

Project No.: TM-2207000268P  
 Report No.: TMWK2207002922KR

FCC ID: 2AX7S-LN313B

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 Rev.: 02

# RADIO TEST REPORT

## FCC 47 CFR PART 15 SUBPART C

<b>Test Standard</b>	<b>FCC Part 15.247</b>
<b>Product name</b>	<b>E-note device</b>
<b>Brand Name</b>	<b>ITOCHU</b>
<b>Model No.</b>	<b>USMUK4</b>
<b>Test Result</b>	<b>Pass</b>
<b>Statements of Conformity</b>	<b>Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.</b>

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:




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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.  
 除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

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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 15, 2022	See the following Note Rev.(01)	P.11	Allison Chen
02	September 27, 2022	See the following Note Rev.(02)	P.11, 22, 36-38, 40, 47, 67	Allison Chen

**Note:**

**Rev.(01)**

1. Modify operation transmitter in section 3.1

**Rev.(02)**

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

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## 1. GENERAL INFORMATION

### 1.1 EUT INFORMATION

<b>Applicant</b>	AIMobile Co., Ltd. 6F., No. 166, Sec.4, Chengde Rd., Shilin Dist., Taipei City 11167 , Taiwan
<b>Manufacturer</b>	AIMobile Co., Ltd. 6F., No. 166, Sec.4, Chengde Rd., Shilin Dist., Taipei City 11167 , Taiwan
<b>Equipment</b>	E-note device
<b>Model Name</b>	USMUK4
<b>Model Discrepancy</b>	N/A
<b>Brand Name</b>	ITOCHU
<b>Received Date</b>	July 19, 2022
<b>Date of Test</b>	July 26 ~ August 12, 2022
<b>Power Supply</b>	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.

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## 1.2 EUT CHANNEL INFORMATION

Frequency Range	802.11b/g/n HT 20: 2412MHz ~ 2462MHz
Modulation Type	1. IEEE 802.11b mode: CCK 2. IEEE 802.11g mode: OFDM 3. IEEE 802.11n HT 20 Mode: OFDM
Number of channel	1. IEEE 802.11b mode: 11 Channels 2. IEEE 802.11g mode: 11 Channels 3. IEEE 802.11n HT 20 Mode : 11 Channels

### 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
<input type="checkbox"/> 1 MHz or less	1	Middle
<input type="checkbox"/> 1 MHz to 10 MHz	2	1 near top and 1 near bottom
<input checked="" type="checkbox"/> More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

## 1.3 ANTENNA INFORMATION

Antenna Specification	<input checked="" type="checkbox"/> PIFA <input type="checkbox"/> PCB <input type="checkbox"/> Dipole <input type="checkbox"/> Coils
Antenna Gain	Chain 0: 2.6 dBi Chain 1: 2.58 dBi  Power Directional Gain: 5.45 dBi
Brand / Model	Chain 0: YAGEO / LN313 (ANTA0ZV1421124553) Chain 1: YAGEO / LN313 (ANTA0ZV1421124554)
Antenna connector	IPEX

### Notes:

- Power Directional Gain =  $10 \cdot \log \{ [ 10^{(Ant1/20)} + 10^{(Ant2/20)} + \dots + 10^{(Ant N /20)} ]^2 / N \text{ ANT} \}$  dBi
- 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.

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## 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
<b>Software</b>	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
<b>Software</b>	Radio Test Software Ver. 21				

**Remark:**

1. Each piece of equipment is scheduled for calibration once a year.
2. 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
<b>Software</b>	e3 210616				

**Remark:**

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



## 1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment						
No.	Equipment	Brand	Model	Series No.	FCC ID	IC
	N/A					

Support Equipment						
No.	Equipment	Brand	Model	Series No.	FCC ID	IC
1	Adapter	Alcatel	UC13US	N/A	N/A	N/A
2	NB(G)	Lenovo	IBM 1951	N/A	N/A	N/A

## 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.

## 2. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	Pass
15.247(a)(2)	4.2	6 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)	4.3	Output Power Measurement	Pass
15.247(e)	4.4	Power Spectral Density	Pass
15.247(d)	4.5	Conducted Band Edge	Pass
15.247(d)	4.5	Conducted Spurious Emission	Pass
15.247(d)	4.6	Radiation Band Edge	Pass
15.247(d)	4.6	Radiation Spurious Emission	Pass

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### 3. DESCRIPTION OF TEST MODES

#### 3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	IEEE 802.11b mode :1Mbps IEEE 802.11g mode :6Mbps IEEE 802.11n HT20 mode :MCS0
Test Channel Frequencies	<b>IEEE 802.11b mode :</b> 1. Lowest Channel : 2412MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2462MHz <b>IEEE 802.11g mode :</b> 1. Lowest Channel : 2412MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2462MHz <b>IEEE 802.11n HT20 mode :</b> 1. Lowest Channel : 2412MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2462MHz
Operation Transmitter	IEEE 802.11b mode : 1T1R IEEE 802.11g mode : 1T1R IEEE 802.11n HT20 mode : 2T2R

**Remark:**

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.
2. For IEEE 802.11 b/g function, it supports SISO mode only.

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### 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	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> 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	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4
Worst Position	<input type="checkbox"/> Placed in fixed position. <input checked="" type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane) <input type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane) <input type="checkbox"/> 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	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> 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

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### 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*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11b	100.00	0.00	0.00	0.01
802.11g	100.00	0.00	0.00	0.01
802.11n_20	100.00	0.00	0.00	0.01



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## 4. TEST RESULT

### 4.1 AC POWER LINE CONDUCTED EMISSION

#### 4.1.1 Test Limit

According to §15.207(a)(2)

Frequency Range (MHz)	Limits(dB $\mu$ 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

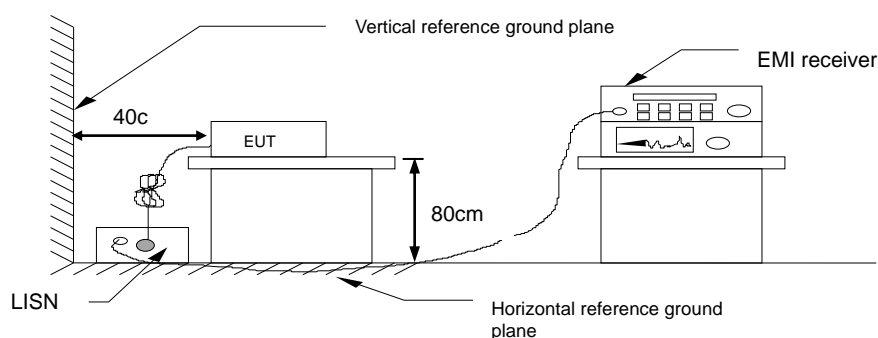
\* Decreases with the logarithm of the frequency.

#### 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



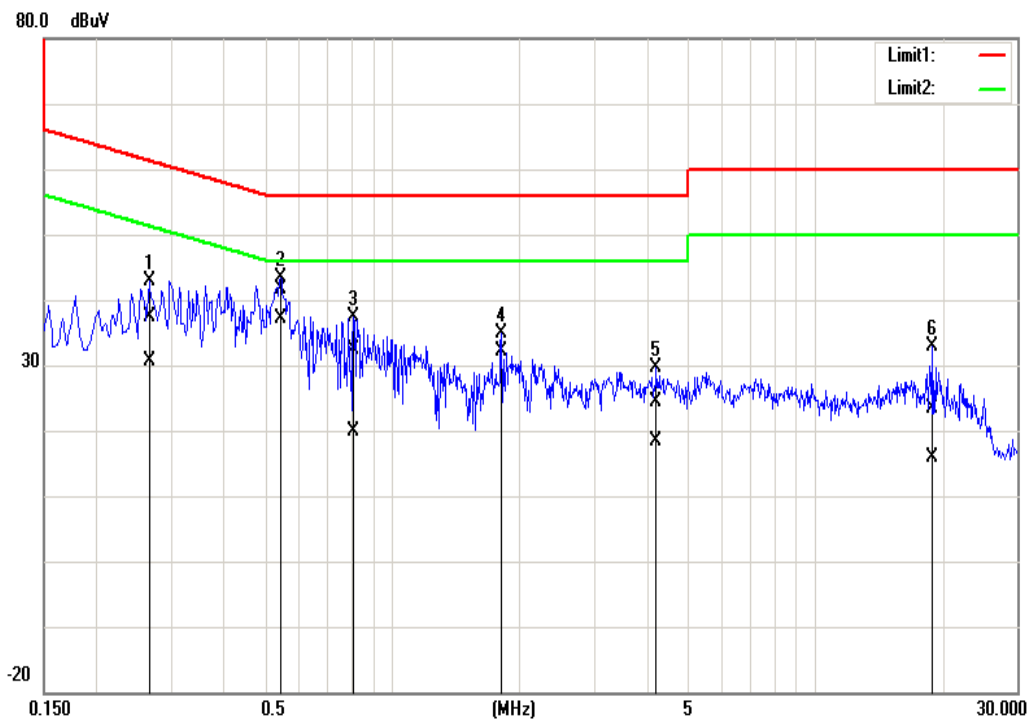
#### 4.1.4 Test Result

**Pass.**

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**Test Data**

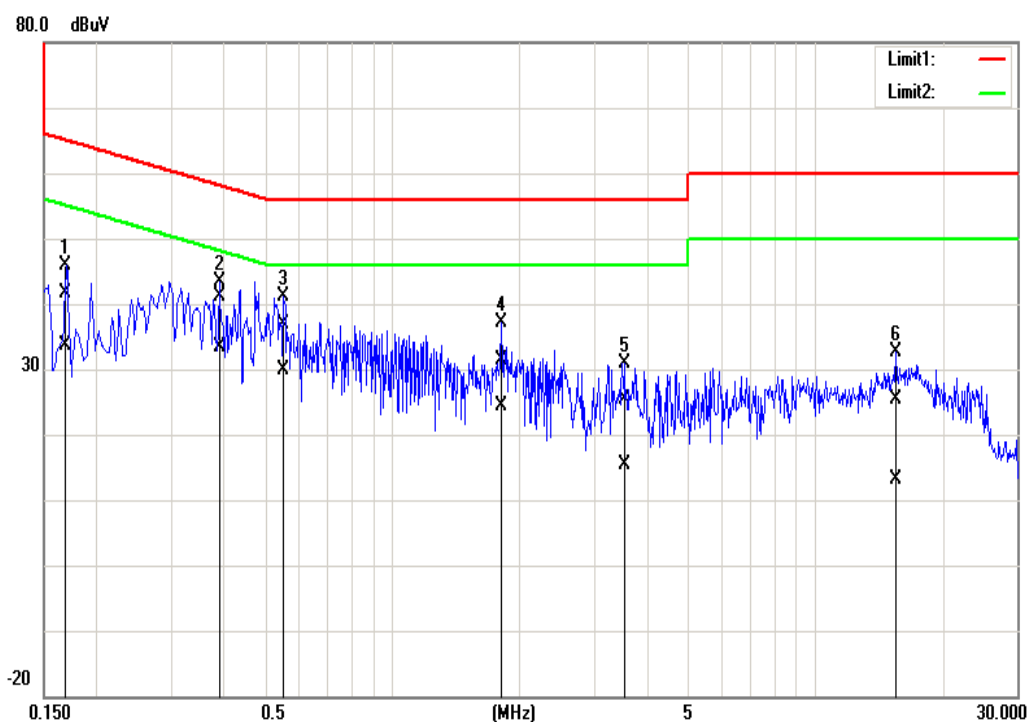
Test Mode:	Mode 1-1%	Temp/Hum	25.9(°C)/ 50%RH
Phase:	Line	Test Date	August 11, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



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
0.2660	27.21	20.56	10.18	37.39	30.74	61.24	51.24	-23.85	-20.50	Pass
0.5460	31.47	26.85	10.19	41.66	37.04	56.00	46.00	-14.34	-8.96	Pass
0.8100	22.28	9.56	10.21	32.49	19.77	56.00	46.00	-23.51	-26.23	Pass
1.8100	24.63	21.90	10.25	34.88	32.15	56.00	46.00	-21.12	-13.85	Pass
4.2020	14.20	8.14	10.30	24.50	18.44	56.00	46.00	-31.50	-27.56	Pass
18.9740	12.98	5.39	10.37	23.35	15.76	60.00	50.00	-36.65	-34.24	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

