

Project No: CB10605218

Report No.: FR733173-01

FCC Test Report

: ePMP Force 190 Equipment

Brand Name : Cambium Networks

Model No. : ePMP Force 190

FCC ID : Z8H89FT0031

Standard : 47 CFR FCC Part 15.407

Operating Band : 5250 MHz - 5350 MHz

5470 MHz - 5725 MHz

Applicant : Cambium Networks Inc.

3800 Golf Road, Suite 360 Rolling Meadows, IL 60008,

USA

Manufacturer : Cambium Networks Inc.

3800 Golf Road, Suite 360 Rolling Meadows, IL 60008,

USA

:

Outdoor;
Indoor;
Fixed P2P Function

Client

: X With TPC Without TPC TPC Function

The product sample received on Mar. 30, 2017 and completely tested on Apr. 18, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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Summary of Test Result

Conformance Test Specifications				
Report Clause	Ref. Std. Clause	Description	Result	
1.1.2	15.203	Antenna Requirement	Complied	
3.1	15.407(a)	Emission Bandwidth	Complied	
3.2	15.407(a)	Maximum Conducted Output Power	Complied	
3.3	15.407(a)	Peak Power Spectral Density	Complied	
3.4	15.407(b)	Unwanted Emissions	Complied	
3.5	15.407(g)	Frequency Stability	Complied	

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Revision History

Report No.	Version	Description	Issued Date
FR733173-01	Rev. 01	Initial issue of report	May 31, 2017

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1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Mode	Ch. Frequency (MHz)	Channel Number
5250-5350	QPSK, 10M	5250	19
		5255	
		5260	
		5265	
		5270	
		5275	
		5280	
		5285	
		5290	
		5295	
		5300	
		5305	
		5310	
		5315	
		5320	
		5325	
		5330	
		5335	
		5340	
5470-5725		5480	50
		5485	
		5490	
		5495	
		5500	
		5505	
		5510	
		5515	
		5520	
		5525	
		5530	
		5535	

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5540 5555 5550 5555 5560 5565 5570 5575 5580 5580 5580 5580 5690 5595 5600 5610 5615 5620 5625 5630 5635 5640 5645 5650 5665 5660 5665 5670 5675 5680 5695 5700 5705 5710 5715	 	
5550 5555 5560 5560 5570 5575 5580 5580 5685 5590 5595 5600 5610 5615 5620 5625 5630 5635 5640 5645 5650 5655 5660 5665 5670 5680 5680 5695 5700 5705 5710 5715	5540	
5555 5560 5560 5570 5575 5580 5580 5585 5590 5595 5600 5605 5610 5615 5620 5625 5630 5635 5640 5645 5650 5655 5660 5665 5670 5675 5680 5685 5690 5695 5700 5705 5710 5715	5545	
5560 5570 5570 5575 5580 5581 5590 5595 5600 5605 5610 5615 5620 5625 5630 5635 5640 5645 5650 5665 5660 5665 5670 5675 5680 5695 5690 5695 5700 5705 5710 5715	5550	
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5590 5595 5600 5605 5610 5615 5620 5625 5630 5635 5640 5645 5660 5665 5660 5670 5675 5680 5695 5690 5695 5700 5705 5710 5715	5580	
5595 5600 5605 5610 5615 5620 5625 5630 5635 5640 5645 5660 5665 5660 5670 5675 5680 5695 5700 5705 5710 5715	5585	
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5615 5620 5625 5630 5630 5635 5640 5645 5650 5665 5660 5665 5670 5675 5680 5685 5690 5695 5700 5710	5605	
5620 5625 5630 5635 5640 5645 5660 5665 5660 5665 5670 5675 5680 5685 5690 5695 5700 5715	5610	
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5630 5635 5640 5645 5650 5650 5660 5665 5670 5675 5680 5685 5690 5695 5700 5715	5620	
5635 5640 5645 5650 5655 5660 5665 5665 5670 5675 5680 5685 5690 5695 5700 5710 5715	5625	
5640 5645 5650 5655 5660 5665 5660 5665 5670 5675 5680 5685 5690 5695 5700 5715	5630	
5645 5650 5655 5660 5665 5660 5665 5670 5675 5680 5685 5690 5695 5700 5715	5635	
5650 5655 5660 5665 5665 5670 5675 5680 5685 5690 5695 5700 5710 5715	5640	
5655 5660 5665 5670 5675 5680 5685 5690 5695 5700 5710 5715	5645	
5660 5665 5670 5675 5680 5685 5690 5695 5700 5705 5710 5715	5650	
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5685 5690 5695 5700 5705 5710 5715	5675	
5690 5695 5700 5705 5710 5715	5680	
5690 5695 5700 5705 5710 5715	5685	
5695 5700 5705 5710 5715		
5700 5705 5710 5715		
5705 5710 5715		
5710 5715		
5715		
5720	5720	

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		5725	
5250-5350	QPSK, 40M	5270	2
		5310	
5470-5725		5510	4
		5550	
		5670	
		5710	

Band	Mode	BWch (MHz)	Nant
5.25-5.35GHz	QPSK,10M	10	2TX
5.25-5.35GHz	QPSK,40M	40	2TX
5.47-5.725GHz	QPSK,10M	10	2TX
5.47-5.725GHz	QPSK,40M	40	2TX

Note:

- 10M, 40M use QPSK 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.

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1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	-	-	Printed	N/A	22
1	2	-	-	Printed	N/A	22

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)
QPSK,10M	0.943	0.255
QPSK,40M	0.908	0.419

1.1.4 EUT Operational Condition

EUT Power Type	From PoE		
Beamforming Function	☐ With beamforming ☐ Without beamforming		
Weather Band	☐ With 5600~5650MHz ☐ Without 5600~5650MHz		

1.1.5 Table for Class III Change

This product is an extension of original one reported under Sporton project number: FR733173. Below is the table for the change of the product with respect to the original one.

Description	Performance Checking
Adding 5G Band 2 (5250/5255//5260/5265/5270/5275/5280/5285/5290/5295/5300/5305/5310/5315/5320/5325/5330/5335/5340) and 5G Band 3 (5480/5485/5490/5495/5500/5505/5510/5515/5520/5525/5530/5535/5540/5545/5550/5555/5560/5565/5570/5575/5580/5585/5590/5595/5600/5605/5610/5615/5620/5625/5630/5635/5640/5645/5650/5655/5660/5665/5670/5675/5680/5685/5690/5695/570 0/5705/5710/5715/5720/5725) only for 10M and 40M.	Emission Bandwidth Maximum Conducted Output Power Spectral Density Unwanted Emissions Frequency Stability

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1.2 Testing Applied Standards

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

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- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 789033 D02 v01r04
- FCC KDB 662911 D01 v02r01

1.3 Testing Location Information

	Testing Location					
	HWA YA	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		
\boxtimes	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	Lucke Hsieh	22°C / 54%	Apr. 07, 2017~Apr. 18, 2017
Radiated	03CH01-CB	Lucke Hsieh	22°C / 54%	Mar. 30, 2017~ Apr. 18, 2017

Test site Designation No. TW0006 with FCC Test site registered number IC 4086D 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
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 x10 ⁻⁸	Confidence levels of 95%
Frequency Stability	6.06 x10 ⁻⁸	Confidence levels of 95%

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2 Test Configuration of EUT

2.1 Test Channel Mode

Band	Power Setting
QPSK,10M_Nss1_2TX	<u>-</u>
5250MHz	13
5250MHz	13
5255MHz	13
5300MHz	7.5
5340MHz	8.5
QPSK,40M_Nss1_2TX	-
5270MHz	10.5
5310MHz	10.5
QPSK,10M_Nss1_2TX	-
5480MHz	9
5595MHz	13
5715MHz	14
5725MHz Straddle 5.47-5.725GHz	14
QPSK,40M_Nss1_2TX	-
5510MHz	11
5550MHz	11.5
5670MHz	11.5
5710MHz Straddle 5.47-5.725GHz	12.5
QPSK,10M_Nss1_2TX	-
5725MHz Straddle 5.725-5.85GHz	14
QPSK,40M_Nss1_2TX	-
5710MHz Straddle 5.725-5.85GHz	12.5

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2.2 The Worst Case Measurement Configuration

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

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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	CTX

Note: 1.The EUT can only be used at Z axis position.

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

Support Unit	Brand	Model
PoE	Cambium	G1021-300-0265

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Support Equipment

For Test Site No: 03CH01-CB / TH01-CB

	Support Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
1	NB	DELL	E4300	DoC
2	PoE	Cambium	G1021-300-0265	DoC

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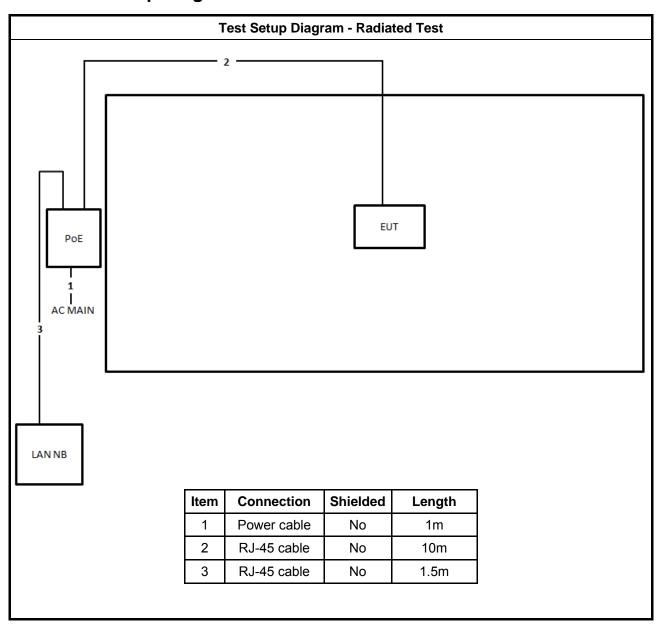
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^{2.} PoE information as below:



2.5 Test Setup Diagram



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3 Transmitter Test Result

3.1 Emission Bandwidth

3.1.1 Emission Bandwidth Limit

	Emission Bandwidth Limit		
UNI	UNII Devices		
\boxtimes	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 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 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.		
\boxtimes	For the 5.725-5.85 GHz band, 6 dB emission bandwidth ≥ 500kHz.		
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 ≥ 500kHz.		

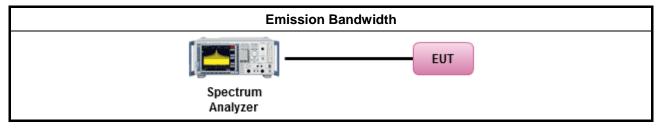
3.1.2 Measuring Instruments

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

3.1.3 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.

3.1.4 Test Setup



3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A

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3.2 Maximum Conducted Output Power

3.2.1 Maximum Conducted Output Power Limit

	Maximum Conducted Output Power Limit
UNI	I Devices
\boxtimes	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 \leq 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).
\boxtimes	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.
	t = maximum conducted output power in dBm, = the maximum transmitting antenna directional gain in dBi.

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3.2.2 Measuring Instruments

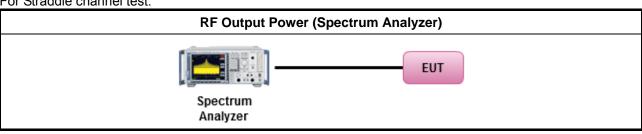
Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

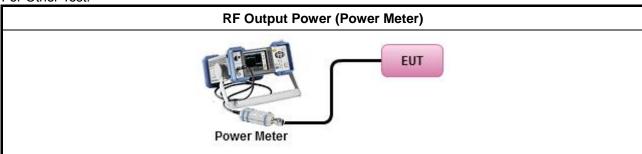
	Test Method
•	Maximum Conducted Output Power
	Average over on/off periods with duty factor
	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).
	Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
	Wideband RF power meter and average over on/off 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 + + P _n (calculated in linear unit [mW] and transfer to log unit [dBm]) EIRP _{total} = P _{total} + DG

3.2.4 Test Setup

For Straddle channel test:



For Other Test:



3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

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3.3 Peak Power Spectral Density

3.3.1 Peak Power Spectral Density Limit

	Peak Power Spectral Density Limit
UN	II Devices
\boxtimes	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) \leq 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) \leq 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) \leq 11 dBm/MHz. If $G_{TX} >$ 6 dBi, then PPSD= 11 $-$ ($G_{TX} -$ 6).
\boxtimes	For the 5.725-5.85 GHz band:
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) \leq 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) \leq 4 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) \leq 10 dBm/MHz.
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) \leq 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 $0^{\circ} \le \theta < 8^{\circ}$; -13 – 0.716 (θ -8) dBW/MHz for $8^{\circ} \le \theta < 40^{\circ}$ -35.9 – 1.22 (θ -40) dBW/MHz for $40^{\circ} \le \theta \le 45^{\circ}$; -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) \leq 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) \leq 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.
pow	SD = peak power spectral density that he same method as used to determine the conducted output ver shall be used to determine the power spectral density. And power spectral density in dBm/MHz $_{c}$ = the maximum transmitting antenna directional gain in dBi.

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3.3.2 Measuring Instruments

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

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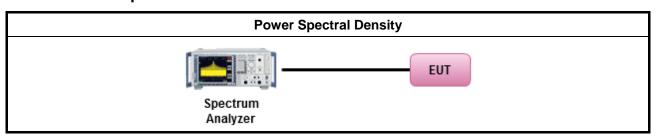
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3.3.3 Test Procedures

		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, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth				
	[duty	v cycle ≥ 98% or external video / power trigger]				
	\boxtimes	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 + + PPSD_n \\ (calculated in linear unit [mW] and transfer to log unit [dBm]) \\ EIRP_{total} = PPSD_{total} + DG $				

3.3.4 Test Setup



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3.3.5 Test Result of Peak Power Spectral Density

Refer as Appendix C

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3.4 Unwanted Emissions

3.4.1 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.p27 dBm [68.2 dBuV/m@3m]						
5.25 - 5.35 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]						
5.47 - 5.725 GHz	e.i.r.p27 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).

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3.4.2 Measuring Instruments

has no need to be reported.

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

3.4.3 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 ≥ 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 ≥ 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

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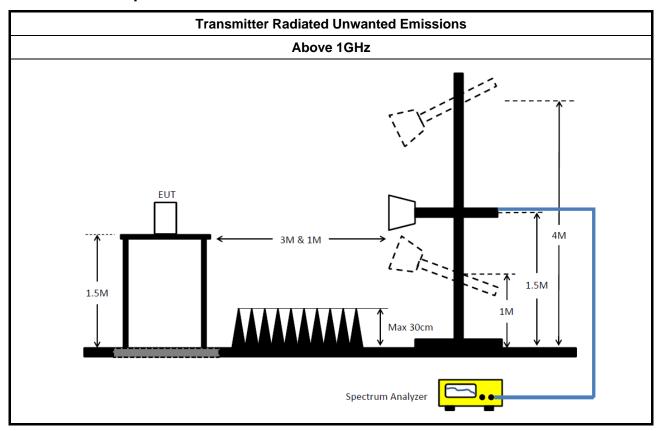
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3.4.4 Test Setup



3.4.5 Test Result of Transmitter Unwanted Emissions

Refer as Appendix D

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3.5 Frequency Stability

3.5.1 Frequency Stability Limit

Frequency Stability Limit

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UNII Devices

• In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

LE-LAN Devices

N/A

IEEE Std. 802.11

■ The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band and ± 25 ppm maximum for the 2.4 GHz band.

3.5.2 Measuring Instruments

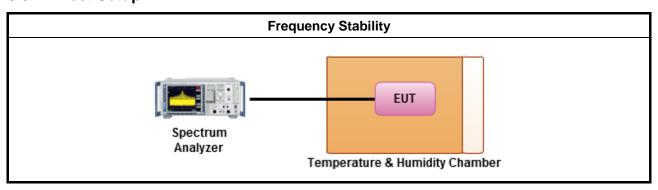
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method

- Refer as ANSI C63.10, clause 6.8 for frequency stability tests
 - Frequency stability with respect to ambient temperature
 - Frequency stability when varying supply voltage
 - Extreme temperature is -40°C~70°C.

3.5.4 Test Setup



3.5.5 Test Result of Frequency Stability

Refer as Appendix E

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4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 22, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-10-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 26, 2016	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 22, 2016	Conducted (TH01-CB)

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

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EBW Result Appendix A

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
QPSK,10M_Nss1_2TX	-	-	-	-	-
5.15-5.25GHz	4.96M	4.398M	4M40D1D	4.8M	4.398M
5.25-5.35GHz	10.8M	8.821M	8M82D1D	4.8M	4.398M
QPSK,40M_Nss1_2TX	-	-	-	-	-
5.25-5.35GHz	47.55M	36.282M	36M3D1D	46.45M	36.182M
QPSK,10M_Nss1_2TX	-	-	-	-	-
5.47-5.725GHz	10.55M	8.821M	8M82D1D	4.92M	4.363M
QPSK,40M_Nss1_2TX	-	-	-	-	-
5.47-5.725GHz	48.35M	36.382M	36M4D1D	38.43M	33.093M
QPSK,10M_Nss1_2TX	-	-	-	-	-
5.725-5.85GHz	4.3M	4.478M	4M48D1D	4.28M	4.338M
QPSK,40M_Nss1_2TX	-	-	-	-	-
5.725-5.85GHz	3.14M	4.978M	4M98D1D	3.14M	4.718M

Max-N dB = Maximum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band; Max-OBW = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;

Min-OBW = Minimum 99% occupied bandwidth;

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EBW Result Appendix A

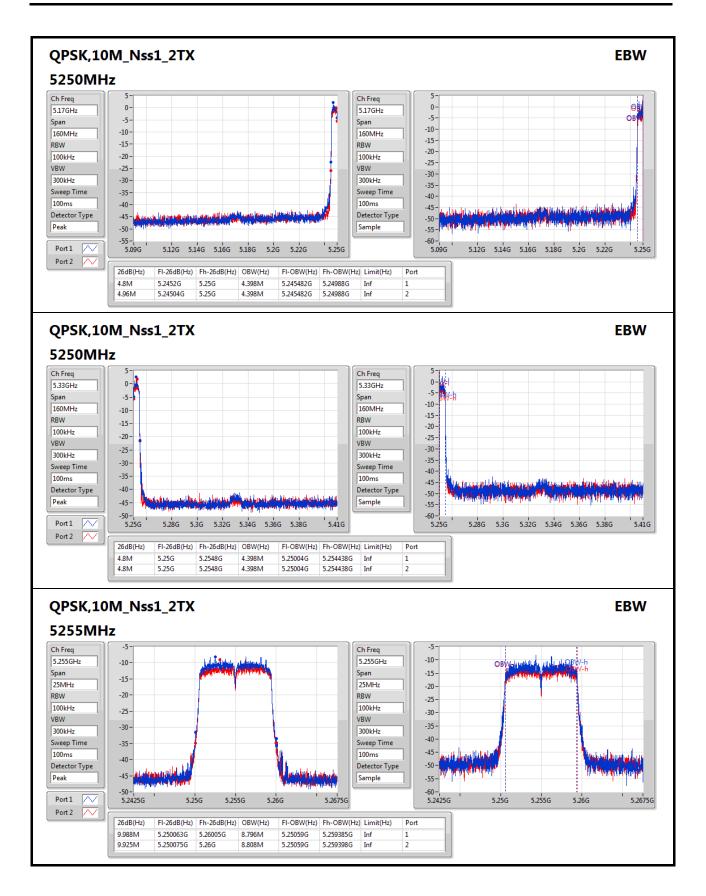
Result

Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
QPSK,10M_Nss1_2TX	-	-	-	-	-	-
5250MHz	Pass	Inf	4.8M	4.398M	4.96M	4.398M
5250MHz	Pass	Inf	4.8M	4.398M	4.8M	4.398M
5255MHz	Pass	Inf	9.988M	8.796M	9.925M	8.808M
5300MHz	Pass	Inf	9.95M	8.808M	10.438M	8.796M
5340MHz	Pass	Inf	10.8M	8.808M	10.388M	8.821M
QPSK,40M_Nss1_2TX	-	-	-	-	-	-
5270MHz	Pass	Inf	47.55M	36.282M	46.45M	36.232M
5310MHz	Pass	Inf	47.55M	36.182M	46.7M	36.232M
QPSK,10M_Nss1_2TX	-	-	-	-	-	-
5480MHz	Pass	Inf	10.375M	8.796M	10.288M	8.821M
5595MHz	Pass	Inf	10.55M	8.808M	10M	8.821M
5715MHz	Pass	Inf	10.413M	8.796M	9.875M	8.808M
5725MHz Straddle 5.47-5.725GHz	Pass	Inf	5.1M	4.363M	4.92M	4.363M
QPSK,40M_Nss1_2TX	-	-	-	-	-	-
5510MHz	Pass	Inf	47.5M	36.282M	47M	36.282M
5550MHz	Pass	Inf	48.35M	36.382M	46.65M	36.182M
5670MHz	Pass	Inf	47.6M	36.182M	45.85M	36.182M
5710MHz Straddle 5.47-5.725GHz	Pass	Inf	40.04M	33.093M	38.43M	33.093M
QPSK,10M_Nss1_2TX	-	-	-	-	-	-
5725MHz Straddle 5.725-5.85GHz	Pass	500k	4.28M	4.338M	4.3M	4.478M
QPSK,40M_Nss1_2TX	-	-	-	-	-	-
5710MHz Straddle 5.725-5.85GHz	Pass	500k	3.14M	4.978M	3.14M	4.718M

