



TEST REPORT

Product Name: Digital photo frame
Trademark: N/A
Model Number: APF1700WIFI
Prepared For: GT Company
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Sample Received Date: May. 19, 2025
Sample tested Date: May. 19, 2025 to Jun. 26, 2025
Issue Date: Jun. 26, 2025
Report No.: CTB25051902203RF02
Test Standards: MIC Notice No.88 Appendix No.45 Item 19-3
Test Results: PASS
Remark: This is 5G WIFI radio test report.

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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.Version

Report No.	Issue Date	Description	Approved
CTB25051902203RF02	Jun. 26, 2025	Original	Valid

2.TEST PROCEDURES AND RESULTS

Test item	Test Requirement	Limit/Severity	Result
Antenna Requirement	Item 19-3 of Article 2 Paragraph 1	Notice 88 Appendix 43,B-1 (1)&(2)	PASS
Frequency Error	Item 19-3 of Article 2 Paragraph 1	+/-20ppm	PASS
Occupied Bandwidth (99%)	Item 19-3 of Article 2 Paragraph 1	W52: Occupied bandwidth: ≤20MHz (20MHz System, OFDM) Occupied bandwidth: ≤40MHz (40MHz System, OFDM) Occupied bandwidth: ≤80MHz (80MHz System, OFDM)	PASS
Adjacent Channel Emitted Power	Item 19-3 of Article 2 Paragraph 1	802.11a/n20/ac20: $F_c \pm 20\text{MHz} \pm 10\text{MHz BW} : -25\text{dBc}$ $F_c \pm 20\text{MHz} \pm 10\text{MHz BW} : -25\text{dBc}$ 802.11n40/ac40: $F_c \pm 40\text{MHz} \pm 20\text{MHz BW} : -25\text{dBc}$ $F_c \pm 80\text{MHz} \pm 20\text{MHz BW} : -40\text{dBc}$ 802.11ac80: $F_c \pm 80\text{MHz} \pm 40\text{MHz BW} : -25\text{dBc}$	PASS
Antenna Power and Tolerance	Item 19-3 of Article 2 Paragraph 1	(1)10mW/MHz(OFDM, DSSS:20MHz system), (2)5mW/MHz(OFDM:40MHz system), (3)2.5mW/MHz(OFDM:80MHz system), (4)10mW/MHz(except above methods), Tolerance : W52: -80%~+20%, W56:-50%~+50%.	PASS
Unwanted Emission Strength	Item 19-3 of Article 2 Paragraph 1	Attachment 1	PASS
Interference Prevention Function	Item 19-3 of Article 2 Paragraph 1	Article 49	PASS
Carrier sense capability	Item 19-3 of Article 2 Paragraph 1	Article 49	PASS
Construction Protection Confirmation	Item 19-3 of Article 2 Paragraph 1	Article 49	PASS
Transmission Burst Length	Item 19-3 of Article 2 Paragraph 1	8ms or less	PASS
Secondary Radiated Emission Strength	Item 19-3 of Article 2 Paragraph 1	(1)Below 1GHz:4nW/100kHz or less (2)1GHz or higher:20nW/MHz or less	PASS

Dynamic Frequency selection(DFS)	Item 19-3 of Article 2 Paragraph 1	WAS/RLAN devices operating in slave mode (slave device) can be operated in a network controlled by aWAN/RLAN device operating in master mode (master device).	N/A
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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.

Parameter	Uncertainty
Frequency error / 99%&90% bandwidth	±54.3Hz
Total RF power, conducted	±1.0dB
Spurious emissions, conducted	±2.8dB
DC and low frequency voltages	±3%
Humidity	±5.3%
Temperature	±0.59℃

4.GENERAL INFORMATION

4.1 GENERAL DESCRIPTION OF EUT

Model(s):	APF1700WIFI
Model Description:	N/A
Wi-Fi Specification:	IEEE 802.11a/n/ac/ax
Hardware Version:	JHA133_UT-C V1.0 20221117
Software Version:	JH-A133-17-LVDS-V1.0
Operation Frequency:	IEEE 802.11a/n/ac/ax(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11n/ac/ax(40M): 5150MHz ~5250MHz/ 2 channel
Rate Output power:	802.11a: 4mW/MHz 802.11ac(VHT20): 4mW/MHz 802.11ac(VHT40): 2mW/MHz 802.11n(HT20): 4mW/MHz 802.11n(HT40): 2mW/MHz 802.11ax(HE20): 4mW/MHz 802.11ax(HE40): 2mW/MHz
Type of Modulation:	OFDM, OFDMA
Antenna installation:	FPC antenna
Antenna Gain:	3.76dBi
Ratings:	For adapter: Internal:100-240V~50/60Hz 1A Output: 12V=2.0A 24.0W

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

4.2 Channel list

For 802.11a/n/ac/ax(20M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz
For 802.11n/ac/ax(40M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

4.3 Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Gain(dBi)	NOTE
1	N/A	5.2G antenna	PCB antenna	3.76dBi	N/A

4.4 DESCRIPTION OF TEST MODES

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
802.11a/n/ac/ax(20M)	5150MHz ~5250 MHz	Channel 36	Channel 40	Channel 48
		5180MHz	5200MHz	5240MHz
802.11n/ac/ax(40M)	5150MHz ~5250 MHz	Channel 38	N/A	Channel 46
		5190MHz	N/A	5230MHz

4.5 TEST CONDITIONS

Supply Voltage					
<div></div>	Adapter power V	Module input power V	Rated module power V	Tolerance (%)	
Normal	100	3.3	3.3		
+10%	110	3.3	3.3		0
-10%	90	3.3	3.3		0
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.					

4.6 Block diagram showing the configuration of system tested

Transmitting mode



4.7 DESCRIPTION OF SUPPORT UNITS(CONDUCTEDMODE)

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	Equipment	Mfr/Brand	Model/Type No.	Note
1	Digital photo frame	N/A	APF1700WIFI	EUT
2	AC/DC ADAPTER	Xinchuang	XC024WZ-1202000J	EUT

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”.

4.8 MEASUREMENT INSTRUMENTS LIST

No.	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	A.14.16	2025/6/28
2	Power Sensor	Agilent	U2021XA	MY56120032	/	2025/6/28
3	Power Sensor	Agilent	U2021XA	MY56120034	/	2025/6/28
4	Communication test set	R&S	CMW500	108058	V3.5.80	2025/6/28
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2025/6/28
6	Signal Generator	Agilent	N5181A	MY50140365	A.01.60	2025/6/28
7	Vector signal generator	Agilent	N5182A	MY47420195	A.01.87	2025/6/28
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2025/6/28
9	2.4 GHz Filter	Shenxiang	MSF2400-24 83.5MS-1154	20181015001	/	2025/6/30
10	5 GHz Filter	Shenxiang	MSF5150-58 50MS-1155	20181015001	/	2025/6/30
11	Filter	Xingbo	XBLBQ-DZA 120	190821-1-1	/	2025/6/30
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	/	2025/6/28
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	/	2025/6/28
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)	2025/6/28
18	Amplifier	HP	8447E	2945A02747	/	2025/6/28

19	Amplifier	Agilent	8449B	3008A01838	/	2025/6/28
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	/	2025/6/28
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	/	2025/6/28
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2025/6/28
24	loop antenna	ZHINAN	ZN30900A	GTS534	/	/
25	40G Horn antenna	A/H/System	SAS-574	588	/	2025/6/28
26	Amplifier	AEROFLEX	Aeroflex	097	/	2025/6/28
27	Power Metter	KEYSIGHT	N1912AP	N/A	A.05.00	2025/6/28
28	DC power supply	Agilent	E3640A	MY53050046	/	2025/6/28

Remark: Calibration institution "Guangzhou Lisai Measurement and Testing Co., LTD."

5. Antenna Requirement

Standard requirement
Applicable for equipment with an antenna terminal, including testing terminals) If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.
EUT Antenna
The best case gain of the antenna is 3.76dBi. FPC antenna
Result: An antenna connector is available; all relevant tests will be carried out conducted.

6. Frequency Error

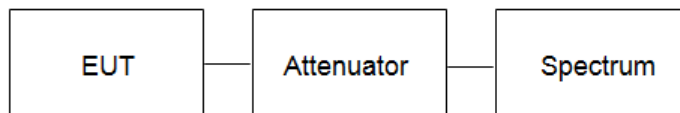
6.1 LIMIT

Item	Limits
Frequency Error	+/-20ppm

6.2 TEST PROCEDURE

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW=10k, VBW=10 kHz, Span = 1MHz.
- 4 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided emission is repetitive in nature.
5. Repeat above procedures until all frequency measured was complete.

6.3 Test Setup Block Diagram

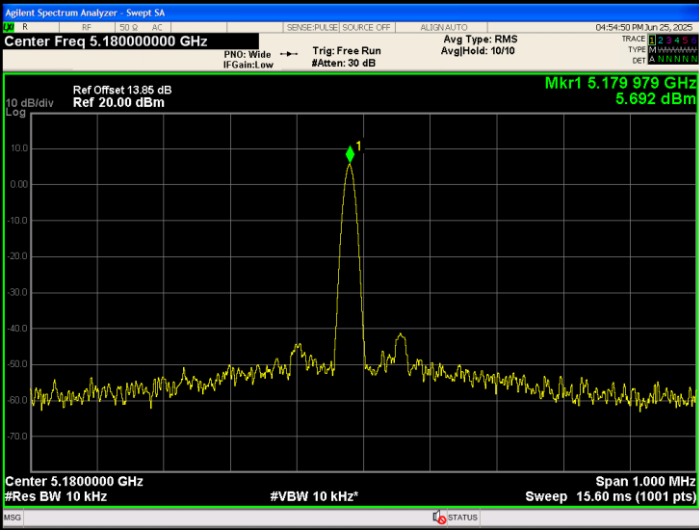
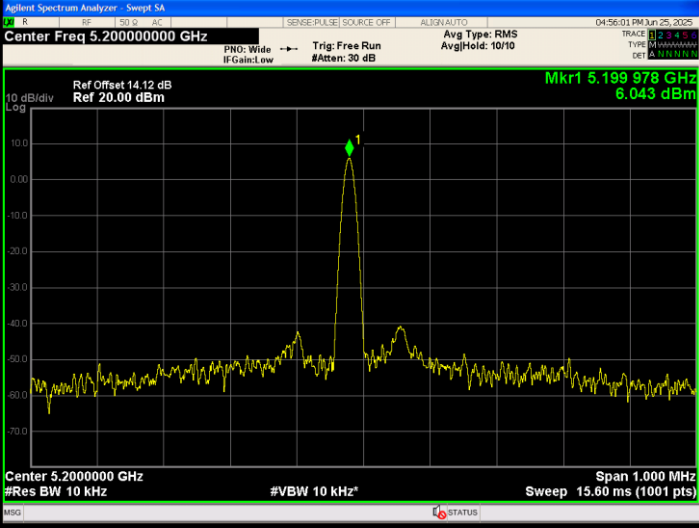
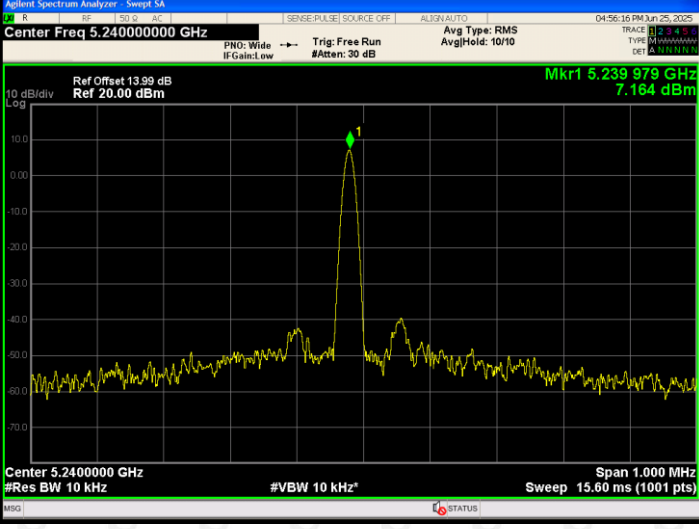


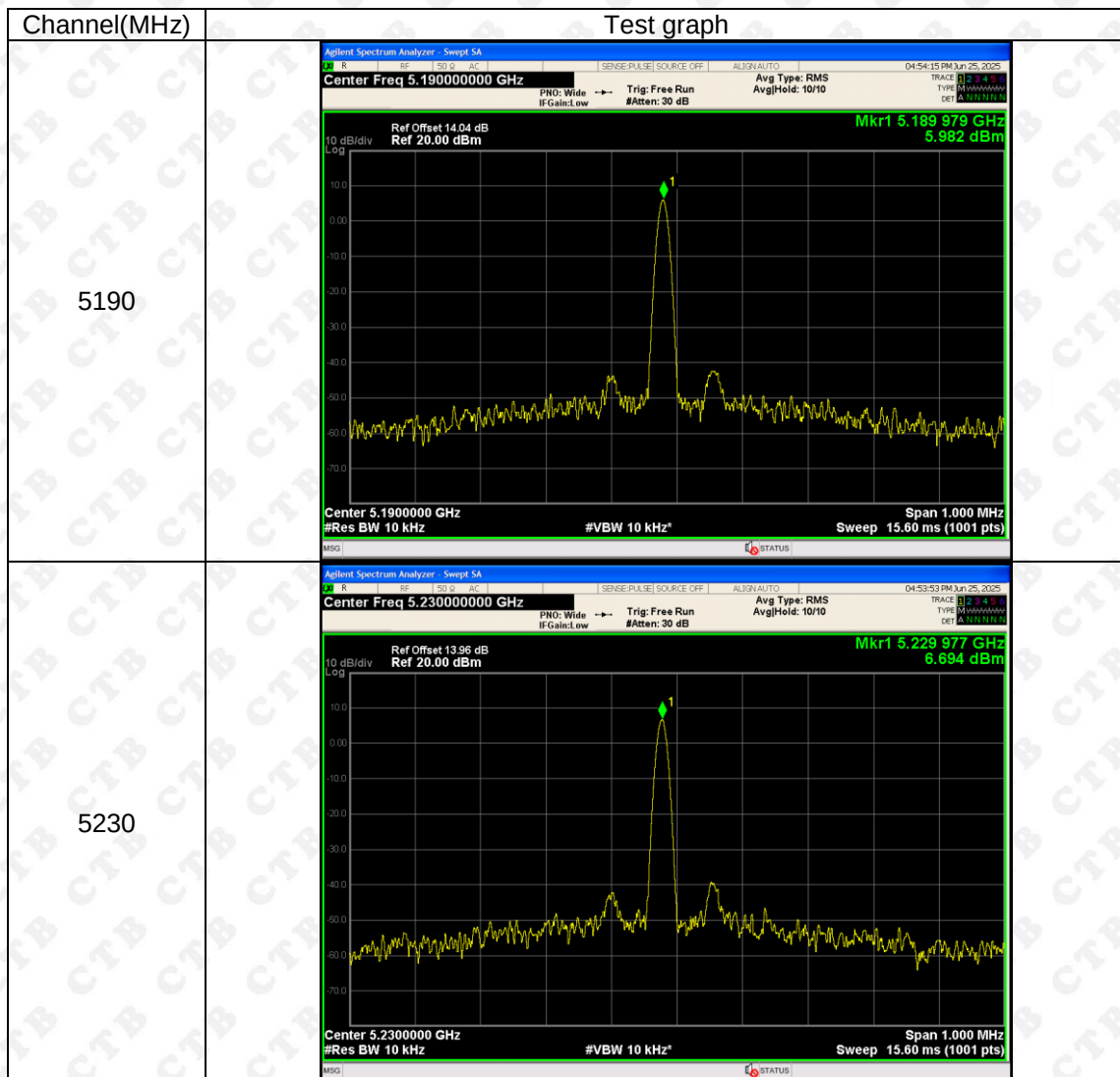
6.4 TEST RESULT

Test condition	Test Frequency	Measured	Tolerance	Test Result	Limit
	MHz	MHz	MHz	ppm	ppm
NVNT W52	5180	5179.979	-0.021	-4.054	+/-20
	5200	5199.978	-0.022	-4.231	+/-20
	5240	5239.979	-0.021	-4.008	+/-20
	5190	5189.979	-0.021	-4.046	+/-20
	5230	5229.977	-0.023	-4.398	+/-20

NVNT- W52

Test graph

Channel(MHz)	
5180	
5200	
5240	



7. Occupied Bandwidth (99%)

7.1 LIMIT

W52:

Occupied bandwidth: $\leq 18\text{MHz}$ (20MHz System, DSSS)

Occupied bandwidth: $\leq 20\text{MHz}$ (20MHz System, OFDM)

Occupied bandwidth: $\leq 40\text{MHz}$ (40MHz System, OFDM)

Occupied bandwidth: $\leq 80\text{MHz}$ (80MHz System, OFDM)

7.2 TEST PROCEDURE

(1) Set up the spectrum analyzer as the follows:

Center frequency: Test frequency

Sweep bandwidth: 2 to 3.5 times of allowance

Resoluble bandwidth: less than 3% of allowance

Video bandwidth: Equivalent to resolvable bandwidth

Sweep time: Minimum time by which measuring accuracy is assured (In case of burst wave, 1 burst shall be contained per 1 sample)

Sampling points: More than 400 points

Sweep mode: Continuous sweeping

Detection mode: Positive peak

Display mode: Maximum holding

(2) Repeat the sweeping till no change was observed on the display and enter all values of data point to the computer as array variable.

(3) About all data, convert dB value to antilogarithm of electric power dimension.

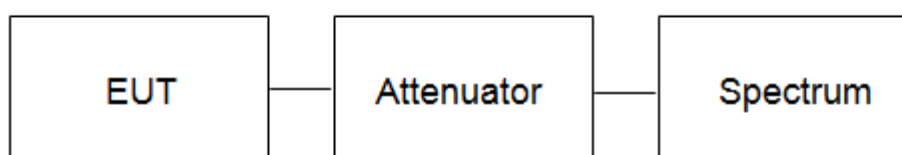
(4) Add up the electric power of all data and record it as "Sum total of electric power".

(5) Adding up data in order from the lowest frequency to upper frequencies, look for a limit point where the value reaches to 0.5% (5% in case of diffusion bandwidth) of "Sum total of electric power". Convert the limit point to frequency and record as "Lowest limit frequency".

(6) Adding up data in order from the highest frequency to lower frequencies, look for a limit point where the value reaches to 0.5% (5% in case of diffusion bandwidth) of "Sum total of electric power". Convert the limit point to frequency and record as "Highest limit frequency".

(7) Repeat above procedures until all frequency measured was complete.

7.3 TEST SETUP BLOCK DIAGRAM



7.4 TEST RESULT

W52

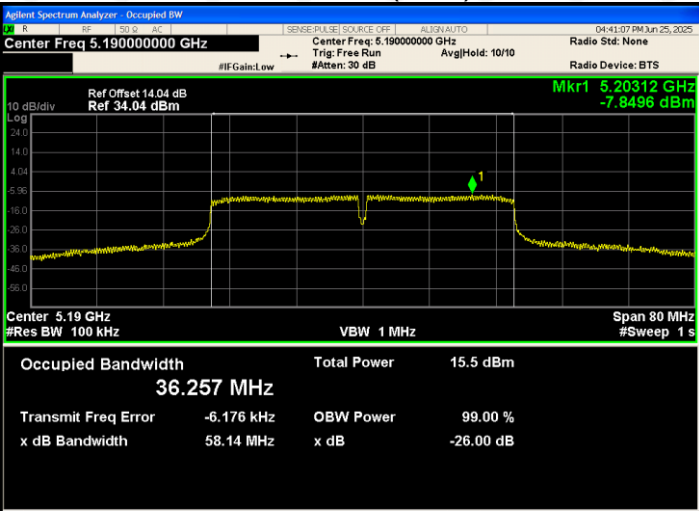
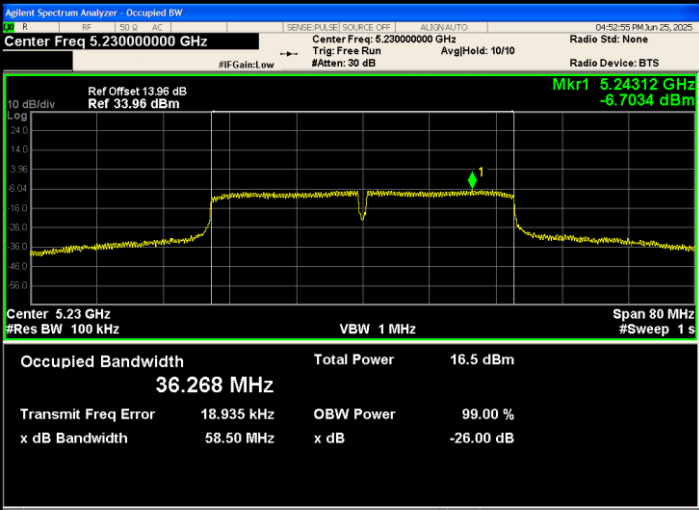
Normal Voltage					
Mode	Channel (MHz)	Occupy Bandwidth (MHz)	Limit (MHz)		
802.11a	LCH	16.9599	≤20		
	MCH	16.5783			
	HCH	17.7896			
802.11n(HT20)	LCH	17.8890	≤20		
	MCH	17.6740			
	HCH	17.6984			
802.11ac(VHT20)	LCH	17.8707		≤20	
	MCH	17.6727			
	HCH	17.7027			
802.11ax(HE20)	LCH	17.8636			≤20
	MCH	17.6723			
	HCH	17.7042			
802.11n(HT40)	LCH	36.2566	≤40		
	MCH	/			
	HCH	36.2683			
802.11ac(VHT40)	LCH	36.2568		≤40	
	MCH	/			
	HCH	36.2703			
802.11ax(HE40)	LCH	36.2548			≤40
	MCH	/			
	HCH	36.2764			
Result	Pass				

