



FCC RADIO TEST REPORT

FCC ID : TE7P7

Equipment : AC1300+AV600 Whole Home Hybrid Mesh Wi-Fi System

Brand Name : tp-link

Model Name : Deco P7

Applicant : TP-Link Technologies Co., Ltd.
Building 24 (floors 1,3,4,5) and 28 (floors1-4),
Central Science and Technology Park,Nanshan
Shenzhen, 518057 China

Manufacturer : TP-Link Technologies Co., Ltd.
Building 24 (floors 1,3,4,5) and 28 (floors1-4),
Central Science and Technology Park,Nanshan
Shenzhen, 518057 China

Standard : 47 CFR FCC Part 15.407

The product was received on Jun. 29, 2016, and testing was started from Nov. 15, 2016 and completed on Mar. 04, 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 C63.10-2013 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: Cliff Chang

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



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History of this test report

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

Page Number : 3 of 32
Issued Date : Mar. 12, 2019
Report Version : 01



Summary of Test Result

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 Conducted Output Power	PASS	-
3.4	15.407(a)	Peak Power Spectral Density	PASS	-
3.5	15.407(b)	Unwanted Emissions	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: Cliff Chang

Report Producer: Wendy Pan

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5150-5250	a, n (HT20), ac (VHT20)	5180-5240	36-48 [4]
5725-5850		5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40)	5190-5230	38-46 [2]
5725-5850		5755-5795	151-159 [2]
5150-5250	ac (VHT80)	5210	42 [1]
5725-5850		5775	155 [1]

Band	Mode	BWch (MHz)	Nant
5.2G	11a	20	2
5.2G	HT20	20	2
5.2G	HT20,BF	20	2
5.2G	VHT20	20	2
5.2G	VHT20,BF	20	2
5.2G	HT40	40	2
5.2G	HT40,BF	40	2
5.2G	VHT40	40	2
5.2G	VHT40,BF	40	2
5.2G	VHT80	80	2
5.2G	VHT80,BF	80	2
5.8G	11a	20	2
5.8G	HT20	20	2
5.8G	HT20,BF	20	2
5.8G	VHT20	20	2
5.8G	VHT20,BF	20	2
5.8G	HT40	40	2
5.8G	HT40,BF	40	2
5.8G	VHT40	40	2
5.8G	VHT40,BF	40	2
5.8G	VHT80	80	2
5.8G	VHT80,BF	80	2



Note:

- ♦ 5.2G/5.2G-I(IC) is the 5.2GHz Band (5.15-5.25GHz).
- ♦ 5.8G/5.8G-I(IC) is the 5.8GHz Band (5.725-5.850GHz).
- ♦ 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ VHT20, VHT40, VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- ♦ BWch is the nominal channel bandwidth.
- ♦ Nss-Min is the minimum number of spatial streams.
- ♦ Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Ant.	Port	Brand	P/N	Antenna Type	Connector	Gain (dBi)			
						WLAN 2.4G	WLAN 5G B1	WLAN 5G B4	Bluetooth
1	1	TP-LINK	3101501201	Omni-Directional Antenna	I-PEX	1.30	-	-	-
2	2	TP-LINK	3101501201	Omni-Directional Antenna	I-PEX	1.30	-	-	-
3	1	TP-LINK	5G2-M5	Omni-Directional Antenna	N/A	-	0.64	0.88	-
4	2	TP-LINK	5G2-M5	Omni-Directional Antenna	N/A	-	0.64	0.88	-
5	1	TP-LINK	Bluetooth-M5	Omni-Directional Antenna	N/A	-	-	-	1.40

Note: The above information was declared by manufacturer.

For 2.4GHz IEEE 802.11b/g/n/ac mode (2TX/2RX):

Ant. 1 and Ant. 2 could transmit/receive simultaneously.

For 5GHz IEEE 802.11n/a/ac mode (2TX/2RX):

Ant. 3 and Ant. 4 could transmit/receive simultaneously.

For bluetooth mode (1TX/1RX):

Only Ant. 5 could transmit/receive.

1.1.3 Table for EUT support function

Operating Mode	WLAN	Bluetooth 4.0	PLC
AP Router	2.4GHz/ 5GHz Band 1+4	V	X
Extender	2.4GHz/ 5GHz Band 1+4	X	V
Description			
The EUT has two operating modes for detail as below:			
1. At the AP router mode, it can support WLAN 2.4GHz + 5GHz and Bluetooth 4.0 simultaneous action.			
2. At the Extender mode, only WLAN 2.4GHz + 5GHz simultaneous operation is supported.			

Note: The above information was declared by manufacturer.

**1.1.4 Mode Test Duty Cycle**

Mode	DC
11a	0.949
VHT20	0.985
VHT20,BF	0.894
VHT40	0.969
VHT40,BF	0.898
VHT80	0.814
VHT80,BF	0.922

1.1.5 EUT Operational Condition

EUT Power Type	From Power Adapter			
Beamforming Function	☒	With beamforming for 802.11n/ac	☐	Without beamforming
Test Software Version	QRCT			

1.2 Testing Applied Standards

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

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013
- ♦ FCC KDB 789033 D02 v02r01
- ♦ FCC KDB 662911 D01 v02r01
- ♦ FCC KDB 412172 D01 v01r01

1.3 Testing Location Information

Testing Location				
☐	HWA YA	ADD	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.	
		TEL	886-3-327-3456	FAX : 886-3-318-0055
☒	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	Gino Huang & Gary Chu	22°C / 55%	Nov. 19, 2016 ~ Jan. 13, 2017
Radiated >1GHz (For Other test)	03CH01-CB	Poul Chen & Mason Chen & Welson Chen & Steven Liang & Zero Chen	22°C / 54%	Nov. 15, 2016 ~ Dec. 13, 2016
Radiated <1GHz and Radiated Emission Co-location	03CH01-CB	Robert Jiang	22~24°C / 54~58%	Mar. 01, 2019 ~ Mar. 04, 2019
AC Conduction	CO02-CB	Max Lin	23~25°C / 51~58%	Jan. 28, 2019 ~ Jan. 29, 2019

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086B with Industry Canada.

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))

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%
Bandwidth Measurement	9.74×10^{-8}	Confidence levels of 95%
Frequency Stability	6.06×10^{-8}	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Band	Mode	BWch (MHz)	Nss-Min	Nant	Ch. (MHz)	Range	Power Setting
5.2G	11a	20	1	2	5180	L	20
5.2G	11a	20	1	2	5200	M	23
5.2G	11a	20	1	2	5240	H	23
5.8G	11a	20	1	2	5745	L	23
5.8G	11a	20	1	2	5785	M	23
5.8G	11a	20	1	2	5825	H	23
5.2G	VHT20	20	1,(M0)	2	5180	L	20.5
5.2G	VHT20	20	1,(M0)	2	5200	M	23
5.2G	VHT20	20	1,(M0)	2	5240	H	23
5.8G	VHT20	20	1,(M0)	2	5745	L	23
5.8G	VHT20	20	1,(M0)	2	5785	M	23
5.8G	VHT20	20	1,(M0)	2	5825	H	23
5.2G	VHT40	40	1,(M0)	2	5190	L	18
5.2G	VHT40	40	1,(M0)	2	5230	H	22
5.8G	VHT40	40	1,(M0)	2	5755	L	23
5.8G	VHT40	40	1,(M0)	2	5795	H	23
5.2G	VHT80	80	1,(M0)	2	5210	S	18.5
5.8G	VHT80	80	1,(M0)	2	5775	S	21
5.2G	VHT20,BF	20	1,(M0)	2	5180	L	22
5.2G	VHT20,BF	20	1,(M0)	2	5200	M	25
5.2G	VHT20,BF	20	1,(M0)	2	5240	H	25
5.8G	VHT20,BF	20	1,(M0)	2	5745	L	26
5.8G	VHT20,BF	20	1,(M0)	2	5785	M	26
5.8G	VHT20,BF	20	1,(M0)	2	5825	H	25
5.2G	VHT40,BF	40	1,(M0)	2	5190	L	21
5.2G	VHT40,BF	40	1,(M0)	2	5230	H	25
5.8G	VHT40,BF	40	1,(M0)	2	5755	L	25
5.8G	VHT40,BF	40	1,(M0)	2	5795	H	26
5.2G	VHT80,BF	80	1,(M0)	2	5210	S	21
5.8G	VHT80,BF	80	1,(M0)	2	5775	S	23

Note:

- ♦ Test range channel consist of L (Low Ch.), M (Middle Ch.), H (High Ch.), S (Single Ch.) and C (Straddle Band Ch.).
- ♦ VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

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
Operating Mode	Normal Link
1	EUT - (AP Router Mode) + WLAN: 2.4GHz + 5GHz + BT
2	EUT - (Extender Mode) + WLAN: 2.4GHz + 5GHz
For operating mode 2 is the worst case and it was record in this test report.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emission Bandwidth Maximum Conducted Output Power Peak Power Spectral Density
Test Condition	Conducted measurement at transmit chains

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.
Operating Mode < 1GHz	Normal Link
1	EUT CTX with BT
2	EUT CTX with WLAN 2.4GHz
3	EUT CTX with WLAN 5GHz
For operating mode 2 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
1	EUT in Z axis



The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Test Condition	Radiated measurement
Operating Mode	Normal Link
There are two radiated emission co-location modes of EUT. One is WLAN 2.4GHz + WLAN 5GHz + Bluetooth mode, and the other is WLAN 2.4GHz + WLAN 5GHz mode, after evaluating, WLAN 2.4GHz + WLAN 5GHz + Bluetooth mode has been evaluated to be the worst case, so it was selected to test and record in this test report.	
1	WLAN 2.4GHz + WLAN 5GHz + Bluetooth
Refer to Sporton Test Report No.: FA672842-04 for Co-location RF Exposure Evaluation and Appendix F for Radiated Emission Co-location.	

Note: The EUT only uses in Z axis.

2.3 EUT Operation during Test

For CTX Mode:

non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

During the test, the following programs under WIN XP were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under LanTest20.
3. Executed "Lantest.exe" to link with the remote workstation to transmit and receive packet by Wireless AP and transmit duty cycle no less 98%.

For Normal Link:

During the test, the EUT operation to normal function.



2.4 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	TP-Link	T120120-2B5	Input: 100-240Vac ~ 50/60Hz, 0.4A Output: 5Vdc, 1.2A, 12Vdc, 1.2A



2.5 Support Equipment

For Test Site No: CO02-CB

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	WAN NB	DELL	E6430	N/A
B	2.4G NB	DELL	E6430	N/A
C	5G NB	DELL	E6430	N/A
D	LAN NB	DELL	E6430	N/A
E	AC1300+AV600 Whole Home Hybrid Mesh Wi-Fi System (Device)	tp-link	Deco P7	TE7P7
F	Router	TP-LINK	Archer C55	N/A
G	Device NB	DELL	E6430	N/A

For Test Site No: 03CH01-CB (below 1GHz)

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A

For Test Site No: 03CH01-CB (above 1GHz)
non-beamforming mode

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A
B	Test Fixture	TP-Link	ZLR113590	N/A

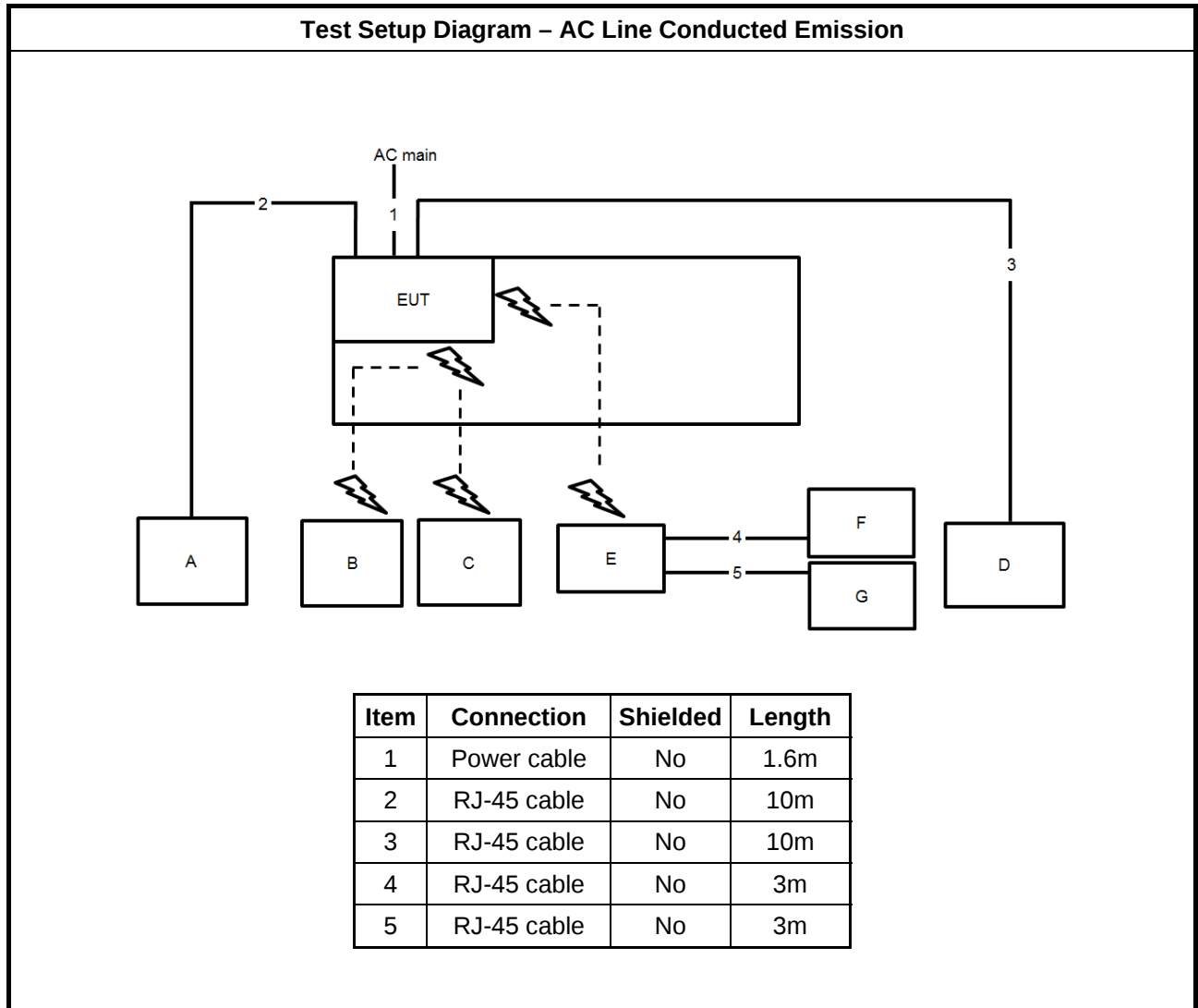
beamforming mode

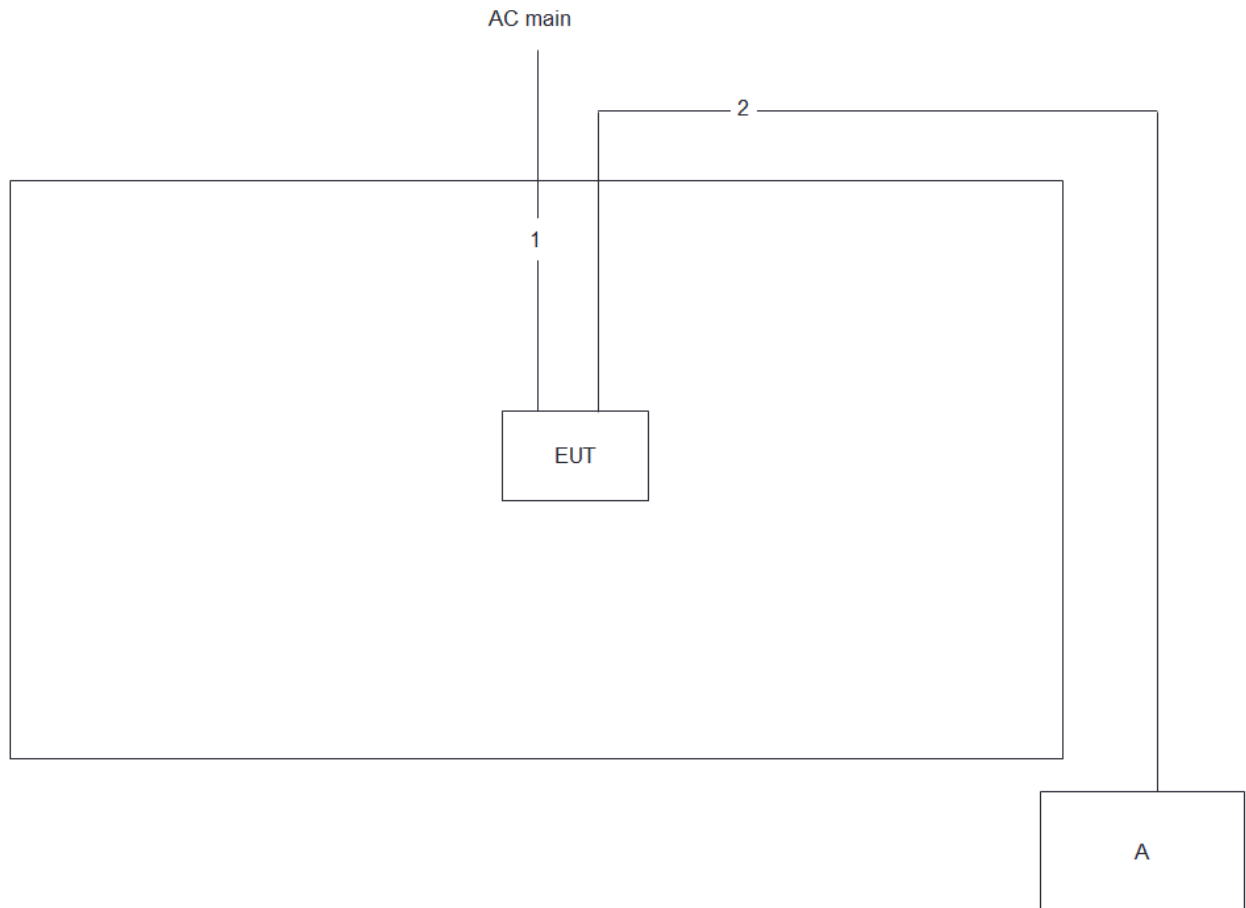
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB*2	DELL	E4300	N/A
B	Test Fixture	TP-Link	ZLR113590	N/A
C	RX Device	TP-Link	Deco M5	TE7M5

