

FCC Test Report

Report No.: 2505Q30506EA

Applicant: ZHENGZHOU DEWENWILS NETWORK TECHNOLOGY CO., LTD.

Address: No.2602, 26th Floor, Block B, Dongfang Building No.198-19, Songshan South Road, Erqi District, Zhengzhou, China

Product Name: Wi-Fi Low Voltage Landscape Transformer

Product Model: TD-300-12WF-1 WiFi-M

Multiple Models: TD-200-12WF-1 WiFi-M, TD-300S-12WF-2 WiFi-M

Trade Mark: N/A

FCC ID: 2A4G9-026

Standards: FCC CFR Title 47 Part 15C (§15.247)

Test Date: 2025-02-14 to 2025-03-18

Test Result: Complied

Report Date: 2025-03-18

Reviewed by:

Abel chen

Approved by:

Jacob Kong

Abel Chen
Project Engineer

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	2025-03-18	Original

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1 General Information

1.1 Client Information

Applicant:	ZHENGZHOU DEWENWILS NETWORK TECHNOLOGY CO., LTD.
Address:	No.2602, 26th Floor, Block B, Dongfang Building No.198-19, Songshan South Road, Erqi District, Zhengzhou, China
Manufacturer:	ZHENGZHOU DEWENWILS NETWORK TECHNOLOGY CO., LTD.
Address:	No.2602, 26th Floor, Block B, Dongfang Building No.198-19, Songshan South Road, Erqi District, Zhengzhou, China

1.2 Product Description of EUT

The EUT is Wi-Fi Low Voltage Landscape Transformer that contains BLE and 2.4G WLAN radios, this report covers the full testing of the BLE radio.

Sample Serial Number	2YET-2(TD-300-12WF-1 WiFi-M) & 2YET-3(TD-200-12WF-1 WiFi-M) for CE&RE test, 2YET-1 for RF conducted test (assigned by WATC)
Sample Received Date	2025-02-14
Sample Status	Good Condition
Frequency Range	2402MHz - 2480MHz(BLE1M)
Maximum Conducted Peak Output Power	-6.32dBm
Modulation Technology	GFSK
Spatial Streams	SISO (1TX, 1RX)
Antenna Gain [#]	2dBi
Power Supply	AC 120V/60Hz
Adapter Information	N/A
Modification	Sample No Modification by the test lab

1.3 Antenna information

<p>15.203 requirement:</p> <p>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.</p>	
Device Antenna information:	
<p>The BLE antenna is an integral antenna which cannot replace by end-user, please see product external photos for details.</p>	

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 558074 D01 15.247 Meas Guidance v05r02

ANSI C63.10-2013

Unless otherwise stated there are no any additions to, deviations, or exclusions from the method

2 Description of Measurement

2.1 Test Configuration

Operating channels:					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	19	2440	38	2478
1	2404	20	2442	39	2480
...	/	/
18	2438	/	/
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:					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	19	2440	39	2480

Test Mode:				
Transmitting mode:		Keep the EUT in continuous transmitting with modulation		
Exercise software [#] :		Wifi Test Tool v1.6.5		
Mode	Data rate	Power Level Setting [#]		
		Low Channel	Middle Channel	High Channel
BLE 1M	1Mbps	0	0	0
The exercise software and the maximum power setting that provided by manufacturer.				

Worst-Case Configuration:
For AC power line conducted emission and 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.
For AC power line conducted emission and radiated emission 9kHz-1GHz were performed with the EUT output connect to resistor loads which make the output to the maximum.
Model TD-200-12WF-1 WiFi-M and TD-300-12WF-1 WiFi-M was electrical identical, difference for transformer coil output power, TD-300-12WF-1 WiFi-M and TD-300S-12WF-2 WiFi-M only difference for Appearance, Housing material (Iron vs stainless steel) and output connector, detail please refer the EUT photo and DOS provided by applicant, Model TD-300-12WF-1 WiFi-M was selected to full test, model TD-200-12WF-1 WiFi-M was additional check AC line conducted emission and radiated emissions of below 1GHz.

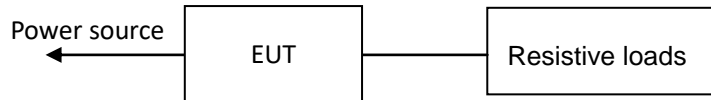
2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
Unknown	Resistive loads	Unknown	Unknown

2.3 Interconnecting Cables

Manufacturer	Description	Length(m)	From	To
Unknown	DC Power Cable	1.0	EUT	Resistive loads

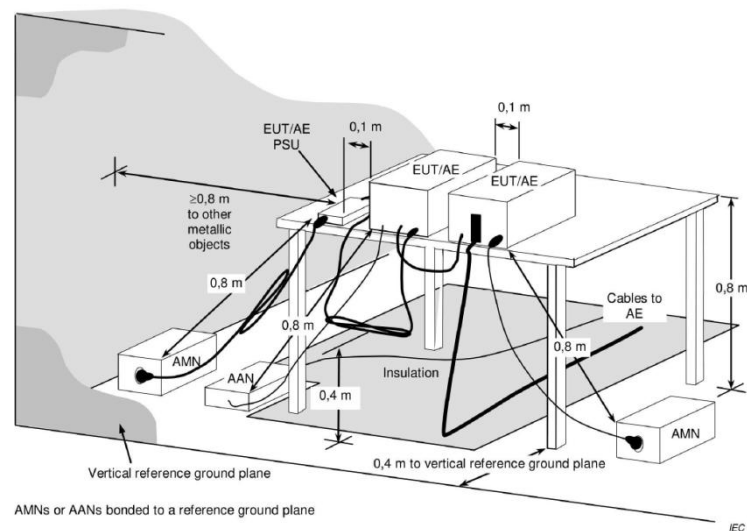
2.4 Block Diagram of Connection between EUT and AE



Note: for reference only, the actual connection setup used for testing please refer to the test photos.

2.5 Test Setup

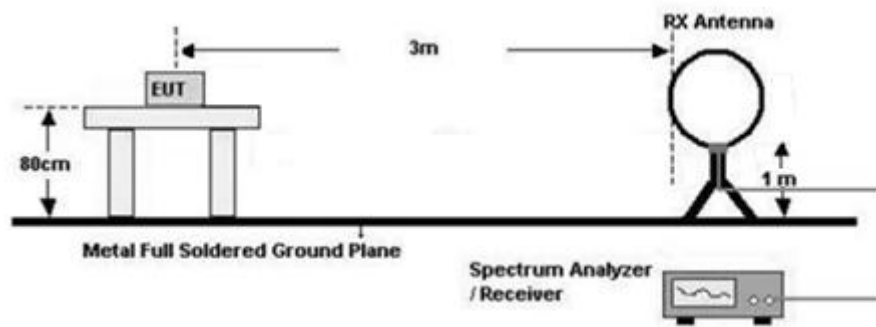
1) Conducted emission measurement:



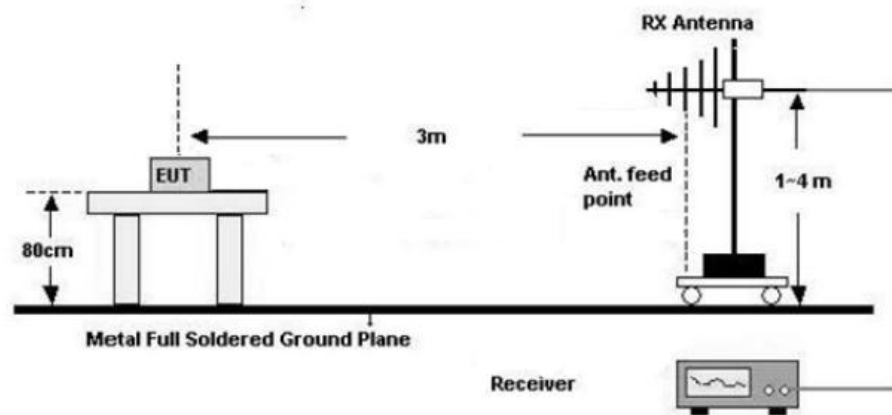
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

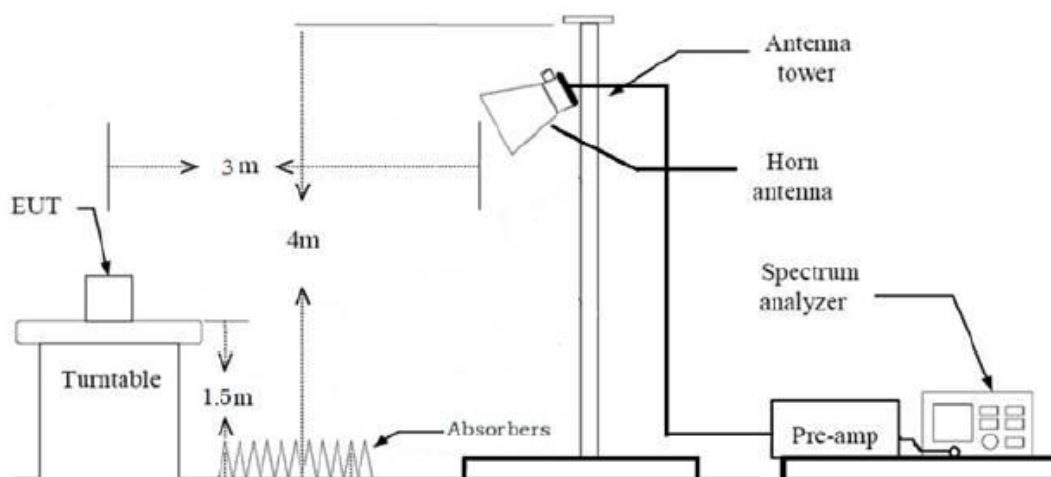
Below 30MHz (3m SAC)

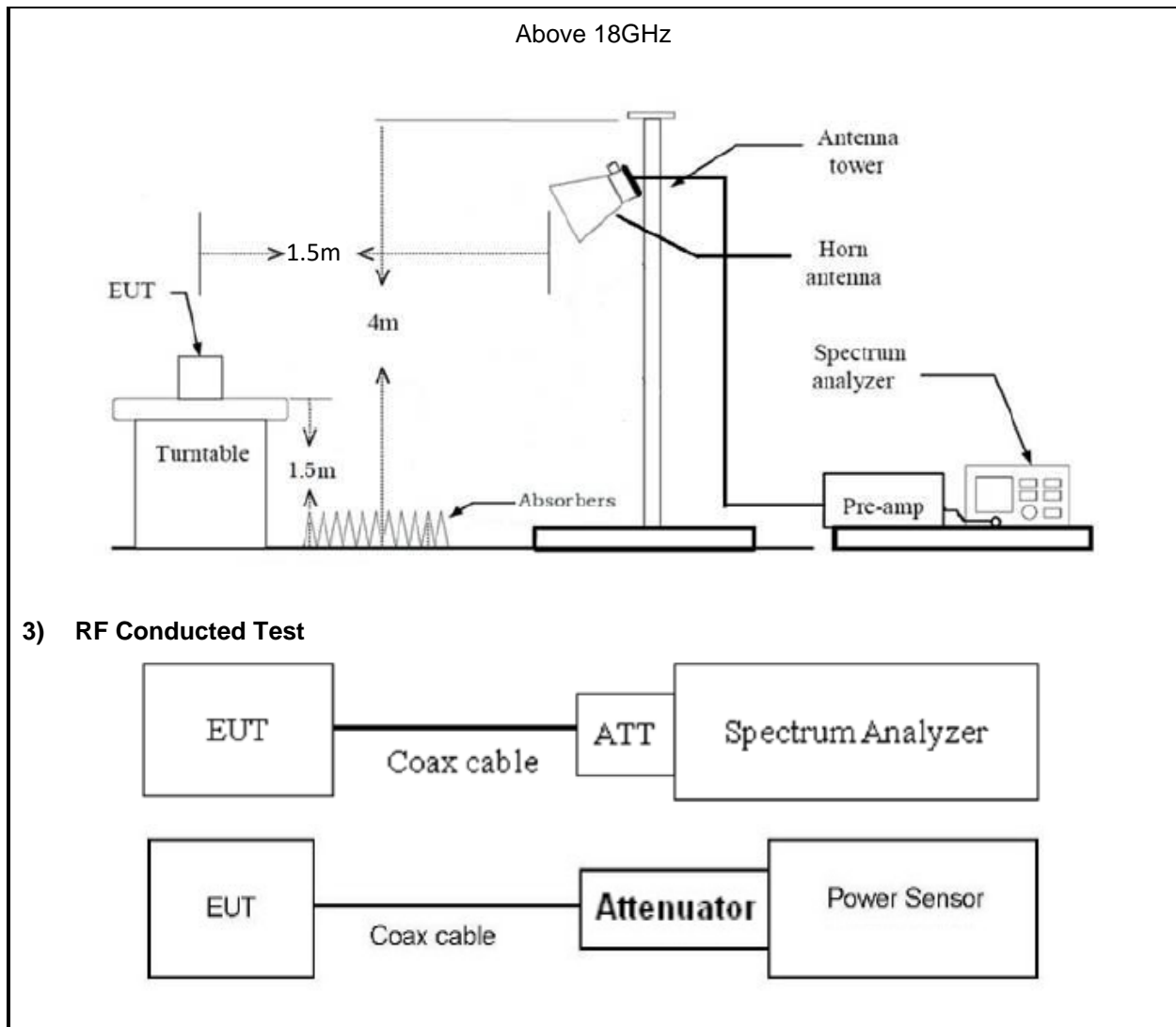


30MHz-1GHz (3m SAC)



1GHz-18GHz





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

1. 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 $40 \cdot \log(\text{test distance} / \text{specification distance})$.

2. Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, ground-parallel)
3. 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.
4. If the Peak emission complies with the QP limit, then perform final measurement is optional.

b) For 30MHz-1GHz:

1. 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.
2. 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.
3. 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.
4. 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 8.0dB (including 6.0 dB Attenuator and 2.0dB cable) was entered as an offset in the power meter. Note: Actual cable loss was unavailable at the time of testing, therefore a loss of 2.0dB 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	ANSI C63.10-2013 Section 11.9.1.1
Power Spectral Density	ANSI C63.10-2013 Section 11.10.2
6 dB Emission Bandwidth	ANSI C63.10-2013 Section 11.8.1
99% Occupied Bandwidth	ANSI C63.10-2013 Section 6.9.3
100kHz Bandwidth of Frequency Band Edge	ANSI C63.10-2013 Section 6.10
Radiated emission	ANSI C63.10-2013 Section 11.11&11.12.1
Duty Cycle	ANSI C63.10-2013 Section 11.6

2.8 Measurement Equipment

Manufacturer	Description	Model	Management No.	Calibration Date	Calibration Due Date
AC Line Conducted Emission Test					
ROHDE& SCHWARZ	EMI TEST RECEIVER	ESR	101817	2024/6/4	2025/6/3
R&S	LISN	ENV216	101748	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.12	N/A	2024/6/4	2025/6/3
Farad	Test Software	EZ-EMC	Ver. EMEC-3A1	/	/
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	2024/8/7	2025/8/6
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
Oulitong	Band Reject Filter	OBSF-2400-248 3.5-50N	OE02103119	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
narda	6dB attenuator	603-06-1	N/A	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)	AC Line Conducted Emissions	Compliance
§15.247(b)(3)	Maximum Conducted Output Power	Compliance
§15.247(e)	Power Spectral Density	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
-	99% Occupied Bandwidth	Report only
§15.247(d)	100kHz Bandwidth of Frequency Band Edge	Compliance
§15.205, §15.209, §15.247(d)	Radiated emission	Compliance
-	Duty Cycle	Report only

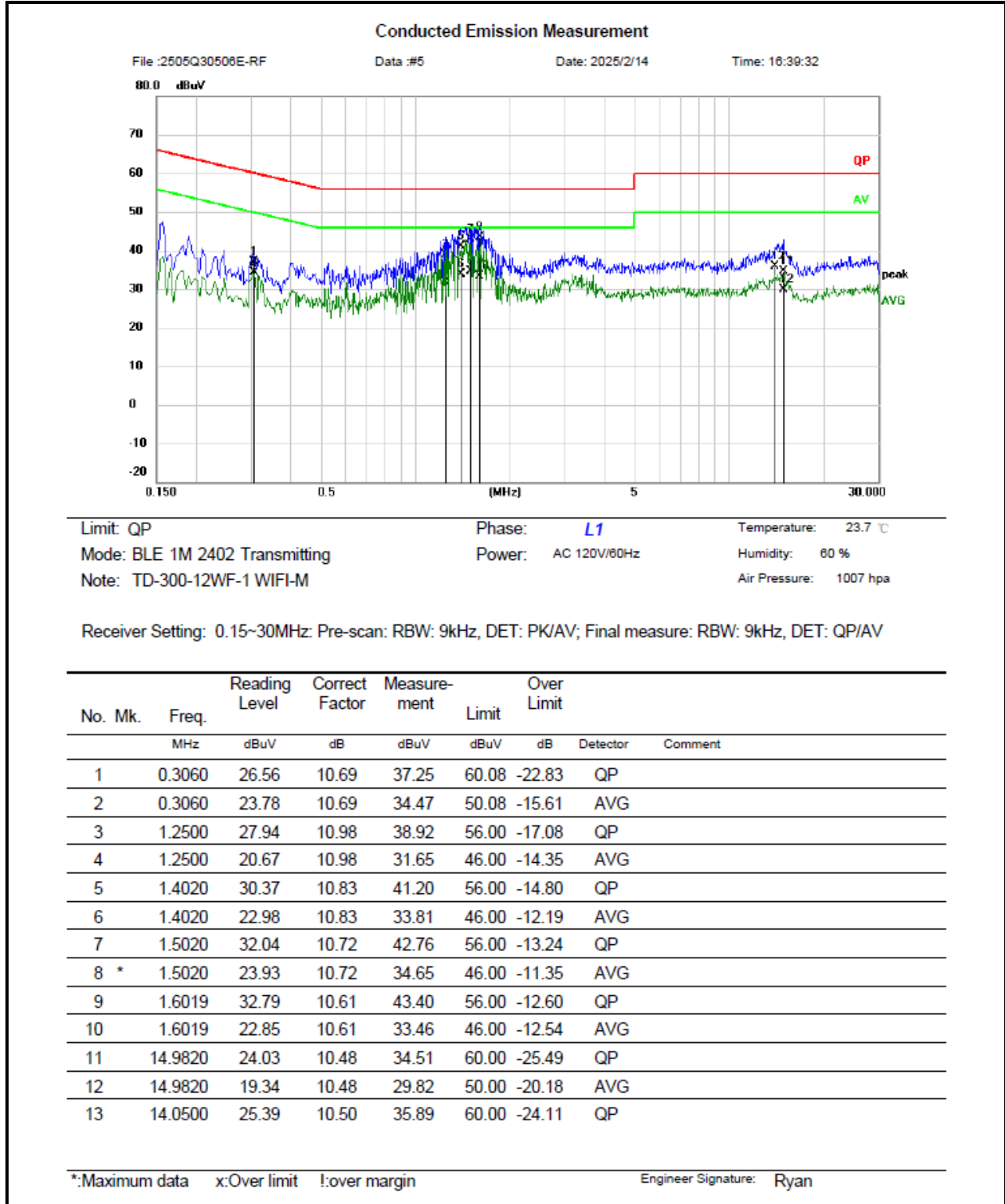
3.2 Limit

Test items	Limit
AC Line Conducted Emissions	See details §15.207 (a)
Conducted Output Power	For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.
6dB Emission Bandwidth	The minimum 6 dB bandwidth shall be at least 500 kHz.
Power Spectral Density	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
Spurious Emissions, 100kHz Bandwidth of Frequency Band Edge	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

3.3 AC Line Conducted Emissions Test Data

Test Date:	2025-02-14~2025-03-13	Test By:	Ryan Zhang
Environment condition:	Temperature: 23.7~25.8°C; Relative Humidity:60~79%; ATM Pressure: 100.7~101.0kPa		

Model: TD-300-12WF-1 WiFi-M



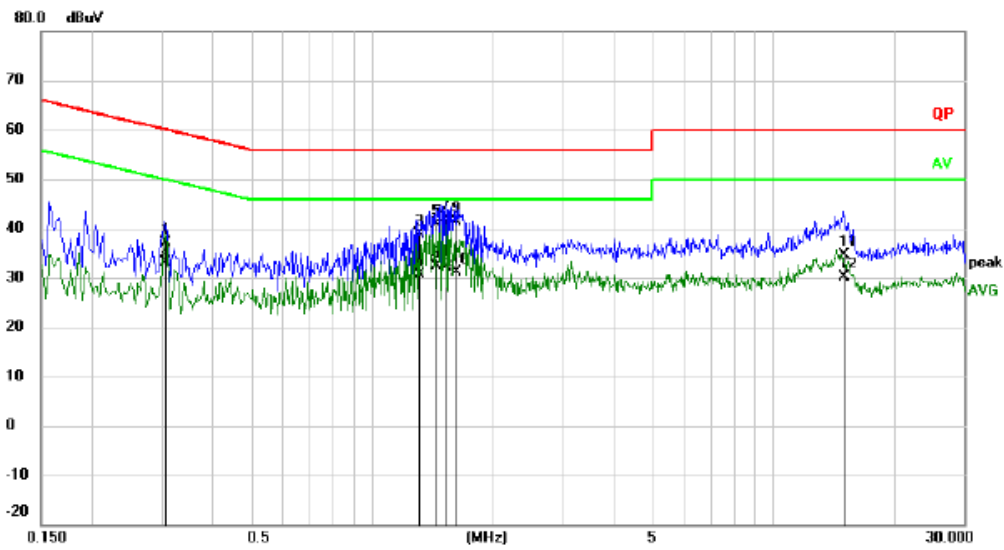
Conducted Emission Measurement

File :2505Q30506E-RF

Data :#6

Date: 2025/2/14

Time: 16:40:59



Limit: QP

Mode: BLE 1M 2402 Transmitting

Note: TD-300-12WF-1 WIFI-M

Phase: *N*

Power: AC 120V/60Hz

Temperature: 23.7 °C

Humidity: 60 %

Air Pressure: 1007 hpa

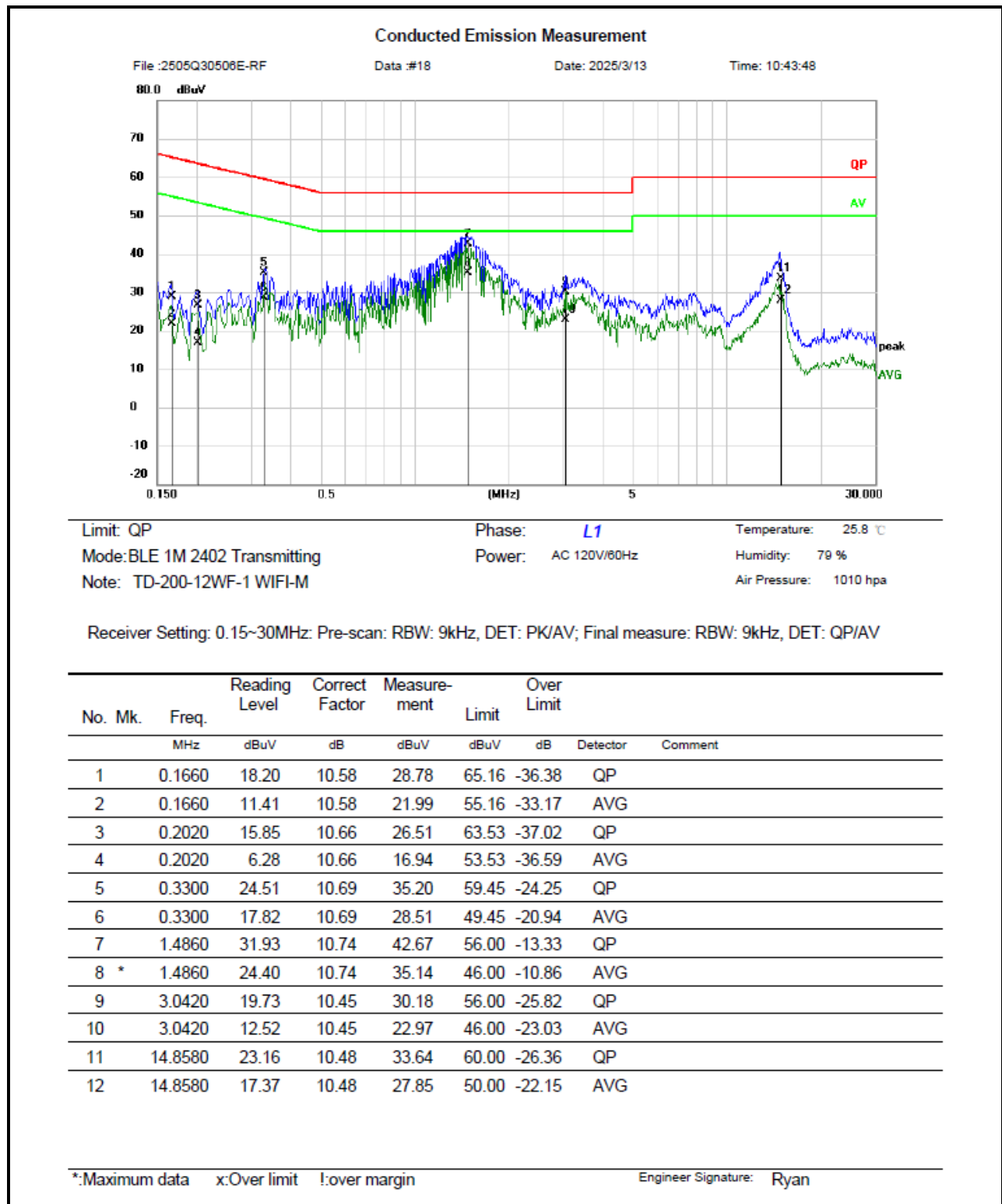
Receiver Setting: 0.15~30MHz; Pre-scan: RBW: 9kHz, DET: PK/AV; Final measure: RBW: 9kHz, DET: QP/AV