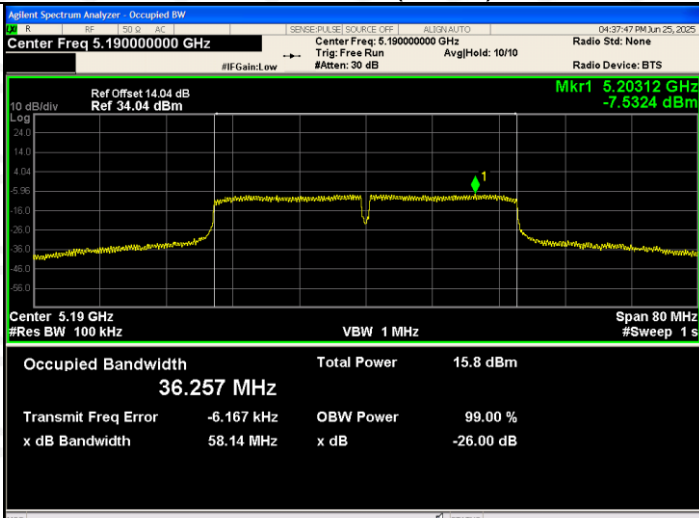
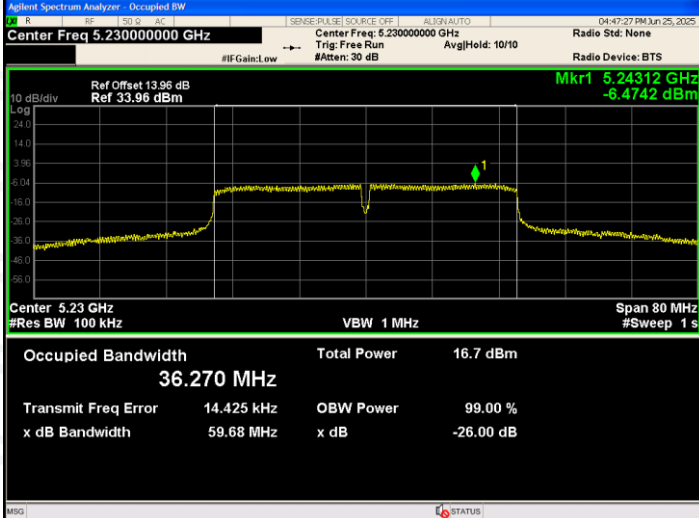
Channel(MHz)	W52:802.11a
5180	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.180000000 GHz</p> <p>Ref Offset 13.85 dB Ref 33.85 dBm</p> <p>Mkr1 5.18652 GHz -3.2943 dBm</p> <p>Center 5.18 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 16.960 MHz</p> <p>Total Power 16.6 dBm</p> <p>Transmit Freq Error -26.022 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 34.38 MHz</p> <p>x dB -26.00 dB</p>
5200	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.200000000 GHz</p> <p>Ref Offset 14.12 dB Ref 34.12 dBm</p> <p>Mkr1 5.20652 GHz -3.2524 dBm</p> <p>Center 5.2 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 16.578 MHz</p> <p>Total Power 16.6 dBm</p> <p>Transmit Freq Error -30.734 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 30.95 MHz</p> <p>x dB -26.00 dB</p>
5240	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.240000000 GHz</p> <p>Ref Offset 13.99 dB Ref 33.99 dBm</p> <p>Mkr1 5.24588 GHz -3.4485 dBm</p> <p>Center 5.24 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.790 MHz</p> <p>Total Power 17.0 dBm</p> <p>Transmit Freq Error -2.159 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 33.54 MHz</p> <p>x dB -26.00 dB</p>

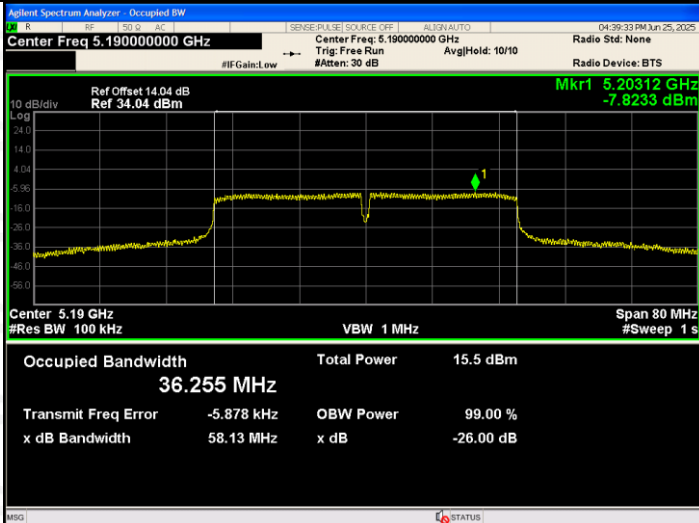
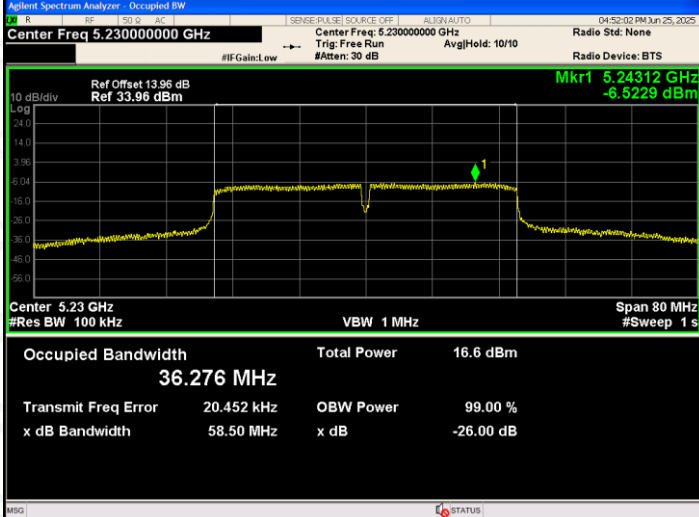
Channel(MHz)	W52:802.11n(HT20)
5180	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.180000000 GHz</p> <p>Ref Offset 13.85 dB Ref 33.85 dBm</p> <p>Mkr1 5.1862 GHz -3.4174 dBm</p> <p>Center 5.18 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.889 MHz</p> <p>Total Power 16.8 dBm</p> <p>Transmit Freq Error 10.272 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 36.01 MHz</p> <p>x dB -26.00 dB</p>
5200	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.200000000 GHz</p> <p>Ref Offset 14.12 dB Ref 34.12 dBm</p> <p>Mkr1 5.2062 GHz -4.1380 dBm</p> <p>Center 5.2 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.674 MHz</p> <p>Total Power 16.0 dBm</p> <p>Transmit Freq Error -19.367 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 26.98 MHz</p> <p>x dB -26.00 dB</p>
5240	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.240000000 GHz</p> <p>Ref Offset 13.99 dB Ref 33.99 dBm</p> <p>Mkr1 5.2462 GHz -3.4643 dBm</p> <p>Center 5.24 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.698 MHz</p> <p>Total Power 16.7 dBm</p> <p>Transmit Freq Error -9.207 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 29.72 MHz</p> <p>x dB -26.00 dB</p>

Channel(MHz)	W52:802.11ac(VHT20)
5180	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.180000000 GHz</p> <p>Ref Offset 13.85 dB Ref 33.85 dBm</p> <p>Mkr1 5.18624 GHz -3.6842 dBm</p> <p>Center 5.18 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.871 MHz</p> <p>Total Power 16.5 dBm</p> <p>Transmit Freq Error 2.869 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 36.00 MHz</p> <p>x dB -26.00 dB</p>
5200	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.200000000 GHz</p> <p>Ref Offset 14.12 dB Ref 34.12 dBm</p> <p>Mkr1 5.20624 GHz -4.4641 dBm</p> <p>Center 5.2 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.673 MHz</p> <p>Total Power 15.7 dBm</p> <p>Transmit Freq Error -20.169 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 26.00 MHz</p> <p>x dB -26.00 dB</p>
5240	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.240000000 GHz</p> <p>Ref Offset 13.99 dB Ref 33.99 dBm</p> <p>Mkr1 5.24624 GHz -3.3326 dBm</p> <p>Center 5.24 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.703 MHz</p> <p>Total Power 16.8 dBm</p> <p>Transmit Freq Error -7.933 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 29.72 MHz</p> <p>x dB -26.00 dB</p>

Channel(MHz)	W52:802.11ax(HE20)
5180	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.180000000 GHz</p> <p>Ref Offset 13.85 dB Ref 33.85 dBm</p> <p>Mkr1 5.18624 GHz -3.6898 dBm</p> <p>Center 5.18 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.864 MHz</p> <p>Total Power 16.5 dBm</p> <p>Transmit Freq Error 983 Hz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 35.97 MHz</p> <p>x dB -26.00 dB</p>
5200	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.200000000 GHz</p> <p>Ref Offset 14.12 dB Ref 34.12 dBm</p> <p>Mkr1 5.20624 GHz -4.4992 dBm</p> <p>Center 5.2 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.672 MHz</p> <p>Total Power 15.7 dBm</p> <p>Transmit Freq Error -19.900 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 26.97 MHz</p> <p>x dB -26.00 dB</p>
5240	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.240000000 GHz</p> <p>Ref Offset 13.99 dB Ref 33.99 dBm</p> <p>Mkr1 5.24624 GHz -3.2782 dBm</p> <p>Center 5.24 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 40 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 17.704 MHz</p> <p>Total Power 16.8 dBm</p> <p>Transmit Freq Error -7.187 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 29.73 MHz</p> <p>x dB -26.00 dB</p>

Channel(MHz)	W52:802.11n(HT40)
5190	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.190000000 GHz</p> <p>Ref Offset 14.04 dB Ref 34.04 dBm</p> <p>Mkr1 5.20312 GHz -7.8496 dBm</p> <p>Center 5.19 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 80 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 36.257 MHz</p> <p>Total Power 15.5 dBm</p> <p>Transmit Freq Error -6.176 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 58.14 MHz</p> <p>x dB -26.00 dB</p>
5230	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.230000000 GHz</p> <p>Ref Offset 13.96 dB Ref 33.96 dBm</p> <p>Mkr1 5.24312 GHz -6.7034 dBm</p> <p>Center 5.23 GHz #Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 80 MHz #Sweep 1 s</p> <p>Occupied Bandwidth 36.268 MHz</p> <p>Total Power 16.5 dBm</p> <p>Transmit Freq Error 18.935 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 58.50 MHz</p> <p>x dB -26.00 dB</p>

Channel(MHz)	W52:802.11ac (VHT40)
5190	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.190000000 GHz</p> <p>Ref Offset 14.04 dB</p> <p>Ref 34.04 dBm</p> <p>Mkr1 5.20312 GHz</p> <p>-7.5324 dBm</p> <p>Center 5.19 GHz</p> <p>#Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 80 MHz</p> <p>#Sweep 1 s</p> <p>Occupied Bandwidth 36.257 MHz</p> <p>Total Power 15.8 dBm</p> <p>Transmit Freq Error -6.167 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 58.14 MHz</p> <p>x dB -26.00 dB</p>
5230	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.230000000 GHz</p> <p>Ref Offset 13.96 dB</p> <p>Ref 33.96 dBm</p> <p>Mkr1 5.24312 GHz</p> <p>-6.4742 dBm</p> <p>Center 5.23 GHz</p> <p>#Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 80 MHz</p> <p>#Sweep 1 s</p> <p>Occupied Bandwidth 36.270 MHz</p> <p>Total Power 16.7 dBm</p> <p>Transmit Freq Error 14.425 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 59.68 MHz</p> <p>x dB -26.00 dB</p>

Channel(MHz)	W52:802.11ax (HE40)
5190	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.190000000 GHz</p> <p>Ref Offset 14.04 dB</p> <p>Ref 34.04 dBm</p> <p>Mkr1 5.20312 GHz</p> <p>-7.8233 dBm</p> <p>Center 5.19 GHz</p> <p>#Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 80 MHz</p> <p>#Sweep 1 s</p> <p>Occupied Bandwidth 36.255 MHz</p> <p>Total Power 15.5 dBm</p> <p>Transmit Freq Error -5.878 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 58.13 MHz</p> <p>x dB -26.00 dB</p>
5230	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 5.230000000 GHz</p> <p>Ref Offset 13.96 dB</p> <p>Ref 33.96 dBm</p> <p>Mkr1 5.24312 GHz</p> <p>-6.5229 dBm</p> <p>Center 5.23 GHz</p> <p>#Res BW 100 kHz</p> <p>VBW 1 MHz</p> <p>Span 80 MHz</p> <p>#Sweep 1 s</p> <p>Occupied Bandwidth 36.276 MHz</p> <p>Total Power 16.6 dBm</p> <p>Transmit Freq Error 20.452 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 58.50 MHz</p> <p>x dB -26.00 dB</p>

8. Adjacent Channel Emitted Power

8.1 LIMIT

W52

For system OBW<20MHz

$F_c \pm 20\text{MHz} \pm 10\text{MHz BW} : -25\text{dBc}$

$F_c \pm 40\text{MHz} \pm 10\text{MHz BW} : -40\text{dBc}$

For system OBW≤20MHz

$F_c \pm 20\text{MHz} \pm 10\text{MHz BW} : -25\text{dBc}$

$F_c \pm 40\text{MHz} \pm 10\text{MHz BW} : -40\text{dBc}$

For system OBW≤40MHz

$F_c \pm 40\text{MHz} \pm 20\text{MHz BW} : -25\text{dBc}$

$F_c \pm 80\text{MHz} \pm 20\text{MHz BW} : -40\text{dBc}$

For system OBW≤80MHz

$F_c \pm 80\text{MHz} \pm 40\text{MHz BW} : -25\text{dBc}$

For system OBW≤80MHz +80MHz (Not adjacent band)

$F_c \pm 80\text{MHz} \pm 40\text{MHz BW} : -25\text{dBc}$

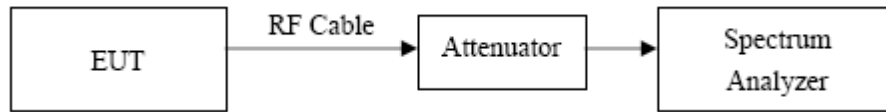
For system OBW≤160MHz

N/A

8.2 TEST PROCEDURE

- (1) A spectrum In case of conducted measurements, the radio device shall be connected to the measuring equipment via a suitable attenuator.
- (2) The measurement equipment shall be set for sample hold mode of operation.
- (3) the transmitter shall be operated at the receiving mode.
- (4) The resolution bandwidth shall be set to ref. the limits , and the sweep time shall be set to auto mode, to ensure all major modulation products are captured.
- (5) When the searched result is less than the specified limit, the maximum one shall be recorded, when the result is more than the specified limit, all measured values shall be recorded.
- (6) This measurement shall be repeated with the transmitter in standby mode where applicable.
- (7) Repeat above procedures until all frequency measured was complete.

8.3 TEST SETUP Block Diagram

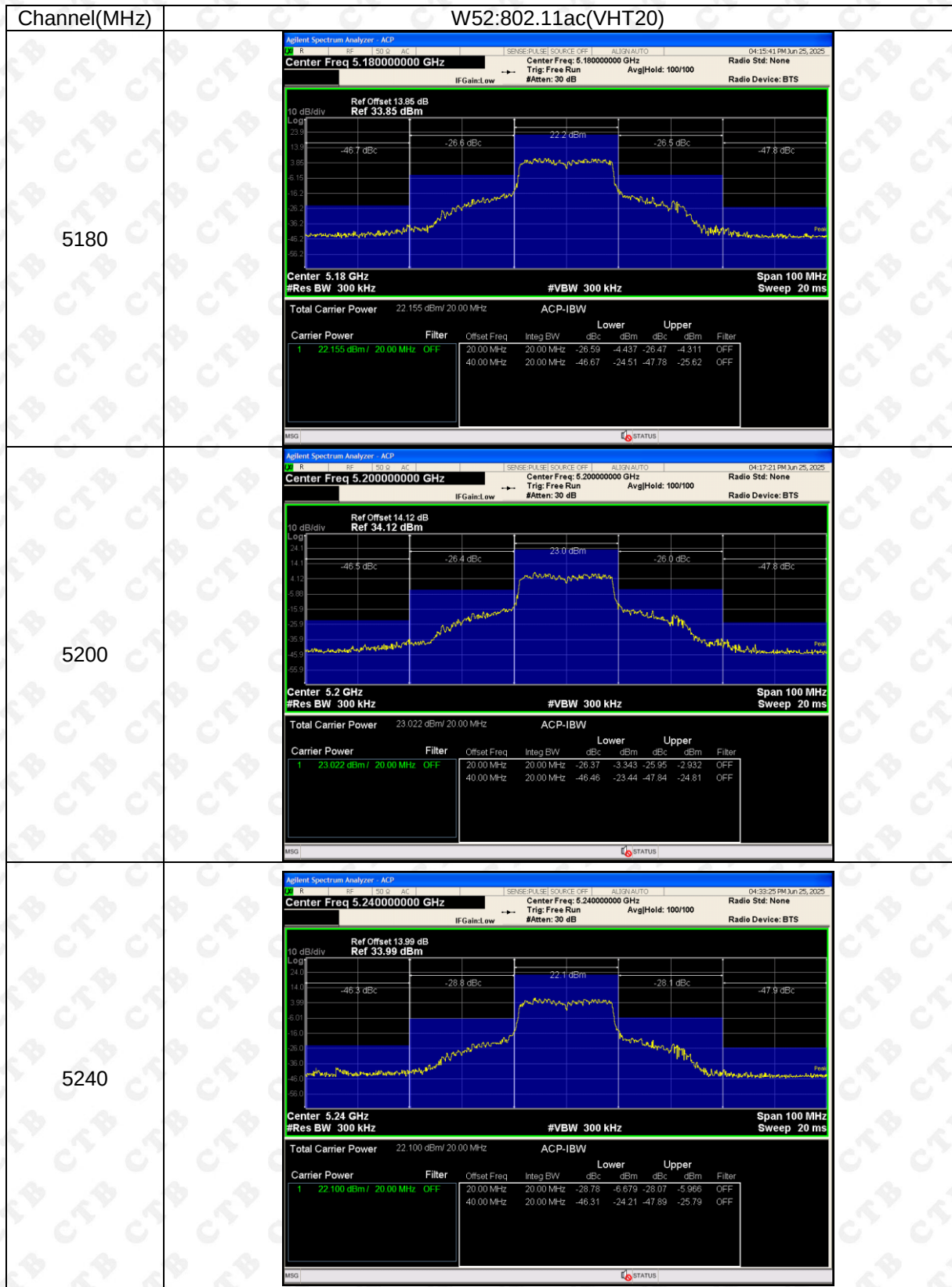


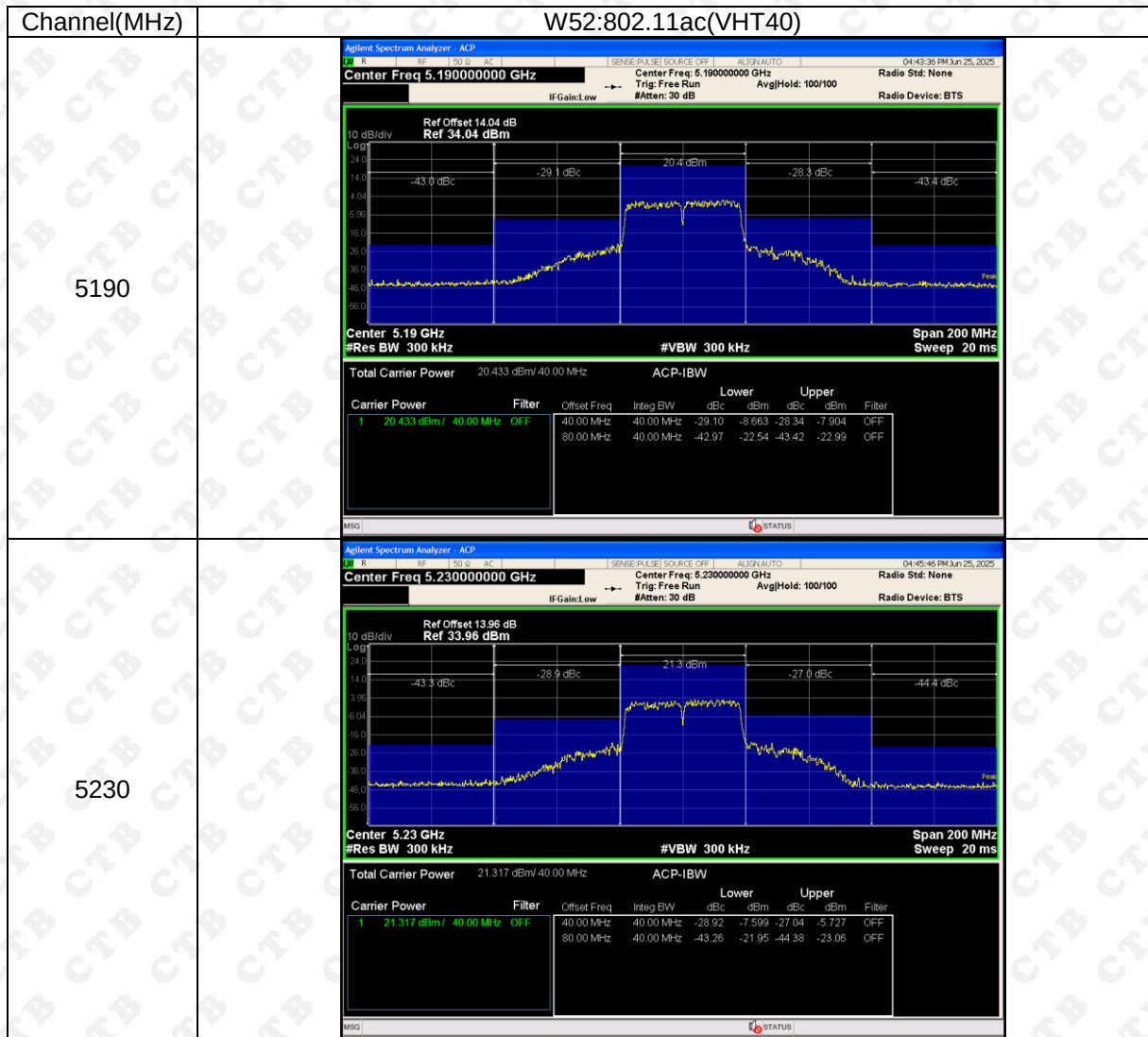
8.4 TEST RESULT

W52:

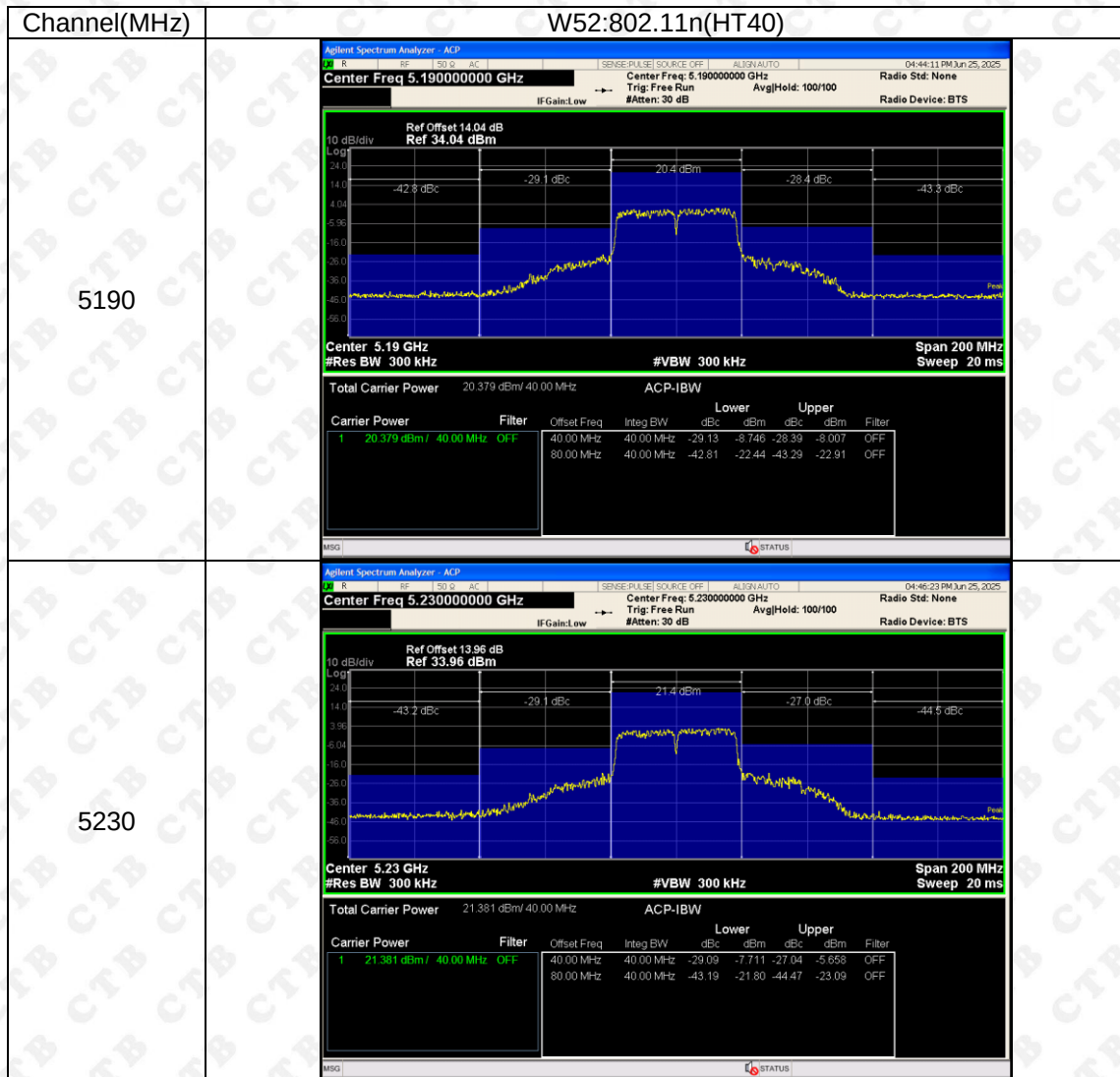
Normal Voltage						
Mode	detuning (MHz)		E.I.R.P (dBm/MHz)			Limit (dBm/MHz)
			LCH	MCH	HCH	
802.11a	20MHz	Lower	-25.77	-28.76	-31.68	-25dBc/20MHz
		Upper	-25.19	-28.06	-31.92	
	40MHz	Lower	-46.82	-46.1	-44.24	-40dBc/40MHz
		Upper	-47.85	-47.18	-45.7	
802.11ac(VHT20)	20MHz	Lower	-26.59	-26.37	-28.78	-25dBc/20MHz
		Upper	-26.47	-25.95	-28.07	
	40MHz	Lower	-46.67	-46.46	-46.31	-40dBc/40MHz
		Upper	-47.78	-47.84	-47.89	
802.11ac(VHT40)	40MHz	Lower	-29.1	/	-28.92	-25dBc/40MHz
		Upper	-28.34	/	-27.04	
	80MHz	Lower	-42.97	/	-43.26	-40dBc/80MHz
		Upper	-43.42	/	-44.38	
802.11n(HT20)	20MHz	Lower	-26.89	-26.44	-28.79	-25dBc/20MHz
		Upper	-26.55	-26.02	-28	
	40MHz	Lower	-46.8	-46.77	-46.44	-40dBc/40MHz
		Upper	-47.79	-47.75	-47.79	
802.11n(HT40)	40MHz	Lower	-29.13	/	-29.09	-25dBc/40MHz
		Upper	-28.39	/	-27.04	
	80MHz	Lower	-42.81	/	-43.19	-40dBc/80MHz
		Upper	-43.29	/	-44.47	
802.11ax(HE20)	20MHz	Lower	-26.77	-26.53	-28.81	-25dBc/20MHz
		Upper	-26.45	-25.89	-28.05	
	40MHz	Lower	-46.62	-46.51	-46.26	-40dBc/40MHz
		Upper	-47.97	-47.84	-47.89	
802.11ax(HE40)	40MHz	Lower	-28.89	/	-29.07	-25dBc/40MHz
		Upper	-28.27	/	-26.91	
	80MHz	Lower	-42.91	/	-43.19	-40dBc/80MHz
		Upper	-43.28	/	-44.35	
Result	Pass					

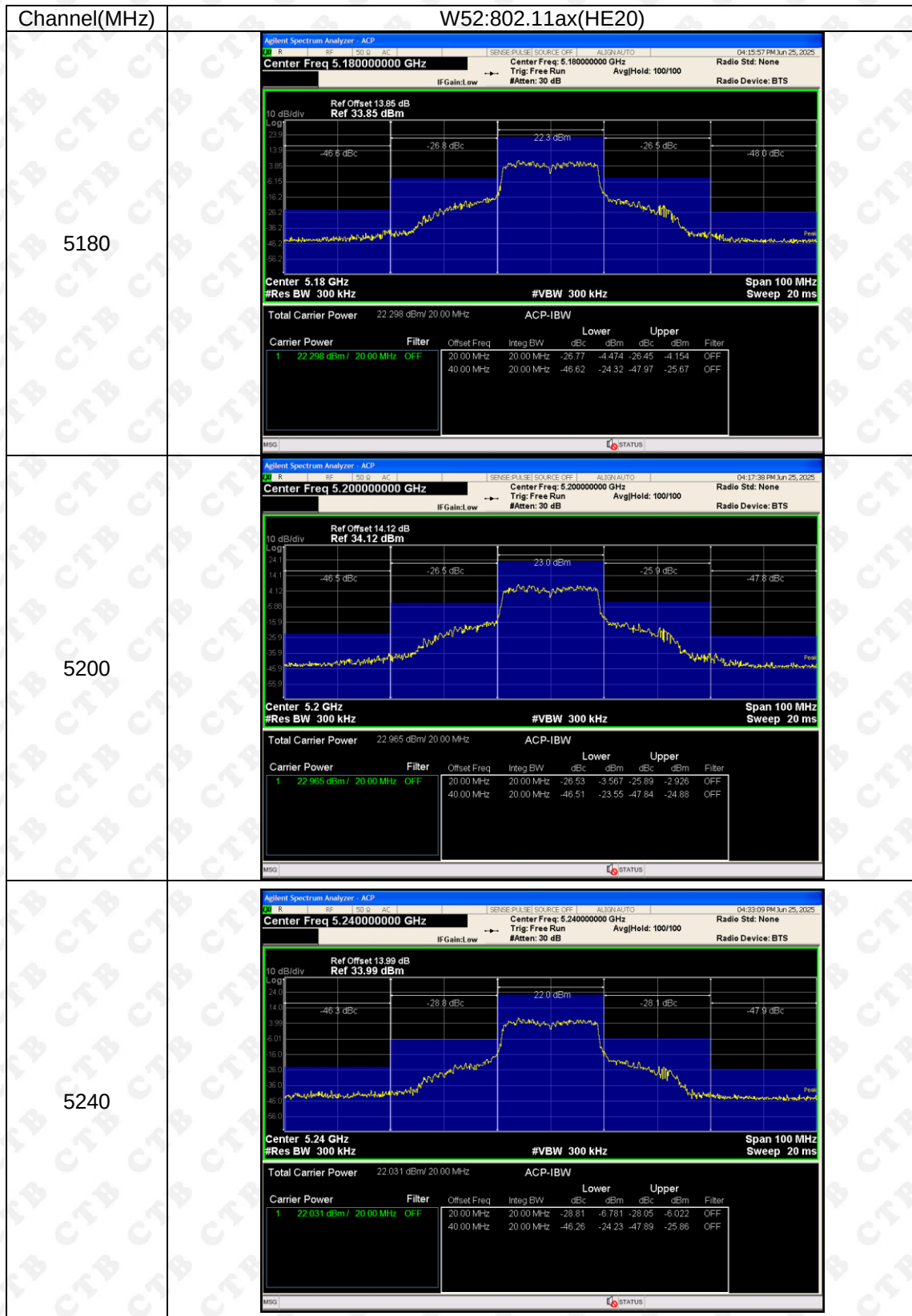






Channel(MHz)	W52:802.11n(HT20)																											
5180	<div><div>Agilent Spectrum Analyzer - ACP</div><div><div>Center Freq 5.180000000 GHz</div><div>Center Freq: 5.180000000 GHz</div><div>Trig: Free Run</div><div>Avg/Hold: 100/100</div><div>Radio Std: None</div><div>Radio Device: BTS</div></div><div><div>Ref Offset 13.85 dB</div><div>Ref 33.85 dBm</div><div><div>-46.8 dBc</div><div>-26.9 dBc</div><div>22.1 dBm</div><div>-26.6 dBc</div><div>-47.8 dBc</div></div></div><div><div>Center 5.18 GHz</div><div>#Res BW 300 kHz</div><div>#VBW 300 kHz</div><div>Span 100 MHz</div><div>Sweep 20 ms</div></div><div><div>Total Carrier Power 22.087 dBm/ 20.00 MHz</div><div>ACP-IBW</div><table><thead><tr><th>Carrier Power</th><th>Filter</th><th>Offset Freq</th><th>Integ BW</th><th>dBc</th><th>dBm</th><th>Lower</th><th>Upper</th><th>Filter</th></tr></thead><tbody><tr><td>1 22.087 dBm/ 20.00 MHz</td><td>OFF</td><td>20.00 MHz</td><td>20.00 MHz</td><td>-26.89</td><td>-4.802</td><td>-26.55</td><td>-4.464</td><td>OFF</td></tr><tr><td></td><td></td><td>40.00 MHz</td><td>20.00 MHz</td><td>-46.80</td><td>-24.72</td><td>-47.79</td><td>-25.70</td><td>OFF</td></tr></tbody></table></div></div>	Carrier Power	Filter	Offset Freq	Integ BW	dBc	dBm	Lower	Upper	Filter	1 22.087 dBm/ 20.00 MHz	OFF	20.00 MHz	20.00 MHz	-26.89	-4.802	-26.55	-4.464	OFF			40.00 MHz	20.00 MHz	-46.80	-24.72	-47.79	-25.70	OFF
Carrier Power	Filter	Offset Freq	Integ BW	dBc	dBm	Lower	Upper	Filter																				
1 22.087 dBm/ 20.00 MHz	OFF	20.00 MHz	20.00 MHz	-26.89	-4.802	-26.55	-4.464	OFF																				
		40.00 MHz	20.00 MHz	-46.80	-24.72	-47.79	-25.70	OFF																				
5200	<div><div>Agilent Spectrum Analyzer - ACP</div><div><div>Center Freq 5.200000000 GHz</div><div>Center Freq: 5.200000000 GHz</div><div>Trig: Free Run</div><div>Avg/Hold: 100/100</div><div>Radio Std: None</div><div>Radio Device: BTS</div></div><div><div>Ref Offset 14.12 dB</div><div>Ref 34.12 dBm</div><div><div>-46.8 dBc</div><div>-26.4 dBc</div><div>23.1 dBm</div><div>-26.0 dBc</div><div>-47.8 dBc</div></div></div><div><div>Center 5.2 GHz</div><div>#Res BW 300 kHz</div><div>#VBW 300 kHz</div><div>Span 100 MHz</div><div>Sweep 20 ms</div></div><div><div>Total Carrier Power 23.063 dBm/ 20.00 MHz</div><div>ACP-IBW</div><table><thead><tr><th>Carrier Power</th><th>Filter</th><th>Offset Freq</th><th>Integ BW</th><th>dBc</th><th>dBm</th><th>Lower</th><th>Upper</th><th>Filter</th></tr></thead><tbody><tr><td>1 23.063 dBm/ 20.00 MHz</td><td>OFF</td><td>20.00 MHz</td><td>20.00 MHz</td><td>-26.44</td><td>-3.376</td><td>-26.02</td><td>-2.981</td><td>OFF</td></tr><tr><td></td><td></td><td>40.00 MHz</td><td>20.00 MHz</td><td>-46.77</td><td>-23.70</td><td>-47.75</td><td>-24.69</td><td>OFF</td></tr></tbody></table></div></div>	Carrier Power	Filter	Offset Freq	Integ BW	dBc	dBm	Lower	Upper	Filter	1 23.063 dBm/ 20.00 MHz	OFF	20.00 MHz	20.00 MHz	-26.44	-3.376	-26.02	-2.981	OFF			40.00 MHz	20.00 MHz	-46.77	-23.70	-47.75	-24.69	OFF
Carrier Power	Filter	Offset Freq	Integ BW	dBc	dBm	Lower	Upper	Filter																				
1 23.063 dBm/ 20.00 MHz	OFF	20.00 MHz	20.00 MHz	-26.44	-3.376	-26.02	-2.981	OFF																				
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5240	<div><div>Agilent Spectrum Analyzer - ACP</div><div><div>Center Freq 5.240000000 GHz</div><div>Center Freq: 5.240000000 GHz</div><div>Trig: Free Run</div><div>Avg/Hold: 100/100</div><div>Radio Std: None</div><div>Radio Device: BTS</div></div><div><div>Ref Offset 13.99 dB</div><div>Ref 33.99 dBm</div><div><div>-46.4 dBc</div><div>-28.8 dBc</div><div>22.0 dBm</div><div>-28.0 dBc</div><div>-47.8 dBc</div></div></div><div><div>Center 5.24 GHz</div><div>#Res BW 300 kHz</div><div>#VBW 300 kHz</div><div>Span 100 MHz</div><div>Sweep 20 ms</div></div><div><div>Total Carrier Power 22.042 dBm/ 20.00 MHz</div><div>ACP-IBW</div><table><thead><tr><th>Carrier Power</th><th>Filter</th><th>Offset Freq</th><th>Integ BW</th><th>dBc</th><th>dBm</th><th>Lower</th><th>Upper</th><th>Filter</th></tr></thead><tbody><tr><td>1 22.042 dBm/ 20.00 MHz</td><td>OFF</td><td>20.00 MHz</td><td>20.00 MHz</td><td>-28.79</td><td>-6.746</td><td>-28.00</td><td>-5.963</td><td>OFF</td></tr><tr><td></td><td></td><td>40.00 MHz</td><td>20.00 MHz</td><td>-46.44</td><td>-24.40</td><td>-47.79</td><td>-25.75</td><td>OFF</td></tr></tbody></table></div></div>	Carrier Power	Filter	Offset Freq	Integ BW	dBc	dBm	Lower	Upper	Filter	1 22.042 dBm/ 20.00 MHz	OFF	20.00 MHz	20.00 MHz	-28.79	-6.746	-28.00	-5.963	OFF			40.00 MHz	20.00 MHz	-46.44	-24.40	-47.79	-25.75	OFF
Carrier Power	Filter	Offset Freq	Integ BW	dBc	dBm	Lower	Upper	Filter																				
1 22.042 dBm/ 20.00 MHz	OFF	20.00 MHz	20.00 MHz	-28.79	-6.746	-28.00	-5.963	OFF																				
		40.00 MHz	20.00 MHz	-46.44	-24.40	-47.79	-25.75	OFF																				







9Antenna Power and Tolerance

9.1 LIMIT

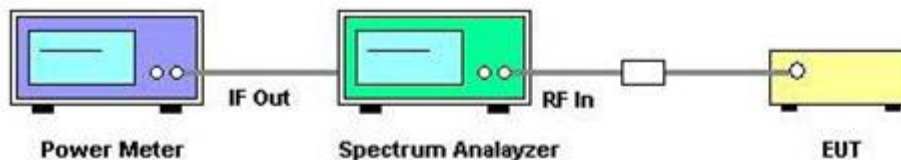
- (1)10mW/MHz(OFDM, DSSS:20MHz system),
 - (2)5mW/MHz(OFDM:40MHz system),
 - (3)2.5mW/MHz(OFDM:80MHz system),
 - (4)1.25mW/MHz(OFDM:160MHz system),
 - (5)10mW/MHz(except above methods),
- Tolerance: W52/W53: -80%~+20%,W56:-50%~+50%.

9.2 TEST PROCEDURE

A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.

- (a) A sample detector function must be used.
- (b) A measurement instrument with an integrated 1MHz power bandwidth function may be used to automate the test process.
- (c) Connect the EUT to the RF input of the spectrum analyzer via a 50ohm attenuator.
- (d) Set the RBW = 1MHz, VBW = 1MHz, center of frequency = operating frequency, Sweep = Auto.
- (e) 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided emission is repetitive in nature.
- (f) Repeat above procedures until all frequency measured was complete.

9.3 Test Setup Block Diagram



9.4 TEST RESULT

W52

W52: Gain=3.76dBi								
Mode	Channel (MHz)	Average burst power(dBm)	Antenna power (mW/MHz)	E.I.R.P (mW/MHz)	Limit (mW/MHz)	Rated output power (mW/MHz)	Tolerance (%)	Limit
802.11a	LCH	5.594	3.626	8.618	10	4	-9.356	-80% ~ +20%
	MCH	5.429	3.491	8.297	10	4	-12.735	
	HCH	5.521	3.565	8.474	10	4	-10.867	
802.11ac (VHT20)	LCH	5.041	3.192	7.588	10	4	-20.193	
	MCH	4.247	2.659	6.320	10	4	-33.528	
	HCH	5.368	3.442	8.181	10	4	-13.952	
802.11ac (VHT40)	LCH	1.105	1.290	3.065	5	2	-35.513	
	HCH	2.228	1.670	3.970	5	2	-16.484	
802.11n20 (HT20)	LCH	5.151	3.274	7.782	10	4	-18.146	
	MCH	4.407	2.759	6.557	10	4	-31.033	
	HCH	5.233	3.337	7.930	10	4	-16.586	
802.11n (HT40)	LCH	1.027	1.267	3.011	5	2	-36.661	
	HCH	2.065	1.609	3.824	5	2	-19.560	
802.11ax (HE20)	LCH	5.011	3.170	7.535	10	4	-20.743	
	MCH	4.216	2.640	6.275	10	4	-34.001	
	HCH	5.413	3.478	8.266	10	4	-13.056	
802.11ax (HE40)	LCH	1.038	1.270	3.019	5	2	-36.501	
	HCH	2.303	1.699	4.039	5	2	-15.029	

10. Unwanted Emissions Strength

10.1 LIMIT

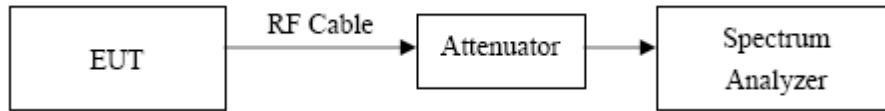
W52	
() - 5250	
20MHz system	
OBW : 18MHz or less	OBW : 18 - 20 MHz
5,142 MHz or less : 2.5 μ W/MHz	5,142 MHz or less : 2.5 μ W/MHz
5,142 - 5,150 MHz : 15 μ W/MHz	5,142 - 5,150 MHz : 15 μ W/MHz
	5,250 - 5,250.2 MHz : $10^{1-(8/2)(f-9.75)}$ mW/MHz
5,250 - 5,251 MHz : $10^{1-(f-9)}$ mW/MHz	5,250.2 - 5,251 MHz : $10^{1-(f-9)}$ mW/MHz
5,251 - 5,260 MHz : $10^{-1-(8/90)(f-11)}$ mW/MHz	5,251 - 5,260 MHz : $10^{-1-(8/90)(f-11)}$ mW/MHz
5,260 - 5,266.7 MHz : $10^{-1.8-(6/50)(f-20)}$ mW/MHz	5,260 - 5,266.7 MHz : $10^{-1.8-(6/50)(f-20)}$ mW/MHz
5,266.7 MHz or more : 2.5 μ W/MHz	5,266.7 MHz or more : 2.5 μ W/MHz
f = MHz, Difference from 5240 (MHz)	f = MHz, Difference from 5240 (MHz)

40MHz system	80MHz system
5,141.6 MHz or less : 2.5 μ W/MHz	5,123.2 MHz or less : 2.5 μ W/MHz
5,141.6 - 5,150 MHz : 15 μ W/MHz	5,123.2 - 5,150 MHz : 15 μ W/MHz
5,250 - 5,251 MHz : $10^{-(f-20)+\log(1/2)}$ mW/MHz	5,250 - 5,251 MHz : $10^{-(f-40)+\log(1/4)}$ mW/MHz
5,251 - 5,270 MHz : $10^{-(8/190)(f-21)-1+\log(1/2)}$ mW/MHz	5,251 - 5,290 MHz : $10^{-(8/290)(f-41)-1+\log(1/4)}$ mW/MHz
5,270 - 5,278.4 MHz : $10^{-(2/50)(f-40)-1.8+\log(1/2)}$ mW/MHz	5,290 - 5,296.7 MHz : $10^{-(2/100)(f-80)-1.8+\log(1/4)}$ mW/MHz
5,278.4 MHz or more : 2.5 μ W/MHz	5,296.7 MHz or more : 2.5 μ W/MHz
f = MHz, Difference from 5230 (MHz)	f = MHz, Difference from 5210 (MHz)

10.2 TEST PROCEDURE

- (1) A spectrumIn case of conducted measurements, the radio device shall be connected to the measuring equipment via a suitable attenuator.
- (2) The measurement equipment shall be set for peak hold mode of operation.
- (3) the transmitter shall be operated at the highest output power, or, in the case of equipment able to operate at more than one power level, at the lowest and highest output powers;
- (4) The resolution bandwidth shall be set to 100kHz from 10MHz to 1GHz, the resolution bandwidth shall be set to 1MHz above 1GHz , and the sweep time shall be set to auto mode, to ensure all major modulation products are captured.
- (5) When the searched result is less than the specified limit, the maximum one shall be recorded, when the result is more than the specified limit, all measured values shall be recorded.
- (5) This measurement shall be repeated with the transmitter in standby mode where applicable.
- (6) Repeat above procedures until all frequency measured was complete.

