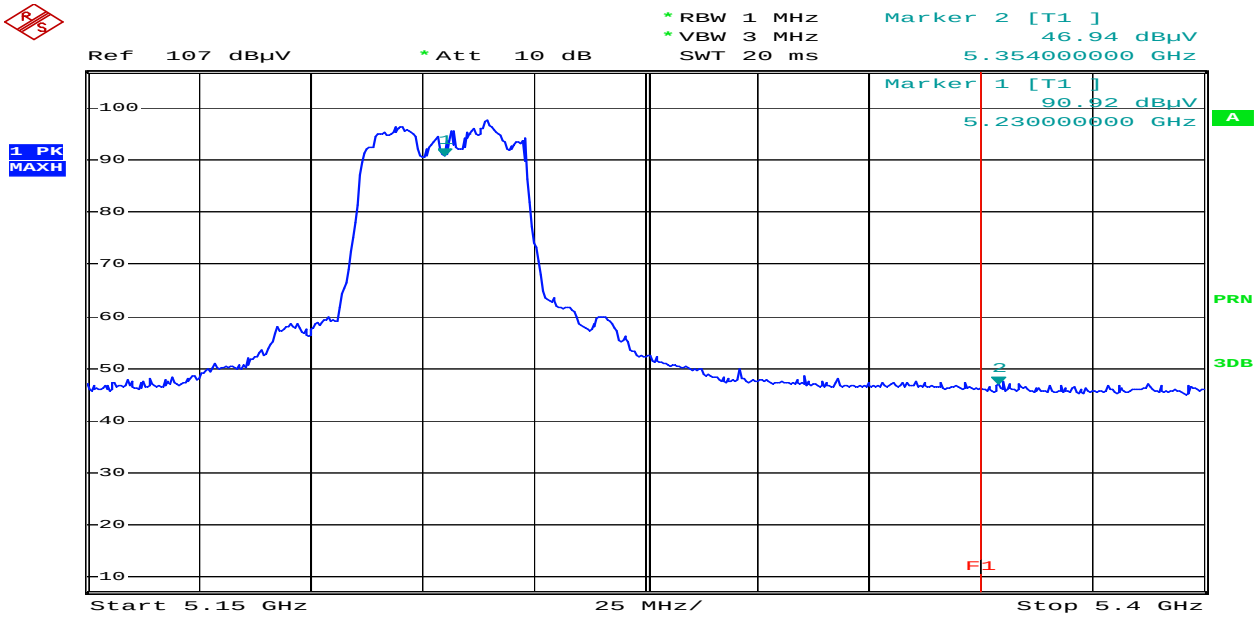
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_46 CH_5230MHz)_VHT 40
Date: 16.MAY.2016 13:39:48

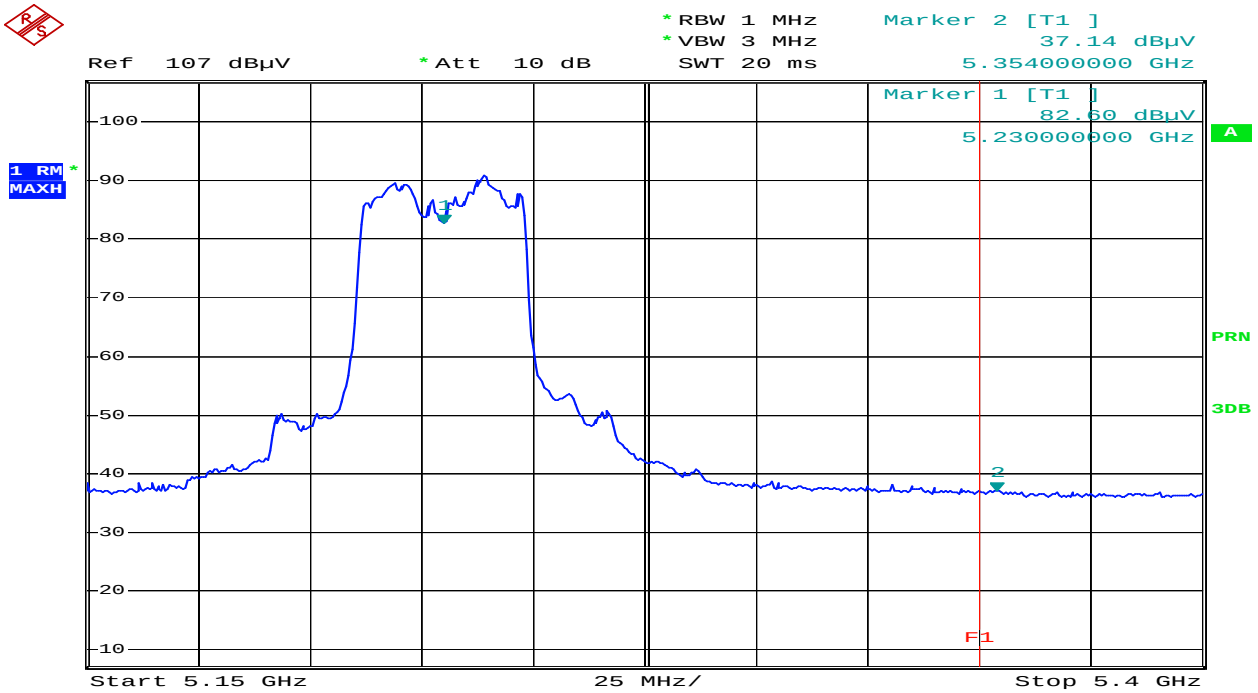
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_VER(PK_46 CH_5230MHz)_VHT 40
Date: 16.MAY.2016 13:36:12

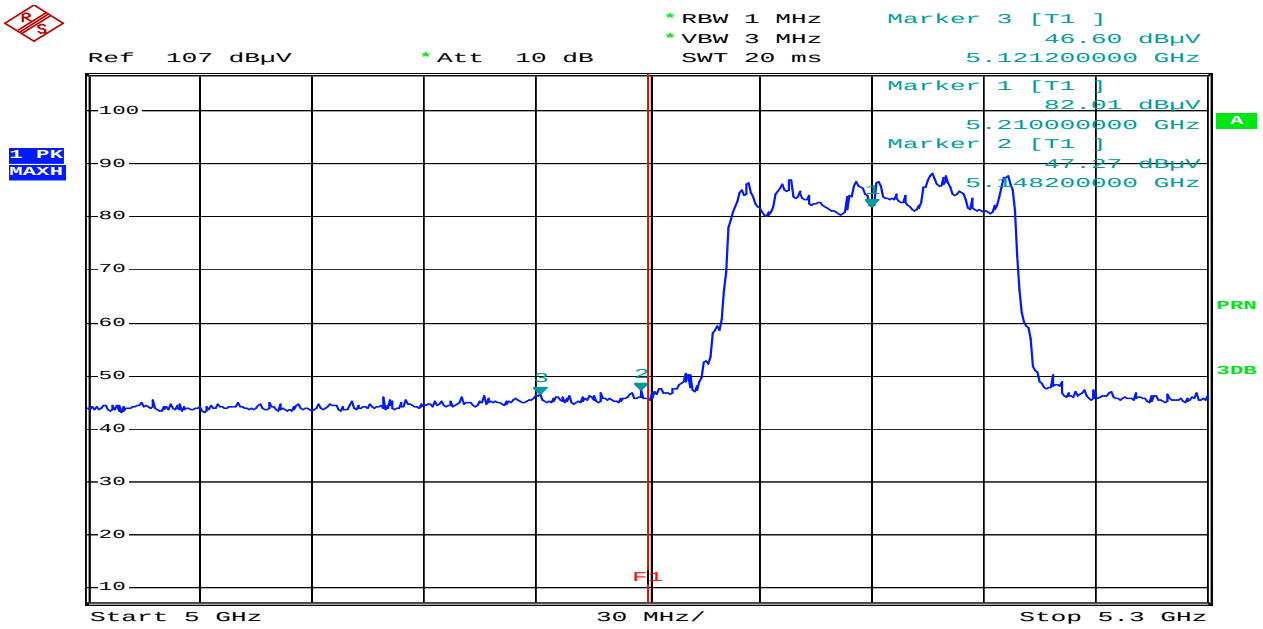
Detector mode:Average Polarity:Vertical



Comment: 15-02519_VER(RM_46 CH_5230MHz)_VHT 40
Date: 16.MAY.2016 13:37:50

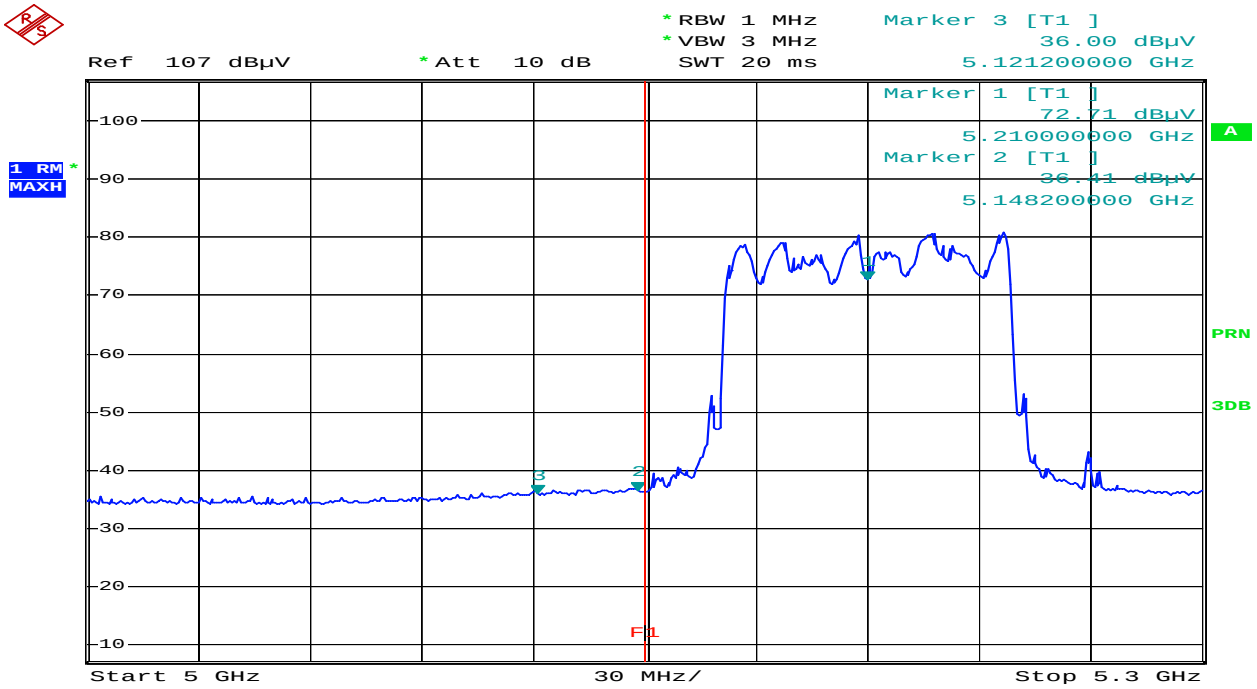
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_42 CH_5210MHz)_VHT 80
Date: 16.MAY.2016 17:13:40

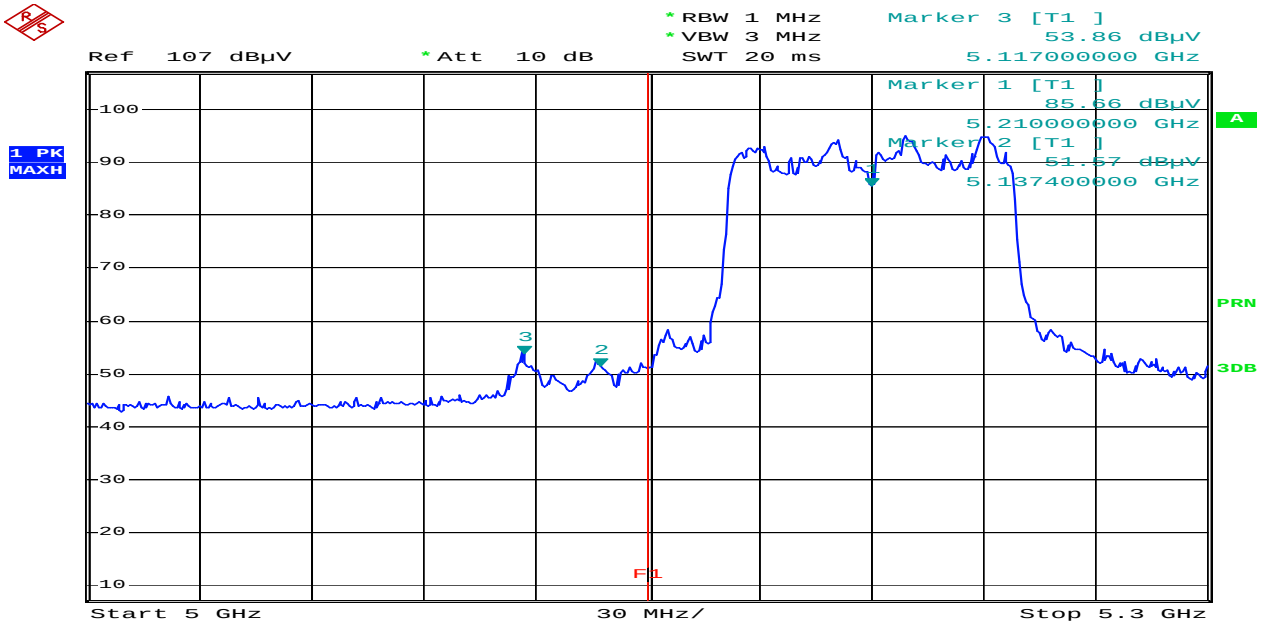
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_42 CH_5210MHz)_VHT 80
Date: 16.MAY.2016 17:15:27

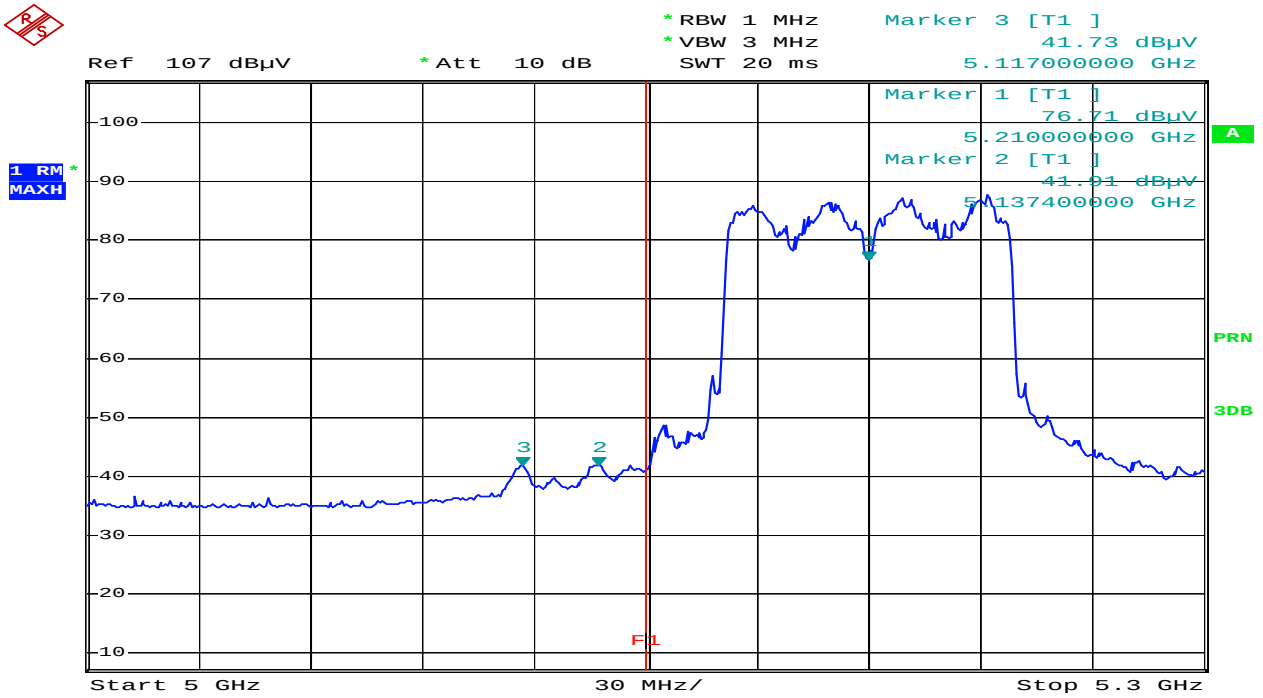
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_VER(PK_42 CH_5210MHz)_VHT 80
Date: 16.MAY.2016 17:19:40

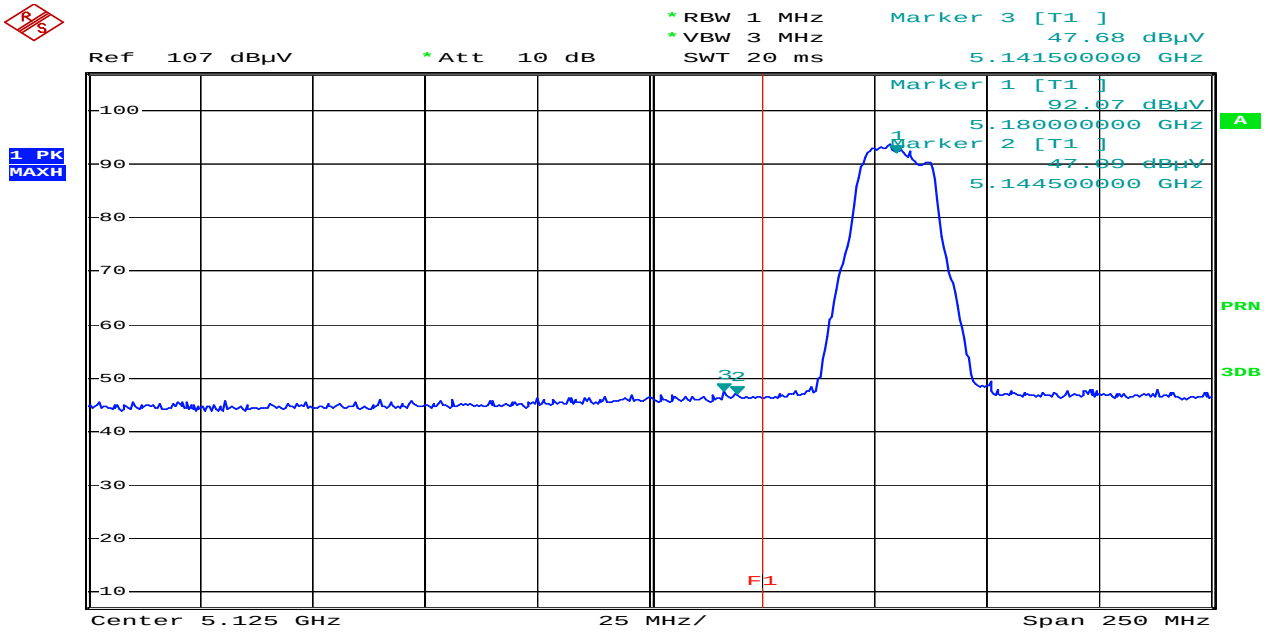
Detector mode:Average Polarity:Vertical



Comment: 15-02519_VER(RM_42 CH_5210MHz)_VHT 80
Date: 16.MAY.2016 17:18:07

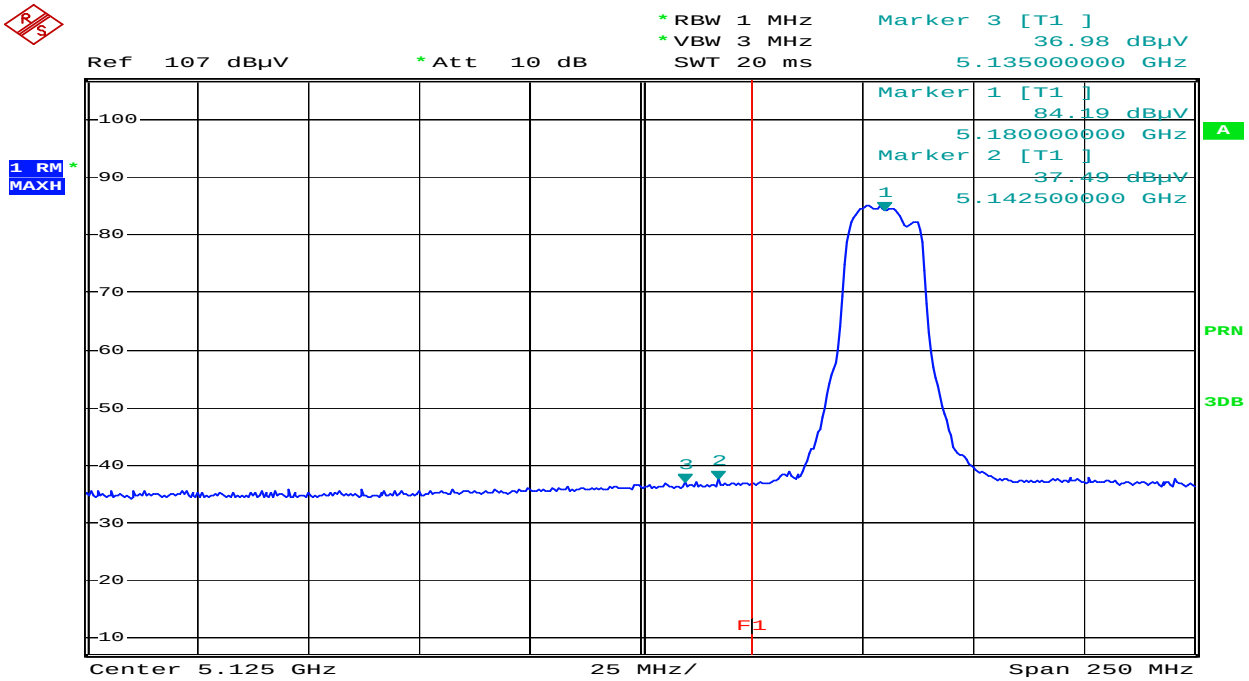
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_36 CH_5180MHz)_VHT 20
Date: 17.MAY.2016 14:45:04

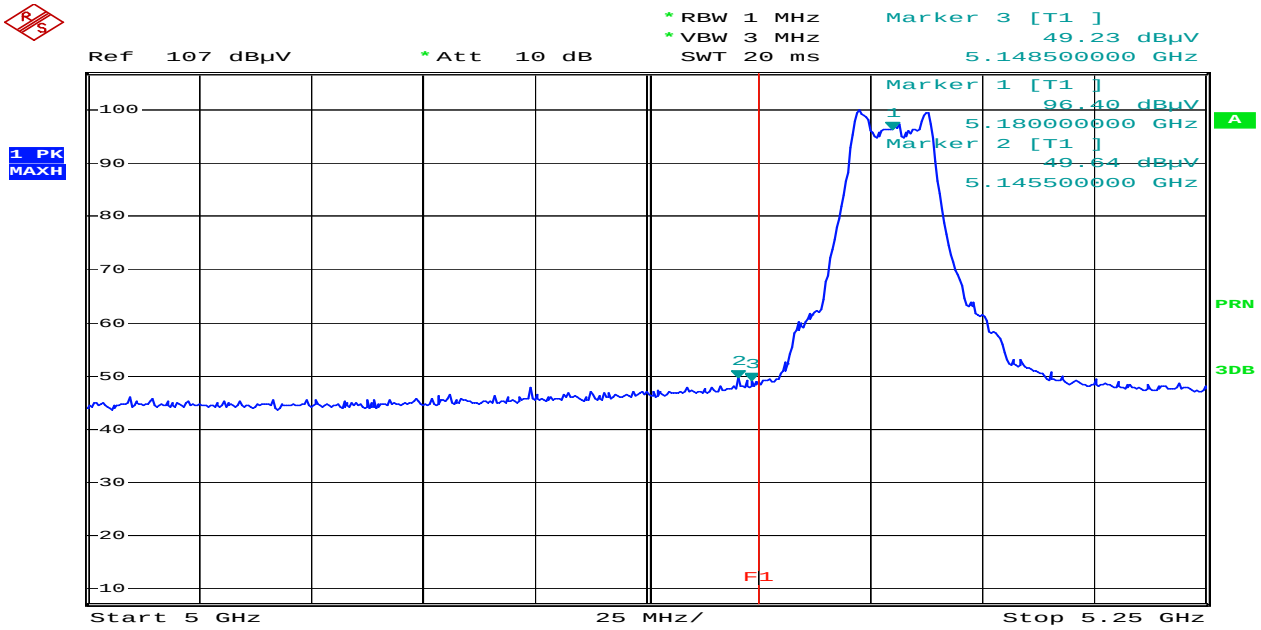
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_36 CH_5180MHz)_VHT 20
Date: 17.MAY.2016 14:47:34

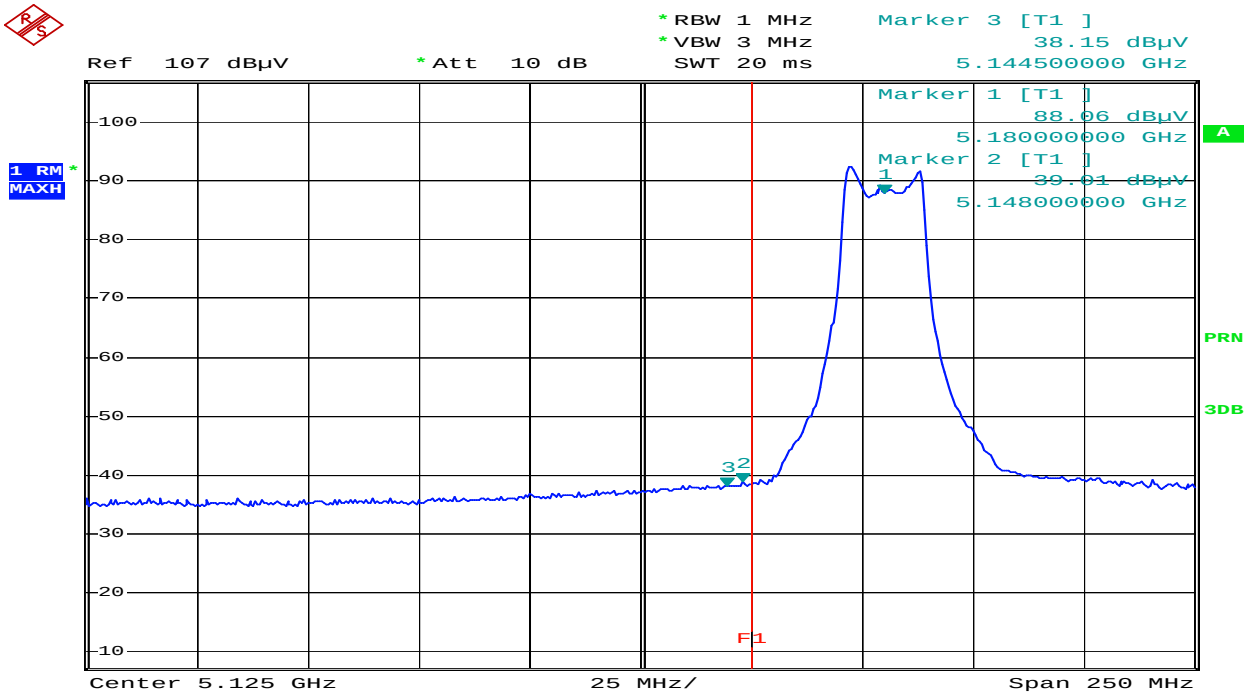
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_VER(PK_36 CH_5180MHz)_VHT 20
Date: 17.MAY.2016 14:53:28

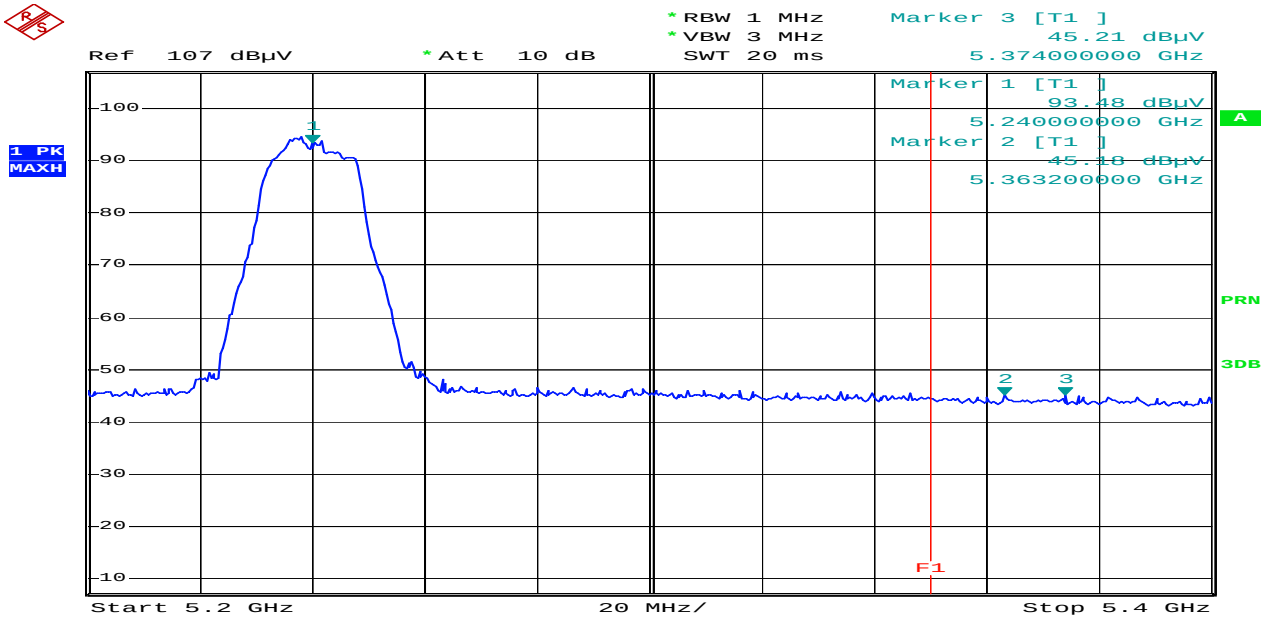
Detector mode:Average Polarity:Vertical



Comment: 15-02519_VER(RM_36 CH_5180MHz)_VHT 20
Date: 17.MAY.2016 14:50:15

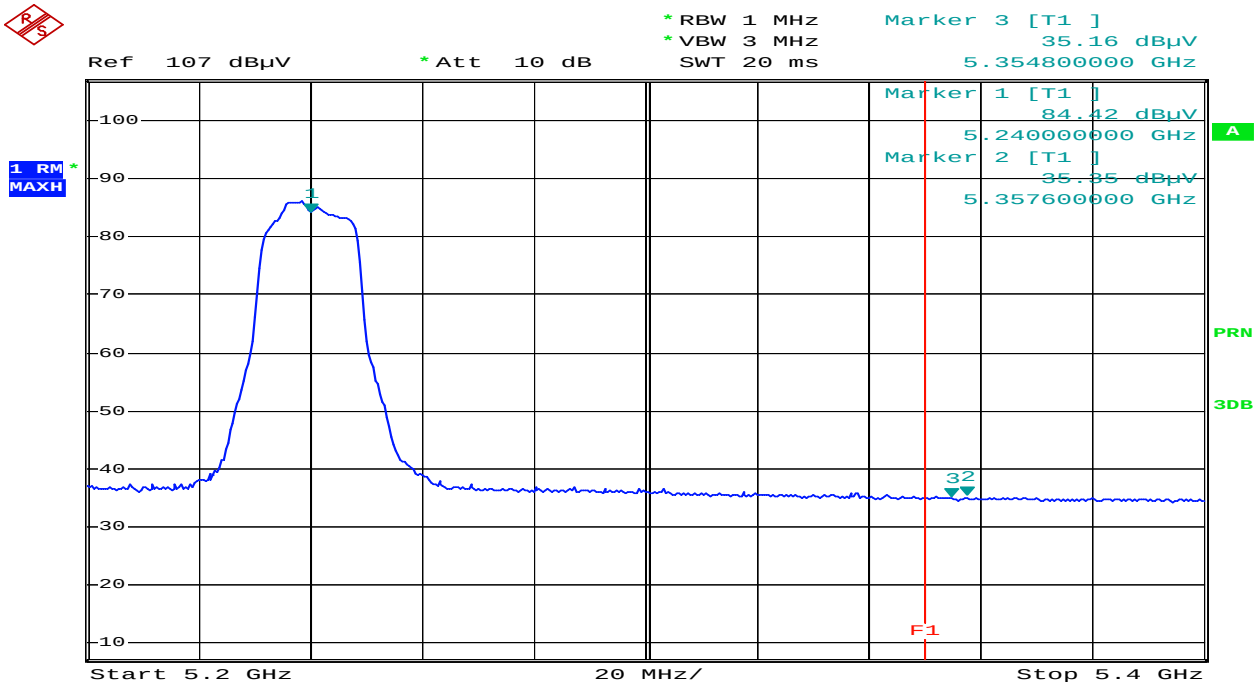
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_48 CH_5240MHz)_VHT 20
Date: 17.MAY.2016 15:19:35

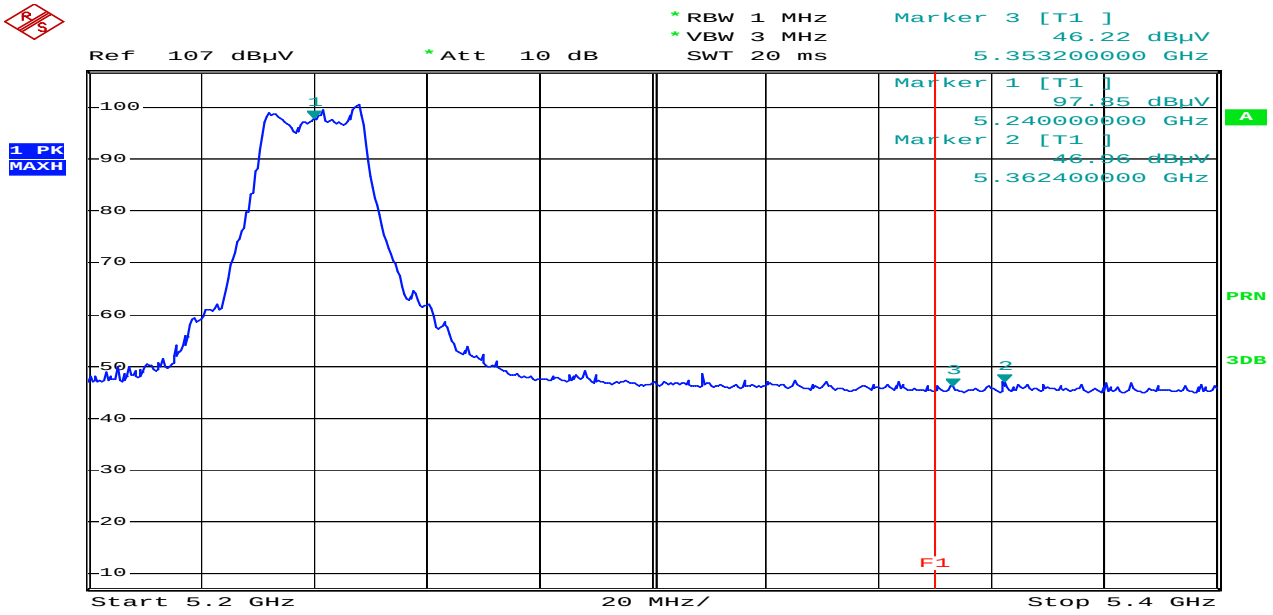
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_48 CH_5240MHz)_VHT 20
Date: 17.MAY.2016 15:23:33

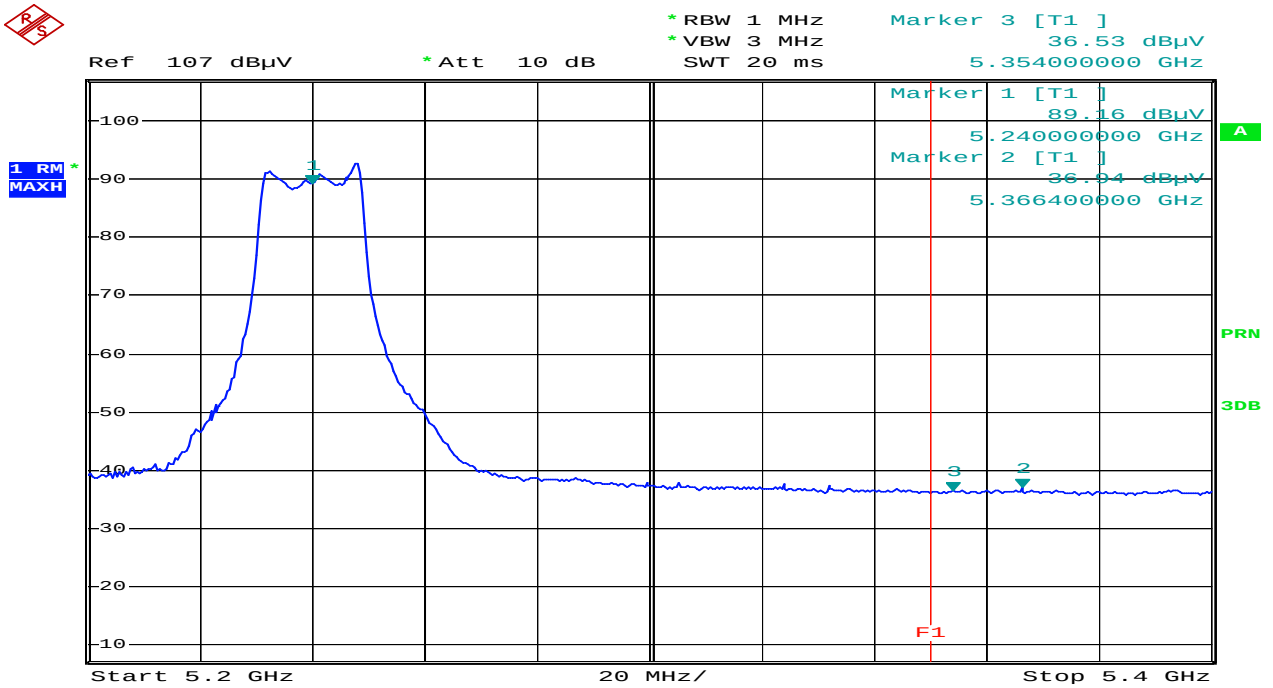
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_VER(PK_48 CH_5240MHz)_VHT 20
Date: 17.MAY.2016 15:29:11

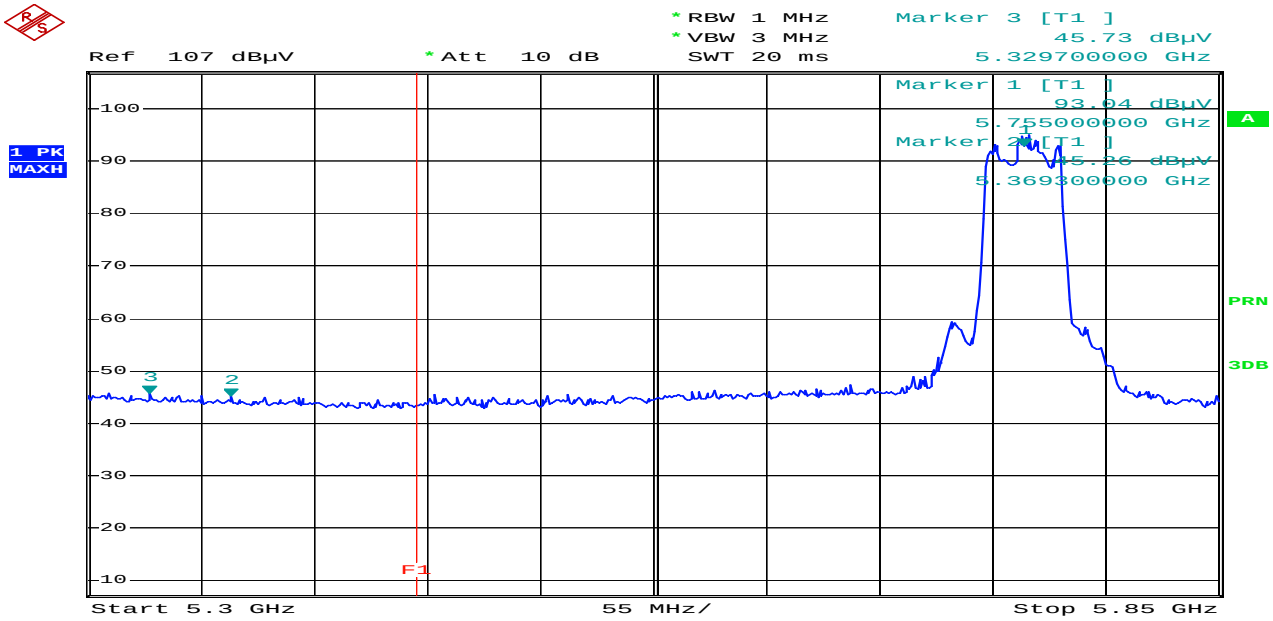
Detector mode:Average Polarity:Vertical



Comment: 15-02519_VER(RM_48 CH_5240MHz)_VHT 20
Date: 17.MAY.2016 15:26:29

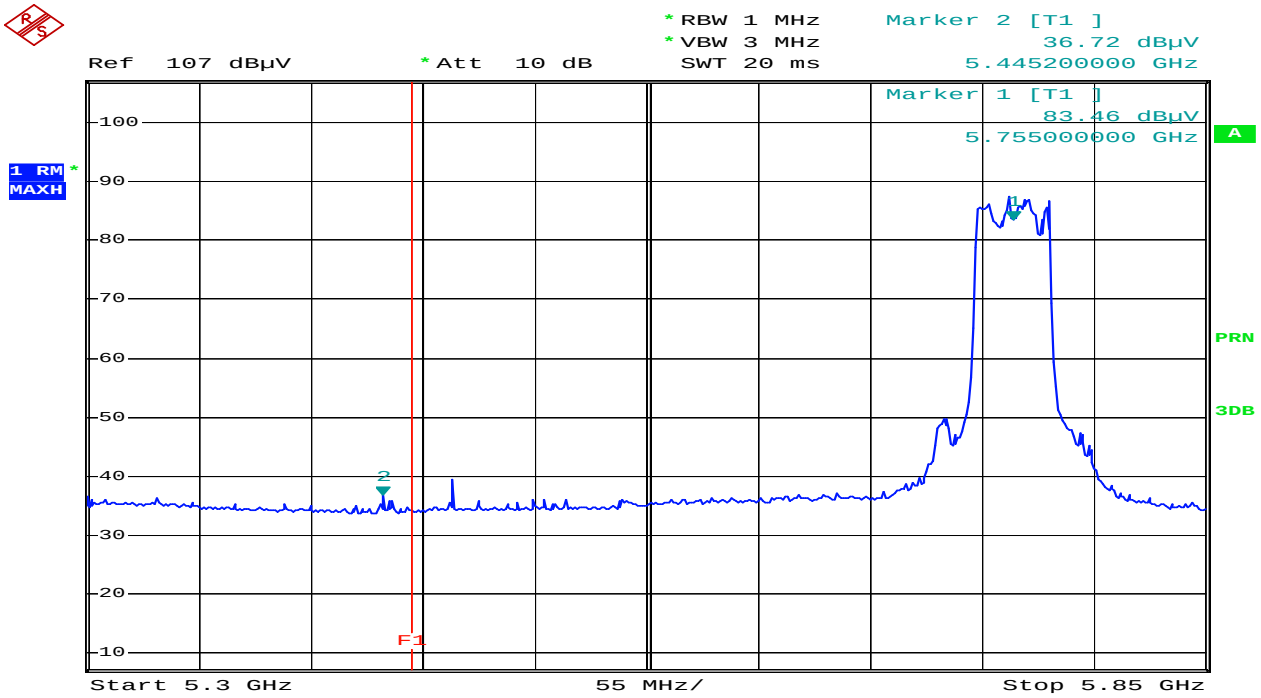
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_151 CH_5755MHz)_VHT 40
Date: 16.MAY.2016 16:36:28

