

# FCC Radio Test Report

# FCC ID: V7TA21

This report concerns: Original Grant

Project No.	:	2006C111A
Equipment	:	AC2100 Dual Band WiFi Range Extender
Brand Name	:	Tenda
Test Model	:	A21
Series Model	:	N/A
Applicant	:	SHENZHEN TENDA TECHNOLOGY CO.,LTD
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Manufacturer	:	SHENZHEN TENDA TECHNOLOGY CO.,LTD
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		Shenzhen, China. 518052
Date of Receipt	:	Aug. 13, 2021
Date of Test	:	Aug. 28, 2021 ~ Sep. 15, 2021
Issued Date	:	Oct. 19, 2021
<b>Report Version</b>	:	R01
Test Sample	:	Engineering Sample No.: DG2021081325
Standard(s)	:	FCC CFR Title 47, Part 15, Subpart E FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 FCC KDB 662911 D01 Multiple Transmitter Output v02r01 ANSI C63.10-2013

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

heldon. Ou

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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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**APPENDIX H - FREQUENCY STABILITY** 

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# **REPORT ISSUED HISTORY**

Report Version	Description	Issued Date
R00	Original Issue.	Oct. 12, 2021
R01	Added the description in Appendix D.	Oct. 19, 2021

# **1. 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



#### 1.1 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, People's Republic of China. BTL's Test Firm Registration Number for FCC: 357015 BTL's Designation Number for FCC: CN1240

#### **1.2 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	U, (dB)
DG-C02	CISPR	150kHz ~ 30MHz	2.60

#### B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
	CISPR	9kHz ~ 30MHz	-	3.02
		30MHz ~ 200MHz	V	4.36
		30MHz ~ 200MHz	Н	3.32
		200MHz ~ 1,000MHz	V	4.08
DG-CB03		200MHz ~ 1,000MHz	Н	3.96
		1GHz ~ 6GHz	I	3.80
		6GHz ~ 18GHz	I	4.82
		18GHz ~ 26.5GHz	I	3.62
		26.5GHz ~ 40GHz	-	4.00

#### C. Other Measurement test:

Test Item	Uncertainty
Bandwidth	±3.8 %
Maximum Output Power	±0.95 dB
Power Spectral Density	±0.86 dB
Frequency Stability	±0.16 dB
Temperature	±0.08 °C
Humidity	±1.5%

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

# **1.3 TEST ENVIRONMENT CONDITIONS**

Test Item	Temperature	Humidity	Test Voltage	Tested By
AC Power Line Conducted Emissions	25°C	53%	AC 120V/60Hz	Laughing Zhang
			AC 240V/50Hz	0 0 0
Radiated Emissions-9kHz to 30MHz	25°C	60%	AC 120V/60Hz	Jakyri Wen
Radiated Emissions-30MHz to 1000MHz	26°C	52%	AC 120V/60Hz	Jakyri Wen
Radiated Emissions-Above 1000 MHz	26°C	52%	AC 120V/60Hz	Jakyri Wen
Bandwidth	21°C	63%	AC 120V/60Hz	Jesse Wang
Maximum Output Power	21°C	49%	AC 120V/60Hz	Silly Zheng
Power Spectral Density	21°C	63%	AC 120V/60Hz	Jesse Wang
Frequency Stability	Normal & Extreme	63%	Normal & Extreme	Jesse Wang



# 2. GENERAL INFORMATION

# 2.1 GENERAL DESCRIPTION OF EUT

Equipment	AC2100 Dual Band WiFi Range Extender
Brand Name	Tenda
Test Model	A21
Series Model	N/A
Model Difference(s)	N/A
Power Source	AC Mains.
Power Rating	100-240V~ 0.3A 50/60Hz
Operation Frequency Band(s)	UNII-1: 5150 MHz ~ 5250 MHz
Operation Frequency Band(s)	UNII-3: 5725 MHz ~ 5850 MHz
Modulation Type	IEEE 802.11a/n/ac: OFDM
	IEEE 802.11a: 54/48/36/24/18/12/9/6 Mbps
Bit Rate of Transmitter	IEEE 802.11n: up to 600 Mbps
	IEEE 802.11ac: up to 1733.2 Mbps
Maximum Output Power	IEEE 802.11ac(VHT40): 24.96 dBm (0.3133 W)
_UNII-1 Non Beamforming	
Maximum Output Power	IEEE 802.11ac(VHT40): 25.52 dBm (0.3565 W)
_UNII-3 Non Beamforming	
Maximum Output Power	IEEE 802.11ac(VHT40): 24.77 dBm (0.2999 W)
_UNII-1 Beamforming	
Maximum Output Power	IEEE 802.11ac(VHT40): 25.33 dBm (0.3412 W)
_UNII-3 Beamforming	

Note:

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

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
UNII-1		UN	II-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 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
UNII-3		UN	II-3	UNII-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.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Dipole	N/A	2.7	
2	N/A	N/A	Dipole	N/A	3.3	UNII-1
3	N/A	N/A	Dipole	N/A	3.7	UNII-1
4	N/A	N/A	Dipole	N/A	3.7	
1	N/A	N/A	Dipole	N/A	3.6	
2	N/A	N/A	Dipole	N/A	3.7	
3	N/A	N/A	Dipole	N/A	3.8	UNII-3
4	N/A	N/A	Dipole	N/A	3.9	

Note:

- This EUT supports CDD, and all antenna gains are not equal. So, the Directional gain=10log[(10<sup>G1/20</sup>+10<sup>G2/20</sup>+...10<sup>GN/20</sup>)<sup>2</sup>/N]dBi.

   a) For UNII-1, the Directional gain = 10log[(10<sup>2.7/20</sup>+10<sup>3.3/20</sup>+10<sup>3.7/20</sup>10<sup>3.7/20</sup>)<sup>2</sup>/4]=9.38. So the output power limit is 30-(9.38-6)=26.62, the power spectral density limit is 17-(9.38-6)=13.62.
   b) For UNII-3, the Directional gain=10log[(10<sup>3.6/20</sup>+10<sup>3.7/20</sup>+10<sup>3.8/20</sup>10<sup>3.9/20</sup>)<sup>2</sup>/4]=9.77. So the output power limit is 30-(9.77-6)=26.23, the power spectral density limit is
  - 30-(9.77-6)=26.23.

2) Beamforming Gain: 6dB.

- a) For UNII-1: The Directional gain=6+3.7=9.70dB. So the output power limit is 30-(9.70-6)=26.30.
- b) For UNII-3: The Directional gain=6+3.9=9.90dB. So the output power limit is 30-(9.90-6)=26.10.
- 3) The antenna gain and beamforming gain are provided by the manufacturer.

#### 4. Table for Antenna Configuration:

# For Non Beamforming:

Operating Mode TX Mode	1TX	4TX
IEEE 802.11a	V (Ant. 1)	-
IEEE 802.11n (HT20)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT40)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT20)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT40)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT80)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

# **BIL**

For Beamforming: Operating Mode TX Mode	4TX
IEEE 802.11n (HT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)



# 2.2 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 N(HT20) Mode Channel 36/40/48 (UNII-1)
Mode 3	TX N(HT40) Mode Channel 38/46 (UNII-1)
Mode 4	TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)
Mode 5	TX AC(VHT40) Mode Channel 38/46 (UNII-1)
Mode 6	TX AC(VHT80) Mode Channel 42 (UNII-1)
Mode 7	TX A Mode Channel 149/157/165 (UNII-3)
Mode 8	TX N(HT20) Mode Channel 149/157/165 (UNII-3)
Mode 9	TX N(HT40) Mode Channel 151/159 (UNII-3)
Mode 10	TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)
Mode 11	TX AC(VHT40) Mode Channel 151/159 (UNII-3)
Mode 12	TX AC(VHT80) Mode Channel 155 (UNII-3)
Mode 13	TX AC(VHT40) Mode Channel 151 (UNII-3)

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 13	TX AC(VHT40) Mode Channel 151 (UNII-3)			

Radiated Emissions Test - Below 1GHz				
Final Test Mode Description				
Mode 13	TX AC(VHT40) Mode Channel 151 (UNII-3)			

Radiated Emissions Test - Above 1GHz_Non Beamforming			
Final Test Mode	Description		
Mode 1	TX A Mode Channel 36/40/48 (UNII-1)		
Mode 4	TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)		
Mode 5	TX AC(VHT40) Mode Channel 38/46 (UNII-1)		
Mode 6	TX AC(VHT80) Mode Channel 42 (UNII-1)		
Mode 7	TX A Mode Channel 149/157/165 (UNII-3)		
Mode 10	TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)		
Mode 11	TX AC(VHT40) Mode Channel 151/159 (UNII-3)		
Mode 12	TX AC(VHT80) Mode Channel 155 (UNII-3)		



Maximum Output Power Test_Non Beamforming			
Final Test Mode	Description		
Mode 1	TX A Mode Channel 36/40/48 (UNII-1)		
Mode 2	TX N(HT20) Mode Channel 36/40/48 (UNII-1)		
Mode 3	TX N(HT40) Mode Channel 38/46 (UNII-1)		
Mode 4	TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)		
Mode 5	TX AC(VHT40) Mode Channel 38/46 (UNII-1)		
Mode 6	TX AC(VHT80) Mode Channel 42 (UNII-1)		
Mode 7	TX A Mode Channel 149/157/165 (UNII-3)		
Mode 8	TX N(HT20) Mode Channel 149/157/165 (UNII-3)		
Mode 9	TX N(HT40) Mode Channel 151/159 (UNII-3)		
Mode 10	TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)		
Mode 11	TX AC(VHT40) Mode Channel 151/159 (UNII-3)		
Mode 12	TX AC(VHT80) Mode Channel 155 (UNII-3)		

Maximum Output Power Test_Beamforming			
Final Test Mode	Description		
Mode 2	TX N(HT20) Mode Channel 36/40/48 (UNII-1)		
Mode 3	TX N(HT40) Mode Channel 38/46 (UNII-1)		
Mode 4	TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)		
Mode 5	TX AC(VHT40) Mode Channel 38/46 (UNII-1)		
Mode 6	TX AC(VHT80) Mode Channel 42 (UNII-1)		
Mode 8	TX N(HT20) Mode Channel 149/157/165 (UNII-3)		
Mode 9	TX N(HT40) Mode Channel 151/159 (UNII-3)		
Mode 10	TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)		
Mode 11	TX AC(VHT40) Mode Channel 151/159 (UNII-3)		
Mode 12	TX AC(VHT80) Mode Channel 155 (UNII-3)		



Other Conducted Test_Non Beamforming			
Final Test Mode	Description		
Mode 1	TX A Mode Channel 36/40/48 (UNII-1)		
Mode 2	TX N(HT20) Mode Channel 36/40/48 (UNII-1)		
Mode 3	TX N(HT40) Mode Channel 38/46 (UNII-1)		
Mode 4	TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)		
Mode 5	TX AC(VHT40) Mode Channel 38/46 (UNII-1)		
Mode 6	TX AC(VHT80) Mode Channel 42 (UNII-1)		
Mode 7	TX A Mode Channel 149/157/165 (UNII-3)		
Mode 8	TX N(HT20) Mode Channel 149/157/165 (UNII-3)		
Mode 9	TX N(HT40) Mode Channel 151/159 (UNII-3)		
Mode 10	TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)		
Mode 11	TX AC(VHT40) Mode Channel 151/159 (UNII-3)		
Mode 12	TX AC(VHT80) Mode Channel 155 (UNII-3)		

Note:

(1) For AC power line conducted emissions and radiated emission below 1 GHz test, the TX AC(VHT40) Mode Channel 151 (UNII-3) 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) The measurements for Output Power are tested, the worst case are IEEE 802.11a mode, IEEE 802.11ac(VHT20) mode, IEEE 802.11ac(VHT40) mode, IEEE 802.11ac(VHT80) mode, only the worst cases are documented for other test items.
- (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) For radiated emissions, the TX WLAN 2.4G B Mode 2412MHz + WLAN 5G A Mode 5180MHz was found the worst case of simultaneous transmission and recorded.

# 2.3 PARAMETERS OF TEST SOFTWARE

Non Beamforming				
UNII-1				
Test Software Version	mp_tool			
Frequency (MHz)	5180	5200	5240	
IEEE 802.11a	86	96	96	
IEEE 802.11n(HT20)	90	94	96	
IEEE 802.11ac(VHT20)	90	94	96	
Frequency (MHz)	5190	5230		
IEEE 802.11n(HT40)	93	107		
IEEE 802.11ac(VHT40)	93	107		
Frequency (MHz)	5210			
IEEE 802.11ac(VHT80)	90			

UNII-3				
Test Software Version	mp_tool			
Frequency (MHz)	5745	5785	5825	
IEEE 802.11a	127	127	127	
IEEE 802.11n(HT20)	127	127	127	
IEEE 802.11ac(VHT20)	127	127	127	
Frequency (MHz)	5755	5795		
IEEE 802.11n(HT40)	127	127		
IEEE 802.11ac(VHT40)	127	127		
Frequency (MHz)	5775			
IEEE 802.11ac(VHT80)	100			



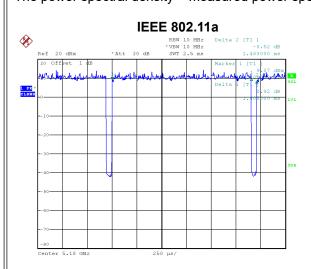
Beamforming UNII-1			
Test Software Version	mp_tool		
Frequency (MHz)	5180	5200	5240
IEEE 802.11n(HT20)	89	93	95
IEEE 802.11ac(VHT20)	89	93	95
Frequency (MHz)	5190	5230	
IEEE 802.11n(HT40)	92	106	
IEEE 802.11ac(VHT40)	92	106	
Frequency (MHz)	5210		
IEEE 802.11ac(VHT80)	89		

UNII-3			
Test Software Version	mp_tool		
Frequency (MHz)	5745	5785	5825
IEEE 802.11n(HT20)	126	126	126
IEEE 802.11ac(VHT20)	126	126	126
Frequency (MHz)	5755	5795	
IEEE 802.11n(HT40)	126	126	
IEEE 802.11ac(VHT40)	126	126	
Frequency (MHz)	5775		
IEEE 802.11ac(VHT80)	99		



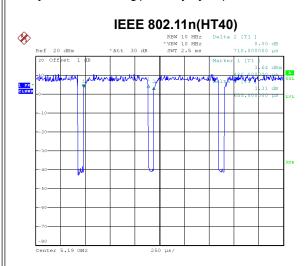
# 2.4 DUTY CYCLE

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.



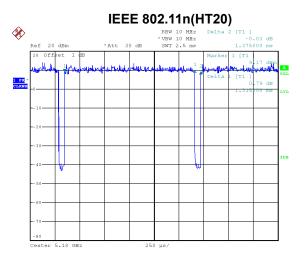
Date: 8.SEP.2021 10:57:50

Duty cycle = 1.405 ms / 1.460 ms = 96.23% Duty Factor = 10 log(1 / Duty cycle) = 0.17



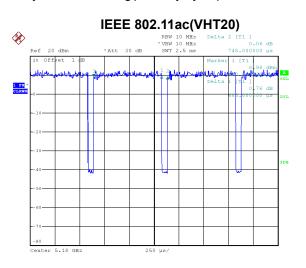
Date: 8.SEP.2021 11:09:12

Duty cycle = 0.655 ms / 0.710 ms = 92.25% Duty Factor = 10 log(1 / Duty cycle) = 0.35



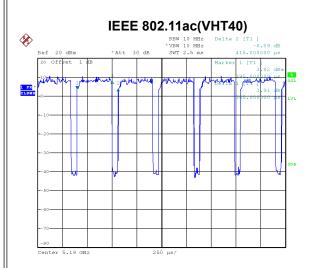
Date: 8.SEP.2021 10:59:33

Duty cycle = 1.315 ms / 1.375 ms = 95.64% Duty Factor = 10 log(1 / Duty cycle) = 0.19



Date: 8.SEP.2021 11:07:18

Duty cycle = 0.685 ms / 0.745 ms = 91.95% Duty Factor = 10 log(1 / Duty cycle) = 0.36



Date: 8.SEP.2021 10:59:01

Duty cycle = 0.355 ms / 0.415 ms = 85.54% Duty Factor = 10 log(1 / Duty cycle) = 0.68

#### 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 712 Hz (Duty cycle < 98%).

#### For IEEE 802.11n(HT20):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 760 Hz (Duty cycle < 98%).

For IEEE 802.11n(HT40):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1527 Hz (Duty cycle < 98%).

For IEEE 802.11ac(VHT20):

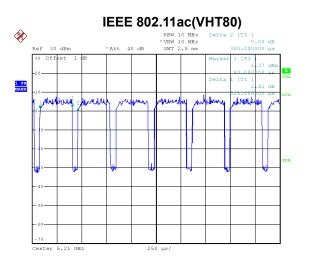
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1460 Hz (Duty cycle < 98%).

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 2817 Hz (Duty cycle < 98%).

For IEEE 802.11ac(VHT80):

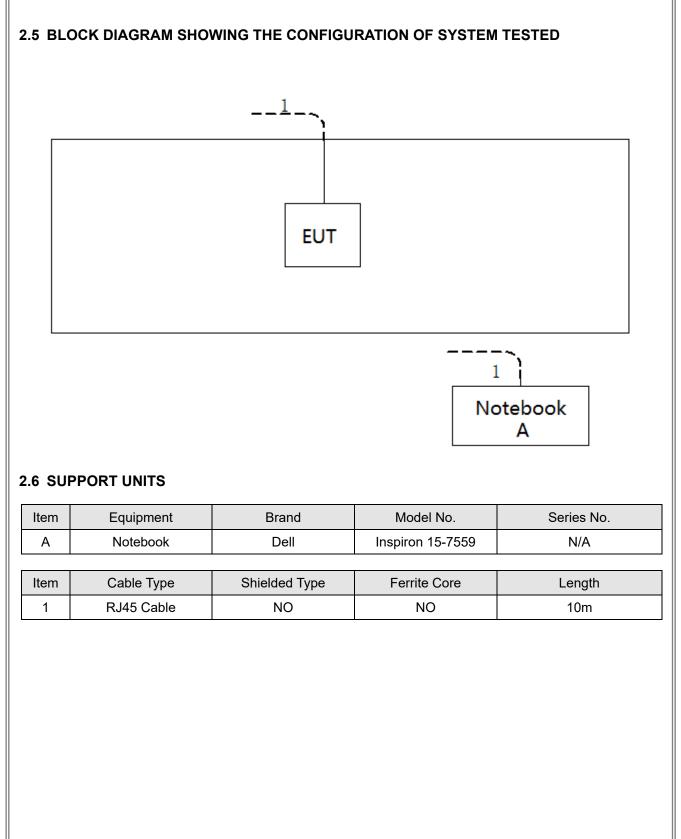
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3077 Hz (Duty cycle < 98%).



Date: 8.SEP.2021 11:08:33

Duty cycle = 0.325 ms / 0.380 ms = 85.53% Duty Factor = 10 log(1 / Duty cycle) = 0.68







# 3. AC POWER LINE CONDUCTED EMISSIONS

#### 3.1 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.

#### 3.2 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:

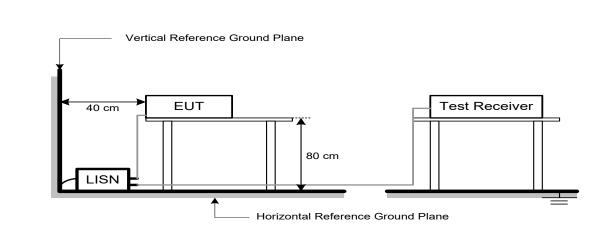
Receiver Parameter	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

#### 3.3 DEVIATION FROM TEST STANDARD

No deviation



# 3.4 TEST SETUP



# 3.5 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.

#### 3.6 TEST RESULTS

Please refer to the APPENDIX A.

# **4. RADIATED EMISSIONS**

#### **4.1 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:  $E = \frac{1000000\sqrt{30P}}{100000}$ 

-μV/m, where P is the eirp (Watts) 3

(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.



# 4.2 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

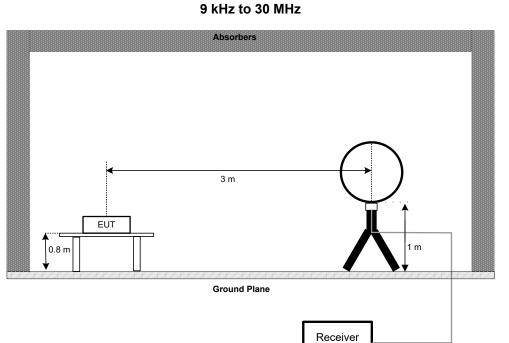
Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector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



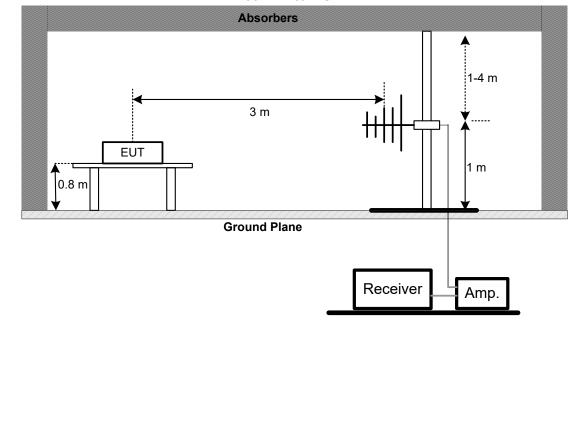
# 4.3 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.4 TEST SETUP

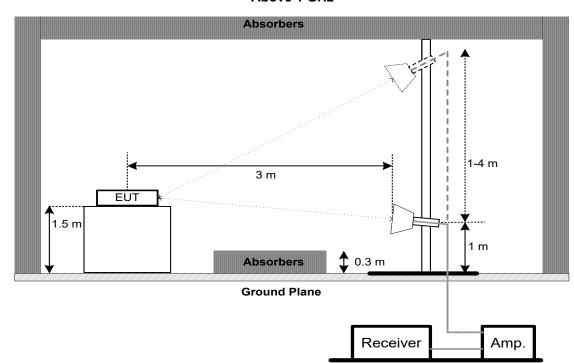


30 MHz to 1 GHz





#### Above 1 GHz



# 4.5 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.

# 4.6 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.

# 4.7 TEST RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX C.

#### 4.8 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.



# 5. BANDWIDTH

#### 5.1 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

#### 5.2 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

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

#### 5.3 DEVIATION FROM STANDARD

No deviation.

# 5.4 TEST SETUP



# 5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 5.6 TEST RESULTS

Please refer to the APPENDIX E.



# 6. MAXIMUM OUTPUT POWER

#### 6.1 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.

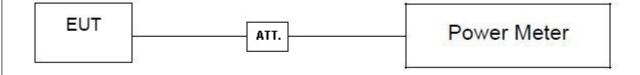
#### 6.2 TEST PROCEDURE

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

#### 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 F.



# 7. POWER SPECTRAL DENSITY

#### 7.1 LIMIT

Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.407(a)	7(a) Power Spectral Density	AP device: 17 dBm/MHz Client device: 11 dBm/MHz	5150-5250
		30 dBm/500 kHz	5725-5850

# 7.2 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 Fraguanay	Encompass the entire emissions bandwidth (EBW)
Span Frequency	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 13 dB, and the final offset is 13 + 7 = 20 dB when RBW=100kHz is used.

