



**FCC PART 15 SUBPART C
ISED RSS-247 ISSUE 2**

CERTIFICATION TEST REPORT

For

Huawei STB / Huawei BOX

MODEL NUMBER: Q21F

FCC ID: QIS-Q21F

IC: 6369A-Q21F

REPORT NUMBER: 4788692075.1-5

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Prepared for

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V0	10/24/2018	Initial Issue	



Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	6dB Bandwidth and 99% Bandwidth	FCC 15.247 (a) (2) RSS-247 Clause 5.2 (a)	PASS
2	Peak Conducted Output Power	FCC 15.247 (b) (3) RSS-247 Clause 5.4 (e)	PASS
3	Power Spectral Density	FCC 15.247 (e) RSS-247 Clause 5.2 (b)	PASS
4	Conducted Bandedge and Spurious Emission	FCC 15.247 (d) RSS-247 Clause 5.5	PASS
5	Radiated Bandedge and Spurious Emission	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	PASS
6	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
7	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: HUAWEI TECHNOLOGIES CO., LTD.
Address: Administration Building, Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, P.R. China, 518129

Manufacturer Information

Company Name: HUAWEI TECHNOLOGIES CO., LTD.
Address: Administration Building, Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, P.R. China, 518129

EUT Description

EUT Name: Huawei STB / Huawei BOX
Model: Q21F
Brand Name: HUAWEI
Sample Status: Normal
Sample Received Date: September 28, 2018
Date of Tested: October 8, 2018 ~ October 17, 2018

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC Part 15 Subpart C	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 5	PASS

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with 558074 D01 DTS Meas Guidance v05, 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013, ISED RSS-247 Issue 2 and ISED RSS-GEN Issue 5.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p>A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p>FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules</p> <p>IC(Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320.</p> <p>VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011</p>
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.



4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.62dB
Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.2dB
Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.00dB
Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.78dB (1GHz-18Gz)
	5.23dB (18GHz-26Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	



5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	Huawei STB / Huawei BOX		
Model	Q21F		
Radio Technology	IEEE802.11b/g/n HT20/n HT40		
Operation frequency	IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz IEEE 802.11n HT40: 2422MHz—2452MHz		
Modulation	IEEE 802.11b: DSSS(CCK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)		
Rated Input	DC 12V		
Power Supply	Power Adapter	Input	AC120~240V, 50/60Hz, 0.5A
		Output	DC 12V, 1.0A

5.2. MAXIMUM OUTPUT POWER

Number of Transmit Chains (NTX)	IEE Std. 802.11	Frequency (MHz)	Channel Number	Max PK Conducted Power (dBm)
1	IEEE 802.11b	2412-2462	1-11[11]	17.22
1	IEEE 802.11g	2412-2462	1-11[11]	21.18
1	IEEE 802.11nHT20	2412-2462	1-11[11]	23.56
1	IEEE 802.11nHT40	2422-2452	3-9[7]	23.66

5.3. CHANNEL LIST

Channel List for 802.11b/g/n (20 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452	/	/

Channel List for 802.11n (40 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	5	2432	7	2442	9	2452
4	2427	6	2437	8	2447	/	/



5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
WiFi TX(802.11b)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11g)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT20)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT40)	CH 3, CH 6, CH 9	2422MHz, 2437MHz, 2452MHz

5.5. THE WORSE CASE CONFIGURATIONS

The Worst Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Software		Tera Term					
Modulation Mode	Transmit Antenna Number	Test Channel					
		NCB: 20MHz			NCB: 40MHz		
		CH 1	CH 6	CH 11	CH 3	CH 6	CH 9
802.11b	1	Default	Default	Default	/		
802.11g	1	Default	Default	Default			
802.11n HT20	1	Default	Default	Default			
802.11n HT40	1	/			Default	Default	Default



5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Chain Ant.	Frequency (MHz)	Max Antenna Gain (dBi)	Antenna Type
A	2412-2472	PCB Antenna	0
B	2412-2472	PCB Antenna	0

Test Mode	Transmit and Receive Mode	Description
IEEE 802.11b	<input checked="" type="checkbox"/> 1TX, 1RX	Chain 1 or Chain 2 can be used as transmitting/receiving antenna.
IEEE 802.11g	<input checked="" type="checkbox"/> 1TX, 1RX	Chain 1 or Chain 2 can be used as transmitting/receiving antenna.
IEEE 802.11n HT20	<input checked="" type="checkbox"/> 2TX, 2RX	Chain 1 and Chain 2 can be used as transmitting/receiving antenna.

5.7. WORST-CASE CONFIGURATIONS

IEE Std. 802.11	Modulation Technology	Modulation Type	Data Rate (Mbps)	Worst Case (Mbps)
b	DSSS	CCK	11/5.5/2/1	1
g	OFDM	BPSK, QPSK, 16QAM, 64QAM	54/48/36/24/18/12/9/6	6
n HT20	OFDM	BPSK, QPSK, 16QAM, 64QAM	(MCS0~MCS23)	MCS0

Remarks: EUT support for SISO and CDD MIMO Transmission, only 802.11n supports CDD MIMO Mode, SISO mode sets the same power level as MIMO mode, so MIMO mode is the WORST-CASE.

5.8. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	35 ~ 75%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	18 ~ 35°C
Voltage :	VL	/
	VN	AC 120V/60Hz
	VH	/

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage
VH= Upper Extreme Test Voltage
TN= Normal Temperature

5.9. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	Laptop	ThinkPad	T460S	SL10K24796 JS
2	High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23
3	Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4

Note:Item1 and Item2 only use for radiated test.

I/O CABLES

Item	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB	Unshielded	0.5	/

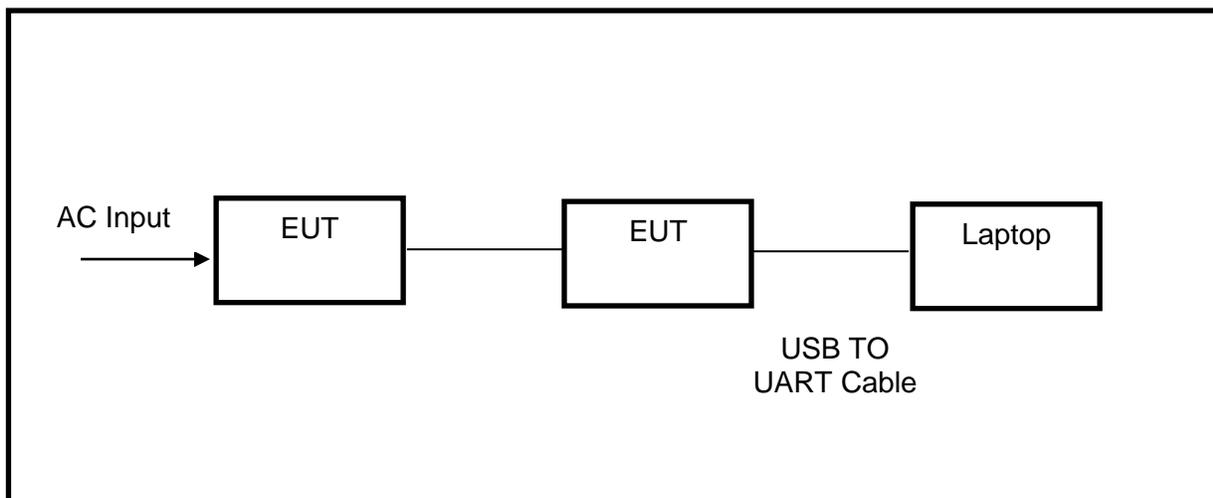
ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
1	AC ADAPTOR	HUAWEI	HW-120100E0W	Input: 100-240 Vac, 50/60 Hz, 0.5 A Output: 12Vdc, 1A
2	remote control	HUAWEI	/	/

TEST SETUP

The EUT can work in engineering mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS





6. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ESR3	101961	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Two-Line V-Network	R&S	ENV216	101983	Jan.16, 2018	Jan.16, 2019
<input checked="" type="checkbox"/>	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.12, 2017	Dec.12, 2018
Software						
Used	Description	Manufacturer	Name	Version		
<input checked="" type="checkbox"/>	Test Software for Conducted disturbance	UL	Antenna port	Ver. 7.2		
Radiated Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	MXE EMI Receiver	KESIGHT	N9038A	MY564000 36	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan.09, 2016	Jan.09, 2019
<input checked="" type="checkbox"/>	Preamplifier	HP	8447D	2944A0909 9	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	EMI Measurement Receiver	R&S	ESR26	101377	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2019
<input checked="" type="checkbox"/>	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2019
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-0118	TRS-305- 00066	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-2	TRS-307- 00003	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Loop antenna	Schwarzbeck	1519B	00008	Mar. 26, 2016	Mar. 26, 2019
Software						
Used	Description	Manufacturer	Name	Version		
<input checked="" type="checkbox"/>	Test Software for Radiated disturbance	Farad	EZ-EMC	Ver. UL-3A1		
Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9030A	MY554105 12	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Power Meter	Keysight	N9031A	MY554160 24	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Power Sensor	Keysight	N9323A	MY554400 13	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Power Sensor	Keysight	U2021XA	MY570300 04	Dec.12, 2017	Dec.12, 2018



7. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6dB Bandwidth	KDB 558074 D01 DTS Meas Guidance v05	8.2
2	Peak Output Power	KDB 558074 D01 DTS Meas Guidance v05	8.3.1.3/8.3.2.3
3	Power Spectral Density	KDB 558074 D01 DTS Meas Guidance v05	8.4
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 DTS Meas Guidance v05	8.5
5	Out-of-band emissions in restricted bands	KDB 558074 D01 DTS Meas Guidance v05	8.6
6	Band-edge	KDB 558074 D01 DTS Meas Guidance v05	8.7
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	6.2



8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

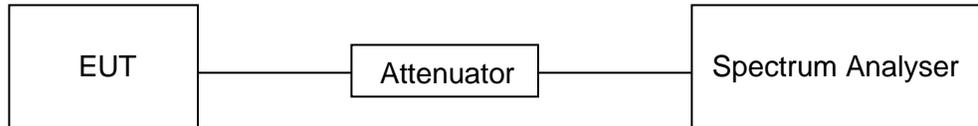
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (KHz)	Final setting For VBW (KHz)
11b	12.41	12.50	0.9928	99.28	0.03	0.08	0.01
11g	2.056	2.106	0.9763	97.63	0.10	0.49	0.5
11n20	1.913	1.978	0.9671	96.71	0.15	0.52	0.6
11n40	0.937	1.053	0.8898	88.98	0.51	1.07	1.1

Note:

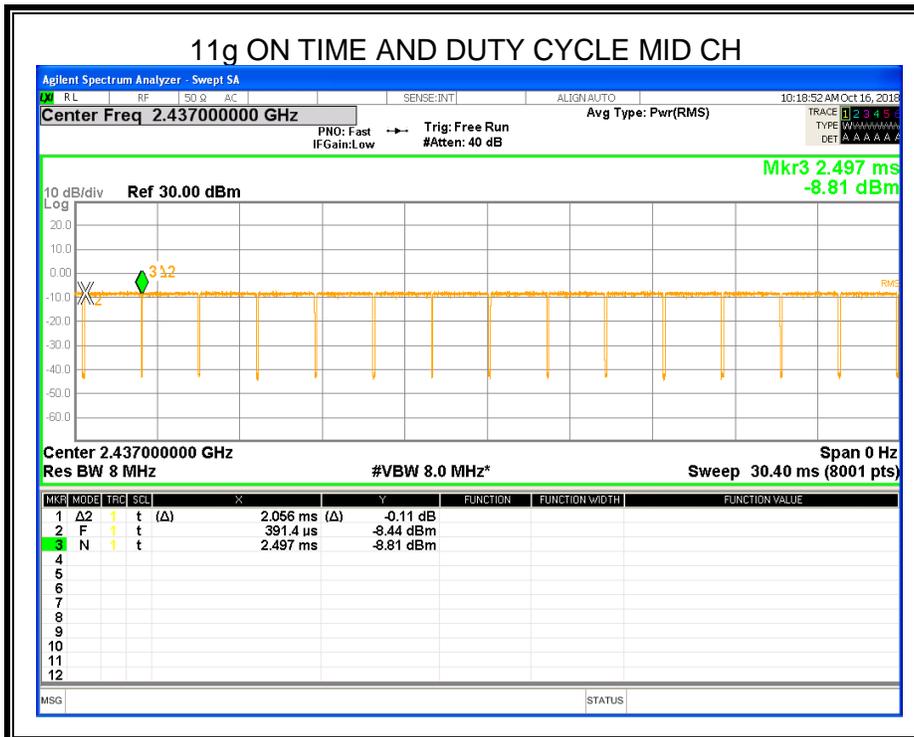
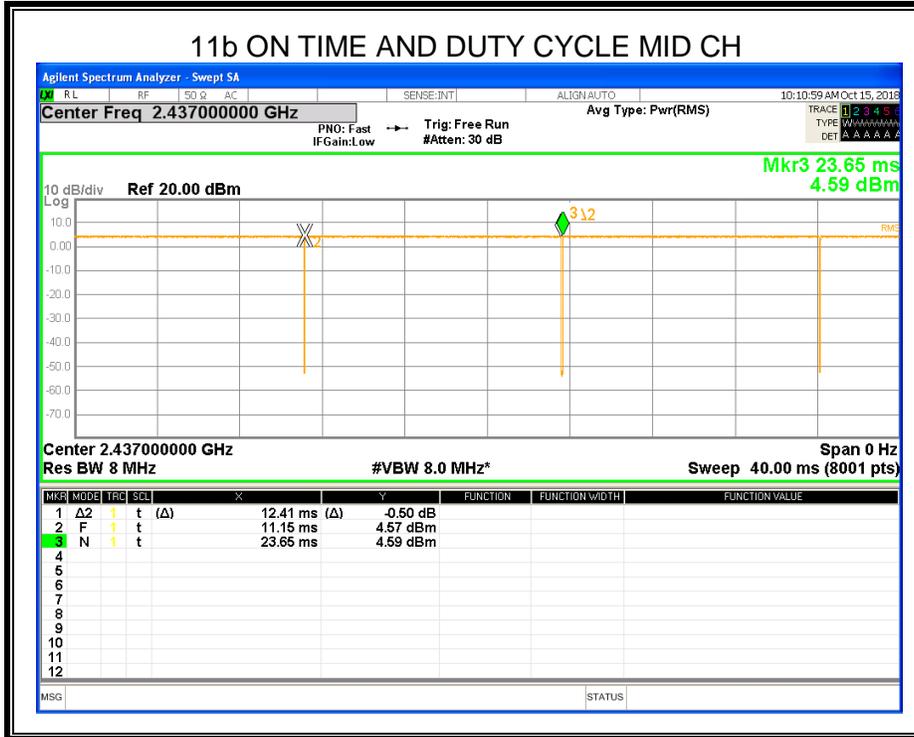
Duty Cycle Correction Factor=10log (1/x).

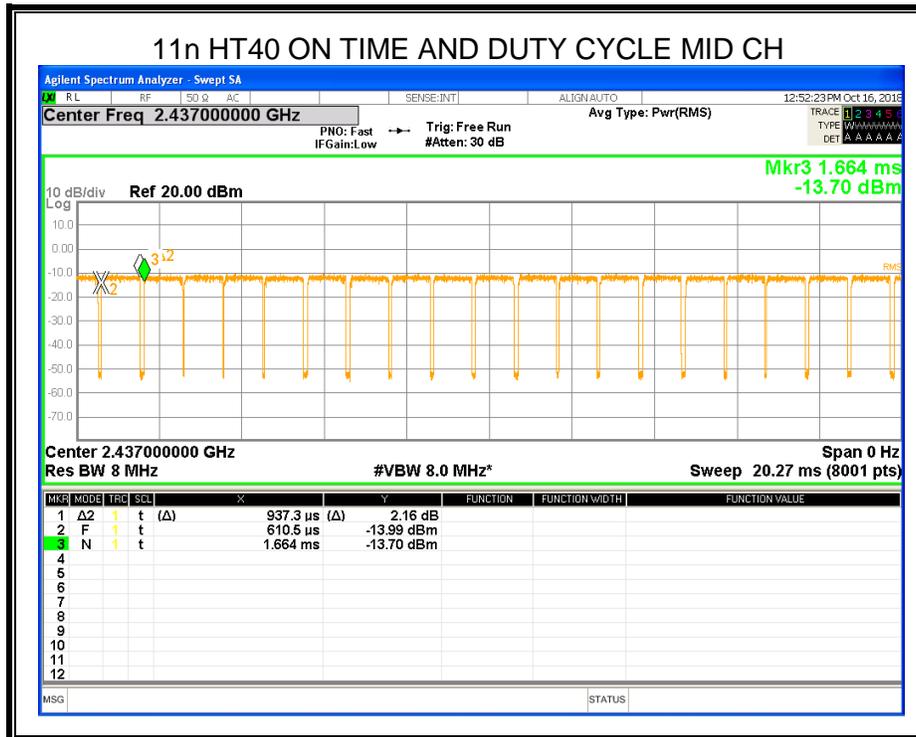
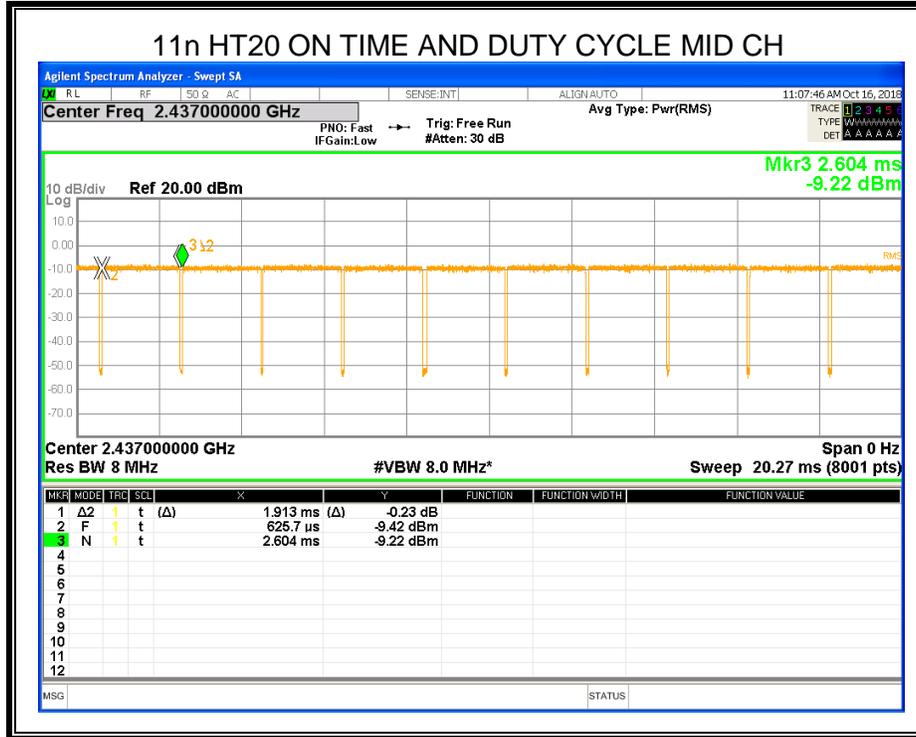
Where: x is Duty Cycle (Linear)

Where: T is On Time

If that calculated VBW is not available on the analyzer then the next higher value should be used.

Antenna A and Antenna B has the same duty cycle, only Antenna B data show here.







8.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(a)(2) RSS-247 5.1 (a)	6 dB Bandwidth	$\geq 500\text{KHz}$	2400-2483.5
RSS-Gen Clause 6.6	99% Bandwidth	For reporting purposes only.	2400-2483.5

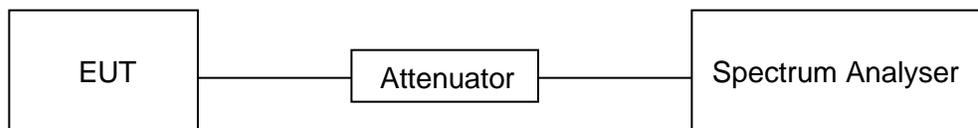
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	For 6dB Bandwidth :100K For 99% Occupied Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : $\geq 3 \times \text{RBW}$ For 99% Occupied Bandwidth : approximately $3 \times \text{RBW}$
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and 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 and 99% relative to the maximum level measured in the fundamental emission.

TEST SETUP



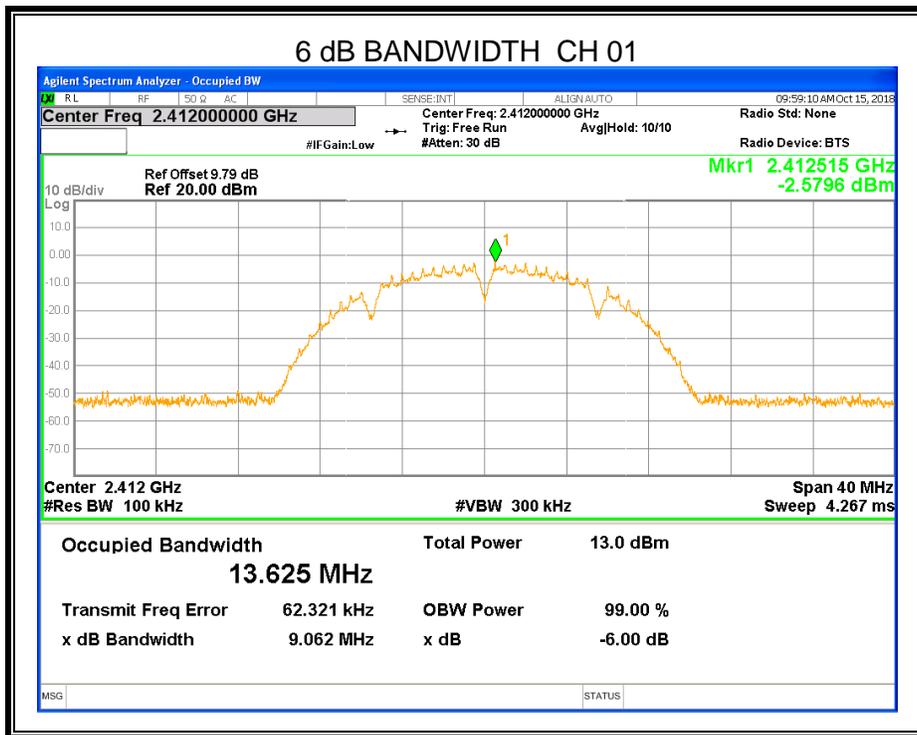


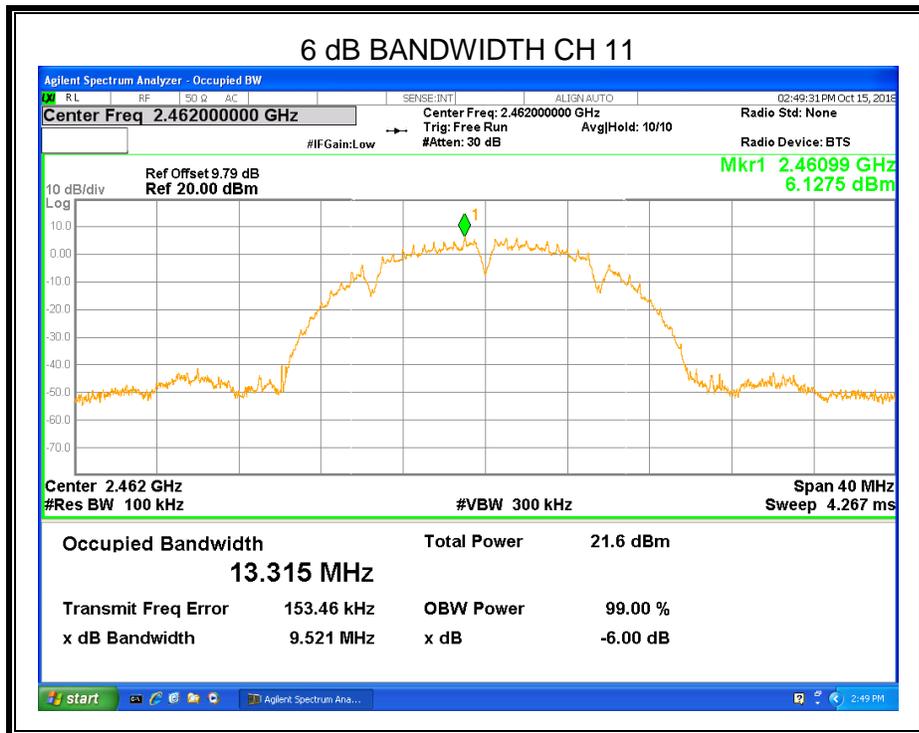
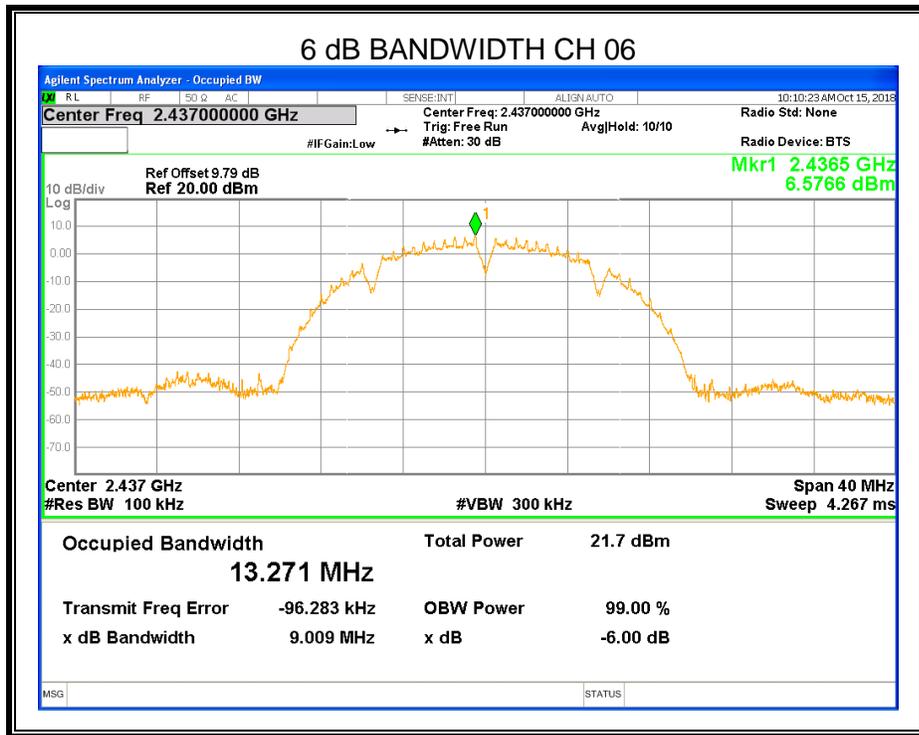
RESULTS

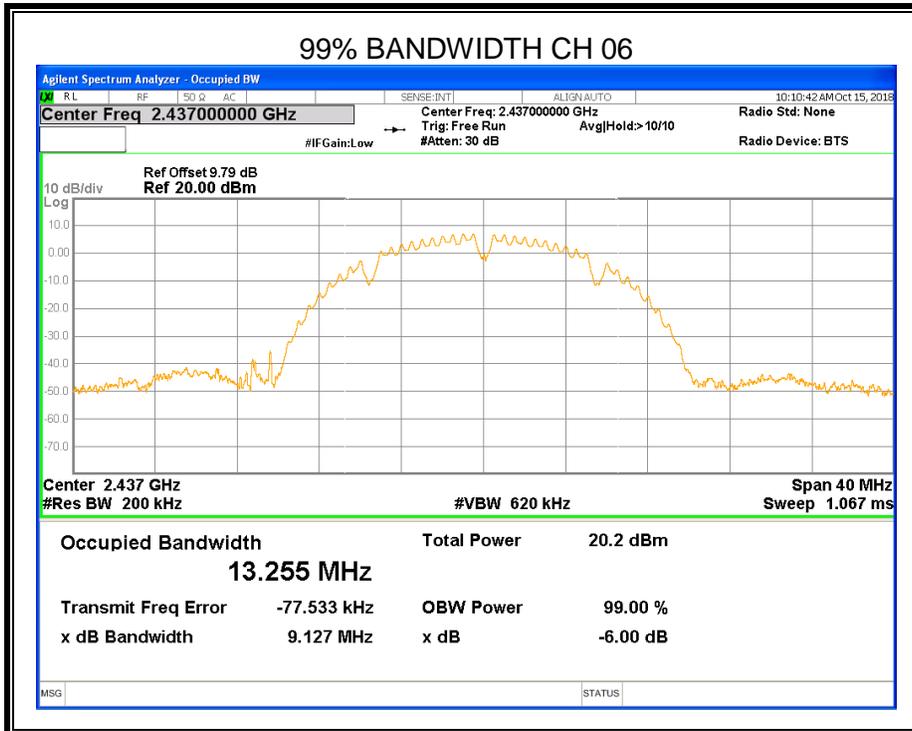
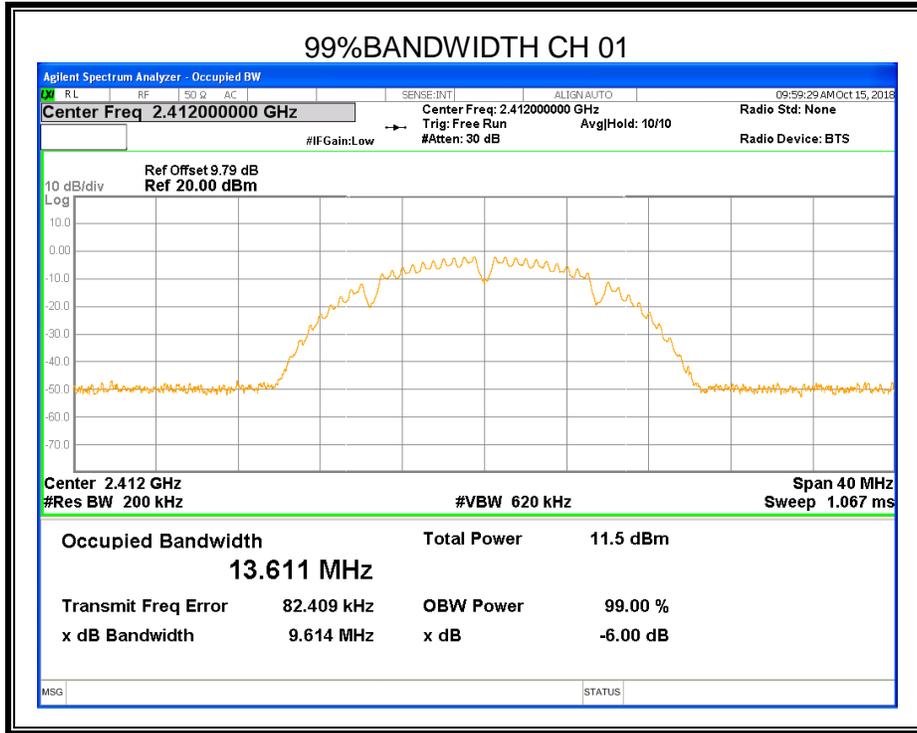
ANTENNA B (WORST-CASE CONFIGURATION)