For Test Site No: TH01-CB

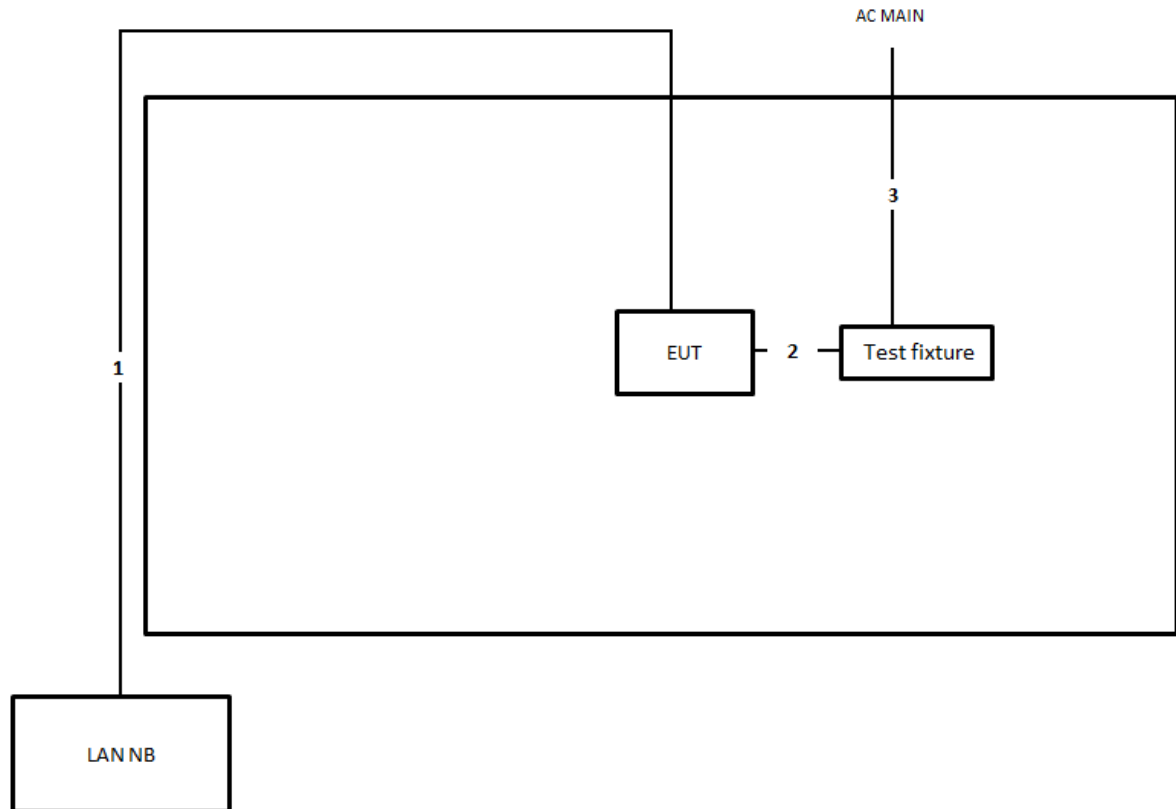
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A
B	Test Fixture	TP-Link	ZLR113590	N/A

2.6 Test Setup Diagram

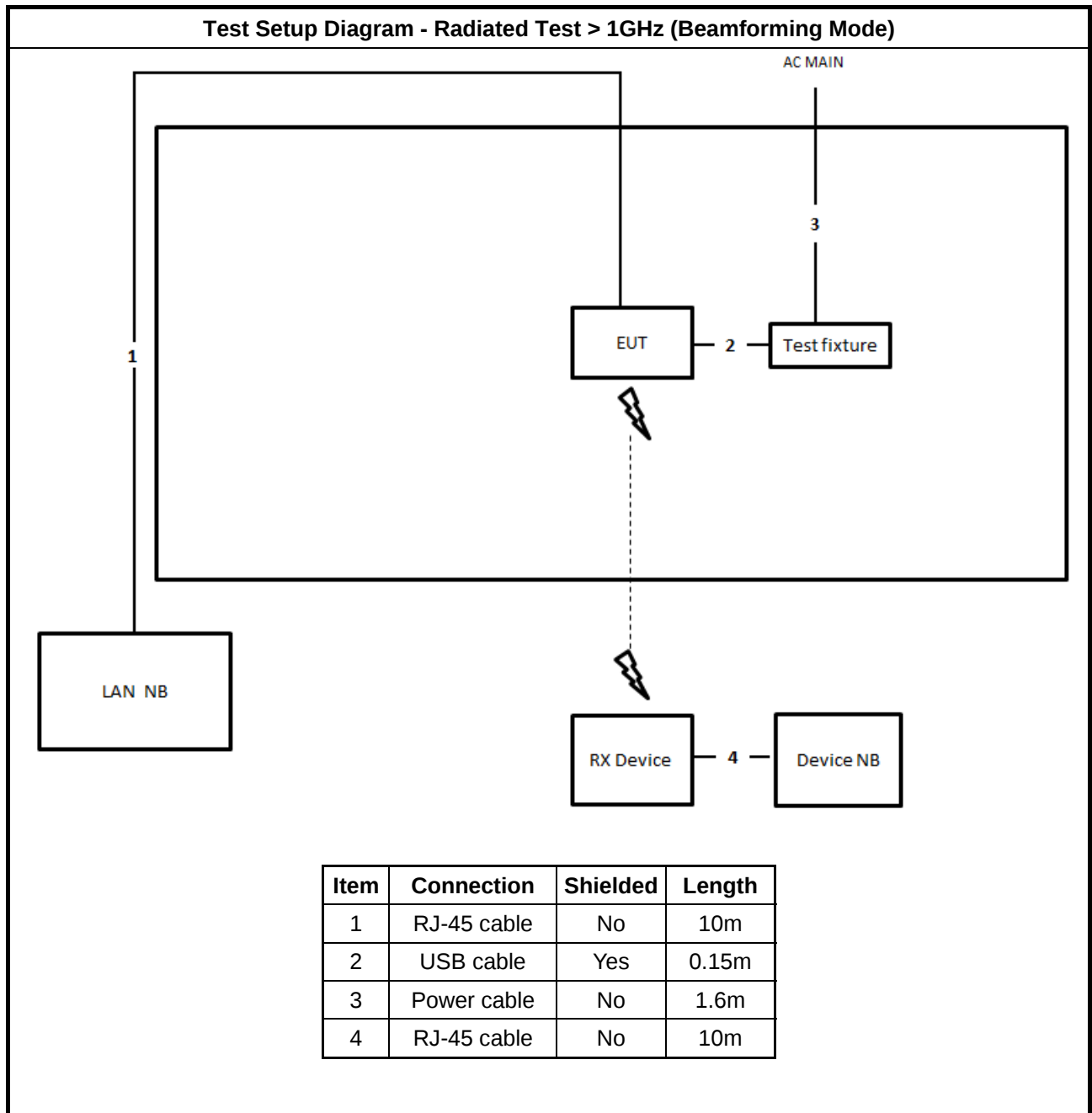


Test Setup Diagram - Radiated Test < 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	1.6m
2	RJ-45 cable	No	10m

Test Setup Diagram - Radiated Test > 1GHz (Non-beamforming Mode)


Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	USB cable	Yes	0.15m
3	Power cable	No	1.6m





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.

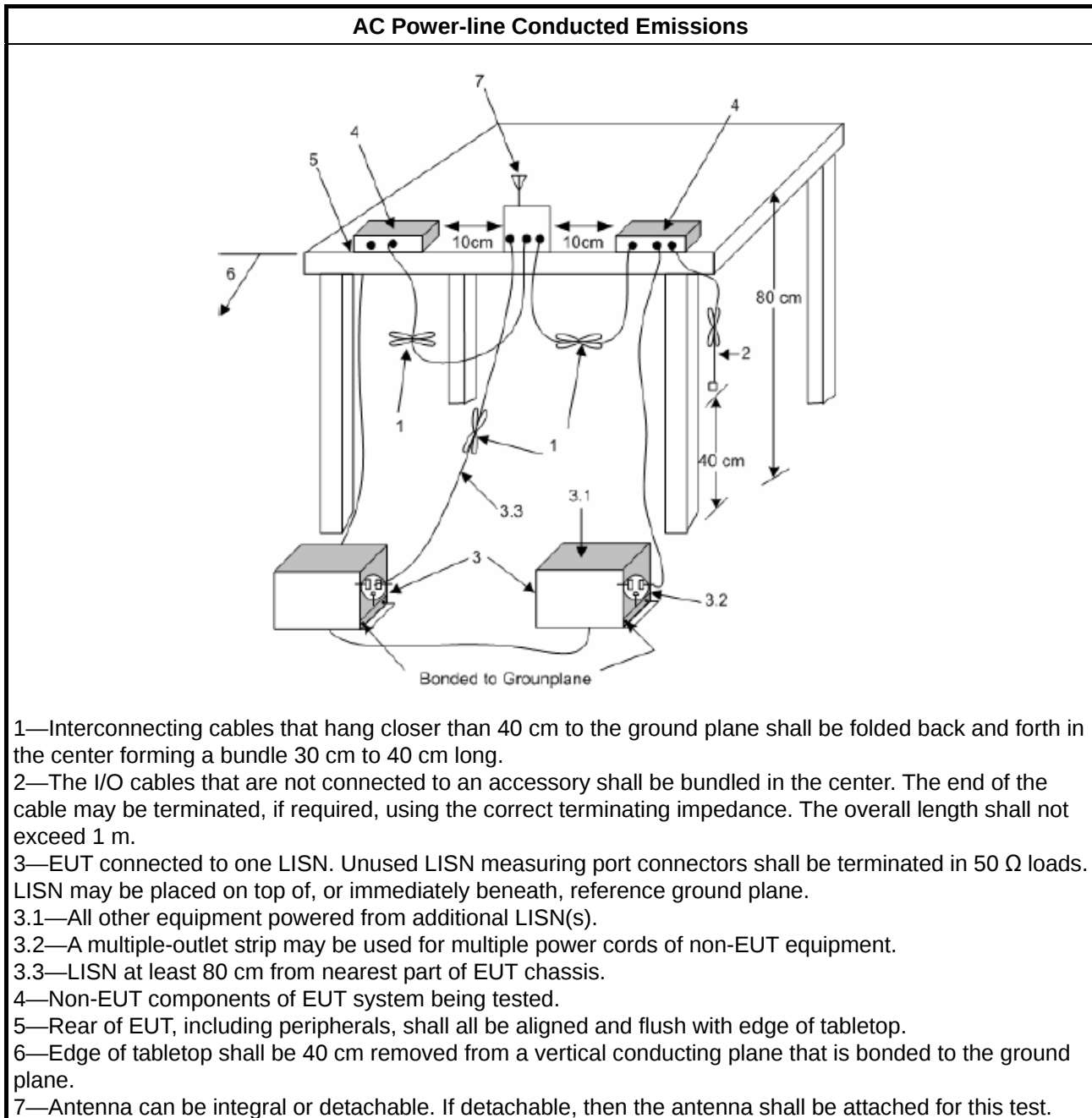
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit	
UNII Devices	
☒	For the 5.15-5.25 GHz band, N/A
☐	For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in MHz.
☐	For the 5.47-5.725 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in MHz.
☒	For the 5.725-5.85 GHz band, 6 dB emission bandwidth $\geq 500\text{kHz}$.
LE-LAN Devices	
☐	For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
☐	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐	For the 5.725-5.85 GHz band, 6 dB emission bandwidth $\geq 500\text{kHz}$.

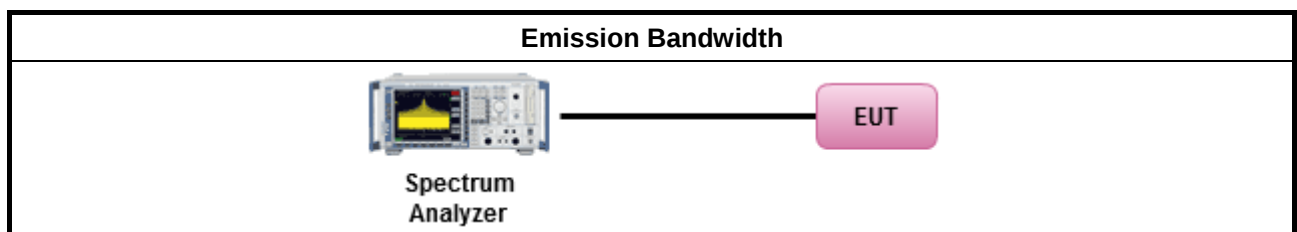
3.2.2 Measuring Instruments

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:	
☒	Refer as FCC KDB 789033, 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



3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
☐	- Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. e.i.r.p. at any elevation angle above 30 degrees ≤ 125mW [21dBm] - Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ - Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$. - Mobile or Portable Client: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☐	For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☐	For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☒ For the 5.725-5.85 GHz band:	
☐	- Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
LE-LAN Devices	
☐	For the 5.15-5.25 GHz band, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
☐	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐	For the 5.725-5.85 GHz band:
☐	- Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

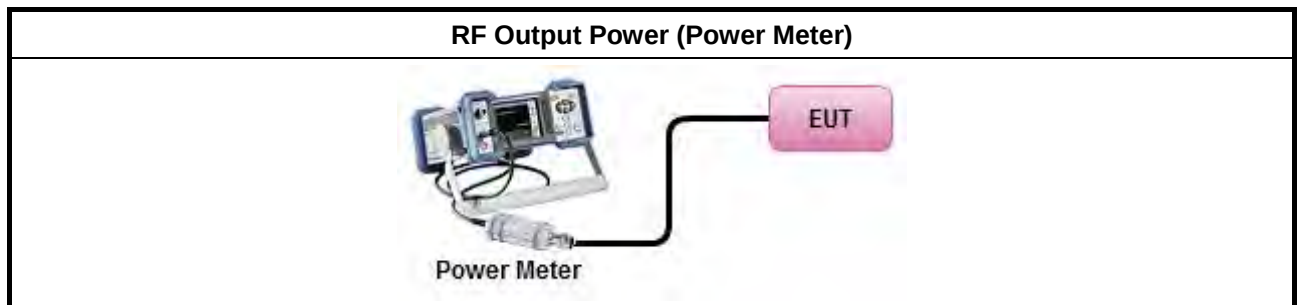
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
Maximum Conducted Output Power	
	Average over on/off periods with duty factor
☐	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).
☐	Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
	Wideband RF power meter and average over on/off periods with duty factor
☒	Refer as FCC KDB 789033, 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: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

Peak Power Spectral Density Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
☐	- Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$. - Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$. - Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$. - Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.
☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☐ For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☒ For the 5.725-5.85 GHz band:	
☐	- Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
LE-LAN Devices	
☐ For the 5.15-5.25 GHz band, the peak power spectral density (PPSD) ≤ 4 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) ≤ 10 dBm/MHz.	
☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) ≤ 17 dBm/MHz.	
☐	e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below: -13 dBW/MHz for $0^\circ \leq \theta < 8^\circ$; -13 - 0.716 (θ-8) dBW/MHz for $8^\circ \leq \theta < 40^\circ$ -35.9 - 1.22 (θ-40) dBW/MHz for $40^\circ \leq \theta \leq 45^\circ$; -42 dBW/MHz for $\theta > 45^\circ$
☐ For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) ≤ 17 dBm/MHz.	
☐ For the 5.725-5.85 GHz band:	
☐	- Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
PPSD = peak power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz G_{TX} = the maximum transmitting antenna directional gain in dBi.	

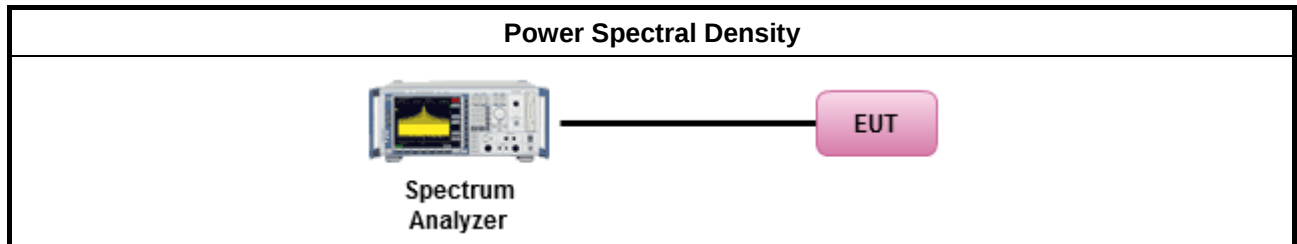
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method	
Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options:	
☐	Refer as FCC KDB 789033, F5) 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]	
☒	Refer as FCC KDB 789033, clause E Method SA-1 (spectral trace averaging).
☐	Refer as FCC KDB 789033, 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, clause E Method SA-2 (spectral trace averaging).
☐	Refer as FCC KDB 789033, 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: $PPSD_{total} = PPSD_1 + PPSD_2 + \dots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$	

3.4.4 Test Setup



3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D



3.5 Unwanted Emissions

3.5.1 Transmitter Radiated 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

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.

Un-restricted band emissions above 1GHz Limit	
Operating Band	Limit
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.85 GHz	all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note 1: 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).