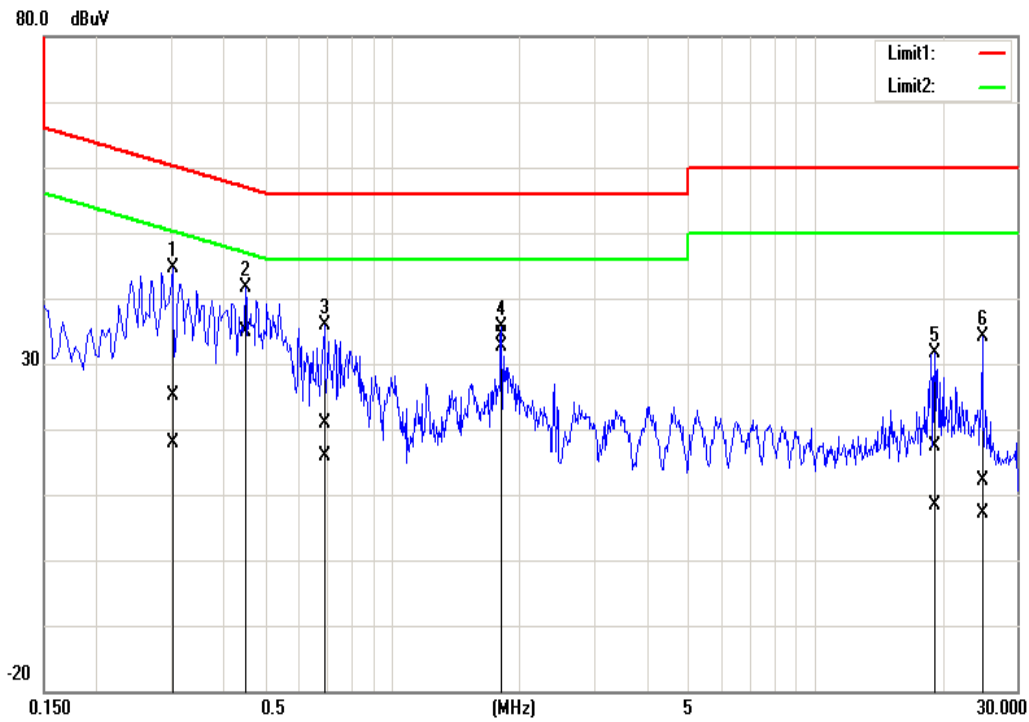


Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1700	31.40	23.47	10.17	41.57	33.64	64.96	54.96	-23.39	-21.32	Pass
0.3900	30.84	23.31	10.18	41.02	33.49	58.06	48.06	-17.04	-14.57	Pass
0.5540	26.72	19.80	10.18	36.90	29.98	56.00	46.00	-19.10	-16.02	Pass
1.8180	21.24	14.04	10.23	31.47	24.27	56.00	46.00	-24.53	-21.73	Pass
3.5420	15.02	5.06	10.28	25.30	15.34	56.00	46.00	-30.70	-30.66	Pass
15.5020	15.06	2.72	10.38	25.44	13.10	60.00	50.00	-34.56	-36.90	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



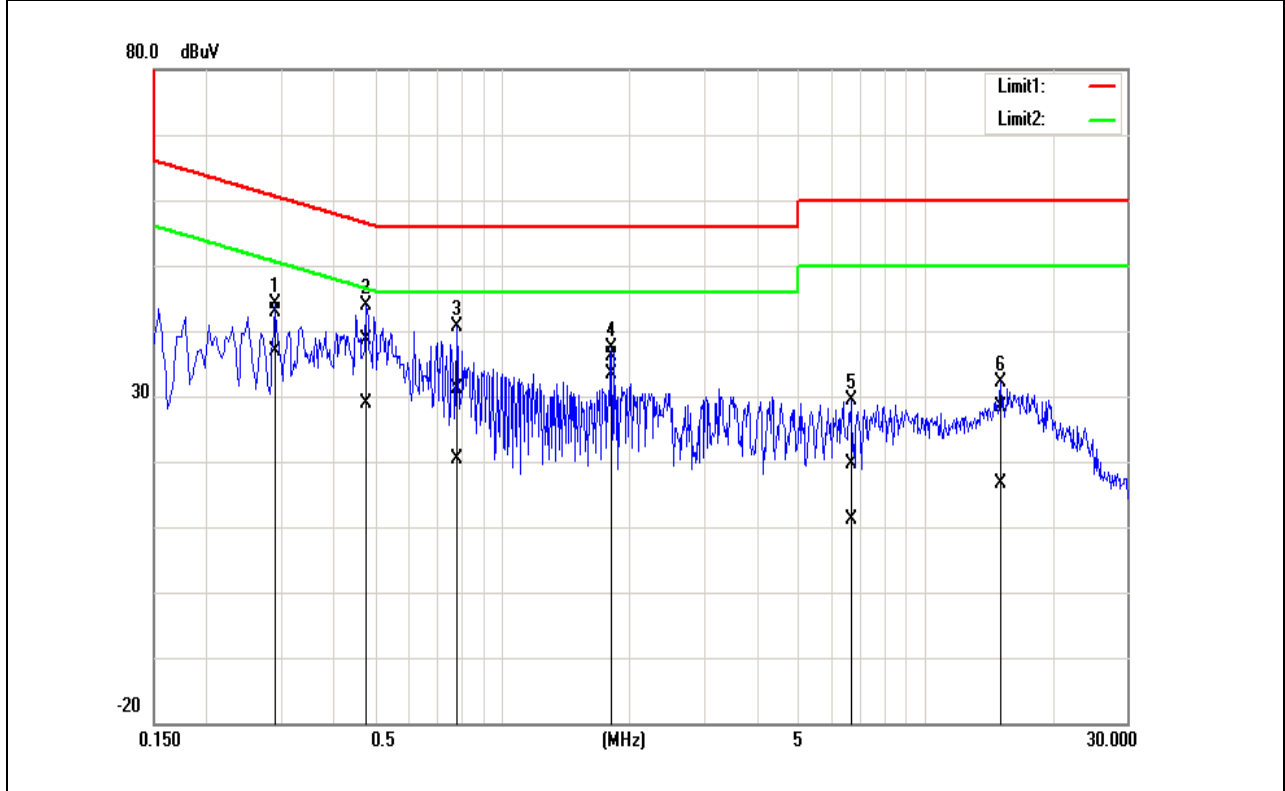
Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.3020	15.00	7.60	10.19	25.19	17.79	60.19	50.19	-35.00	-32.40	Pass
0.4500	31.47	24.65	10.19	41.66	34.84	56.88	46.88	-15.22	-12.04	Pass
0.6900	10.76	5.61	10.19	20.95	15.80	56.00	46.00	-35.05	-30.20	Pass
1.8100	24.02	22.39	10.25	34.27	32.64	56.00	46.00	-21.73	-13.36	Pass
19.1460	7.07	-2.05	10.37	17.44	8.32	60.00	50.00	-42.56	-41.68	Pass
24.8380	2.02	-3.13	10.23	12.25	7.10	60.00	50.00	-47.75	-42.90	Pass

Note: Correction factor = LISN loss + Cable loss.



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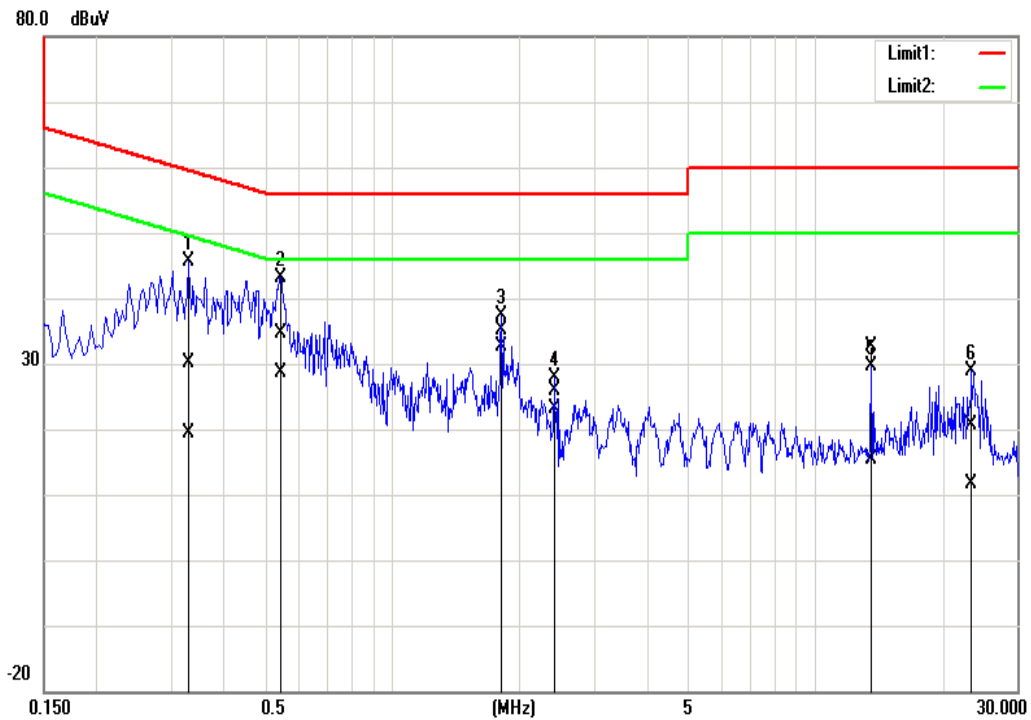
Test Mode:	Mode 1-50%	Temp/Hum	25.9(°C)/ 50%RH
Phase:	Neutral	Test Date	August 11, 2022
Test Voltage:	120Vac, 60Hz	Test Engineer	Tony Chao



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
0.2900	32.67	26.81	10.17	42.84	36.98	60.52	50.52	-17.68	-13.54	Pass
0.4780	28.51	18.67	10.18	38.69	28.85	56.37	46.37	-17.68	-17.52	Pass
0.7820	20.84	10.17	10.20	31.04	20.37	56.00	46.00	-24.96	-25.63	Pass
1.8100	25.83	23.10	10.23	36.06	33.33	56.00	46.00	-19.94	-12.67	Pass
6.6940	9.26	0.77	10.31	19.57	11.08	60.00	50.00	-40.43	-38.92	Pass
15.1020	17.89	6.21	10.38	28.27	16.59	60.00	50.00	-31.73	-33.41	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

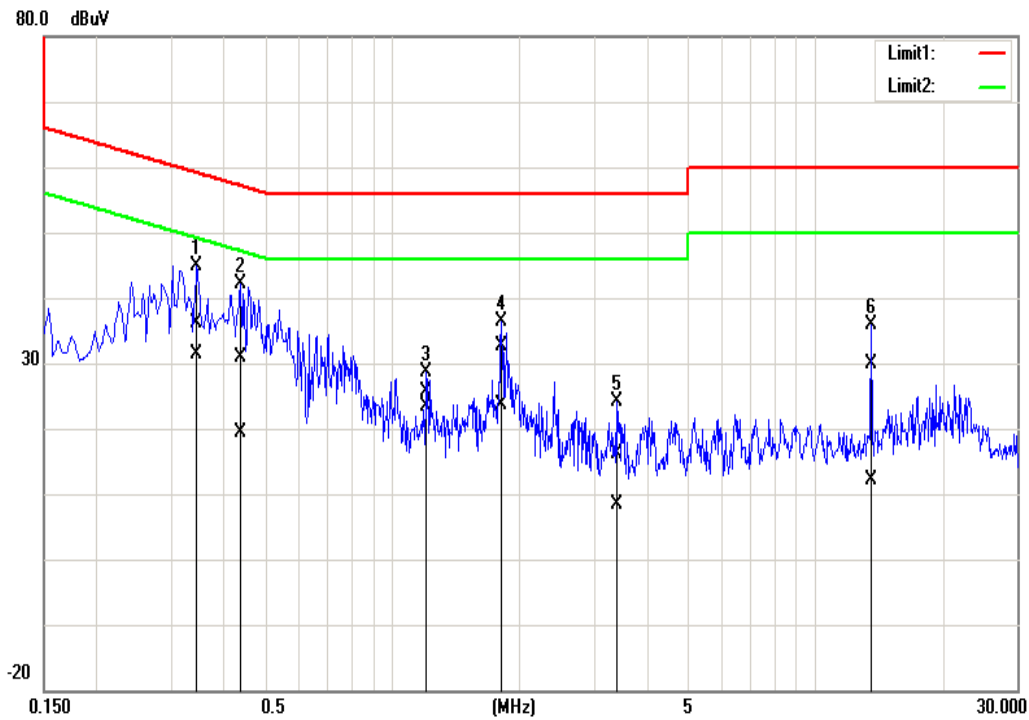


Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.3300	19.94	9.21	10.19	30.13	19.40	59.45	49.45	-29.32	-30.05	Pass
0.5460	24.39	18.55	10.19	34.58	28.74	56.00	46.00	-21.42	-17.26	Pass
1.8140	24.87	22.35	10.25	35.12	32.60	56.00	46.00	-20.88	-13.40	Pass
2.4180	15.61	12.91	10.26	25.87	23.17	56.00	46.00	-30.13	-22.83	Pass
13.5620	22.34	5.02	10.36	32.70	15.38	60.00	50.00	-27.30	-34.62	Pass
23.4980	10.29	1.43	10.27	20.56	11.70	60.00	50.00	-39.44	-38.30	Pass

Note: Correction factor = LISN loss + Cable loss.

