

Project No.: TM-2207000268P
Report No.: TMWK2207002920KR

FCC ID: 2AX7S-LN313B

Page: 1 / 264
Rev.: 01

RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART E

Test Standard	FCC Part 15.407
Product name	E-note device
Brand Name	ITOCHU
Model No.	USMUK4
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory)

Approved by:



Shawn Wu
Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	September 2, 2022	Initial Issue	ALL	Allison Chen
01	September 27, 2022	See the following Note Rev.(01)	P.12, 24-27, 82, 86-89, 117	Allison Chen

Note:**Rev.(01)**

1. Modify output power and power density in section 4.3, 4.4.
2. Added remark description.

Table of contents

1.	GENERAL INFORMATION.....	4
1.1	EUT INFORMATION.....	4
1.2	EUT CHANNEL INFORMATION.....	5
1.3	ANTENNA INFORMATION.....	6
1.4	MEASUREMENT UNCERTAINTY	6
1.5	FACILITIES AND TEST LOCATION.....	7
1.6	INSTRUMENT CALIBRATION	7
1.7	SUPPORT AND EUT ACCESSORIES EQUIPMENT	10
1.8	TEST METHODOLOGY AND APPLIED STANDARDS.....	10
2.	TEST SUMMARY.....	11
3.	DESCRIPTION OF TEST MODES.....	12
3.1	THE EUT CHANNEL NUMBER OF OPERATING CONDITION	12
3.2	THE WORST MODE OF MEASUREMENT.....	13
3.3	EUT DUTY CYCLE	14
4.	TEST RESULT	15
4.1	AC POWER LINE CONDUCTED EMISSION.....	15
4.2	26DB BANDWIDTH, 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)	22
4.3	OUTPUT POWER MEASUREMENT	80
4.4	POWER SPECTRAL DENSITY	84
4.5	RADIATION BANDEDGE AND SPURIOUS EMISSION.....	116
4.6	DYNAMIC FREQUENCY SELECTION.....	248
	APPENDIX-A TEST PHOTO	A-1
	APPENDIX 1 - PHOTOGRAPHS OF EUT	

1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	AIMobile Co., Ltd. 6F., No. 166, Sec.4, Chengde Rd., Shilin Dist., Taipei City 11167, Taiwan
Manufacturer	AIMobile Co., Ltd. 6F., No. 166, Sec.4, Chengde Rd., Shilin Dist., Taipei City 11167, Taiwan
Equipment	E-note device
Model No.	USMUK4
Model Discrepancy	N/A
Trade Name	ITOCHU
Received Date	July 19, 2022
Date of Test	July 26 ~ August 11, 2022
Power Operation	1. Power from Host System. Rechargeable Li-Polymer Battery / LIS1633RDPCA Rating: 2000mAh, 7.4Wh 2. Power from Adapter.

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

1.2 EUT CHANNEL INFORMATION

Frequency Range	UNII-1	
	IEEE 802.11a	5180 ~ 5240 MHz
	IEEE 802.11n HT20	5180 ~ 5240 MHz
	IEEE 802.11n HT40	5190 ~ 5230 MHz
	IEEE 802.11ac VHT20	5180 ~ 5240 MHz
	IEEE 802.11ac VHT40	5190 ~ 5230 MHz
	IEEE 802.11ac VHT80	5210 MHz
	UNII-2a	
	IEEE 802.11a	5260 ~ 5320 MHz
	IEEE 802.11n HT20	5260 ~ 5320 MHz
	IEEE 802.11n HT40	5270 ~ 5310 MHz
	IEEE 802.11ac VHT20	5260 ~ 5320 MHz
	IEEE 802.11ac VHT40	5270 ~ 5310 MHz
	IEEE 802.11ac VHT80	5290 MHz
	UNII-2c	
	IEEE 802.11a	5500 ~ 5700 MHz
	IEEE 802.11n HT20	5500 ~ 5700 MHz
	IEEE 802.11n HT40	5510 ~ 5670 MHz
	IEEE 802.11ac VHT20	5500 ~ 5700 MHz
	IEEE 802.11ac VHT40	5510 ~ 5670 MHz
	IEEE 802.11ac VHT80	5530 ~ 5610 MHz
	UNII-3	
	IEEE 802.11a	5745 ~ 5825 MHz
	IEEE 802.11n HT20	5745 ~ 5825 MHz
	IEEE 802.11n HT40	5755 ~ 5795 MHz
	IEEE 802.11ac VHT20	5745 ~ 5825 MHz
	IEEE 802.11ac VHT40	5755 ~ 5795 MHz
	IEEE 802.11ac VHT80	5775 MHz
Modulation Type	1. IEEE 802.11a mode: OFDM 2. IEEE 802.11n HT20 mode: OFDM 3. IEEE 802.11n HT40 mode: OFDM 4. IEEE 802.11ac VHT20 mode: OFDM 5. IEEE 802.11ac VHT40 mode: OFDM 6. IEEE 802.11ac VHT80 mode: OFDM	

Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Specification	☒ PIFA ☐ PCB ☐ Dipole ☐ Coils			
Antenna Gain				
	Band	Chain0 (dBi)	Chain1 (dBi)	Power Directional Gain: (dBi)
	5G_U-NII 1	3.93	2.69	6.34
	5G_U-NII 2a	3.93	2.69	6.34
	5G_U-NII 2c	3.93	2.69	6.34
	5G_U-NII 3	3.93	2.69	6.34
Brand / Model	Chain 0: YAGEO / LN313 (ANTA0ZV1421124553) Chain 1: YAGEO / LN313 (ANTA0ZV1421124554)			
Antenna connector	IPEX			

Notes:

1. Power Directional Gain = $10 \cdot \log \{ [10^{(Ant1/20)} + 10^{(Ant2/20)} + \dots + 10^{(Ant N / 20)}]^2 / N \text{ ANT} \}$ dBi
2. The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203.

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	± 2.1183
Channel Bandwidth	± 2.1863
RF output power (Power Meter + Power sensor)	± 1.2688
Power Spectral density	± 2.1855
Conducted Bandedge	± 2.1866
Conducted Spurious Emission	± 2.1859
Radiated Emission_9kHz-30MHz	± 3.814
Radiated Emission_30MHz-200MHz	± 4.272
Radiated Emission_200MHz-1GHz	± 4.619
Radiated Emission_1GHz-6GHz	± 5.522
Radiated Emission_6GHz-18GHz	± 5.228
Radiated Emission_18GHz-26GHz	± 4.089
Radiated Emission_26GHz-40GHz	± 4.019

Remark:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan. (R.O.C.)
CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	Tony Chao	-
Radiation	Ray Li, Tony Chao	-
RF Conducted	Marco Chan	-

Remark: The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC public Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

1.6 INSTRUMENT CALIBRATION

AC line Conduction Test Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
CABLE	EMCI	CFD300-NL	CERF	06/27/2022	06/26/2023
EMI Test Receiver	R&S	ESCI	100064	06/17/2022	06/16/2023
LISN	SCHAFFNER	NNB 41	03/10013	02/15/2022	02/14/2023
Software	EZ-EMC(CCS-3A1-CE-wugu)				

RF Conducted Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Signal Analyzer	KEYSIGHT	N9010B	MY55460167	09/07/2021	09/06/2022
Power Meter	Anritsu	ML2496A	2136002	12/06/2021	12/05/2022
Power Seneor	Anritsu	MA2411B	1911386	08/19/2021	08/18/2022
Power Seneor	Anritsu	MA2411B	1911387	08/19/2021	08/18/2022
Software	Radio Test Software Ver. 21				

Remark:

- Each piece of equipment is scheduled for calibration once a year.
- N.C.R. = No Calibration Required.

3M 966A Chamber					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Band Reject Filters	MICRO TRONICS	BRM 50702	112	11/23/2021	11/22/2022
Bilog Antenna	Sunol Sciences	JB3	A030105	08/03/2022	08/02/2023
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/23/2022	02/22/2023
Coaxial Cable	Woken	J-1099	201709090004	12/23/2021	12/22/2022
Coaxial Cable	EMCI	EMC105	190914+33953	06/15/2022	06/14/2023
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	12/28/2021	12/27/2022
Horn Antenna	ETS LINDGREN	3116	00026370	11/30/2021	11/29/2022
Horn Antenna	MCTD	1209	DRH13M02003	01/25/2022	01/24/2023
K Type Cable	Huber+Suhner	SUCOFLEX 102	29406/2	12/05/2021	12/04/2022
Pre-Amplifier	EMEC	EM330	060609	02/23/2022	02/22/2023
Pre-Amplifier	HP	8449B	3008A00965	12/24/2021	12/23/2022
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	12/06/2021	12/05/2022
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	e3 210616				

Remark:

1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Required.

DFS Test					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Attenuator	E-INSTRUMENT	EPA-600H	EC1400050	06/28/2022	06/27/2023
Coaxial Cable	Woken	SUMITOMO	1	03/02/2022	03/01/2023
Coaxial Cable	Woken	SUMITOMO	4	03/02/2022	03/01/2023
Coaxial Cable	Woken	SUMITOMO	6	03/02/2022	03/01/2023
Coaxial Cable	Woken	SUMITOMO	9	03/02/2022	03/01/2023
Coaxial Cable	Woken	SUMITOMO	10	03/02/2022	03/01/2023
Coaxial Cable	Woken	SUMITOMO	12	03/02/2022	03/01/2023
Coaxial Cable	Woken	SUMITOMO	13	03/02/2022	03/01/2023
Power Divider	Marvelous Microwave	MVE8586	16011201	06/29/2022	06/28/2023
Power Divider	Marvelous Microwave	MVE8586	16011202	06/29/2022	06/28/2023
Power Divider	Marvelous Microwave	MVE8586	160112206	07/20/2022	07/29/2023
Power Divider	Solvang Technology	STI08-0015	008	07/26/2021	07/25/2022
Spectrum Analyzer	R&S	FSU 26	100258	06/06/2022	06/05/2023
Vector Signal Generator	KEYSIGHT	N5182B/N5182BX07	MY61252828/ MY59362552	02/22/2022	02/22/2023
Software	GPIBShot,DFS-Aggregate-Time FSU,DFS Test Softwaer				

Remark:

- Each piece of equipment is scheduled for calibration once a year.
- N.C.R. = No Calibration Required.

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

Support Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

Support Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	Adapter	Alcatel	UC13US	N/A	N/A
2	NB(G)	Lenovo	IBM 1951	N/A	N/A
3	NB(J)	TOSHIBA	PT345T-00L002	N/A	PD97260H
4	NB	Lenovo	20175	N/A	TX2-RTL8723AS
5	AP	ASUS	RT-AX88U	N/A	MSQ-RTAXHP00

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247, KDB 789033 D02 and KDB 905462 D02.

2. TEST SUMMARY

FCC Standard Sec.	Chapter	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207	4.1	AC Conducted Emission	Pass
15.403(i)	4.2	26dB Bandwidth	Pass
15.407(e)	4.2	6dB Bandwidth	Pass
2.1049	4.2	Occupied Bandwidth (99%)	Pass
15.407(a)	4.3	Output Power Measurement	Pass
15.407(a)	4.4	Power Spectral Density	Pass
15.407(b)	4.5	Radiation Band Edge	Pass
15.407(b)	4.5	Radiation Spurious Emission	Pass
15.407(h)	4.6	Dynamic Frequency Selection	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE EUT CHANNEL NUMBER OF OPERATING CONDITION

Operation mode	1. IEEE 802.11a mode: 6Mbps 2. IEEE 802.11n HT20 mode: MCS0 3. IEEE 802.11n HT40 mode: MCS0 4. IEEE 802.11ac VHT80 mode: MCS0		
Operating Frequency	U-NII-1	IEEE 802.11a	5180, 5220, 5240
		IEEE 802.11n HT20	5180, 5220, 5240
		IEEE 802.11n HT40	5190, 5230
		IEEE 802.11ac VHT80	5210
	U-NII-2a	IEEE 802.11a	5260, 5300, 5320
		IEEE 802.11n HT20	5260, 5300, 5320
		IEEE 802.11n HT40	5270, 5310
		IEEE 802.11ac VHT80	5290
	U-NII-2c	IEEE 802.11a	5500, 5580, 5700
		IEEE 802.11n HT20	5500, 5580, 5700
		IEEE 802.11n HT40	5510, 5550, 5670
		IEEE 802.11ac VHT80	5530, 5610
	U-NII-3	IEEE 802.11a	5745, 5785, 5825
		IEEE 802.11n HT20	5745, 5785, 5825
		IEEE 802.11n HT40	5755, 5795
		IEEE 802.11ac VHT80	5775

Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.
2. The system support 802.11a/n ht20/n ht40/ac vht20/40/80/ax hew 20/40/80, the vht20/vht40 were reduced since the identical parameters with 802.11n ht20 and ht40.
3. For IEEE 802.11 a function, it supports SISO mode only.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	AC Power line conducted emission for line and neutral
Power supply Mode	Mode 1: EUT power by Adapter Mode 2: EUT power by Notebook
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

1. The worst mode was record in this test report.
2. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Host System
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☒ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☐ Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Host System
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report

