

## FCC Radio Test Report

### FCC ID: 2APPZ-V65

This report concerns: Original Grant

Project No.	:	2204C250
Equipment	:	IP Phone
Brand Name	:	Fanvil
Test Model	:	V65
Series Model	:	N/A
Applicant	:	Fanvil Technology Co., Ltd
Address	:	10/F Block A, Dualshine Global Science Innovation Center, Honglang
		North 2nd Road, Bao'an District, Shenzhen, China
Manufacturer	:	Fanvil Technology Co., Ltd
Address	:	10/F Block A, Dualshine Global Science Innovation Center, Honglang
		North 2nd Road, Bao'an District, Shenzhen, China
Factory	:	Fanvil Technology Co., Ltd
Address	:	10/F Block A, Dualshine Global Science Innovation Center, Honglang
		North 2nd Road, Bao'an District, Shenzhen, China
Date of Receipt	:	Apr. 28, 2022
Date of Test	:	May 05, 2022 ~ Aug. 10, 2022
Issued Date	:	Aug. 16, 2022
<b>Report Version</b>	:	R00
Test Sample	:	Engineering Sample No.: DG202204297 for radiated and output power,
		DG202204296 for others.
Standard(s)	:	FCC CFR Title 47, Part 15, Subpart E
		FCC KDB 789033 D02 General UNII Test Procedures New Rules 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. l

Prepared by : Sheldon Ou

Approved by : Chay Cai



#### BTL Inc.

No. 3 Jinshagang 1st Rd. Shixia, Dalang Town Dongguan City, Guangdong 523792 People's Republic of China.

Web: www.newbtl.com

Tel: +86-769-8318-3000

Service mail: btl\_qa@newbtl.com



#### Declaration

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

**BTL**'s laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** 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.



Table of Contents	Page
REPORT ISSUED HISTORY	6
1 . SUMMARY OF TEST RESULTS	7
1.1 TEST FACILITY	8
1.2 MEASUREMENT UNCERTAINTY	8
1.3 TEST ENVIRONMENT CONDITIONS	9
2 . GENERAL INFORMATION	10
2.1 GENERAL DESCRIPTION OF EUT	10
2.2 TEST MODES	12
2.3 PARAMETERS OF TEST SOFTWARE	14
2.4 DUTY CYCLE	15
2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	17
2.6 SUPPORT UNITS	17
3 . AC POWER LINE CONDUCTED EMISSIONS	18
3.1 LIMIT	18
3.2 TEST PROCEDURE	18
3.3 DEVIATION FROM TEST STANDARD	18
3.4 TEST SETUP	19
3.5 EUT OPERATION CONDITIONS	19
3.6 TEST RESULTS	19
4 . RADIATED EMISSIONS	20
4.1 LIMIT	20
4.2 TEST PROCEDURE	21
4.3 DEVIATION FROM TEST STANDARD	22
4.4 TEST SETUP	22
4.5 EUT OPERATION CONDITIONS	23
4.6 TEST RESULTS - 9 KHZ TO 30 MHZ	23
4.7 TEST RESULTS - 30 MHZ TO 1000 MHZ	23
4.8 TEST RESULTS - ABOVE 1000 MHZ	23
5.BANDWIDTH	24
5.1 LIMIT	24
5.2 TEST PROCEDURE	24
5.3 DEVIATION FROM STANDARD	24
5.4 TEST SETUP	25



Table of Contents	Page
5.5 EUT OPERATION CONDITIONS	25
5.6 TEST RESULTS	25
6 . MAXIMUM OUTPUT POWER	26
6.1 LIMIT	26
6.2 TEST PROCEDURE	26
6.3 DEVIATION FROM STANDARD	26
6.4 TEST SETUP	26
6.5 EUT OPERATION CONDITIONS	26
6.6 TEST RESULTS	26
7 . POWER SPECTRAL DENSITY	27
7.1 LIMIT	27
7.2 TEST PROCEDURE	27
7.3 DEVIATION FROM STANDARD	27
7.4 TEST SETUP	28
7.5 EUT OPERATION CONDITIONS	28
7.6 TEST RESULTS	28
8 . FREQUENCY STABILITY	29
8.1 LIMIT	29
8.2 TEST PROCEDURE	29
8.3 DEVIATION FROM STANDARD	29
8.4 TEST SETUP	29
8.5 EUT OPERATION CONDITIONS	29
8.6 TEST RESULTS	29
9 . MEASUREMENT INSTRUMENTS LIST	30
10 . EUT TEST PHOTOS	33
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS	38
APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ	41
APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ	46
APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ	49
APPENDIX E - BANDWIDTH	82
APPENDIX F - MAXIMUM OUTPUT POWER	89
APPENDIX G - POWER SPECTRAL DENSITY	92



#### **Table of Contents**

Page

**APPENDIX H - FREQUENCY STABILITY** 

97



#### 

REPORT ISSUED HISTORY				
Report No.	Version	Description	Issued Date	Note
BTL-FCCP-4-2204C250	R00	Original Report.	Aug. 16, 2022	Valid



#### **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	N/A			
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	Power Spectral Density APPENDIX G				
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
  - ☐ 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 523792 People's Republic of China. BTL's 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	Method Measurement Frequency Range			
DG-C02	CISPR	150kHz ~ 30MHz	2.60		

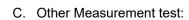
#### B. Radiated emissions test:

Test Site	Method	Method Measurement Frequency Range		
DG-CB01	CISPR	9kHz ~ 30MHz	2.36	

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m)		30MHz ~ 200MHz	V	4.36
	CISPR	30MHz ~ 200MHz	Н	3.32
	CISER	200MHz ~ 1,000MHz	V	4.08
		200MHz ~ 1,000MHz	Н	3.96

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03		1GHz ~ 6GHz	3.80
(3m)	CISPR	6GHz ~ 18GHz	4.82

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (1m)		18 ~ 26.5 GHz	3.62
	CISPR	26.5 ~ 40 GHz	4.00



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	22°C	51%	AC 120V/60Hz	Jeter Wang
Radiated Emissions-9kHz to 30MHz	25°C	55%	DC 5V	Farun Liang
Radiated Emissions-30MHz to 1000MHz	26°C	56%	DC 5V	Meers Zhang
Radiated Emissions-Above 1000 MHz	24°C	53%	DC 5V	Charles Xiang
Bandwidth	26°C	62%	DC 5V	Nicole Chen
Maximum Output Power	20-22.4°C	57.4-59%	DC 5V	Complex Qin
Power Spectral Density	26°C	62%	DC 5V	Nicole Chen
Frequency Stability	Normal & Extreme	62%	Normal & Extreme	Nicole Chen



#### 2. GENERAL INFORMATION

#### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	IP Phone		
Brand Name	Fanvil		
Test Model	V65		
Series Model	N/A		
Model Difference(s)	N/A		
Power Source	1# DC voltage supplied from AC adapter. (Supports Unit) 2# Supplied from PoE.		
Power Rating	1# I/P: 100-240V~50/60Hz 0.3A O/P: 5.0V === 2.0A 2# PoE 48V		
Operation Frequency Band(s)	UNII-1: 5150 MHz ~ 5250 MHz UNII-3: 5725 MHz ~ 5850 MHz		
Modulation Type	IEEE 802.11a/n/ac: OFDM		
Bit Rate of Transmitter	IEEE 802.11a: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 150 Mbps IEEE 802.11ac: up to 200 Mbps		
Maximum Output Power _UNII-1	IEEE 802.11ac(VHT40): 13.12 dBm (0.0205 W)		
Maximum Output Power _UNII-3	IEEE 802.11ac(VHT20): 13.88 dBm (0.0244 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 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40)	
UNII-1		UI	NII-1
Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190
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)	
UNII-3		UN	111-3
Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755
153	5765	159	5795
157	5785		
161	5805		
165	5825		



#### 3. Antenna Specification:

Ant.	Manufacturer	P/N	Antenna Type	Connector	Gain (dBi)
1	Dongguan YiJia Electronics Communication Technology Co.,Ltd.	YJL01.106.031. 302A	FPC	N/A	3.5

Note: The antenna gain is provided by the manufacturer.



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 A Mode Channel 149/157/165 (UNII-3)
Mode 7	TX N(HT20) Mode Channel 149/157/165 (UNII-3)
Mode 8	TX N(HT40) Mode Channel 151/159 (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(VHT20) Mode Channel 165 (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 11 TX AC(VHT20) Mode Channel 165 (UNII-3)			

Radiated Emissions Test - Below 1GHz		
Final Test Mode Description		
Mode 11	TX AC(VHT20) Mode Channel 165 (UNII-3)	

Radiated Emissions Test - Above 1GHz		
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 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)	



	Maximum Output Power Test			
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 A Mode Channel 149/157/165 (UNII-3)			
Mode 7	TX N(HT20) Mode Channel 149/157/165 (UNII-3)			
Mode 8	TX N(HT40) Mode Channel 151/159 (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)			

# Other Conducted TestFinal Test ModeDescriptionMode 1TX A Mode Channel 36/40/48 (UNII-1)Mode 4TX AC(VHT20) Mode Channel 36/40/48 (UNII-1)Mode 5TX AC(VHT40) Mode Channel 38/46 (UNII-1)Mode 6TX A Mode Channel 149/157/165 (UNII-3)Mode 9TX AC(VHT20) Mode Channel 149/157/165 (UNII-3)

Note:

Mode 10

(1) For AC power line conducted emissions and radiated emission below 1 GHz test, the TX AC(VHT20) Mode Channel 165 (UNII-3) is found to be the worst case and recorded.

TX AC(VHT40) Mode Channel 151/159 (UNII-3)

(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 and IEEE 802.11ac(VHT40) mode, only the worst cases are documented for other test items.

(5) For AC power line conducted emissions and radiated emission below 1 GHz test, adapter supply and PoE supply are pretested, the worst case is adapter supply and recorded.

(6) For radiated emission above 1 GHz test, the polarization of Vertical and Hoizontal are evaluated, the worst case is Hoizontal for Band edge, Vertical for Harmonic. In this report only recorded the worst case.

(7) For radiated emission test, every axis (X, Y, Z) are verified. The test results shown in the following sections represent the worst case emissions.

#### 2.3 PARAMETERS OF TEST SOFTWARE

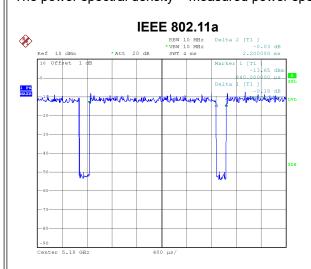
UNII-1			
Test Software Version		IPOP_V4.0	
Frequency (MHz)	5180	5200	5240
IEEE 802.11a	11	11	11
IEEE 802.11n(HT20)	11	11	11
IEEE 802.11ac(VHT20)	11	11	11
Frequency (MHz)	5190	5230	
IEEE 802.11n(HT40)	11	11	
IEEE 802.11ac(VHT40)	11	11	

UNII-3			
Test Software Version		IPOP_V4.0	
Frequency (MHz)	5745	5785	5825
IEEE 802.11a	11	11	11
IEEE 802.11n(HT20)	11	11	11
IEEE 802.11ac(VHT20)	11	11	11
Frequency (MHz)	5755	5795	
IEEE 802.11n(HT40)	11	11	
IEEE 802.11ac(VHT40)	11	11	



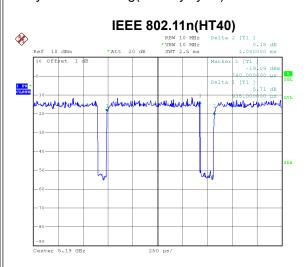
#### 2.4 DUTY CYCLE

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.



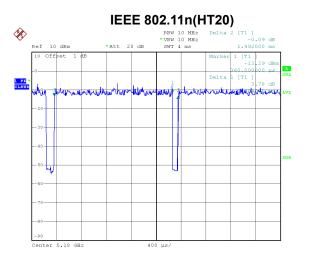


Duty cycle = 2.040 ms / 2.200 ms = 92.73% Duty Factor = 10 log(1 / Duty cycle) = 0.33



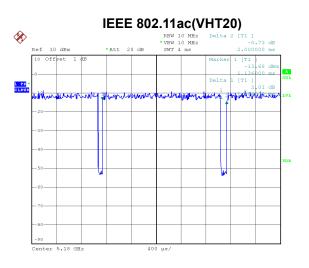
Date: 23.MAY.2022 11:18:23

Duty cycle = 0.935 ms / 1.080 ms = 86.57% Duty Factor = 10 log(1 / Duty cycle) = 0.63



Date: 23.MAY.2022 11:16:18

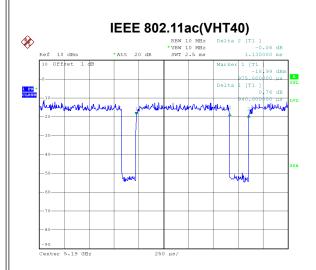
Duty cycle = 1.904 ms / 1.992 ms = 95.58% Duty Factor = 10 log(1 / Duty cycle) = 0.20



Date: 23.MAY.2022 11:16:42

Duty cycle = 1.904 ms / 2.000 ms = 95.20% Duty Factor = 10 log(1 / Duty cycle) = 0.21

# **3**TL



Date: 23.MAY.2022 11:18:01

Duty cycle = 0.940 ms / 1.130 ms = 83.19% Duty Factor = 10 log(1 / Duty cycle) = 0.80

#### 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 490 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 525 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 1070 Hz (Duty cycle < 98%).

#### For IEEE 802.11ac(VHT20):

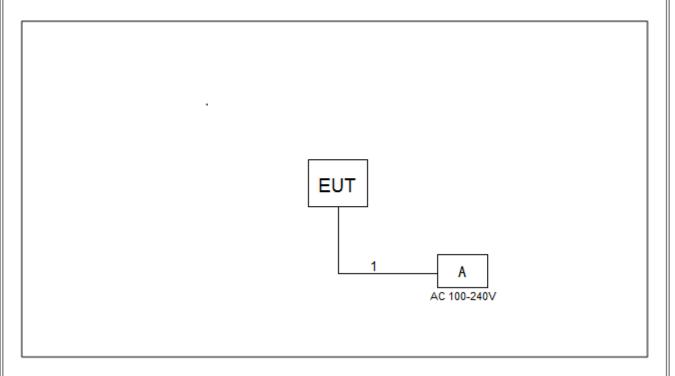
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 525 Hz (Duty cycle < 98%).

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 1064 Hz (Duty cycle < 98%).



