

FCC Test Report

Report No.: 2405Y99385EC

Applicant: Shenzhen VanTop Technology & Innovation Co., Ltd.

Address: 506, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community, Taoyuan Street, Nanshan District, Shenzhen, China

Product Name: R/C QUADCOPTER

Product Model: DR-STP31G

Multiple Models: DR-UHG30G

Trade Mark: N/A

FCC ID: 2AQ3A-STP31GT2424

Standards: FCC CFR Title 47 Part 15E (§15.407)

Test Date: 2024-10-23 to 2024-11-18

Test Result: Complied

Issue Date: 2024-11-18

Reviewed by:

Abel chen

Abel Chen
Project Engineer

Approved by:

Jacob Kong

Jacob Kong
Manager

Prepared by:

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China



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Revision History

Version No.	Issued Date	Description
00	2024-11-18	Original

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1 General Information

1.1 Client Information

Applicant:	Shenzhen VanTop Technology & Innovation Co., Ltd.
Address:	506, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community, Taoyuan Street, Nanshan District, Shenzhen, China
Manufacturer:	Shenzhen VanTop Technology & Innovation Co., Ltd.
Address:	506, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community, Taoyuan Street, Nanshan District, Shenzhen, China

1.2 Product Description of EUT

The EUT is R/C QUADCOPTER that contains 5G WLAN radio, this report covers the full testing of the 5G WLAN radio.

Sample Serial number	2SWX-2 for RE test, 2SWX-3 for RF conducted test(assigned by WATC)
Sample Received Date	2024-10-16
Sample Status	Good Condition
Frequency Range	5725 MHz - 5850MHz
Maximum Conducted Output Power	5725 MHz - 5850MHz: 26.37dBm
Modulation Technology	OFDM
Spatial Streams	MIMO (2TX, 2RX)
Antenna Gain [#]	1.88dBi
Power Supply	DC 7.4V from battery
Adapter Information	N/A
Modification	Sample No Modification by the test lab

1.3 Antenna information

15.203 requirement:	
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
Device Antenna information:	
The Wi-Fi antenna is an internal antenna which cannot replace by end-user. Please see the product internal photos for details.	

1.4 Related Submittal(s)/Grant(s)

No related submittal(s)/Grant(s)

1.5 Measurement Uncertainty

Parameter		Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
AC Power Lines Conducted Emissions		±3.14dB
Emissions, Radiated	Below 30MHz	±2.78dB
	Below 1GHz	±4.84dB
	Above 1GHz	±5.44dB
Emissions, Conducted		1.75dB
Conducted Power		0.74dB
Frequency Error		150Hz
Bandwidth		0.34%
Power Spectral Density		0.74dB
Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.		

1.6 Laboratory Location

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: qa@watc.com.cn

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

1.7 Test Methodology

FCC CFR 47 Part 2

FCC CFR 47 Part 15

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

2 Description of Measurement

2.1 Test Configuration

Operating channels: (5725-5850MHz)					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
149	5745	153	5765	157	5785
161	5805	165	5825	/	/
According to ANSI C63.10-2013 chapter 5.6.1 Table 11 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:					
802.11a, 802.11n-HT20, 802.11ac-VHT20					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
149	5745	157	5785	165	5825

Test Mode:					
Transmitting mode:		Keep the EUT in continuous transmitting with modulation			
Exercise software [#] :		SecureCRT			
Band	Mode	Data rate	Power Level Setting [#]		
			Low Channel	Middle Channel	High Channel
5725-5850MHz	802.11a	6Mbps	95	95	95
	802.11ac-VHT20	MCS0	95	95	95
The exercise software and the maximum power setting that provided by manufacturer.					

Worst-Case Configuration:
For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was photo and recorded in report
For radiated emission 9kHz-1GHz and above 18GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario.
For radiated emissions below 30MHz, three antenna orientations (parallel, perpendicular, gound-parallel) were tested, only record the worse case test data in report.
According to manufacturer, the device support SISO/MIMO for all mode, all modes share the same power level setting under the same modulation. So the worst mode MIMO was selected to test
The n-ht20 was reduced test since the identical parameters with ac vht20.

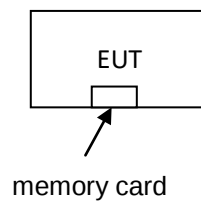
2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
Samsung	memory card	unknown	unknown

2.3 Interconnecting Cables

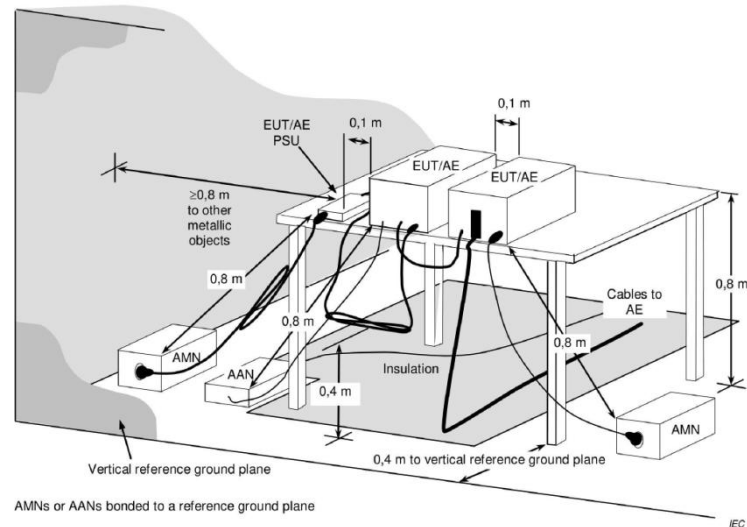
Manufacturer	Description	Length(m)	From	To
/	/	/	/	/

2.4 Block Diagram of Connection between EUT and AE



2.5 Test Setup

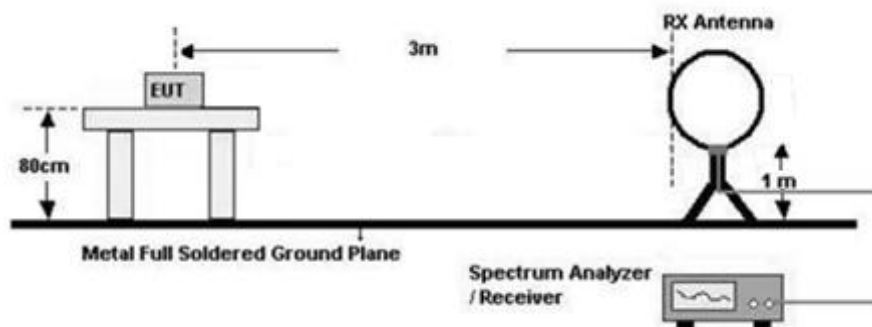
1) Conducted emission measurement:



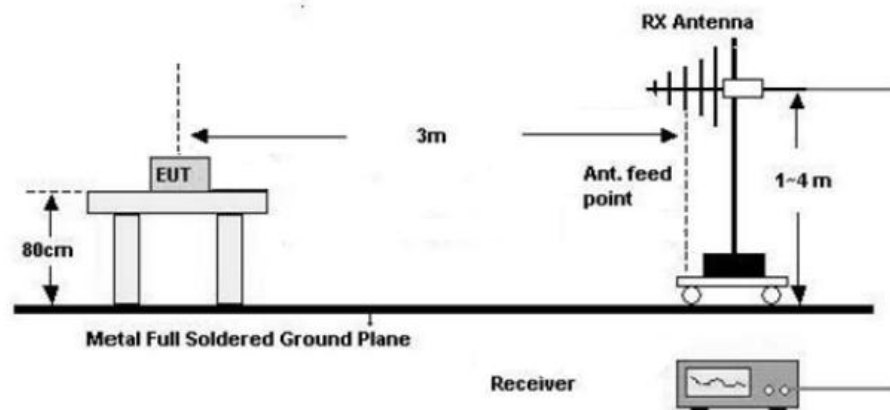
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

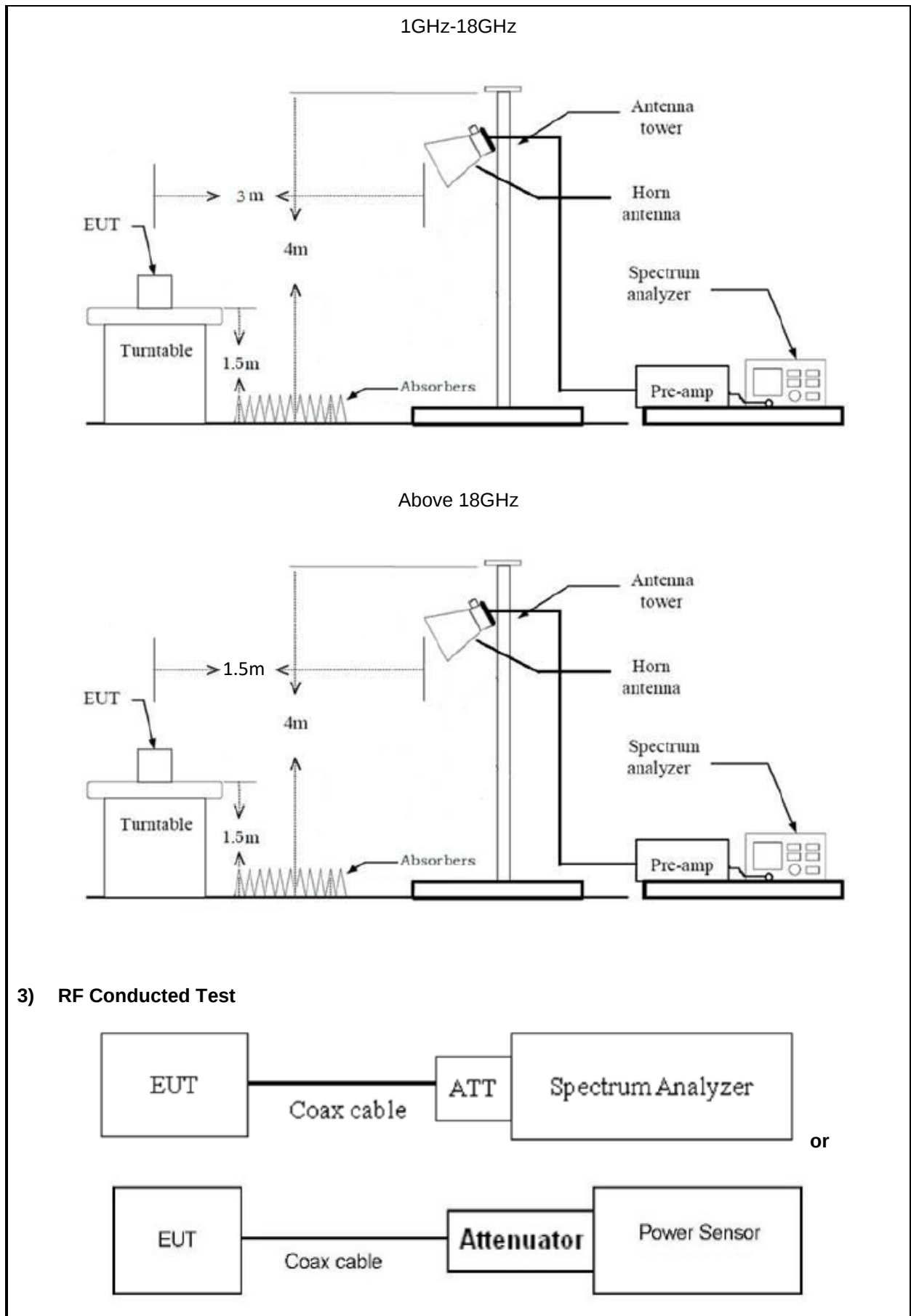
2) Radiated emission measurement:

Below 30MHz (3m SAC)



0MHz-1GHz (3m SAC)





2.6 Test Procedure

Conducted emission:

1. The E.U.T is placed on a non-conducting table 40cm from the vertical ground plane and 80cm above the horizontal ground plane (Please refer to the block diagram of the test setup and photographs).
2. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
3. Line conducted data is recorded for both Line and Neutral

Radiated Emission Procedure:

a) For below 30MHz

- All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz- 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were $40 \cdot \log(\text{test distance} / \text{specification distance})$.
- Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, ground-parallel)
- The RBW/VBW of receiver is set to 200Hz/1kHz for 9kHz to 150kHz range, to 10kHz/30kHz for 150kHz to 30MHz range for scan Peak emission, 200Hz/9kHz IF BW was used for final measurement in the Quasi-peak or average detection mode for frequency range 9~150kHz/150kHz~30MHz respectively.
- If the Peak emission complies with the QP limit, then perform final measurement is optional.

b) For 30MHz-1GHz:

- The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
- EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
- The RBW/VBW of receiver is set to 100kHz/300kHz for scan Peak emission, 120kHz IF BW was used for final measurement in the Quasi-peak detection mode.
- If the Peak emission complies with the QP limit, then perform final measurement is optional.

c) For above 1GHz:

1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m (1-18GHz) and 1.5 m (above 18GHz).
2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.

3. The RBW/VBW of spectrum analyzer is set to 1MHz/3MHz for scan Peak emission, for measured average emission, reduce the VBW to 10Hz(for duty cycle $\geq$ 98%), or $\geq 1/T$ (for duty cycle $<$ 98%). T is minimum transmission duration. (Note: a high VBW (for example 1kHz, not less than $1/T$) may used to scan average emissions to avoid long sweep time.)
4. If the Peak emission complies with the Average limit, then perform average measurement is optional.
5. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
6. Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

RF Conducted Test:

1. The antenna port of EUT was connected to the RF port of the test equipment (Power Meter or Spectrum analyzer) through Attenuator and RF cable.
2. The cable assembly insertion loss of 14.0dB (including Attenuator and cable loss) was entered as an offset in the power meter. Note: Actual cable loss was unavailable at the time of testing, therefore the cable loss was assumed as worst case. This was later verified to be true by laboratory. (if the RF cable provided by client, the cable loss declared by client)
3. The EUT is keeping in continuous transmission mode and tested in all modulation modes.

2.7 Measurement Method

Description of Test	Measurement Method
AC Line Conducted Emissions	ANSI C63.10-2013 Section 6.2
Maximum Conducted Output Power	KDB 789033 D02 v02r01 section E.3. b)
Power Spectral Density	KDB 789033 D02 v02r01 section F
26 dB Emission Bandwidth	KDB 789033 D02 v02r01 section C.1
6 dB Emission Bandwidth	KDB 789033 D02 v02r01 section C.2
99% Occupied Bandwidth	KDB 789033 D02 v02r01 section D.
Unwanted Emissions	KDB 789033 D02 v02r01 section G.
Duty Cycle	KDB 789033 D02 v02r01 section B.

2.8 Measurement Equipment

Manufacturer	Description	Model	Management No.	Calibration Date	Calibration Due Date
Radiated Emission Test					
R&S	EMI test receiver	ESR3	102758	2024/6/4	2025/6/3
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSV40-N	101608	2024/6/4	2025/6/3
SONOMA INSTRUMENT	Low frequency amplifier	310	186014	2024/6/4	2025/6/3
A.H. Systems	PREAMPLIFIER	PAM-0118P	531	2024/6/4	2025/6/3
COM-POWER	Amplifier	PAM-840A	461306	2023/8/8	2024/8/7
BACL	Loop Antenna	1313-1A	4010611	2024/2/7	2027/2/6
SCHWARZBECK	Log - periodic wideband antenna	VULB 9163	9163-872	2023/7/7	2026/7/6
Astro Antenna Ltd	Horn antenna	AHA-118S	3015	2023/7/6	2026/7/5
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2023/7/10	2026/7/9
Ducommun technologies	Horn Antenna	ARH-2823-02	1007726-03	2023/7/10	2026/7/9
Oulitong	Band Reject Filter	OBSF-5150-585 0-S	OE02104371	2024/6/4	2025/6/3
Unknown	6.7G High Pass Filter	Unknown	6.7G	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.9	N/A	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.13	N/A	2024/8/7	2025/8/6
N/A	Coaxial Cable	NO.15	N/A	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.16	N/A	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.17	N/A	2024/6/4	2025/6/3
Audix	Test Software	E3	191218 V9	/	/
RF Conducted Test					
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSU-26	200680/026	2024/6/4	2025/6/3
ANRITSU	USB Power Sensor	MA24418A	12620	2024/6/4	2025/6/3
Unknown	10dB attenuator	10dB	10-1	2024/6/4	2025/6/3

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

3 Test Results

3.1 Test Summary

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207 (a) §15.407 (b)(9)	AC Line Conducted Emissions	N/A
§15.407 (a)(3)(i)	Conducted Output Power Power Spectral Density	Compliance
§15.407 (a)	99% Occupied Bandwidth	Compliance
§15.407 (e)	6 dB Emission Bandwidth	Compliance
§15.205, §15.209, §15.407 (b) (4), (9), (10)	Unwanted Emissions	Compliance
/	Duty Cycle	Report only

3.2 Limit

Test items	Limit
AC Power Line Conducted Emission	See details §15.207 (a)
Conducted Output Power Power Spectral Density	For the band 5.725-5.850 GHz: For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, Fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
26dB Emission Bandwidth 99% Occupied Bandwidth	N/A
6dB Emission Bandwidth	Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.
Unwanted Emissions	For transmitters operating solely in the 5.725–5.850 GHz band: All emissions shall be limited to a level of –27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. The provisions of § 15.205 apply to intentional radiators operating under this section.

