



FCC RADIO TEST REPORT

FCC ID : Z8H89FT0048

Equipment : ePMP 5GHz Force 300-19R SM

Brand Name : Cambium Networks

Model Name : ePMP 5GHz Force 300-19R SM

Model Number : C058900P901A

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 90 Subpart Y

The product was received on Sep. 24, 2019, and testing was started from Oct. 04, 2019 and completed on Nov. 28, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI/TIA-603-D-2010, 47 CFR FCC Part 90 Subpart Y, ANSI C63.26-2015, and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.


Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



TABLE OF CONTENTS

History of this test report	3
Summary of Test Result	4
1 General Description	5
1.1 Product Information.....	5
1.2 Applicable Standards	8
1.3 Testing Information	8
1.4 Measurement Uncertainty	8
2 Test Configuration	9
2.1 Test Channel Mode.....	9
2.2 Worst Case Modulation Configuration	10
2.3 EUT Operation during Test.....	10
2.4 Accessories	11
2.5 Support Equipment	11
2.6 Test Setup Diagram	12
3 Test Result	13
3.1 Maximum Conducted Output Power and Peak Power Spectral Density Measurement	13
3.2 Peak Excursion Measurement.....	16
3.3 Occupied Bandwidth and Emission Mask Measurement.....	17
3.4 Transmitter Conducted Unwanted Emissions Measurement	19
3.5 Transmitter Radiated Unwanted Emissions Measurement	20
3.6 Frequency Stability Measurement	22
4 Test Equipment and Calibration Data	23
Appendix A. Maximum Conducted Output Power / Peak Power Spectral Density	
Appendix B. Peak Excursion	
Appendix C. Occupied Bandwidth / Emission Mask	
Appendix D. Transmitter Conducted Unwanted Emissions	
Appendix E. Transmitter Radiated Unwanted Emissions	
Appendix F. Frequency Stability	
Appendix G. Test Photos	
Photographs of EUT v01	



TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A16_3 Ver1.0



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	2.1046/90.1215(a)	Maximum Conducted Output Power / Peak Power Spectral Density	PASS	-
3.2	90.1215	Peak Excursion	PASS	-
3.3	2.1049/90.210(m)	Occupied Bandwidth / Emission Mask	PASS	-
3.4	2.1051/90.210(m)	Transmitter Conducted Unwanted Emissions	PASS	-
3.5	2.1053/90.210(m)	Transmitter Radiated Unwanted Emissions	PASS	-
3.6	2.1055/90.213(a)	Frequency Stability	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Cindy Peng



1 General Description

1.1 Product Information

1.1.1 Specification Information

RF General Information			
Frequency Range (MHz)	Modulation	Ch. Frequency (MHz)	Channel Bandwidth (MHz)
4940-4990	QPSK	4942.5-4987.5	5
4940-4990	QPSK	4945-4985	10
4940-4990	QPSK	4950-4980	20

Band	Mode	Modulation	BWch (MHz)	Nant
4.9G	11j	QPSK	5	2
4.9G	11j	QPSK	10	2
4.9G	11j	QPSK	20	2



Channel Bandwidth	Carrier Frequency (MHz)	Carrier Frequency (MHz)
5 MHz	4942.5	4967.5
	4945	4970
	4947.5	4972.5
	4950	4975
	4952.5	4977.5
	4955	4980
	4957.5	4982.5
	4960	4985
	4962.5	4987.5
	4965	-
10 MHz	4945	4967.5
	4947.5	4970
	4950	4972.5
	4952.5	4975
	4955	4977.5
	4957.5	4980
	4960	4982.5
	4962.5	4985
	4965	-
20 MHz	4950	4967.5
	4952.5	4970
	4955	4972.5
	4957.5	4975
	4960	4977.5
	4962.5	4980
	4965	-

**1.1.2 Antenna Information**

Ant.	Port	Brand	Model Name	Type	Connector	Gain (dBi)
1	1	TSKY	180-100-1077R	Patch	I-PEX	19
	2	TSKY	180-100-1077R	Patch	I-PEX	19

Note 1: The above information was declared by manufacturer.

Note 2: The array gain of the antenna is 0dBi.

Note 3: The EUT has one antenna, and each antenna has two ports. (2TX/2RX)

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

Port 1 and Port 2 could transmit/receive simultaneously.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF (dB)
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX	0.992	0.03
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX	0.981	0.08
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX	0.962	0.17

Note:

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

1.1.4 EUT Operational Condition

EUT Power Type	From PoE		
Test Software Version	QSPR Version 5.0-00086		
Device Type	<input type="checkbox"/> Low power device	<input checked="" type="checkbox"/> High power device	

Note: The above information was declared by manufacturer.

1.1.5 Table for Class III Change

This product is an extension of original one reported under Sporton project number: 932717-02.

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding 4.9G function for the model name "ePMP 5GHz Force 300-19R SM" only, and it with one set antenna "brand name: TSKY, model name: 180-100-1077R, gain: 19dBi".	All test items for the model name "ePMP 5GHz Force 300-19R SM" only.



1.2 Applicable Standards

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

- ♦ 47 CFR FCC Part 90 Subpart Y
- ♦ ANSI/TIA-603-D-2010
- ♦ FCC KDB 552295 D01v03
- ♦ FCC KDB 662911 D01 v02r01
- ♦ FCC KDB 412172 D01 v01r01
- ♦ FCC KDB 971168 D01 v03r01

1.3 Testing Information

Testing Location		
<input type="checkbox"/>	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL : 886-3-327-3456 FAX : 886-3-327-0973
<input checked="" type="checkbox"/>	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-CB	Lucas Huang	24.8~25.9°C / 57~60%	Oct. 04, 2019~Nov. 28, 2019
Radiated	03CH01-CB	Justin Lin	24.5~25.3°C / 55~59%	Oct. 17, 2019

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086D with Industry Canada.

1.4 Measurement Uncertainty

Test Items	Uncertainty	Remark
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%



2 Test Configuration

2.1 Test Channel Mode

Mode	Power Setting
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX	-
4942.5MHz	16.5
4965MHz	16.5
4987.5MHz	16
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX	-
4945MHz	18.5
4965MHz	18.5
4985MHz	18.5
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX	-
4950MHz	18.5
4965MHz	18.5
4980MHz	19



2.2 Worst Case Modulation Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Maximum Conducted Output Power / Peak Power Spectral Density Peak Excursion Occupied Bandwidth / Emission Mask Transmitter Conducted Unwanted Emissions Frequency Tolerance
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests	
Tests Item	Transmitter Radiated 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.
Operating Mode < 1GHz	CTX (Cabinet)
The EUT was performed in X axis, Y axis and Z axis postion. "EUT Y axis" generated the worst test result for Transmitter Radiated Unwanted Emissions above 1GHz test, thus the measurement for Transmitter Radiated Unwanted Emissions below 1GHz test will follow this same test configuration.	
Operating Mode > 1GHz	CTX (Cabinet)
The EUT was performed in X axis, Y axis and Z axis postion, and the worst case was found in Y axis. So the meaasurement will follow this same test configuraiton.	

Note1: For Transmitter Radiated Unwanted Emissions test, only the highest power carrier frequency "20MHz / 4980MHz" was tested and recorded in the report.

Note2: The EUT was powered by PoE, and the PoE was for measurement only, would not be marketed.

Equipment	Brand Name	Model Name	FCC ID
PoE	Cambium Networks	NET-P15-30IN	N/A

2.3 EUT Operation during Test

During the test, "QSPR Version 5.0-00086" under WIN 7 was executed the test program to control the EUT continuously transmit RF signal.



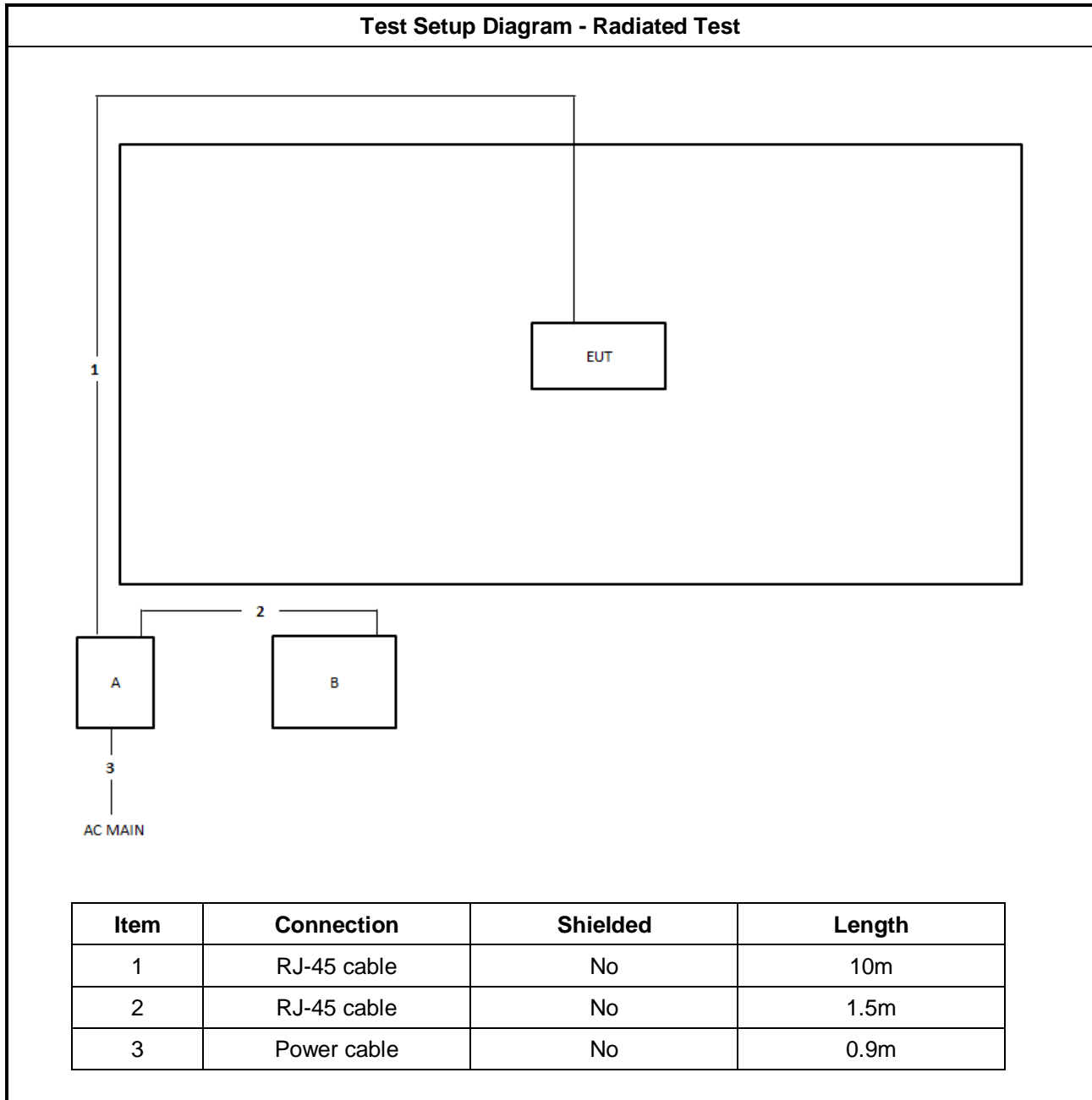
2.4 Accessories

N/A

2.5 Support Equipment

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A
B	PoE	Cambium Networks	NET-P15-30IN	N/A

2.6 Test Setup Diagram





3 Test Result

3.1 Maximum Conducted Output Power and Peak Power Spectral Density Measurement

3.1.1 Limit of Maximum Conducted Output Power and Peak Power Spectral Density

Maximum Conducted Output Power:

The transmitting power of stations operating in the 4940-4990 MHz band must not exceed the maximum limits in this table.

Channel Bandwidth (MHz)	Low Power Device Peak Transmitter Power (dBm)	High Power Device Peak Transmitter Power (dBm)
1	7.0	20.0
5	14.0	27.0
10	17.0	30.0
15	18.8	31.8
20	20.0	33.0

Peak Power Spectral Density Limit:

1. High power devices are also limited to a peak power spectral density of 21 dBm per one MHz. High power devices using channel bandwidths other than those listed above are permitted; however, they are limited to peak power spectral density of 21 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the maximum conducted output power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi. However, high power point-to-point and point-to-multipoint operations (both fixed and temporary-fixed rapid deployment) may employ transmitting antennas with directional gain up to 26 dBi without any corresponding reduction in the maximum conducted output power or spectral density. Corresponding reduction in the maximum conducted output power and peak power spectral density should be the amount in decibels that the directional gain of the antenna exceeds 26 dBi.
2. Low power devices are also limited to a peak power spectral density of 8 dBm per one MHz. Low power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 8 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the maximum conducted output power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi.

Maximum Conducted Output Power Definition:

The maximum conducted output power is measured as a conducted emission over any interval of continuous transmission using instrumentation calibrated in terms of an RMS-equivalent voltage. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true maximum conducted output power measurement conforming to the definitions in this paragraph for the emission in question.

3.1.2 Measuring Instruments and Setting

Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	Average

Spectrum Parameters	Setting
Detector	Peak
Center Frequency	Low / middle / high channels
RBW / VBW	1MHz / 3MHz

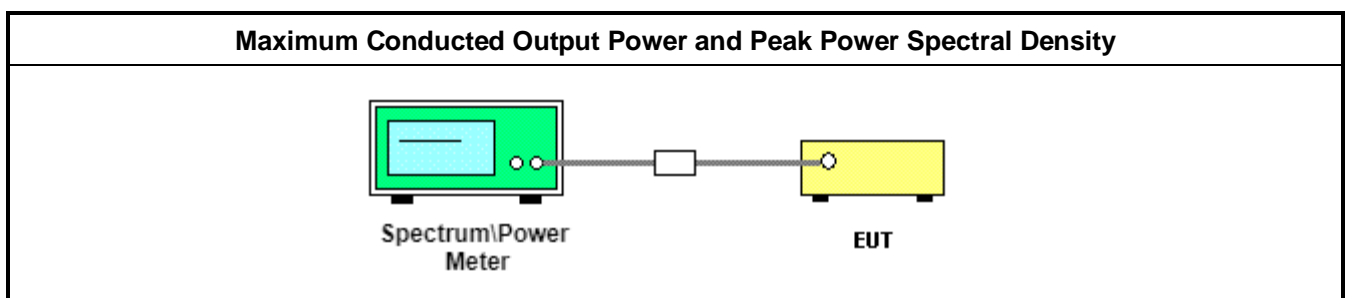
3.1.3 Test Procedures for Maximum Conducted Output Power

Using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

3.1.4 Test Procedures for Peak Power Density

1. The EUT transmitter output was connected through an appropriate 50 ohm attenuator to a spectrum analyzer. Resolution bandwidth was set to 1MHz and video bandwidth was set to a value greater than the resolution bandwidth. Instrument limited resolution bandwidth less than channel emission bandwidth; so as to obtain a true peak measurement shall be calculated by total channel power within channel bandwidth.
2. Peak search was used to find peak power spectral density within channel bandwidth and the spectrum analyzer integrated measurement plot was taken.

3.1.5 Test Setup





3.1.6 Test Deviation

There is no deviation with the original standard.

3.1.7 Test Result of Maximum Conducted Output Power

Refer as Appendix A

3.1.8 Test Result of Peak Power Spectral Density (PSD)

Refer as Appendix A

3.2 Peak Excursion Measurement

3.2.1 Limit of Peak Excursion

13 dB

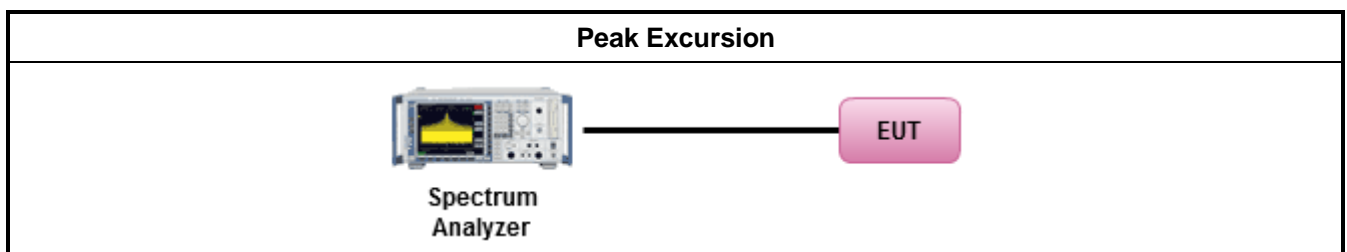
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Testing a single output port is sufficient to demonstrate compliance with the peak excursion.

3.2.4 Test Setup



3.2.5 Test Deviation

There is no deviation with the original standard.

3.2.6 Test Result of Peak Excursion

Refer as Appendix B



3.3 Occupied Bandwidth and Emission Mask Measurement

3.3.1 Limit of Occupied Bandwidth and Emission Mask

Emission Mask M: For high power transmitters (greater than 20 dBm) operating in the 4940-4990 MHz frequency band, the power spectral density of the emissions must be attenuated below the output power of the transmitter as follows:

- (1) On any frequency removed from the assigned frequency between 0–45% of the authorized bandwidth (BW): 0 dB
- (2) On any frequency removed from the assigned frequency between 45–50% of the authorized bandwidth: $568 \log (\% \text{ of } (BW)/45)$ dB.
- (3) On any frequency removed from the assigned frequency between 50–55% of the authorized bandwidth: $26 + 145 \log (\% \text{ of } (BW)/50)$ dB.
- (4) On any frequency removed from the assigned frequency between 55–100% of the authorized bandwidth: $32 + 31 \log (\% \text{ of } (BW)/55)$ dB attenuation.
- (5) On any frequency removed from the assigned frequency between 100–150% of the authorized bandwidth: $40 + 57 \log (\% \text{ of } (BW)/100)$ dB attenuation.
- (6) On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 50 or $55 + 10 \log (P)$ dB, whichever is the lesser attenuation. (P in watts)

The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least 1% of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.