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



#### 2.6 SUPPORT UNITS

Item	Equipment	Mfr/Brand	Model No.	Series No.
А	Adapter	FRECOM	N/A	N/A
Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1.5m



#### 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:

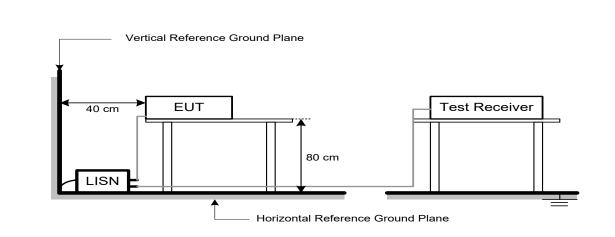
5		
Receiver Parameter	Setting	
Start Frequency	0.15 MHz	
Stop Frequency	30 MHz	
IF Bandwidth	9 kHz	

#### 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		
5725-5850 NOTE (2)	-27	68.2		
	10	105.2		
	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 = -

(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	

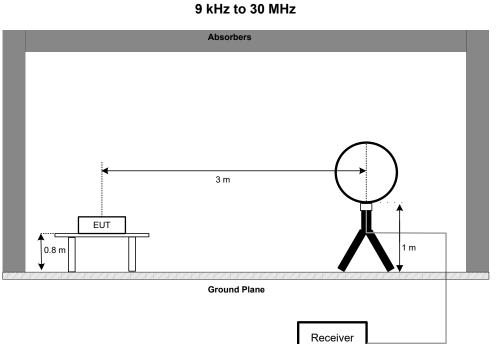
Receiver Parameters	Setting	
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector	
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector	
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector	
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector	
Start ~ Stop Frequency	30 MHz~1000 MHz for QP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



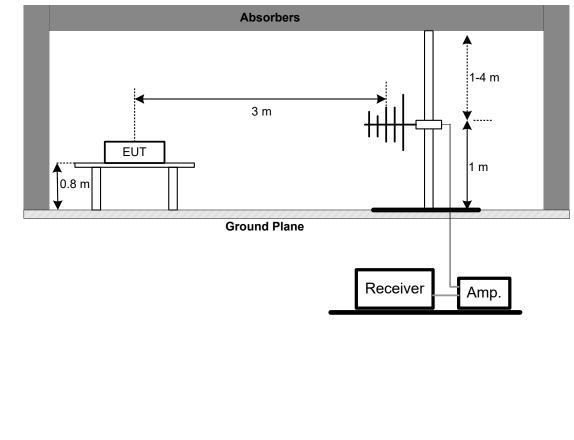
#### 4.3 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.4 TEST SETUP



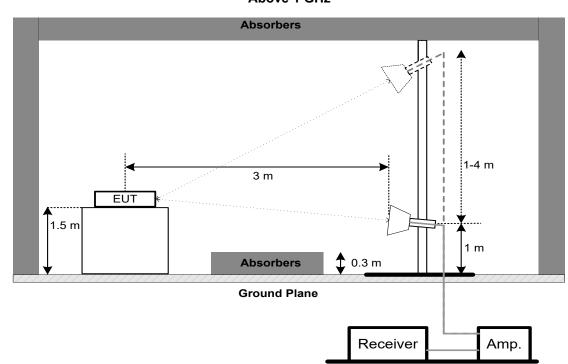






## <u>3TL</u>

#### 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	

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.

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

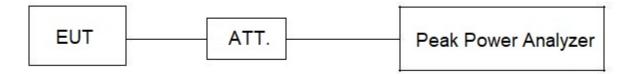
#### 6.2 TEST PROCEDURE

- a. The EUT was directly connected to the peak power analyzer and antenna output port as show in the block diagram below.
- b. 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)
		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

#### 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

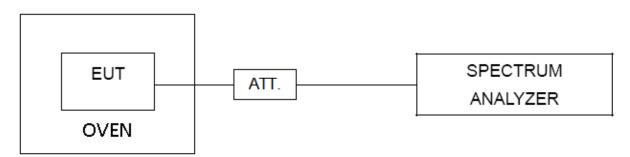
c. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

d. User manual temperature is 0°C~45°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	Jan. 22, 2023	
2	LISN	EMCO	3816/2	52765	Jan. 23, 2023	
3	TWO-LINE V-NETWORK	R&S	ENV216	101447	Jan. 23, 2023	
4	50Ω Terminator	SHX	TF5-3	15041304	Jan. 22, 2023	
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	
6	Cable	N/A	RG223	12m	Mar. 08, 2023	
7	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	MXE EMI Receiver	Keysight	N9038A	MY56400091	Jan. 22, 2023		
2*	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Aug. 23, 2024		
3	Cable	N/A	RG 213/U(9kHz~1GHz)	N/A	Jun. 17, 2022 Jun. 17, 2023		
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. 14, 2022 Jul. 14, 2023		

	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. 03, 2023		
2	Amplifier	HP	8447D	2944A08742	Jan. 22, 2023		
3	Cable	emci	LMR-400	N/A	Nov. 30, 2022		
4	Controller	СТ	SC100	N/A	N/A		
5	Controller	MF	MF-7802	MF780208416	N/A		
6	Receiver	Agilent	N9038A	MY52130039	Jan. 22, 2023		
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A		
8	966 Chamber Room	RM	9*6*6	N/A	Jul. 15, 2022 Jul. 15, 2023		



	-	Radiated	Emissions - Above 1	GHz	
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Horn Antenna	ARA	DRG-118A	16554	Apr. 18, 2023
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	May 27, 2022 May 27, 2023
3	Amplifier	Agilent	8449B	3008A02584	Jul. 03, 2022 Jul. 03, 2023
4	Controller	СТ	SC100	N/A	N/A
5	Controller	MF	MF-7802	MF780208416	N/A
6	Receiver	Agilent	N9038A	MY52130039	Jan. 22, 2023
7	EXA Spectrum Analyzer	Keysight	N9010A	MY56480488	Jan. 22, 2023
8*	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330 -K	619413	Jul. 05, 2022 Jul. 05, 2025
9	Cable	Talent microwave	A81-SMAMSMAM- 12.5M	N/A	Oct. 15, 2022
10	Cable	Talent microwave	A40-2.92M2.92M-2. 5M	N/A	Nov. 30, 2022
11*	Band Reject Filter	Micro-Tronics	BRC50703-01	7	Feb. 27, 2024
12*	Band Reject Filter	Micro-Tronics	BRC50705-01	10	Feb. 27, 2024
13	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
14	966 Chamber Room	RM	9*6*6	N/A	Jul. 15, 2022 Jul. 15, 2023

	Bandwidth & Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	R&S	FSP40	100185	Jul. 03, 2022 Jul. 03, 2023	
2	Attenuator	WOKEN	6SM3502	VAS1214NL	N/A	
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. 03, 2022 Jul. 03, 2023		
2	Wideband power sensor	Keysight	N1923A	MY58310004	Jul. 03, 2022 Jul. 03, 2023		
3	Attenuator	WOKEN	6SM3502	VAS1214NL	N/A		
4	RF Cable	Tongkaichuan	N/A	N/A	N/A		



	Frequency Stability						
Ite	em	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
	1	Spectrum Analyzer	R&S	FSP40	100185	Jul. 03, 2022 Jul. 03, 2023	
:	2	Precision Oven Tester	CEPREI	CEEC-M64T-40	15-008	Jan. 22, 2023	
	3	Attenuator	WOKEN	6SM3502	VAS1214NL	N/A	
4	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.

"\*" calibration period of equipment list is three year.

Except \* item, all calibration period of equipment list is one year.



#### **10. EUT TEST PHOTOS**



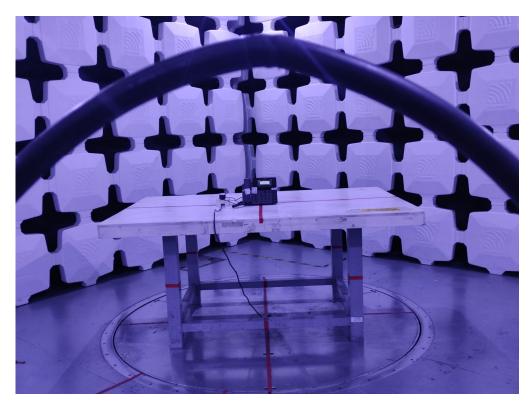
#### AC Power Line Conducted Emissions Test Photos

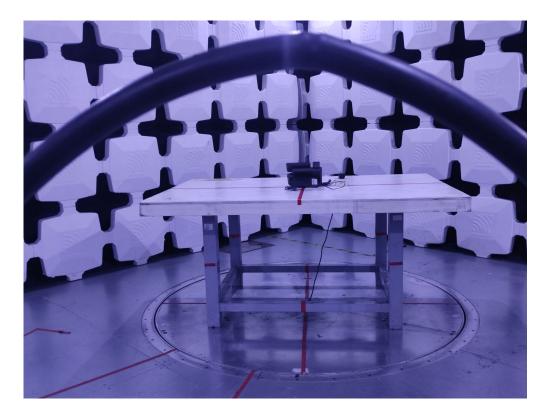




#### **Radiated Emissions Test Photos**

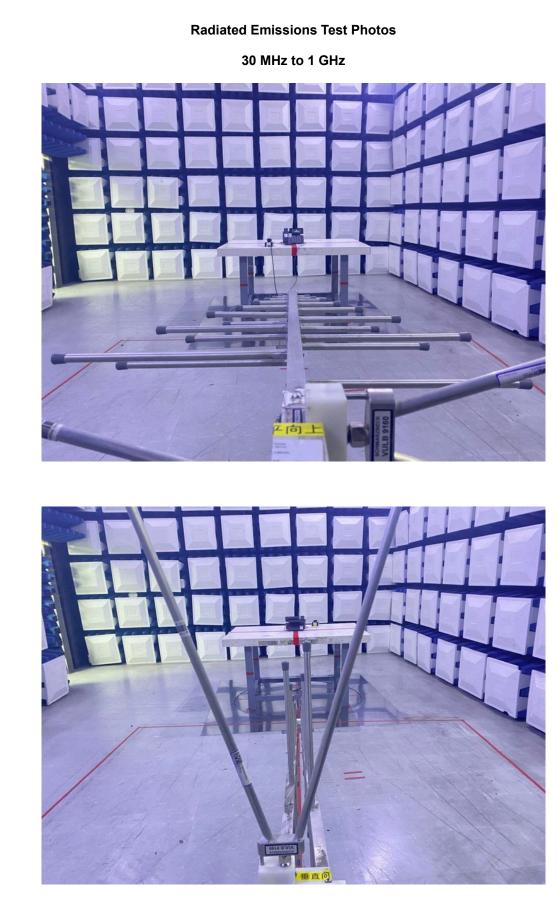
9 kHz to 30 MHz







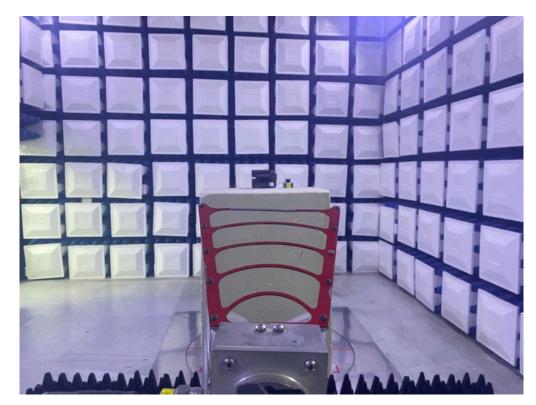


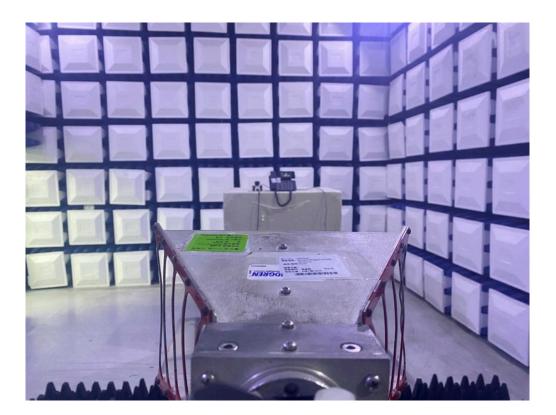




**Radiated Emissions Test Photos** 

Above 1 GHz







### **Conducted Test Photos**

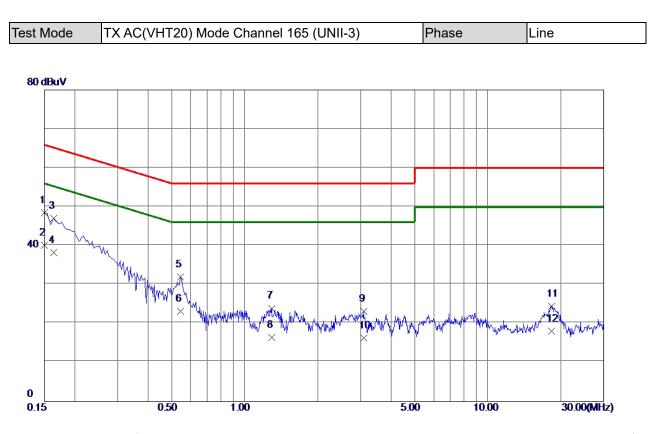






## **APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS**

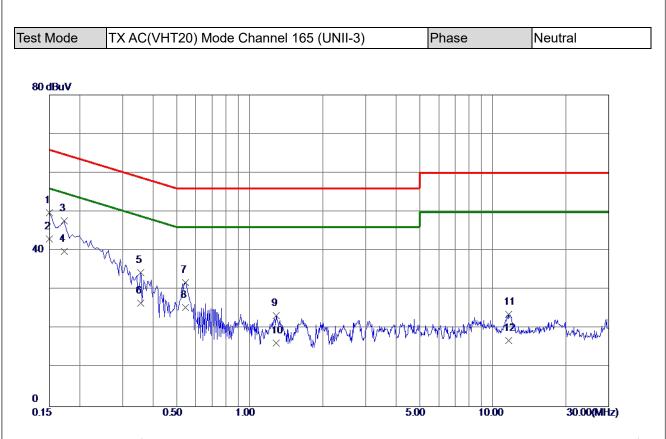




No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1500	38.83	9.65	48.48	66.00	-17. 52	QP	
2 *	0.1500	30. 51	9.65	40.16	56. <b>00</b>	-15.84	AVG	
3	0.1635	37.44	9.67	47.11	65.28	-18.17	QP	
4	0.1635	28.60	9.67	38.27	55.28	-17.01	AVG	
5	0.5460	22.17	9.77	31.94	56. <b>00</b>	-24.06	QP	
6	0. 5460	13. 40	9.77	23.17	46.00	-22.83	AVG	
7	1.2930	14.08	9.84	23.92	56. <b>00</b>	-32.08	QP	
8	1.2930	6.71	9.84	16. 55	46.00	-29.45	AVG	
9	3. 0885	13.19	9.98	23.17	56. <b>00</b>	-32.83	QP	
10	3. 0885	6.29	9.98	16.27	46.00	-29.73	AVG	
11	18. 2985	13.82	10.71	24. 53	60.00	-35. 47	QP	
12	18. 2985	7.40	10. 71	18.11	<b>50.00</b>	-31.89	AVG	

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





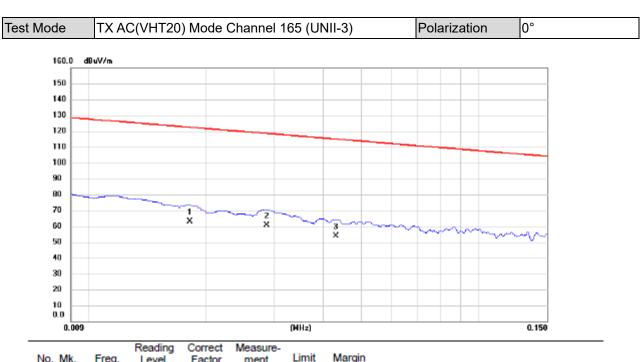
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1500	40.10	9.70	49.80	66.00	-16. 20	QP	
2 *	0.1500	33. 41	9.70	43.11	56.00	-12.89	AVG	
3	0.1725	37.93	9.71	47.64	64.84	-17.20	QP	
4	0.1725	30.10	9.71	39.81	54.84	-15. 03	AVG	
5	0.3570	24.61	9.78	34.39	58.80	-24.41	QP	
6	0.3570	16.80	9.78	26.58	48.80	-22.22	AVG	
7	0.5460	22. 02	9.80	31.82	56.00	-24.18	QP	
8	0.5460	15.70	9.80	25. 50	46.00	-20. 50	AVG	
9	1.2839	13. 52	9.88	23. 40	56.00	-32.60	QP	
10	1.2839	6. 40	9.88	16.28	46.00	-29.72	AVG	
11	11.6115	13.17	10. 52	23.69	60.00	-36. 31	QP	
12	11.6115	6. 51	10. 52	17.03	<b>50.00</b>	-32. 97	AVG	

