EMC

TEST REPORT

Report No. : **180400028TWN-001**
Model No. : **HURESAC-3XE-C**
Issued Date : **Apr. 09, 2018**

Applicant: **Johnson Health Tech. Co., Ltd.**
No. 999, Sec. 2, Dongda Rd., Daya Dist., Taichung City 428, Taiwan

Test Method/ Standard: **47 CFR FCC Part 15.407**
KDB 789033 D02 v01r02
ANSI C63.10 2013
KDB 662911 D01 v02r01

Test Site: **960839**
Test By: **Intertek Testing Services Taiwan Ltd.,**
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Title Supervisor

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Revision History

Report No.	Issue Date	Revision Summary
180400028TWN-001	Apr. 09, 2018	Add NFC module only. After engineer judgment, the difference does not affect original the RF characteristic, PCB layout and antenna location. Then the all test data and test items in this report based on report of 160300205TWN-001.

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1. Summary of Test Data

Test Requirement	Applicable Rule (Section 15.407)	Result
Maximum Conducted Output Power	15.407 (a)(1)/(2)/(3) KDB 789033 D02 v01r02	Pass
Power Spectrum Density	15.407 (a)(1)/(2)/(3) KDB 789033 D02 v01r02	Pass
Minimum Emission Bandwidth	15.407(a)(5), 15.407(e) KDB 789033 D02 v01r02	Pass
Emissions In Restricted Frequency Bands (Radiated emission measurements)	15.407(b), 15.209	Pass
Emission on The Band Edge	15.407(b), 15.209	Pass
AC Line Conducted Emission	15.407(b)(6) 15.207	Pass
Antenna requirement	15.203	Pass

2. General information

2.1 Identification of the EUT

Product:	Console for Exercise Machine
Model No.:	HURESAC-3XE-C
Radio Module:	MS-57423
Operating Frequency:	1. 5180 MHz ~ 5240 MHz for 802.11a, 802.11n(HT20) 2. 5190 MHz ~ 5230 MHz for 802.11n (HT40) 3. 5745 MHz ~ 5825 MHz for 802.11a, 802.11n (HT20) 4. 5755 MHz ~ 5795 MHz for 802.11n (HT40)
Channel Number:	1. 4 channels for 5180 MHz ~ 5240 MHz for 802.11a,802.11n (HT20) 2. 2 channels for 5190 MHz ~ 5230 MHz for 802.11n (HT40) 3. 5 channels for 5745 MHz ~ 5825 MHz for 802.11a, 802.11n (HT20) 4. 2 channels for 5755 MHz ~ 5795 MHz for 802.11n (HT40)
Access scheme:	DSSS, OFDM
Modulation	64QAM, 16QAM, QPSK, BPSK for OFDM
Rated Power:	DC 12 V from adapter
Power Cord:	N/A
Sample Received:	Mar. 08, 2016
Test Date(s):	Apr. 21, 2016 ~ Jun. 03, 2016

Note 1: The test report only allows to be revised within three years from its original issued date unless further standard or the requirement was noticed.
Note 2: When determining the test conclusion, the Measurement Uncertainty of test has been considered.
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2.2 Additional information of EUT

Modulation mode	Transmit path	
	Chain 0 / Main	Chain 1 / AUX
802.11a	V	V
802.11 n (HT20)	V	V

Product SW version :	UI 0.1.7.2, OS 2.0.19, IO 10
Product HW version :	v1.1
Radio SW version :	N/A
Radio HW version :	0B
Test SW Version :	USI_BCM43XX_Testing_Tool_V1_4_10r8

2.3 Antenna description

Antenna 1

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

.

Antenna Gain : 4.3 dBi max for 5GHz
Antenna Type : PIFA antenna
Connector Type : I-pex

Antenna 2

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

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Antenna Gain : 3.88 dBi max for 5GHz
Antenna Type : PIFA antenna
Connector Type : I-pex

2.4 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Data cable
Notebook PC	HP	HP Compaq nc2400	CNF6413CGN	Micro USB 0.5 meter × 1
Adapter	N/A	LSE0107A1240	N/A	N/A

2.7 Operation mode

The EUT was supplied with DC 12 V from adapter (Test voltage: 120 Vac, 60 Hz) .
TX-MODE is based on a specific test program “USI BCM FCC CE REG Tool”, and the program can select different frequency and modulation.

With individual verifying, the maximum output power were found out 6 Mbps data rate for 802.11a mode, 6.5 Mbps data rate for 802.11n(HT20) mode and, 13.5 Mbps data rate for 802.11n(HT40) mode the final tests were executed under these conditions recorded in this report individually.

802.11a ch40 chain0		**802.11n HT20 ch40 chain0**		**802.11n HT20 ch40 chain1**		**802.11n HT20 ch40 chain1+chain0**	
Data rate	**AV (dBm)**	**Data rate**	**AV (dBm)**	**Data rate**	**AV (dBm)**	**Data rate**	**AV (dBm)**
6	13.82	MCS0	12.04	MCS0	11.49	MCS0	14.78
9	13.75	MCS1	11.96	MCS1	11.41	MCS1	14.70
12	13.63	MCS2	11.87	MCS2	11.35	MCS2	14.63
18	13.57	MCS3	11.83	MCS3	11.29	MCS3	14.58
24	13.51	MCS4	11.75	MCS4	11.22	MCS4	14.50
36	13.44	MCS5	11.69	MCS5	11.16	MCS5	14.44
48	13.36	MCS6	11.62	MCS6	11.08	MCS6	14.37
54	13.3	MCS7	11.56	MCS7	11.01	MCS7	14.30
802.11a ch40 chain1		**802.11n HT40 ch38 chain0**		**802.11n HT40 ch38 chain1**		**802.11n HT40 ch38 chain1+chain0**	
Data rate	**AV (dBm)**	**Data rate**	**AV (dBm)**	**Data rate**	**AV (dBm)**	**Data rate**	**AV (dBm)**
6	13.83	MCS0	11.73	MCS0	11.05	MCS0	14.41
9	13.73	MCS1	11.68	MCS1	10.96	MCS1	14.35
12	13.65	MCS2	11.61	MCS2	10.91	MCS2	14.28
18	13.58	MCS3	11.57	MCS3	10.85	MCS3	14.24
24	13.5	MCS4	11.5	MCS4	10.79	MCS4	14.17
36	13.43	MCS5	11.43	MCS5	10.72	MCS5	14.10
48	13.34	MCS6	11.36	MCS6	10.66	MCS6	14.03
54	13.25	MCS7	11.29	MCS7	10.58	MCS7	13.96

2.8 Applied test modes and channels

Test items	Mode	Data Rate (Mbps)	Channel	Antenna
Maximum Conducted Output Power	802.11a	6	36,40,48,149,157,165	Chain0/Chain1
	802.11 n (HT20)	6.5	36,40,48,149,157,165	Chain0/Chain1
	802.11 n (HT40)	13.5	38,46,151,159	Chain0/Chain1
Power Spectrum Density	802.11a	6	36,40,48,149,157,165	Chain0/Chain1
	802.11 n (HT20)	6.5	36,40,48,149,157,165	Chain0/Chain1
	802.11 n (HT40)	13.5	38,46,151,159	Chain0/Chain1
Emission BW	802.11a	6	36,40,48,149,157,165	Chain0/Chain1
	802.11 n (HT20)	6.5	36,40,48,149,157,165	Chain0/Chain1
	802.11 n (HT40)	13.5	38,46,151,159	Chain0/Chain1
Radiated spurious Emission 9kHz~1GHz	Normal Link			
Emissions In Restricted Frequency Bands (Radiated emission measurements)	802.11a	6	36,40,48,149,157,165	Chain0/Chain1
	802.11 n (HT20)	6.5	36,40,48,149,157,165	Chain0+Chain1
	802.11 n (HT40)	13.5	38,46,151,159	Chain0+Chain1
Emission on The Band Edge	802.11a	6	36,40,48,149,157,165	Chain0/Chain1
	802.11 n (HT20)	6.5	36,40,48,149,157,165	Chain0+Chain1
	802.11 n (HT40)	13.5	38,46,151,159	Chain0+Chain1
AC Line Conducted Emission	Normal Link			

2.9 Power setting of test software

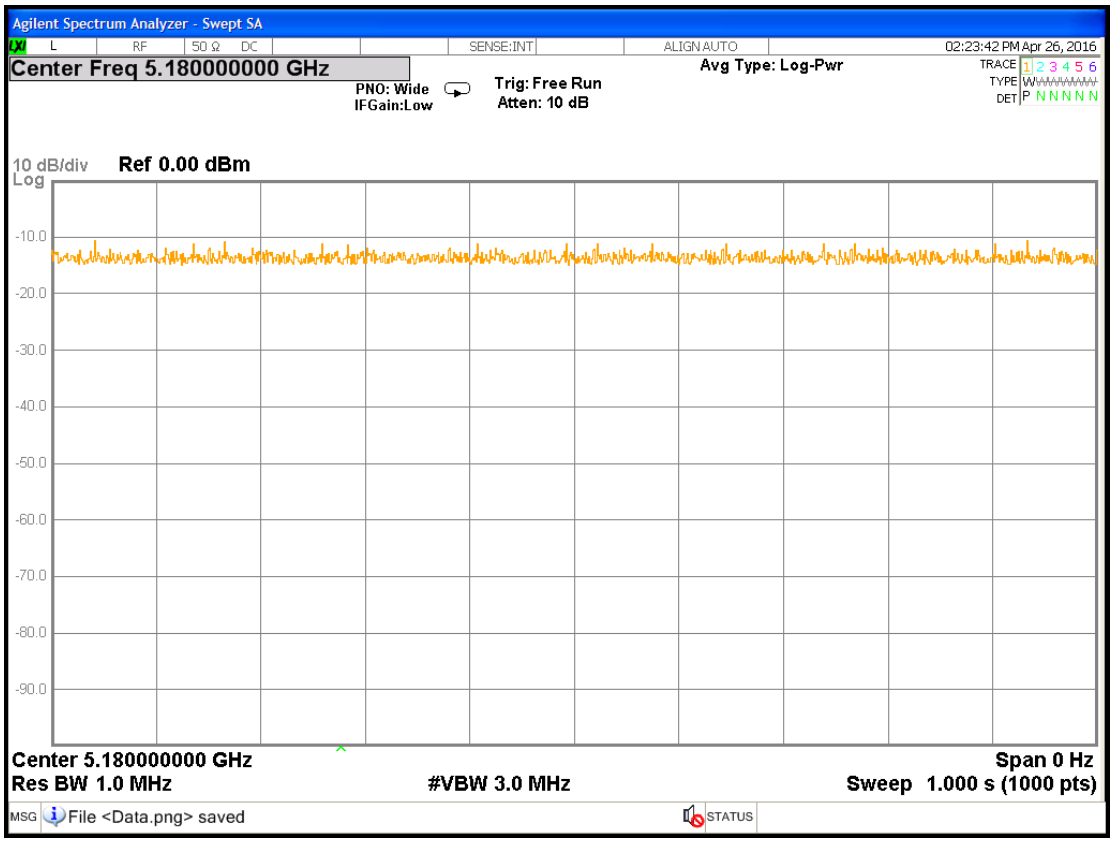
Channels & power setting software provided by the client was used to change the operating channels as well as the output power level and is going to be installed in the final end product.

Mode	Software Version: USI_BCM43XX_Testing_Tool_V1_4_10r8		
	Channel	Frequency	Power setting
802.11a (Chain 0)	36	5180	18
	40	5200	18
	48	5240	18
	149	5745	19.5
	157	5785	19.5
	165	5825	19.5
802.11a (Chain 1)	36	5180	19
	40	5200	19
	48	5240	19
	149	5745	19.5
	157	5785	20
	165	5825	20
802.11n (HT 20)	36	5180	16
	40	5200	16
	48	5240	16
	149	5745	17
	157	5785	18
	165	5825	18
802.11ac (HT 40)	38	5190	15.5
	46	5230	15.5
	151	5755	17
	159	5795	17

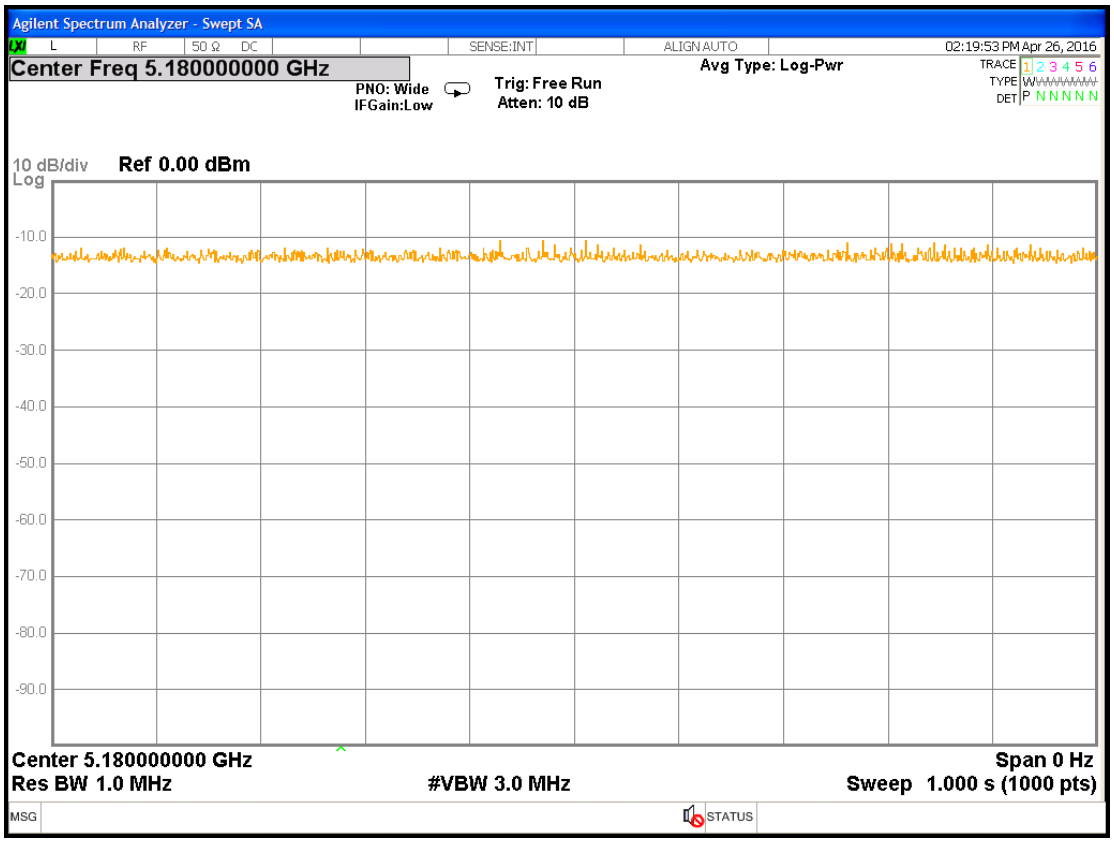
Note: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

Mode	Channel	Frequency (MHz)	Data rate	Signal on time(s)	Total signal transmit time(s)	Duty cycle	Duty Cycle factor
802.11a	36	5180	6	1	1	1.000	0.000
802.11n(HT20)	36	5180	6.5	1	1	1.000	0.000
802.11n(HT40)	38	5190	13.5	1	1	1.000	0.000
802.11n(HT20) chain1	36	5180	6.5	1	1	1.000	0.000
802.11n(HT20) chain1	38	5190	13.5	1	1	1.000	0.000
802.11n(HT20) chain2	38	5190	13.5	1	1	1.000	0.000

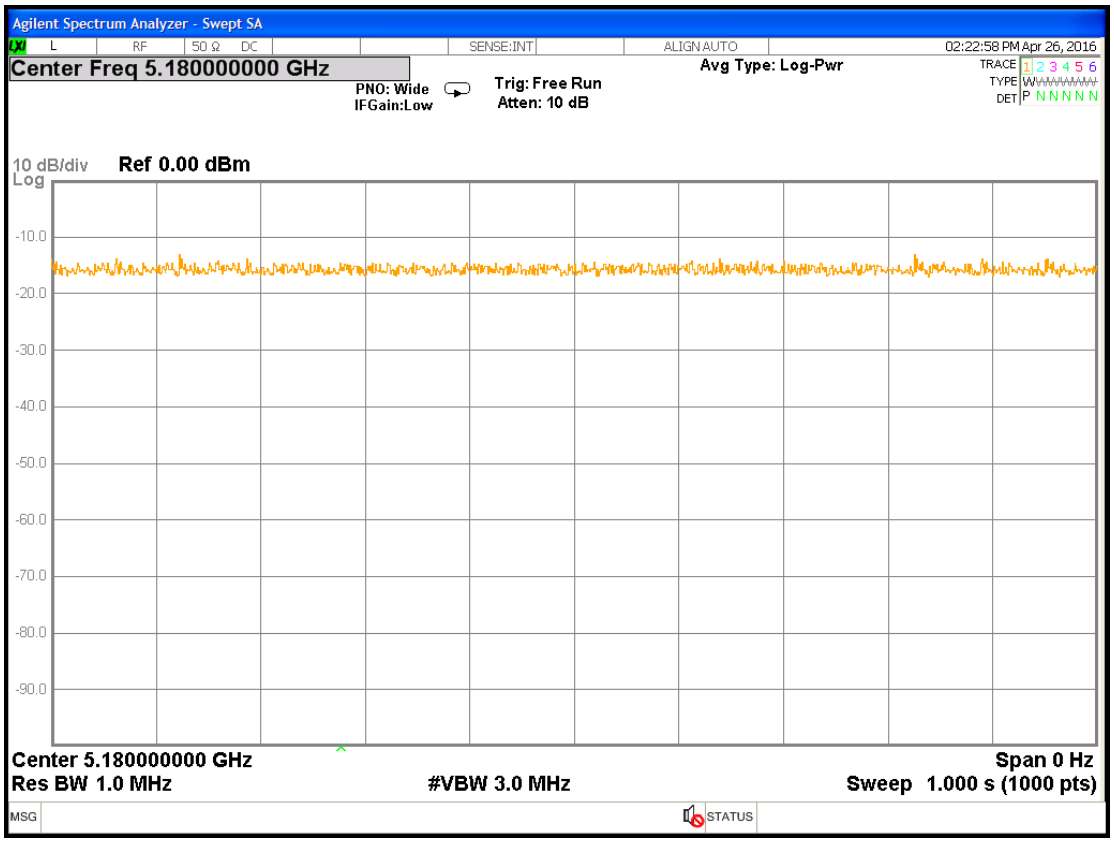
Chain0 : Duty cycle @ 802.11a mode Ch 36



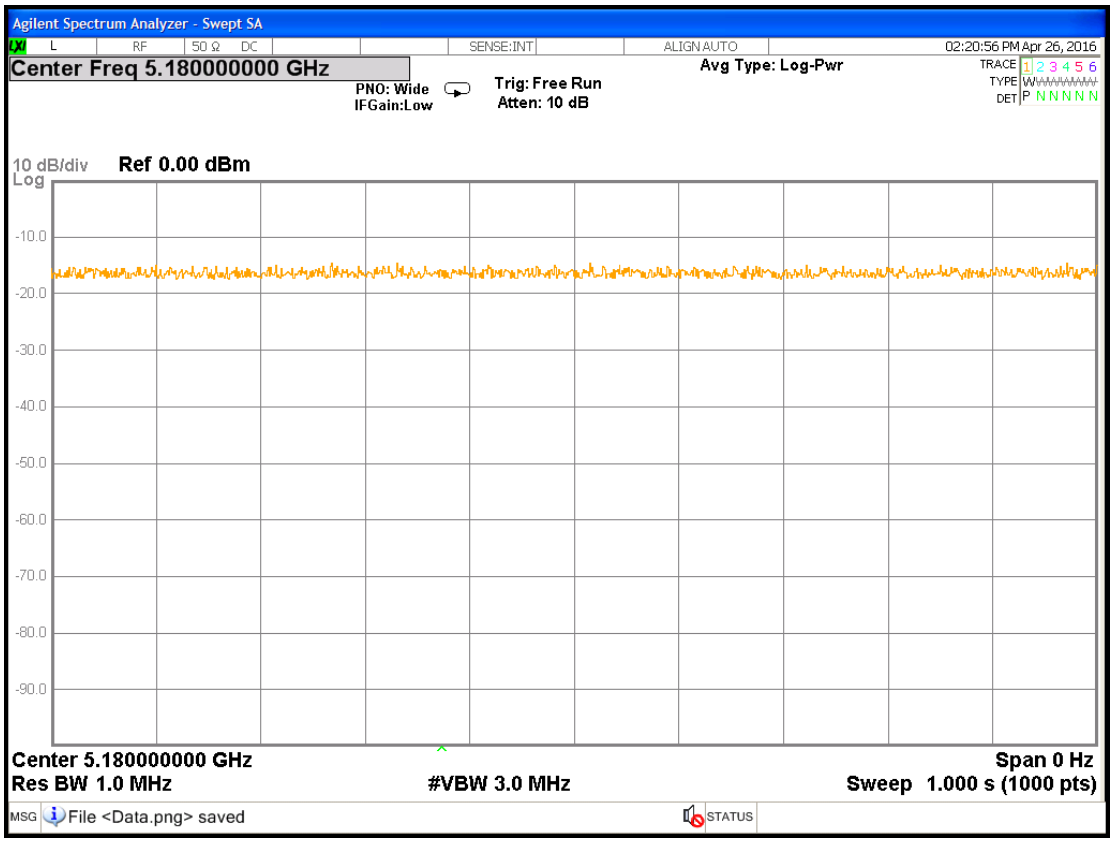
Chain1 : Duty cycle @ 802.11a mode Ch 36



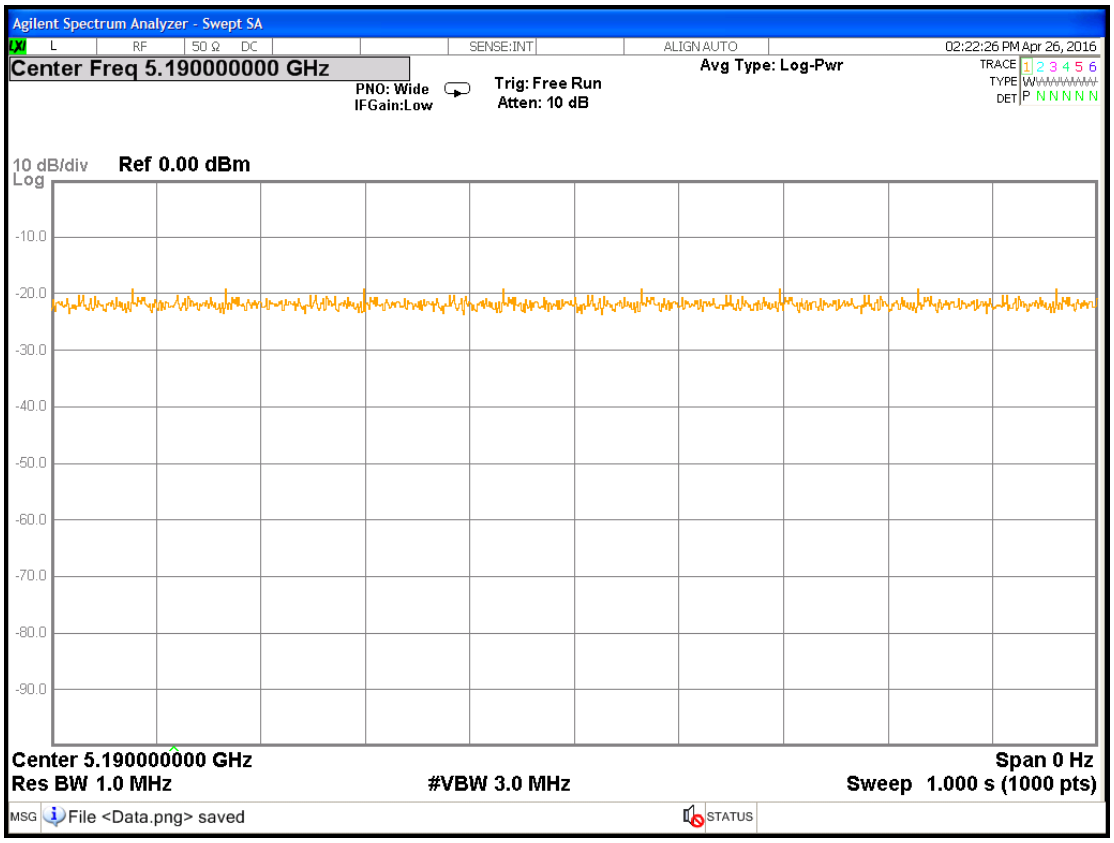
Chain0 : Duty cycle @ 802.11n(HT20) mode Ch 36



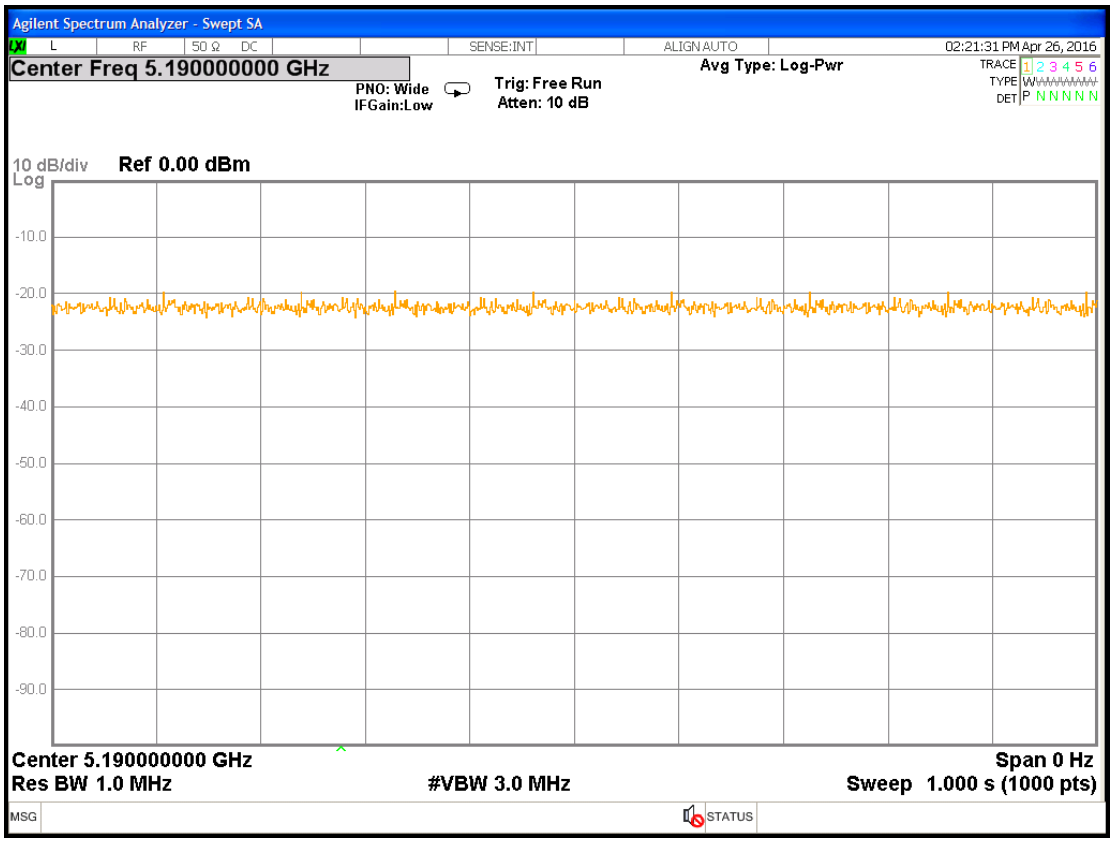
Chain1 : Duty cycle @ 802.11n(HT20) mode Ch 36



Chain0 : Duty cycle @ 802.11n(HT40) mode Ch 38



Chain1 : Duty cycle @ 802.11n(HT40) mode Ch 38



3. Maximum Conducted Output Power

3.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Channel number	36,40,48,149,157,165 for 20MHz 38,46,151,159 for 40MHz	

3.2 Limit for maximum output power

Operating Frequency (MHz)	Conducted output power limit
5150~5250	< 0.25 W (24 dBm)
5725~5850	< 1 W (30 dBm)

Operating Frequency (MHz)	Maximum E.I.R.P. limit
5150~5250	< 1 W (30 dBm)
5725~5850	< 4 W (36 dBm)

3.3 Measuring instrument setting

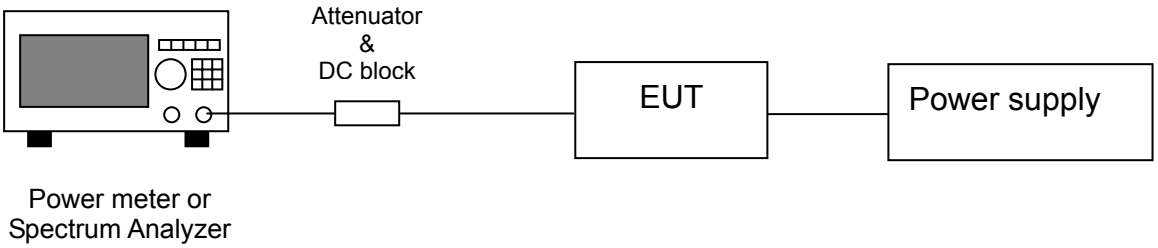
Power meter for Nominal Bandwidth less than 65MHz	
Power meter	**Setting**
Bandwidth	65MHz bandwidth is greater than the EUT emission bandwidth
Detector	Average

3.4 Test procedure

Test procedures refer to clause E) 3) b) measurement using a gated RF average power meter of KDB 789033 D02 v01r02

Test procedures refer to clause E) 2) b) Method SA-1 of KDB 789033 D02 v01r02

3.5 Test diagram



3.6 Test results

Mode	Ch.	Freq. (MHz)	Data Rate (Mbps)	Output Power (AV)		Antenna Gain (dBi)	Total Output Power (dBm)	Limit of Conducted Power (dBm)	Margin (dB)	Limit of E.I.R.P. (dBm)	Margin (dB)
				dBm	mW						
802.11a Chain0	36	5180	6	13.88	24.43	4.3	18.18	24.00	-10.12	36.00	-17.82
	40	5200		13.82	24.10	4.3	18.12	24.00	-10.18	36.00	-17.88
	48	5240		14.33	27.10	4.3	18.63	24.00	-9.67	36.00	-17.37
	149	5745		14.05	25.41	4.3	18.35	30.00	-15.95	36.00	-17.65
	157	5785		13.72	23.55	4.3	18.02	30.00	-16.28	36.00	-17.98
	165	5825		13.11	20.46	4.3	17.41	30.00	-16.89	36.00	-18.59
802.11a Chain1	36	5180	6	13.63	23.07	3.88	17.51	24.00	-10.37	36.00	-18.49
	40	5200		13.83	24.15	3.88	17.71	24.00	-10.17	36.00	-18.29
	48	5240		14.30	26.92	3.88	18.18	24.00	-9.70	36.00	-17.82
	149	5745		13.45	22.13	3.88	17.33	30.00	-16.55	36.00	-18.67
	157	5785		13.26	21.18	3.88	17.14	30.00	-16.74	36.00	-18.86
	165	5825		12.55	17.99	3.88	16.43	30.00	-17.45	36.00	-19.57

Mode	Channel	Freq. (MHz)	Data Rate (Mbps)	Output Power (AV)		Total Power (AV)		Antenna0 Gain (dBi)	Antenna1 Gain (dBi)	Caculated Output Power (dBm)	Limit of Conducted Power (dBm)	Margin (dB)	Limit of E.I.R.P. (dBm)	Margin (dB)
				Chain 0	Chain 1									
				dBm	dBm	mW	dBm							
802.11n (HT 20)	36	5180	6.5	11.93	11.37	29.30	14.67	4.3	3.88	18.78	24.00	-9.33	36.00	-17.22
	40	5200		12.04	11.49	30.09	14.78	4.3	3.88	18.89	24.00	-9.22	36.00	-17.11
	48	5240		12.55	12.22	34.66	15.40	4.3	3.88	19.50	24.00	-8.60	36.00	-16.50
	149	5745		11.65	11.55	28.91	14.61	4.3	3.88	18.71	30.00	-15.39	36.00	-17.29
	157	5785		12.15	11.7	31.20	14.94	4.3	3.88	19.05	30.00	-15.06	36.00	-16.95
	165	5825		11.68	10.59	26.18	14.18	4.3	3.88	18.30	30.00	-15.82	36.00	-17.70
802.11n (HT 40)	38	5190	13.5	11.73	11.05	27.63	14.41	4.3	3.88	18.53	24.00	-9.59	36.00	-17.47
	46	5230		12.05	11.52	30.22	14.80	4.3	3.88	18.91	24.00	-9.20	36.00	-17.09
	151	5755		11.7	11.47	28.82	14.60	4.3	3.88	18.70	30.00	-15.40	36.00	-17.30
	159	5795		11.46	10.93	26.38	14.21	4.3	3.88	18.32	30.00	-15.79	36.00	-17.68

4. Power Spectrum Density

4.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Channel number	36,40,48,149,157,165 for 20MHz 38,46,151,159 for 40MHz	

4.2 Limit for power spectrum density

Operating Frequency (MHz)	Power density limit
5150~5250	< 17 dBm/MHz
5725~5850	< 30 dBm/500kHz

4.3 Measuring instrument setting

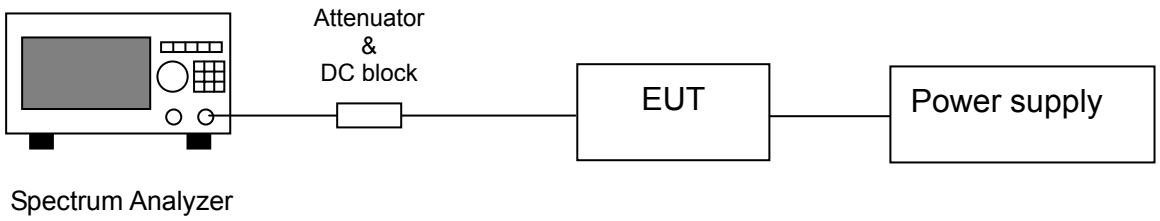
Spectrum analyzer settings (5150~5250MHz)	
Spectrum Analyzer function	**Setting**
Detector	RMS
RBW	=1MHz
VBW	≧3 MHz
Sweep	Auto couple
Trace	Average
Span	Encompass the 26 dB EBW
Attenuation	Auto
Sweep point	≥ 2 Span / RBW

Spectrum analyzer settings (5725~5850MHz)	
Spectrum Analyzer function	**Setting**
Detector	RMS
RBW	=100kHz
VBW	≧300 kHz
Sweep	Auto couple
Trace	Average
Span	Encompass the 6 dB EBW
Attenuation	Auto
Sweep point	≥ 2 Span / RBW

4.4 Test procedure

1. Set relevant parameter according to clause 4.3.
2. Trace average at least 100 traces in power averaging mode.
3. Compute power by integrating the spectrum across the 26 dB or 6dB EBW of the signal using the instrument's band power measurement function with band limits set equal to the EBW band edges
4. If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement. The RBW is 100 kHz. So, we will add 6.989 to the results.

4.5 Test diagram



4.6 Test results

Mode	Channel	Frequency (MHz)	PSD		Result	Limit (dBm)	Margin (dB)
			(dBm)	(mw)			
802.11a Chain0	36	5180	2.717	1.87	2.717	11	-8.28
	40	5200	2.948	1.97	2.948	11	-8.05
	48	5240	3.696	2.34	3.696	11	-7.30
	149	5745	1.256	1.34	1.26	30	-21.75
	157	5785	0.140	1.03	0.14	30	-22.87
	165	5825	0.167	1.04	0.17	30	-22.84
802.11a Chain1	36	5180	3.328	2.15	3.328	11	-7.67
	40	5200	3.381	2.18	3.381	11	-7.62
	48	5240	4.376	2.74	4.376	11	-6.62
	149	5745	-0.088	0.98	-0.09	30	-30.09
	157	5785	-0.393	0.91	-0.39	30	-30.39
	165	5825	-1.164	0.76	-1.16	30	-31.16

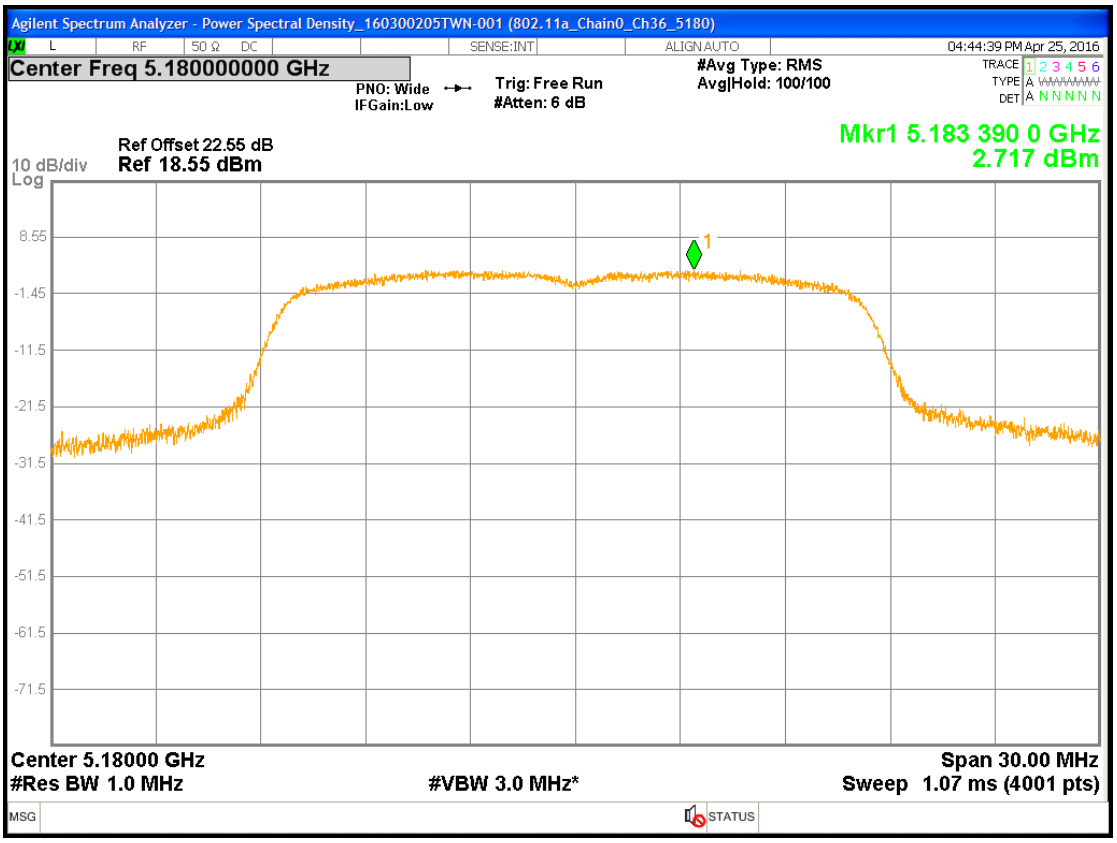
Note: The values of 802.11a Chain1 have modified with Reference level Offset(29.54 dB=22.55(cable loss) + 10Log(500/100)).