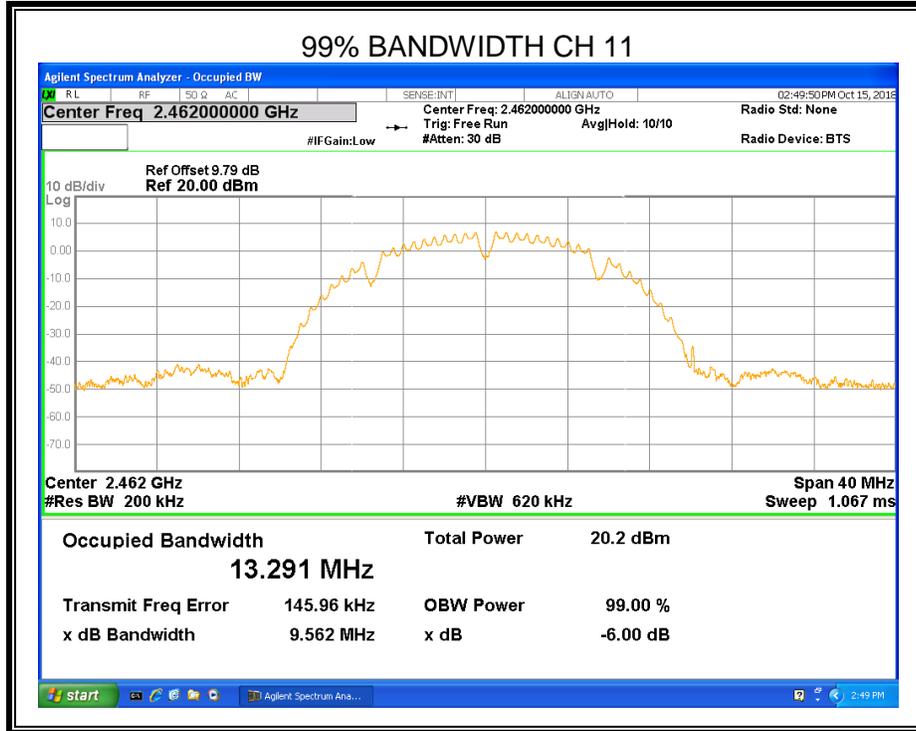
8.2.1. 802.11b MODE

Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
01	9.062	13.611	≲500	Pass
06	9.009	13.255	≲500	Pass
11	9.521	13.291	≲500	Pass





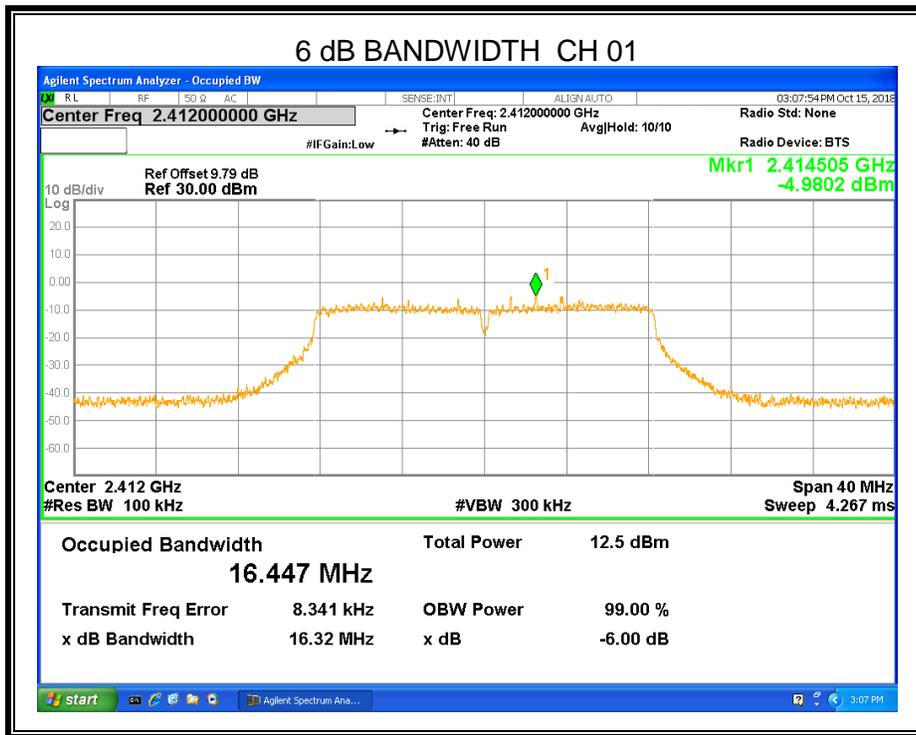


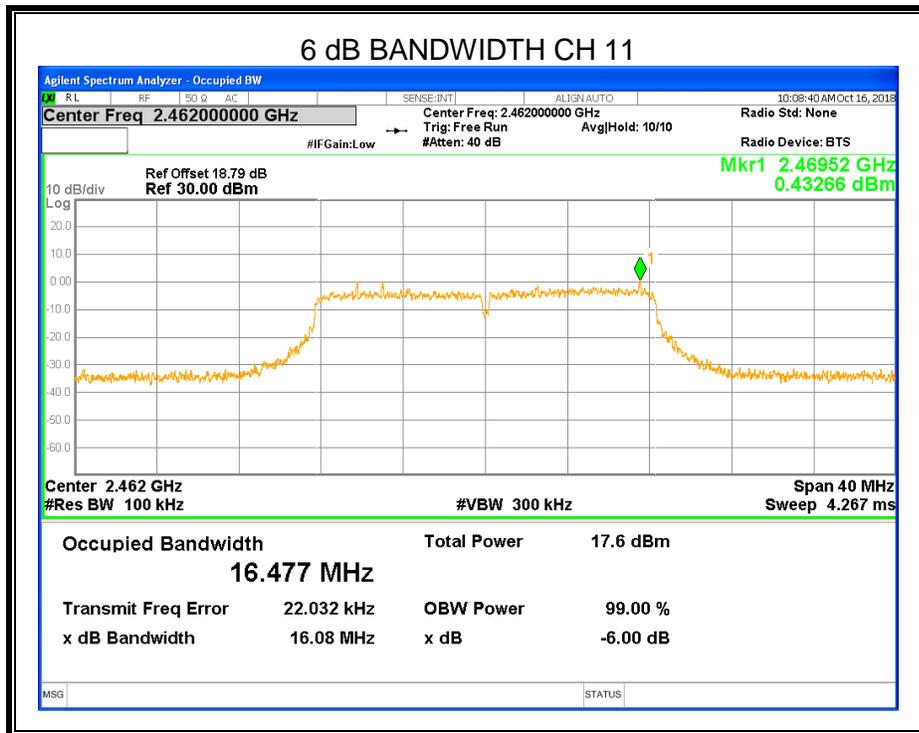
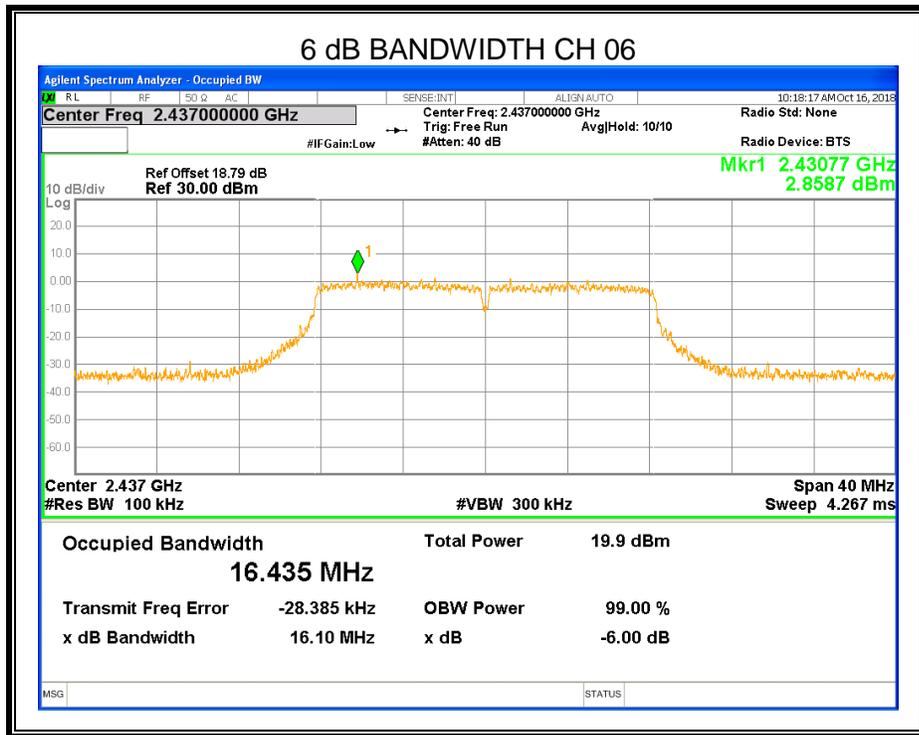


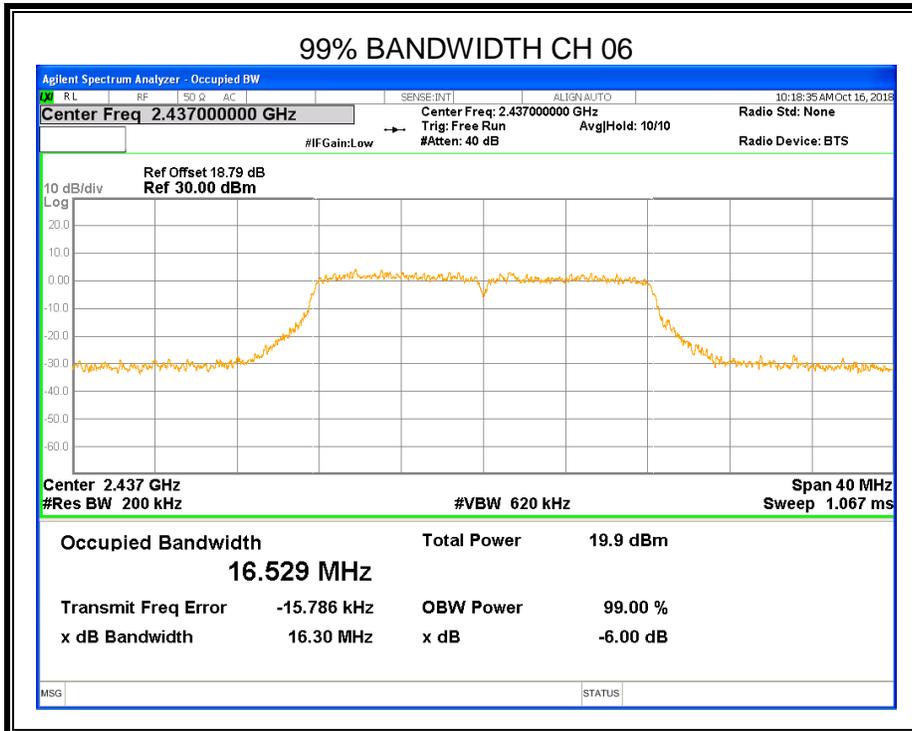
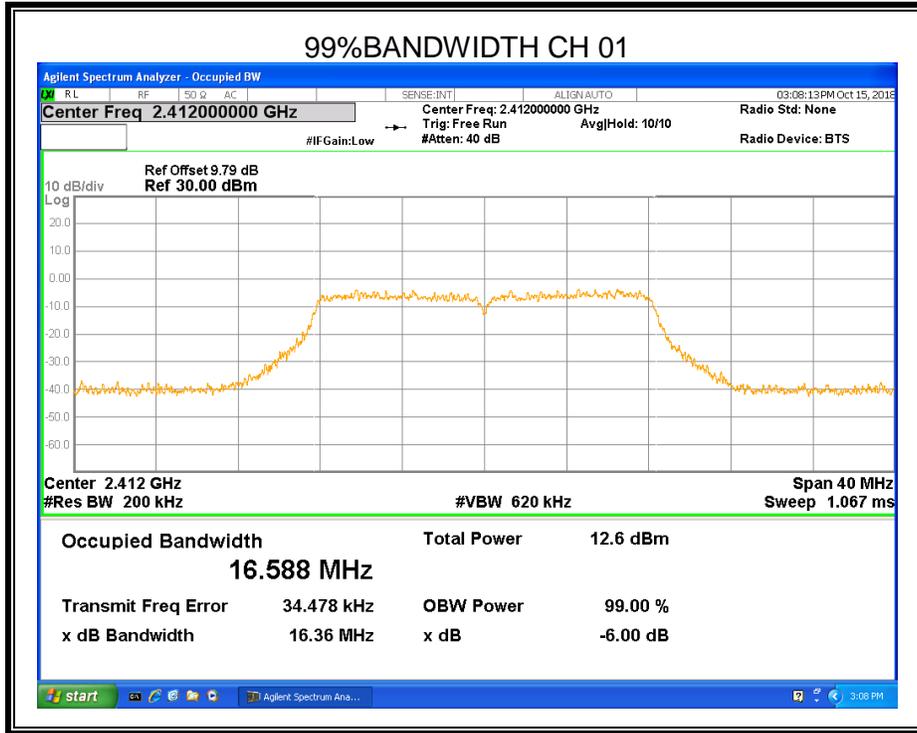


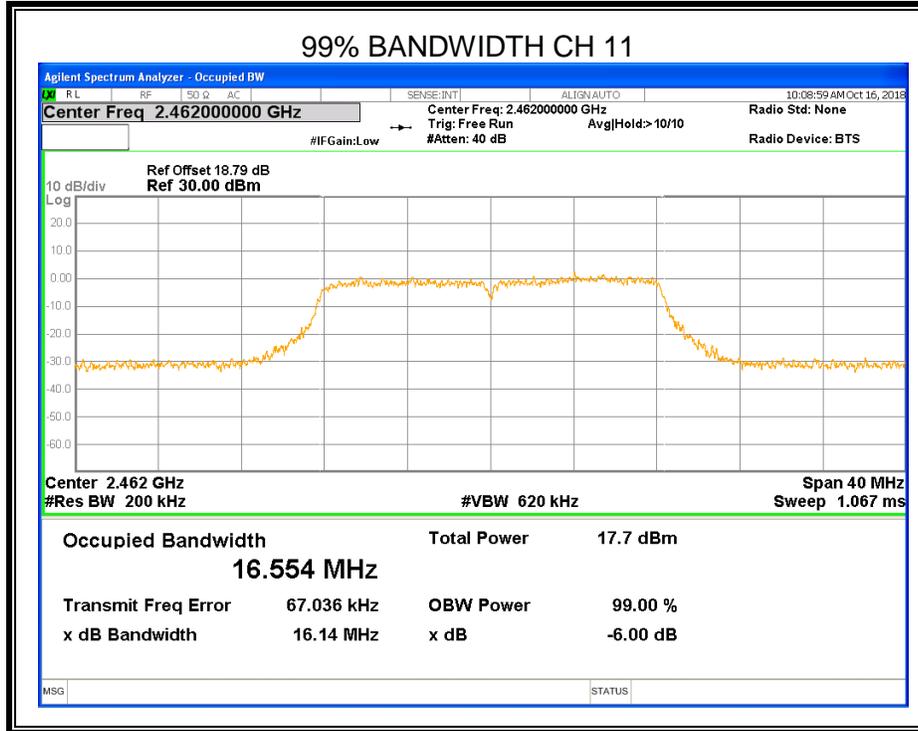
8.2.2. 802.11g MODE

Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
01	16.32	16.588	±500	Pass
06	16.10	16.529	±500	Pass
11	16.08	16.554	±500	Pass





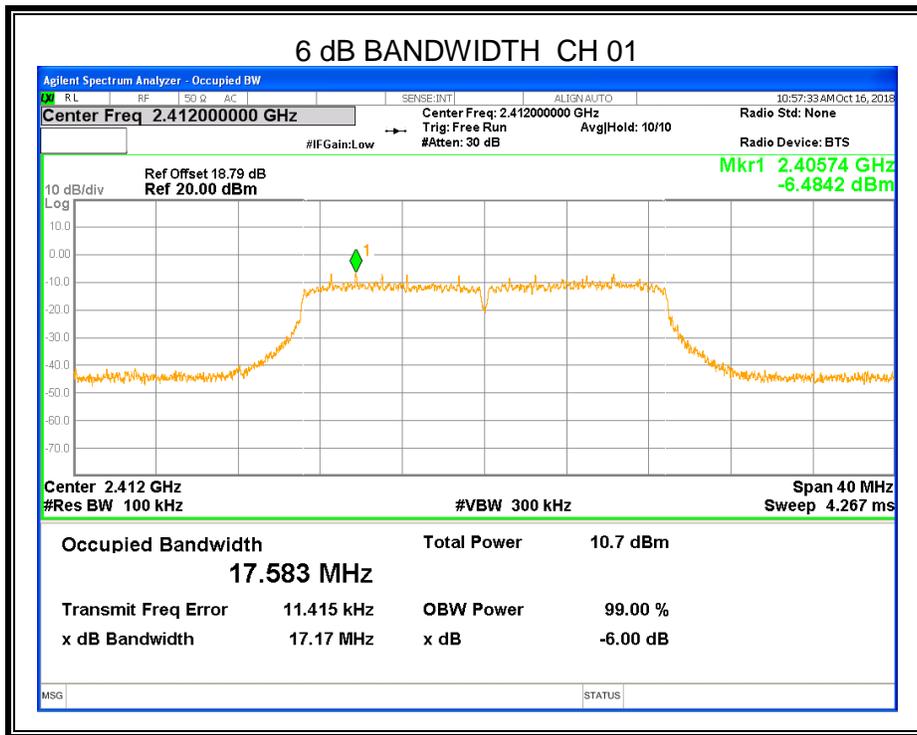


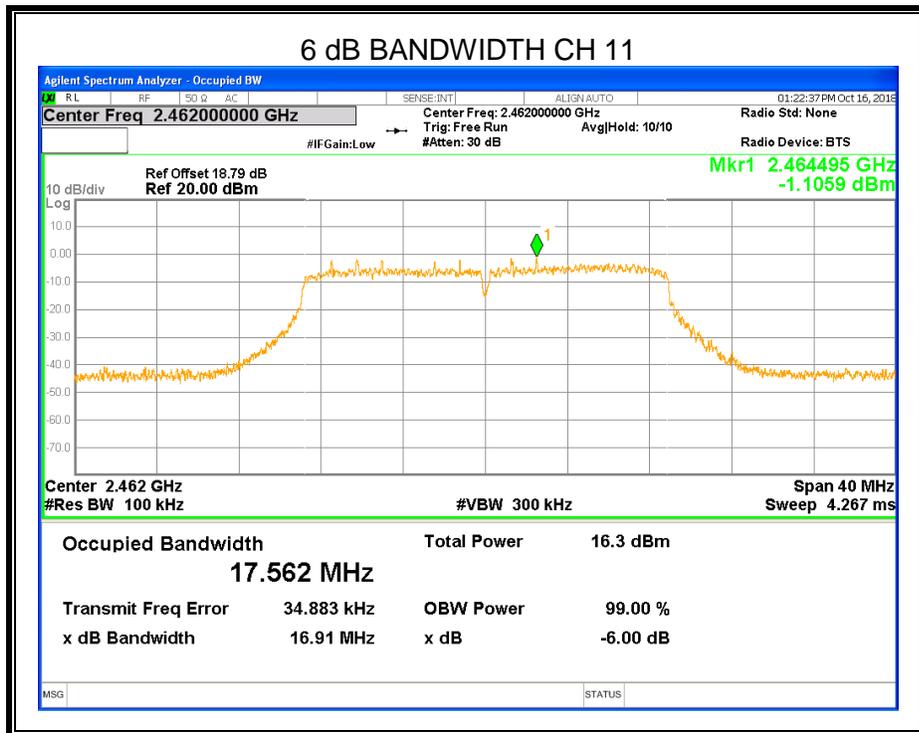
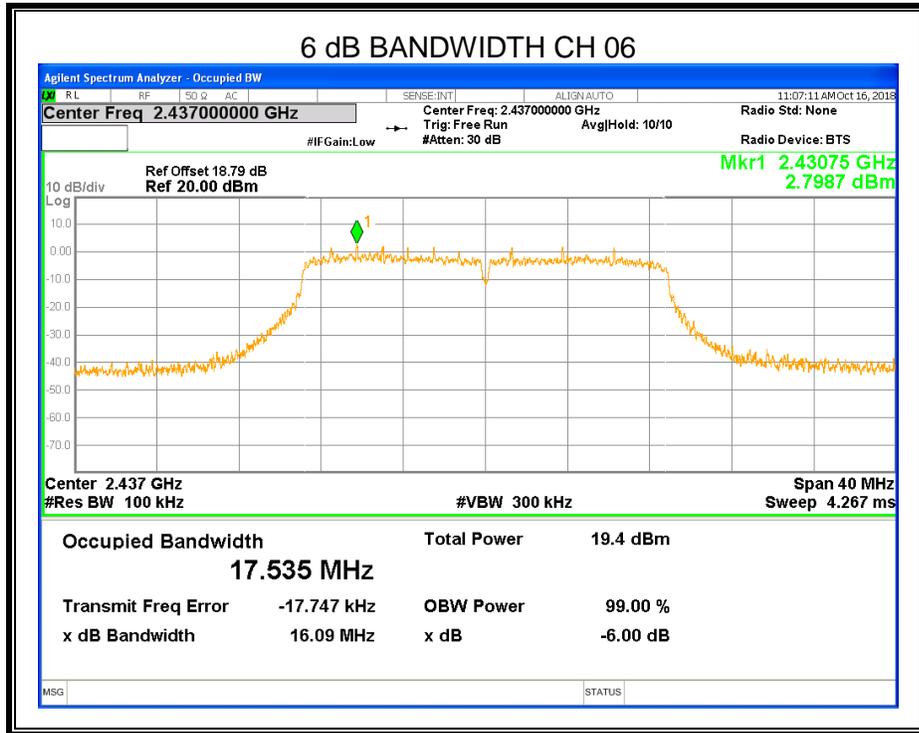


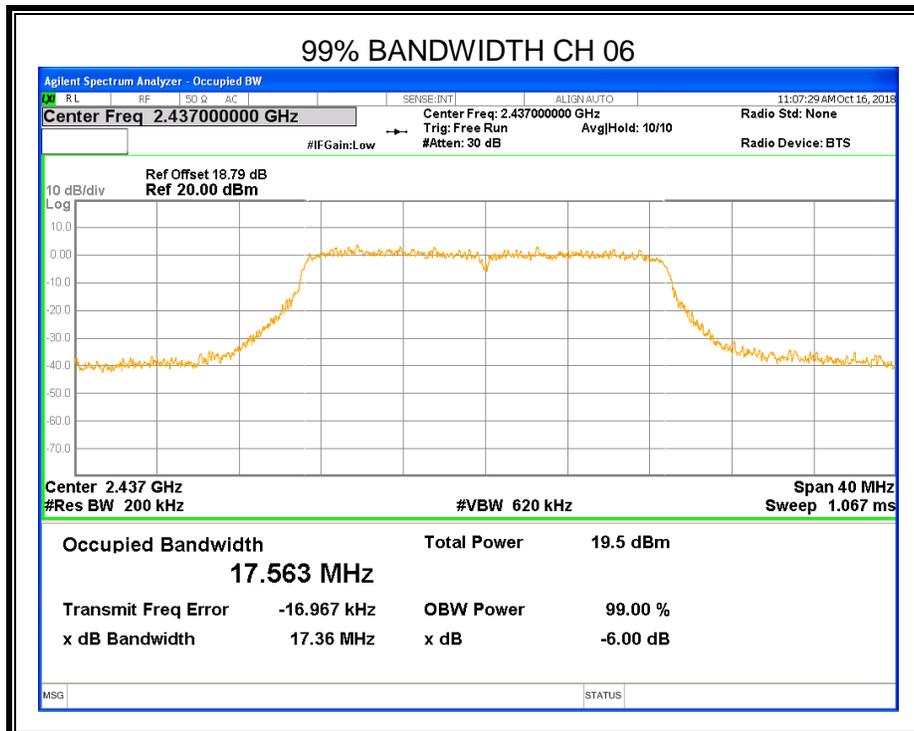
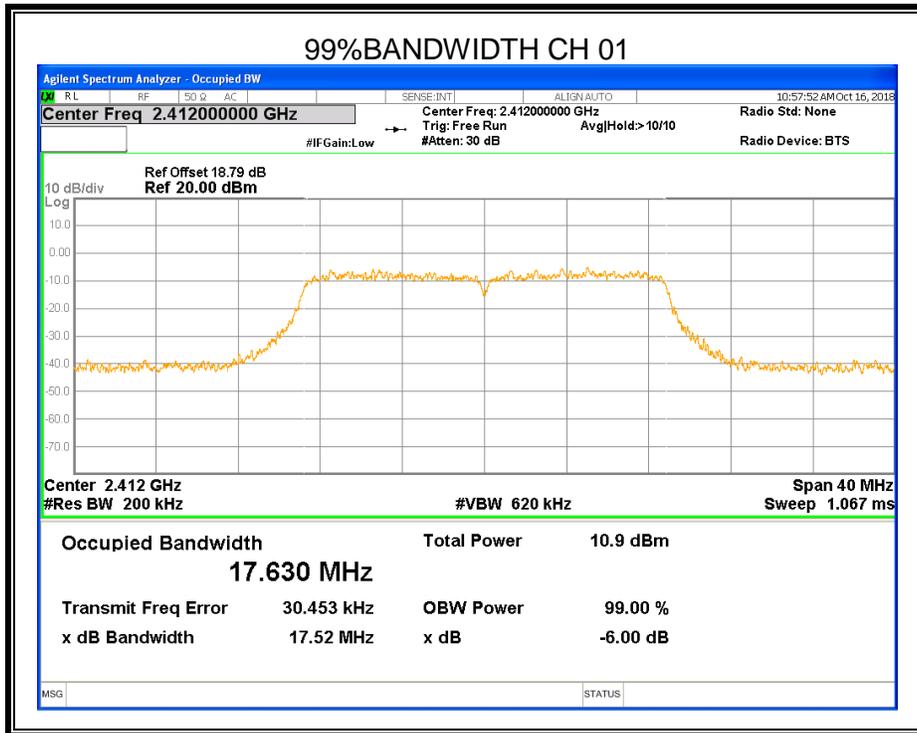


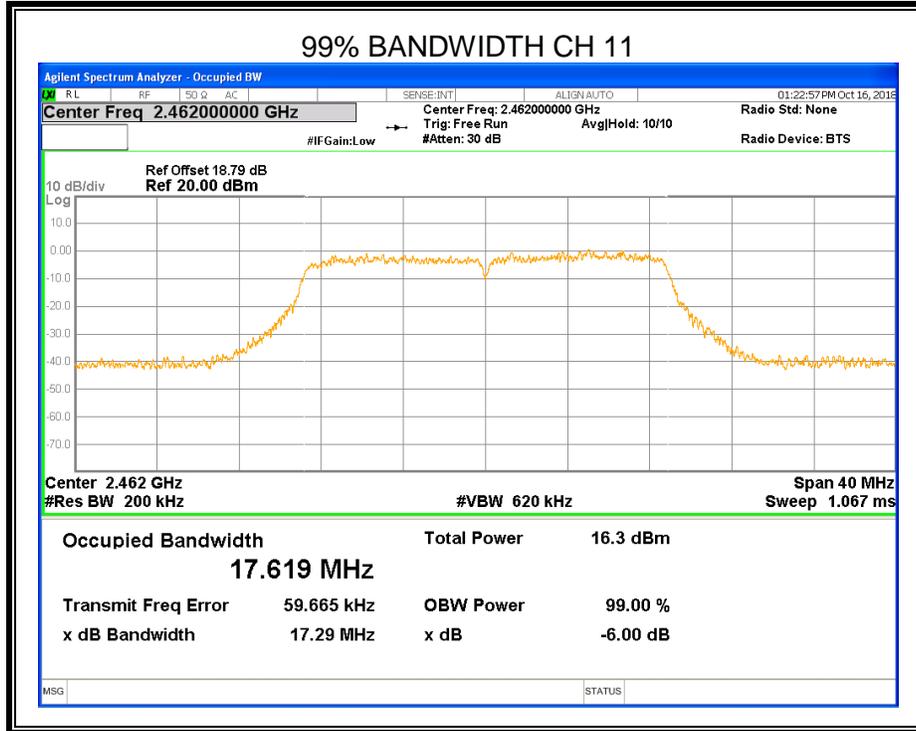
8.2.3. 802.11n HT20 MODE

Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
01	17.17	17.630	±500	Pass
06	16.09	17.563	±500	Pass
11	16.91	17.619	±500	Pass





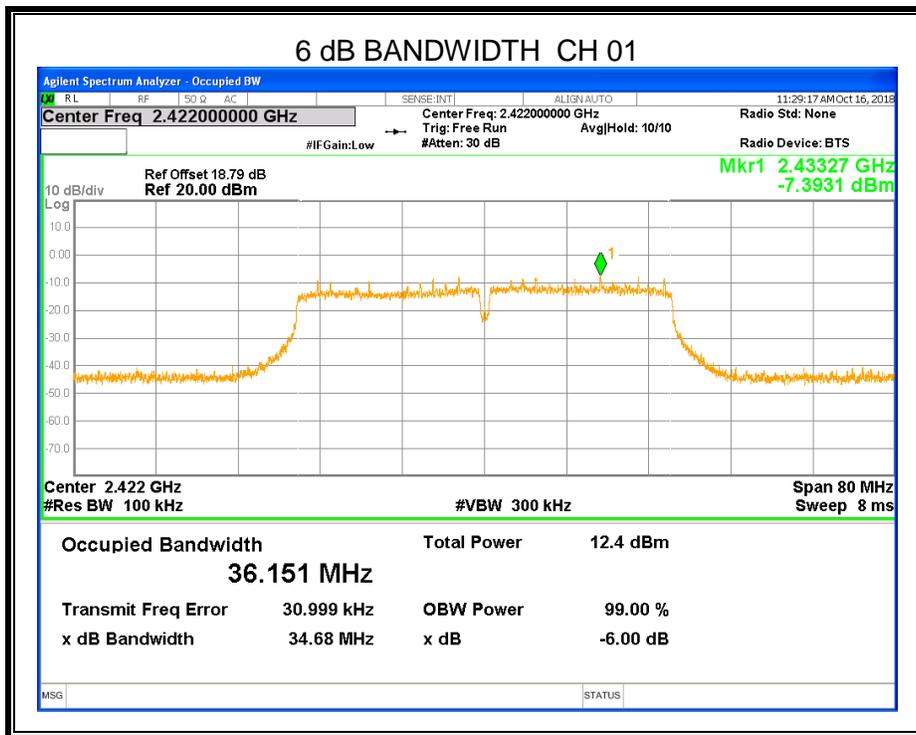


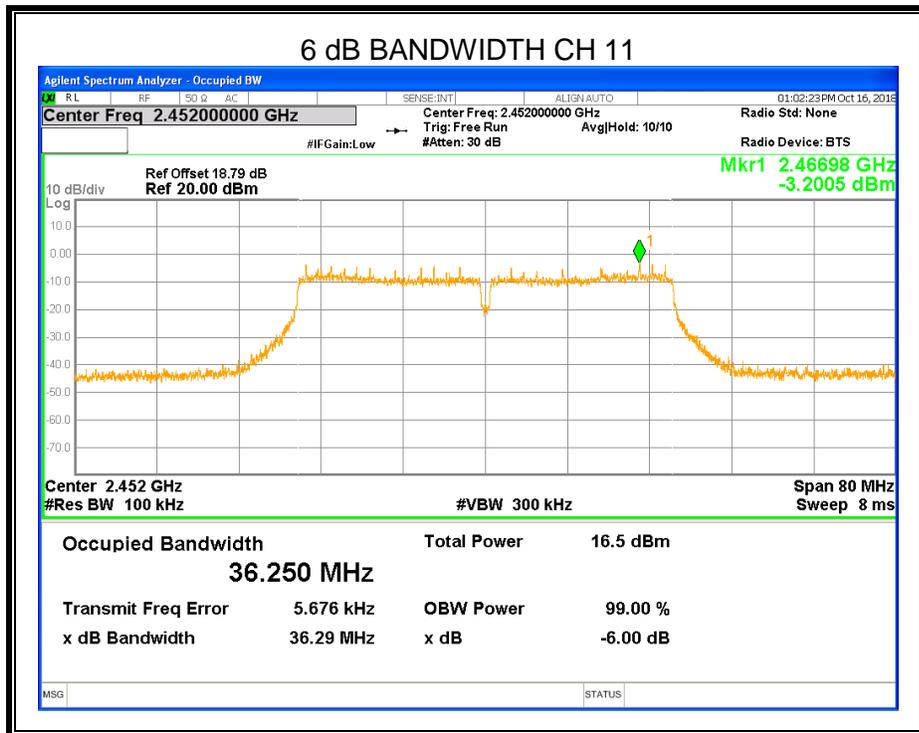
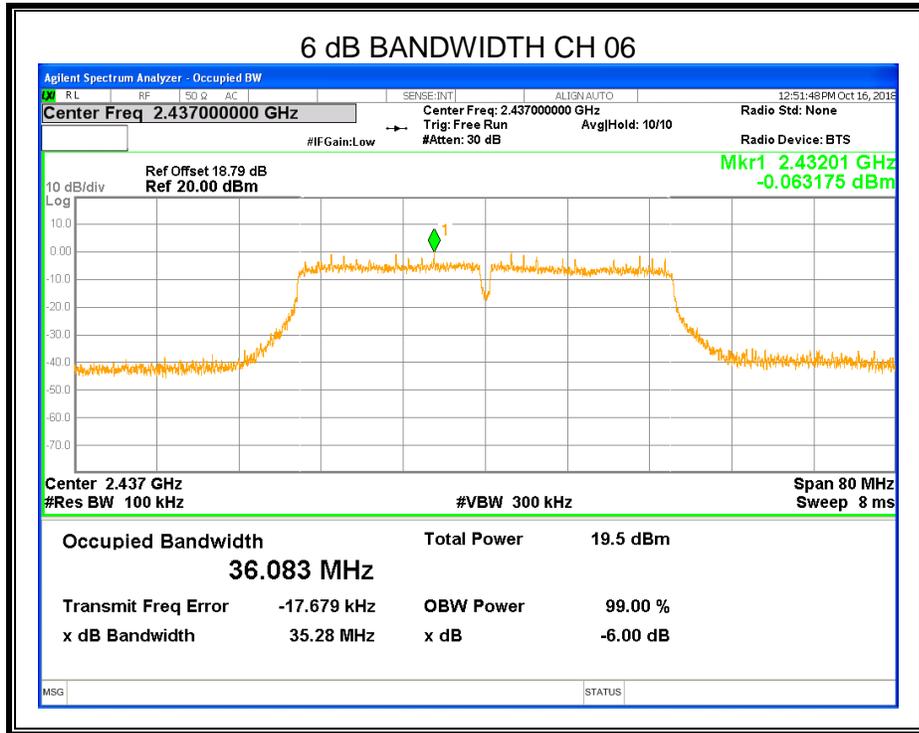