Report No.: TMWK2207002922KR

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
0.3460	25.90	21.23	10.18	36.08	31.41	59.06	49.06	-22.98	-17.65	Pass
0.4380	20.67	9.26	10.18	30.85	19.44	57.10	47.10	-26.25	-27.66	Pass
1.2060	15.49	13.18	10.21	25.70	23.39	56.00	46.00	-30.30	-22.61	Pass
1.8180	22.28	13.28	10.23	32.51	23.51	56.00	46.00	-23.49	-22.49	Pass
3.3820	5.80	-1.89	10.26	16.06	8.37	56.00	46.00	-39.94	-37.63	Pass
13.5660	19.44	1.67	10.37	29.81	12.04	60.00	50.00	-30.19	-37.96	Pass

Note: Correction factor = LISN loss + Cable loss.

Report No.: TMWK2207002922KR

## 4.2 6dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

### 4.2.1 Test Limit

According to §15.247(a)(2)

#### 6 dB Bandwidth :

Limit	Shall be at least 500kHz
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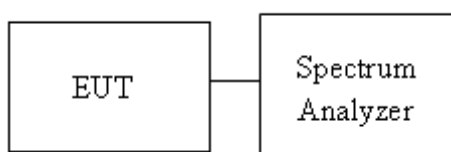
Occupied Bandwidth(99%) : For reporting purposes only.

### 4.2.2 Test Procedure

Test method Refer as ANSI C63.10: 2013,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 6 dB Bandwidth.
4. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth
5. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

### 4.2.3 Test Setup



Report No.: TMWK2207002922KR

### 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

Test mode: IEEE 802.11b mode / 2412-2462 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (kHz)	Chain 1 6dB BW (kHz)	6dB limit (kHz)
Low	2412	13.479	<b>13.517</b>	<b>10060.00</b>	<b>10060.00</b>	≥500
Mid	2437	<b>13.481</b>	13.515	10050.00	<b>10060.00</b>	
High	2462	13.476	13.503	10050.00	<b>10060.00</b>	

Test mode: IEEE 802.11g mode / 2412-2462 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (kHz)	Chain 1 6dB BW (kHz)	6dB limit (kHz)
Low	2412	16.792	16.707	<b>16600.00</b>	<b>16600.00</b>	≥500
Mid	2437	16.791	16.700	<b>16600.00</b>	<b>16600.00</b>	
High	2462	<b>16.795</b>	<b>16.718</b>	<b>16600.00</b>	<b>16600.00</b>	

Test mode: IEEE 802.11n HT 20 mode / 2412-2462 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (kHz)	Chain 1 6dB BW (kHz)	6dB limit (kHz)
Low	2412	17.677	17.655	<b>17720.00</b>	<b>17730.00</b>	≥500
Mid	2437	17.680	<b>17.660</b>	<b>17720.00</b>	<b>17730.00</b>	
High	2462	<b>17.684</b>	17.659	<b>17720.00</b>	<b>17730.00</b>	