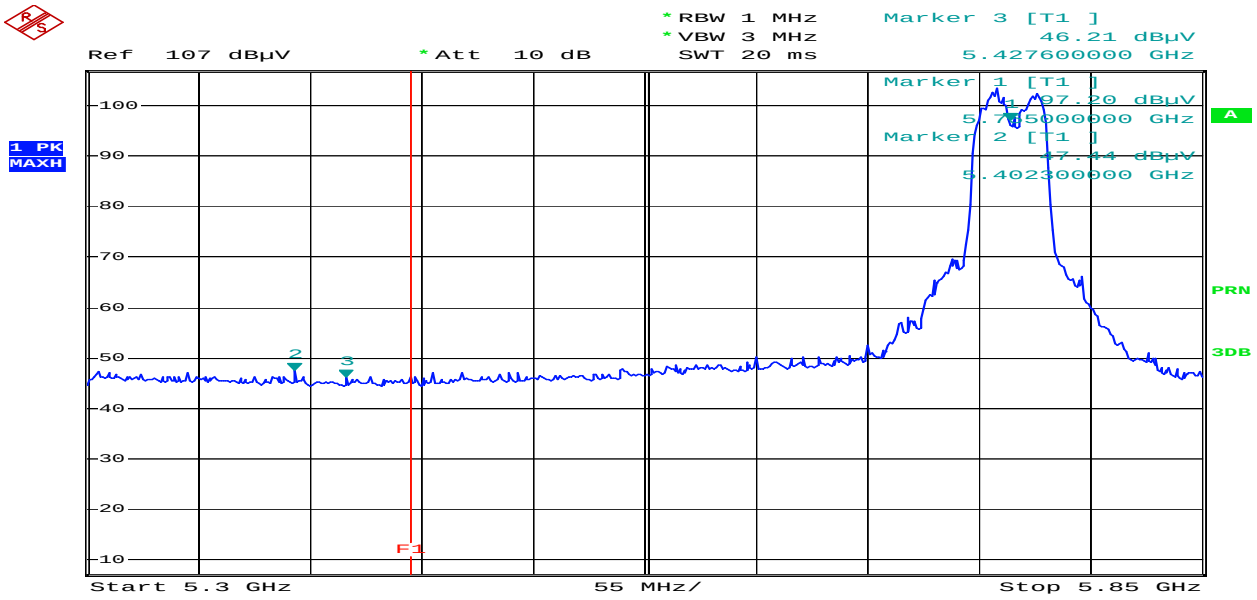
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_151 CH_5755MHz)_VHT 40
Date: 16.MAY.2016 16:32:08

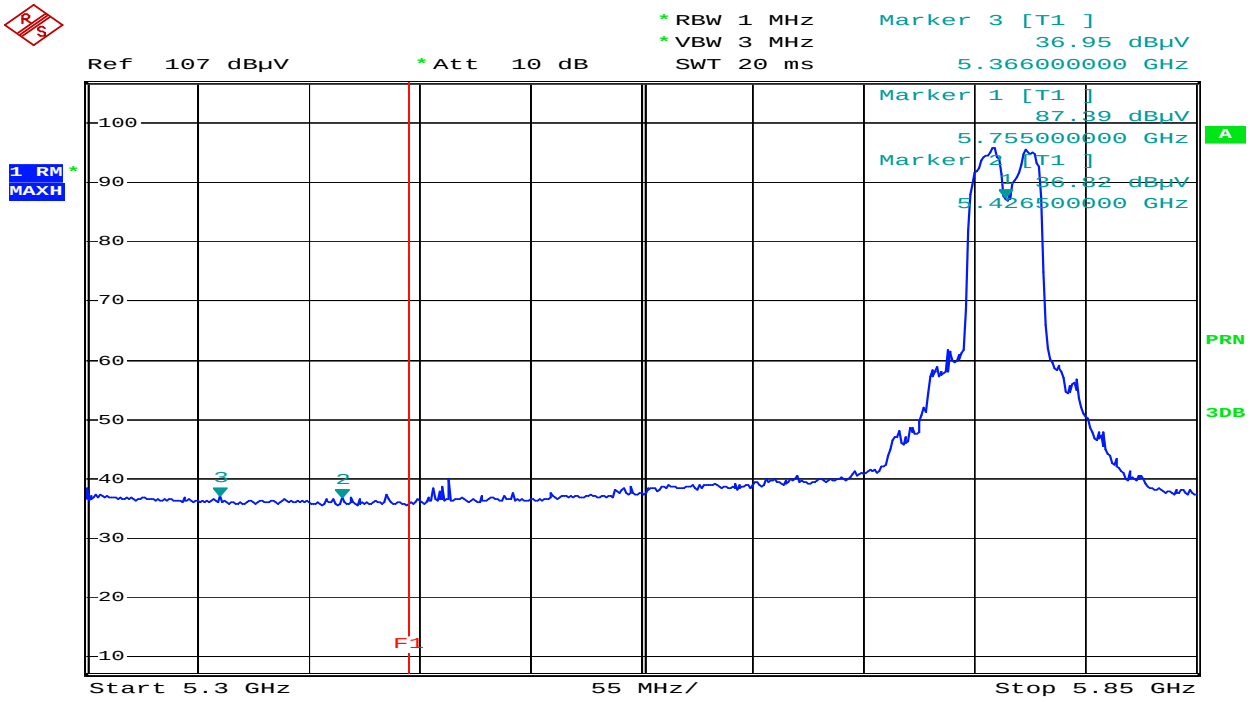
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_VER(PK_151 CH_5755MHz)_VHT 40
Date: 16.MAY.2016 16:39:44

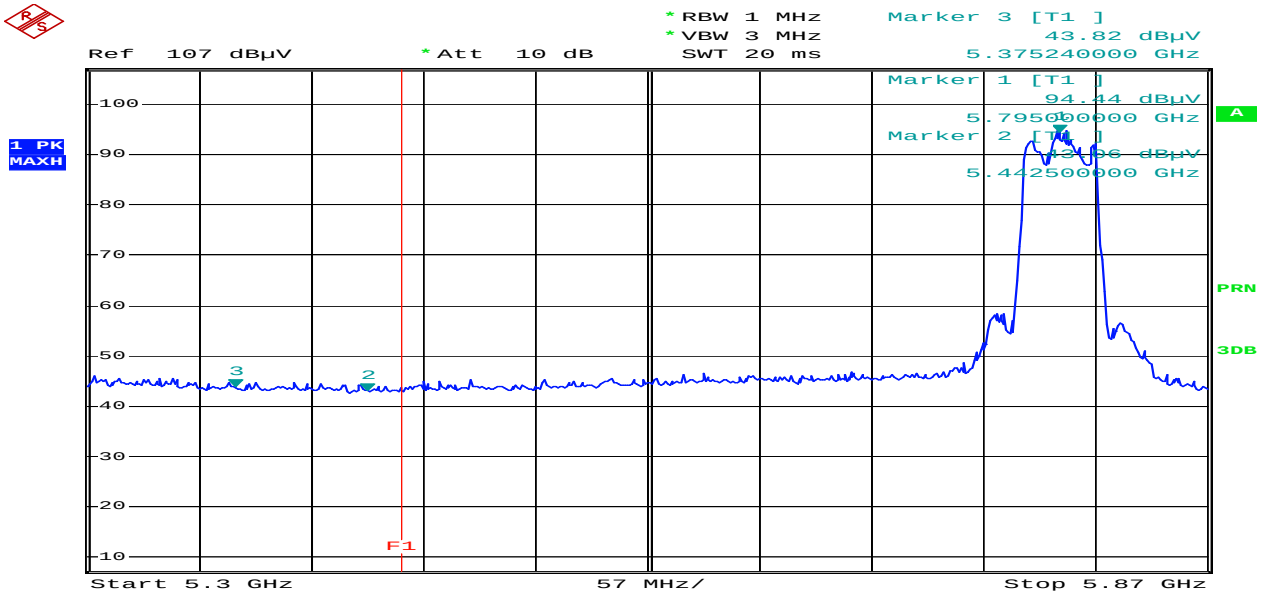
Detector mode:Average Polarity:Vertical



Comment: 15-02519_VER(RM_151 CH_5755MHz)_VHT 40
Date: 16.MAY.2016 16:42:58

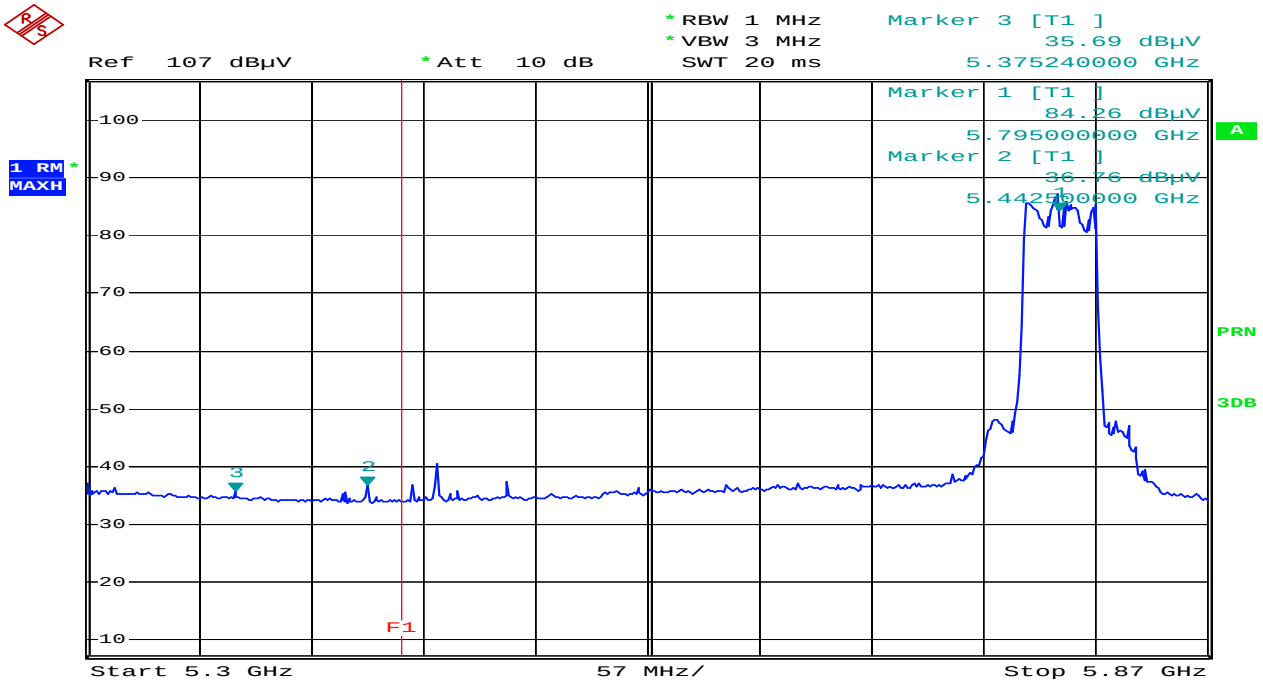
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_159 CH_5795MHz)_VHT 40
Date: 16.MAY.2016 16:58:42

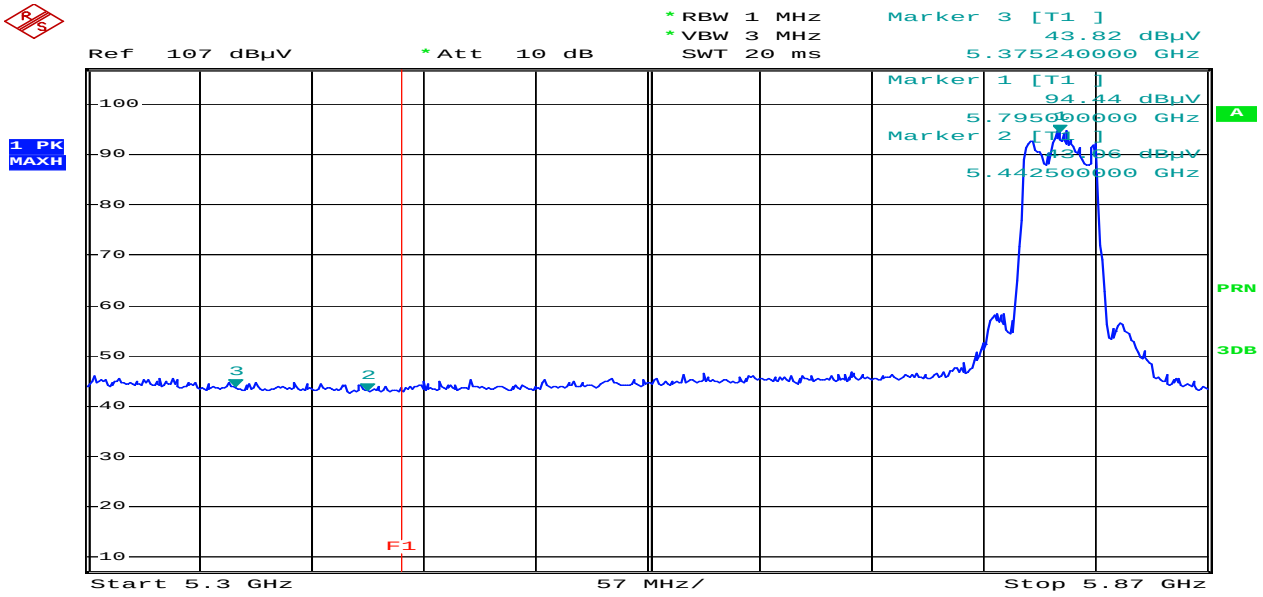
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_159 CH_5795MHz)_VHT 40
Date: 16.MAY.2016 16:56:37

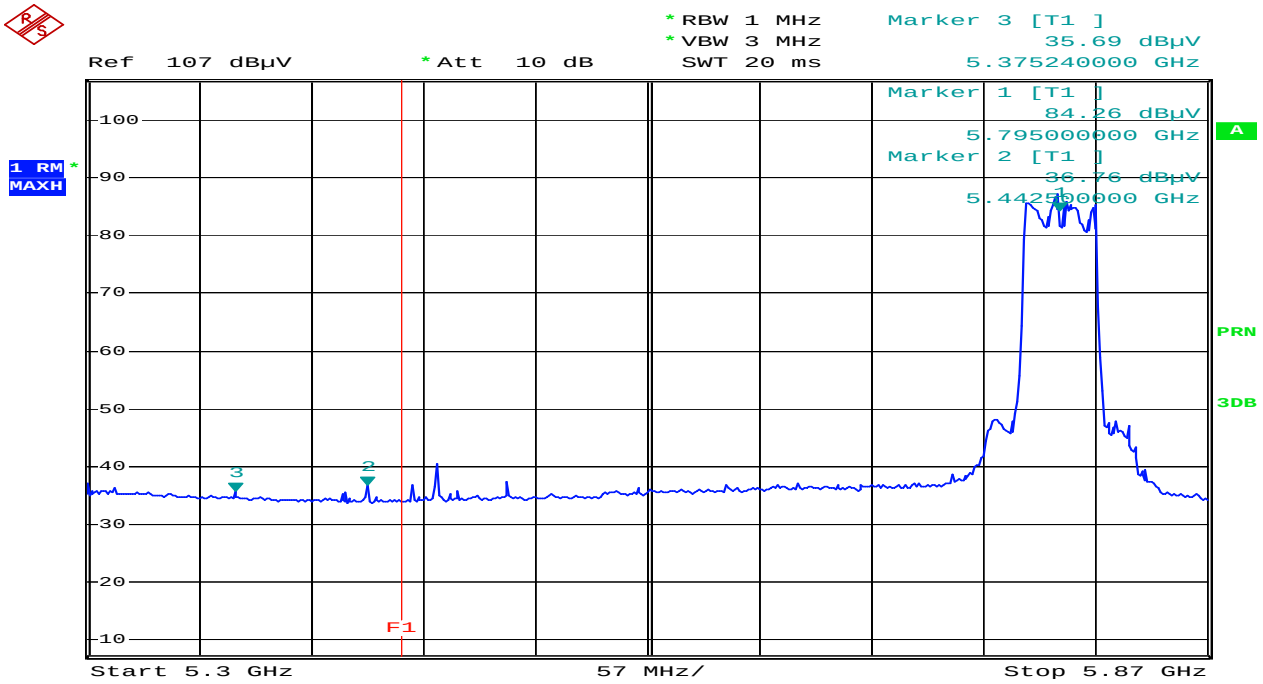
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_HOR(PK_159 CH_5795MHz)_VHT 40
Date: 16.MAY.2016 16:58:42

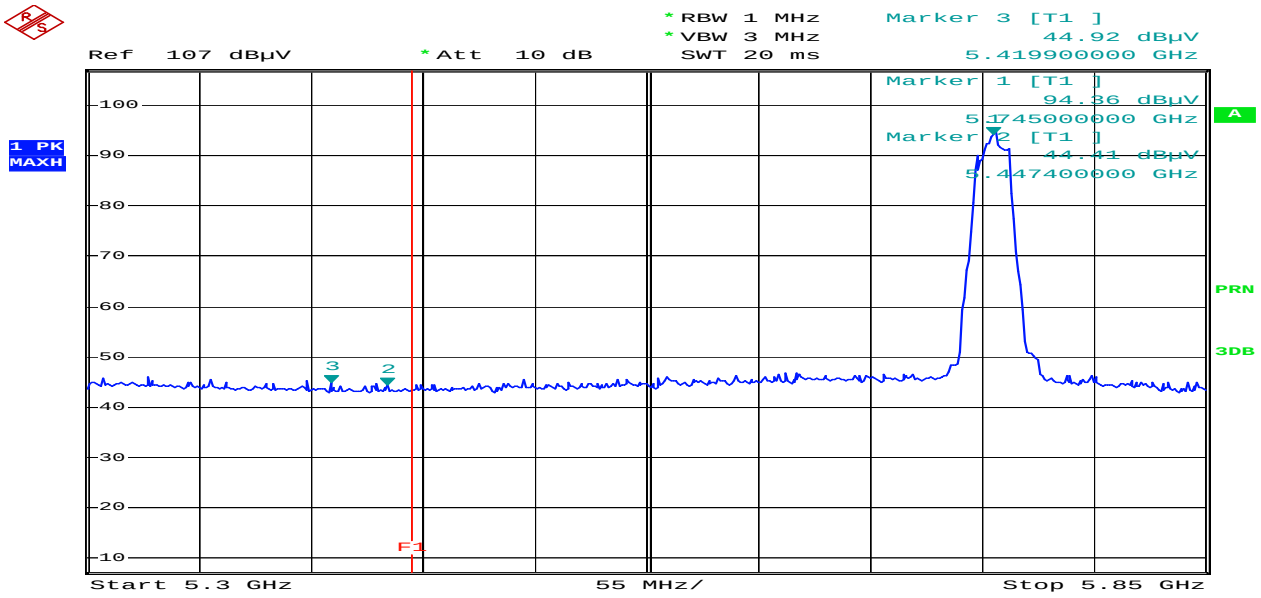
Detector mode:Average Polarity:Vertical



Comment: 15-02519_HOR(RM_159 CH_5795MHz)_VHT 40
Date: 16.MAY.2016 16:56:37

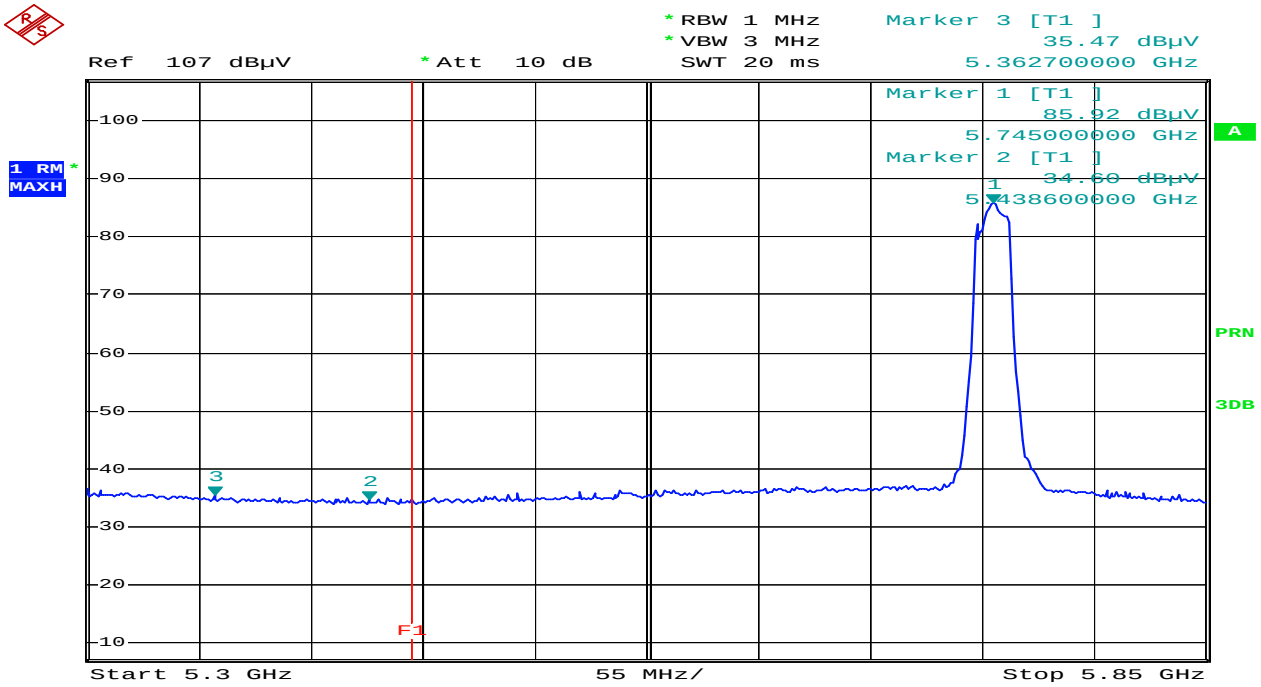
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_149 CH_5745MHz)_VHT 20
Date: 17.MAY.2016 15:46:26

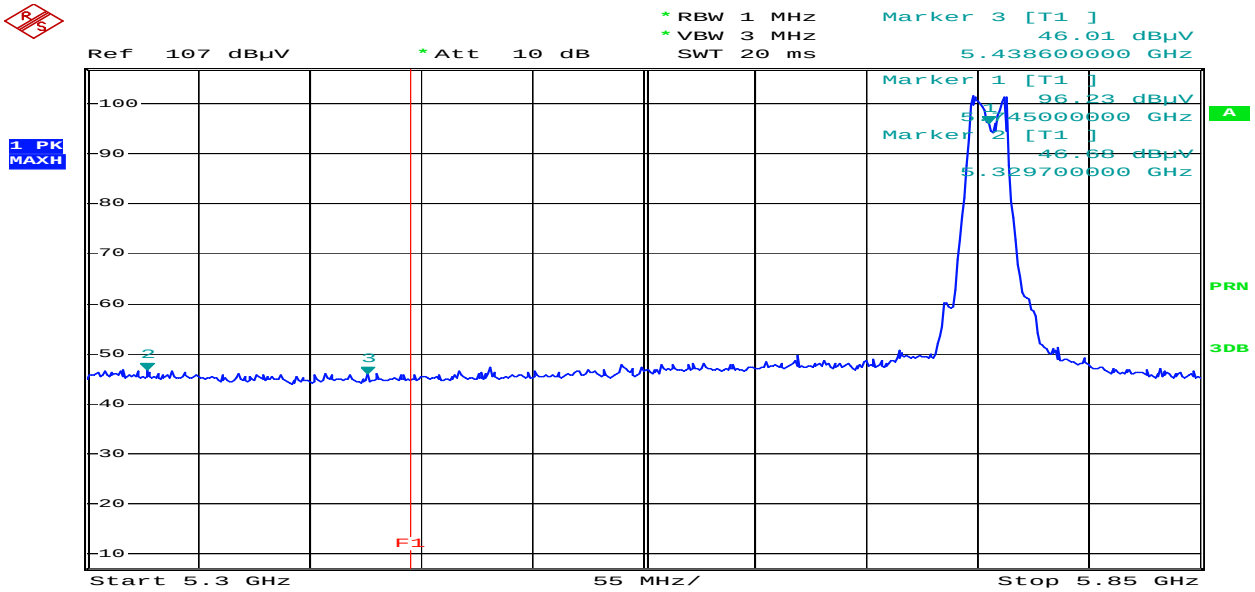
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_149 CH_5745MHz)_VHT 20
Date: 17.MAY.2016 15:44:08

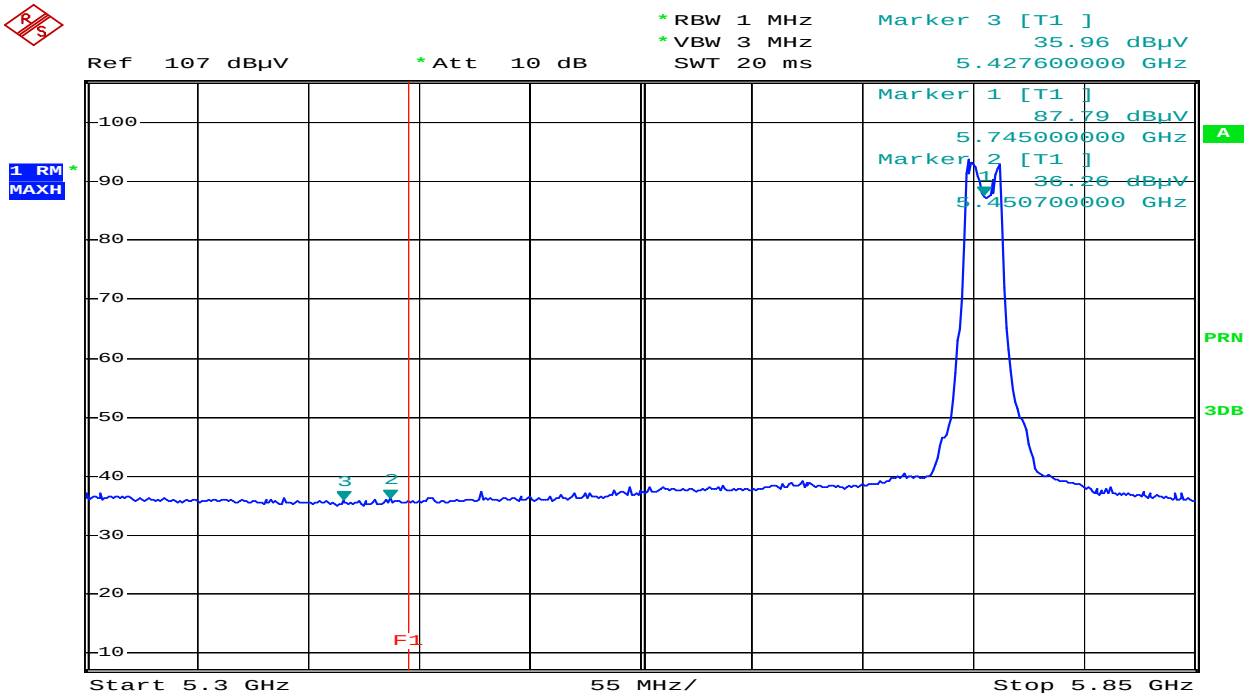
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_VER(PK_149 CH_5745MHz)_VHT 20
Date: 17.MAY.2016 15:37:11

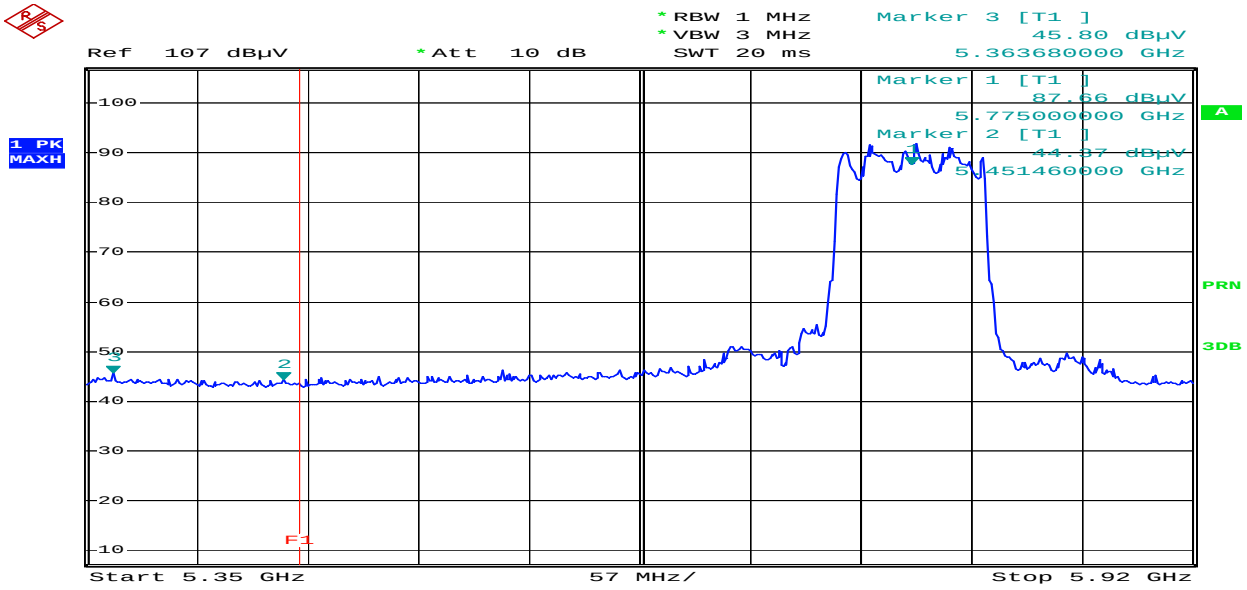
Detector mode:Average Polarity:Vertical



Comment: 15-02519_VER(RM_149 CH_5745MHz)_VHT 20
Date: 17.MAY.2016 15:39:23

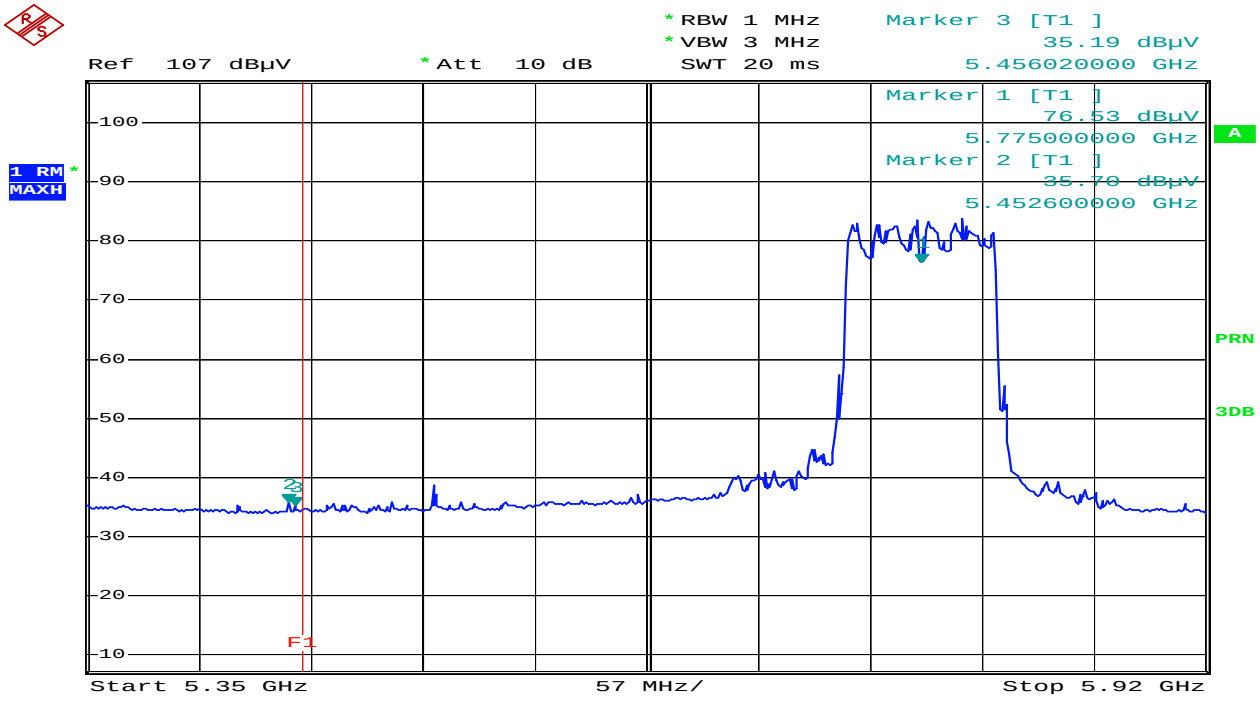
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_155 CH_5775MHz)_VHT 80
Date: 16.MAY.2016 19:19:19

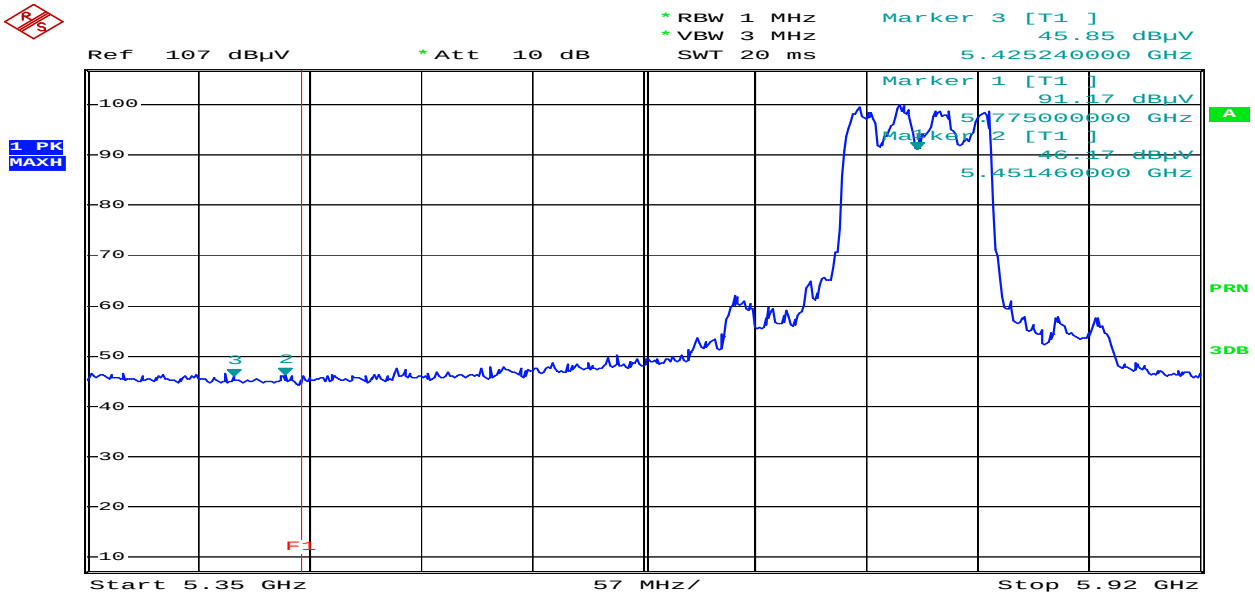
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_155 CH_5775MHz)_VHT 80
Date: 16.MAY.2016 19:16:01

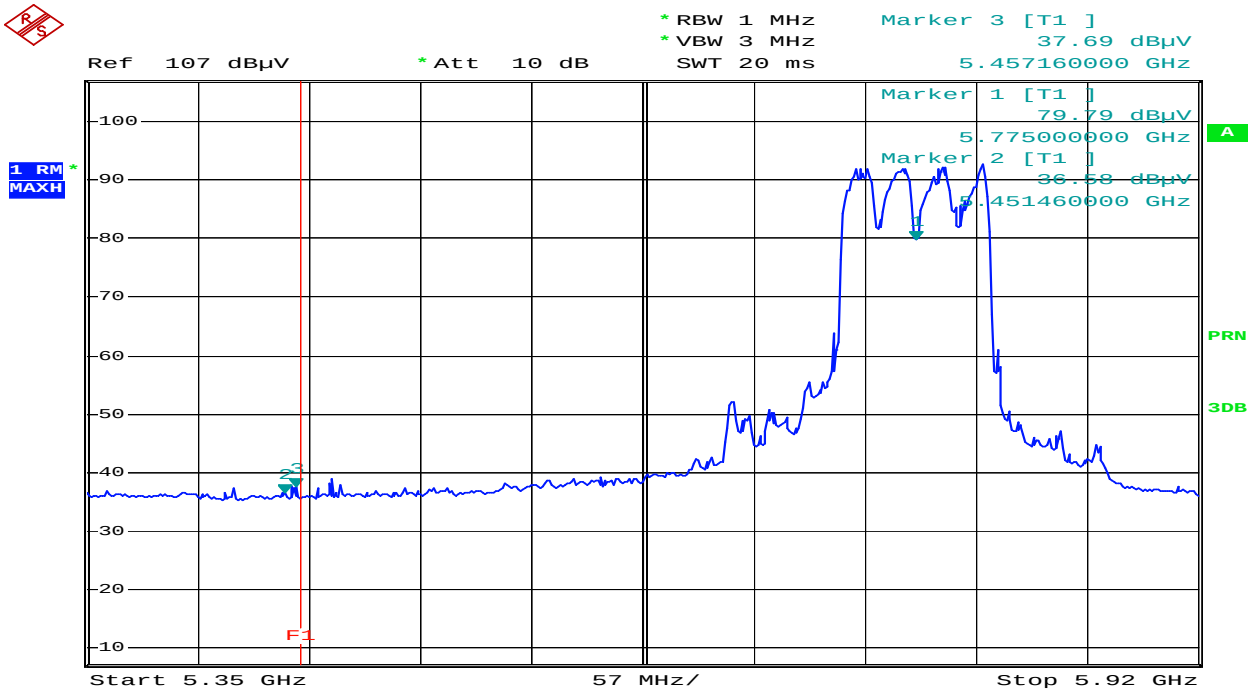
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_VER(PK_155 CH_5775MHz)_VHT 80
Date: 16.MAY.2016 19:09:55

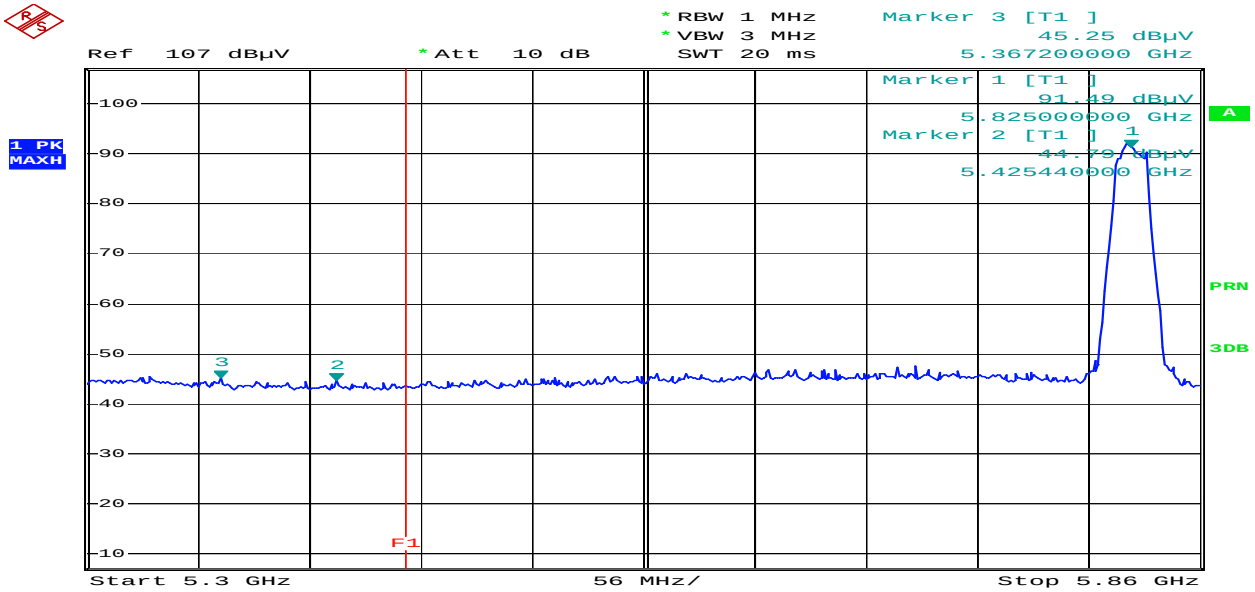
Detector mode:Average Polarity:Vertical



Comment: 15-02519_VER(RM_155 CH_5775MHz)_VHT 80
Date: 16.MAY.2016 19:11:47

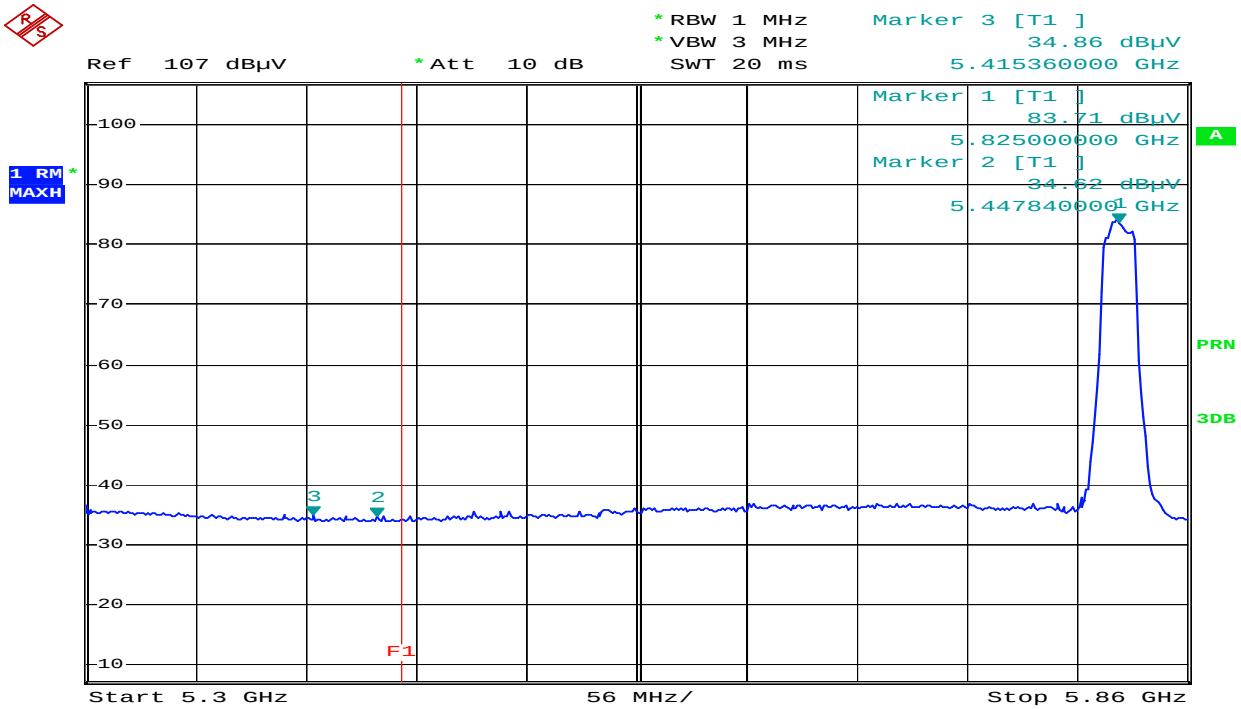
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Horizontal