Mode	Channel	Frequency (MHz)	PSD (dBm)		Total PSD		MIMO Correction	Result	Limit (dBm)	Margin (dB)
			chain0	chain1	mW	dBm				
802.11n (HT 20)	36	5180	0.985	0.281	2.32	3.66	3.01	6.67	11	-4.33
	40	5200	1.305	0.69	2.52	4.02	3.01	7.03	11	-3.97
	48	5240	2.031	1.553	3.03	4.81	3.01	7.82	11	-3.18
	149	5745	-0.585	-0.934	1.68	2.25	3.01	5.26	26	-20.74
	157	5785	-0.925	-1.24	1.56	1.93	3.01	4.94	26	-21.06
	165	5825	-1.71	-1.91	1.32	1.20	3.01	4.21	26	-21.79
802.11n (HT 40)	38	5190	-3.726	-4.338	0.79	-1.01	3.01	2.00	11	-9.00
	46	5230	-2.726	-3.309	1.00	0.00	3.01	3.01	11	-7.99
	151	5755	-4.368	-4.956	0.69	-1.64	3.01	1.37	26	-24.63
	159	5795	-5.202	-5.348	0.59	-2.26	3.01	0.75	26	-25.25

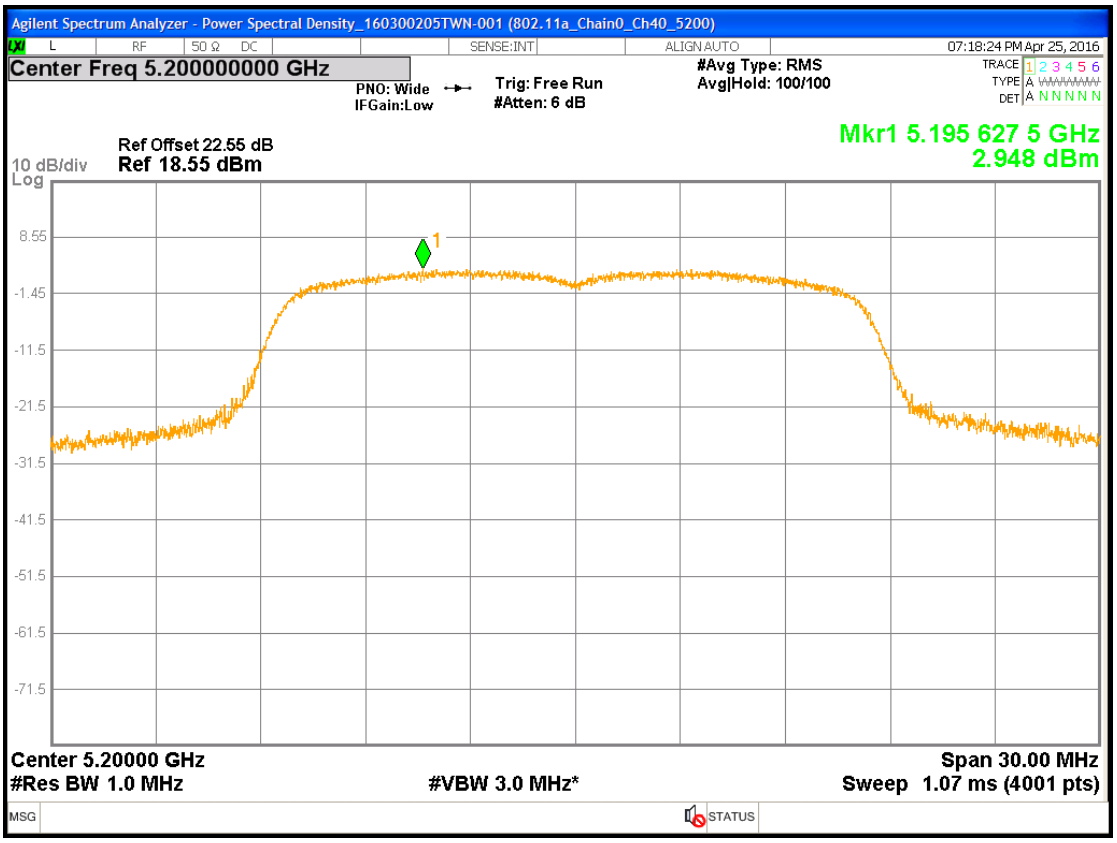
Note: MIMO Correction: 10log(Nant)

RBW Correction: 10log(500kHz/1MHz) or 10log(500kHz/100kHz)

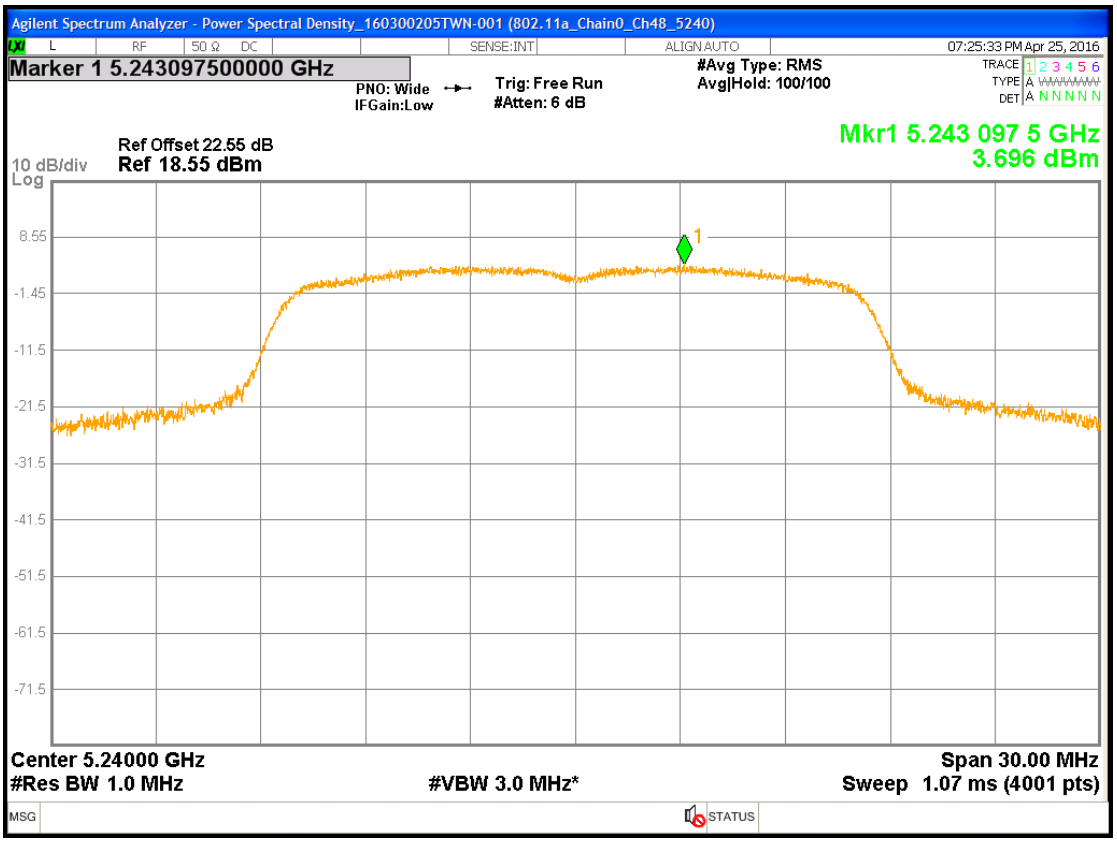
Chain0 : Power Spectral Density @ 802.11a mode Ch36



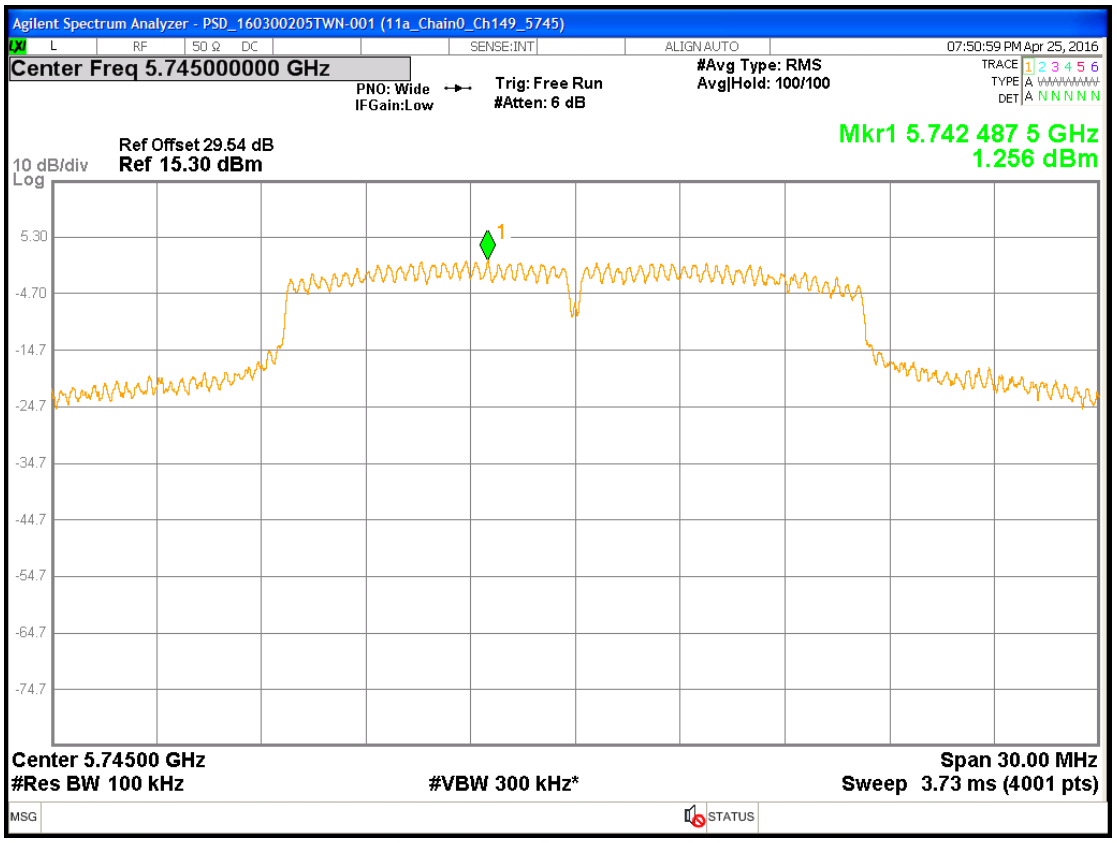
Chain0 : Power Spectral Density @ 802.11a mode Ch40



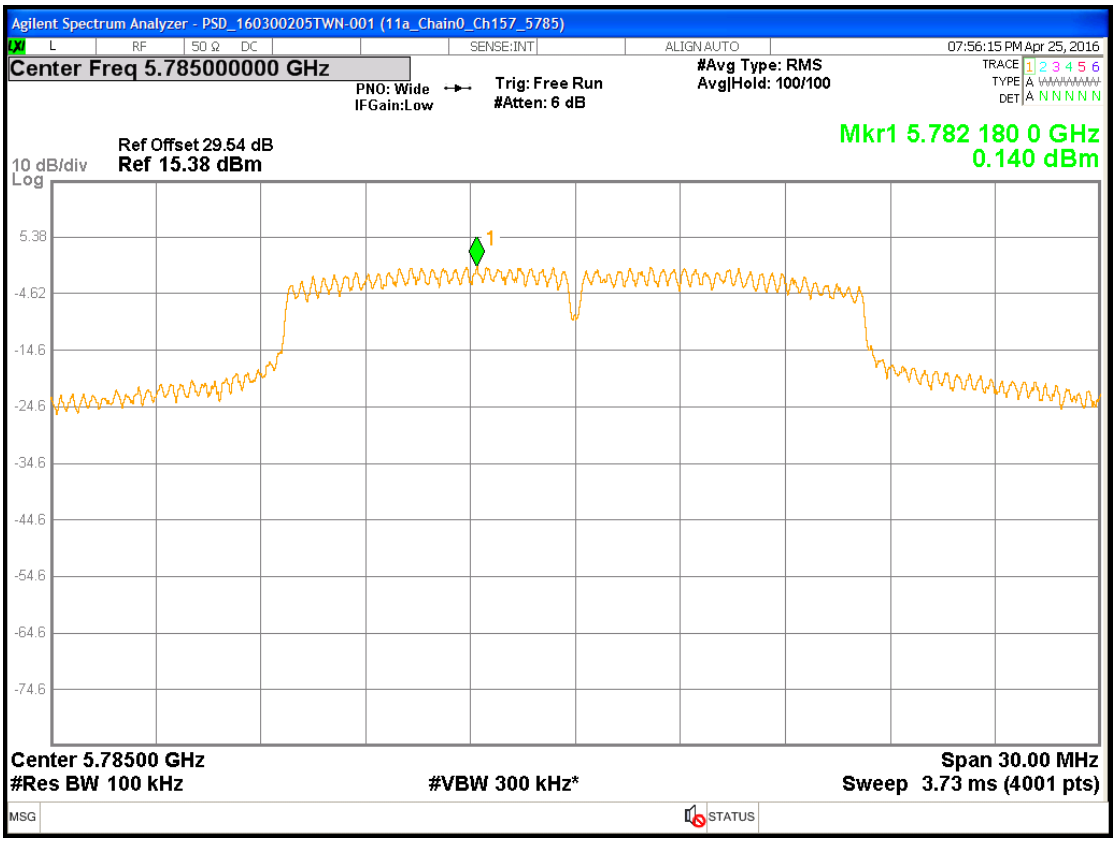
Chain0 : Power Spectral Density @ 802.11a mode Ch48



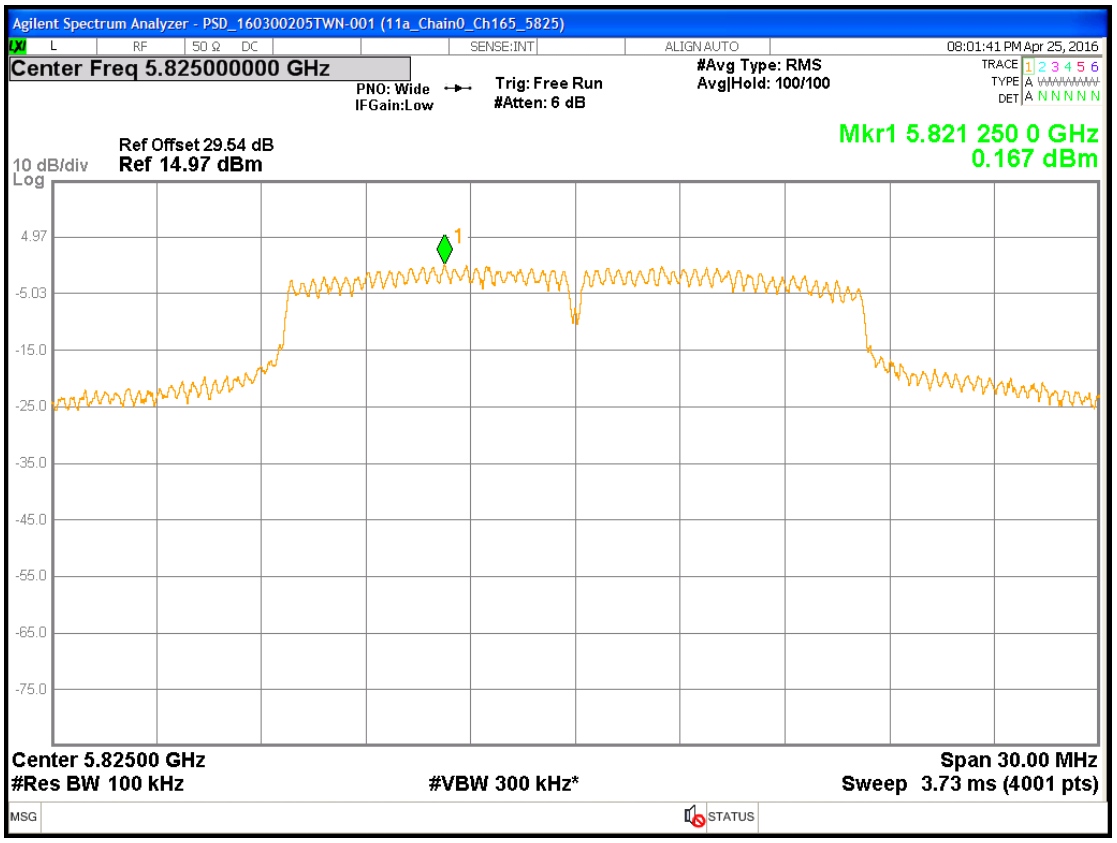
Chain0 : Power Spectral Density @ 802.11a mode Ch149



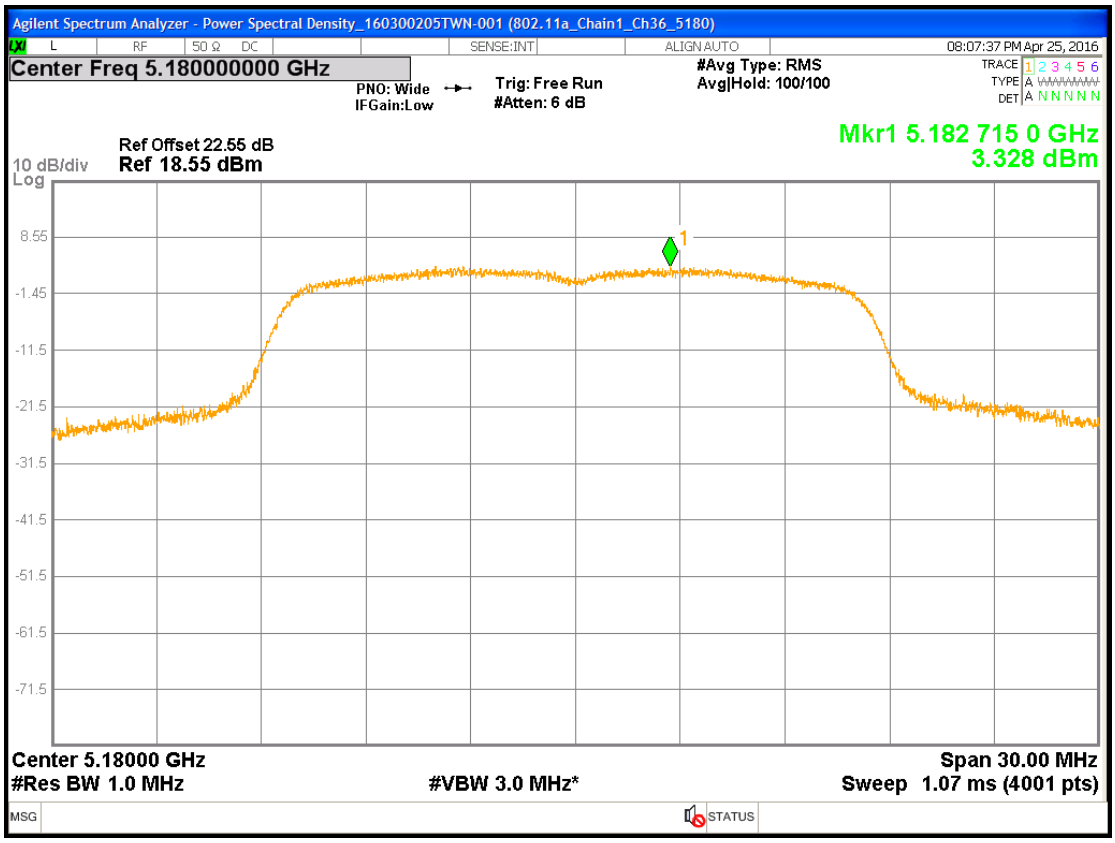
Chain0 : Power Spectral Density @ 802.11a mode Ch157



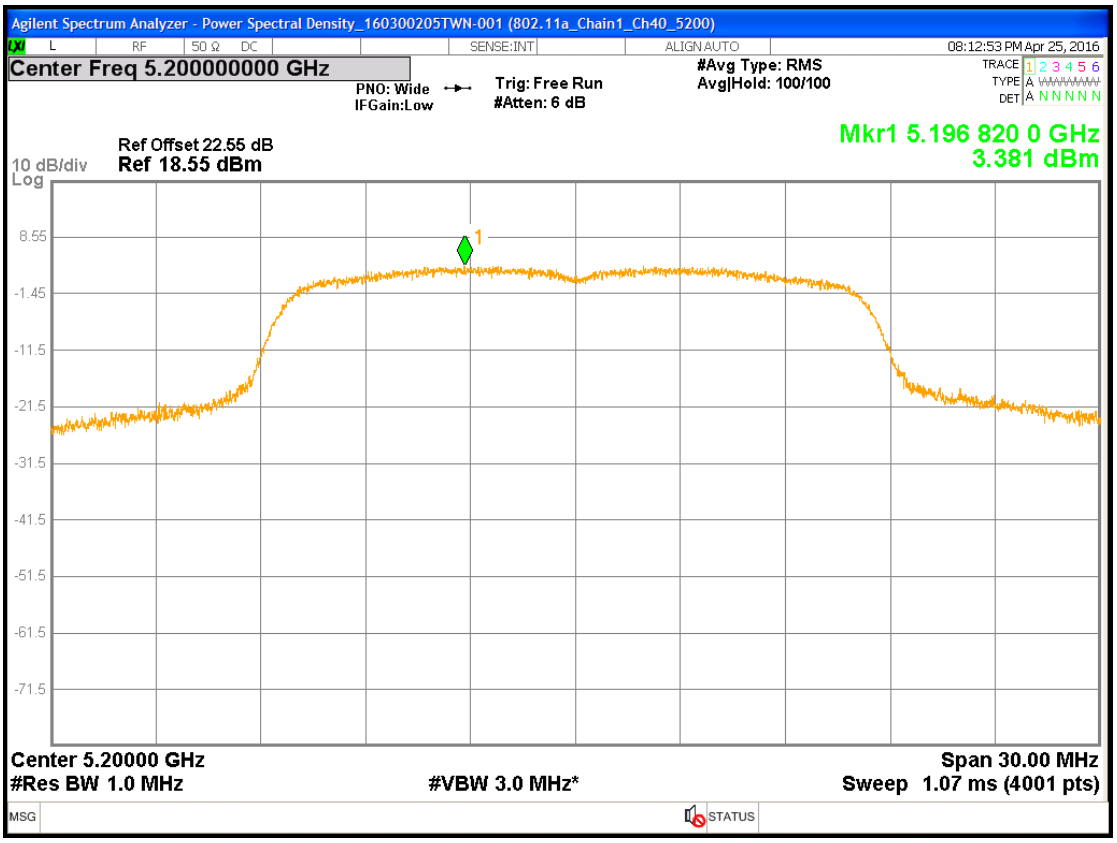
Chain0 : Power Spectral Density @ 802.11a mode Ch165



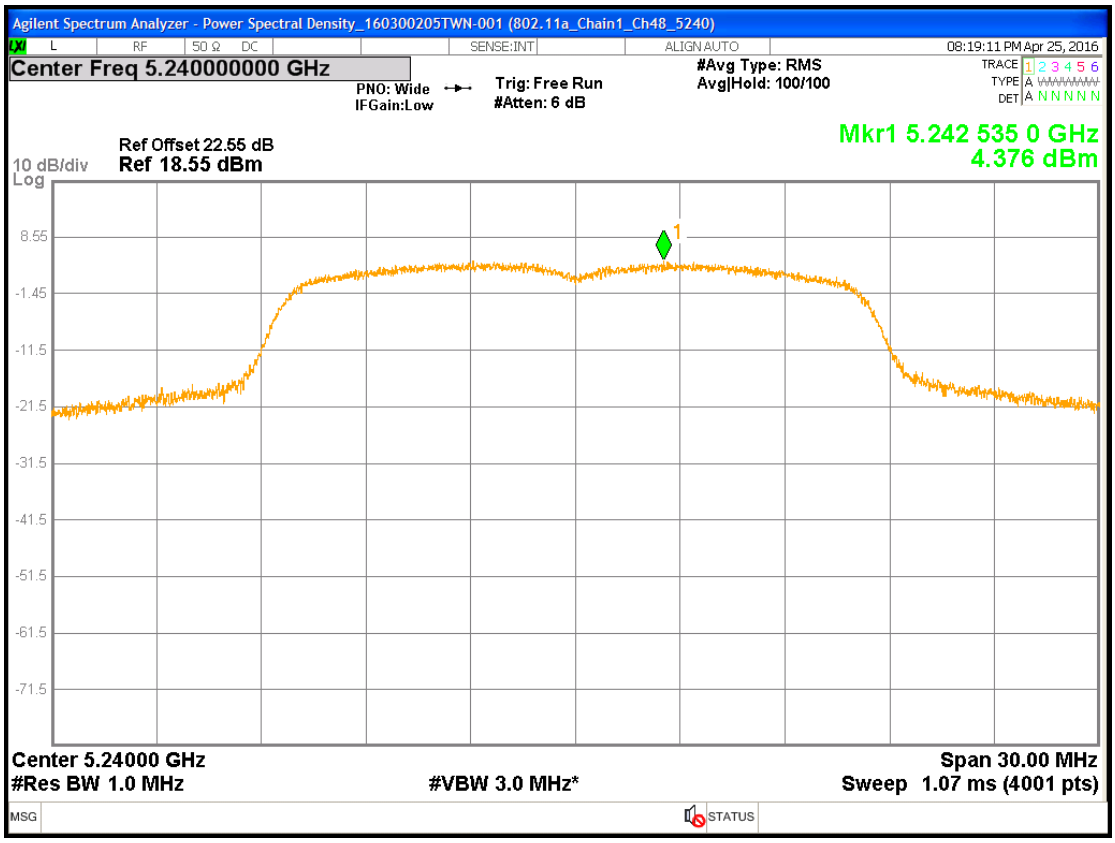
Chain1 : Power Spectral Density @ 802.11a mode Ch36



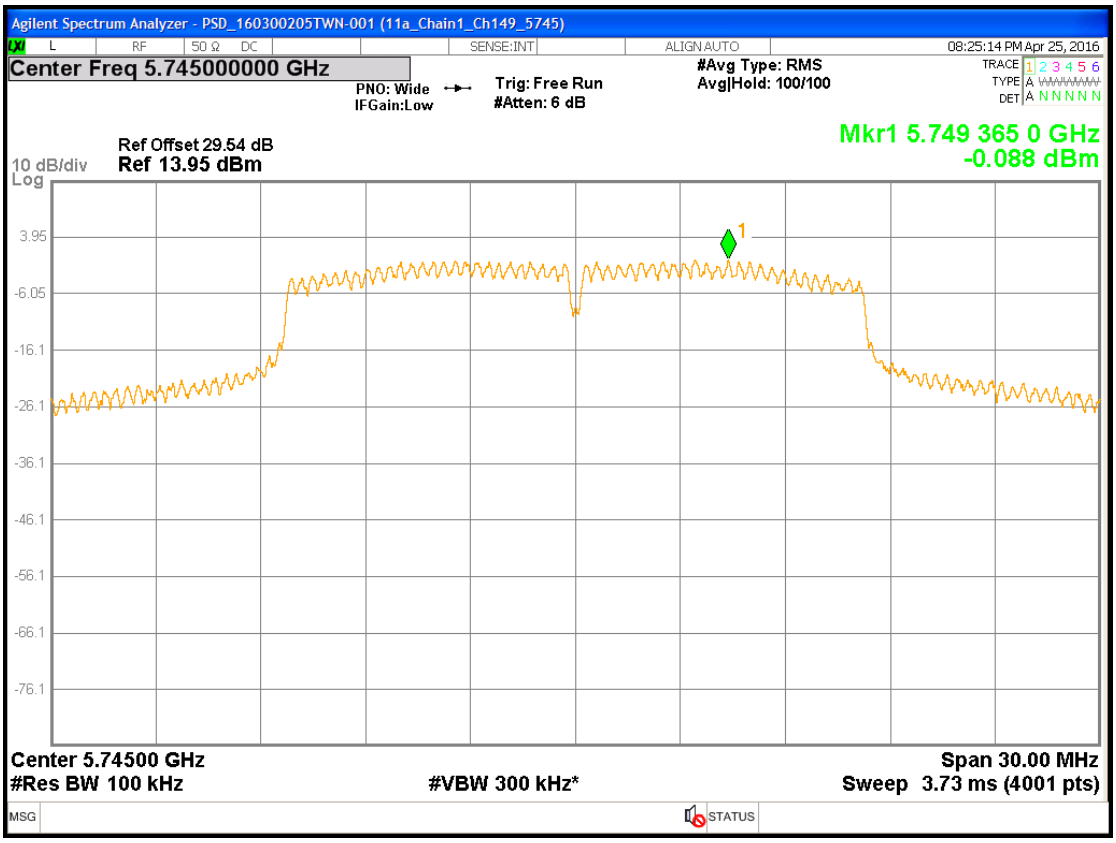
Chain1 : Power Spectral Density @ 802.11a mode Ch40



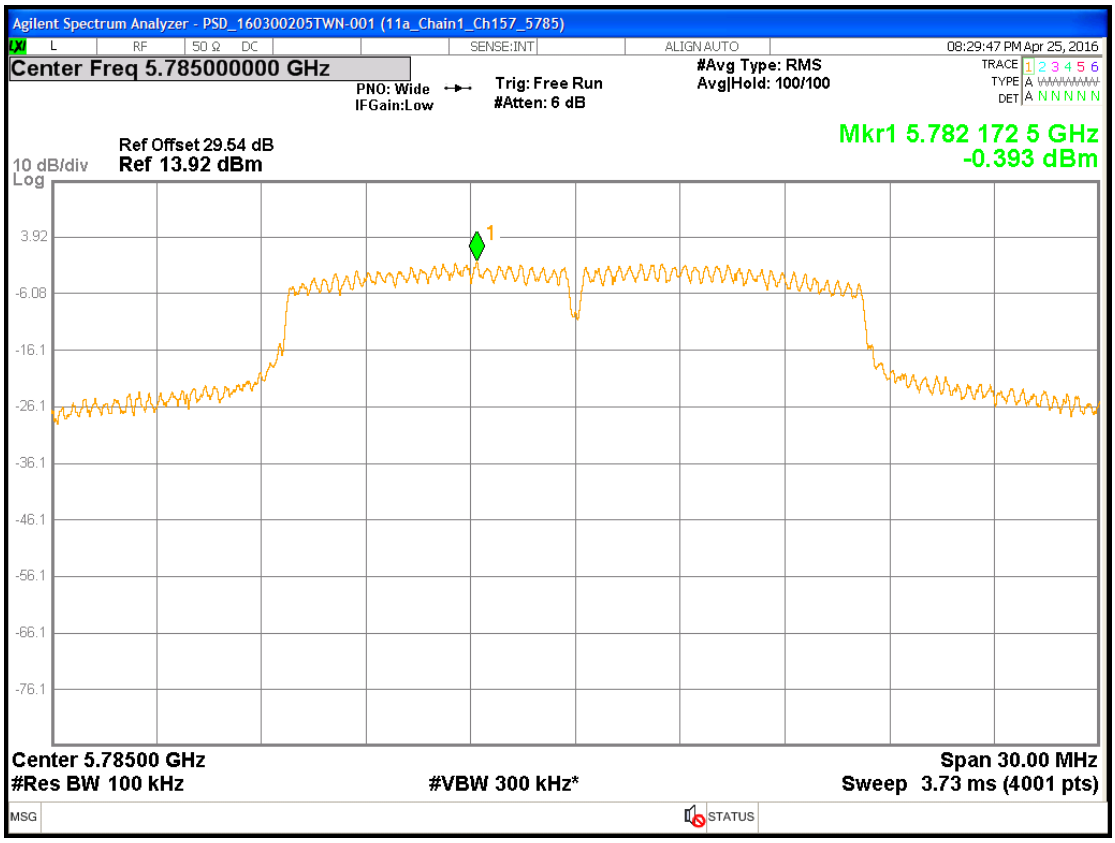
Chain1 : Power Spectral Density @ 802.11a mode Ch48



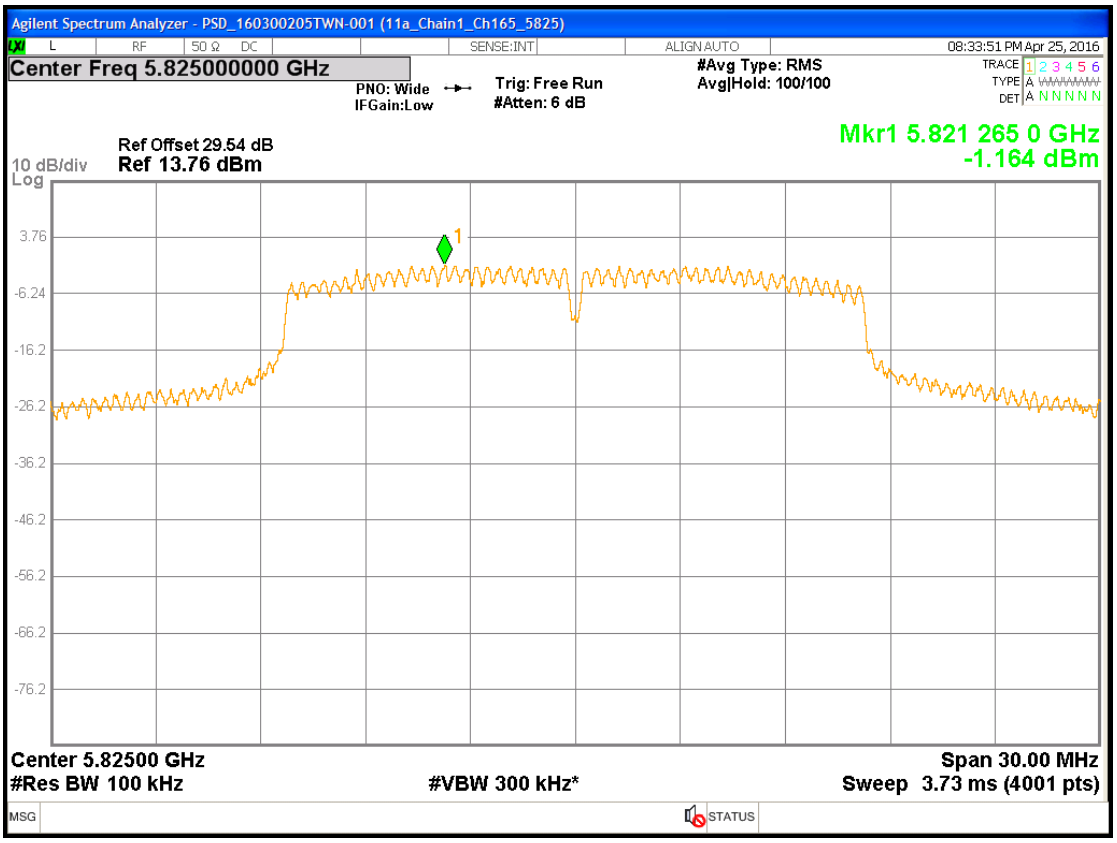
Chain1 : Power Spectral Density @ 802.11a mode Ch149



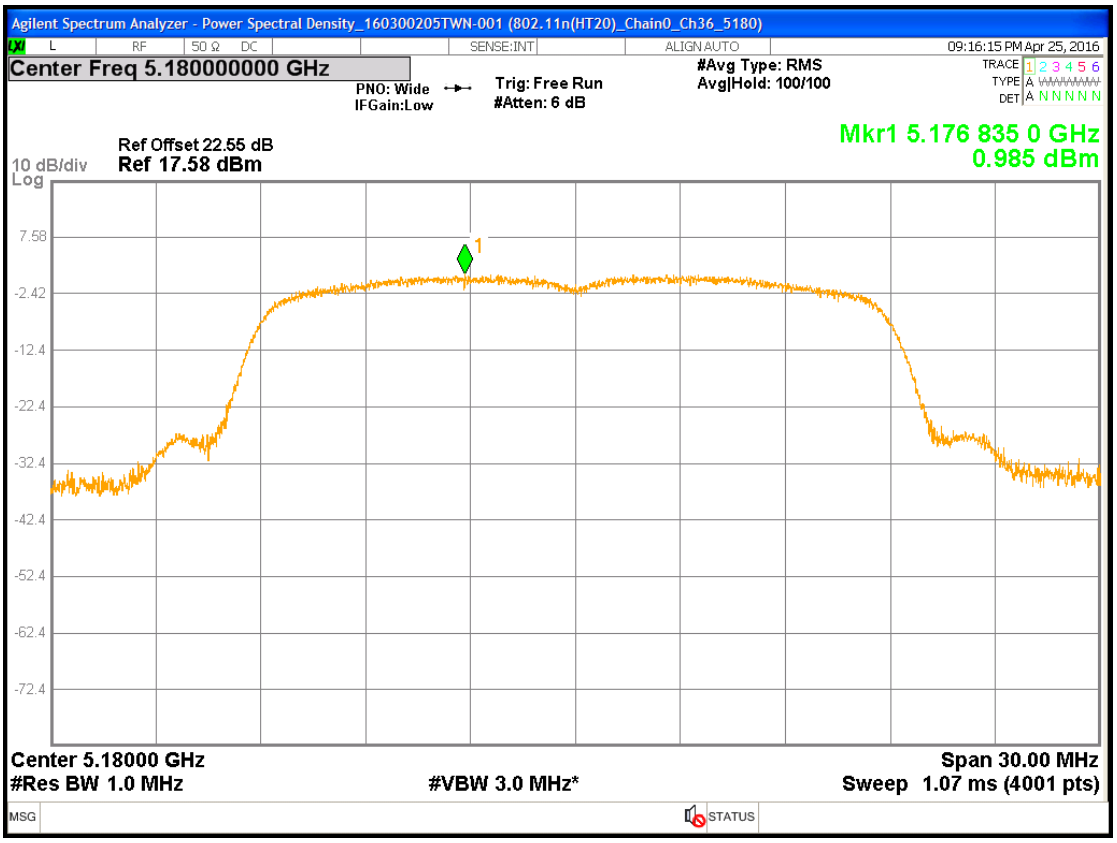
Chain1 : Power Spectral Density @ 802.11a mode Ch157



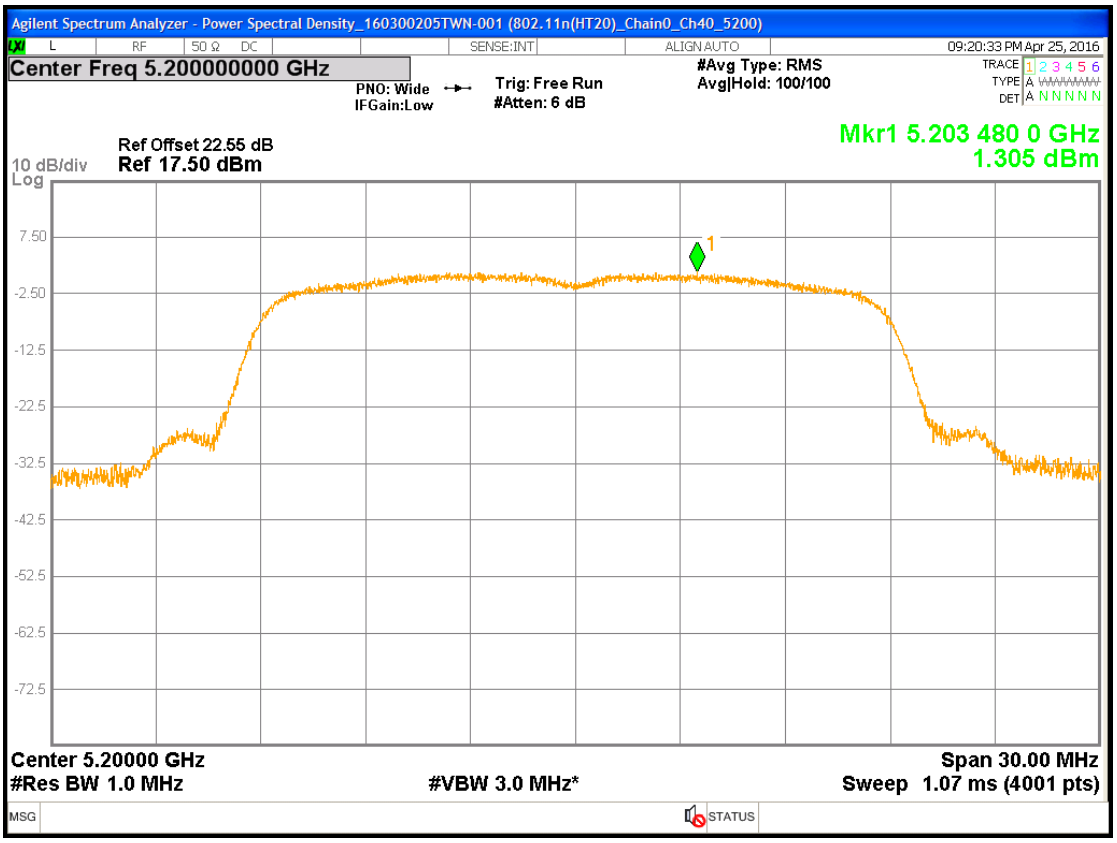
Chain1 : Power Spectral Density @ 802.11a mode Ch165



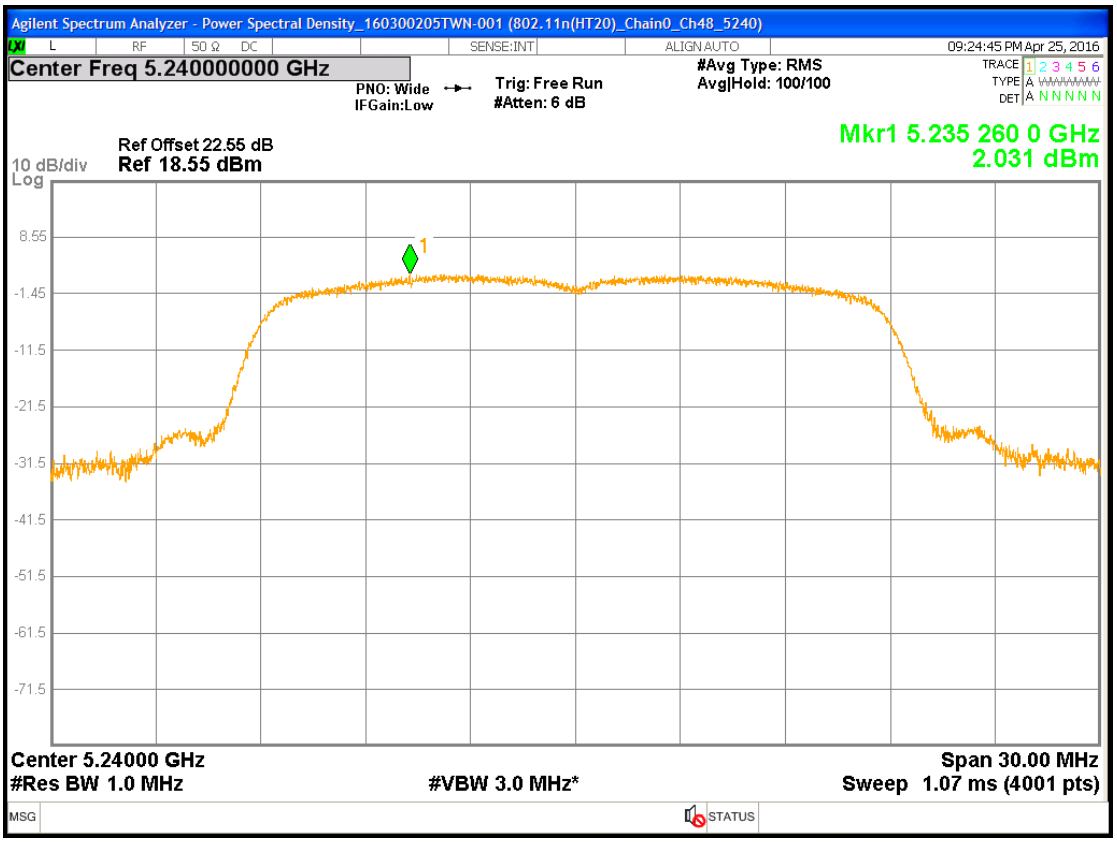
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch36



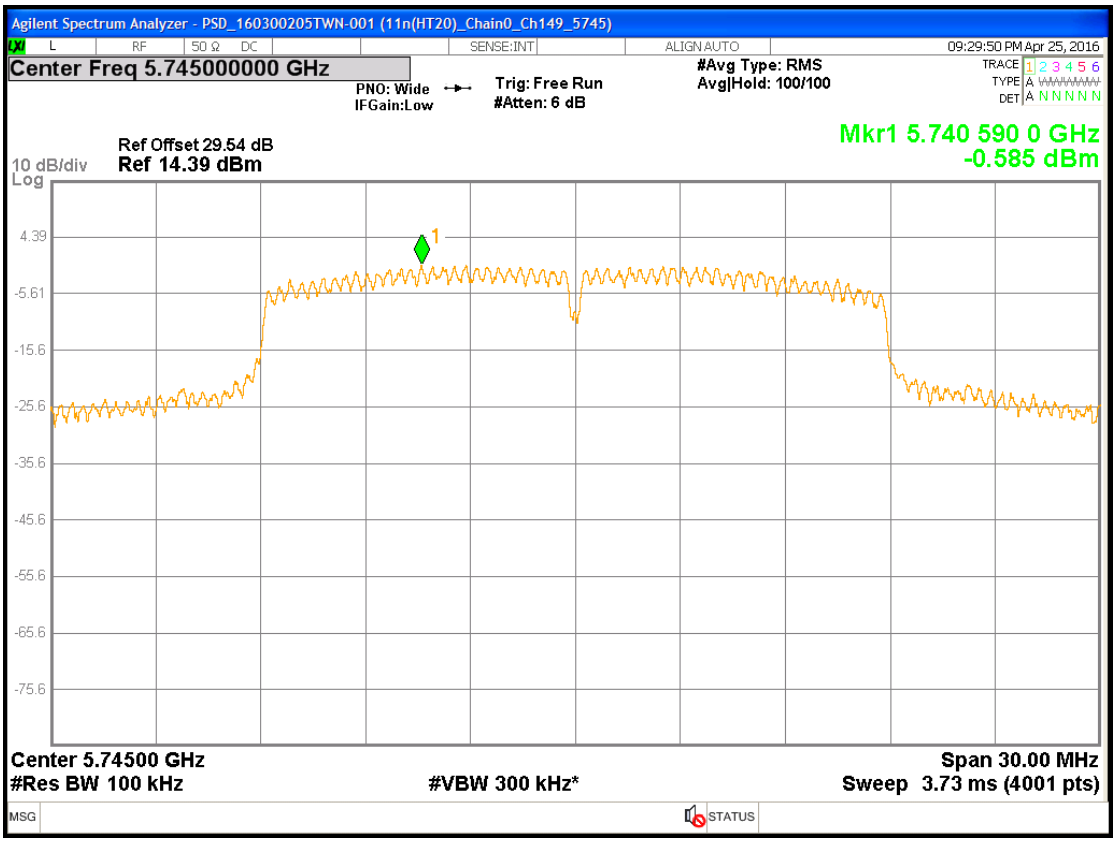
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch40



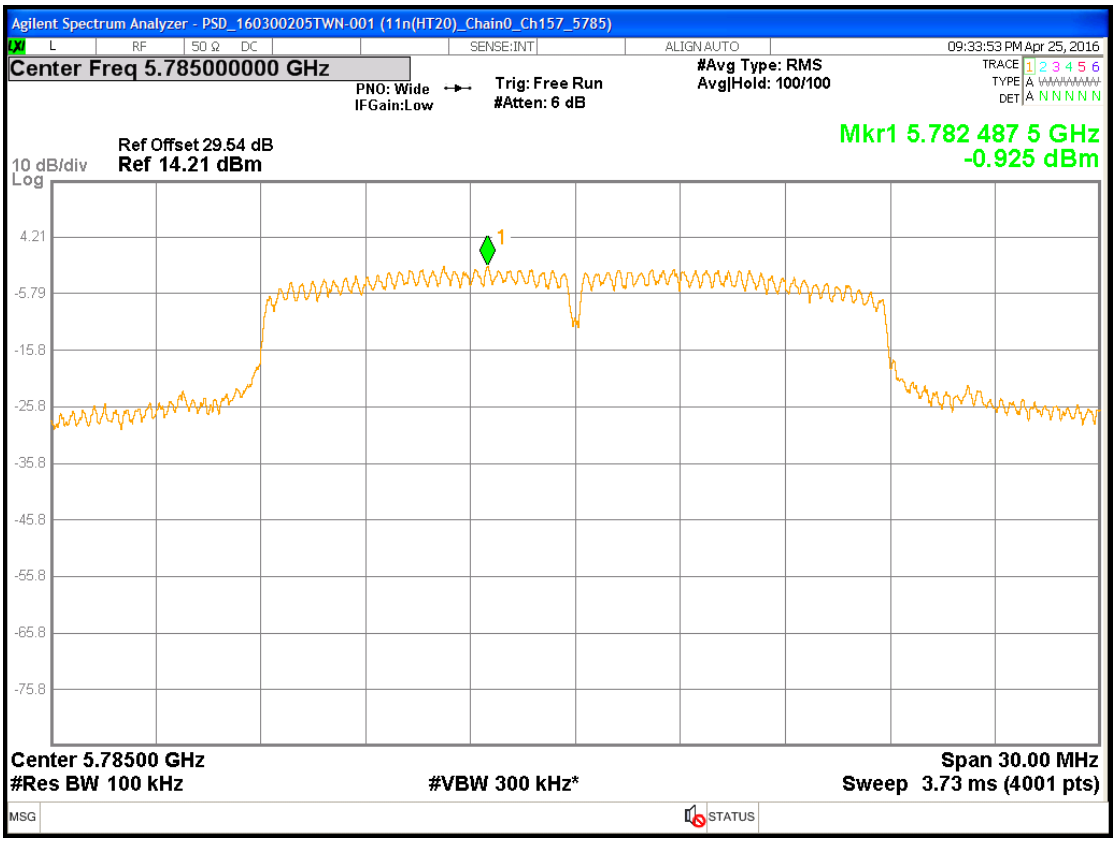
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch48



