FCC PART 15.407
TEST REPORT

On Behalf of

Shenzhen ZO Video Technology Co., Ltd.

2c, 2 / F, building 6, longbi Industrial Zone, 27 Dafa Road, Bantian street, Longgang District, Shenzhen

FCC ID: 2A2RJ-TPMINITX

Model: TP Mini TX, TP Max TX, TP Max Pro TX, TP Mini 2 TX, TP Max 2 TX, TP Max Pro 2 TX, TP One, TP Multi

July 9, 2024

This Report Concerns:	**Equipment Type:**
☒ Original Report	Wireless video system

Test Engineer:	LBi Li / LBi Li
Report Number:	**QCT24FR-1704E-01**
Test Date:	June 12,2024 ~ July 5, 2024
Reviewed By:	Gordon Tan/ Gordon.Tan
Approved By:	Kendy Wang / Kendy Wang
Prepared By:	**Shenzhen QC Testing Laboratory Co., Ltd.** East of 1/F., Building E, Xinghong Science Park, No.111, Shuiku Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China **Tel: 0755-23008269** **Fax: 0755-23726780**

Address: East of 1/F., Building E, Xinghong Science Park, No.111, Shuiku Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
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Revision History of This Test Report

Report Number	Description	Issued Date
QCT24FR-1704E-01	Initial Issue	2024-7-9

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1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Description	Wireless video system
Model No.	TP Mini TX, TP Max TX, TP Max Pro TX, TP Mini 2 TX, TP Max 2 TX, TP Max Pro 2 TX, TP One, TP Multi
Model Difference	All models in each series have similar construction with the same diagram circuit and PCB layout, but different from model names. All tests were conducted on the models (TP Mini TX) and the test result was passed.
Tested Model	TP Mini TX
Software Version	HD_MIN_TX_V1.0-20231205
Hardware Version	15376037
Sample(s) Status	Engineer sample
Operation Frequency:	U-NII-1: 5180MHz~5240MHz
Channel numbers:	IEEE 802.11a/n 20MHz: 4
Modulation type:	802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type:	Built-in antenna
Antenna gain*1:	2.5dBi
Power supply:	DC 5V (Powered by adapter)
USB port:	Type-C
Trade Mark:	SHIMBOL
Applicant	Shenzhen ZO Video Technology Co., Ltd.
Address	2c, 2 / F, building 6, longbi Industrial Zone, 27 Dafa Road, Bantian street, Longgang District, Shenzhen
Manufacturer	Shenzhen ZO Video Technology Co., Ltd.
Address	2c, 2 / F, building 6, longbi Industrial Zone, 27 Dafa Road, Bantian street, Longgang District, Shenzhen
Sample No.	Y24F1704E01WC（Model: TP Mini TX）

Note: *1This information provided by Manufacturer, SZ QC Lab is not responsible for the accuracy of this information.

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1.2 System Test Configuration

1.2.1 Channel List

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5180~5240MHz **(U-NII-1)**	36	5180 MHz		
	40	5200 MHz		
	44	5220 MHz		
	48	5240 MHz		
For 20 MHz Bandwidth, use channel 36, 40, 44, 48.				

Note: In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)	
	802.11a	802.11n(HT20)
Lowest channel	5180MHz	5180MHz
Middle channel	5220MHz	5220MHz
Highest channel	5240MHz	5240MHz

1.2.2 EUT Exercise Software

The test software (RTL8733BU) was used to control EUT work in Continuous TX mode, and select test channel, wireless mode:

Mode	Data Rate (Mbps)	Power Level
802.11 a	6	95
802.11 n20	MCS0	95

1.2.3 Support Equipment

Manufacturer	Description	Model	Remark
Lenovo	Notebook	ThinkPad E15	S/N: PF-26227L 20/04
Vivo	Adapter	BK-T-01Q	Input:110-240V~, 50/60Hz Output:5V/1A

1.2.4 Test mode

Transmitting mode: Keep the EUT in continuously transmitting.

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1.3 Test Facility

Test Firm : Shenzhen QC Testing Laboratory Co., Ltd.

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19. The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS – Registration No.: L8464

The EMC Laboratory has been accredited by CNAS, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

A2LA Certificate Number: 6759.01

The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 561109

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission.

IC Registration Number: 29628

CAB identifier: CN0141

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

1.4 Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	±1.42 x10^{-4}%
RF output power, conducted	±1.06dB
Power Spectral Density, conducted	±1.06dB
Unwanted Emissions, conducted	±2.51dB
AC Power Line Conducted Emission	±1.80dB
Radiated Spurious Emission test (9kHz-30MHz)	±2.66dB
Radiated Spurious Emission test (30MHz-1000MHz)	±4.04dB
Radiated Spurious Emission test (1000MHz-18000MHz)	±4.70 dB
Radiated Spurious Emission test (18GHz-40GHz)	±4.80dB
Temperature	±0.8℃
Humidity	±3.2%
DC and low frequency voltages	±0.1%
Time	±5%
Duty cycle	±5%

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

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2. Summary of Test Results

Test Item	Section	Result
Antenna Requirement	FCC part 15.203	Pass
AC Power Line Conducted Emission	FCC part 15.207	Pass
Bandwidth	FCC part 15.407(a)	Pass
Conducted Transmitter Output Power	FCC part 15.407(a)(1)	Pass
Power Spectral Density	FCC part 15.407(a)(1)	Pass
Band Edge	FCC part 15.407(b)(1)	Pass
Undesirable Emission& Restricted Bands	FCC part 15.407(b)(1), 15.205/15.209	Pass

Note: 1. Pass: The EUT complies with the essential requirements in the standard,

2. Test according to ANSI C63.10:2013,

3. The Frequency Stability item is declared by the manufacturer,

4. All indications of Pass/Fail in this report are opinions expressed by Shenzhen QC Testing Laboratory Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

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3. List of Test and Measurement Instruments

3.1 Conducted Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	R&S	ESIB 7	2277573376	2024.03.14	2025.03.13
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101820	2023.08.21	2024.08.20
3	Artificial Mains Network	SCHWARZBECK	NSLK8126	8126200	2024.03.14	2025.03.13
4	PULSE LIMITER	R&S	ESH3-Z2	100058	2024.03.14	2025.03.13
Conducted Emission Measurement Software: TS						

3.2 Radiated Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1.	Spectrum Analyzer	ROHDE&SCHWARZ	FSV 40	101458	2024.03.14	2025.03.13
2.	Loop Antenna	EMCO	6502	2133	2022.07.23	2024.07.22
3.	Logarithmic compound broadband Antenna	SCKWARZBECK	VULB9168	VULB9168-1-588	2023.04.01	2025.03.31
4.	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB 7	2277573376	2024.03.14	2025.03.13
5.	EMI Test Receiver	R&S	ESPI	101131	2024.03.14	2025.03.13
6.	Horn Antenna	SCHWARZBECK	BBHA9120D	02069	2023.04.01	2025.03.31
7.	Horn Antenna	COM-MW	ZLB7-18-40G -950	12221225	2023.01.12	2025.01.09
8.	Amplifier	R&S	BBV9721	9721-031	2024.03.14	2025.03.13
9.	Amplifier	HPX	BP-01G-18G	210902	2024.03.14	2025.03.13
10.	Pre-amplifier	COM-MW	DLAN-18000 -40000-02	10229104	2024.03.14	2025.03.13
11.	966 Chamber	ZhongYu Electron	9*6*6	/	2022.07.25	2025.07.24
Radiated Emission Measurement Software: EZ_EMC						

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3.3 RF Conducted test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1.	Wideband Radio Communication Tester	Rohde & Schwarz	CW500	151583	2024.03.14	2025.03.13
2.	Spectrum Analyzer	ROHDE& SCHWARZ	FSV 40	101458	2024.03.14	2025.03.13
3.	Signal Generator	Agilent	N5182A	MY50141563	2024.03.14	2025.03.13
4.	RF Automatic Test System	MW	MW100-RFCB/ MW100-PSB	MW2007004	2024.03.14	2025.03.13
RF Conducted Measurement Software: MTS 8310						

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4. Antenna requirement

Standard requirement: FCC Part15 C Section 15.203

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.

EUT Antenna: The Ant is Built-in antenna, the best case gain of the antenna is 2.5dBi, reference to the Internal photo for details.

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5. Conducted Emissions

5.1 Applicable Standard

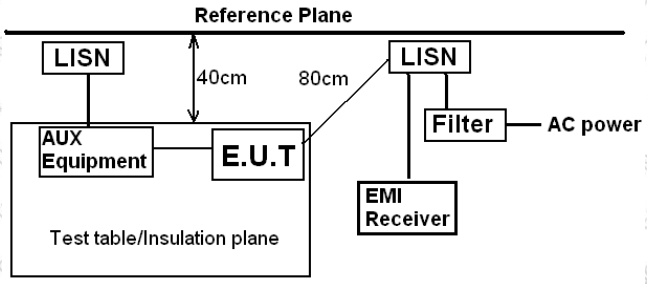
FCC Part15 C Section 15.207

5.2 Limit

Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

Note *: The level decreases linearly with the logarithm of the frequency.

5.3 Test setup



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

5.4 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.
RBW=9 kHz, VBW=30 kHz, Sweep time=auto

5.5 Test procedure

1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. 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.

