

Report No. : FR191618

# RADIO TEST REPORT

FCC ID

: Z8H89FT0075

Equipment

: ePMP 6GHz Force 4625 SM

**Brand Name** 

: Cambium Networks

Model Name

: ePMP 6GHz Force 4625 SM

Model Number: C068940P142A

**Applicant** 

: Cambium Networks Inc.

3800 Golf Road, Suite 360 Rolling Meadows, IL

60008, USA

Manufacturer

: Cambium Networks, Ltd.

Ashburton, TQ13 7UP, UK

Standard

: 47 CFR FCC Part 15.407

The product was received on Sep. 22, 2021, and testing was started from Sep. 27, 2021 and completed on Sep. 11, 2023. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

TEL: 886-3-656-9065

FAX: 886-3-656-9085

Report Template No.: CB-A12\_5 Ver1.1

: 1 of 33 Page Number

: Mar. 20, 2024 Issued Date

Report Version : 02

## **Table of Contents**

Histo	ory of this test report	3
Sumi	mary of Test Result	4
1	General Description	
1.1	Information	
1.2	Applicable Standards	
1.3	Testing Location Information	
1.4	Measurement Uncertainty	
2	Test Configuration of EUT	11
2.1	Test Channel Mode	11
2.2	The Worst Case Measurement Configuration	12
2.3	EUT Operation during Test	13
2.4	Accessories	13
2.5	Support Equipment	13
2.6	Test Setup Diagram	15
3	Transmitter Test Result	18
3.1	AC Power-line Conducted Emissions	18
3.2	Emission Bandwidth	20
3.3	Maximum Equivalent Isotopically Radiated Power (E.I.R.P.)	21
3.4	Peak Power Spectral Density (E.I.R.P.)	24
3.5	Unwanted Emissions	27
4	Test Equipment and Calibration Data	32

Appendix A. Test Results of AC Power-line Conducted Emissions

**Appendix B. Test Results of Emission Bandwidth** 

Appendix C. Test Results of Maximum Equivalent Isotopically Radiated Power (E.I.R.P.)

Appendix D. Test Results of Peak Power Spectral Density (E.I.R.P.)

**Appendix E. Test Results of Unwanted Emissions** 

**Appendix F. Test Photos** 

Photographs of EUT v01

TEL: 886-3-656-9065 FAX: 886-3-656-9085

Report Template No.: CB-A12\_5 Ver1.1

Page Number : 2 of 33

Issued Date : Mar. 20, 2024

**Report No. : FR191618** 

Report Version : 02

# History of this test report

**Report No. : FR191618** 

Report No.	Version	Description	Issued Date
FR191618	01	Initial issue of report	Jan. 23, 2024
FR191618	02	Revising the device type	Mar. 20, 2024

TEL: 886-3-656-9065 Page Number : 3 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

## **Summary of Test Result**

**Report No.: FR191618** 

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark	
1.1.2	15.203	Antenna Requirement	PASS	-	
3.1	15.207	AC Power-line Conducted Emissions	PASS	-	
3.2	15.407(a)	Emission Bandwidth	PASS	-	
3.3	15.407(a)	Maximum Equivalent Isotopically Radiated Power (E.I.R.P.)	PASS	-	
3.4	15.407(a)	Peak Power Spectral Density (E.I.R.P.) PASS -		-	
3.5	15.407(b)	Unwanted Emissions	PASS	-	

#### **Conformity Assessment Condition:**

- 1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- 2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

#### Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sam Chen

Report Producer: Lavender Zeng

TEL: 886-3-656-9065 Page Number : 4 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

# 1 General Description

### 1.1 Information

#### 1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5925-6425			1-93 [24]
6525-6875	ax (HEW20)	6535-6855	117-181 [17]
5925-6425	ov (HEW/40)	5965-6405	3-91 [12]
6525-6875	ax (HEW40)	6565-6845	123-179 [8]
5925-6425	ov (UEW00)	5985-6385	7-87 [6]
6525-6875	ax (HEW80)	6625-6785	135-167 [3]
5925-6425	ov (HEW160)	6025-6345	15-79 [3]
6525-6875	ax (HEW160)	6665	143 [1]

**Report No. : FR191618** 

Band	Mode	BWch (MHz)	Nant		
5.925-6.425GHz	802.11ax HEW20	20	2TX		
5.925-6.425GHz	802.11ax HEW40	802.11ax HEW40 40 2TX			
5.925-6.425GHz	802.11ax HEW80	80	2TX		
5.925-6.425GHz	802.11ax HEW160	160	2TX		
6.525-6.875GHz	802.11ax HEW20	20	2TX		
6.525-6.875GHz	802.11ax HEW40	40	2TX		
6.525-6.875GHz	802.11ax HEW80	80	2TX		
6.525-6.875GHz	802.11ax HEW160	160	2TX		

#### Note:

• HEW20, HEW40, HEW80 and HEW160 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.

• BWch is the nominal channel bandwidth.

TEL: 886-3-656-9065 Page Number : 5 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

#### 1.1.2 Antenna Information

					Gain (dBi)				
An	. Port	Brand	Model Name	Antenna Type	ame Antenna Type C		5GHz	6GHz	6GHz
						UNII 3	UNII 5	UNII 7	
1	1/2	Cambium	25dBi Dish antenna	Dish	N/A	25.38	25.38	26.22	

**Report No.: FR191618** 

Note 1: Directional gain information

Туре	Maximum Output Power	Power Spectral Density
Non-BF	Directional gain = Max.gain + array gain. For power measurements on IEEE 802.11 devices Array Gain = 0 dB (i.e., no array gain) for N ANT ≤ 4	$Directional Gain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^{2}}{N_{ANT}} \right]$
BF	$Directional Gain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{AMT}} g_{j,k} \right\}^{2}}{N_{ANT}} \right]$	$Directional Gain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^{2}}{N_{ANT}} \right]$

Ex.

Directional Gain = 
$$10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{BE}} \left\{ \sum_{k=1}^{N_{BE}} \mathbf{g}_{j,k} \right\}^{2}}{N_{ANT}} \right]$$

$$\begin{split} & \text{NSS1}(\text{g1,1}) = \ 10^{\text{G1/20}} \ ; \ \text{NSS1}(\text{g1,2}) = \ 10^{\text{G2/20}} \ ; \ \text{NSS1}(\text{g1,2}) = \ 10^{\text{G3/20}}; \ \text{NSS1}(\text{g1,2}) = \ 10^{\text{G4/20}} \\ & \text{gj,k} = & (\text{Nss1}(\text{g1,1}) \ + \ \text{Nss1}(\text{g1,2}) \ + \ \text{Nss1}(\text{g1,3}) \ + \ \text{Nss1}(\text{g1,4}) \ )^2 \\ & \text{DG} = 10 \ \log[(\text{Nss1}(\text{g1,1}) \ + \ \text{Nss1}(\text{g1,2}) \ + \ \text{Nss1}(\text{g1,3}) \ + \ \text{Nss1}(\text{g1,4}))^2 \ / \ \text{N}_{ANT}/\textit{Nss}] => 10 \\ & \log[(10^{\text{G1/20}} \ + \ 10^{\text{G2/20}} \ + \ 10^{\text{G3/20}} \ + \ 10^{\text{G4/20}} \ )^2 \ / \ \text{N}_{ANT}] \\ & \text{Where} \ ; \end{split}$$

#### Cross-Polarized Antenna

5G UNII-3 G1 = 25.38 dBi; G2 = 25.38 dBi

6E UNII-5 G1 = 25.38 dBi; G2 = 25.38 dBi;

6E UNII-7 G1 = 26.22 dBi; G2 = 26.22 dBi;

5G UNII-3 DG = 25.38 dBi

6E UNII-5 DG = 25.38 dBi

6E UNII-7 DG = 26.22 dBi

Note 2: The above information was declared by manufacturer.

TEL: 886-3-656-9065 Page Number : 6 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

Note 3: The EUT has one antenna.

#### <5GHz UNII 3 function>

#### For IEEE 802.11a/n/ac/ax mode (2TX/2RX)

Port 1, Port 2 can be used as transmitting/receiving antenna.

Port 1, Port 2 could transmit/receive simultaneously.

#### <6GHz UNII 5 and UNII 7 function>

### For IEEE 802.11ax mode (2TX/2RX)

Port 1, Port 2 can be used as transmitting/receiving antenna.

Port 1, Port 2 could transmit/receive simultaneously.

## 1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11ax HEW20	0.931	0.31	5.452m	300
802.11ax HEW40	0.931	0.31	5.452m	300
802.11ax HEW80	0.929	0.32	5.452m	300
802.11ax HEW160	0.927	0.33	5.452m	300

**Report No.: FR191618** 

- DC is Duty Cycle.
- DCF is Duty Cycle Factor.

### 1.1.4 EUT Operational Condition

EUT Power Type		From PoE				
Beamforming Function		With beamforming	$\boxtimes$	Without beamforming		
Device Toma		Indoor Access Point		Subordinate		
		Indoor Client	$\boxtimes$	Standard Power Access Point		
Device Type		Dual Client	$\boxtimes$	Standard Client		
	$\boxtimes$	Fixed Client				
Channel Puncturing Function		Supported	$\boxtimes$	Unsupported		
Support RU		Full RU		Partial RU		
Test Software Version		For RF Conducted: QSPR V5.0-00199 For other tests: QSPR v5.0-00201				

Note: The above information was declared by manufacturer.

TEL: 886-3-656-9065 Page Number : 7 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

## 1.1.5 Table for EUT supports functions

Function	Support Band
Master	5GHz UNII 3 / 6GHz UNII5, UNII 7
Slave	5GHz UNII 3 / 6GHz UNII5, UNII 7

**Report No. : FR191618** 

Note: The above information was declared by manufacturer.

### 1.1.6 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR191618-01 Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
	Only evaluated Fixed Client for below test items:
	AC power-line conducted emissions
Adding 6GHz function (UNII 5, UNII 7) for	2. Emission Bandwidth
the device.	3. Maximum Equivalent Isotopically Radiated Power (E.I.R.P.)
	4. Peak Power Spectral Density (E.I.R.P.)
	5. Unwanted Emissions

TEL: 886-3-656-9065 Page Number : 8 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

## 1.2 Applicable Standards

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

**Report No.: FR191618** 

- 47 CFR FCC Part 15.407
- ANSI C63.10-2013
- FCC KDB 789033 D02 v02r01

The following reference test guidance is not within the scope of accreditation of TAF.

- FCC KDB 987594 D02 v02r01
- FCC KDB 662911 D01 v02r01
- FCC KDB 412172 D01 v01r01
- FCC KDB 414788 D01 v01r01

### 1.3 Testing Location Information

Testing Location Information	n
------------------------------	---

Test Lab.: Sporton International Inc. Hsinchu Laboratory

Hsinchu ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

(TAF: 3787) TEL: 886-3-656-9065 FAX: 886-3-656-9085

Test site Designation No. TW3787 with FCC.

Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH03-CB	Owen Hsu	24.2-25.1 / 54-63	Sep. 11, 2023
Radiated (other tests)	03CH01-CB	RJ Huang	21.2-22.3 / 56-59	Sep. 08, 2023~ Sep. 11, 2023
Radiated (Below 1GHz)	03CH05-CB	Bruce Yang	23.5-24.6 / 55-59	Sep. 27, 2021
AC Conduction	CO02-CB	Ryo Fan	22~23 / 58~59	Sep. 28, 2021

TEL: 886-3-656-9065 Page Number : 9 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

# 1.4 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)

**Report No.: FR191618** 

#### For AC Conduction and Radiated Below 1GHz:

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	4.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.5 dB	Confidence levels of 95%

#### For other tests:

Test Items	Uncertainty	Remark
Radiated Emission (1GHz ~ 18GHz)	4.1 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.2 dB	Confidence levels of 95%
Conducted Emission	3.1 dB	Confidence levels of 95%
Output Power Measurement	0.8 dB	Confidence levels of 95%
Power Density Measurement	3.1 dB	Confidence levels of 95%
Bandwidth Measurement	2.2%	Confidence levels of 95%

TEL: 886-3-656-9065 Page Number : 10 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

# 2 Test Configuration of EUT

# 2.1 Test Channel Mode

Mode	Power Setting
802.11ax HEW20_Nss1,(MCS0)_2TX	-
5955MHz	12.5
6175MHz	12.5
6415MHz	12
6535MHz	11.5
6695MHz	11.5
6855MHz	11
802.11ax HEW40_Nss1,(MCS0)_2TX	-
5965MHz	13.5
6165MHz	14
6405MHz	13.5
6565MHz	13.5
6685MHz	13
6845MHz	12.5
802.11ax HEW80_Nss1,(MCS0)_2TX	-
5985MHz	13.5
6145MHz	14
6385MHz	14
6625MHz	13.5
6705MHz	13.5
6785MHz	13
802.11ax HEW160_Nss1,(MCS0)_2TX	-
6025MHz	13
6185MHz	13.5
6345MHz	13.5
6665MHz	13

**Report No. : FR191618** 

TEL: 886-3-656-9065 Page Number : 11 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

# 2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests		
Tests Item AC power-line conducted emissions		
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz	
Operating Mode	Normal Link	
1	EUT_WLAN 6GHz	

**Report No. : FR191618** 

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emission Bandwidth Emission MASK Maximum E.I.R.P. at any elevation angle above 30 degrees		
Test Condition Conducted measurement at transmit chains			

The Worst Case Mode for Following Conformance Tests			
Tests Item  Maximum Equivalent Isotopically Radiated Power (E.I.R.P.)  Peak Power Spectral Density (E.I.R.P.)			
	Radiated measurement		
Test Condition	After evaluating, the worst case was found at Z axis. Thus, the measurement will follow this same test configuration.		
1 EUT in Z axis			

The Worst Case Mode for Following Conformance Tests				
Tests Item Unwanted Emissions				
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.			
	Normal Link			
Operating Mode < 1GHz	After evaluating, the worst case was found at Z axis. Thus, the measurement will follow this same test configuration.			
1	EUT_WLAN 6GHz in Z axis			
	CTX			
Operating Mode > 1GHz	After evaluating, the worst case was found at Z axis. Thus, the measurement will follow this same test configuration.			
1	EUT in Z axis			

Note: The PoE below is for measurement only, would not be marketed.

The PoE information as below:

Support Unit	Brand	Model Number
PoE	CWT	P015U06

TEL: 886-3-656-9065 Page Number : 12 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

## 2.3 EUT Operation during Test

For CTX Mode:

The EUT was programmed to be in continuously transmitting mode.

For Normal Link:

During the test, the EUT operation to normal function.

#### 2.4 Accessories

N/A

## 2.5 Support Equipment

#### For AC Conduction:

Support Equipment					
No.	Equipment	Brand Name	Model Name	FCC ID	
Α	LAN NB	DELL	E6430	N/A	
В	PoE	CWT	P015U06	N/A	
С	6E Device	Cambium	Force 4625	N/A	
D	Device NB	DELL	E6430	N/A	
Е	GPS	SKYLAB M&C Technology Co., Lt	SKM55D	N/A	

**Report No. : FR191618** 

#### For Radiated (below 1GHz):

	Support Equipment					
No.	Equipment	Brand Name	Model Name	FCC ID		
Α	PoE	CWT	P015U06	N/A		
В	NB	DELL	E4300	N/A		
С	GPS	SKYLAB M&C Technology Co., Lt	SKM55D	N/A		
D	NB	DELL	E4300	N/A		
Е	6E Device	Cambium	Force 4625	N/A		

TEL: 886-3-656-9065 Page Number : 13 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

For Radiated (above 1GHz) and RF Radiated (Maximum Equivalent Isotopically Radiated Power (E.I.R.P.) and Peak Power Spectral Density (E.I.R.P.):

**Report No. : FR191618** 

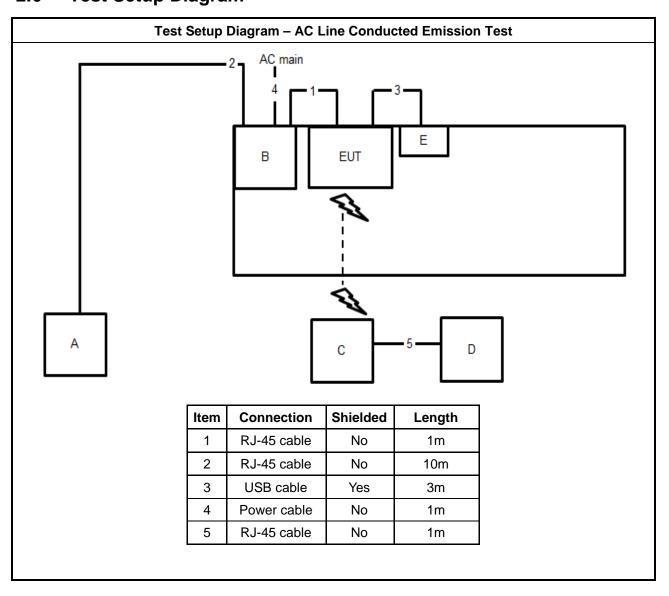
	Support Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
Α	Notebook	DELL	E4300	N/A
В	POE	CWT	P015U06	N/A

#### For RF Conducted:

	Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID	
Α	Notebook	DELL	E4300	N/A	
В	POE	CWT	P015U06	N/A	

TEL: 886-3-656-9065 Page Number : 14 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

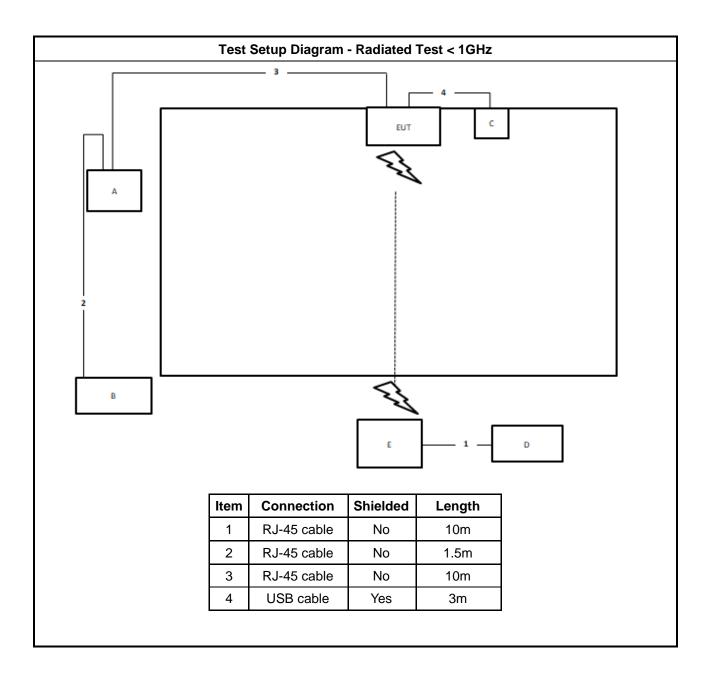
# 2.6 Test Setup Diagram



**Report No. : FR191618** 

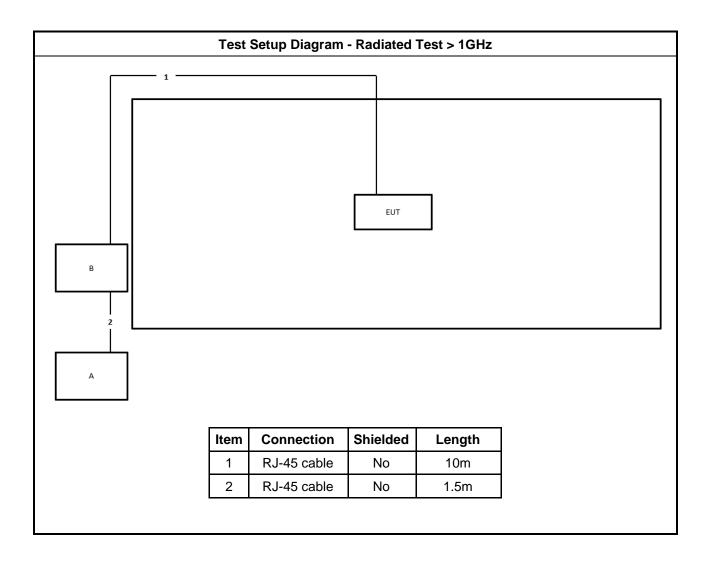
TEL: 886-3-656-9065 Page Number : 15 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

Report No. : FR191618



TEL: 886-3-656-9065 Page Number : 16 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

Report No. : FR191618



TEL: 886-3-656-9065 Page Number : 17 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

## 3 Transmitter Test Result

## 3.1 AC Power-line Conducted Emissions

#### 3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz) Quasi-Peak Average		
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

**Report No. : FR191618** 

## 3.1.2 Measuring Instruments

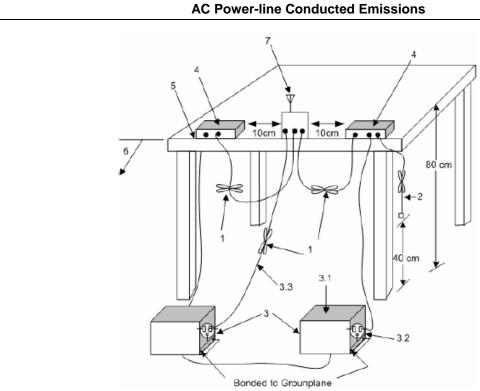
Refer a test equipment and calibration data table in this test report.

## 3.1.3 Test Procedures

	Test Method
$\boxtimes$	Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

TEL: 886-3-656-9065 Page Number : 18 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

#### 3.1.4 Test Setup



1—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 cm to 40 cm long.

Report No.: FR191618

- 2—The I/O cables that are not connected to an accessory 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.
- 3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50  $\Omega$  loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
- 3.1—All other equipment powered from additional LISN(s).
- 3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
- 3.3—LISN at least 80 cm from nearest part of EUT chassis.
- 4—Non-EUT components of EUT system being tested.
- 5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
- 6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
- 7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

#### 3.1.5 Measurement Results Calculation

The measured Level is calculated using:

- a. Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- b. Margin = Limit + (Read Level + LISN Factor + Cable Loss)

#### 3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

TEL: 886-3-656-9065 Page Number : 19 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

## 3.2 Emission Bandwidth

#### 3.2.1 Emission Bandwidth Limit

	Emission Bandwidth Limit				
UNI	JNII Devices				
$\boxtimes$	For the 5925-6425 GHz band, N/A				
	For the 6425-6525 GHz band, N/A				
$\boxtimes$	For the 6525-6875 GHz band, N/A				
	For the 6875-7125 GHz band, N/A				
RL	AN Devices				
	For the 5925-6425 GHz band, N/A				
	For the 6425-6525 GHz band, N/A				
	For the 6525-6875 GHz band, N/A				
	For the 6875-7125 GHz band, N/A				

**Report No. : FR191618** 

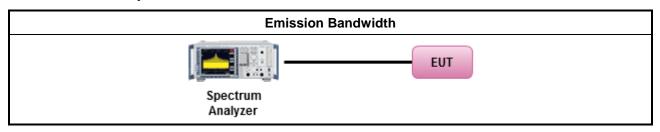
### 3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

#### 3.2.3 Test Procedures

	Test Method		
•	For the emission bandwidth shall be measured using one of the options below:		
		According to FCC KDB 987594 D02 clause II.C, measurement procedure shall refer to FCC KDB 789033 D02, clause C for EBW and clause D for OBW measurement.	
		Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.	
		Refer as IC RSS-Gen, clause 4.6 for bandwidth testing.	

## 3.2.4 Test Setup



### 3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

TEL: 886-3-656-9065 Page Number : 20 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024



# 3.3 Maximum Equivalent Isotopically Radiated Power (E.I.R.P.)

**Report No. : FR191618** 

## 3.3.1 Maximum Equivalent Isotopically Radiated Power (E.I.R.P.) Limit

	Maximum Equivalent Isotopically Radiated Power (E.I.R.P.) Limit				
UNI	UNII Devices				
$\boxtimes$	For the 5.925 ~ 6.425 GHz band:				
	•	For standard power access point and fixed client device : e.i.r.p < 36 dBm , For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees not exceed 125 mW (21 dBm).			
	-	For indoor access point : e.i.r.p < 30 dBm.			
	-	For subordinate device control of an indoor access point : e.i.r.p < 30 dBm.			
	-	For client device control of a standard power access point : e.i.r.p < 30 dBm.			
	•	For client device control of an indoor access point : e.i.r.p < 24 dBm.			
	For	the 6.425 ~ 6.525 GHz band:			
	•	For indoor access point : e.i.r.p < 30 dBm.			
	-	For client device control of an indoor access point : e.i.r.p < 24 dBm.			
$\boxtimes$	For	the 6.525 ~ 6.875 GHz band:			
	•	For standard power access point and fixed client device : e.i.r.p < 36 dBm , For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees not exceed 125 mW (21 dBm).			
	-	For indoor access point : e.i.r.p < 30 dBm.			
	•	For subordinate device control of an indoor access point : e.i.r.p < 30 dBm.			
	•	For client device control of a standard power access point : e.i.r.p < 30 dBm.			
	-	For client device control of an indoor access point : e.i.r.p < 24 dBm.			
	For	the 6.875 ~ 7.125 GHz band:			
	•	For indoor access point : e.i.r.p < 30 dBm.			
	•	For client device control of an indoor access point : e.i.r.p < 24 dBm.			
RL	AN [	Devices			
	For the 5.925 ~ 7.125 GHz band:				
	-	For low-power indoor access-points & indoor subordinate devices < 30 dBm .			
	-	For low-power client devices < 24 dBm.			
	For	the 5.925 ~ 6.875 GHz band:			
	•	For standard-power access points & fixed client devices < 36 dBm.			
	•	For standard client devices < 30 dBm.			

TEL: 886-3-656-9065 Page Number : 21 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024



## 3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

## 3.3.3 Test Procedures

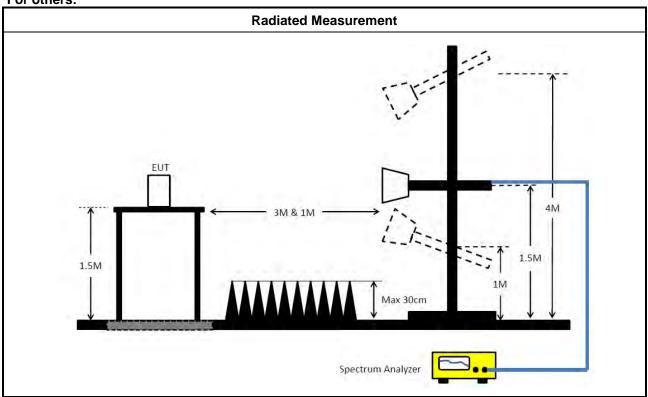
	Test Method			
•	According to FCC KDB 987594 D02 clause II.E, the test measurement procedure shall refer to KDB 789033.			
	Average over on/off periods with duty factor			
		For others: Refer as FCC KDB 789033 D02, clause E Method SA-2 (spectral trace averaging). Spectrum analyzer setting: RBW/VBW: 1/3MHz; Detector: RMS; Trace mode: Average; Sweep Count 100.		
	Refer as FCC KDB 789033 D02, clause E Method SA-2 Alt. (RMS detection with slow sweed)			
	Wid	eband RF power meter and average over on/off periods with duty factor		
		For Maximum E.I.R.P. at any elevation angle above 30 degrees: Refer as FCC KDB 789033 D02, clause E Method PM-G (using an RF average power meter).		
	For conducted measurement.			
	•	If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.		
	•	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + + P_n \\ \text{(calculated in linear unit [mW] and transfer to log unit [dBm])} \\ \text{EIRP}_{total} = P_{total} + DG$		
$\boxtimes$	For	radiated measurement.		
	•	Refer as FCC KDB 789033 D02 clause II A.1.F "Antenna-port Conducted versus Radiated Testing"		
	•	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.		
	•	Refer as FCC KDB 412172 D01 clause 2.2 for EIRP calculation.		

**Report No. : FR191618** 

TEL: 886-3-656-9065 Page Number : 22 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

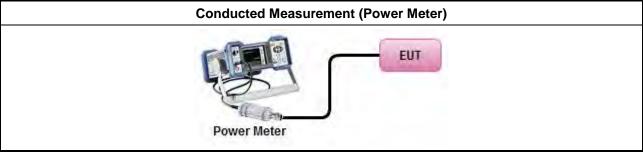
### 3.3.4 Test Setup

#### For others:



**Report No. : FR191618** 

For Maximum E.I.R.P. at any elevation angle above 30 degrees:



## 3.3.5 Test Result of Maximum Equivalent Isotopically Radiated Power (E.I.R.P)

Refer as Appendix C

TEL: 886-3-656-9065 Page Number : 23 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

# 3.4 Peak Power Spectral Density (E.I.R.P.)

## 3.4.1 Peak Power Spectral Density (E.I.R.P.) Limit

	Peak Power Spectral Density (E.I.R.P.) Limit				
UNI	UNII Devices				
$\boxtimes$	For	For the 5.925 ~ 6.425 GHz band:			
	•	For standard power access point and fixed client device : e.i.r.p PSD < 23 dBm/MHz.			
	•	For indoor access point : e.i.r.p PSD < 5 dBm/MHz.			
	•	For subordinate device control of an indoor access point : e.i.r.p PSD < 5 dBm/MHz.			
	•	For client device control of a standard power access point : e.i.r.p PSD < 17 dBm/MHz.			
	•	For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.			
	For	the 6.425 ~ 6.525 GHz band:			
	•	For indoor access point : e.i.r.p PSD < 5 dBm/MHz.			
	•	For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.			
$\boxtimes$	For	the 6.525 ~ 6.875 GHz band:			
	•	For standard power access point and fixed client device : e.i.r.p PSD < 23 dBm/MHz.			
	•	For indoor access point : e.i.r.p PSD < 5 dBm/MHz.			
	•	For subordinate device control of an indoor access point : e.i.r.p PSD < 5 dBm/MHz.			
	•	For client device control of a standard power access point : e.i.r.p PSD < 17 dBm/MHz.			
	•	For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.			
	For	the 6.875 ~ 7.125 GHz band:			
	•	For indoor access point : e.i.r.p PSD < 5 dBm/MHz.			
	•	For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.			
RL	AN D	evices			
	For	the 5.925 ~ 7.125 GHz band:			
	•	For low-power indoor access-points & indoor subordinate devices < 5 dBm / MHz.			
	•	For low-power client devices < -1 dBm / MHz.			
	For	the 5.925 ~ 6.875 GHz band:			
	•	For standard-power access points & fixed client devices < 23 dBm / MHz.			
	•	For standard client devices < 17 dBm / MHz.			

**Report No. : FR191618** 

## 3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

TEL: 886-3-656-9065 Page Number : 24 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024



### 3.4.3 Test Procedures

		Test Method	
•	Pea outp	ording to FCC KDB 987594 D02 clause II.F, the measurement procedure shall refer to KDB 789033. It power spectral density procedures that the same method as used to determine the conducted put power shall be used to determine the peak power spectral density and use the peak search cition on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density II be measured using below options:	
		Refer as FCC KDB 789033 D02, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth	
	[duty cycle ≥ 98% or external video / power trigger]		
	$\boxtimes$	Refer as FCC KDB 789033 D02, clause E Method SA-1 (spectral trace averaging).	
		Refer as FCC KDB 789033 D02, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)	
	duty	cycle < 98% and average over on/off periods with duty factor	
		Refer as FCC KDB 789033 D02, clause E Method SA-2 (spectral trace averaging).	
		Refer as FCC KDB 789033 D02, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)	
	For	conducted measurement.	
	•	If the EUT supports multiple transmit chains using options given below:	
		Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.	
		Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,	
		Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.	
	•	If multiple transmit chains, EIRP PPSD calculation could be following as methods:  PPSDtotal = PPSD1 + PPSD2 + + PPSDn  (calculated in linear unit [mW] and transfer to log unit [dBm])  EIRPtotal = PPSDtotal + DG	
$\boxtimes$	For	radiated measurement.	
	•	Refer as FCC KDB 789033 D02 clause II A.1.F "Antenna-port Conducted versus Radiated Testing"	
	•	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.	

**Report No. : FR191618** 

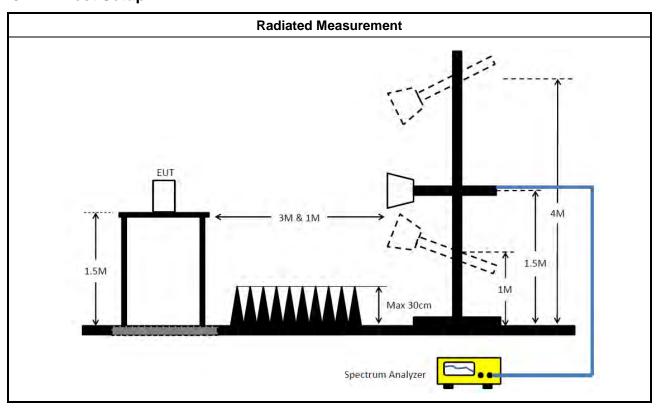
TEL: 886-3-656-9065 Page Number : 25 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

Report No. : FR191618

#### **Test Method**

• Refer as FCC KDB 412172 D01 clause 2.2 for EIRP calculation.

## 3.4.4 Test Setup



## 3.4.5 Test Result of Peak Power Spectral Density (E.I.R.P.)

Refer as Appendix D

TEL: 886-3-656-9065 Page Number : 26 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

#### 3.5 Unwanted Emissions

#### 3.5.1 Transmitter Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz limit				
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)	
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300	
0.490~1.705	24000/F(kHz)	33.8 - 23	30	
1.705~30.0	30	29	30	
30~88	100	40	3	
88~216	150	43.5	3	
216~960	200	46	3	
Above 960	500	54	3	

**Report No.: FR191618** 

- Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.
- Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m(20 x log (standard distance/ test distance) = 20log(3/1) = 9.54dB.

  EX. Above 18GHz emission limit calculation (3m to 1m) = 54dBuV/m at 3m + 9.54dB = 63.54 dBuV/m at 1m.

	Un-restricted band emissions above 1GHz Limit		
Frequency	Limit		
Any outside the 5.945 –	e.i.r.p27 dBm [68.2 dBuV/m@3m]		
7.125 GHz emission	Note 1: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m(20 x log (standard distance/test distance) = 20log(3/1) = 9.54dB.  EX. Above 18GHz emission limit calculation (3m to 1m) = 68.2dBuV/m at 3m + 9.54dB = 77.74 dBuV/m at 1m.  Note 2:-27 dBm EIRP OOBE is measured RMS which is a deviation from the current 15E rules for 5 GHz bands. In addition, 15.35(b) applies where the peak emissions must be limited to no more than 20 dB above the average limit.		

TEL: 886-3-656-9065 Page Number : 27 of 33

FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

**Frequency Emission MASK Limit** 5.945 - 7.125 GHz Power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel center, and by 40 dB at one- and one-half times the channel bandwidth away from channel center. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression, and at frequencies between one and one- and one-half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression. Emissions removed from the channel center by more than oneand one-half times the channel bandwidth must be suppressed by at least 40 dB. Fc - EBW Fc + EBW 28 dB 40 dB Fc + 1.5 X EBW EBW/2 - 1MHz 1.5 X EBW + 1MHz

Report No.: FR191618

TEL: 886-3-656-9065 Page Number : 28 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

### 3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

#### 3.5.3 Test Procedures

#### **Test Method**

Report No.: FR191618

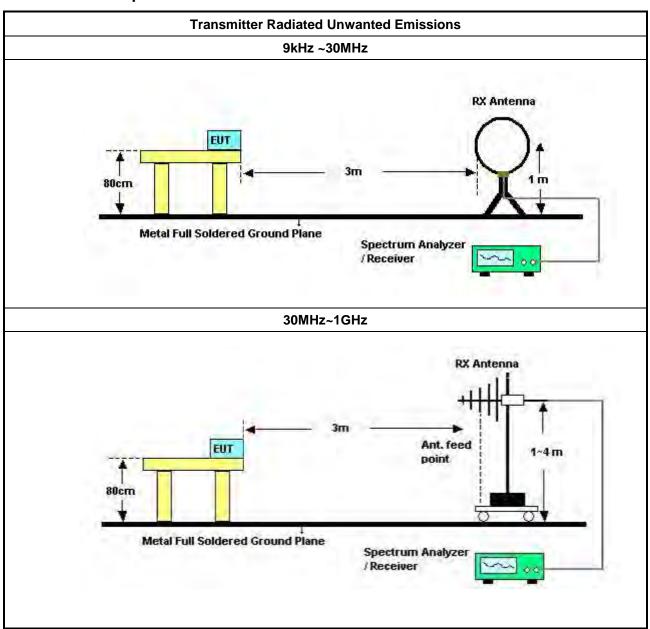
- According to FCC KDB 987594 D02 II.G. the unwanted emission measurement procedure shall refer to KDB 789300(except emission MASK).
  - Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
- For the transmitter unwanted emissions shall be measured using following options below:
  - Refer as FCC KDB 789033 D02, clause G)2) for unwanted emissions into non-restricted bands.
  - Refer as FCC KDB 789033 D02, clause G)1) for unwanted emissions into restricted bands.
    - Refer as FCC KDB 789033 D02, G)6) Method AD (Trace Averaging). (For unrestricted band measurement)
    - Refer as FCC KDB 789033 D02, G)6) Method VB (Reduced VBW).
    - Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time. (For restricted band average measurement)
    - Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
    - Refer as FCC KDB 789033 D02, clause G)5) measurement procedure peak limit.
    - Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
  - Refer as FCC KDB 789033 D02, clause G)3)d)ii) for Band edge Integration measurements.
- For emission MASK shall be measured using following options below:
  - Refer as FCC KDB 987594 D02, J) In-Band Emissions
- For radiated measurement.
  - Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
  - Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
  - Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
- The any unwanted emissions level shall not exceed the fundamental emission level.
- All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

TEL: 886-3-656-9065 Page Number : 29 of 33

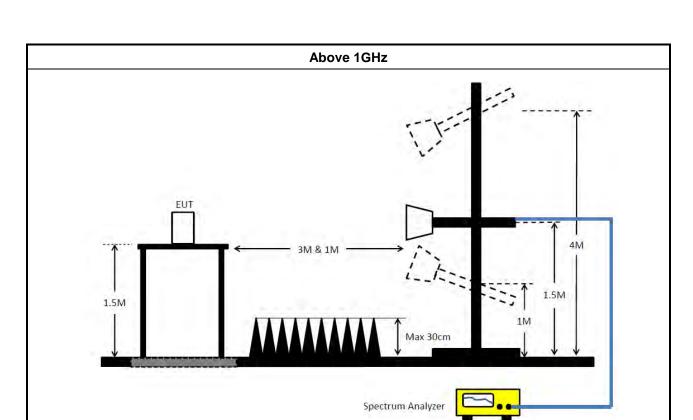
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

ADIO TEST REPORT Report No. : FR191618

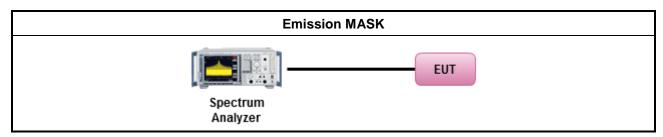
### 3.5.4 Test Setup



TEL: 886-3-656-9065 Page Number : 30 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024



Report No.: FR191618



#### 3.5.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level

### 3.5.6 Transmitter Unwanted Emissions (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10th harmonic or 40 GHz, whichever is appropriate.

#### 3.5.7 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E

TEL: 886-3-656-9065 Page Number : 31 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

# 4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Dec. 04, 2020	Dec. 04, 2020 Dec. 03, 2021	
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 20, 2020	Nov. 19, 2021	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	May 05, 2021	May 04, 2022	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F-N	00378	9kHz ~ 30MHz	Mar. 18, 2021 Mar. 17, 2022		Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Oct. 20, 2020	Oct. 19, 2021	Conduction (CO02-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 09, 2021 Aug. 08, 2022		Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	31244	9kHz - 30 MHz	Mar. 23, 2023 Mar. 22, 2024		Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 26, 2021 Mar. 25, 202		Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	Apr. 27, 2021	Apr. 26, 2022	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Nov. 10, 2020	Nov. 09, 2021	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 21, 2021	Jun. 20, 2022	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH05-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R. N.C.R.		Radiation (03CH05-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH01-CB	1GHz ~18GHz 3m	May 05, 2023	May 04, 2024	Radiation (03CH01-CB)
Horn Antenna	ETS-LINDGREN	3115	00075790	750MHz ~ 18GHz	Nov. 04, 2022	Nov. 03, 2023	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Sep. 04, 2023	Sep. 03, 2024	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02121	1GHz ~ 26.5GHz	May 18, 2023	May 17, 2024	Radiation (03CH01-CB)
Pre-Amplifier	SGH	SGH184	20221107-3	18GHz ~ 40GHz	Nov. 16, 2022	Nov. 15, 2023	Radiation (03CH01-CB)
Signal Analyzer	R&S	FSV3044	101437	10kHz ~ 44GHz	Nov. 29, 2022	Nov. 29, 2023	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH01-CB)

**Report No. : FR191618** 

TEL: 886-3-656-9065 Page Number : 32 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024

Instrument	Brand	Model No.	Serial No.	Characteristics	teristics Calibration Calibra Date Due D		Remark
High Cable	Woken	WCA0929M	M 40G#5+6 1GHz ~ 40 GHz Dec. 07, 2022 Dec. 06, 2023		Radiation (03CH01-CB)		
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH01-CB)
High Cable	Woken	WCA0929M	40G#6 1GHz ~ 40 GHz Dec. 07, 2022 Dec. 06, 2023		Dec. 06, 2023	Radiation (03CH01-CB)	
Test Software	SPORTON	SENSE	V5.10	-	N.C.R. N.C.R.		Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Dec. 30, 2022 Dec. 29, 2023		Conducted (TH03-CB)
Power Sensor	Anritsu	MA2411B	1531344	300MHz~40GHz	Aug. 01, 2023 Jul. 31, 2024		Conducted (TH03-CB)
Power Meter	Anritsu	ML2495A	1728002	300MHz~40GHz	Aug. 01, 2023	Jul. 31, 2024	Conducted (TH03-CB)
RF Cable	Woken	RG402	High Cable-11	30MHz –18 GHz	Feb. 14, 2023	Feb. 13, 2024	Conducted (TH03-CB)
RF Cable	Woken	RG402	High Cable-12	30MHz –18 GHz	Feb. 14, 2023	Feb. 13, 2024	Conducted (TH03-CB)
RF Cable	Woken	RG402	High Cable-13	30MHz –18 GHz	Feb. 14, 2023 Feb. 13, 2024		Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz –18 GHz	dz Oct. 03, 2022 Oct. 02, 2023		Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz –18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH03-CB)
Band Rejector	MTJ	6G Band Rejector	CB6G-BRJ-01	1GHz ~ 7.4GHz	Oct. 04, 2022	Oct. 03, 2023	Conducted (TH03-CB)
Band Rejector	MTJ	6G Band Rejector	CB6G-BRJ-02	1GHz ~ 8GHz	Oct. 04, 2022	Oct. 03, 2023	Conducted (TH03-CB)
Switch	SPTCB	SP-SWI	SWI-03	1 GHz –26.5 GHz	Oct. 04, 2022	Oct. 03, 2023	Conducted (TH03-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH03-CB)

**Report No. : FR191618** 

Note: Calibration Interval of instruments listed above is one year.

