



TEST REPORT

Test item description: 4K Pan-Tilt Camera

Trademark(s): blurams

Model/Type reference: A33P, A11, A12, A13, A21, A22, A32, A33, A35, A36, A37, A11C, A12C, A13C, A21C, A22C, A31C, A32C, A33C, A35C, A36C, A11S, A12S, A13S, A15S, A16S, A21S, A22S, A31S, A32S, A33S, A31S, A32S, A33S, A35S, A36S, A37S, A11P, A12P, A13P, A15P, A16P, A31P, A32P, A34P, A35P, A36P, A21P, A22P, A31P, A32P, A35P, S20C, S21C, S22C, S23C, S25C

Applicant's name: Hangzhou Vision Insight Technology Co., Ltd.

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Manufacturer: Hangzhou Vision Insight Technology Co., Ltd.

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Sample Received Date: Dec. 16, 2025

Sample tested Date: Dec. 16, 2025 to Mar. 27, 2026

Issue Date: Mar. 27, 2026

Report No.: CTB25121615806RF02

Test Standards: MIC Public Notice 88:2004, annex 1 and annex 43

Ordinance Article 2 paragraph 1 item (19)

ARIB STD-T66 V3.7

Test Results: PASS

Remark: This is WIFI-2.4GHz band radio test report.

Compiled by:

Reviewed by:

Approved by:

Kai Chen

Martin Feng

Kai ChenMartin FengBin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

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1. TEST SUMMARY

1.1Version

Report No.	Issue Date	Description	Approved
CTB25121615806RF02	Mar. 27, 2026	Original	Valid

1.2 TEST PROCEDURES AND RESULTS

Part	Rule Section	Description of Test	Result
4.1	3	Frequency Error	Complies
4.3	4	Occupied Bandwidth (99%), Spread-spectrum Bandwidth (90%) and Spread Factor	Complies
4.4	5	Unwanted Emission Intensity	Complies
4.2	6	Antenna Power Error	Complies
4.5	7	Limitation of Collateral Emission of Receiver	Complies
4.6	8	Transmission Antenna Gain (EIRP Antenna Power)	N/A
4.7	9	Transmission Radiation Angle Width (3dB Beamwidth)	N/A
4.8	10	Radio Interference Prevention Capability	Complies
4.9	Note 2	Carrier Sense Capability	Complies
4.10	Note 3	Number of carriers	Complies

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

(2) Note2: MIC Public Notice 88:2004, annex 1 and annex 43

(3) Note3: MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20

1.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Frequency Error	54.3Hz
Adjacent channel power below 1G	2.6dB
Adjacent channel power Above 1G	2.8dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63℃
frequency	1×10^{-7}

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Model/Type reference: A33P, A11, A12, A13, A21, A22, A32, A33, A35, A36, A37, A11C, A12C, A13C, A21C, A22C, A31C, A32C, A33C, A35C, A36C, A11S, A12S, A13S, A15S, A16S, A21S, A22S, A31S, A32S, A33S, A31S, A32S, A33S, A35S, A36S, A37S, A11P, A12P, A13P, A15P, A16P, A31P, A32P, A34P, A35P, A36P, A21P, A22P, A31P, A32P, A35P, S20C, S21C, S22C, S23C, S25C

Model Description: All the model are the same circuit and RF module, only the model names are different. Test sample model: A33P

Wi-Fi Specification: IEEE 802.11b/g/n/ax

Hardware Version: V1.0

Software Version: V1.0

Operation Frequency: IEEE 802.11b/g/n20/ax20: 2412-2472MHz
IEEE 802.11n40/ax40: 2422-2462MHz

Max. RF output power: 802.11b: 4mW/MHz
802.11g: 4mW/MHz
802.11n20: 3mW/MHz
802.11n40: 3mW/MHz
802.11ax20: 3mW/MHz
802.11ax40: 3mW/MHz

Type of Modulation: 802.11b: DSSS(CCK/DQPSK/DBPSK)
802.11g: OFDM(BPSK/QPSK/16QAM/64QAM)
802.11n/ax (HT20/40)): OFDM (64QAM, 16QAM, QPSK, BPSK)

Transmit Data Rate: 802.11b: 1M/2M/5.5M/11M bps
802.11g: 6M/9M/12M/18M/24M/36M/48M/54M bps
802.11n20/ax20: up to 75M bps
802.11n40/ax40: up to 150M bps

Antenna installation: FPC antenna

Antenna Gain: 3.27dBi

Ratings: DC 5V 1.5A

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. This report is for Wi-Fi test report.

2.2 Carrier Frequency of Channels

Channel List for 802.11b/g/n/ax(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452	13	2472
02	2417	06	2437	10	2457	/	/
03	2422	07	2442	11	2462	/	/
04	2427	08	2447	12	2467	/	/

Channel List for 802.11n/ax(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
/	/	05	2432	09	2452	/	/
/	/	06	2437	10	2457	/	/
03	2422	07	2442	11	2462	/	/
04	2427	08	2447	/	/	/	/

Mode	Low channel (MHz)	Middle channel(MHz)	High channel(MHz)
b	2412	2442	2472
g	2412	2442	2472
n20	2412	2442	2472
ax20	2412	2442	2472
n40	2422	2442	2462
ax40	2422	2442	2462

2.3 Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Gain(dBi)	NOTE
1	N/A	2.4G antenna	FPC antenna	3.27dBi	N/A

2.4DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX
Mode 2	RX

2.5 TEST CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

Supply Voltage					
	PC supply power	Module input power	Rated module power	Tolerance (%)	
	V	V	V		
	Normal	5	3.3		3.3
	+10%	5.5	3.3		3.3
	-10%	4.5	3.3		3.3
Others					
Temperature (°C)		20-25			
Relative humidity		54 %.			
ATM Pressure:		1010 mbar			
Note 1: When the input voltage is reduced or increased by 10%, the regulator voltage changes of less than 1%. So the following test items are conducted in the normal voltage.					

BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Mode 1:



2.6 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Test item description	Trademark(s)	Model/Type reference	Note
1	4K Pan-Tilt Camera	blurams	A33P, A11, A12, A13, A21, A22, A32, A33, A35, A36, A37, A11C, A12C, A13C, A21C, A22C, A31C, A32C, A33C, A35C, A36C, A11S, A12S, A13S, A15S, A16S, A21S, A22S, A31S, A32S, A33S, A31S, A32S, A33S, A35S, A36S, A37S, A11P, A12P, A13P, A15P, A16P, A31P, A32P, A34P, A35P, A36P, A21P, A22P, A31P, A32P, A35P, S20C, S21C, S22C, S23C, S25C	EUT



Item	Shielded Type	Ferrite Core	Length	Note

Note:

1. The support equipment was authorized by Declaration of Confirmation.
2. For detachable type I/O cable should be specified the length in cm in 『Length』 column.
3. “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.7 MEASUREMENT INSTRUMENTS LIST

No.	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	A.14.16	2026/6/27
2	Power Sensor	Agilent	U2021XA	MY56120032	/	2026/6/27
3	Power Sensor	Agilent	U2021XA	MY56120034	/	2026/6/27
4	Communication test set	R&S	CMW500	108058	V3.5.80	2026/6/27
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2026/6/27
6	Signal Generator	Agilent	N5181A	MY50140365	A.01.60	2026/6/27
7	Vector signal generator	Agilent	N5182A	MY47420195	A.01.87	2026/6/27
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2026/6/27
9	2.4 GHz Filter	Shenxiang	MSF2400-24 83.5MS-1154	20181015001	/	2026/6/29
10	5 GHz Filter	Shenxiang	MSF5150-58 50MS-1155	20181015001	/	2026/6/29
11	Filter	Xingbo	XBLBQ-DZA 120	190821-1-1	/	2026/6/29
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	/	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	/	2026/6/27
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	/	2026/6/27
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	/	/
16	966 chamber	C.R.T.	966	/	/	2027/6/21
17	Receiver	R&S	ESPI	100362	RF_ATTEN_7 (104489/003)	2026/6/27
18	Amplifier	HP	8447E	2945A02747	/	2026/6/27

19	Amplifier	Agilent	8449B	3008A01838	/	2026/6/27
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	/	2026/6/27
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	/	2026/6/27
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2026/6/27
24	loop antenna	ZHINAN	ZN30900A	GTS534	/	/
25	40G Horn antenna	A/H/System	SAS-574	588	/	2026/6/27
26	Amplifier	AEROFLEX	Aeroflex	097	/	2026/6/27
27	Power Meter	KEYSIGHT	N1912AP	N/A	A.05.00	2026/6/27
28	DC power supply	Agilent	E3640A	MY53050046	/	2026/6/27

Remark: Calibration institution "GRG METROLOGY & TEST GROUP Co., LTD."

Remark: Calibration based on Article 24-2, paragraph 4 of the Radio Act method c.

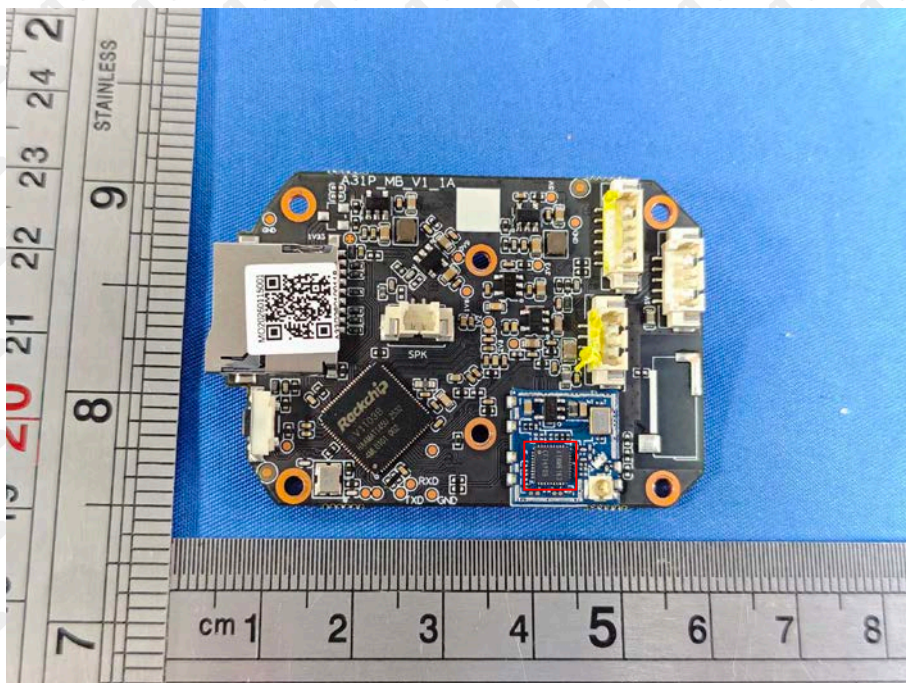
3. RF SHIELDING METHOD

We apply the product for Japan RF certification. The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

Confirmation method

☐	Sealed with special screws.
☐	Plastic chassis is being welded using ultrasonic waves.
☐	Chassis is glued using a special adhesive.
☐	Metal covers are spot-fused.
☐	Cover is specially interlocked.
☐	RF and Modulation components are covered with shielding case and this shielding case is soldered.
☐	Shield case is welded ant RF and modulations parts, and ID-ROM is welded using BGA Method.
☐	Shield case is welded ant RF and modulations parts, and ID-ROM is glued at its lead with a special adhesive.
☐	Shield case is welded ant RF and modulations parts, and ID-ROM is glued with a non-transparent laminating agent.
☒	Other: All RF and modulation section packet in one IC, and IC is welded using QFN Method, and RF module is welded on the main board, end-User can't open it easily.

The red circle is welding point.



4 FREQUENCY ERROR

4.1 LIMIT

Item	Limits
Frequency Error	+/-50ppm

4.2 MEASURING INSTRUMENTS AND SETTING

The following table is the setting of Spectrum Analyzer.

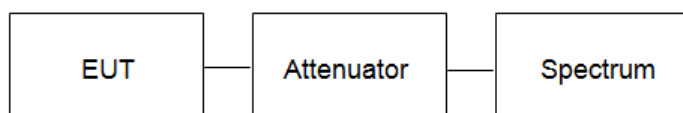
Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	10KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.3 TEST PROCEDURE

1. In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a frequency meter.
2. In the case of burst waves, the measurement shall be done for enough time in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.
3. In the case of a test mode with a specific frequency spectrum, measure the frequency of the specific spectrum by a spectrum analyzer connected a frequency meter.
4. In the cases above, if the frequency equivalent to the test frequency is not directly measured in principle, it shall be obtained by necessary calculation.

In the case of modulated signal, if there is no specific spectrum measurable by a spectrum analyzer but a specific dip is observed, it is allowed to measure the frequency with the signal generator (synthesized). That is, observe a signal of the signal generator concurrently (or alternately) with the tested signal using the spectrum analyzer while setting the frequency of the signal generator to the position of the dip on the screen of the spectrum analyzer, and determine the frequency of the signal generator at the time as a measured value.

4.4 TEST SETUP LAYOUT



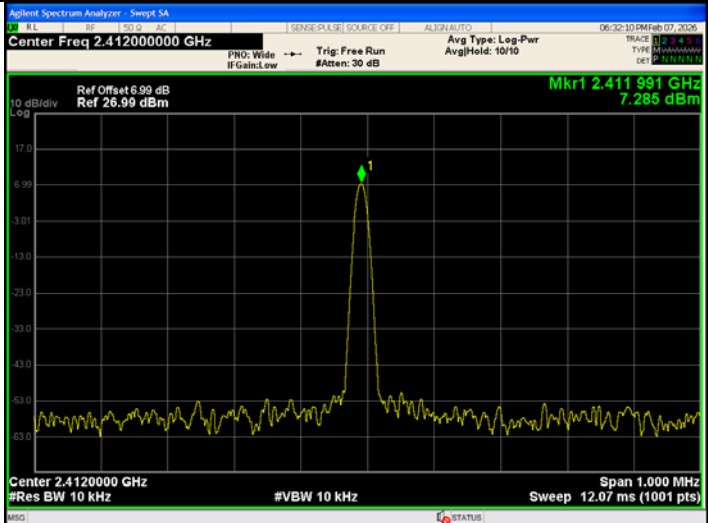
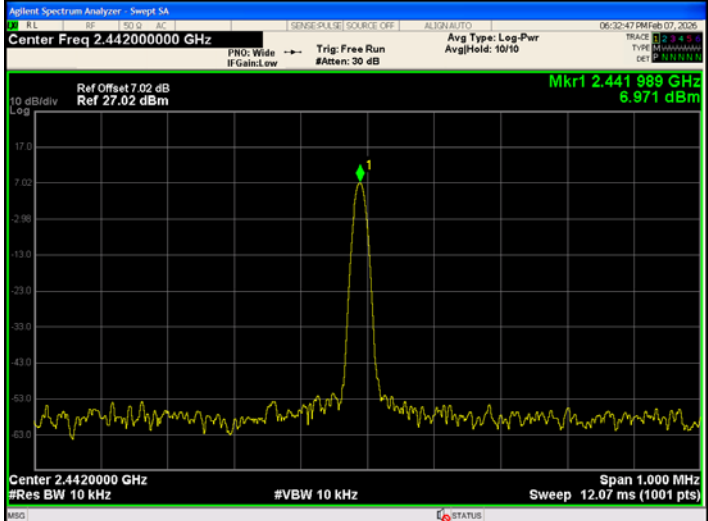
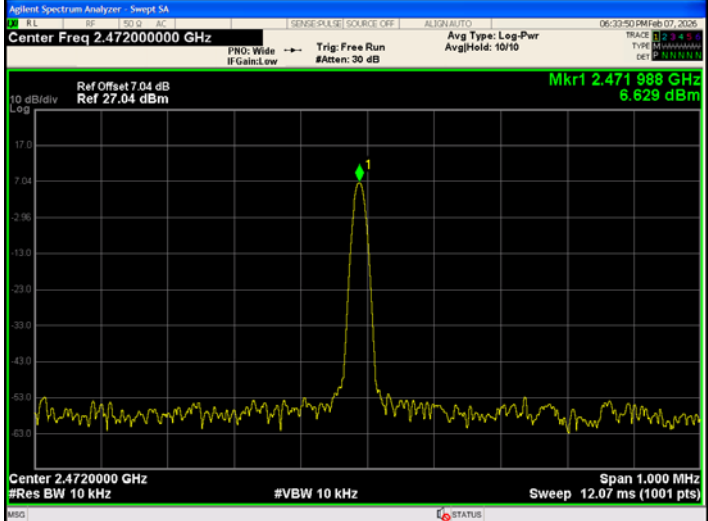
4.5 EUT OPERATION DURING TEST

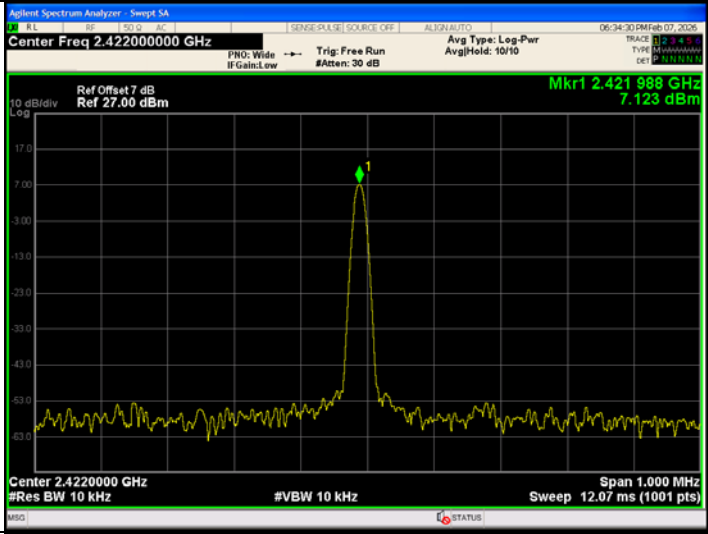
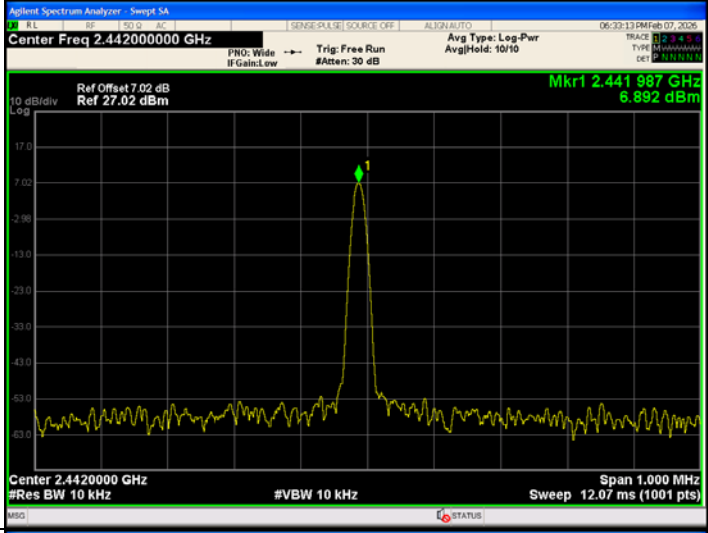
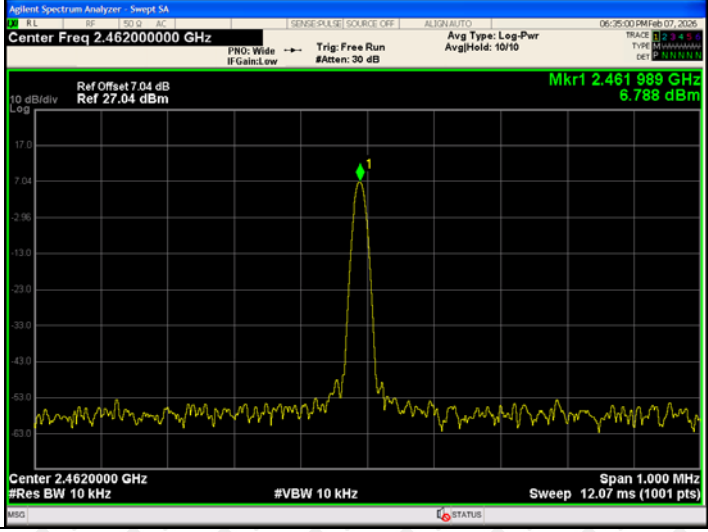
The EUT was placed on the test table and programmed in un-modulation function.

4.6 TEST RESULT

Temperature:	23℃	Relative Humidity:	54%
Test Mode:	TX Mode	Pressure:	101kPa

Test Voltage	Test Frequency (MHz)	Measured Frequency (MHz)	Frequency Error(ppm)	Limit (ppm)	P/F
Normal Voltage	2412	2411.991	-3.731	±50	PASS
	2442	2441.989	-4.505	±50	PASS
	2472	2471.988	-4.854	±50	PASS
	2422	2421.988	-4.95	±50	PASS
	2442	2441.987	-5.32	±50	PASS
	2462	2461.989	-4.47	±50	PASS

Mode	Channel	Test graph
Normal Voltage	Low	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.41200000 GHz Ref Offset 6.99 dB Ref 26.99 dBm Mkr1 2.411991 GHz 7.285 dBm Center 2.4120000 GHz #Res BW 10 kHz #VBW 10 kHz Span 1.000 MHz Sweep 12.07 ms (1001 pts)</p>
	Middle	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.44200000 GHz Ref Offset 7.02 dB Ref 27.02 dBm Mkr1 2.441989 GHz 6.971 dBm Center 2.4420000 GHz #Res BW 10 kHz #VBW 10 kHz Span 1.000 MHz Sweep 12.07 ms (1001 pts)</p>
	High	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.47200000 GHz Ref Offset 7.04 dB Ref 27.04 dBm Mkr1 2.471988 GHz 6.629 dBm Center 2.4720000 GHz #Res BW 10 kHz #VBW 10 kHz Span 1.000 MHz Sweep 12.07 ms (1001 pts)</p>

Mode	Channel	Test graph
Normal Voltage	Low	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.42200000 GHz Ref Offset 7 dB Ref 27.00 dBm Mkr1 2.421988 GHz 7.123 dBm Center 2.4220000 GHz #Res BW 10 kHz #VBW 10 kHz Span 1.000 MHz Sweep 12.07 ms (1001 pts)</p>
	Middle	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.44200000 GHz Ref Offset 7.02 dB Ref 27.02 dBm Mkr1 2.441987 GHz 6.892 dBm Center 2.4420000 GHz #Res BW 10 kHz #VBW 10 kHz Span 1.000 MHz Sweep 12.07 ms (1001 pts)</p>
	High	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.46200000 GHz Ref Offset 7.04 dB Ref 27.04 dBm Mkr1 2.461989 GHz 6.788 dBm Center 2.4620000 GHz #Res BW 10 kHz #VBW 10 kHz Span 1.000 MHz Sweep 12.07 ms (1001 pts)</p>

5 ANTENNA POWER

5.1 LIMIT

Item	Limits
Antenna Power Density	802.11b,g,n(HT20),ax(HE20):10mW/MHz 802.11n(HT40),ax(HE40): 5mW/MHz
Antenna Power Error	+20% (Base on manufacturer declare antenna power density)

5.2 MEASURING INSTRUMENTS AND SETTING

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.3 TEST PROCEDURE

Attenuation of the attenuator shall be set to provide an optimum input level to the spectrum analyzer.

1. Set the spectrum analyzer as follows for searching the frequency that outputs the maximum antenna power:

Center frequency: Test frequency

Frequency sweep width: Approximately twice of the occupied bandwidth

Resolution bandwidth: 1MHz

Video bandwidth: Approximately three times of the resolution bandwidth

Y-axis scale: 10dB/Div

Sweep time: Minimum time to ensure the measuring accuracy

(In the case of burst wave, one burst shall be included per data point.)

Trigger condition: Free run

Data points: 400 points or more

Sweep mode: Continuous sweep

Detection mode: Positive peak

Display mode: Maximum hold

2. When the trace is complete, find the peak value of the power envelope and record.

In the case of bandwidth above RBW, connect to power meter directly.