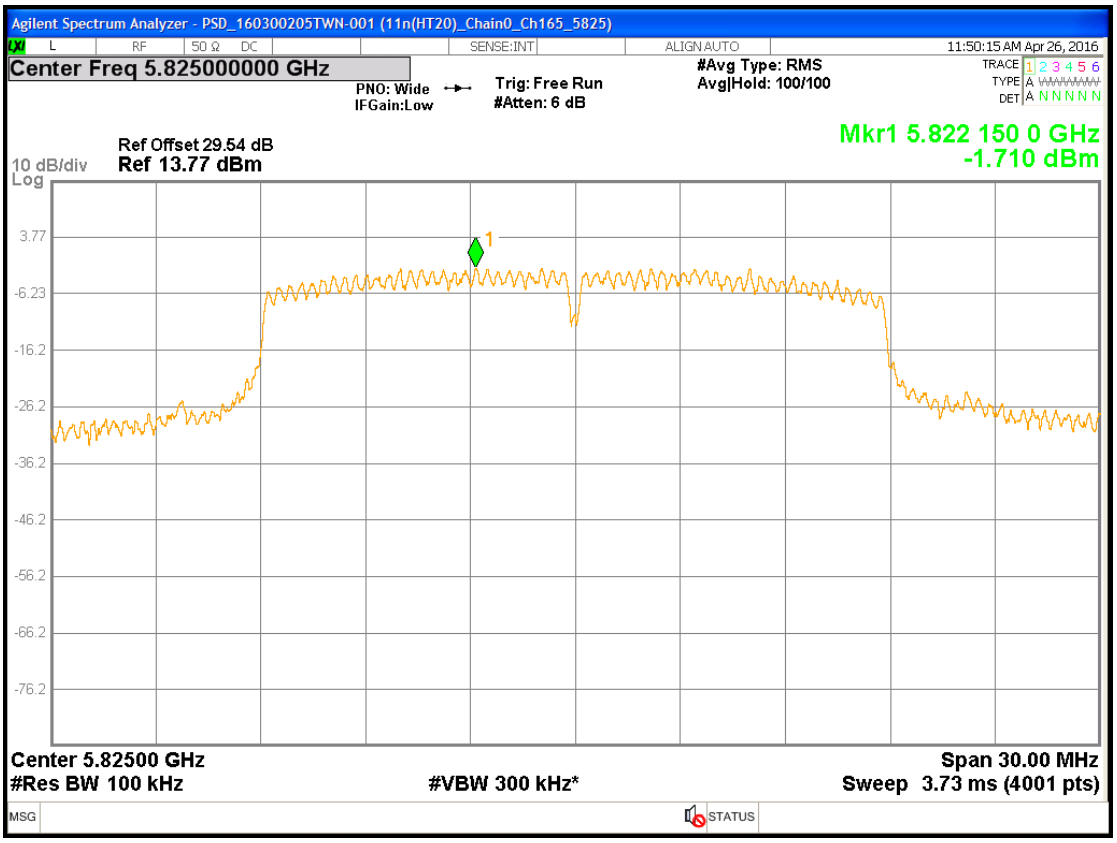
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch149



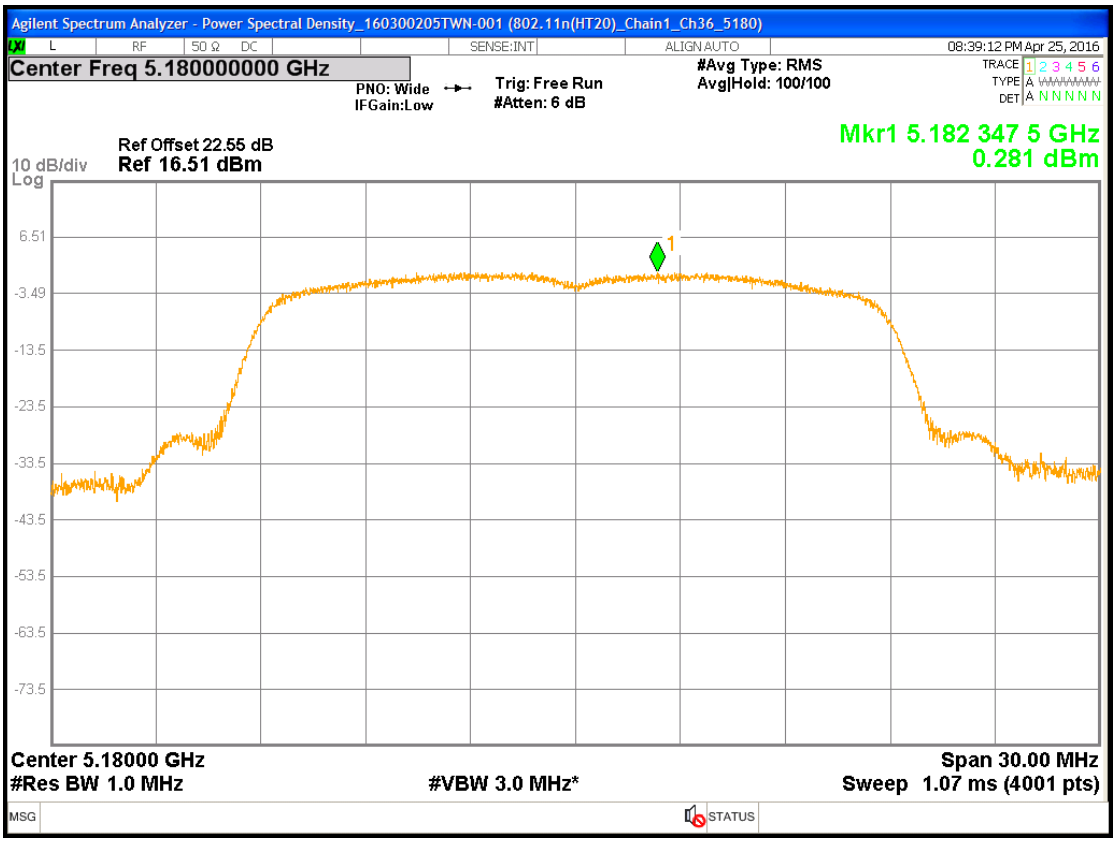
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch157



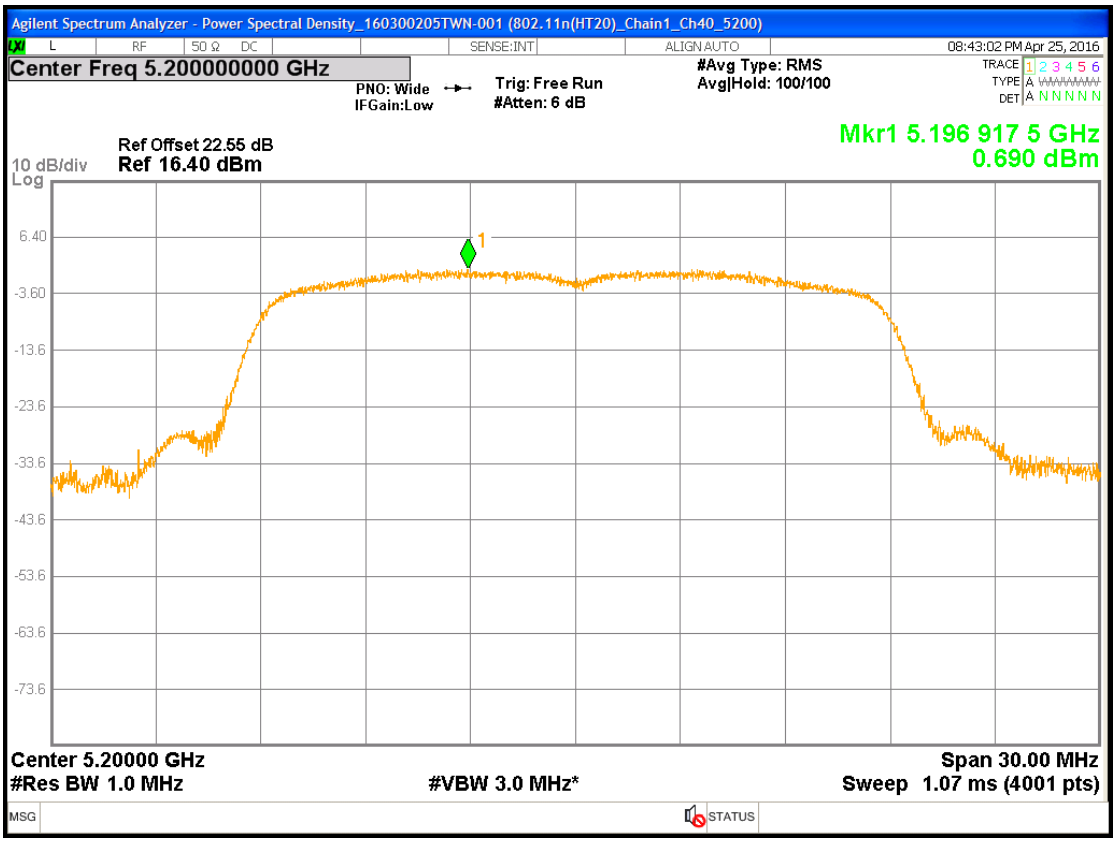
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch165



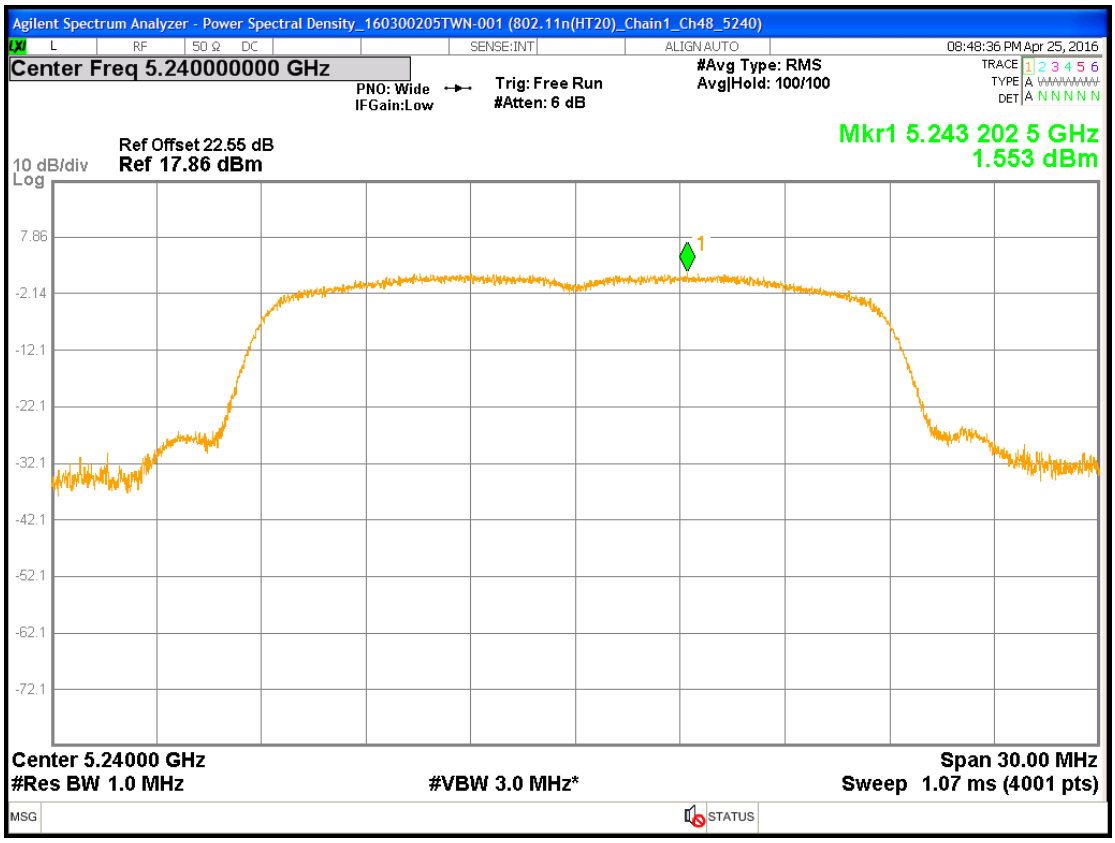
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch36



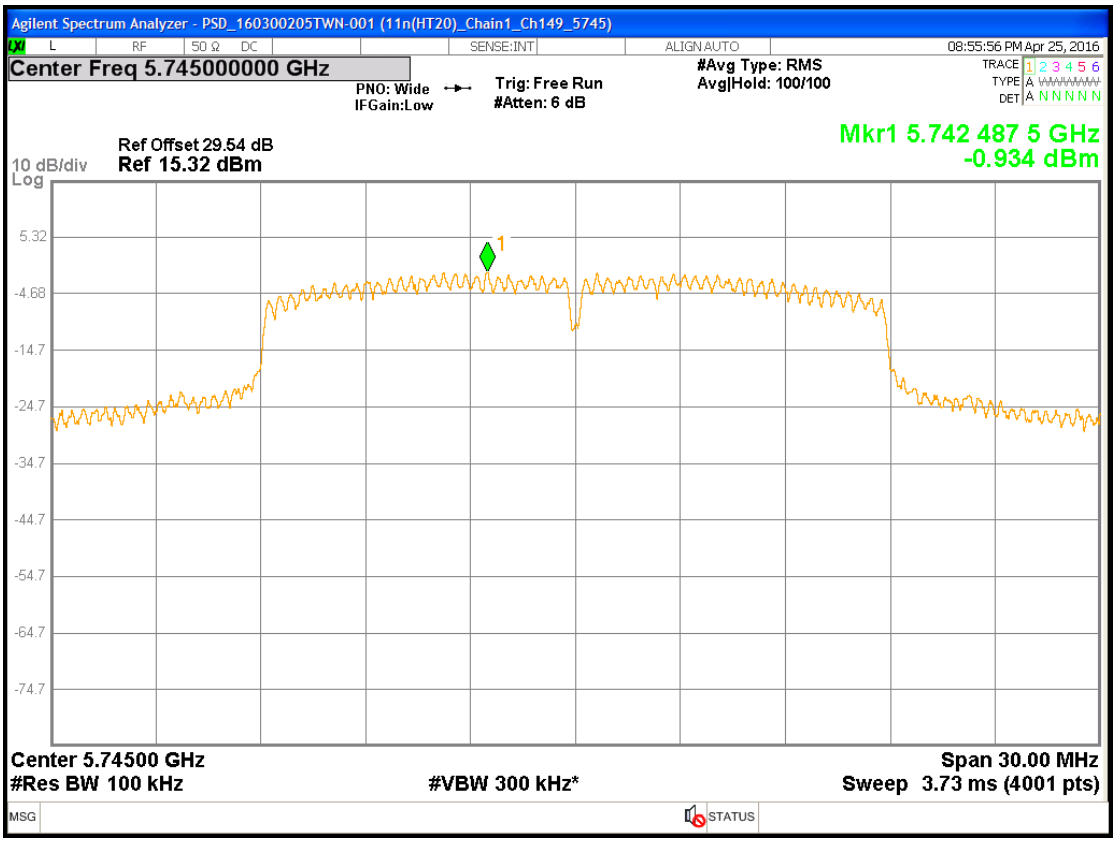
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch40



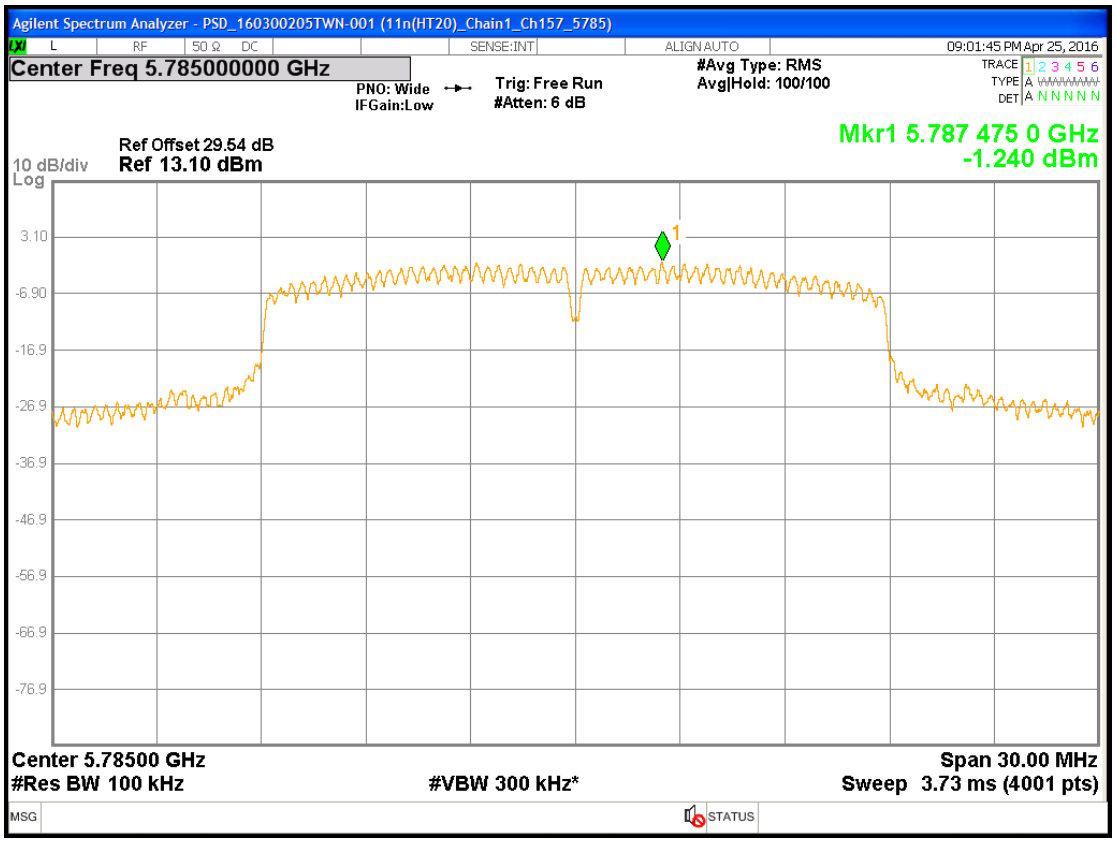
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch48



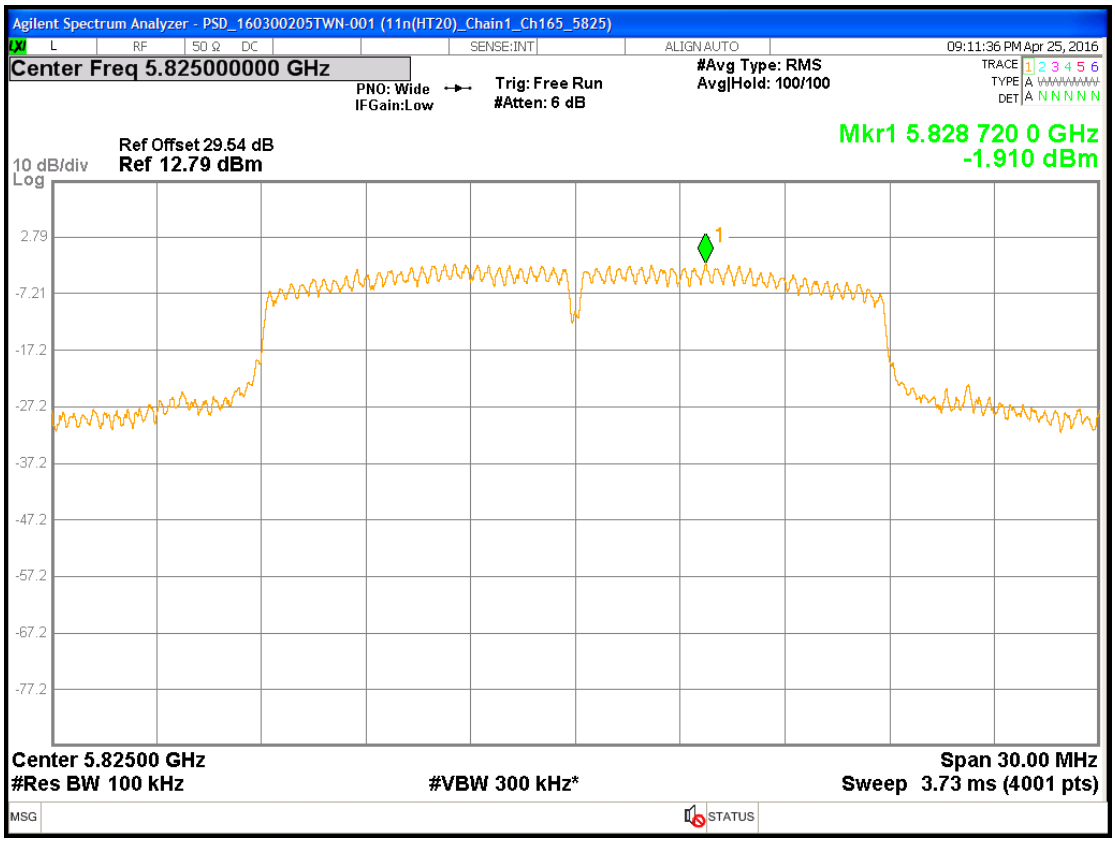
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch149



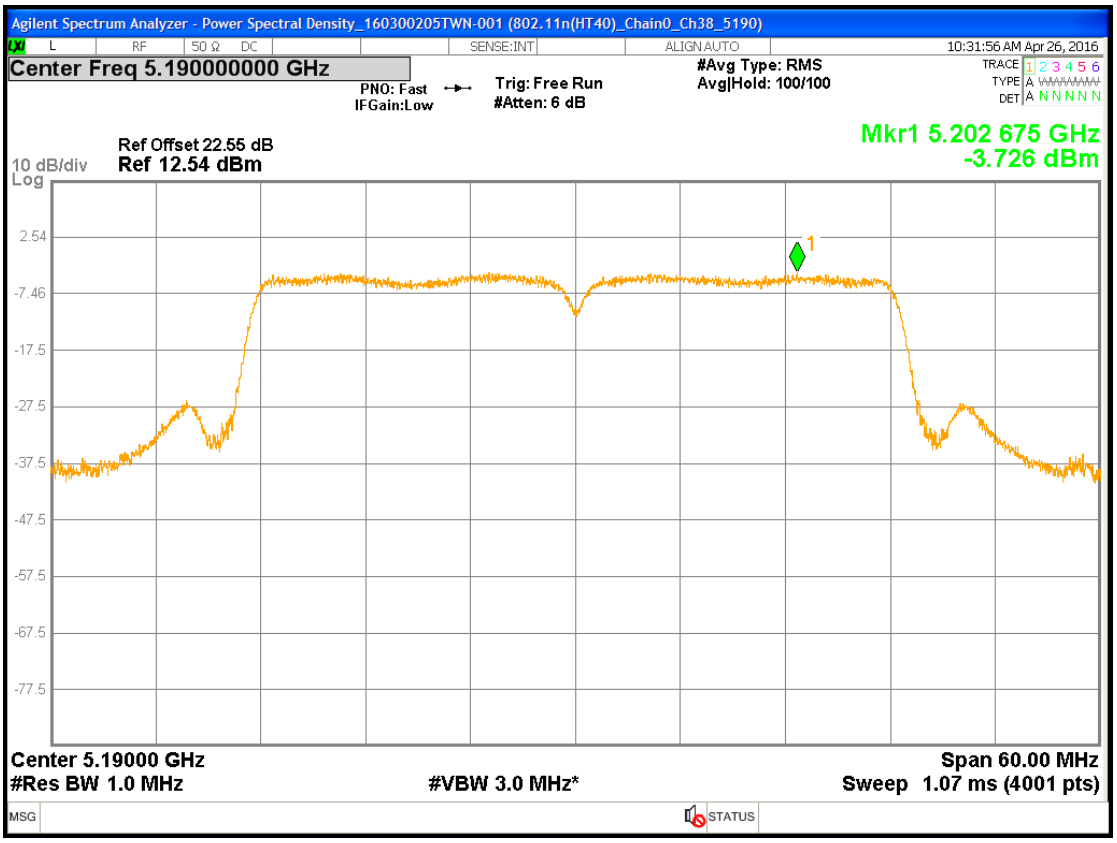
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch157



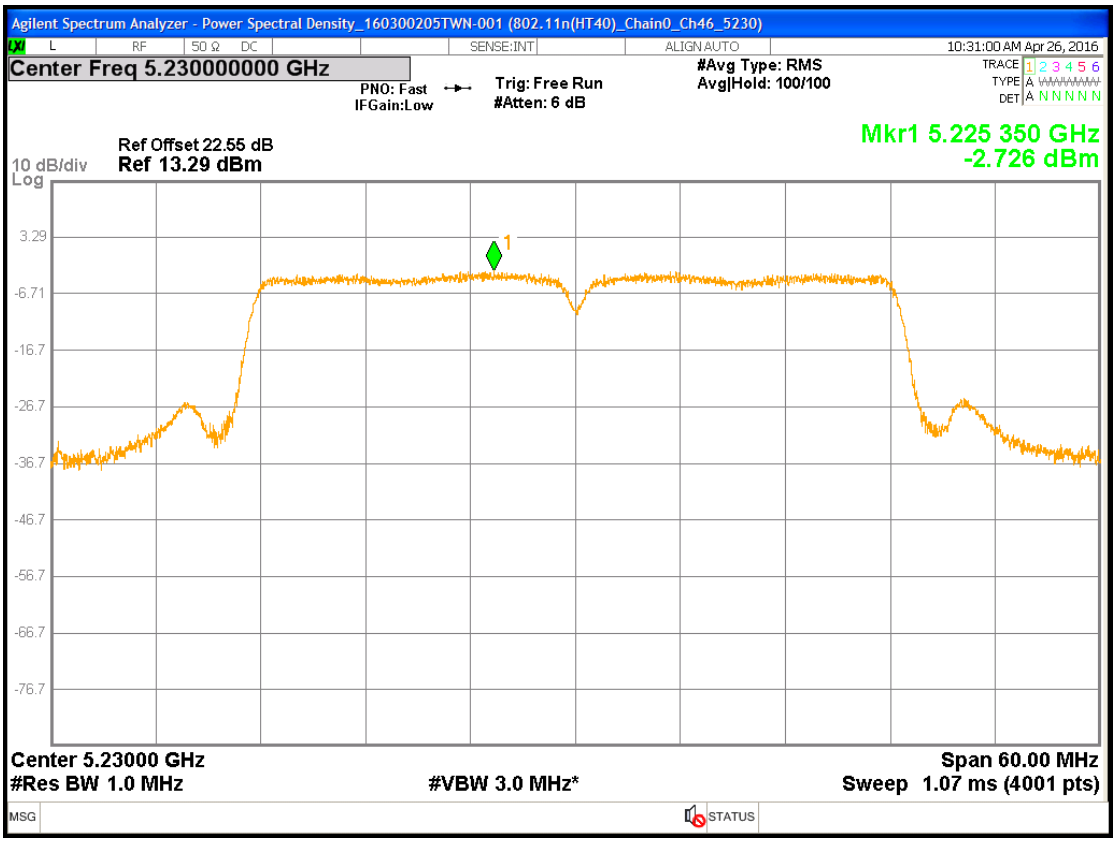
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch165



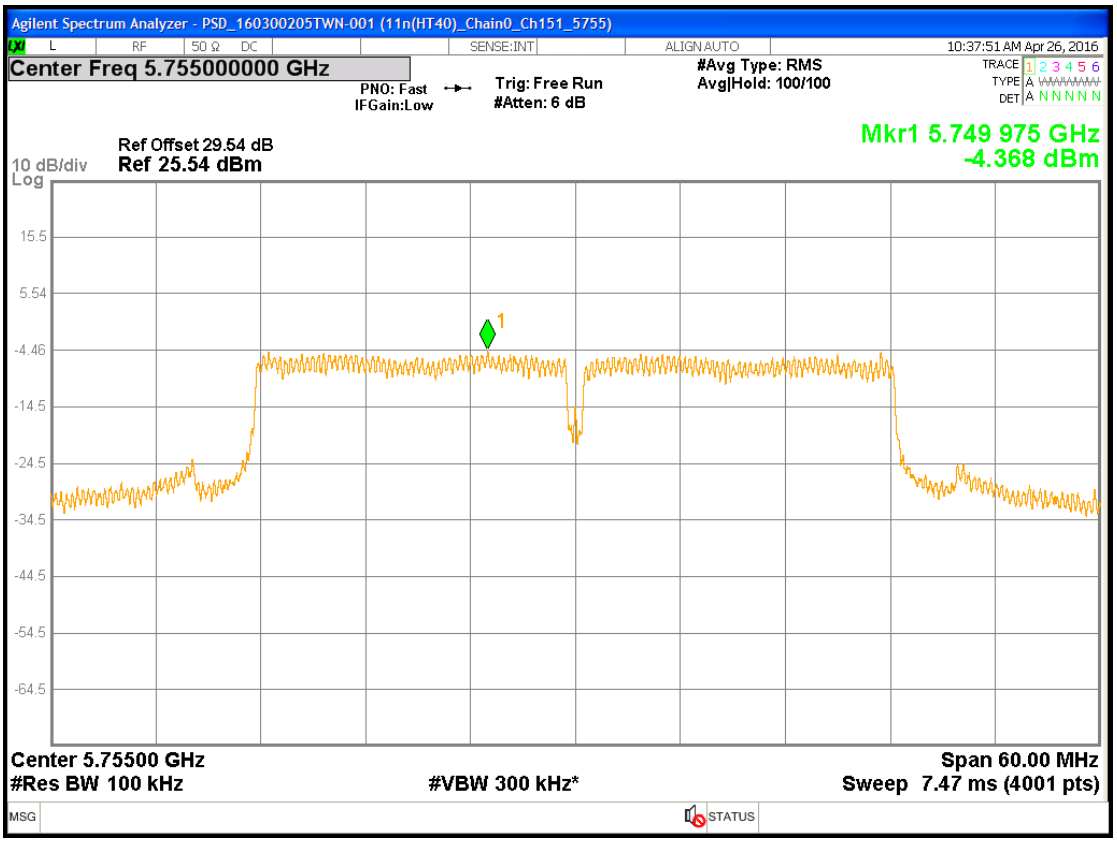
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch38



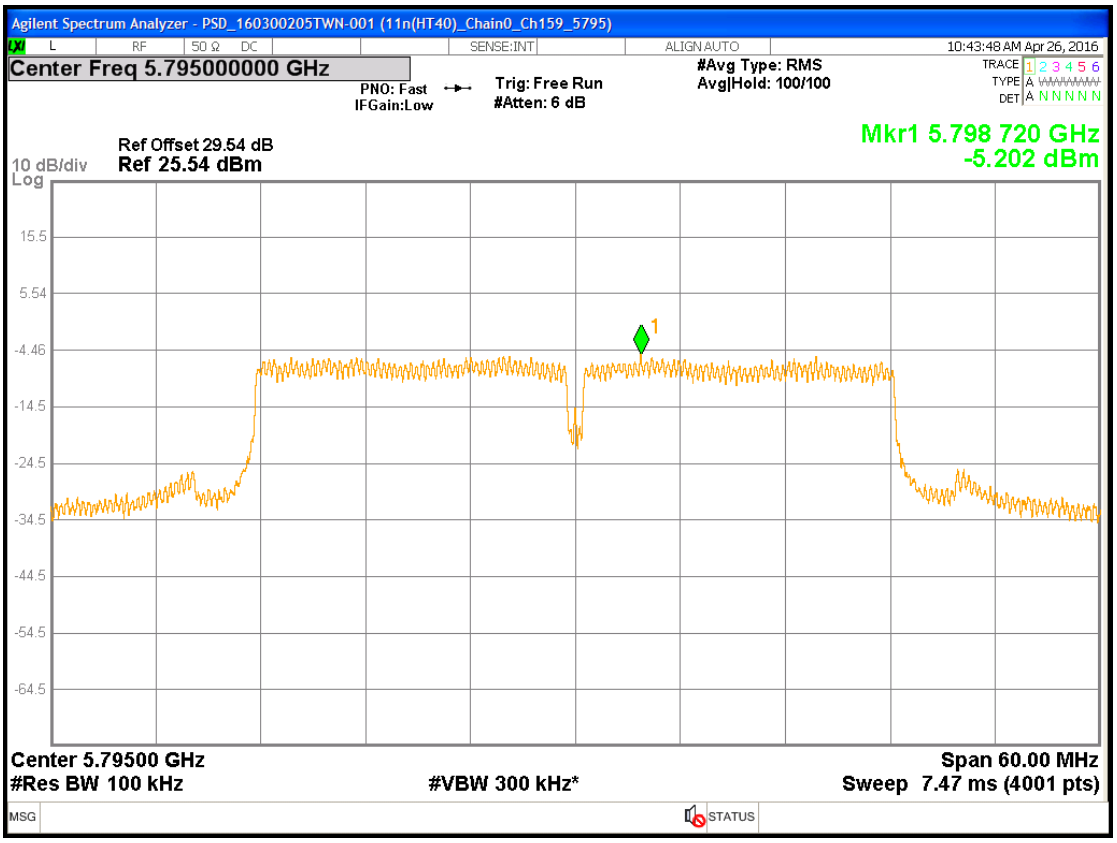
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch46



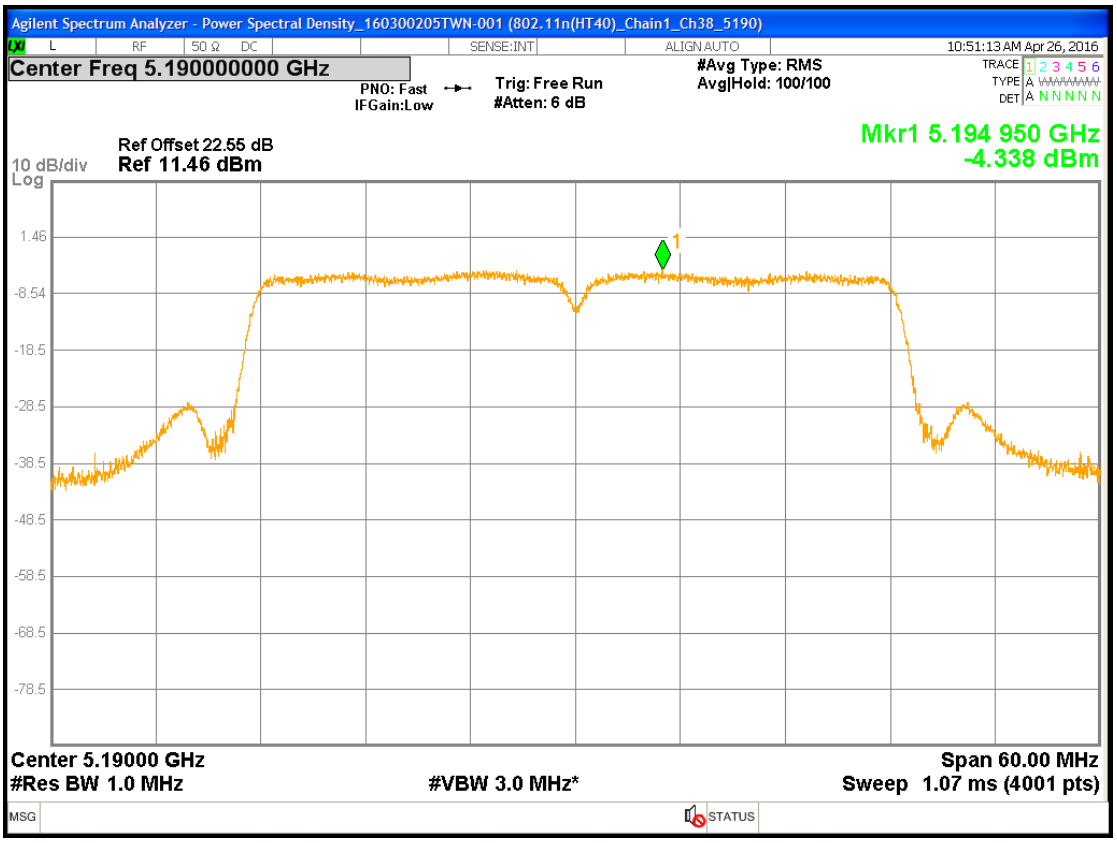
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch151



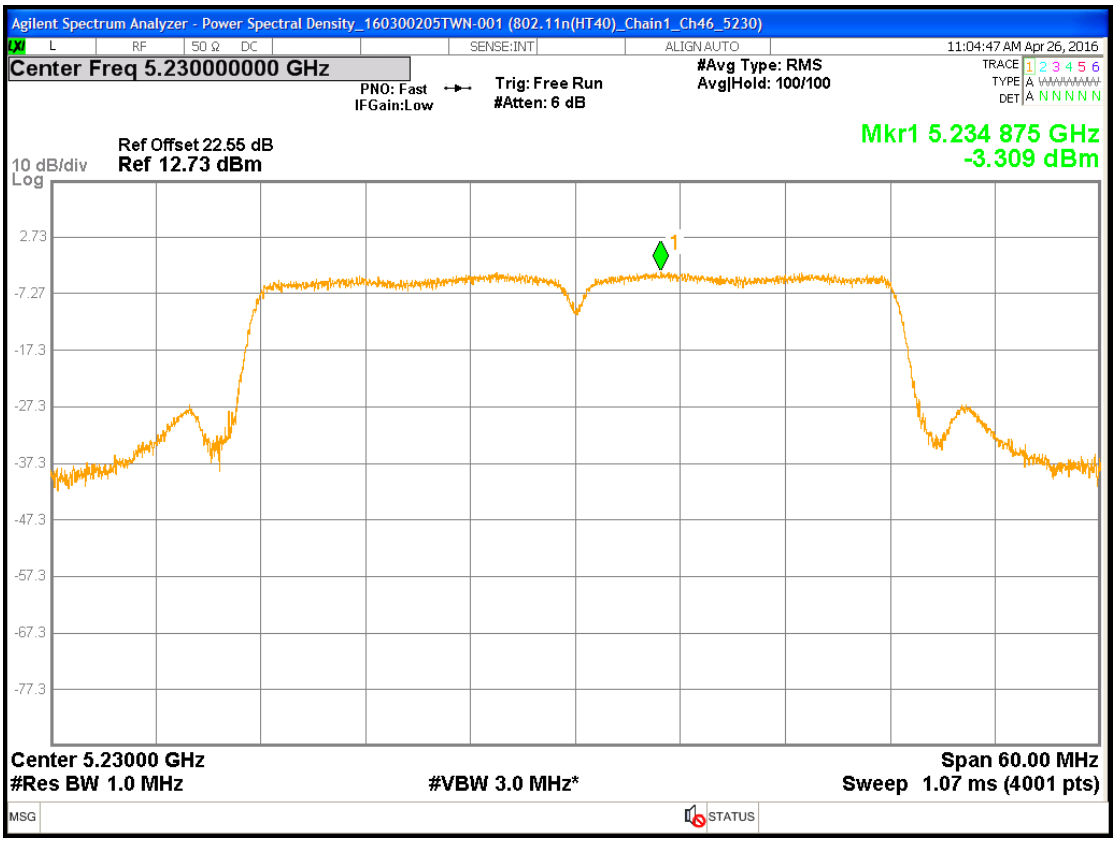
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch159



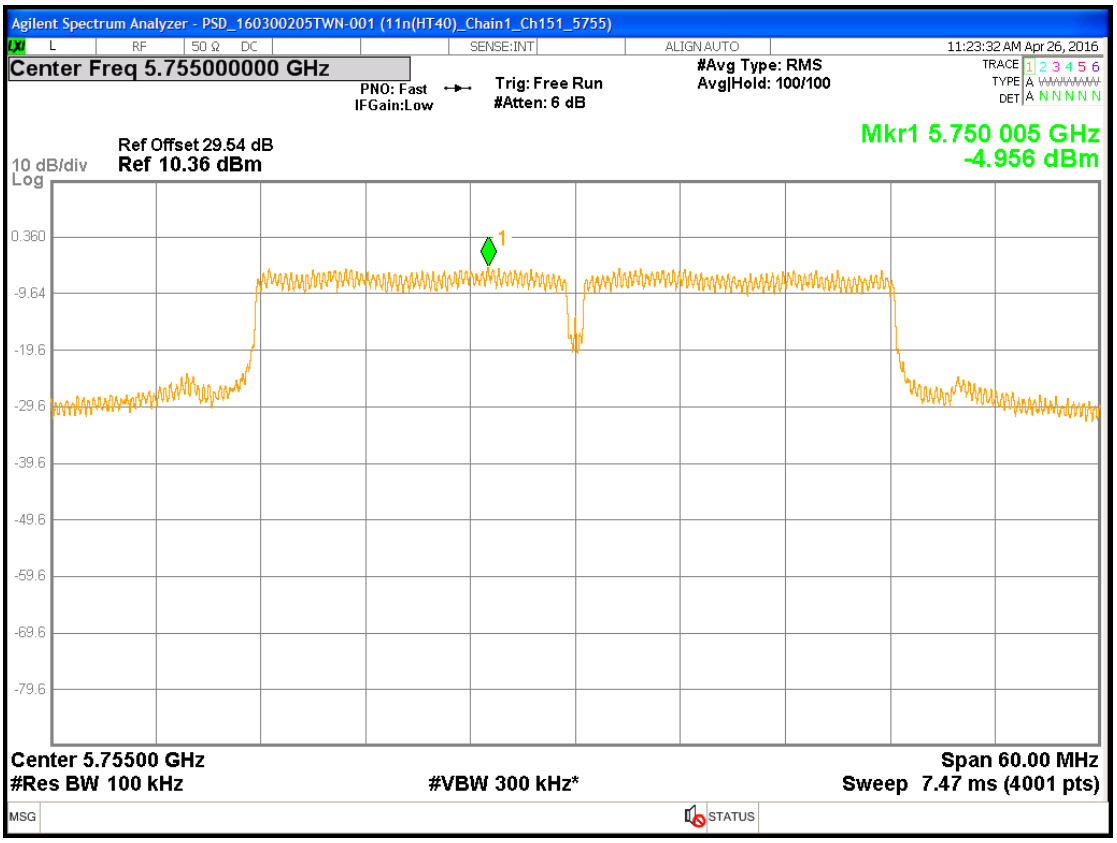
Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch38



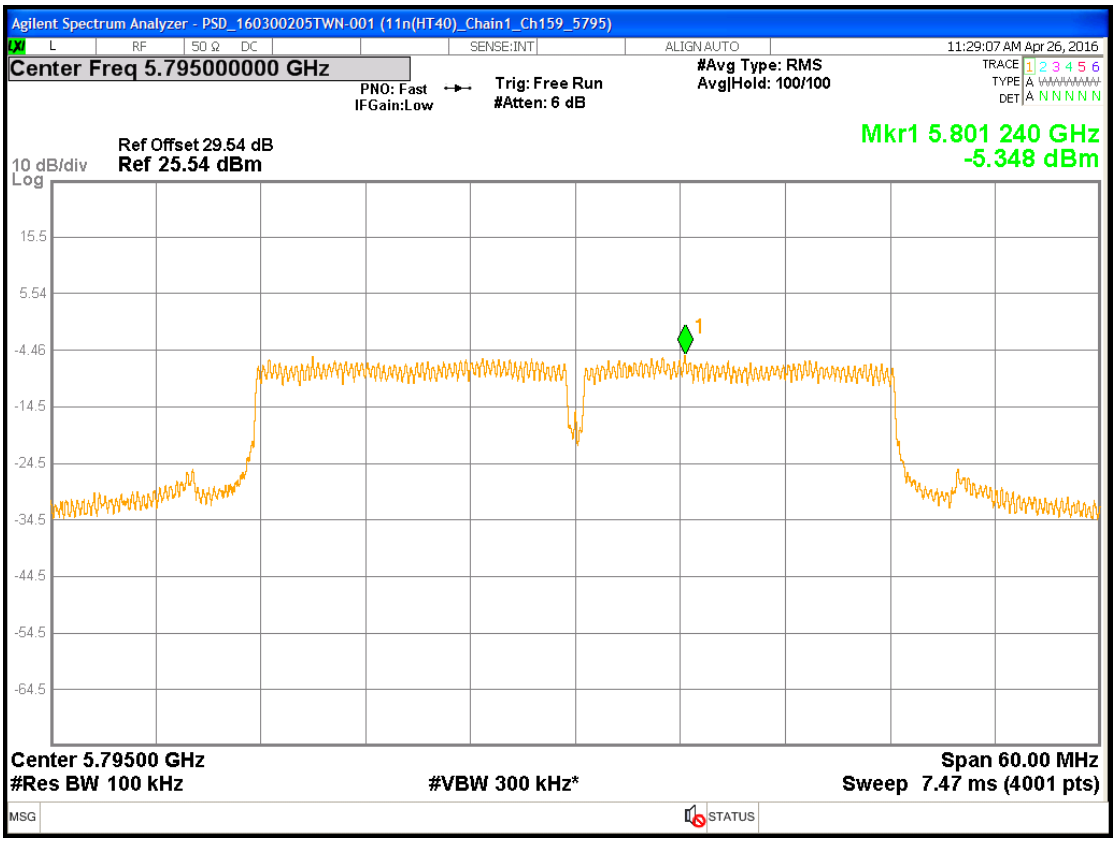
Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch46



Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch151



Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch159



5. Minimum Bandwidth

5.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.407(a)(5) 15.407(e) KDB 789033 D02 v01r02	

5.2 Limit for minimum emission bandwidth.

Within the 5.15-5.25 GHz, the 26 dB bandwidth is for reporting purpose only.
Within the 5.725-5.85 GHz, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz..