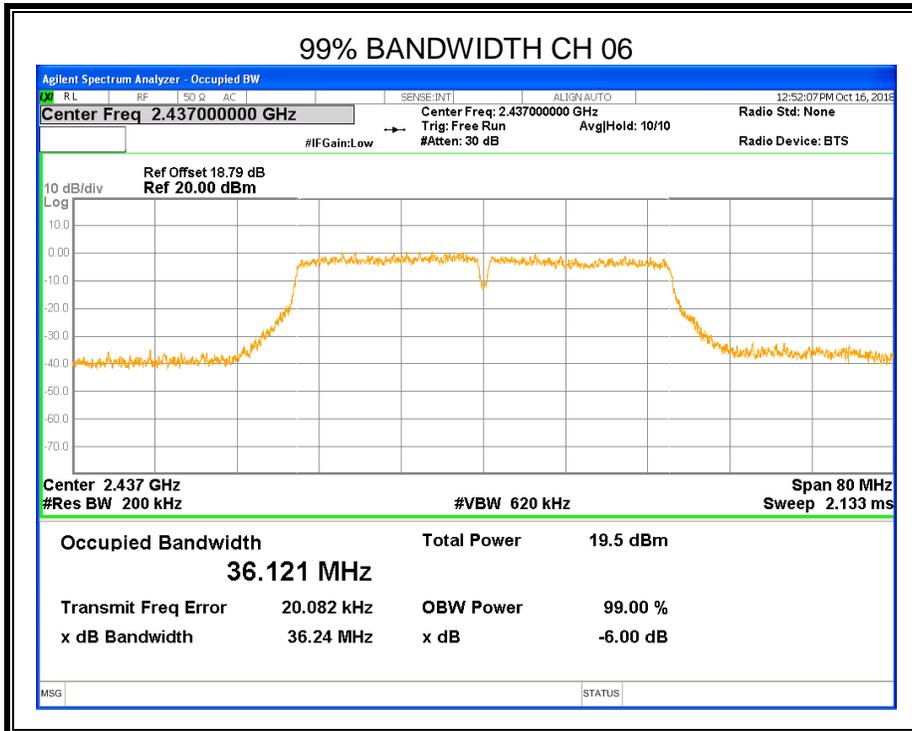
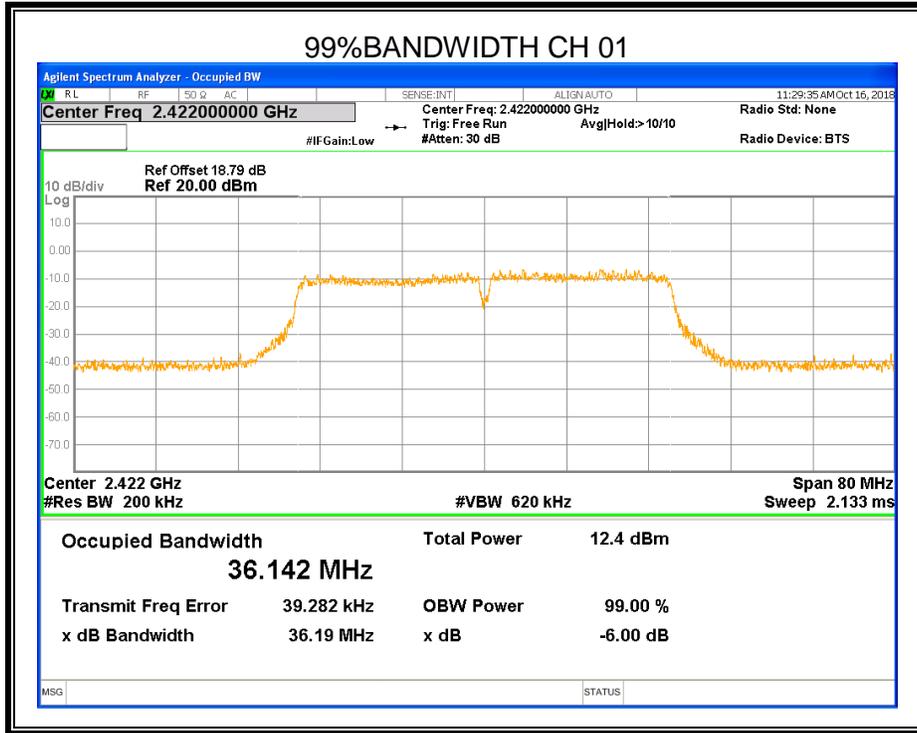


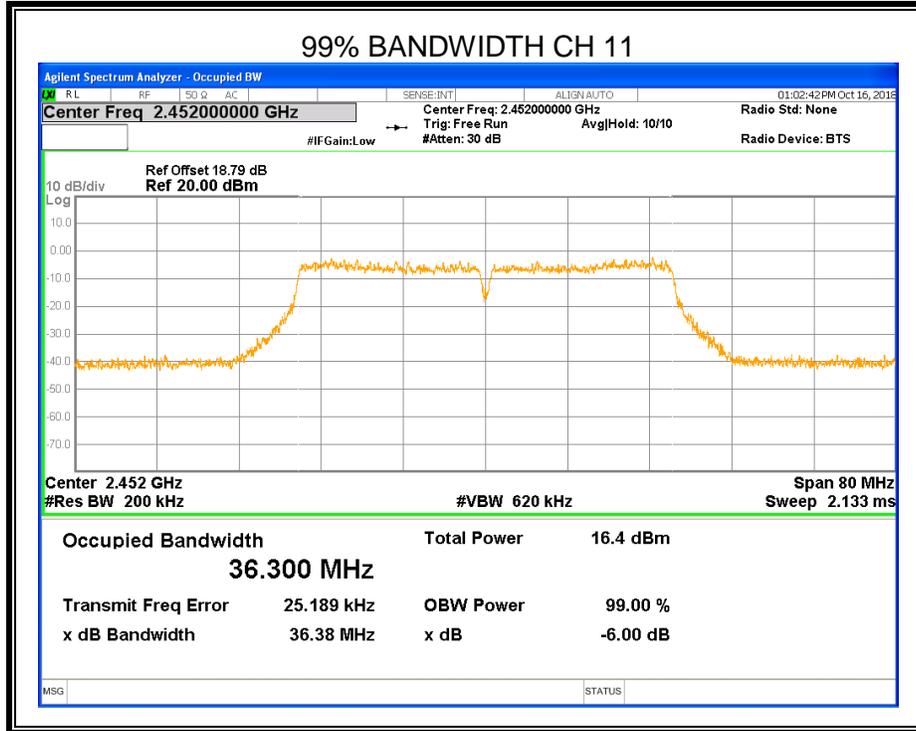
8.2.4. 802.11n HT40 MODE

Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
03	34.68	36.142	±500	Pass
06	35.28	36.121	±500	Pass
09	36.29	36.300	±500	Pass









8.3. MAXIMUM CONDUCTED (AVERAGE AND PEAK) OUTPUT POWER

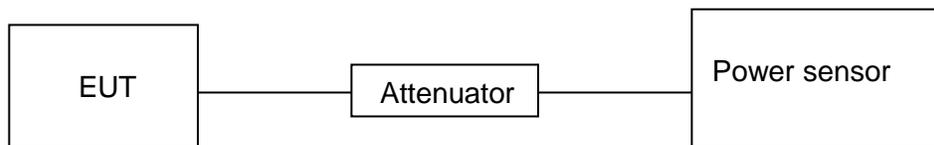
LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(b)(3) RSS-247 5.4 (e)	Conducted Output Power	1 watt or 30dBm (See Note 1/2)	2400-2483.5
Note:	1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. 2. Limit=30dBm – (Directional gain -6)dBi Directional gain: Please refer to the description in section 5.4.		

TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.
 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.
 Measure peak power each channel.
 Peak Detector use for Peak result.
 AVG Detector use for AVG result.

TEST SETUP





RESULTS

Maximum Conducted AVG Outpower

SISO for 802.11b and 802.11g, MIMO CDD for 802.11n Mode							
Mode	Channel	Chain	Maximum Conducted AVG Outpower [dBm]		EIRP [dBm]	Limit [dBm]	Verdict
			Single	Total			
802.11b	01	A	\	8.05	\	30	PASS
		B	6.36		6.36		
	06	A	\	16.49	\	30	PASS
		B	15.01		15.01		
	11	A	\	13.47	\	30	PASS
		B	14.86		14.86		
802.11g	01	A	\	8.05	\	30	PASS
		B	6.60		6.60		
	06	A	\	16.49	\	30	PASS
		B	13.98		13.98		
	11	A	\	13.47	\	30	PASS
		B	11.79		11.79		
802.1120	01	A	4.92	8.05	8.05	30	PASS
		B	5.16				
	06	A	13.38	16.49	16.49	30	PASS
		B	13.57				
	11	A	10.28	13.47	13.47	30	PASS
		B	10.64				
802.1140	03	A	6.24	9.21	9.21	30	PASS
		B	6.15				
	06	A	13.61	16.65	16.65	30	PASS
		B	13.66				
	09	A	10.28	13.62	13.62	30	PASS
		B	10.91				

Note: The EUT only support SISO mode for b and g, all the antenna had been tested, but only the worst data recorded in the report.



Maximum Conducted Peak Outpower

SISO for 802.11b and 802.11g, MIMO CDD for 802.11n Mode							
Mode	Channel	Chain	Maximum Conducted Peak Outpower [dBm]		EIRP [dBm]	Limit [dBm]	Verdict
			Single	Total			
802.11b	01	A	\	15.18	15.18	30	PASS
		B	8.51				
	06	A	\	23.56	23.56	30	PASS
		B	17.21				
	11	A	\	20.62	20.62	30	PASS
		B	17.22				
802.11g	01	A	\	16.30	16.30	30	PASS
		B	13.76				
	06	A	\	23.66	23.66	30	PASS
		B	21.18				
	11	A	\	20.74	20.74	30	PASS
		B	18.94				
802.1120	01	A	12.04	15.18	15.18	30	PASS
		B	12.29				
	06	A	20.45	23.56	23.56	30	PASS
		B	20.64				
	11	A	17.49	20.62	20.62	30	PASS
		B	17.72				
802.1140	03	A	13.20	16.30	16.30	30	PASS
		B	13.38				
	06	A	20.54	23.66	23.66	30	PASS
		B	20.76				
	09	A	17.50	20.74	20.74	30	PASS
		B	17.95				

Note: The EUT only support SISO mode for b and g, all the antenna had been tested, but only the worst data recorded in the report.

8.4. POWER SPECTRAL DENSITY

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC §15.247 (e) RSS-247 5.2 (b)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5
Note:	1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. 2. Limit=8dBm – (Directional gain -6)dBi Directional gain: Please refer to the description in section 5.4.		

TEST PROCEDURE

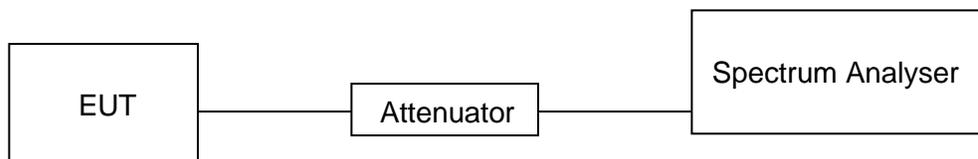
Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP





RESULTS

SISO for 802.11b and 802.11g, MIMO CDD for 802.11n Mode

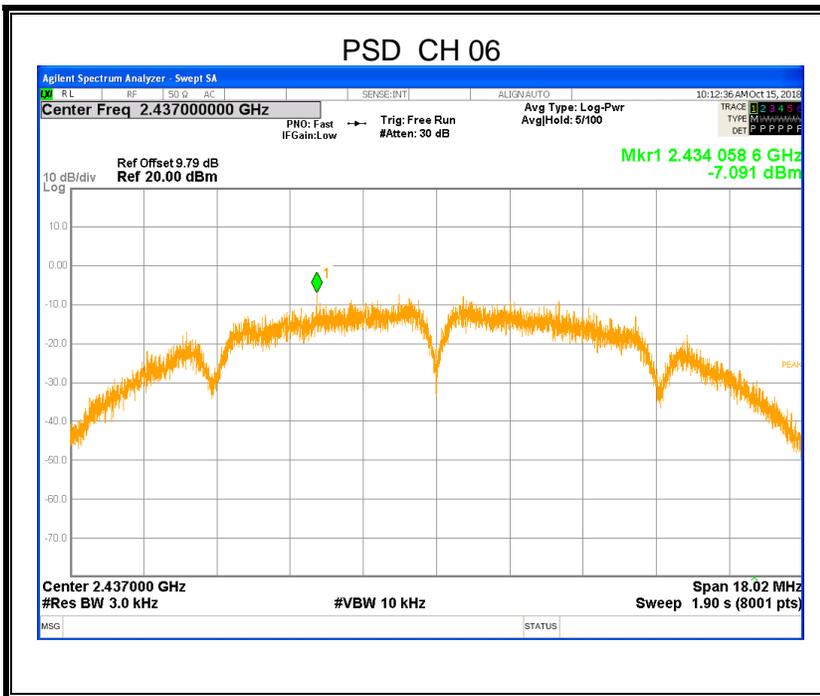
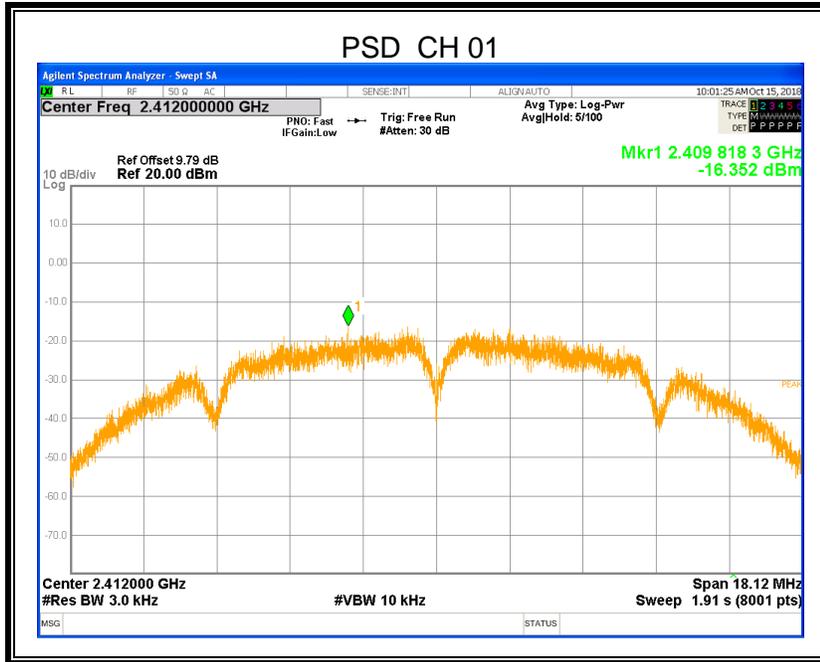
Mode	Channel	Chain	Meas.Level [dBm/3kHz]	Total [dBm/3kHz]	Limit (dBm/3KHz)	Verdict
802.11b	01	A	/		8	PASS
		B	-16.352			
	06	A	/		8	PASS
		B	-7.091			
	11	A	/		8	PASS
		B	-8.298			
802.11g	01	A	/		8	PASS
		B	-18.691			
	06	A	/		8	PASS
		B	-11.053			
	11	A	/		8	PASS
		B	-13.482			
802.11n20	01	A	-21.664	-18.132	8	PASS
		B	-20.676			
	06	A	-12.494	-9.021	8	PASS
		B	-11.613			
	11	A	-14.589	-11.764	8	PASS
		B	-14.967			
802.11n40	03	A	-22.417	-19.567	8	PASS
		B	-22.744			
	06	A	-15.069	-12.045	8	PASS
		B	-15.042			
	09	A	-18.172	-14.760	8	PASS
		B	-17.397			

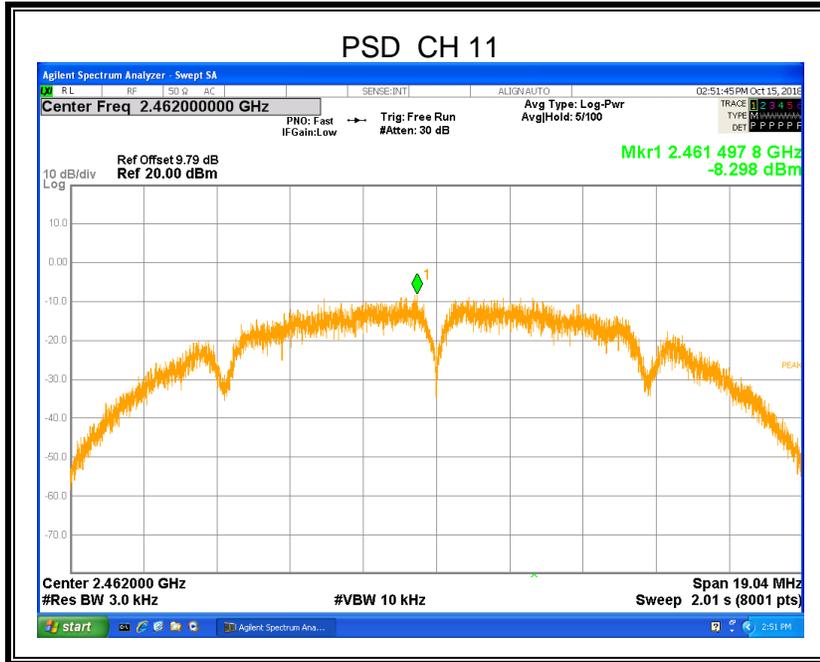
Note: The EUT only support SISO mode for b and g, all the antenna had been tested, but only the worst data recorded in the report.



TEST PLOT

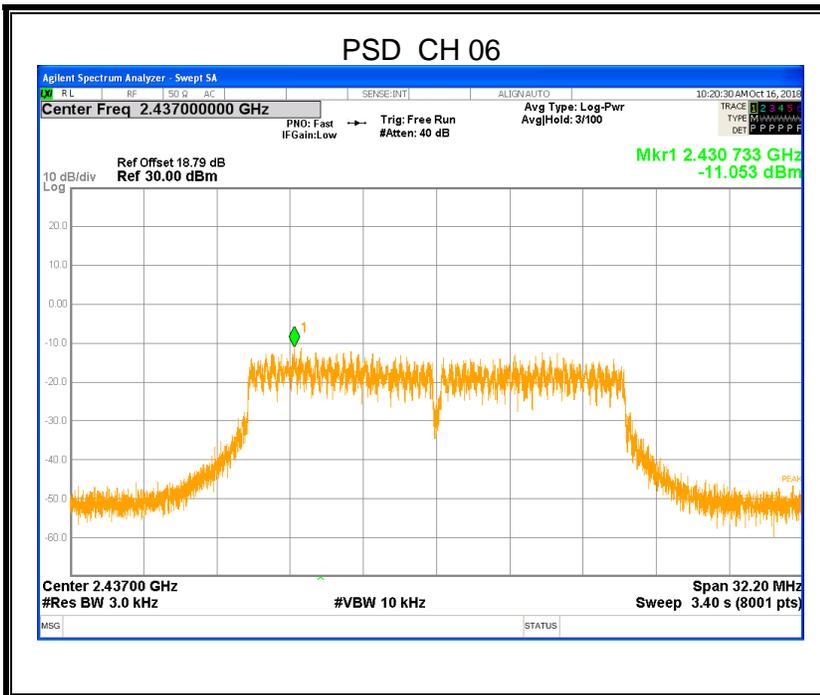
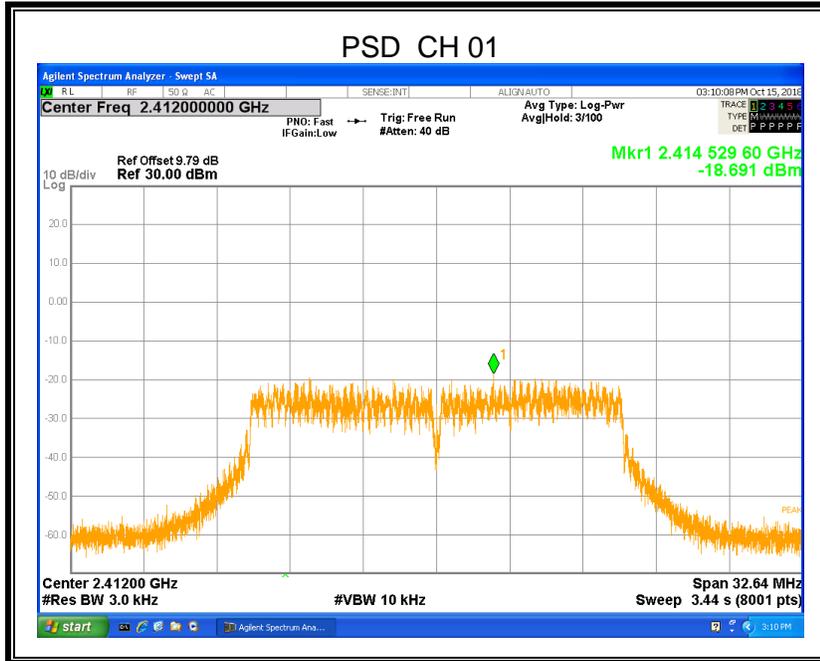
802.11b

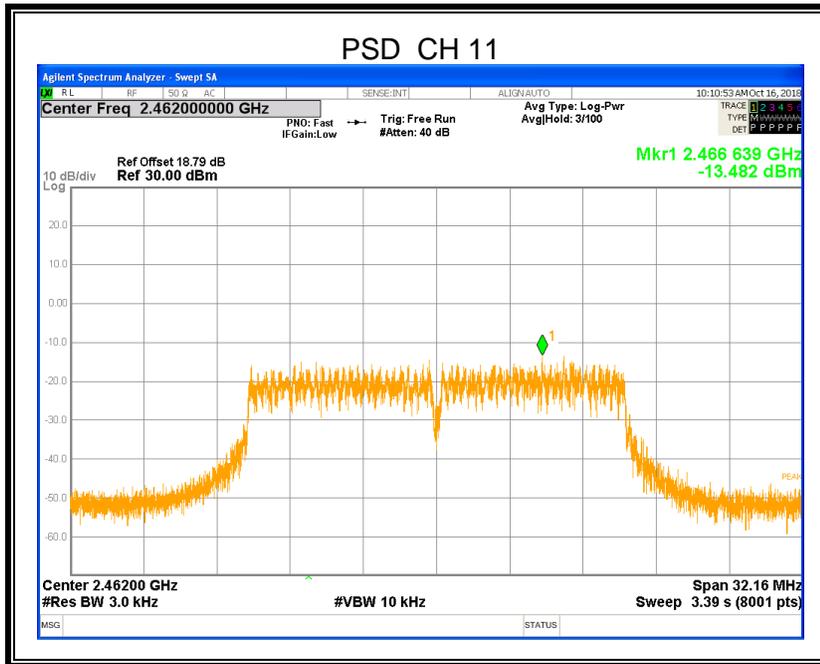






8.4.1. 802.11g

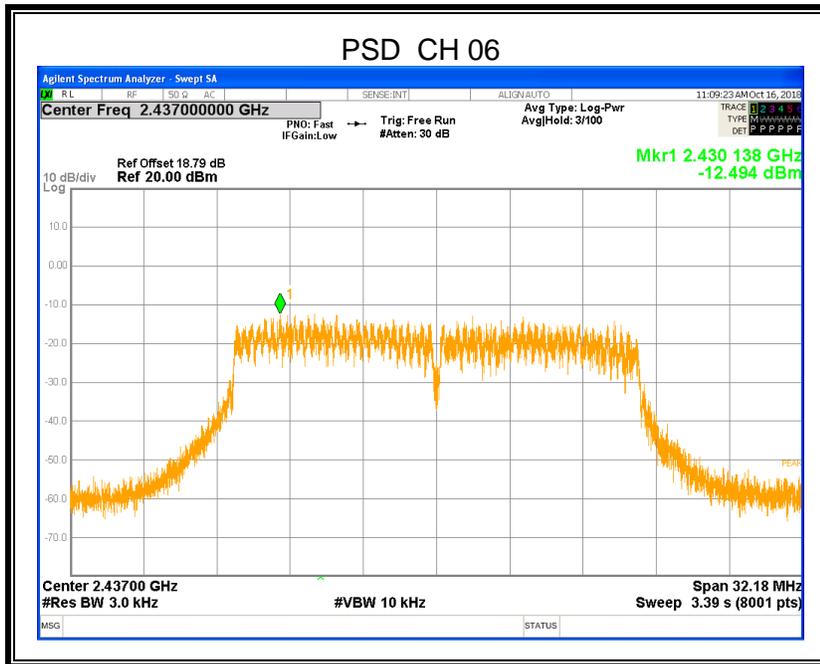
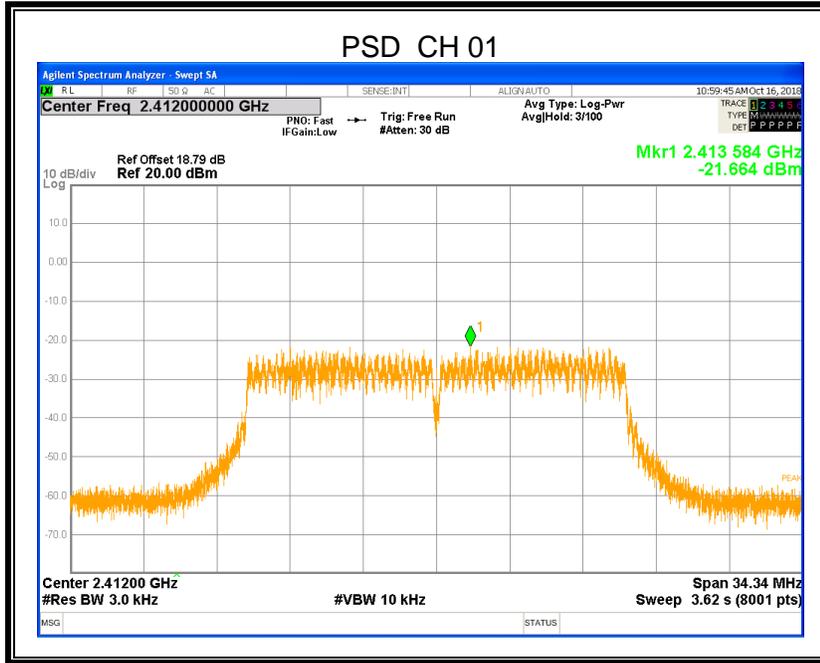


