FCC Test Report

Report No.:	2405Y58028EE
Applicant:	Hatch Baby, Inc.
Address:	3525 Alameda De Las Pulgas, Suite D, Menlo Park, California, 94025 United States
Product Name:	Hatch Restore 3
Product Model:	RESTORE05
Multiple Models:	N/A
Trade Mark:	Hatch
FCC ID:	2AFYZ-RESTORE05
Standards:	FCC CFR Title 47 Part 15C (§15.247)
Test Date:	2024-10-22 to 2024-10-31
Test Result:	Complied
Report Date:	2024-11-01

Reviewed by: Frank Yin — Frank Yin, Project Engineer

Approved by: Jacob Gong — 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

NVLAP TESTING NVLAP LAB CODE 600335-0

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Announcement

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2. The results in this report apply only to the sample tested.

3. This sample tested is in compliance with the limits of the above regulation.

4. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

5. The information marked "#" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

Revision History

Version No.	Issued Date	Description
00	*2024-11-01*	*Original*

Contents

1 General Information

1.1 Client Information

Applicant:	Hatch Baby, Inc.
Address:	3525 Alameda De Las Pulgas, Suite D, Menlo Park, California, 94025 United States
Manufacturer:	Hatch Baby, Inc.
Address:	3525 Alameda De Las Pulgas, Suite D, Menlo Park, California, 94025 United States

1.2 Product Description of EUT

The EUT is Hatch Restore 3 that contains Classic Bluetooth(BDR/EDR), BLE and 2.4G WLAN radios, this report covers the full testing of the 2.4G WLAN radio.

Sample Serial Number	2T0R-5 for CE&RE test, 2T0R-6 for RF conducted test(assigned by WATC)
Sample Received Date	2024-10-16
Sample Status	Good Condition
Frequency Range	2412MHz - 2462MHz(802.11b, g, n-HT20) 2422MHz - 2452MHz(802.11n-HT40)
Maximum Conducted Peak Output Power	18.95dBm
Modulation Technology	DSSS, OFDM
Antenna Gain#	3.76dBi
Spatial Streams#	SISO (1TX, 1RX)
Power Supply	DC 24V from AC adapter
Adapter Information	Model: LACW030 Input: AC100-240V, 50/60Hz, 0.8A Output: DC 24V/1.5A,
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 product internal photos for details.

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DSS, FCC ID: 2AFYZ-RESTORE05

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

2 Description of Measurement

2.1 Test Configuration

Operating channels:					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	6	2437	11	2462
2	2417	7	2442	/	/
3	2422	8	2447	/	/
4	2427	9	2452	/	/
5	2432	10	2457	/	/

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:

802.11b, 802.11g, 802.11n-HT20					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	6	2437	11	2462

802.11n-HT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
3	2422	6	2437	9	2452

Test Mode:				
Transmitting mode:	Keep the EUT in continuous transmitting with modulation			
Exercise software#:	EspRFTestTool V3.6			
Mode	**Worst-case Data rate**	**Power Level Setting#**		
		Low Channel	**Middle Channel**	**High Channel**
802.11b	1Mbps	10 ATT	10 ATT	10 ATT
802.11g	6Mbps	14 ATT	14 ATT	14 ATT
802.11n-HT20	6.5Mbps	14 ATT	14 ATT	14 ATT
802.11n-HT40	13.5Mbps	18 ATT	18 ATT	18 ATT
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. There is two WLAN module install in the device, the applicant declared only one module used as wireless module, another was disable the wireless function and work as MCU, detail please refer the declaration letter provide by applicant.

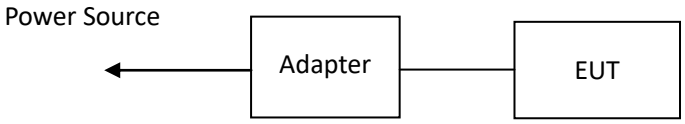
2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

2.3 Interconnecting Cables

Manufacturer	Description	Length(m)	From	To
ASAP	DC Power Cable	1.5	Adapter	EUT

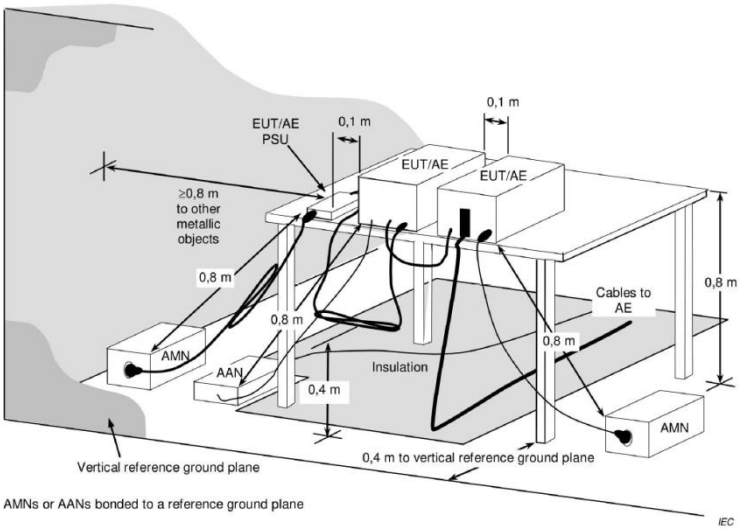
2.4 Block Diagram of Connection between EUT and AE



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

2.5 Test Setup

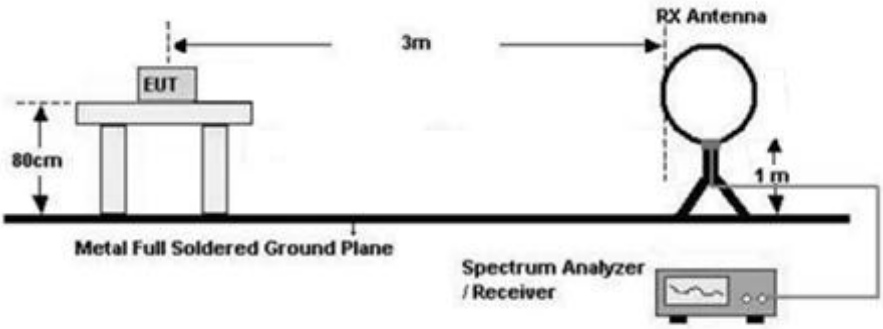
1) Conducted emission measurement:



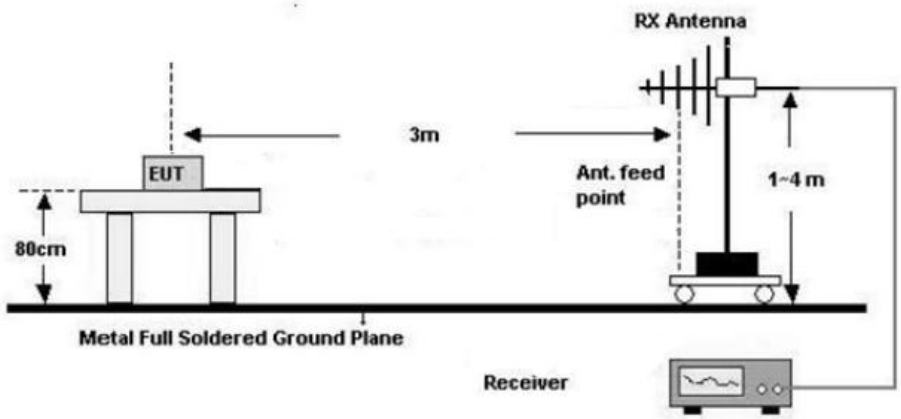
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

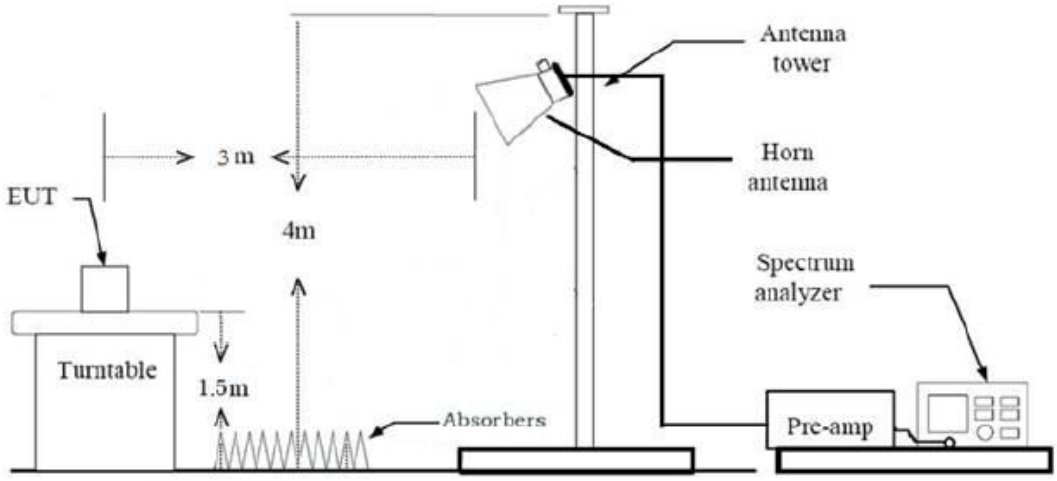
Below 30MHz (3m SAC)



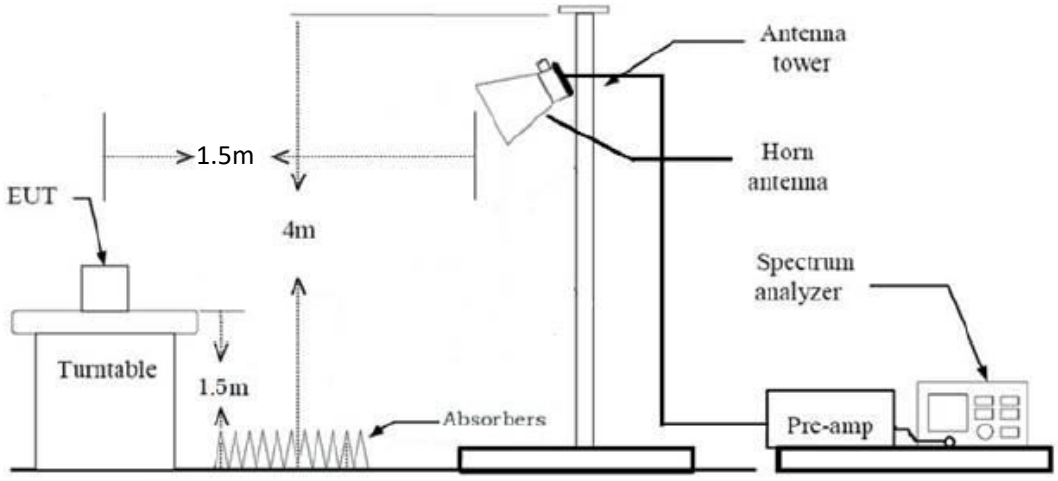
30MHz-1GHz (3m SAC)



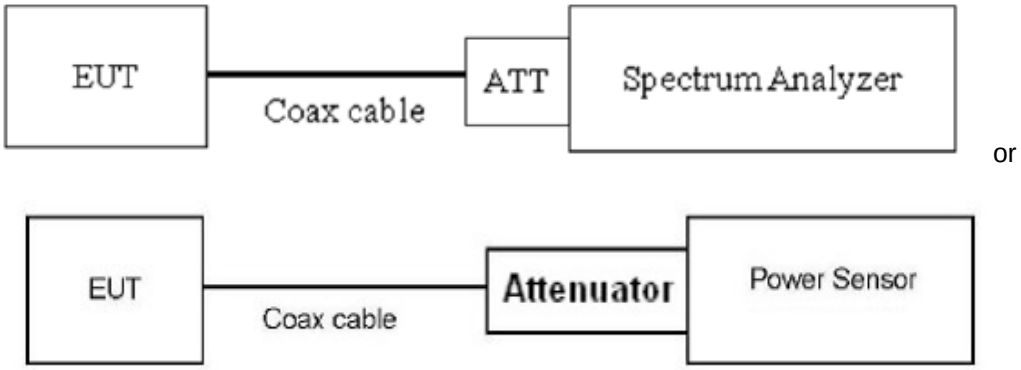
1GHz-18GHz(3m FAC)



Above 18GHz (3m FAC)



3) RF Conducted Test



or

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*Log (test distance /

specification distance).

2. Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, gound-parallel)

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.

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≥98%), or ≥1/T(for duty cycle<98%). T is minimum transmission duration. (Note: a high VBW (for example 5kHz, 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 7.0dB (including 6.0 dB Attenuator and 1.0 dB 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 1.0dB 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 11.9.1.2 PKPM1 Peak power meter method or ANSI C63.10-2013 Section 11.9.2.3.2 Method AVGPM-G
Power Spectral Density	ANSI C63.10-2013 Section 11.10.2 Method PKPSD (peak PSD)
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
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
N/A	Coaxial Cable	NO.9	N/A	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.13	N/A	2024/6/4	2025/6/3
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	FSV40	101419	2024/6/4	2025/6/3
ANRITSU	USB Power Sensor	MA24418A	12620	2024/6/4	2025/6/3
MEEA	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

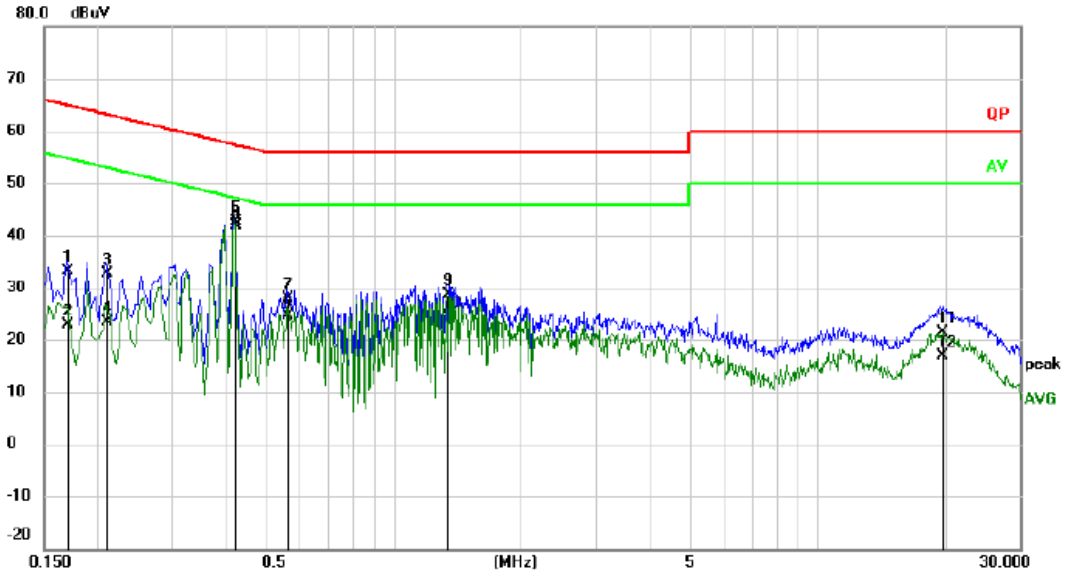
Test items	Limit
AC Line Conducted Emissions	See details §15.207 (a)
Conducted Output Power	For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.
6dB Emission Bandwidth	The minimum 6 dB bandwidth shall be at least 500 kHz.
Power Spectral Density	For 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:	2024-10-22	Test By:	Lirou Li
Environment condition:	Temperature: 24.1°C; Relative Humidity:56%; ATM Pressure: 100.5kPa		

Conducted Emission Measurement

File :2405Y58028E Data :#6 Date: 2024/10/22 Time: 10:00:26



Limit: QP
Mode:transmitting
Note: 802.11g L Channel

Phase: L1
Power: AC 120V/60Hz

Temperature: 24.1 ℃
Humidity: 56 %
Air Pressure: 1005 hpa

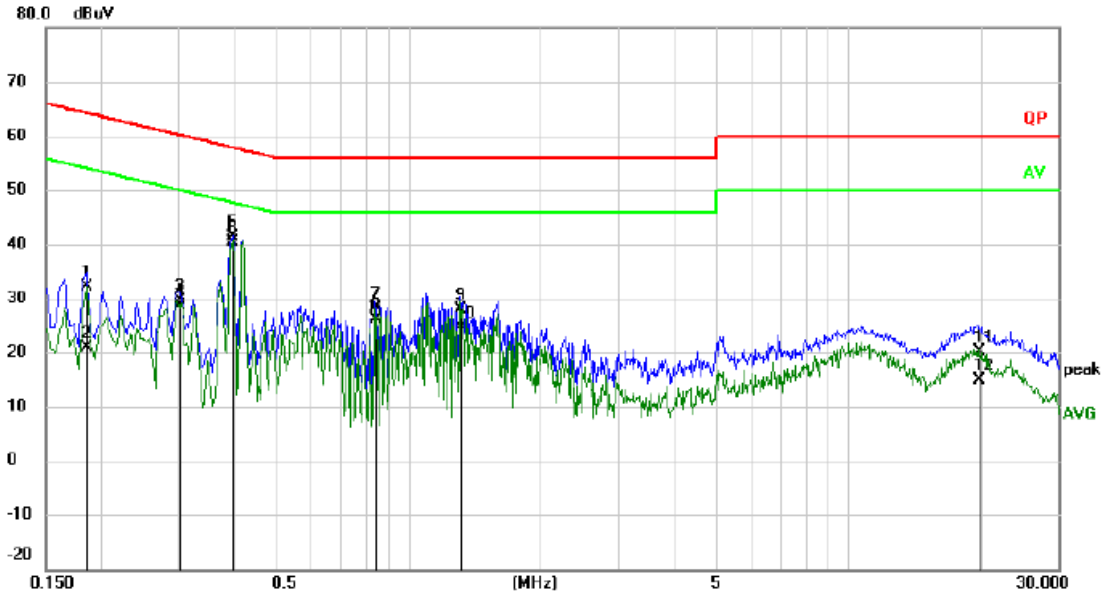
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1700	22.54	10.55	33.09	64.96	-31.87	QP	
2		0.1700	12.32	10.55	22.87	54.96	-32.09	AVG	
3		0.2100	22.12	10.61	32.73	63.21	-30.48	QP	
4		0.2100	12.74	10.61	23.35	53.21	-29.86	AVG	
5		0.4220	32.10	10.64	42.74	57.41	-14.67	QP	
6	*	0.4220	31.28	10.64	41.92	47.41	-5.49	AVG	
7		0.5620	17.27	10.60	27.87	56.00	-28.13	QP	
8		0.5620	13.97	10.60	24.57	46.00	-21.43	AVG	
9		1.3380	17.68	10.90	28.58	56.00	-27.42	QP	
10		1.3380	13.46	10.90	24.36	46.00	-21.64	AVG	
11		19.6620	10.29	11.19	21.48	60.00	-38.52	QP	
12		19.6620	5.80	11.19	16.99	50.00	-33.01	AVG	

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

Engineer Signature: Lirou

Conducted Emission Measurement

File :2405Y58028E Data :#5 Date: 2024/10/22 Time: 9:56:04



Limit: QP
Mode:transmitting
Note: 802.11g L Channel

Phase: N
Power: AC 120V/60Hz

Temperature: 24.1 ℃
Humidity: 56 %
Air Pressure: 1005 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1860	21.76	10.41	32.17	64.21	-32.04	QP	
2		0.1860	10.58	10.41	20.99	54.21	-33.22	AVG	
3		0.3020	19.06	10.54	29.60	60.19	-30.59	QP	
4		0.3020	18.00	10.54	28.54	50.19	-21.65	AVG	
5		0.3980	30.73	10.65	41.38	57.90	-16.52	QP	
6	*	0.3980	29.74	10.65	40.39	47.90	-7.51	AVG	
7		0.8420	17.59	10.48	28.07	56.00	-27.93	QP	
8		0.8420	15.58	10.48	26.06	46.00	-19.94	AVG	
9		1.3140	17.70	10.30	28.00	56.00	-28.00	QP	
10		1.3140	14.26	10.30	24.56	46.00	-21.44	AVG	
11		19.7900	8.77	11.31	20.08	60.00	-39.92	QP	
12		19.7900	3.68	11.31	14.99	50.00	-35.01	AVG	

*:Maximum data x:Over limit !:over margin Engineer Signature: Lirou

Remark:

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

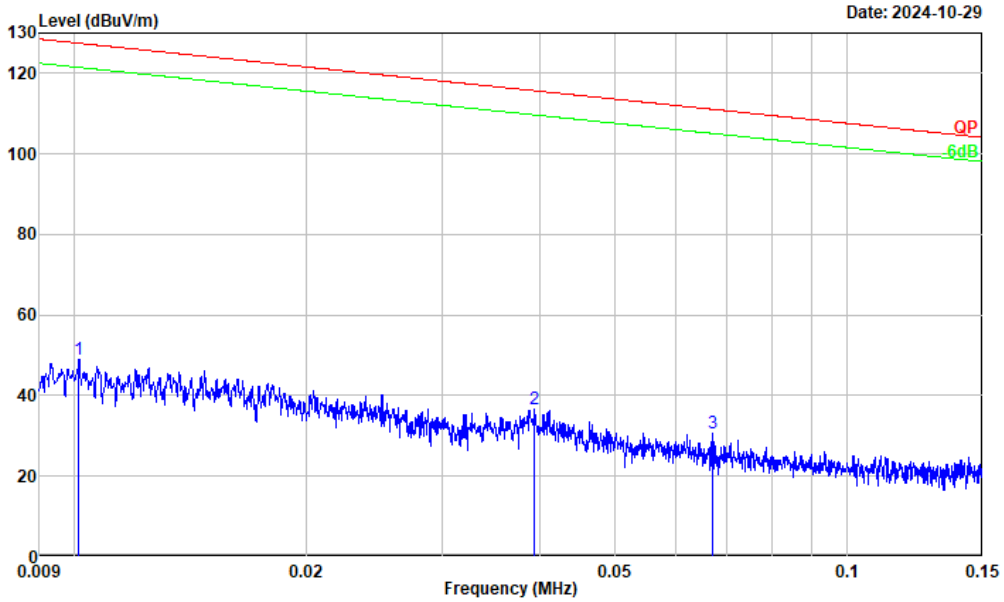
Correct Factor (dB)= LISN Voltage Division Factor (dB)+ Cable loss(dB)