5.3 Measuring instrument setting

For 5.15-5.25 GHz

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	Approximately 1% of the EBW
VBW	> RBW
Trace mode	Max hold

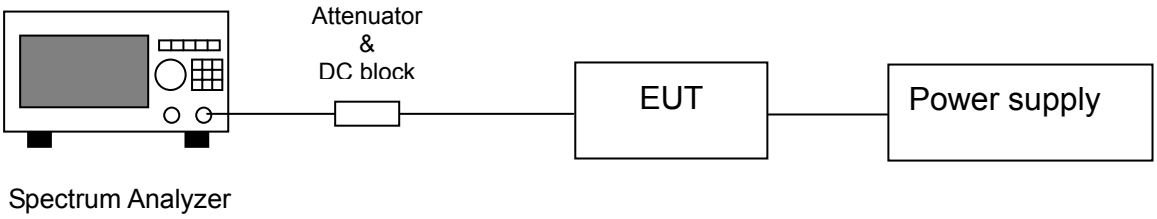
For 5.725-5.85 GHz

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	100kHz
VBW	≧3 x RBW
Sweep	Auto couple
Trace mode	Max hold

5.4 Test procedure

1. The transmitter output was connected to the spectrum analyzer.
2. Test was performed in accordance with section C of KDB 789033 D02 v01r02.
3. For the 5.725-5.85 GHz, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
4. For the 5.15-5.25 GHz and 5.725-5.85 GHz, measure the maximum width of the emission that is 26 dB down from the maximum of the emission.

5.5 Test diagram

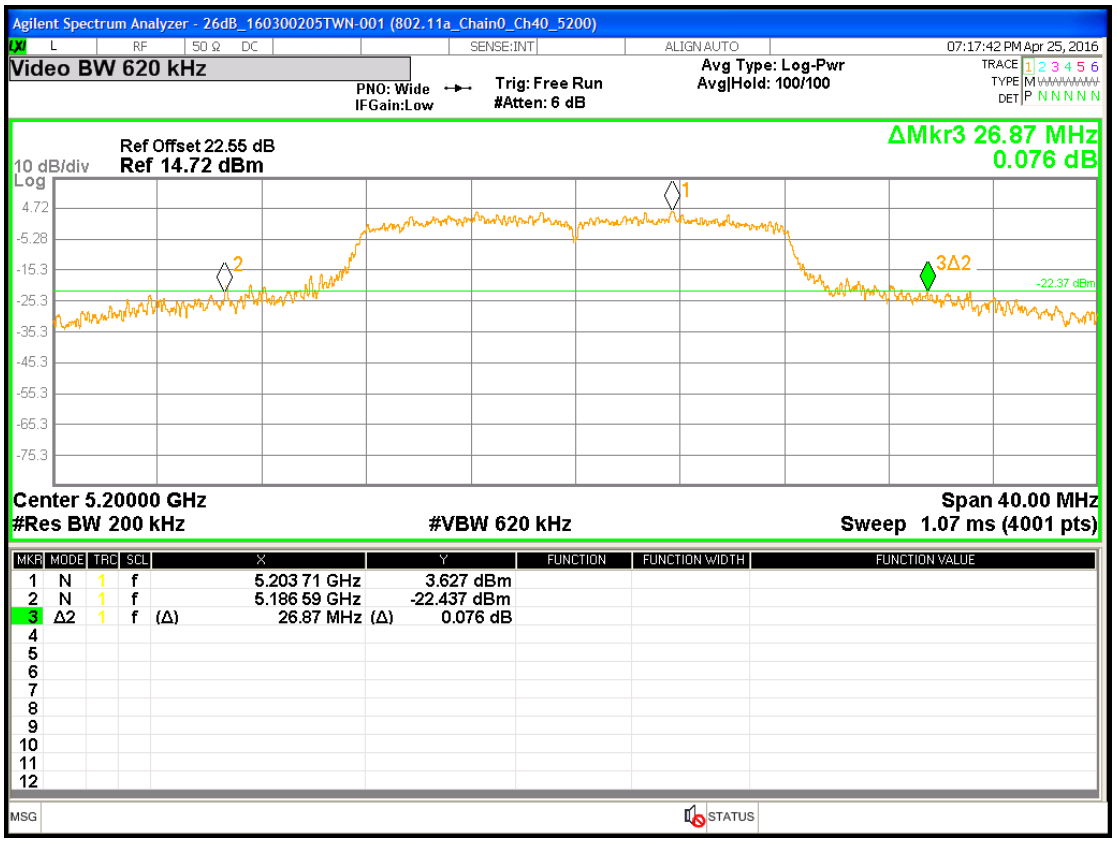


5.6 Test results

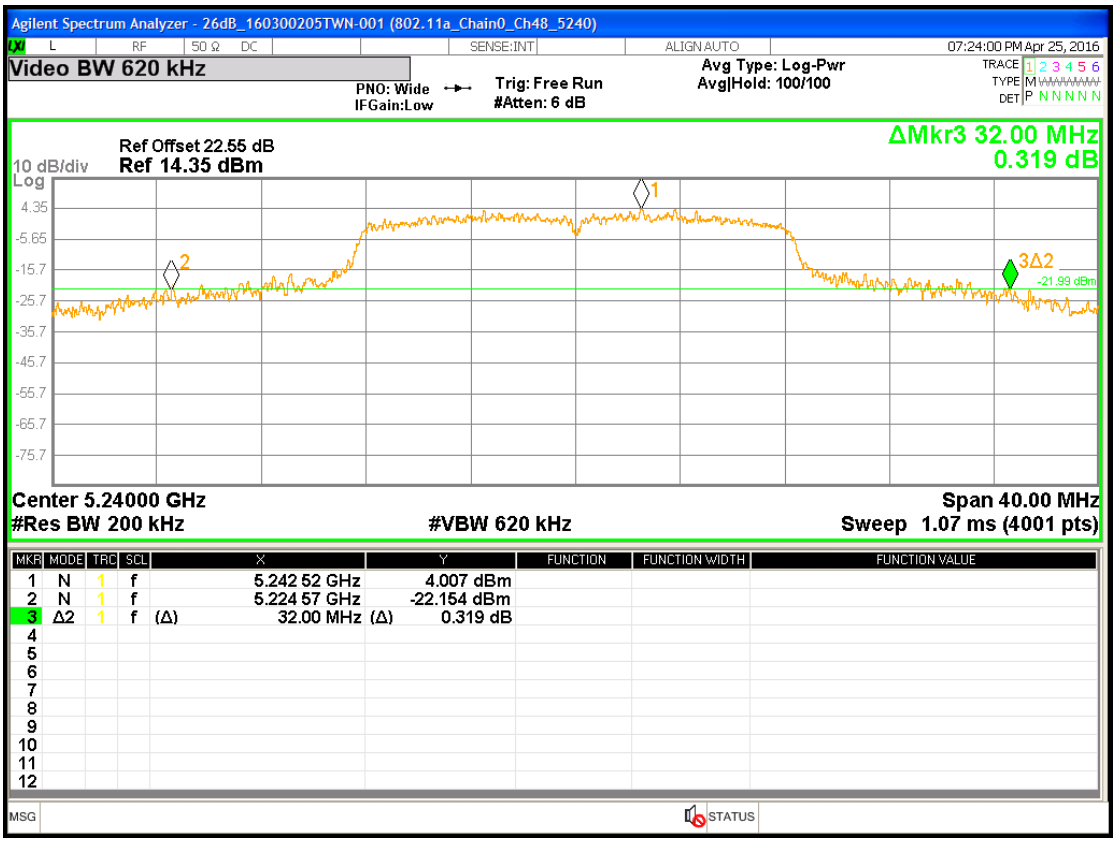
Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
802.11a Chain0	36	5180		29.18	N/A
	40	5200		26.87	
	48	5240		32	
	149	5745	15.11		0.5
	157	5785	14.01		0.5
	165	5825	15.08		0.5
802.11a Chain1	36	5180		32.91	N/A
	40	5200		31.25	
	48	5240		35.8	
	149	5745	14.45		0.5
	157	5785	14.4		0.5
	165	5825	14.46		0.5
802.11n (HT 20) Chain0	36	5180		20.71	N/A
	40	5200		22.95	
	48	5240		26.6	
	149	5745	15.59		0.5
	157	5785	15.68		0.5
	165	5825	15.08		0.5
802.11n (HT 20) Chain1	36	5180		20.41	N/A
	40	5200		19.67	
	48	5240		23.58	
	149	5745	15.66		0.5
	157	5785	15.16		0.5
	165	5825	15.27		0.5
802.11n (HT 40) Chain0	38	5190		47.61	N/A
	46	5230		52.72	
	151	5755	36.33		0.5
	159	5795	36.31		0.5
802.11n (HT 40) Chain1	38	5190		46.16	N/A
	46	5230		47.84	
	151	5755	36		0.5
	159	5795	35.92		0.5

Chain0 : 26dB Bandwidth @ 802.11a mode Ch36

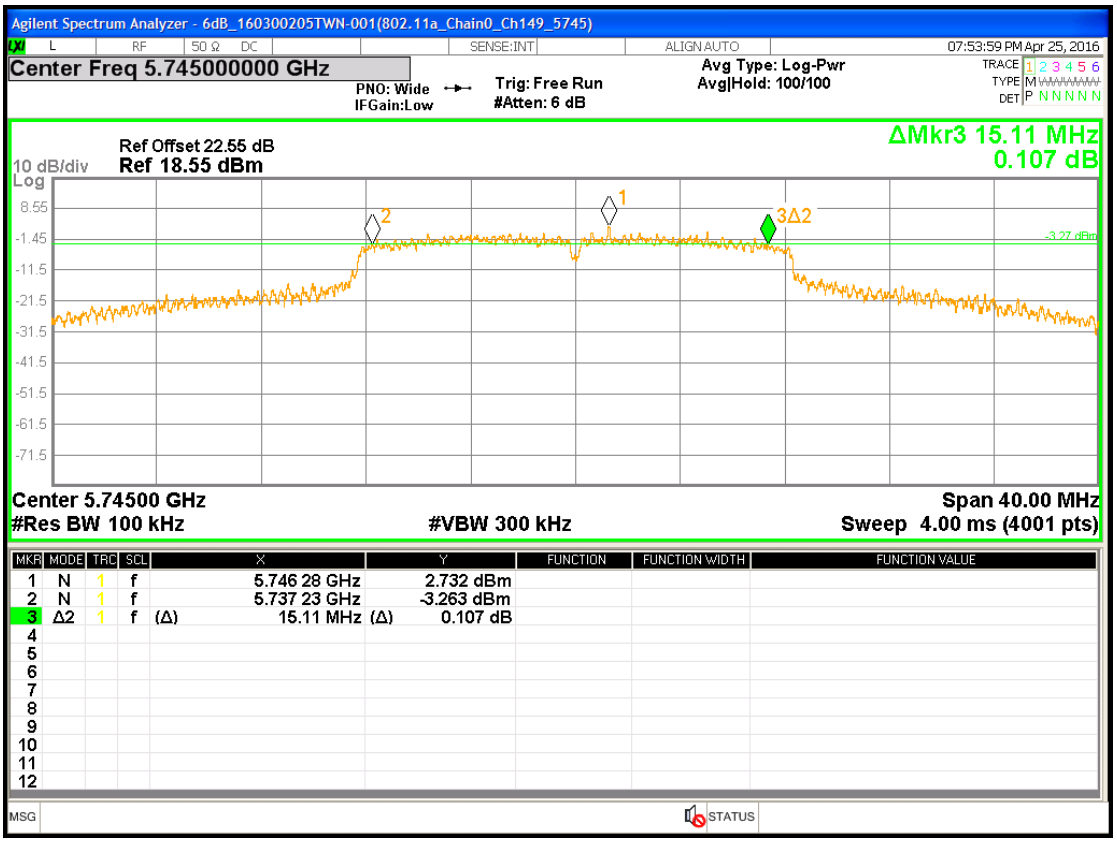
Chain0 : 26dB Bandwidth @ 802.11a mode Ch40



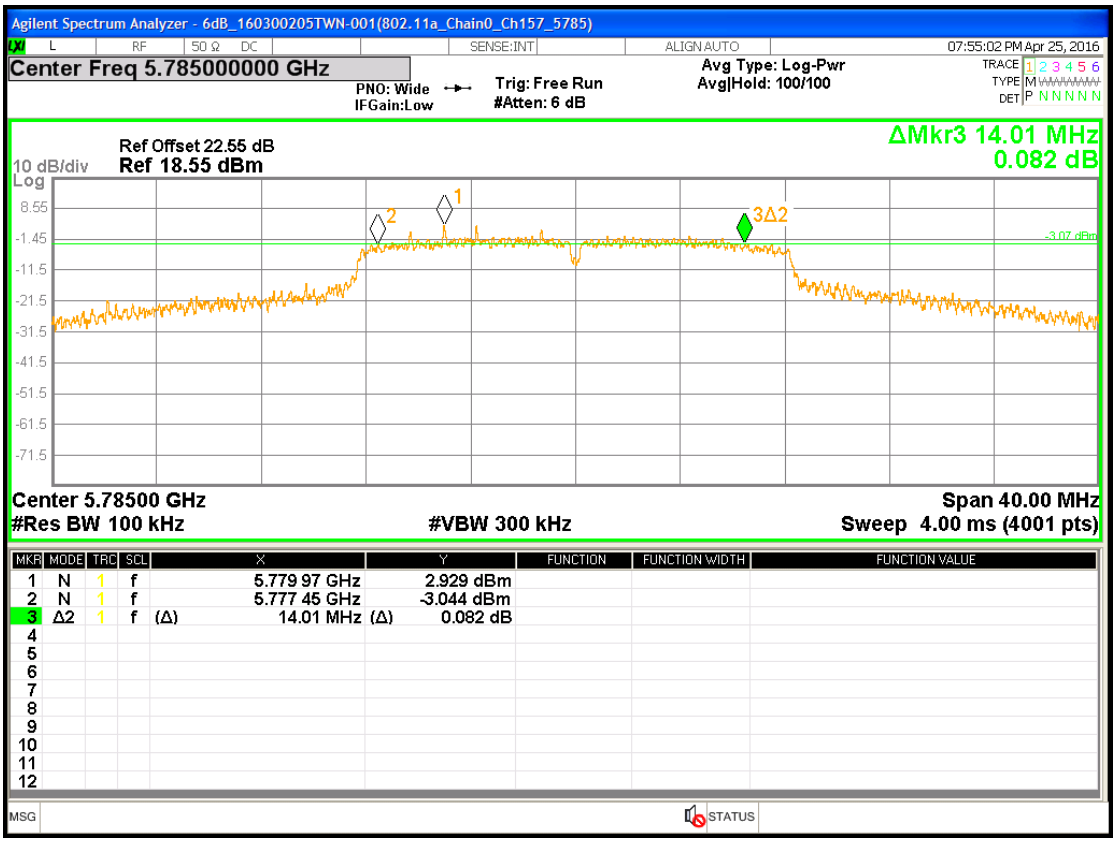
Chain0 : 26dB Bandwidth @ 802.11a mode Ch48



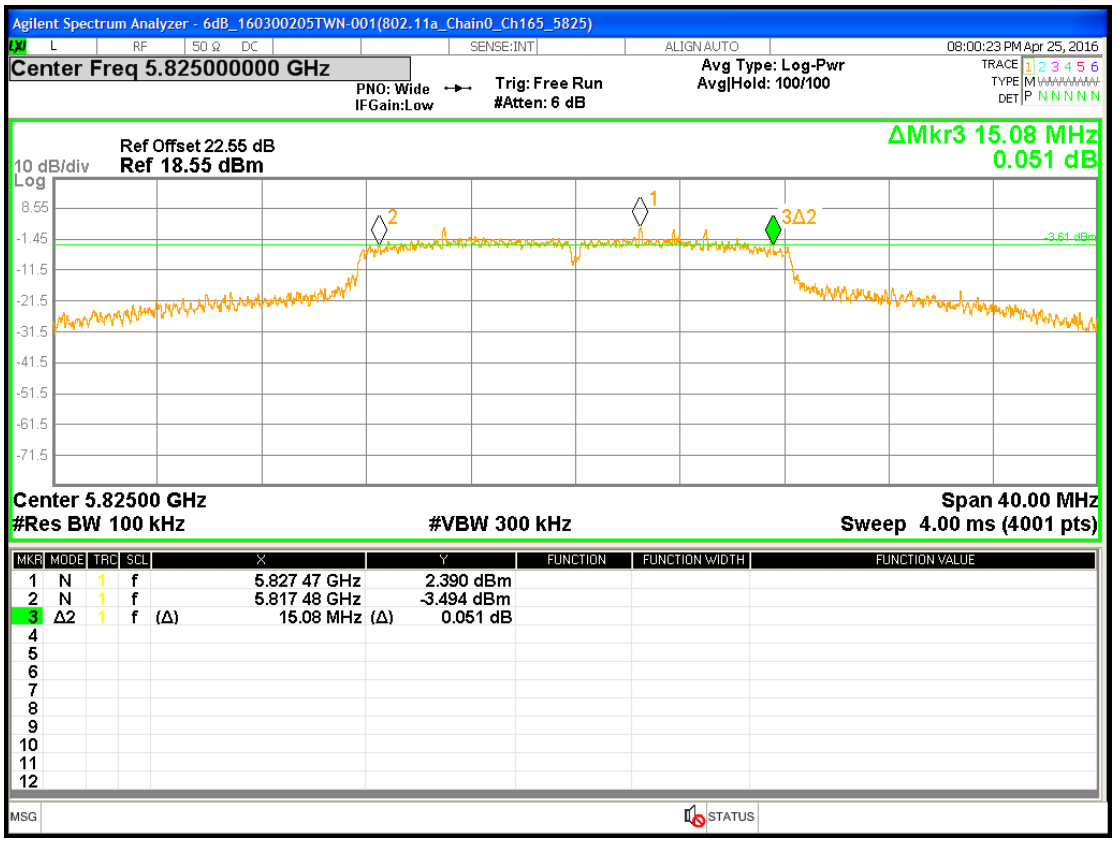
Chain0 : 6dB Bandwidth @ 802.11a mode Ch149



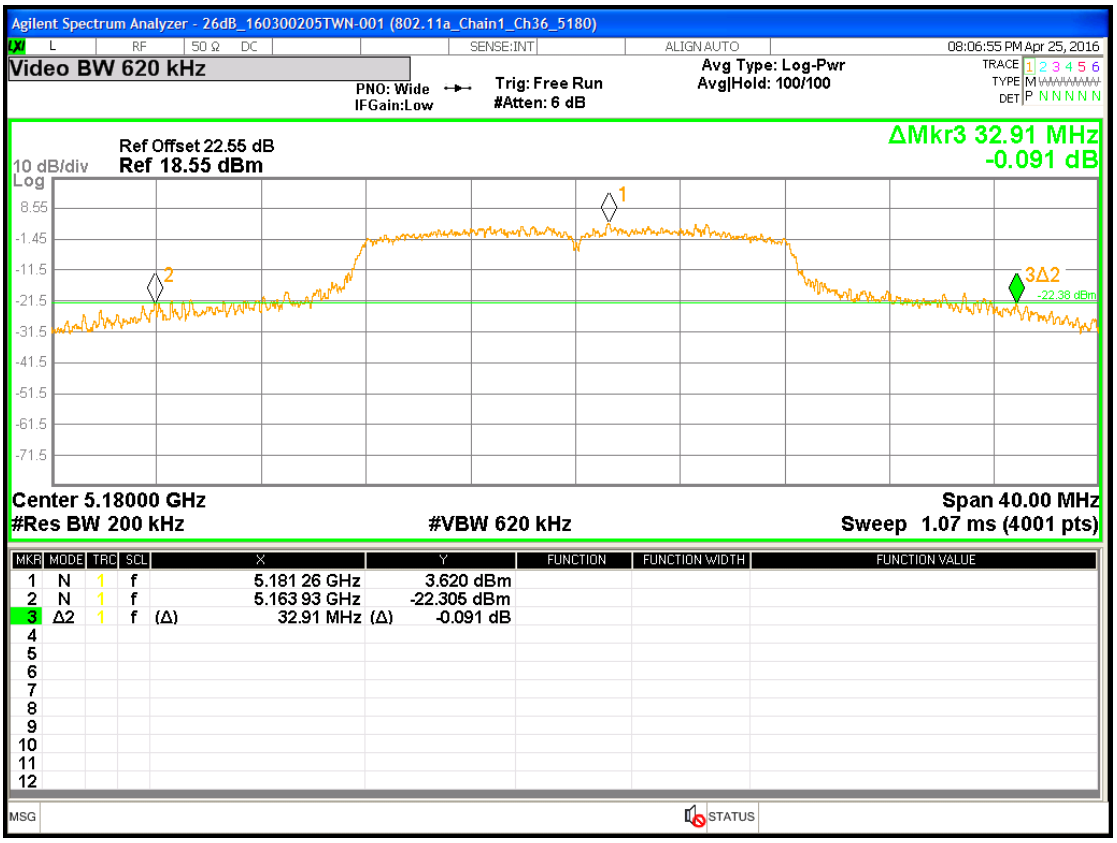
Chain0 : 6dB Bandwidth @ 802.11a mode Ch157



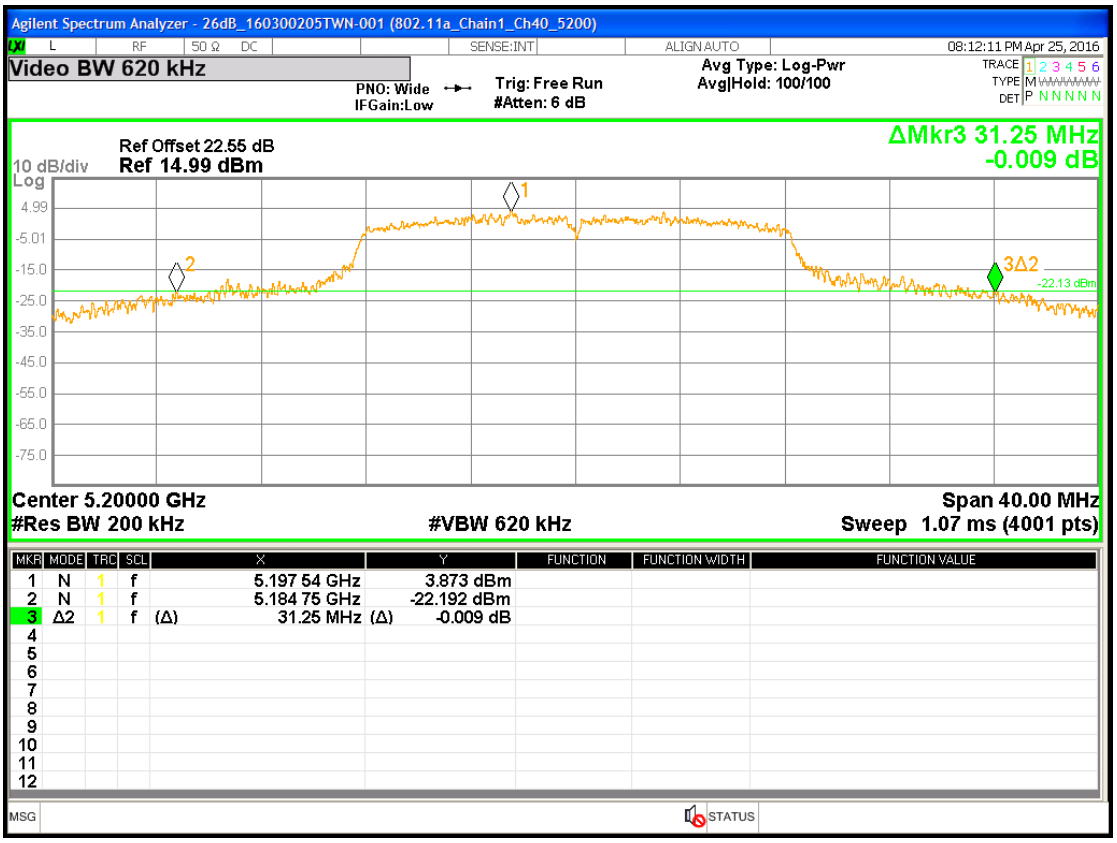
Chain0 : 6dB Bandwidth @ 802.11a mode Ch165



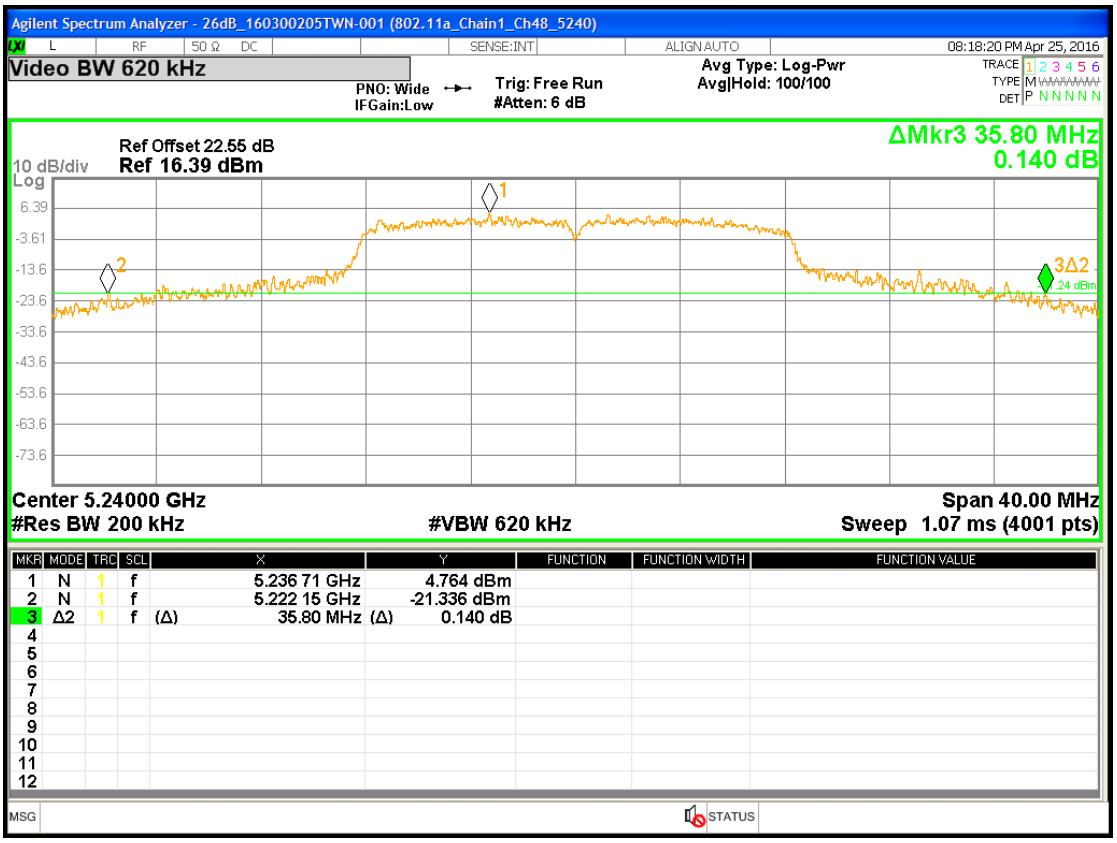
Chain1 : 26dB Bandwidth @ 802.11a mode Ch36



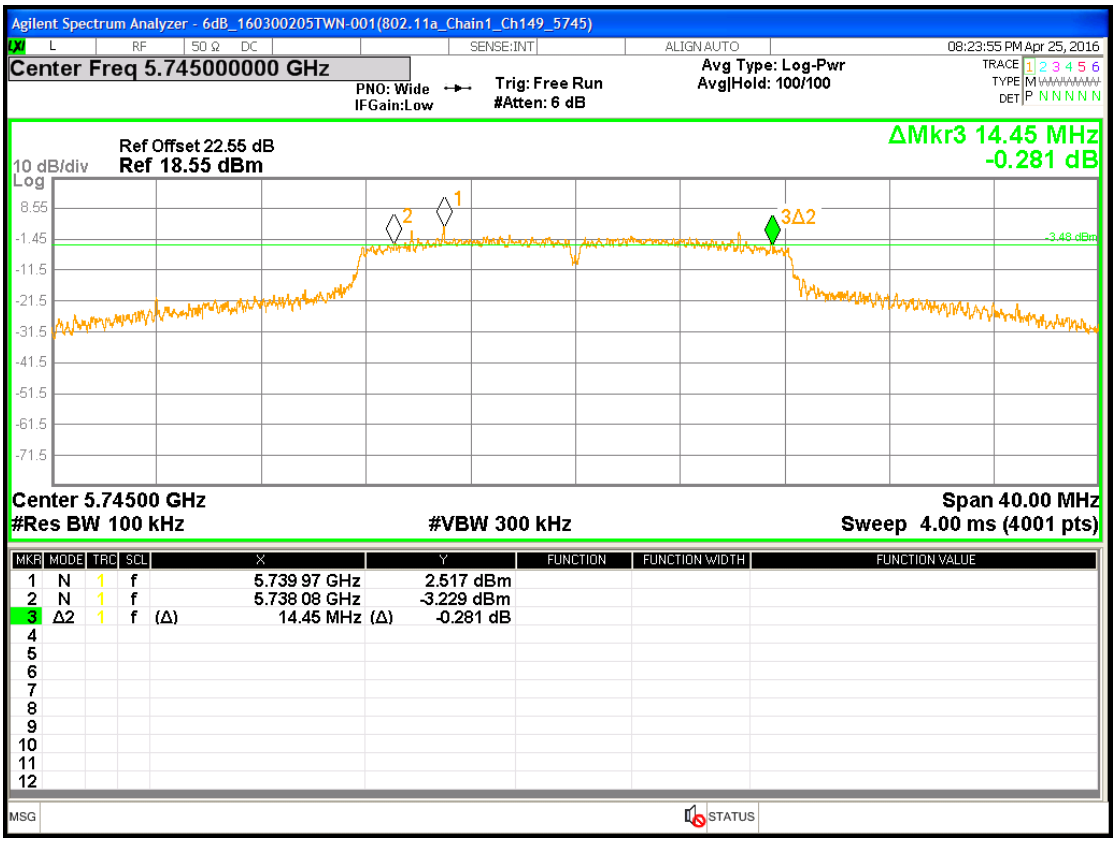
Chain1 : 26dB Bandwidth @ 802.11a mode Ch40



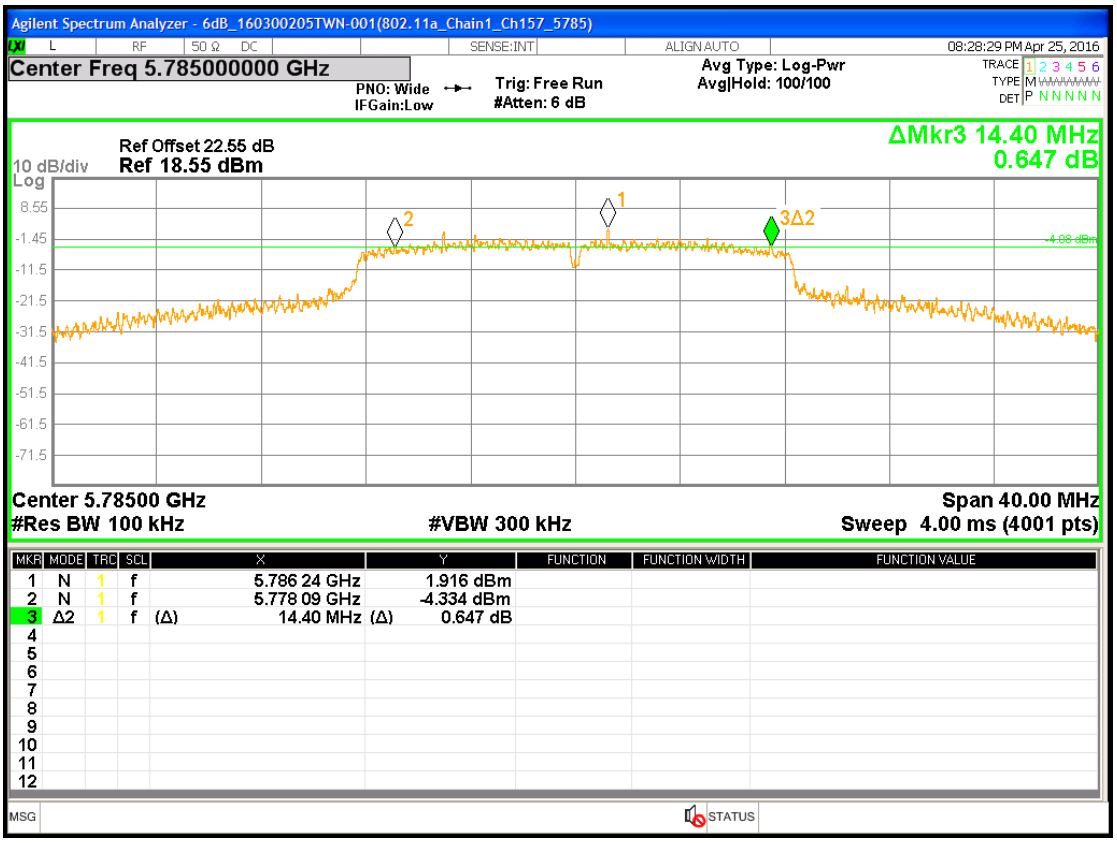
Chain1 : 26dB Bandwidth @ 802.11a mode Ch48



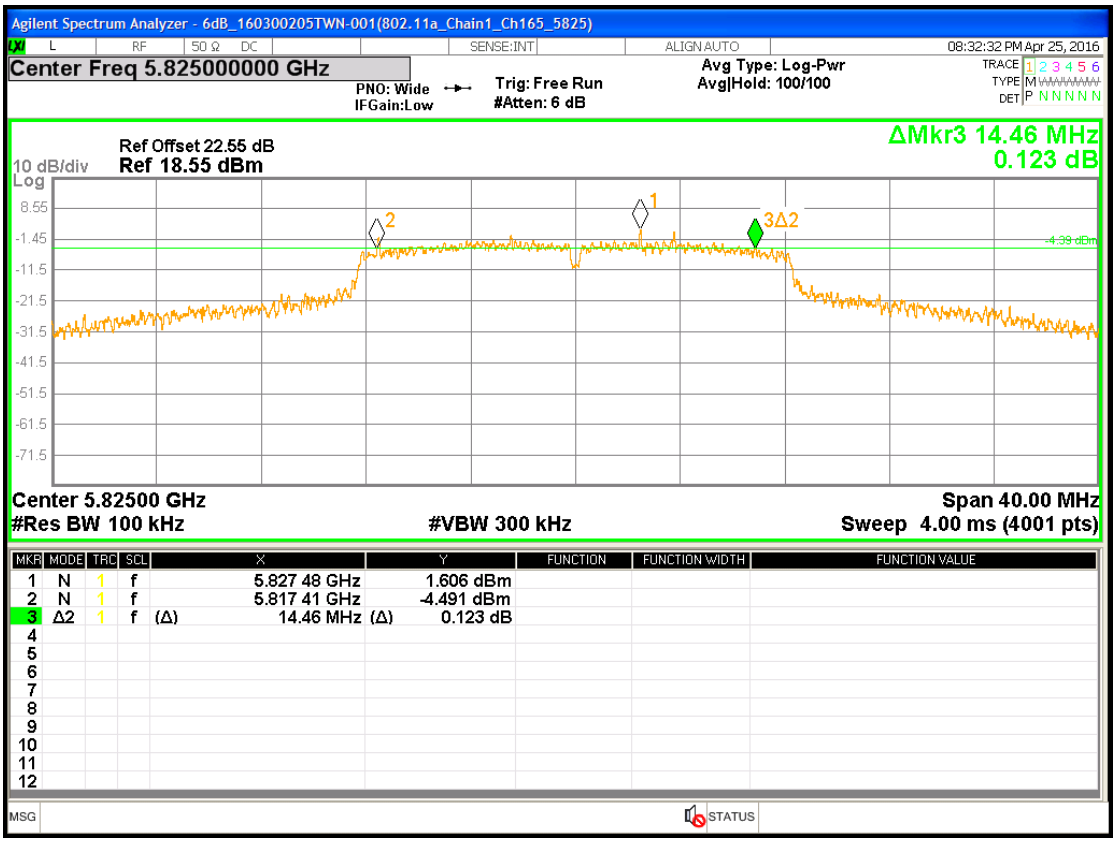
Chain1 : 6dB Bandwidth @ 802.11a mode Ch149



Chain1 : 6dB Bandwidth @ 802.11a mode Ch157



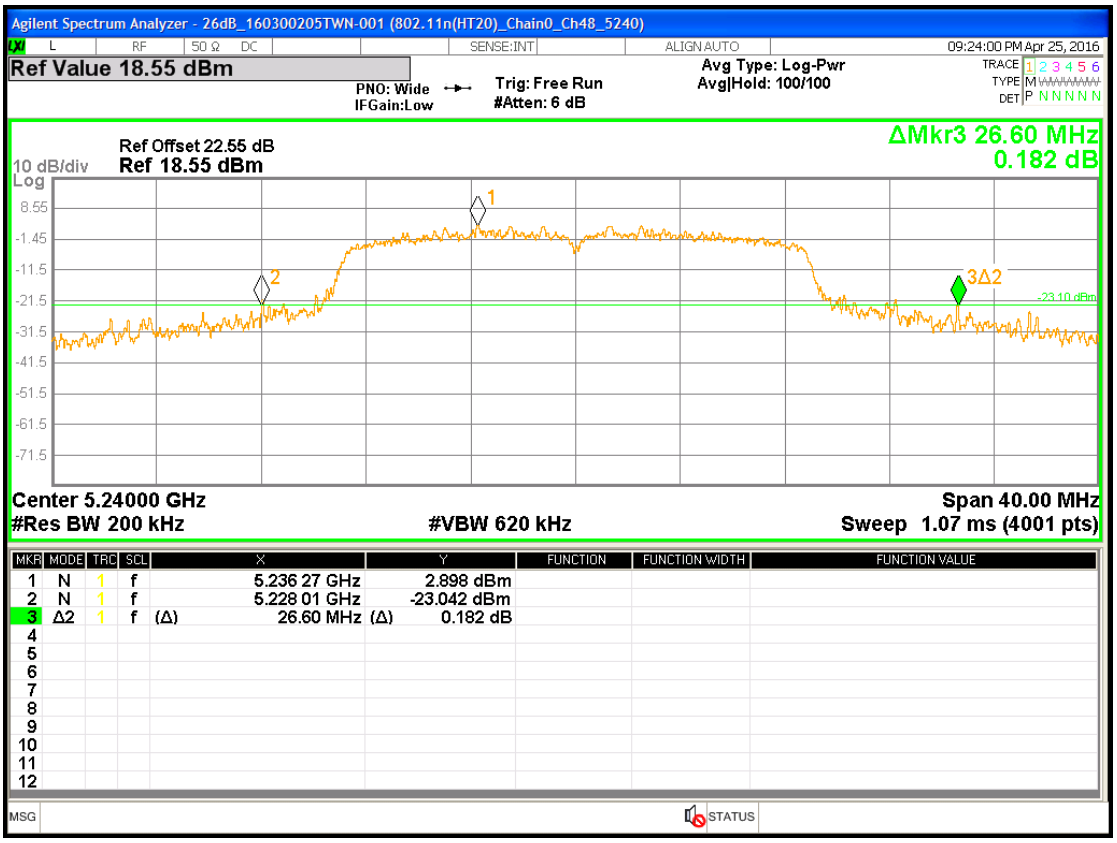
Chain1 : 6dB Bandwidth @ 802.11a mode Ch165



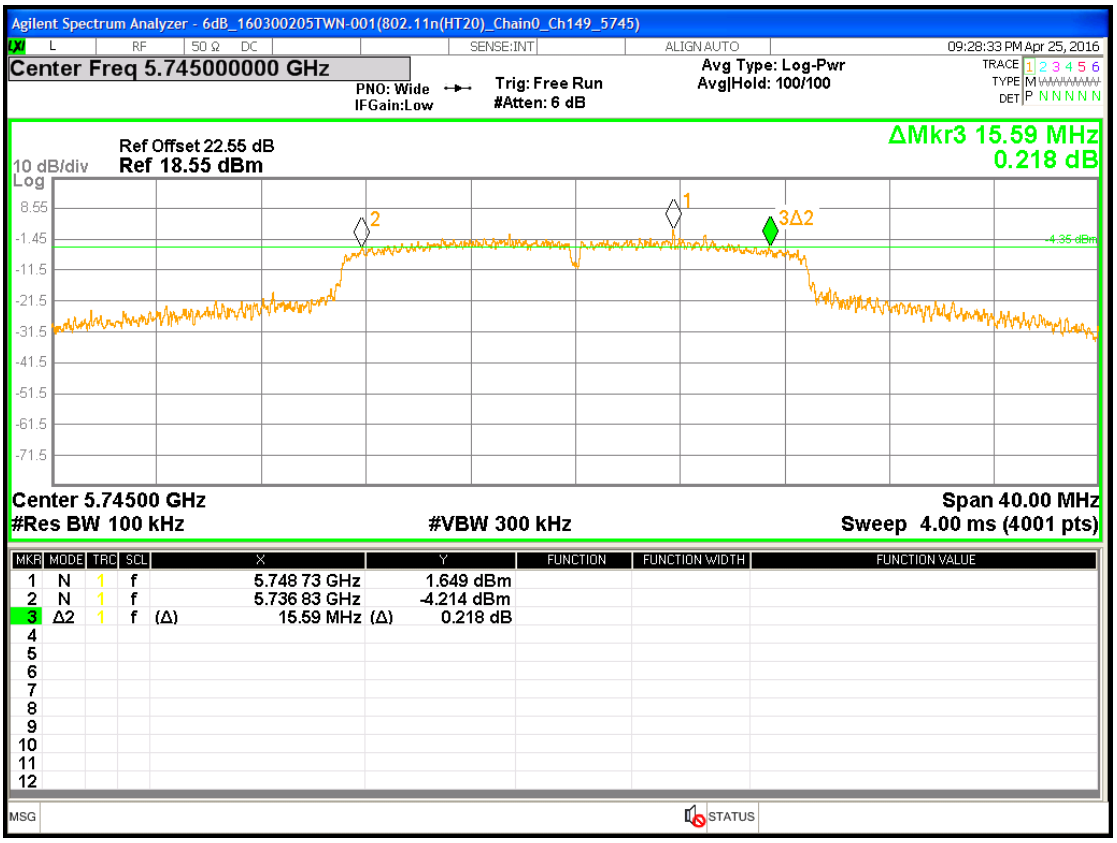
Chain0 : 26dB Bandwidth @ 802.11n(HT20) mode Ch36