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



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

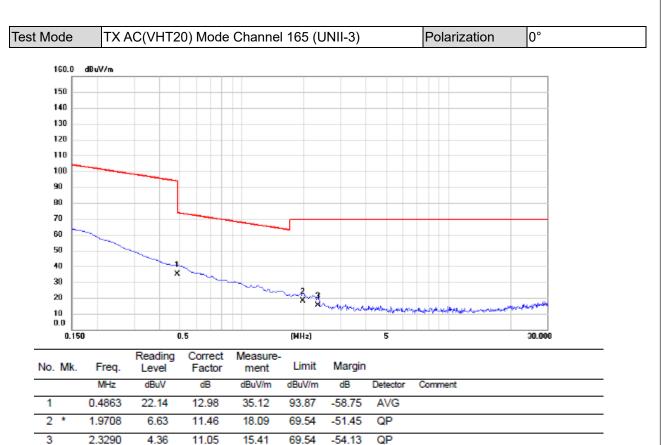




NO. WIN.	ricq.	Level	Factor	meni	Carrie	inter girt		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0182	48.25	14.84	63.09	122.40	-59.31	AVG	
2 *	0.0286	46.63	14.06	60.69	118.48	-57.79	AVG	
3	0.0431	40.25	13.64	53.89	114.92	-61.03	AVG	

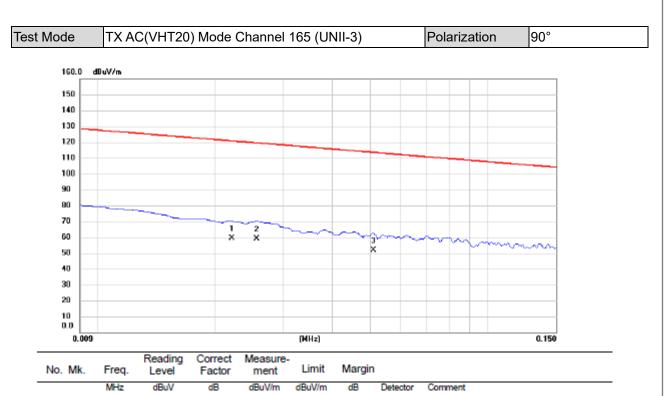
- Measurement Value = Reading Level + Correct Factor.
  Margin Level = Measurement Value Limit Value.





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





120.72

119.44

113.45

-61.21

-60.27

-61.72

AVG

AVG

AVG

59.51

59.17

51.73

#### **REMARKS**:

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

0.0221

0.0256

0.0510

1

2 \*

3

45.26

45.02

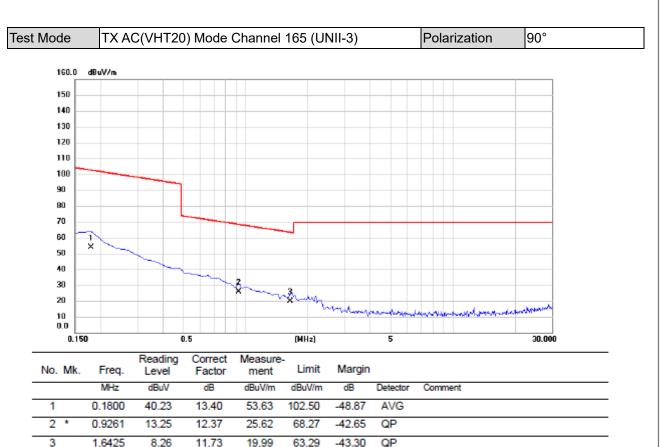
38.29

14.25

14.15

13.44



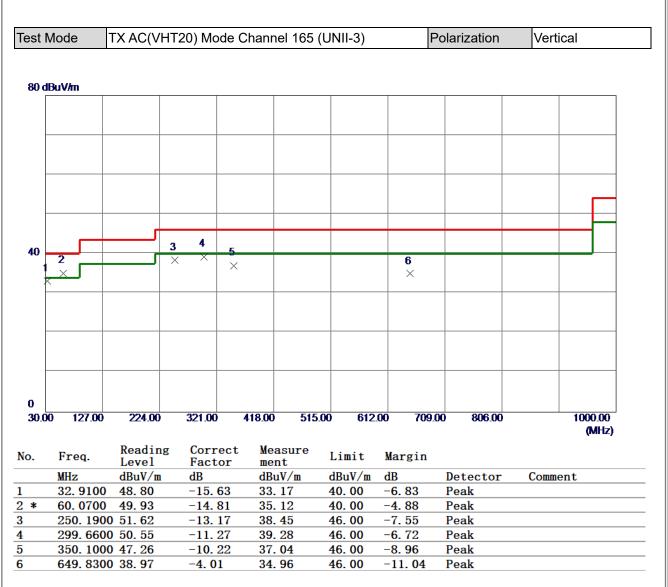


- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



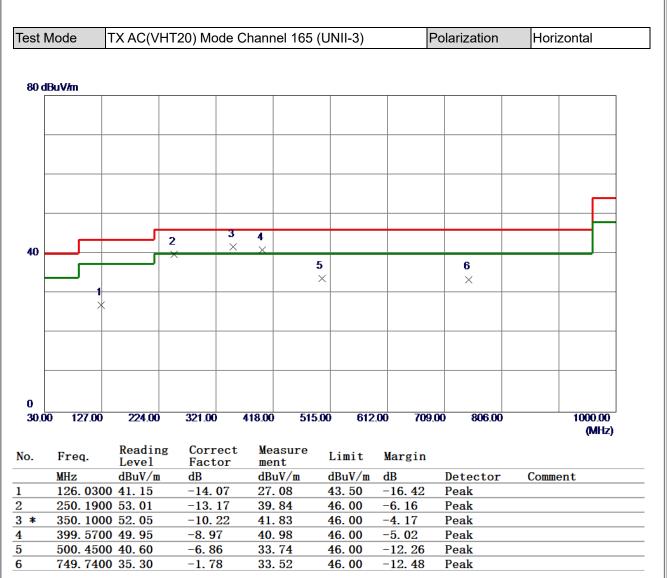
## APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ





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



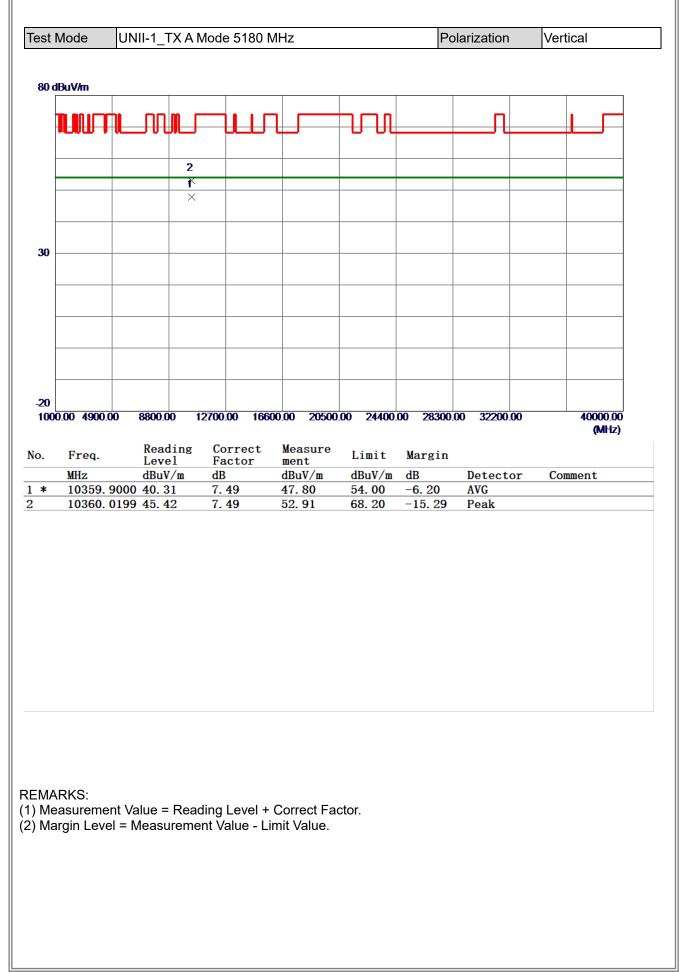


- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

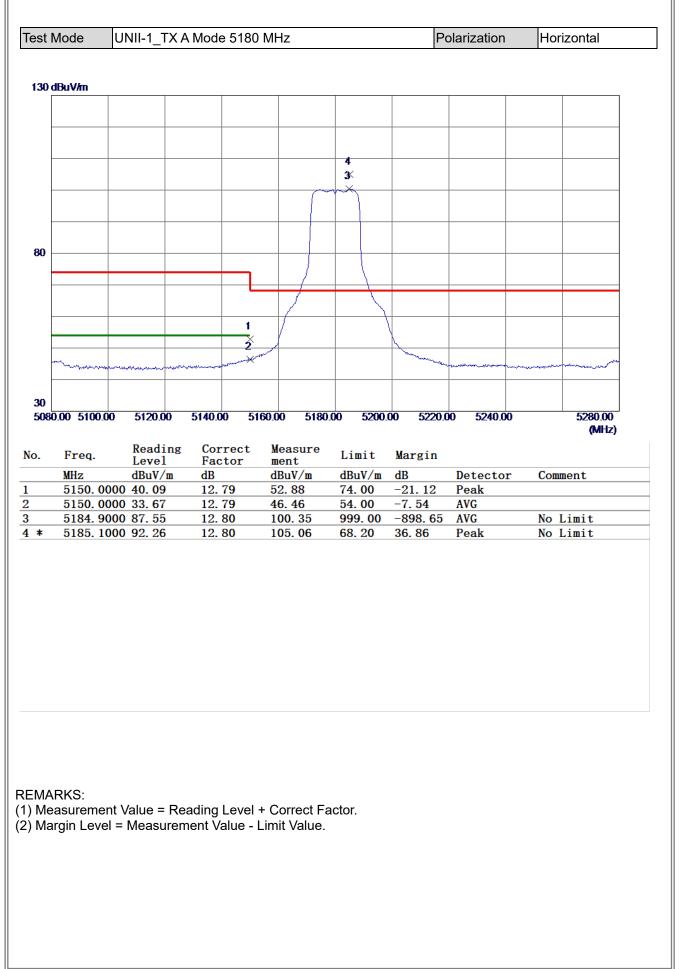


## **APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ**

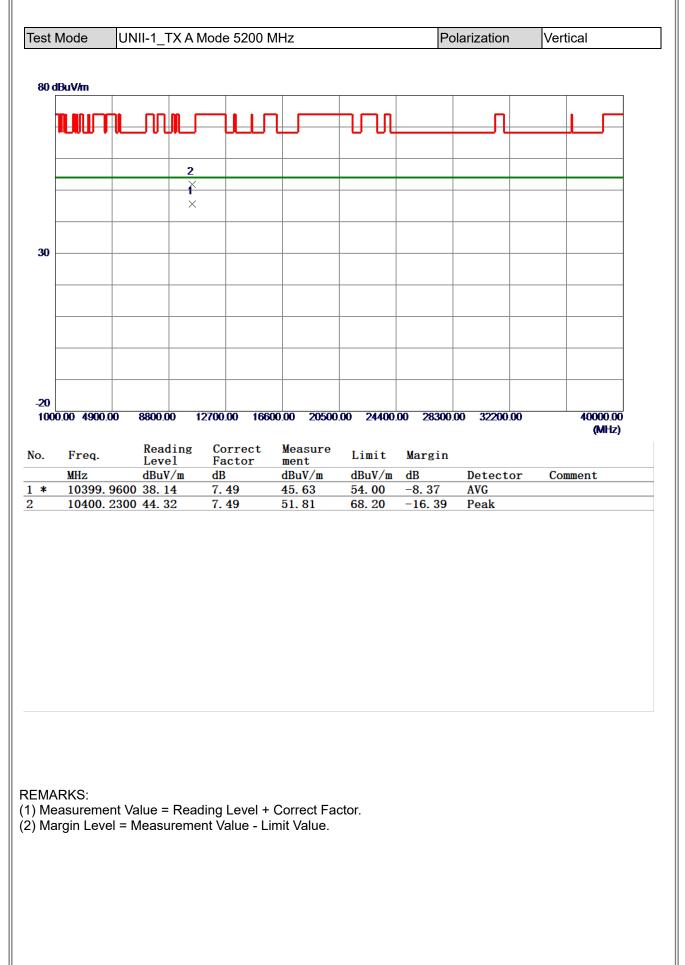




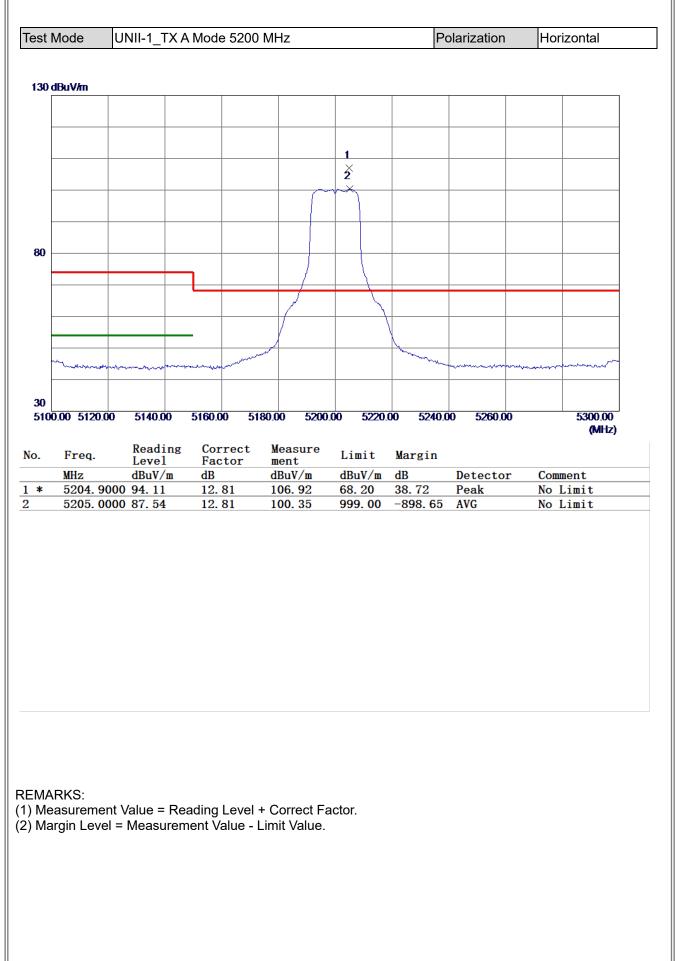




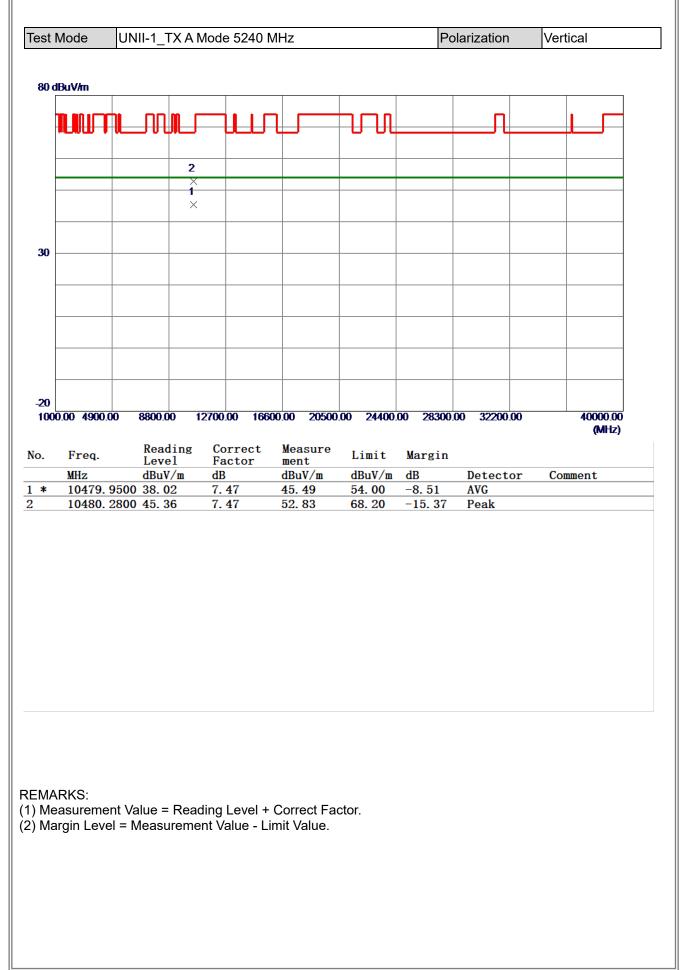




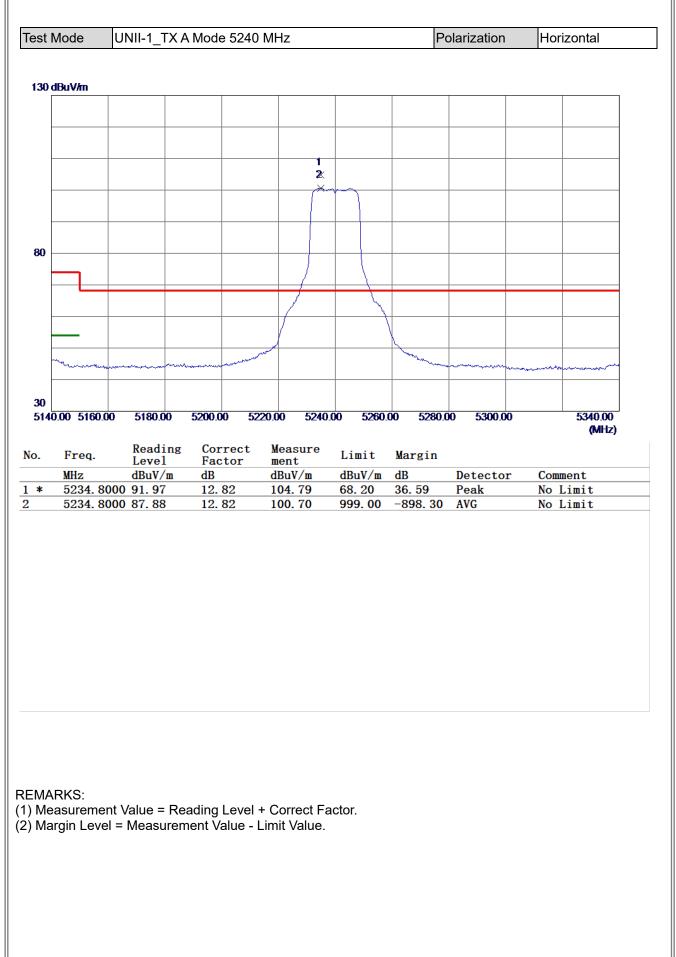




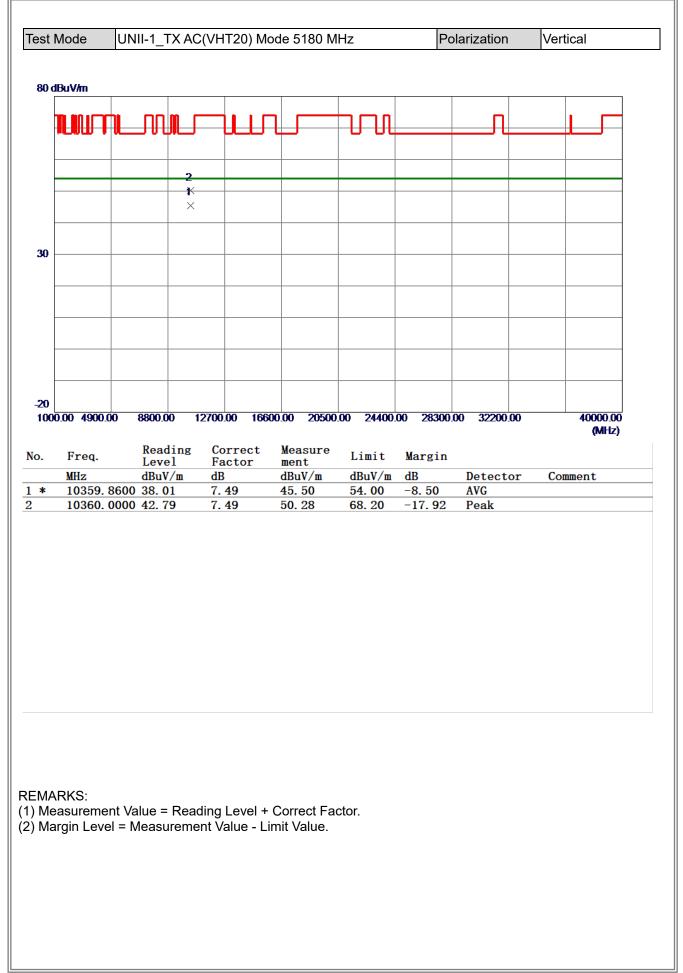