3. Calculate antenna power density by the formula below

$PT(mW/MHz) = \text{Total Output Power (mW)} / \text{Burst Ratio} / \text{Spread Bandwidth (MHz)}$ Burst Ratio = ON Time / OFF Time

4. Antenna Power Error is definition that actual measure antenna power tolerance between + 20% to - 80% power range that base on manufacturer declare the conducted power density.

5.4 TEST SETUP LAYOUT



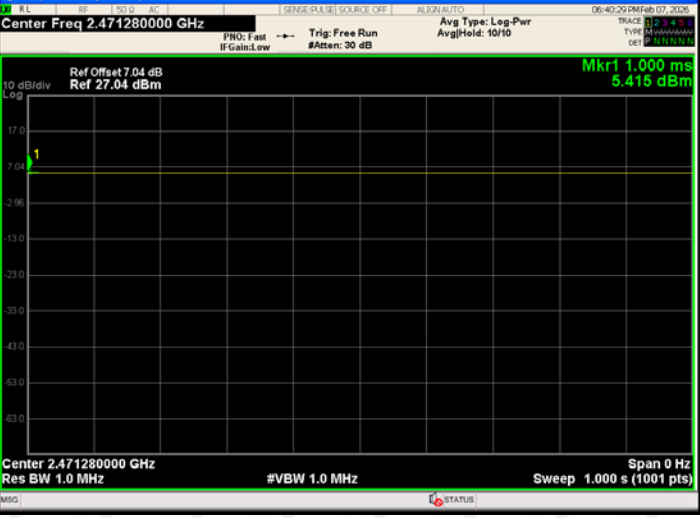
EST DEVIATION

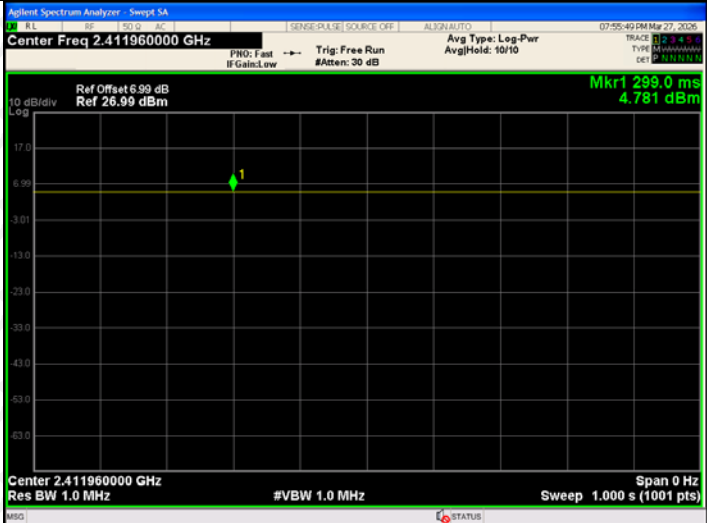
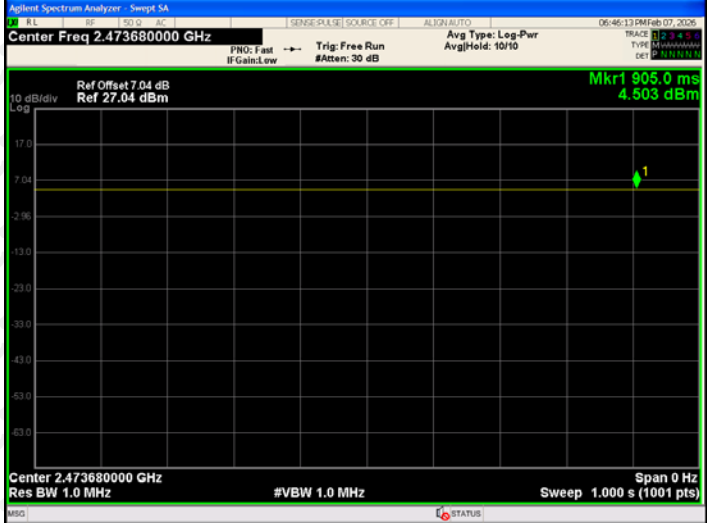
There is no deviation with the original standard.

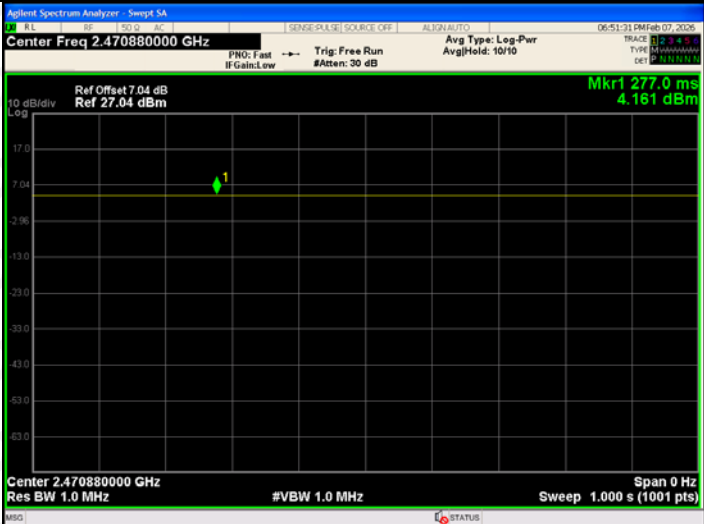
5.5 TEST RESULT

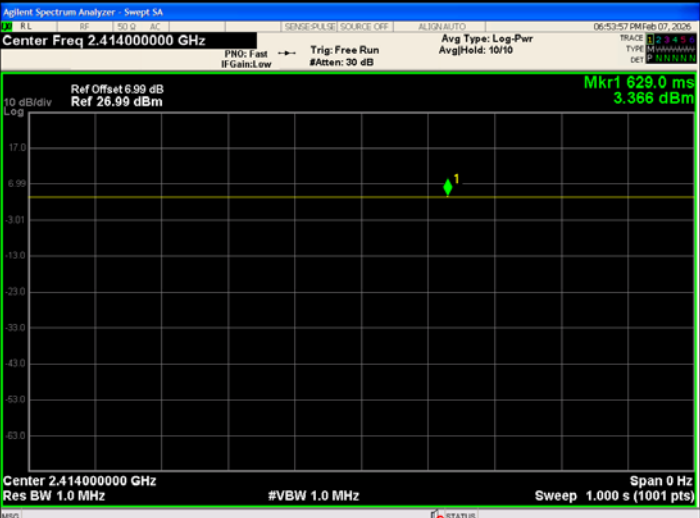
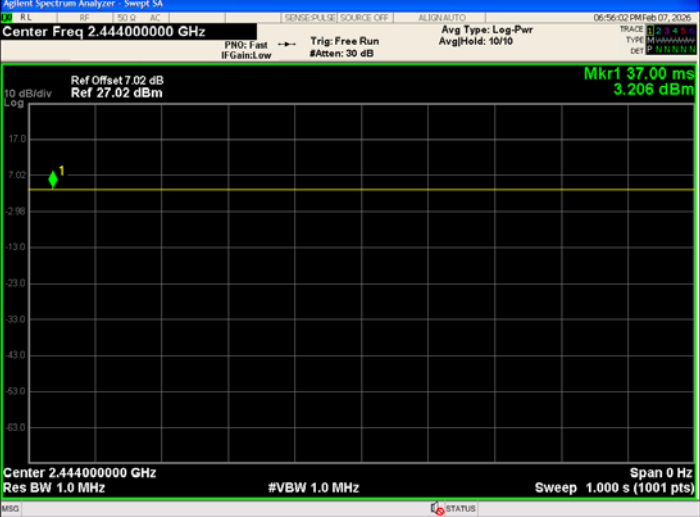
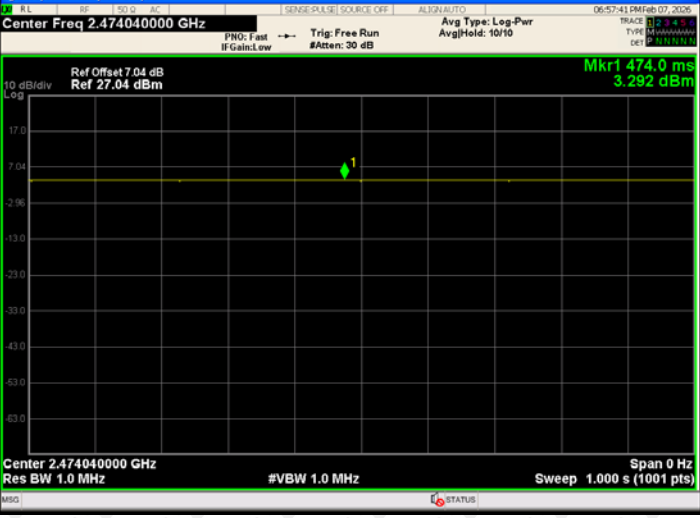
Temperature:	23℃	Relative Humidity:	54%
Test Mode:	TX Mode		101kPa

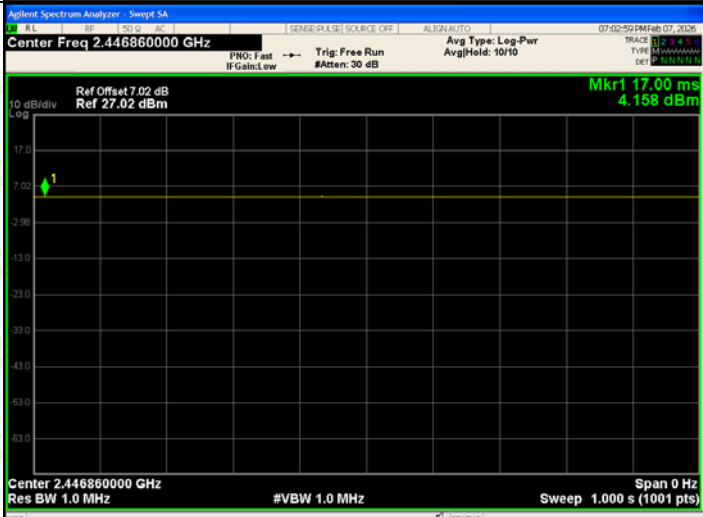
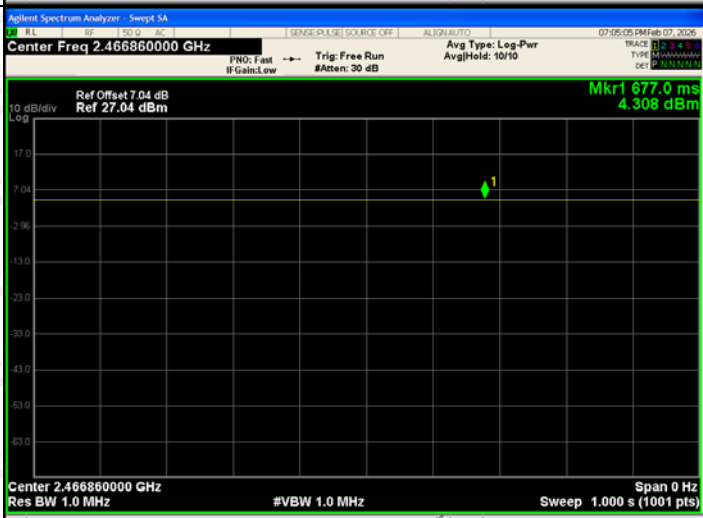
Test voltage (V)	Mode	Channel (MHz)	Antenna Power (dBm/MHz)	output power (mW/MHz)	Rated output power (mW/MHz)	Tolerance (%)	Limit
Normal	802.11b	2412	5.499	3.547	4	-11.32	10mW/MHz +20%
		2442	5.380	3.451	4	-13.71	
		2472	5.415	3.479	4	-13.02	
	802.11g	2412	4.781	3.007	4	-11.03	
		2442	4.624	2.900	4	-27.50	
		2472	4.503	2.820	4	-29.49	
	802.11n(HT20)	2412	4.592	2.879	3	-4.04	
		2442	4.313	2.700	3	-10.01	
		2472	4.161	2.607	3	-13.11	
	802.11ax(HT20)	2412	3.366	2.171	3	-27.64	5mW/MHz +20%
		2442	3.206	2.092	3	-30.26	
		2472	3.292	2.134	3	-28.87	
	802.11n(HT40)	2422	4.288	2.684	3	-10.53	
		2442	4.158	2.605	3	-13.17	
		2462	4.308	2.696	3	-10.12	
	802.11ax(HT40)	2422	4.214	2.639	3	-12.04	
		2442	4.158	2.605	3	-13.17	
		2462	4.310	2.698	3	-10.08	

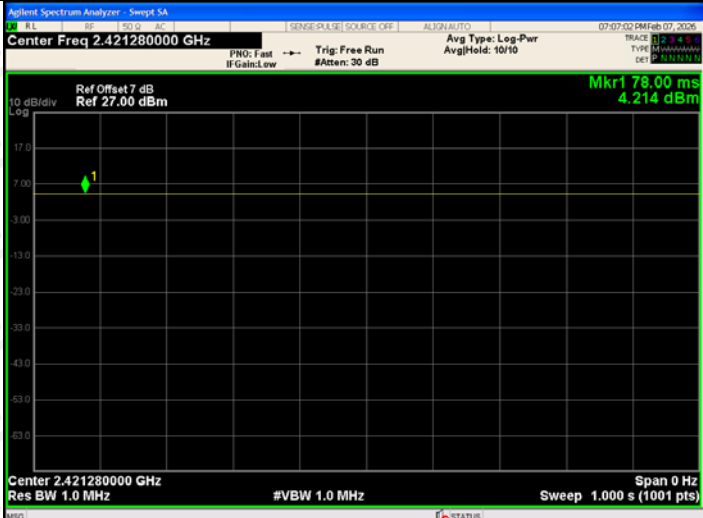
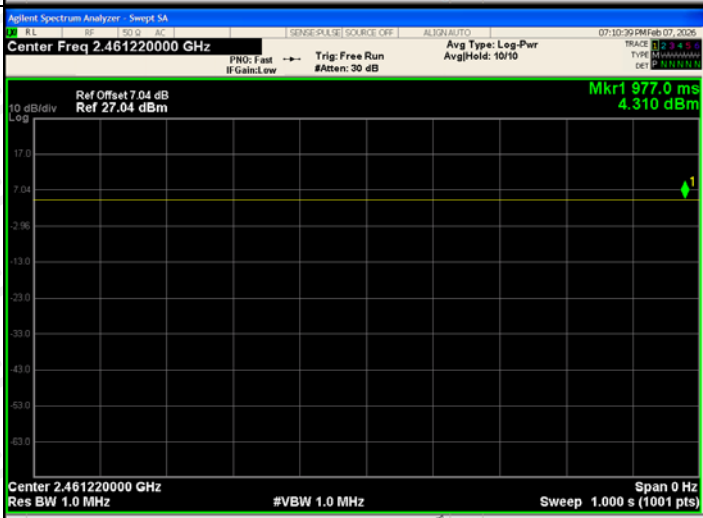
Normal Voltage		
Mode	Channel	Test graph
802.11b	Low	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.411280000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 s (1001 pts) Mkr1 324.0 ms 5.499 dBm</p>
	Middle	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.441240000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 s (1001 pts) Mkr1 236.0 ms 5.380 dBm</p>
	High	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.471280000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 s (1001 pts) Mkr1 1.000 ms 5.415 dBm</p>

Normal Voltage		
Mode	Channel	Test graph
802.11g	Low	
	Middle	
	High	

Normal Voltage		
Mode	Channel	Test graph
802.11n/HT20	Low	
	Middle	
	High	

Normal Voltage		
Mode	Channel	Test graph
802.11ax/HT20	Low	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.414000000 GHz Ref Offset 6.99 dB Ref 26.99 dBm Mkr1 629.0 ms 3.366 dBm Center 2.414000000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 s (1001 pts)</p>
	Middle	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.444000000 GHz Ref Offset 7.02 dB Ref 27.02 dBm Mkr1 37.00 ms 3.206 dBm Center 2.444000000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 s (1001 pts)</p>
	High	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.474040000 GHz Ref Offset 7.04 dB Ref 27.04 dBm Mkr1 474.0 ms 3.292 dBm Center 2.474040000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 s (1001 pts)</p>

Normal Voltage		
Mode	Channel	Test graph
802.11 n/HT40	Low	
	Middle	
	High	

Normal Voltage		
Mode	Channel	Test graph
802.11 ax/HT40	Low	
	Middle	
	High	

6 OCCUPIED BANDWIDTH and Spread Factor

6.1 LIMIT

Item	Limits
Occupied Band Width	OFDM (802.11n40/ax40): 40MHz Others : 26MHz or less

6.2 MEASURING INSTRUMENTS AND SETTING

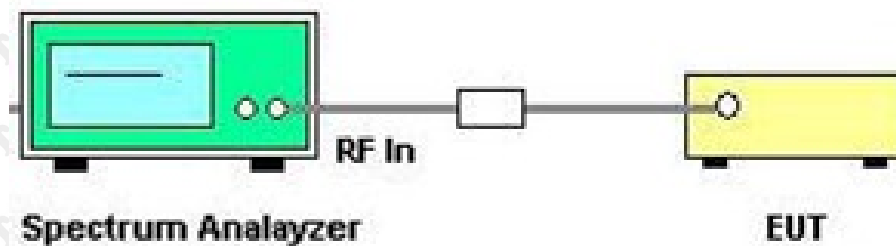
The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	300KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.3 TEST PROCEDURE

- Setting of SA is following as: RB: 300kHz / VB: 300kHz / SPAN: 40MHz / AT: 30dB Ref: 20dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
- EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode(For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz(For DSSS or OFDM Device) or 83.5MHz(For FHSS Device).
- SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.
- Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
The modulation rate: MR=1.375 for 802.11b, MR=1.5 for 802.11g/n20, MR=3 for 802.11n40.

6.4 TEST SETUP LAYOUT



EST DEVIATION

There is no deviation with the original standard.

6.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

6.6 TEST RESULT

Temperature:	23℃	Relative Humidity:	54%
Test Mode:	TX Mode	Pressure:	101kPa

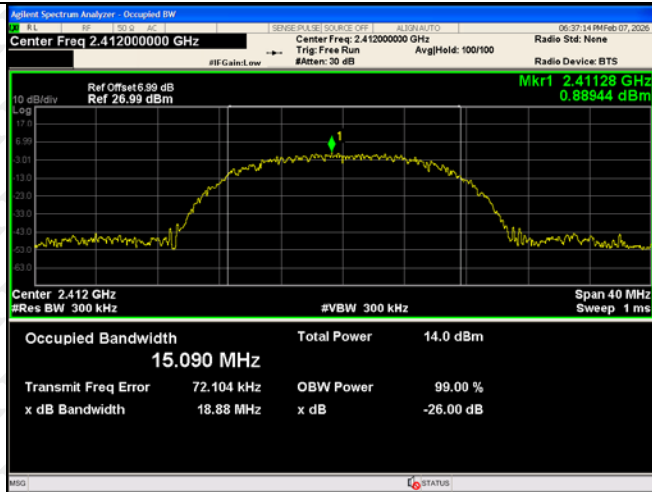
Mode	Test Voltage	Frequency (MHz)	Occupied Bandwidth 99%(MHz)	Spread Bandwidth 90%(MHz)	Spread Factor
802.11b	Normal	2412	15.0898	10.8008	7.534
		2442	15.0734	10.8209	7.550
		2472	15.0883	11.0302	7.572

NOTE: For DS system: (Spreading bandwidth) / (Frequency corresponding to transmission rate) ≥ 5
(Frequency corresponding to transmission rate)=max rate/8

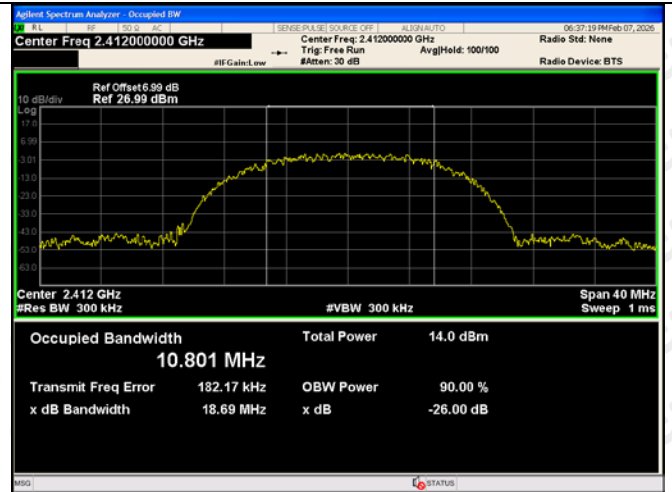
Mode	Test Voltage	Frequency (MHz)	Occupied Bandwidth 99% (MHz)	Spread Bandwidth 90%(MHz)	Spread Factor
802.11g	Normal	2412	16.4118	14.0197	9.914
		2442	16.3899	14.0447	9.903
		2472	16.3392	14.3324	9.880
802.11n/HT 20	Normal	2412	17.5586	15.0531	10.460
		2442	17.5050	15.0786	10.454
		2472	17.5244	15.1618	10.435
802.11n/HT 40	Normal	2422	35.9495	31.2666	10.820
		2442	35.9016	31.4395	10.838
		2462	35.9957	31.4580	10.795
802.11ax/H T20	Normal	2412	18.8503	15.8357	10.474
		2442	18.8149	16.0572	10.443
		2472	18.7755	16.0279	10.476
802.11ax/H T40	Normal	2422	37.5318	32.3581	10.905
		2442	37.7076	32.4112	10.838
		2462	37.6659	32.2981	10.876