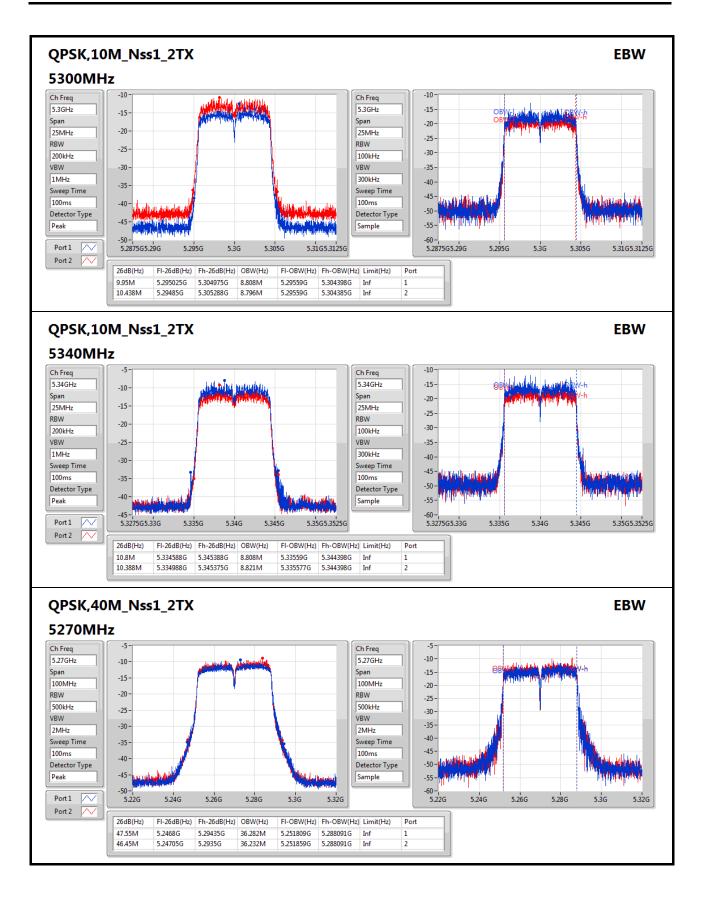
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band Port X-OBW = Port X 99% occupied bandwidth;

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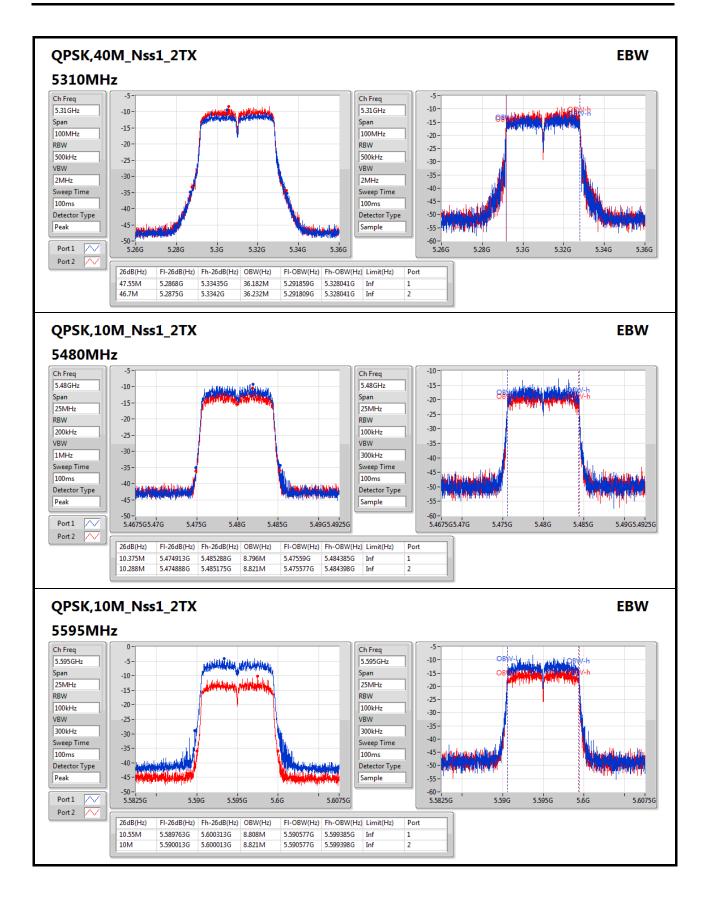




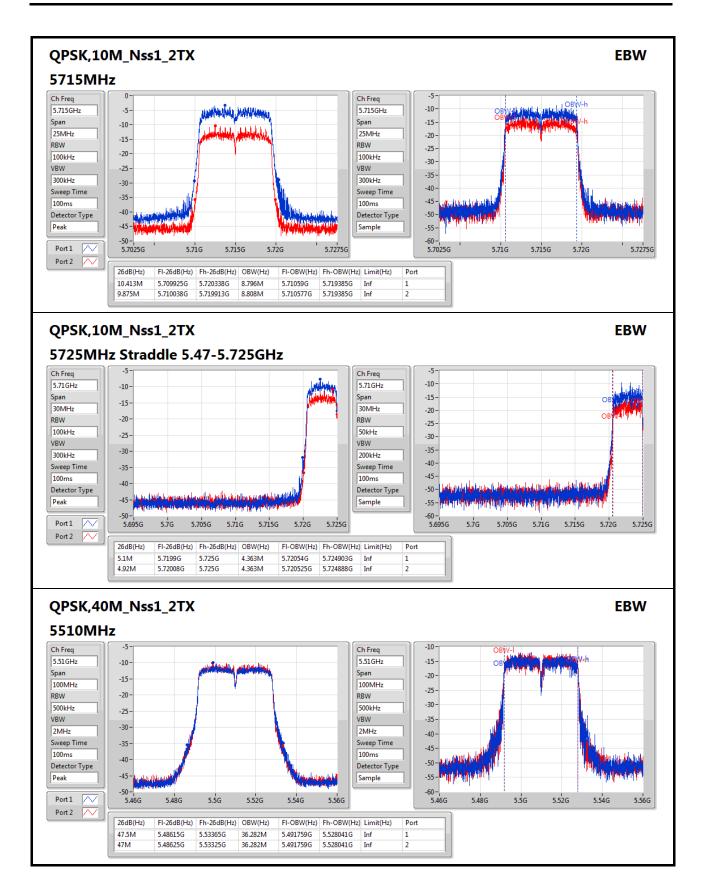


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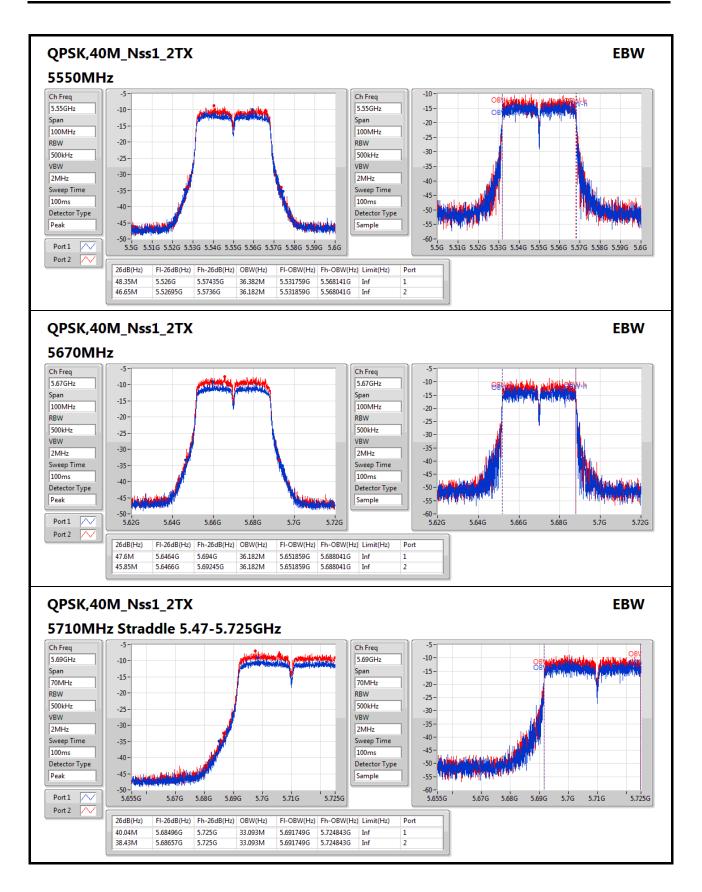




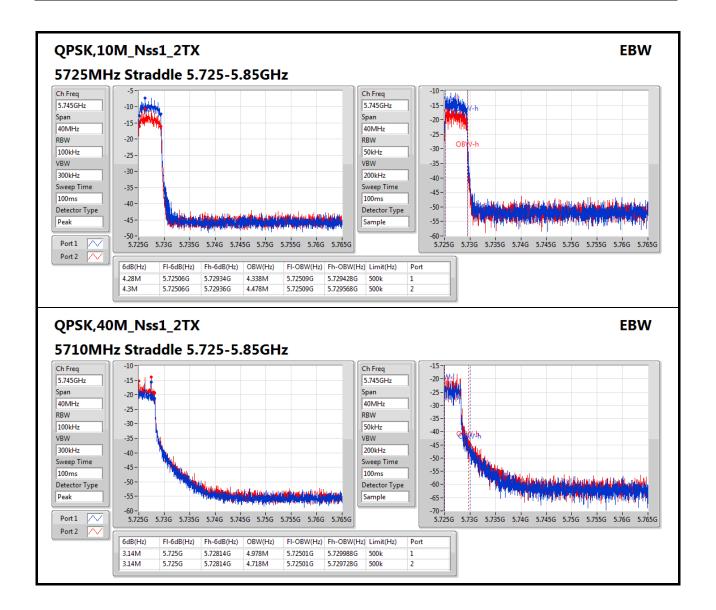


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Power Result Appendix B

Summary

Mode	Total Power	Total Power	EIRP	EIRP
	(dBm)	(W)	(dBm)	(W)
QPSK,10M_Nss1_2TX	-	-	-	-
5.15-5.25GHz	1.38	0.00137	23.38	0.21777
5.25-5.35GHz	4.84	0.00305	26.84	0.48306
QPSK,40M_Nss1_2TX	-	-	-	-
5.25-5.35GHz	3.01	0.00200	25.01	0.31696
QPSK,10M_Nss1_2TX	-	-	-	-
5.47-5.725GHz	4.87	0.00307	26.87	0.48641
QPSK,40M_Nss1_2TX	-	-	-	-
5.47-5.725GHz	4.14	0.00259	26.14	0.41115
QPSK,10M_Nss1_2TX	-	-	-	-
5.725-5.85GHz	1.64	0.00146	23.64	0.23121
QPSK,40M_Nss1_2TX	-	-	-	-
5.725-5.85GHz	-7.01	0.00020	14.99	0.03155

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Power Result Appendix B

Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
QPSK,10M_Nss1_2TX	-	-	-	-	-	-
5250MHz	Pass	22.00	-0.93	-2.47	1.38	30.00
5250MHz	Pass	22.00	-0.72	-1.89	1.74	1.81
5255MHz	Pass	22.00	2.38	1.2	4.84	4.97
5300MHz	Pass	22.00	-2.47	-4.35	-0.30	4.98
5340MHz	Pass	22.00	-1.55	-3.13	0.74	5.17
QPSK,40M_Nss1_2TX	-	-	-	-	-	-
5270MHz	Pass	22.00	-0.68	-0.23	2.56	7.98
5310MHz	Pass	22.00	-0.57	0.51	3.01	7.98
QPSK,10M_Nss1_2TX	-	-	-	-	-	-
5480MHz	Pass	22.00	-2.18	-3.78	0.10	5.12
5595MHz	Pass	22.00	3.06	0.08	4.83	5.00
5715MHz	Pass	22.00	3.35	-0.43	4.87	4.95
5725MHz Straddle 5.47-5.725GHz	Pass	22.00	0.36	-3.45	1.87	1.92
QPSK,40M_Nss1_2TX	-	-	-	-	-	-
5510MHz	Pass	22.00	-0.89	-0.5	2.32	7.98
5550MHz	Pass	22.00	-0.39	0.65	3.17	7.98
5670MHz	Pass	22.00	-0.15	1.72	3.90	7.98
5710MHz Straddle 5.47-5.725GHz	Pass	22.00	0.13	1.94	4.14	7.98
QPSK,10M_Nss1_2TX	-	-	-	-	-	-
5725MHz Straddle 5.725-5.85GHz	Pass	22.00	0.05	-3.5	1.64	30.00
QPSK,40M_Nss1_2TX	-	-	-	-	-	-
5710MHz Straddle 5.725-5.85GHz	Pass	22.00	-10.81	-9.35	-7.01	30.00

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

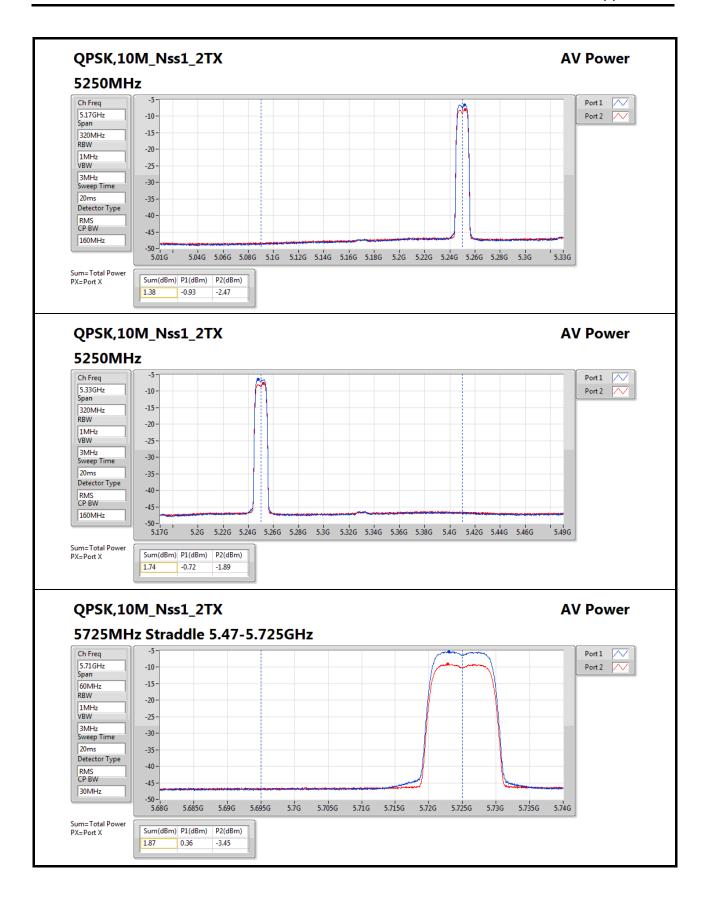
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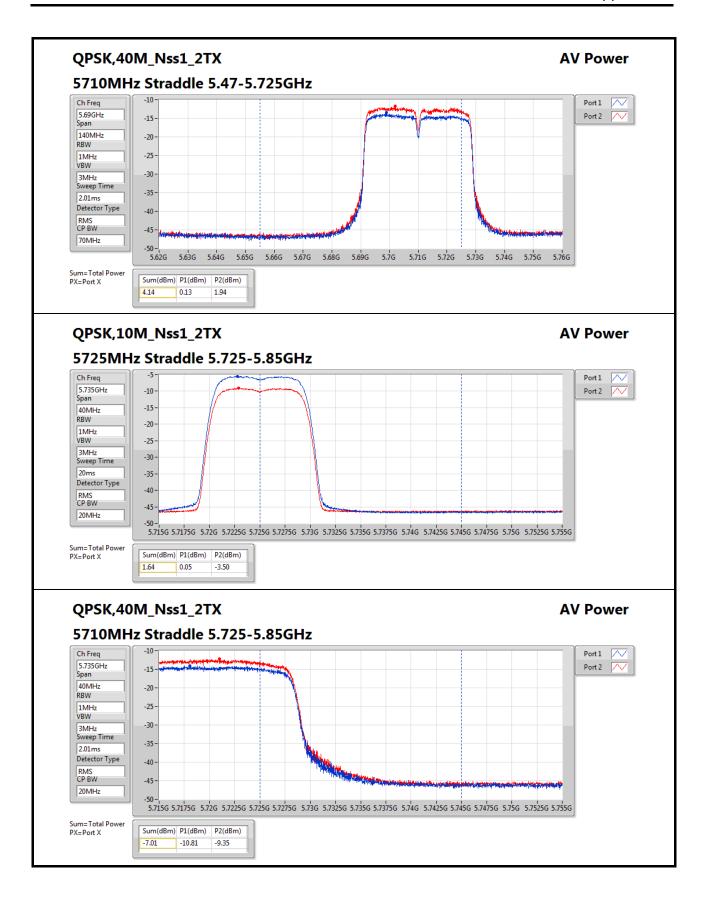
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PSD Result Appendix C

Summary

Mode	PD	EIRP PD
	(dBm/RBW)	(dBm/RBW)
QPSK,10M_Nss1_2TX	-	-
5.15-5.25GHz	-5.87	16.13
5.25-5.35GHz	-5.16	16.84
QPSK,40M_Nss1_2TX	-	-
5.25-5.35GHz	-12.39	9.61
QPSK,10M_Nss1_2TX	-	-
5.47-5.725GHz	-5.02	16.98
QPSK,40M_Nss1_2TX	-	-
5.47-5.725GHz	-11.6	10.40
QPSK,10M_Nss1_2TX	-	-
5.725-5.85GHz	-6.99	15.01
QPSK,40M_Nss1_2TX	-	-
5.725-5.85GHz	-14.2	7.80