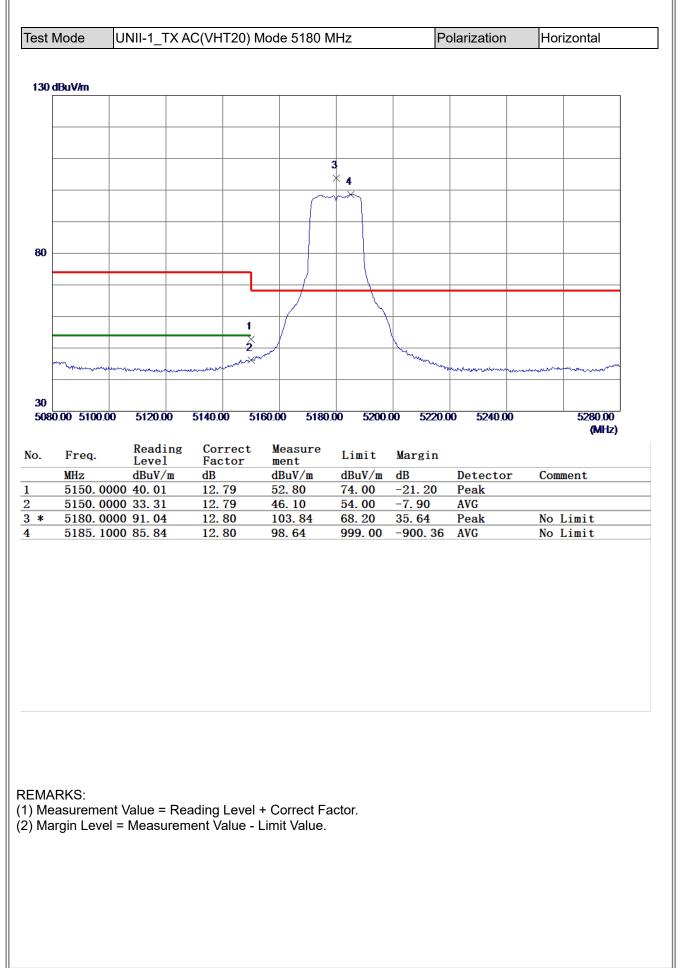




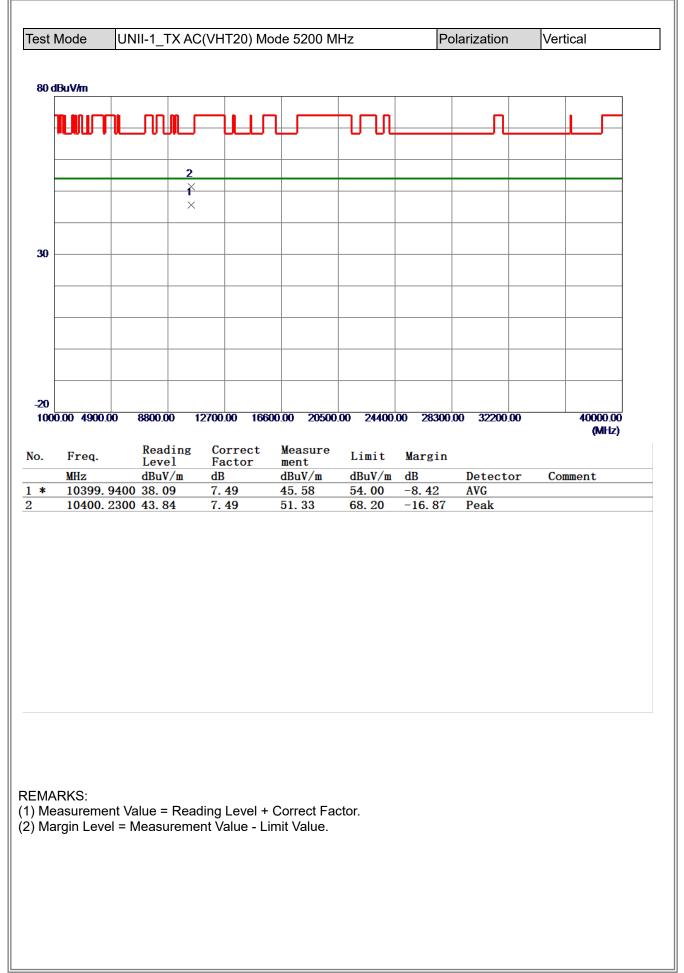




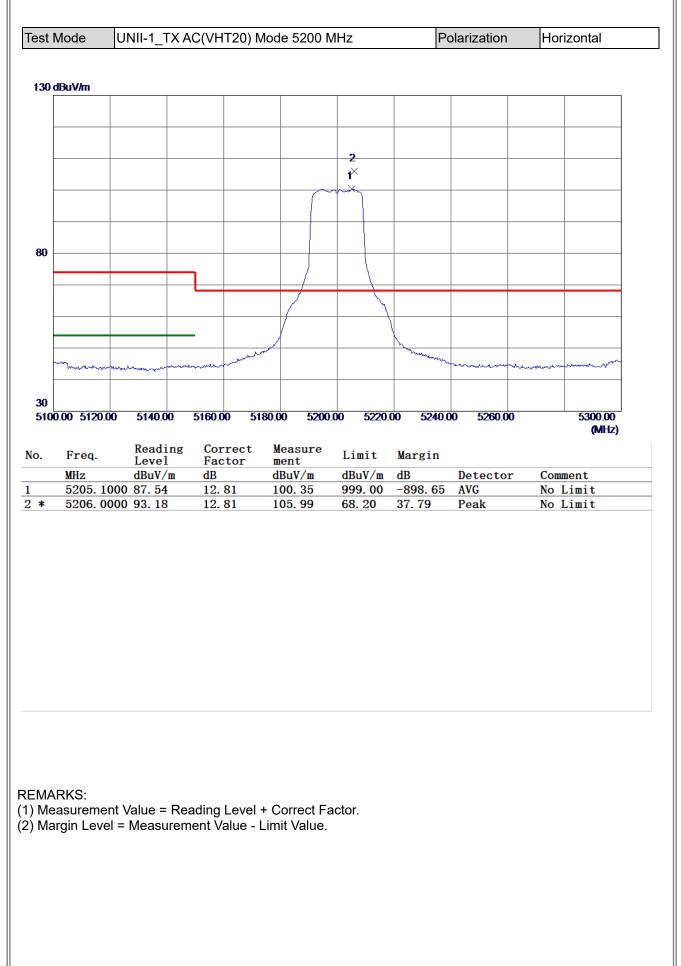




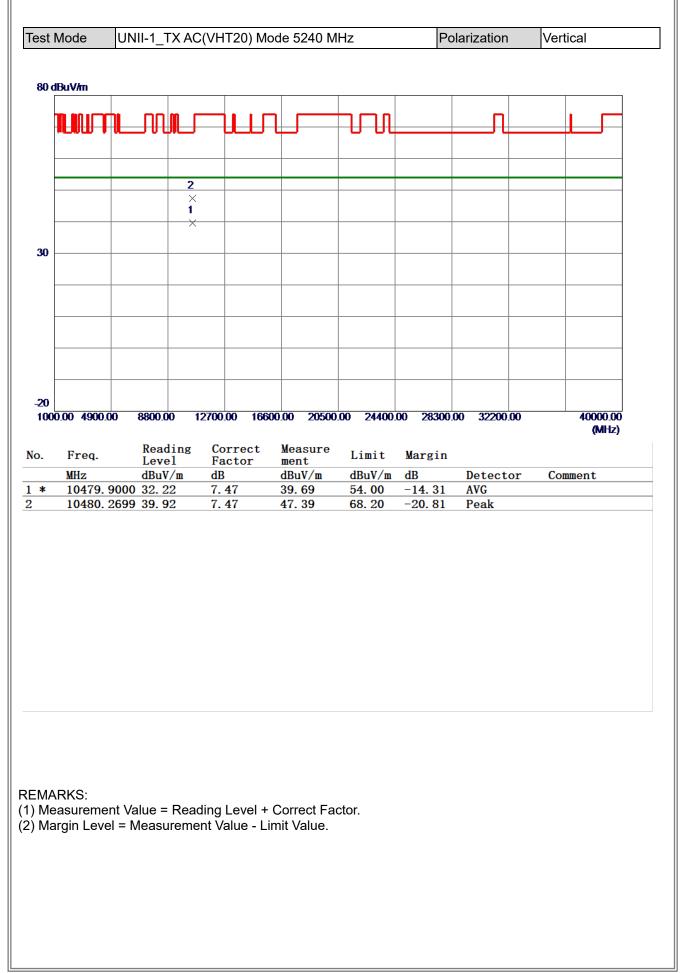




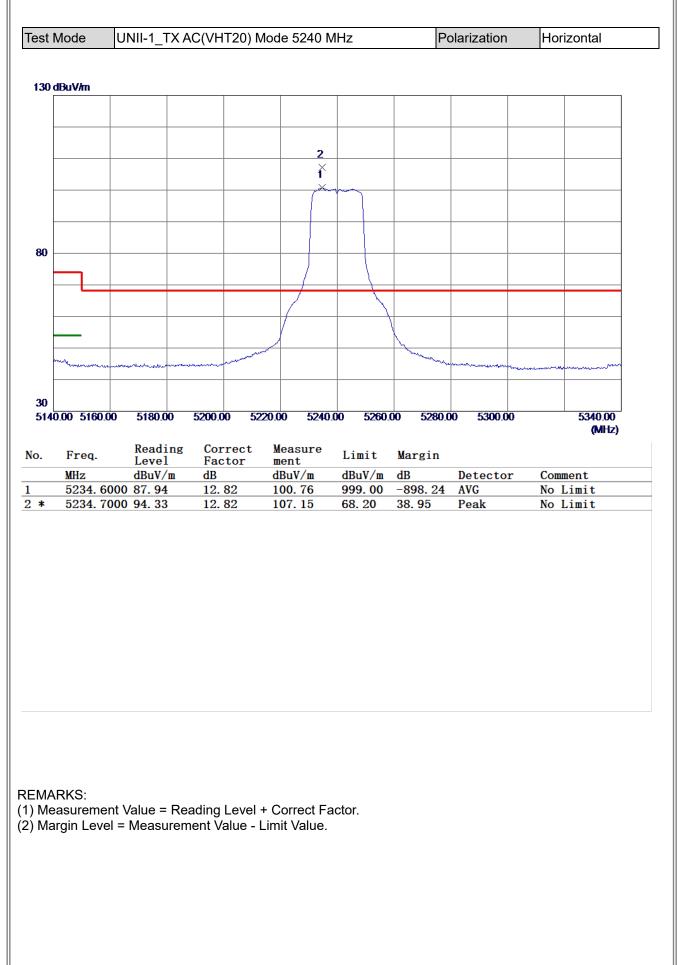




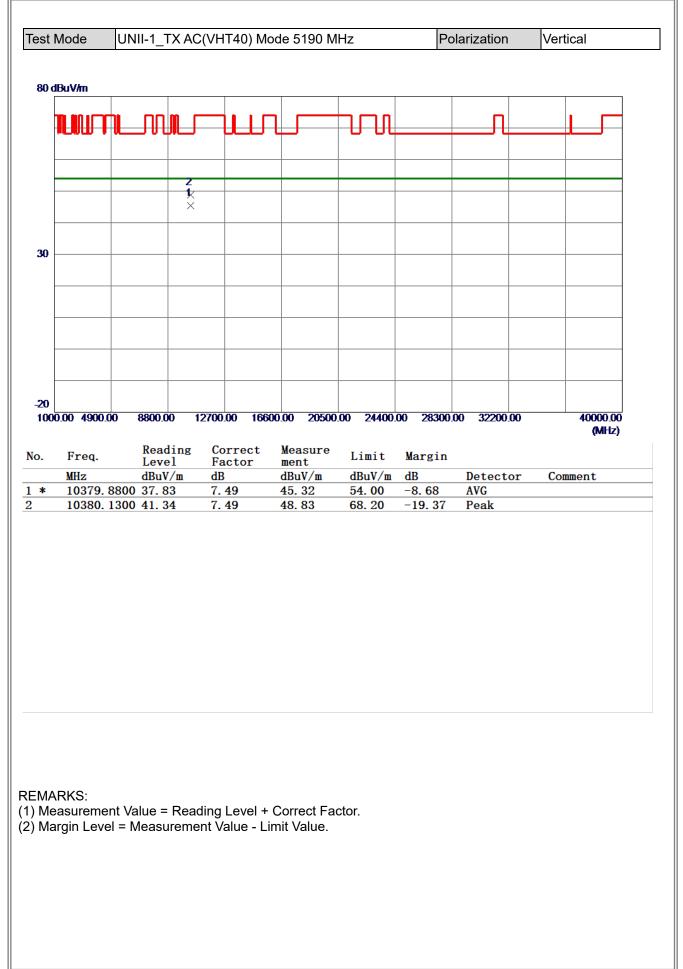




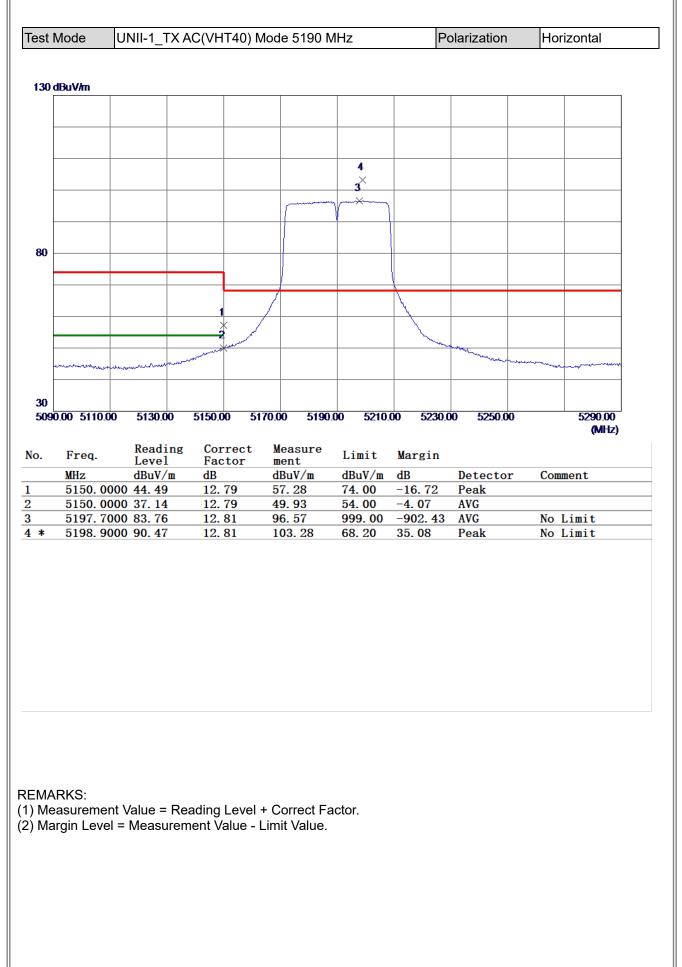




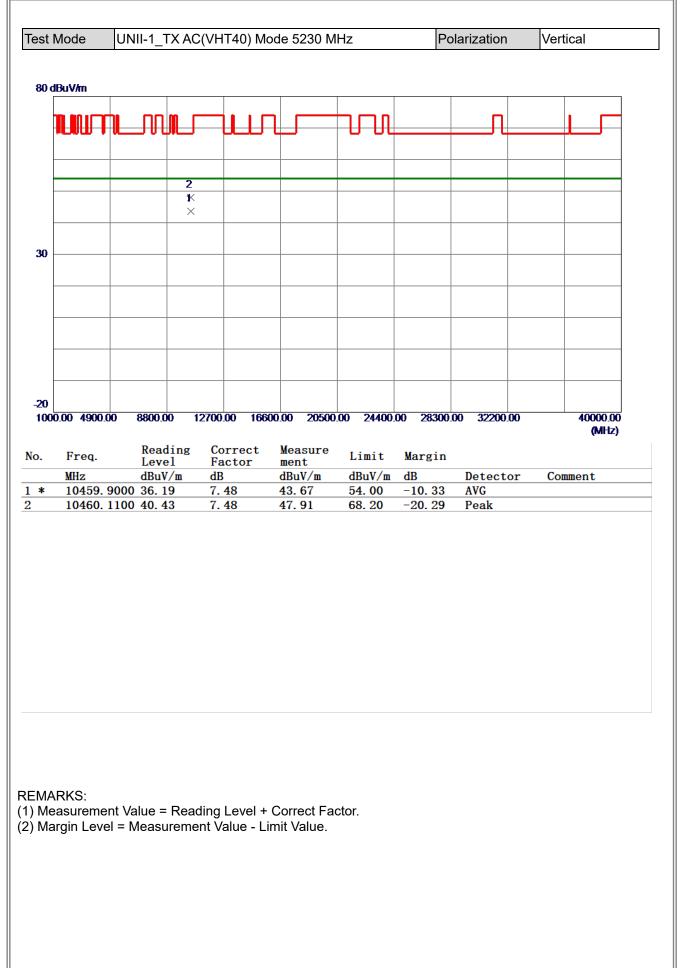




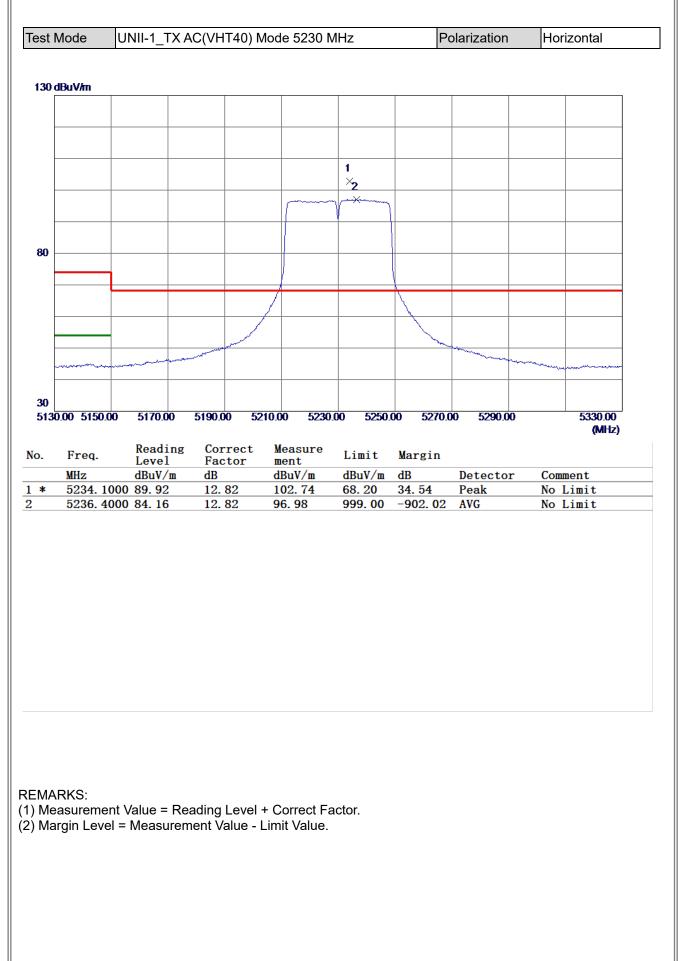




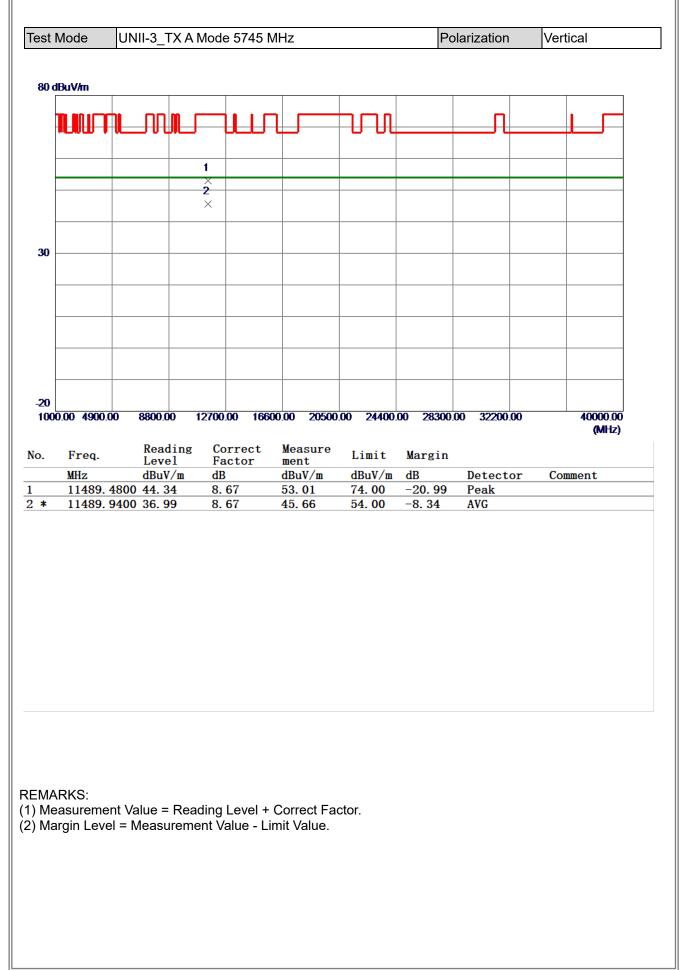




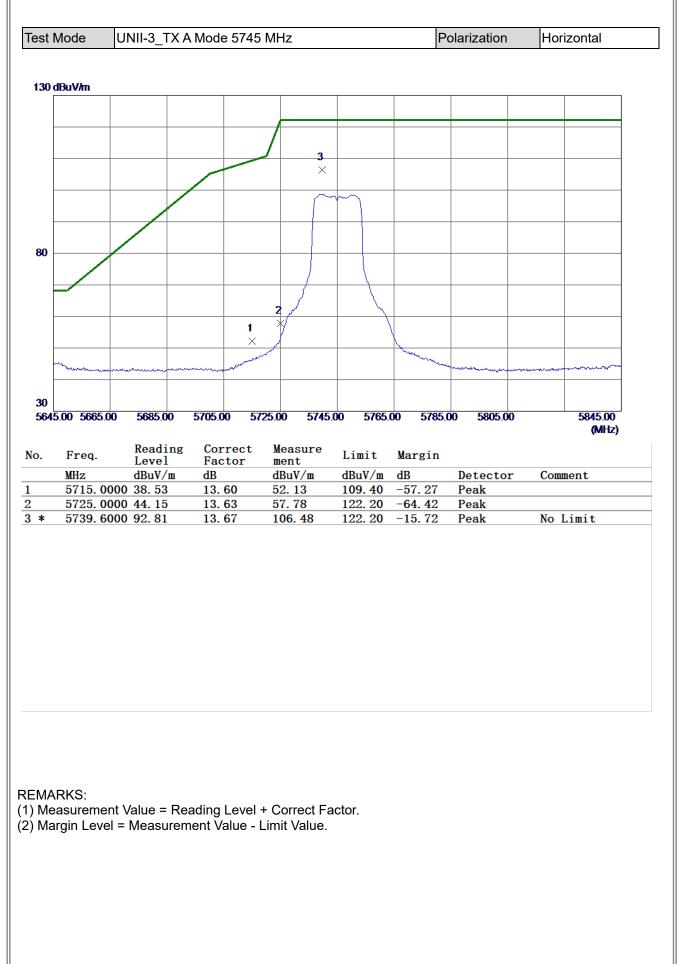




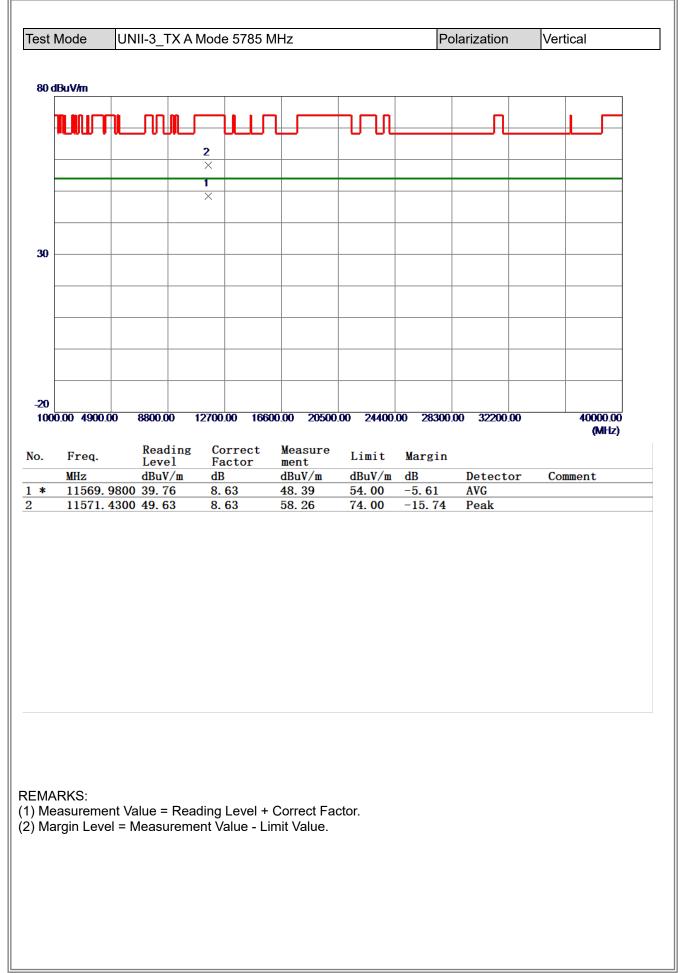