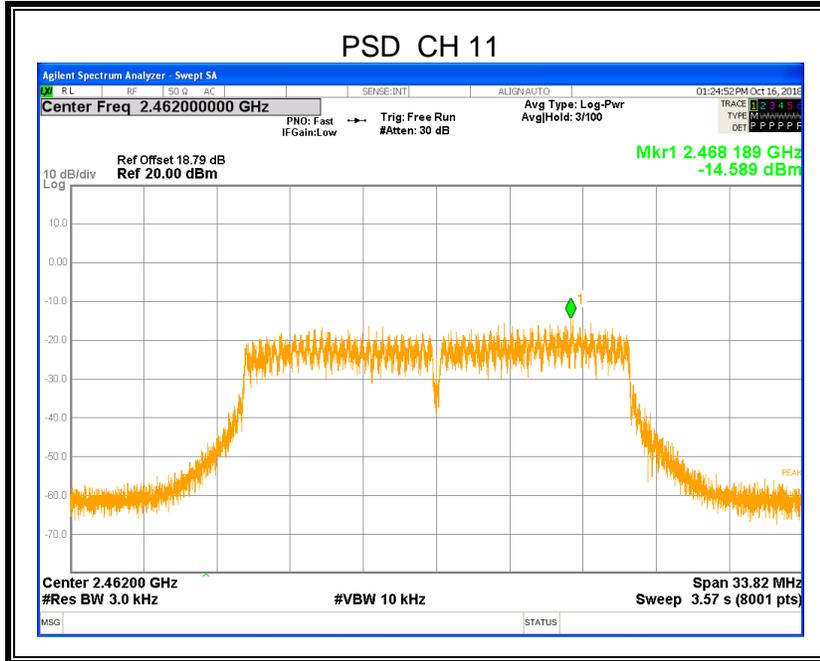




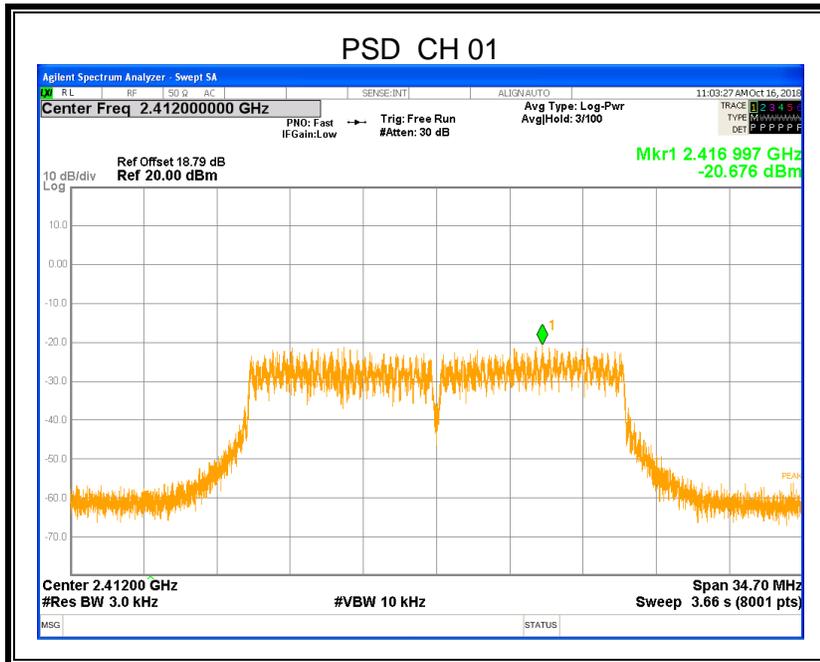
8.4.2. 802.11n20

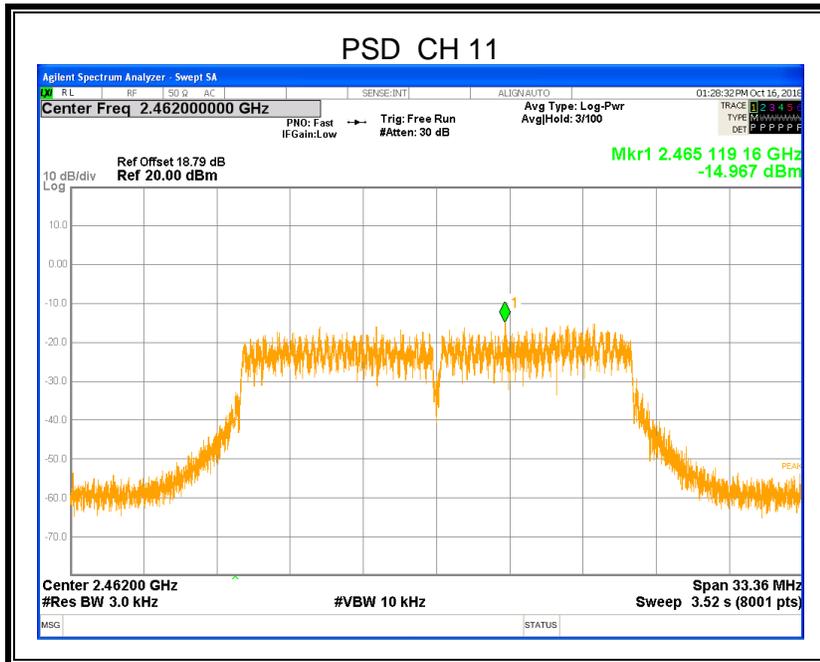
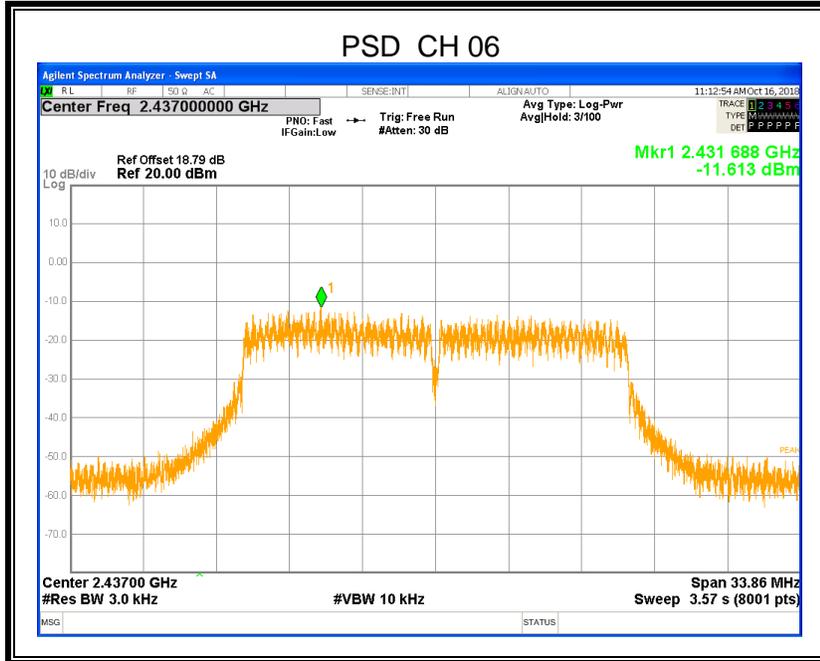
Ant. A





Ant. B

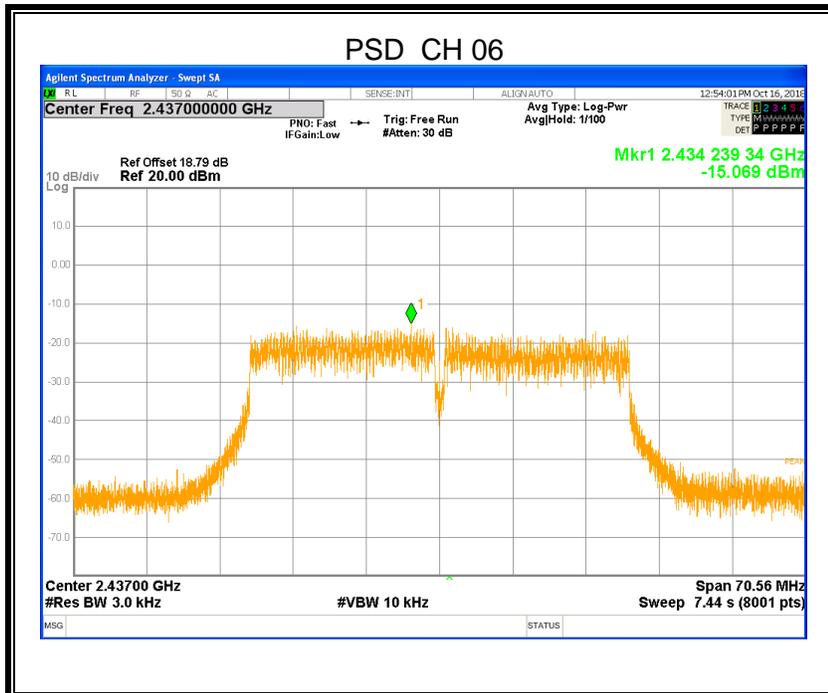
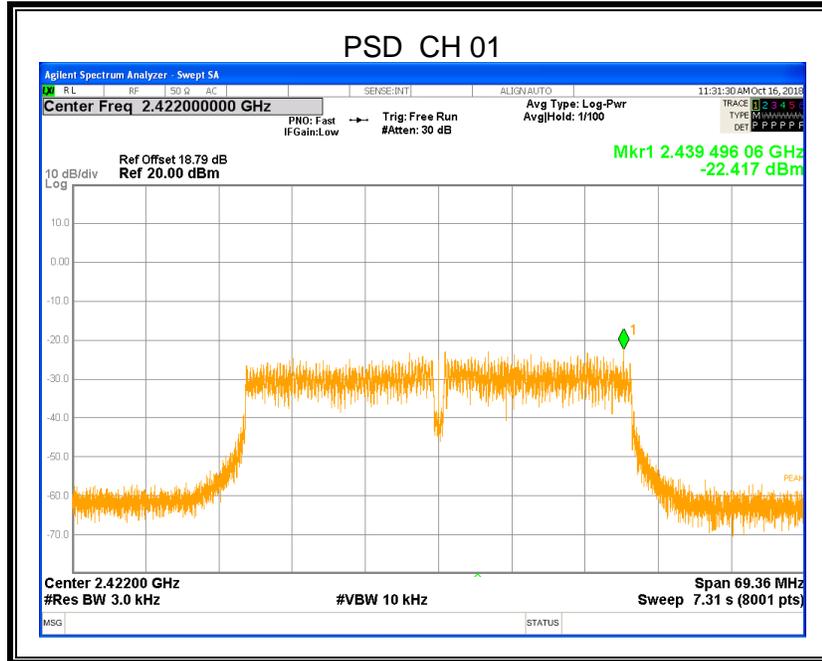


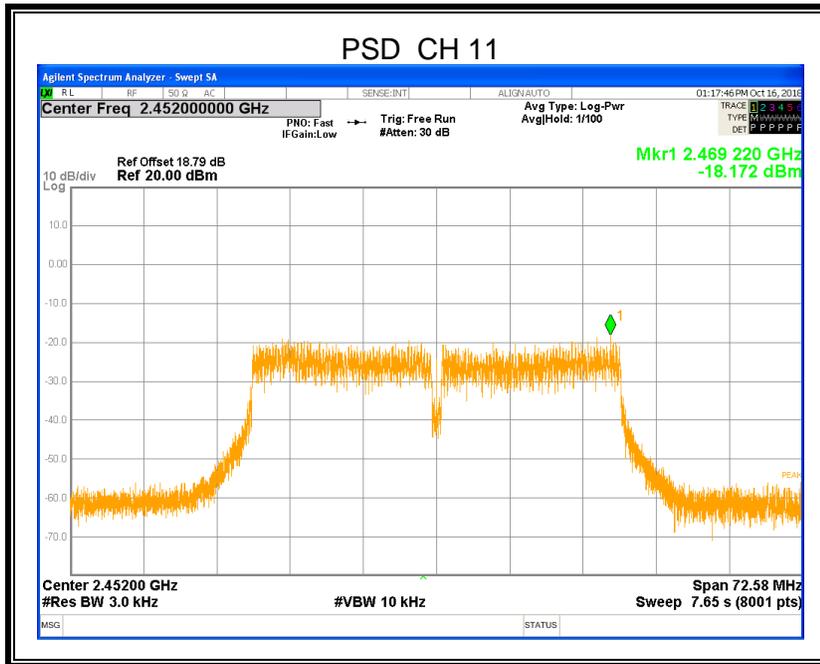




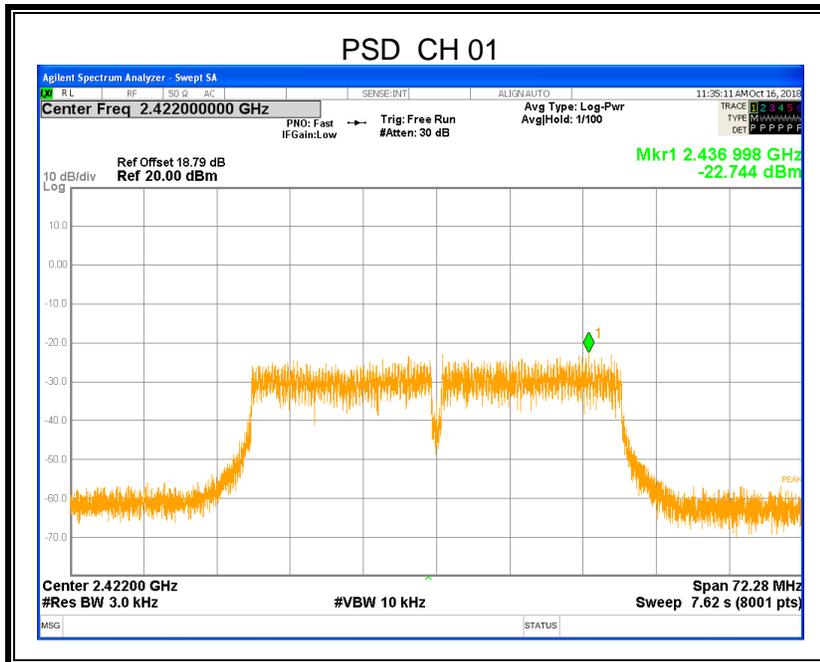
8.4.3. 802.11n40

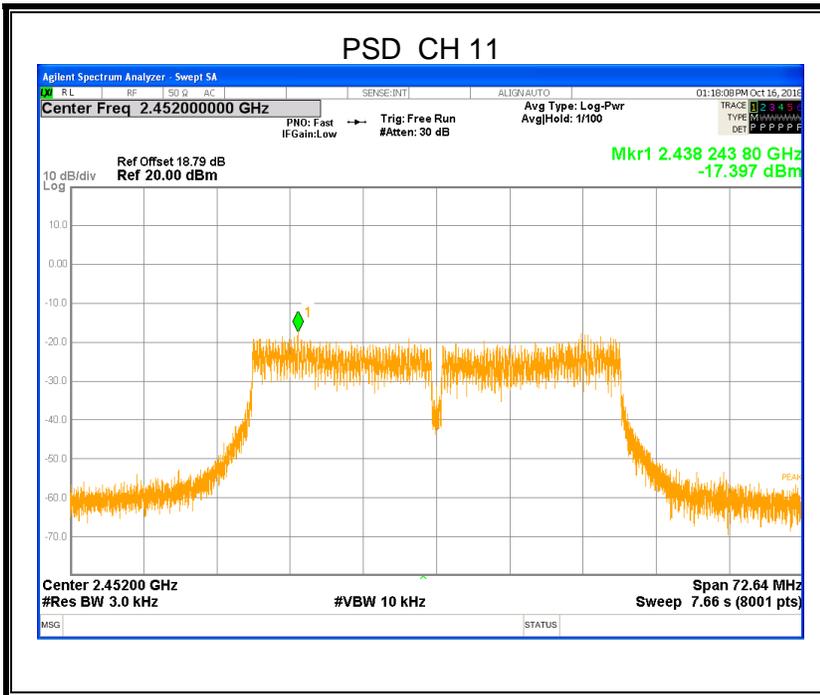
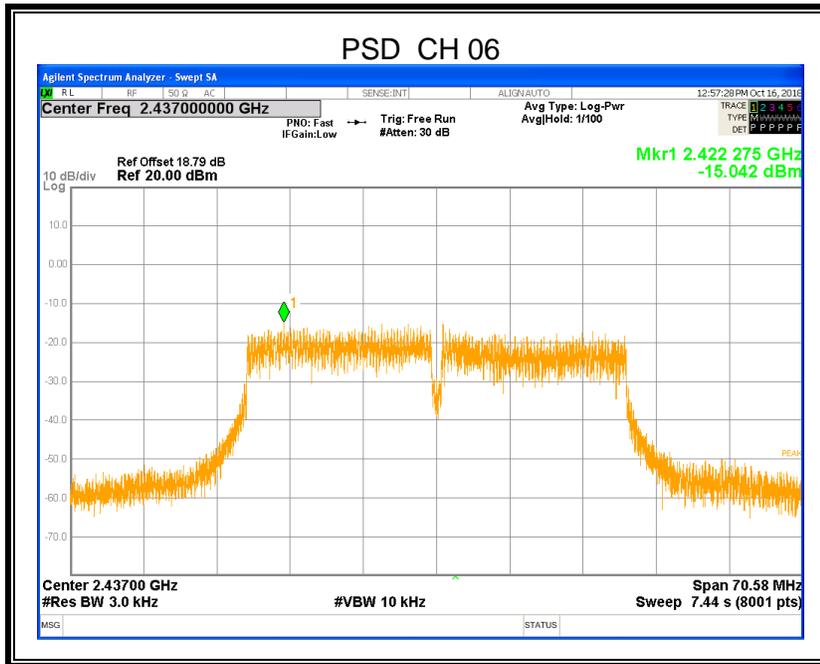
Ant. A





Ant. B







8.5. CONDUCTED BANDEGE AND SPURIOUS EMISSIONS

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2		
Section	Test Item	Limit
FCC §15.247 (d) RSS-247 5.5	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

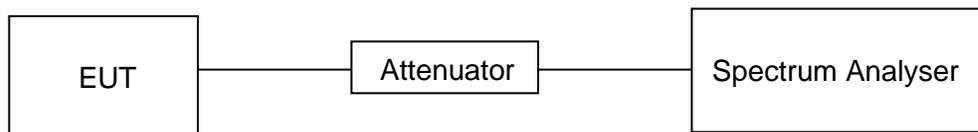
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100K
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	$\geq 3 \times \text{RBW}$
measurement points	$\geq \text{span}/\text{RBW}$
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level.

TEST SETUP



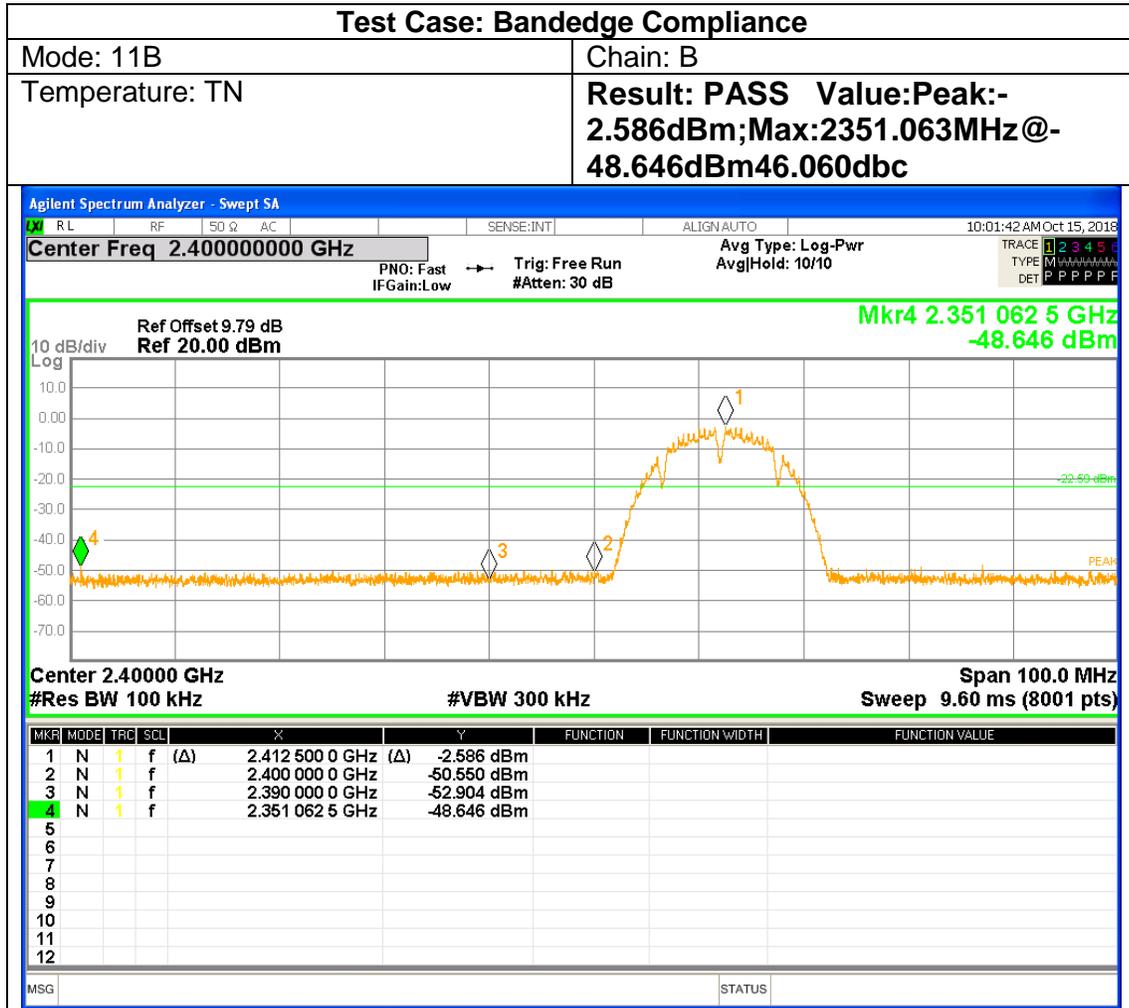


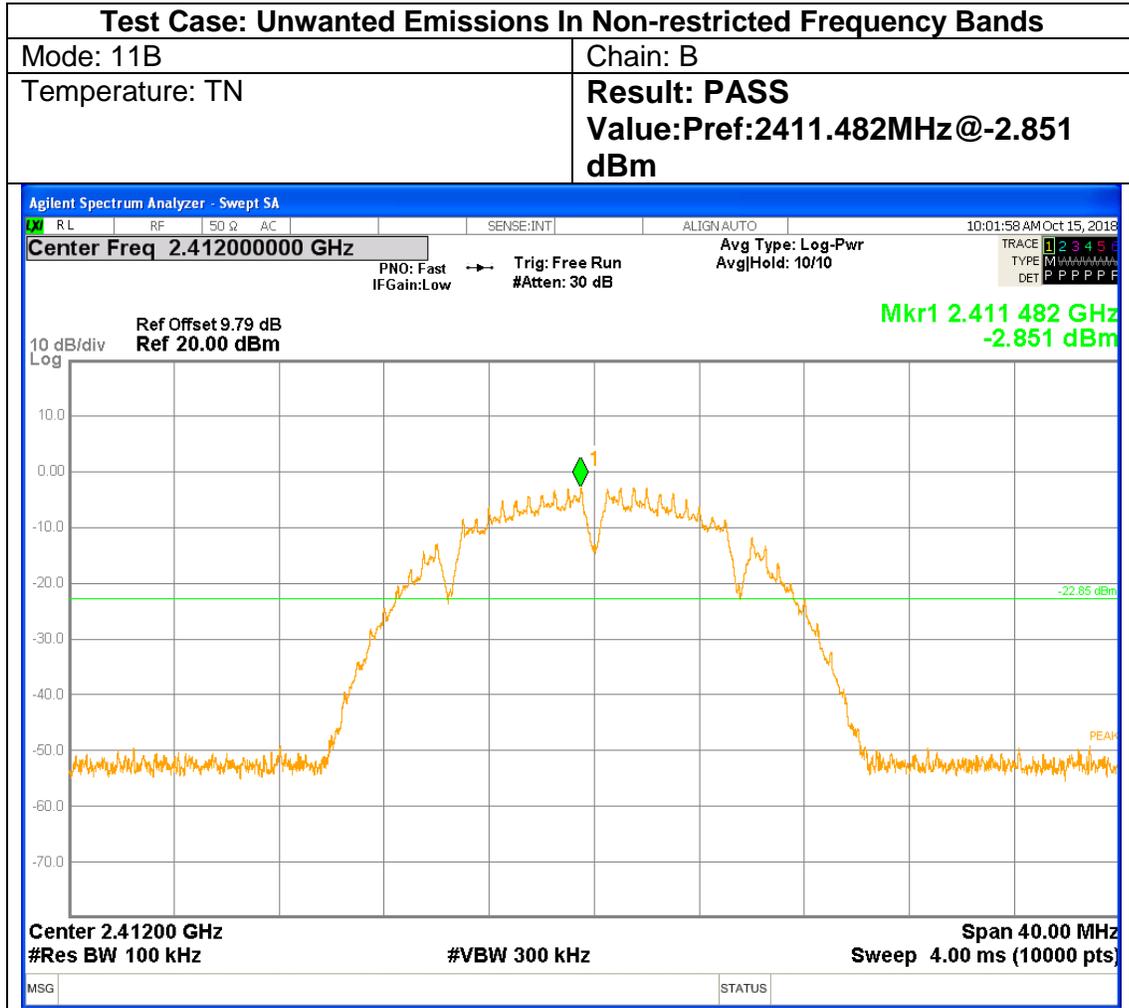
RESULTS

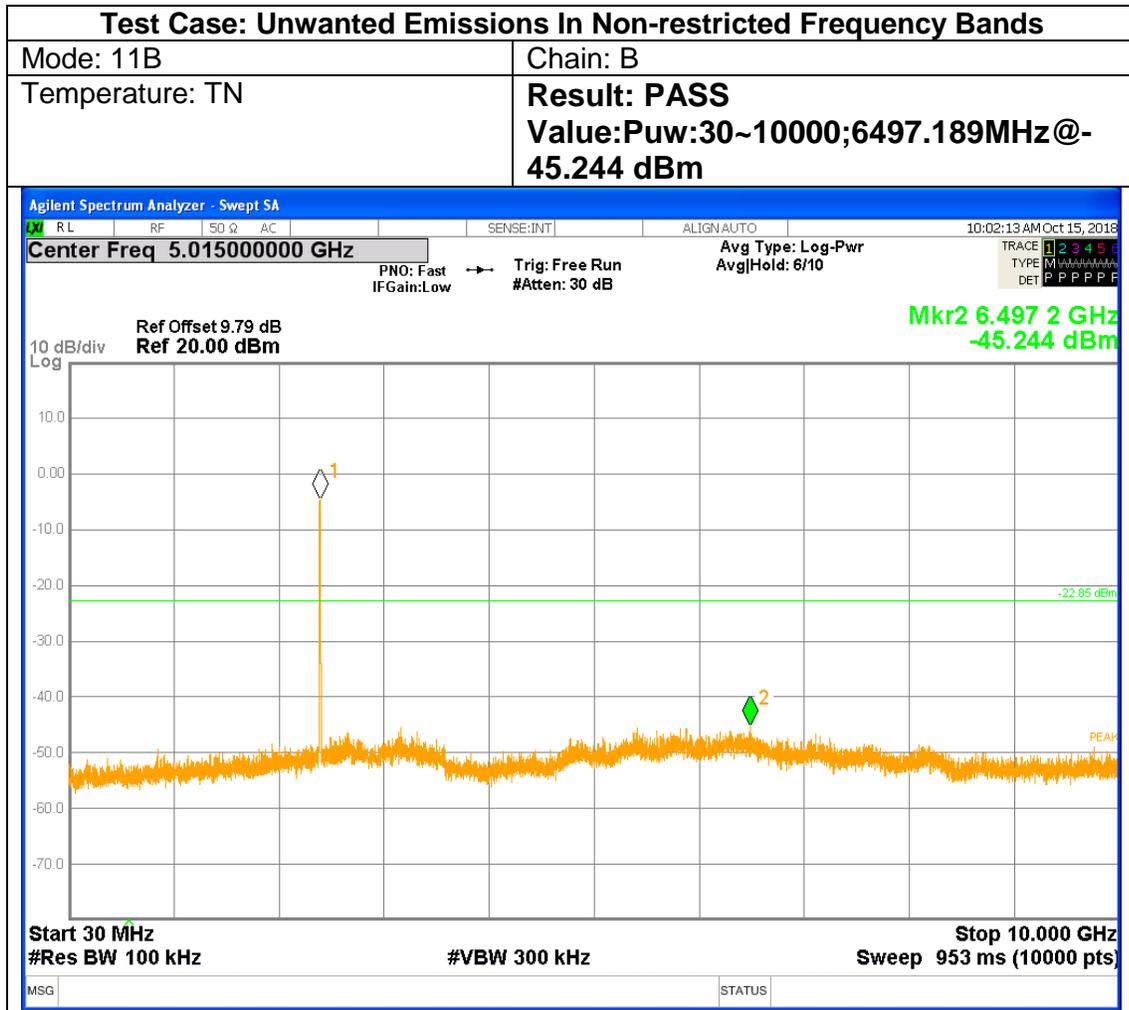
8.5.1. 802.11b MODE

SISO MODE ANTENNA B (WORST-CASE CONFIGURATION)