N.C.R means Non-Calibration required.

TEL: 886-3-656-9065 Page Number : 33 of 33
FAX: 886-3-656-9085 Issued Date : Mar. 20, 2024



## **Conducted Emissions at Powerline**

Appendix A

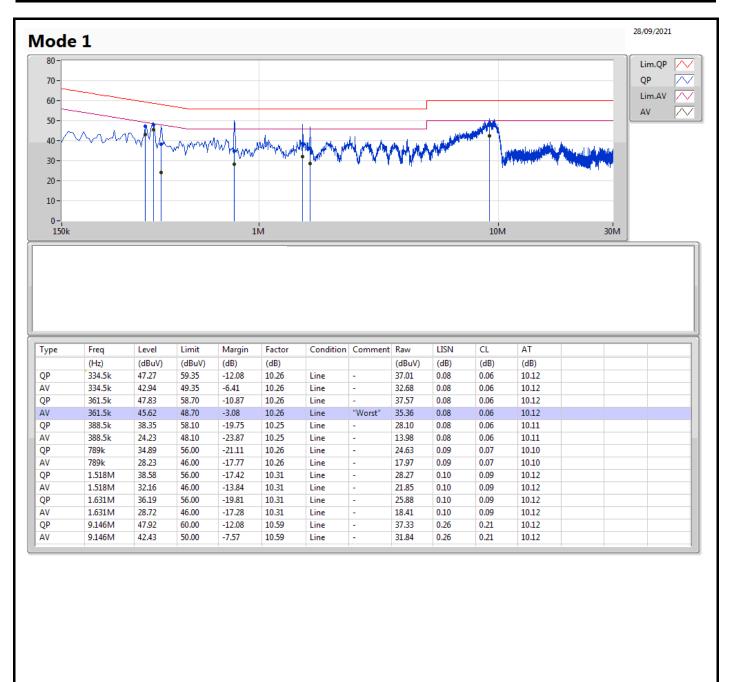
Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	361.5k	45.62	48.70	-3.08	Line

Sporton International Inc. Hsinchu Laboratory

Page No. : 1 of 3
Report No. : FR191618

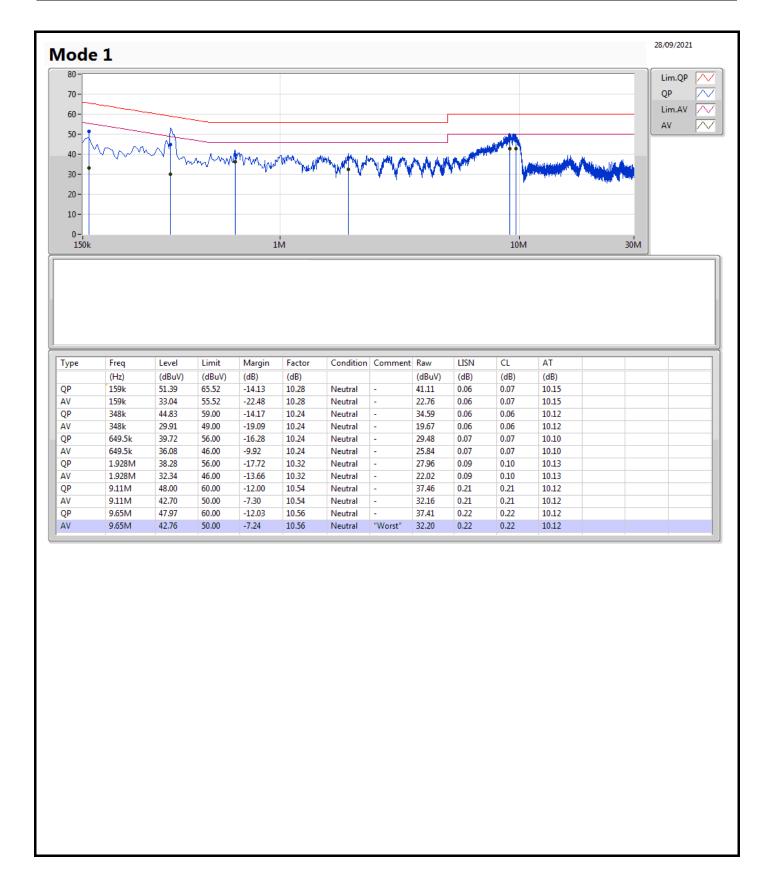




Page No. : 2 of 3

Report No. : FR191618





Page No. : 3 of 3 Report No. : FR191618



Appendix B **EBW** 

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
5.925-6.425GHz	-	-	-	-	-
802.11ax HEW20_Nss1,(MCS0)_2TX	21.065M	18.941M	18M9D1D	20.35M	18.866M
802.11ax HEW40_Nss1,(MCS0)_2TX	40.59M	37.831M	37M8D1D	39.38M	37.681M
802.11ax HEW80_Nss1,(MCS0)_2TX	82.06M	77.261M	77M3D1D	81.18M	76.862M
802.11ax HEW160_Nss1,(MCS0)_2TX	165M	155.922M	156MD1D	163.68M	155.522M
6.525-6.875GHz	-	-	-	-	-
802.11ax HEW20_Nss1,(MCS0)_2TX	21.175M	18.991M	19M0D1D	19.745M	18.891M
802.11ax HEW40_Nss1,(MCS0)_2TX	40.48M	37.781M	37M8D1D	40.04M	37.581M
802.11ax HEW80_Nss1,(MCS0)_2TX	82.28M	77.361M	77M4D1D	80.96M	76.962M
802.11ax HEW160_Nss1,(MCS0)_2TX	165.88M	155.922M	156MD1D	163.24M	155.322M

 $\label{eq:max-NdB} Max - N \ dB = Maximum \ 6dB \ down \ bandwidth \ for \ 5.725-5.85 \ GHz \ band \ / \ Maximum \ 26dB \ down \ bandwidth \ for \ other \ bandwidth \ for \ bandwidth \ for \ bandwidth \ for \ 5.725-5.85 \ GHz \ band \ / \ Maximum \ 26dB \ down \ bandwidth \ for \ other \ bandwidth \ for \ other \ bandwidth \ for \ b$ 

Page No. : 1 of 13 : FR191618 Report No.



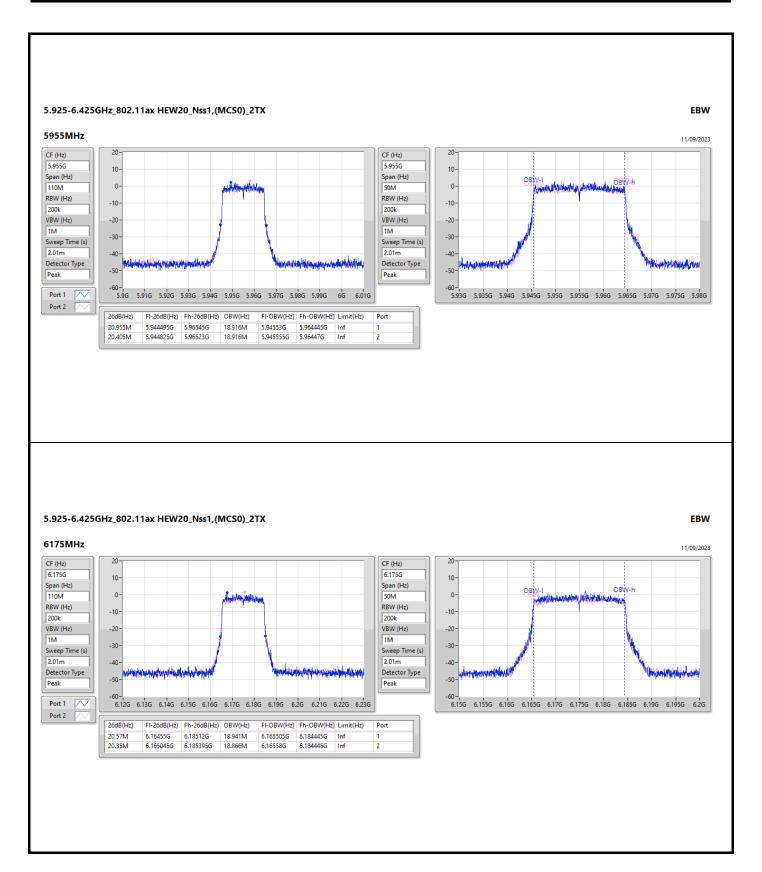
### Result

Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5955MHz	Pass	Inf	20.955M	18.916M	20.405M	18.916M
6175MHz	Pass	Inf	20.57M	18.941M	20.35M	18.866M
6415MHz	Pass	Inf	21.065M	18.916M	20.57M	18.891M
6535MHz	Pass	Inf	20.57M	18.966M	21.175M	18.916M
6695MHz	Pass	Inf	20.845M	18.941M	19.745M	18.891M
6855MHz	Pass	Inf	20.35M	18.916M	20.295M	18.991M
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5965MHz	Pass	Inf	40.37M	37.681M	40.26M	37.831M
6165MHz	Pass	Inf	39.38M	37.731M	40.15M	37.731M
6405MHz	Pass	Inf	40.15M	37.681M	40.59M	37.681M
6565MHz	Pass	Inf	40.37M	37.781M	40.48M	37.731M
6685MHz	Pass	Inf	40.48M	37.681M	40.04M	37.581M
6845MHz	Pass	Inf	40.04M	37.681M	40.48M	37.731M
802.11ax HEW80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5985MHz	Pass	Inf	82.06M	77.161M	81.62M	77.161M
6145MHz	Pass	Inf	81.84M	77.061M	81.18M	77.261M
6385MHz	Pass	Inf	81.4M	76.862M	81.4M	77.061M
6625MHz	Pass	Inf	81.4M	77.261M	80.96M	76.962M
6705MHz	Pass	Inf	82.06M	77.261M	81.84M	76.962M
6785MHz	Pass	Inf	82.06M	77.261M	82.28M	77.361M
802.11ax HEW160_Nss1,(MCS0)_2TX	-	-	-	-	-	-
6025MHz	Pass	Inf	164.56M	155.722M	163.68M	155.522M
6185MHz	Pass	Inf	165M	155.922M	164.12M	155.722M
6345MHz	Pass	Inf	165M	155.522M	164.56M	155.722M
6665MHz	Pass	Inf	165.88M	155.922M	163.24M	155.322M

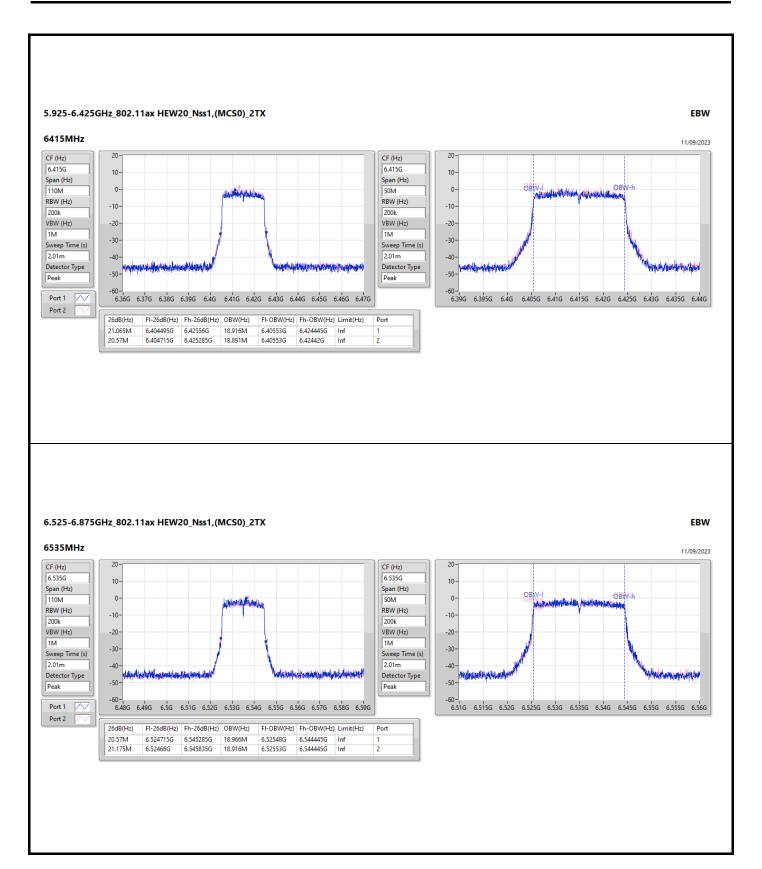
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band Port X-OBW = Port X 99% occupied bandwidth

Sporton International Inc. Hsinchu Laboratory

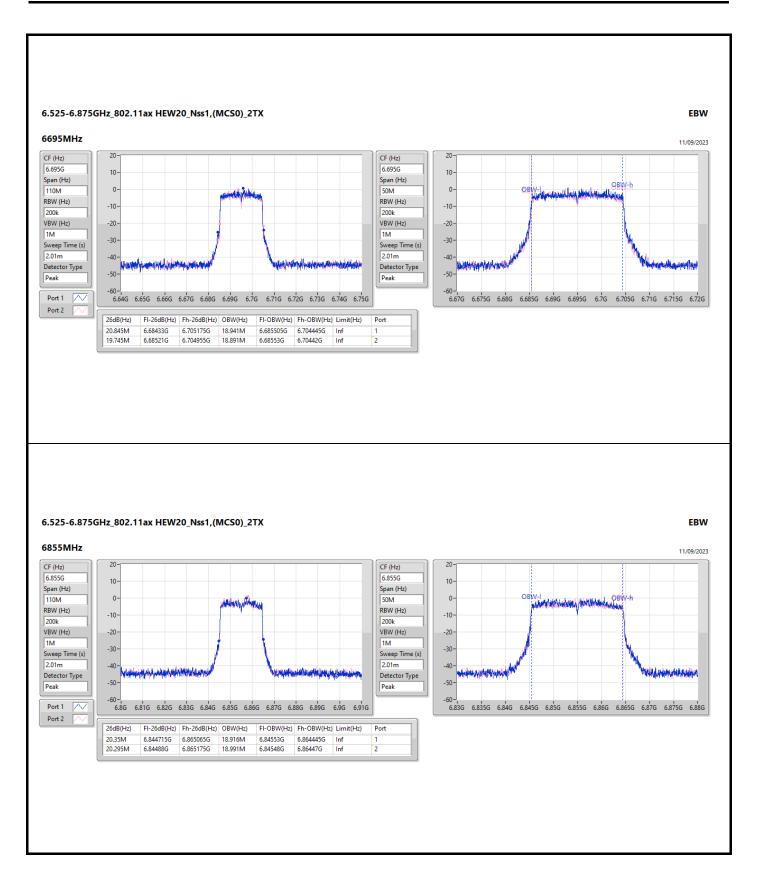
Page No. : 2 of 13 Report No. : FR191618



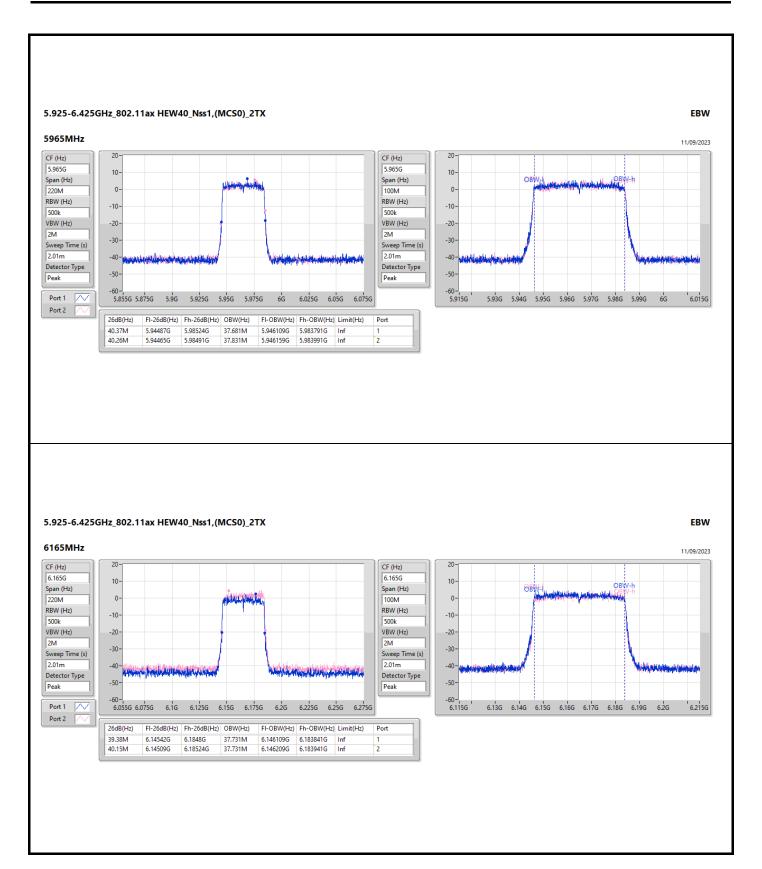
Page No. : 3 of 13 Report No. : FR191618



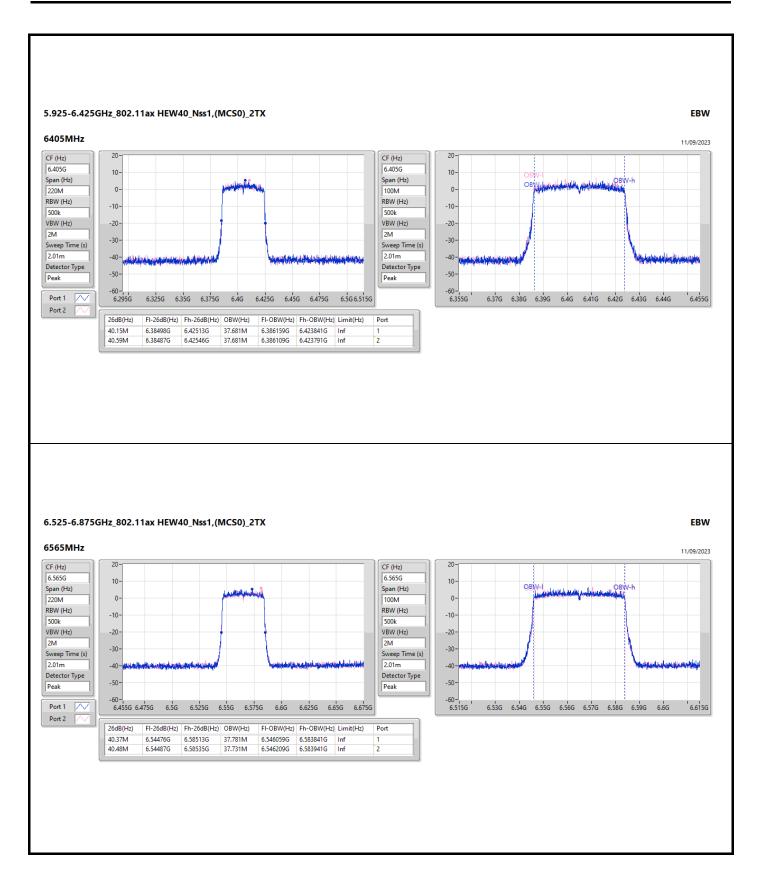
Page No. : 4 of 13 Report No. : FR191618



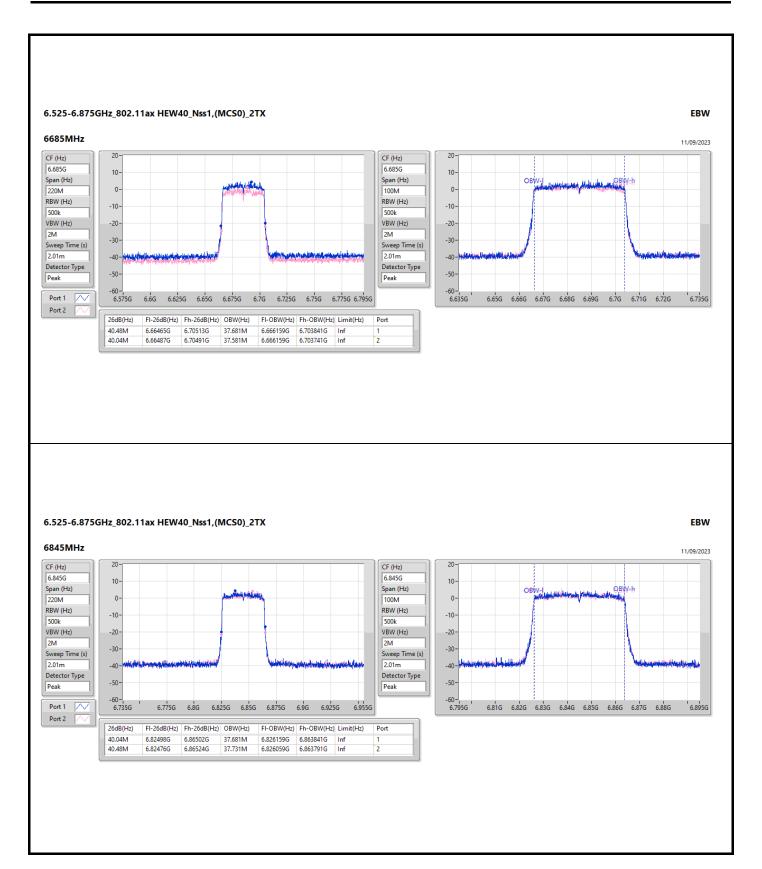
Page No. : 5 of 13 Report No. : FR191618



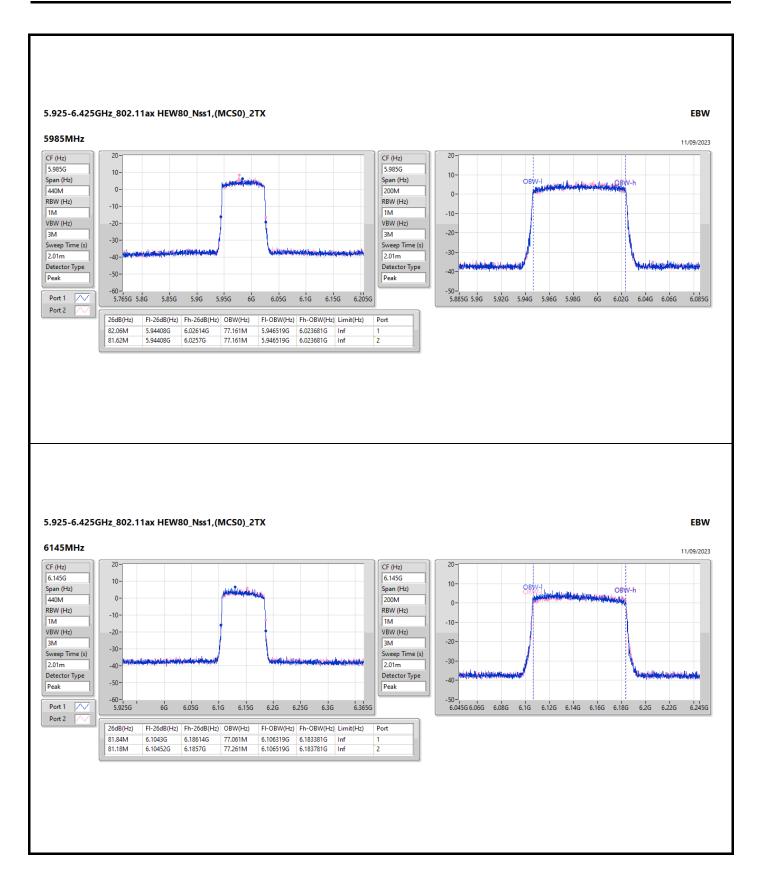
Page No. : 6 of 13 Report No. : FR191618



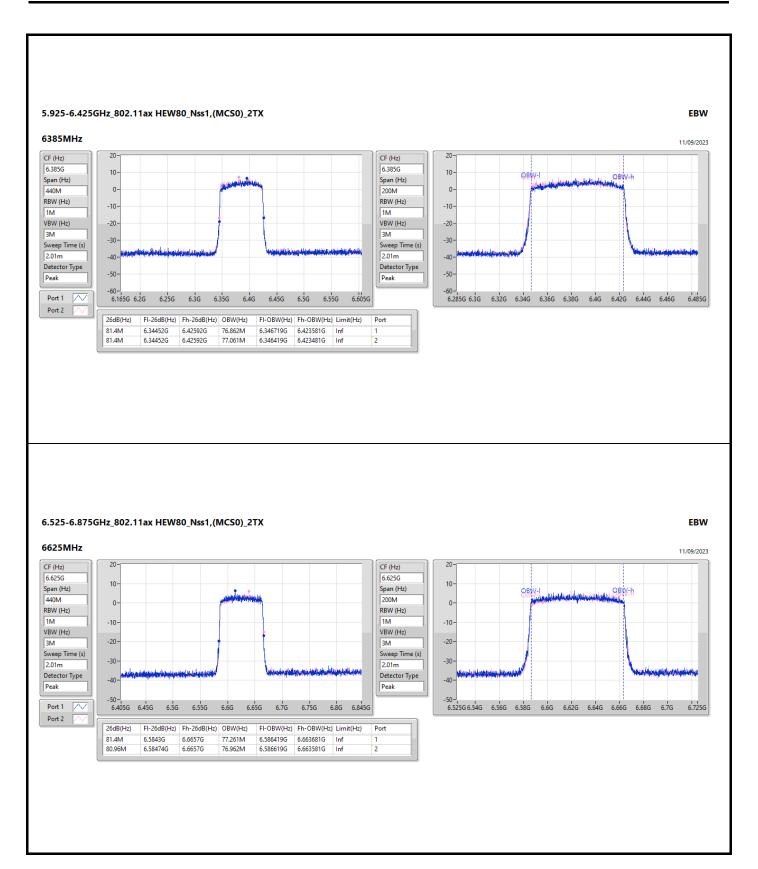
Page No. : 7 of 13 Report No. : FR191618



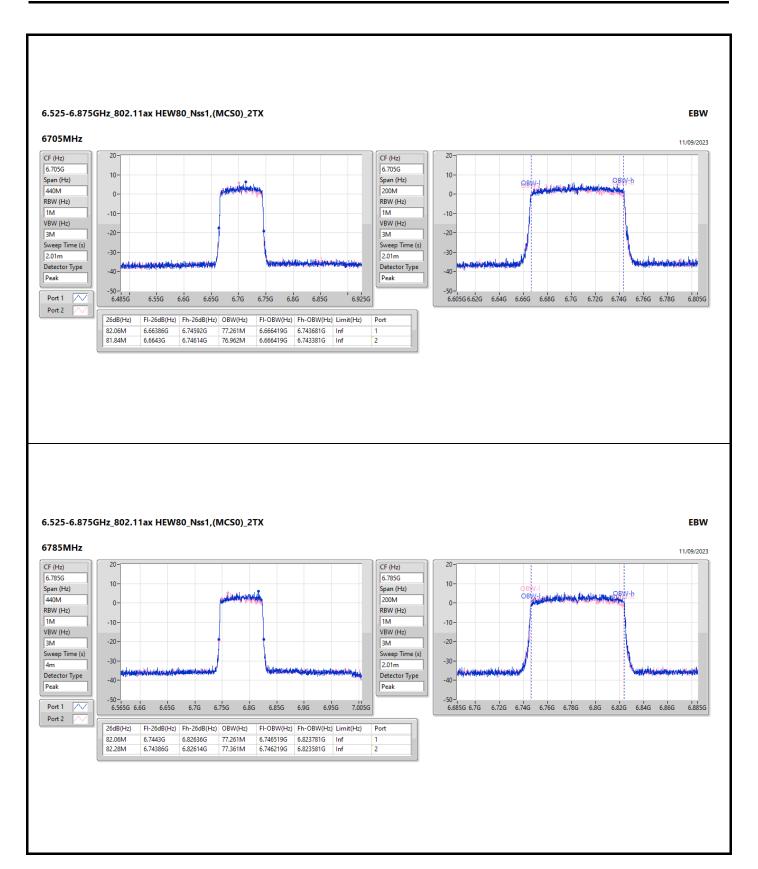
Page No. : 8 of 13 Report No. : FR191618



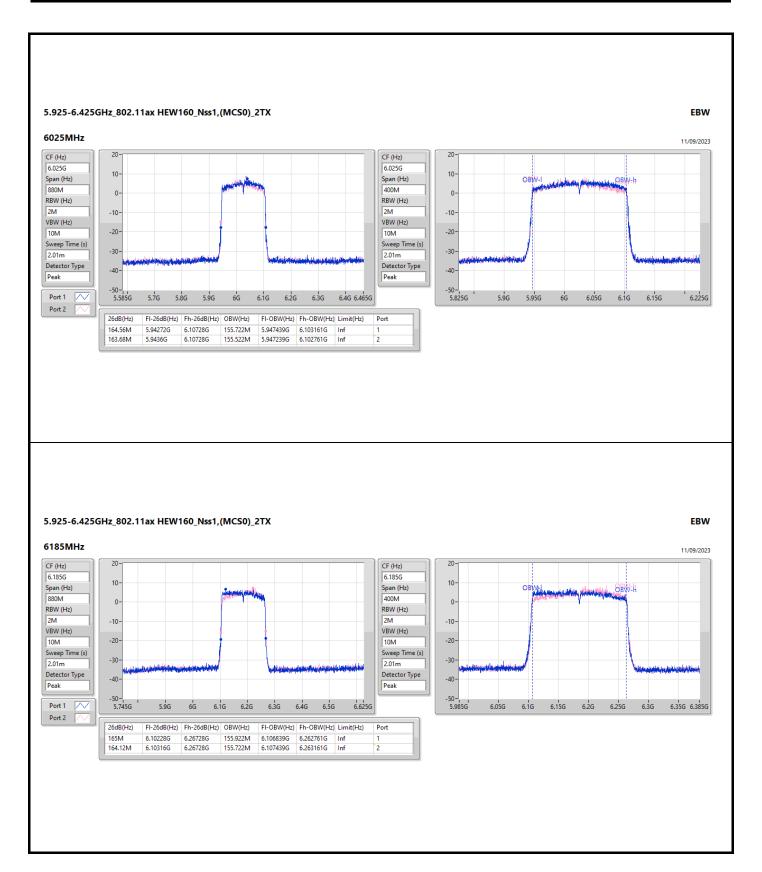
Page No. : 9 of 13 Report No. : FR191618



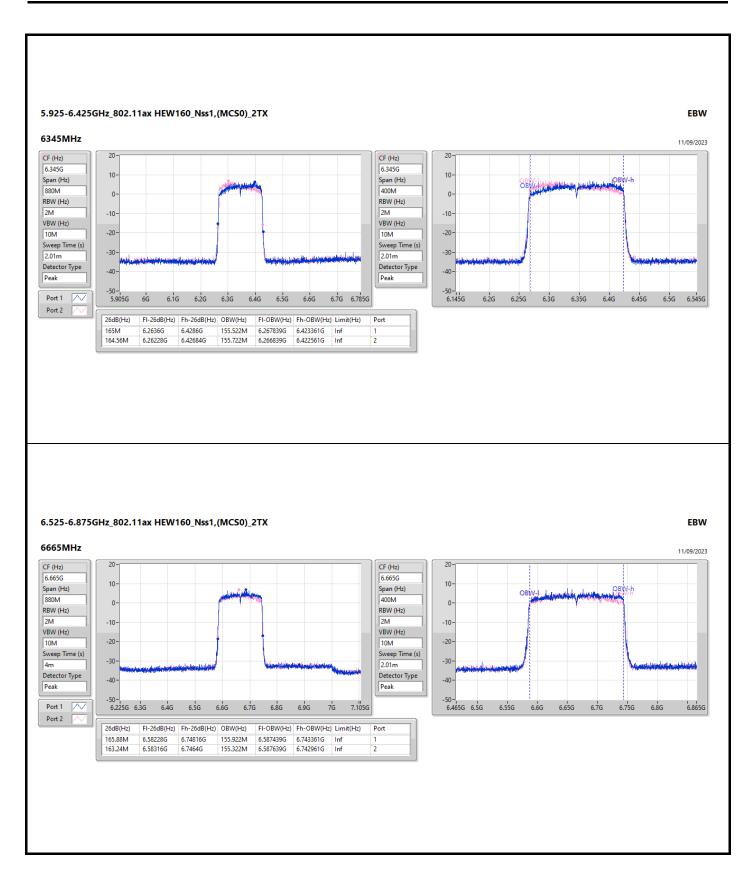
Page No. : 10 of 13 Report No. : FR191618



Page No. : 11 of 13 Report No. : FR191618



Page No. : 12 of 13 Report No. : FR191618



Page No. : 13 of 13 Report No. : FR191618



Appendix C.1



Summary

Mode	EIRP	EIRP
	(dBm)	(W)
5.925-6.425GHz	-	-
802.11ax HEW20_Nss1,(MCS0)_2TX	34.04	2.53513
802.11ax HEW40_Nss1,(MCS0)_2TX	35.90	3.89045
802.11ax HEW80_Nss1,(MCS0)_2TX	35.84	3.83707
802.11ax HEW160_Nss1,(MCS0)_2TX	35.89	3.88150
6.525-6.875GHz	-	-
802.11ax HEW20_Nss1,(MCS0)_2TX	34.24	2.65461
802.11ax HEW40_Nss1,(MCS0)_2TX	35.98	3.96278
802.11ax HEW80_Nss1,(MCS0)_2TX	35.97	3.95367
802.11ax HEW160_Nss1,(MCS0)_2TX	35.74	3.74973

Page No. : 1 of 13 Report No. : FR191618

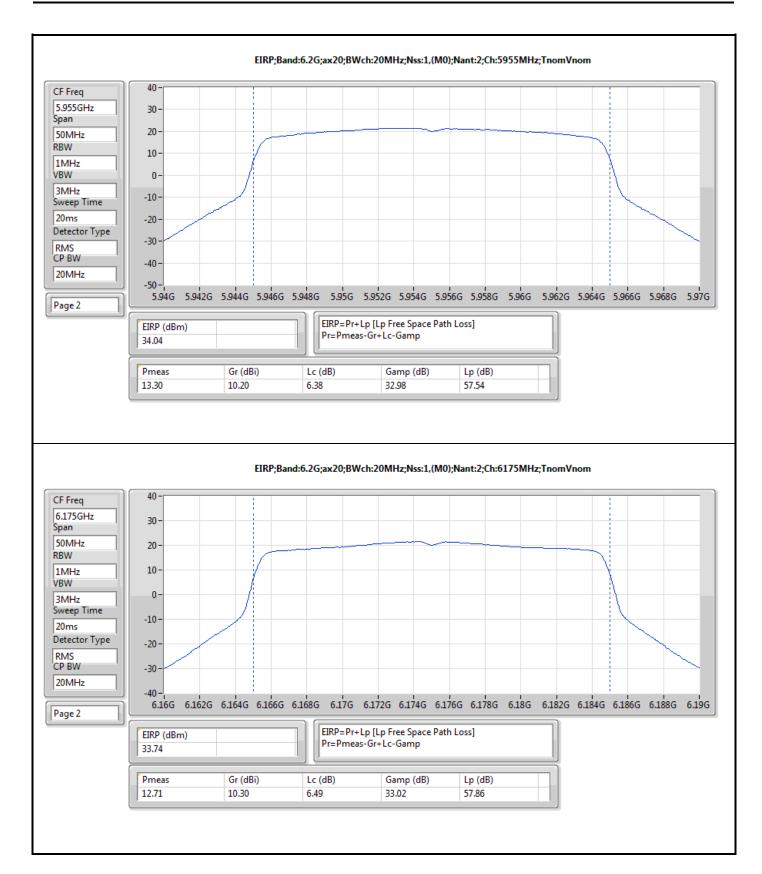


#### Result

Mode	Result	Radiated EIRP	EIRP Limit	
		(dBm)	(dBm)	
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	
5955MHz	Pass	34.04	36.00	
6175MHz	Pass	33.74	36.00	
6415MHz	Pass	33.77	36.00	
6535MHz	Pass	33.79	36.00	
6695MHz	Pass	34.24	36.00	
6855MHz	Pass	33.86	36.00	
802.11ax HEW40_Nss1,(MCS0)_2TX		-	-	
5965MHz	Pass	35.79	36.00	
6165MHz	Pass	35.90	36.00	
6405MHz	Pass	35.77	36.00	
6565MHz	Pass	35.98	36.00	
6685MHz	Pass	35.84	36.00	
6845MHz	Pass	35.78	36.00	
802.11ax HEW80_Nss1,(MCS0)_2TX		-	-	
5985MHz	Pass	35.64	36.00	
6145MHz	Pass	35.84	36.00	
6385MHz	Pass	35.76	36.00	
6625MHz	Pass	35.89	36.00	
6705MHz	Pass	35.97	36.00	
6785MHz	Pass	35.93	36.00	
802.11ax HEW160_Nss1,(MCS0)_2TX		-	-	
6025MHz	Pass	35.67	36.00	
6185MHz	Pass	35.23	36.00	
6345MHz	Pass	35.89	36.00	
6665MHz	Pass	35.74	36.00	

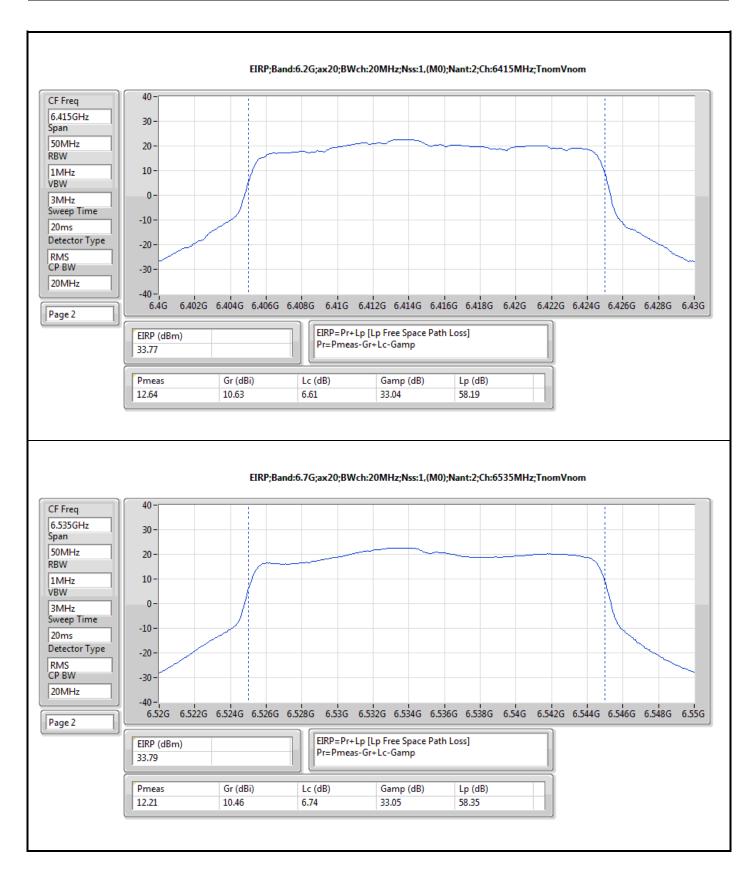
DG = Directional Gain; Port X = Port X output power

Page No. : 2 of 13 Report No. : FR191618



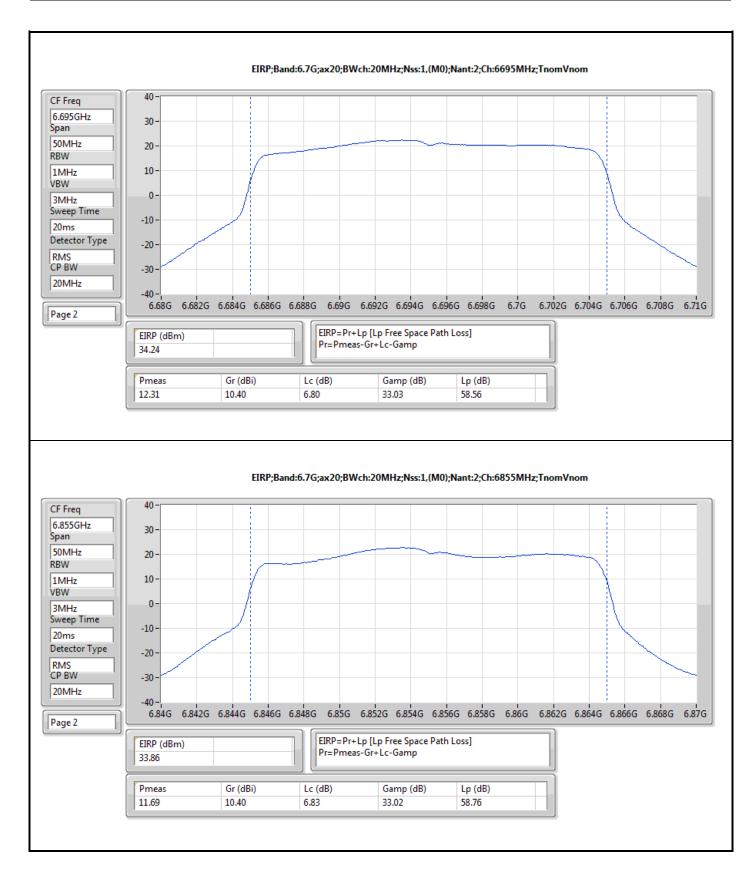
Page No. : 3 of 13 Report No. : FR191618