3.3 EUT DUTY CYCLE

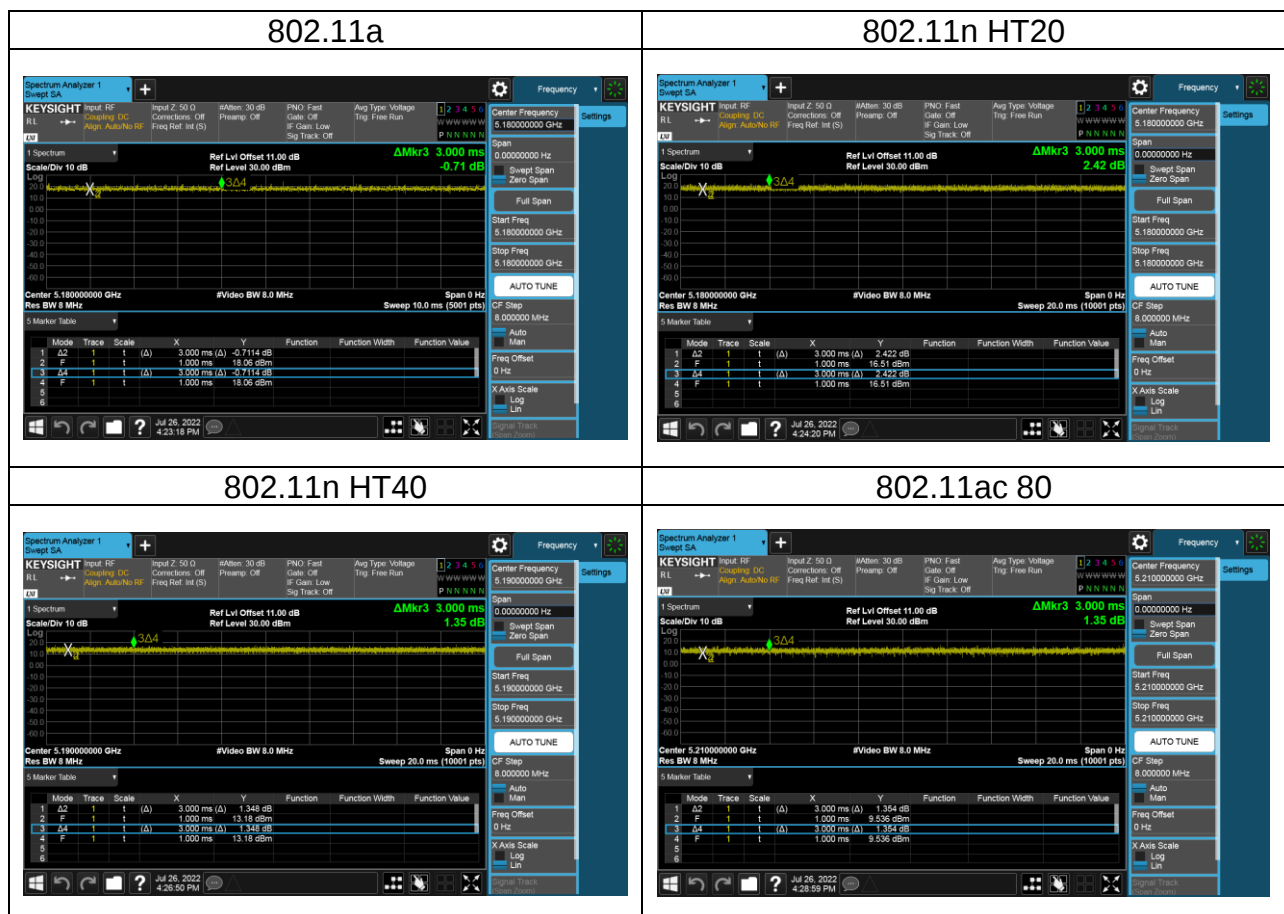
Temperature: 25.6~26.6°C

Test date: July 26~29, 2022

Humidity: 50~53% RH

Tested by: Marco Chan

Duty Cycle				
Configuration	Duty Cycle (%)	Duty Factor (dB) $=10 \cdot \log(1/\text{Duty Cycle})$	1/T (kHz)	VBW setting (kHz)
802.11a	100.00	0.00	0.00	0.01
802.11n_20	100.00	0.00	0.00	0.01
802.11n_40	100.00	0.00	0.00	0.01
802.11ac_80	100.00	0.00	0.00	0.01



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

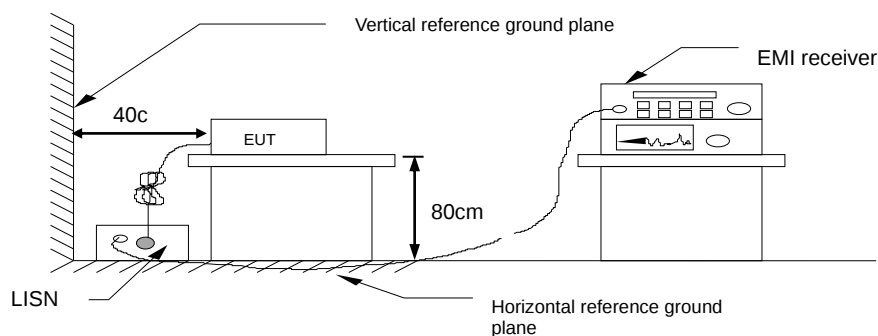
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup

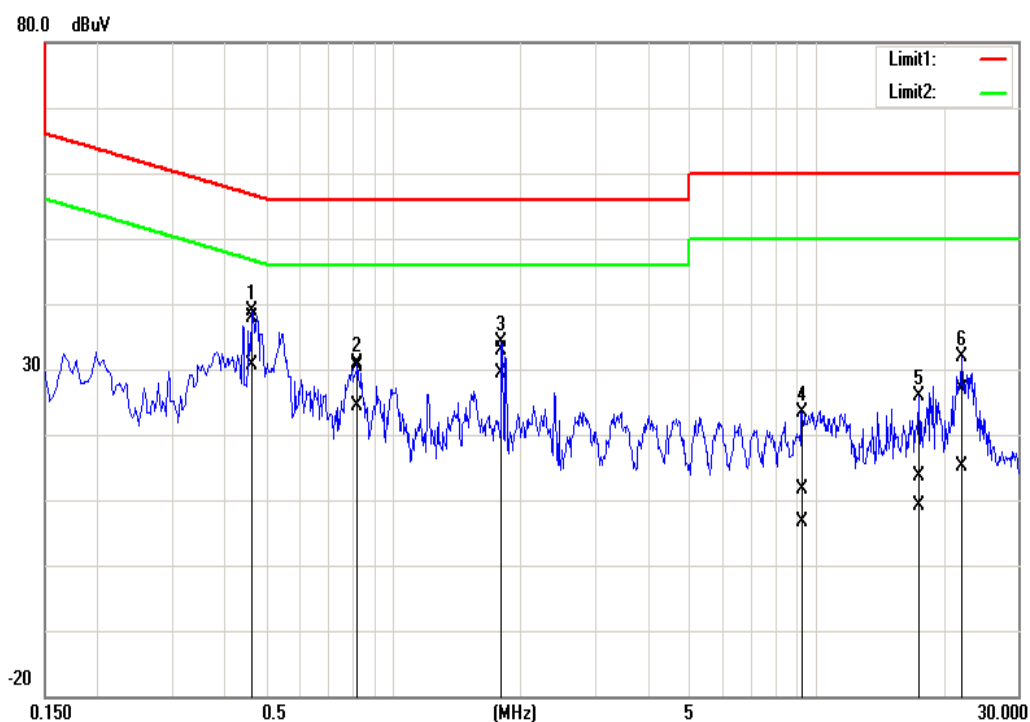


4.1.4 Test Result

Pass.

Test Data

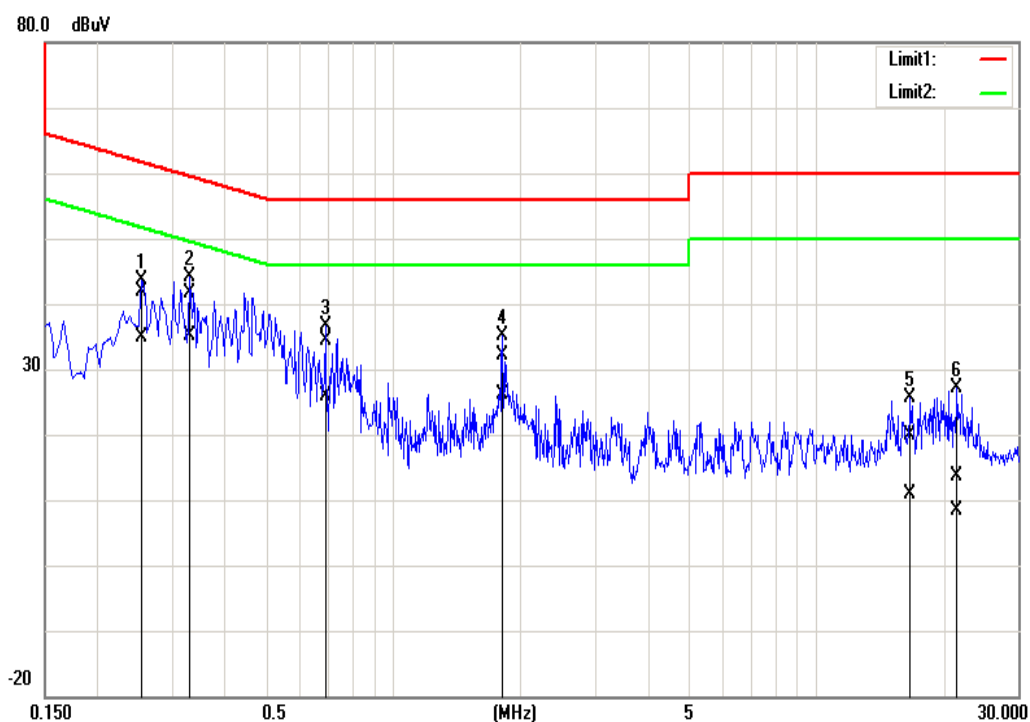
Test Mode:	Mode 1-1%	Temp/Hum	25.9(°C)/ 50%RH
Phase:	Line	Test Date	August 11, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.4660	27.77	20.39	10.19	37.96	30.58	56.58	46.58	-18.62	-16.00	Pass
0.8220	20.26	14.26	10.21	30.47	24.47	56.00	46.00	-25.53	-21.53	Pass
1.8060	22.66	19.21	10.25	32.91	29.46	56.00	46.00	-23.09	-16.54	Pass
9.2860	1.35	-3.68	10.36	11.71	6.68	60.00	50.00	-48.29	-43.32	Pass
17.5140	3.36	-1.28	10.36	13.72	9.08	60.00	50.00	-46.28	-40.92	Pass
22.1260	16.68	4.86	10.30	26.98	15.16	60.00	50.00	-33.02	-34.84	Pass

Note: Correction factor = LISN loss + Cable loss.

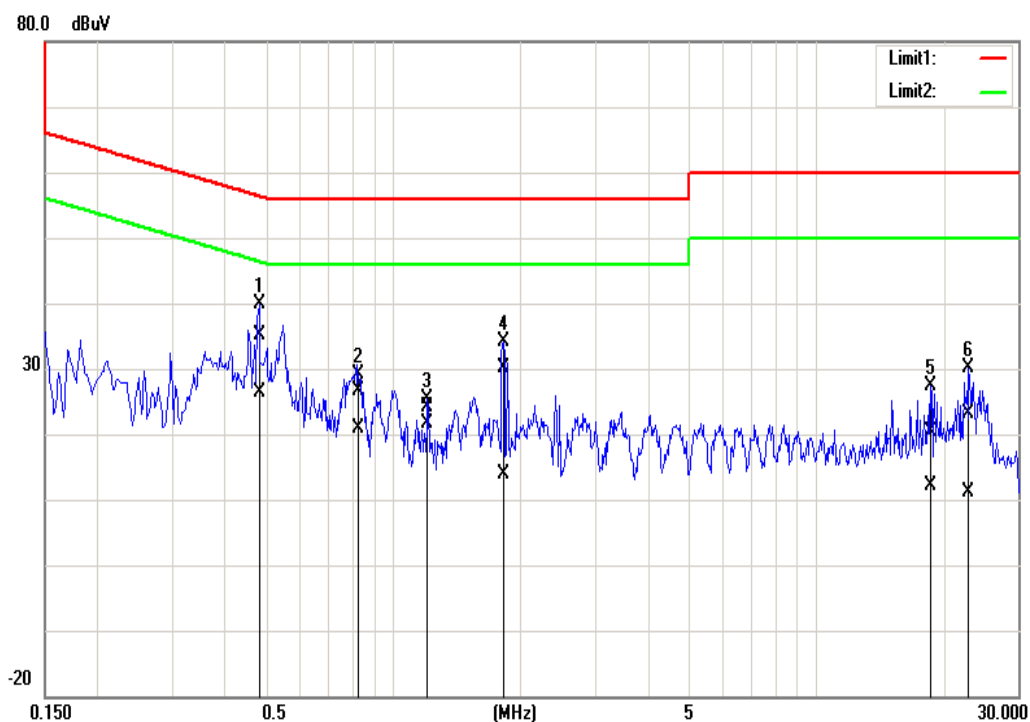
Test Mode:	Mode 1-1%	Temp/Hum	25.9(°C)/ 50%RH
Phase:	Neutral	Test Date	August 11, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.2540	31.71	24.62	10.17	41.88	34.79	61.63	51.63	-19.75	-16.84	Pass
0.3300	31.46	24.86	10.18	41.64	35.04	59.45	49.45	-17.81	-14.41	Pass
0.6900	24.23	15.75	10.18	34.41	25.93	56.00	46.00	-21.59	-20.07	Pass
1.8140	21.82	15.91	10.23	32.05	26.14	56.00	46.00	-23.95	-19.86	Pass
16.7460	9.60	0.49	10.39	19.99	10.88	60.00	50.00	-40.01	-39.12	Pass
21.5380	3.21	-2.17	10.44	13.65	8.27	60.00	50.00	-46.35	-41.73	Pass

Note: Correction factor = LISN loss + Cable loss.

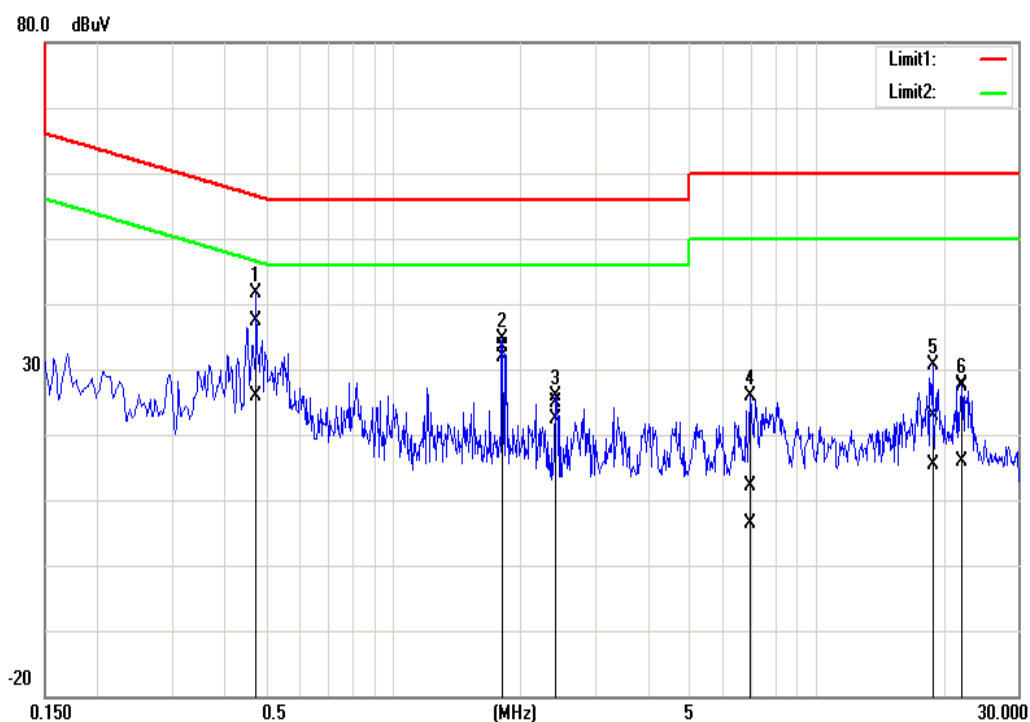
Test Mode:	Mode 1-50%	Temp/Hum	25.9(°C)/ 50%RH
Phase:	Line	Test Date	August 11, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.4820	24.82	16.09	10.19	35.01	26.28	56.30	46.30	-21.29	-20.02	Pass
0.8300	16.54	10.64	10.21	26.75	20.85	56.00	46.00	-29.25	-25.15	Pass
1.2060	13.85	11.37	10.22	24.07	21.59	56.00	46.00	-31.93	-24.41	Pass
1.8220	19.81	3.70	10.25	30.06	13.95	56.00	46.00	-25.94	-32.05	Pass
18.7100	10.10	1.64	10.37	20.47	12.01	60.00	50.00	-39.53	-37.99	Pass
22.9940	12.96	0.90	10.28	23.24	11.18	60.00	50.00	-36.76	-38.82	Pass

Note: Correction factor = LISN loss + Cable loss.