802.11b Normal Voltage

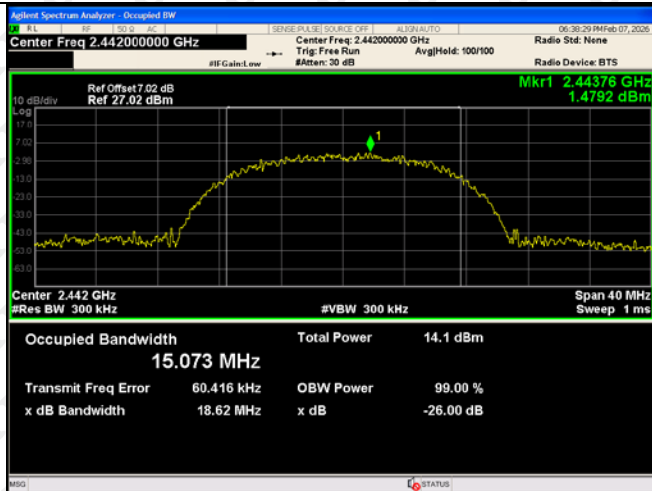
99% Bandwidth



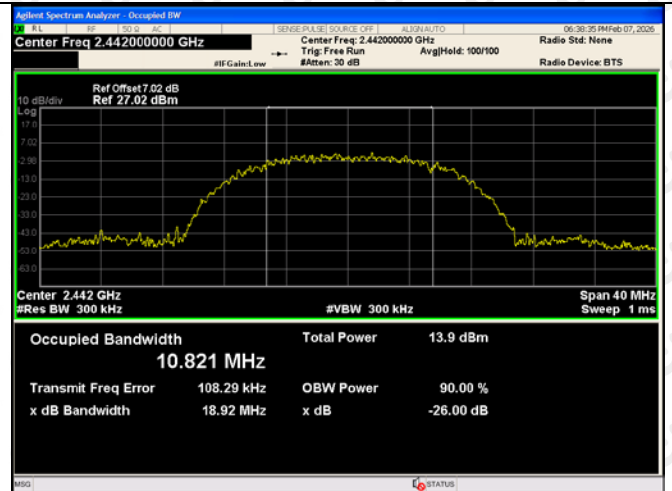
90% Bandwidth



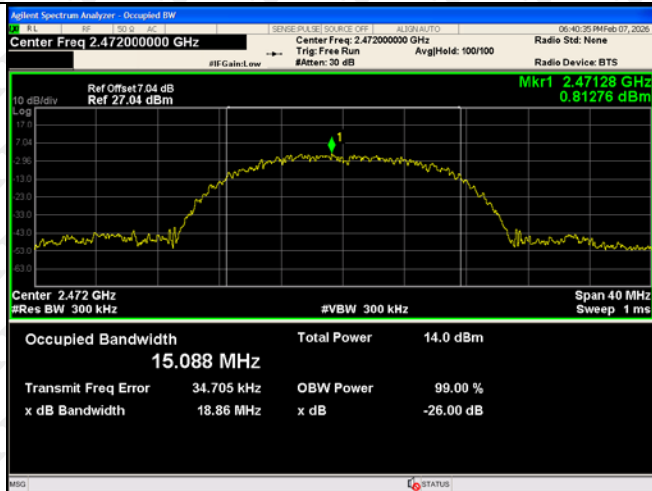
2412MHz



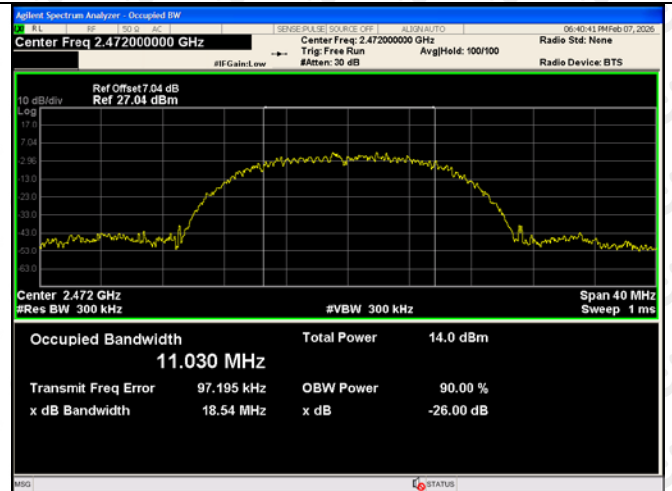
2412 MHz



2442 MHz



2442 MHz

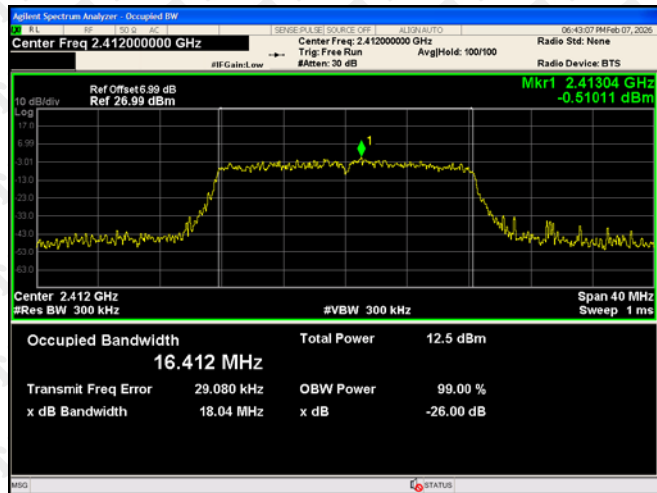


2472 MHz

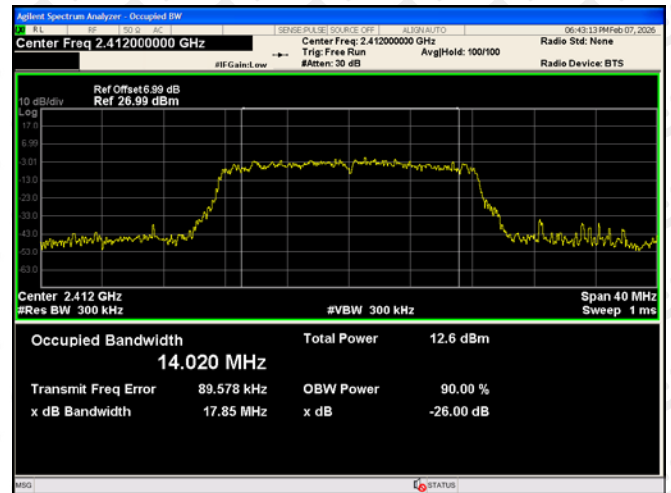
2472 MHz

802.11g Normal Voltage

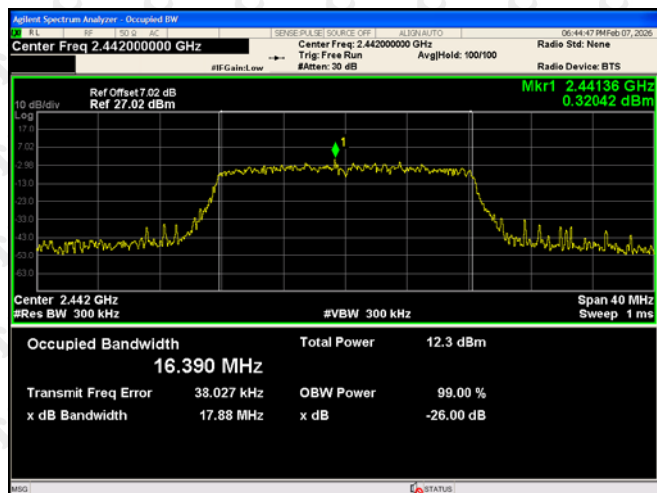
99% Bandwidth



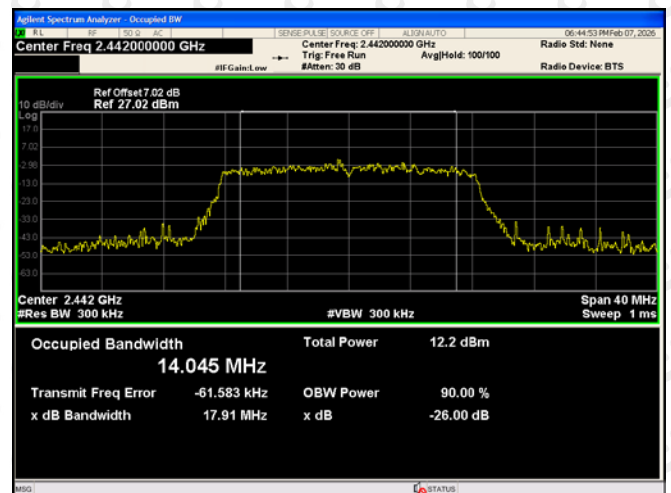
90% Bandwidth



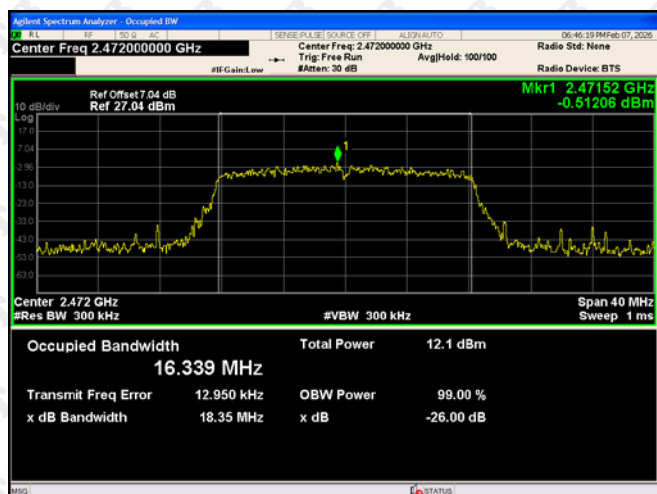
2412MHz



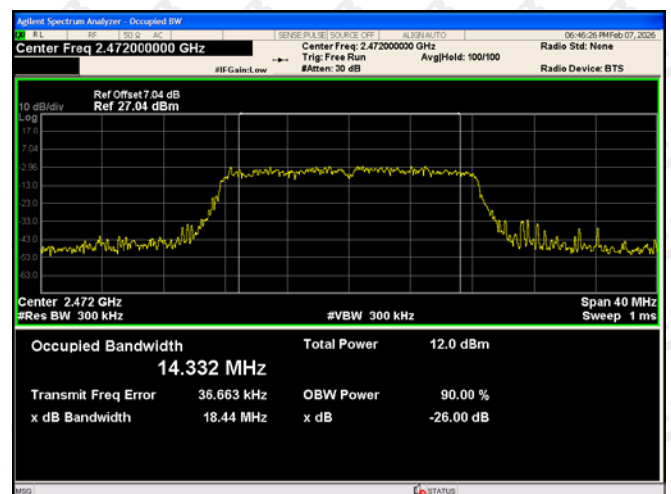
2412 MHz



2442 MHz



2442 MHz

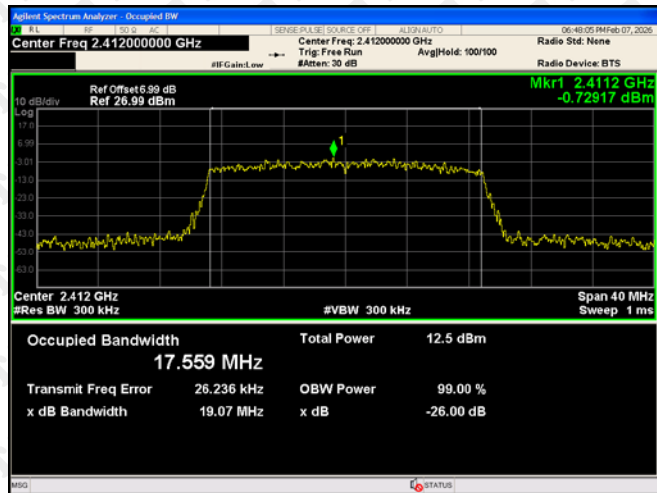


2472 MHz

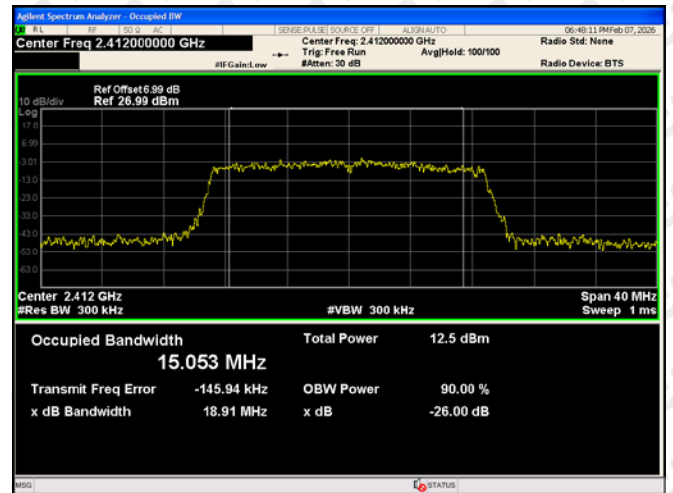
2472 MHz

802.11n/HT20 Normal Voltage

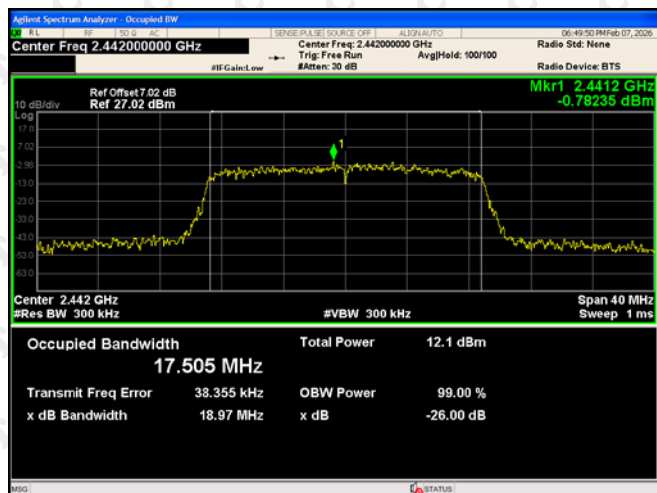
99% Bandwidth



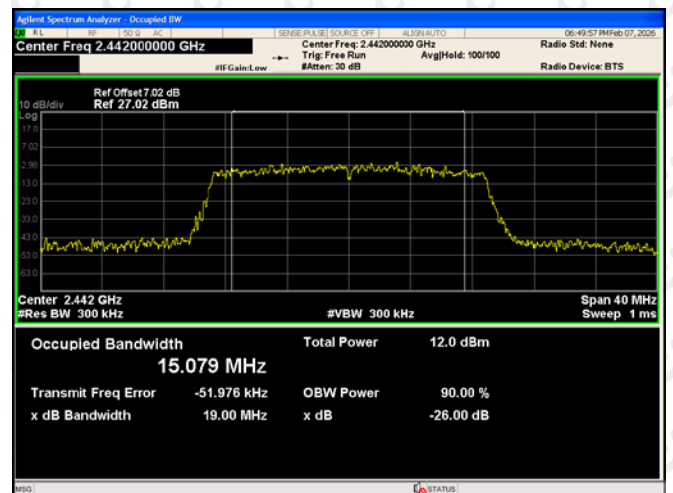
90% Bandwidth



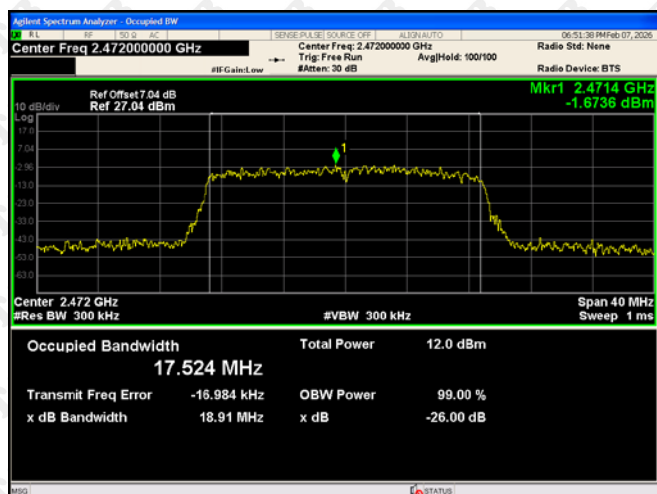
2412MHz



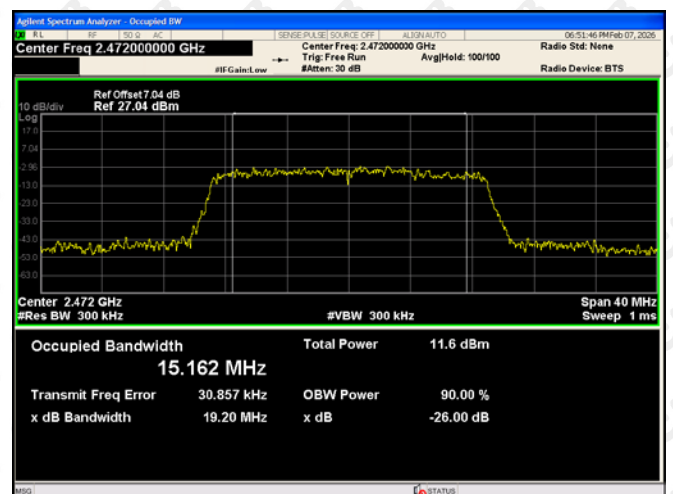
2412 MHz



2442 MHz



2442 MHz

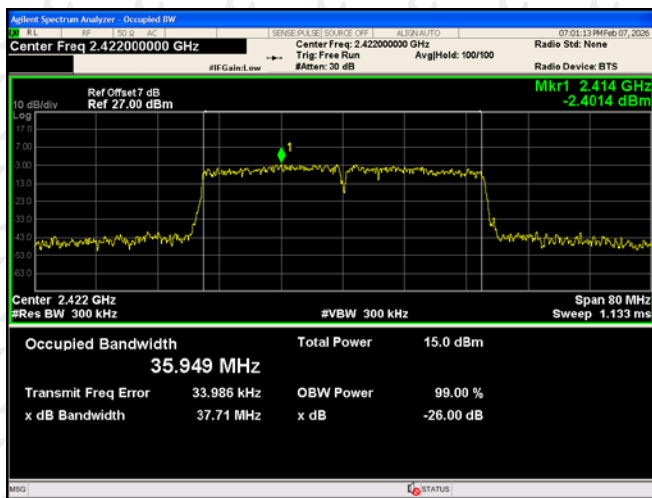


2472 MHz

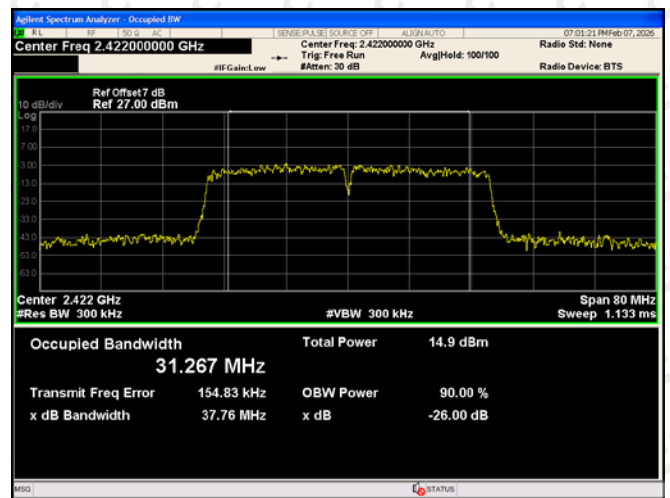
2472 MHz

802.11n/HT40 Normal Voltage

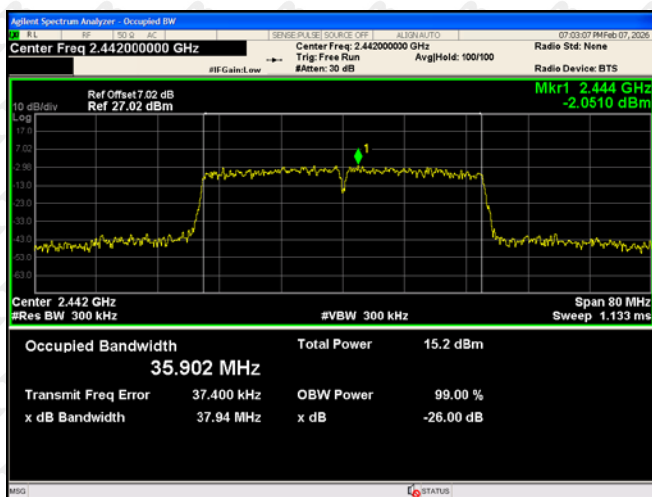
99% Bandwidth



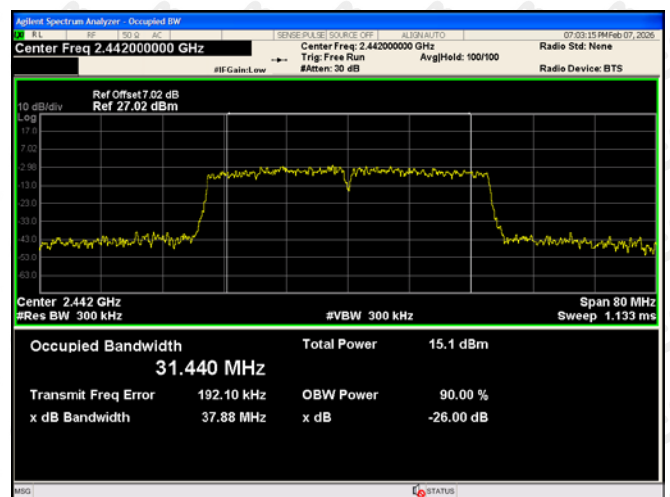
90% Bandwidth



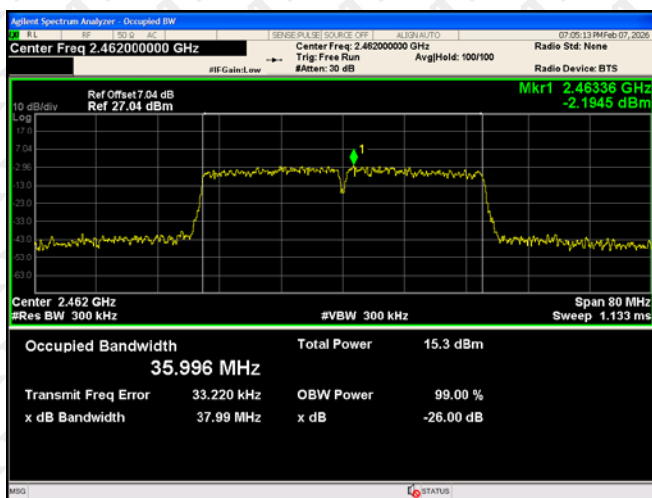
2422MHz



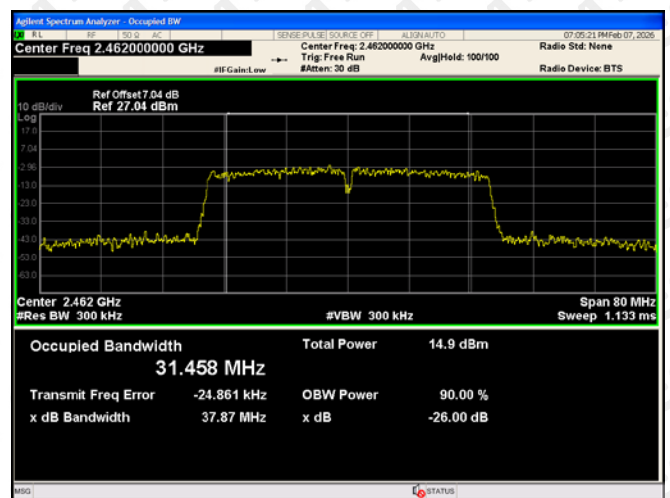
2412 MHz



2442 MHz



2442 MHz

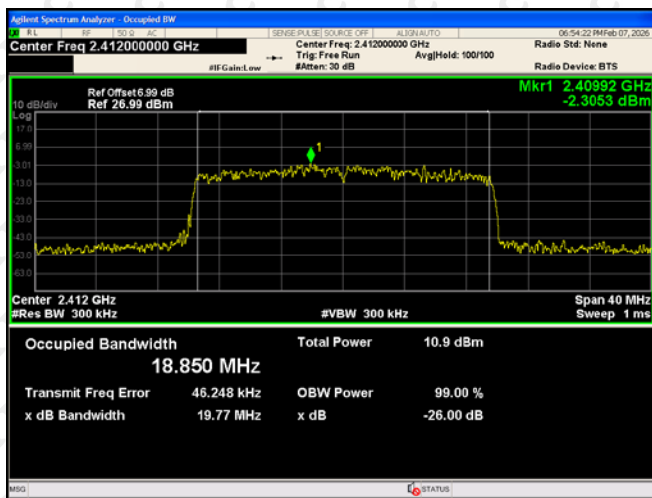


2462 MHz

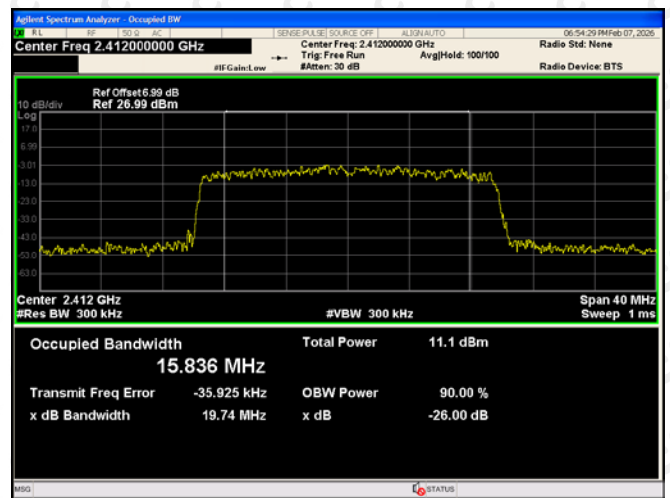
2462 MHz

802.11ax/HT20 Normal Voltage

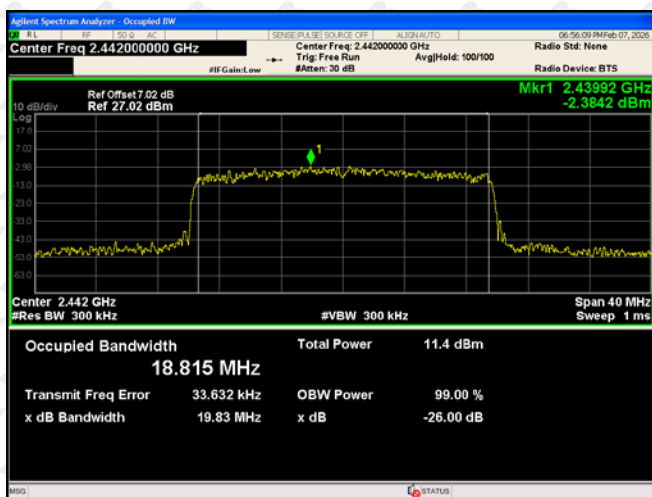
99% Bandwidth



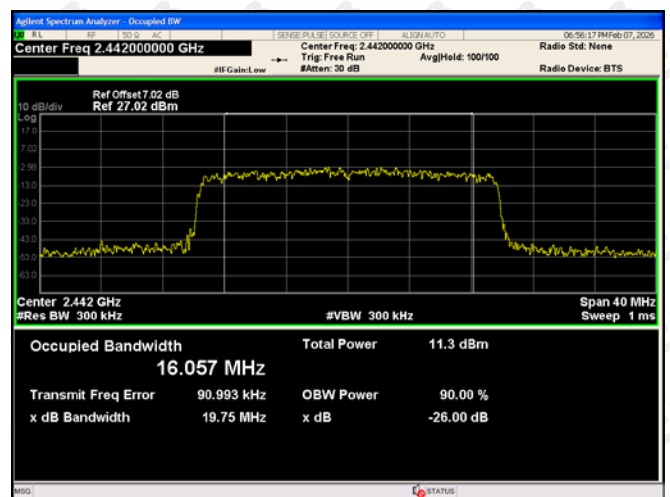
90% Bandwidth



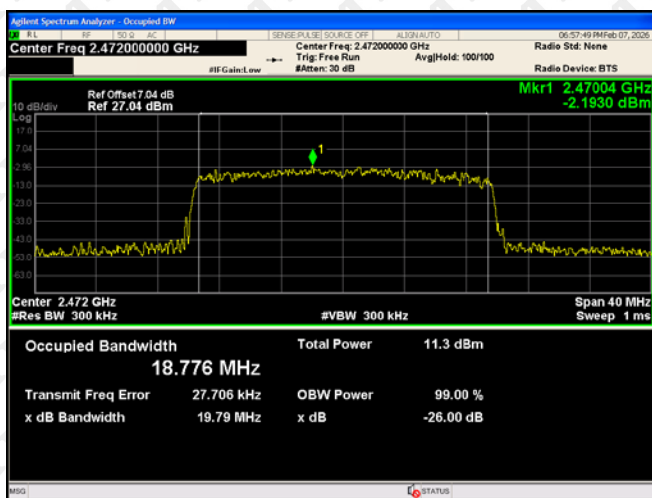
2412MHz



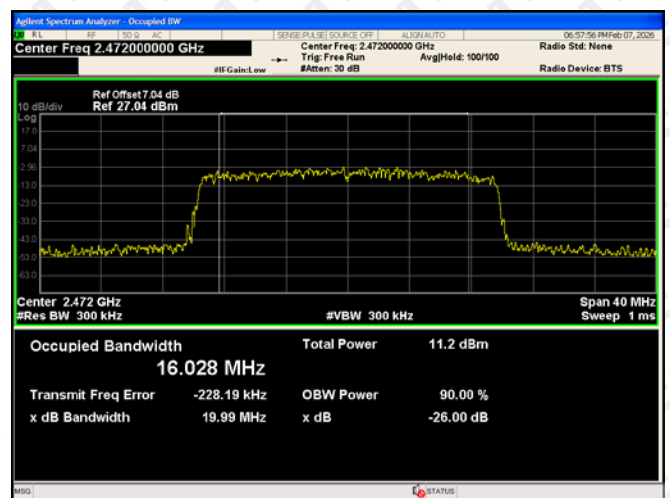
2412 MHz



2442 MHz



2442 MHz

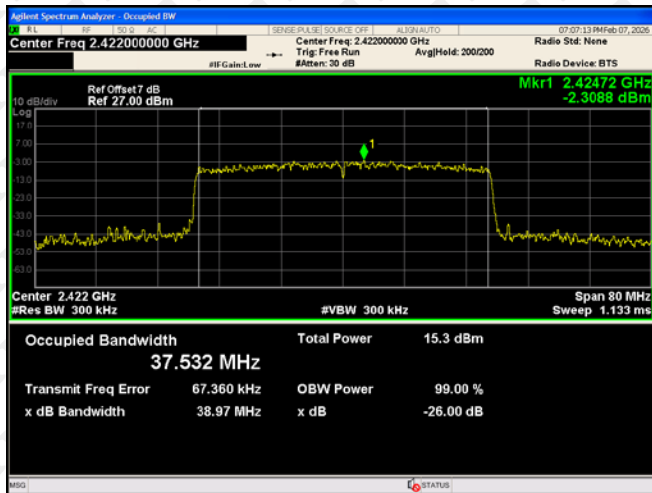


2472 MHz

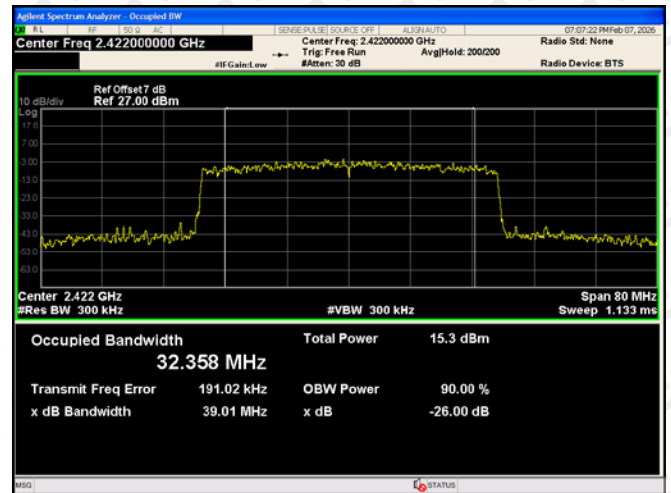
2472 MHz

802.11ax/HT40 Normal Voltage

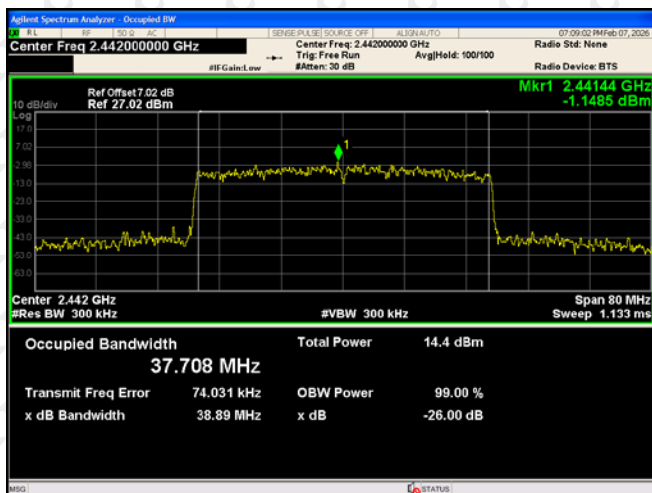
99% Bandwidth



