



Report No.: TW2404282-01E

Applicant: Dongguan ULT-unite Electronic Technology Co., Ltd.

Product: 4K Wireless HDMI Transmitter and Receiver

Model No.: 6011-01001, 6011-01002, 6011-01003, 6011-01004,
6011-01005, 6011-01006, 6011-01007, 6011-01008,
6011-01009

Trademark: N/A

Test Standards: FCC Part 15 Subpart E, Paragraph 15.407

Test Result: It is herewith confirmed and found to comply with the requirements set up by ANSI C63.10, FCC Part 15 Subpart C, Paragraph 15.247 for the evaluation of electromagnetic compatibility

Approved By

Terry Tang

Terry Tang

Manager

Dated: June 12, 2024

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com



Special Statement:

FCC-Registration No.: 744189

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 744189.

Industry Canada (IC) —Registration No.:5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

A2LA (Certification Number:5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

CAB identifier: CN0033

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Test Report Conclusion

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1.0 General Details

1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TESTING LABORATORIES.
Address: Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China
Telephone: (755) 83448688
Fax: (755) 83442996
Site Listed with Federal Communications commission (FCC)
Registration Number: 744189
For 3m Anechoic Chamber
Site Listed with Industry Canada of Ottawa, Canada
Registration Number: IC: 5205A-02
For 3m Anechoic Chamber

1.2 Applicant Details

Applicant: Dongguan ULT-unite Electronic Technology Co., Ltd.
Address: No. 6 Yinkeng Road, Shangyuan Village, Qingxi Town, Dongguan City, Guangdong Province 523640, China

1.3 Description of EUT

Product: 4K Wireless HDMI Transmitter and Receiver
Manufacturer: Dongguan ULT-unite Electronic Technology Co., Ltd.
Address: No. 6 Yinkeng Road, Shangyuan Village, Qingxi Town, Dongguan City, Guangdong Province 523640, China
Trademark: N/A
Additional Trademark: N/A
Model Number: 6011-01001
Hardware Version: V01
Software Version: 16249000
Serial No.: L20240318
Additional Model Number: 6011-01002, 6011-01003, 6011-01004, 6011-01005, 6011-01006, 6011-01007, 6011-01008, 6011-01009
Type of Modulation IEEE 802.11a/n (HT20): OFDM (64QAM, 16QAM, QPSK, BPSK)
Frequency Band 1: 5180MHz-5240MHz
Channel Separation 802.11a/802.11n20:20MHz
Air Data Rate IEEE 802.11a: 54, 48, 36, 24, 18, 12, 9, 6 Mbps
IEEE 802.11n/HT20: mcs0~ mcs7: Up to 72.2Mbps
Antenna: Dipole antenna used with revers polarity antenna connector
Antenna Gain: 3.76dBi. (Get from the antenna specification)
Test Mode: During testing, EUT was set to 100% duty cycle. 6Mbps air data rate was the worst case

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for 802.11a mode; mcs0 air data rate was the worst case for 802.11n mode;

Frequency Selection By software

Rating: DC5V, 1A Max

Each Channel Operation Frequency

Band 1	
802.11a / 11n HT20 / 802.11ac VHT20	
Channel	Frequency
36	5180MHz
40	5200 MHz
44	5220 MHz
48	5240 MHz

The selected test channels as follows:

Band 1	
802.11a / 11n HT20	
Channel	Frequency
36	5180MHz
40	5200 MHz
48	5240 MHz

1.4 Submitted Sample: 2 Samples

1.5 Test Duration

2024-04-20 to 2024-06-12

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

Andy Xing

The sample tested by _____

Print Name: Andy Xing

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2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2023-07-14	2024-07-13
LISN	R&S	EZH3-Z5	100294	2023-07-14	2024-07-13
LISN	R&S	EZH3-Z5	100253	2023-07-14	2024-07-13
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2023-07-14	2024-07-13
Loop Antenna	EMCO	6507	00078608	2022-07-18	2025-07-17
Spectrum	R&S	FSIQ26	100292	2023-07-14	2024-07-13
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2022-07-18	2025-07-17
Horn Antenna	R&S	BBHA 9120D	9120D-631	2022-07-18	2024-07-17
Power meter	Anritsu	ML2487A	6K00003613	2023-07-14	2024-07-13
Power sensor	Anritsu	MA2491A	32263	2023-07-14	2024-07-13
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2022-07-18	2025-07-17
9*6*6 Anechoic	--	--	N/A	2022-07-26	2025-07-25
EMI Test Receiver	RS	ESVB	826156/011	2023-07-14	2024-07-13
EMI Test Receiver	RS	ESCS 30	834115/006	2023-07-14	2024-07-13
Spectrum	HP/Agilent	E4407B	MY50441392	2023-07-14	2024-07-13
Spectrum	RS	FSP	1164.4391.38	2023-07-14	2024-07-13
RF Cable	Zhengdi	ZT26-NJ-NJ-8M/FA	--	2023-07-14	2024-07-13
RF Cable	Zhengdi	7m	--	2023-07-14	2024-07-13
Pre-Amplifier	Schwarebeck	BBV9743	#218	2023-07-14	2024-07-13
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2023-07-14	2024-07-13
LISN	SCHAFFNER	NNB42	00012	2023-07-14	2024-07-13
ESPI Test Receiver	R&S	ESPI 3	100379	2023-07-14	2024-07-13
LISN	R&S	EZH3-Z5	100294	2023-07-14	2024-07-13

2.2 Automation Test Software

For Conducted Emission Test

Name	Version
EZ-EMC	Ver.EMC-CON 3A1.1

For Radiated Emissions

Name	Version
EMI Test Software BL410-EV18.91	V18.905
EMI Test Software BL410-EV18.806 High Frequency	V18.06

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3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:			
Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107 & 15.407	Conducted Emission Test	Pass	Complies
FCC Part 15 Subpart E Paragraph 15.407 (b1/4/5/6/7), Part 15.205 and Part 15.209	Undesirable Emission and Restrict band	Pass	Complies
FCC Part 15, Paragraph 15.407 (a1/2/3)	Peak Transmit Power	Pass	Complies
FCC Part 15, Paragraph 15.407 (a)(6)	Peak Power Excursion	Pass	Complies
FCC Part 15, Paragraph 15.407 (a1/2/3)	Peak Power Spectral Density	Pass	Complies
FCC Part 15, Paragraph 15.407(g)	Frequency Stability	Pass	Complies

3.2 Test Standards

FCC Part 15 Subpart & Subpart C, Paragraph 15.247, ANSI C63.10 :2013, ANSI C63.4 :2014
789033 D02 General UNII Test Procedures New Rules v01r04

4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES.

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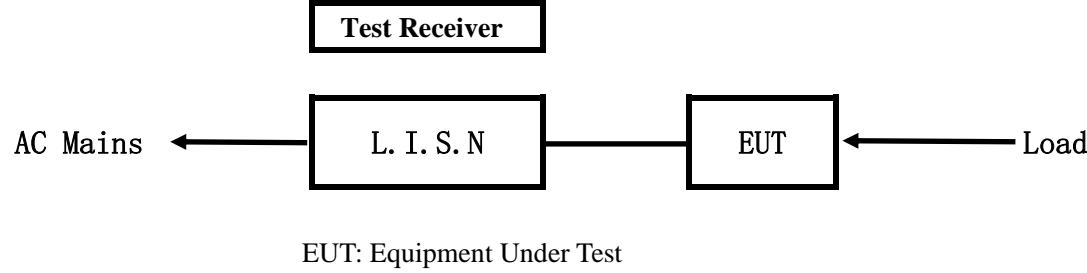
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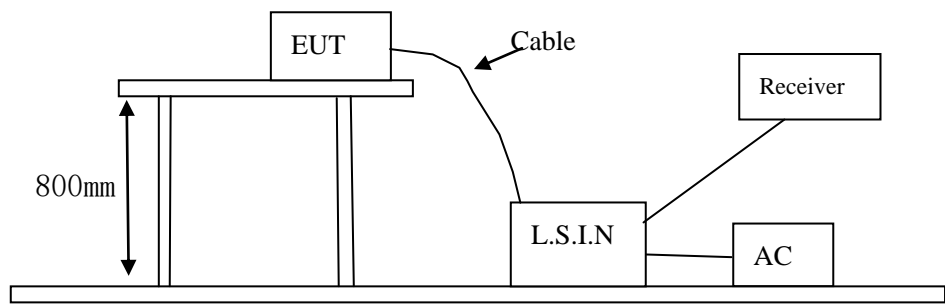
5. Power Line Conducted Emission Test

5.1 Schematics of the test



5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2013. The Frequency spectrum from 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10-2013.
Test Voltage: 120V~, 60Hz
Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model	FCC ID
4K Wireless HDMI Transmitter and Receiver	Dongguan ULT-unite Electronic Technology Co., Ltd.	6011-01001, 6011-01002, 6011-01003, 6011-01004, 6011-01005, 6011-01006, 6011-01007, 6011-01008, 6011-01009	2BGSH-6011-01003

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B. Internal Device

Device	Manufacturer	Model	Rating

C. Peripherals

Device	Manufacturer	Model	Rating
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5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2013.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency (MHz)	Limits (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

- Notes:
- 1. *Decreasing linearly with logarithm of frequency.
 - 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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A: Conducted Emission on Live Terminal (150kHz to 30MHz)

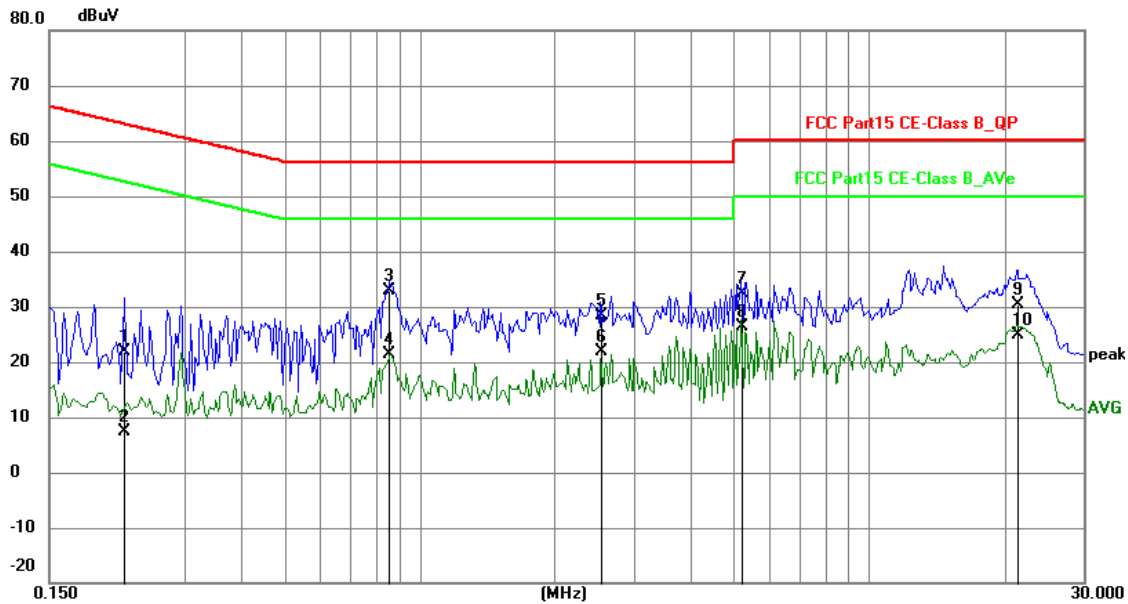
EUT Operating Environment

Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Keeping WIFI Transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2202	12.11	9.75	21.86	62.81	-40.95	QP	P
2	0.2202	-2.26	9.75	7.49	52.81	-45.32	AVG	P
3	0.8559	23.14	9.79	32.93	56.00	-23.07	QP	P
4	0.8559	11.63	9.79	21.42	46.00	-24.58	AVG	P
5	2.5329	18.51	9.82	28.33	56.00	-27.67	QP	P
6	2.5329	12.00	9.82	21.82	46.00	-24.18	AVG	P
7	5.1996	22.51	9.94	32.45	60.00	-27.55	QP	P
8	5.1996	16.54	9.94	26.48	50.00	-23.52	AVG	P
9	21.3495	19.70	10.76	30.46	60.00	-29.54	QP	P
10	21.3495	14.20	10.76	24.96	50.00	-25.04	AVG	P

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B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

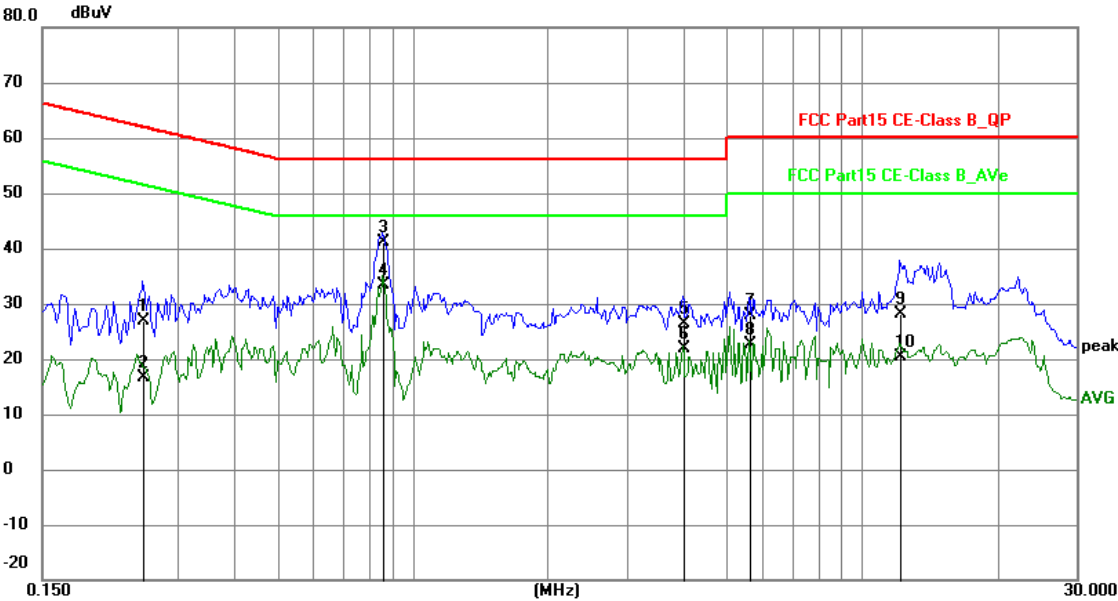
EUT Operating Environment

Temperature: 26℃ Humidity: 65%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Keeping WIFI Transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2514	17.21	9.75	26.96	61.71	-34.75	QP	P
2	0.2514	6.77	9.75	16.52	51.71	-35.19	AVG	P
3	0.8598	31.30	9.79	41.09	56.00	-14.91	QP	P
4	0.8598	23.47	9.79	33.26	46.00	-12.74	AVG	P
5	3.9984	16.50	9.89	26.39	56.00	-29.61	QP	P
6	3.9984	12.00	9.89	21.89	46.00	-24.11	AVG	P
7	5.5974	17.94	9.95	27.89	60.00	-32.11	QP	P
8	5.5974	12.73	9.95	22.68	50.00	-27.32	AVG	P
9	12.1650	17.79	10.26	28.05	60.00	-31.95	QP	P
10	12.1650	10.01	10.26	20.27	50.00	-29.73	AVG	P

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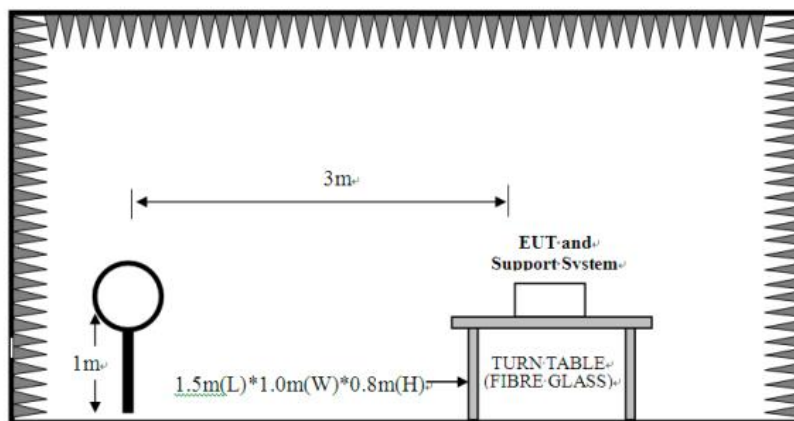
6 Undesirable Emission and Restrict band

6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.
- (3) The frequency spectrum from 30 MHz to 40 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=1MHz, VBW=3MHz and PK detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a “QP” in the data table.
- (6) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup

For radiated emissions from 9kHz to 30MHz



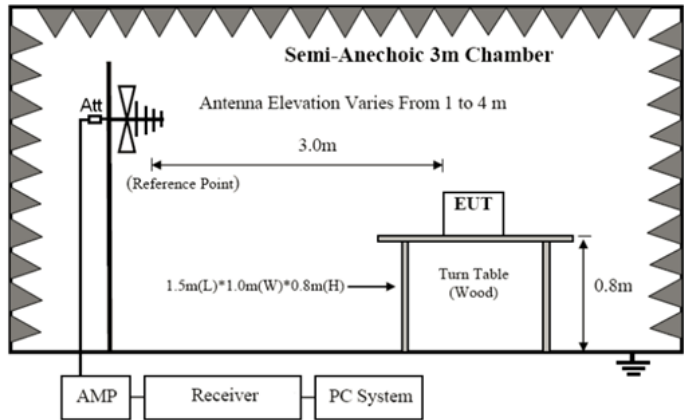
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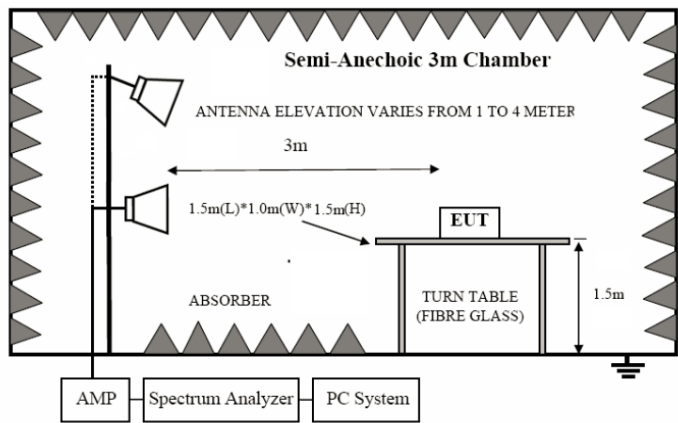
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For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

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Frequencies in restricted band are complied to limit on Paragraph 15.209

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

- (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 -27dBm/MHz
- (2) For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27dBm/MHz.