3.3.2 Measuring Instruments and Setting

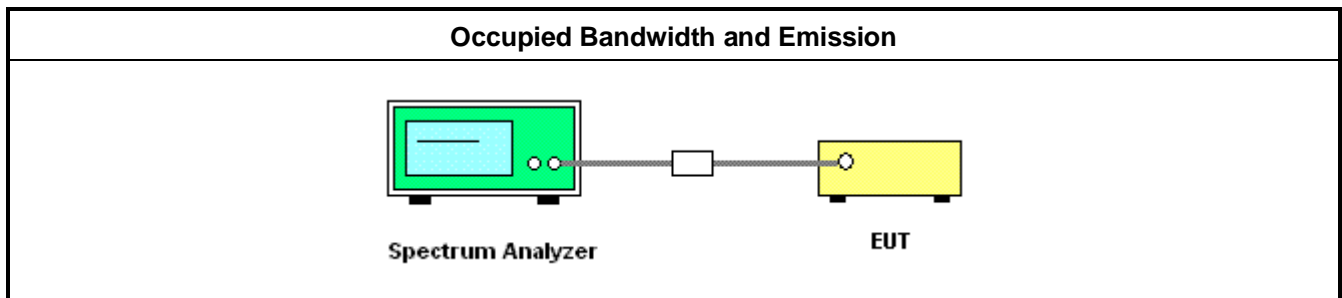
Please refer to section 4 in this report. The following table is the setting of the spectrum.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth of the signal
RBW	at least 1% of the occupied bandwidth
VBW	BW=3 x RBW, Mask=30kHz
Detector	Peak
Trace	Max Hold

3.3.3 Test Procedures

1. The EUT transmitter was connected to a spectrum analyzer through an appropriate 50 ohm attenuator. Used measurement function of spectrum to measure the 99% occupied bandwidth.
2. The reference level for the mask was set using the highest average power of the fundamental emission measured across the channel bandwidth using a RBW of at least 1% of the occupied bandwidth of the fundamental emission and a VBW of 30 kHz.

3.3.4 Test Setup



3.3.5 Test Deviation

There is no deviation with the original standard.

3.3.6 Test Result of 99% Occupied Bandwidth (OBW)

Refer as Appendix C

3.3.7 Test Result of Emission Mask

Refer as Appendix C

3.4 Transmitter Conducted Unwanted Emissions Measurement

3.4.1 Limit of Transmitter Conducted Unwanted Emission

On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 50 or 55+ 10 log (P) dB, whichever is the lesser attenuation. (P=Average transmit power in watt)

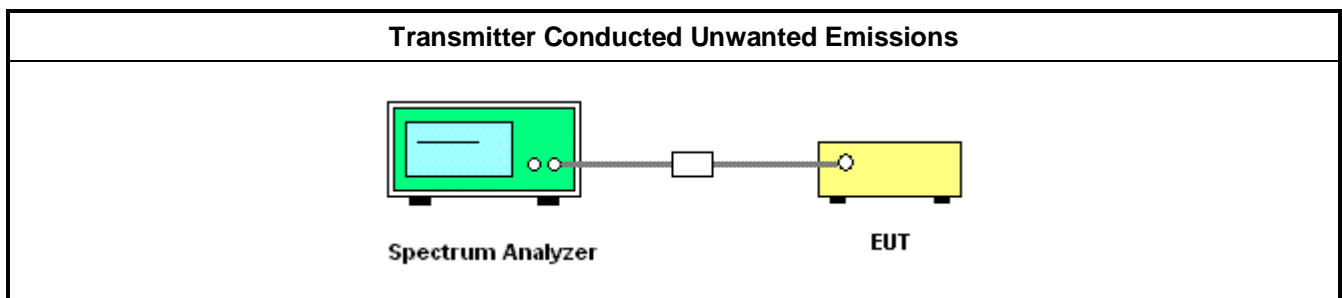
3.4.2 Measuring Instruments and Setting

Spectrum Parameter	Setting
Detector	RMS (Average)
Frequency Range	9kHz – 40GHz

3.4.3 Test Procedures

1. The EUT transmitter was connected to a spectrum analyzer through an appropriate 50 ohm attenuator. The spectrum analyzer resolution bandwidth was set to 1 MHz, and the video bandwidth was set to 1 MHz.
2. Find spurious emissions under 50 or 55+ 10 log (P) dB limit, whichever is the lesser attenuation and the spectrum analyzer integrated measurement plot was taken.

3.4.4 Test Setup Layout



3.4.5 Test Deviation

There is no deviation with the original standard.

3.4.6 Test Result of Transmitter Conducted Unwanted Emissions

Refer as Appendix D



3.5 Transmitter Radiated Unwanted Emissions Measurement

3.5.1 Limit of Transmitter Radiated Unwanted Emissions

On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 50 or 55+ 10 log (P) dB, whichever is the lesser attenuation. (P=Average transmit power in watt)

3.5.2 Measuring Instruments and Setting

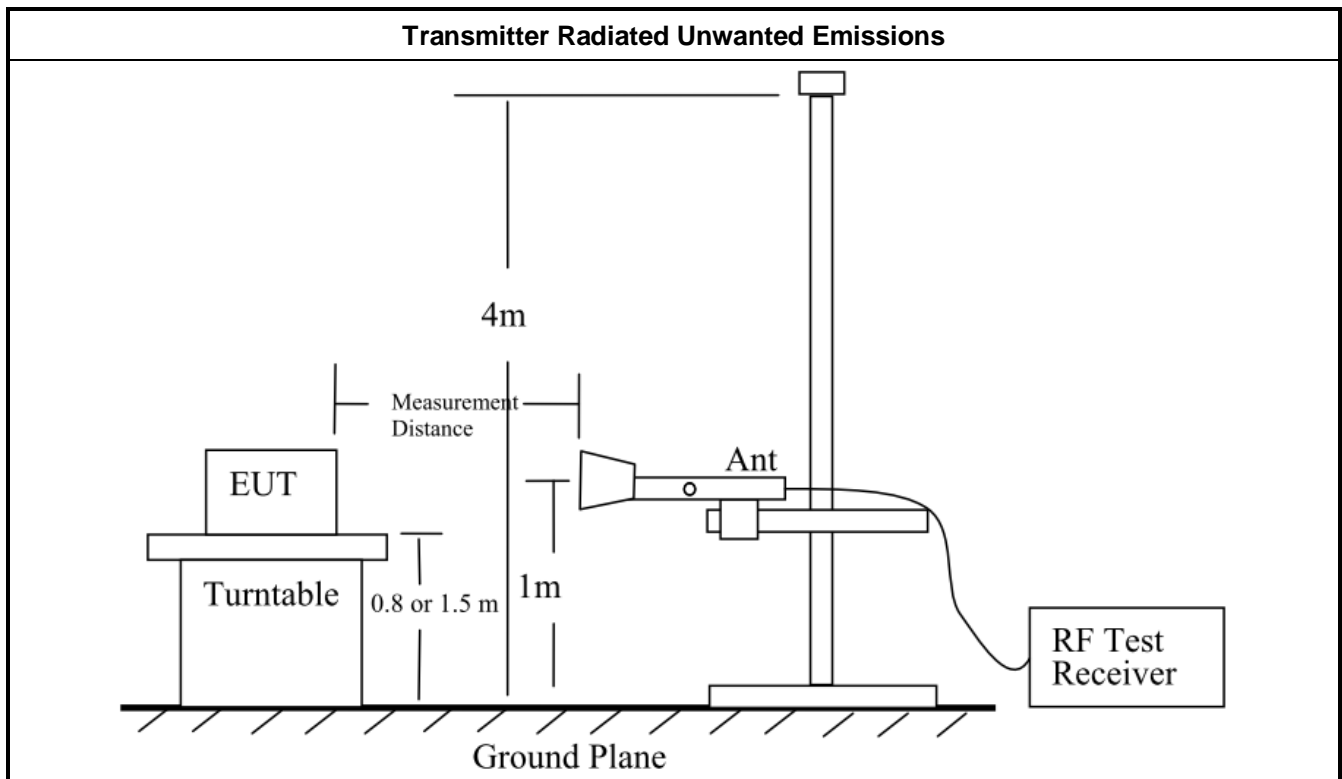
Please refer to section 4 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Detector	RMS (Average)
Frequency Range	30MHz – 40GHz
RBW / VBW	1 MHz / 3MHz

3.5.3 Test Procedures

1. The EUT was placed on the top of the turntable in anechoic chamber.
2. A spectrum analyzer was used RBW of 1 MHz and VBW of 3 MHz for the final measurements utilizing an RMS detector at the frequencies with spurious emissions amplitudes.
3. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find spurious emissions reading.
4. Spurious emissions field strength level equal to spurious emissions reading on spectrum analyzer+ Corrected Reading (Antenna Factor + Cable Loss - Preamplifier Factor).
5. Final radiated spurious emissions may be converted from spurious emissions field strength level - 95.2 dB

3.5.4 Test Setup



3.5.5 Test Deviation

There is no deviation with the original standard.

3.5.6 Results of Transmitter Radiated Unwanted Emissions

Refer as Appendix E

3.6 Frequency Stability Measurement

3.6.1 Limit of Frequency Stability

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency band. For equipment authorization purposes, this is a reporting requirement only.

3.6.2 Measuring Instruments and Setting

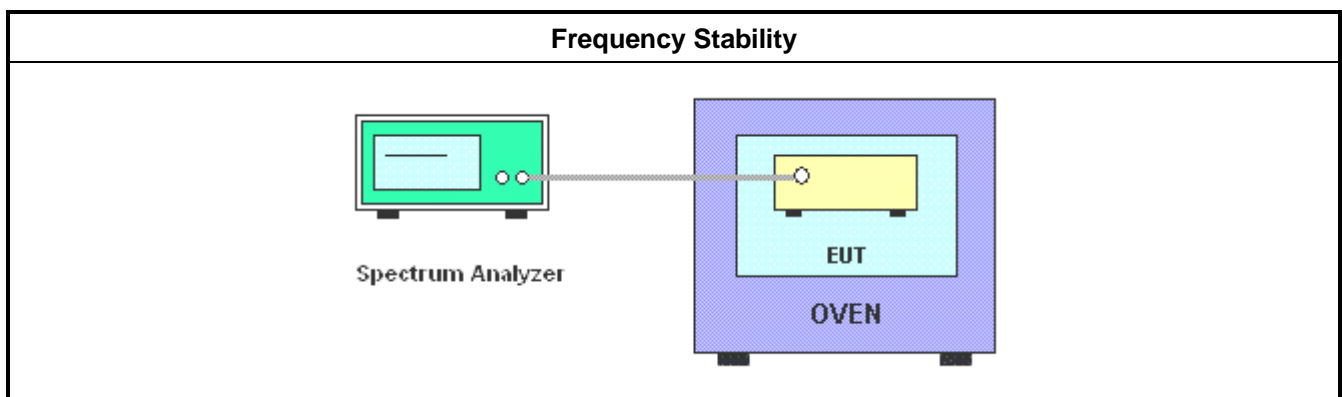
Please refer to section 4 in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Detector	Peak
RBW / VBW	10 kHz / 30kHz

3.6.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channel.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with frequency counter function.
5. f_c is declaring of carrier channel frequency. Then the frequency error formula is $(f_c - f) / f_c \times 10^6$ ppm.
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value and extreme temperature rule is -20°C~55°C.

3.6.4 Test Setup



3.6.5 Test Deviation

There is no deviation with the original standard.

3.6.6 Test Result of Frequency Stability

Refer as Appendix F



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Bilog Antenna with 6 dB attenuator	Schaffner	CBL6112B & N-6-06	2928 & AT-N0607	20MHz ~ 2GHz	Jan. 02, 2019	Jan. 01, 2020	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 13, 2018	Nov. 12, 2019	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 08, 2019	Jan. 07, 2020	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH01-CB)
RF Cable-low	Woken	RG402	Low Cable-16+17	30 MHz ~ 1 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	May 30, 2019	May 29, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz ~ 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz ~ 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz ~ 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz ~ 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz ~ 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-28	1 GHz –26.5 GHz	Nov. 19, 2018	Nov. 18, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-28	1 GHz –26.5 GHz	Nov. 18, 2019	Nov. 17, 2020	Conducted (TH01-CB)
Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)

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



Average Power Result

Appendix A.1

Summary

Mode	Power (dBm)	Power (W)
4.94-4.99GHz	-	-
802.11j_5MHz_Nss1_2TX	20.68	0.117
802.11j_10MHz_Nss1_2TX	22.18	0.165
802.11j_20MHz_Nss1_2TX	23.28	0.213

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Power (dBm)	Power (W)	Power Lim. (W)
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX	-	-	-	-	-	-	-
4942.5MHz	Pass	19.00	17.92	17.41	20.68	0.117	27.00
4965MHz	Pass	19.00	17.21	16.90	20.07	0.102	27.00
4987.5MHz	Pass	19.00	17.00	16.49	19.76	0.095	27.00
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX	-	-	-	-	-	-	-
4945MHz	Pass	19.00	18.86	19.39	22.14	0.164	30.00
4965MHz	Pass	19.00	19.01	19.33	22.18	0.165	30.00
4985MHz	Pass	19.00	18.82	19.20	22.02	0.159	30.00
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX	-	-	-	-	-	-	-
4950MHz	Pass	19.00	19.68	20.07	22.89	0.195	33.00
4965MHz	Pass	19.00	19.55	20.02	22.80	0.191	33.00
4980MHz	Pass	19.00	20.09	20.45	23.28	0.213	33.00

DG = Directional Gain; **Port n** = Port n output power



PSD Result

Appendix A.2

Summary

Mode	PD (dBm/MHz)
4.94-4.99GHz	-
802.11j_5MHz_Nss1_2TX	13.46
802.11j_10MHz_Nss1_2TX	12.53
802.11j_20MHz_Nss1_2TX	9.22

Result

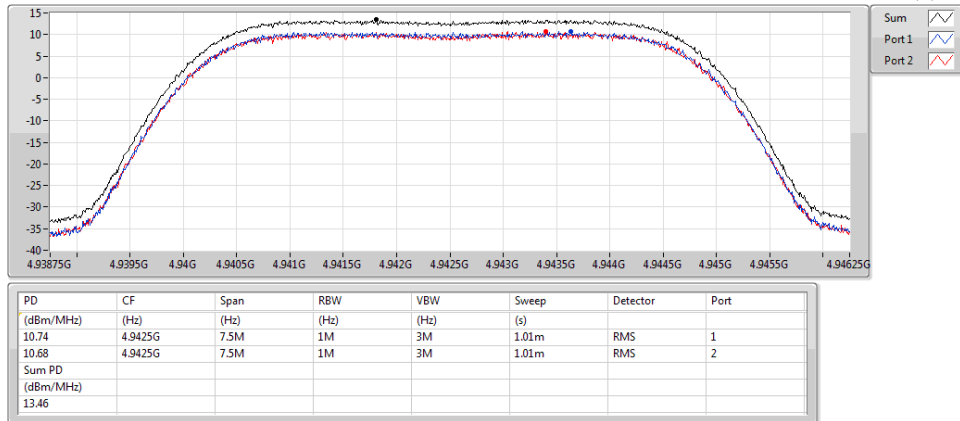
Mode	Result	DG (dBi)	Port 1 (dBm/MHz)	Port 2 (dBm/MHz)	PD (dBm/MHz)	PD Limit (dBm/MHz)
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX	-	-	-	-	-	-
4942.5MHz	Pass	22.01	10.74	10.68	13.46	21.00
4965MHz	Pass	22.01	10.43	10.05	12.95	21.00
4987.5MHz	Pass	22.01	9.96	9.88	12.76	21.00
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX	-	-	-	-	-	-
4945MHz	Pass	22.01	9.68	9.99	12.49	21.00
4965MHz	Pass	22.01	9.77	9.81	12.53	21.00
4985MHz	Pass	22.01	9.28	9.73	12.31	21.00
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX	-	-	-	-	-	-
4950MHz	Pass	22.01	6.05	5.93	8.90	21.00
4965MHz	Pass	22.01	5.95	5.84	8.83	21.00
4980MHz	Pass	22.01	6.39	6.12	9.22	21.00

DG = Directional Gain;

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port Xpower density;

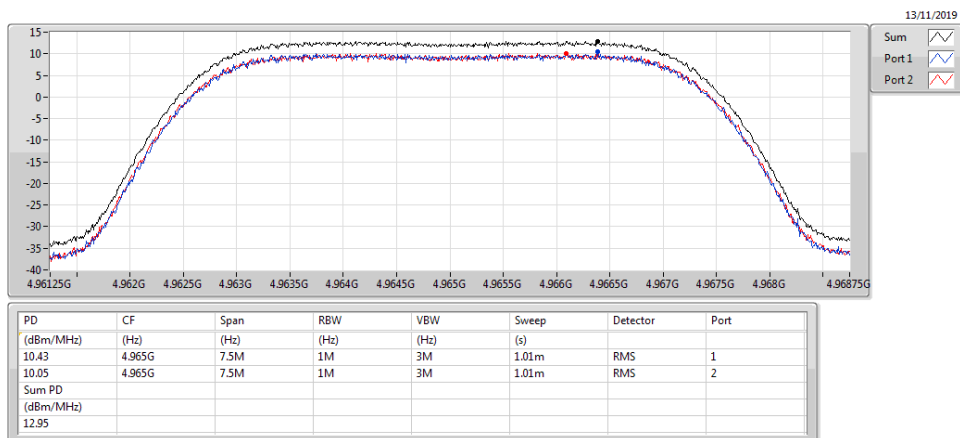
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
4942.5MHz

PSD



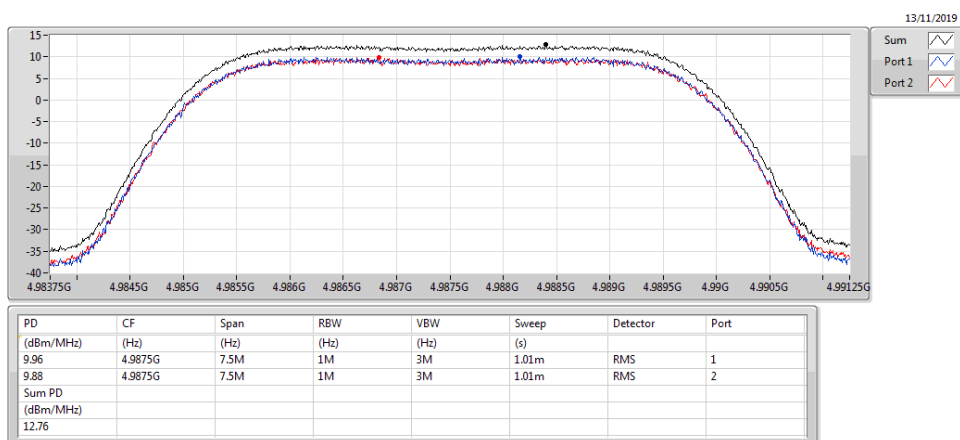
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
4965MHz