5.6 Test Data

Temperature	24.5 ℃	Humidity	51.1%
ATM Pressure	101.1kPa	Antenna Gain	2.5dBi
Test by	LBi Li	Test result	PASS

Test Voltage: AC 120V/60Hz

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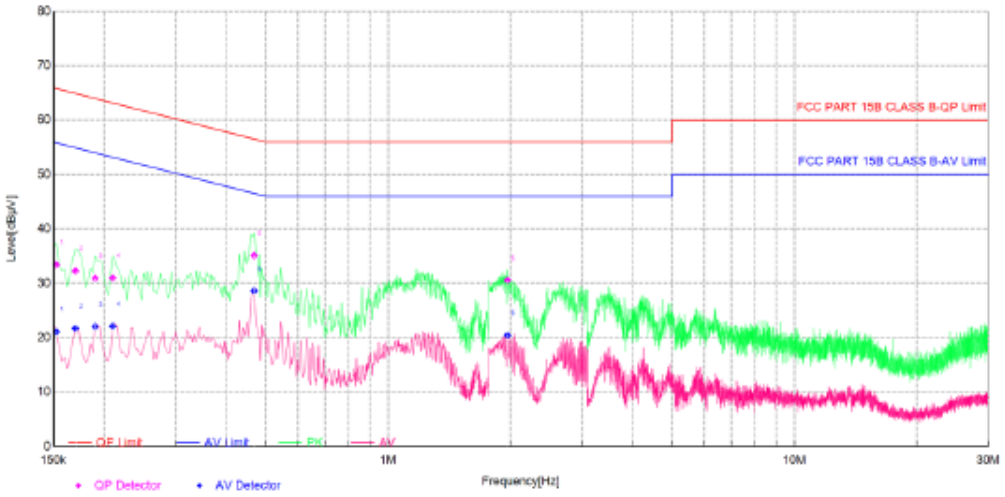
Measurement data:

Pre-scan all test modes, found worst case at 802.11a mode 5180MHz, and so only show the test result of 802.11a mode 5180MHz

Line:



Final Data List

NO.	Freq. [MHz]	Factor[dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Phase	Verdict
1	0.1525	10.47	33.43	65.86	32.43	21.14	55.86	34.72	L	PASS
2	0.17	10.54	32.30	64.96	32.66	21.77	54.96	33.19	L	PASS
3	0.19	10.62	30.94	64.04	33.10	22.06	54.04	31.98	L	PASS
4	0.21	10.66	31.00	63.21	32.21	22.14	53.21	31.07	L	PASS
5	0.4675	10.70	35.14	56.56	21.42	28.60	46.56	17.96	L	PASS
6	1.9675	10.63	30.56	56.00	25.44	20.47	46.00	25.53	L	PASS

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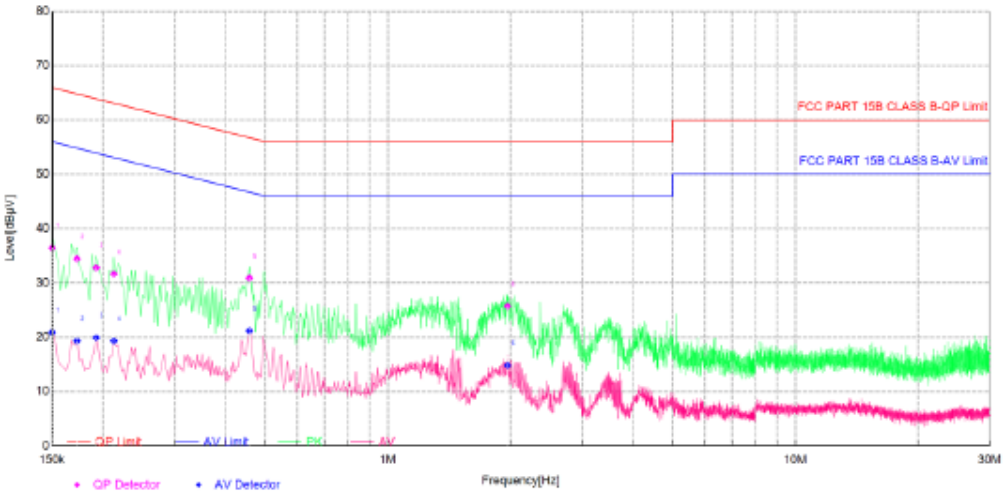
Neutral:



Final Data List										
NO.	Freq. [MHz]	Factor[dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Phase	Verdict
1	0.15	10.36	36.45	66.00	29.55	20.91	56.00	35.09	N	PASS
2	0.1725	10.41	34.44	64.84	30.40	19.32	54.84	35.52	N	PASS
3	0.1925	10.46	32.84	63.93	31.09	19.92	53.93	34.01	N	PASS
4	0.2125	10.52	31.64	63.11	31.47	19.32	53.11	33.79	N	PASS
5	0.4575	10.55	30.88	56.74	25.86	21.21	46.74	25.53	N	PASS
6	1.9675	10.60	25.71	56.00	30.29	14.82	46.00	31.18	N	PASS

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

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6. Bandwidth

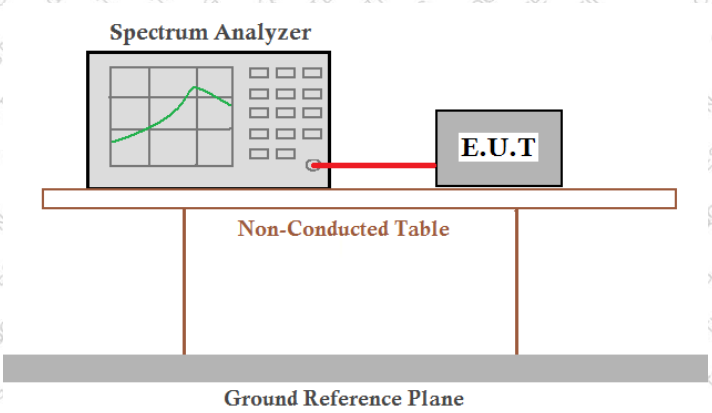
6.1 Applicable Standard

FCC Part15 E Section 15.407

6.2 Limit

N/A

6.3 Test setup



6.4 Test Procedure

According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.

6.5 Test Data

Temperature	22 ℃	Humidity	50%
ATM Pressure	101.1kPa	Antenna Gain	2.5dBi
Test by	LBi Li	Test result	PASS

Please refer to following table and plots.

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Measurement Data:

Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	99% OBW (MHz)	Verdict
802.11a	5180	Ant1	29.433	16.423	Pass
	5200	Ant1	28.935	16.348	Pass
	5240	Ant1	29.511	16.396	Pass
802.11n20	5180	Ant1	29.973	17.506	Pass
	5200	Ant1	28.887	17.446	Pass
	5240	Ant1	29.844	17.494	Pass

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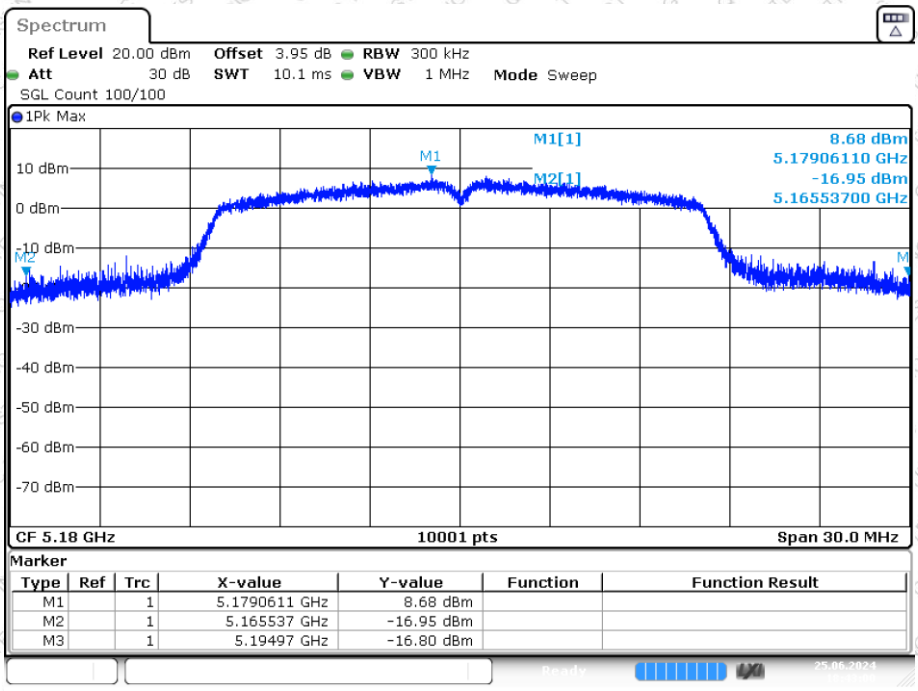
-26dB Bandwidth NVNT a 5180MHz Ant1



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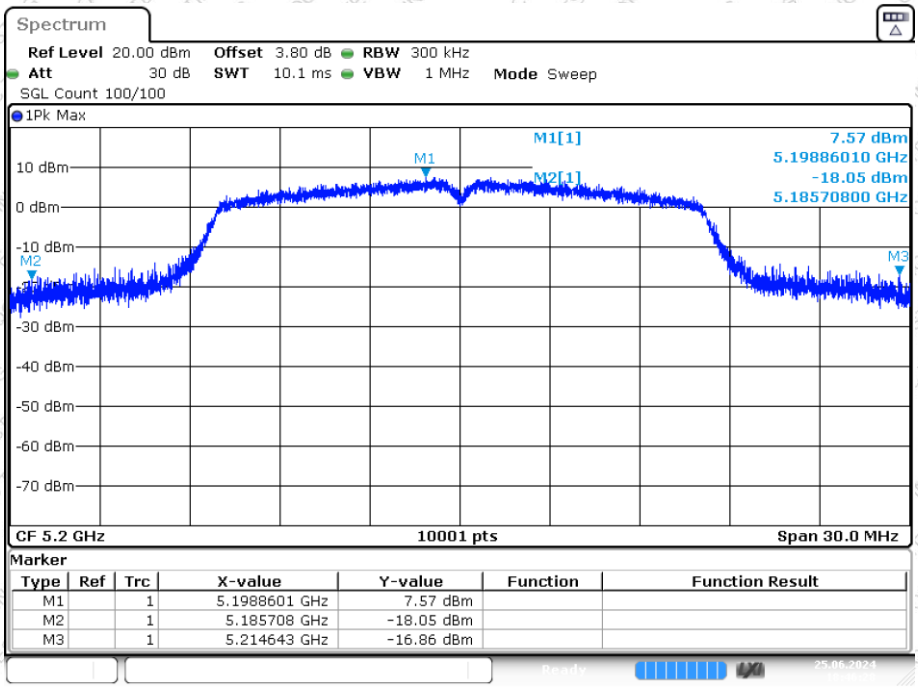
-26dB Bandwidth NVNT a 5200MHz Ant1



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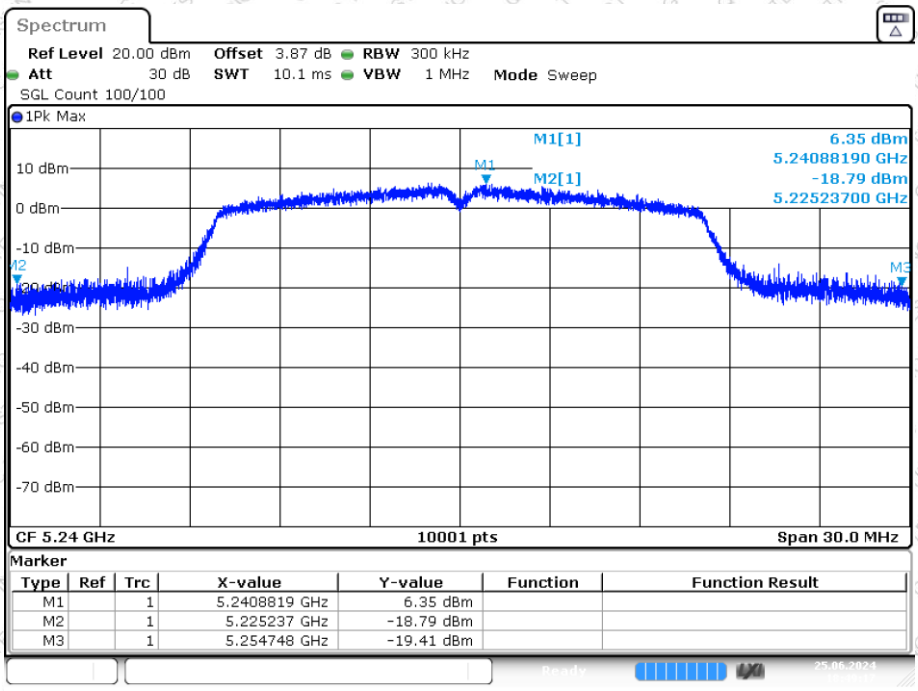
-26dB Bandwidth NVNT a 5240MHz Ant1