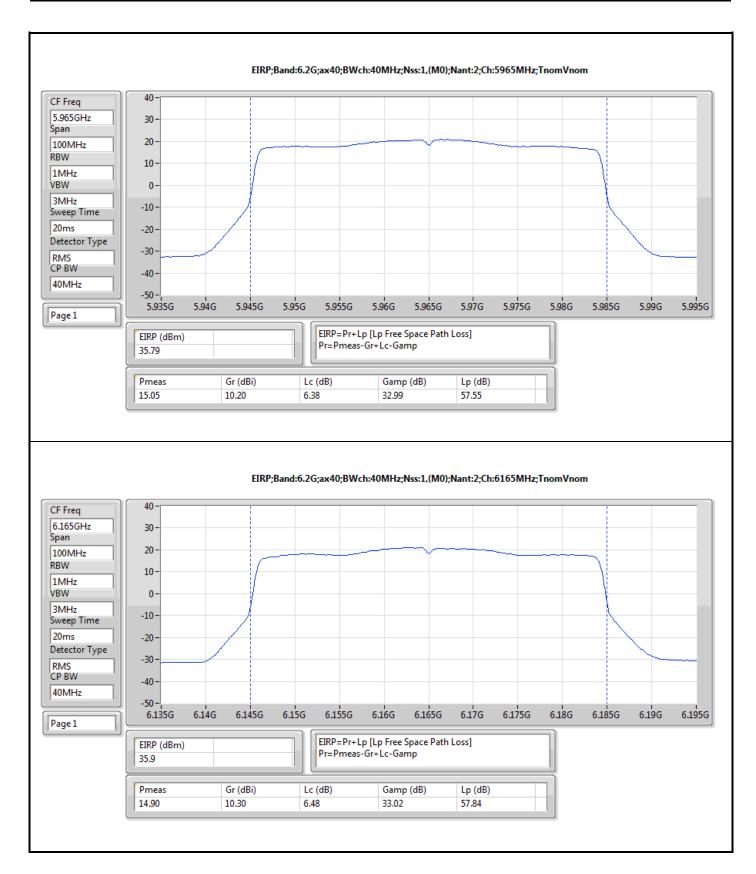
Page No. : 4 of 13 Report No. : FR191618





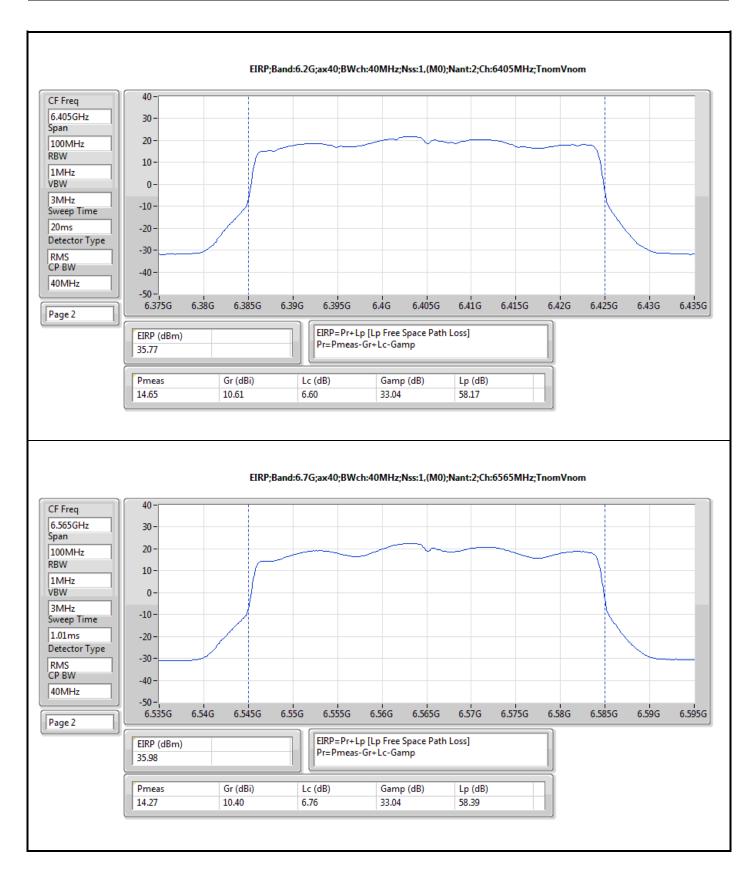
Page No. : 5 of 13 Report No. : FR191618



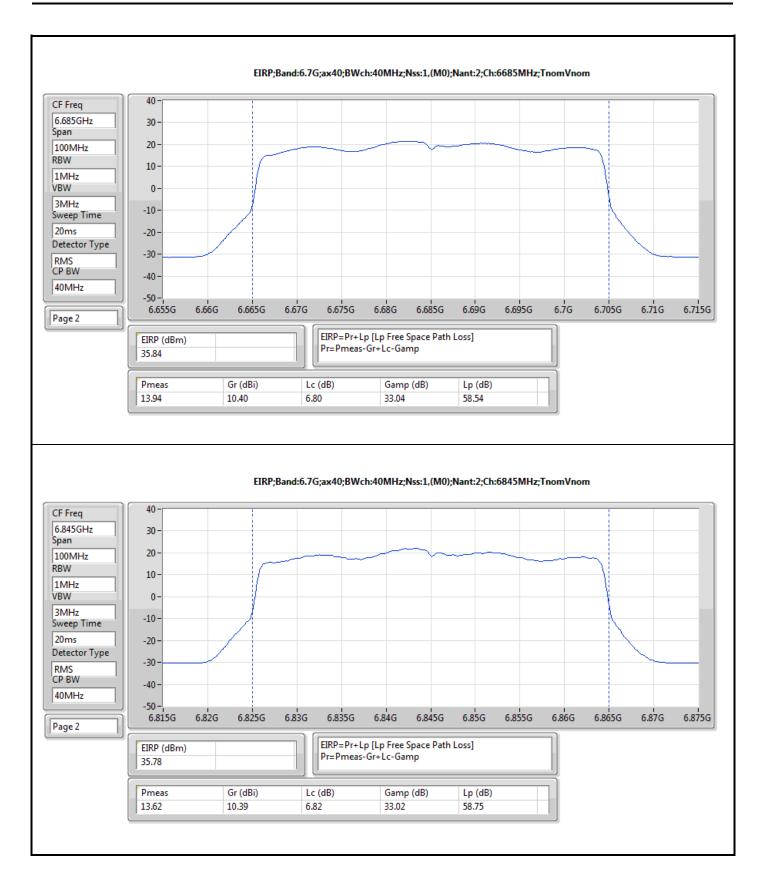


Page No. : 6 of 13 Report No. : FR191618



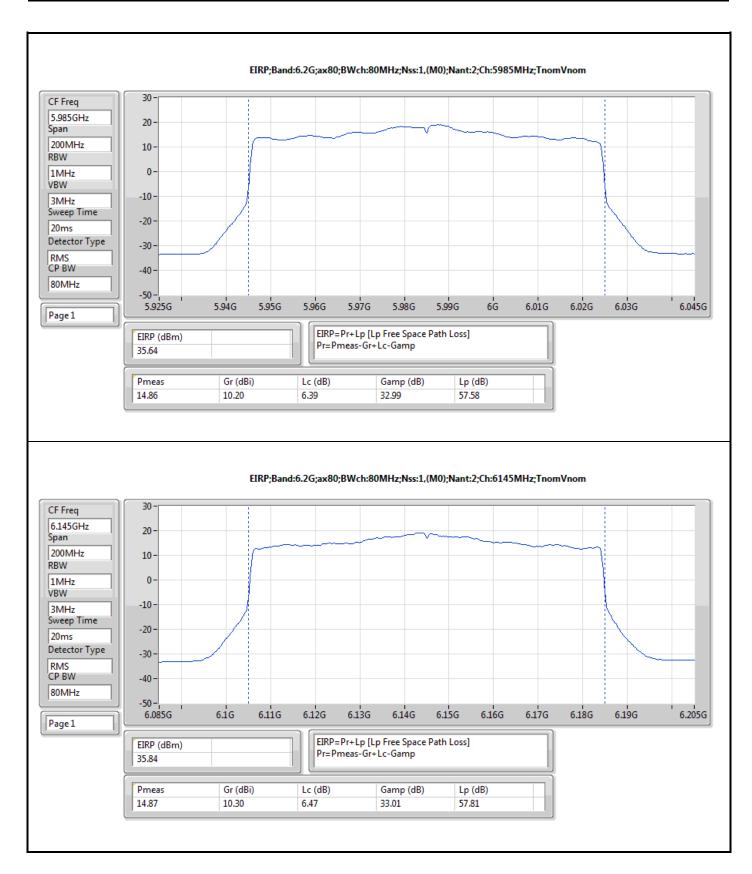


Page No. : 7 of 13 Report No. : FR191618

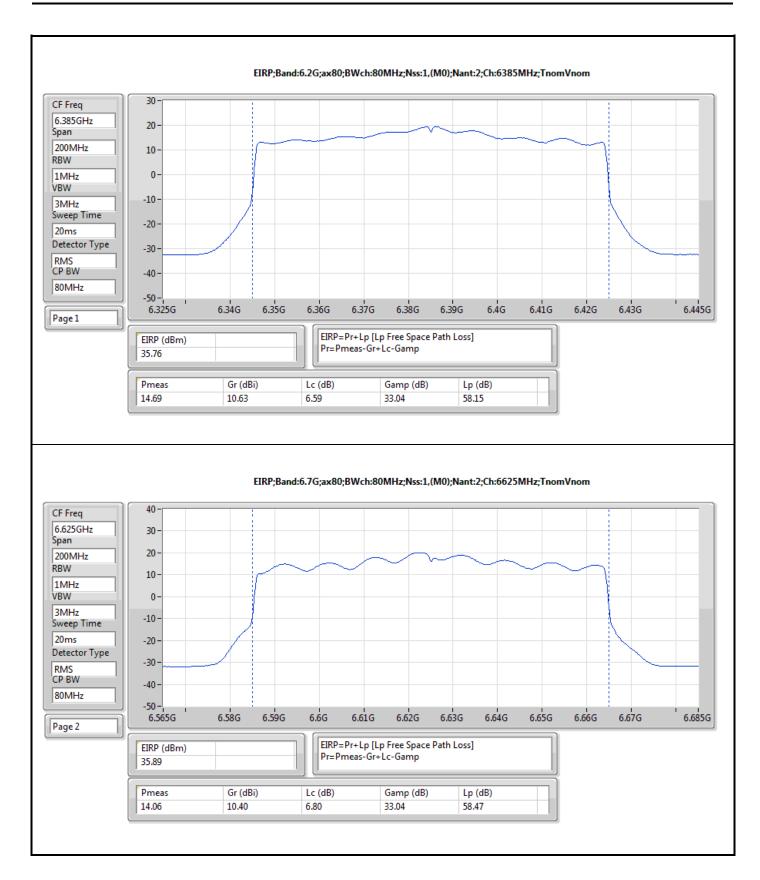


Page No. : 8 of 13 Report No. : FR191618



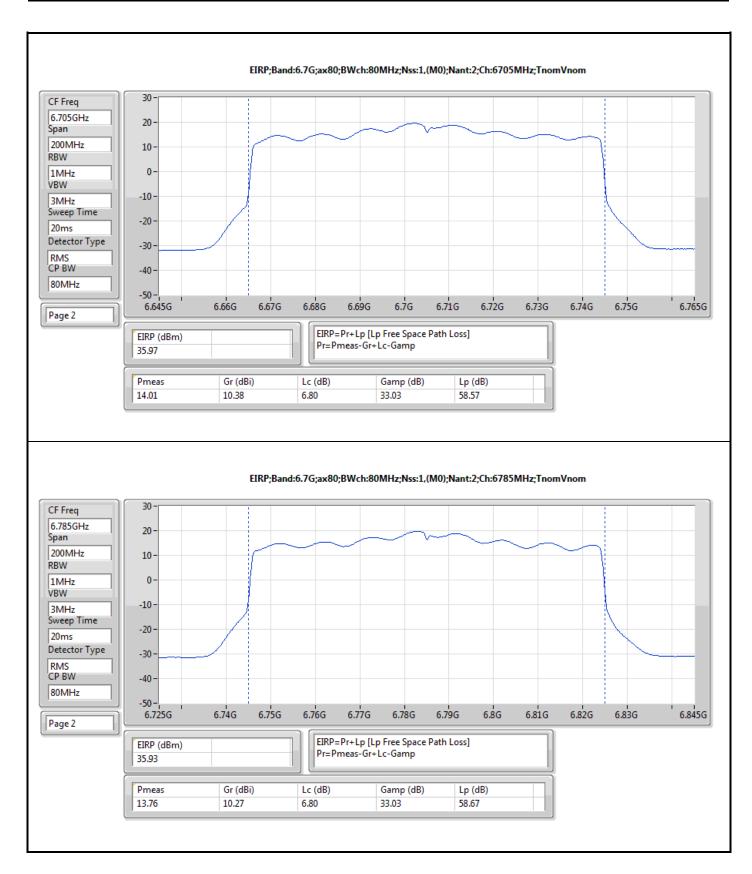


Page No. : 9 of 13 Report No. : FR191618

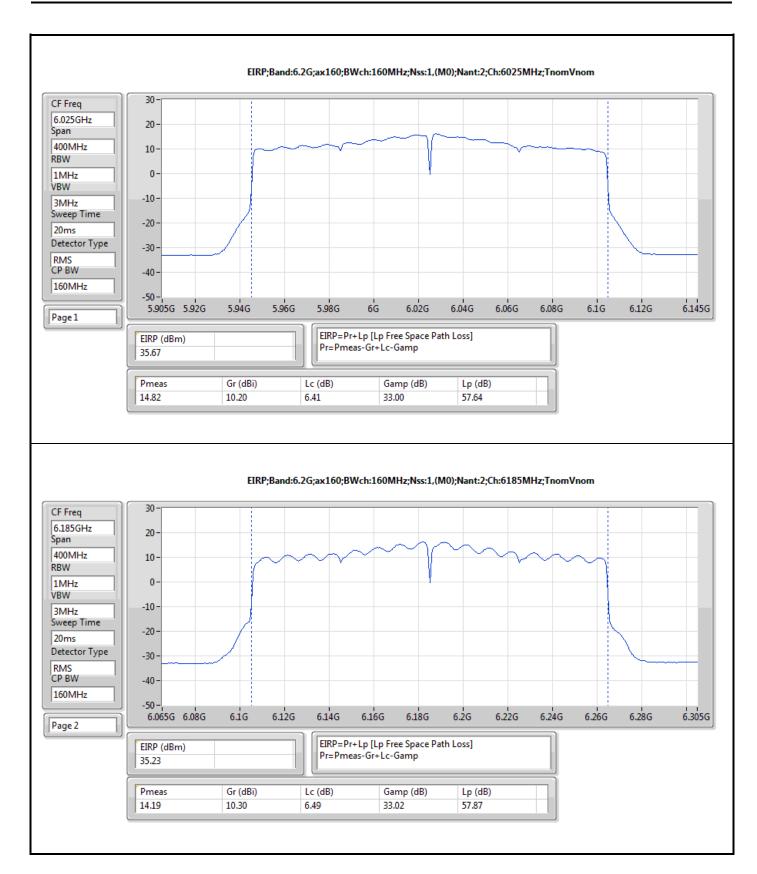


Page No. : 10 of 13 Report No. : FR191618

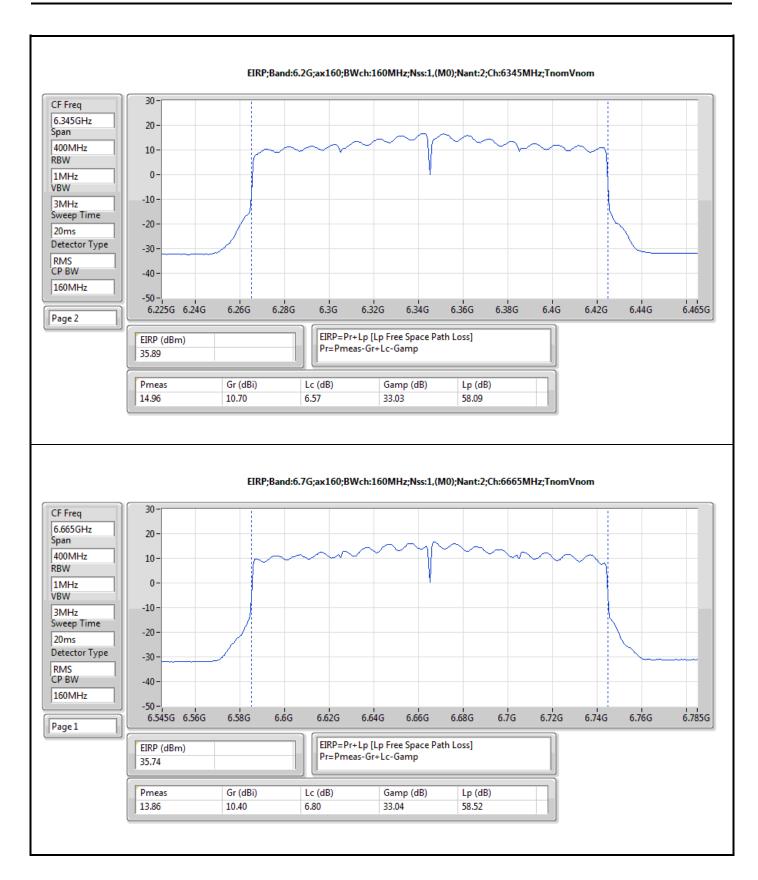




Page No. : 11 of 13 Report No. : FR191618



Page No. : 12 of 13 Report No. : FR191618



Page No. : 13 of 13 Report No. : FR191618



## Average Power-E.I.R.P. at any elevation angle above 30 degrees

Appendix C.2

Summary

Mode	Total Power	Total Power	EIRP [Phi 30°]	EIRP [Phi 30°]
	(dBm)	(W)	(dBm)	(W)
5.925-6.425GHz	-	=	=	-
802.11ax HEW20_Nss1,(MCS0)_2TX	15.39	0.03459	19.41	0.087297
802.11ax HEW40_Nss1,(MCS0)_2TX	16.89	0.04887	20.91	0.123310
802.11ax HEW80_Nss1,(MCS0)_2TX	16.67	0.04645	20.69	0.117220
802.11ax HEW160_Nss1,(MCS0)_2TX	16.76	0.04742	20.78	0.119674
6.525-6.875GHz	-	=	-	-
802.11ax HEW20_Nss1,(MCS0)_2TX	13.53	0.02254	17.54	0.056754
802.11ax HEW40_Nss1,(MCS0)_2TX	16.19	0.04159	20.20	0.104713
802.11ax HEW80_Nss1,(MCS0)_2TX	15.78	0.03784	19.79	0.095280
802.11ax HEW160_Nss1,(MCS0)_2TX	16.09	0.04064	20.10	0.102329

Page No. : 1 of 2 Sporton International Inc. Hsinchu Laboratory Report No.



# Average Power-E.I.R.P. at any elevation angle above 30 degrees

Appendix C.2

### Result

Mode	Result	DG [Phi 30°]	Port 1	Port 2	Total Power	EIRP [Phi 30°]	EIRP Limit [Phi 30°]
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-
5955MHz	Pass	4.02	12.51	12.24	15.39	19.41	21.00
6175MHz	Pass	4.02	11.47	11.10	14.30	18.32	21.00
6415MHz	Pass	4.02	10.61	10.97	13.80	17.82	21.00
6535MHz	Pass	4.01	10.67	10.36	13.53	17.54	21.00
6695MHz	Pass	4.01	10.40	9.92	13.18	17.19	21.00
6855MHz	Pass	4.01	10.42	9.99	13.22	17.23	21.00
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-	-		-
5965MHz	Pass	4.02	13.98	13.77	16.89	20.91	21.00
6165MHz	Pass	4.02	13.36	13.01	16.20	20.22	21.00
6405MHz	Pass	4.02	13.02	13.37	16.21	20.23	21.00
6565MHz	Pass	4.01	13.34	13.02	16.19	20.20	21.00
6685MHz	Pass	4.01	12.59	12.11	15.37	19.38	21.00
6845MHz	Pass	4.01	12.43	12.06	15.26	19.27	21.00
802.11ax HEW80_Nss1,(MCS0)_2TX	-	-	-	-	-		-
5985MHz	Pass	4.02	13.55	13.77	16.67	20.69	21.00
6145MHz	Pass	4.02	13.32	13.19	16.27	20.29	21.00
6385MHz	Pass	4.02	13.37	13.52	16.46	20.48	21.00
6625MHz	Pass	4.01	12.77	12.66	15.73	19.74	21.00
6705MHz	Pass	4.01	13.05	12.46	15.78	19.79	21.00
6785MHz	Pass	4.01	12.71	12.18	15.46	19.47	21.00
802.11ax HEW160_Nss1,(MCS0)_2TX	-	-	-	-	-		-
6025MHz	Pass	4.02	13.73	13.30	16.53	20.55	21.00
6185MHz	Pass	4.02	13.79	13.71	16.76	20.78	21.00
6345MHz	Pass	4.02	13.59	13.78	16.70	20.72	21.00
6665MHz	Pass	4.01	13.44	12.68	16.09	20.10	21.00

DG = Directional Gain; Port X = Port X output power

Sporton International Inc. Hsinchu Laboratory

Page No. : 2 of 2 Report No. : FR191618



**Summary** 

Mode	PD	EIRP PD	
	(dBm/RBW)	(dBm/RBW)	
5.925-6.425GHz	-	-	
802.11ax HEW20_Nss1,(MCS0)_2TX	22.96	22.96	
802.11ax HEW40_Nss1,(MCS0)_2TX	21.51	21.51	
802.11ax HEW80_Nss1,(MCS0)_2TX	19.54	19.54	
802.11ax HEW160_Nss1,(MCS0)_2TX	16.44	16.44	
6.525-6.875GHz	-	-	
802.11ax HEW20_Nss1,(MCS0)_2TX	22.95	22.95	
802.11ax HEW40_Nss1,(MCS0)_2TX	22.65	22.65	
802.11ax HEW80_Nss1,(MCS0)_2TX	19.93	19.93	
802.11ax HEW160_Nss1,(MCS0)_2TX	17.09	17.09	

RBW = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

Sporton International Inc. Hsinchu Laboratory

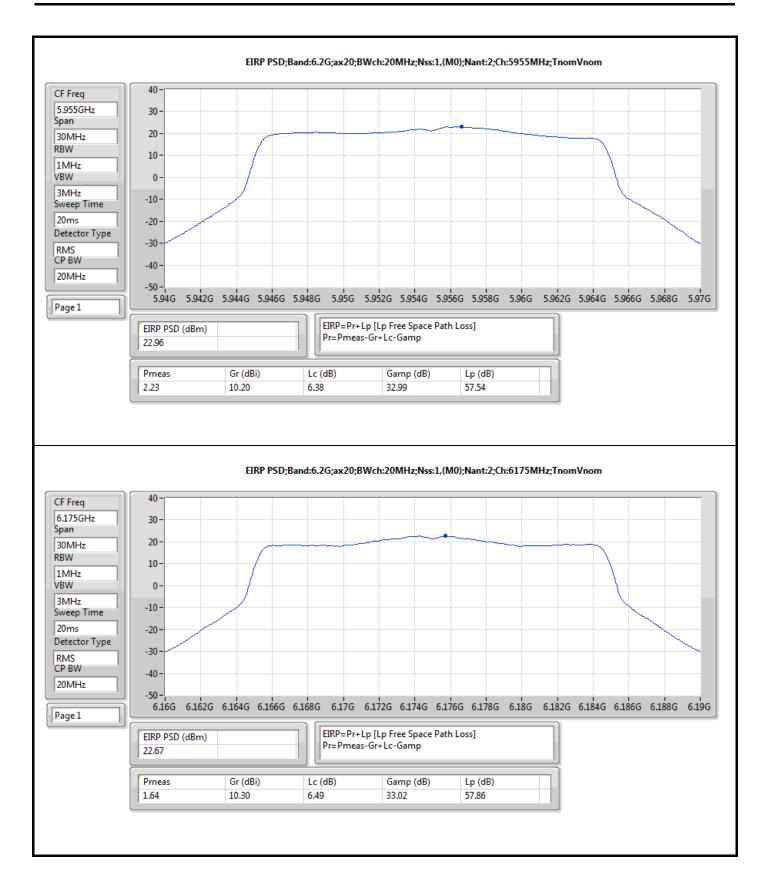
Page No. : 1 of 13 Report No. : FR191618

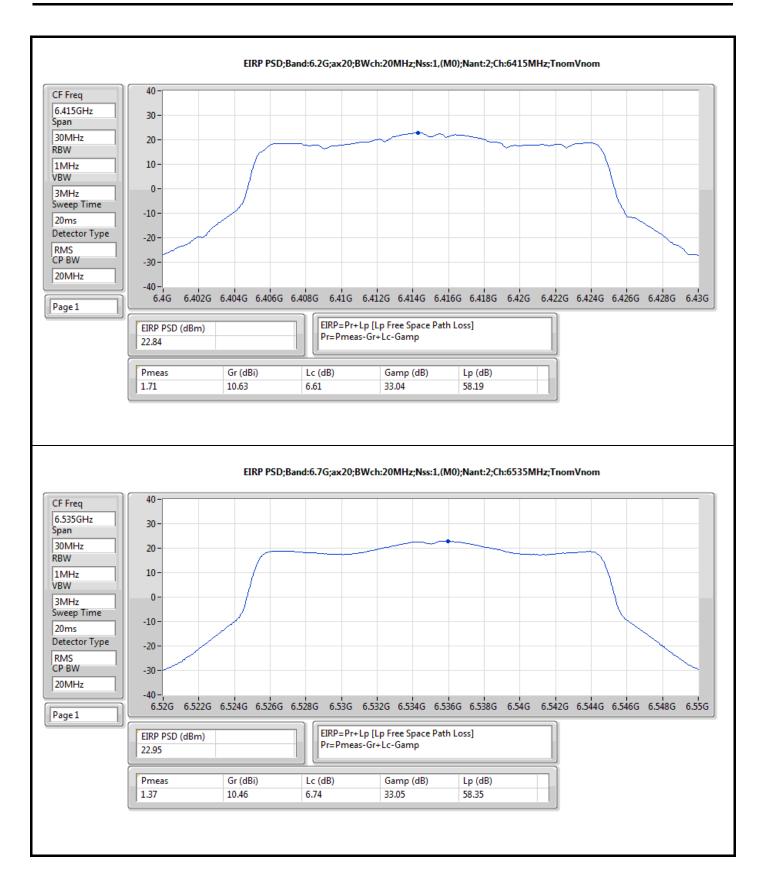
### Result

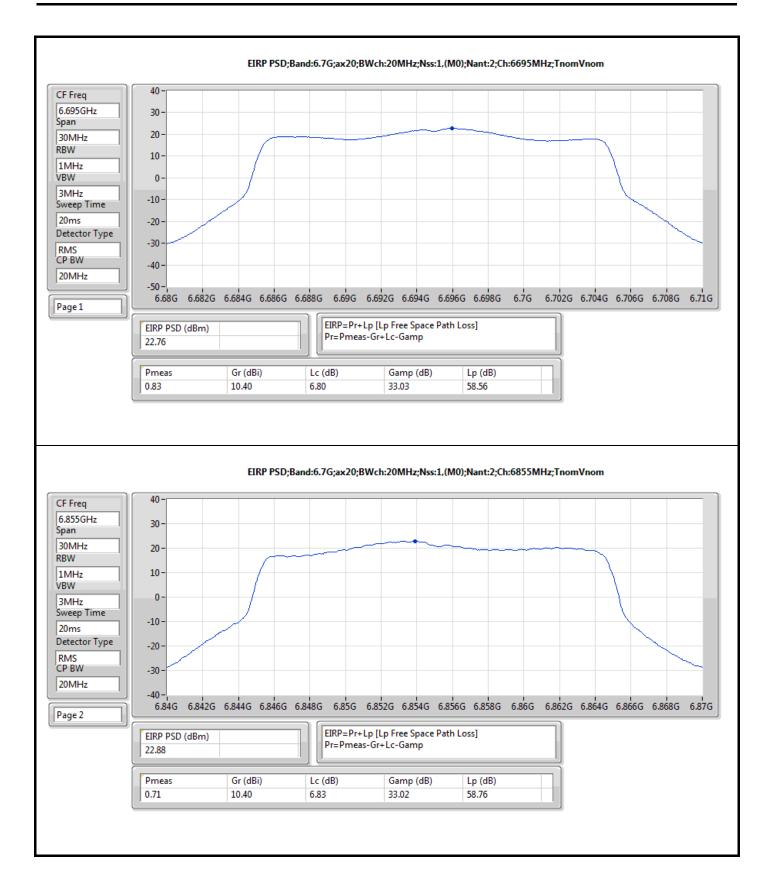
Mode	Result	EIRP PD	EIRP PD Limit
		(dBm/RBW)	(dBm/RBW)
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-
5955MHz	Pass	22.96	23.00
6175MHz	Pass	22.67	23.00
6415MHz	Pass	22.84	23.00
6535MHz	Pass	22.95	23.00
6695MHz	Pass	22.76	23.00
6855MHz	Pass	22.88	23.00
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-
5965MHz	Pass	21.24	23.00
6165MHz	Pass	21.33	23.00
6405MHz	Pass	21.51	23.00
6565MHz	Pass	22.65	23.00
6685MHz	Pass	21.57	23.00
6845MHz	Pass	21.53	23.00
802.11ax HEW80_Nss1,(MCS0)_2TX	-	-	-
5985MHz	Pass	18.63	23.00
6145MHz	Pass	18.69	23.00
6385MHz	Pass	19.54	23.00
6625MHz	Pass	19.93	23.00
6705MHz	Pass	19.60	23.00
6785MHz	Pass	19.39	23.00
802.11ax HEW160_Nss1,(MCS0)_2TX	-	-	=
6025MHz	Pass	15.79	23.00
6185MHz	Pass	15.58	23.00
6345MHz	Pass	16.44	23.00
6665MHz	Pass	17.09	23.00

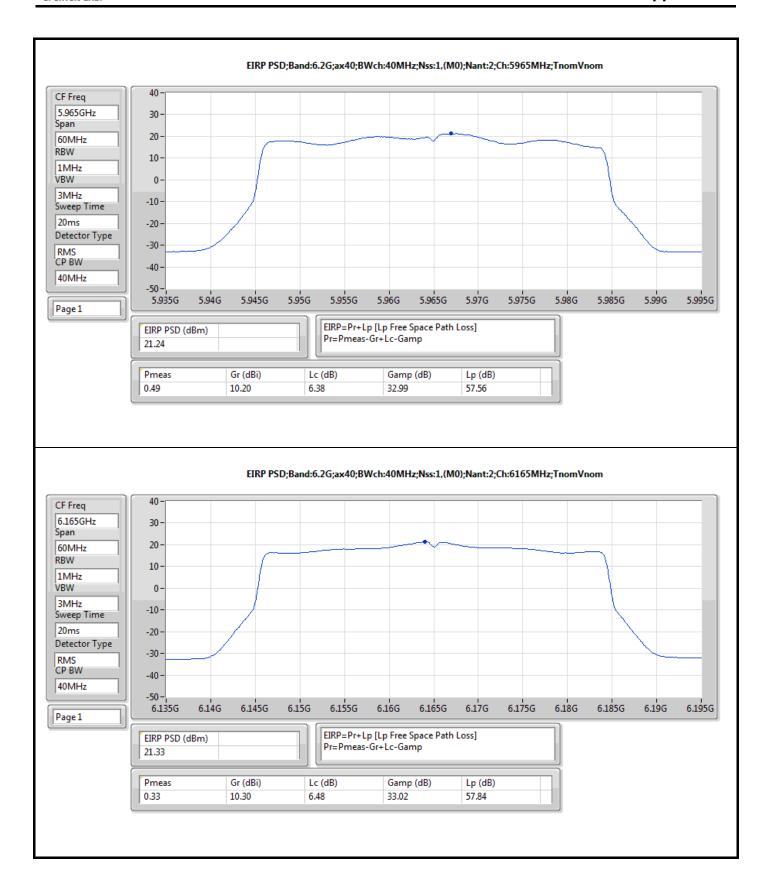
: 2 of 13 Page No. Report No. : FR191618

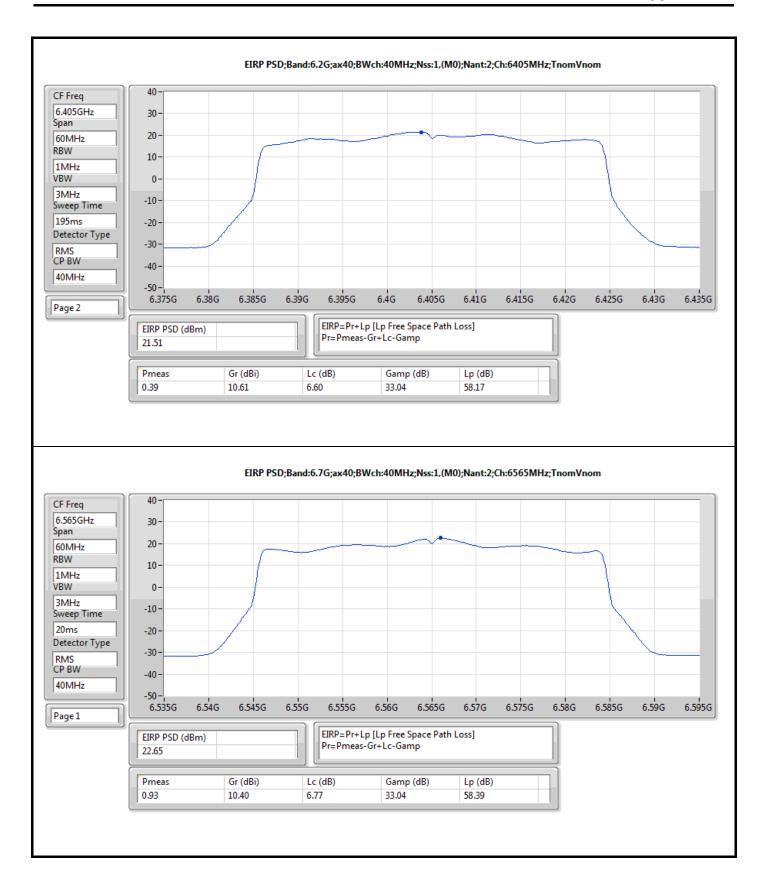
DG = Directional Gain; RBW = 500kHz for 5.725-5.85GHz band / 1MHz for other band;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