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



Appendix C **PSD** Result

Result

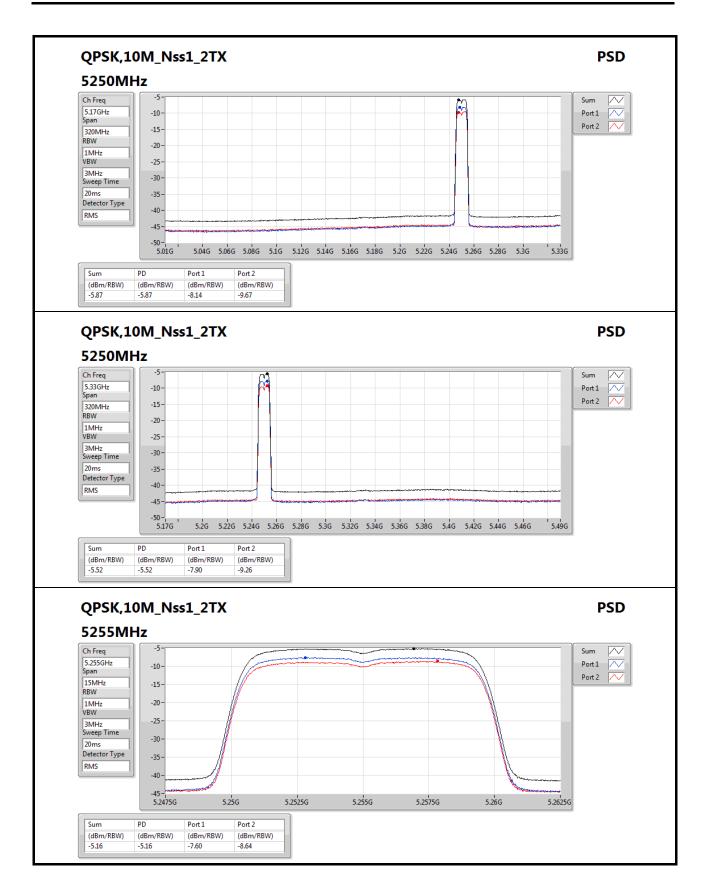
Mode	Result	DG	Port 1	Port 2	PD	PD Limit	
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	
QPSK,10M_Nss1_2TX	-	-	-	-	-	-	
5250MHz	Pass	22.00	-8.14	-9.67	-5.87	17.00	
5250MHz	Pass	22.00	-7.9	-9.26	-5.52	-5.00	
5255MHz	Pass	22.00	-7.6	-8.64	-5.16	-5.00	
5300MHz	Pass	22.00	-12.14	-14.08	-10.05	-5.00	
5340MHz	Pass	22.00	-11.33	-12.96	-9.11	-5.00	
QPSK,40M_Nss1_2TX	-	-	-	-	-	-	
5270MHz	Pass	22.00	-16.09	-15.67	-12.88	-5.00	
5310MHz	Pass	22.00	-15.93	-14.86	-12.39	-5.00	
QPSK,10M_Nss1_2TX	-	-	-	-	-	-	
5480MHz	Pass	22.00	-12.19	-13.77	-9.92	-5.00	
5595MHz	Pass	22.00	-7.23	-10.17	-5.56	-5.00	
5715MHz	Pass	22.00	-6.58	-10.13	-5.02	-5.00	
5725MHz Straddle 5.47-5.725GHz	Pass	22.00	-6.88	-10.63	-5.37	-5.00	
QPSK,40M_Nss1_2TX	-	-	-	-	-	-	
5510MHz	Pass	22.00	-16.88	-16.75	-13.83	-5.00	
5550MHz	Pass	22.00	-16.55	-15.77	-13.16	-5.00	
5670MHz	Pass	22.00	-16.07	-14.12	-12.03	-5.00	
5710MHz Straddle 5.47-5.725GHz	Pass	22.00	-15.61	-13.72	-11.60	-5.00	
QPSK,10M_Nss1_2TX	-	-	-	-	-	-	
5725MHz Straddle 5.725-5.85GHz	Pass	22.00	-8.59	-12.08	-6.99	30.00	
QPSK,40M_Nss1_2TX	-	-	=	-	-	-	
5710MHz Straddle 5.725-5.85GHz	Pass	22.00	-18.1	-16.38	-14.20	30.00	

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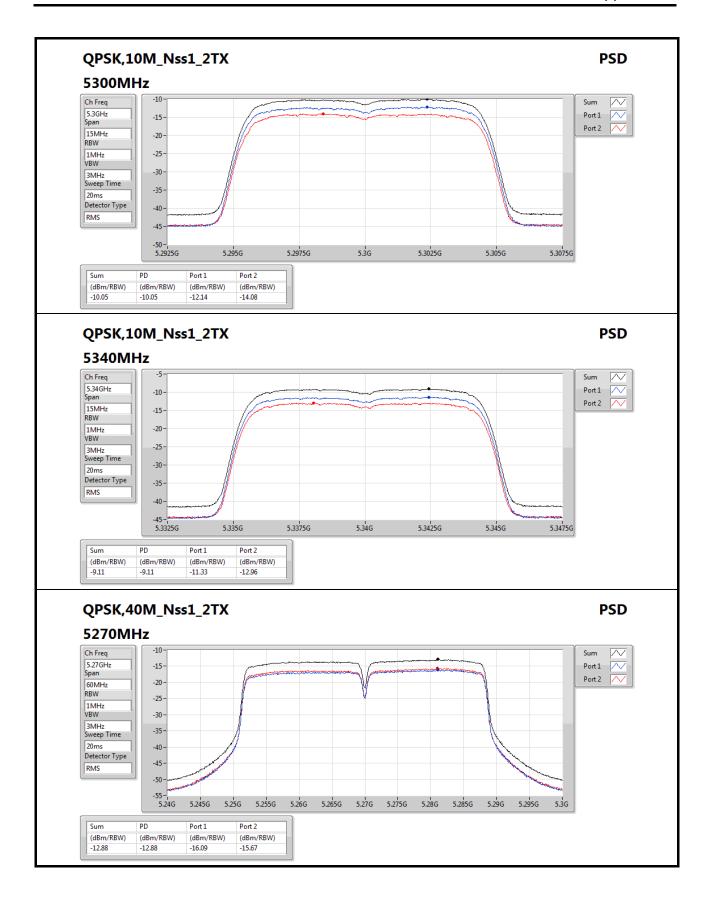
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : 2 of 8

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



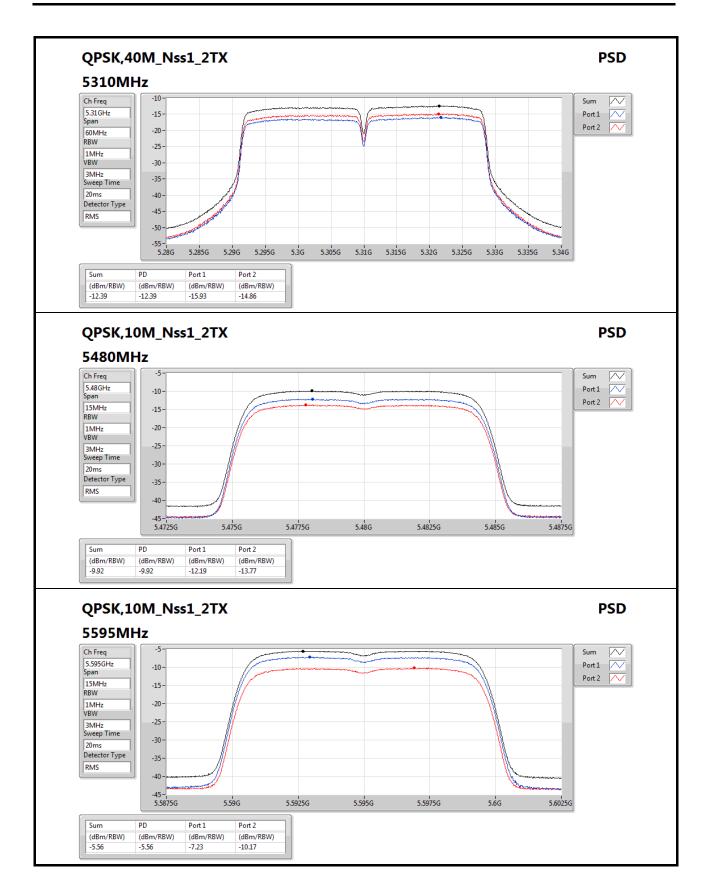




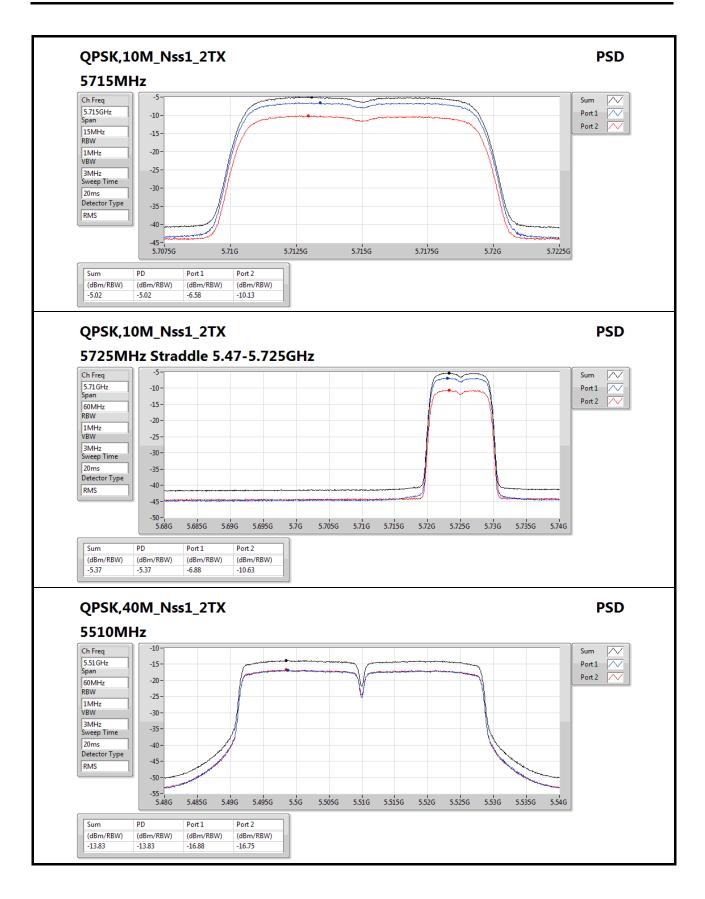


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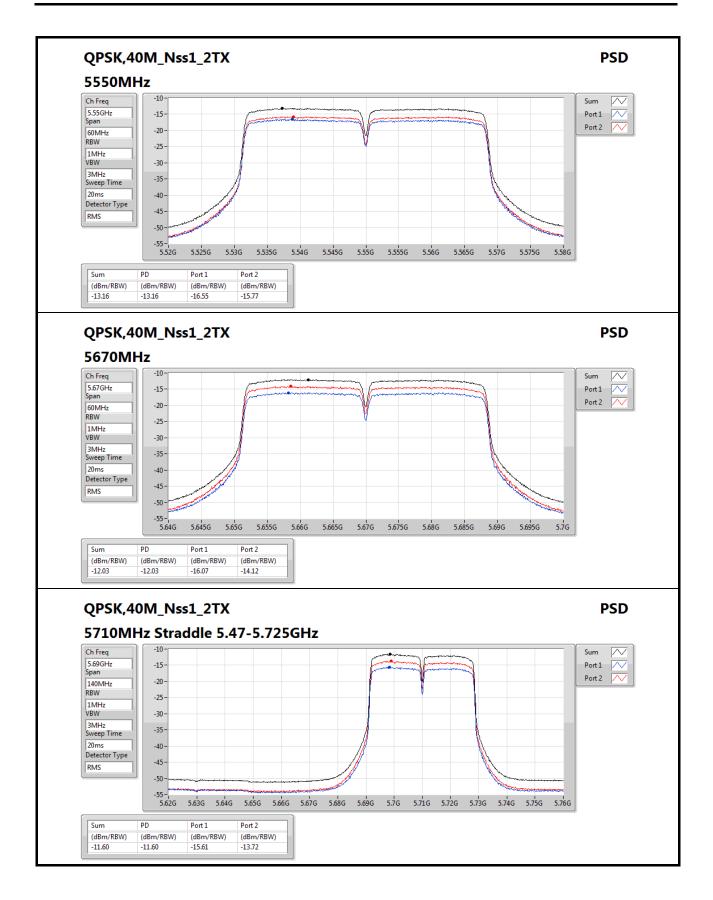






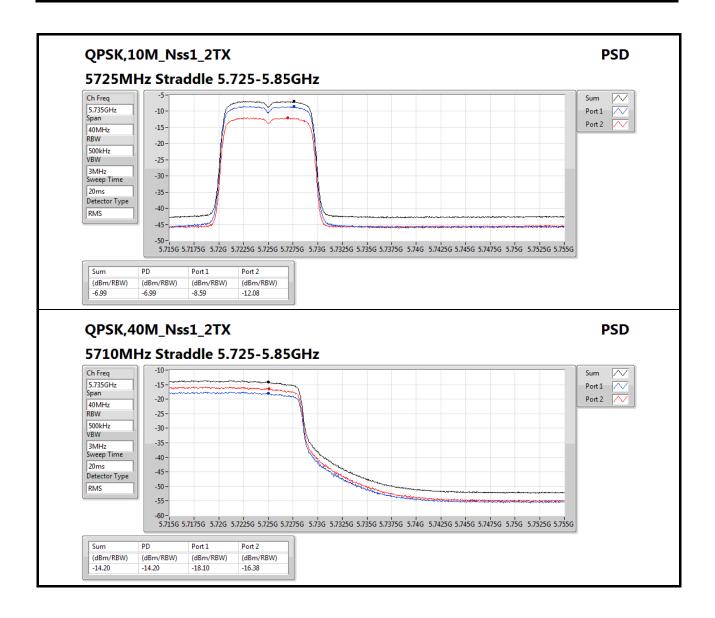
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RSE TX above 1GHz Result

Appendix D

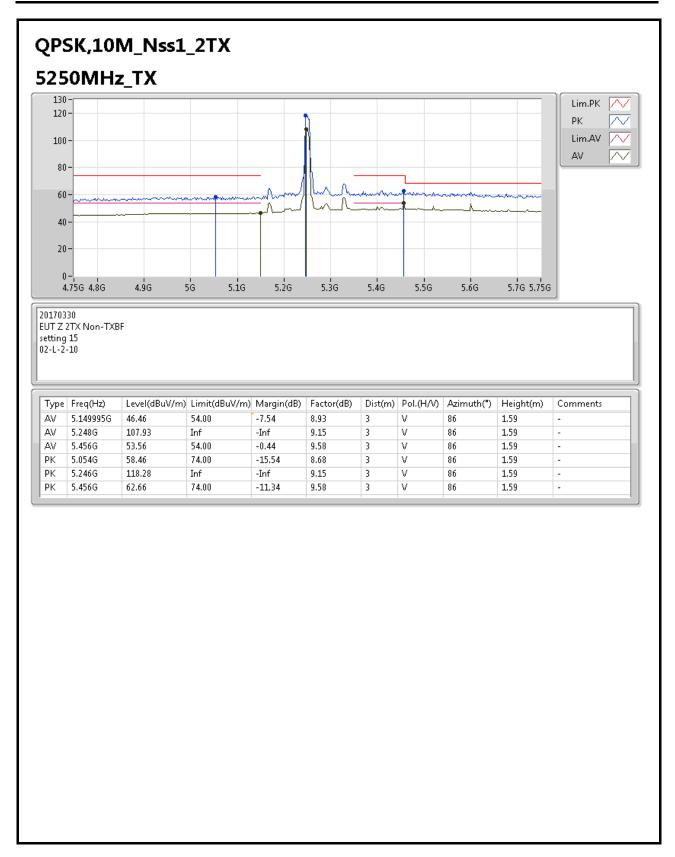
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Summary

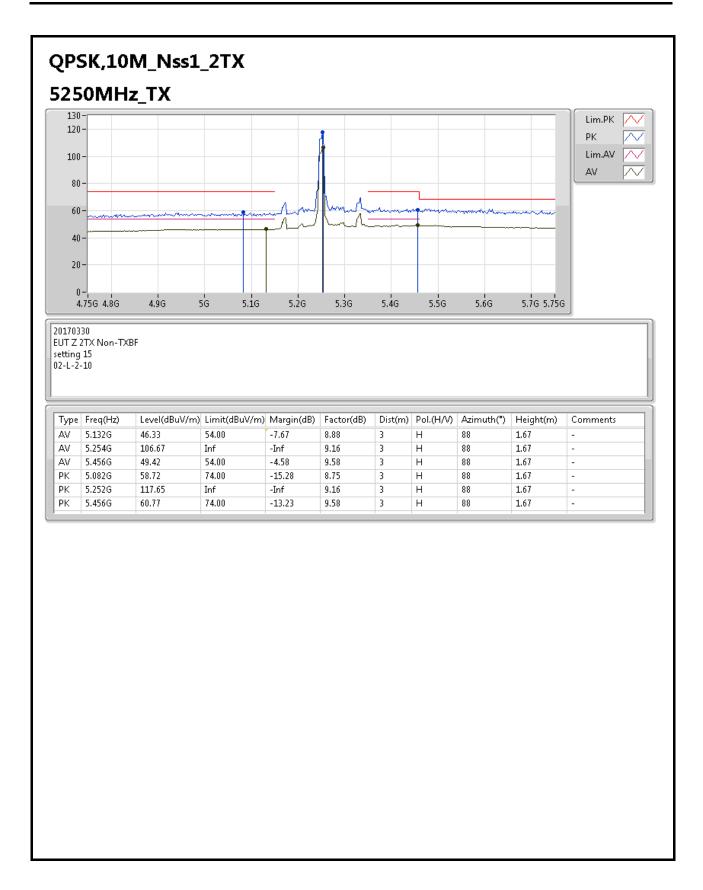
Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth	Height (m)	Comments
QPSK,10M_Nss1_2TX	-	-	-	-	-							-
5.47-5.725GHz	Pass	AV	5.402G	53.97	54.00	-0.03	9.44	3	Н	87	1.68	-

SPORTON INTERNATIONAL INC.