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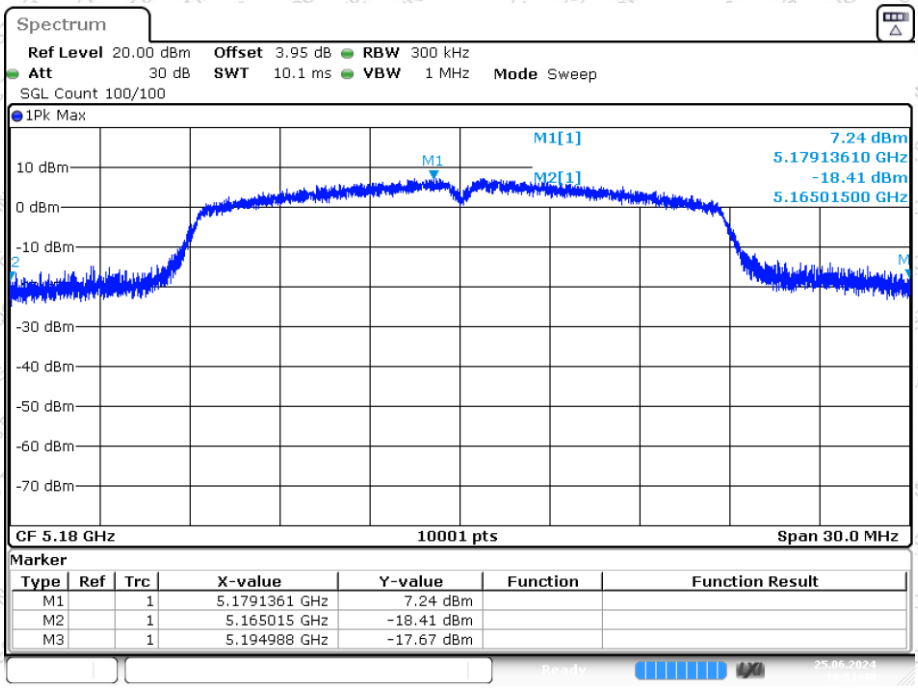
-26dB Bandwidth NVNT n20 5180MHz Ant1



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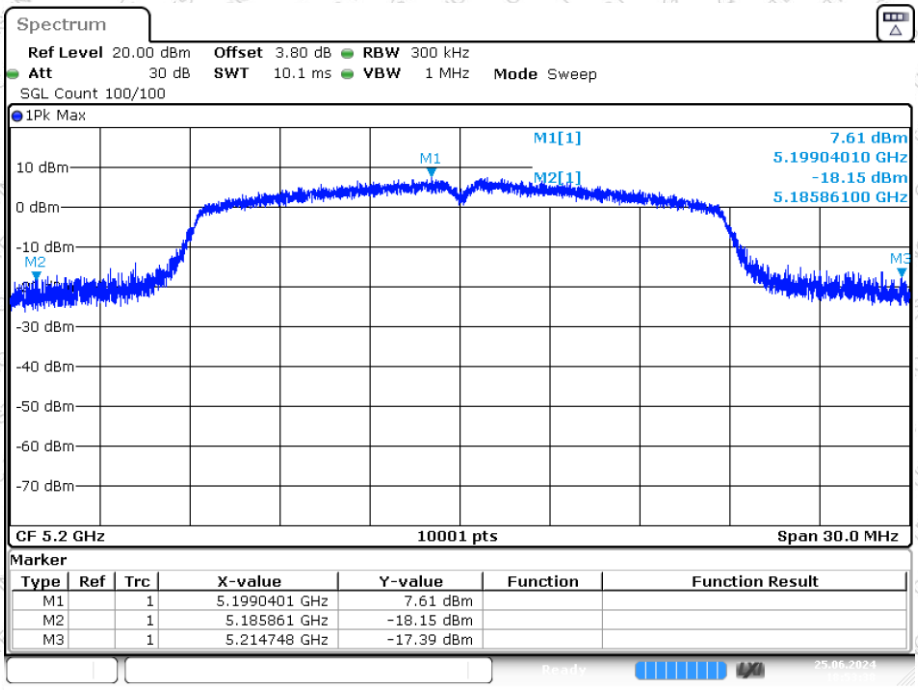
-26dB Bandwidth NVNT n20 5200MHz Ant1



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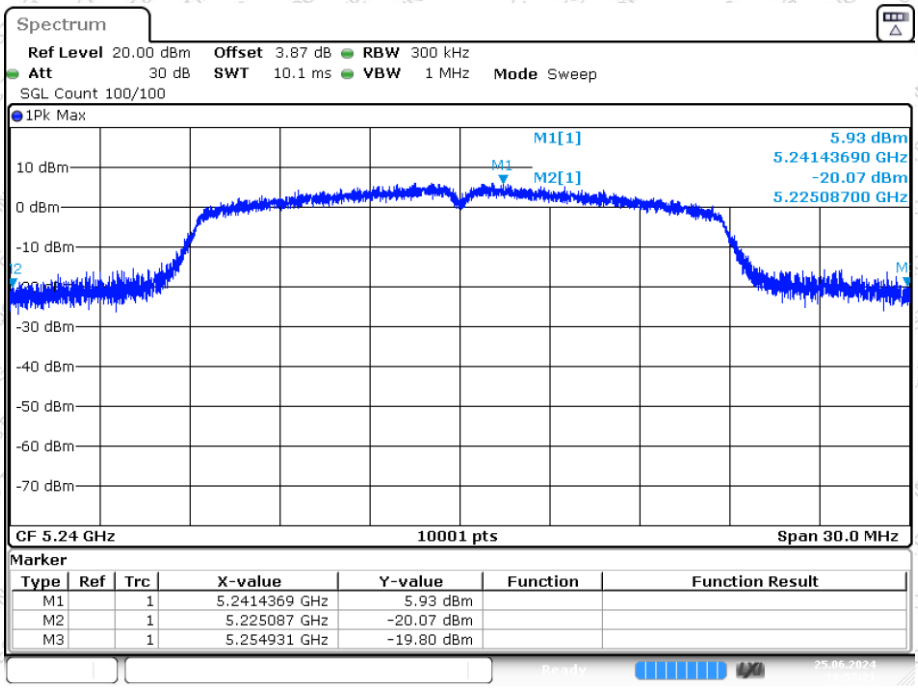
-26dB Bandwidth NVNT n20 5240MHz Ant1



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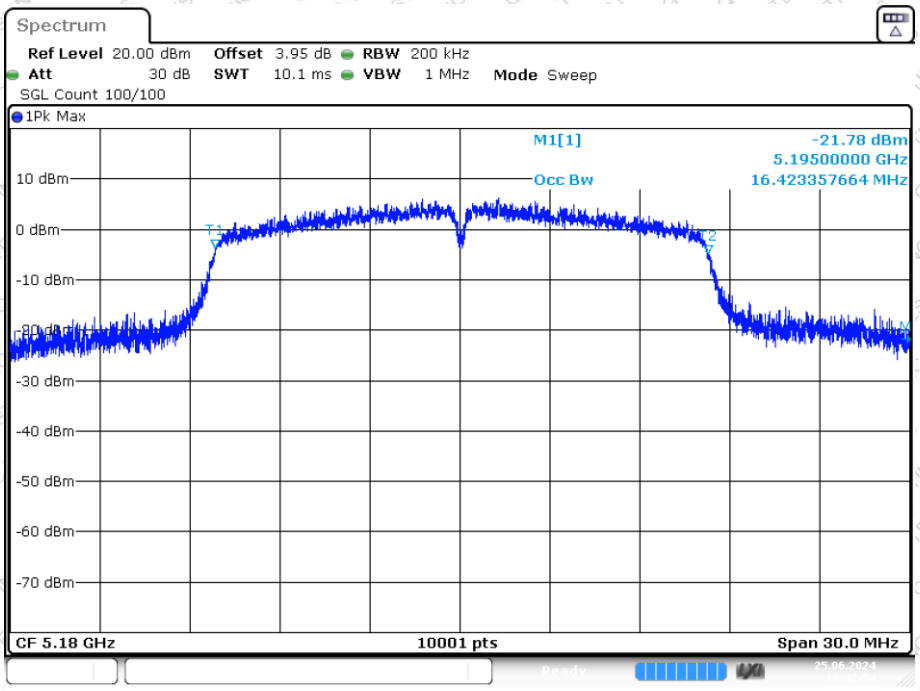
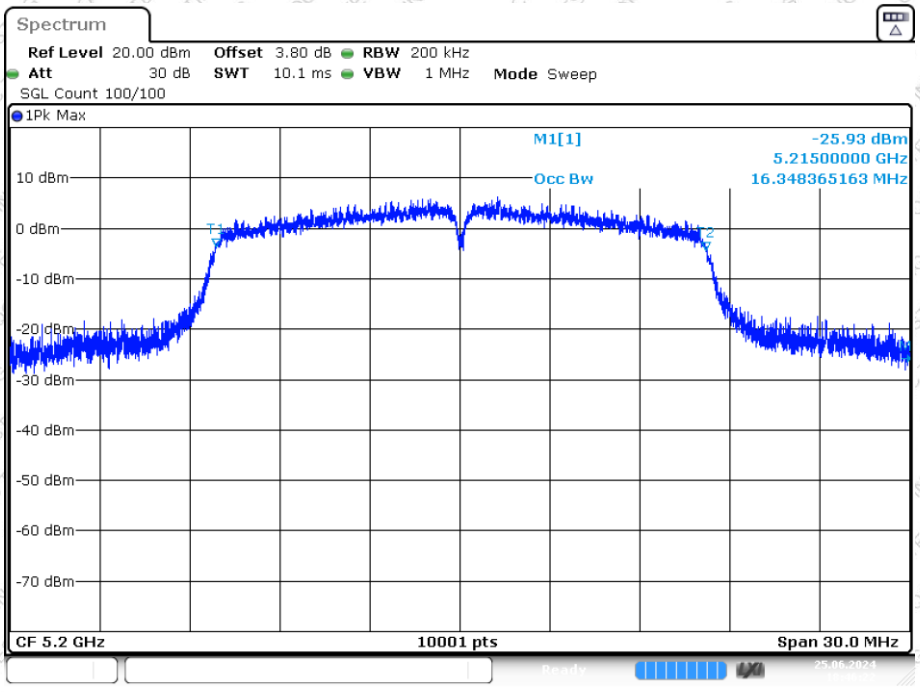
OBW NVNT a 5180MHz Ant1