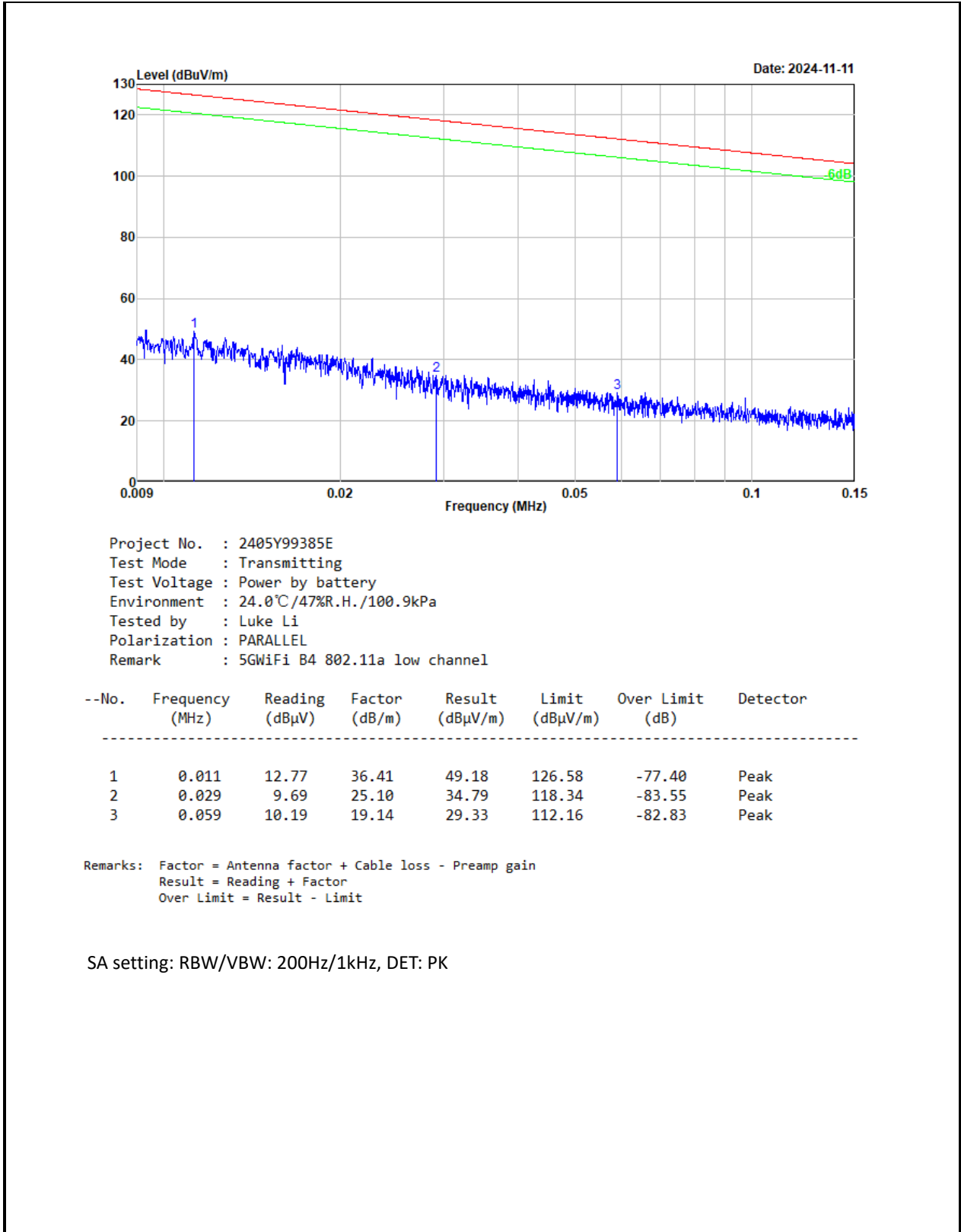
3.3 AC Line Conducted Emissions Test Data

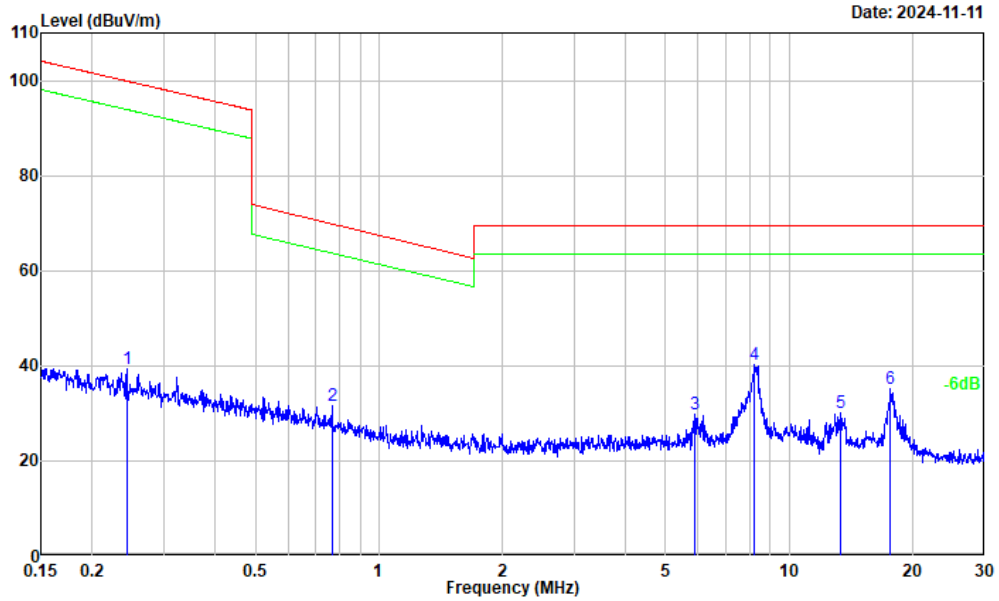
Not Applicable, the device only powered by battery

3.4 Radiated emission Test Data

9 kHz-30MHz:

Test Date:	2024-11-11	Test By:	Luke Li
Environment condition:	Temperature: 24.0°C; Relative Humidity:47%; ATM Pressure: 100.9kPa		





Project No. : 2405Y99385E
 Test Mode : Transmitting
 Test Voltage : Power by battery
 Environment : 24.0°C/47%R.H./100.9kPa
 Tested by : Luke Li
 Polarization : PARALLEL
 Remark : 5GWiFi B4 802.11a low channel

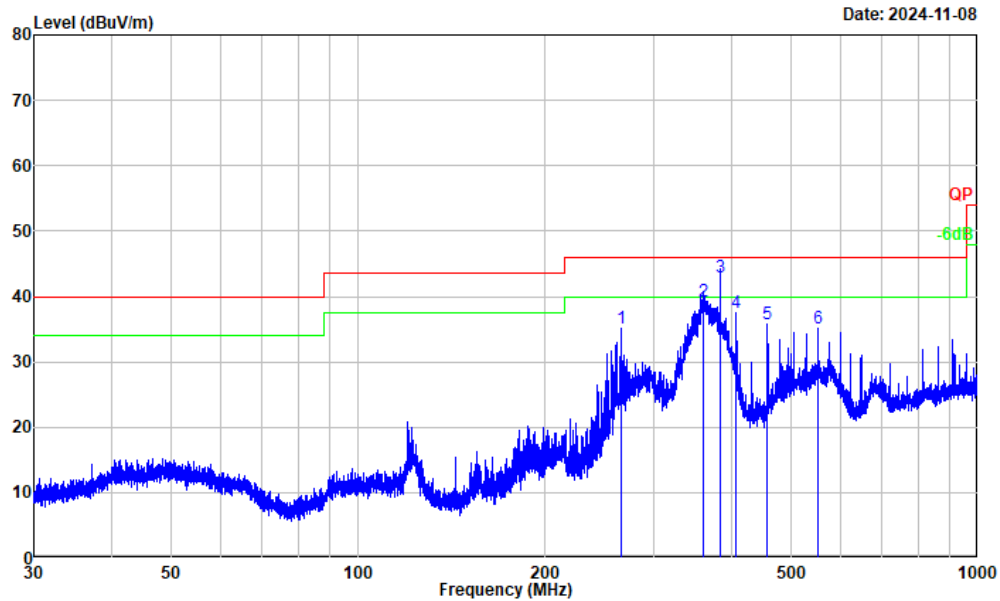
--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	0.243	28.28	10.93	39.21	99.89	-60.68	Peak
2	0.770	28.94	2.68	31.62	69.79	-38.17	Peak
3	5.893	34.03	-4.14	29.89	69.54	-39.65	Peak
4	8.230	44.15	-3.89	40.26	69.54	-29.28	Peak
5	13.332	33.72	-3.56	30.16	69.54	-39.38	Peak
6	17.656	38.58	-3.27	35.31	69.54	-34.23	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
 Result = Reading + Factor
 Over Limit = Result - Limit

SA setting: RBW/VBW: 10kHz/30kHz, DET: PK

30MHz-1GHz:

Test Date:	2024-11-08	Test By:	Luke Li
Environment condition:	Temperature: 23.6°C; Relative Humidity:41%; ATM Pressure: 101.1kPa		



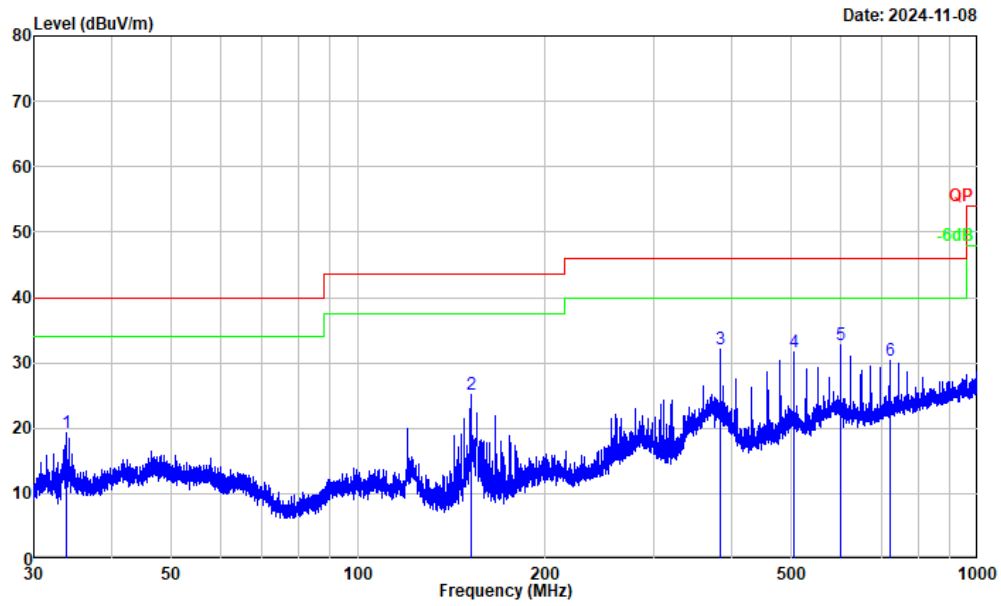
Project No. : 2405Y99385E
 Test Mode : Transmitting
 Test Voltage : Power by battery
 Environment : 23.6°C/41%R.H./101.1kPa
 Tested by : Luke Li
 Polarization : horizontal
 Remark : 5GWiFi B4 802.11a low channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	265.559	47.20	-12.15	35.05	46.00	-10.95	Peak
2	359.974	48.90	-9.67	39.23	46.00	-6.77	QP
3	384.100	52.11	-9.21	42.90	46.00	-3.10	QP
4	408.051	46.06	-8.58	37.48	46.00	-8.52	Peak
5	456.106	44.23	-8.37	35.86	46.00	-10.14	Peak
6	552.157	41.70	-6.56	35.14	46.00	-10.86	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
 Result = Reading + Factor
 Over Limit = Result - Limit

SA setting: Pre-scan: RBW/VBW: 100kHz/300kHz, DET: PK

Final measurement: RBW: 120kHz, DET: QP



Project No. : 2405Y99385E
 Test Mode : Transmitting
 Test Voltage : Power by battery
 Environment : 23.6°C/41%R.H./101.1kPa
 Tested by : Luke Li
 Polarization : vertical
 Remark : 5GWiFi B4 802.11a low channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	33.784	34.30	-15.05	19.25	40.00	-20.75	Peak
2	151.996	42.45	-17.32	25.13	43.50	-18.37	Peak
3	383.932	41.22	-9.21	32.01	46.00	-13.99	Peak
4	504.043	39.12	-7.38	31.74	46.00	-14.26	Peak
5	600.110	38.01	-5.30	32.71	46.00	-13.29	Peak
6	720.146	34.20	-3.74	30.46	46.00	-15.54	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
 Result = Reading + Factor
 Over Limit = Result - Limit

SA setting: Pre-scan: RBW/VBW: 100kHz/300kHz, DET: PK

Final measurement: RBW: 120kHz, DET: QP

Above 1GHz:

Test Date:	2024-10-23~2024-11-01	Test By:	Bard Huang
Environment condition:	Temperature: 23.9~25°C; Relative Humidity: 57~59%; ATM Pressure: 100.6kPa		

Frequency (MHz)	Reading level (dBμV)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
5725-5850MHz Band							
802.11a							
Low Channel							
11490.000	45.38	horizontal	4.54	49.92	54.00	-4.08	Average
11490.000	53.18	horizontal	4.54	57.72	74.00	-16.28	Peak
11490.000	46.08	vertical	4.54	50.62	74.00	-23.38	Peak
17235.000	53.73	horizontal	4.46	58.19	68.20	-10.01	Peak
17235.000	53.15	vertical	4.46	57.61	68.20	-10.59	Peak
Middle Channel							
11550.000	43.88	horizontal	4.12	48.00	54.00	-6.00	Average
11550.000	51.32	horizontal	4.12	55.44	74.00	-18.56	Peak
11550.000	46.27	vertical	4.12	50.39	74.00	-23.61	Peak
17355.000	49.97	horizontal	4.62	54.59	68.20	-13.61	Peak
17355.000	45.45	vertical	4.62	50.07	68.20	-18.13	Peak
High Channel							
11650.000	47.34	horizontal	3.64	50.98	54.00	-3.02	Average
11650.000	57.68	horizontal	3.64	61.32	74.00	-12.68	Peak
11650.000	49.53	vertical	3.64	53.17	74.00	-20.83	Peak
17475.000	60.17	horizontal	5.29	65.46	68.20	-2.74	Peak
17475.000	56.08	vertical	5.29	61.37	68.20	-6.83	Peak
802.11ac-VHT20							
Low Channel							
11490.000	45.09	horizontal	4.54	49.63	54.00	-4.37	Average
11490.000	56.17	horizontal	4.54	60.71	74.00	-13.29	Peak
11490.000	45.97	vertical	4.54	50.51	74.00	-23.49	Peak
17235.000	55.73	horizontal	4.46	60.19	68.20	-8.01	Peak
17235.000	51.63	vertical	4.46	56.09	68.20	-12.11	Peak
Middle Channel							
11570.000	46.30	horizontal	3.96	50.26	54.00	-3.74	Average
11570.000	54.59	horizontal	3.96	58.55	74.00	-15.45	Peak
11570.000	43.67	vertical	3.96	47.63	54.00	-6.37	Average
11570.000	51.25	vertical	3.96	55.21	74.00	-18.79	Peak