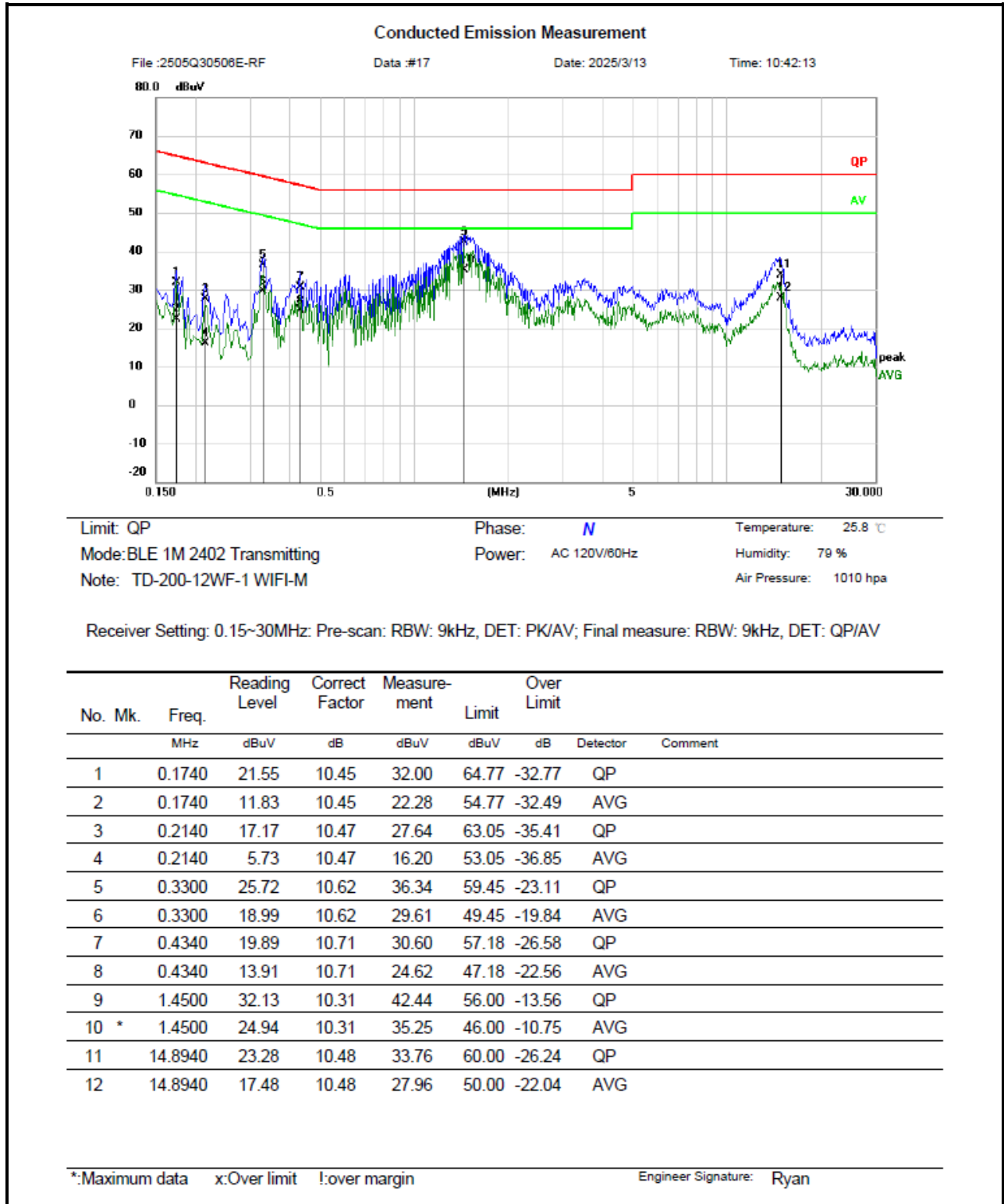
No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over Limit	Detector	Comment
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.3060	26.44	10.60	37.04	60.08	-23.04	QP	
2	0.3060	22.65	10.60	33.25	50.08	-16.83	AVG	
3	1.3099	28.49	10.29	38.78	56.00	-17.22	QP	
4	1.3099	20.40	10.29	30.69	46.00	-15.31	AVG	
5	1.4540	30.61	10.32	40.93	56.00	-15.07	QP	
6 *	1.4540	21.98	10.32	32.30	46.00	-13.70	AVG	
7	1.5300	31.82	10.32	42.14	56.00	-13.86	QP	
8	1.5300	21.88	10.32	32.20	46.00	-13.80	AVG	
9	1.6220	31.17	10.33	41.50	56.00	-14.50	QP	
10	1.6220	20.76	10.33	31.09	46.00	-14.91	AVG	
11	15.0060	24.25	10.48	34.73	60.00	-25.27	QP	
12	15.0060	19.73	10.48	30.21	50.00	-19.79	AVG	

*:Maximum data x:Over limit !:over margin

Engineer Signature: Ryan

Model: TD-200-12WF-1 WiFi-M





Remark:

Measurement (dBuV)= Reading Level (dBuV) + Correct Factor(dB)

Correct Factor(dB)= LISN Voltage Division Factor (dB)+ Cable loss(dB)

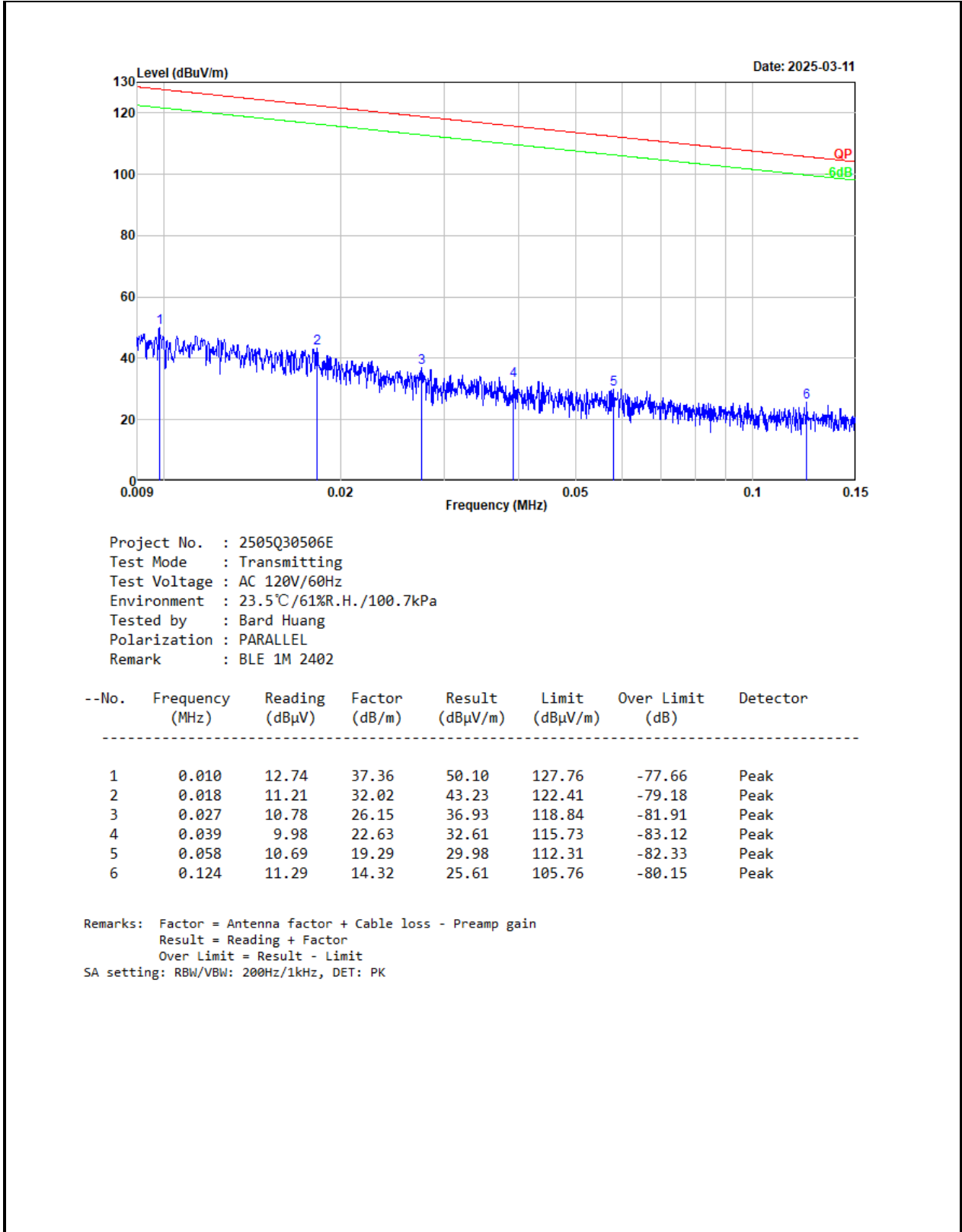
Over Limit = Measurement – Limit

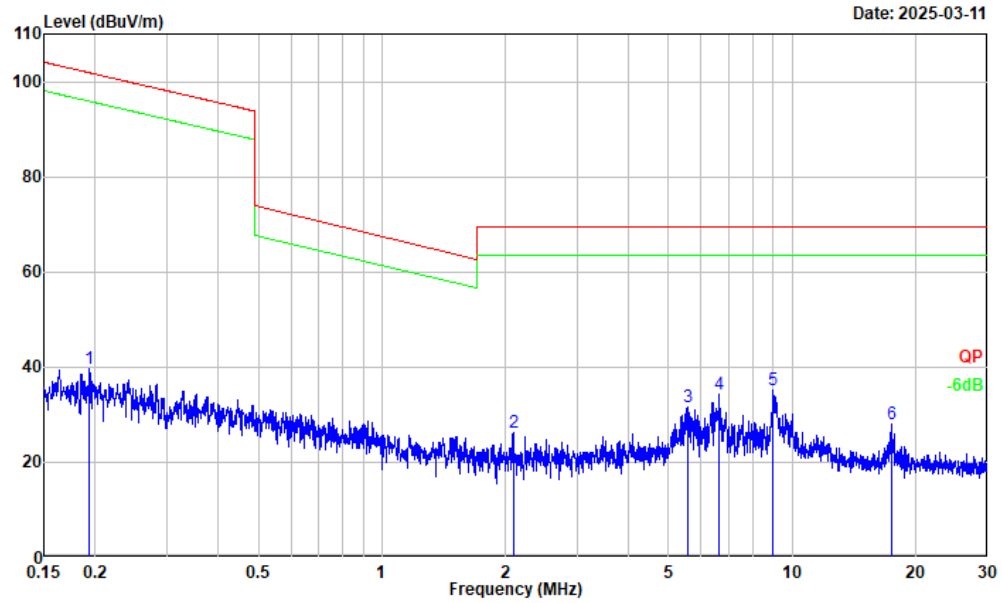
3.4 Radiated emission Test Data

9 kHz-30MHz:

Test Date:	2025-03-11	Test By:	Bard Huang
Environment condition:	Temperature: 23.5°C; Relative Humidity:61%; ATM Pressure: 100.7kPa		

Model: TD-300-12WF-1 WiFi-M



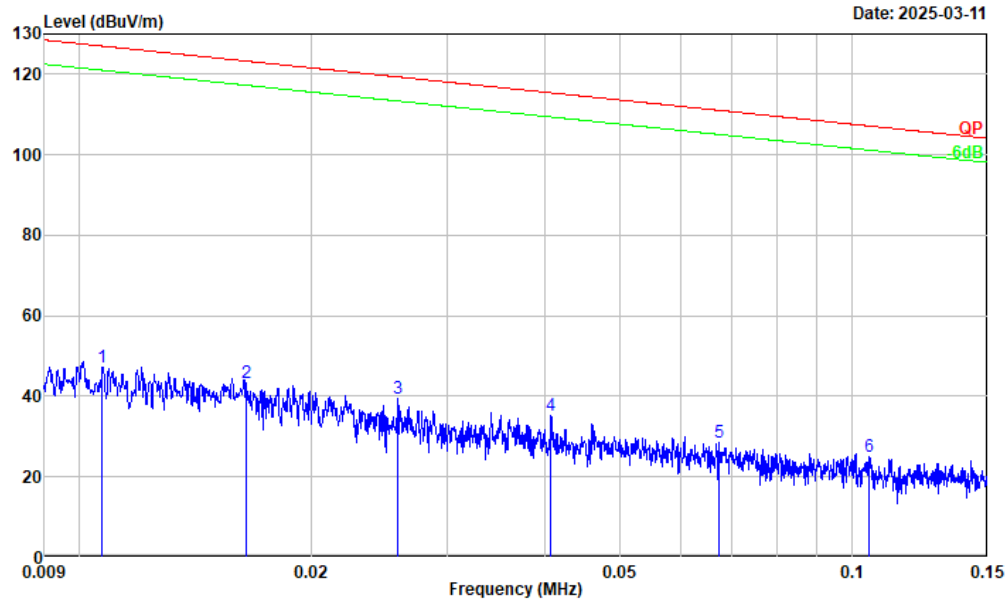


Project No. : 2505Q30506E
 Test Mode : Transmitting
 Test Voltage : AC 120V/60Hz
 Environment : 23.5°C/61%R.H./100.7kPa
 Tested by : Bard Huang
 Polarization : PARALLEL
 Remark : BLE 1M 2402

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	0.194	27.20	12.33	39.53	101.86	-62.33	Peak
2	2.090	28.83	-2.59	26.24	69.54	-43.30	Peak
3	5.551	35.75	-4.03	31.72	69.54	-37.82	Peak
4	6.636	38.33	-4.03	34.30	69.54	-35.24	Peak
5	8.976	38.77	-3.67	35.10	69.54	-34.44	Peak
6	17.472	31.13	-3.24	27.89	69.54	-41.65	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
 Result = Reading + Factor
 Over Limit = Result - Limit
 SA setting: RBW/VBW: 9kHz/30kHz, DET: PK

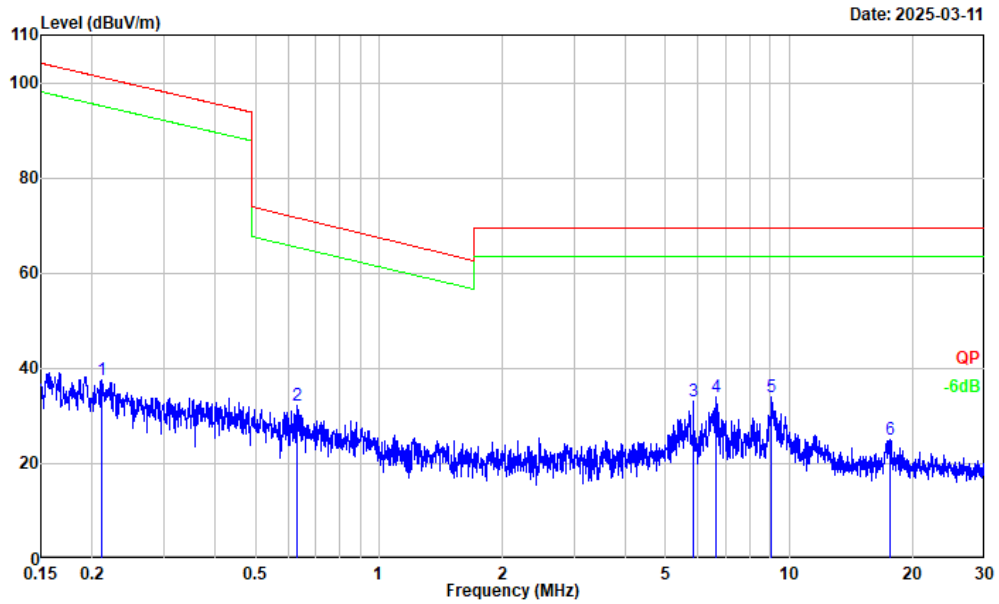
Model: TD-200-12WF-1 WiFi-M



Project No. : 2505Q30506E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.5°C/61%R.H./100.7kPa
Tested by : Bard Huang
Polarization : PARALLEL
Remark : BLE 1M 2402