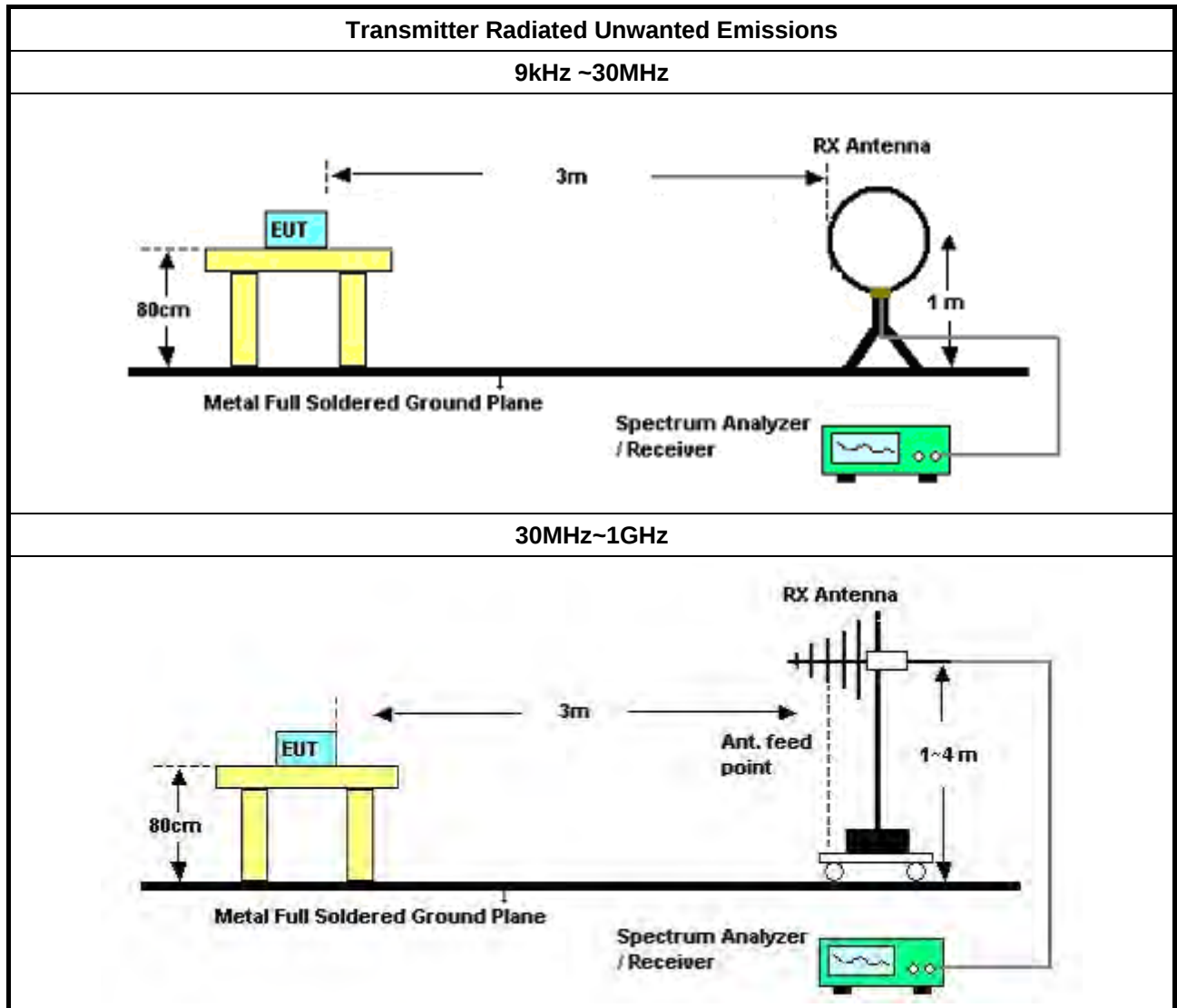
3.5.2 Measuring Instruments

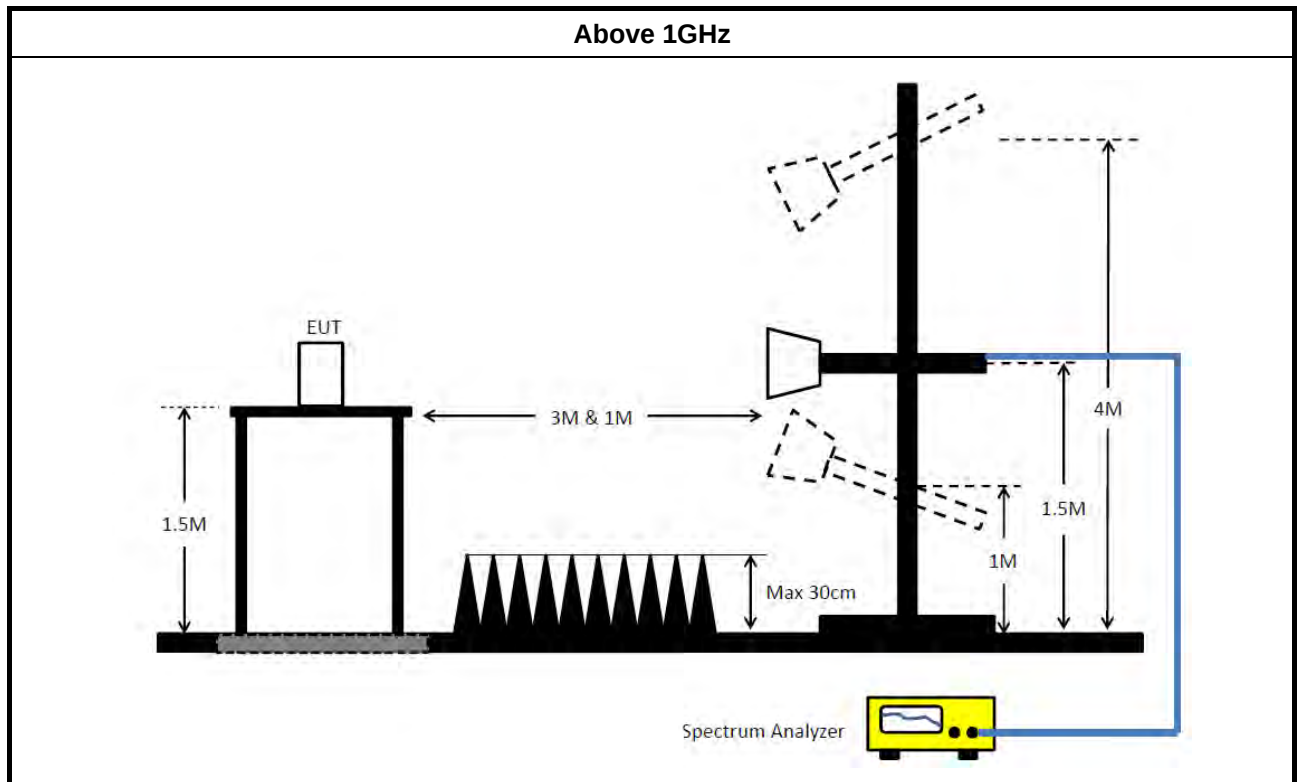
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method	
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 $\geq$ 98 or duty factor].	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as FCC KDB 789033, clause H)2) for unwanted emissions into non-restricted bands.
	Refer as FCC KDB 789033, clause H)1) for unwanted emissions into restricted bands.
	☐ Refer as FCC KDB 789033, H)6) Method AD (Trace Averaging).
	☒ Refer as FCC KDB 789033, H)6) Method VB (Reduced VBW).
	☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq$ 1/T, where T is pulse time.
	☐ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
	☒ Refer as FCC KDB 789033, clause H)5) measurement procedure peak limit.
	☐ Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
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.	

3.5.4 Test Setup





3.5.5 Transmitter Unwanted Emissions (Below 30MHz)

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 10 harmonic or 40 GHz, whichever is appropriate.

3.5.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2018	Nov. 20, 2019	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 05, 2018	Nov. 04, 2019	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 16, 2019	Jan. 15, 2020	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Nov. 06, 2018	Nov. 05, 2019	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 27, 2018	Aug. 26, 2019	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2018	Mar. 15, 2019	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Nov. 09, 2017	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	Jul. 25, 2016	Jul. 24, 2017	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 28, 2018	Jun. 27, 2019	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 02, 2018	May 01, 2019	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Jan. 17, 2017	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-H G	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Jun. 27, 2017	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP-40	100019	9kHz ~ 40GHz	Apr. 21, 2016	Apr. 20, 2017	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP-40	100019	9kHz ~ 40GHz	Apr. 25, 2018	Apr. 24, 2019	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS	100359	9kHz ~ 2.75GHz	Jul. 03, 2018	Jul. 02, 2019	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)



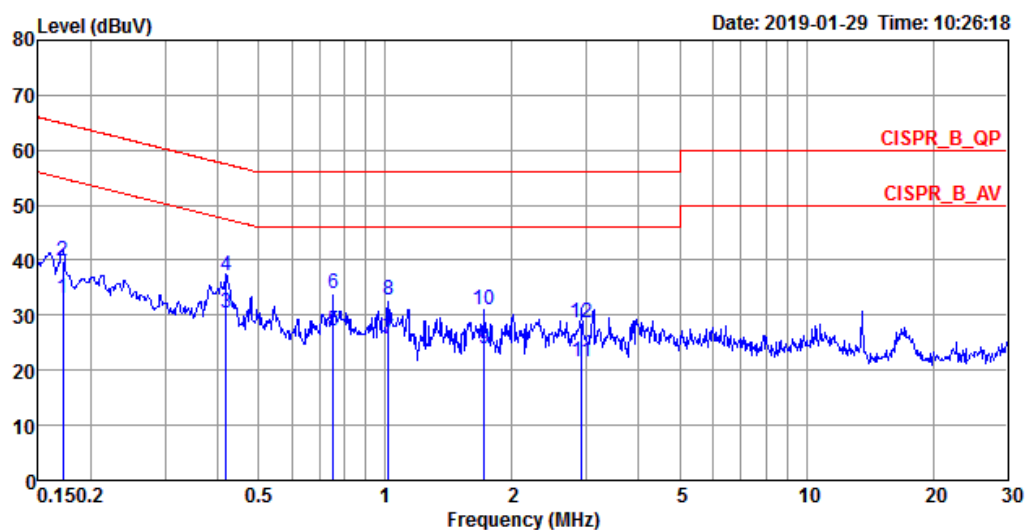
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Jul. 26, 2016	Jul. 25, 2017	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz ~ 26.5 GHz	Oct. 24, 2016	Oct. 23, 2017	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz ~ 26.5 GHz	Oct. 24, 2016	Oct. 23, 2017	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz ~ 26.5 GHz	Oct. 24, 2016	Oct. 23, 2017	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz ~ 26.5 GHz	Oct. 24, 2016	Oct. 23, 2017	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz ~ 26.5 GHz	Oct. 24, 2016	Oct. 23, 2017	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 09, 2016	Sep. 08, 2017	Conducted (TH01-CB)

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

N.C.R. means Non-Calibration required.

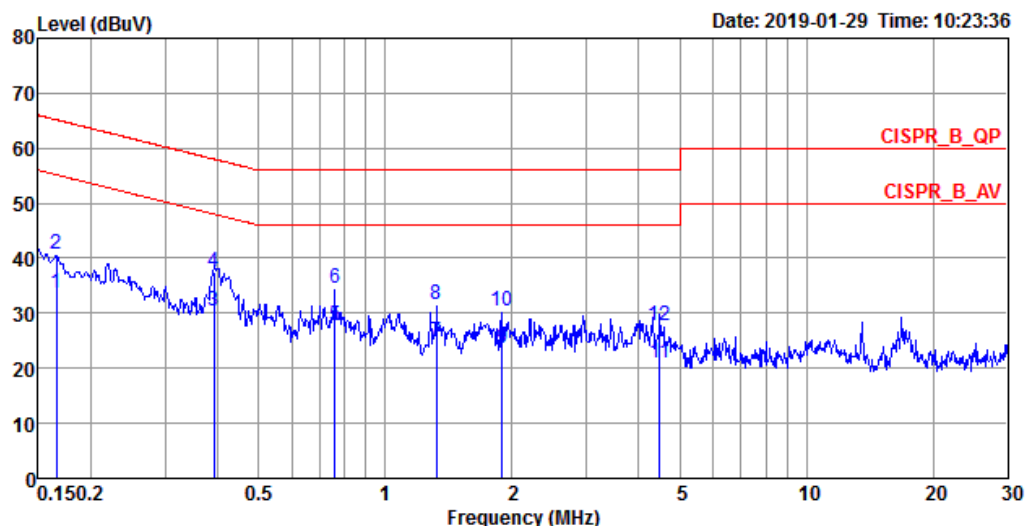
Test Mode	Mode 2	Frequency Range	0.15 MHz to 30 MHz
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Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1712	33.02	-21.88	54.90	22.85	10.15	0.02	Average	LINE
2	0.1712	39.83	-25.07	64.90	29.66	10.15	0.02	QP	LINE
3	0.4193	30.37	-17.09	47.46	20.19	10.16	0.02	Average	LINE
4	0.4193	37.11	-20.35	57.46	26.93	10.16	0.02	QP	LINE
5	0.7509	27.02	-18.98	46.00	16.83	10.17	0.02	Average	LINE
6	0.7509	33.93	-22.07	56.00	23.74	10.17	0.02	QP	LINE
7	1.0157	25.72	-20.28	46.00	15.53	10.17	0.02	Average	LINE
8	1.0157	32.64	-23.36	56.00	22.45	10.17	0.02	QP	LINE
9	1.7162	23.90	-22.10	46.00	13.67	10.19	0.04	Average	LINE
10	1.7162	30.97	-25.03	56.00	20.74	10.19	0.04	QP	LINE
11	2.9307	21.58	-24.42	46.00	11.31	10.21	0.06	Average	LINE
12	2.9307	28.58	-27.42	56.00	18.31	10.21	0.06	QP	LINE

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1659	33.56	-21.60	55.16	23.41	10.13	0.02	Average	NEUTRAL
2	0.1659	40.60	-24.56	65.16	30.45	10.13	0.02	QP	NEUTRAL
3	0.3914	30.53	-17.50	48.03	20.37	10.14	0.02	Average	NEUTRAL
4	0.3914	37.54	-20.49	58.03	27.38	10.14	0.02	QP	NEUTRAL
5	0.7589	27.69	-18.31	46.00	17.53	10.14	0.02	Average	NEUTRAL
6	0.7589	34.42	-21.58	56.00	24.26	10.14	0.02	QP	NEUTRAL
7	1.3238	24.76	-21.24	46.00	14.58	10.15	0.03	Average	NEUTRAL
8	1.3238	31.63	-24.37	56.00	21.45	10.15	0.03	QP	NEUTRAL
9	1.8979	23.49	-22.51	46.00	13.28	10.16	0.05	Average	NEUTRAL
10	1.8979	30.27	-25.73	56.00	20.06	10.16	0.05	QP	NEUTRAL
11	4.4777	20.96	-25.04	46.00	10.70	10.19	0.07	Average	NEUTRAL
12	4.4777	27.83	-28.17	56.00	17.57	10.19	0.07	QP	NEUTRAL