# 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 G.



# 8. FREQUENCY STABILITY

# 8.1 LIMIT

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

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

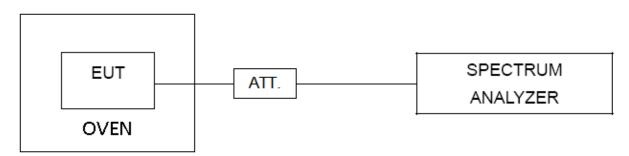
c. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

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

#### 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 H.

# 9. 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	ESCI	100382	Feb. 28, 2022	
2	LISN	EMCO	3816/2	52765	Feb. 27, 2022	
3	TWO-LINE V-NETWORK	R&S	ENV216	101447	Feb. 27, 2022	
4	50Ω Terminator	SHX	TF5-3	15041305	Feb. 27, 2022	
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	
6	Cable	N/A	RG223	12m	Mar. 09, 2022	
7	643 Shield Room	ETS	6*4*3m	N/A	N/A	

	Radiated Emissions - 9 kHz to 30 MHz						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Loop Antenna	EM	EM-6876-1	230	Apr. 28, 2022		
2	Cable	N/A	RG 213/U	N/A	May 27, 2022		
3	EMI Test Receiver	R&S	ESCI	100895	Feb. 27, 2022		
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A		
5	966 Chambe Room	RM	9*6*6m	N/A	Jul. 24, 2022		

	Radiated Emissions - 30 MHz to 1 GHz						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 15, 2022		
2	Amplifier	HP	8447D	2944A08742	Feb. 28, 2022		
3	Receiver	Agilent	N9038A	MY52130039	Mar. 19, 2022		
4	Cable	emci	LMR-400(30MHz-1 GHz)(8m+5m)	N/A	May 20, 2022		
5	Controller	СТ	SC100	N/A	N/A		
6	Controller	MF	MF-7802	MF780208416	N/A		
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A		
8	966 Chambe Room	RM	9*6*6m	N/A	Jul. 24, 2022		

	Radiated Emissions - Above 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Double Ridged Guide Antenna	ETS	3115	75789	May 10, 2022	
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 30, 2022	
3	Amplifier	Agilent	8449B	3008A02584	Jul. 10, 2022	
4	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Feb. 28, 2022	
5	Receiver	Agilent	N9038A	MY52130039	Mar. 19, 2022	
6	Controller	СТ	SC100	N/A	N/A	
7	Controller	MF	MF-7802	MF780208416	N/A	
8	Cable	N/A	EMC104-SM-SM-6 000	N/A	Oct. 16, 2021	
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	
10	Band Reject Filter	Micro-Tronics	BRC50705-01	10	Feb. 27, 2022	
11	Band Reject Filter	Micro-Tronics	BRC50703-01	7	Feb. 27, 2022	
12	966 Chambe Room	RM	9*6*6m	N/A	Jul. 24, 2022	

	Bandwidth & Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	R&S	FSP40	100185	Jul. 10, 2022	
2	Attenuator	WOKEN	6SM3502	VAS1214NL	Feb. 07, 2022	
3	RF Cable	Tongkaichuan	N/A	N/A	N/A	
4	DC Block	Mini	N/A	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	Jul. 10, 2022	
2	Wideband power sensor	Keysight	N1923A	MY58310004	Jul. 10, 2022	
3	Attenuator	WOKEN	6SM3502	VAS1214NL	Feb. 07, 2022	
4	RF Cable	Tongkaichuan	N/A	N/A	N/A	

Frequency Stability					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Jul. 10, 2022
2	Precision Oven Tester	CEPREI	CEEC-M64T-40	15-008	Feb. 27, 2022
3	Attenuator	WOKEN	6SM3502	VAS1214NL	Feb. 07, 2022
4	RF Cable	Tongkaichuan	N/A	N/A	N/A
5	DC Block	Mini	N/A	N/A	N/A

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

All calibration period of equipment list is one year.



# **10. EUT TEST PHOTOS**

# AC Power Line Conducted Emissions Test Photos







**Radiated Emissions Test Photos** 

9 kHz to 30 MHz







<section-header><section-header>

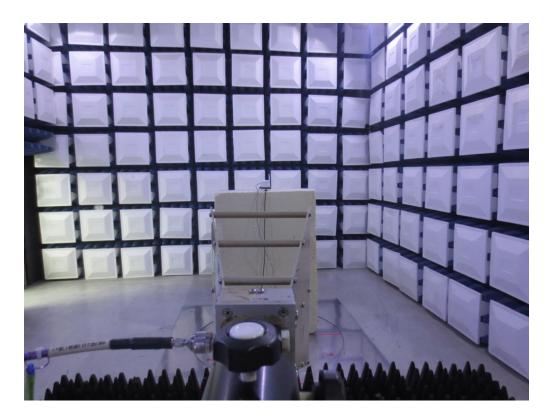




**Radiated Emissions Test Photos** 

Above 1 GHz

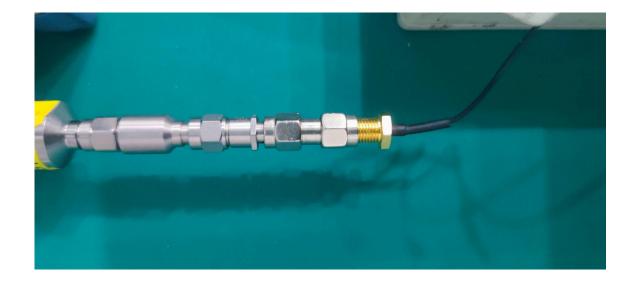






### **Conducted Test Photos**

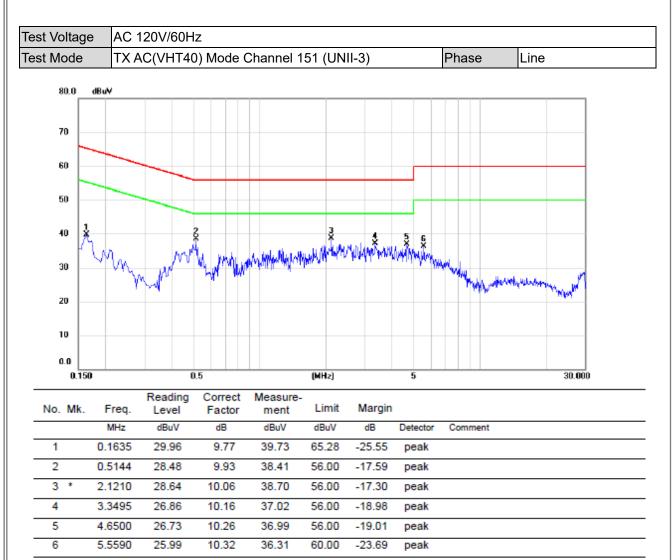






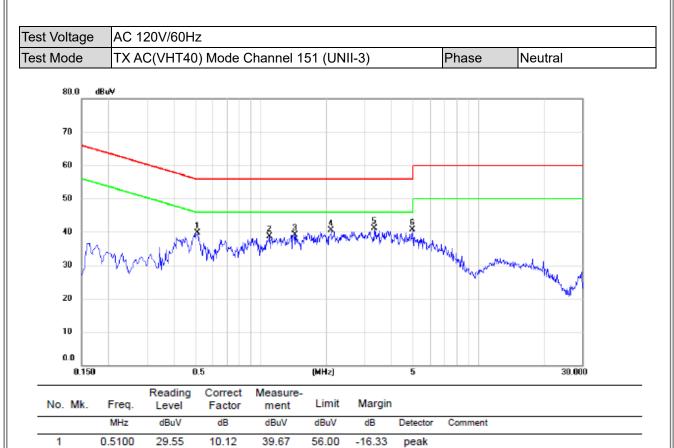
## **APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS**





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





2

3

4

5 \*

6

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

(3) The test result has included the cable loss.

1.0950

1.4325

2.1030

3.3315

4.9740

28.40

28.86

30.02

30.56

30.14

10.28

10.33

10.39

10.50

10.62

38.68

39.19

40.41

41.06

40.76

56.00

56.00

56.00

56.00

56.00

-17.32

-16.81

-15.59

-14.94

-15.24

peak

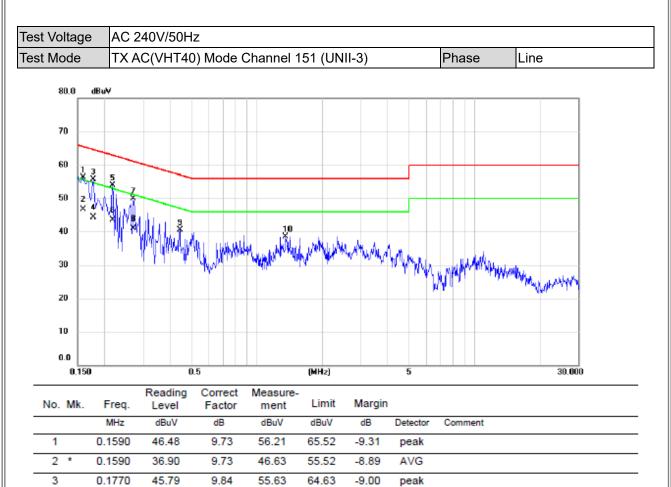
peak

peak

peak

peak





4

5

6

7

8

9

10

0.1770

0.2175

0.2175

0.2714

0.2714

0.4425

1.3560

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

34.50

44.09

33.70

40.06

31.00

30.50

28.47

9.84

9.90

9.90

9.87

9.87

9.91

10.00

44.34

53.99

43.60

49.93

40.87

40.41

38.47

54.63

62.91

52.91

61.07

51.07

57.01

56.00

-10.29

-8.92

-9.31

-11.14

-10.20

-16.60

-17.53

AVG

peak

AVG

peak

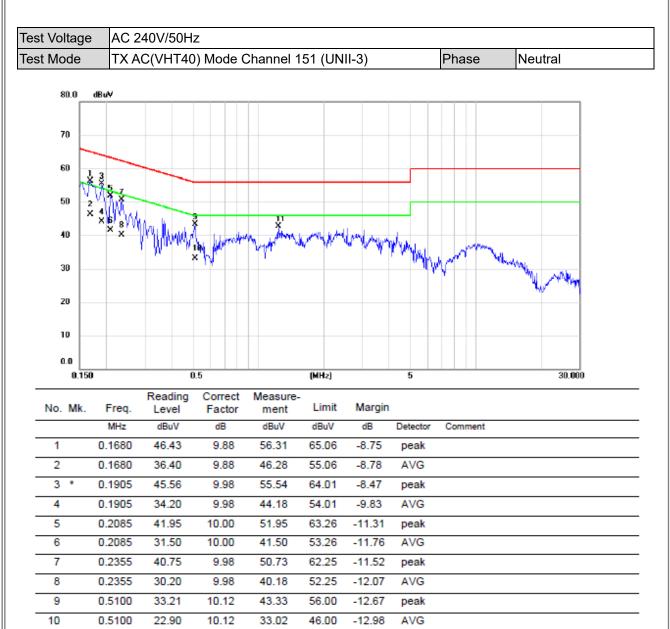
AVG

peak

peak

(3) The test result has included the cable loss.





11

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

10.29

42.80

56.00

-13.20

peak

(2) Margin Level = Measurement Value - Limit Value.

32.51

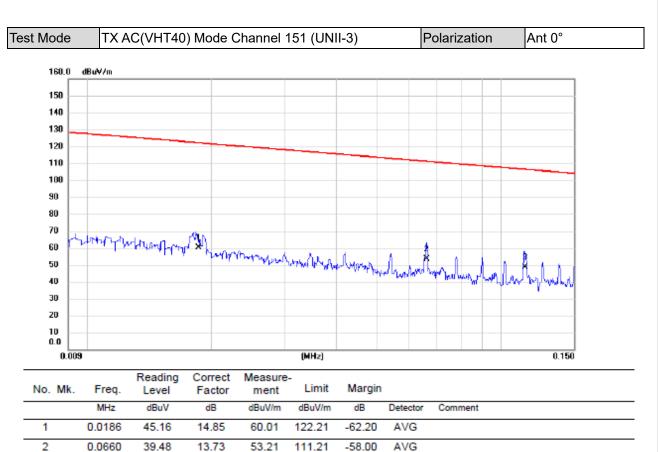
(3) The test result has included the cable loss.

1.2390



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





3 \*

0.1142

34.69

13.79

48.48

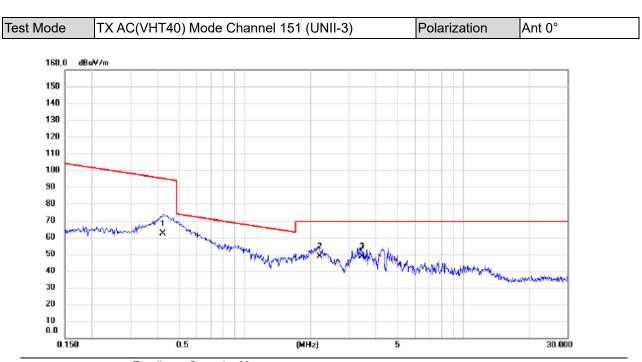
106.45

-57.97

AVG

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

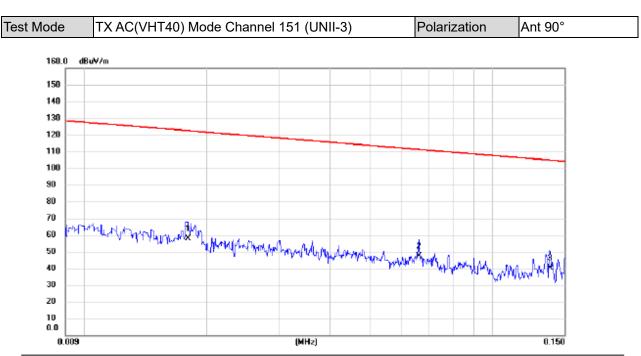




No. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.4237	48.52	13.62	62.14	95.06	-32.92	AVG	
2 *	2.2015	36.49	12.18	48.67	69.54	-20.87	QP	
3	3.4538	36.58	11.99	48.57	69.54	-20.97	QP	

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

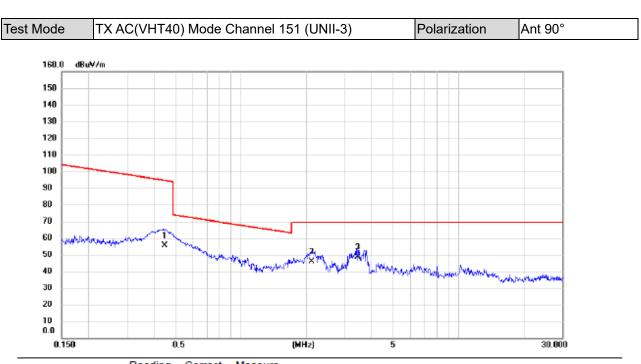




No.	Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0180	42.71	15.04	57.75	122.50	-64.75	AVG	
2	*	0.0660	33.59	13.73	47.32	111.21	-63.89	AVG	
3		0.1382	26.48	13.78	40.26	104.80	-64.54	AVG	

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





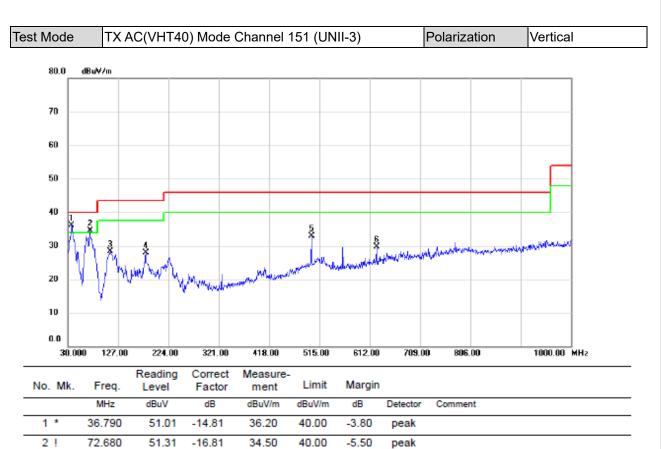
No. Mk.	Freq.	Level	Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.4468	41.63	13.60	55.23	94.60	-39.37	AVG	
2	2.1101	33.58	12.21	45.79	69.54	-23.75	QP	
3 *	3.4538	36.79	11.99	48.78	69.54	-20.76	QP	

