



## FCC Radio Test Report

## FCC ID: 2BCGWAX10

This report concerns: Class II permissive Change

Project No.	:	2311G085A
Equipment	:	AX1500 Wi-Fi 6 Router
Brand Name	:	tp-link
Test Model	:	Archer AX15
Series Model	:	N/A
Applicant	:	TP-LINK CORPORATION PTE. LTD.
Address	:	7 Temasek Boulevard #29-03 Suntec Tower One, Singapore 038987
Manufacturer	:	TP-LINK CORPORATION PTE. LTD.
Address	:	7 Temasek Boulevard #29-03 Suntec Tower One, Singapore 038987
Date of Receipt	:	Nov. 17, 2023
Date of Test	:	Dec. 13, 2023 ~ Feb. 05, 2024
Issued Date	:	Apr. 22, 2024
<b>Report Version</b>	:	R01
Test Sample	:	Engineering Sample No.: SSL202311163 for conducted,
		SSL202311164 for radiated.
Standard(s)	:	FCC CFR Title 47, Part 15, Subpart E

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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**BTL**'s reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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**BTL**'s laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

**BTL** is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

#### Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective. Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.



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		REPORT ISSUED HISTORY		
Report No.	Version	Description	Issued Date	Note
BTL-FCCP-2-2311G085A	R00	<ul> <li>This is a copy report which referencing test data are provided from the original test report (BTL-FCCP-2-2311G085)</li> <li>Changed the model name.</li> <li>Changed the CPU(pin to pin are the same).</li> <li>Removed the series model.</li> <li>Updated the hardware version.</li> <li>Added an adapter(Model: T120100-2D1, only differ in plug.)</li> <li>So output power and radiated emission below 1GHz have been re-evaluated. It was found that the original data was the worst case. Other are kept the same.</li> </ul>	Apr. 02, 2024	Invalid
BTL-FCCP-2-2311G085A	R01	Updated the antenna information.	Apr. 22, 2024	Valid



#### 1. APPLICABLE STANDARDS

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of NVLAP: KDB 789033 D02 General UNII Test Procedures New Rules v02r01 KDB 662911 D01 Multiple Transmitter Output v02r01

#### 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart E					
Standard(s) Section	Test Item	Test Result	Judgment	Remark	
15.207 15.407(b)	AC Power Line Conducted Emissions	APPENDIX A	PASS		
15.407(b) 15.205(a) 15.209(a)	Radiated Emissions	APPENDIX B APPENDIX C APPENDIX D	PASS		
15.407(a) 15.407(e)	Bandwidth	APPENDIX E	PASS		
15.407(a)	Maximum Output Power	APPENDIX F	PASS		
15.407(a)	Power Spectral Density	APPENDIX G	PASS		
15.407(g)	Frequency Stability	APPENDIX H	PASS		
15.203	Antenna Requirements		PASS	NOTE (2)	
15.407(c)	Automatically Discontinue Transmission		PASS	NOTE (3)	

Note:

- (1) "N/A" denotes test is not applicable in this test report.
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.
- (3) During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. the EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.
- (4) For UNII-1 this device was functioned as a
  - Outdoor access point device
  - $\boxtimes$  Indoor access point device
  - Fixed point-to-point access points device
  - Client device



#### 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town, Dongguan City, Guangdong 523792. BTL's Registration Number for FCC: 162128

BTL's Designation Number for FCC: CN5042

#### 2.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)) The BTL measurement uncertainty as below table:

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	<i>U</i> ,(dB)
DG-C02	CISPR	150kHz ~ 30MHz	2.60

#### B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	<i>U</i> ,(dB)
DG-CB01	CISPR	9kHz ~ 30MHz	2.36

Test Site	Method	Measurement Frequency Range	Ant. H / V	<i>U</i> ,(dB)
DG-CB03 (3m)	CISPR	30MHz ~ 200MHz	V	4.40
		30MHz ~ 200MHz	Н	3.62
		200MHz ~ 1,000MHz	V	4.58
		200MHz ~ 1,000MHz	Н	3.98

Test Site	Method	Measurement Frequency Range	<i>U</i> ,(dB)
DG-CB03		1GHz ~ 6GHz	4.08
(3m)	(3m) CISPR	6GHz ~ 18GHz	4.62

Test Site	Method	Measurement Frequency Range	<i>U</i> ,(dB)
DG-CB03 (1m)	CISPR	18 ~ 26.5 GHz	3.36
	CISPR	26.5 ~ 40 GHz	3.58



#### C. Other Measurement test:

Test Item	Uncertainty
Bandwidth	0.90 %
Maximum Output Power	1.3 dB
Power Spectral Density	1.4 dB
Frequency Stability	2.7 ppm
Temperature	0.8 °C
Humidity	2.2 %

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

#### 2.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
AC Power Line Conducted Emissions	24°C	58%	AC 120V/60Hz	Hayden Chen
Radiated Emissions-9kHz to 30MHz	22°C	48%	AC 120V/60Hz	Hayden Chen
Radiated Emissions-30MHz to 1000MHz	24°C	46%	AC 120V/60Hz	Max Wang
Radiated Emissions-Above 1000 MHz	24°C	46%	AC 120V/60Hz	Berton Luo
Bandwidth	25°C	49-52%	DC 12V	Steve Zhou
Maximum Output Power	23-24°C	51%	DC 12V	Gene Yang Oliver Wang
Power Spectral Density	25°C	49-52%	DC 12V	Steve Zhou
Frequency Stability	Normal & Extreme	49-52%	Normal & Extreme	Steve Zhou



#### **3. GENERAL INFORMATION**

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	AX1500 Wi-Fi 6 Router
Brand Name	tp-link
Test Model	Archer AX15
Series Model	N/A
Model Difference(s)	N/A
Hardware Version	1.0
Software Version	ax10v3-flash-us-ver1-0-0-P1[20230825-rel33060]-ecc
Power Source	DC Voltage supplied from AC adapter. 1# Model: T120100-2B1(US) 2# Model: T120100-2D1(UK) Only differ in plug, so test with US plug.
Power Rating	I/P: 100-240V~ 50-60Hz 0.3A O/P: 12.0V 1.0A
Operation Frequency Band(s)	UNII-1: 5150 MHz ~ 5250 MHz UNII-3: 5725 MHz ~ 5850 MHz
Modulation Type	IEEE 802.11a/n/ac: OFDM IEEE 802.11ax: OFDMA
Bit Rate of Transmitter	IEEE 802.11a: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 300 Mbps IEEE 802.11ac: up to 866.7 Mbps IEEE 802.11ax: up to 1201 Mbps
Maximum Output Power _UNII-1 Non Beamforming	IEEE 802.11a: 26.03 dBm (0.4009 W)
Maximum Output Power _UNII-3 Non Beamforming	IEEE 802.11ax(HE40): 25.81 dBm (0.3811 W)
Maximum Output Power _UNII-1 Beamforming	IEEE 802.11a: 26.03 dBm (0.4009 W)
Maximum Output Power _UNII-3 Beamforming	IEEE 802.11ax(HE40): 25.70 dBm (0.3715 W)

#### Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.



#### 2. Channel List:

IEEE 802.1 IEEE 802.11	IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20) IEEE 802.11ax(HE20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40) IEEE 802.11ax(HE40)		1ac(VHT80) 1ax(HE80)
UNI	I-1	UNII-1		UNII-1	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20) IEEE 802.11ax(HE20)		IEEE 802.1	11n(HT40) 1ac(VHT40) I1ax(HE40)	IEEE 802.1 <sup>-</sup> IEEE 802.1	
UNI	I-3	UN	II-3	UN	II-3
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

#### 3. Antenna Specification:

Ant.	Manufacturer	P/N	Antenna Type	Connector	Gain (dBi)
1	TP-LINK CORPORATION PTE. LTD.	3101506685	Dipole	N/A	3
2	TP-LINK CORPORATION PTE. LTD.	3101506301	Dipole	N/A	3

Note:

 This EUT supports CDD, and all antennas have the same gain, Directional gain = G<sub>ANT</sub>+Array Gain. For power measurements, Array Gain=0dB (N<sub>ANT</sub>≤4), so the Directional gain=3.

For power spectral density measurements,  $N_{ANT}$ =2,  $N_{SS}$  = 1.

So the Directional gain= $G_{ANT}$ +Array Gain= $G_{ANT}$ +10log( $N_{ANT}$ / $N_{SS}$ )dBi=3+10log(2/1)dBi=6.01. Then, the UNII-1 power spectral density limit is 17-(6.01-6)=16.99, the UNII-3 power spectral density limit is 30-(6.01-6)=29.99.

2) Beamforming gain is 3dB. So Directional gain=3+3=6.

#### 4. Table for Antenna Configuration:

For Non Beamforming:

i of Nen Deamorning.	
Operating Mode TX Mode	2TX
IEEE 802.11a	V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT20)	V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT20)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT80)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE20)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2)



### For Beamforming:

Operating Mode TX Mode	2TX
IEEE 802.11n(HT20)	V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT20)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT80)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE20)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2)



#### 3.2 TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

Pretest Mode	Description
Mode 1	TX A Mode Channel 36/40/48 (UNII-1)
Mode 2	TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)
Mode 3	TX AC(VHT40) Mode Channel 38/46 (UNII-1)
Mode 4	TX AC(VHT80) Mode Channel 42 (UNII-1)
Mode 5	TX AX(HE20) Mode Channel 36/40/48 (UNII-1)
Mode 6	TX AX(HE40) Mode Channel 38/46 (UNII-1)
Mode 7	TX AX(HE80) Mode Channel 42 (UNII-1)
Mode 8	TX A Mode Channel 149/157/165 (UNII-3)
Mode 9	TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)
Mode 10	TX AC(VHT40) Mode Channel 151/159 (UNII-3)
Mode 11	TX AC(VHT80) Mode Channel 155 (UNII-3)
Mode 12	TX AX(HE20) Mode Channel 149/157/165 (UNII-3)
Mode 13	TX AX(HE40) Mode Channel 151/159 (UNII-3)
Mode 14	TX AX(HE80) Mode Channel 155 (UNII-3)
Mode 15	TX A Mode Channel 48 (UNII-1)

Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

AC power line conducted emissions test		
Final Test Mode	Description	
Mode 15	TX A Mode Channel 48 (UNII-1)	

Radiated Emissions Test - Below 1GHz		
Final Test Mode Description		
Mode 15	TX A Mode Channel 48 (UNII-1)	



Radiated Emissions Test - Above 1GHz		
Final Test Mode	Description	
Mode 1	TX A Mode Channel 36/40/48 (UNII-1)	
Mode 2	TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)	
Mode 3	TX AC(VHT40) Mode Channel 38/46 (UNII-1)	
Mode 4	TX AC(VHT80) Mode Channel 42 (UNII-1)	
Mode 5	TX AX(HE20) Mode Channel 36/40/48 (UNII-1)	
Mode 6	TX AX(HE40) Mode Channel 38/46 (UNII-1)	
Mode 7	TX AX(HE80) Mode Channel 42 (UNII-1)	
Mode 8	TX A Mode Channel 149/157/165 (UNII-3)	
Mode 9	TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)	
Mode 10	TX AC(VHT40) Mode Channel 151/159 (UNII-3)	
Mode 11	TX AC(VHT80) Mode Channel 155 (UNII-3)	
Mode 12	TX AX(HE20) Mode Channel 149/157/165 (UNII-3)	
Mode 13	TX AX(HE40) Mode Channel 151/159 (UNII-3)	
Mode 14	TX AX(HE80) Mode Channel 155 (UNII-3)	

Maximum Output Power_ Beamforming & Other Conducted Test		
Final Test Mode	Description	
Mode 2	TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)	
Mode 3	TX AC(VHT40) Mode Channel 38/46 (UNII-1)	
Mode 4	TX AC(VHT80) Mode Channel 42 (UNII-1)	
Mode 5	TX AX(HE20) Mode Channel 36/40/48 (UNII-1)	
Mode 6	TX AX(HE40) Mode Channel 38/46 (UNII-1)	
Mode 7	TX AX(HE80) Mode Channel 42 (UNII-1)	
Mode 9	TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)	
Mode 10	TX AC(VHT40) Mode Channel 151/159 (UNII-3)	
Mode 11	TX AC(VHT80) Mode Channel 155 (UNII-3)	
Mode 12	TX AX(HE20) Mode Channel 149/157/165 (UNII-3)	
Mode 13	TX AX(HE40) Mode Channel 151/159 (UNII-3)	
Mode 14	TX AX(HE80) Mode Channel 155 (UNII-3)	



Maximum Output Power_Non Beamforming & Other Conducted Test		
Final Test Mode	Description	
Mode 1	TX A Mode Channel 36/40/48 (UNII-1)	
Mode 2	TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)	
Mode 3	TX AC(VHT40) Mode Channel 38/46 (UNII-1)	
Mode 4	TX AC(VHT80) Mode Channel 42 (UNII-1)	
Mode 5	TX AX(HE20) Mode Channel 36/40/48 (UNII-1)	
Mode 6	TX AX(HE40) Mode Channel 38/46 (UNII-1)	
Mode 7	TX AX(HE80) Mode Channel 42 (UNII-1)	
Mode 8	TX A Mode Channel 149/157/165 (UNII-3)	
Mode 9	TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)	
Mode 10	TX AC(VHT40) Mode Channel 151/159 (UNII-3)	
Mode 11	TX AC(VHT80) Mode Channel 155 (UNII-3)	
Mode 12	TX AX(HE20) Mode Channel 149/157/165 (UNII-3)	
Mode 13	TX AX(HE40) Mode Channel 151/159 (UNII-3)	
Mode 14	TX AX(HE80) Mode Channel 155 (UNII-3)	

Note:

(1) For AC power line conducted emissions and radiated emission below 1 GHz test, the TX A Mode Channel 48 (UNII-1) is found to be the worst case and recorded.

- (2) For radiated emission above 1 GHz test, the spurious points of 1GHz~26.5GHz and 26.5GHz~40GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.
- (3) All the bit rate of transmitter have been tested and found the lowest rate is found to be the worst case and recorded.
- (4) VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.
- (5) The measurements for Output Power are tested, the Non Beamforming and Beamforming are recorded in the report. The worst case is Non Beamforming and only the worst case is documented for other test items.
- (6) IEEE 802.11ax mode only supports full RU, so only the full RU is evaluated and measured inside report.
- (7) For radiated emission above 1 GHz test, the polarization of Vertical and Horizontal are evaluated, the worst case is Vertical and recorded.
- (8) The chip of the product with or without a shield cover, so radiated emission and power were evaluated. It found that chip of the product without a shield cover was worst case and record.

#### 3.3 PARAMETERS OF TEST SOFTWARE

Non Beamforming				
UNII-1				
Test Software Version		IPOP V4.0		
Frequency (MHz)	5180	5200	5240	
IEEE 802.11a	1800	2230	2300	
IEEE 802.11ac(VHT20)	1850	2100	2100	
IEEE 802.11ax(HE20)	1800	2100	2100	
Frequency (MHz)	5190	5230		
IEEE 802.11ac(VHT40)	1700	2100		
IEEE 802.11ax(HE40)	1700	2100		
Frequency (MHz)	5210			
IEEE 802.11ac(VHT80)	1650			
IEEE 802.11ax(HE80)	1650			

UNII-3			
Test Software Version	IPOP V4.0		
Frequency (MHz)	5745	5785	5825
IEEE 802.11a	2150	2000	2050
IEEE 802.11ac(VHT20)	2100	2100	2100
IEEE 802.11ax(HE20)	2100	2100	2100
Frequency (MHz)	5755	5795	
IEEE 802.11ac(VHT40)	2100	2100	
IEEE 802.11ax(HE40)	2100	2100	
Frequency (MHz)	5775		
IEEE 802.11ac(VHT80)	2000		
IEEE 802.11ax(HE80)	2000		

### Beamforming

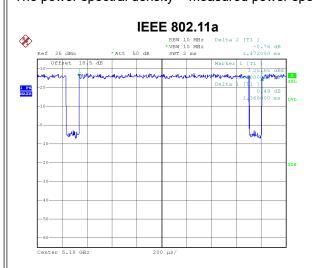
UNII-1			
Test Software Version	IPOP V4.0		
Frequency (MHz)	5180	5200	5240
IEEE 802.11ac(VHT20)	1800	2050	2050
IEEE 802.11ax(HE20)	1750	2050	2050
Frequency (MHz)	5190	5230	
IEEE 802.11ac(VHT40)	1650	2050	
IEEE 802.11ax(HE40)	1650	2050	
Frequency (MHz)	5210		
IEEE 802.11ac(VHT80)	1600		
IEEE 802.11ax(HE80)	1600		

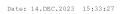
UNII-3			
Test Software Version	IPOP V4.0		
Frequency (MHz)	5745	5785	5825
IEEE 802.11ac(VHT20)	2050	2050	2050
IEEE 802.11ax(HE20)	2050	2050	2050
Frequency (MHz)	5755	5795	
IEEE 802.11ac(VHT40)	2050	2050	
IEEE 802.11ax(HE40)	2050	2050	
Frequency (MHz)	5775		
IEEE 802.11ac(VHT80)	1950		
IEEE 802.11ax(HE80)	1950		



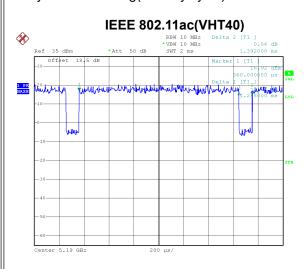
#### 3.4 DUTY CYCLE

If duty cycle is  $\geq$  98 %, duty factor is not required. If duty cycle is < 98 %, duty factor shall be considered. The output power = measured power + duty factor. The power spectral density = measured power spectral density + duty factor.



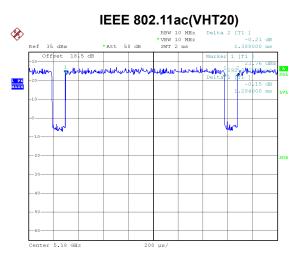


Duty cycle = 1.368 ms / 1.472 ms = 92.93% Duty Factor = 10 log(1 / Duty cycle) = 0.32



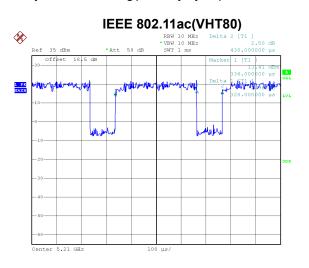
Date: 14.DEC.2023 15:40:38

Duty cycle = 1.288 ms / 1.392 ms = 92.53% Duty Factor = 10 log(1 / Duty cycle) = 0.34



Date: 14.DEC.2023 15:37:07

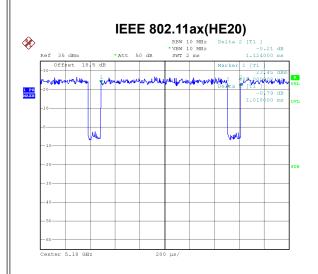
Duty cycle = 1.284 ms / 1.388 ms = 92.51% Duty Factor = 10 log(1 / Duty cycle) = 0.34



Date: 14.DEC.2023 16:45:34

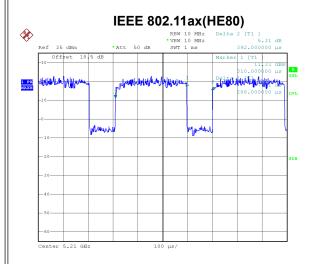
Duty cycle = 0.328 ms / 0.430 ms = 76.28% Duty Factor = 10 log(1 / Duty cycle) = 1.18

# **3**โL



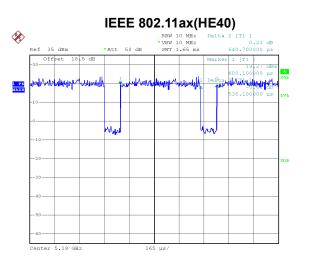
Date: 14.DEC.2023 16:29:21

Duty cycle = 1.018 ms / 1.124 ms = 90.57% Duty Factor = 10 log(1 / Duty cycle) = 0.43



Date: 14.DEC.2023 16:36:24

Duty cycle = 0.288 ms / 0.392 ms = 73.47% Duty Factor = 10 log(1 / Duty cycle) = 1.34



Date: 14.DEC.2023 16:34:03

Duty cycle = 0.535 ms / 0.641 ms = 83.52% Duty Factor = 10 log(1 / Duty cycle) = 0.78





#### NOTE:

#### For IEEE 802.11a:

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 731 Hz (Duty cycle < 98%).

For IEEE 802.11ac(VHT20):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 779 Hz (Duty cycle < 98%).

For IEEE 802.11ac(VHT40):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 776 Hz (Duty cycle < 98%).

For IEEE 802.11ac(VHT80):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3049 Hz (Duty cycle < 98%).

For IEEE 802.11ax(HE20):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 982 Hz (Duty cycle < 98%).