OBW NVNT a 5200MHz Ant1



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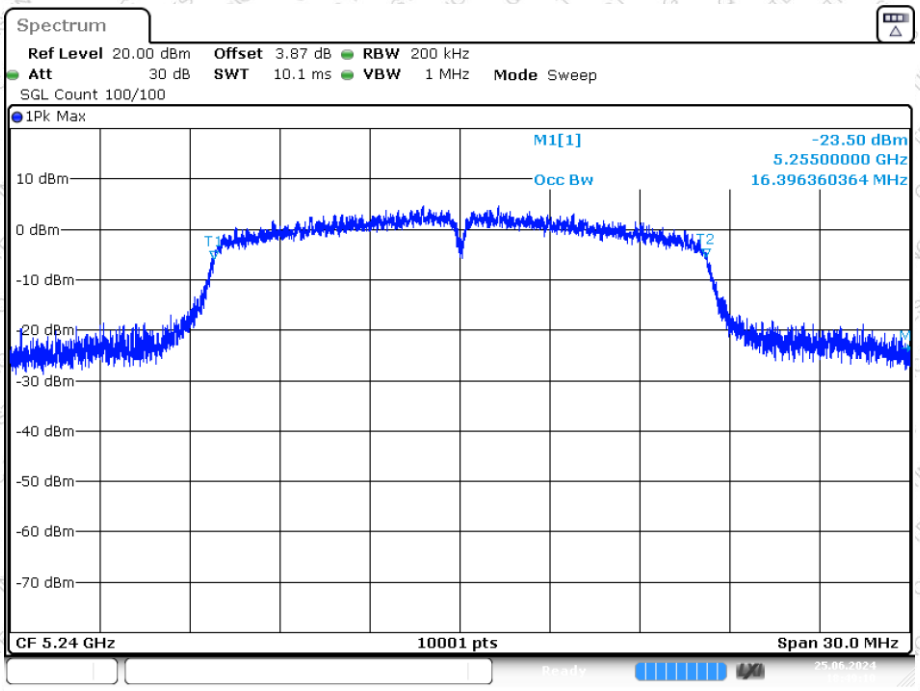
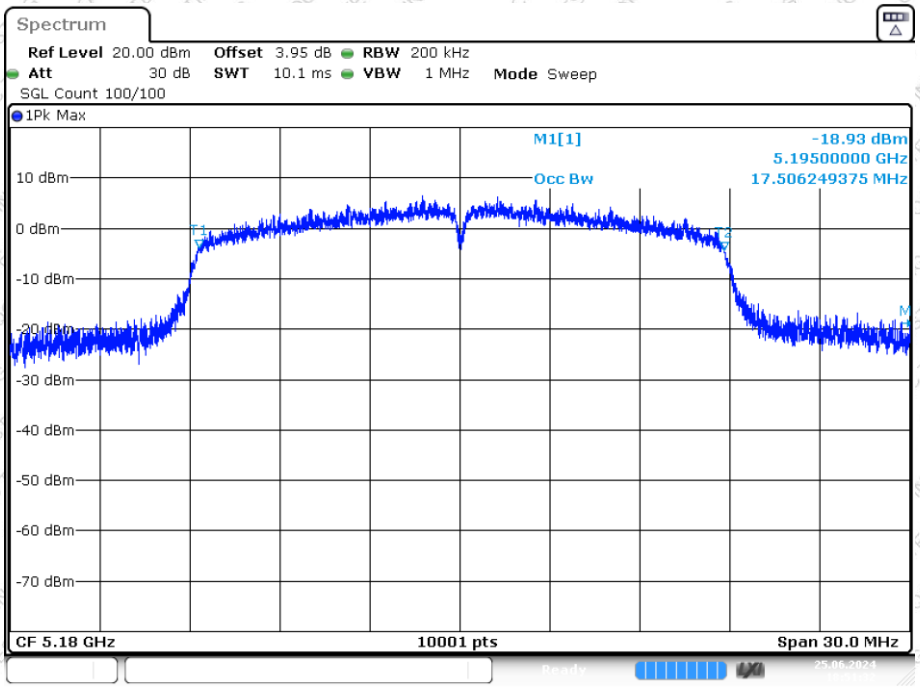
OBW NVNT a 5240MHz Ant1



Date: 25.JUN.2024 18:49:11

OBW NVNT n20 5180MHz Ant1



Date: 25.JUN.2024 18:51:33

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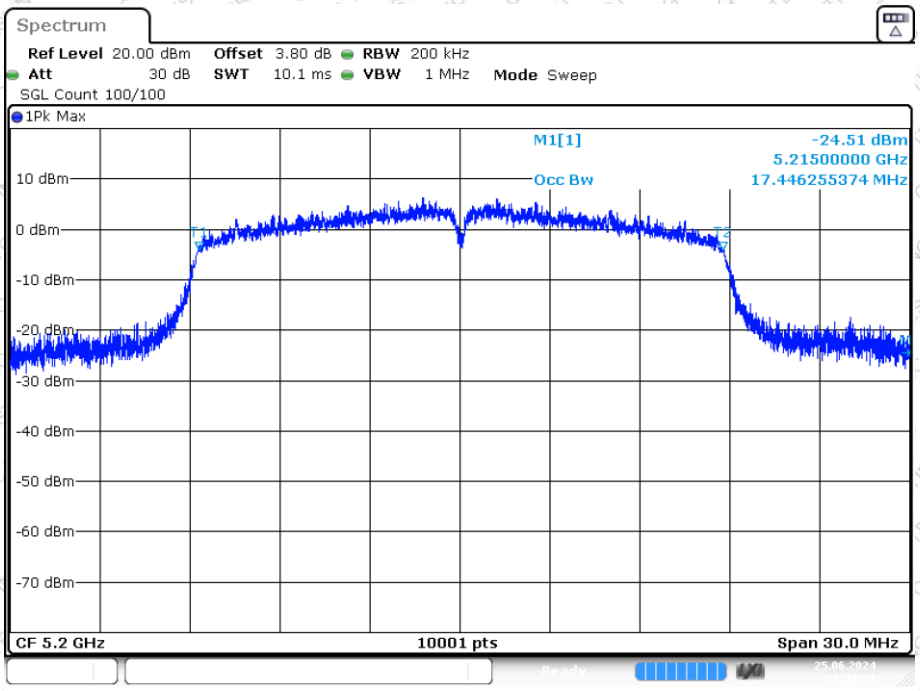
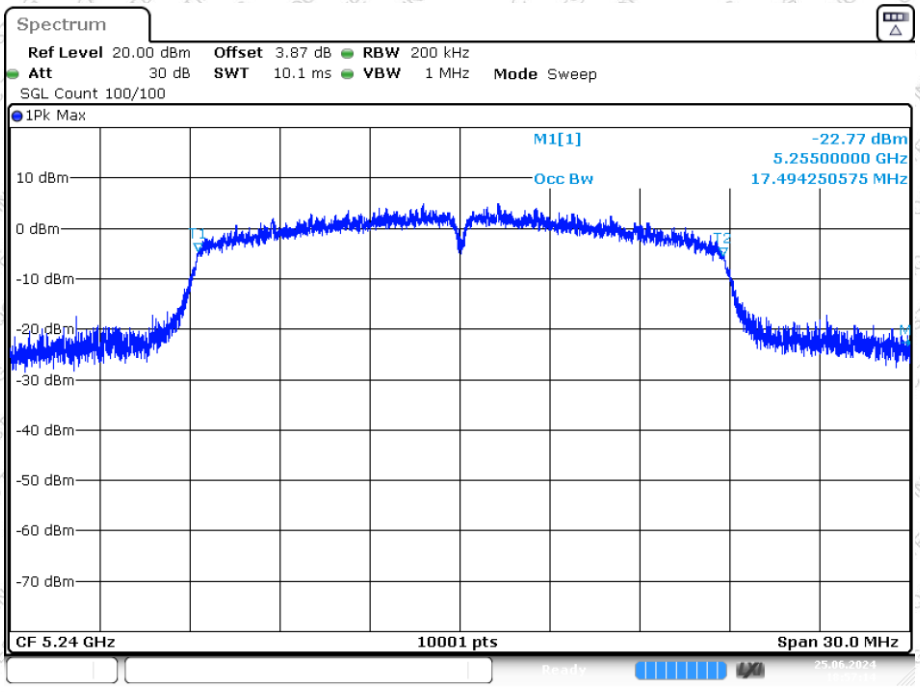
OBW NVNT n20 5200MHz Ant1



OBW NVNT n20 5240MHz Ant1



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7. Conducted Transmitter Output Power

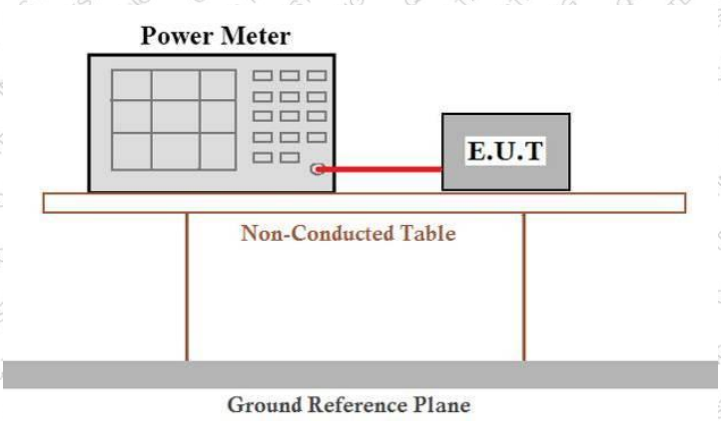
7.1 Applicable Standard

FCC Part15 E Section 15.407

7.2 Limit

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.3 Test setup



7.4 Test Procedure

Measurement using an RF average power meter

(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied

a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle.

b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.

c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B).

(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

(iv) Adjust the measurement in dBm by adding 10 log(1/x) where x is the duty cycle (e.g., 10log(1/0.25) if the duty cycle is 25 percent).

7.5 Test Data

Temperature	22 ℃	Humidity	50%
ATM Pressure	101.1kPa	Antenna Gain	2.5dBi
Test by	LBi Li	Test result	PASS

Please refer to following table and plots.