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



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





3

4

5

6

111.480

180.835

499.965

625.095

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

43.23

41.59

39.50

33.82

-14.90

-13.75

-6.54

-4.14

28.33

27.84

32.96

29.68

43.50

43.50

46.00

46.00

-15.17

-15.66

-13.04

-16.32

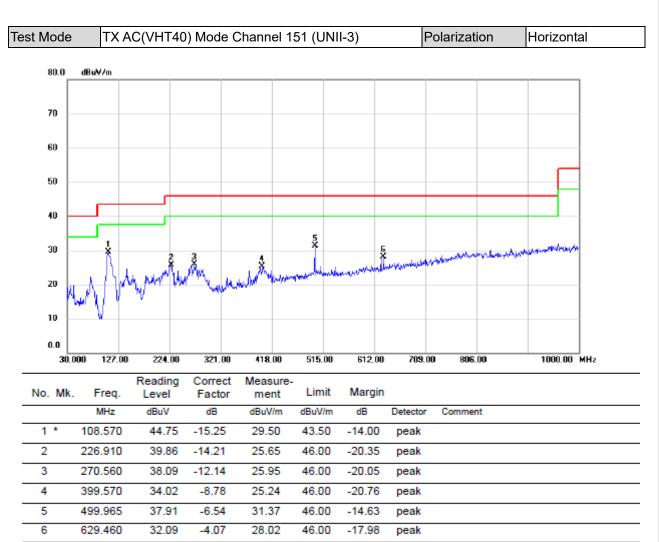
peak

peak

peak

peak



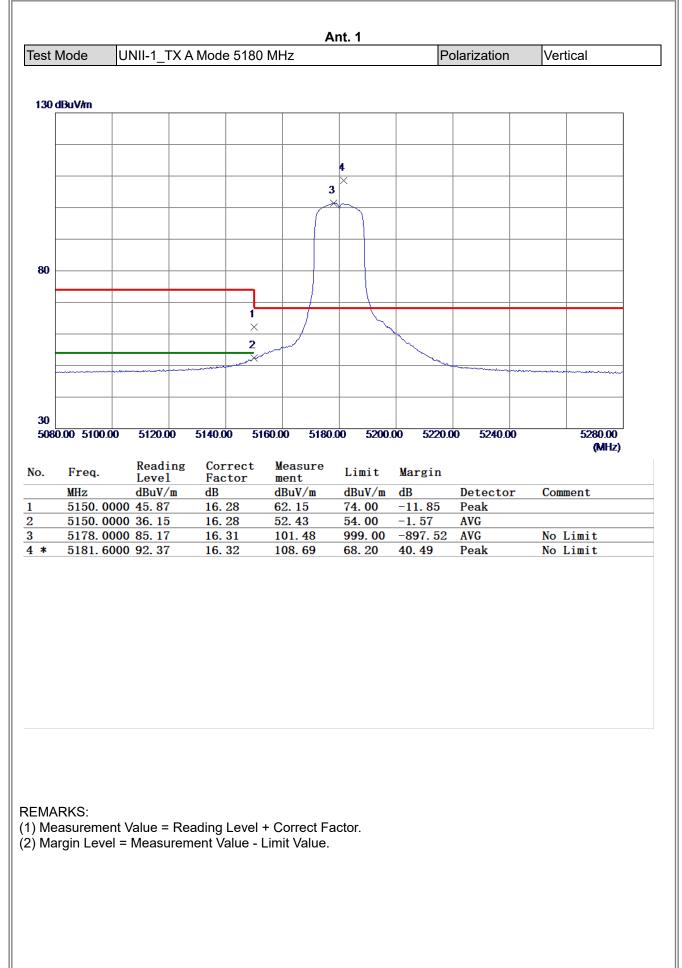


- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

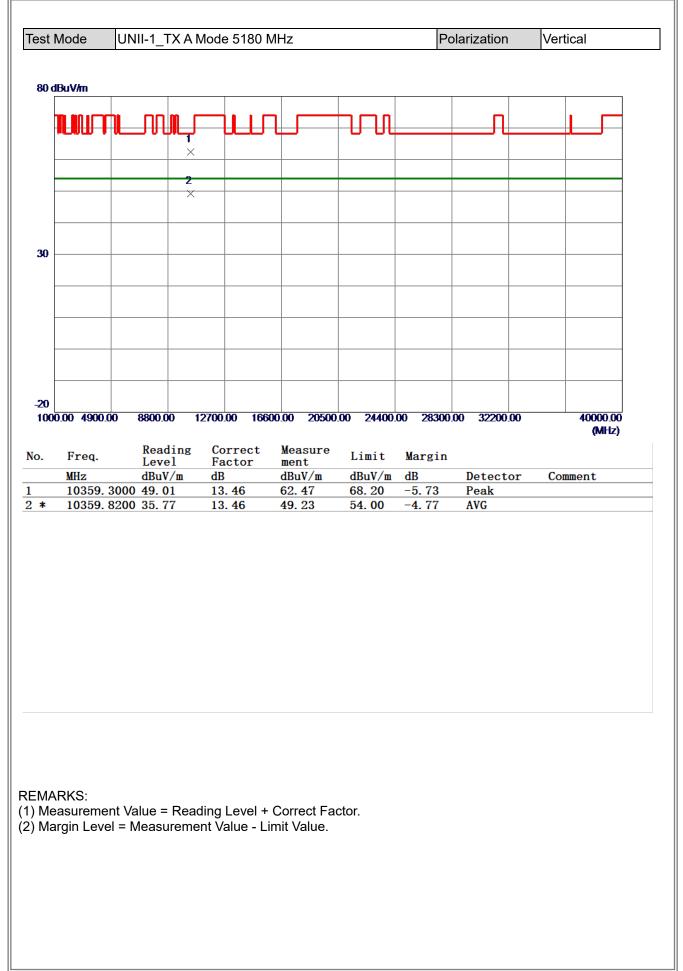


## **APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ**

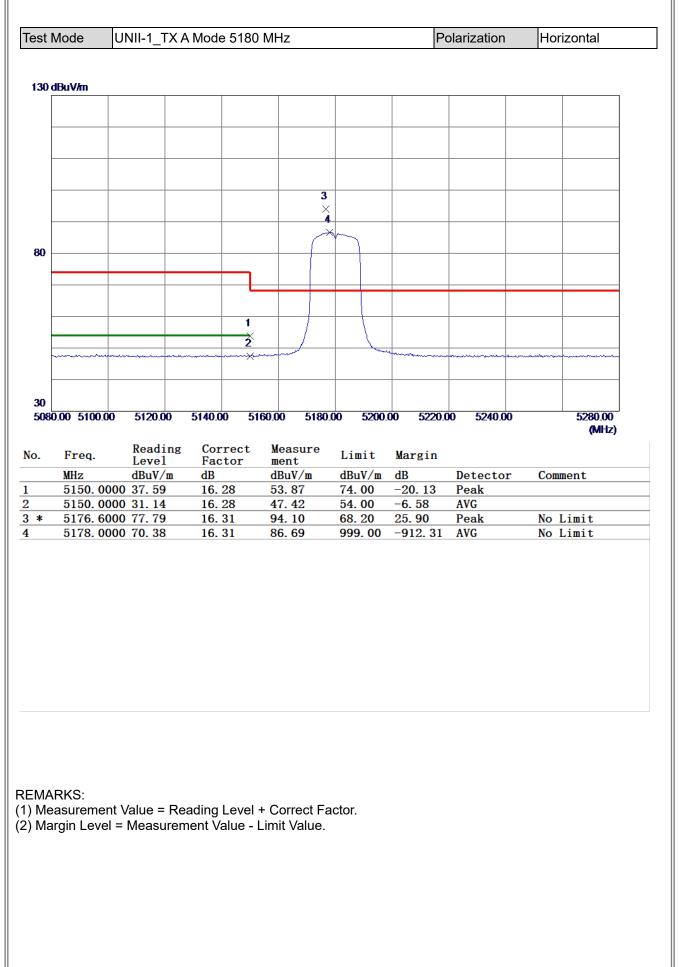
# **BIL**



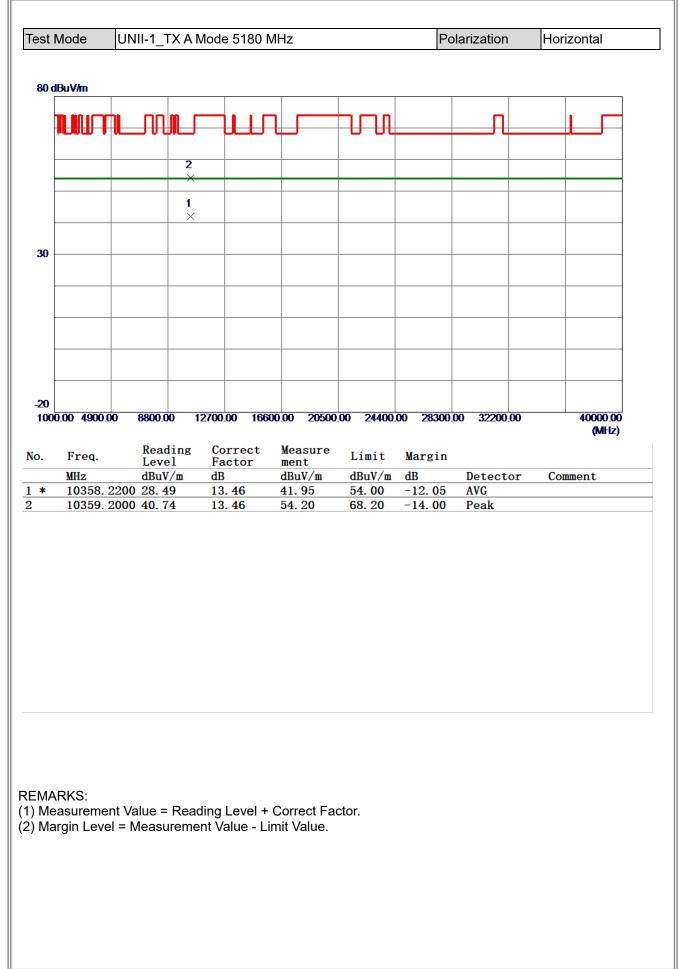




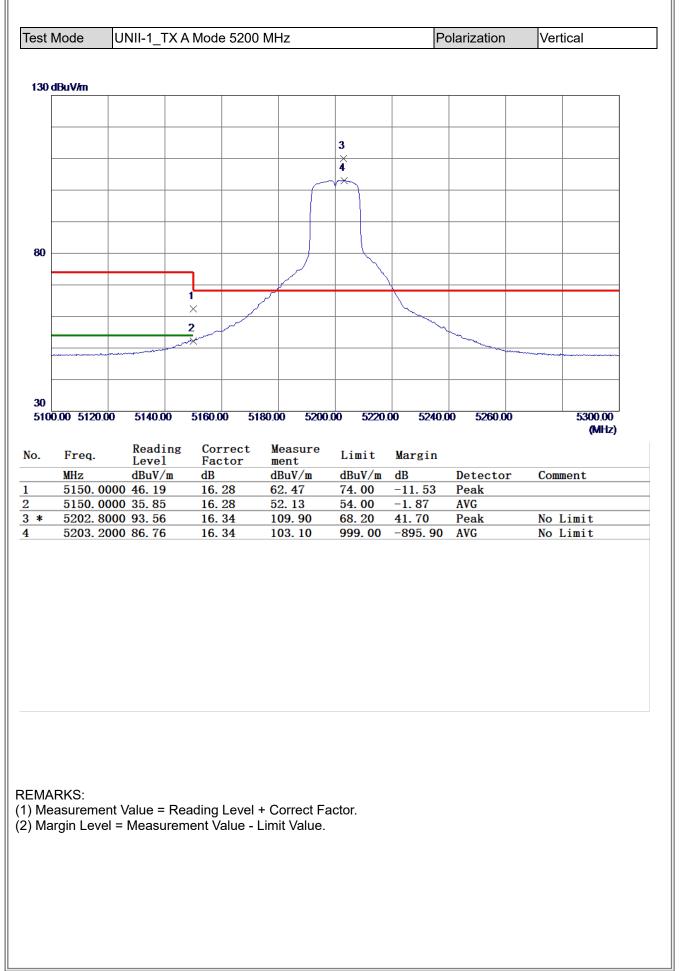




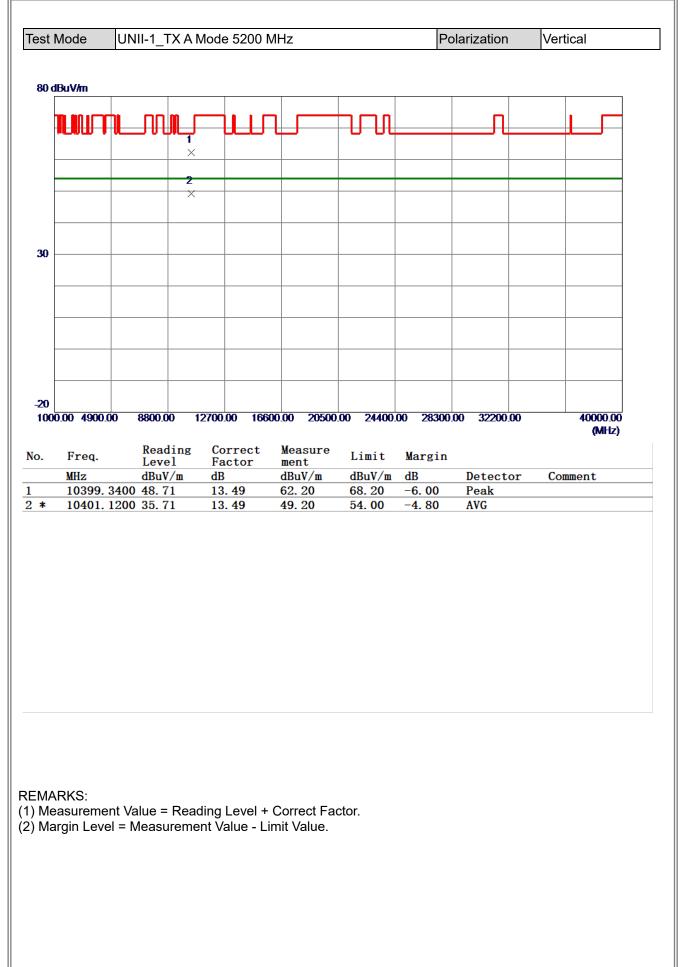




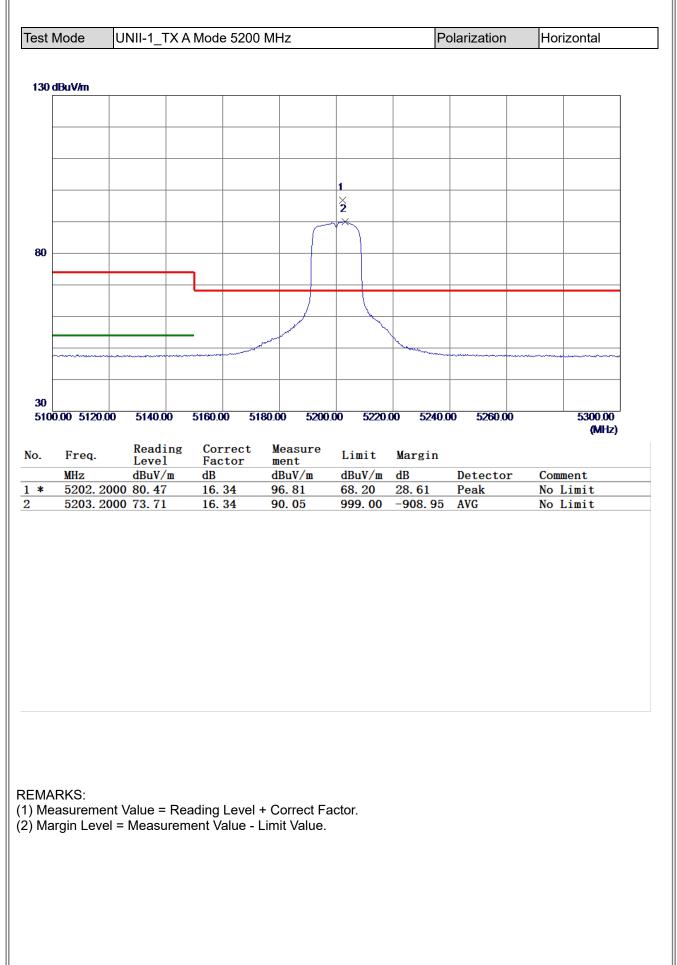




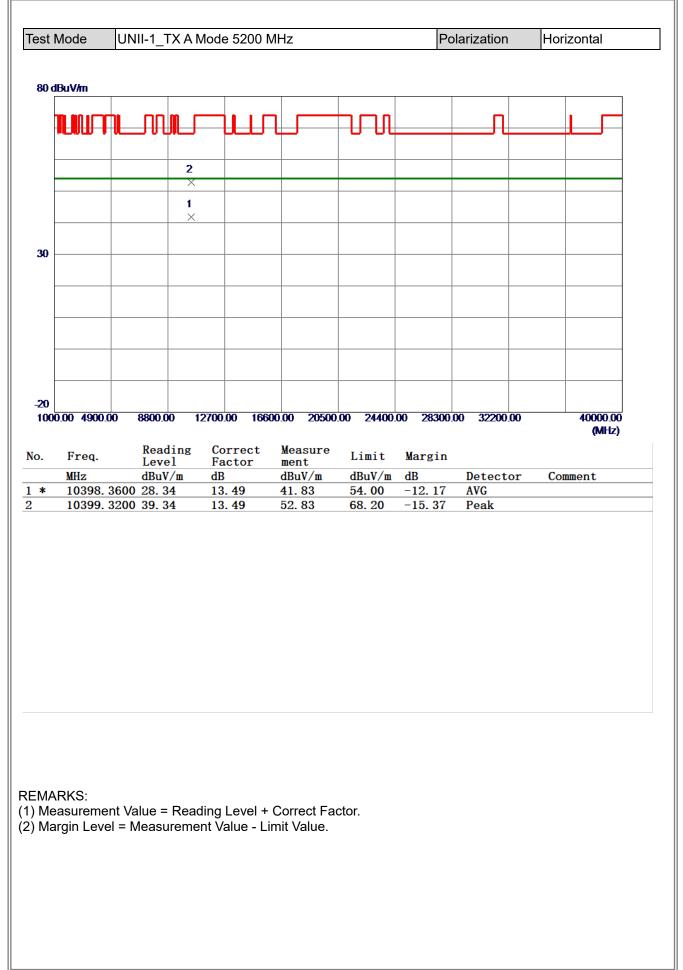




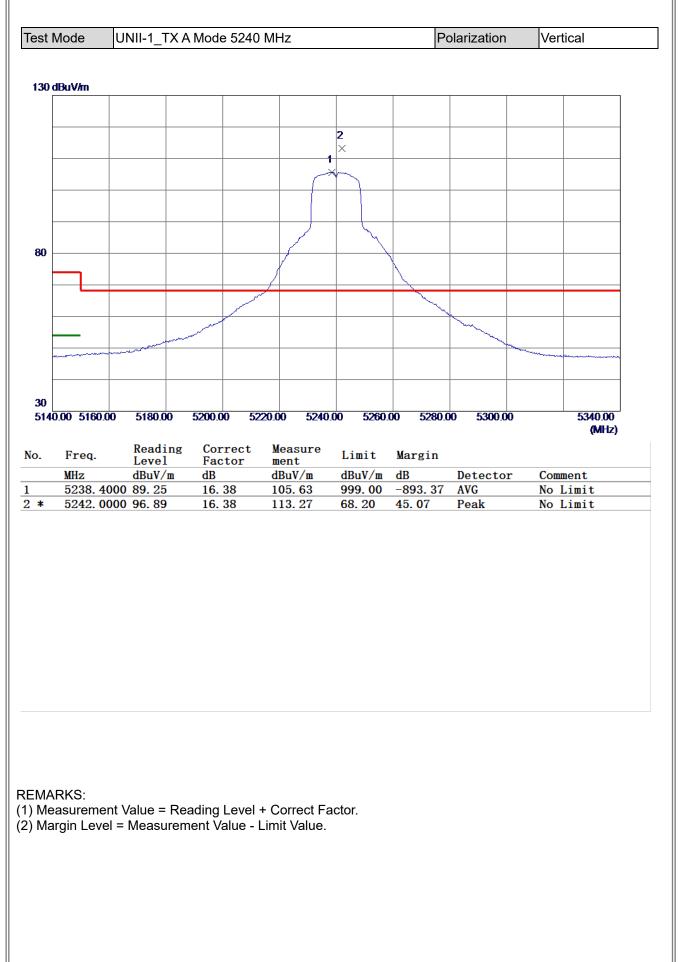




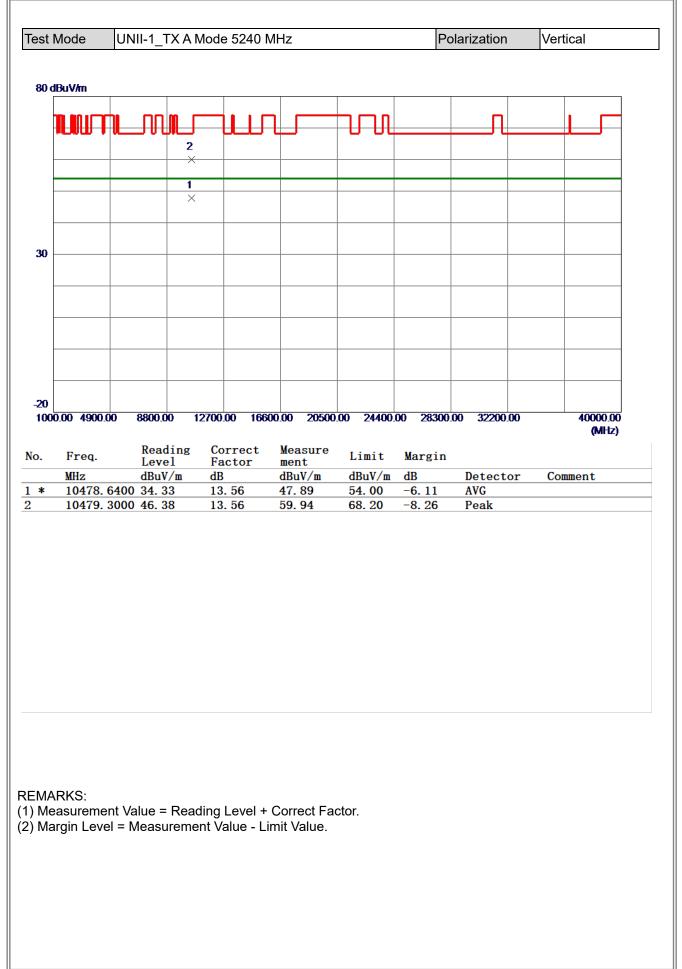




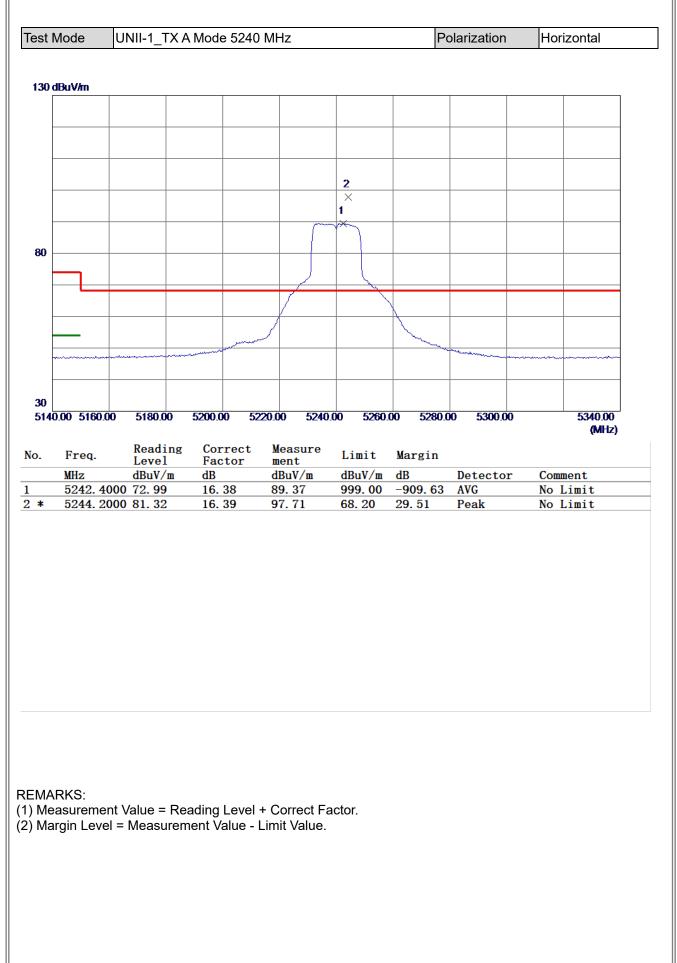




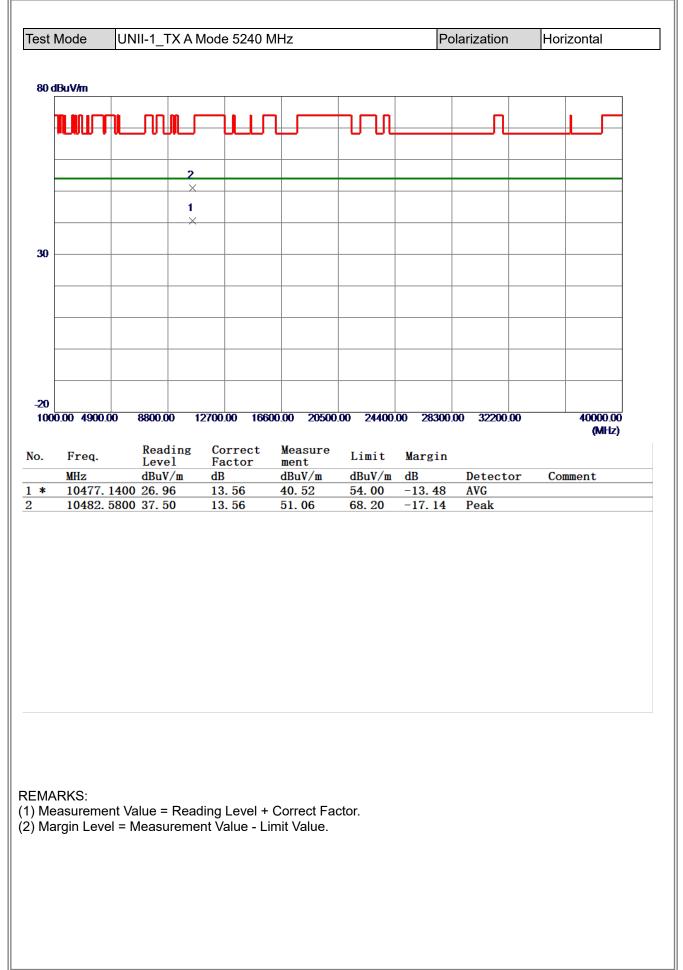








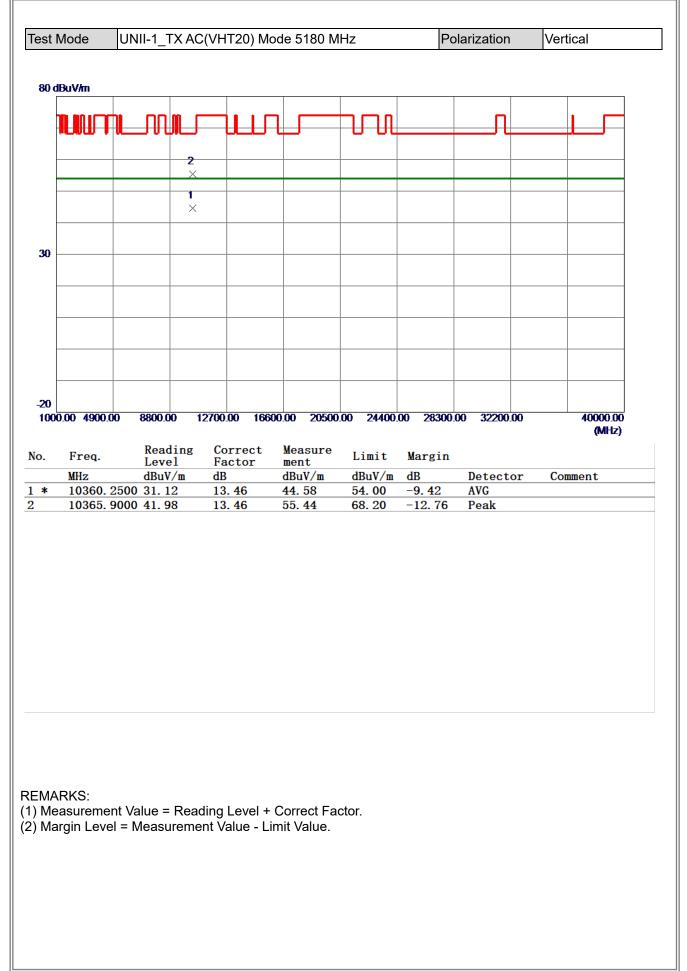




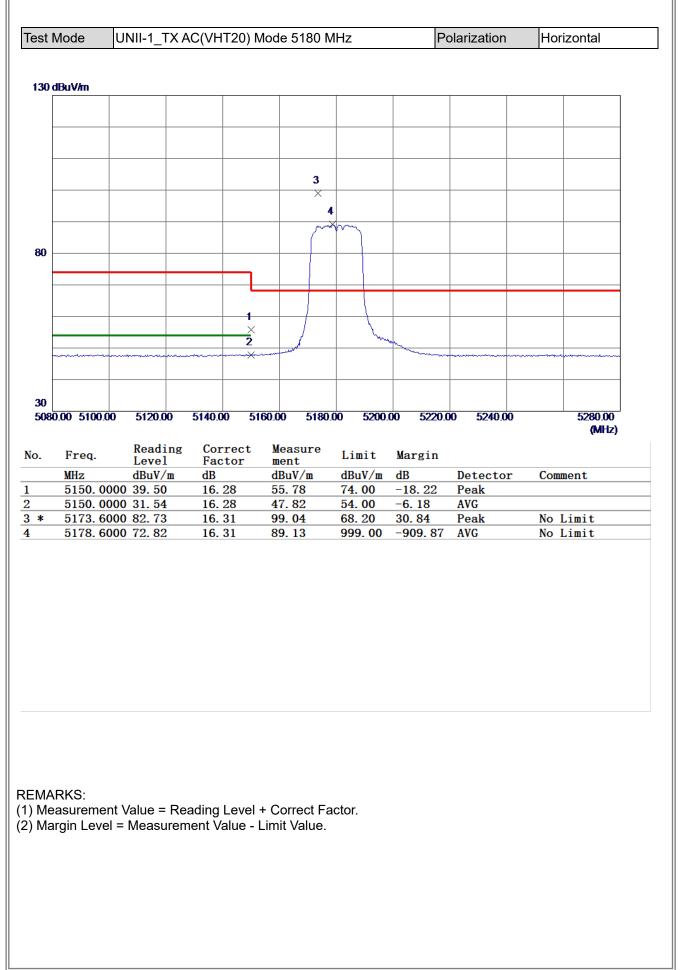


	Node	UNII-1_TX A	C(VHT20)	Mode 5180 N	/IHz	F	Polarization	Vertical
1 <b>30 c</b>	lBuV/m							
				4				
				3				
				قسم	+			
80 -								
00								
					- hu	m the second sec		
			2			1 m		
~								
30								
	<b>).00 5100</b> .	00 5120.00	5140.00 5	160.00 5180.	.00 5200.	00 5220	0.00 5240.00	5280.00
	-	Reading	Correct	Measure				<b>(MHz</b> )
).	Freq. MHz	Level dBuV/m	Factor dB	ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
	5150.0	000 50.94	16.28	67.22	74.00	-6.78	Peak	
		000 35.79 000 87.85	16.28 16.31	52.07 104.16	54.00 999.00	-1. 93 -894. 84	AVG 4 AVG	No Limit
*		000 95. 22	16. 31	111. 53	68.20	43. 33	Peak	No Limit
	RKS:							