10.3 TEST SETUP Block Diagram



10.4 TEST RESULT

W52

802.11a

Test voltage	Test freq.	Test freq. range	Mkr(MHz)	Test result(dBm)	Limit Start(dBm)	Limit Stop (dBm)	Result
Normal Voltage	5180MHz	30MHz-5142MHz	4549.01	-39.12	-26	-26	PASS
		5142MHz-5150MHz	5149.69	-28.5	-18	-18	PASS
		5250MHz-5251MHz	5250.71	-38.08	0	-10	PASS
		5251MHz-5260MHz	5259.03	-39.02	-10	-18	PASS
		5260MHz-5266.7MHz	5263.89	-38.7	-18	-26	PASS
		5266.7MHz-26000MHz	25771.93	-35.44	-26	-26	PASS
	5200MHz	30MHz-5142MHz	4549.01	-39.4	-26	-26	PASS
		5142MHz-5150MHz	5145.17	-37.79	-18	-18	PASS
		5250MHz-5251MHz	5250.5	-38.57	0	-10	PASS
		5251MHz-5260MHz	5255.35	-39.09	-10	-18	PASS
		5260MHz-5266.7MHz	5260.4	-37.73	-18	-26	PASS
		5266.7MHz-26000MHz	25730.47	-34.94	-26	-26	PASS
	5240MHz	30MHz-5142MHz	2570.66	-39.79	-26	-26	PASS
		5142MHz-5150MHz	5145.1	-34.08	-18	-18	PASS
		5250MHz-5251MHz	5250.58	-38.7	0	-10	PASS
		5251MHz-5260MHz	5255.82	-38.81	-10	-18	PASS
		5260MHz-5266.7MHz	5262.83	-38.94	-18	-26	PASS
		5266.7MHz-26000MHz	25730.47	-34.96	-26	-26	PASS

802.11ac

Test voltage	Test freq.	Test freq. range	Mkr(MHz)	Test result	Limit Start(dBm)	Limit Stop (dBm)	Result
Normal Voltage	5180MHz	30MHz-5142MHz	2672.9	-39.54	-26	-26	PASS
		5142MHz-5150MHz	5149.76	-28.28	-18	-18	PASS
		5250MHz-5251MHz	5250.05	-39.01	0	-10	PASS
		5251MHz-5260MHz	5252.4	-38.87	-10	-18	PASS

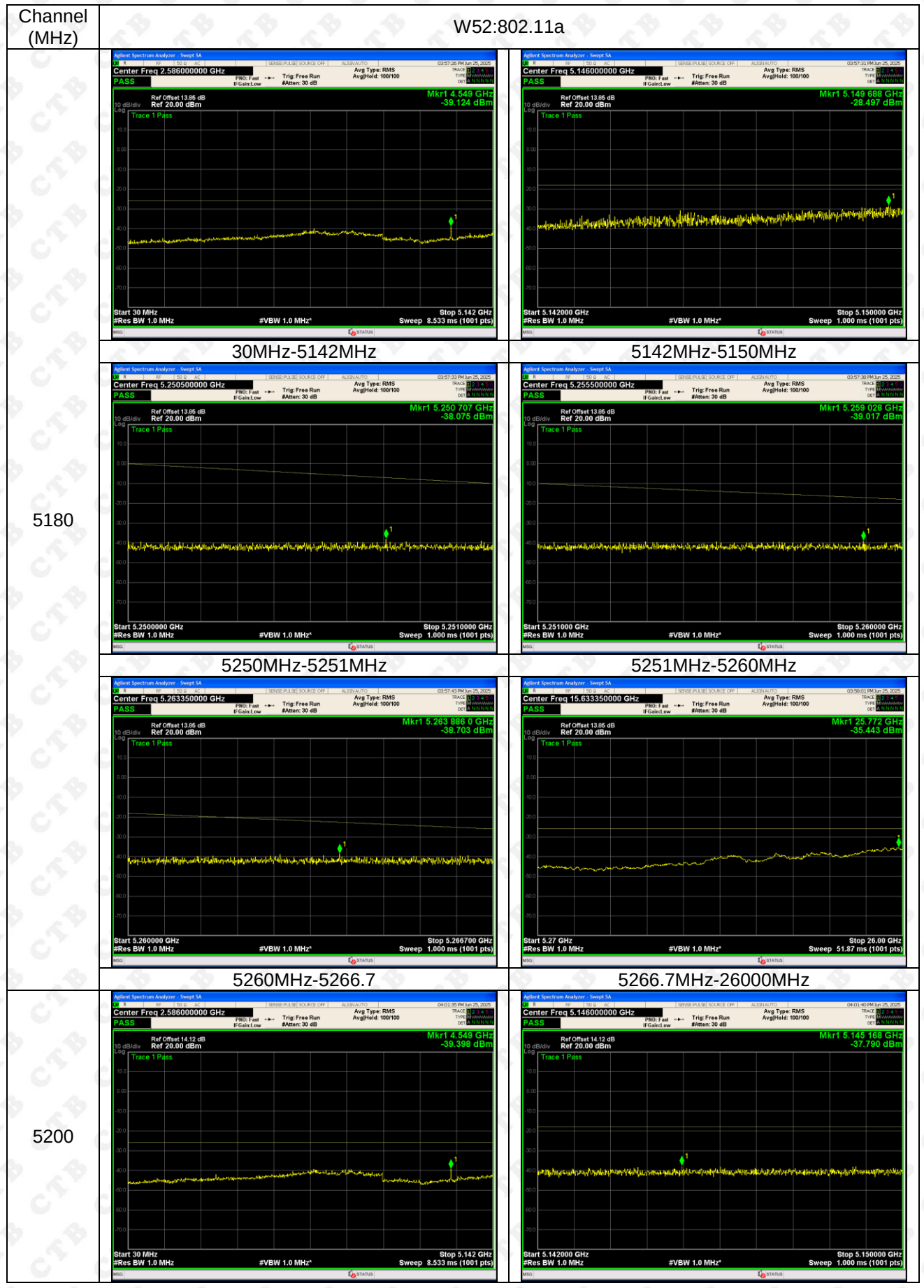
Normal Voltage		5260MHz-5266.7MHz	5263.57	-37.85	-18	-26	PASS
		5266.7MHz-26000MHz	25025.53	-35.16	-26	-26	PASS
	5200MHz	30MHz-5142MHz	3255.67	-39.79	-26	-26	PASS
		5142MHz-5150MHz	5143.83	-37.86	-18	-18	PASS
		5250MHz-5251MHz	5250.52	-38.66	0	-10	PASS
		5251MHz-5260MHz	5251.42	-36.72	-10	-18	PASS
		5260MHz-5266.7MHz	5260.6	-38.55	-18	-26	PASS
		5266.7MHz-26000MHz	25067	-35.19	-26	-26	PASS
	5240MHz	30MHz-5142MHz	3168.77	-39.74	-26	-26	PASS
		5142MHz-5150MHz	5149.14	-38.28	-18	-18	PASS
		5250MHz-5251MHz	5250.49	-39.3	0	-10	PASS
		5251MHz-5260MHz	5254.22	-38.87	-10	-18	PASS
		5260MHz-5266.7MHz	5264.01	-38.83	-18	-26	PASS
		5266.7MHz-26000MHz	25709.73	-34.96	-26	-26	PASS
	5190MHz	30MHz-5141.6MHz	5141.6	-32.13	-26	-26	PASS
		5141.6MHz-5150MHz	5145.53	-20.73	-18	-18	PASS
		5250MHz-5251MHz	5250.92	-33.05	-3	-13	PASS
		5251MHz-5270MHz	5251.04	-35.03	-13	-21	PASS
		5270MHz-5278.4MHz	5270.57	-37.94	-21	-26	PASS
		5278.4MHz-26000MHz	24984.64	-35.14	-26	-26	PASS
	5230MHz	30MHz-5141.6MHz	2667.59	-39.68	-26	-26	PASS
		5141.6MHz-5150MHz	5144.96	-37.62	-18	-18	PASS
		5250MHz-5251MHz	5250.09	-39.33	-3	-13	PASS
		5251MHz-5270MHz	5257.5	-39.26	-13	-21	PASS
		5270MHz-5278.4MHz	5274.17	-38.43	-21	-26	PASS
		5278.4MHz-26000MHz	25461.24	-35.23	-26	-26	PASS

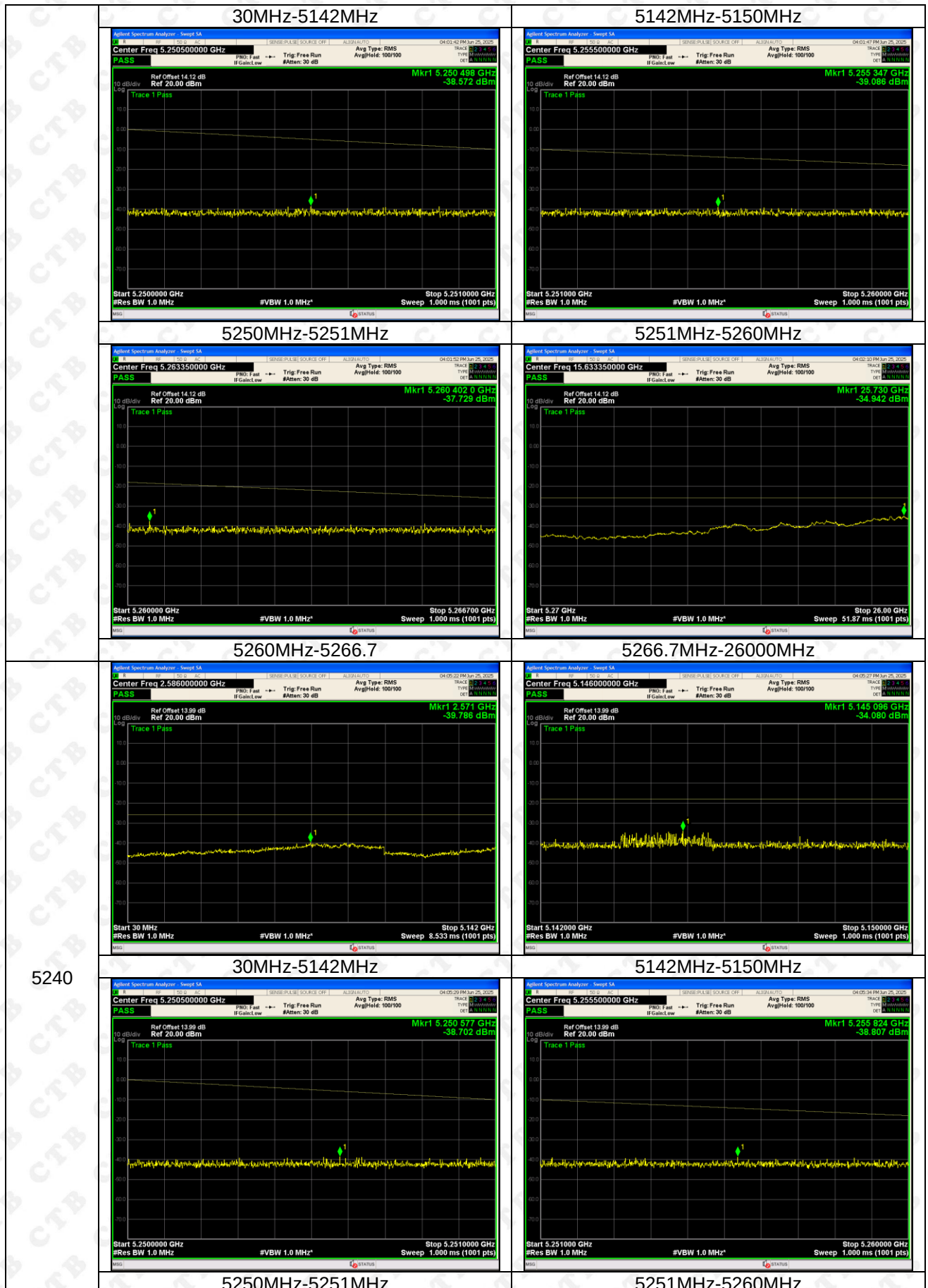
802.11n

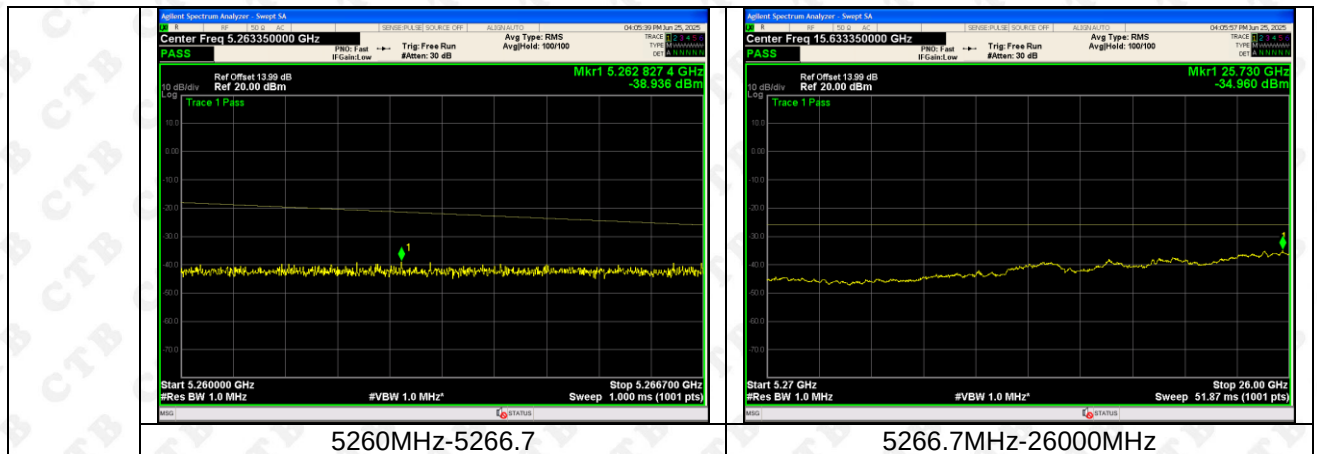
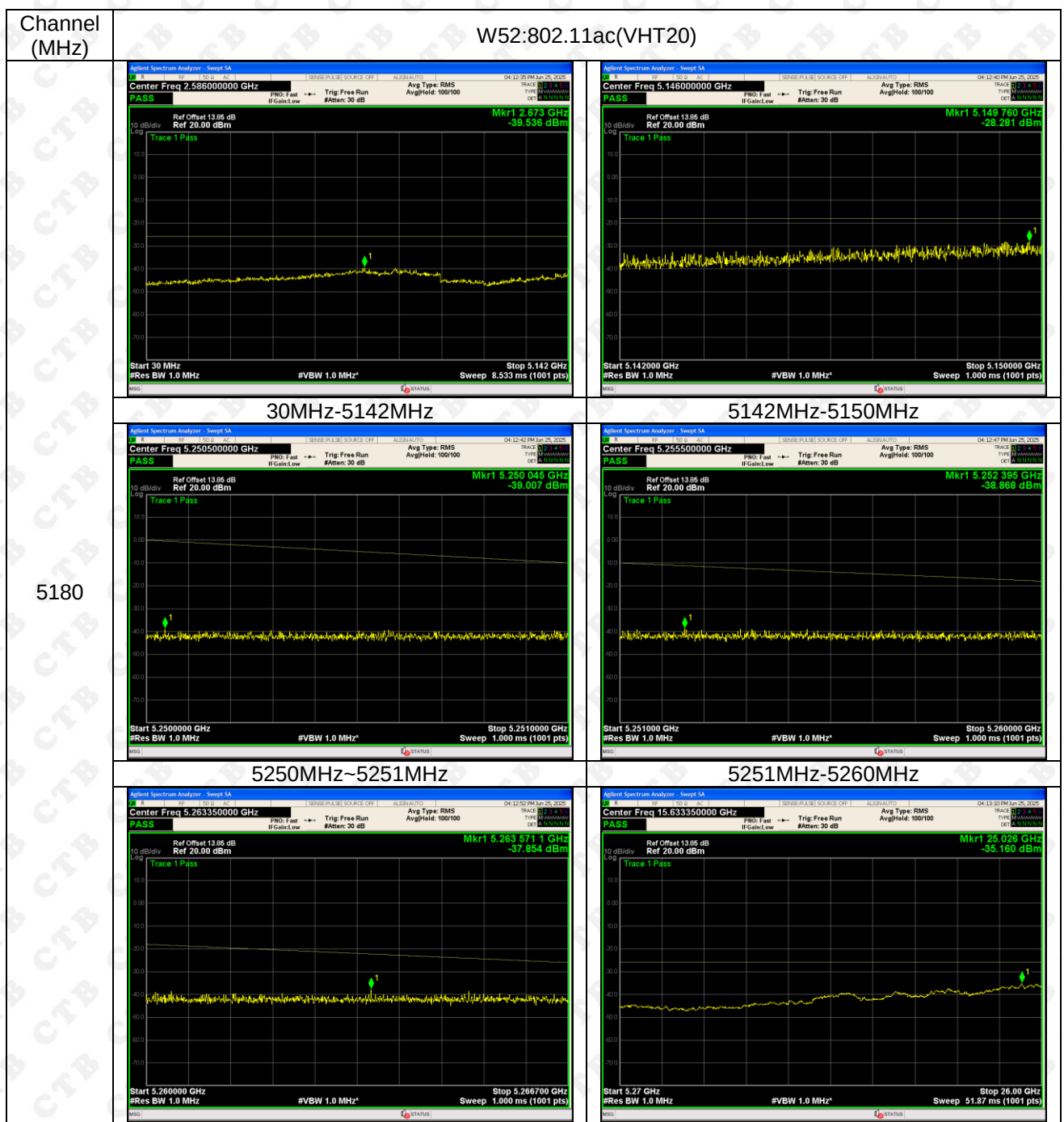
Test voltage	Test freq.	Test freq. range	Mkr(MHz)	Test result	Limit Start(dBm)	Limit Stop (dBm)	Result
Normal Voltage	5180MHz	30MHz-5142MHz	2662.68	-39.69	-26	-26	PASS
		5142MHz-5150MHz	5149.94	-27.94	-18	-18	PASS
		5250MHz-5251MHz	5250.54	-38.26	0	-10	PASS
		5251MHz-5260MHz	5252.74	-38.71	-10	-18	PASS
		5260MHz-5266.7MHz	5265.23	-39.05	-18	-26	PASS
		5266.7MHz-26000MHz	24984.07	-35.2	-26	-26	PASS
	5200MHz	30MHz-5142MHz	4554.12	-38.48	-26	-26	PASS
		5142MHz-5150MHz	5148.55	-37.26	-18	-18	PASS
		5250MHz-5251MHz	5250.72	-38.56	0	-10	PASS
		5251MHz-5260MHz	5256.65	-38.67	-10	-18	PASS
		5260MHz-5266.7MHz	5261.8	-38.7	-18	-26	PASS
		5266.7MHz-26000MHz	24984.07	-35.21	-26	-26	PASS
	5240MHz	30MHz-5142MHz	3046.08	-39.93	-26	-26	PASS
		5142MHz-5150MHz	5144.73	-37.79	-18	-18	PASS
		5250MHz-5251MHz	5250.25	-38.56	0	-10	PASS
		5251MHz-5260MHz	5252.87	-39.01	-10	-18	PASS
		5260MHz-5266.7MHz	5264.47	-39.15	-18	-26	PASS
		5266.7MHz-26000MHz	25709.73	-35.19	-26	-26	PASS
Normal Voltage	5190MHz	30MHz-5141.6MHz	5141.6	-32.5	-26	-26	PASS
		5141.6MHz-5150MHz	5145.44	-20.9	-18	-18	PASS
		5250MHz-5251MHz	5250.6	-32.88	-3	-13	PASS
		5251MHz-5270MHz	5252.1	-34.56	-13	-21	PASS
		5270MHz-5278.4MHz	5278.27	-37.26	-21	-26	PASS
		5278.4MHz-26000MHz	25730.62	-35.13	-26	-26	PASS
	5230MHz	30MHz-5141.6MHz	4548.65	-38.95	-26	-26	PASS
		5141.6MHz-5150MHz	5145.93	-37.26	-18	-18	PASS
		5250MHz-5251MHz	5250.68	-39.2	-3	-13	PASS
		5251MHz-5270MHz	5251.44	-38.91	-13	-21	PASS
		5270MHz-5278.4MHz	5276.39	-38.2	-21	-26	PASS
		5278.4MHz-26000MHz	24984.64	-35.4	-26	-26	PASS