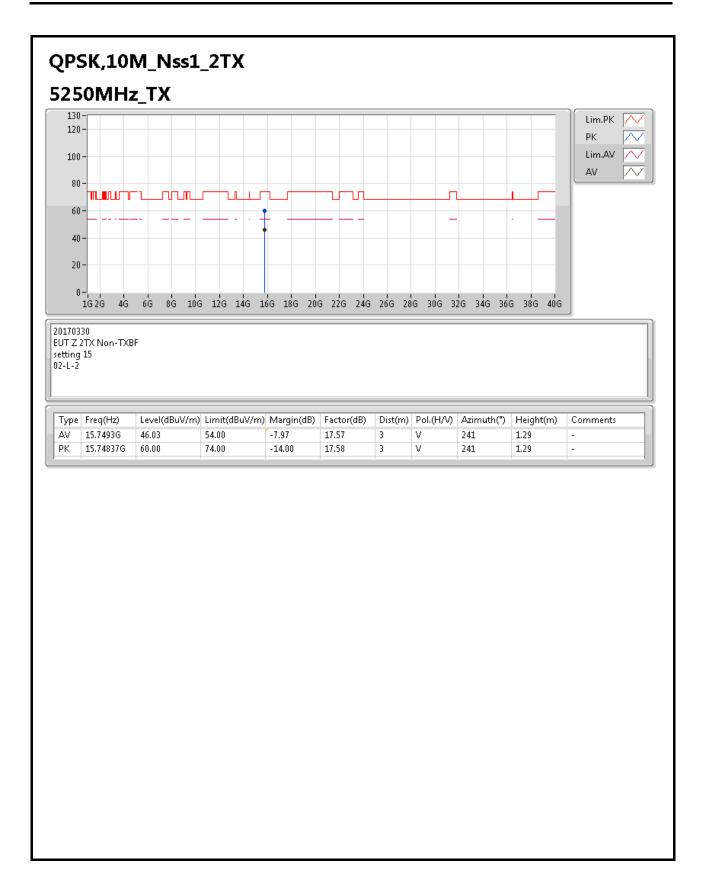






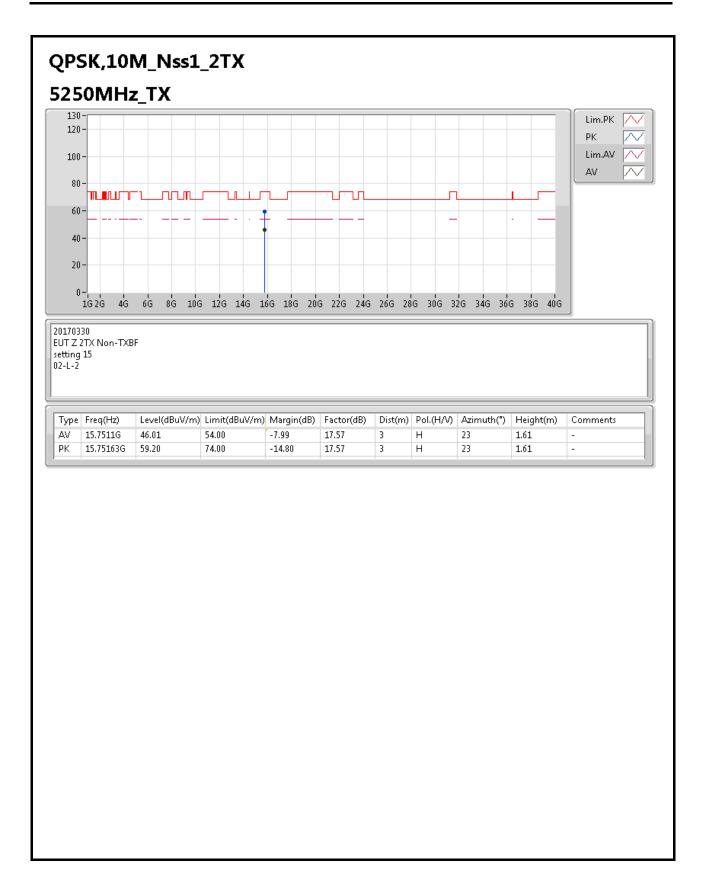




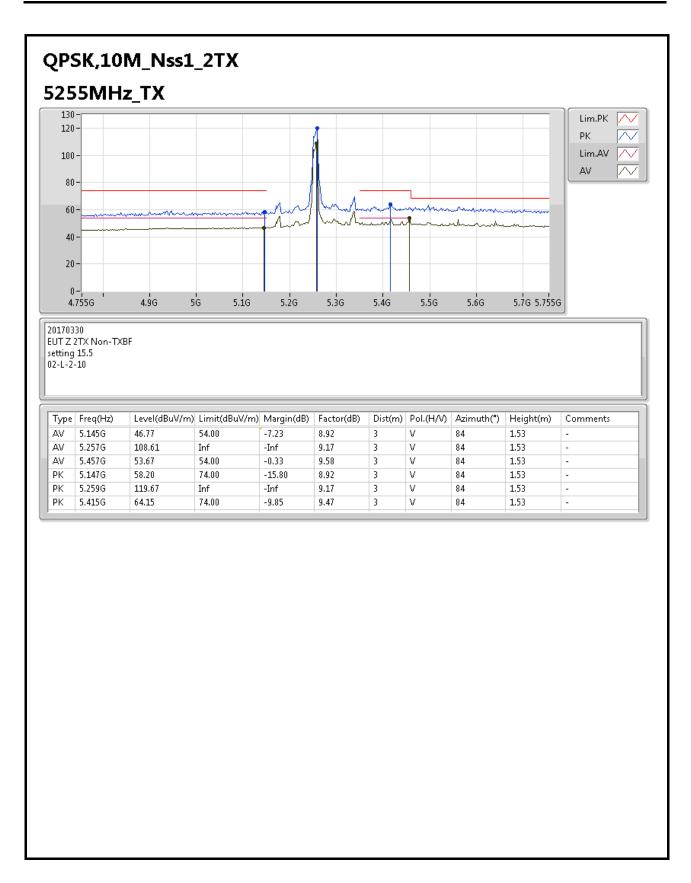


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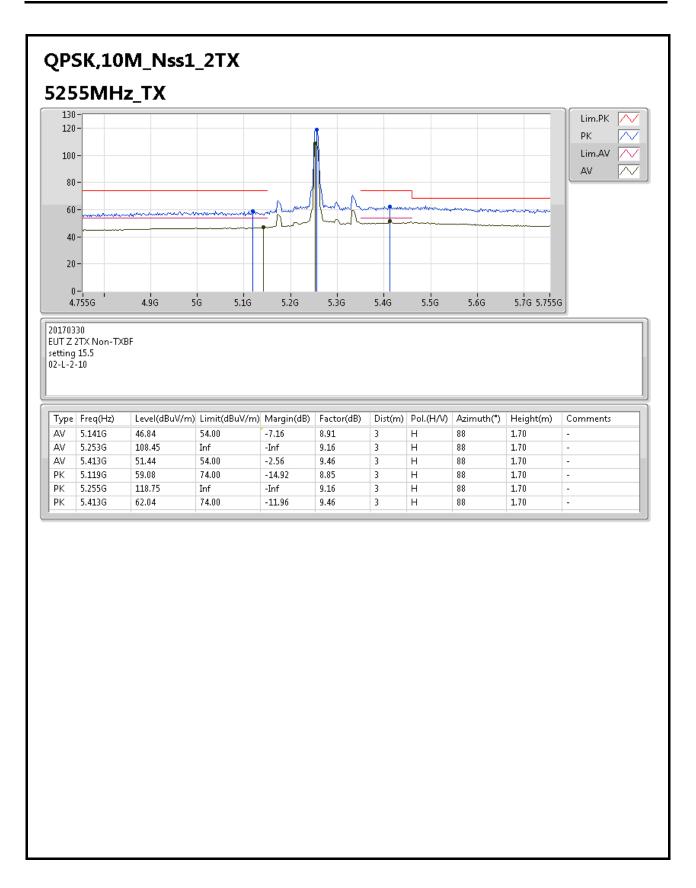




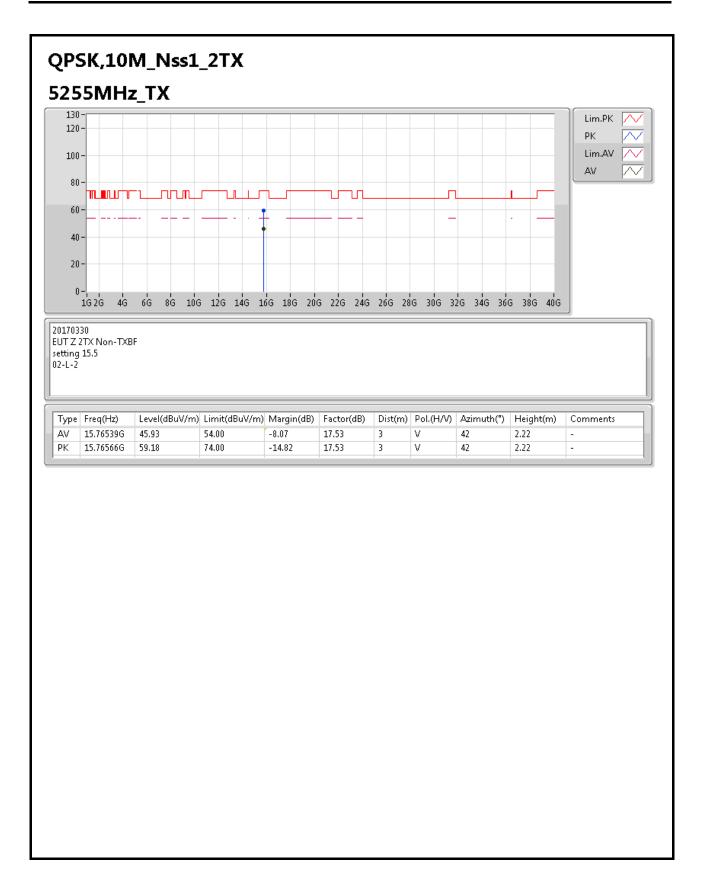






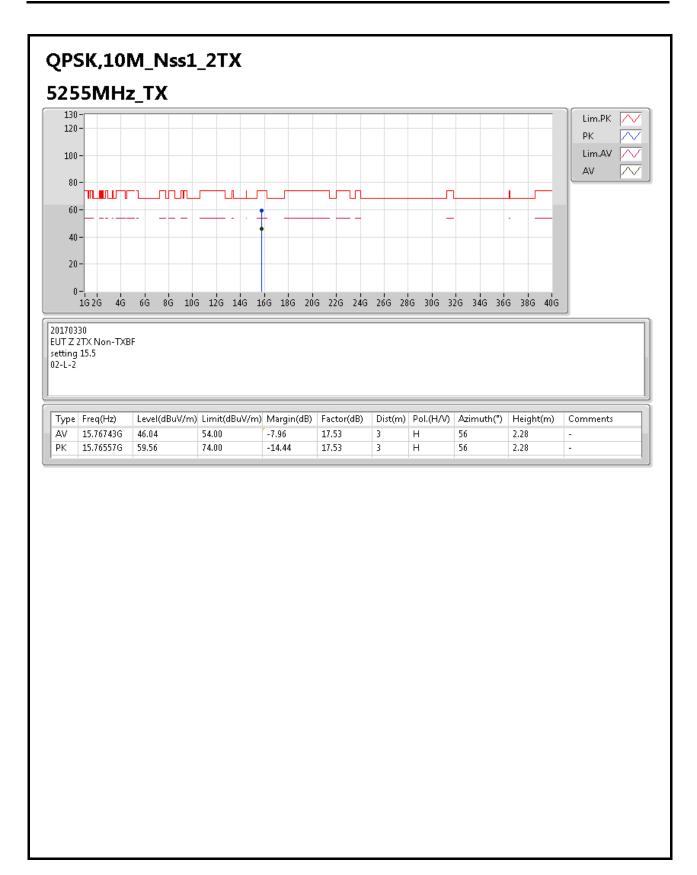




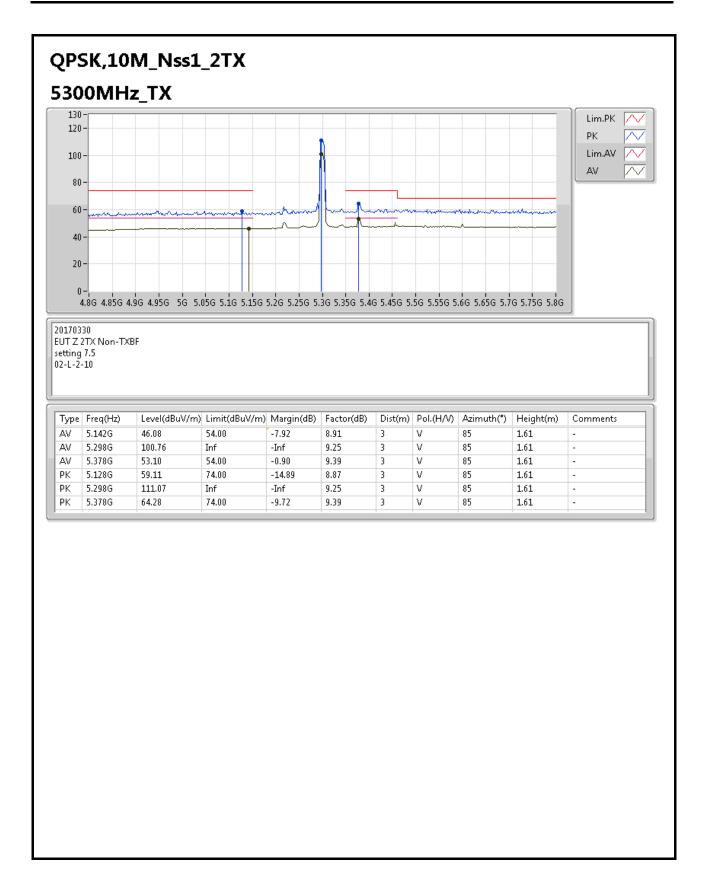


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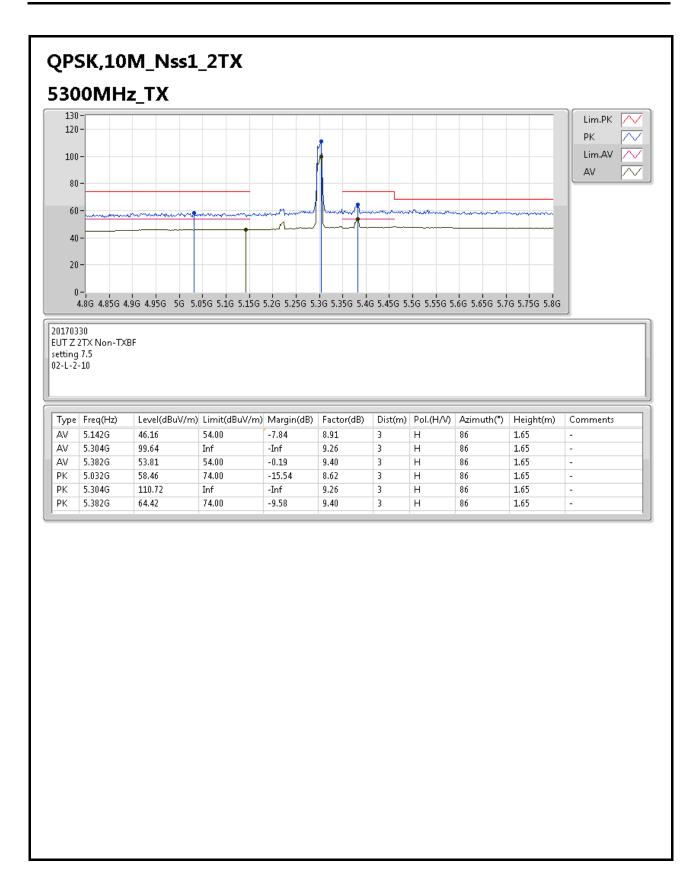