For IEEE 802.11ax(HE40):

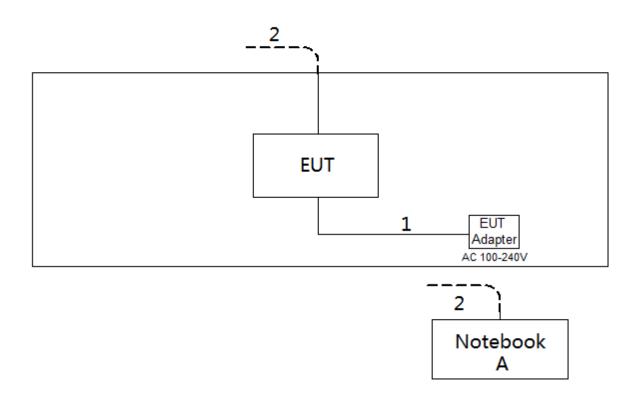
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1869 Hz (Duty cycle < 98%).

For IEEE 802.11ax(HE80):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3472 Hz (Duty cycle < 98%).



#### 3.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



#### 3.6 SUPPORT UNITS

ANotebookDellInspiron 15-7559	N/A	

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1.5m
2	RJ45 Cable	NO	NO	10m

#### 3.7 CUSTOMER INFORMATION DESCRIPTION

- 1) The antenna gain and beamforming gain are provided by the manufacturer.
- 2) Except for AC power line conducted emissions and radiated emissions, the results of all test items include cable losses. All cable losses are provided by the testing laboratory.



#### 4. AC POWER LINE CONDUCTED EMISSIONS

#### 4.1 LIMIT

Frequency	Limit (dBµV)	
(MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56*	56 to 46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

#### 4.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### The following table is the setting of the receiver:

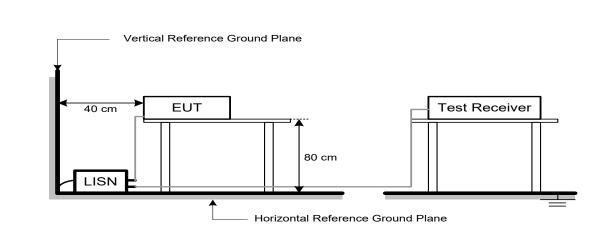
Receiver Parameter	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

#### 4.3 DEVIATION FROM TEST STANDARD

No deviation



#### 4.4 TEST SETUP



#### 4.5 EUT OPERATION CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting/TX mode.

#### 4.6 TEST RESULTS

Please refer to the APPENDIX A.

#### **5. RADIATED EMISSIONS**

#### **5.1 LIMIT**

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

#### LIMITS OF RADIATED EMISSIONS MEASUREMENT (9 kHz to 1000 MHz)

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

#### LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS (Above 1000 MHz)

Frequency	EIRP Limit	Equivalent Field Strength at 3m
(MHz)	(dBm/MHz)	(dBµV/m)
5150-5250	-27	68.2
	-27	68.2
5725-5850	10	105.2
NOTE (2)	15.6	110.8
	27	122.2

NOTE:

(1) The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength: 1000000<del>√30P</del> E = 1

(2) According to 15.407(b)(4)(i), all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.



#### 5.2 TEST PROCEDURE

- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. 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 find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1 GHz)
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1 GHz)
- i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

The following table is the setting of the receiver:

Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz

Spectrum Parameters	Setting
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic or 40 GHz, whichever is lower
RBW / VBW	1 MHz / 3 MHz for PK value
(Emission in restricted band)	1 MHz / 1/T Hz for AVG value

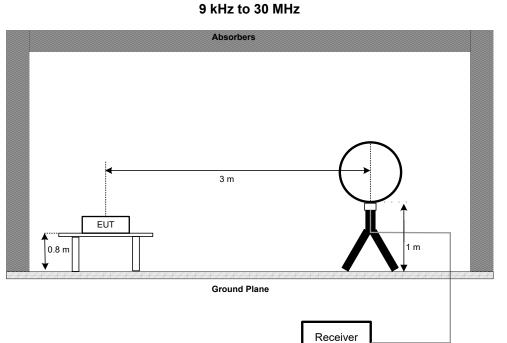
Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector
Start ~ Stop Frequency	1 GHz~40 GHz for PK/AVG detector



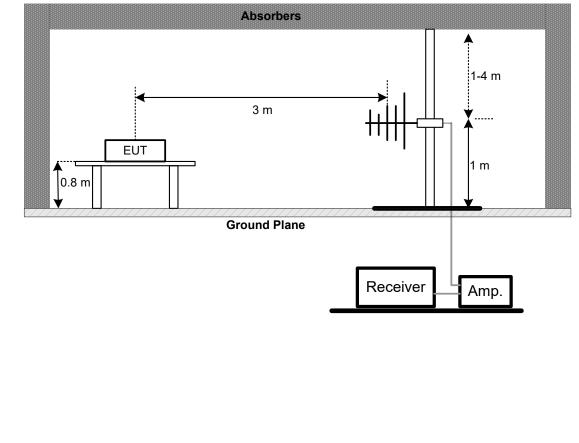
#### 5.3 DEVIATION FROM TEST STANDARD

No deviation.

#### 5.4 TEST SETUP

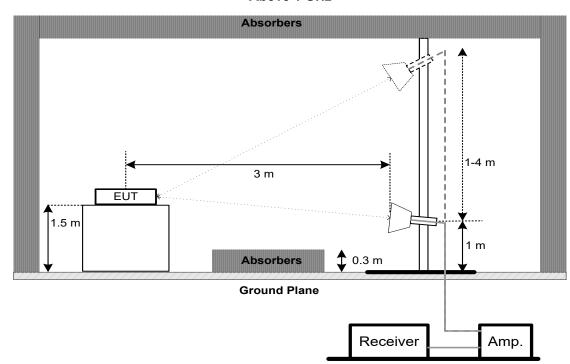


30 MHz to 1 GHz





#### Above 1 GHz



#### 5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

#### 5.6 TEST RESULTS - 9 KHZ TO 30 MHZ

Please refer to the APPENDIX B.

#### Remark:

- (1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 5.7 TEST RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX C.

#### 5.8 TEST RESULTS - ABOVE 1000 MHZ

Please refer to the APPENDIX D.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.



#### 6. BANDWIDTH

#### 6.1 LIMIT

Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.407(a)	26 dB Bandwidth	-	5150-5250
FCC 15.407(e)	6 dB Bandwidth	Minimum 500 kHz	5725-5850

#### 6.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below
- b. Spectrum Setting:
- For UNII-1:

Spectrum Parameter	Setting
Span Frequency	> 26 dB Bandwidth
RBW	Appromiximately 1% of the emission bandwidth
VBW	> RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### For UNII-3:

Spectrum Parameter	Setting
Span Frequency	> 6 dB Bandwidth
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

For 99% Occupied Bandwidth:

Spectrum Parameter	Setting
Span Frequency	1.5 times to 5 times the OBW
RBW	1% to 5% of the OBW
VBW	≥3*RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

c. Measured the spectrum width with power higher than 26 dB / 6 dB below carrier.

#### 6.3 DEVIATION FROM STANDARD

No deviation.



#### 6.4 TEST SETUP



#### 6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 6.6 TEST RESULTS

Please refer to the APPENDIX E.



#### 7. MAXIMUM OUTPUT POWER

#### 7.1 LIMIT

Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.407(a)	Maximum Output Power	AP device: 1 Watt (30 dBm) Client device: 250 mW (23.98 dBm)	5150-5250
		1 Watt (30dBm)	5725-5850

#### Note:

- a. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 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.
- b. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 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.

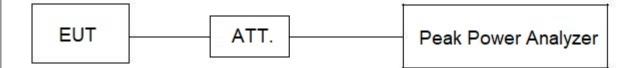
#### 7.2 TEST PROCEDURE

- a. The EUT was directly connected to the peak power analyzer and antenna output port as show in the block diagram below.
- b. The test was performed in accordance with method of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

#### 7.3 DEVIATION FROM STANDARD

No deviation.

#### 7.4 TEST SETUP



#### 7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 7.6 TEST RESULTS

Please refer to the APPENDIX F.



#### 8. POWER SPECTRAL DENSITY

#### 8.1 LIMIT

Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.407(a)	Power Spectral Density	AP device: 17 dBm/MHz Client device: 11 dBm/MHz	5150-5250
		30 dBm/500 kHz	5725-5850

#### 8.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting:

For UNII-1:

Spectrum Parameter	Setting
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1 MHz.
VBW	3 MHz.
Detector	RMS
Trace average	100 trace
Sweep Time	Auto

For UNII-3:

Spectrum Parameter	Setting
Span Frequency	Encompass the entire emissions bandwidth (EBW)
	of the signal
RBW	100 kHz.
VBW	300 kHz.
Detector	RMS
Trace average	100 trace
Sweep Time	Auto

Note:

- For UNII-3, according to KDB publication 789033 D02 General UNII Test Procedures New Rules v02r01, section II.F.5., it is acceptable to set RBW at 100kHz and VBW at 300kHz if the spectrum analyzer does not have 500 kHz RBW. Then, add 10 log (500 kHz/100 kHz) to the measured result, i.e. 7 dB.
- During the test of U-NII 3 PSD, the measurement result with RBW=100kHz has been added 7 dB by compensating offset. For example, the cable loss is 25.5 dB, and the final offset is 18.5 + 7 = 25.5 dB when RBW=100kHz is used.

#### 8.3 DEVIATION FROM STANDARD

No deviation.



#### 8.4 TEST SETUP



#### 8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 8.6 TEST RESULTS

Please refer to the APPENDIX G.



#### 9. FREQUENCY STABILITY

#### 9.1 LIMIT

Section	Test Item	Limit	Frequency Range (MHz)
		An emission is maintained within the band of	5150-5250
FCC 15.407(g)	Frequency Stability	operation under all conditions of normal operation as specified in the users manual.	5725-5850

#### 9.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting:

Spectrum Parameter	Setting
Span Frequency	Entire absence of modulation emissions bandwidth
RBW	10 kHz
VBW	10 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

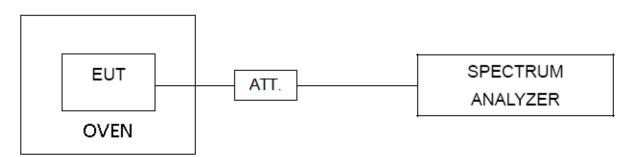
c. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

d. User manual temperature is 0°C~40°C.

#### 9.3 DEVIATION FROM STANDARD

No deviation.

#### 9.4 TEST SETUP



#### 9.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 9.6 TEST RESULTS

Please refer to the APPENDIX H.



### **10. MEASUREMENT INSTRUMENTS LIST**

	AC Power Line Conducted Emissions						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	EMI Test Receiver	R&S	ESR3	103027	Jun. 16, 2024		
2	TWO-LINE V-NETWORK	R&S	ENV216	101447	Dec. 22, 2024		
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A		
4	Cable	N/A	RG223	12m	Sep. 13, 2024		
5	643 Shield Room	ETS	6*4*3	N/A	N/A		

	Radiated Emissions - 9 kHz to 30 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Active Loop Antenna	Schwarzbeck	FMZB 1513-60B	1513-60 B-034	Apr. 01, 2024	
2	MXE EMI Receiver	Keysight	N9038A	MY56400091	Dec. 22, 2024	
3	Cable	N/A	RW2350-3.8A-NMB M-1.5M	N/A	Jun. 10, 2024	
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	
5	966 Chamber room	ETS	9*6*6	N/A	Jul. 11, 2024	

	Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	1461	Nov. 28, 2024	
2	Attenuator	EMC INSTRUMENT	EMCI-N-6-06	AT-06010	Nov. 28, 2024	
3	Preamplifier	EMC INSTRUMENT	EMC001330	980863	Nov.17, 2024	
4	Cable	RegalWay	LMR400-NMNM-12 .5m	N/A	Jul. 04, 2024	
5	Cable	RegalWay	LMR400-NMNM-3 m	N/A	Jul. 04, 2024	
6	Cable	RegalWay	LMR400-NMNM-0. 5m	N/A	Jul. 04, 2024	
7	Receiver	Agilent	N9038A	MY52130039	Jan. 07, 2024	
8	Positioning Controller	MF	MF-7802	N/A	N/A	
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	
10	966 Chamber room	CM	9*6*6	N/A	May 17, 2024	



	Radiated Emissions - Above 1 GHz						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Receiver	Agilent	N9038A	MY52130039	Jan. 07, 2024		
2	Preamplifier	EMC INSTRUMENT	EMC118A45SE	980888	Nov. 17, 2024		
3	EXA Spectrum Analyzer	Keysight	N9010A	MY55150209	Jun. 16, 2024		
4	Double Ridged Guide Antenna	ETS	3115	75789	May 31,2024		
5	Cable	RegalWay	A81-SMAMSMAM- 12.5M	N/A	Aug. 08, 2024		
6	Cable	RegalWay	RWLP50-4.0A-NM RASM-2.5M	N/A	Aug. 08, 2024		
7	Cable	RegalWay	RWLP50-4.0A-NM RASMRA-0.8M	N/A	Aug. 08, 2024		
8	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330 -K	619413	Jul. 06, 2024		
9	Cable	RegalWay	RWLP50-2.6A-2.92 M2.92M-1.1M	N/A	Jul. 26, 2024		
10	Cable	Tonscend	HF160-KMKM-3M	N/A	Jul. 26, 2024		
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA9170(3m)	9170-319	Jun. 20, 2024		
12	966 Chamber room	CM	9*6*6	N/A	May 17,2024		
13	Positioning Controller	MF	MF-7802	N/A	N/A		

	Bandwidth & Power Spectral Density						
Item	Item Kind of Equipment Manufacturer Type No. Serial No. Calibrated un						
1	Spectrum Analyzer	R&S	FSP40	100185	Jun. 16, 2024		
2	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A		
3	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A		
4	DC Block	N/A	N/A	N/A	N/A		
5	Measurement Software	BTL	BTL Conducted Test	N/A	N/A		

	Maximum Output Power						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Peak Power Analyzer	Keysight	8990B	MY51000506	Jun. 17, 2024		
2	Wideband power sensor	Keysight	N1923A	MY58310004	Jun. 17, 2024		
3	Attenuator	Talent Microwave	TA10A2-S-18	N/A	N/A		



Frequency Stability						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	R&S	FSP40	100185	Jun. 16, 2024	
2	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A	
3	Attenuator	Talent Microwave	TA10A0-S-26.5	N/A	N/A	
4	DC Block	N/A	N/A	N/A	N/A	
5	Measurement Software	BTL	BTL Conducted Test	N/A	N/A	
6	Table top type high and low temperature test chamber	CEPREI	CEEC-M64T-40	15-008	Dec. 22, 2024	
7	Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Jul. 07, 2024	

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.



## **11. EUT TEST PHOTOS**



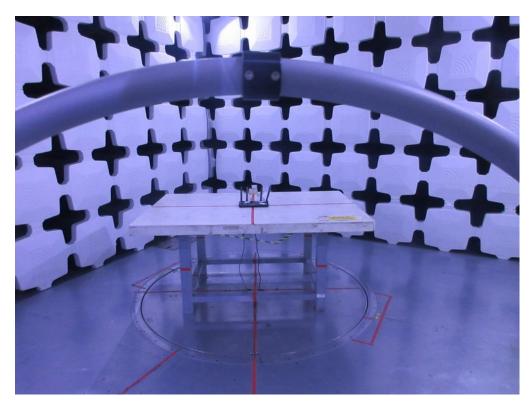
## AC Power Line Conducted Emissions Test Photos

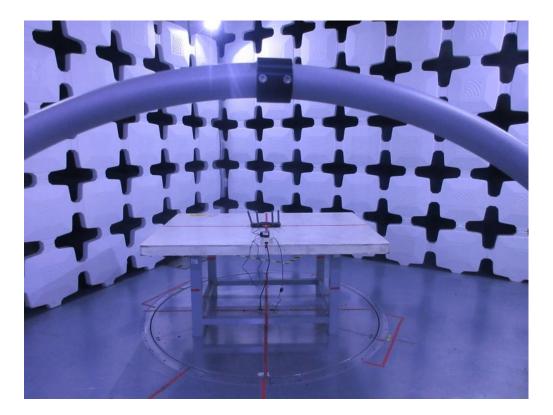




## **Radiated Emissions Test Photos**

9 kHz to 30 MHz

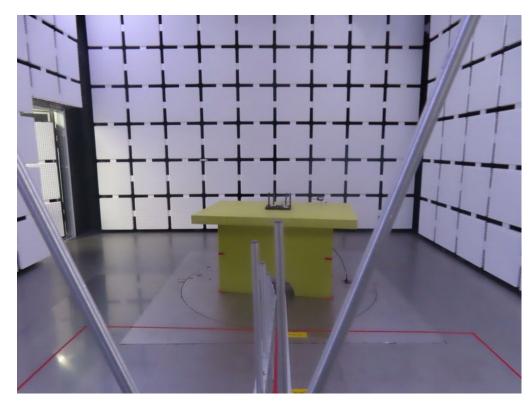


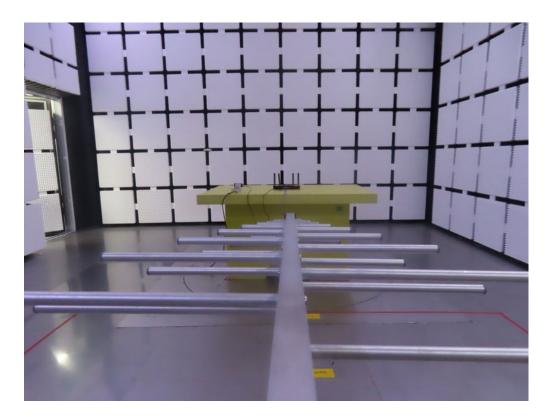




**Radiated Emissions Test Photos** 

30 MHz to 1 GHz

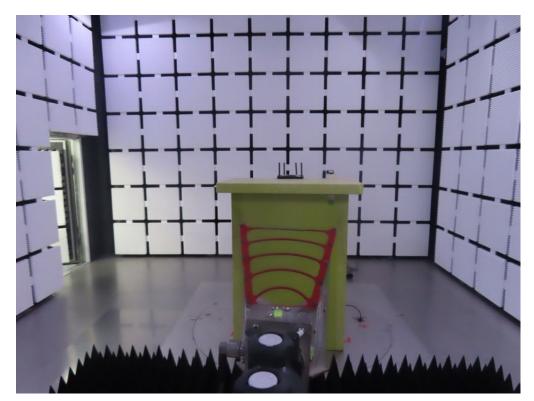






**Radiated Emissions Test Photos** 

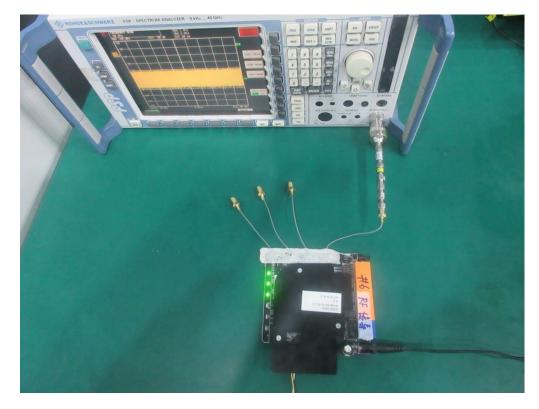
Above 1 GHz







## **Conducted Test Photos**

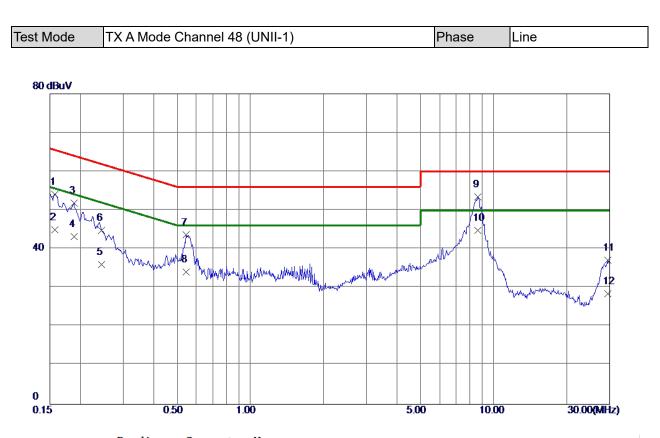






# **APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS**

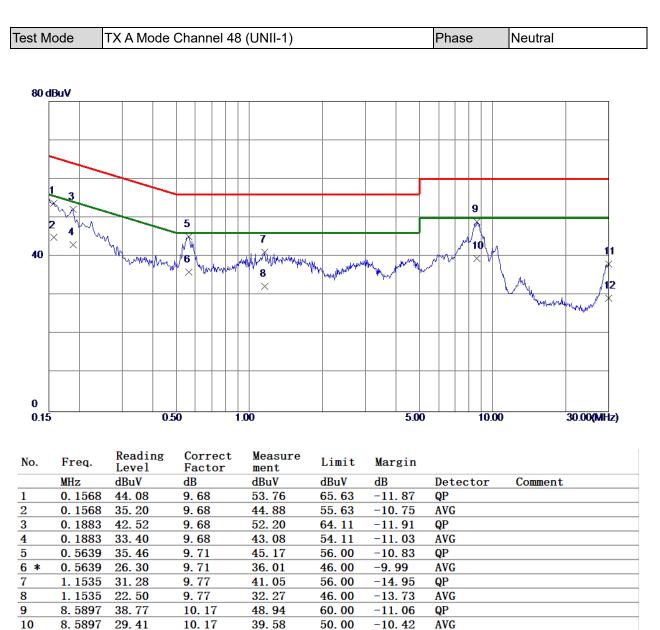




No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1568	44. 44	9.71	54.15	65.63	-11. 48	QP	
2	0.1568	35.20	9.71	44. 91	55.63	-10.72	AVG	
3	0.1883	42.06	9.71	51.77	<b>64</b> . 11	-12.34	QP	
4	0.1883	33. 50	9.71	43.21	54.11	-10. 90	AVG	
5	0.2445	26.29	9.71	36.00	61. 94	-25 <b>. 94</b>	QP	
6	0.2445	35.13	9.71	44.84	51. 94	-7.10	AVG	
7	0.5437	33.86	9.74	43.60	56.00	-12. 40	QP	
8	0.5437	24.30	9.74	34.04	46.00	-11.96	AVG	
9	8.6235	43. 29	10. 19	<b>53.48</b>	60.00	-6. 52	QP	
10 *	8.6235	34.60	10. 19	44. 79	50.00	-5.21	AVG	
11	29. 5395	26.12	11.03	37.15	60.00	-22.85	QP	
12	29. 5395	17.50	11.03	28.53	50.00	-21.47	AVG	

- (1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value Limit Value.
- (3) The test result has included the cable loss.