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
<hr/>							
1	0.011	10.51	36.77	47.28	127.00	-79.72	Peak
2	0.016	10.18	33.12	43.30	123.28	-79.98	Peak
3	0.026	12.43	27.15	39.58	119.35	-79.77	Peak
4	0.041	12.79	22.31	35.10	115.39	-80.29	Peak
5	0.067	10.39	18.01	28.40	111.04	-82.64	Peak
6	0.105	10.33	14.84	25.17	107.15	-81.98	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: RBW/VBW: 200Hz/1kHz, DET: PK



Project No. : 2505Q30506E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.5°C/61%R.H./100.7kPa
Tested by : Bard Huang
Polarization : PARALLEL
Remark : BLE 1M 2402

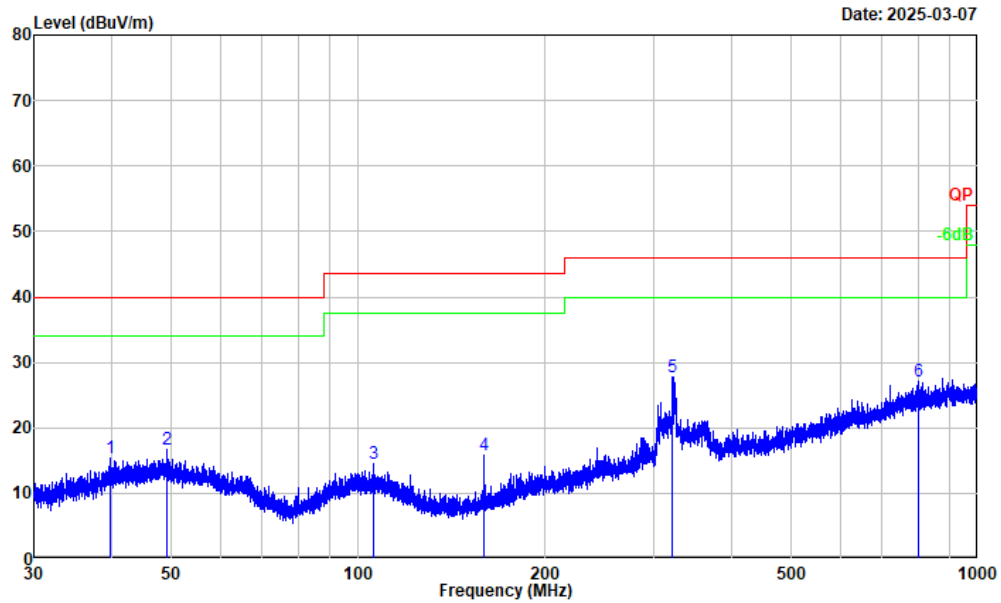
--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	0.211	25.67	11.86	37.53	101.14	-63.61	Peak
2	0.633	28.02	4.17	32.19	71.53	-39.34	Peak
3	5.843	37.19	-4.07	33.12	69.54	-36.42	Peak
4	6.636	37.91	-4.03	33.88	69.54	-35.66	Peak
5	9.056	37.67	-3.66	34.01	69.54	-35.53	Peak
6	17.596	28.33	-3.21	25.12	69.54	-44.42	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: RBW/VBW: 9kHz/30kHz, DET: PK

30MHz-1GHz:

Test Date:	2025-03-07	Test By:	Bard Huang
Environment condition:	Temperature: 22.5°C; Relative Humidity:56%; ATM Pressure: 101.5kPa		

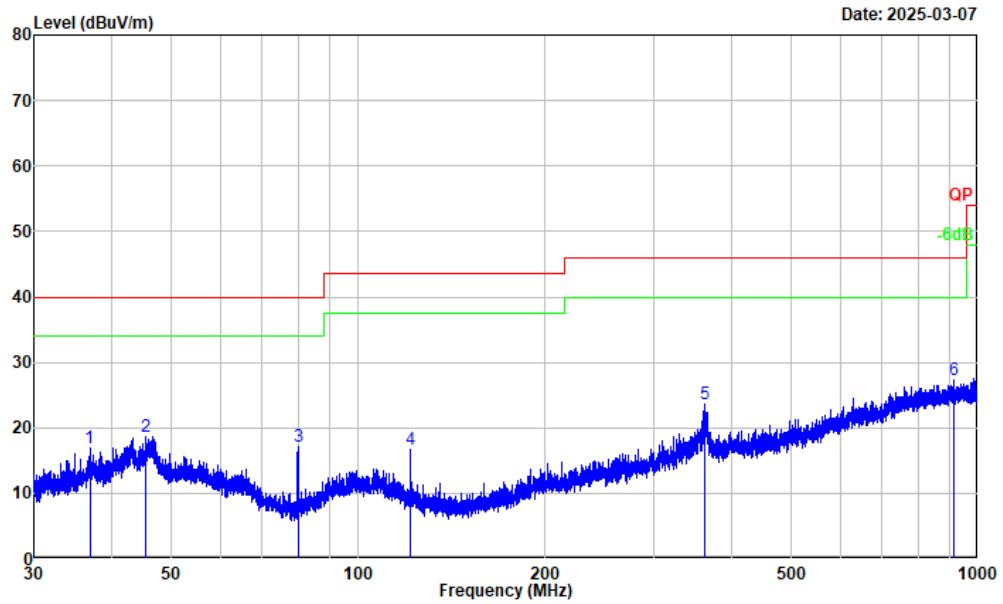
Model: TD-300-12WF-1 WiFi-M



Project No. : 2505Q30506
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.5°C/56%R.H./101.5kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : BLE 1M 2402

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	39.942	28.36	-13.03	15.33	40.00	-24.67	Peak
2	49.144	28.74	-12.07	16.67	40.00	-23.33	Peak
3	106.106	28.35	-13.82	14.53	43.50	-28.97	Peak
4	159.995	32.56	-16.78	15.78	43.50	-27.72	Peak
5	321.483	38.51	-10.76	27.75	46.00	-18.25	Peak
6	802.841	29.51	-2.31	27.20	46.00	-18.80	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 measure: RBW: 120kHz, DET: QP

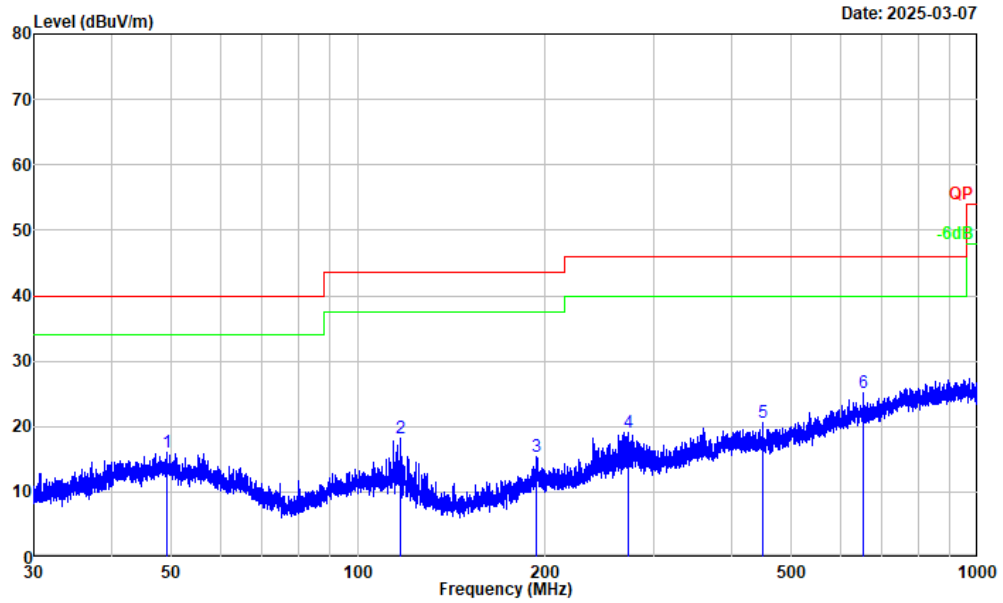


Project No. : 2505Q30506
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.5°C/56%R.H./101.5kPa
Tested by : Bard Huang
Polarization : vertical
Remark : BLE 1M 2402

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	36.928	30.81	-13.98	16.83	40.00	-23.17	Peak
2	45.475	30.81	-12.09	18.72	40.00	-21.28	Peak
3	80.010	35.20	-17.98	17.22	40.00	-22.78	Peak
4	121.442	32.80	-16.02	16.78	43.50	-26.72	Peak
5	361.714	33.04	-9.49	23.55	46.00	-22.45	Peak
6	914.865	28.63	-1.34	27.29	46.00	-18.71	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 measure: RBW: 120kHz, DET: QP

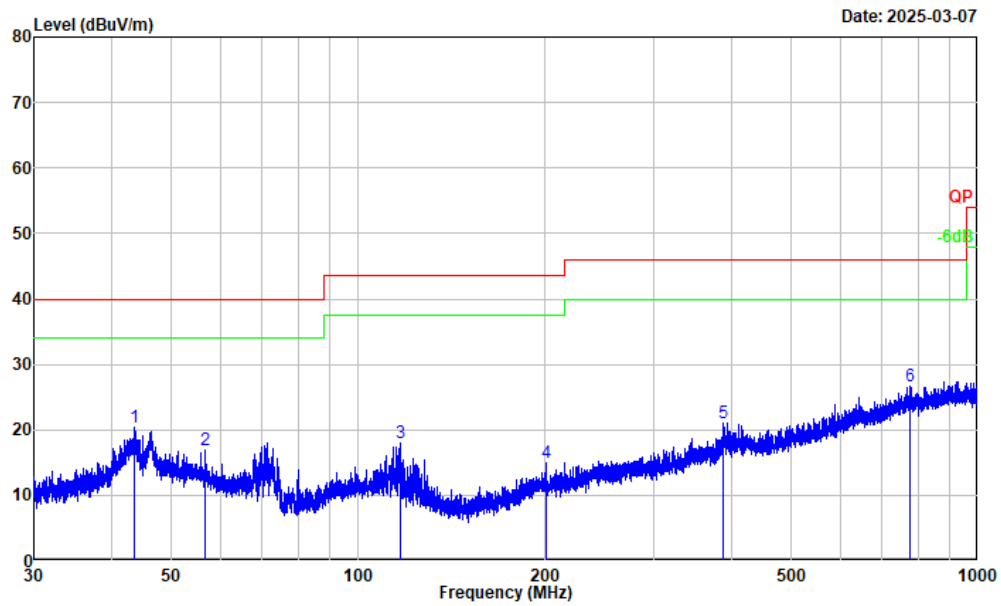
Model: TD-200-12WF-1 WiFi-M



Project No. : 2505Q30506
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.5°C/56%R.H./101.5kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : BLE 1M 2402

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
<hr/>							
1	49.122	28.07	-12.07	16.00	40.00	-24.00	Peak
2	117.360	33.58	-15.32	18.26	43.50	-25.24	Peak
3	193.773	29.53	-14.16	15.37	43.50	-28.13	Peak
4	272.516	30.95	-11.88	19.07	46.00	-26.93	Peak
5	449.950	28.79	-8.27	20.52	46.00	-25.48	Peak
6	652.800	29.42	-4.27	25.15	46.00	-20.85	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 measure: RBW: 120kHz, DET: QP



Project No. : 2505Q30506
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.5°C/56%R.H./101.5kPa
Tested by : Bard Huang
Polarization : vertical
Remark : BLE 1M 2402

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	43.487	32.55	-12.25	20.30	40.00	-19.70	Peak
2	56.568	29.86	-12.91	16.95	40.00	-23.05	Peak
3	116.898	33.30	-15.23	18.07	43.50	-25.43	Peak
4	200.776	28.75	-13.72	15.03	43.50	-28.47	Peak
5	388.162	30.08	-8.96	21.12	46.00	-24.88	Peak
6	778.582	29.15	-2.42	26.73	46.00	-19.27	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 measure: RBW: 120kHz, DET: QP

Above 1GHz:

Test Date:	2025-03-10	Test By:	Luke Li
Environment condition:	Temperature: 22.1°C; Relative Humidity:52%; ATM Pressure:101.1 kPa		

Frequency (MHz)	Reading level (dBμV)	Polar	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
BLE 1M							
Low Channel							
2560.000	52.89	horizontal	-2.60	50.29	74.00	-23.71	Peak
2560.000	55.83	vertical	-2.60	53.23	74.00	-20.77	Peak
4804.000	47.41	horizontal	-2.42	44.99	74.00	-29.01	Peak
4804.000	47.61	vertical	-2.42	45.19	74.00	-28.81	Peak
Middle Channel							
2560.000	53.10	horizontal	-2.60	50.50	74.00	-23.50	Peak
2559.000	55.39	vertical	-2.60	52.79	74.00	-21.21	Peak
4880.000	46.87	horizontal	-1.88	44.99	74.00	-29.01	Peak
4880.000	48.79	vertical	-1.88	46.91	74.00	-27.09	Peak
High Channel							
2512.000	54.07	horizontal	-2.63	51.44	74.00	-22.56	Peak
2559.000	53.22	horizontal	-2.60	50.62	74.00	-23.38	Peak
1594.000	55.21	vertical	-4.26	50.95	74.00	-23.05	Peak
2240.000	54.05	vertical	-3.12	50.93	74.00	-23.07	Peak
2510.000	56.05	vertical	-2.63	53.42	74.00	-20.58	Peak
4960.000	47.47	horizontal	-1.70	45.77	74.00	-28.23	Peak
4960.000	49.73	vertical	-1.70	48.03	74.00	-25.97	Peak