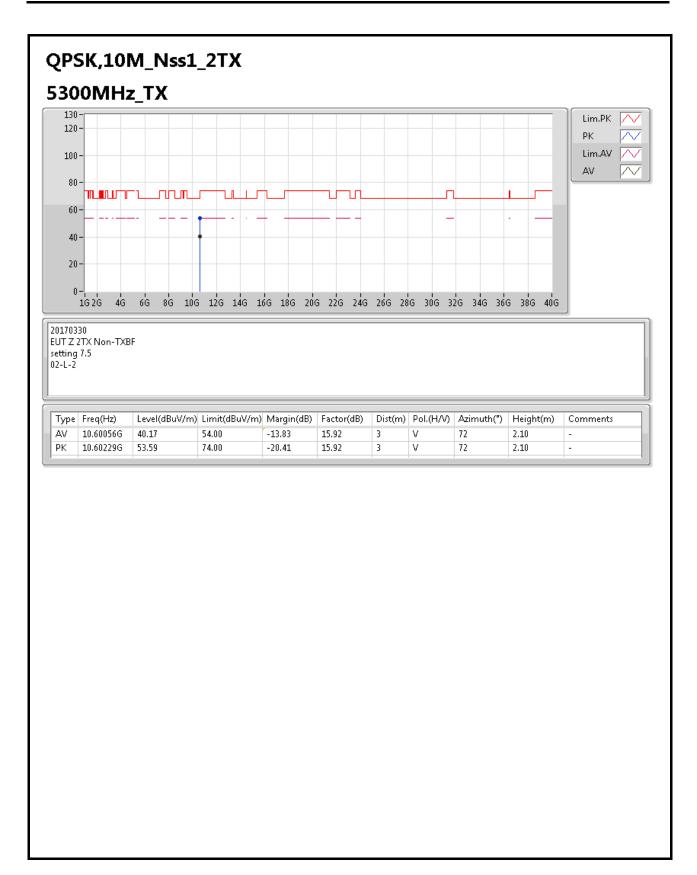




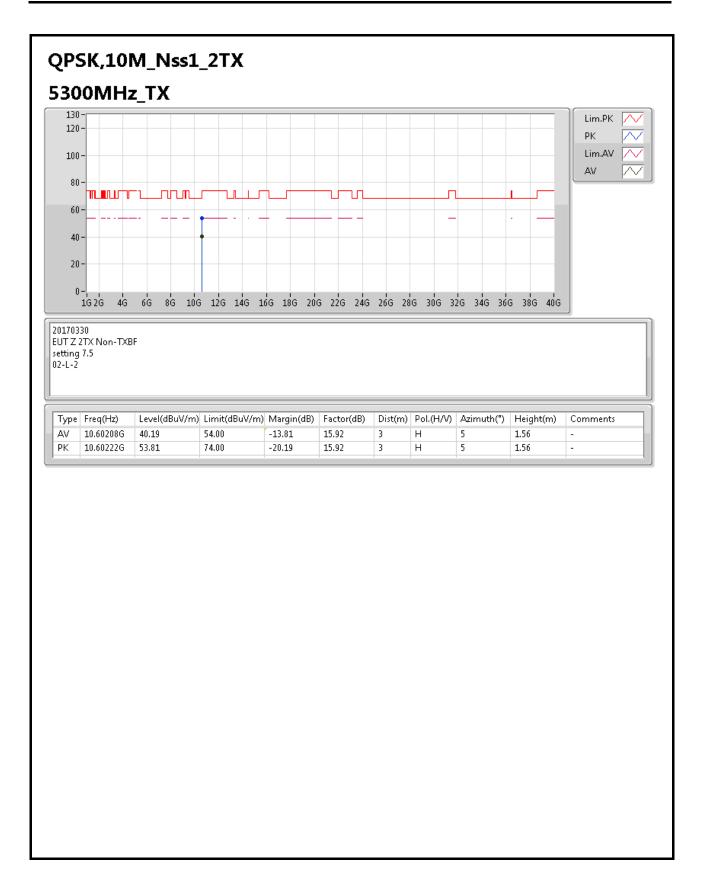




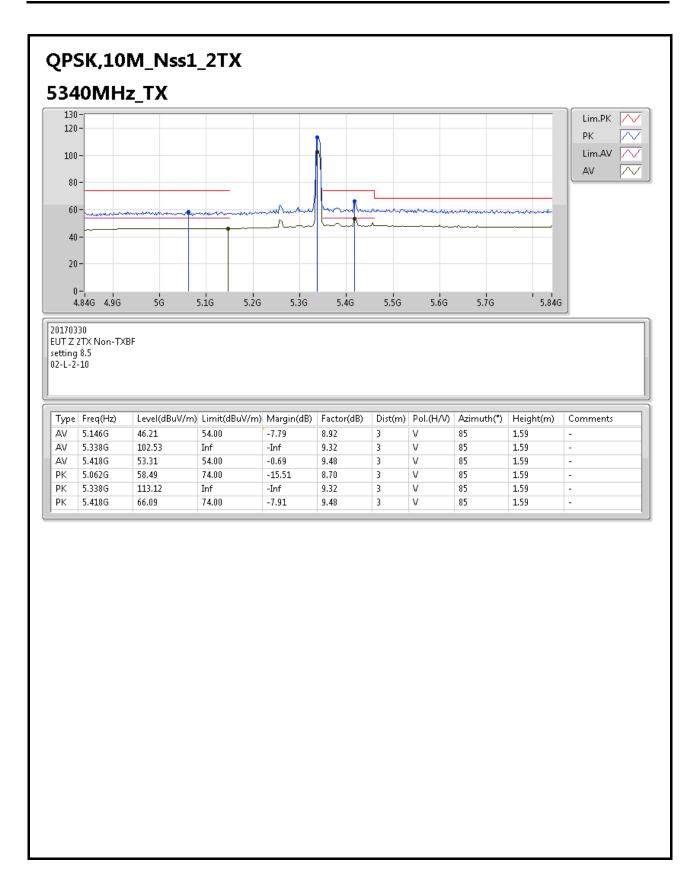






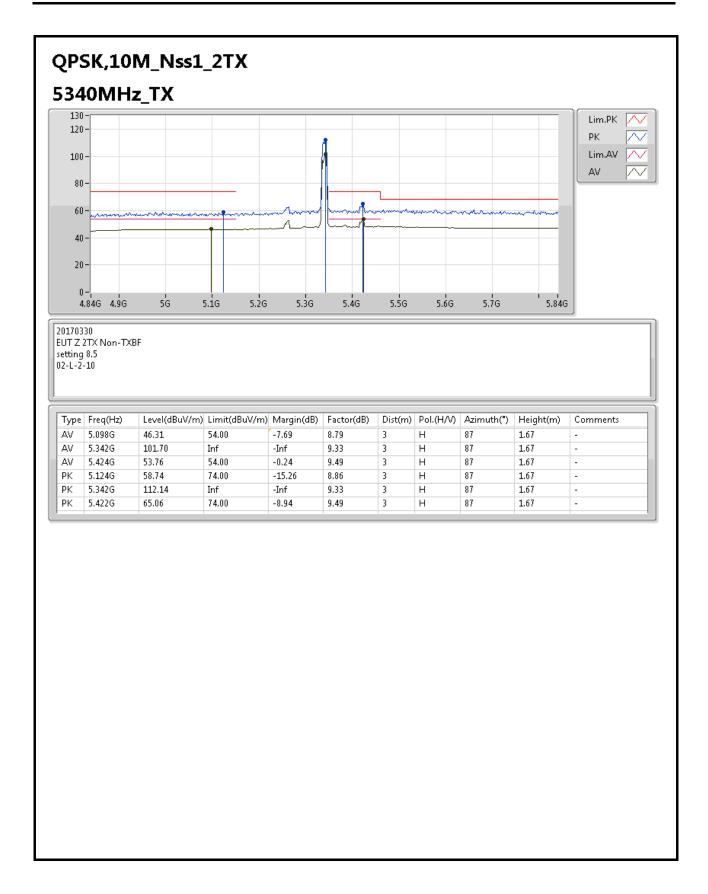




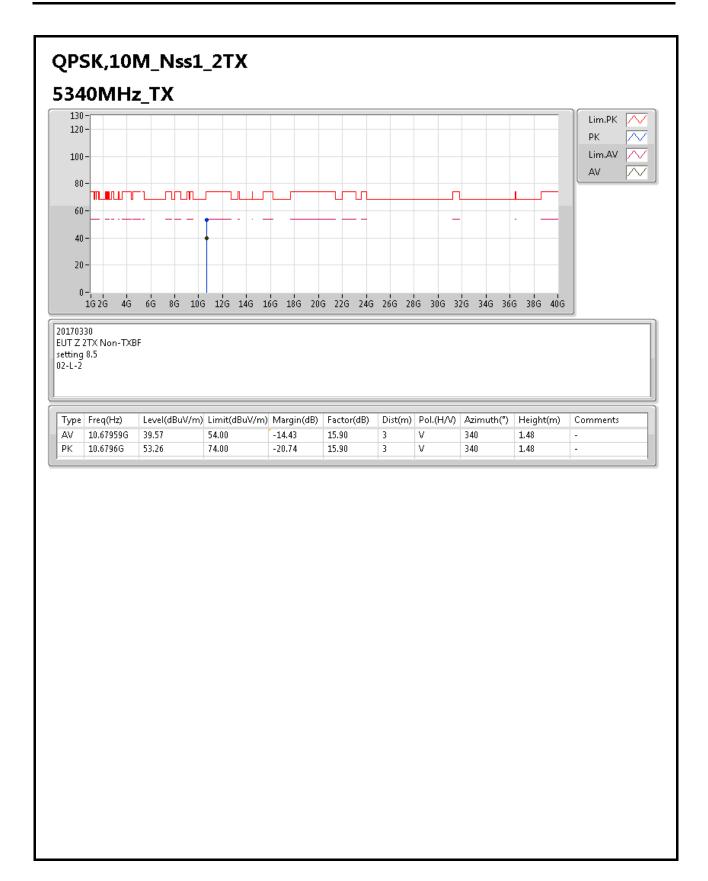


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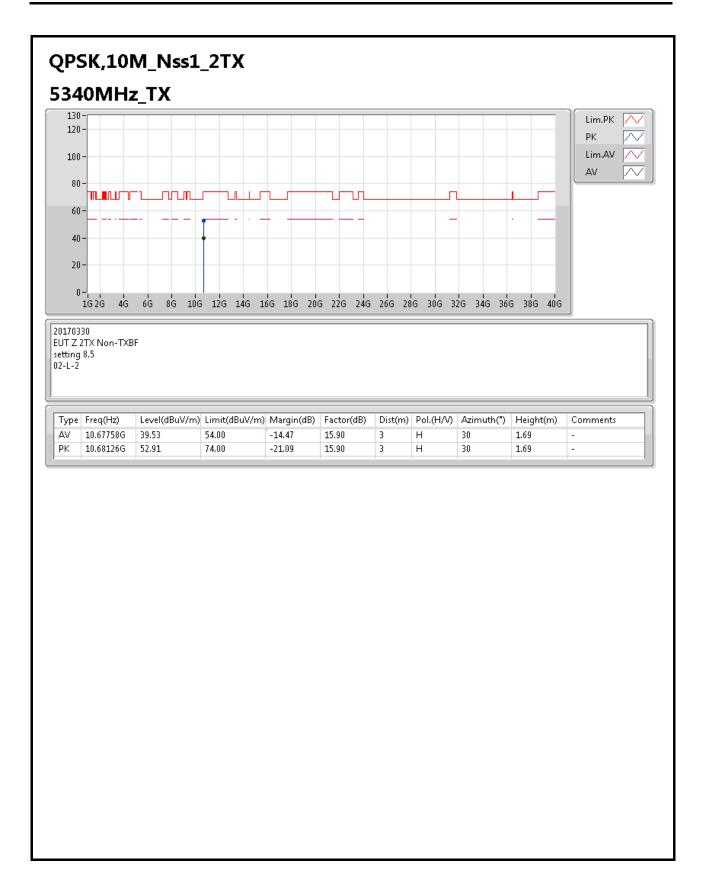




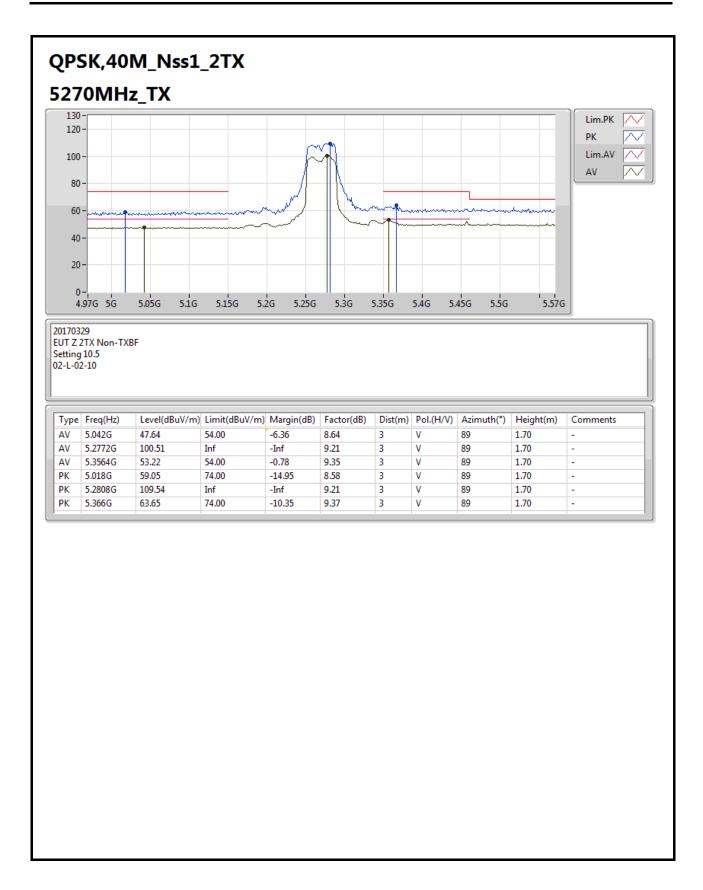




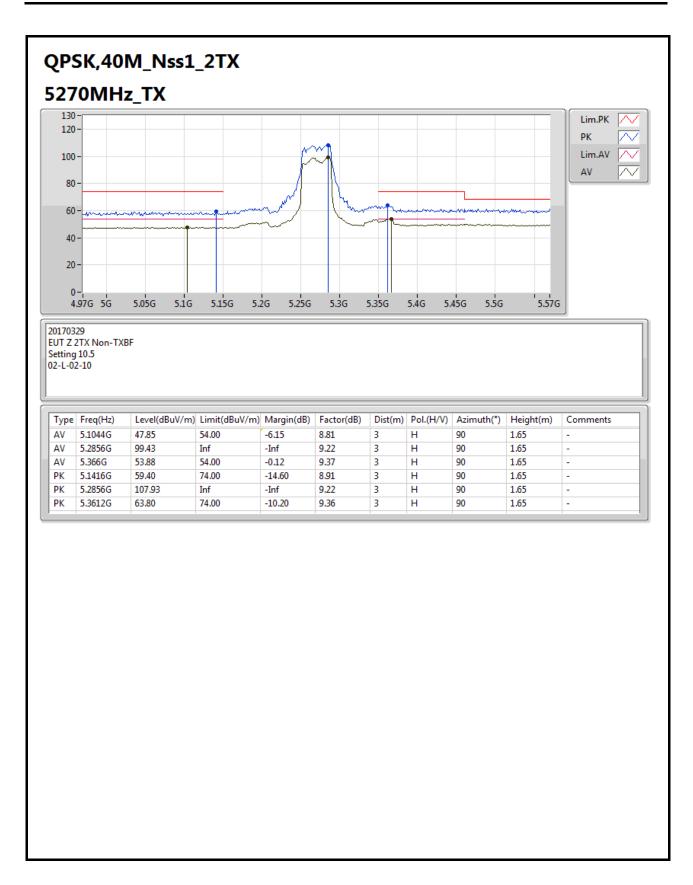




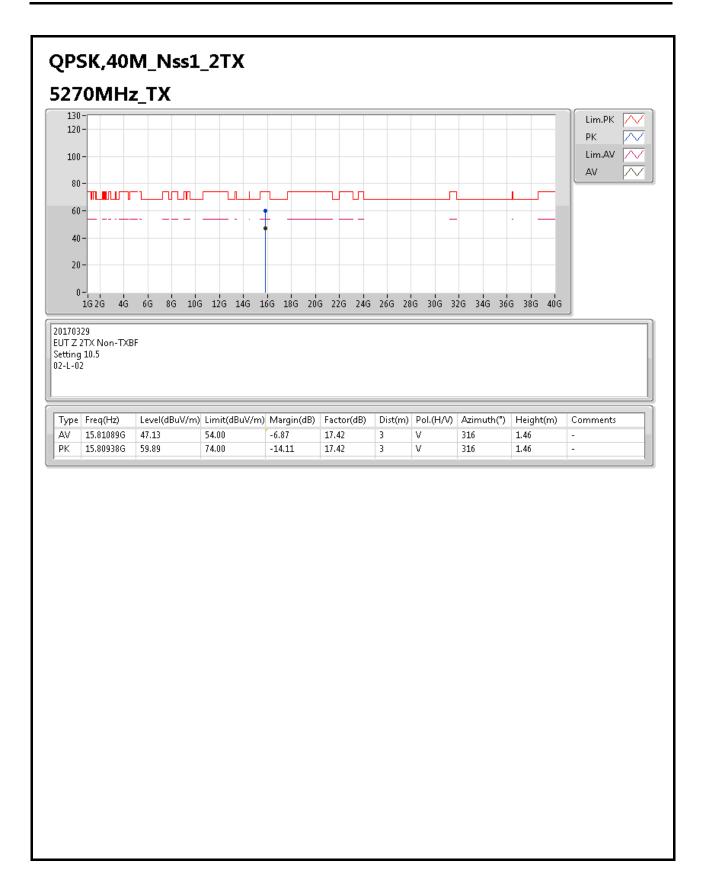






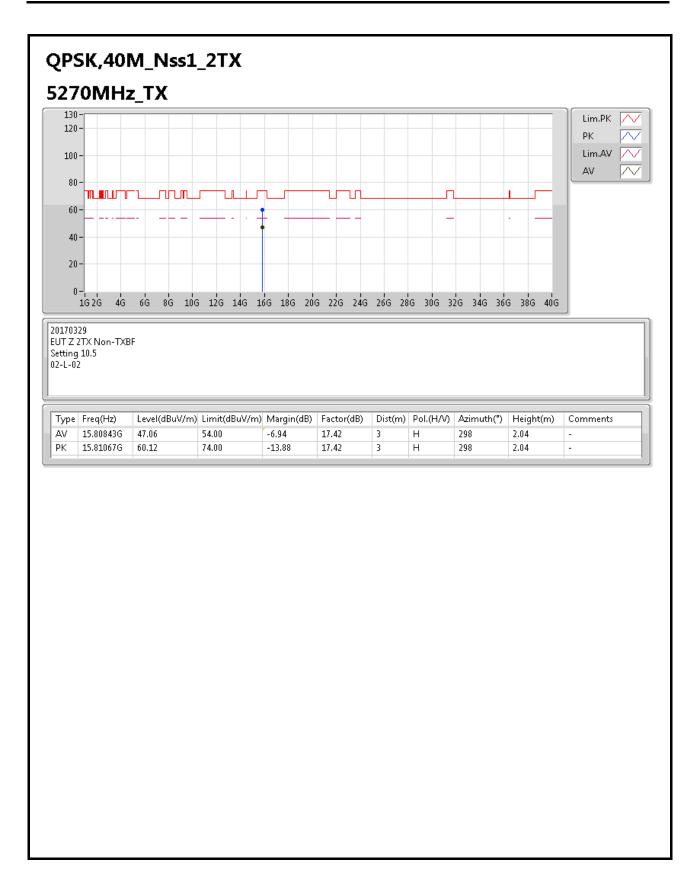




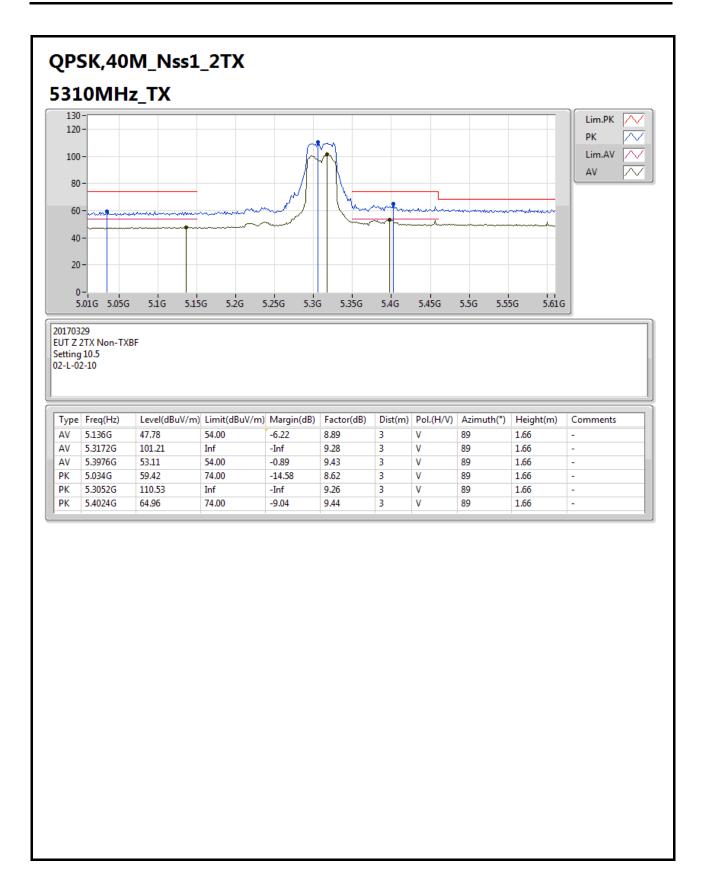


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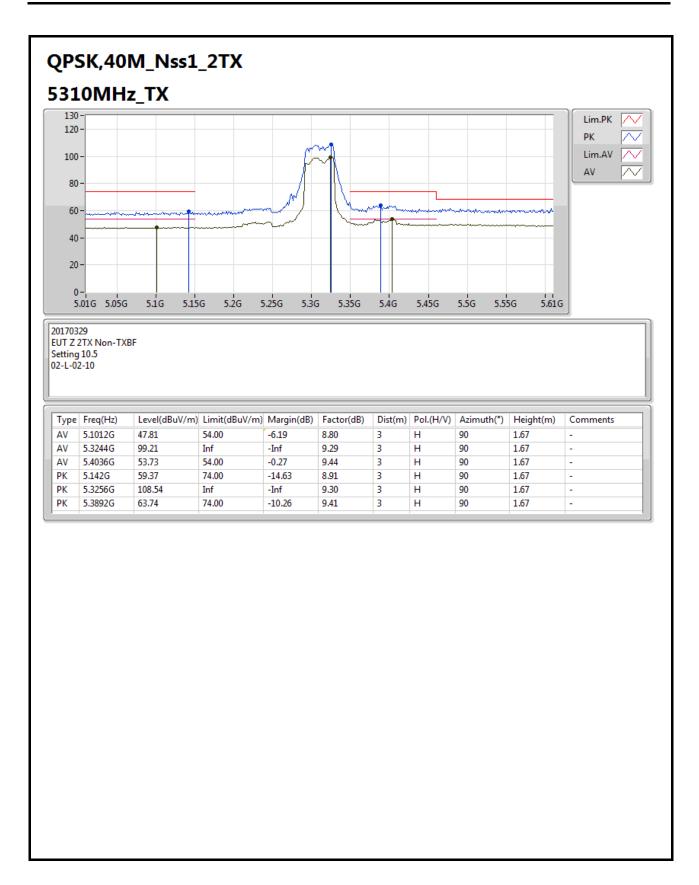