PSD



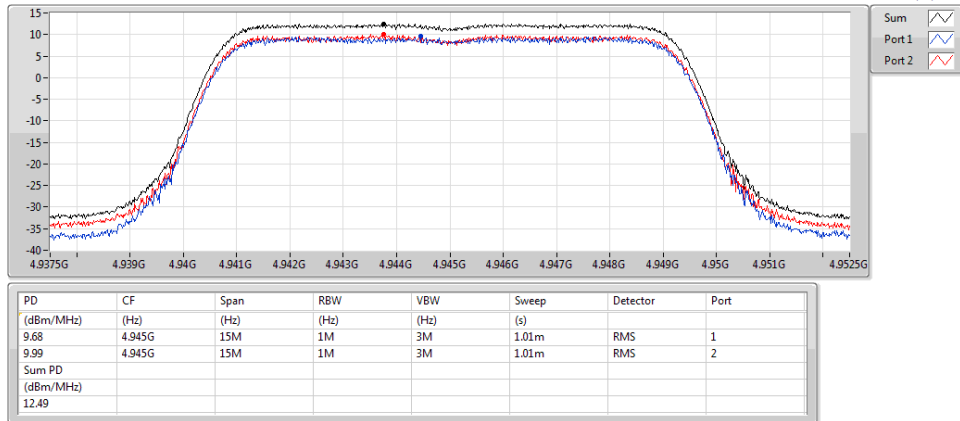
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
4987.5MHz

PSD



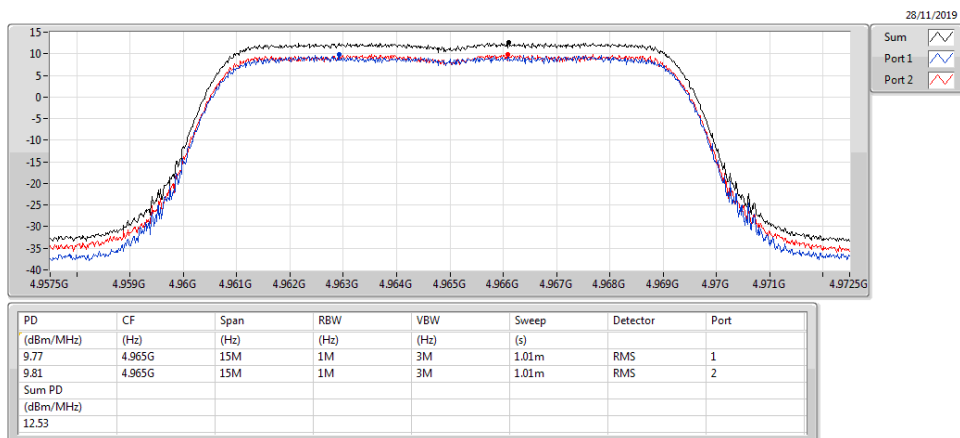
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX
4945MHz

PSD



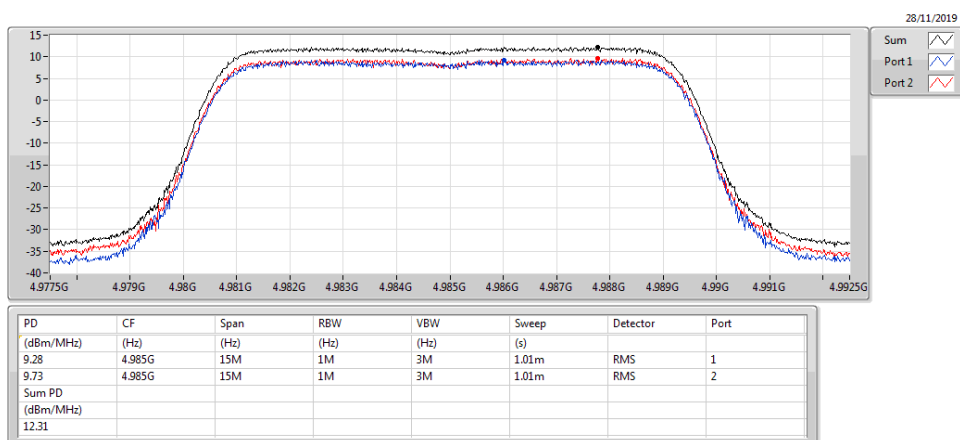
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX
4965MHz

PSD



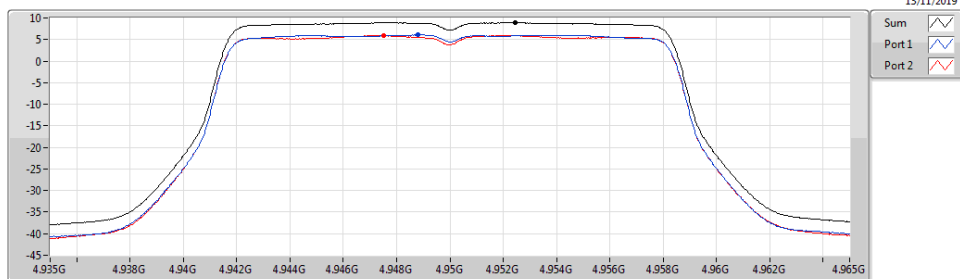
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX
4985MHz

PSD



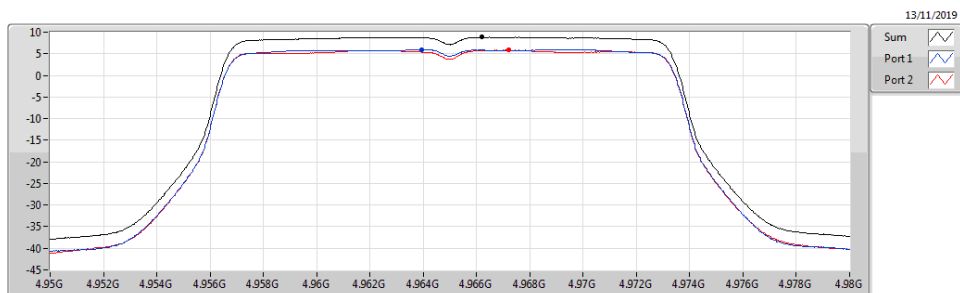
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX
4950MHz

PSD



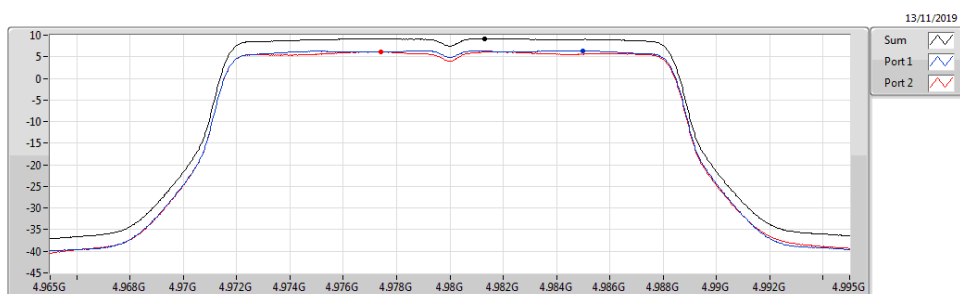
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX
4965MHz

PSD



4.94-4.99GHz_802.11j_20MHz_Nss1_2TX
4980MHz

PSD





Peak to Average Power Ratio (PAPR) Result

Appendix B

Summary

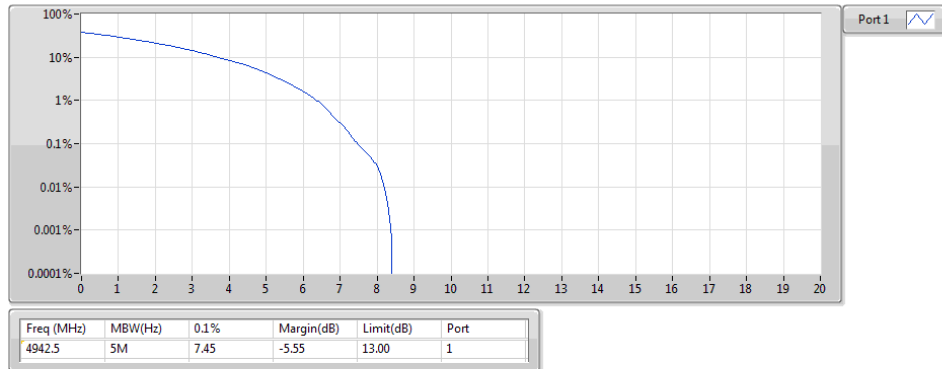
Mode	Result	Freq (MHz)	Limit (dB)	0.1%	Port
4.94-4.99GHz	-	-	-	-	-
802.11j_5MHz_Nss1_2TX	Pass	4987.5	13.00	7.71	1
802.11j_10MHz_Nss1_2TX	Pass	4985	13.00	7.83	1
802.11j_20MHz_Nss1_2TX	Pass	4950	13.00	8.03	1

Result

Mode	Result	Freq (MHz)	Limit (dB)	0.1%	Port
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX	-	-	-	-	-
4942.5MHz	Pass	4942.5	13.00	7.45	1
4965MHz	Pass	4965	13.00	7.62	1
4987.5MHz	Pass	4987.5	13.00	7.71	1
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX	-	-	-	-	-
4945MHz	Pass	4945	13.00	6.43	1
4965MHz	Pass	4945	13.00	7.57	1
4985MHz	Pass	4985	13.00	7.83	1
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX	-	-	-	-	-
4950MHz	Pass	4950	13.00	8.03	1
4965MHz	Pass	4965	13.00	8.03	1
4980MHz	Pass	4980	13.00	8.03	1

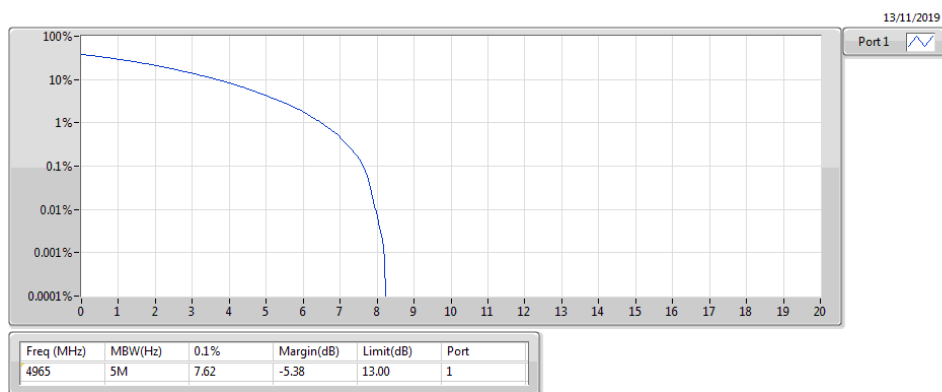
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
4942.5MHz

PAR



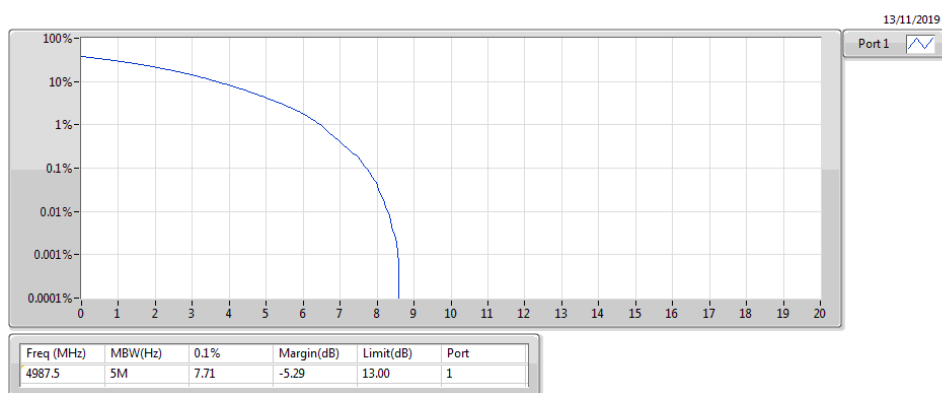
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
4965MHz

PAR



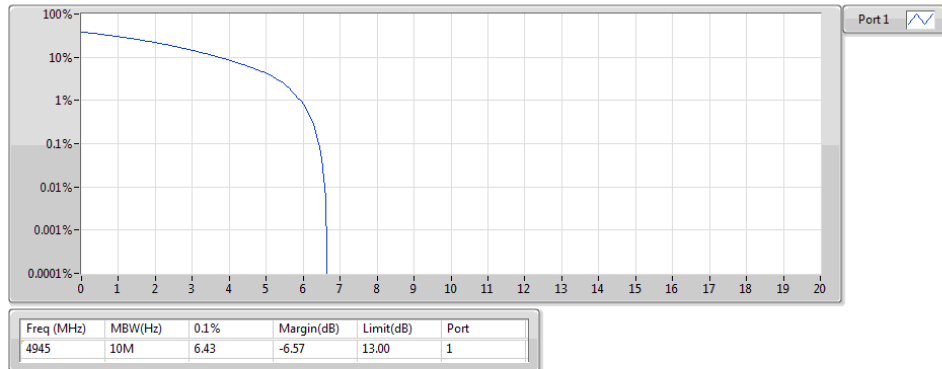
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
4987.5MHz

PAR



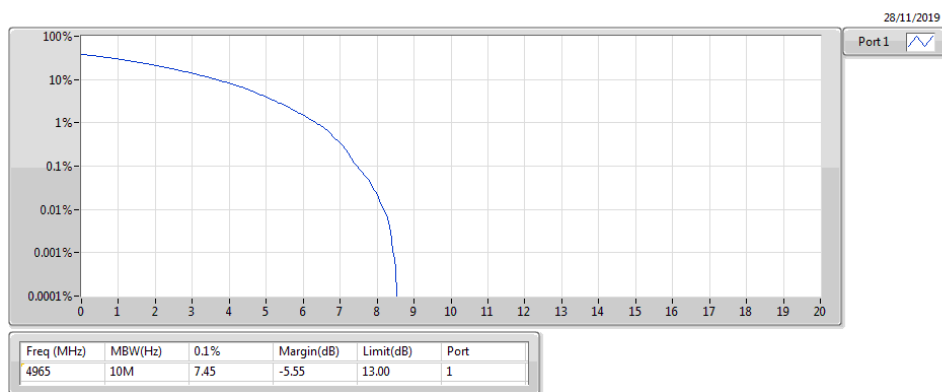
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX
4945MHz

PAR



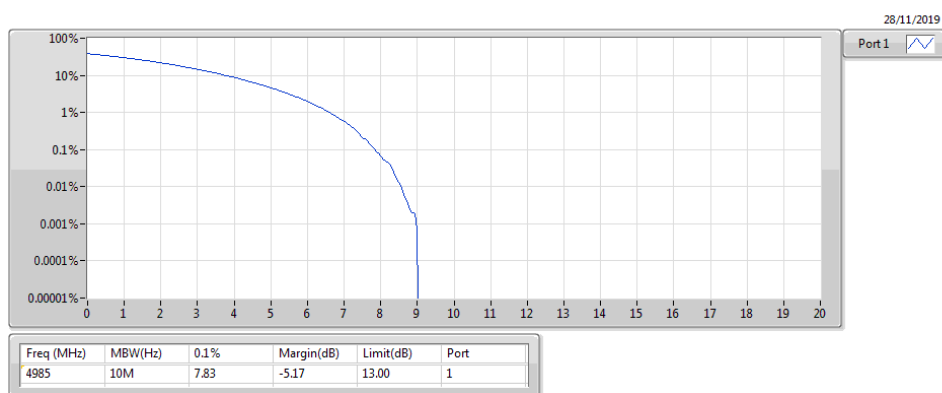
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX
4965MHz

PAR



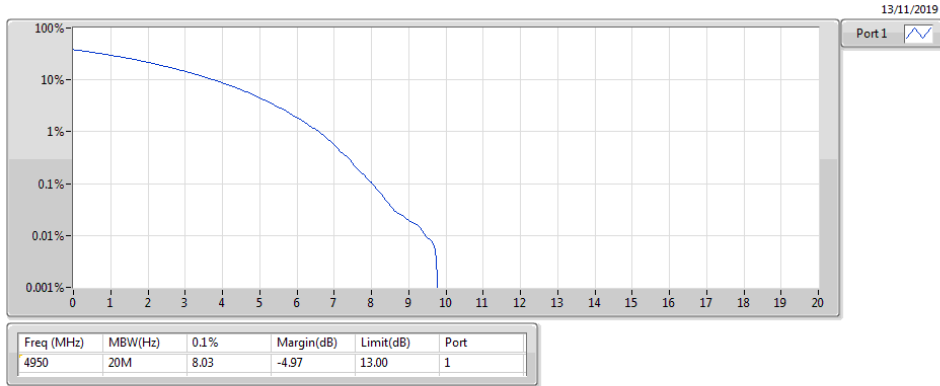
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX
4985MHz

PAR



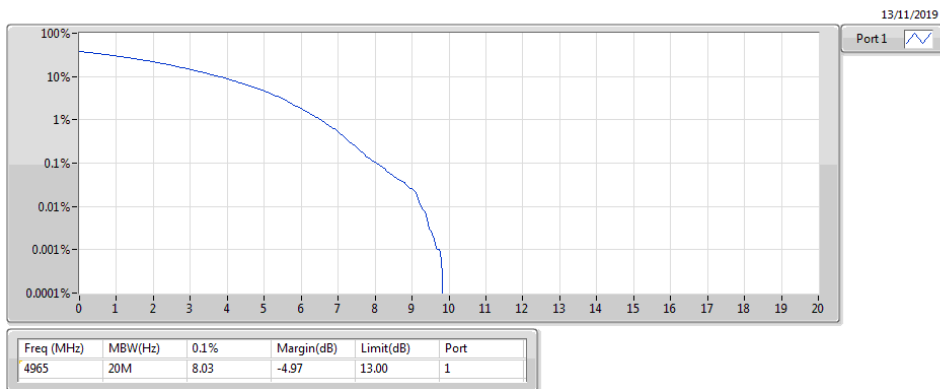
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX
4950MHz

PAR



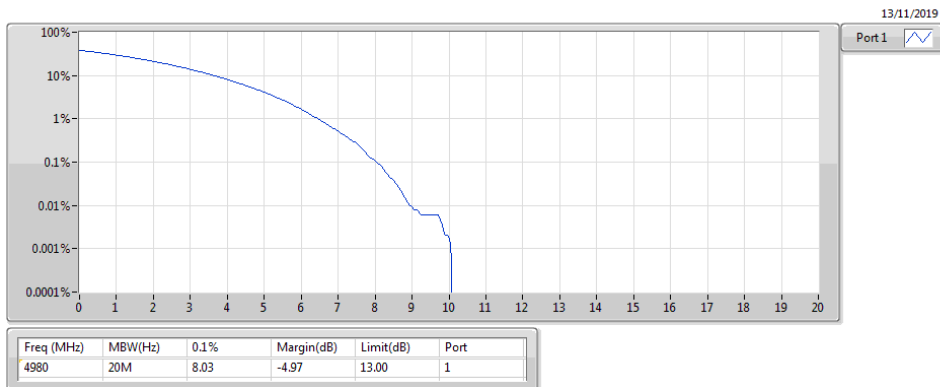
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX
4965MHz