Over Limit = Measurement – Limit

3.4 Radiated emission Test Data

9 kHz-30MHz:

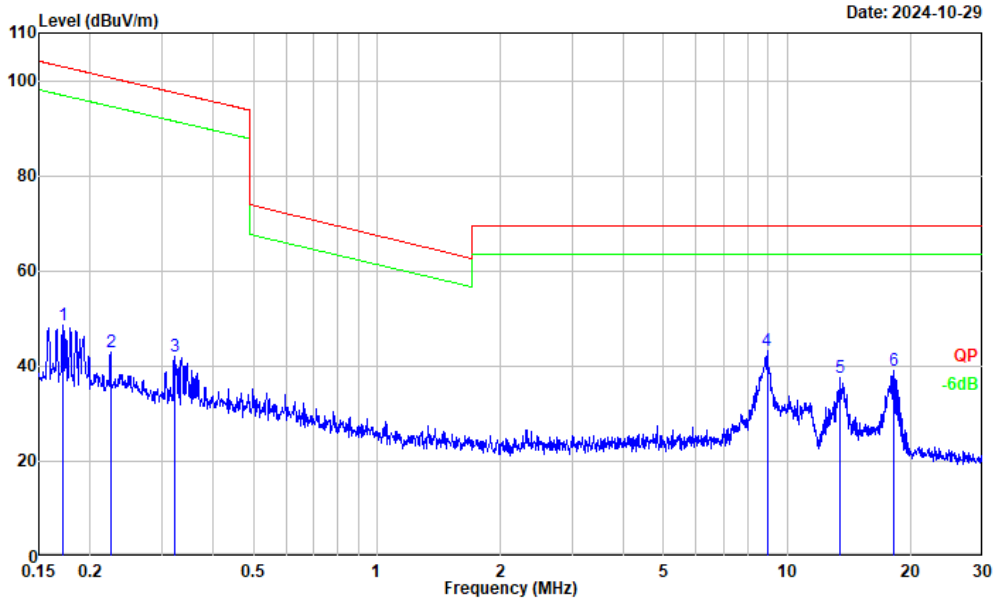
Test Date:	2024-10-29	**Test By:**	Bard Huang
Environment condition:	Temperature: 23.7°C; Relative Humidity:54%; ATM Pressure: 100.6kPa		



Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.7℃/54%R.H./100.6kPa
Tested by : Bard Huang
Polarization : PARALLEL
Remark : 802.11g Low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	0.010	11.78	37.12	48.90	127.48	-78.58	Peak
2	0.039	14.16	22.57	36.73	115.68	-78.95	Peak
3	0.067	12.67	18.05	30.72	111.09	-80.37	Peak

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



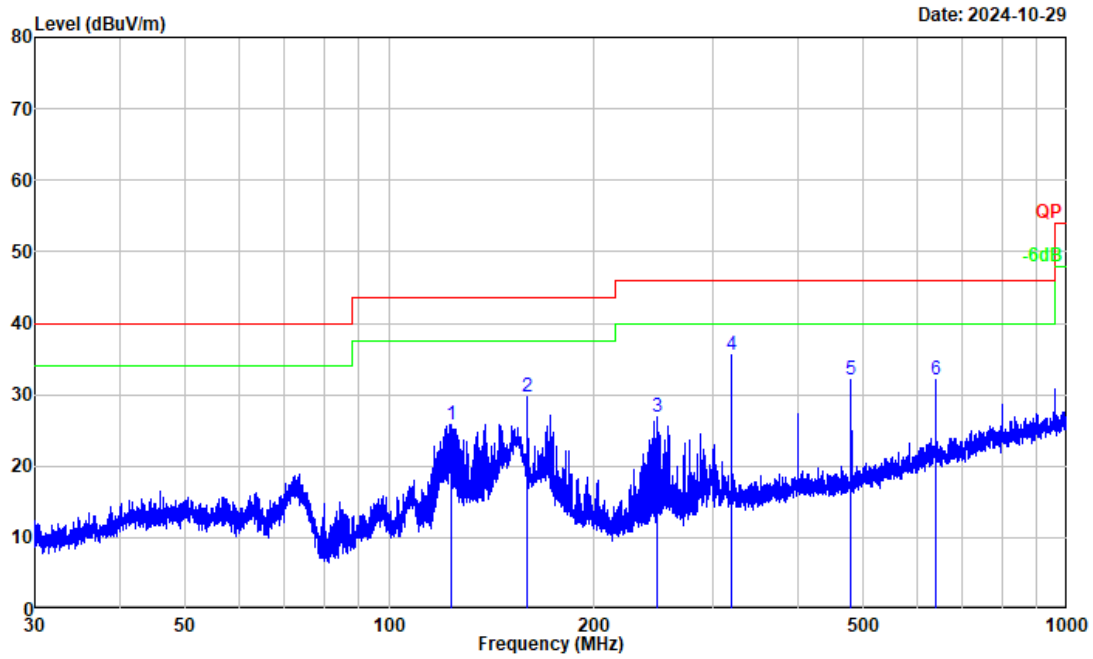
Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.7℃/54%R.H./100.6kPa
Tested by : Bard Huang
Polarization : PARALLEL
Remark : 802.11g Low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	0.172	35.77	12.93	48.70	102.91	-54.21	Peak
2	0.224	31.48	11.45	42.93	100.58	-57.65	Peak
3	0.322	33.08	8.92	42.00	97.45	-55.45	Peak
4	8.935	46.88	-3.74	43.14	69.54	-26.40	Peak
5	13.474	41.24	-3.58	37.66	69.54	-31.88	Peak
6	18.131	42.28	-3.22	39.06	69.54	-30.48	Peak

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

30MHz-1GHz:

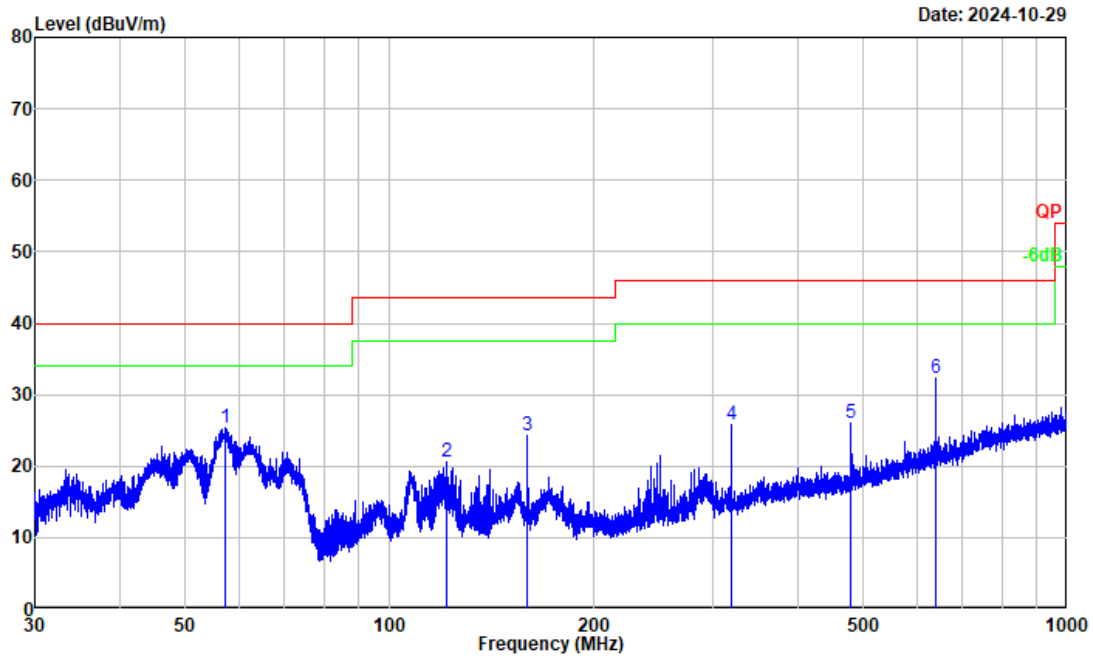
Test Date:	2024-10-29	Test By:	Bard Huang
Environment condition:	Temperature: 23.7°C; Relative Humidity:54%; ATM Pressure: 100.6kPa		



Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.7℃/54%R.H./100.6kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11g low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	123.644	42.40	-16.55	25.85	43.50	-17.65	Peak
2	159.995	46.50	-16.88	29.62	43.50	-13.88	Peak
3	248.552	39.45	-12.50	26.95	46.00	-19.05	Peak
4	320.077	46.48	-10.94	35.54	46.00	-10.46	Peak
5	480.107	40.06	-7.94	32.12	46.00	-13.88	Peak
6	640.050	36.66	-4.66	32.00	46.00	-14.00	Peak

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



Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.7℃/54%R.H./100.6kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11g low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	57.242	38.62	-13.15	25.47	40.00	-14.53	Peak
2	121.283	36.59	-16.09	20.50	43.50	-23.00	Peak
3	159.995	41.08	-16.88	24.20	43.50	-19.30	Peak
4	319.937	36.75	-10.94	25.81	46.00	-20.19	Peak
5	480.107	33.90	-7.94	25.96	46.00	-20.04	Peak
6	640.050	36.99	-4.66	32.33	46.00	-13.67	Peak

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

Above 1GHz:

Test Date:	2024-10-22~2024-10-31	**Test By:**	Bard Huang
Environment condition:	Temperature: 22.8~24.3°C; Relative Humidity:49~59%; ATM Pressure: 99.7~100.7kPa		

Frequency (MHz)	Reading level (dBμV)	Polar	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
802.11b							
Low Channel							
4824.000	49.95	horizontal	-2.75	47.20	54.00	-6.80	Average
4824.000	57.74	horizontal	-2.75	54.99	74.00	-19.01	Peak
4824.000	52.14	vertical	-2.75	49.39	54.00	-4.61	Average
4824.000	59.88	vertical	-2.75	57.13	74.00	-16.87	Peak
Middle Channel							
4874.000	50.22	horizontal	-2.39	47.83	54.00	-6.17	Average
4874.000	57.95	horizontal	-2.39	55.56	74.00	-18.44	Peak
4874.000	55.76	vertical	-2.39	53.37	74.00	-20.63	Peak
High Channel							
4924.000	53.15	horizontal	-2.17	50.98	54.00	-3.02	Average
4924.000	59.80	horizontal	-2.17	57.63	74.00	-16.37	Peak
4924.000	51.84	vertical	-2.17	49.67	54.00	-4.33	Average
4924.000	58.89	vertical	-2.17	56.72	74.00	-17.28	Peak
802.11g							
Low Channel							
4824.000	52.44	horizontal	-2.75	49.69	74.00	-24.31	Peak
4824.000	52.30	vertical	-2.75	49.55	74.00	-24.45	Peak
Middle Channel							
4874.000	52.33	horizontal	-2.39	49.94	74.00	-24.06	Peak
4874.000	51.68	vertical	-2.39	49.29	74.00	-24.71	Peak
High Channel							
4924.000	55.61	horizontal	-2.17	53.44	74.00	-20.56	Peak
4924.000	53.19	vertical	-2.17	51.02	74.00	-22.98	Peak
802.11n20							
Low Channel							
4824.000	51.44	horizontal	-2.75	48.69	74.00	-25.31	Peak
4824.000	52.45	vertical	-2.75	49.70	74.00	-24.30	Peak
Middle Channel							
4874.000	52.96	horizontal	-2.39	50.57	74.00	-23.43	Peak

4874.000	51.73	vertical	-2.39	49.34	74.00	-24.66	Peak
High Channel							
4924.000	41.80	horizontal	-2.17	39.63	54.00	-14.37	Average
4924.000	56.19	horizontal	-2.17	54.02	74.00	-19.98	Peak
4924.000	53.11	vertical	-2.17	50.94	74.00	-23.06	Peak
802.11n40							
Low Channel							
4844.000	49.02	horizontal	-2.63	46.39	74.00	-27.61	Peak
4844.000	49.55	vertical	-2.63	46.92	74.00	-27.08	Peak
Middle Channel							
4874.000	48.72	horizontal	-2.39	46.33	74.00	-27.67	Peak
4874.000	48.89	vertical	-2.39	46.50	74.00	-27.50	Peak
High Channel							
4904.000	50.22	horizontal	-2.18	48.04	74.00	-25.96	Peak
4904.000	49.82	vertical	-2.18	47.64	74.00	-26.36	Peak

Remark:

Corrected Amplitude= Reading level + corrected Factor

Corrected Factor = Antenna factor + Cable loss – Amplifier gain

Margin = Corrected Amplitude – Limit

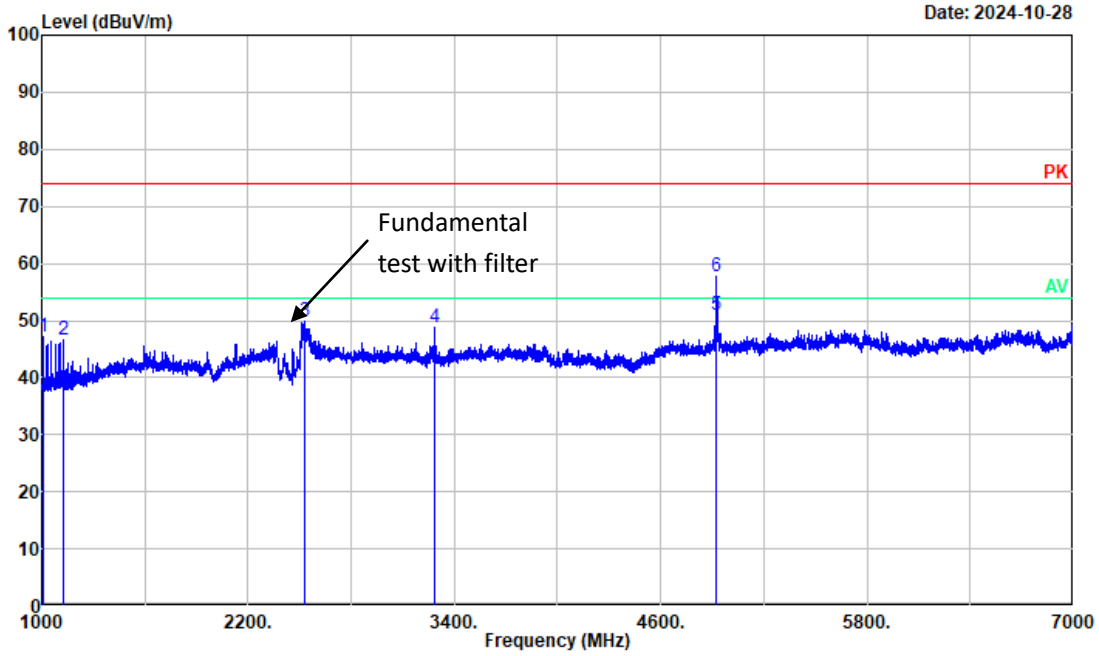
For the test result of Peak below the Peak limit more than 20dB, which can compliance with the average limit, just the Peak level was recorded.

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:

Mode:	802.11b	Channel:	2462MHz

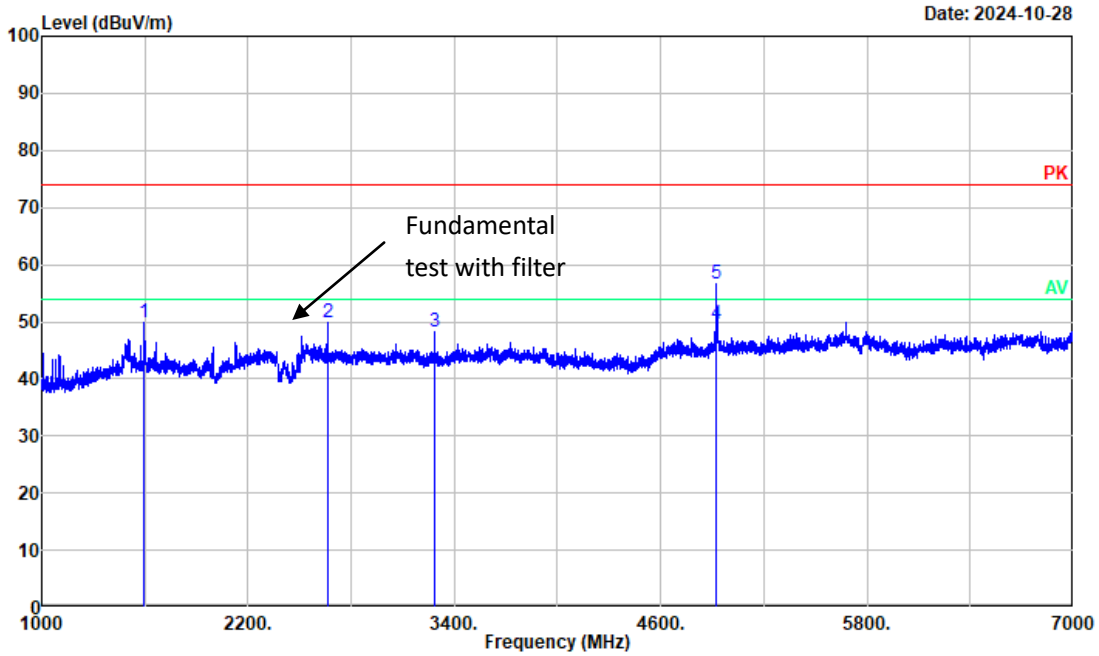


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11b high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	1008.000	55.39	-8.18	47.21	74.00	-26.79	Peak
2	1128.000	54.43	-7.75	46.68	74.00	-27.32	Peak
3	2527.000	52.77	-2.91	49.86	74.00	-24.14	Peak
4	3283.000	51.62	-2.97	48.65	74.00	-25.35	Peak
5	4924.000	53.15	-2.17	50.98	54.00	-3.02	Average
6	4924.000	59.80	-2.17	57.63	74.00	-16.37	Peak

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

Mode:	802.11b	Channel:	2462MHz

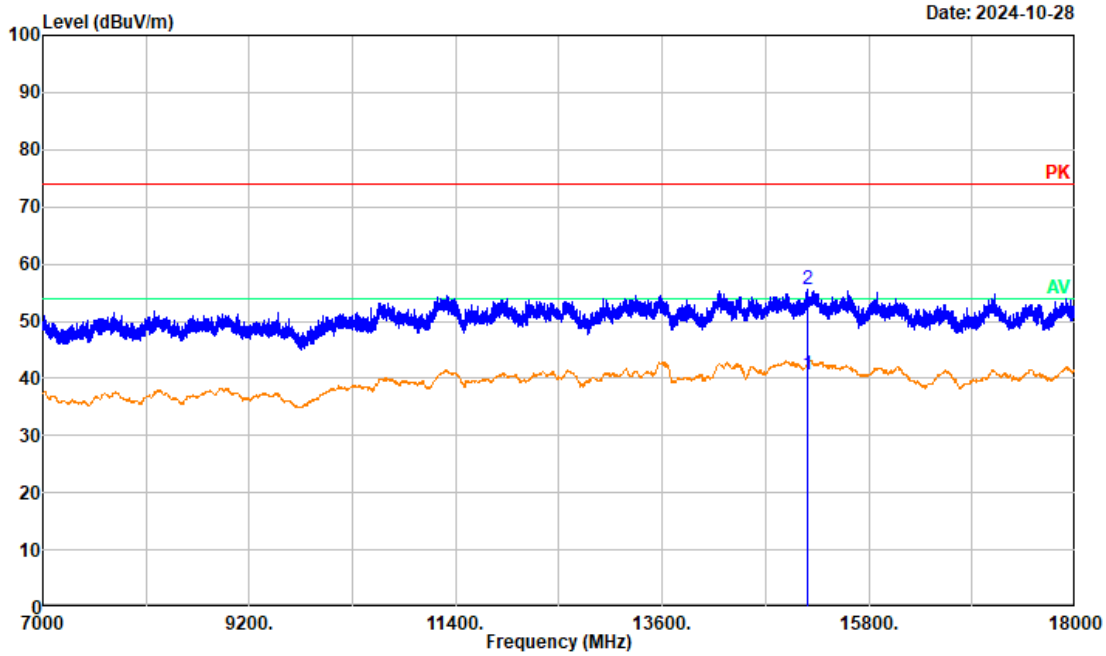


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11b high channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	1596.000	54.25	-4.48	49.77	74.00	-24.23	Peak
2	2662.000	52.52	-2.70	49.82	74.00	-24.18	Peak
3	3283.000	51.24	-2.97	48.27	74.00	-25.73	Peak
4	4924.000	51.84	-2.17	49.67	54.00	-4.33	Average
5	4924.000	58.89	-2.17	56.72	74.00	-17.28	Peak