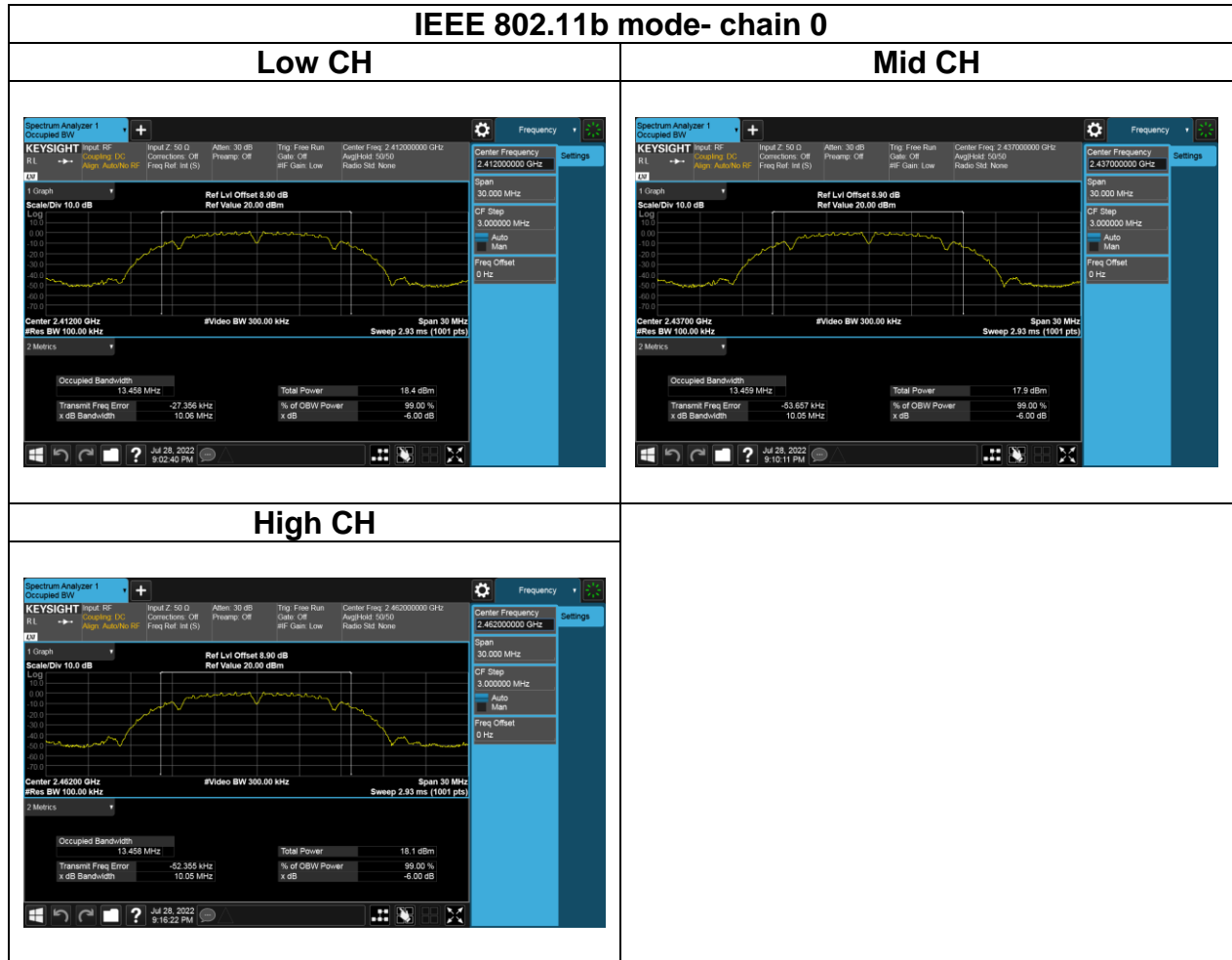
**Remark:**

1. For IEEE 802.11 b/g function, it supports SISO mode only.

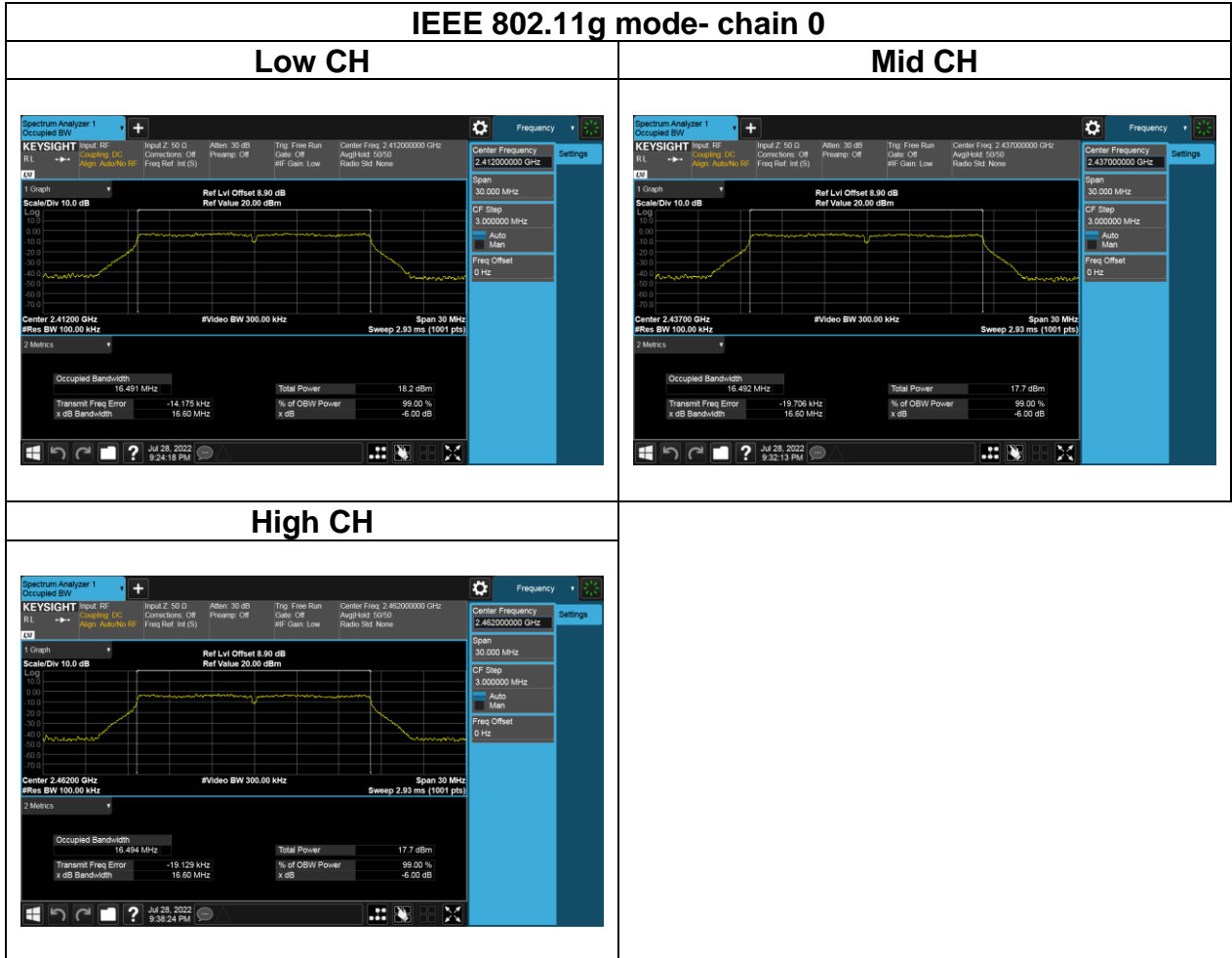
Report No.: TMWK2207002922KR

## Test Data

### 6dB BANDWIDTH

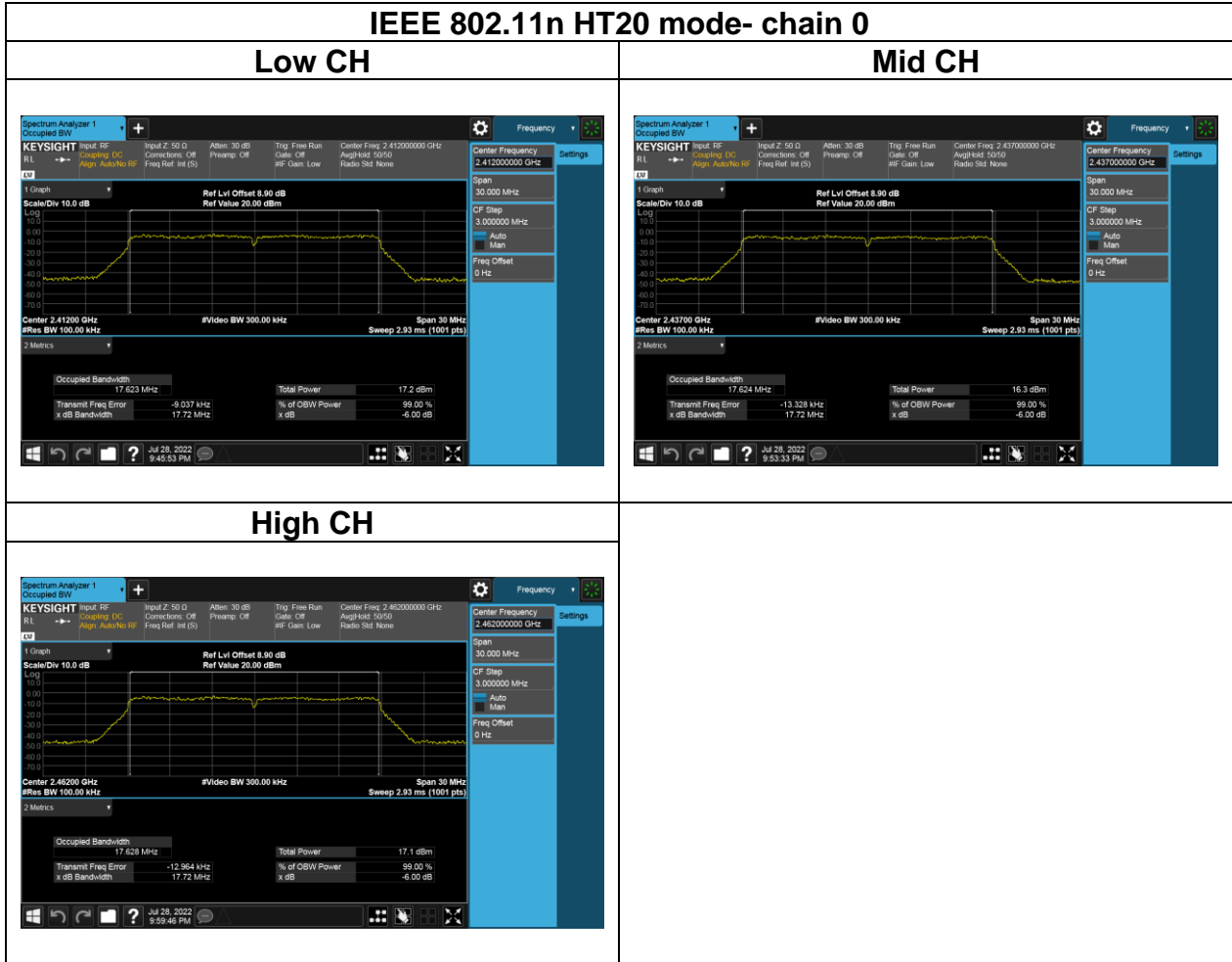


Report No.: TMWK2207002922KR

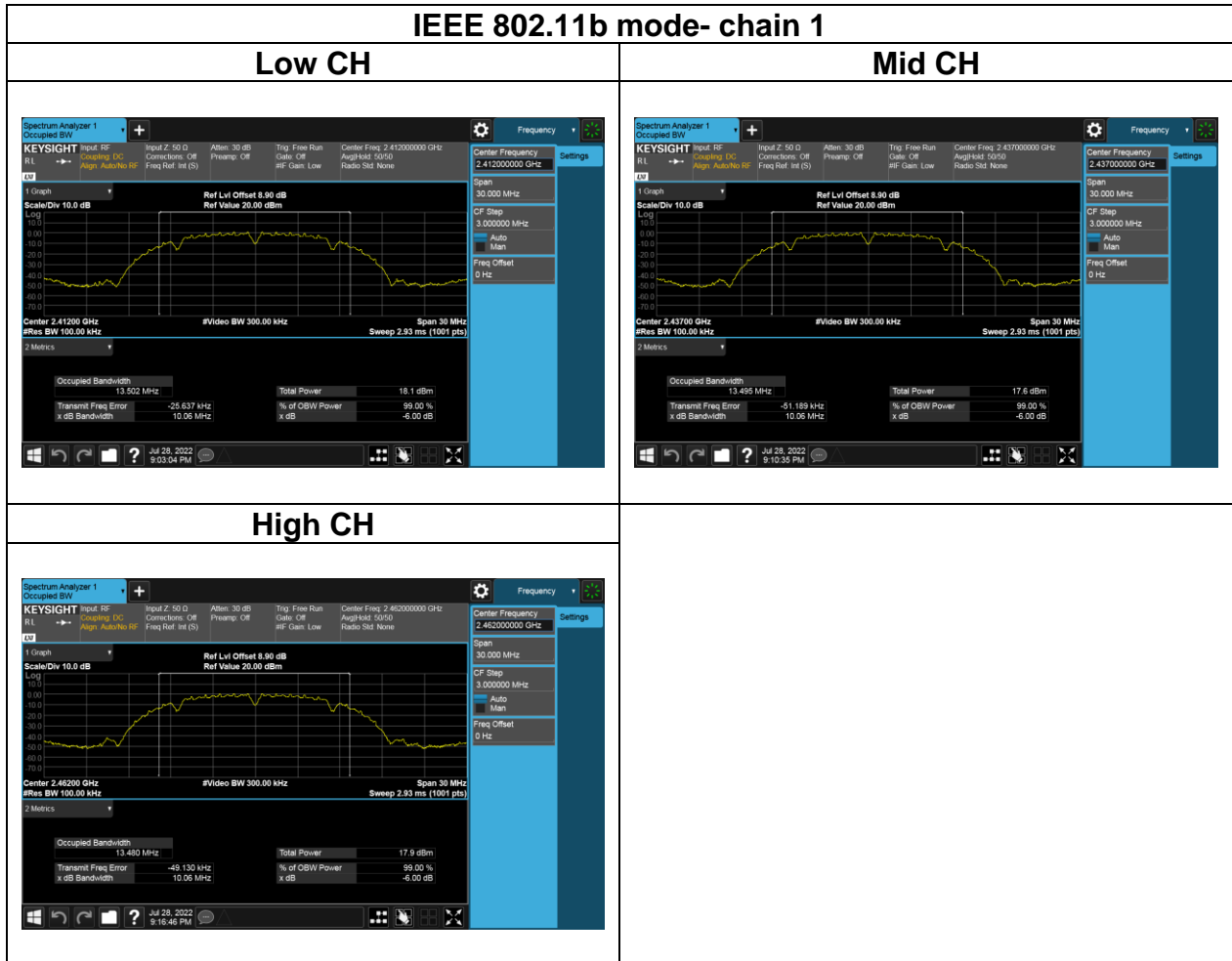




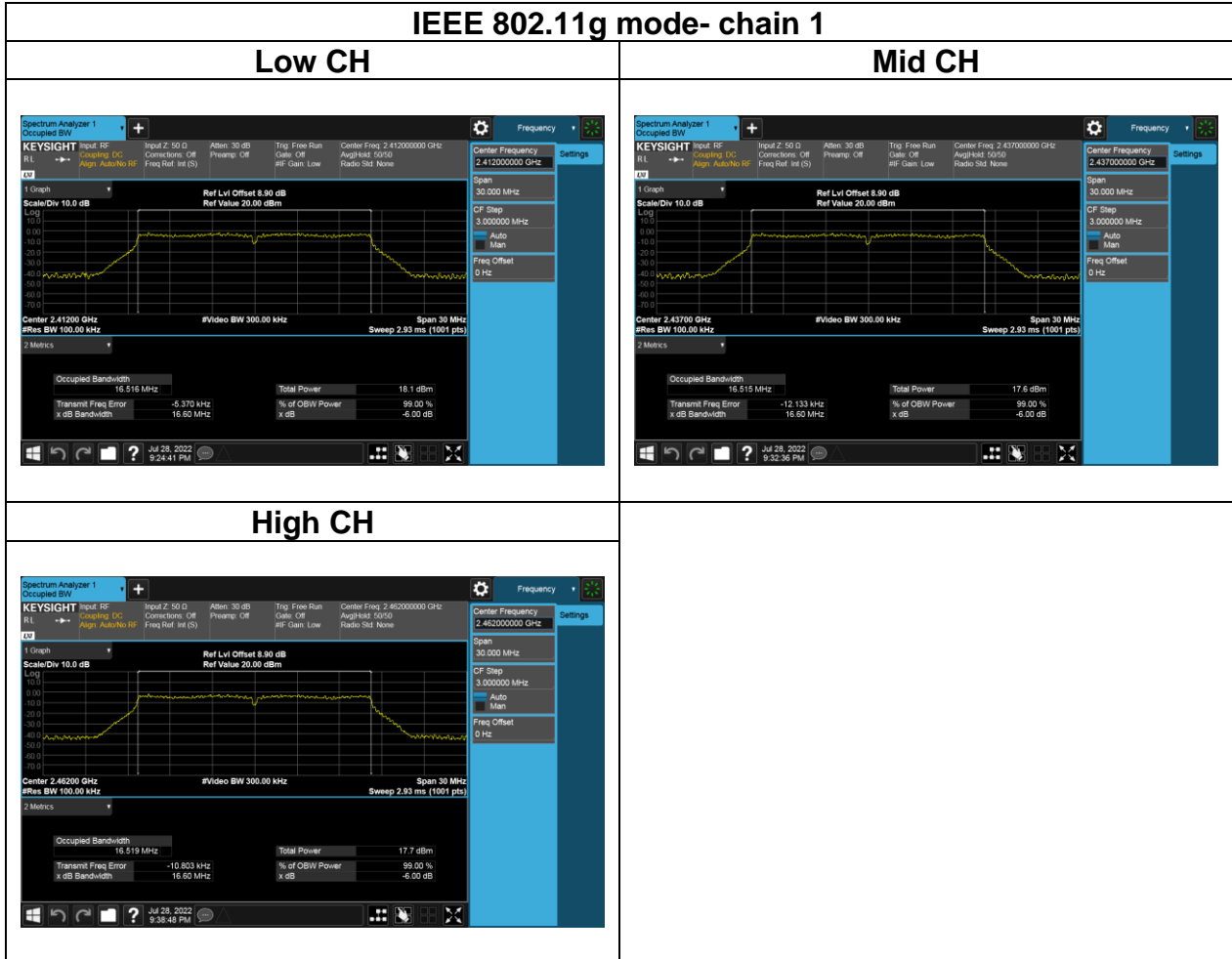
Report No.: TMWK2207002922KR



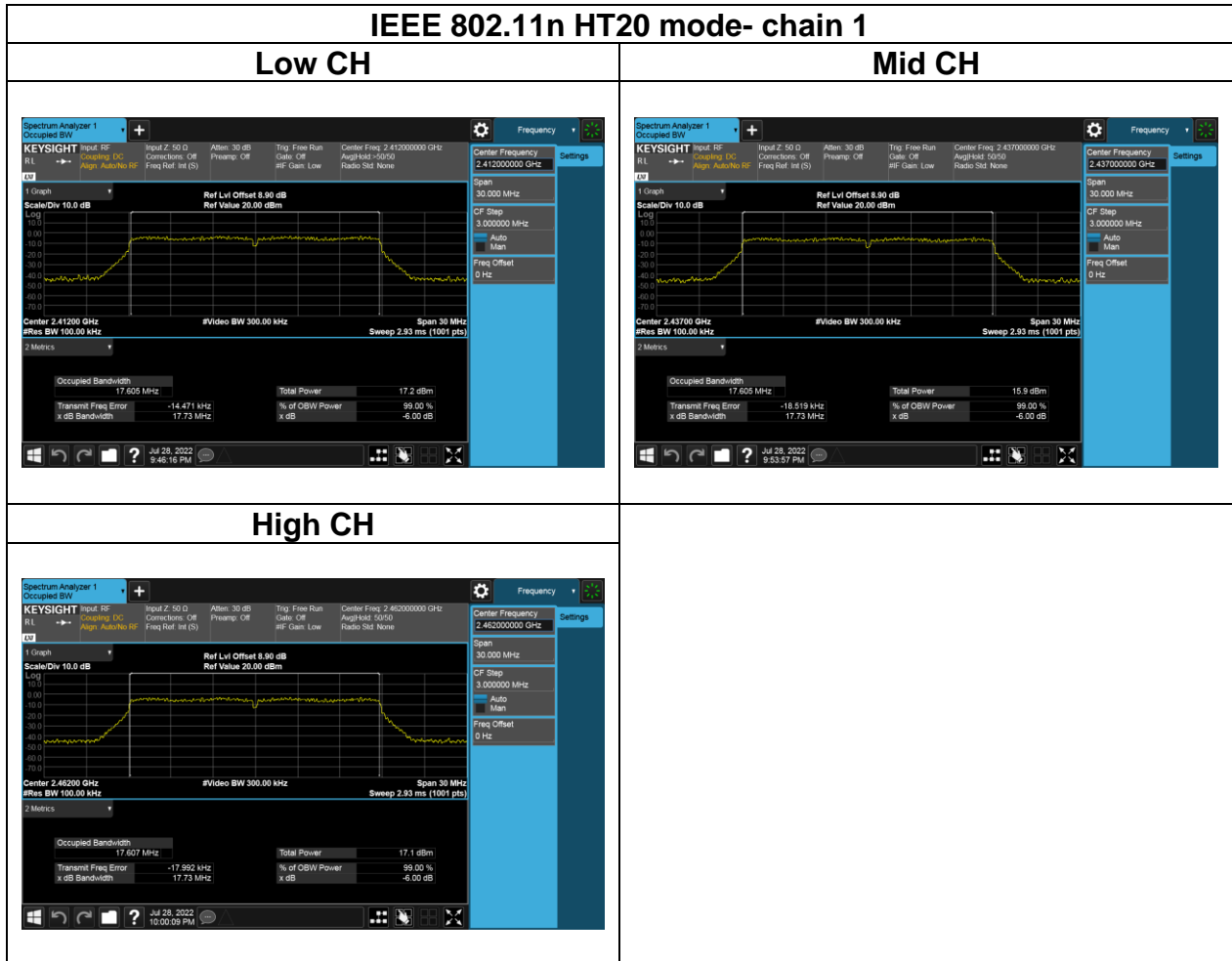
Report No.: TMWK2207002922KR



Report No.: TMWK2207002922KR



Report No.: TMWK2207002922KR



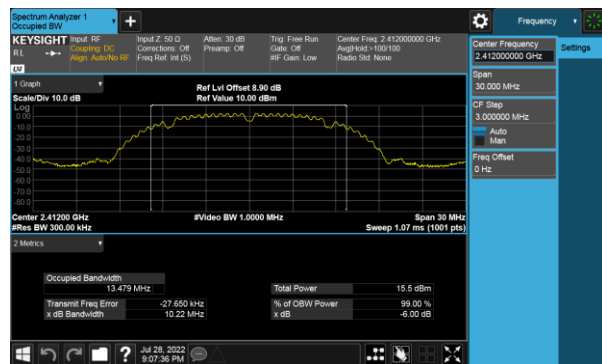
Report No.: TMWK2207002922KR

## Test Data

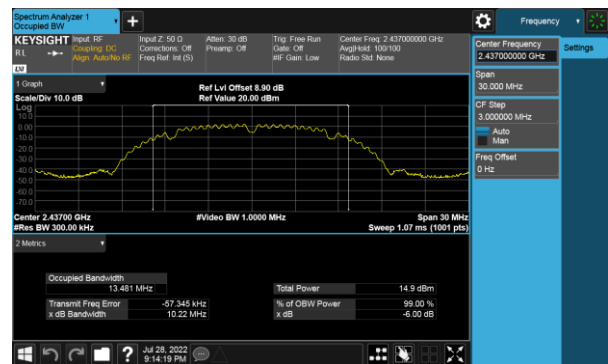