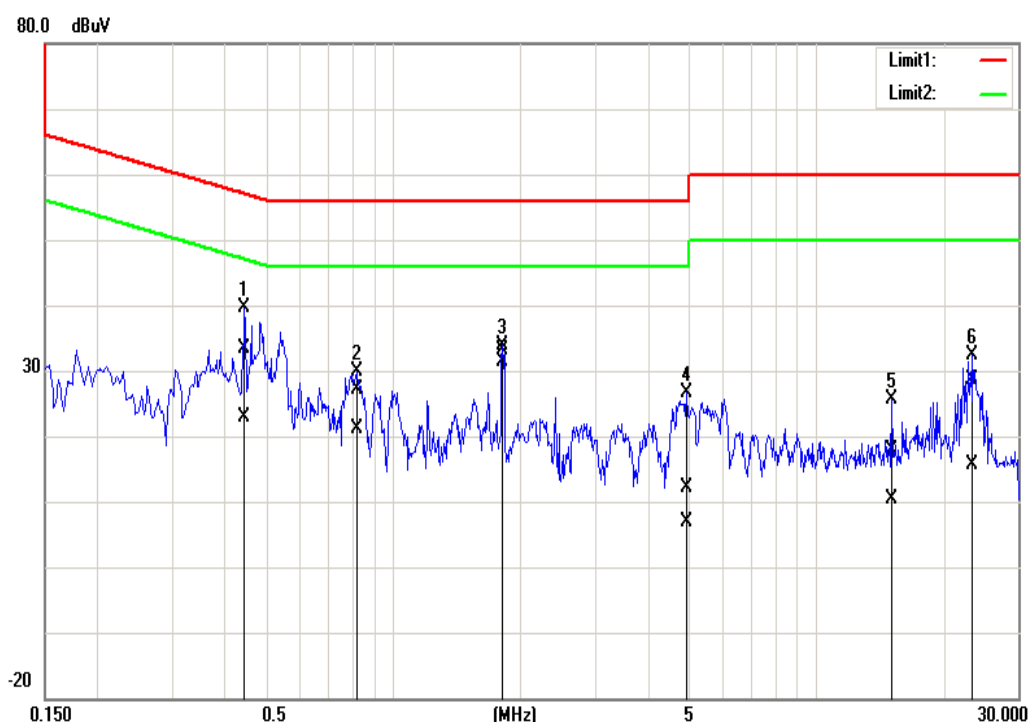
Test Mode:	Mode 1-50%	Temp/Hum	25.9(°C)/ 50%RH
Phase:	Neutral	Test Date	August 11, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.4740	27.09	15.59	10.18	37.27	25.77	56.44	46.44	-19.17	-20.67	Pass
1.8100	23.22	21.58	10.23	33.45	31.81	56.00	46.00	-22.55	-14.19	Pass
2.4140	14.62	12.16	10.24	24.86	22.40	56.00	46.00	-31.14	-23.60	Pass
7.0180	1.86	-4.00	10.32	12.18	6.32	60.00	50.00	-47.82	-43.68	Pass
18.8860	12.56	4.95	10.40	22.96	15.35	60.00	50.00	-37.04	-34.65	Pass
22.1300	17.03	5.34	10.45	27.48	15.79	60.00	50.00	-32.52	-34.21	Pass

Note: Correction factor = LISN loss + Cable loss.

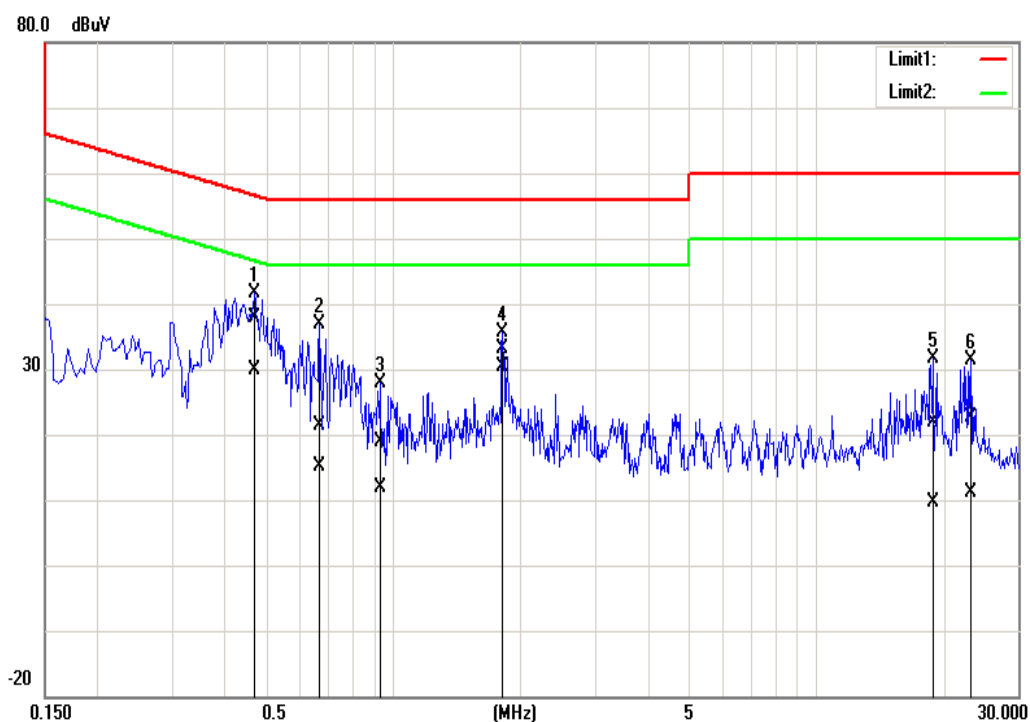
Test Mode:	Mode 1-99%	Temp/Hum	25.9(°C)/ 50%RH
Phase:	Line	Test Date	August 11, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.4460	23.29	12.61	10.19	33.48	22.80	56.95	46.95	-23.47	-24.15	Pass
0.8180	17.01	10.99	10.21	27.22	21.20	56.00	46.00	-28.78	-24.80	Pass
1.8100	22.98	21.20	10.25	33.23	31.45	56.00	46.00	-22.77	-14.55	Pass
4.9260	1.80	-3.35	10.30	12.10	6.95	56.00	46.00	-43.90	-39.05	Pass
15.0980	7.39	-0.08	10.37	17.76	10.29	60.00	50.00	-42.24	-39.71	Pass
23.5020	18.43	5.33	10.27	28.70	15.60	60.00	50.00	-31.30	-34.40	Pass

Note: Correction factor = LISN loss + Cable loss.

Test Mode:	Mode 1-99%	Temp/Hum	25.9(°C)/ 50%RH
Phase:	Neutral	Test Date	August 11, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.4700	27.65	19.77	10.18	37.83	29.95	56.51	46.51	-18.68	-16.56	Pass
0.6700	11.12	5.01	10.18	21.30	15.19	56.00	46.00	-34.70	-30.81	Pass
0.9300	8.62	1.60	10.20	18.82	11.80	56.00	46.00	-37.18	-34.20	Pass
1.8140	22.87	20.16	10.23	33.10	30.39	56.00	46.00	-22.90	-15.61	Pass
18.8860	11.44	-0.83	10.40	21.84	9.57	60.00	50.00	-38.16	-40.43	Pass
23.1620	12.16	0.58	10.47	22.63	11.05	60.00	50.00	-37.37	-38.95	Pass

Note: Correction factor = LISN loss + Cable loss.

4.2 26dB BANDWIDTH, 6dB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

26 dB Bandwidth : For reporting purposes only.

6 dB Bandwidth : Least 500kHz.

Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

26dB

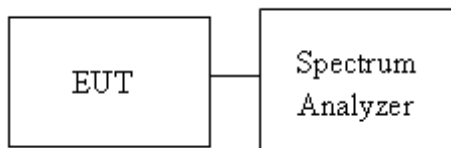
1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW: approximately 1% of the emission bandwidth.
3. Set the VBW>RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26dB down from the peak of the emission. Compare this with the RBW setting of the analyser. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6dB

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = 100 kHz.
3. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. 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.

99%

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set center frequency to the nominal EUT channel center frequency.
3. Set span = 1.5 times to 5.0 times the OBW.
4. Set RBW = 1 % to 5% of the OBW.
5. Set VBW $\geq$ 3 xRBW

4.2.3 Test Setup

4.2.4 Test Result

Temperature: 25.6~26.6°C

Test date: July 26~29, 2022

Humidity: 50~53% RH

Tested by: Marco Chan

UNII-1 5150-5250 MHz

Test mode: IEEE 802.11a mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5180	16.583	16.592	19.76	19.39
Mid	5220	16.631	16.578	19.79	19.55
High	5240	16.625	16.586	19.64	19.50

Remark:

1. For IEEE 802.11 a function, it supports SISO mode only.

Test mode: IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5180	17.651	17.641	19.92	19.86
Mid	5220	17.668	17.656	19.87	19.66
High	5240	17.649	17.644	20.08	19.91

Test mode: IEEE 802.11n HT40 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5190	36.097	36.135	40.08	39.61
High	5230	36.110	36.135	39.83	39.14

Test mode: IEEE 802.11ac VHT80 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5210	76.028	75.820	81.82	80.47

UNII-2a 5250-5350 MHz

Test mode: IEEE 802.11a mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5260	16.601	16.578	19.66	19.49
Mid	5300	16.590	16.572	19.58	19.47
High	5320	16.602	16.583	19.47	19.58

Remark:

1. For IEEE 802.11 a function, it supports SISO mode only.

Test mode: IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5260	17.669	17.626	20.00	19.97
Mid	5300	17.650	17.631	19.82	19.92
High	5320	17.659	17.639	19.99	19.85

Test mode: IEEE 802.11n HT40 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5270	36.126	36.143	40.14	39.83
High	5310	36.122	36.141	39.87	39.73

Test mode: IEEE 802.11ac VHT80 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5290	76.029	75.718	81.15	80.70

UNII-2c 5470-5725 MHz

Test mode: IEEE 802.11a mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5500	16.633	16.585	19.59	19.59
Mid	5580	16.605	16.598	19.50	19.58
High	5700	16.604	16.615	19.78	19.65

Remark:

1. For IEEE 802.11 a function, it supports SISO mode only.

Test mode: IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5500	17.656	17.645	19.67	19.56
Mid	5580	17.631	17.634	19.74	19.86
High	5700	17.664	17.659	19.96	19.72

Test mode: IEEE 802.11n HT40 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5510	36.118	36.134	40.02	39.42
Mid	5550	36.137	36.106	39.88	39.38
High	5670	36.109	36.171	40.40	39.97

Test mode: IEEE 802.11ac VHT80 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5530	76.002	75.701	81.36	80.77
High	5610	75.959	75.850	81.44	80.68

UNII-3 5725-5850 MHz

Test mode: IEEE 802.11a mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)
Low	5745	16.596	16.564	16.58	16.57
Mid	5785	16.594	16.564	16.60	16.57
High	5825	16.594	16.582	16.55	16.59

Remark:

1. For IEEE 802.11 a function, it supports SISO mode only.

Test mode: IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)
Low	5745	17.649	17.621	17.78	17.70
Mid	5785	17.649	17.644	17.69	17.69
High	5825	17.669	17.635	17.78	17.73