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

Mode:	802.11b	Channel:	2462MHz

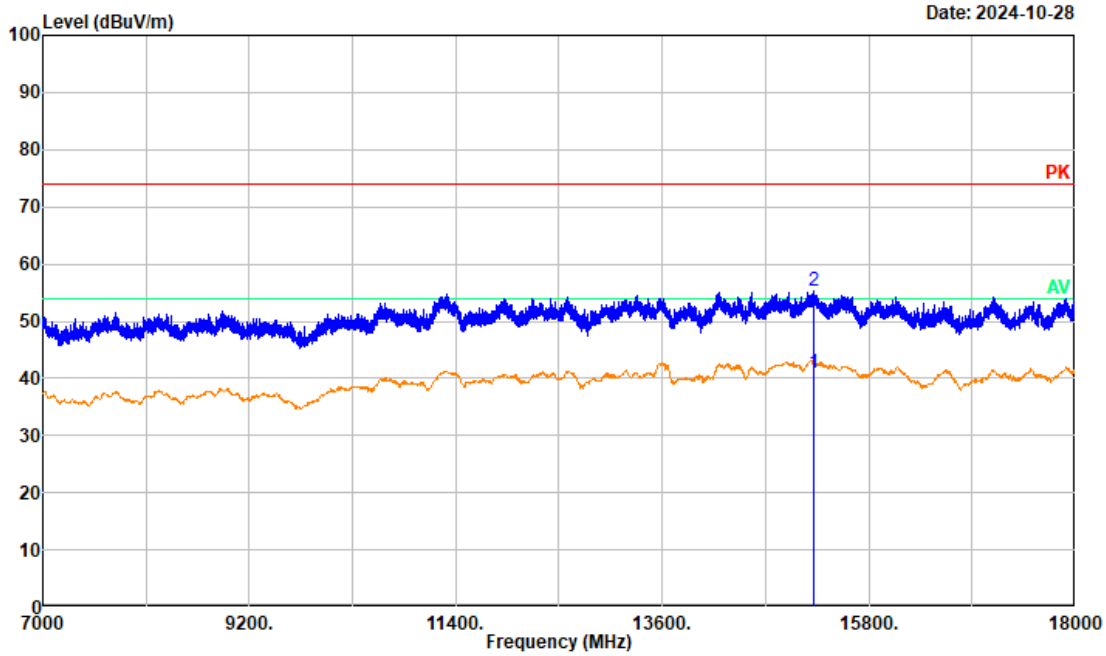


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11b high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	15146.000	35.35	5.20	40.55	54.00	-13.45	Average
2	15146.000	50.48	5.20	55.68	74.00	-18.32	Peak

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

Mode:	802.11b	Channel:	2462MHz

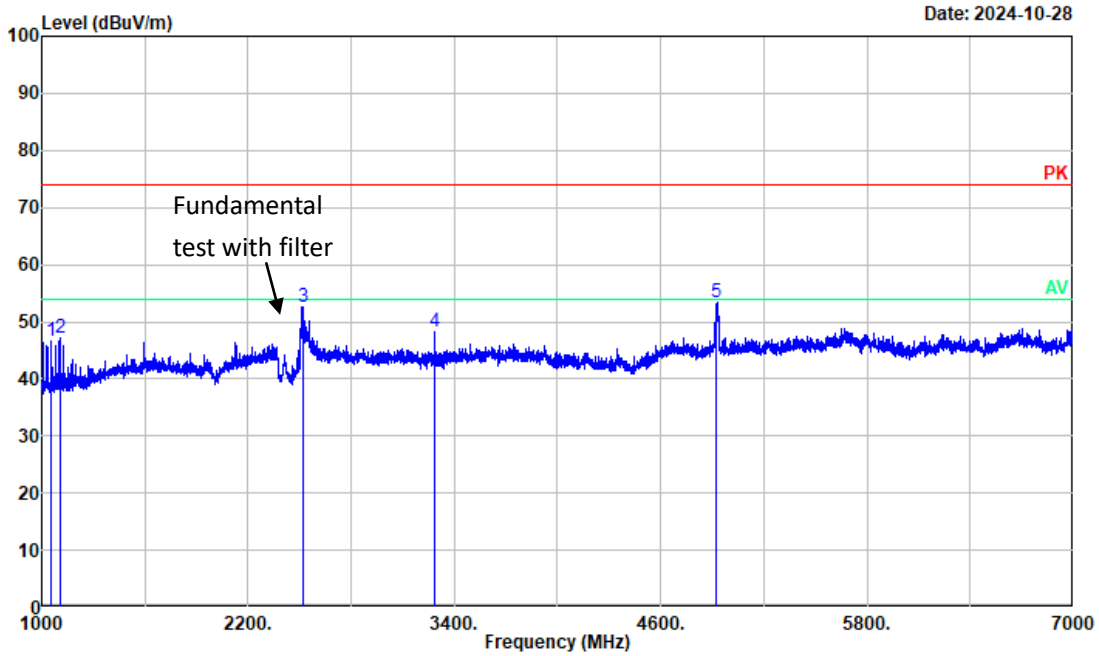


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11b high channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	15207.000	35.69	5.27	40.96	54.00	-13.04	Average
2	15207.000	50.01	5.27	55.28	74.00	-18.72	Peak

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

Mode:	802.11g	Channel:	2462MHz

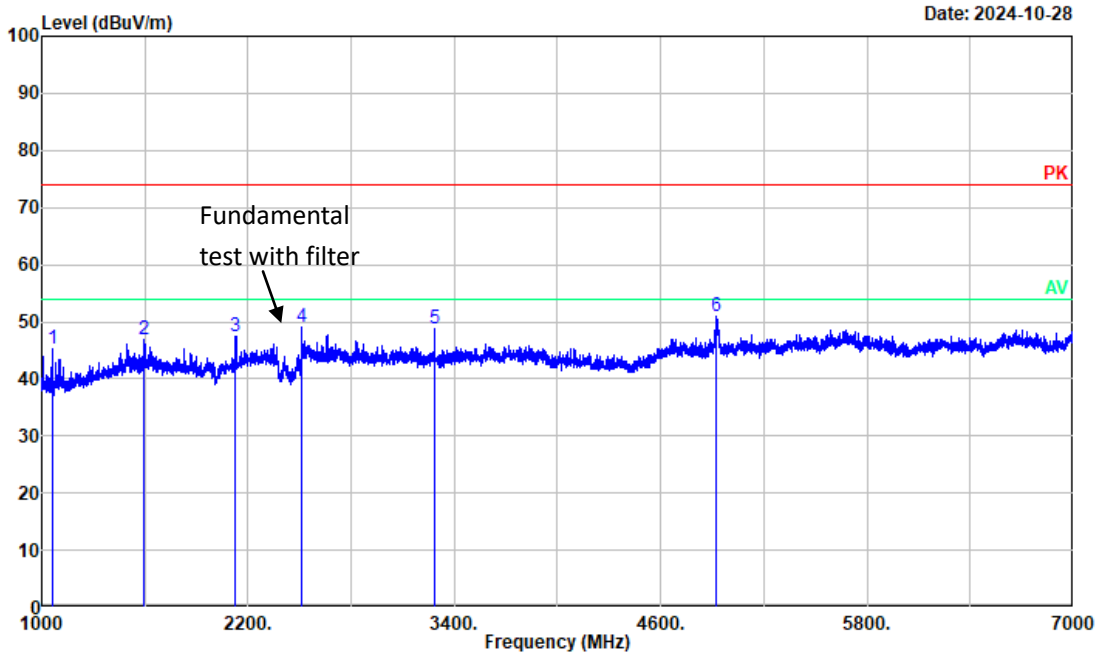


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11g high channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	1056.000	54.74	-8.04	46.70	74.00	-27.30	Peak
2	1104.000	54.94	-7.87	47.07	74.00	-26.93	Peak
3	2518.000	55.48	-2.91	52.57	74.00	-21.43	Peak
4	3282.000	51.30	-2.97	48.33	74.00	-25.67	Peak
5	4924.000	55.61	-2.17	53.44	74.00	-20.56	Peak

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

Mode:	802.11g	Channel:	2462MHz

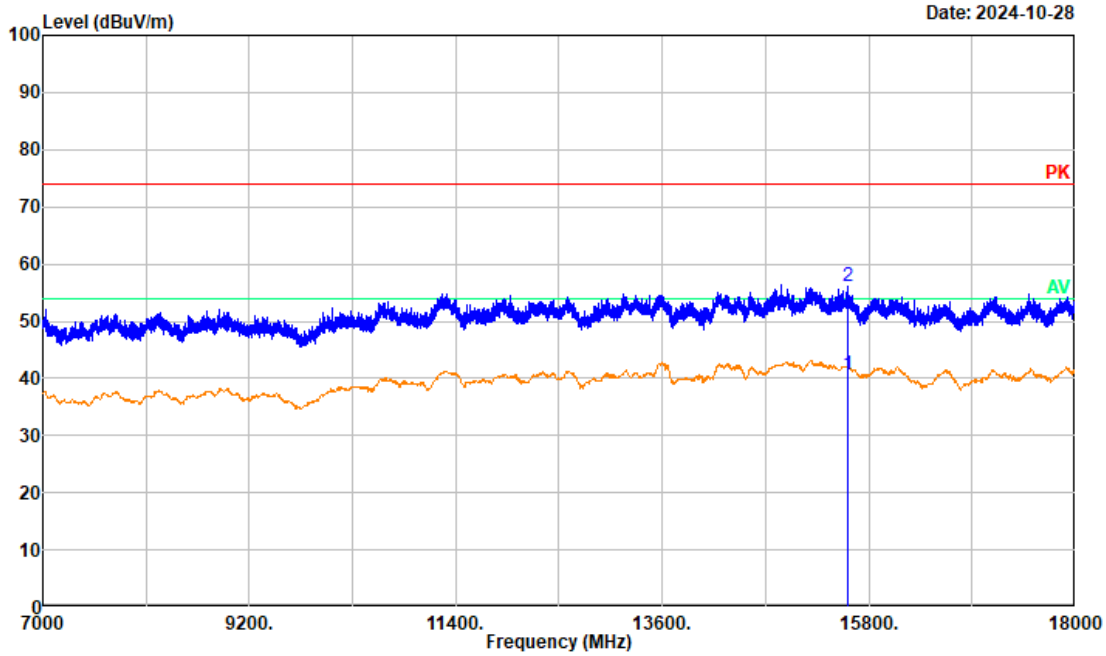


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11g high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	1062.000	53.33	-8.02	45.31	74.00	-28.69	Peak
2	1593.000	51.30	-4.51	46.79	74.00	-27.21	Peak
3	2127.000	51.72	-4.24	47.48	74.00	-26.52	Peak
4	2512.000	52.07	-2.92	49.15	74.00	-24.85	Peak
5	3283.000	51.78	-2.97	48.81	74.00	-25.19	Peak
6	4924.000	53.19	-2.17	51.02	74.00	-22.98	Peak

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

Mode:	802.11g	Channel:	2462MHz

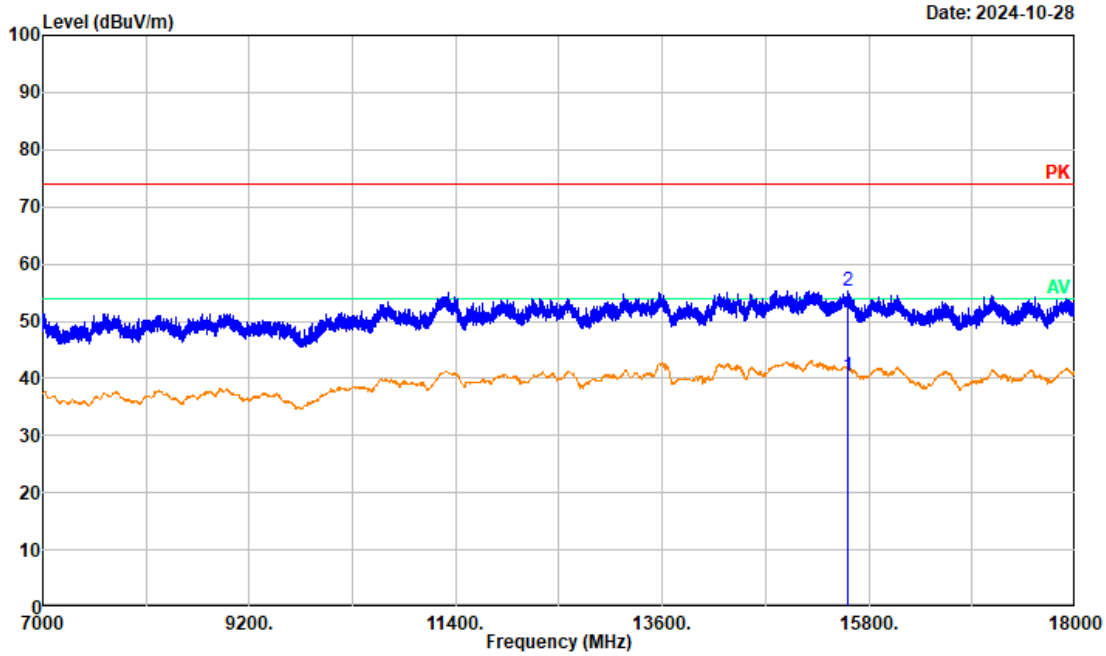


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11g high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	15572.000	35.62	5.07	40.69	54.00	-13.31	Average
2	15572.000	51.11	5.07	56.18	74.00	-17.82	Peak

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

Mode:	802.11g	Channel:	2462MHz

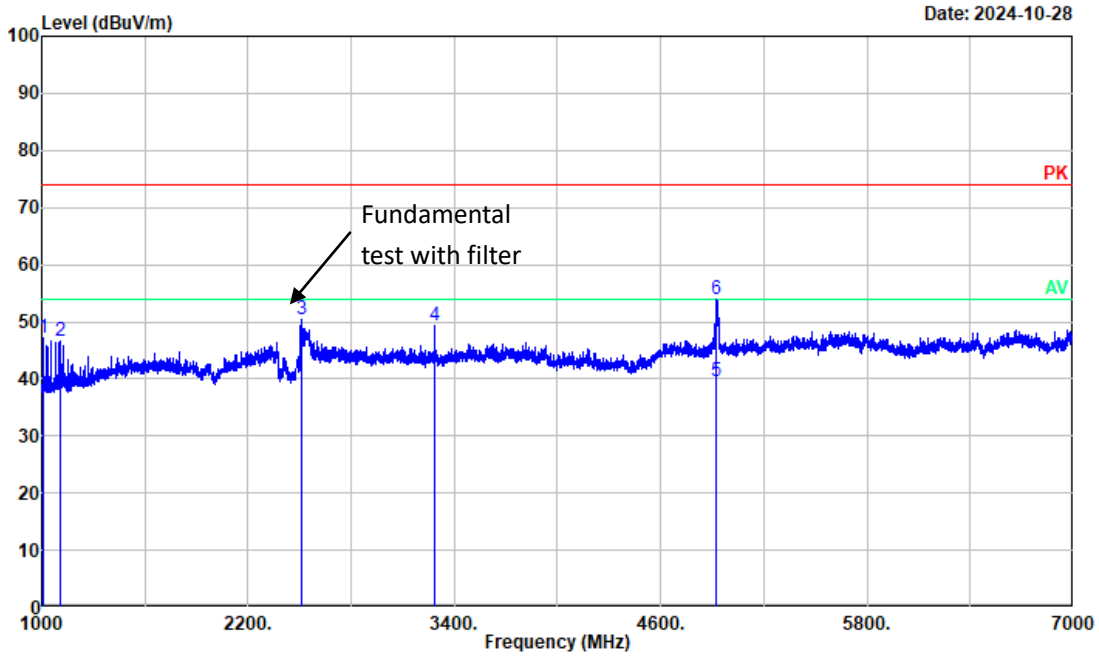


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11g high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	15572.000	35.18	5.07	40.25	54.00	-13.75	Average
2	15572.000	50.18	5.07	55.25	74.00	-18.75	Peak

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

Mode:	802.11n20	Channel:	2462MHz

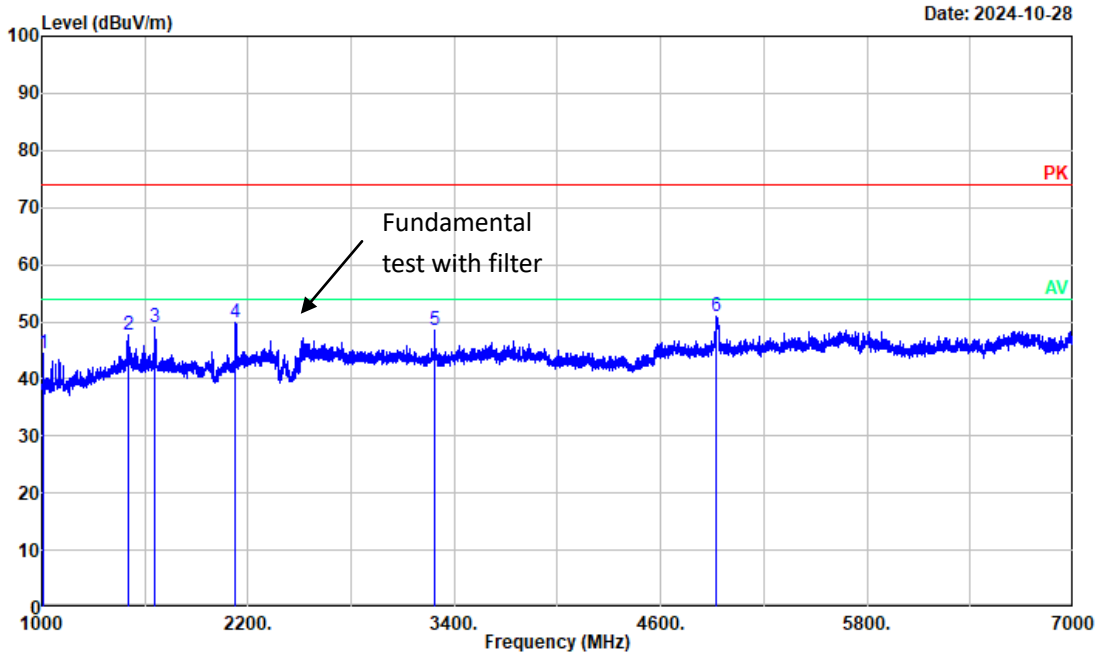


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	1008.000	55.24	-8.18	47.06	74.00	-26.94	Peak
2	1104.000	54.60	-7.87	46.73	74.00	-27.27	Peak
3	2510.000	53.37	-2.92	50.45	74.00	-23.55	Peak
4	3282.000	52.21	-2.97	49.24	74.00	-24.76	Peak
5	4924.000	41.80	-2.17	39.63	54.00	-14.37	Average
6	4924.000	56.19	-2.17	54.02	74.00	-19.98	Peak

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

Mode:	802.11n20	Channel:	2462MHz

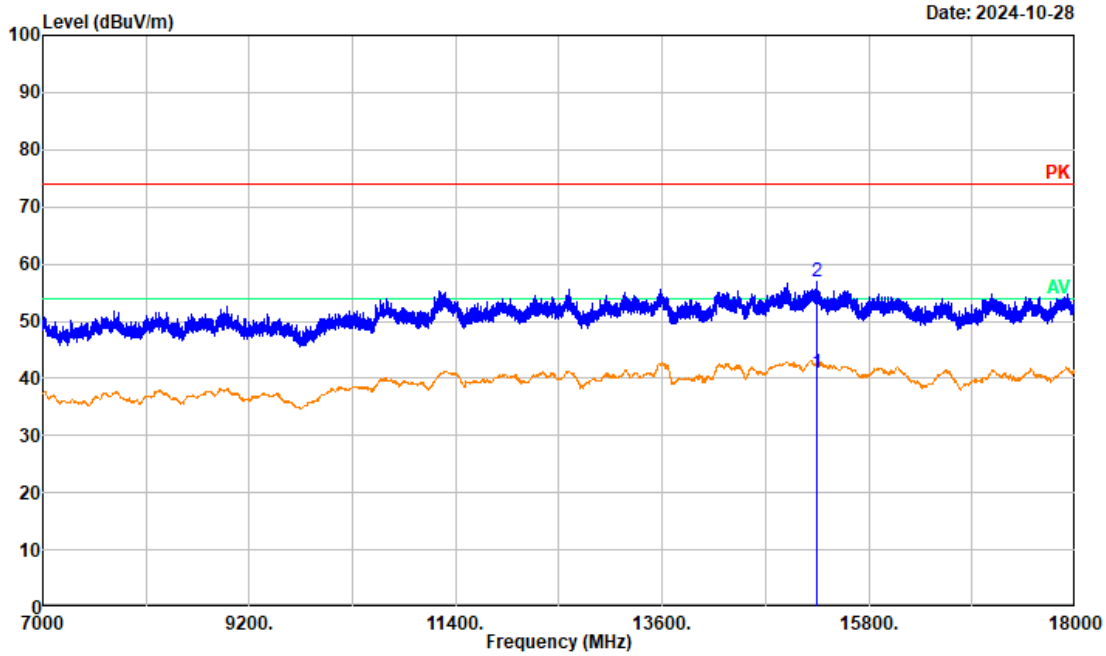


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n high channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	1007.000	52.51	-8.19	44.32	74.00	-29.68	Peak
2	1507.000	52.72	-5.07	47.65	74.00	-26.35	Peak
3	1660.000	53.03	-4.05	48.98	74.00	-25.02	Peak
4	2128.000	53.99	-4.24	49.75	74.00	-24.25	Peak
5	3283.000	51.56	-2.97	48.59	74.00	-25.41	Peak
6	4924.000	53.11	-2.17	50.94	74.00	-23.06	Peak