### BANDWIDTH 99%

#### IEEE 802.11b mode- chain 0

##### Low CH



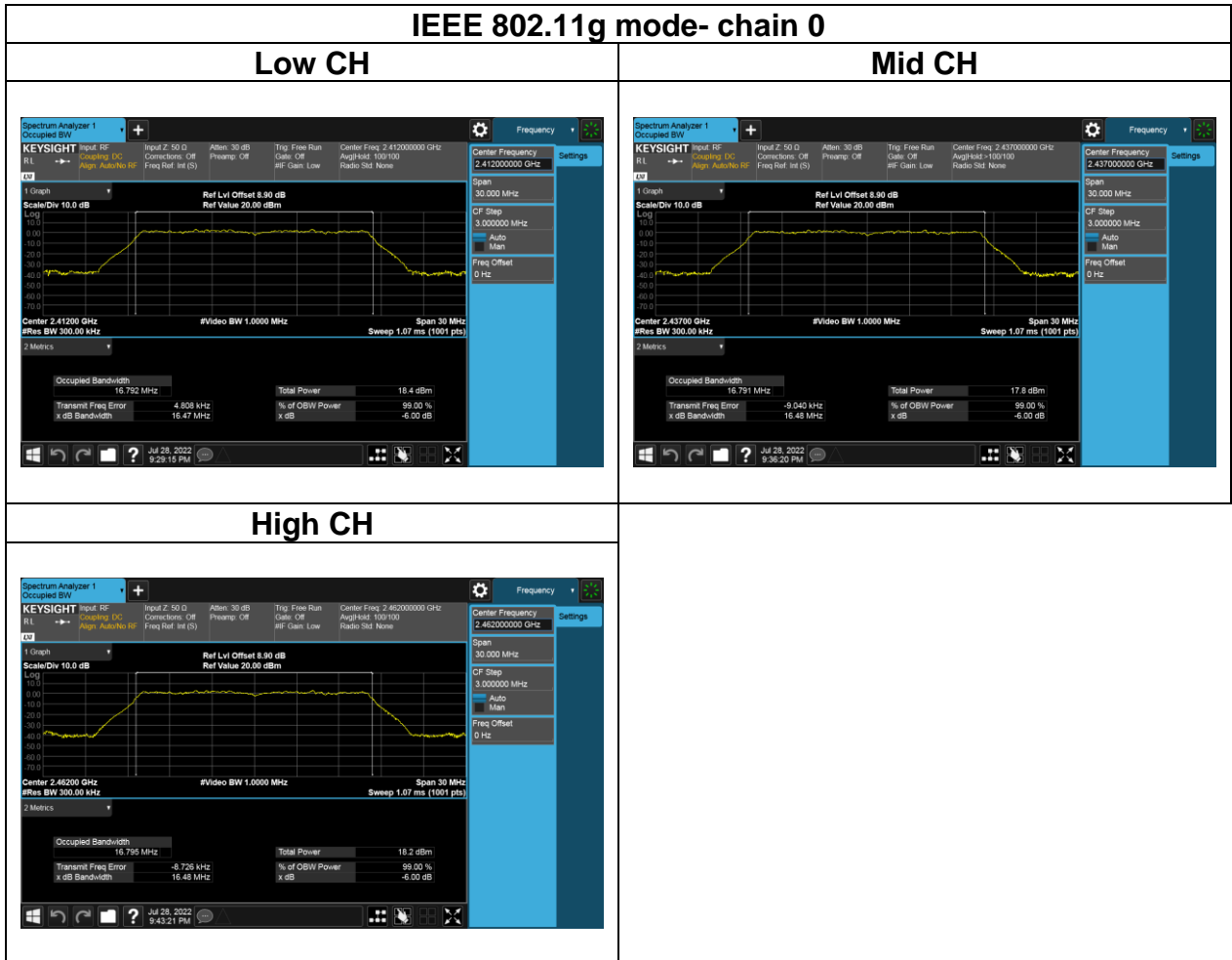
##### Mid CH



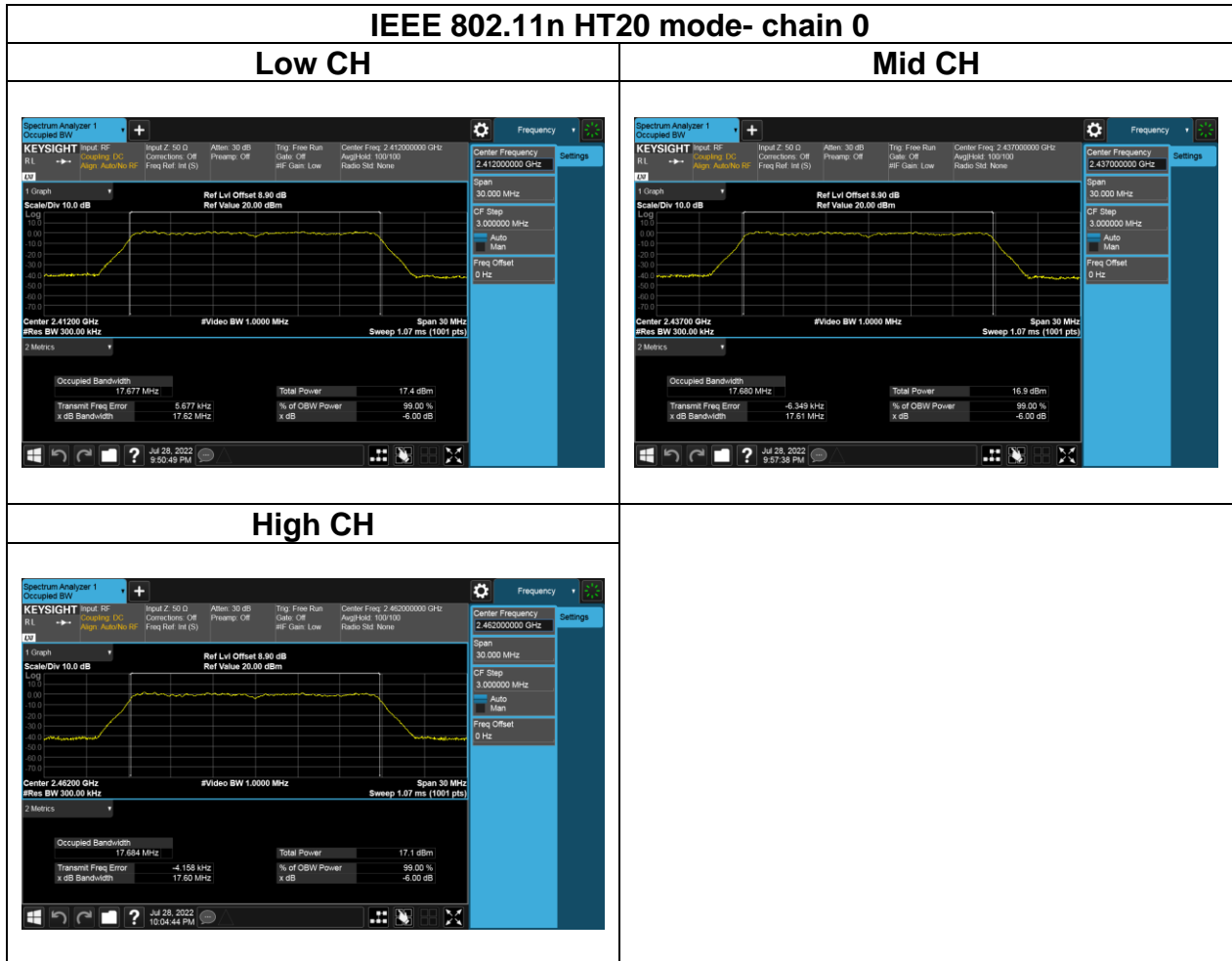
##### High CH



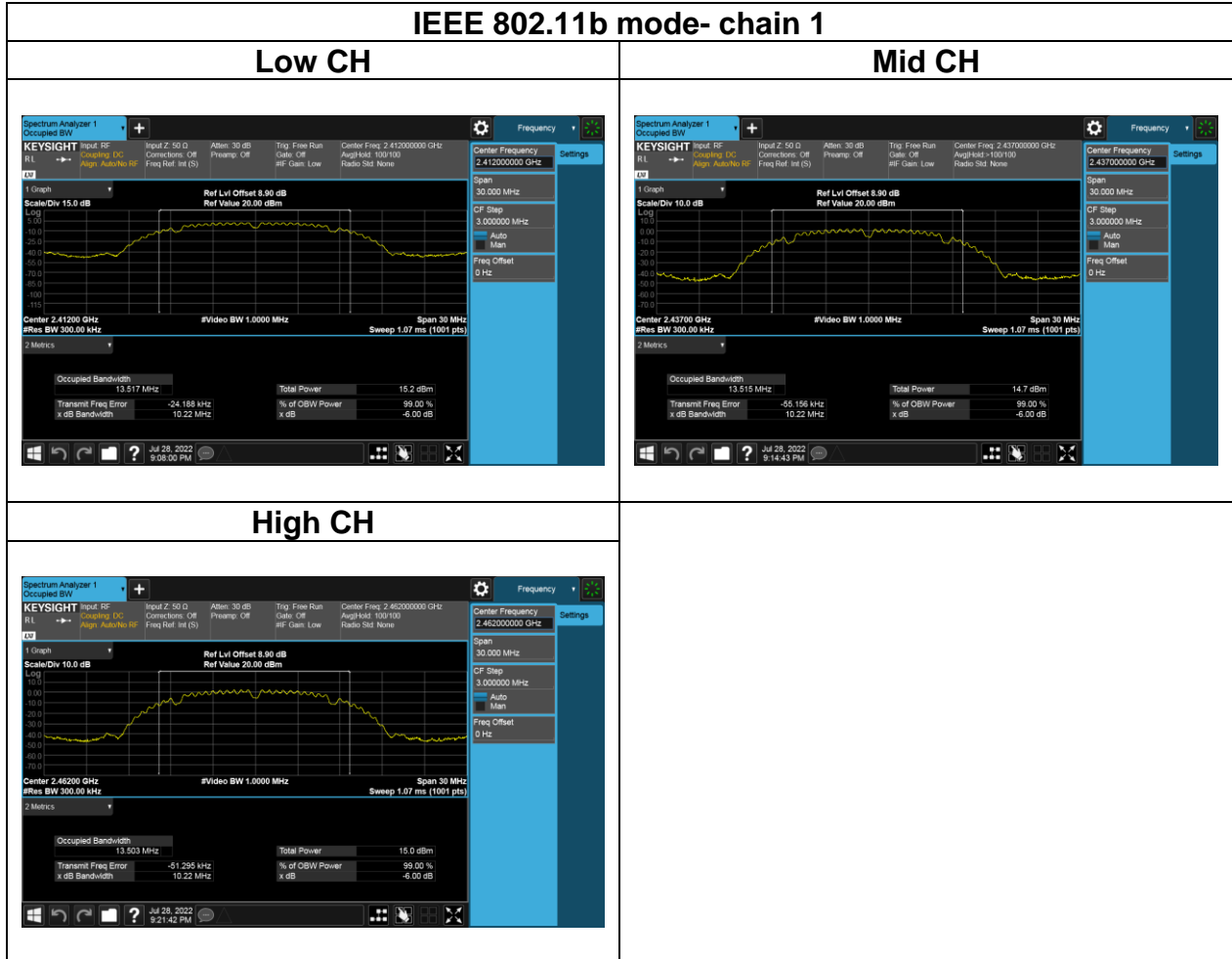
Report No.: TMWK2207002922KR



Report No.: TMWK2207002922KR

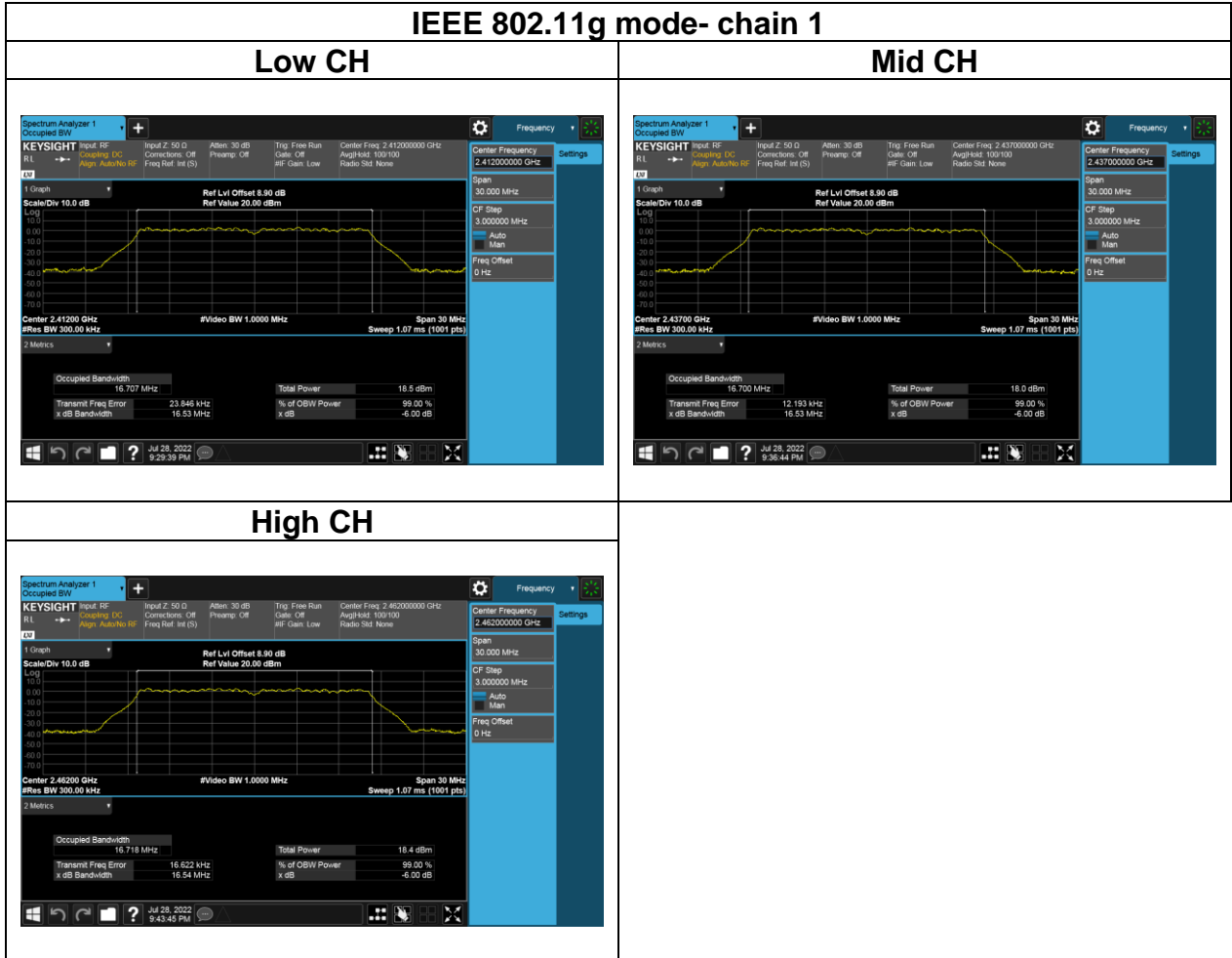


Report No.: TMWK2207002922KR

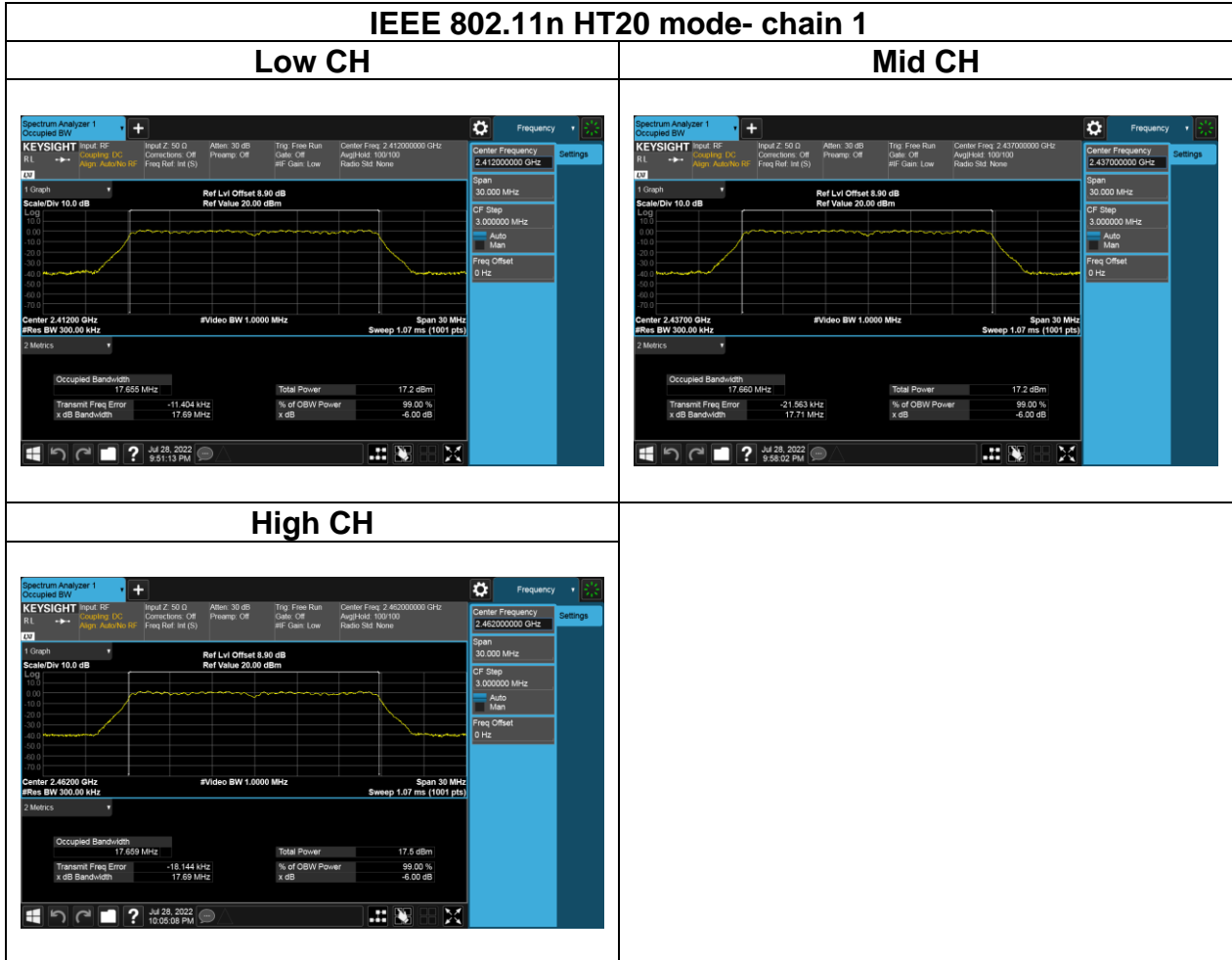




Report No.: TMWK2207002922KR



Report No.: TMWK2207002922KR



## 4.3 OUTPUT POWER MEASUREMENT

### 4.3.1 Test Limit

According to §15.247(b)

#### **Peak output power** :

For systems using digital modulation in the 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt(30 dBm) and the e.i.r.p. shall not exceed 4Watt(36 dBm), base on the use of antennas with directional gain not exceed 6 dBi If transmitting antennas of directional gain greater than 6dBi are used the peak output power the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Limit	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 30dBm <input type="checkbox"/> Antenna with DG greater than 6 dBi : [Limit = 30 – (DG – 6)] <input type="checkbox"/> Point-to-point operation :
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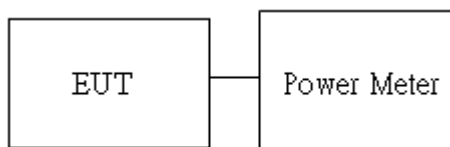
**Average output power** : For reporting purposes only.