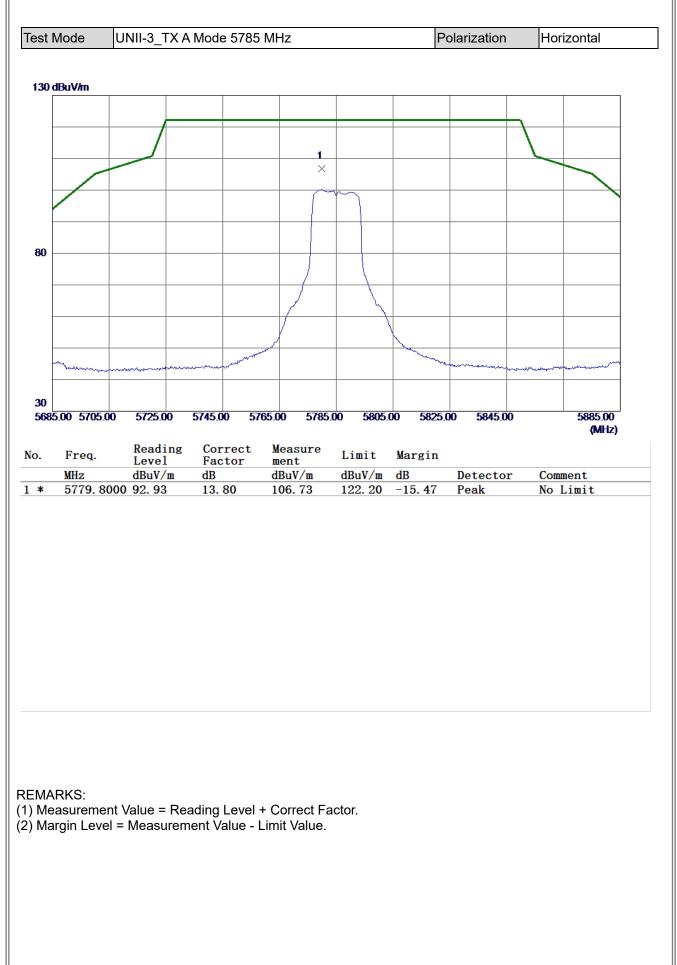




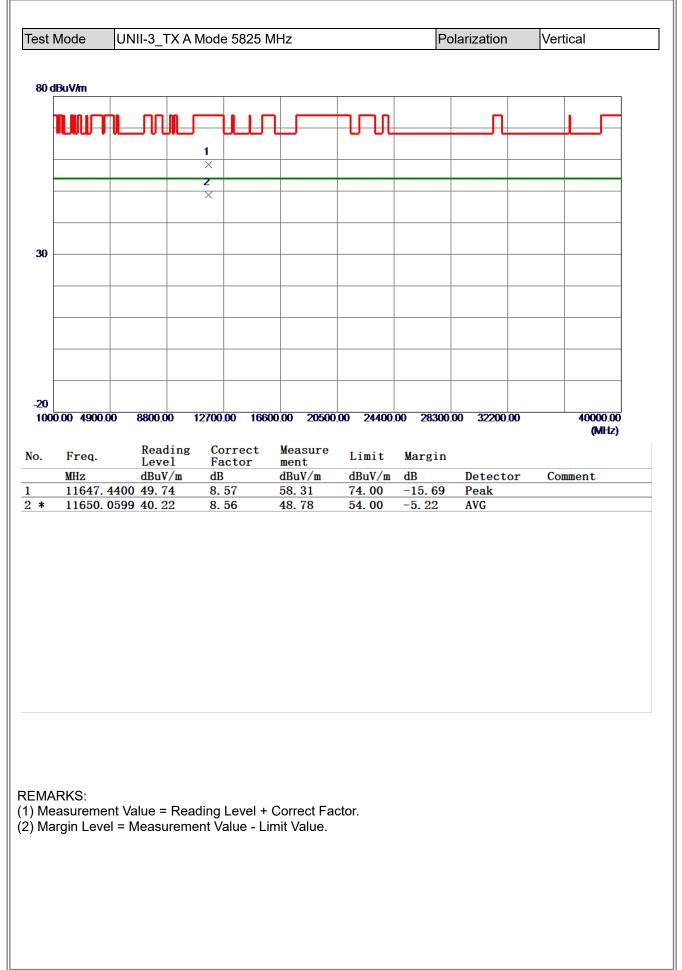




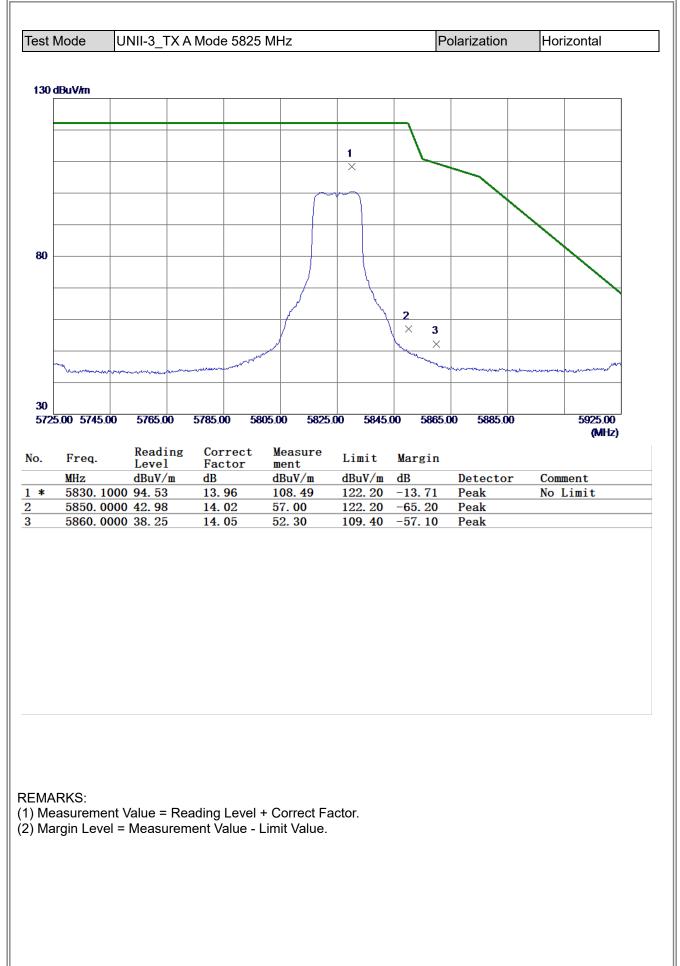




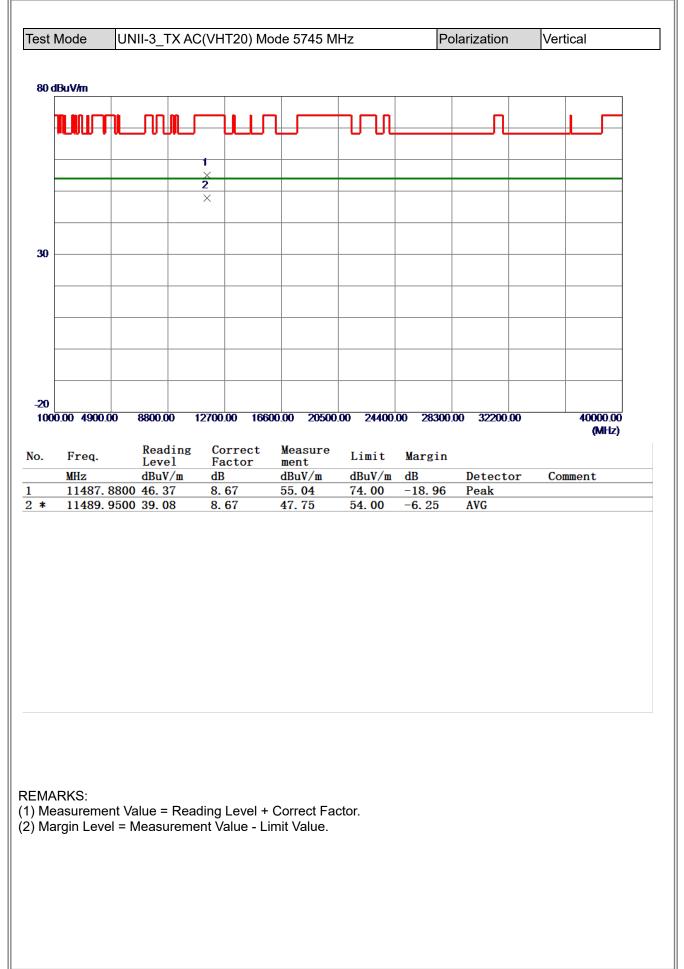




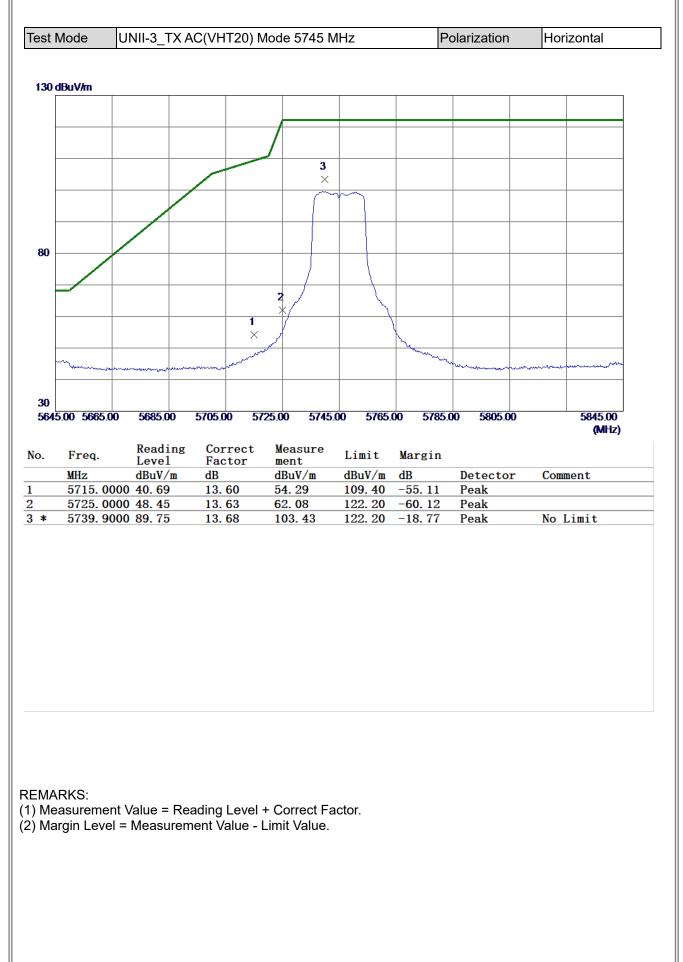
# **B**L



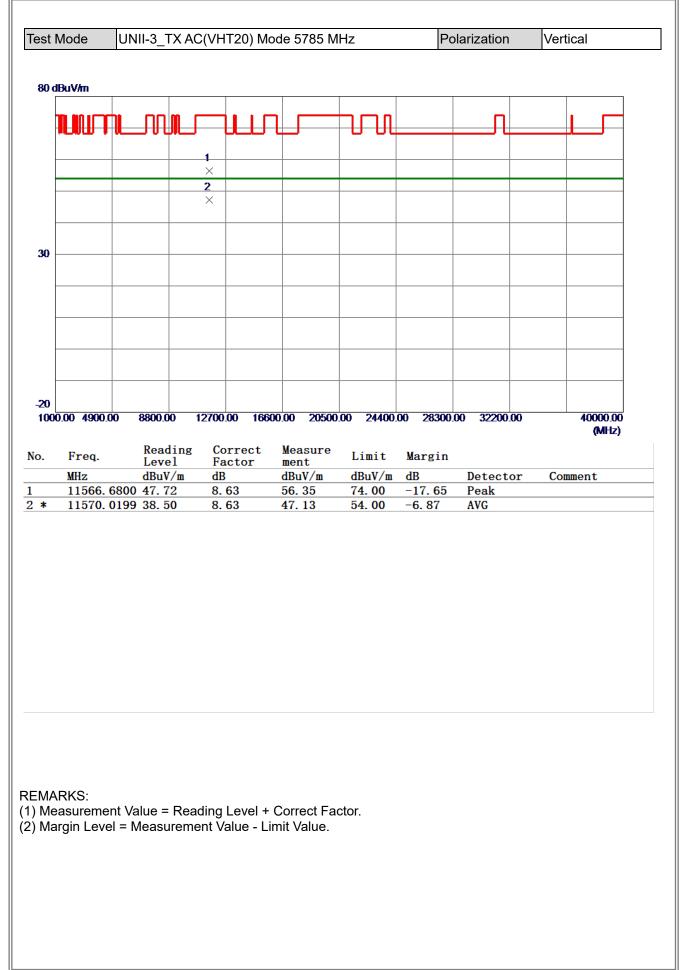




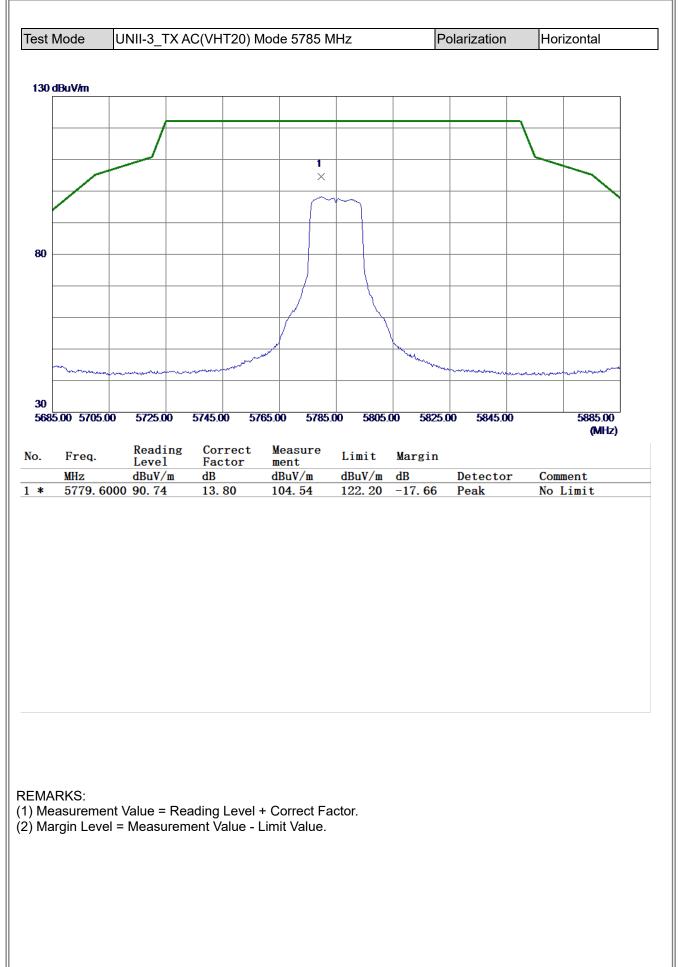




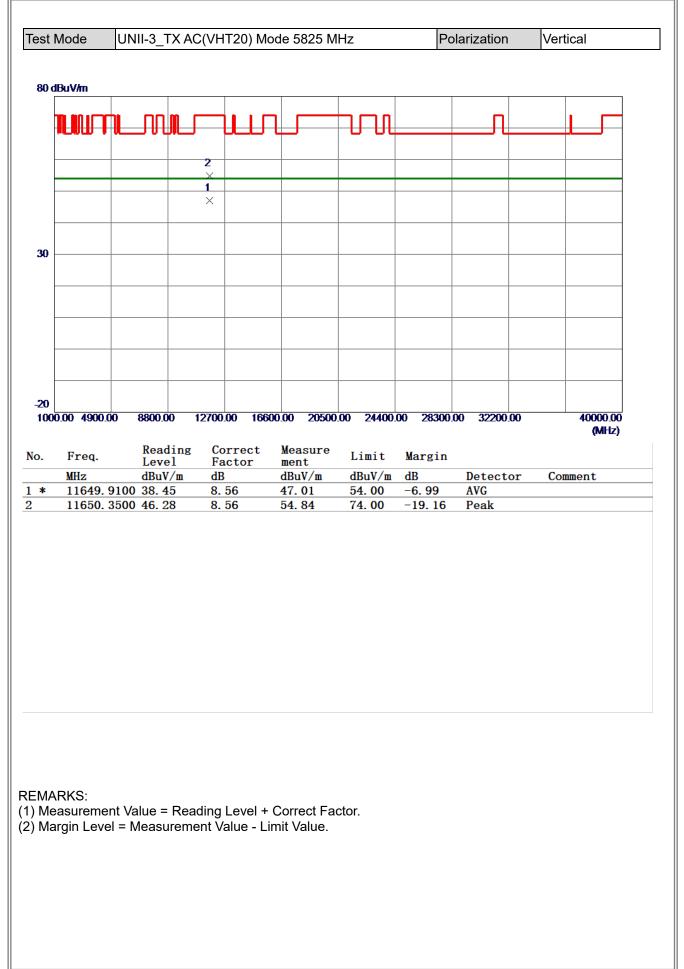




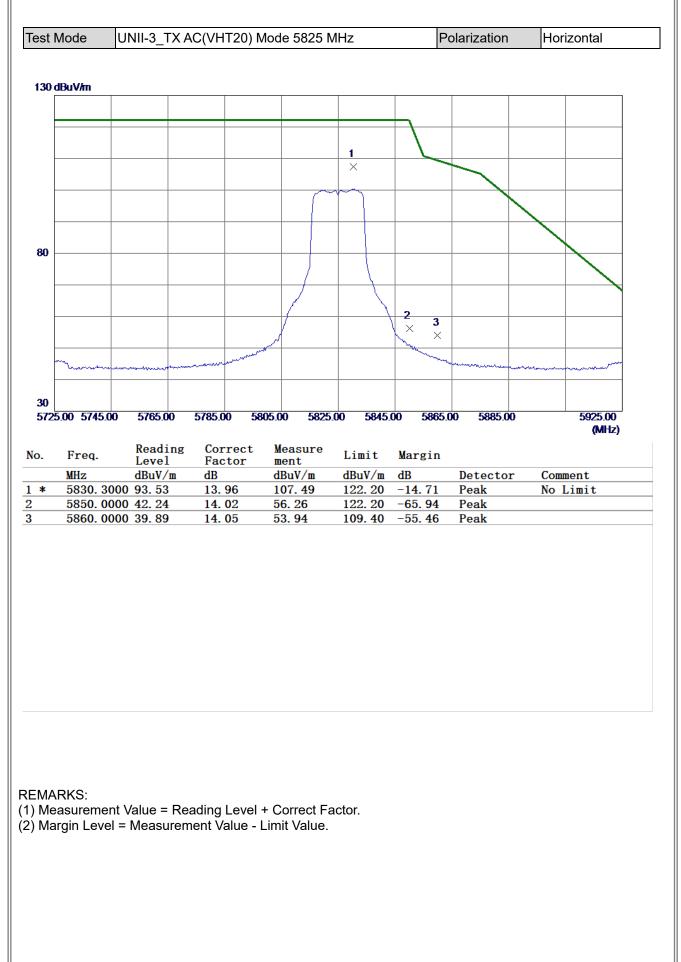




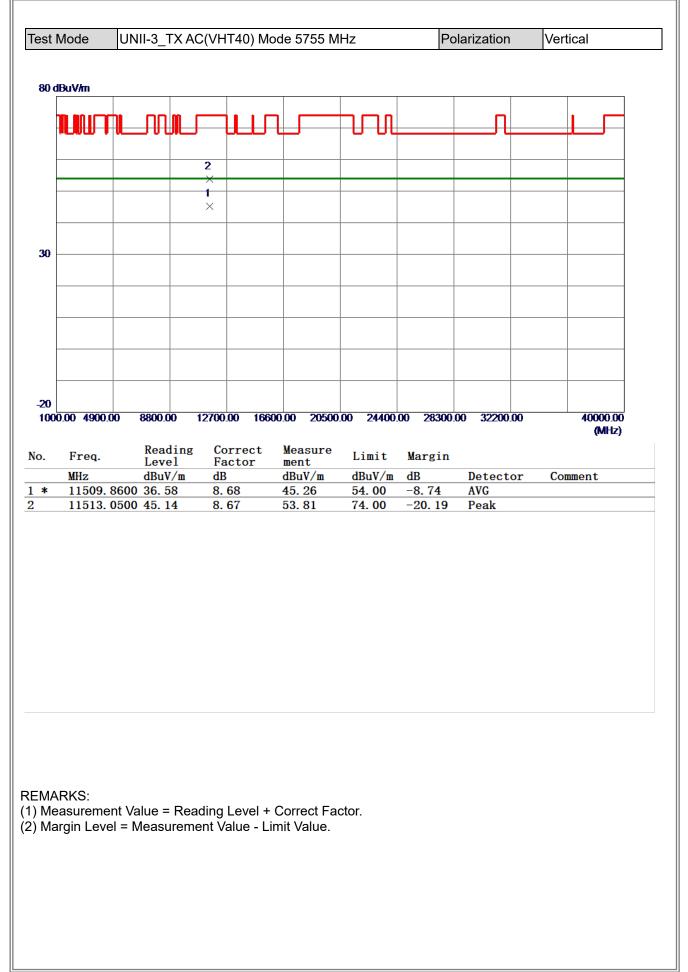




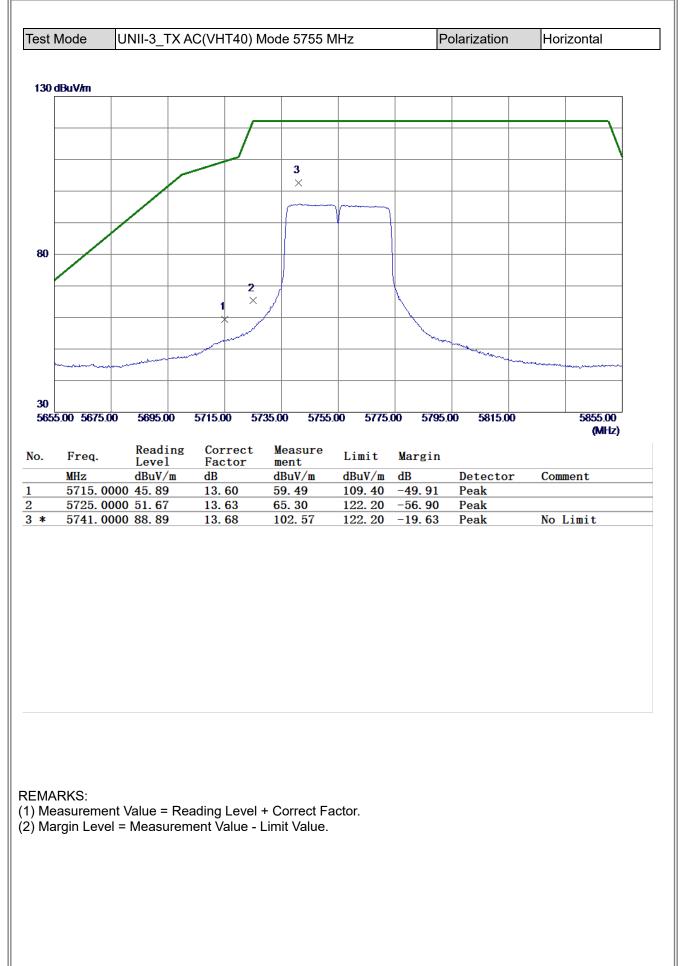