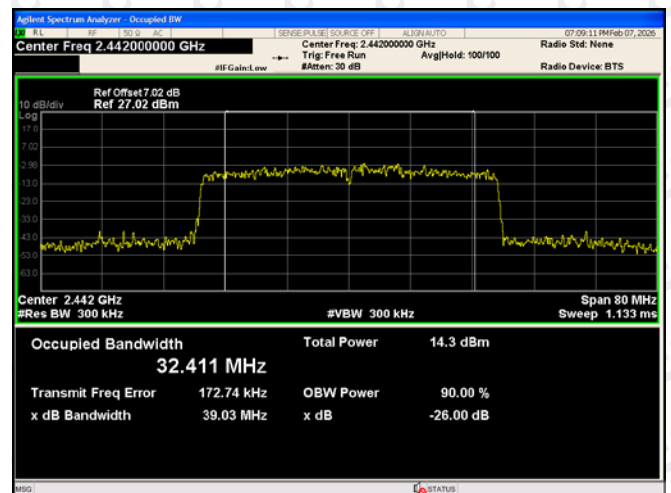
90% Bandwidth



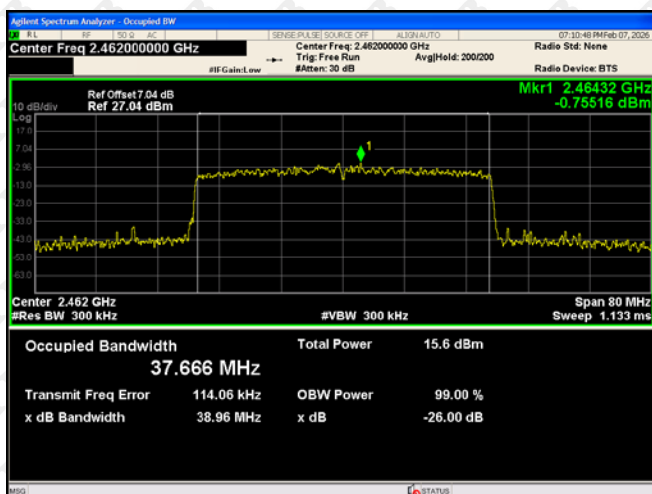
2422MHz



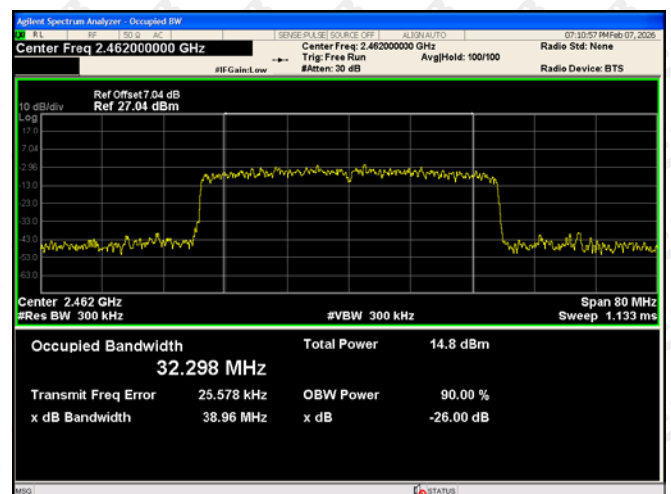
2412 MHz



2442 MHz



2442 MHz



2462 MHz

2462 MHz

7 UNWANTED EMISSION INTENSITY MEASUREMENT

7.1 LIMIT

Item	Limits
TX Spurious Emission	$\leq 2.5 \mu\text{W/MHz} (30\text{MHz} \leq f \leq 1000\text{MHz})$
	$\leq 2.5 \mu\text{W/MHz} (1000\text{MHz} < f \leq 2387\text{MHz})$
	$\leq 25 \mu\text{W/MHz} (2387\text{MHz} < f \leq 2400\text{MHz})$
	$\leq 25 \mu\text{W/MHz} (2483.5\text{MHz} \leq f < 2496.5\text{MHz})$
	$\leq 2.5 \mu\text{W/MHz} (2496.5\text{MHz} \leq f < 12500\text{MHz})$

7.2 MEASURING INSTRUMENTS AND SETTING

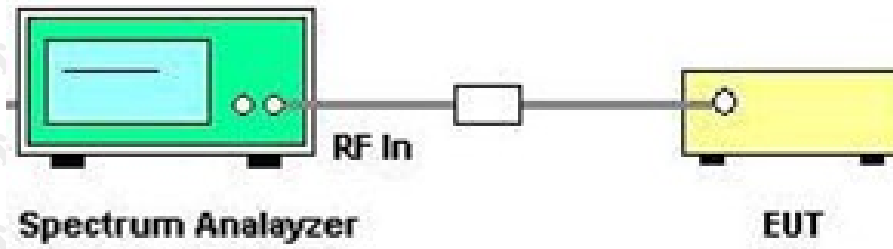
The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.3 TEST PROCEDURE

1. EUT have transmitted the maximum modulation signal and fixed channelize.
2. Setting of SA is following as: Below 1GHz RB: 100kHz / VB:100kHz
Above 1GHz RB: 1MHz / VB:1MHz / AT: 10dB Ref: 0dBm / Sweep time: Auto
Sweep Mode: Continuous sweep / Detect mode: Positive peak
Trace mode: Max hold
3. Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than 2.5μW.
4. Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5μW.
5. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25μW.
6. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25μW
7. SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than 2.5μW
8. Measure side band spurious as follows: For 2.4GHz band: 2374MHz~2400MHz and 2483.5MHz~2509.5MHz RBW = VBW = 30kHz, Result_Value = Measured_Value + 15.2 [dBm]
9. If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

7.4 TEST SETUP LAYOUT



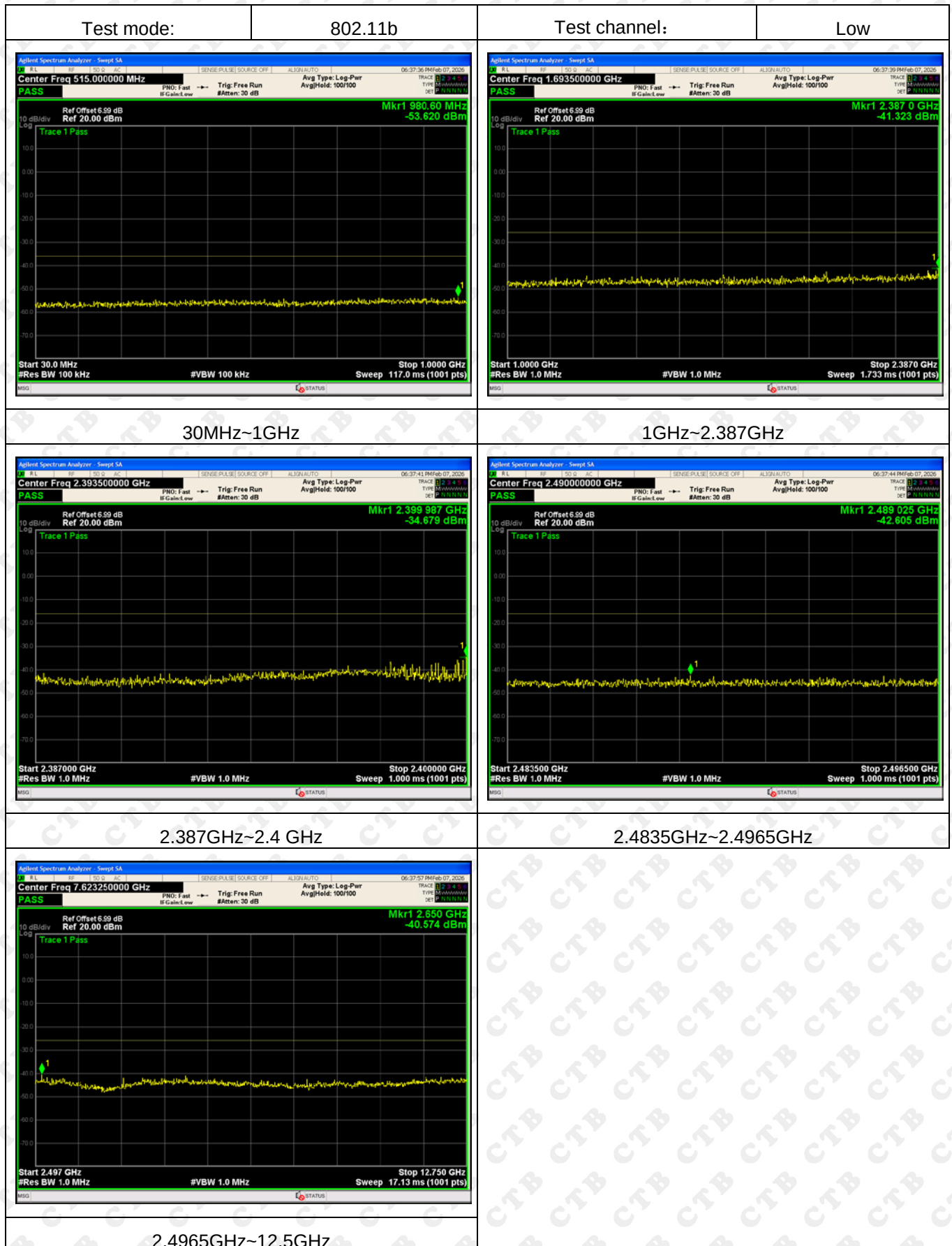
EST DEVIATION

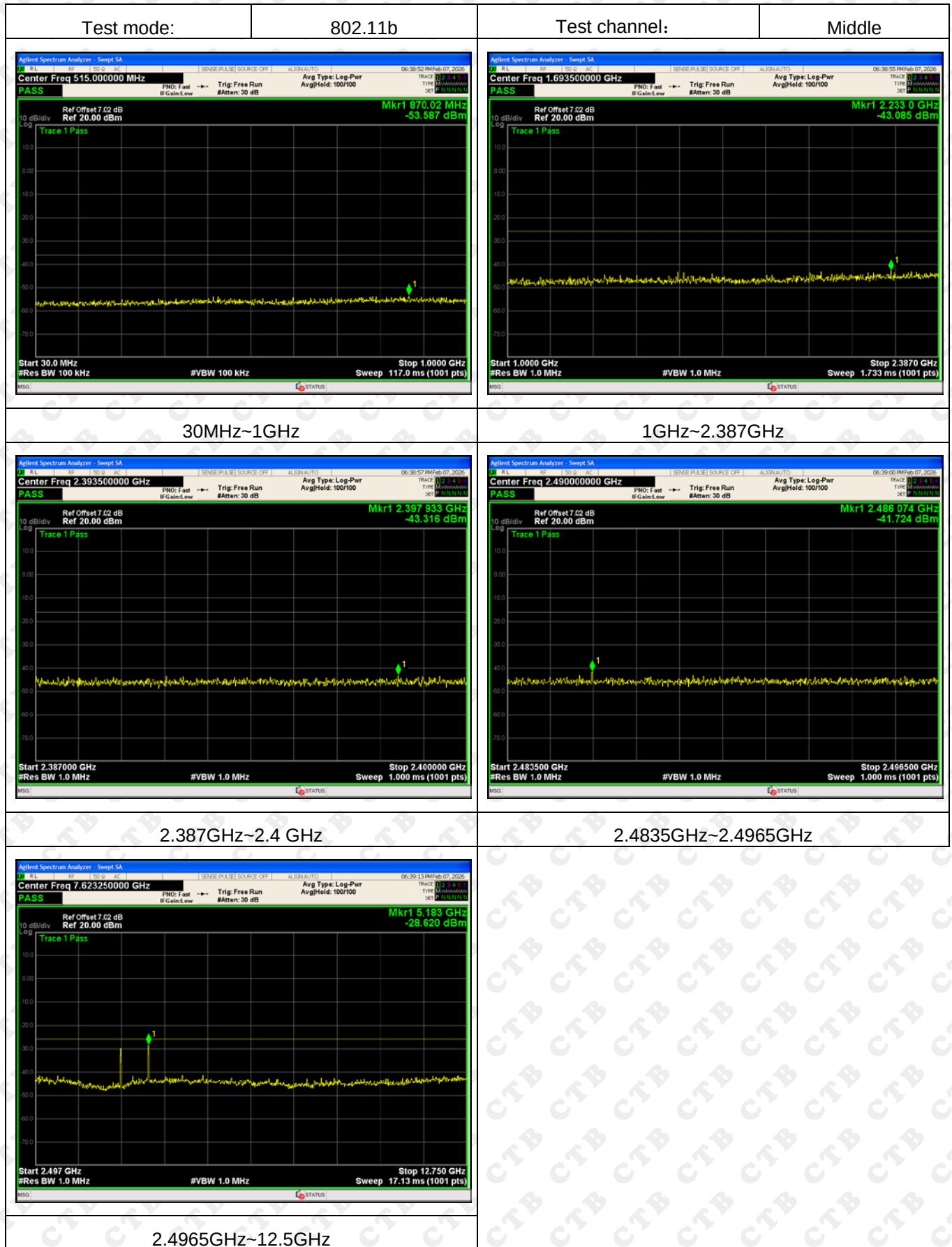
There is no deviation with the original standard.

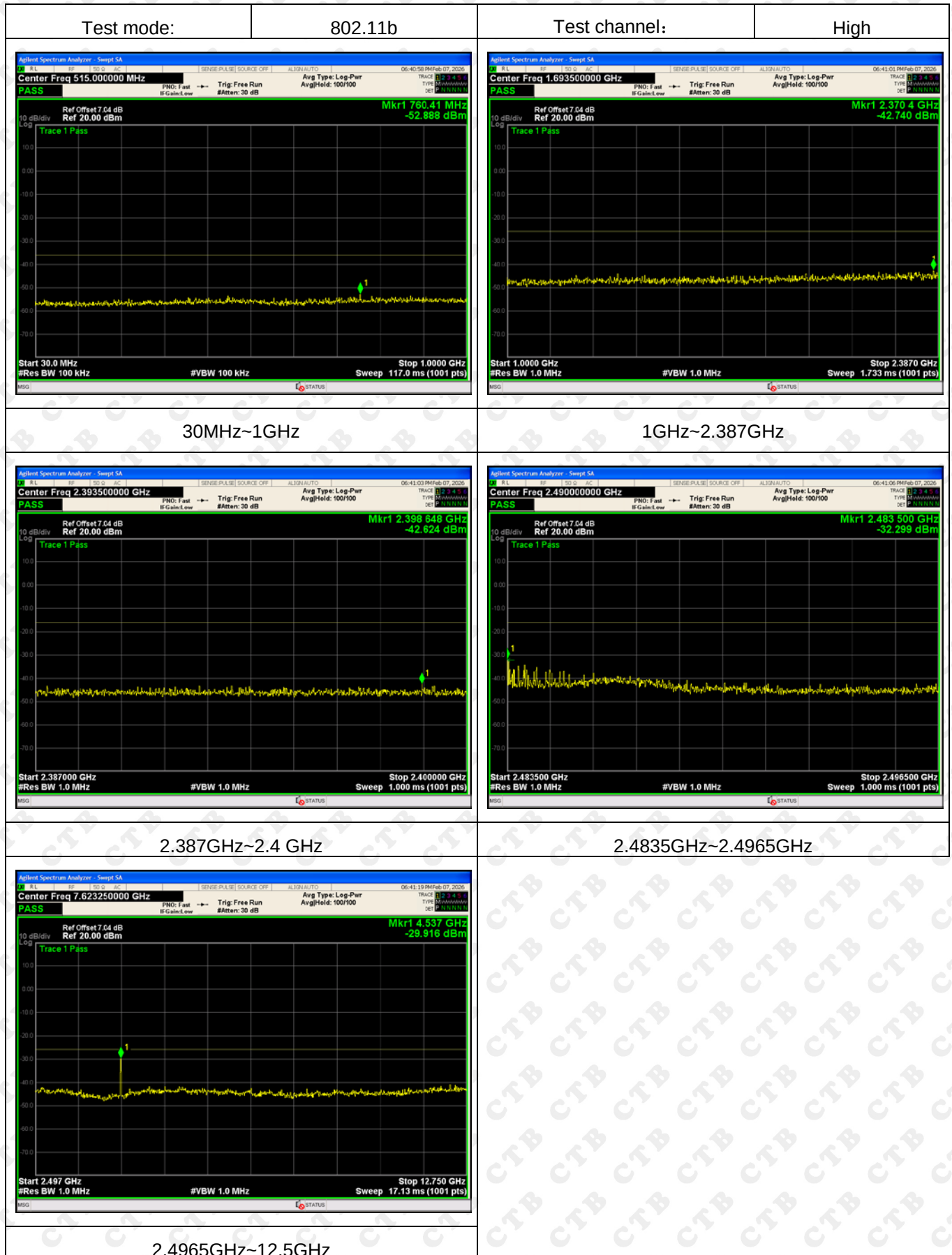
7.5 TEST RESULT

Temperature:	23℃	Relative Humidity:	54%
Test Voltage:	Normal Voltage	Pressure:	101kPa