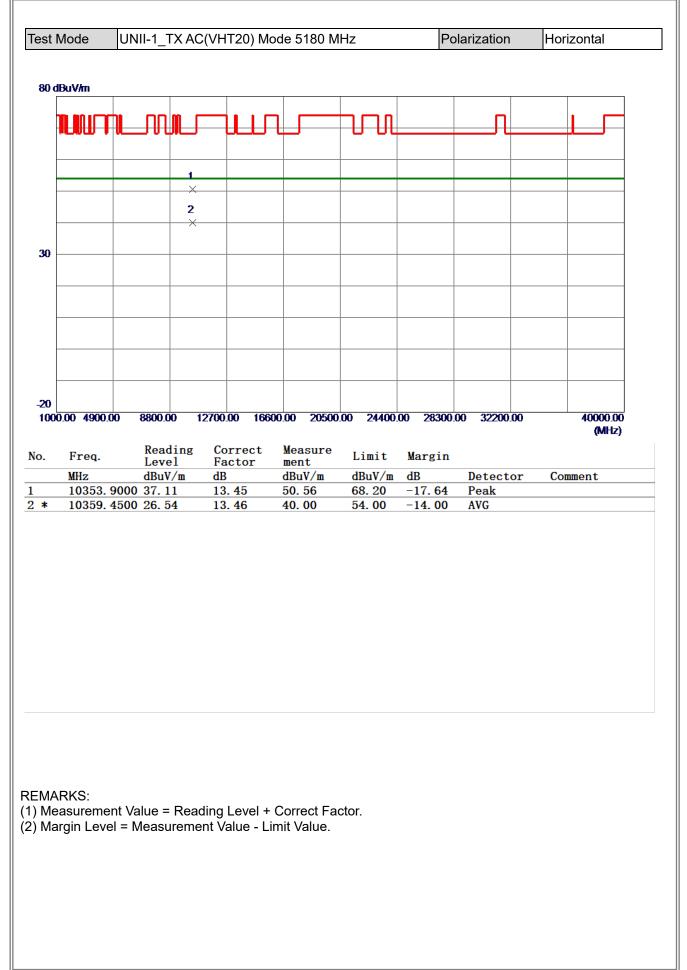




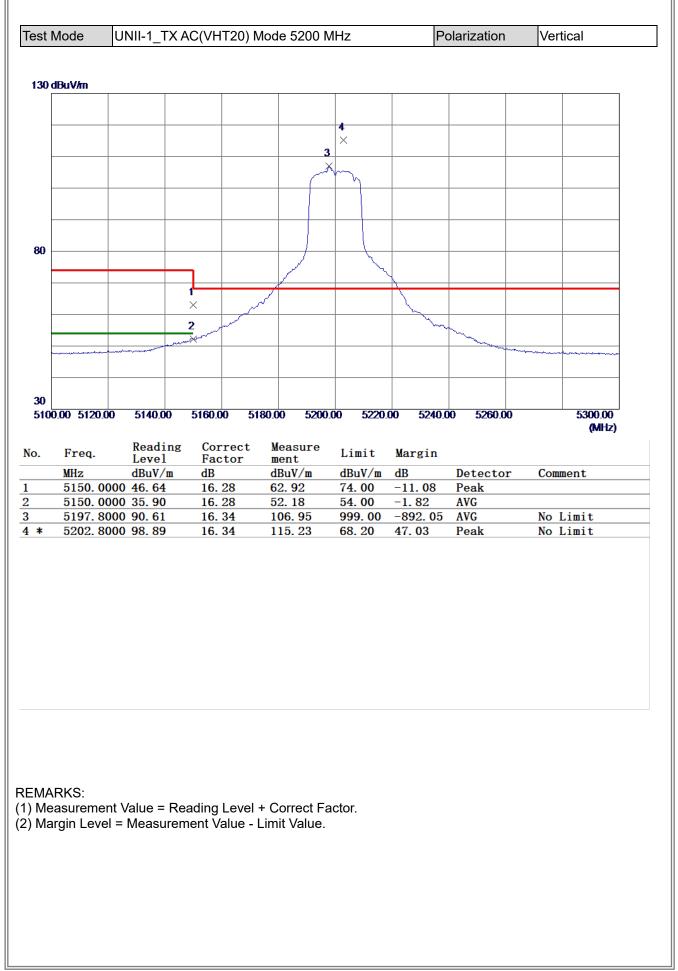




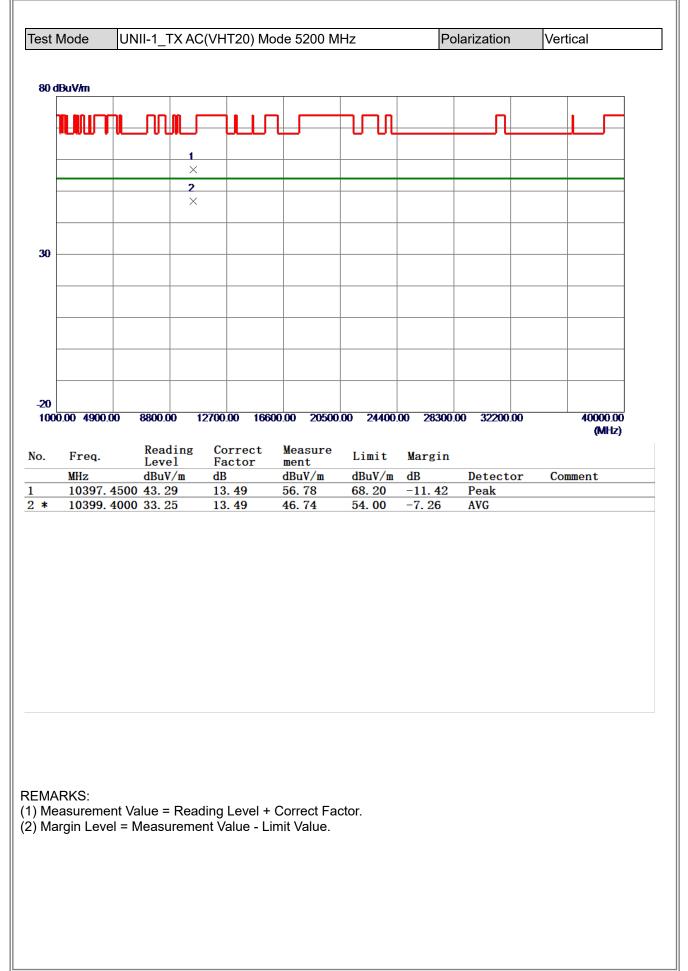




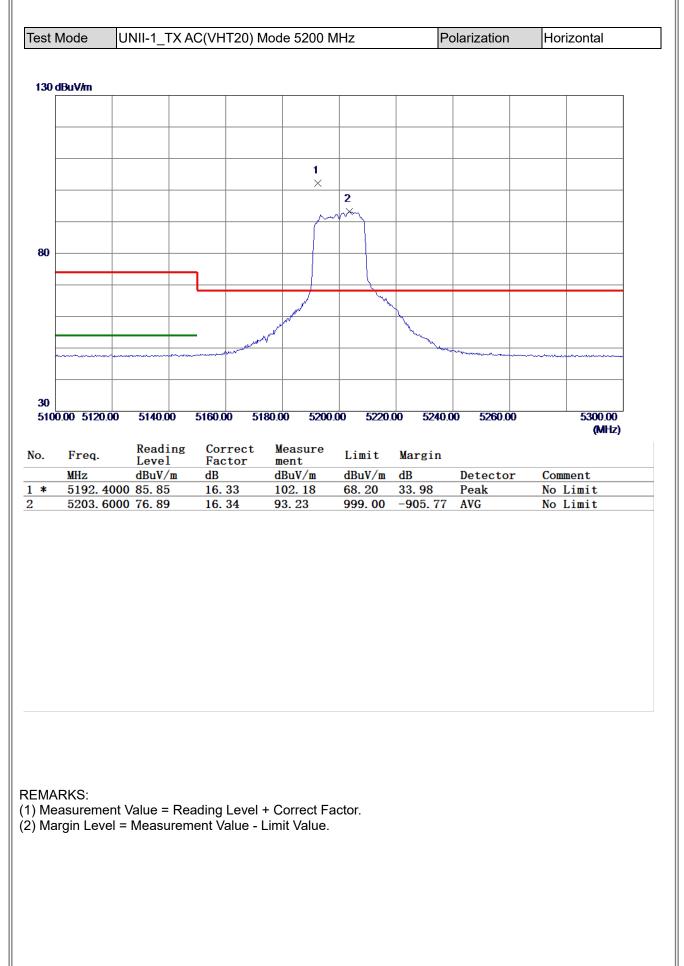




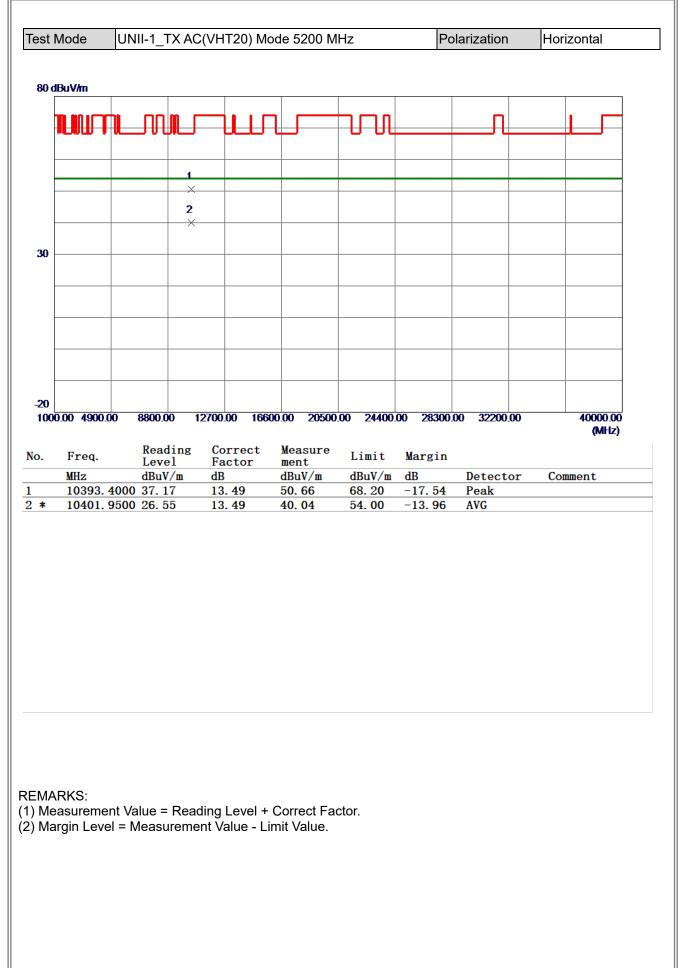




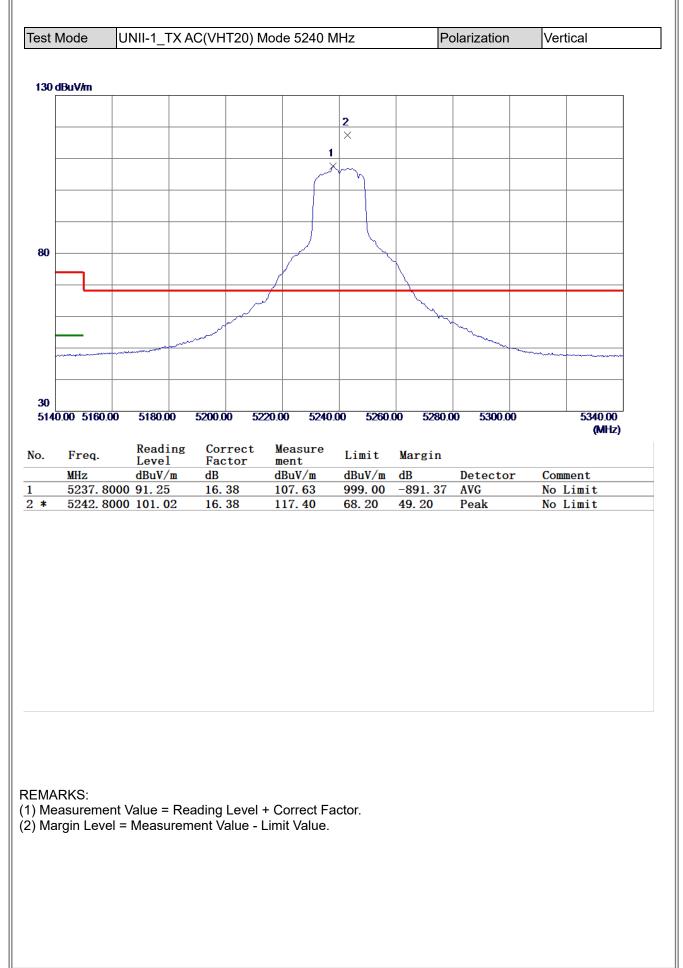




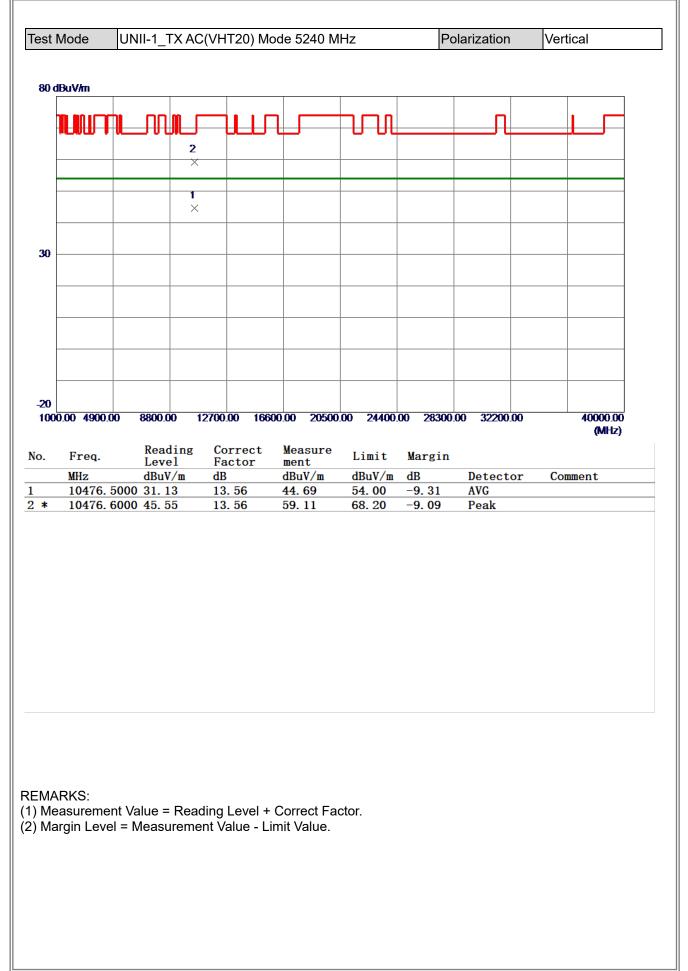




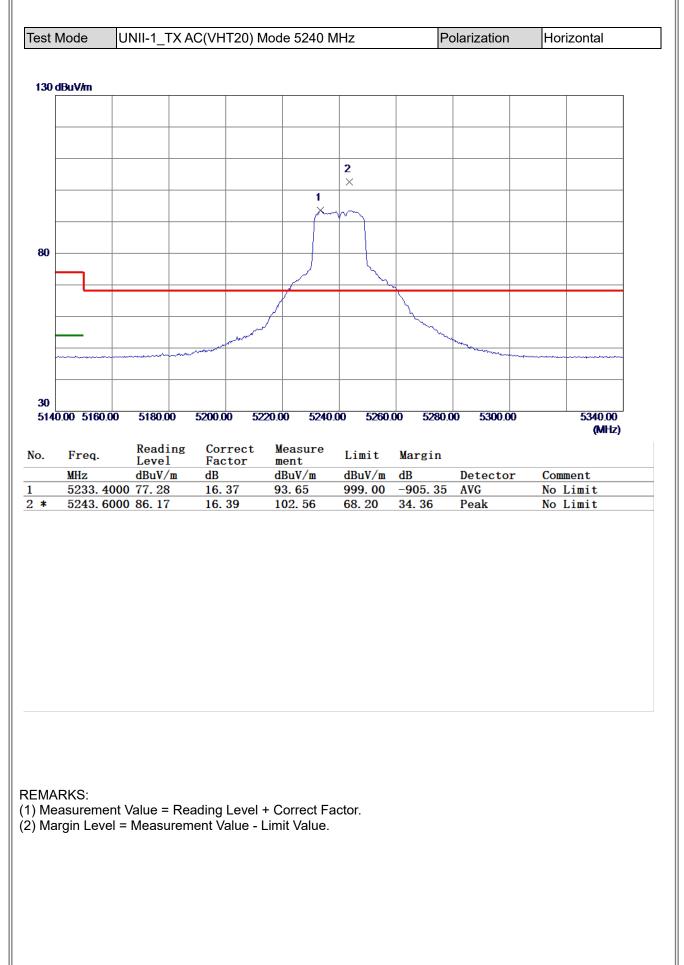




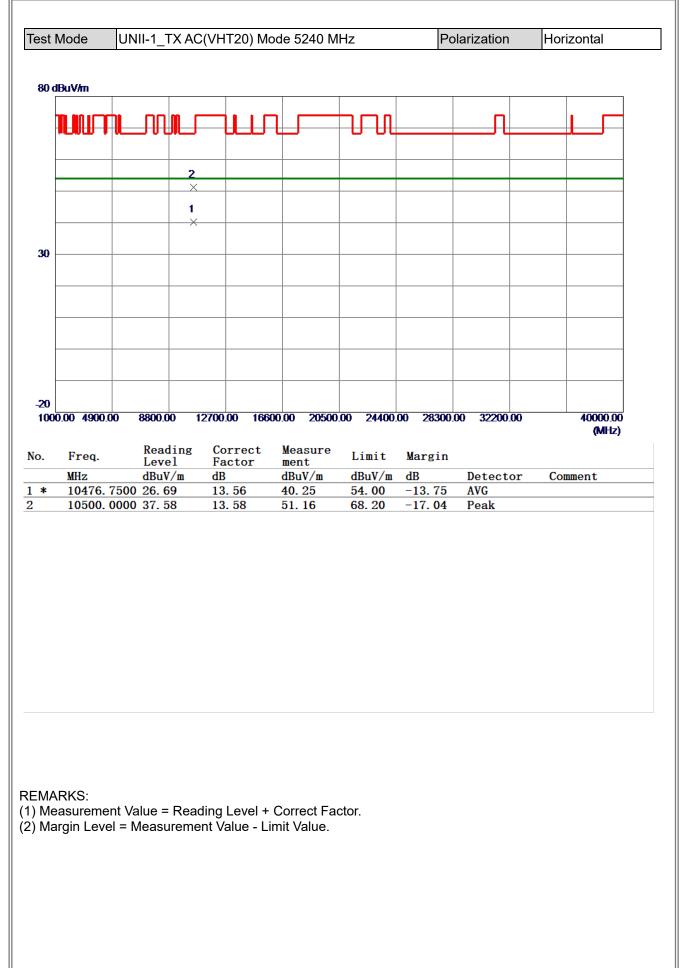




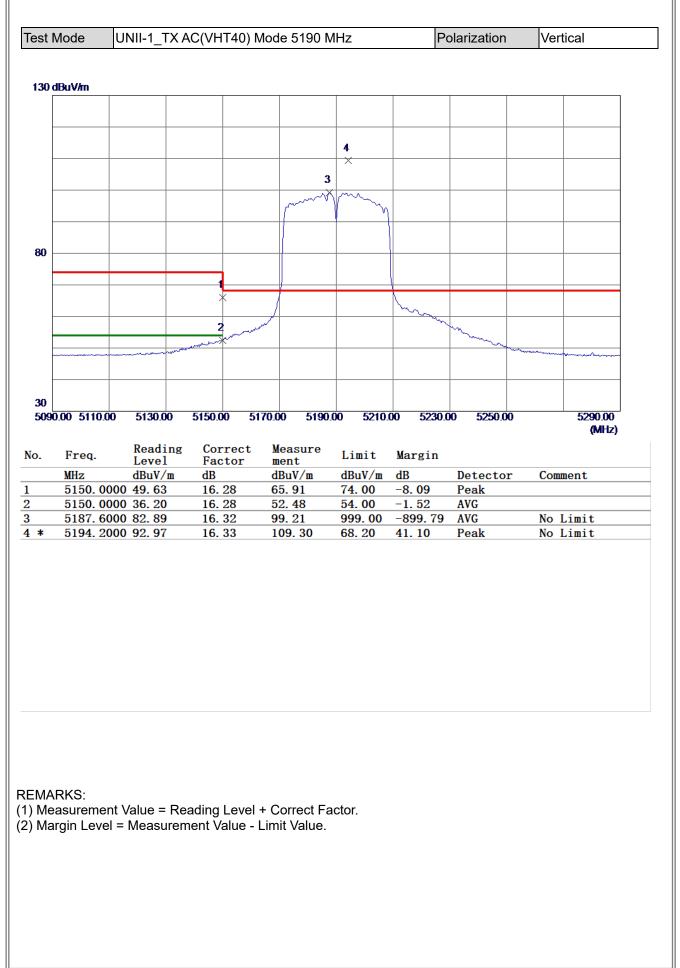




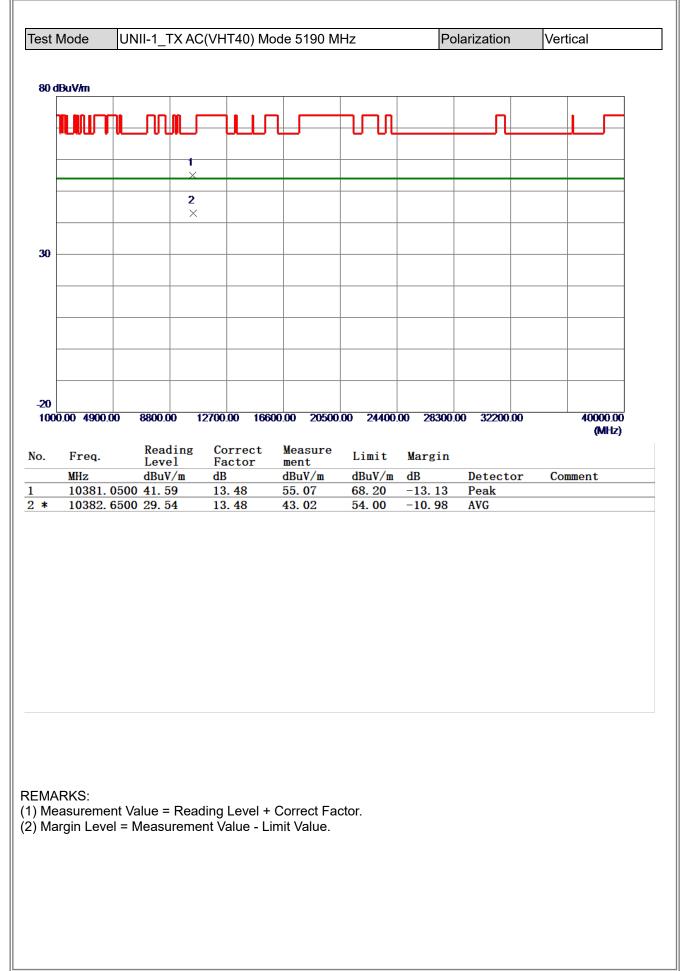




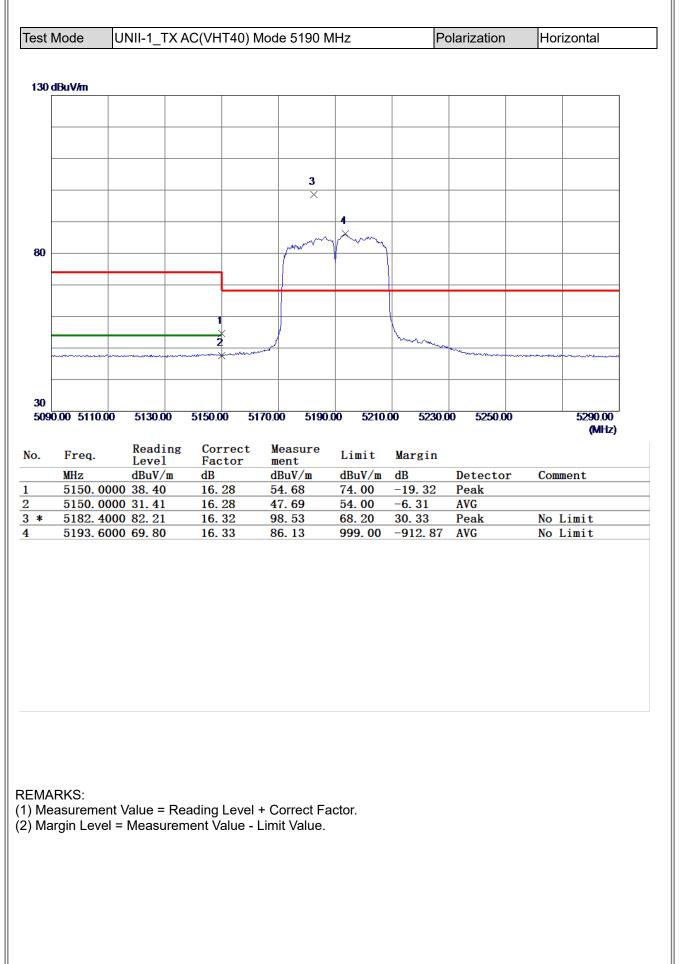




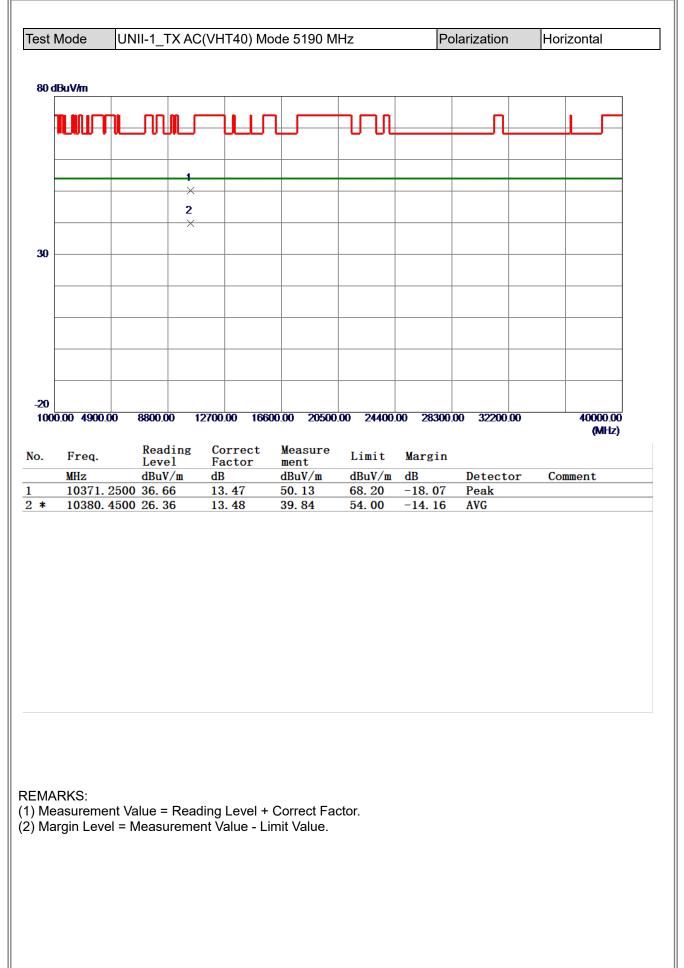




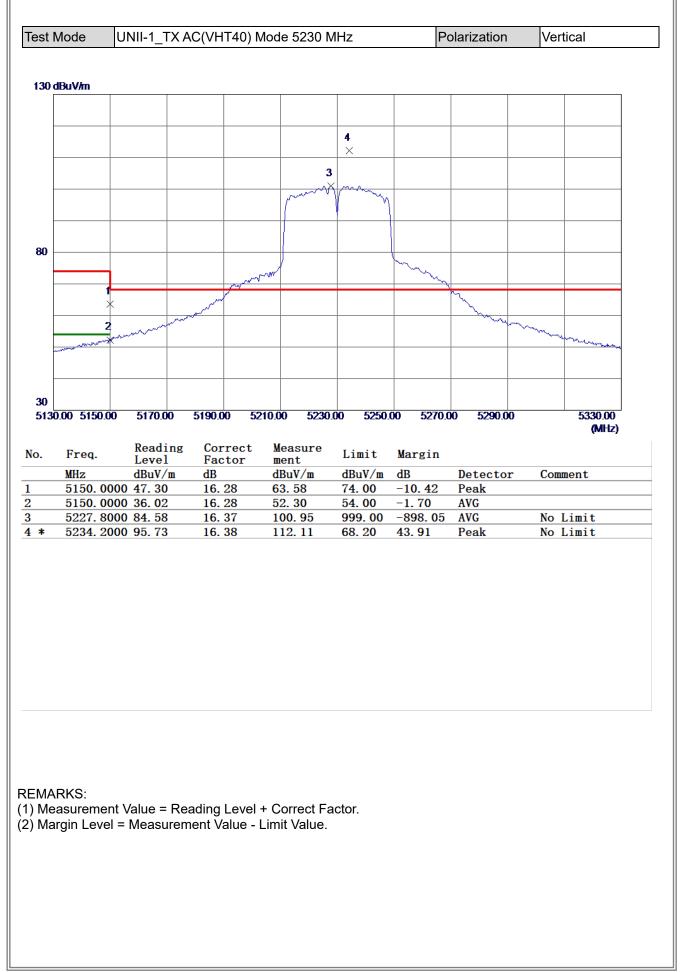




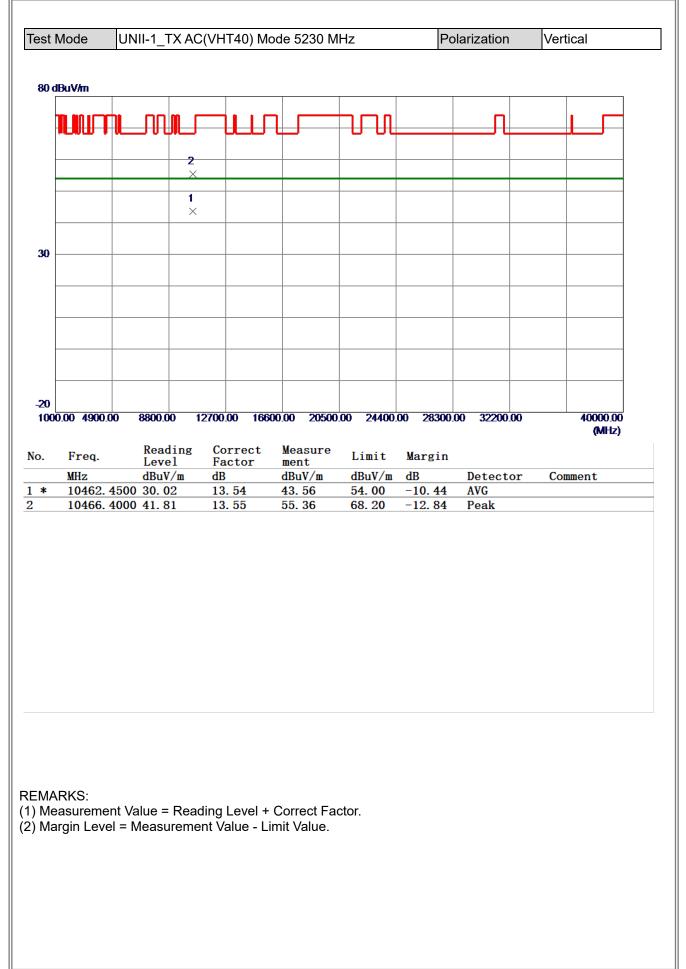




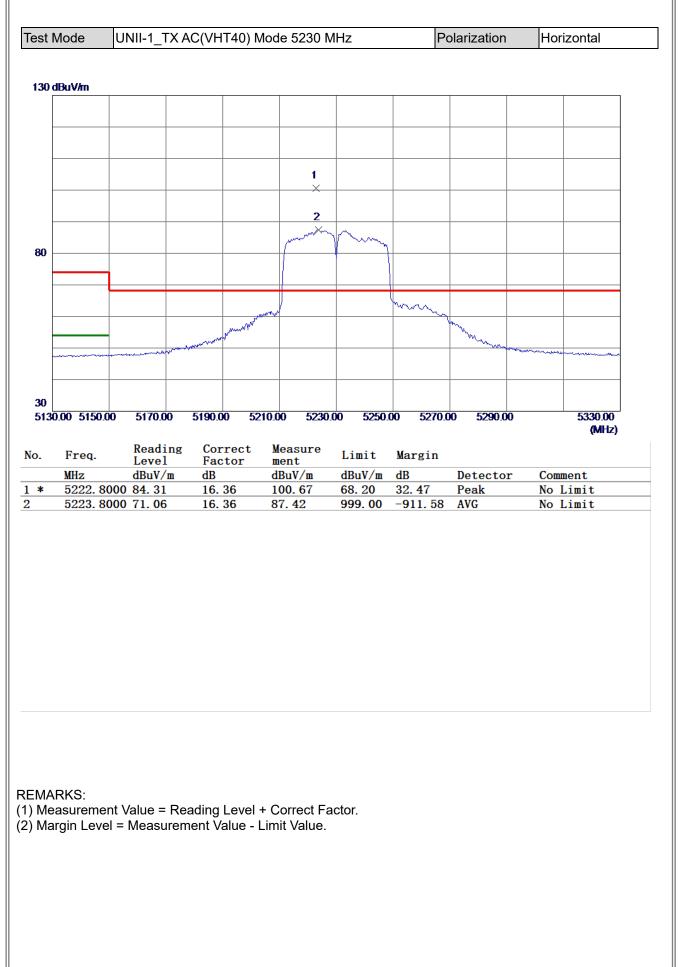




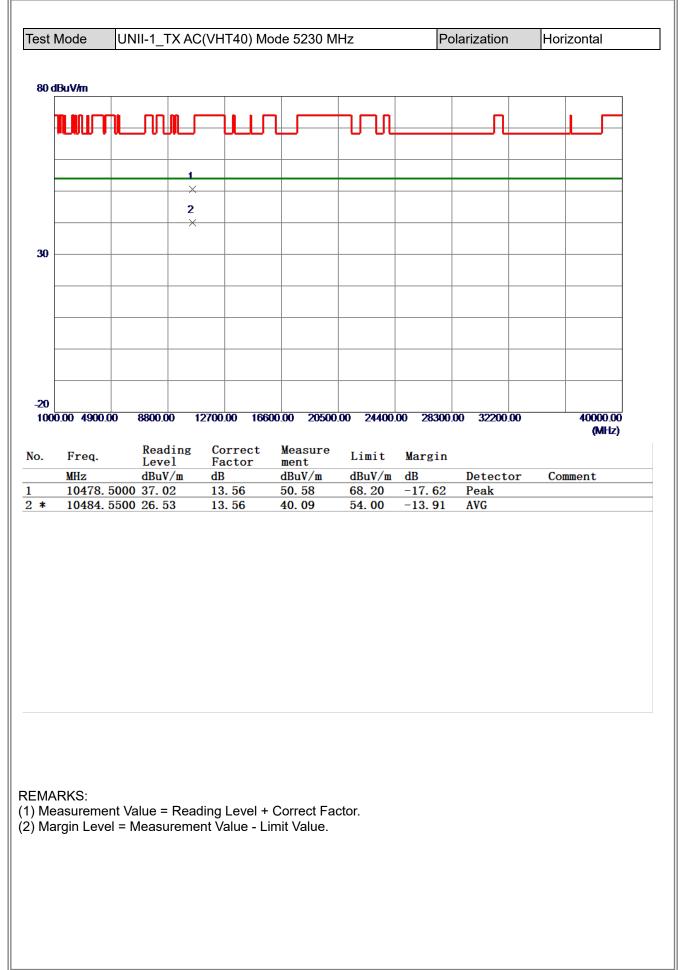




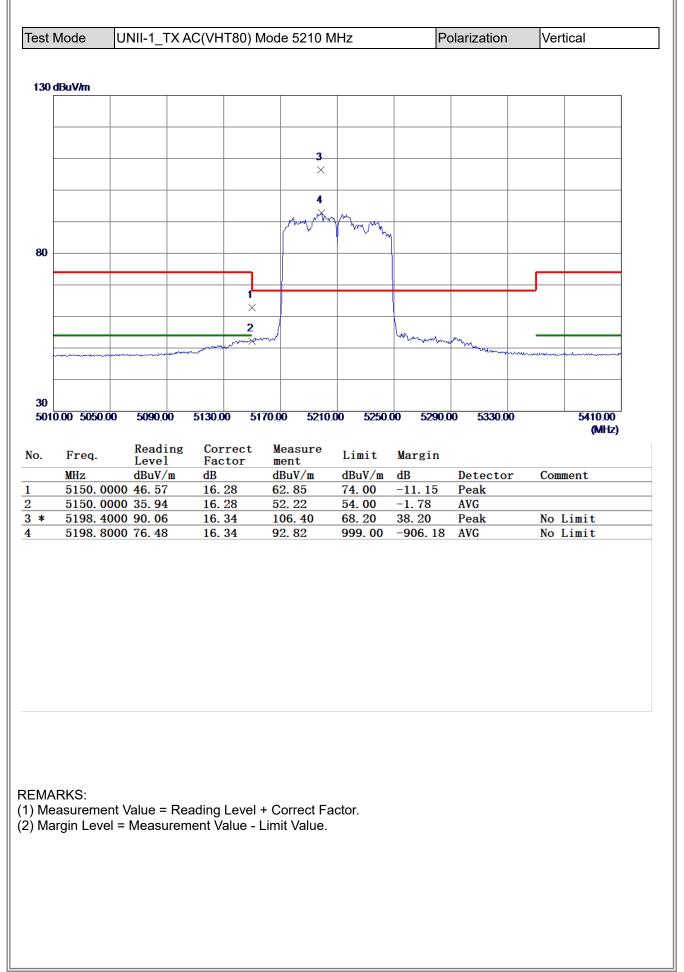




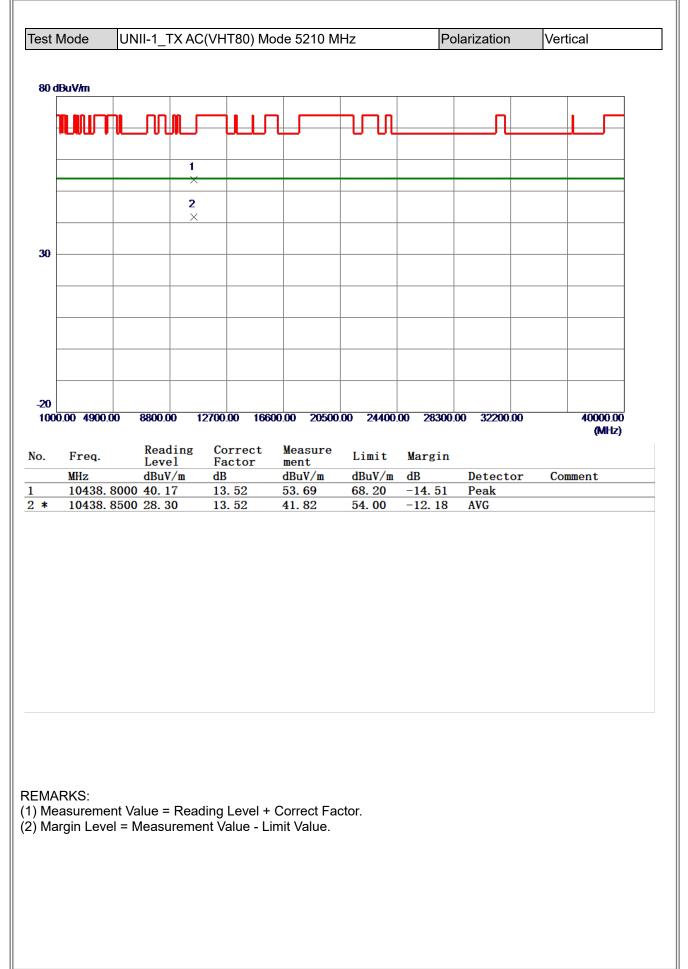




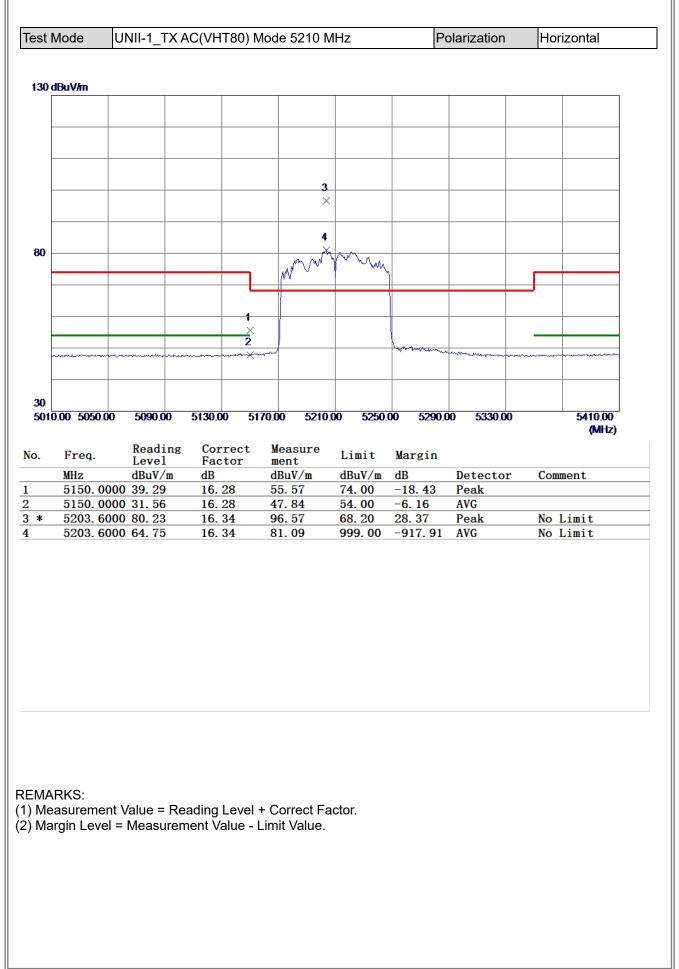




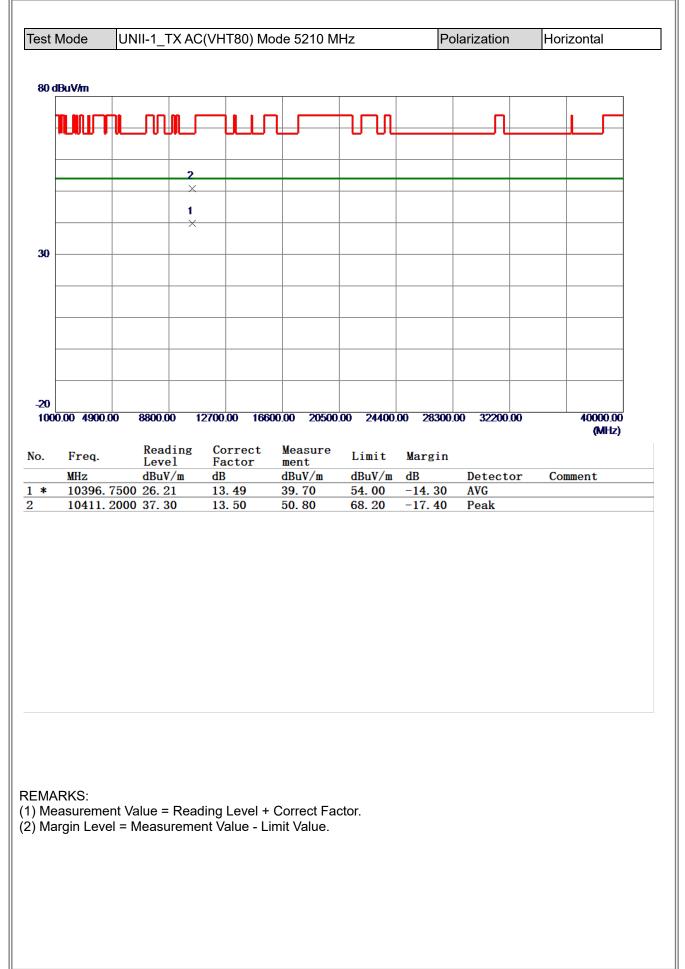




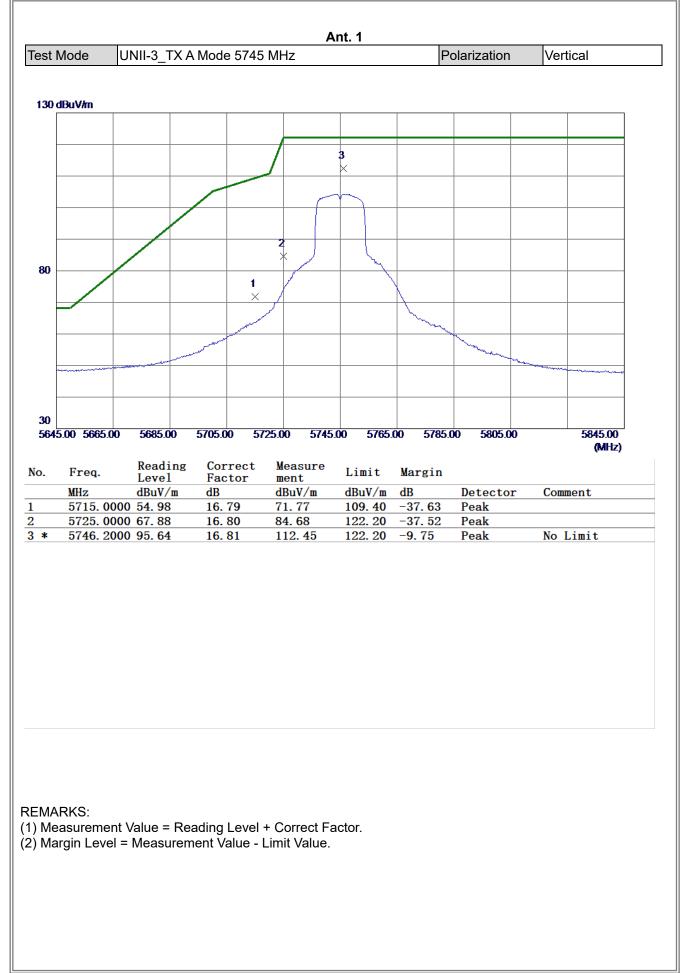




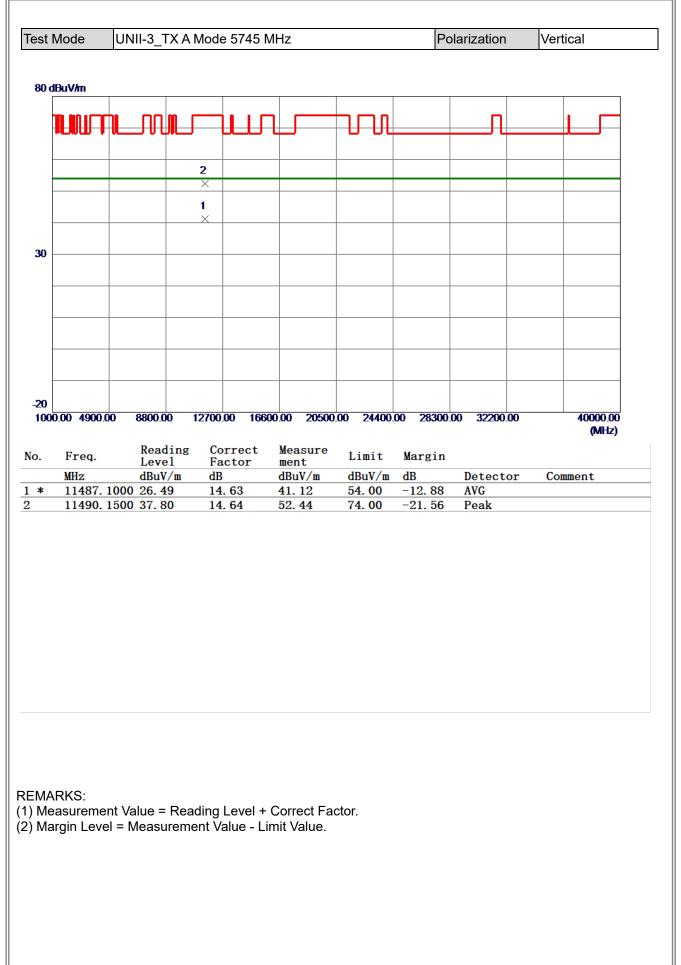




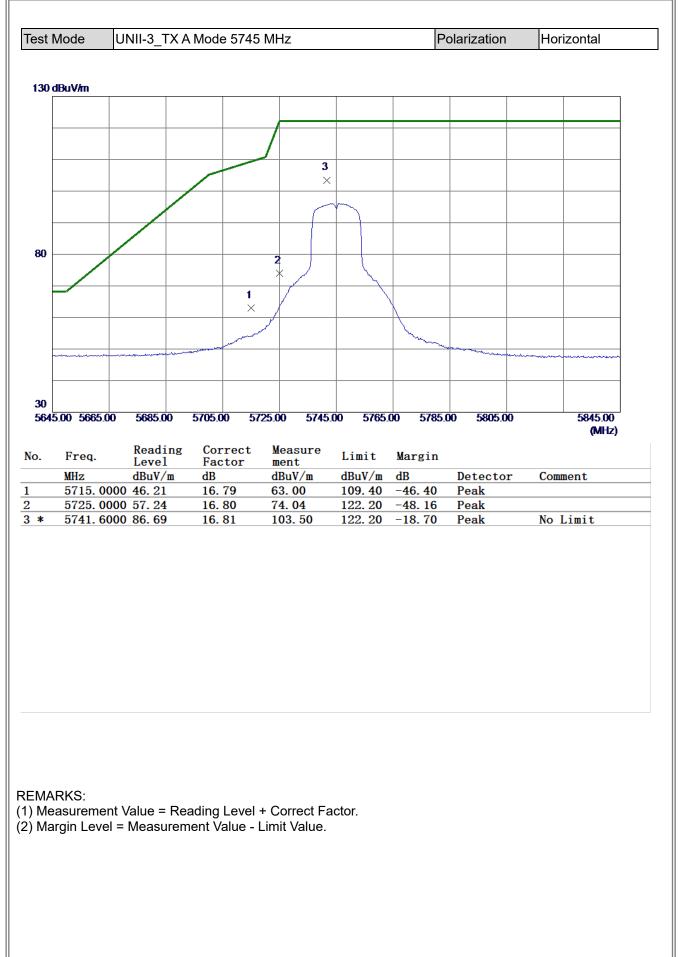