Comment: 15-02519_HOR(PK_165 CH_5825MHz)_VHT 20
Date: 17.MAY.2016 17:02:04

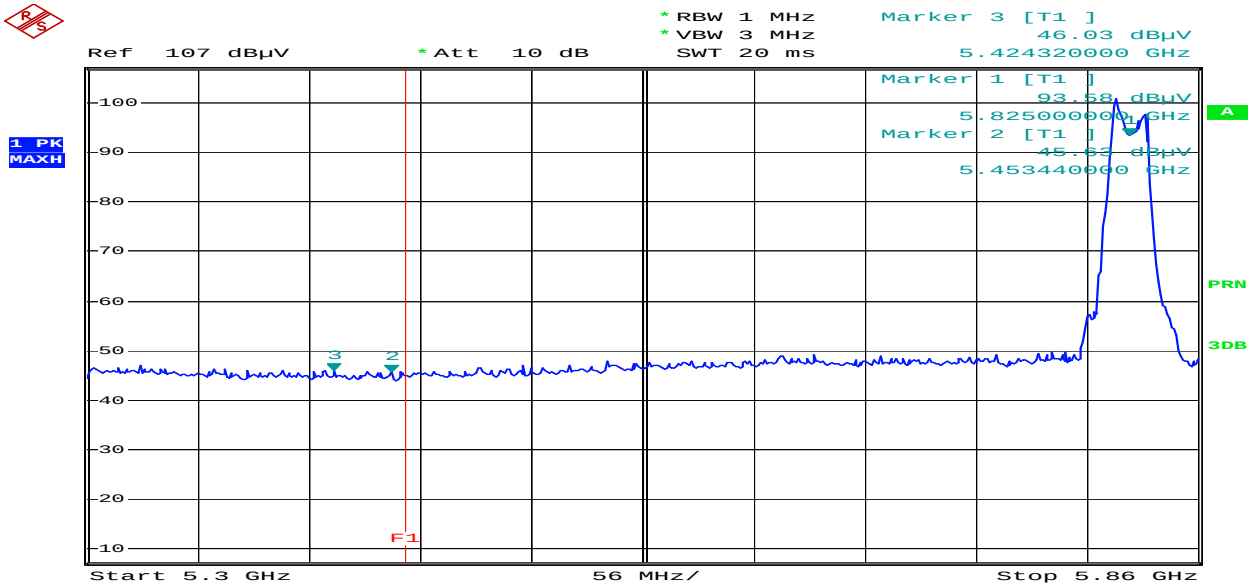
Detector mode:Average Polarity:Horizontal



Comment: 15-02519_HOR(RM_165 CH_5825MHz)_VHT 20
Date: 17.MAY.2016 16:59:55

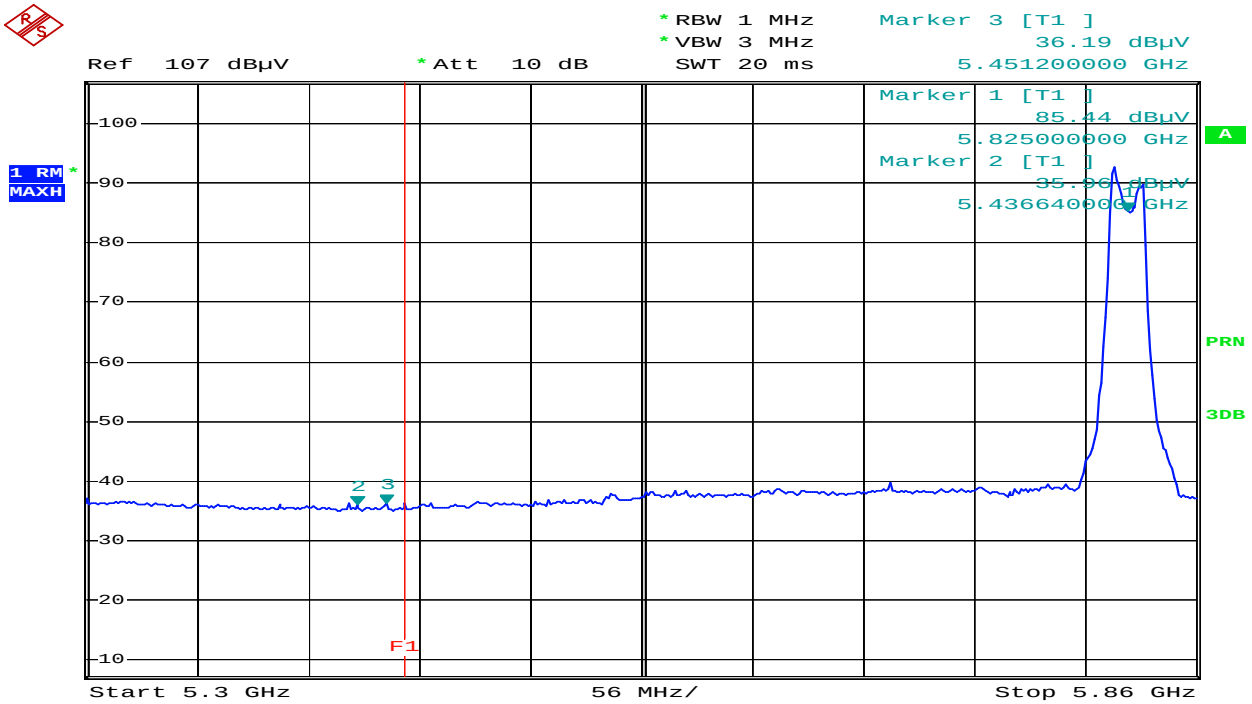
6.3-1 Restricted Band Edges

Detector mode:Peak Polarity:Vertical



Comment: 15-02519_VER(PK_165 CH_5825MHz)_VHT 20
Date: 17.MAY.2016 16:55:31

Detector mode:Average Polarity:Vertical



Comment: 15-02519_VER(RM_165 CH_5825MHz)_VHT 20
Date: 17.MAY.2016 16:57:30

7. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 MHz to 30 MHz was measured in accordance to FCC PART 15.207 & IC RSS-Gen 7.2.2. The test setup was made according to ANSI C 63.4 (2009) in a shielded room. The EUT was placed on a non-conductive table at least 0.8 m above the ground plan. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0 m. The test receiver with Quasi Peak detector complies with CISPR 16.

7.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
EMI TEST Receiver	ESPI	Rohde & Schwarz	100005	7-Dec-16
LISN	ESH3-Z5	Rohde & Schwarz	836679/025	7-Dec-16
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	7-Dec-16

7.2 Environmental Condition

Test Place : Shielded Room

Wireless LAN 802.11ac VHT 20

Temperature (°C) : 20.5 ℃

Humidity (% R.H.) : 48.6 % R.H.

Wireless LAN 802.11ac VHT 40

Temperature (°C) : 20.4 ℃

Humidity (% R.H.) : 48.7 % R.H.

Wireless LAN 802.11ac VHT 80

Temperature (°C) : 20.6 ℃

Humidity (% R.H.) : 48.6 % R.H.

7.3 Test Data for wireless LAN (802.11ac) - VHT 20

Test Date : 19-May-16

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.15	0.12	0.12	H	66.00	43.62	43.86	56.00		
0.18	0.12	0.13	H	64.63	39.97	40.22	54.63		
0.21	0.12	0.14	H	63.32	36.92	37.18	53.32		
0.23	0.12	0.39	H	62.41	35.09	35.35	52.41		
14.00	0.55	0.39	N	60.00	30.61	31.55	50.00		
14.09	0.66	0.39	H	60.00	29.95	31.00	50.00		
Remark	TEST MODE : 802.11ac - VHT 20 H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading								

7.3 Test Data for wireless LAN (802.11ac) - VHT 40

Test Date : 19-May-16

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.15	0.12	0.12	H	66.00	43.49	43.73	56.00		
0.17	0.12	0.13	H	64.96	40.86	41.11	54.96		
0.18	0.13	0.13	N	64.49	39.02	39.28	54.49		
0.20	0.13	0.14	N	63.61	37.28	37.55	53.61		
0.60	0.14	0.17	N	56.00	37.58	37.90	46.00		
13.76	0.54	0.39	N	60.00	29.58	30.51	50.00		
Remark	TEST MODE : 802.11ac - VHT 40 H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading								

7.3 Test Data for wireless LAN (802.11ac) - VHT 80

Test Date : 19-May-16

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.15	0.12	0.12	H	66.00	43.78	44.02	56.00		
0.18	0.13	0.13	N	64.49	39.80	40.06	54.49		
0.19	0.13	0.14	N	64.04	38.63	38.90	54.04		
0.21	0.13	0.14	N	63.21	36.82	37.09	53.21		
0.60	0.14	0.17	N	56.00	37.55	37.87	46.00		
13.24	0.52	0.38	N	60.00	29.14	30.04	50.00		
Remark	TEST MODE : 802.11ac - VHT 80 H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading								

8. On Time, Duty Cycle and Measurement Methods

8.1 Test procedure

KDB 789033 v01r03- Section B Duty Cycle (x), Transmission Duration (T), and Maximum Power Control Level

8.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

. RBW= 8 MHz

. VBW= 50 MHz

. Span= Zero

6dB Bandwidth Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041281	2017-01-12

8.3 Measurement results

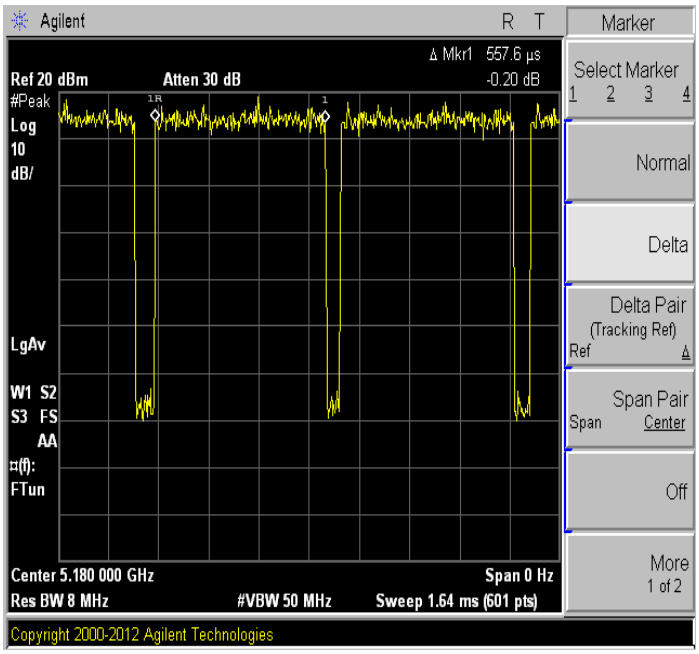
EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	24 ℃, 44 % R.H.
INPUT POWER	DC 12 V		

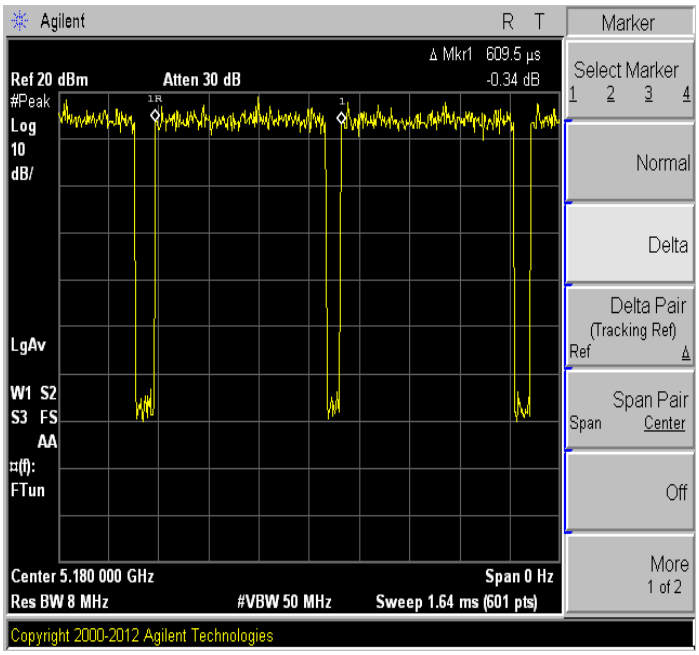
(802.11ac VHT20)

Mode	On Time B (msec)	Period (msec)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dBm)	Minimum VBW (KHz)
802.11ac	0.61	0.56	0.91	91.46	0.39	1.64

8.4 Trace data

UNII Band1 OFDM (802.11ac VHT20-36ch)





9. Emission bandwidth and 99% Occupied Bandwidth

9.1 Test procedure

KDB 789033 v01r03- Section C and D Emission bandwidth and 99 Percent Occupied Bandwidth

9.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

1) Set RBW = approximately 1% of the emission bandwidth.

2) Set the VBW > RBW.

3) Detector = Peak

4) Trace mode = max hold.

5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

The following procedure shall be used for measuring (99 %) power bandwidth.

1) Set center frequency to the nominal EUT channel center frequency.

2) Set span = 1.5 times to 5.0 times the OBW.

3) Set RBW = 1 % to 5 % of the OBW

4) Set VBW ≥ 3 · RBW

5) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

6) Use the 99 % power bandwidth function of the instrument (if available).

7) If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

. Sweep= suitable duration based on the EUT specification.

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041281	2017-01-12

9.3 Measurement results

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	24 ℃, 44 % R.H.
INPUT POWER	DC 12 V		

UNII Band1(802.11ac VHT20) ANT1

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5180	17.95	23.38
5200	17.94	23.12
5240	17.96	23.48

UNII Band1(802.11ac VHT20) ANT2

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5180	17.89	23.70
5200	17.85	23.14
5240	17.92	23.03

UNII Band1(802.11ac VHT20) ANT3

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5180	17.86	23.25
5200	17.87	23.46
5240	17.90	23.60

UNII Band1(802.11ac VHT20) ANT4

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5180	17.86	23.25
5200	17.87	23.46
5240	17.90	23.60

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	24 ℃, 44 % R.H.
INPUT POWER	DC 12 V		

UNII Band1(802.11ac VHT40) ANT1

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5190	36.24	40.04
5230	36.10	40.25

UNII Band1(802.11ac VHT40) ANT2

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5190	36.35	41.45
5230	36.39	41.59

UNII Band1(802.11ac VHT40) ANT3

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5190	36.25	41.59
5230	36.27	41.45

UNII Band1(802.11ac VHT40) ANT4

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5190	36.35	42.17
5230	36.41	42.49

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	24 ℃, 44 % R.H.
INPUT POWER	DC 12 V		

UNII Band1(802.11ac VHT80) ANT1

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5210	74.81	80.31

UNII Band1(802.11ac VHT80) ANT2

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5210	75.12	80.60

UNII Band1(802.11ac VHT80) ANT3

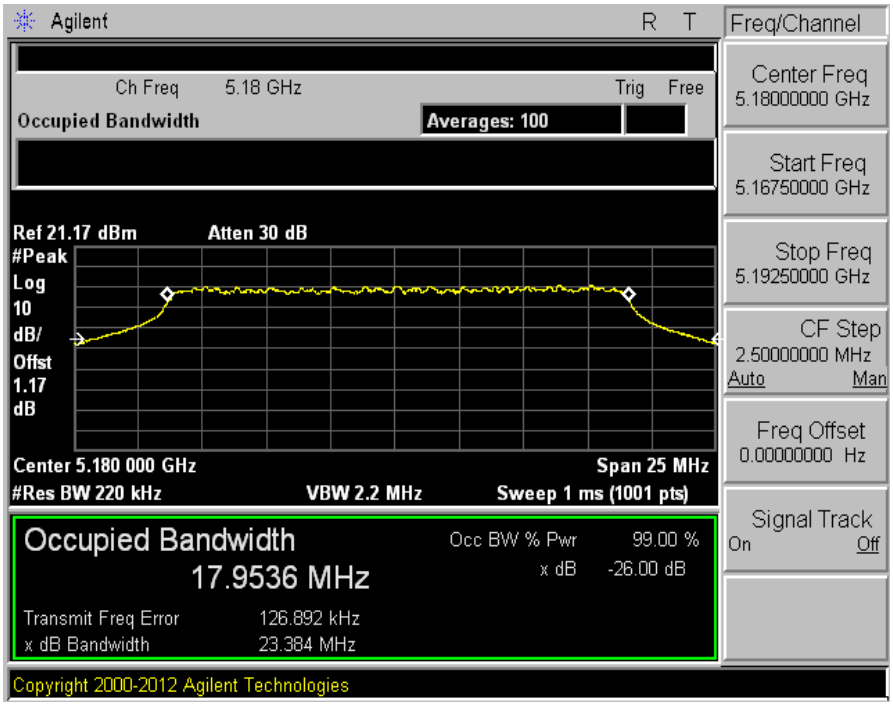
Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5210	75.09	80.84

UNII Band1(802.11ac VHT80) ANT4

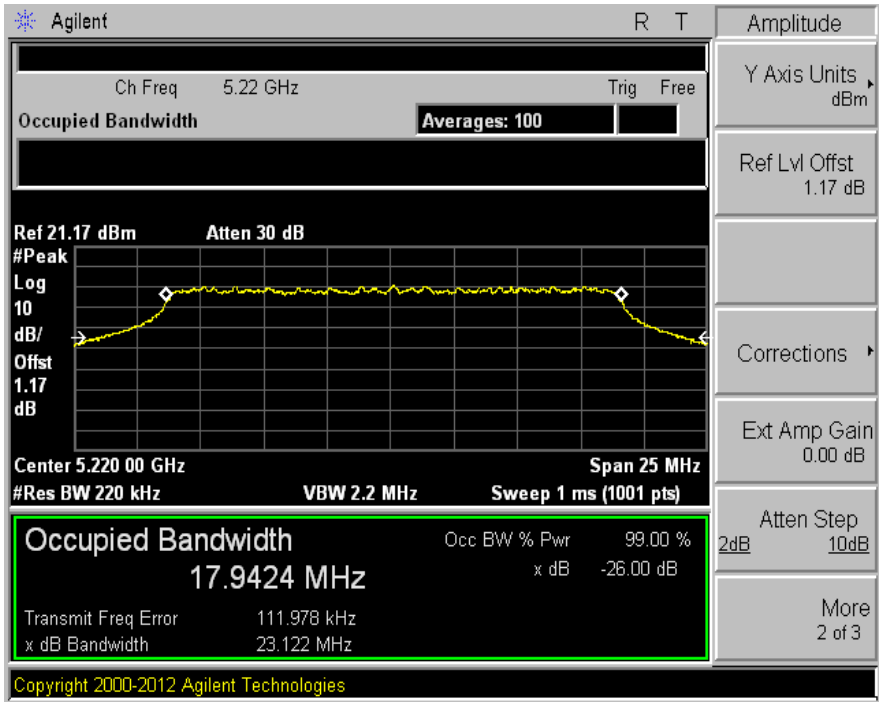
Channel Frequency (MHz)	99% bandwidth	Bandwidth at 26dB below(MHz)
5210	74.99	81.87

9.4 Trace data

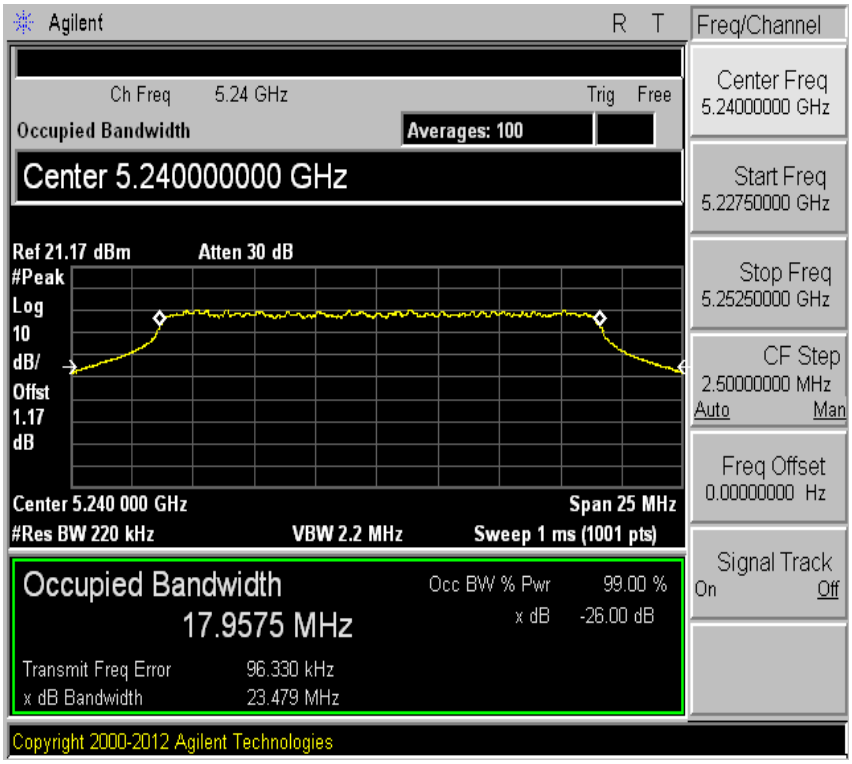
UNII Band1 OFDM (802.11ac-VHT20 36ch)AN1



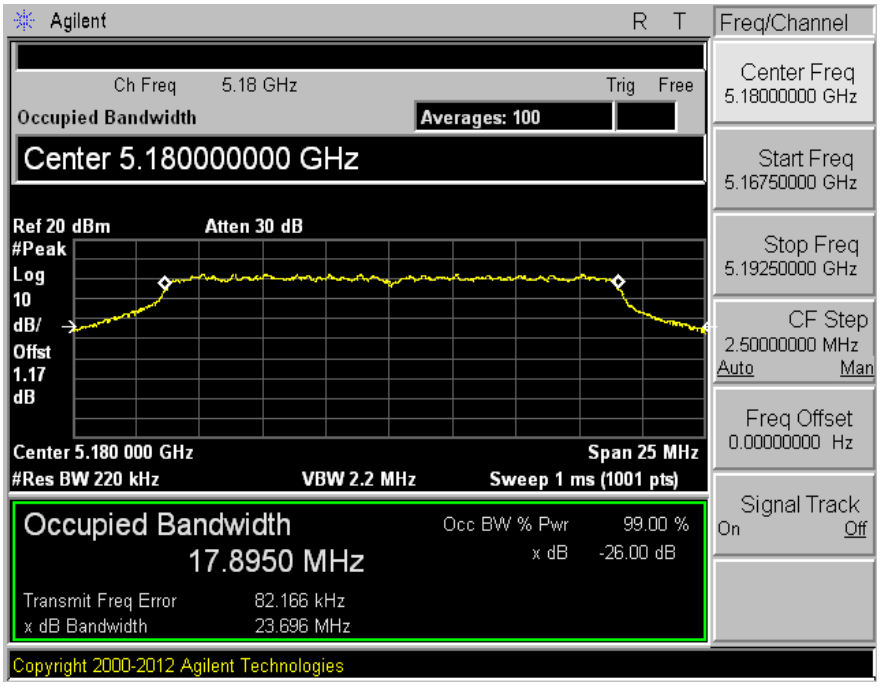
UNII Band1 OFDM (802.11ac-VHT20 44ch)AN1



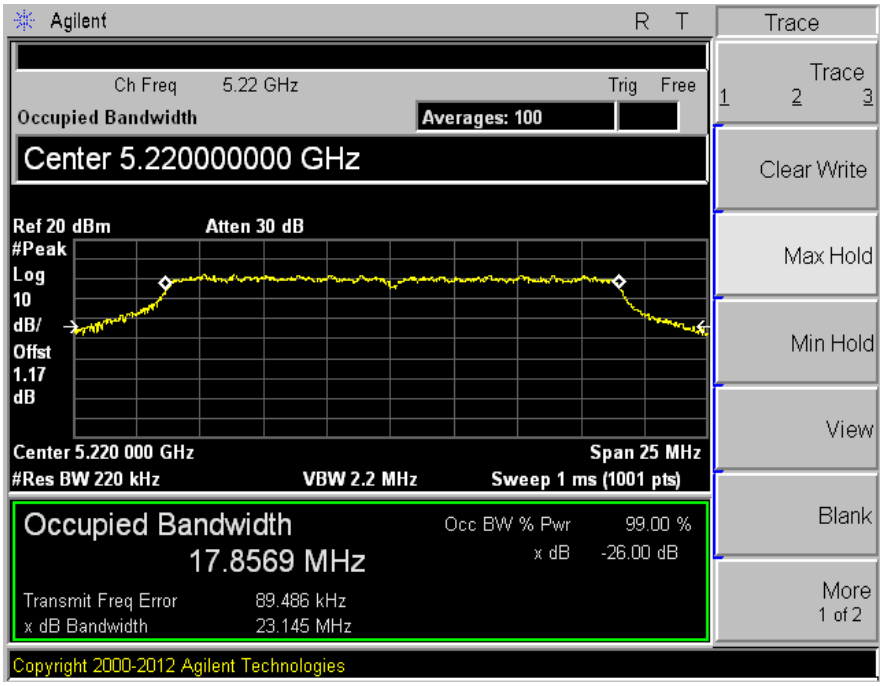
UNII Band1 OFDM (802.11ac VHT20-48ch) ANT1



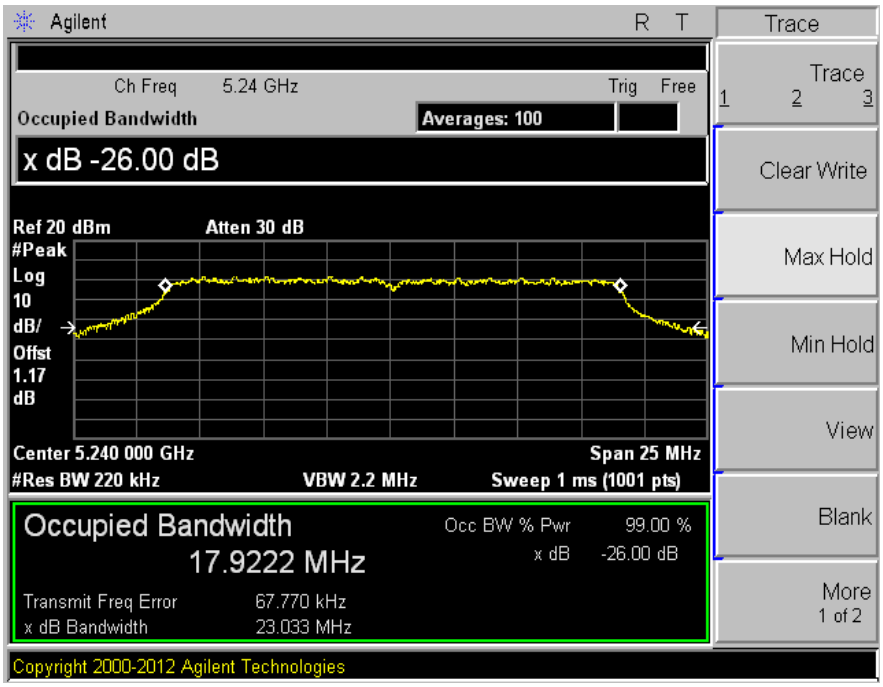
UNII Band1 OFDM (802.11ac VHT20-36ch)ANT2



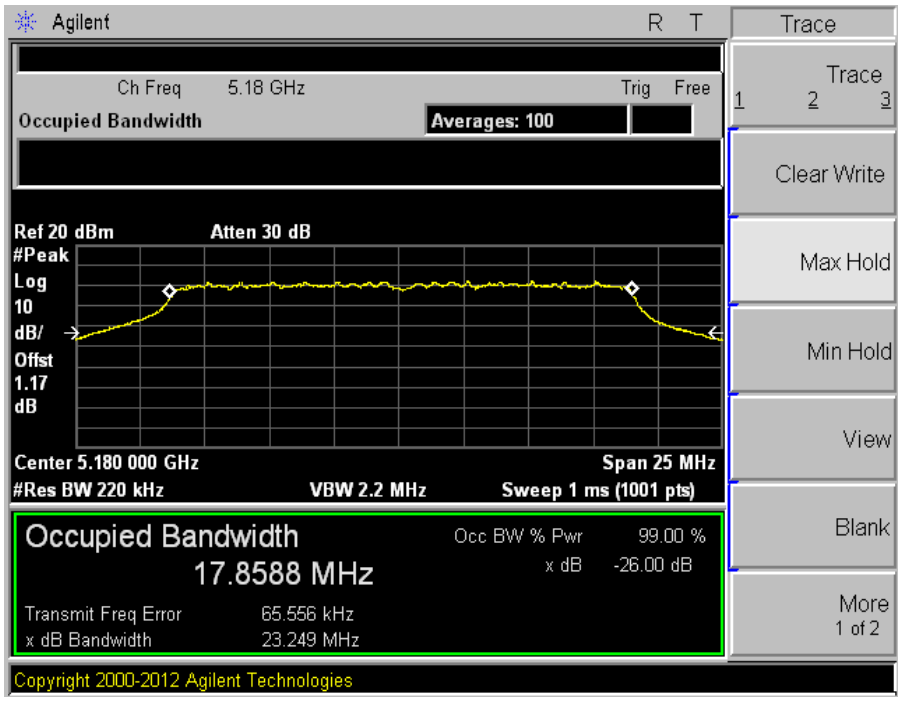
UNII Band1 OFDM (802.11ac VHT20-44ch)ANT2



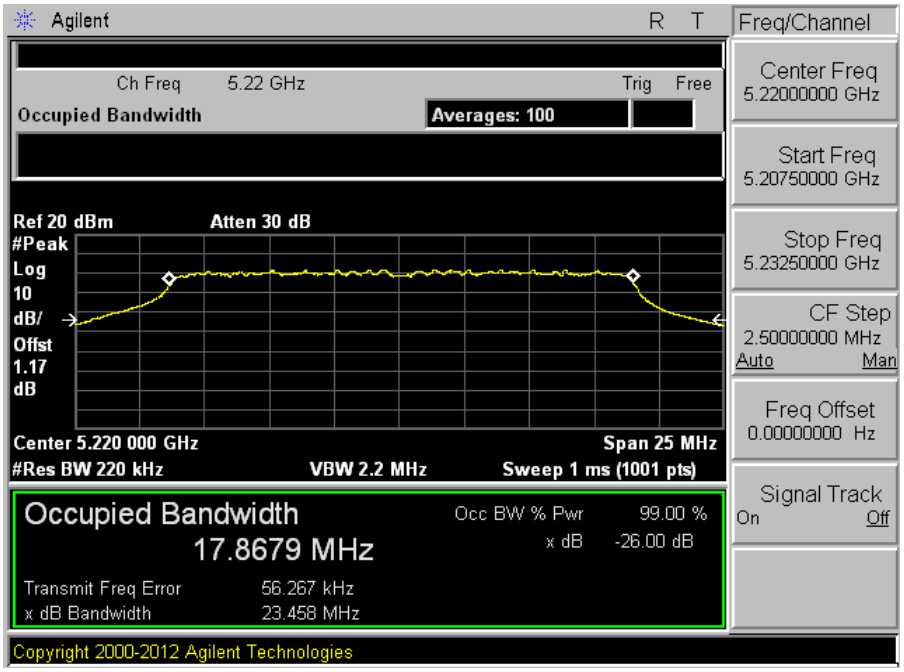
UNII Band1 OFDM (802.11ac VHT20-48ch)ANT2



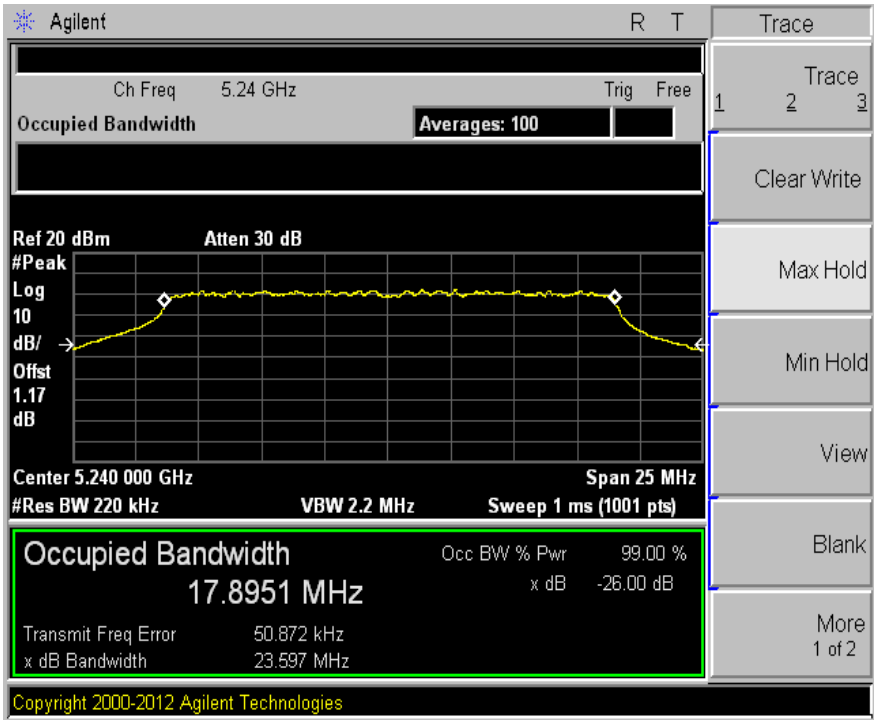
UNII Band1 OFDM (802.11ac VHT20-36ch)ANT3



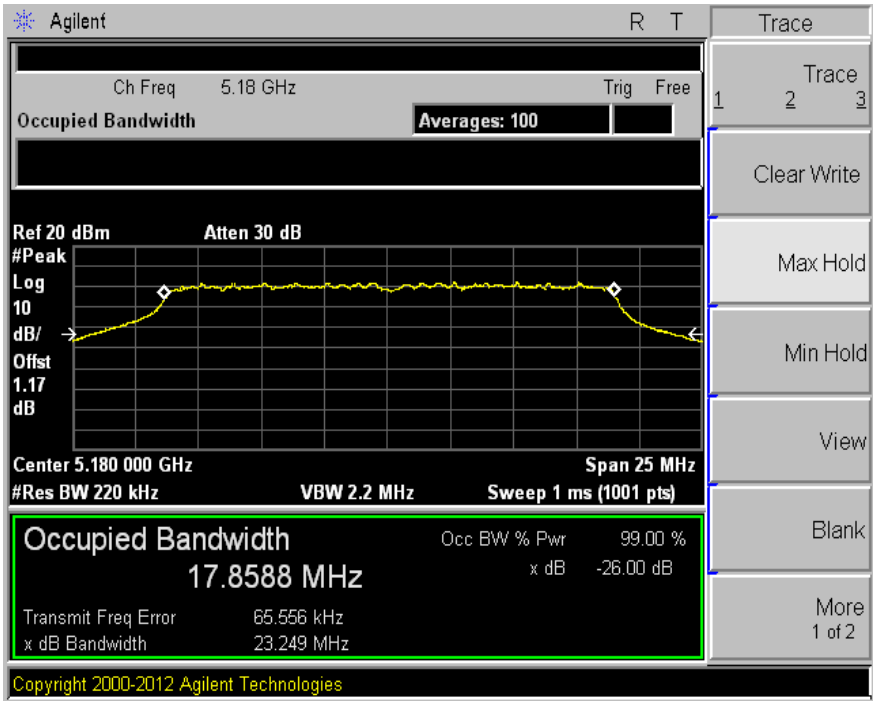
UNII Band1 OFDM (802.11ac VHT20-44ch)ANT3



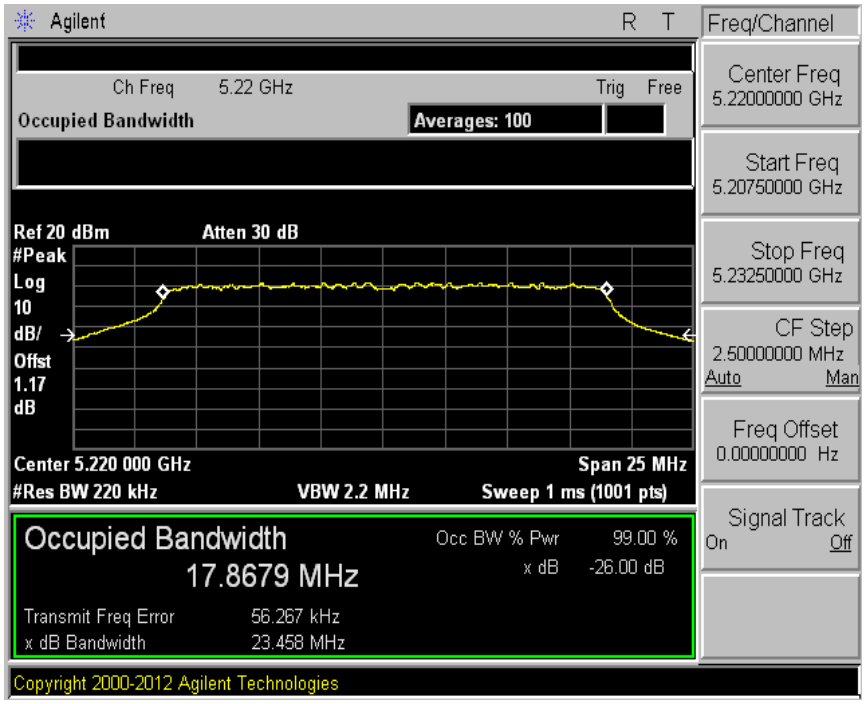
UNII Band1 OFDM (802.11ac VHT20-48ch)ANT3



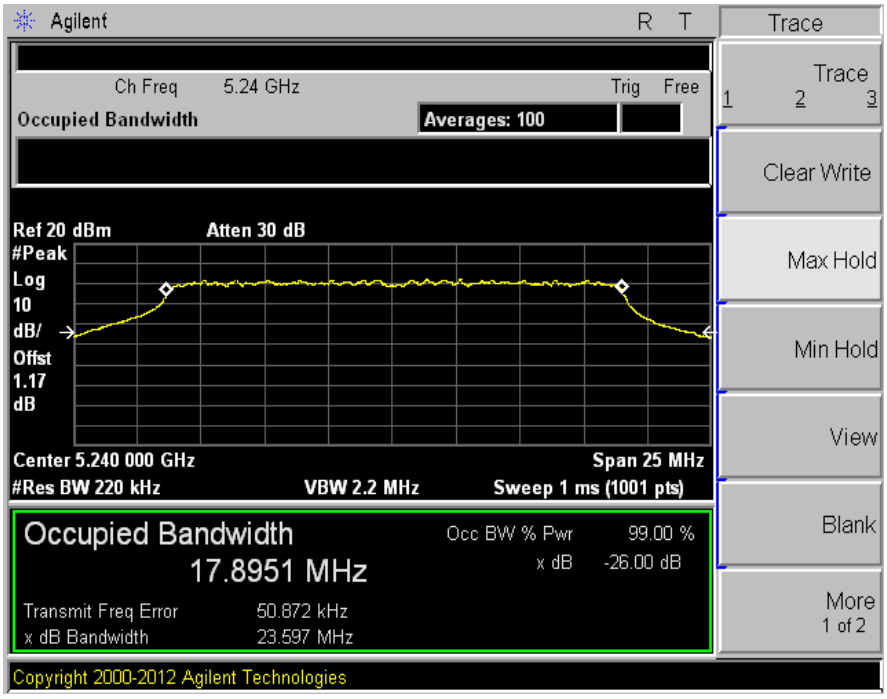
UNII Band1 OFDM (802.11ac VHT20-36ch)ANT4



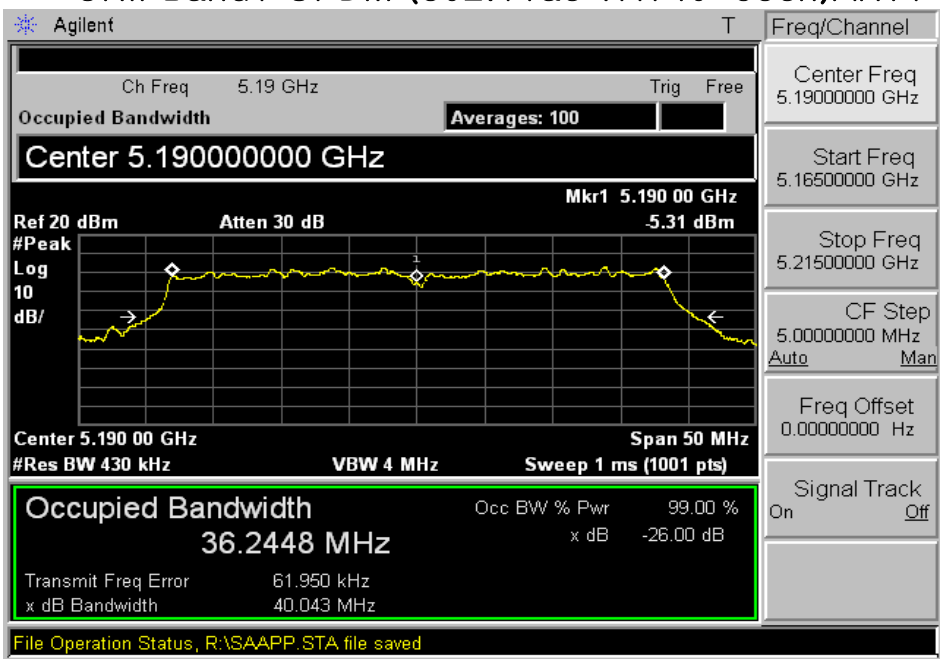
UNII Band1 OFDM (802.11ac VHT20-44ch)ANT4