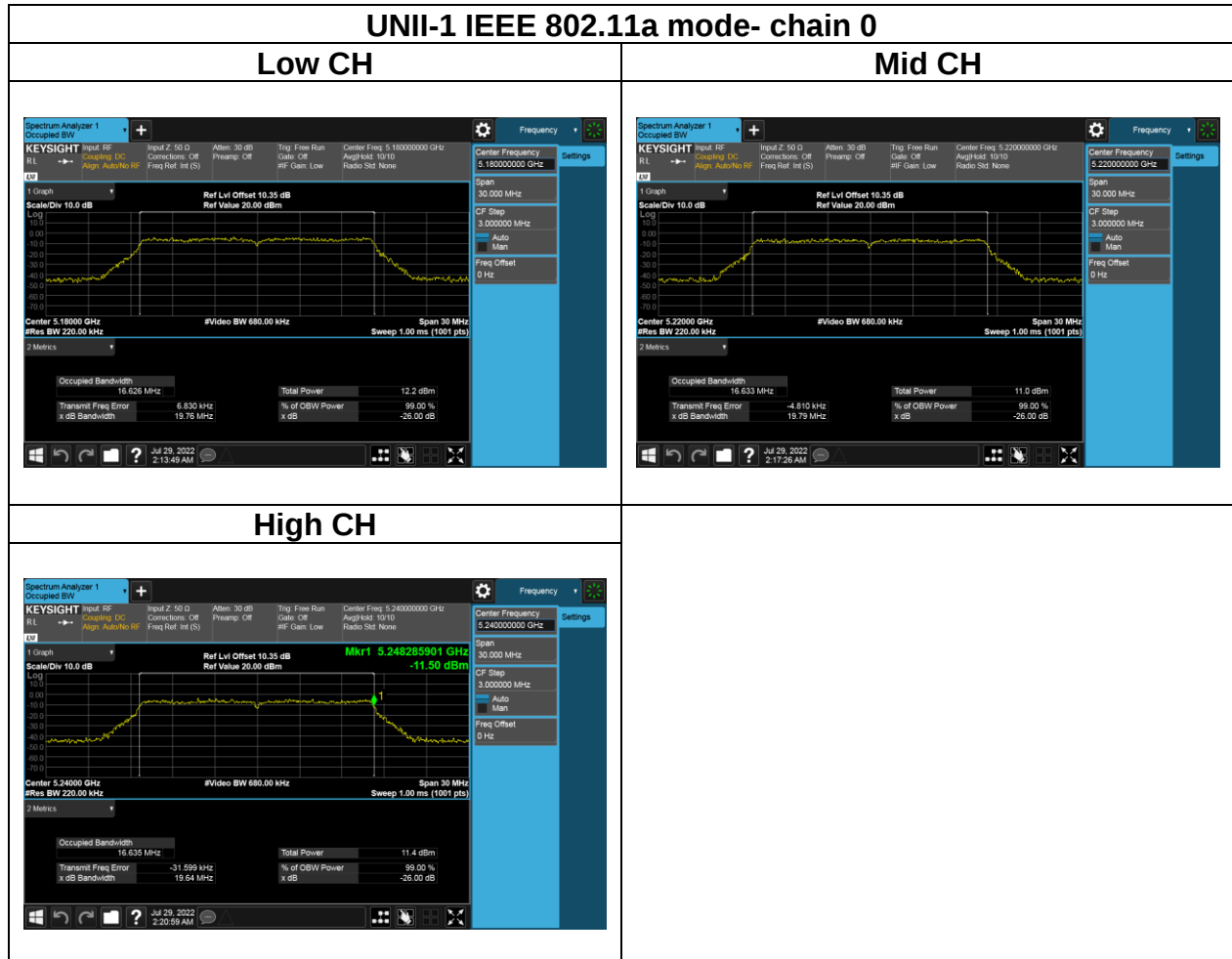
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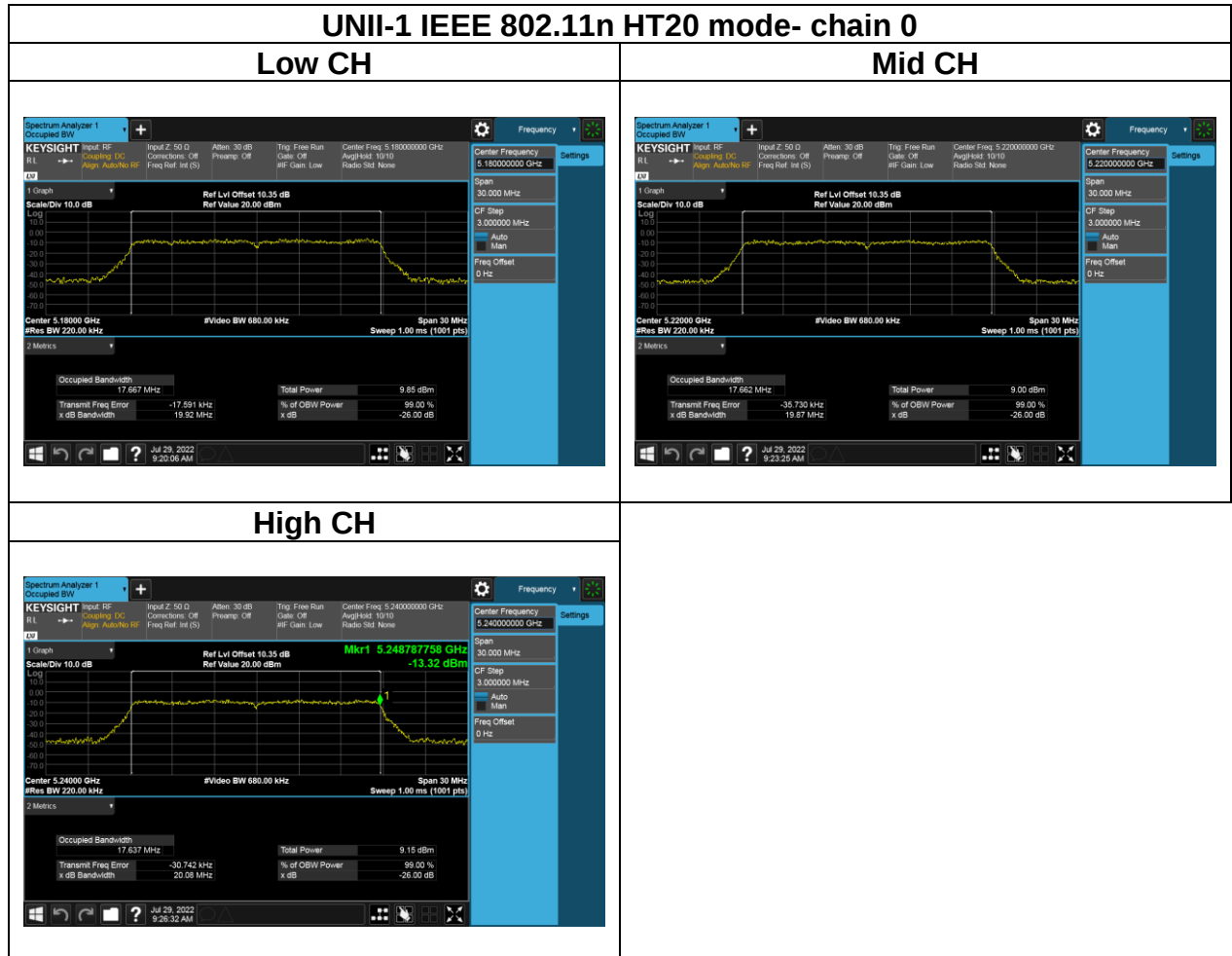
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)
Low	5755	36.139	36.108	36.43	36.36
High	5795	36.112	36.089	36.45	36.44

Test mode: IEEE 802.11ac VHT80 mode

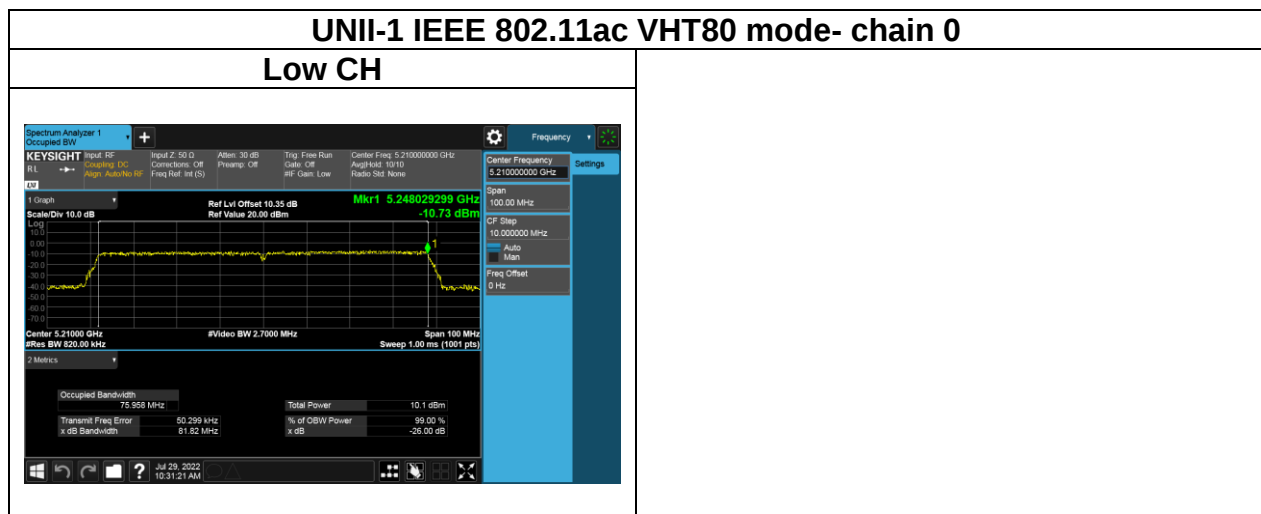
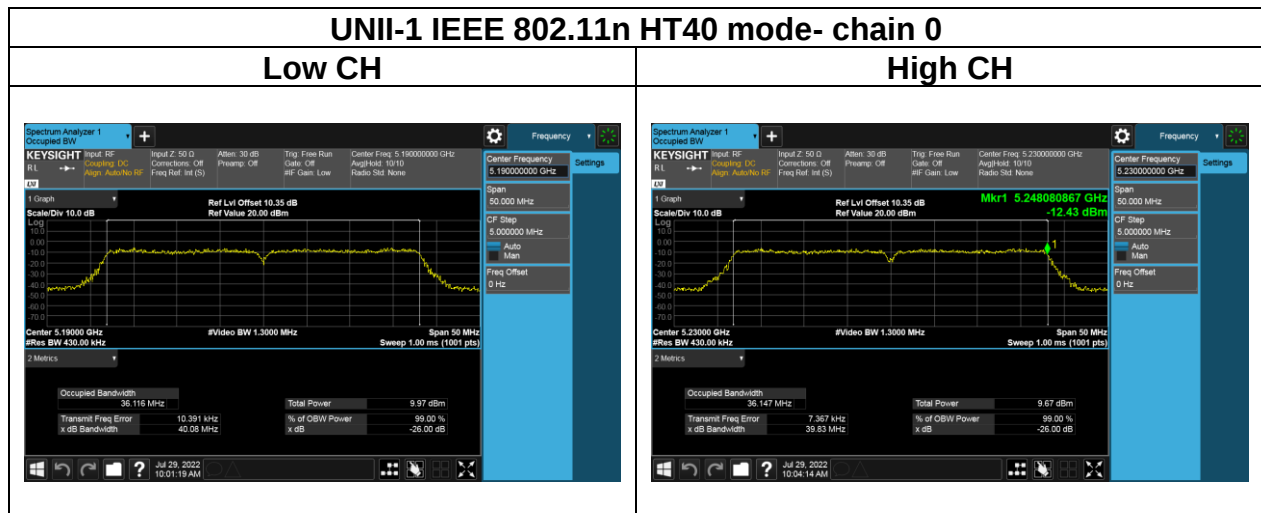
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)
Low	5775	75.960	75.891	76.57	76.54

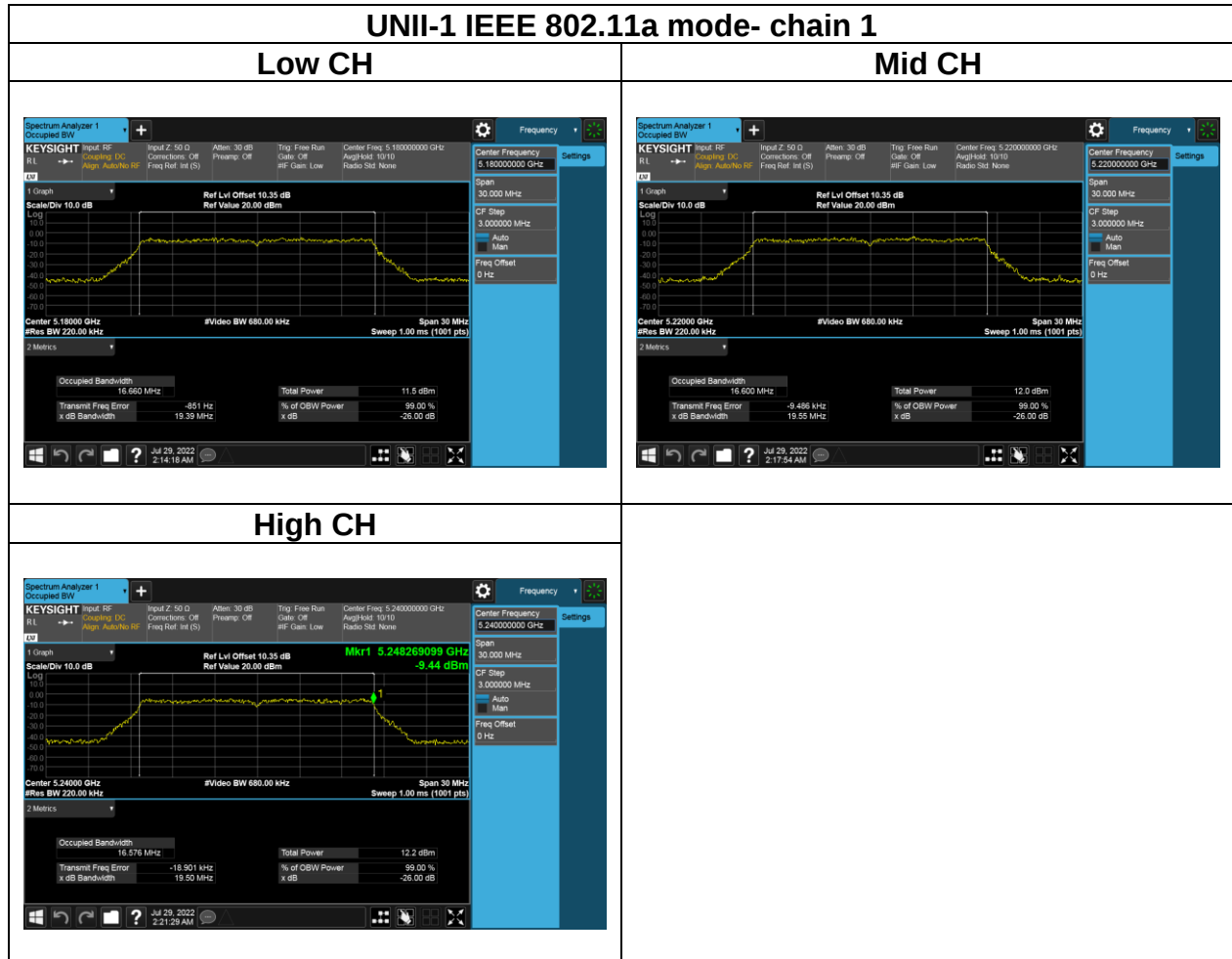
Test Plots (26dB BANDWIDTH)