- Note:
- 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 - 2. In the Above Table, the higher limit applies at the band edges.
 - 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

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Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

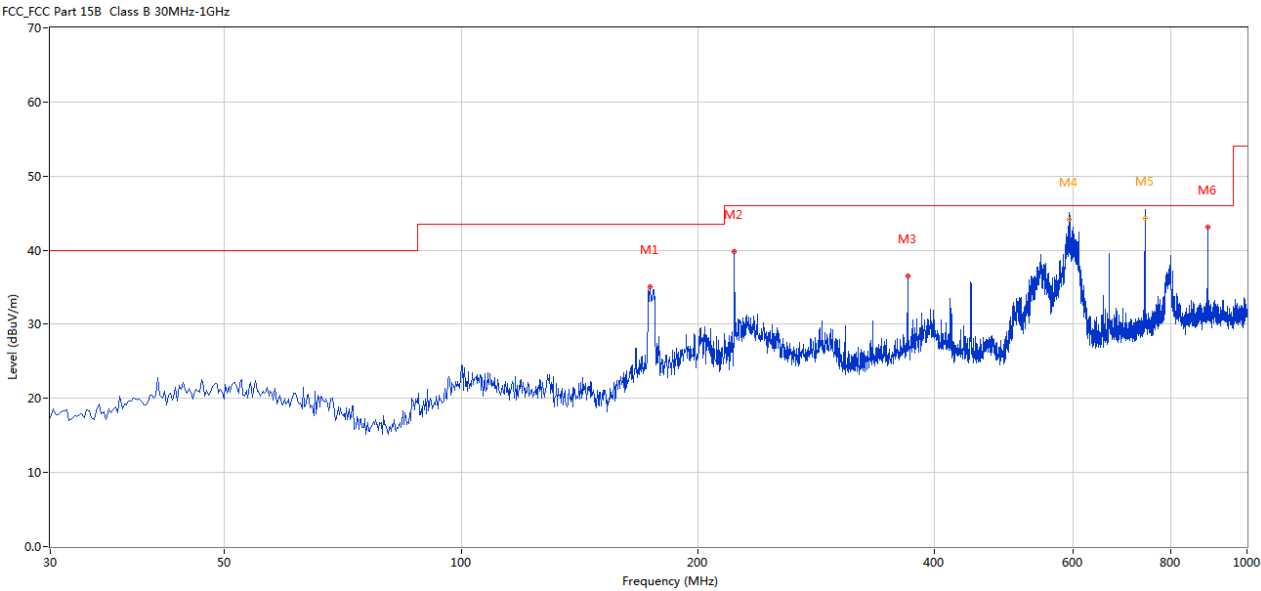
Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keeping WIFI Transmitting

Results: Pass



Test Figure



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	173.767	35.05	-15.88	43.5	8.45	Peak	51.00	100	Horizontal	Pass
2	222.739	39.80	-13.19	46.0	6.20	Peak	120.00	100	Horizontal	Pass
3	369.900	36.51	-9.57	46.0	9.49	Peak	65.00	100	Horizontal	Pass
4*	593.914	44.19	-5.25	46.0	1.81	QP	120.00	100	Horizontal	Pass
5*	741.560	44.27	-3.44	46.0	1.73	QP	27.00	100	Horizontal	Pass
6	890.902	43.09	-1.91	46.0	2.91	Peak	206.00	100	Horizontal	Pass

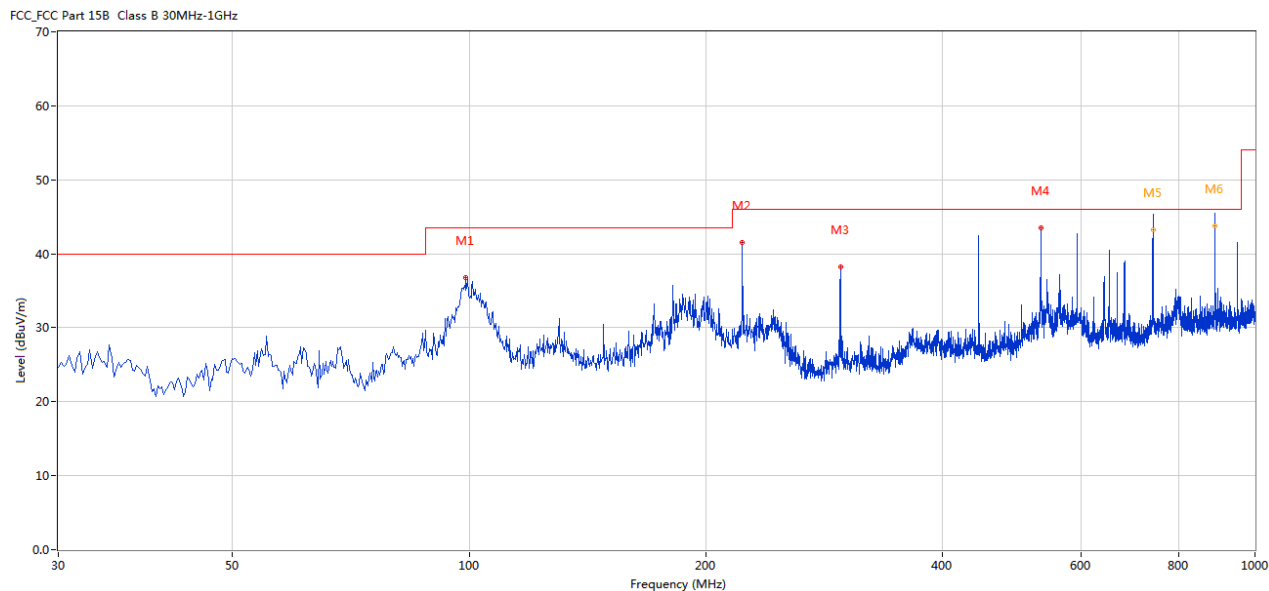
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Test Figure



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	99.095	36.82	-13.66	43.5	6.68	Peak	13.00	100	Vertical	Pass
2	222.739	41.50	-13.19	46.0	4.50	Peak	16.00	100	Vertical	Pass
3	296.683	38.22	-11.04	46.0	7.78	Peak	297.00	100	Vertical	Pass
4	534.031	43.56	-6.51	46.0	2.44	Peak	342.00	100	Vertical	Pass
5*	741.560	43.30	-3.44	46.0	2.70	QP	342.00	100	Vertical	Pass
6*	889.933	43.81	-1.90	46.0	2.19	QP	238.00	100	Vertical	Pass

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Operation Mode: Keeping Transmitting under CH36 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5180.00	87.31 (PK)	H	Fundamental Frequency
5180.00	83.82 (PK)	V	
10360	52.48 (PK)	H	74(Peak)/ 54(AV)
10360	--	V	74(Peak)/ 54(AV)
15540	--	V	74(Peak)/ 54(AV)
20720	--	H/V	74(Peak)/ 54(AV)
25900	--	H/V	74(Peak)/ 54(AV)
31080	--	H/V	74(Peak)/ 54(AV)
36260	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured
3. For 802.11a mode 6Mbps

Operation Mode: Keeping Transmitting under CH40 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5200.00	88.40 (PK)	H	Fundamental Frequency
5200.00	83.61 (PK)	V	
10400	--	H	74(Peak)/ 54(AV)
10400	--	V	74(Peak)/ 54(AV)
15600	--	V	74(Peak)/ 54(AV)
20800	--	H/V	74(Peak)/ 54(AV)
26000	--	H/V	74(Peak)/ 54(AV)
31200	--	H/V	74(Peak)/ 54(AV)
36400	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured
3. For 802.11a mode 6Mbps

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Operation Mode: Keeping Transmitting under CH48 for 11g at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
5240.00	88.78 (PK)	H	Fundamental Frequency
5240.00	84.74 (PK)	V	
10480	--	H	74(Peak)/ 54(AV)
10480	--	V	74(Peak)/ 54(AV)
15720	--	H/V	74(Peak)/ 54(AV)
20960	--	H/V	74(Peak)/ 54(AV)
26200	--	H/V	74(Peak)/ 54(AV)
31440	--	H/V	74(Peak)/ 54(AV)
36680	--	H/V	74(Peak)/ 54(AV)

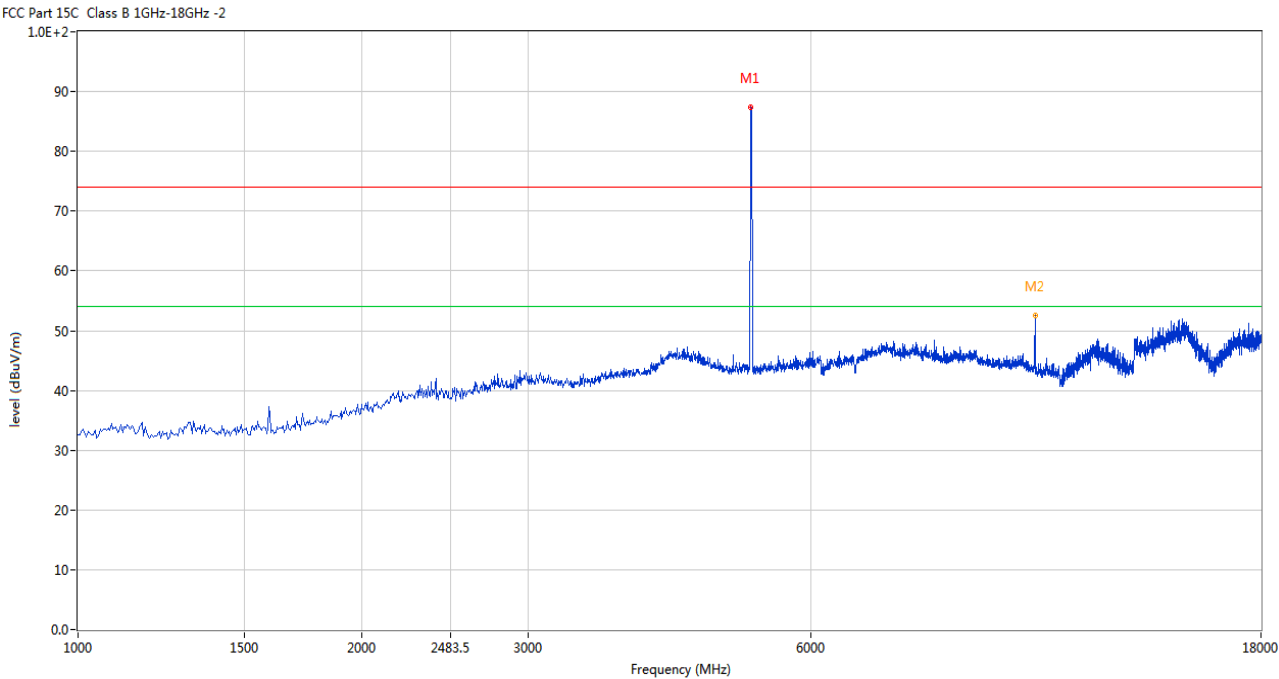
- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured
3. For 802.11a mode 6Mbps

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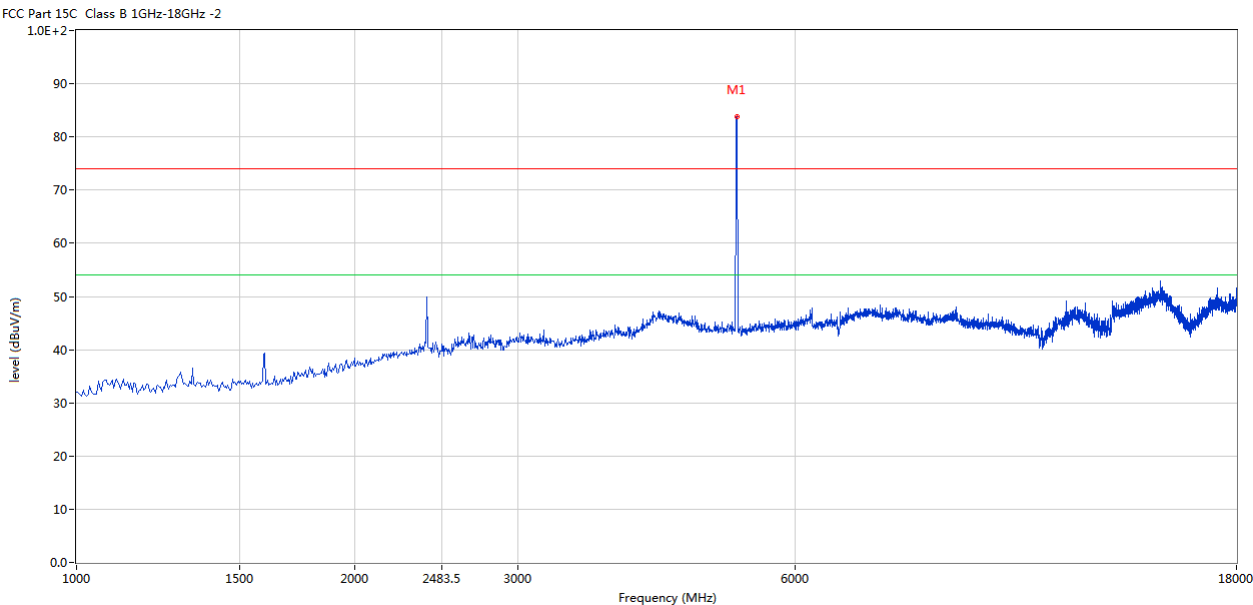


Please refer to the following test plots for details:

CH36 for 11a at 6Mbps: Horizontal



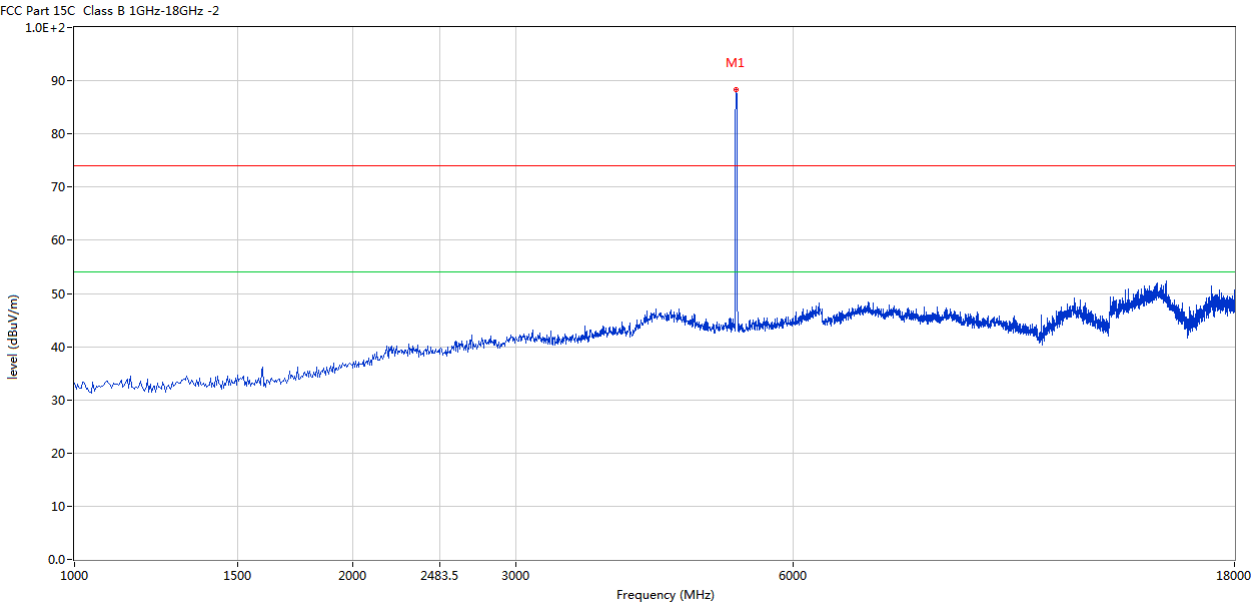
CH36 for 11a at 6Mbps: Vertical



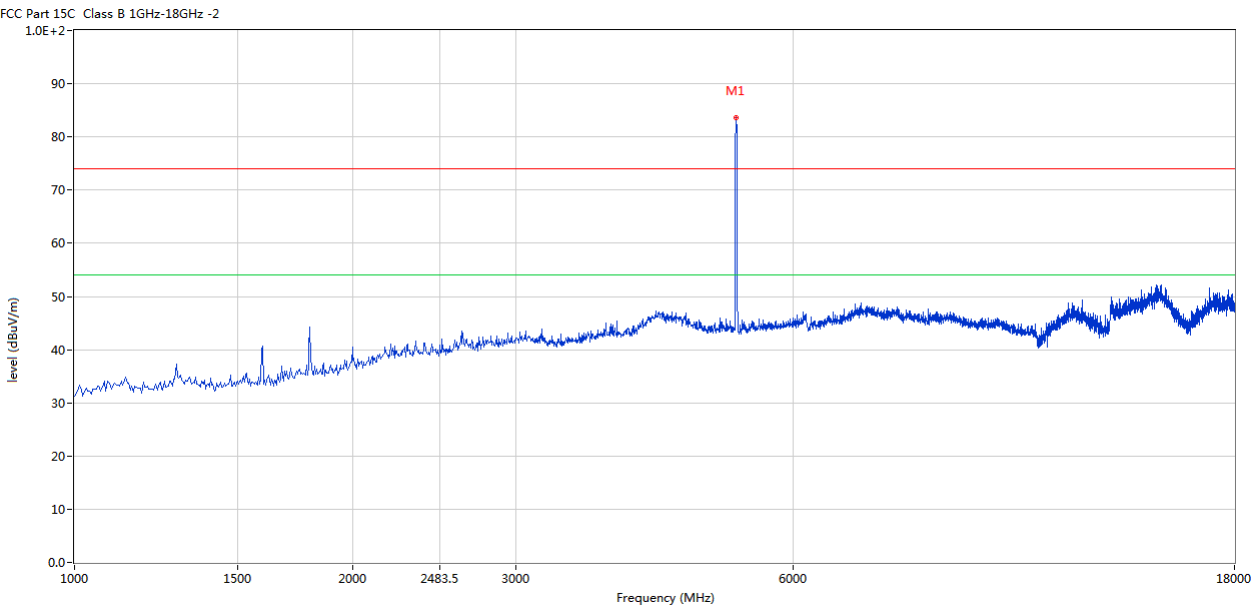
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CH40 for 11a at 6Mbps: Vertical