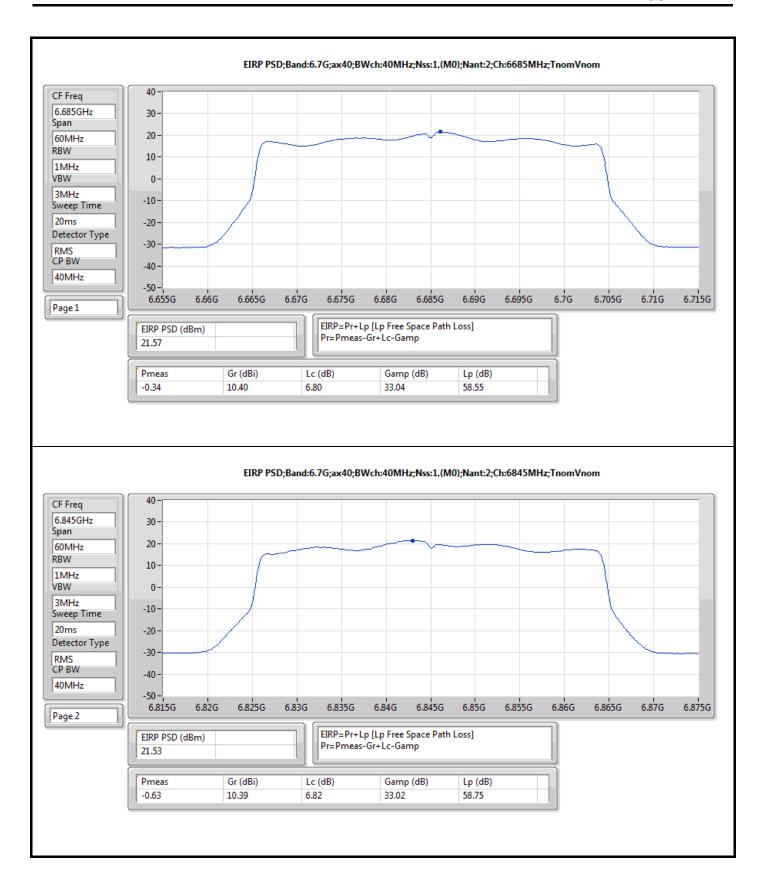


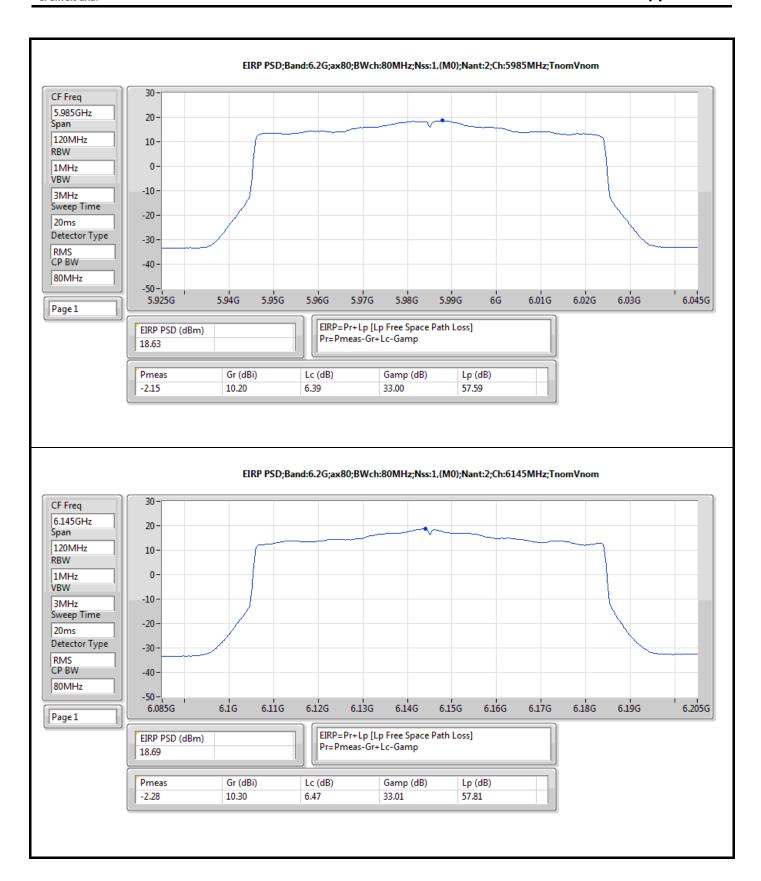


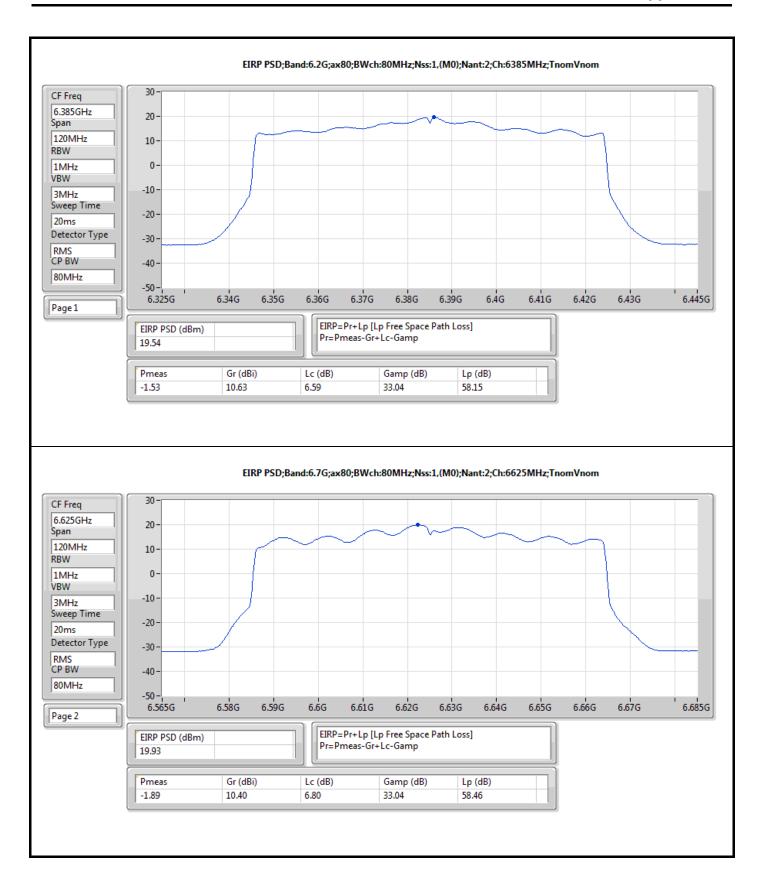




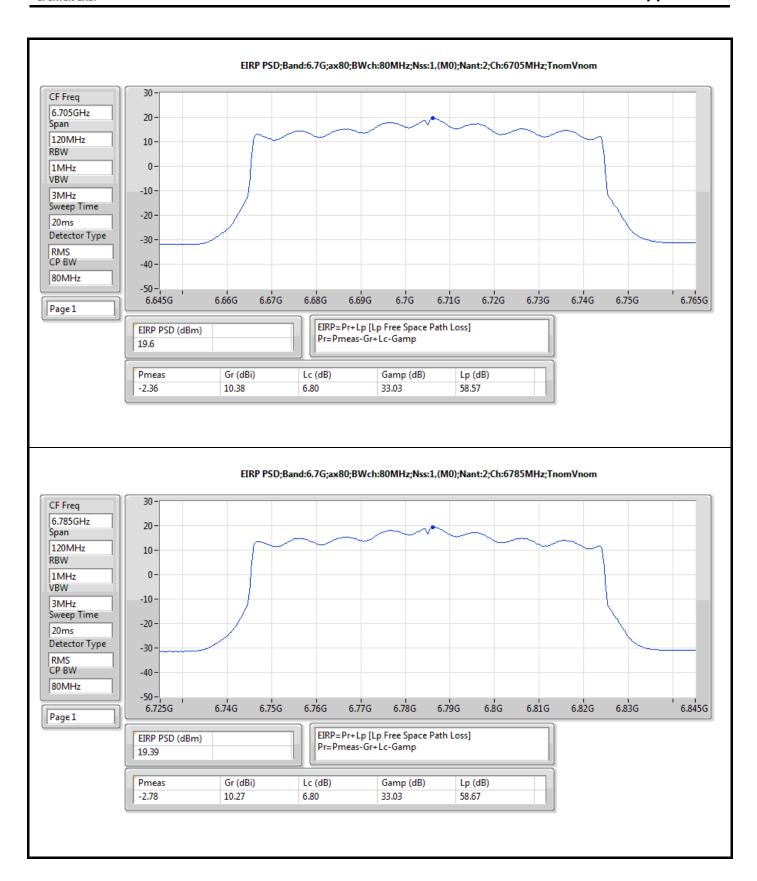


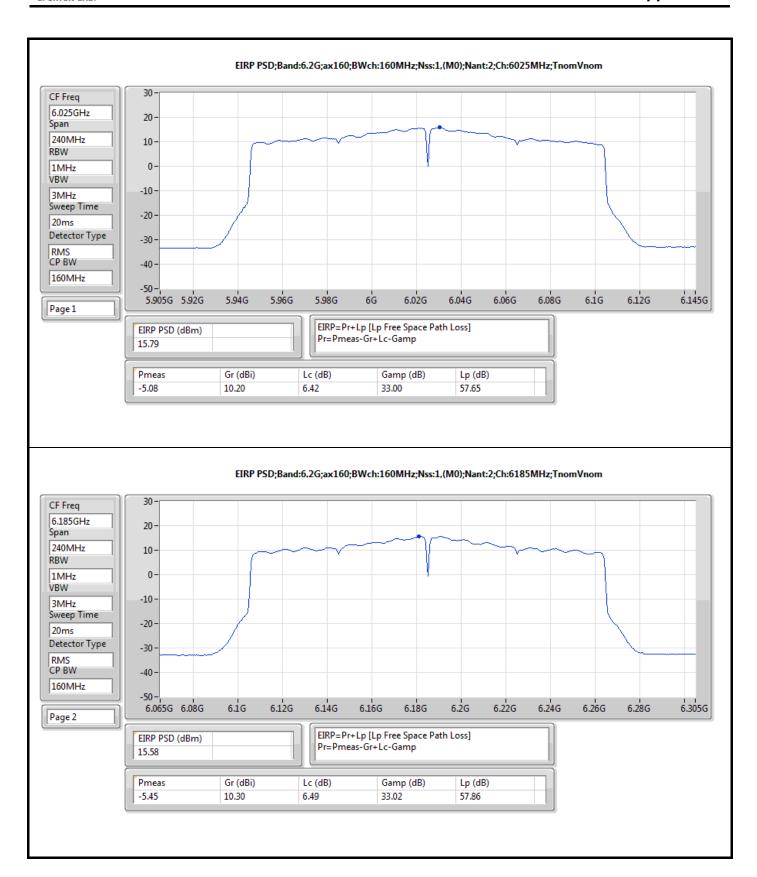


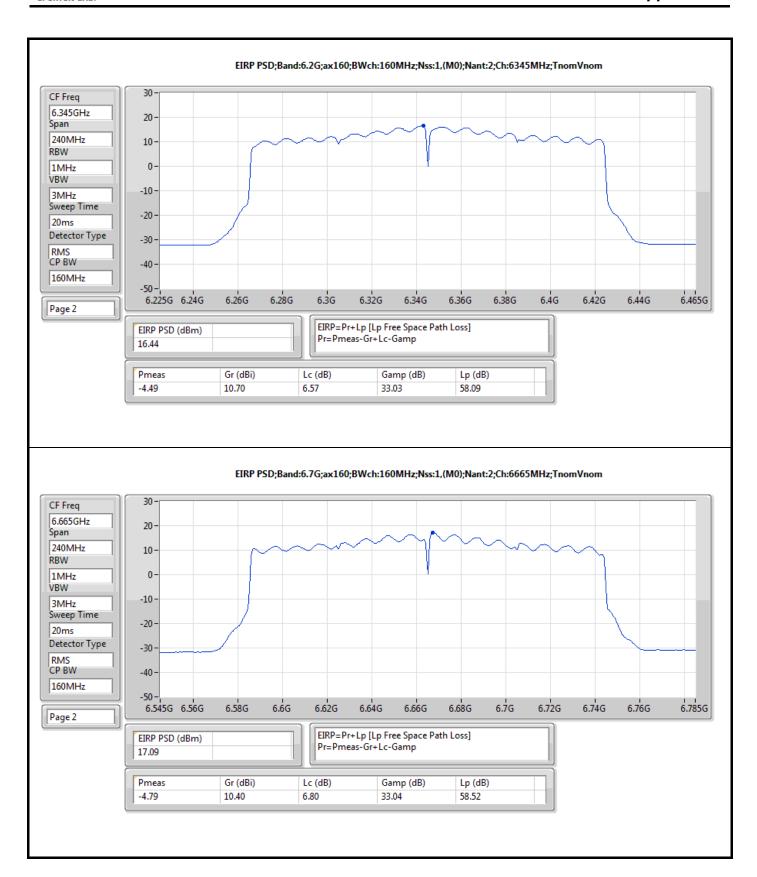




Page No. : 10 of 13 Report No. : FR191618









## Radiated Emissions below 1GHz

Appendix E.1

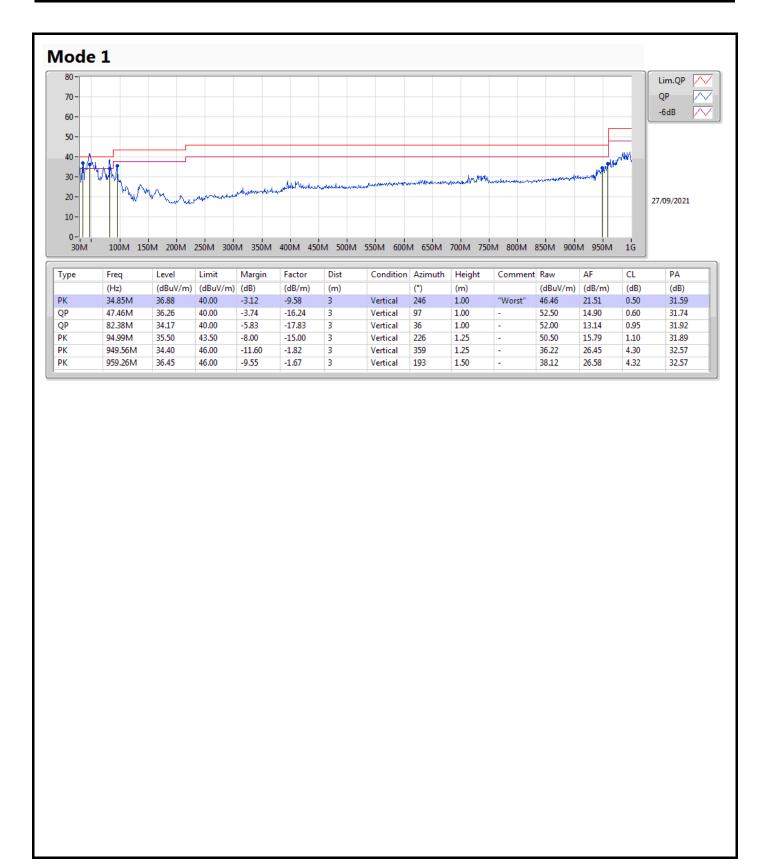
Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition	
Mode 1	Pass	PK	34.85M	36.88	40.00	-3.12	Vertical	

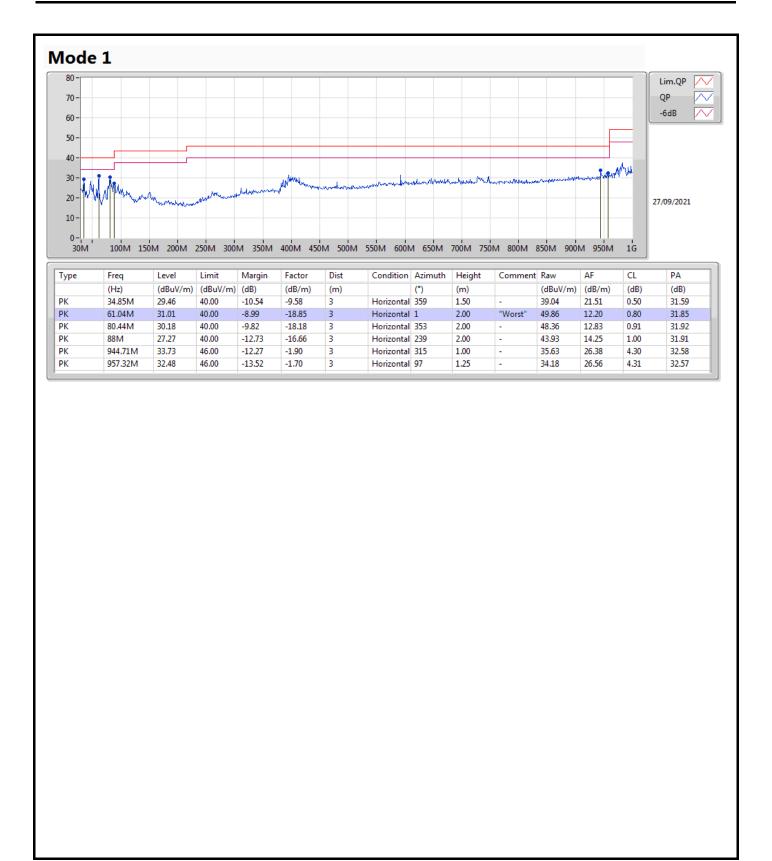
Sporton International Inc. Hsinchu Laboratory

Page No. : 1

Page No. : 1 of 3
Report No. : FR191618



Page No. : 2 of 3 Report No. : FR191618



Page No. : 3 of 3

Report No. : FR191618



## RSE TX above 1GHz

Appendix E.2

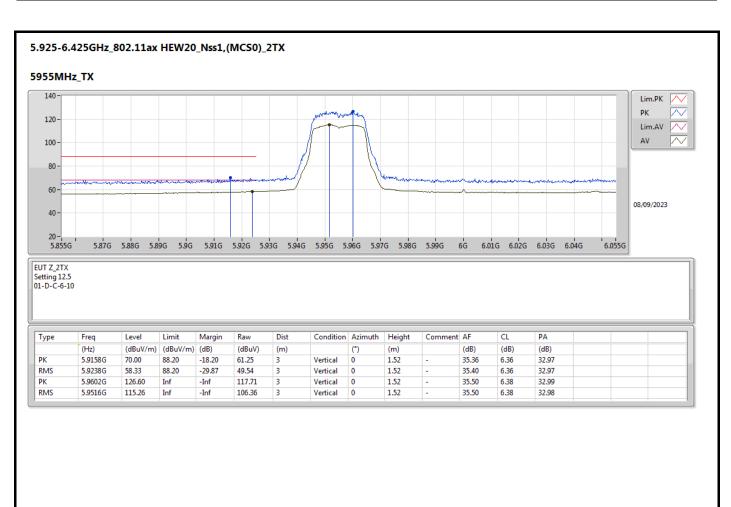
Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
5.925-6.425GHz	-	-	-	-	-	-	-	-	-	-	-
802.11ax HEW20_Nss1,(MCS0)_2TX	Pass	AV	17.86631G	51.36	54.00	-2.64	3	Vertical	215	1.75	-

Sporton International Inc. Hsinchu Laboratory Page No. Report No.

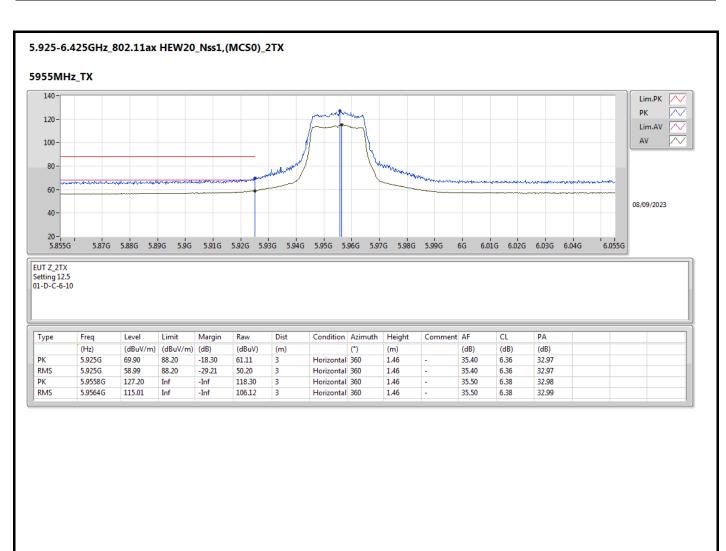
: 1 of 97 : FR191618





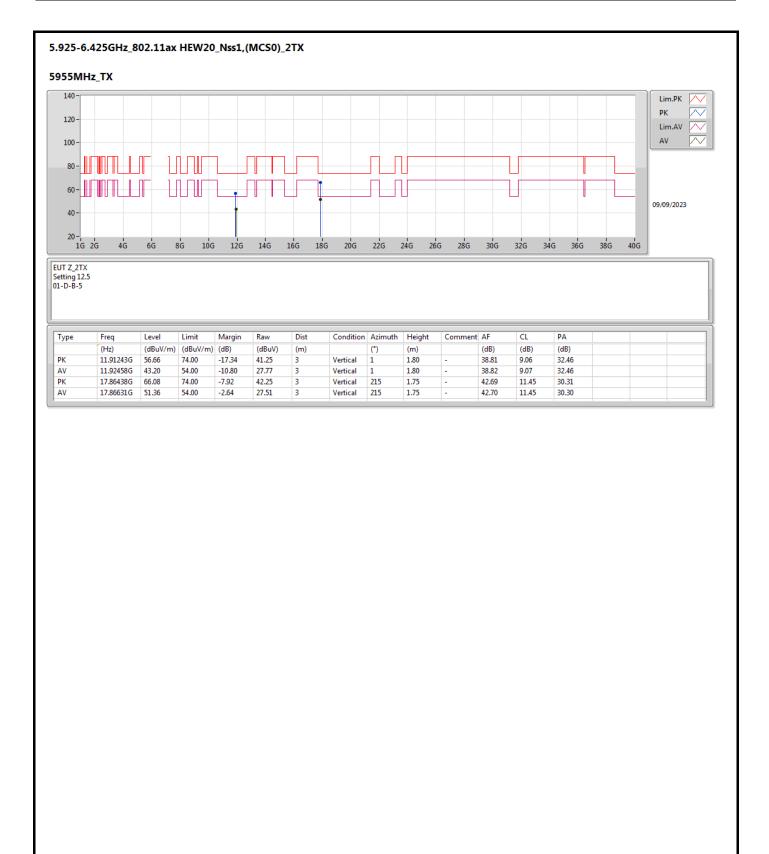
Page No. : 2 of 97 Report No. : FR191618



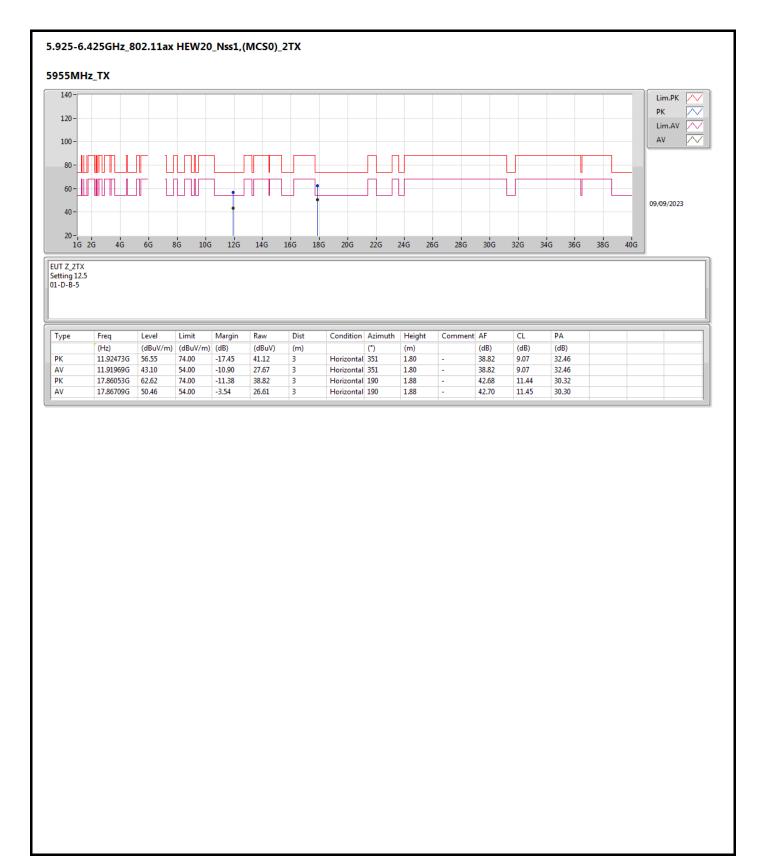


Page No. : 3 of 97 Report No. : FR191618

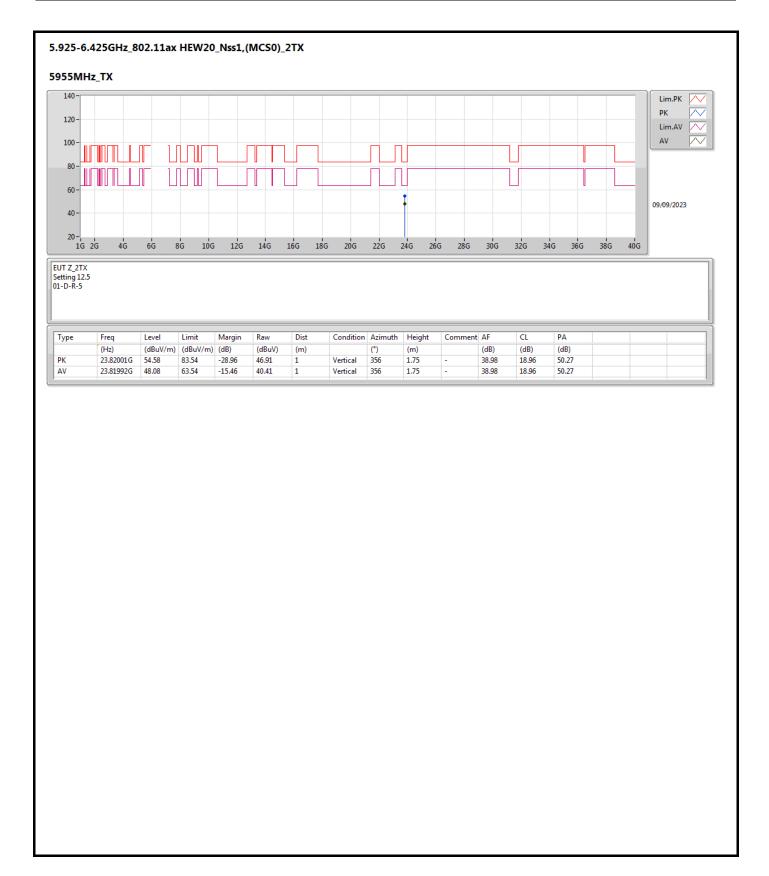






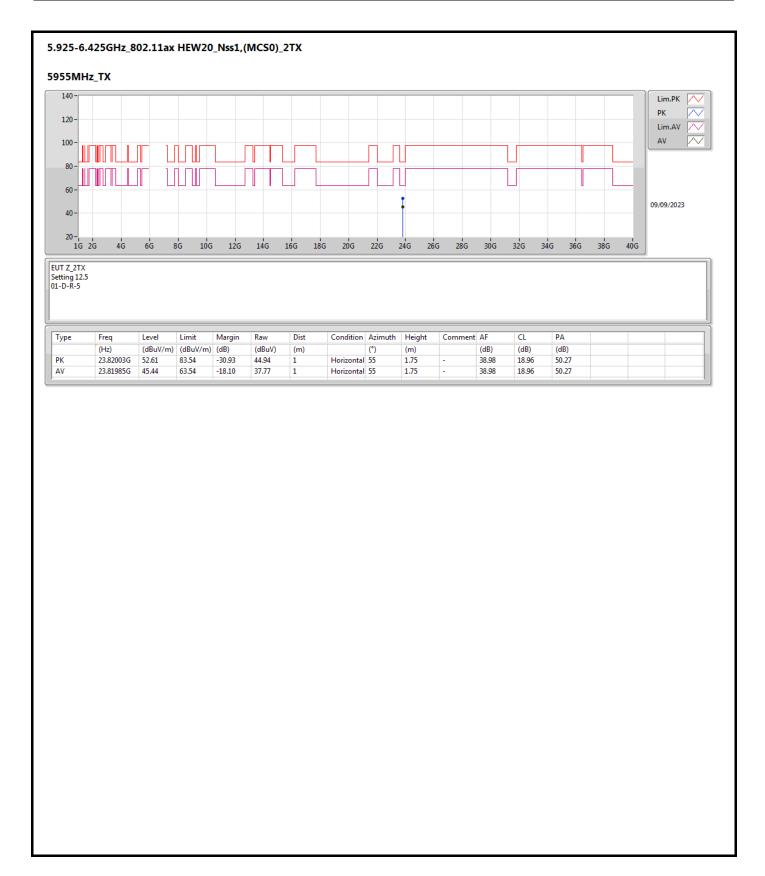




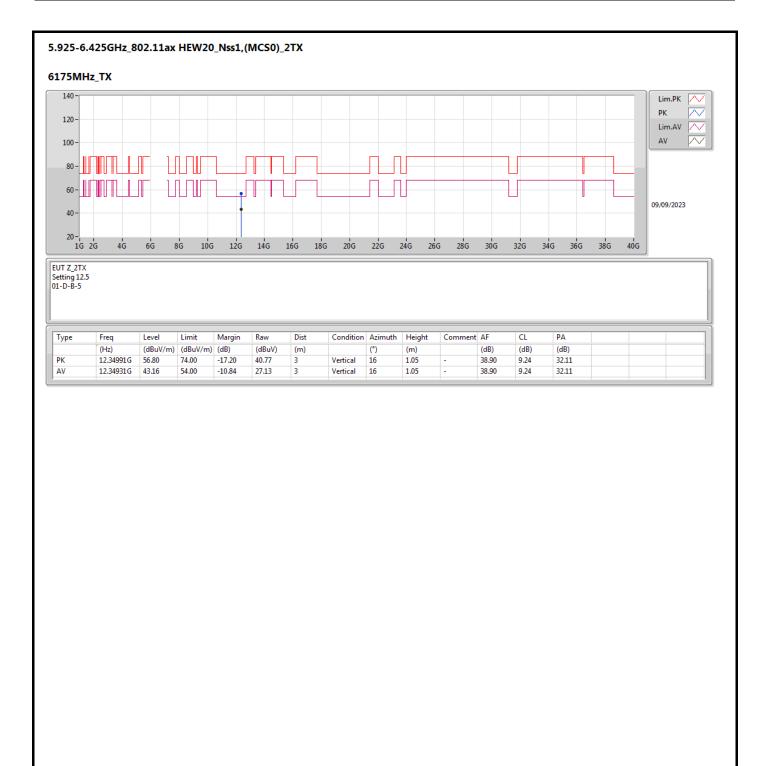


Page No. : 6 of 97 Report No. : FR191618







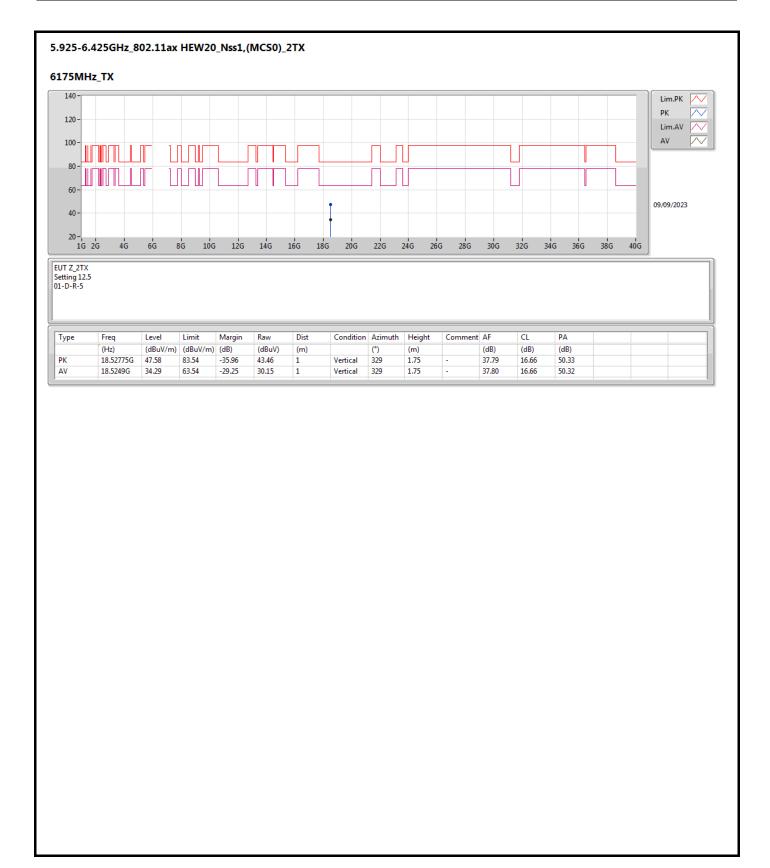


Page No. : 8 of 97 Report No. : FR191618







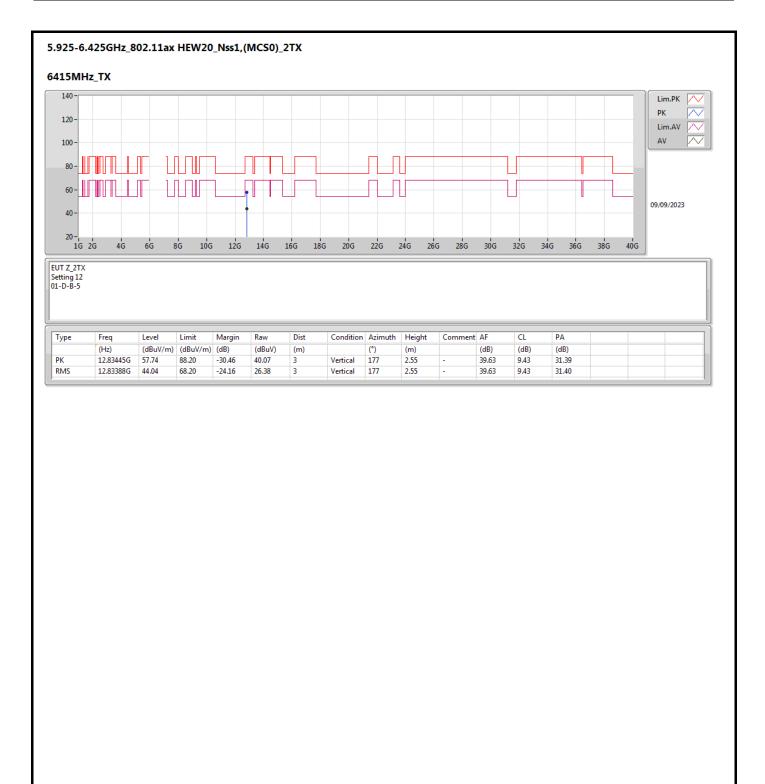




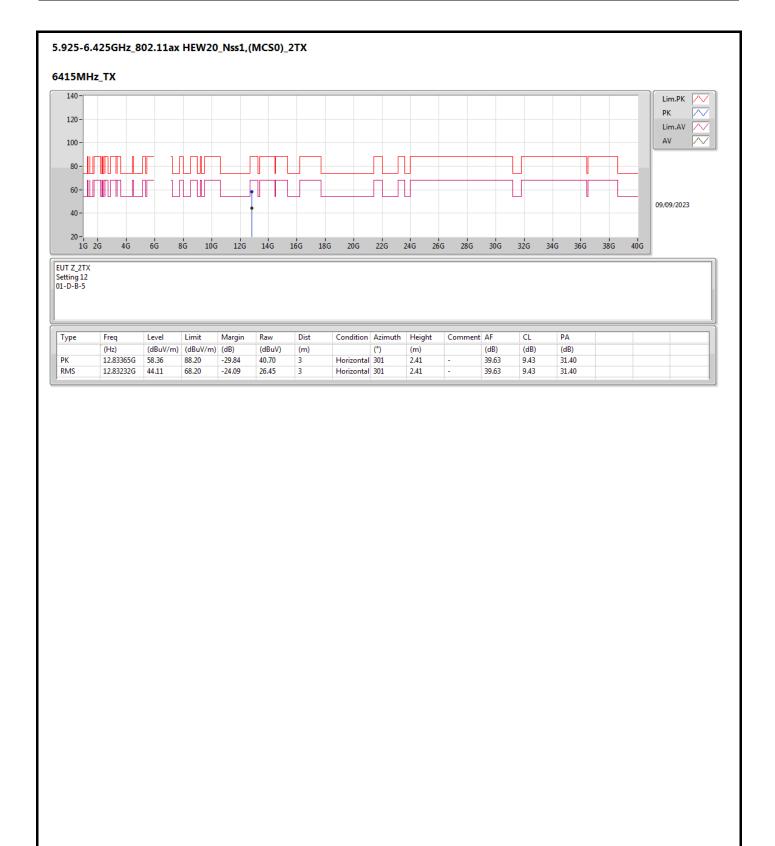


Page No. : 11 of 97 Report No. : FR191618

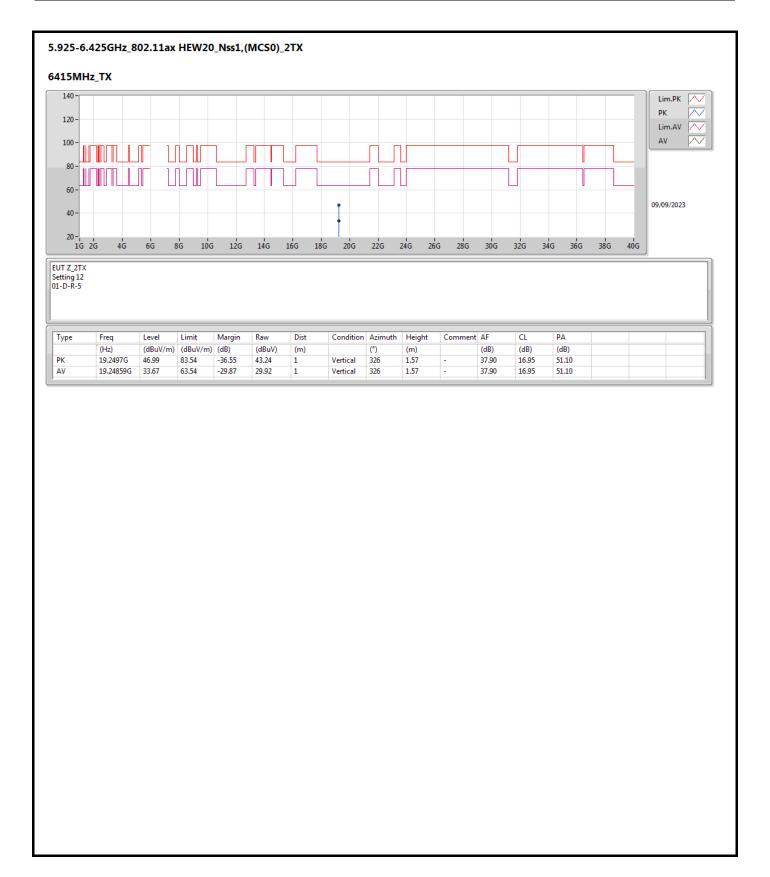






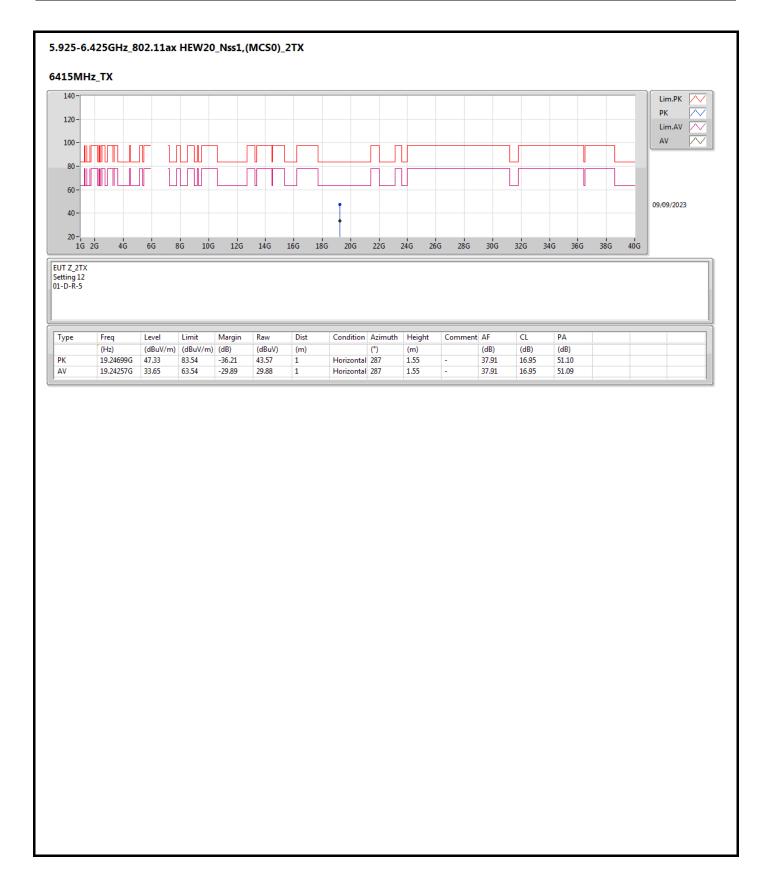






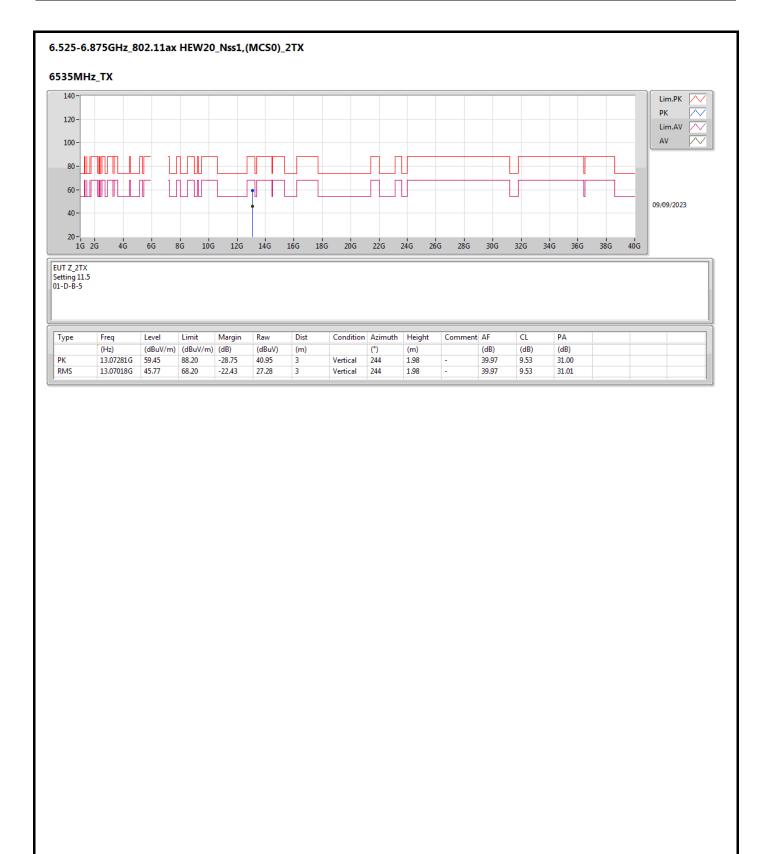
Page No. : 14 of 97 Report No. : FR191618





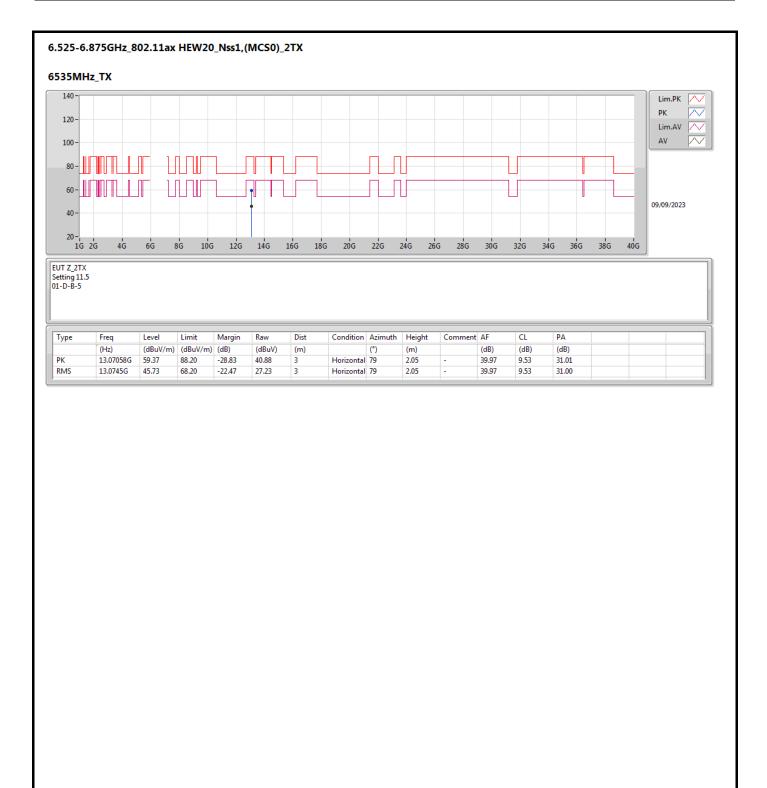
Page No. : 15 of 97 Report No. : FR191618





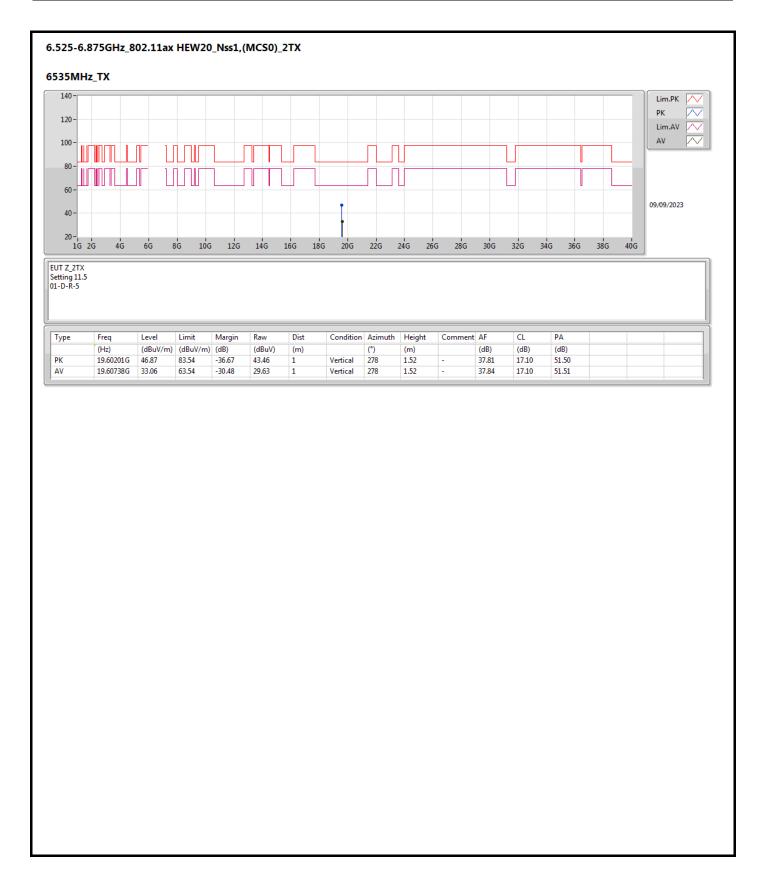
Page No. : 16 of 97 Report No. : FR191618