11

12

(1) Measurement Value = Reading Level + Correct Factor.

11.03

11.03

38.08

29.33

60.00

50.00

-21.92

-20.67

QP

AVG

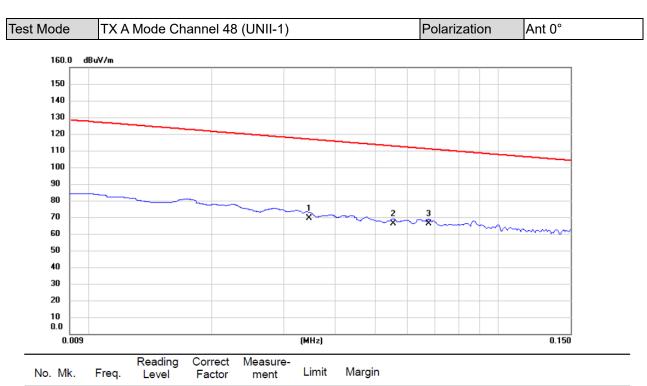
- (2) Margin Level = Measurement Value Limit Value.
- (3) The test result has included the cable loss.

29.9175 27.05

29.9175 18.30



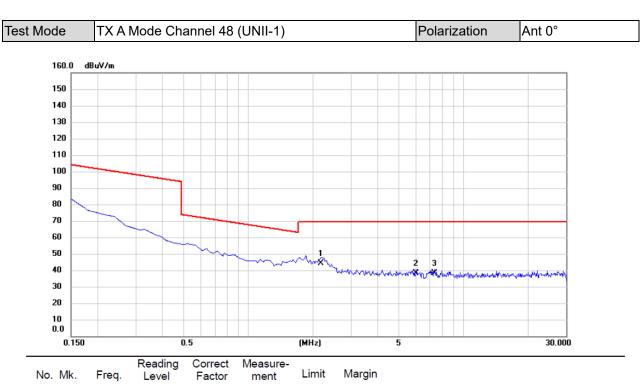
# **APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ**



	No. Mk.	Freq.	Level	Factor	ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
_	1	0.035	49.63	19.80	69.43	116.85	-47.42	AVG	
_	2	0.055	46.51	19.82	66.33	112.73	-46.40	AVG	
	3 *	0.068	46.22	19.86	66.08	111.02	-44.94	AVG	

- Measurement Value = Reading Level + Correct Factor.
   Margin Level = Measurement Value Limit Value.

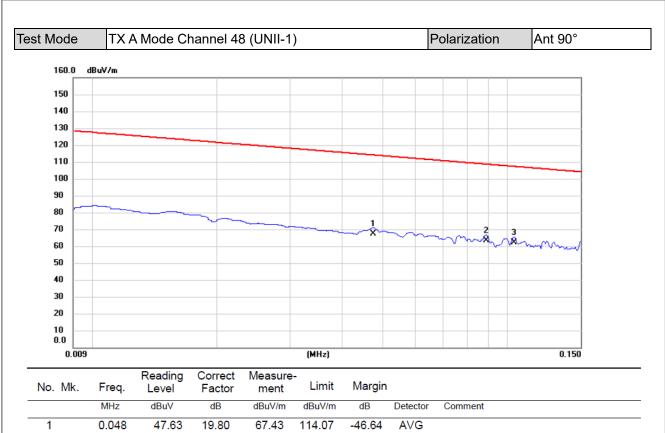




No. Mk.	Freq.	Level	Factor	ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2.180	24.32	19.81	44.13	69.54	-25.41	QP	
2	6.030	18.11	19.96	38.07	69.54	-31.47	QP	
3	7.314	18.23	20.04	38.27	69.54	-31.27	QP	

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

# <u>3ĩL</u>



-45.16

-44.94

AVG

QP

## REMARKS:

2

3 \*

0.089

0.104

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

43.62

42.51

19.86

19.83

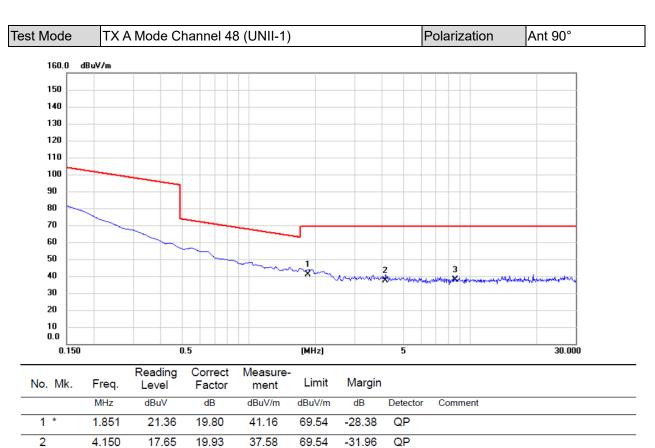
63.48

62.34

108.64

107.28





3

8.568

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

17.52

20.12

37.64

69.54

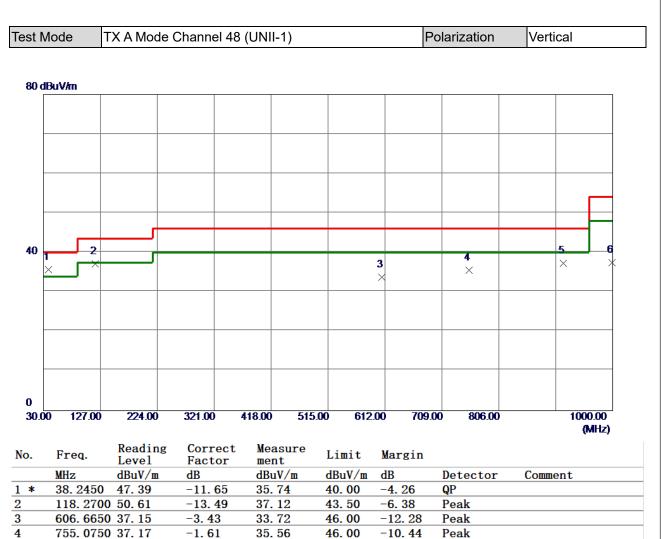
-31.90

QP



# APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ





-8.74

-16. 49

Peak

Peak

46.00

54.00

37.26

37.51

-0.02

1.03

REMARKS:

5

6

916. 0950 37. 28

998. 5450 36. 48

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



est N	/lode	TX A Mode	Channel 48	Polarization	Horizontal			
80 d	BuV/m							
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40						5		6 ×
		3				×		
ľ	1 2 1 ×	×		- <b>4</b> ×				
	× ^							
-								
0 30.0	0 127.00	224.00	321.00	418.00 51	5.00 612	200 70	9.00 806.00	1000.00
	- 121.00		521.00		012			(MHz)
lo.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin	1	
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
	40. 1850	) 38.60	-11.45	27.15	40.00	-12.85	Peak	

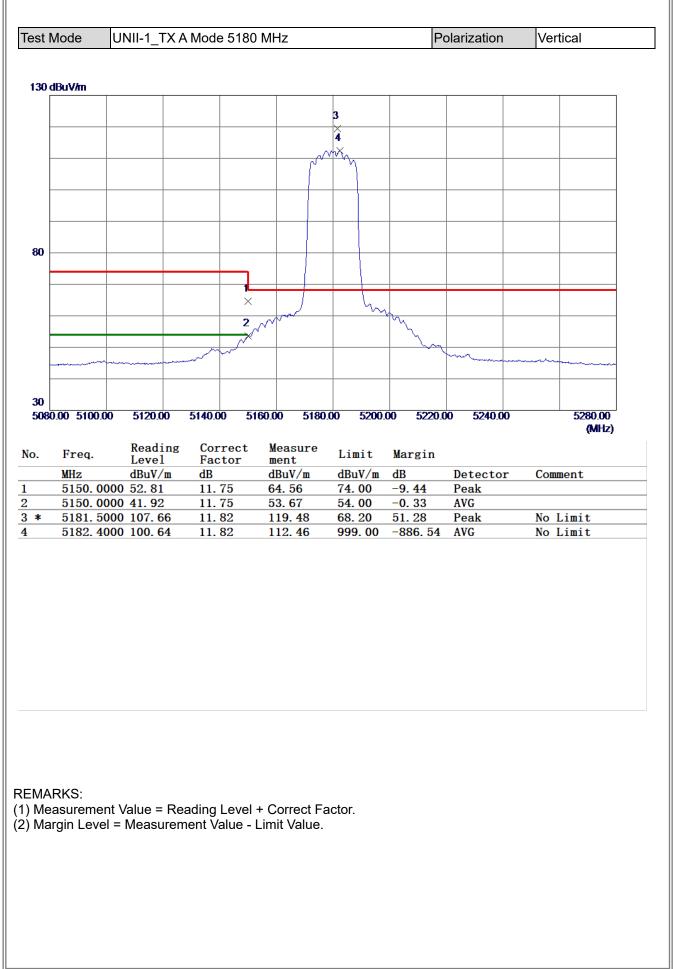
	MHZ	abuv/m	dВ	abuv/m	abuv/m	ab	Detector	Comment
1	40. 1850	38.60	-11. 45	27.15	40.00	-12.85	Peak	
2	118. 7550	42.22	-13. 43	28.79	43. 50	-14. 71	Peak	
3	142. 0350	<b>42.96</b>	-11. 50	31.46	43. 50	-12.04	Peak	
4	388. 9000	35.85	-8.38	27.47	46.00	-18.53	Peak	
5	625. <b>094</b> 9	37.38	-3.35	34.03	46.00	-11.97	Peak	
6	* 882.1450	38.72	-0.17	38.55	46.00	-7.45	Peak	

- (1) Measurement Value = Reading Level + Correct Factor.
  (2) Margin Level = Measurement Value Limit Value.