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

Mode:	802.11n20	Channel:	2462MHz

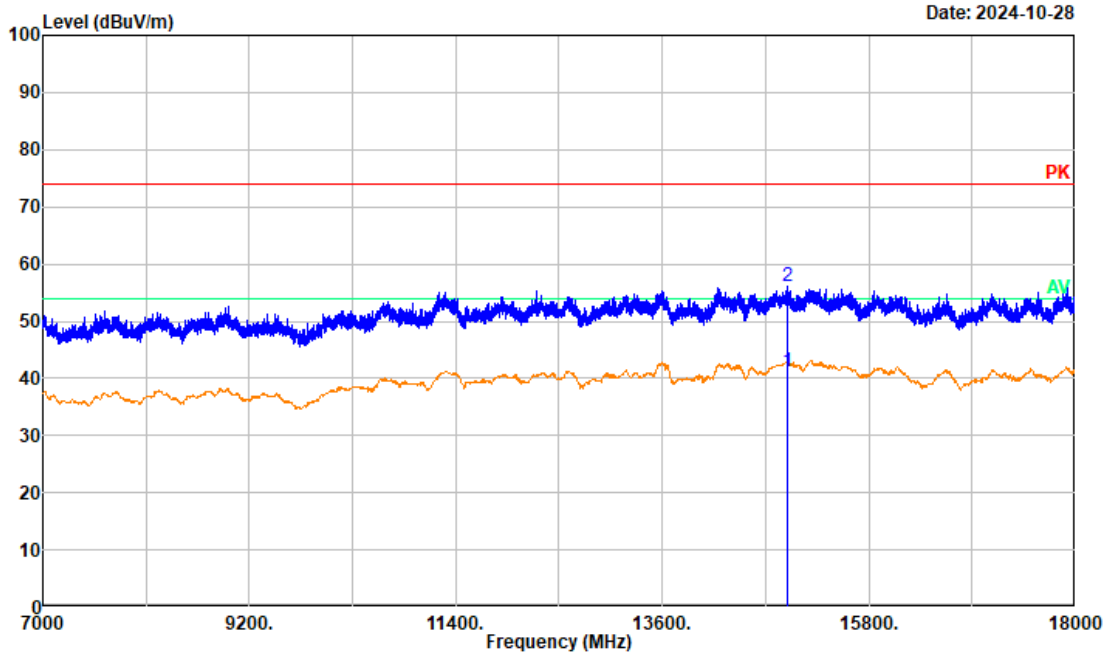


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	15246.000	35.77	5.22	40.99	54.00	-13.01	Average
2	15246.000	51.56	5.22	56.78	74.00	-17.22	Peak

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

Mode:	802.11n20	Channel:	2462MHz

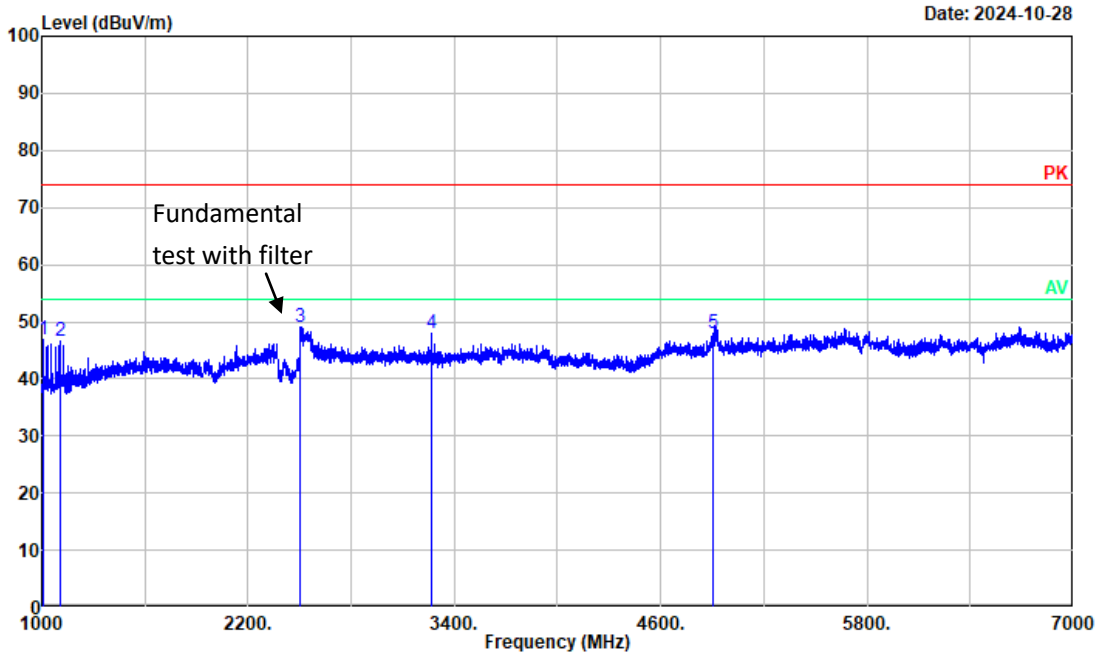


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	14936.000	35.73	5.58	41.31	54.00	-12.69	Average
2	14936.000	50.56	5.58	56.14	74.00	-17.86	Peak

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

Mode:	802.11n40	Channel:	2452MHz

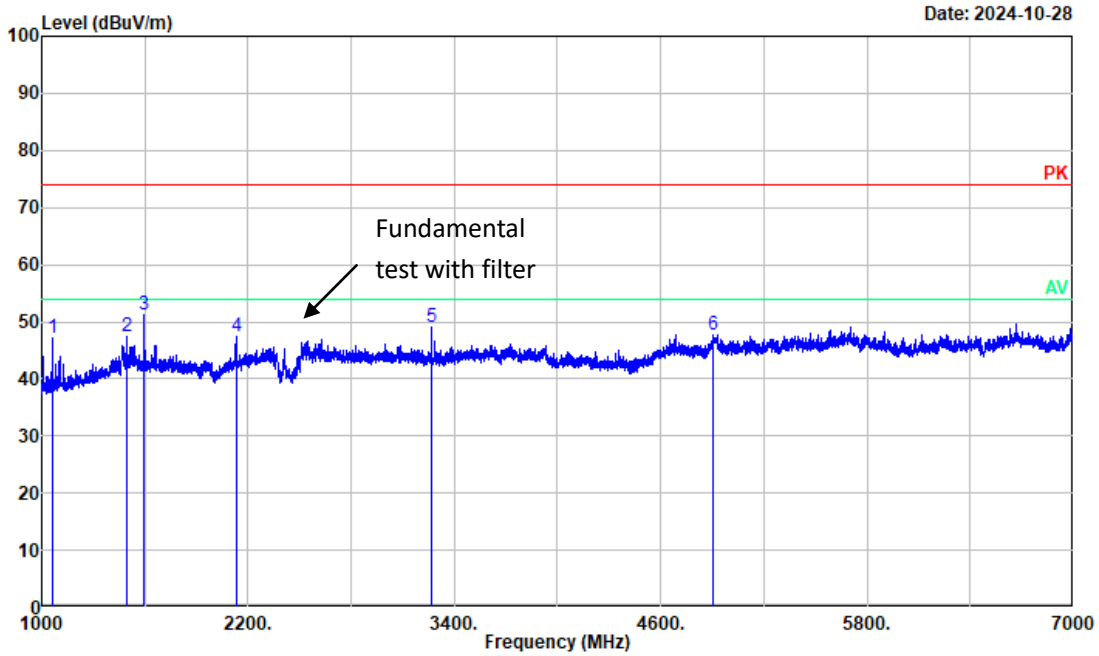


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n40 high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	1008.000	54.95	-8.18	46.77	74.00	-27.23	Peak
2	1104.000	54.59	-7.87	46.72	74.00	-27.28	Peak
3	2506.000	51.86	-2.92	48.94	74.00	-25.06	Peak
4	3270.000	50.98	-2.99	47.99	74.00	-26.01	Peak
5	4904.000	50.22	-2.18	48.04	74.00	-25.96	Peak

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

Mode:	802.11n40	Channel:	2452MHz

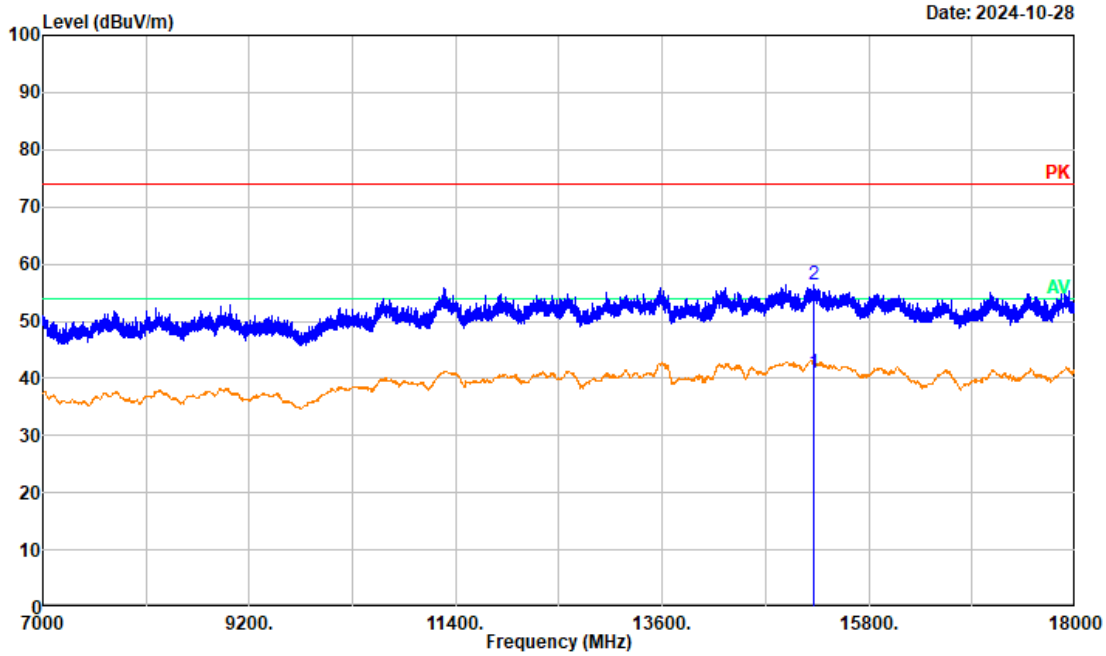


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n40 high channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	1063.000	55.23	-8.01	47.22	74.00	-26.78	Peak
2	1497.000	52.57	-5.11	47.46	74.00	-26.54	Peak
3	1593.000	55.71	-4.51	51.20	74.00	-22.80	Peak
4	2131.000	51.67	-4.23	47.44	74.00	-26.56	Peak
5	3269.000	52.14	-2.99	49.15	74.00	-24.85	Peak
6	4904.000	49.82	-2.18	47.64	74.00	-26.36	Peak

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

Mode:	802.11n40	Channel:	2452MHz

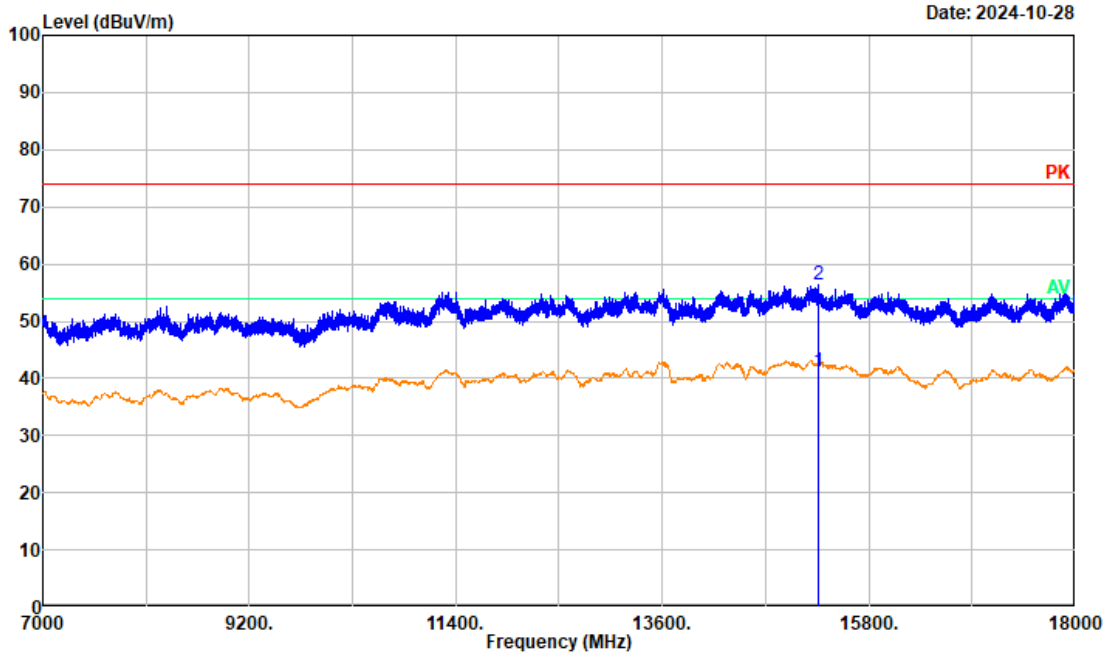


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n40 high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	15217.000	35.74	5.25	40.99	54.00	-13.01	Average
2	15217.000	51.16	5.25	56.41	74.00	-17.59	Peak

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

Mode:	802.11n40	Channel:	2452MHz



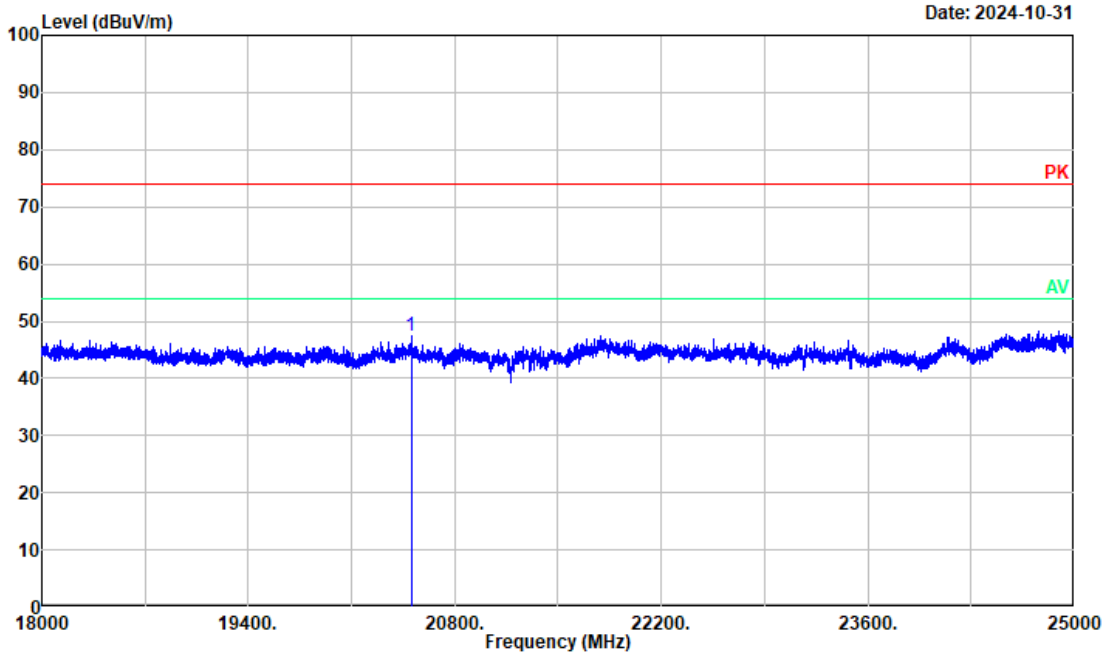
Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.3℃/52%R.H./100.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n40 high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	15261.000	35.93	5.19	41.12	54.00	-12.88	Average
2	15261.000	51.04	5.19	56.23	74.00	-17.77	Peak

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

18-25GHz: (test with maximum output power mode/channel)

Mode:	802.11g	**Channel:**	2412MHz

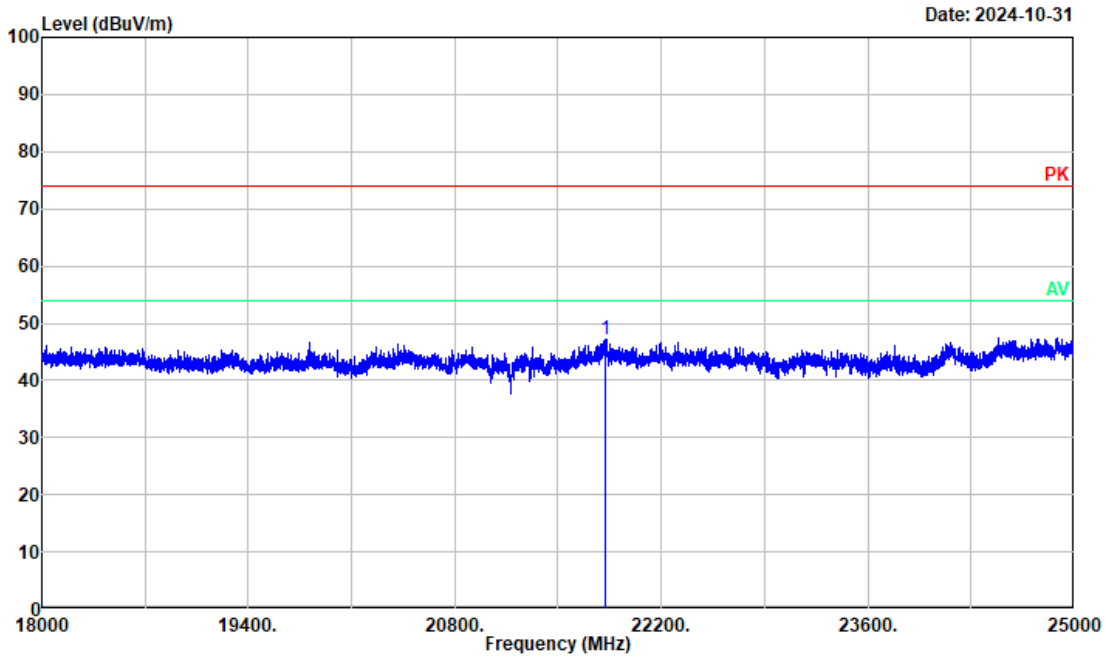


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.8℃/49%R.H./99.7kPa
Tested by : Bard Huang
Polarization : Horizontal
Remark : 802.11g low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	20503.360	55.06	-7.59	47.47	74.00	-26.53	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain - Distance extrapolate factor
Distance extrapolate factor = 20*log(specified distance/measured distance)
Specified distance = 3 meters, measured distance = 1.5 meters
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	802.11g	Channel:	2412MHz



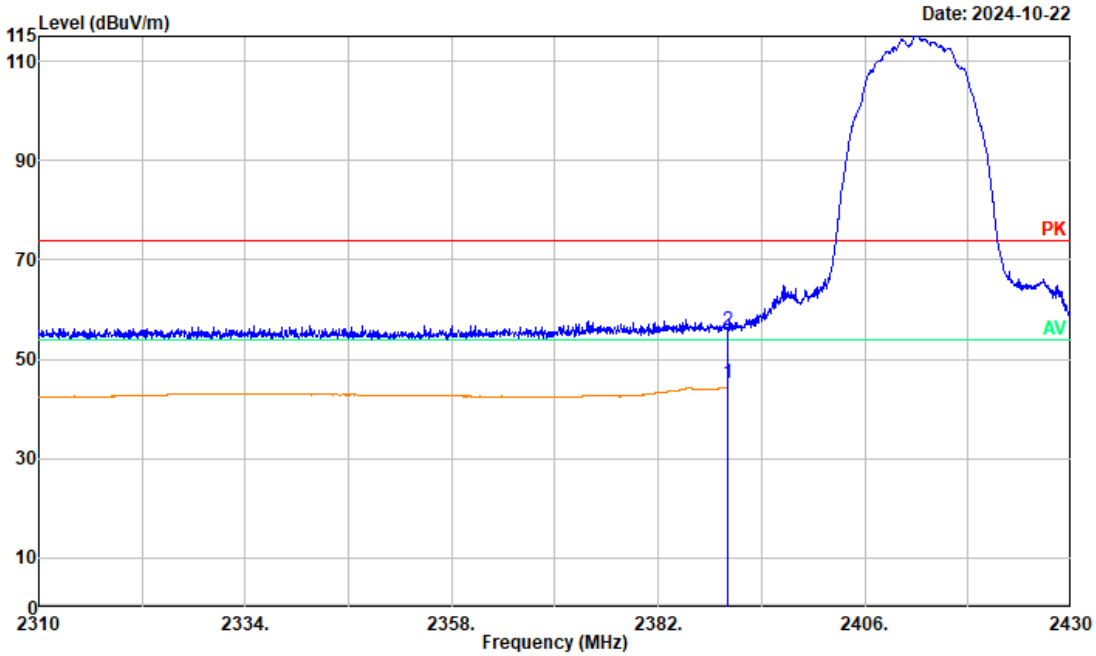
Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.8℃/49%R.H./99.7kPa
Tested by : Bard Huang
Polarization : Vertical
Remark : 802.11g low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	21815.540	54.12	-6.96	47.16	74.00	-26.84	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain - Distance extrapolate factor
Distance extrapolate factor = 20*log(specified distance/measured distance)
Specified distance = 3 meters, measured distance = 1.5 meters
Result = Reading + Factor
Over Limit = Result - Limit

Radiated band edge:

Mode:	802.11b	Channel:	2412MHz

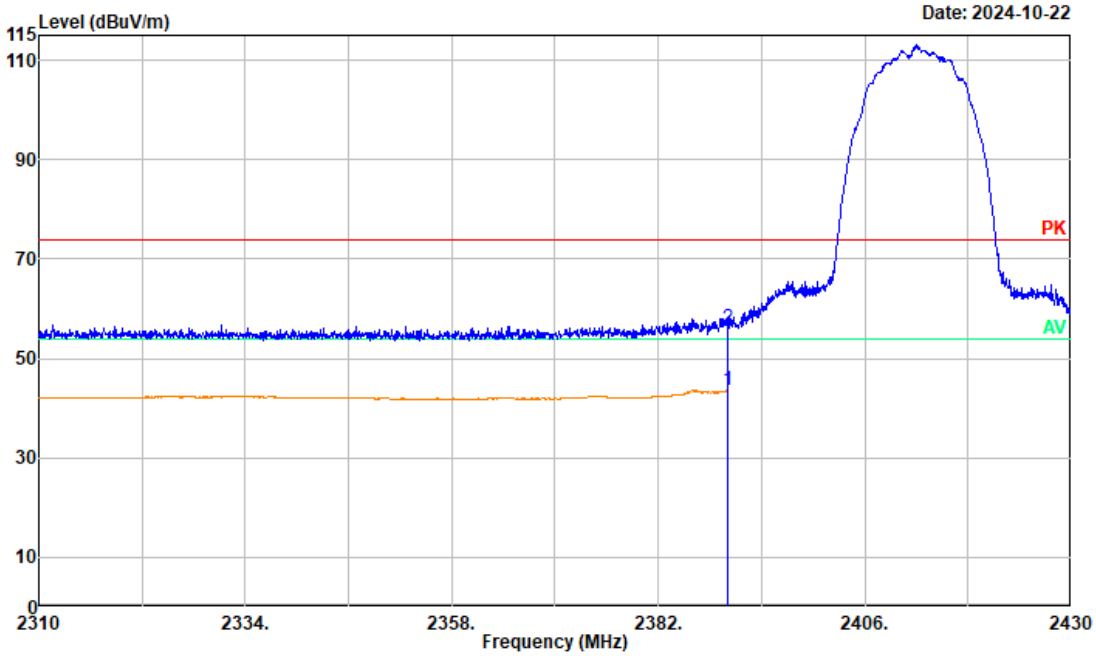


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11b low channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	2390.000	38.43	6.82	45.25	54.00	-8.75	Average
2	2390.000	49.07	6.82	55.89	74.00	-18.11	Peak

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

Mode:	802.11b	Channel:	2412MHz

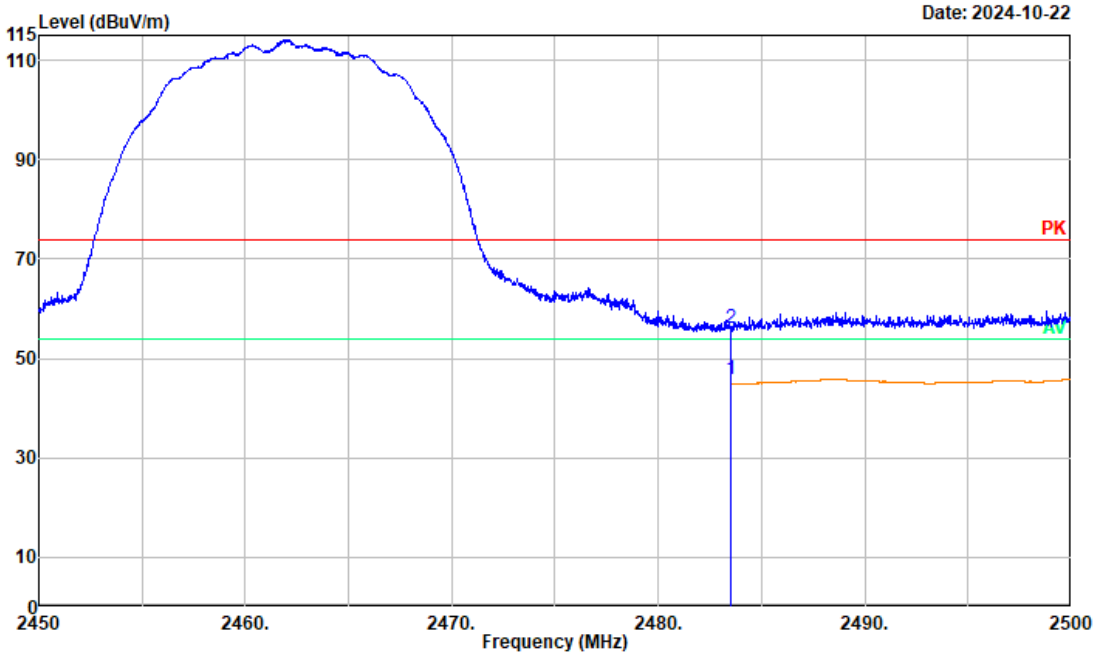


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11b low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2390.000	36.78	6.82	43.60	54.00	-10.40	Average
2	2390.000	49.30	6.82	56.12	74.00	-17.88	Peak

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

Mode:	802.11b	Channel:	2462MHz

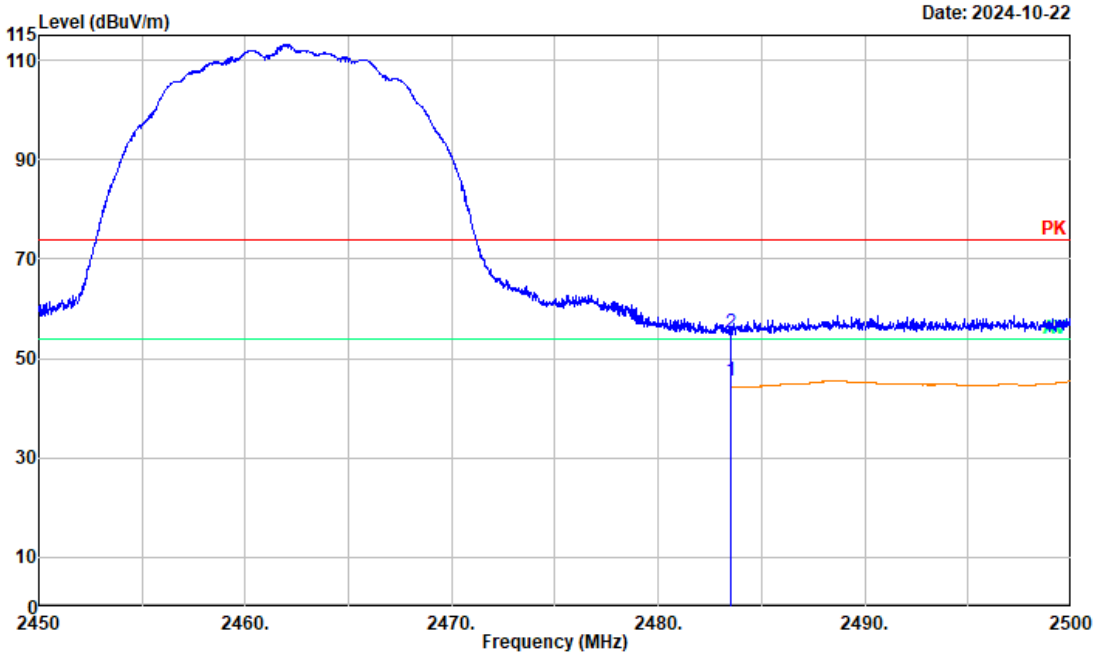


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11b high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2483.500	38.82	7.02	45.84	54.00	-8.16	Average
2	2483.500	48.96	7.02	55.98	74.00	-18.02	Peak

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

Mode:	802.11b	Channel:	2462MHz

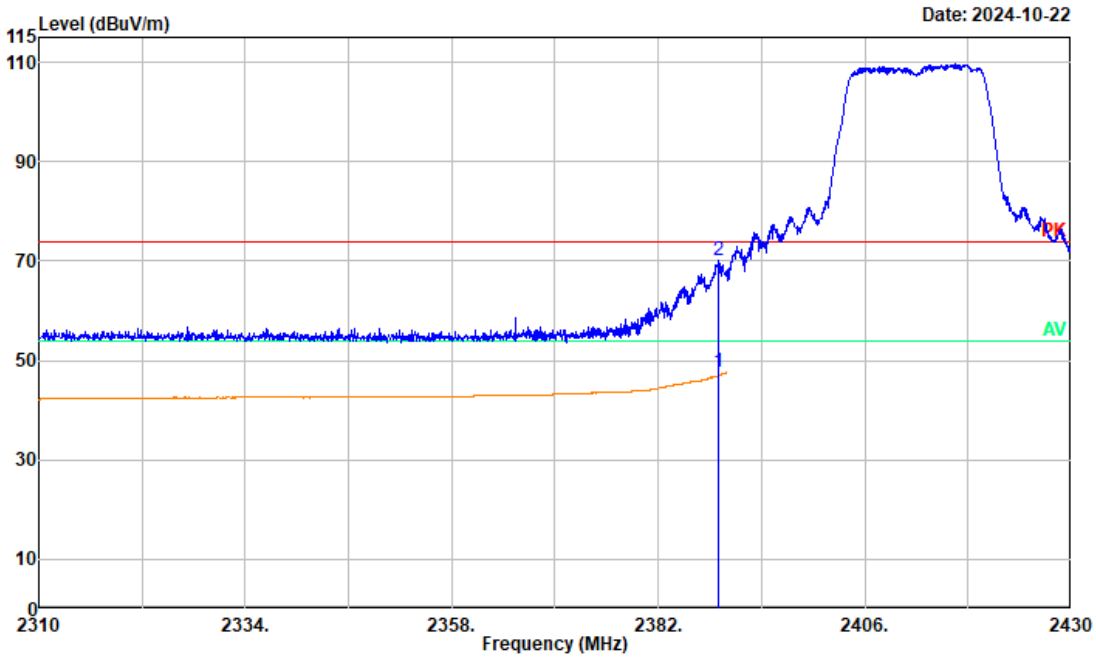


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11b high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2483.500	38.53	7.02	45.55	54.00	-8.45	Average
2	2483.500	48.15	7.02	55.17	74.00	-18.83	Peak

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

Mode:	802.11g	Channel:	2412MHz

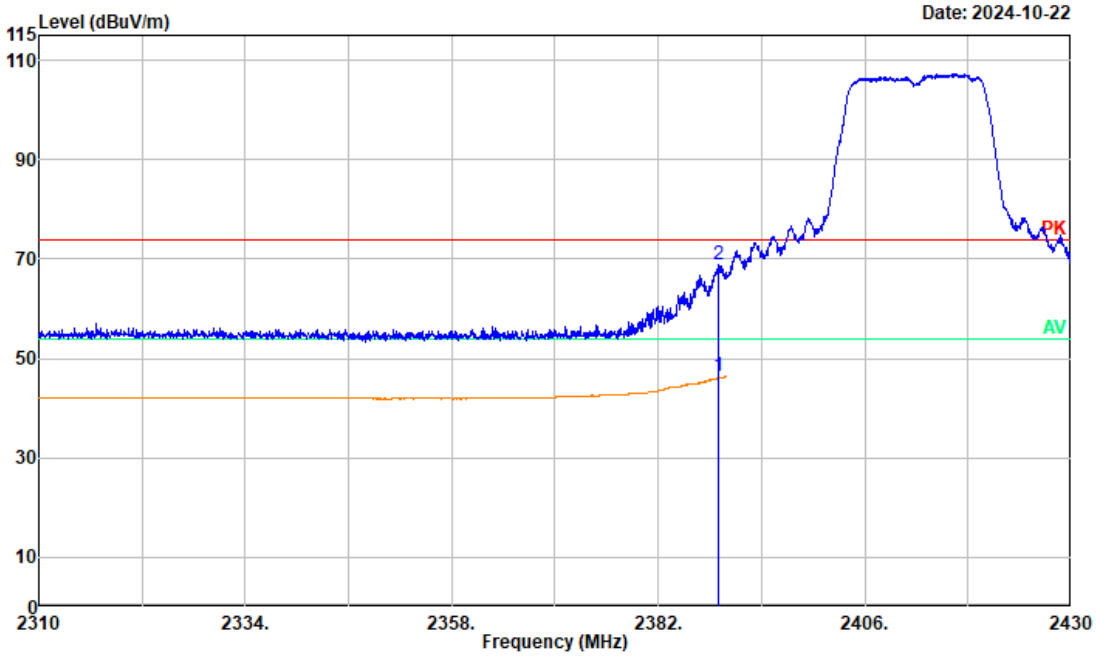


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11g low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2388.960	40.73	6.82	47.55	54.00	-6.45	Average
2	2388.960	63.45	6.82	70.27	74.00	-3.73	Peak

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

Mode:	802.11g	Channel:	2412MHz

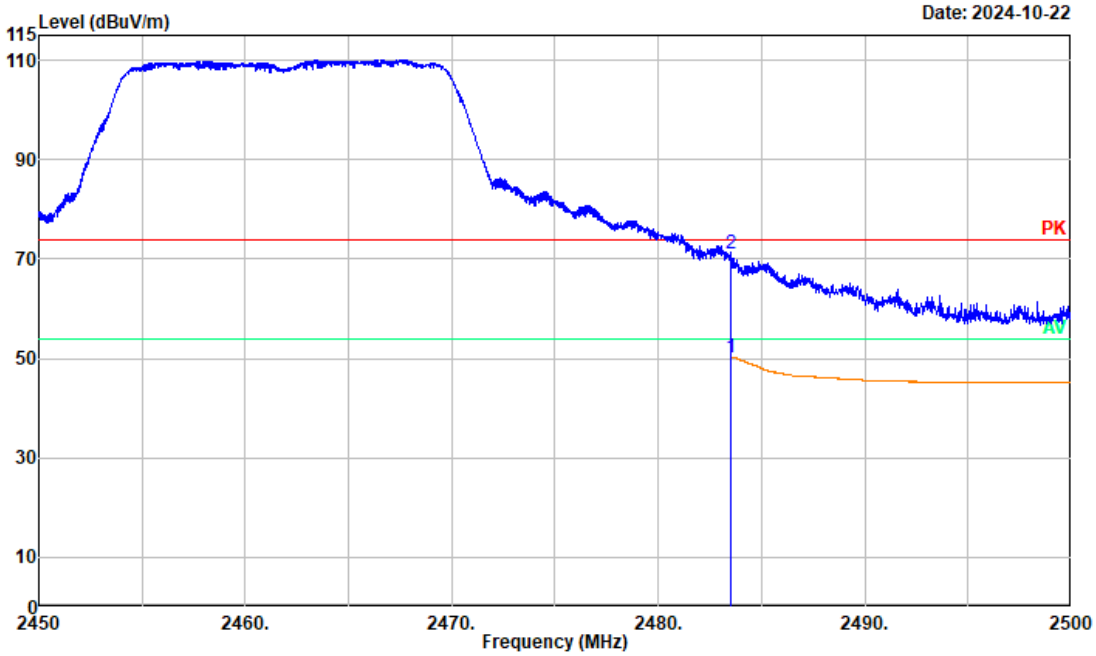


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11g low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2388.960	39.74	6.82	46.56	54.00	-7.44	Average
2	2388.960	62.02	6.82	68.84	74.00	-5.16	Peak

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

Mode:	802.11g	Channel:	2462MHz

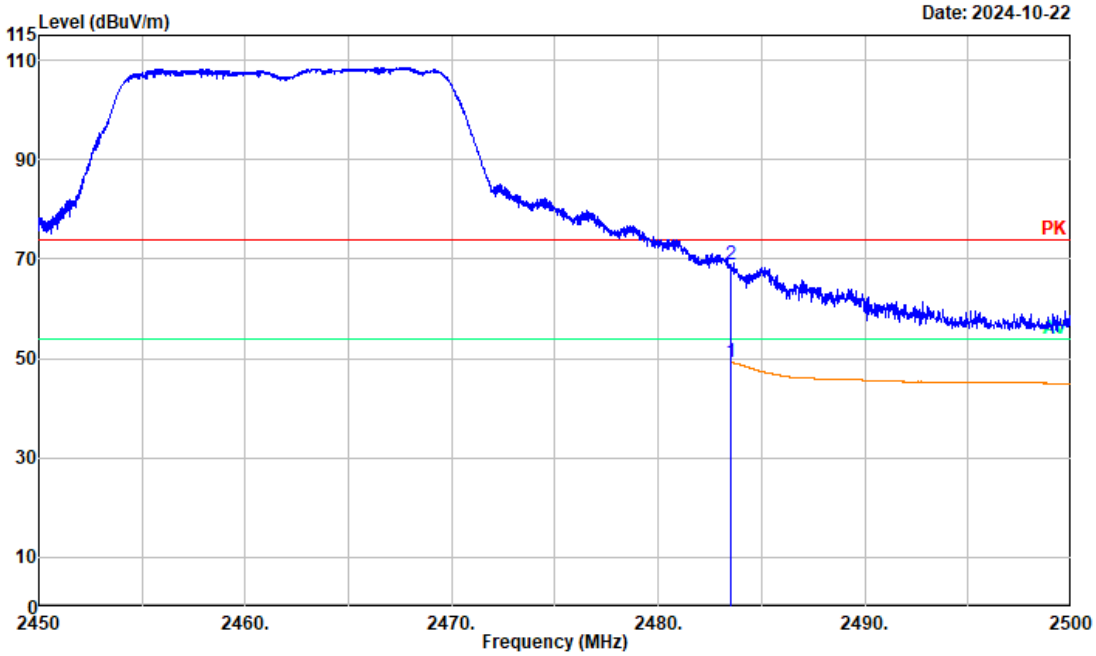


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11g high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2483.500	43.28	7.02	50.30	54.00	-3.70	Average
2	2483.500	63.93	7.02	70.95	74.00	-3.05	Peak

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

Mode:	802.11g	Channel:	2462MHz

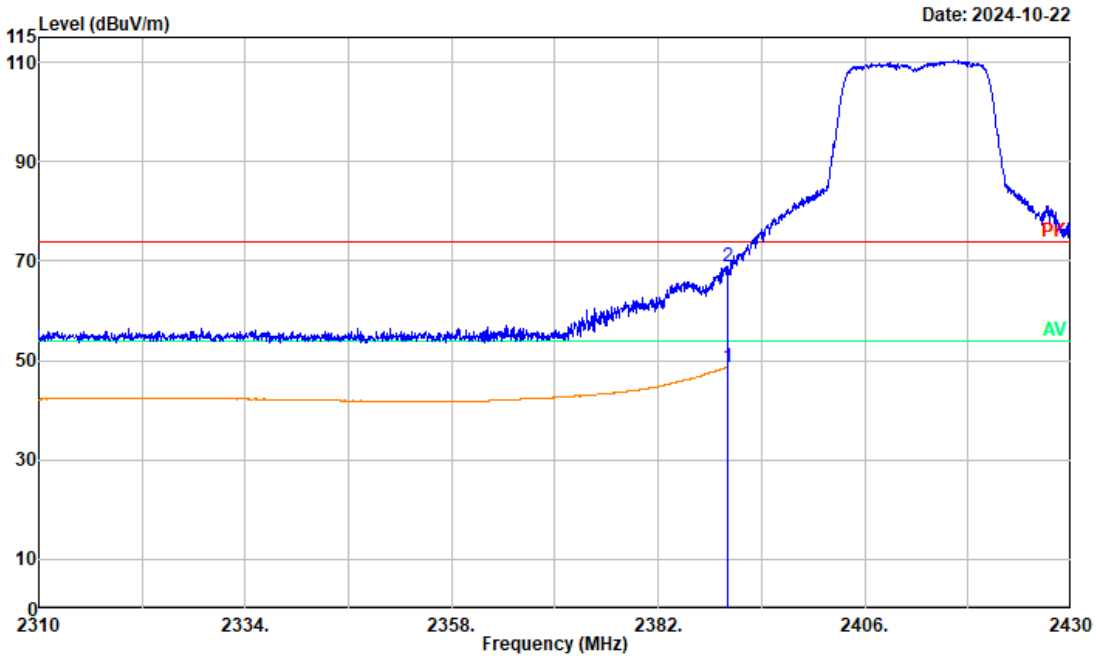


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11g high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2483.500	42.24	7.02	49.26	54.00	-4.74	Average
2	2483.500	61.95	7.02	68.97	74.00	-5.03	Peak

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

Mode:	802.11n20	Channel:	2412MHz

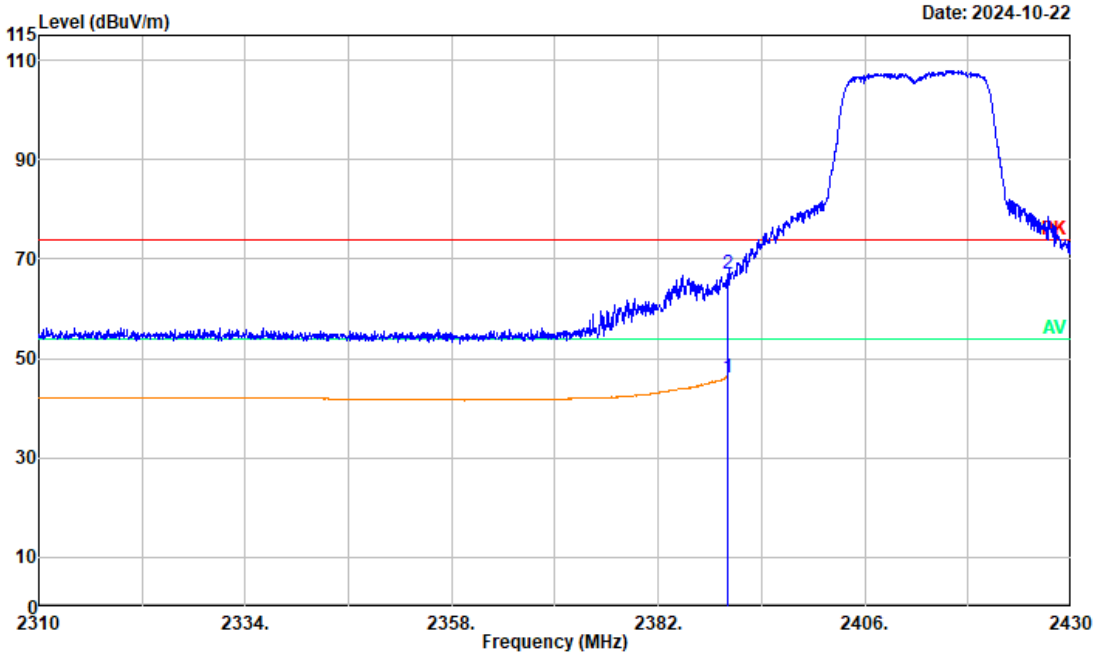


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2389.980	41.76	6.82	48.58	54.00	-5.42	Average
2	2389.980	62.09	6.82	68.91	74.00	-5.09	Peak