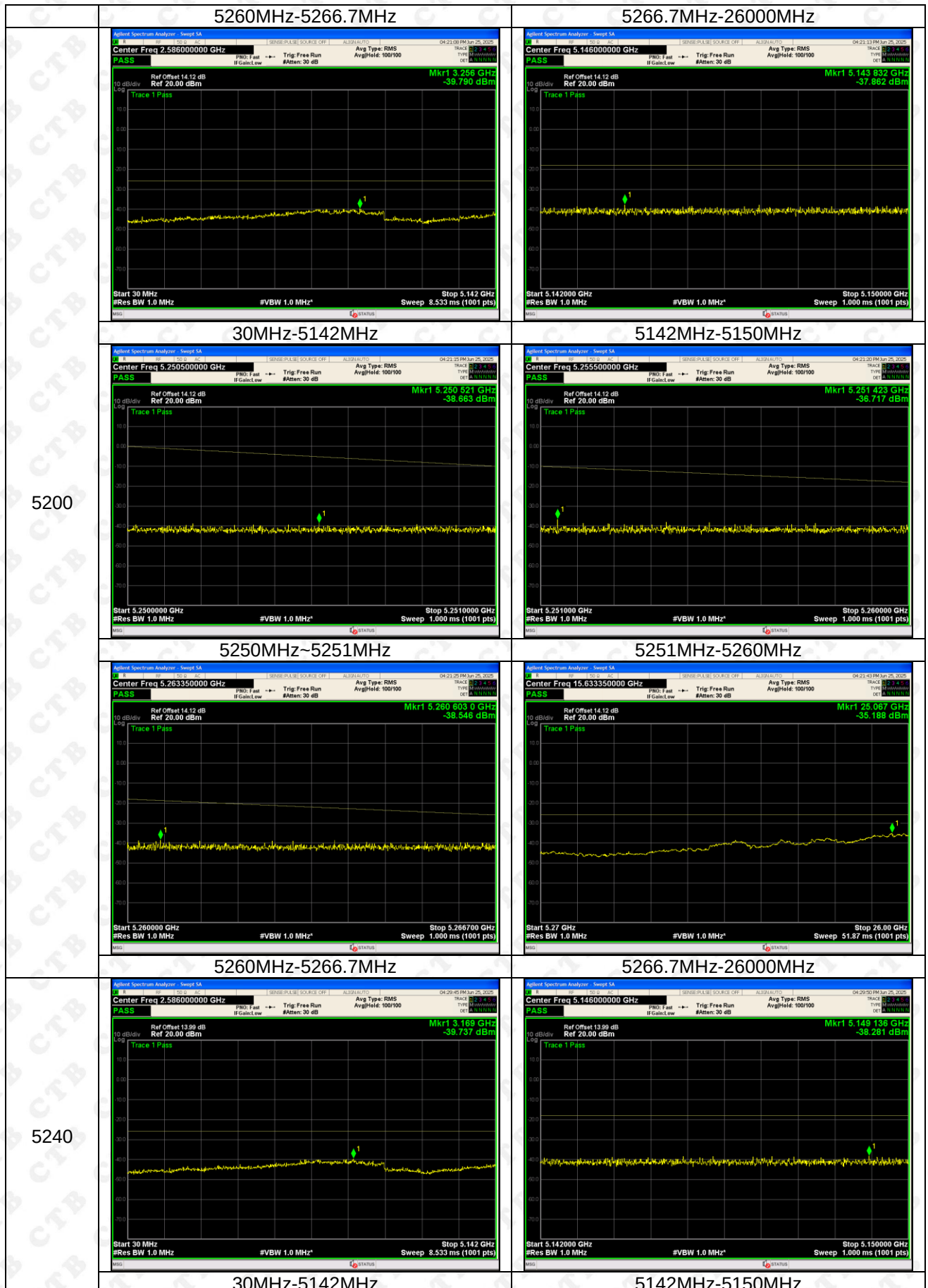
802.11ax

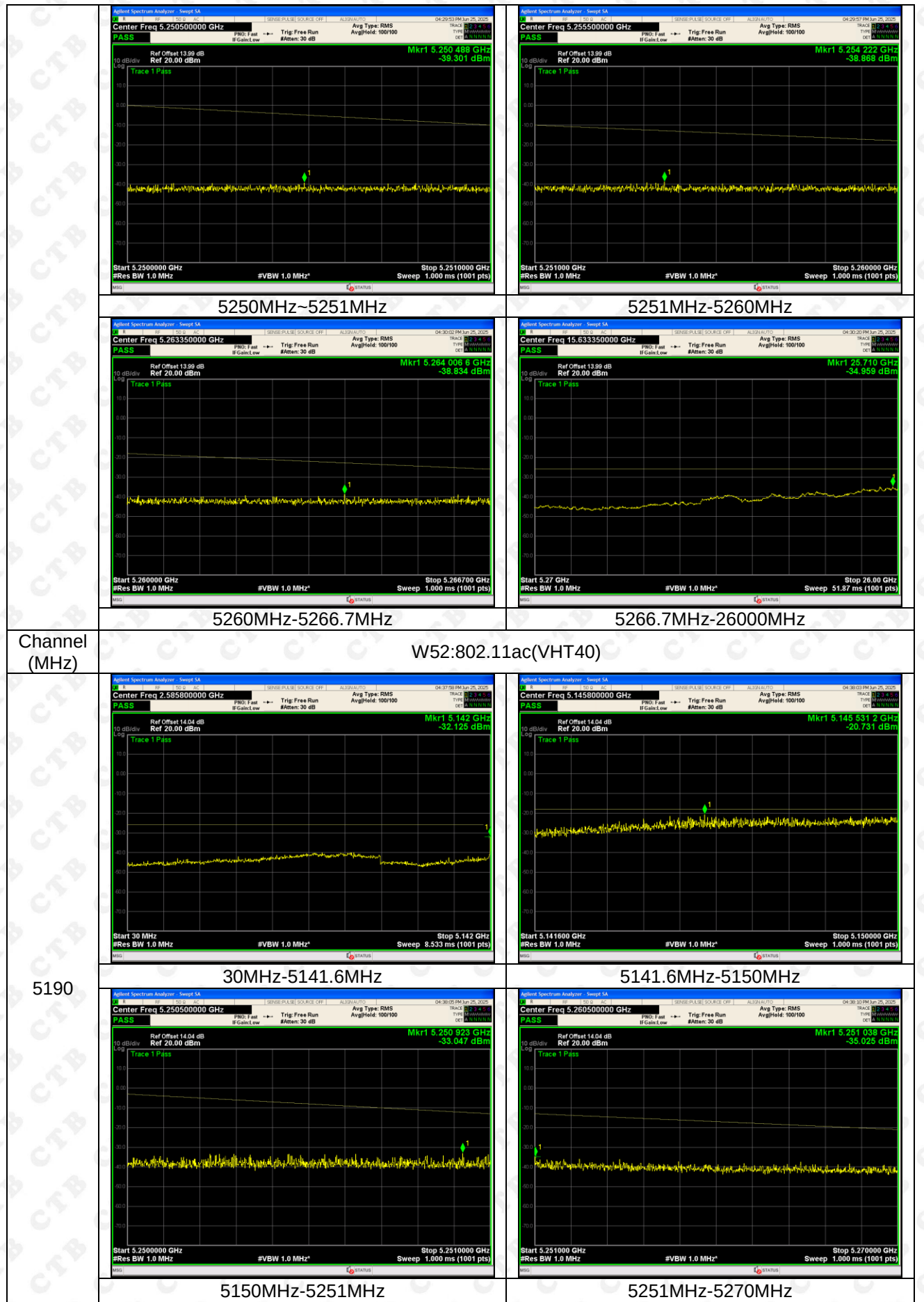
Test voltage	Test freq.	Test freq. range	Mkr(MHz)	Test result	Limit Start(dBm)	Limit Stop (dBm)	Result
Normal Voltage	5180MHz	30MHz-5142MHz	5142	-38.56	-26	-26	PASS
		5142MHz-5150MHz	5149.3	-25.06	-18	-18	PASS
		5250MHz-5251MHz	5250.36	-38.19	0	-10	PASS
		5251MHz-5260MHz	5255.09	-40.96	-10	-18	PASS
		5260MHz-5266.7MHz	5261.23	-40.89	-18	-26	PASS
		5266.7MHz-26000MHz	24652.34	-34.73	-26	-26	PASS
	5200MHz	30MHz-5142MHz	4160.5	-40.61	-26	-26	PASS
		5142MHz-5150MHz	5149.49	-33.6	-18	-18	PASS
		5250MHz-5251MHz	5250.77	-30.98	0	-10	PASS
		5251MHz-5260MHz	5252.49	-32.05	-10	-18	PASS
		5260MHz-5266.7MHz	5260.4	-35.14	-18	-26	PASS
		5266.7MHz-26000MHz	24631.6	-34.53	-26	-26	PASS
	5240MHz	30MHz-5142MHz	2657.57	-44.97	-26	-26	PASS
		5142MHz-5150MHz	5149.74	-42.52	-18	-18	PASS
		5250MHz-5251MHz	5250.2	-7.24	0	-10	PASS
		5251MHz-5260MHz	5251.51	-15.56	-10	-18	PASS
		5260MHz-5266.7MHz	5260.12	-25.93	-18	-26	PASS
		5266.7MHz-26000MHz	24673.07	-34.59	-26	-26	PASS
Normal Voltage	5190MHz	30MHz-5141.6MHz	5141.6	-29.44	-26	-26	PASS
		5141.6MHz-5150MHz	5148.67	-18.81	-18	-18	PASS
		5250MHz-5251MHz	5251	-24.9	-3	-13	PASS
		5251MHz-5270MHz	5251.4	-24.85	-13	-21	PASS
		5270MHz-5278.4MHz	5271.55	-31.2	-21	-26	PASS
		5278.4MHz-26000MHz	24632.37	-34.81	-26	-26	PASS
	5230MHz	30MHz-5141.6MHz	3275.87	-44.82	-26	-26	PASS
		5141.6MHz-5150MHz	5146.96	-40.12	-18	-18	PASS
		5250MHz-5251MHz	5250.05	-9.01	-3	-13	PASS
		5251MHz-5270MHz	5251.17	-13.68	-13	-21	PASS
		5270MHz-5278.4MHz	5271.34	-25.85	-21	-26	PASS
		5278.4MHz-26000MHz	24632.37	-34.79	-26	-26	PASS