## **BIL**



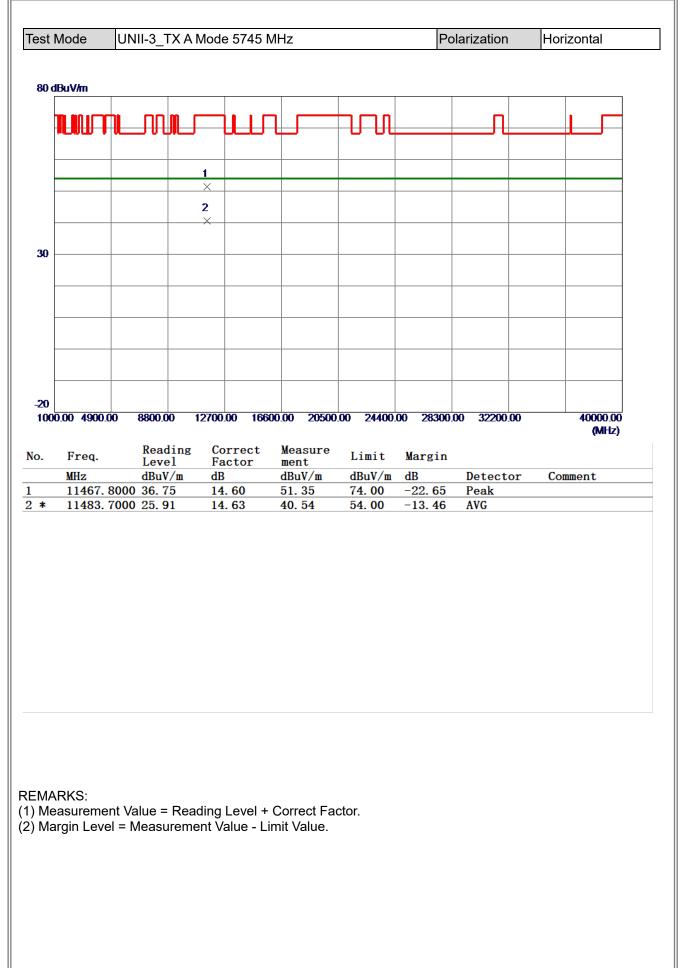




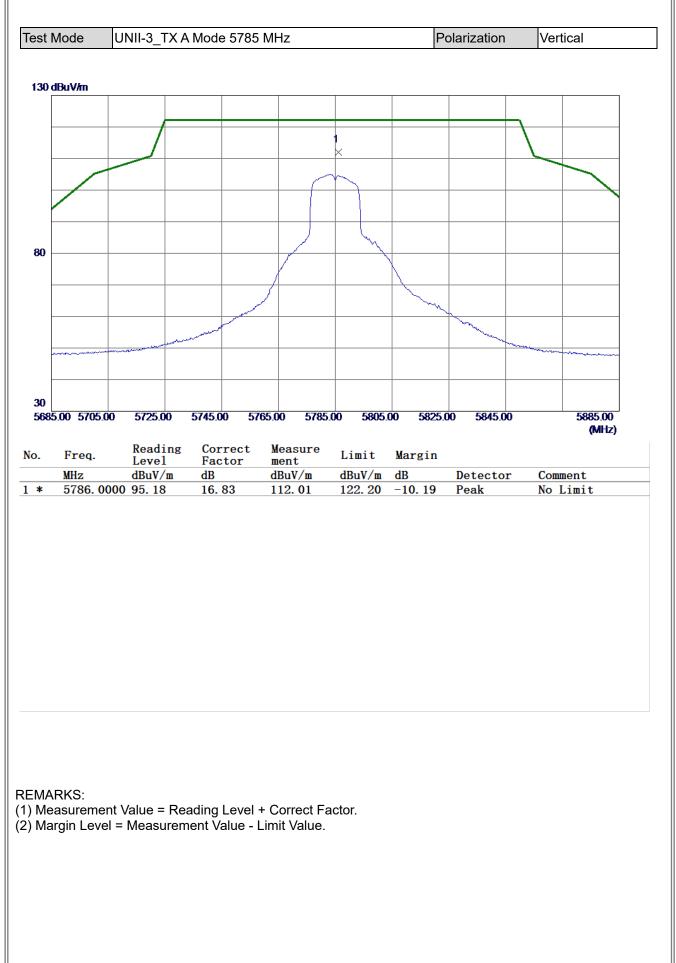




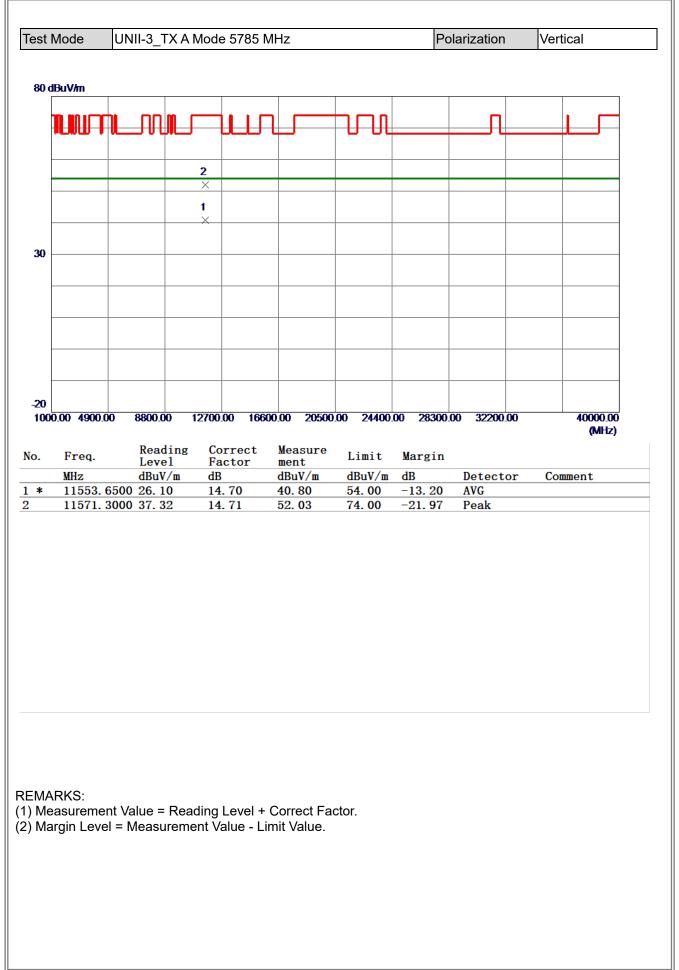




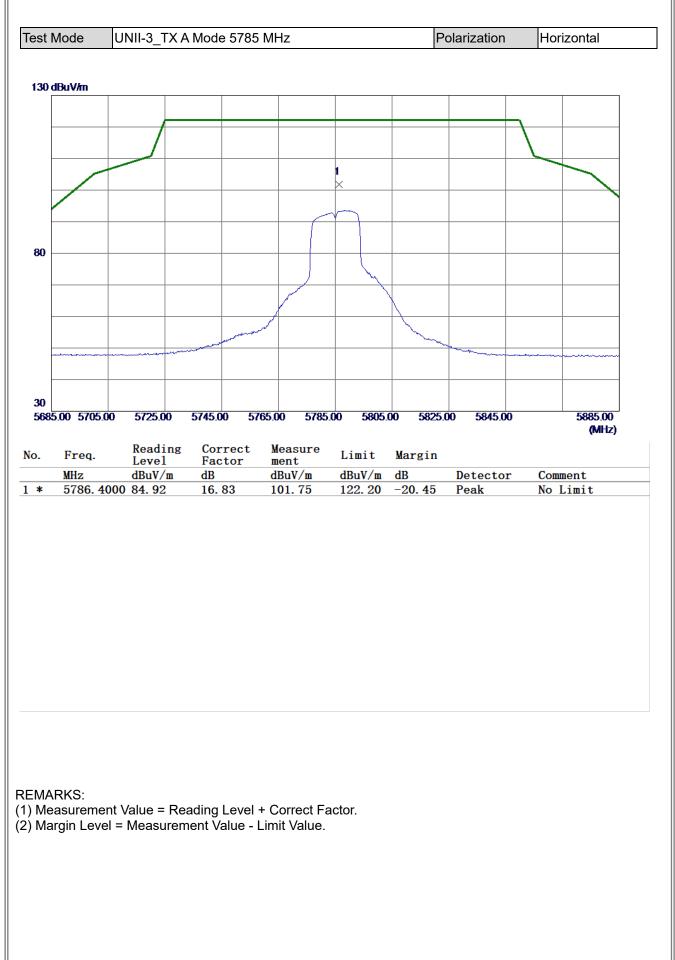




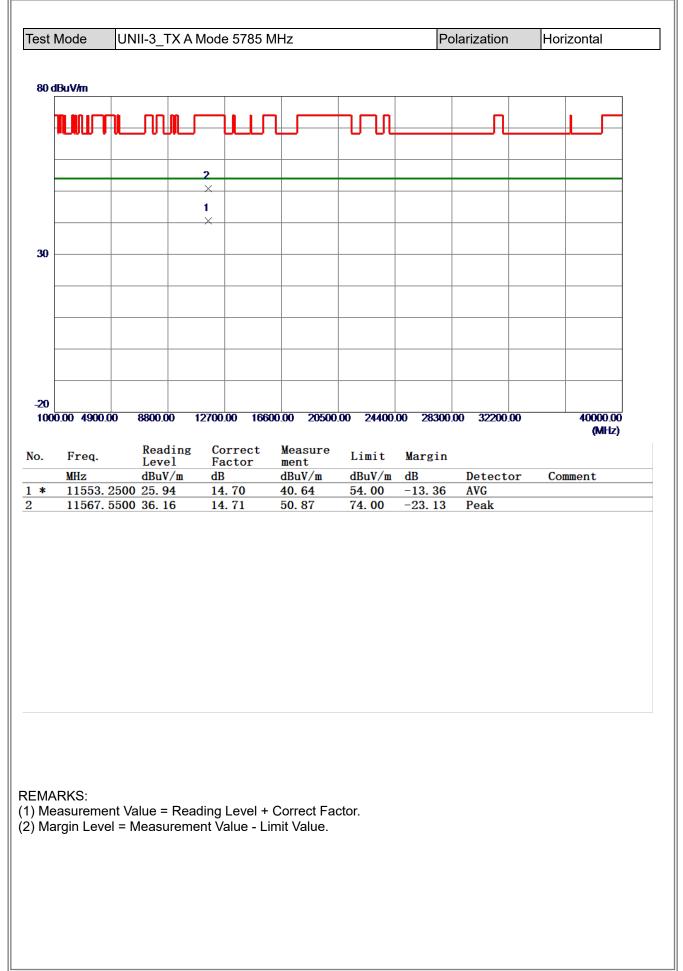




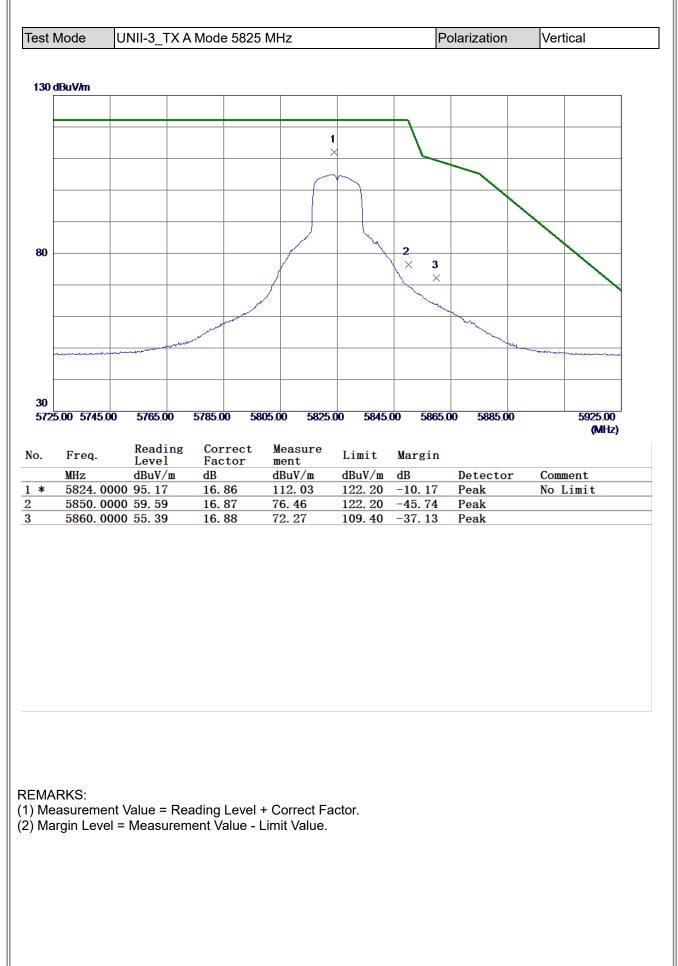




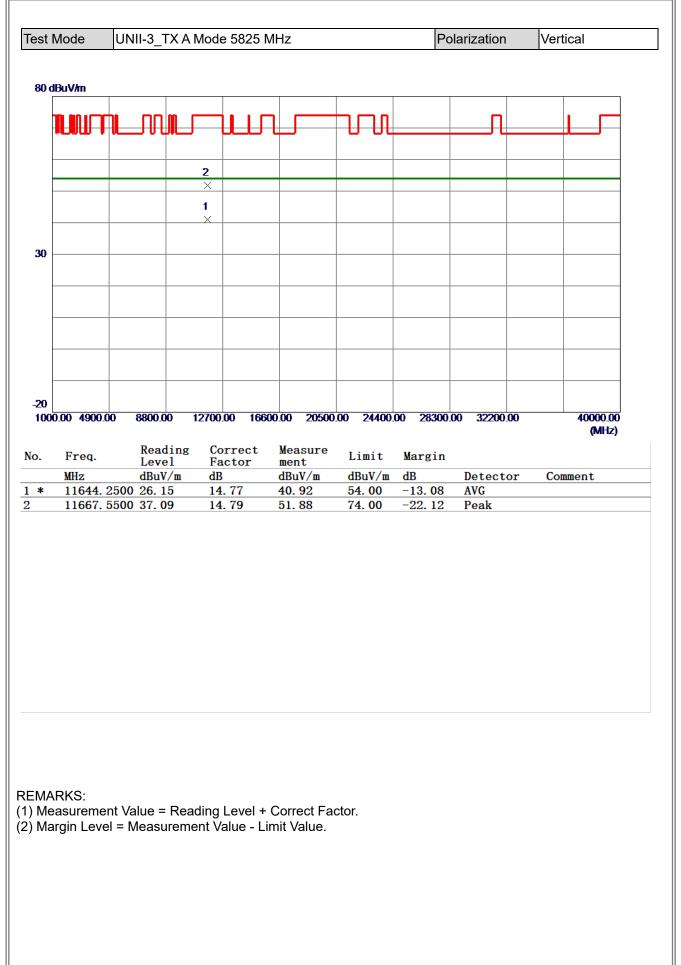




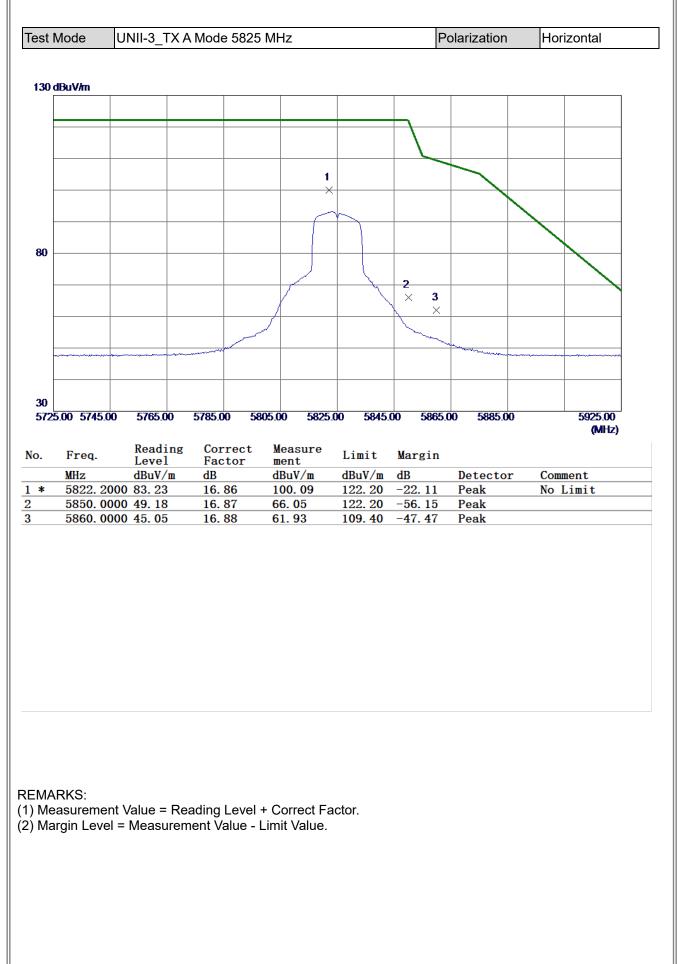




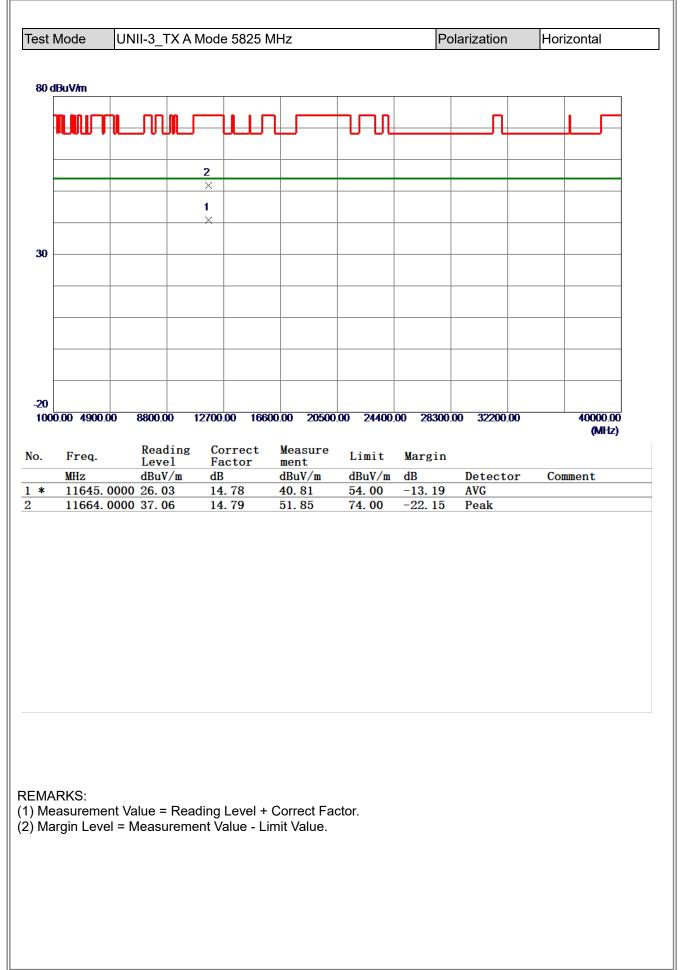




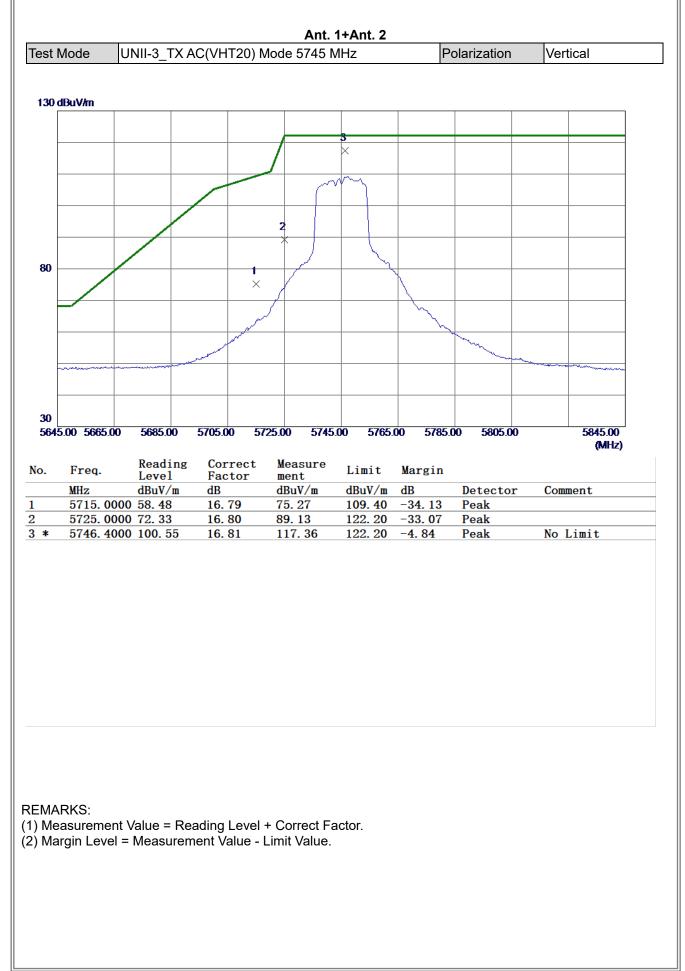




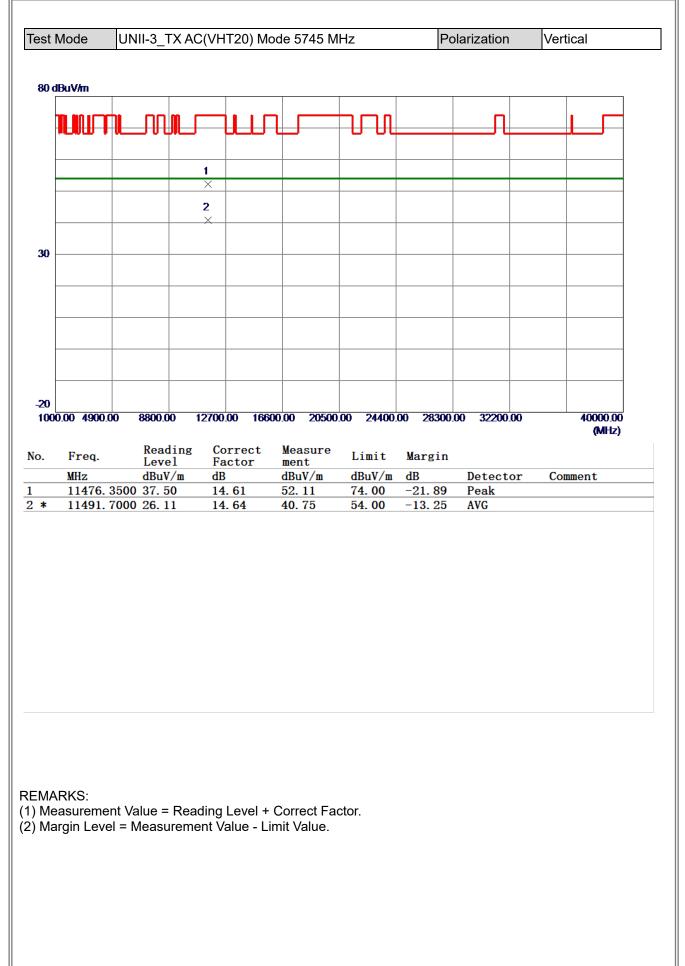




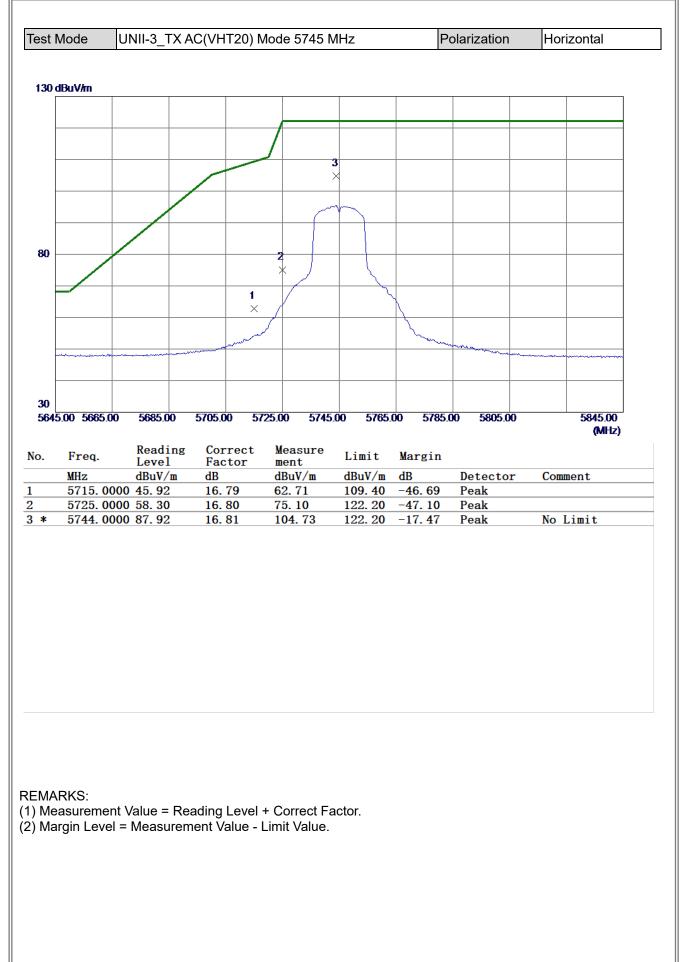




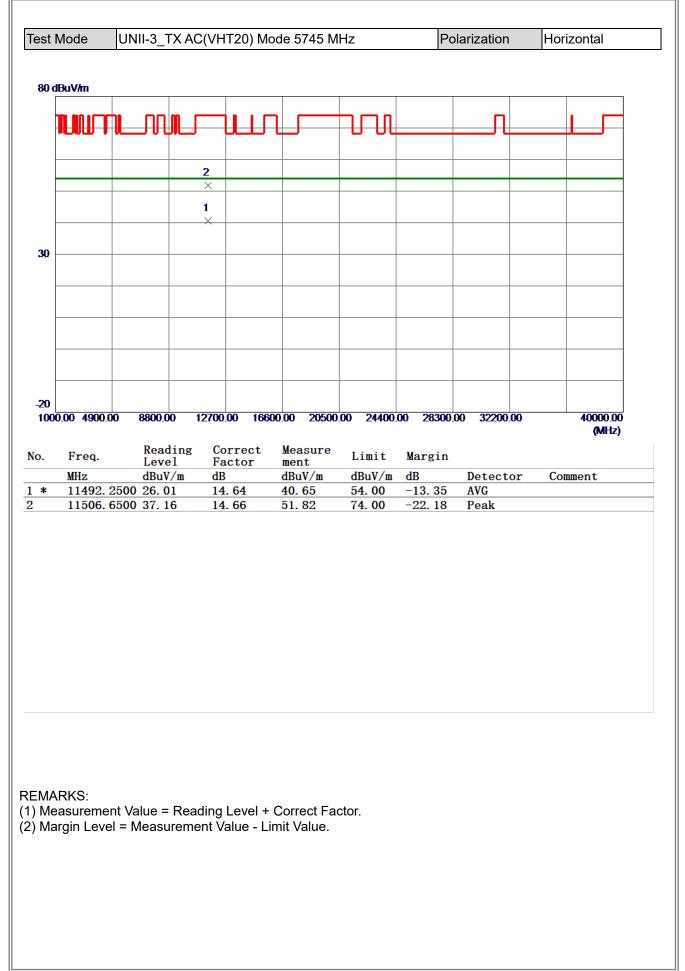




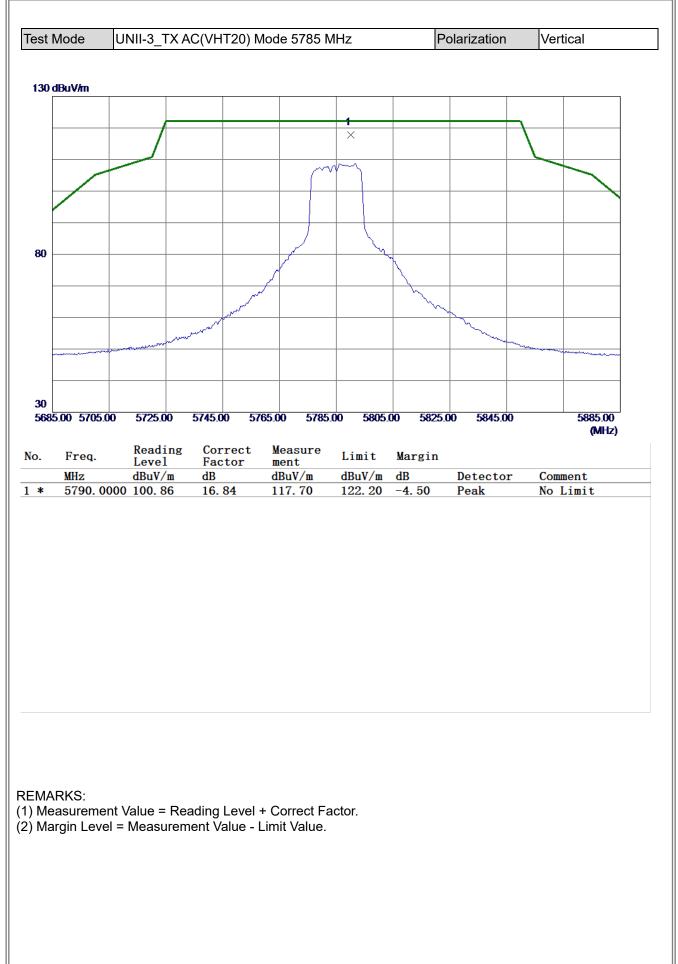




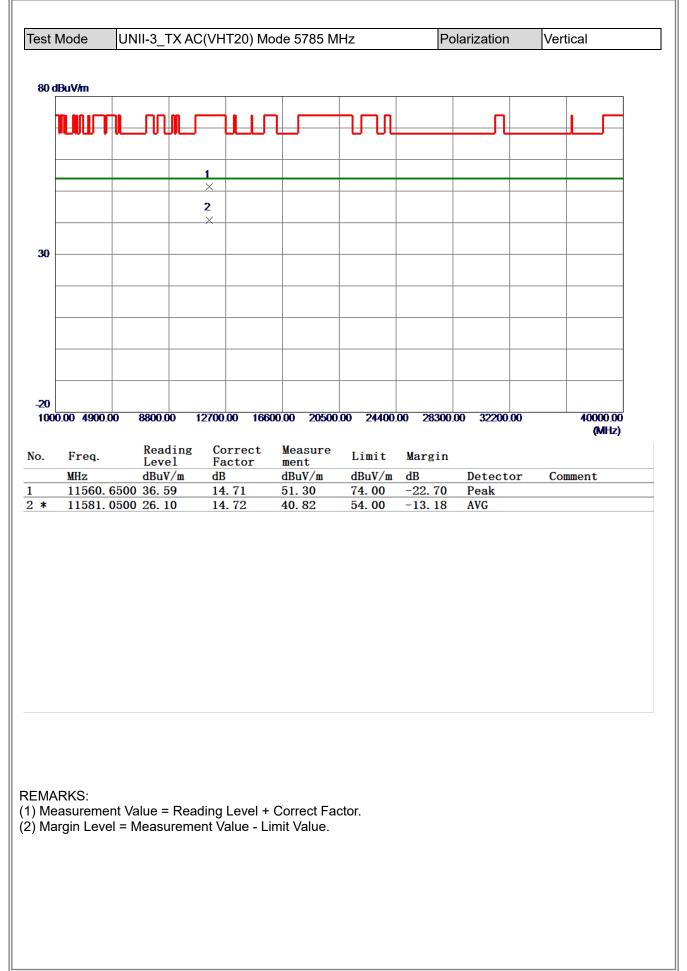




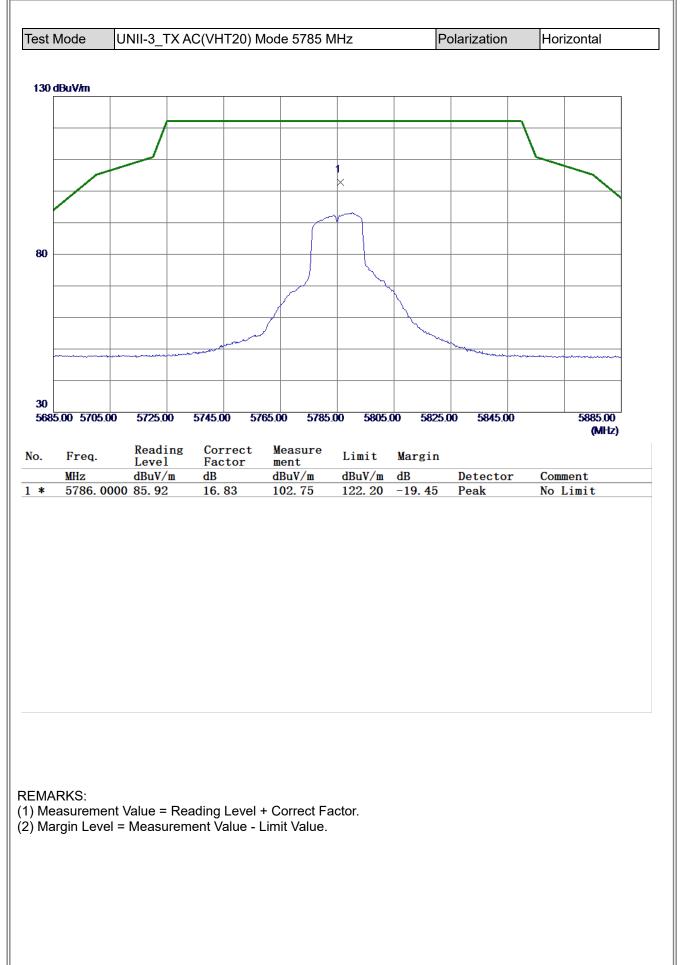




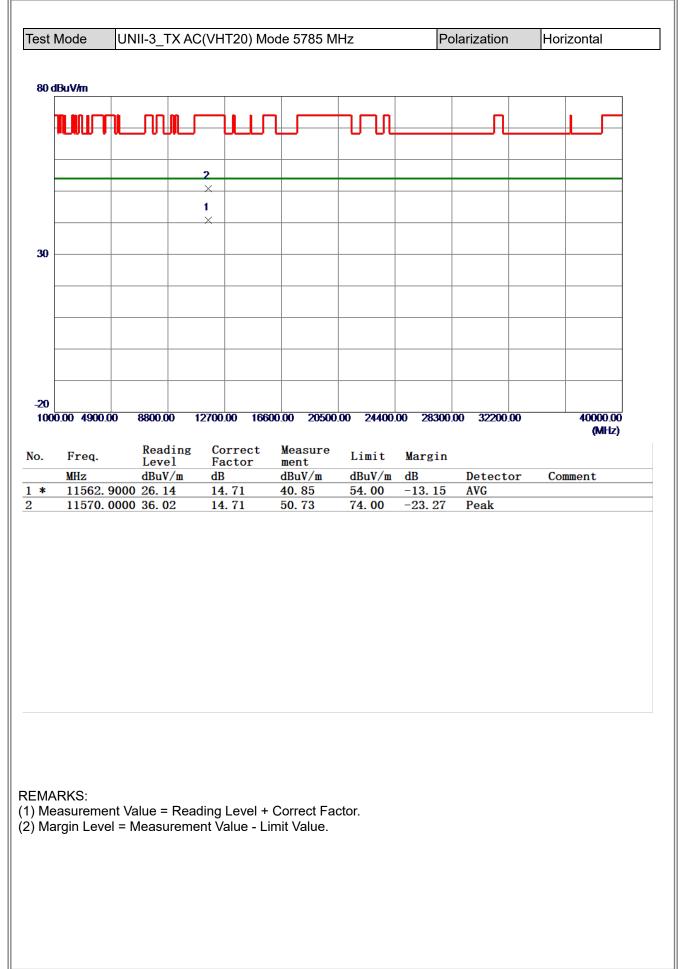




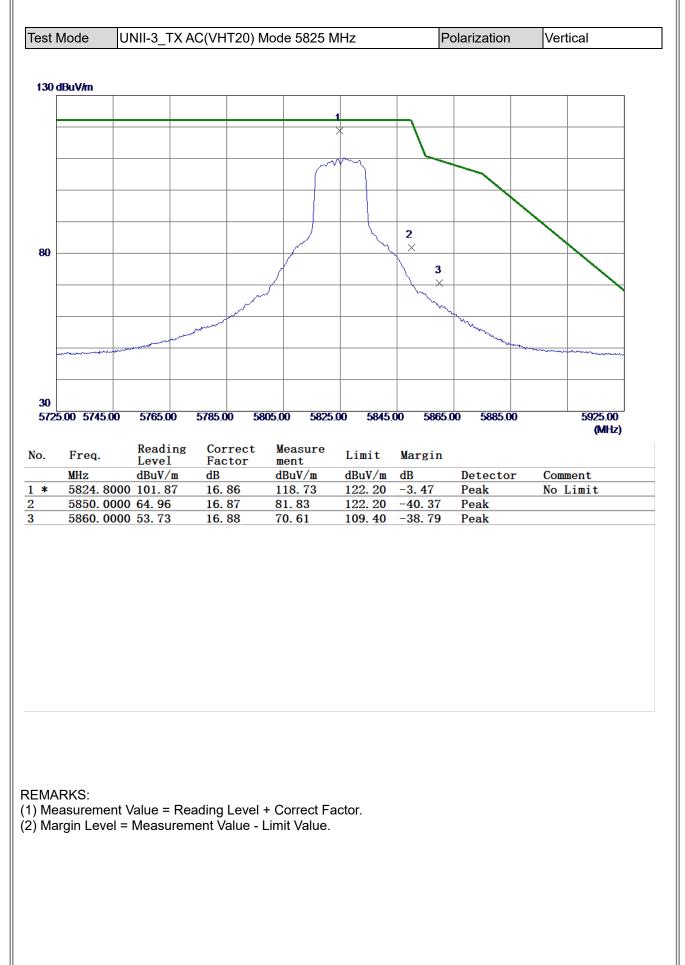




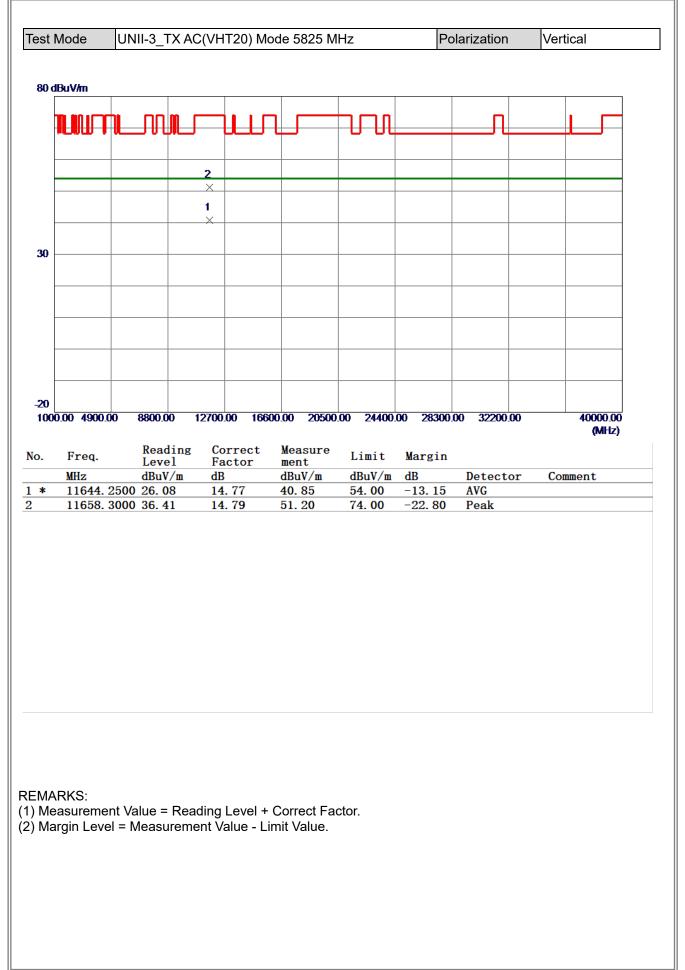




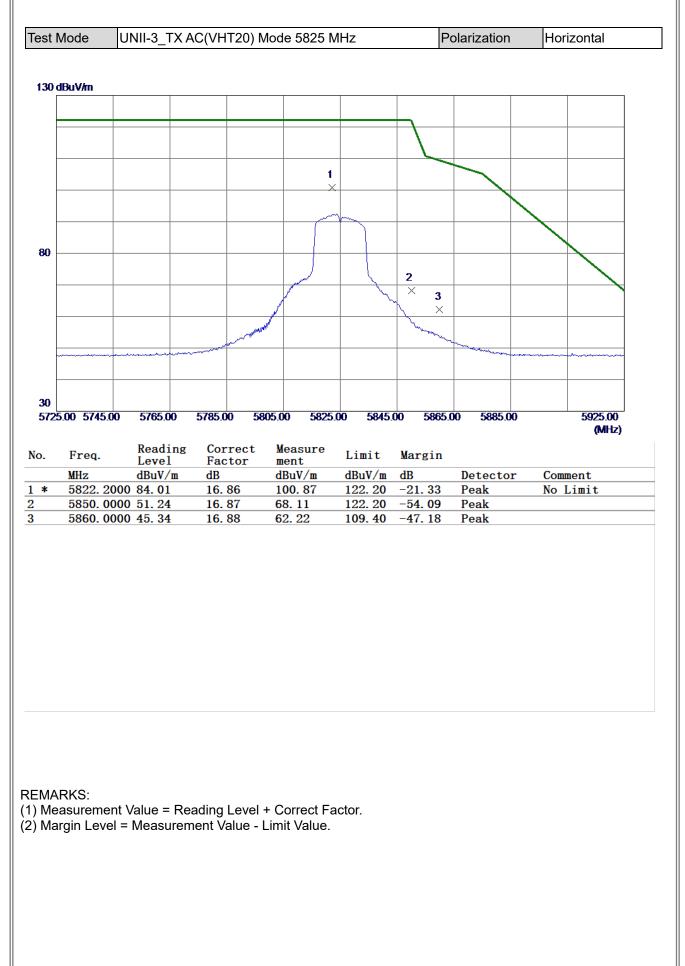




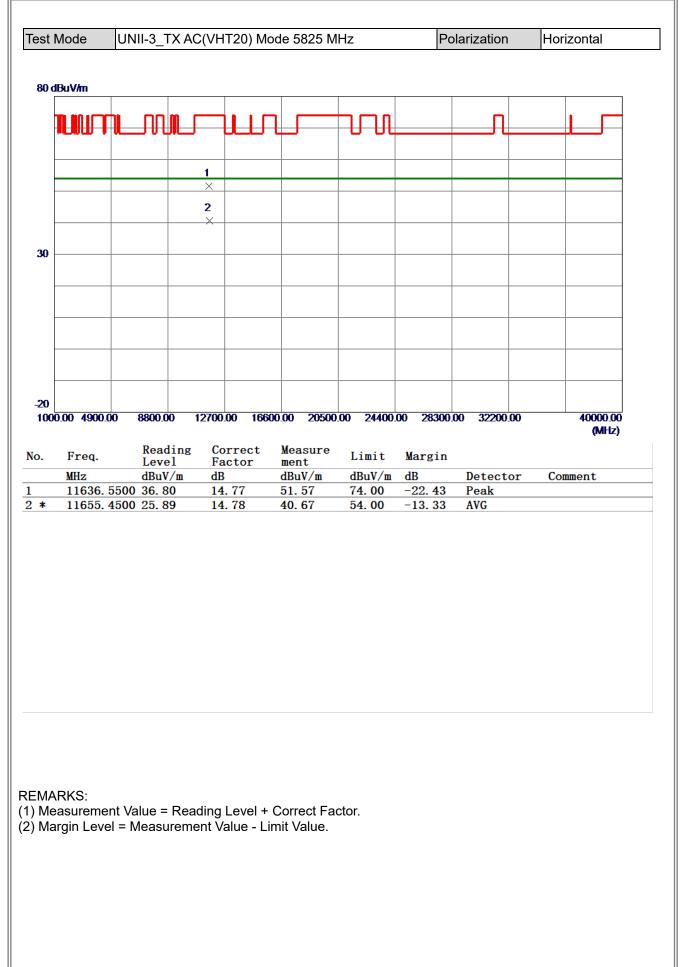




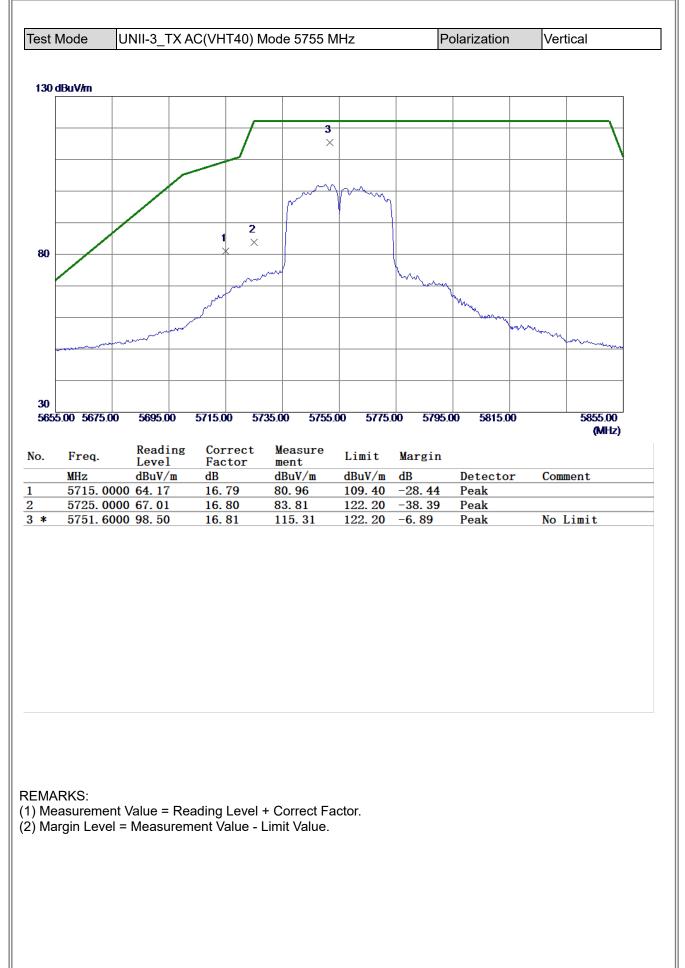




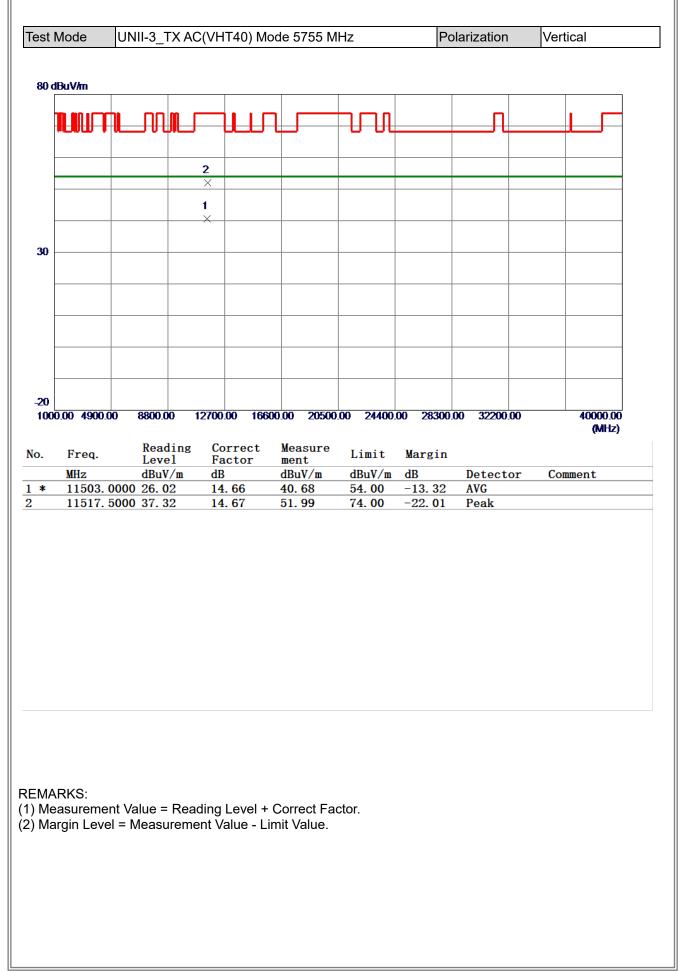




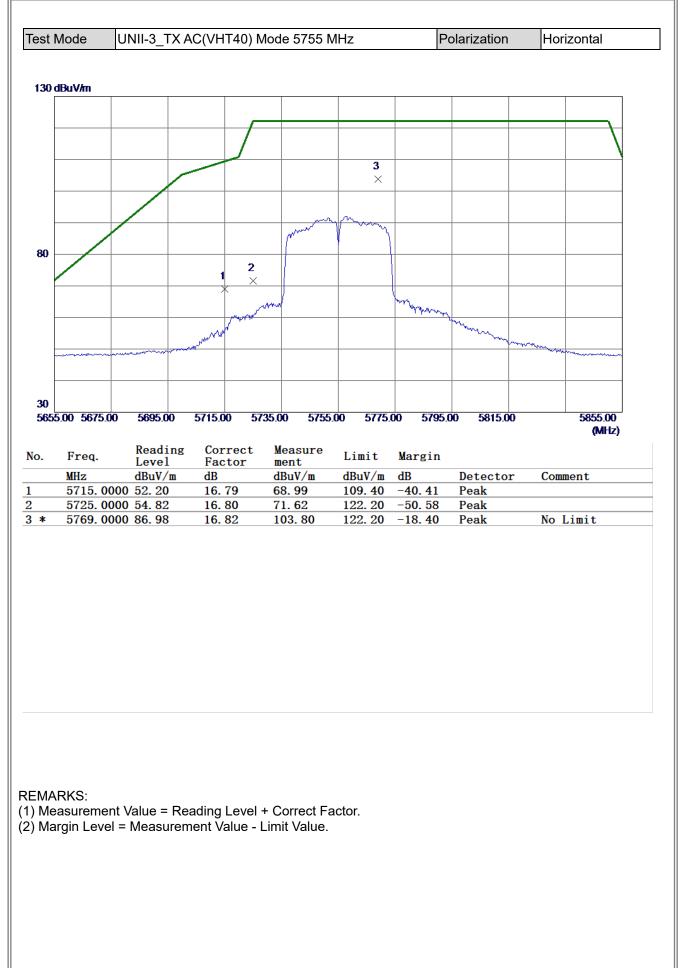