UNII Band1 OFDM (802.11ac VHT20-48ch)ANT4



UNII Band1 OFDM (802.11ac VHT40-38ch)ANT1



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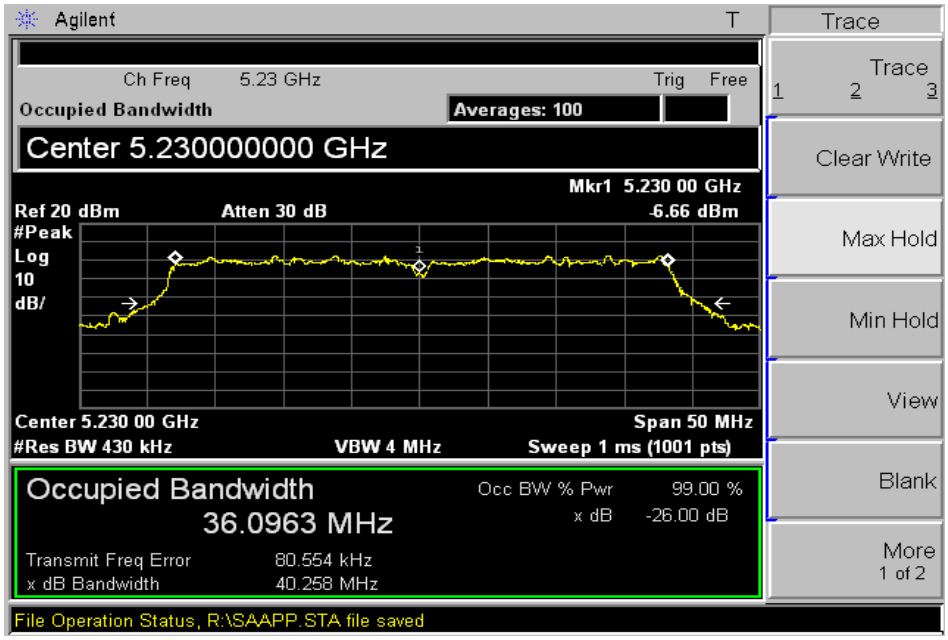
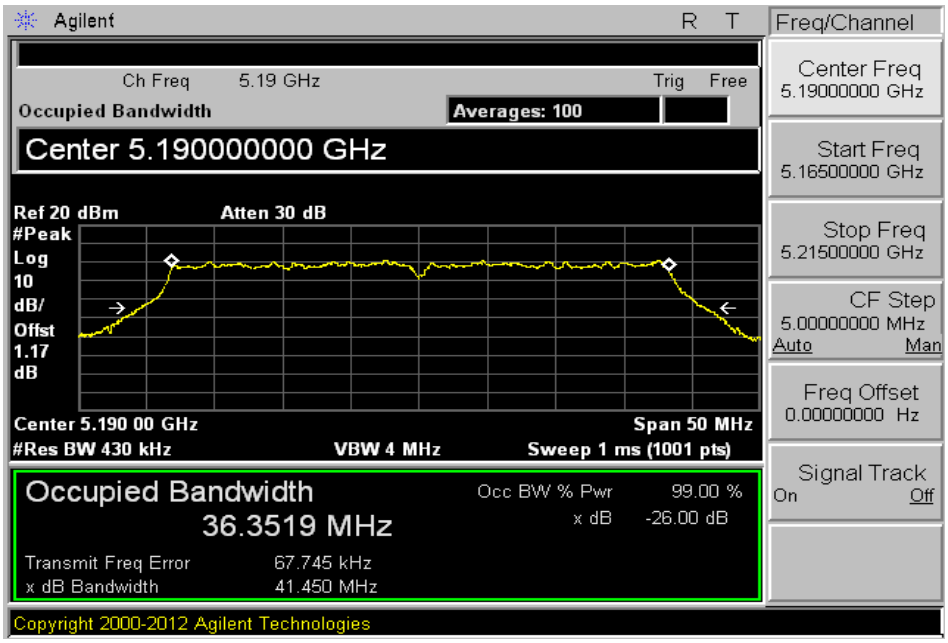


UNII Band1 OFDM (802.11ac VHT40-38ch)ANT2



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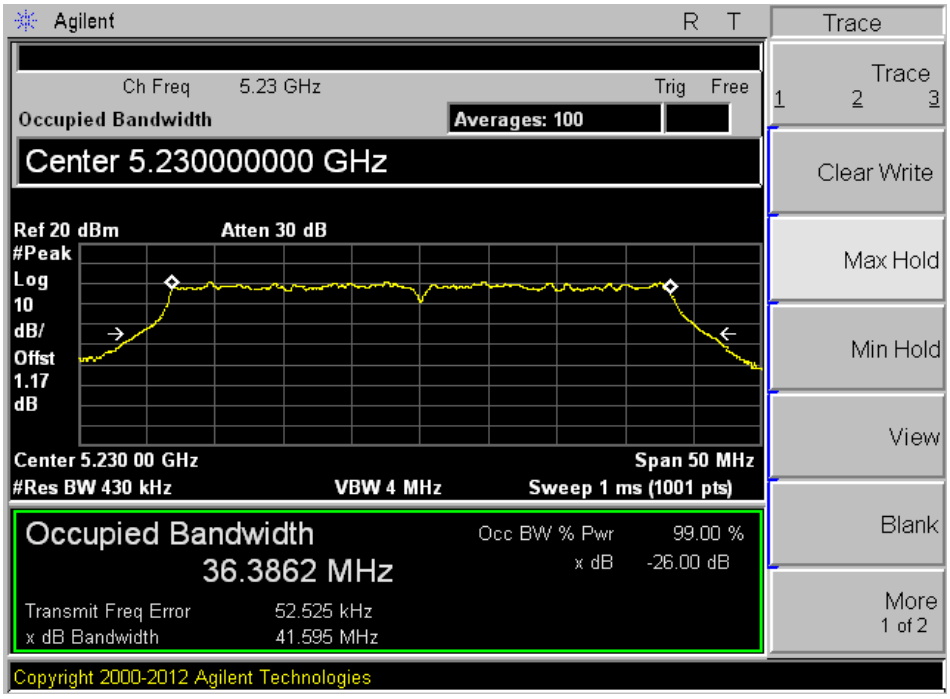
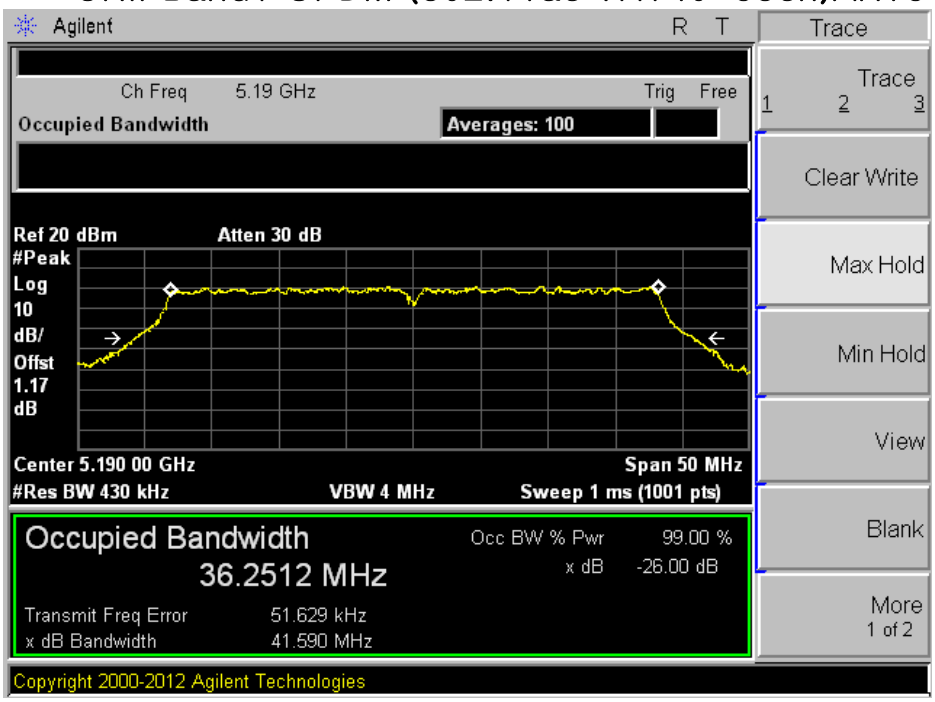
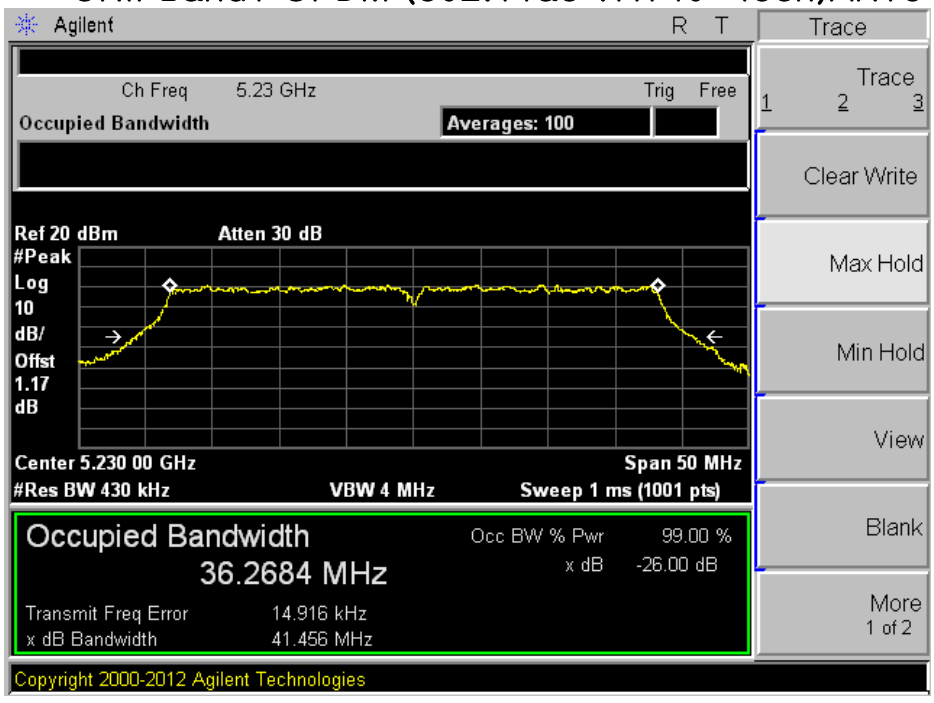


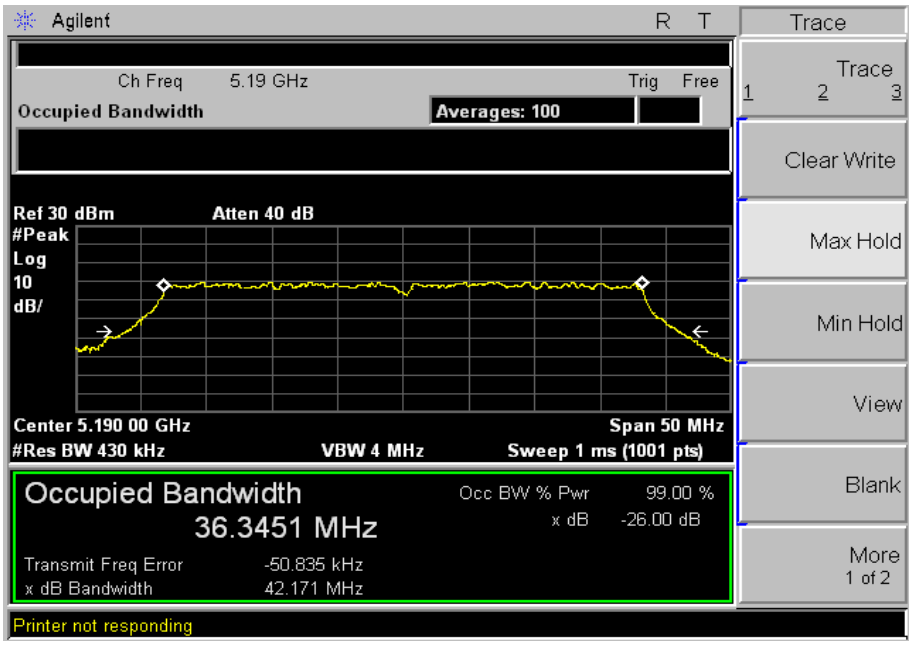
UNII Band1 OFDM (802.11ac VHT40-38ch)ANT3



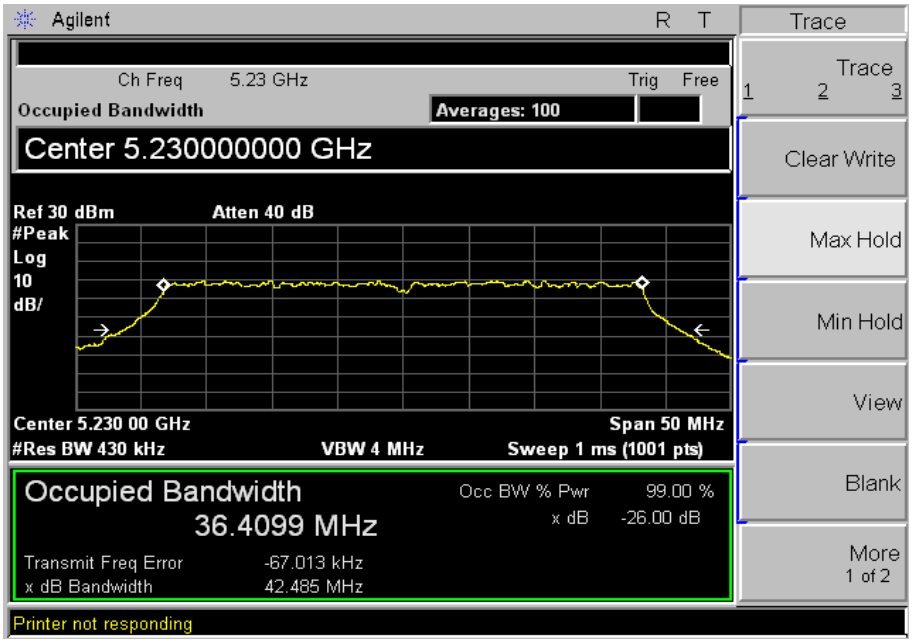
UNII Band1 OFDM (802.11ac VHT40-46ch)ANT3



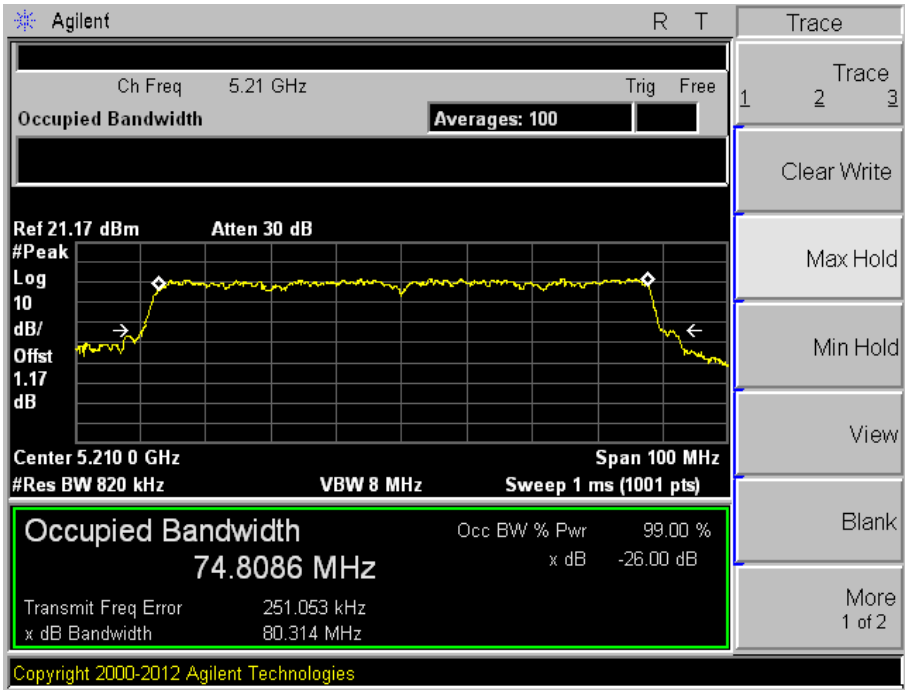
UNII Band1 OFDM (802.11ac VHT40-38ch)ANT4



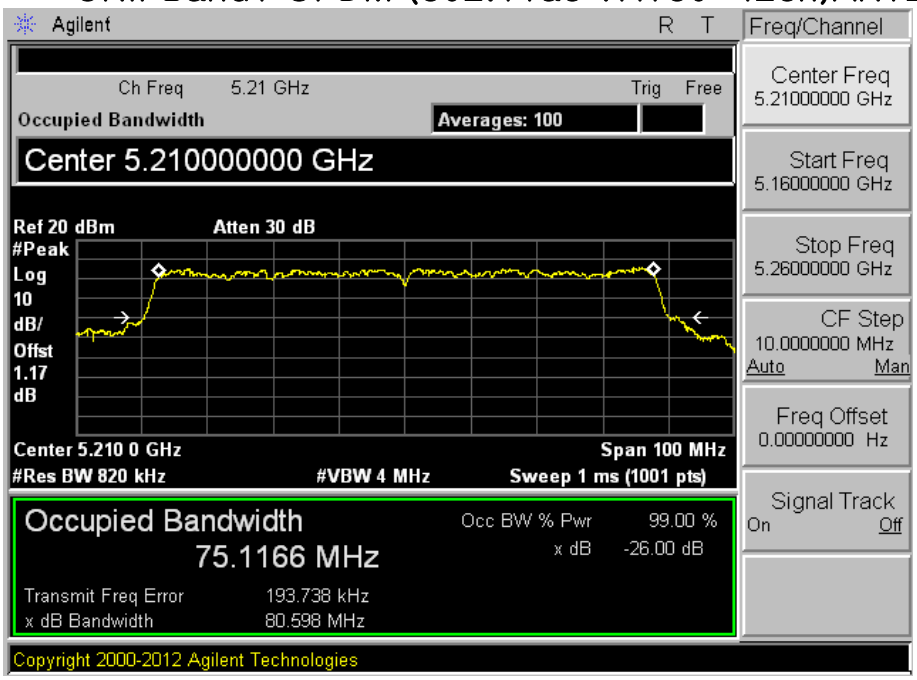
UNII Band1 OFDM (802.11ac VHT40-46ch)ANT4



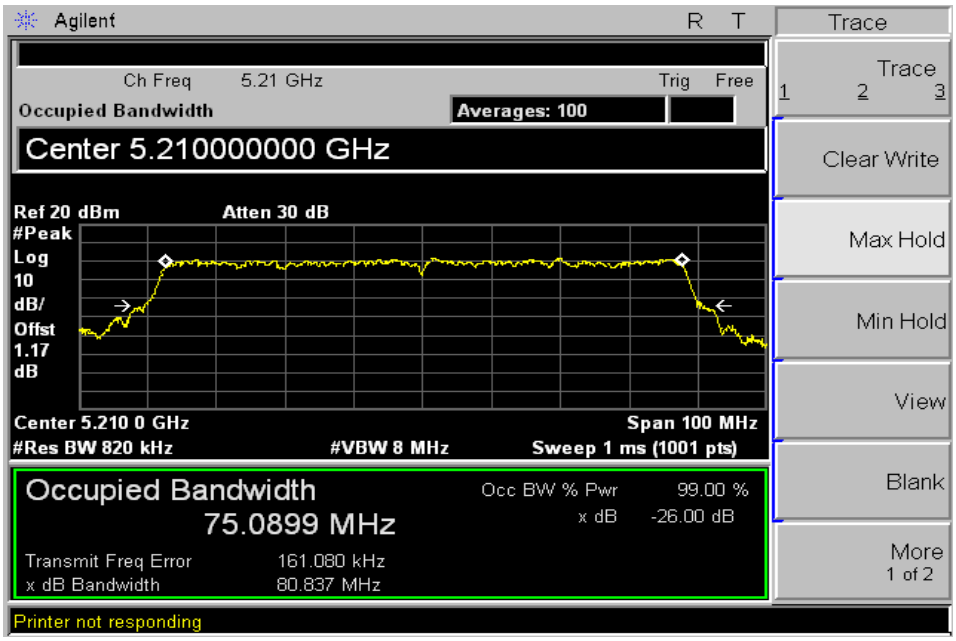
UNII Band1 OFDM (802.11ac VHT80-42ch)ANT1



UNII Band1 OFDM (802.11ac VHT80-42ch)ANT2



UNII Band1 OFDM (802.11ac VHT80-42ch)ANT3



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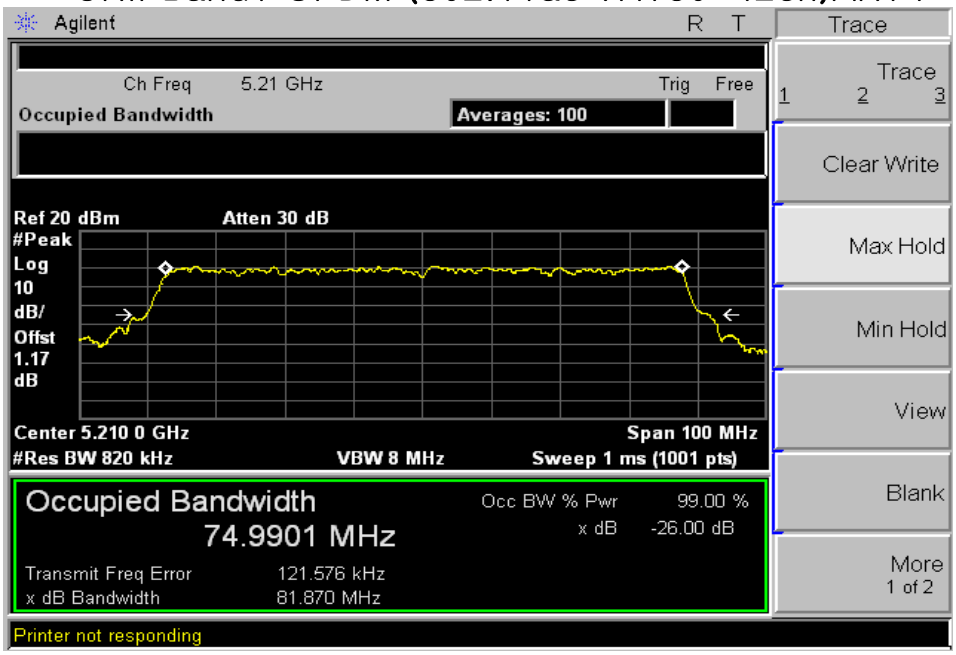


10. 6dB Bandwidth Measurement

10.1 Test procedure

KDB 789033 v01r03- Section C &15.407(e)

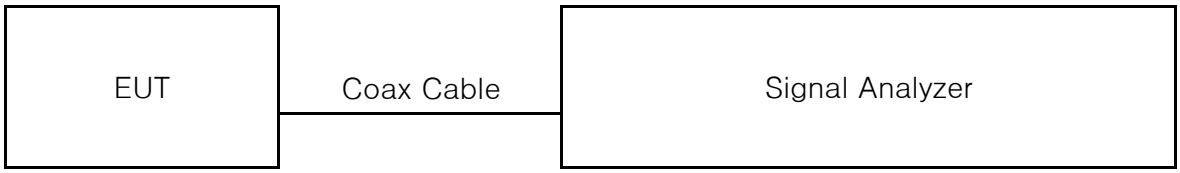
Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum duty cycle, at power control level, as defined in KDB 789033 D02 v01r03, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 6dB bandwidth

10.2 Test instruments and measurement setup

1. The signal analyzer' automatic bandwidth measurement capability was used to perform the 6dE bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The automatic ba measurement function also has the capability of simultaneously measuring the 99 % occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in t fundamental emission.
2. RBW = 100 kHz
3. VBW = 3 x RBW
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = auto couple

10.3 Test setup



Test instrument & Measurement Setup

10.4 Measurement results

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	23 ℃, 42 % R.H.
INPUT POWER	DC 12 V		

UNII Band3(802.11ac VHT20) ANT1

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5745	17.72	17.62
5785	17.72	17.63
5825	17.73	17.63

UNII Band3(802.11ac VHT20) ANT2

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5745	17.68	17.62
5785	17.68	17.58
5825	17.67	17.62

UNII Band3(802.11ac VHT20) ANT3

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5745	17.68	17.63
5785	17.68	17.60
5825	17.67	17.59

UNII Band3(802.11ac VHT20) ANT4

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5745	17.68	17.63
5785	17.68	17.60
5825	17.67	17.59

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	23 ℃, 42 % R.H.
INPUT POWER	DC 12 V		

UNII Band3(802.11ac VHT40) ANT1

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5755	36.19	36.29
5795	36.19	35.99

UNII Band3(802.11ac VHT40) ANT2

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5755	36.35	36.38
5795	36.22	36.39

UNII Band3(802.11ac VHT40) ANT3

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5755	36.16	35.84
5795	36.11	35.26

UNII Band3(802.11ac VHT40) ANT4

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5755	36.21	36.28
5795	36.20	35.87

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	23 ℃, 42 % R.H.
INPUT POWER	DC 12 V		

UNII Band3(802.11ac VHT80) ANT1

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5775	75.06	75.01

UNII Band3(802.11ac VHT80) ANT2

Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5775	75.04	75.22

UNII Band3(802.11ac VHT80) ANT3

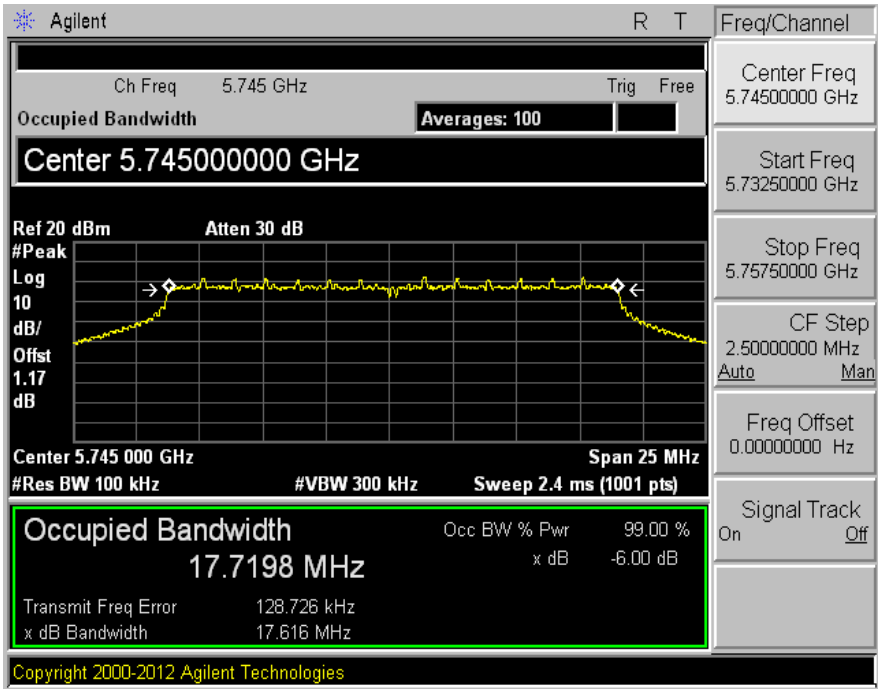
Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5775	75.05	75.24

UNII Band3(802.11ac VHT80) ANT4

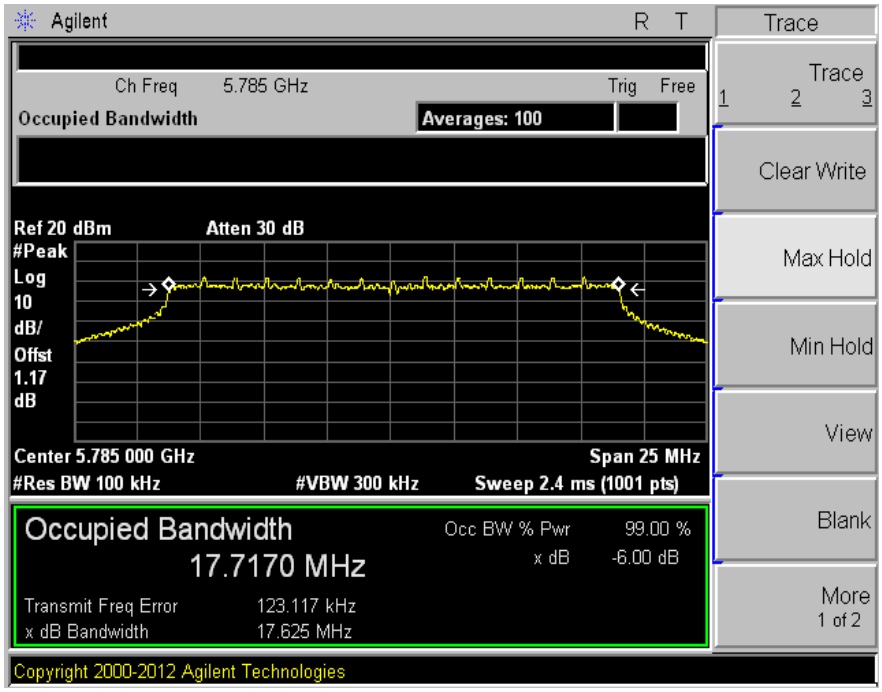
Channel Frequency (MHz)	99% bandwidth	Bandwidth at 6dB below(MHz)
5775	75.11	75.45

10.5 Trace data

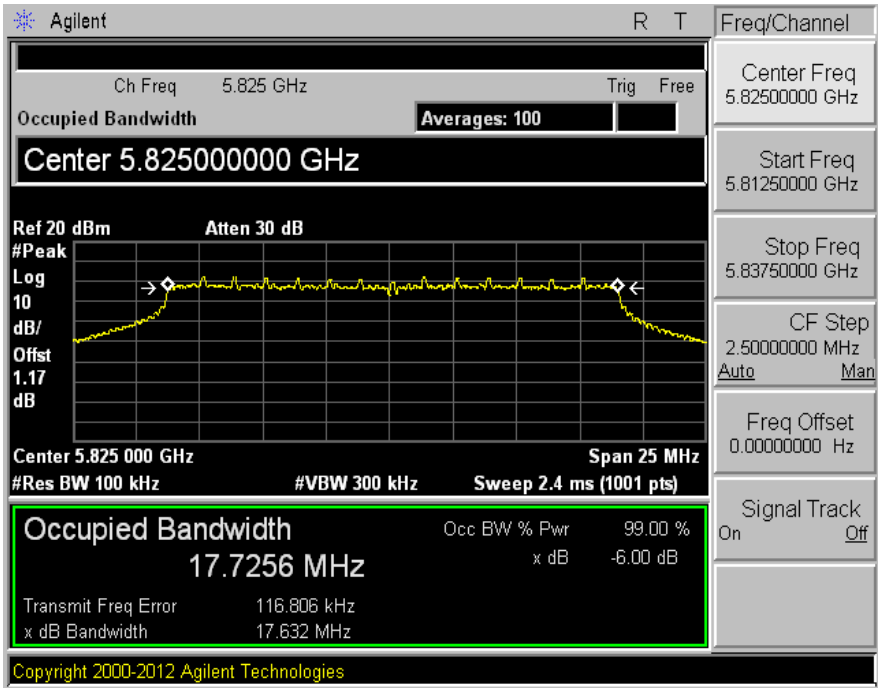
UNII Band3 OFDM (802.11ac-VHT20 149ch)AN1



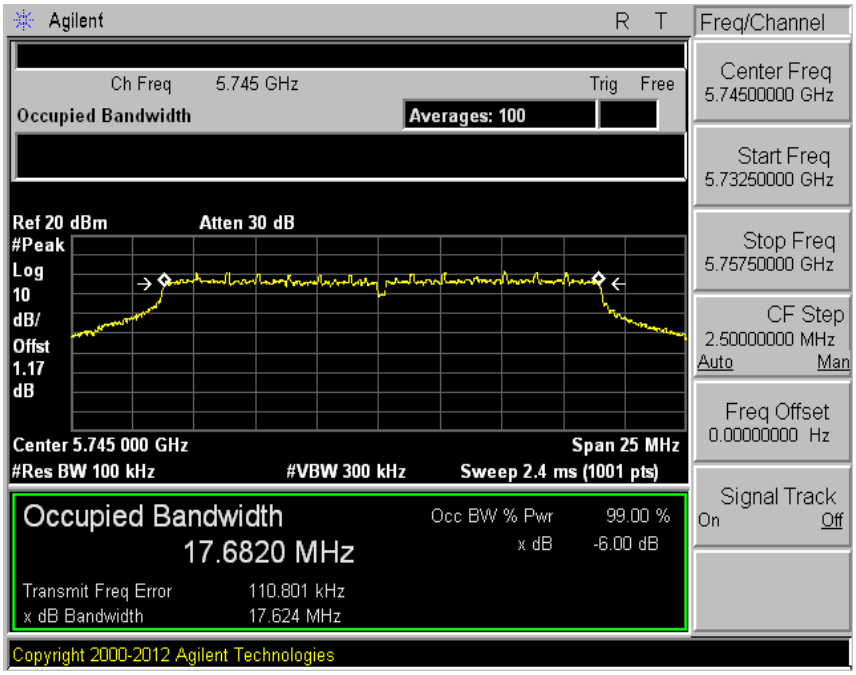
UNII Band3 OFDM (802.11ac-VHT20 157ch)AN1



UNII Band3 OFDM (802.11ac VHT20-165ch) ANT1



UNII Band3 OFDM (802.11ac VHT20-149ch)ANT2



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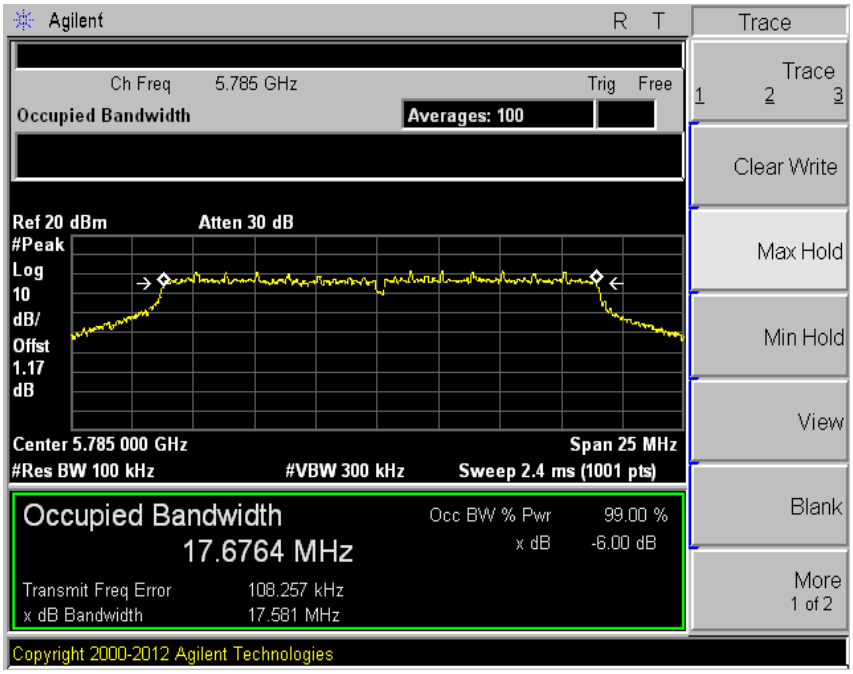
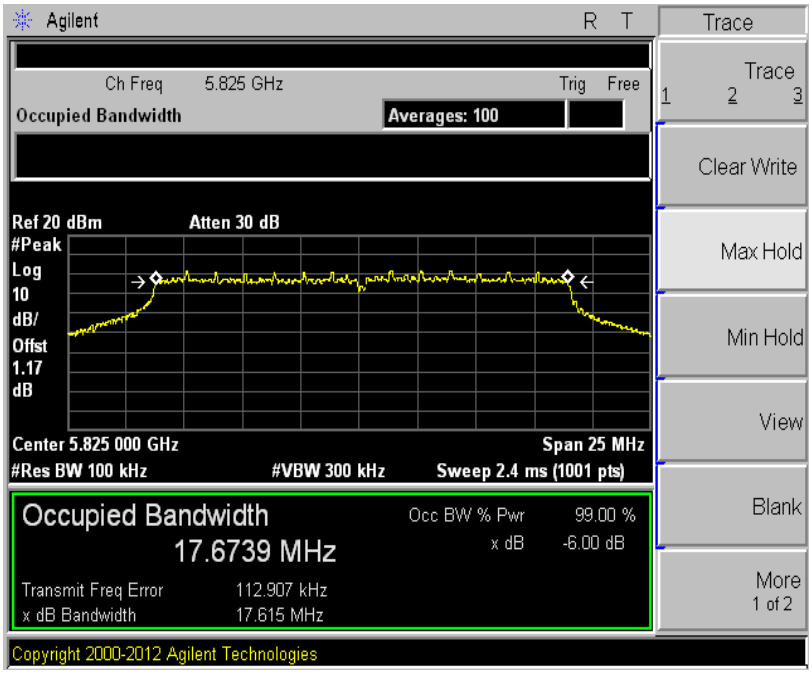
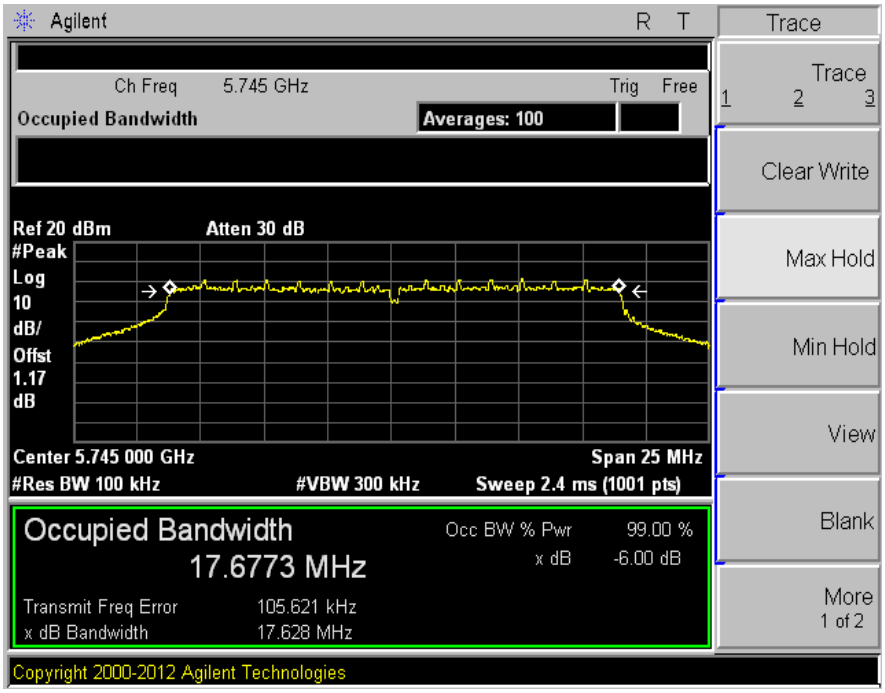


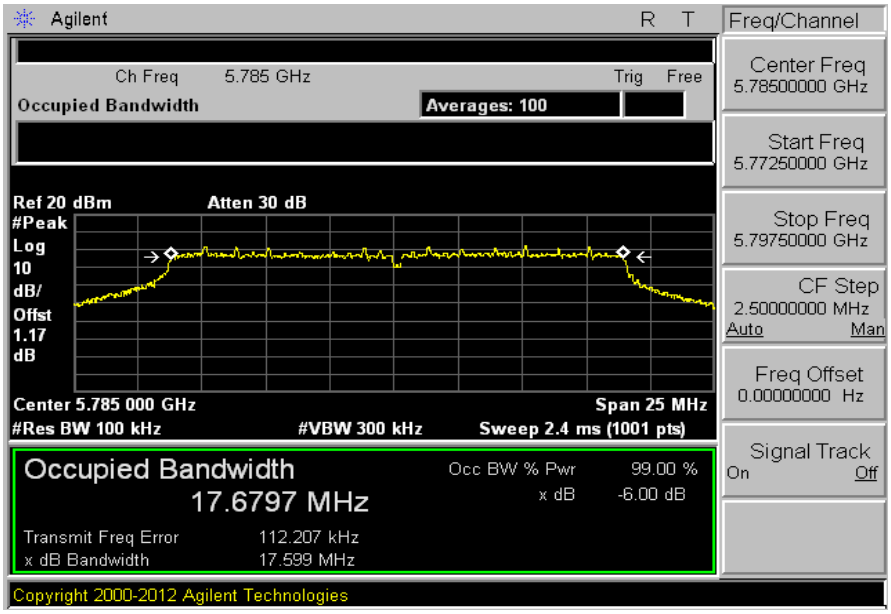
UNII Band3 OFDM (802.11ac VHT20-165ch)ANT2



UNII Band3 OFDM (802.11ac VHT20-149ch)ANT3



UNII Band3 OFDM (802.11ac VHT20-157ch)ANT3



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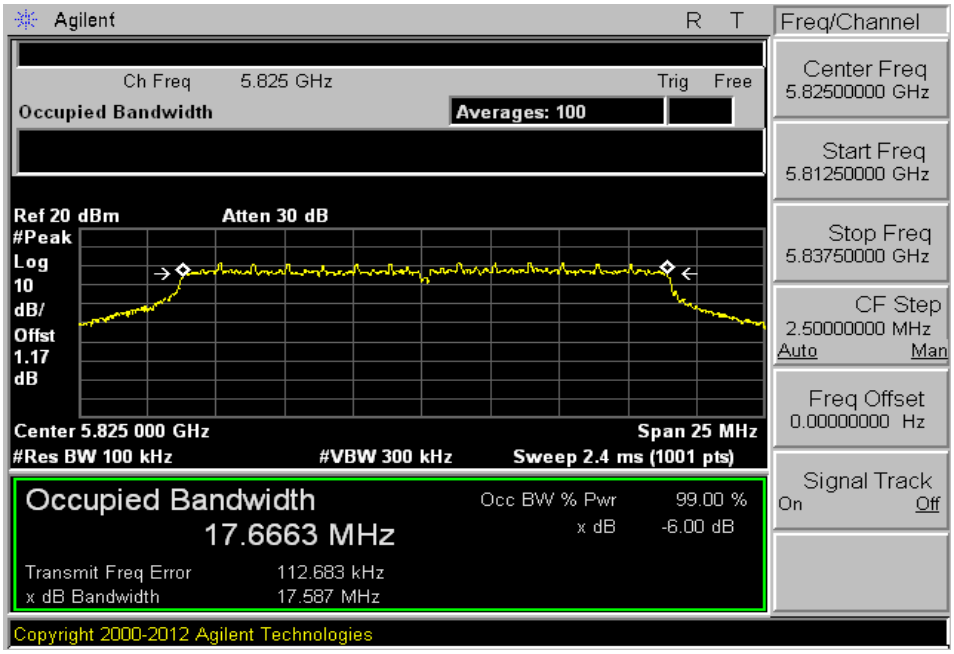
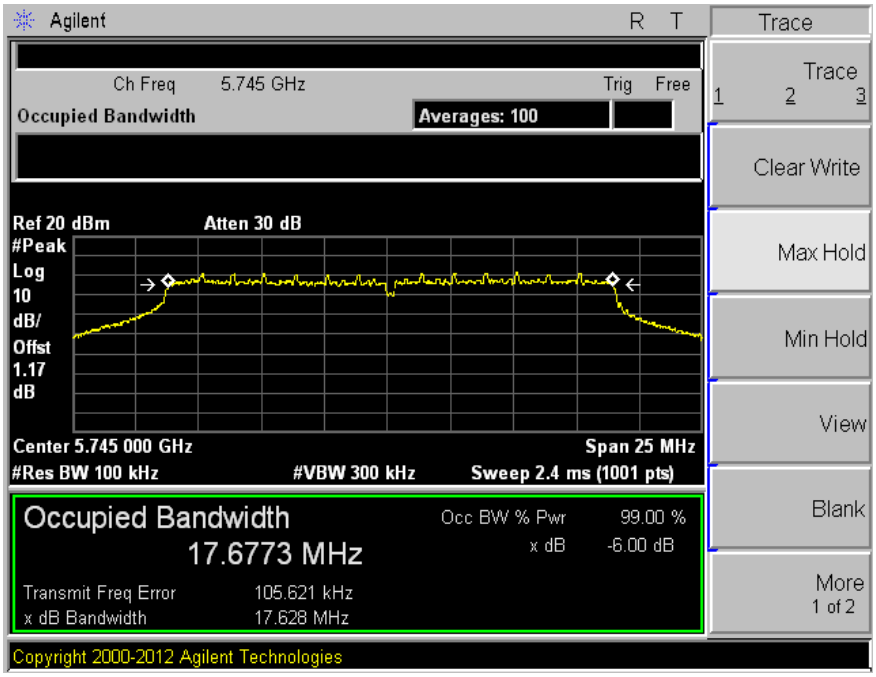
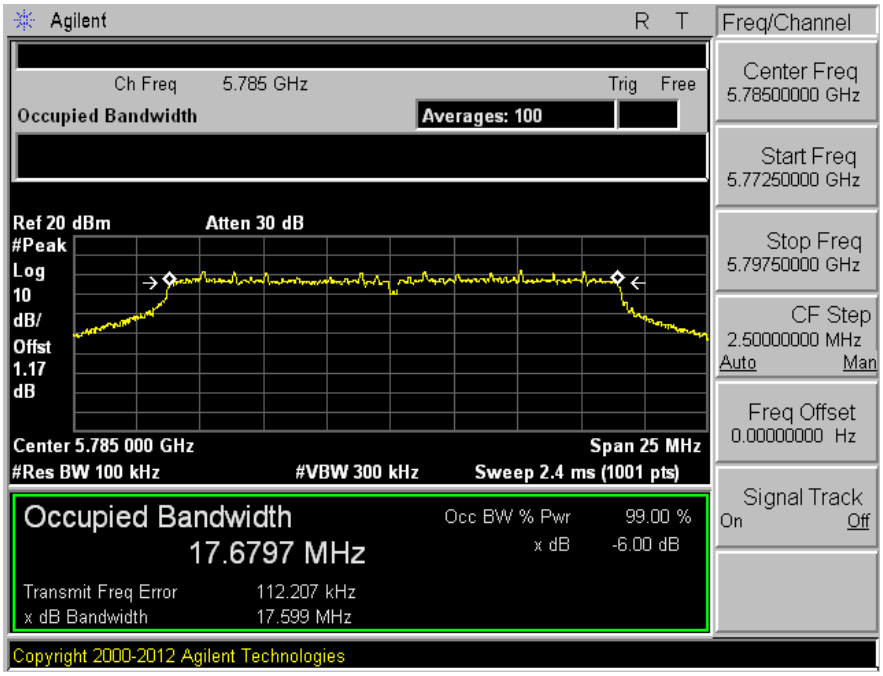