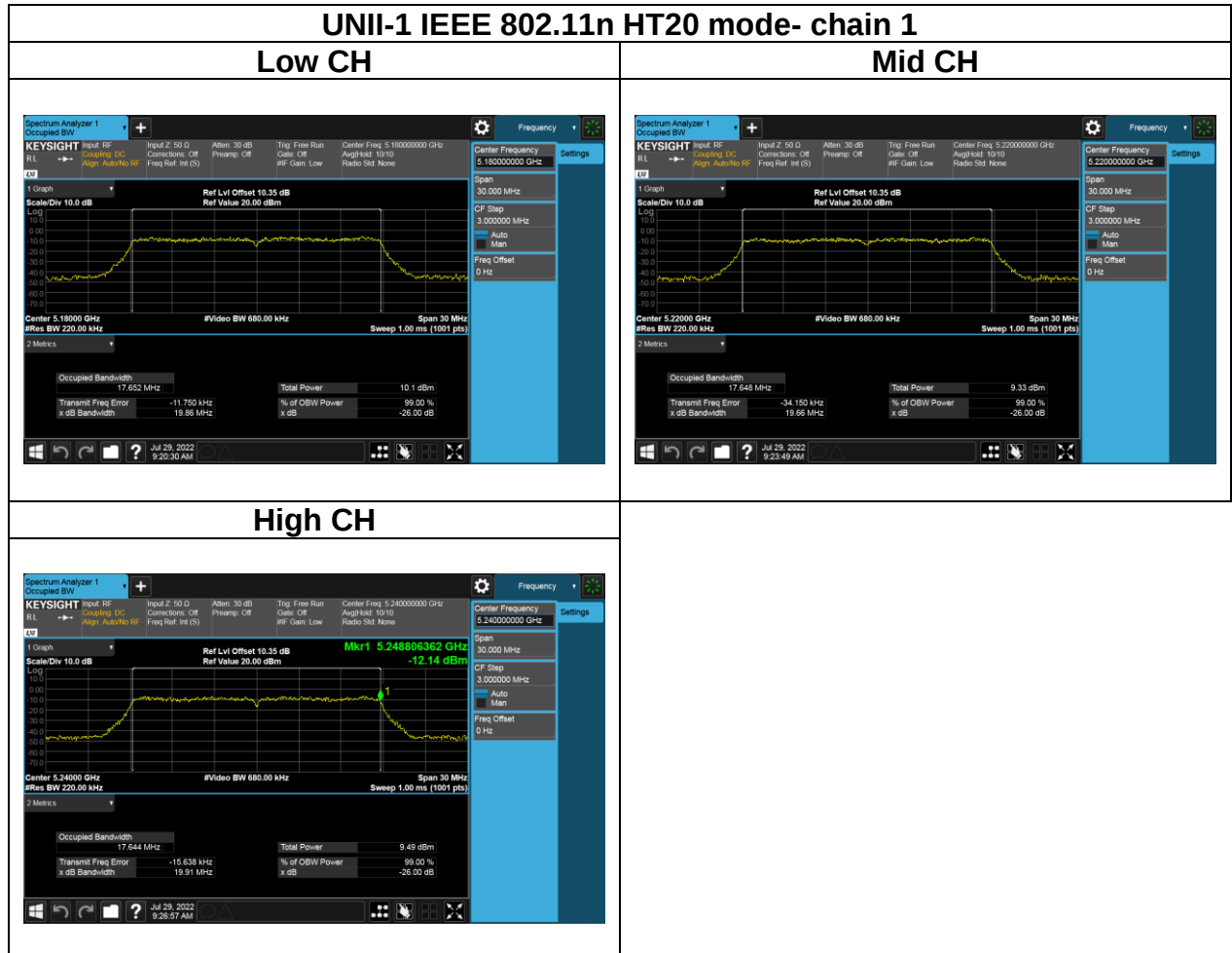


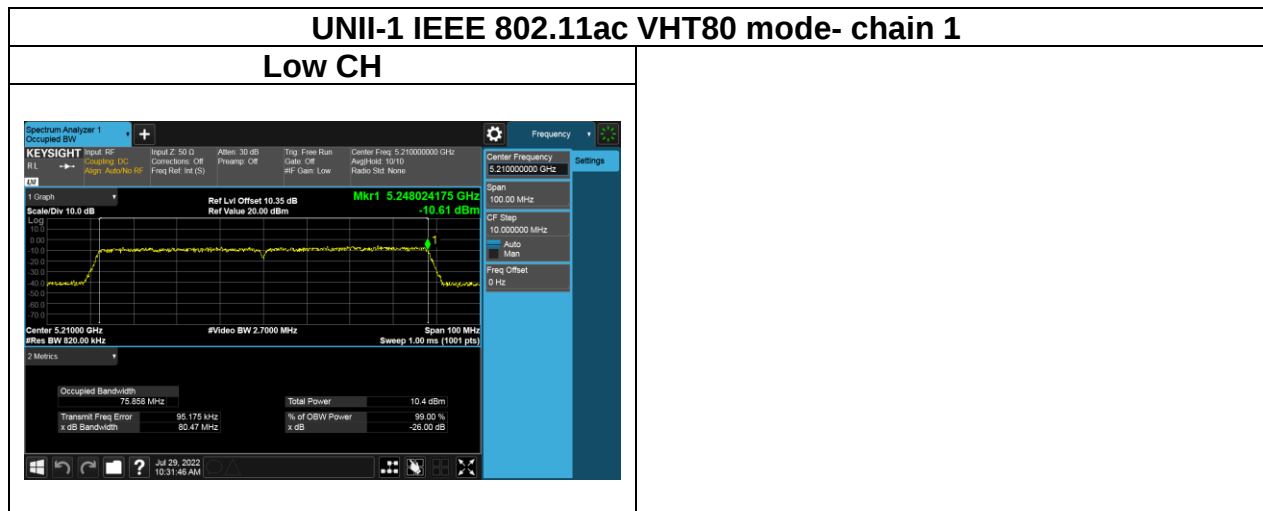
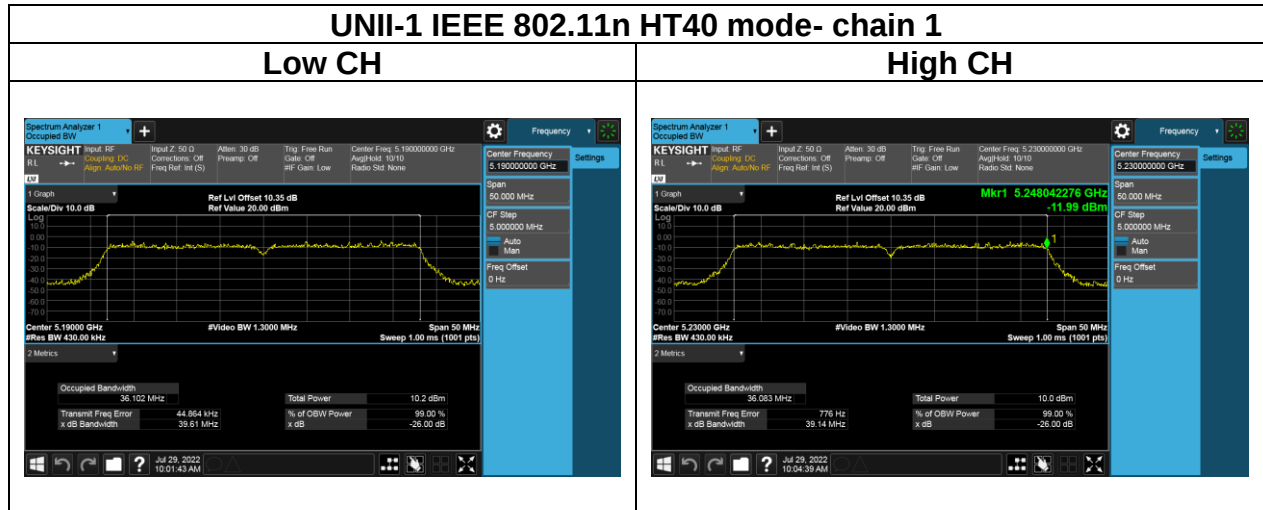