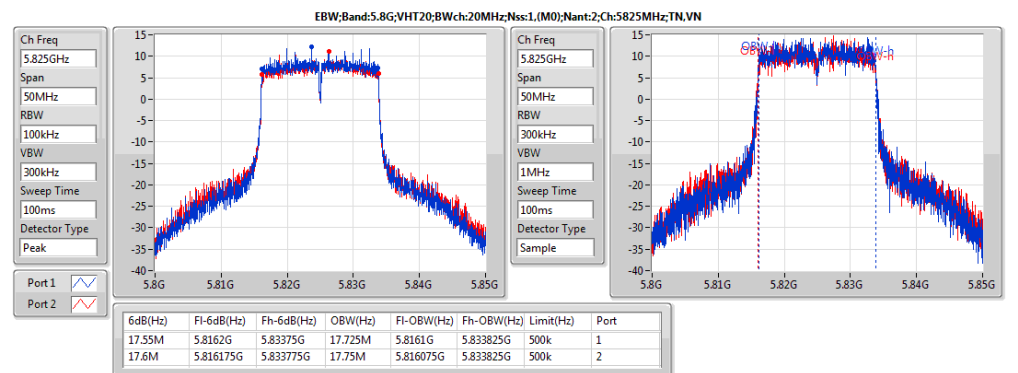
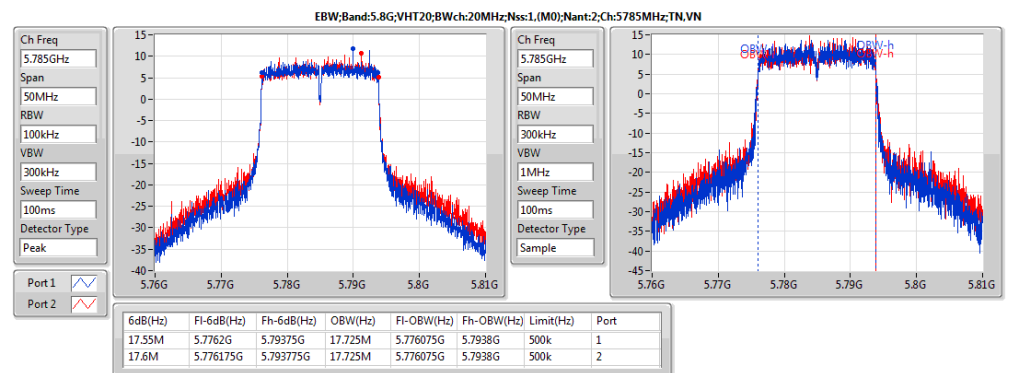
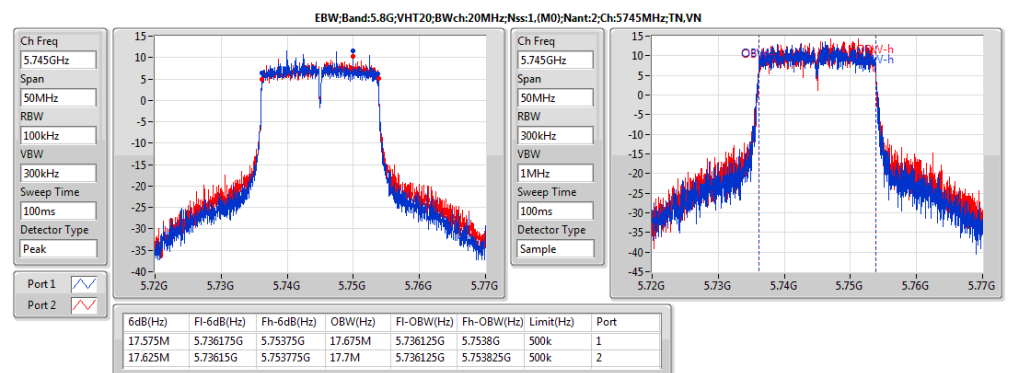
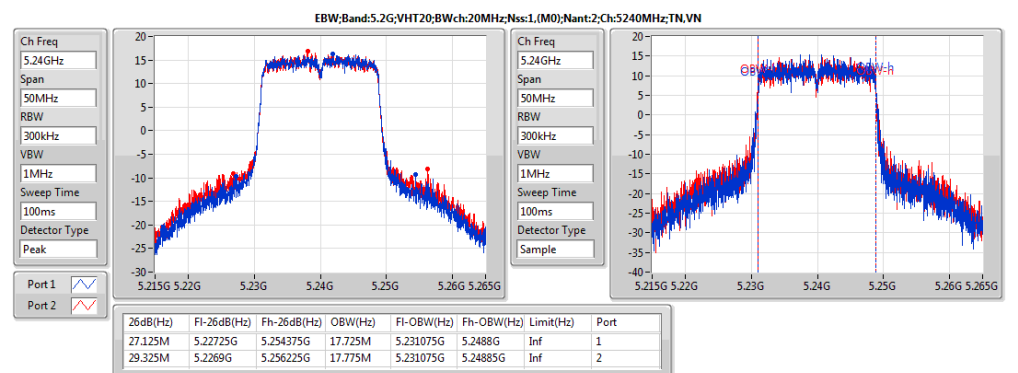
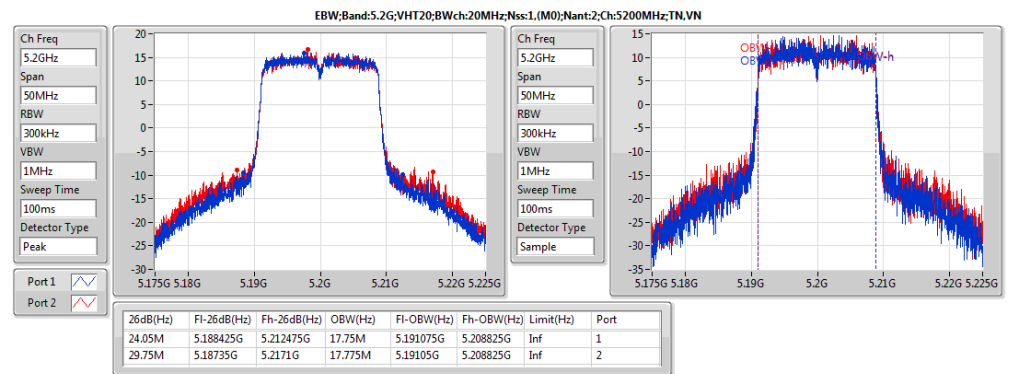
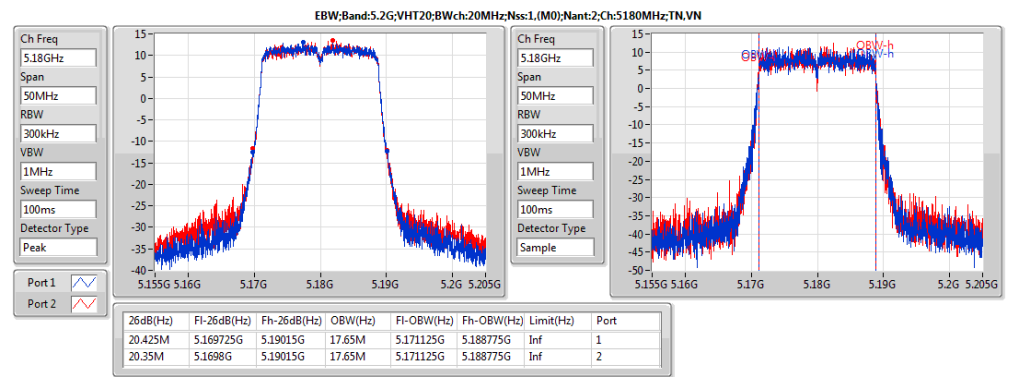
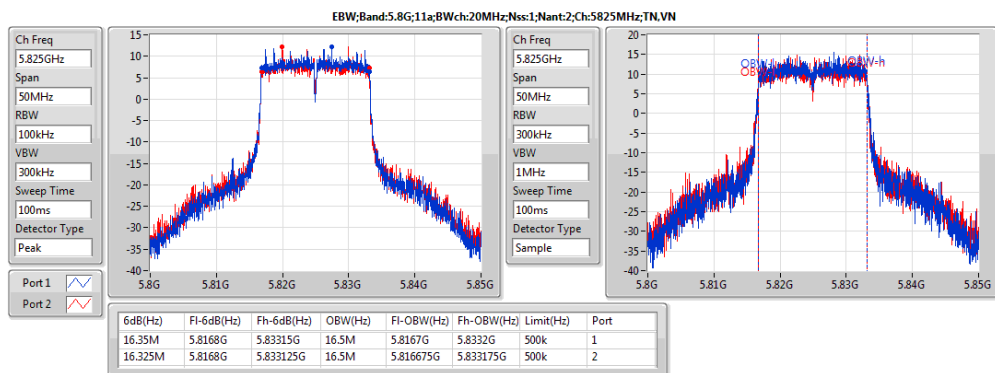
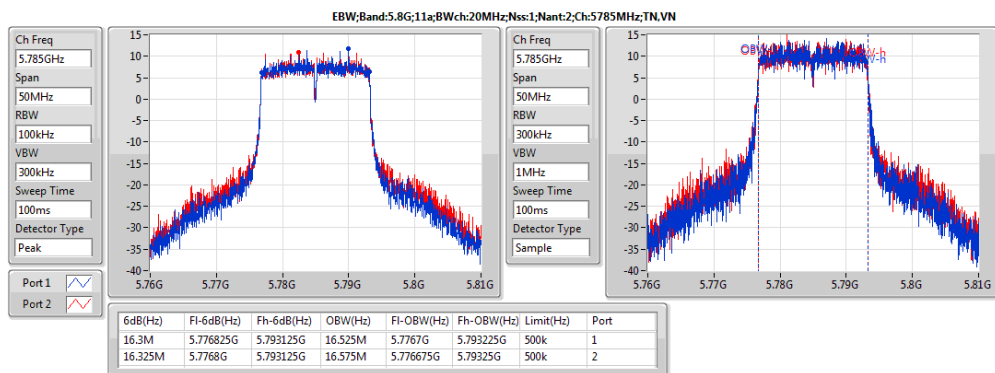
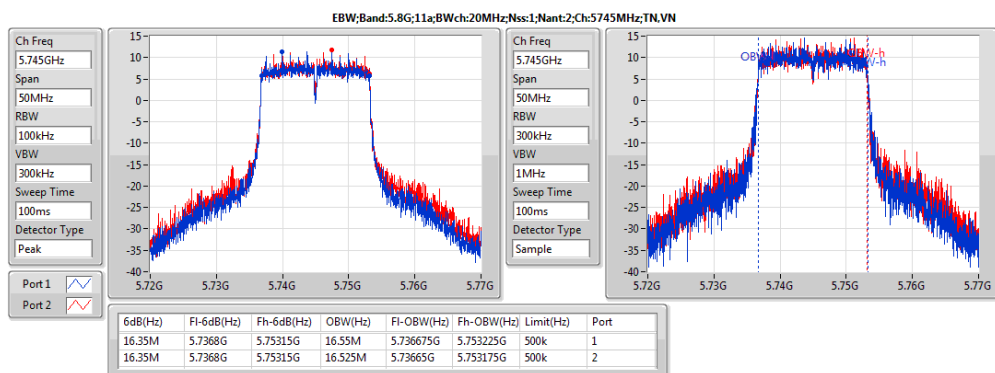
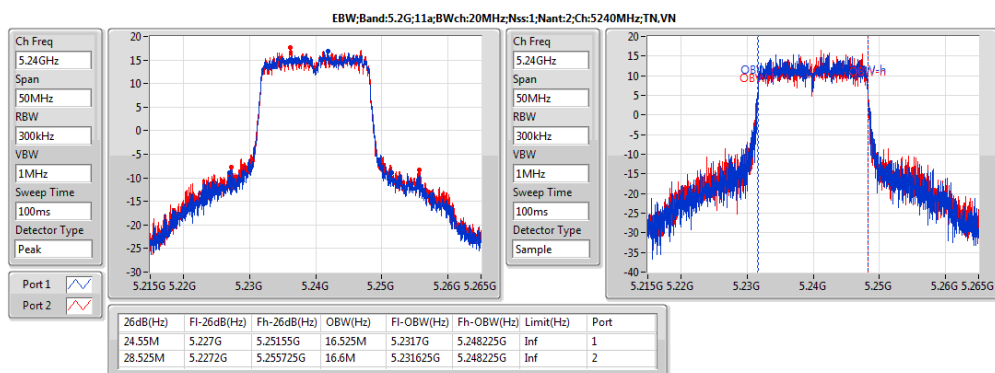
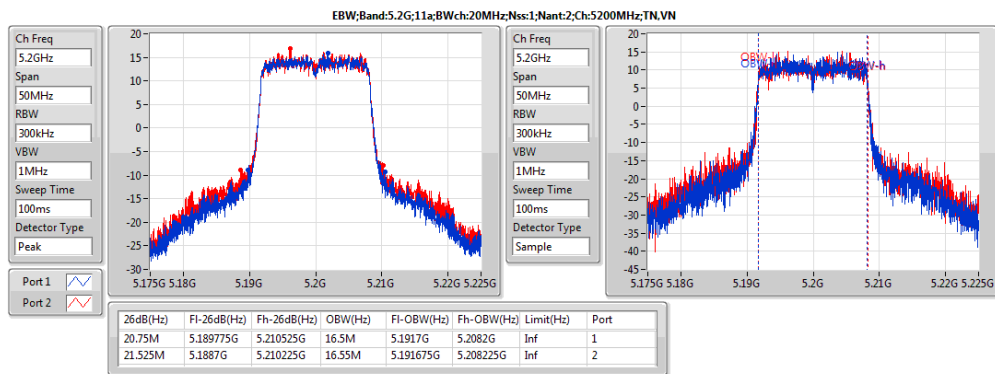
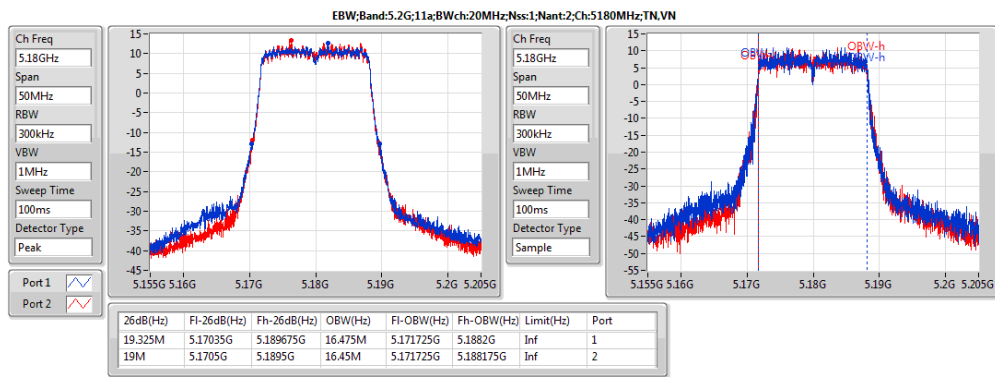
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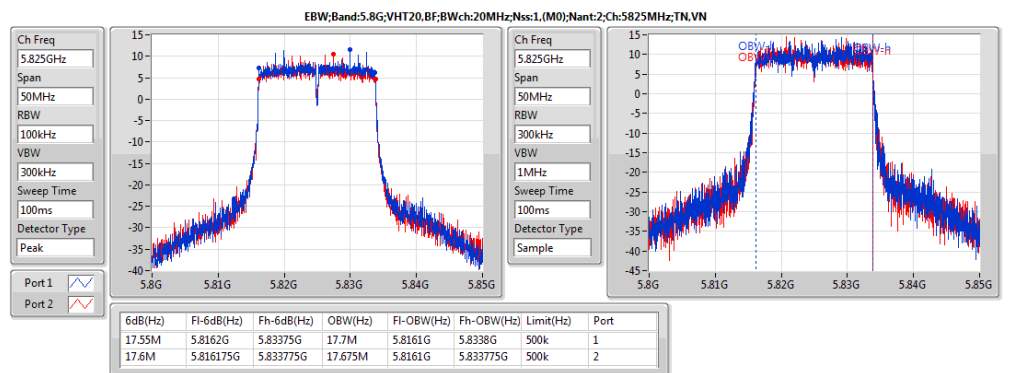
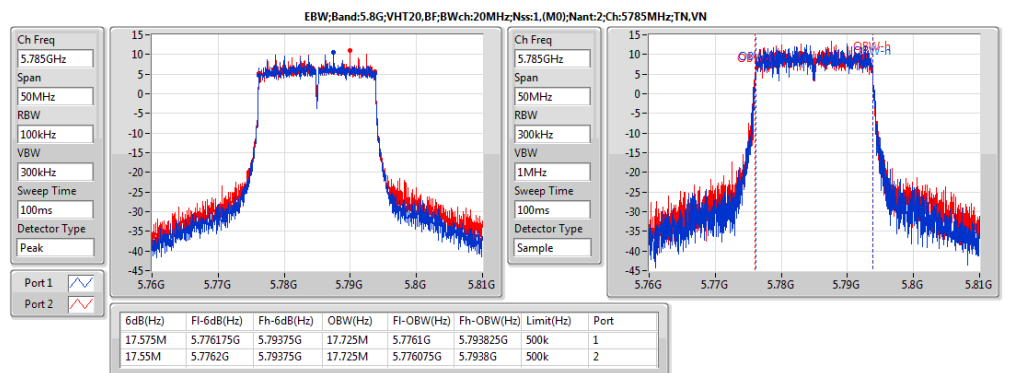
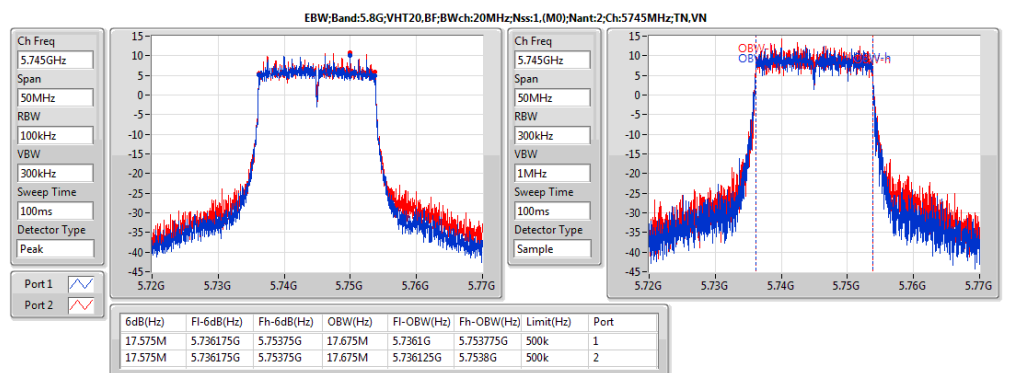
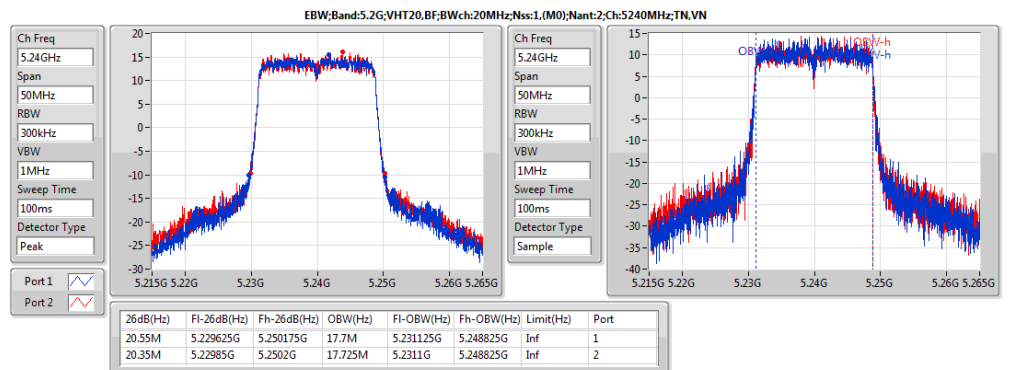
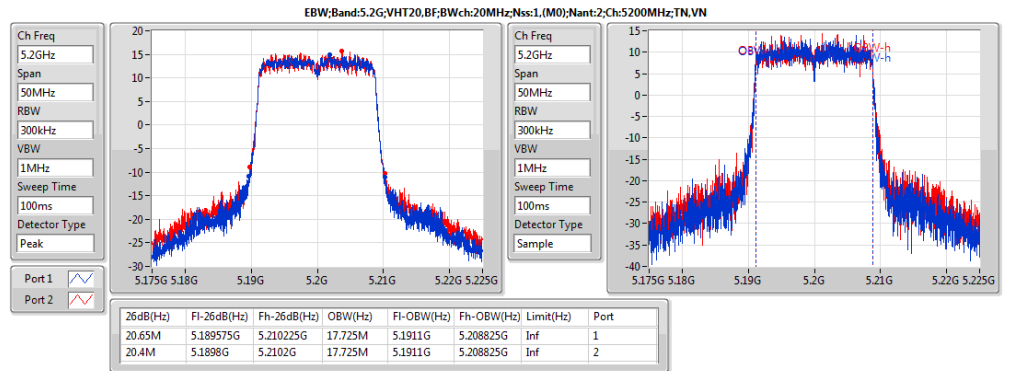
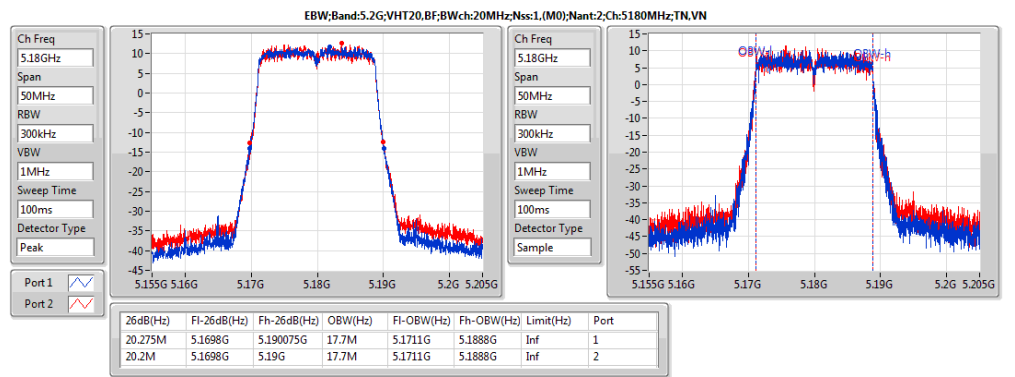
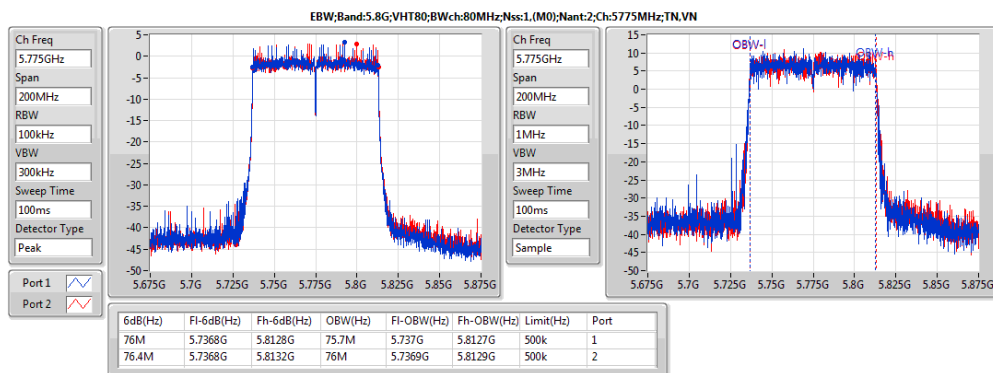
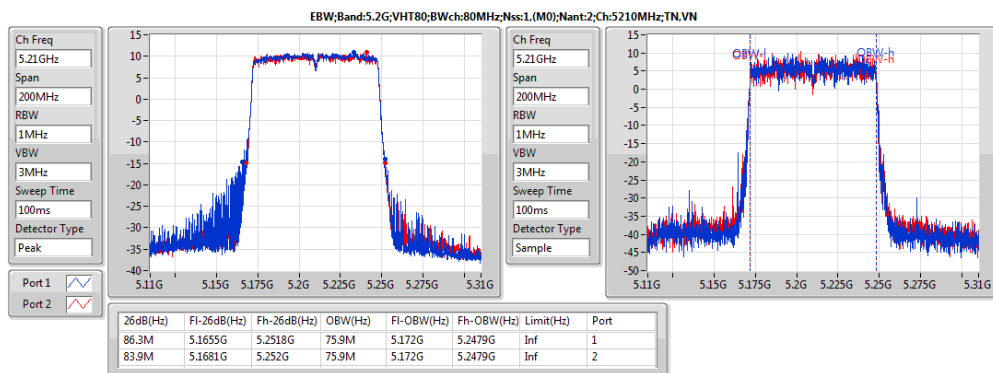
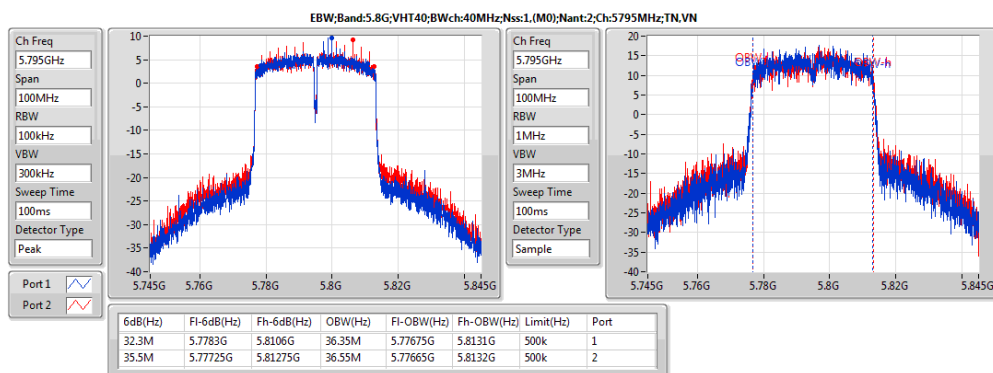
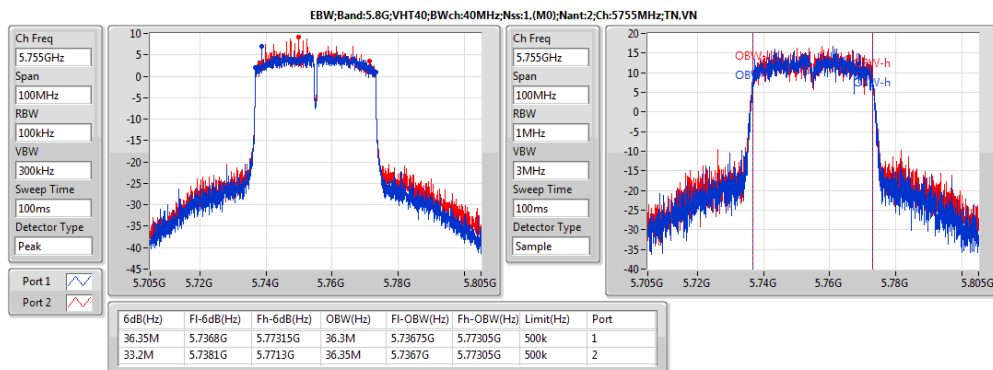
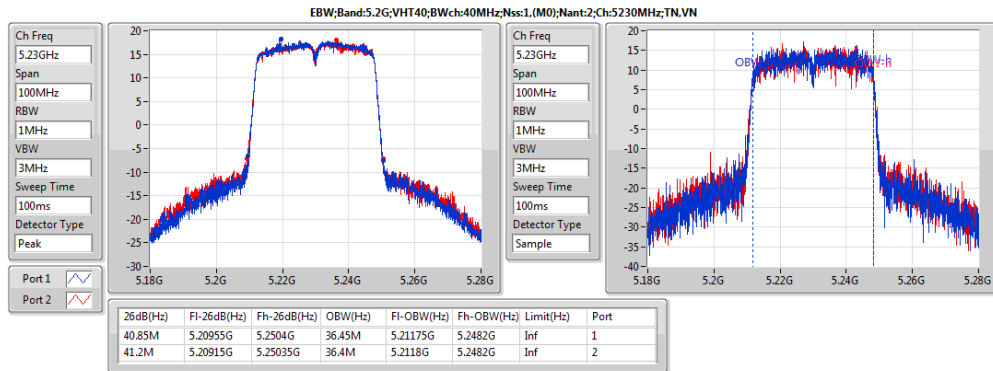
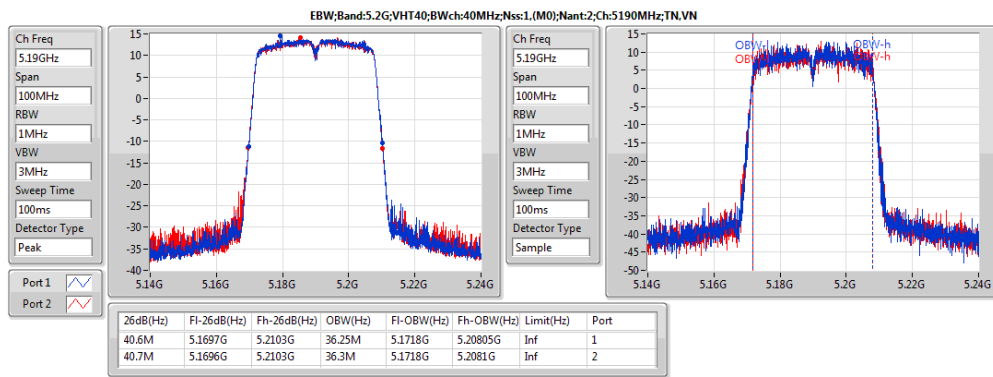
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5.2G;11a;Nss1;Ntx2	28.525M	16.6M	16M6D1D	19M	16.45M
5.8G;11a;Nss1;Ntx2	16.35M	16.575M	16M6D1D	16.3M	16.5M
5.2G;VHT20;Nss1,(M0);Ntx2	29.75M	17.775M	17M8D1D	20.35M	17.65M
5.8G;VHT20;Nss1,(M0);Ntx2	17.625M	17.75M	17M7D1D	17.55M	17.675M
5.2G;VHT40;Nss1,(M0);Ntx2	41.2M	36.45M	36M4D1D	40.6M	36.25M
5.8G;VHT40;Nss1,(M0);Ntx2	36.35M	36.55M	36M5D1D	32.3M	36.3M
5.2G;VHT80;Nss1,(M0);Ntx2	86.3M	75.9M	75M9D1D	83.9M	75.9M
5.8G;VHT80;Nss1,(M0);Ntx2	76.4M	76M	76M0D1D	76M	75.7M
5.2G;VHT20,BF;Nss1,(M0);Ntx2	20.65M	17.725M	17M7D1D	20.2M	17.7M
5.8G;VHT20,BF;Nss1,(M0);Ntx2	17.6M	17.725M	17M7D1D	17.55M	17.675M
5.2G;VHT40,BF;Nss1,(M0);Ntx2	48.55M	36.35M	36M3D1D	40.25M	36.15M
5.8G;VHT40,BF;Nss1,(M0);Ntx2	35.1M	36.45M	36M4D1D	34.3M	36.25M
5.2G;VHT80,BF;Nss1,(M0);Ntx2	83.2M	75.9M	75M9D1D	82.8M	75.6M
5.8G;VHT80,BF;Nss1,(M0);Ntx2	76.3M	75.7M	75M7D1D	75.7M	75.7M