UNII Band3 OFDM (802.11ac VHT20-149ch)ANT4



UNII Band3 OFDM (802.11ac VHT20-157ch)ANT4



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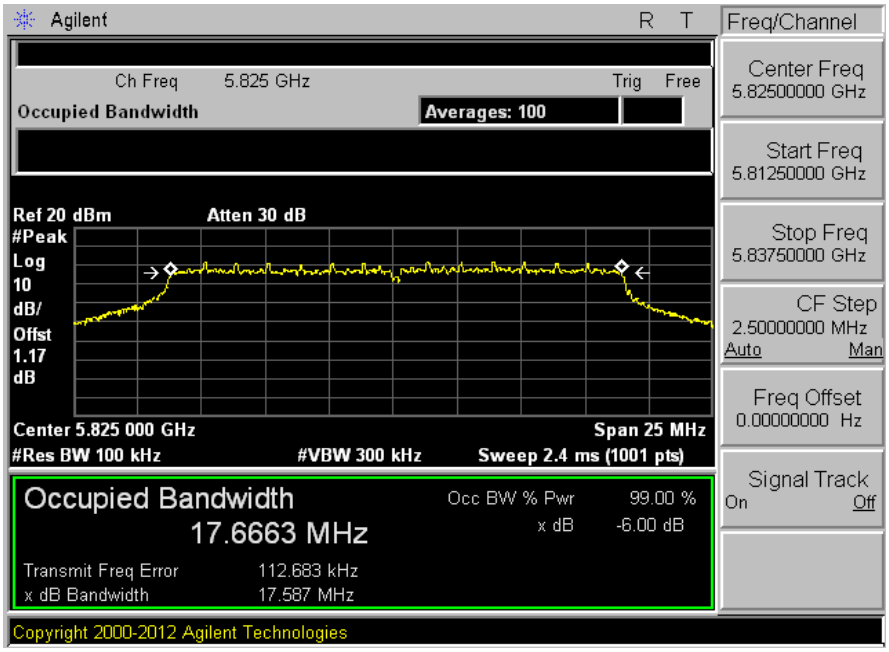
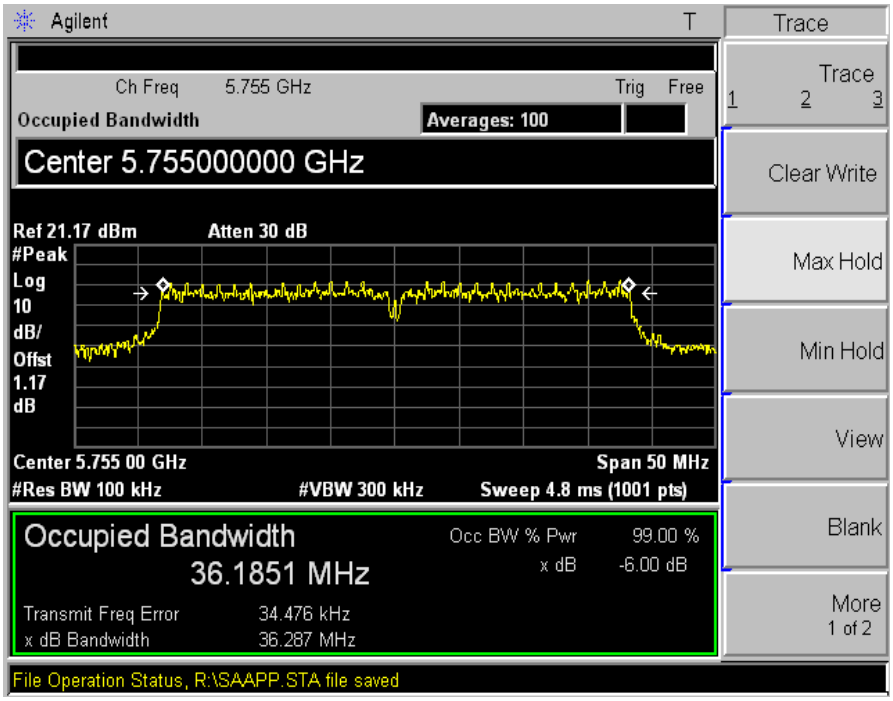


UNII Band3 OFDM (802.11ac VHT40-151ch)ANT1



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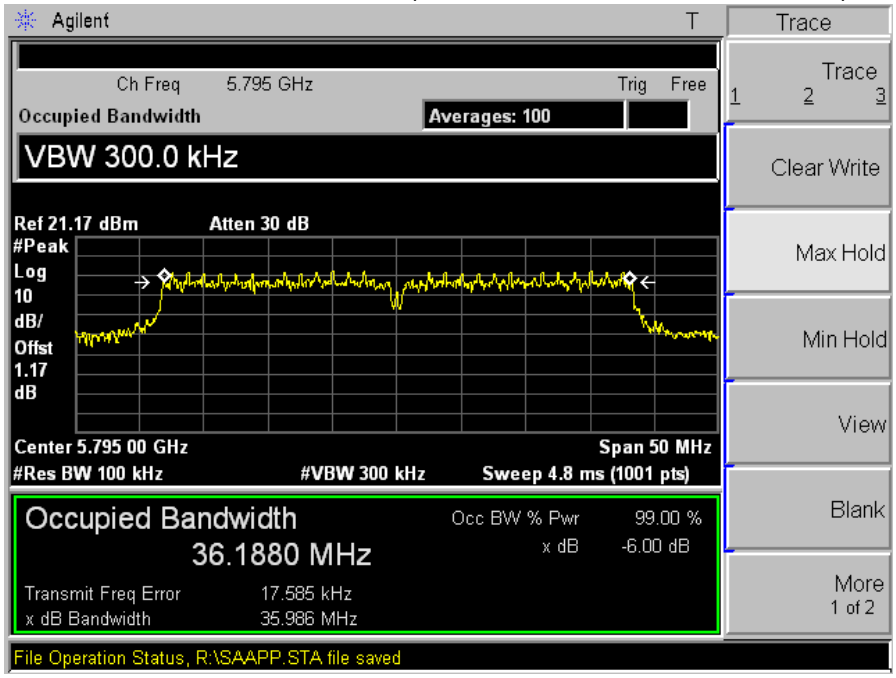
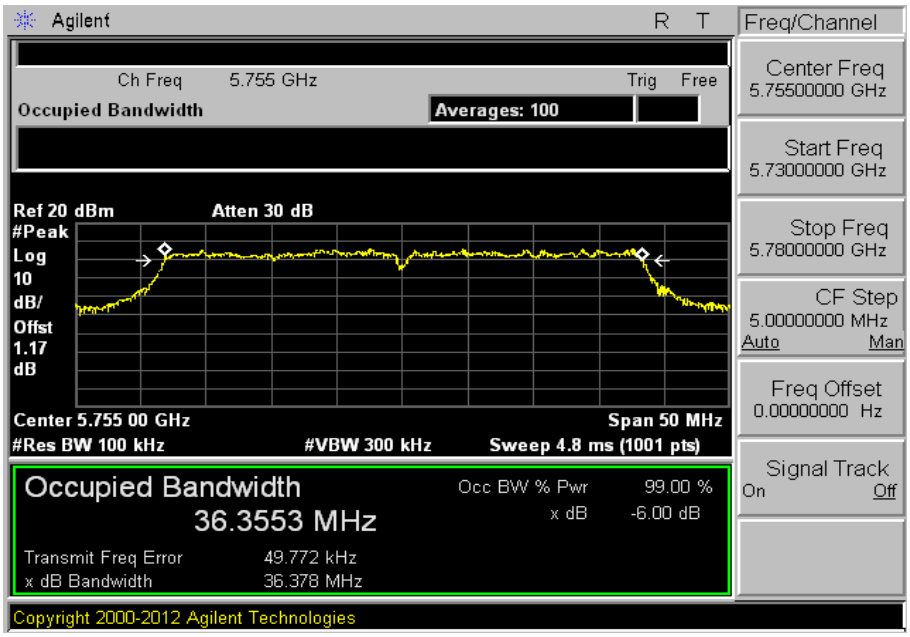
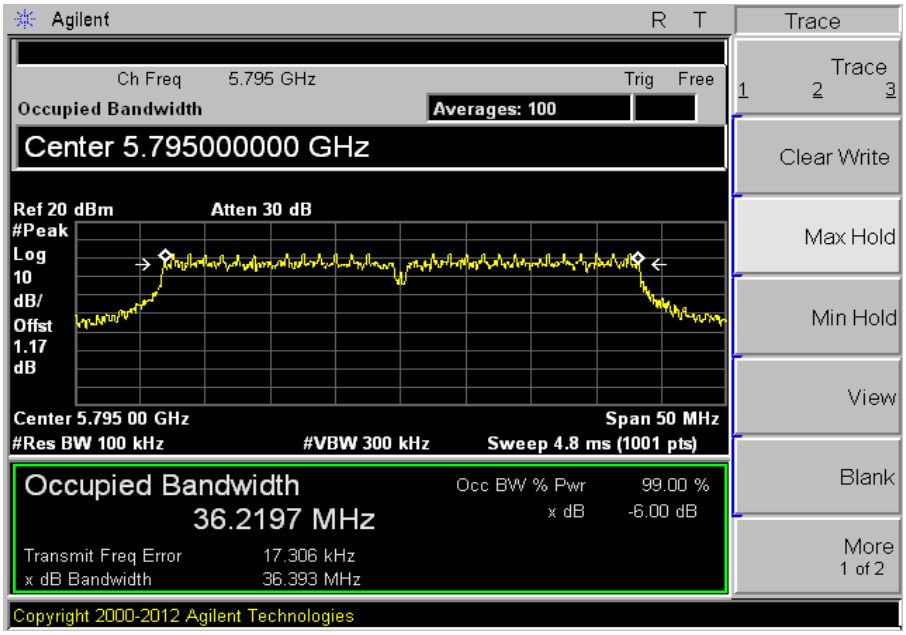


UNII Band3 OFDM (802.11ac VHT40-151ch)ANT2



UNII Band3 OFDM (802.11ac VHT40-159ch)ANT2



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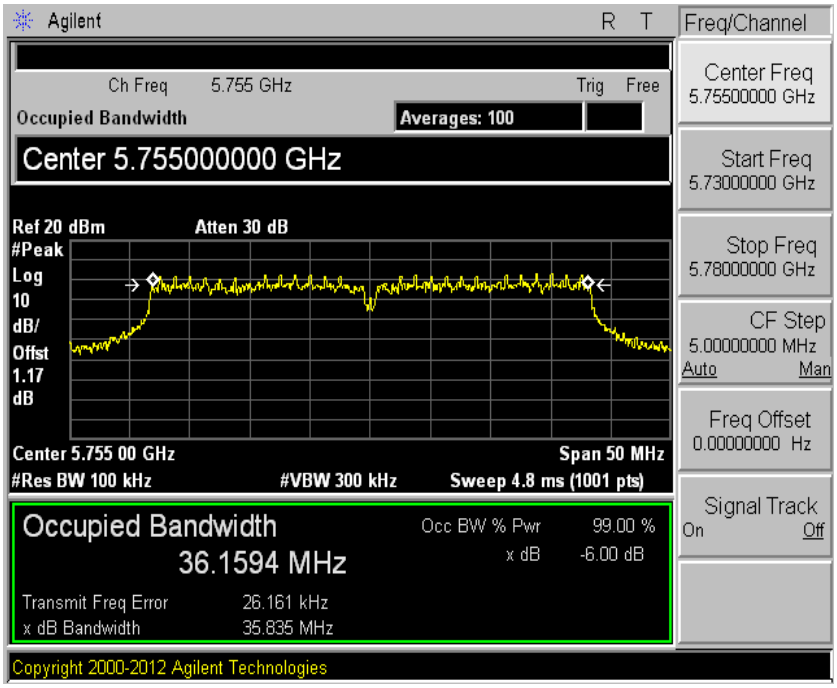

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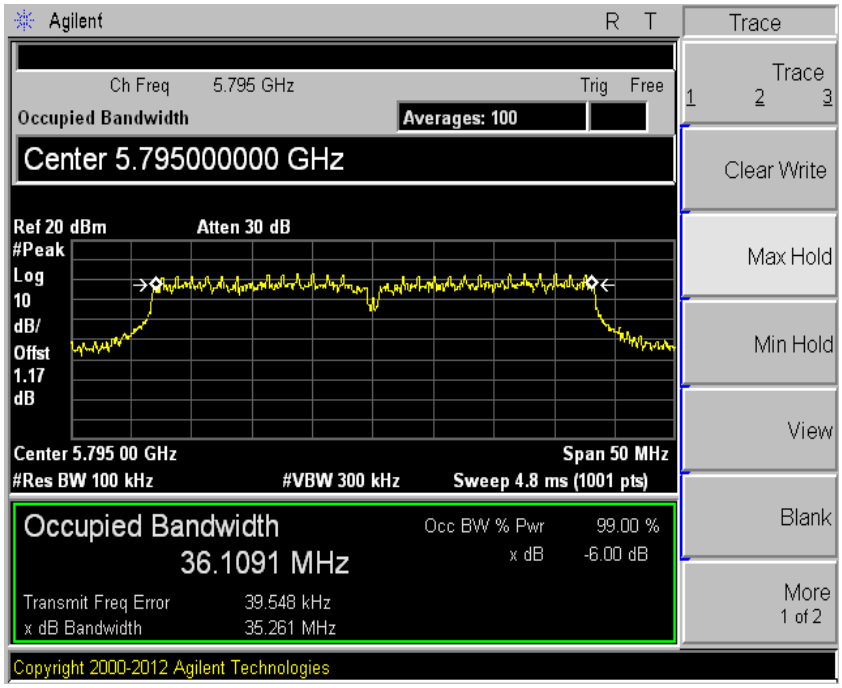

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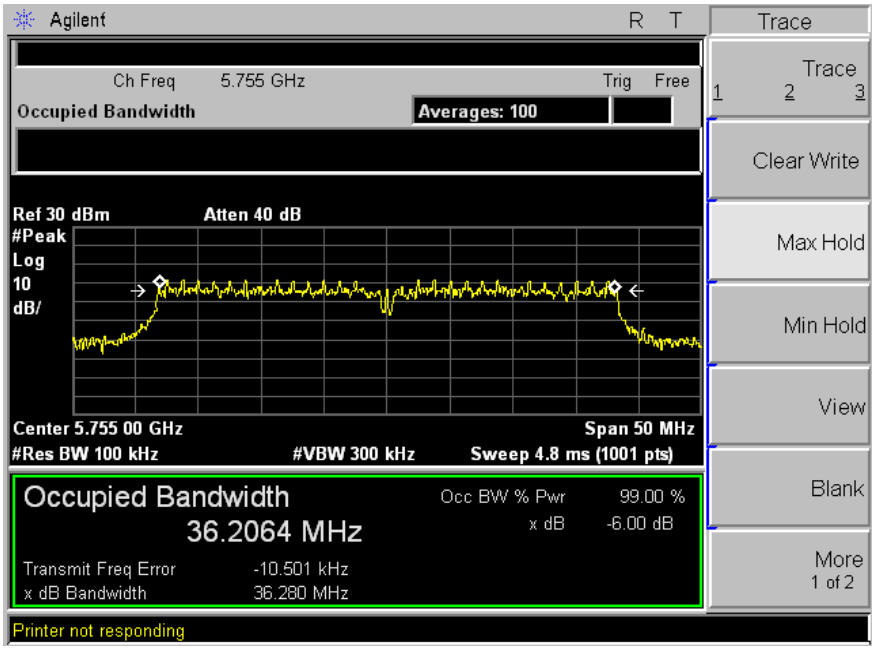

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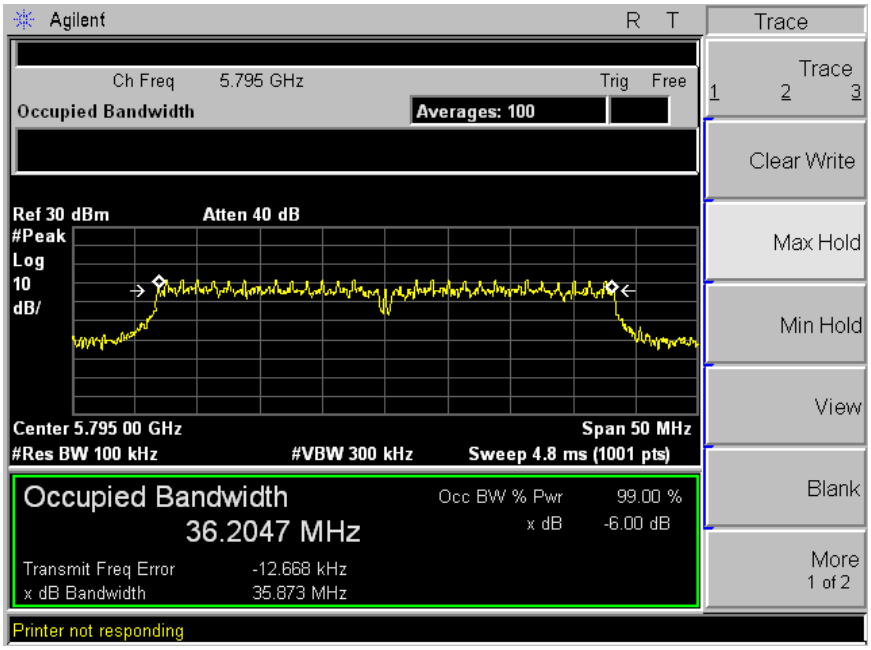
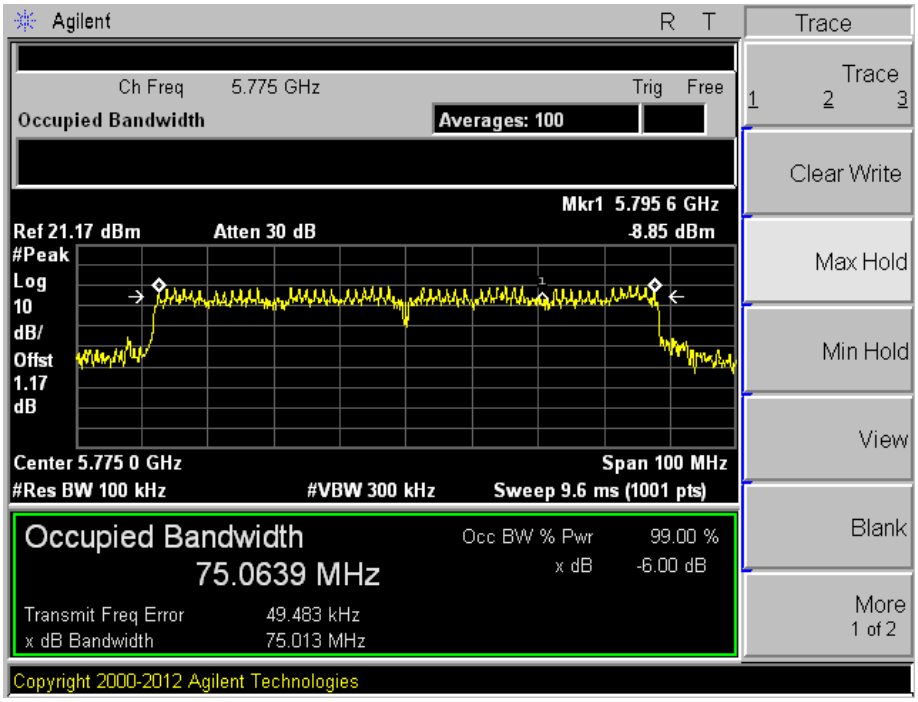
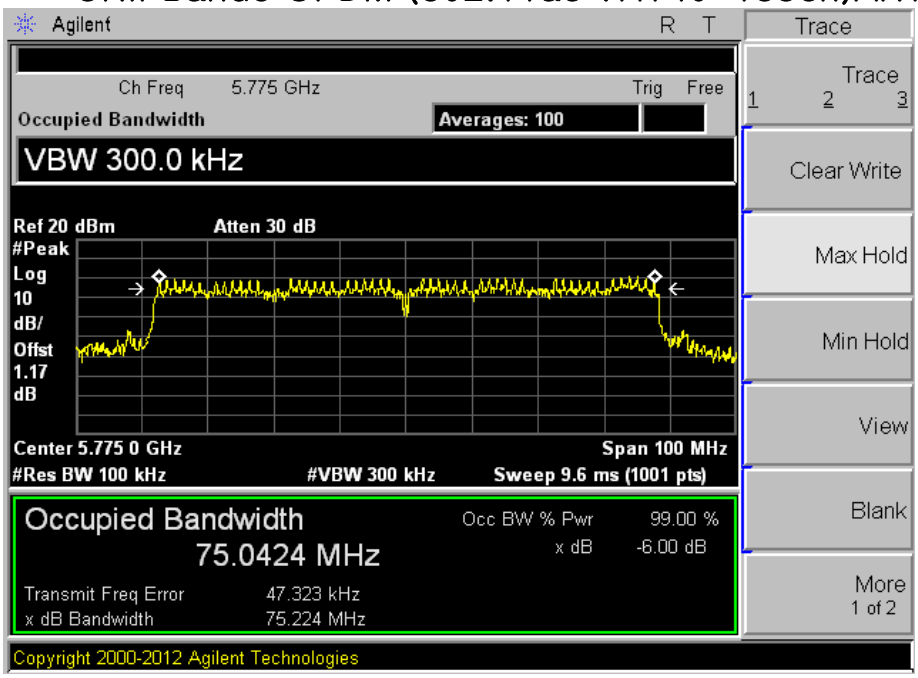


UNII Band3 OFDM (802.11ac VHT40-155ch)ANT1



UNII Band3 OFDM (802.11ac VHT40-155ch)ANT2



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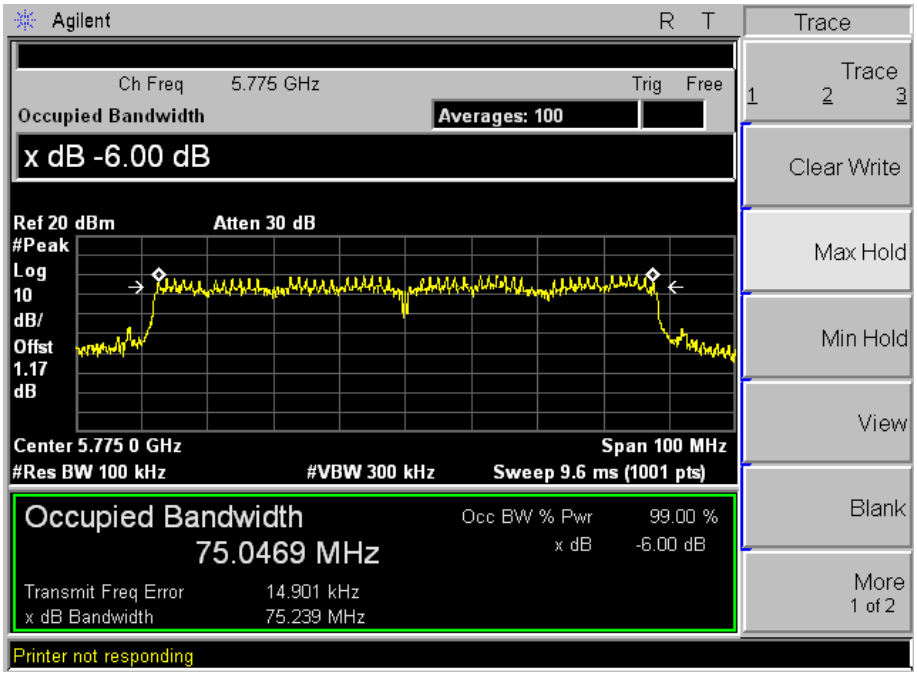

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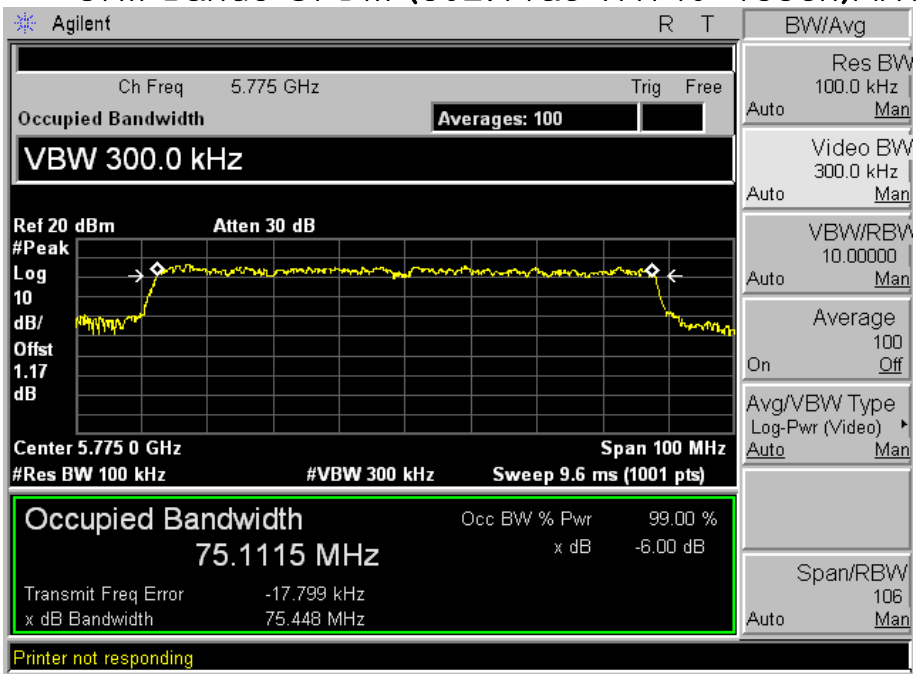


11. MAXIMUM CONDUCTED OUTPUT POWER

11.1 Test procedure

KDB 789033 v01r03- Section E d) Maximum conducted output power

11.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.
(i) Measure the duty cycle, x, of the transmitter output signal as described in section B).
(ii) Set span to encompass the 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
(iii) Set RBW = 1 MHz.
(iv) Set VBW ≥ 3 MHz.
(v) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
(vi) Sweep time = auto.
(vii) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
(viii) Do not use sweep triggering. Allow the sweep to "free run".
(ix) Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
(x) Compute power by integrating the spectrum across the 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
xi) Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

Limits FCC §15.407 (a)(1) , IC RSS-210 A9.2 (1)

Maximum Peak Output Power Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041281	2017-01-12

11.3 Measurement results

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	24 ℃, 43 % R.H.
INPUT POWER	DC 12 V		

UNII Band1,3(802.11ac VHT20)ANT1

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
36	5180	AVG	11.22	13.24
44	5220	AVG	11.47	14.03
48	5240	AVG	10.64	11.59
149	5745	AVG	11.70	14.79
157	5785	AVG	11.91	15.52
165	5825	AVG	11.84	15.28

UNII Band1,3(802.11ac VHT20)ANT2

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
36	5180	AVG	11.64	14.59
44	5220	AVG	11.46	14.00
48	5240	AVG	11.24	13.30
149	5745	AVG	11.98	15.78
157	5785	AVG	11.83	15.24
165	5825	AVG	12.01	15.89

UNII Band1,3(802.11ac VHT20)ANT3

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
36	5180	AVG	10.82	12.08
44	5220	AVG	10.66	11.64
48	5240	AVG	10.90	12.30
149	5745	AVG	11.89	15.45
157	5785	AVG	12.09	16.18
165	5825	AVG	12.15	16.41

UNII Band1,3(802.11ac VHT20)ANT4

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
36	5180	AVG	11.07	12.79
44	5220	AVG	8.75	7.50
48	5240	AVG	9.10	8.13
149	5745	AVG	8.70	7.41
157	5785	AVG	10.02	10.05
165	5825	AVG	10.20	10.47

UNII Band1,3(802.11ac VHT40)ANT1

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
38	5190	AVG	10.55	11.35
46	5230	AVG	10.53	11.30
151	5755	AVG	13.11	20.46
159	5795	AVG	13.12	20.51

UNII Band1,3(802.11ac VHT40)ANT2

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
38	5190	AVG	9.08	8.09
46	5230	AVG	8.41	6.93
151	5755	AVG	13.5	22.39
159	5795	AVG	13.84	24.21

UNII Band1,3(802.11ac VHT40)ANT3

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
38	5190	AVG	9.54	8.99
46	5230	AVG	9.08	8.09
151	5755	AVG	13.52	22.49
159	5795	AVG	13.79	23.93

UNII Band1,3(802.11ac VHT40)ANT4

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
38	5190	AVG	7.93	6.21
46	5230	AVG	7.22	5.27
151	5755	AVG	12.57	18.07
159	5795	AVG	12.80	19.05

UNII Band1,3(802.11ac VHT80)ANT1

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
42	5210	AVG	10.03	10.07
155	5775	AVG	13.07	20.28

UNII Band1,3(802.11ac VHT80)ANT2

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
42	5210	AVG	7.85	6.10
155	5775	AVG	12.88	19.41

UNII Band1,3(802.11ac VHT80)ANT3

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
42	5210	AVG	8.34	6.82
155	5775	AVG	12.54	17.95

UNII Band1,3(802.11ac VHT80)ANT4

CHANNEL	Channel requency (MHz)	Detector	Conducted Power output	
			Measured (dBm)	Measured (mW)
42	5210	AVG	8.01	6.32
155	5775	AVG	13.3	21.38

Test Mode	channel No.	Freq. (MHz)	Ant 1 Average Power (dBm)	Ant 2 Average Power (dBm)	Ant 3 Average Power (dBm)	Ant 4 Average Power (dBm)	Total Average Power (dBm)	Total Average Power (mW)
ANT 1 + 2 + 3 + 4								
11ac -VHT20	36	5 180	11.22	11.64	10.82	11.07	17.22	52.70
	44	5 220	11.47	11.46	10.66	8.75	16.74	47.16
	48	5 240	10.64	11.24	10.90	9.10	16.56	45.32
	149	5 745	11.70	11.98	11.89	8.70	17.28	53.43
	157	5 785	11.91	11.83	12.09	10.02	17.56	56.99
	165	5 825	11.84	12.01	12.15	10.20	17.64	58.04
11ac -VHT40	38	5 190	10.55	9.08	9.54	7.93	15.40	34.64
	46	5 230	10.53	8.41	9.08	7.22	15.00	31.60
	151	5 755	13.11	13.50	13.52	12.57	19.21	83.41
	159	5 795	13.12	13.84	13.79	12.80	19.43	87.71
11ac -VHT80	42	5 210	10.03	7.85	8.34	8.01	14.67	29.31
	155	5 775	13.07	12.88	12.54	13.30	18.98	79.01

12. Peak power spectral density (PPSD)

12.1 Test procedure

KDB 789033 v01r03- Section F) Peak power spectral density (PPSD)

12.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.
1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power…". (This
2) Use the peak search function on the instrument to find the peak of the spectrum.
3) Make the following adjustments to the peak value of the spectrum, if applicable:
a) If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.
b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power
4) The result is the PPSD.
5) The above procedures make use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified in the 15.407(a)(5). That rule section also permits use of resolution bandwidths less than 1 MHz "provided that the measured power is integrated to show the total power over the measurement bandwidth" (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth, the following
a) Set RBW ≥ 1/T, where T is defined in section B)1)a).
b) Set VBW ≥ 3 RBW
c) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Limits : FCC § 15.407 (a)(1) IC RSS-210 A9.2(1)

The peak power density Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041281	2017-01-12

12.3 Measurement results

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	23 ℃, 43 % R.H.
INPUT POWER	DC 12 V		

UNII Band1 802.11ac VHT20 ANT1

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
36	5180	8.41	11.0	2.59
44	5220	8.56	11.0	2.44
48	5240	8.51	11.0	2.49

UNII Band1 802.11ac VHT20 ANT2

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
36	5180	9.89	11.0	1.11
44	5220	9.43	11.0	1.57
48	5240	9.15	11.0	1.85

UNII Band1 802.11ac VHT20 ANT3

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
36	5180	6.63	11.0	4.37
44	5220	7.25	11.0	3.75
48	5240	7.61	11.0	3.39

UNII Band1 802.11ac VHT20 ANT4

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
36	5180	7.78	11.0	3.22
44	5220	4.99	11.0	6.01
48	5240	4.92	11.0	6.08

UNII Band1 802.11ac VHT40 ANT1

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
38	5190	6.93	11.0	4.07
46	5230	6.76	11.0	4.24

UNII Band1 802.11ac VHT40 ANT2

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
38	5190	4.63	11.0	6.37
46	5230	4.42	11.0	6.58

UNII Band1 802.11ac VHT40 ANT3

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
38	5190	4.71	11.0	6.29
46	5230	4.88	11.0	6.13

UNII Band1 802.11ac VHT40 ANT4

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
38	5190	3.82	11.0	7.18
46	5230	3.21	11.0	7.79

UNII Band1 802.11ac VHT80 ANT1

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
42	5210	3.73	11.0	7.27

UNII Band1 802.11ac VHT80 ANT2

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
42	5210	1.98	11.0	9.02

UNII Band1 802.11ac VHT80 ANT3

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
42	5210	2.60	11.0	8.40

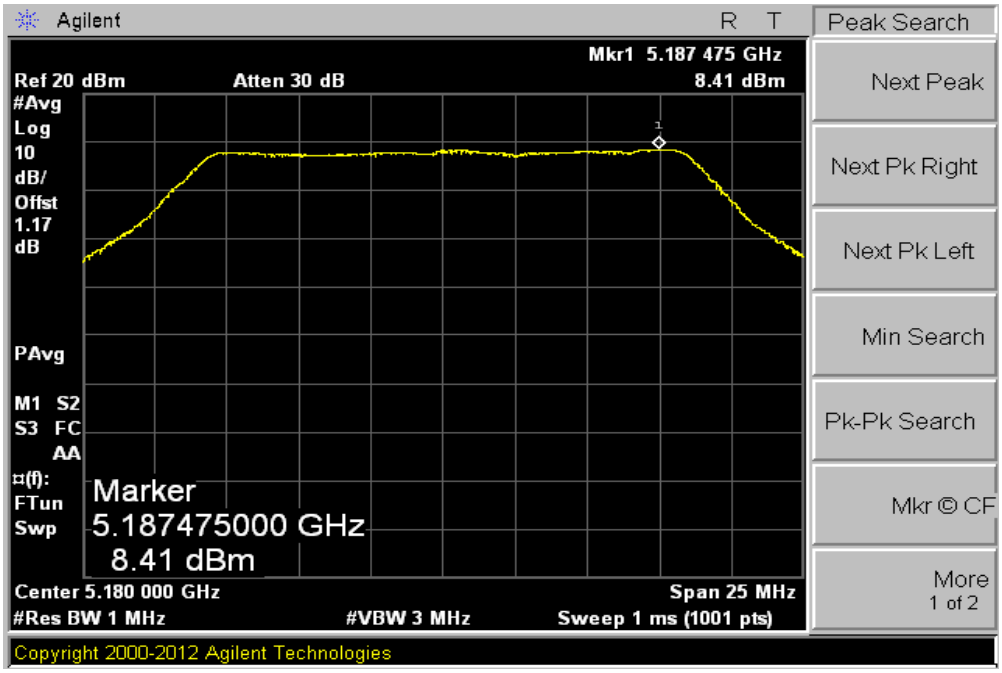
UNII Band1 802.11ac VHT80 ANT4

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/MHz]	Margin [dB]
42	5210	1.98	11.0	9.02

12.4 Trace data

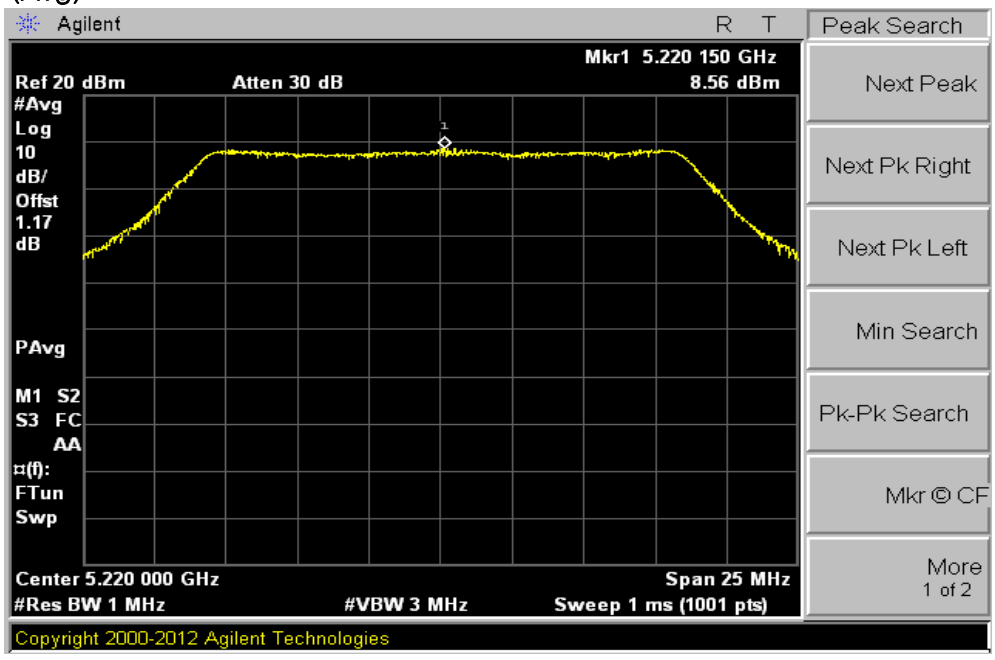
UNII Band1 OFDM (802.11ac VHT20-36ch) ANT1

(Avg)



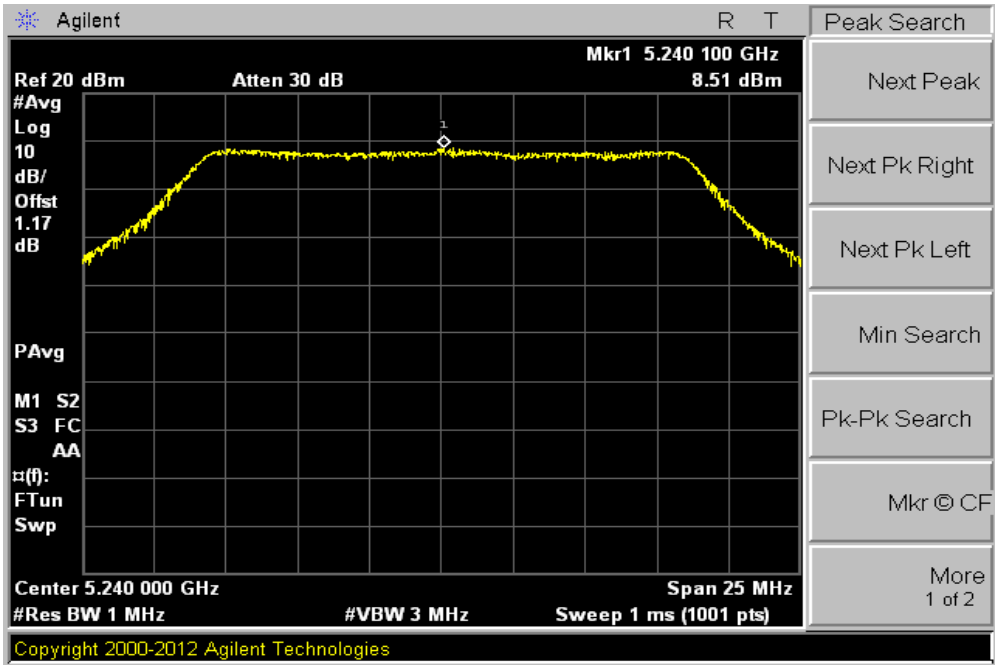
UNII Band1 OFDM (802.11ac VHT20-44ch) ANT1

(Avg)



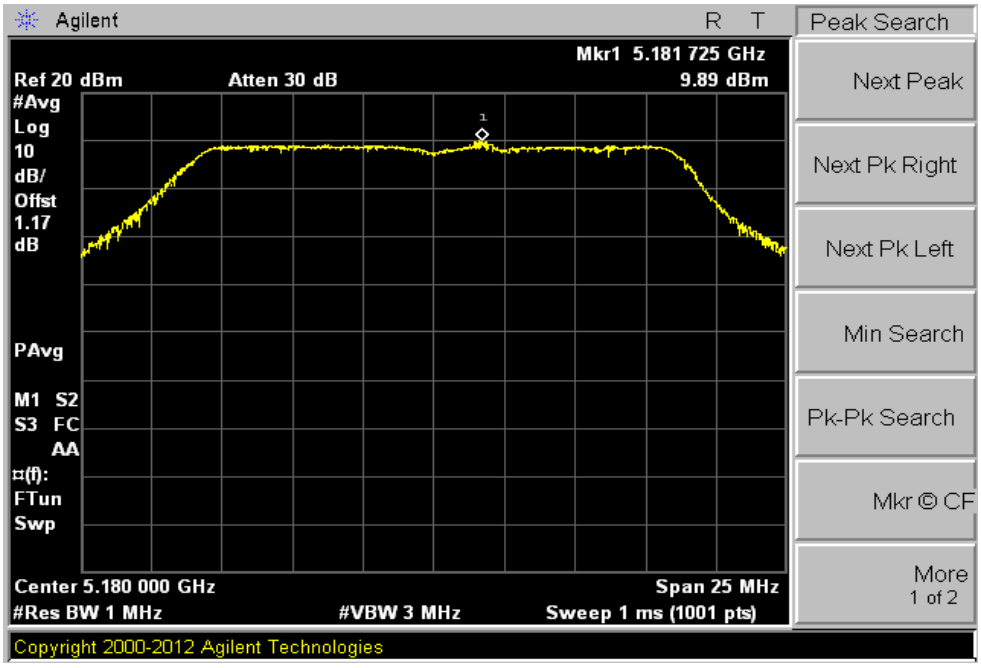
UNII Band1 OFDM (802.11ac VHT20-48ch)ANT1