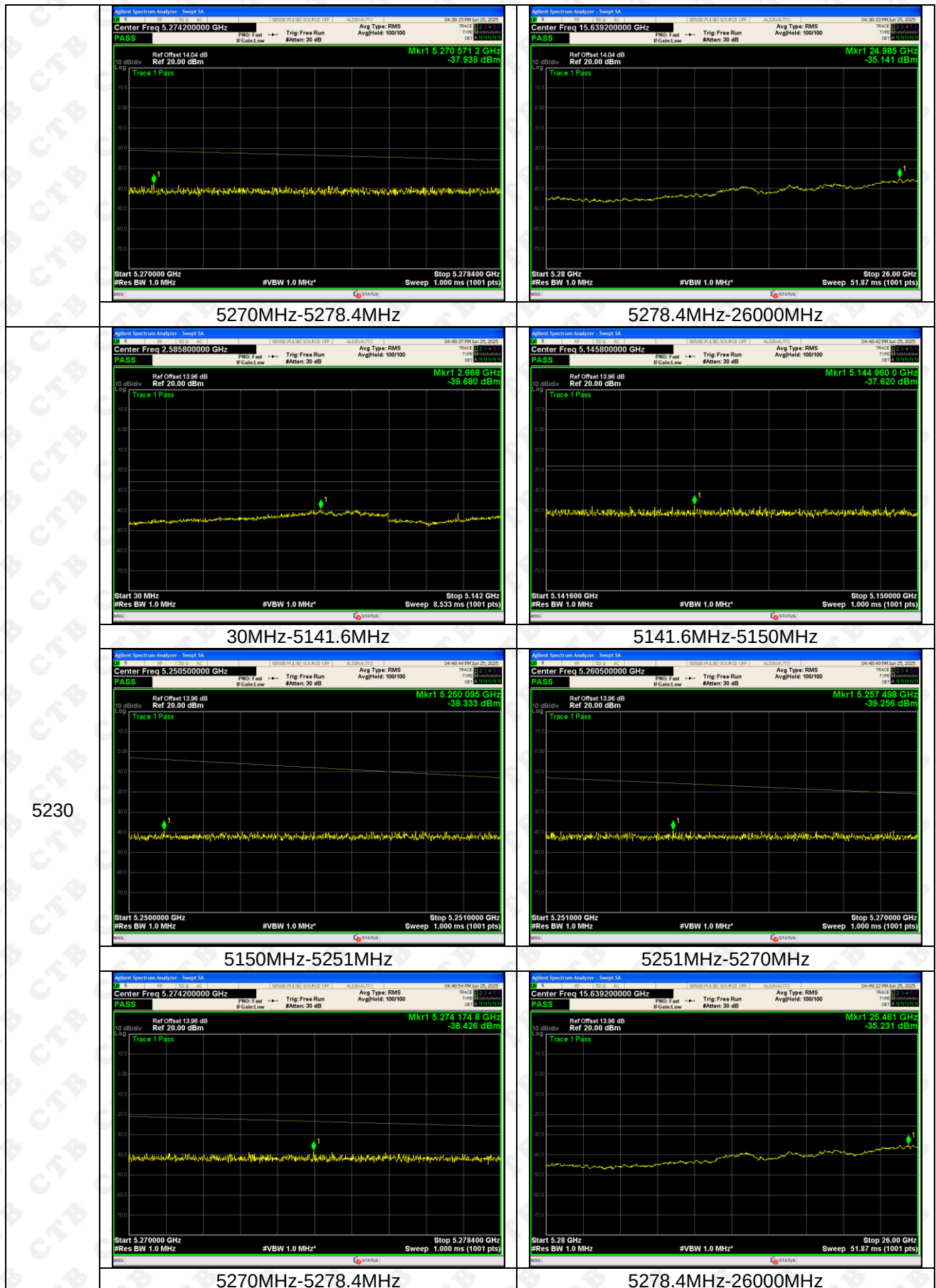


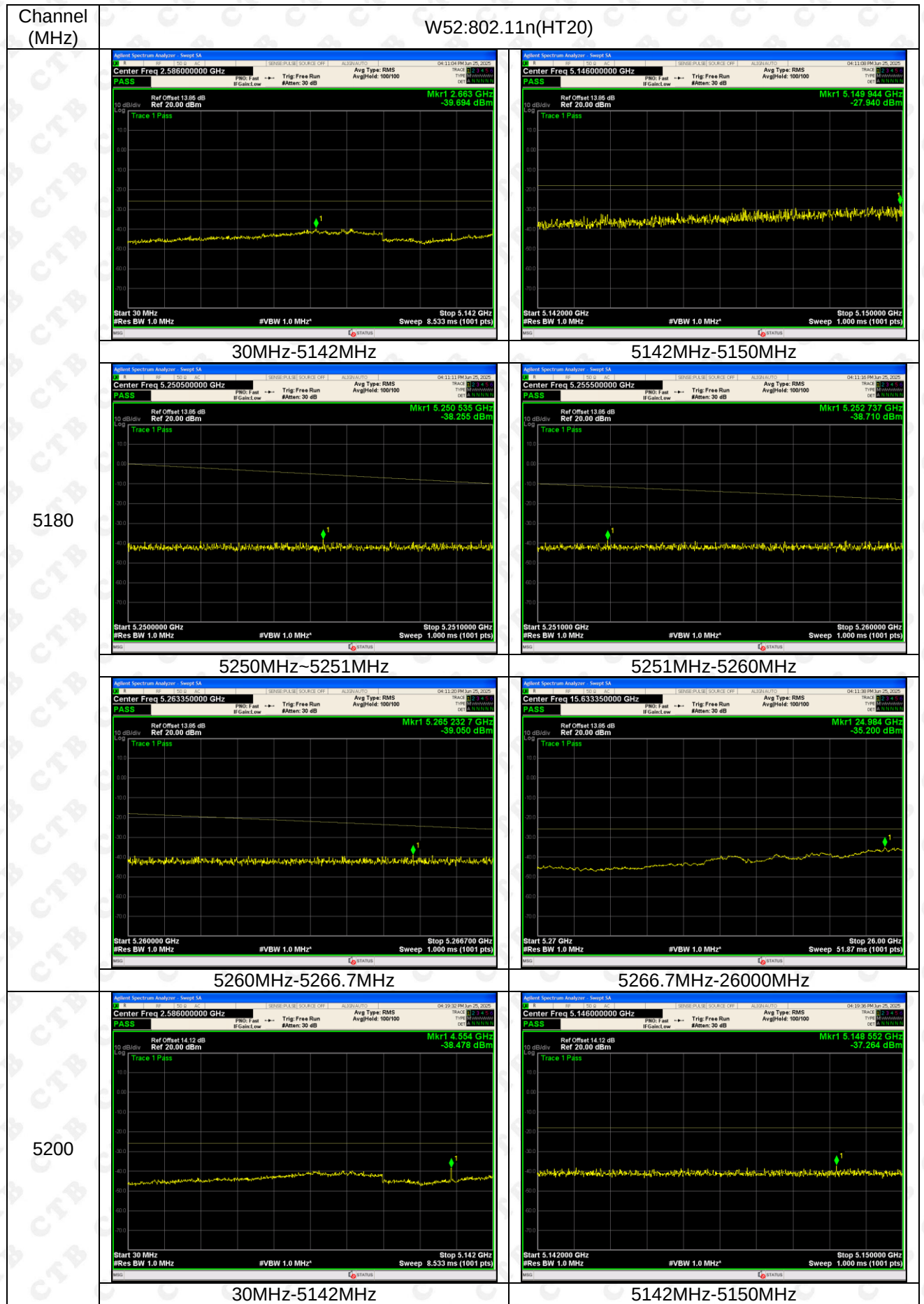


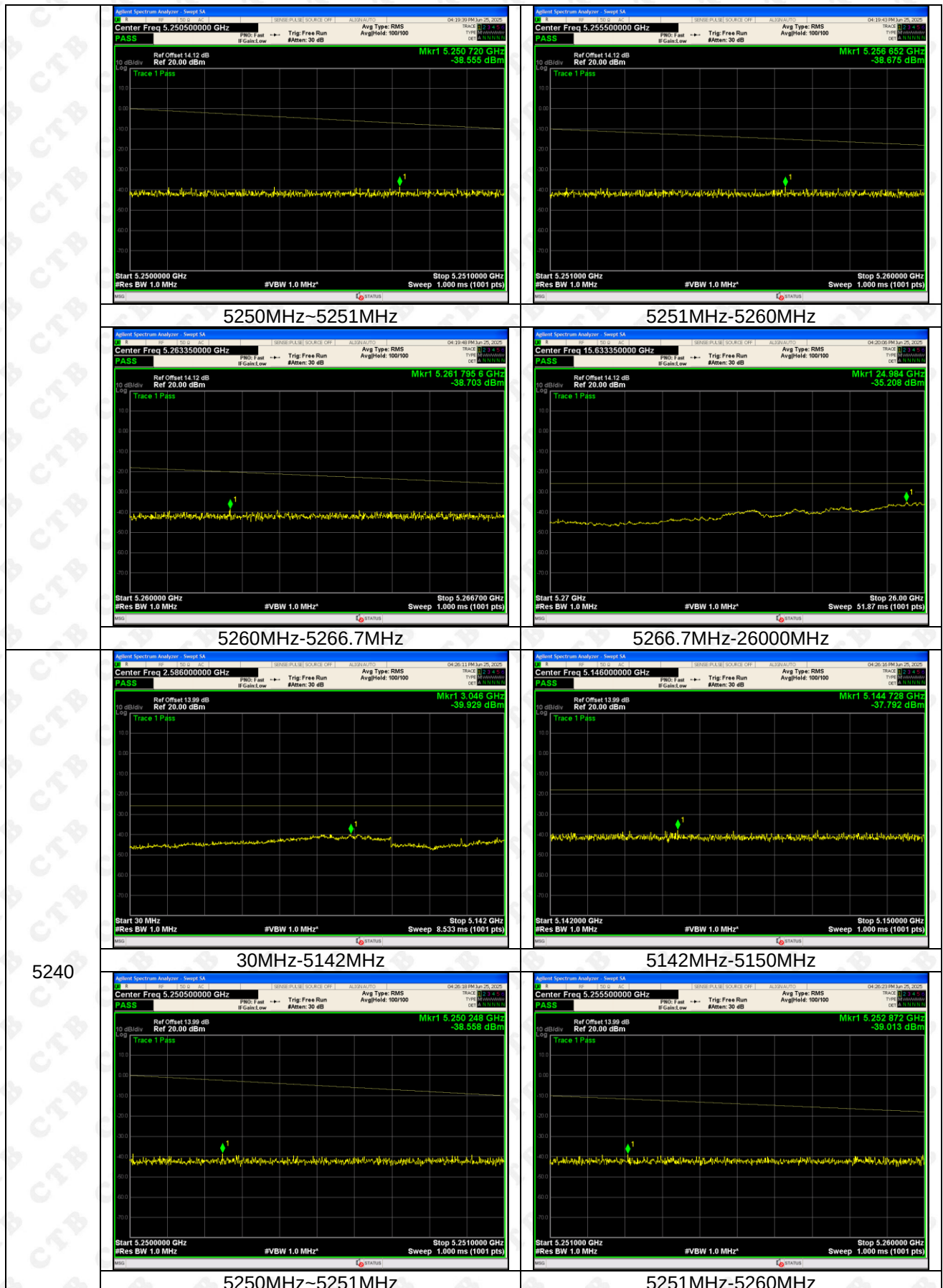


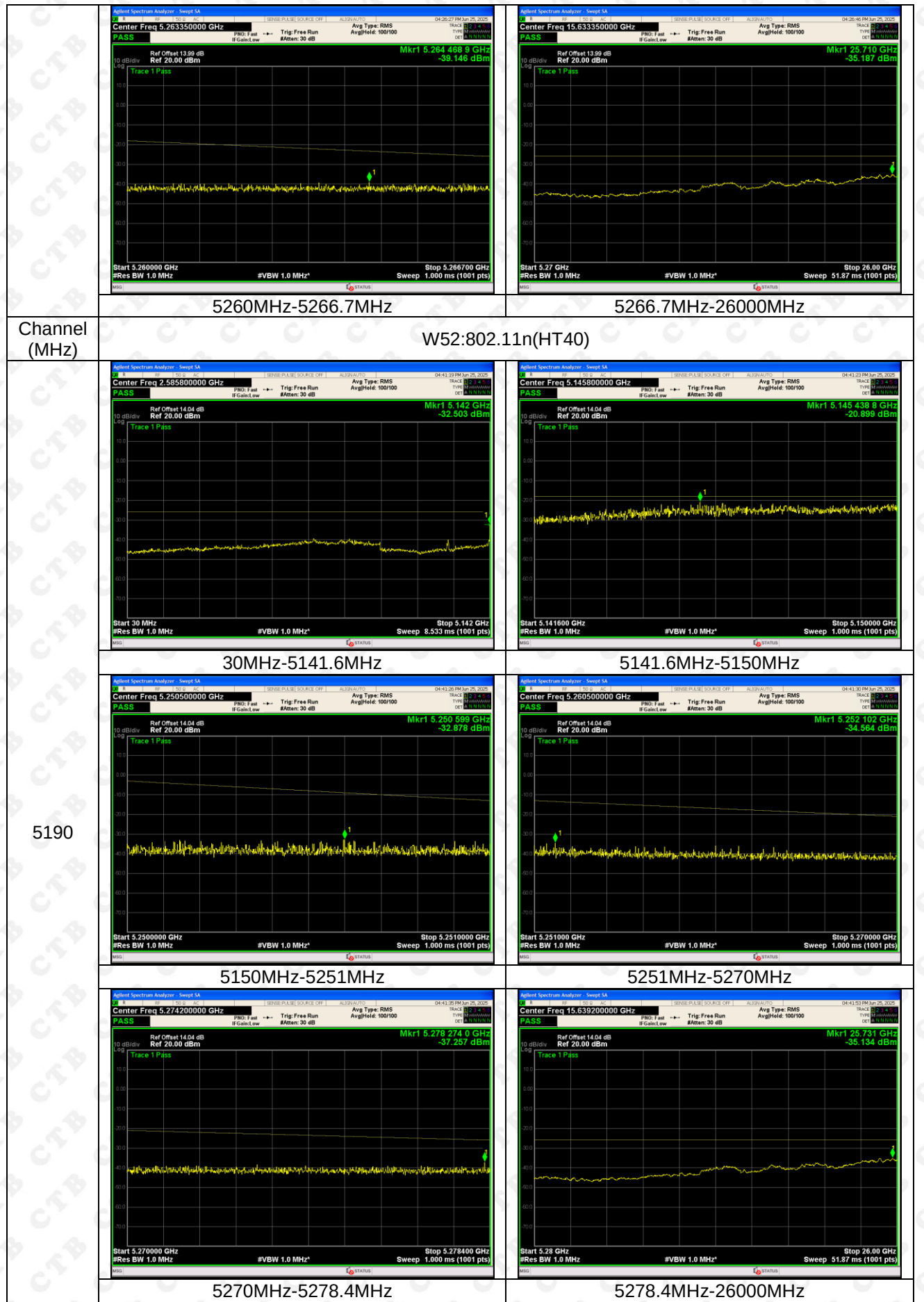


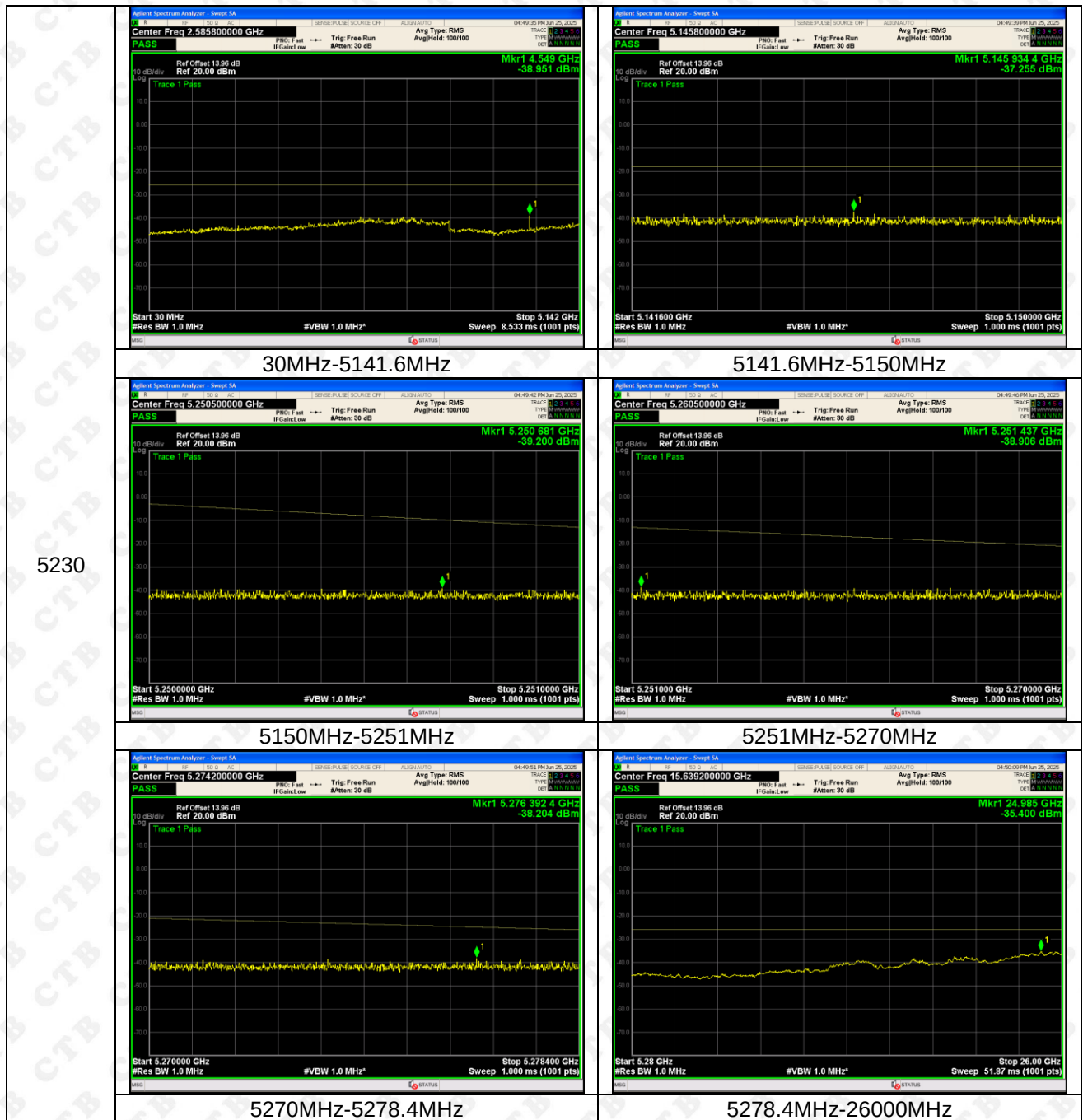


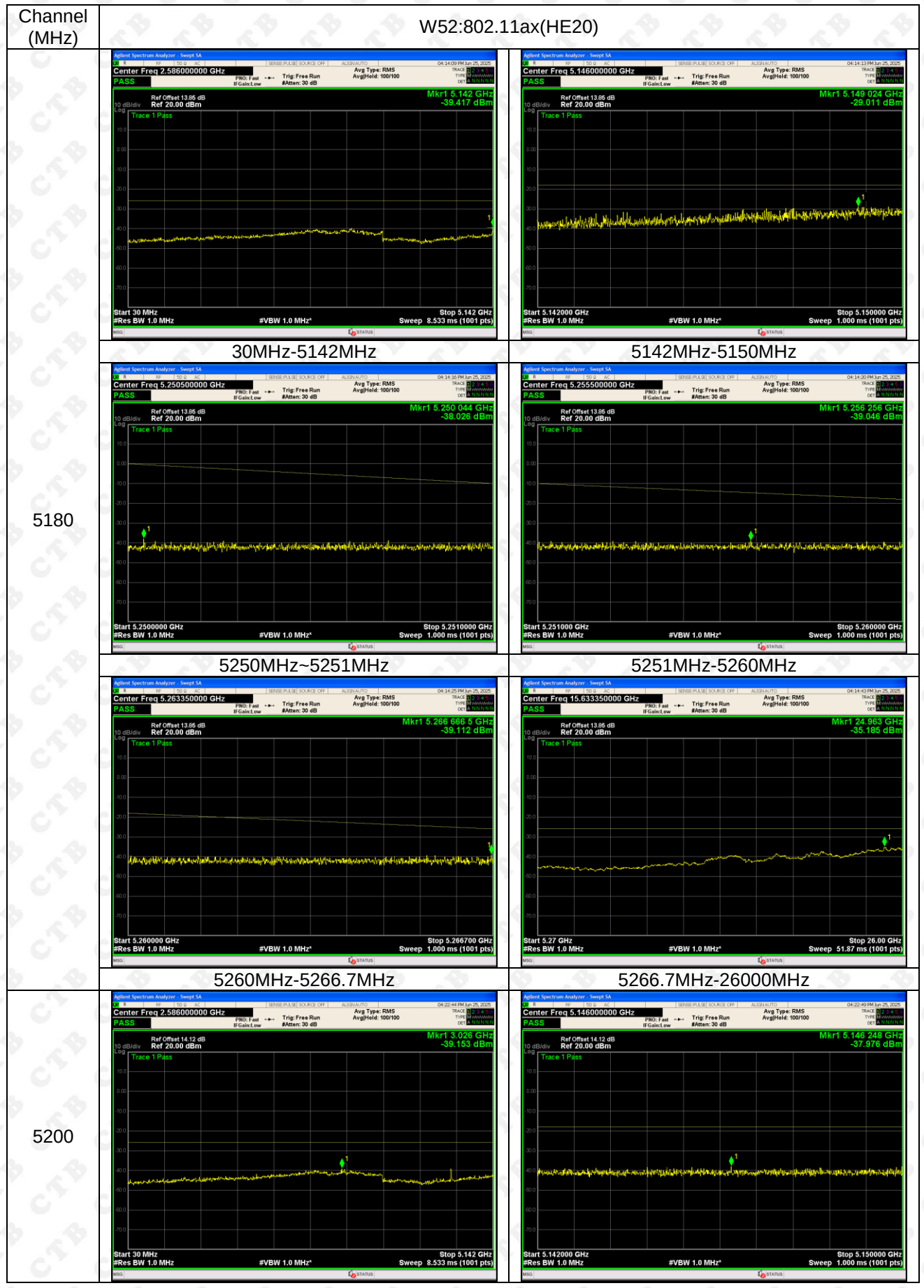


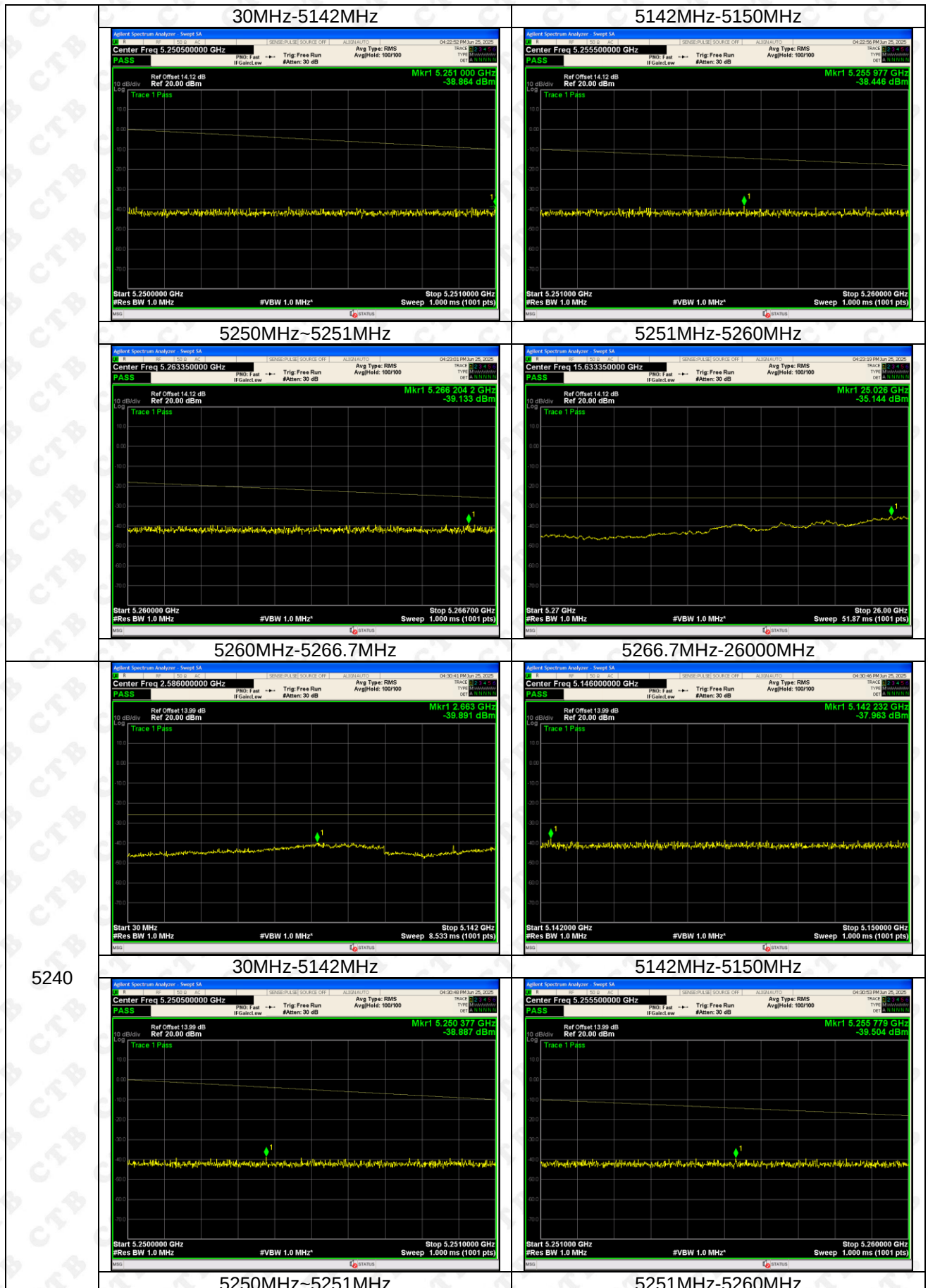


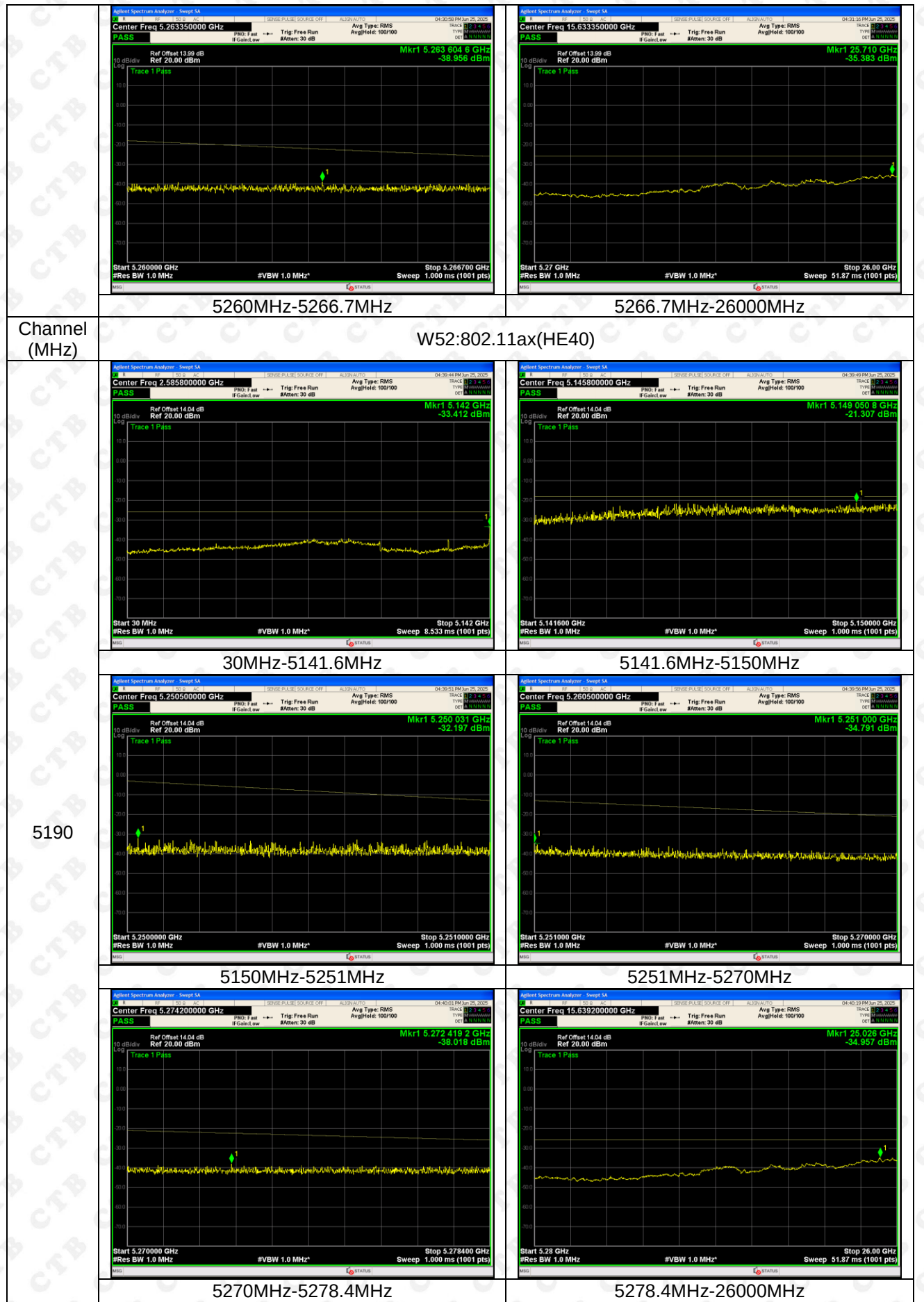


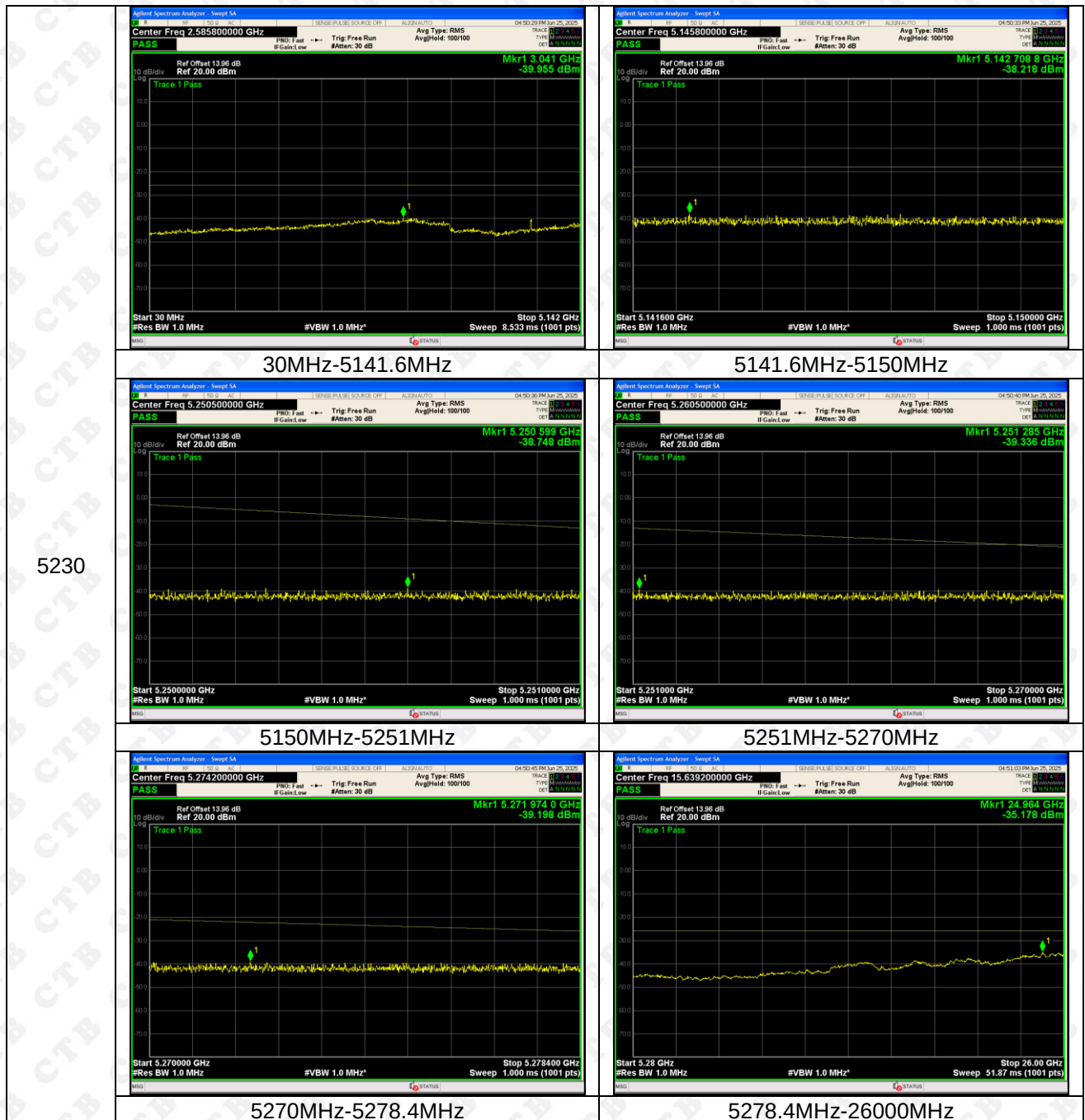












11 Interference Prevention Function

11.1 LIMIT

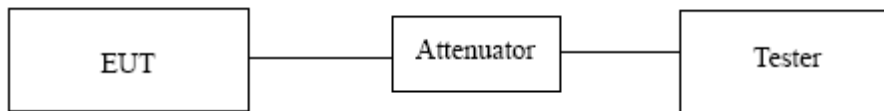
According to Item 19-3 of Article 2 Paragraph 1. The device shall have the function of automatic transmission or reception of identification code.