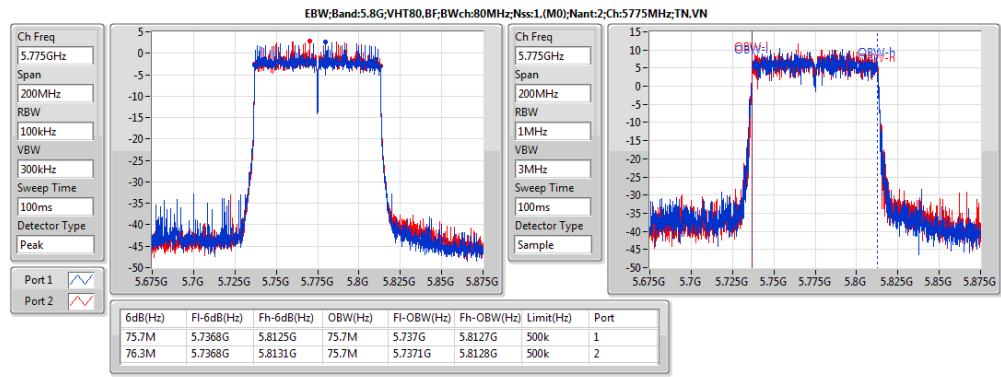
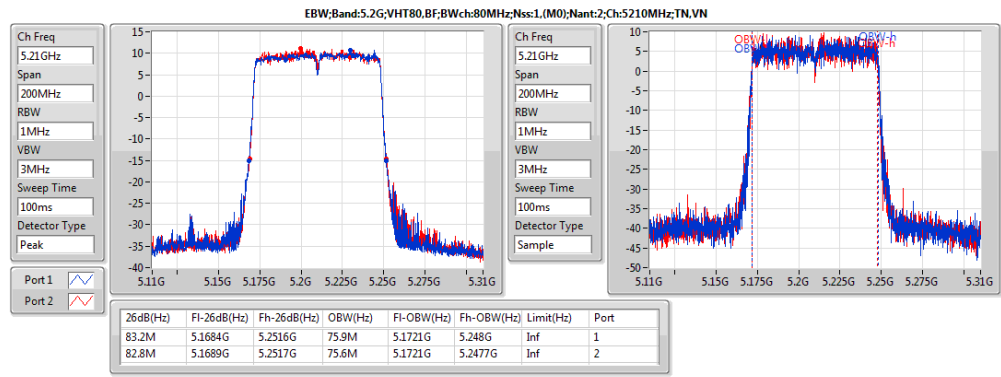
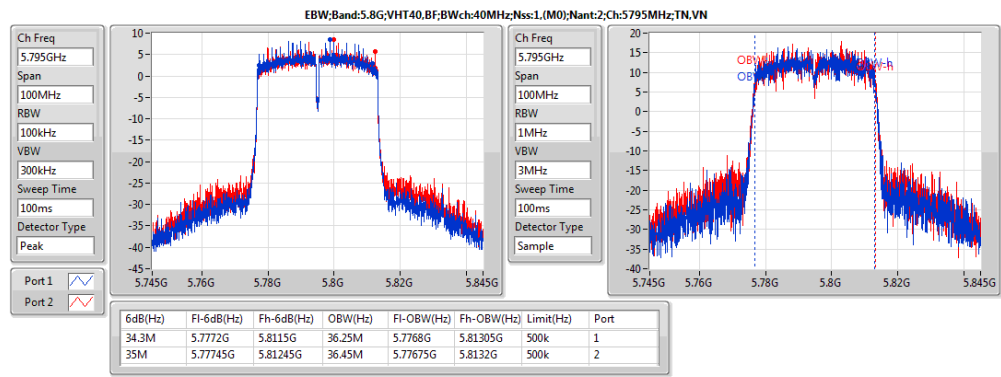
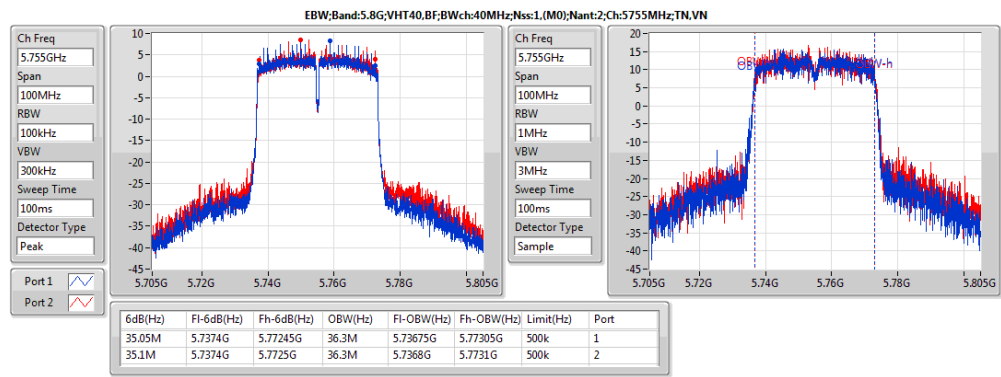
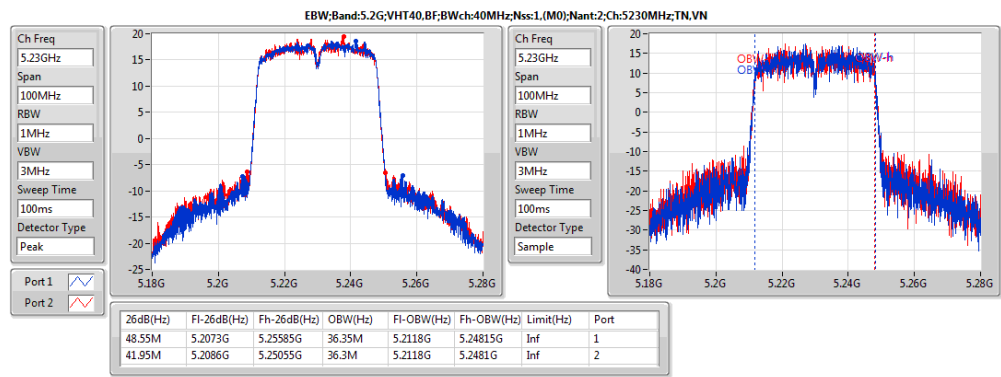
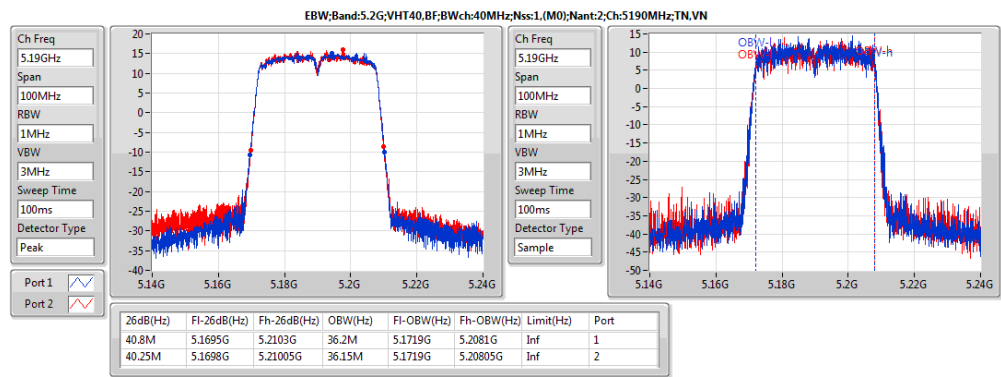


Result

Mode	Result	Limit (Hz)	P1-N dB (Hz)	P1-OBW (Hz)	P2-N dB (Hz)	P2-OBW (Hz)
5.2G;11a;Nss1;Ntx2;5180	Pass	Inf	19.325M	16.475M	19M	16.45M
5.2G;11a;Nss1;Ntx2;5200	Pass	Inf	20.75M	16.5M	21.525M	16.55M
5.2G;11a;Nss1;Ntx2;5240	Pass	Inf	24.55M	16.525M	28.525M	16.6M
5.8G;11a;Nss1;Ntx2;5745	Pass	500k	16.35M	16.55M	16.35M	16.525M
5.8G;11a;Nss1;Ntx2;5785	Pass	500k	16.3M	16.525M	16.325M	16.575M
5.8G;11a;Nss1;Ntx2;5825	Pass	500k	16.35M	16.5M	16.325M	16.5M
5.2G;VHT20;Nss1,(M0);Ntx2;5180	Pass	Inf	20.425M	17.65M	20.35M	17.65M
5.2G;VHT20;Nss1,(M0);Ntx2;5200	Pass	Inf	24.05M	17.75M	29.75M	17.775M
5.2G;VHT20;Nss1,(M0);Ntx2;5240	Pass	Inf	27.125M	17.725M	29.325M	17.775M
5.8G;VHT20;Nss1,(M0);Ntx2;5745	Pass	500k	17.575M	17.675M	17.625M	17.7M
5.8G;VHT20;Nss1,(M0);Ntx2;5785	Pass	500k	17.55M	17.725M	17.6M	17.725M
5.8G;VHT20;Nss1,(M0);Ntx2;5825	Pass	500k	17.55M	17.725M	17.6M	17.75M
5.2G;VHT40;Nss1,(M0);Ntx2;5190	Pass	Inf	40.6M	36.25M	40.7M	36.3M
5.2G;VHT40;Nss1,(M0);Ntx2;5230	Pass	Inf	40.85M	36.45M	41.2M	36.4M
5.8G;VHT40;Nss1,(M0);Ntx2;5755	Pass	500k	36.35M	36.3M	33.2M	36.35M
5.8G;VHT40;Nss1,(M0);Ntx2;5795	Pass	500k	32.3M	36.35M	35.5M	36.55M
5.2G;VHT80;Nss1,(M0);Ntx2;5210	Pass	Inf	86.3M	75.9M	83.9M	75.9M
5.8G;VHT80;Nss1,(M0);Ntx2;5775	Pass	500k	76M	75.7M	76.4M	76M
5.2G;VHT20,BF;Nss1,(M0);Ntx2;5180	Pass	Inf	20.275M	17.7M	20.2M	17.7M
5.2G;VHT20,BF;Nss1,(M0);Ntx2;5200	Pass	Inf	20.65M	17.725M	20.4M	17.725M
5.2G;VHT20,BF;Nss1,(M0);Ntx2;5240	Pass	Inf	20.55M	17.7M	20.35M	17.725M
5.8G;VHT20,BF;Nss1,(M0);Ntx2;5745	Pass	500k	17.575M	17.675M	17.575M	17.675M
5.8G;VHT20,BF;Nss1,(M0);Ntx2;5785	Pass	500k	17.575M	17.725M	17.55M	17.725M
5.8G;VHT20,BF;Nss1,(M0);Ntx2;5825	Pass	500k	17.55M	17.7M	17.6M	17.675M
5.2G;VHT40,BF;Nss1,(M0);Ntx2;5190	Pass	Inf	40.8M	36.2M	40.25M	36.15M
5.2G;VHT40,BF;Nss1,(M0);Ntx2;5230	Pass	Inf	48.55M	36.35M	41.95M	36.3M
5.8G;VHT40,BF;Nss1,(M0);Ntx2;5755	Pass	500k	35.05M	36.3M	35.1M	36.3M
5.8G;VHT40,BF;Nss1,(M0);Ntx2;5795	Pass	500k	34.3M	36.25M	35M	36.45M
5.2G;VHT80,BF;Nss1,(M0);Ntx2;5210	Pass	Inf	83.2M	75.9M	82.8M	75.6M
5.8G;VHT80,BF;Nss1,(M0);Ntx2;5775	Pass	500k	75.7M	75.7M	76.3M	75.7M









Summary

Mode	Sum (dBm)	Sum (W)	EIRP (dBm)	EIRP (W)
5.2G;11a;Nss1;Ntx2	25.88	0.38726	26.52	0.44875
5.8G;11a;Nss1;Ntx2	25.89	0.38815	26.77	0.47534
5.2G;VHT20;Nss1,(M0);Ntx2	25.98	0.39628	26.62	0.4592
5.8G;VHT20;Nss1,(M0);Ntx2	25.83	0.38282	26.71	0.46881
5.2G;VHT40;Nss1,(M0);Ntx2	24.98	0.31477	25.62	0.36475
5.8G;VHT40;Nss1,(M0);Ntx2	25.97	0.39537	26.85	0.48417
5.2G;VHT80;Nss1,(M0);Ntx2	21.38	0.1374	22.02	0.15922
5.8G;VHT80;Nss1,(M0);Ntx2	23.82	0.24099	24.70	0.29512
5.2G;VHT20,BF;Nss1,(M0);Ntx2	25.56	0.35975	29.21	0.83368
5.8G;VHT20,BF;Nss1,(M0);Ntx2	25.82	0.38194	29.71	0.93541
5.2G;VHT40,BF;Nss1,(M0);Ntx2	24.83	0.30409	28.48	0.70469
5.8G;VHT40,BF;Nss1,(M0);Ntx2	26.00	0.39811	29.89	0.97499
5.2G;VHT80,BF;Nss1,(M0);Ntx2	20.72	0.11803	24.37	0.27353
5.8G;VHT80,BF;Nss1,(M0);Ntx2	22.64	0.18365	26.53	0.44978