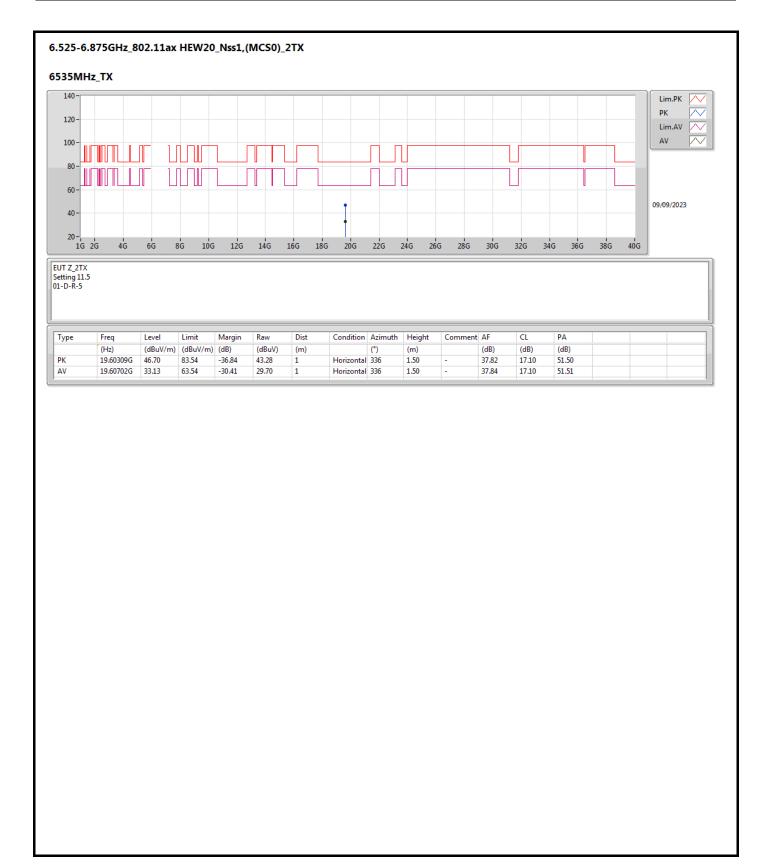
Page No. : 17 of 97 Report No. : FR191618





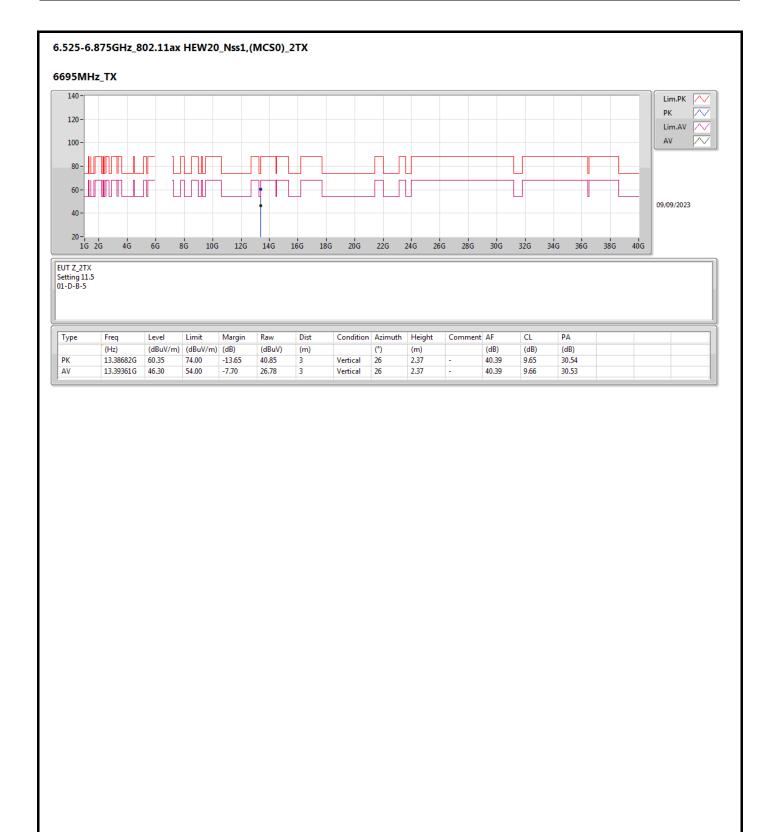
Page No. : 18 of 97 Report No. : FR191618





Page No. : 19 of 97 Report No. : FR191618



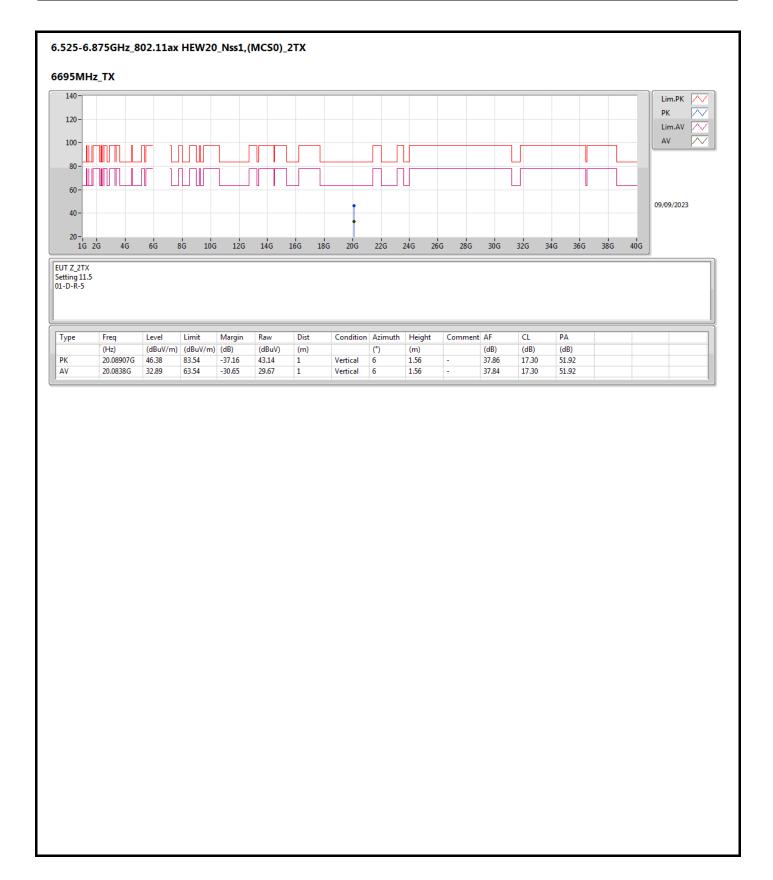


Page No. : 20 of 97 Report No. : FR191618



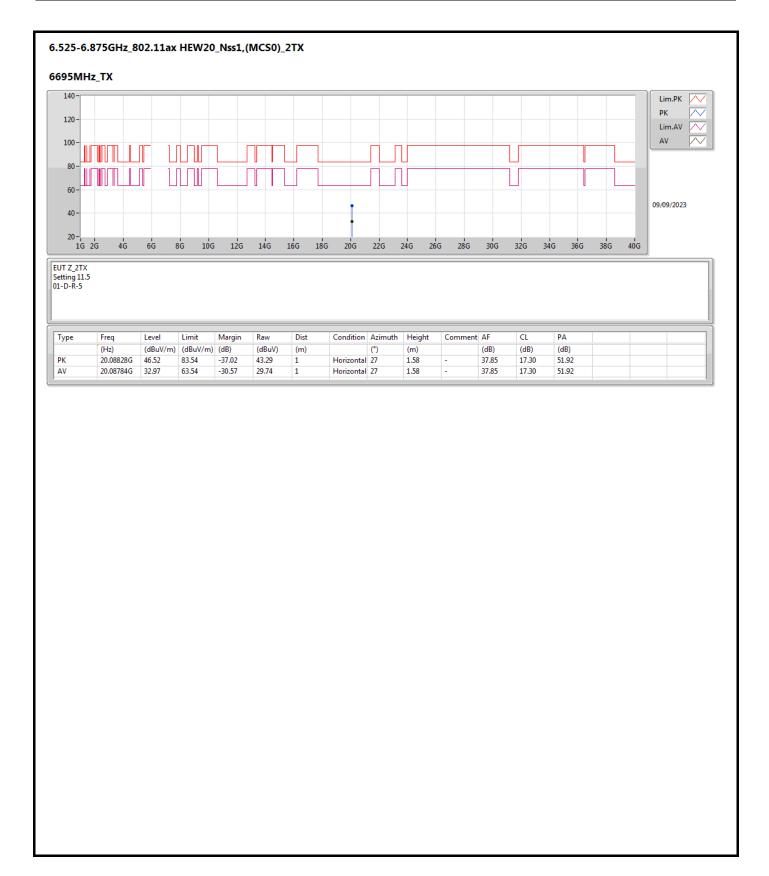






Page No. : 22 of 97 Report No. : FR191618





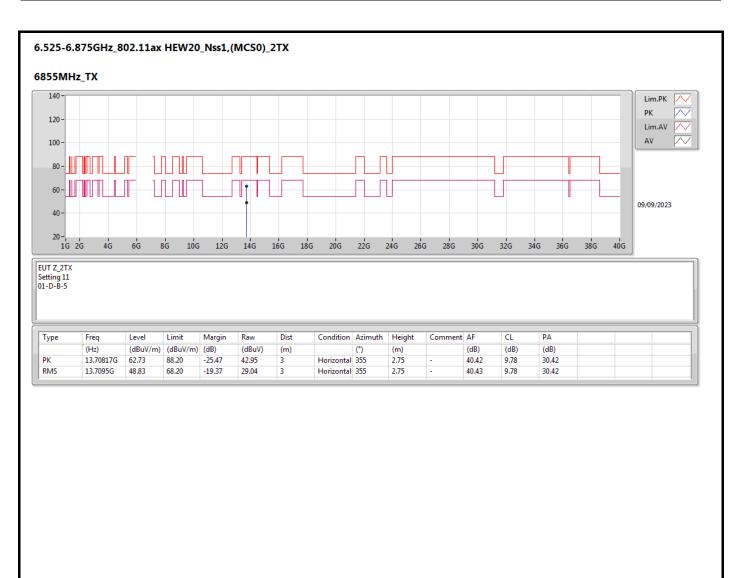
Page No. : 23 of 97 Report No. : FR191618





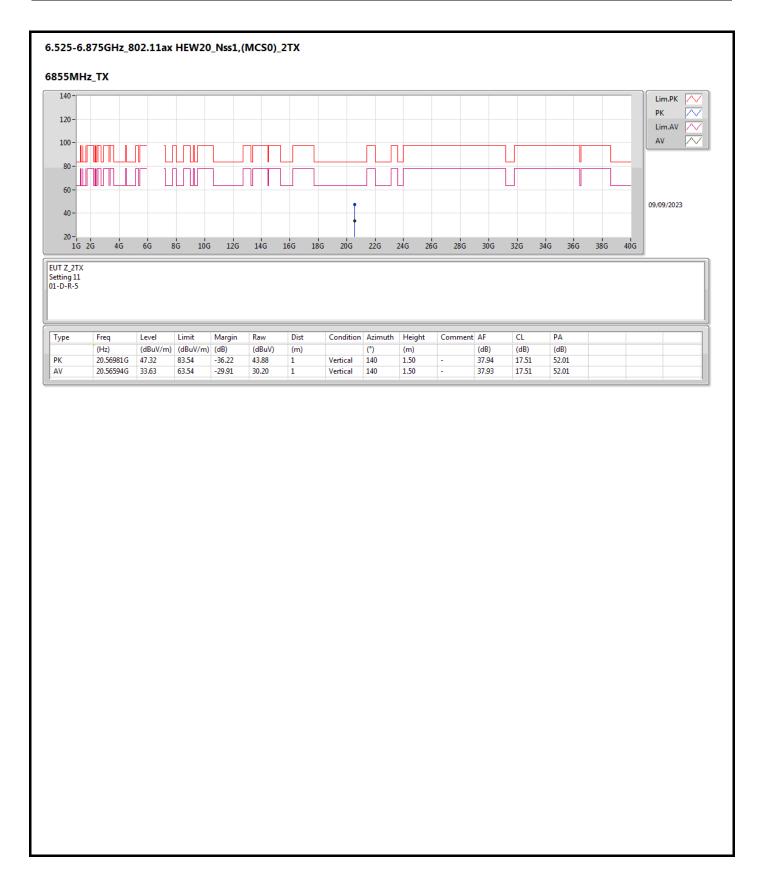
Page No. : 24 of 97 Report No. : FR191618





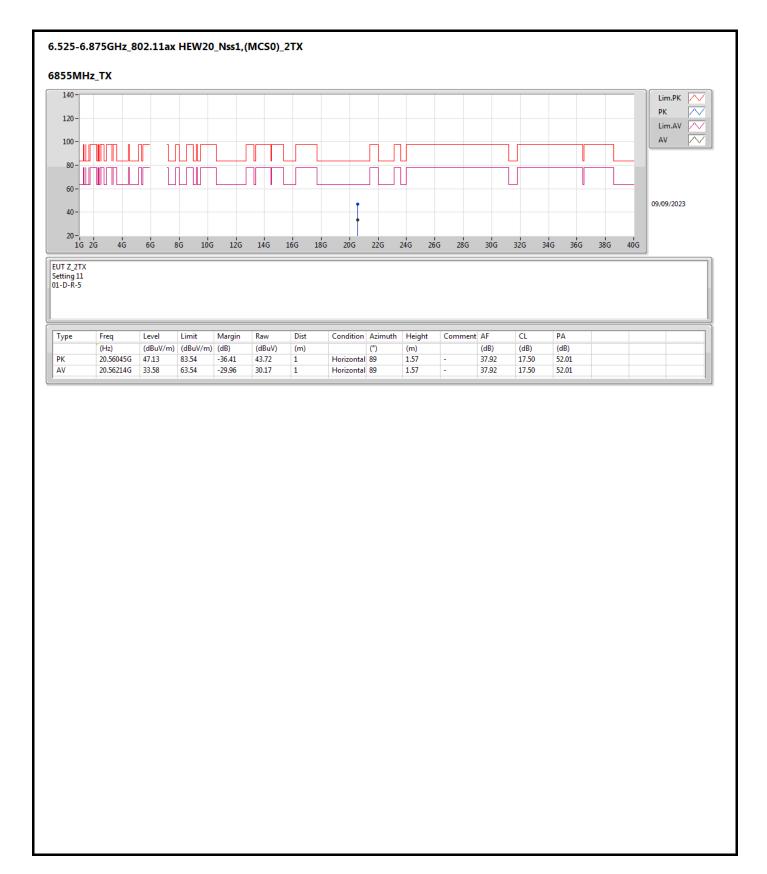
Page No. : 25 of 97 Report No. : FR191618



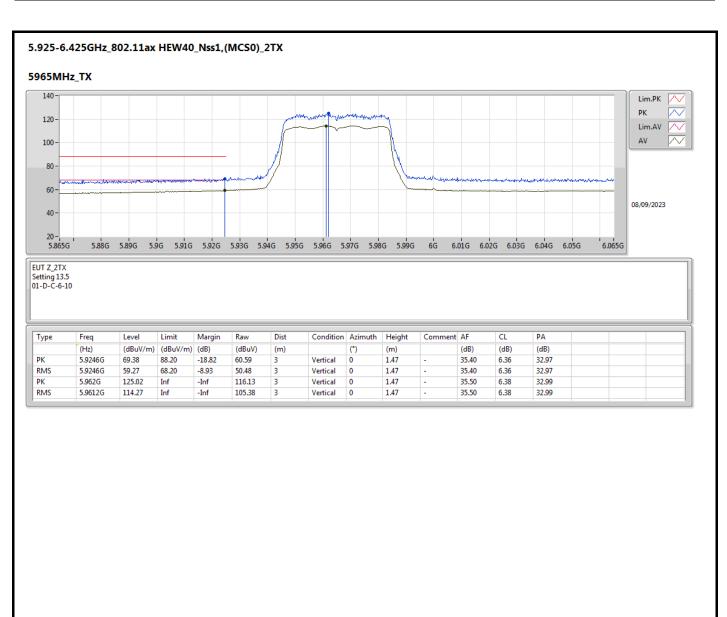


Page No. : 26 of 97 Report No. : FR191618



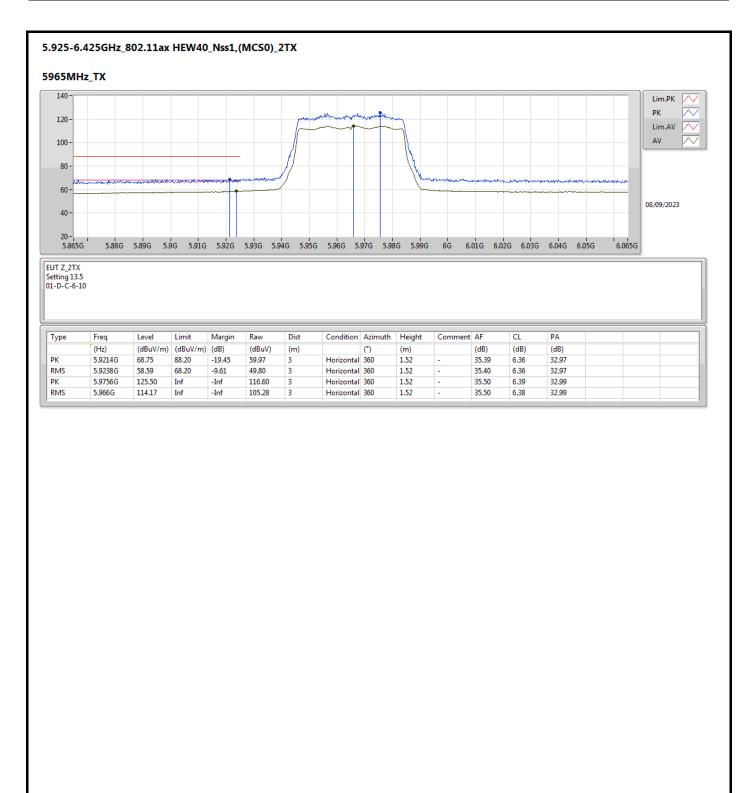






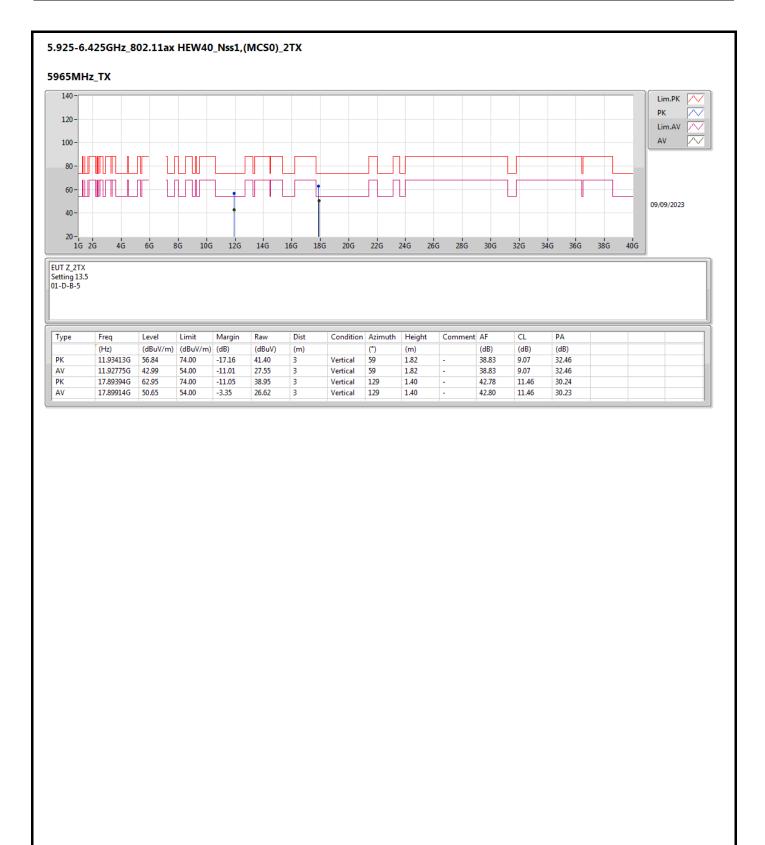
Page No. : 28 of 97 Report No. : FR191618



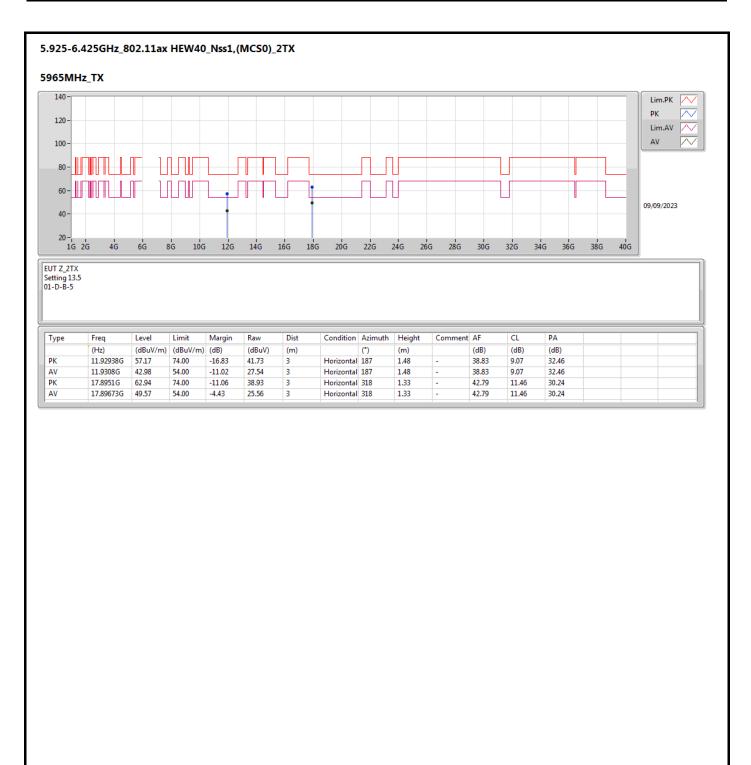


Page No. : 29 of 97 Report No. : FR191618

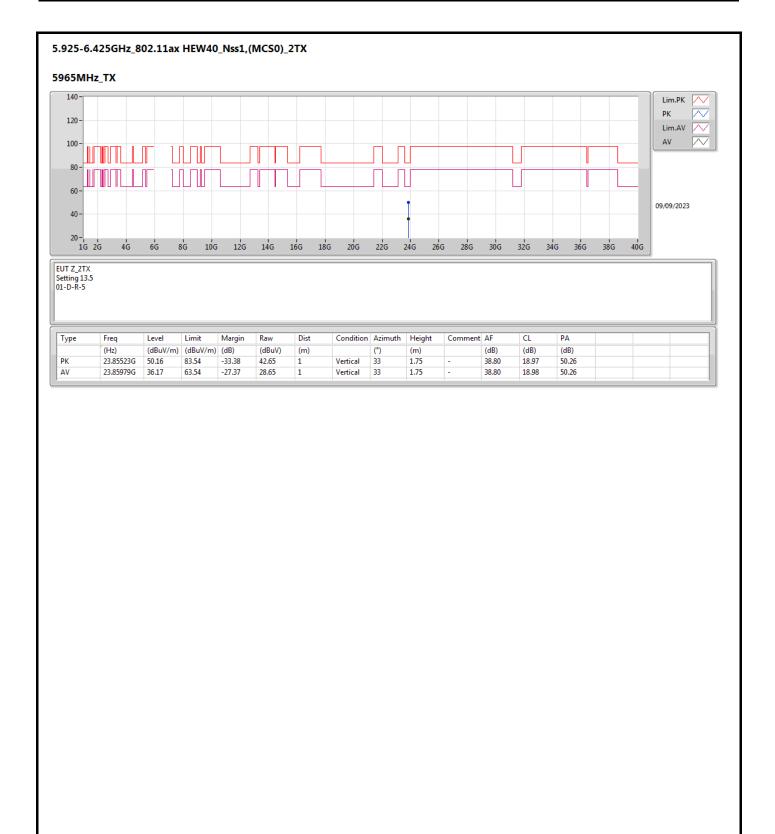






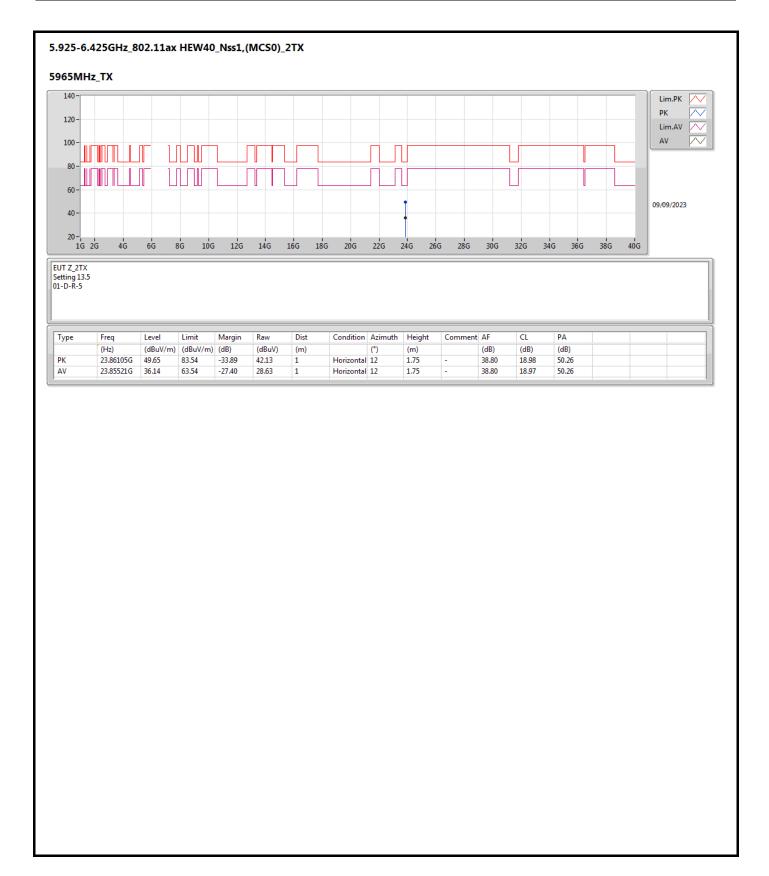






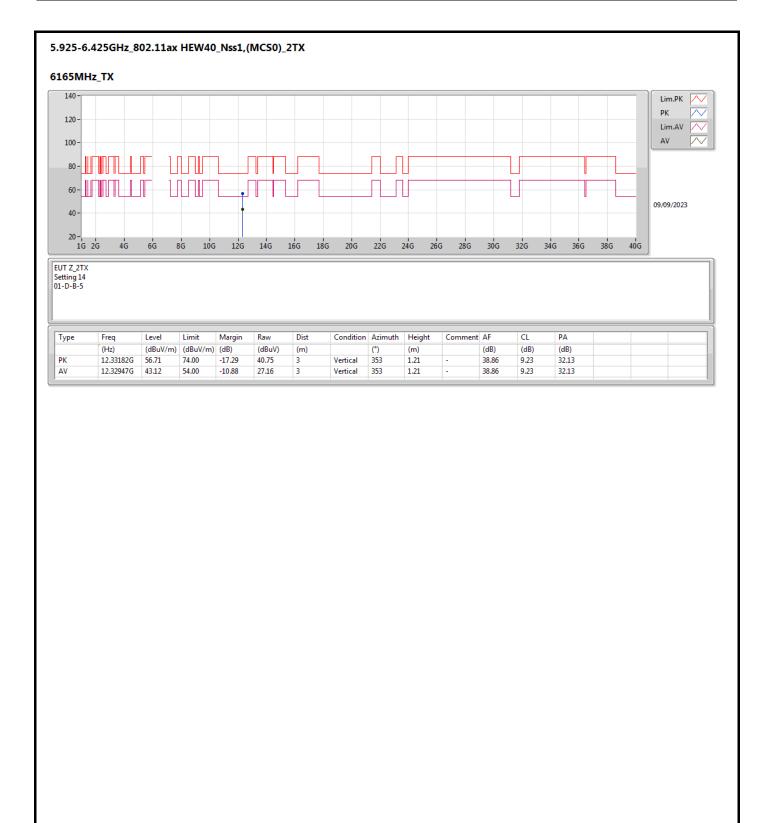
Page No. : 32 of 97 Report No. : FR191618



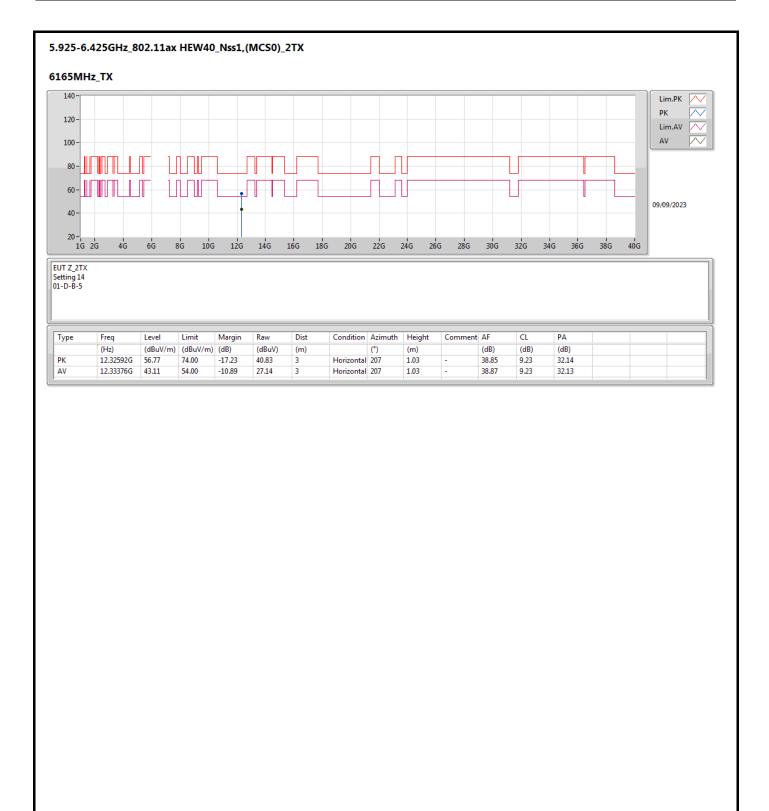


Page No. : 33 of 97 Report No. : FR191618











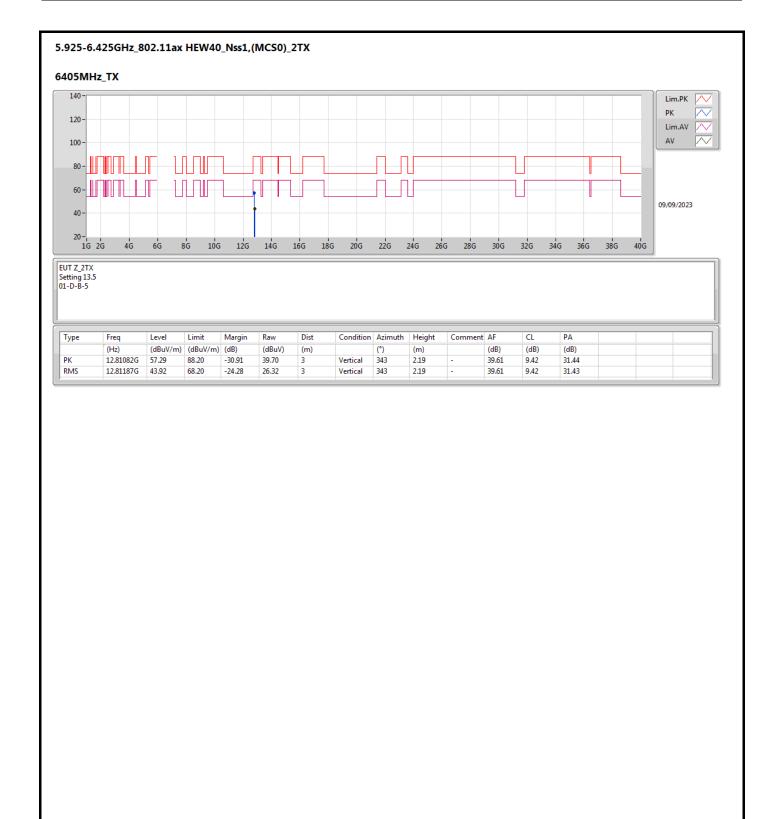


Page No. : 36 of 97 Report No. : FR191618

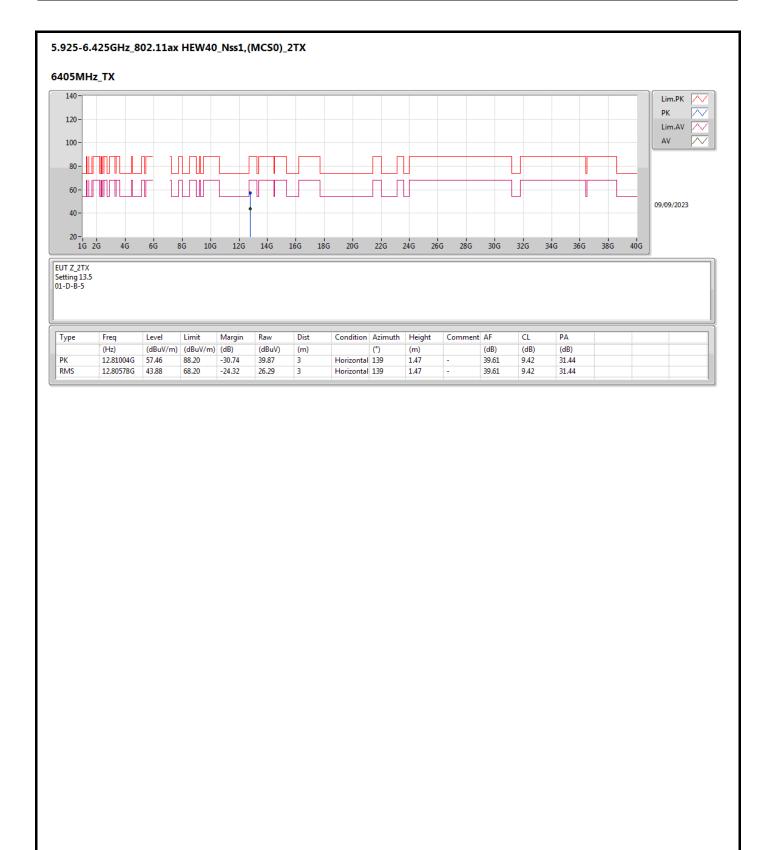










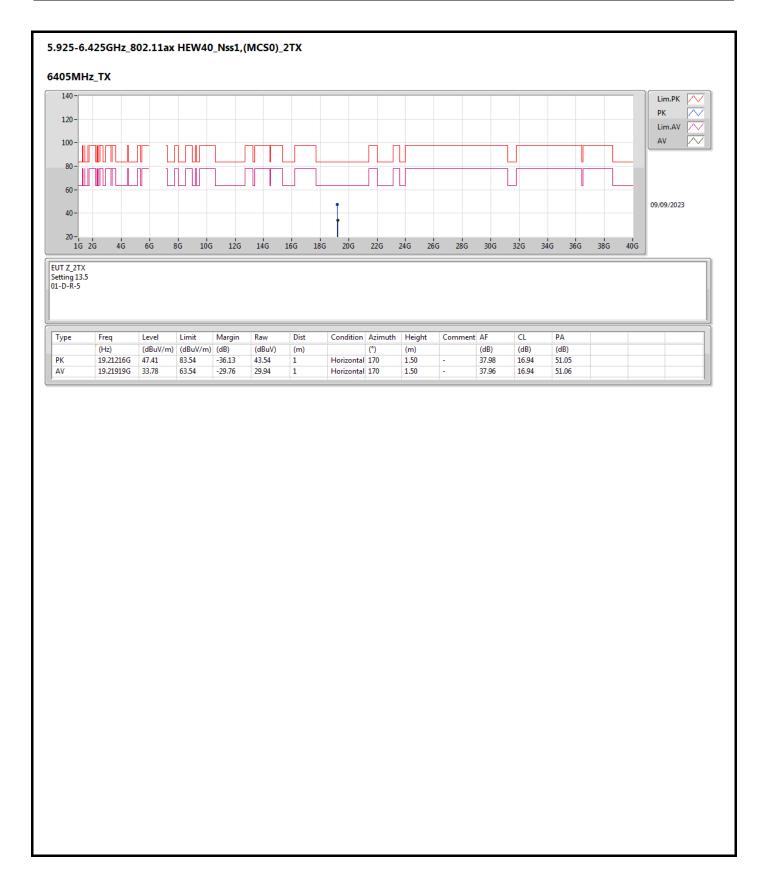






Page No. : 40 of 97 Report No. : FR191618



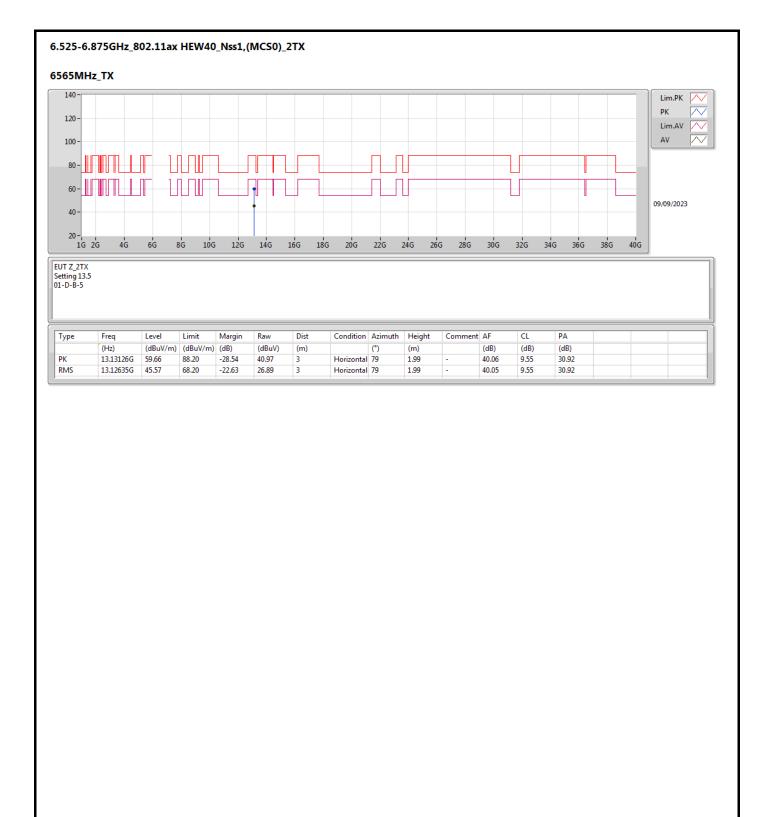






Page No. : 42 of 97 Report No. : FR191618

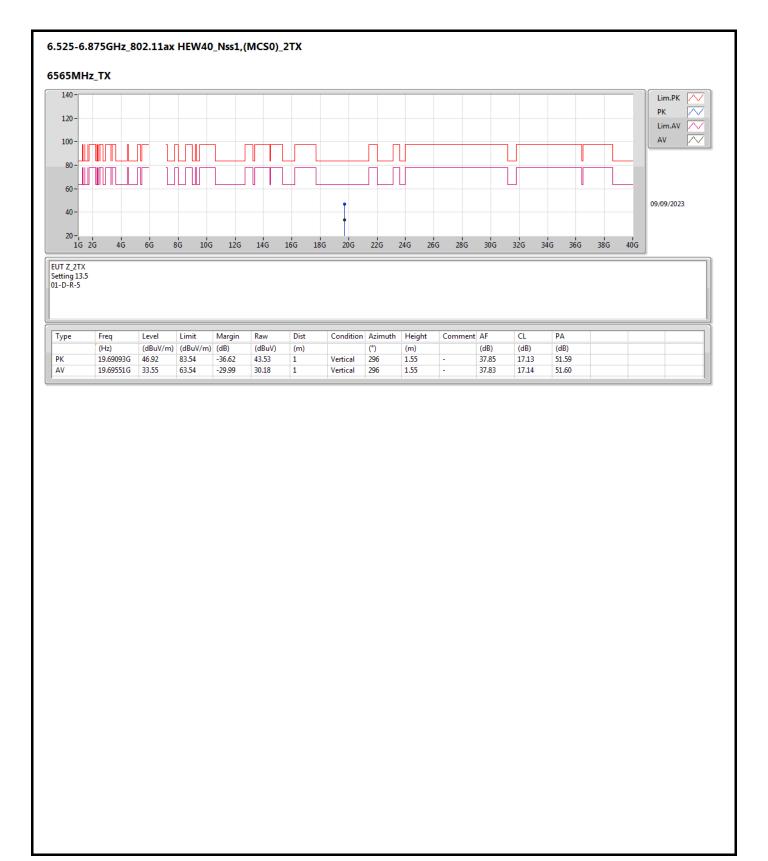




Page No. : 43 of 97

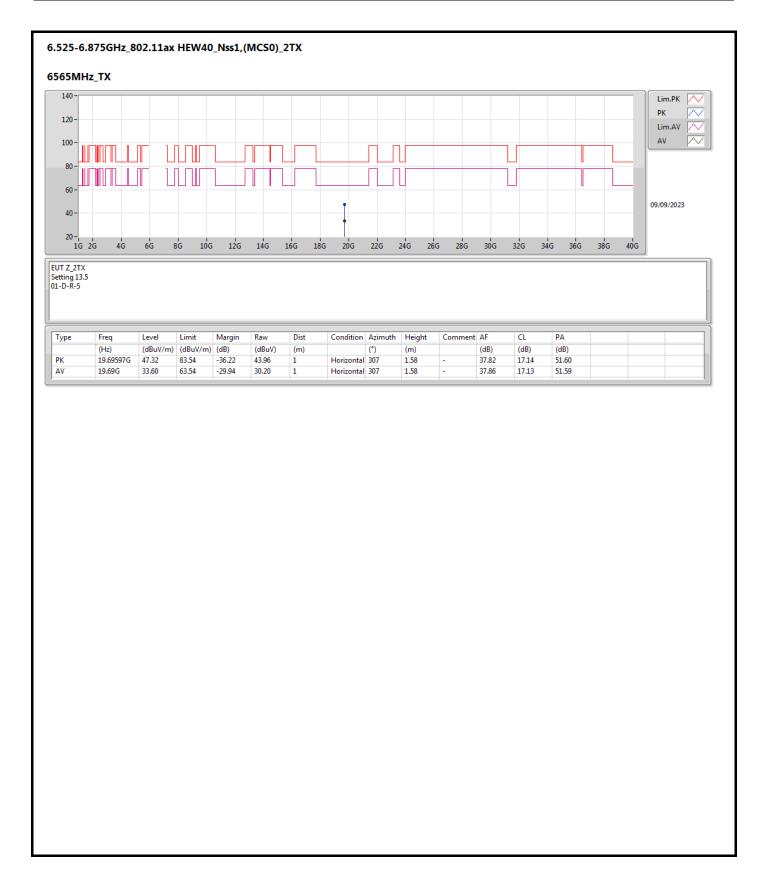
Report No. : FR191618





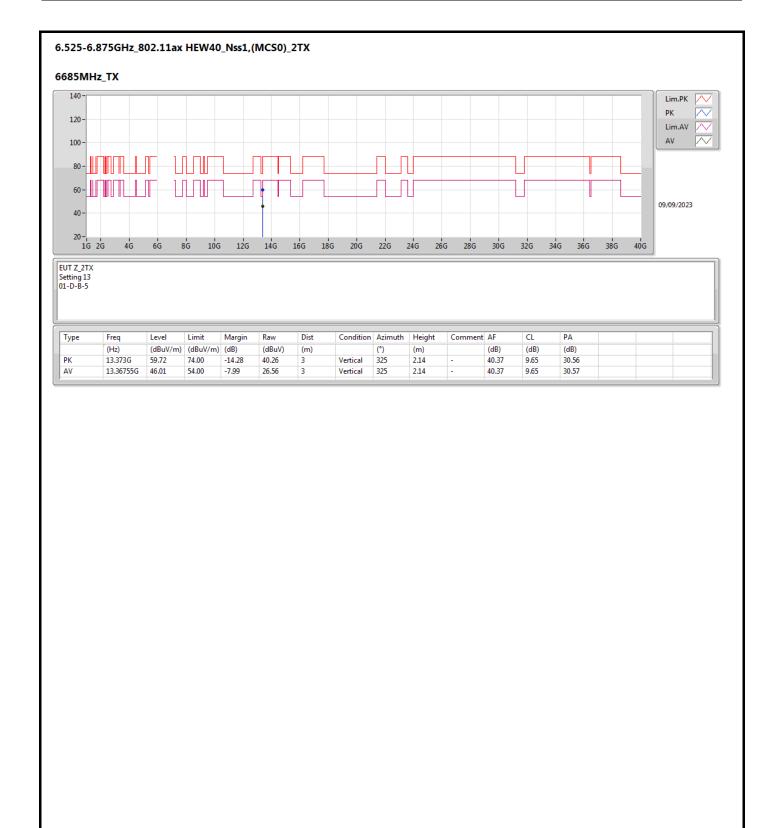
Page No. : 44 of 97 Report No. : FR191618