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Measurement Data

Duty Cycle:

Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
802.11a	5180	Ant1	73.16	1.36
	5200	Ant1	85.55	0.68
	5240	Ant1	87.33	0.59
802.11n20	5180	Ant1	84.59	0.73
	5200	Ant1	86.47	0.63
	5240	Ant1	88.82	0.51

Note: Duty Factor = 10 log (1/Duty Cycle)

Maximum Conducted Output Power

Mode	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle (%)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
802.11a	5180	14.17	73.16	1.36	15.53	24	Pass
	5200	14.31	85.55	0.68	14.99	24	Pass
	5240	13.05	87.33	0.59	13.64	24	Pass
802.11n20	5180	14.42	84.59	0.73	15.15	24	Pass
	5200	14.36	86.47	0.63	14.99	24	Pass
	5240	13.08	88.82	0.51	13.59	24	Pass

Note: Output Power = Measured Power + Duty Factor

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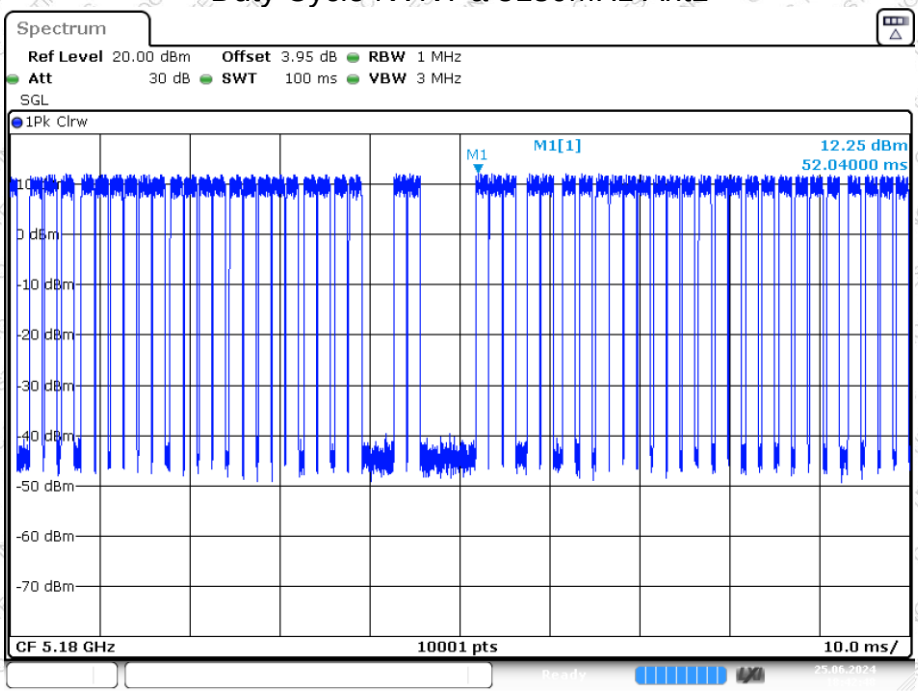
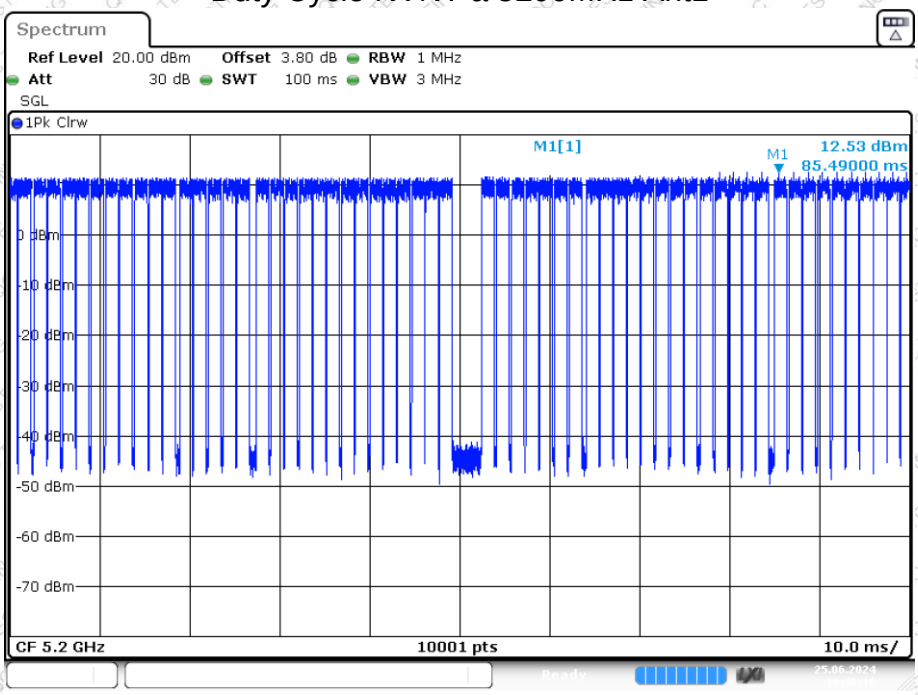
Test plots as followed:

Duty Cycle NVNT a 5180MHz Ant1



Date: 25.JUN.2024 18:42:48

Duty Cycle NVNT a 5200MHz Ant1



Date: 25.JUN.2024 18:46:17

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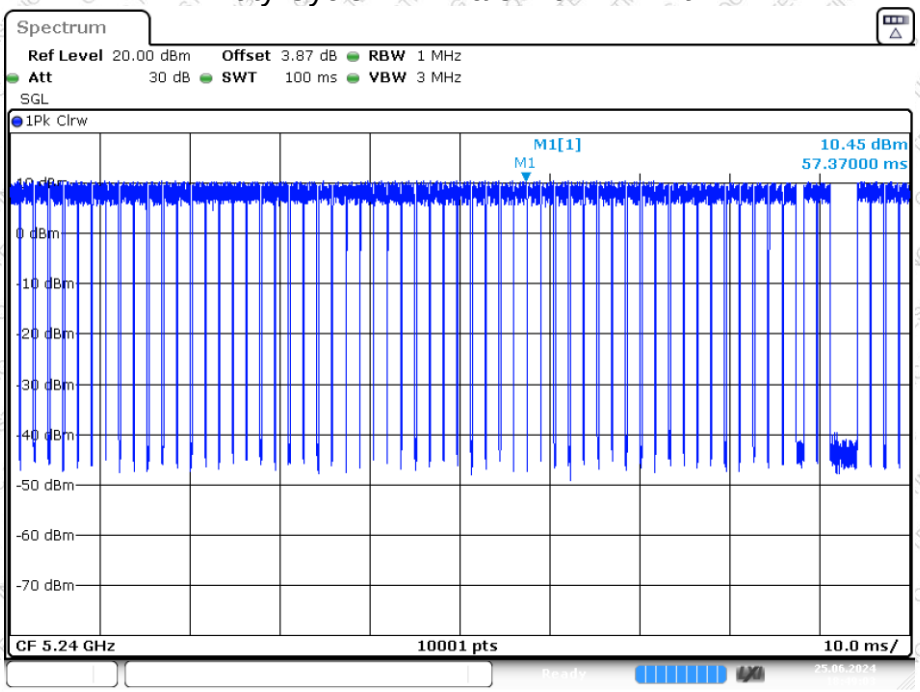
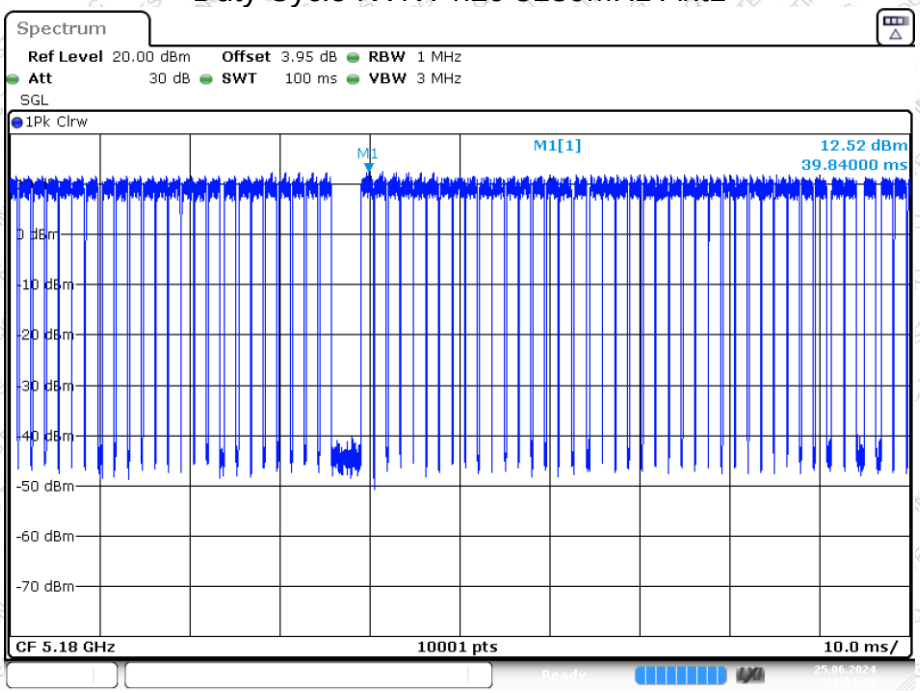
Duty Cycle NVNT a 5240MHz Ant1



Date: 25.JUN.2024 18:49:04

Duty Cycle NVNT n20 5180MHz Ant1



Date: 25.JUN.2024 18:51:26

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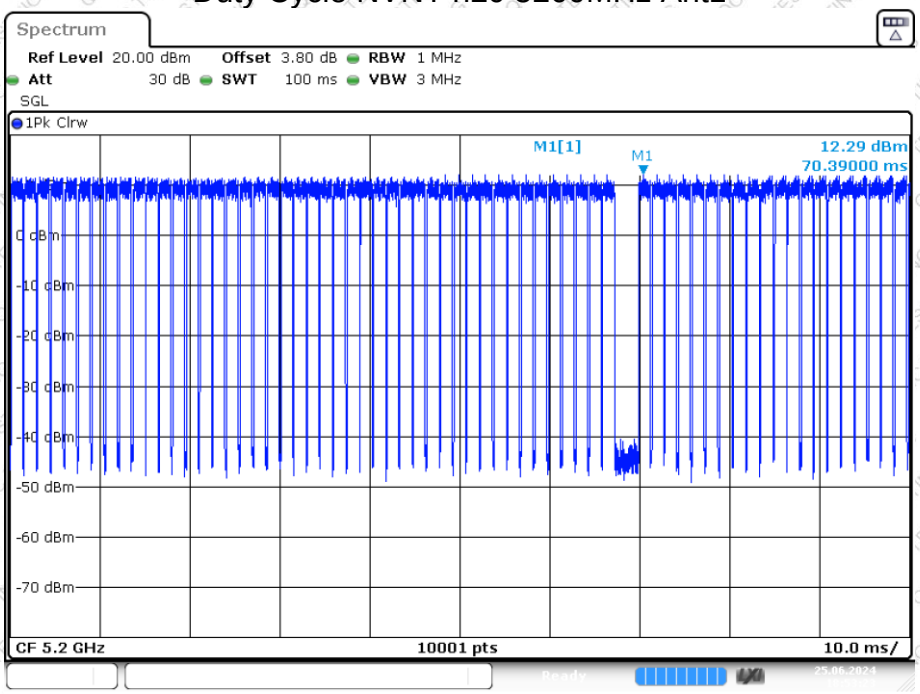
Duty Cycle NVNT n20 5200MHz Ant1