Low Channel



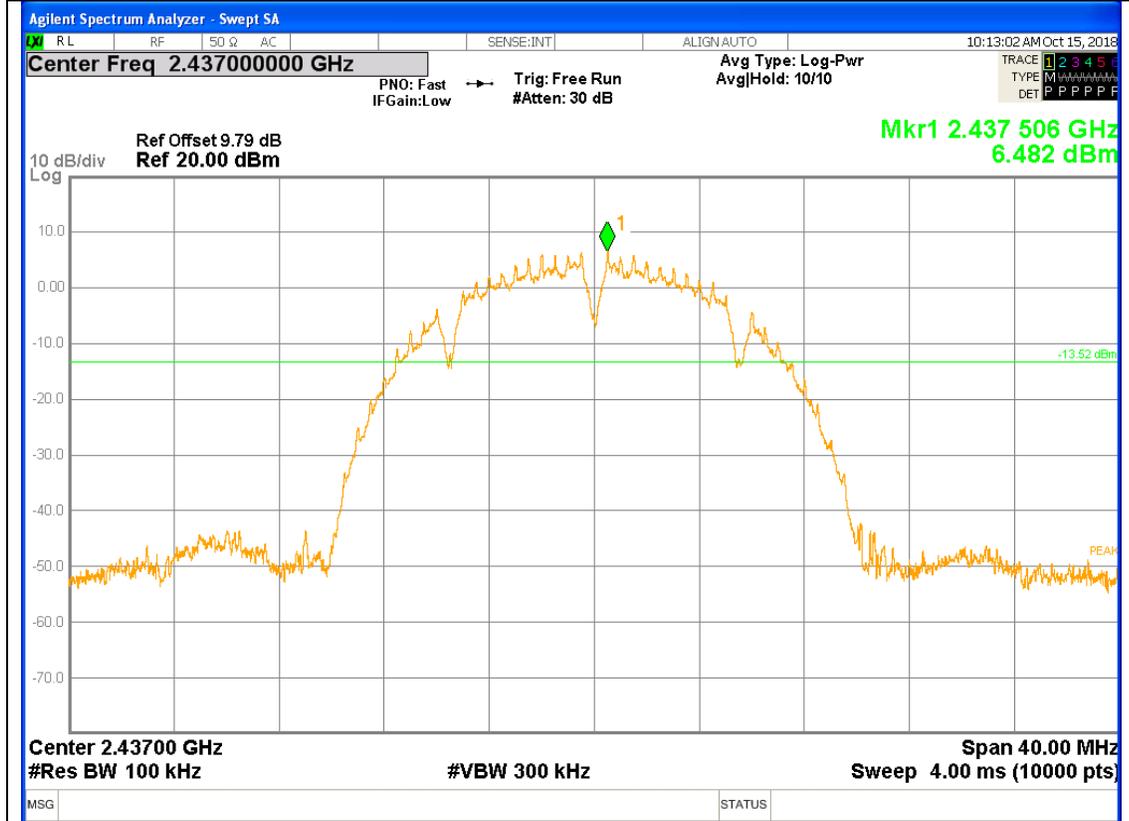


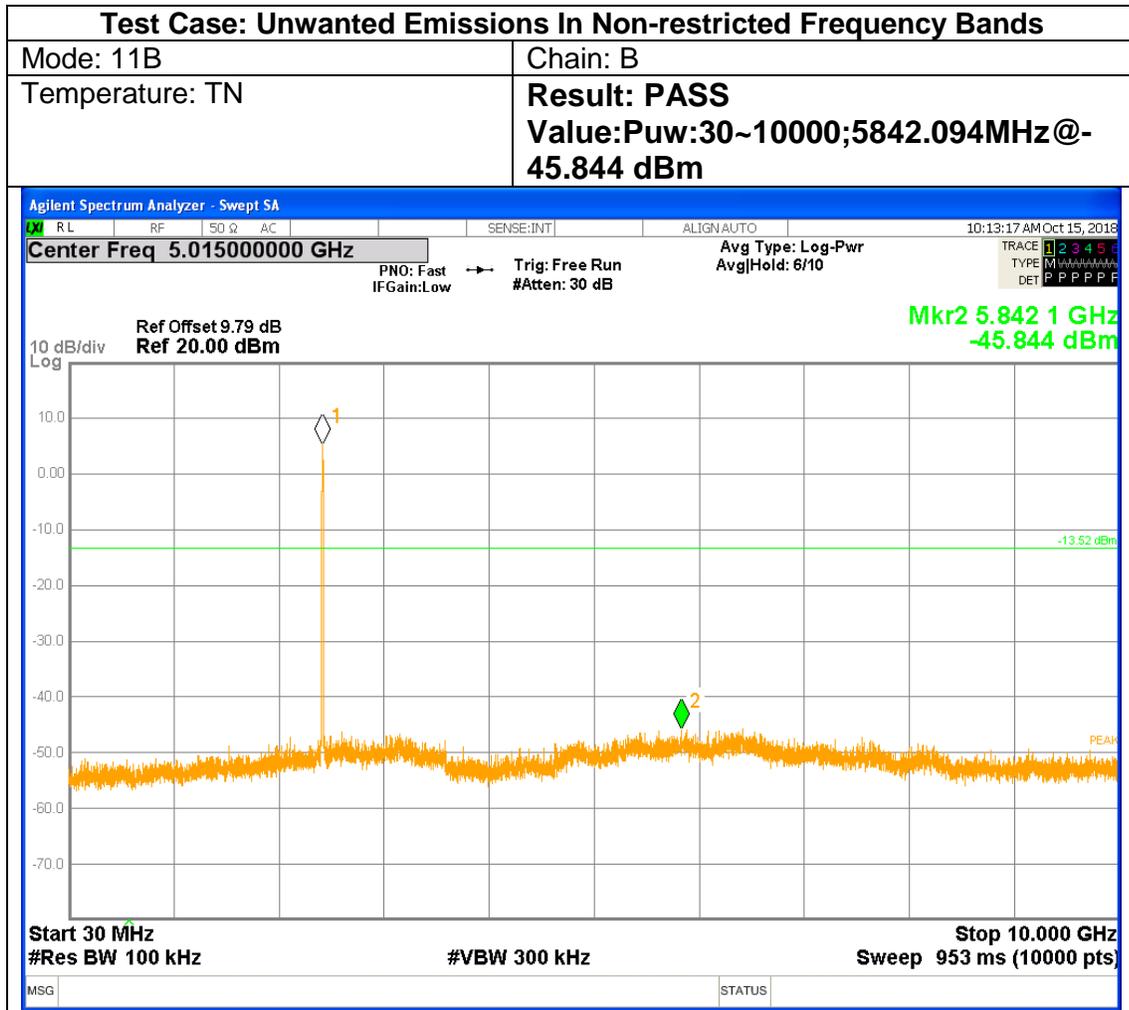


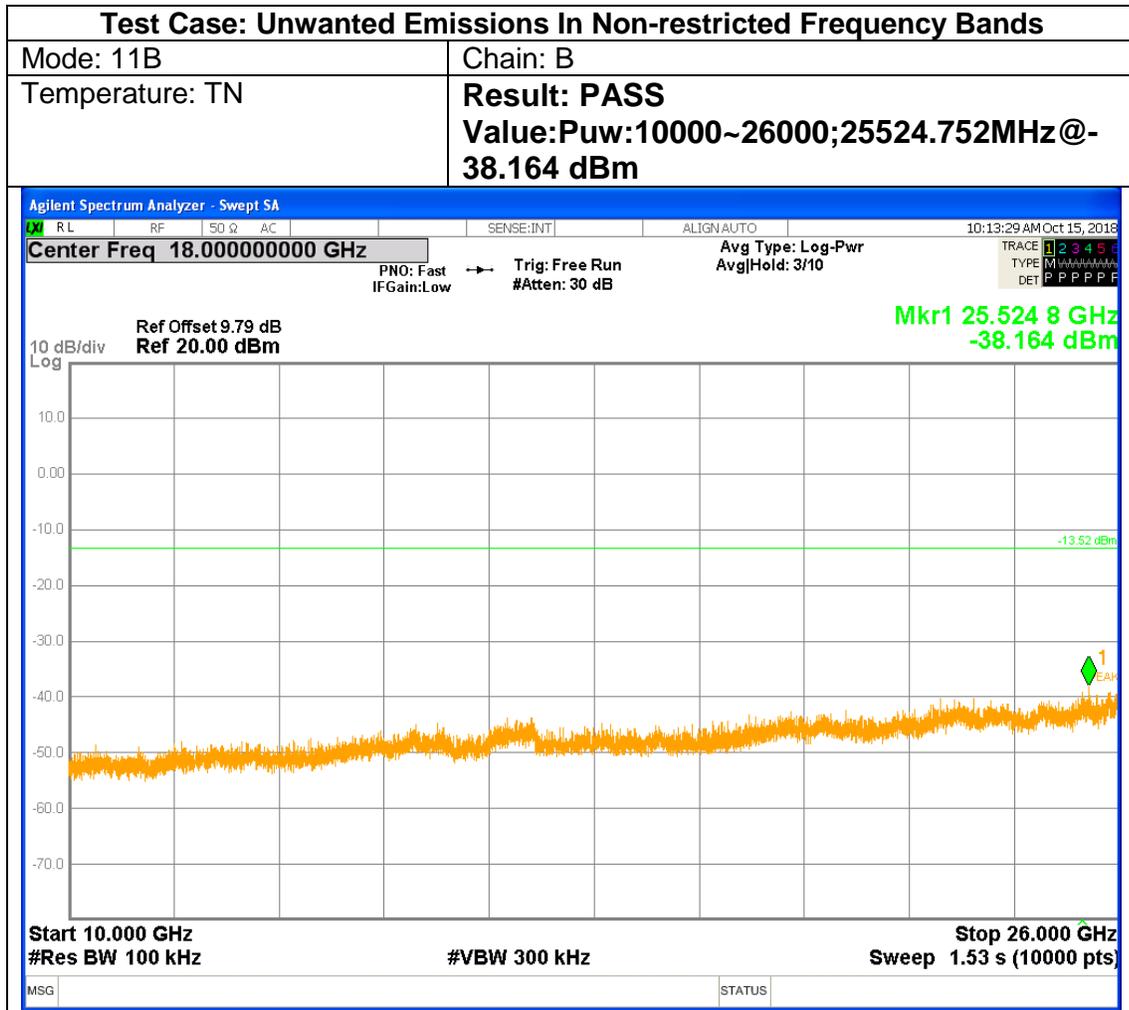


Middle Channel

Test Case: Unwanted Emissions In Non-restricted Frequency Bands	
Mode: 11B	Chain: B
Temperature: TN	Result: PASS Value: Pref: 2437.506MHz @ 6.482 dBm

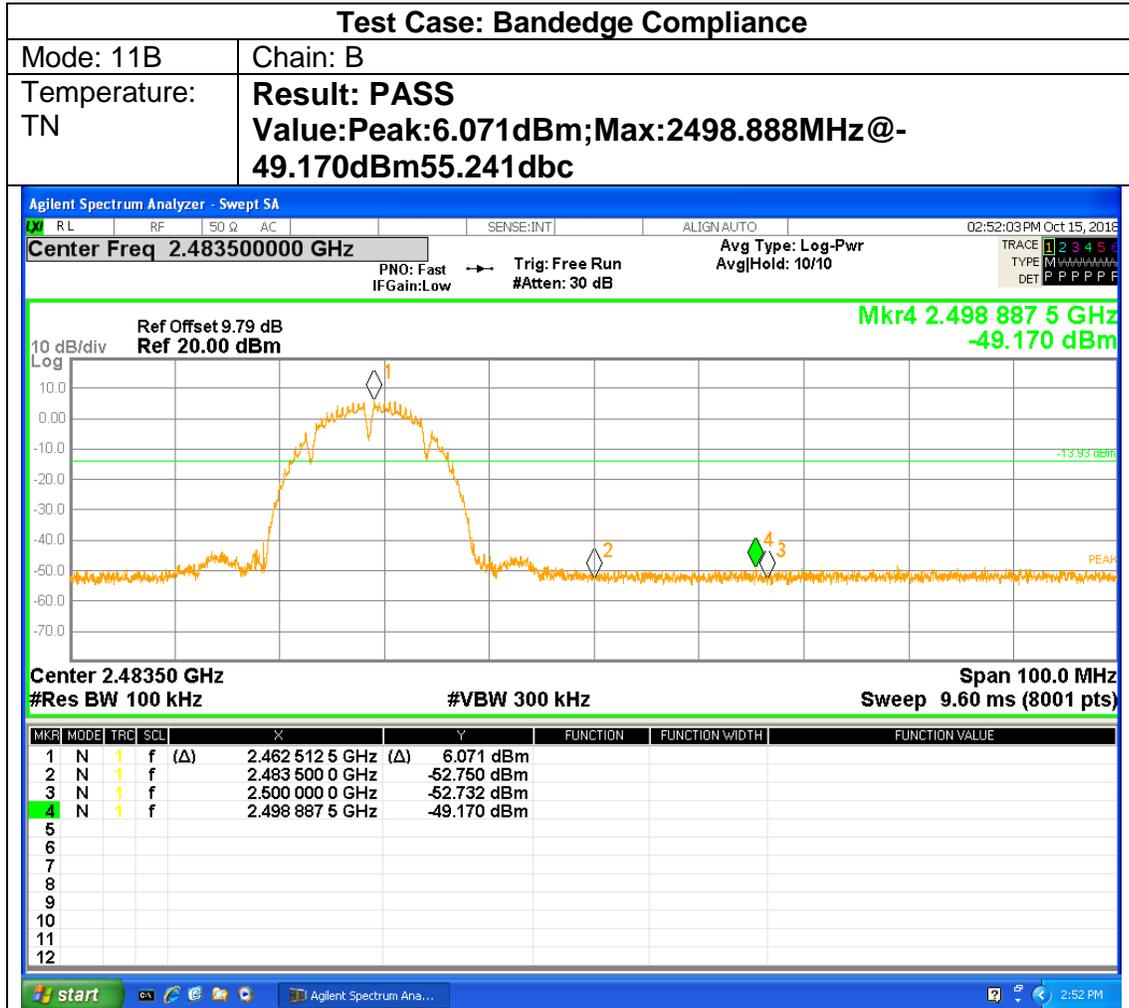


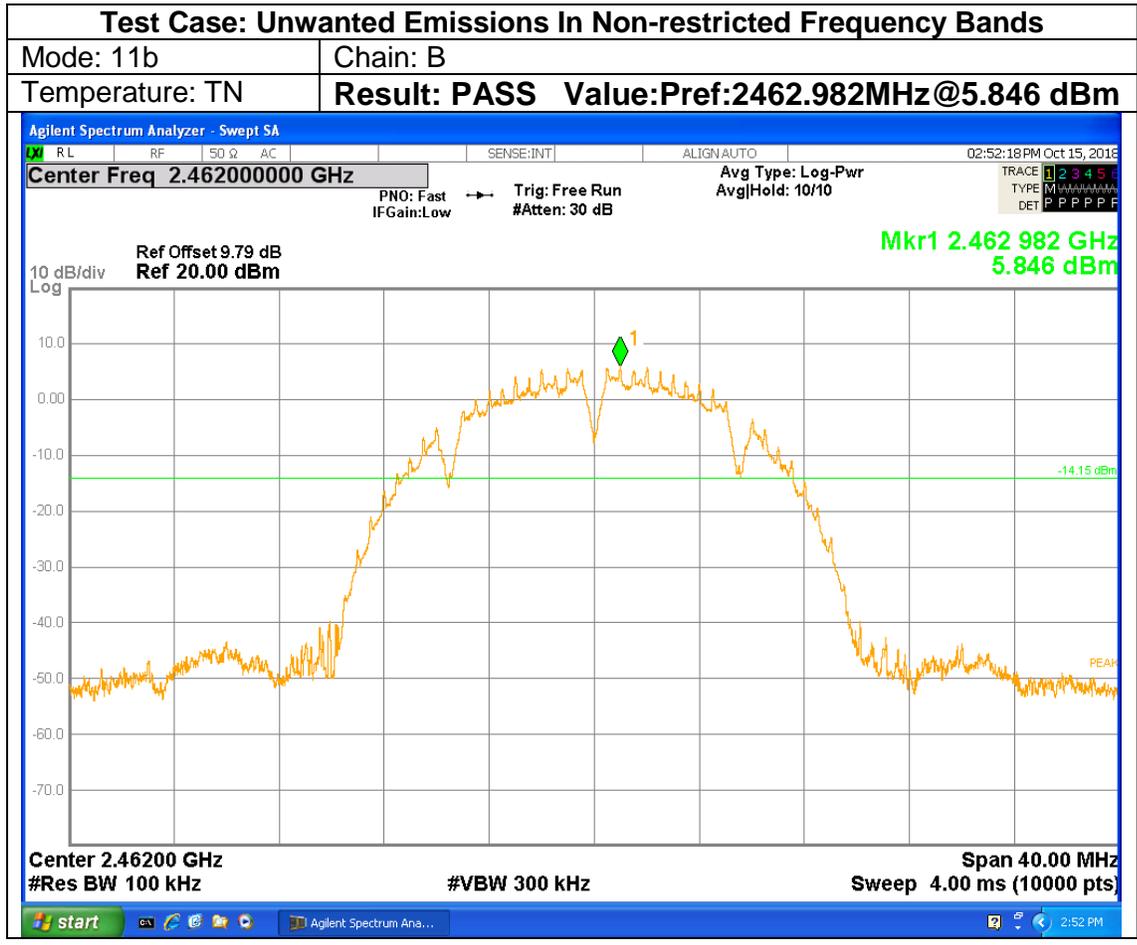


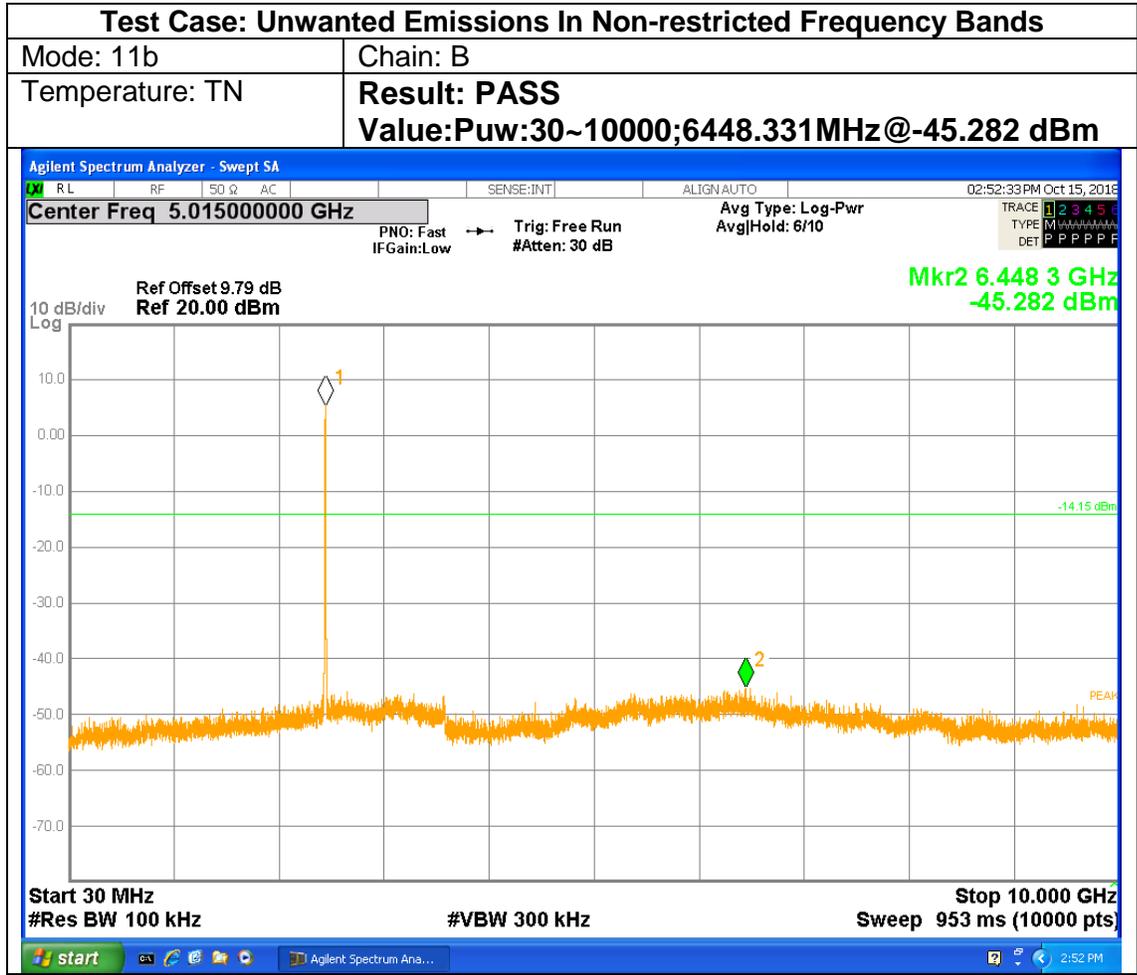


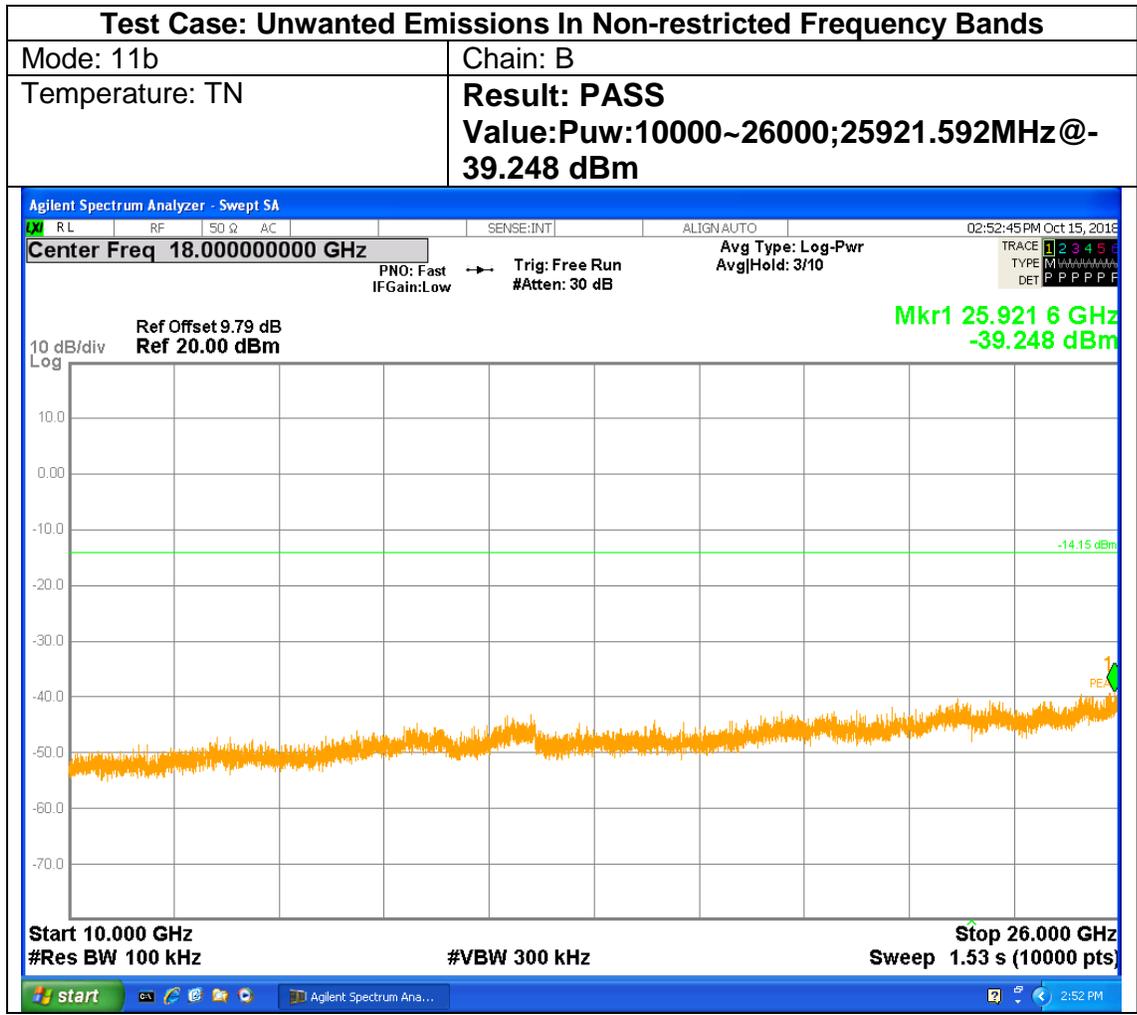


High Channel







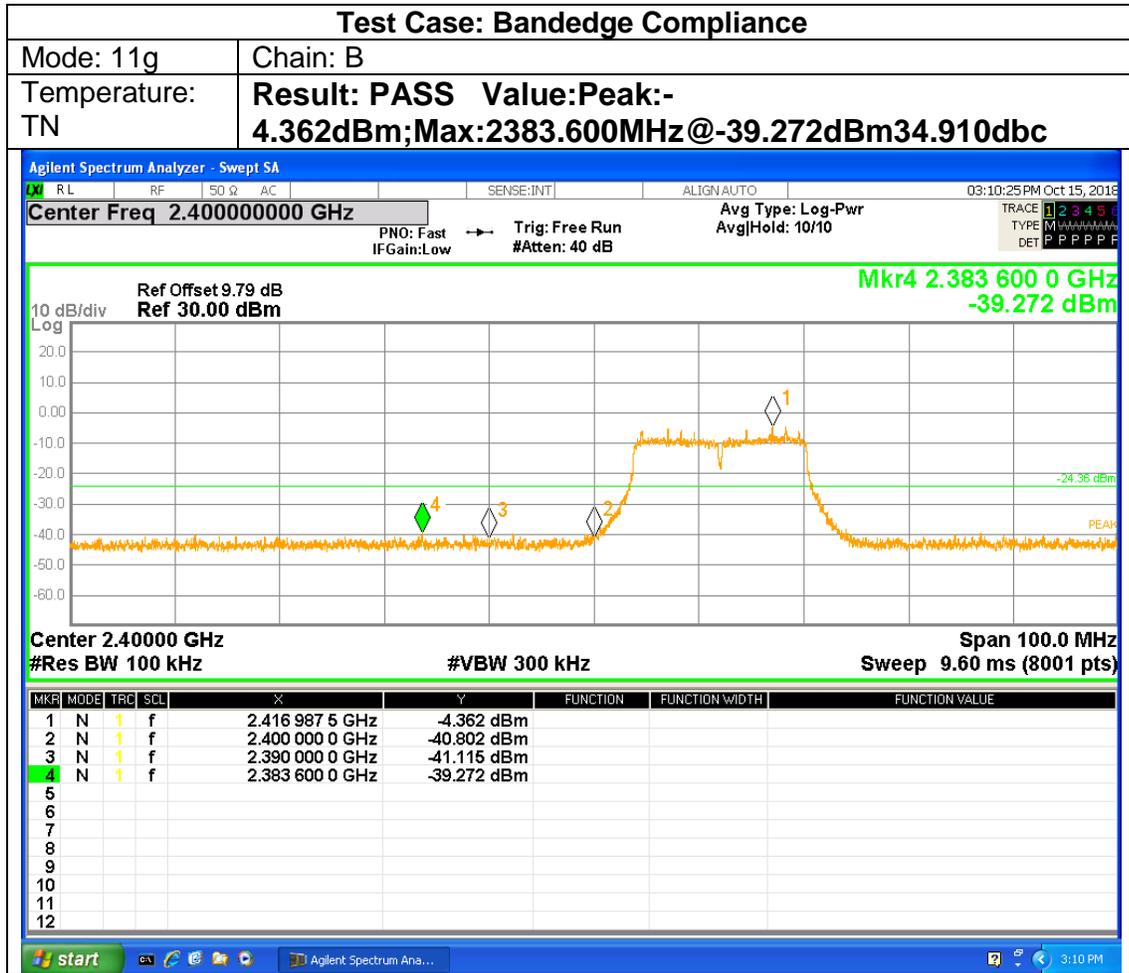


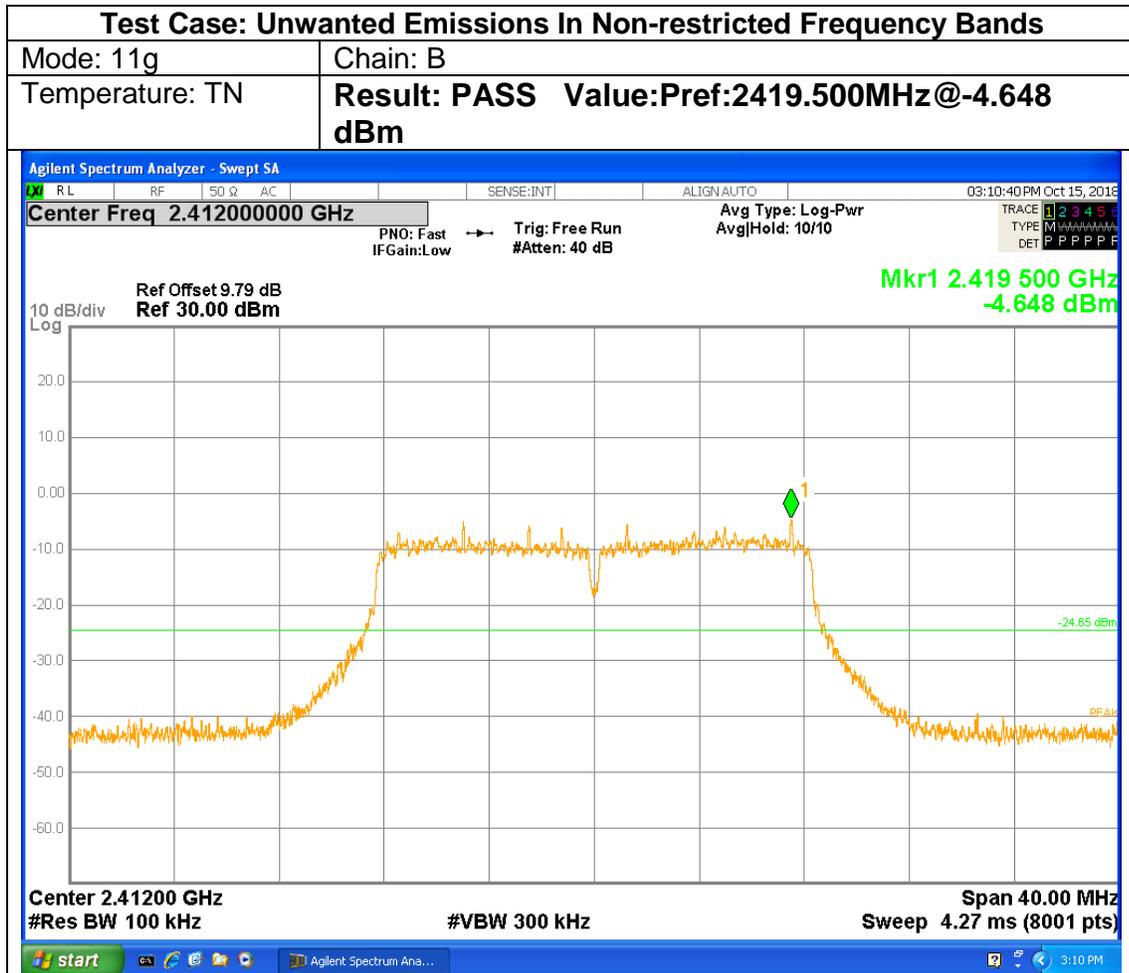


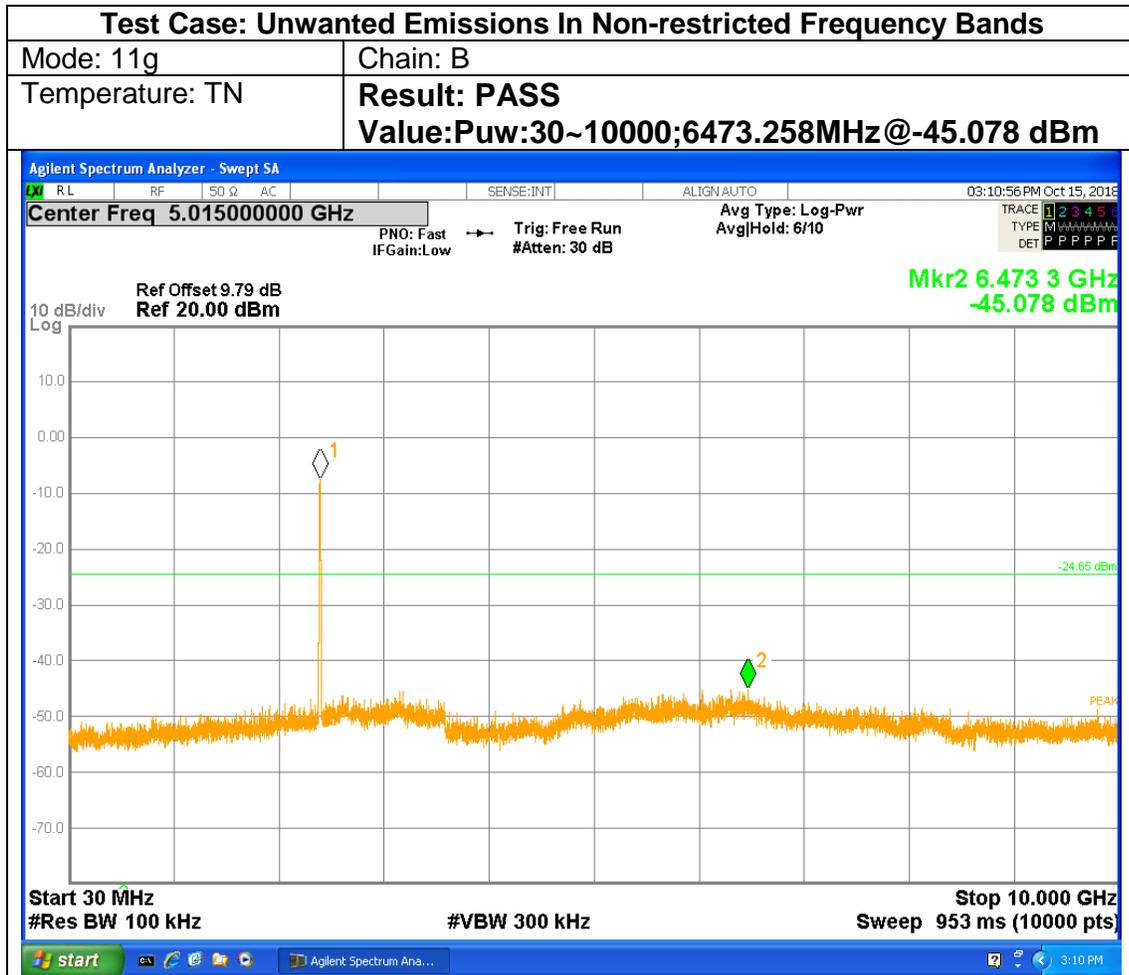
8.5.2. 802.11g MODE

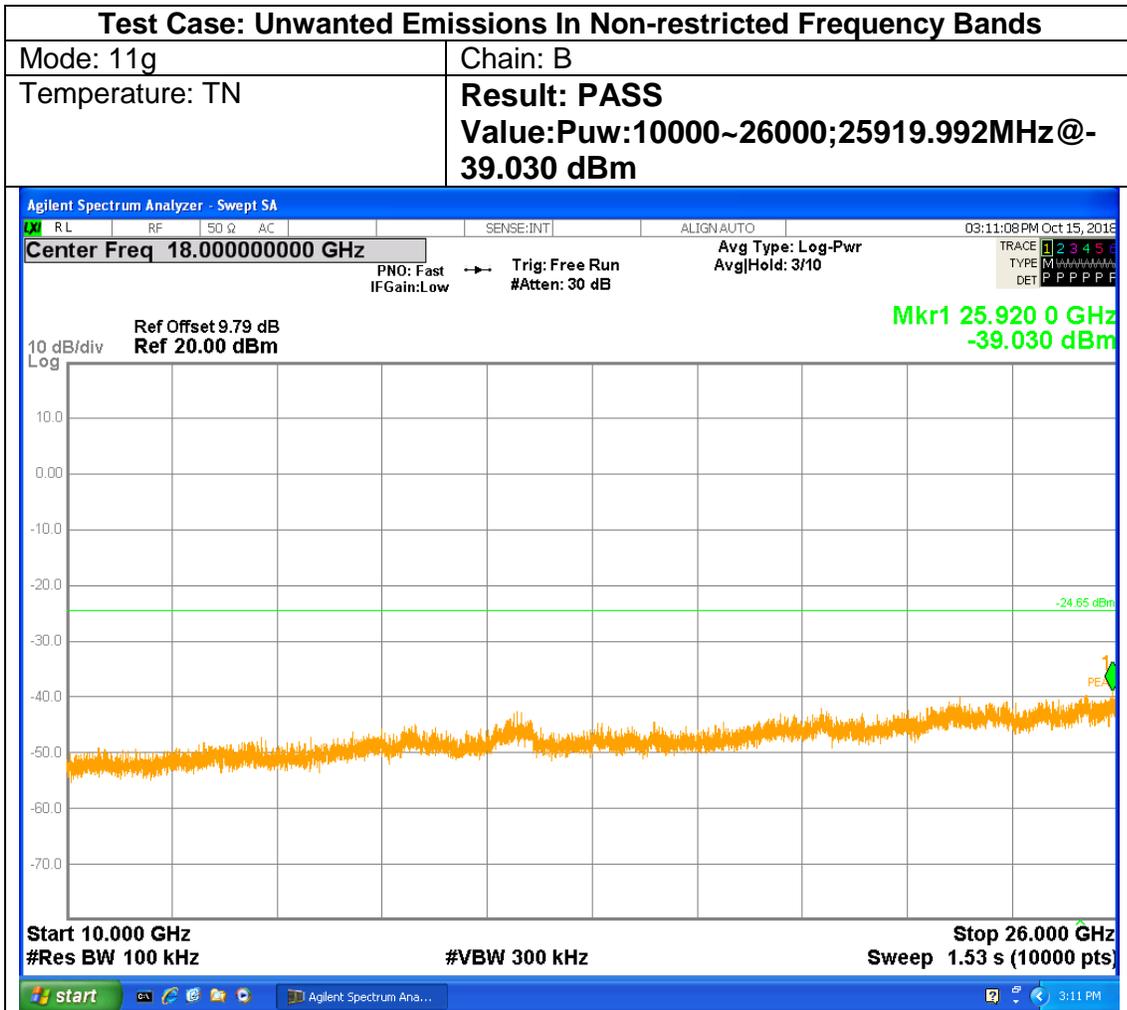
SISO MODE ANTENNA B (WORST-CASE CONFIGURATION)