Page No. : 45 of 97 Report No. : FR191618

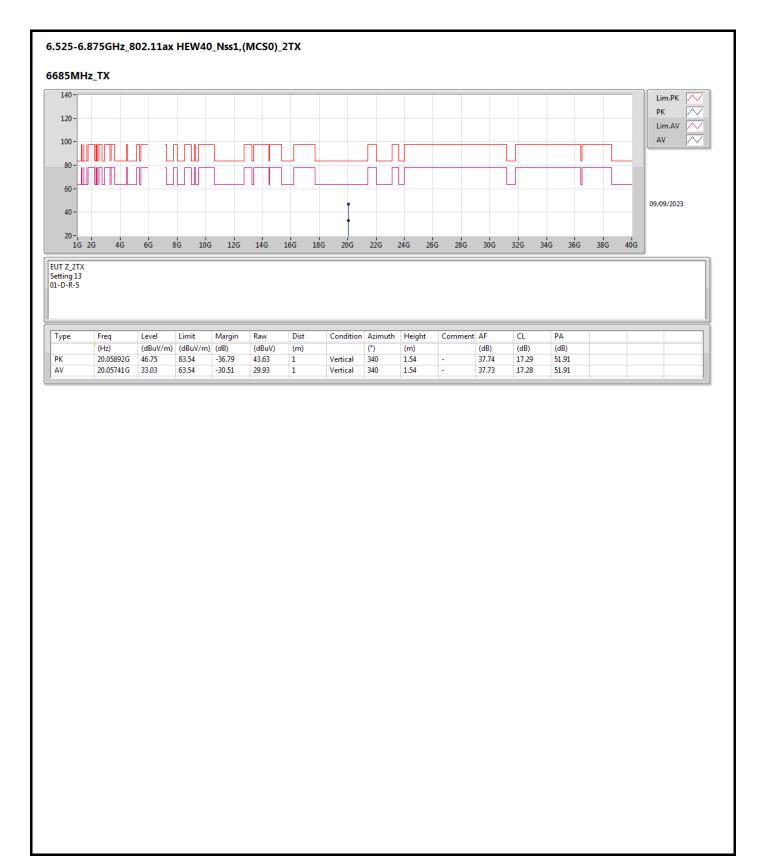






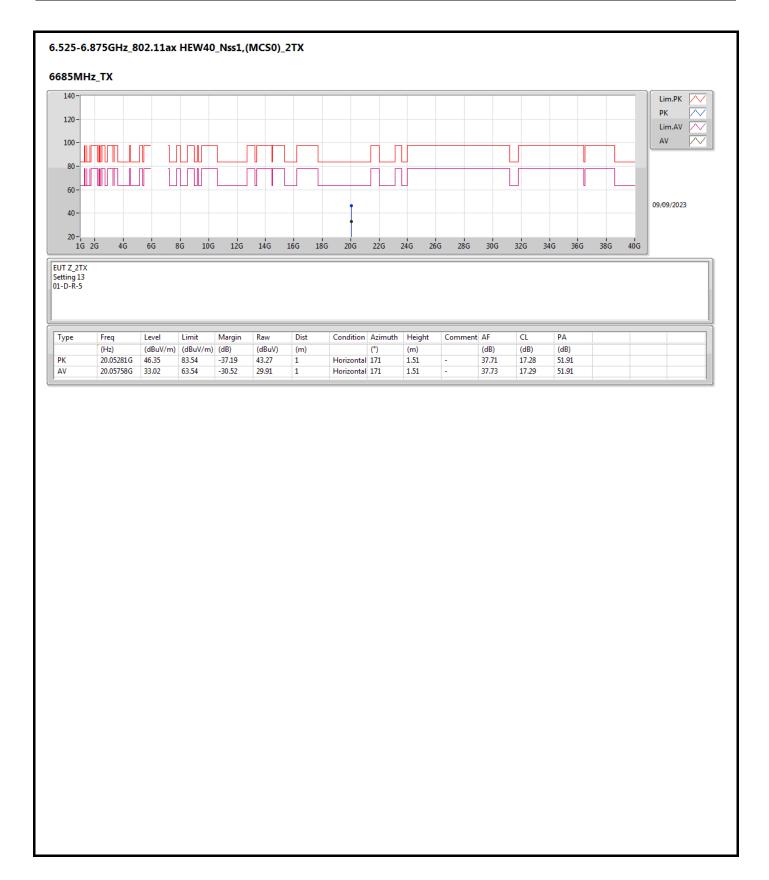






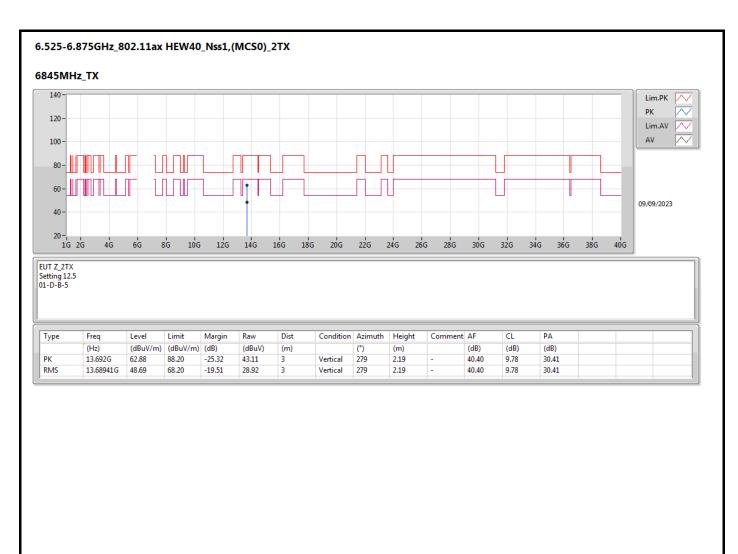
Page No. : 48 of 97 Report No. : FR191618





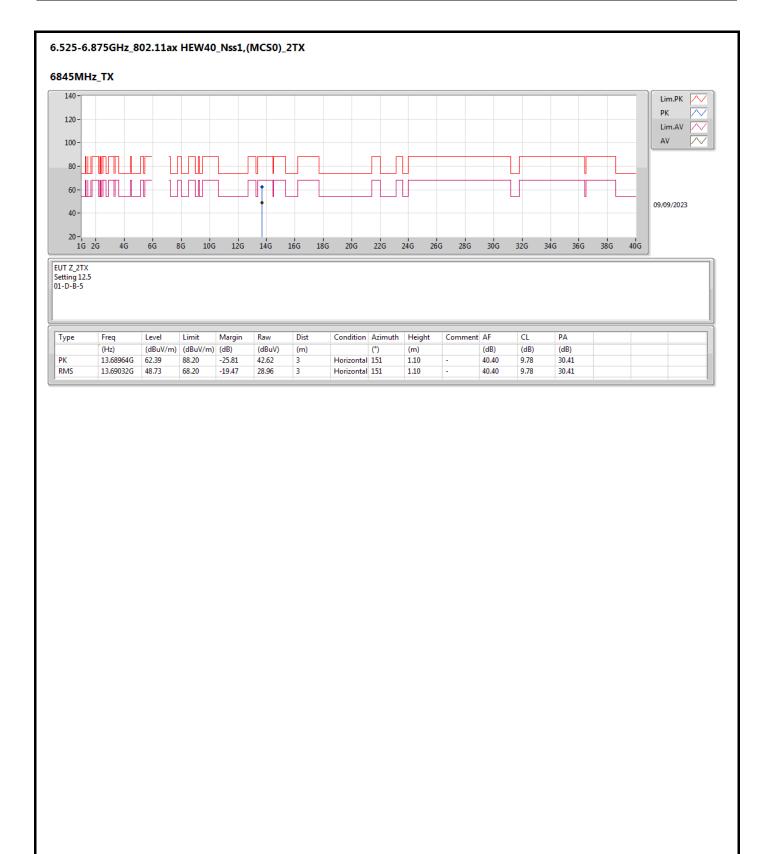
Page No. : 49 of 97 Report No. : FR191618





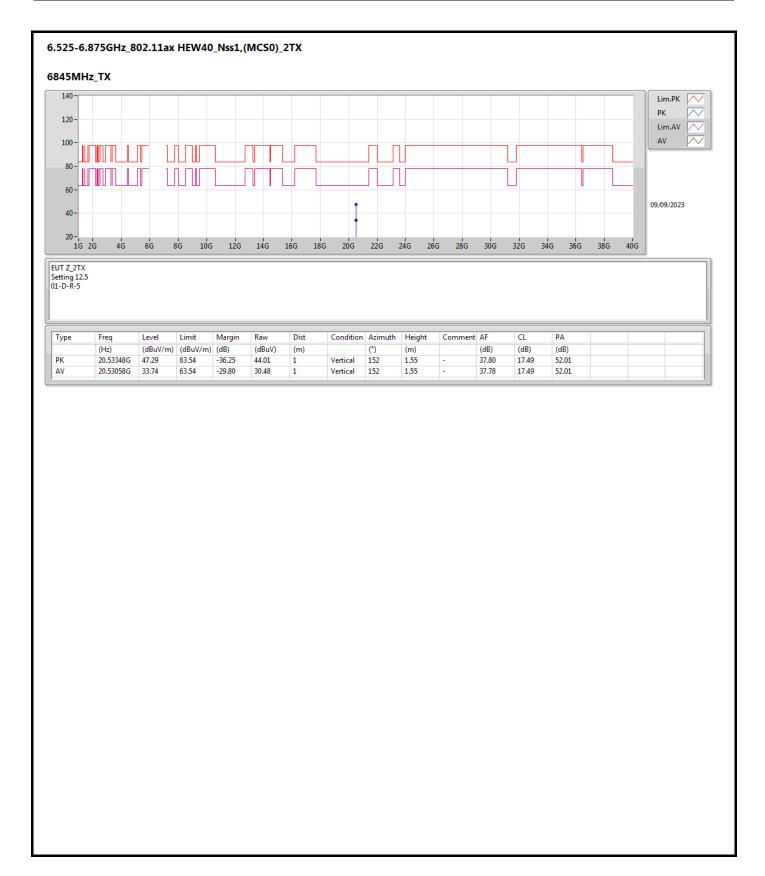
Page No. : 50 of 97 Report No. : FR191618





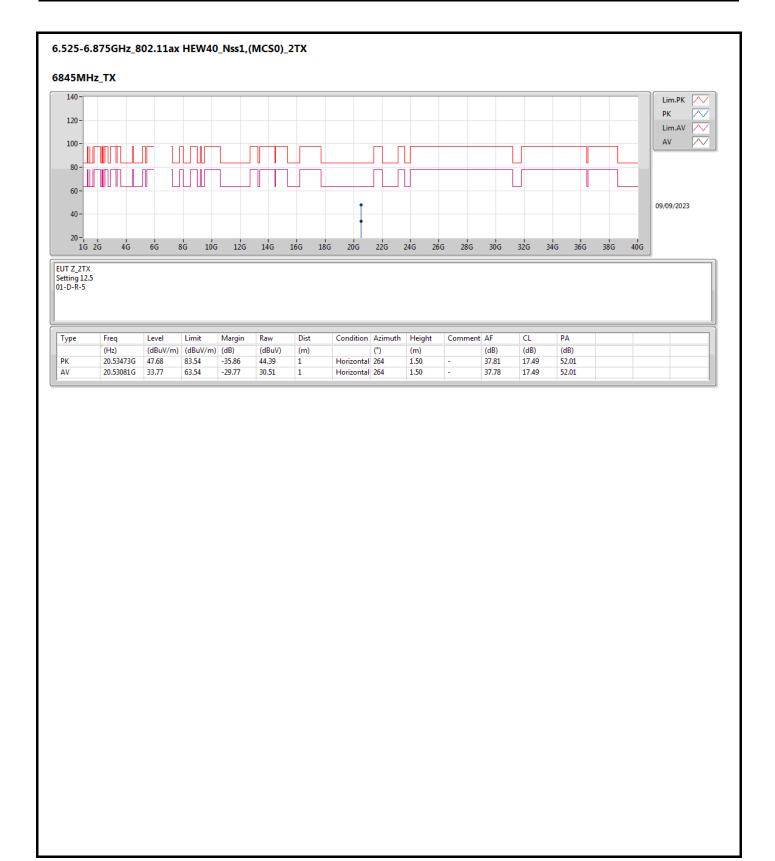
Page No. : 51 of 97 Report No. : FR191618



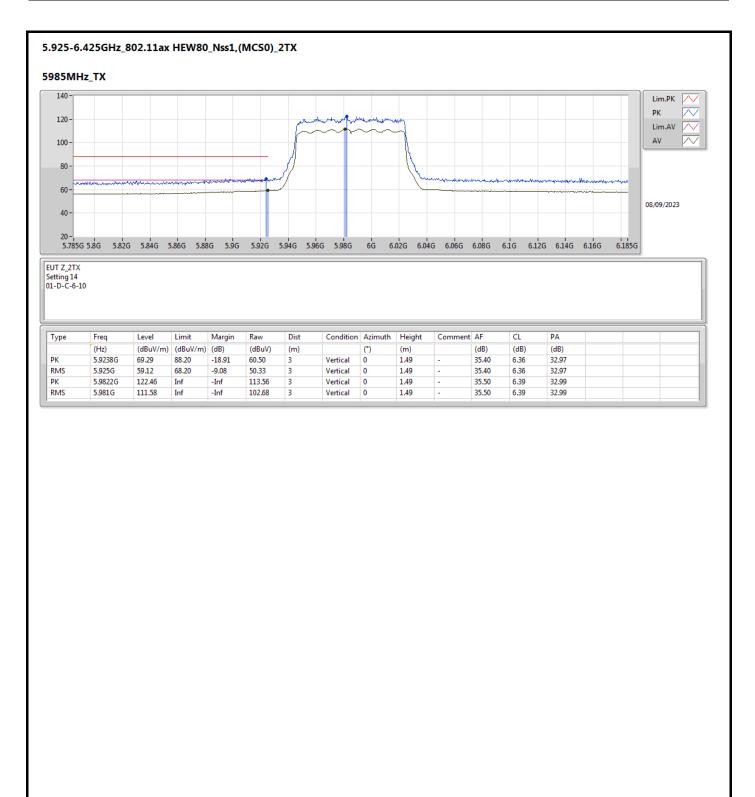


Page No. : 52 of 97 Report No. : FR191618

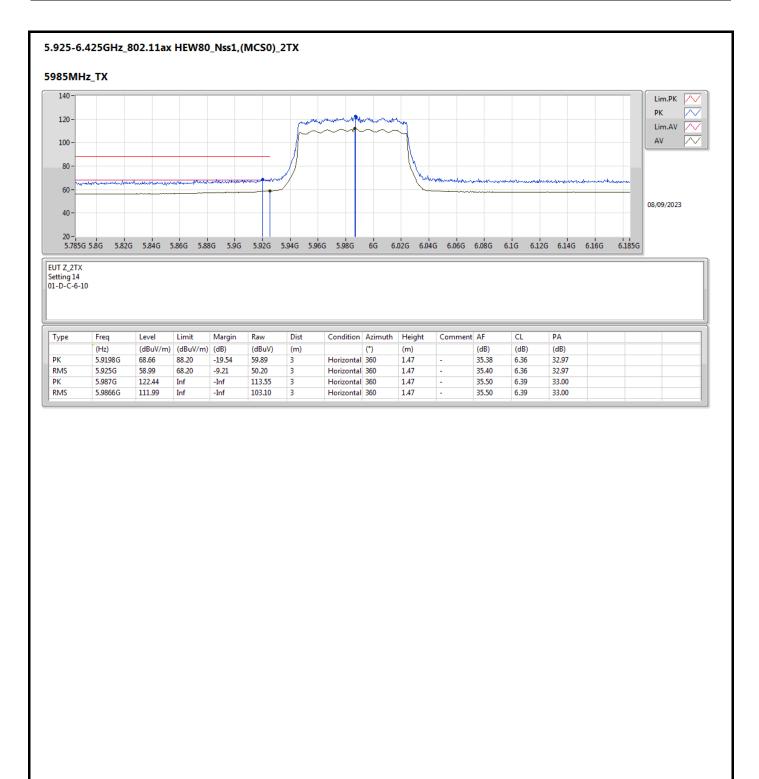






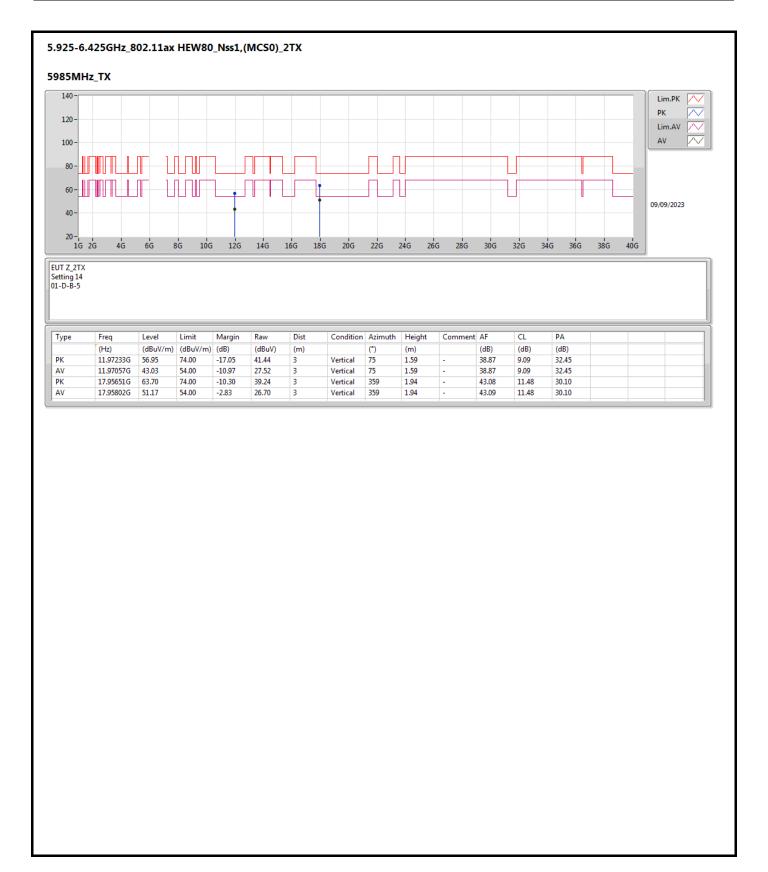




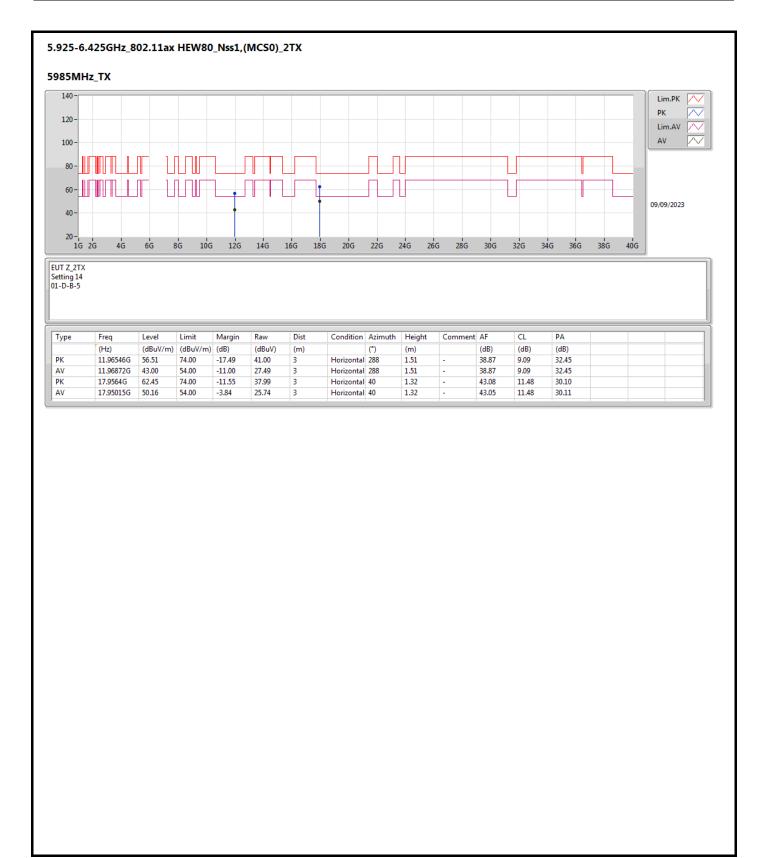


Page No. : 55 of 97 Report No. : FR191618







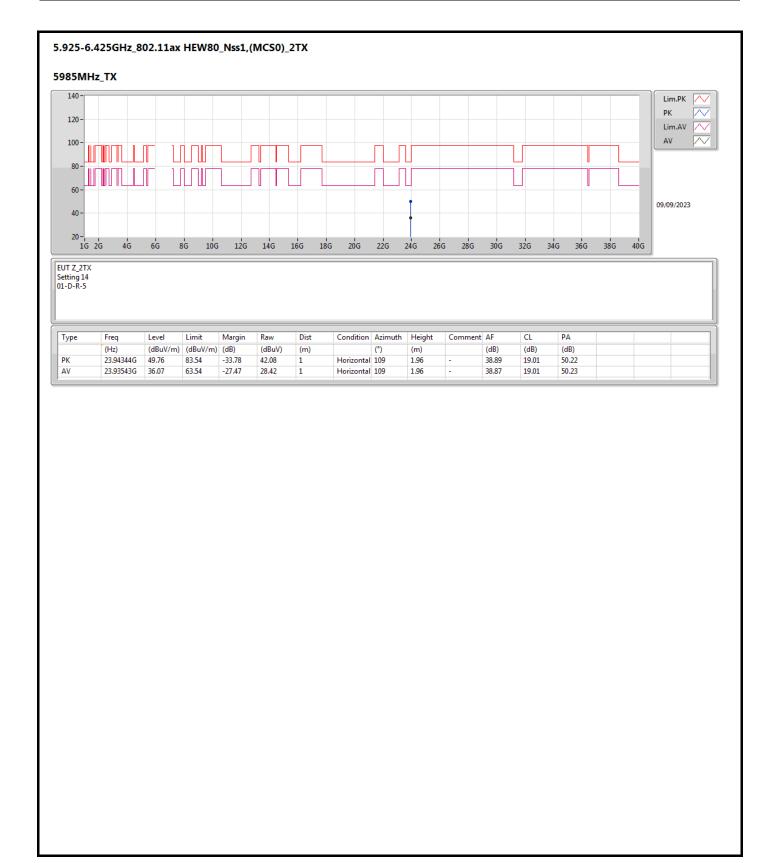






Page No. : 58 of 97 Report No. : FR191618

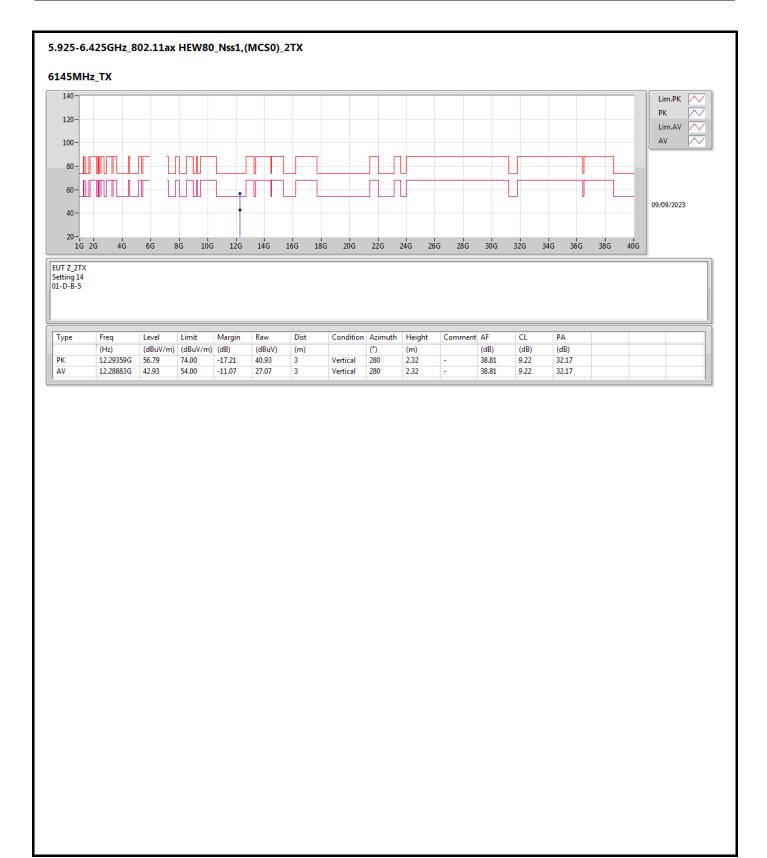




Page No. : 59 of 97

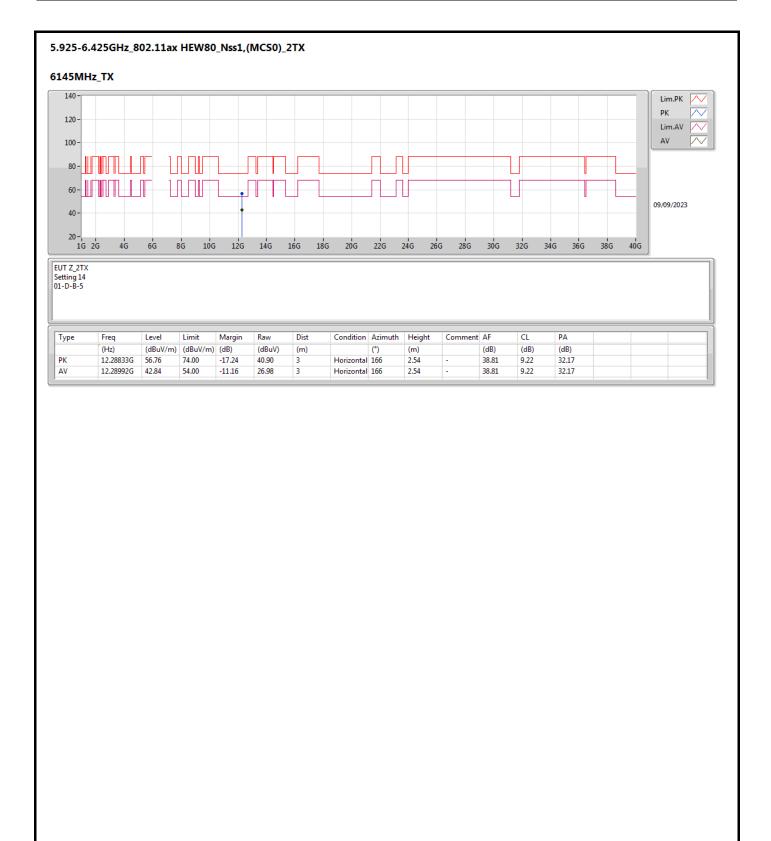
Report No. : FR191618



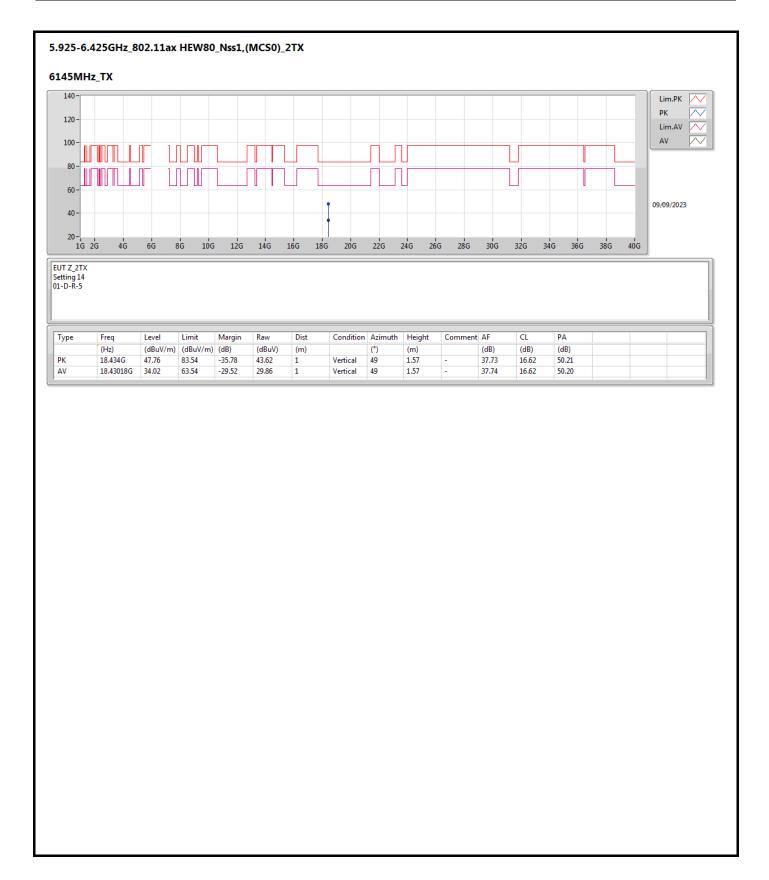


Page No. : 60 of 97 Report No. : FR191618







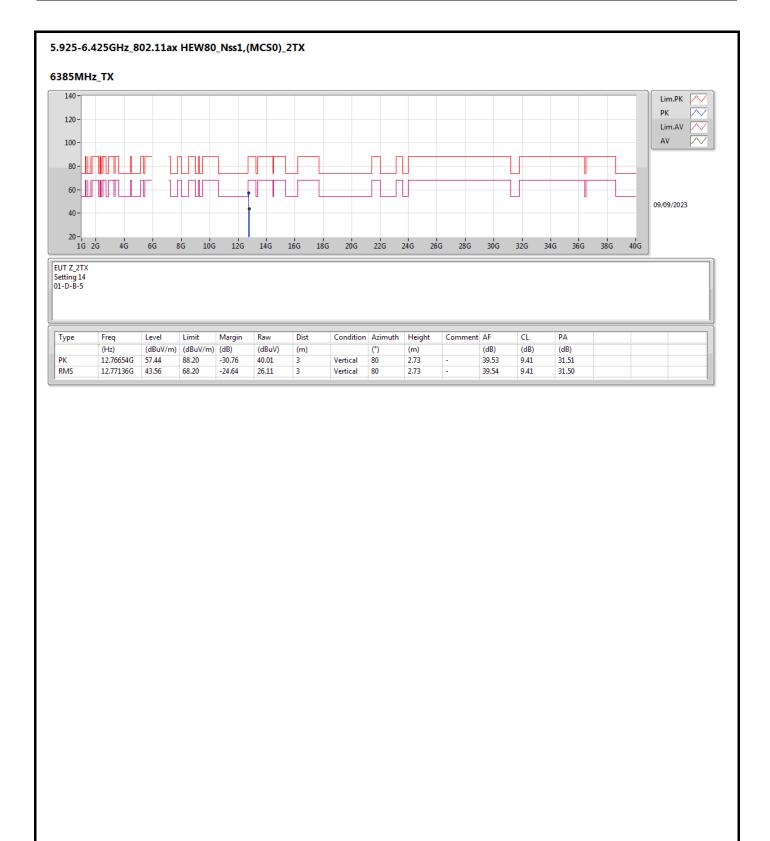


Page No. : 62 of 97 Report No. : FR191618

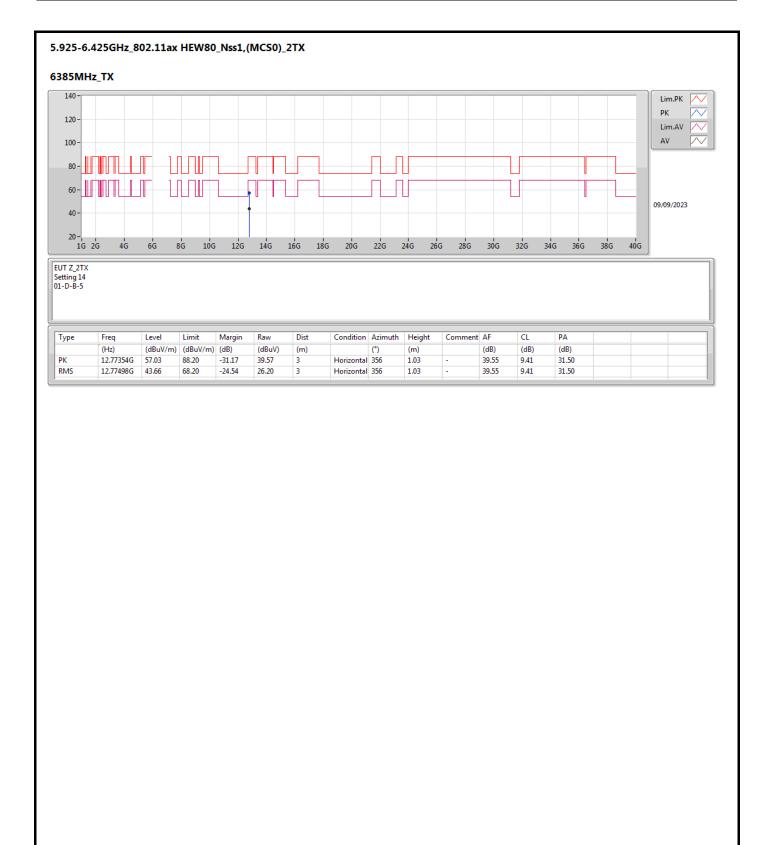




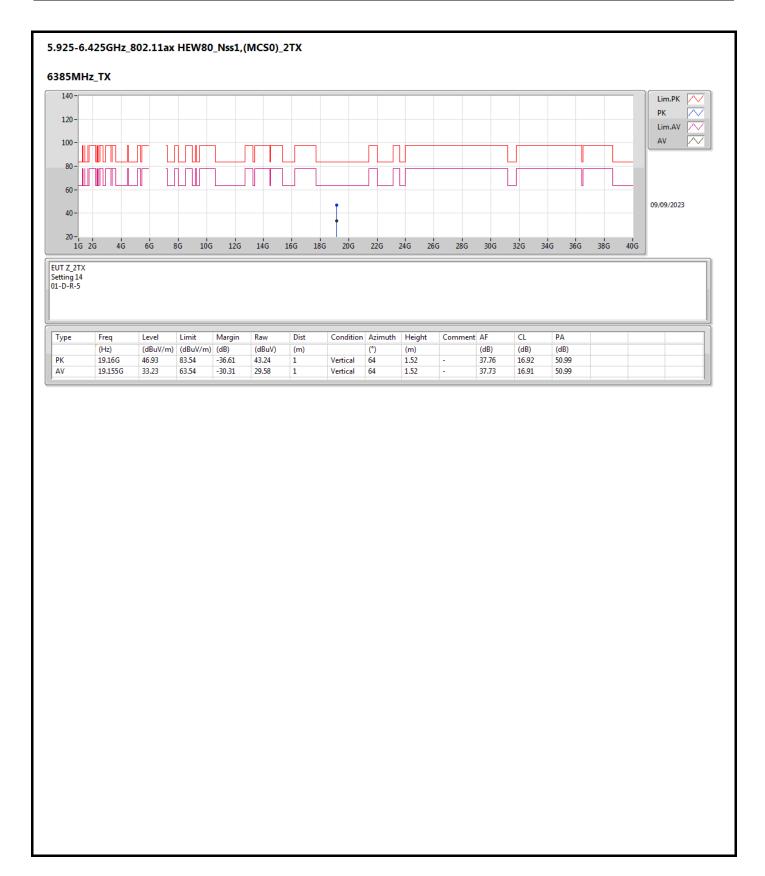




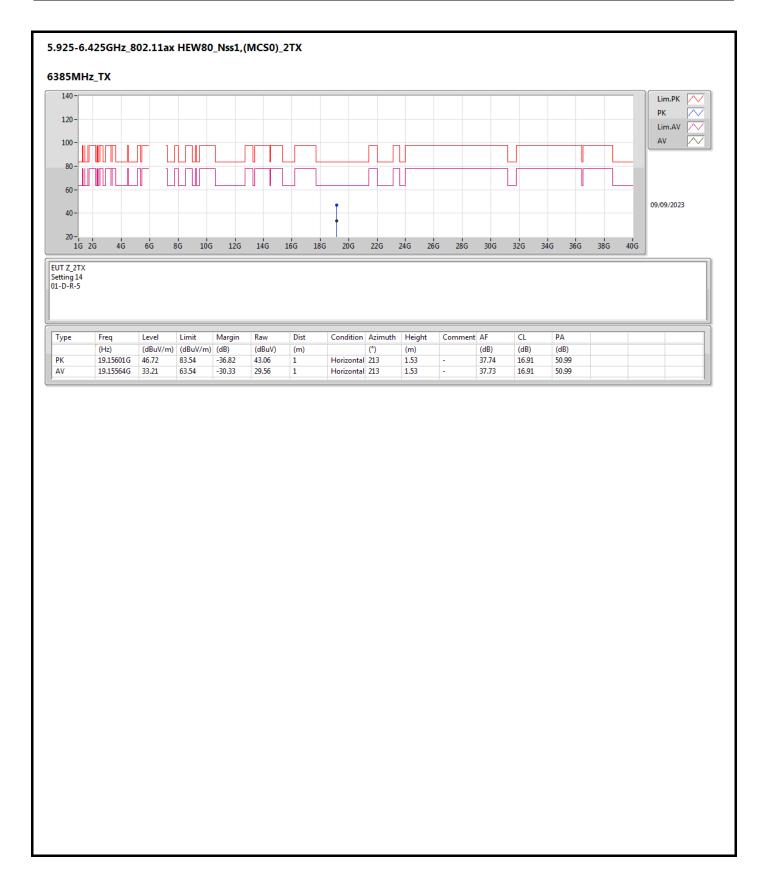






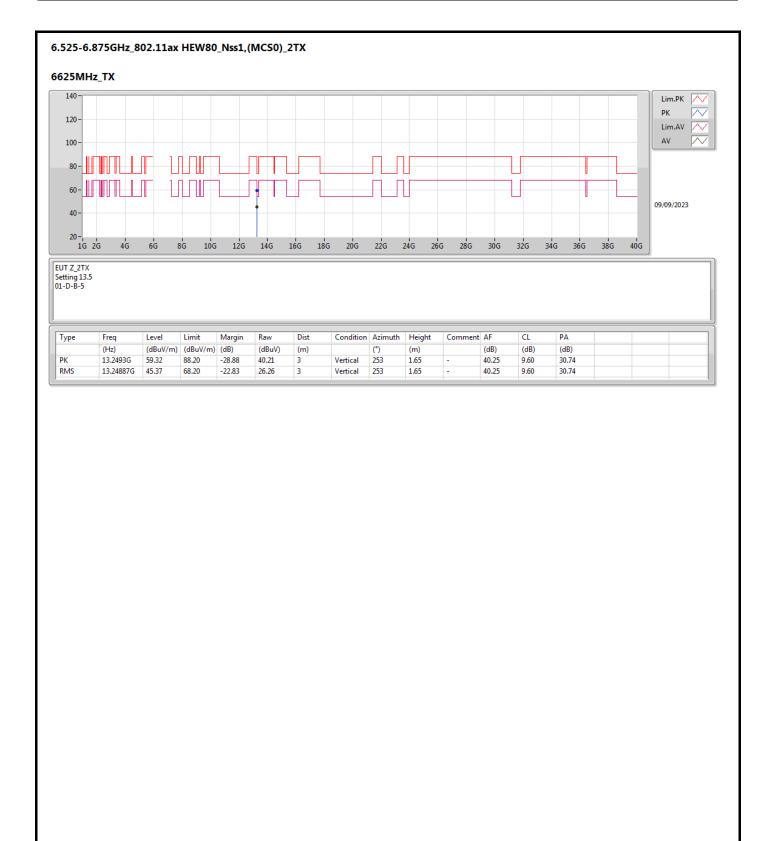






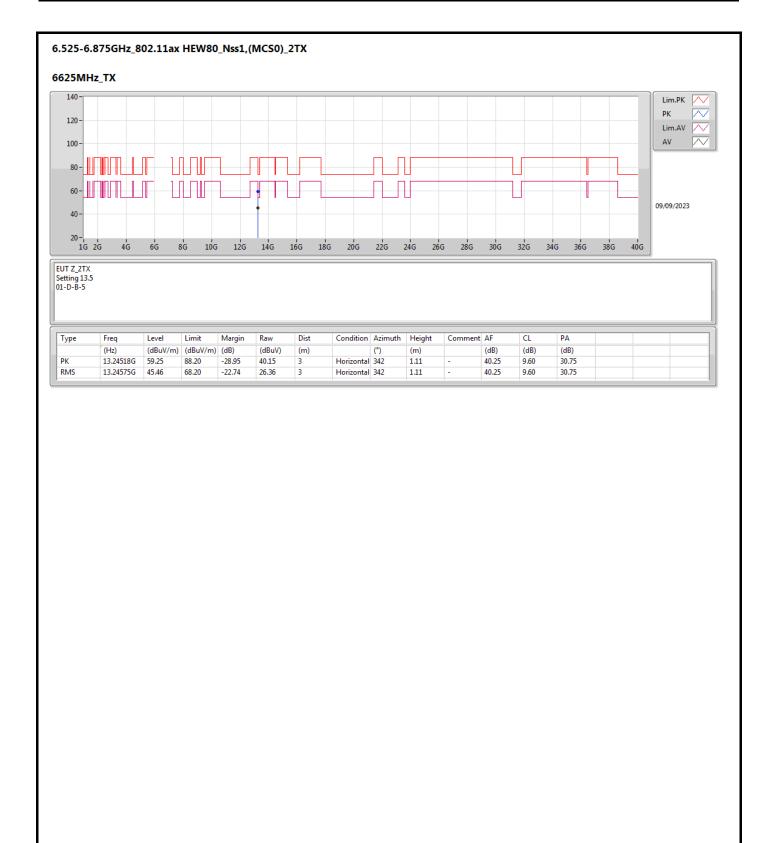
Page No. : 67 of 97 Report No. : FR191618