PAR



4.94-4.99GHz_802.11j_20MHz_Nss1_2TX
4980MHz

PAR



Summary

Mode	Max-NdB (Hz)	Max-OBW (Hz)	ITU-Code	Min-NdB (Hz)	Min-OBW (Hz)
4.94-4.99GHz	-	-	-	-	-
802.11j_5MHz_Nss1_2TX	4.825M	4.11M	4M11	4.725M	4.104M
802.11j_10MHz_Nss1_2TX	9.613M	8.208M	8M21	9.55M	8.196M
802.11j_20MHz_Nss1_2TX	19.2M	16.392M	16M4	18.975M	16.367M

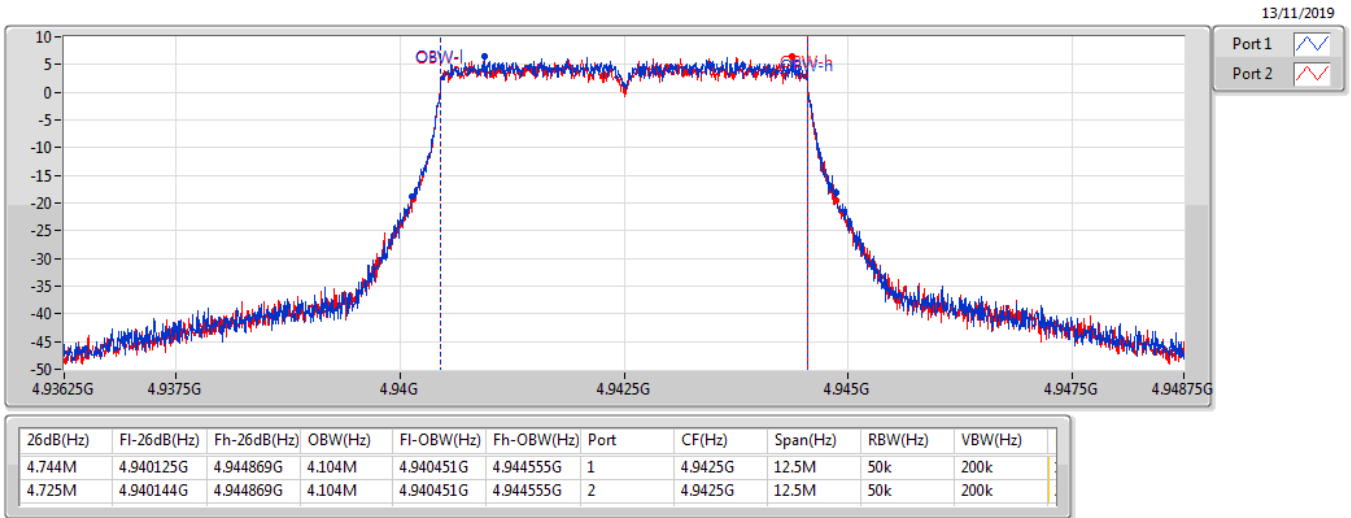
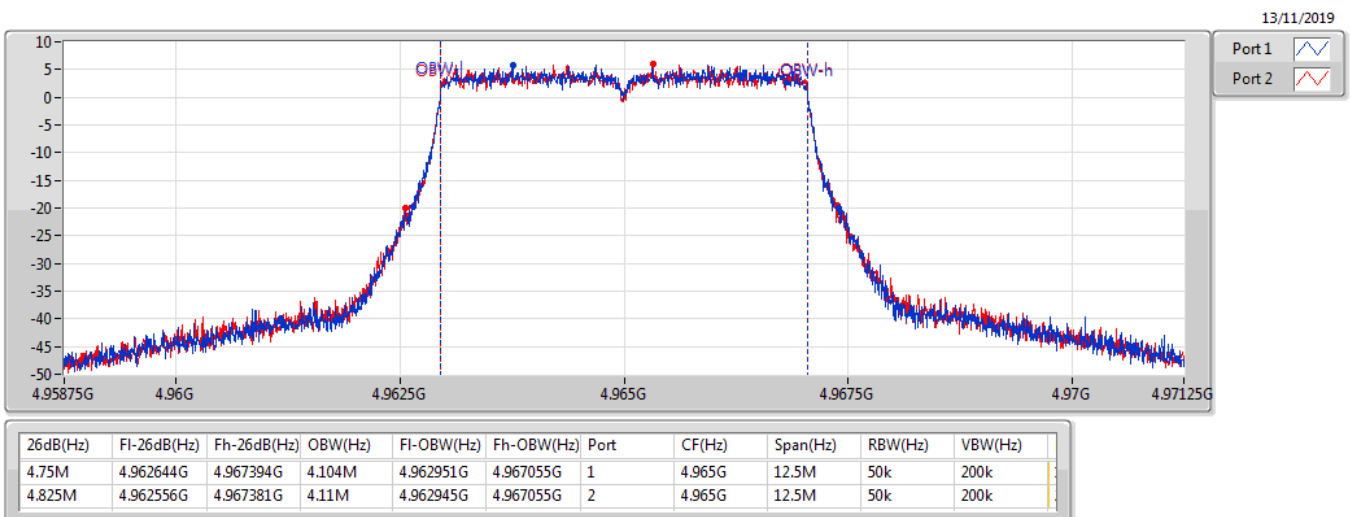
Max-N dB = Maximum 26dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 26dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

Mode	Result	Limit (Hz)	Port 1-NdB (Hz)	Port 1-OBW (Hz)	Port 2-NdB (Hz)	Port 2-OBW (Hz)
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX	-	-	-	-	-	-
4942.5MHz	Pass	Inf	4.744M	4.104M	4.725M	4.104M
4965MHz	Pass	Inf	4.75M	4.104M	4.825M	4.11M
4987.5MHz	Pass	Inf	4.75M	4.104M	4.738M	4.104M
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX	-	-	-	-	-	-
4945MHz	Pass	Inf	9.575M	8.208M	9.55M	8.208M
4965MHz	Pass	Inf	9.575M	8.196M	9.6M	8.208M
4985MHz	Pass	Inf	9.613M	8.208M	9.55M	8.208M
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX	-	-	-	-	-	-
4950MHz	Pass	Inf	19.2M	16.367M	19M	16.392M
4965MHz	Pass	Inf	19.175M	16.392M	18.975M	16.392M
4980MHz	Pass	Inf	19.175M	16.392M	19.2M	16.392M

Port X-N dB = Port X 26dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

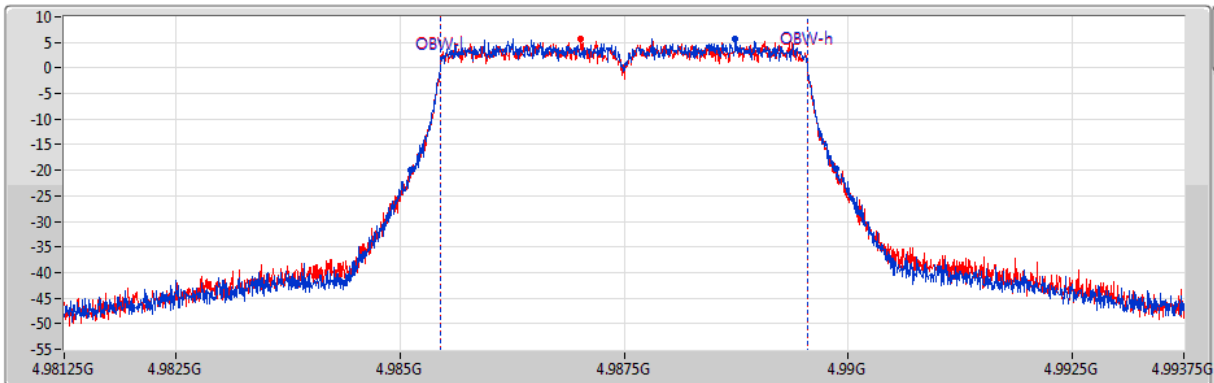
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
EBW
4942.5MHz

4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
EBW
4965MHz


4.94-4.99GHz_802.11j_5MHz_Nss1_2TX

EBW

4987.5MHz

13/11/2019



Port 1
Port 2

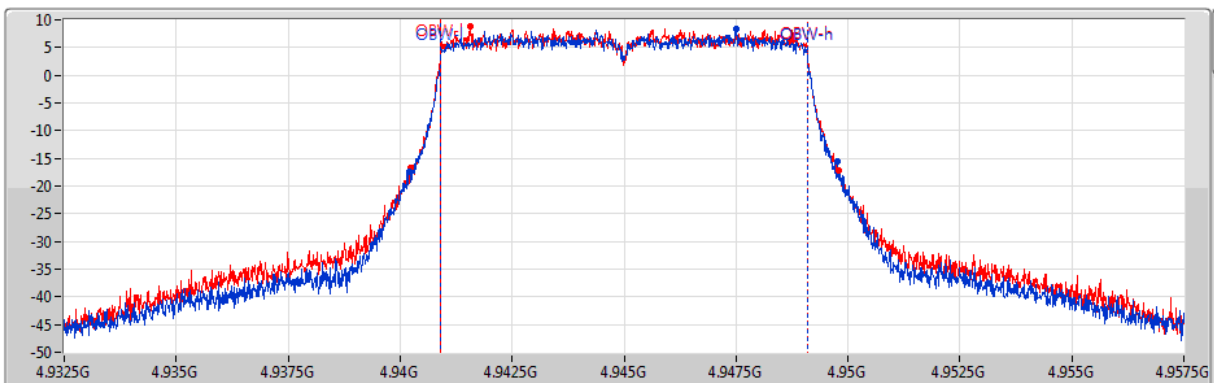
26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Port	CF(Hz)	Span(Hz)	RBW(Hz)	VBW(Hz)
4.75M	4.985113G	4.989863G	4.104M	4.985445G	4.989549G	1	4.9875G	12.5M	50k	200k
4.738M	4.985119G	4.989856G	4.104M	4.985445G	4.989549G	2	4.9875G	12.5M	50k	200k

4.94-4.99GHz_802.11j_10MHz_Nss1_2TX

EBW

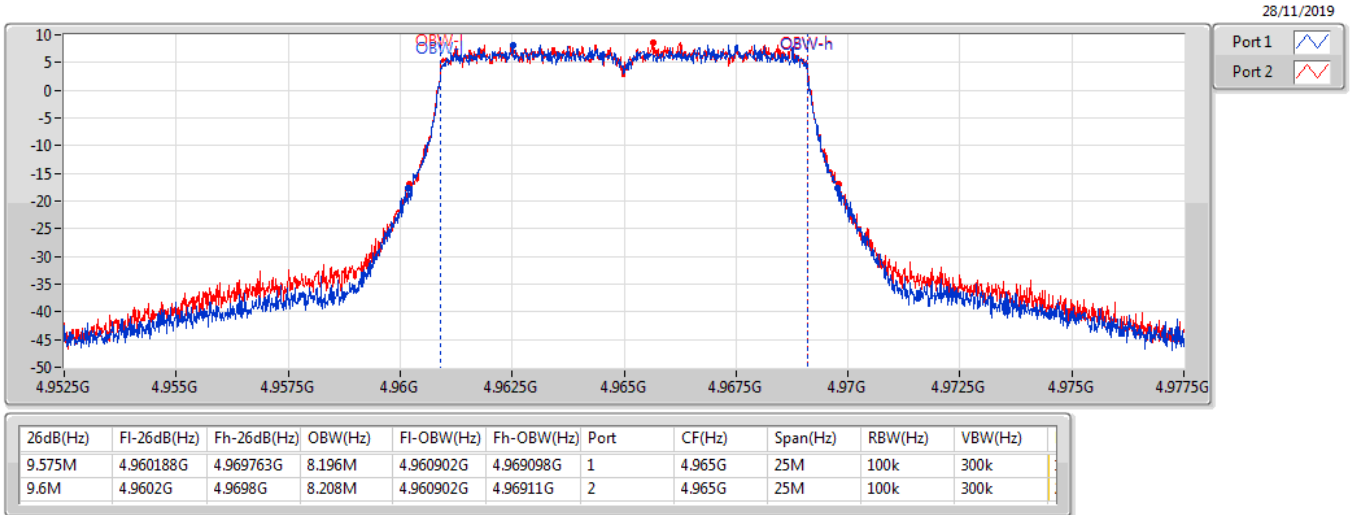
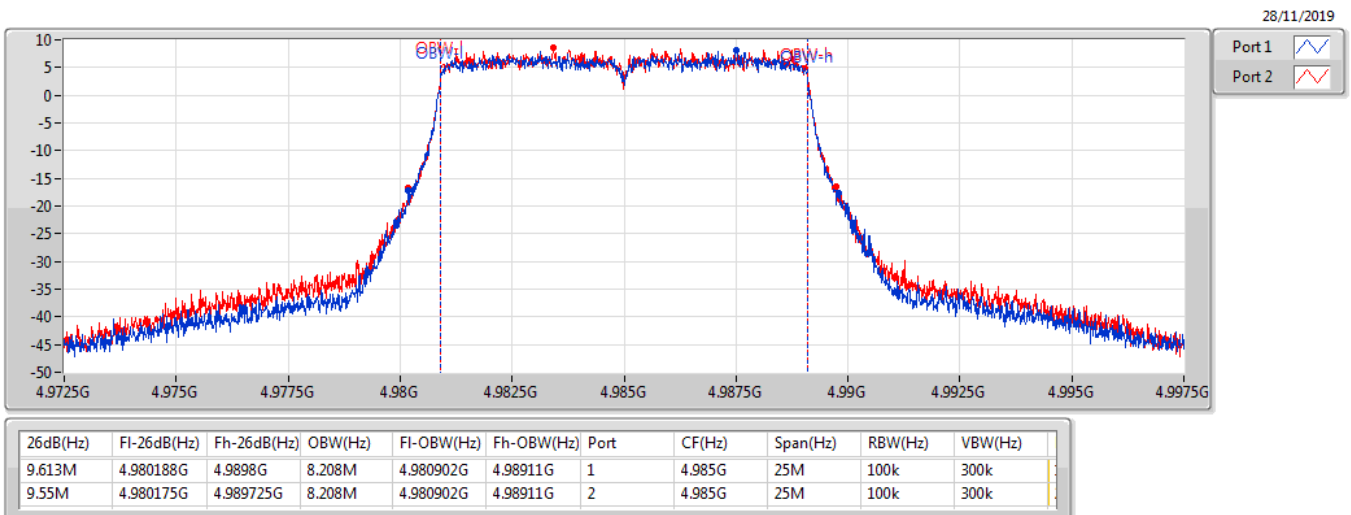
4945MHz

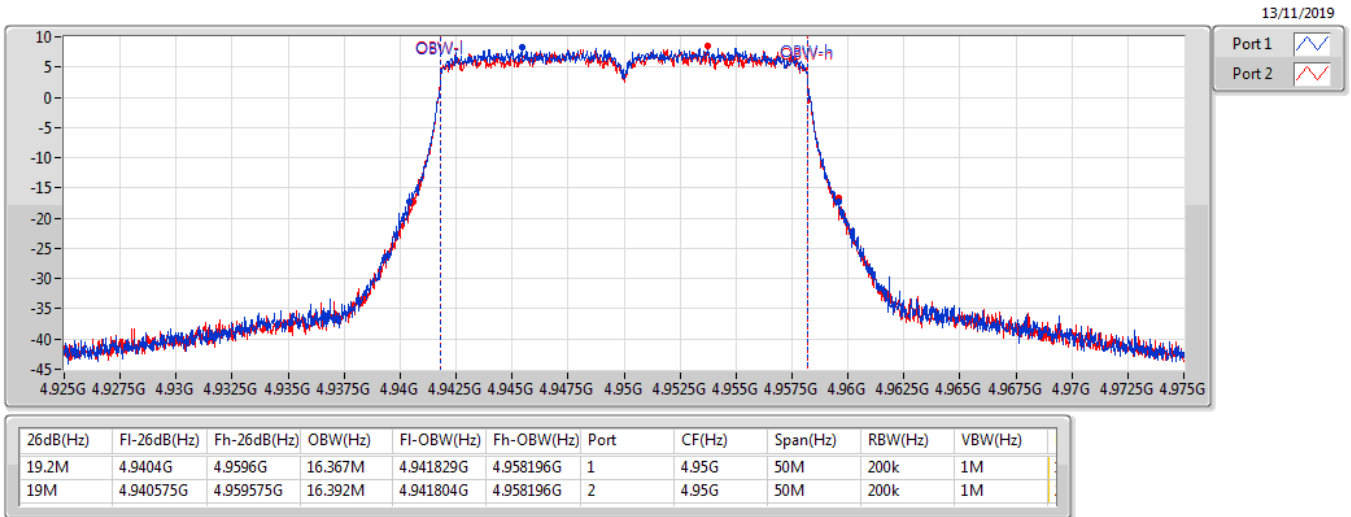
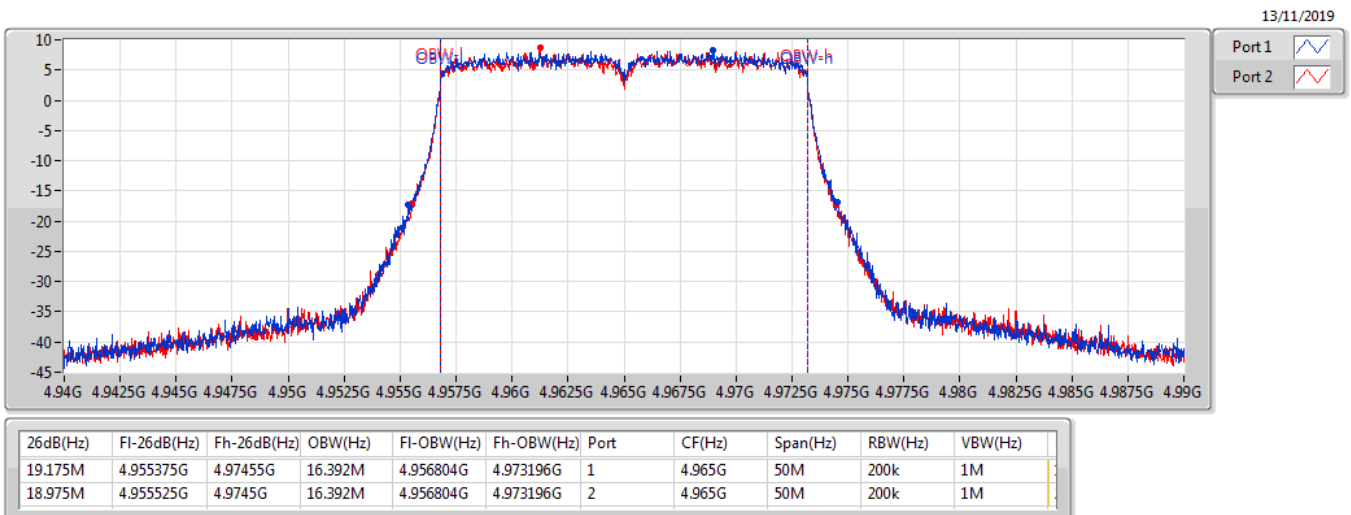
28/11/2019