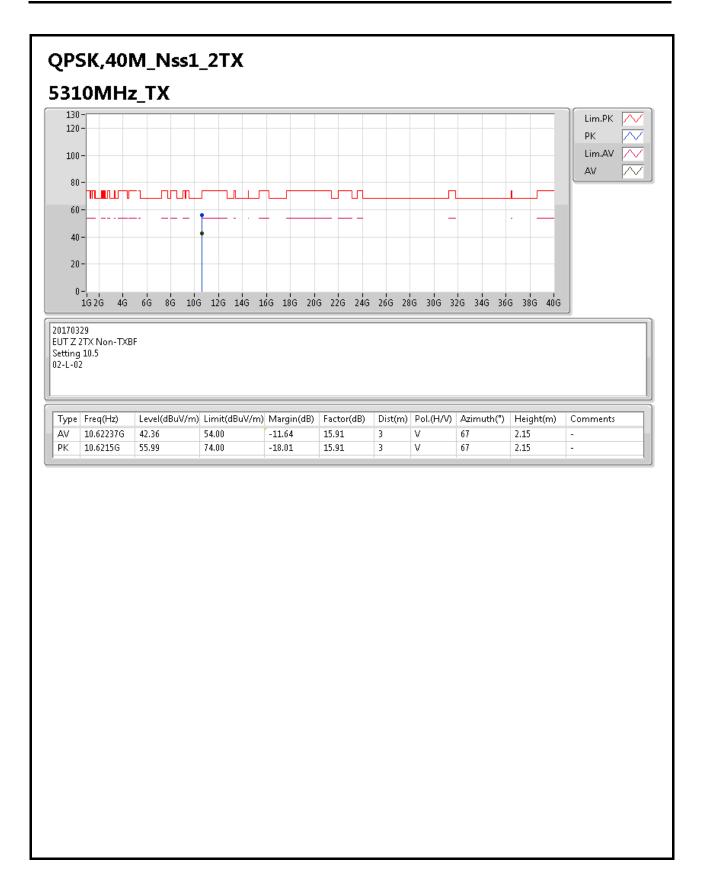




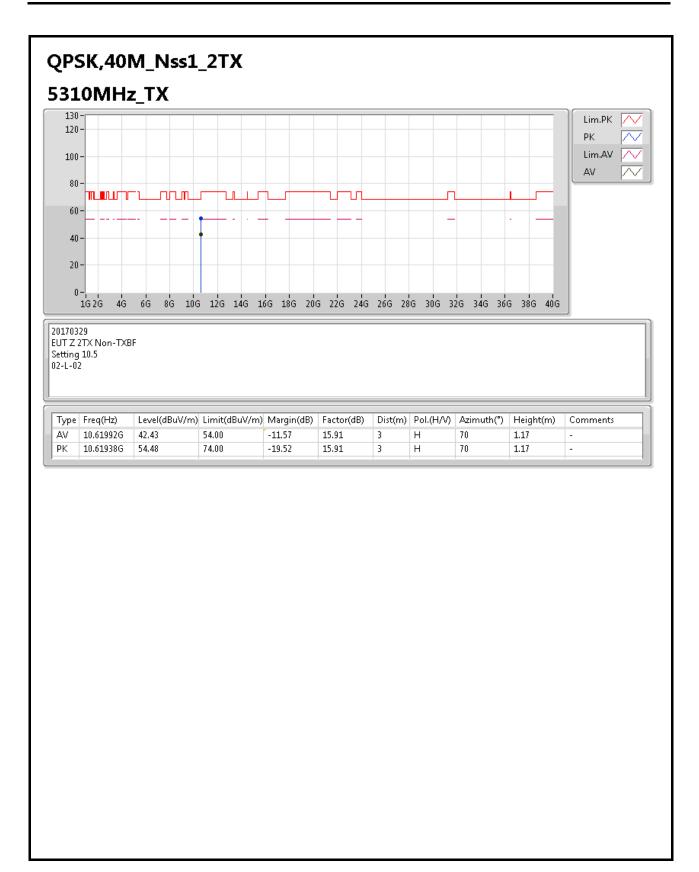




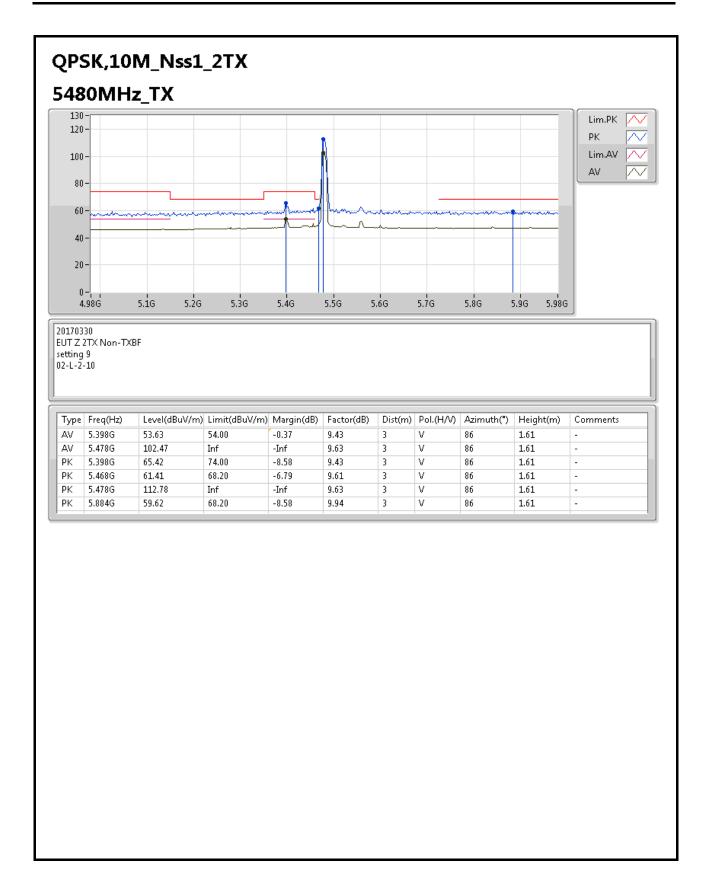




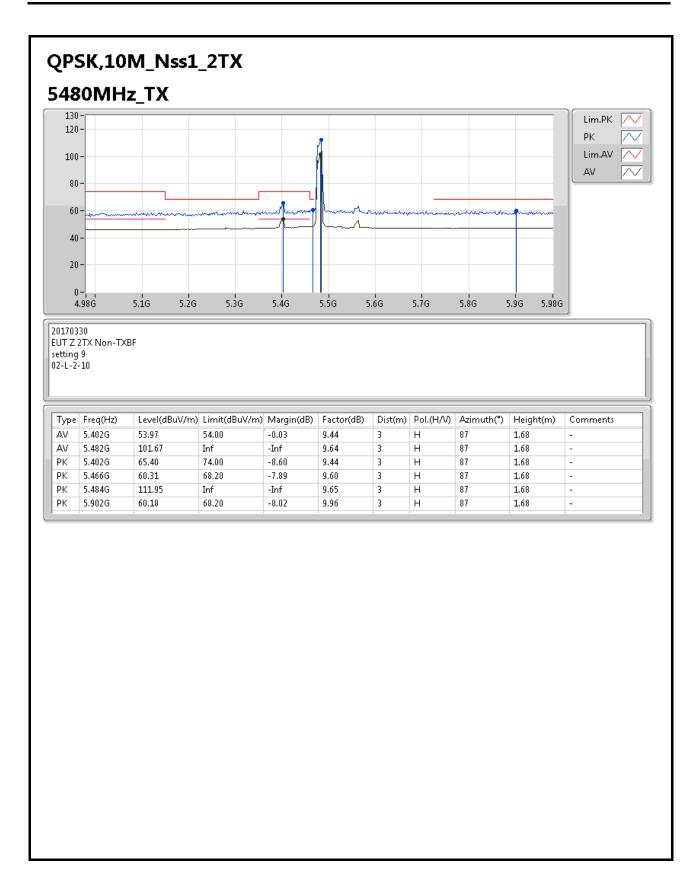






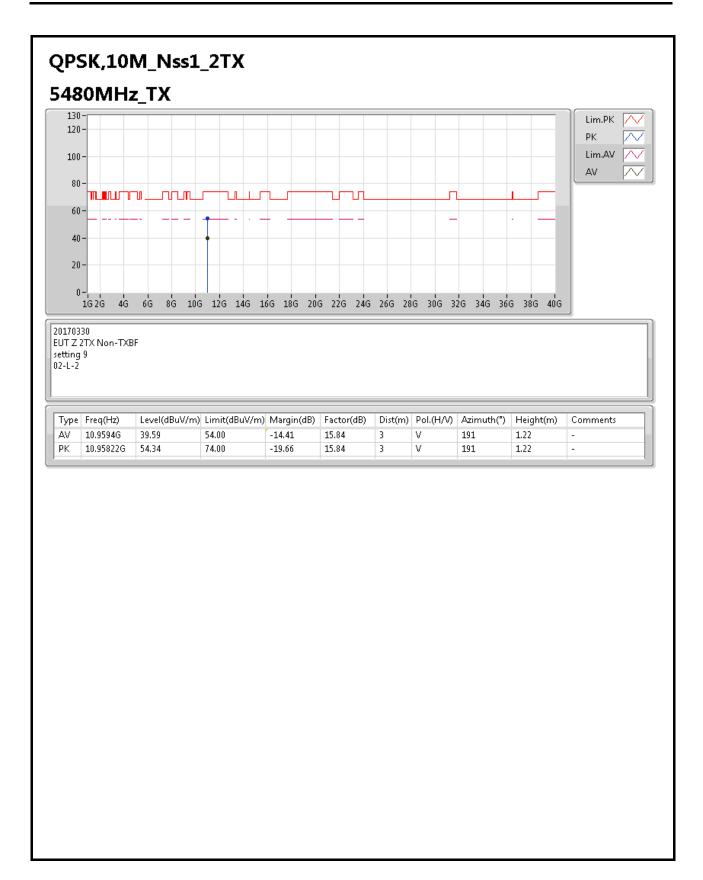




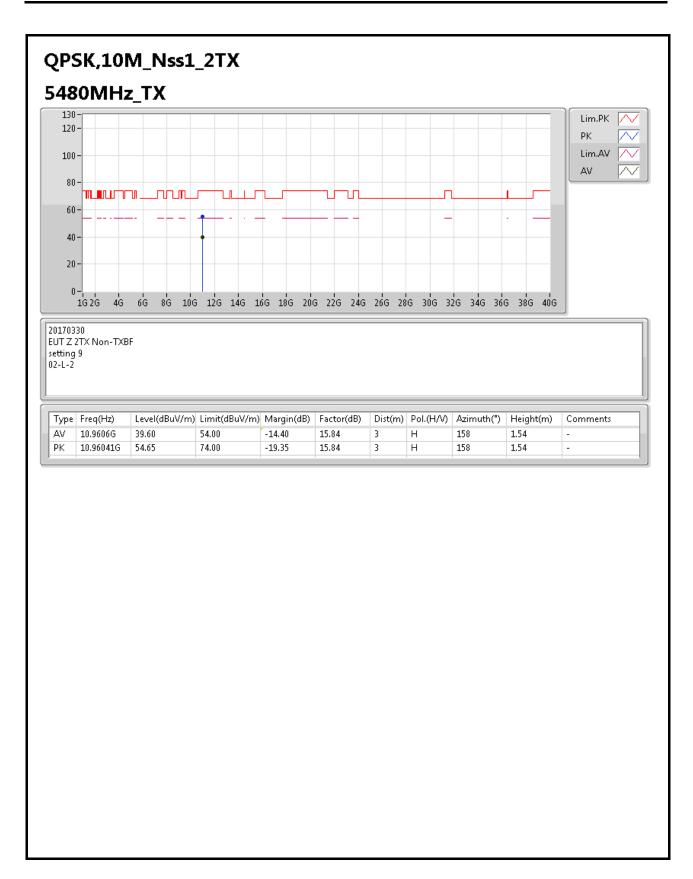


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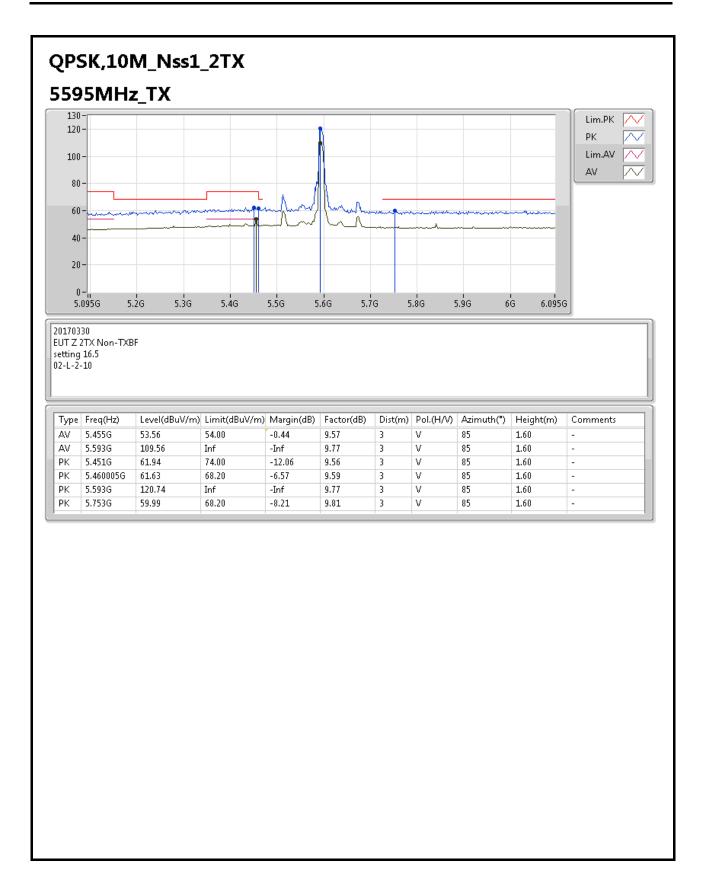




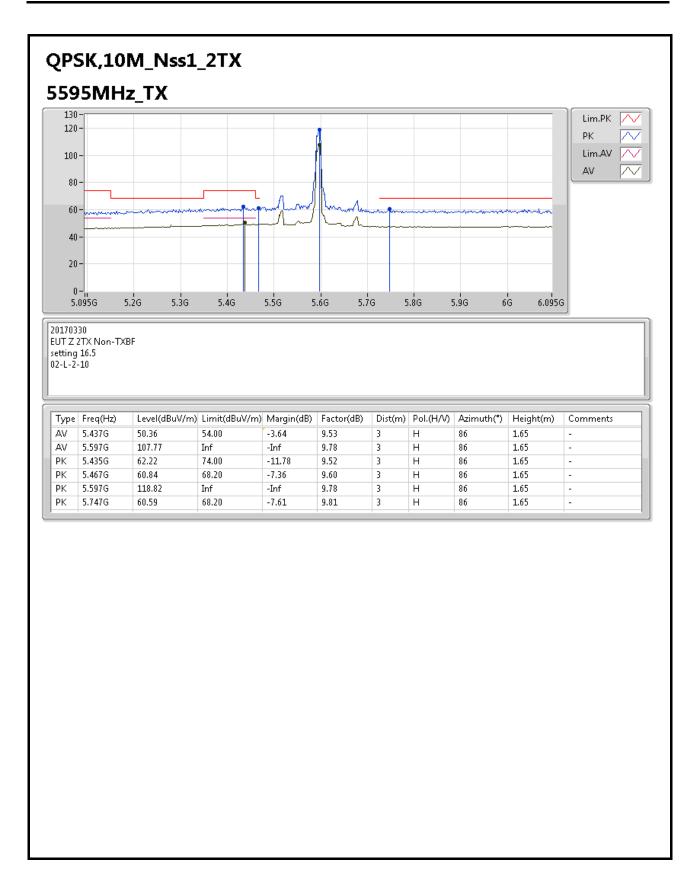


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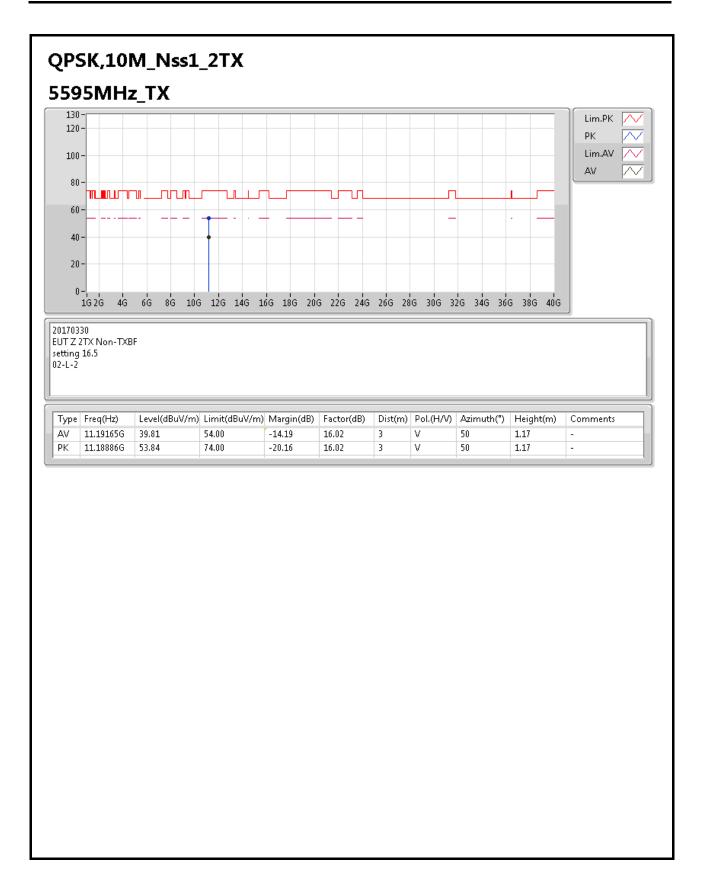




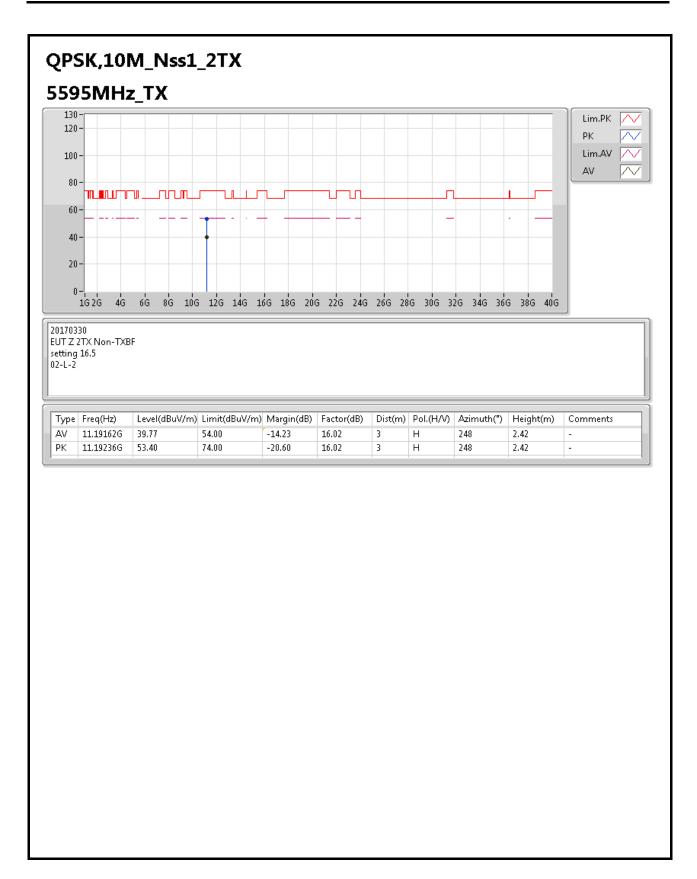


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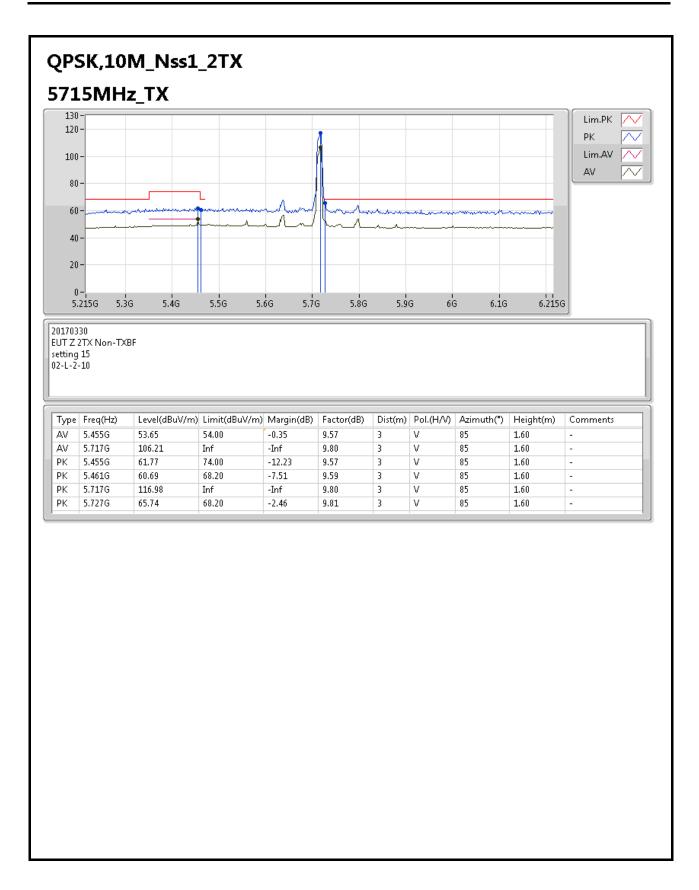