Low Channel



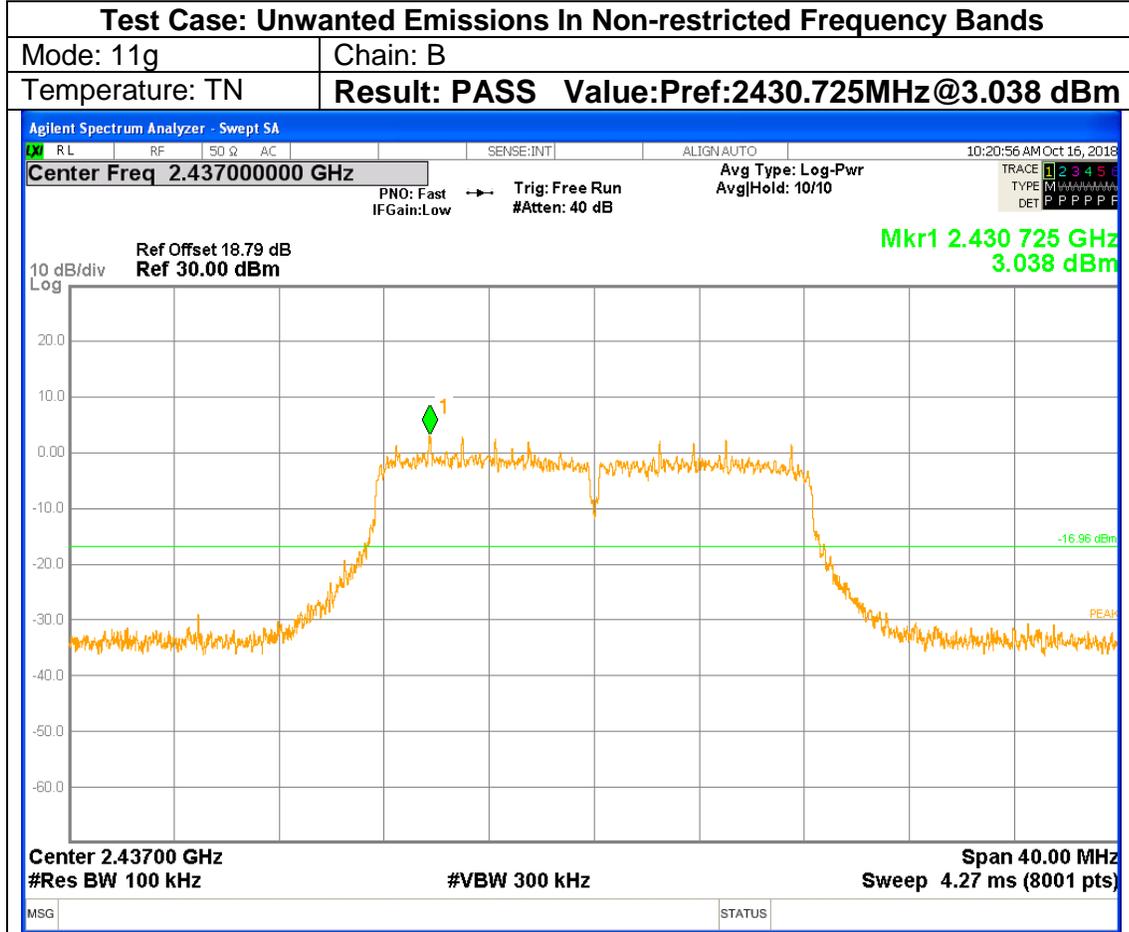


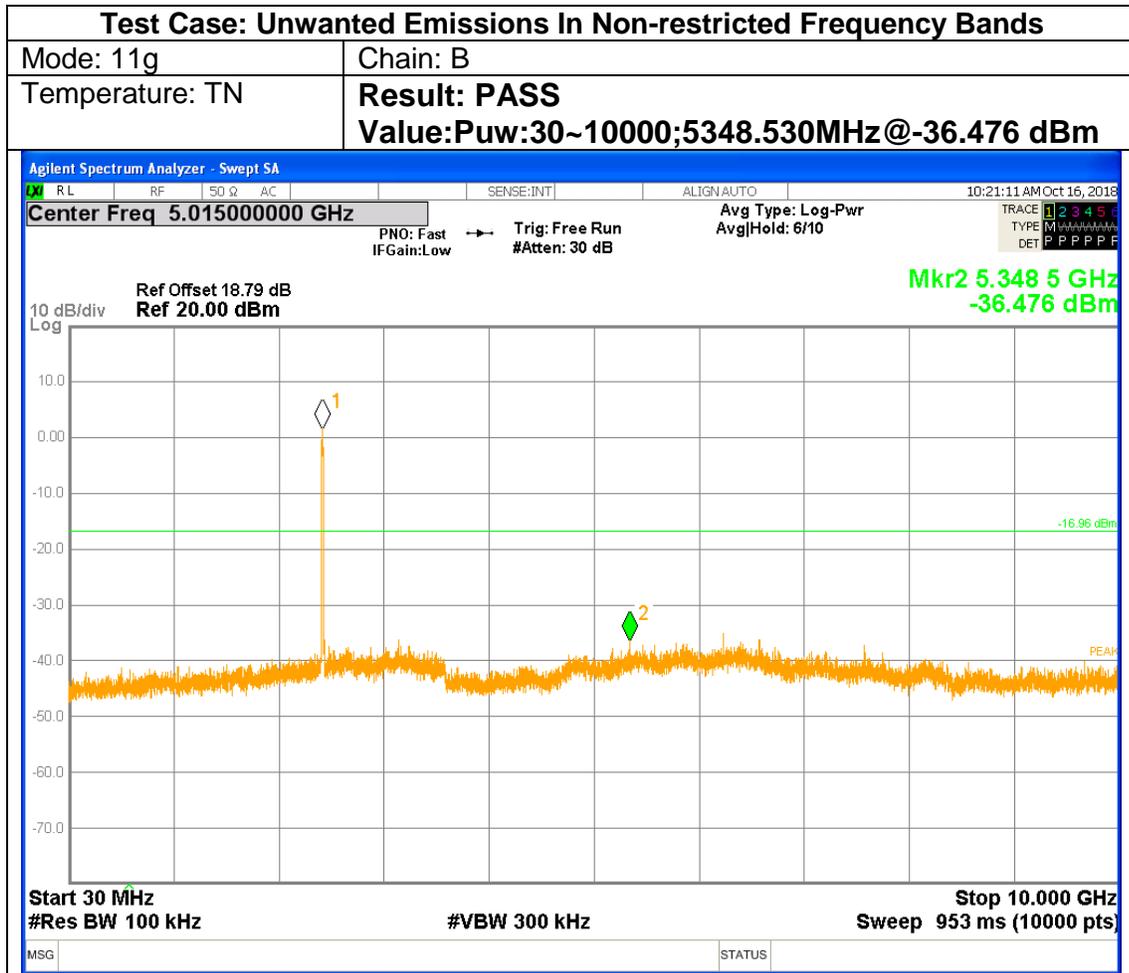


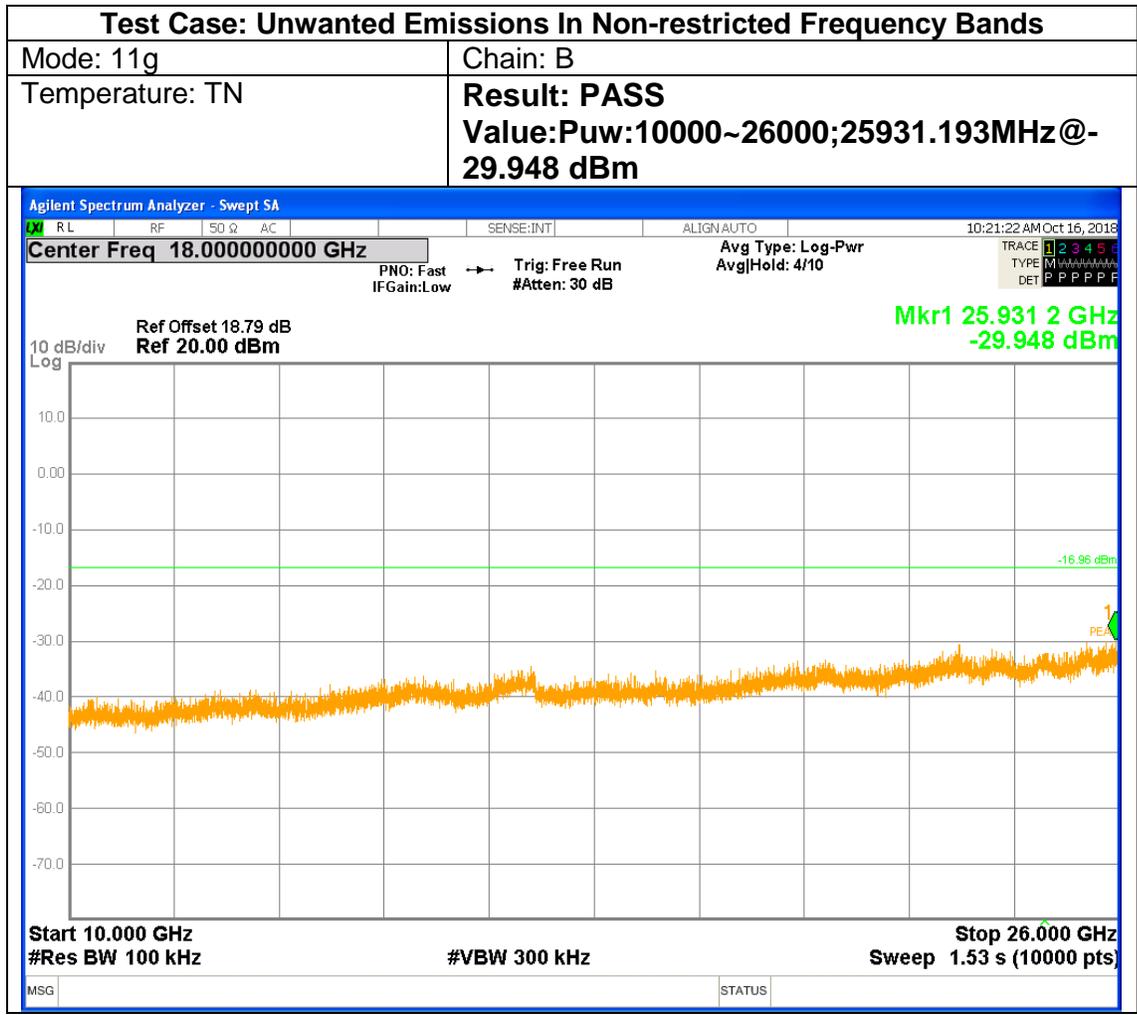




Middle Channel

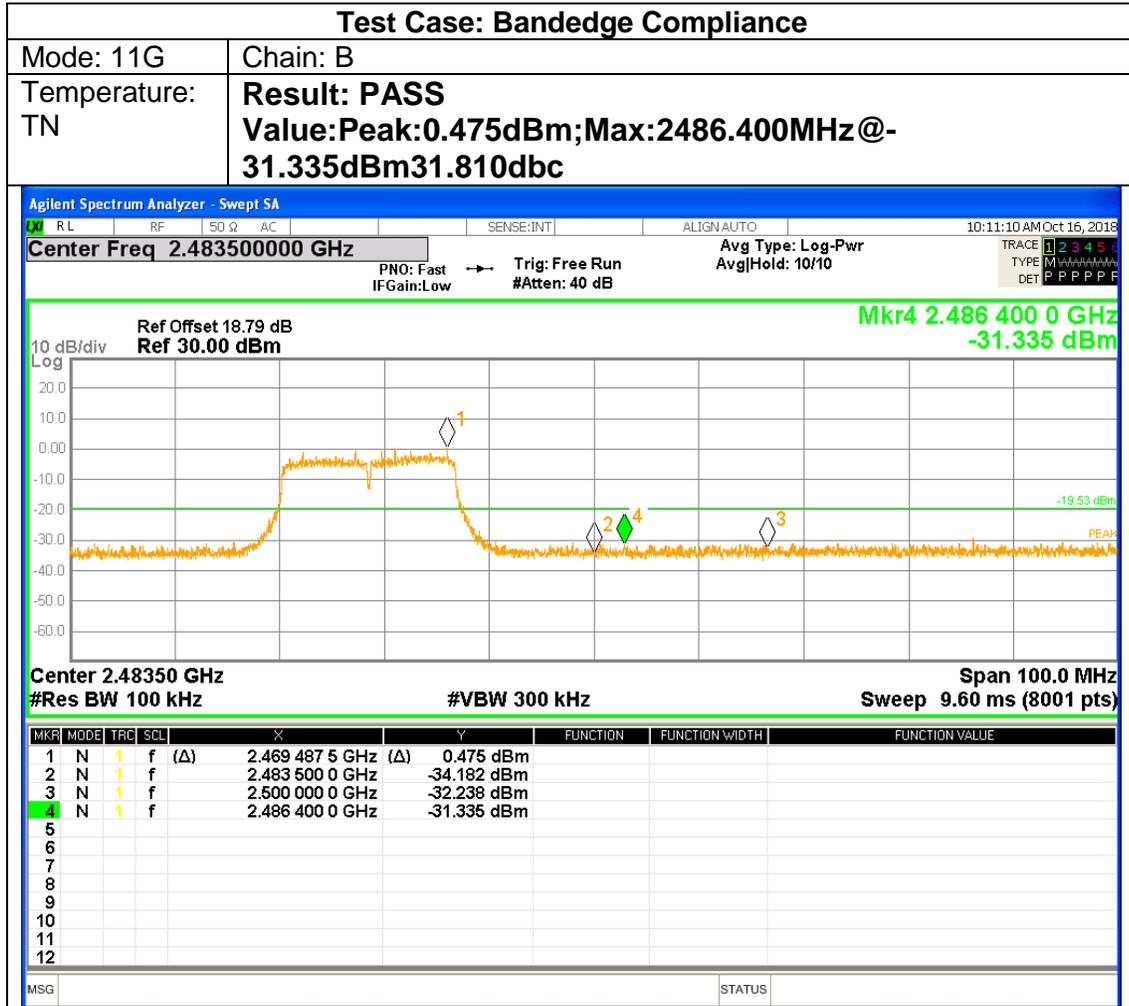


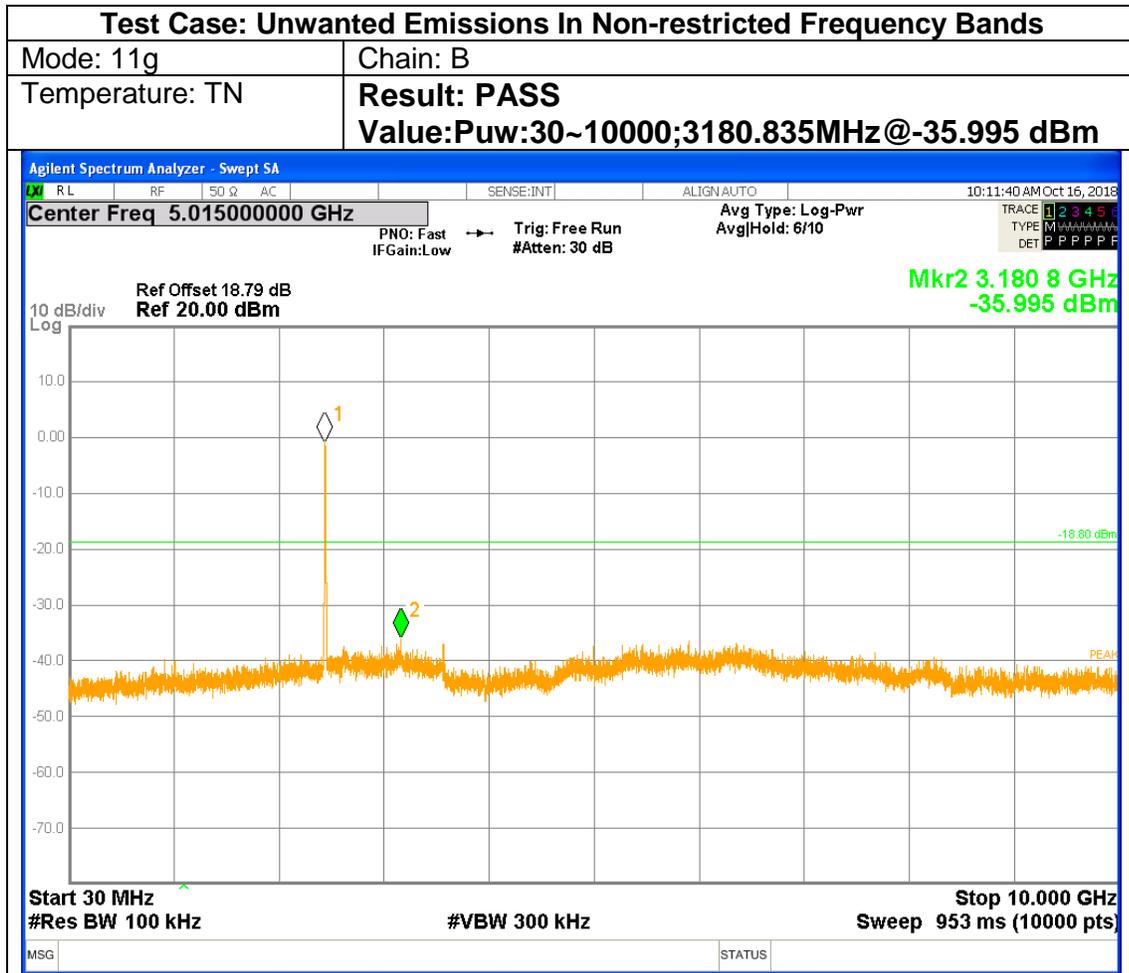


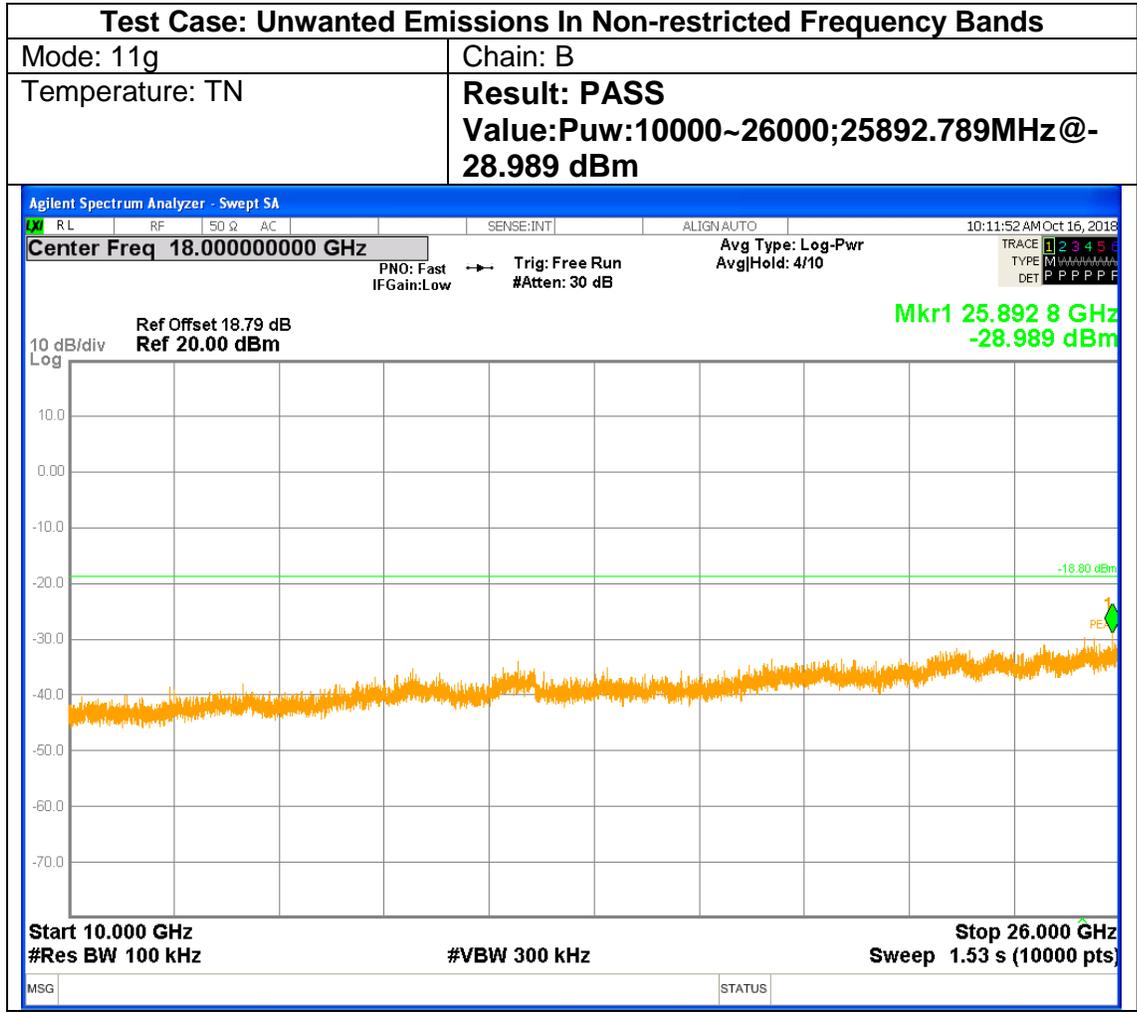




High Channel 11



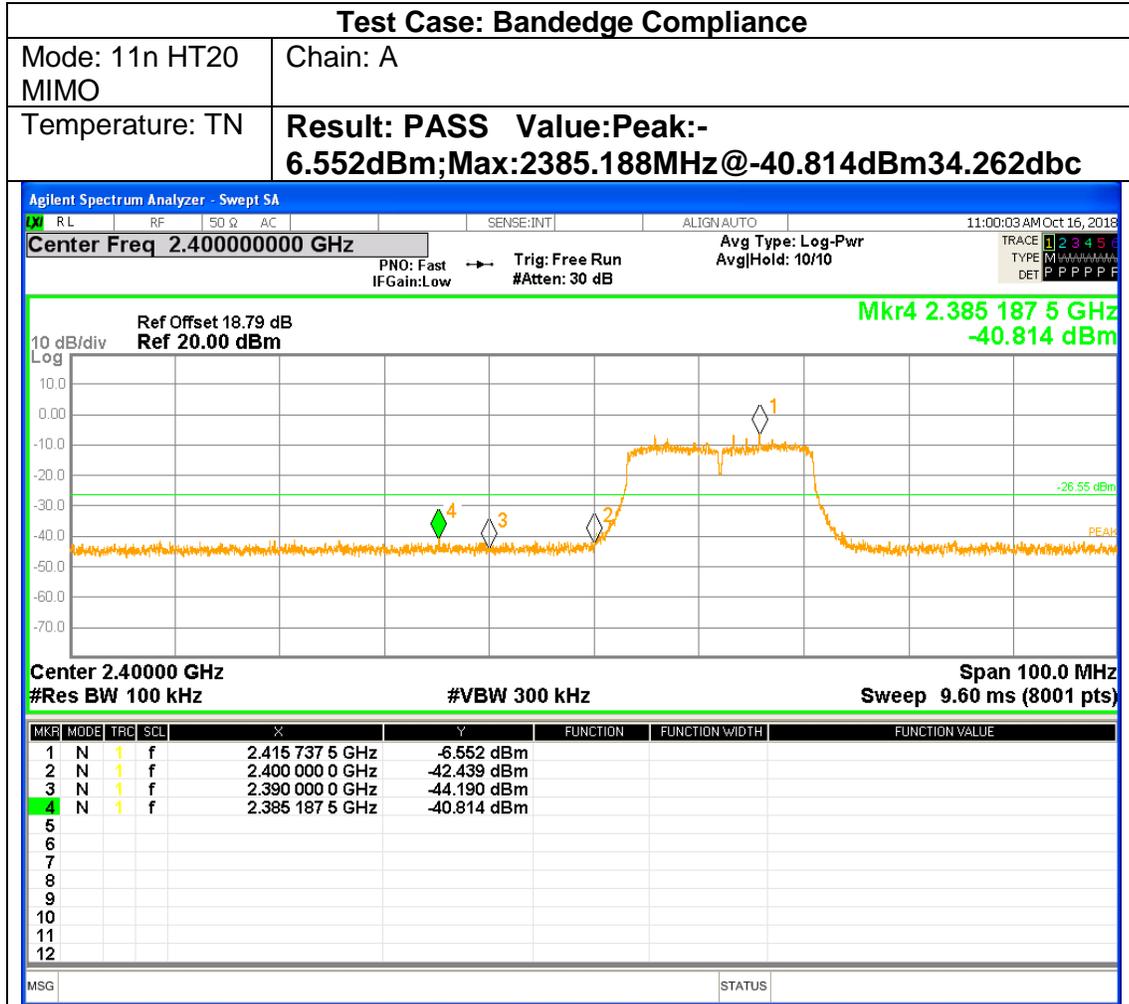


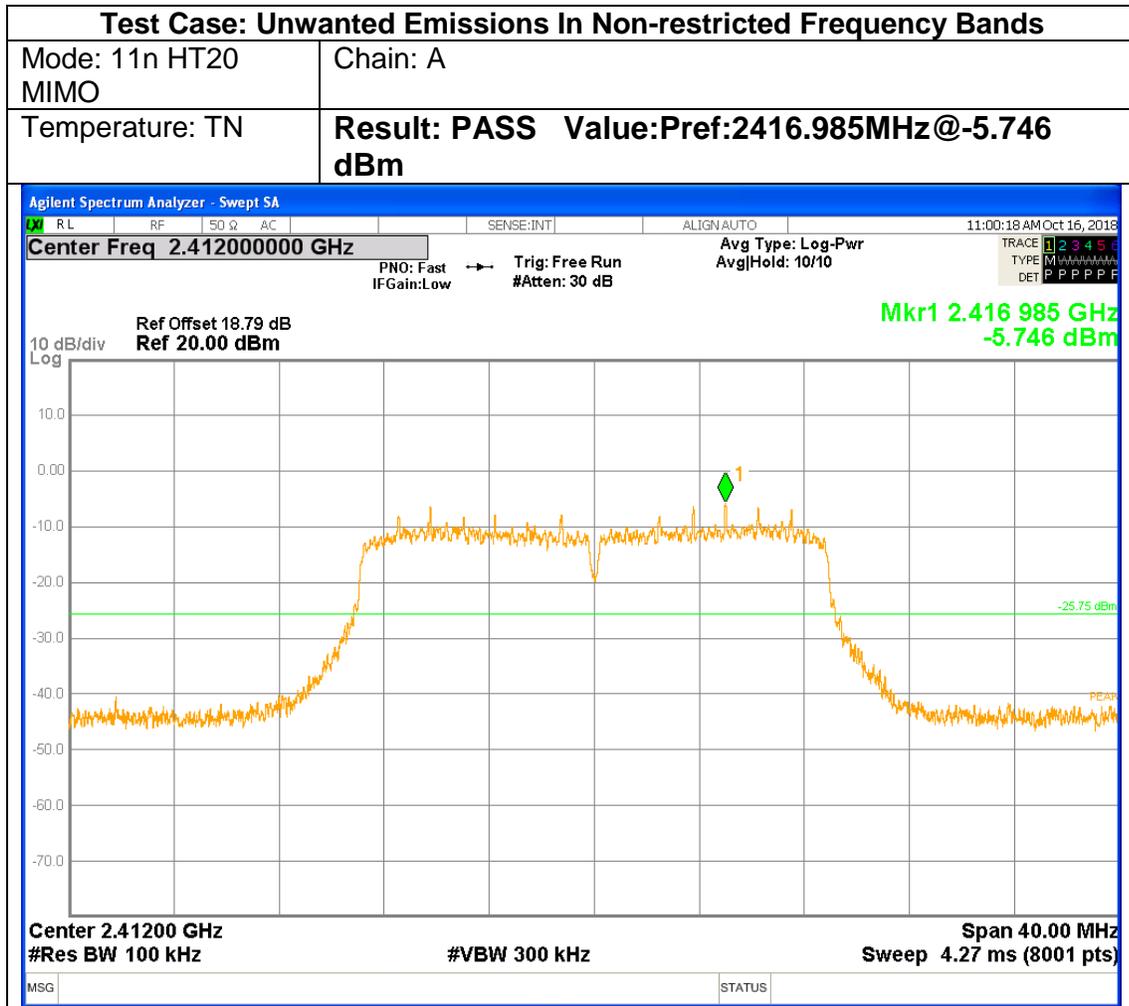


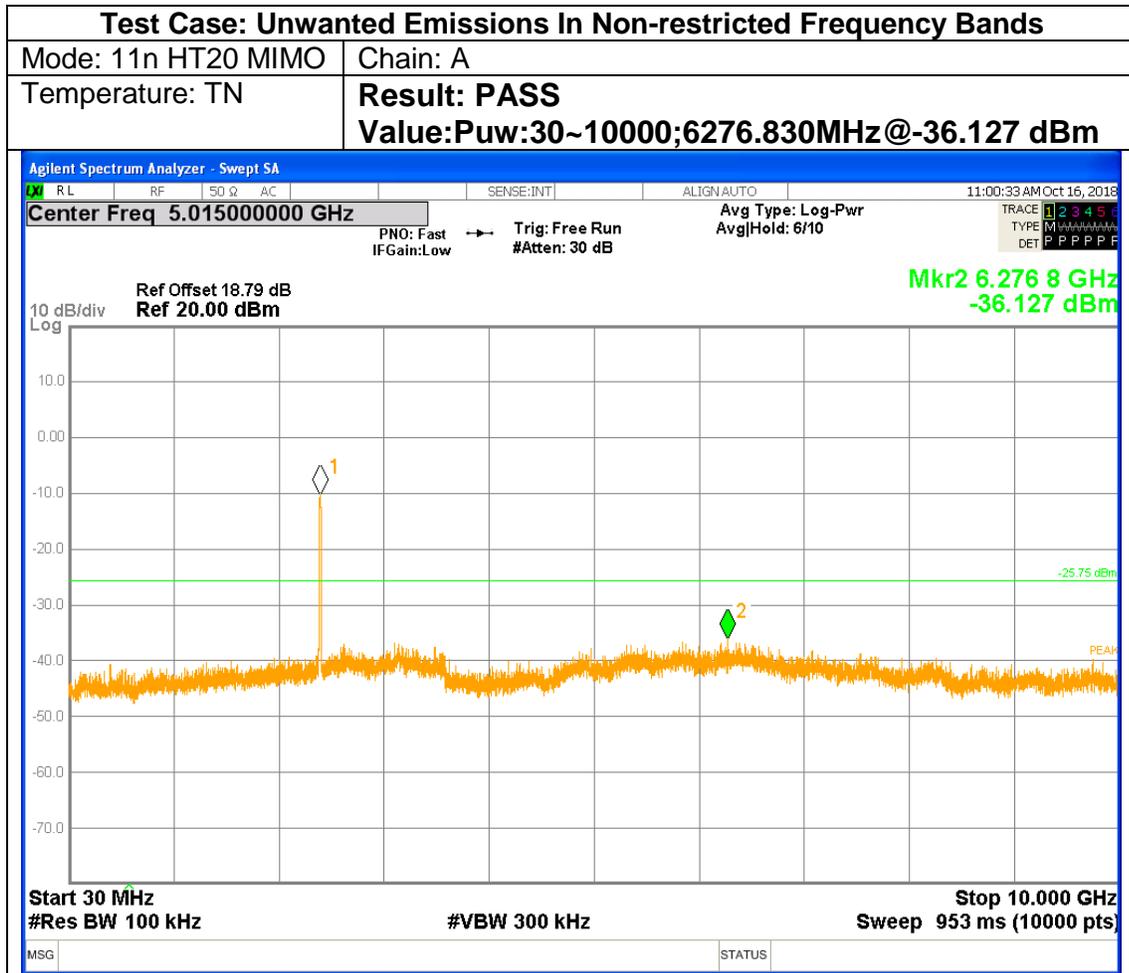