Result

Mode	Result	DG (dBi)	Sum (dBm)	Sum Lim. (dBm)	EIRP (dBm)	EIRP Lim. (dBm)	P1 (dBm)	P2 (dBm)
5.2G;11a;Nss1;Ntx2;5180	Pass	0.64	22.95	30.00	23.59	36.00	20.00	19.87
5.2G;11a;Nss1;Ntx2;5200	Pass	0.64	25.88	30.00	26.52	36.00	22.75	22.98
5.2G;11a;Nss1;Ntx2;5240	Pass	0.64	25.86	30.00	26.50	36.00	22.79	22.91
5.8G;11a;Nss1;Ntx2;5745	Pass	0.88	25.82	30.00	26.70	36.00	22.72	22.89
5.8G;11a;Nss1;Ntx2;5785	Pass	0.88	25.83	30.00	26.71	36.00	22.66	22.97
5.8G;11a;Nss1;Ntx2;5825	Pass	0.88	25.89	30.00	26.77	36.00	22.86	22.89
5.2G;VHT20;Nss1,(M0);Ntx2;5180	Pass	0.64	23.58	30.00	24.22	36.00	20.51	20.63
5.2G;VHT20;Nss1,(M0);Ntx2;5200	Pass	0.64	25.85	30.00	26.49	36.00	22.71	22.96
5.2G;VHT20;Nss1,(M0);Ntx2;5240	Pass	0.64	25.98	30.00	26.62	36.00	22.95	22.98
5.8G;VHT20;Nss1,(M0);Ntx2;5745	Pass	0.88	25.75	30.00	26.63	36.00	22.61	22.87
5.8G;VHT20;Nss1,(M0);Ntx2;5785	Pass	0.88	25.80	30.00	26.68	36.00	22.63	22.94
5.8G;VHT20;Nss1,(M0);Ntx2;5825	Pass	0.88	25.83	30.00	26.71	36.00	22.79	22.85
5.2G;VHT40;Nss1,(M0);Ntx2;5190	Pass	0.64	21.12	30.00	21.76	36.00	18.03	18.18
5.2G;VHT40;Nss1,(M0);Ntx2;5230	Pass	0.64	24.98	30.00	25.62	36.00	21.96	21.98
5.8G;VHT40;Nss1,(M0);Ntx2;5755	Pass	0.88	25.94	30.00	26.82	36.00	22.89	22.97
5.8G;VHT40;Nss1,(M0);Ntx2;5795	Pass	0.88	25.97	30.00	26.85	36.00	22.94	22.98
5.2G;VHT80;Nss1,(M0);Ntx2;5210	Pass	0.64	21.38	30.00	22.02	36.00	18.24	18.49
5.8G;VHT80;Nss1,(M0);Ntx2;5775	Pass	0.88	23.82	30.00	24.70	36.00	20.64	20.97
5.2G;VHT20,BF;Nss1,(M0);Ntx2;5180	Pass	3.65	22.53	30.00	26.18	36.00	19.51	19.53
5.2G;VHT20,BF;Nss1,(M0);Ntx2;5200	Pass	3.65	25.56	30.00	29.21	36.00	22.52	22.57
5.2G;VHT20,BF;Nss1,(M0);Ntx2;5240	Pass	3.65	25.54	30.00	29.19	36.00	22.51	22.54
5.8G;VHT20,BF;Nss1,(M0);Ntx2;5745	Pass	3.89	25.67	30.00	29.56	36.00	22.54	22.78
5.8G;VHT20,BF;Nss1,(M0);Ntx2;5785	Pass	3.89	25.82	30.00	29.71	36.00	22.56	23.04
5.8G;VHT20,BF;Nss1,(M0);Ntx2;5825	Pass	3.89	25.56	30.00	29.45	36.00	22.52	22.58
5.2G;VHT40,BF;Nss1,(M0);Ntx2;5190	Pass	3.65	21.05	30.00	24.70	36.00	18.02	18.05
5.2G;VHT40,BF;Nss1,(M0);Ntx2;5230	Pass	3.65	24.83	30.00	28.48	36.00	21.76	21.87
5.8G;VHT40,BF;Nss1,(M0);Ntx2;5755	Pass	3.89	25.54	30.00	29.43	36.00	22.51	22.55
5.8G;VHT40,BF;Nss1,(M0);Ntx2;5795	Pass	3.89	26.00	30.00	29.89	36.00	22.93	23.05
5.2G;VHT80,BF;Nss1,(M0);Ntx2;5210	Pass	3.65	20.72	30.00	24.37	36.00	17.63	17.78
5.8G;VHT80,BF;Nss1,(M0);Ntx2;5775	Pass	3.89	22.64	30.00	26.53	36.00	19.59	19.67



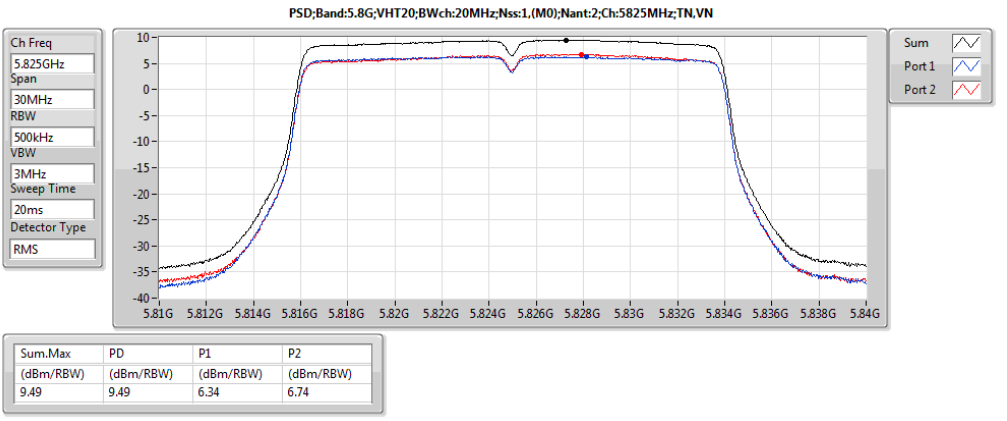
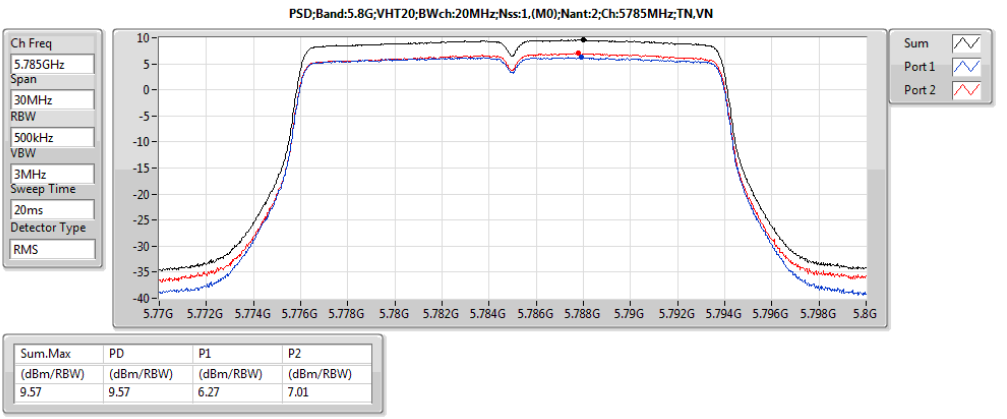
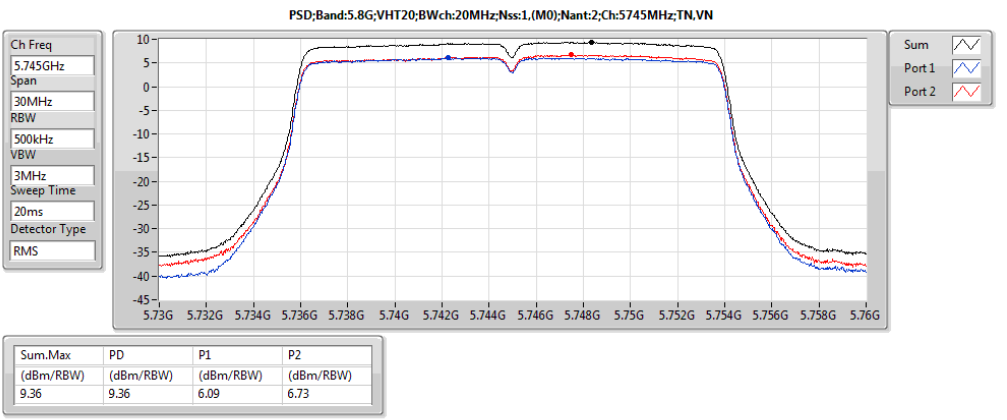
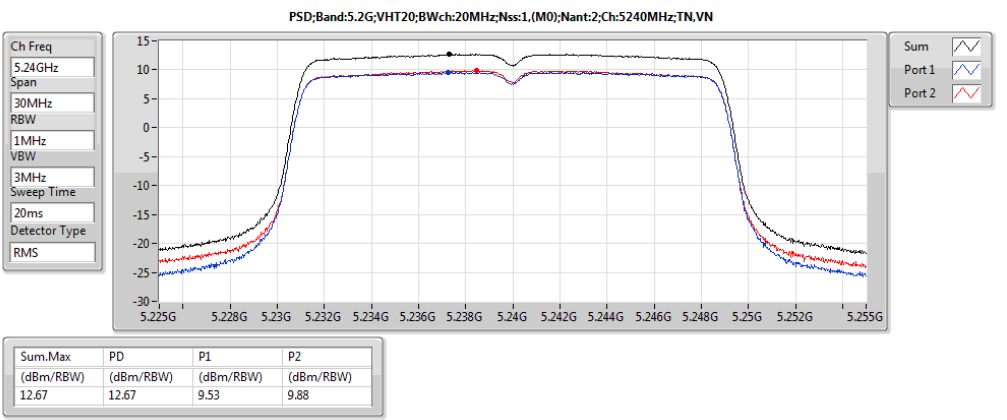
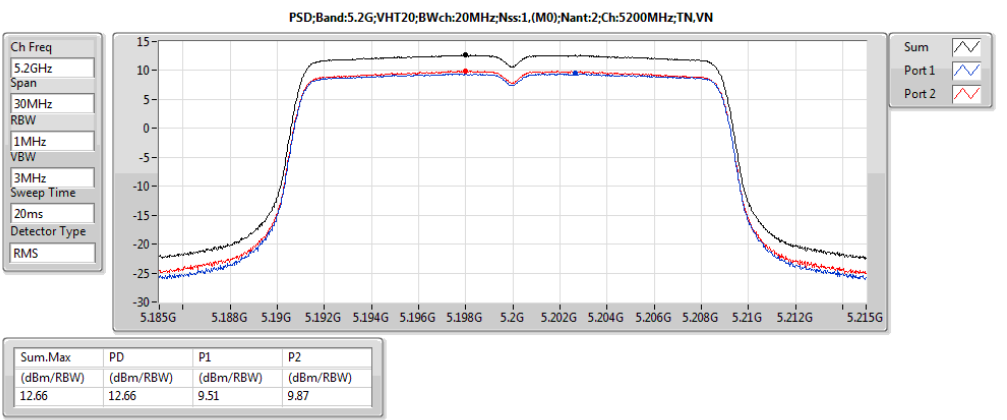
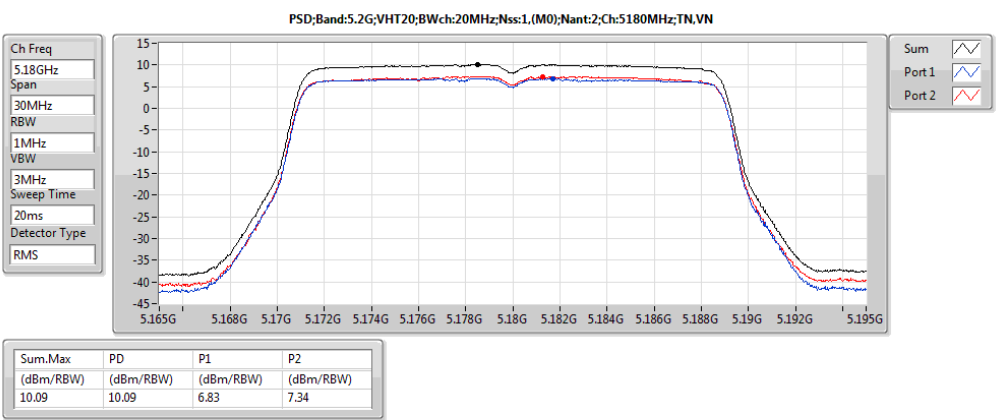
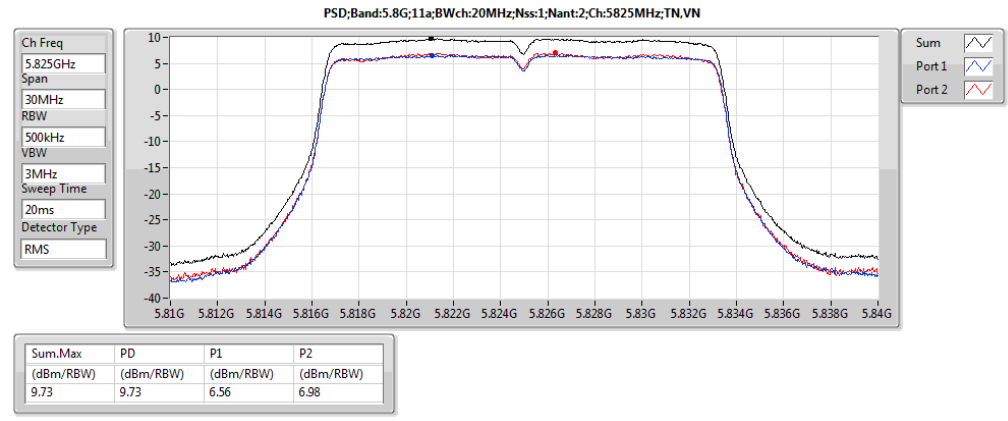
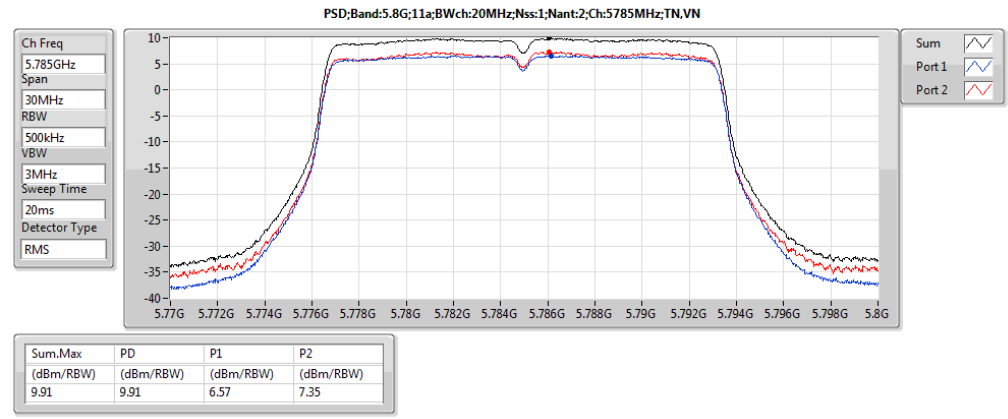
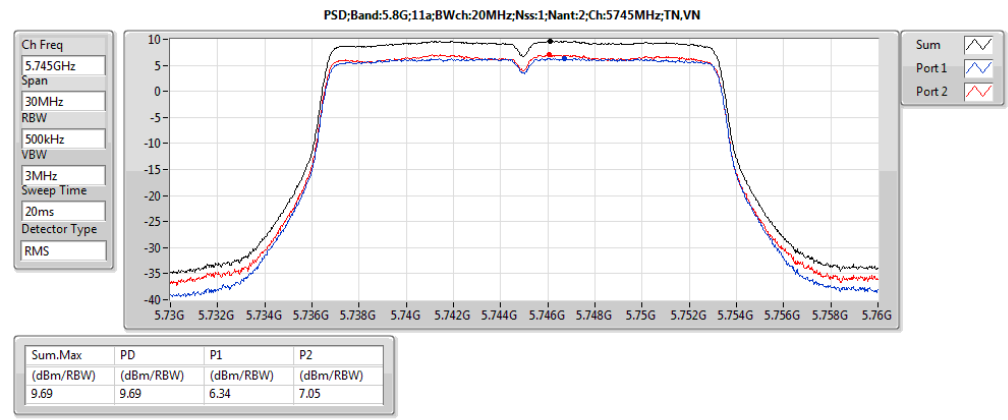
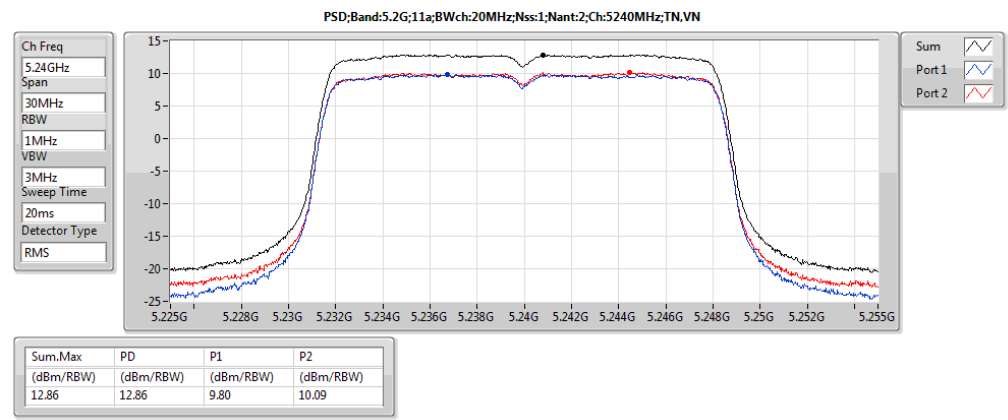
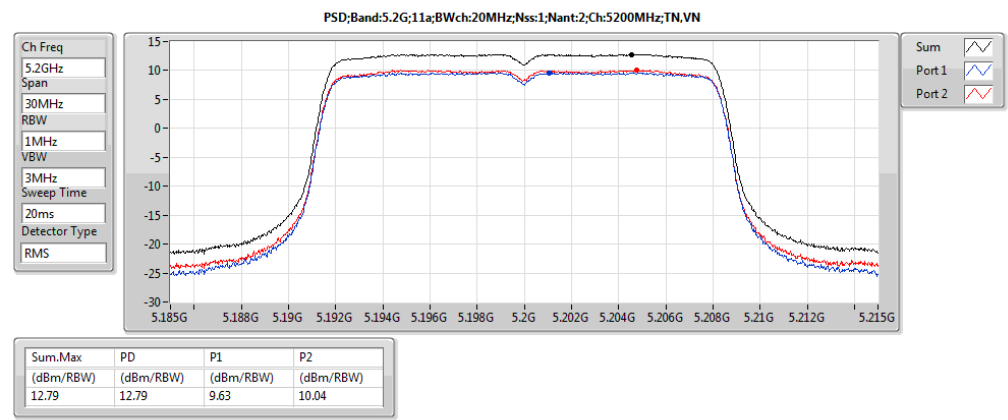
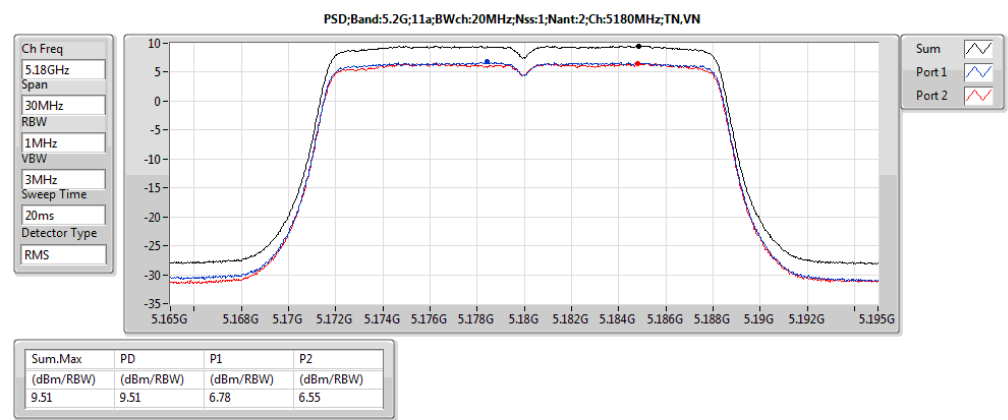
Summary