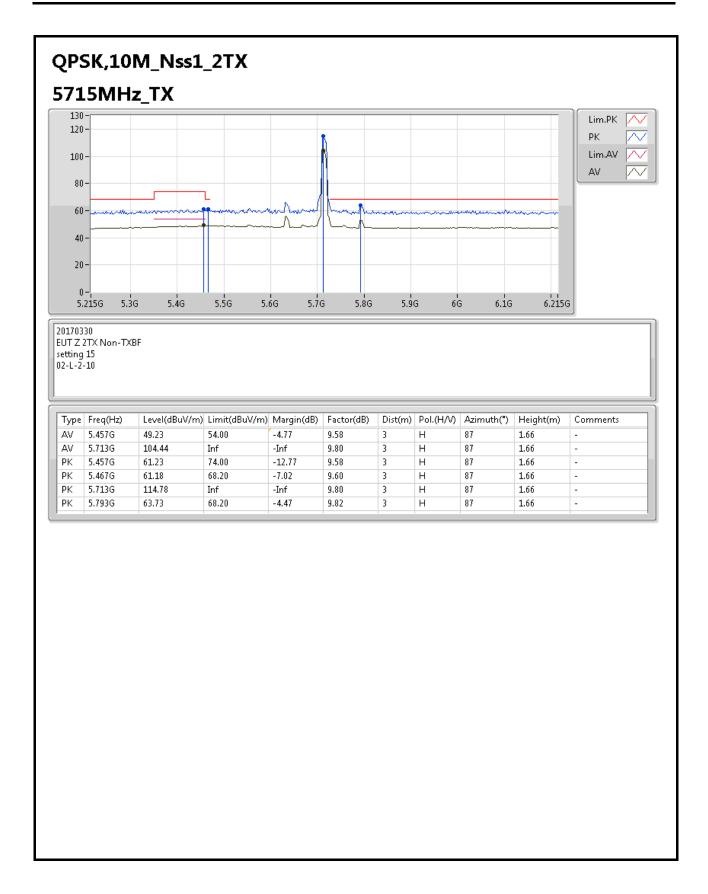






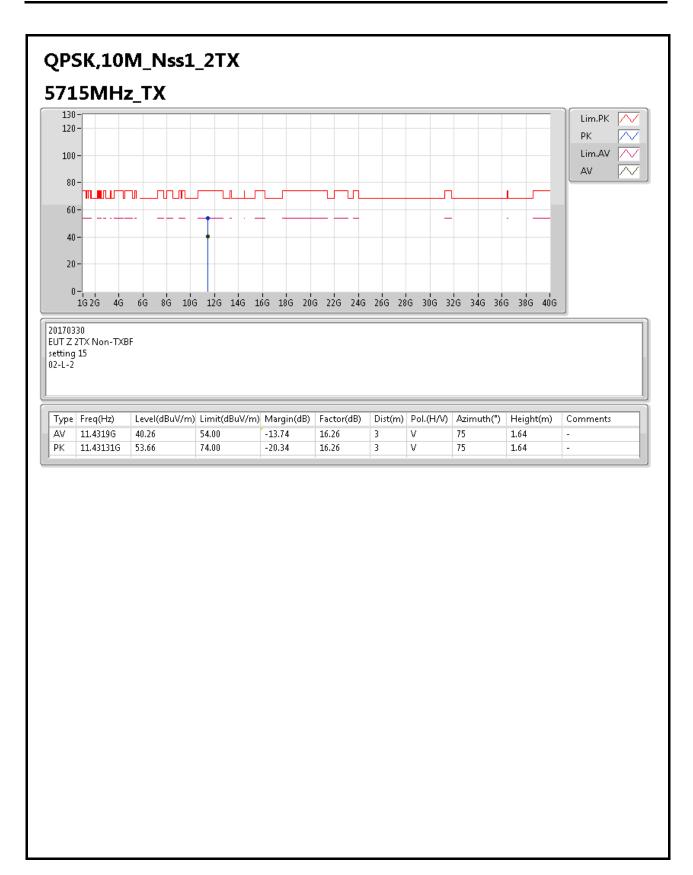
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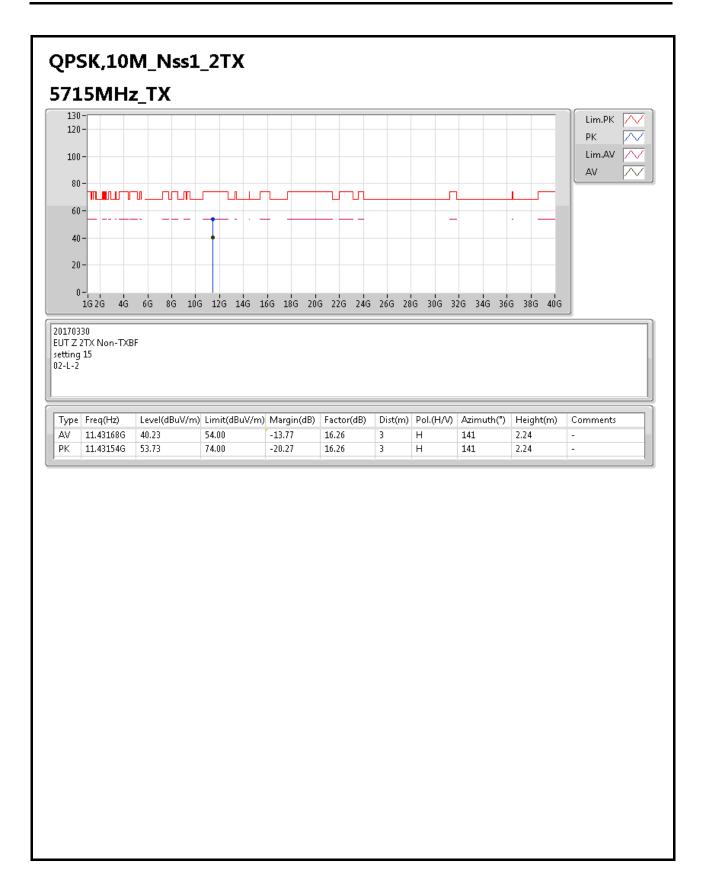
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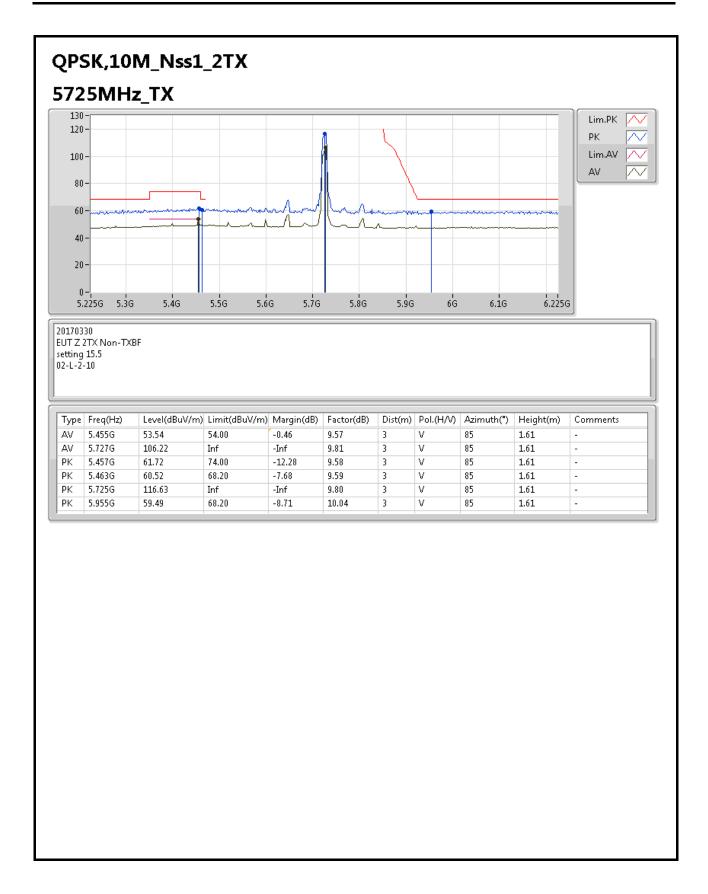


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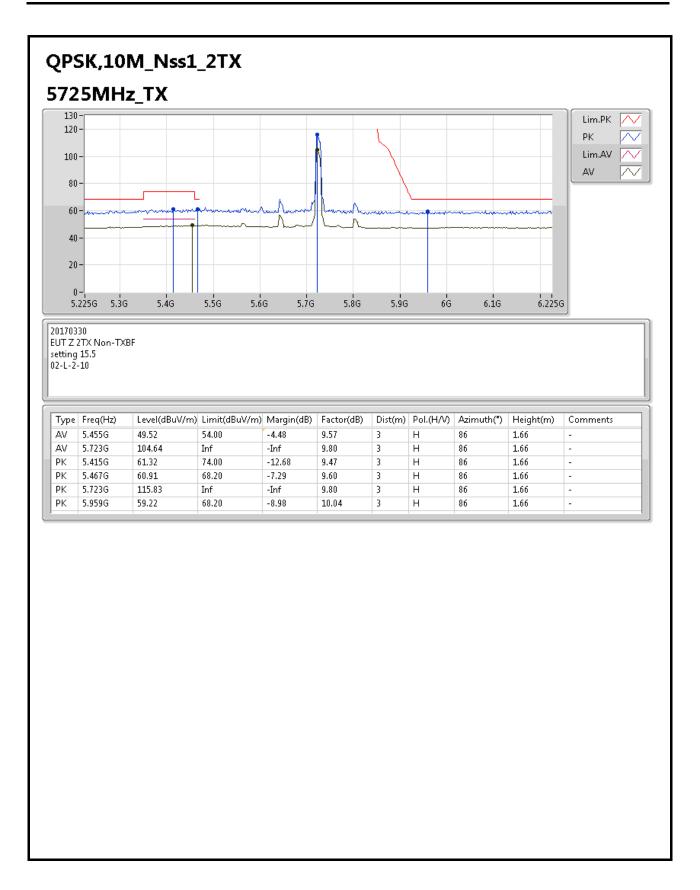