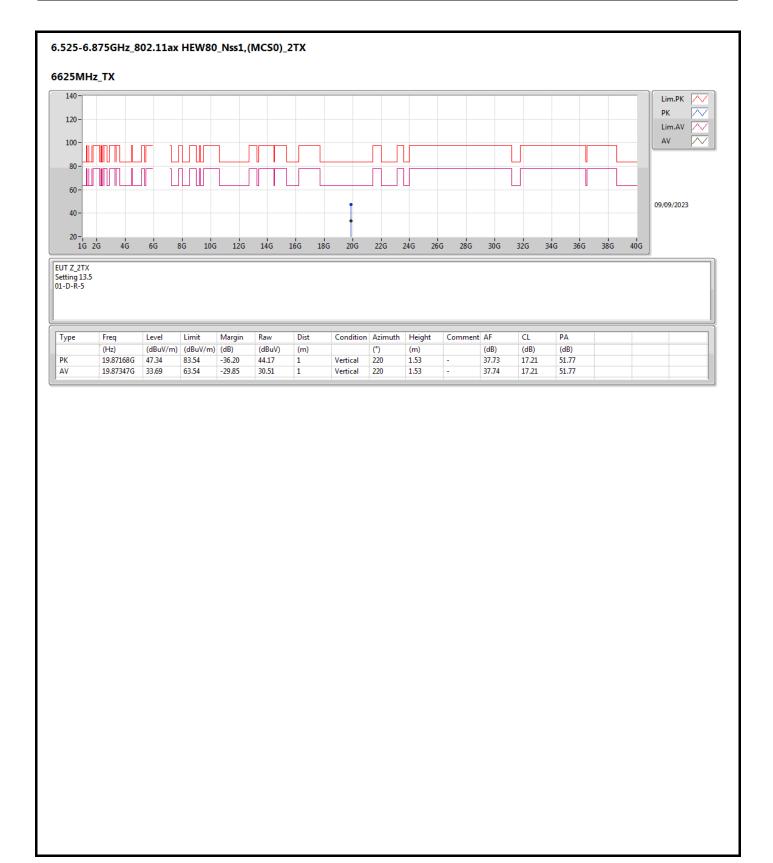
Page No. : 68 of 97 Report No. : FR191618





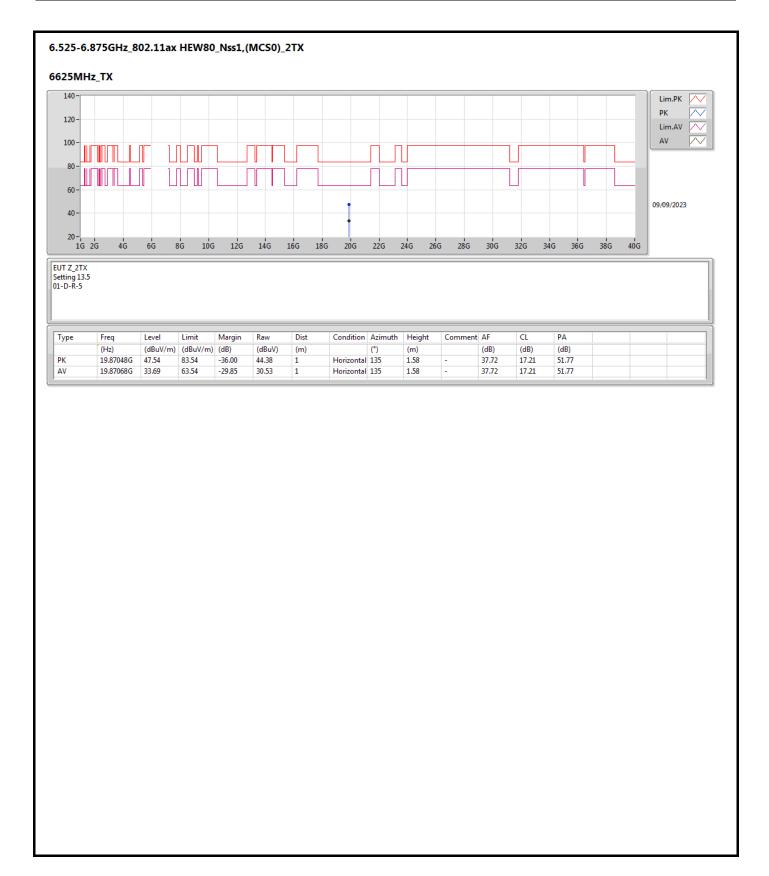
Page No. : 69 of 97 Report No. : FR191618





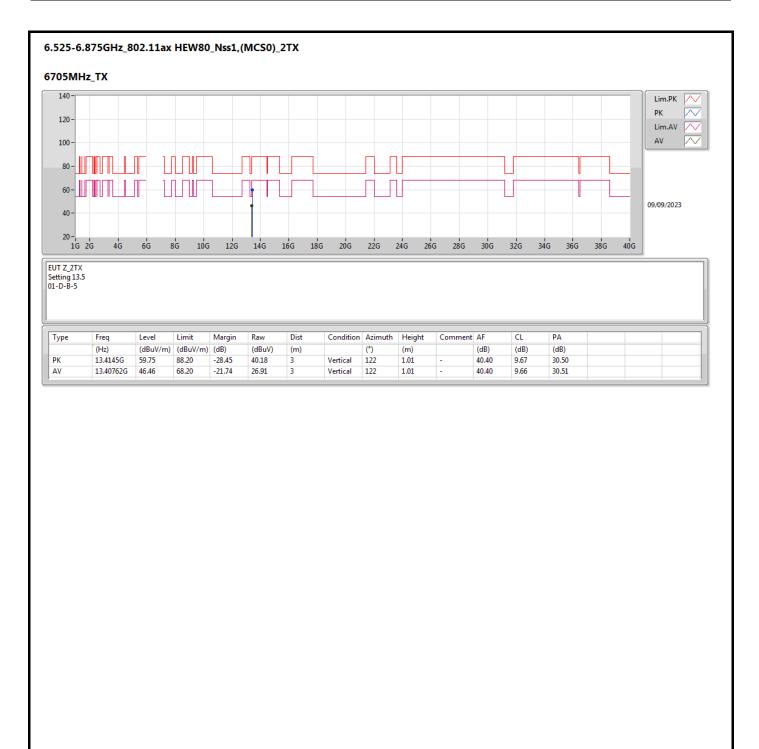
Page No. : 70 of 97 Report No. : FR191618



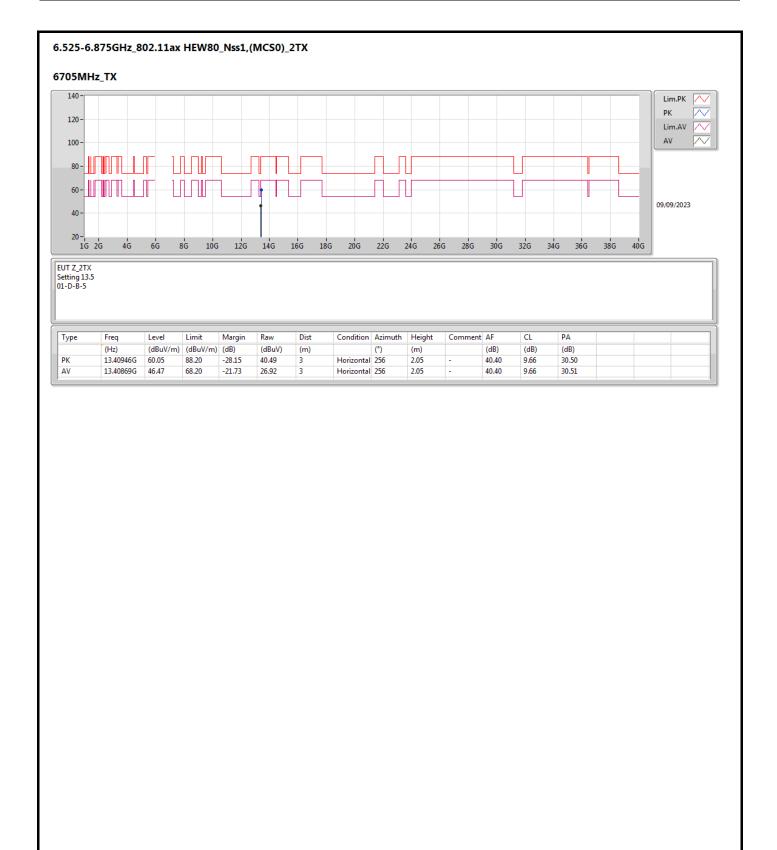


Page No. : 71 of 97 Report No. : FR191618

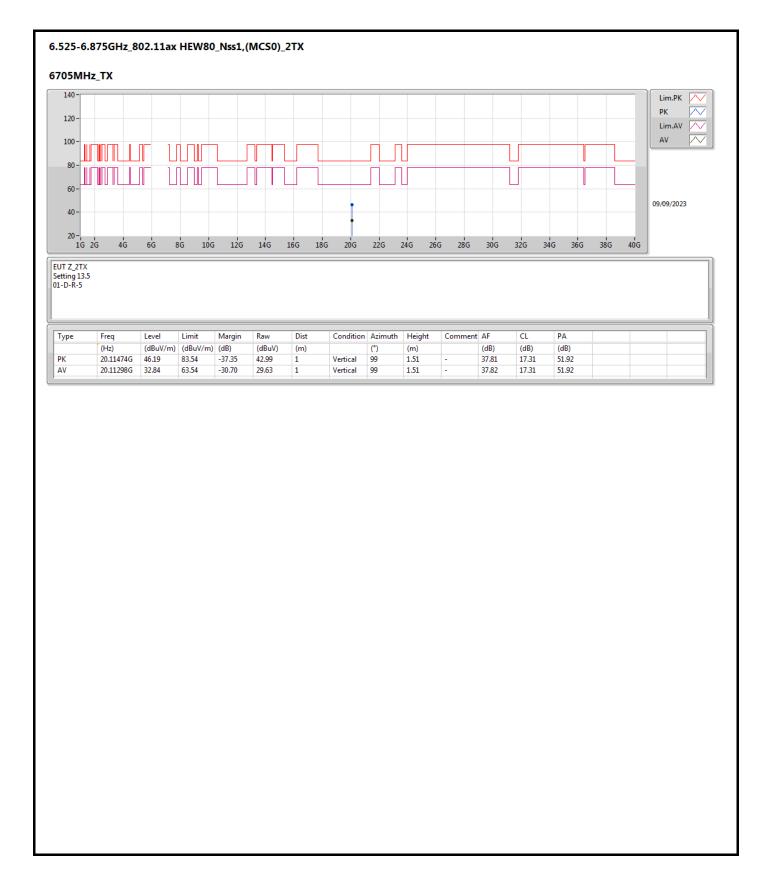




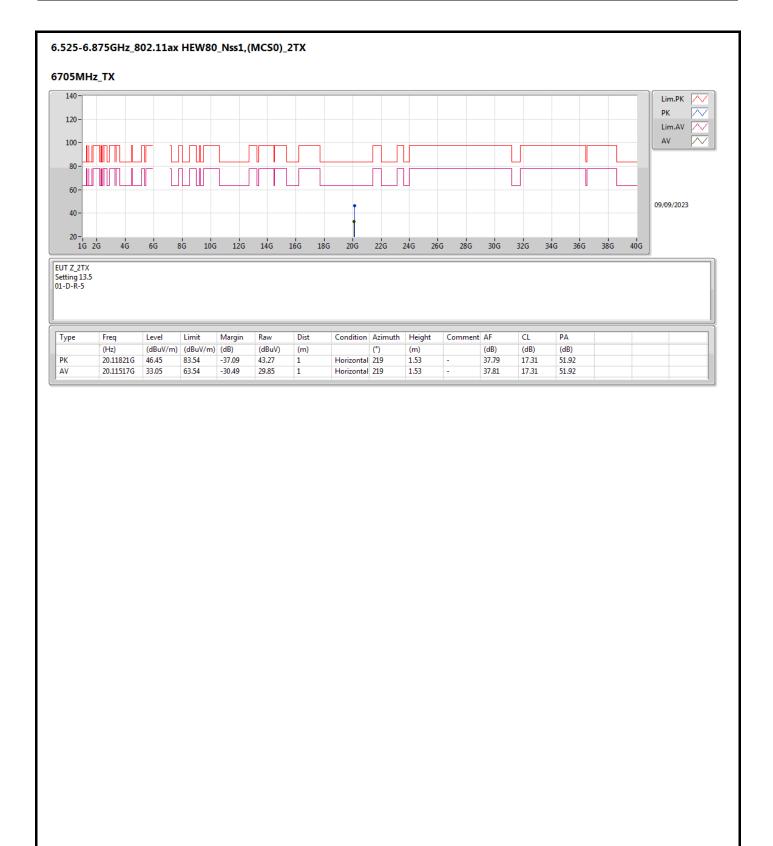






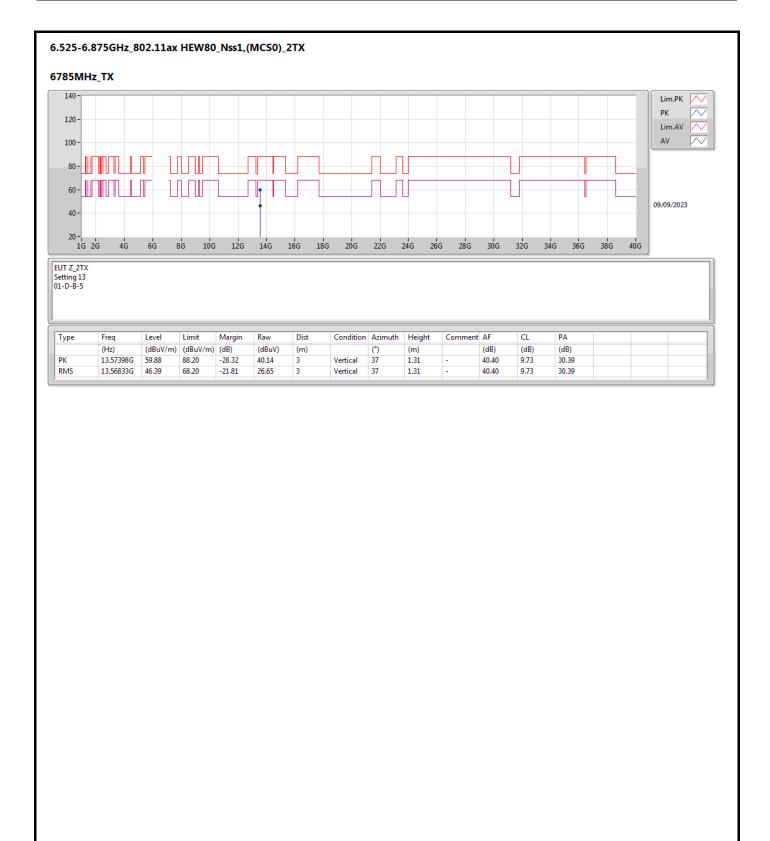






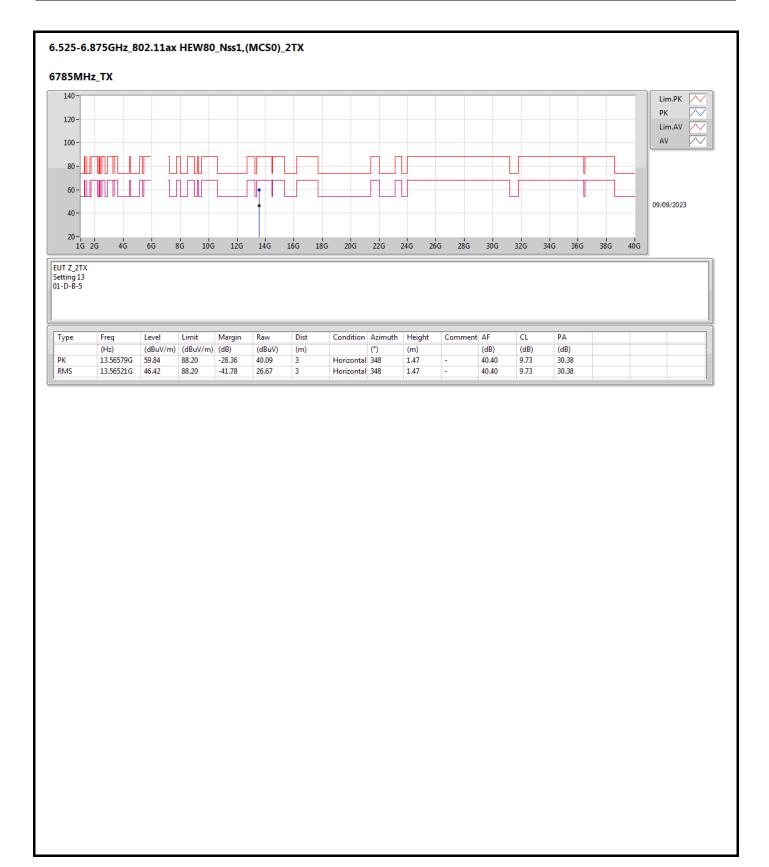
Page No. : 75 of 97 Report No. : FR191618



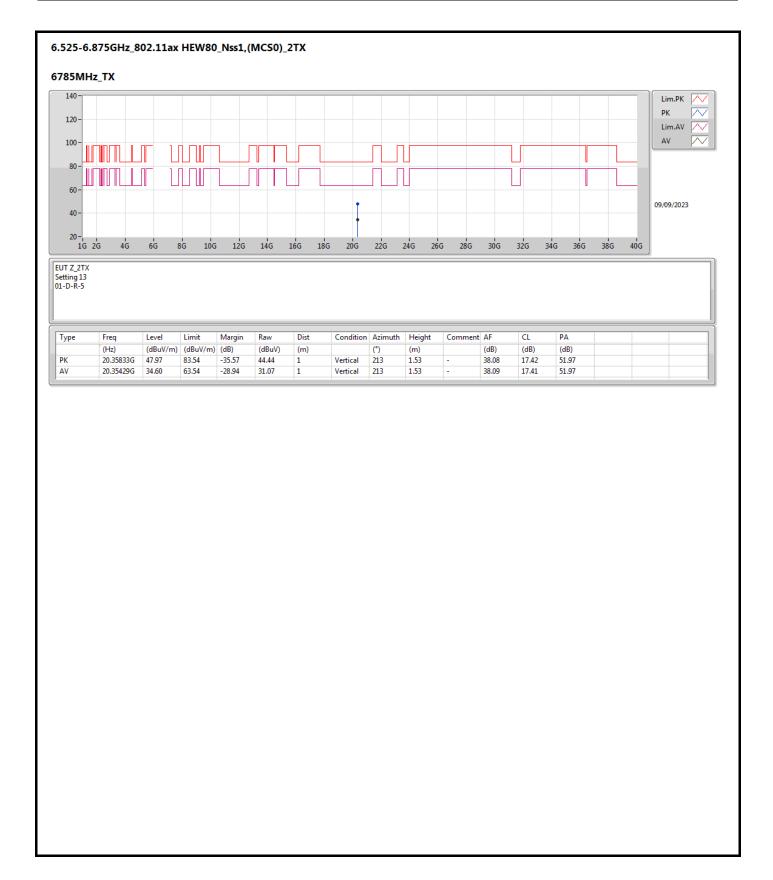


Page No. : 76 of 97 Report No. : FR191618



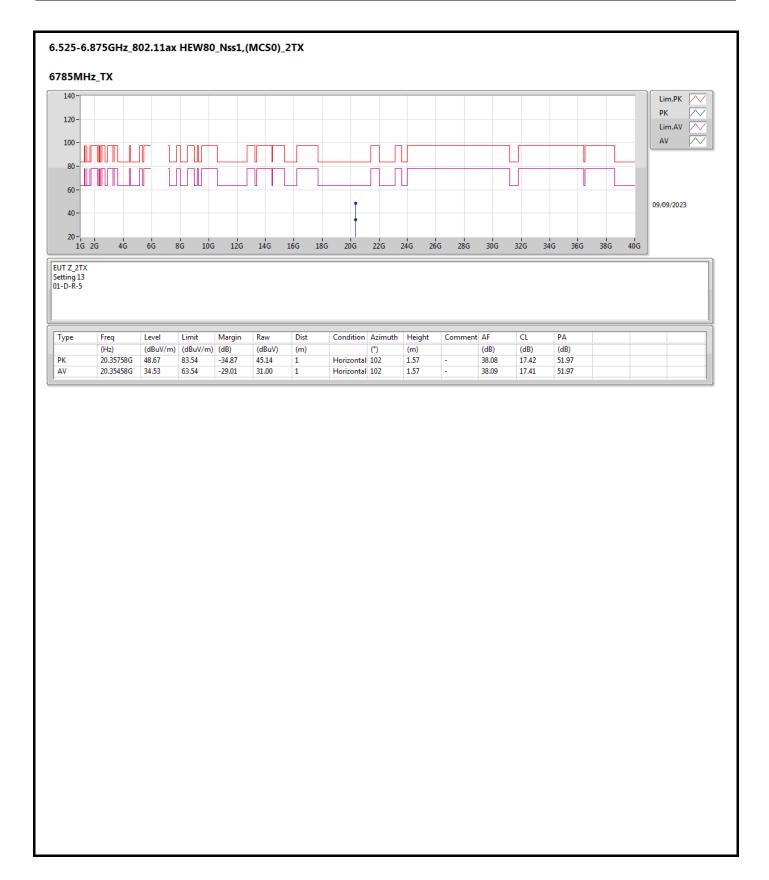






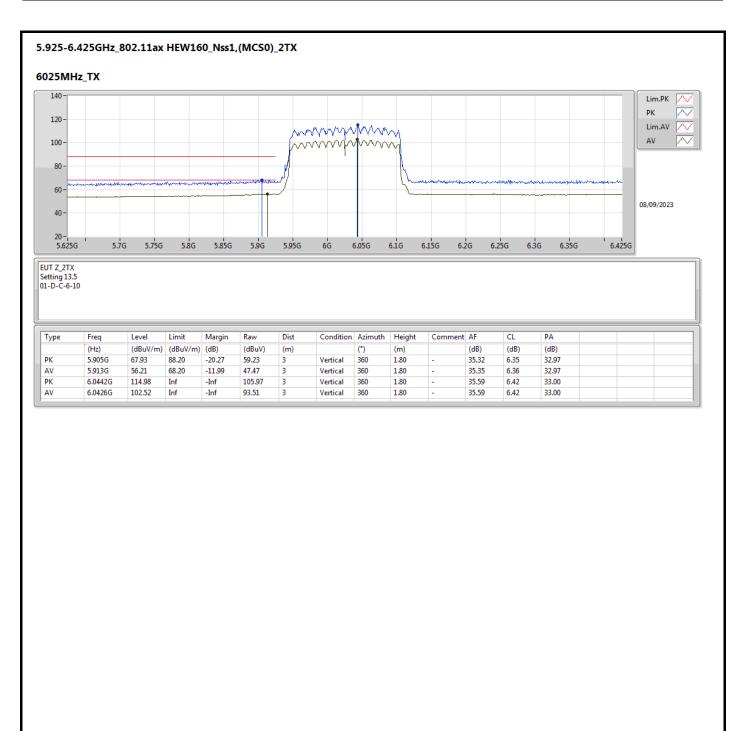
Page No. : 78 of 97 Report No. : FR191618



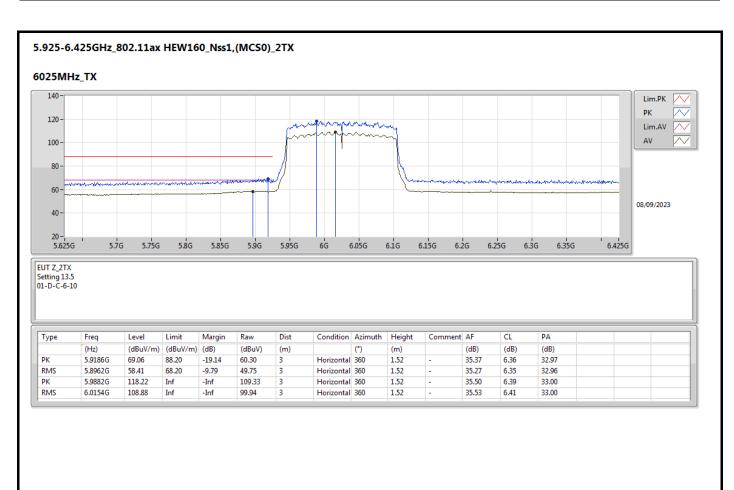


Page No. : 79 of 97 Report No. : FR191618



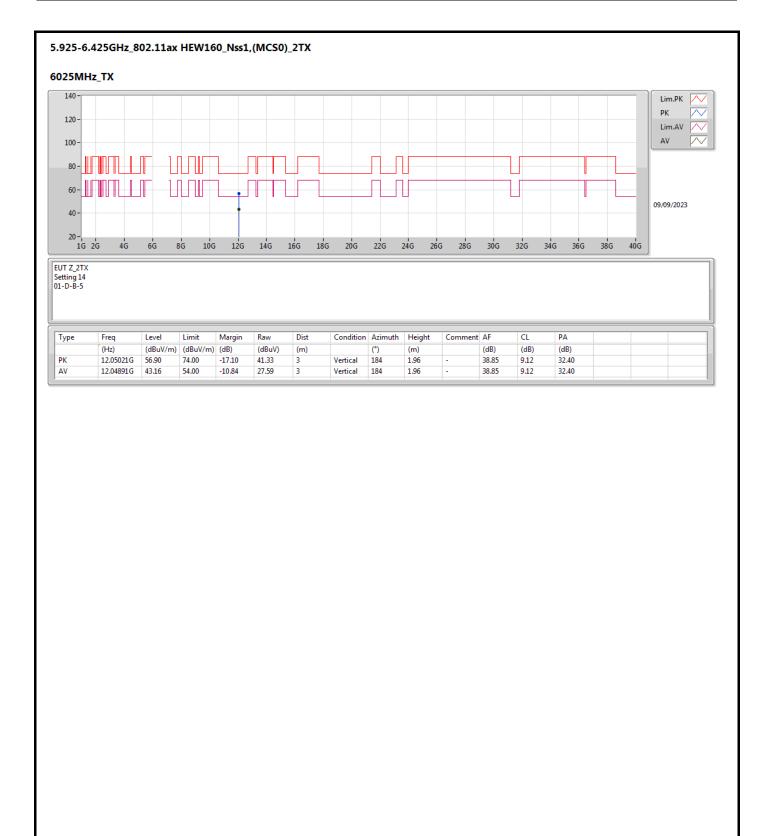




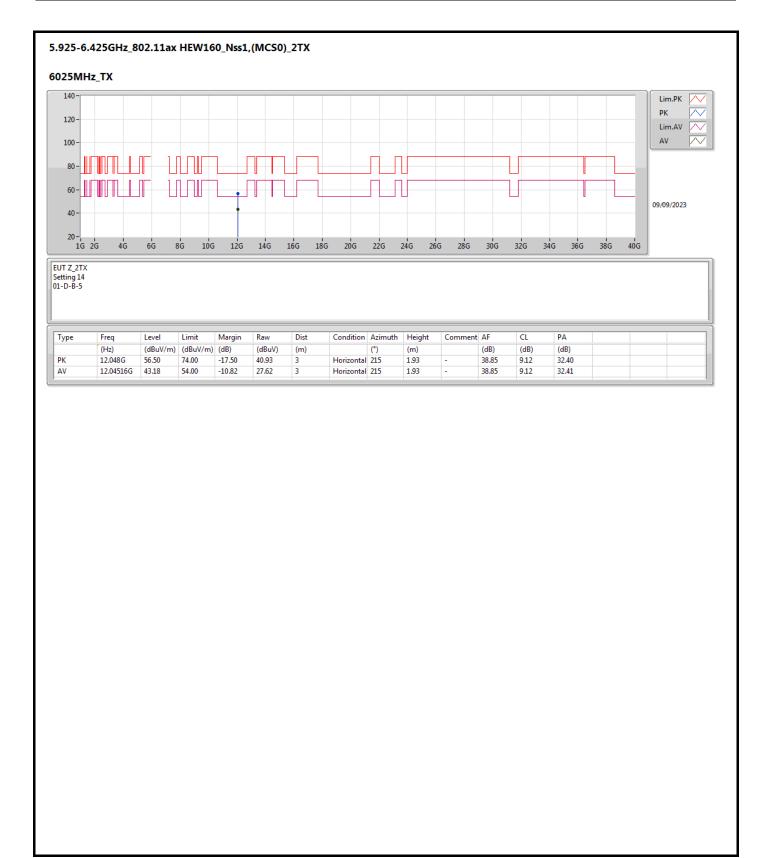


Page No. : 81 of 97 Report No. : FR191618

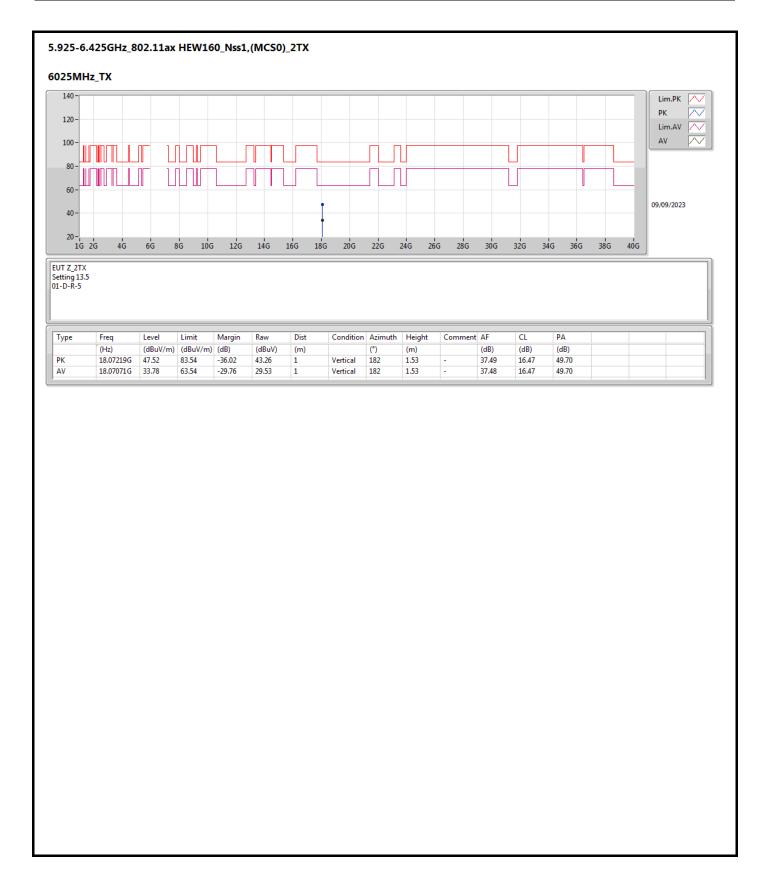












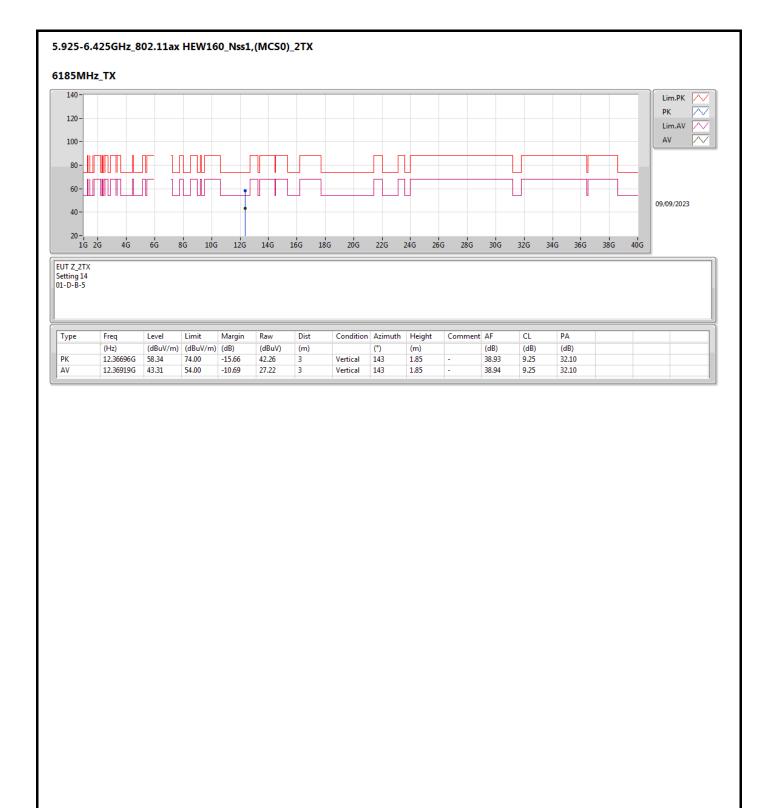
Page No. : 84 of 97 Report No. : FR191618





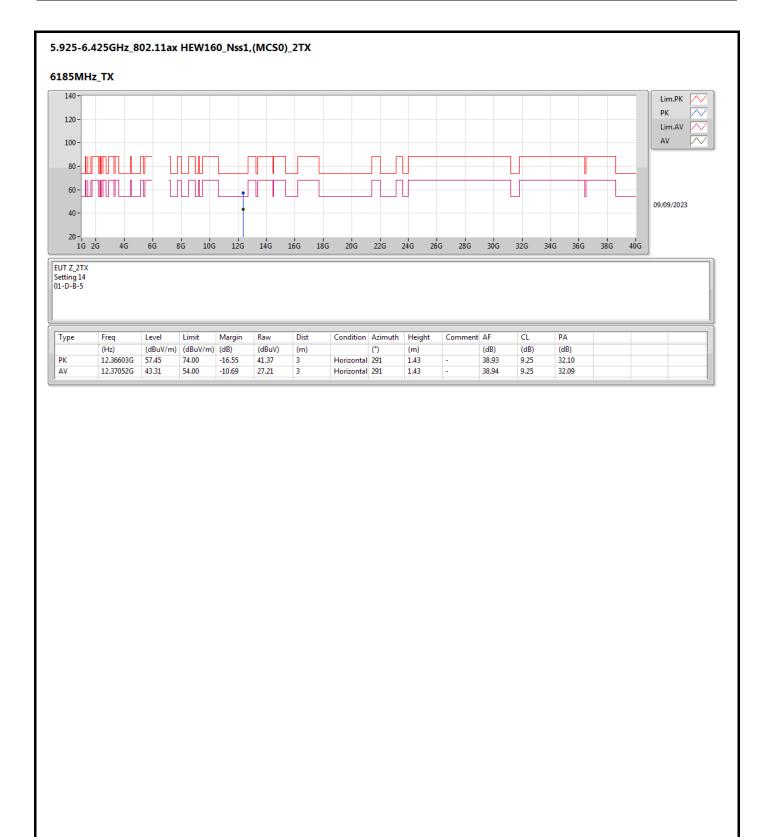
Page No. : 85 of 97 Report No. : FR191618