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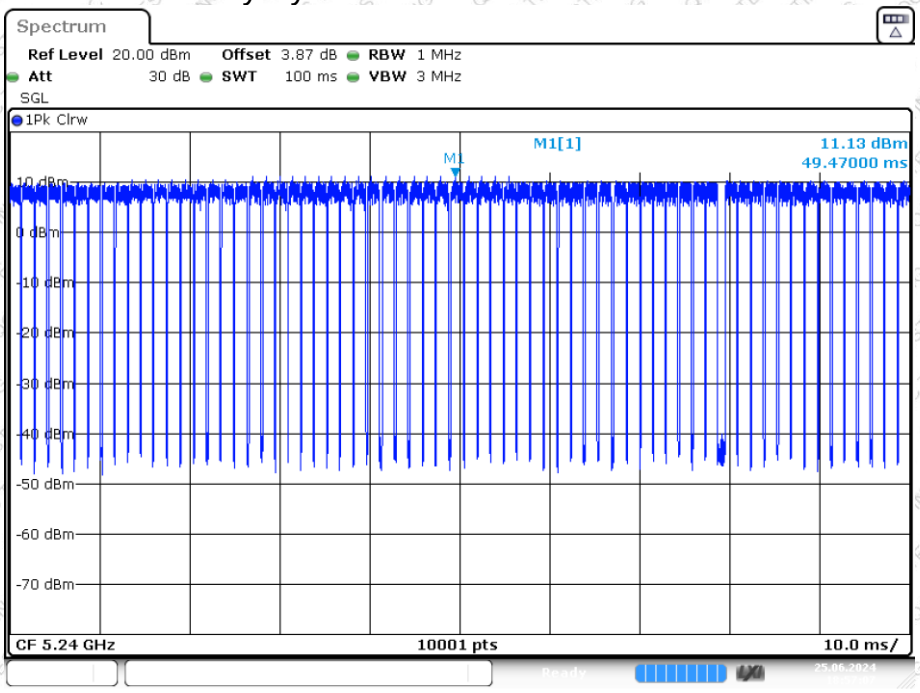
Duty Cycle NVNT n20 5240MHz Ant1



Date: 25.JUN.2024 18:57:07

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8. Power Spectral Density

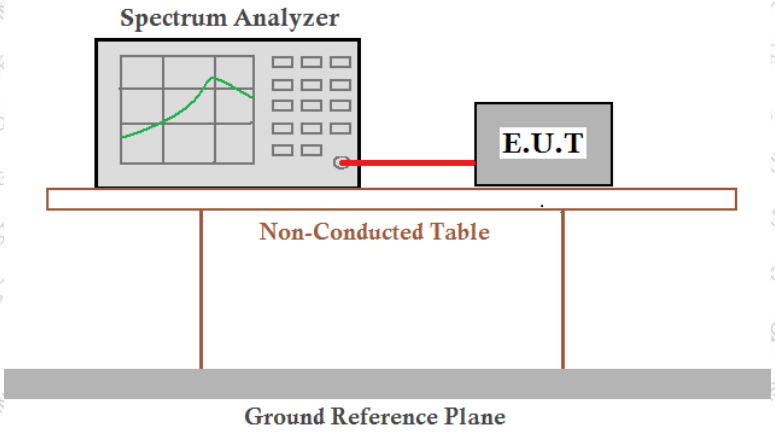
8.1 Applicable Standard

FCC Part15 E Section 15.407

8.2 Limit

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.3 Test setup



8.4 Test Procedure

i. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”.

ii. Use the peak search function on the instrument to find the peak of the spectrum.

iii. Make the following adjustments to the peak value of the spectrum, if applicable:

iv. a) If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.

v. b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

vi. The result is the PSD.

8.5 Test Data

Temperature	22 ℃	Humidity	50%
ATM Pressure	101.1kPa	Antenna Gain	2.5dBi
Test by	LBi Li	Test result	PASS

Please refer to following table and plots.

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Mode	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Cycle (%)	Duty Factor (dB)	PSD (dBm/MHz)	Limit (dBm)	Verdict
802.11a	5180	4.69	73.16	1.36	6.05	11	Pass
	5200	5.07	85.55	0.68	5.75	11	Pass
	5240	3.82	87.33	0.59	4.41	11	Pass
802.11n20	5180	4.96	84.59	0.73	5.69	11	Pass
	5200	4.96	86.47	0.63	5.59	11	Pass
	5240	3.61	88.82	0.51	4.13	11	Pass

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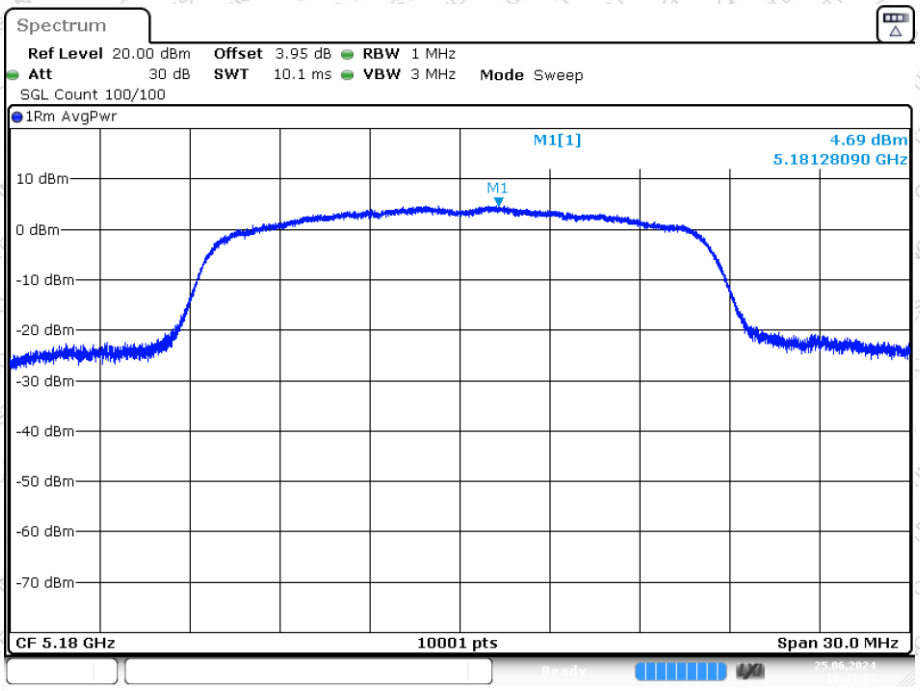
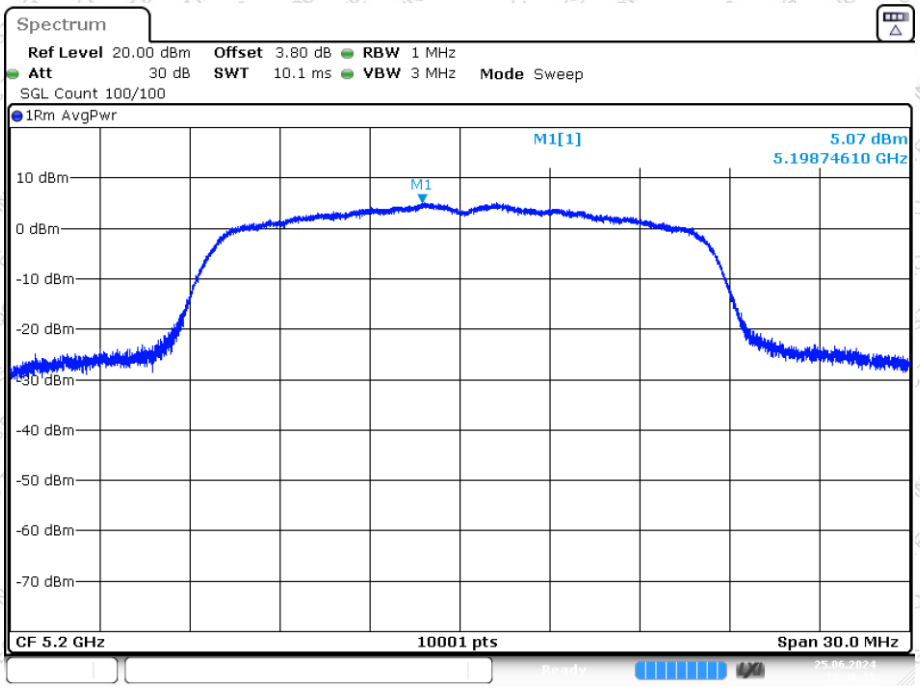
PSD NVNT a 5180MHz Ant1