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

Mode:	802.11n20	Channel:	2412MHz

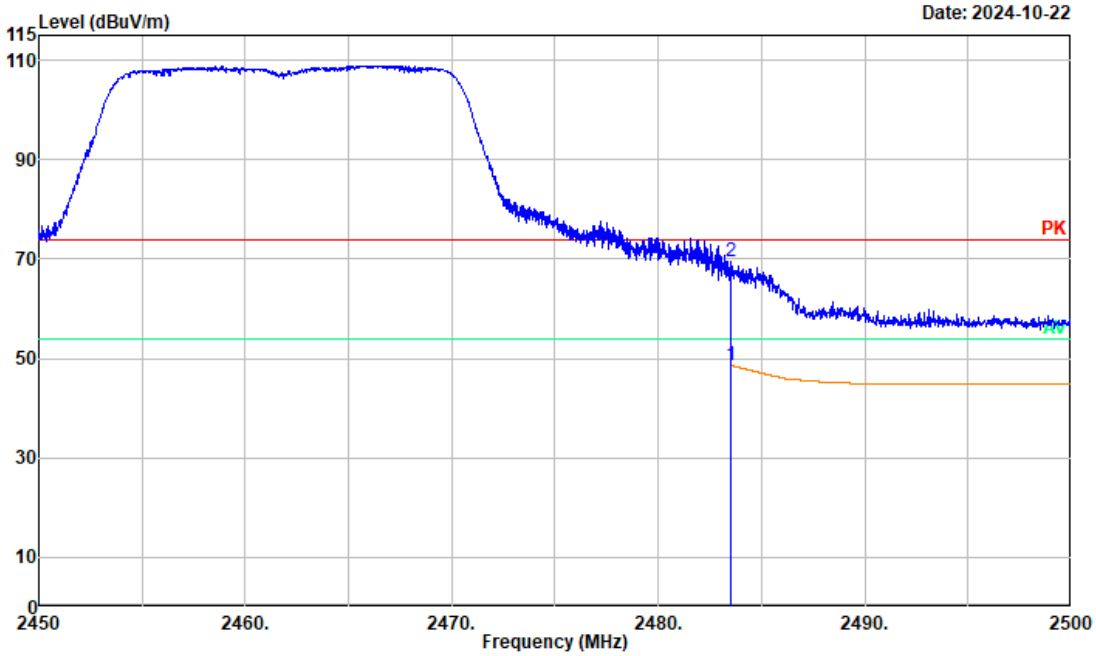


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2389.980	39.45	6.82	46.27	54.00	-7.73	Average
2	2389.980	60.30	6.82	67.12	74.00	-6.88	Peak

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

Mode:	802.11n20	Channel:	2462MHz

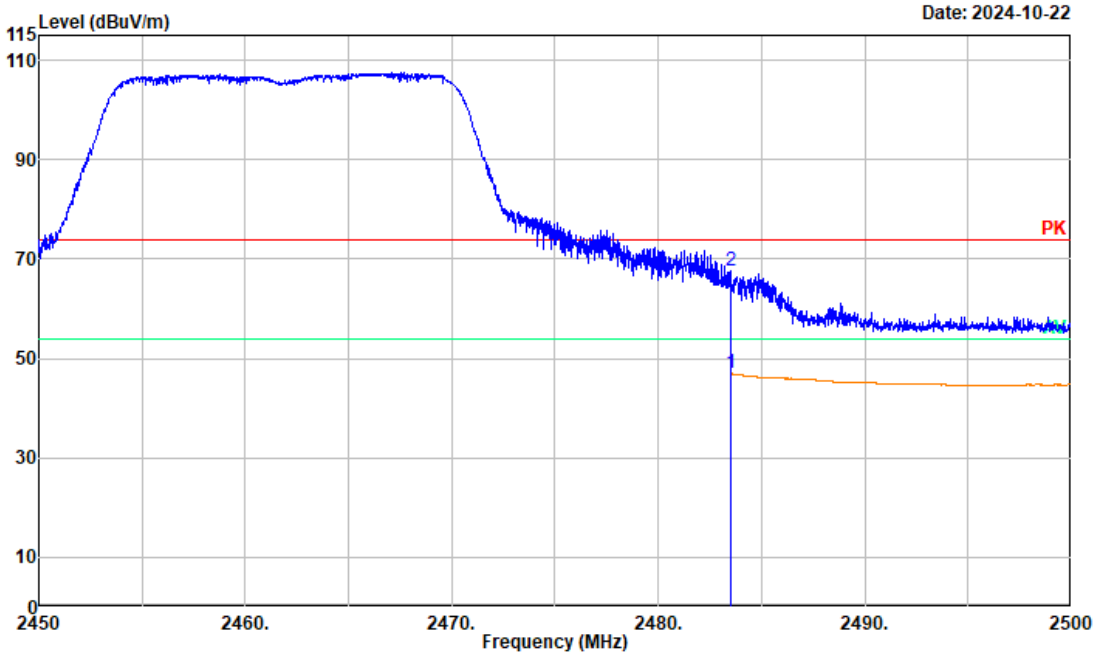


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2483.500	41.54	7.02	48.56	54.00	-5.44	Average
2	2483.500	62.61	7.02	69.63	74.00	-4.37	Peak

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

Mode:	802.11n20	Channel:	2462MHz

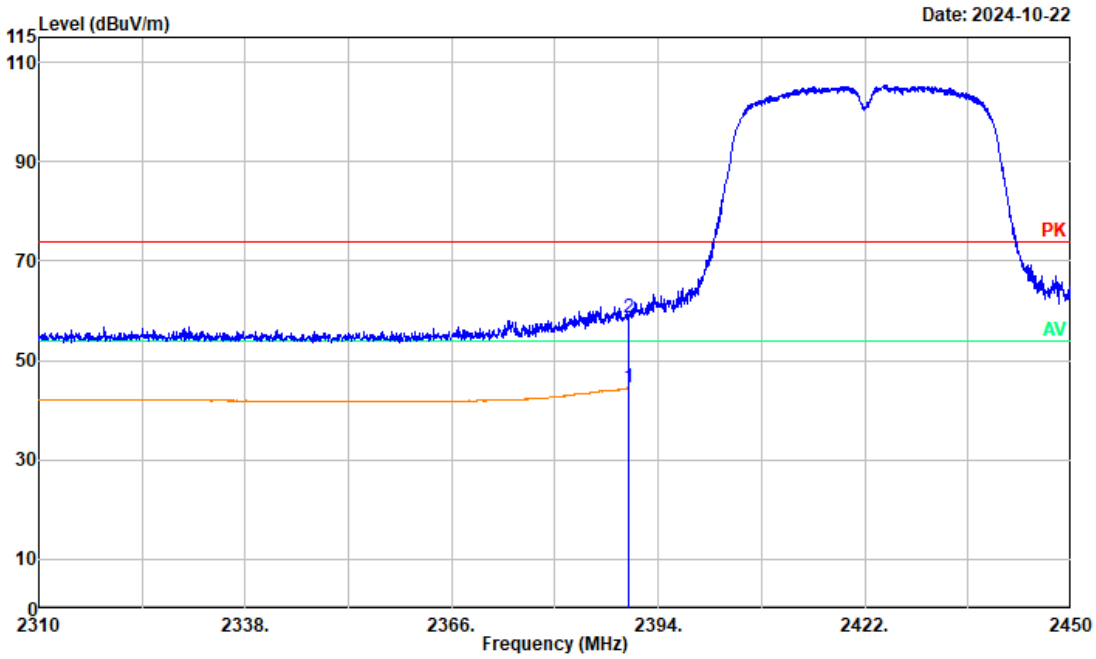


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2483.500	39.90	7.02	46.92	54.00	-7.08	Average
2	2483.500	60.67	7.02	67.69	74.00	-6.31	Peak

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

Mode:	802.11n40	Channel:	2422MHz

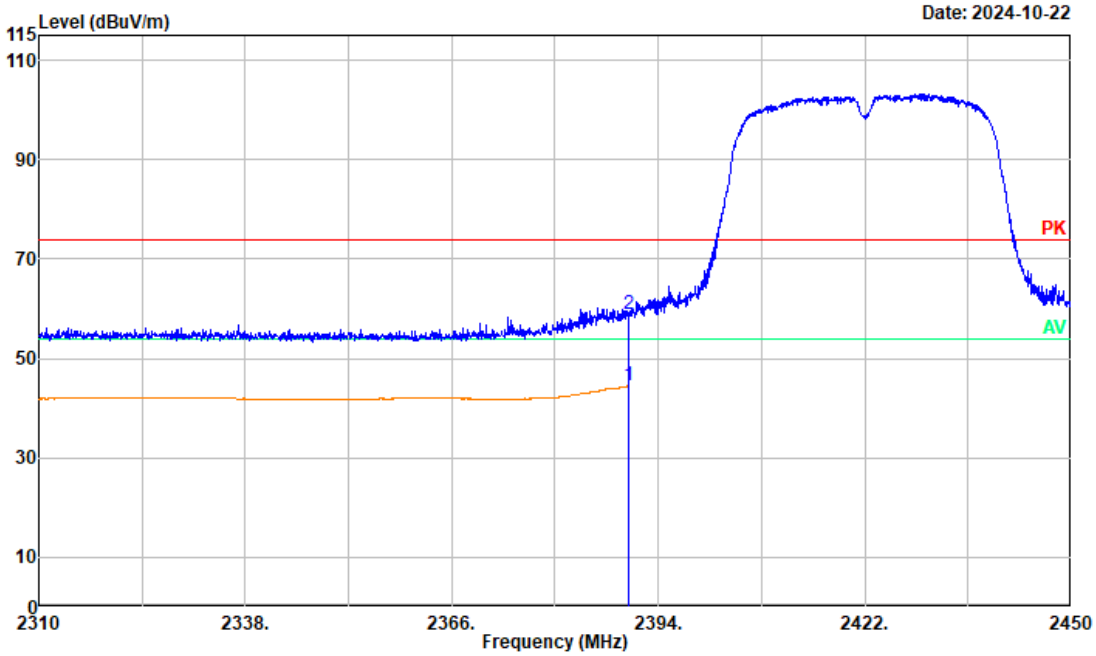


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n40 low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2390.000	37.73	6.82	44.55	54.00	-9.45	Average
2	2390.000	51.92	6.82	58.74	74.00	-15.26	Peak

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

Mode:	802.11n40	Channel:	2422MHz

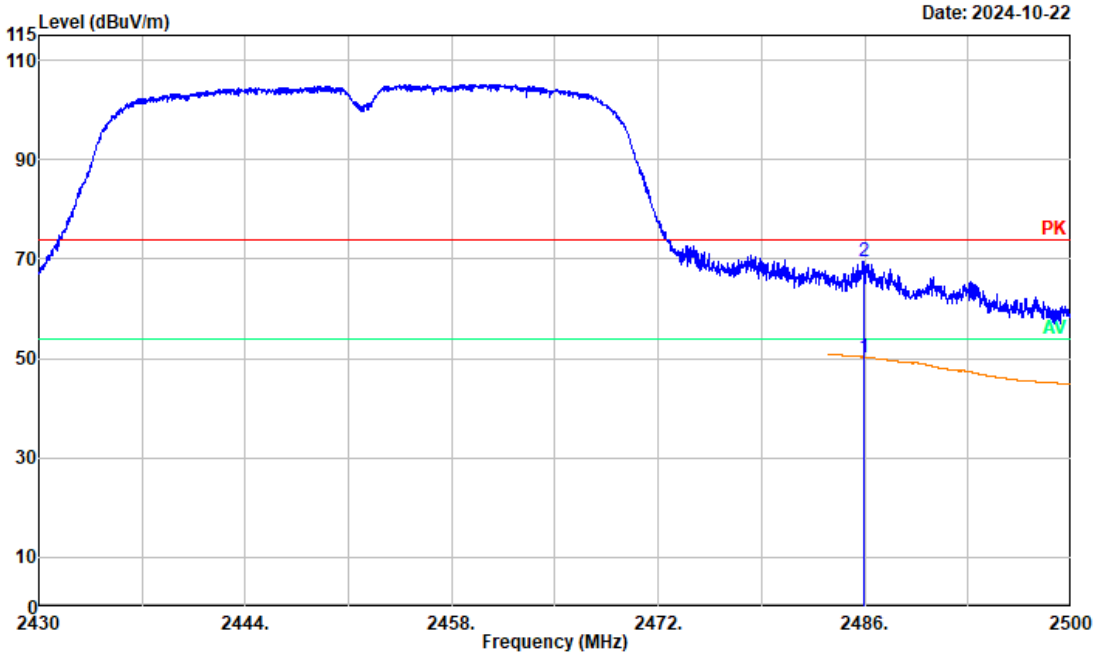


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n40 low channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	2390.000	37.61	6.82	44.43	54.00	-9.57	Average
2	2390.000	52.24	6.82	59.06	74.00	-14.94	Peak

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

Mode:	802.11n40	Channel:	2452MHz

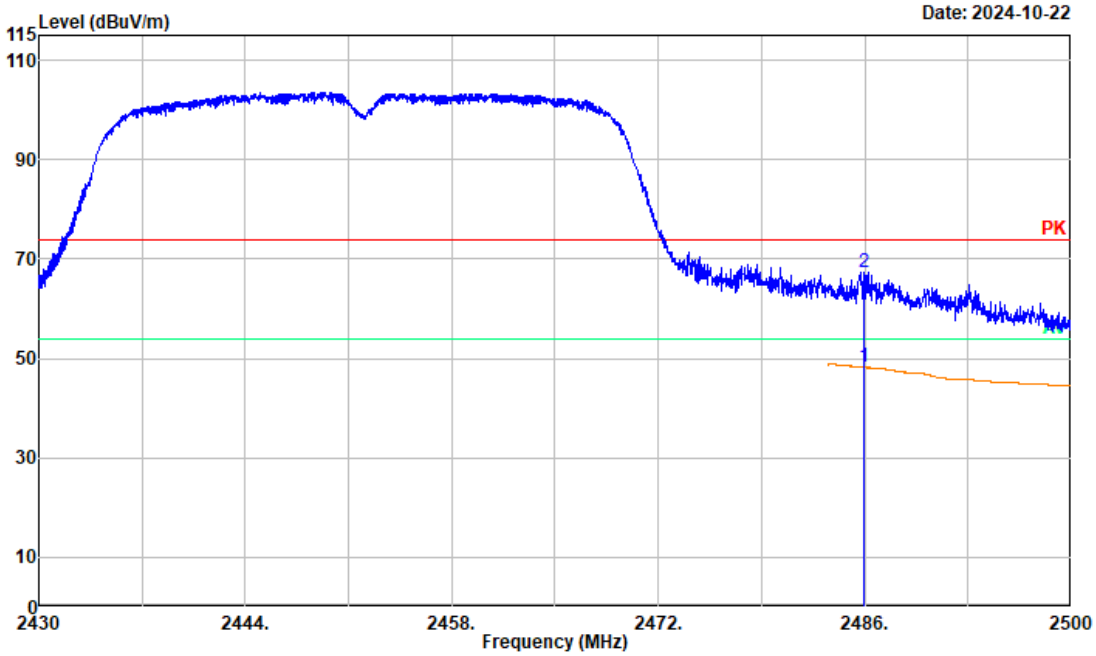


Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n40 high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2485.930	43.24	7.03	50.27	54.00	-3.73	Average
2	2485.930	62.46	7.03	69.49	74.00	-4.51	Peak

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

Mode:	802.11n40	Channel:	2452MHz



Project No. : 2405Y58028E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/59%R.H./100.7kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n40 high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2485.895	41.28	7.03	48.31	54.00	-5.69	Average
2	2485.895	60.44	7.03	67.47	74.00	-6.53	Peak

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

3.5 RF Conducted Test Data

Test Date:	2024-10-29	Test By:	Ryan Zhang
Environment condition:	Temperature: 25.6°C; Relative Humidity:47%; ATM Pressure: 100.4kPa		

3.5.1 6dB Emission Bandwidth

Mode	Antenna	Test Frequency (MHz)	Result (MHz)	Limit (MHz)	Verdict
802.11b	Chain 0	2412	9.610	≥0.5	Pass
		2437	9.650	≥0.5	Pass
		2462	9.650	≥0.5	Pass
802.11g	Chain 0	2412	16.537	≥0.5	Pass
		2437	16.537	≥0.5	Pass
		2462	16.496	≥0.5	Pass
802.11n20	Chain 0	2412	17.618	≥0.5	Pass
		2437	17.618	≥0.5	Pass
		2462	17.618	≥0.5	Pass
802.11n40	Chain 0	2422	33.714	≥0.5	Pass
		2437	33.794	≥0.5	Pass
		2452	33.794	≥0.5	Pass

3.5.2 99% Occupied Bandwidth

Mode	Antenna	Test Frequency (MHz)	99% OBW (MHz)
802.11b	Chain 0	2412	13.360
		2437	13.440
		2462	13.480
802.11g	Chain 0	2412	16.520
		2437	16.440
		2462	16.480
802.11n20	Chain 0	2412	17.440
		2437	17.440
		2462	17.480
802.11n40	Chain 0	2422	34.880
		2437	34.880
		2452	34.800

3.5.3 Maximum Conducted Peak Output Power

Mode	Antenna	Test Frequency (MHz)	Peak Output Power(dBm)	Limit (dBm)	Verdict
802.11b	Chain 0	2412	15.56	30	Pass
		2437	14.60	30	Pass
		2462	14.04	30	Pass
802.11g	Chain 0	2412	18.95	30	Pass
		2437	18.52	30	Pass
		2462	17.99	30	Pass
802.11n20	Chain 0	2412	17.82	30	Pass
		2437	16.97	30	Pass
		2462	16.32	30	Pass
802.11n40	Chain 0	2422	17.02	30	Pass
		2437	16.59	30	Pass
		2452	16.18	30	Pass

3.5.4 Power Spectral Density

Mode	Antenna	Test Frequency (MHz)	Result (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
802.11b	Chain 0	2412	-10.94	8	Pass
		2437	-11.91	8	Pass
		2462	-12.02	8	Pass
802.11g	Chain 0	2412	-18.06	8	Pass
		2437	-19.14	8	Pass
		2462	-19.35	8	Pass
802.11n20	Chain 0	2412	-17.17	8	Pass
		2437	-18.49	8	Pass
		2462	-18.55	8	Pass
802.11n40	Chain 0	2422	-20.19	8	Pass
		2437	-21.07	8	Pass
		2452	-21.35	8	Pass

3.5.5 100 kHz Bandwidth of Frequency Band Edge

Mode	Antenna	Test Frequency (MHz)	Result (dB)	Limit (dB)	Verdict
802.11b	Chain 0	2412	42.41	20	Pass
		2462	47.57	20	Pass
802.11g	Chain 0	2412	27.01	20	Pass
		2462	40.79	20	Pass
802.11n20	Chain 0	2412	30.97	20	Pass
		2462	40.35	20	Pass
802.11n40	Chain 0	2422	28.37	20	Pass
		2452	32.63	20	Pass

3.5.6 Duty Cycle

Mode	Antenna	Test Frequency (MHz)	Ton (ms)	Ton+Toff (ms)	Duty Cycle (%)	Duty Cycle Factor(dB)	1/Ton (Hz)	VBW Setting (kHz)
802.11b	Chain 0	2437	100	100	100	0	NA	0.010
802.11g	Chain 0	2437	100	100	100	0	NA	0.010
802.11n20	Chain 0	2437	100	100	100	0	NA	0.010
802.11n40	Chain 0	2437	100	100	100	0	NA	0.010

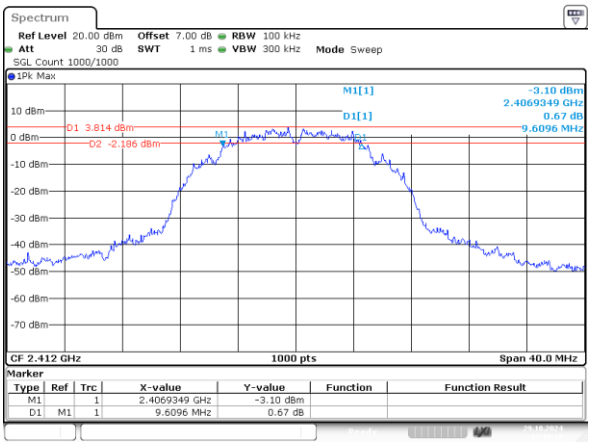
Duty Cycle = Ton/(Ton+Toff)*100%

Test Plots:

6 dB Emission Bandwidth:

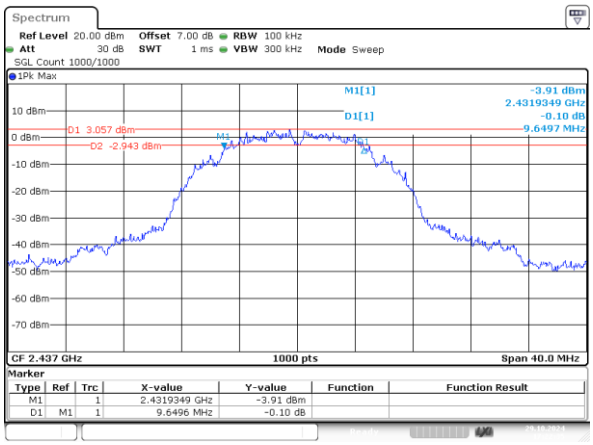
2412~2462

802.11b_2412MHz 9.610MHz



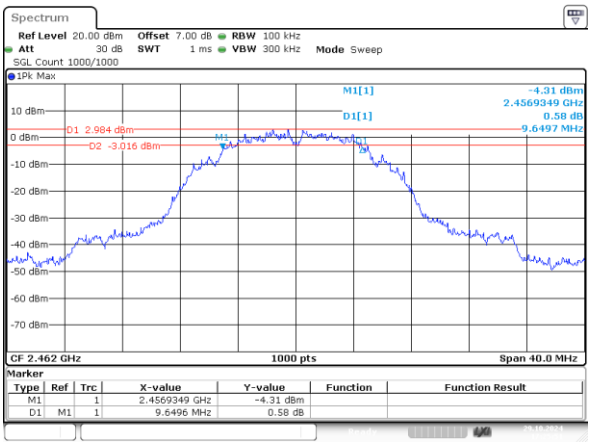
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:19:10

802.11b_2437MHz 9.650MHz



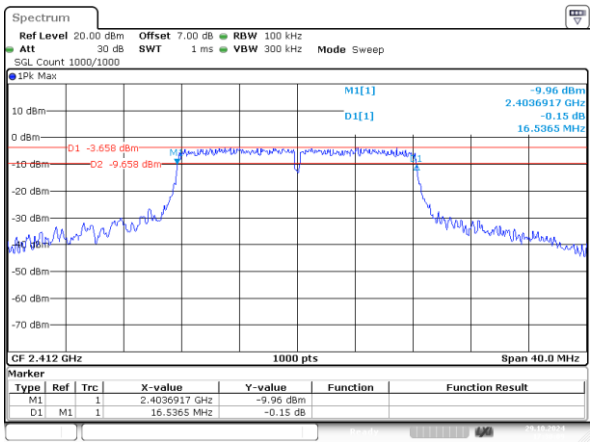
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:22:35

802.11b_2462MHz 9.650MHz



ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:25:50

802.11g_2412MHz 16.537MHz



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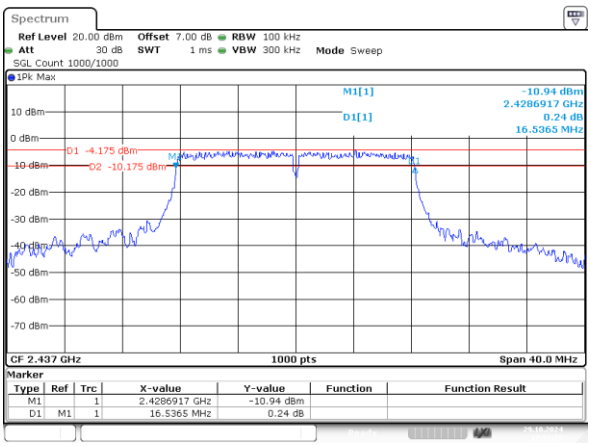
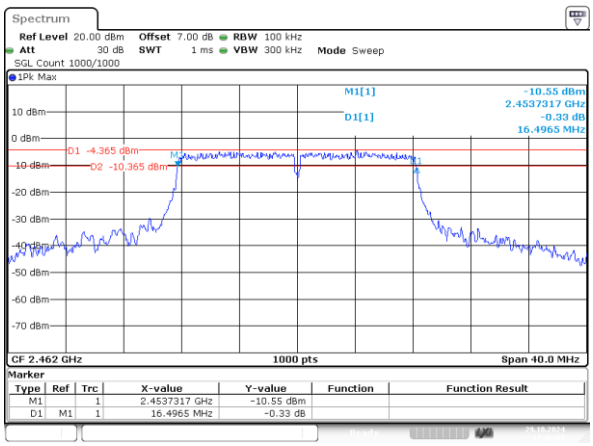
802.11g_2437MHz 16.537MHz



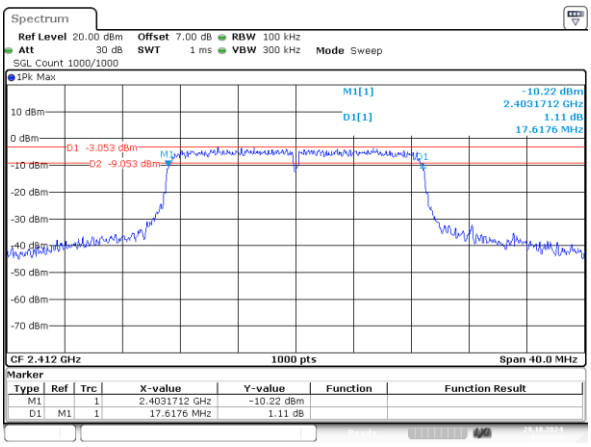
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:33:29

802.11g_2462MHz 16.496MHz



ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:36:07

802.11n20_2412MHz 17.618MHz



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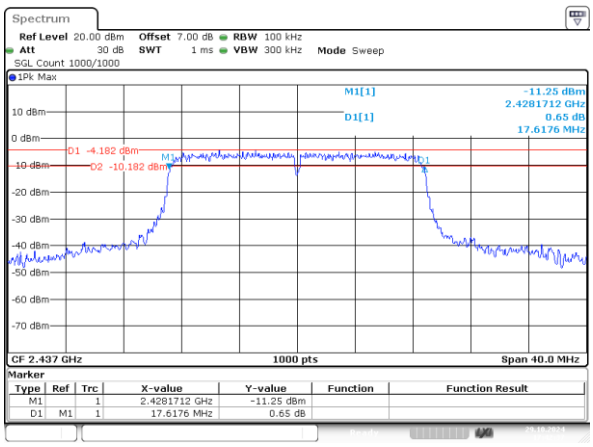
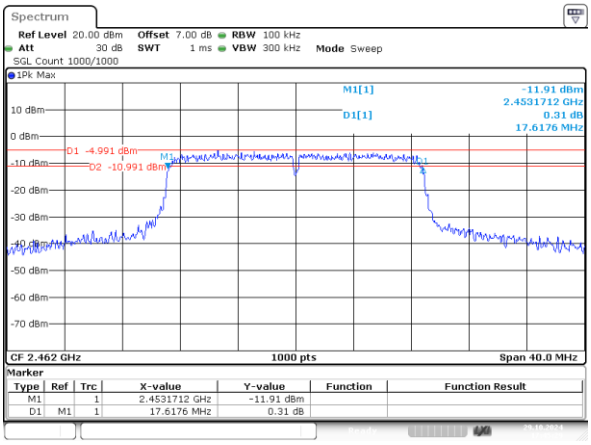
Date: 29.OCT.2024 17:39:29

802.11n20_2437MHz 17.618MHz



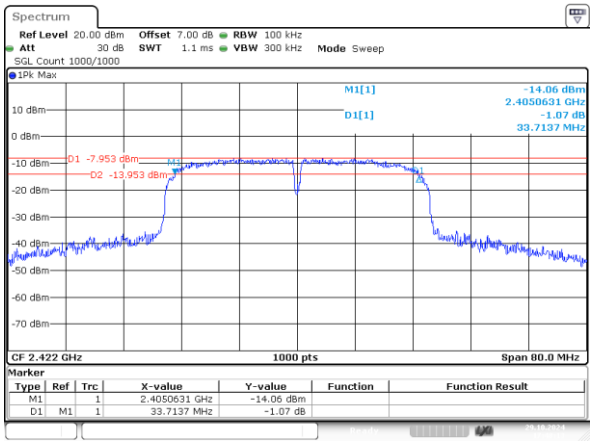
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:42:36

802.11n20_2462MHz 17.618MHz



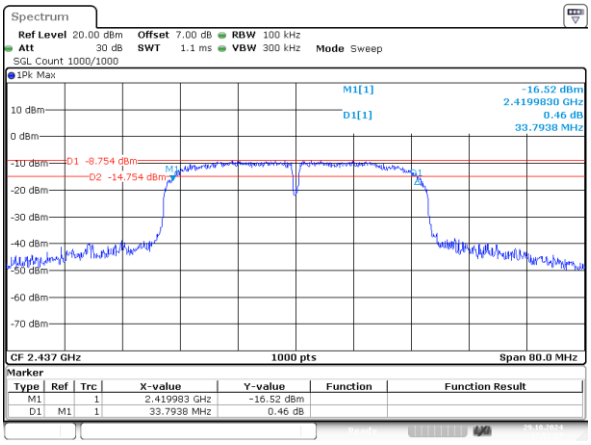
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:45:29

802.11n40_2422MHz 33.714MHz



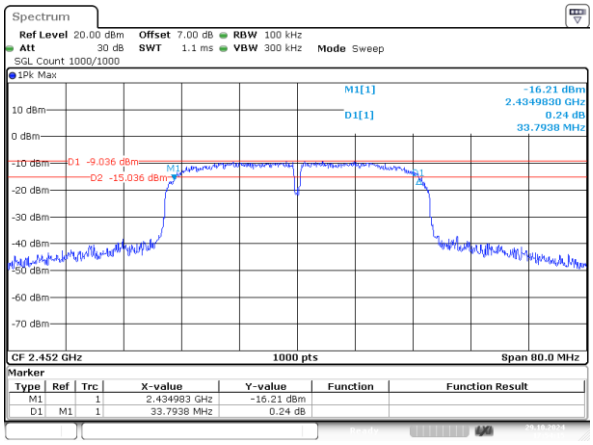
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:48:14

802.11n40_2437MHz 33.794MHz



ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:51:37

802.11n40_2452MHz 33.794MHz

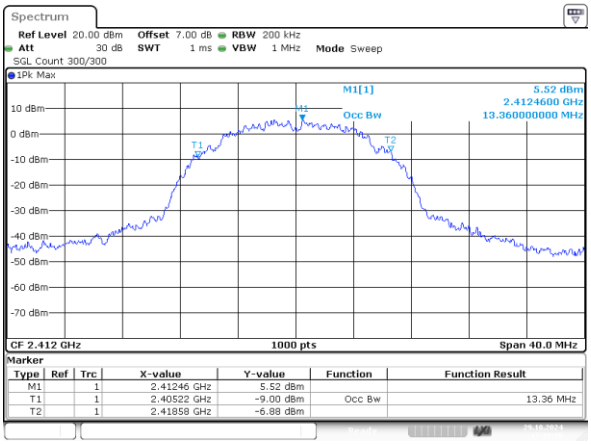


ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:54:16

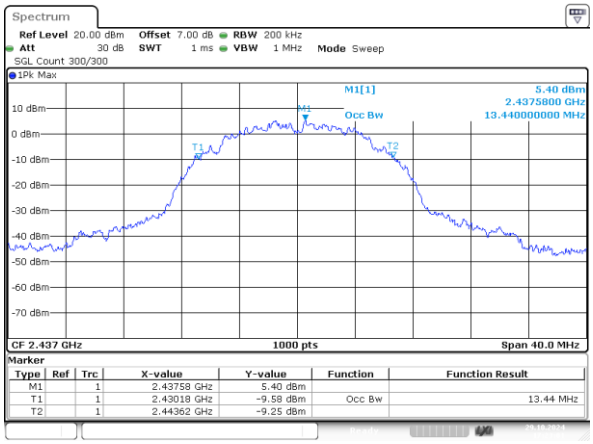
99% Occupied Bandwidth:

2412~2462

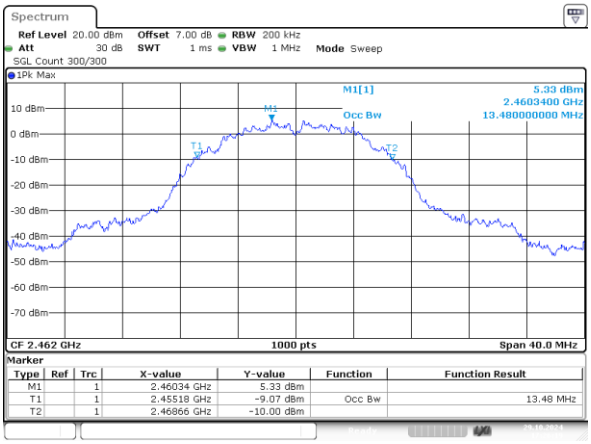
802.11b_2412MHz 13.360MHz



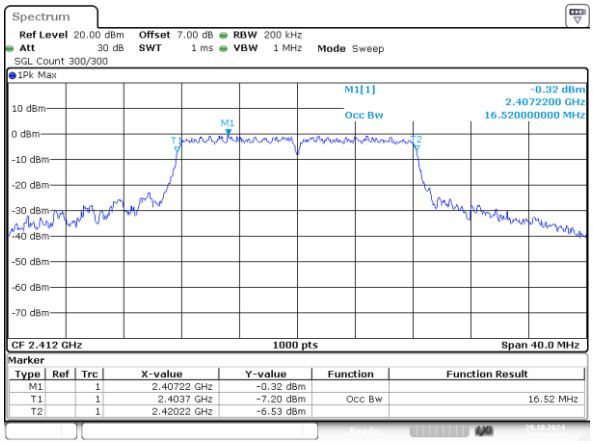
802.11b_2437MHz 13.440MHz



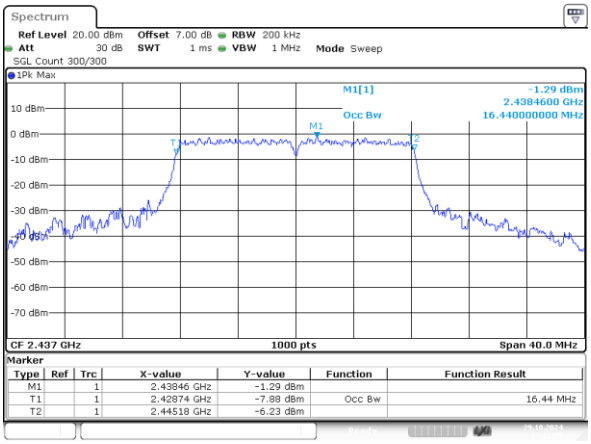
802.11b_2462MHz 13.480MHz



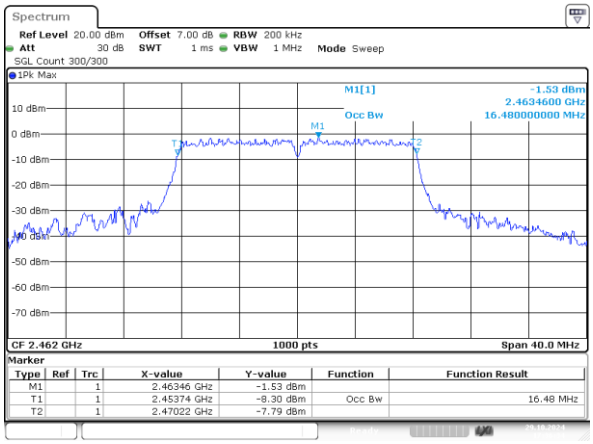
802.11g_2412MHz 16.520MHz



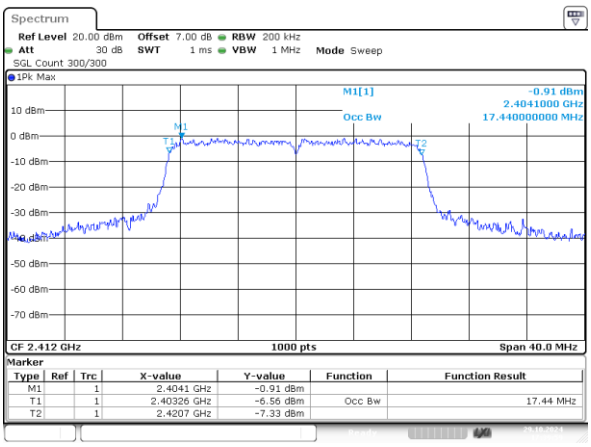
802.11g_2437MHz 16.440MHz



802.11g_2462MHz 16.480MHz



802.11n20_2412MHz 17.440MHz



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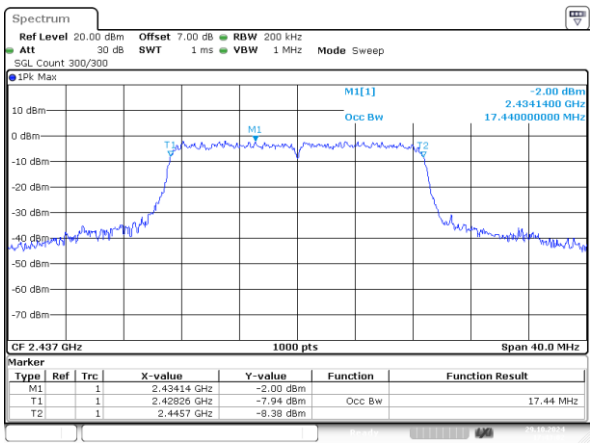
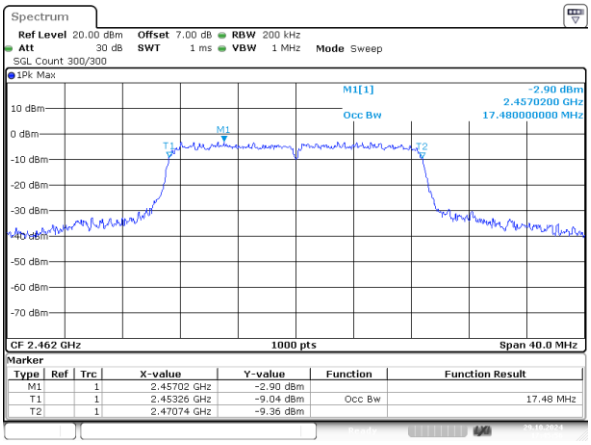
802.11n20_2437MHz 17.440MHz



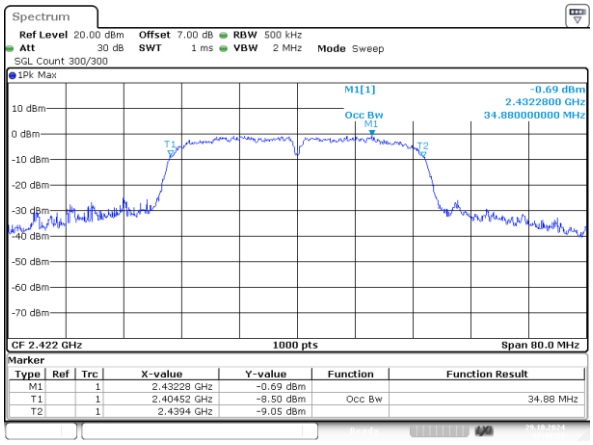
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:43:02

802.11n20_2462MHz 17.480MHz



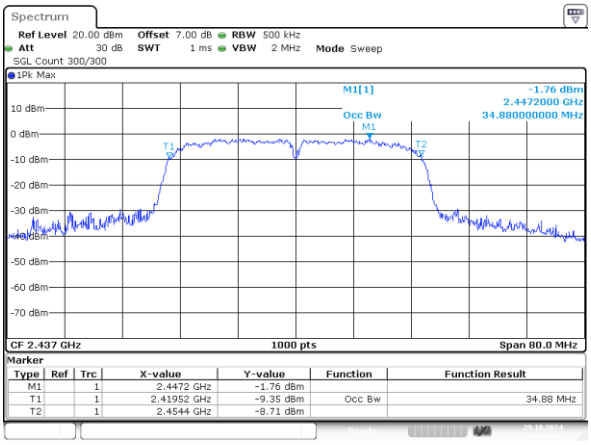
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:45:56

802.11n40_2422MHz 34.880MHz



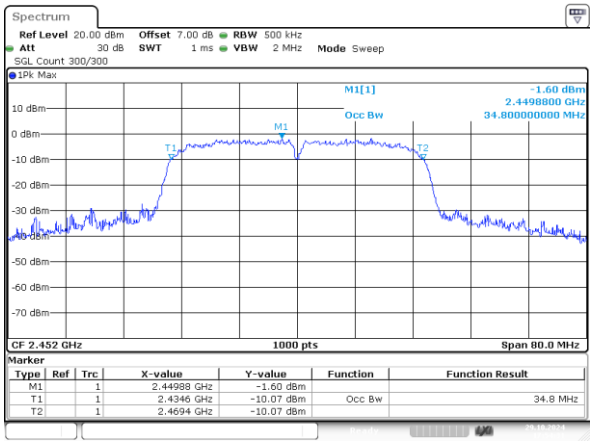
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:48:30

802.11n40_2437MHz 34.880MHz



ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:51:53

802.11n40_2452MHz 34.800MHz

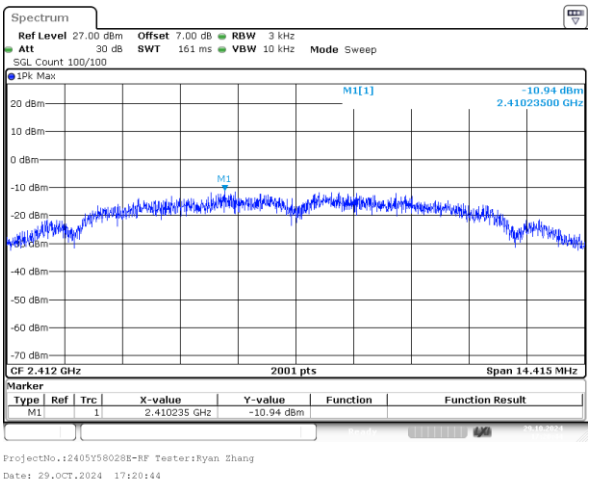


ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:54:31

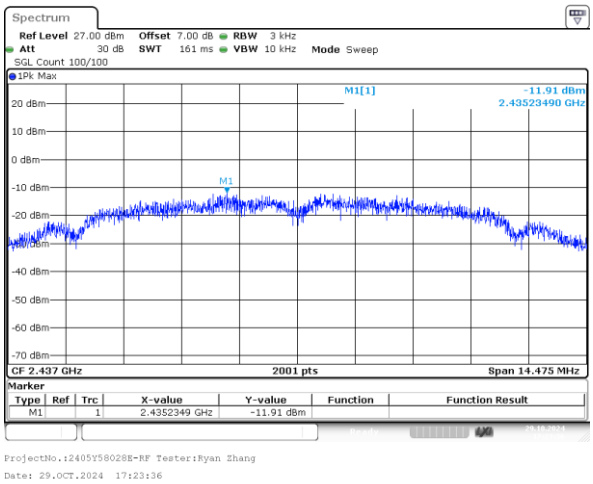
Power Spectral Density:

2412~2462

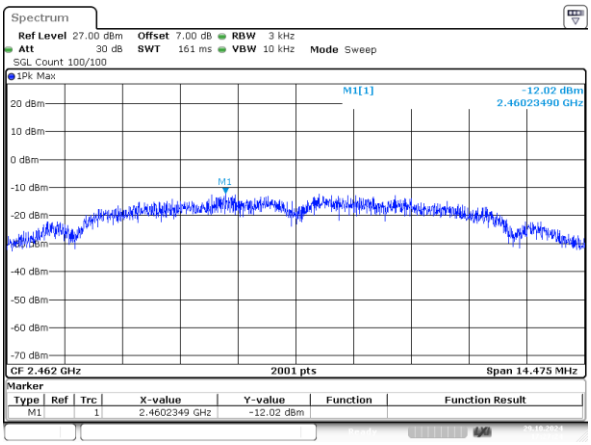
802.11b_2412MHz -10.94dBm/3kHz



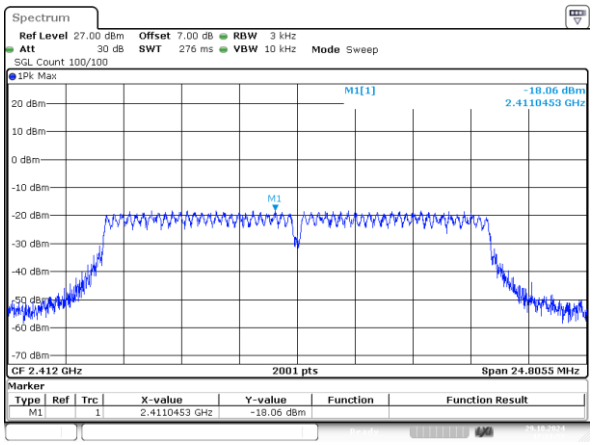
802.11b_2437MHz -11.91dBm/3kHz



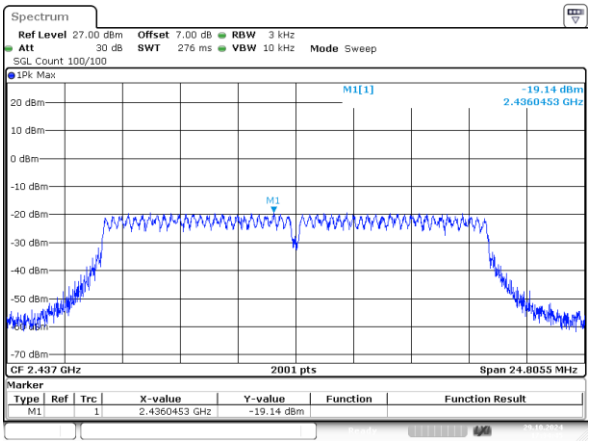
802.11b_2462MHz -12.02dBm/3kHz



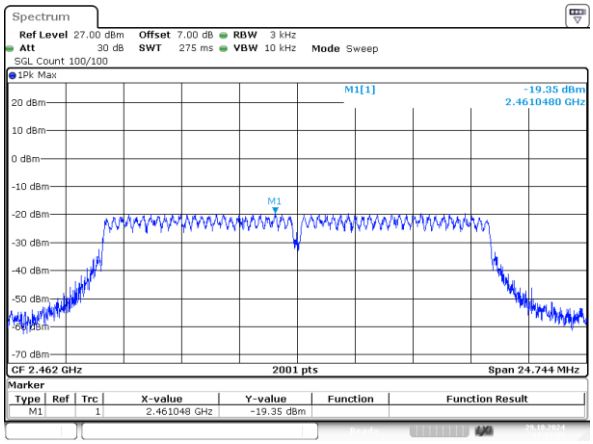
802.11g_2412MHz -18.06dBm/3kHz



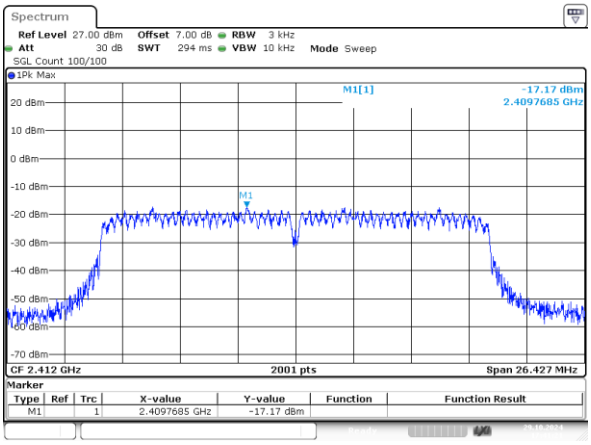
802.11g_2437MHz -19.14dBm/3kHz



802.11g_2462MHz -19.35dBm/3kHz

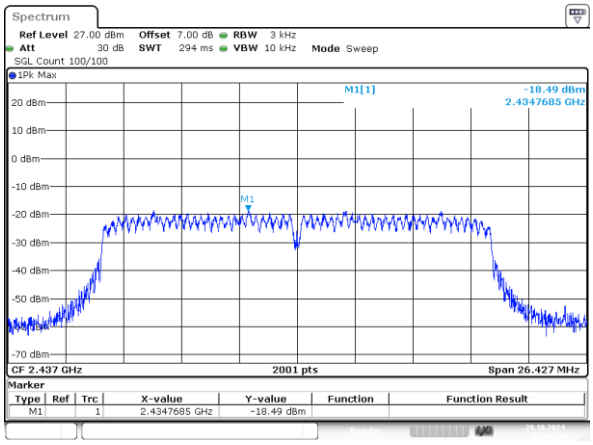


802.11n20_2412MHz -17.17dBm/3kHz



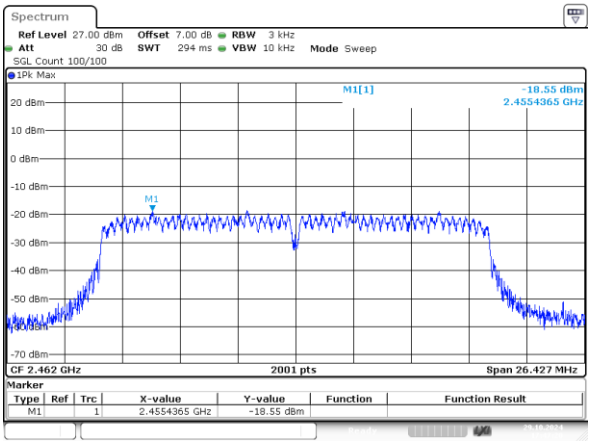
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:41:22

802.11n20_2437MHz -18.49dBm/3kHz



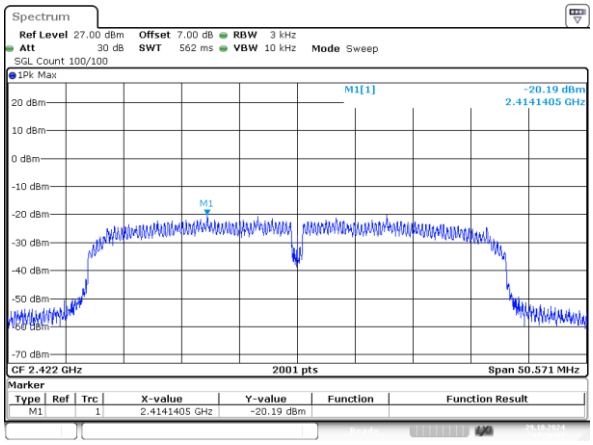
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:43:55

802.11n20_2462MHz -18.55dBm/3kHz



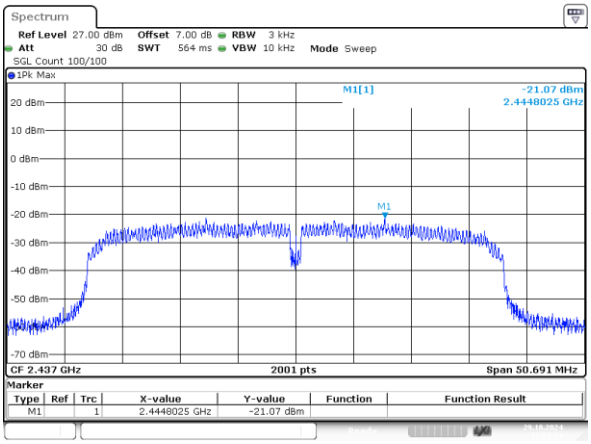
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:47:20

802.11n40_2422MHz -20.19dBm/3kHz



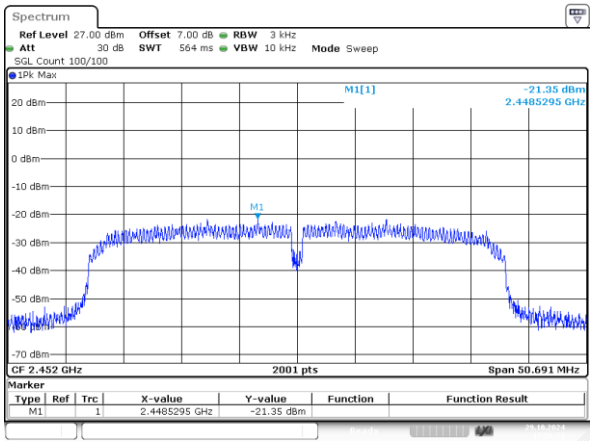
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:50:31

802.11n40_2437MHz -21.07dBm/3kHz



ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:53:24

802.11n40_2452MHz -21.35dBm/3kHz

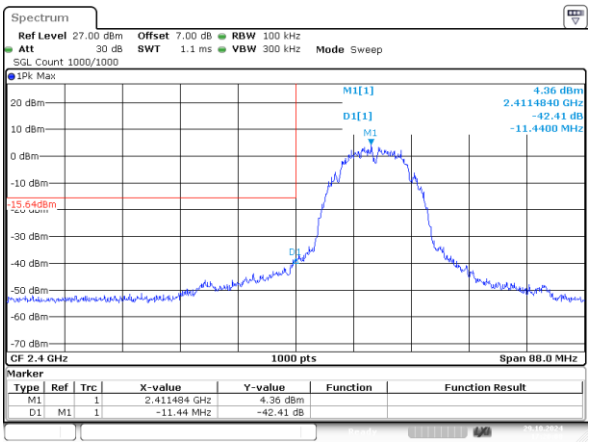


ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:56:34

100kHz Bandwidth of Frequency Band Edge:

2412~2462

802.11b_2412MHz 42.41dB



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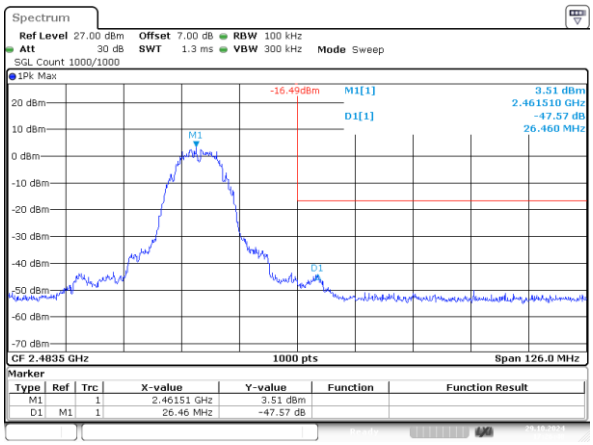
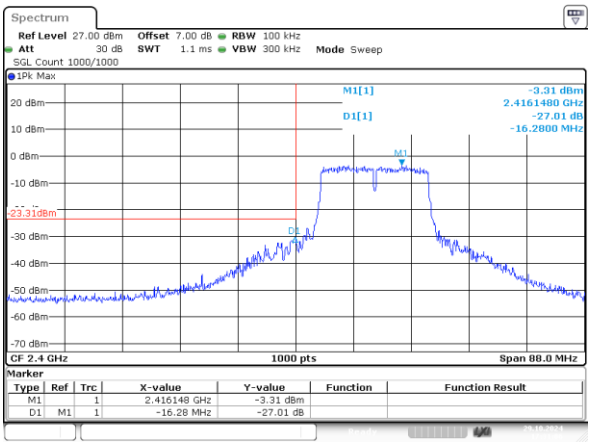
Date: 29.OCT.2024 17:20:07

802.11b_2462MHz 47.57dB



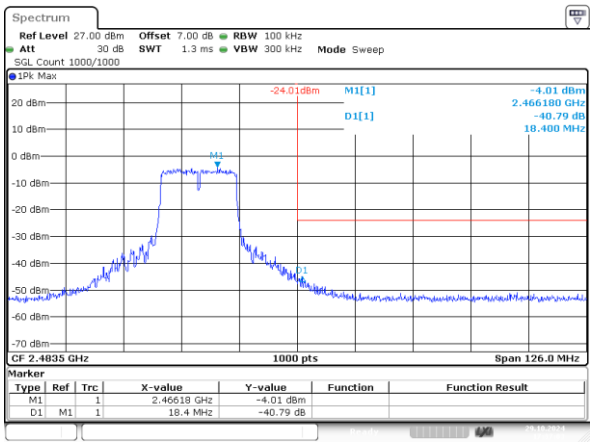
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:26:48

802.11g_2412MHz 27.01dB



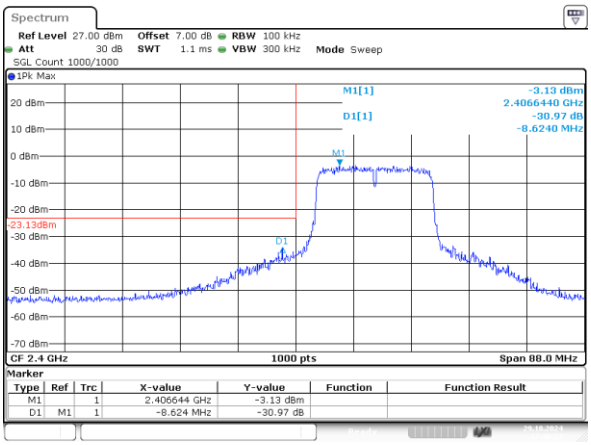
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:31:06

802.11g_2462MHz 40.79dB



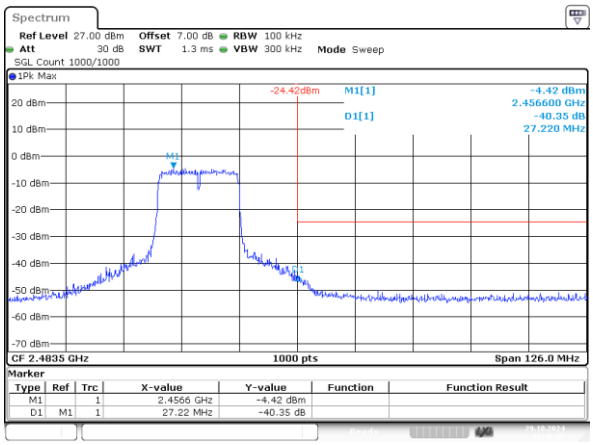
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:37:04

802.11n20_2412MHz 30.97dB



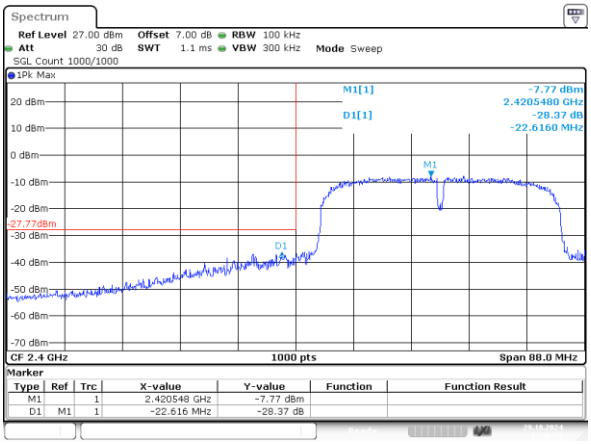
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:40:27

802.11n20_2462MHz 40.35dB



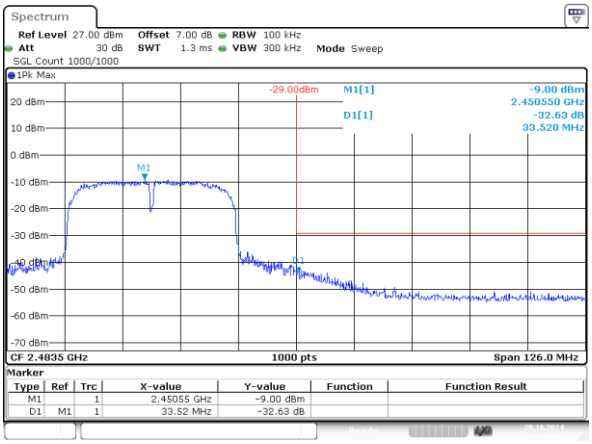
ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:46:26

802.11n40_2422MHz 28.37dB



ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:48:59

802.11n40_2452MHz 32.63dB

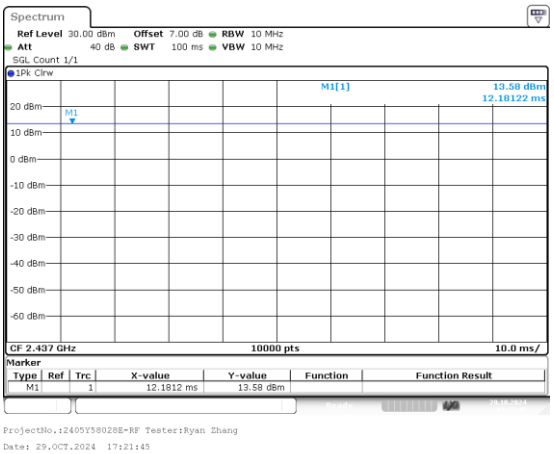


ProjectNo.:2405Y58028E-RF Tester:Ryan Zhang
Date: 29.OCT.2024 17:55:02

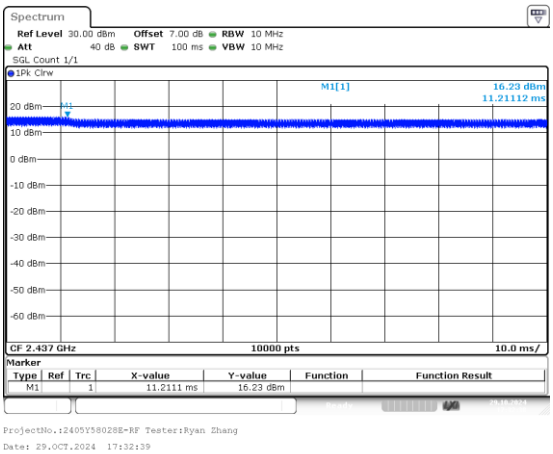
Duty Cycle:

2412~2462

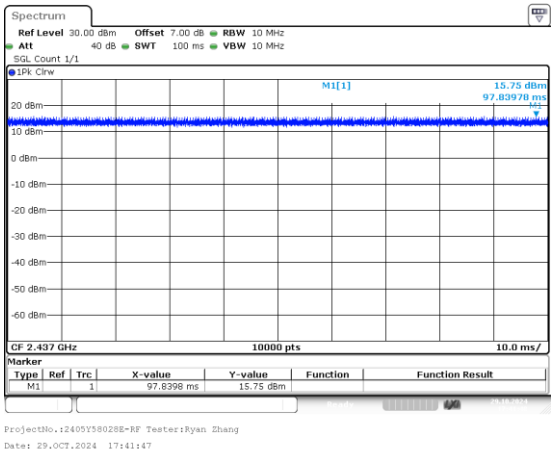
802.11b_2437MHz
100ms,100ms



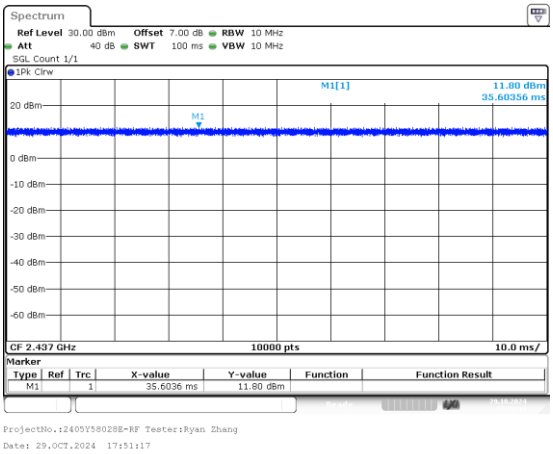
802.11g_2437MHz
100ms,100ms



802.11n20_2437MHz
100ms,100ms



802.11n40_2437MHz
100ms,100ms



4 Test Setup Photo

Please refer to the attachment 2405Y58028E Test Setup photo.

5 E.U.T Photo

Please refer to the attachment 2405Y58028E External photo and 2405Y58028E Internal photo.

---End of Report---