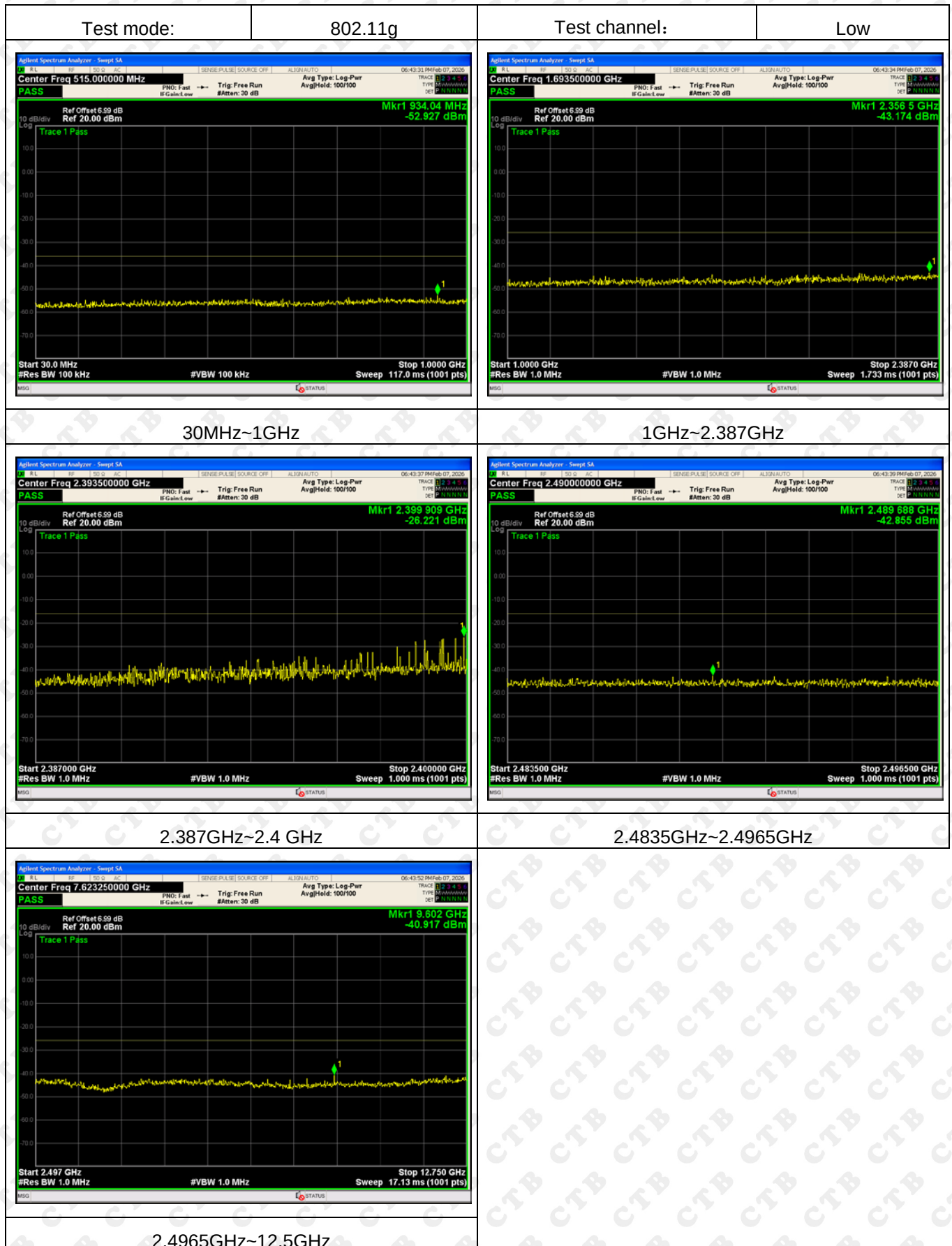
Test mode	Test Channel	Test freq. range	Emission Frequency (MHz)	Test result (dBm/MHz)	Test result (uW/MHz)	limits (uW/MHz)	Result
802.11b	Low	30MHz≤f≤1000MHz	980.6	-53.62	0.043	2.5	PASS
		1000MHz < f≤2387MHz	2387	-41.32	0.074	2.5	PASS
		2387MHz < f≤2400MHz	2399.99	-34.68	0.340	25	PASS
		2483.5MHz≤f < 2496.5MHz	2489.03	-42.61	0.055	25	PASS
		2496.5MHz≤f < 12750MHz	2650.3	-40.57	0.088	2.5	PASS
	Middle	30MHz≤f≤1000MHz	870.02	-53.59	0.004	2.5	PASS
		1000MHz < f≤2387MHz	2233.04	-43.09	0.049	2.5	PASS
		2387MHz < f≤2400MHz	2397.93	-43.32	0.047	25	PASS
		2483.5MHz≤f < 2496.5MHz	2486.07	-41.72	0.067	25	PASS
		2496.5MHz≤f < 12750MHz	5182.92	-28.62	1.374	2.5	PASS
	High	30MHz≤f≤1000MHz	760.41	-52.89	0.005	2.5	PASS
		1000MHz < f≤2387MHz	2370.36	-42.74	0.053	2.5	PASS
		2387MHz < f≤2400MHz	2398.65	-42.62	0.055	25	PASS
		2483.5MHz≤f < 2496.5MHz	2483.5	-32.3	0.589	25	PASS
		2496.5MHz≤f < 12750MHz	4536.95	-29.92	1.019	2.5	PASS

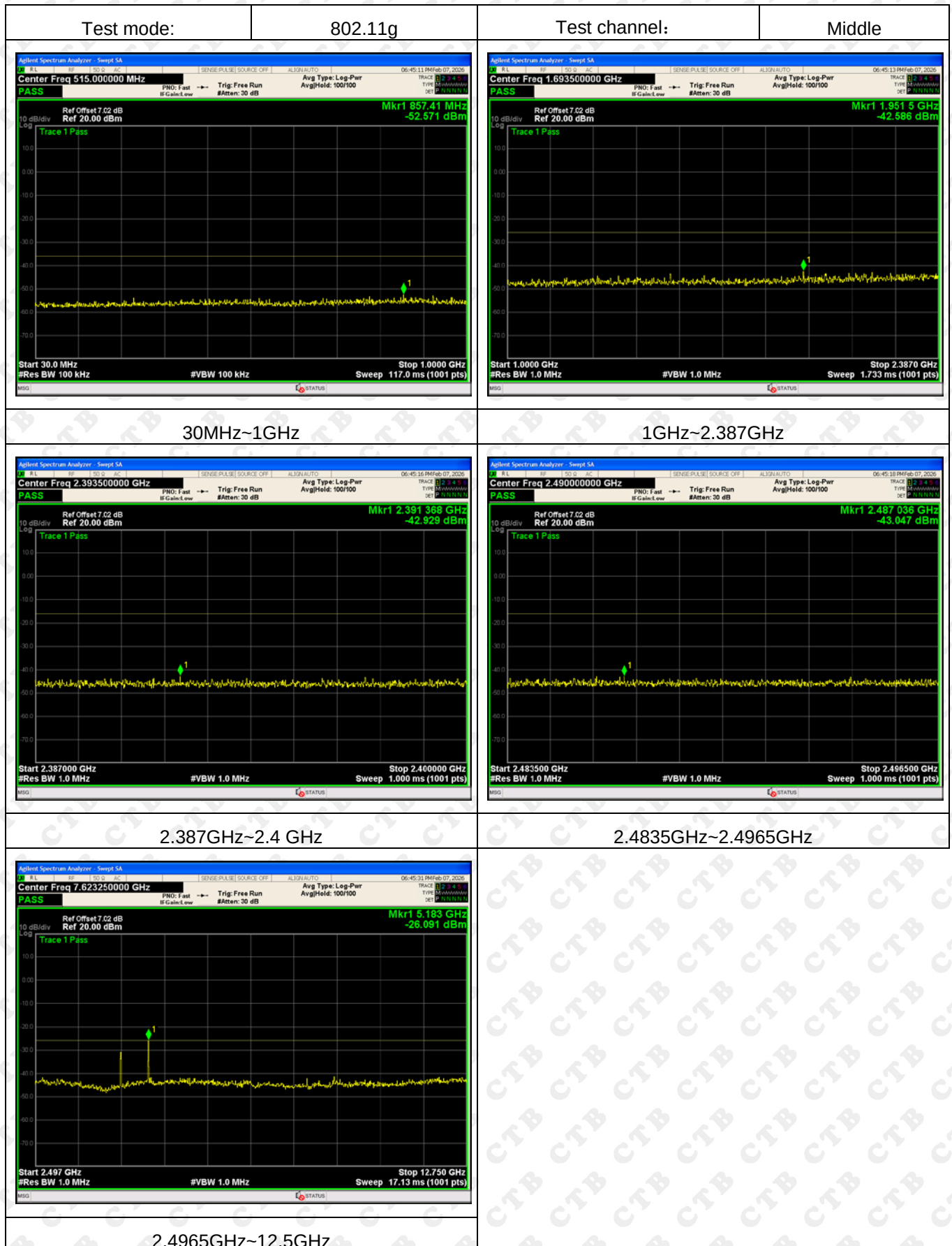


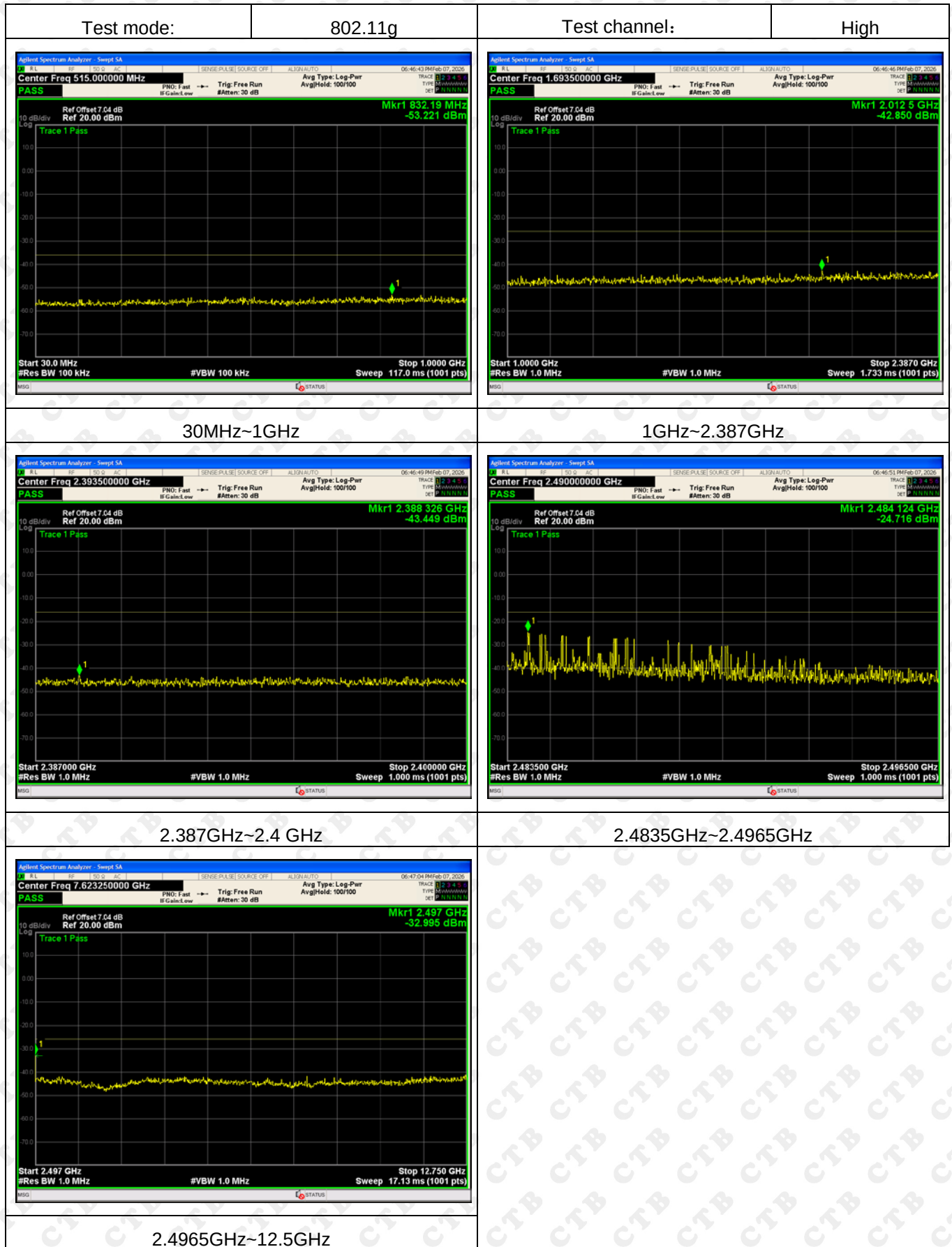




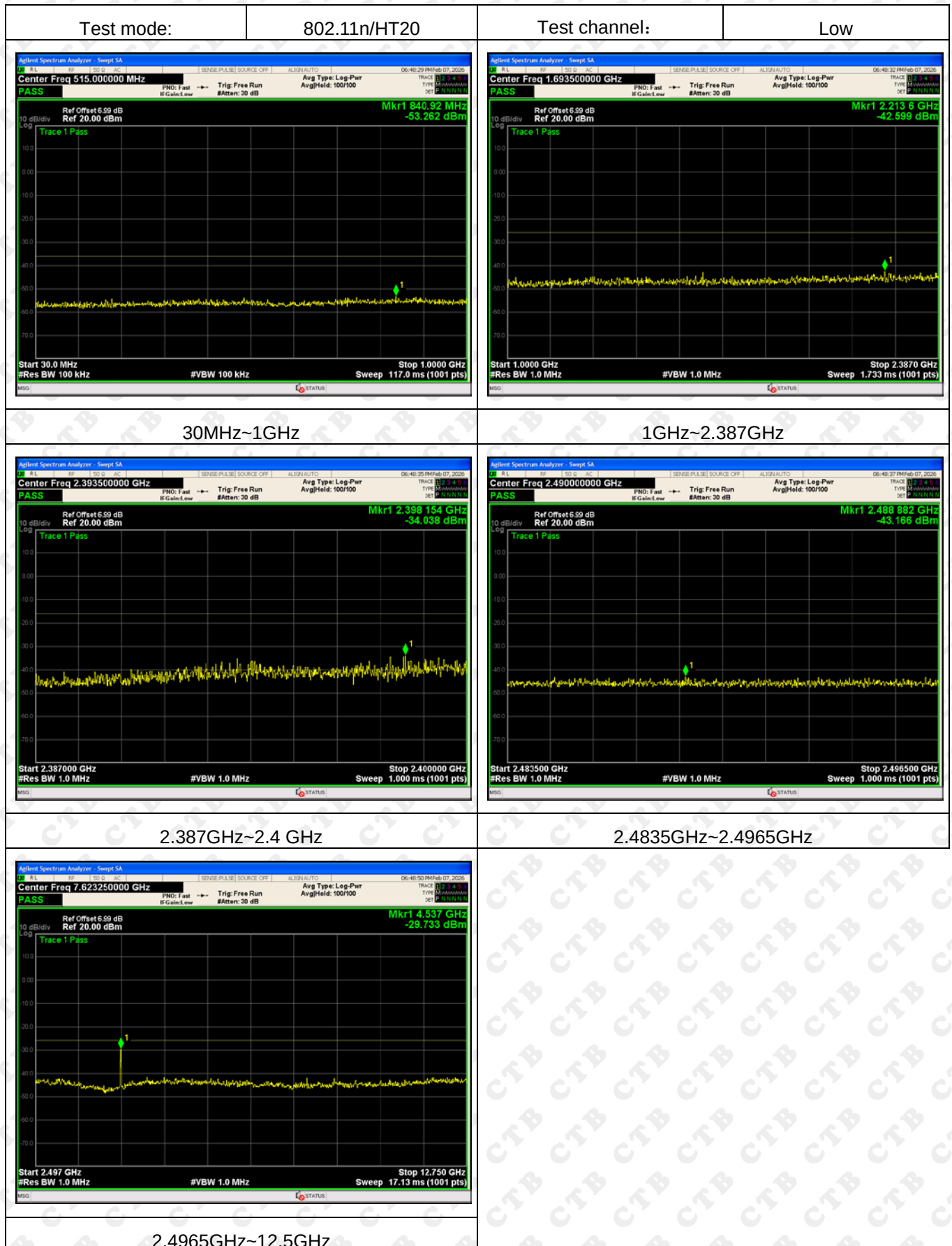
Test mode	Test Channel	Test freq. range	Emission Frequency (MHz)	Test result (dBm/MHz)	Test result (uW/MHz)	limits (uW/MHz)	Result
802.11g	Low	30MHz≤f≤1000MHz	934.04	-52.93	0.051	2.5	PASS
		1000MHz < f≤2387MHz	2356.49	-43.17	0.048	2.5	PASS
		2387MHz < f≤2400MHz	2399.91	-26.22	2.388	25	PASS
		2483.5MHz≤f < 2496.5MHz	2489.69	-42.86	0.052	25	PASS
		2496.5MHz≤f < 12750MHz	9602.18	-40.92	0.081	2.5	PASS
	Middle	30MHz≤f≤1000MHz	857.41	-52.57	0.006	2.5	PASS
		1000MHz < f≤2387MHz	1951.48	-42.59	0.055	2.5	PASS
		2387MHz < f≤2400MHz	2391.37	-42.93	0.051	25	PASS
		2483.5MHz≤f < 2496.5MHz	2487.04	-43.05	0.050	25	PASS
		2496.5MHz≤f < 12750MHz	5182.92	-26.09	2.460	2.5	PASS
	High	30MHz≤f≤1000MHz	832.19	-53.22	0.005	2.5	PASS
		1000MHz < f≤2387MHz	2012.51	-42.85	0.052	2.5	PASS
		2387MHz < f≤2400MHz	2388.33	-43.45	0.045	25	PASS
		2483.5MHz≤f < 2496.5MHz	2484.12	-24.72	3.373	25	PASS
		2496.5MHz≤f < 12750MHz	2496.5	-32.99	0.502	2.5	PASS