Remark:

Corrected Amplitude= Reading level + corrected Factor

Corrected Factor = Antenna factor + Cable loss – Amplifier gain

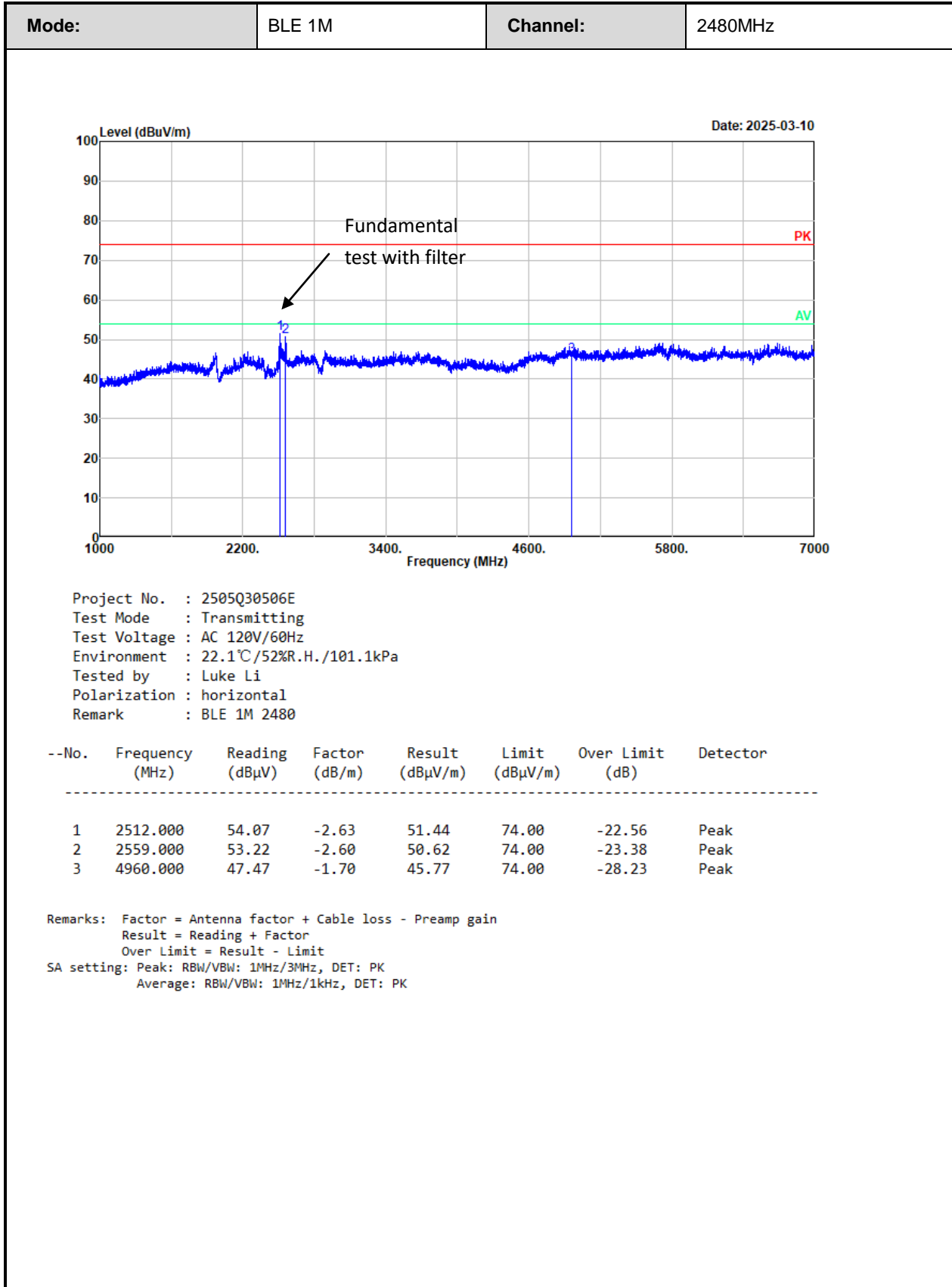
Margin = Corrected Amplitude – Limit

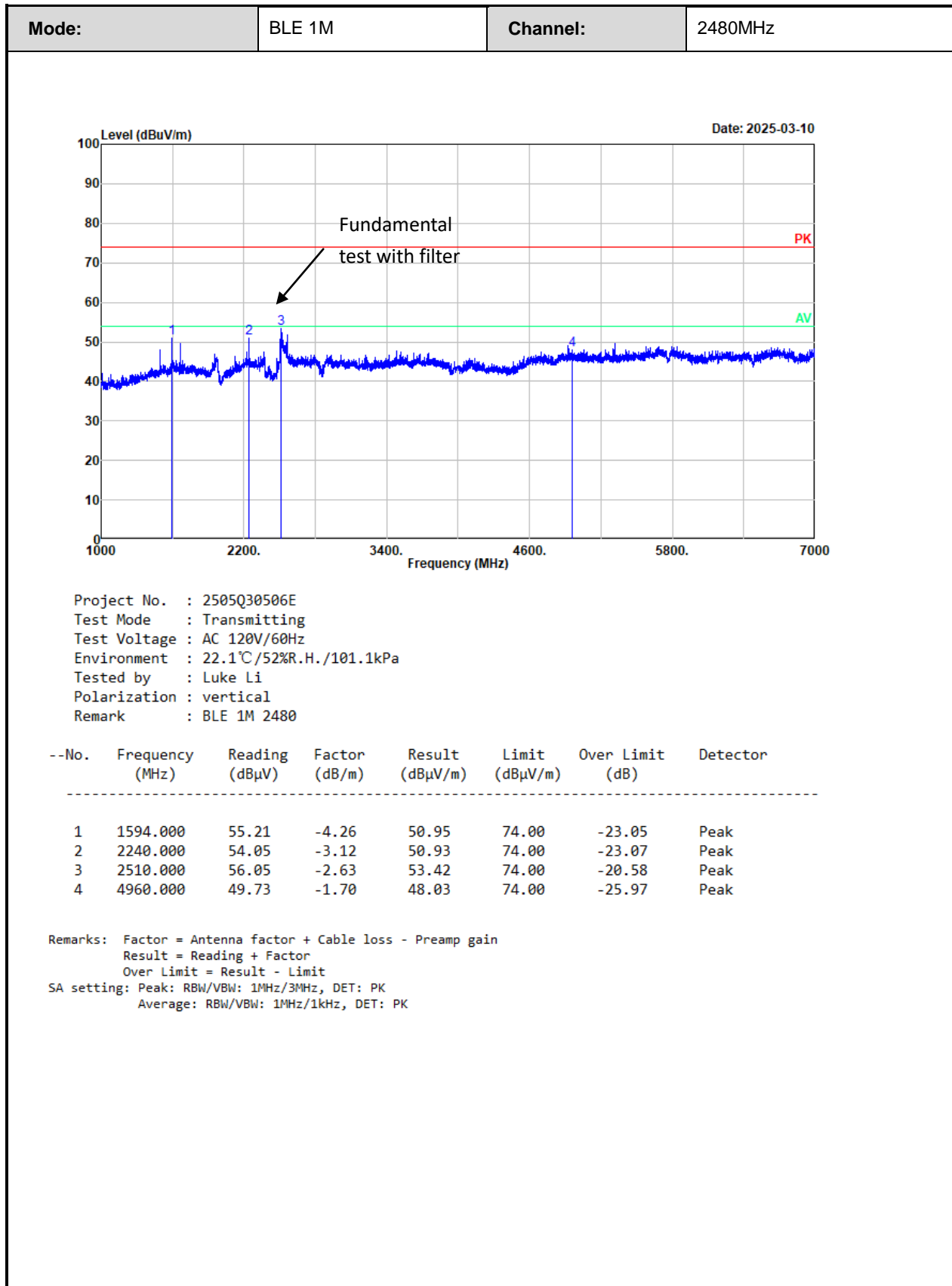
For the test result of Peak below the Peak limit more than 20dB, which can compliance with the average limit, just the Peak level was recorded.

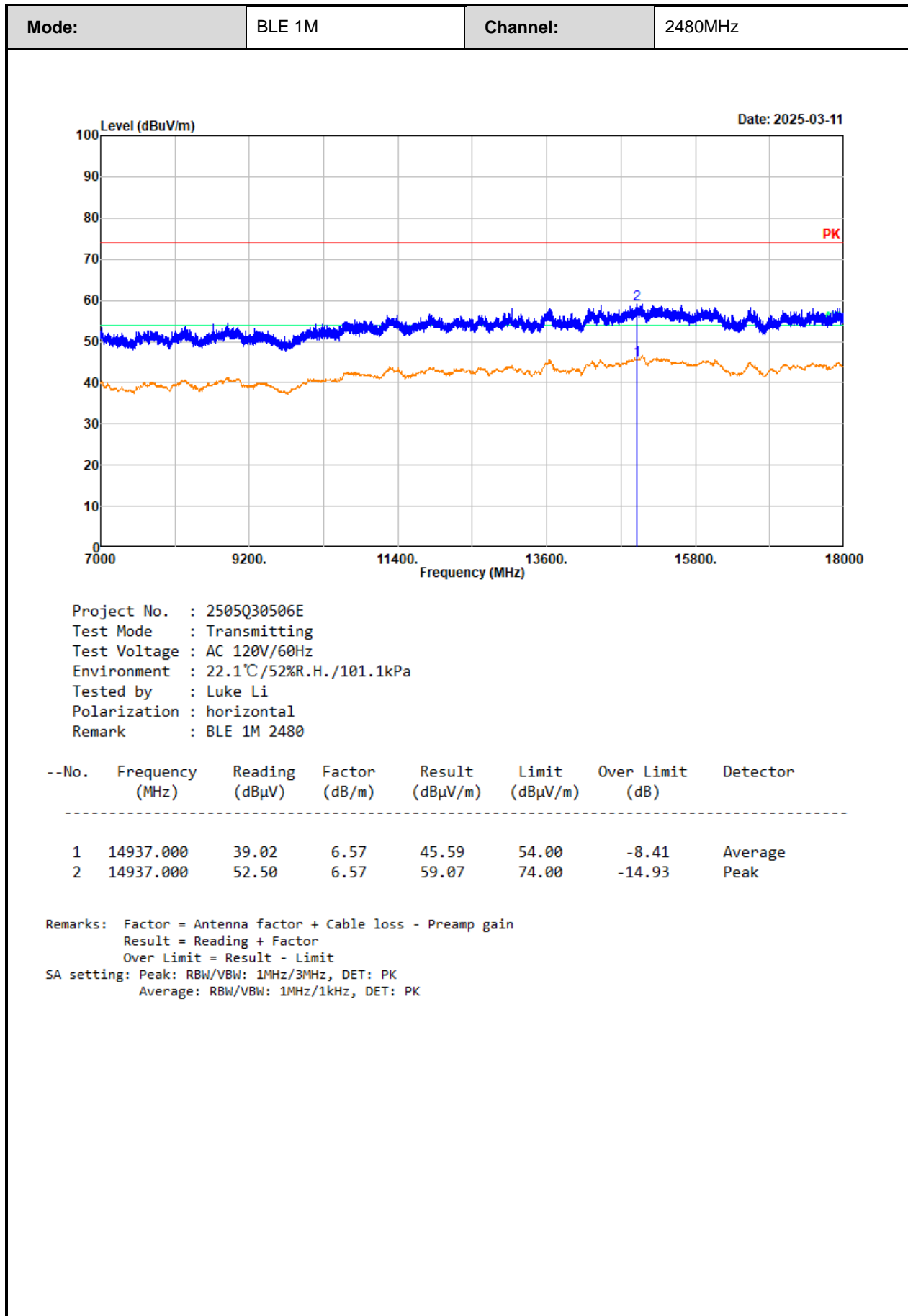
The emission levels of other frequencies that were lower than the limit 20dB not show in test report.