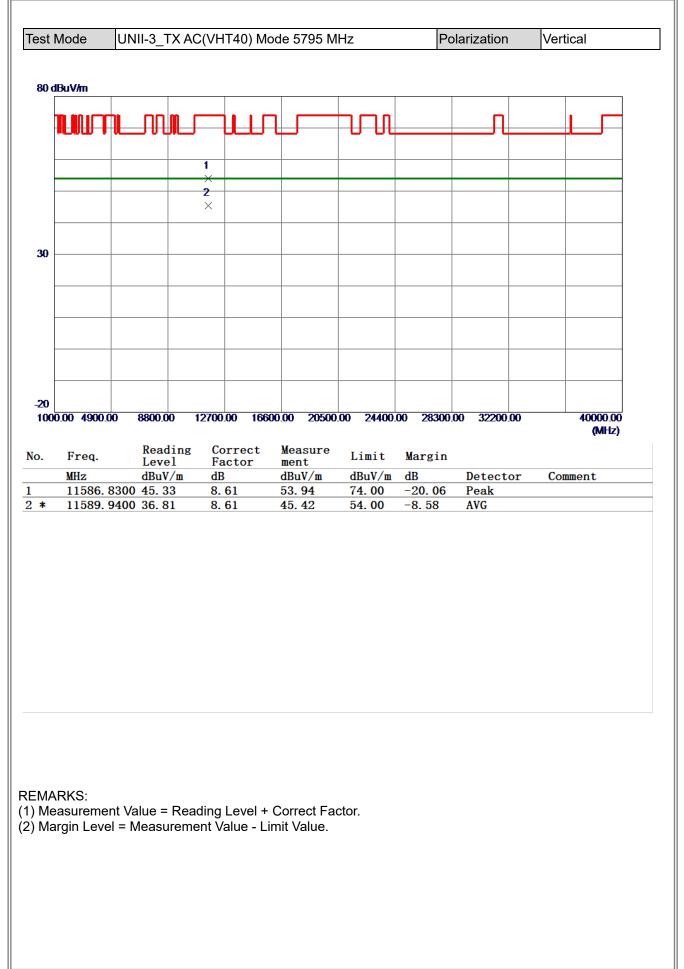




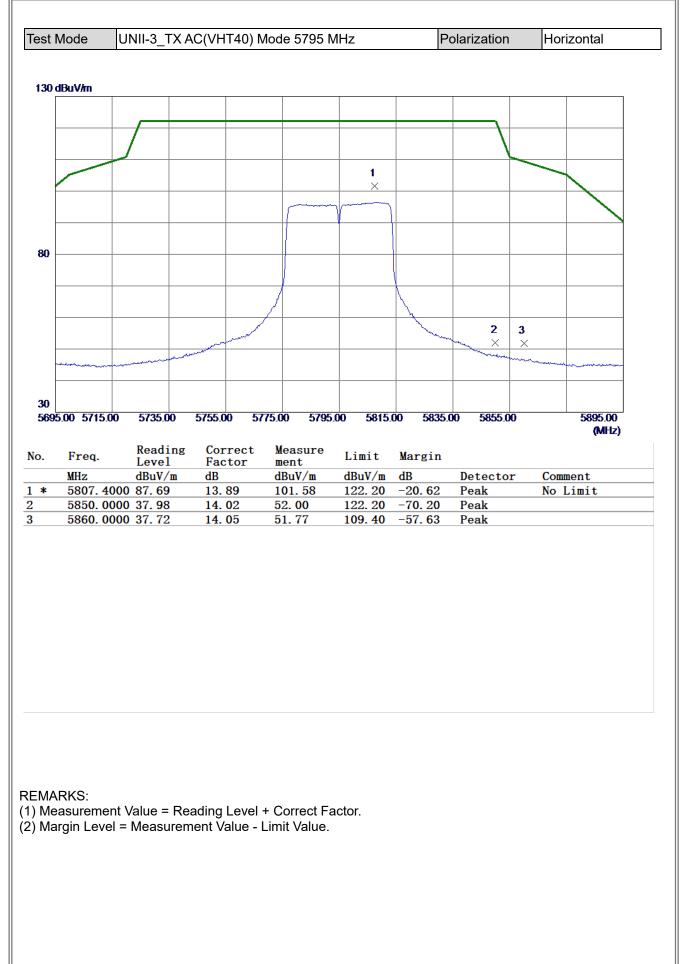








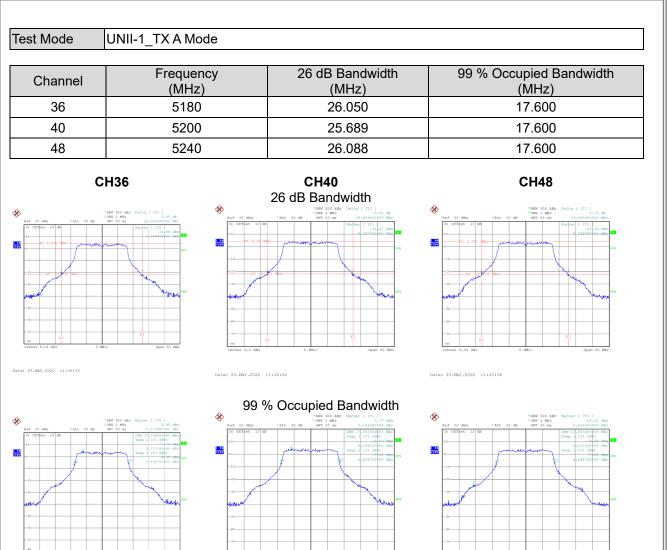






# **APPENDIX E - BANDWIDTH**





Date: 23.MAY.2022 11:29:56

Date: 23.MAY.2022 11:31:19

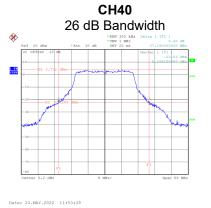
Date: 23.MAY.2022 11:32:57



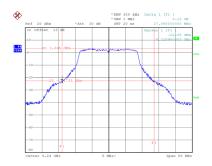
# Test Mode UNII-1\_TX AC(VHT20) Mode

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
36	5180	27.449	19.000
40	5200	27.190	19.000
48	5240	27.690	19.000