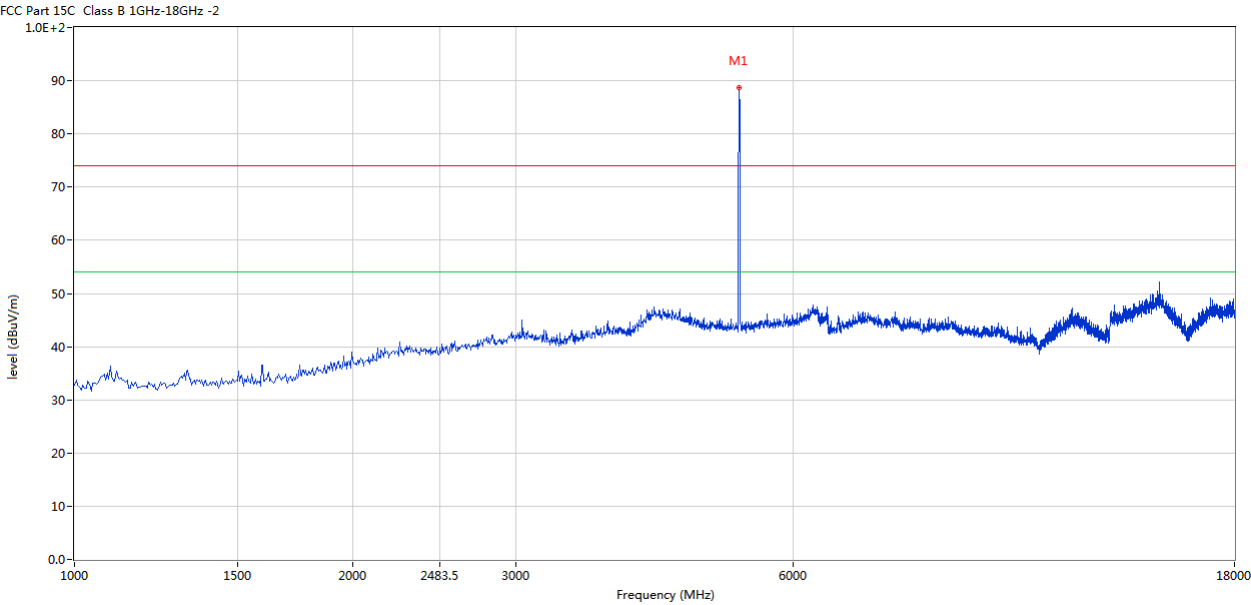
CH40 for 11a at 6Mbps: Horizontal



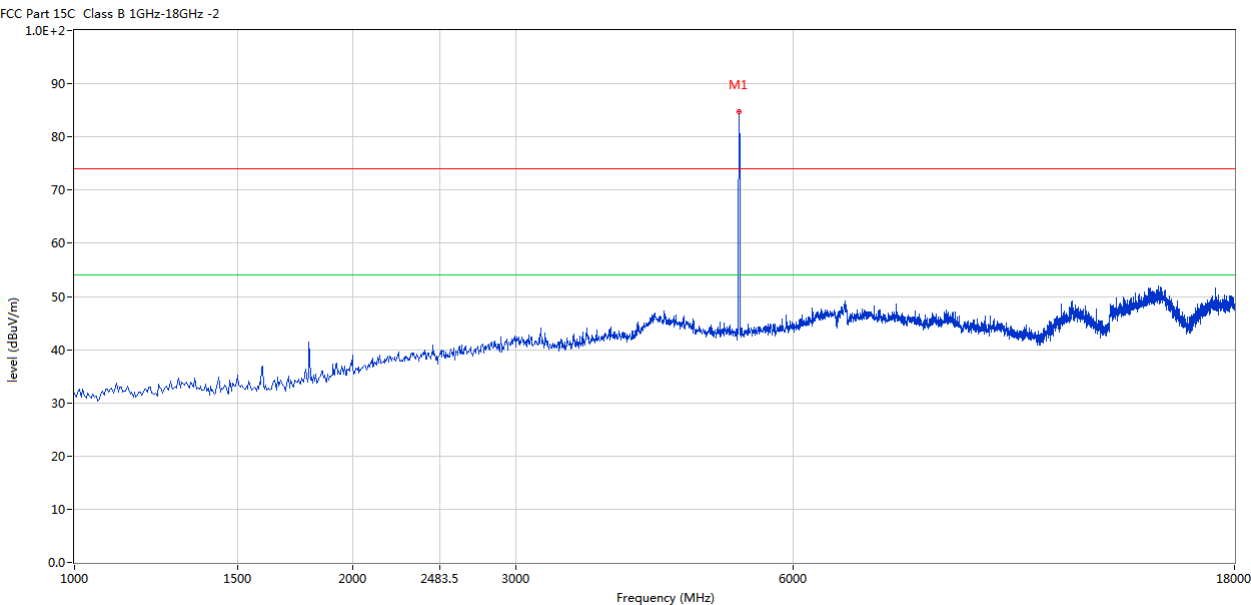
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CH48 for 11a at 6Mbps: Vertical



CH48 for 11g at 6Mbps: Horizontal



- Note: 1.For radiated Emissions from 18-40GHz and below 30MHz, it is only the floor noise.
2. 802.11a is the worst case.

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Restricted band Measurement				
EUT	4K Wireless HDMI Transmitter and Receiver		Test Mode:	Channel 36 (5180MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC5.0V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	45.8 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-49.4		
Polarity	Horizontal		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2$$

For Example, if E[dB μV/m]= 45.8 dB μV/m,

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2 = 45.8 - 95.2 = -49.4 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	4K Wireless HDMI Transmitter and Receiver		Test Mode:	Channel 36 (5180MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC5.0V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	42.2 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-53.0		
Polarity	Vertical		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2$$

For Example, if E[dB μV/m]= 42.2 dB μV/m,

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2 = 42.2 - 95.2 = -53.0 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement				
EUT	4K Wireless HDMI Transmitter and Receiver		Test Mode:	Channel 48 (5240MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC5.0V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	61.3 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-33.9		
Polarity	Horizontal			

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2$$

For Example, if $\text{E[dB } \mu\text{V/m]} = 61.3 \text{ dB } \mu\text{V/m}$,

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2 = 61.3 - 95.2 = -33.9 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	4K Wireless HDMI Transmitter and Receiver		Test Mode:	Channel 48 (5240MHz)-11a
Mode	Keeping Transmitting		Input Voltage	DC5.0V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	59.0 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-36.2		
Polarity	Vertical		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2$$

For Example, if $\text{E[dB } \mu\text{V/m]} = 59.0 \text{ dB } \mu\text{V/m}$,

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2 = 59.0 - 95.2 = -36.2 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement				
EUT	4K Wireless HDMI Transmitter and Receiver		Test Mode:	Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC5.0V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	53.7 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-41.5		
Polarity	Horizontal		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2$$

For Example, if $\text{E[dB } \mu\text{V/m]} = 53.7 \text{ dB } \mu\text{V/m}$,

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2 = 53.7 - 95.2 = -41.5 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	4K Wireless HDMI Transmitter and Receiver		Test Mode:	Channel 36 (5180MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC5.0V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5150	PK (dBμV/m)	42.6 (PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-52.6		
Polarity	Vertical		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2$$

For Example, if $\text{E[dB } \mu\text{V/m]} = 42.6 \text{ dB } \mu\text{V/m}$,

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2 = 42.6 - 95.2 = -52.6 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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Restricted band Measurement				
EUT	4K Wireless HDMI Transmitter and Receiver		Test Mode:	Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC5.0V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	60.8(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-34.4		
Polarity	Horizontal			

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2$$

For Example, if E[dB μV/m]= 60.8 dB μV/m,

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2 = 60.8 - 95.2 = -34.4 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

Restricted band Measurement				
EUT	4K Wireless HDMI Transmitter and Receiver		Test Mode:	Channel 48 (5240MHz)-11n/HT20
Mode	Keeping Transmitting		Input Voltage	DC5.0V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
5250	PK (dBμV/m)	57.9(PK)	Limit	-27dBm/MHz
	EIRP (dBm)	-37.3		
Polarity	Vertical		--	--

Remark: 1. According to KDB 789033 D02 General UNII Test Procedures New Rules v01 section G) d) (ii), for measurement above 1000MHz@3m distance, the limit of EIRP is calculated as follows:

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2$$

For Example, if E[dB μV/m]= 57.9dB μV/m,

$$\text{EIRP[dBm]} = \text{E[dB } \mu\text{V/m]} - 95.2 = 57.9 - 95.2 = -37.3 \text{ dBm}$$

2. RBW=1MHz, VBW=3MHz

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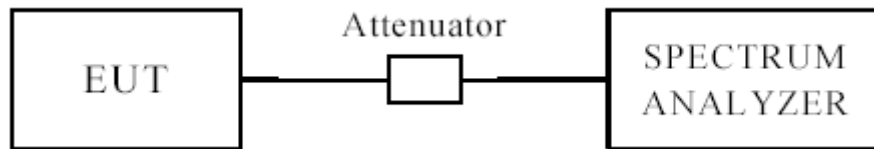
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7.0 Emission Bandwidth

7.1 Test Setup



7.3 Test Procedure for Emission Bandwidth

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set VBW > RBW
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

7.4 Test Procedure for Minimum Bandwidth for the Band 5725-5850MHz

1. Set RBW = 100 kHz.
2. Set $VBW \geq 3 \times RBW$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.5 Test Procedure for 99% Bandwidth

1. Set center frequency to the nominal EUT channel center frequency
2. Set span = 1.5 times to 5.0 times OBW
3. Set RBW = 1% TO 5% of the OBW
4. Set $VBW \geq 3 \times RBW$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Other, peak detection and max mode (until trace stabilizes) shall be used.
6. Use the 99% power bandwidth function of the instrument

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7.6 Test Result

EUT		4K Wireless HDMI Transmitter and Receiver		Model	6011-01001
Mode		802.11a		Input Voltage	DC5.0V
Temperature		24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
36	5180	6	22.61	--	Pass
40	5200	6	22.55	--	Pass
48	5240	6	22.61	--	Pass
99% Bandwidth					
36	5180	6	16.89	--	Pass
40	5200	6	16.89	--	Pass
48	5240	6	16.89	--	Pass

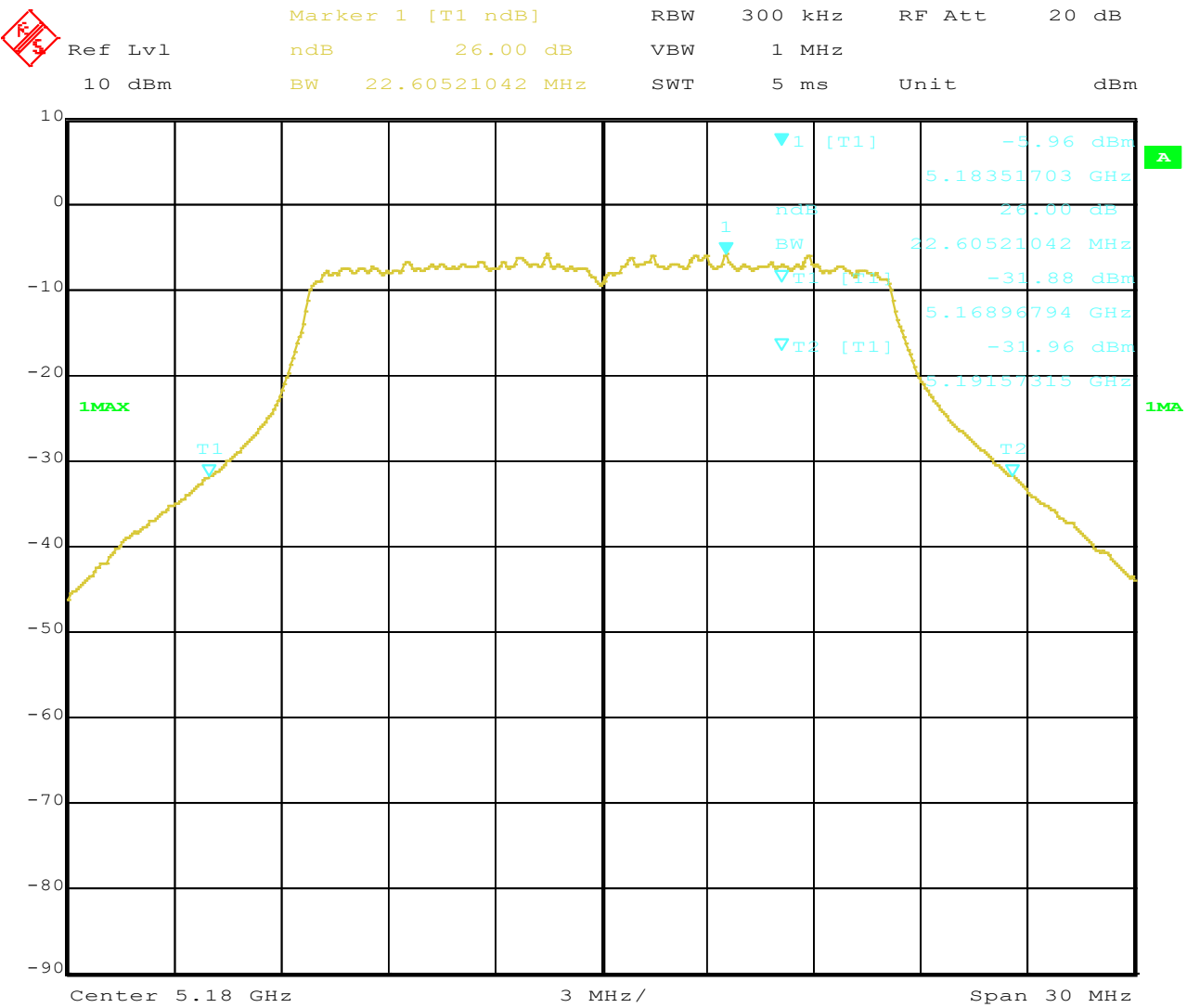
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Test Figure:

26dB Bandwidth

Channel 36



Date: 12.JUN.2024 12:10:49

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1MAX

T1

1

T2

A

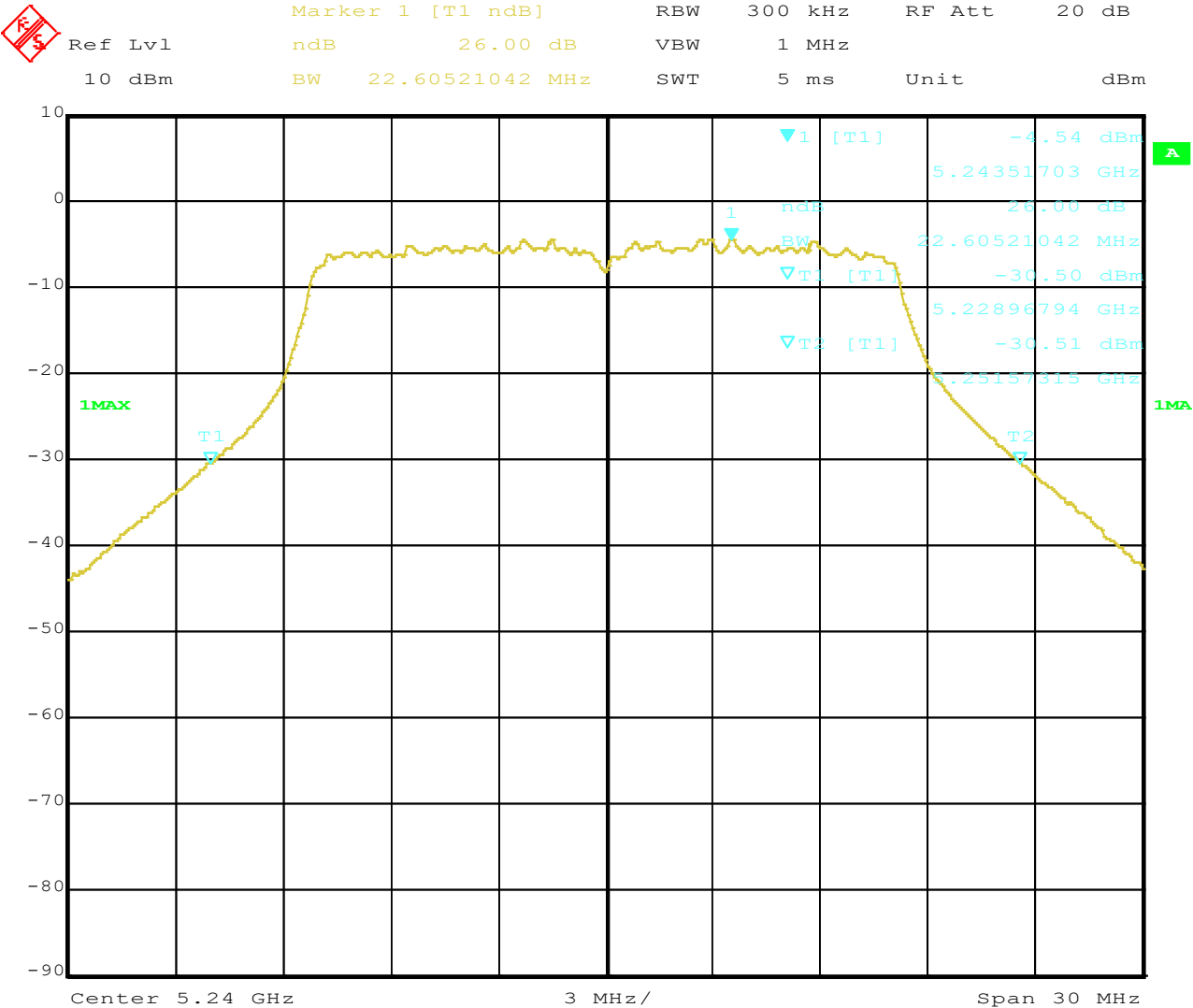
▼1 [T1]	-5.56 dBm
5.20351703 GHz	
26.00 dB	
22.54509018 MHz	
▼T1 [T1]	-31.62 dBm
5.18896794 GHz	
▼T2 [T1]	-31.57 dBm
5.21151503 GHz	

Center 5.2 GHz 3 MHz/ Span 30 MHz

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Channel 48



Date: 12.JUN.2024 12:19:19

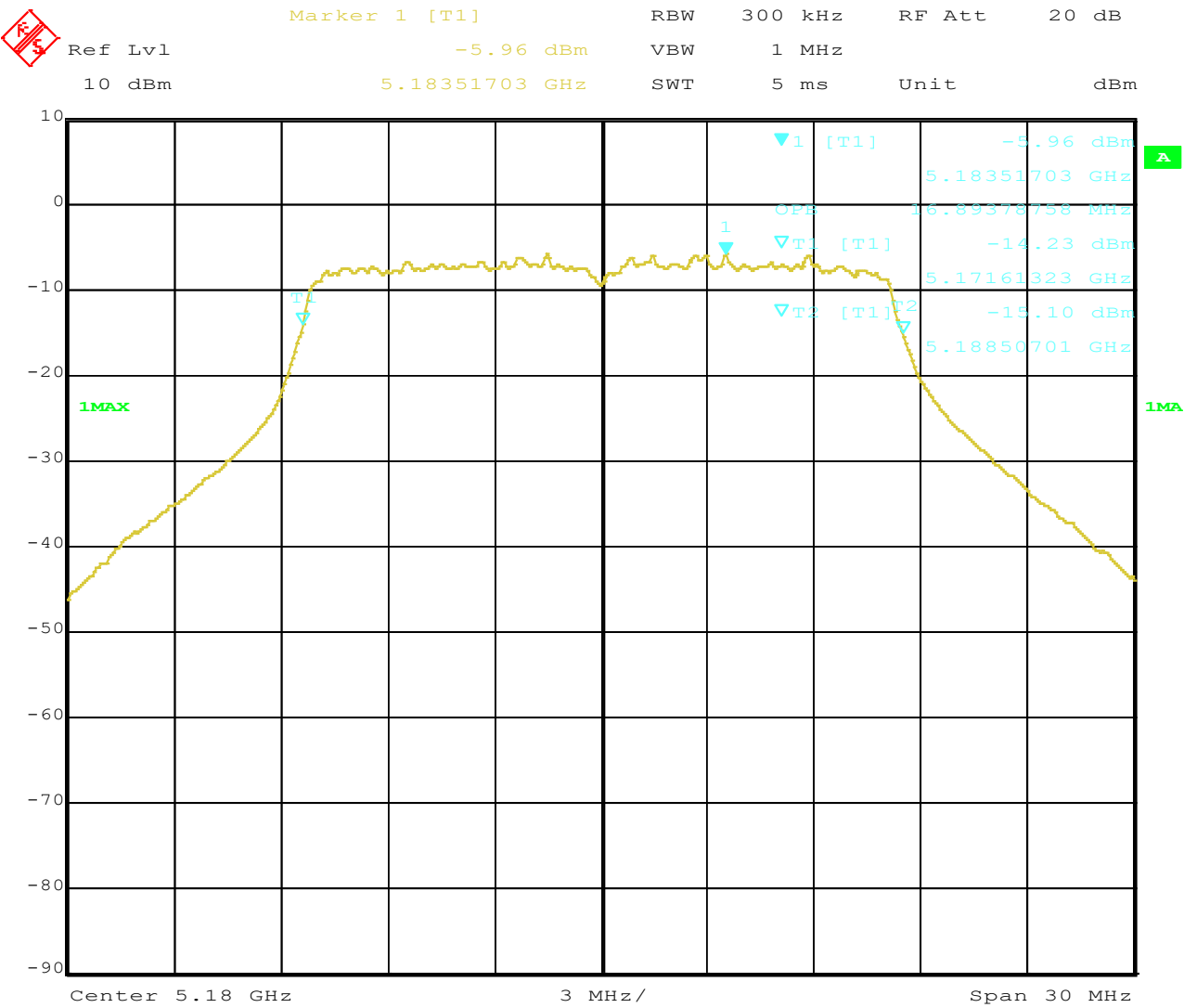
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Test Figure:

99% Bandwidth

Channel 36

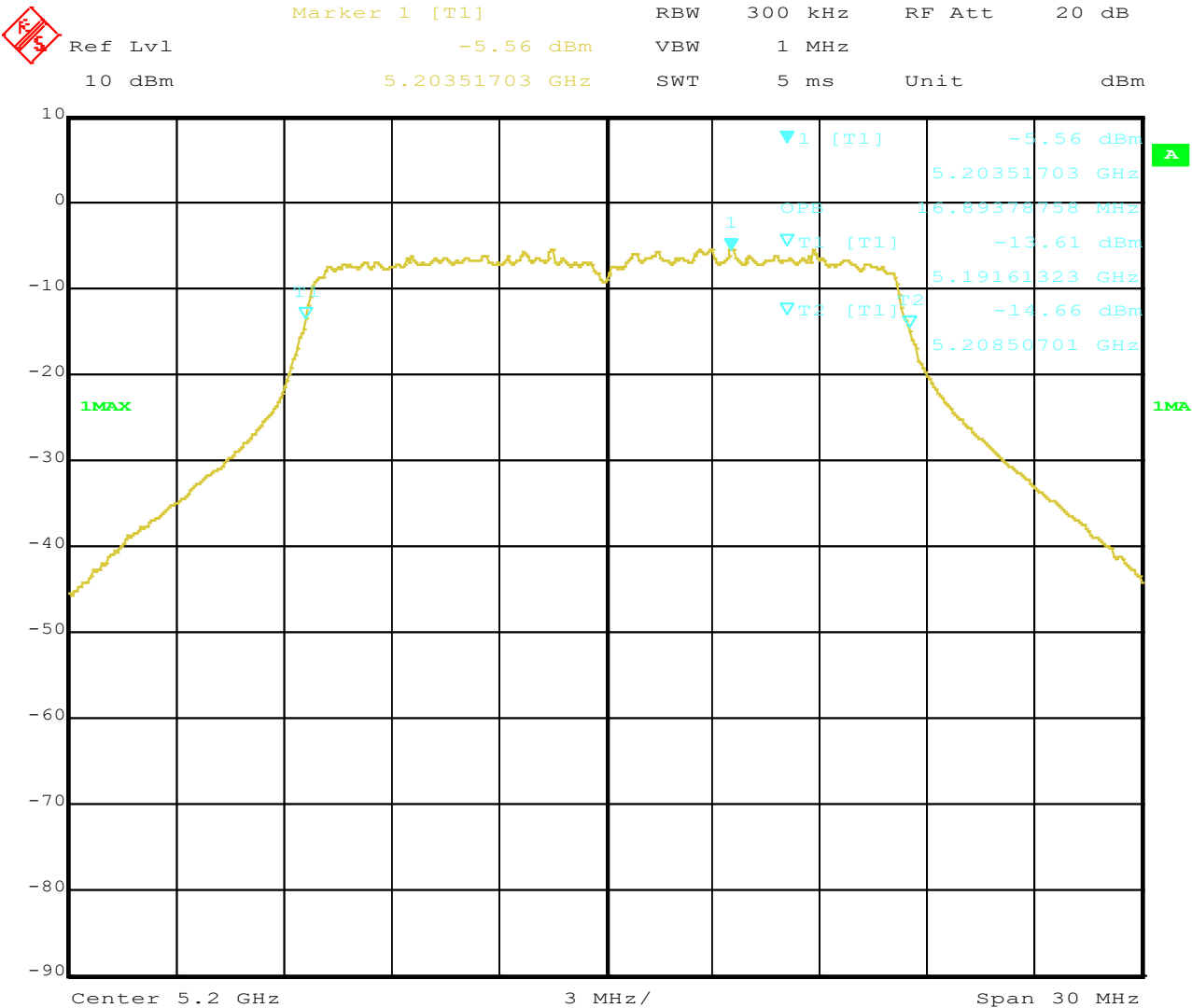


Date: 12.JUN.2024 12:11:01

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Channel 40



Date: 12.JUN.2024 12:14:31

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EUT		4K Wireless HDMI Transmitter and Receiver		Model	6011-01001
Mode		802.11n HT20		Input Voltage	DC5.0V
Temperature		24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
26dB Bandwidth					
36	5180	mcs0	23.21	--	Pass
40	5200	mcs0	23.15	--	Pass
48	5240	mcs0	23.27	--	Pass
99% Bandwidth					
36	5180	mcs0	18.04	--	Pass
40	5200	mcs0	18.04	--	Pass
48	5240	mcs0	18.04	--	Pass

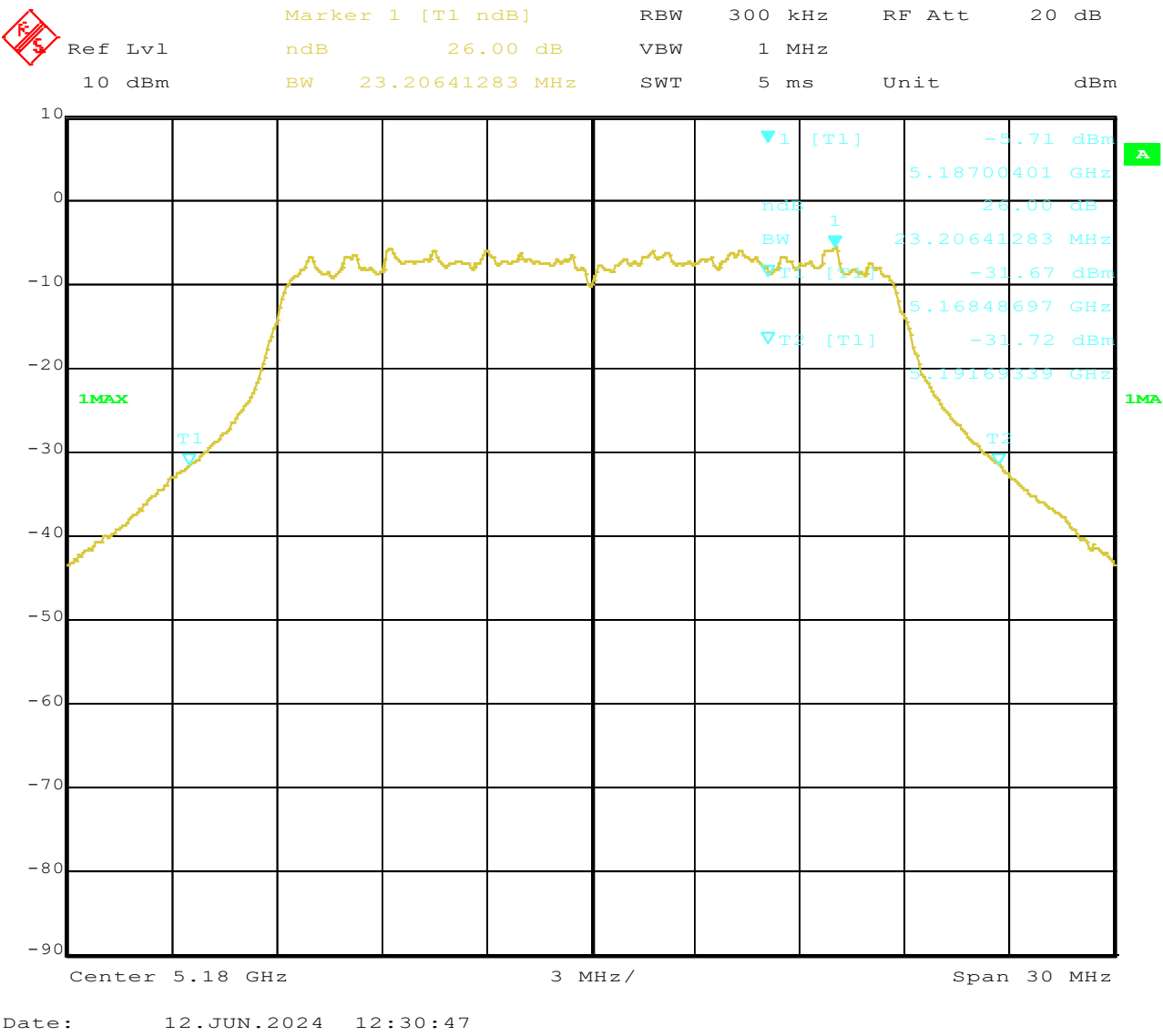
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Test Configure