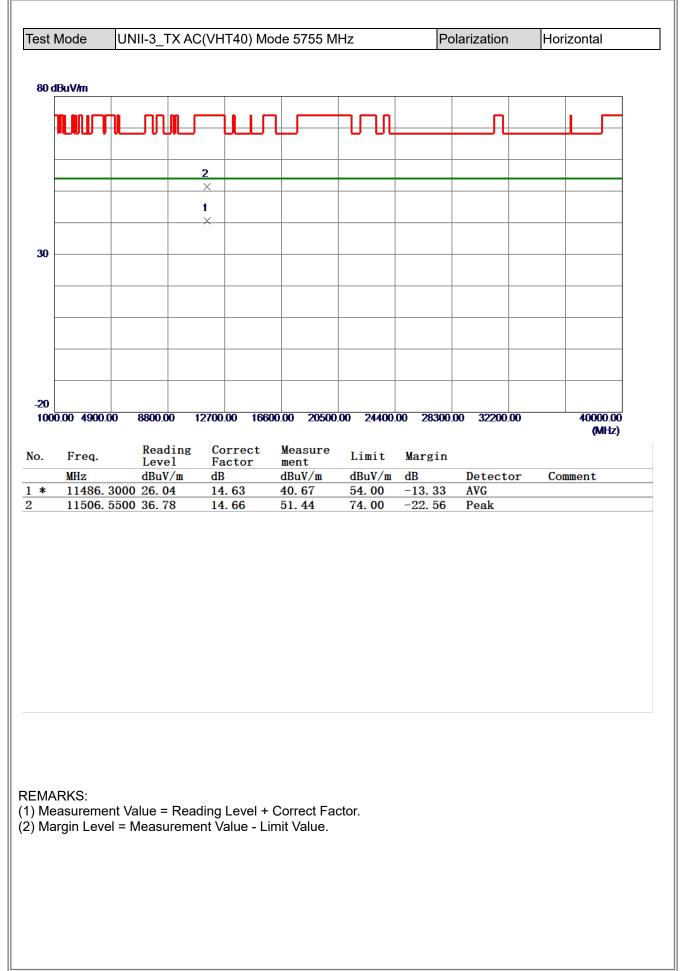




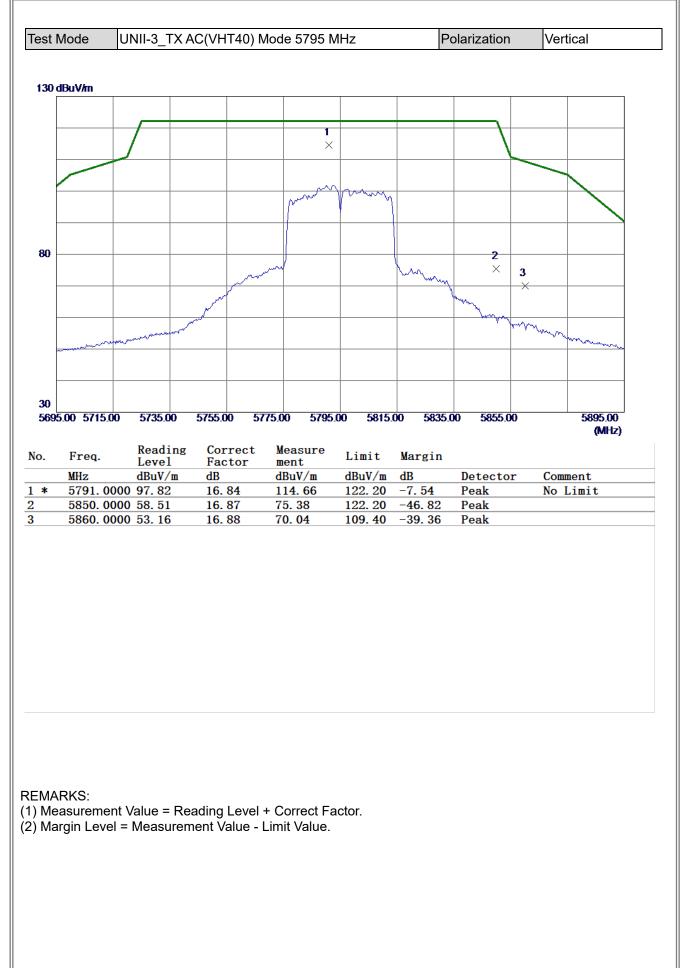




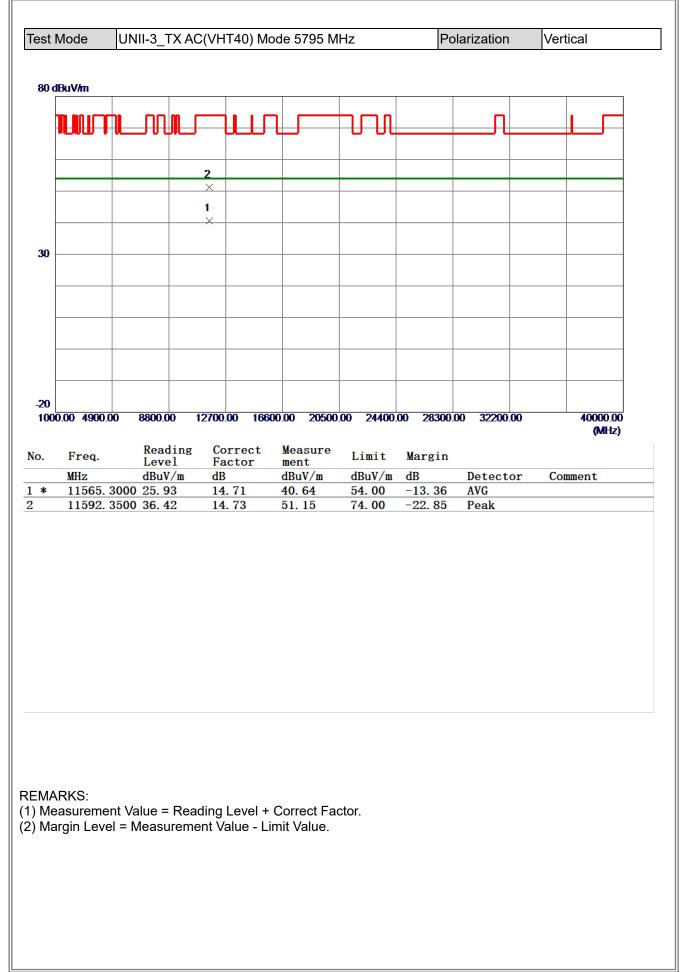




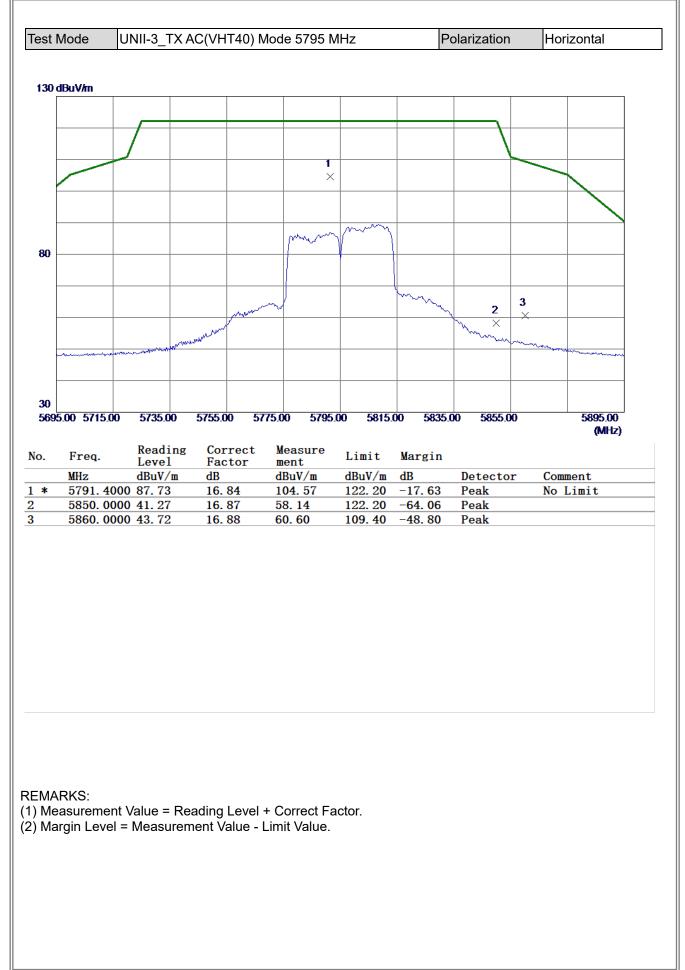




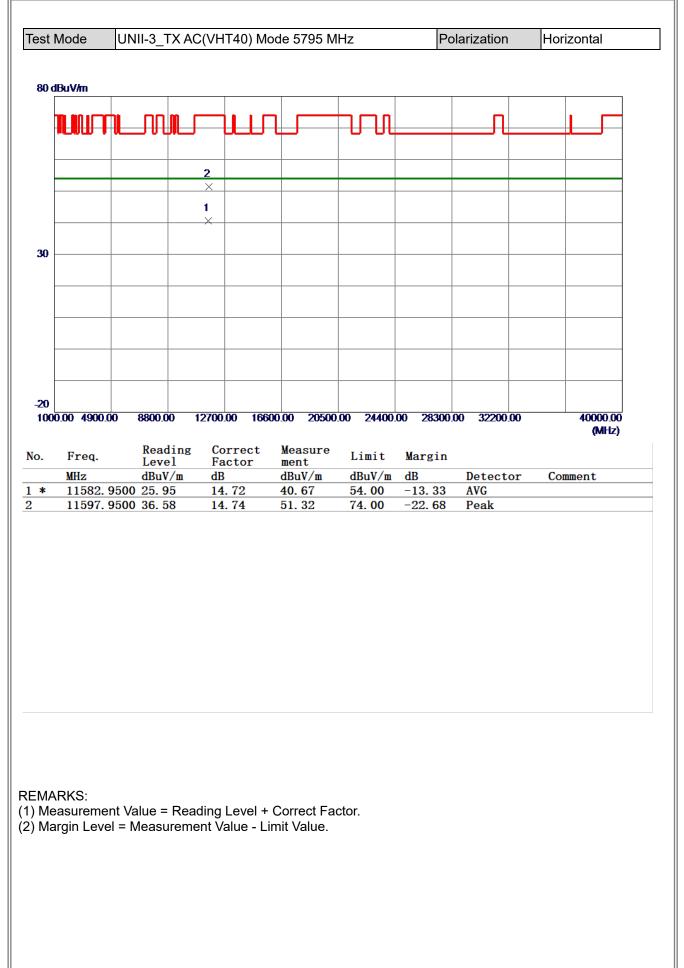




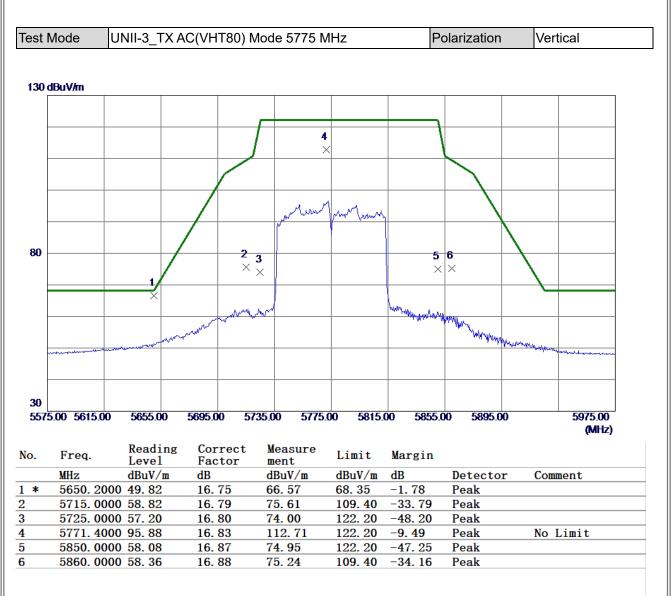








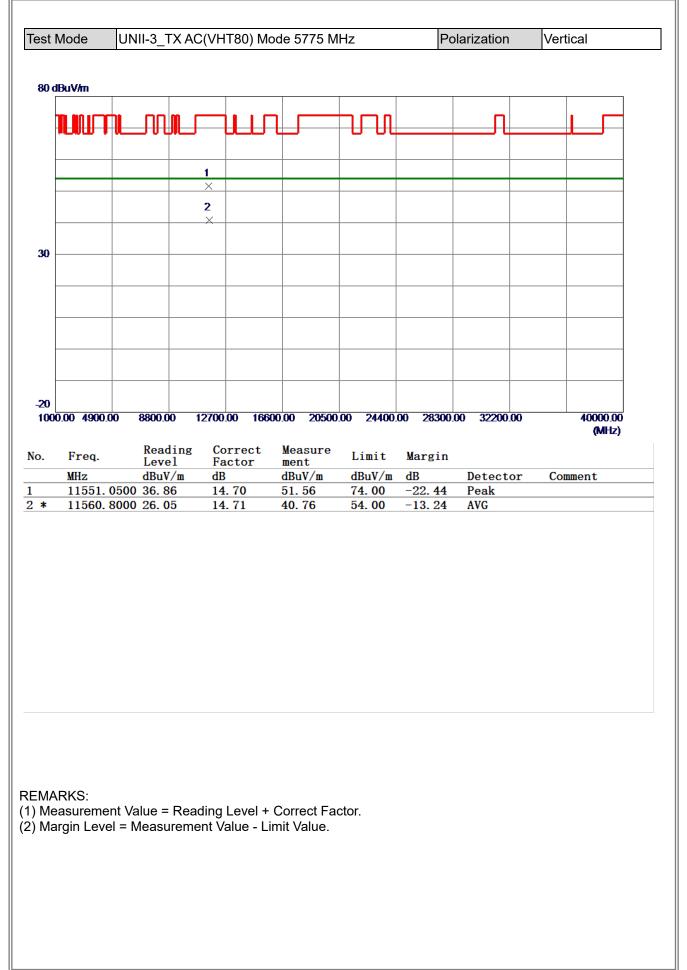




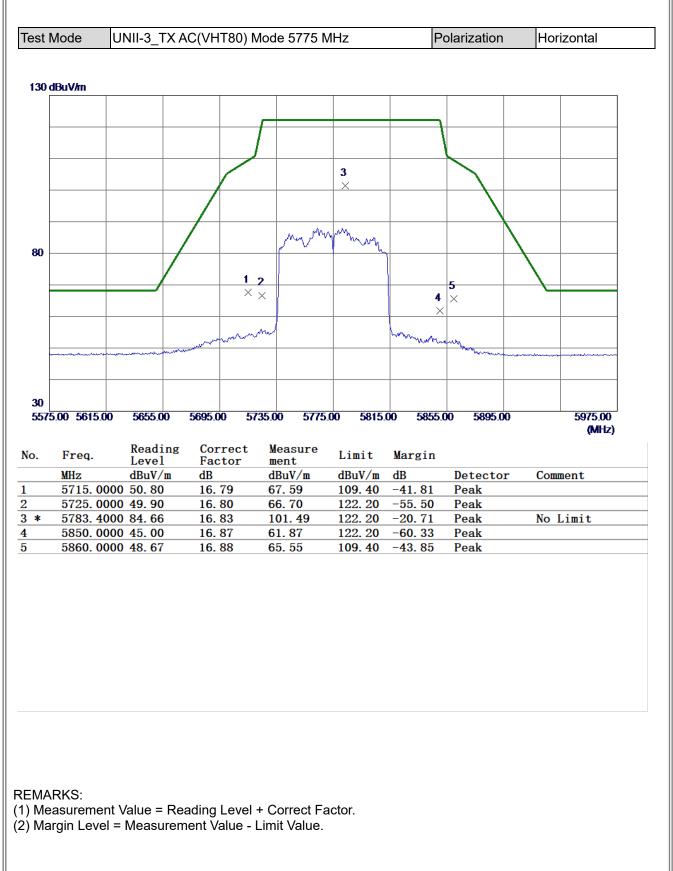
**REMARKS**:

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

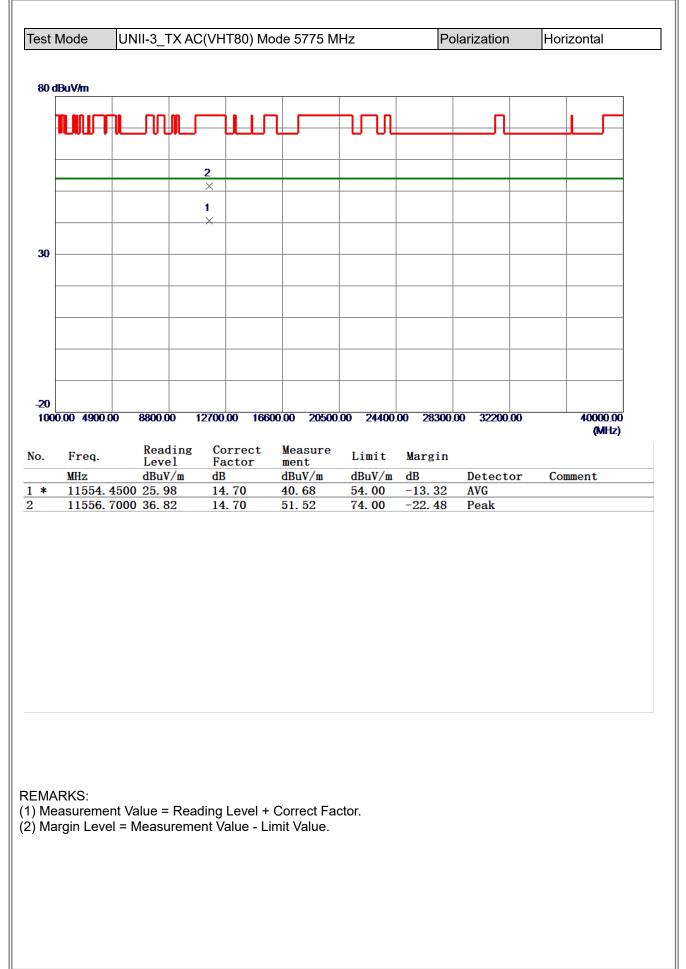




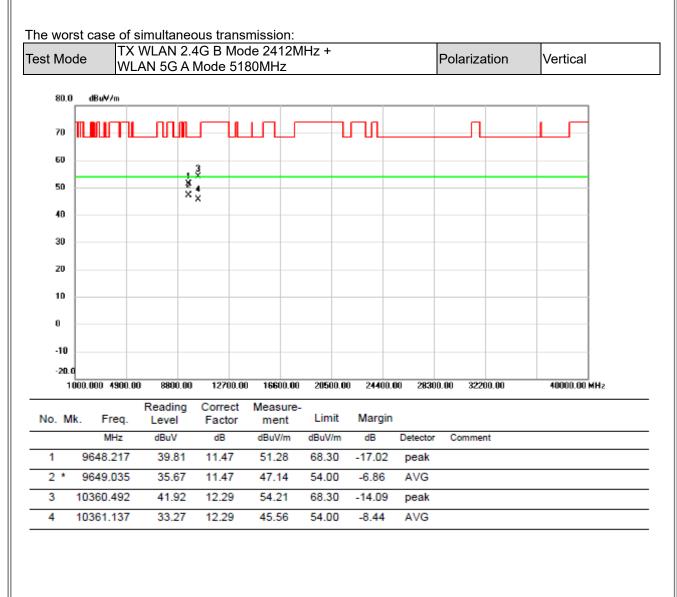








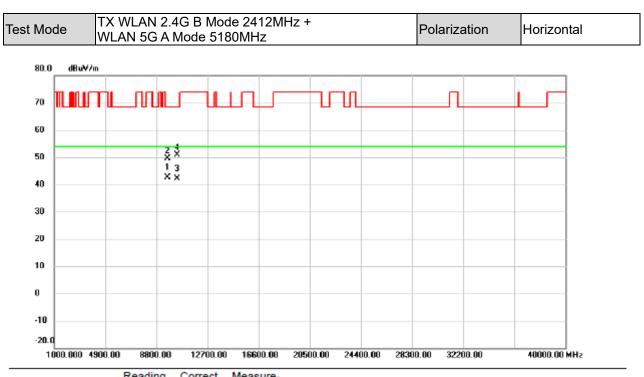




**REMARKS**:

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





No.	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	9648.176	31.18	11.47	42.65	54.00	-11.35	AVG	
2		9648.234	38.23	11.47	49.70	68.30	-18.60	peak	
3		10360.051	29.88	12.29	42.17	54.00	-11.83	AVG	
4		10361.230	38.54	12.29	50.83	68.30	-17.47	peak	

**REMARKS**:

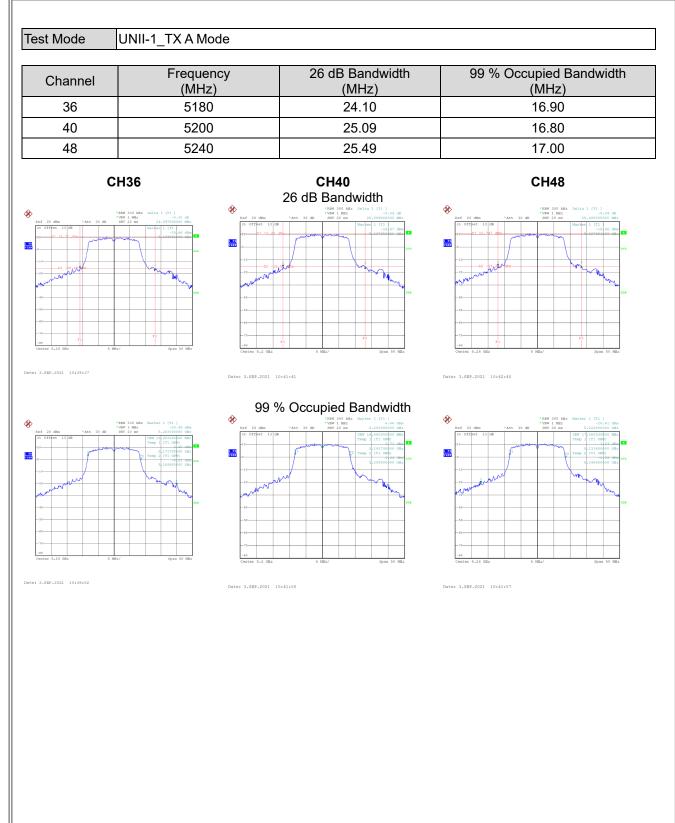
- (1) Measurement Value = Reading Level + Correct Factor.
  (2) Margin Level = Measurement Value Limit Value.