17355.000	55.38	horizontal	4.62	60.00	68.20	-8.20	Peak
17355.000	53.72	vertical	4.62	58.34	68.20	-9.86	Peak
High Channel							
11650.000	47.17	horizontal	3.64	50.81	54.00	-3.19	Average
11650.000	56.43	horizontal	3.64	60.07	74.00	-13.93	Peak
11650.000	45.46	vertical	3.64	49.10	54.00	-4.90	Average
11650.000	53.37	vertical	3.64	57.01	74.00	-16.99	Peak
17474.000	55.66	horizontal	5.28	60.94	68.20	-7.26	Peak
17475.000	54.43	vertical	5.29	59.72	68.20	-8.48	Peak

Remark:

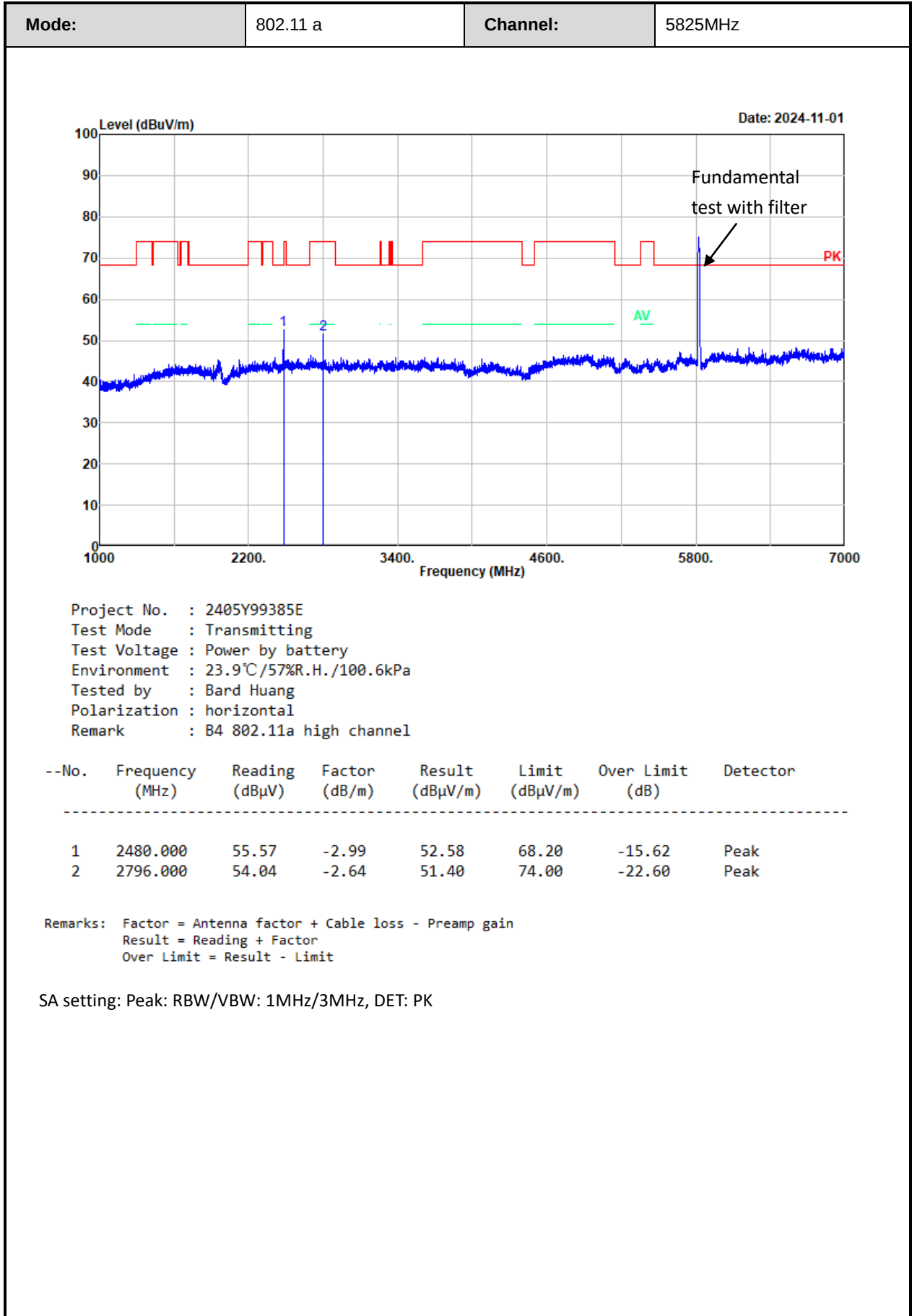
Corrected Amplitude= Reading level + corrected Factor

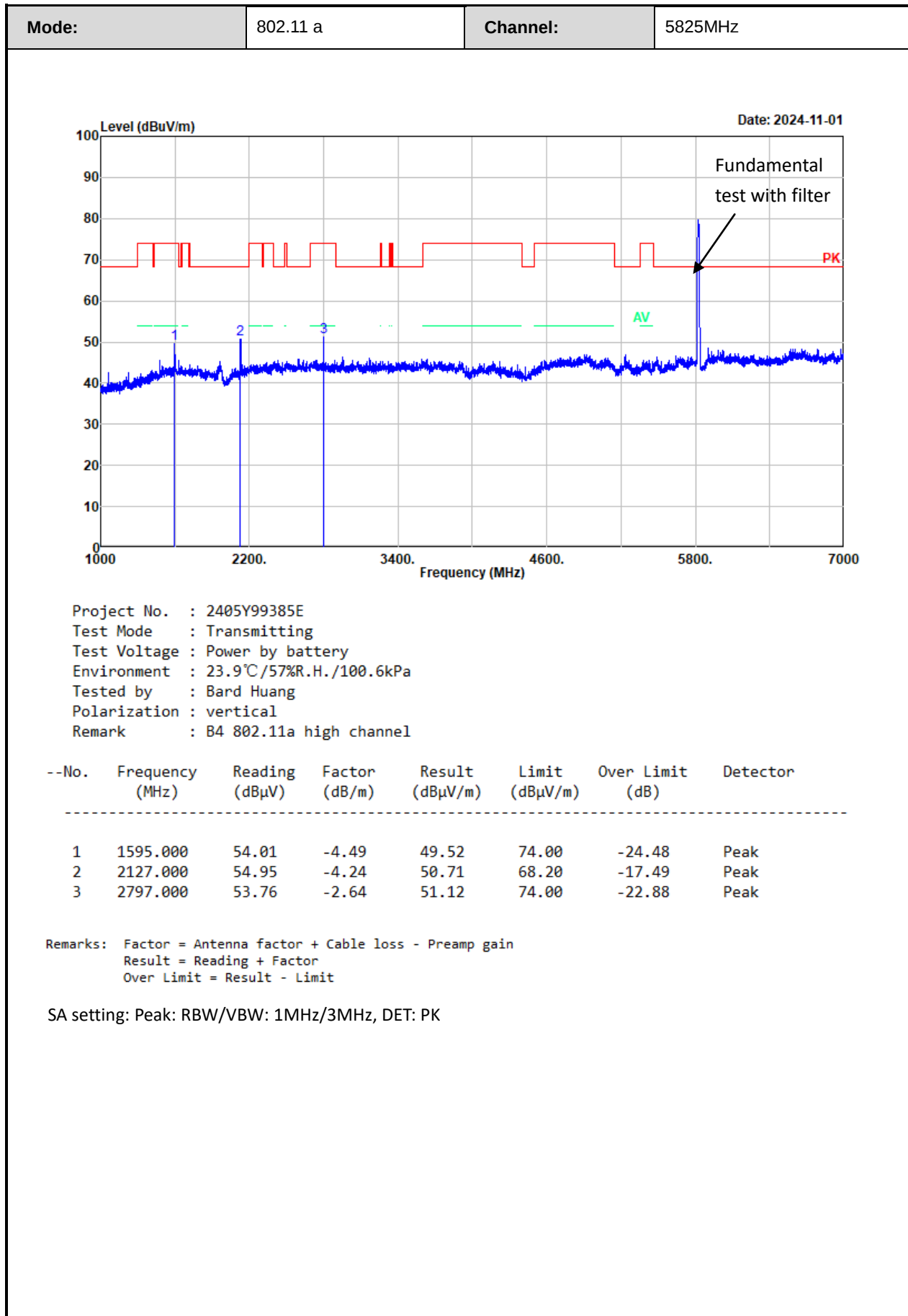
Corrected Factor = Antenna factor + Cable loss – Amplifier gain

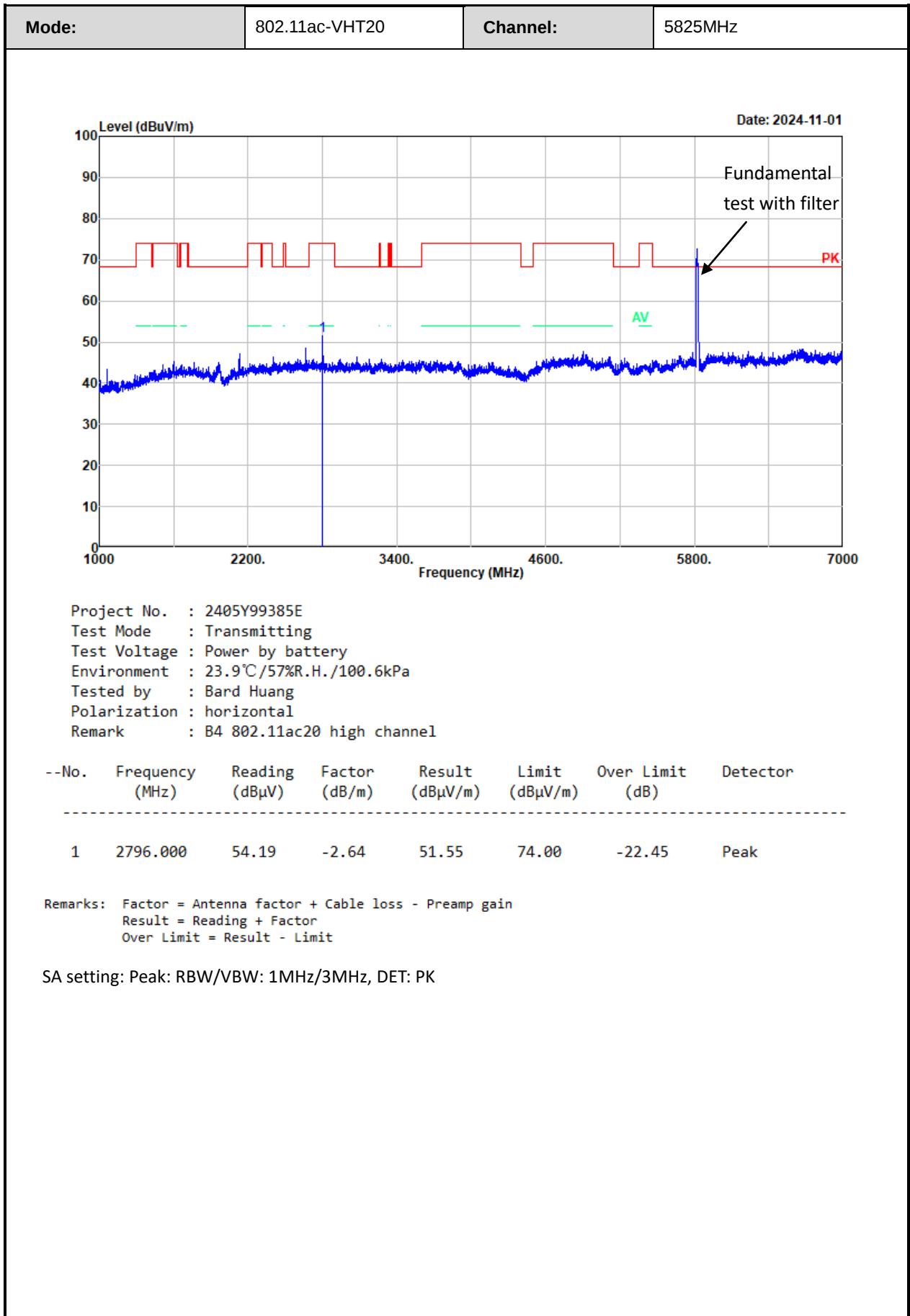
Margin = Corrected Amplitude – Limit

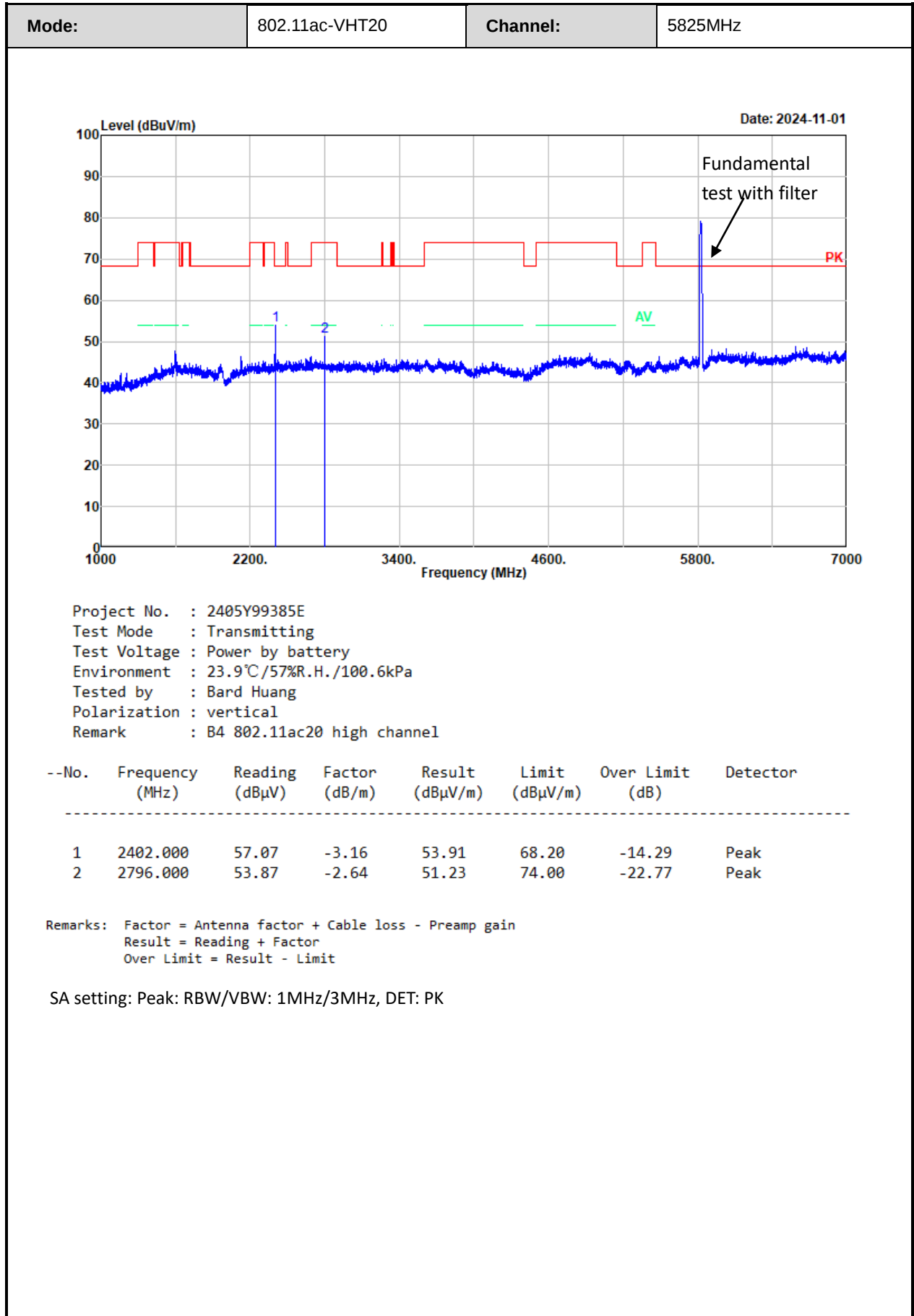
For the test result of Peak below the Peak limit more than 20dB, which can compliance with the average limit, just the Peak level was recorded.