26dB Bandwidth

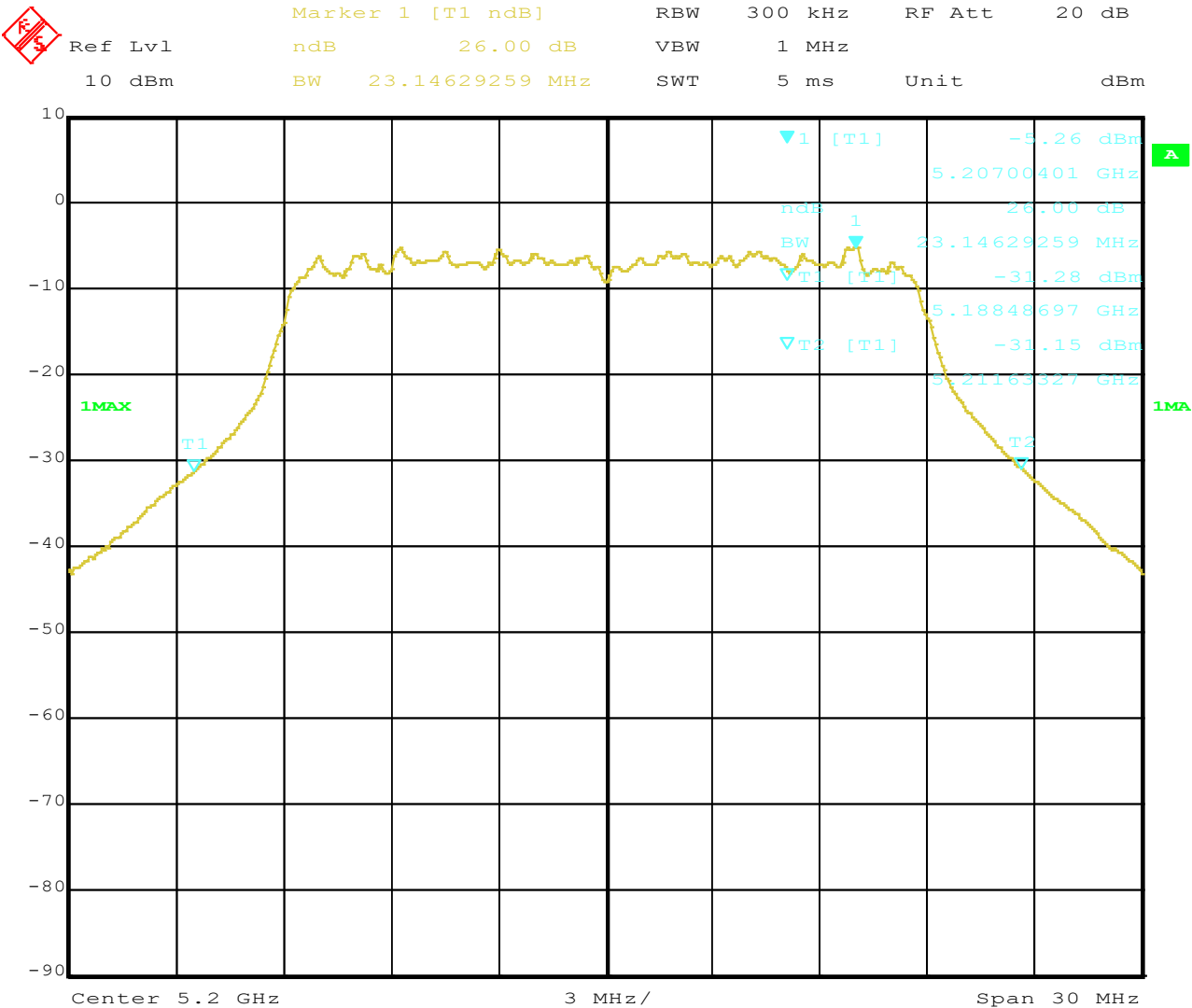
Channel 36



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Channel 40

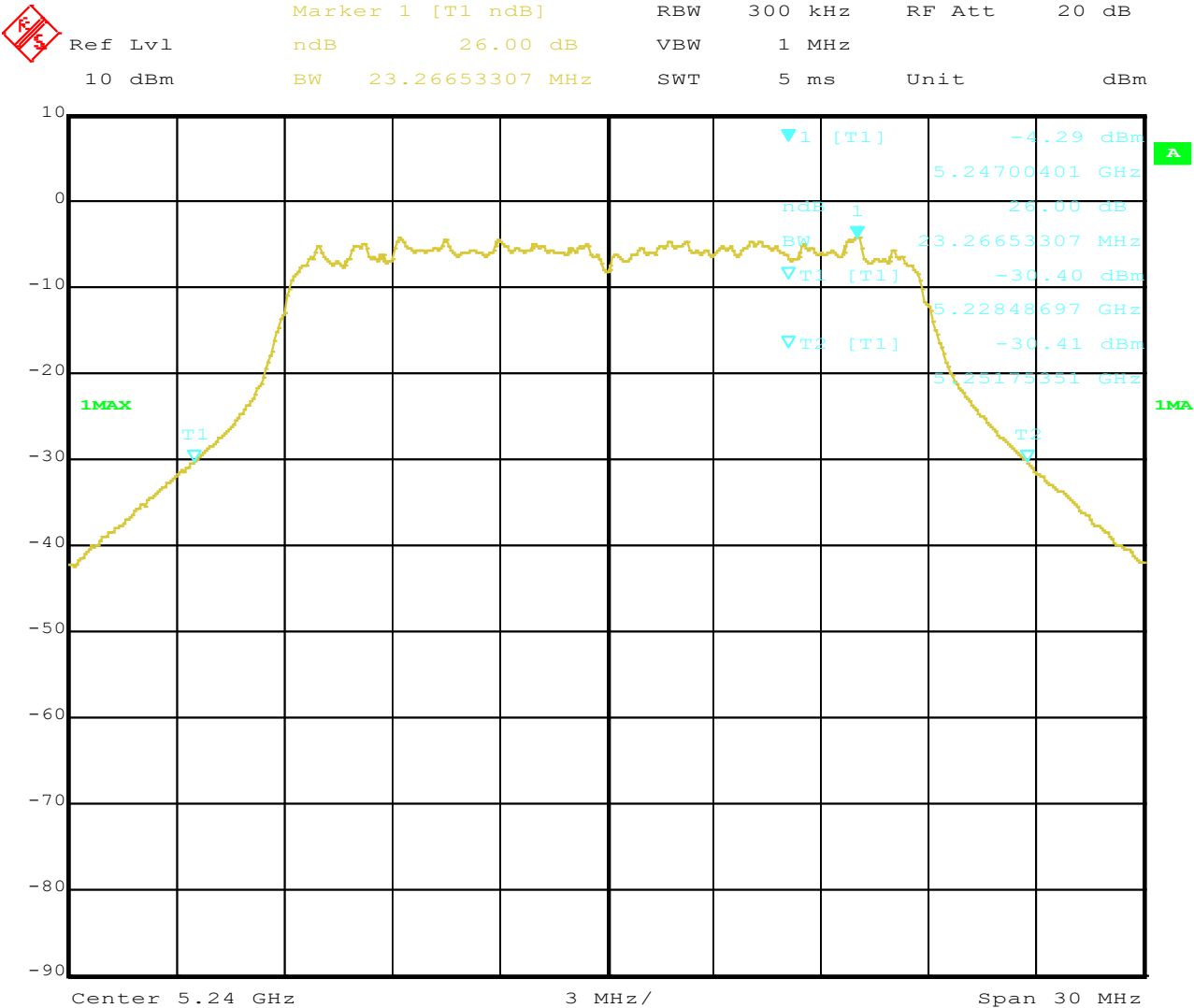


Date: 12.JUN.2024 12:27:39

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Channel 48



Date: 12.JUN.2024 12:23:05

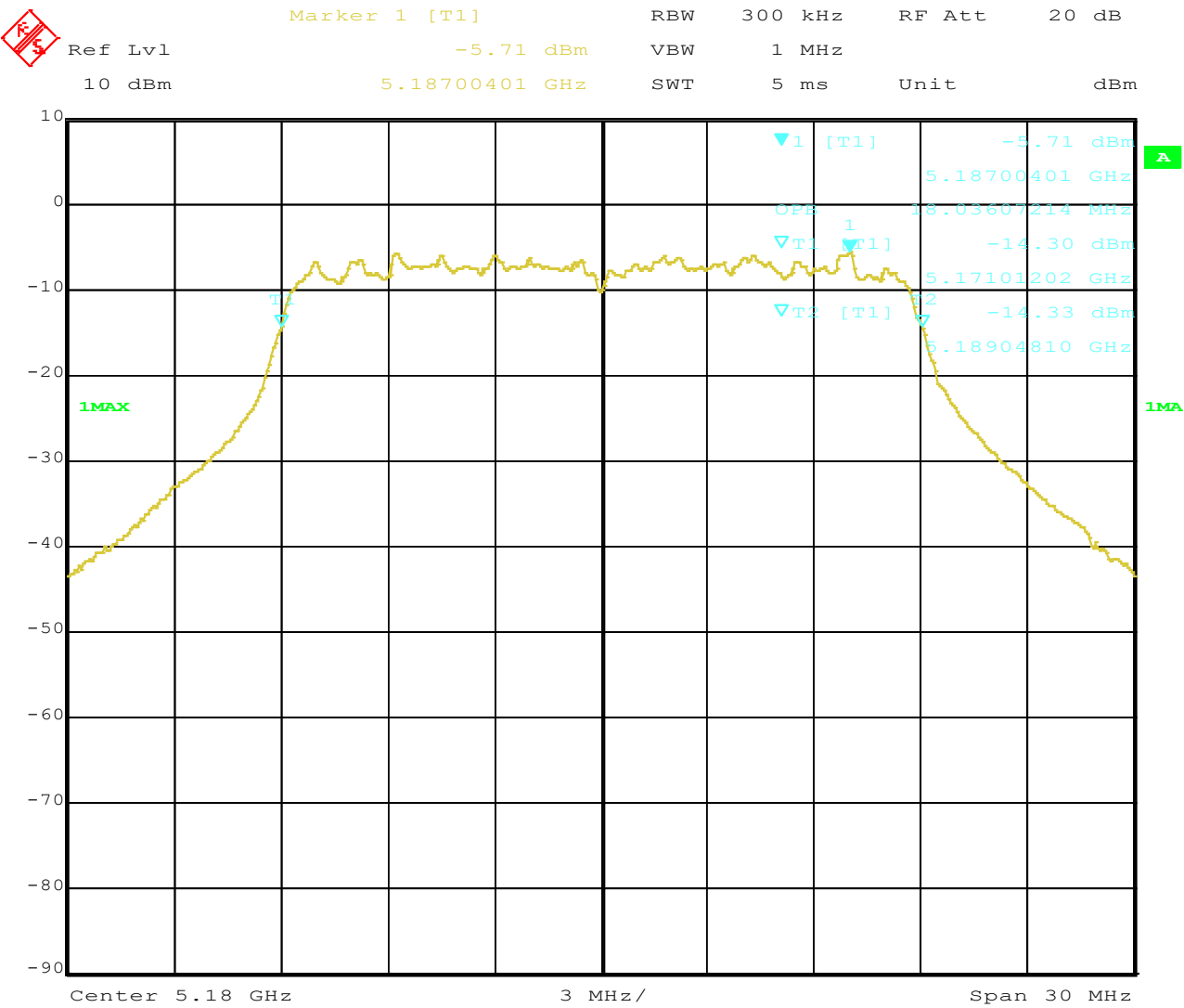
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Test Configure

99% Bandwidth

Channel 36



Center 5.18 GHz

3 MHz/

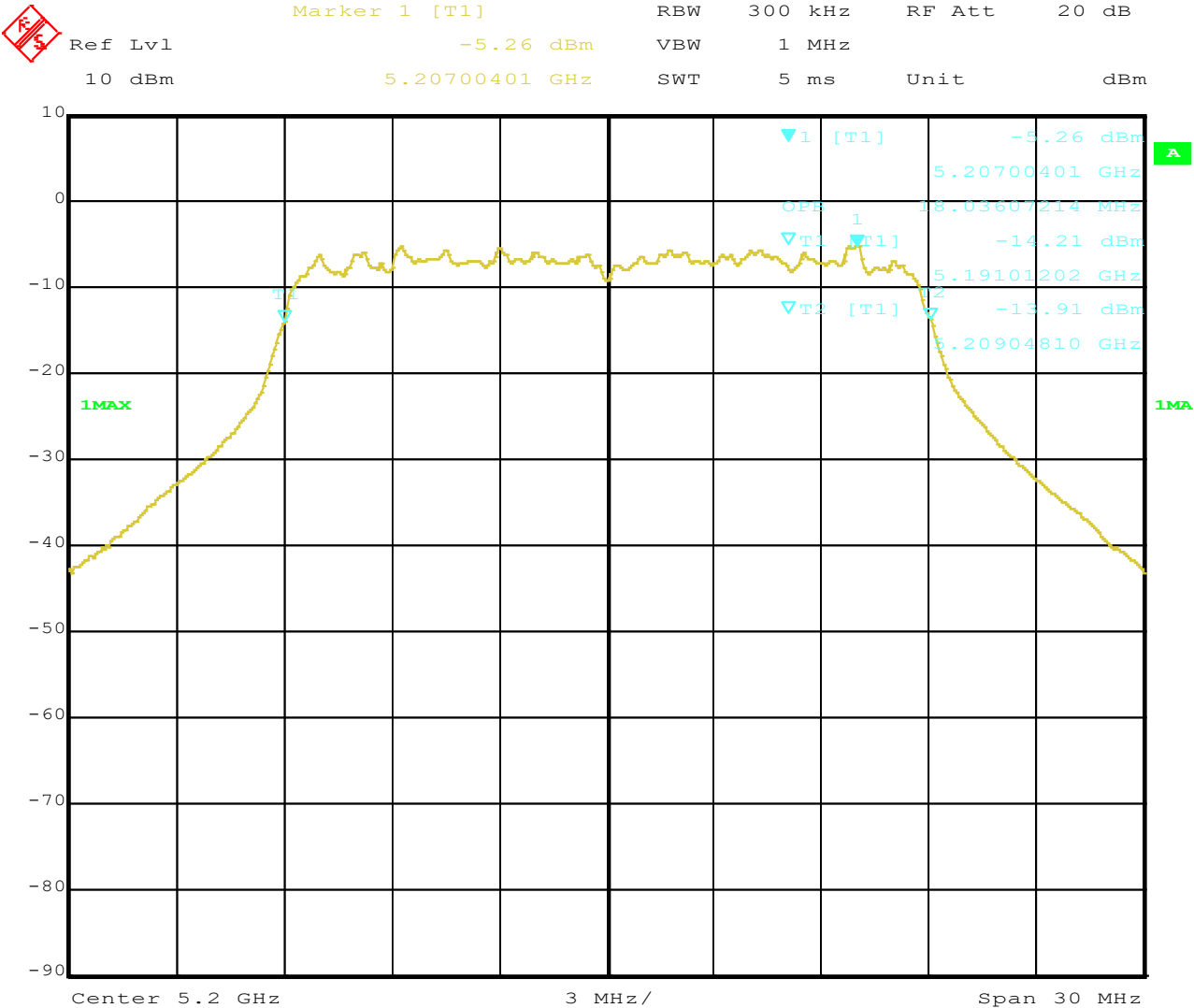
Span 30 MHz

Date: 12.JUN.2024 12:30:35

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Channel 40

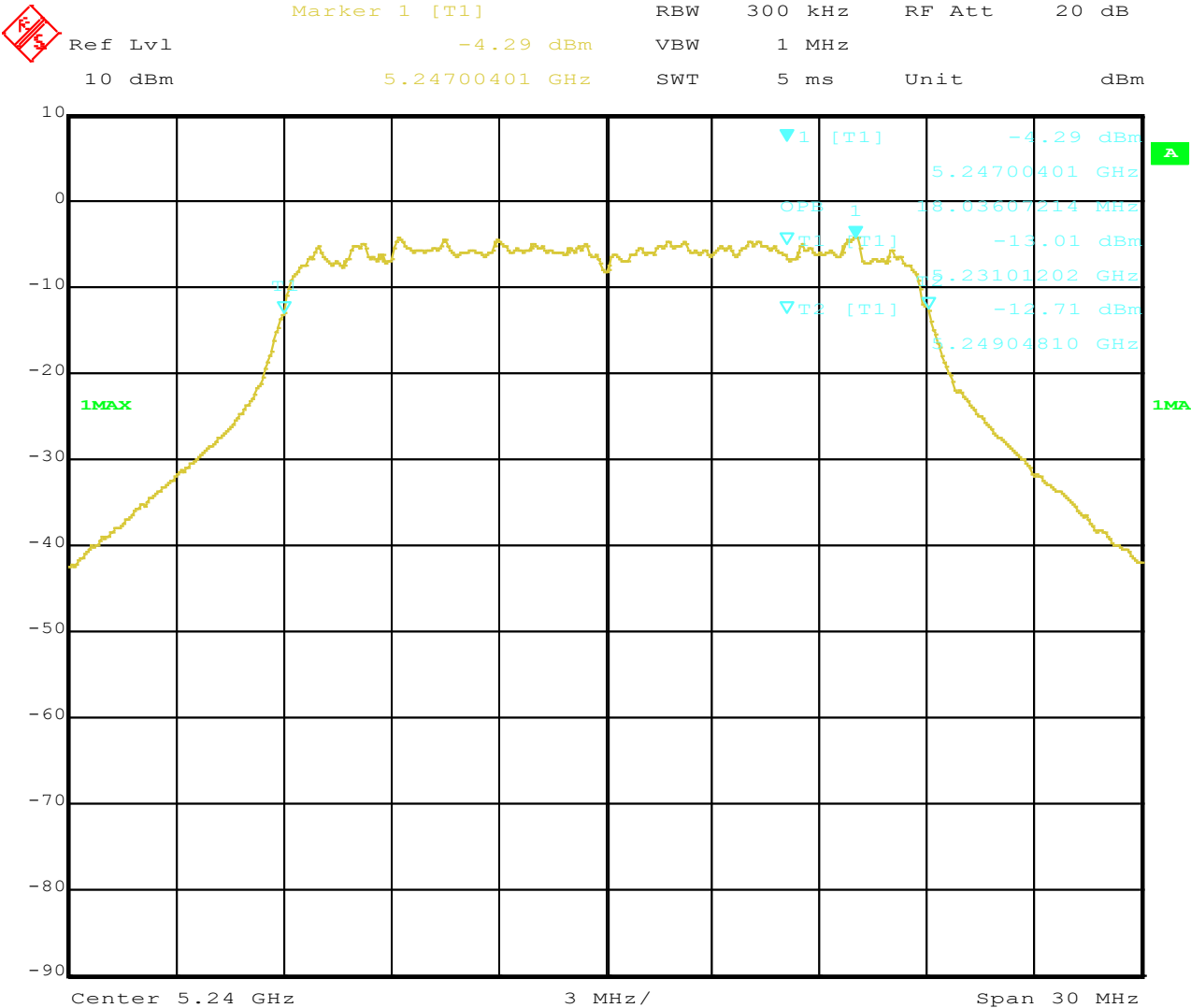


Date: 12.JUN.2024 12:27:49

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Channel 48



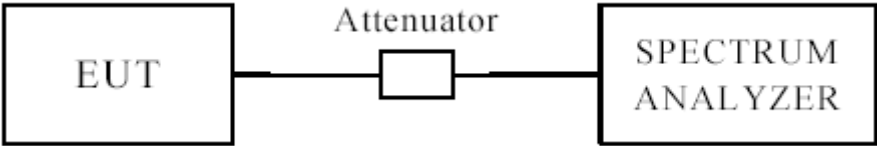
Date: 12.JUN.2024 12:22:45

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8.0 Peak Transmit Power Measurement

8.1 Test Setup



8.2 Limits of Peak Transmit Power Measurement

For client devices in the 5.15-5.25 GHz band	250mW (24 dBm)
--	----------------

8.3 Test Procedure

The average power output was measured with a Spectrum analyzer connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate centre frequency.