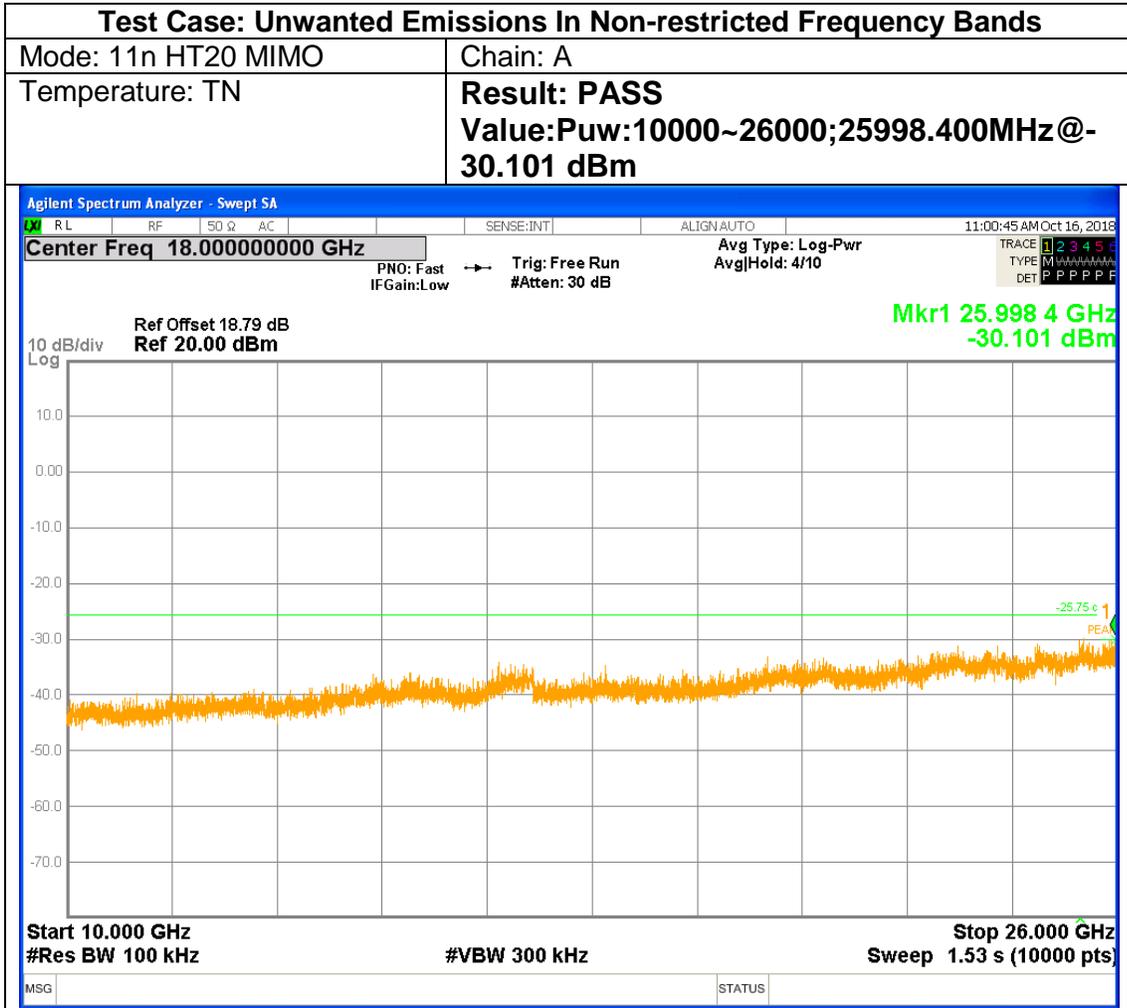
8.5.3. 802.11n HT20 MODE

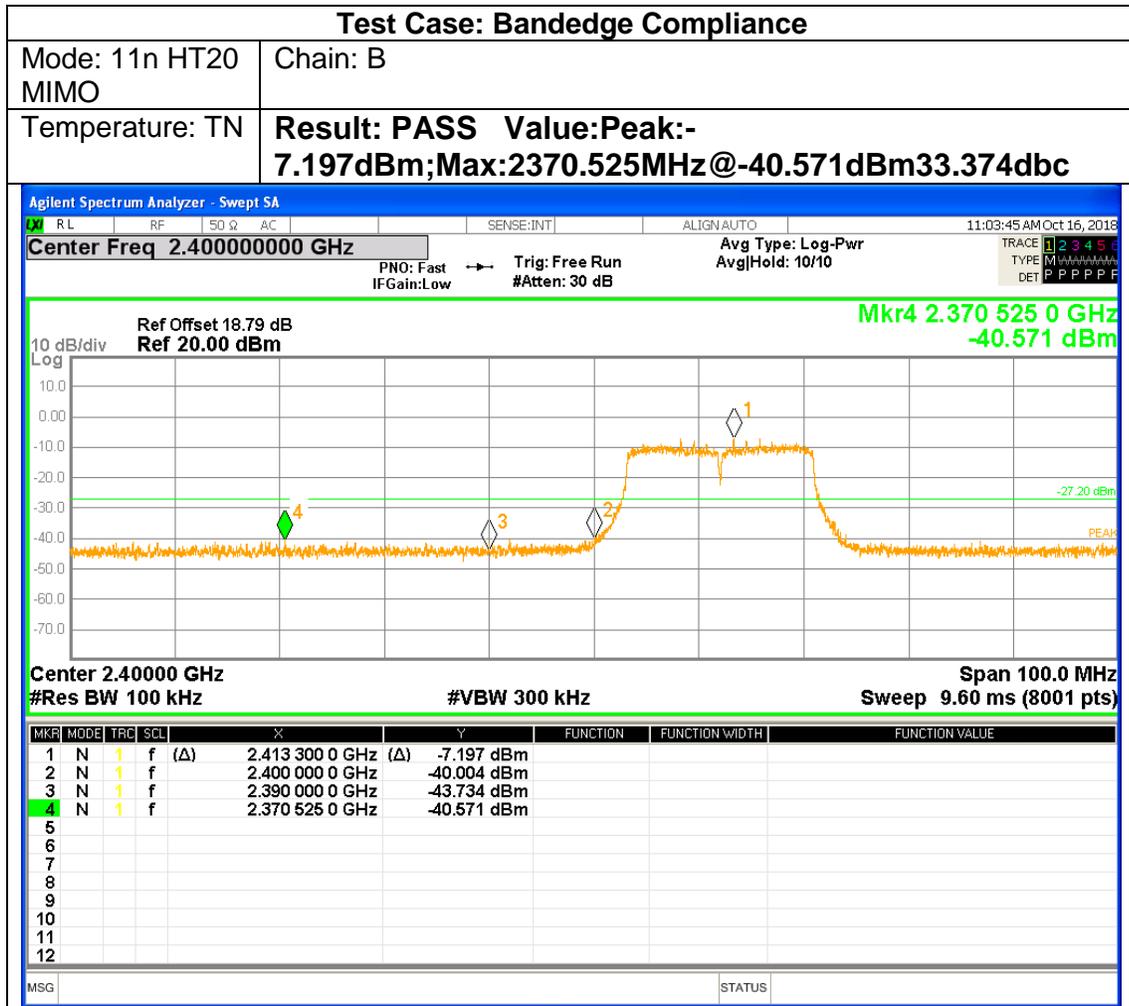
Low Channel

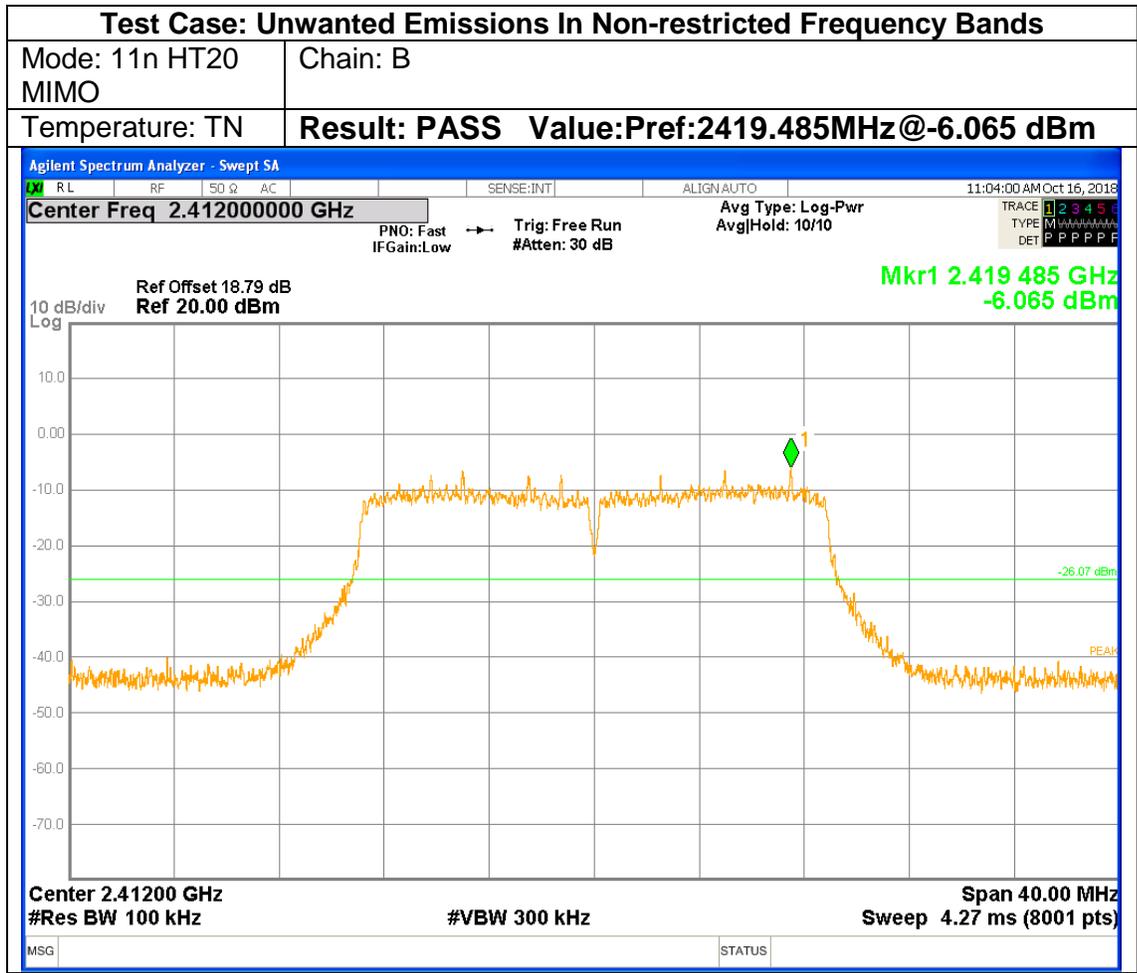


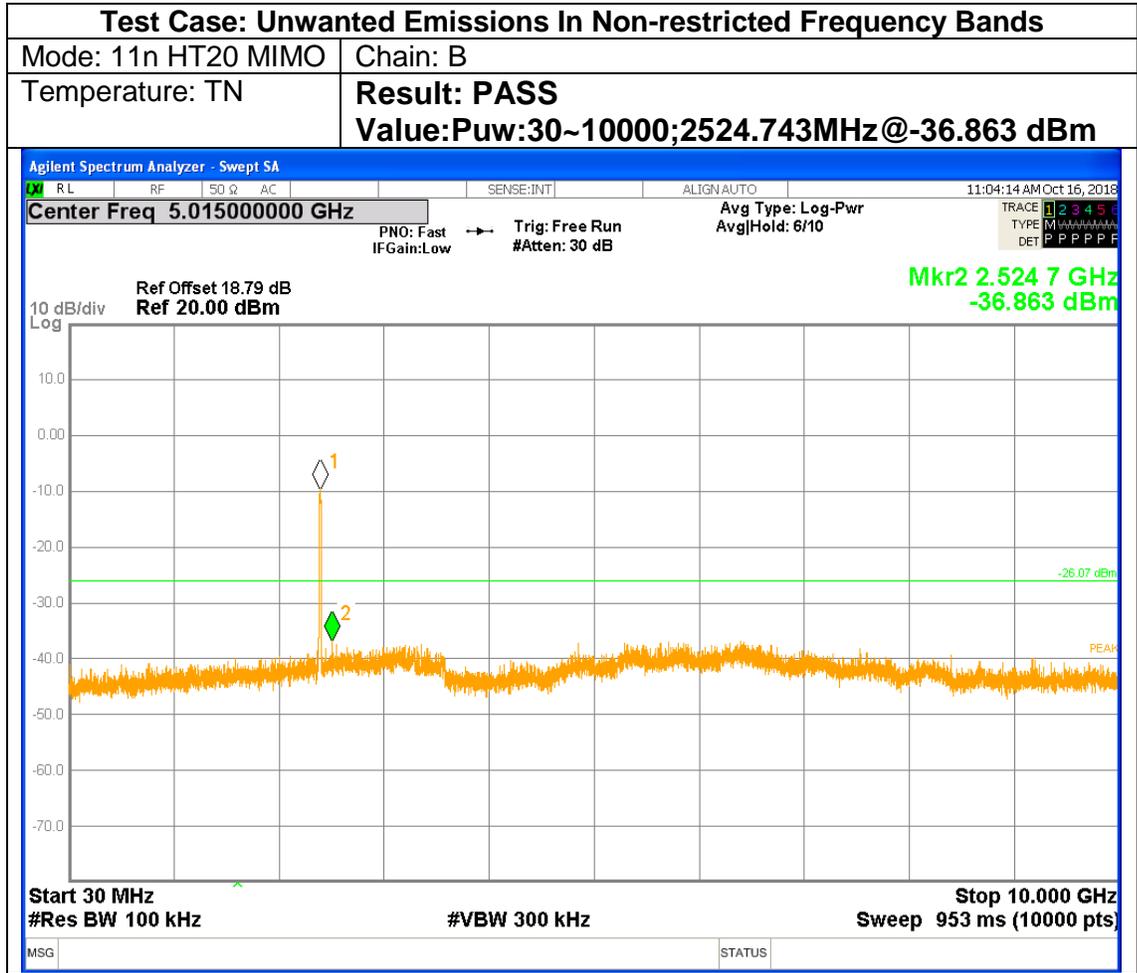


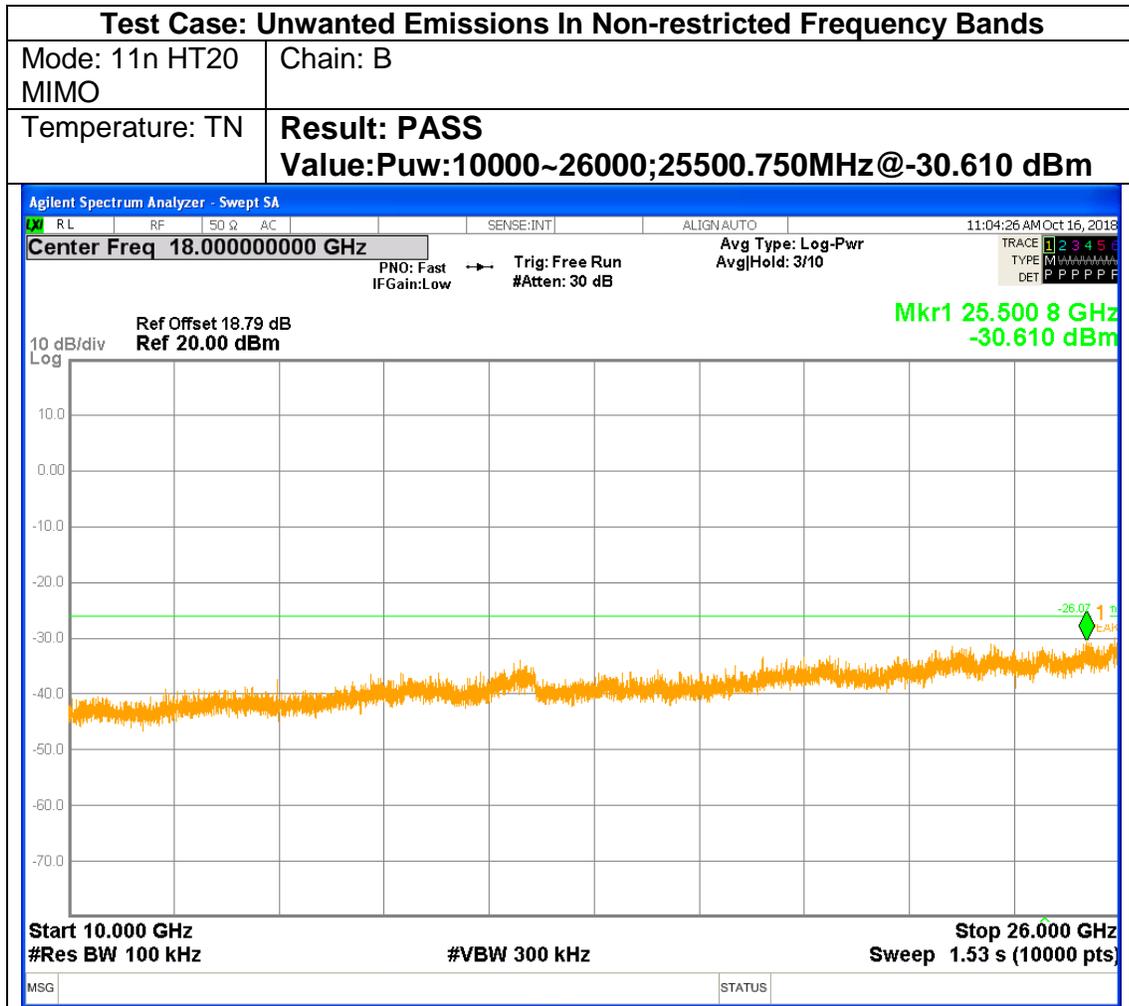






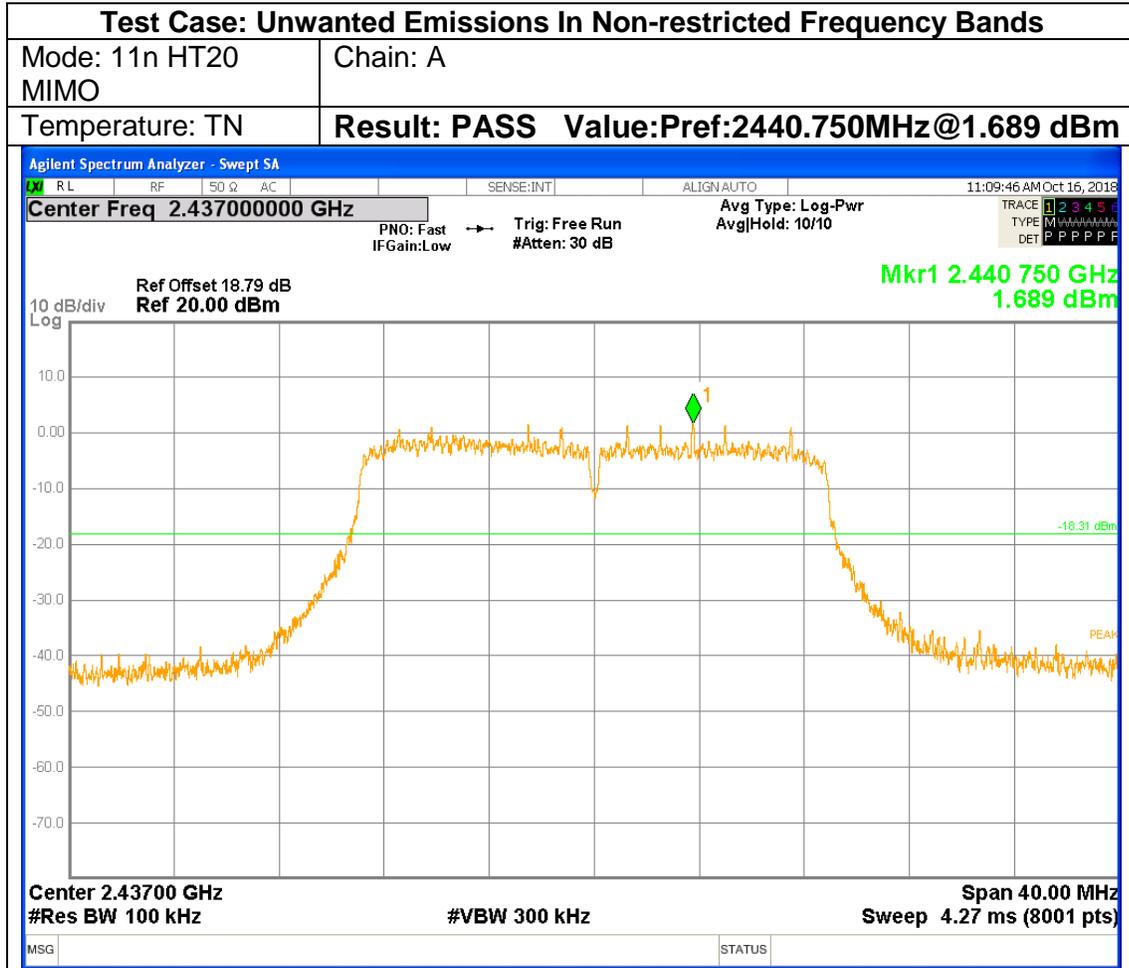


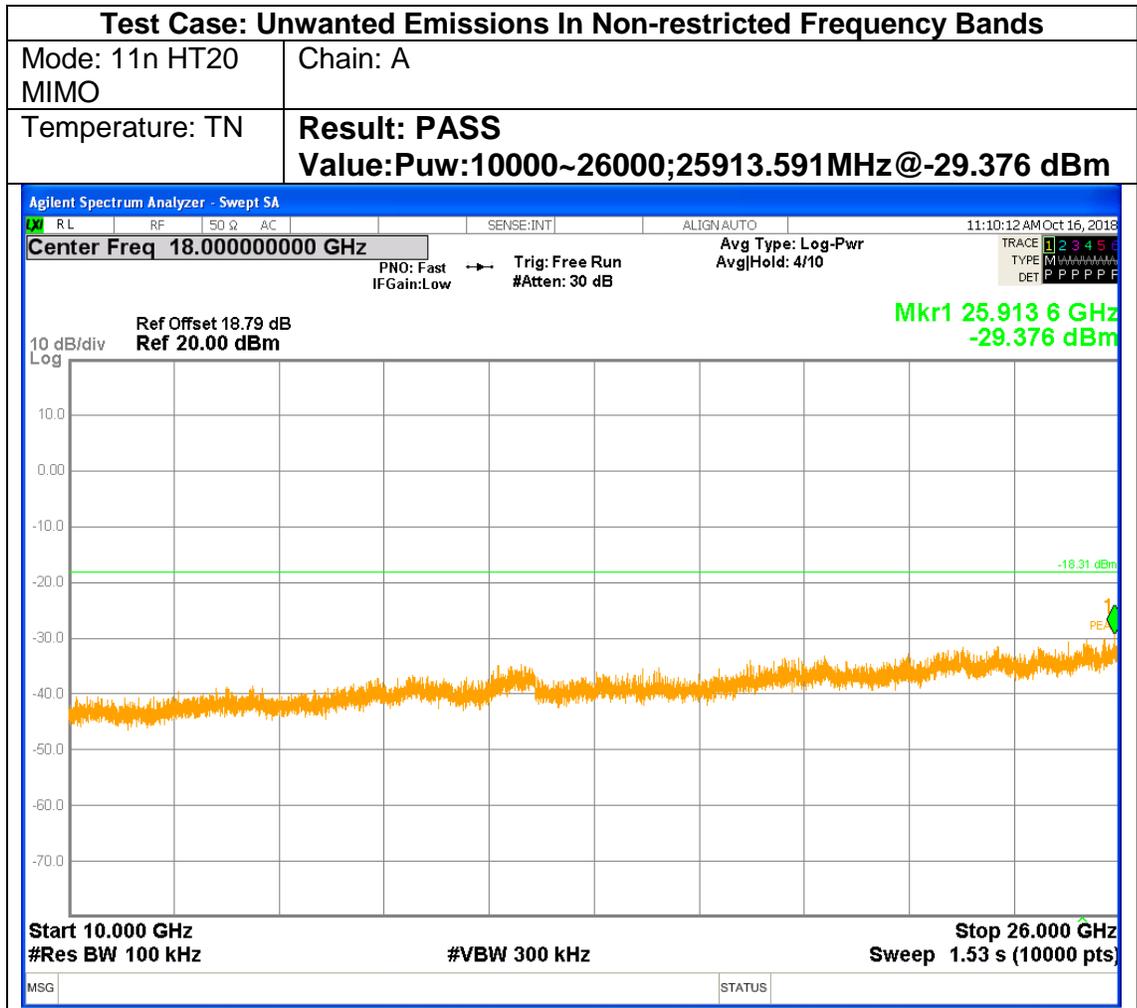


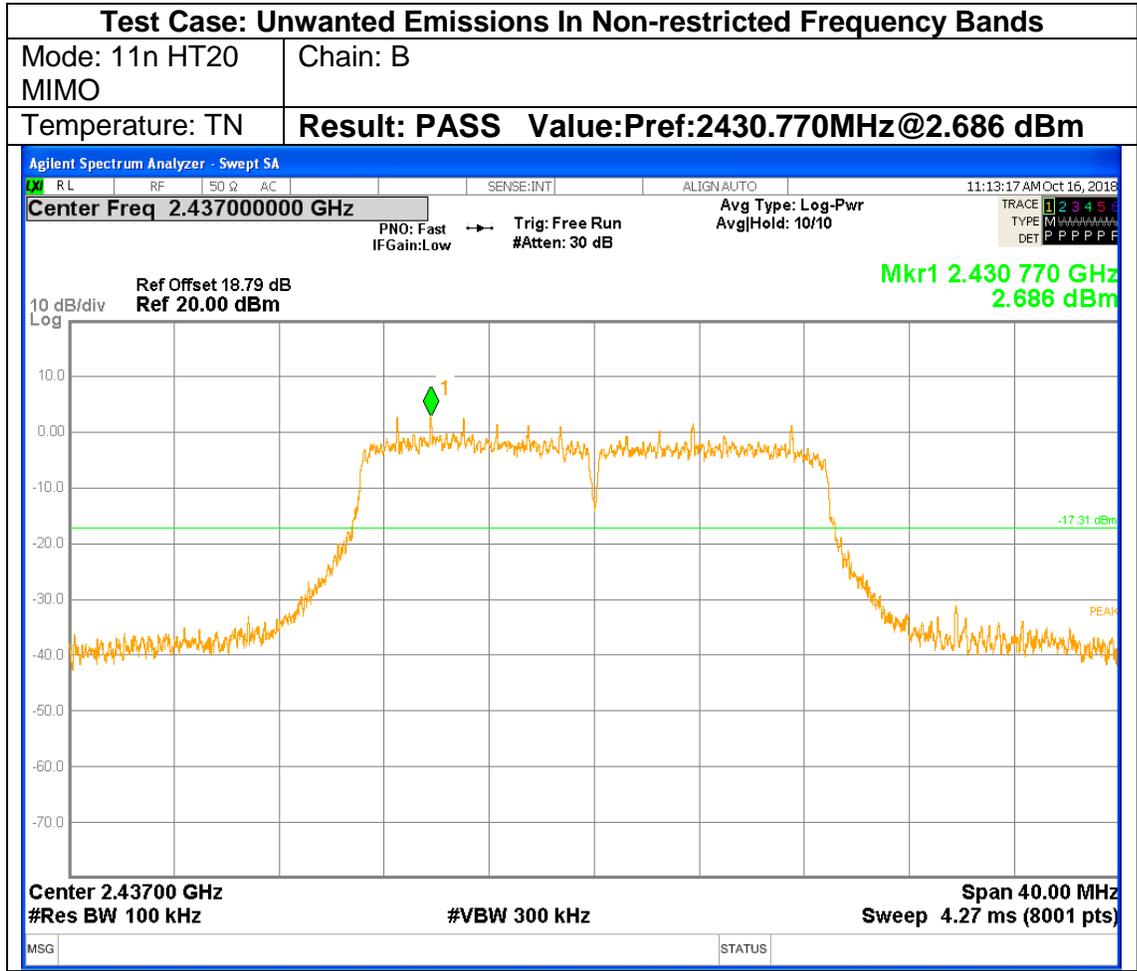


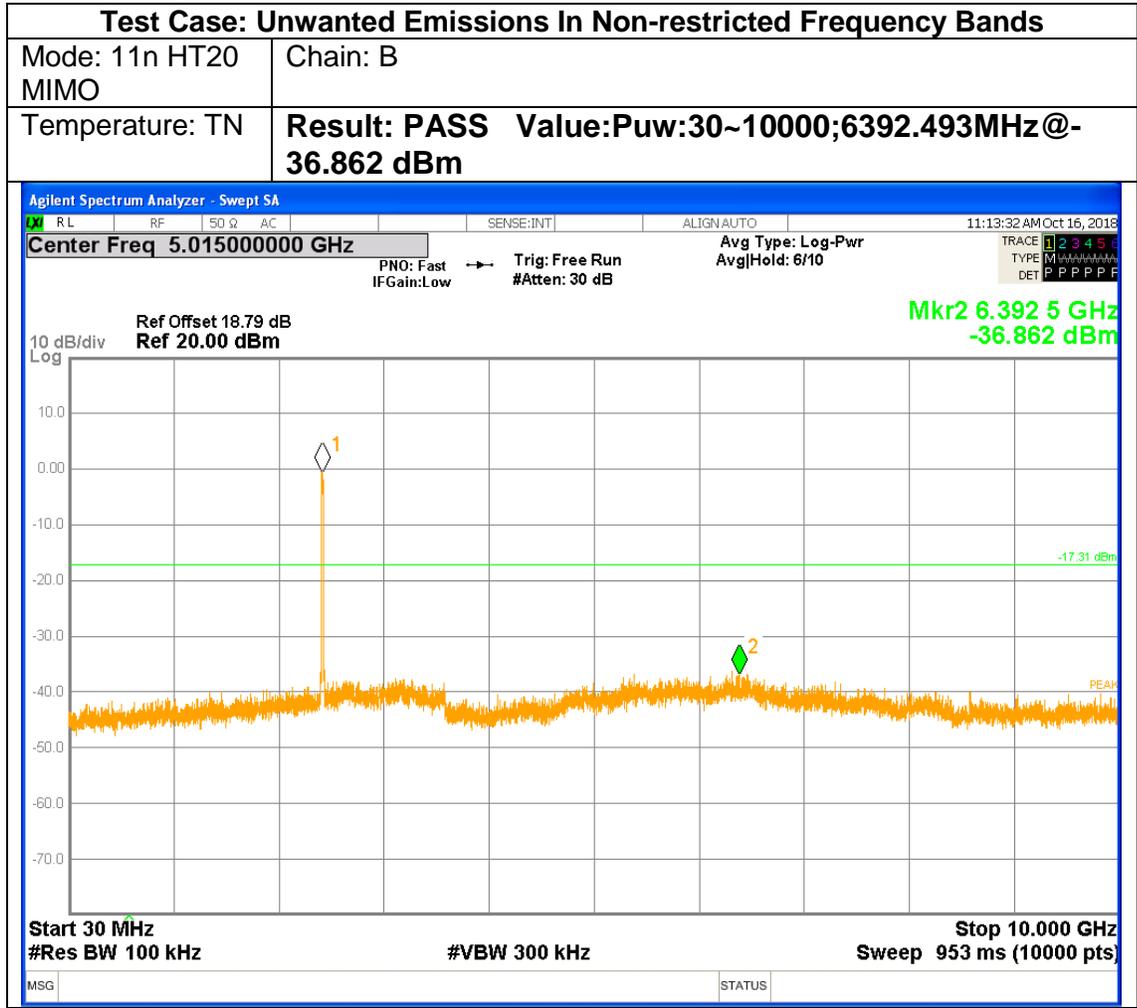