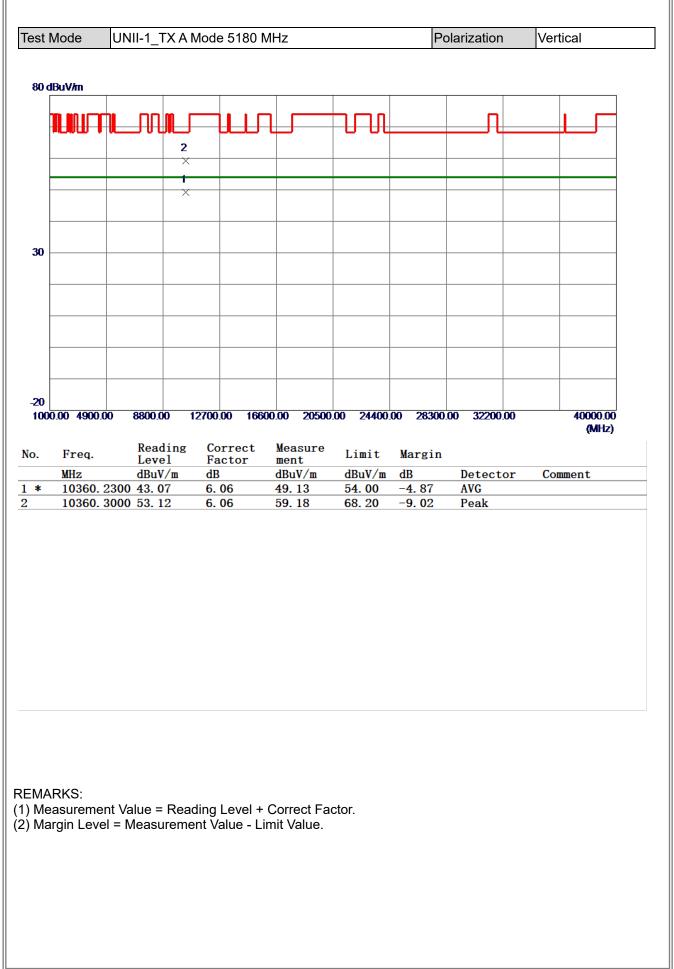


# **APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ**

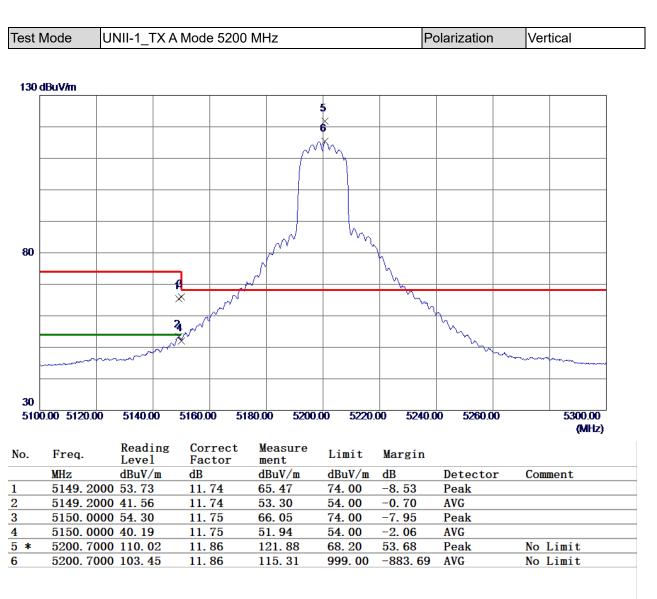






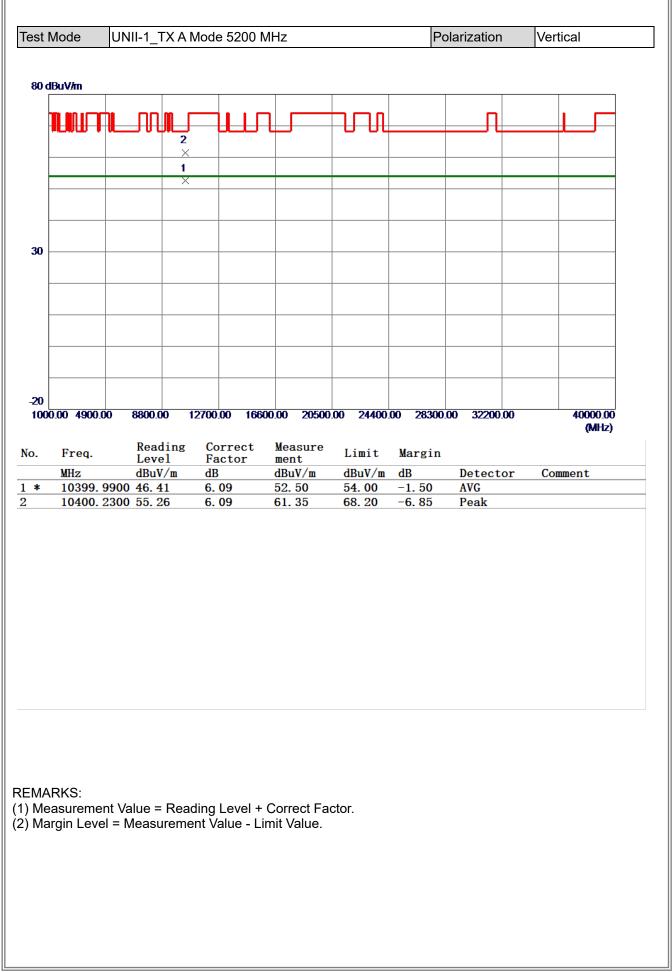




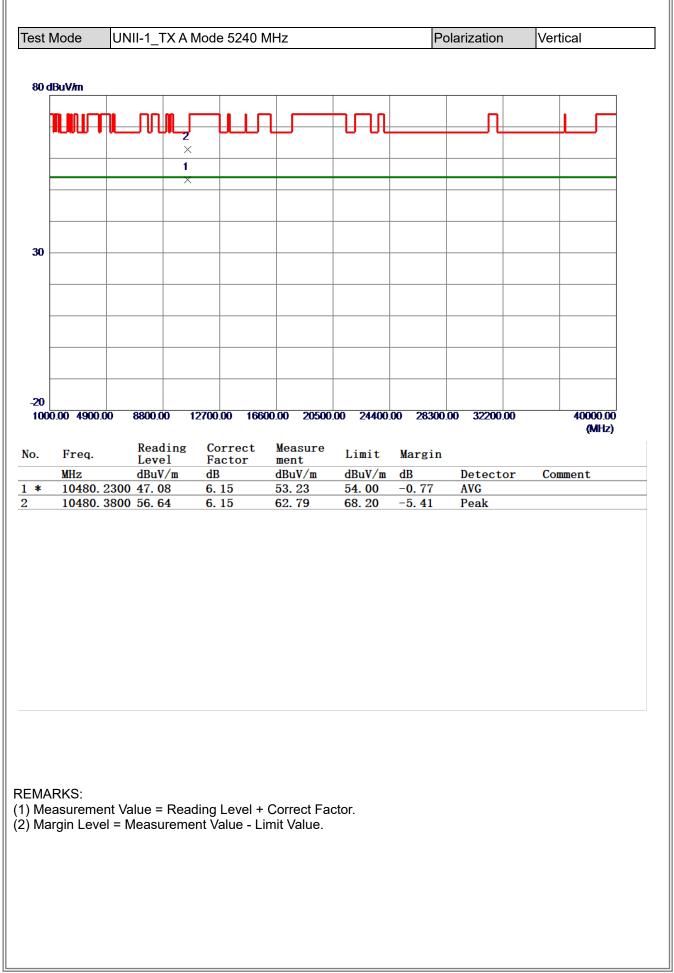


- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

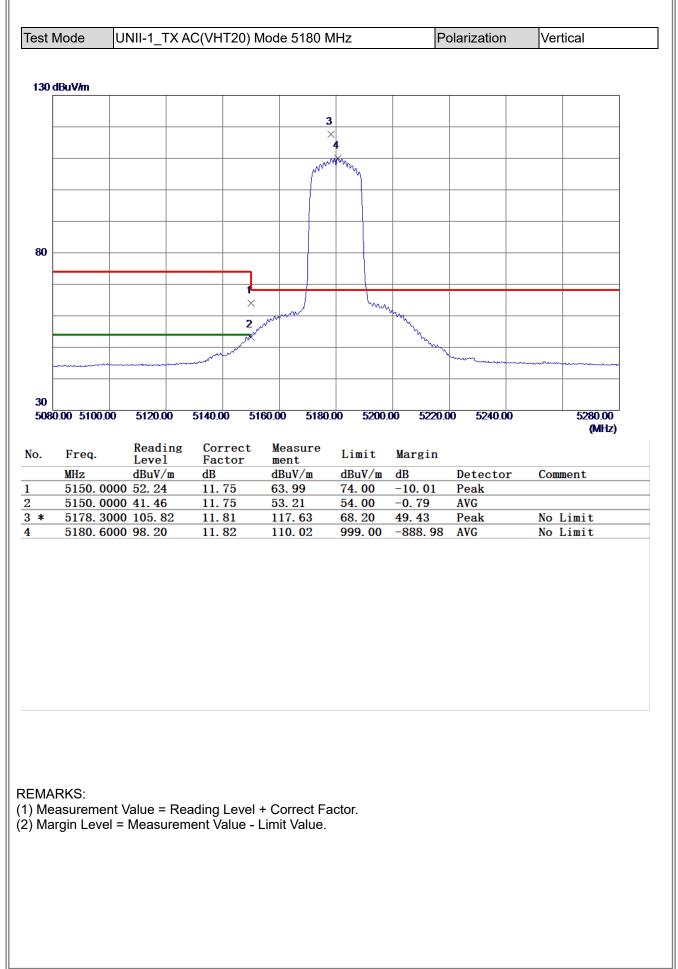




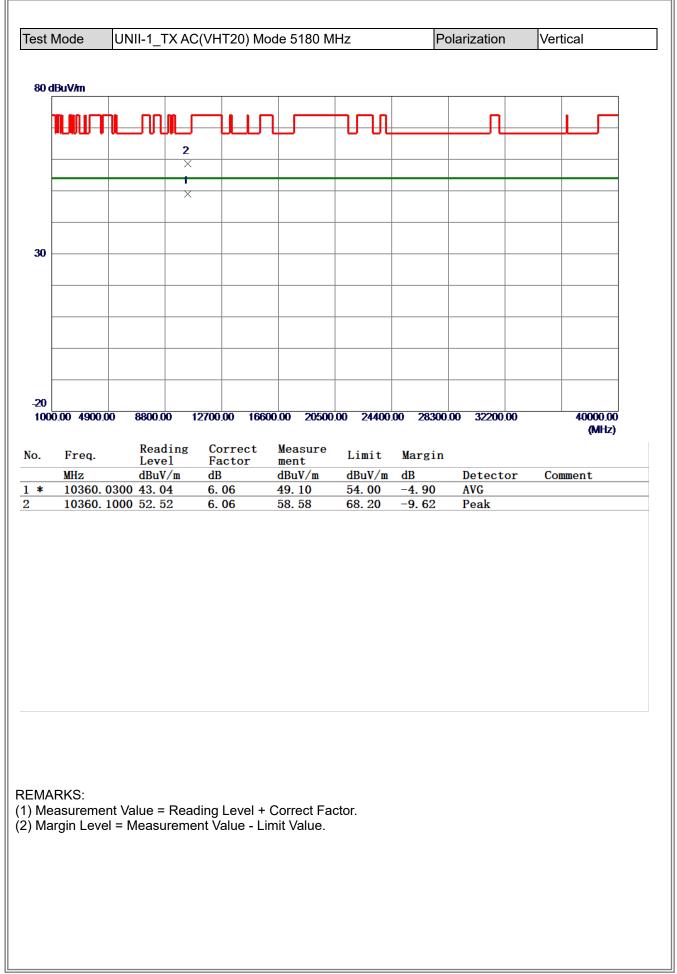




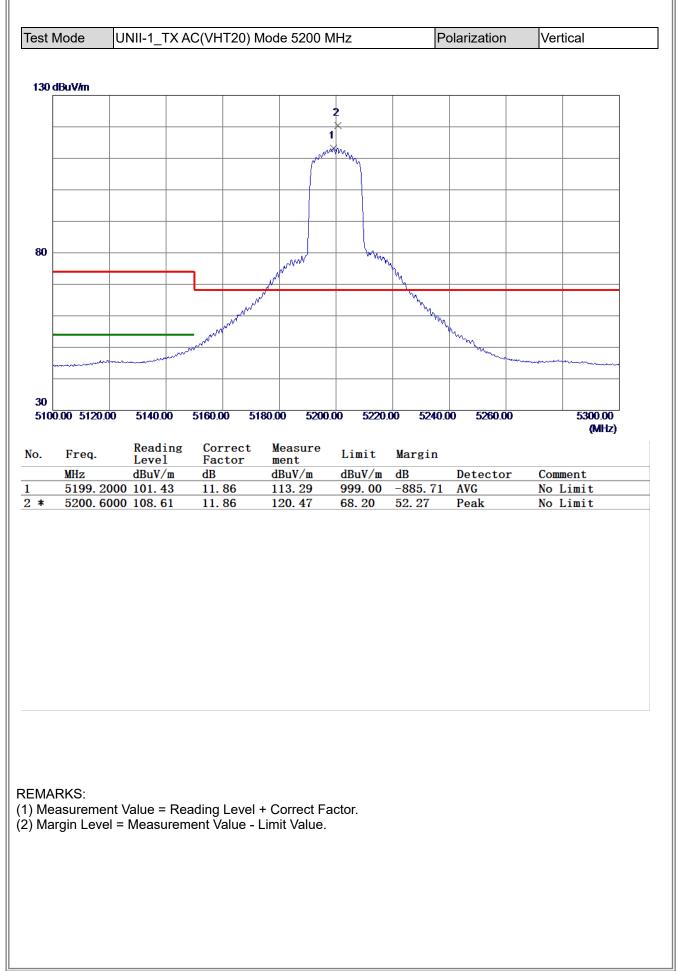




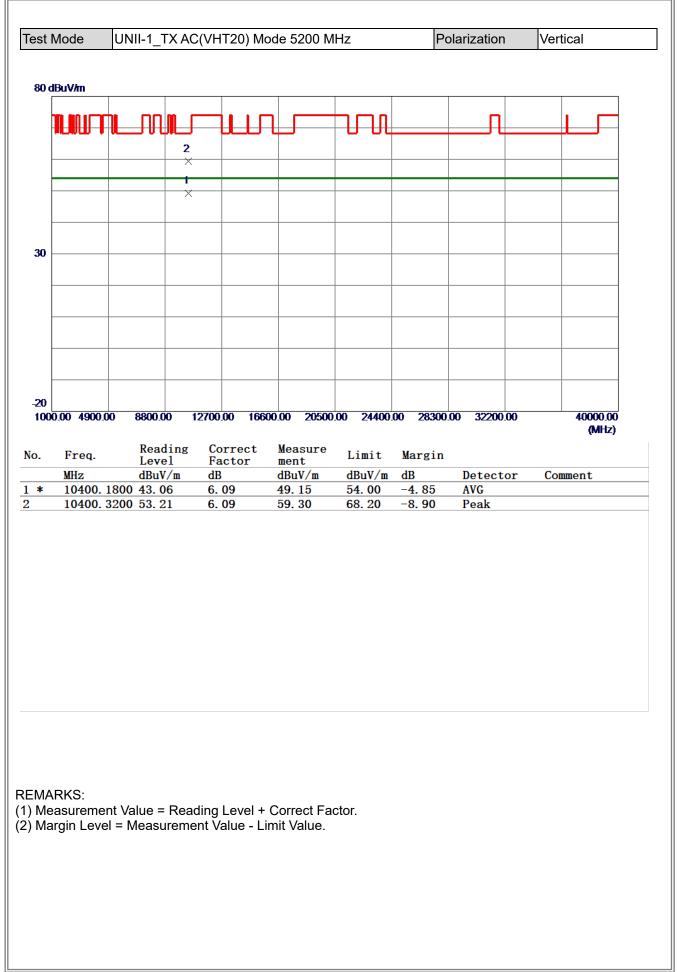




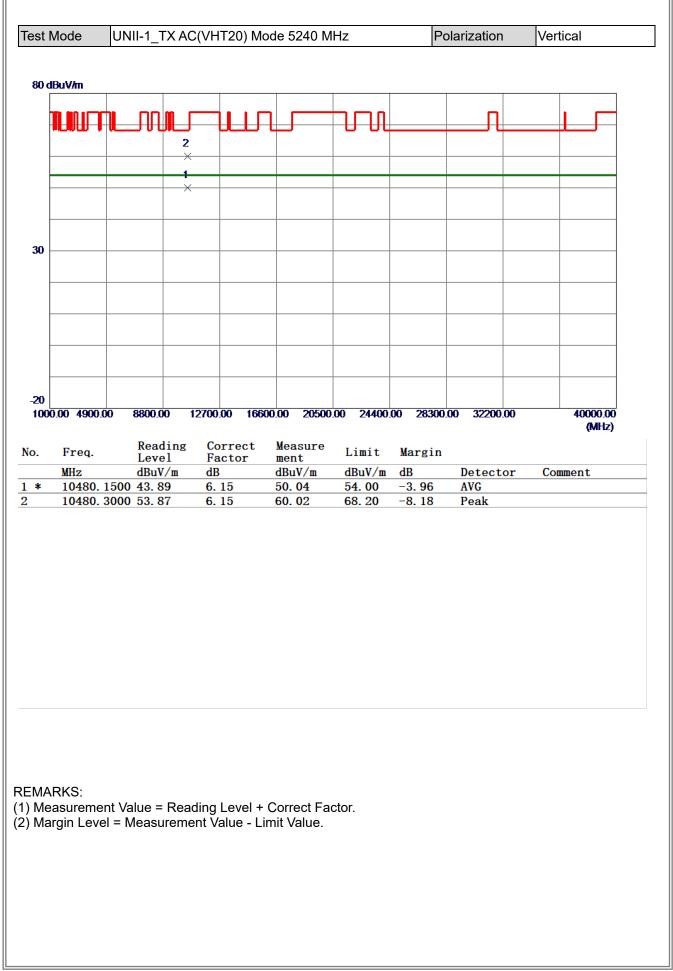




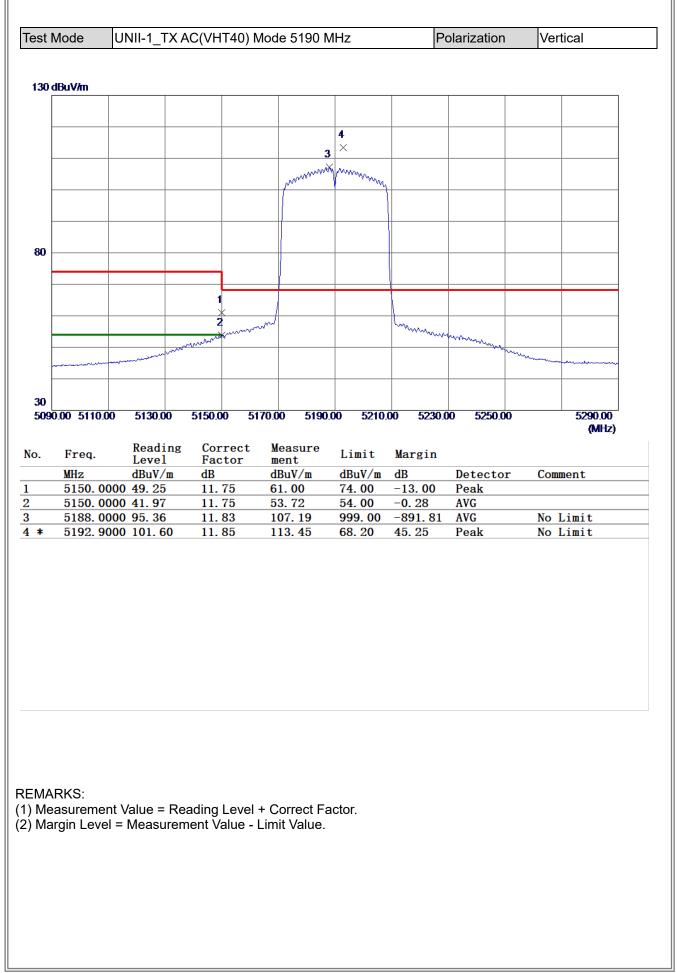




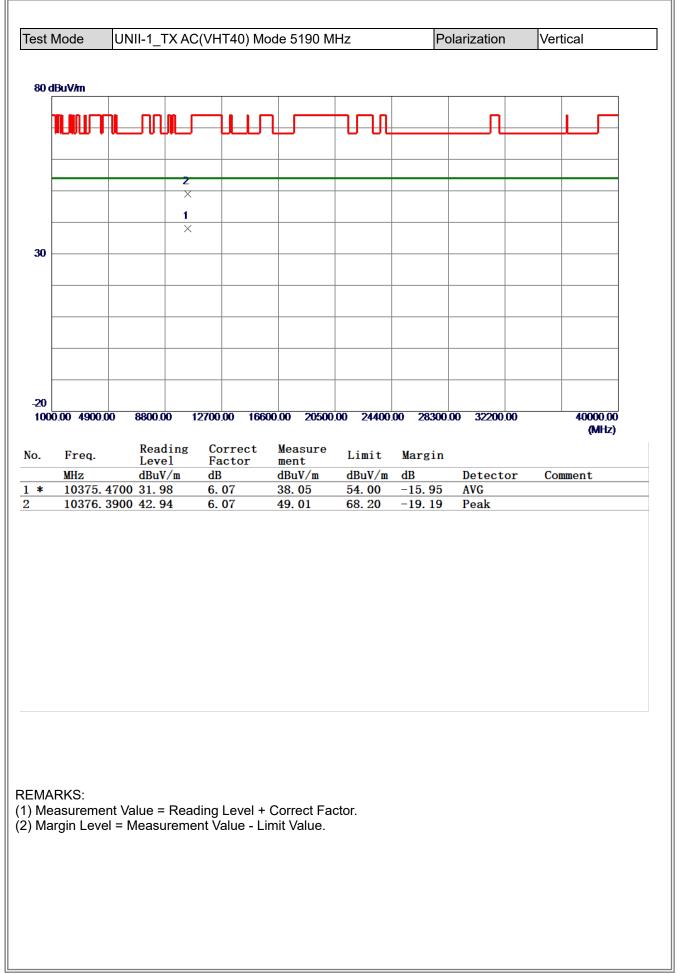




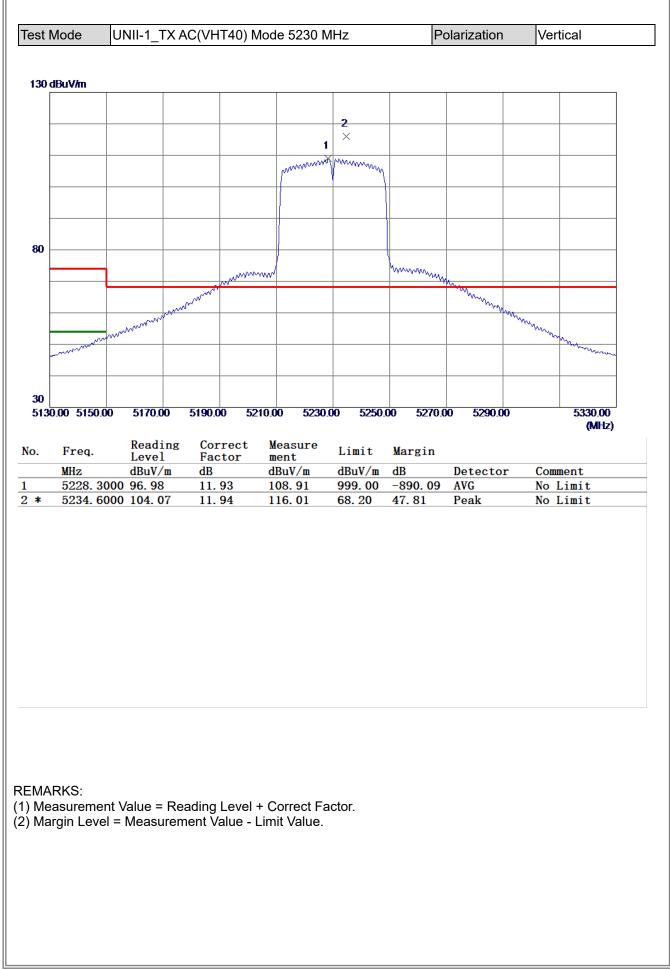




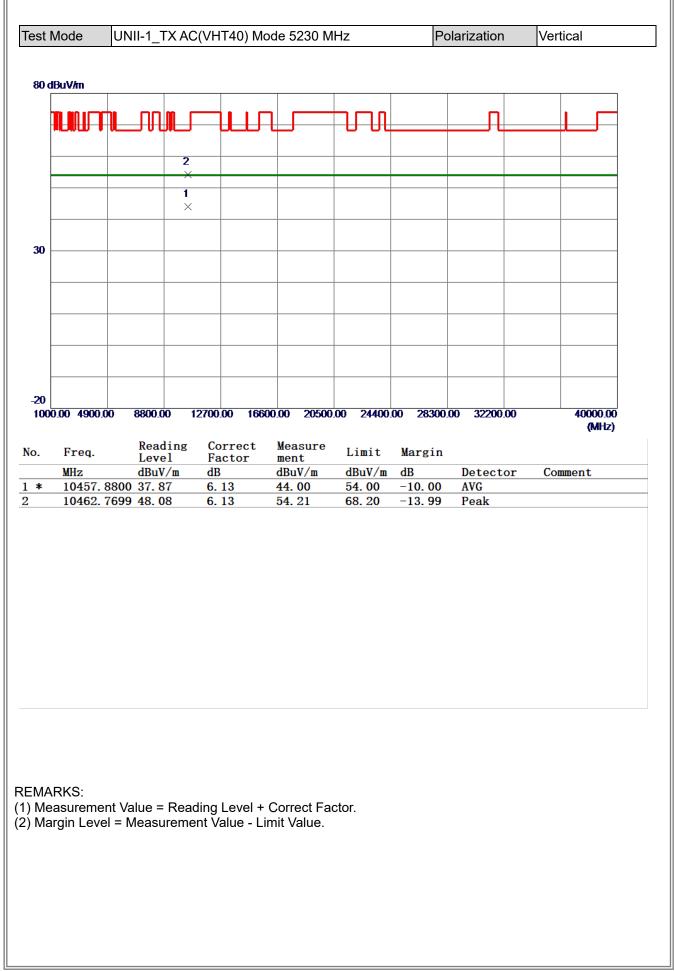




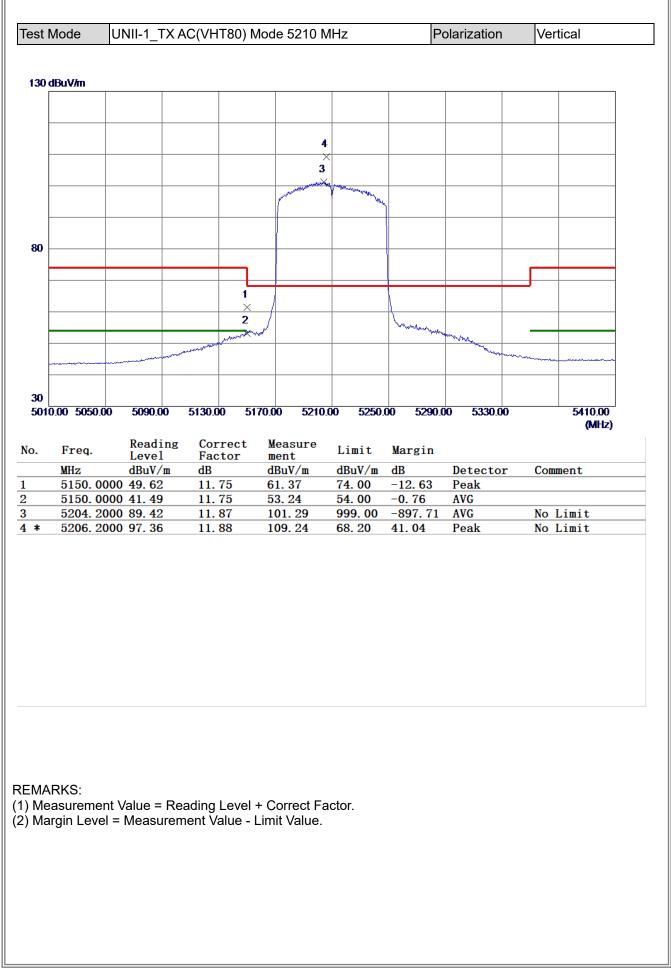




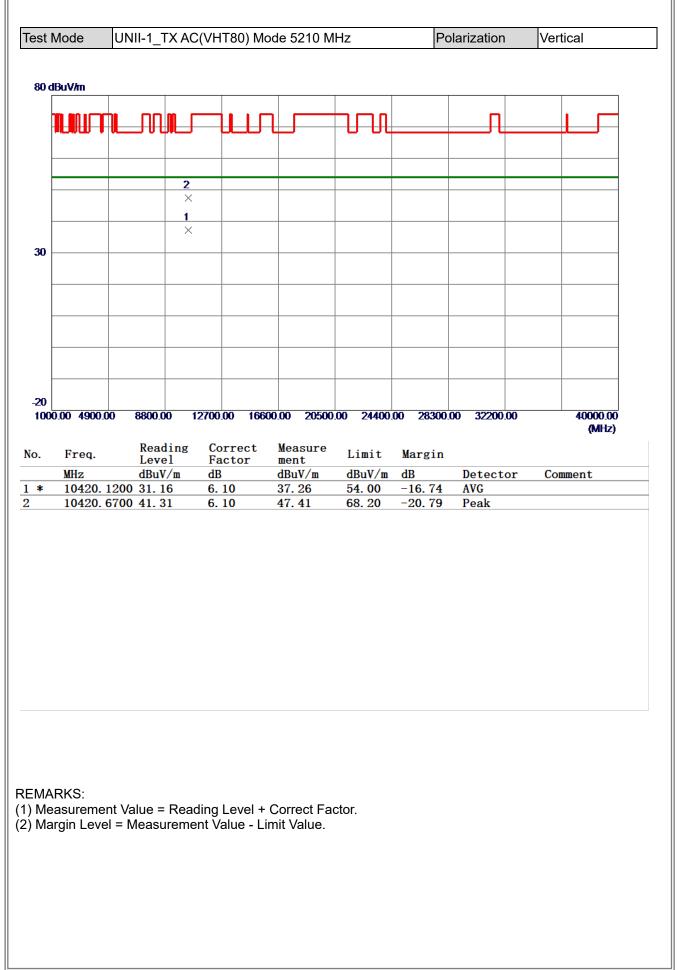




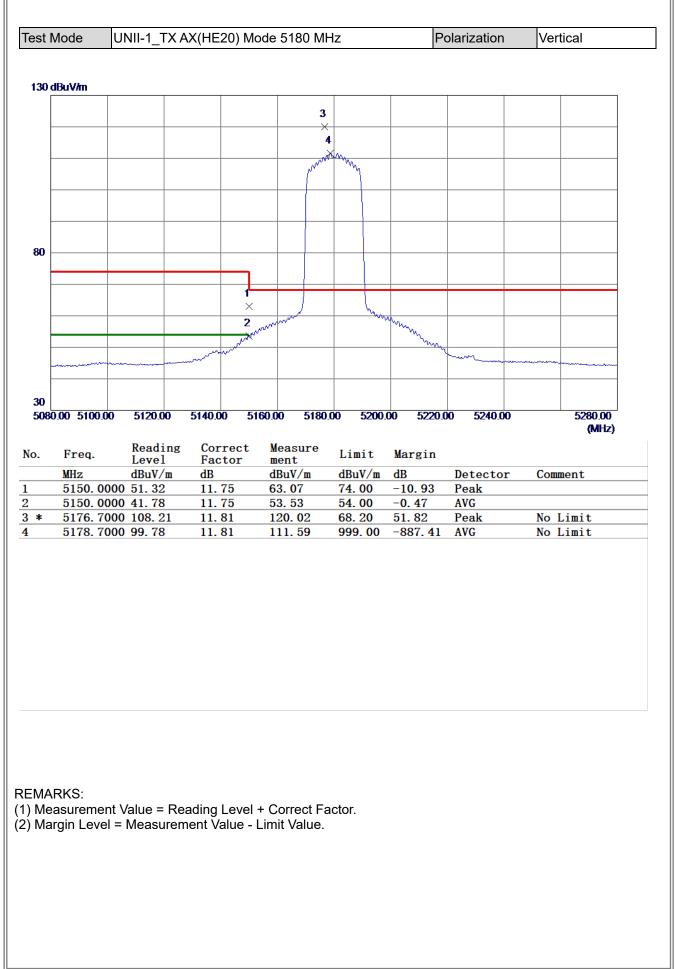




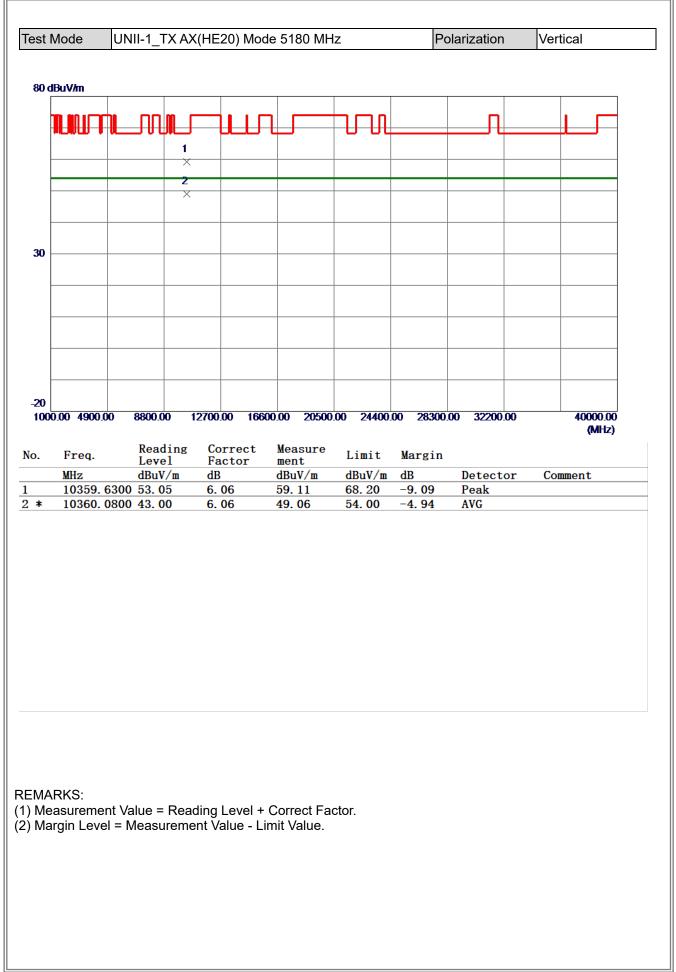