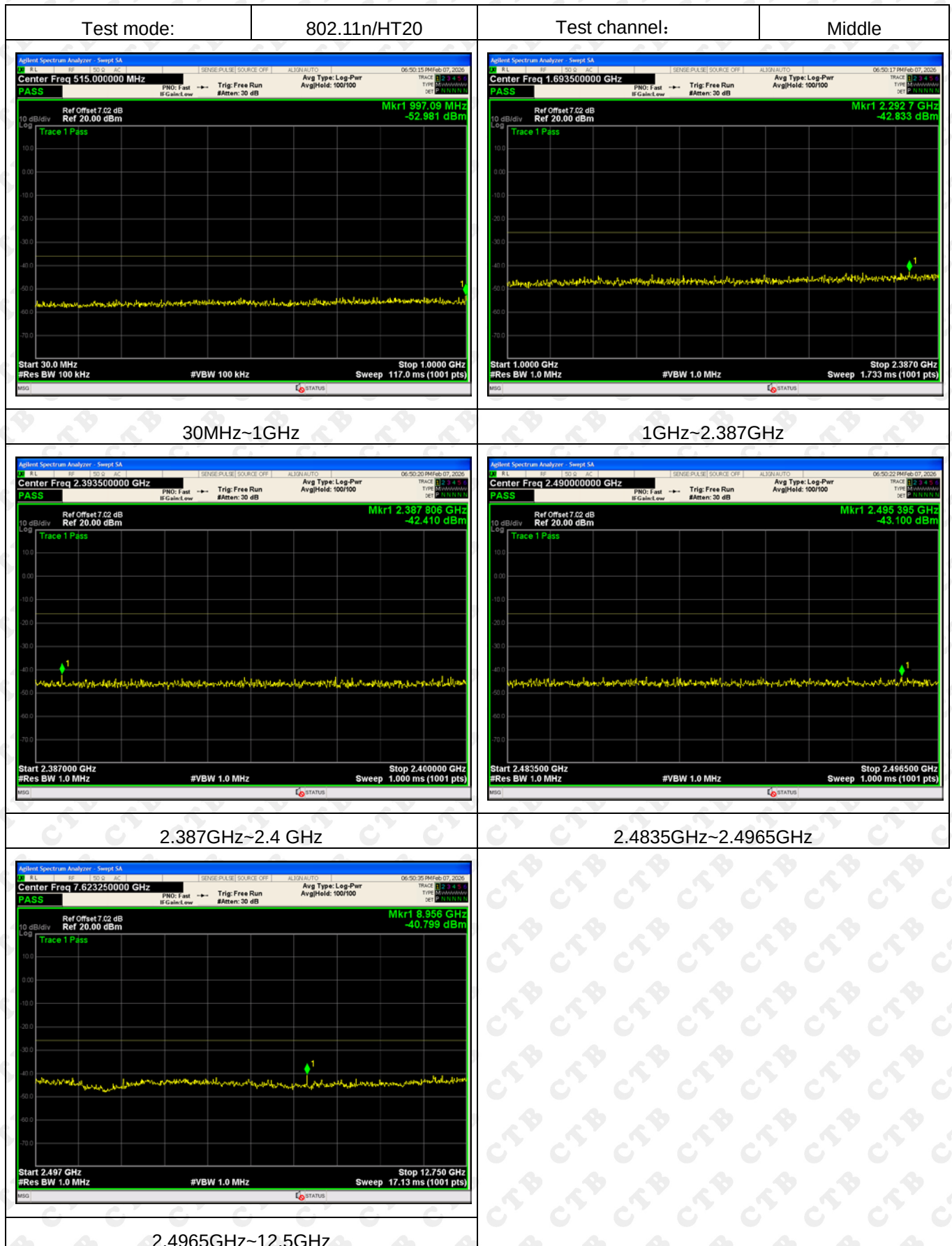


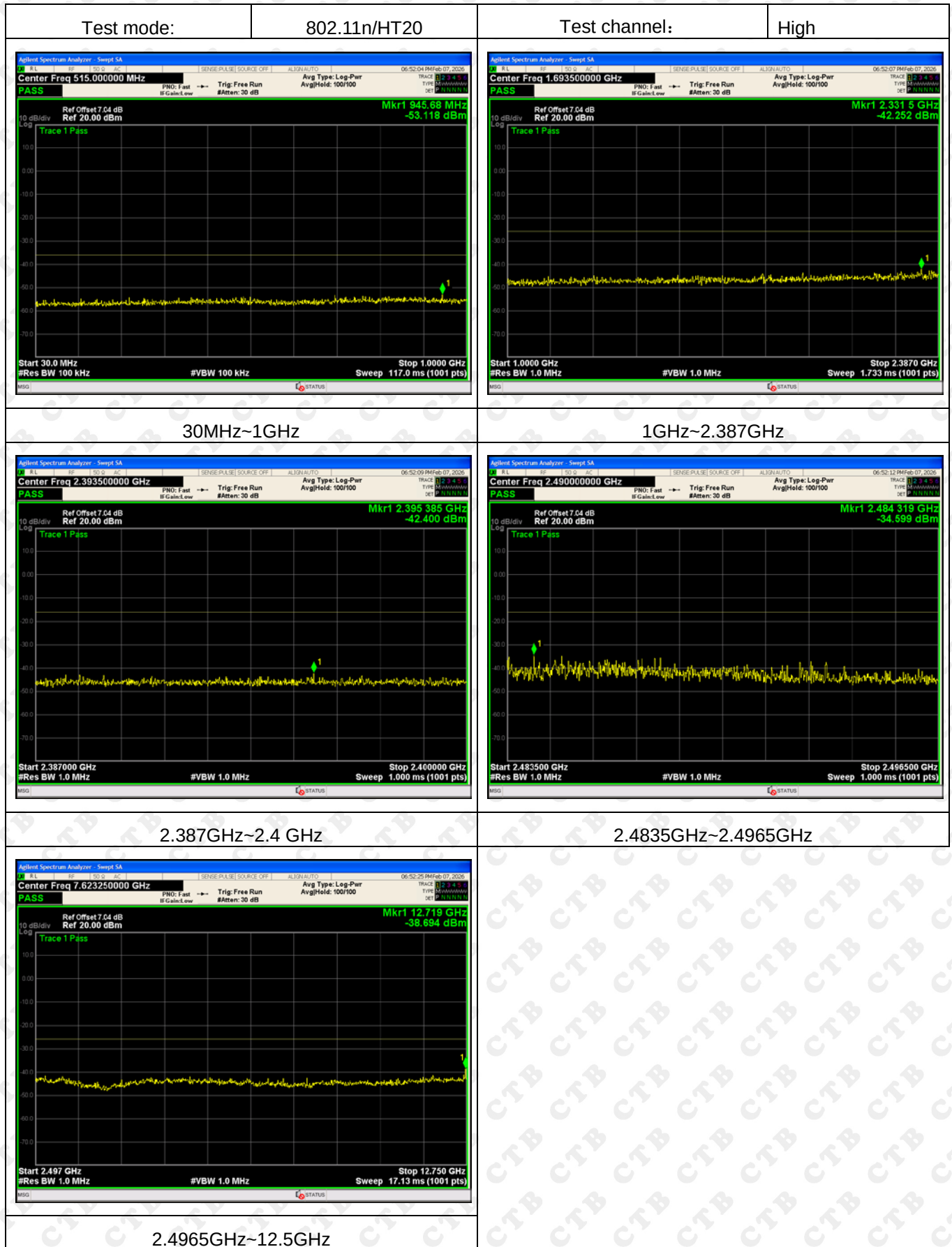




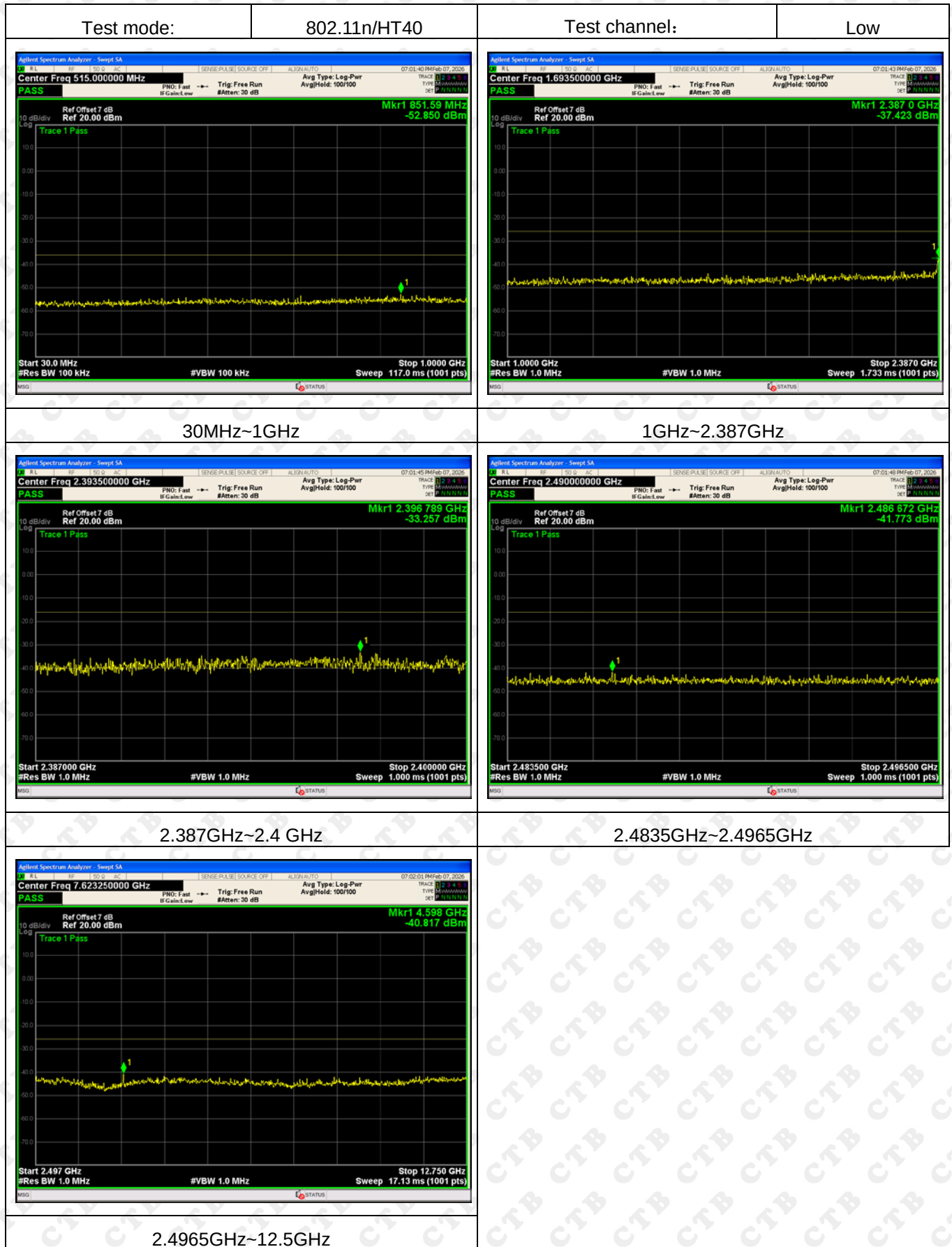
Test mode	Test Channel	Test freq. range	Emission Frequency (MHz)	Test result (dBm/MHz)	Test result (uW/MHz)	limits (uW/MHz)	Result
802.11n 20	Low	30MHz≤f≤1000MHz	840.92	-53.26	0.047	2.5	PASS
		1000MHz < f≤2387MHz	2213.63	-42.6	0.055	2.5	PASS
		2387MHz < f≤2400MHz	2398.15	-34.04	0.394	25	PASS
		2483.5MHz≤f < 2496.5MHz	2488.88	-43.17	0.048	25	PASS
		2496.5MHz≤f < 12750MHz	4536.95	-29.73	1.064	2.5	PASS
	Middle	30MHz≤f≤1000MHz	997.09	-52.98	0.005	2.5	PASS
		1000MHz < f≤2387MHz	2292.68	-42.83	0.052	2.5	PASS
		2387MHz < f≤2400MHz	2387.81	-42.41	0.057	25	PASS
		2483.5MHz≤f < 2496.5MHz	2495.4	-43.1	0.049	25	PASS
		2496.5MHz≤f < 12750MHz	8956.21	-40.8	0.083	2.5	PASS
	High	30MHz≤f≤1000MHz	945.68	-53.12	0.005	2.5	PASS
		1000MHz < f≤2387MHz	2331.52	-42.25	0.060	2.5	PASS
		2387MHz < f≤2400MHz	2395.38	-42.4	0.058	25	PASS
		2483.5MHz≤f < 2496.5MHz	2484.32	-34.6	0.347	25	PASS
		2496.5MHz≤f < 12750MHz	12719.24	-38.69	0.135	2.5	PASS

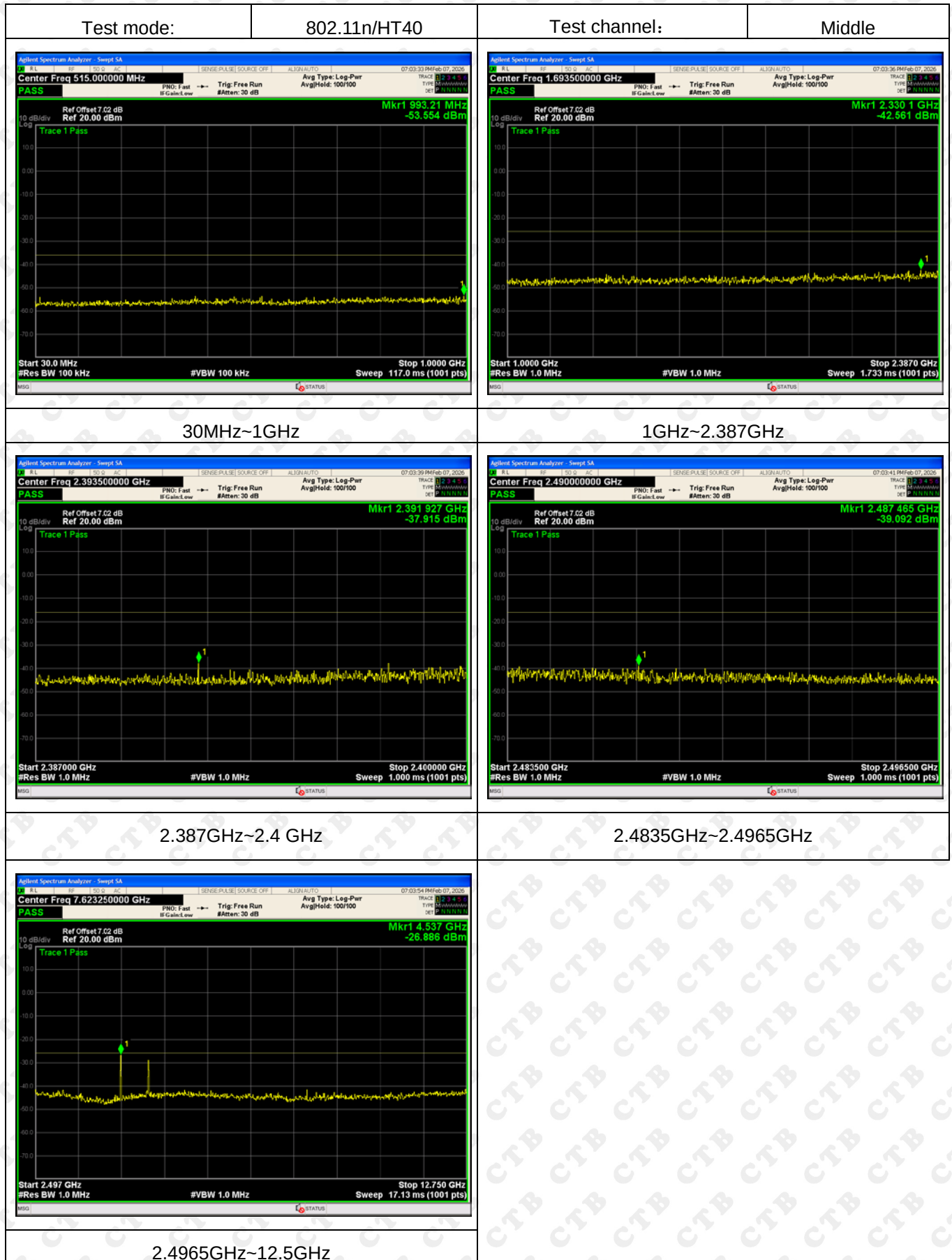


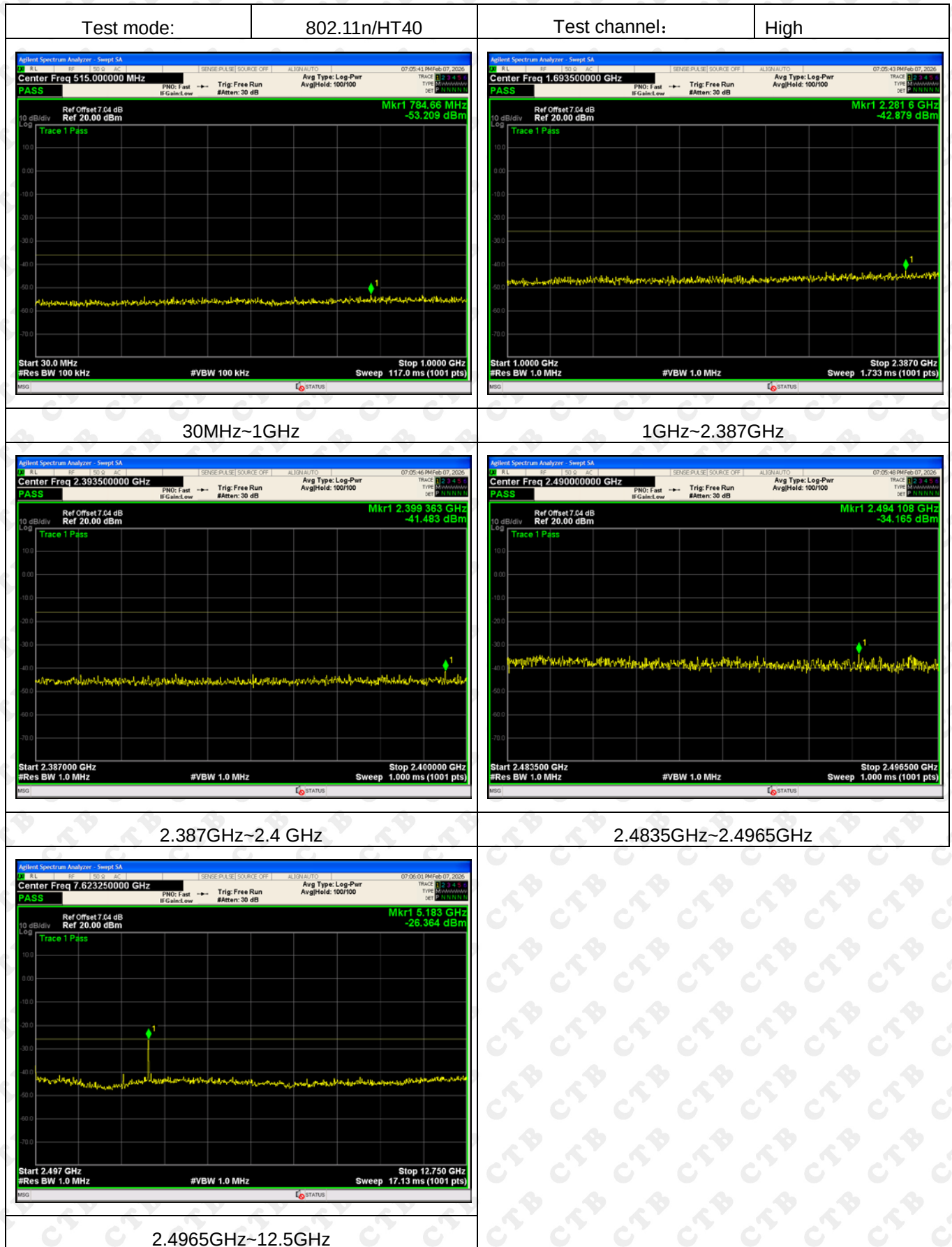




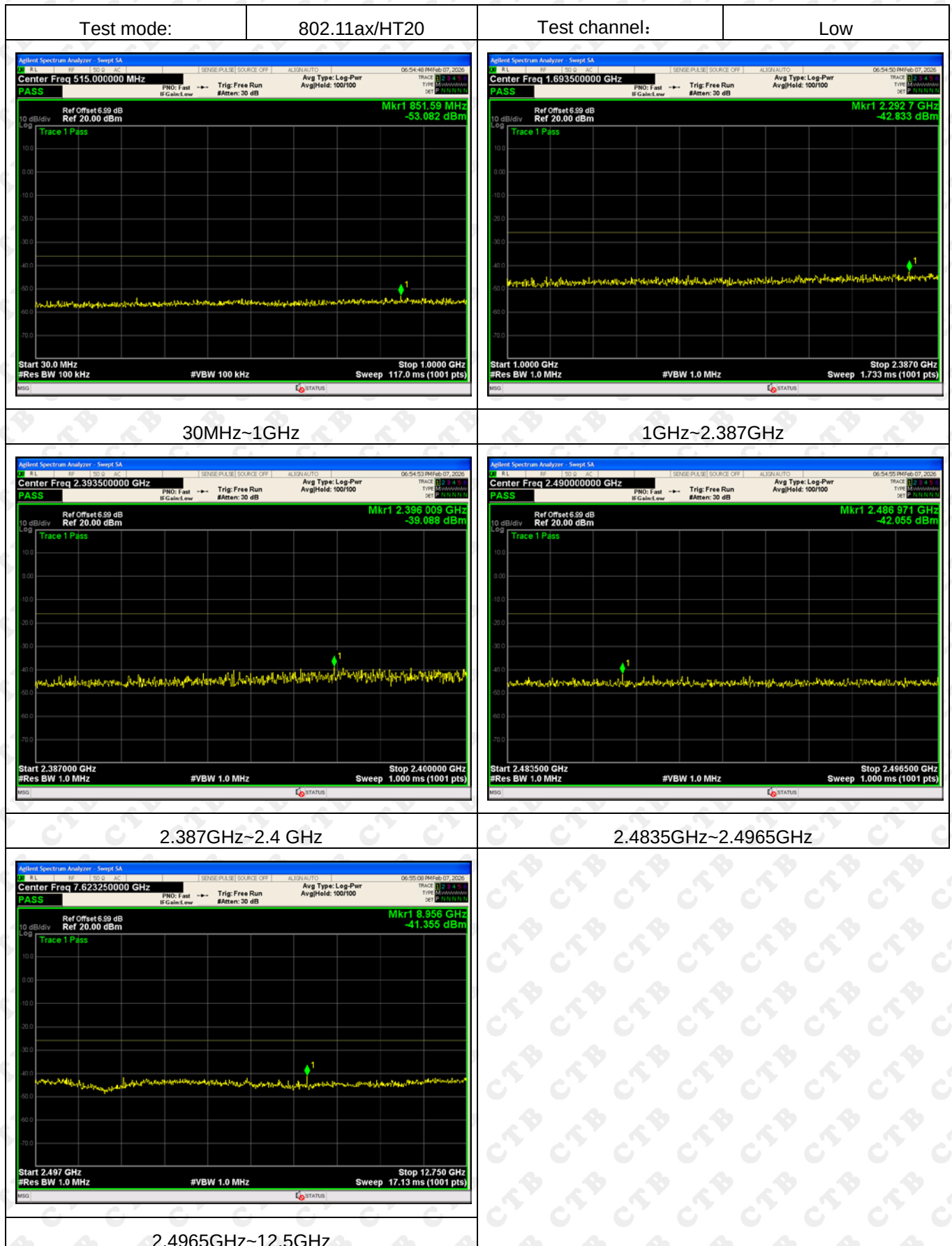
Test mode	Test Channel	Test freq. range	Emission Frequency (MHz)	Test result (dBm/MHz)	Test result (uW/MHz)	limits (uW/MHz)	Result
802.11n 40	Low	30MHz≤f≤1000MHz	851.59	-52.85	0.052	2.5	PASS
		1000MHz < f≤2387MHz	2387	-37.42	0.181	2.5	PASS
		2387MHz < f≤2400MHz	2396.79	-33.26	0.472	25	PASS
		2483.5MHz≤f < 2496.5MHz	2486.67	-41.77	0.067	25	PASS
		2496.5MHz≤f < 12750MHz	4598.47	-40.82	0.083	2.5	PASS
	Middle	30MHz≤f≤1000MHz	993.21	-53.55	0.004	2.5	PASS
		1000MHz < f≤2387MHz	2330.13	-42.56	0.055	2.5	PASS
		2387MHz < f≤2400MHz	2391.93	-37.92	0.161	25	PASS
		2483.5MHz≤f < 2496.5MHz	2487.46	-39.09	0.123	25	PASS
		2496.5MHz≤f < 12750MHz	4536.95	-26.89	2.046	2.5	PASS
	High	30MHz≤f≤1000MHz	784.66	-53.21	0.005	2.5	PASS
		1000MHz < f≤2387MHz	2281.59	-42.88	0.052	2.5	PASS
		2387MHz < f≤2400MHz	2399.36	-41.48	0.071	25	PASS
		2483.5MHz≤f < 2496.5MHz	2494.11	-34.17	0.383	25	PASS
		2496.5MHz≤f < 12750MHz	5182.92	-26.36	2.312	2.5	PASS