Port 1
Port 2

26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Port	CF(Hz)	Span(Hz)	RBW(Hz)	VBW(Hz)
9.575M	4.9402G	4.949775G	8.208M	4.940902G	4.94911G	1	4.945G	25M	100k	300k
9.55M	4.940238G	4.949788G	8.208M	4.940902G	4.94911G	2	4.945G	25M	100k	300k

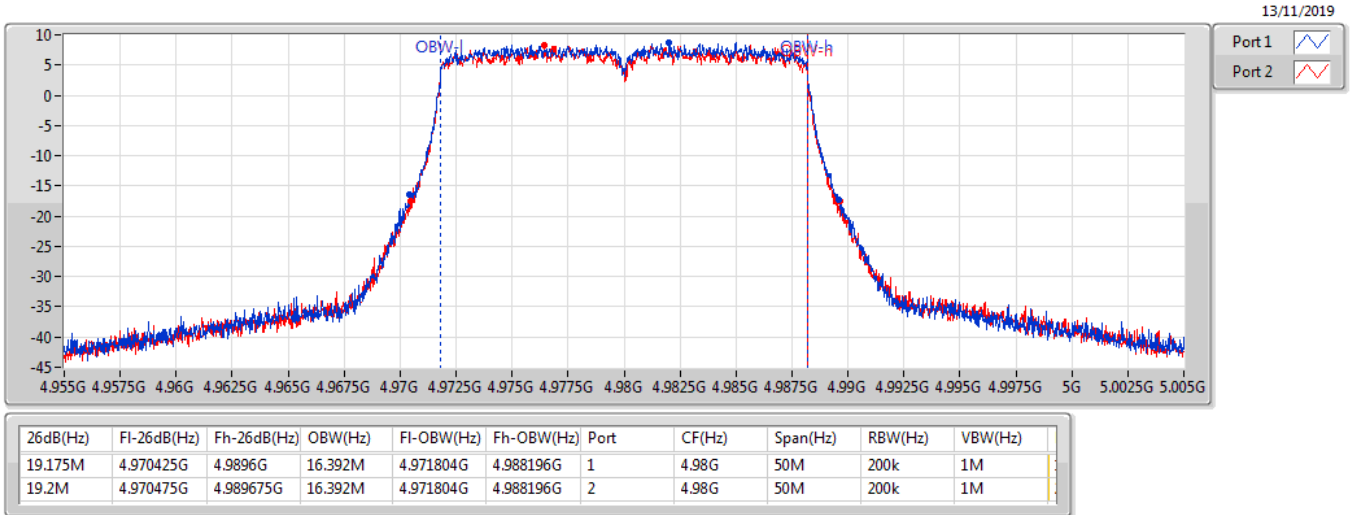
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX
EBW
4965MHz

4.94-4.99GHz_802.11j_10MHz_Nss1_2TX
EBW
4985MHz


4.94-4.99GHz_802.11j_20MHz_Nss1_2TX
EBW
4950MHz

4.94-4.99GHz_802.11j_20MHz_Nss1_2TX
EBW
4965MHz


4.94-4.99GHz_802.11j_20MHz_Nss1_2TX

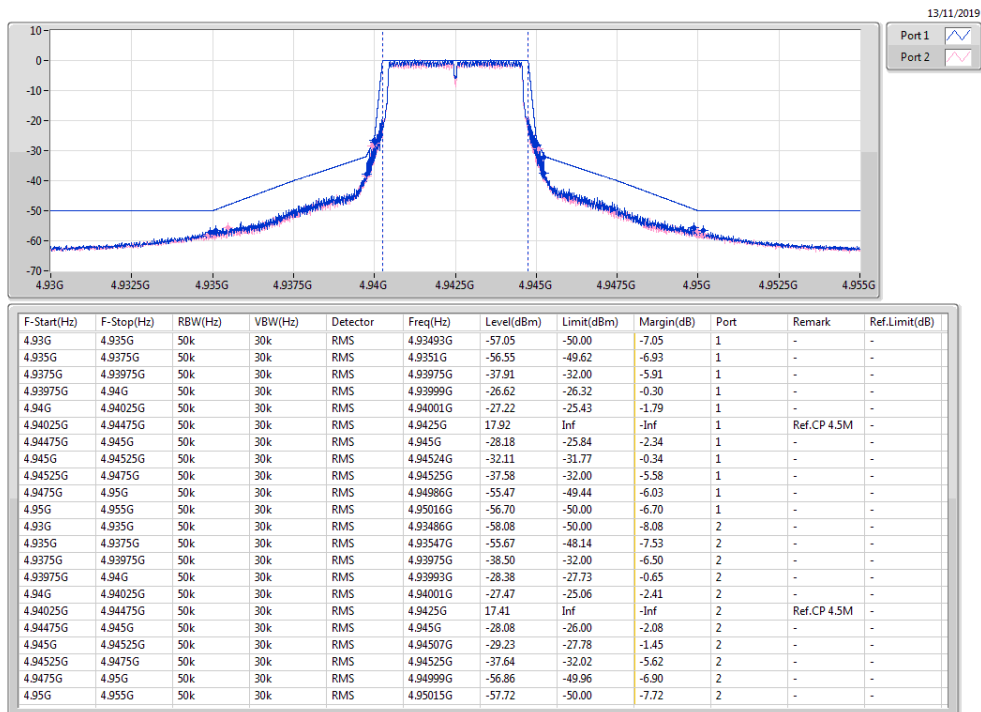
EBW

4980MHz

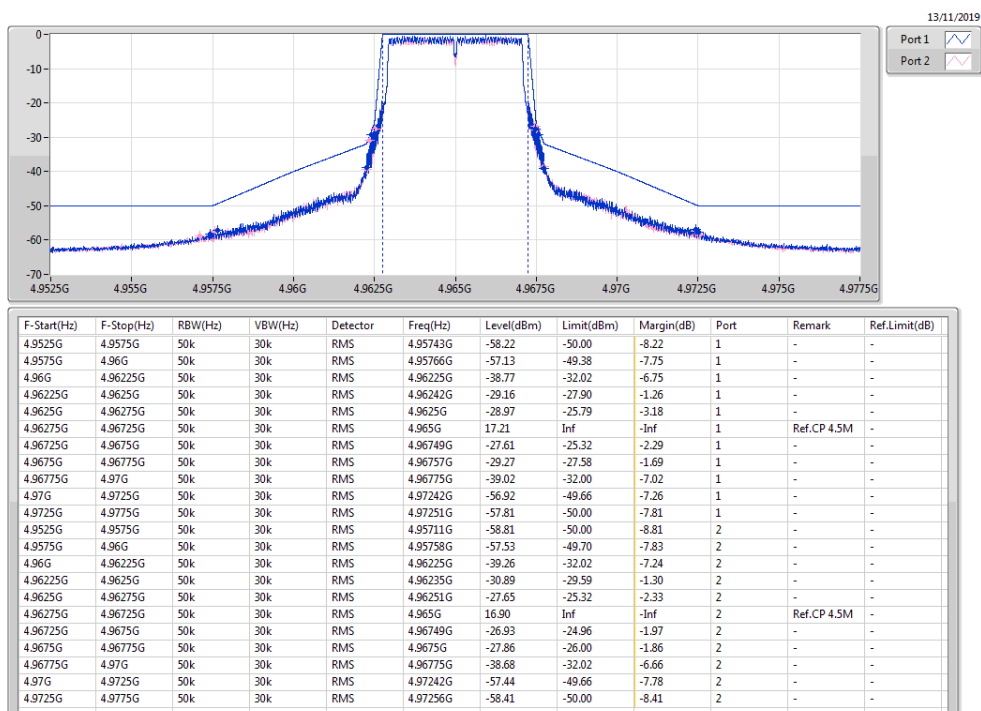


4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
4942.5MHz

Mask

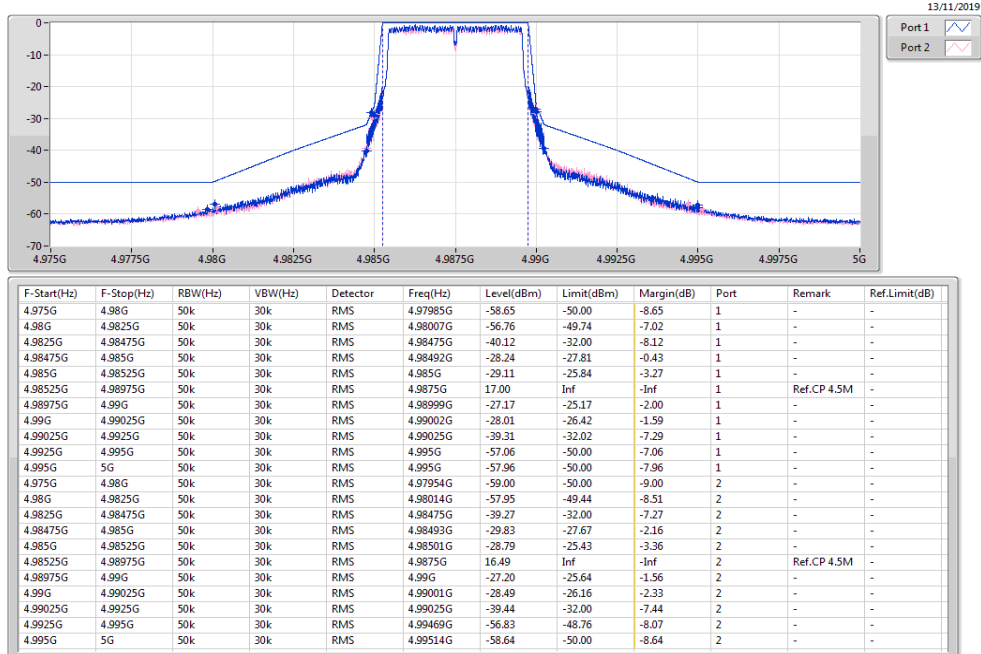
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX
4965MHz

Mask

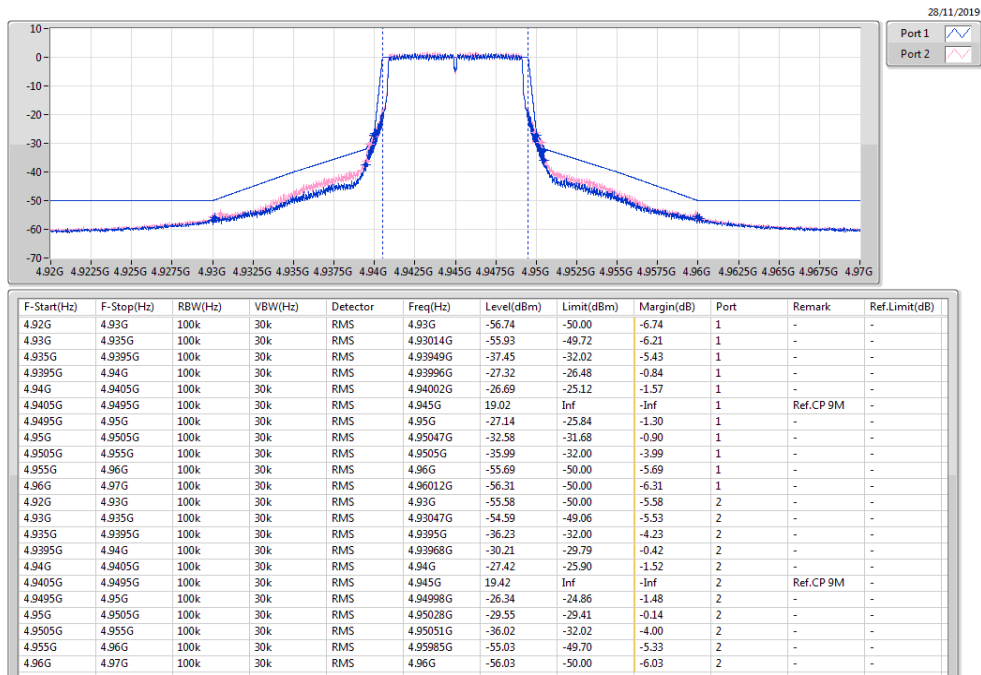


4.94-4.99GHz 802.11j_5MHz_Nss1_2TX
4987.5MHz

Mask

4.94-4.99GHz 802.11j_10MHz_Nss1_2TX
4945MHz

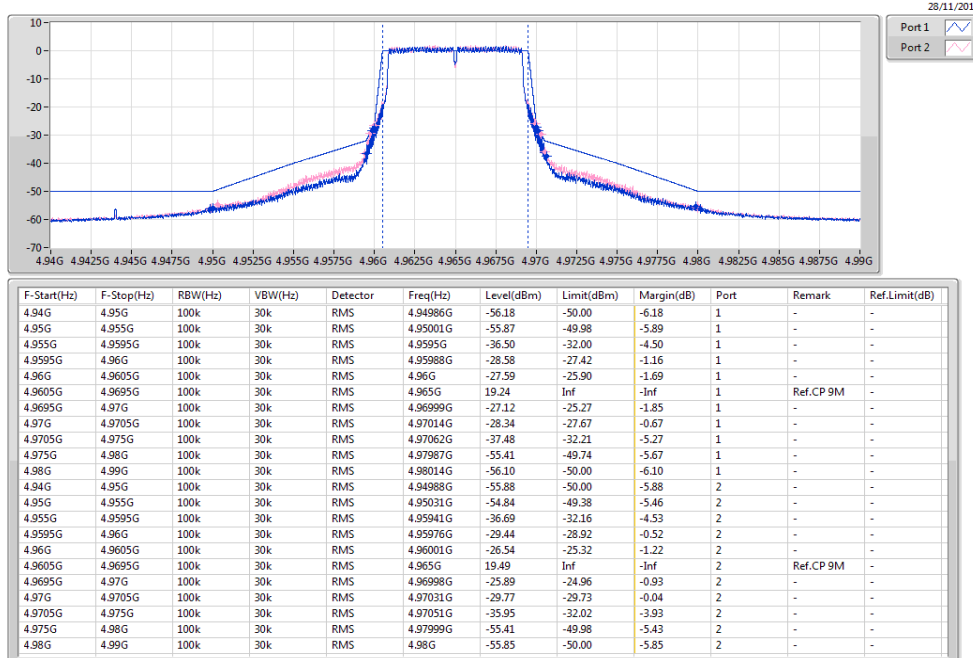
Mask



4.94-4.99GHz_802.11j_10MHz_Nss1_2TX

Mask

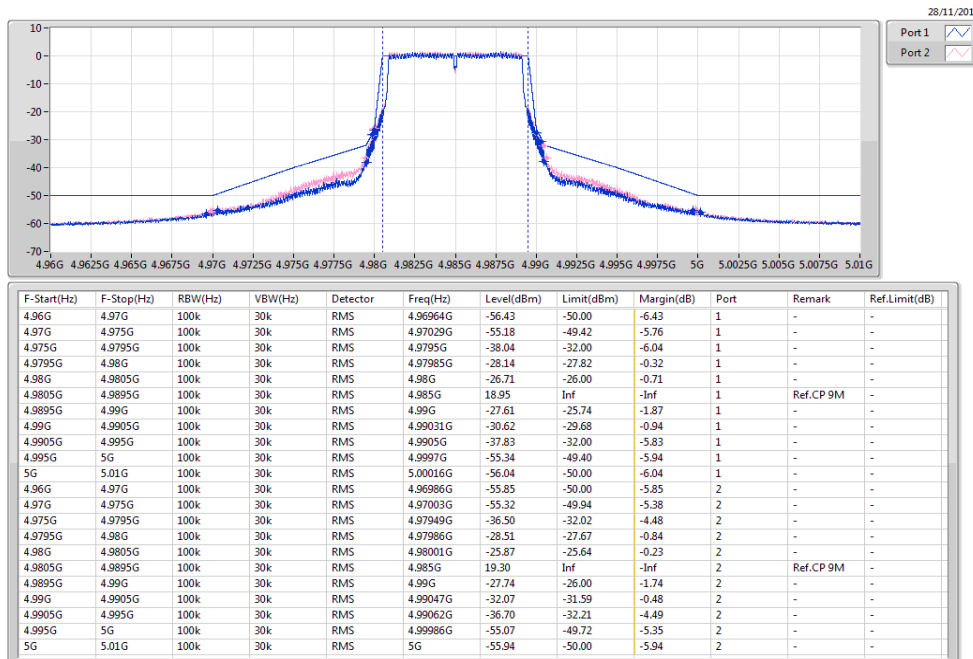
4965MHz



4.94-4.99GHz_802.11j_10MHz_Nss1_2TX

Mask

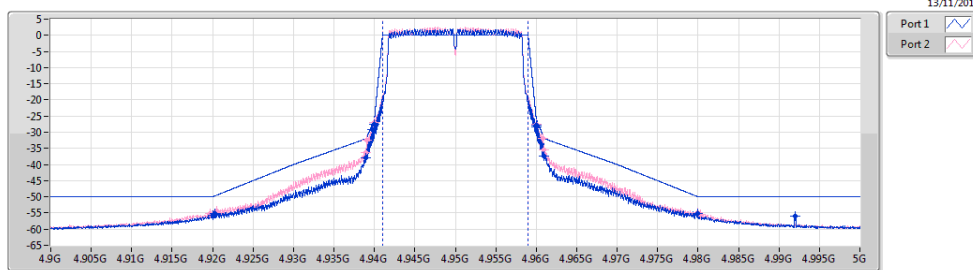
4985MHz



4.94-4.99GHz_802.11j_20MHz_Nss1_2TX

Mask

4950MHz

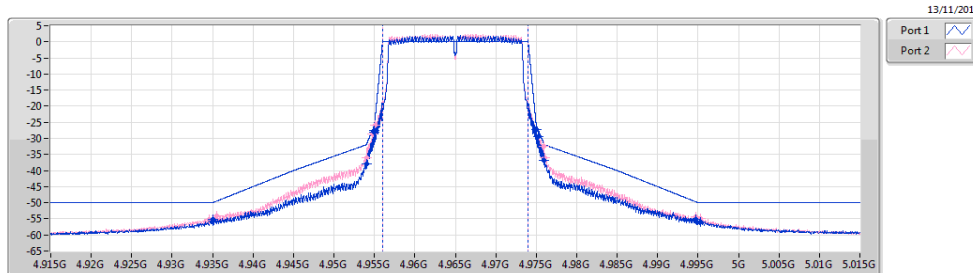


F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	VBW(Hz)	Detector	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Remark	Ref.Limit(dB)
4.9G	4.92G	200k	30k	RMS	4.92G	-55.65	-50.00	-5.65	1	-	-
4.92G	4.93G	200k	30k	RMS	4.9203G	-55.14	-49.70	-5.44	1	-	-
4.93G	4.939G	200k	30k	RMS	4.93895G	-38.01	-32.05	-5.96	1	-	-
4.939G	4.94G	200k	30k	RMS	4.93974G	-29.28	-27.58	-1.70	1	-	-
4.94G	4.941G	200k	30k	RMS	4.94001G	-27.67	-25.69	-1.98	1	-	-
4.941G	4.959G	200k	30k	RMS	4.95G	19.68	Inf	-Inf	1	Ref.CP 18M	-
4.959G	4.96G	200k	30k	RMS	4.95999G	-28.31	-25.69	-2.62	1	-	-
4.96G	4.961G	200k	30k	RMS	4.96004G	-27.82	-26.25	-1.57	1	-	-
4.961G	4.97G	200k	30k	RMS	4.961G	-37.27	-32.00	-5.27	1	-	-
4.97G	4.98G	200k	30k	RMS	4.98G	-55.04	-50.00	-5.04	1	-	-
4.98G	5G	200k	30k	RMS	4.992G	-55.96	-50.00	-5.96	1	-	-
4.9G	4.92G	200k	30k	RMS	4.91968G	-55.17	-50.00	-5.17	2	-	-
4.92G	4.93G	200k	30k	RMS	4.92056G	-54.27	-49.44	-4.83	2	-	-
4.93G	4.939G	200k	30k	RMS	4.93898G	-36.16	-32.02	-4.14	2	-	-
4.939G	4.94G	200k	30k	RMS	4.93904G	-32.33	-31.74	-0.59	2	-	-
4.94G	4.941G	200k	30k	RMS	4.94001G	-26.97	-25.64	-1.33	2	-	-
4.941G	4.959G	200k	30k	RMS	4.95G	20.07	Inf	-Inf	2	Ref.CP 18M	-
4.959G	4.96G	200k	30k	RMS	4.96G	-27.58	-26.00	-1.58	2	-	-
4.96G	4.961G	200k	30k	RMS	4.96085G	-31.87	-31.11	-0.76	2	-	-
4.961G	4.97G	200k	30k	RMS	4.961G	-35.53	-32.00	-3.53	2	-	-
4.97G	4.98G	200k	30k	RMS	4.97996G	-54.93	-49.96	-4.97	2	-	-
4.98G	5G	200k	30k	RMS	4.98028G	-55.53	-50.00	-5.53	2	-	-