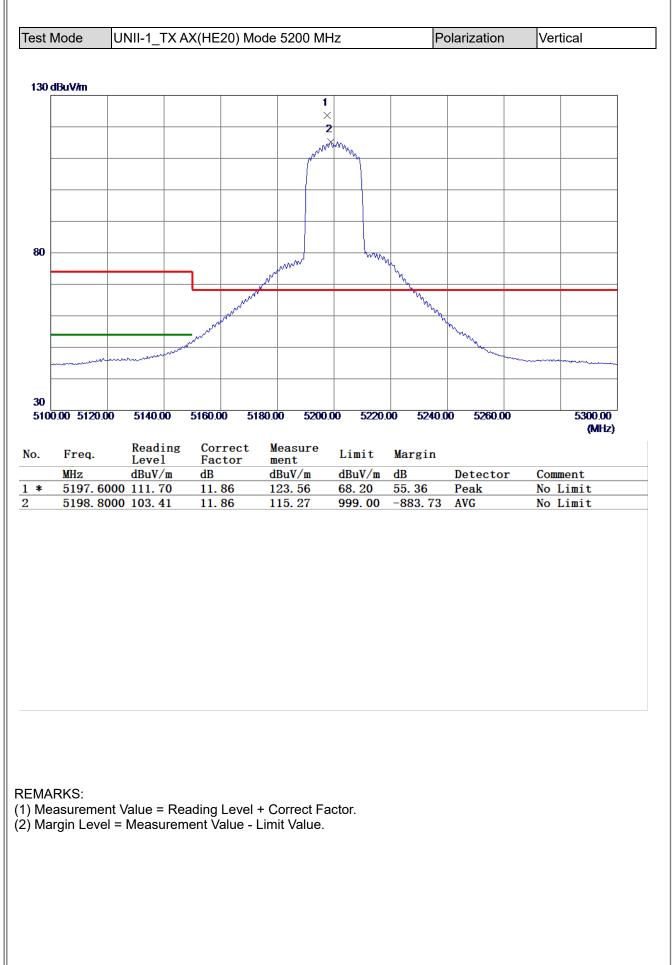




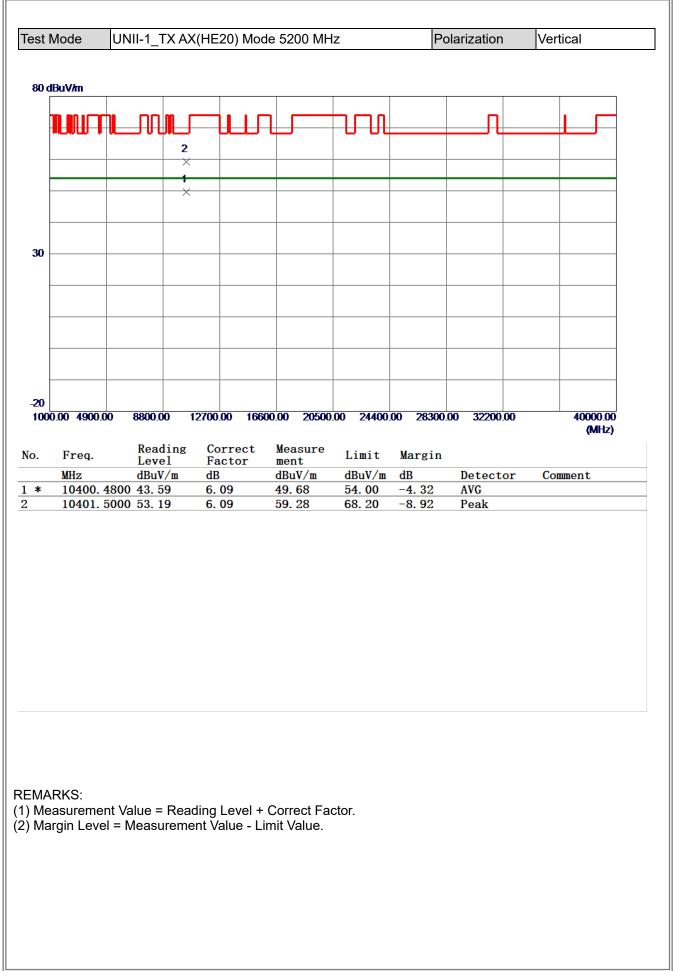




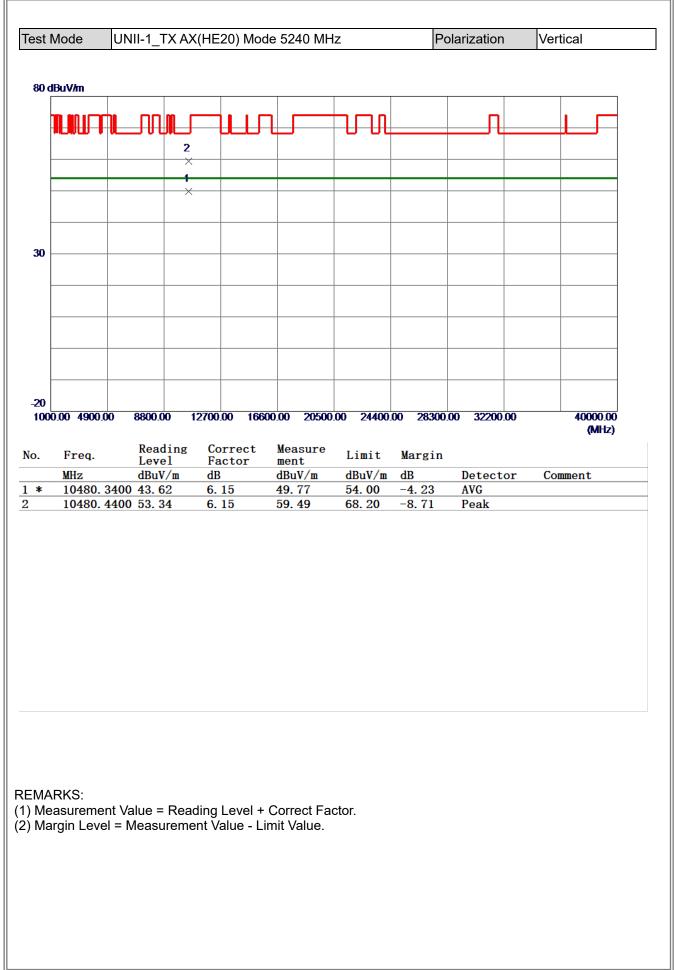












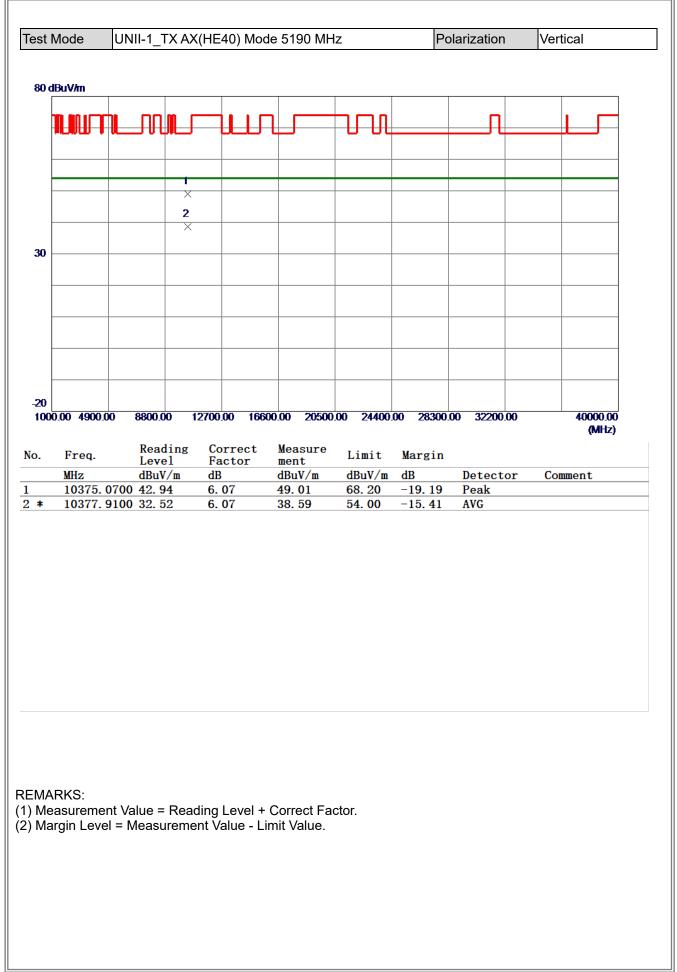


1 <b>30</b> d	dBuV/m							
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-								
30 5090	0.00 5110.00	5130.00	5150.00 5	170.00 5190.	.00 5210.	00 5230.0	0 5250.00	5290.00
No.	Freq.	Reading	Correct	Measure	Limit	Margin		(MHz)
	MHz	Level dBuV/m	Factor dB	ment dBuV/m	dBuV/m	dB	Detector	Comment
2	5149.300		11.74	60. 43	74.00	-13. 57	Peak	
	5149.300		11.74	53.05	54.00	-0.95	AVG	
	5150.000 5150.000		11.75 11.75	60. 94 52. 65	74.00 54.00	-13.06 -1.35	Peak AVG	
; ;	5191.000		11.84	105. 41		-893. 59	AVG	No Limit
*		00 103.00	11.86	114.86	68.20	46.66	Peak	No Limit

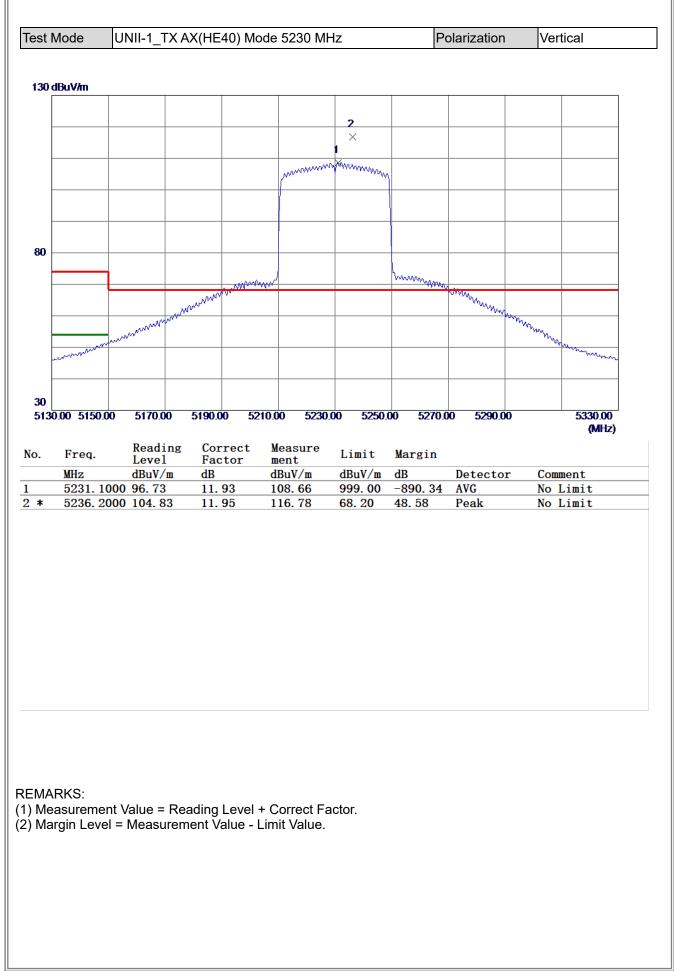
REMARKS:

- Measurement Value = Reading Level + Correct Factor.
   Margin Level = Measurement Value Limit Value.