(Avg)



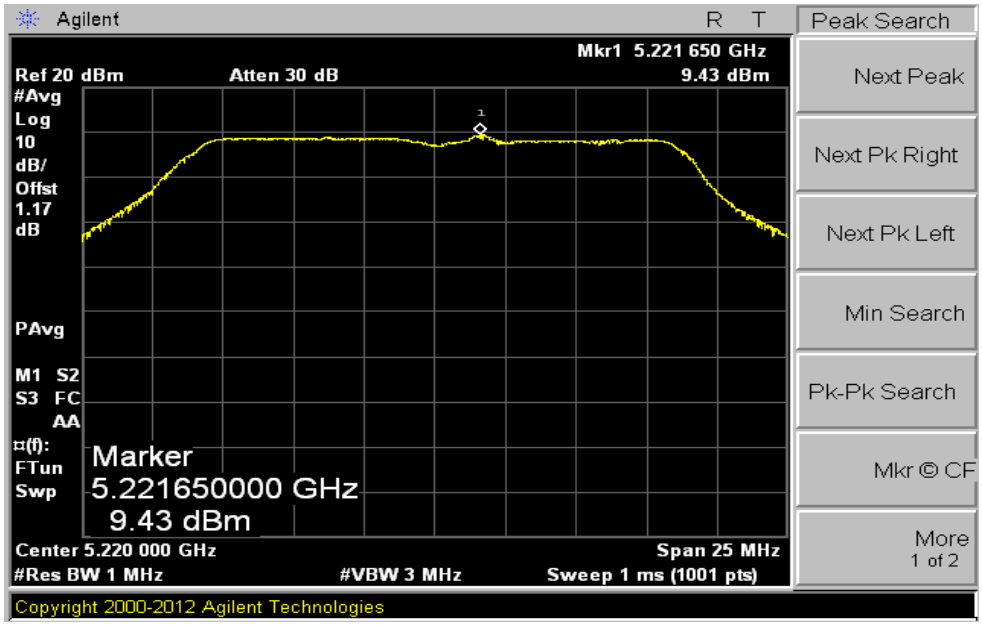
UNII Band1 OFDM (802.11ac VHT20-36ch) ANT2

(Avg)



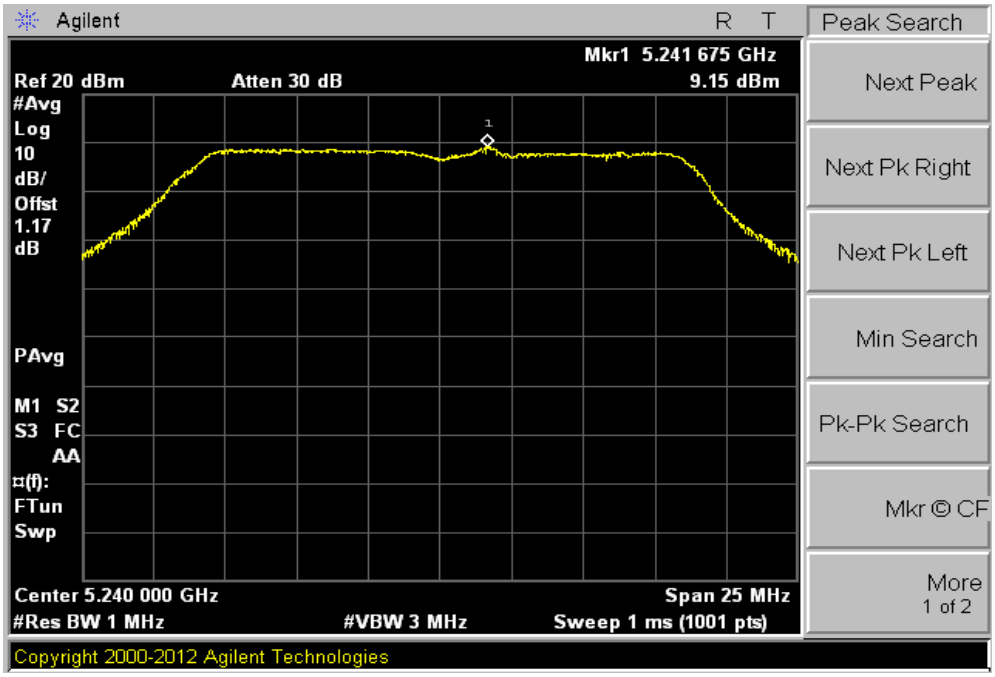
UNII Band1 OFDM (802.11ac VHT20-44ch) ANT2

(Avg)



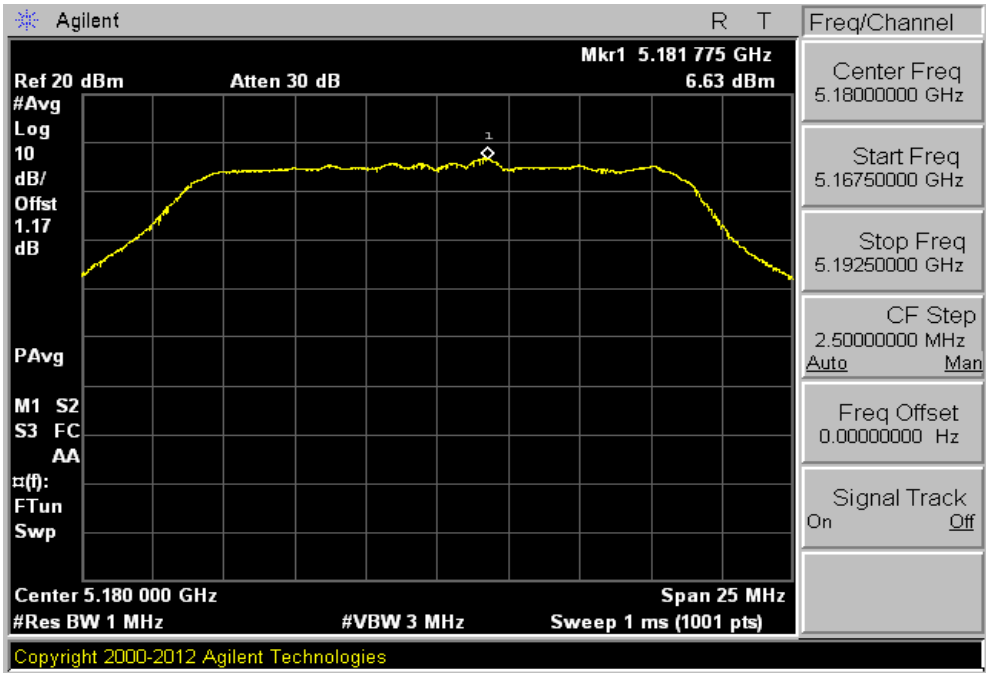
UNII Band1 OFDM (802.11ac VHT20-48ch) ANT2

(Avg)



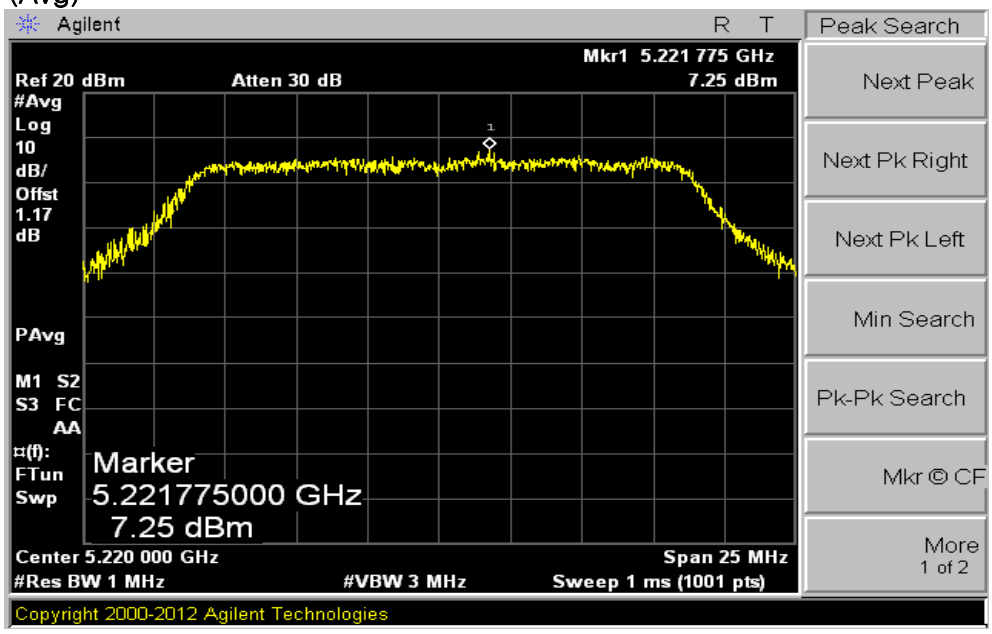
UNII Band1 OFDM (802.11ac VHT20-36ch) ANT3

(Avg)



UNII Band1 OFDM (802.11ac VHT20-44ch) ANT3

(Avg)



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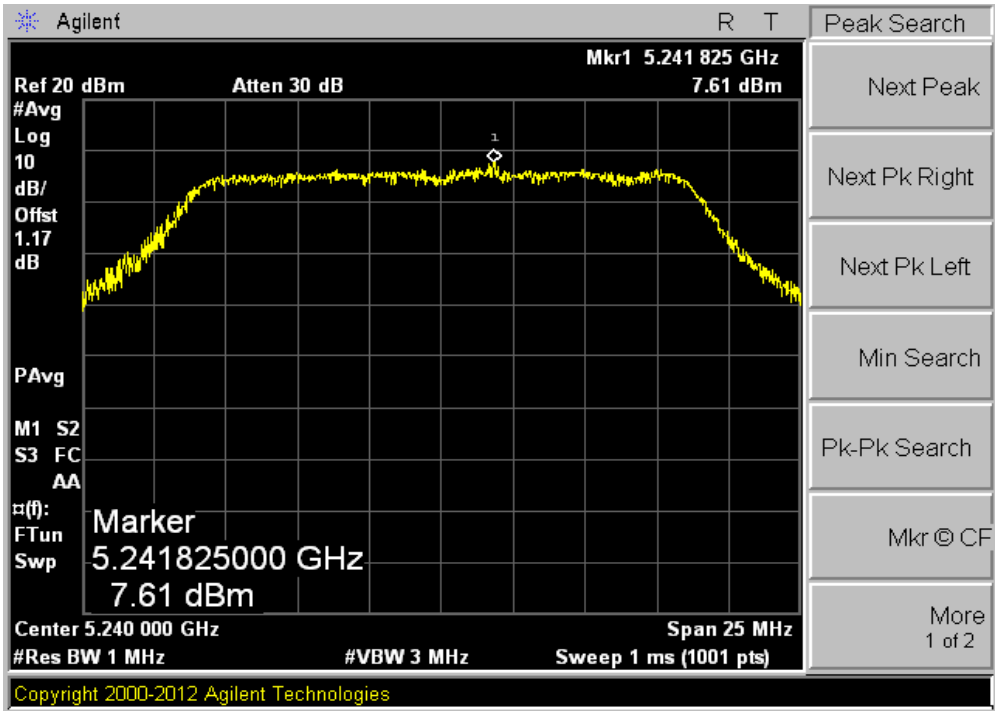
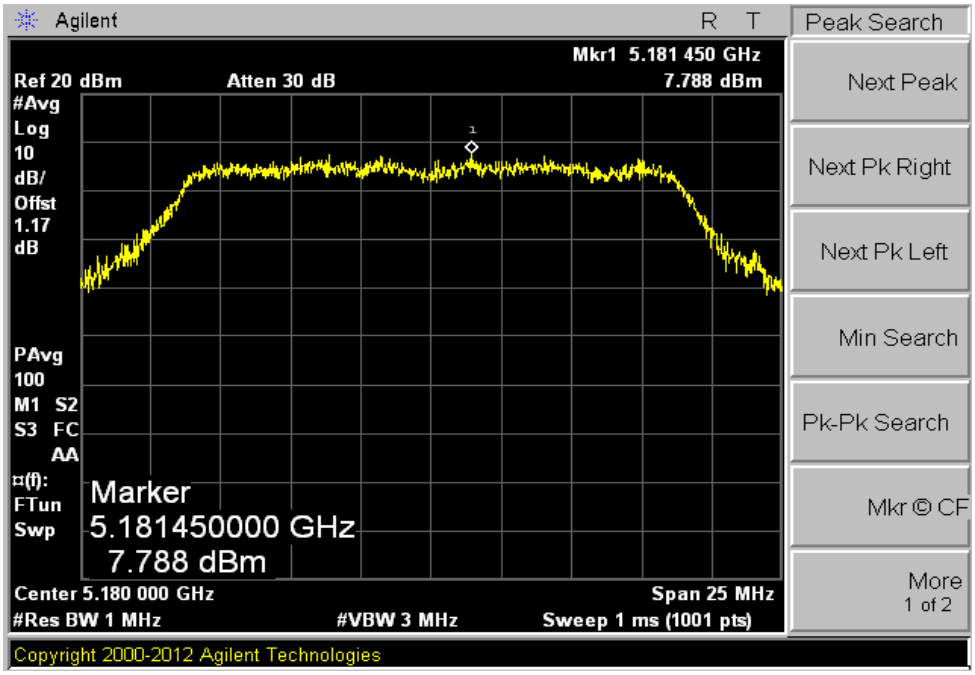
(Avg)



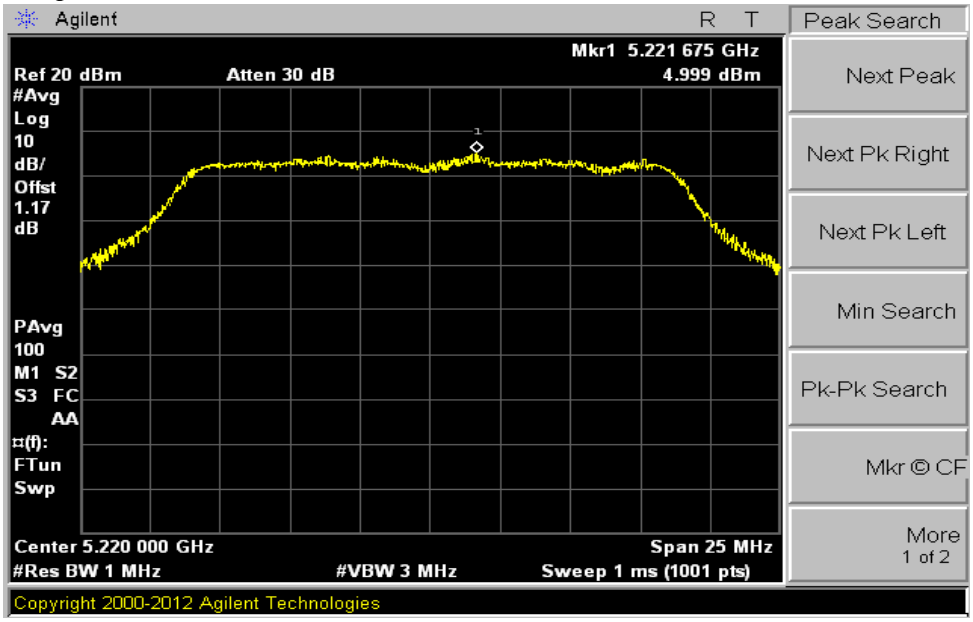
UNII Band1 OFDM (802.11ac VHT20-36ch) ANT4

(Avg)



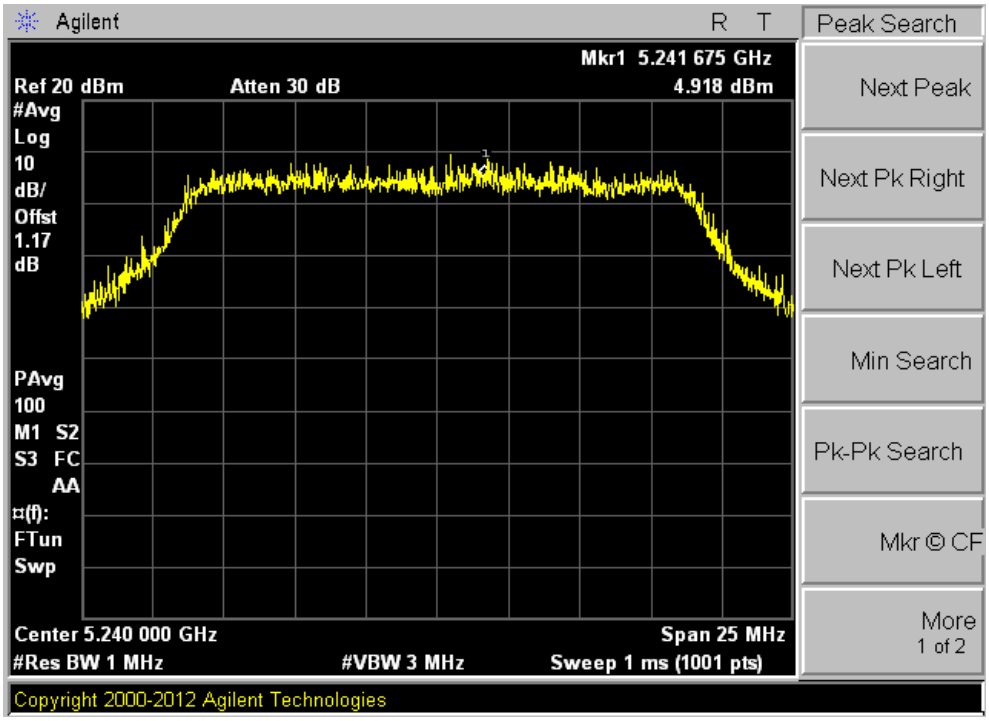
UNII Band1 OFDM (802.11ac VHT20-44ch) ANT4

(Avg)



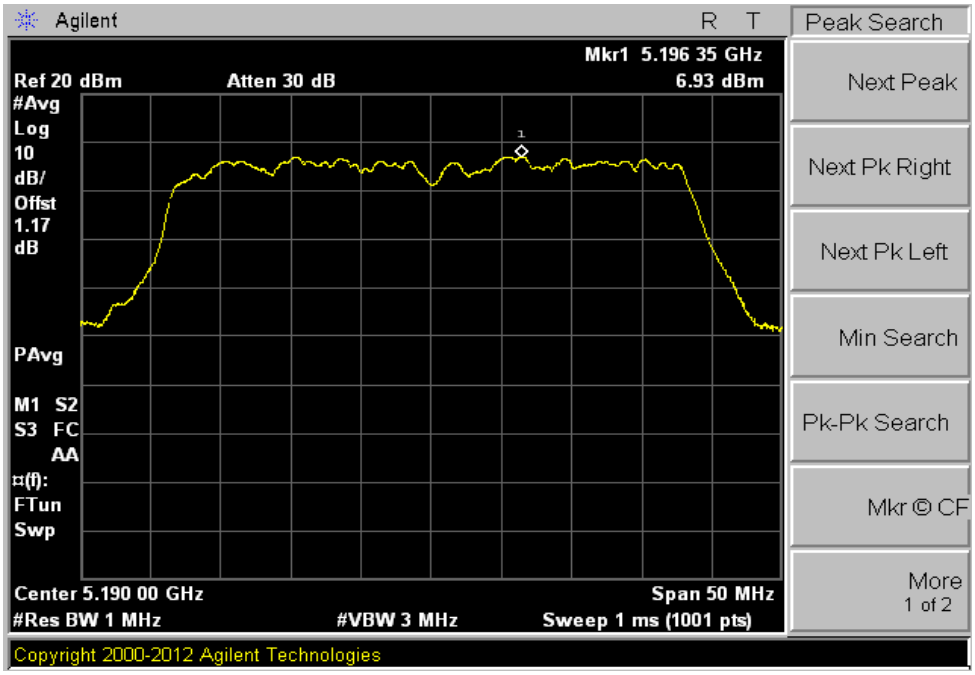
UNII Band1 OFDM (802.11ac VHT20-48ch) ANT4

(Avg)



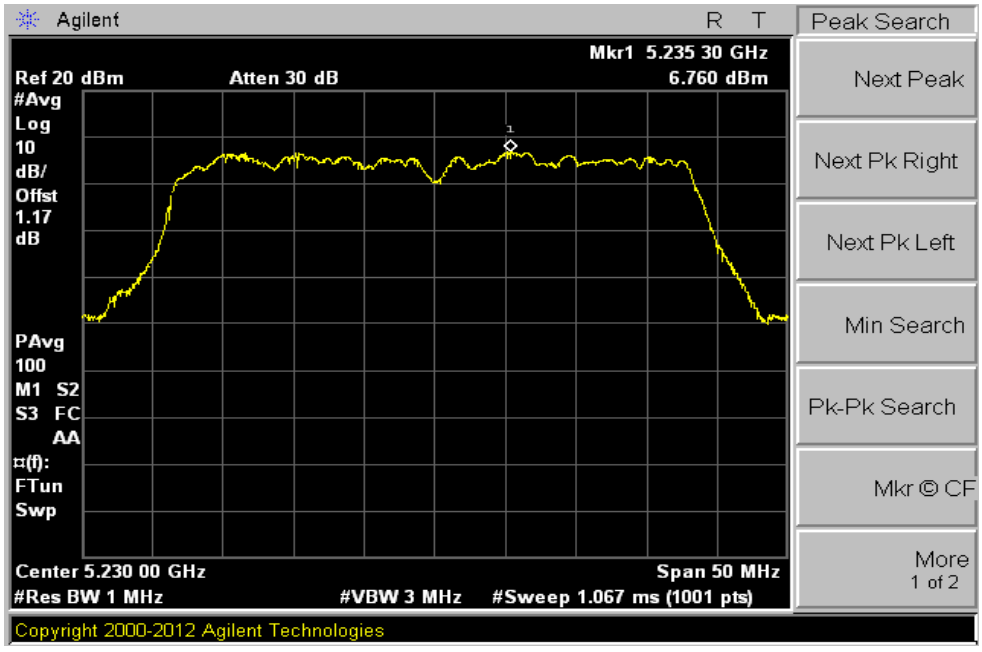
UNII Band1 OFDM (802.11ac VHT40-38ch) ANT1

(Avg)



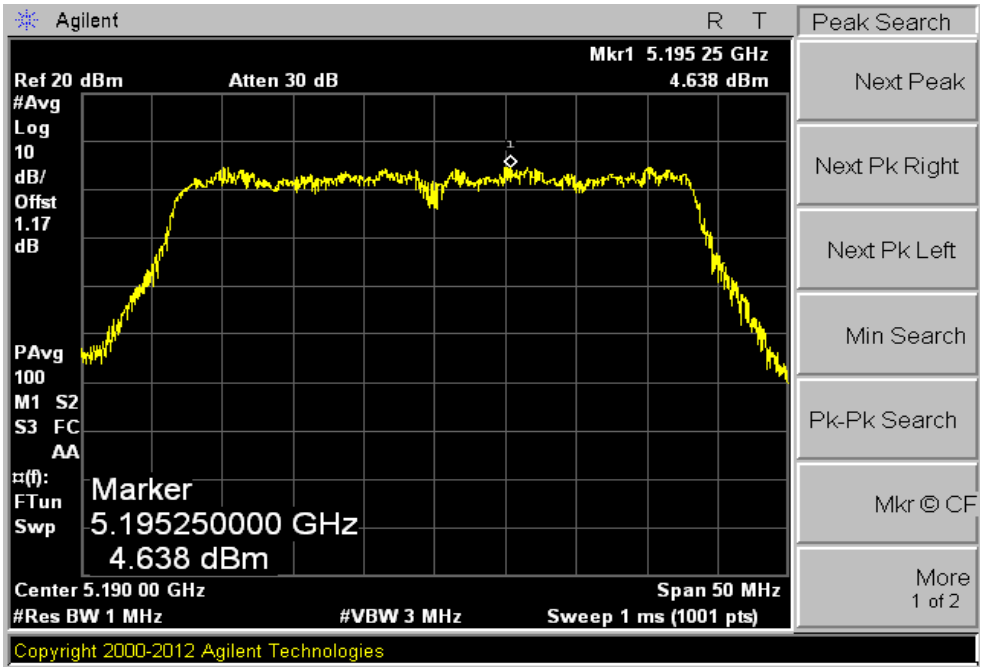
UNII Band1 OFDM (802.11ac VHT40-46ch) ANT1

(Avg)



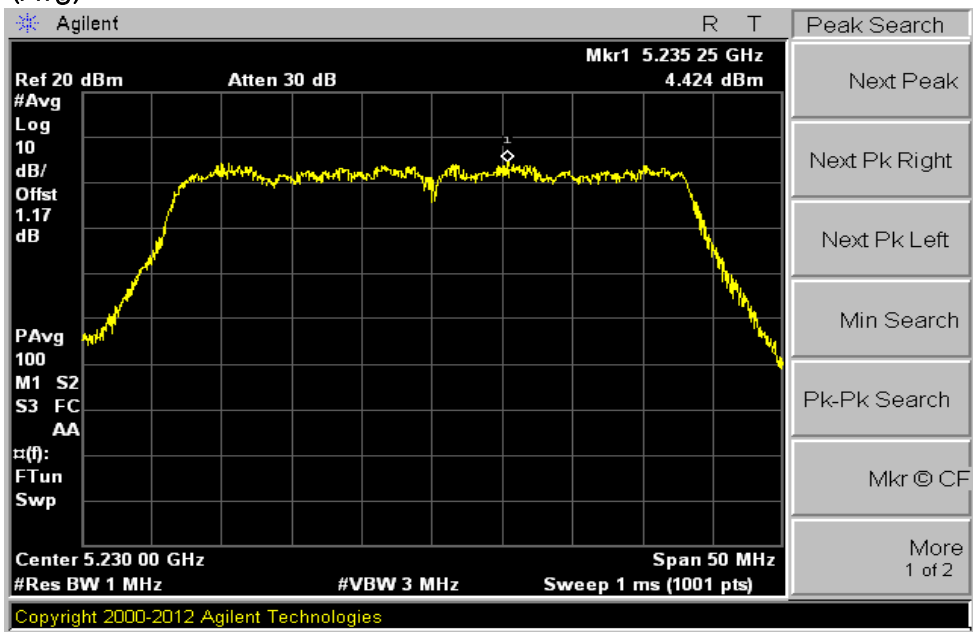
UNII Band1 OFDM (802.11ac VHT40-46ch) ANT2

(Avg)



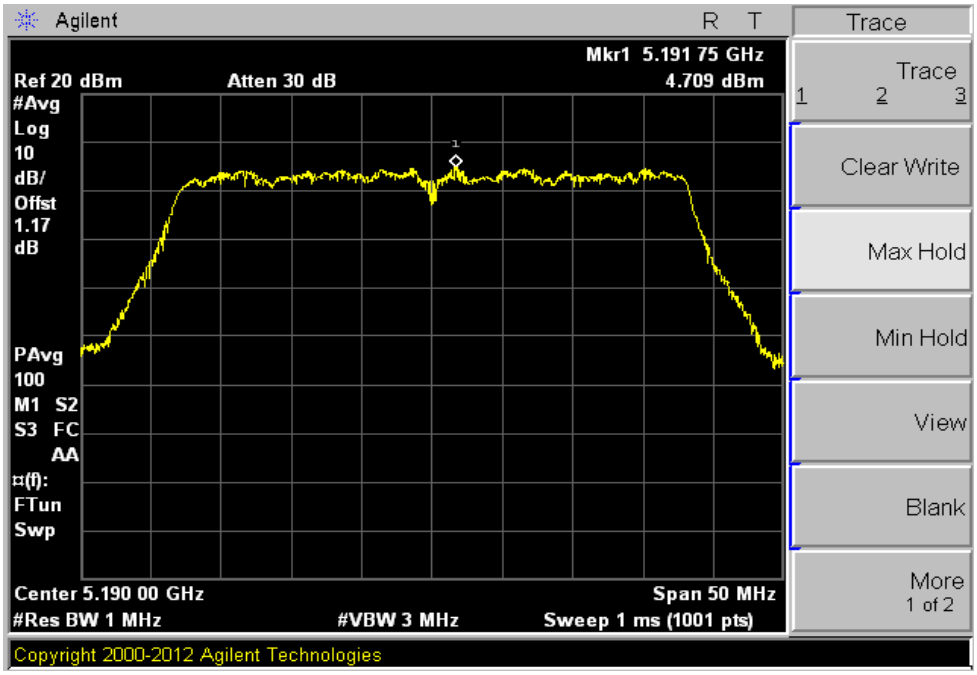
UNII Band1 OFDM (802.11ac VHT40-46ch) ANT2

(Avg)



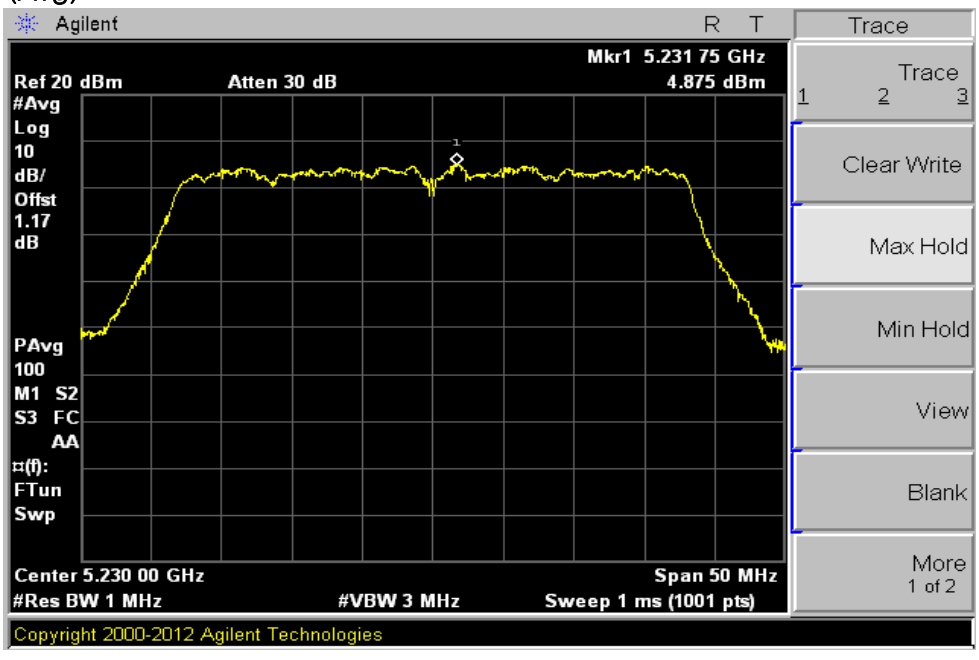
UNII Band1 OFDM (802.11ac VHT40-38ch) ANT3

(Avg)



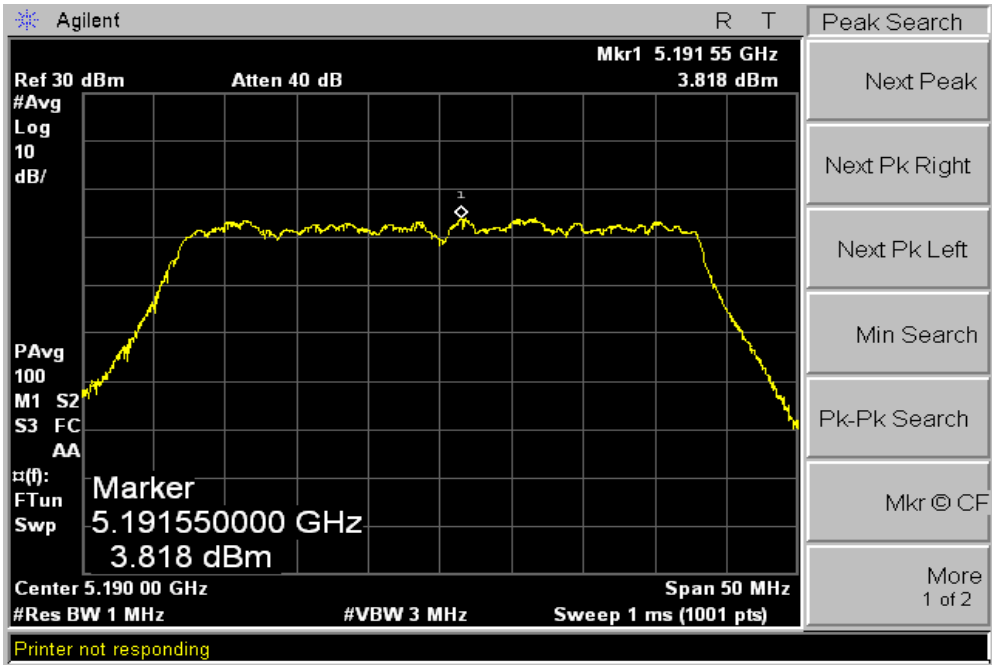
UNII Band1 OFDM (802.11ac VHT40-46ch) ANT3

(Avg)



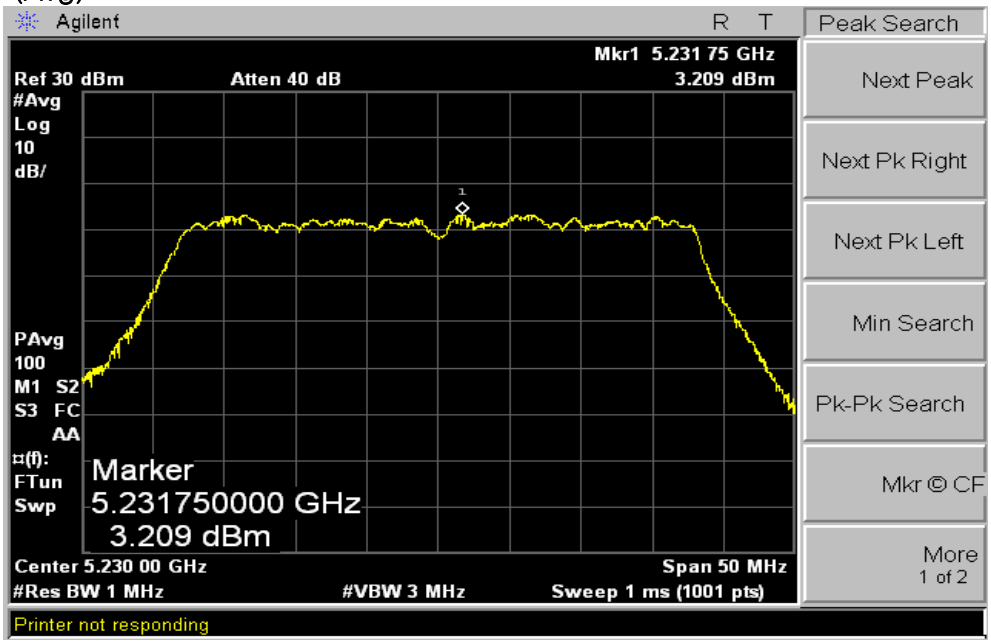
UNII Band1 OFDM (802.11ac VHT40-38ch) ANT4

(Avg)



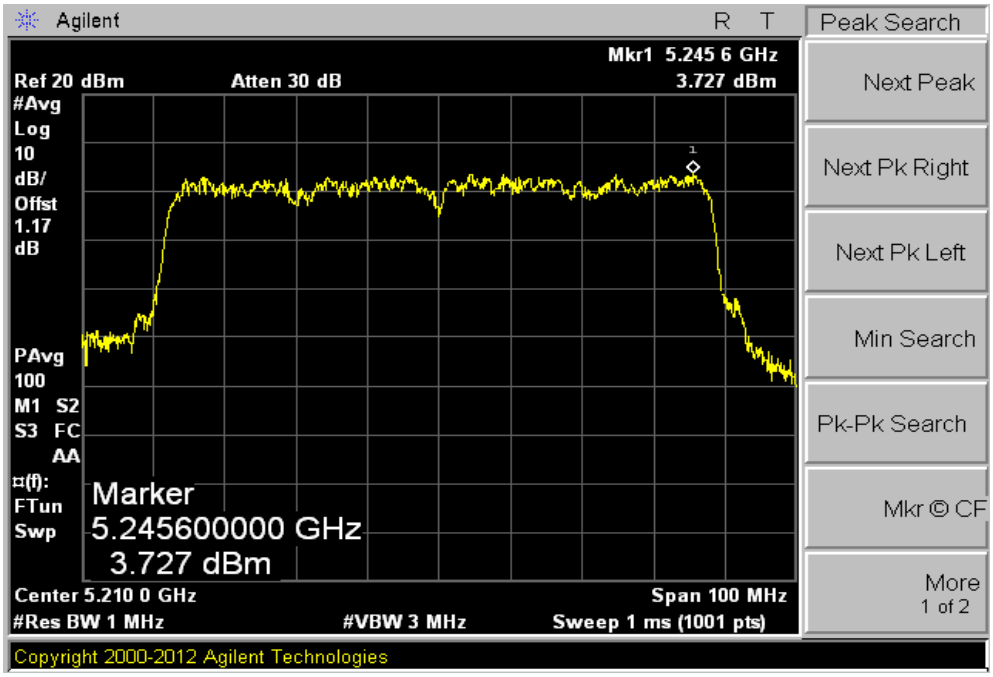
UNII Band1 OFDM (802.11ac VHT40-46ch) ANT4

(Avg)



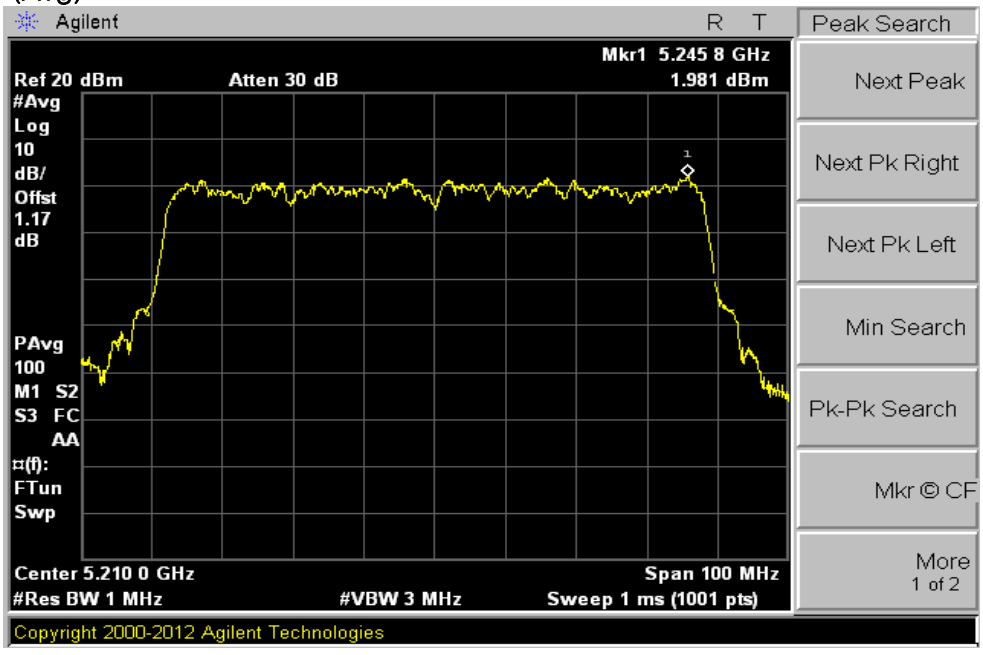
UNII Band1 OFDM (802.11ac VHT80-42ch) ANT1

(Avg)



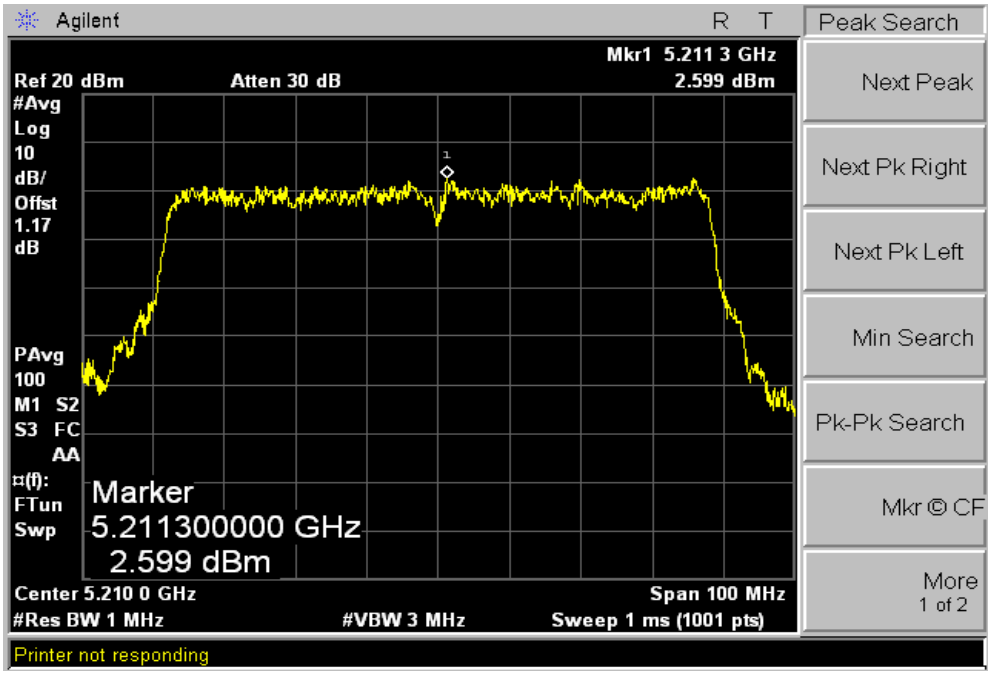
UNII Band1 OFDM (802.11ac VHT80-42ch) ANT2

(Avg)