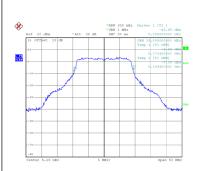


CH48



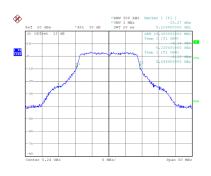
Date: 23.MAY.2022 11:51:46

Date: 23.MAY.2022 11:51:10



Date: 23.MAY.2022 11:54:54

Date: 23.MAY.2022 11:54:17

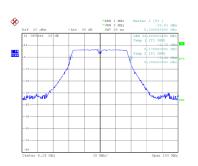


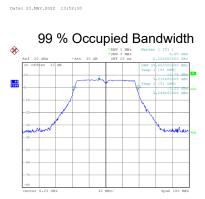
Date: 23.MAY.2022 11:52:56



#### Test Mode UNII-1\_TX AC(VHT40) Mode Frequency 26 dB Bandwidth 99 % Occupied Bandwidth Channel (MHz) (MHz) (MHz) 38 5190 46.988 38.600 46 5230 47.500 38.600 **CH38** CH46 26 dB Bandwidth 8 ¢ • RBW 300 1 1 PF VIET 1 99







Date: 23.MAY.2022 13:49:01

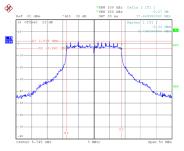
Date: 23.MAY.2022 13:51:48



Hz) (N	1Hz)	99 % Occu Bandwidth (		6 dB Bandwid Limit (MH		Resu	ılt	
45 16	.450	17.600		0.5	_/	Compli	ies	
85 16	.450	17.600		0.5		Compli		
25 16	.450	17.600		0.5		Compl	ies	
		<b></b>						
149	6		n		CH165			
59 100 kHz Delta 1 [T1 ] 59 300 kHz -0.95 dB	**	*RBW 100 kHz Delta 1 *VBW 500 kHz t 30 dB SWT 20 ms 16.44	(T1 ) -0.29 dB 49992000 MHz	Ref 20 dBm •Att 3	• RBW 100 kHz • VBW 300 kHz 0 dB SWT 20 ms	Delta 1 [T1 ] -0.21 dB 16.449992000 MBz		
Marker 1 (71) -2,86 dBm -2,86 dBm	20 Offbet 13 dB		(T1) -3.28 dBm 76750008 GE2	20 Offet 13 dz		Marker 1 [T1 -3,63 dBm		
inter test of a series of the	-10 -0 -0 -0 -0 -0 -0 -0 -0 -0 -	and the shall be a second second	LVL	0 D1 1.063 dBm	allyladded		LVE.	
	-20			-20				
Minister and Allerthe	-30		50a	- 30		- adama and	ion.	
	- 50			- 50				
¥2	70	. F2		70	F2			
Span 50 MEz	-80 Center 5.785 GHz	5 MHz/	Span 50 MHz	-80 P1 Center 5.825 GHz	5 MHz/	Span 50 MHz		
	Date: 23.MAY.2022 11:37:4	1		Date: 23.MAY.2022 11:39:14				
Approx      Traps      [11:09] <th [1<="" th=""><th>-10 -10 -10 -10 -11 -12 -13 -10 -10 -10 -10 -10 -10 -10 -10 -10 -10</th><th>5. MIL/</th><th>-6,89 dBm .w.</th><th>200 </th><th>5 MEz/</th><th>2010 10 10 10 10 10 10 10 10 10 10 10 10</th><th></th></th>	<th>-10 -10 -10 -10 -11 -12 -13 -10 -10 -10 -10 -10 -10 -10 -10 -10 -10</th> <th>5. MIL/</th> <th>-6,89 dBm .w.</th> <th>200 </th> <th>5 MEz/</th> <th>2010 10 10 10 10 10 10 10 10 10 10 10 10</th> <th></th>	-10 -10 -10 -10 -11 -12 -13 -10 -10 -10 -10 -10 -10 -10 -10 -10 -10	5. MIL/	-6,89 dBm .w.	200 	5 MEz/	2010 10 10 10 10 10 10 10 10 10 10 10 10	
	25 16			<section-header><figure><figure><figure><figure><figure></figure></figure></figure></figure></figure></section-header>	<figure></figure>	25 16.450 17.60 0.5 CH65 CH64 CH64 CH64 CH64 CH64 CH64 CH64 CH64	25 16.450 17.600 0.5 Complete 149 FLSS Complete 149 Complete 149 Complete 149 Complete 140 Comp	

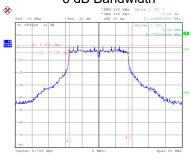


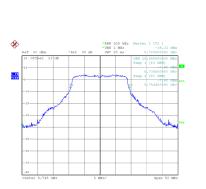
Test Mod					
Test Mod		TX AC(VHT20) Mode	5		
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result
149	5745	17.650	18.900	0.5	Complies
157	5785	17.650	19.000	0.5	Complies
165	5825	17.650	19.100	0.5	Complies
	CH149		<b>CH157</b> 6 dB Bandwidth	CH165	
bef      2.6 cfm        1000      1000        1000      1000        1000      1000        1000      1000        1000      1000        1000      1000        1000      1000        1000      1000        1000      1000        1000      1000        1000      1000        1000      1000        1000      1000	Marker 9-	-0.27 dB Ref 20 dBm 649992000 MBz 20 Offet 13 dB	- 1984 10 485 Octo 1 (1) - 0.0 00 907 90 485 Octo 1 (1) - 0.0 00 907 90 487 Octo 1 (1) - 0.0 00 907 90 90 90 90 90 90 90 90 90 90 90 90 90	*389 100 UB 100 305 UB 100 300 UB 100 U	0-12 00 1021 -0-12 00 11-0-0920200 Mit -1-0-0920200 Mit -1-0-00200 Mit -1



Date: 23.MAY.2022 11:56:22

Date: 23.MAY.2022 11:55:35

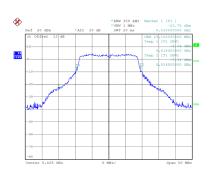




99 % Occupied Bandwidth Ø 1 PR VIEW

Date: 23.MAY.2022 11:59:18

Date: 23.MAY.2022 11:58:30



Date: 23.MAY.2022 11:56:59

Date: 23.MAY.2022 11:57:47



1 PR VIEW

Date: 23.MAY.2022 13:54:41

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result				
151	5755	36.500	38.600	0.5	Complies				
159	5795	36.600	38.800	0.5	Complies				
ate: 23.MAY.2022 13:5	5:28	Date: 23.MAY.2022 13:	57:02						

1 PE VIEW

Date: 23.MAY.2022 13:56:16



# **APPENDIX F - MAXIMUM OUTPUT POWER**



Test Mod	Test Mode UNII-1_TX A Mode											
Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result					
36	5180	11.48	0.33	11.81	23.98	0.2500	Complies					
40	5200	11.47	0.33	11.80	23.98	0.2500	Complies					
48	5240	10.84	0.33	11.17	23.98	0.2500	Complies					

#### Test Mode UNII-1\_TX N(HT20) Mode

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
36	5180	11.28	0.20	11.48	23.98	0.2500	Complies
40	5200	11.07	0.20	11.27	23.98	0.2500	Complies
48	5240	10.57	0.20	10.77	23.98	0.2500	Complies

#### Test Mode UNII-1\_TX N(HT40) Mode

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
38	5190	10.73	0.63	11.36	23.98	0.2500	Complies
46	5230	10.32	0.63	10.95	23.98	0.2500	Complies

### Test Mode UNII-1\_TX AC(VHT20) Mode

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
36	5180	11.31	0.21	11.52	23.98	0.2500	Complies
40	5200	11.18	0.21	11.39	23.98	0.2500	Complies
48	5240	10.61	0.21	10.82	23.98	0.2500	Complies

#### Test Mode UNII-1\_TX AC(VHT40) Mode

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
38	5190	11.43	0.80	12.23	23.98	0.2500	Complies
46	5230	12.32	0.80	13.12	23.98	0.2500	Complies



Test Mod	e UNII-3	B_TX A Mode					
Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
149	5745	12.41	0.33	12.74	30.00	1.0000	Complies
157	5785	12.87	0.33	13.20	30.00	1.0000	Complies
165	5825	13.52	0.33	13.85	30.00	1.0000	Complies

## Test Mode UNII-3\_TX N(HT20) Mode

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
149	5745	12.08	0.20	12.28	30.00	1.0000	Complies
157	5785	12.68	0.20	12.88	30.00	1.0000	Complies
165	5825	13.41	0.20	13.61	30.00	1.0000	Complies

### Test Mode UNII-3\_TX N(HT40) Mode

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
151	5755	11.43	0.63	12.06	30.00	1.0000	Complies
159	5795	12.32	0.63	12.95	30.00	1.0000	Complies

## Test Mode UNII-3\_TX AC(VHT20) Mode

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
149	5745	12.18	0.21	12.39	30.00	1.0000	Complies
157	5785	12.72	0.21	12.93	30.00	1.0000	Complies
165	5825	13.67	0.21	13.88	30.00	1.0000	Complies

### Test Mode UNII-3\_TX AC(VHT40) Mode

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
151	5755	11.74	0.80	12.54	30.00	1.0000	Complies
159	5795	12.38	0.80	13.18	30.00	1.0000	Complies

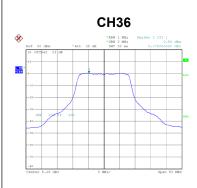




# **APPENDIX G - POWER SPECTRAL DENSITY**



Test	Test Mode UNII-1_TX A Mode						
Cha	annel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Duty Factor	Power Spectral Density + Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Result
3	36	5180	0.59	0.33	0.92	11.00	Complies
4	40	5200	0.77	0.33	1.10	11.00	Complies
4	18	5240	0.48	0.33	0.81	11.00	Complies



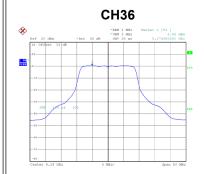




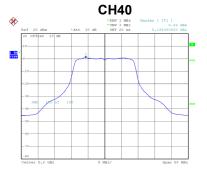
### Date: 27.MAY.2022 12:08:28

# Test Mode UNII-1\_TX AC(VHT20) Mode

Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Duty Factor	Power Spectral Density + Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180	0.56	0.21	0.77	11.00	Complies
40	5200	0.49	0.21	0.70	11.00	Complies
48	5240	0.36	0.21	0.57	11.00	Complies



Date: 27.MAY.2022 12:11:15





Date: 27.MAY.2022 12:11:39



# Test Mode UNII-1\_TX AC(VHT40) Mode

Channe	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Duty Factor	Power Spectral Density + Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190	-3.07	0.80	-2.27	11.00	Complies
46	5230	-3.10	0.80	-2.30	11.00	Complies



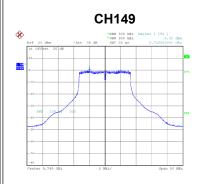


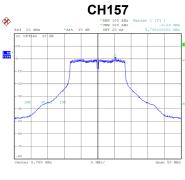
Date: 27.MAY.2022 12:14:11

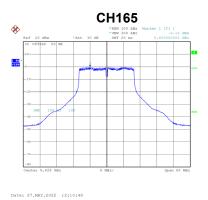
Date: 27.MAY.2022 12:14:43



Test Mode UNII-3_TX A Mode						
Channel	Frequency (MHz)	Power Spectral Density (dBm/500 kHz)	Duty Factor	Power Spectral Density + Duty Factor (dBm/500 kHz)	Max. Limit (dBm/500 kHz)	Result
149	5745	-0.32	0.33	0.01	30.00	Complies
157	5785	-0.29	0.33	0.04	30.00	Complies
165	5825	-0.13	0.33	0.20	30.00	Complies

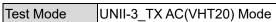




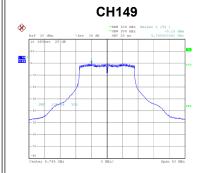


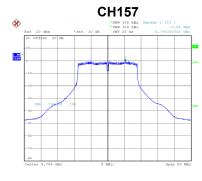
Date: 27.MAY.2022 12:09:40

Date: 27.MAY.2022 12:10:22



Channel	Frequency (MHz)	Power Spectral Density (dBm/500 kHz)	Duty Factor	Power Spectral Density + Duty Factor (dBm/500 kHz)	Max. Limit (dBm/500 kHz)	Result
149	5745	-0.19	0.21	0.02	30.00	Complies
157	5785	-0.56	0.21	-0.35	30.00	Complies
165	5825	-0.28	0.21	-0.07	30.00	Complies





Date: 27.MAY.2022 12:12:56



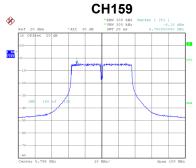
Date: 27.MAY.2022 12:12:28

Page 95 of 99



Test Mod	Test Mode UNII-3_TX AC(VHT40) Mode						
Channel	Frequency (MHz)	Power Spectral Density (dBm/500 kHz)	Duty Factor	Power Spectral Density + Duty Factor (dBm/500 kHz)	Max. Limit (dBm/500 kHz)	Result	
151	5755	-4.42	0.80	-3.62	30.00	Complies	
159	5795	-4.18	0.80	-3.38	30.00	Complies	





Date: 27.MAY.2022 12:15:21

Date: 27.MAY.2022 12:15:43





# **APPENDIX H - FREQUENCY STABILITY**



Test Mode

le UNII-1

## Voltage vs. Frequency Stability

Voltage (V)	Measurement Frequency (MHz)		
Center Frequency	5180.0000		
5.75	5179.9816		
5	5179.9812		
4.25	5179.9812		
Maximum Deviation (MHz)	0.0188		
Maximum Deviation (ppm)	3.6293		

# Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
Center Frequency	5180.0000
0	5179.9812
10	5179.9812
20	5179.9808
30	5179.9808
40	5179.9808
45	5179.9808
Maximum Deviation (MHz)	0.0192
Maximum Deviation (ppm)	3.7066



Test Mode

UNII-3

## Voltage vs. Frequency Stability

Voltage (V)	Measurement Frequency (MHz)		
Center Frequency	5745.0000		
5.75	5744.9788		
5	5744.9796		
4.25	5744.9796		
Maximum Deviation (MHz)	0.0212		
Maximum Deviation (ppm)	3.6902		

# Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
Center Frequency	5745.0000
0	5744.9804
10	5744.9804
20	5744.9804
30	5744.9804
40	5744.9808
45	5744.9804
Maximum Deviation (MHz)	0.0196
Maximum Deviation (ppm)	3.4117

### **End of Test Report**