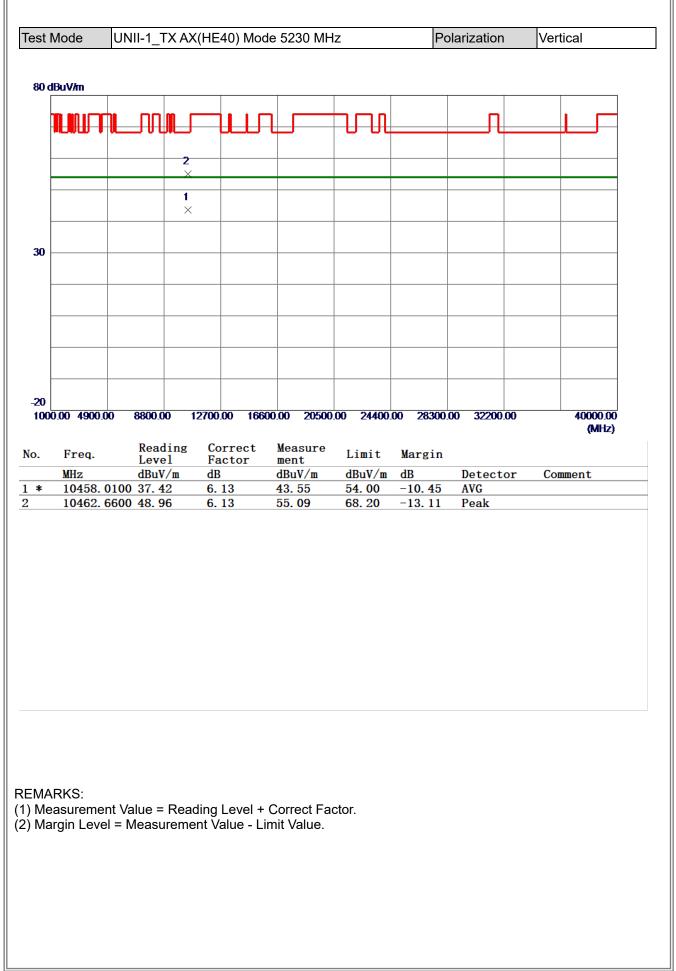




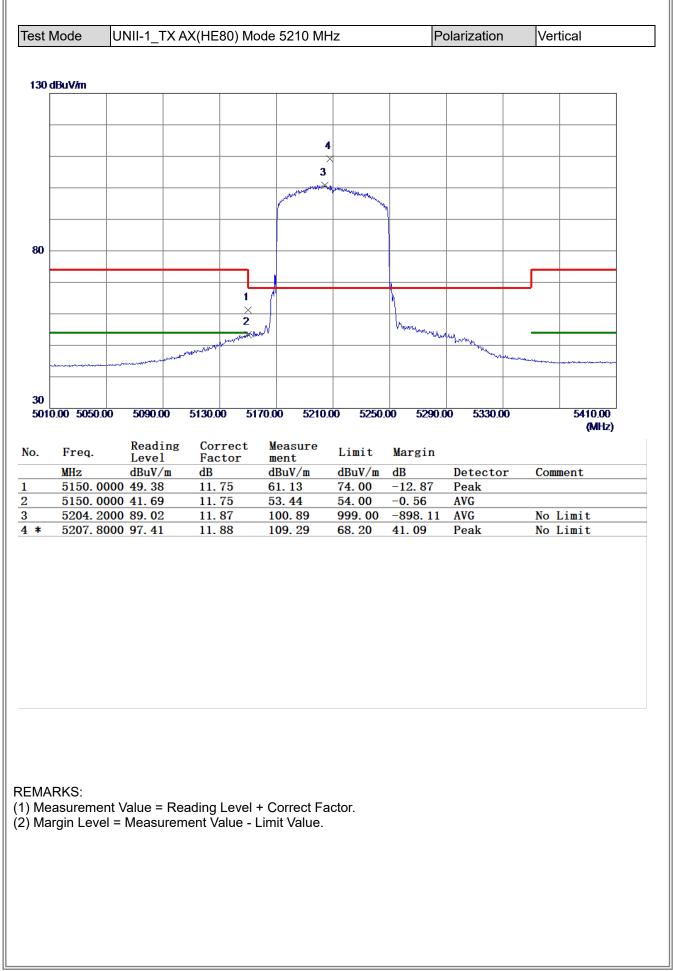




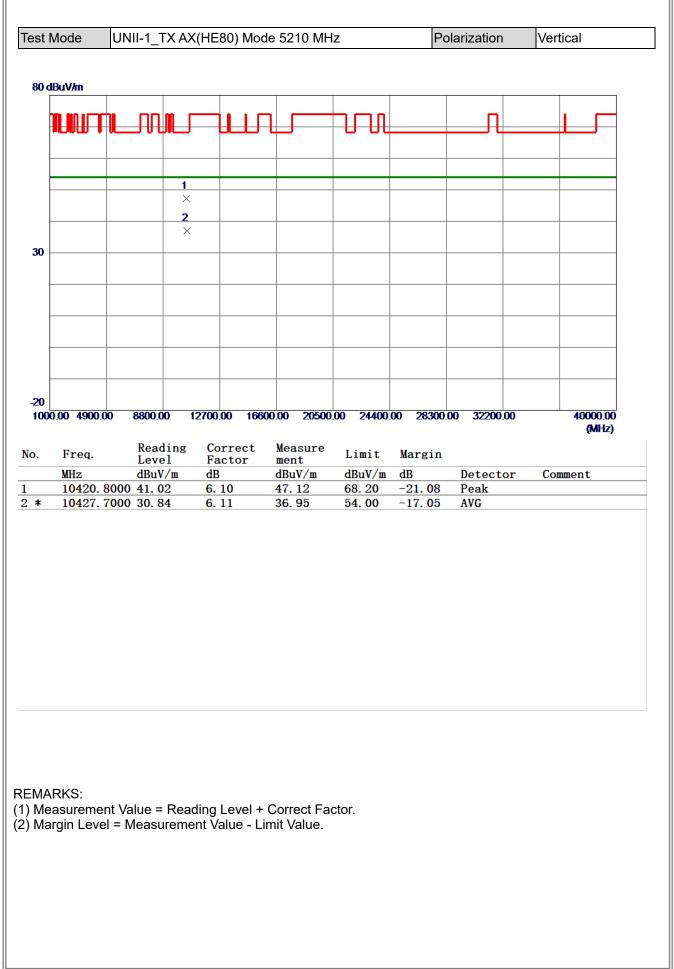




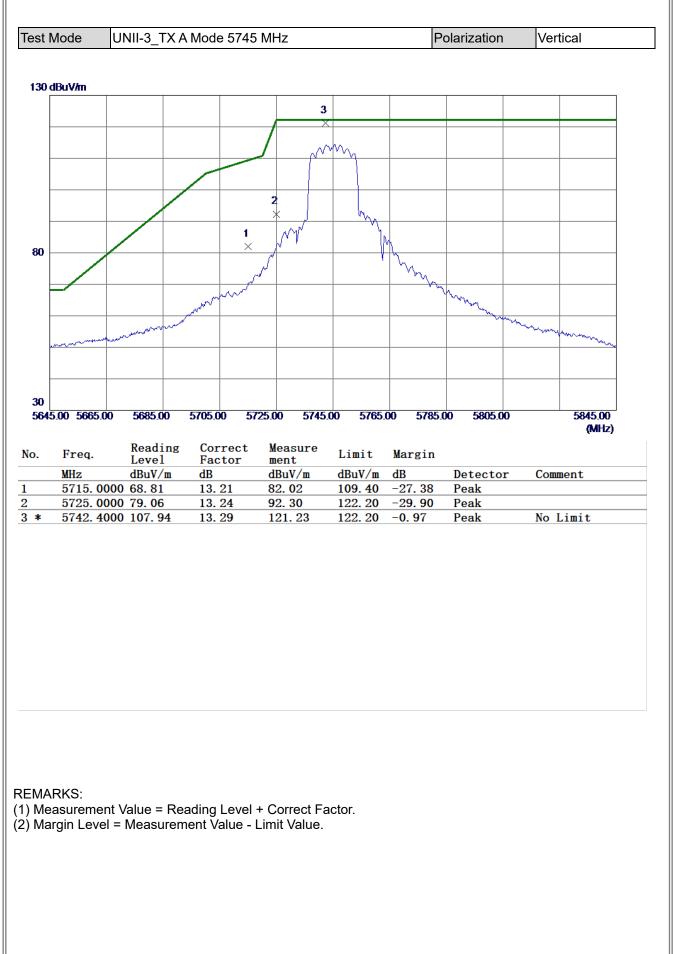




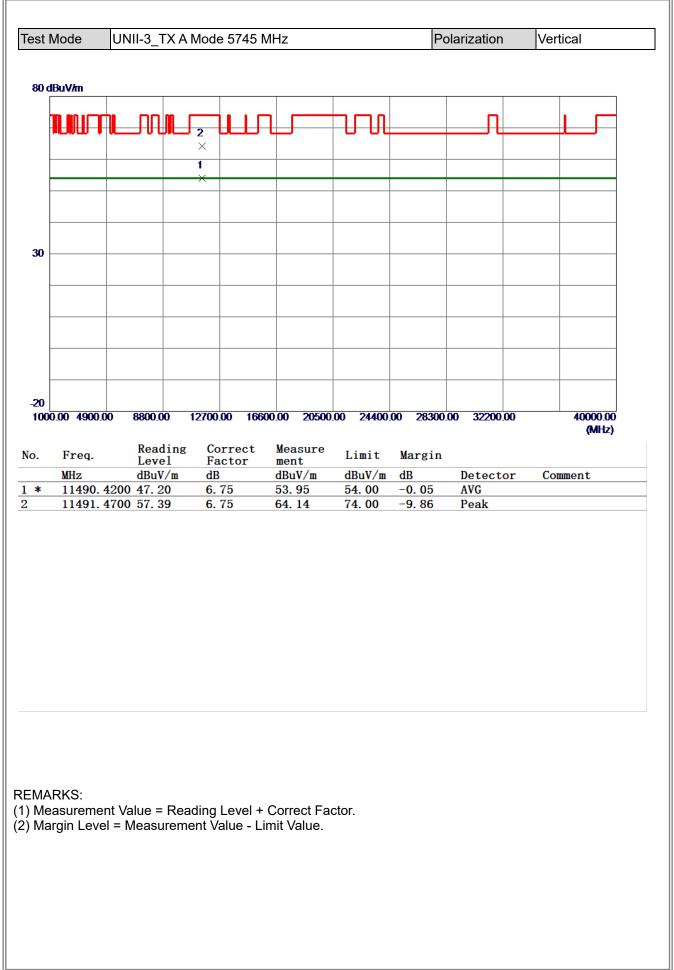




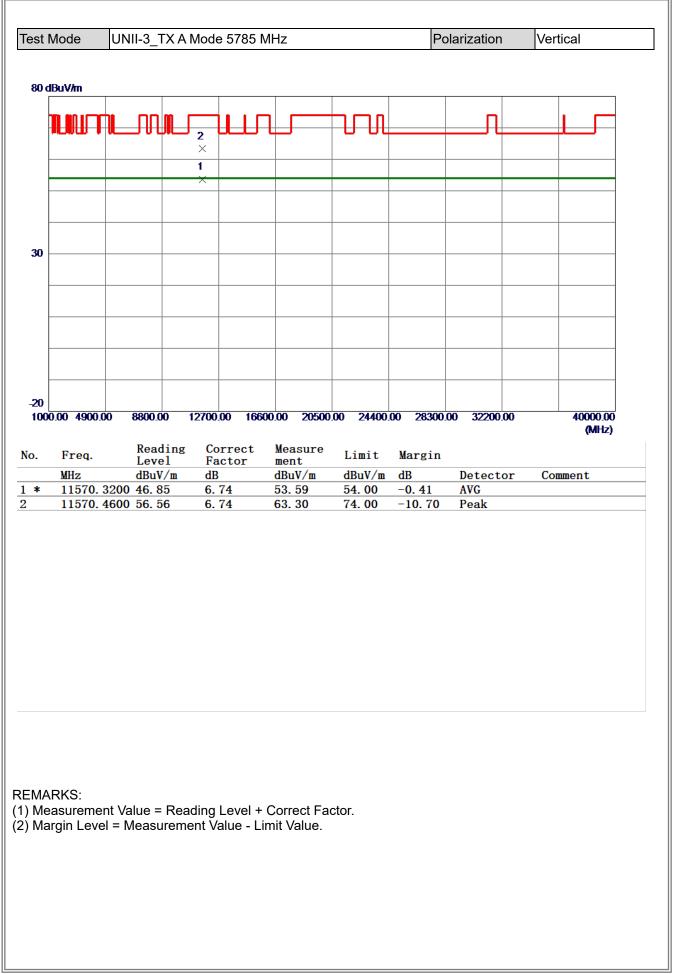




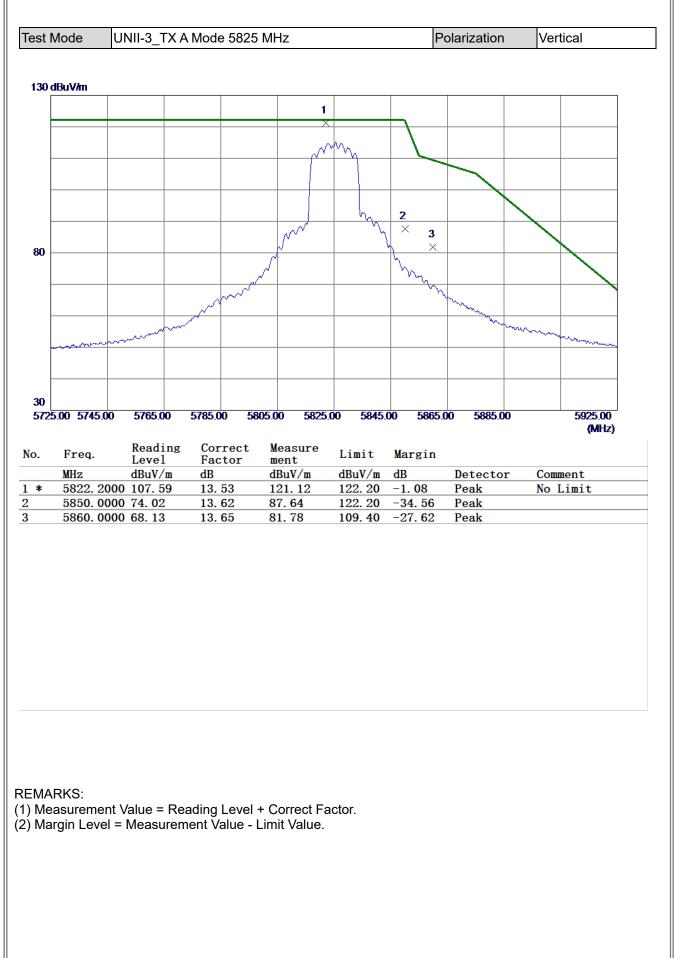




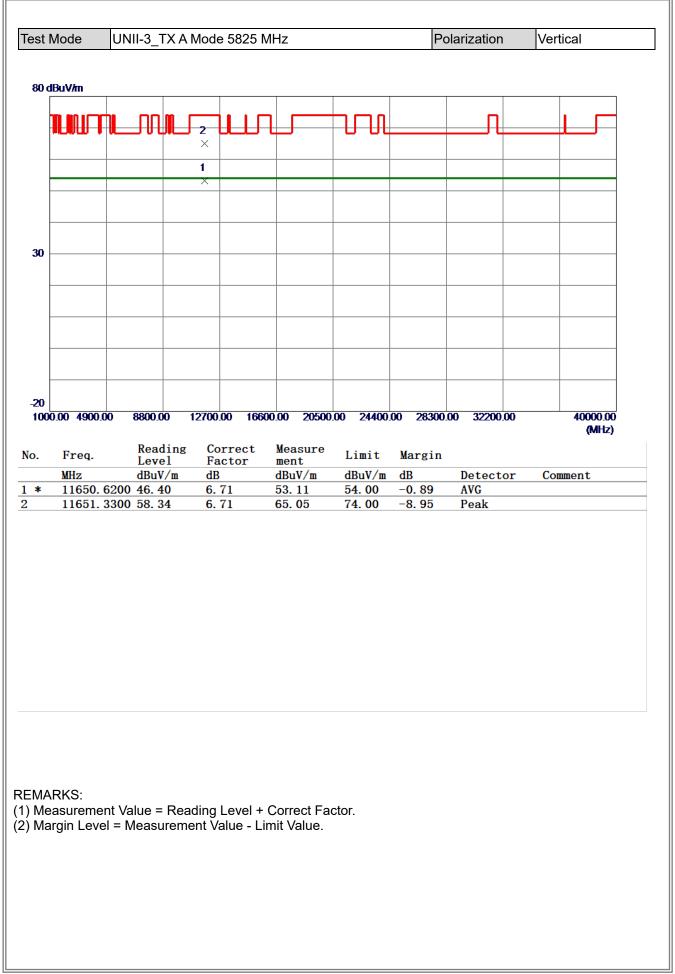




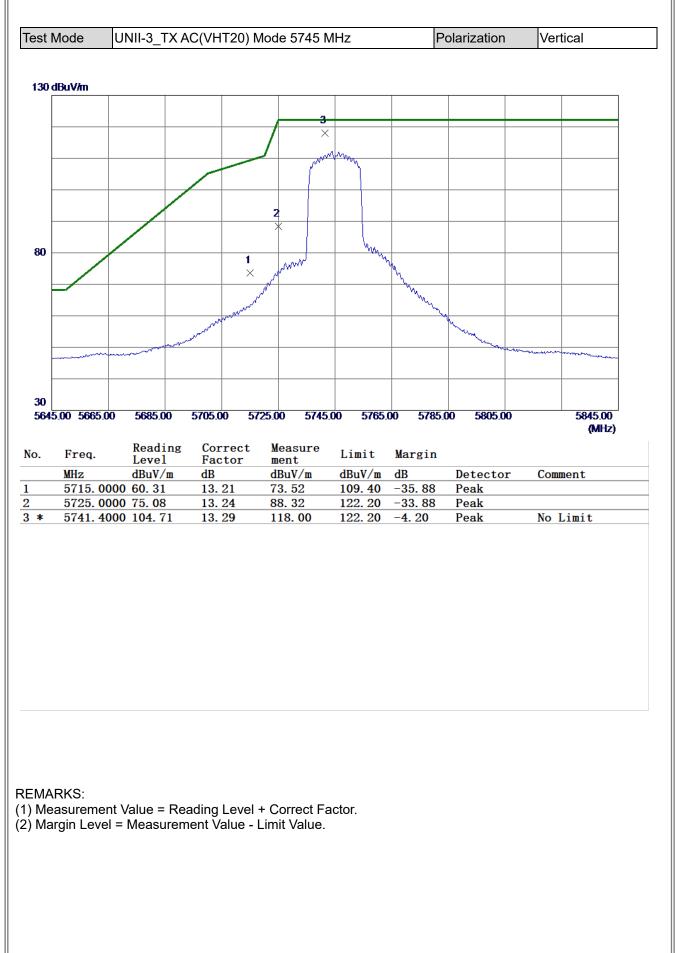




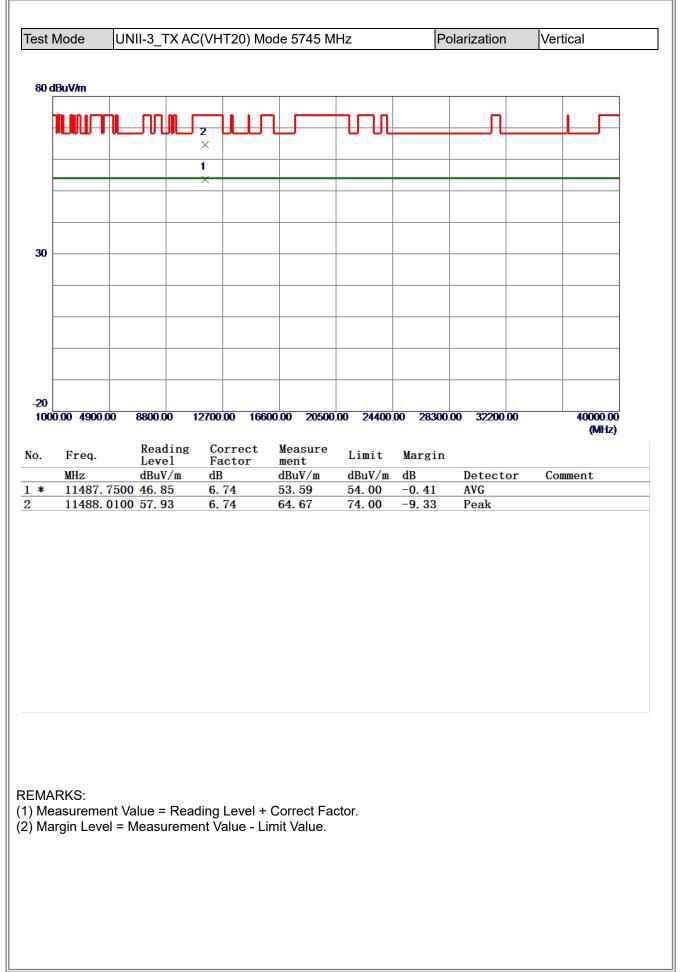




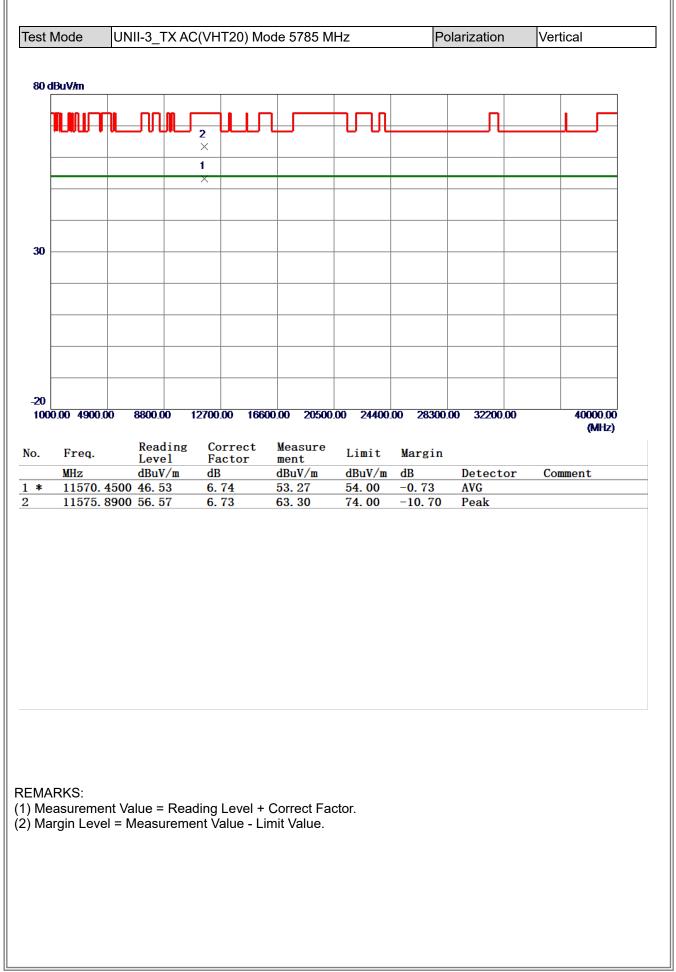