Chain0 : 26dB Bandwidth @ 802.11n(HT20) mode Ch40

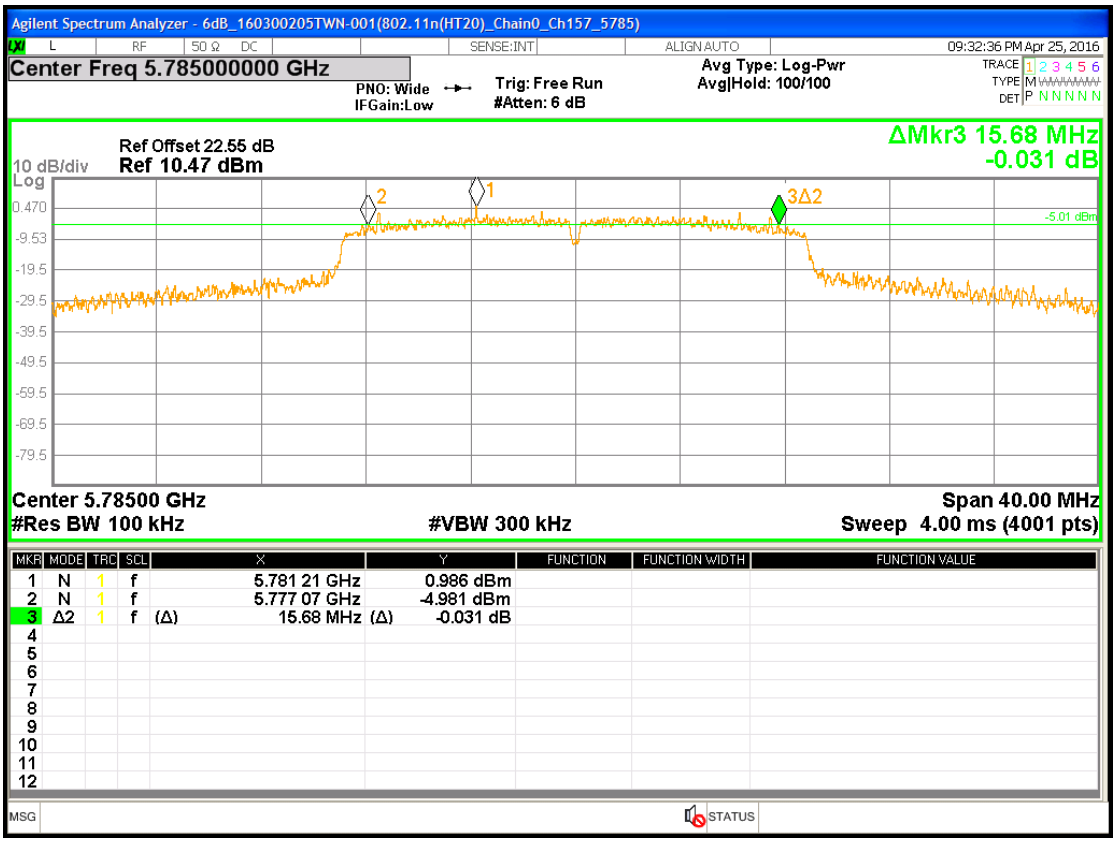
Chain0 : 26dB Bandwidth @ 802.11n(HT20) mode Ch48



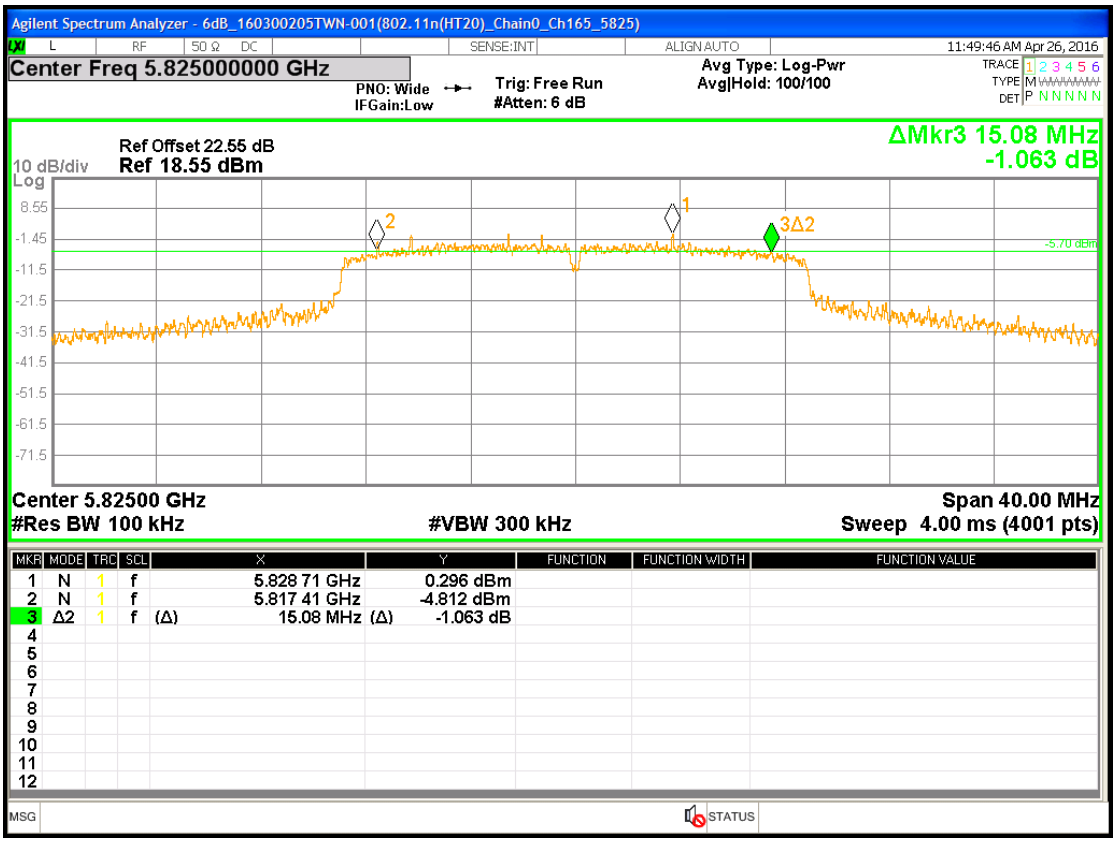
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch149



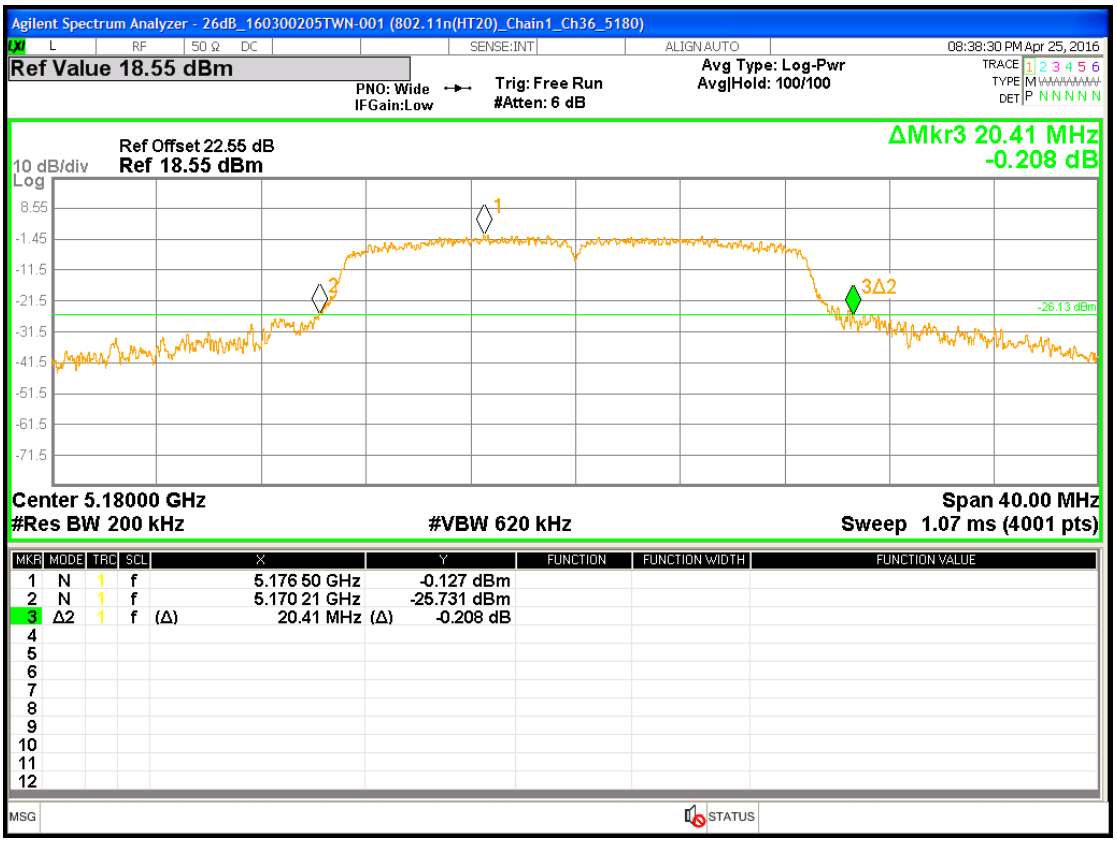
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch157



Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch165

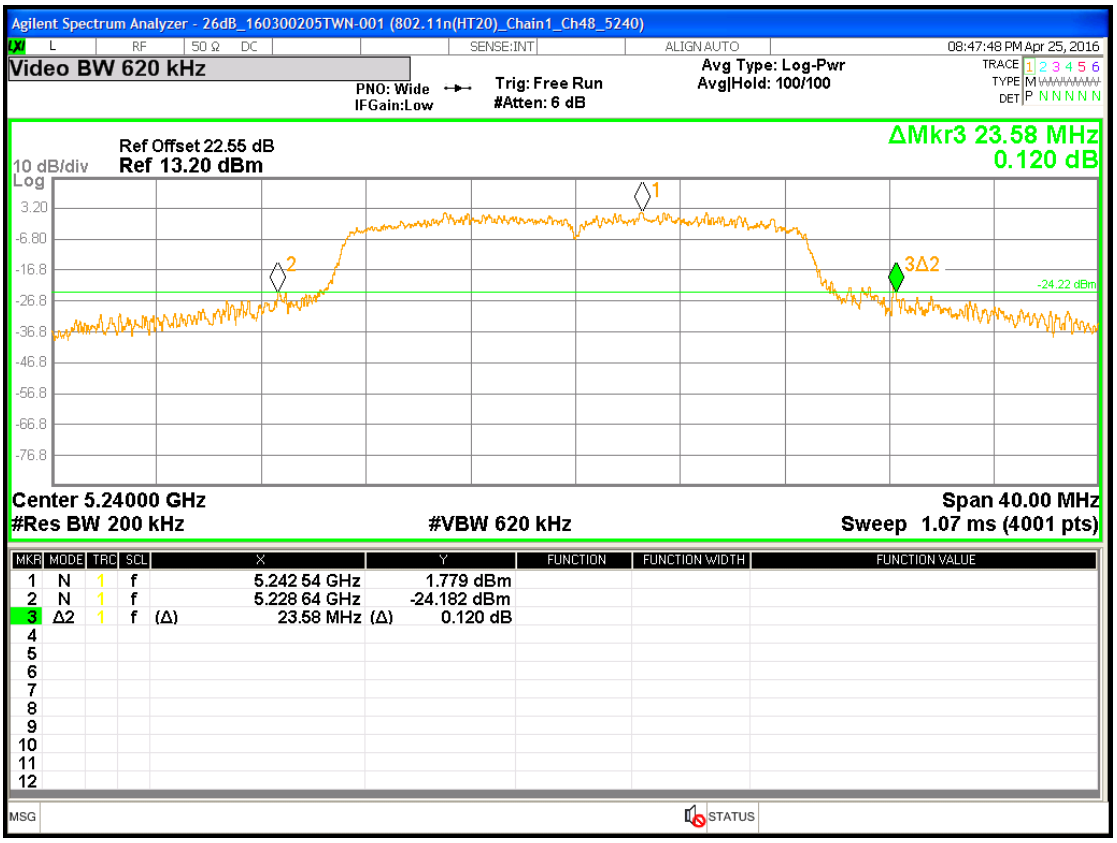


Chain1 : 26dB Bandwidth @ 802.11n(HT20) mode Ch36

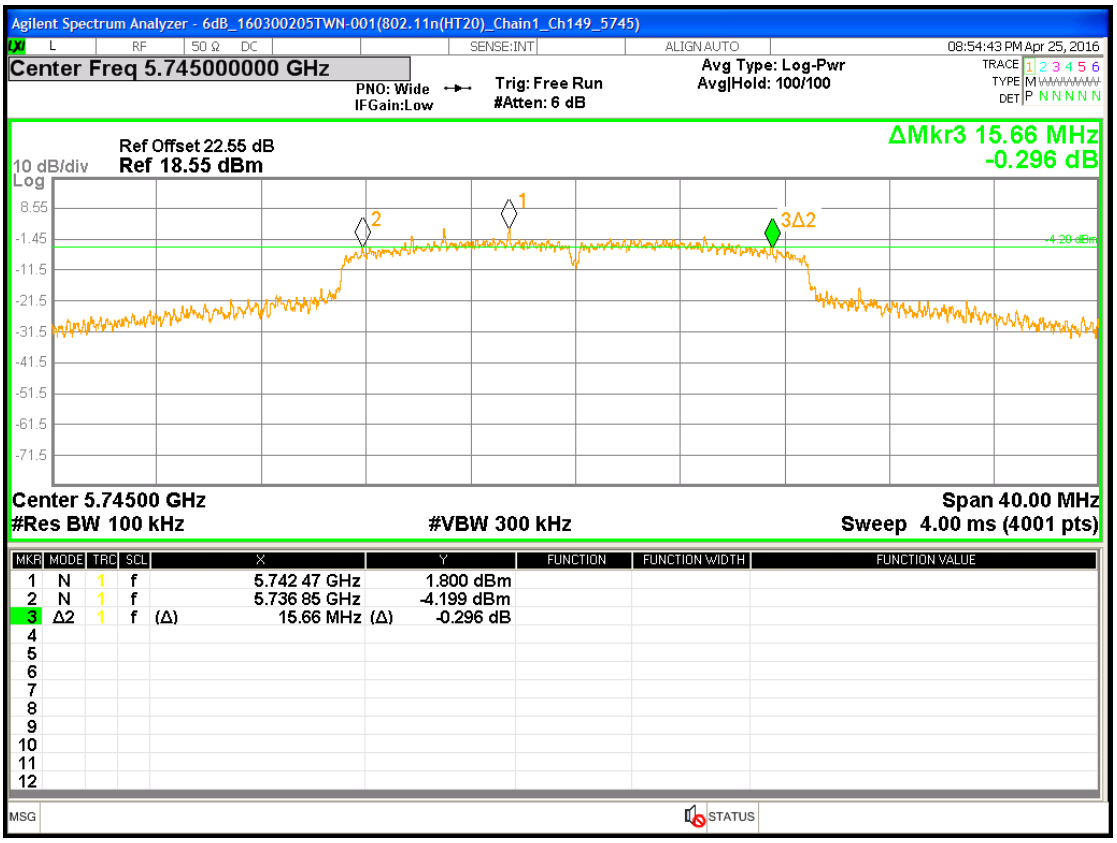


Chain1 : 26dB Bandwidth @ 802.11n(HT20) mode Ch40

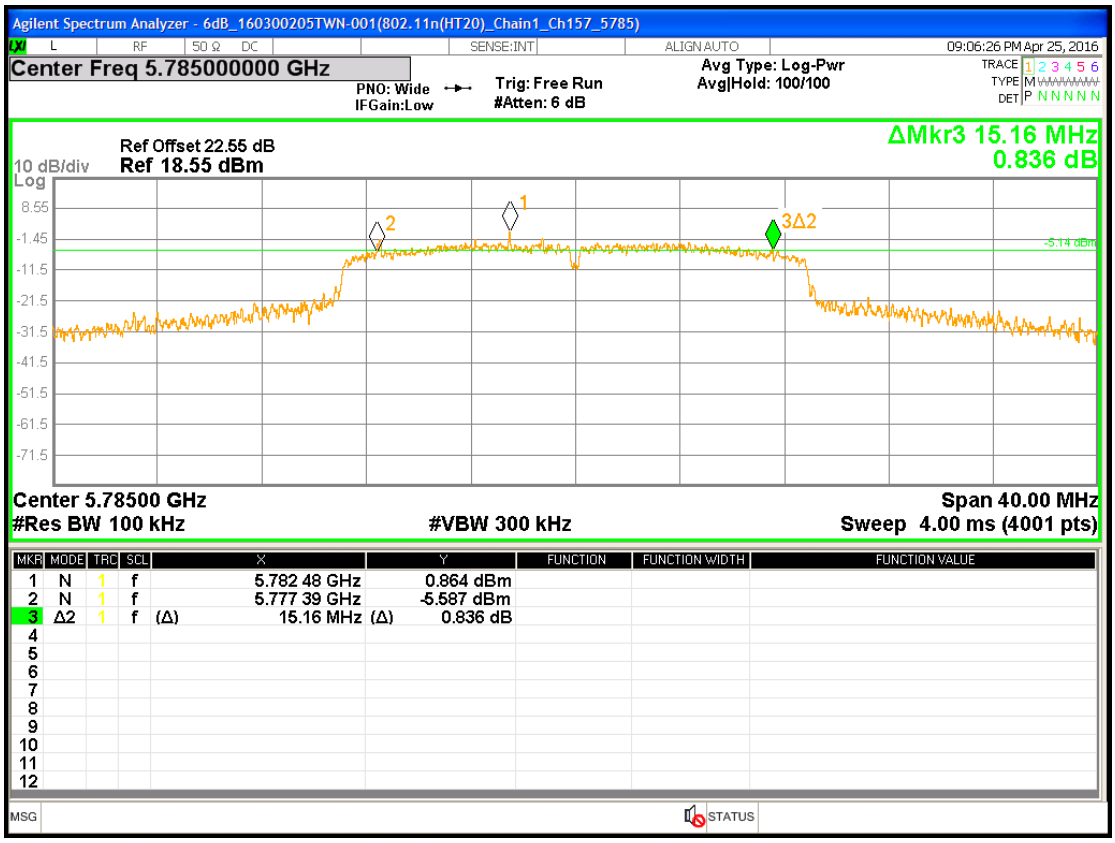
Chain1 : 26dB Bandwidth @ 802.11n(HT20) mode Ch48



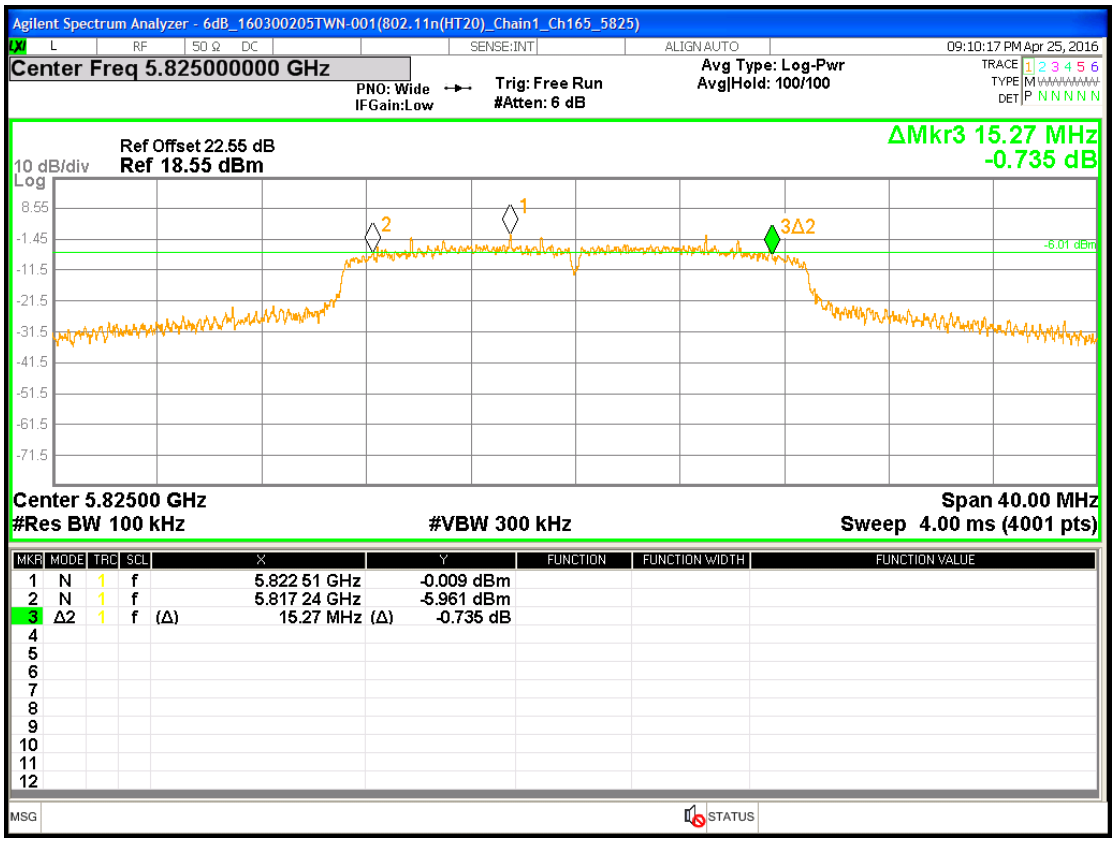
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch149



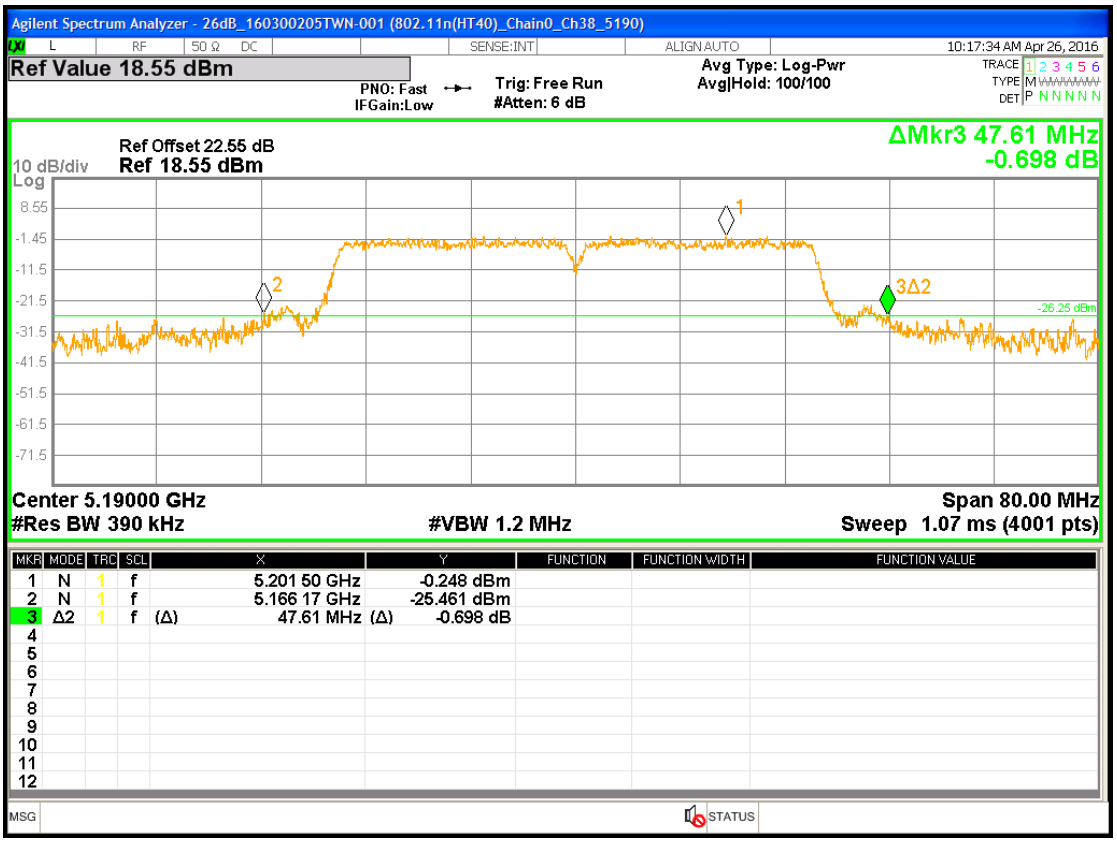
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch157



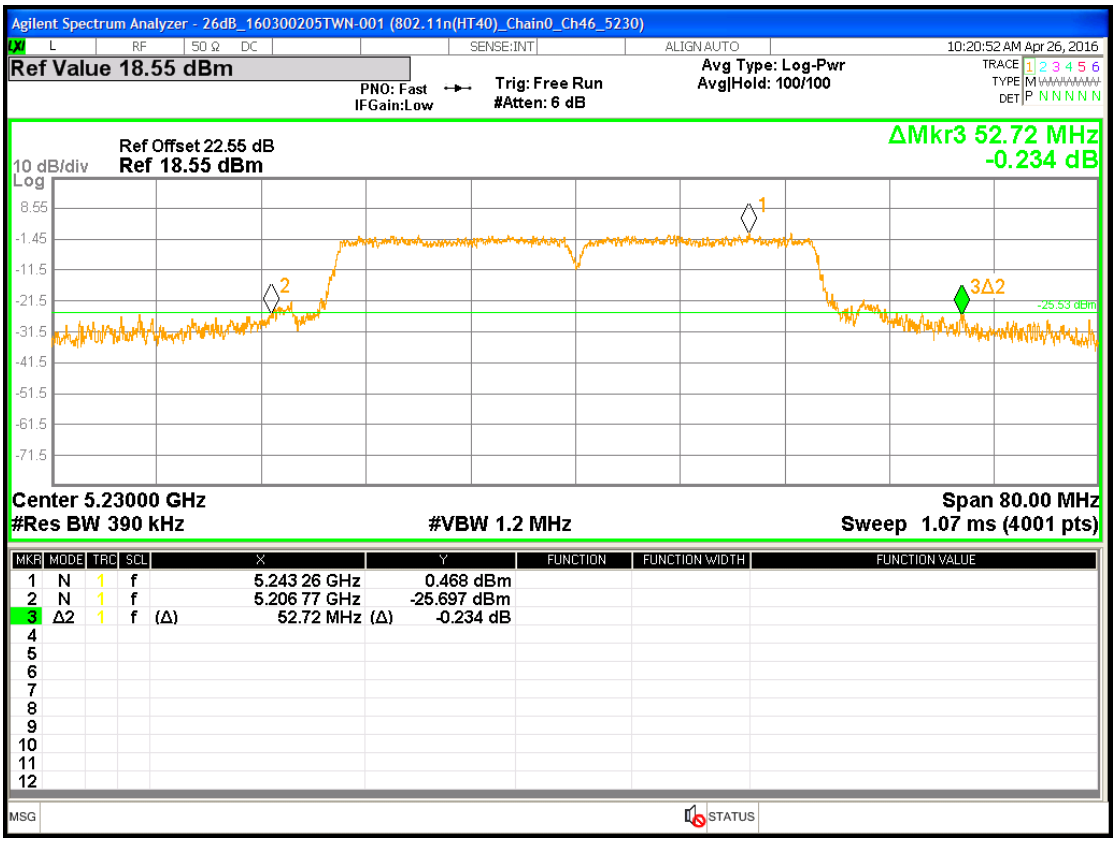
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch165



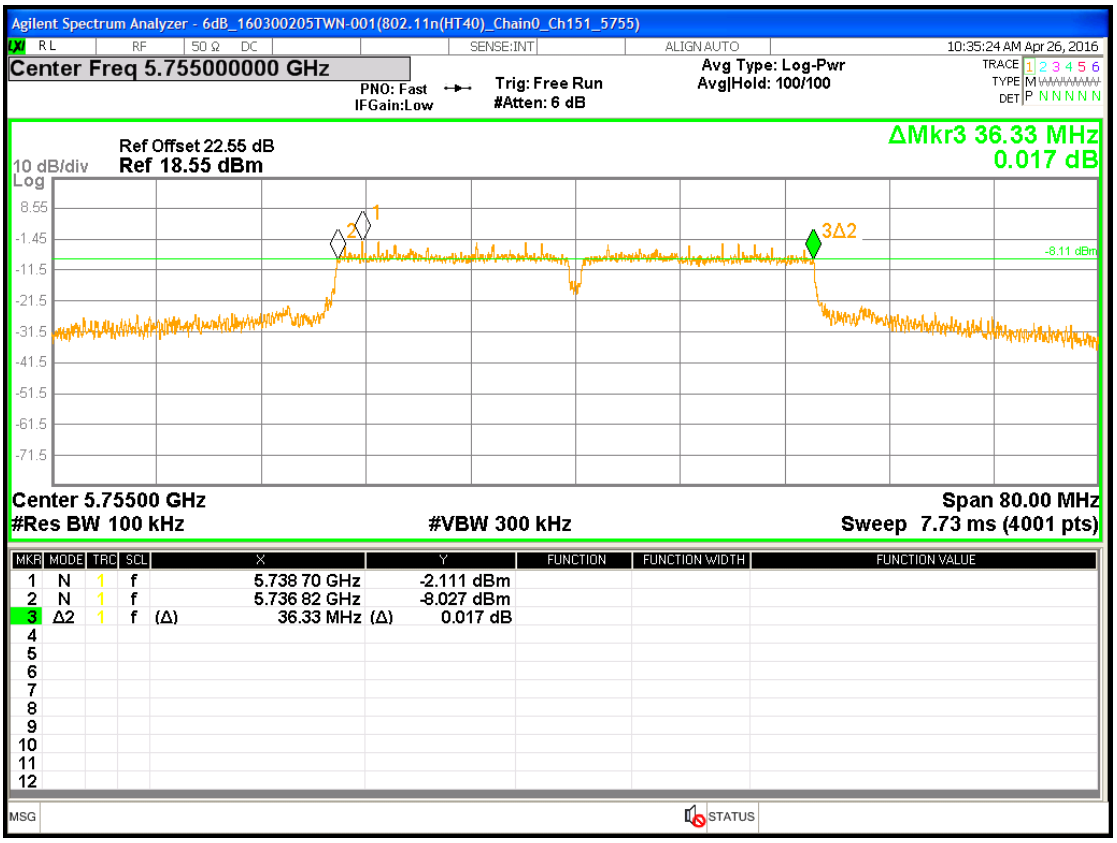
Chain0 : 26dB Bandwidth @ 802.11n(HT40) mode Ch38



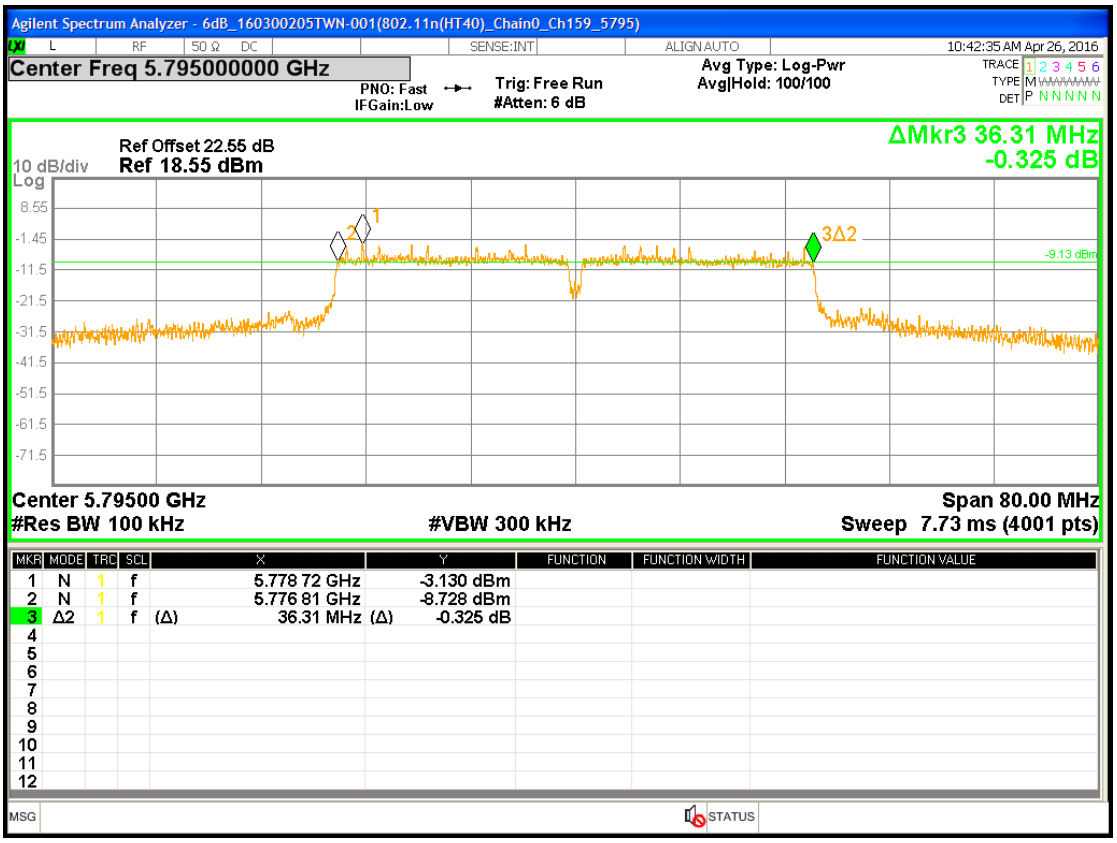
Chain0 : 26dB Bandwidth @ 802.11n(HT40) mode Ch46



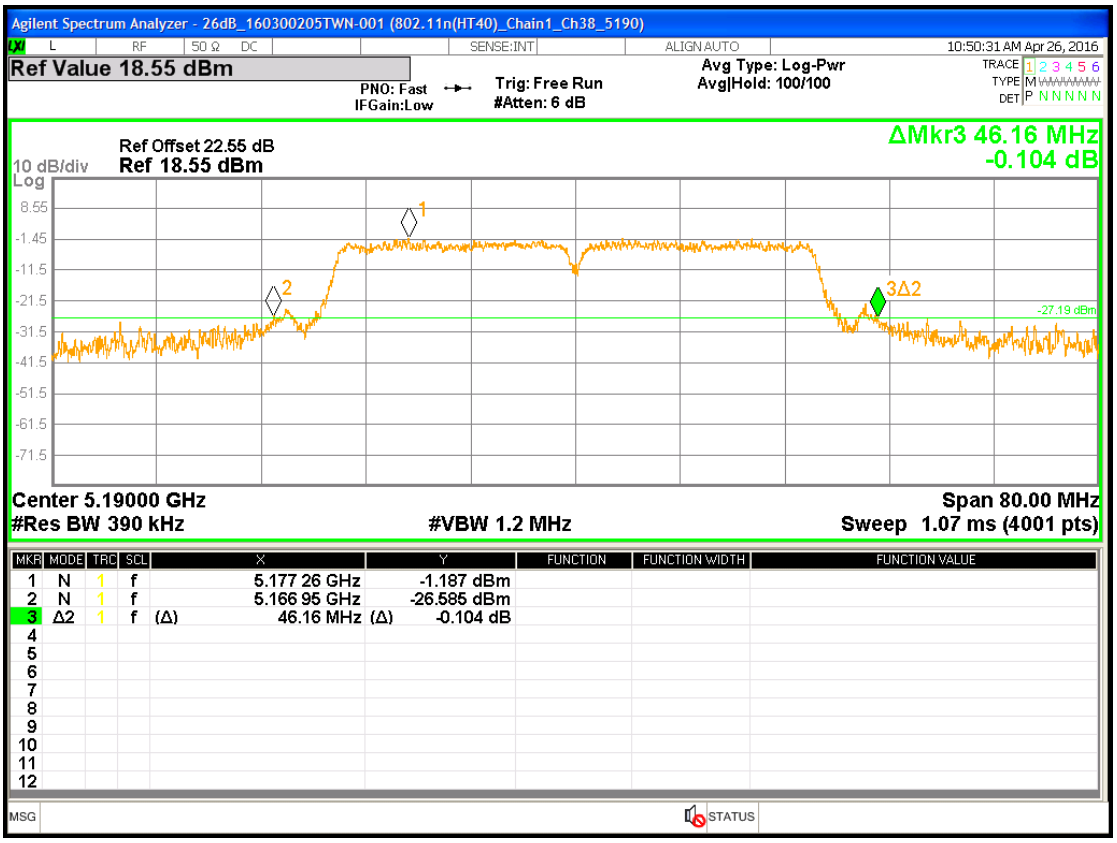
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch151



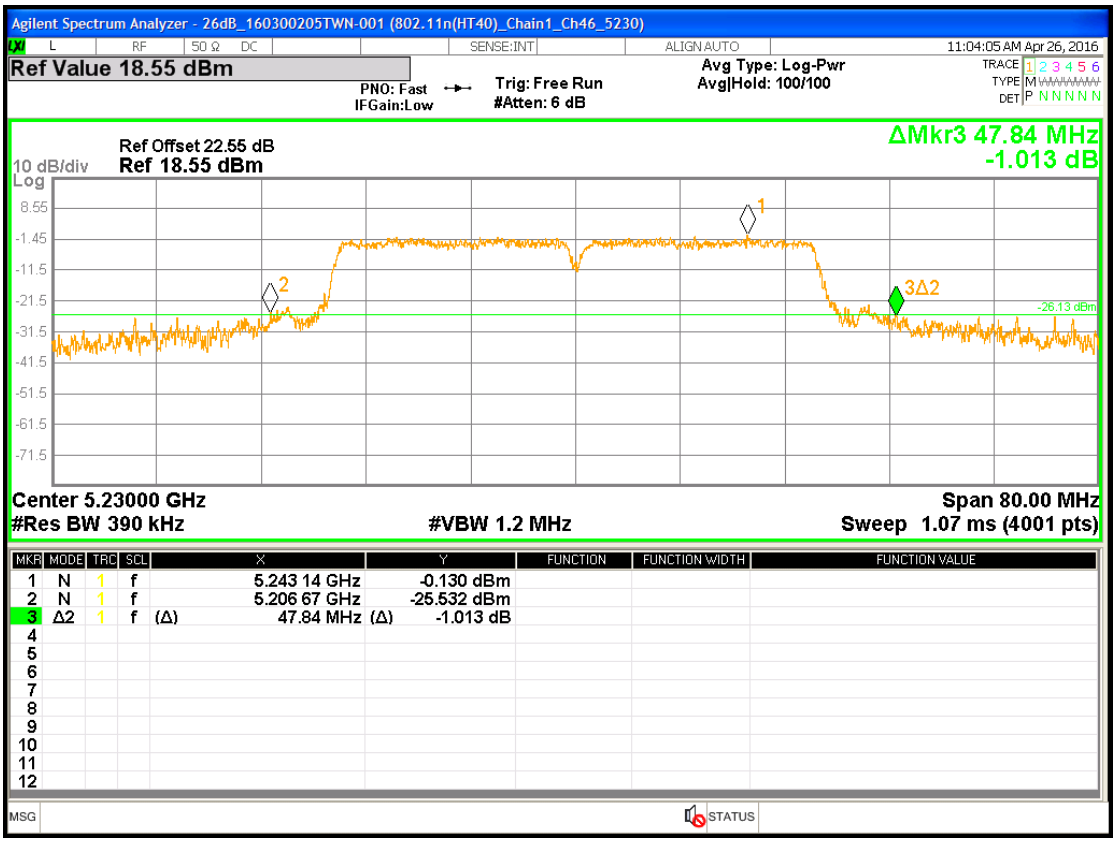
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch159



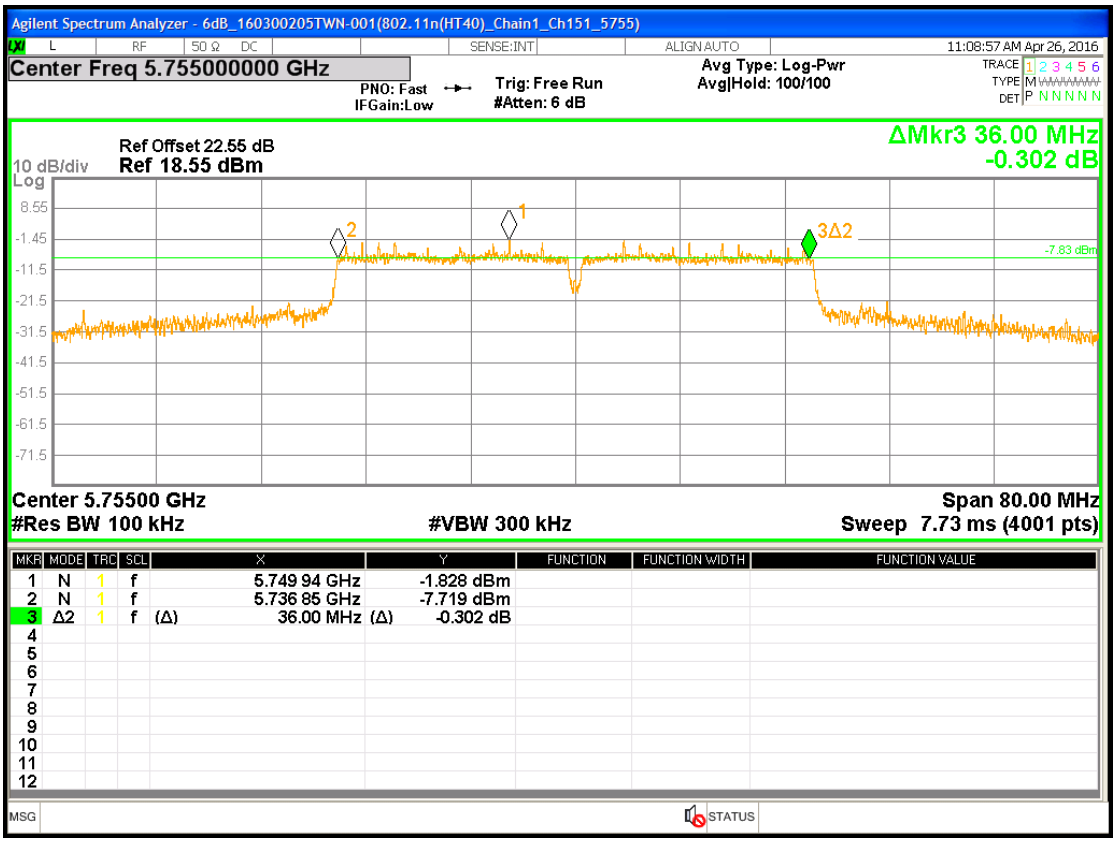
Chain1 : 26dB Bandwidth @ 802.11n(HT40) mode Ch38