Report No.: TMWK2207002920KR



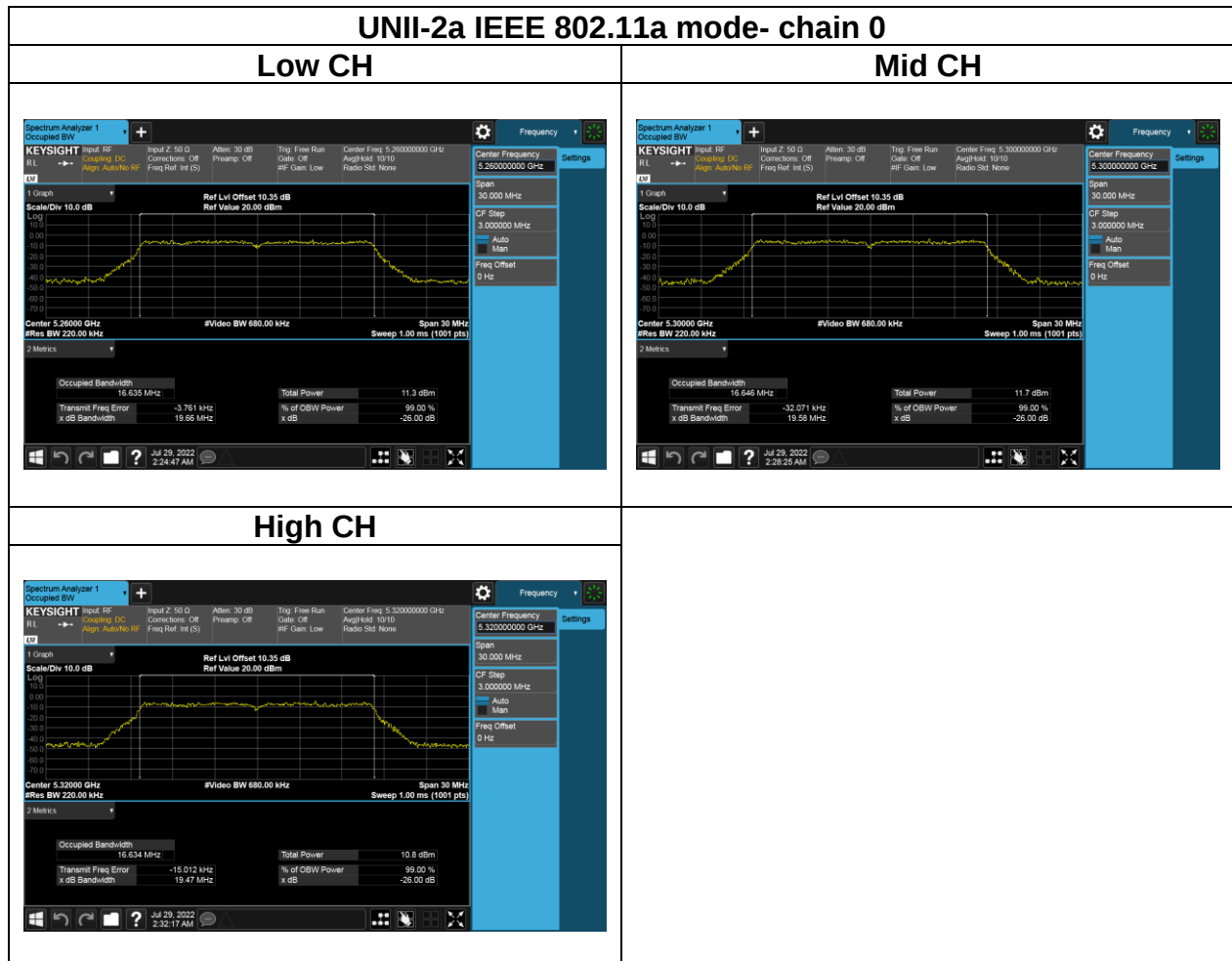


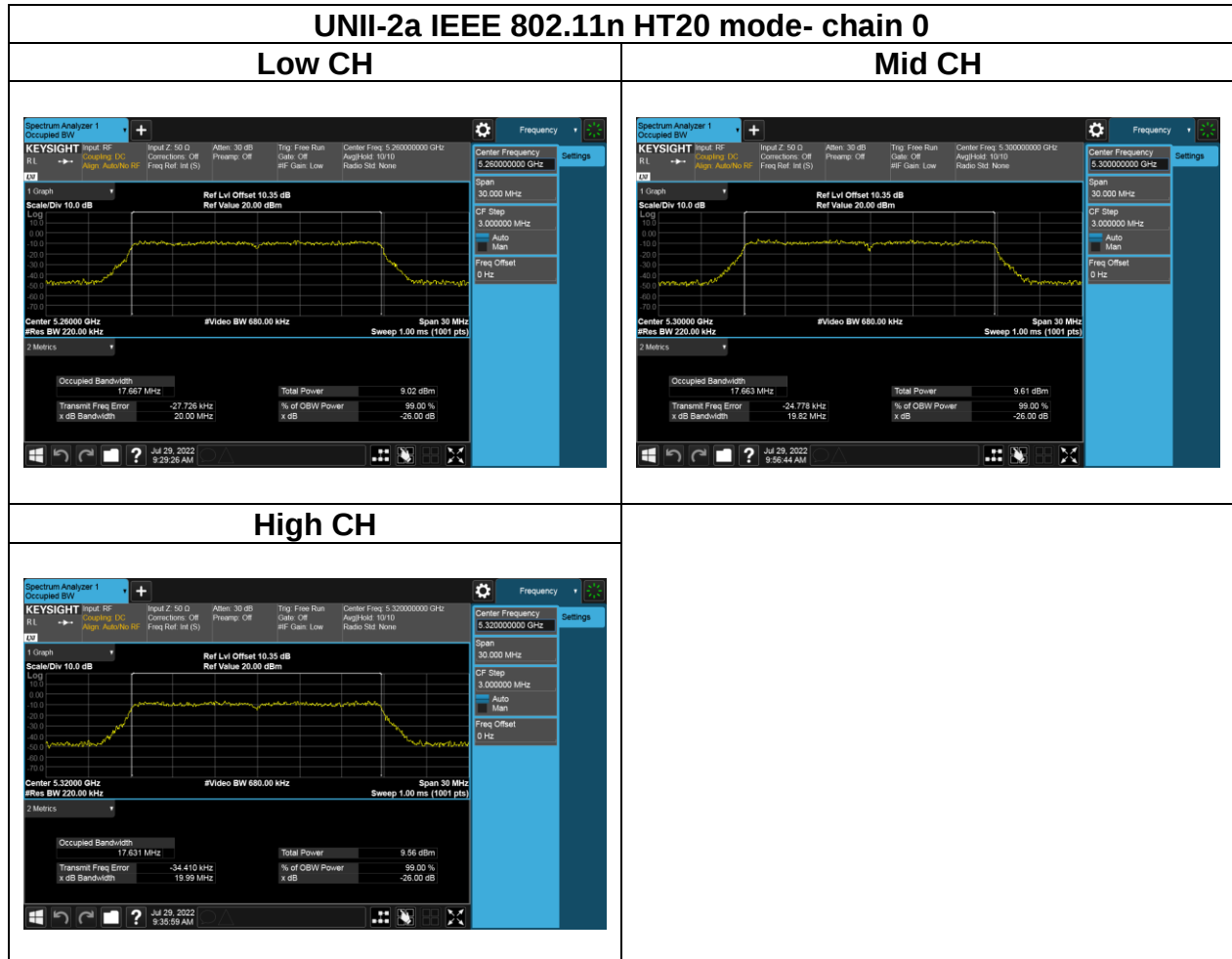




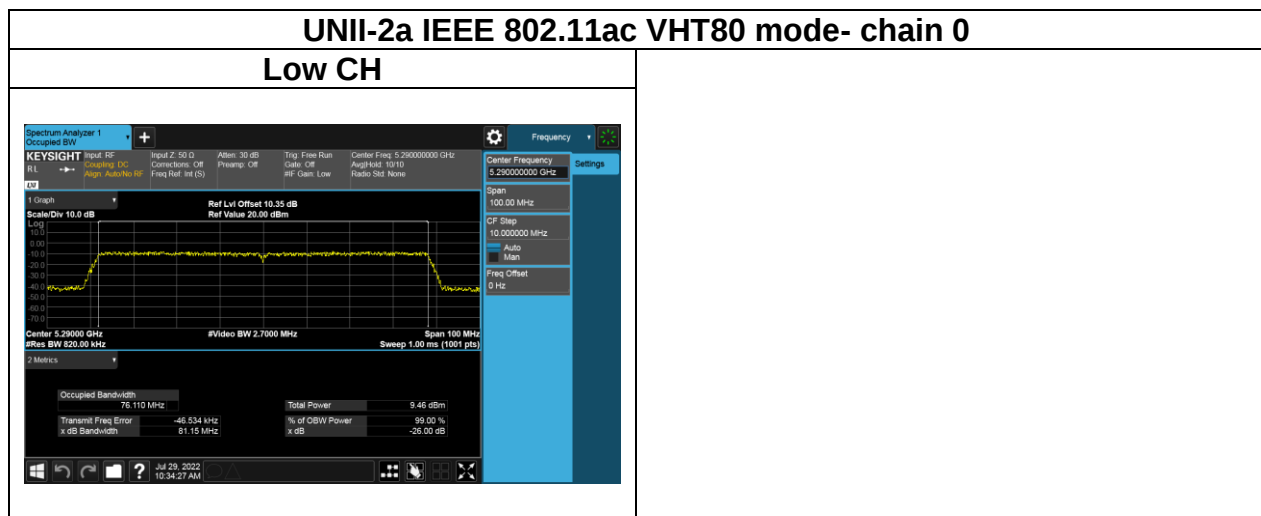
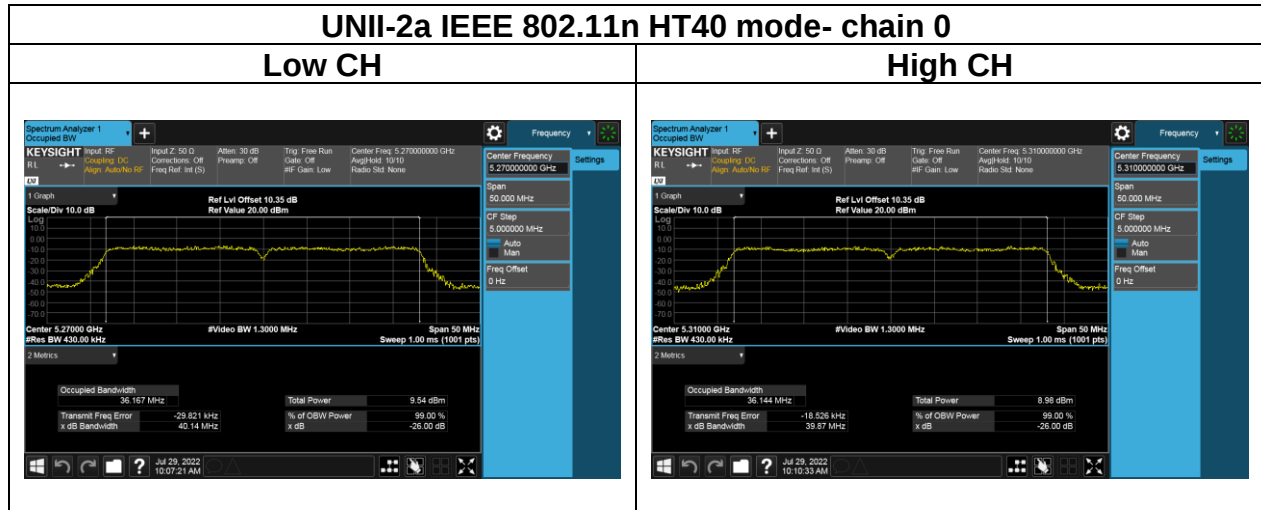
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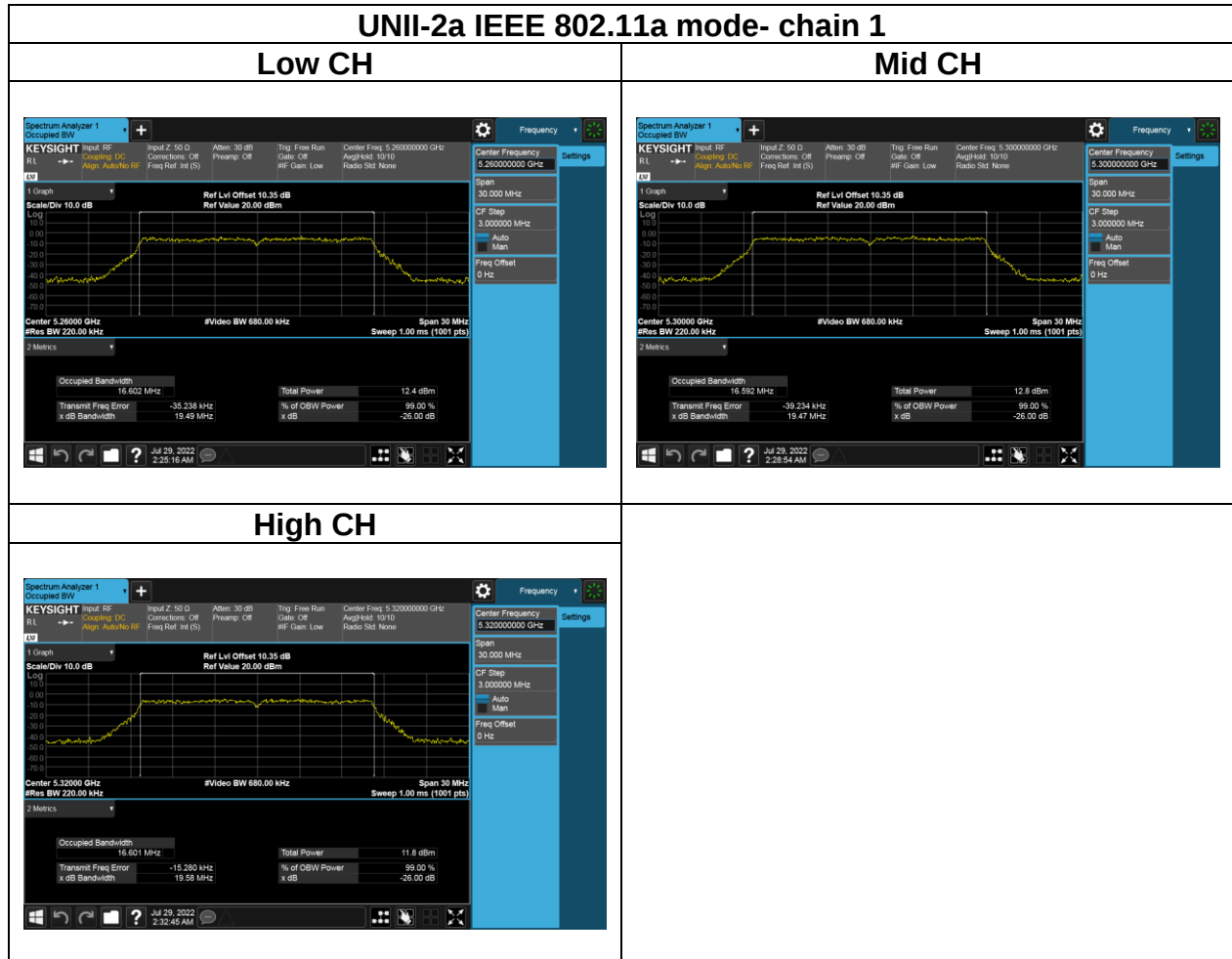
Test Plots (26dB BANDWIDTH)

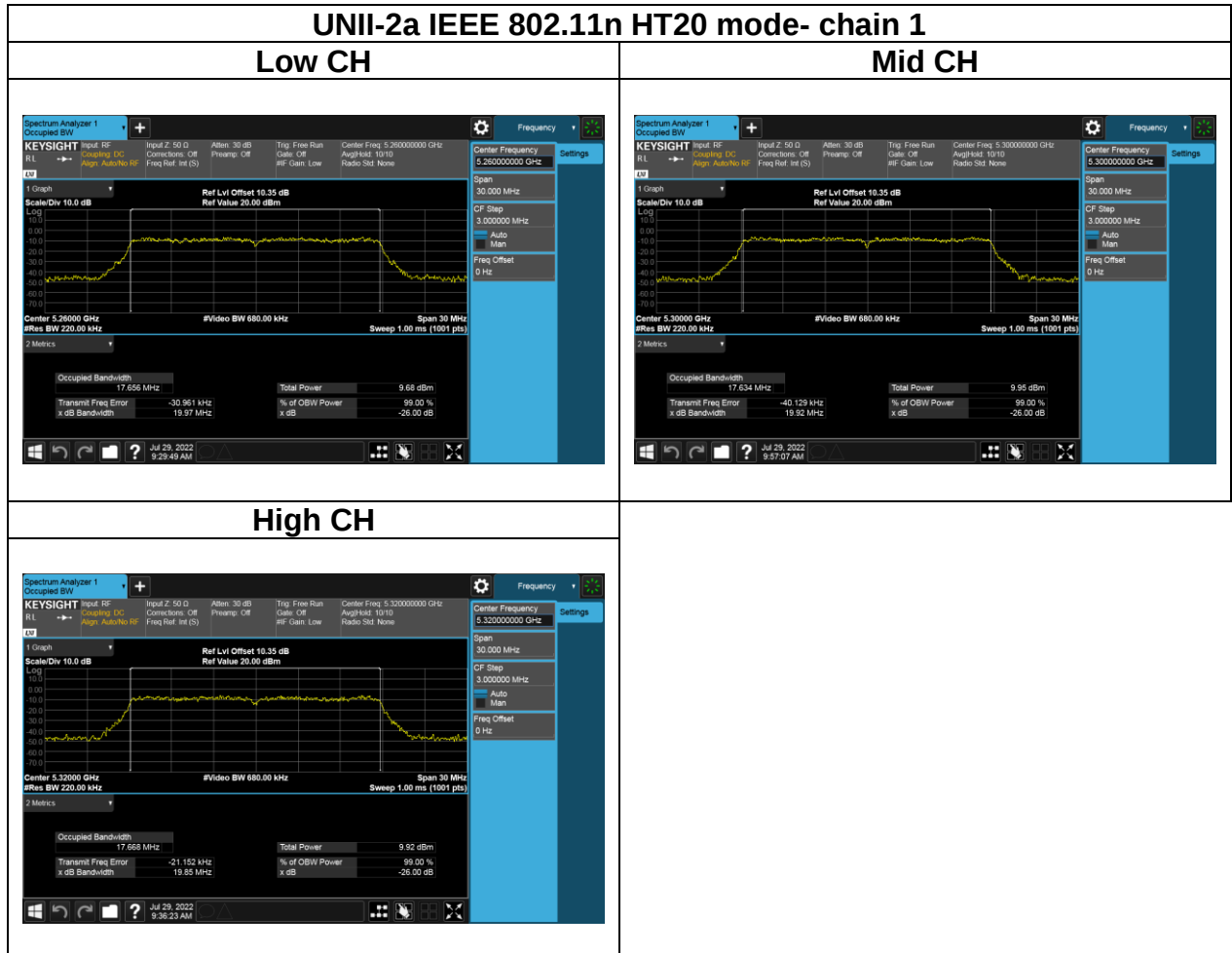


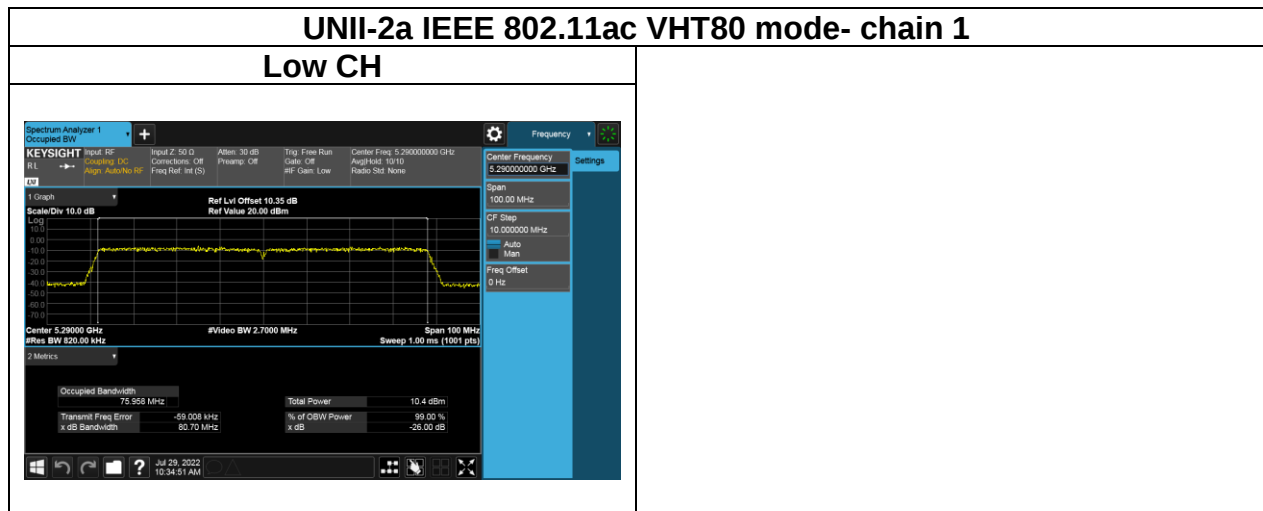
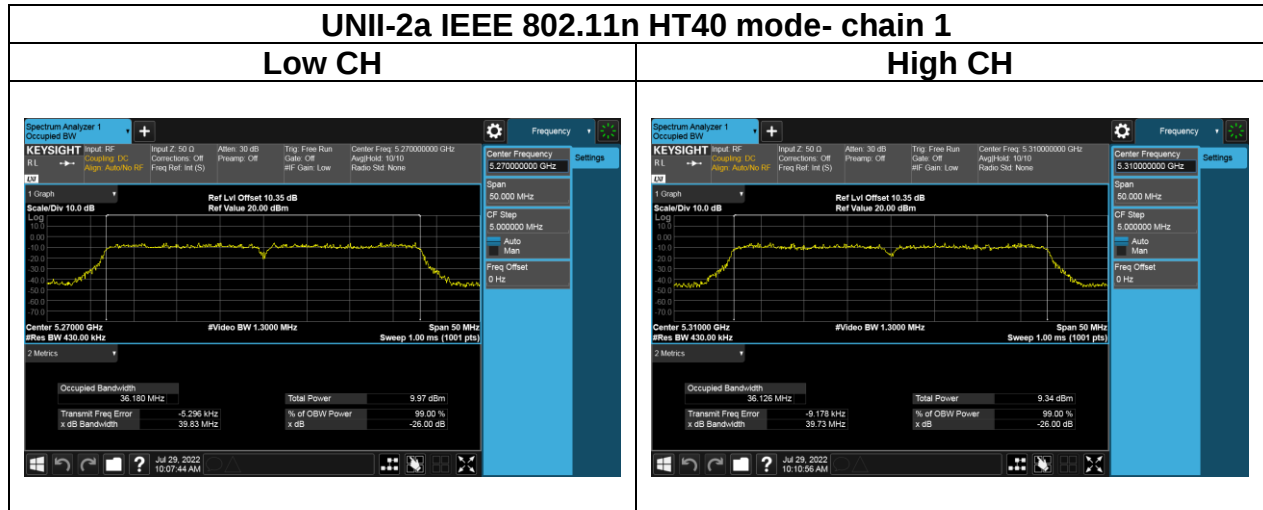