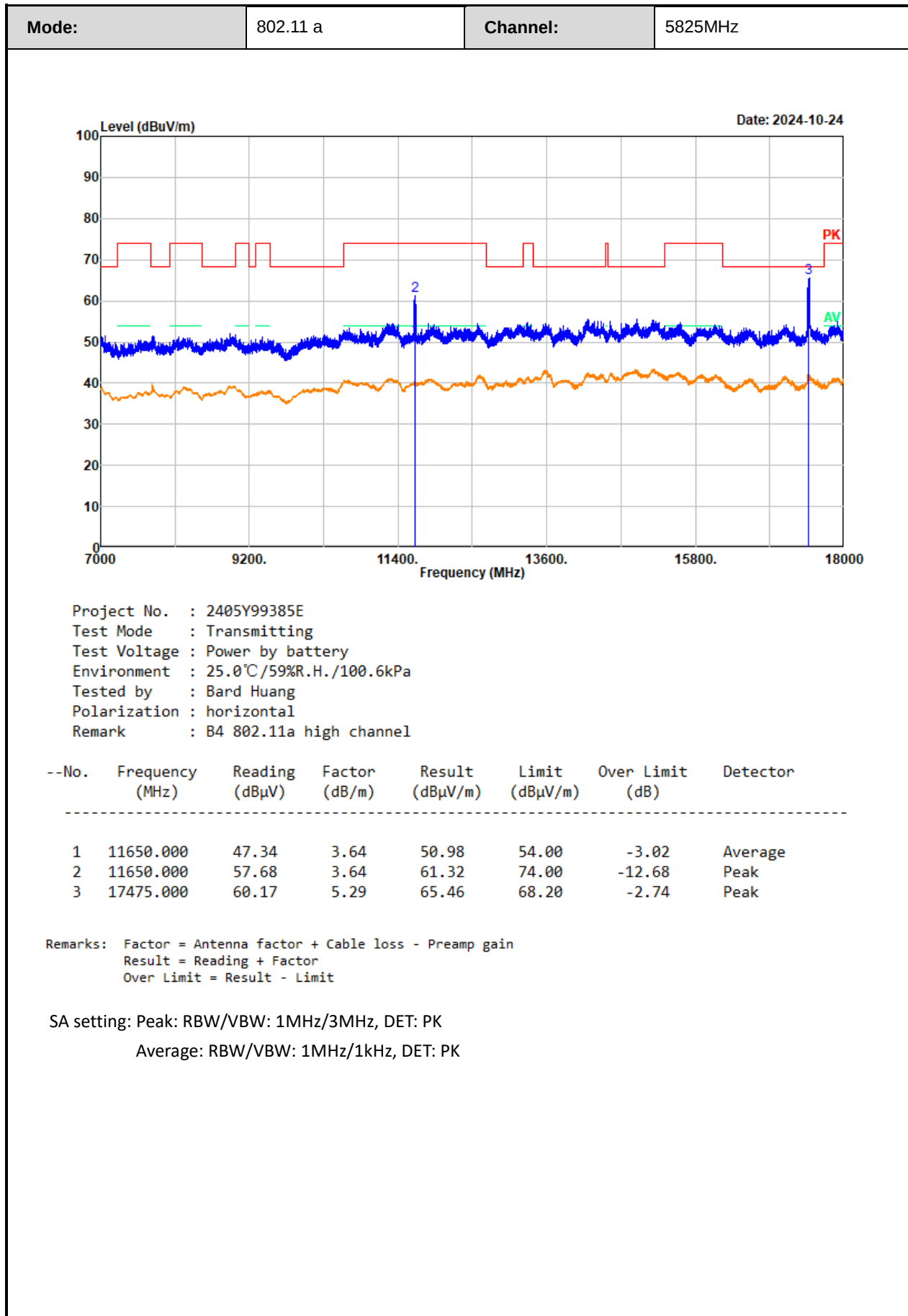
Test plot for example as below:

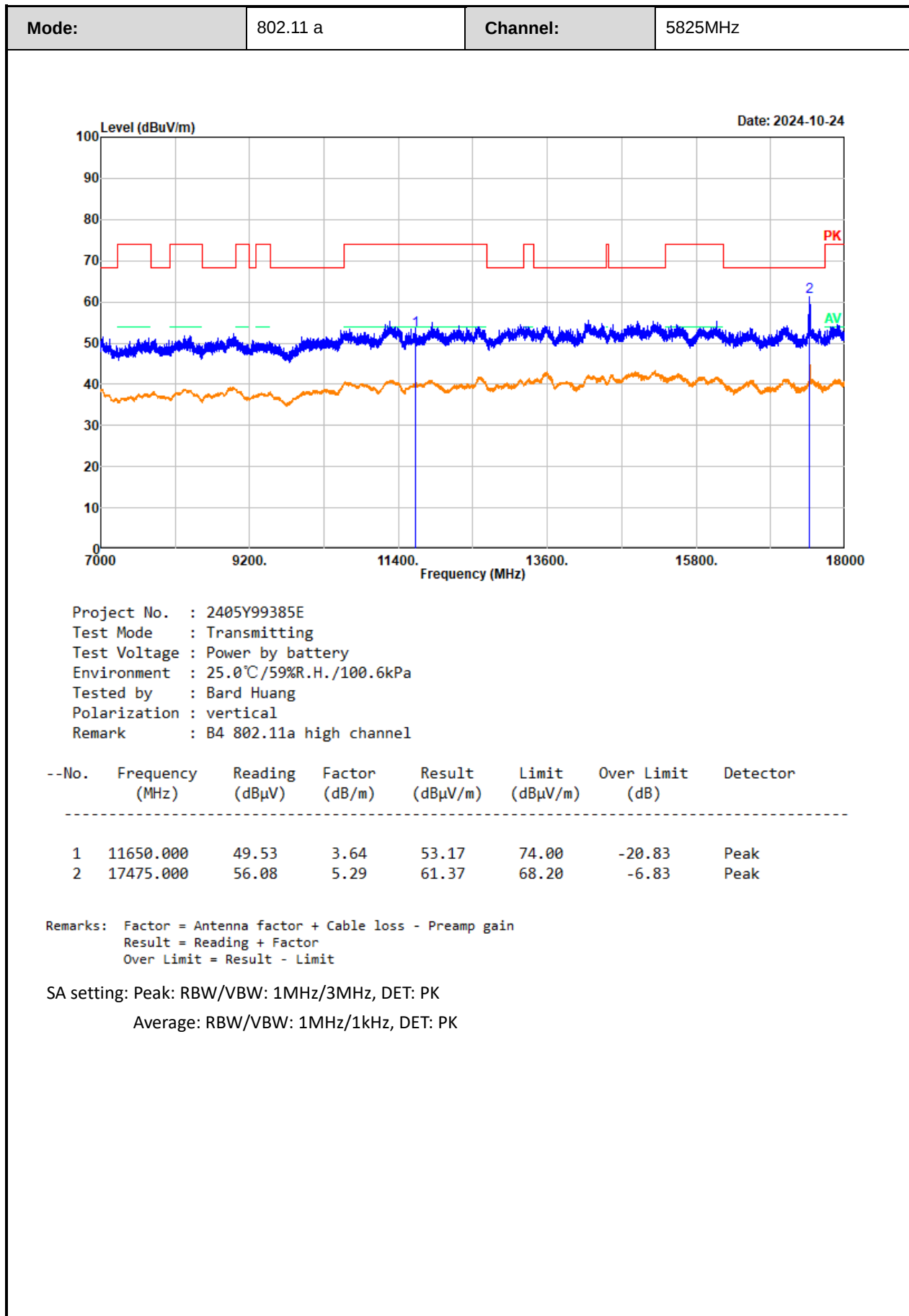


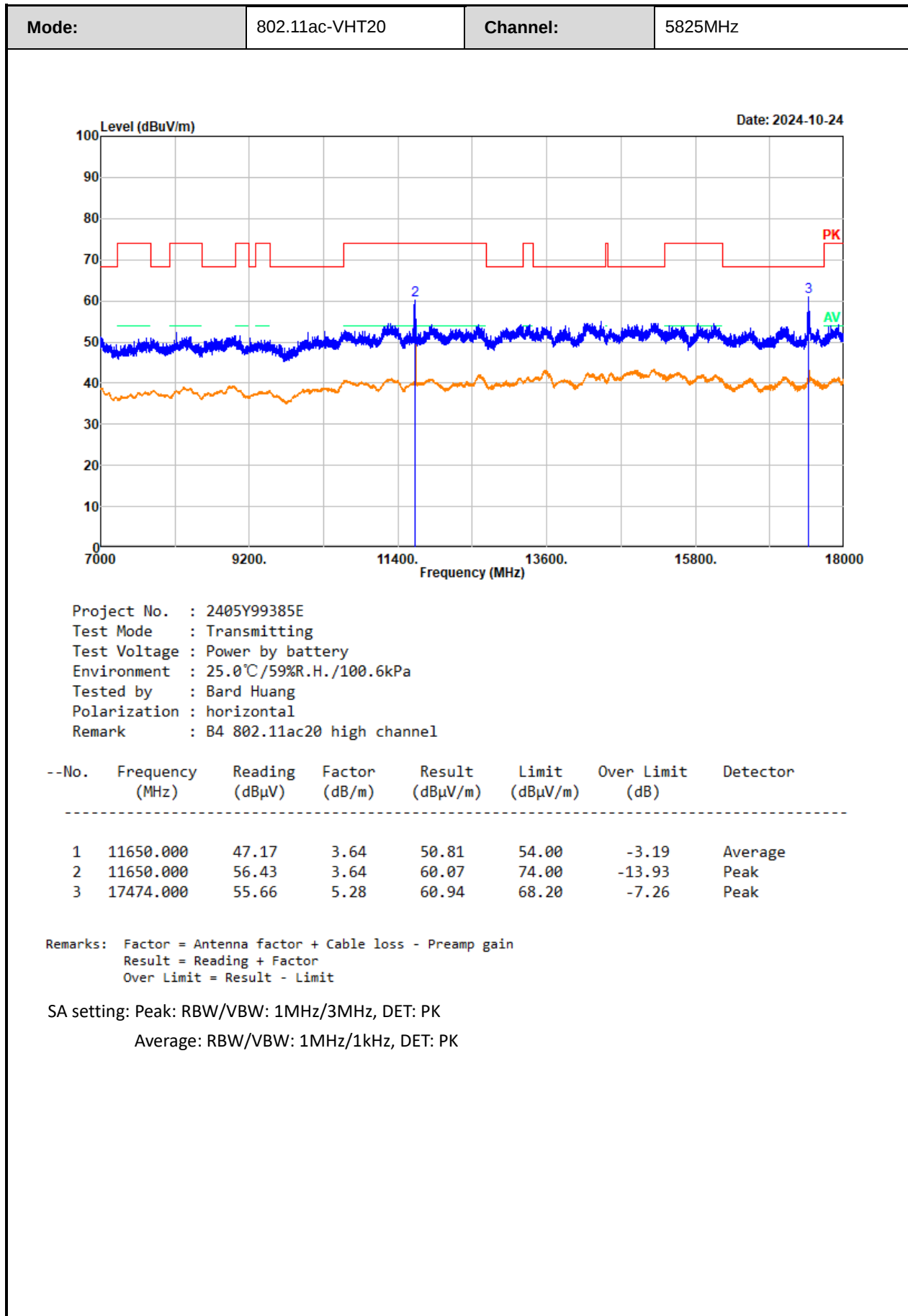


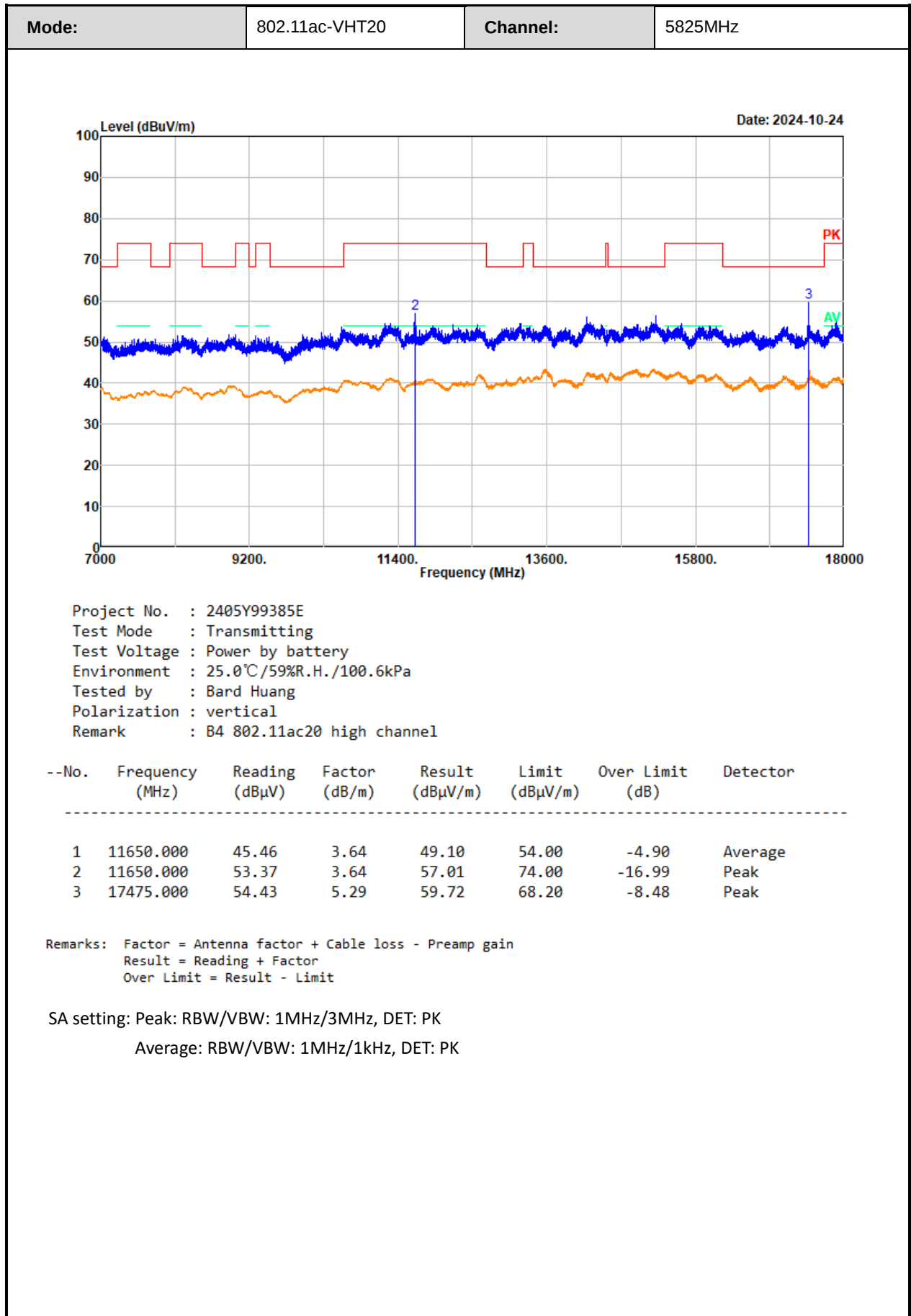


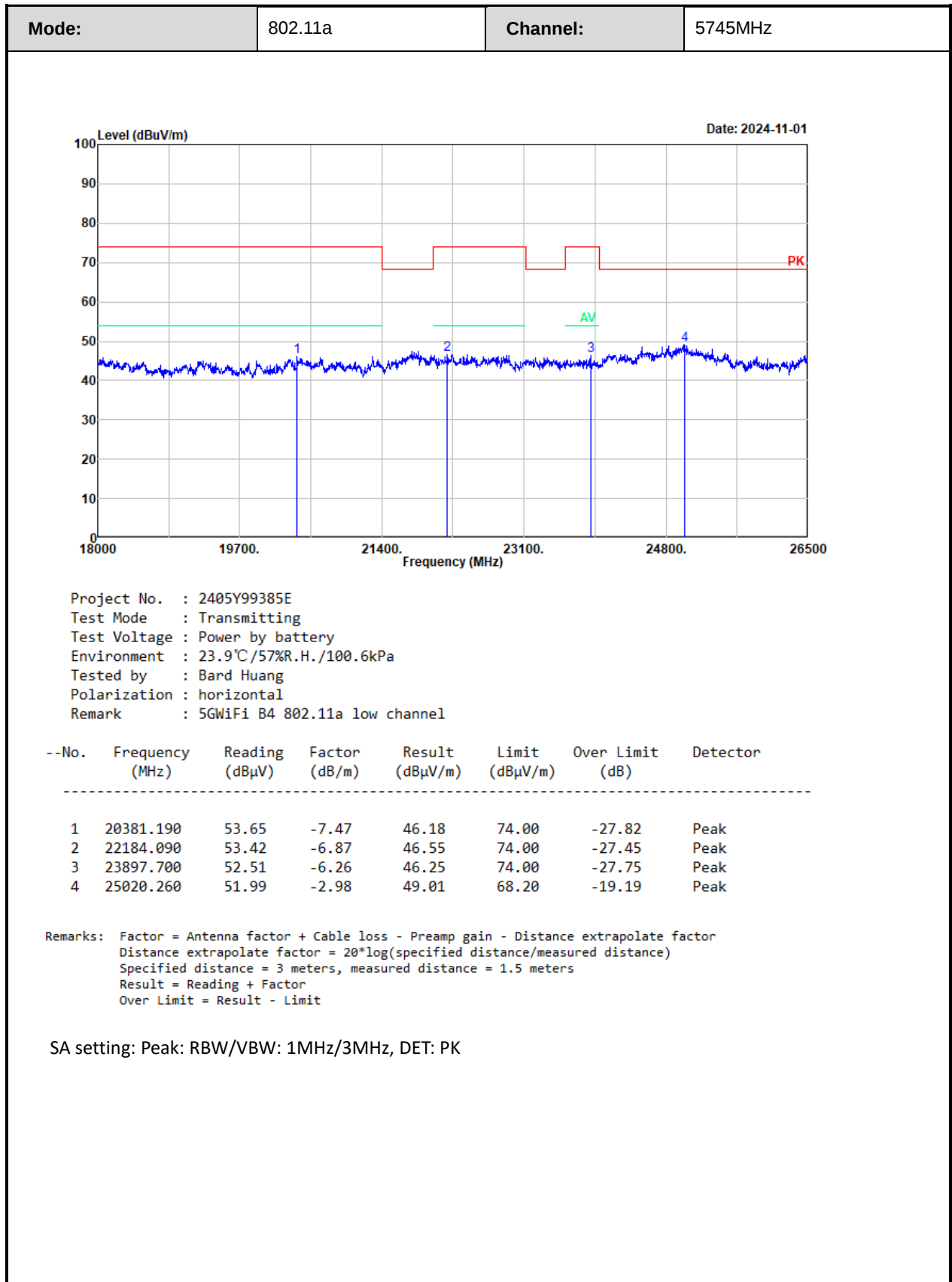


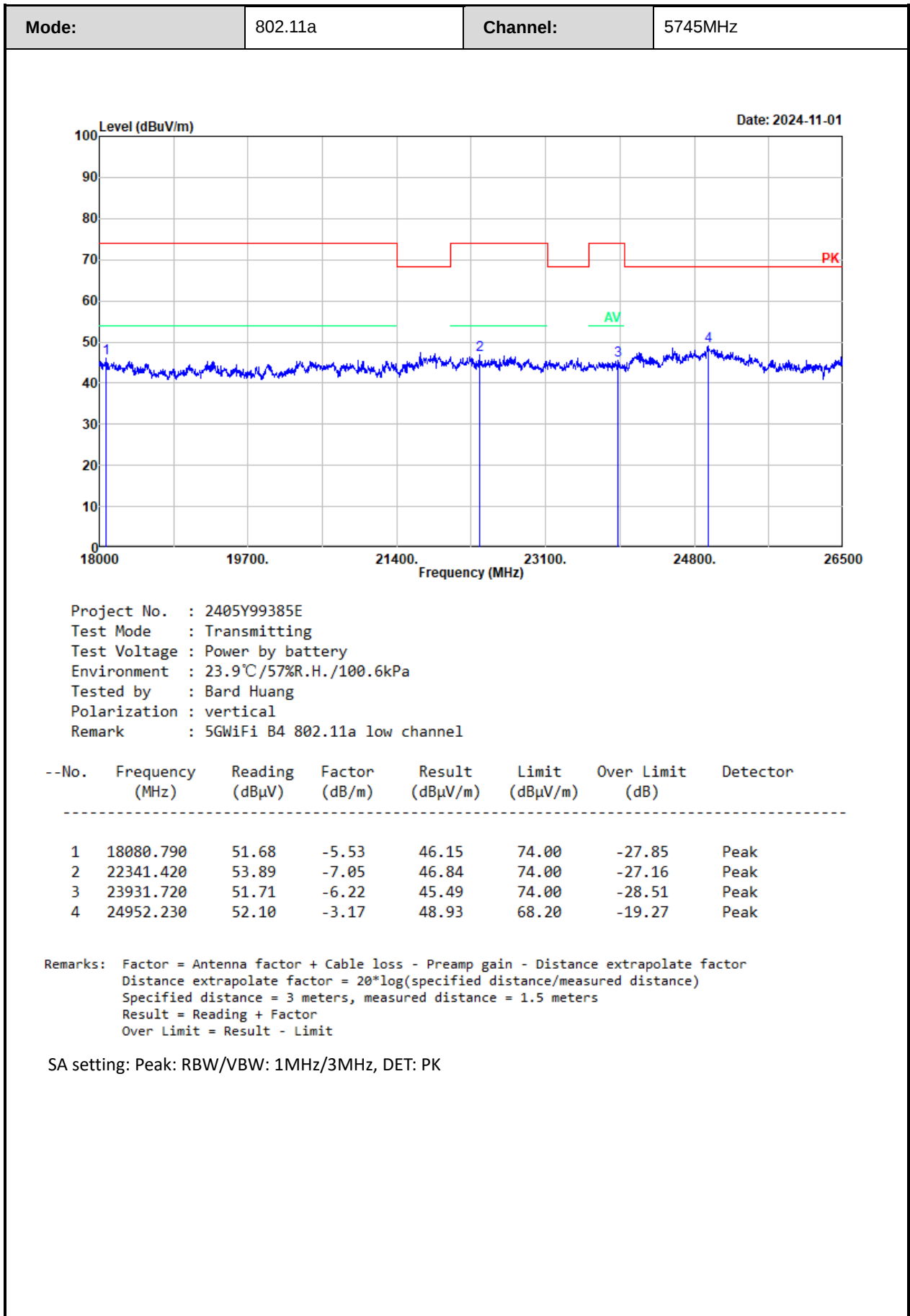


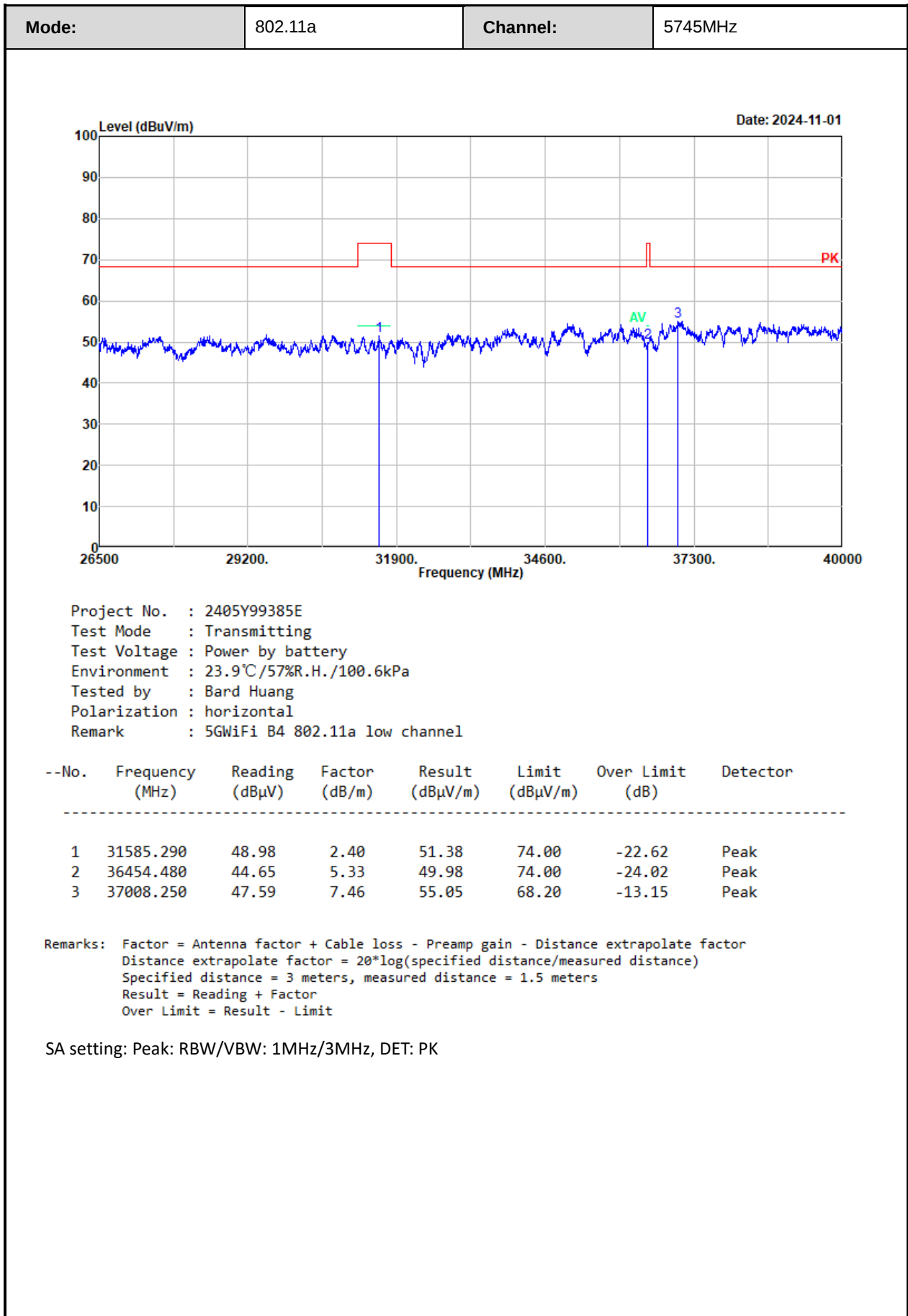