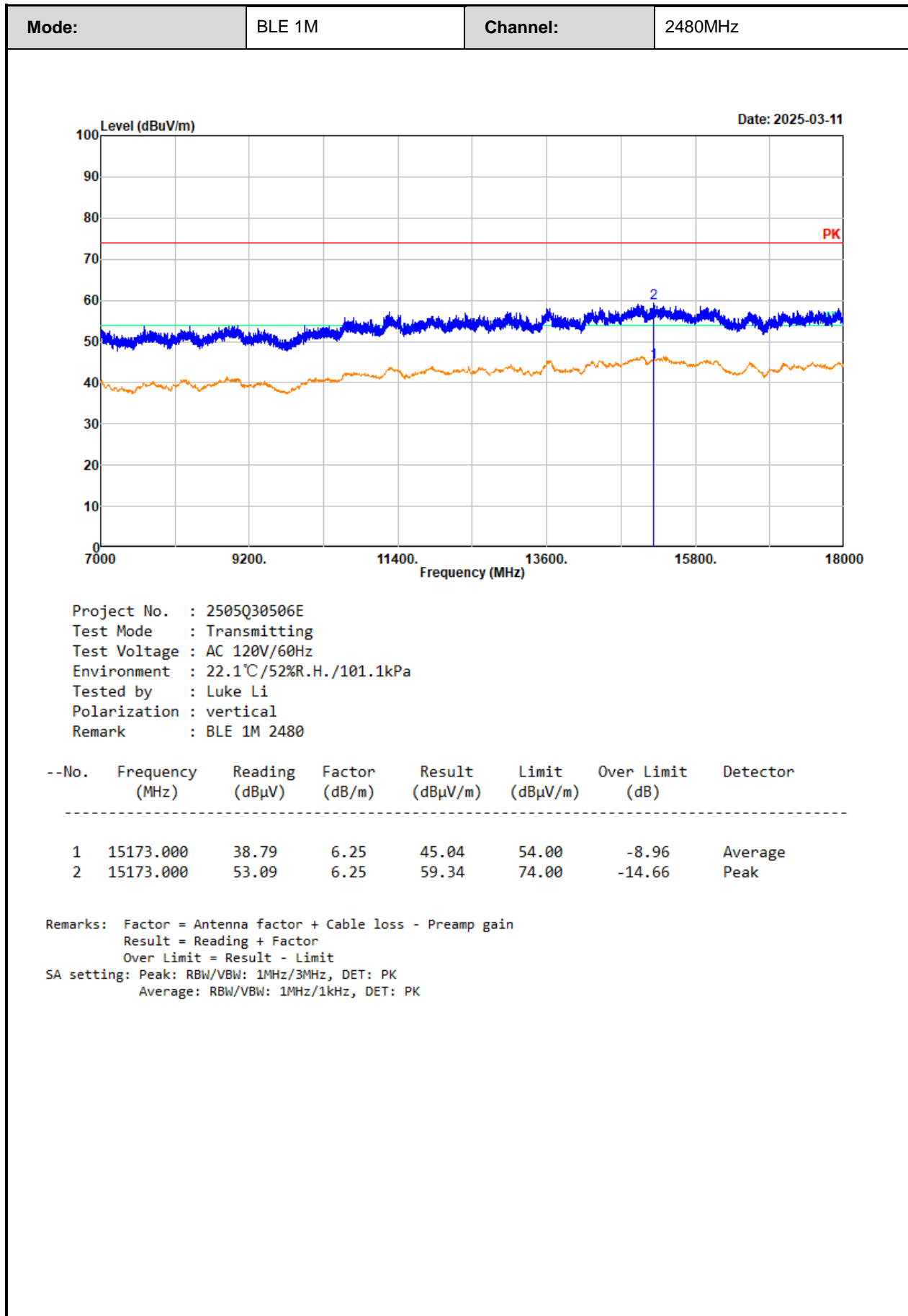
For emissions in 18GHz-25GHz range, all emissions were investigated and in the noise floor level.

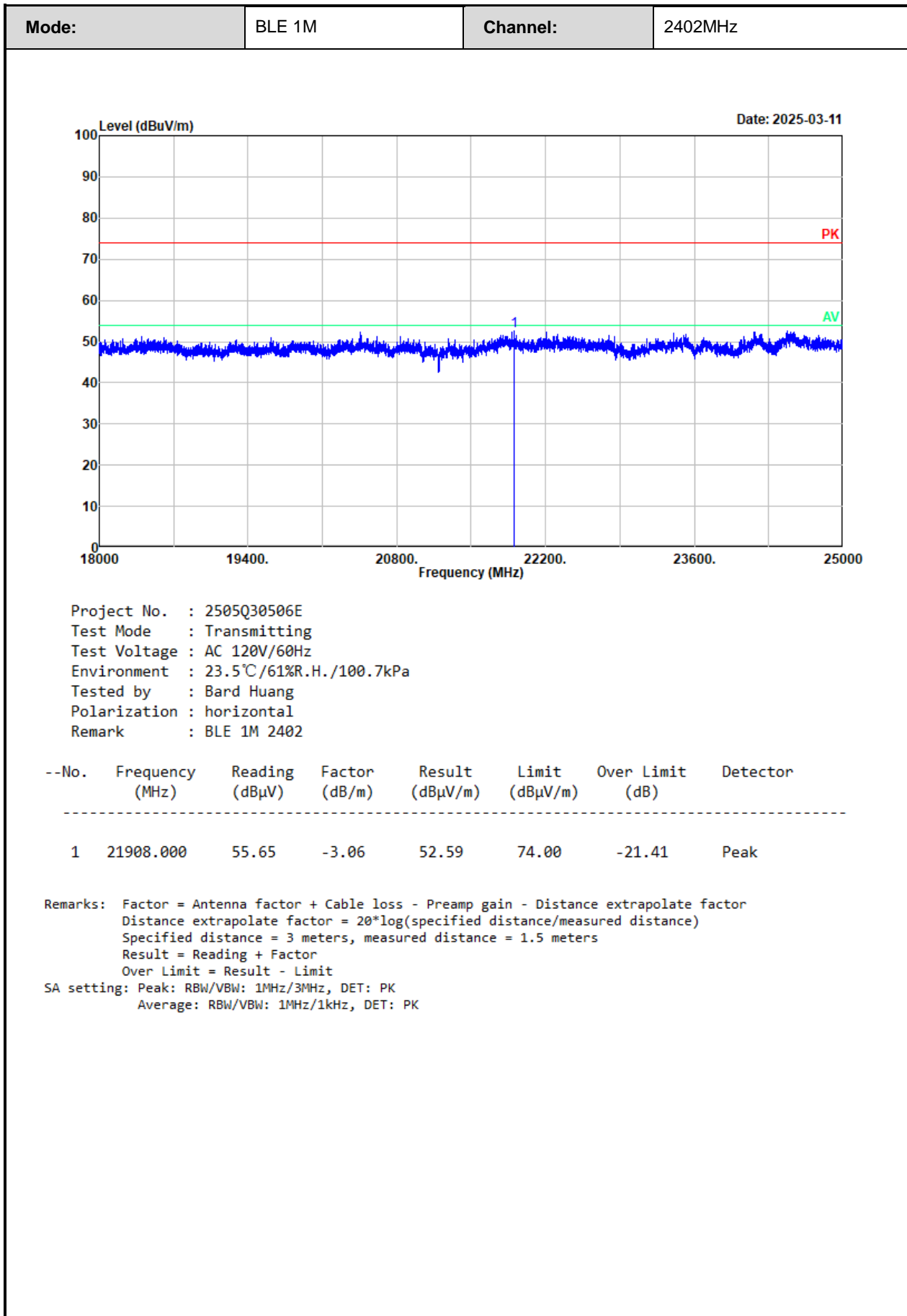
Test plot for example as below:

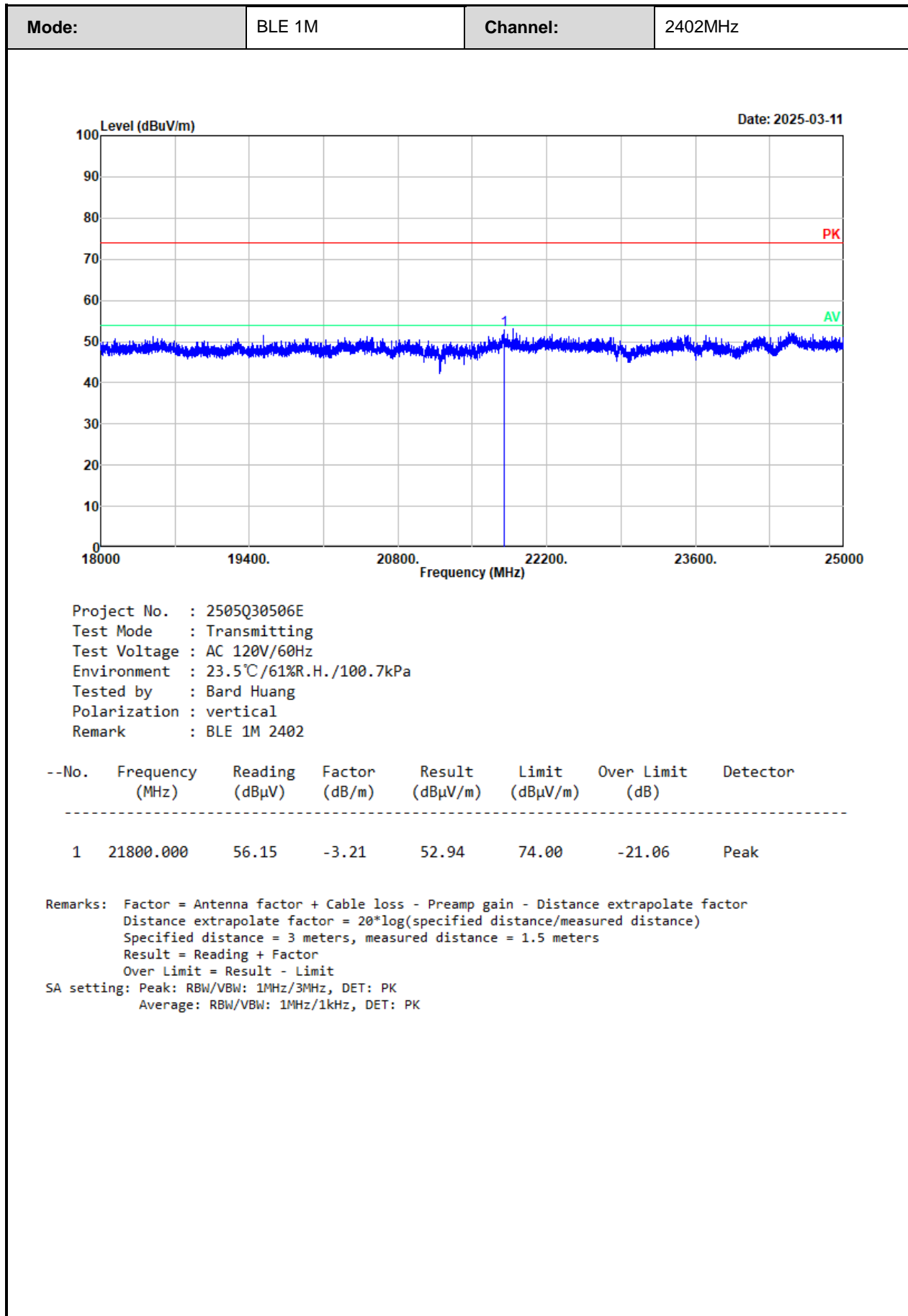




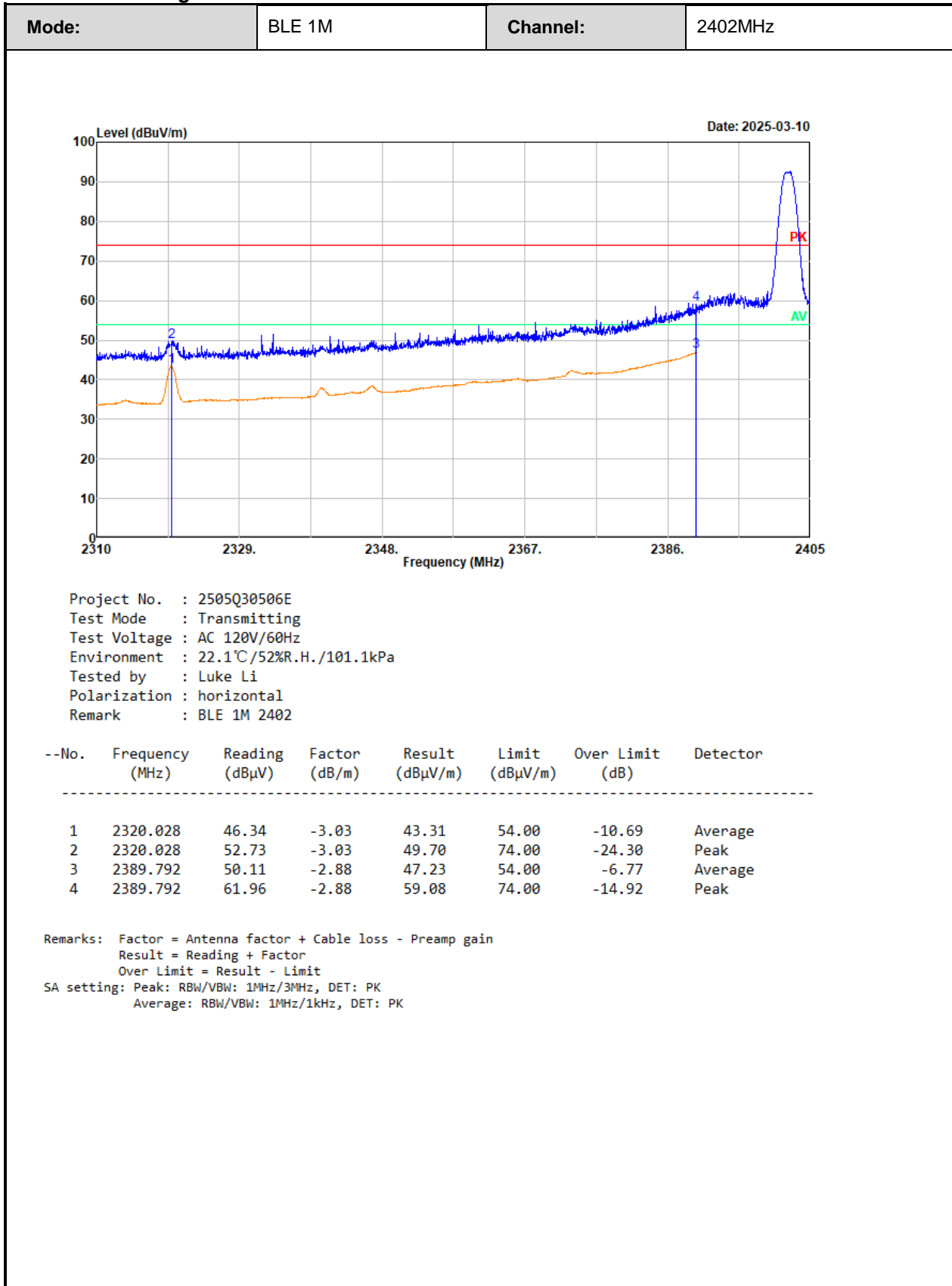


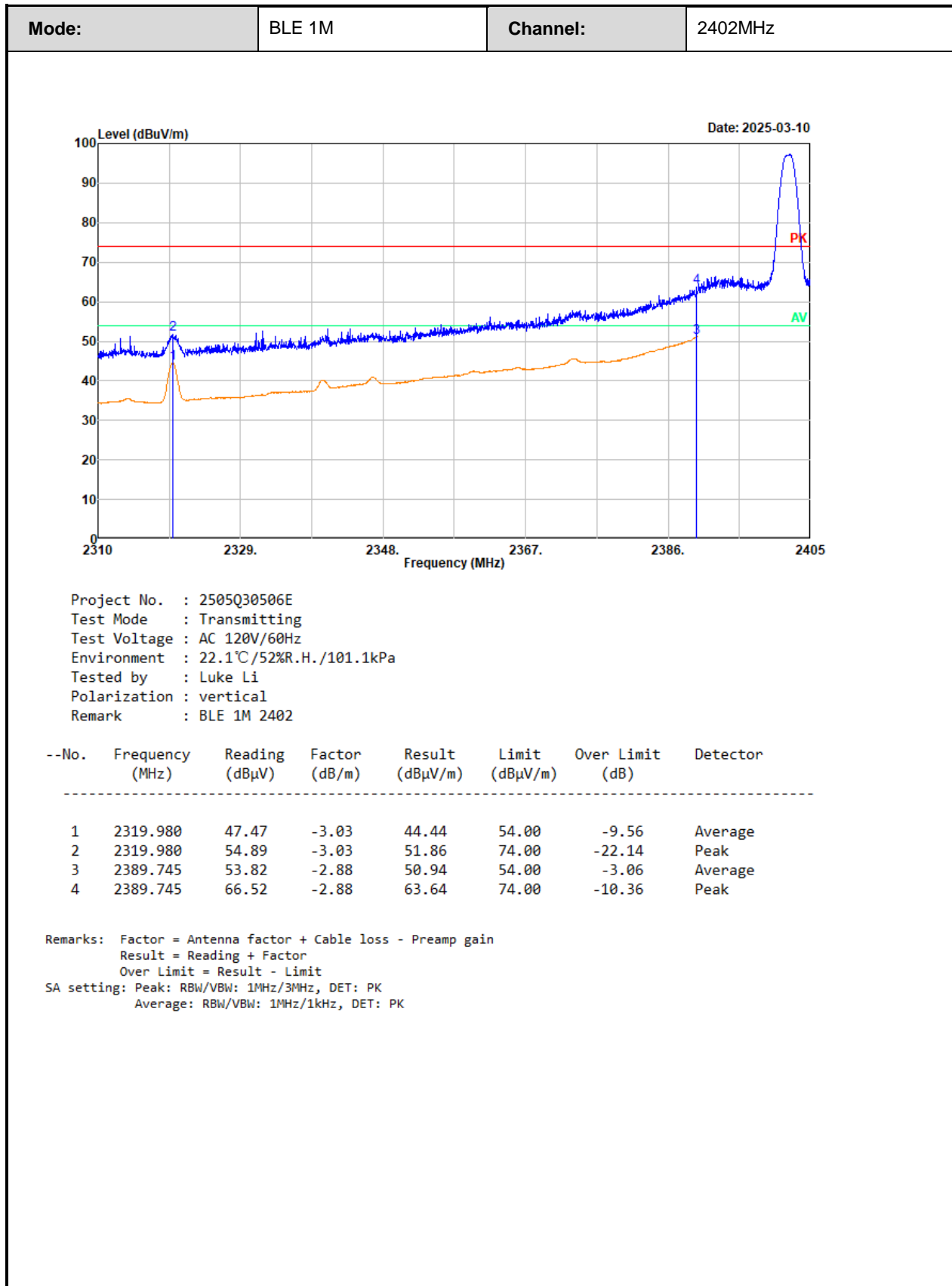


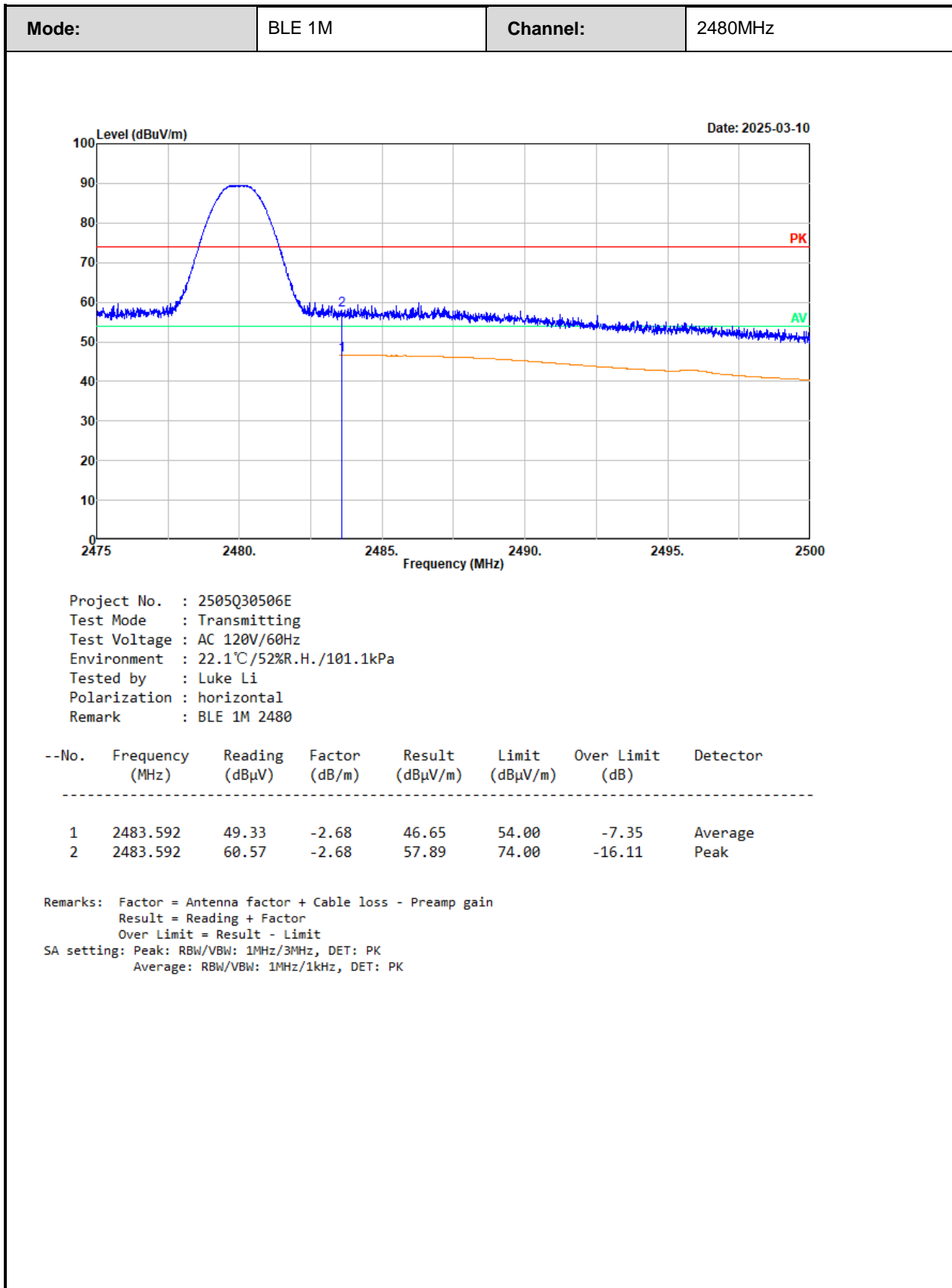


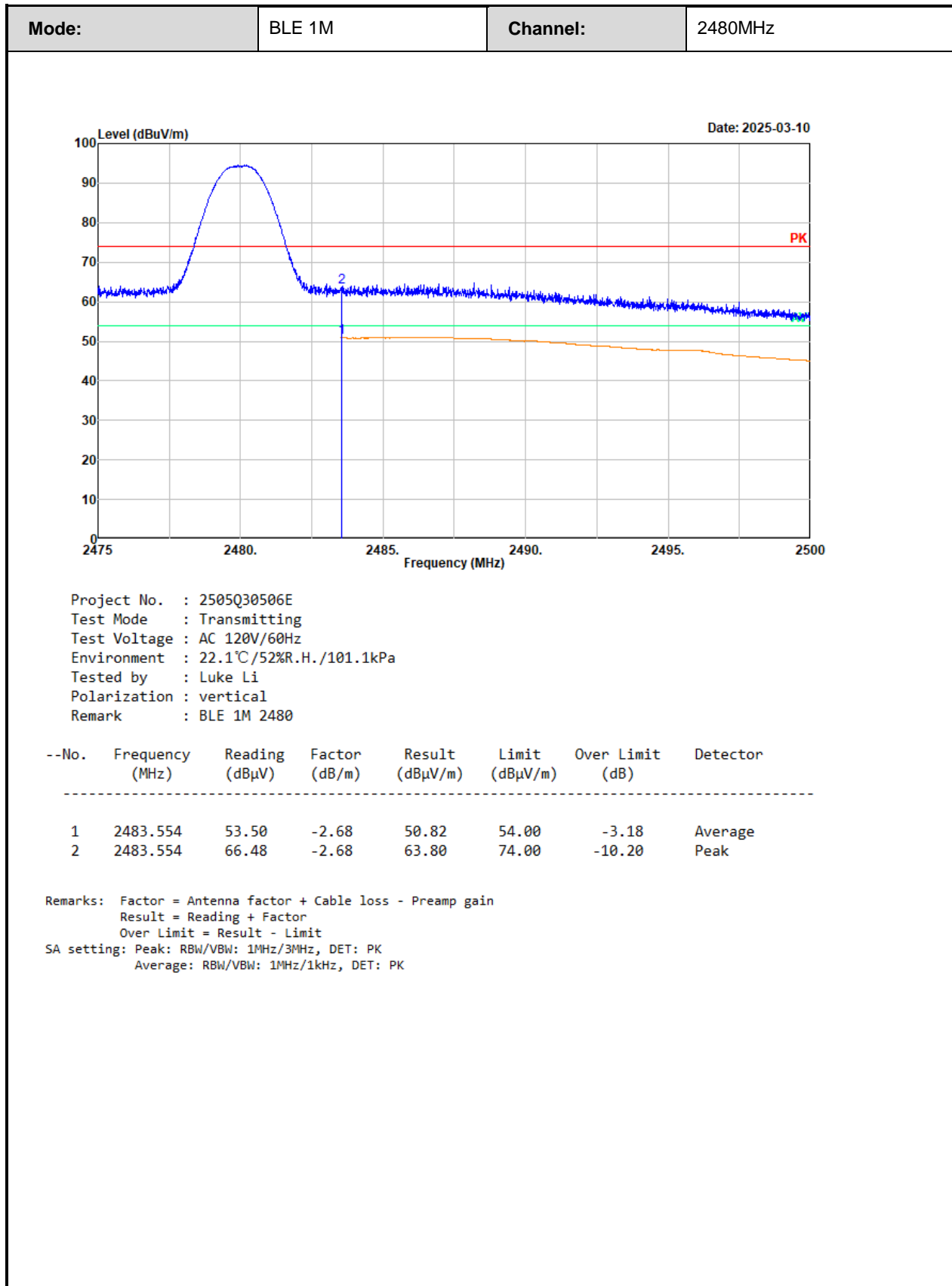


Radiated Band edge:









3.5 RF Conducted Test Data

Test Date:	2025-03-12~2025-03-18	Test By:	Ryan Zhang
Environment condition:	Temperature: 25.4~25.9°C;RelativeHumidity:51~60%; ATM Pressure: 100.8~101.2kPa		

3.5.1 6 dB Emission Bandwidth and 99% Occupied Bandwidth

BLE 1M

Channel	Result (MHz)	Limit (MHz)	Verdict
Low	0.749	≥0.5	Pass
Middle	0.745	≥0.5	Pass
High	0.741	≥0.5	Pass

BLE 1M

Channel	99% OBW (MHz)
Low	1.052
Middle	1.044
High	1.052

3.5.2 Maximum Conducted Peak Output Power

BLE 1M

Channel	Peak Output Power (dBm)	Limit (dBm)	Verdict
Low	-6.32	30.00	Pass
Middle	-7.21	30.00	Pass
High	-8.53	30.00	Pass

3.5.3 Power Spectral Density

BLE 1M

Channel	Result (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
Low	-21.31	8	Pass
Middle	-22.72	8	Pass
High	-23.11	8	Pass

3.5.4 100 kHz Bandwidth of Frequency Band Edge

BLE 1M

Channel	Result (dB)	Limit (dB)	Verdict
Low	36.82	20	Pass
High	36.07	20	Pass

3.5.5 Duty Cycle

BLE 1M

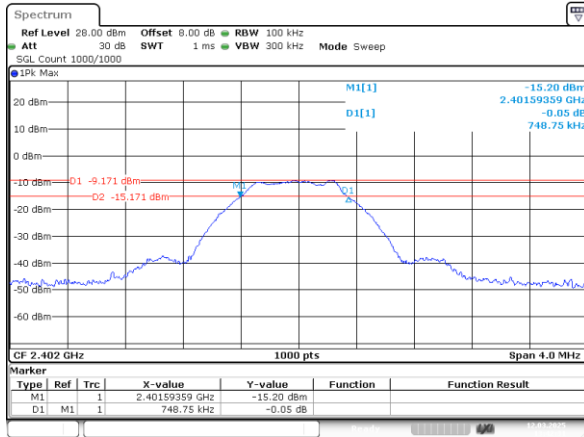
Channel	Ton (ms)	Ton+Toff (ms)	Duty Cycle (%)	Duty Cycle Factor(dB)	1/Ton (Hz)	VBW Setting (kHz)
Middle	100	100	100	0	NA	0.010