## **APPENDIX E - BANDWIDTH**

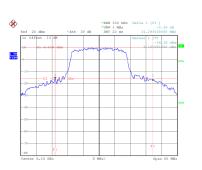


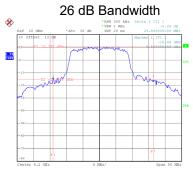


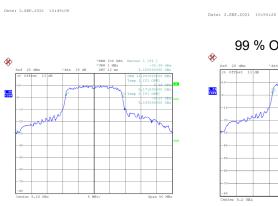


• RBW 300 kB • VBW 1 MBz

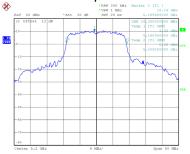
## Test Mode UNII-1\_TX AC(VHT20) Mode Frequency 26 dB Bandwidth 99 % Occupied Bandwidth Channel (MHz) (MHz) (MHz) 36 5180 31.30 18.20 40 5200 30.59 18.30 48 5240 30.69 18.30 **CH36 CH40 CH48**







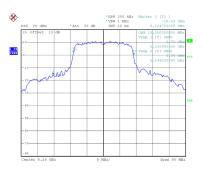






Ø

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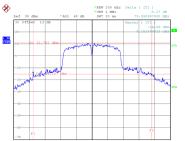
Date: 3.SEP.2021 10:48:36

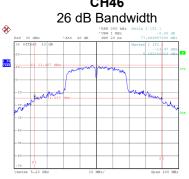
Date: 3.SEP.2021 10:49:42

Date: 3.SEP.2021 10:50:52



## Test Mode UNII-1\_TX AC(VHT40) Mode Frequency 26 dB Bandwidth 99 % Occupied Bandwidth Channel (MHz) (MHz) (MHz) 5190 42.40 38 76.00 5230 77.50 45.60 46 **CH38** CH46 26 dB Bandwidth Ŷ RBW





Date: 3.SEP.2021 10:58:22

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 \*201 1 00.
 \*201 1 00.
 \*101 0 00.
 \*101 0 00.

 \*\*10 1 00.
 \*201 0 00.
 \*201 0 00.