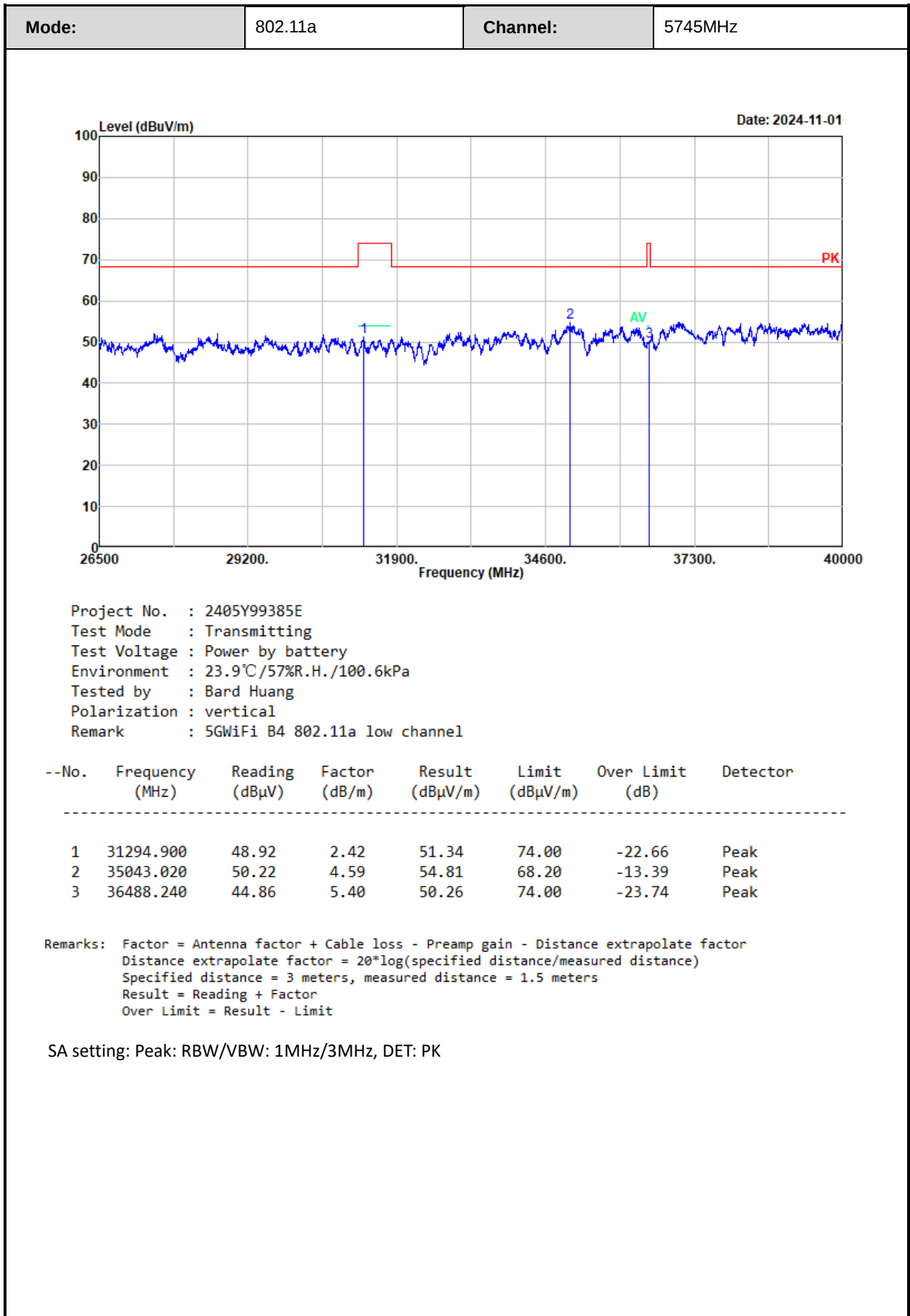




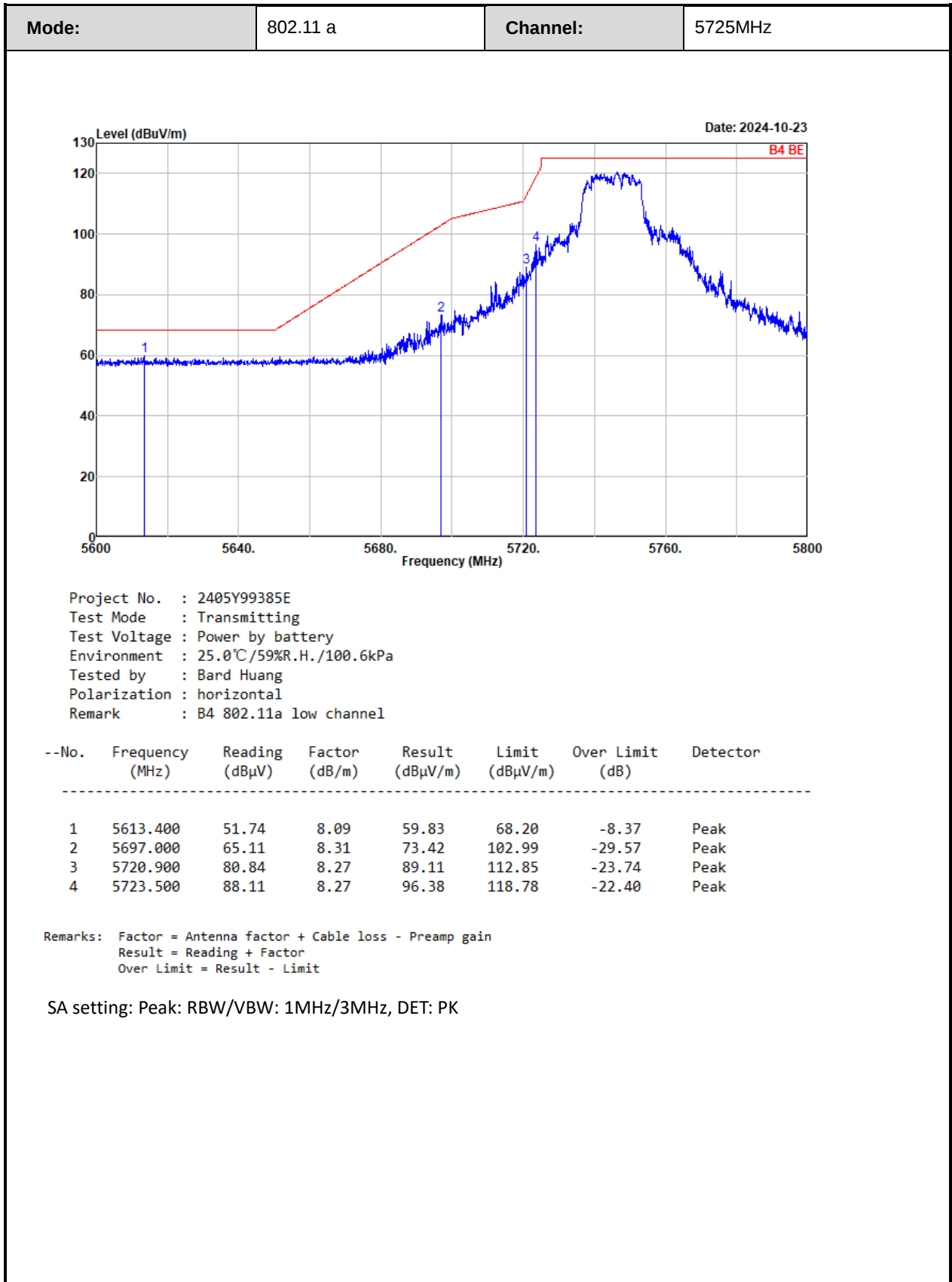


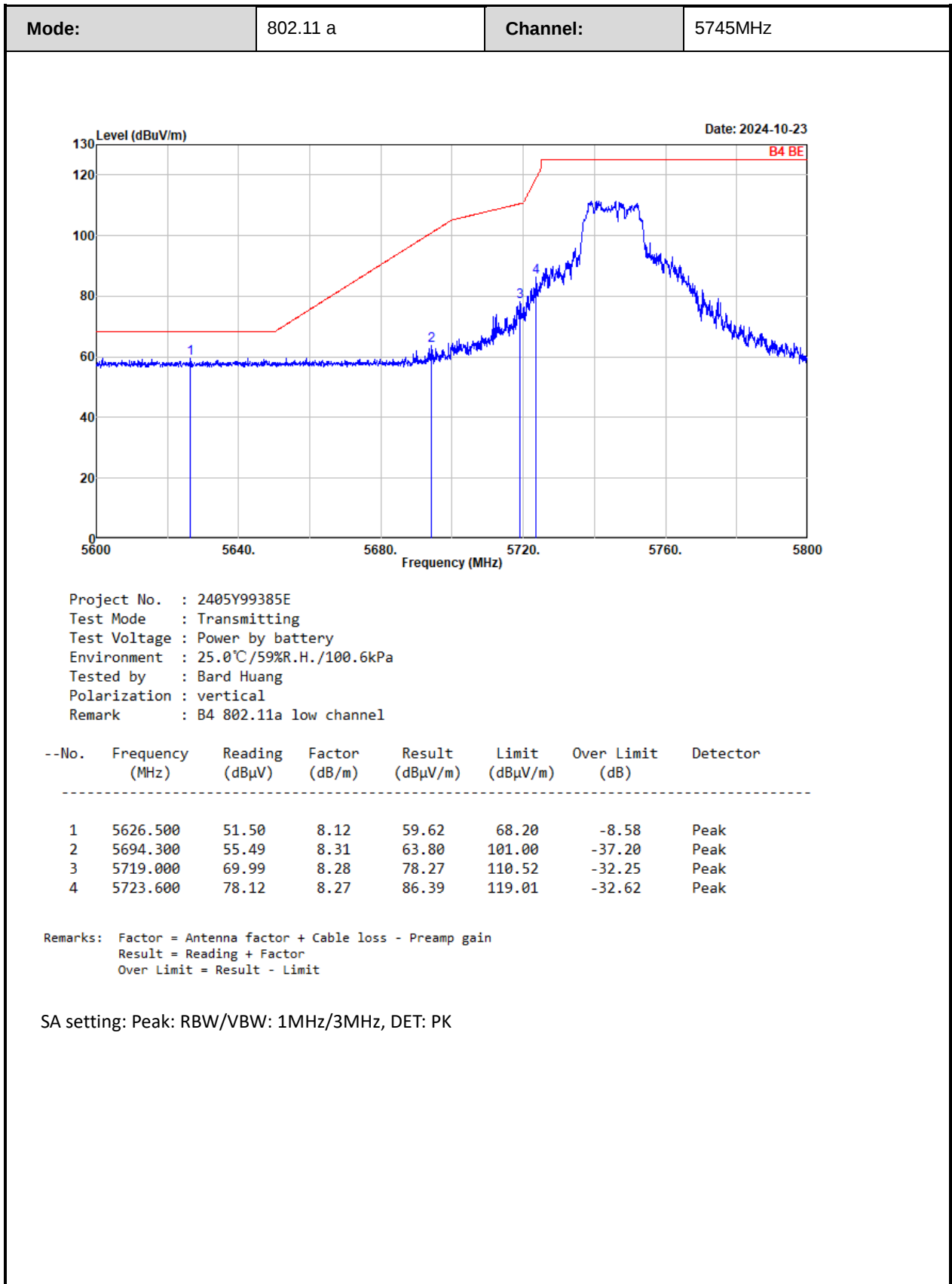


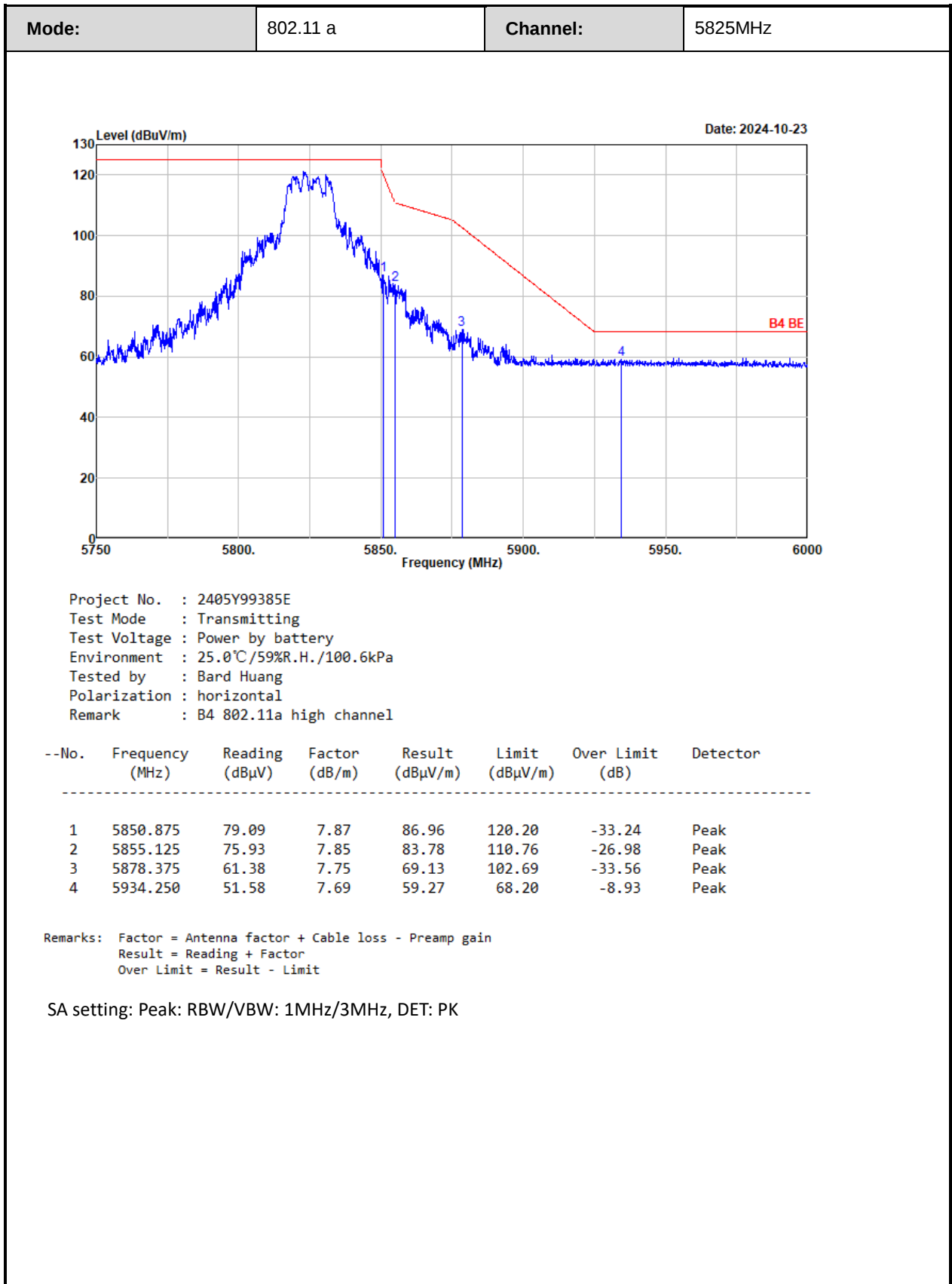


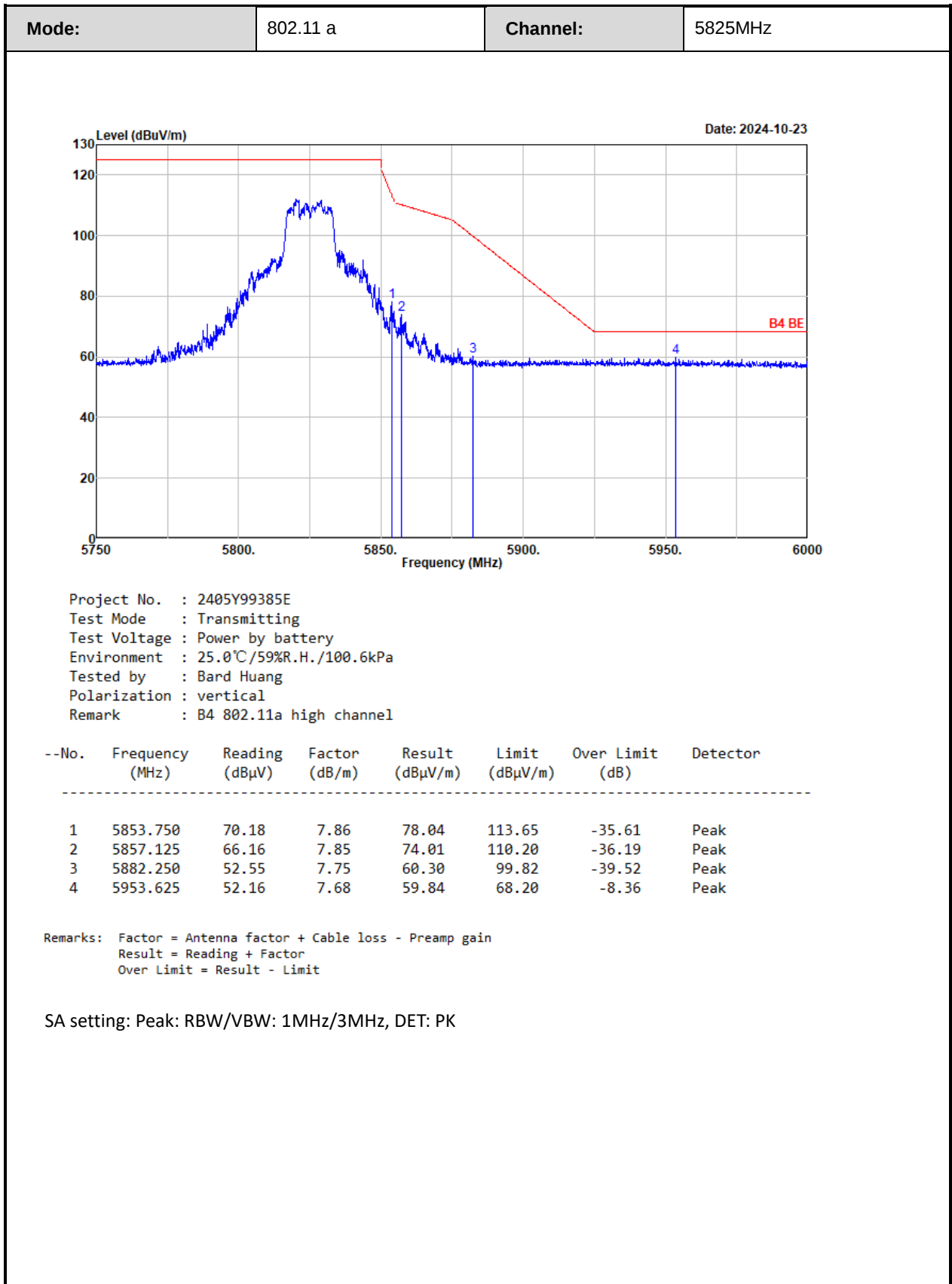


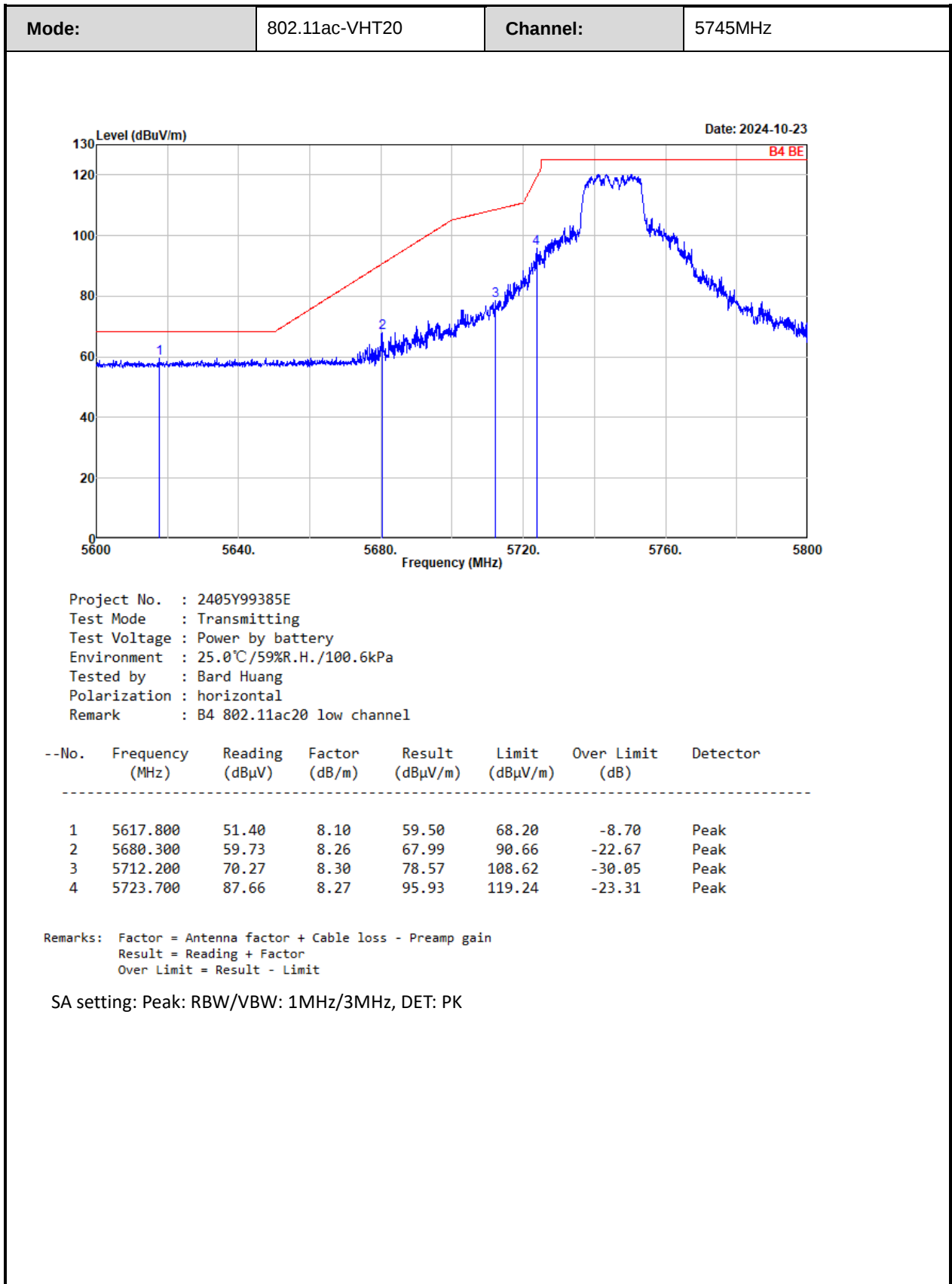
Test plot for Band edge:

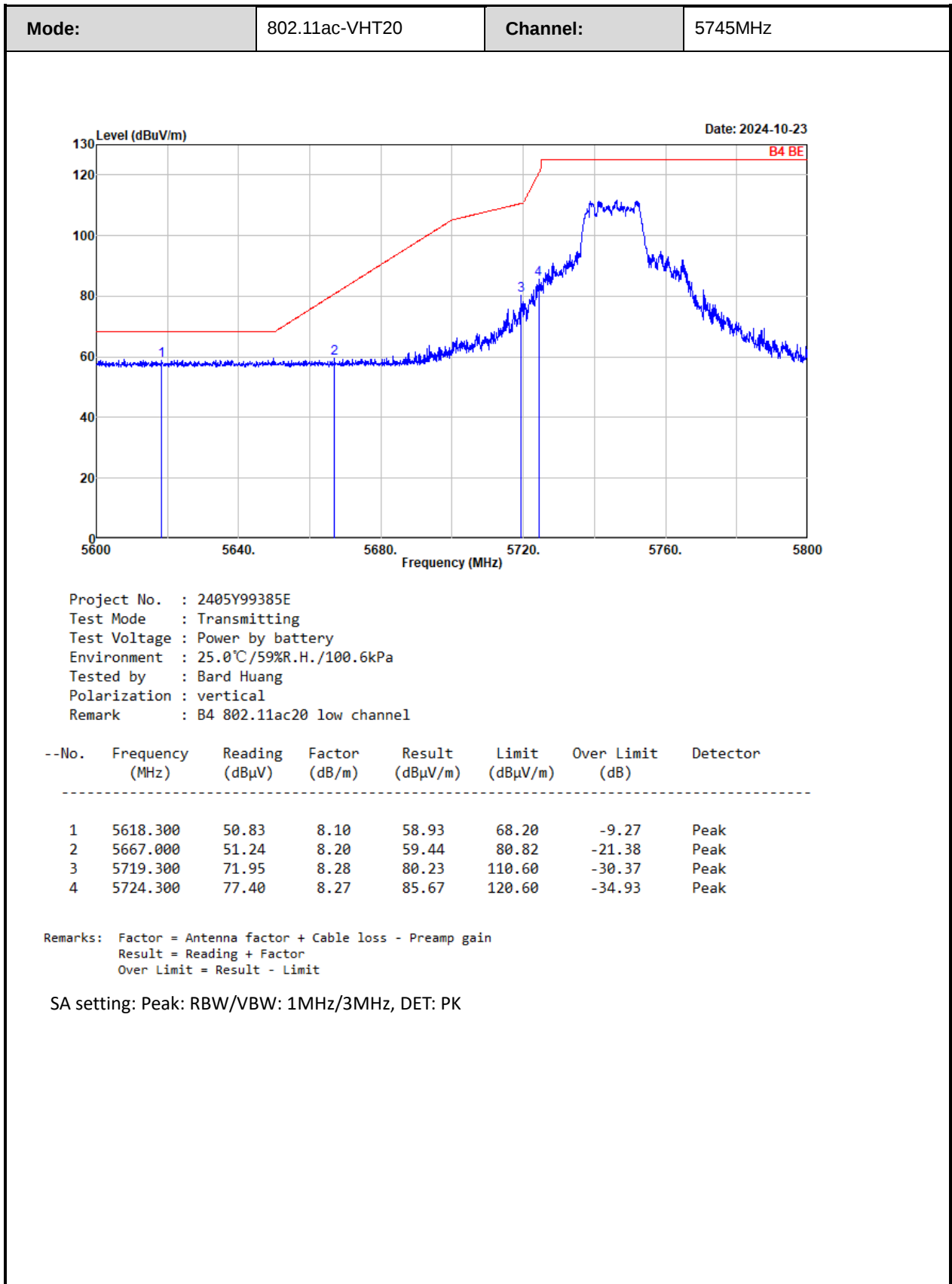


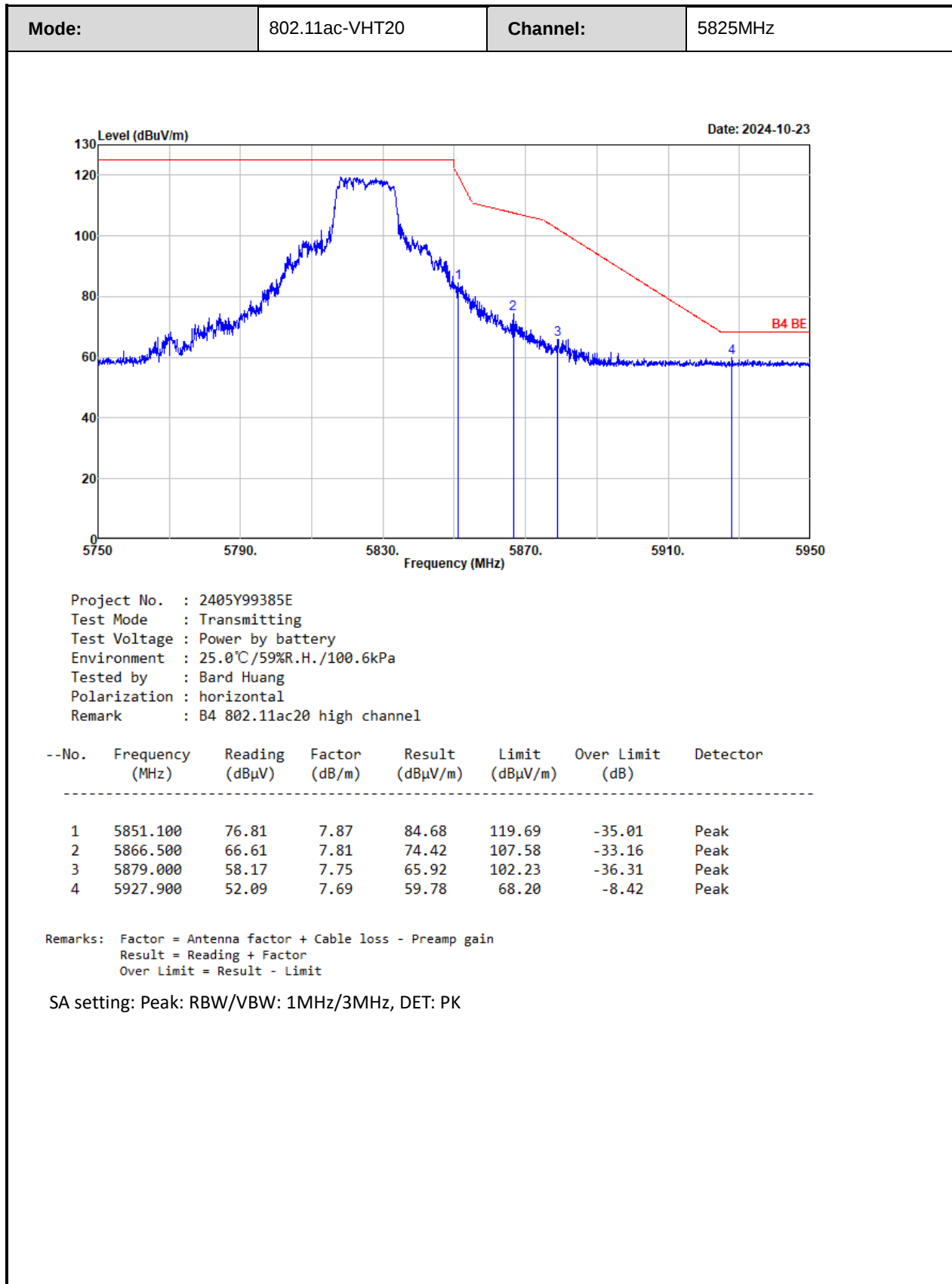


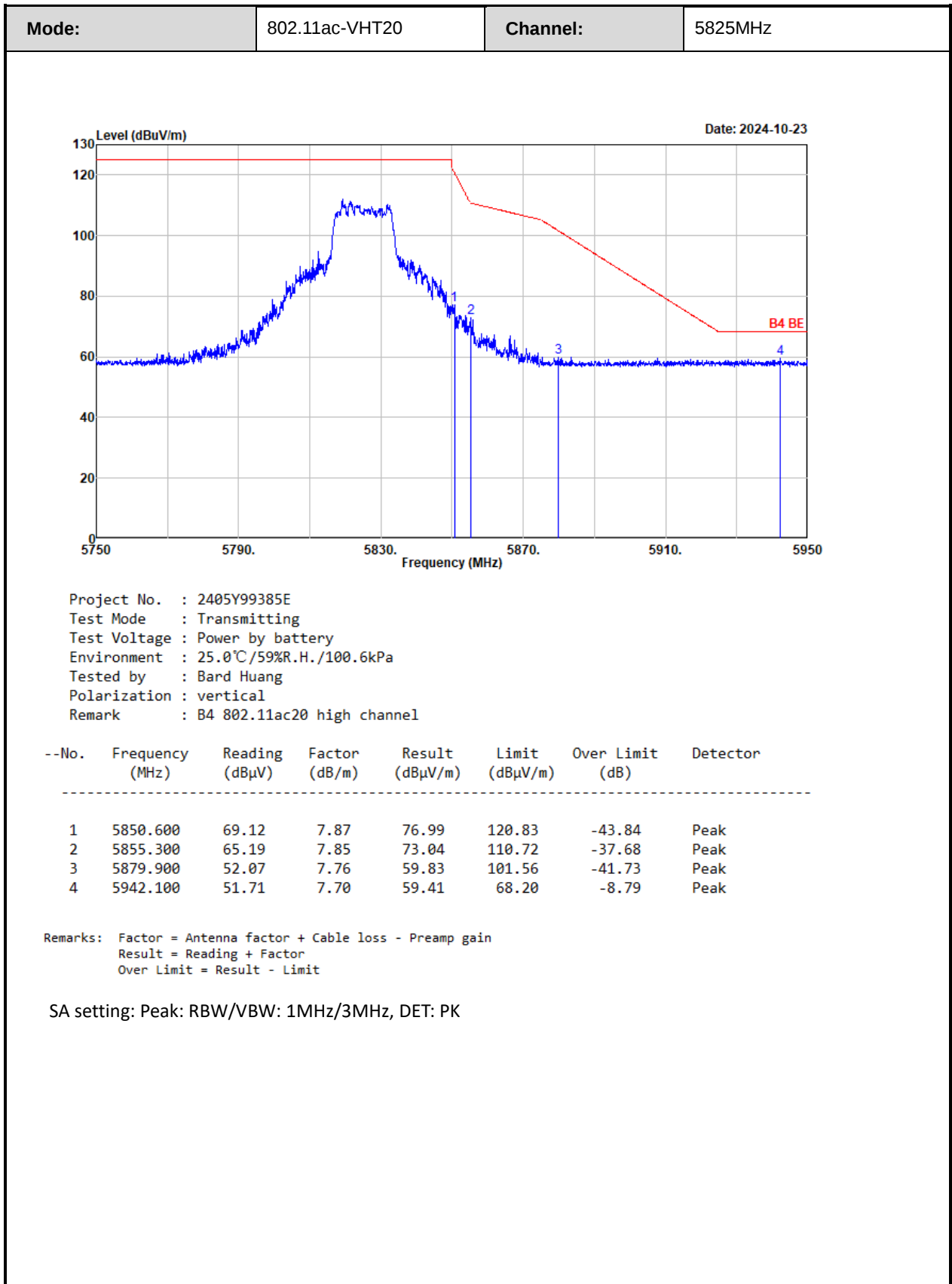












3.5 RF Conducted Test Data

Test Date:	2024-10-29~2024-11-18	Test By:	Ryan Zhang
Environment condition:	Temperature: 23.8~24.5°C;RelativeHumidity:54~60%; ATM Pressure: 100.0~100.5kPa		

3.5.1 Emission Bandwidth

5725-5850MHz

Mode	Antenna	Test Frequency (MHz)	6dB BW (MHz)	Limit (MHz)	Verdict
802.11a	Chain 0	5745	16.400	0.5	Pass
		5785	16.400	0.5	Pass
		5825	16.400	0.5	Pass
802.11ac20	Chain 0	5745	16.800	0.5	Pass
		5785	17.300	0.5	Pass
		5825	17.300	0.5	Pass

3.5.2 99% Occupied Bandwidth

5725-5850MHz

Mode	Antenna	Test Frequency (MHz)	99% OBW (MHz)
802.11a	Chain 0	5745	16.450
		5785	16.500
		5825	16.500
802.11ac20	Chain 0	5745	17.600
		5785	17.700
		5825	17.600

Note:

The 99% Occupied Bandwidth have not fall into the band 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.

3.5.3 Maximum conducted output power

5725-5850MHz

Mode	Antenna	Test Frequency (MHz)	Average Output Power(dBm)	Limit (dBm)	Verdict
802.11a	Chain 0	5745	22.97	30	Pass
		5785	22.46	30	Pass
		5825	21.56	30	Pass
	Chain 1	5745	23.71	30	Pass
		5785	23.09	30	Pass
		5825	22.26	30	Pass
	Chain 0+Chain 1	5745	26.37	30	Pass
		5785	25.80	30	Pass
		5825	24.93	30	Pass
802.11ac20	Chain 0	5745	22.50	30	Pass
		5785	22.19	30	Pass
		5825	21.39	30	Pass
	Chain 1	5745	23.59	30	Pass
		5785	23.00	30	Pass
		5825	22.20	30	Pass
	Chain 0+Chain 1	5745	26.09	30	Pass
		5785	25.62	30	Pass
		5825	24.82	30	Pass

Note:

The device employ CDD for MIMO mode, according to KDB 662911 D01 Multiple Transmitter Output v02r01, Directional gain = $G_{ANT} + \text{Array Gain}$

For power measurements on IEEE 802.11 devices:

$\text{Array Gain} = 0 \text{ dB}$, for $N_{ANT} \leq 4$;

$G_{ANT} = 2.16 \text{ dBi}$, Directional gain = $2.16 + 0 = 2.16 \text{ dBi} < 6 \text{ dBi}$

3.5.4 Power Spectral Density

5725-5850MHz

Mode	Antenna	Test Frequency (MHz)	Reading(dBm /500kHz)	Duty Cycle Factor(dB)	Result(dBm /500kHz)	Limit(dBm /500kHz)	Verdict
802.11a	Chain 0	5745	2.77	6.98	9.75	30	Pass
		5785	2.67	6.98	9.65	30	Pass
		5825	1.49	6.98	8.47	30	Pass
	Chain 1	5745	4.15	6.98	11.13	30	Pass
		5785	3.66	6.98	10.64	30	Pass
		5825	2.70	6.98	9.68	30	Pass
	Chain 0+Chain 1	5745	6.52	6.98	13.50	30	Pass
		5785	6.20	6.98	13.18	30	Pass
		5825	5.15	6.98	12.13	30	Pass
802.11ac20	Chain 0	5745	2.07	7.35	9.42	30	Pass
		5785	2.28	7.35	9.63	30	Pass
		5825	1.14	7.35	8.49	30	Pass
	Chain 1	5745	3.75	7.35	11.10	30	Pass
		5785	3.44	7.35	10.79	30	Pass
		5825	1.96	7.35	9.31	30	Pass
	Chain 0+Chain 1	5745	6.00	7.35	13.35	30	Pass
		5785	5.91	7.35	13.26	30	Pass
		5825	4.58	7.35	11.93	30	Pass

Note:

The device employ CDD for MIMO mode, according to KDB 662911 D01 Multiple Transmitter Output v02r01, Directional gain = $G_{ANT} + \text{Array Gain}$

For power spectral density (PSD) measurements:

$\text{Array Gain} = 10 \log(N_{ANT}/N_{SS}) \text{ dB};$

$G_{ANT1} = 2.16 \text{ dBi}$, Directional gain = $2.16 + 10 * \log(2) = 5.16 \text{ dBi} < 6 \text{ dBi}$