Test Plots:

6 dB Emission Bandwidth:

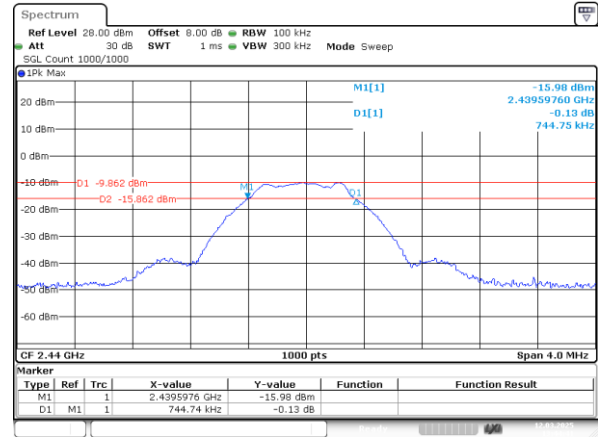
BLE 1M

BLE_1M_Low_Channel



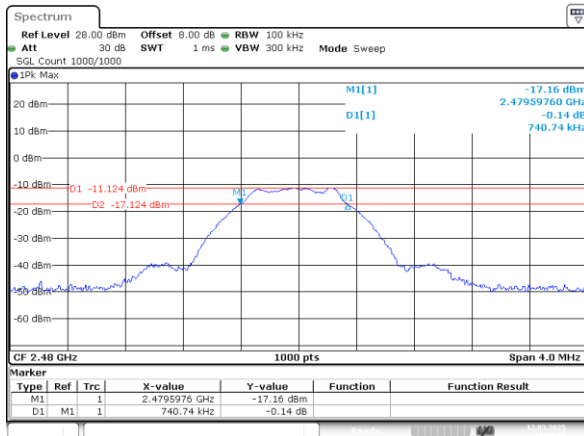
ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 12.MAR.2025 13:42:30

BLE_1M_Middle_Channel



ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 12.MAR.2025 13:44:41

BLE_1M_High_Channel

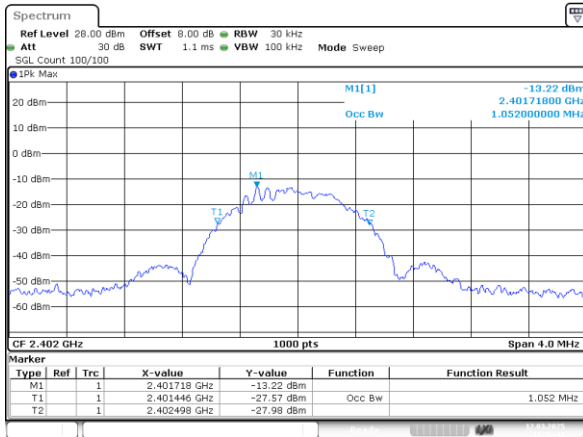


ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 12.MAR.2025 13:47:39

99% Occupied Bandwidth:

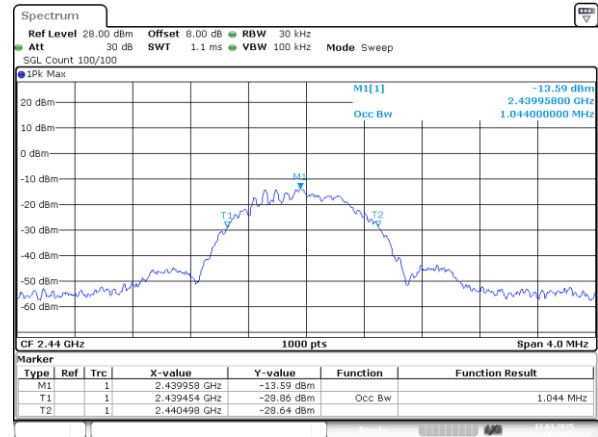
BLE 1M

BLE_1M_Low_Channel



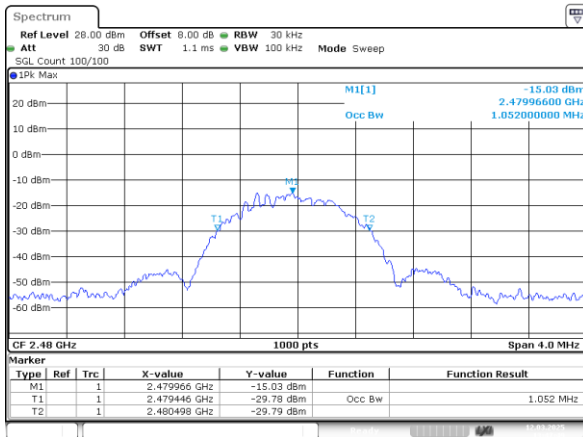
ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 12.MAR.2025 13:42:41

BLE_1M_Middle_Channel



ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 12.MAR.2025 13:44:51

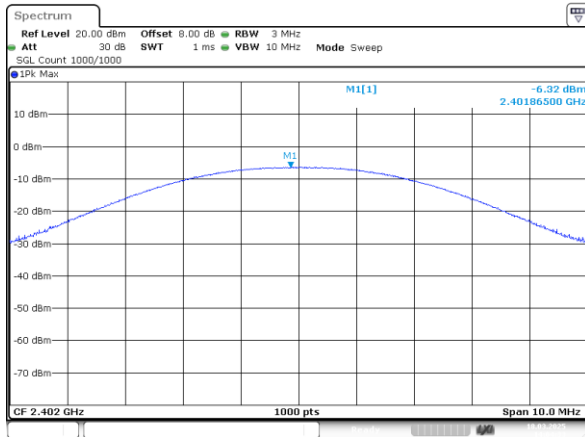
BLE_1M_High_Channel



ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 12.MAR.2025 13:47:49

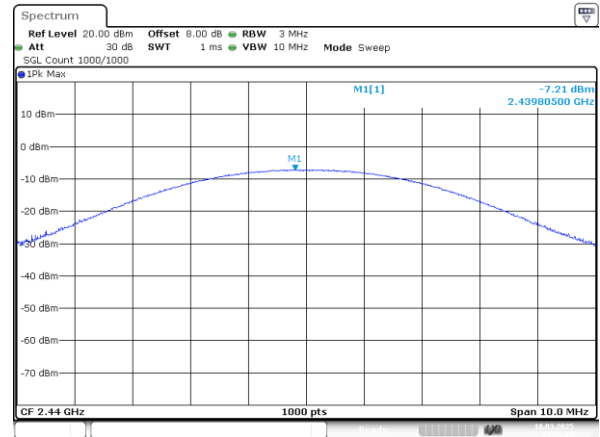
Maximum Conducted Peak Output Power: BLE 1M

BLE_1M_Low_Channel



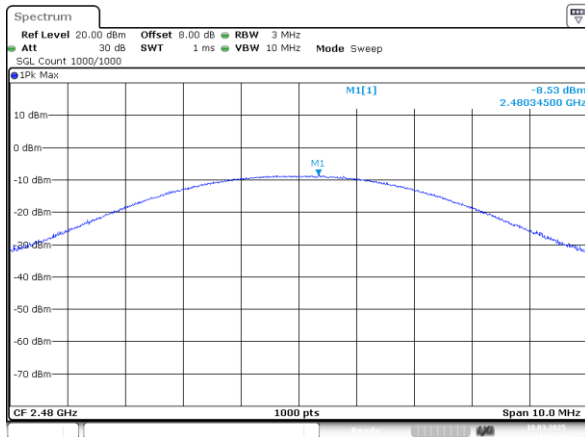
ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 18.MAR.2025 14:04:33

BLE_1M_Middle_Channel



ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 18.MAR.2025 14:06:03

BLE_1M_High_Channel

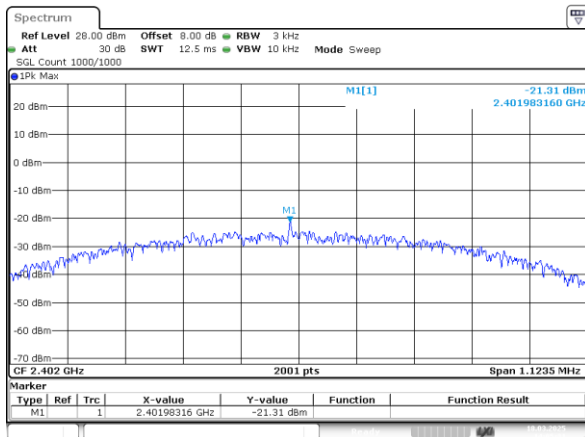


ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 18.MAR.2025 14:07:36

Power Spectral Density:

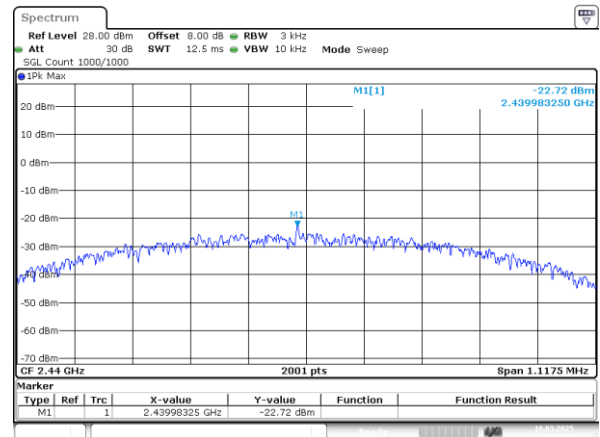
BLE 1M

BLE_1M_Low_Channel



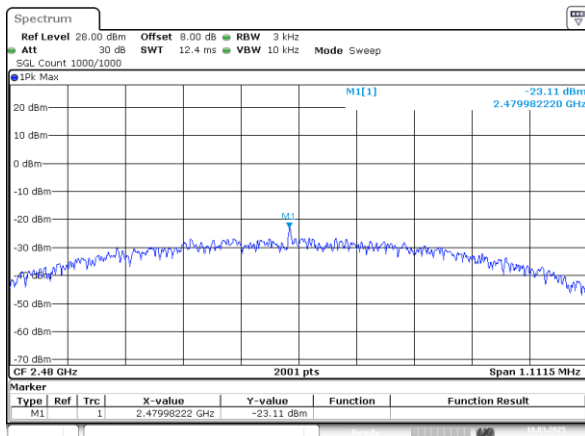
ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 18.MAR.2025 14:05:31

BLE_1M_Middle_Channel



ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 18.MAR.2025 14:07:01

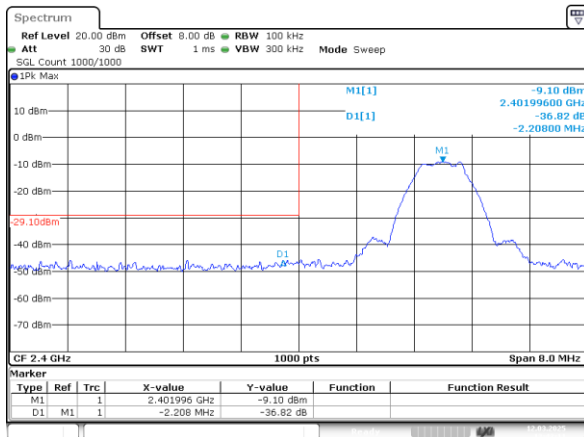
BLE_1M_High_Channel



ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 18.MAR.2025 14:08:34

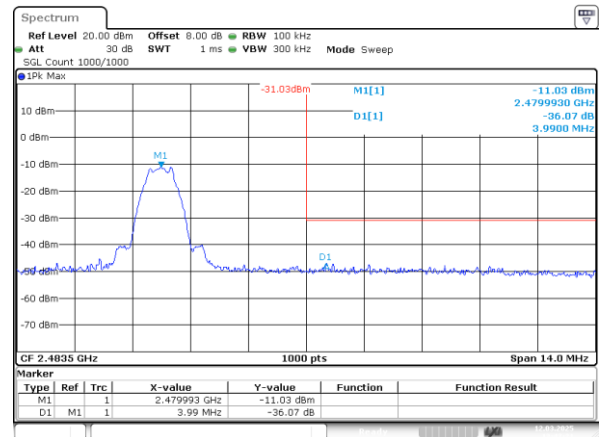
100kHz Bandwidth of Frequency Band Edge: BLE 1M

BLE_1M_Low_Channel



ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 12.MAR.2025 13:42:10

BLE_1M_High_Channel

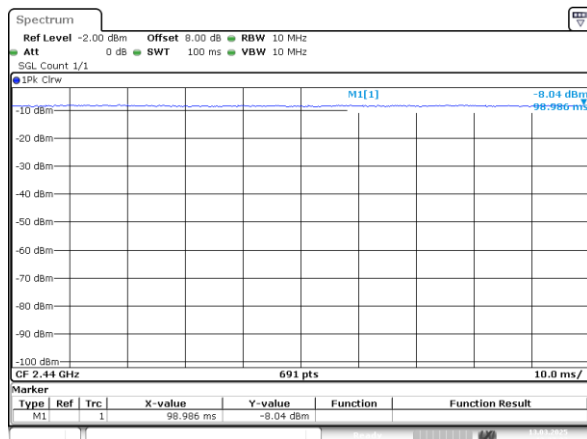


ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 12.MAR.2025 13:47:21

Duty cycle:

BLE 1M

BLE_1M_Middle_Channel



ProjectNo.:2505Q30506E-RF Tester:Ryan Zhang
Date: 13.MAR.2025 13:27:22

4 Test Setup Photo

Please refer to the attachment 2505Q30506E Test Setup photo.

5 E.U.T Photo

Please refer to the attachment 2505Q30506E External photo and 2505Q30506E Internal photo.

---End of Report---