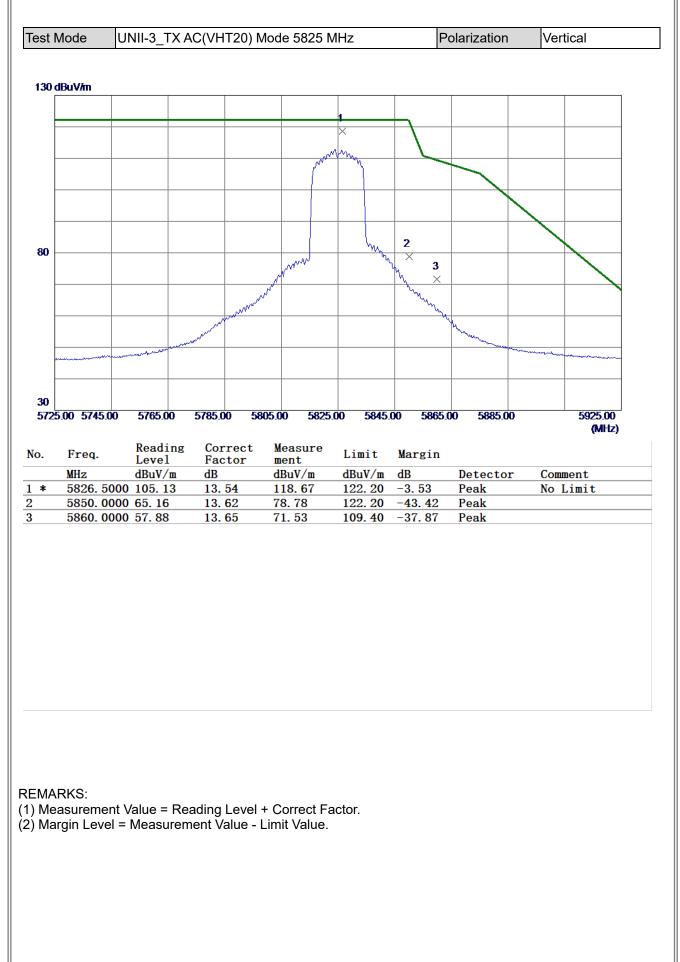




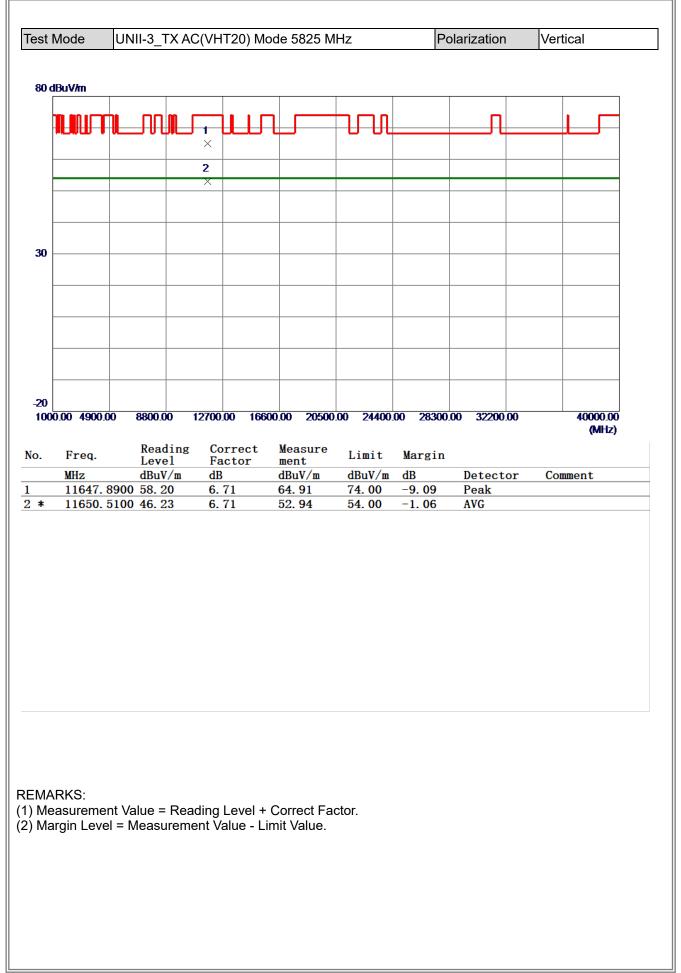




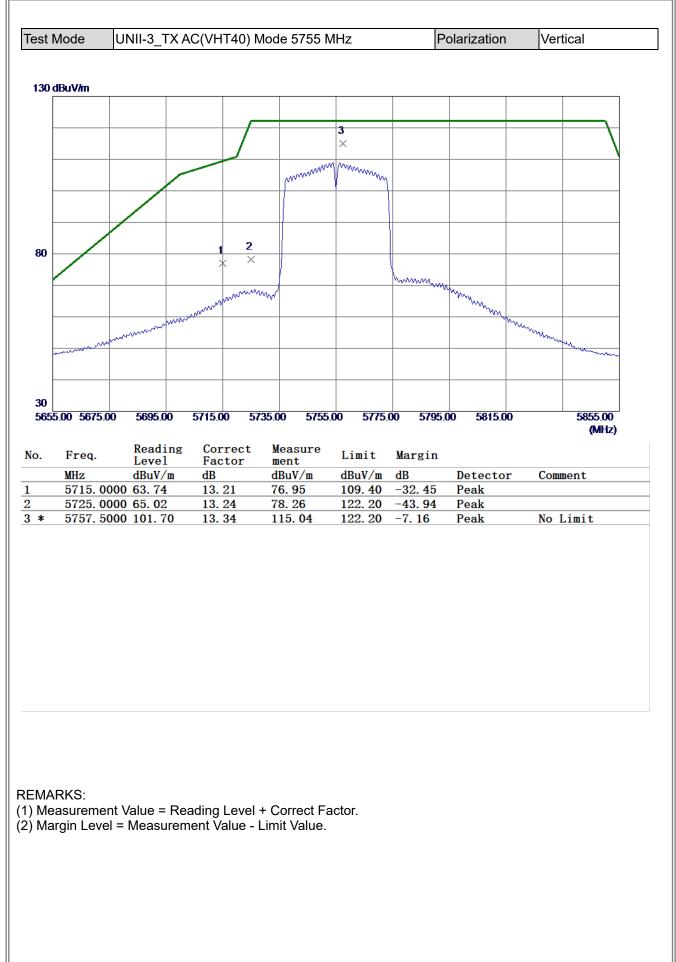




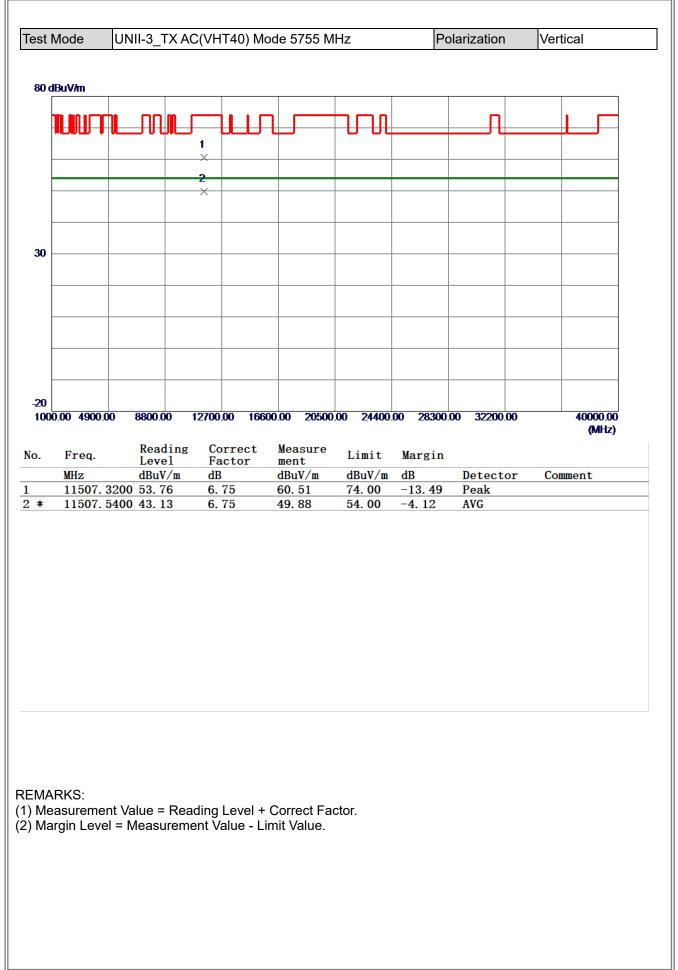




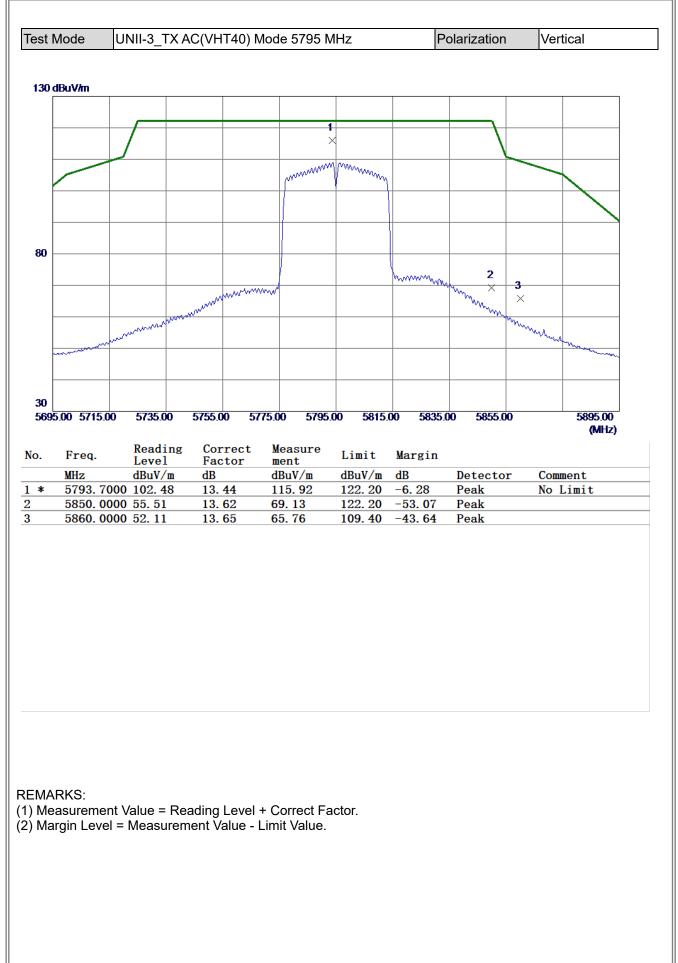




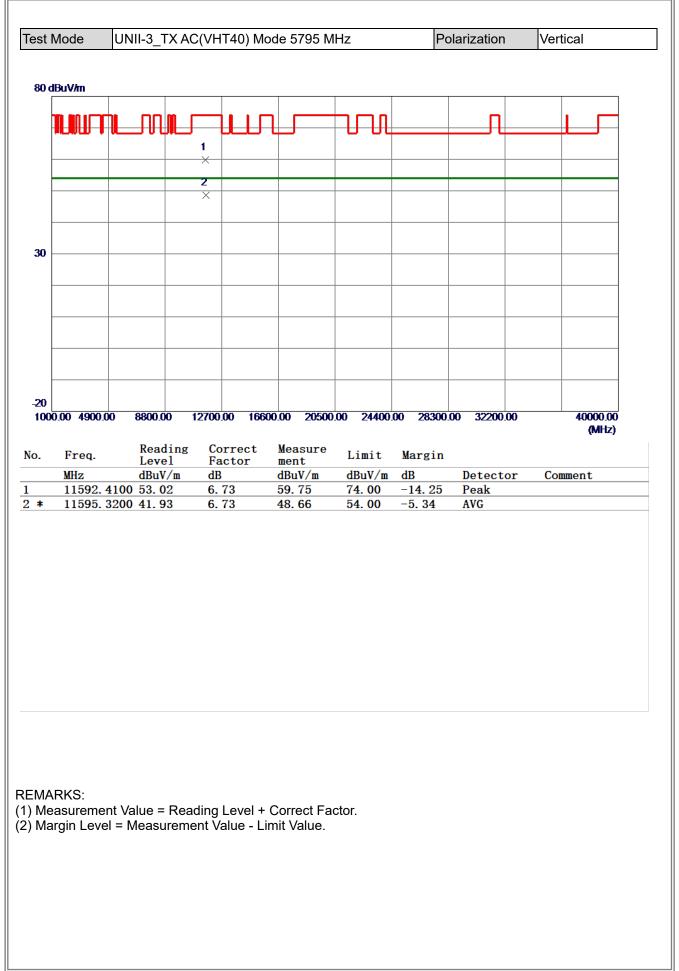




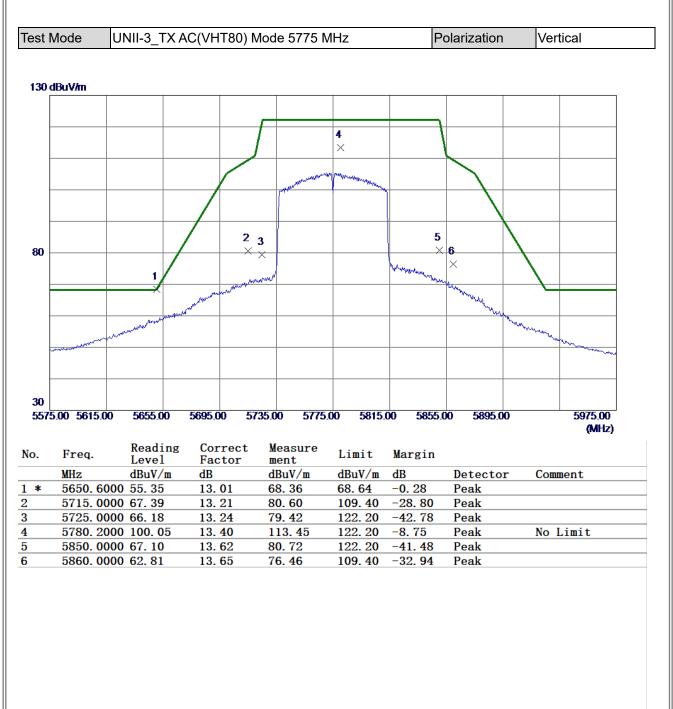








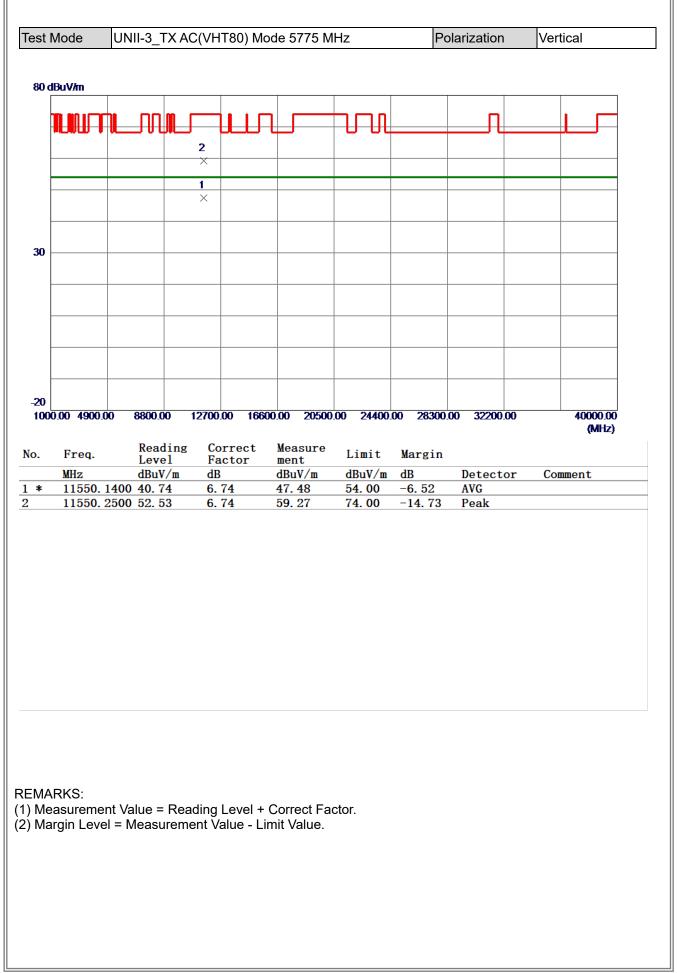




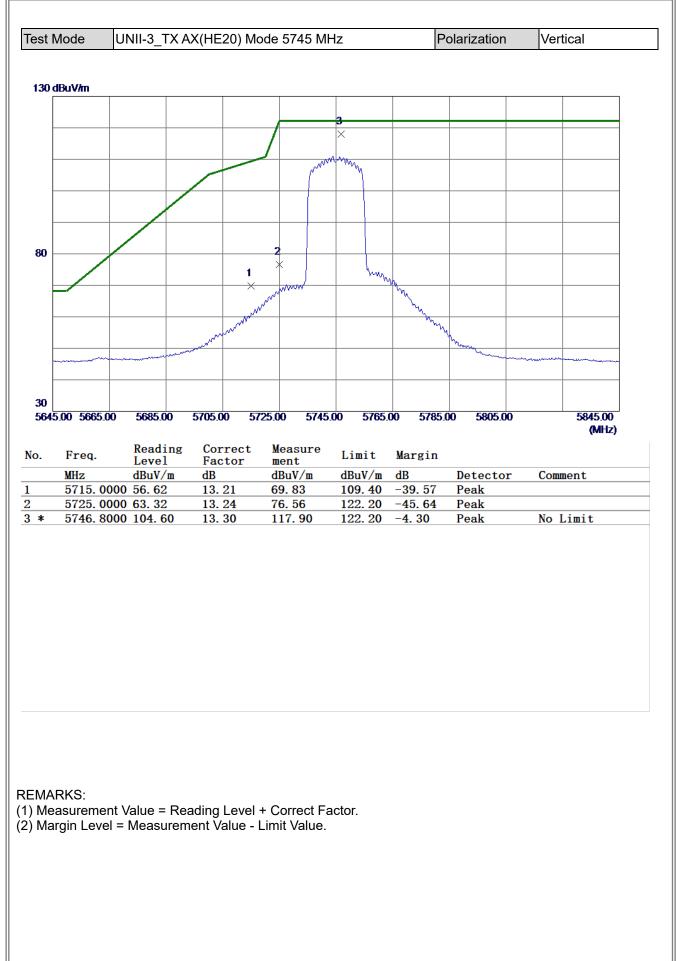
REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