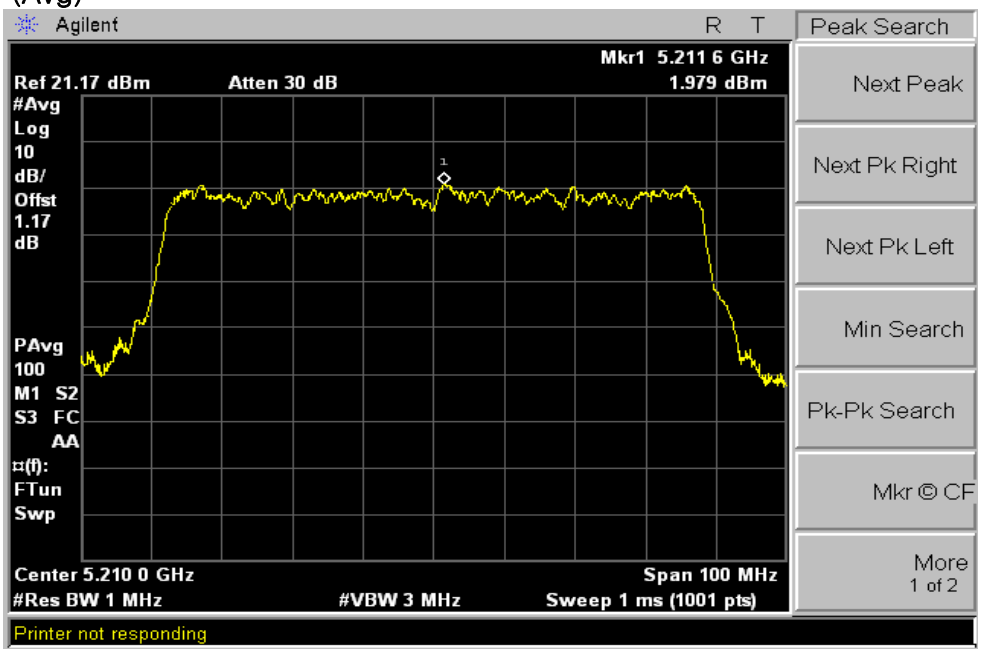
UNII Band1 OFDM (802.11ac VHT80-42ch) ANT3

(Avg)



UNII Band1 OFDM (802.11ac VHT80-42ch) ANT4

(Avg)



12.5 Measurement results

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	23 ℃, 43 % R.H.
INPUT POWER	DC 12 V		

UNII Band3 802.11ac VHT20 ANT1

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
149	5745	6.22	30.0	23.78
157	5785	6.26	30.0	23.74
165	5825	6.61	30.0	23.39

UNII Band3 802.11ac VHT20 ANT2

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
149	5745	7.07	30.0	22.93
157	5785	7.52	30.0	22.48
165	5825	7.45	30.0	22.55

UNII Band3 802.11ac VHT20 ANT3

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
149	5745	6.43	30.0	23.57
157	5785	7.00	30.0	23.00
165	5825	6.61	30.0	23.39

UNII Band3 802.11ac VHT20 ANT4

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
149	5745	4.07	30.0	25.93
157	5785	5.34	30.0	24.66
165	5825	4.46	30.0	25.54

UNII Band3 802.11ac VHT40 ANT1

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
151	5755	7.71	30.0	22.29
159	5795	7.73	30.0	22.27

UNII Band3 802.11ac VHT40 ANT2

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
151	5755	5.99	30.0	24.01
159	5795	6.08	30.0	23.93

UNII Band3 802.11ac VHT40 ANT3

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
151	5755	6.25	30.0	23.75
159	5795	6.49	30.0	23.51

UNII Band3 802.11ac VHT40 ANT4

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
151	5755	5.36	30.0	24.64
159	5795	5.54	30.0	24.46

UNII Band3 802.11ac VHT80 ANT1

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
155	5775	4.96	30.0	25.04

UNII Band3 802.11ac VHT80 ANT2

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
155	5775	4.23	30.0	25.78

UNII Band3 802.11ac VHT80 ANT3

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
155	5775	4.43	30.0	25.57

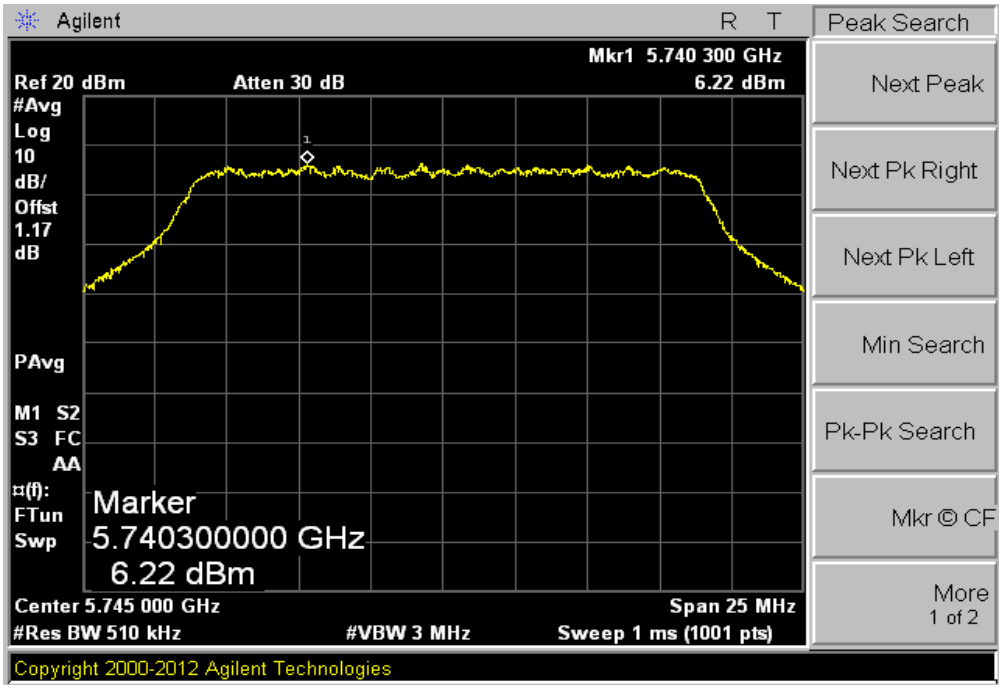
UNII Band3 802.11ac VHT80 ANT4

CHANNEL	Channel Frequency (MHz)	Measured PPSD (dBm)	PPSD Limit [dBm/500 kHz]	Margin [dB]
155	5775	3.20	30.0	26.80

12.6 Trace data

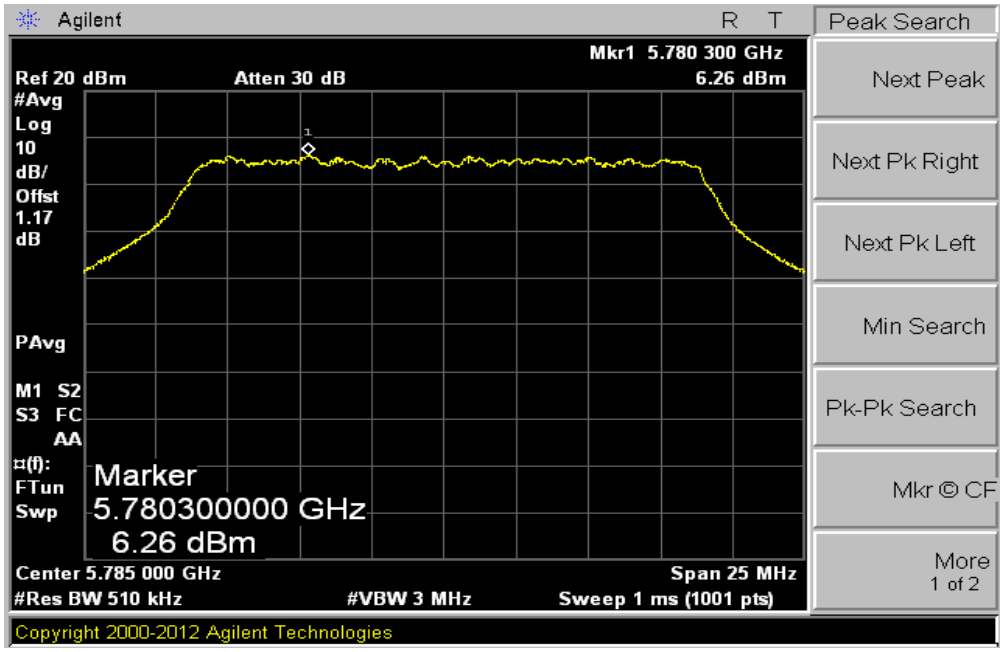
UNII Band3 OFDM (802.11ac VHT20-149ch) ANT1

(Avg)



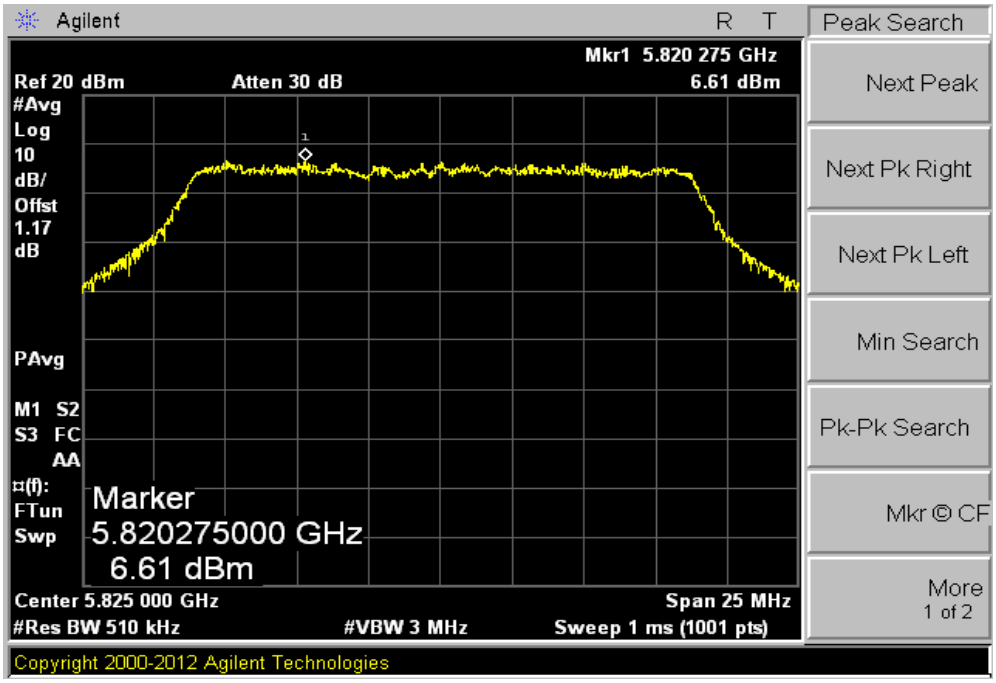
UNII Band3 OFDM (802.11ac VHT20-157ch) ANT1

(Avg)



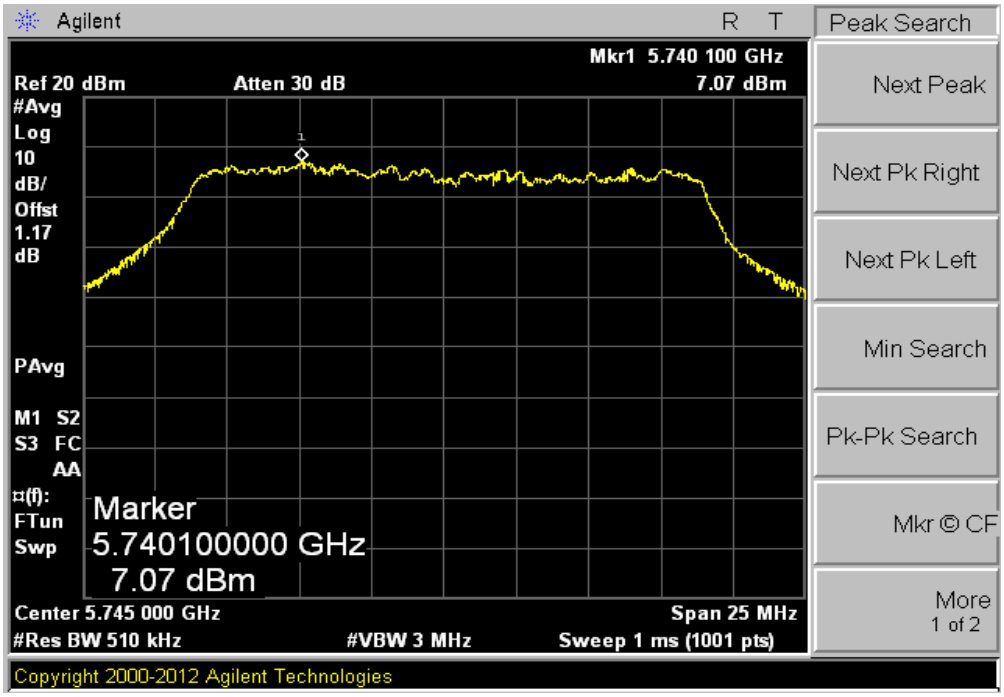
UNII Band3 OFDM (802.11ac VHT20-165ch) ANT1

(Avg)



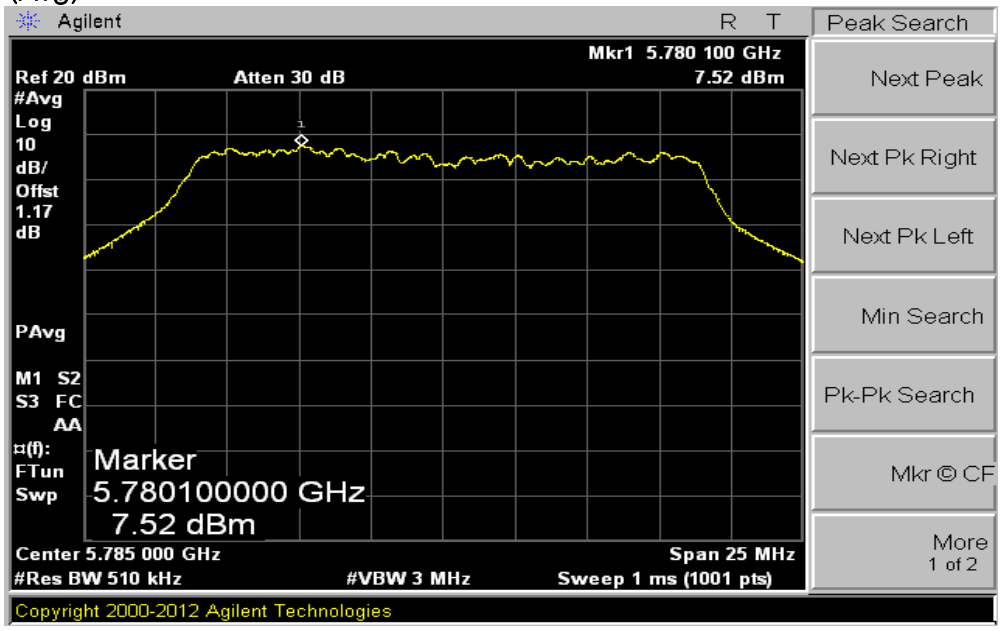
UNII Band3 OFDM (802.11ac VHT20-149ch) ANT2

(Avg)



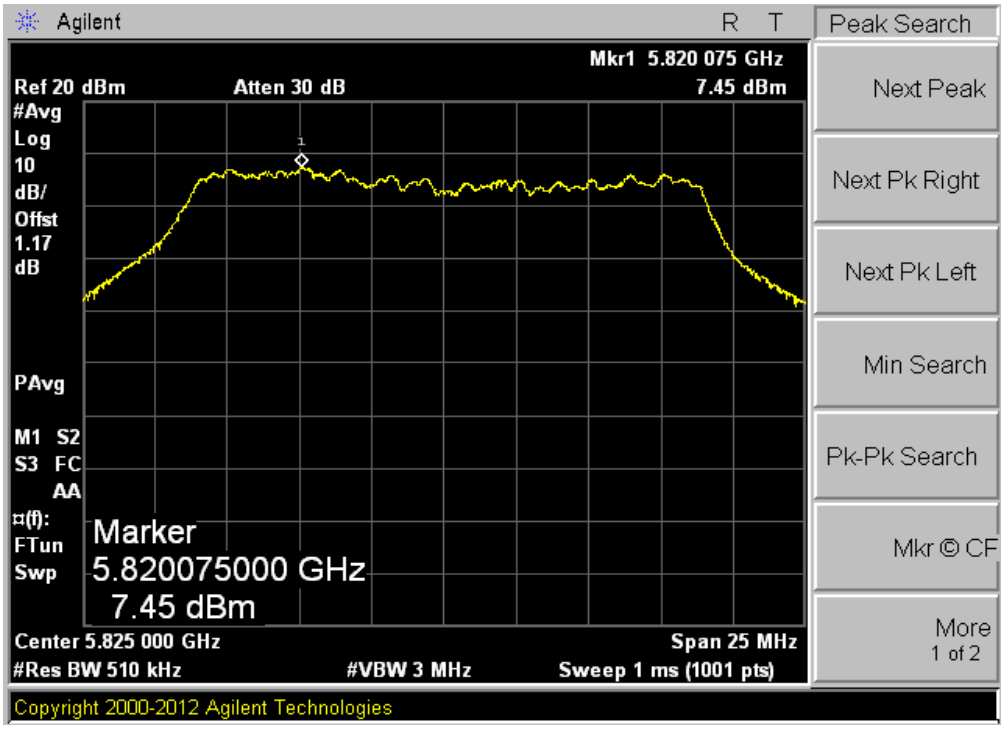
UNII Band3 OFDM (802.11ac VHT20-157ch) ANT2

(Avg)



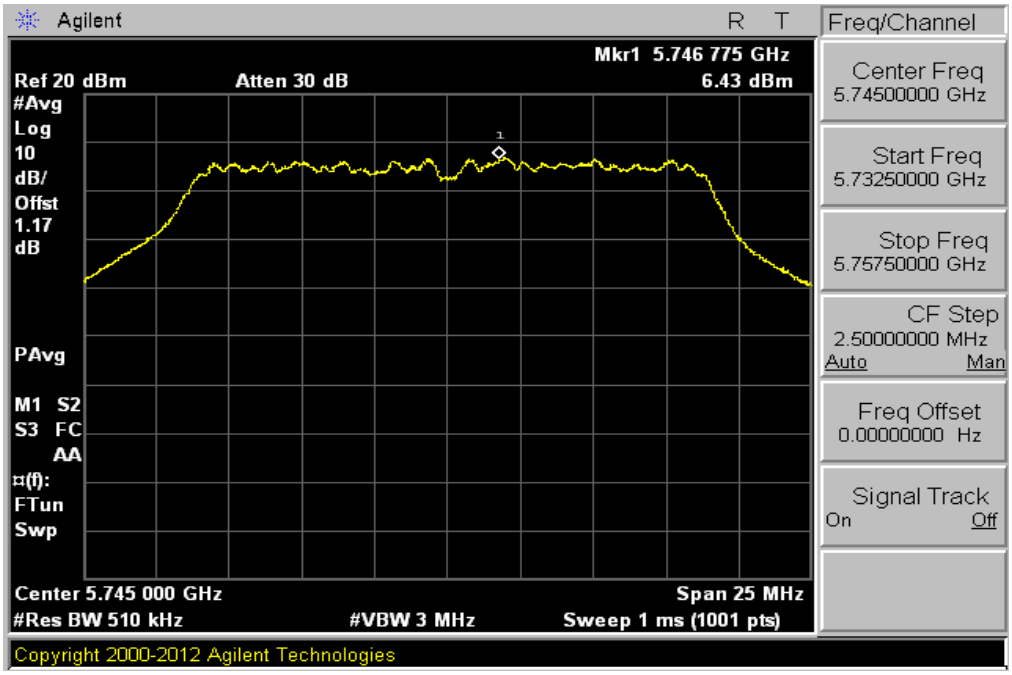
UNII Band3 OFDM (802.11ac VHT20-165ch) ANT2

(Avg)



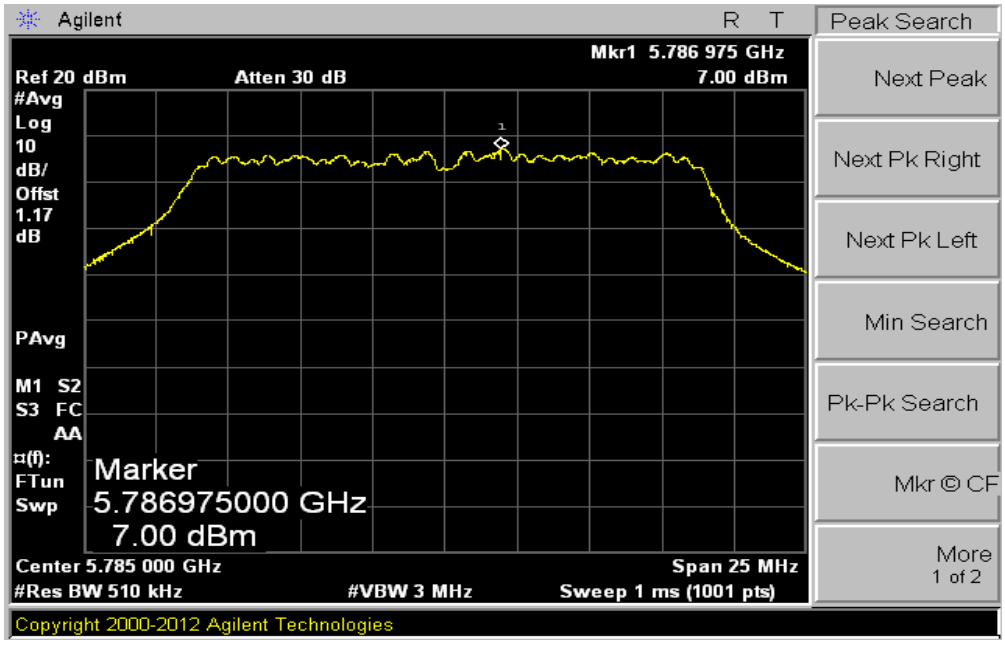
UNII Band3 OFDM (802.11ac VHT20-149ch) ANT3

(Avg)



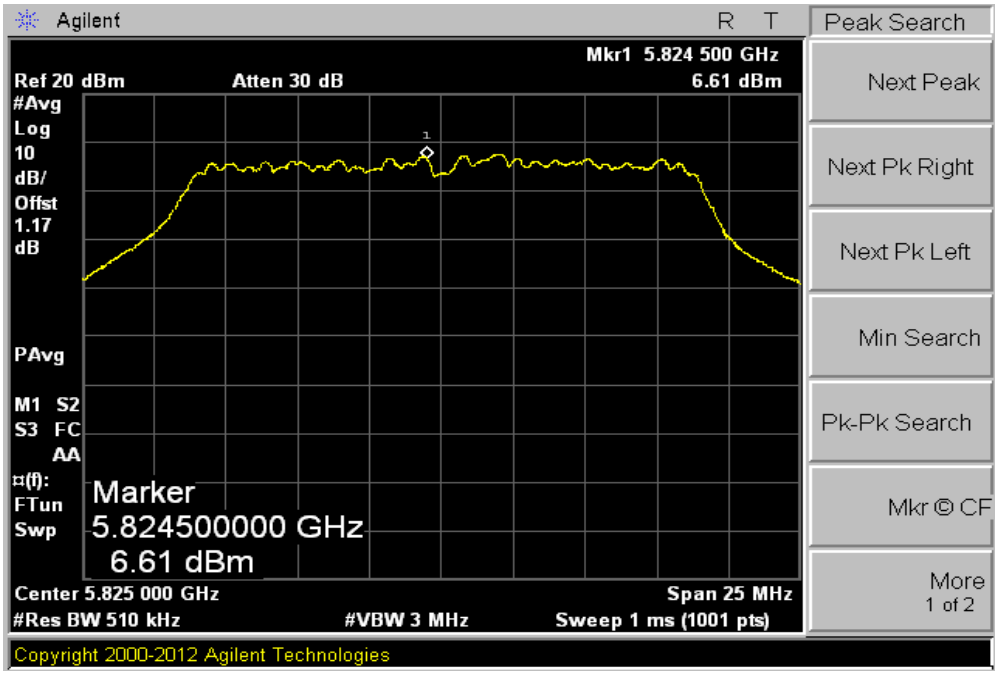
UNII Band3 OFDM (802.11ac VHT20-157ch) ANT3

(Avg)



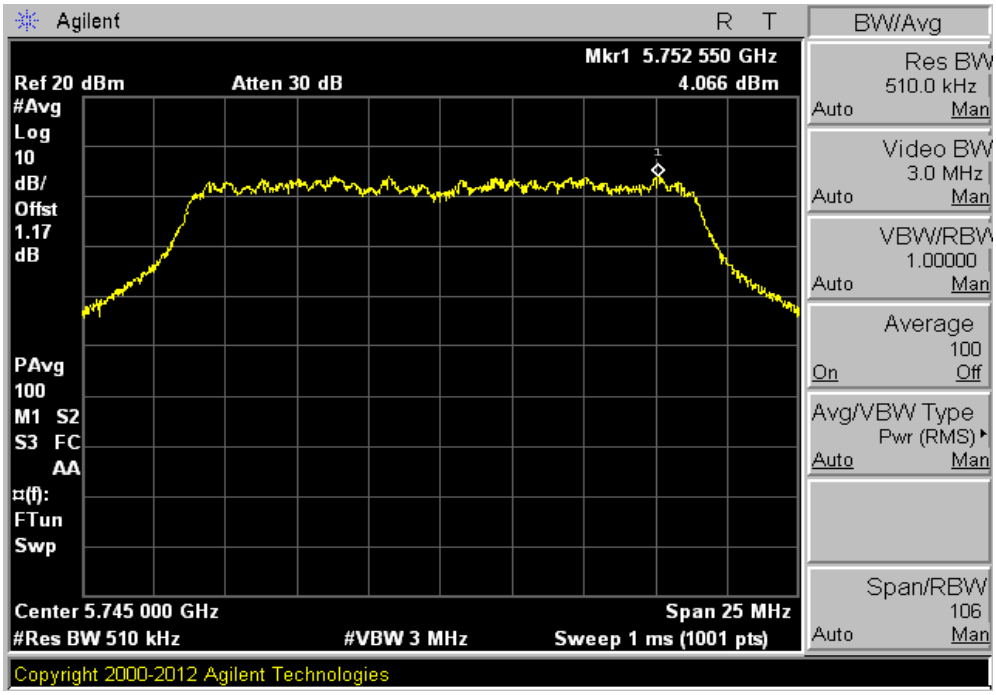
UNII Band3 OFDM (802.11ac VHT20-165ch) ANT3

(Avg)



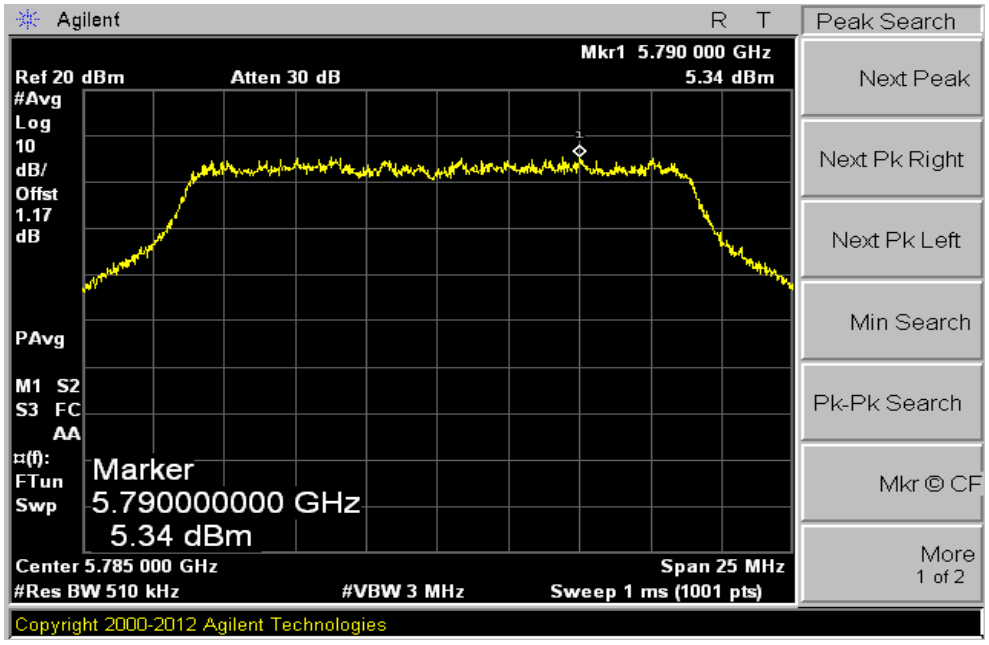
UNII Band3 OFDM (802.11ac VHT20-149ch) ANT4

(Avg)



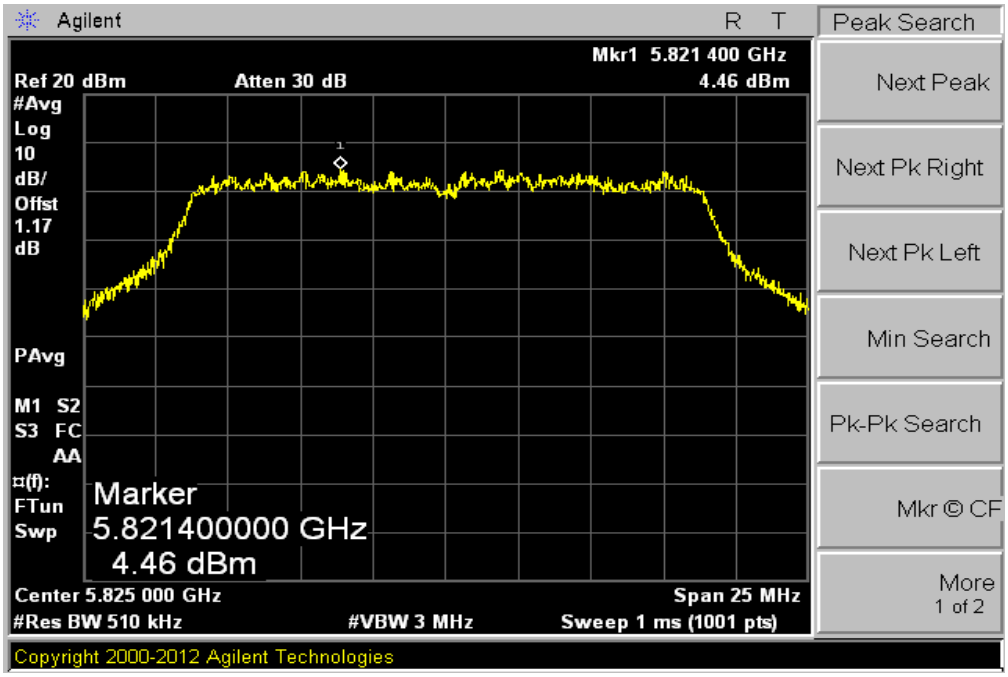
UNII Band3 OFDM (802.11ac VHT20-157ch) ANT4

(Avg)



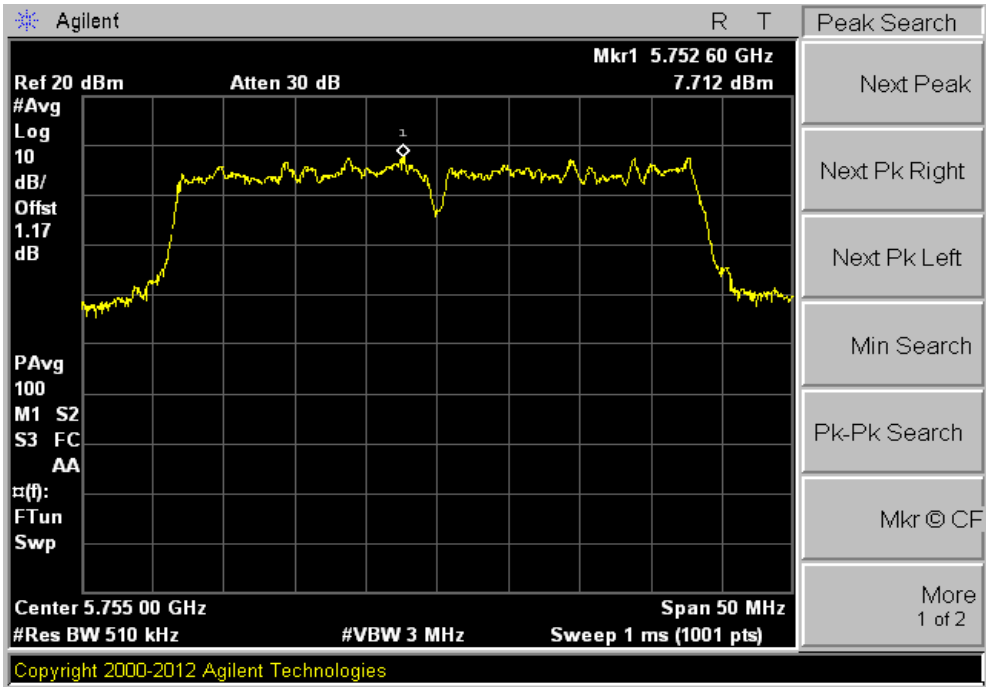
UNII Band3 OFDM (802.11ac VHT20-165ch) ANT4

(Avg)



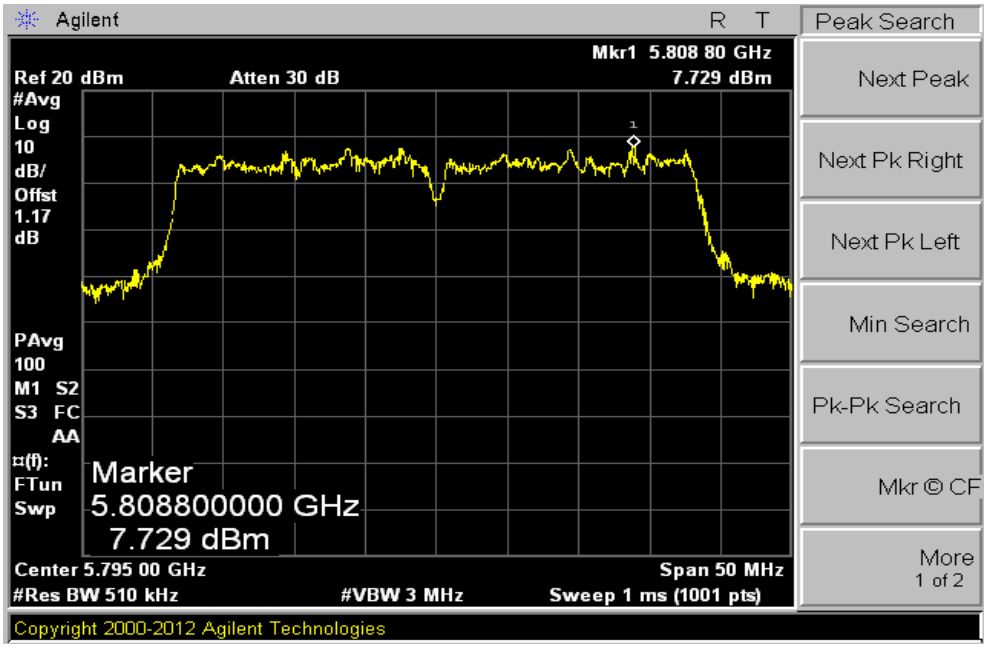
UNII Band3 OFDM (802.11ac VHT40-151ch) ANT1

(Avg)



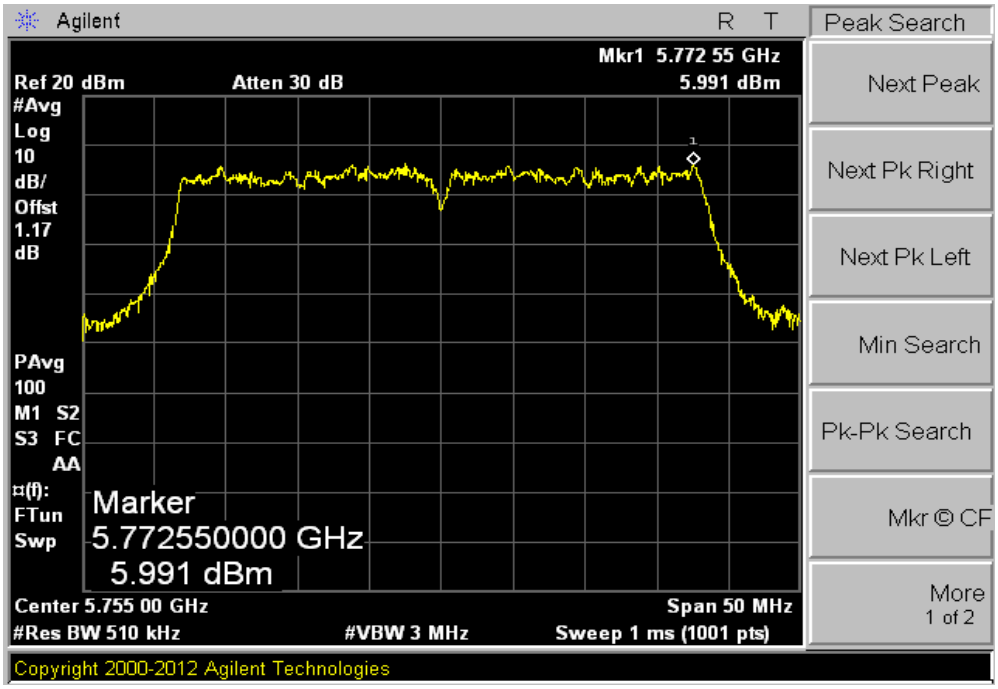
UNII Band3 OFDM (802.11ac VHT40-159ch) ANT1

(Avg)



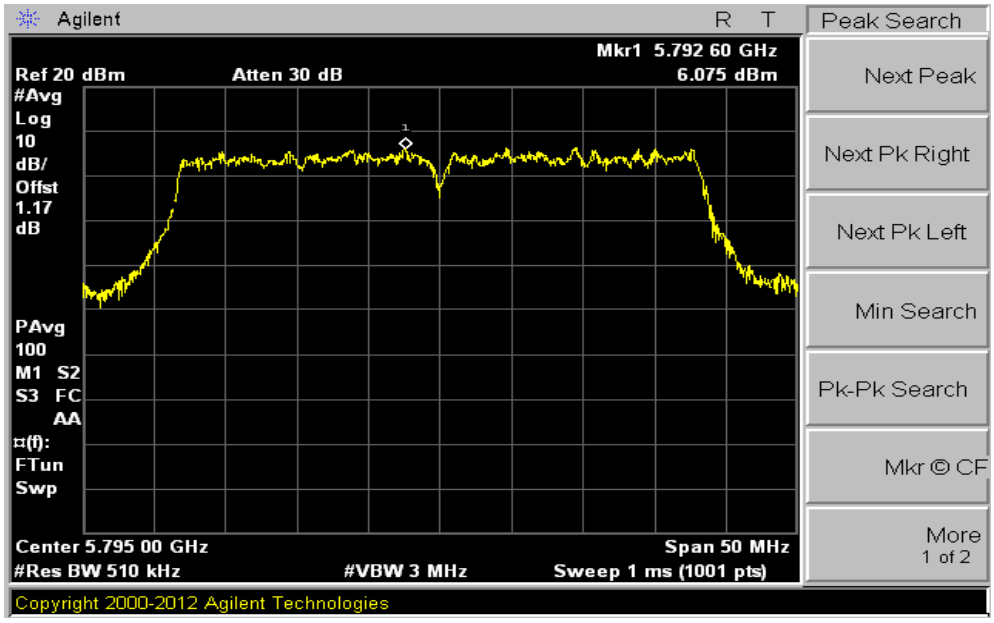
UNII Band3 OFDM (802.11ac VHT40-151ch) ANT2

(Avg)



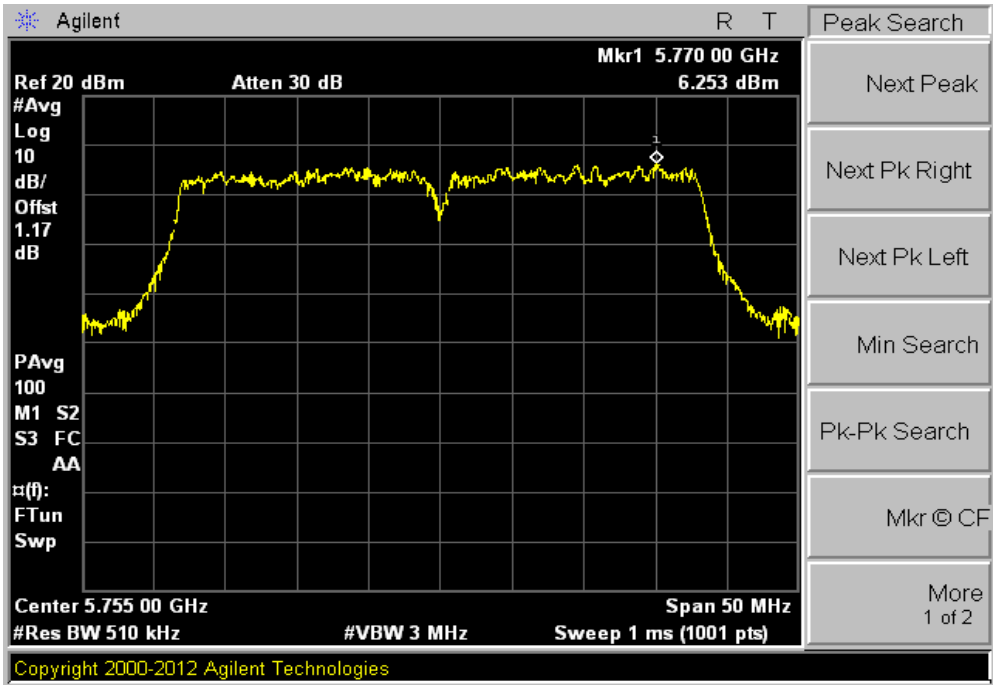
UNII Band3 OFDM (802.11ac VHT40-159ch) ANT2

(Avg)



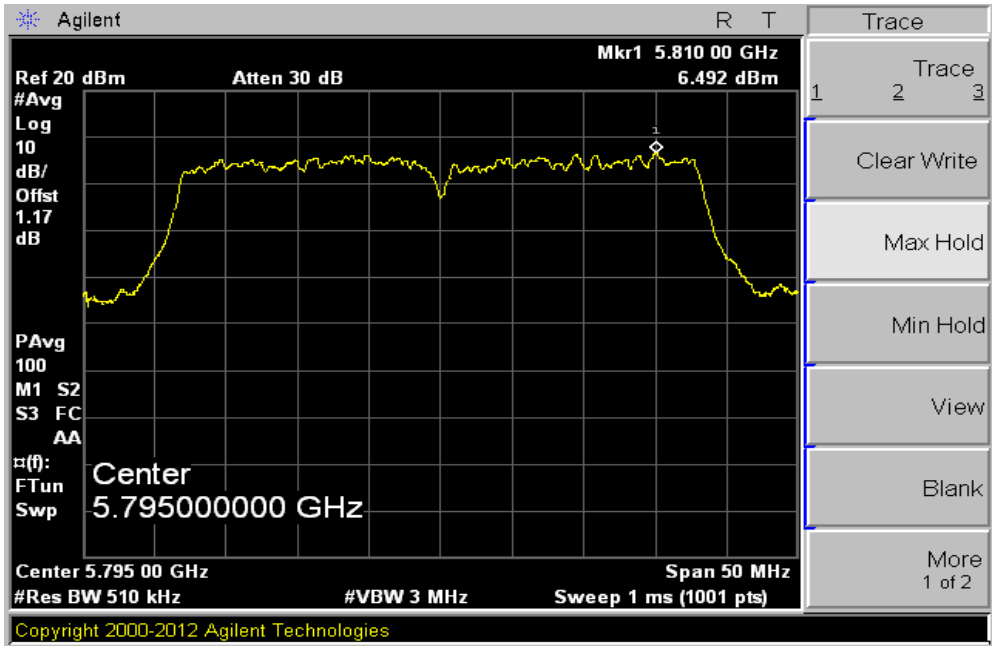
UNII Band3 OFDM (802.11ac VHT40-151ch) ANT3