4.94-4.99GHz_802.11j_20MHz_Nss1_2TX

Mask

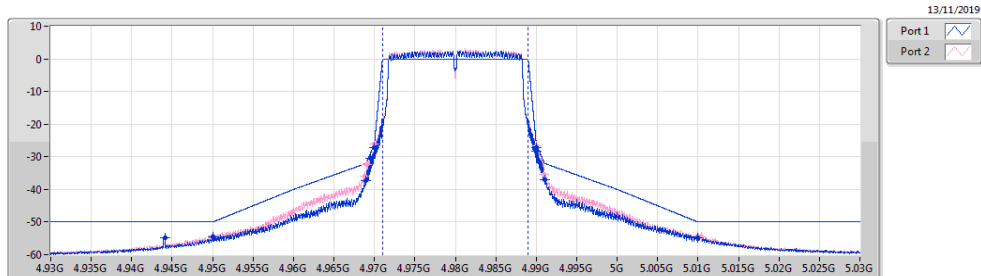
4965MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	VBW(Hz)	Detector	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Remark	Ref.Limit(dB)
4.915G	4.935G	200k	30k	RMS	4.935G	-55.67	-50.00	-5.67	1	-	-
4.935G	4.945G	200k	30k	RMS	4.935G	-55.23	-50.00	-5.23	1	-	-
4.945G	4.954G	200k	30k	RMS	4.954G	-37.93	-32.00	-5.93	1	-	-
4.954G	4.955G	200k	30k	RMS	4.95499G	-27.59	-26.07	-1.52	1	-	-
4.955G	4.956G	200k	30k	RMS	4.95501G	-28.06	-25.74	-2.32	1	-	-
4.956G	4.974G	200k	30k	RMS	4.965G	19.55	Inf	-Inf	1	Ref.CP 18M	-
4.974G	4.975G	200k	30k	RMS	4.97498G	-27.17	-25.58	-1.59	1	-	-
4.975G	4.976G	200k	30k	RMS	4.97527G	-29.44	-27.62	-1.82	1	-	-
4.976G	4.985G	200k	30k	RMS	4.976G	-36.92	-32.00	-4.92	1	-	-
4.985G	4.995G	200k	30k	RMS	4.9947G	-55.19	-49.70	-5.49	1	-	-
4.995G	5.015G	200k	30k	RMS	4.99528G	-55.85	-50.00	-5.85	1	-	-
4.915G	4.935G	200k	30k	RMS	4.93464G	-55.15	-50.00	-5.15	2	-	-
4.935G	4.945G	200k	30k	RMS	4.93556G	-54.12	-49.44	-4.68	2	-	-
4.945G	4.954G	200k	30k	RMS	4.954G	-36.13	-32.00	-4.13	2	-	-
4.954G	4.955G	200k	30k	RMS	4.95472G	-28.72	-27.69	-1.03	2	-	-
4.955G	4.956G	200k	30k	RMS	4.95504G	-25.98	-25.06	-0.92	2	-	-
4.956G	4.974G	200k	30k	RMS	4.965G	20.02	Inf	-Inf	2	Ref.CP 18M	-
4.974G	4.975G	200k	30k	RMS	4.97498G	-27.29	-25.53	-1.76	2	-	-
4.975G	4.976G	200k	30k	RMS	4.97599G	-32.45	-31.96	-0.49	2	-	-
4.976G	4.985G	200k	30k	RMS	4.97602G	-35.98	-32.02	-3.96	2	-	-
4.985G	4.995G	200k	30k	RMS	4.99472G	-54.33	-49.72	-4.61	2	-	-
4.995G	5.015G	200k	30k	RMS	4.99528G	-54.94	-50.00	-4.94	2	-	-

4.94-4.99GHz_802.11j_20MHz_Nss1_2TX
4980MHz

Mask



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	VBW(Hz)	Detector	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Remark	Ref.Limit(dB)
4.93G	4.95G	200k	30k	RMS	4.94408G	-54.82	-50.00	-4.82	1	-	-
4.95G	4.96G	200k	30k	RMS	4.95002G	-54.48	-49.98	-4.50	1	-	-
4.96G	4.969G	200k	30k	RMS	4.96898G	-37.44	-32.02	-5.42	1	-	-
4.969G	4.97G	200k	30k	RMS	4.96952G	-30.59	-28.88	-1.71	1	-	-
4.97G	4.971G	200k	30k	RMS	4.97002G	-27.28	-25.58	-1.70	1	-	-
4.971G	4.989G	200k	30k	RMS	4.98G	20.09	Inf	Inf	1	Ref.CP 18M	-
4.989G	4.99G	200k	30k	RMS	4.99G	-28.33	-25.95	-2.38	1	-	-
4.99G	4.991G	200k	30k	RMS	4.99004G	-27.30	-26.22	-1.08	1	-	-
4.991G	5G	200k	30k	RMS	4.99102G	-36.94	-32.02	-4.92	1	-	-
5G	5.01G	200k	30k	RMS	5.00998G	-54.73	-49.98	-4.75	1	-	-
5.01G	5.03G	200k	30k	RMS	5.01G	-54.86	-50.00	-4.86	1	-	-
4.93G	4.95G	200k	30k	RMS	4.95G	-54.38	-50.00	-4.38	2	-	-
4.95G	4.96G	200k	30k	RMS	4.95G	-54.24	-50.00	-4.24	2	-	-
4.96G	4.969G	200k	30k	RMS	4.96888G	-35.95	-32.18	-3.77	2	-	-
4.969G	4.97G	200k	30k	RMS	4.96906G	-32.29	-31.64	-0.65	2	-	-
4.97G	4.971G	200k	30k	RMS	4.97002G	-26.05	-25.53	-0.52	2	-	-
4.971G	4.989G	200k	30k	RMS	4.98G	20.45	Inf	Inf	2	Ref.CP 18M	-
4.989G	4.99G	200k	30k	RMS	4.98999G	-26.58	-25.64	-0.94	2	-	-
4.99G	4.991G	200k	30k	RMS	4.99002G	-26.58	-26.14	-0.44	2	-	-
4.991G	5G	200k	30k	RMS	4.991G	-35.48	-32.00	-3.48	2	-	-
5G	5.01G	200k	30k	RMS	5.01G	-54.20	-50.00	-4.20	2	-	-
5.01G	5.03G	200k	30k	RMS	5.01036G	-54.50	-50.00	-4.50	2	-	-



Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	VBW (Hz)	Detector	Freq (Hz)	Level (dBm)	Limit (dBm)	Margin (dB)	Remark	Ref.Limit (dB)
4.94 4.99GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11j_5MHz_Nss1_2TX	Pass	13.618G	40G	1M	3M	RMS	14.82498G	-40.36	-25.00	-15.36	-	-
802.11j_10MHz_Nss1_2TX	Pass	13.618G	40G	1M	3M	RMS	14.95359G	-39.55	-25.00	-14.55	-	-
802.11j_20MHz_Nss1_2TX	Pass	13.618G	40G	1M	3M	RMS	14.84806G	-42.22	-25.00	-17.22	-	-

**Result**

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	VBW (Hz)	Detector	Freq (Hz)	Level (dBm)	Limit (dBm)	Margin (dB)	Remark	Ref.Limit (dB)
4.94-4.99GHz_802.11j_5MHz_Nss1_2TX	-	-	-	-	-	-	-	-	-	-	-	-
4942.5MHz	Pass	9k	150k	200	1k	RMS	12.278k	-82.62	-25.00	-57.62	-	-
4942.5MHz	Pass	150k	30M	10k	30k	RMS	269.4k	-71.83	-25.00	-46.83	-	-
4942.5MHz	Pass	30M	1.5G	1M	3M	RMS	843.83M	-51.52	-25.00	-26.52	-	-
4942.5MHz	Pass	1.5G	4.9315G	1M	3M	RMS	4.9315G	-46.68	-25.00	-21.68	-	-
4942.5MHz	Pass	4.9315G	4.9325G	50k	200k	RMS	4.932G	-46.70	-25.00	-21.70	MBW 1M	-
4942.5MHz	Pass	4.9525G	4.9535G	50k	200k	RMS	4.953G	-46.75	-25.00	-21.75	MBW 1M	-
4942.5MHz	Pass	4.9535G	13.618G	1M	3M	RMS	4.95892G	-48.17	-25.00	-23.17	-	-
4942.5MHz	Pass	13.618G	40G	1M	3M	RMS	14.82498G	-40.36	-25.00	-15.36	-	-
4965MHz	Pass	9k	150k	200	1k	RMS	10.868k	-83.01	-25.00	-58.01	-	-
4965MHz	Pass	150k	30M	10k	30k	RMS	16.993M	-72.11	-25.00	-47.11	-	-
4965MHz	Pass	30M	1.5G	1M	3M	RMS	760.22M	-51.16	-25.00	-26.16	-	-
4965MHz	Pass	1.5G	4.954G	1M	3M	RMS	4.95357G	-46.88	-25.00	-21.88	-	-
4965MHz	Pass	4.954G	4.955G	50k	200k	RMS	4.9545G	-46.97	-25.00	-21.97	MBW 1M	-
4965MHz	Pass	4.975G	4.976G	50k	200k	RMS	4.9755G	-46.92	-25.00	-21.92	MBW 1M	-
4965MHz	Pass	4.976G	13.618G	1M	3M	RMS	4.976G	-47.57	-25.00	-22.57	-	-
4965MHz	Pass	13.618G	40G	1M	3M	RMS	14.89423G	-41.76	-25.00	-16.76	-	-
4987.5MHz	Pass	9k	150k	200	1k	RMS	9.423k	-83.74	-25.00	-58.74	-	-
4987.5MHz	Pass	150k	30M	10k	30k	RMS	202.238k	-72.55	-25.00	-47.55	-	-
4987.5MHz	Pass	30M	1.5G	1M	3M	RMS	781.35M	-50.94	-25.00	-25.94	-	-
4987.5MHz	Pass	1.5G	4.9765G	1M	3M	RMS	4.9765G	-46.43	-25.00	-21.43	-	-
4987.5MHz	Pass	4.9765G	4.9775G	50k	200k	RMS	4.977G	-46.99	-25.00	-21.99	MBW 1M	-
4987.5MHz	Pass	4.9975G	4.9985G	50k	200k	RMS	4.998G	-46.93	-25.00	-21.93	MBW 1M	-
4987.5MHz	Pass	4.9985G	13.618G	1M	3M	RMS	5.00065G	-47.28	-25.00	-22.28	-	-
4987.5MHz	Pass	13.618G	40G	1M	3M	RMS	14.96018G	-42.54	-25.00	-17.54	-	-
4.94-4.99GHz_802.11j_10MHz_Nss1_2TX	-	-	-	-	-	-	-	-	-	-	-	-
4965MHz	Pass	9k	150k	200	1k	RMS	10.586k	-84.89	-25.00	-59.89	-	-
4965MHz	Pass	150k	30M	10k	30k	RMS	150k	-73.28	-25.00	-48.28	-	-
4965MHz	Pass	30M	1.5G	1M	3M	RMS	740.75M	-50.80	-25.00	-25.80	-	-
4965MHz	Pass	1.5G	4.924G	1M	3M	RMS	4.92357G	-47.00	-25.00	-22.00	-	-
4965MHz	Pass	4.924G	4.925G	100k	300k	RMS	4.9245G	-47.25	-25.00	-22.25	MBW 1M	-
4965MHz	Pass	4.965G	4.966G	100k	300k	RMS	4.9655G	-47.04	-25.00	-22.04	MBW 1M	-
4965MHz	Pass	4.966G	13.618G	1M	3M	RMS	5.4981G	-46.55	-25.00	-21.55	-	-
4965MHz	Pass	13.618G	40G	1M	3M	RMS	14.83157G	-43.28	-25.00	-18.28	-	-
4965MHz	Pass	9k	150k	200	1k	RMS	9.176k	-84.52	-25.00	-59.52	-	-
4965MHz	Pass	150k	30M	10k	30k	RMS	157.462k	-73.45	-25.00	-48.45	-	-
4965MHz	Pass	30M	1.5G	1M	3M	RMS	759.67M	-47.74	-25.00	-22.74	-	-
4965MHz	Pass	1.5G	4.944G	1M	3M	RMS	4.944G	-46.33	-25.00	-21.33	-	-
4965MHz	Pass	4.944G	4.945G	100k	300k	RMS	4.9445G	-46.88	-25.00	-21.88	MBW 1M	-
4965MHz	Pass	4.985G	4.986G	100k	300k	RMS	4.9855G	-46.89	-25.00	-21.89	MBW 1M	-
4965MHz	Pass	4.986G	13.618G	1M	3M	RMS	5.49745G	-45.85	-25.00	-20.85	-	-
4965MHz	Pass	13.618G	40G	1M	3M	RMS	14.89423G	-40.75	-25.00	-15.75	-	-
4985MHz	Pass	9k	150k	200	1k	RMS	18.588k	-84.87	-25.00	-59.87	-	-
4985MHz	Pass	150k	30M	10k	30k	RMS	567.9k	-74.15	-25.00	-49.15	-	-
4985MHz	Pass	30M	1.5G	1M	3M	RMS	780.62M	-48.09	-25.00	-23.09	-	-
4985MHz	Pass	1.5G	4.964G	1M	3M	RMS	4.96227G	-46.75	-25.00	-21.75	-	-
4985MHz	Pass	4.964G	4.965G	100k	300k	RMS	4.9645G	-46.98	-25.00	-21.98	MBW 1M	-
4985MHz	Pass	5.005G	5.006G	100k	300k	RMS	5.0055G	-46.89	-25.00	-21.89	MBW 1M	-
4985MHz	Pass	5.006G	13.618G	1M	3M	RMS	5.49688G	-45.14	-25.00	-20.14	-	-
4985MHz	Pass	13.618G	40G	1M	3M	RMS	14.95359G	-39.55	-25.00	-14.55	-	-
4.94-4.99GHz_802.11j_20MHz_Nss1_2TX	-	-	-	-	-	-	-	-	-	-	-	-
4950MHz	Pass	9k	150k	200	1k	RMS	15.028k	-82.66	-25.00	-57.66	-	-
4950MHz	Pass	150k	30M	10k	30k	RMS	21.135M	-72.12	-25.00	-47.12	-	-



CSE-TX-Sum Result

Appendix D

Mode	Result	F-Start (Hz)	F-Stop (Hz)	RBW (Hz)	VBW (Hz)	Detector	Freq (Hz)	Level (dBm)	Limit (dBm)	Margin (dB)	Remark	Ref.Limit (dB)
4950MHz	Pass	30M	1.5G	1M	3M	RMS	882.05M	-51.49	-25.00	-26.49	-	-
4950MHz	Pass	1.5G	4.909G	1M	3M	RMS	4.90474G	-49.09	-25.00	-24.09	-	-
4950MHz	Pass	4.909G	4.91G	200k	1M	RMS	4.9095G	-49.23	-25.00	-24.23	MBW 1M	-
4950MHz	Pass	4.99G	4.991G	200k	1M	RMS	4.9905G	-49.28	-25.00	-24.28	MBW 1M	-
4950MHz	Pass	4.991G	13.618G	1M	3M	RMS	5.4946G	-47.65	-25.00	-22.65	-	-
4950MHz	Pass	13.618G	40G	1M	3M	RMS	14.84806G	-42.22	-25.00	-17.22	-	-
4965MHz	Pass	9k	150k	200	1k	RMS	10.022k	-81.65	-25.00	-56.65	-	-
4965MHz	Pass	150k	30M	10k	30k	RMS	523.125k	-71.10	-25.00	-46.10	-	-
4965MHz	Pass	30M	1.5G	1M	3M	RMS	1.13379G	-51.86	-25.00	-26.86	-	-
4965MHz	Pass	1.5G	4.924G	1M	3M	RMS	4.92272G	-48.60	-25.00	-23.60	-	-
4965MHz	Pass	4.924G	4.925G	200k	1M	RMS	4.9245G	-49.25	-25.00	-24.25	MBW 1M	-
4965MHz	Pass	5.005G	5.006G	200k	1M	RMS	5.0055G	-49.21	-25.00	-24.21	MBW 1M	-
4965MHz	Pass	5.006G	13.618G	1M	3M	RMS	5.49473G	-46.66	-25.00	-21.66	-	-
4965MHz	Pass	13.618G	40G	1M	3M	RMS	14.89423G	-42.69	-25.00	-17.69	-	-
4980MHz	Pass	9k	150k	200	1k	RMS	10.375k	-82.46	-25.00	-57.46	-	-
4980MHz	Pass	150k	30M	10k	30k	RMS	21.276M	-71.27	-25.00	-46.27	-	-
4980MHz	Pass	30M	1.5G	1M	3M	RMS	795.87M	-51.39	-25.00	-26.39	-	-
4980MHz	Pass	1.5G	4.939G	1M	3M	RMS	4.93857G	-48.64	-25.00	-23.64	-	-
4980MHz	Pass	4.939G	4.94G	200k	1M	RMS	4.9395G	-49.16	-25.00	-24.16	MBW 1M	-
4980MHz	Pass	5.02G	5.021G	200k	1M	RMS	5.0205G	-48.96	-25.00	-23.96	MBW 1M	-
4980MHz	Pass	5.021G	13.618G	1M	3M	RMS	5.49491G	-45.68	-25.00	-20.68	-	-
4980MHz	Pass	13.618G	40G	1M	3M	RMS	14.9338G	-43.14	-25.00	-18.14	-	-