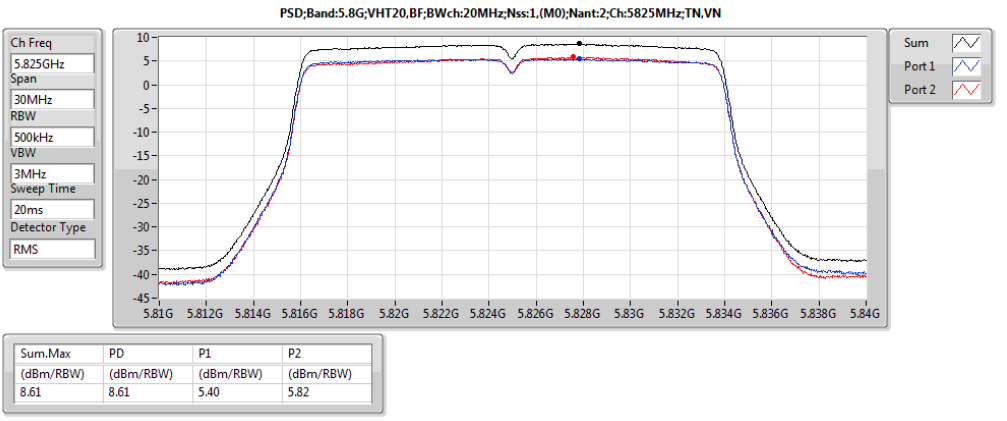
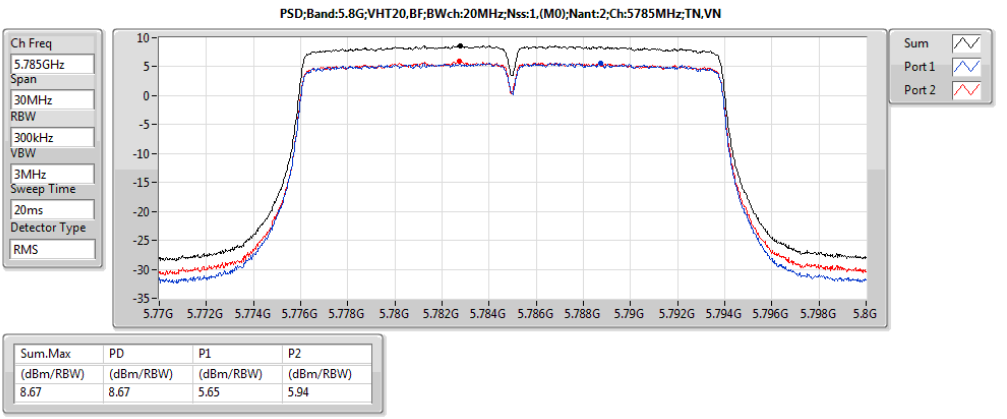
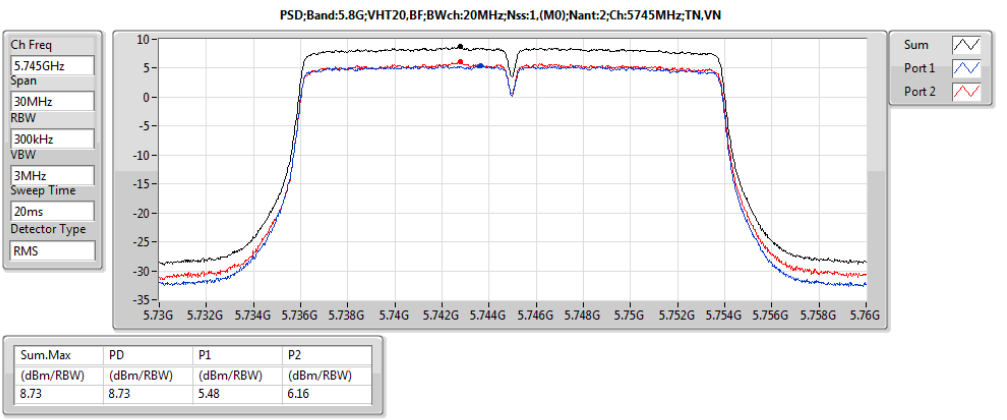
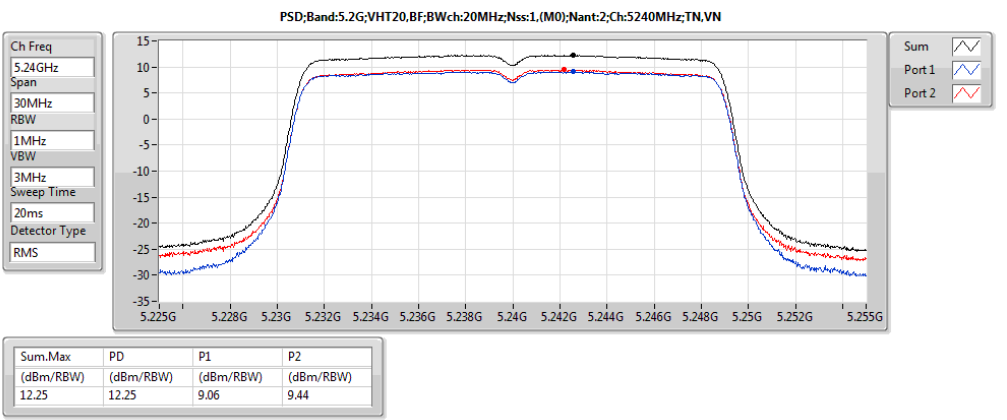
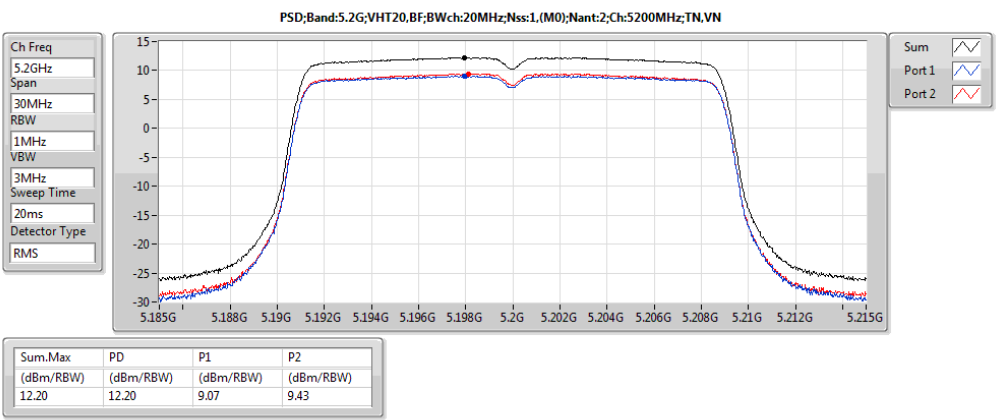
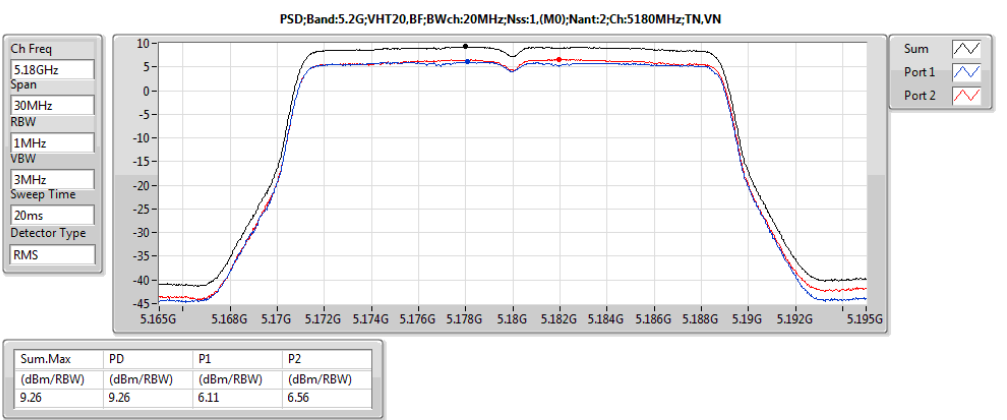
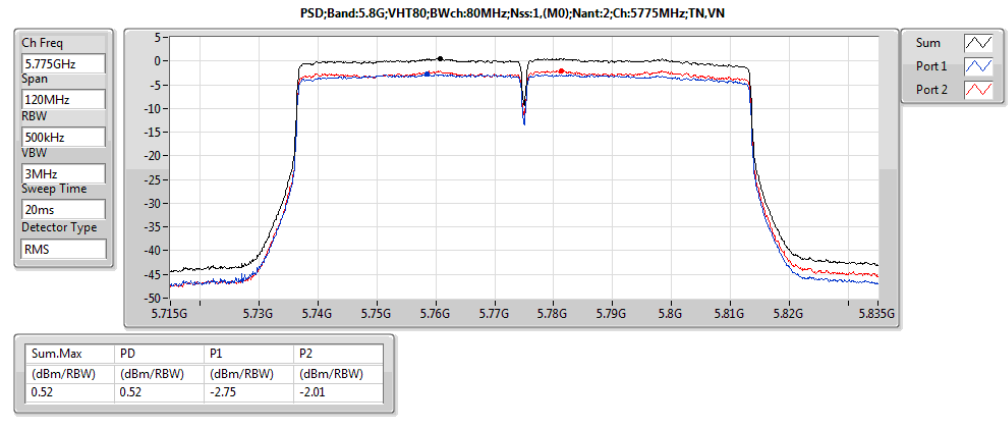
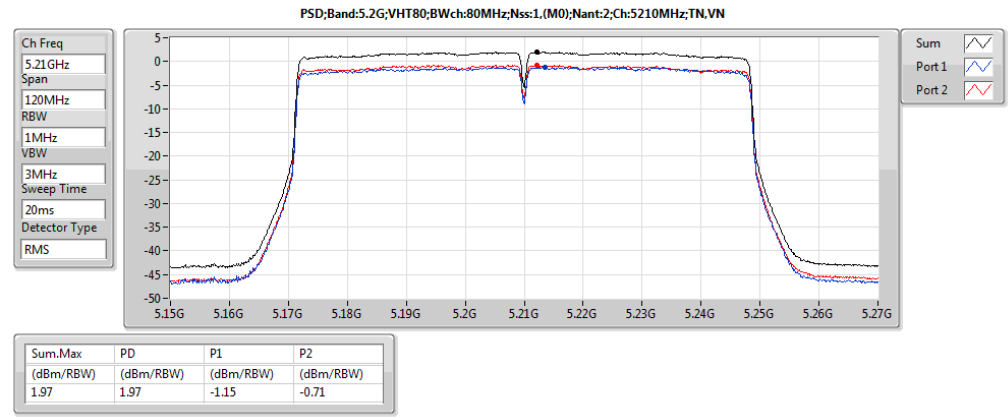
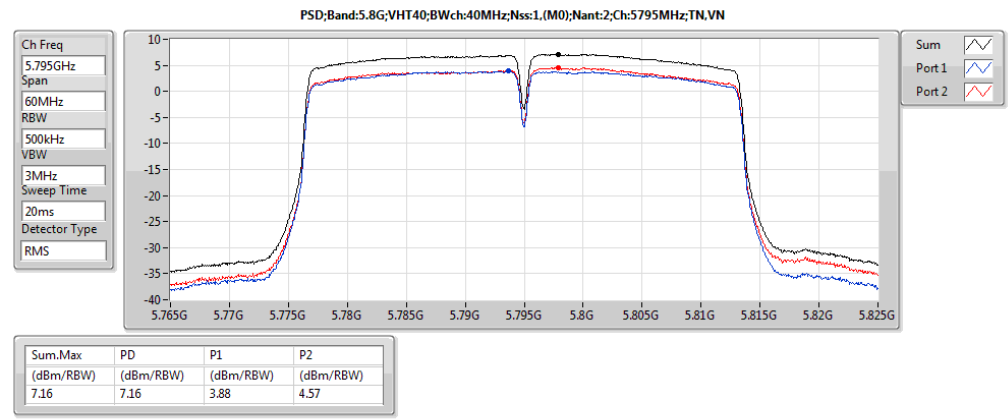
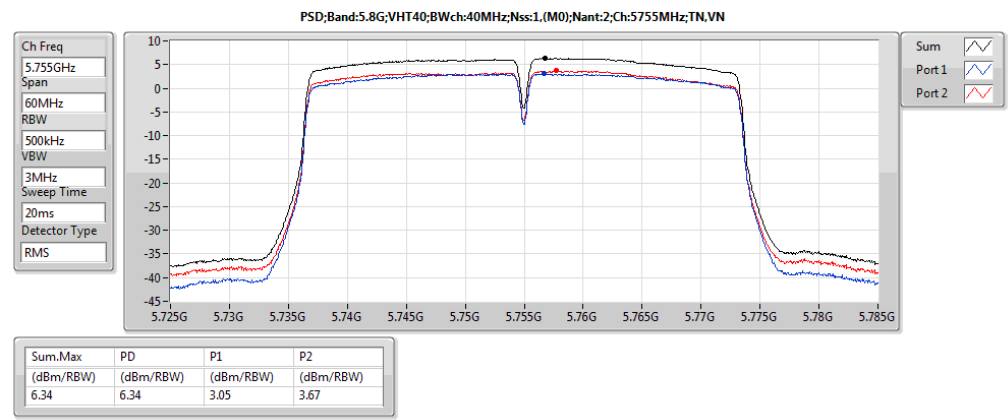
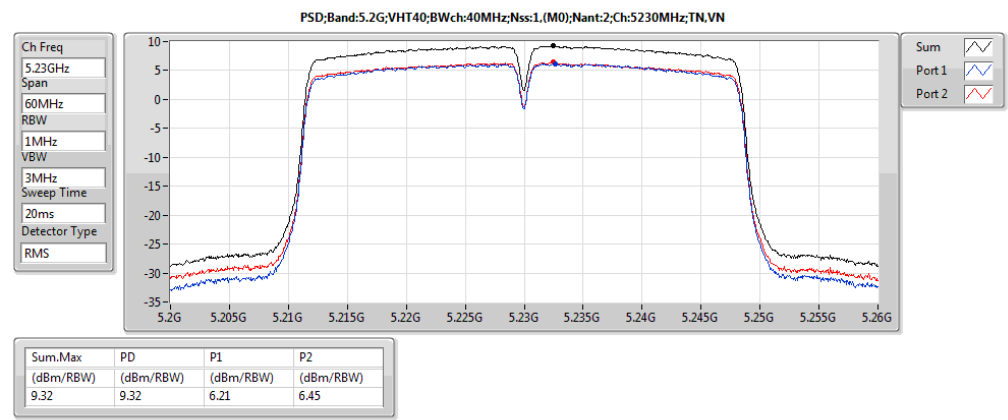
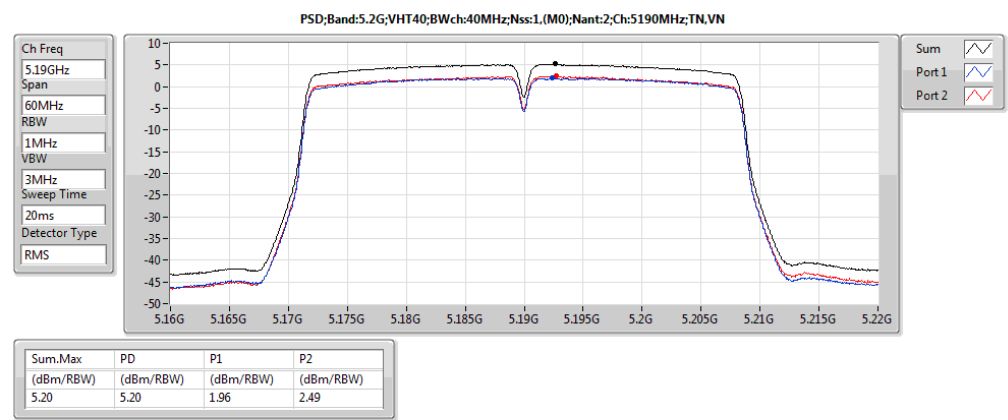
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5.2G;11a;Nss1;Ntx2	12.86	16.51
5.8G;11a;Nss1;Ntx2	9.91	13.80
5.2G;VHT20;Nss1,(M0);Ntx2	12.67	16.32
5.8G;VHT20;Nss1,(M0);Ntx2	9.57	13.46
5.2G;VHT40;Nss1,(M0);Ntx2	9.32	12.97
5.8G;VHT40;Nss1,(M0);Ntx2	7.16	11.05
5.2G;VHT80;Nss1,(M0);Ntx2	1.97	5.62
5.8G;VHT80;Nss1,(M0);Ntx2	0.52	4.41
5.2G;VHT20,BF;Nss1,(M0);Ntx2	12.25	15.90
5.8G;VHT20,BF;Nss1,(M0);Ntx2	8.73	12.62
5.2G;VHT40,BF;Nss1,(M0);Ntx2	8.84	12.49
5.8G;VHT40,BF;Nss1,(M0);Ntx2	6.30	10.19
5.2G;VHT80,BF;Nss1,(M0);Ntx2	1.53	5.18
5.8G;VHT80,BF;Nss1,(M0);Ntx2	0.10	3.99