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Date: 3.SEP.2021 10:58:58



Date: 3.SEP.2021 10:57:57

Date: 3.SEP.2021 10:58:36



Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
42	5210	175.59	94.00
42	5210	<section-header></section-header>	(MHz) 94.00



		6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result	
149	5745	16.10	19.60	0.50	Complies	
157 5785 <sup>2</sup>		15.89	21.20	0.50	Complies	
165	5825	15.59	21.60	0.50	Complies	
	CH149		<b>CH157</b> 6 dB Bandwidth	CH165		
hef         20 dm           32 OFFJet:         33 dB           47	harker 1			• 280 130 100 200 200 200 200 200 200 200 200 20	(alta ( r. ) 	
3.SEP.2021 10:44	1:24	Date: 3.585.2021 10:	Occupied Bandwidth	Date: 3.5EF.2021 10:46:42		
Ref. 30 @m 34 072Fet 13 @B -2 -10 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12	Temp 2	L (1.) 3-54 det websetes det T (1. org) 5-55 det T (1. org) 5-55 det 5-55 det	- 2.00 10 10 10 10 10 10 10 10 10 10 10 10 1	*342 30 10 10 10 10 10 10 10 10 10 10 10 10 10	Marker 1( 7) (1) (1) (1) (1) (1) (1) (1) (1	
st 3.58F.2021 10:42	1134	Date: 3.5EP.2021 10:	44:45	Date: 3.58P.2021 10:45:52		