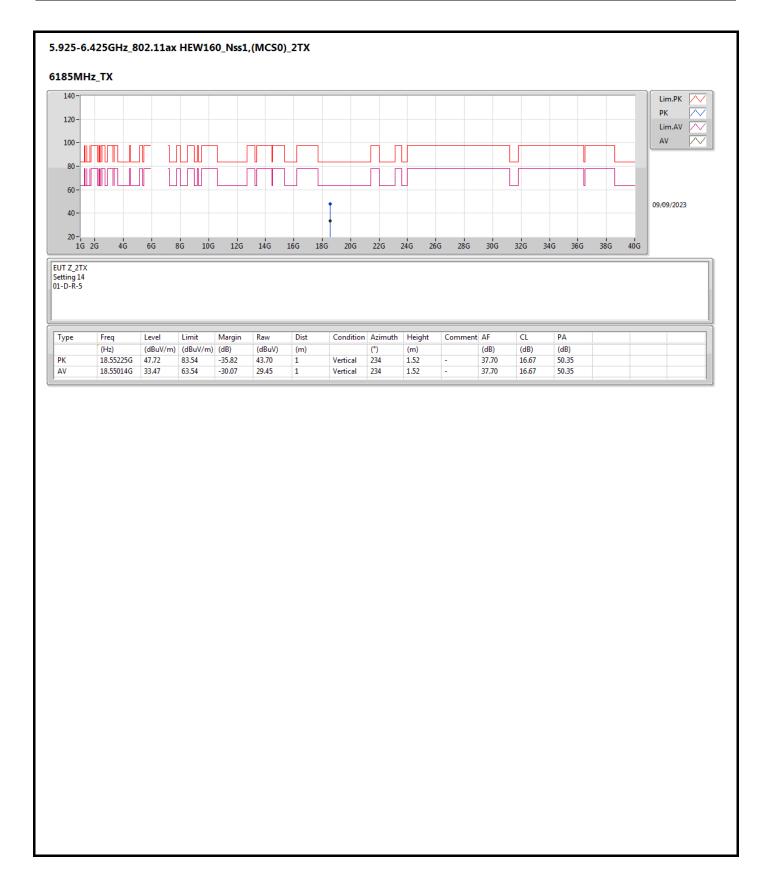


Page No. : 86 of 97 Report No. : FR191618

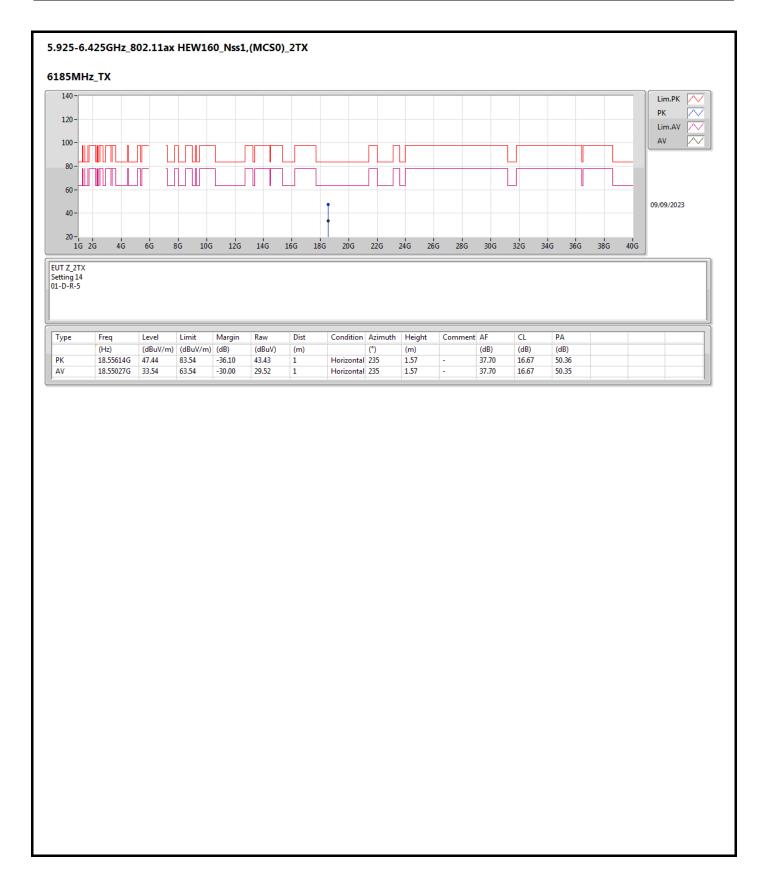






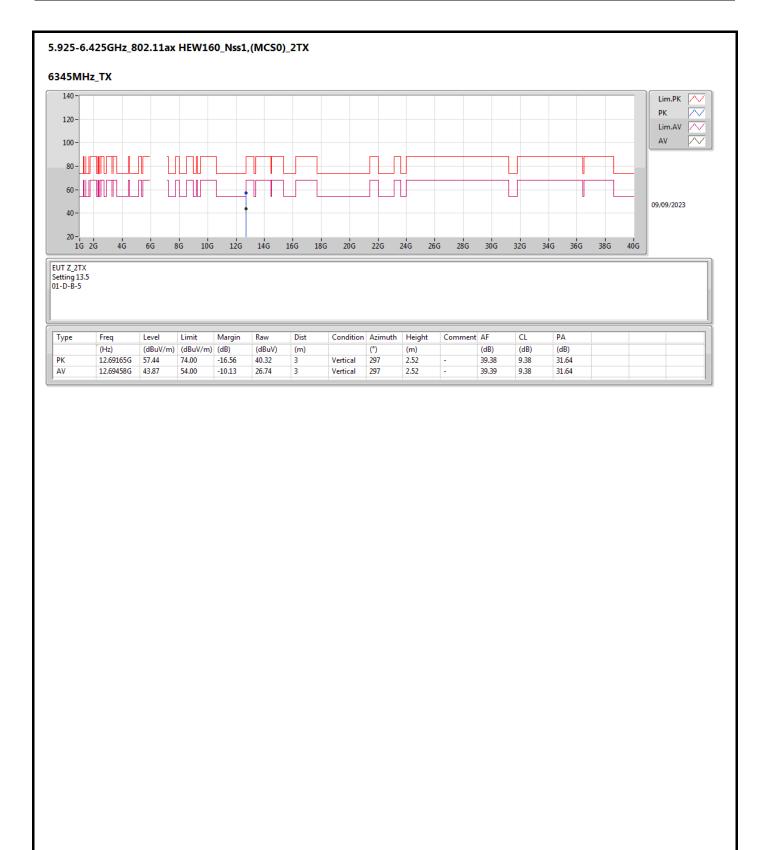




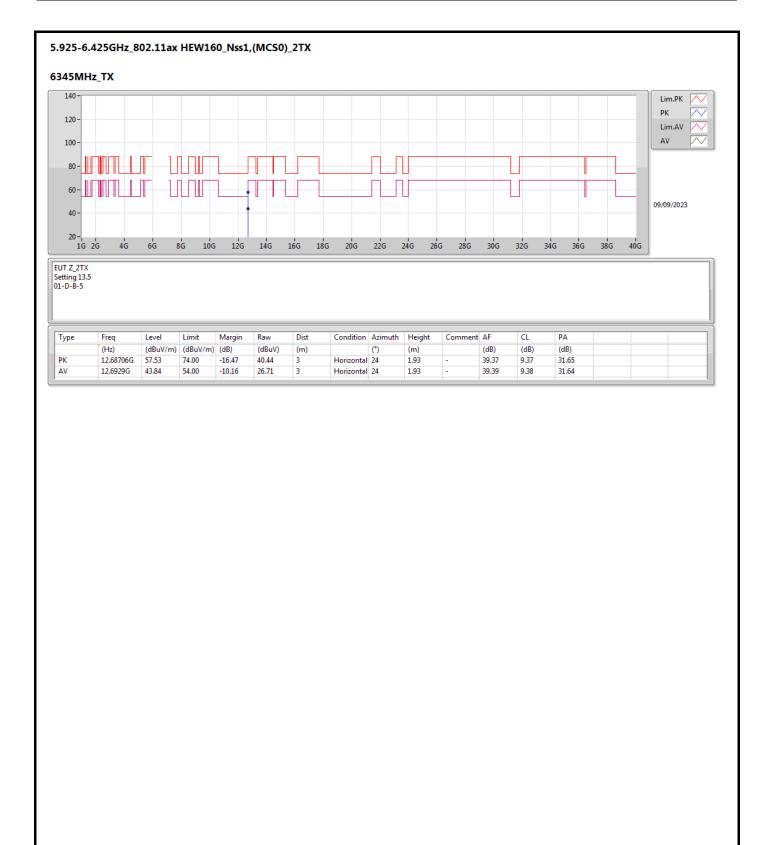


Page No. : 89 of 97 Report No. : FR191618

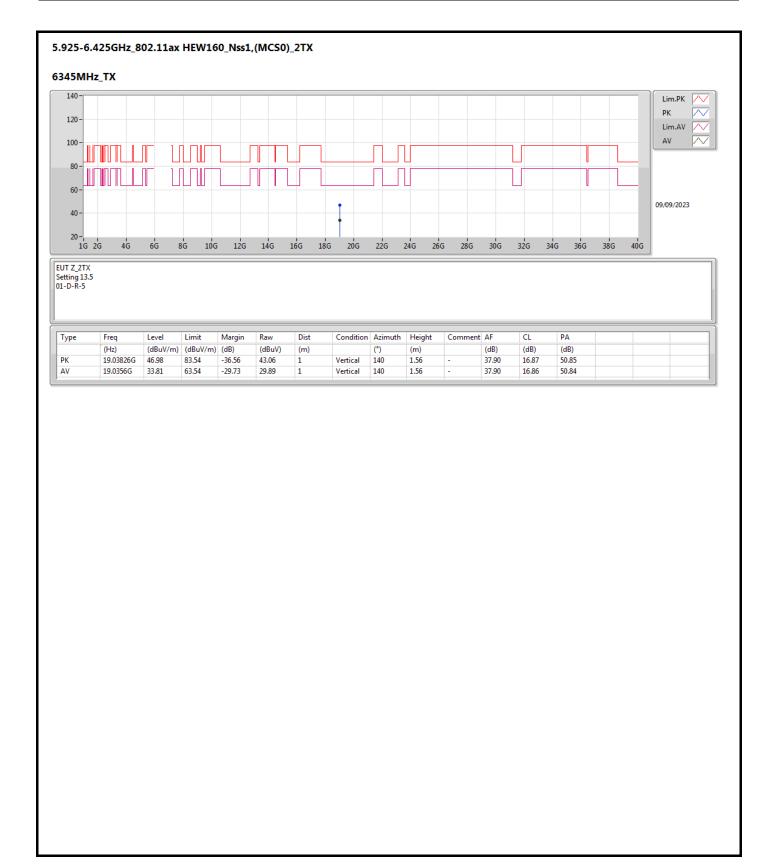




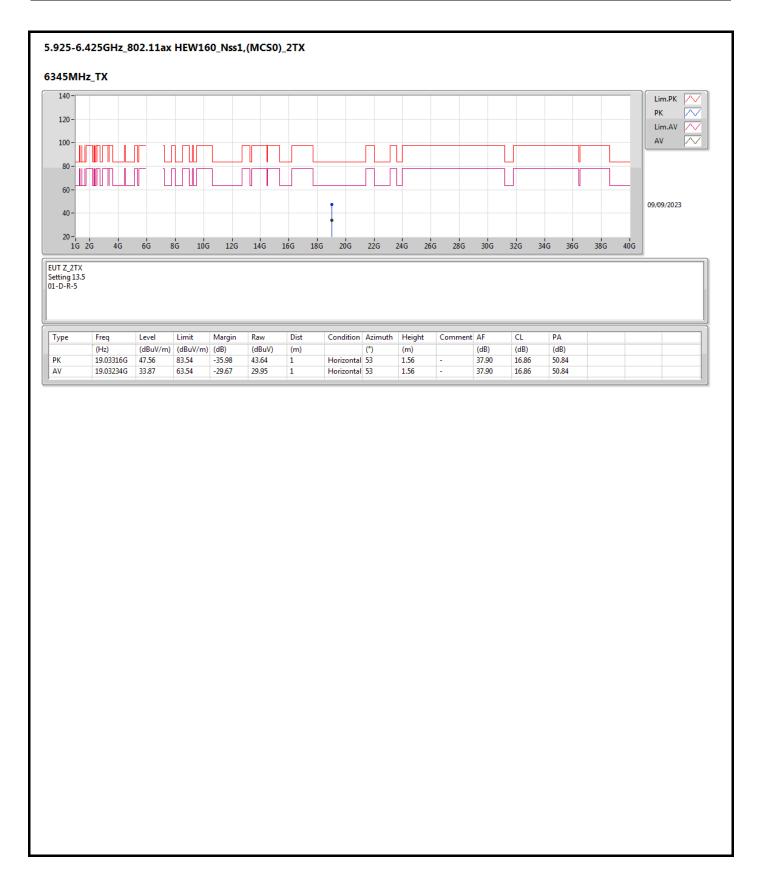






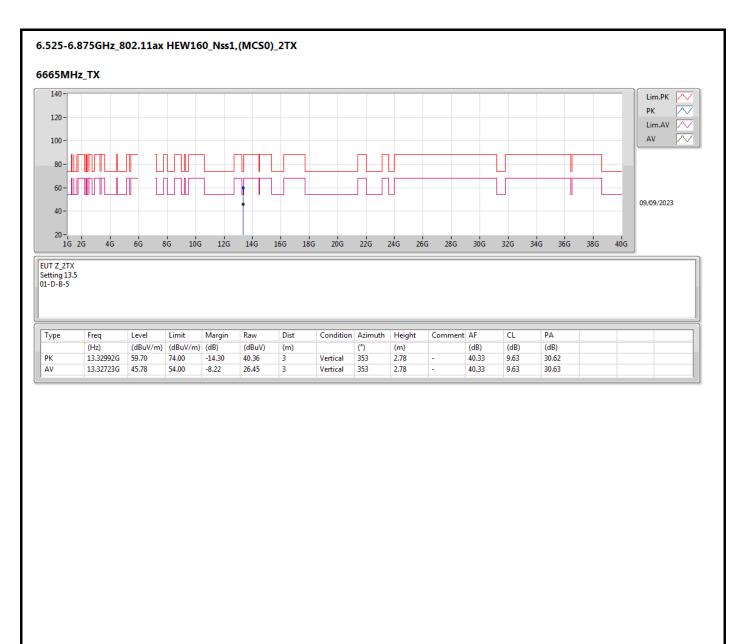




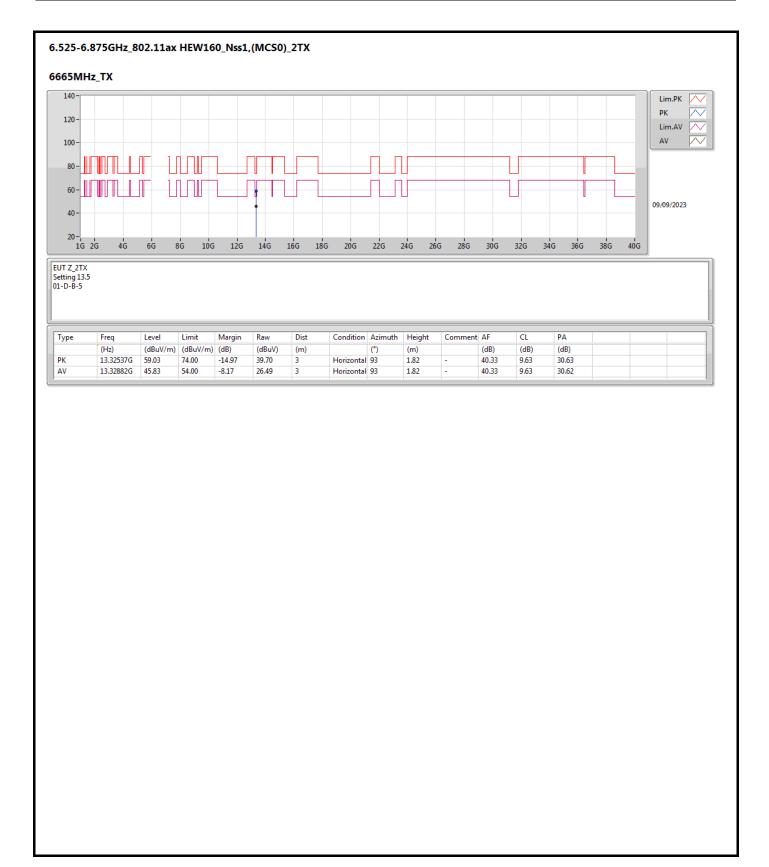


Page No. : 93 of 97 Report No. : FR191618

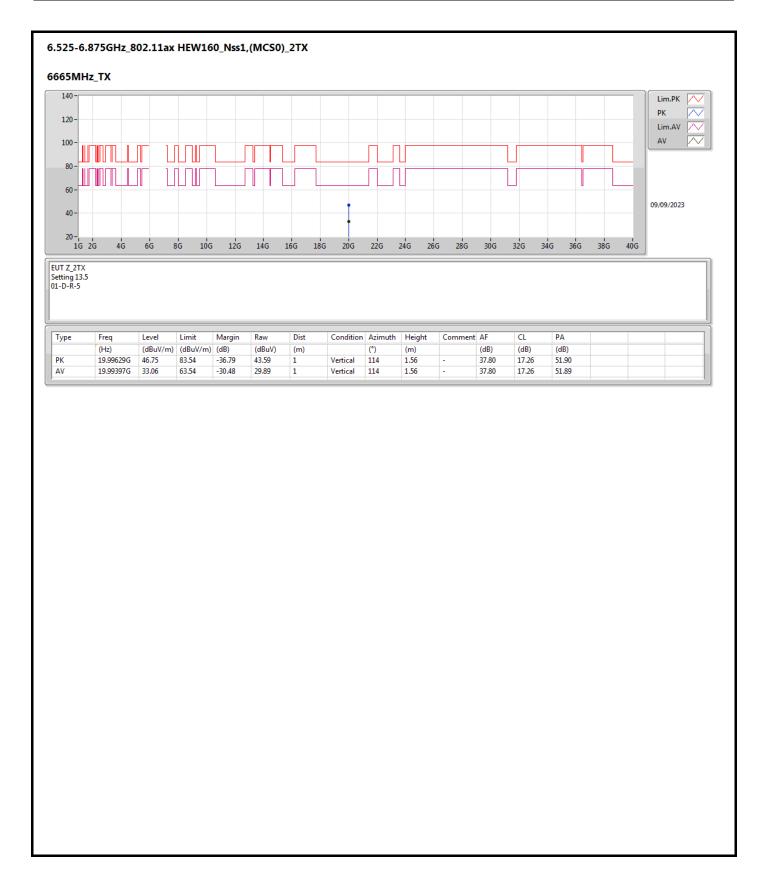






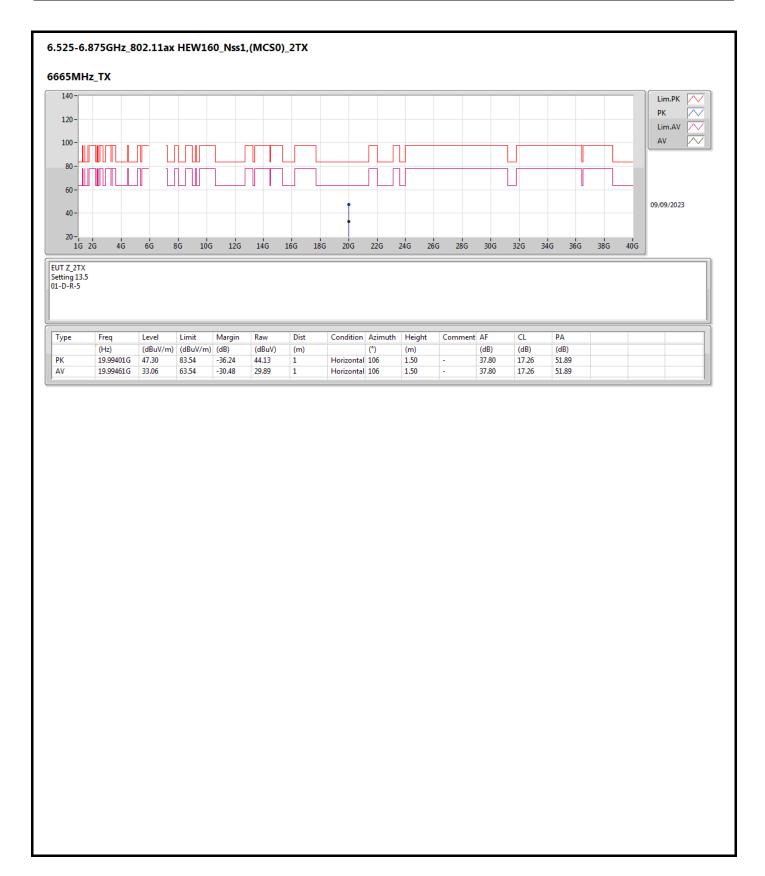


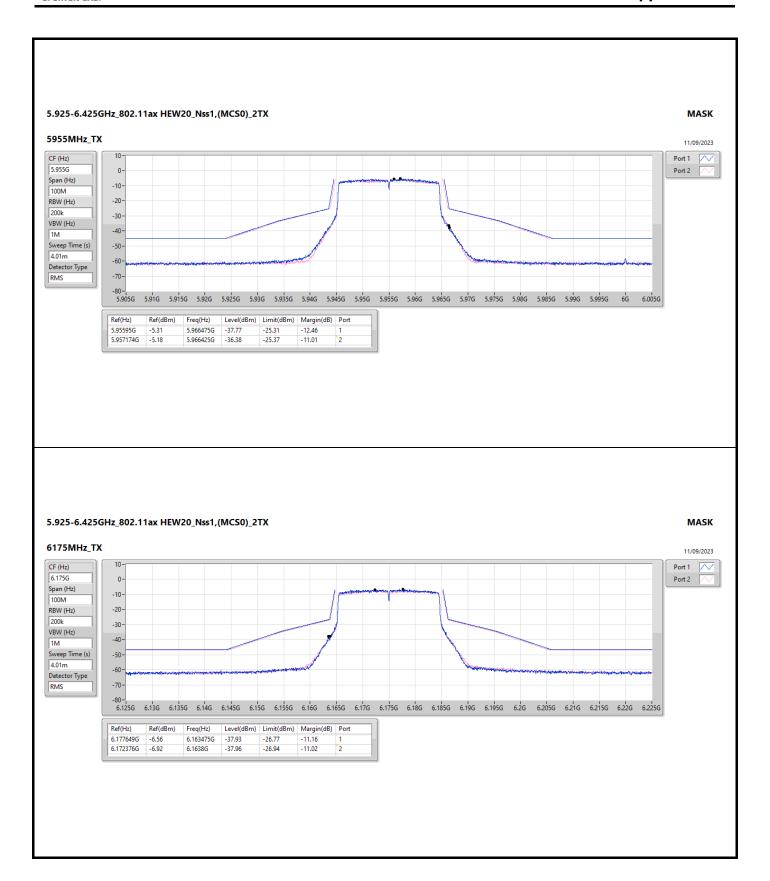




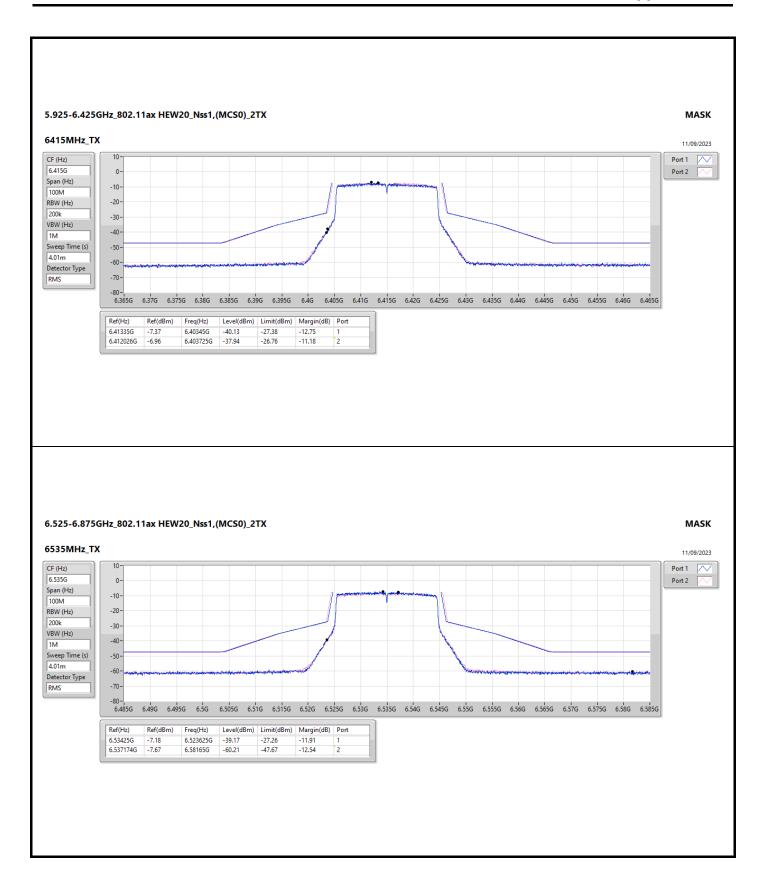
Page No. : 96 of 97 Report No. : FR191618



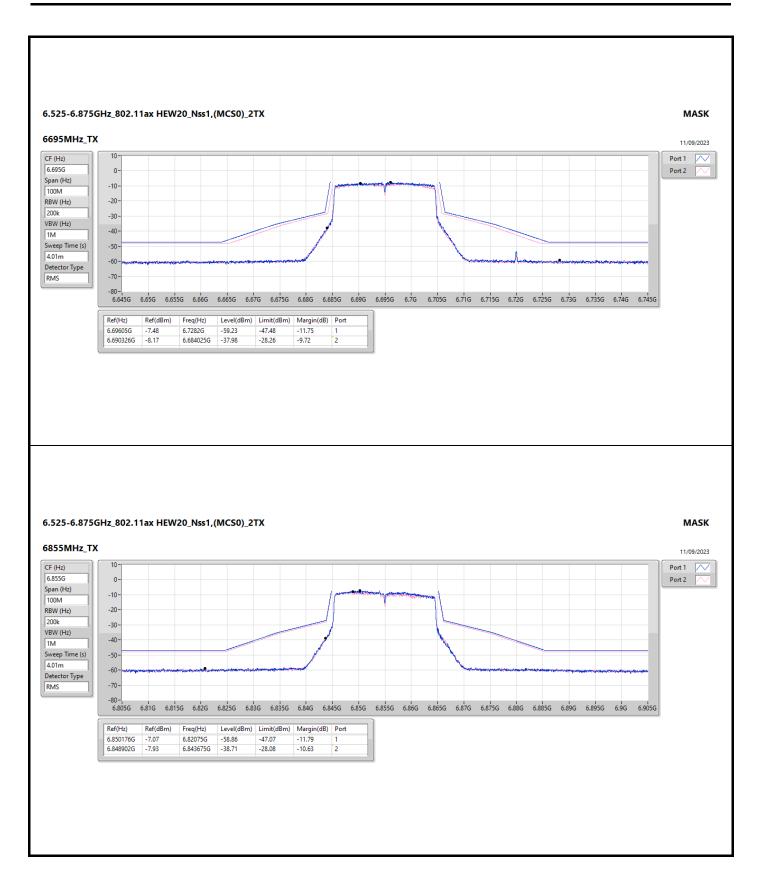




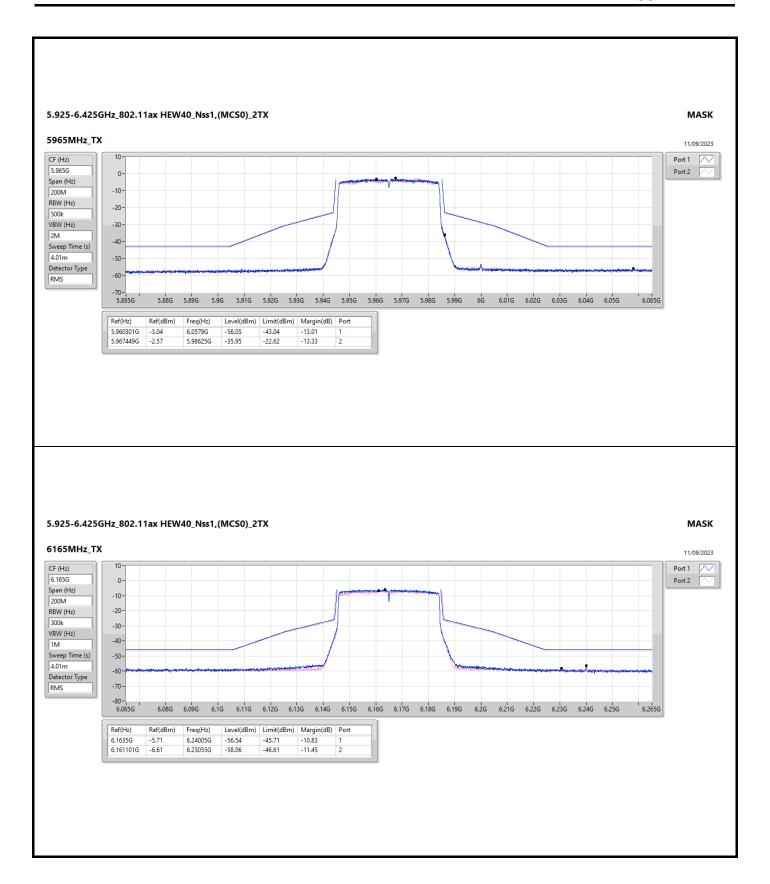
Page No. : 1 of 11 Report No. : FR191618



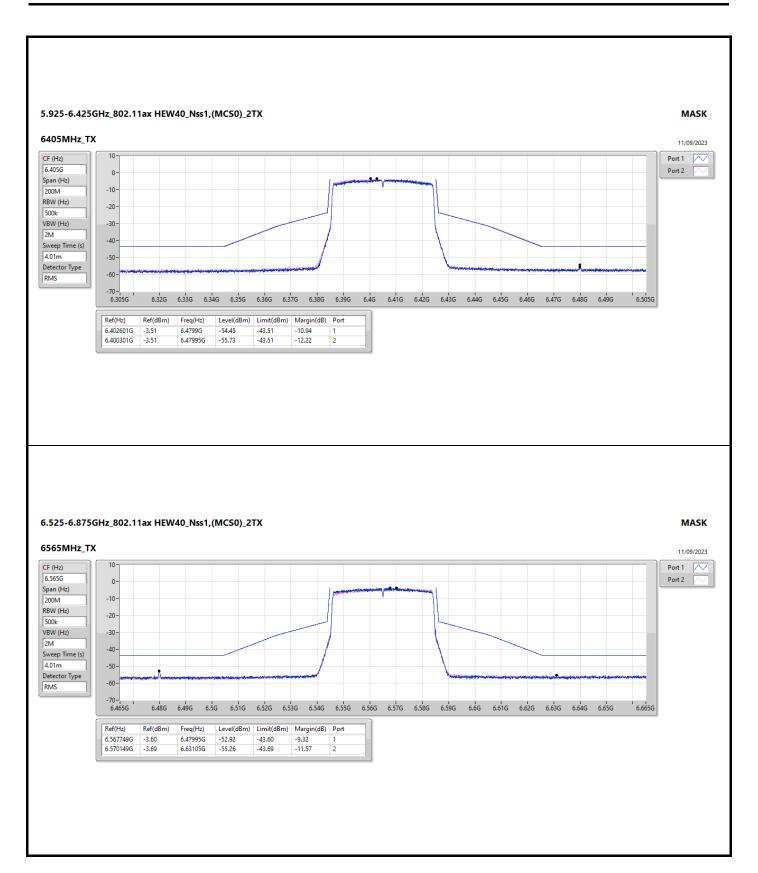
Page No. : 2 of 11 Report No. : FR191618



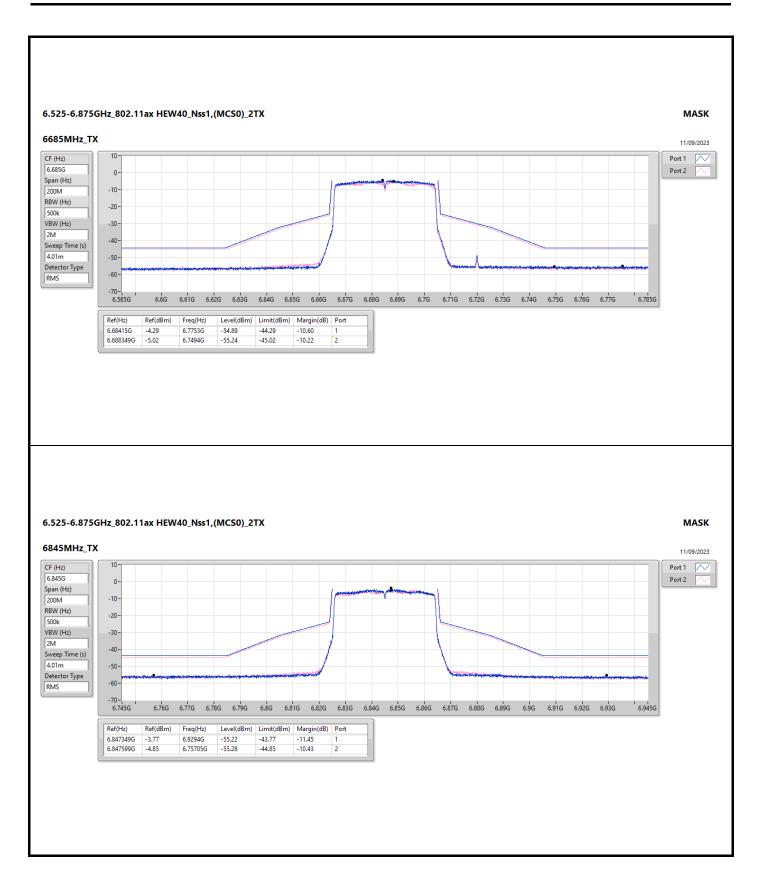
Page No. : 3 of 11 Report No. : FR191618



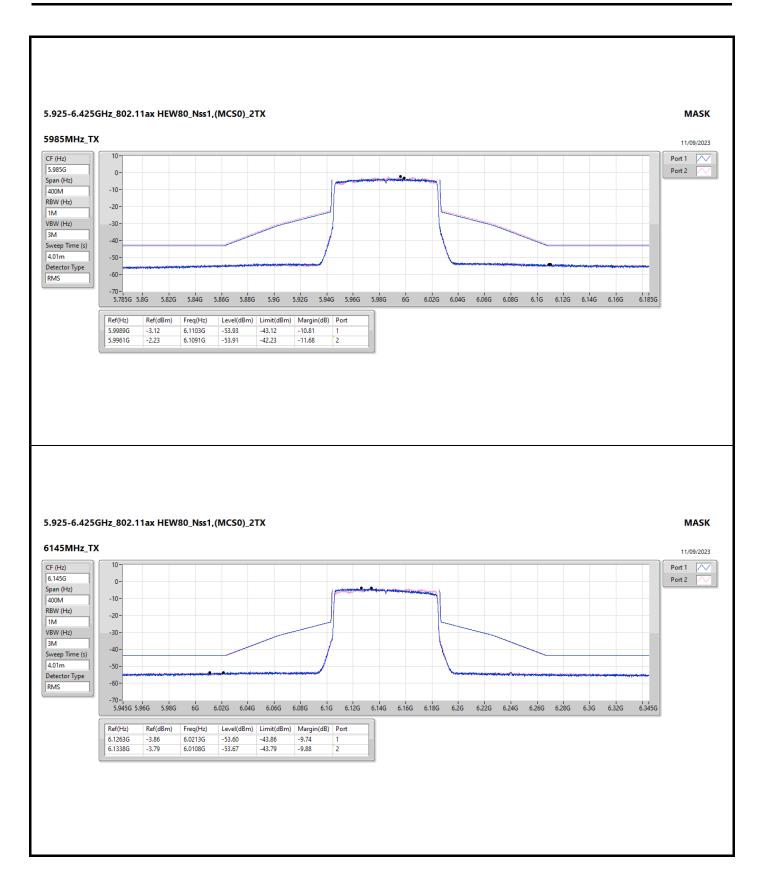
Page No. : 4 of 11 Report No. : FR191618



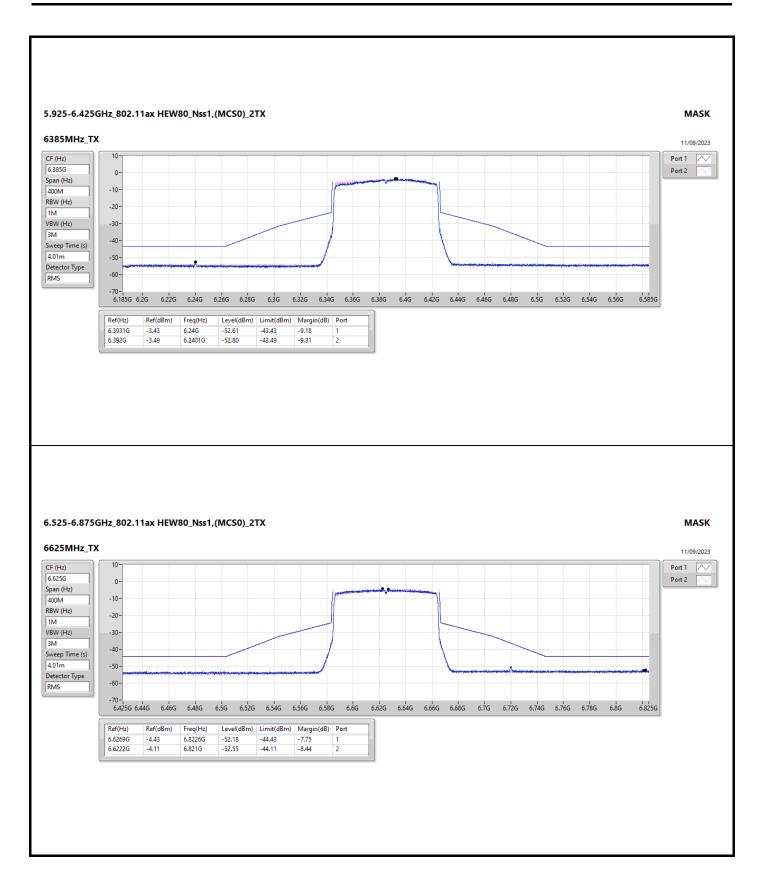
Page No. : 5 of 11 Report No. : FR191618



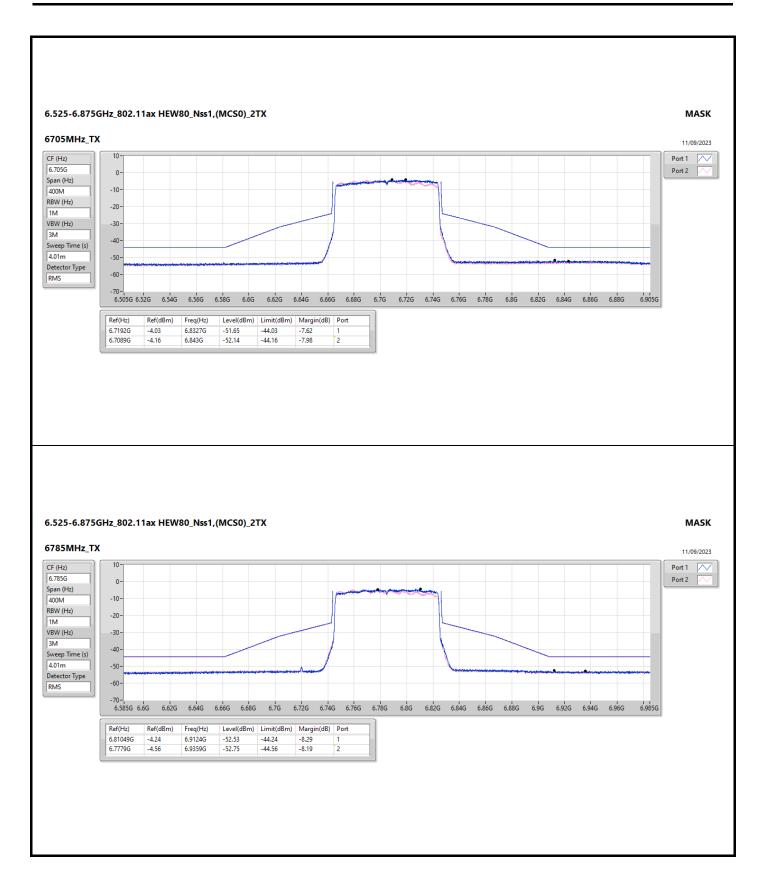
Page No. : 6 of 11 Report No. : FR191618



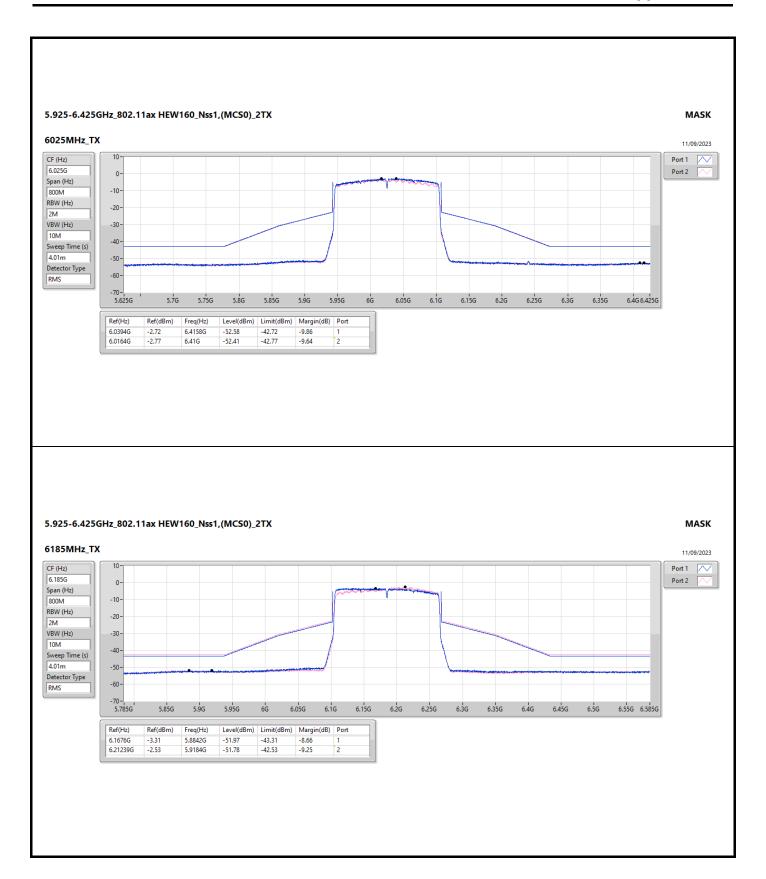
Page No. : 7 of 11 Report No. : FR191618



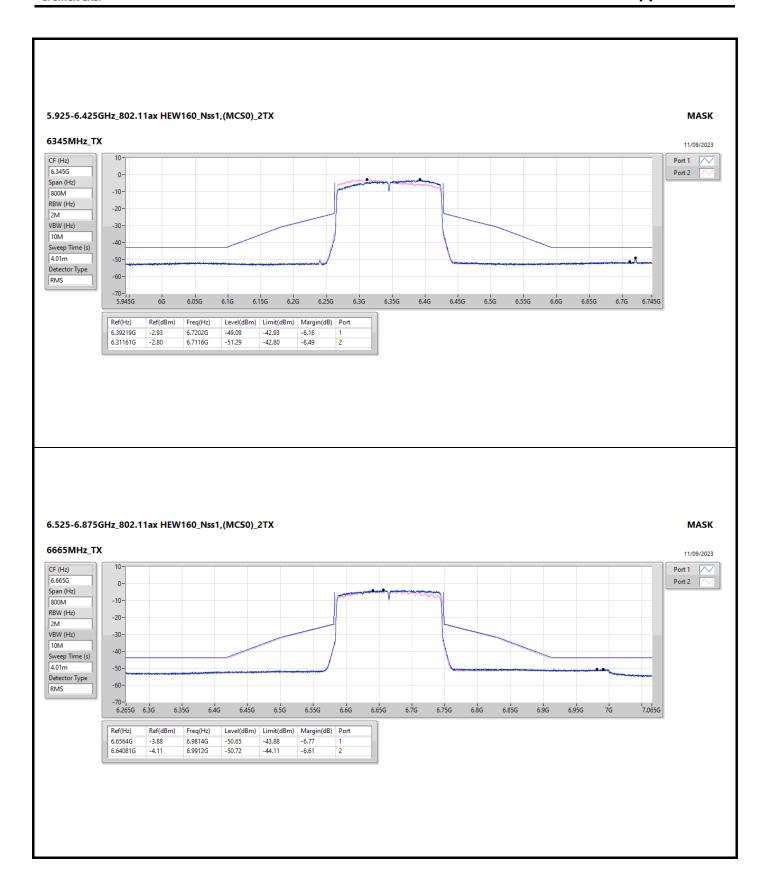
Page No. : 8 of 11 Report No. : FR191618



Page No. : 9 of 11 Report No. : FR191618



Page No. : 10 of 11 Report No. : FR191618



Page No. : 11 of 11 Report No. : FR191618