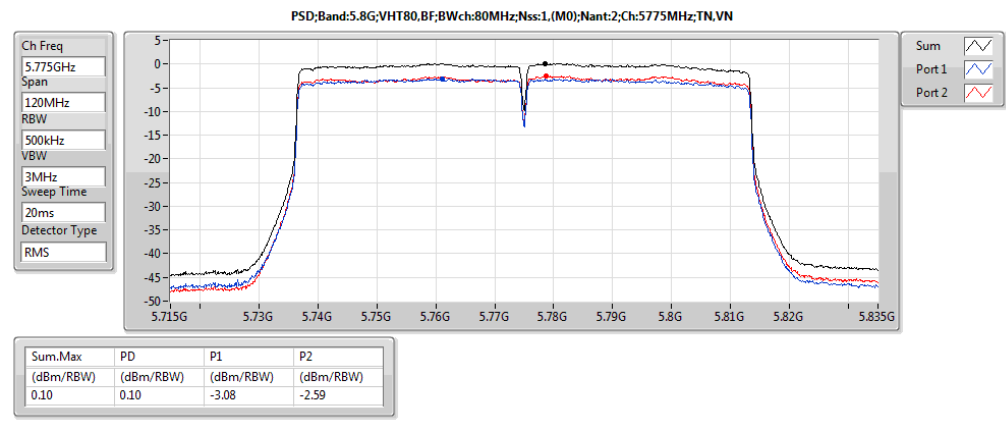
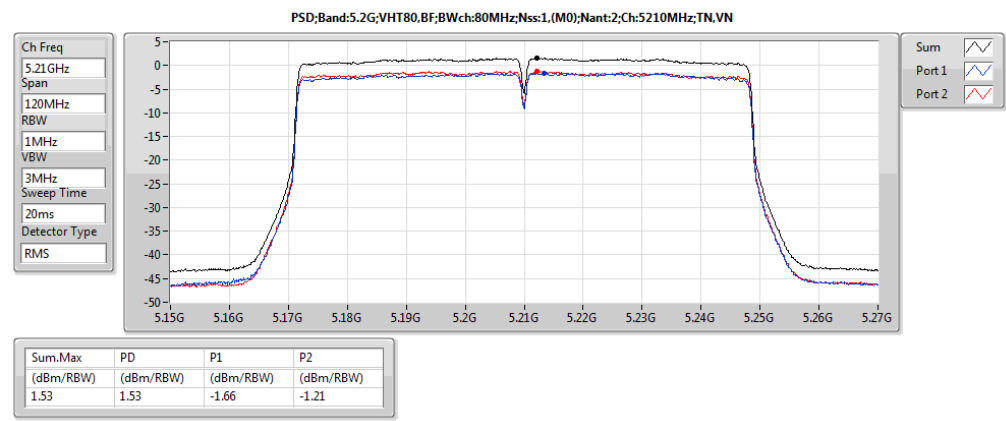
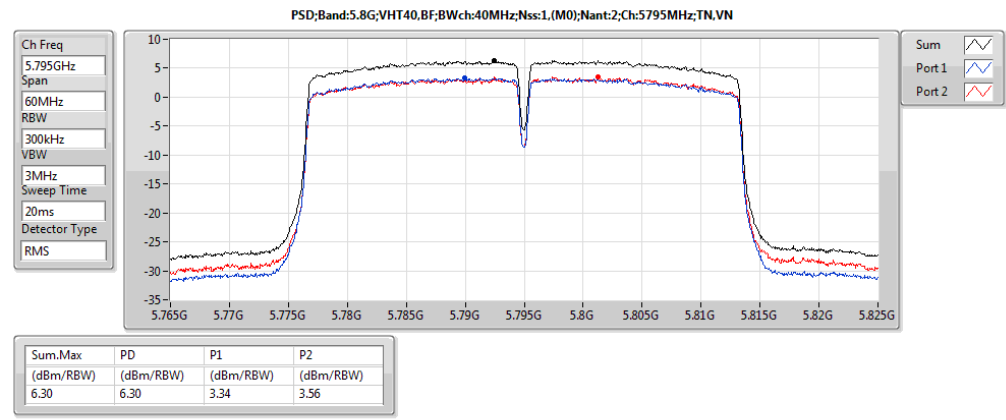
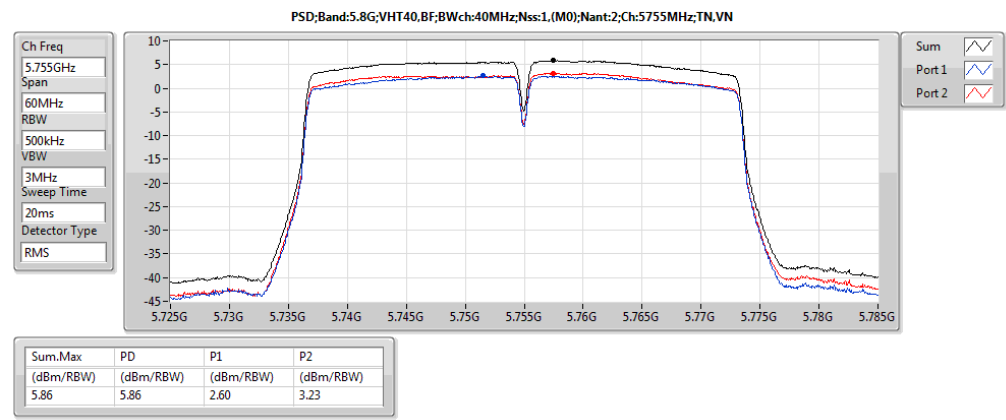
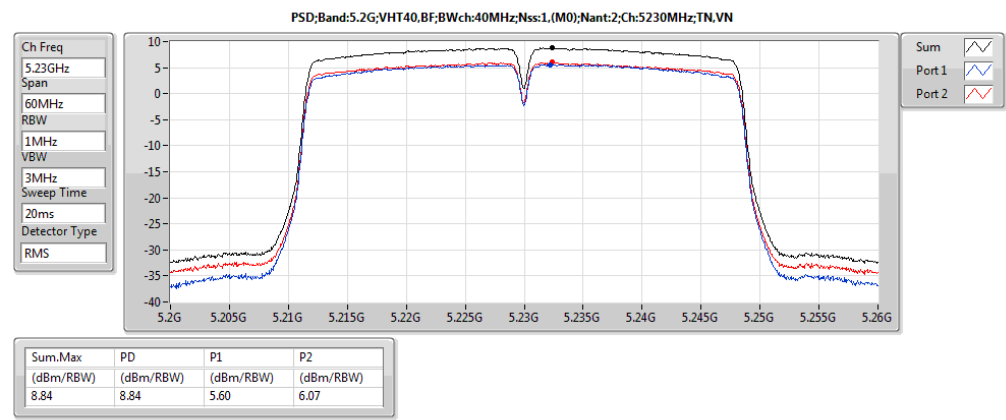
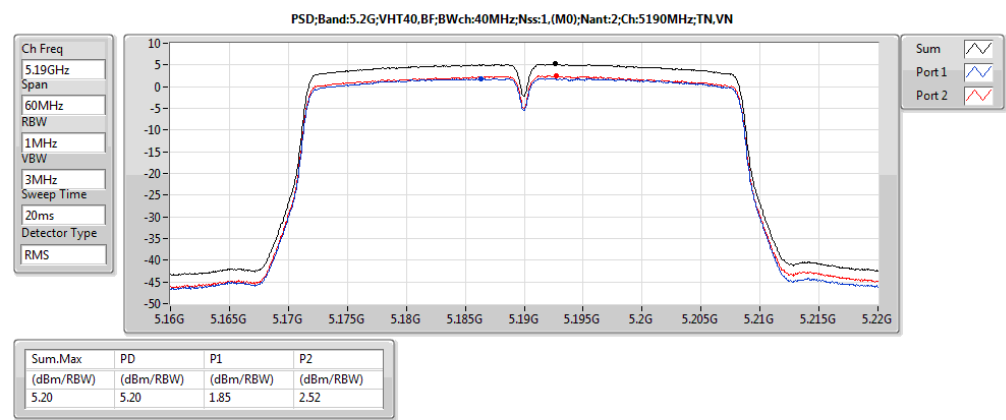


Result

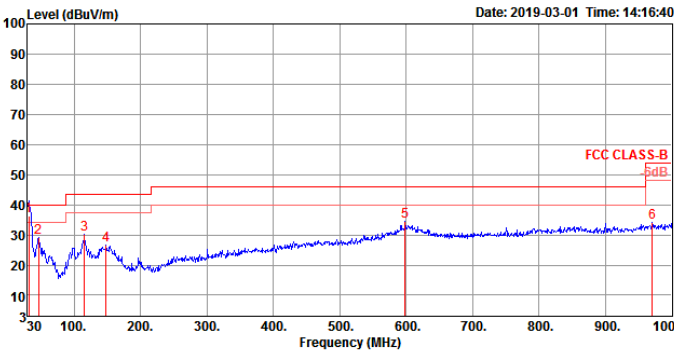
Mode	Result	DG (dBi)	PD (dBm/RBW)	PD.Limit (dBm/RBW)	P1 (dBm/RBW)	P2 (dBm/RBW)
5.2G;11a;Nss1;Ntx2;5180	Pass	3.65	9.51	17.00	6.78	6.55
5.2G;11a;Nss1;Ntx2;5200	Pass	3.65	12.79	17.00	9.63	10.04
5.2G;11a;Nss1;Ntx2;5240	Pass	3.65	12.86	17.00	9.80	10.09
5.8G;11a;Nss1;Ntx2;5745	Pass	3.89	9.69	30.00	6.34	7.05
5.8G;11a;Nss1;Ntx2;5785	Pass	3.89	9.91	30.00	6.57	7.35
5.8G;11a;Nss1;Ntx2;5825	Pass	3.89	9.73	30.00	6.56	6.98
5.2G;VHT20;Nss1,(M0);Ntx2;5180	Pass	3.65	10.09	17.00	6.83	7.34
5.2G;VHT20;Nss1,(M0);Ntx2;5200	Pass	3.65	12.66	17.00	9.51	9.87
5.2G;VHT20;Nss1,(M0);Ntx2;5240	Pass	3.65	12.67	17.00	9.53	9.88
5.8G;VHT20;Nss1,(M0);Ntx2;5745	Pass	3.89	9.36	30.00	6.09	6.73
5.8G;VHT20;Nss1,(M0);Ntx2;5785	Pass	3.89	9.57	30.00	6.27	7.01
5.8G;VHT20;Nss1,(M0);Ntx2;5825	Pass	3.89	9.49	30.00	6.34	6.74
5.2G;VHT40;Nss1,(M0);Ntx2;5190	Pass	3.65	5.20	17.00	1.96	2.49
5.2G;VHT40;Nss1,(M0);Ntx2;5230	Pass	3.65	9.32	17.00	6.21	6.45
5.8G;VHT40;Nss1,(M0);Ntx2;5755	Pass	3.89	6.34	30.00	3.05	3.67
5.8G;VHT40;Nss1,(M0);Ntx2;5795	Pass	3.89	7.16	30.00	3.88	4.57
5.2G;VHT80;Nss1,(M0);Ntx2;5210	Pass	3.65	1.97	17.00	-1.15	-0.71
5.8G;VHT80;Nss1,(M0);Ntx2;5775	Pass	3.89	0.52	30.00	-2.75	-2.01
5.2G;VHT20,BF;Nss1,(M0);Ntx2;5180	Pass	3.65	9.26	17.00	6.11	6.56
5.2G;VHT20,BF;Nss1,(M0);Ntx2;5200	Pass	3.65	12.20	17.00	9.07	9.43
5.2G;VHT20,BF;Nss1,(M0);Ntx2;5240	Pass	3.65	12.25	17.00	9.06	9.44
5.8G;VHT20,BF;Nss1,(M0);Ntx2;5745	Pass	3.89	8.73	30.00	5.48	6.16
5.8G;VHT20,BF;Nss1,(M0);Ntx2;5785	Pass	3.89	8.67	30.00	5.65	5.94
5.8G;VHT20,BF;Nss1,(M0);Ntx2;5825	Pass	3.89	8.61	30.00	5.40	5.82
5.2G;VHT40,BF;Nss1,(M0);Ntx2;5190	Pass	3.65	5.20	17.00	1.85	2.52
5.2G;VHT40,BF;Nss1,(M0);Ntx2;5230	Pass	3.65	8.84	17.00	5.60	6.07
5.8G;VHT40,BF;Nss1,(M0);Ntx2;5755	Pass	3.89	5.86	30.00	2.60	3.23
5.8G;VHT40,BF;Nss1,(M0);Ntx2;5795	Pass	3.89	6.30	30.00	3.34	3.56
5.2G;VHT80,BF;Nss1,(M0);Ntx2;5210	Pass	3.65	1.53	17.00	-1.66	-1.21
5.8G;VHT80,BF;Nss1,(M0);Ntx2;5775	Pass	3.89	0.10	30.00	-3.08	-2.59

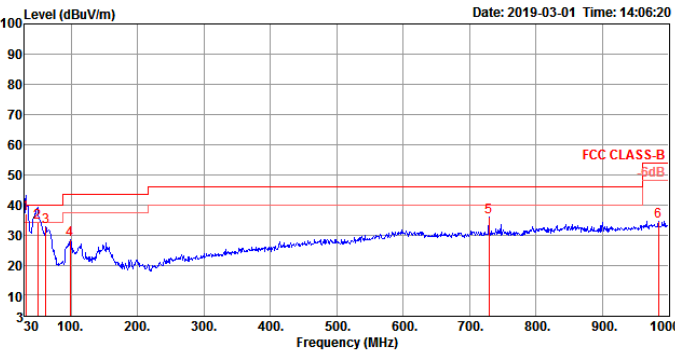








RSE below 1GHz Result																																																																																																												
Operating Mode	2				Polarization				Horizontal																																																																																																			
Operating Function	CTX																																																																																																											
Level (dBuV/m) Date: 2019-03-01 Time: 14:16:40  Frequency (MHz) <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>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>31.94</td><td>36.42</td><td>40.00</td><td>-3.58</td><td>45.40</td><td>0.52</td><td>22.93</td><td>32.43</td><td>127</td><td>168 QP</td><td>HORIZONTAL</td></tr><tr><td>2</td><td>46.49</td><td>29.15</td><td>40.00</td><td>-10.85</td><td>45.72</td><td>0.69</td><td>15.16</td><td>32.42</td><td>300</td><td>360 Peak</td><td>HORIZONTAL</td></tr><tr><td>3</td><td>115.36</td><td>30.27</td><td>43.50</td><td>-13.23</td><td>43.24</td><td>1.11</td><td>18.28</td><td>32.36</td><td>300</td><td>360 Peak</td><td>HORIZONTAL</td></tr><tr><td>4</td><td>148.34</td><td>26.61</td><td>43.50</td><td>-16.89</td><td>41.24</td><td>1.25</td><td>16.45</td><td>32.33</td><td>300</td><td>360 Peak</td><td>HORIZONTAL</td></tr><tr><td>5</td><td>598.42</td><td>34.45</td><td>46.00</td><td>-11.55</td><td>39.50</td><td>2.59</td><td>24.74</td><td>32.38</td><td>300</td><td>360 Peak</td><td>HORIZONTAL</td></tr><tr><td>6</td><td>970.90</td><td>34.03</td><td>54.00</td><td>-19.97</td><td>34.99</td><td>3.24</td><td>26.79</td><td>30.99</td><td>300</td><td>360 Peak</td><td>HORIZONTAL</td></tr></table>														Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		1	31.94	36.42	40.00	-3.58	45.40	0.52	22.93	32.43	127	168 QP	HORIZONTAL	2	46.49	29.15	40.00	-10.85	45.72	0.69	15.16	32.42	300	360 Peak	HORIZONTAL	3	115.36	30.27	43.50	-13.23	43.24	1.11	18.28	32.36	300	360 Peak	HORIZONTAL	4	148.34	26.61	43.50	-16.89	41.24	1.25	16.45	32.33	300	360 Peak	HORIZONTAL	5	598.42	34.45	46.00	-11.55	39.50	2.59	24.74	32.38	300	360 Peak	HORIZONTAL	6	970.90	34.03	54.00	-19.97	34.99	3.24	26.79	30.99	300	360 Peak	HORIZONTAL
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																																																																																																	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg																																																																																																		
1	31.94	36.42	40.00	-3.58	45.40	0.52	22.93	32.43	127	168 QP	HORIZONTAL																																																																																																	
2	46.49	29.15	40.00	-10.85	45.72	0.69	15.16	32.42	300	360 Peak	HORIZONTAL																																																																																																	
3	115.36	30.27	43.50	-13.23	43.24	1.11	18.28	32.36	300	360 Peak	HORIZONTAL																																																																																																	
4	148.34	26.61	43.50	-16.89	41.24	1.25	16.45	32.33	300	360 Peak	HORIZONTAL																																																																																																	
5	598.42	34.45	46.00	-11.55	39.50	2.59	24.74	32.38	300	360 Peak	HORIZONTAL																																																																																																	
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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.)																																																																																																												

RSE below 1GHz Result																																																																																																												
Operating Mode	2				Power Phase				Vertical																																																																																																			
Operating Function	CTX																																																																																																											
Level (dBuV/m) Date: 2019-03-01 Time: 14:06:20  Frequency (MHz) <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>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>31.94</td><td>36.83</td><td>40.00</td><td>-3.17</td><td>45.81</td><td>0.52</td><td>22.93</td><td>32.43</td><td>122</td><td>178 QP</td><td>VERTICAL</td></tr><tr><td>2</td><td>49.40</td><td>34.08</td><td>40.00</td><td>-5.92</td><td>51.90</td><td>0.72</td><td>13.88</td><td>32.42</td><td>100</td><td>89 QP</td><td>VERTICAL</td></tr><tr><td>3</td><td>62.01</td><td>32.63</td><td>40.00</td><td>-7.37</td><td>51.97</td><td>0.83</td><td>12.23</td><td>32.40</td><td>300</td><td>0 Peak</td><td>VERTICAL</td></tr><tr><td>4</td><td>98.87</td><td>28.34</td><td>43.50</td><td>-15.16</td><td>42.91</td><td>1.06</td><td>16.74</td><td>32.37</td><td>300</td><td>0 Peak</td><td>VERTICAL</td></tr><tr><td>5</td><td>729.37</td><td>36.09</td><td>46.00</td><td>-9.91</td><td>39.94</td><td>2.89</td><td>25.53</td><td>32.27</td><td>300</td><td>0 Peak</td><td>VERTICAL</td></tr><tr><td>6</td><td>984.48</td><td>34.55</td><td>54.00</td><td>-19.45</td><td>35.39</td><td>3.20</td><td>26.87</td><td>30.91</td><td>300</td><td>0 Peak</td><td>VERTICAL</td></tr></table>														Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		1	31.94	36.83	40.00	-3.17	45.81	0.52	22.93	32.43	122	178 QP	VERTICAL	2	49.40	34.08	40.00	-5.92	51.90	0.72	13.88	32.42	100	89 QP	VERTICAL	3	62.01	32.63	40.00	-7.37	51.97	0.83	12.23	32.40	300	0 Peak	VERTICAL	4	98.87	28.34	43.50	-15.16	42.91	1.06	16.74	32.37	300	0 Peak	VERTICAL	5	729.37	36.09	46.00	-9.91	39.94	2.89	25.53	32.27	300	0 Peak	VERTICAL	6	984.48	34.55	54.00	-19.45	35.39	3.20	26.87	30.91	300	0 Peak	VERTICAL
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase																																																																																																	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg																																																																																																		
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4	98.87	28.34	43.50	-15.16	42.91	1.06	16.74	32.37	300	0 Peak	VERTICAL																																																																																																	
5	729.37	36.09	46.00	-9.91	39.94	2.89	25.53	32.27	300	0 Peak	VERTICAL																																																																																																	
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Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
5.2G;VHT40;Nss1,(M0);Ntx2;5190	Pass	AV	5.1496G	53.87	54.00	-0.13	7.24	3	V	312	1.08	-