11.2 TEST PROCEDURE

1. Set the EUT in the usual operation condition
2. The radio equipment with automatic transmitting function of identification code
 - A. Transmit the assigned identification code from the radio equipment.
 - B. Confirm the identification code received by the demodulator.
3. The radio equipment with automatic receiving function of identification code
 - A. Transmit the assigned identification code from the opposite equipment.

- B. Confirm that the usual communication is available.
 - C. Transmit the identification code distinct from the assigned one from the opposite equipment.
 - D. Confirm that the radio equipment is stopped or an indication is displayed as the identification code is different.
4. The identification function shall be recorded with "Good" or "No".

11.3 TEST SETUP LAYOUT



11.4 TEST RESULT

Transmitter:

The transmitting mode (the identification code is more than 48 bits) of EUT is on normal operating, the interference prevention function is good.

Receiver:

The transmitting mode of EUT is on normal operating, the interference prevention function is good.

MAC: 9C:A5:25:BA:87:F7

12 Carrier sense capability

12.1 LIMIT

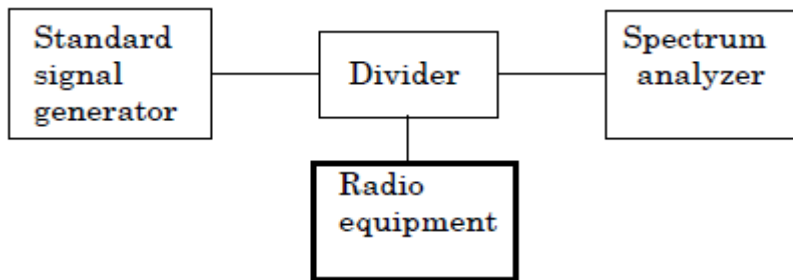
According to ORRE, art 49.20. The device shall have the carrier sensing function.

12.2 TEST PROCEDURE

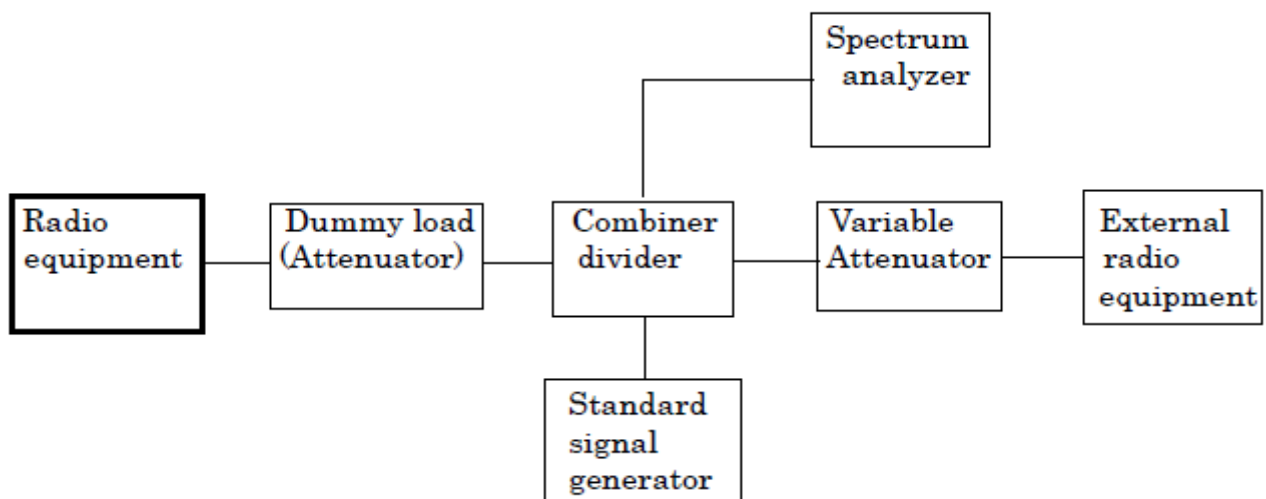
1. SG adjust the frequency as same as the EUT transmitted signal, unmodulation, power level 0dBm, Then turn off the RF signal
2. EUT have transmitted the maximum modulation signal and fixed channel
3. Setting of the SA following as RBW/VBW: 1/3MHz SPAN: 50MHz Sweep time: Auto continue PK
4. SG Signal on EUT shall be stop the transmitted, Then turn off the SG, The EUT shall be continuous transmitted signal.

12.3 TEST SETUP BLOCK DIAGRAM

(1) Test performed with the radio equipment to be tested only



(2) Test performed using the external radio equipment



12.4 TEST RESULT

EUT Stop RF transmission signal after carrier inject to EUT. Stop carrier inject, EUT will transmitting normal.)

13 Construction Protection Confirmation

12.1 Requirement

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily

13.2 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 BGA Method, and RF module is welded on the main board, end-User can't open it easily.

13.3 The photos of construction protection

The red circle is welding point.

The RF chip has a terminal distance to less than 1mm and has 44 terminal.

14 Transmission Burst Length

14.1 LIMIT

8ms or less

14.2 TEST PROCEDURE

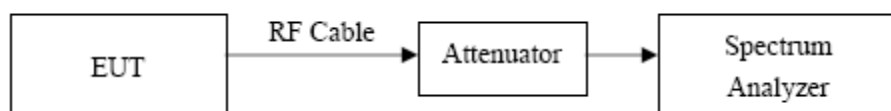
Enable EUT under transmission mode and connected it to the spectrum analyzer through antenna output port as the block diagram show in TEST CONFIGURATION

Use Spectrum's ACP measurement function and set spectrum analyzer as fellow:

Spectrum Condition:

- (1) Frequency: test frequency
- (2) Span: 0Hz, RBW: 1MHz, VBW: 3MHz, Sweep time: Auto, Sweep mode: single
- (3) Detector mode: Peak, Indication mode: Max hold

14.3 TEST SETUP BLOCK DIAGRAM

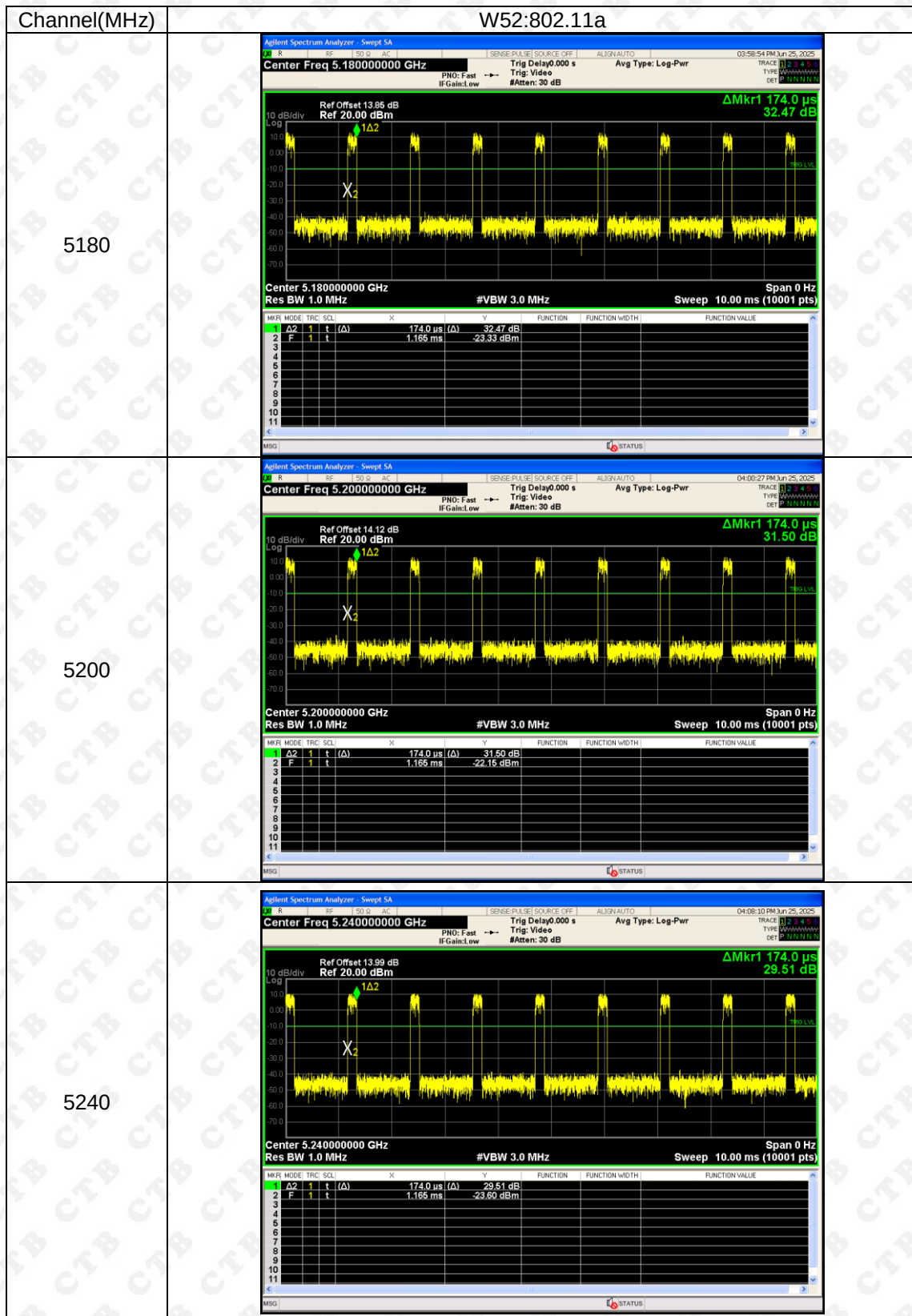


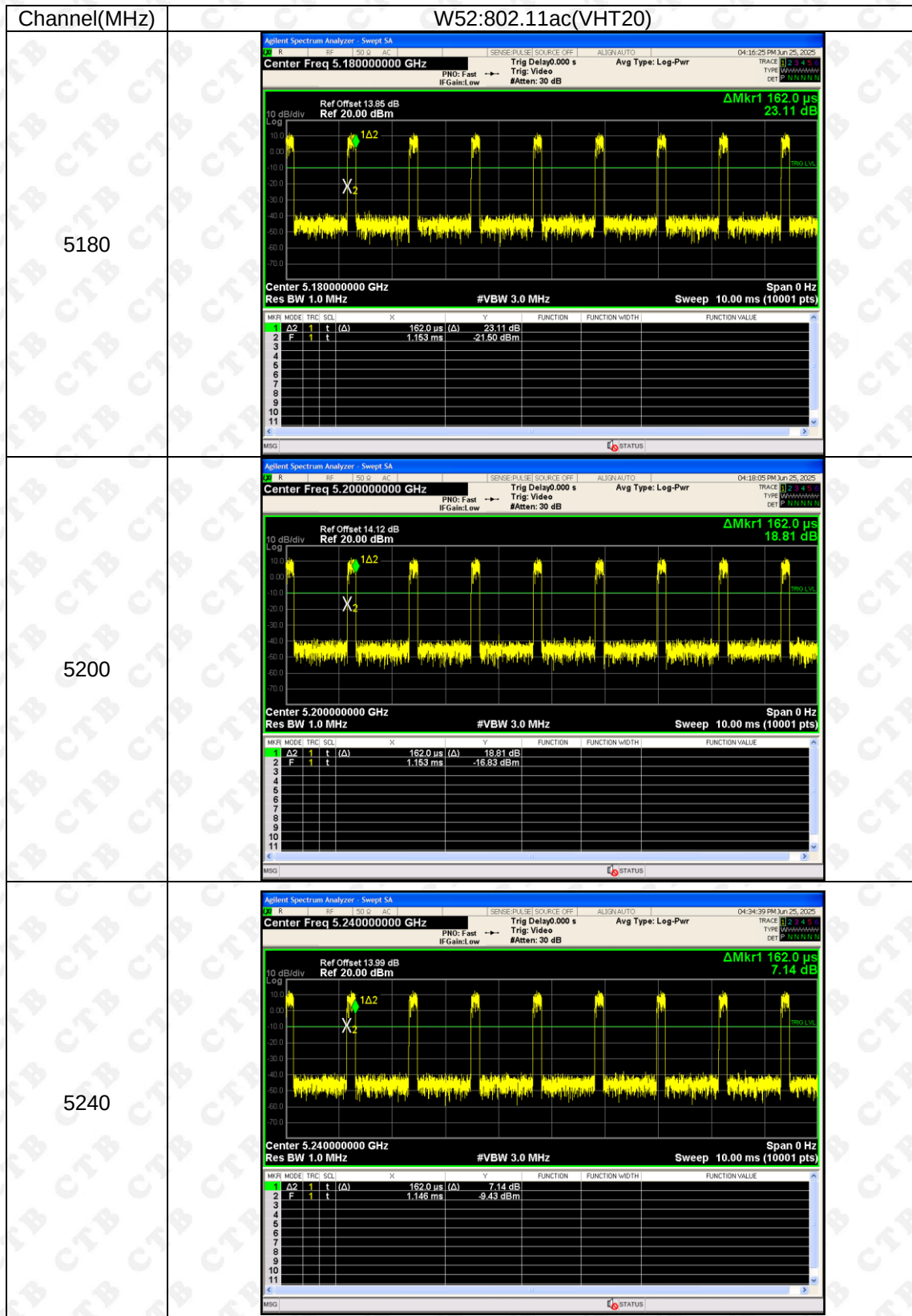
14.4 TEST RESULT

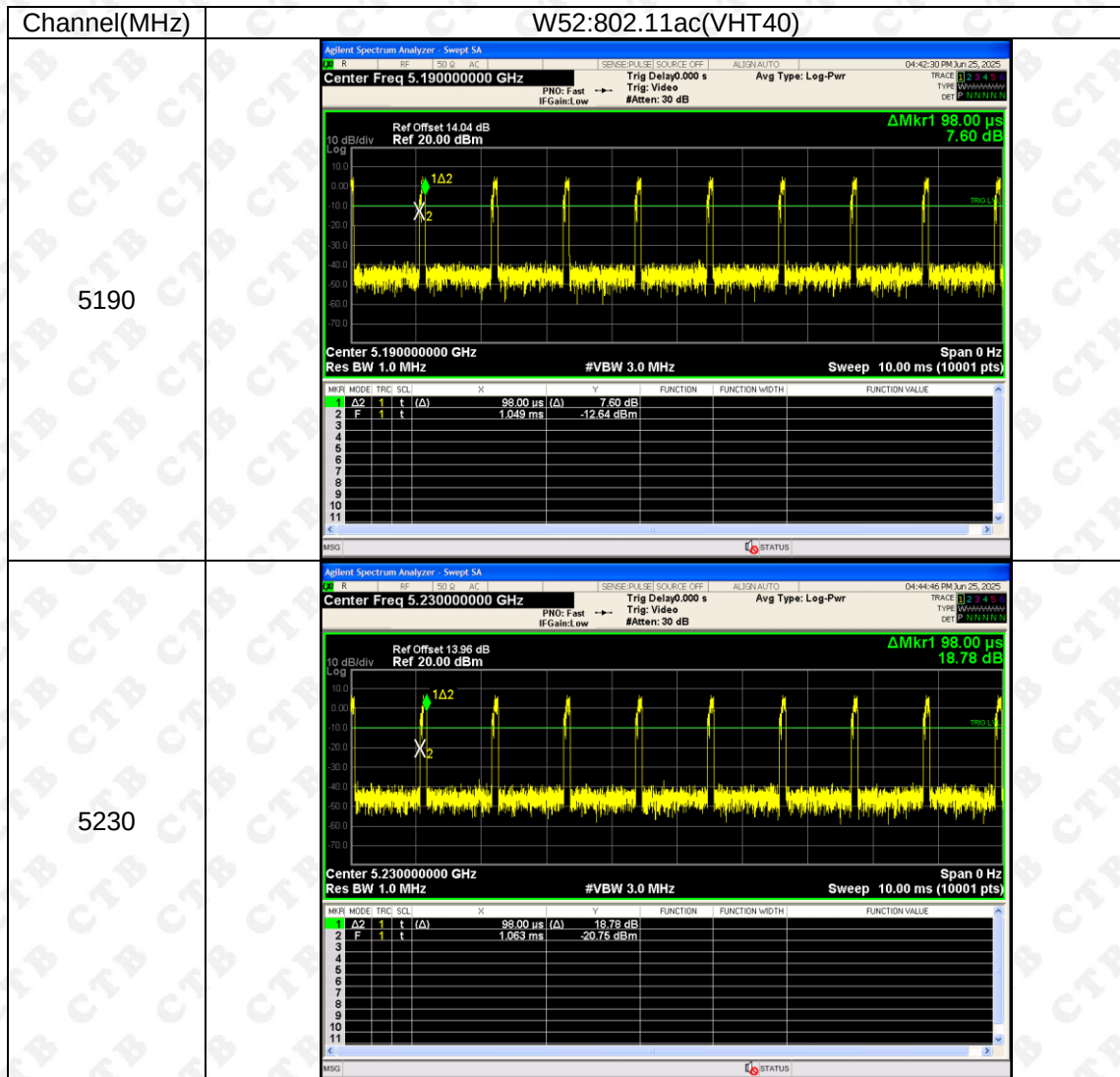
W52

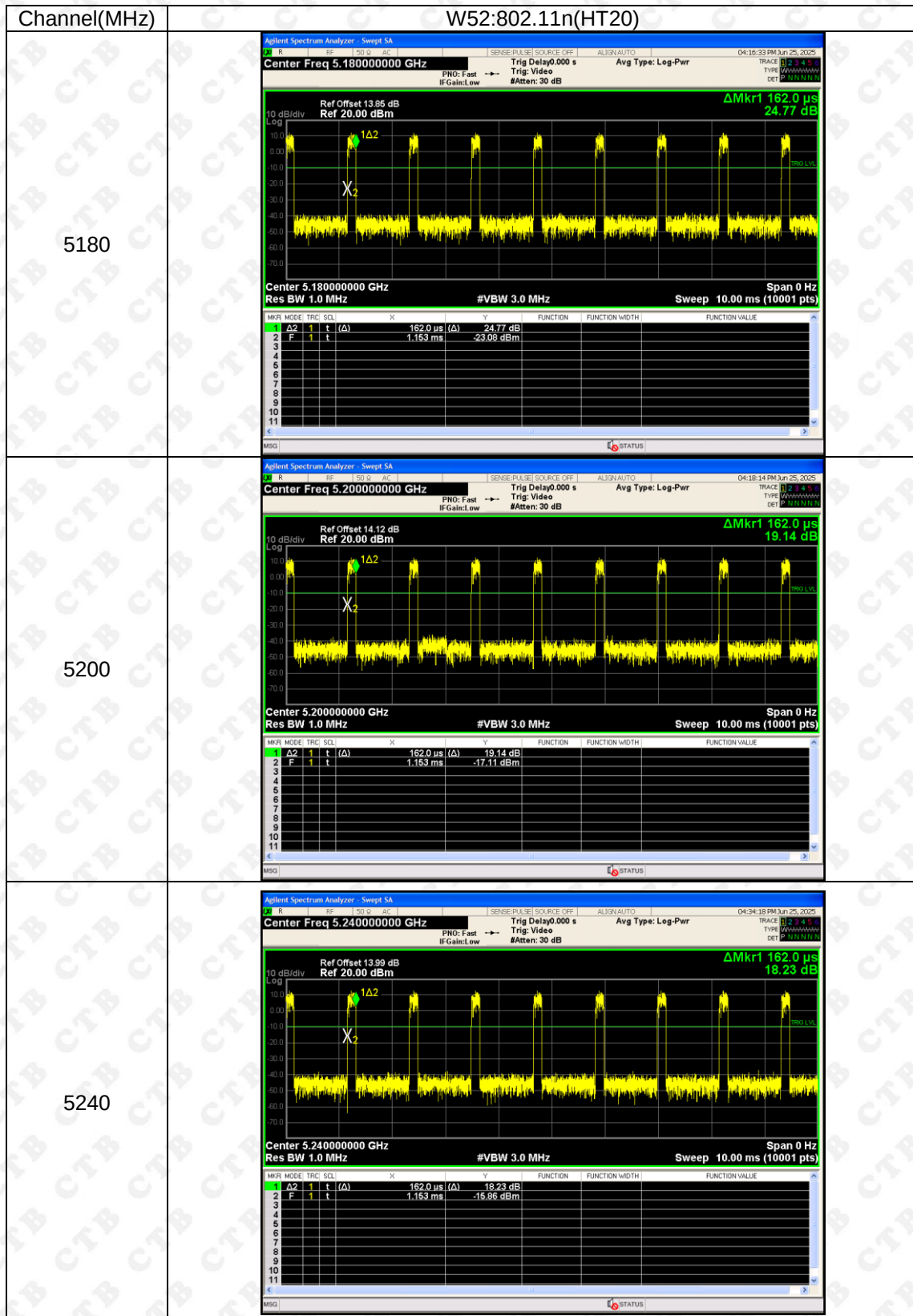
Normal Voltage			
Mode	Channel (MHz)	Read Level(ms)	Limit (ms)
802.11a	LCH	0.174	8ms or less
	MCH	0.174	
	HCH	0.174	
802.11ac(VHT20)	LCH	0.162	
	MCH	0.162	
	HCH	0.162	
802.11ac(VHT40)	LCH	0.098	
	MCH	/	
	HCH	0.098	
802.11n(HT20)	LCH	0.162	
	MCH	0.162	
	HCH	0.162	
802.11n(HT40)	LCH	0.098	
	MCH	/	
	HCH	0.098	
802.11ax(HE20)	LCH	0.162	
	MCH	0.162	
	HCH	0.162	
802.11ax(HE40)	LCH	0.098	
	MCH	/	
	HCH	0.098	