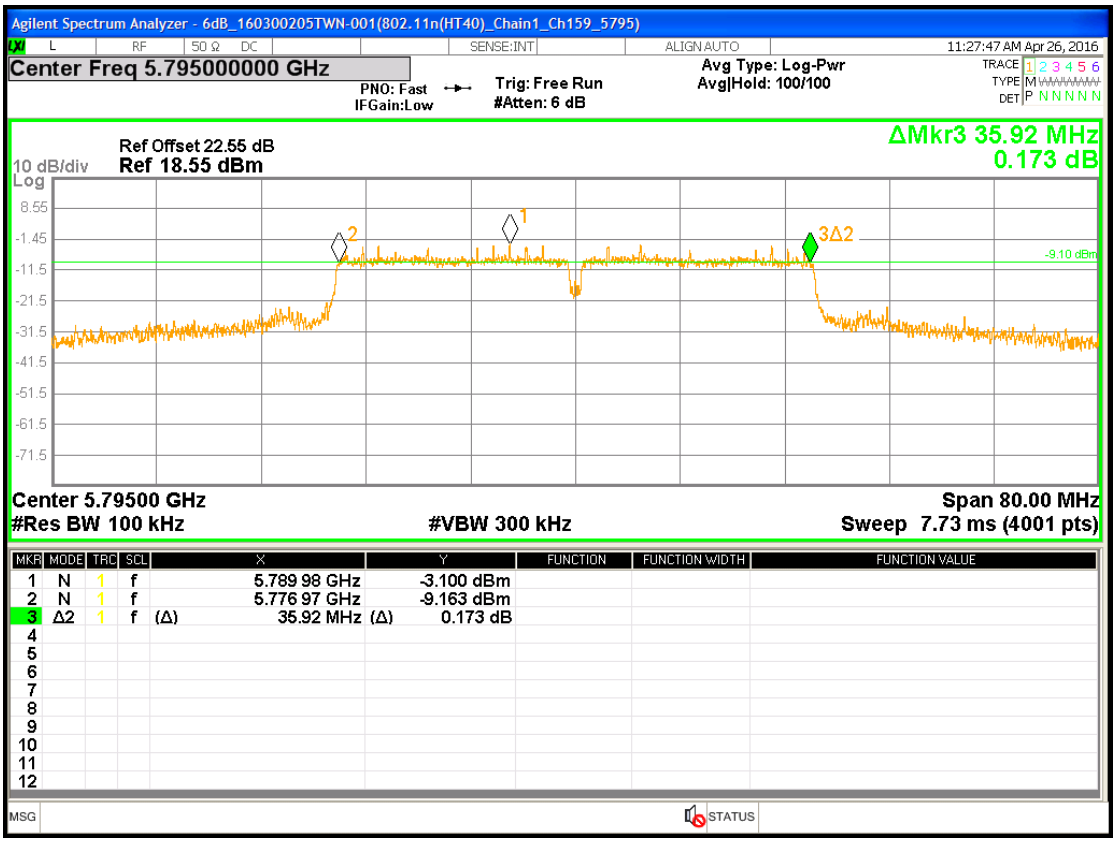
Chain1 : 26dB Bandwidth @ 802.11n(HT40) mode Ch46



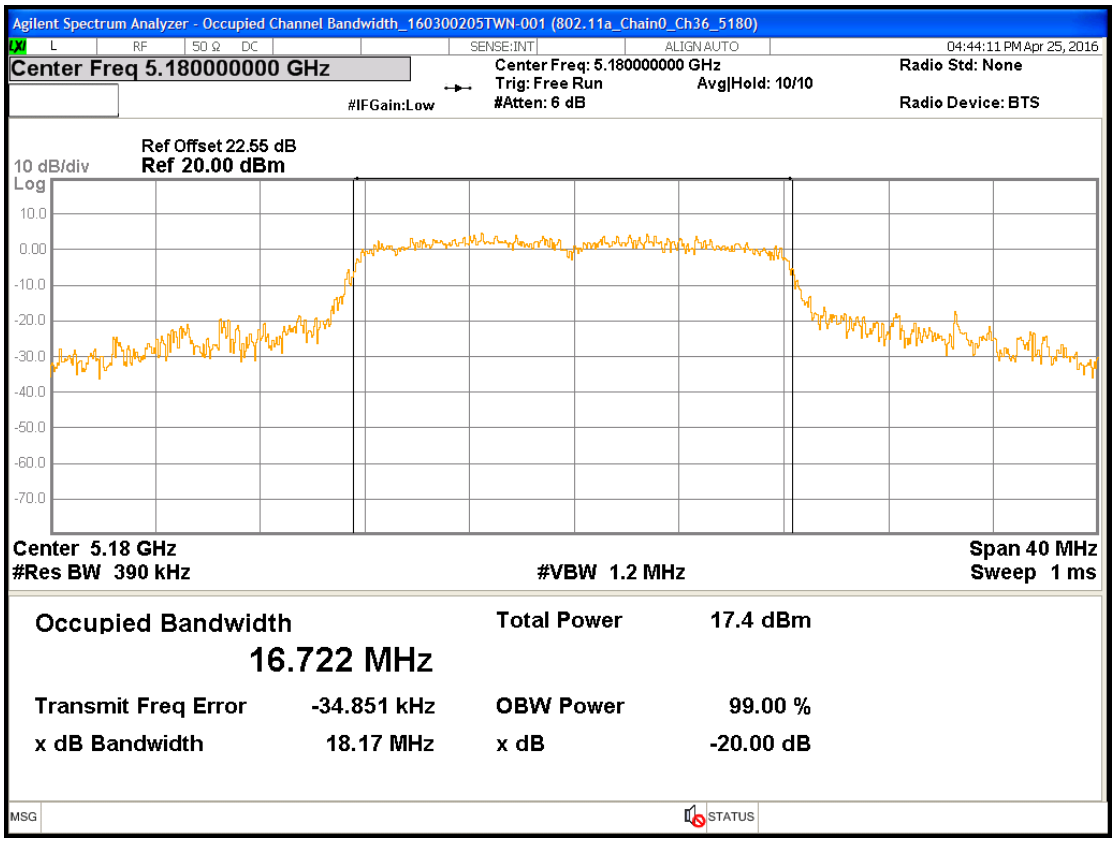
Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch151



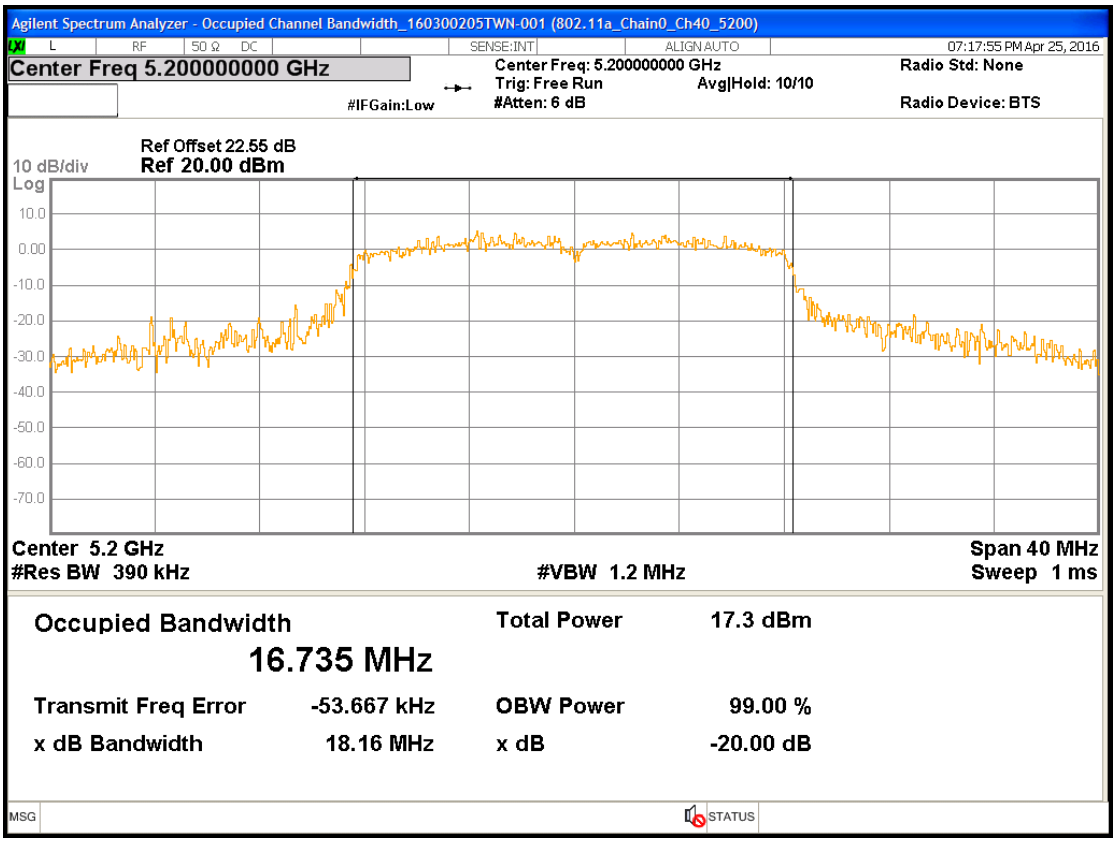
Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch159



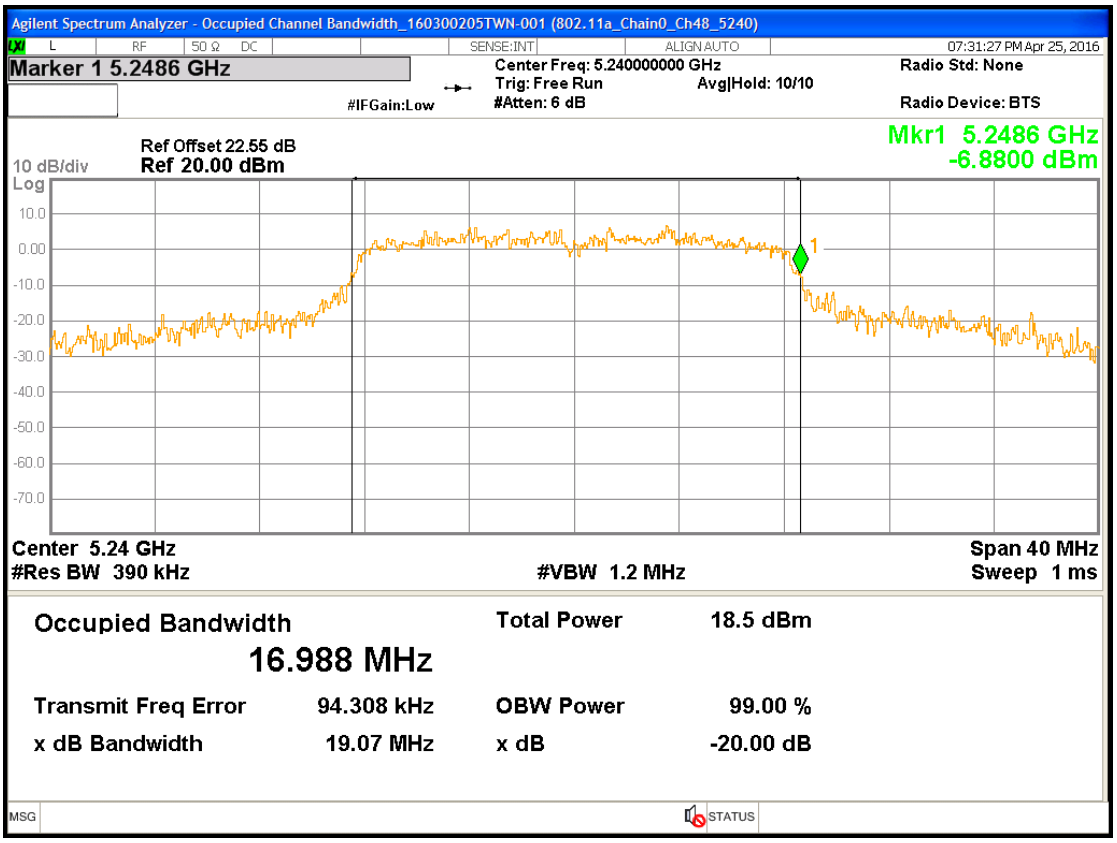
Chain0 : Occupied Channel Bandwidth @ 802.11a mode Ch36



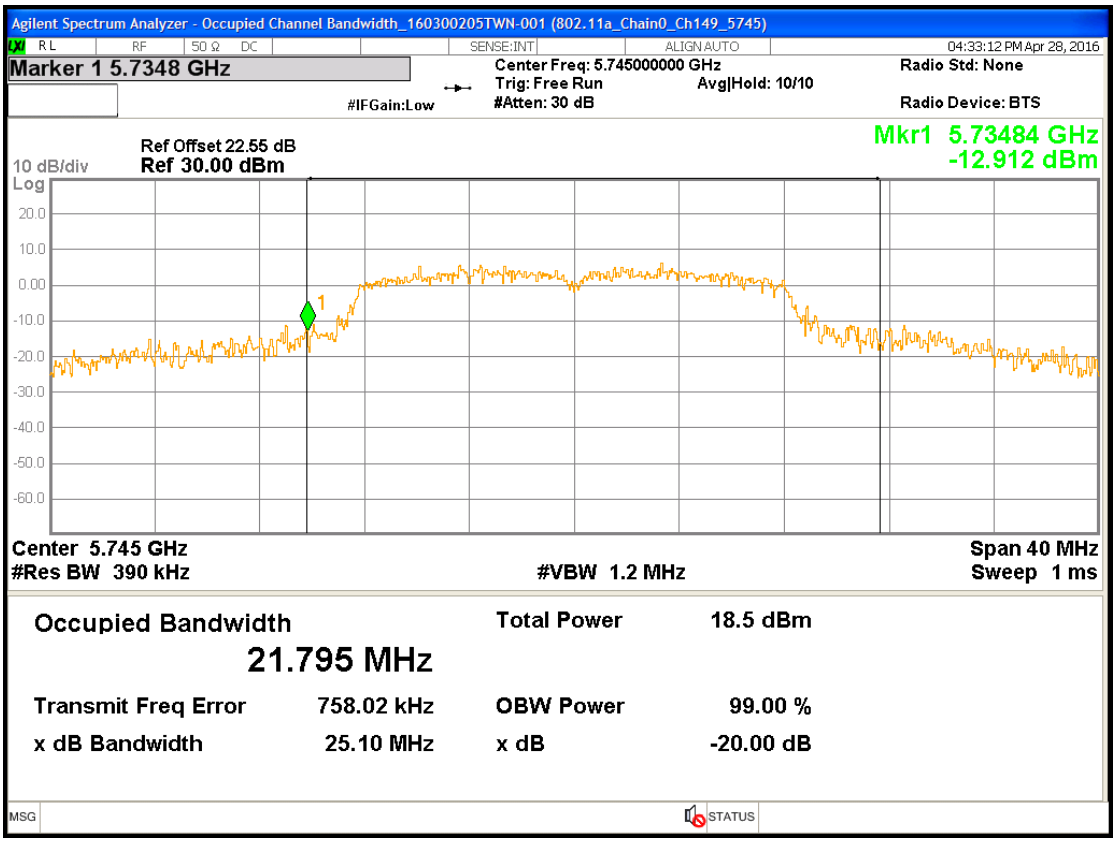
Chain0 : Occupied Channel Bandwidth @ 802.11a mode Ch40



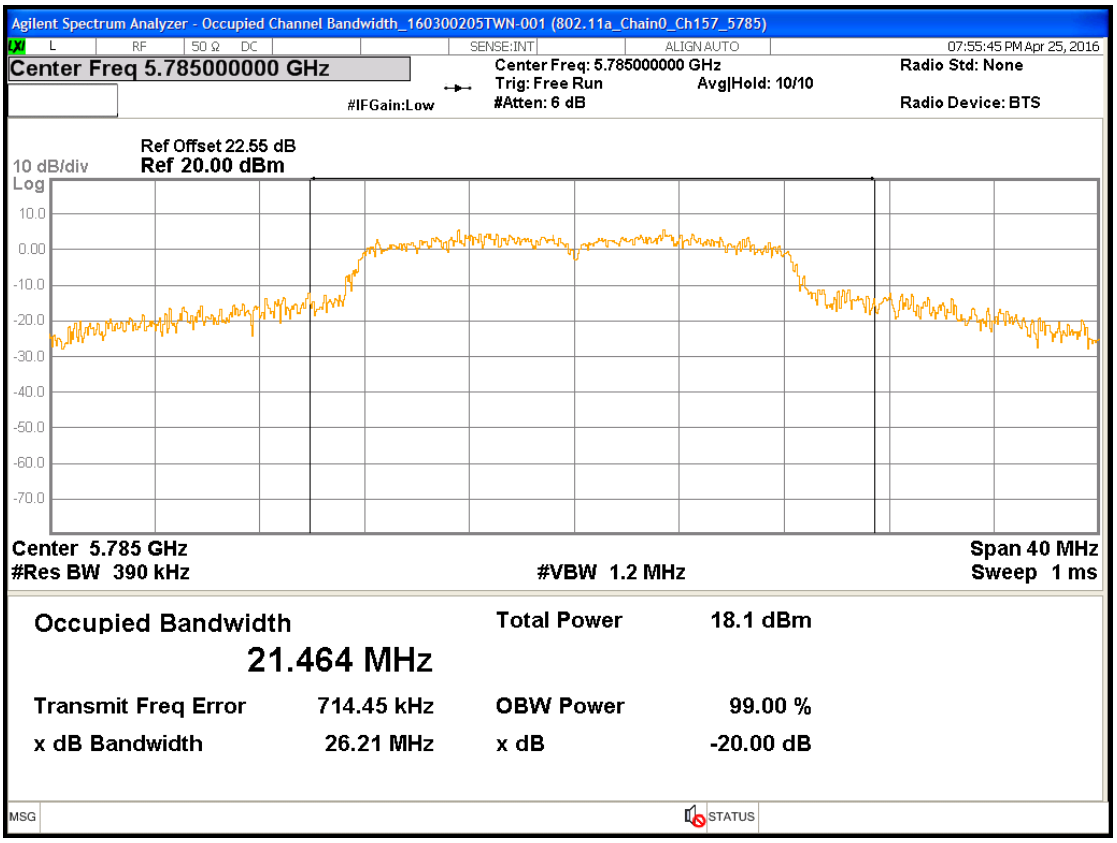
Chain0 : Occupied Channel Bandwidth @ 802.11a mode Ch48



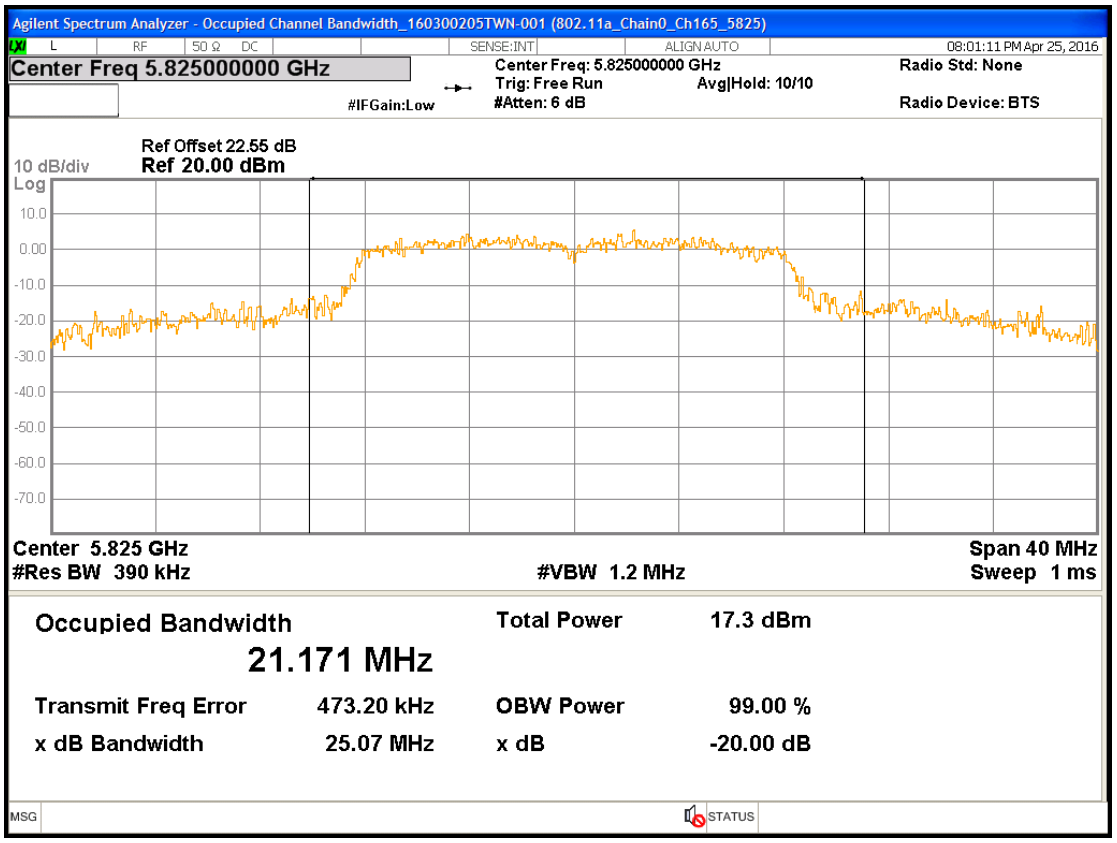
Chain0 : Occupied Channel Bandwidth @ 802.11a mode Ch149



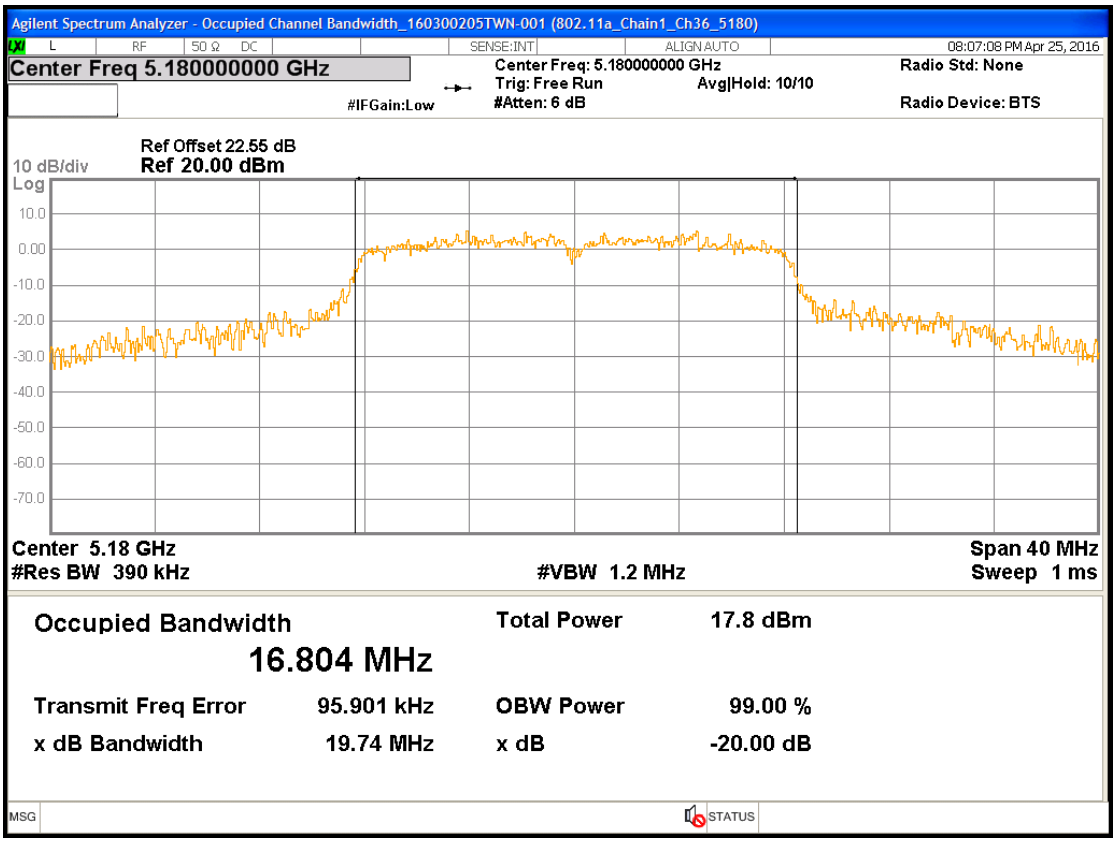
Chain0 : Occupied Channel Bandwidth @ 802.11a mode Ch157



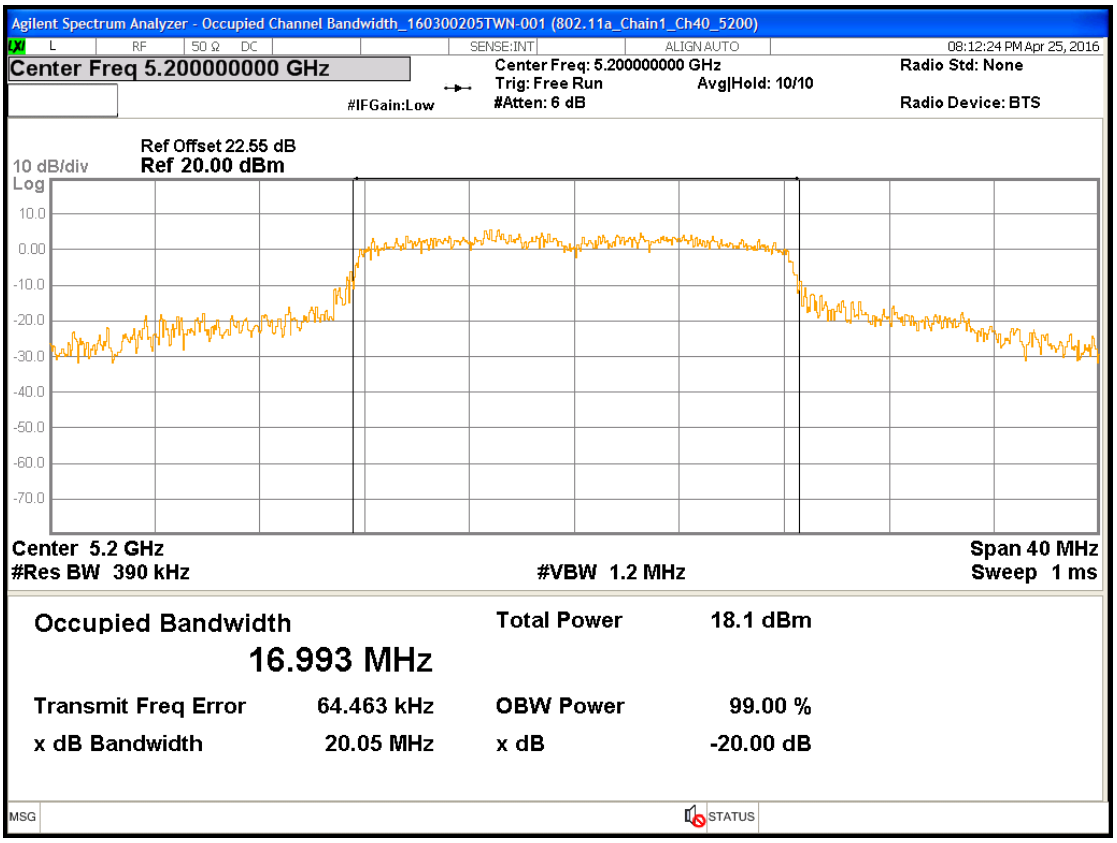
Chain0 : Occupied Channel Bandwidth @ 802.11a mode Ch165



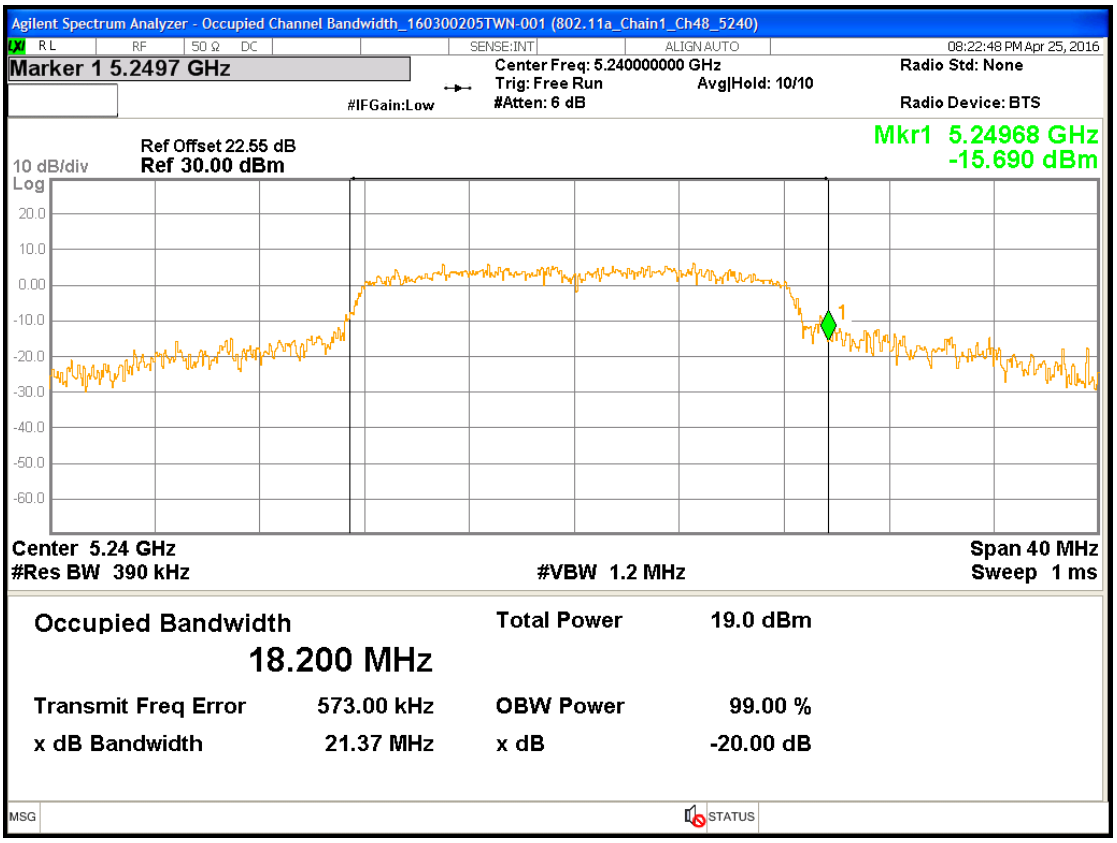
Chain1 : Occupied Channel Bandwidth @ 802.11a mode Ch36



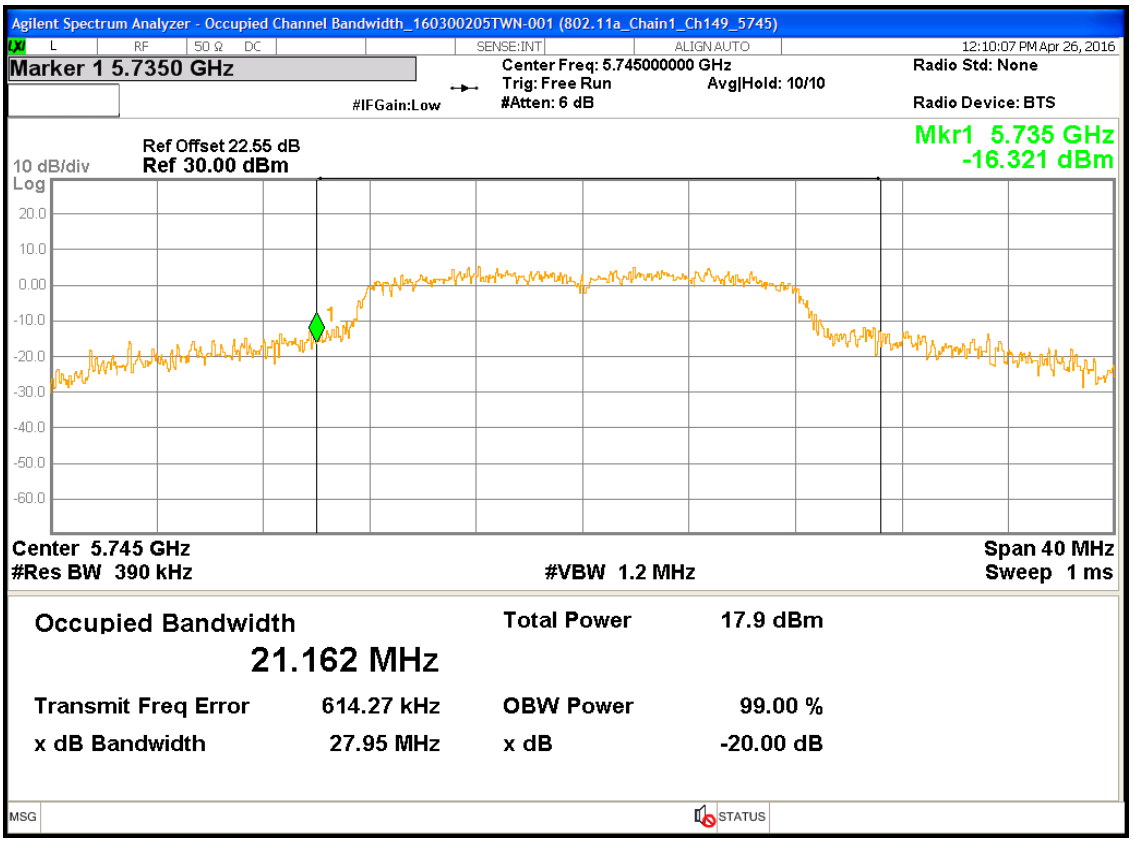
Chain1 : Occupied Channel Bandwidth @ 802.11a mode Ch40



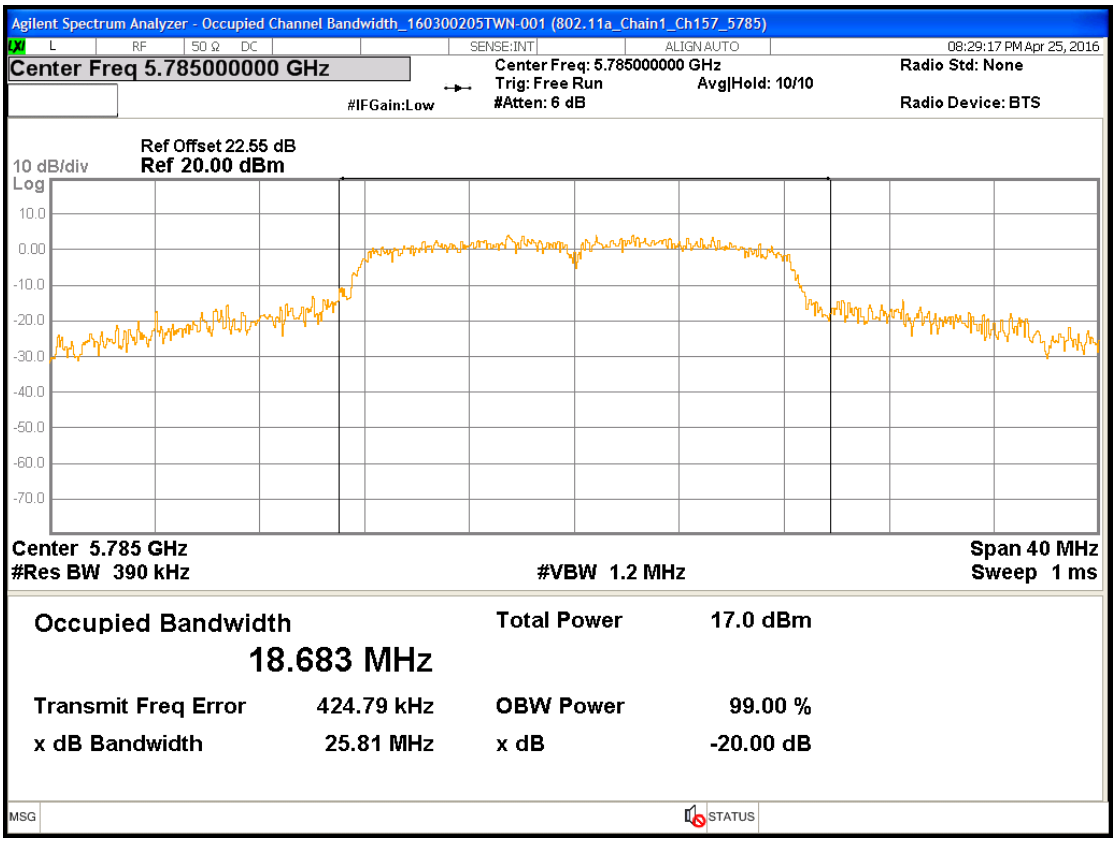
Chain1 : Occupied Channel Bandwidth @ 802.11a mode Ch48



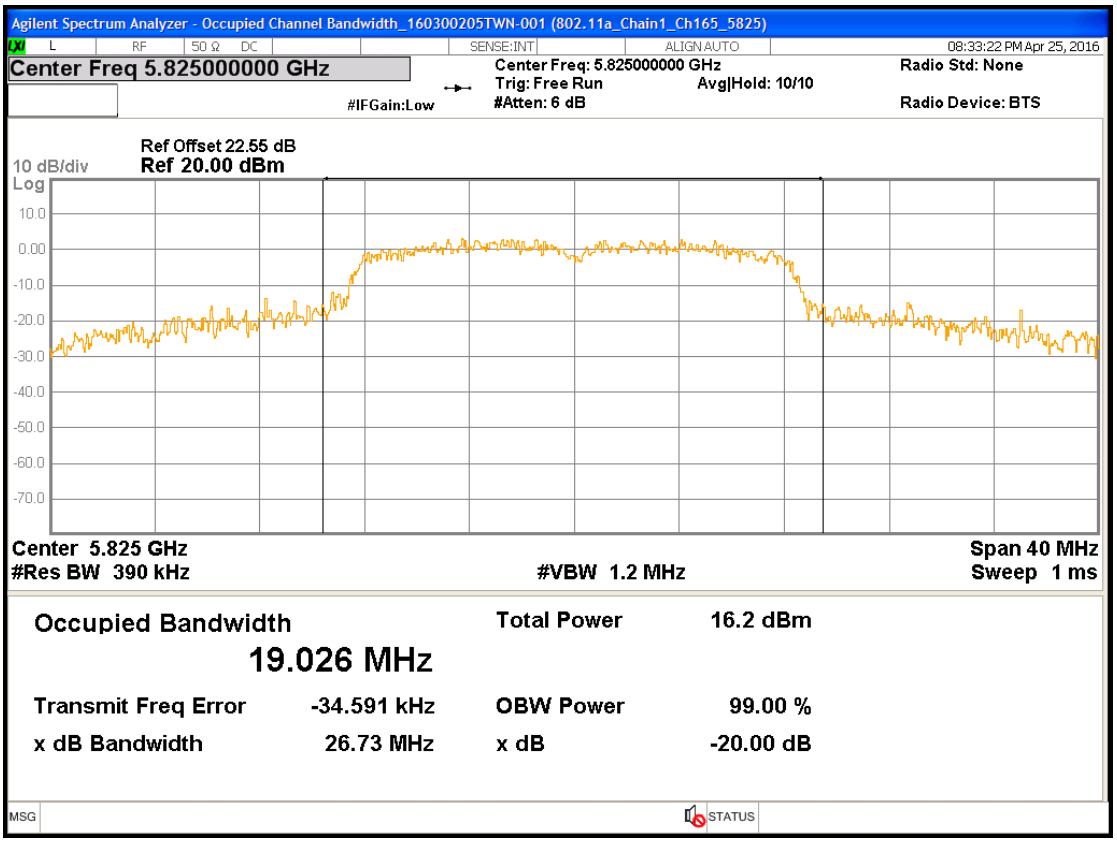
Chain1 : Occupied Channel Bandwidth @ 802.11a mode Ch149



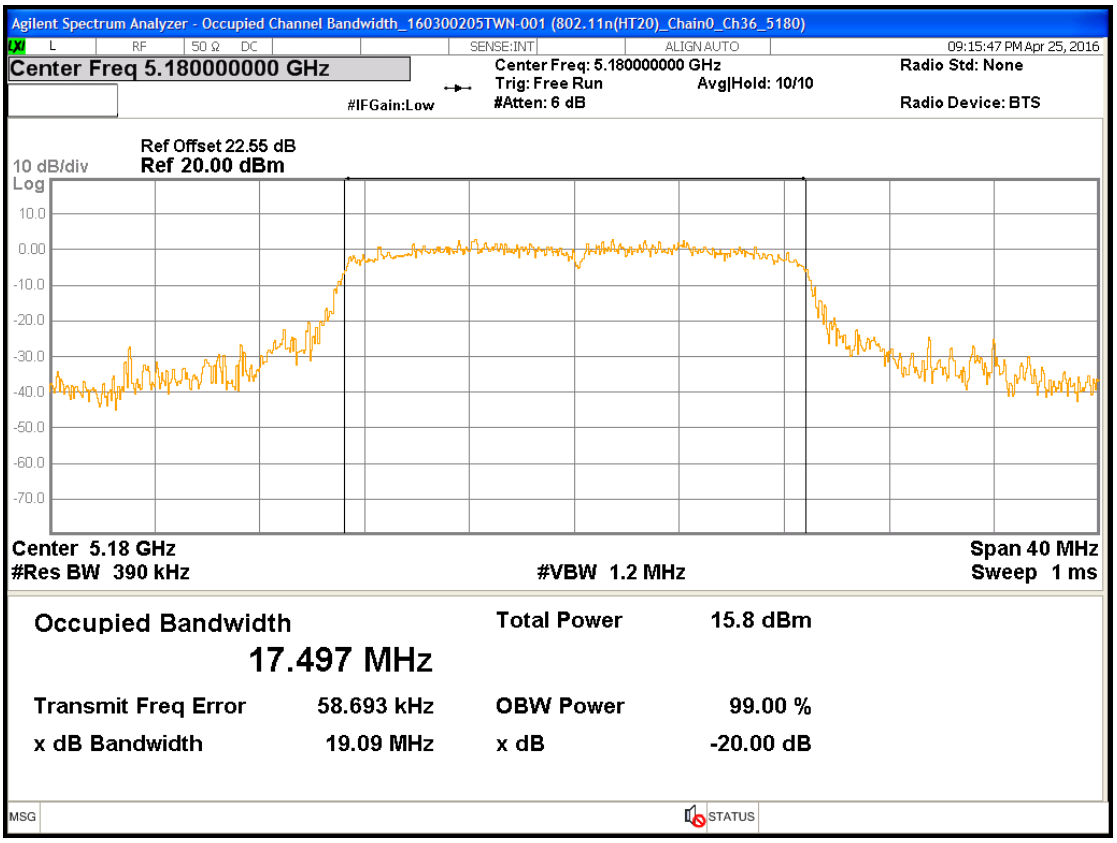
Chain1 : Occupied Channel Bandwidth @ 802.11a mode Ch157



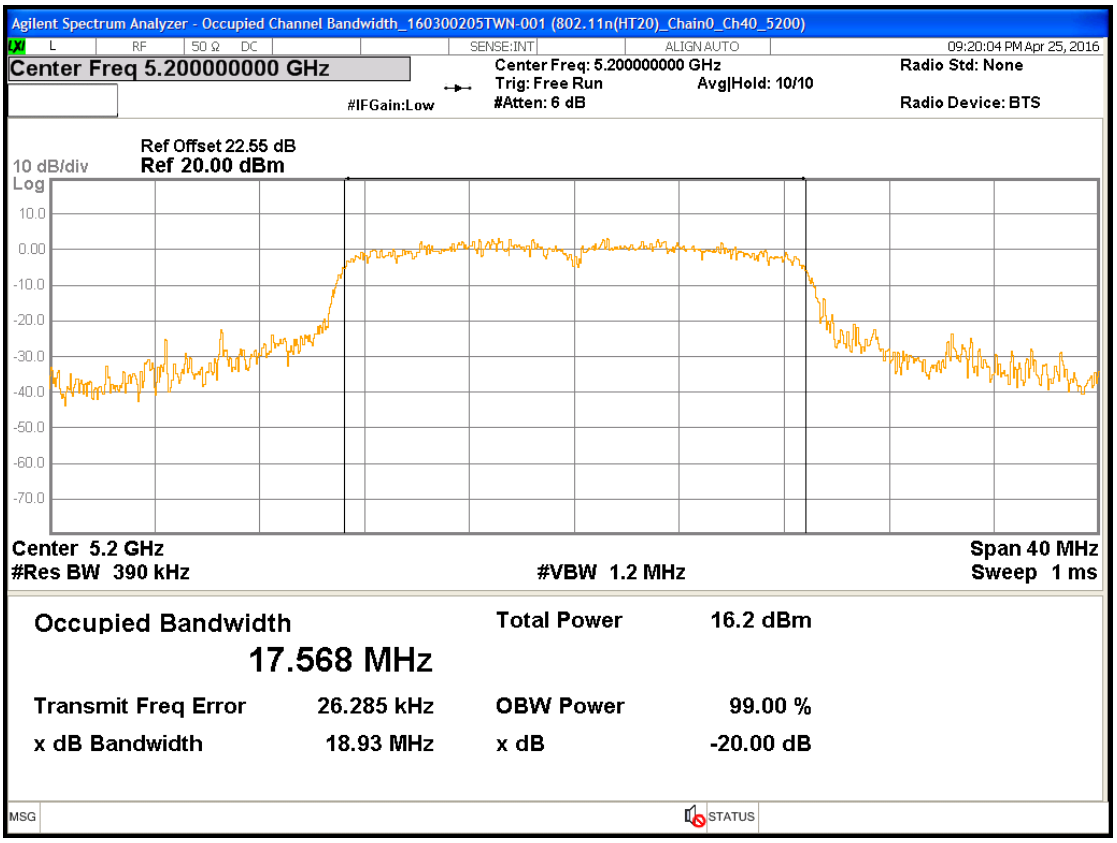
Chain1 : Occupied Channel Bandwidth @ 802.11a mode Ch165