3.5.5 Duty Cycle

5725-5850MHz

Mode	Antenna	Test Frequency (MHz)	Ton (ms)	Ton+Toff (ms)	Duty Cycle (%)	Duty Cycle Factor(dB)	1/Ton (Hz)	VBW Setting (kHz)
802.11a	Chain 0	5785	2.005	10.010	20.03	6.98	499	0.500
802.11ac20	Chain 0	5785	1.850	10.040	18.43	7.35	541	1

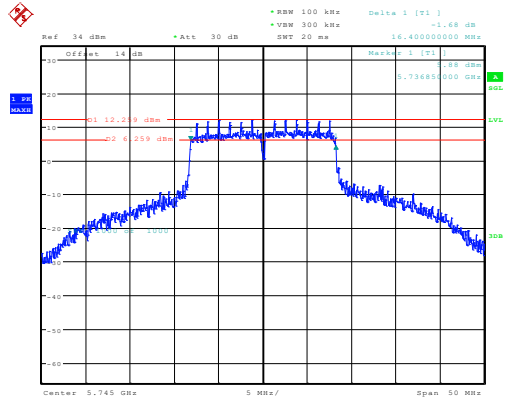
Duty Cycle = Ton/(Ton+Toff)*100%

Test Plots:

6dB Emission Bandwidth

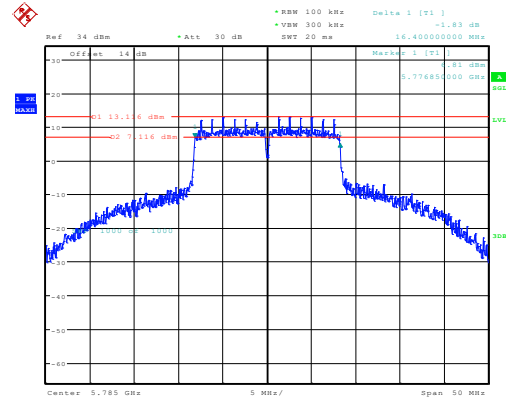
5725-5850MHz

802.11a_5745MHz_Chain 0 16.400MHz



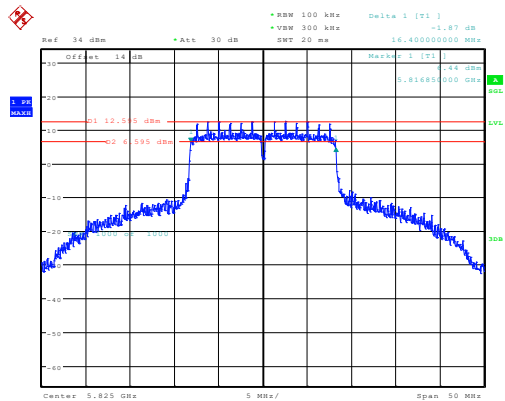
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:04:58

802.11a_5785MHz_Chain 0 16.400MHz



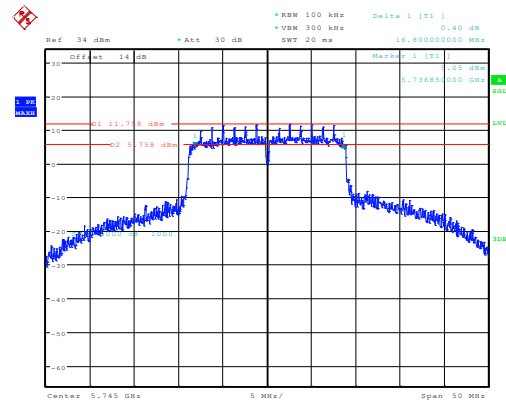
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:06:08

802.11a_5825MHz_Chain 0 16.400MHz



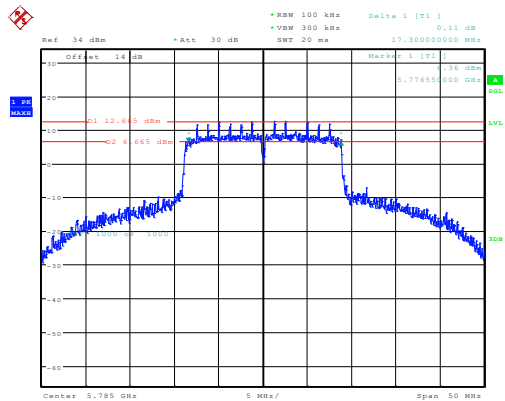
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:07:17

802.11ac20_5745MHz_Chain 0 17.400MHz



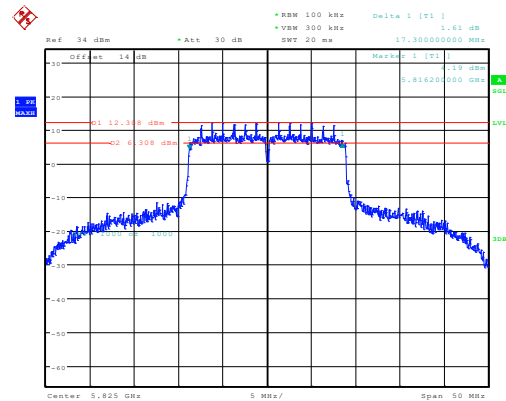
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:08:49

802.11ac20_5785MHz_Chain 0 17.650MHz



ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:09:59

802.11ac20_5825MHz_Chain 0 17.400MHz

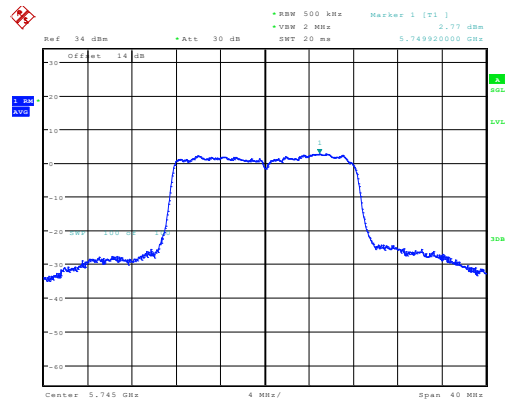


ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 18.NOV.2024 13:11:10

Power Spectral Density

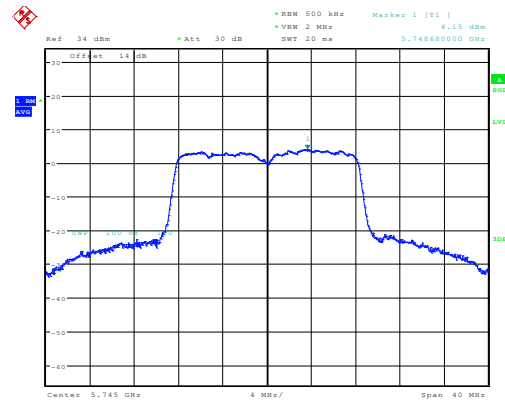
5725-5850MHz

802.11a_5745MHz_Chain 0



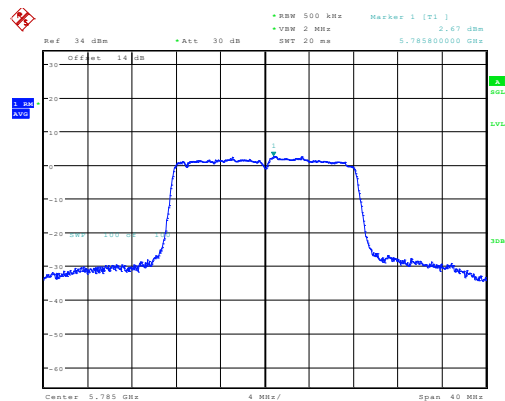
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:10:22

802.11a_5745MHz_Chain 1



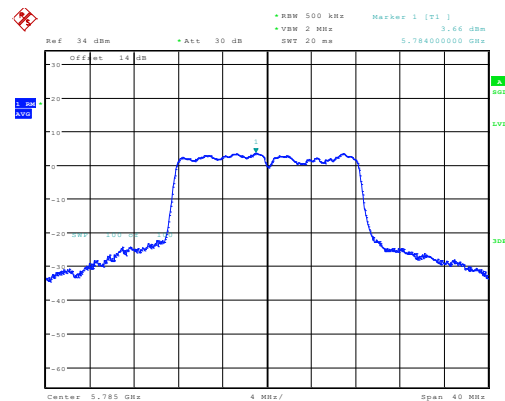
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:00:02

802.11a_5785MHz_Chain 0



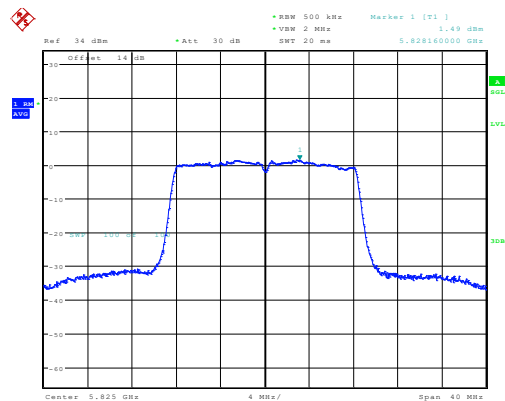
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:12:51

802.11a_5785MHz_Chain 1



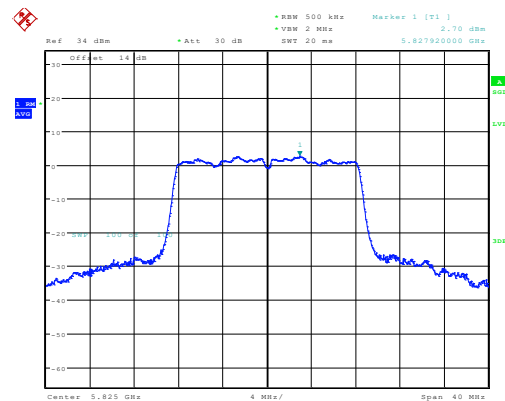
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:00:49

802.11a_5825MHz_Chain 0



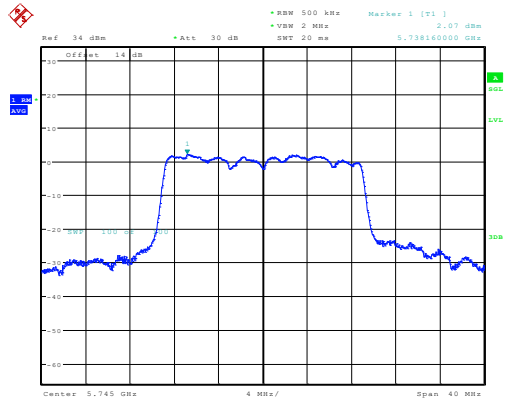
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:15:18

802.11a_5825MHz_Chain 1



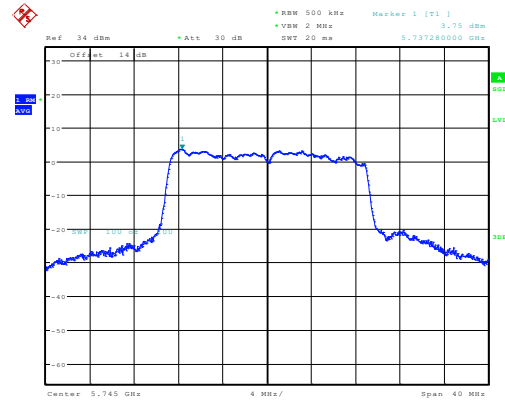
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:02:06

802.11ac20_5745MHz_Chain 0



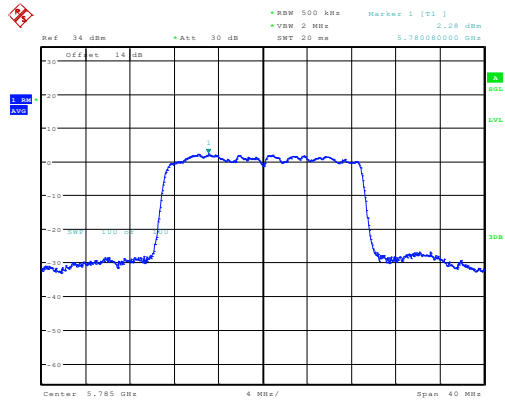
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:17:46

802.11ac20_5745MHz_Chain 1



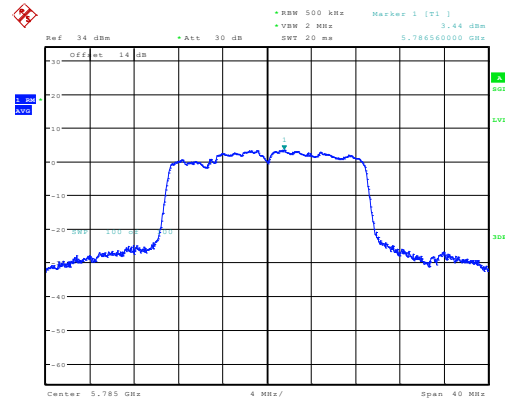
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:02:44

802.11ac20_5785MHz_Chain 0



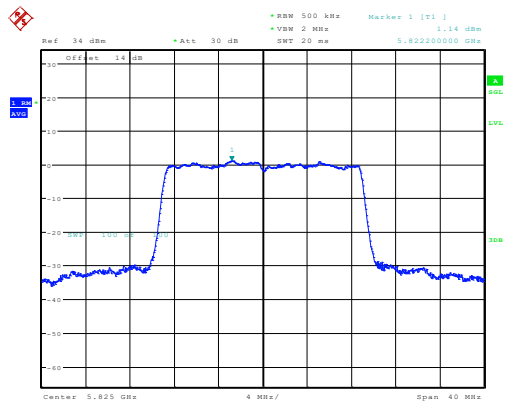
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:26:37

802.11ac20_5785MHz_Chain 1



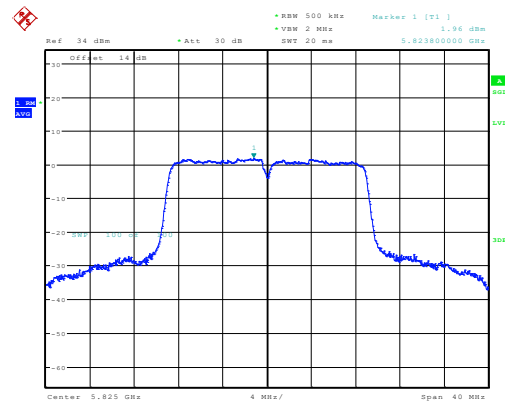
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:03:19

802.11ac20_5825MHz_Chain 0



ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:34:36

802.11ac20_5825MHz_Chain 1



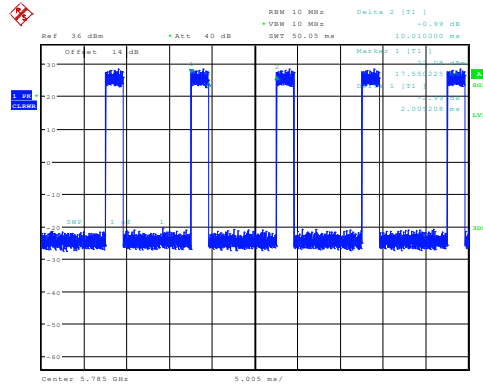
ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:03:57

Duty Cycle

5725-5850MHz

802.11a_5785MHz_Chain 0

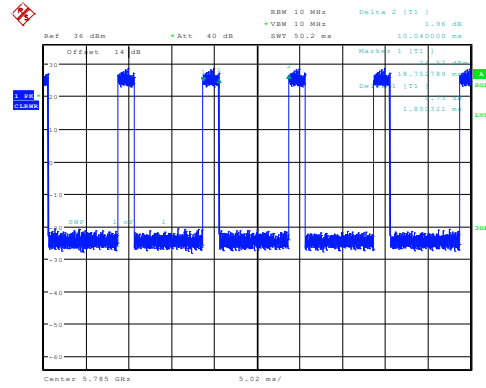
2.005ms,10.010ms



ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:06:07

802.11ac20_5785MHz_Chain 0

1.850ms,10.040ms



ProjectNo.:2405Y99385E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 15:07:25

4 Test Setup Photo

Please refer to the attachment 2405Y99385E Test Setup photo.

5 E.U.T Photo

Please refer to the attachment 2405Y99385E External photo and 2405Y99385E Internal photo.

---End of Report---