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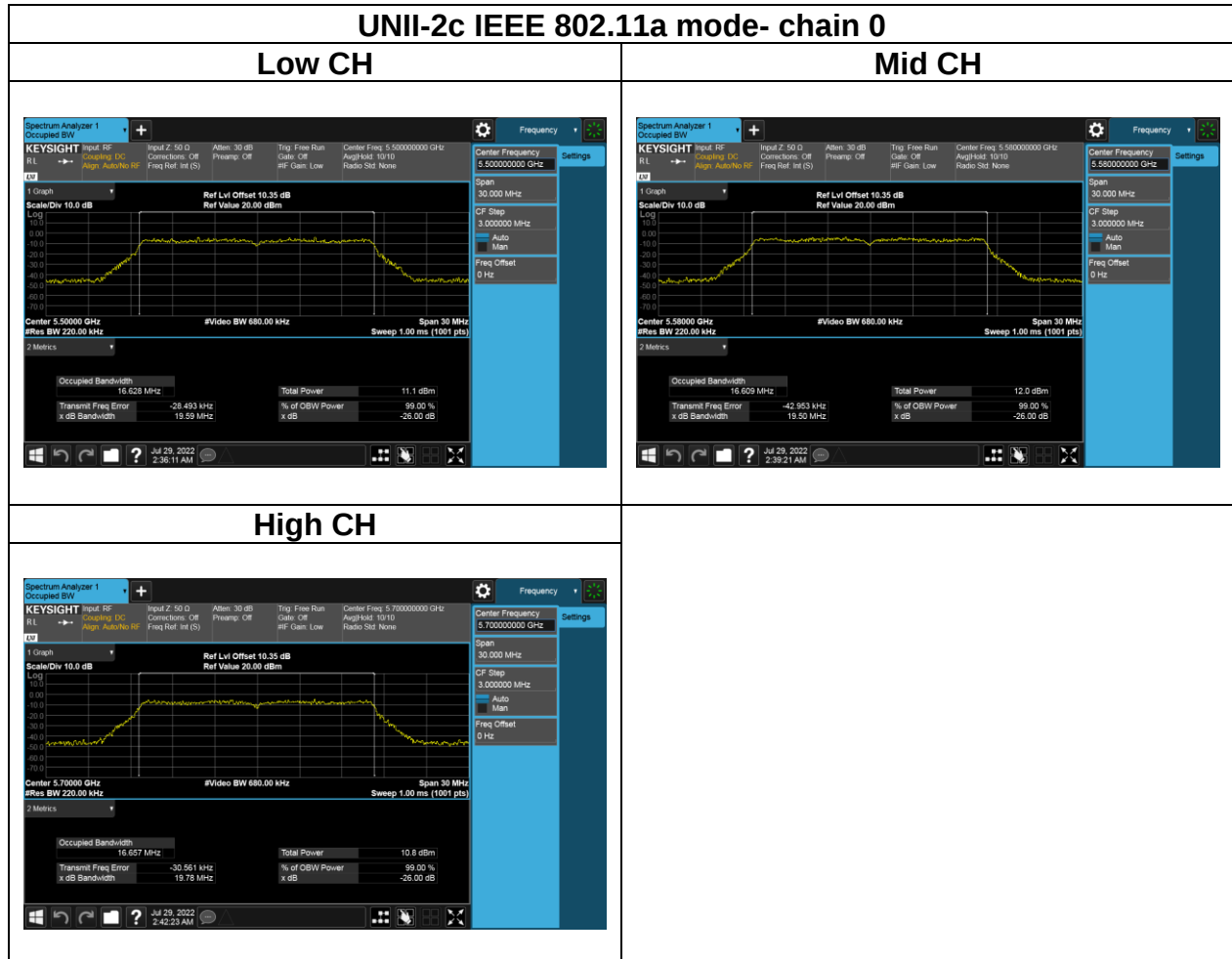