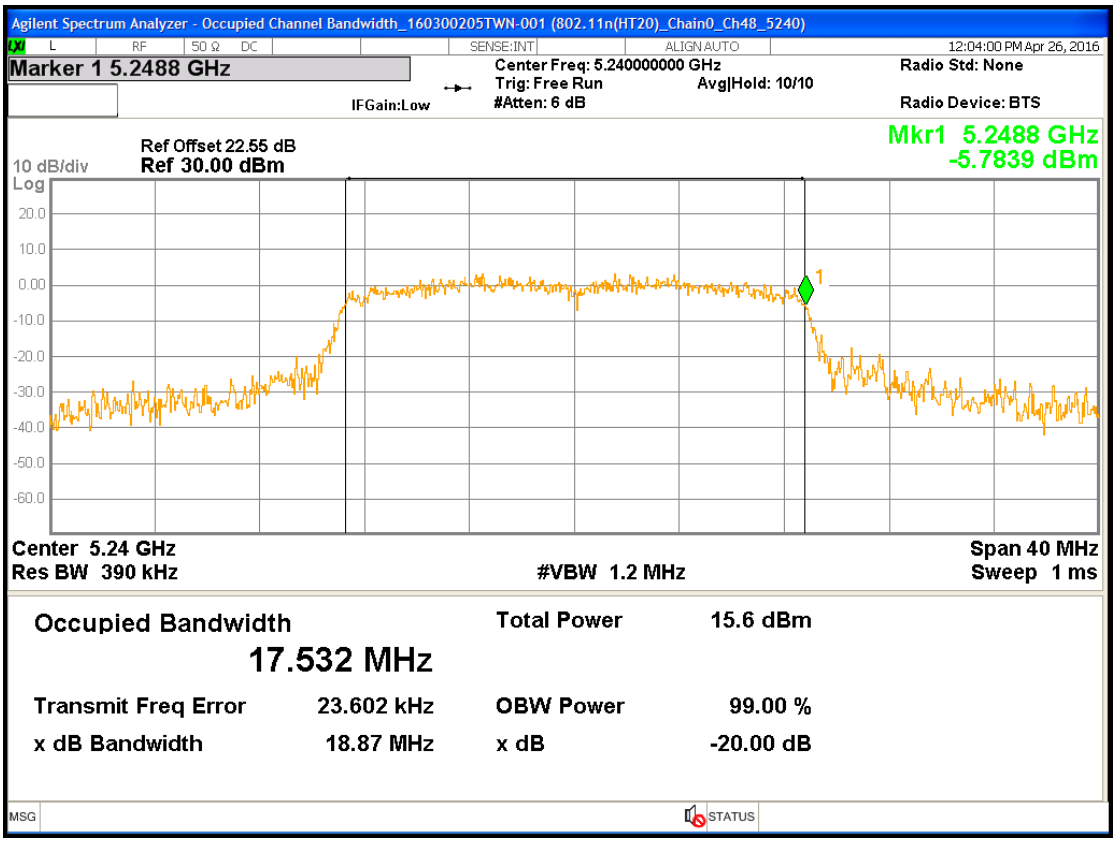
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch36



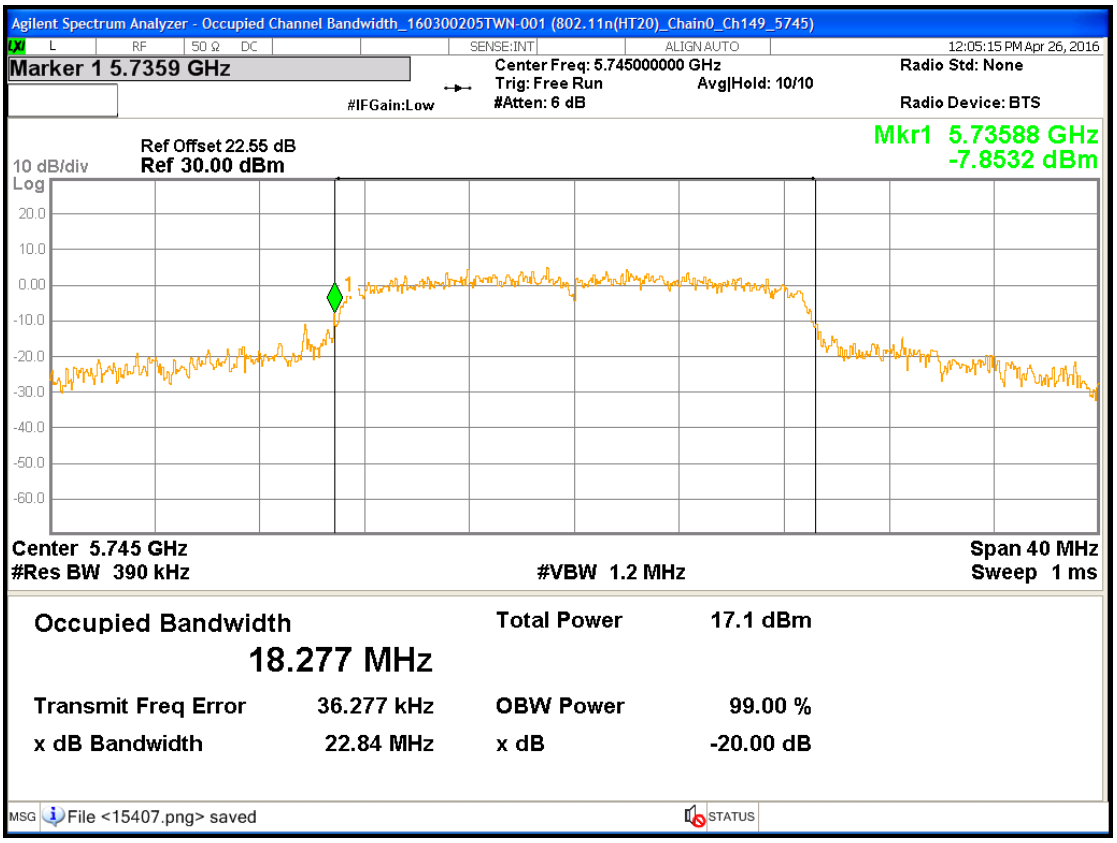
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch40



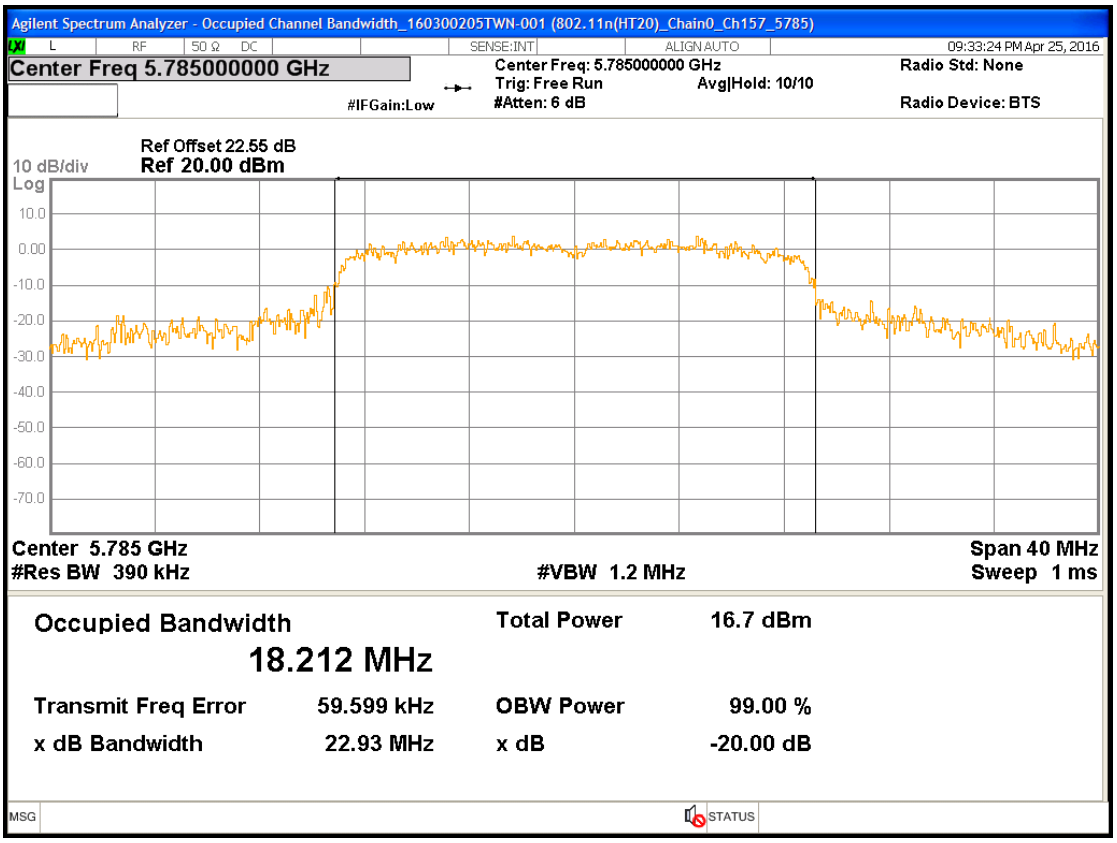
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch48



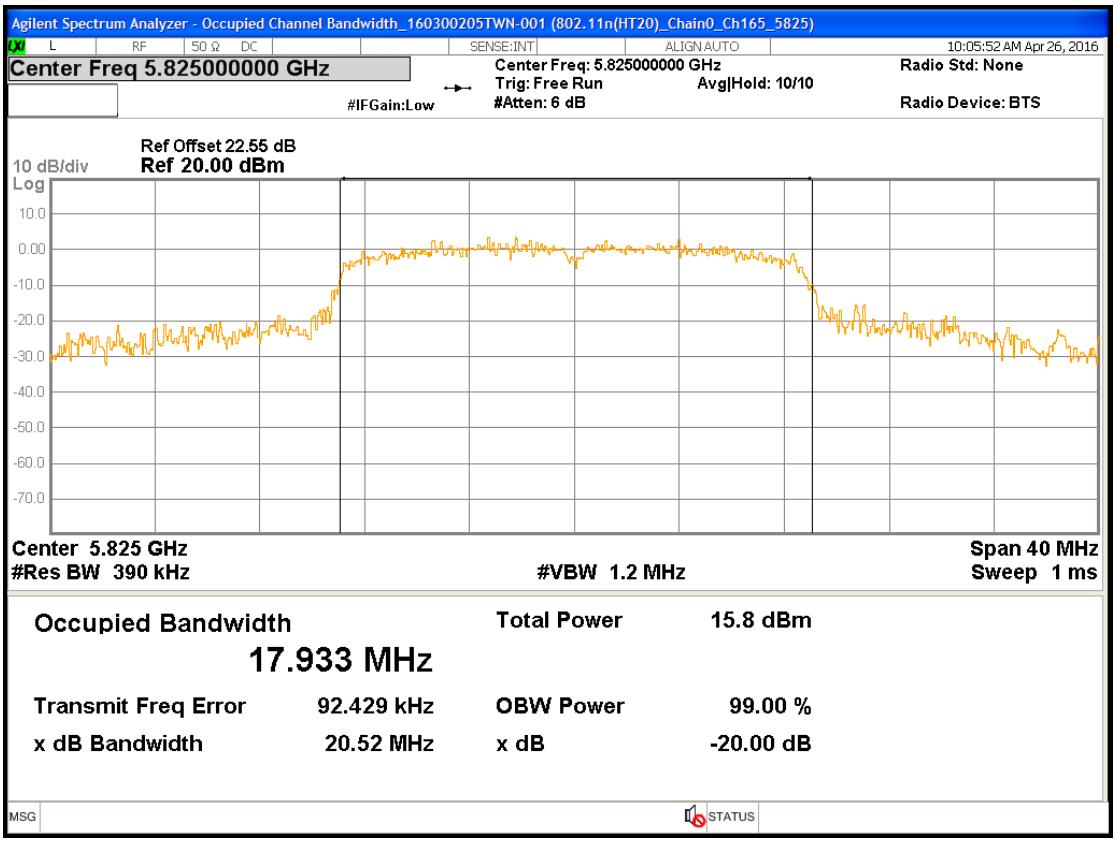
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch149



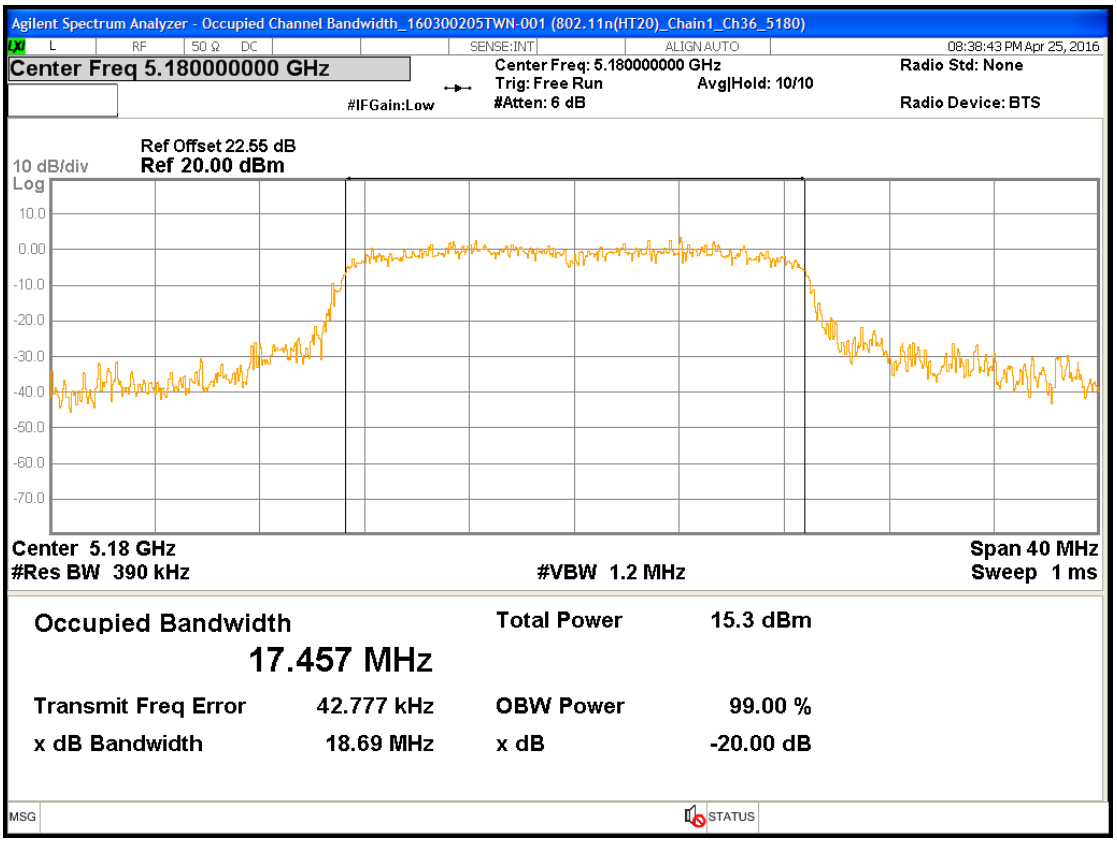
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch157



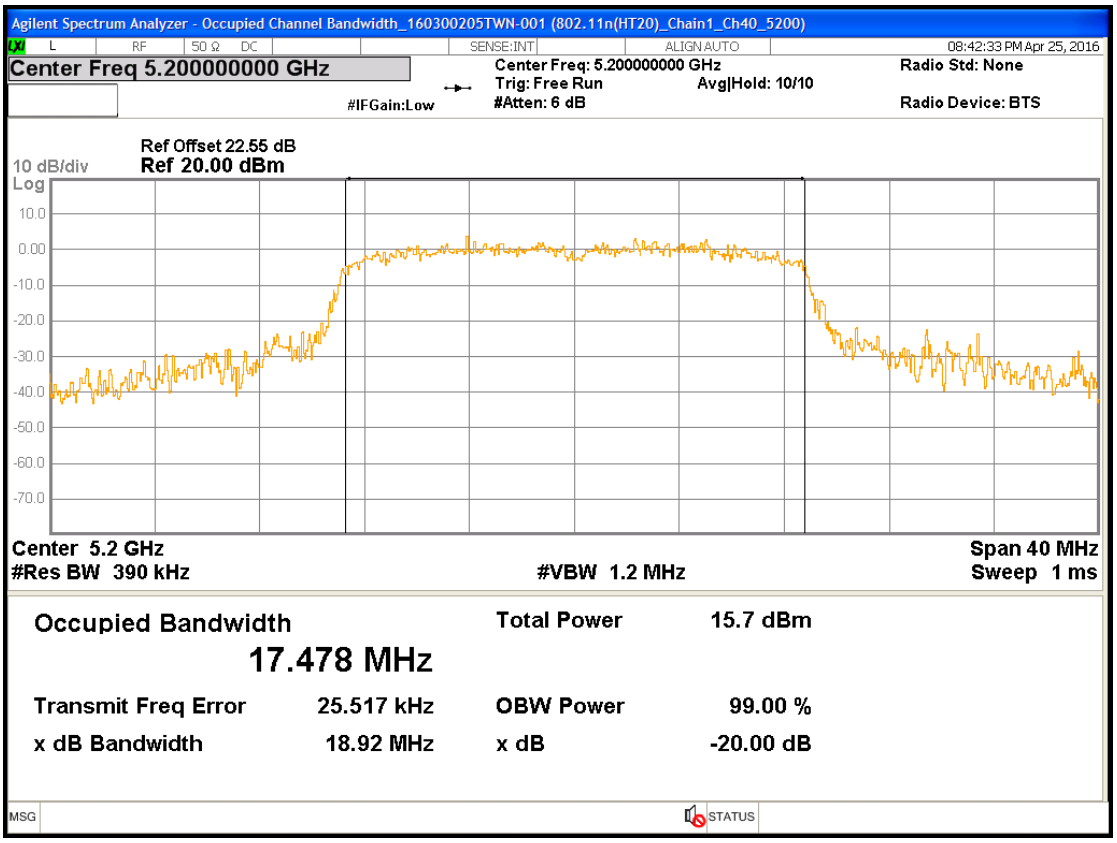
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch165



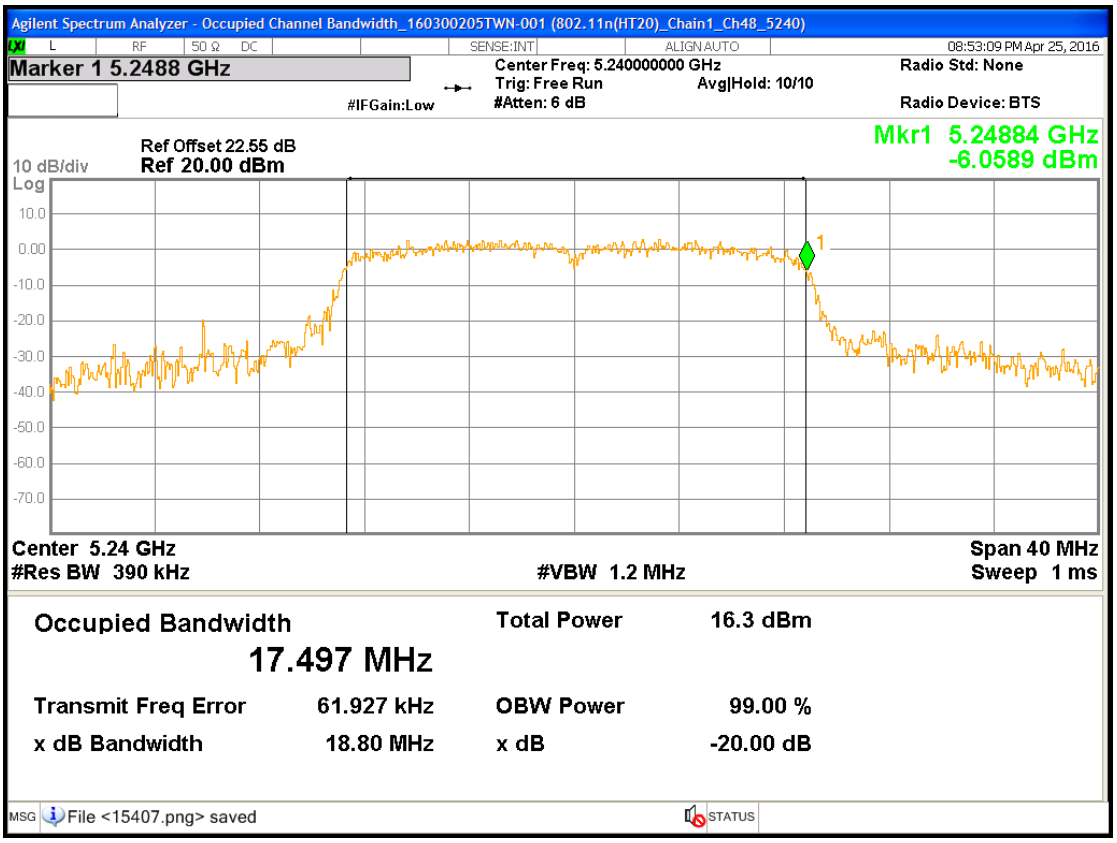
Chain1 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch36



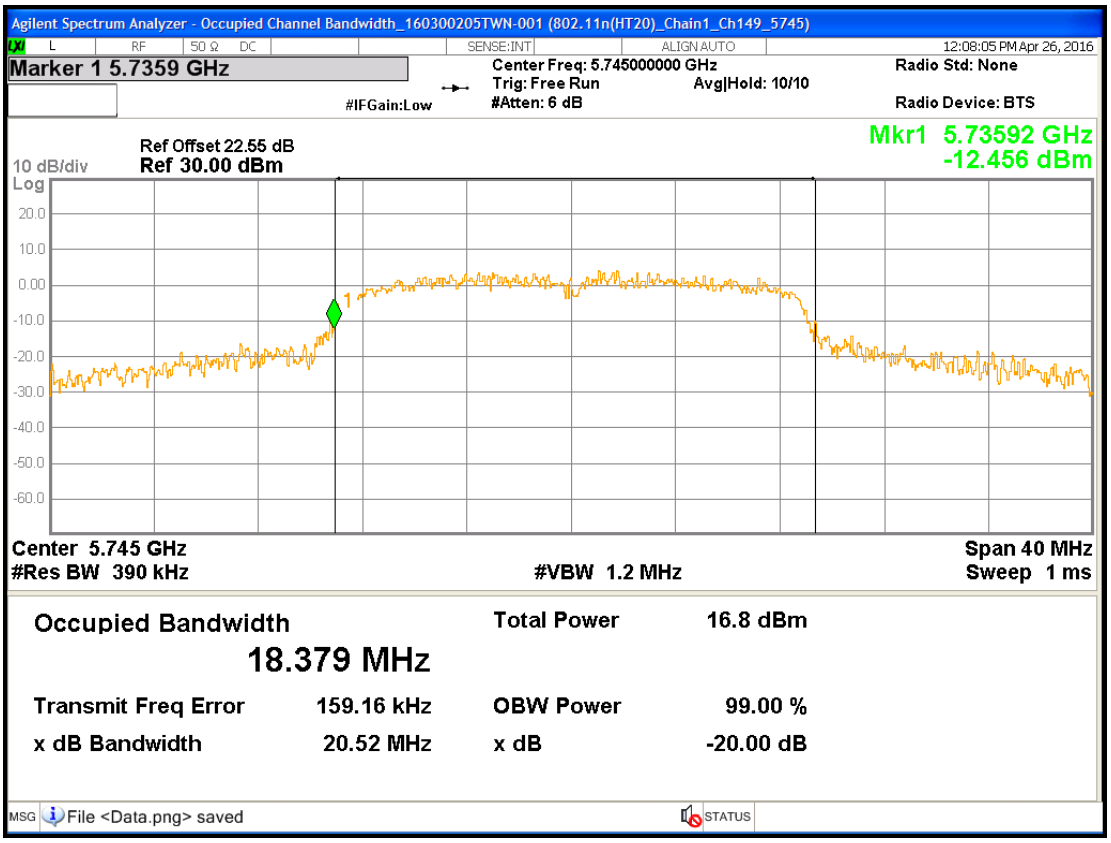
Chain1 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch40



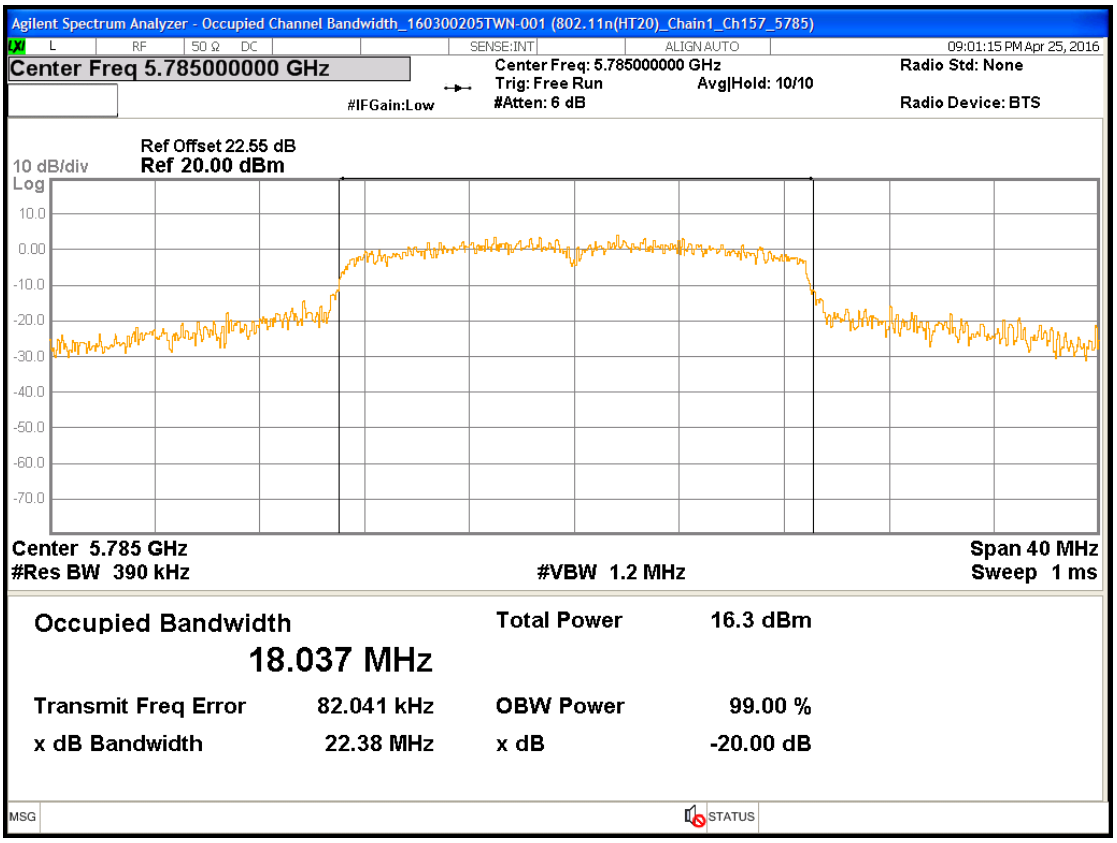
Chain1 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch48



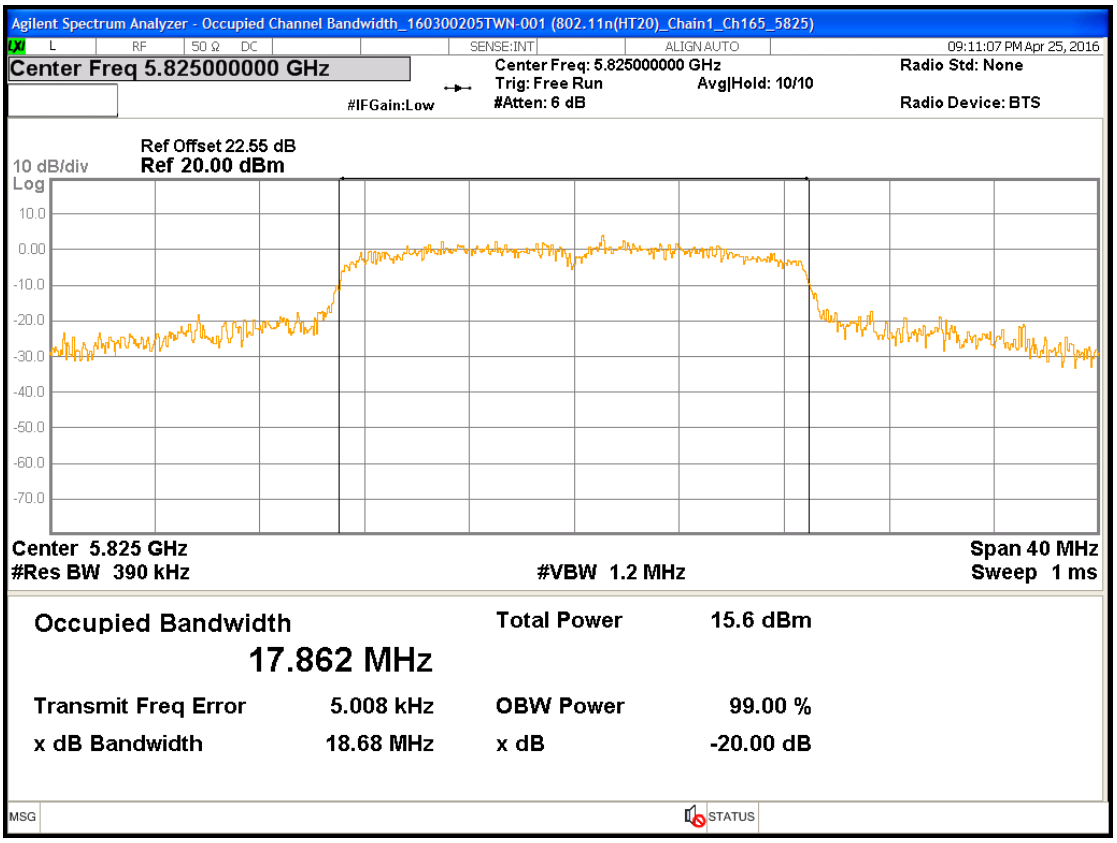
Chain1 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch149



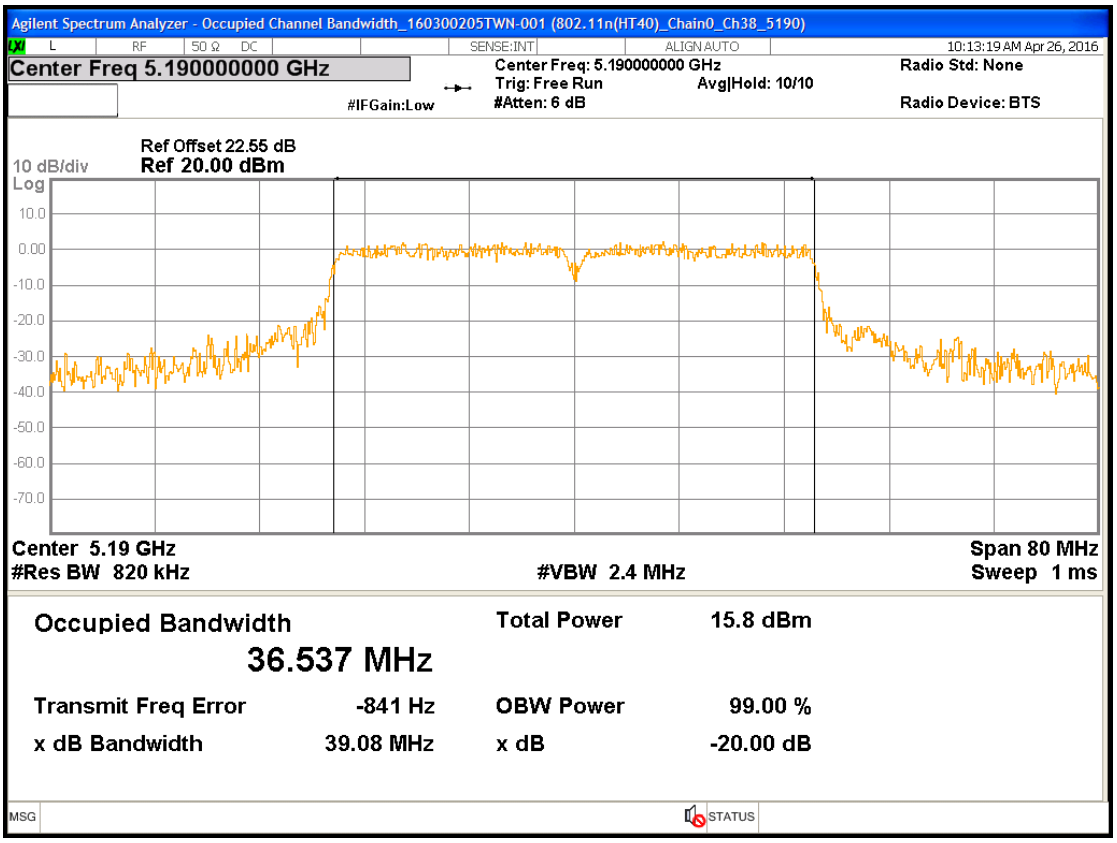
Chain1 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch157



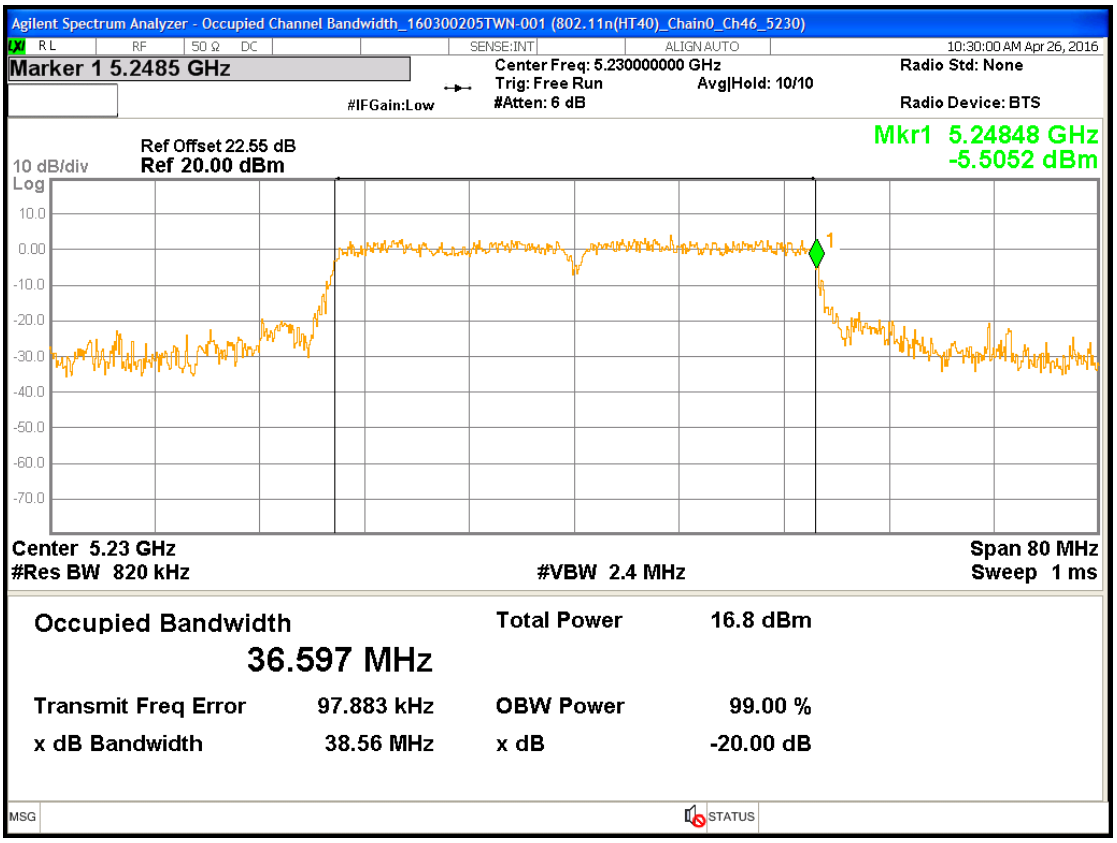
Chain1 : Occupied Channel Bandwidth @ 802.11n(HT20) mode Ch165



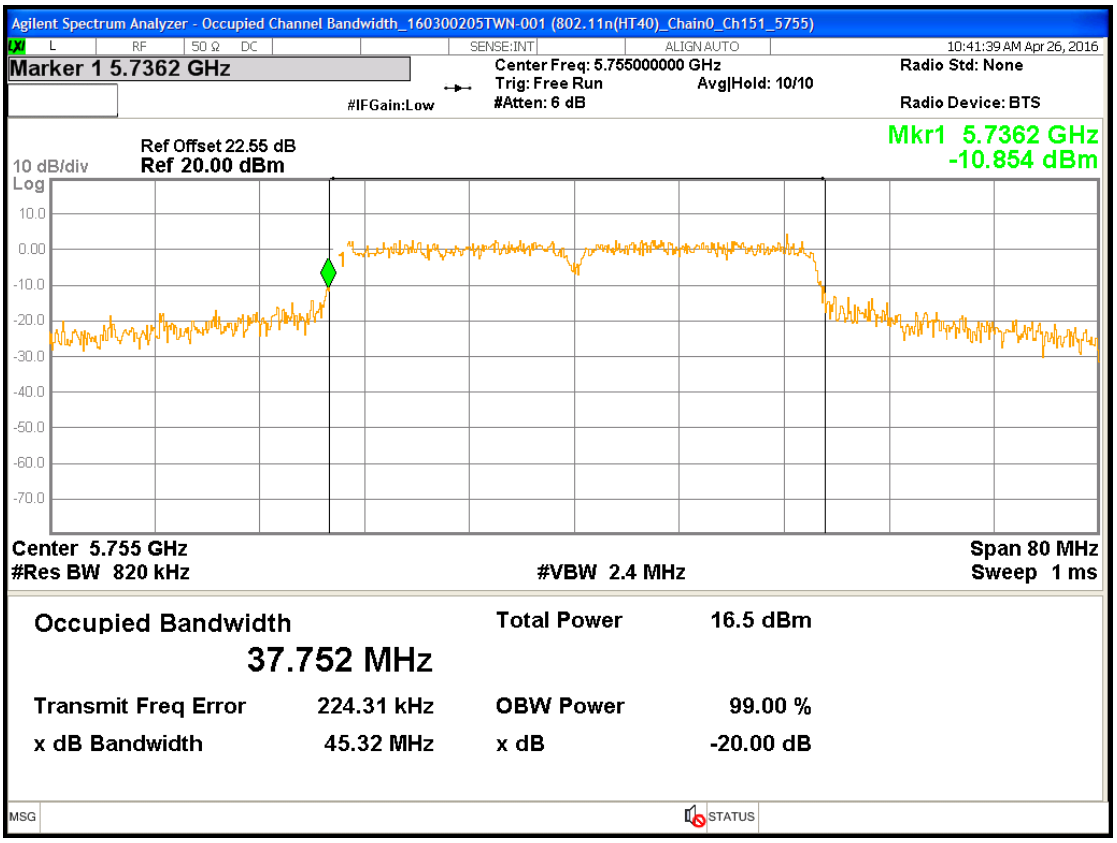
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT40) mode Ch38



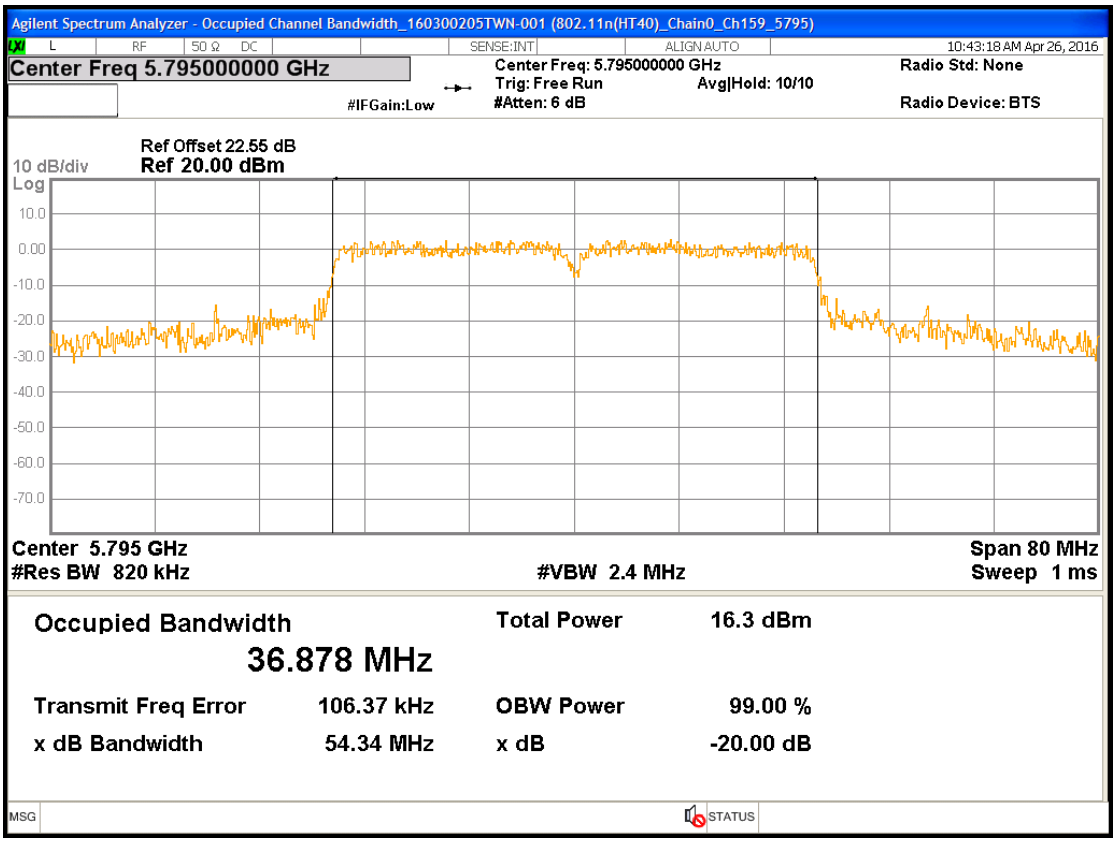
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT40) mode Ch46