PSD NVNT a 5200MHz Ant1



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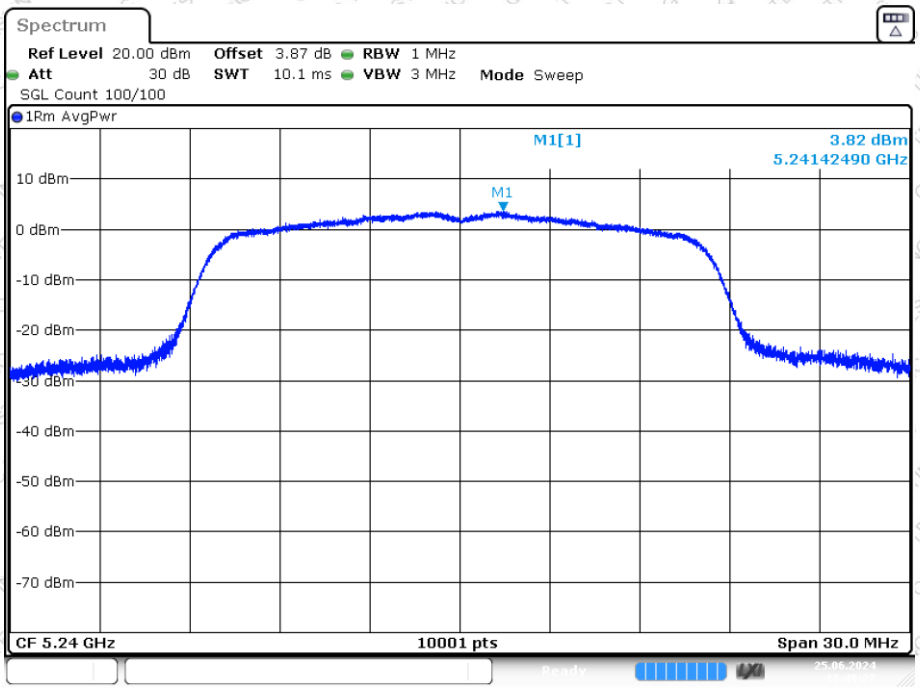
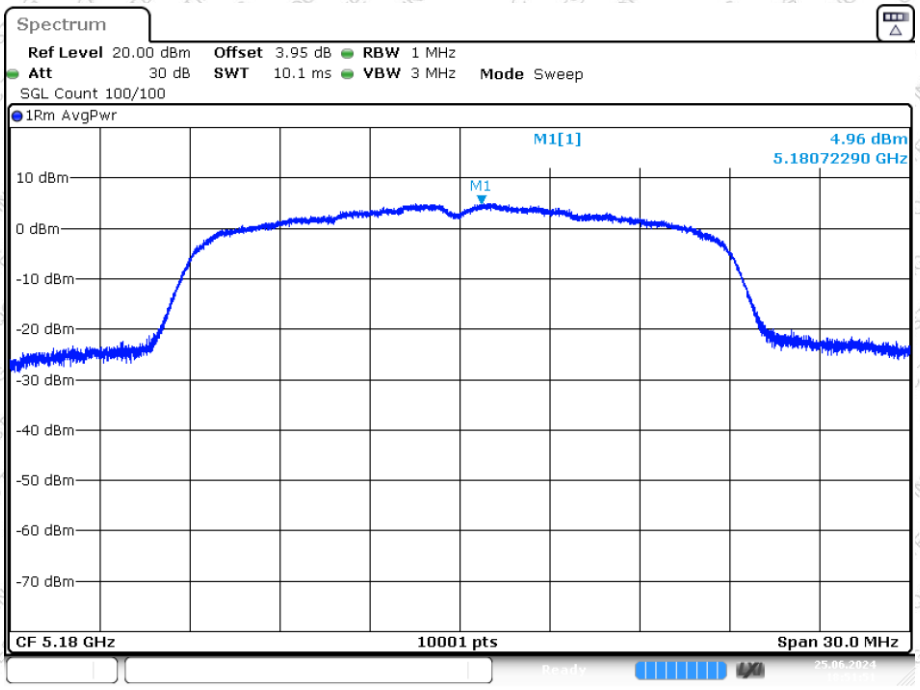
PSD NVNT a 5240MHz Ant1



Date: 25.JUN.2024 18:49:27

PSD NVNT n20 5180MHz Ant1



Date: 25.JUN.2024 18:51:51

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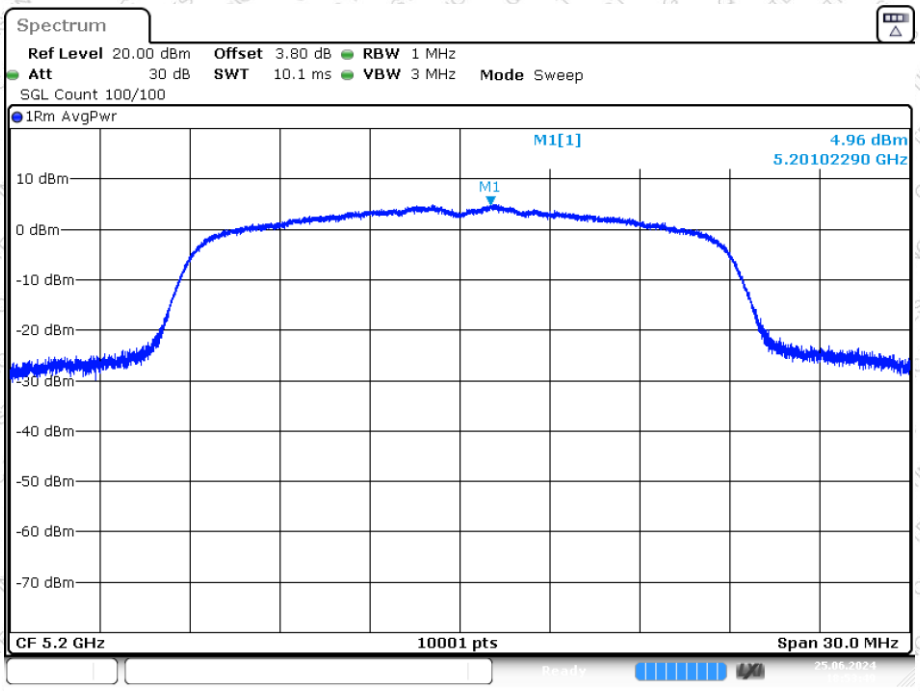
PSD NVNT n20 5200MHz Ant1



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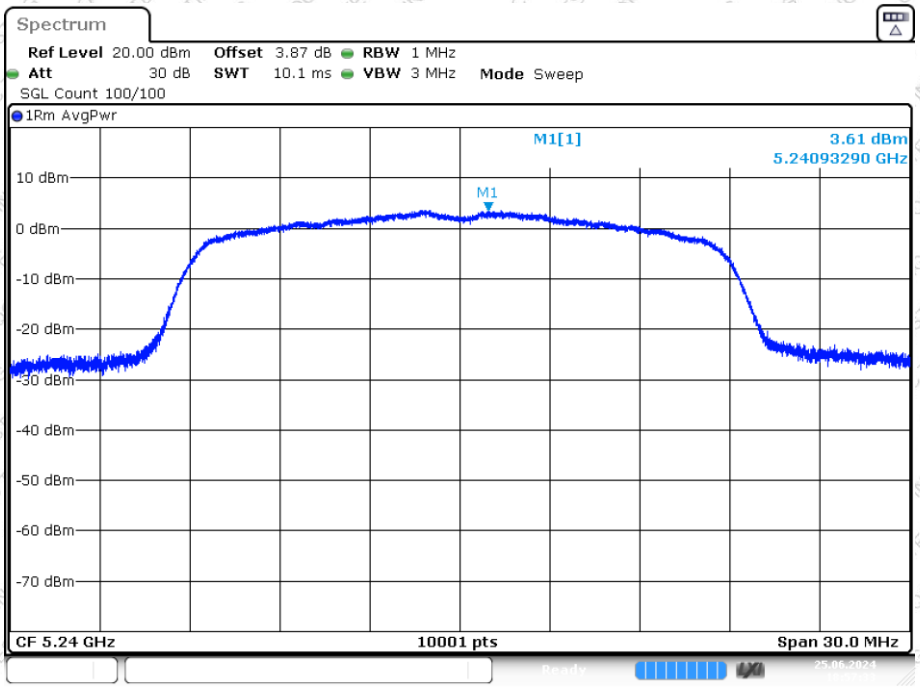

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9. Band Edge

9.1 Applicable Standard

FCC Part15 E Section 15.407 and 5.205

9.2 Limit

Undesirable emission limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

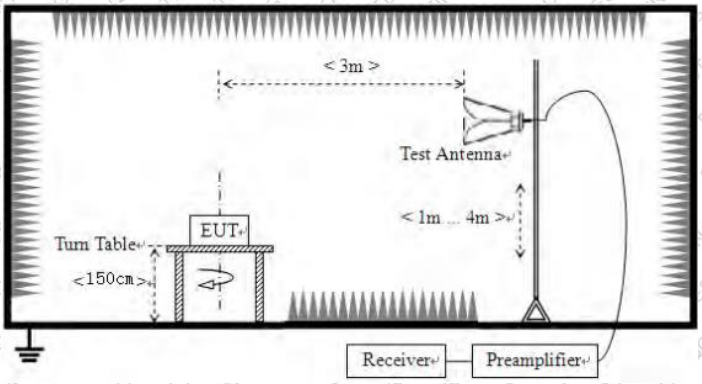
(3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.

9.3 EMI Test Receiver Setup

Frequency	RBW	VBW	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10 Hz Note 1	/	Average
1MHz	1MHz	＞1/T Note 2	/	Average

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 98%

9.4 Test setup



9.5 Test Procedure

a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

9.6 Test Data

Temperature	26 ℃	Humidity	54%
ATM Pressure	101.1kPa	Antenna Gain	2.5dBi
Test by	LBi Li	Test result	PASS

Test Voltage: AC 120V/60Hz

According to KDB 789033 D02 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:
E[dBuV/m] = EIRP[dBm] + 95.2;
For example, if EIRP = -27dBm
E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
a Low Channel							
5150	70.98	H	-4.70	66.28	68.2	1.92	peak
5150	67.49	V	-4.74	62.75	68.2	5.45	peak
a High Channel							
5350	50.49	H	-4.15	46.34	68.2	21.86	peak
5350	49.88	V	-4.11	45.77	68.2	22.43	peak
n20 Low Channel							
5150	70.23	H	-4.70	65.53	68.2	2.67	peak
5150	67.52	V	-4.74	62.78	68.2	5.42	peak
n20 High Channel							
5350	51.24	H	-4.15	47.09	68.2	21.11	peak
5350	50.05	V	-4.11	45.94	68.2	22.26	peak

Remarks:

1. Level =Receiver Read level + Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

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10. Radiated Emission Method

10.1 Applicable Standard

FCC Part15 C Section 15.209 and 15.205

10.2 Limit

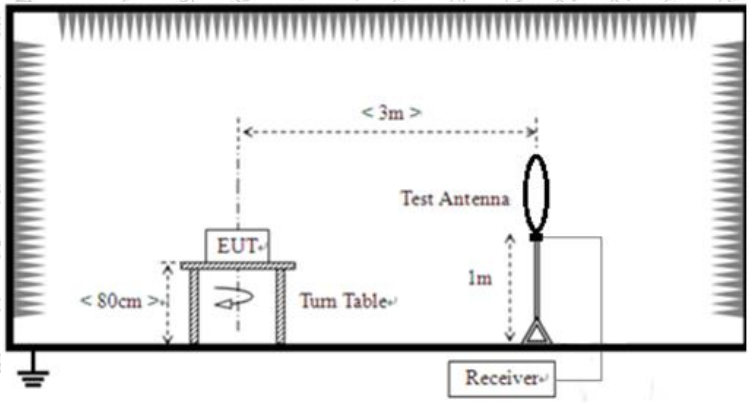
Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	30m
1.705MHz-30MHz	30	QP	30m

Frequency	Field Strengths Limits (μV/m at 3 m)	Field Strengths Limits (dBμV/m at 3 m)	Remark
30 – 88	100	40.0	Quasi-peak
88 – 216	150	43.5	Quasi-peak
216 – 960	200	46.0	Quasi-peak
Above 960	500	54.0	Quasi-peak
Above 1GHz	/	54.0	Peak
		74.0	Average

Note: dBμV/m =20log(μV/m)