4.94-4.99GHz 802.11j 5MHz_Nss1_2TX
4942.5MHz

CSE-TX-Sum

13/11/2019

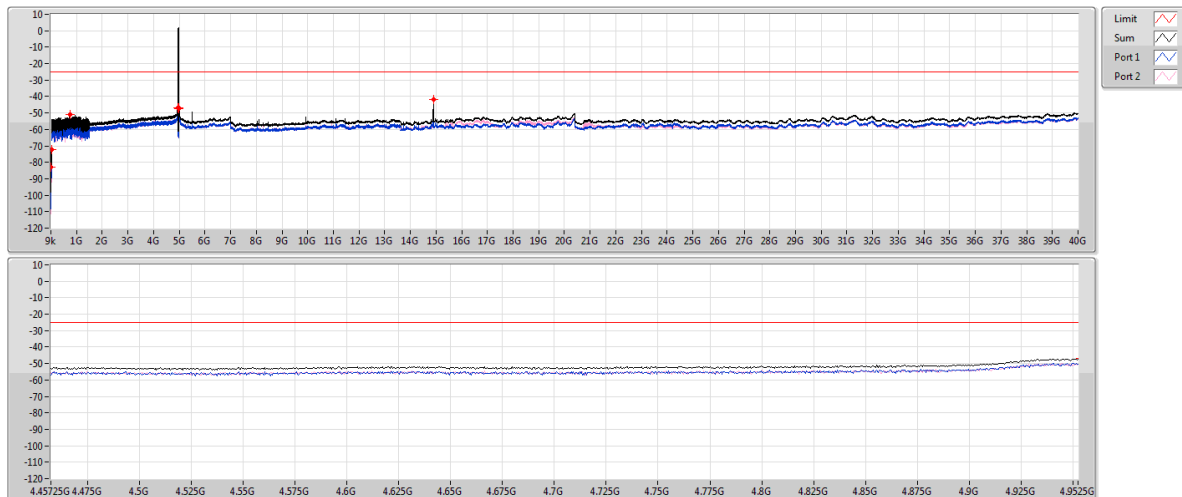


F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	VBW(Hz)	Detector	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Remark	Ref.Limit(dB)	P1(dBm)	P2(dBm)
9k	150k	200	1k	RMS	12.278k	-82.62	-25.00	-57.62	-	-	-83.22	-91.52
150k	30M	10k	30k	RMS	269.4k	-71.83	-25.00	-46.83	-	-	-74.50	-75.20
30M	1.5G	1M	3M	RMS	843.83M	-51.52	-25.00	-26.52	-	-	-55.71	-53.61
1.5G	4.9315G	1M	3M	RMS	4.9315G	-46.68	-25.00	-21.68	-	-	-50.17	-49.25
4.9315G	4.9325G	50k	200k	RMS	4.932G	-46.70	-25.00	-21.70	MBW 1M	-	-	-
4.9325G	4.9335G	50k	200k	RMS	4.933G	-46.75	-25.00	-21.75	MBW 1M	-	-	-
4.9335G	13.618G	1M	3M	RMS	4.95892G	-48.17	-25.00	-23.17	-	-	-51.12	-51.25
13.618G	40G	1M	3M	RMS	14.82498G	-40.36	-25.00	-15.36	-	-	-42.57	-44.35

4.94-4.99GHz 802.11j 5MHz_Nss1_2TX
4965MHz

CSE-TX-Sum

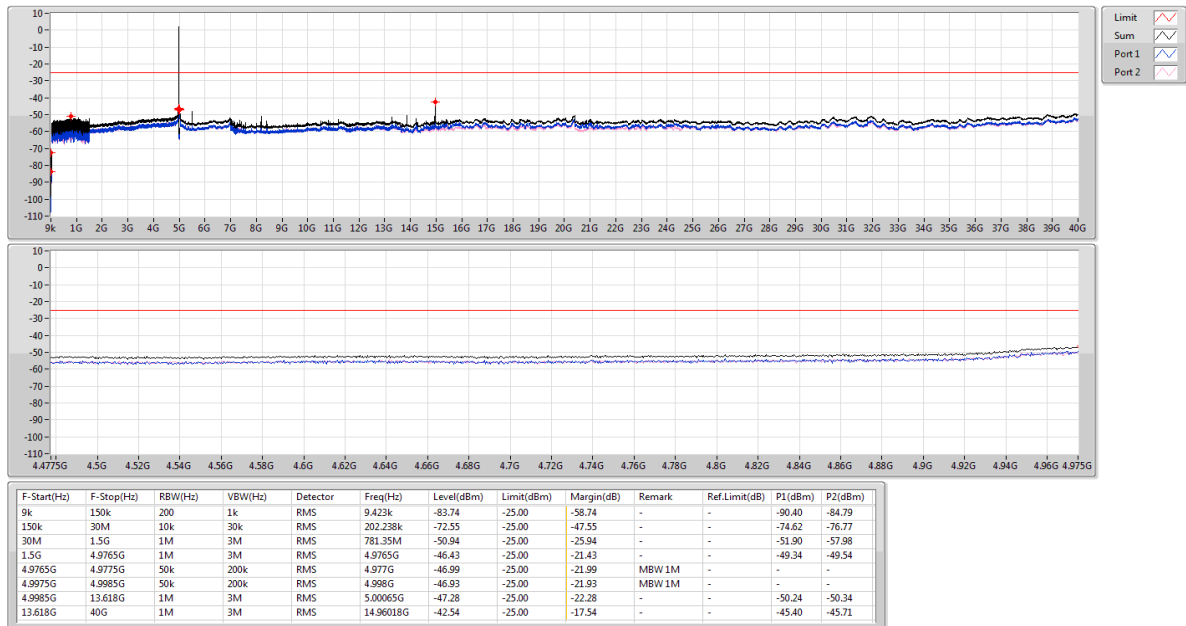
13/11/2019



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	VBW(Hz)	Detector	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Remark	Ref.Limit(dB)	P1(dBm)	P2(dBm)
9k	150k	200	1k	RMS	10.868k	-83.01	-25.00	-58.01	-	-	-84.01	-89.88
150k	30M	10k	30k	RMS	16.993M	-72.11	-25.00	-47.11	-	-	-73.64	-77.40
30M	1.5G	1M	3M	RMS	760.22M	-51.16	-25.00	-26.16	-	-	-54.65	-53.74
1.5G	4.954G	1M	3M	RMS	4.95357G	-46.88	-25.00	-21.88	-	-	-50.27	-49.55
4.954G	4.955G	50k	200k	RMS	4.9545G	-46.97	-25.00	-21.97	MBW 1M	-	-	-
4.955G	4.976G	50k	200k	RMS	4.9755G	-46.92	-25.00	-21.92	MBW 1M	-	-	-
4.976G	13.618G	1M	3M	RMS	4.976G	-47.57	-25.00	-22.57	-	-	-50.41	-50.75
13.618G	40G	1M	3M	RMS	14.89423G	-41.76	-25.00	-16.76	-	-	-44.56	-45.00

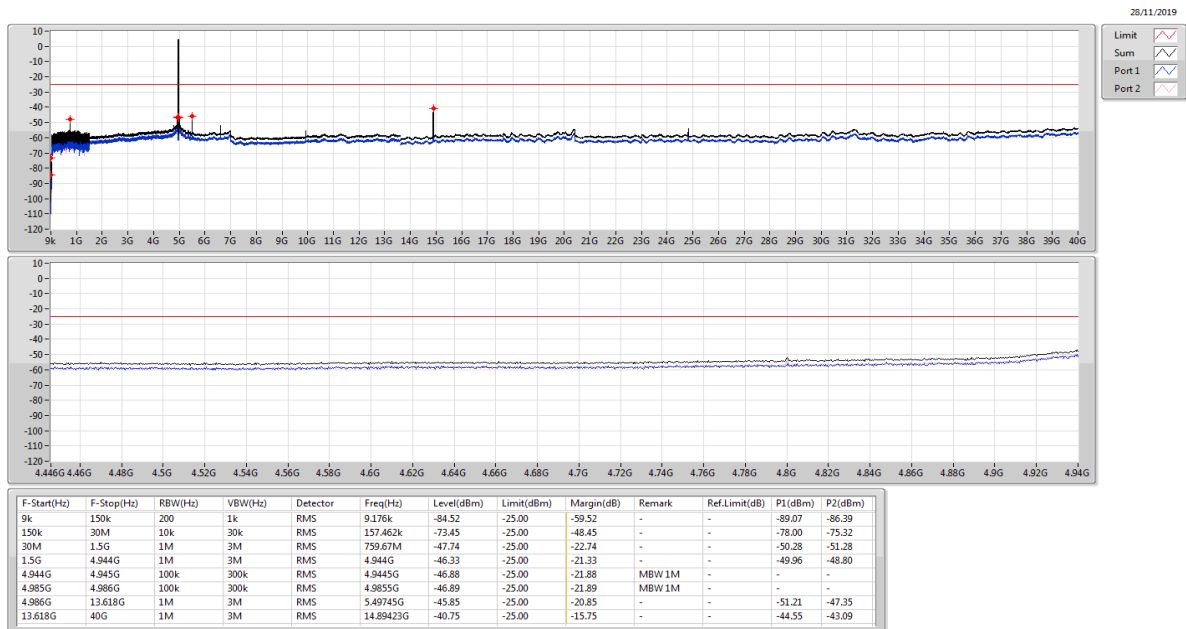
4.94-4.99GHz 802.11j 5MHz_Nss1_2TX
4987.5MHz

CSE-TX-Sum



4.94-4.99GHz 802.11j 10MHz_Nss1_2TX
4965MHz

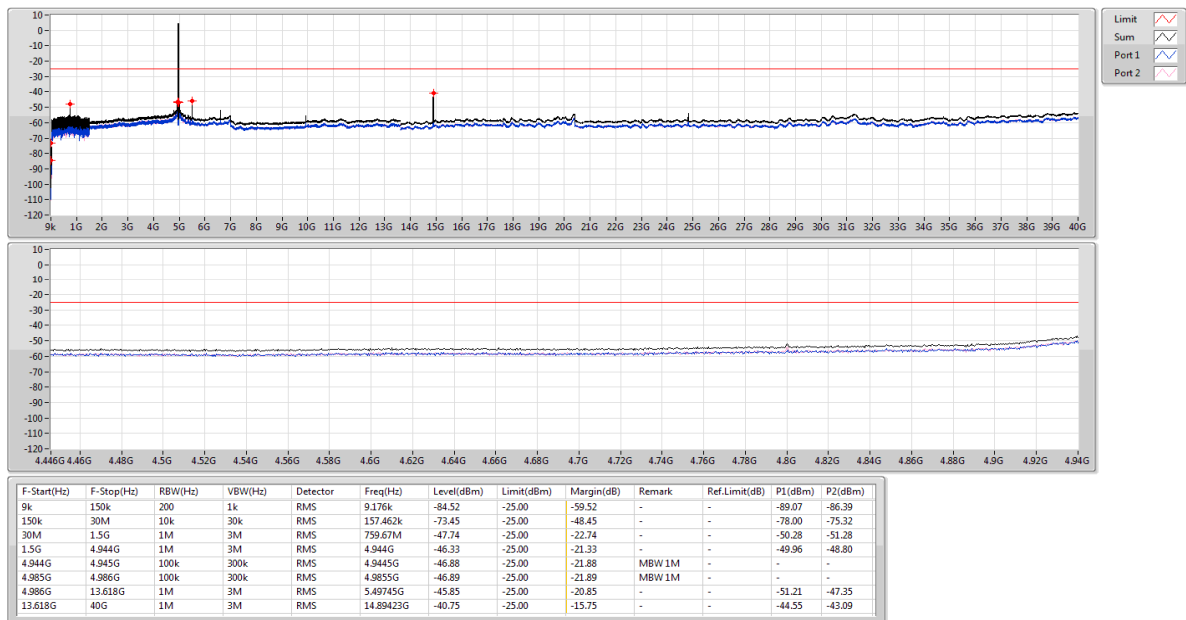
CSE-TX-Sum





4.94-4.99GHz 802.11j_10MHz_Nss1_2TX
4965MHz

CSE-TX-Sum



4.94-4.99GHz 802.11j_10MHz_Nss1_2TX
4985MHz

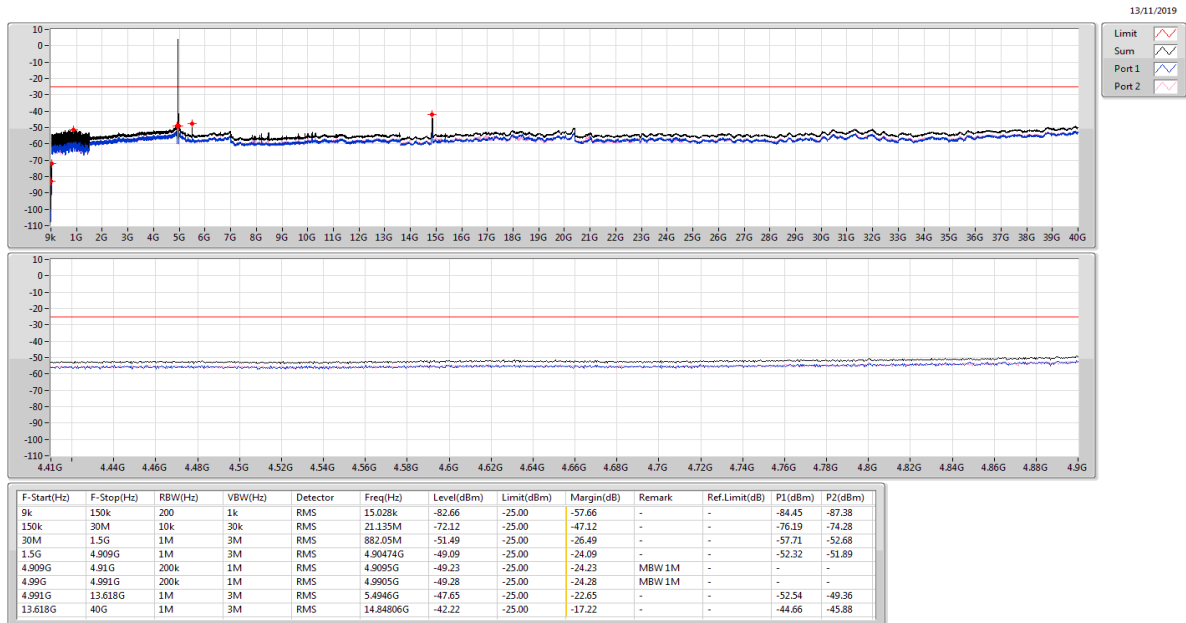
CSE-TX-Sum





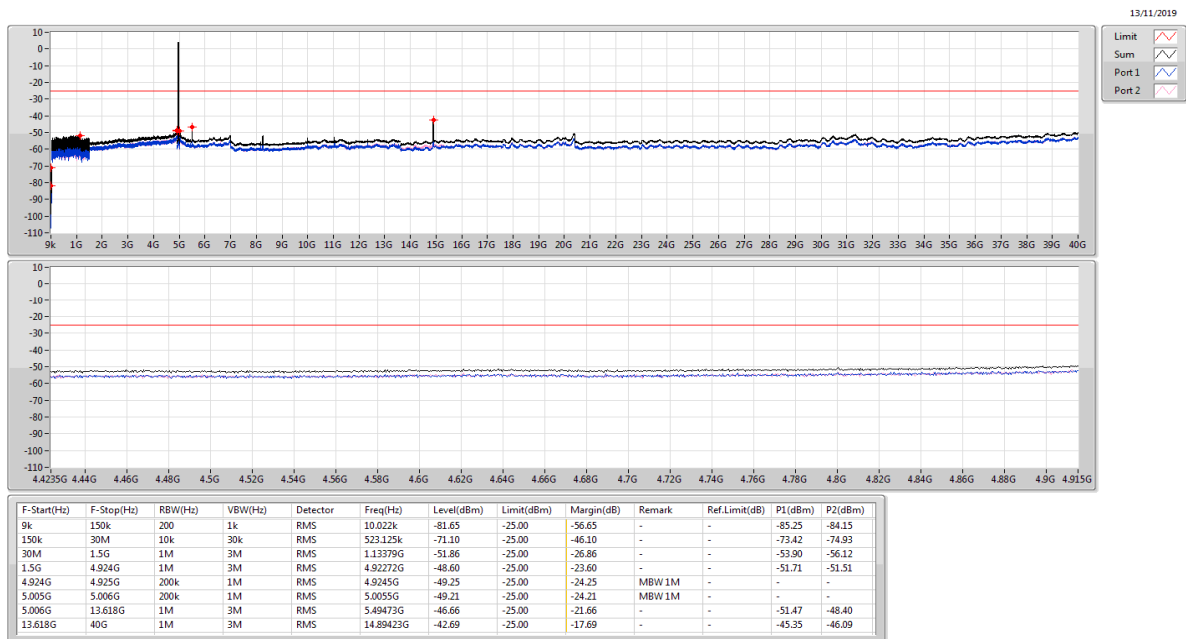
4.94-4.99GHz 802.11j 20MHz Nss1_2TX
4950MHz