Middle Channel



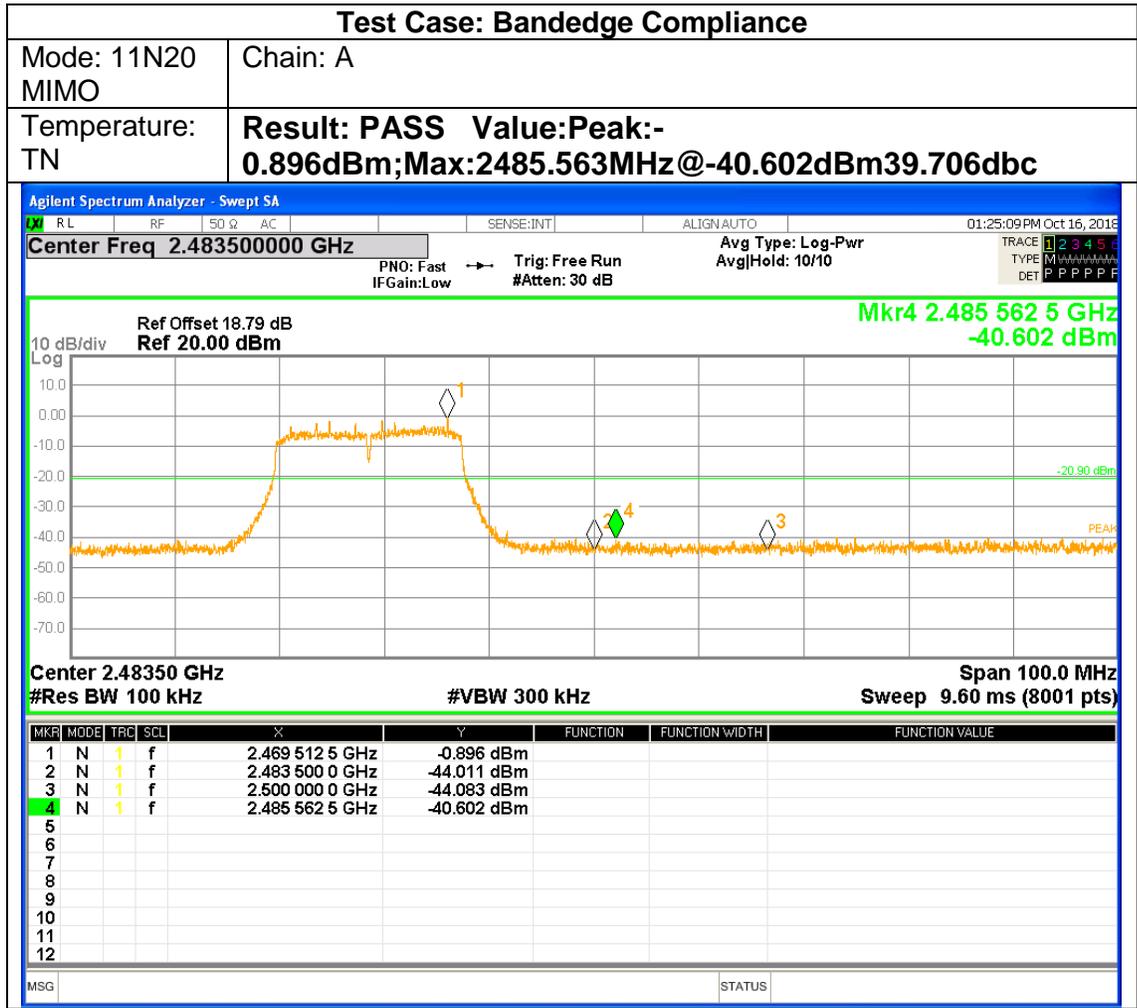


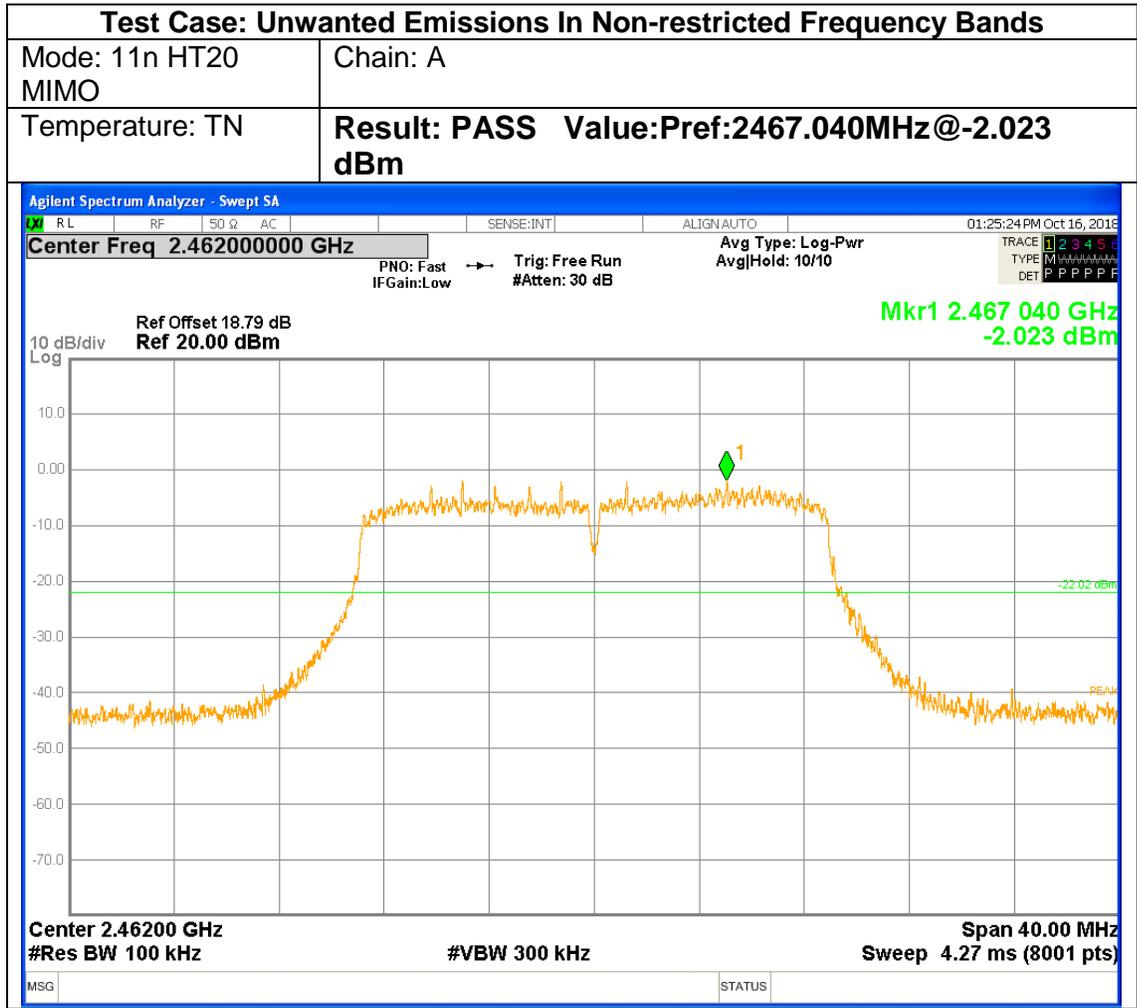


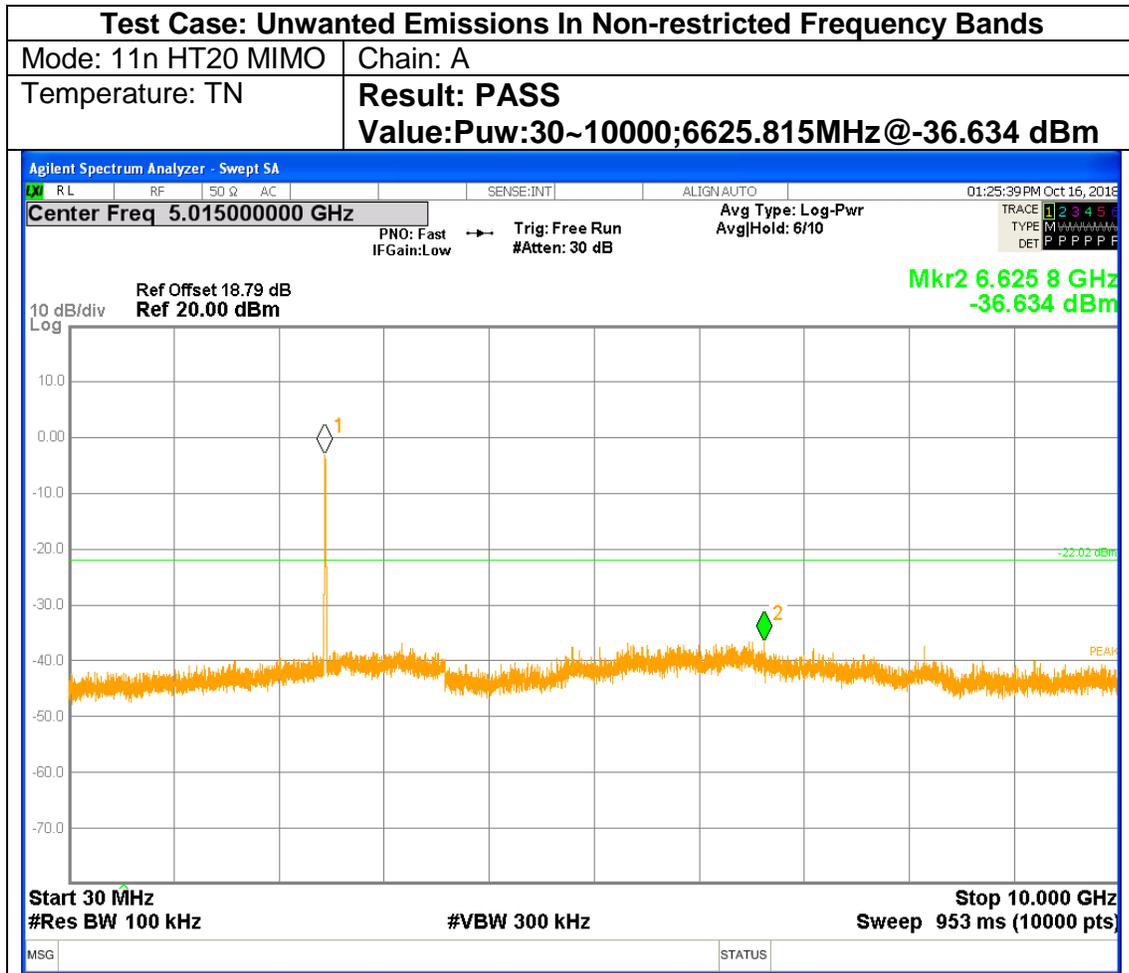


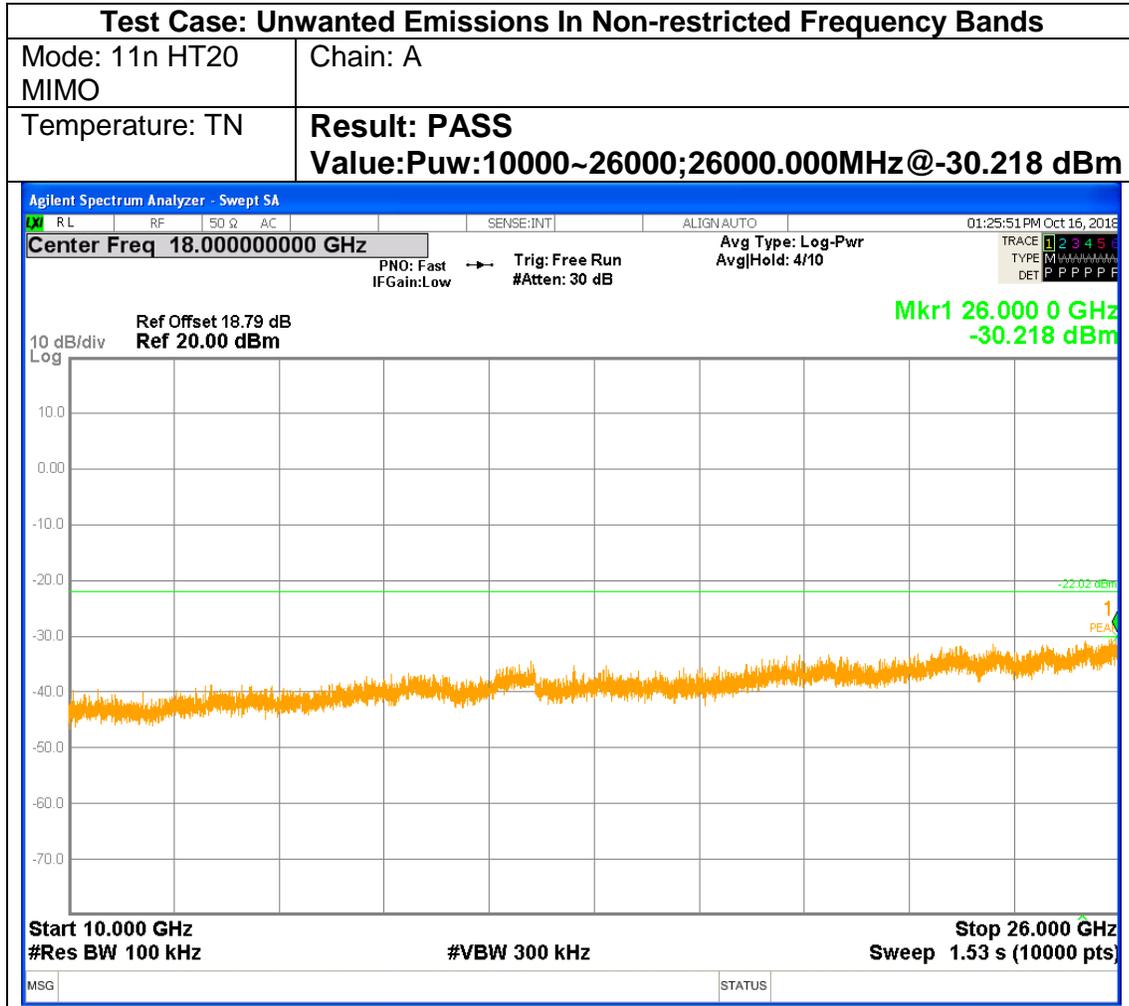


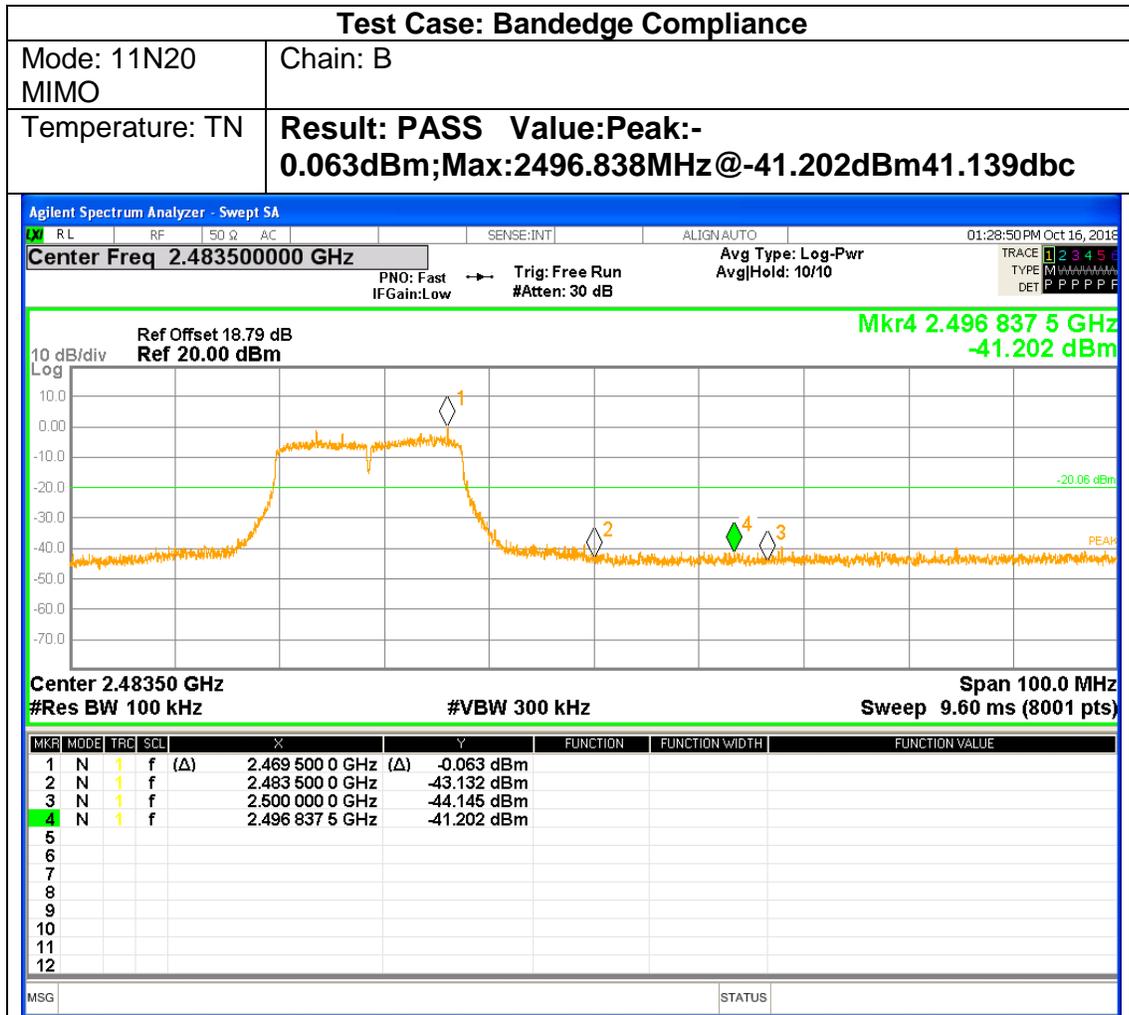
High Channel

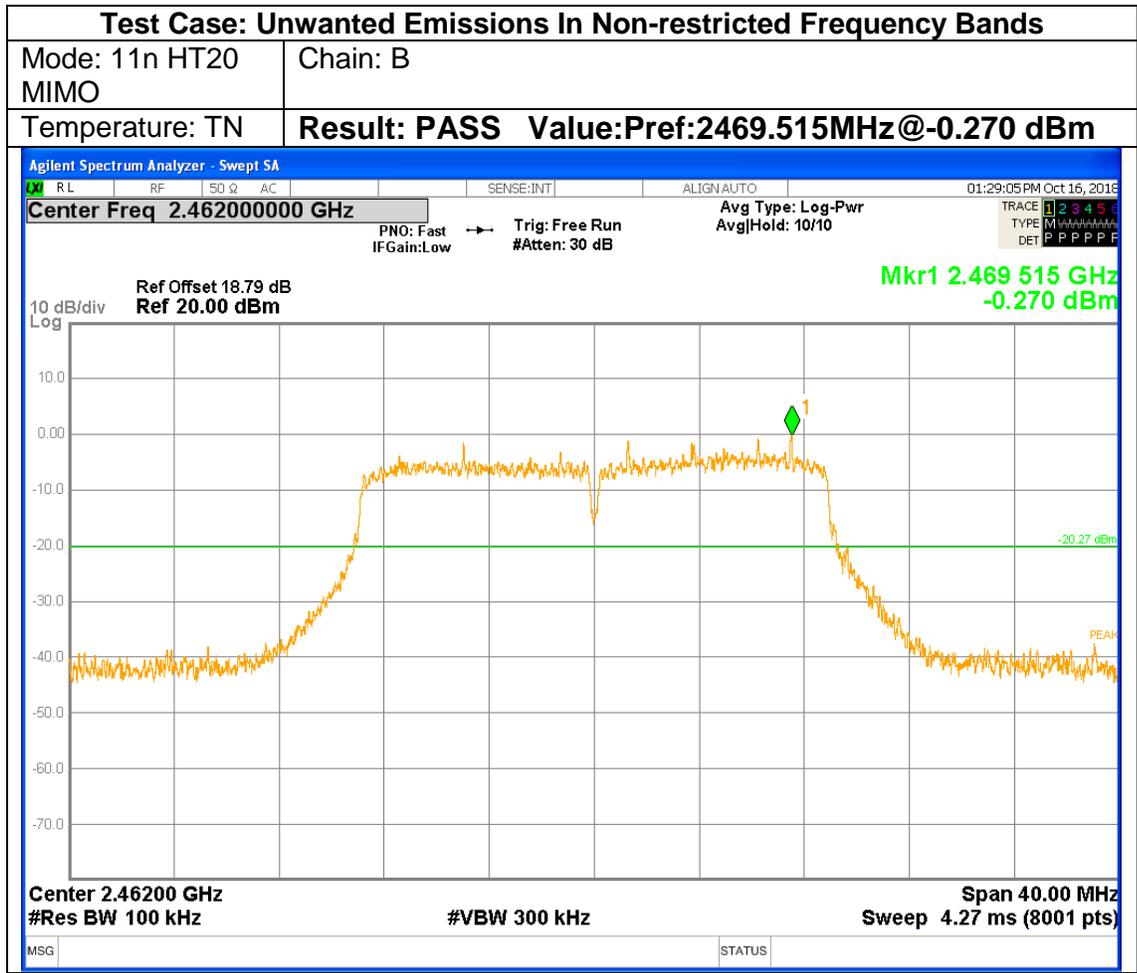


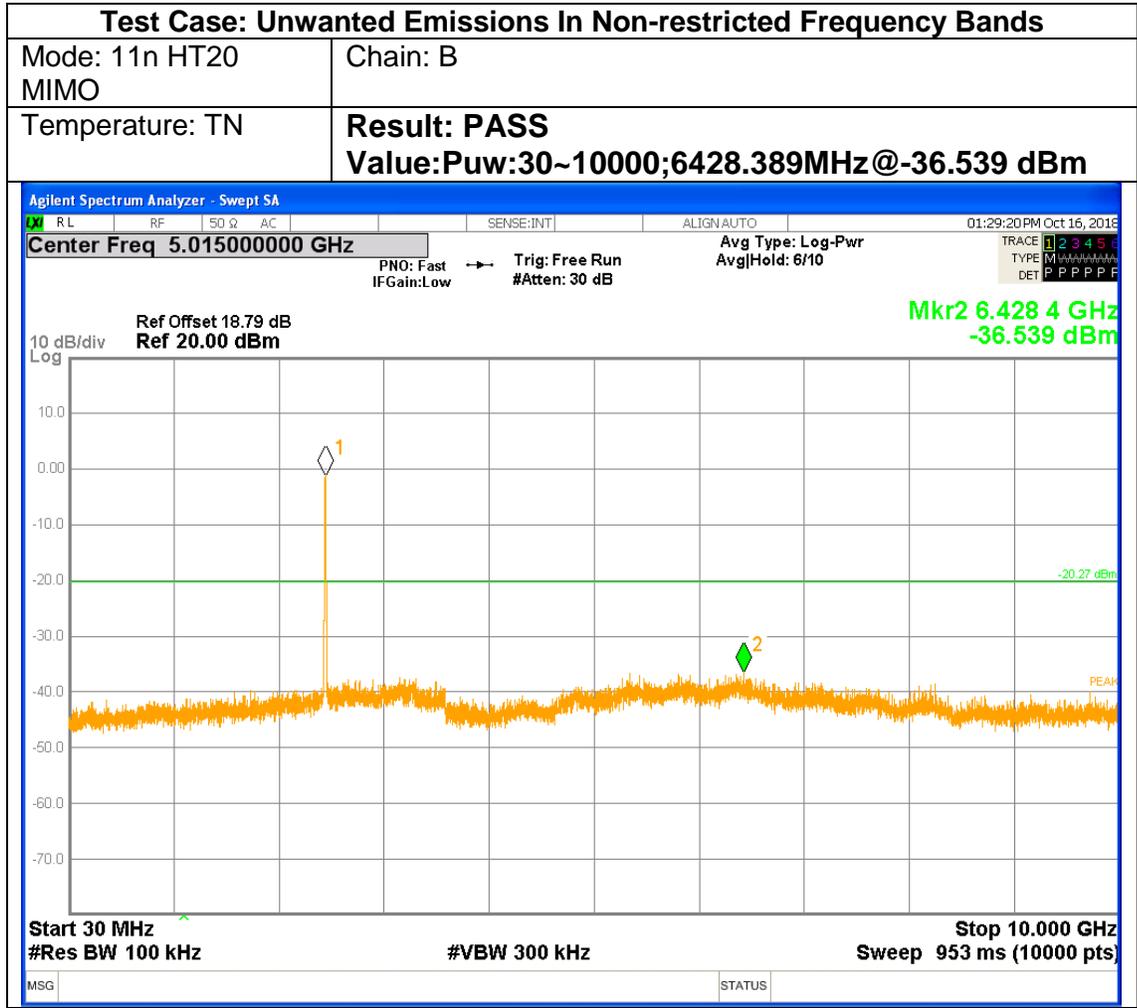


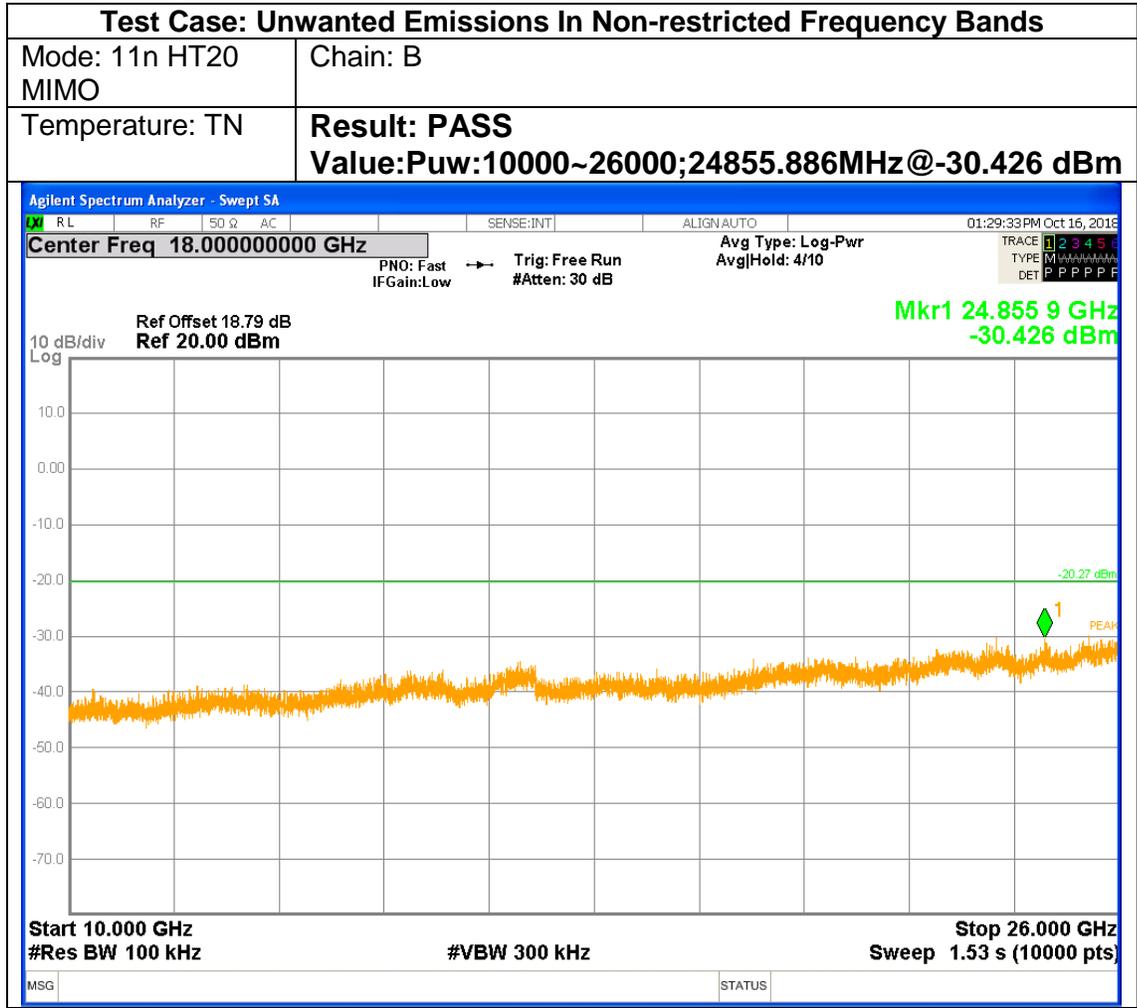














8.5.4. 802.11n HT40 MODE

Low Channel