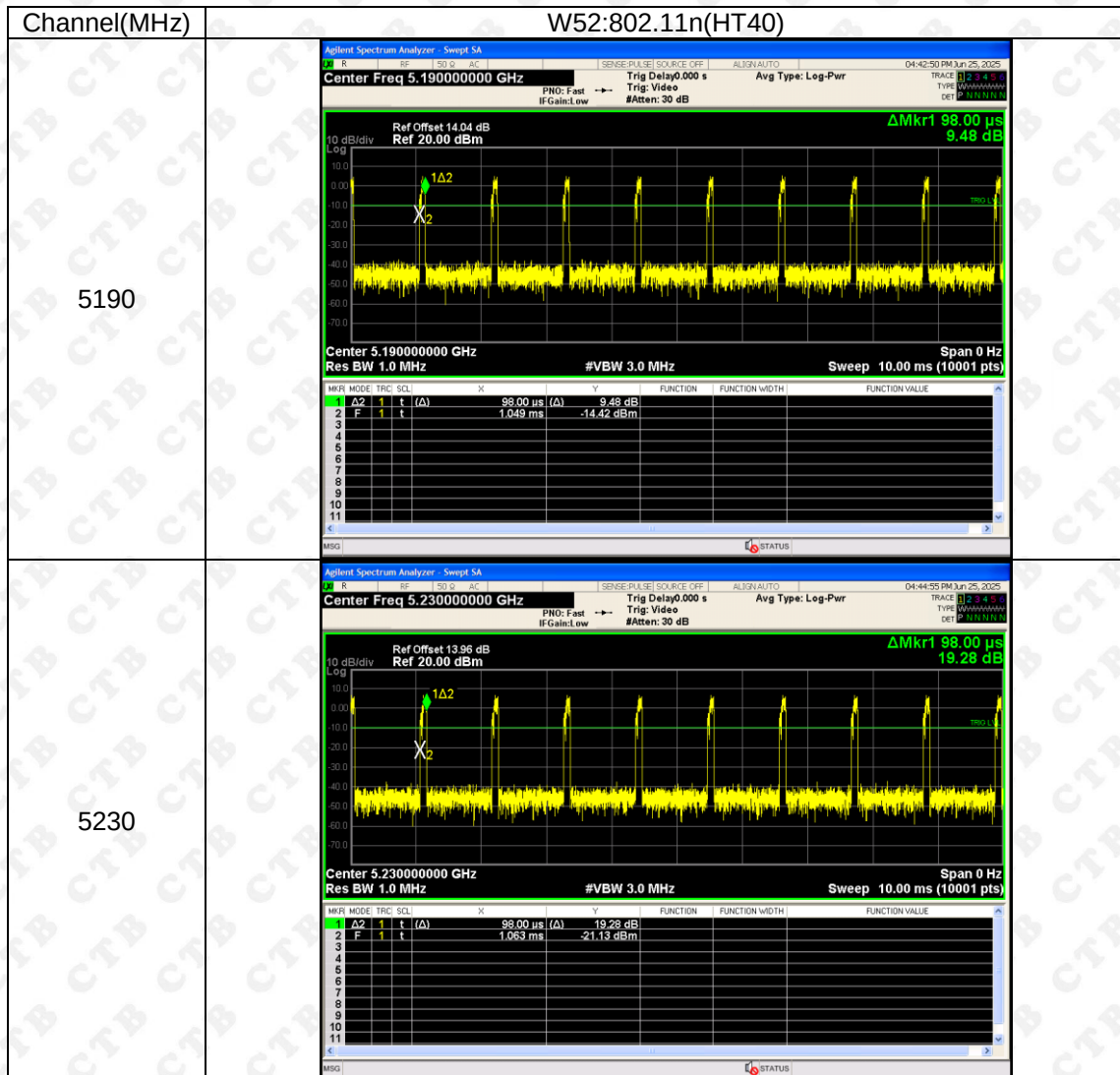
Test graph















15 Secondary Radiated Emitted Power

15.1 LIMIT

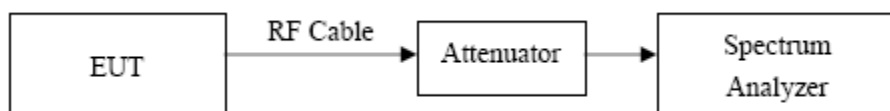
According to Item 19-3 of Article 2 Paragraph 1. The receiver spurious emissions shall not exceed the following limit:

- (1) Below 1GHz : 4nW/100kHz or less
- (2) 1GHz or more : 20nW/MHz or more

15.2 TEST PROCEDURE

- (1) A spectrumIn case of conducted measurements, the radio device shall be connected to the measuring equipment via a suitable attenuator.
- (2) The measurement equipment shall be set for peak hold mode of operation.
- (3) the transmitter shall be operated at the receiving mode.
- (4) The resolution bandwidth shall be set to 100kHz from 10MHz to 1GHz, the resolution bandwidth shall be set to 1MHz above 1GHz , and the sweep time shall be set to auto mode, to ensure all major modulation products are captured.
- (5) When the searched result is less than the specified limit, the maximum one shall be recorded, when the result is more than the specified limit, all measured values shall be recorded.
- (5) This measurement shall be repeated with the transmitter in standby mode where applicable.
- (6) Repeat above procedures until all frequency measured was complete.

15.3 TEST SETUP BLOCK DIAGRAM

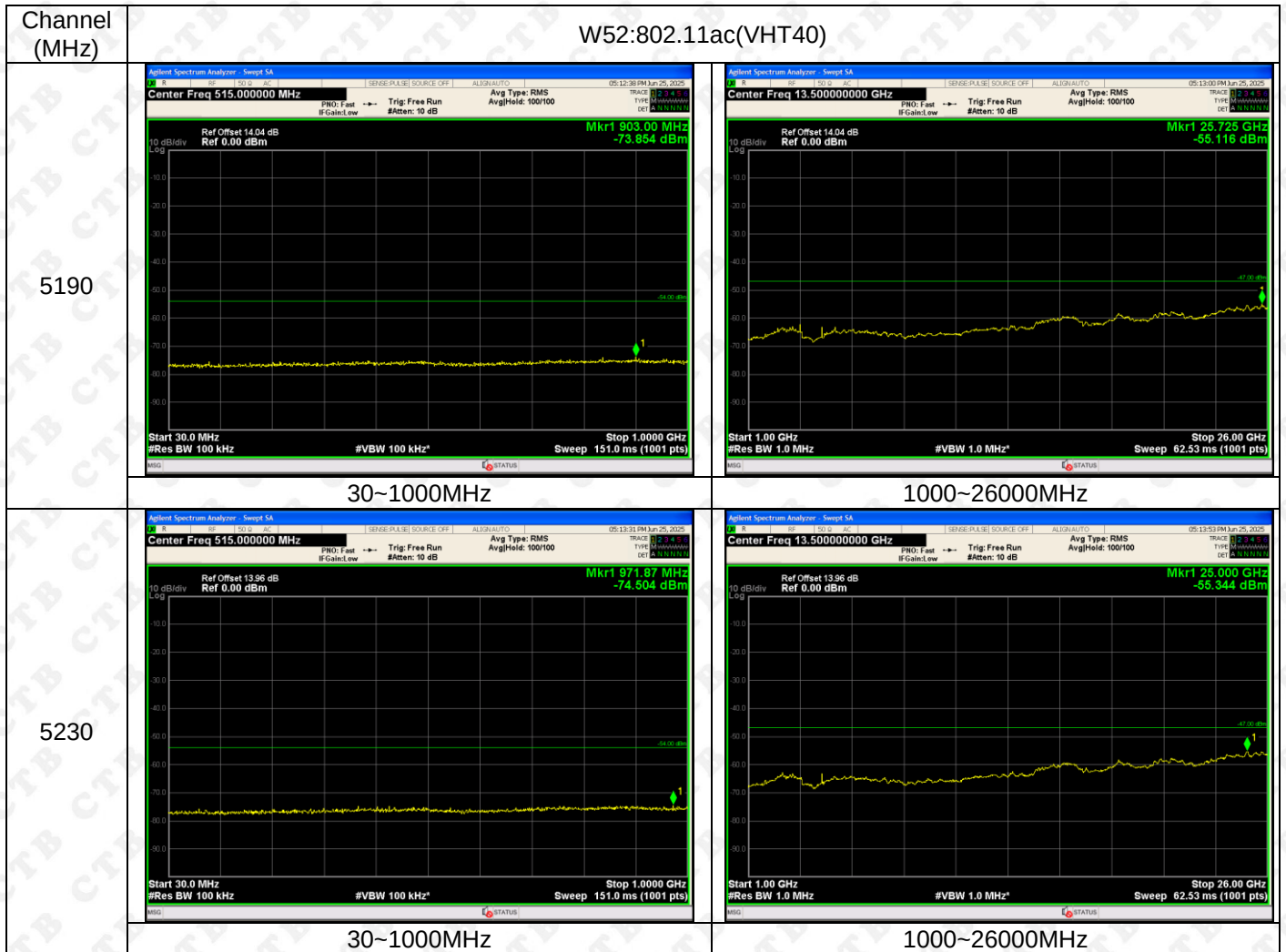


15.4 TEST RESULT
W52

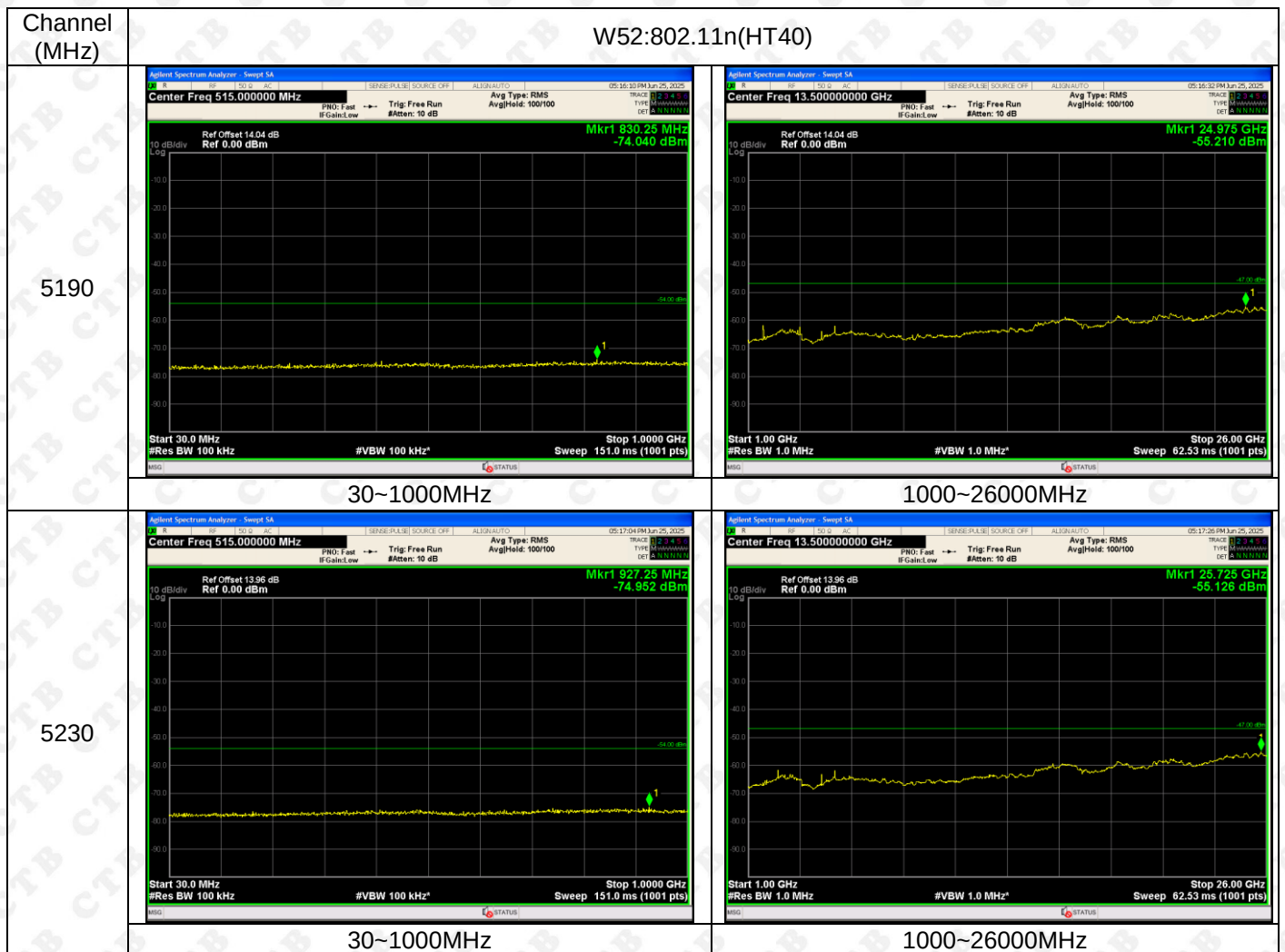
Normal Voltage						
Mode	Channel (MHz)	Frequency(MHz)	Mkr(MHz)	Test result(dBm)	Limit (dBm)	Result
802.11a	LCH	30~1000	936.95	-74.49	-54	Pass
		1000~26000	25025	-55.49	-47	Pass
	MCH	30~1000	871.96	-73.27	-54	Pass
		1000~26000	25000	-55.12	-47	Pass
	HCH	30~1000	872.93	-74.42	-54	Pass
		1000~26000	25725	-55.28	-47	Pass
802.11ac(VHT20)	LCH	30~1000	768.17	-74.55	-54	Pass
		1000~26000	24975	-55.66	-47	Pass
	MCH	30~1000	871.96	-73.72	-54	Pass
		1000~26000	25025	-55.03	-47	Pass
	HCH	30~1000	742.95	-74.4	-54	Pass
		1000~26000	25000	-55.06	-47	Pass
802.11ac(VHT40)	LCH	30~1000	903	-73.85	-54	Pass
		1000~26000	25725	-55.12	-47	Pass
	HCH	30~1000	971.87	-74.5	-54	Pass
		1000~26000	25000	-55.34	-47	Pass
802.11n(HT20)	LCH	30~1000	738.1	-74	-54	Pass
		1000~26000	25725	-55.05	-47	Pass
	MCH	30~1000	844.8	-73.71	-54	Pass
		1000~26000	25775	-55.16	-47	Pass
	HCH	30~1000	919.49	-74.04	-54	Pass
		1000~26000	25000	-55.31	-47	Pass
802.11n(HT40)	LCH	30~1000	830.25	-74.04	-54	Pass
		1000~26000	24975	-55.21	-47	Pass
	HCH	30~1000	927.25	-74.95	-54	Pass
		1000~26000	25725	-55.13	-47	Pass
802.11ax(HE20)	LCH	30~1000	732.28	-74.35	-54	Pass
		1000~26000	24975	-55.28	-47	Pass
	MCH	30~1000	845.77	-73.08	-54	Pass
		1000~26000	24975	-55.19	-47	Pass
	HCH	30~1000	906.88	-73.59	-54	Pass
		1000~26000	25000	-55.37	-47	Pass
802.11ax(HE40)	LCH	30~1000	887.48	-74.21	-54	Pass
		1000~26000	25475	-55.35	-47	Pass
	HCH	30~1000	882.63	-74.25	-54	Pass
		1000~26000	25025	-55.64	-47	Pass

Channel(MHz)	W52:802.11a	
5180		
	30~1000MHz	1000~26000MHz
5200		
	30~1000MHz	1000~26000MHz
5240		
	30~1000MHz	1000~26000MHz

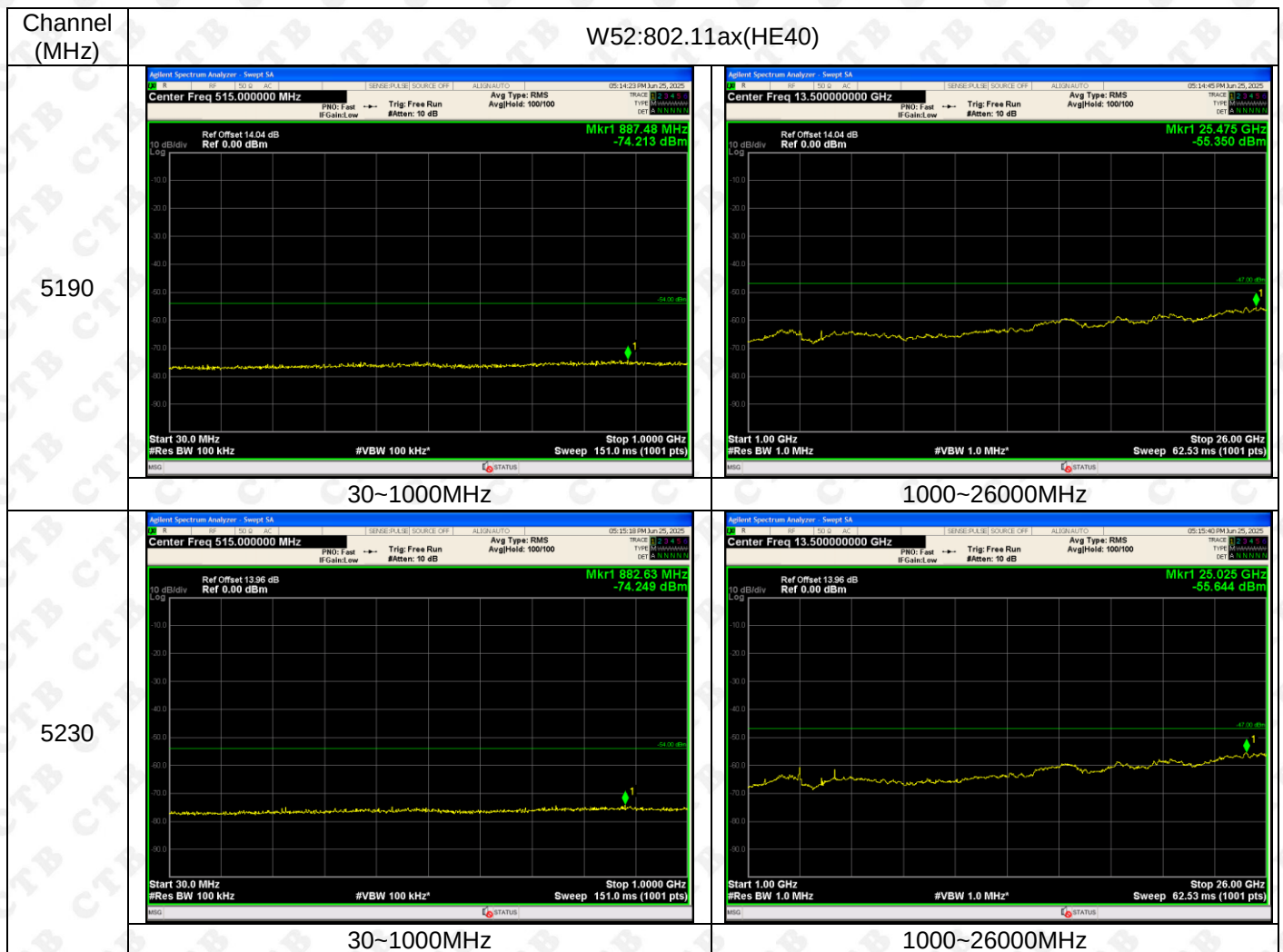
Channel(MHz)	W52:802.11ac(VHT20)	
5180		
	30~1000MHz	1000~26000MHz
5200		
	30~1000MHz	1000~26000MHz
5240		
	30~1000MHz	1000~26000MHz



Channel(MHz)	W52:802.11n(HT20)	
5180		
	30~1000MHz	1000~26000MHz
5200		
	30~1000MHz	1000~26000MHz
5240		
	30~1000MHz	1000~26000MHz



Channel(MHz)	W52:802.11ax(HE20)	
5180		
	30~1000MHz	1000~26000MHz
5200		
	30~1000MHz	1000~26000MHz
5240		
	30~1000MHz	1000~26000MHz



16 DYNAMIC FREQUENCY SELECTION (SLAVE)

16.1 Standard Applicable

Article 2 paragraph 1 item (19-3)

16.2 TEST PROCEDURE

Ordinance Regulating Radio Equipment No. 18, Article 49-20

WAS/RLAN devices operating in slave mode (slave device) can be operated in a network controlled by a WAN/RLAN device operating in master mode (master device).

16.3 Summary of Test Results

Can be operated in a network controlled by a WAN/RLAN device operating in master mode.

Pass

17 EUT TEST PHOTO



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