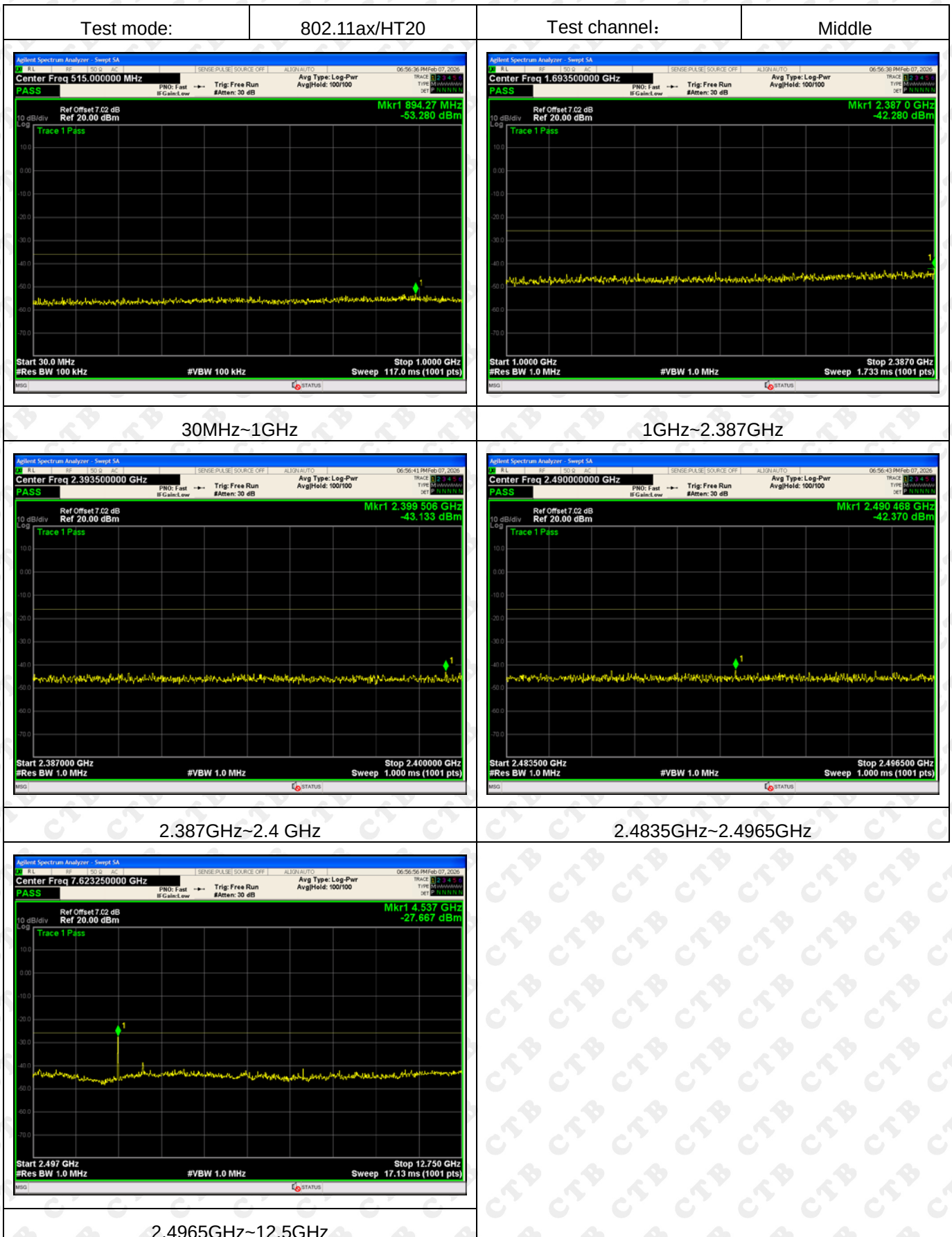


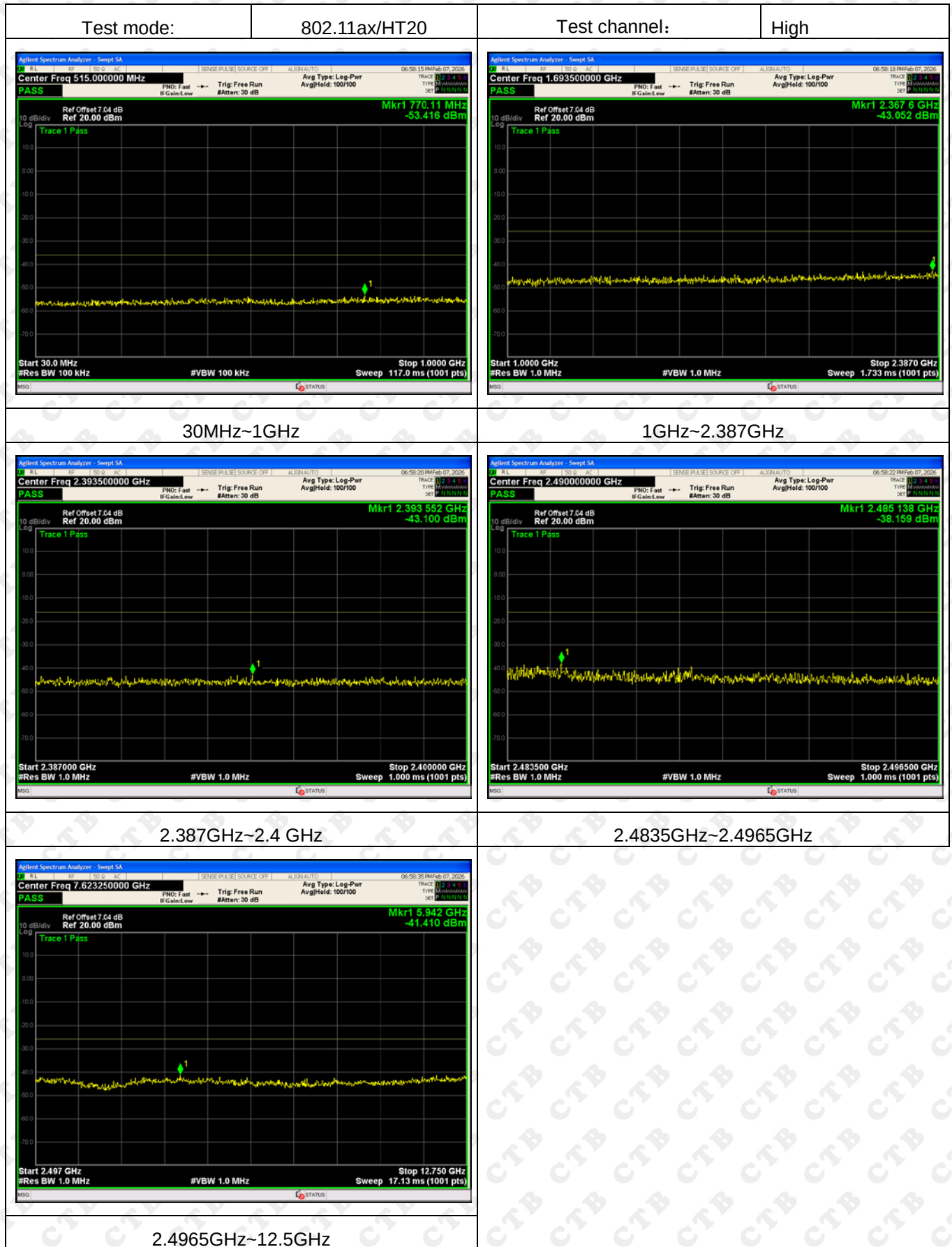




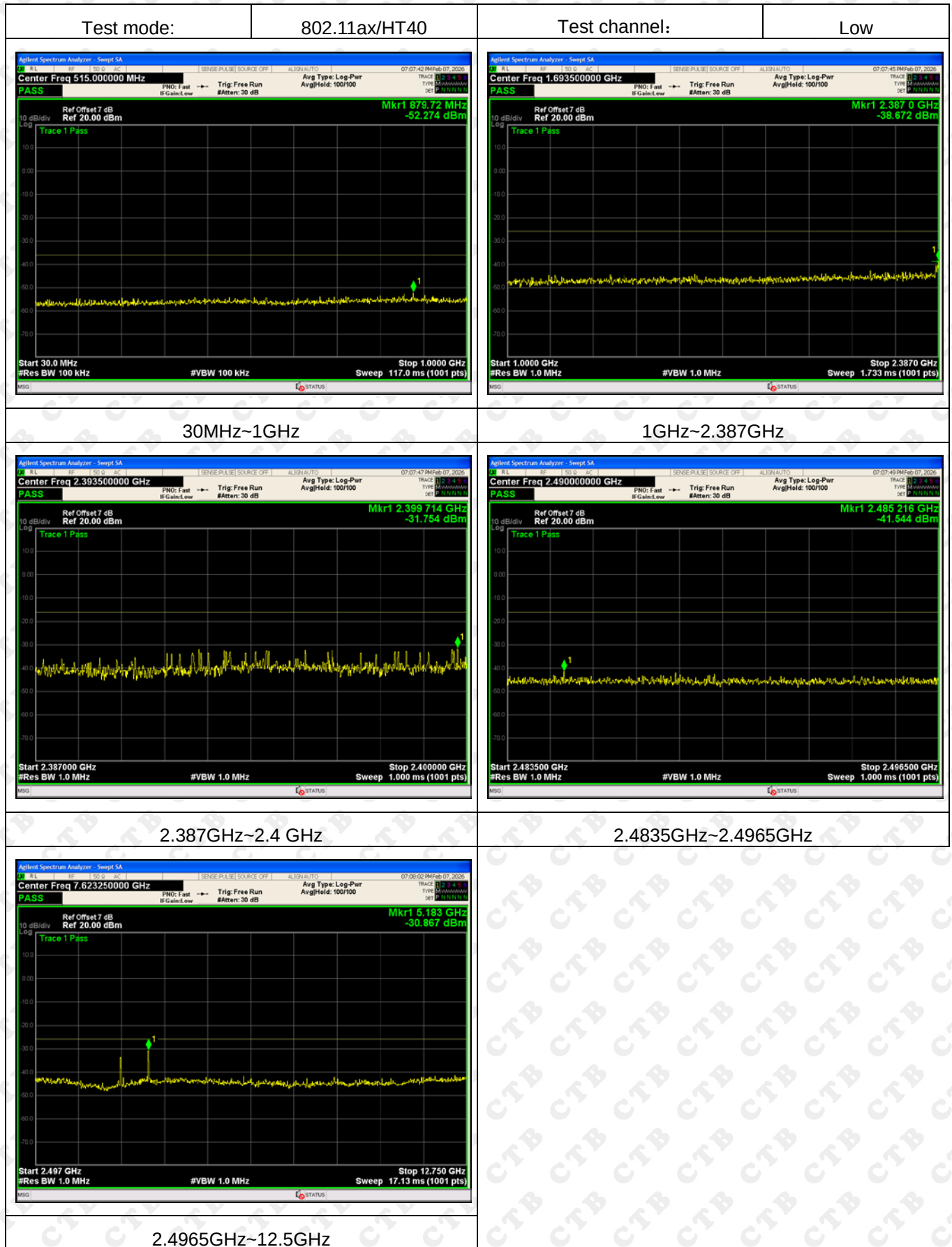
Test mode	Test Channel	Test freq. range	Emission Frequency (MHz)	Test result (dBm/MHz)	Test result (uW/MHz)	limits (uW/MHz)	Result
802.11a x20	Low	30MHz≤f≤1000MHz	851.59	-53.08	0.049	2.5	PASS
		1000MHz < f≤2387MHz	2292.68	-42.83	0.052	2.5	PASS
		2387MHz < f≤2400MHz	2396.01	-39.09	0.123	25	PASS
		2483.5MHz≤f < 2496.5MHz	2486.97	-42.06	0.062	25	PASS
		2496.5MHz≤f < 12750MHz	8956.21	-41.36	0.073	2.5	PASS
	Middle	30MHz≤f≤1000MHz	894.27	-53.28	0.005	2.5	PASS
		1000MHz < f≤2387MHz	2387	-42.28	0.059	2.5	PASS
		2387MHz < f≤2400MHz	2399.51	-43.13	0.049	25	PASS
		2483.5MHz≤f < 2496.5MHz	2490.47	-42.37	0.058	25	PASS
		2496.5MHz≤f < 12750MHz	4536.95	-27.67	1.710	2.5	PASS
	High	30MHz≤f≤1000MHz	770.11	-53.42	0.005	2.5	PASS
		1000MHz < f≤2387MHz	2367.58	-43.05	0.050	2.5	PASS
		2387MHz < f≤2400MHz	2393.55	-43.1	0.049	25	PASS
		2483.5MHz≤f < 2496.5MHz	2485.14	-38.16	0.153	25	PASS
		2496.5MHz≤f < 12750MHz	5941.68	-41.41	0.072	2.5	PASS

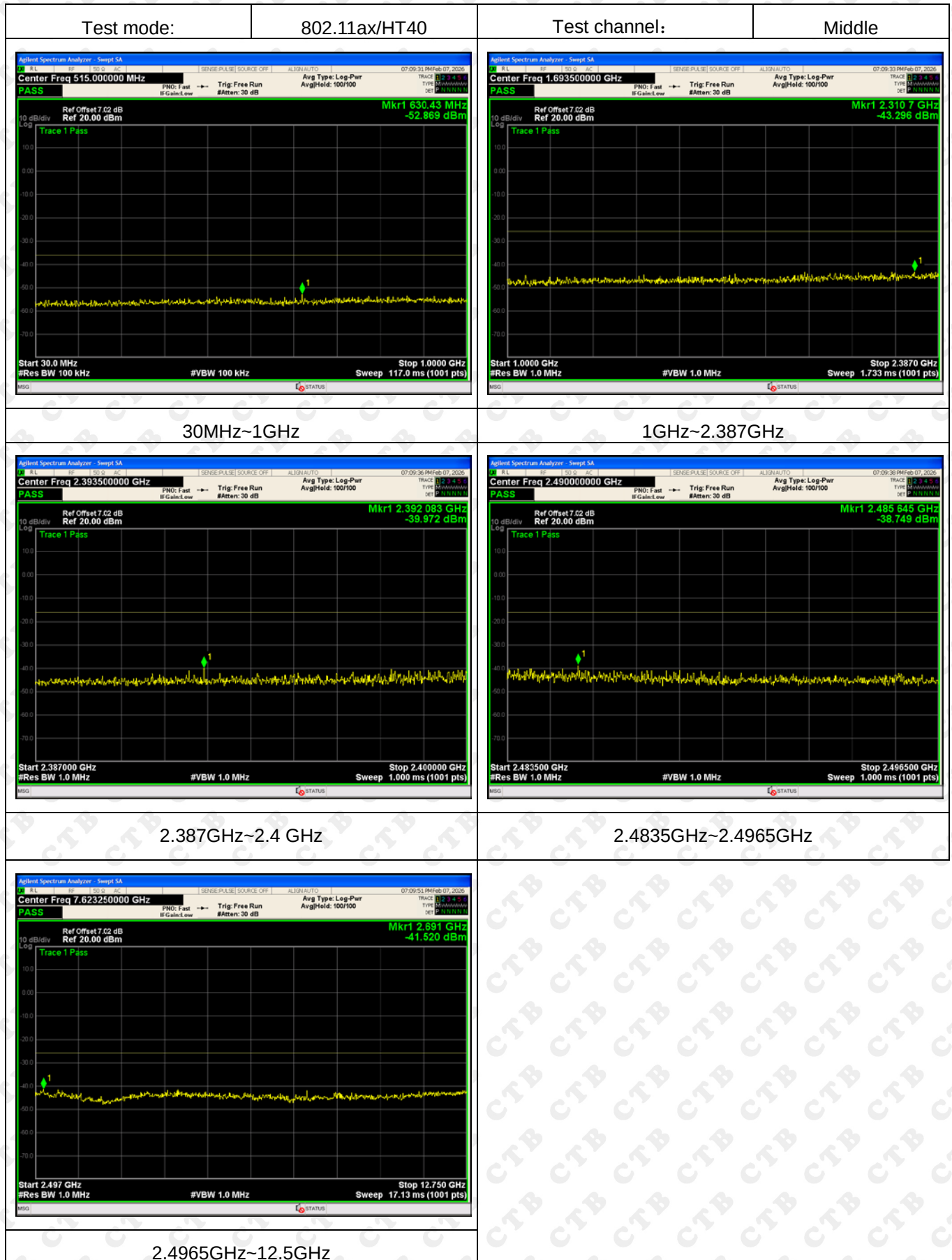


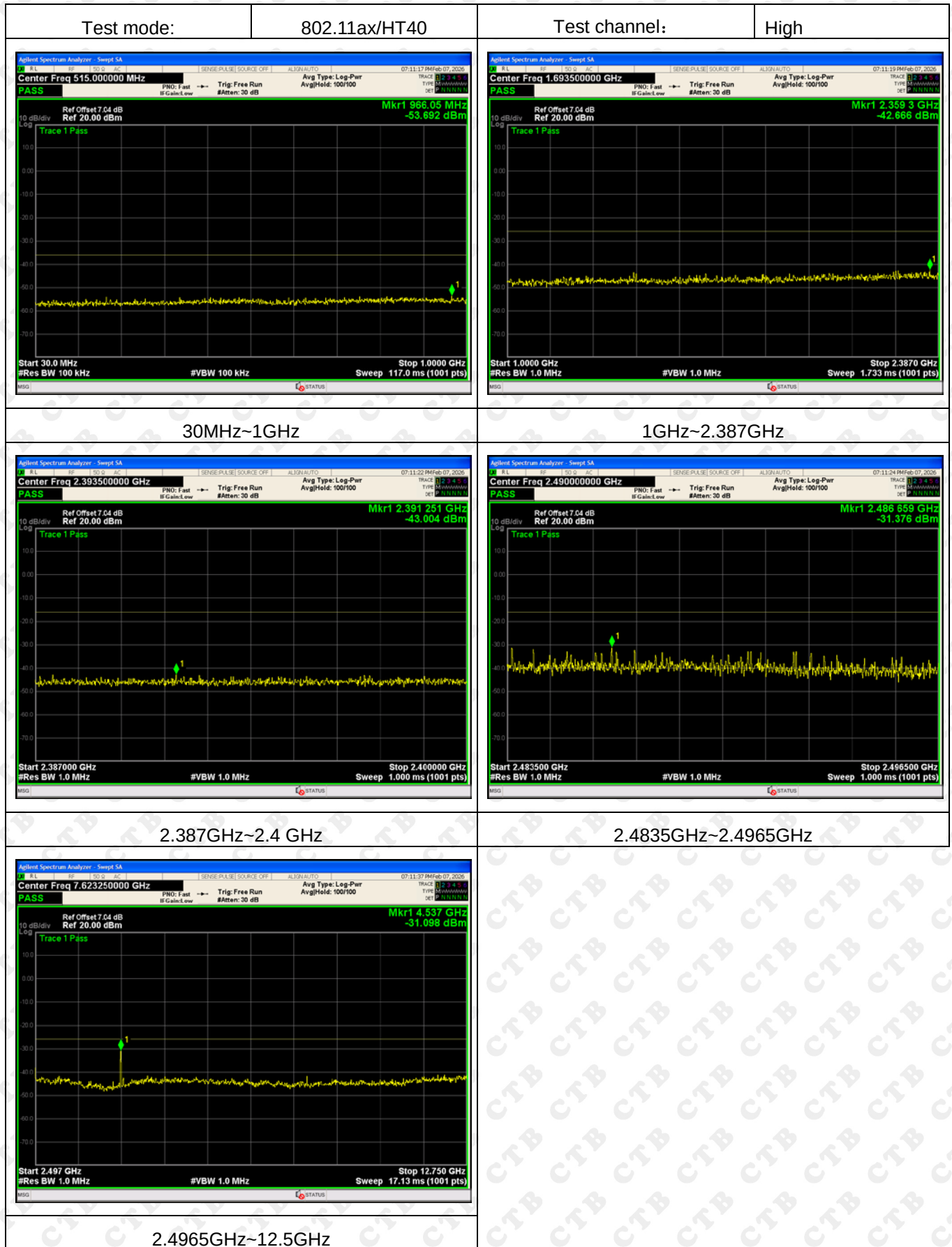




Test mode	Test Channel	Test freq. range	Emission Frequency (MHz)	Test result (dBm/MHz)	Test result (uW/MHz)	limits (uW/MHz)	Result
802.11a x40	Low	30MHz≤f≤1000MHz	879.72	-52.27	0.059	2.5	PASS
		1000MHz < f≤2387MHz	2387	-38.67	0.136	2.5	PASS
		2387MHz < f≤2400MHz	2399.71	-31.75	0.668	25	PASS
		2483.5MHz≤f < 2496.5MHz	2485.22	-41.54	0.070	25	PASS
		2496.5MHz≤f < 12750MHz	5182.92	-30.87	0.818	2.5	PASS
	Middle	30MHz≤f≤1000MHz	630.43	-52.87	0.005	2.5	PASS
		1000MHz < f≤2387MHz	2310.71	-43.3	0.047	2.5	PASS
		2387MHz < f≤2400MHz	2392.08	-39.97	0.101	25	PASS
		2483.5MHz≤f < 2496.5MHz	2485.65	-38.75	0.133	25	PASS
		2496.5MHz≤f < 12750MHz	2691.32	-41.52	0.070	2.5	PASS
	High	30MHz≤f≤1000MHz	966.05	-53.69	0.004	2.5	PASS
		1000MHz < f≤2387MHz	2359.26	-42.67	0.054	2.5	PASS
		2387MHz < f≤2400MHz	2391.25	-43	0.050	25	PASS
		2483.5MHz≤f < 2496.5MHz	2486.66	-31.38	0.728	25	PASS
		2496.5MHz≤f < 12750MHz	4536.95	-31.1	0.776	2.5	PASS







8 UNWANTED EMISSION INTENSITY MEASUREMENT

8.1 LIMIT

Item	Limits
RX Spurious Emission	$\leq 4\text{nW}$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$)

8.2 MEASURING INSTRUMENTS AND SETTING

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
VB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

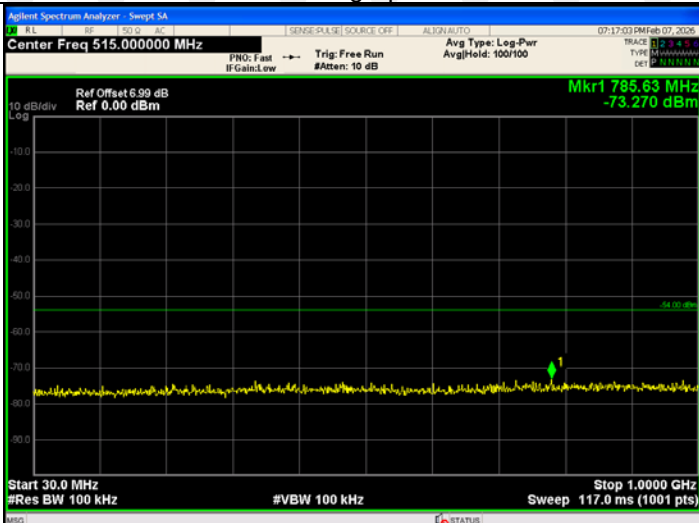
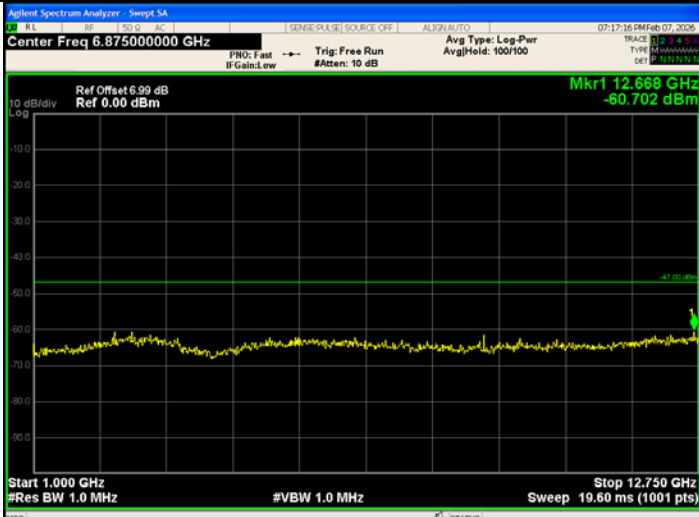
8.3 TEST PROCEDURE

- EUT have the continuous reception mode and fixed only one channelize.
- Setting of SA is following as
RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) /
AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep /
Detect mode: Positive peak / Trace mode: Max hold
- SA set RB: 100 kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
- SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
- If power level of lower emissions are more than 1/10 of limit (0.4nW for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

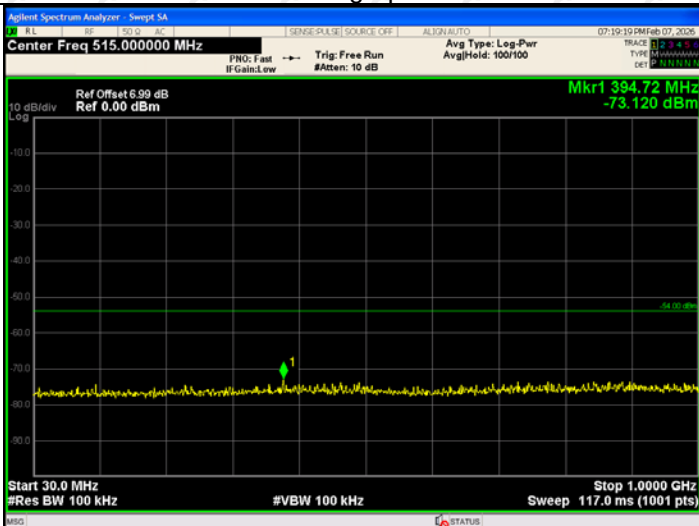
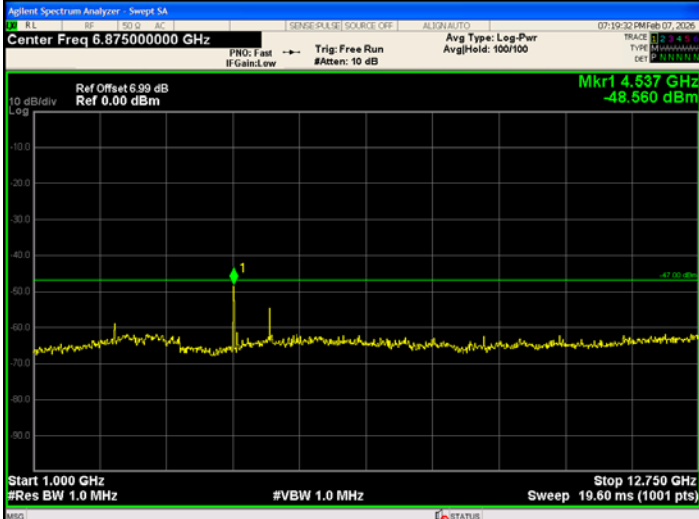
8.4 TEST RESULT

Temperature:	23℃	Relative Humidity:	54%
Test Voltage:	Normal Voltage	Pressure:	101kPa