### 4.3.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power. in the test report.

### 4.3.3 Test Setup



Report No.: TMWK2207002922KR

### 4.3.4 Test Result

Temperature: 25.6~26.6°C      Test date: July 26~29, 2022  
Humidity: 50~53% RH      Tested by: Marco Chan

#### Peak output power :

802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	RESULT
1	2412	1	11	14.43	27.73	30.00	PASS
6	2437	1	11	13.98	25.00	30.00	PASS
11	2462	1	12	14.30	26.92	30.00	PASS

802.11b Ch1							
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	RESULT
1	2412	1	11	14.38	27.42	30.00	PASS
6	2437	1	11	13.83	24.15	30.00	PASS
11	2462	1	12	14.22	26.42	30.00	PASS

#### Test Mode: IEEE 802.11g Mode

802.11g Ch0							
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	RESULT
1	2412	6	11	22.08	161.44	30.00	PASS
6	2437	6	11	21.67	146.89	30.00	PASS
11	2462	6	12	21.24	133.05	30.00	PASS

802.11g Ch1							
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	RESULT
1	2412	6	11	22.02	159.22	30.00	PASS
6	2437	6	11	21.52	141.91	30.00	PASS
11	2462	6	12	21.12	129.42	30.00	PASS

#### Remark:

1. For IEEE 802.11 b/g function, it supports SISO mode only.

**Average output power :**

**Test Mode: IEEE 802.11b Mode**

802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output Power (dBm)	Max. Avg. Output Power (mW)	Limit (dBm)	RESULT
1	2412	1	11	11.82	15.21	30.00	PASS
6	2437	1	11	11.23	13.27	30.00	PASS
11	2462	1	12	11.61	14.49	30.00	PASS

802.11b Ch1							
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output Power (dBm)	Max. Avg. Output Power (mW)	Limit (dBm)	RESULT
1	2412	6	11	11.69	14.76	30.00	PASS
6	2437	6	11	11.13	12.97	30.00	PASS
11	2462	6	12	11.46	14.00	30.00	PASS

**Test Mode: IEEE 802.11g Mode**

802.11g Ch0							
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output Power (dBm)	Max. Avg. Output Power (mW)	Limit (dBm)	RESULT
1	2412	1	11	11.75	14.96	30.00	PASS
6	2437	1	11	11.41	13.84	30.00	PASS
11	2462	1	12	11.57	14.35	30.00	PASS

802.11g Ch1							
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output Power (dBm)	Max. Avg. Output Power (mW)	Limit (dBm)	RESULT
1	2412	6	11	11.67	14.69	30.00	PASS
6	2437	6	11	11.36	13.68	30.00	PASS
11	2462	6	12	11.40	13.80	30.00	PASS

**Remark:**

1. For IEEE 802.11 b/g function, it supports SISO mode only.

Report No.: TMWK2207002922KR

**Peak output power :**

**Test Mode: IEEE 802.11n HT20 Mode**

802.11n_HT20M_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
1	2412	MCS0	10	20.41	20.36	<b>23.40</b>	30.00	PASS
6	2437	MCS0	10	20.25	20.07	23.17	30.00	PASS
11	2462	MCS0	11	20.43	20.31	23.38	30.00	PASS

**Average output power :**

**Test Mode: IEEE 802.11n HT20 Mode**

802.11n_HT20M_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Max. Avg. Output Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
1	2412	MCS0	10	10.91	10.79	<b>13.86</b>	30.00	PASS
6	2437	MCS0	10	10.36	10.61	13.50	30.00	PASS
11	2462	MCS0	11	10.67	10.75	13.72	30.00	PASS

Report No.: TMWK2207002922KR

## 4.4 POWER SPECTRAL DENSITY

### 4.4.1 Test Limit

According to §15.247(e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

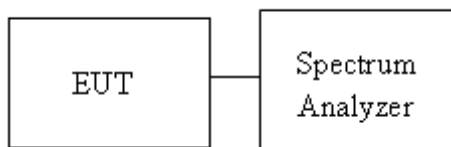
Limit	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 8dBm <input type="checkbox"/> Antenna with DG greater than 6 dBi : [ Limit = 8 – (DG – 6) ] <input type="checkbox"/> Point-to-point operation :
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### 4.4.2 Test Procedure

Test method Refer as ANSI C63.10:2013,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 3kHz, VBW = 10kHz, Span = 1.5 times DTS Bandwidth (6 dB BW), Detector = Peak, Sweep Time = Auto and Trace = Max hold.
4. The path loss and Duty Factor were compensated to the results for each measurement by SA.
5. Mark the maximum level.
6. Measure and record the result of power spectral density. in the test report.

### 4.4.3 Test Setup



Report No.: TMWK2207002922KR

#### 4.4.4 Test Result

Temperature: 25.6~26.6°C

Test date: July 26~29, 2022

Humidity: 50~53% RH

Tested by: Marco Chan

Test mode: IEEE 802.11b mode / 2412-2462 MHz					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
Low	2412	-17.37	-17.64	-17.37	8.00
Mid	2437	-17.90	-18.11	-17.90	
High	2462	-17.70	-17.84	-17.70	

Test mode: IEEE 802.11g mode / 2412-2462 MHz					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
Low	2412	-15.56	-15.67	-15.56	8.00
Mid	2437	-16.01	-16.30	-16.01	
High	2462	-16.20	-15.40	-16.20	

**Remark:**

1. For IEEE 802.11 b/g function, it supports SISO mode only.

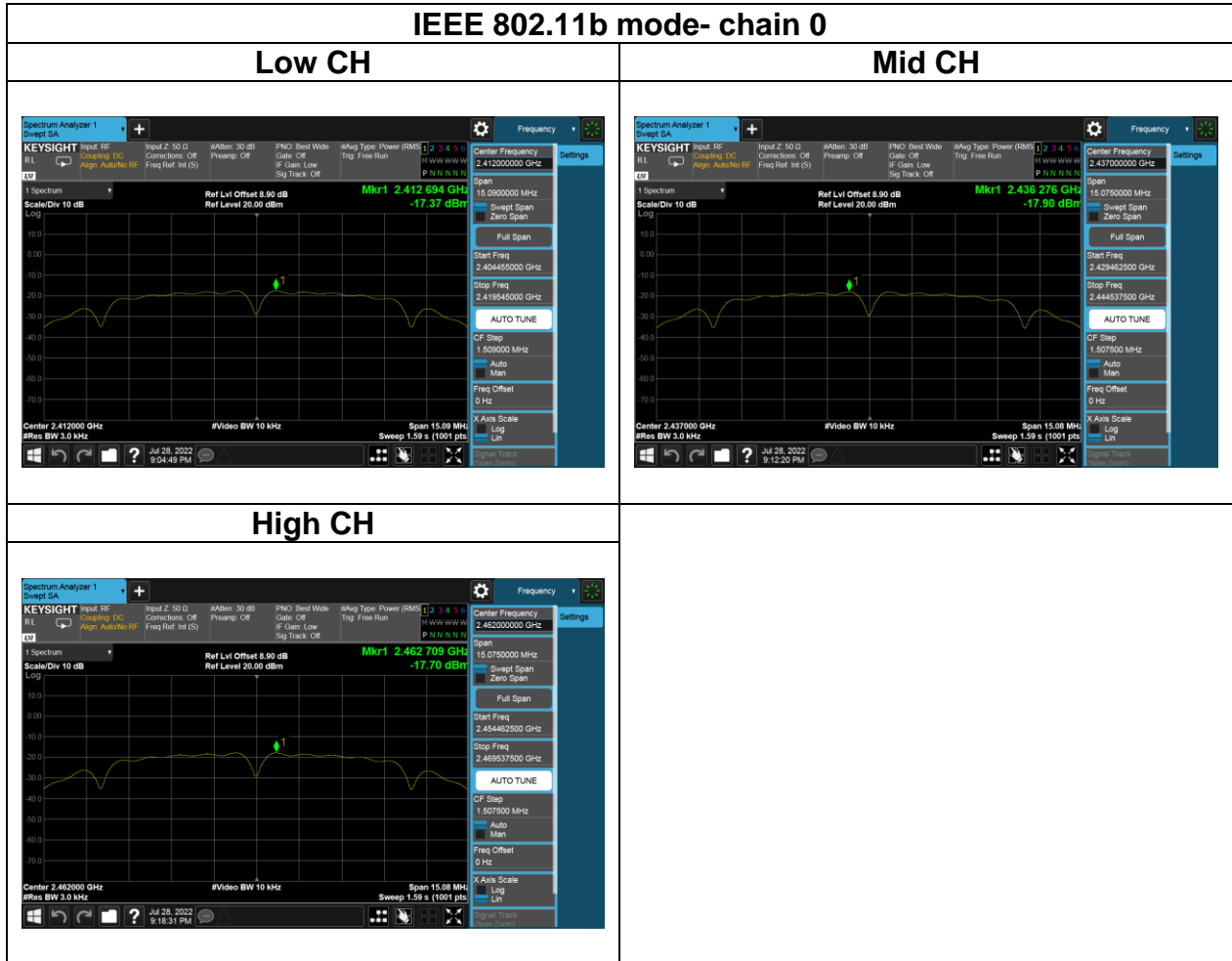
Test mode: IEEE 802.11n HT20 mode / 2412-2462 MHz					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm/3kHz)	Limit (dBm/3kHz)
Low	2412	-16.93	-16.13	-13.50	8.00
Mid	2437	-18.10	-17.26	-14.65	
High	2462	-17.08	-17.06	-14.06	