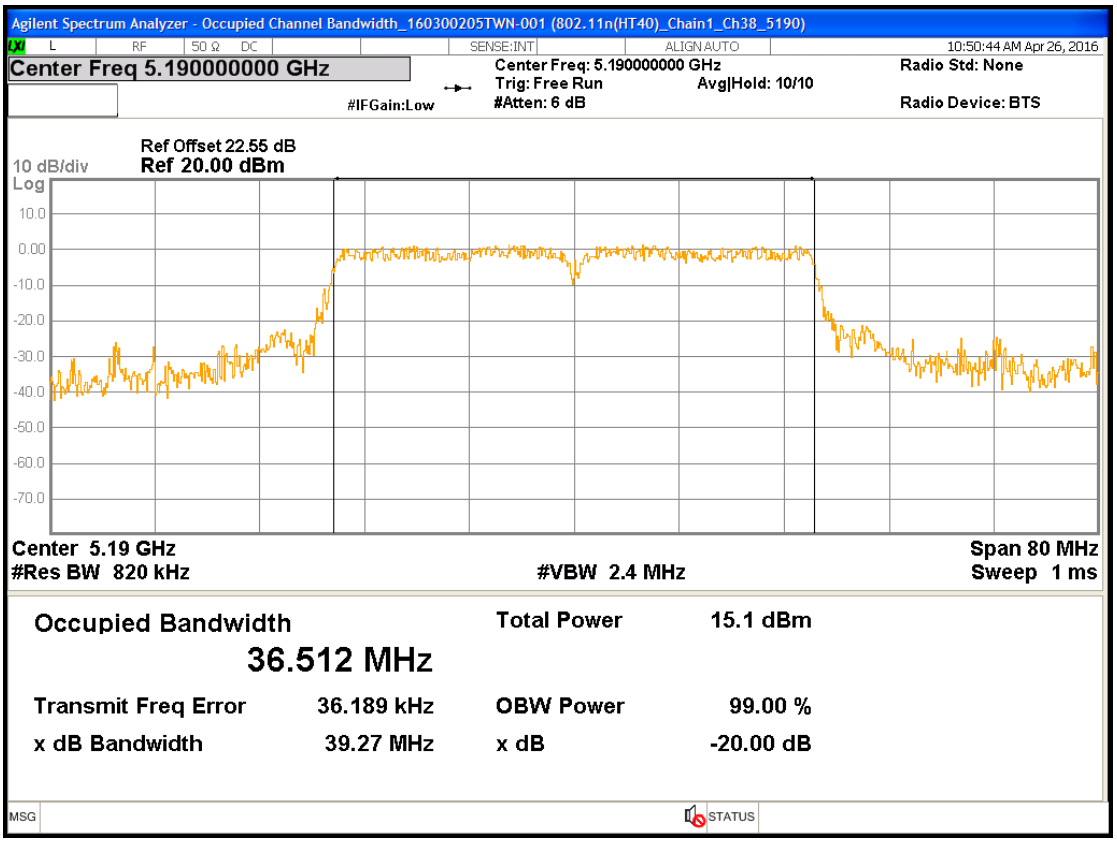
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT40) mode Ch151



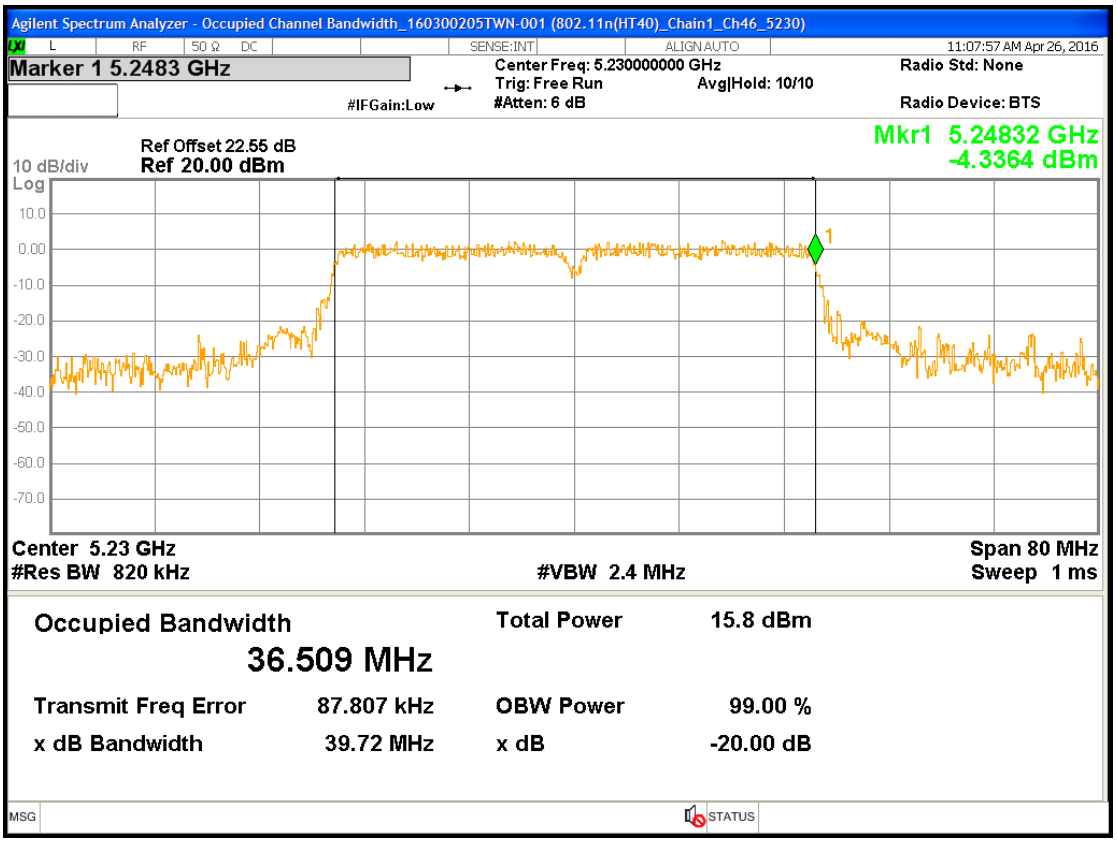
Chain0 : Occupied Channel Bandwidth @ 802.11n(HT40) mode Ch159



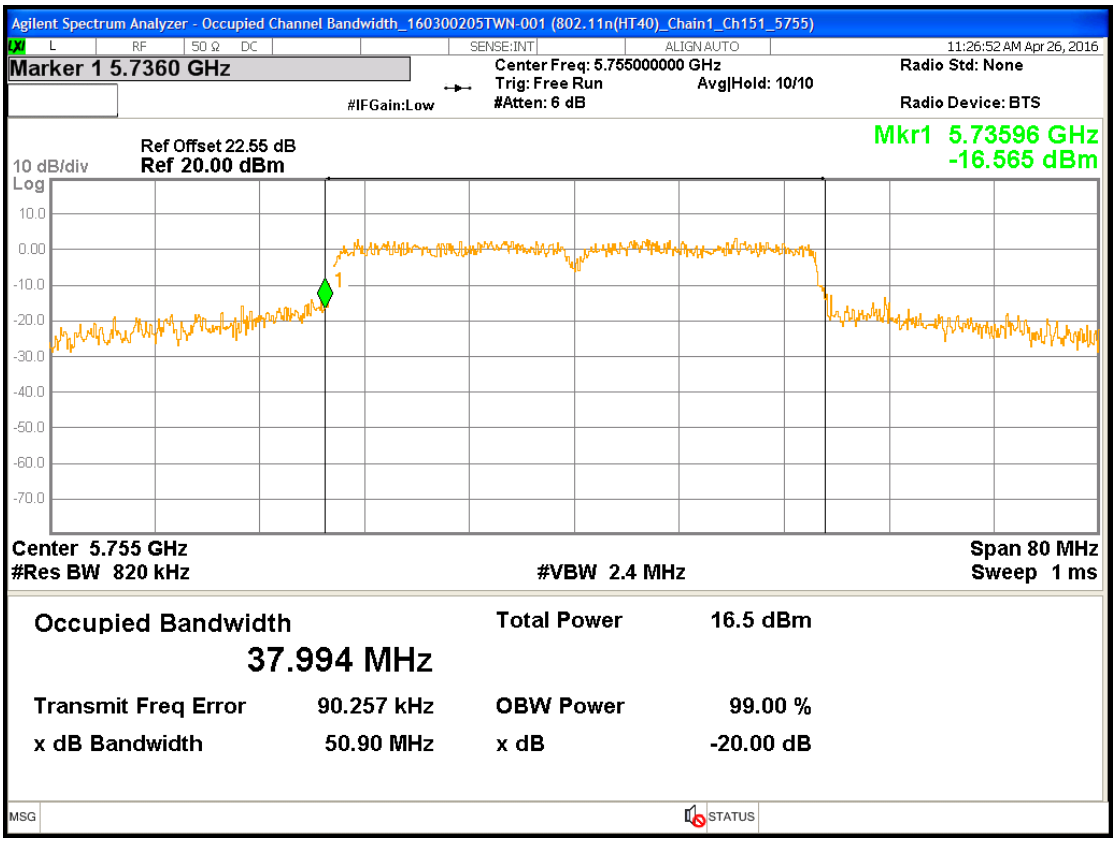
Chain1 : Occupied Channel Bandwidth @ 802.11n(HT40) mode Ch38



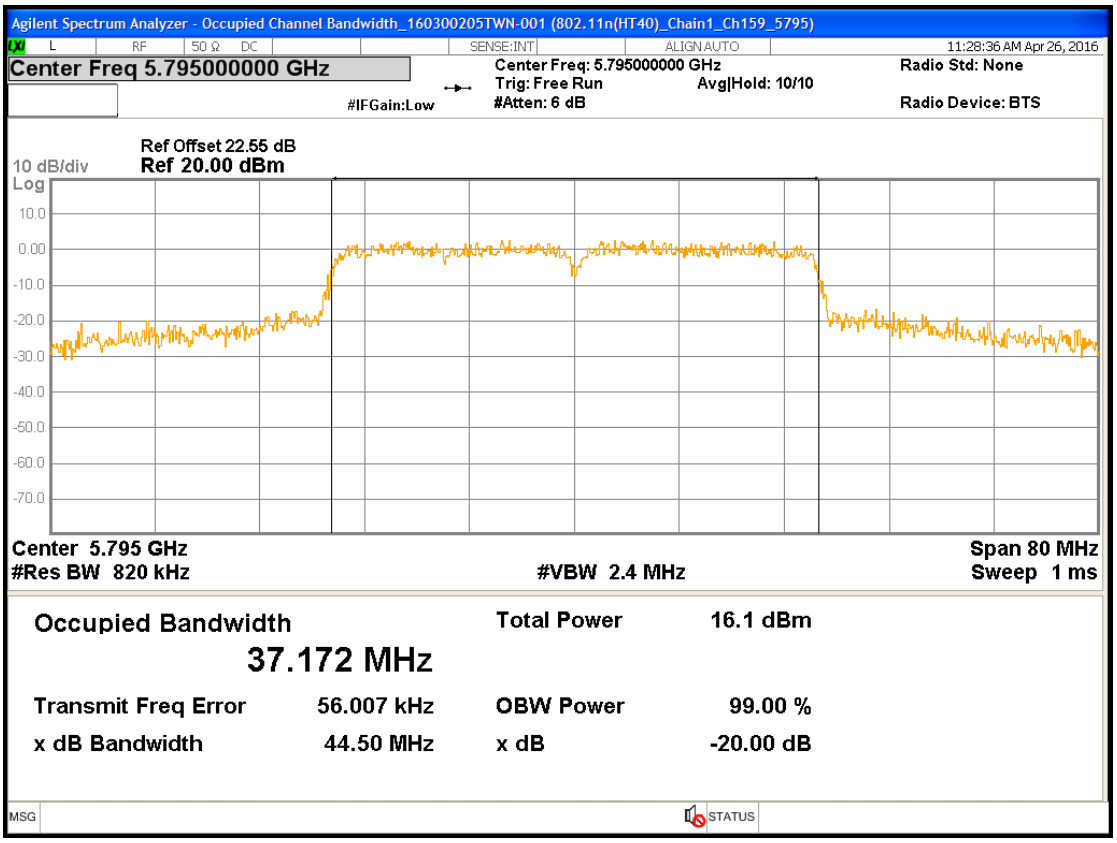
Chain1 : Occupied Channel Bandwidth @ 802.11n(HT40) mode Ch46



Chain1 : Occupied Channel Bandwidth @ 802.11n(HT40) mode Ch151



Chain1 : Occupied Channel Bandwidth @ 802.11n(HT40) mode Ch159



6. Emissions in Restricted Frequency Bands (Radiated emission measurements)

6.1 Operating environment

Temperature:	25	℃
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa
Channel number	36,40,48,149,157,161 for 20MHz 38,46,151,159 for 40MHz	

6.2 Limit for emission in restricted frequency bands (Radiated emission measurement)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	2400/F(kHz)	30
1.705~30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

As specified in 15.407(b), For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:
All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

6.3 Measuring instrument setting

Below 1GHz measurement

Receiver settings	
Receiver function	**Setting**
Detector	QP
RBW	9-150 kHz ; 200-300 Hz 0.15-30 MHz; 9-10 kHz 30-1000 MHz; 100-120 kHz
VBW	≧3 x RBW
Sweep	Auto couple
Attenuation	Auto

Above 1GHz measurement

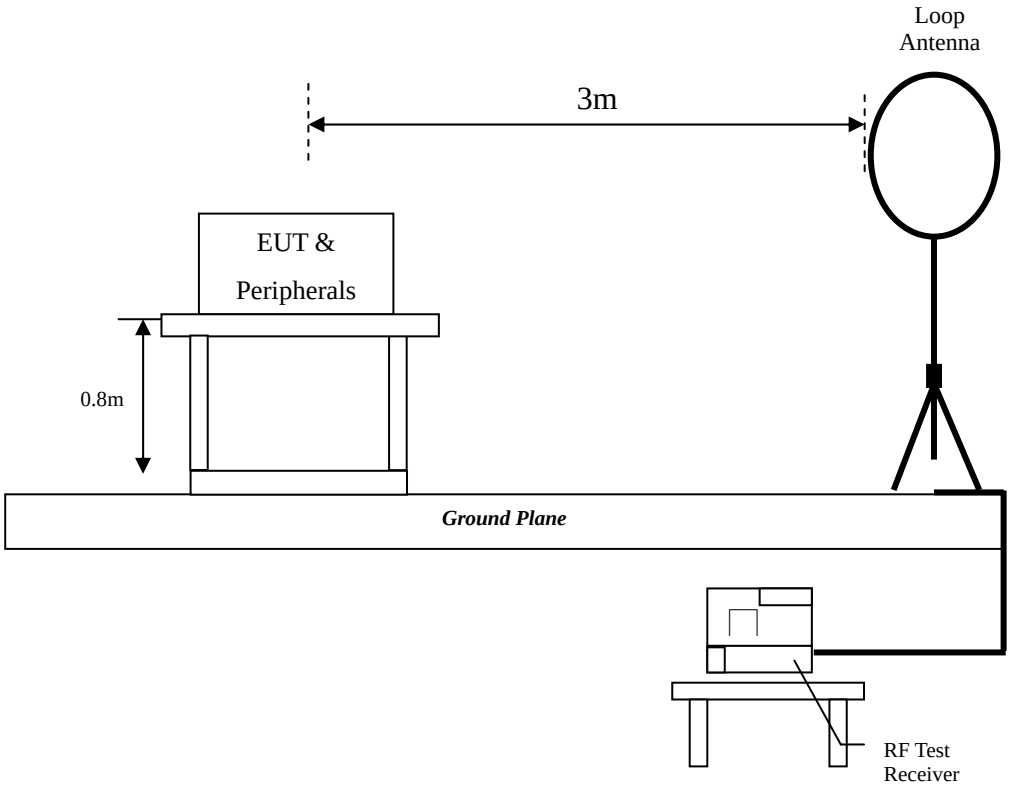
Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	1MHz
VBW	3MHz for Peak; 10Hz for Average
Sweep	Auto couple
Start Frequency	1GHz
Stop Frequency	Tenth harmonic
Attenuation	Auto

6.4 Test procedure

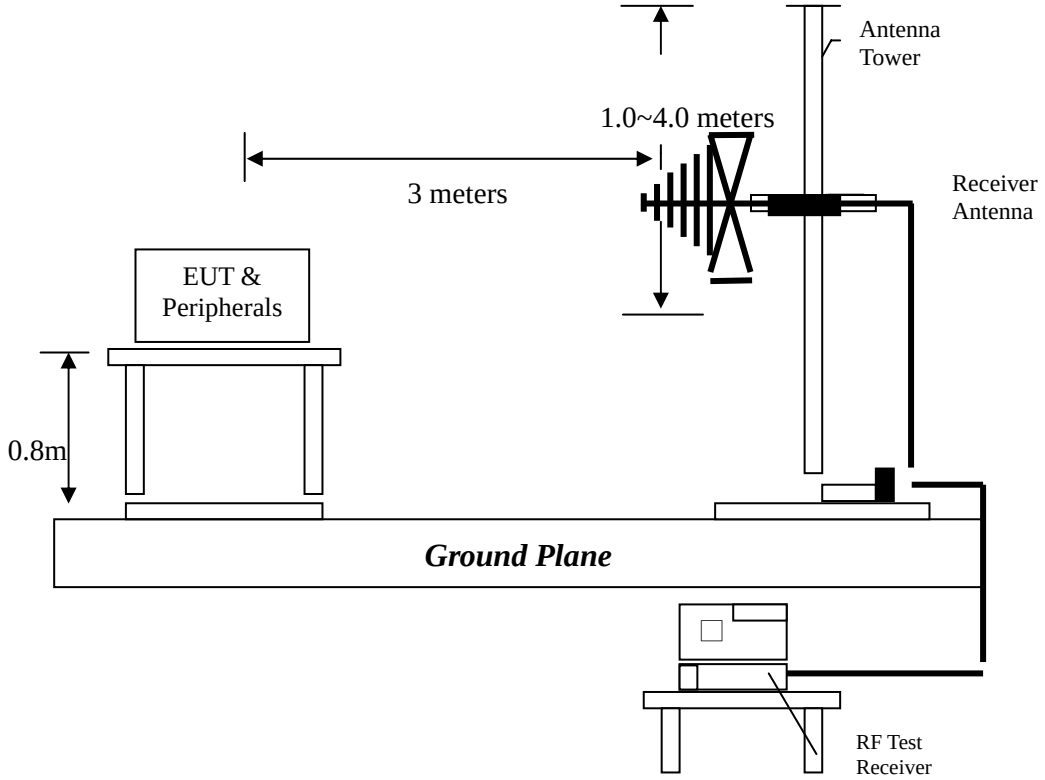
1. Configure the EUT according to ANSI C63.10: 2013 The EUT was placed on the top of the turntable 1.5 meter above ground for above 1GHz and placed on the top of the turntable 0.8 meter above ground for below 1GHz. The center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the companion devices. The turntable was rotated by 360 degree to find the position of the maximum emission level.
3. The height of the receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of the both horizontal and vertical polarization
4. If find the frequencies above the limit or below within 3dB, the antenna tower was scan (from 1m to 4m) and then the turntable was rotated to find the maximum reading.
5. Set the test-receiver system to peak or CISPR quasi-peak detector with specified bandwidth under maximum hold mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
   Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
7. If the emissions level of the EUT in peak mode was 3dB lower than the average limit specified then testing will be stopped and peak values of the EUT will be reported. Otherwise, the emissions which do not have 3dB margin will be measured using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, The emissions level of the EUT in peak mode was lower than average limit, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be quasi-peak measured by receiver.

6.5 Test configuration

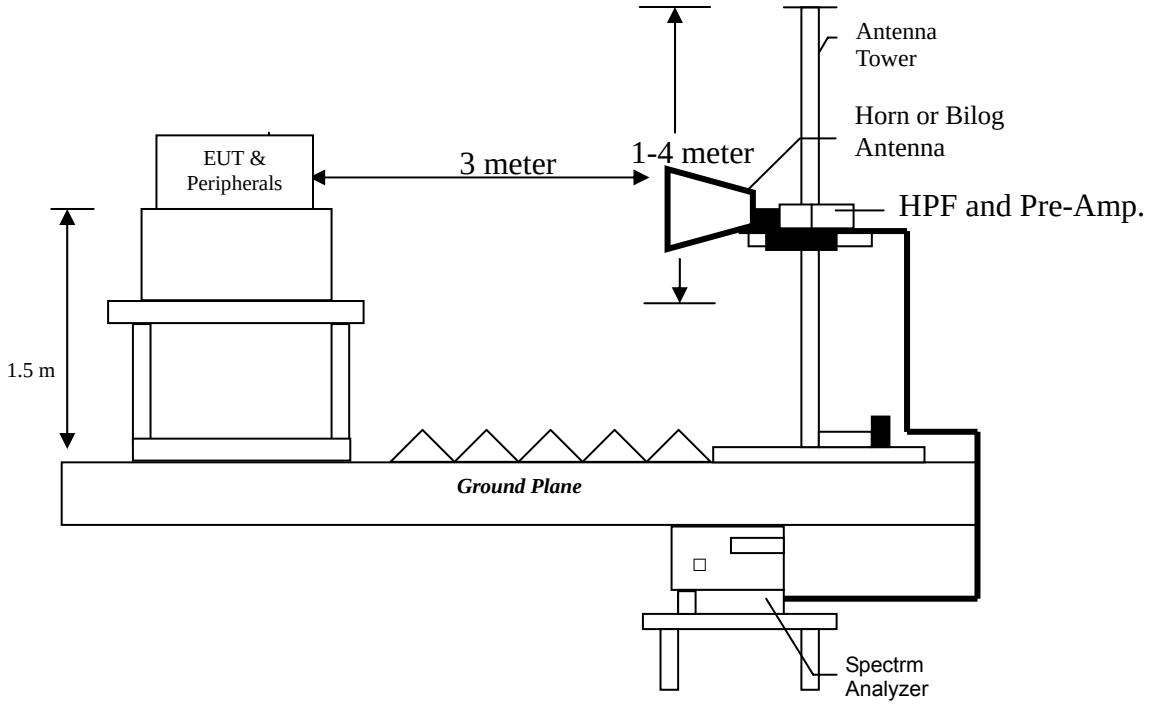
6.5.1 Radiated emission from 9 kHz to 30MHz using Loop Antenna



6.5.2 Radiated emission below 1GHz using Bilog Antenna



6.5.3 Radiated emission above 1GHz using Horn Antenna



6.6 Test results

6.6.1 Measurement results: frequencies from 9 kHz to 30MHz

Frequency (MHz)	Detection value	Factor (dB/m)	Reading (dBµV)	Value (dBµV/m)	Limit @ 3m (dBµV/m)	Tolerance (dB)
0.02	QP	20.92	14.19	35.11	200.00	-164.90
0.03	QP	20.86	18.20	39.06	160.00	-120.94
0.04	QP	20.85	11.93	32.78	140.00	-107.23
0.07	QP	20.81	14.54	35.35	114.29	-78.94

Remark: Corr. Factor = Antenna Factor + Cable Loss - PreAmplifier Gain

6.6.2 Measurement results: frequencies from 30 MHz to 1GHz

The test was performed on EUT under 802.11a/an continuously transmitting mode. The worst case occurred at 802.11n(HT20) Tx channel 36.

EUT : HURESAC-3XE-C
Worst Case : 802.11n(HT20) Tx channel 36

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
Vertical	47.46	QP	16.97	18.10	35.07	40.00	-4.93
Vertical	142.52	QP	16.16	16.91	33.07	43.50	-10.43
Vertical	191.02	QP	13.98	23.11	37.09	43.50	-6.41
Vertical	288.02	QP	17.06	23.38	40.44	46.00	-5.56
Vertical	336.52	QP	18.38	19.44	37.82	46.00	-8.18
Vertical	528.58	QP	22.60	16.20	38.80	46.00	-7.20
Horizontal	142.52	QP	15.15	15.57	30.72	43.50	-12.78
Horizontal	191.02	QP	16.00	18.81	34.81	43.50	-8.69
Horizontal	216.24	QP	16.44	17.12	33.56	46.00	-12.44
Horizontal	288.02	QP	17.70	21.64	39.34	46.00	-6.66
Horizontal	336.52	QP	18.55	17.77	36.32	46.00	-9.68
Horizontal	528.58	QP	21.92	10.65	32.57	46.00	-13.43

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

6.6.3 Measurement results: frequency above 1GHz to 40GHz

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
802.11a Ch36 Chain0	10360	PK	V	38.95	12.23	46.99	59.22	74.00	-14.78
	10360	AV	V	38.95	12.23	33.97	46.20	54.00	-7.80
	10360	PK	H	38.95	12.23	46.18	58.41	74.00	-15.59
	10360	AV	H	38.95	12.23	33.14	45.37	54.00	-8.63
802.11a Ch40 Chain0	10400	PK	V	38.97	12.36	49.01	61.37	74.00	-12.63
	10400	AV	V	38.97	12.36	37.41	49.77	54.00	-4.23
	10400	PK	H	38.97	12.36	49.27	61.63	74.00	-12.37
	10400	AV	H	38.97	12.36	36.46	48.82	54.00	-5.18
802.11a Ch48 Chain0	10480	PK	V	39.03	12.62	50.79	63.41	74.00	-10.59
	10480	AV	V	39.03	12.62	38.00	50.62	54.00	-3.38
	10480	PK	H	39.03	12.62	47.92	60.54	74.00	-13.46
	10480	AV	H	39.03	12.62	34.93	47.55	54.00	-6.45
802.11a Ch149 Chain0	11490	PK	V	39.01	14.46	44.46	58.92	74.00	-15.08
	11490	AV	V	39.01	14.46	30.64	45.10	54.00	-8.90
	11490	PK	H	39.01	14.46	40.50	54.96	74.00	-19.04
	11490	AV	H	39.01	14.46	29.23	43.69	54.00	-10.31
802.11a Ch157 Chain0	11570	PK	V	38.98	14.33	44.79	59.12	74.00	-14.88
	11570	AV	V	38.98	14.33	31.84	46.17	54.00	-7.83
	11570	PK	H	38.98	14.33	40.33	54.66	74.00	-19.34
	11570	AV	H	38.98	14.33	27.56	41.89	54.00	-12.11
802.11a Ch165 Chain0	11650	PK	V	38.94	14.16	45.30	59.46	74.00	-14.54
	11650	AV	V	38.94	14.16	32.37	46.53	54.00	-7.47
	11650	PK	H	38.94	14.16	40.08	54.24	74.00	-19.76
	11650	AV	H	38.94	14.16	27.27	41.43	54.00	-12.57

Remark:

Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
802.11a Ch36 Chain1	10360	PK	V	38.95	12.23	51.89	64.12	74.00	-9.88
	10360	AV	V	38.95	12.23	39.02	51.25	54.00	-2.75
	15540	PK	H	38.21	15.50	50.51	66.01	74.00	-7.99
	15540	AV	H	38.21	15.50	37.99	53.49	54.00	-0.51
802.11a Ch40 Chain1	10400	PK	V	38.97	12.36	53.46	65.82	74.00	-8.18
	10400	AV	V	38.97	12.36	40.01	52.37	54.00	-1.63
	15600	PK	H	38.17	15.34	51.94	67.28	74.00	-6.72
	15600	AV	H	38.17	15.34	38.07	53.41	54.00	-0.59
802.11a Ch48 Chain1	10480	PK	V	39.03	12.62	54.35	66.97	74.00	-7.03
	10480	AV	V	39.03	12.62	40.75	53.37	54.00	-0.63
	15720	PK	H	38.08	15.03	52.47	67.50	74.00	-6.50
	15720	AV	H	38.08	15.03	38.41	53.44	54.00	-0.56
802.11a Ch149 Chain1	10480	PK	V	39.03	12.62	47.88	60.50	74.00	-13.50
	10480	AV	V	39.03	12.62	35.75	48.37	54.00	-5.63
	10480	PK	H	39.03	12.62	43.36	55.98	74.00	-18.02
	10480	AV	H	39.03	12.62	31.19	43.81	54.00	-10.19
802.11a Ch157 Chain1	11490	PK	V	39.01	14.46	39.53	53.99	74.00	-20.01
	11490	AV	V	39.01	14.46	27.79	42.25	54.00	-11.75
	11490	PK	H	39.01	14.46	40.19	54.65	74.00	-19.35
	11490	AV	H	39.01	14.46	28.16	42.62	54.00	-11.38
802.11a Ch165 Chain1	11570	PK	V	38.98	14.33	39.38	53.71	74.00	-20.29
	11570	AV	V	38.98	14.33	27.40	41.73	54.00	-12.27
	11570	PK	H	38.98	14.33	39.36	53.69	74.00	-20.31

Remark:

Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
802.11n (HT20) Ch36	10360	PK	V	38.95	12.23	44.98	57.21	74.00	-16.79
	10360	AV	V	38.95	12.23	34.14	46.37	54.00	-7.63
	10360	PK	H	38.95	12.23	44.36	56.59	74.00	-17.41
	10360	AV	H	38.95	12.23	32.99	45.22	54.00	-8.78
802.11n (HT20) Ch40	10400	PK	V	38.97	12.36	48.61	60.97	74.00	-13.03
	10400	AV	V	38.97	12.36	37.52	49.88	54.00	-4.12
	10400	PK	H	38.97	12.36	44.91	57.27	74.00	-16.73
	10400	AV	H	38.97	12.36	33.79	46.15	54.00	-7.85
802.11n (HT20) Ch48	10480	PK	V	39.03	12.62	49.61	62.23	74.00	-11.77
	10480	AV	V	39.03	12.62	38.75	51.37	54.00	-2.63
	10480	PK	H	39.03	12.62	44.85	57.47	74.00	-16.53
	10480	AV	H	39.03	12.62	33.90	46.52	54.00	-7.48
802.11n (HT20) Ch149	11490	PK	V	39.01	14.46	40.37	54.83	74.00	-19.17
	11490	AV	V	39.01	14.46	28.09	42.55	54.00	-11.45
	11490	PK	H	39.01	14.46	39.81	54.27	74.00	-19.73
	11490	AV	H	39.01	14.46	27.70	42.16	54.00	-11.84
802.11n (HT20) Ch157	11570	PK	V	38.98	14.33	40.95	55.28	74.00	-18.72
	11570	AV	V	38.98	14.33	28.74	43.07	54.00	-10.93
	11570	PK	H	38.98	14.33	38.84	53.17	74.00	-20.83
802.11n (HT20) Ch165	11650	PK	V	38.94	14.16	40.54	54.70	74.00	-19.30
	11650	AV	V	38.94	14.16	28.39	42.55	54.00	-11.45
	11650	PK	H	38.94	14.16	39.25	53.41	74.00	-20.59

Remark:

Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
80.211n (HT40) Ch38	11380	PK	V	39.02	14.31	40.83	55.14	74.00	-18.86
	11380	AV	V	39.02	14.31	38.95	53.26	54.00	-0.74
	10380	PK	H	38.96	12.29	41.63	53.92	74.00	-20.08
	10380	AV	H	38.96	12.29	29.60	41.89	54.00	-12.11
80.211n (HT40) Ch46	10460	PK	V	39.01	12.56	47.43	59.99	74.00	-14.01
	10460	AV	V	39.01	12.56	35.06	47.62	54.00	-6.38
	10460	PK	H	39.01	12.56	42.69	55.25	74.00	-18.75
	10460	AV	H	39.01	12.56	30.55	43.11	54.00	-10.89
80.211n (HT40) Ch151	11510	PK	V	39.01	14.46	39.03	53.49	74.00	-20.51
	11510	PK	H	39.01	14.46	38.93	53.39	74.00	-20.61
80.211n (HT40) Ch159	11590	PK	V	38.97	14.29	39.44	53.73	74.00	-20.27
	11590	AV	V	38.97	14.29	27.40	41.69	54.00	-12.31
	11590	PK	H	38.97	14.29	38.85	53.14	74.00	-20.86

Remark:

Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

7. Emission on The Band Edge

7.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement	15.407(b), 15.209	
Channel	36, 38, 42, 46, 48 149, 157, 165, 151, 159, 155	

7.2 Measuring instrument setting

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	1MHz
VBW	3MHz for Peak; 10Hz for Average
Sweep	Auto couple
Restrict bands	4500~5150MHz
	5350 ~5460MHz
Attenuation	Auto

Applicable to	**Limit**	
	EIRP Limit (dBm)	**Equivalent Field Strength at 3m (dBμV/m)**
5715-5725MHz	PK	PK
5850-5860MHz	-17	78.2

7.3 Test procedure

The test procedure is the same as clause 6.4

7.4 Test Result

Mode	CH	Freq. (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)	Restricted band (MHz)
802.11a Chain 0	36	5150.00	PK	V	39.27	1.50	69.45	70.95	74	-3.05	4500~5150
		5150.00	AV	V	39.27	1.50	51.09	52.59	54	-1.41	
	48	5447.96	PK	V	38.34	3.30	59.32	62.62	74	-11.38	5350~5460
		5447.43	AV	V	38.34	3.30	46.13	49.43	54	-4.57	
802.11a Chain 1	36	5150.00	PK	V	39.27	1.50	67.77	69.27	74	-4.73	4500~5150
		5150.00	AV	V	39.27	1.50	51.70	53.20	54	-0.80	
	48	5391.83	PK	V	38.52	2.96	58.59	61.55	74	-12.45	5350~5460
		5385.36	AV	V	38.54	2.92	45.75	48.67	54	-5.33	
802.11n (HT20) Chain 0+1	36	5150.00	PK	V	39.27	1.50	68.21	69.71	74	-4.29	4500~5150
		4864.40	AV	V	39.96	0.16	51.16	51.32	54	-2.68	
	48	5386.44	PK	V	38.53	2.93	58.87	61.80	74	-12.20	5350~5460
		5447.34	AV	V	38.34	3.30	46.15	49.45	54	-4.55	
802.11n (HT40) Chain 0+1	38	5144.00	PK	V	39.28	1.46	68.73	70.19	74	-3.81	4500~5150
		5150.00	AV	V	39.27	1.50	51.07	52.57	54	-1.43	
	46	5449.82	PK	V	38.34	3.32	58.99	62.31	74	-11.69	5350~5460
		5447.03	AV	V	38.34	3.30	46.37	49.67	54	-4.33	

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

8. Power Line Conducted Emission

8.1 Operating environment

Temperature:	20	℃
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa
Requirement	15.207	

8.2 Limit for AC power line conducted emission

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

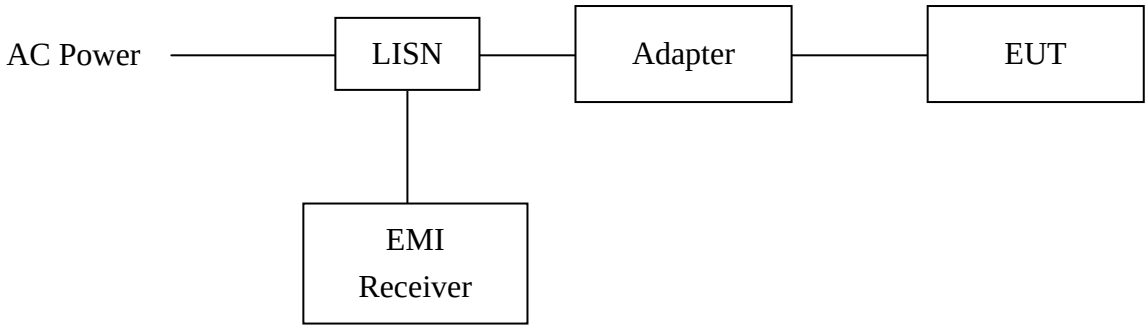
8.3 Measuring instrument setting

Receiver settings	
Receiver function	**Setting**
Detector	QP
Start frequency	0.15 MHz
Stop frequency	30 MHz
IF bandwidth	9 kHz
Attenuation	10 dB

8.4 Test procedure

1. Configure the EUT according to ANSI C63.10:2013. The EUT or host of EHT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network.
3. All the companion devices are connected to the other LISN. The LISN should provide 50Uh/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30MHz was searched
5. Set the test-receiver system to peak detector and specified bandwidth with maximum hold mode.
6. The measurement has to be done between each power line and ground at the power terminal.

8.5 Test diagram



Note: The EUT was tested while in normal communication mode.

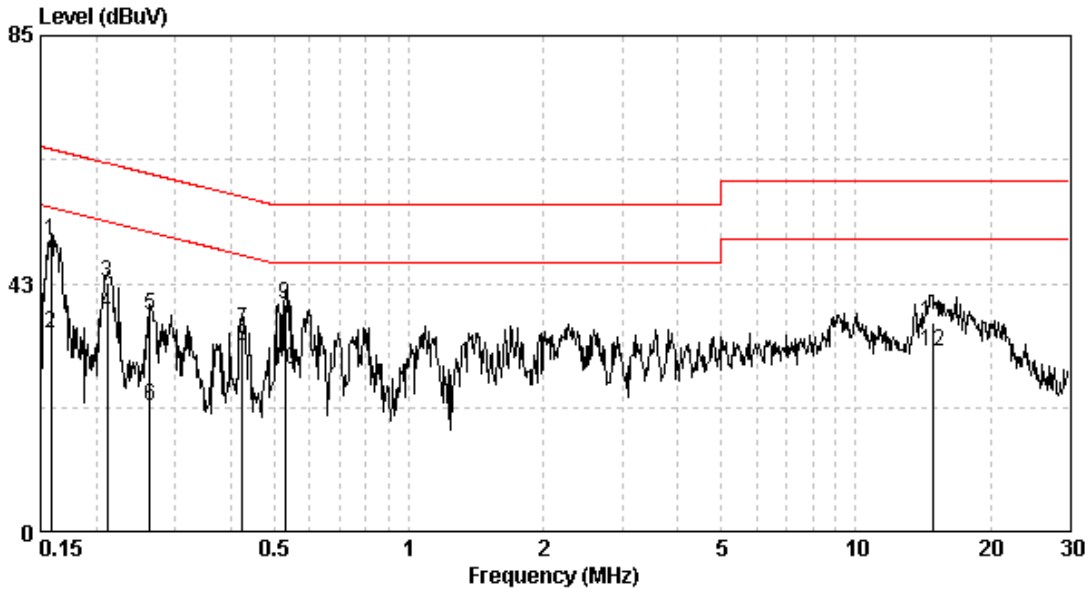
8.6 Test results

Phase : Line
EUT : HURESAC-3XE-C
Test Condition : TX mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Av
0.158	9.74	49.74	65.56	34.09	55.56	-15.82	-21.47
0.212	9.74	42.80	63.14	37.22	53.14	-20.34	-15.92
0.263	9.74	37.06	61.34	21.36	51.34	-24.28	-29.98
0.424	9.73	34.55	57.37	31.84	47.37	-22.82	-15.54
0.529	9.74	38.81	56.00	27.60	46.00	-17.19	-18.40
14.828	9.88	35.80	60.00	30.81	50.00	-24.20	-19.19

Remark:

1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Over Limit (dB) = Level (dBuV) – Limit (dBuV)

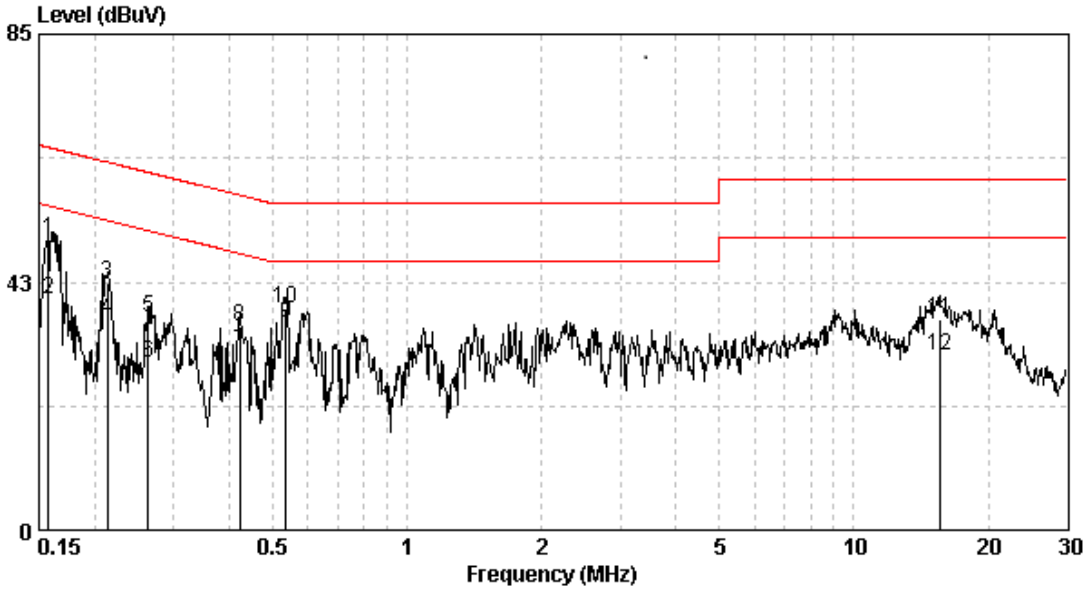


Phase	: Neutral
EUT	: HURESAC-3XE-C
Test Condition	: TX mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Av
0.157	9.74	49.91	65.60	39.40	55.60	-15.70	-16.21
0.214	9.74	42.37	63.05	36.23	53.05	-20.68	-16.82
0.263	9.74	36.57	61.34	28.50	51.34	-24.76	-22.83
0.421	9.73	34.85	57.42	30.57	47.42	-22.57	-16.85
0.535	9.74	38.00	56.00	35.42	46.00	-18.00	-10.58
15.552	9.92	36.21	60.00	29.89	50.00	-23.79	-20.11

Remark:

1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Appendix A: Test equipment list

Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
ESCI EMI Test Receiver	Rohde & Schwarz	ESCI	100018	2015/12/02	2016/11/30
Spectrum Analyzer	Rohde & Schwarz	FSP30	100137	2015/08/18	2016/08/16
Horn Antenna (1-18G)	SHWARZBECK	BBHA 9120 D	9120D-456	2014/08/29	2017/08/27
Horn Antenna (14-42G)	SHWARZBECK	BBHA 9170	BBHA9170159	2014/09/16	2017/09/14
Broadband Antenna	SHWARZBECK	VULB 9168	9168-172	2013/08/08	2016/08/06
Pre-Amplifier	EMC Co.	EMC12635SE	980205	2015/10/7	2016/10/05
Pre-Amplifier	MITEQ	JS4-26004000--27-8A	828825	2015/09/15	2016/09/13
Power Meter	Anritsu	ML2495A	0844001	2015/11/11	2016/11/09
Power Sensor	Anritsu	MA2411B	0738452	2015/11/11	2016/11/09
Two-Line V-Network	Rohde & Schwarz	ENV216	101159	2015/06/08	2016/06/06
Artificial Mains Network (LISN)	Schaffner	MN2050D	1586	2015/05/27	2016/05/25
CON-1 Cable	SUHNER	BNC / RG-58	1521946	2015/05/09	2016/05/07
Test software	Audix	e3	4.2004-1-12k	NCR	NCR
Signal Analyzer	Agilent	N9030A	MY51380492	2015/09/21	2016/09/19
966-2(A) Cable 9kHz~26.5GHz	SUHNER	SMA / EX 100	N/A	2015/05/06	2016/05/05
966-2(B) Cable 9kHz~26.5GHz	SUHNER	SMA / SUCOFLEX 104P	CB0005	2015/05/06	2016/05/04

Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
RF Cable 9kHz~26.5GHz	SUHNER	SUCOFLEX 102	CB0006	2015/05/06	2016/05/05
966-2_3m Semi-Anechoic Chamber	966_2	CEM-966_2	N/A	2016/02/24	2017/02/22
High Pass Filter	Reactel	7HS-3G/18G-S11	N/A	2015/06/06	2016/06/04
Active Loop Antenna	SCHWARZBECK MESS-ELEKTRONIC	FMZB1519	1519-067	2016/03/03	2017/03/02
EMI Test Receiver	Rohde & Schwarz	ESR-7	101232	2015/12/02	2016/11/30
Test software	ADT	Radiated test system	7.5.14	NCR	NCR

Note: No Calibration Required (NCR).

Appendix B: Measurement Uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of *k*=2.

Item	Uncertainty
Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.14 dB
Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.22 dB
Vertically polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	3.64 dB
Horizontally polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	3.64 dB
Vertically polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m	2.7 dB
Horizontally polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m	2.7 dB
Radiated disturbances from 9kHz~30MHz in a semi-anechoic chamber at a distance of 3m	3.53 dB
Emission on the Band Edge Test	3.64 dB
Minimum Emission Bandwidth	0.85 dB
Maximum Conducted Output Power	0.42 dB
Power Spectral Density	0.85 dB
AC Power Line Conducted Emission	2.47 dB