(Avg)



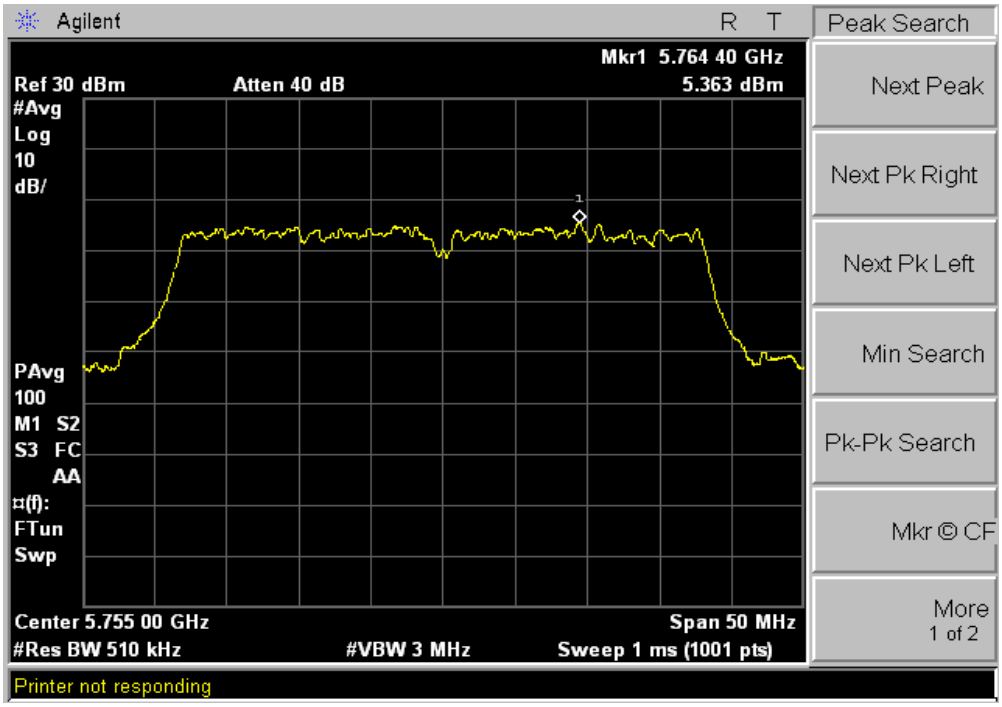
UNII Band3 OFDM (802.11ac VHT40-159ch) ANT3

(Avg)



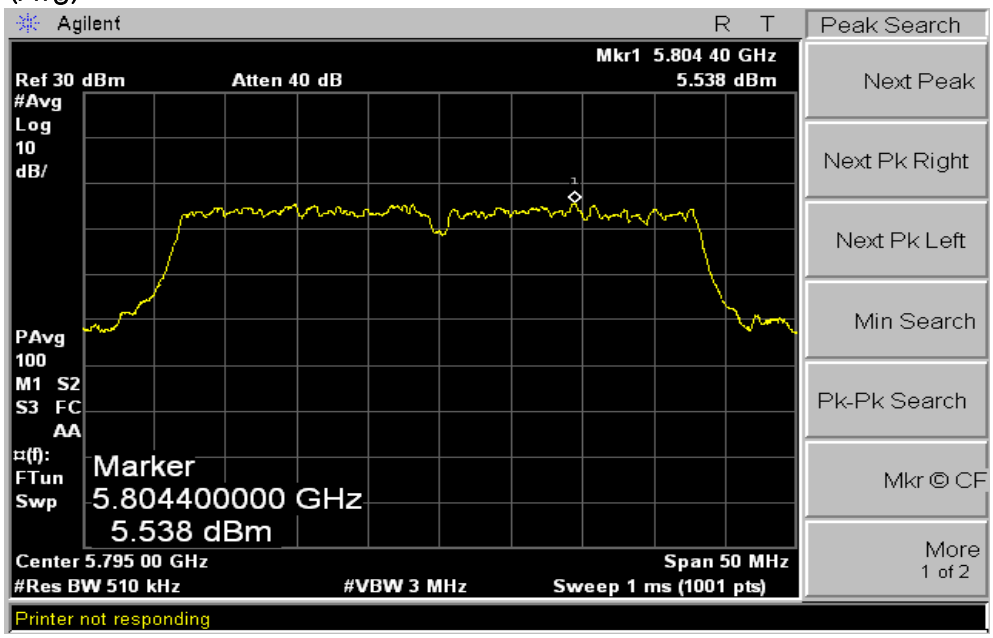
UNII Band3 OFDM (802.11ac VHT40-151ch) ANT4

(Avg)



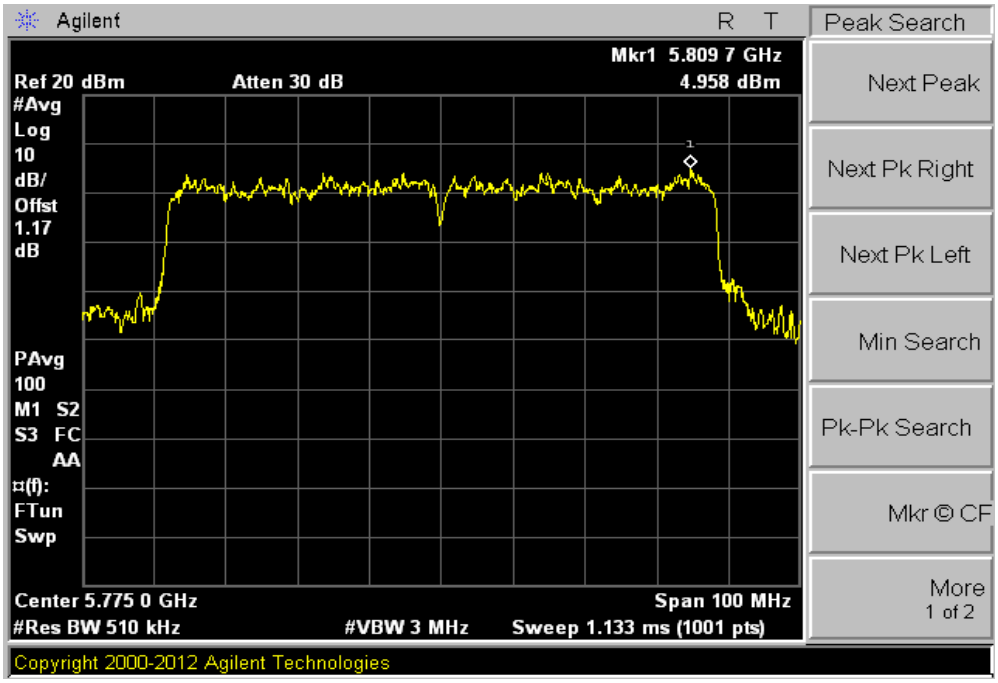
UNII Band3 OFDM (802.11ac VHT40-159ch) ANT4

(Avg)



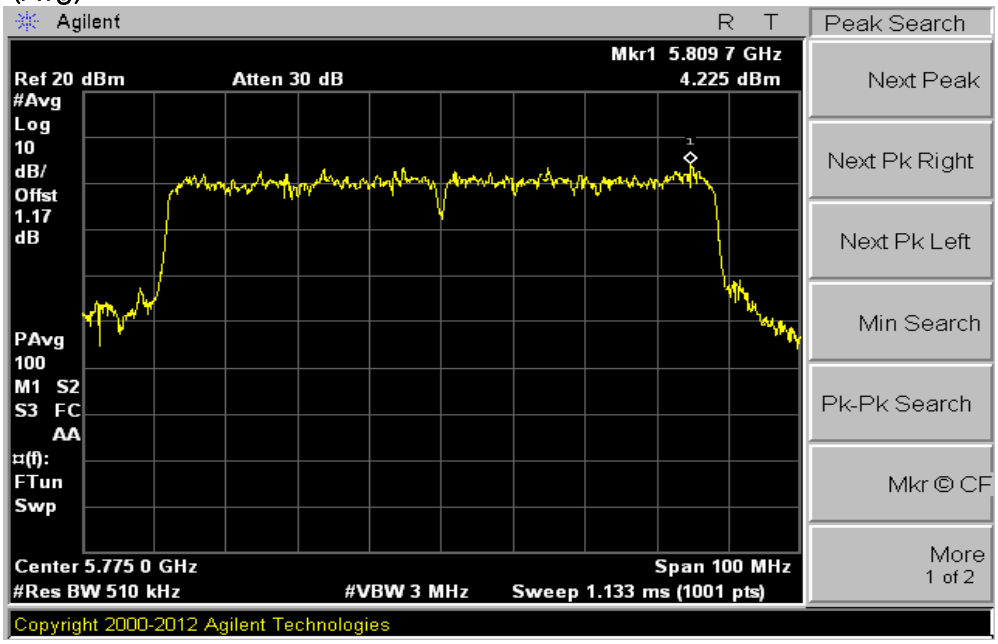
UNII Band3 OFDM (802.11ac VHT80-155ch) ANT1

(Avg)



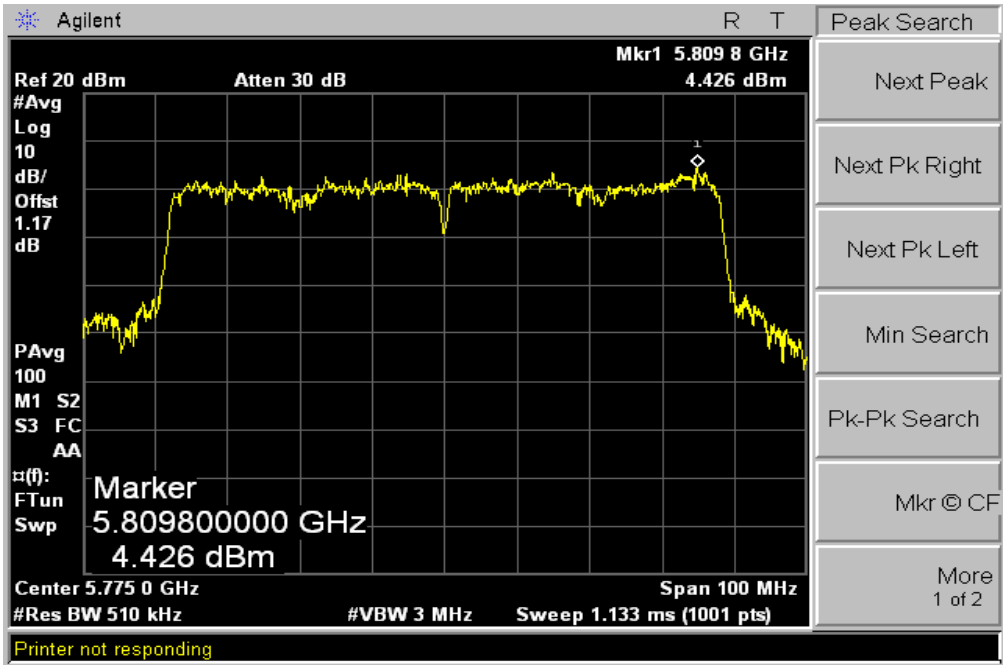
UNII Band3 OFDM (802.11ac VHT80-155ch) ANT2

(Avg)



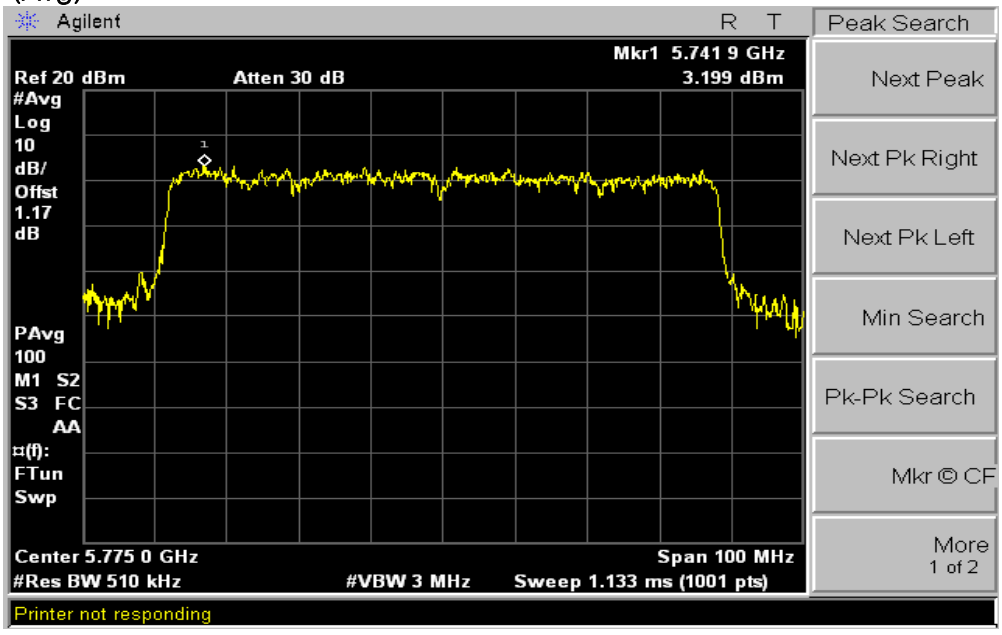
UNII Band3 OFDM (802.11ac VHT80-155ch) ANT3

(Avg)



UNII Band3 OFDM (802.11ac VHT80-155ch) ANT4

(Avg)



13. Frequency Stability

13.1 Test procedure

KDB 789033 v01r03 &15.407(g)

13.2 Test instruments and measurement setup

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30℃ and +50℃. The temperature was incremented by 10° Intervals and the unit was allowed to stabilize at each temperture before each measurement. the center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.Data for the worst case channel is shown below.

OPERATING FREQUENCY:	5,180,000,000	Hz
CHANNEL:	36	
REFERENCE VOLTAGE:	12	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (℃)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	12	+ 20(Ref)	5,179,999,811	-189	-0.0000000365
100%		-30	5,179,999,825	-175	-0.0000000338
100%		-20	5,179,999,835	-165	-0.0000000319
100%		-10	5,179,999,888	-112	-0.0000000216
100%		0	5,180,000,112	112	0.0000000216
100%		+10	5,179,999,813	-187	-0.0000000361
100%		+20	5,179,999,801	-199	-0.0000000384
100%		+30	5,179,999,831	-169	-0.0000000326
100%		+40	5,179,999,816	-184	-0.0000000355
100%		+50	5,179,999,821	-179	-0.0000000346
85%	10.2	+20	5,179,999,771	-229	-0.0000000442
BATT.ENDPOINT	10.8	+20	5,179,999,861	-139	-0.0000000268

13. Frequency Stability

13.1 Test procedure

KDB 789033 v01r03 &15.407(g)

13.2 Test instruments and measurement setup

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30℃ and +50℃. The temperature was incremented by 10° Intervals and the unit was allowed to stabilize at each temperture before each measurement. the center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.Data for the worst case channel is shown below.

OPERATING FREQUENCY:	5,745,000,000	Hz
CHANNEL:	36	
REFERENCE VOLTAGE:	12	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (℃)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	12	+ 20(Ref)	5,744,999,835	-165	-0.0000000365
100%		-30	5,744,999,811	-189	-0.0000000329
100%		-20	5,744,999,868	-132	-0.0000000230
100%		-10	5,744,999,891	-109	-0.0000000190
100%		0	5,744,999,834	-166	-0.0000000289
100%		+10	5,744,999,863	-137	-0.0000000238
100%		+20	5,744,999,945	-55	-0.0000000096
100%		+30	5,745,000,123	123	0.0000000214
100%		+40	5,744,999,869	-131	-0.0000000228
100%		+50	5,744,999,891	-109	-0.0000000190
85%	10.2	+20	5,744,999,809	-191	-0.0000000332
BATT.ENDPOINT	10.8	+20	5,744,999,799	-201	-0.0000000350

14. Peak excursion measurement

14.1 Test procedure

KDB 789033 v01r03- Section G) Peak excursion measurement

14.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

a) Set RBW = 1 MHz.

b) VBW ≥ 3 MHz.

c) Detector = peak.

d) Trace mode = max-hold.

e) Allow the sweeps to continue until the trace stabilizes.

f) Use the peak search function to find the peak of the spectrum

Limit : FCC § 15.407 (a) (6)

Band Edge&Out of Emission Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US41421291	2017-01-12
Spectrum Analyzer	FSV40	100939	2017-01-11

14.3 Measurement results of band-edge & out of emission

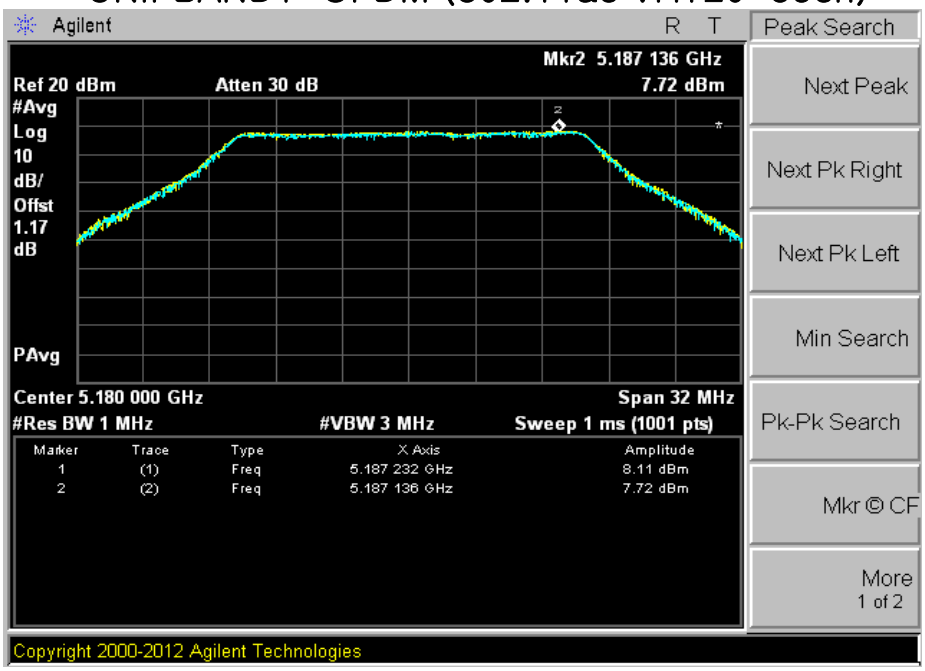
802.11ac VHT20

EUT	Wireless Video Bridge	MODEL	EVB-A100
MODE	OFDM	ENVIRONMENTAL CONDITION	23 ℃, 43 % R.H.
INPUT POWER	DC 12 V		

Frequency (channel)	Mode (Data Rate)	Measured Peak Excursion Ratio [dBm]	Max Permissible Peak Excursion Ratio [dBm]	Margin
5180(36)	802.11a(6Mbps)	0.39	13.00	12.61

14.4 Trace data of PEAK EXCURSION

UNII BAND1 OFDM (802.11ac VHT20-36ch)

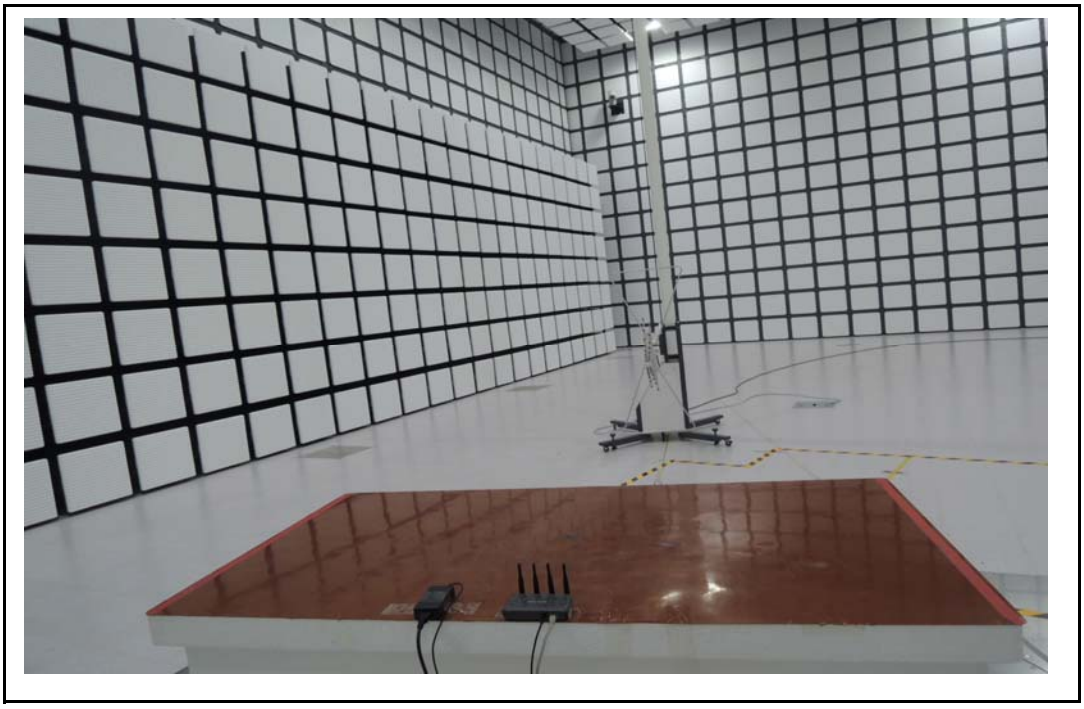


15. Photographs of test setup

14.5.Setup for Radiated Test : 30 ~ 1 000 MHz

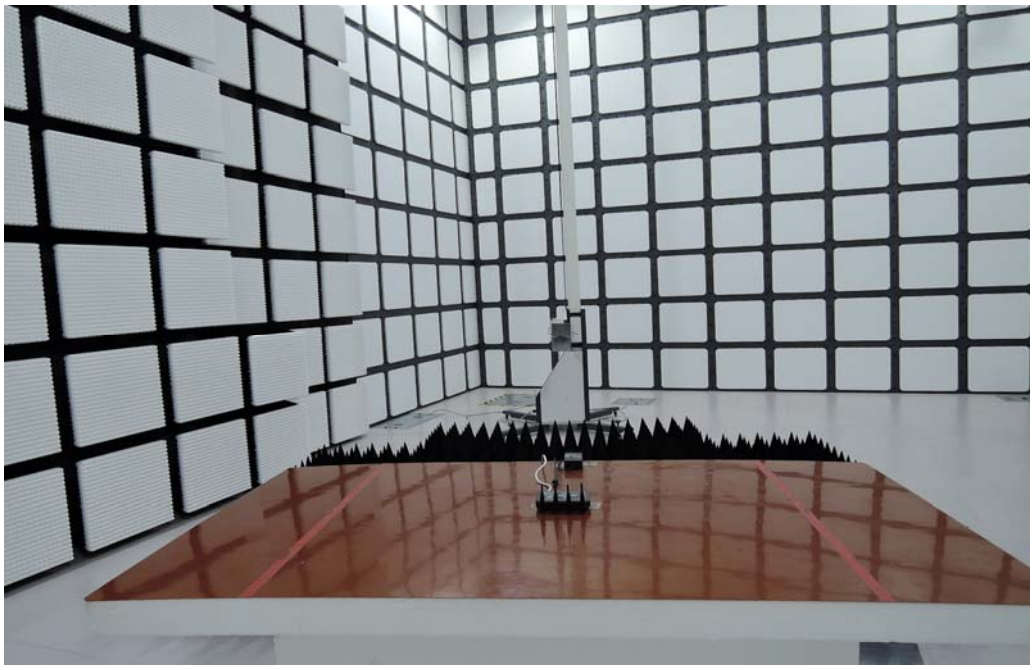
[Front]

[Rear]

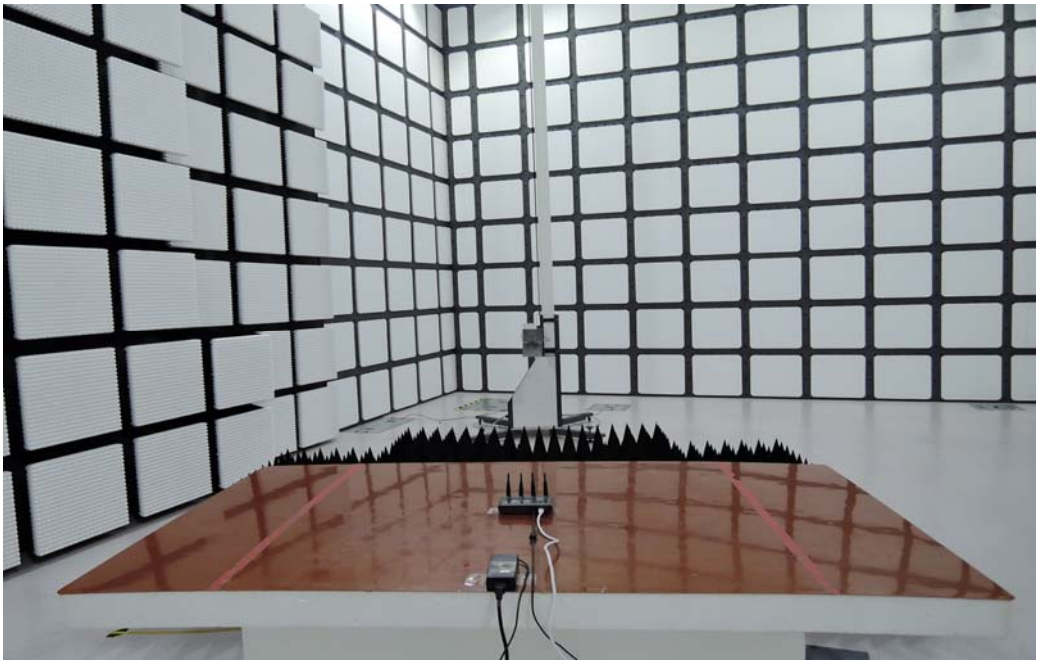


15.2. Setup for Radiated Test :Above 1 000 MHz

[Front]



[Rear]



15.3. Setup for Conducted Test : 0.15 ~ 30 MHz

[Front]

[Rear]

15.4. Photographs of EUT

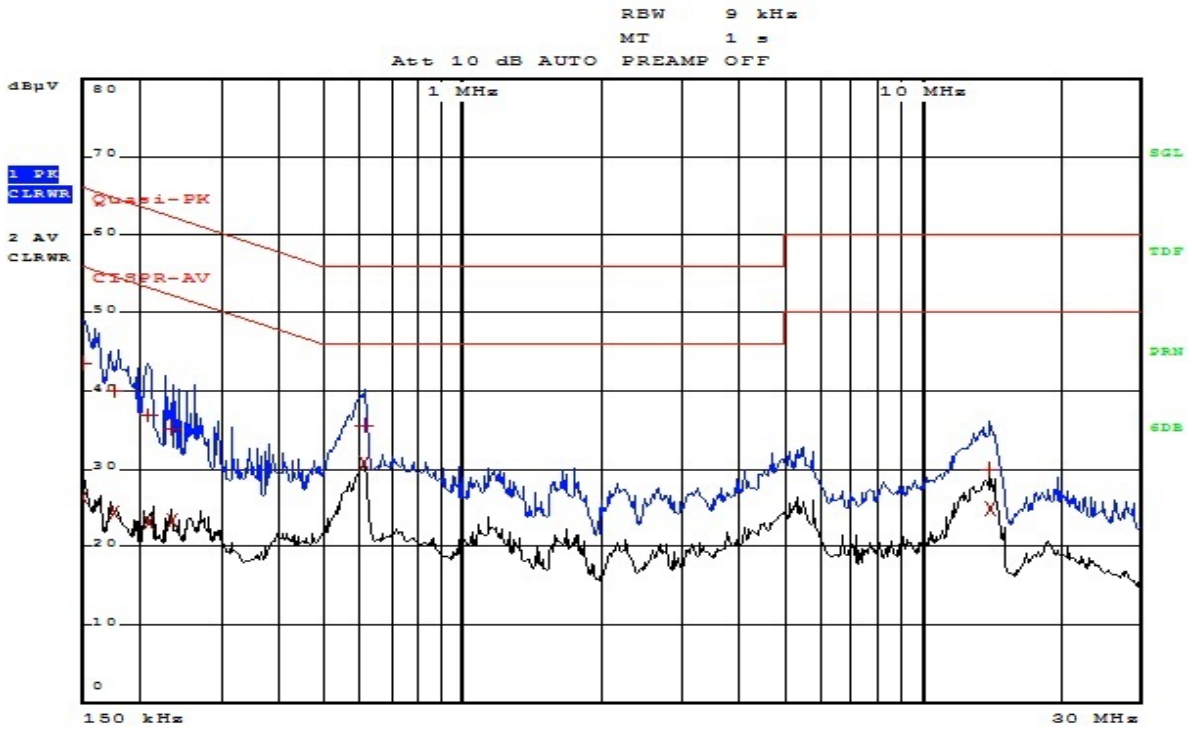
[Front]

[Rear]

Appendix 1. Special diagram for Wireless LAN

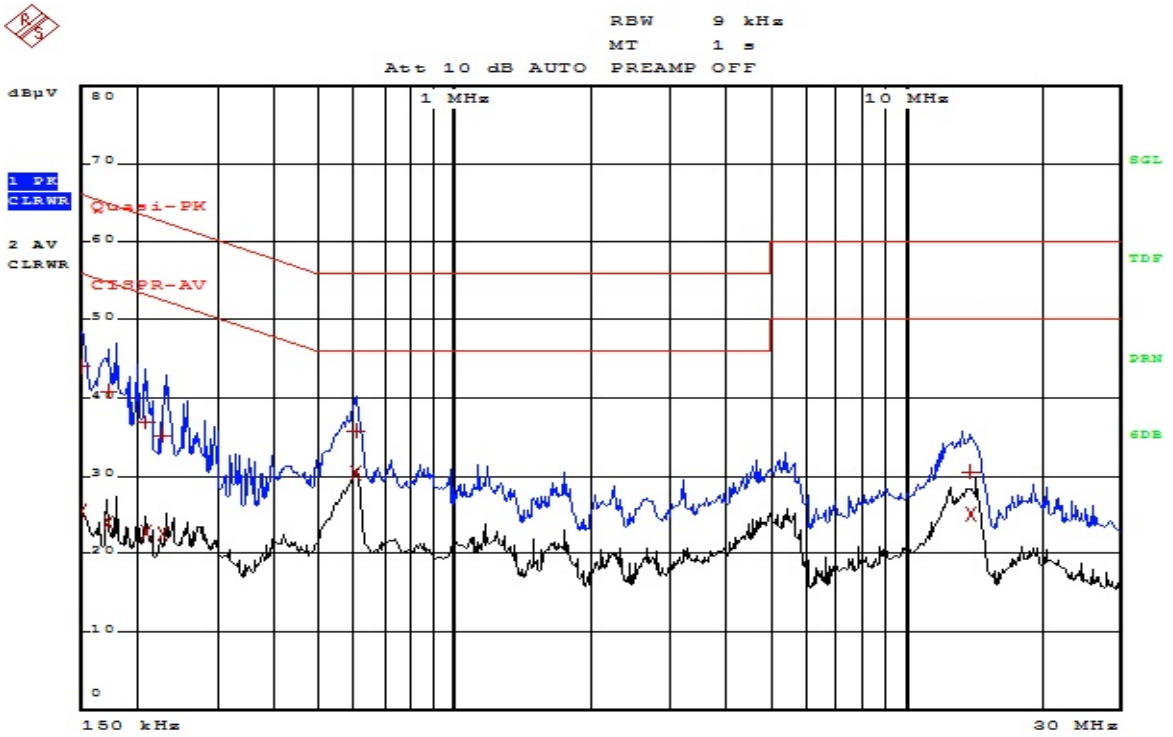
* 802.11ac - VHT 20

* HOT LINE



Comment: 15-02519_802.11ac(20 MHz)_HOT
Date: 19.MAY.2016 09:30:46

* NEUTRAL LINE

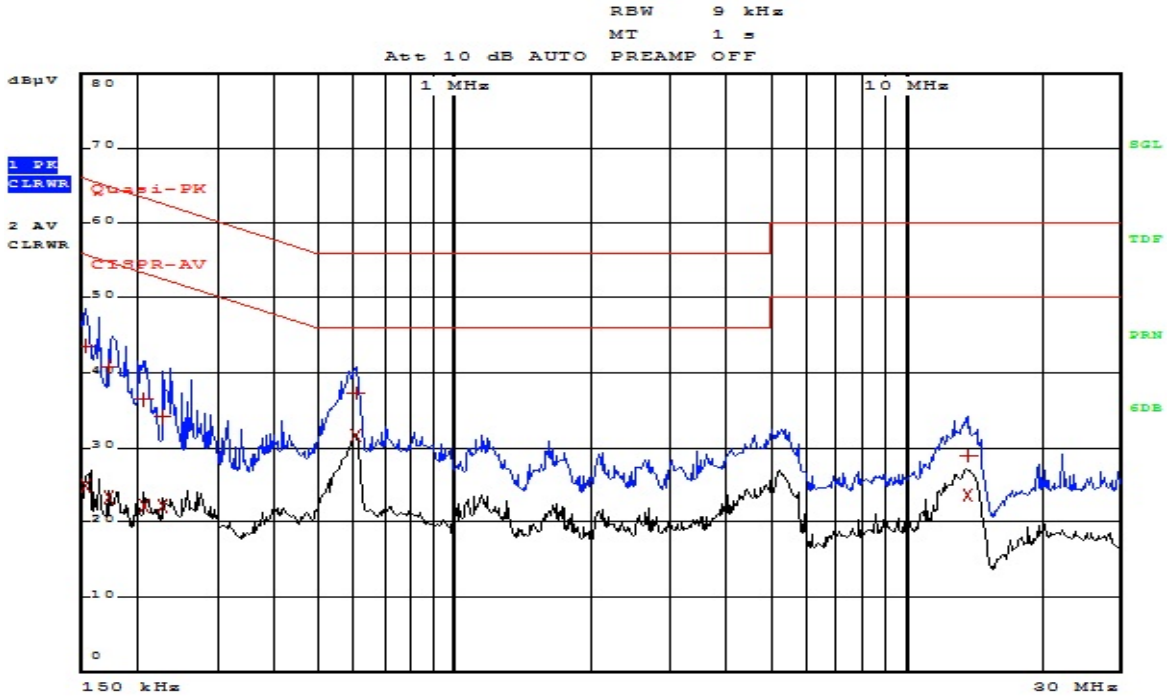


Comment: 15-02519_802.11ac(20 MHz)_NEUTRAL
Date: 19.MAY.2016 09:33:52

Appendix 1. Special diagram for Wireless LAN

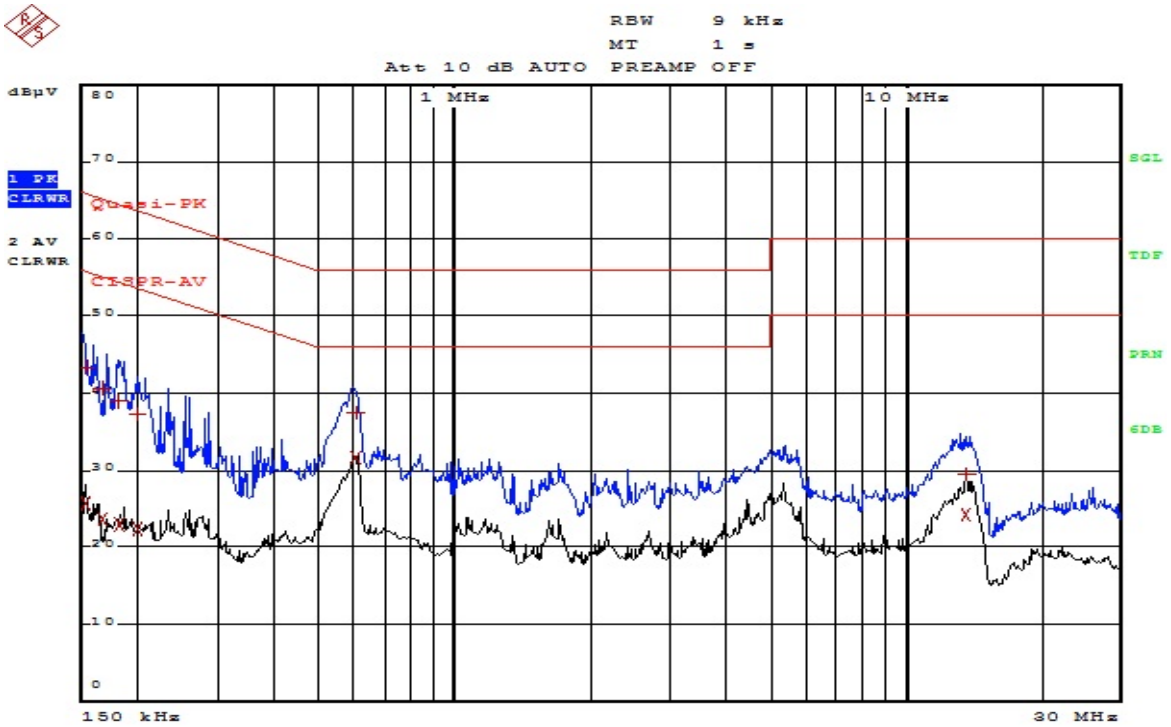
* 802.11ac - VHT 40

* HOT LINE



Comment: 15-02519_802.11ac(40 MHz)_HOT
Date: 19.MAY.2016 10:19:37

* NEUTRAL LINE

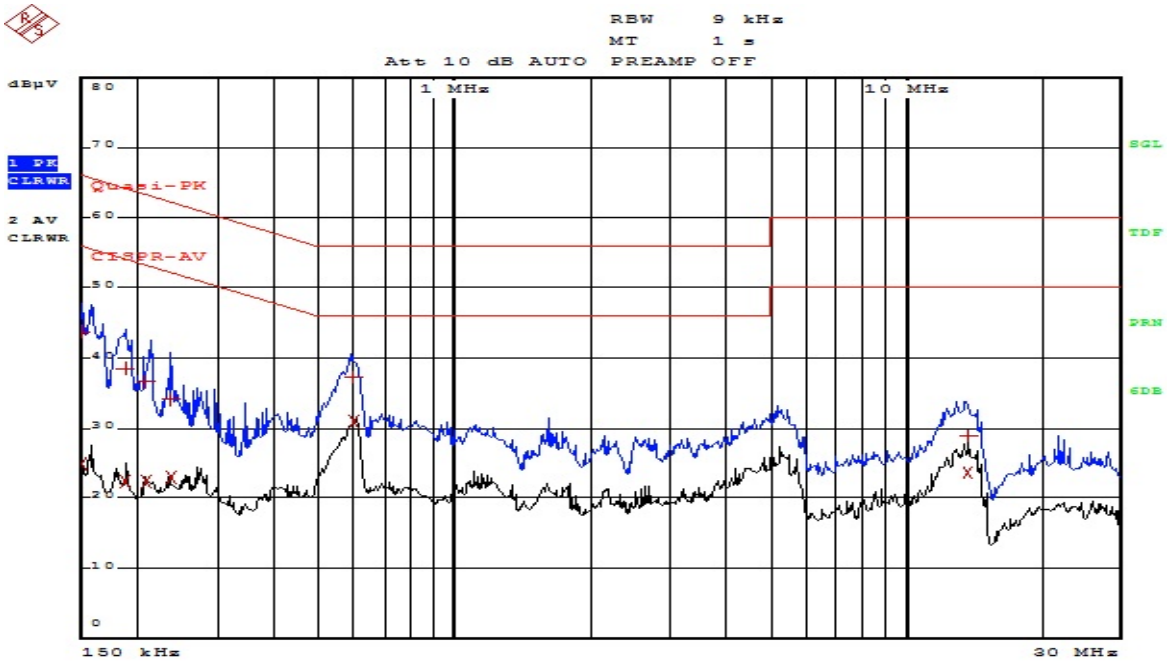


Comment: 15-02519_802.11ac(40 MHz)_NEUTRAL
Date: 19.MAY.2016 10:22:43

Appendix 1. Special diagram for Wireless LAN

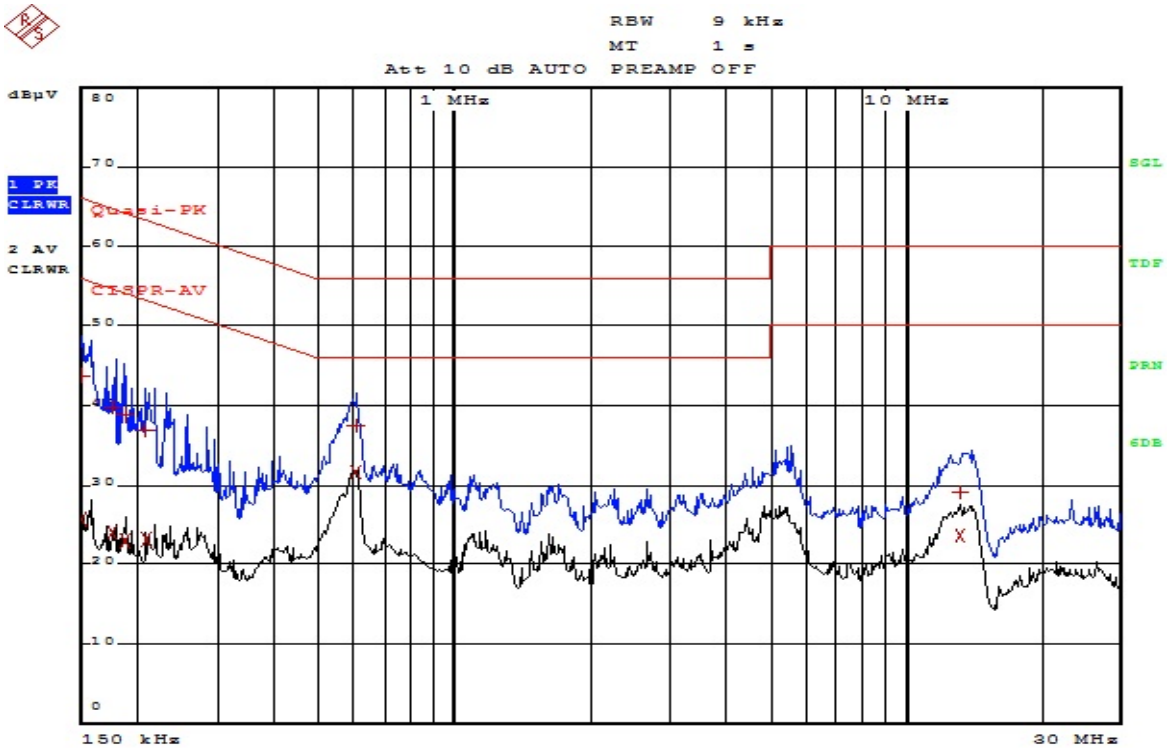
*802.11ac - VHT 80

* HOT LINE



Comment: 15-02519_802.11ac(80 MHz)_HOT
Date: 19.MAY.2016 10:41:18

* NEUTRAL LINE



Comment: 15-02519_802.11ac(80 MHz)_NEUTRAL
Date: 19.MAY.2016 10:37:37

Appendix 2. Antenna Requirement

1. Antenna Requirement

1.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.24

1.2 Antenna Connected Construction

The antenna types used in this product are Intergrated Sandwich antenna . The maximum Gain of this antenna 5 Ghz is 2 dBi.