Note: the average power was measured

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8.4 Test Results

EUT		4K Wireless HDMI Transmitter and Receiver		Model	6011-01001
Mode		802.11a		Test Voltage	DC5.0V
Temperature		24 deg. C,		Humidity	56% RH
Channel	Frequency (MHz)	AV Power		Limit (dBm)	Pass/ Fail
		dBm	mW		
36	5180	-2.13	0.61	24	Pass
40	5200	-1.69	0.68	24	Pass
48	5240	-0.66	0.86	24	Pass

Note: 1. At final test to get the worst-case emission at 6Mbps for CH36, CH40 and CH48

2. The result basic equation calculation as follow:

Average Power Output = AV Power Reading + Cable loss + Attenuator

3. The worse case was recorded

EUT		4K Wireless HDMI Transmitter and Receiver		Model		6011-01001	
Mode		802.11n HT20		Test Voltage		DC5.0V	
Temperature		24 deg. C,		Humidity		56% RH	
Channel	Frequency (MHz)	AV Power			Limit (dBm)		Pass/ Fail
		dBm		mW			
36	5180	-2.63	0.55		24		Pass
40	5200	-2.20	0.60		24		Pass
48	5240	-1.08	0.78		24		Pass

Note: 1. At final test to get the worst-case emission at mcs0 for CH36, CH40 and CH48

2. The result basic equation calculation as follow:

Average Power Output = AV Power Reading + Cable loss + Attenuator

3. The worse case was recorded

The report refers only to the sample tested and does not apply to the bulk.

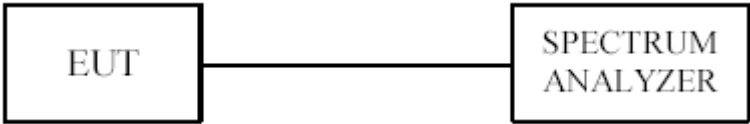
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9. Power Spectral Density Measurement

9.1 Test Setup



9.2 Limits of Power Spectral Density Measurement

Operation Band	Limit
U-NII-1	11dBm/MHz

9.3 Test Procedure

1. The EUT was directly connected to the spectrum analyzer
2. Set the RBW = 1MHz.
3. Set the VBW =3MHz.
4. Set the span to encompass the entire emissions bandwidth (EBW) of the signal
5. Detector = RMS
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.



9.4Test Result

EUT	4K Wireless HDMI Transmitter and Receiver		Model	6011-01001	
Mode	802.11a		Test Voltage	DC5.0V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)		Limit (dBm)	Pass/ Fail
36	5180	-7.03		11	Pass
40	5200	-6.69		11	Pass
48	5240	-5.43		11	Pass

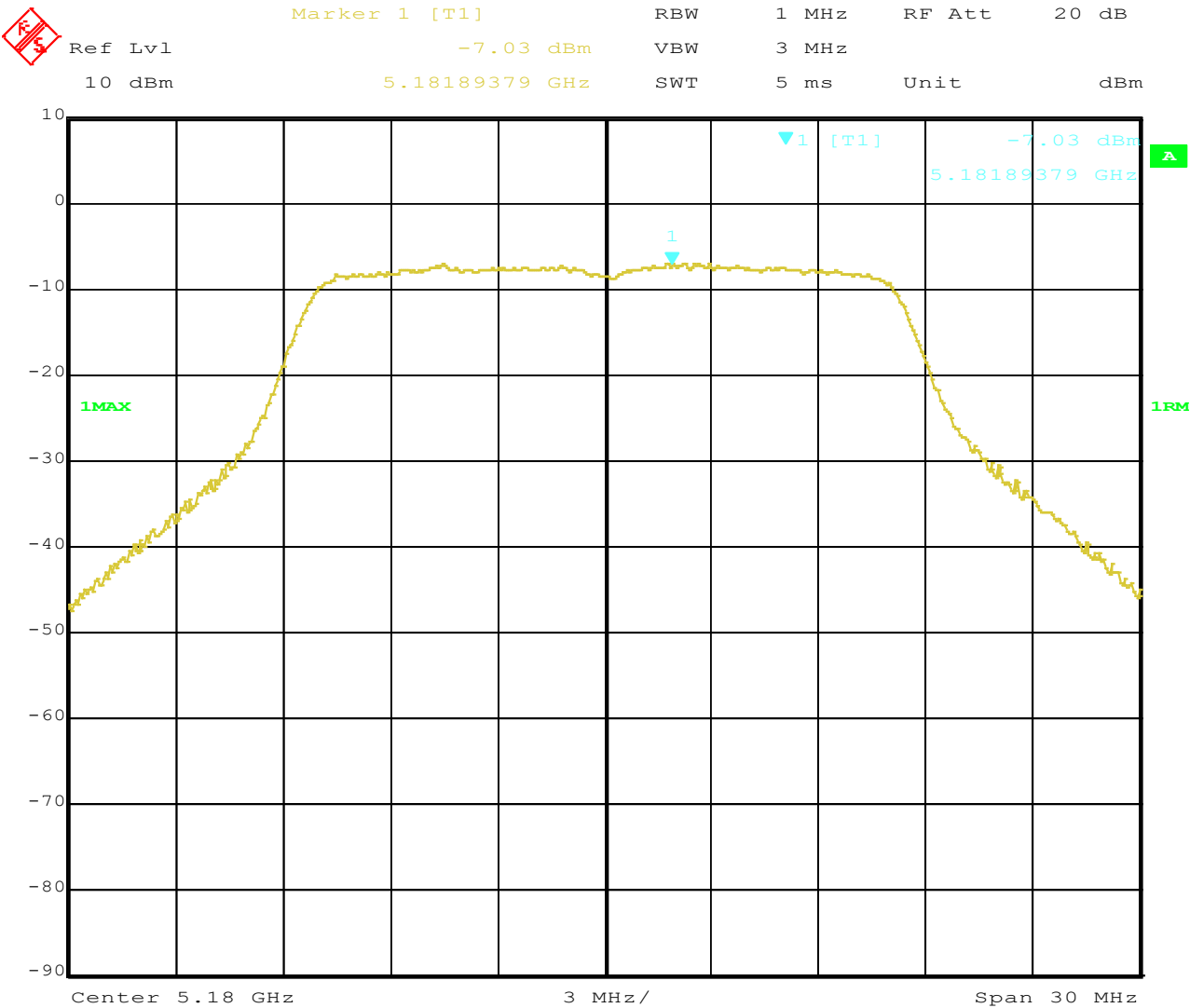
Note: Two antennas (Ant 0 and Ant 1) were tested and only the worst cased was recorded in the test report. Ant 0 was the worst case.

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9.5 Plots of Power Spectral Density Measurement

1.802.11a at CH36



Center 5.18 GHz

3 MHz/

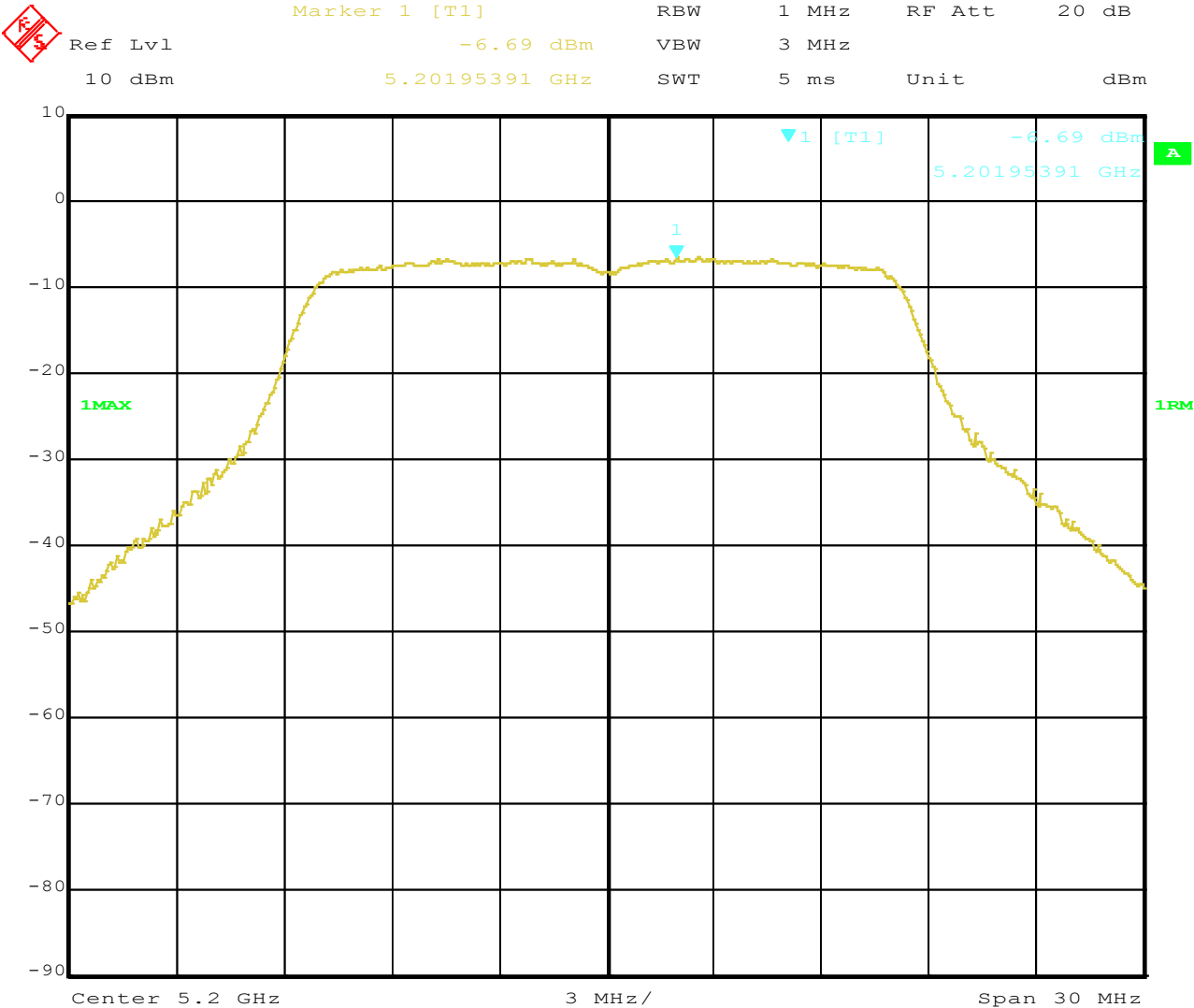
Span 30 MHz

Date: 12.JUN.2024 12:51:39

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2.802.11a at CH40

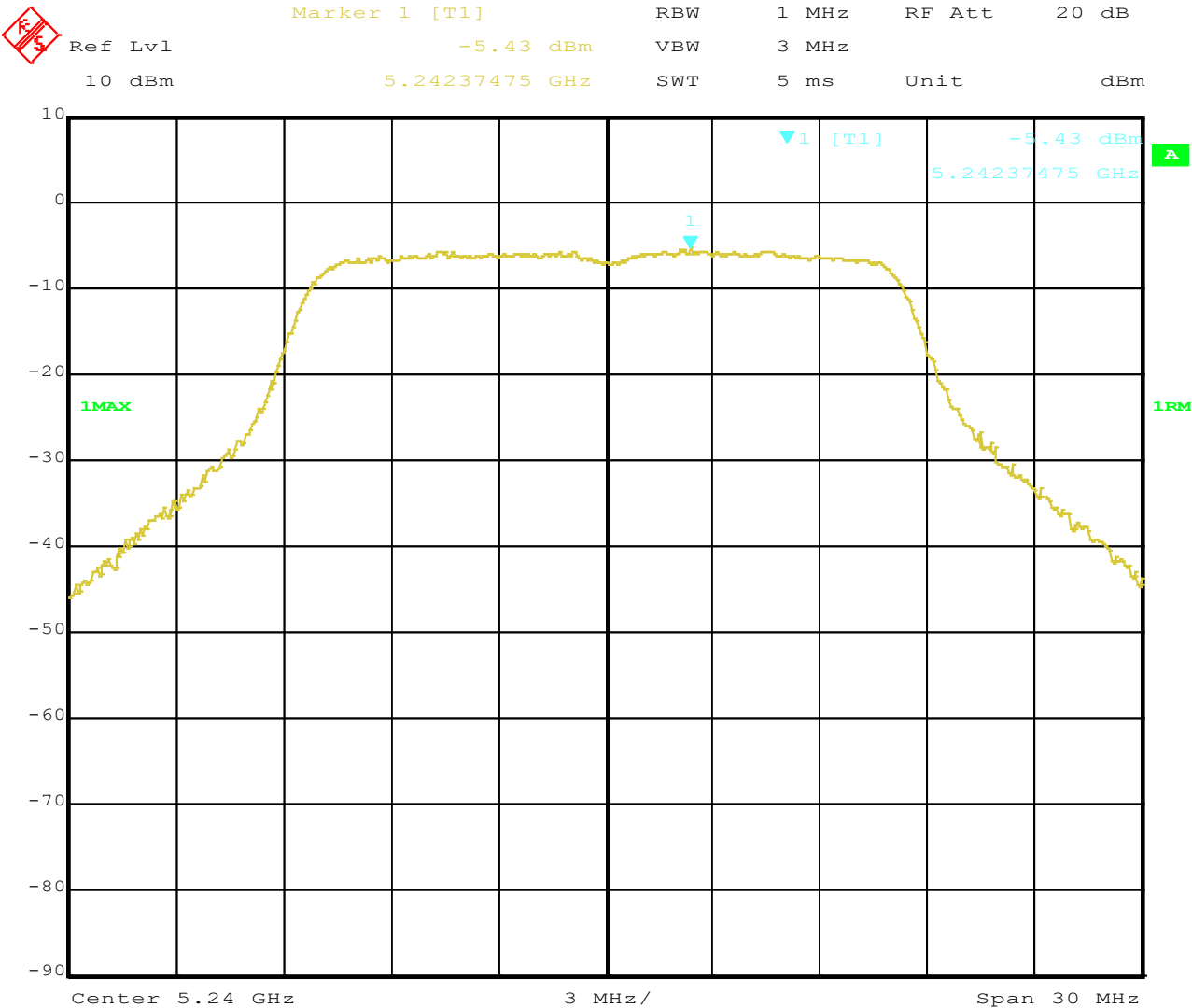


Date: 12.JUN.2024 12:50:26

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3.802.11a at CH48



Date: 12.JUN.2024 12:45:51

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EUT		4K Wireless HDMI Transmitter and Receiver		Model	6011-01001	
Mode		802.11n HT20		Test Voltage	DC5.0V	
Temperature		24 deg. C,		Humidity	56% RH	
Channel	Frequency (MHz)	Power Spectral Density(dBm/MHz)	Factor	Total Spectral Density-MIMO (dBm/MHz)	Limit (dBm/MHz)	Pass/ Fail
36	5180	-7.14	3.01	-4.13	11	Pass
40	5200	-6.88	3.01	-3.87	11	Pass
48	5240	-5.93	3.01	-2.92	11	Pass

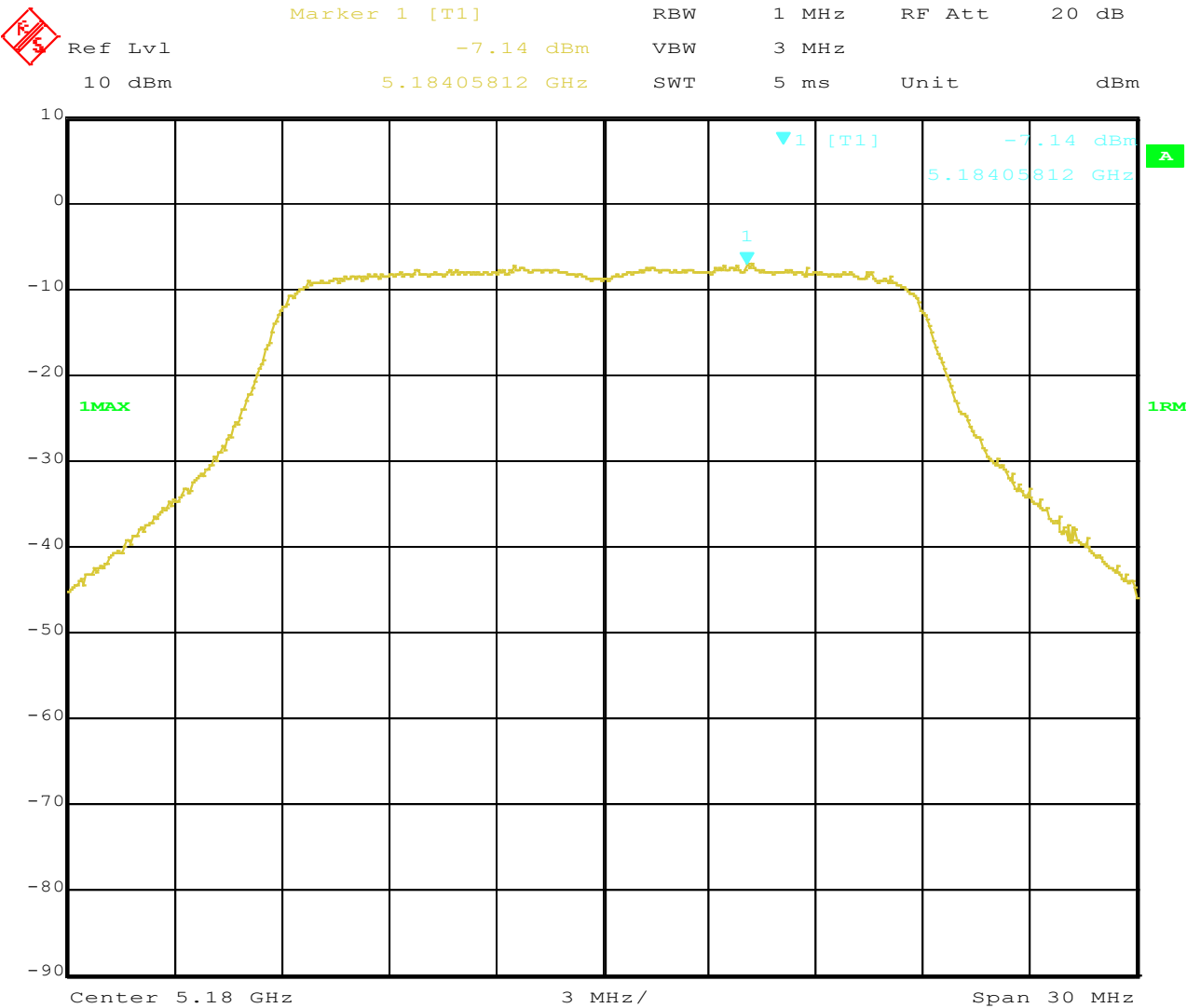
Note: Two antennas (Ant 0 and Ant 1) were tested and only the worst case was recorded in the test report. Ant 0 was the worst case.