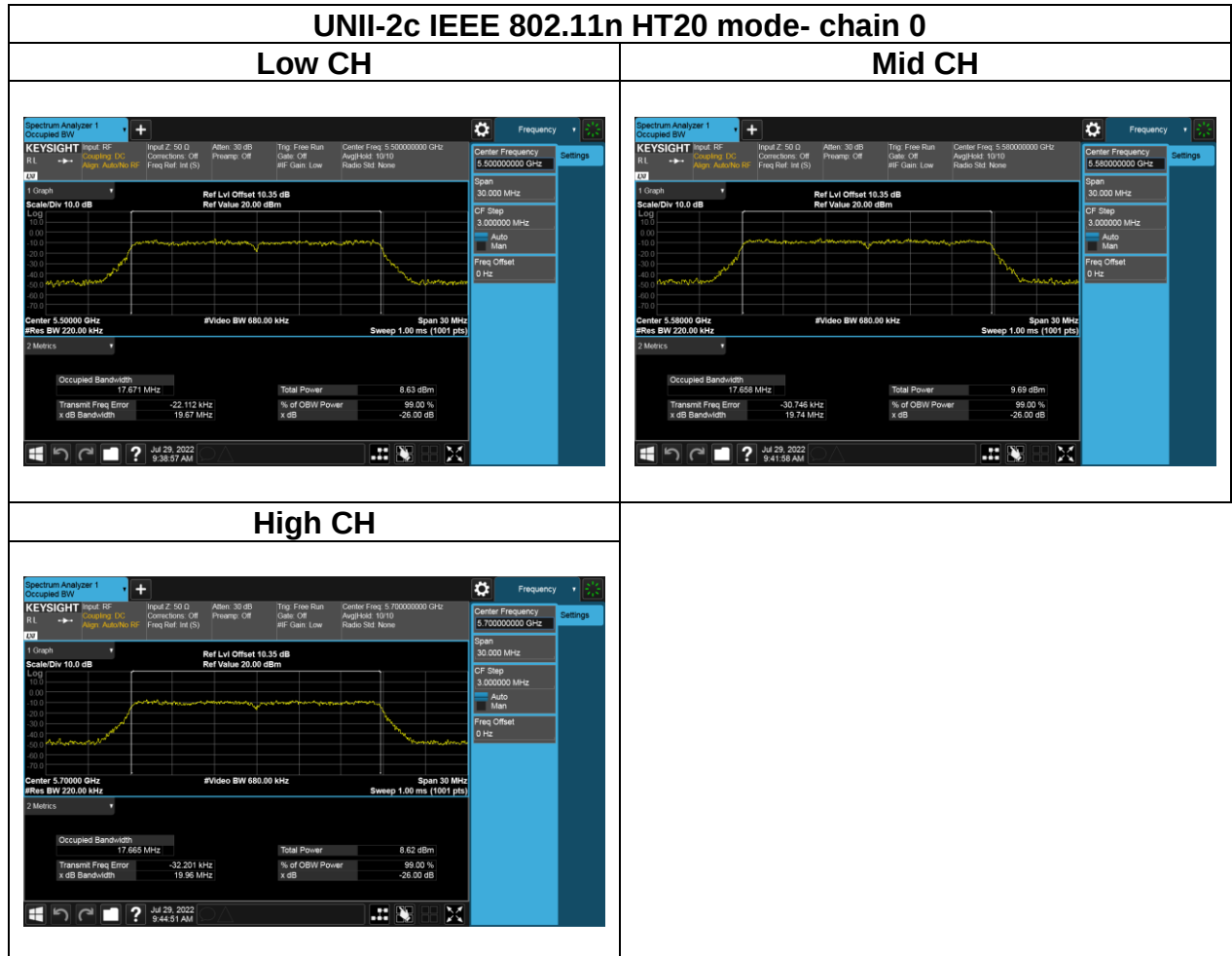


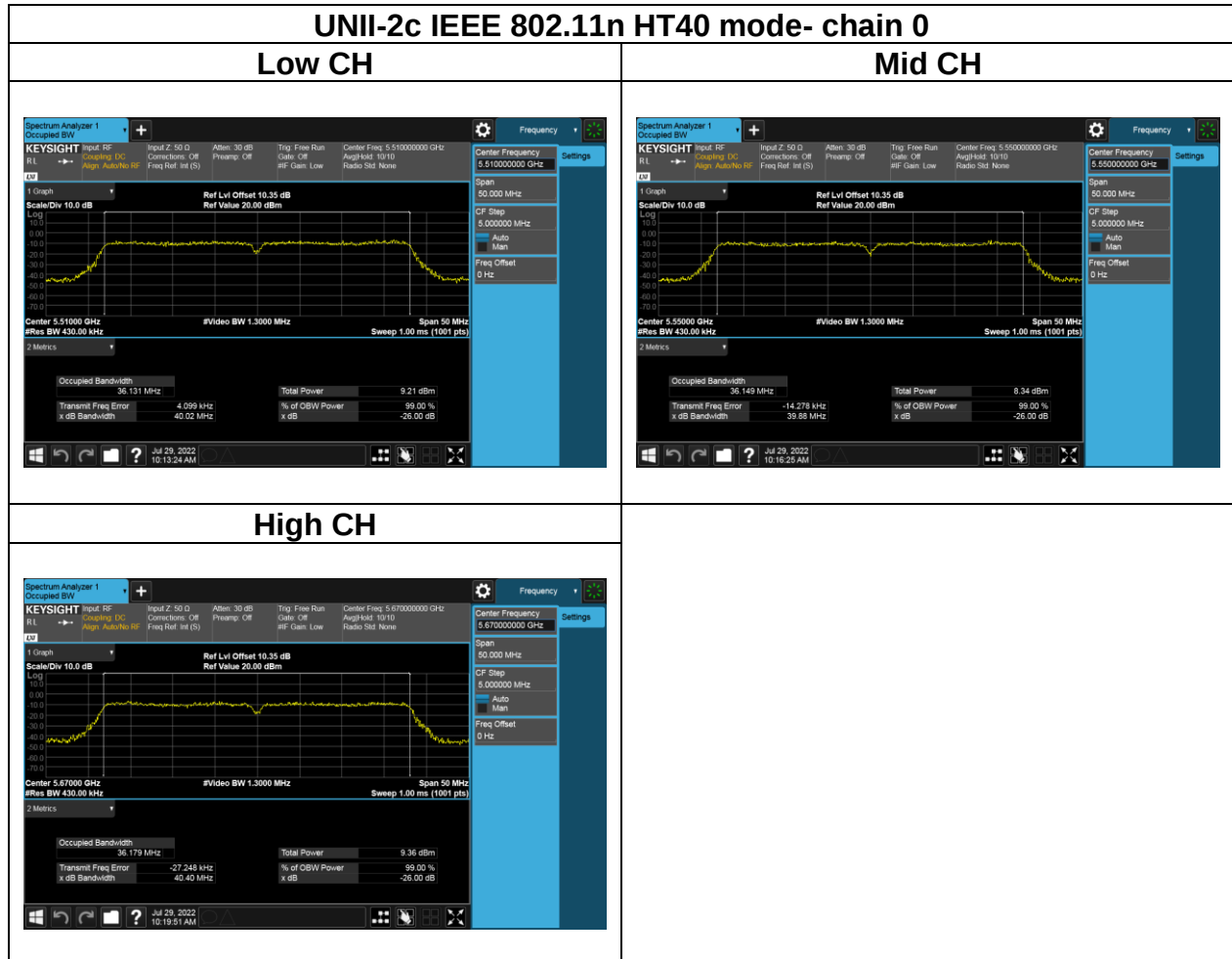


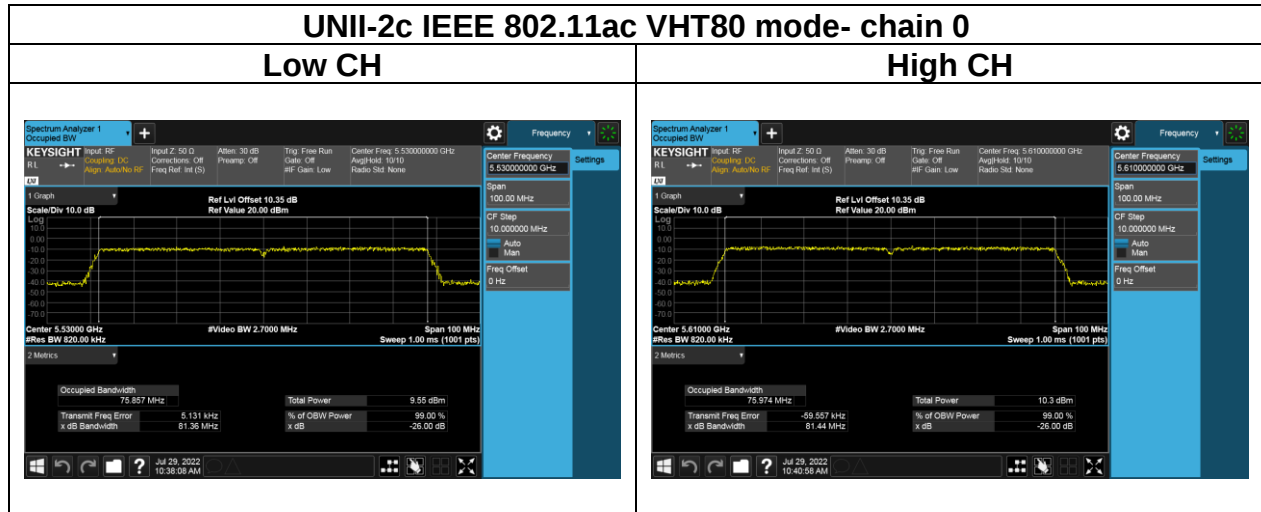


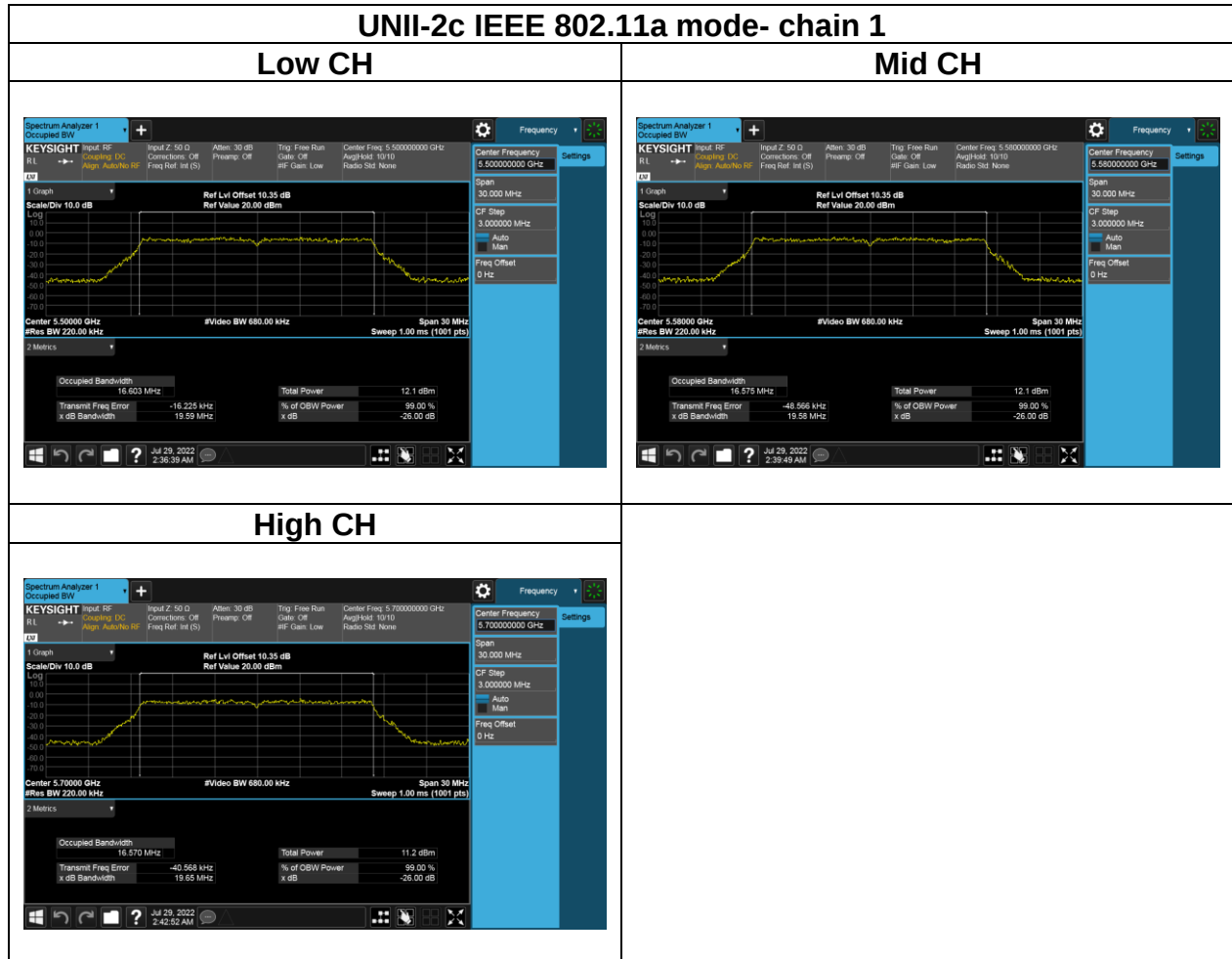
Test Plots (26dB BANDWIDTH)

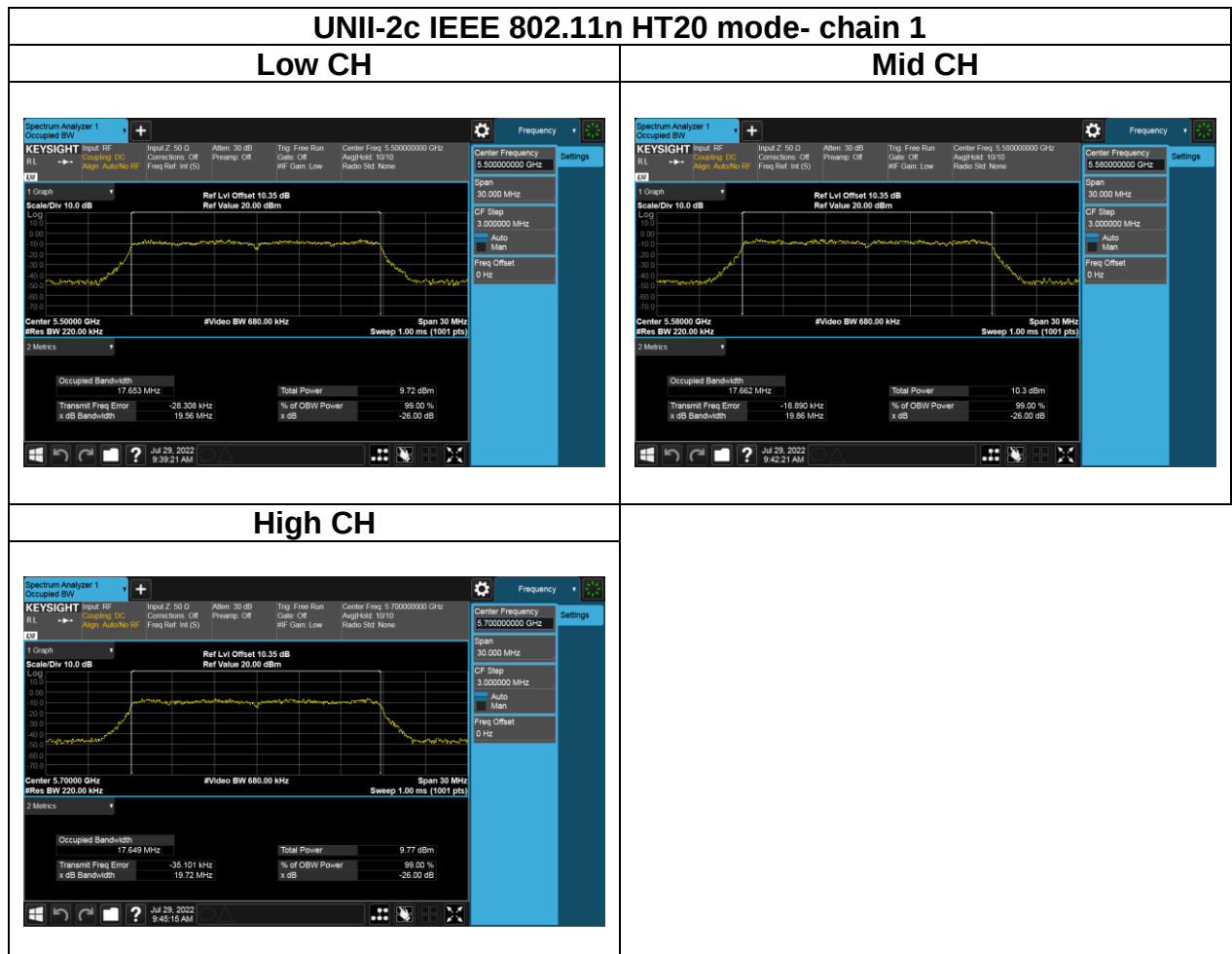


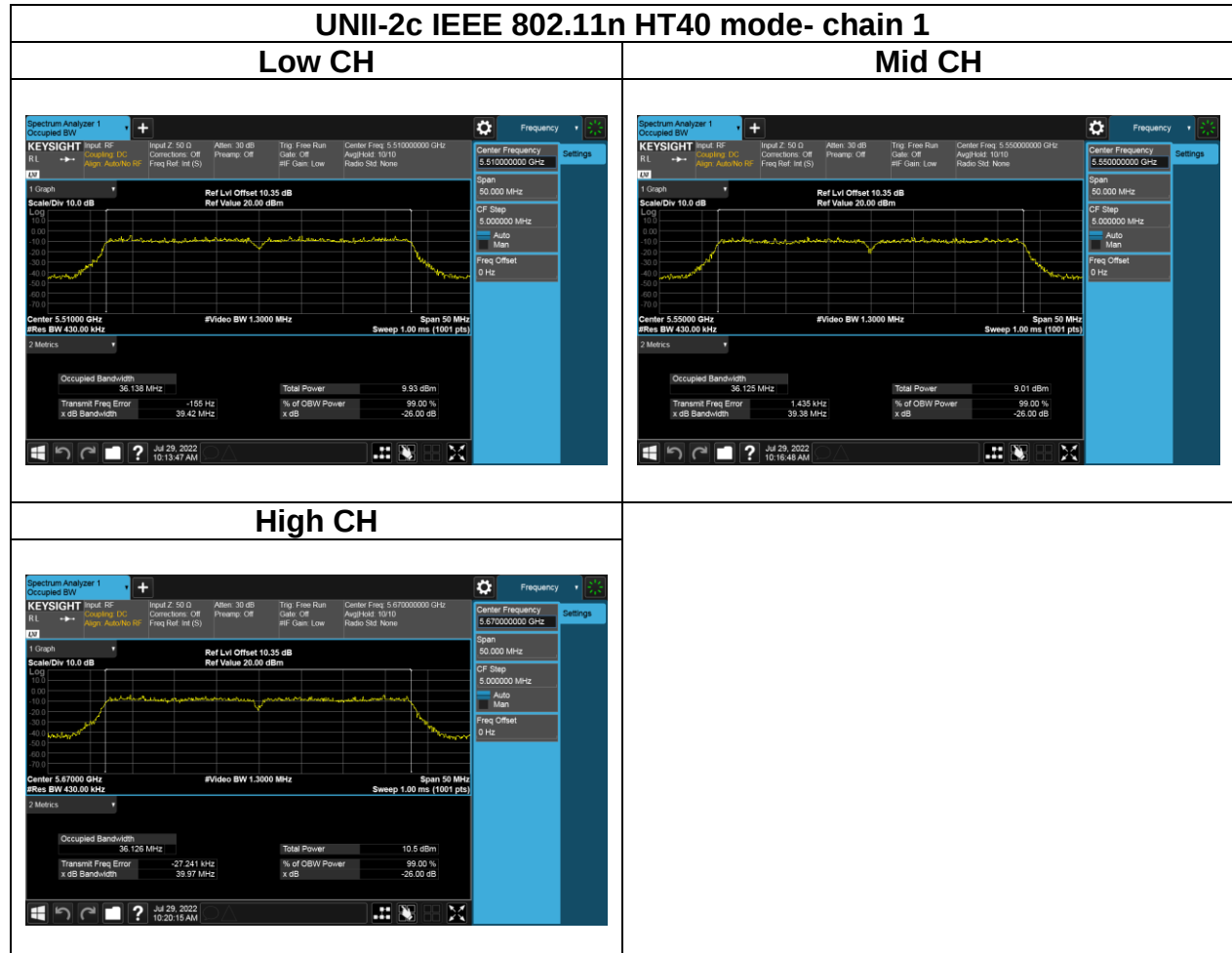


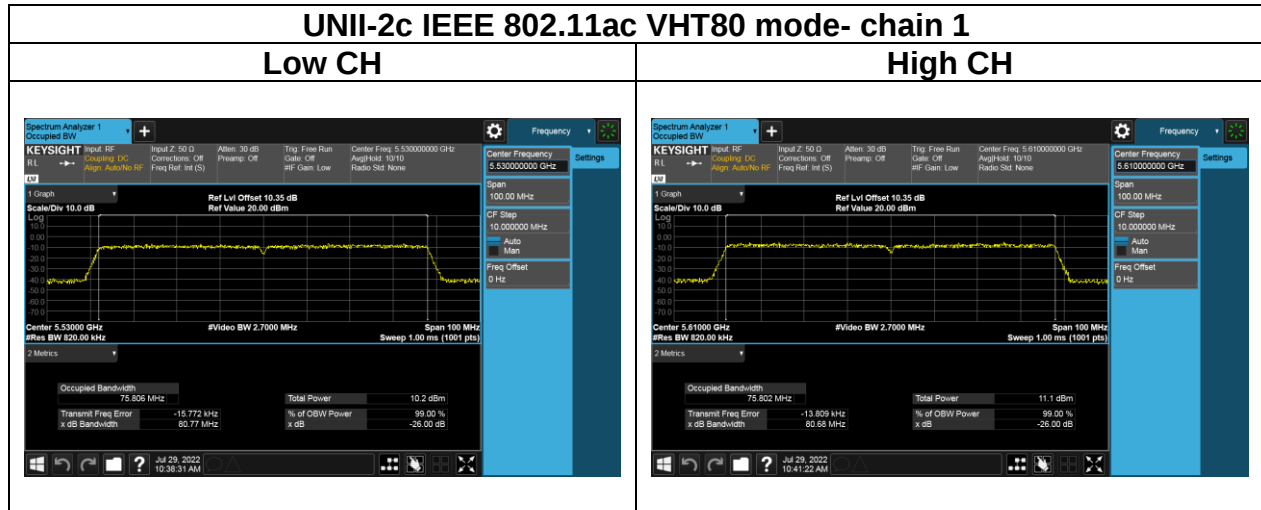












Test Plots (6dB BANDWIDTH)