CSE-TX-Sum



4.94-4.99GHz 802.11j 20MHz Nss1_2TX
4965MHz

CSE-TX-Sum

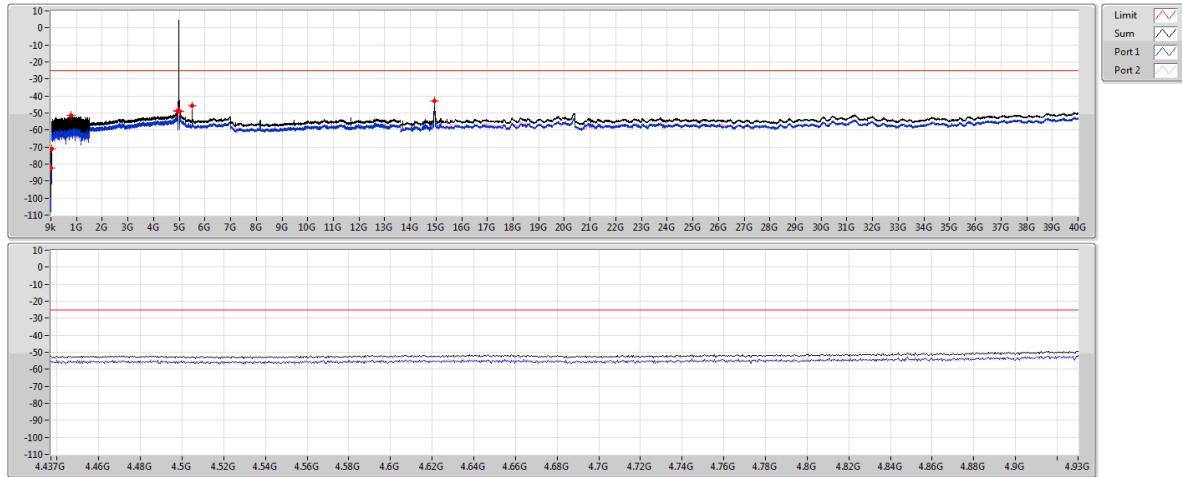


4.94-4.99GHz 802.11j_20MHz_Nss1_2TX

CSE-TX-Sum

4980MHz

13/11/2019



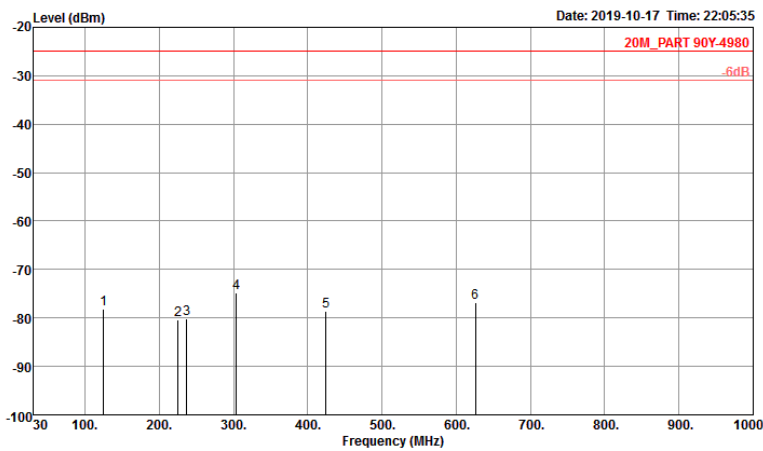
F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	VBW(Hz)	Detector	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Remark	Ref.Limit(dB)	P1(dBm)	P2(dBm)
9k	150k	200	1k	RMS	10.375k	-82.46	-25.00	-57.46	-	-	-84.94	-86.07
150k	30M	10k	30k	RMS	21.276M	-71.27	-25.00	-46.27	-	-	-72.80	-76.54
30M	1.5G	1M	3M	RMS	795.87M	-51.39	-25.00	-26.39	-	-	-58.63	-52.30
1.5G	4.939G	1M	3M	RMS	4.93857G	-48.64	-25.00	-23.64	-	-	-51.35	-51.97
4.939G	4.94G	200k	1M	RMS	4.9395G	-49.16	-25.00	-24.16	MBW 1M	-	-	-
5.02G	5.021G	200k	1M	RMS	5.0205G	-48.96	-25.00	-23.96	MBW 1M	-	-	-
5.021G	13.618G	1M	3M	RMS	5.49491G	-45.68	-25.00	-20.68	-	-	-50.16	-47.59
13.618G	40G	1M	3M	RMS	14.9338G	-43.14	-25.00	-18.14	-	-	-45.51	-46.89



RSE below 1GHz Result

Appendix E.1

RSE below 1GHz Result												
Operating Mode	1				Polarization				Vertical			
Operating Function	CTX											
<div><div><div>Level (dBm)</div><div><div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div></div></div></div></div></div>												

RSE below 1GHz Result																																																																																																											
Operating Mode	1				Polarization			Horizontal																																																																																																			
Operating Function	CTX																																																																																																										
<div><div><div>Level (dBm)</div><div>Date: 2019-10-17 Time: 22:05:35</div><div>Frequency (MHz)</div></div><table><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>CableAntenna</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th><th>Pol/Phase</th></tr><tr><th></th><th>MHz</th><th>dBm</th><th>dBm</th><th>dB</th><th>dBm</th><th>dB</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>125.06</td><td>-78.07</td><td>-25.00</td><td>-53.07</td><td>-66.50</td><td>1.38</td><td>18.80</td><td>31.75</td><td>100</td><td>0 Peak</td><td>HORIZONTAL</td></tr><tr><td>2</td><td>224.97</td><td>-80.45</td><td>-25.00</td><td>-55.45</td><td>-67.00</td><td>1.82</td><td>16.60</td><td>31.87</td><td>100</td><td>0 Peak</td><td>HORIZONTAL</td></tr><tr><td>3</td><td>236.61</td><td>-80.26</td><td>-25.00</td><td>-55.26</td><td>-67.92</td><td>1.88</td><td>17.67</td><td>31.89</td><td>100</td><td>0 Peak</td><td>HORIZONTAL</td></tr><tr><td>4</td><td>303.54</td><td>-74.89</td><td>-25.00</td><td>-49.89</td><td>-64.76</td><td>2.13</td><td>19.68</td><td>31.94</td><td>100</td><td>0 Peak</td><td>HORIZONTAL</td></tr><tr><td>5</td><td>424.79</td><td>-78.56</td><td>-25.00</td><td>-53.56</td><td>-71.98</td><td>2.55</td><td>23.00</td><td>32.13</td><td>100</td><td>0 Peak</td><td>HORIZONTAL</td></tr><tr><td>6</td><td>625.58</td><td>-76.74</td><td>-25.00</td><td>-51.74</td><td>-72.80</td><td>3.06</td><td>25.30</td><td>32.30</td><td>100</td><td>0 Peak</td><td>HORIZONTAL</td></tr></table></div>													Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase		MHz	dBm	dBm	dB	dBm	dB	dB	dB	cm	deg		1	125.06	-78.07	-25.00	-53.07	-66.50	1.38	18.80	31.75	100	0 Peak	HORIZONTAL	2	224.97	-80.45	-25.00	-55.45	-67.00	1.82	16.60	31.87	100	0 Peak	HORIZONTAL	3	236.61	-80.26	-25.00	-55.26	-67.92	1.88	17.67	31.89	100	0 Peak	HORIZONTAL	4	303.54	-74.89	-25.00	-49.89	-64.76	2.13	19.68	31.94	100	0 Peak	HORIZONTAL	5	424.79	-78.56	-25.00	-53.56	-71.98	2.55	23.00	32.13	100	0 Peak	HORIZONTAL	6	625.58	-76.74	-25.00	-51.74	-72.80	3.06	25.30	32.30	100	0 Peak	HORIZONTAL
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																																																																																																
	MHz	dBm	dBm	dB	dBm	dB	dB	dB	cm	deg																																																																																																	
1	125.06	-78.07	-25.00	-53.07	-66.50	1.38	18.80	31.75	100	0 Peak	HORIZONTAL																																																																																																
2	224.97	-80.45	-25.00	-55.45	-67.00	1.82	16.60	31.87	100	0 Peak	HORIZONTAL																																																																																																
3	236.61	-80.26	-25.00	-55.26	-67.92	1.88	17.67	31.89	100	0 Peak	HORIZONTAL																																																																																																
4	303.54	-74.89	-25.00	-49.89	-64.76	2.13	19.68	31.94	100	0 Peak	HORIZONTAL																																																																																																
5	424.79	-78.56	-25.00	-53.56	-71.98	2.55	23.00	32.13	100	0 Peak	HORIZONTAL																																																																																																
6	625.58	-76.74	-25.00	-51.74	-72.80	3.06	25.30	32.30	100	0 Peak	HORIZONTAL																																																																																																
<div>Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)</div>																																																																																																											



Configurations	20MHz / 4980MHz / Port 1 + Port 2
-----------------------	-----------------------------------

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBm	dBm	dB	dBm	dB	dB	cm	deg		
1	3319.99	-59.44	-25.00	-34.44	-59.59	4.63	30.14	34.62	228	17 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBm	dBm	dB	dBm	dB	dB	cm	deg		
1	3319.94	-60.49	-25.00	-35.49	-60.64	4.63	30.14	34.62	233	0 Peak	VERTICAL

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level



Mode: 5 MHz

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	4942.5 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	4942.4272	4942.4262	4942.4256	4942.4251
110.00	4942.4262	4942.4257	4942.4251	4942.4241
93.50	4942.4258	4942.4256	4942.4247	4942.4240
Max. Deviation (MHz)	0.0742	0.0744	0.0753	0.0760
Max. Deviation (ppm)	15.01	15.05	15.24	15.38
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	4942.5 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	4942.4302	4942.4293	4942.4291	4942.4289
-10	4942.4293	4942.4285	4942.4278	4942.4274
0	4942.4292	4942.4282	4942.4273	4942.4270
10	4942.4280	4942.4279	4942.4273	4942.4263
20	4942.4262	4942.4255	4942.4248	4942.4241
30	4942.4252	4942.4246	4942.4244	4942.4236
40	4942.4245	4942.4238	4942.4235	4942.4229
50	4942.4237	4942.4231	4942.4228	4942.4227
55	4942.4232	4942.4224	4942.4217	4942.4208
Max. Deviation (MHz)	0.0768	0.0776	0.0783	0.0792
Max. Deviation (ppm)	15.54	15.70	15.84	16.02
Result	Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	4965 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	4964.9255	4964.9252	4964.9249	4964.9244
110.00	4964.9247	4964.9238	4964.9233	4964.9225
93.50	4964.9237	4964.9228	4964.9222	4964.9220
Max. Deviation (MHz)	0.0763	0.0772	0.0778	0.0780
Max. Deviation (ppm)	15.37	15.55	15.67	15.71
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	4965 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	4964.9203	4964.9195	4964.9192	4964.9190
-10	4964.9208	4964.9201	4964.9191	4964.9184
0	4964.9227	4964.9222	4964.9217	4964.9207
10	4964.9240	4964.9230	4964.9223	4964.9220
20	4964.9247	4964.9244	4964.9238	4964.9234
30	4964.9251	4964.9242	4964.9240	4964.9239
40	4964.9271	4964.9270	4964.9264	4964.9259
50	4964.9279	4964.9275	4964.9273	4964.9267
55	4964.9288	4964.9284	4964.9277	4964.9268
Max. Deviation (MHz)	0.0811	0.0812	0.0813	0.0816
Max. Deviation (ppm)	16.33	16.35	16.37	16.44
Result	Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	4987.5 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	4987.4236	4987.4232	4987.4229	4987.4228
110.00	4987.4233	4987.4230	4987.4223	4987.4216
93.50	4987.4231	4987.4226	4987.4219	4987.4216
Max. Deviation (MHz)	0.0769	0.0774	0.0781	0.0784
Max. Deviation (ppm)	15.42	15.52	15.66	15.72
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	4987.5 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	4987.4261	4987.4255	4987.4252	4987.4242
-10	4987.4251	4987.4242	4987.4241	4987.4239
0	4987.4250	4987.4243	4987.4237	4987.4230
10	4987.4234	4987.4231	4987.4225	4987.4223
20	4987.4233	4987.4225	4987.4222	4987.4213
30	4987.4231	4987.4229	4987.4223	4987.4218
40	4987.4224	4987.4219	4987.4216	4987.4209
50	4987.4207	4987.4198	4987.4197	4987.4188
55	4987.4206	4987.4196	4987.4194	4987.4186
Max. Deviation (MHz)	0.0793	0.0802	0.0803	0.0812
Max. Deviation (ppm)	15.90	16.08	16.10	16.28
Result	Pass			

Mode: 10 MHz
Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	4945 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	4944.9229	4944.9228	4944.9223	4944.9214
110.00	4944.9223	4944.9217	4944.9215	4944.9213
93.50	4944.9214	4944.9210	4944.9200	4944.9191
Max. Deviation (MHz)	0.0786	0.0790	0.0800	0.0809
Max. Deviation (ppm)	15.89	15.98	16.18	16.36
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	4945 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	4944.9169	4944.9163	4944.9156	4944.9149
-10	4944.9182	4944.9172	4944.9169	4944.9163
0	4944.9199	4944.9196	4944.9192	4944.9190
10	4944.9208	4944.9201	4944.9197	4944.9194
20	4944.9223	4944.9221	4944.9218	4944.9217
30	4944.9224	4944.9218	4944.9208	4944.9207
40	4944.9239	4944.9235	4944.9231	4944.9229
50	4944.9248	4944.9242	4944.9235	4944.9226
55	4944.9258	4944.9248	4944.9244	4944.9242
Max. Deviation (MHz)	0.0867	0.0875	0.0877	0.0887
Max. Deviation (ppm)	17.53	17.69	17.74	17.94
Result	Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	4965 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	4964.9256	4964.9250	4964.9240	4964.9237
110.00	4964.9247	4964.9246	4964.9244	4964.9240
93.50	4964.9240	4964.9237	4964.9234	4964.9224
Max. Deviation (MHz)	0.0760	0.0763	0.0766	0.0776
Max. Deviation (ppm)	15.31	15.37	15.43	15.63
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	4965 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	4964.9189	4964.9187	4964.9186	4964.9180
-10	4964.9208	4964.9198	4964.9193	4964.9185
0	4964.9216	4964.9215	4964.9207	4964.9197
10	4964.9236	4964.9226	4964.9220	4964.9215
20	4964.9247	4964.9241	4964.9238	4964.9233
30	4964.9251	4964.9245	4964.9238	4964.9234
40	4964.9263	4964.9259	4964.9254	4964.9249
50	4964.9269	4964.9260	4964.9255	4964.9250
55	4964.9273	4964.9271	4964.9268	4964.9260
Max. Deviation (MHz)	0.0824	0.0826	0.0836	0.0842
Max. Deviation (ppm)	16.60	16.64	16.84	16.96
Result	Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	4985 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	4984.9223	4984.9221	4984.9211	4984.9209
110.00	4984.9222	4984.9213	4984.9205	4984.9196
93.50	4984.9219	4984.9209	4984.9201	4984.9193
Max. Deviation (MHz)	0.0781	0.0791	0.0799	0.0807
Max. Deviation (ppm)	15.66	15.86	16.02	16.18
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	4985 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	4984.9184	4984.9182	4984.9181	4984.9179
-10	4984.9190	4984.9186	4984.9179	4984.9171
0	4984.9200	4984.9192	4984.9191	4984.9186
10	4984.9214	4984.9211	4984.9206	4984.9198
20	4984.9222	4984.9212	4984.9205	4984.9195
30	4984.9244	4984.9243	4984.9234	4984.9233
40	4984.9245	4984.9237	4984.9232	4984.9226
50	4984.9255	4984.9246	4984.9236	4984.9227
55	4984.9266	4984.9261	4984.9253	4984.9250
Max. Deviation (MHz)	0.0823	0.0825	0.0830	0.0833
Max. Deviation (ppm)	16.50	16.54	16.64	16.70
Result	Pass			

Mode: 20 MHz

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	4950 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	4949.9226	4949.9218	4949.9217	4949.9214
110.00	4949.9223	4949.9213	4949.9210	4949.9204
93.50	4949.9218	4949.9209	4949.9207	4949.9206
Max. Deviation (MHz)	0.0782	0.0791	0.0793	0.0796
Max. Deviation (ppm)	15.80	15.98	16.02	16.08
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	4950 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	4949.9172	4949.9170	4949.9166	4949.9161
-10	4949.9191	4949.9184	4949.9181	4949.9174
0	4949.9209	4949.9203	4949.9197	4949.9188
10	4949.9216	4949.9213	4949.9205	4949.9201
20	4949.9223	4949.9216	4949.9209	4949.9206
30	4949.9322	4949.9321	4949.9313	4949.9306
40	4949.9342	4949.9340	4949.9330	4949.9325
50	4949.9352	4949.9350	4949.9348	4949.9343
55	4949.9368	4949.9364	4949.9358	4949.9353
Max. Deviation (MHz)	0.0849	0.0854	0.0861	0.0870
Max. Deviation (ppm)	17.15	17.25	17.39	17.58
Result	Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	4965 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	4964.9255	4964.9249	4964.9239	4964.9235
110.00	4964.9247	4964.9241	4964.9238	4964.9236
93.50	4964.9237	4964.9236	4964.9231	4964.9226
Max. Deviation (MHz)	0.0763	0.0764	0.0769	0.0774
Max. Deviation (ppm)	15.37	15.39	15.49	15.59
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	4965 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	4964.9207	4964.9198	4964.9189	4964.9184
-10	4964.9219	4964.9211	4964.9210	4964.9205
0	4964.9232	4964.9222	4964.9212	4964.9210
10	4964.9244	4964.9236	4964.9226	4964.9219
20	4964.9247	4964.9240	4964.9238	4964.9234
30	4964.9251	4964.9247	4964.9243	4964.9241
40	4964.9265	4964.9264	4964.9263	4964.9261
50	4964.9269	4964.9261	4964.9260	4964.9256
55	4964.9273	4964.9264	4964.9256	4964.9247
Max. Deviation (MHz)	0.0803	0.0813	0.0822	0.0827
Max. Deviation (ppm)	16.17	16.37	16.56	16.66
Result	Pass			

**Voltage vs. Frequency Stability**

Voltage	Measurement Frequency (MHz)			
(V)	4980 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	4979.9780	4979.9771	4979.9763	4979.9755
110.00	4979.9776	4979.9772	4979.9771	4979.9768
93.50	4979.9769	4979.9760	4979.9756	4979.9752
Max. Deviation (MHz)	0.0231	0.0240	0.0244	0.0248
Max. Deviation (ppm)	4.64	4.82	4.90	4.98
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	4980 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	4979.9825	4979.9824	4979.9819	4979.9816
-10	4979.9813	4979.9808	4979.9807	4979.9800
0	4979.9801	4979.9800	4979.9791	4979.9787
10	4979.9785	4979.9783	4979.9776	4979.9768
20	4979.9776	4979.9770	4979.9765	4979.9764
30	4979.9759	4979.9751	4979.9741	4979.9739
40	4979.9753	4979.9743	4979.9740	4979.9739
50	4979.9733	4979.9731	4979.9729	4979.9725
55	4979.9723	4979.9716	4979.9714	4979.9712
Max. Deviation (MHz)	0.0267	0.0269	0.0271	0.0275
Max. Deviation (ppm)	5.36	5.40	5.44	5.52
Result	Pass			