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Test Plots

1.802.11n at CH36

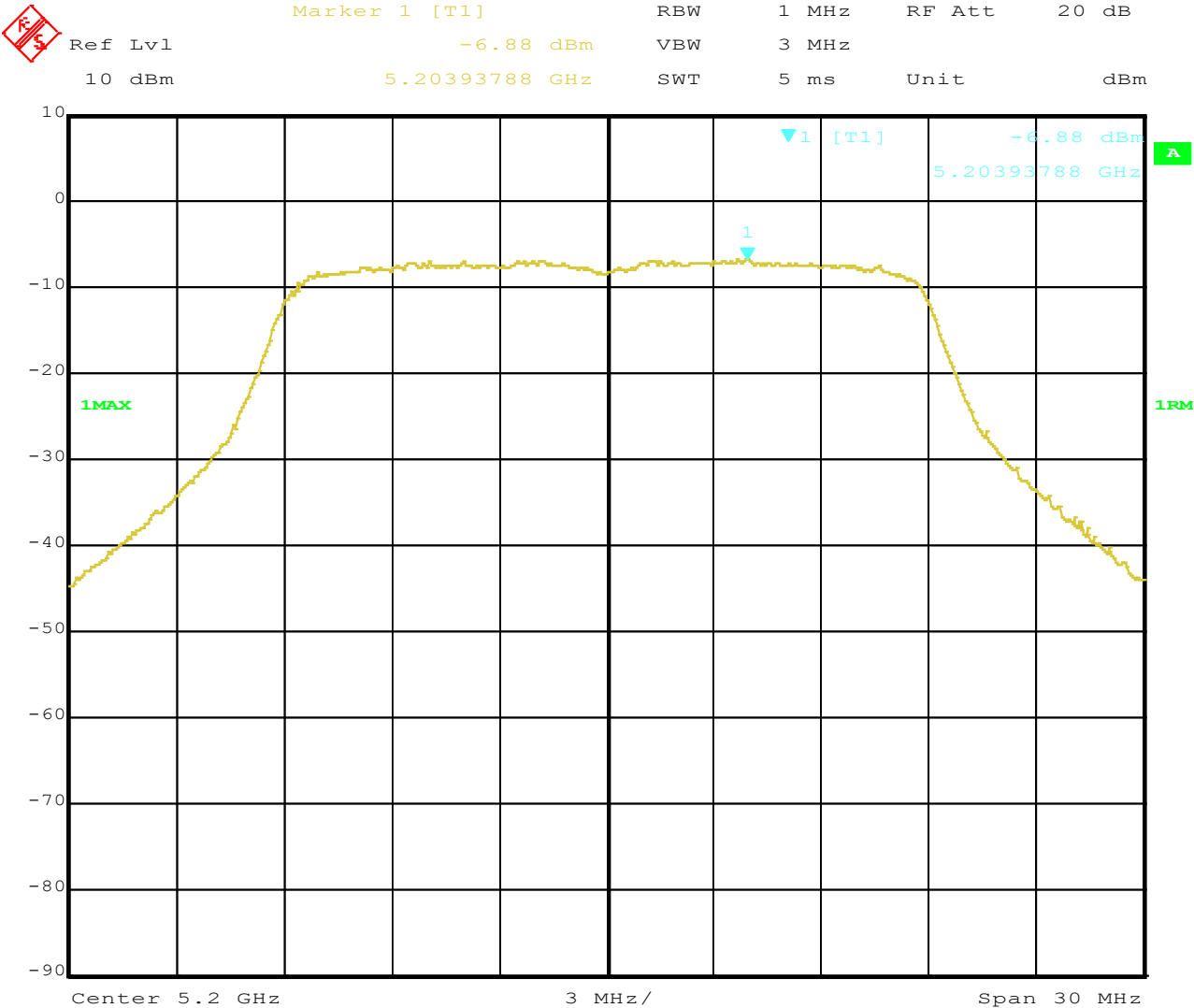


Date: 12.JUN.2024 12:36:26

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2.802.11n at CH40



Date: 12.JUN.2024 12:37:57

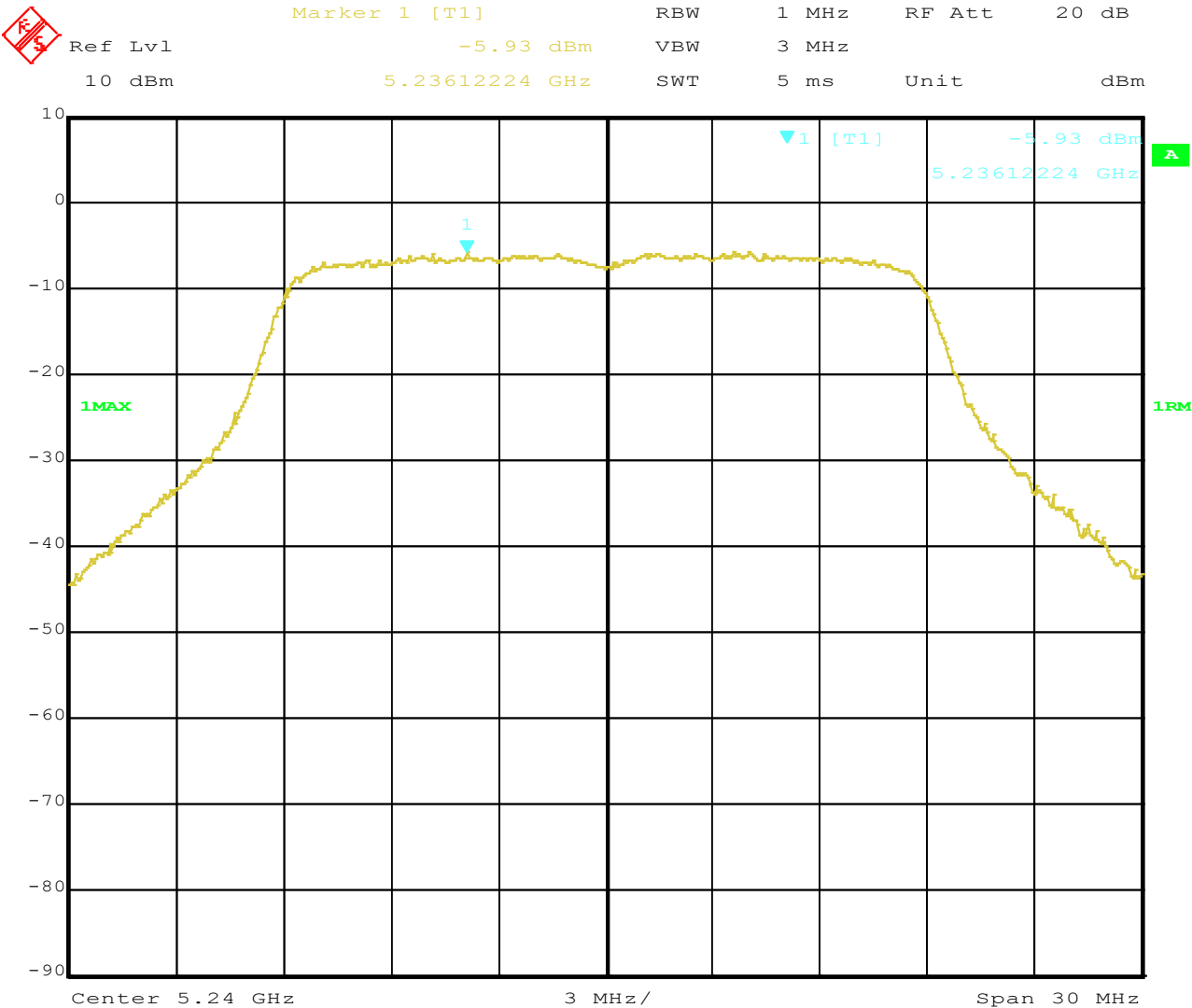
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3.802.11n at CH48



Date: 12.JUN.2024 12:44:37

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10.0 Frequency Stability

10.1 Limits of Frequency Stability Measurement

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.02\%$ of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees

10.2 Test Procedure

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at $+20$ degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

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10.3 Test Result

Channel 36 (5180MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
DC5.0V	5180.0247
DC4.5V	5180.0263
DC5.5V	5180.0235
Max. Deviation (MHz)	0.0263
Max. Deviation (ppm)	5.1

Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5180.0214
-20	5180.0239
-10	5180.0252
0	5180.0260
10	5180.0234
20	5180.0227
30	5180.0249
40	5180.0231
50	5180.0256
Max. Deviation (MHz)	0.0260
Max. Deviation (ppm)	5.0

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11.0 Antenna Requirement

11.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected construction

Dipole antenna used with reverse polarity antenna connector. The maximum Gain is 3.76dBi.

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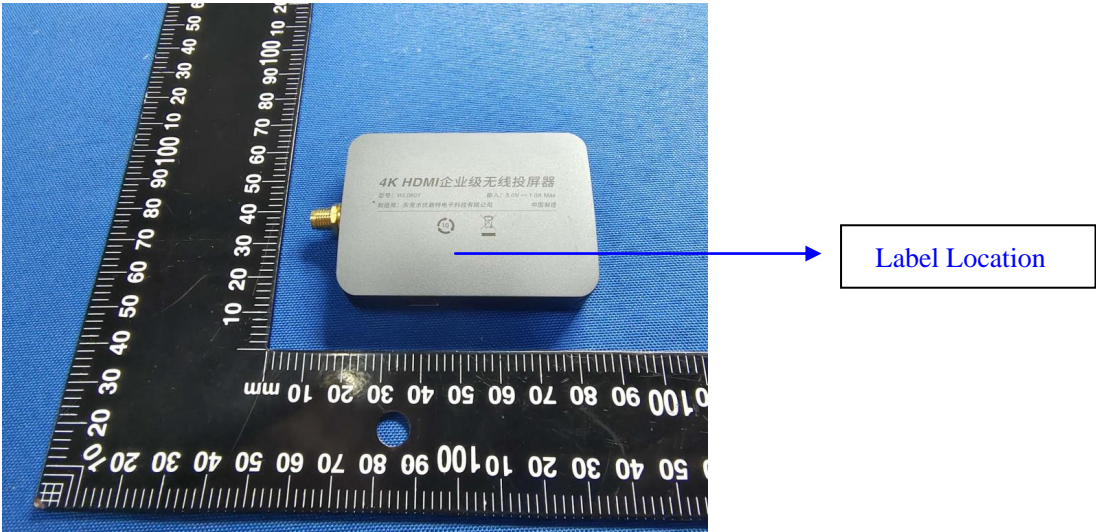
12.0 FCC Label

FCC ID: 2BGSH-6011-01003

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



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13.0 Photo of testing

Conducted Emission Test Setup:



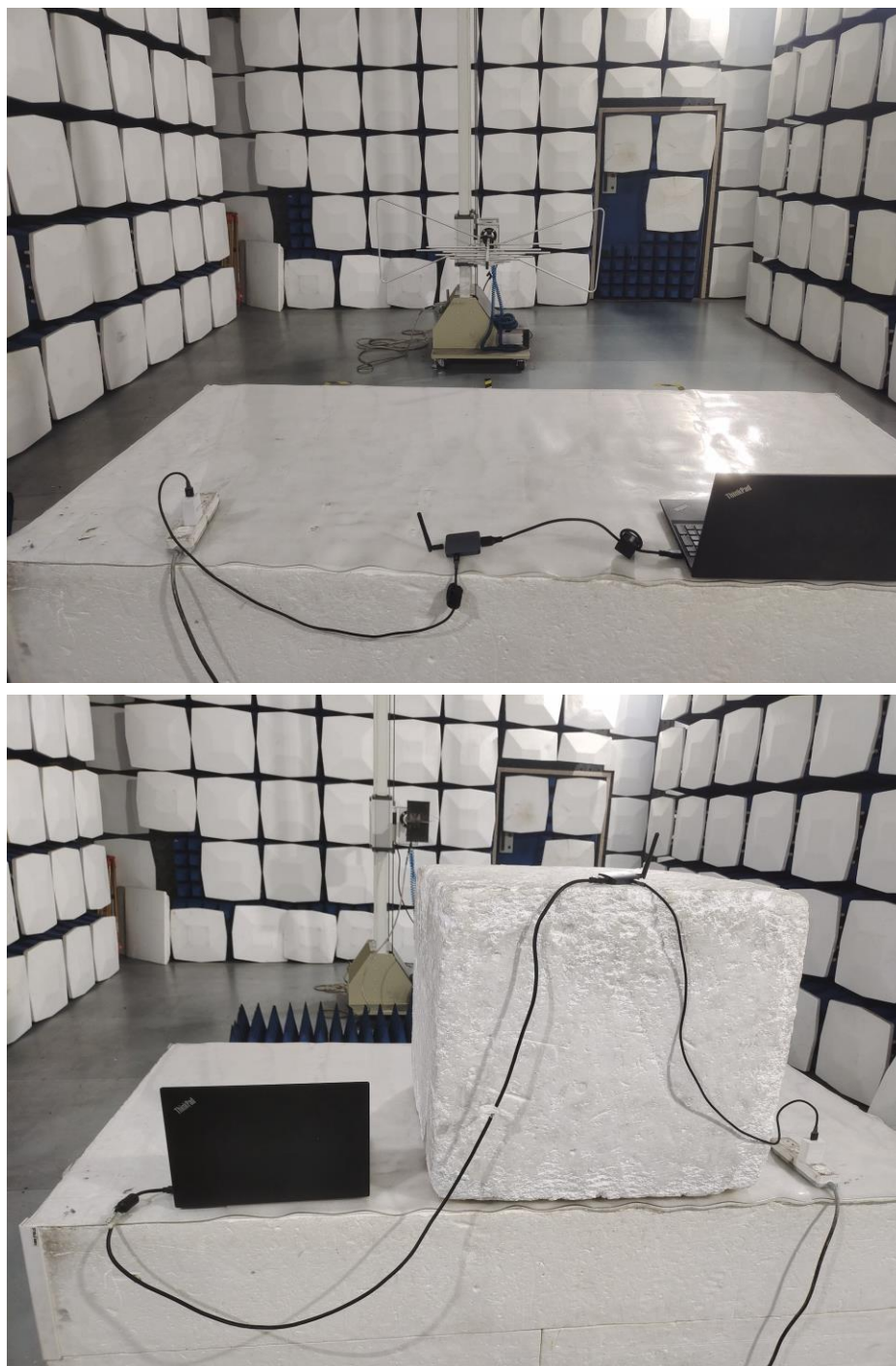
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Radiated Emission Test Setup:



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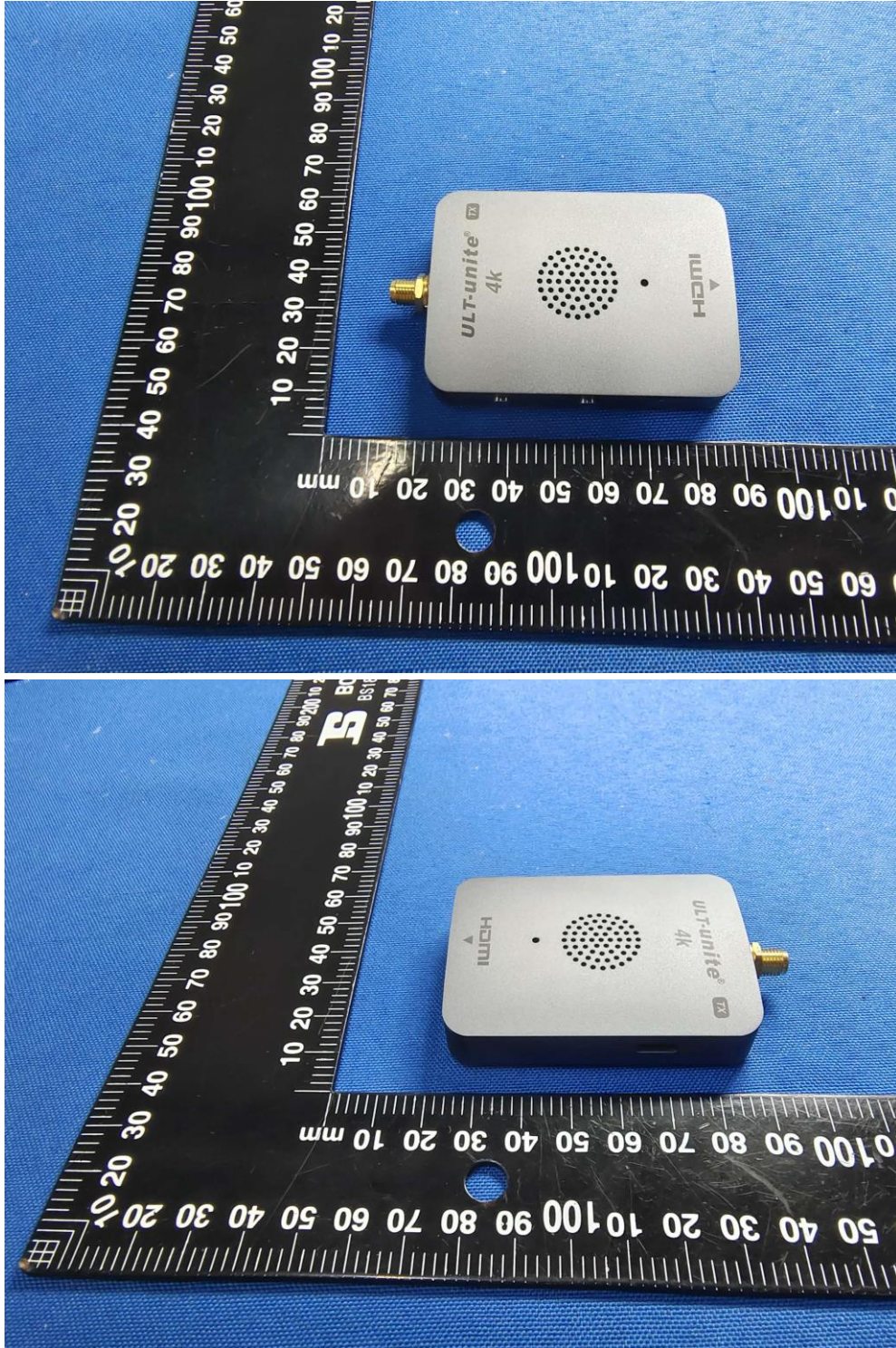
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Photos of EUT

Outside View



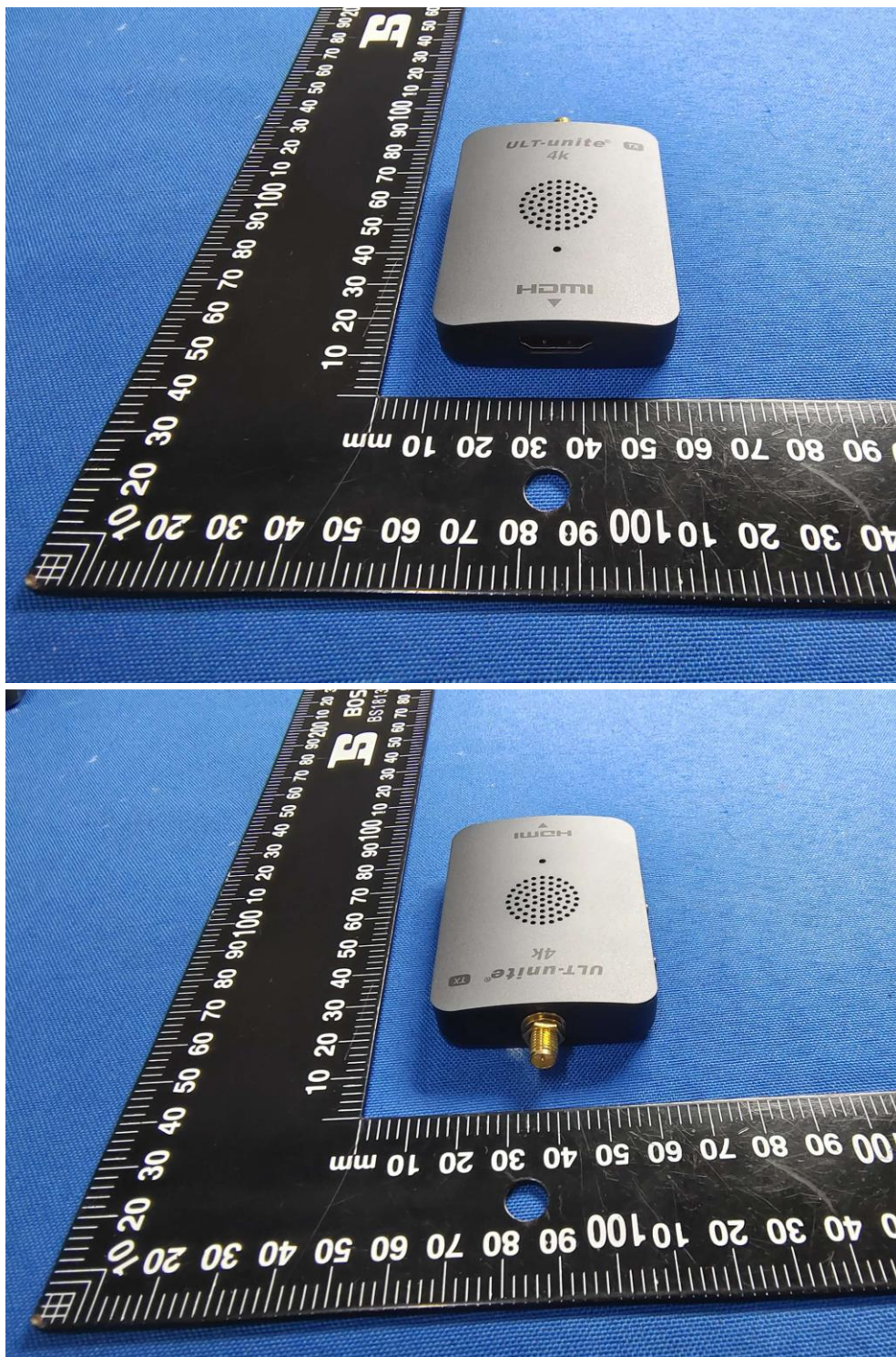
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Outside View



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Outside View



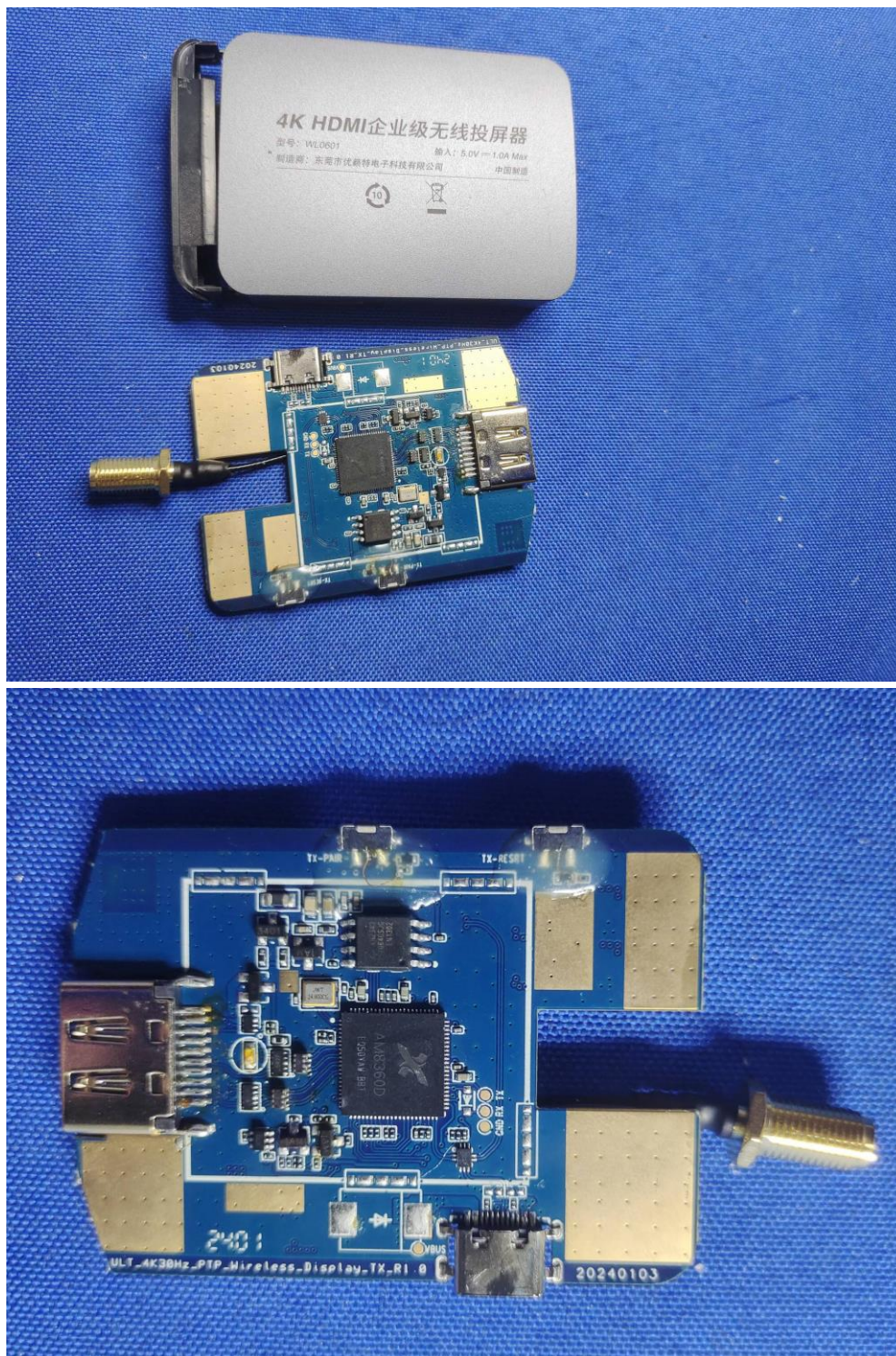
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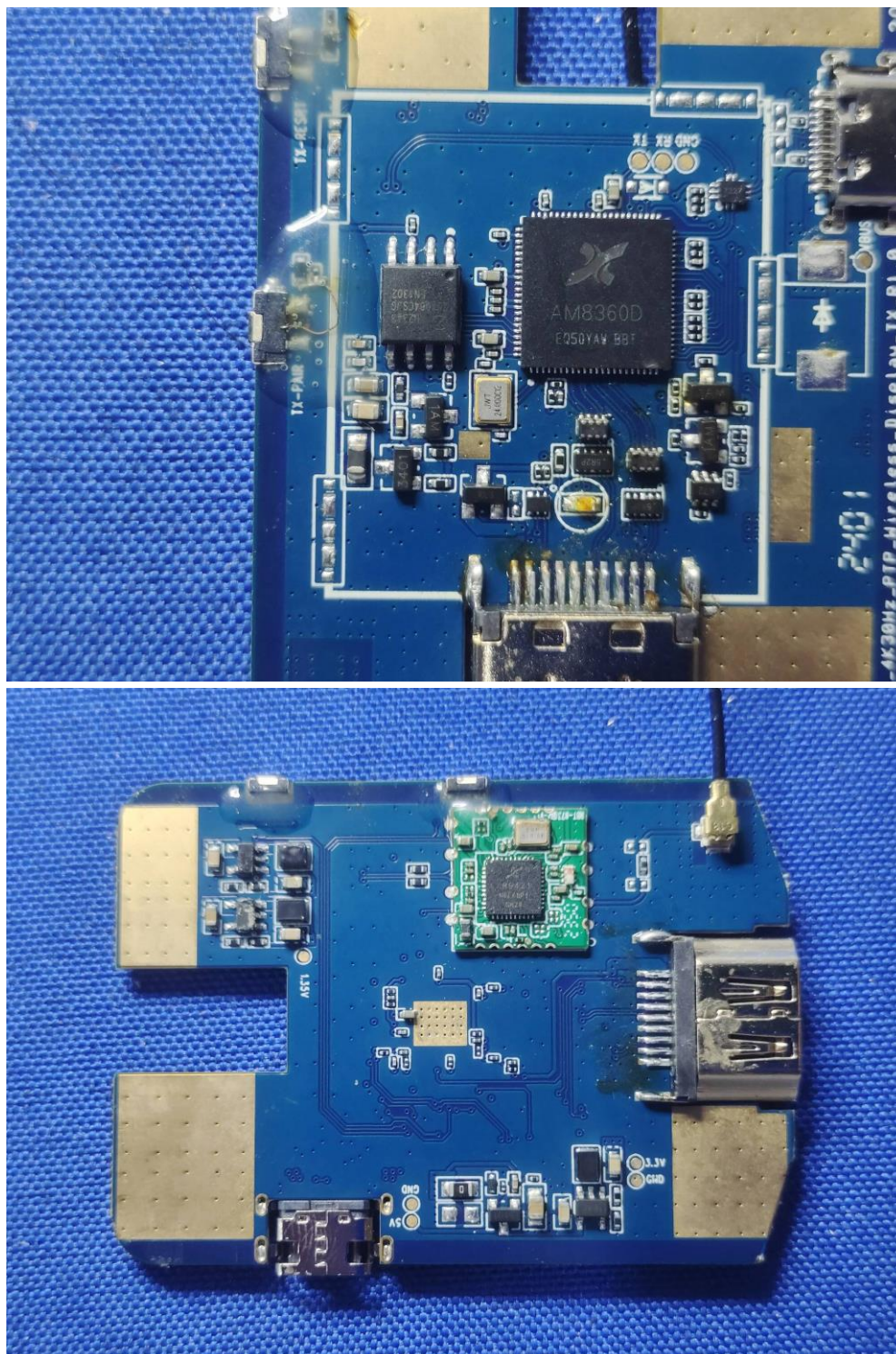
Inside view



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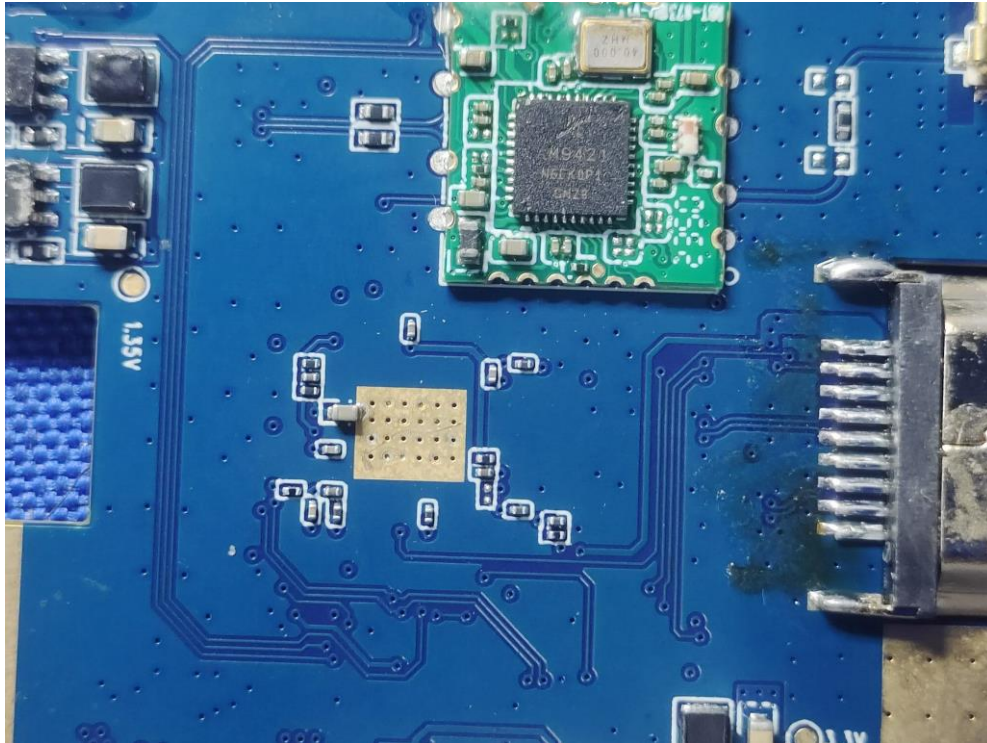


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Inside view



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