10.3 Test setup

For radiated emissions from 9kHz to 30MHz



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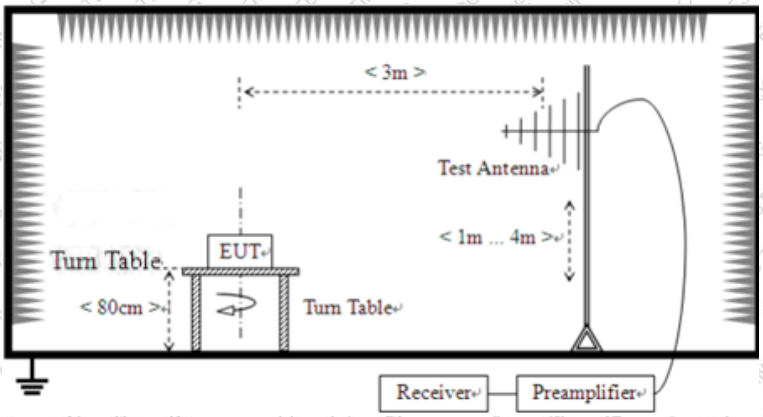
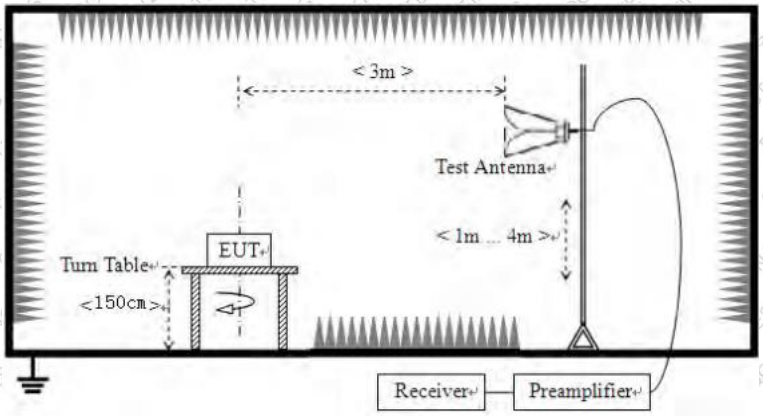
For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



10.4 EMI Test Receiver Setup

Frequency	RBW	VBW	IF B/W	Measurement
9KHz-150KHz	200Hz	600Hz	/	QP
150KHz-30MHz	9KHz	30KHz	/	QP
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10 Hz Note 1	/	Average
1MHz	1MHz	＞1/T Note 2	/	Average

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 98%
Remark: For the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission test in these three bands are based on measurements employing an average detector.

10.5 Test procedure

- The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

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- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

10.6 Test Data

Temperature	26 ℃	Humidity	54%
ATM Pressure	101.1kPa	Antenna Gain	2.5dBi
Test by	LBi Li	Test result	PASS

Test Voltage: AC 120V/60Hz

Remarks:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.
2. The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

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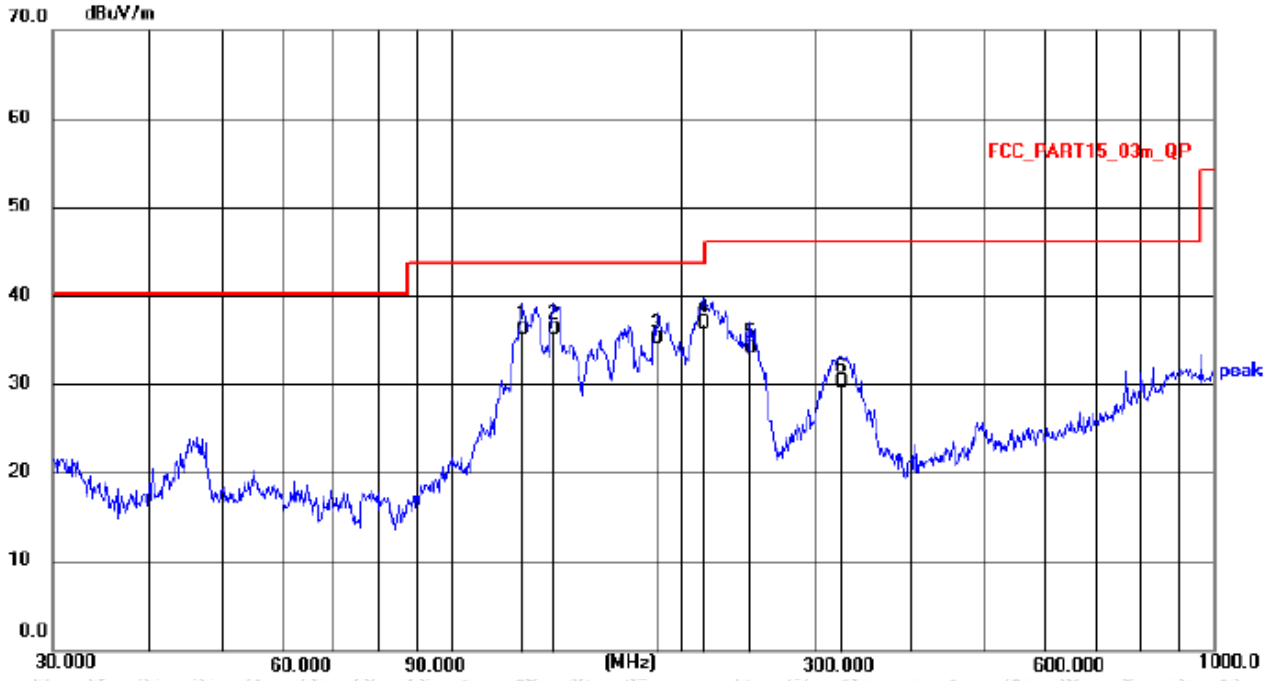
Below 1GHz

Pre-scan all test modes, found worst case at 802.11a mode 5180MHz, and so only show the test result of 802.11a mode 5180MHz

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	124.1329	22.46	13.70	36.16	43.50	7.34	QP
2	135.9821	21.83	14.23	36.06	43.50	7.44	QP
3	186.4404	22.94	12.08	35.02	43.50	8.48	QP
4 *	213.7632	24.74	12.02	36.76	43.50	6.74	QP
5	246.8146	20.72	13.34	34.06	46.00	11.94	QP
6	324.4560	14.86	15.35	30.21	46.00	15.79	QP

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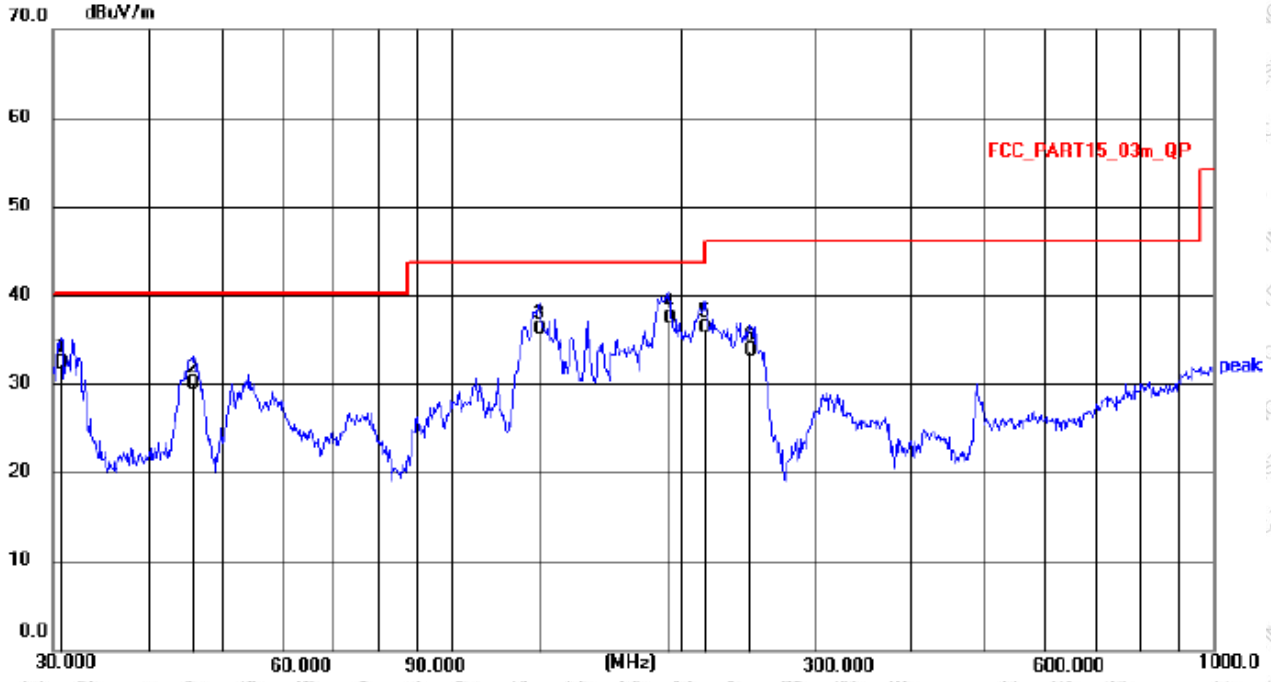
Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.7454	19.70	12.58	32.28	40.00	7.72	QP
2	45.8551	15.58	14.50	30.08	40.00	9.92	QP
3	130.3788	22.46	13.73	36.19	43.50	7.31	QP
4 *	193.0944	25.91	11.41	37.32	43.50	6.18	QP
5	215.2675	24.49	11.87	36.36	43.50	7.14	QP
6	245.9507	20.35	13.35	33.70	46.00	12.30	QP

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Above 1GHz

Frequency (MHz)	Read Level (dBμV)	polarization	Factor (dB/m)	Level (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)	Detector
a Low Channel							
10360	41.80	H	5.15	46.95	68.2	21.25	peak
10360	40.56	V	5.01	45.57	68.2	22.63	peak
a Middle Channel							
10400	43.02	H	5.42	48.44	68.2	19.76	peak
10400	42.16	V	5.28	47.44	68.2	20.76	peak
a High Channel							
10480	41.47	H	5.54	47.01	68.2	21.19	peak
10480	43.21	V	5.40	48.61	68.2	19.59	peak
n20 Low Channel							
10360	43.30	H	5.15	48.45	68.2	19.75	peak
10360	42.56	V	5.01	47.57	68.2	20.63	peak
n20 Middle Channel							
10400	43.52	H	5.42	48.94	68.2	19.26	peak
10400	44.16	V	5.28	49.44	68.2	18.76	peak
n20 High Channel							
10480	41.38	H	5.54	46.92	68.2	21.28	peak
10480	42.21	V	5.40	47.61	68.2	20.59	peak

Remarks:

3. Level =Receiver Read level + Factor
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

---------- THE END OF TEST REPORT ----------

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