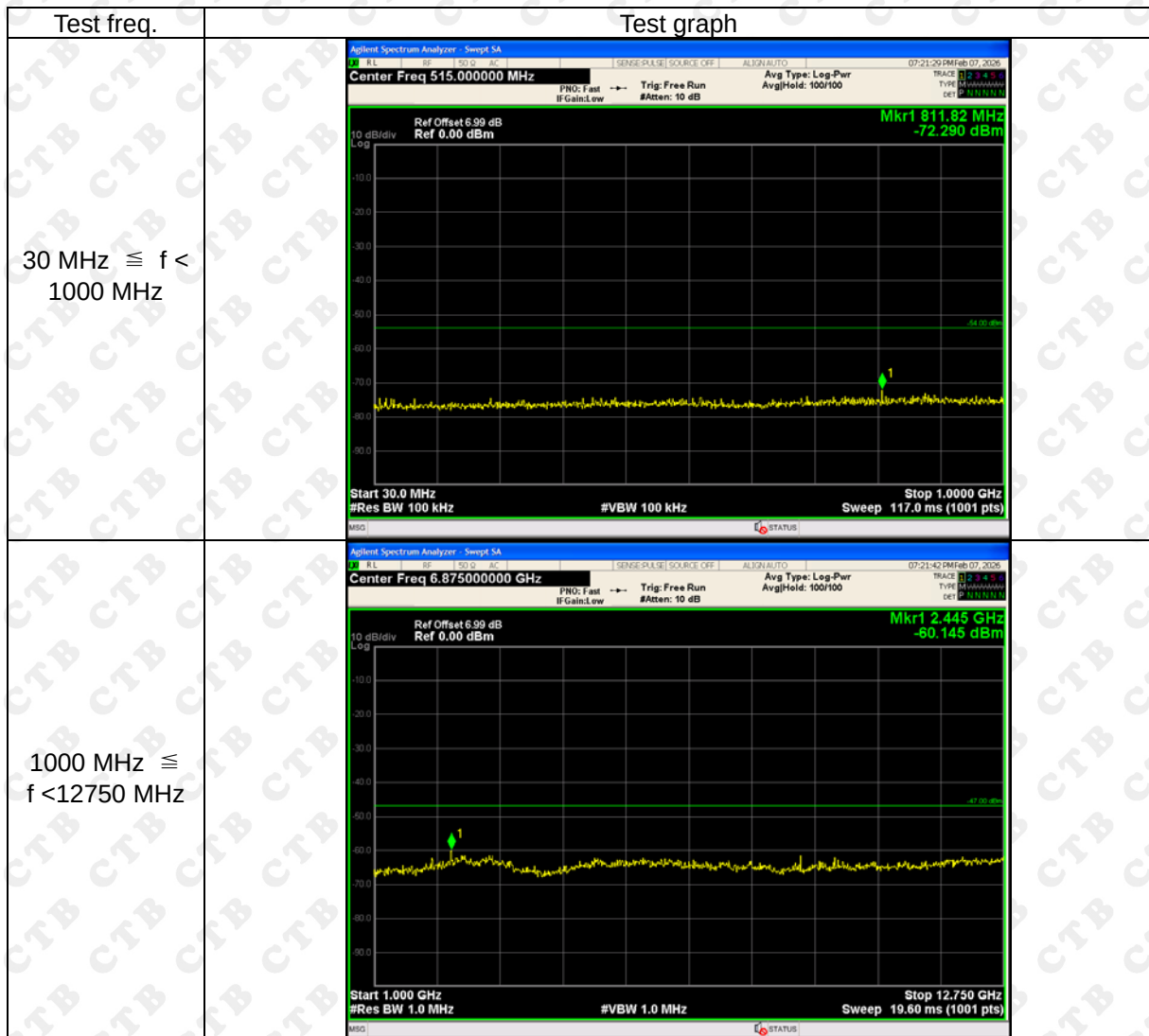
Test mode	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
b mode	30MHz≤f≤1000MHz	785.63	-73.27	0.047	4	PASS
	1000MHz < f≤12750MHz	12667.75	-60.7	0.851	20	PASS

Test freq.	Test graph
30 MHz ≤ f < 1000 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 515.000000 MHz Ref Offset 6.99 dB Ref 0.00 dBm Mkr1 785.63 MHz -73.270 dBm Start 30.0 MHz #Res BW 100 kHz #VBW 100 kHz Sweep 117.0 ms (1001 pts)</p>
1000 MHz ≤ f < 12750 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 6.875000000 GHz Ref Offset 6.99 dB Ref 0.00 dBm Mkr1 12.668 GHz -60.702 dBm Start 1.000 GHz #Res BW 1.0 MHz #VBW 1.0 MHz Sweep 19.60 ms (1001 pts)</p>

Test mode	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
g mode	30MHz≤f≤1000MHz	394.72	-73.12	0.049	4	PASS
	1000MHz < f≤12750MHz	4536.75	-48.56	13.932	20	PASS

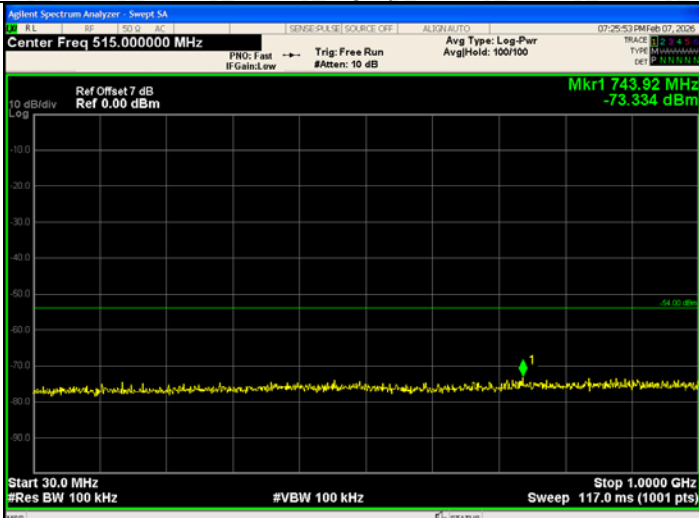
Test freq.	Test graph
$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	
$1000 \text{ MHz} \leq f < 12750 \text{ MHz}$	

Test mode	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
N20 mode	30MHz≤f≤1000MHz	811.82	-72.29	0.059	4	PASS
	1000MHz < f≤12750MHz	2445.25	-60.15	0.966	20	PASS

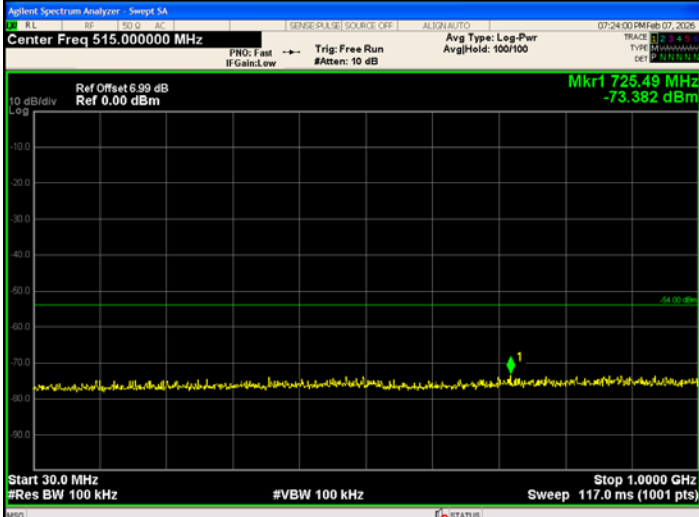
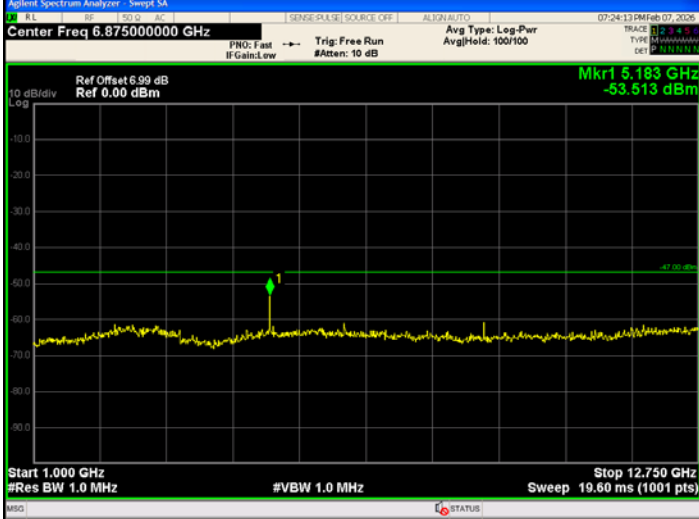


Temperature:	23℃	Relative Humidity:	54%
Test Voltage:	Normal Voltage	Pressure:	101kPa

Test mode	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
N40 mode	30MHz≤f≤1000MHz	743.92	-73.33	0.046	4	PASS
	1000MHz < f≤12750MHz	4536.75	-52.29	5.902	20	PASS

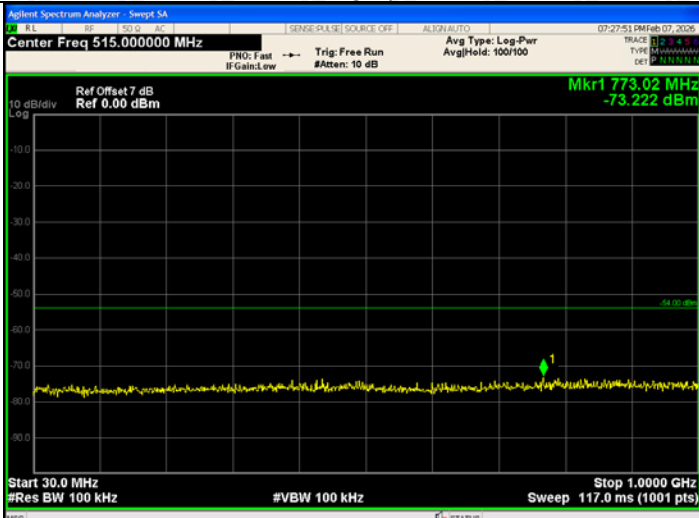
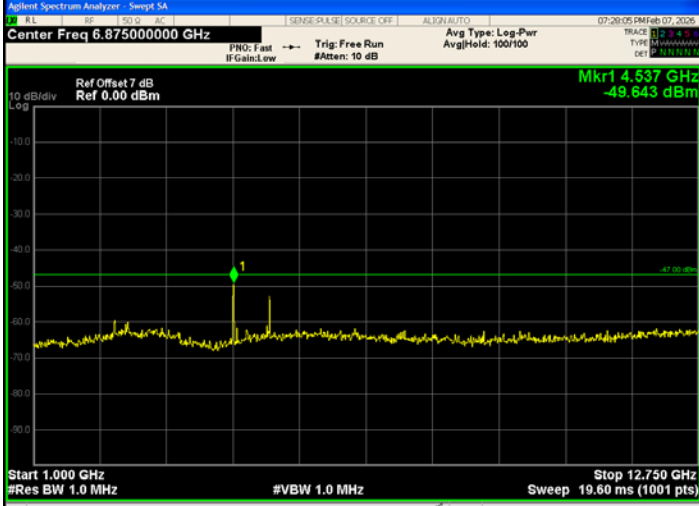
Test freq.	Test graph
30 MHz ≤ f < 1000 MHz	
1000 MHz ≤ f < 12750 MHz	

Test mode	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
ax20 mode	30MHz≤f≤1000MHz	725.49	-73.38	0.046	4	PASS
	1000MHz < f≤12750MHz	5183	-53.51	4.457	20	PASS

Test freq.	Test graph
30 MHz ≤ f < 1000 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 515.000000 MHz Ref Offset 6.99 dB Ref 0.00 dBm Mkr1 725.49 MHz -73.382 dBm Start 30.0 MHz #Res BW 100 kHz #VBW 100 kHz Sweep 117.0 ms (1001 pts)</p>
1000 MHz ≤ f < 12750 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 6.875000000 GHz Ref Offset 6.99 dB Ref 0.00 dBm Mkr1 5183 GHz -53.513 dBm Start 1.000 GHz #Res BW 1.0 MHz #VBW 1.0 MHz Sweep 19.60 ms (1001 pts)</p>

Temperature:	23℃	Relative Humidity:	54%
Test Voltage:	Normal Voltage	Pressure:	101kPa

Test mode	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
ax40 mode	30MHz≤f≤1000MHz	773.02	-73.22	0.048	4	PASS
	1000MHz < f≤12750MHz	4536.75	-49.64	10.864	20	PASS

Test freq.	Test graph
30 MHz ≤ f < 1000 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 515.000000 MHz Ref Offset 7 dB Ref 0.00 dBm Mkr1 773.02 MHz -73.222 dBm Start 30.0 MHz #Res BW 100 kHz #VBW 100 kHz Stop 1.0000 GHz Sweep 117.0 ms (1001 pts)</p>
1000 MHz ≤ f < 12750 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 6.875000000 GHz Ref Offset 7 dB Ref 0.00 dBm Mkr1 4.537 GHz -49.643 dBm Start 1.000 GHz #Res BW 1.0 MHz #VBW 1.0 MHz Stop 12.750 GHz Sweep 19.60 ms (1001 pts)</p>

9 TRANSMISSION ANTENNA GAIN (EIRP ANTENNA POWER) MEASUREMENT

9.1 LIMIT

Item	Limits
EIRP Power Density	$\leq 6.91\text{dBm/MHz}$ (FH form 2427 - 2470.75 MHz) $\leq 12.14\text{dBm/MHz}$ (OFDM,DS from 2400~2483.5MHz) $\leq 12.14\text{dBm}$ (Other from 2400~2483.5MHz)
Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power(Conducted) limit is 10 mW/MHz (10 dBm/MHz), So the test item will be notapplied to the transmission antenna which has a gain of 2.14dBi or less	

9.2 MEASURING INSTRUMENTS AND SETTING

The following table is the setting of Spectrum Analyzer.

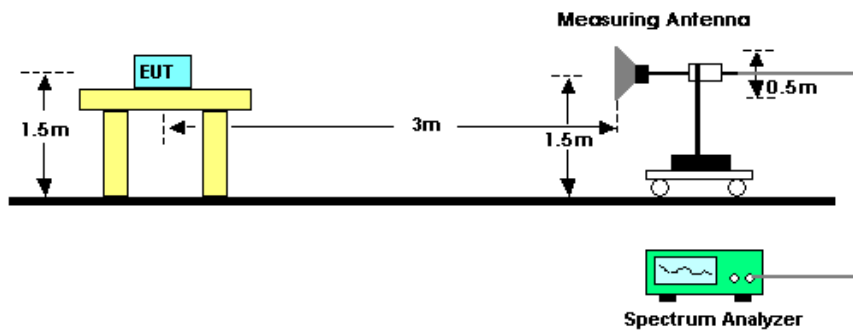
Spectrum Parameter	Setting
Attenuation	Auto
RB/VB	1MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

9.3 TEST PROCEDURE

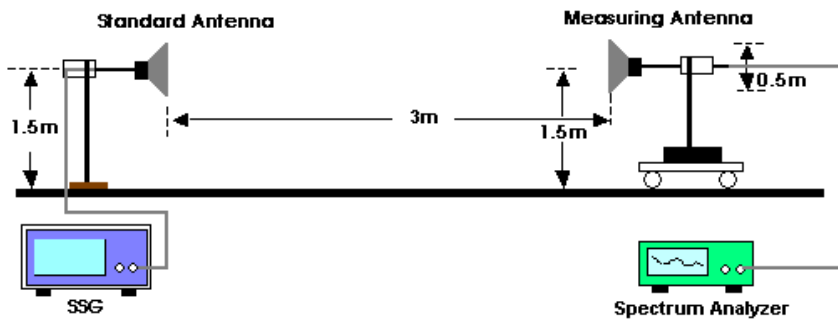
1. Set EUT ad measuring antenna at the same height and roughly facing each other.
2. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of the measuring antenna. The output level at the spectrum analyzer is read sa "E".
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at Pt to give the equivalent output level of "E" or caluate Pt with SSG output which gives the nearest of "E" and difference ($\pm 1\text{dB}$). Record the Pt.
7. Calculate EIRP by the formula below $\text{EIRP} = \text{Gt} - \text{L} + \text{Pt}$. Gt: gain of replacing antenna (dBi)
L: feeder loss between SSG and replacing antenna Pt: Output power of the SSG
8. If the antenna for the EUT has circular polarization, sum of V-field and H-field will be result if measuring antenna is linear polarization.

9.4 TEST SETUP LAYOUT

For EUT radiation measurement



For standard antenna measurement



TEST DEVIATION

There is no deviation with the original standard.

9.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

9.6 TEST RESULT

Test mode	Max Antenna Power (dBm /MHz)	Antenna Gain (dBi)	EIRP(dBm /MHz)
802.11b	5.499	3.27	8.769
802.11g	4.933	3.27	8.203
802.11n(HT20)	4.592	3.27	7.862
802.11ax(HT20)	3.366	3.27	6.636
802.11n(HT40)	4.308	3.27	7.578
802.11ax(HT40)	4.310	3.27	7.58

10 TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT

10.1 LIMIT

Item	Limits
3dB antenna beam width	$360/A$ (If $A < 1$; then $A = 1$) $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$
Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power(Conducted) limit is 10 mW/MHz (10 dBm/MHz), So the test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less	

10.2 MEASURING INSTRUMENTS AND SETTING

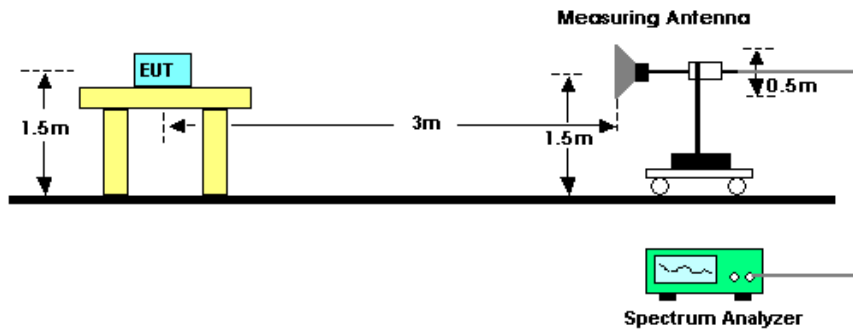
The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0MHz
RB	1MHz
VB	1KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

10.3 TEST PROCEDURE

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.7.2 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of measuring antenna. The output level at the spectrum analyzer is read as "E"
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$). $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$

10.4 TEST SETUP LAYOUT



TEST DEVIATION

There is no deviation with the original standard.

10.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

10.6 TEST RESULT

N/A

Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz

11 RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

11.1 LIMIT

Item	Limits
Identification code	≥ 48 bits

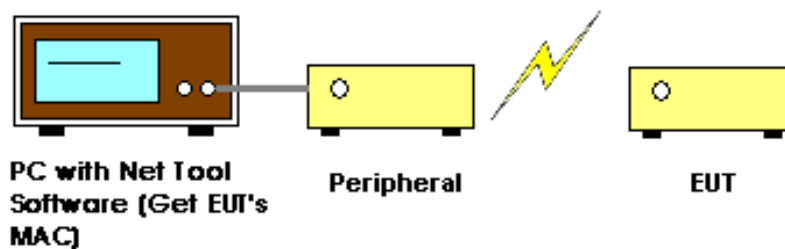
11.2 MEASURING ID CODE SOFTWARE

Item	Limits
MAC IP List	MAC Scan

11.3 TEST PROCEDURE

1. In the case that the EUT has the function of automatically transmitting the identification code:
 - a. Transmit the predetermined identification codes from EUT.
 - b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code:
 - a. Transmit the predetermined identification codes from the counterpart.
 - b. Check if communication is normal.
 - c. Transmit the signals other than predetermined ID codes from the counterpart.
 - d. Check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

11.4 TEST SETUP LAYOUT



TEST DEVIATION

There is no deviation with the original standard.

11.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

11.6 TEST RESULT

Temperature:	23°C	Relative Humidity:	54%
Pressure:	101kPa		
Test Result:	CONFORM		

MAC: 9CA525BA87F7

12 CARRIER SENSING FUNCTION

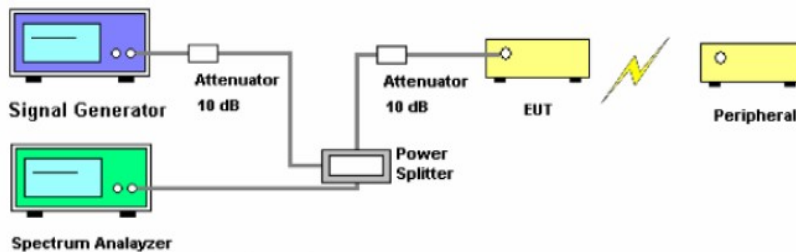
12.1 TEST REQUIREMENT

MIC Notice No.88 Appendix No.43

Article 2, Paragraph 1, Item 19 Rules Section 10

12.2 BLOCK DIAGRAM OF TEST SETUP

❖ Measurement System Diagram



❖ Conditions of Application Equipment (EUT)

- The EUT state shall be "normal mode link with wireless router".

12.3 TEST PROCEDURE

- SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is $(on\ 22.79 + G - 20 \cdot \log(f) \text{ dBm})$ (G is the antenna gain, f is the test frequency).
- Turn off the RF signal of the SG.
- EUT have transmitted the maximum modulation signal and fixed channelize.
- Setting of SA: RBW/BW=1MHz/1MHz, span=50MHz, Sweep time=auto, Sweep mode=continuous, Detect mode=positive peak
- SG RF signal on.
- EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous

12.4 TEST RESULT

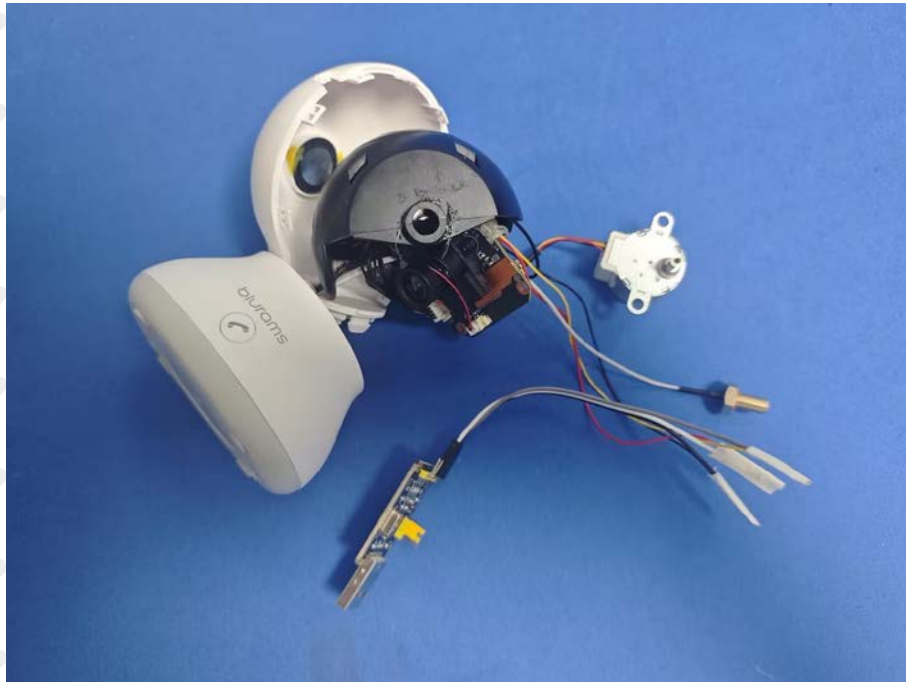
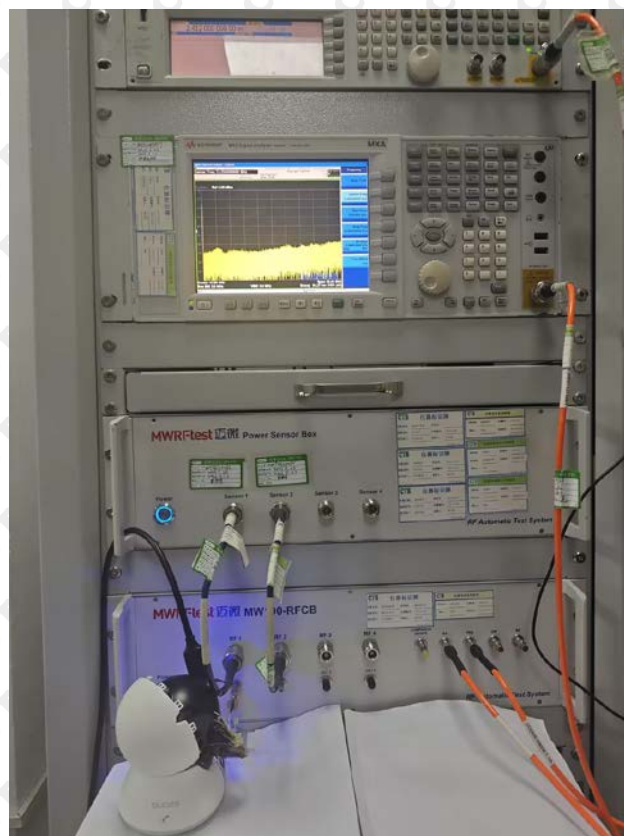
Temperature:	23℃	Relative Humidity:	54%
Pressure:	101kPa		
Test Result:	CONFORM for 802.11n/ax(HT40)		
Note: The EUT cannot transmit radio when the field strength at maximal gain direction of receiving antenna power is over 100mV/m; and The Camera can start to transmit after carrier sensing.			



13 NUMBER OF CARRIERS

This device has more than 1 subcarrier in 1MHz, compliance with the requirement.

14EUT TEST PHOTO



***** END OF REPORT *****