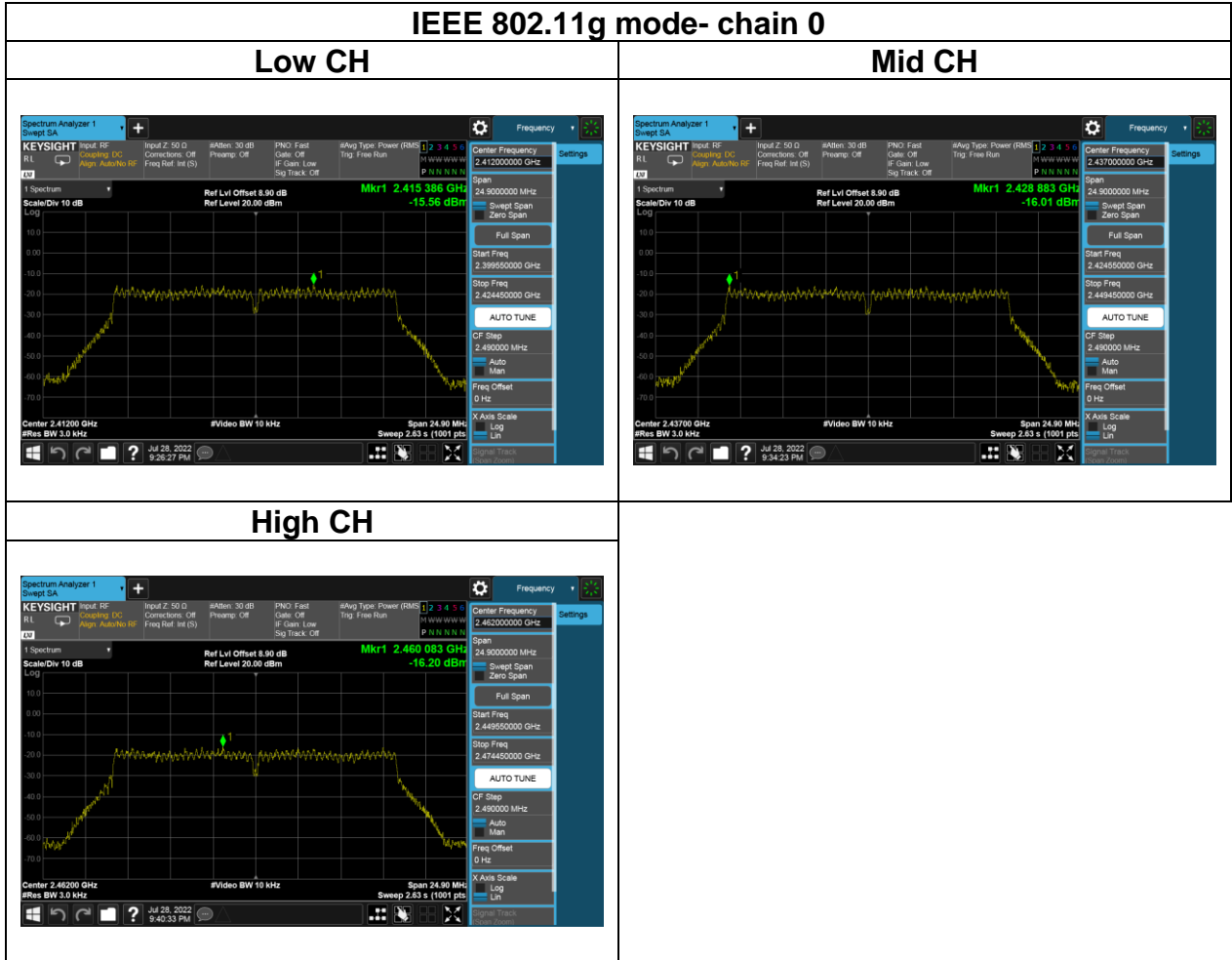


Report No.: TMWK2207002922KR

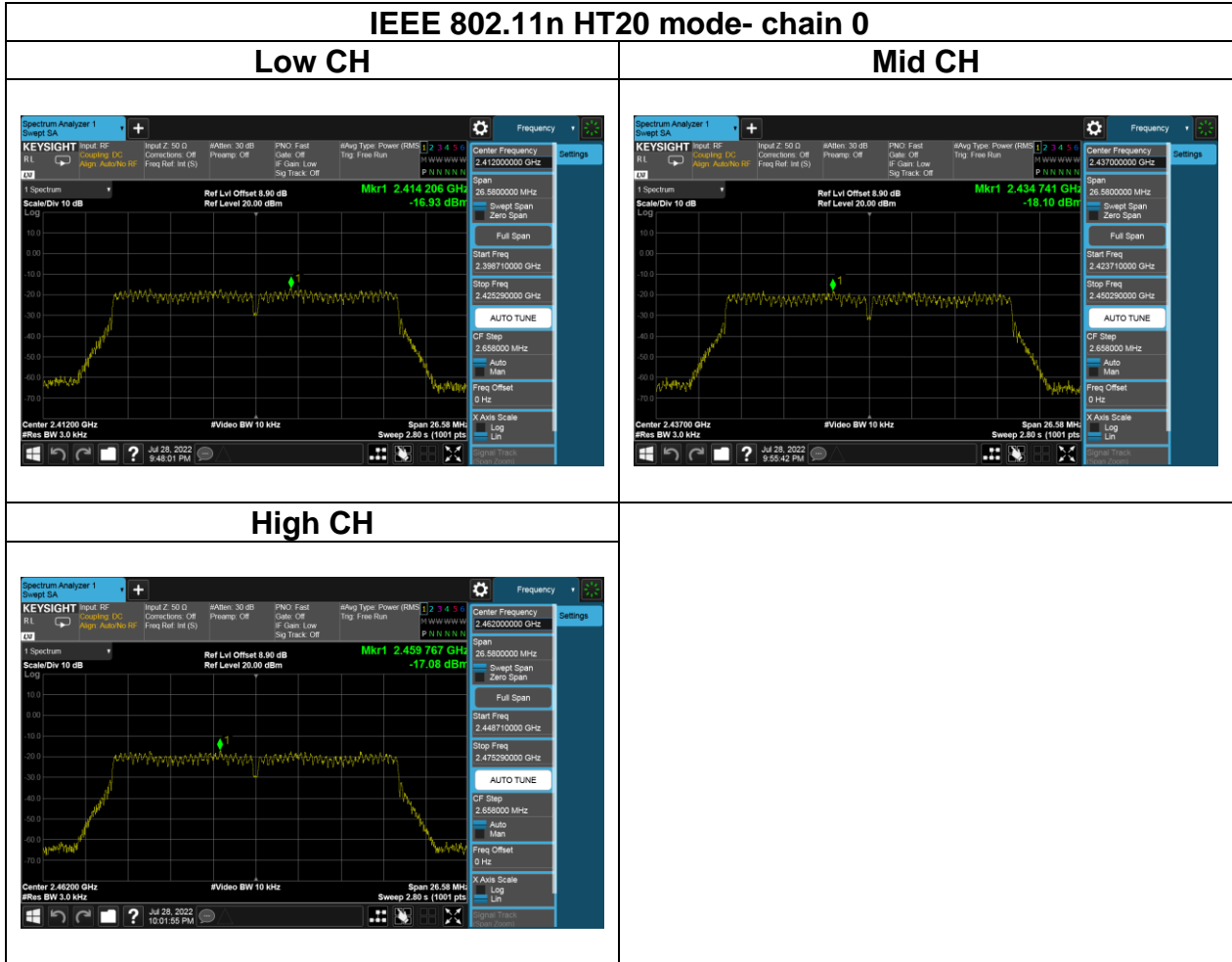
### Test Data



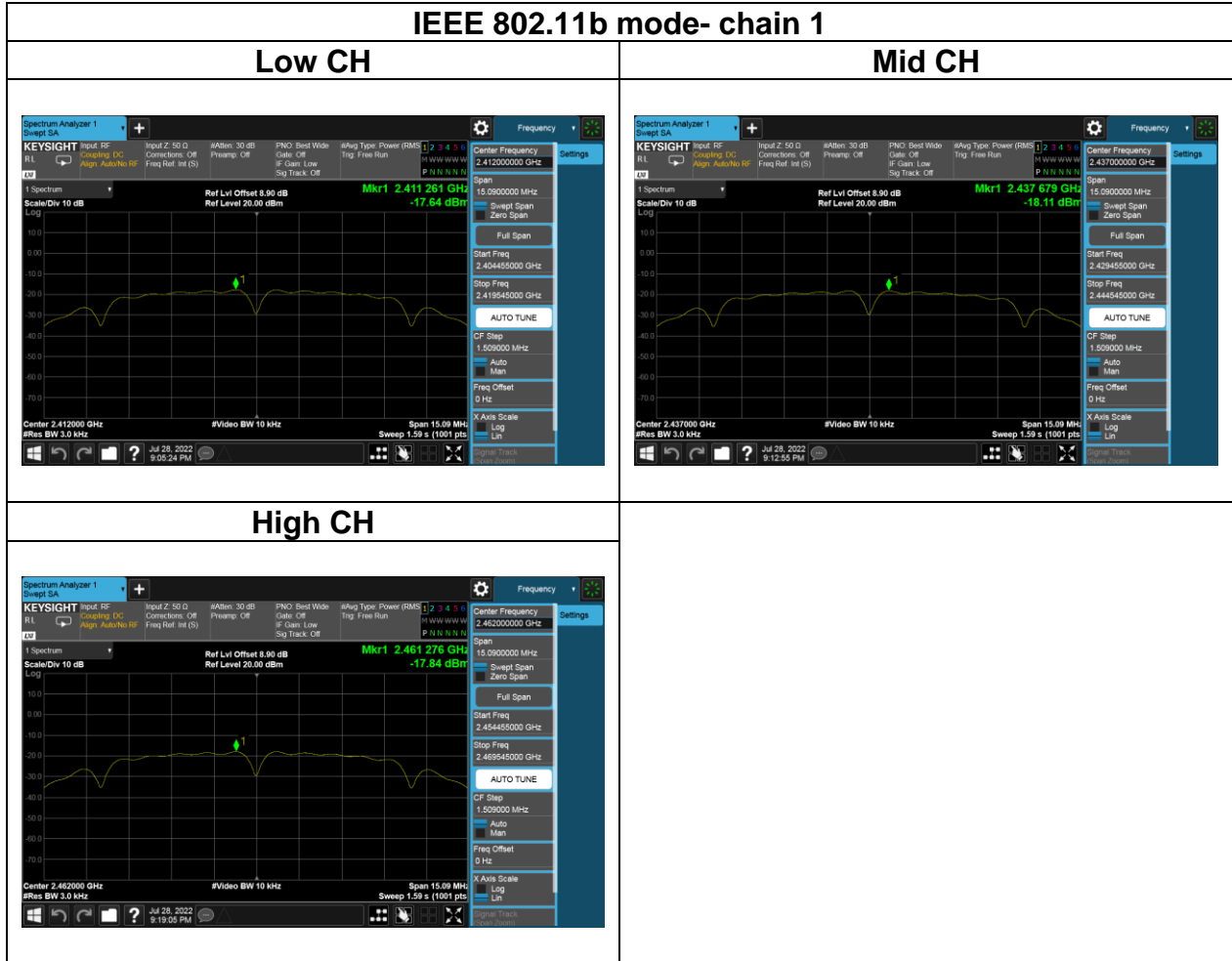
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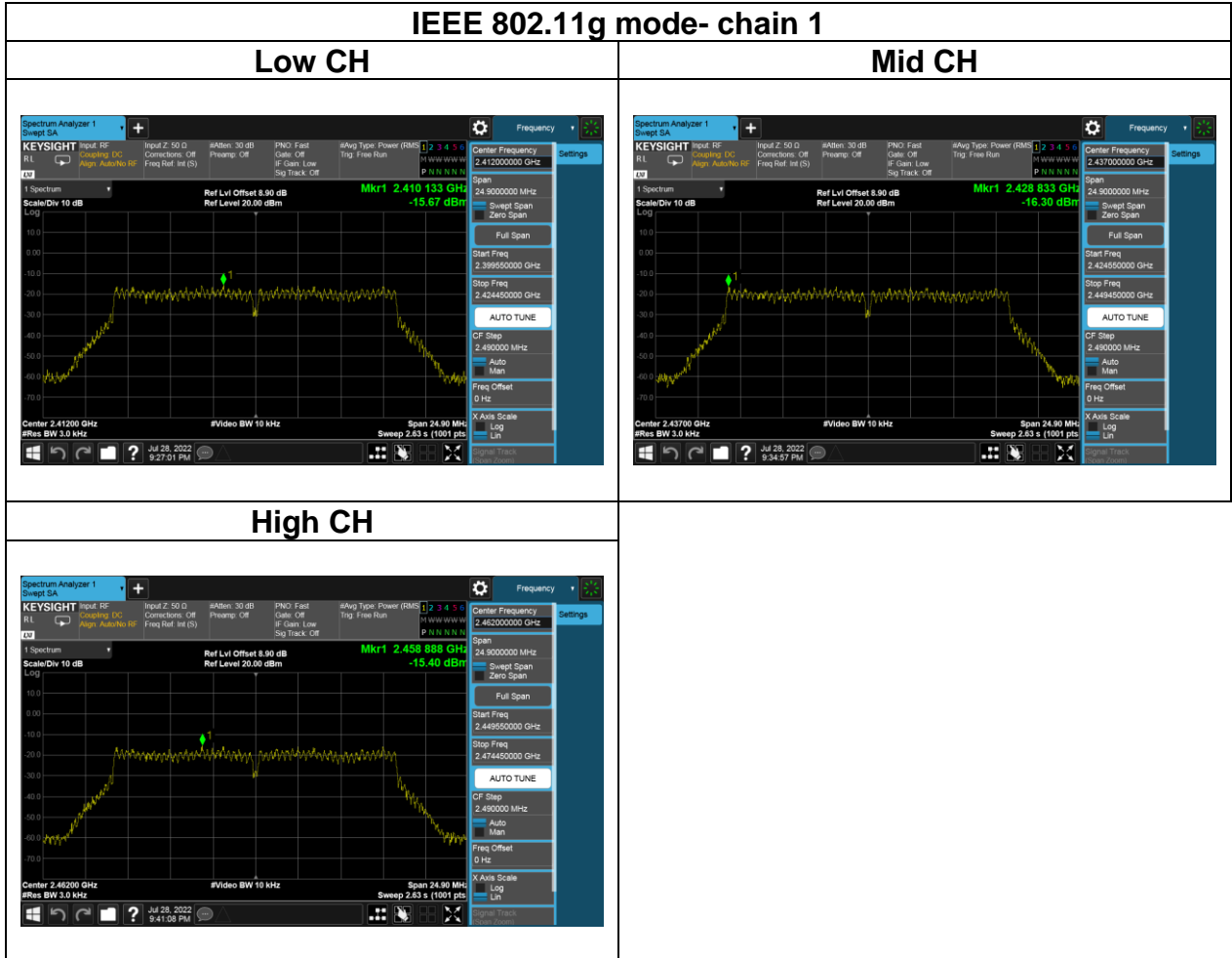
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Report No.: TMWK2207002922KR



Report No.: TMWK2207002922KR



Report No.: TMWK2207002922KR