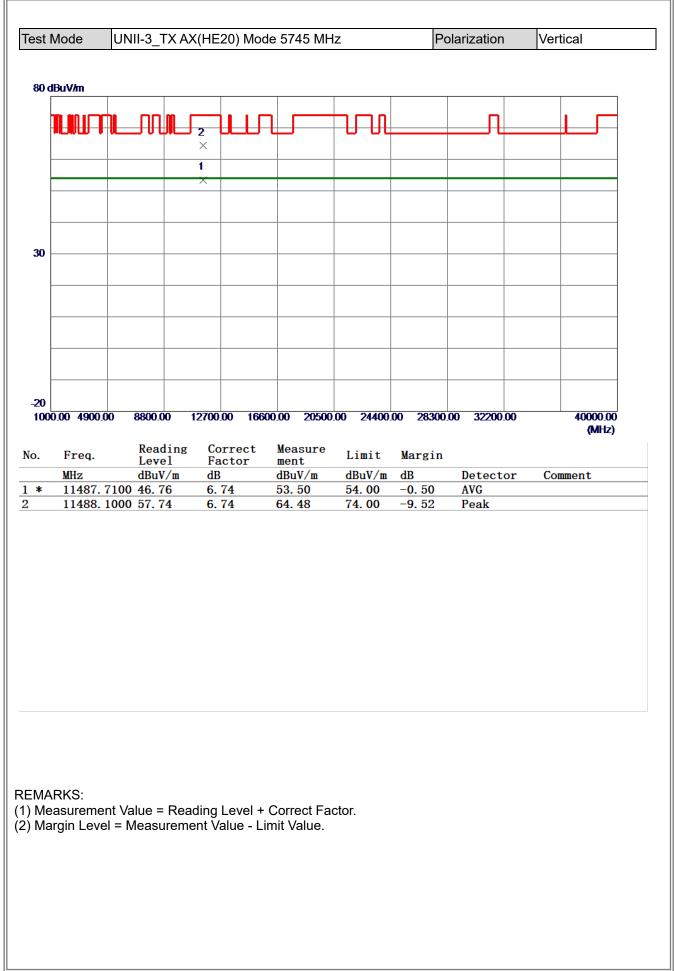




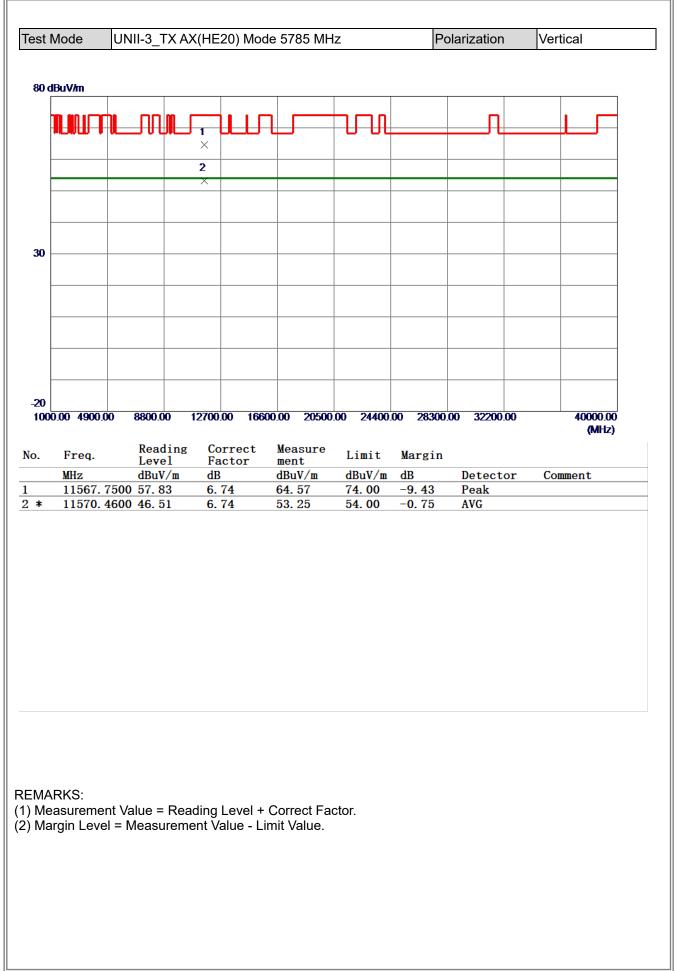




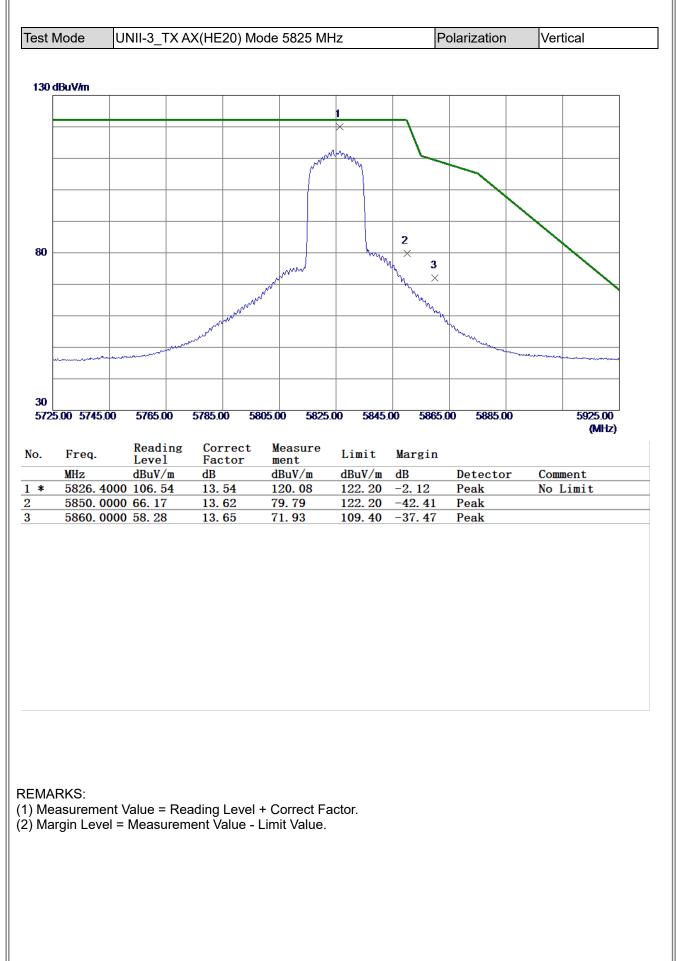




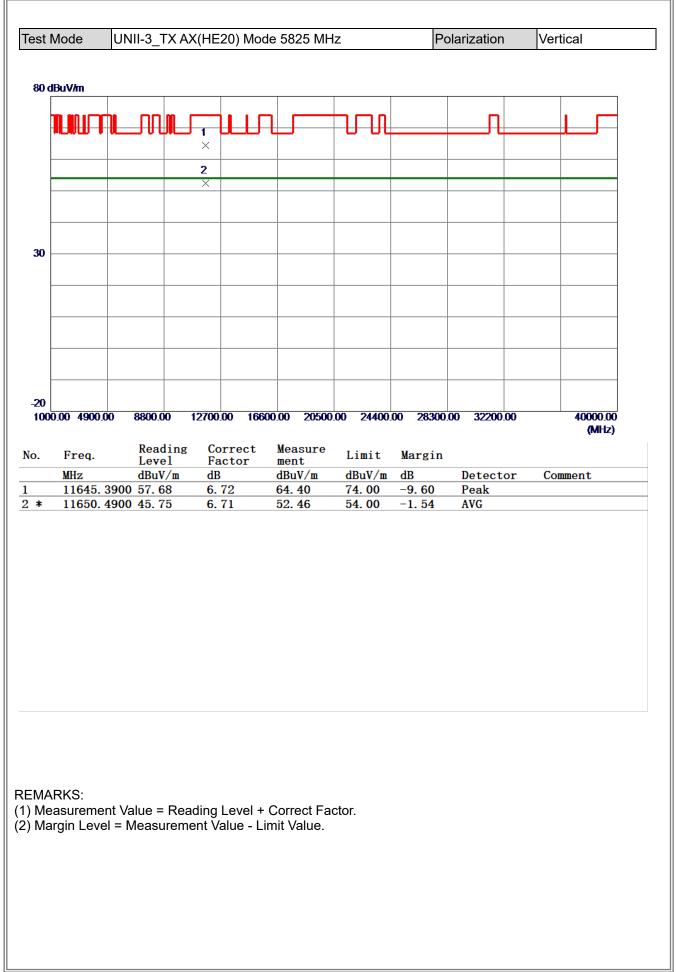








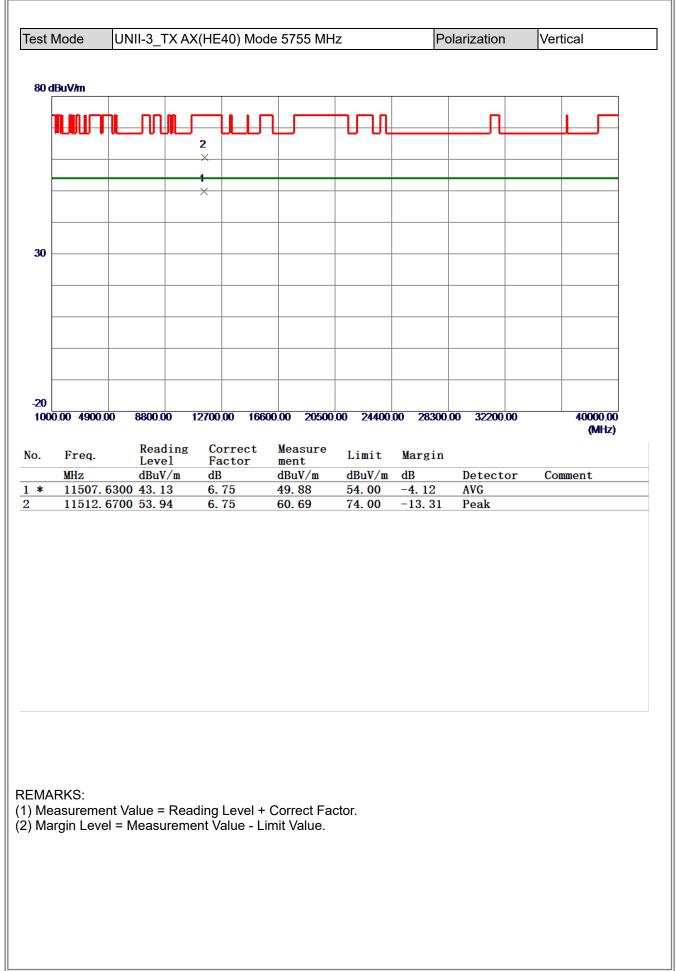




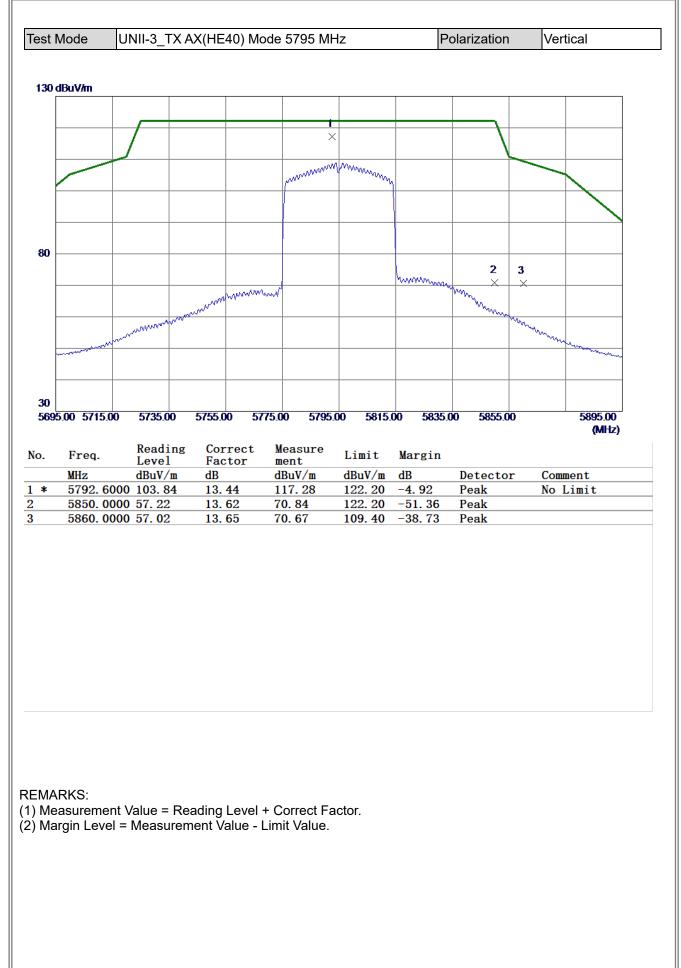




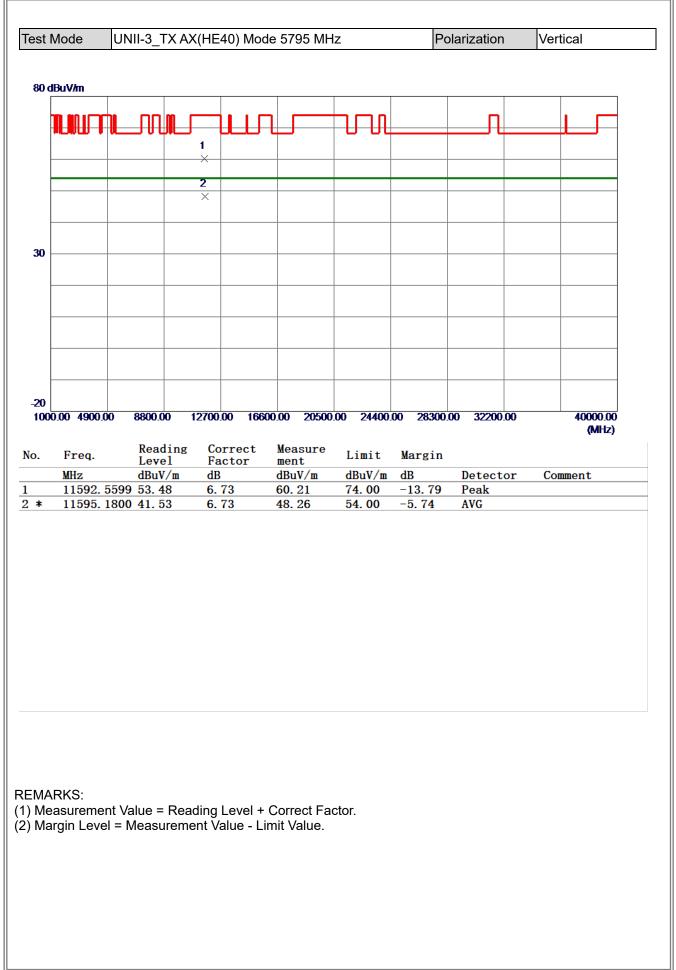




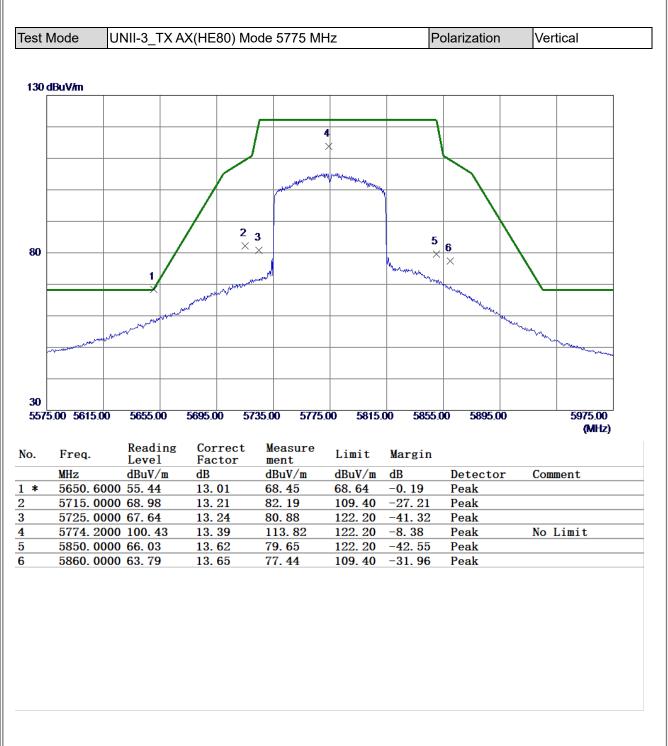








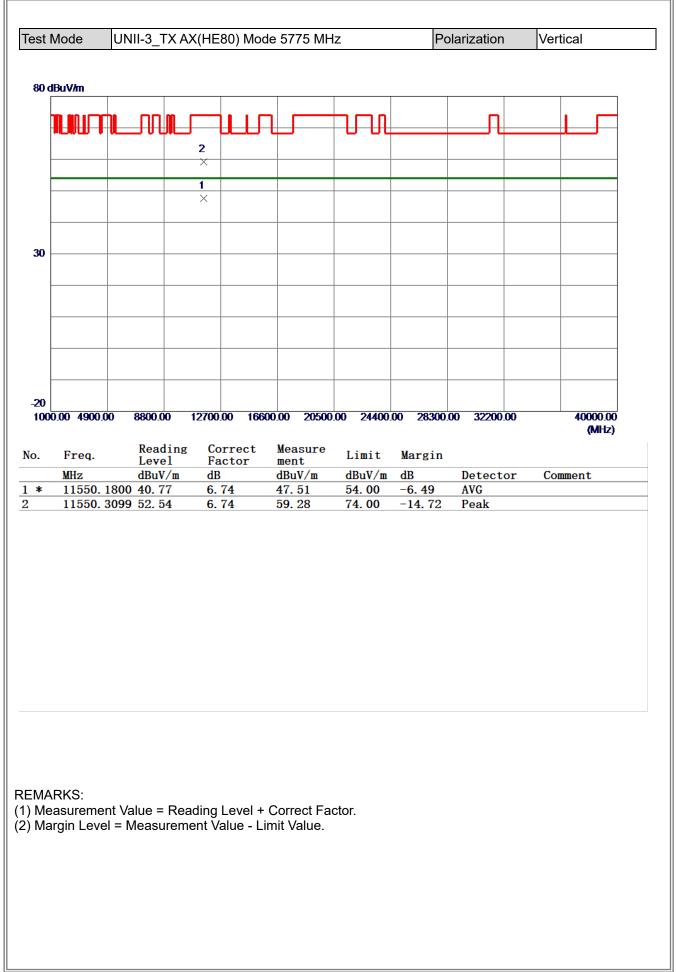




REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.







## **APPENDIX E - BANDWIDTH**





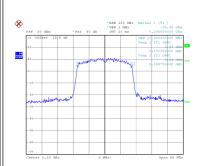


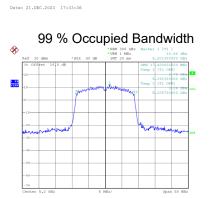
## Test Mode UNII-1\_TX AC(VHT20) Mode Frequency 26 dB Bandwidth 99 % Occupied Bandwidth Channel (MHz) (MHz) (MHz) 36 5180 19.309 17.400 5200 17.400 40 19.450 48 5240 19.350 17.400 **CH36 CH40 CH48** 26 dB Bandwidth Ø Ø rbn Vbn • RBW 300 kH • VBW 1 MHz SWT 20 mg 1 98 1 11

Date: 21.DEC.2023 17:32:35

8

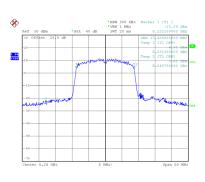
1 25





Date: 21.DEC.2023 17:34:41

Date: 21.DEC.2023 17:33:59

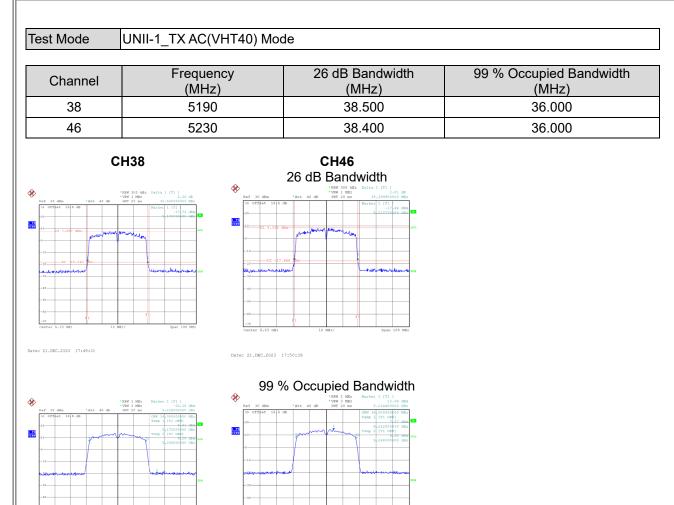


Date: 21.DEC.2023 17:31:52

Date: 21.DEC.2023 17:32:54

Page 110 of 167

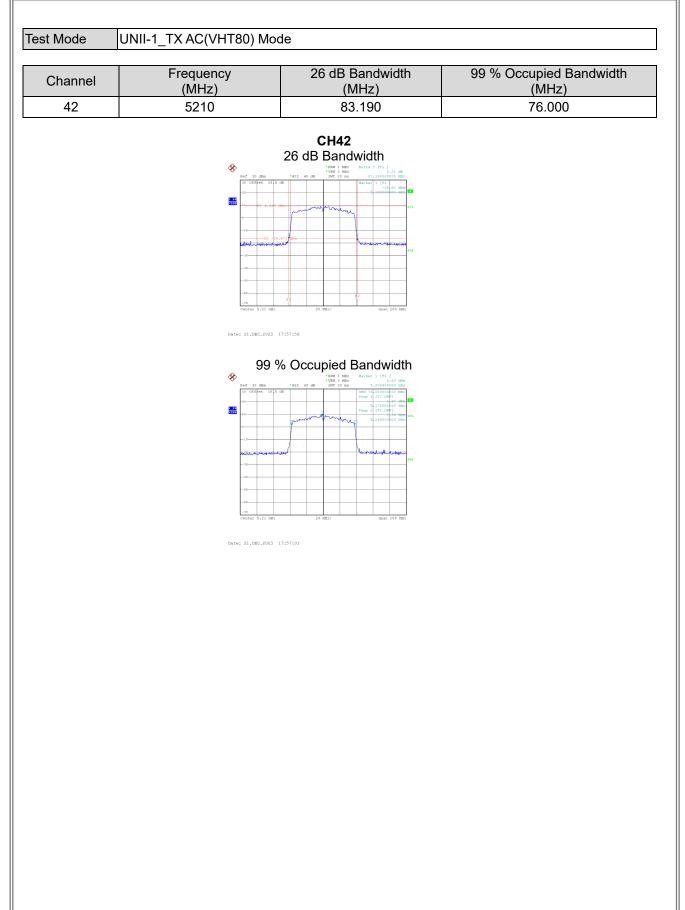




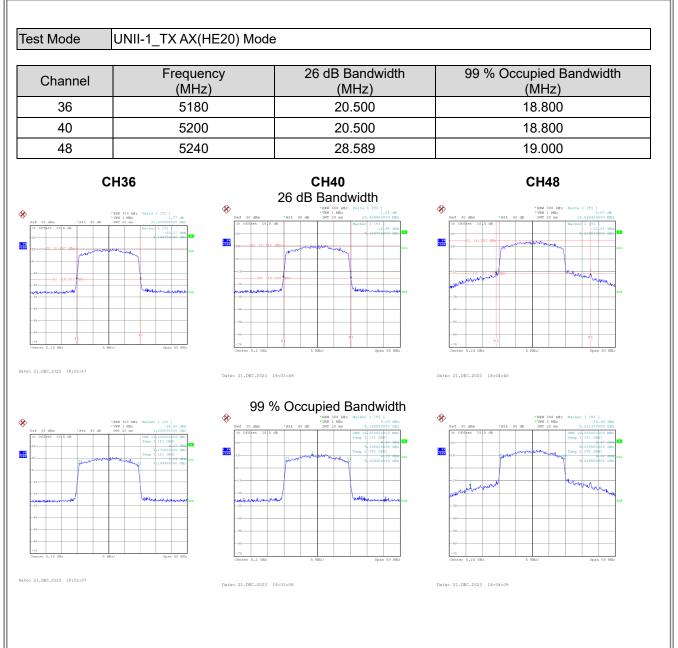
Date: 21.DEC.2023 17:48:48

Date: 21.DEC.2023 17:49:57











	(MHz)	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz) 37.600
38	5190	40.000	
46 5230		39.700	37.600
2.0.00         *At5.40.00           OFFIRE         1.0.10           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00           01         4.00	Image: 1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (	Pret: 1810 00       Image:	



Channel 42	Frequency (MHz) 5210	26 dB Bandwidth (MHz) 81.800	99 % Occupied Bandwidth (MHz) 77.600
	€ 10 dbs 10	<b>CH42</b> 26 dB Bandwidth **** 49 00 00 00 00 00 00 00 00 00 00 00 00 00	
		73 74 74 74 74 74 74 74 74 74 74 74 74 74	
	Date: 21.DBC.202	3 18:15:00	
	Image: Control of the second secon	тевр 1 (т. сері) 6 (т. сері) 6 (т. сері) 1 (т. сері) 6 (т. сері) 1 (т. сері)	