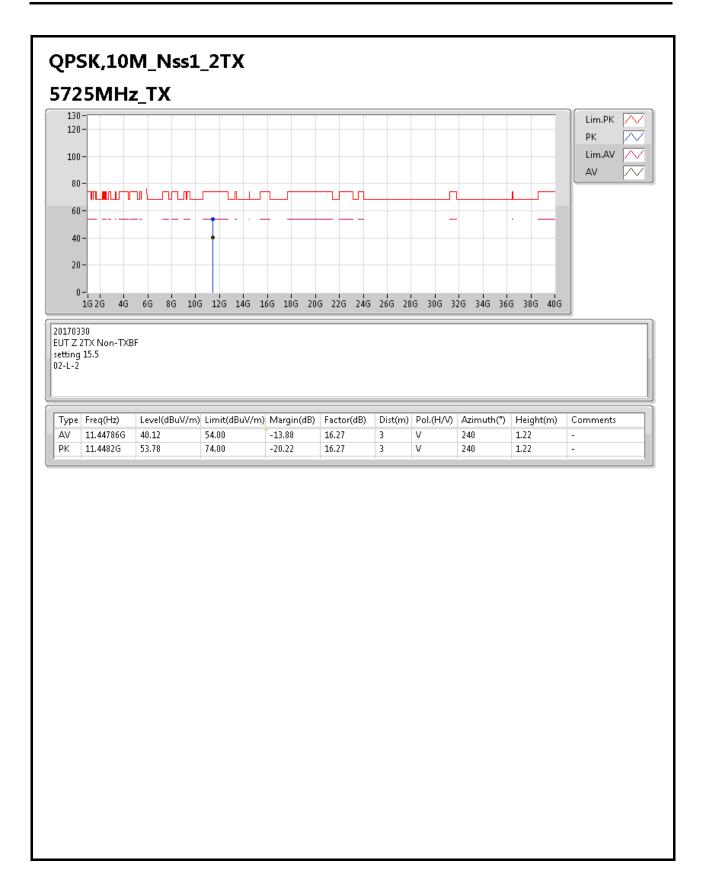




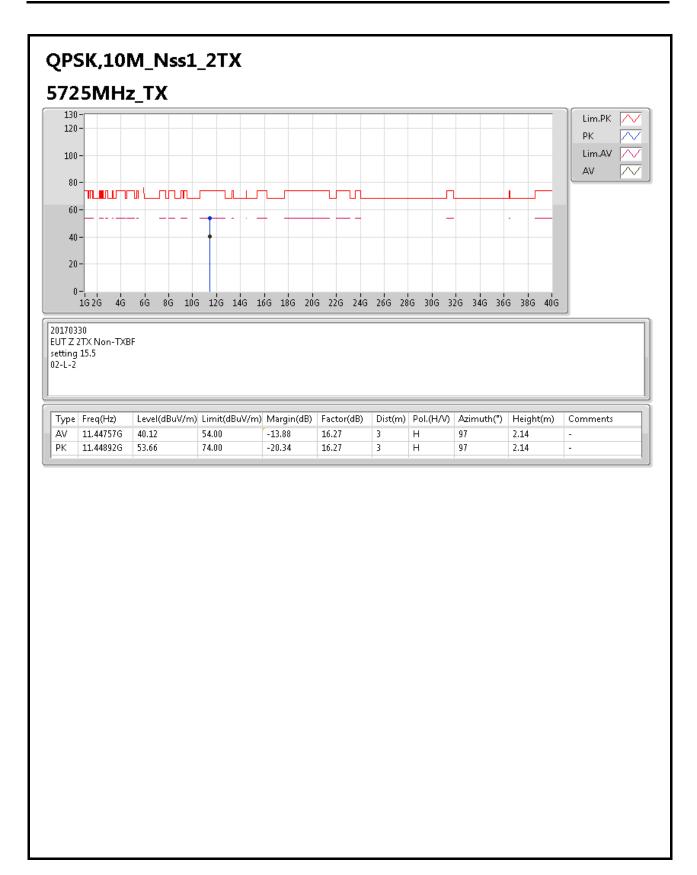




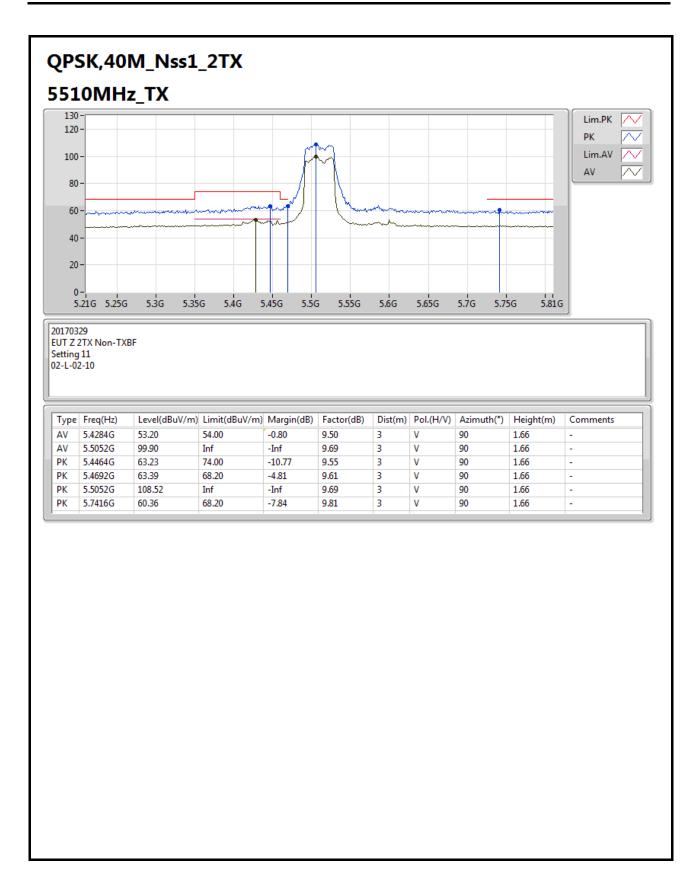




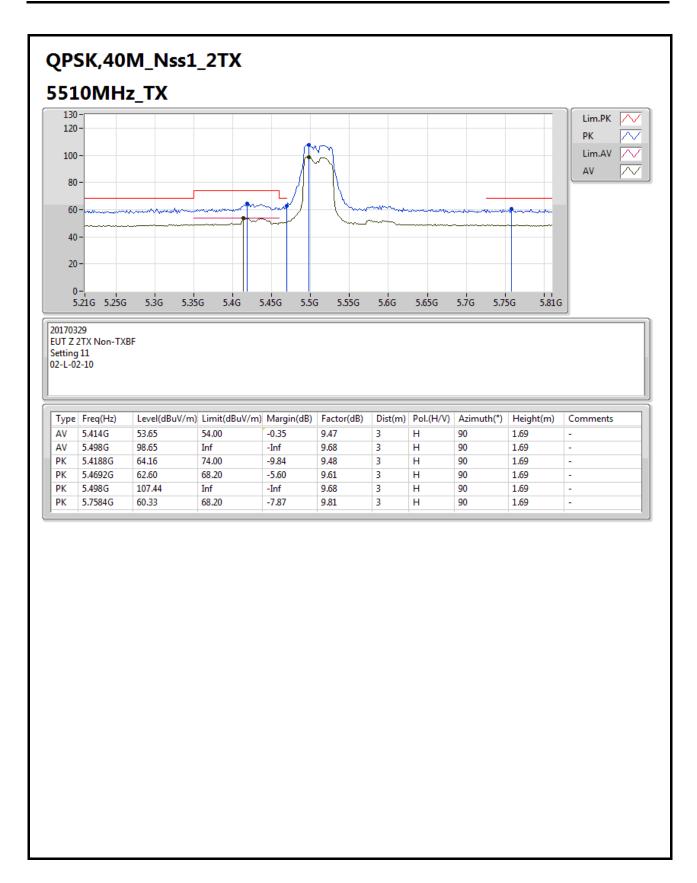




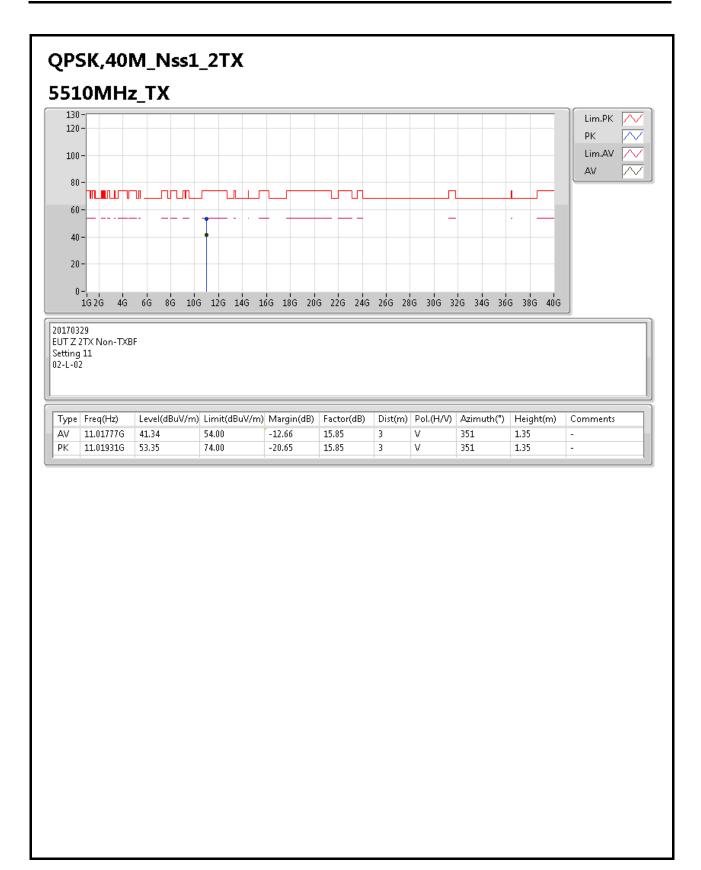




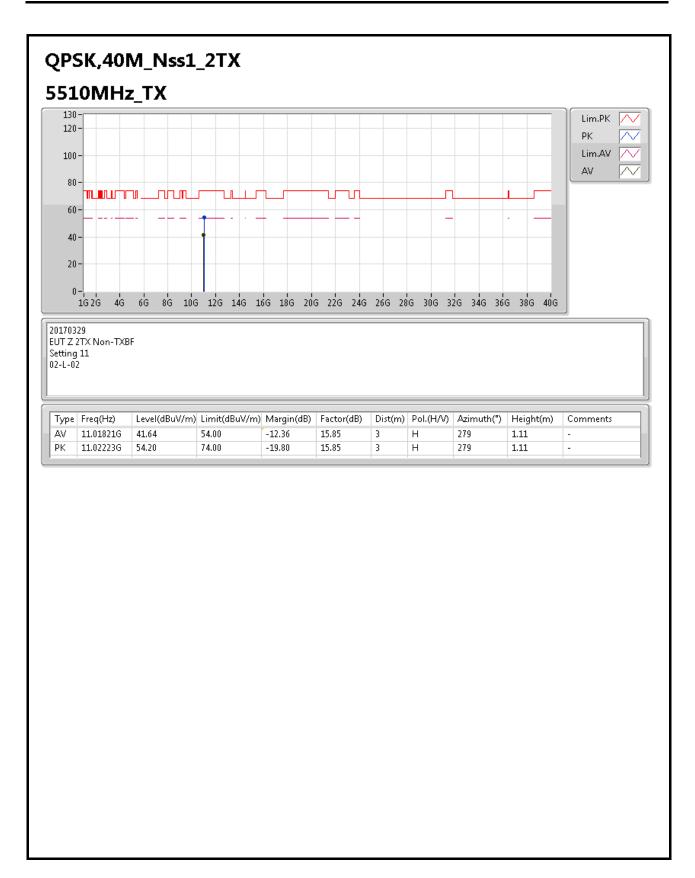




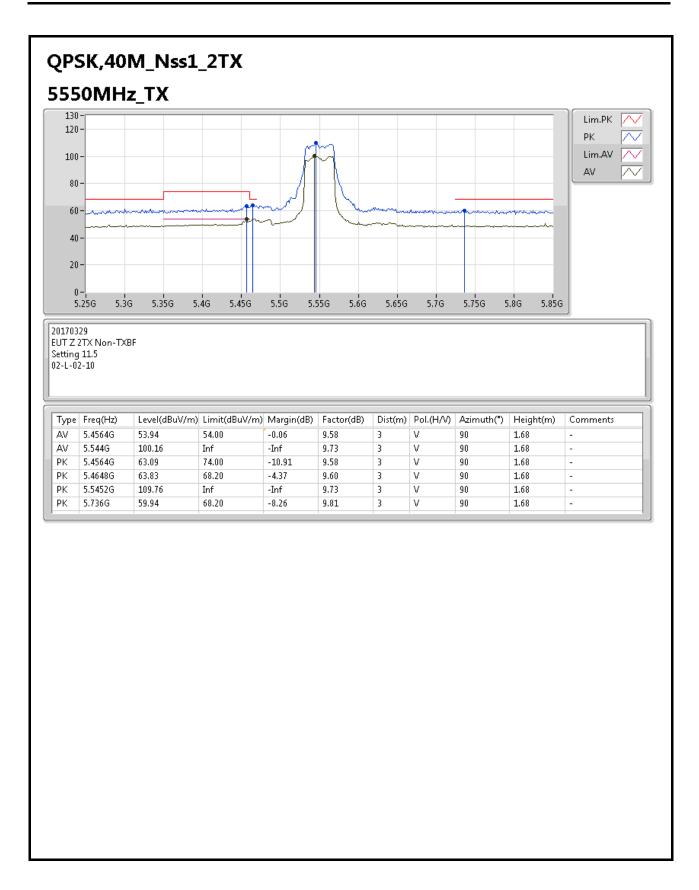






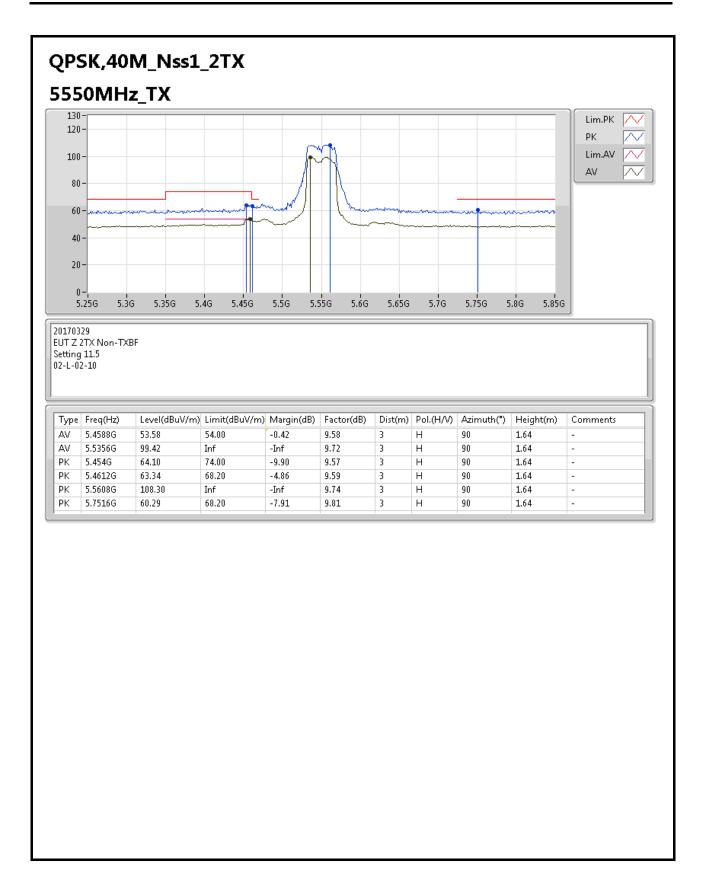




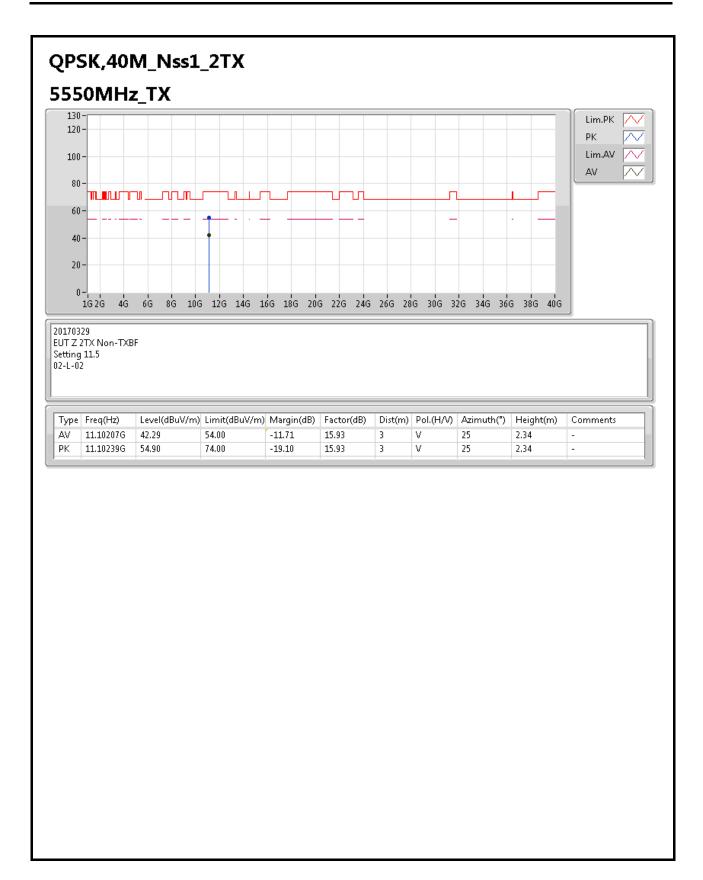


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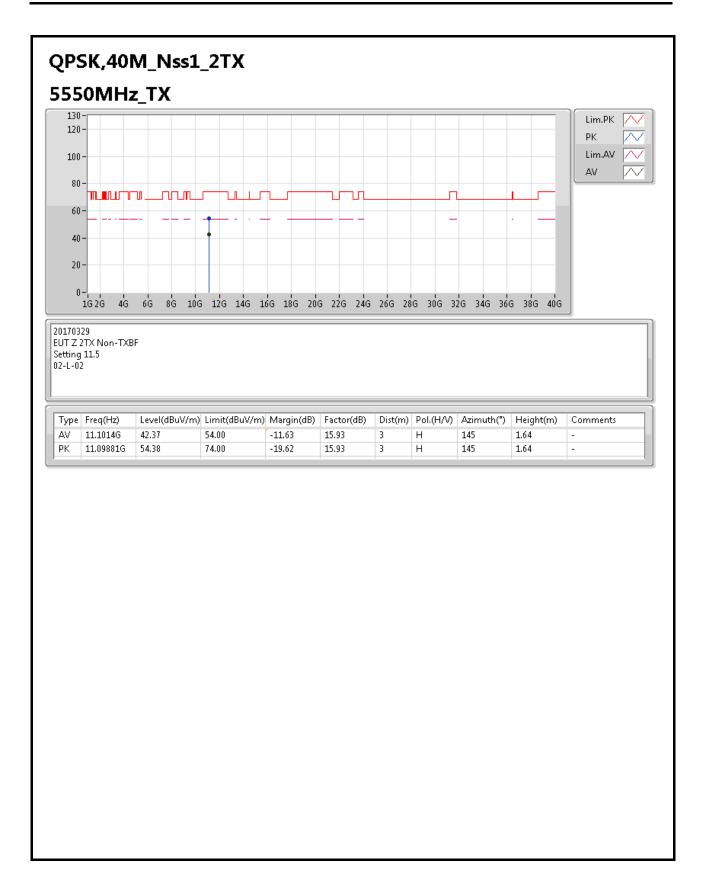




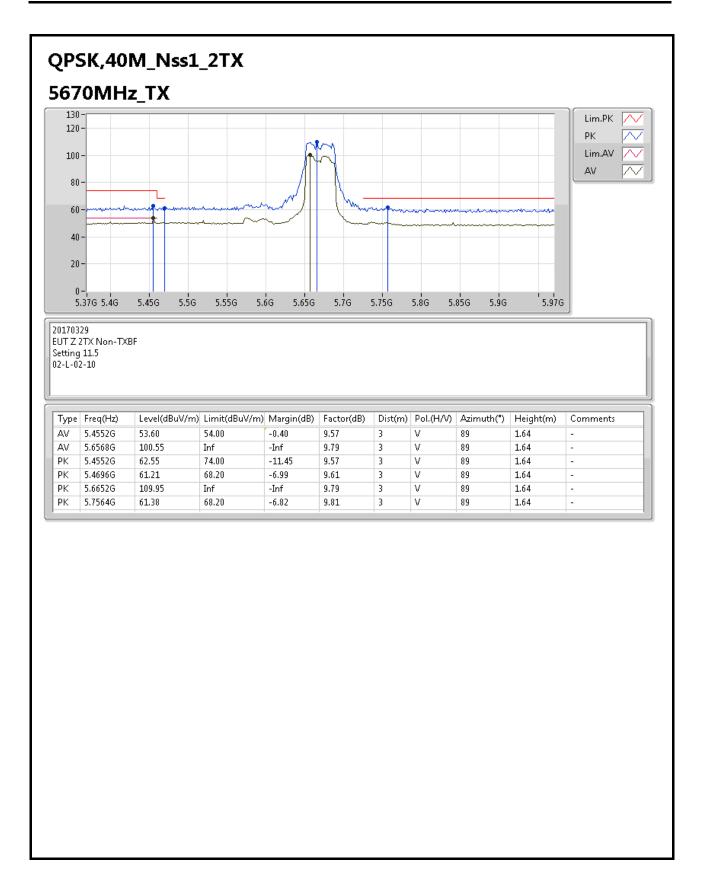


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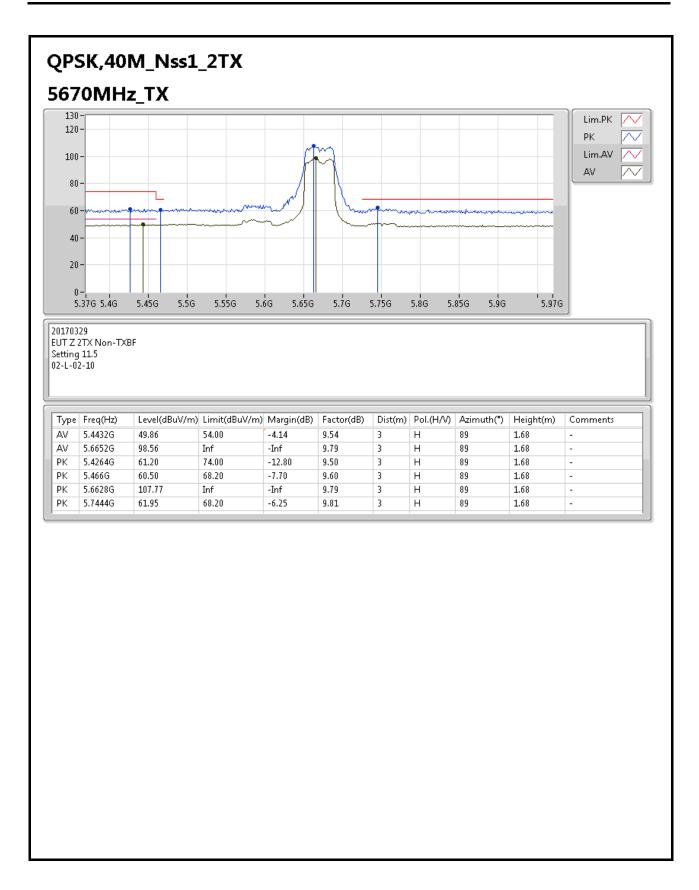




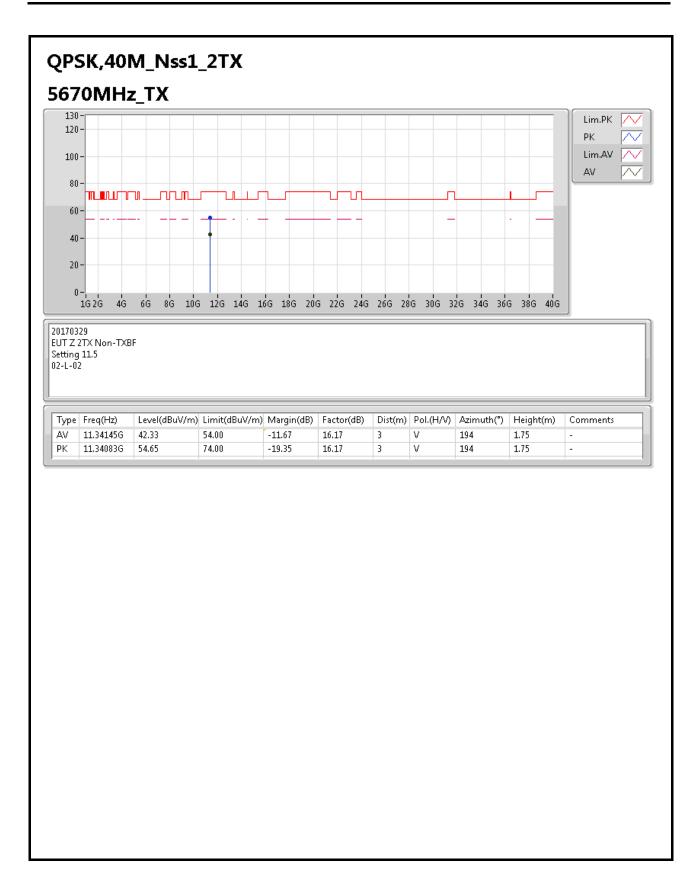


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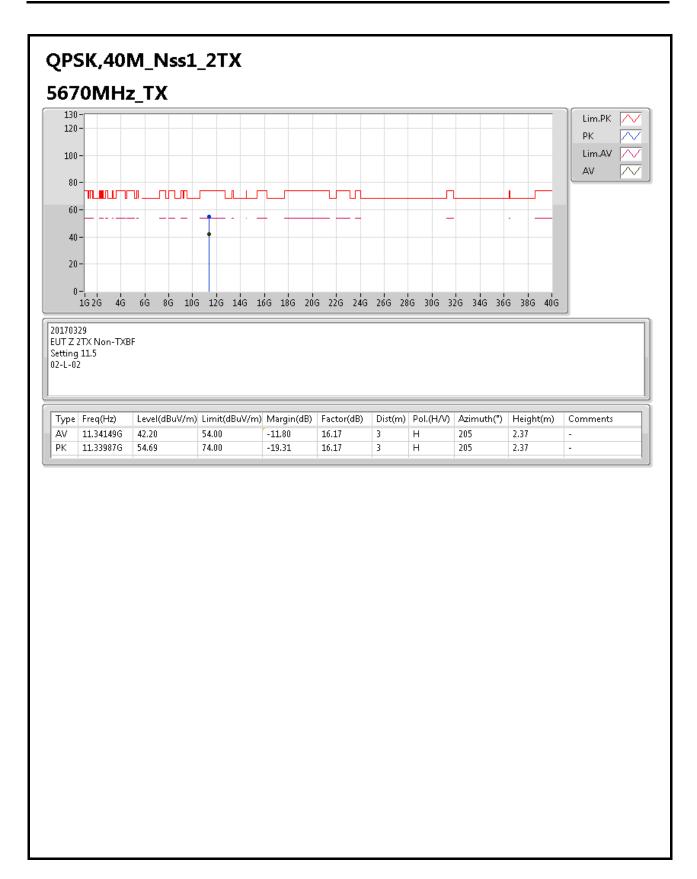






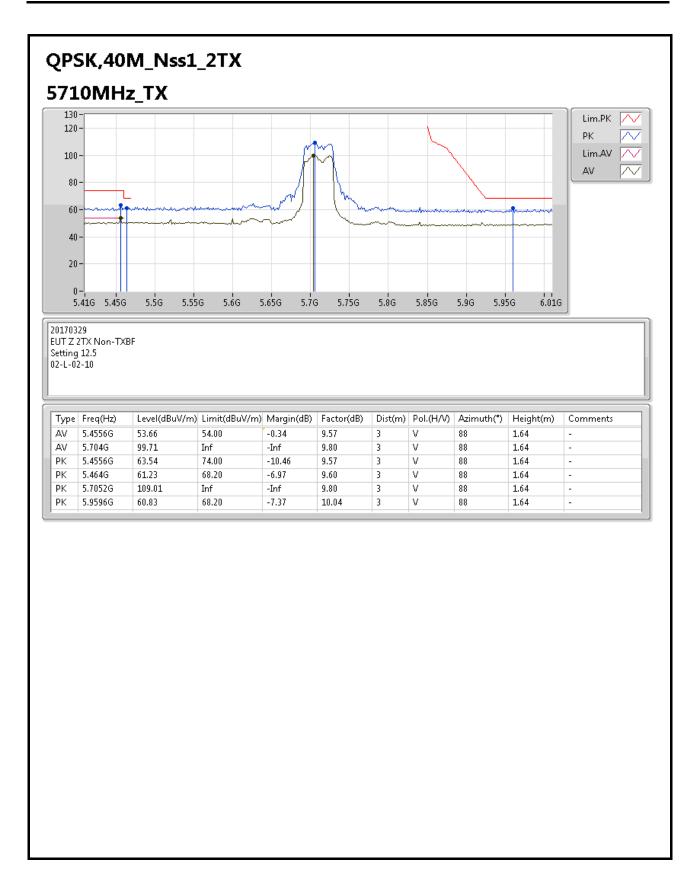




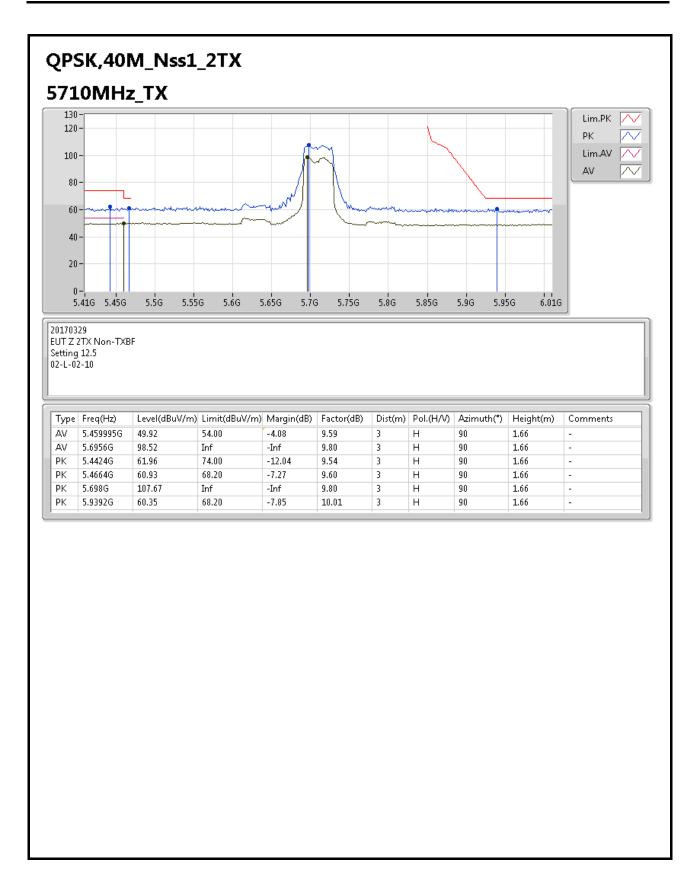


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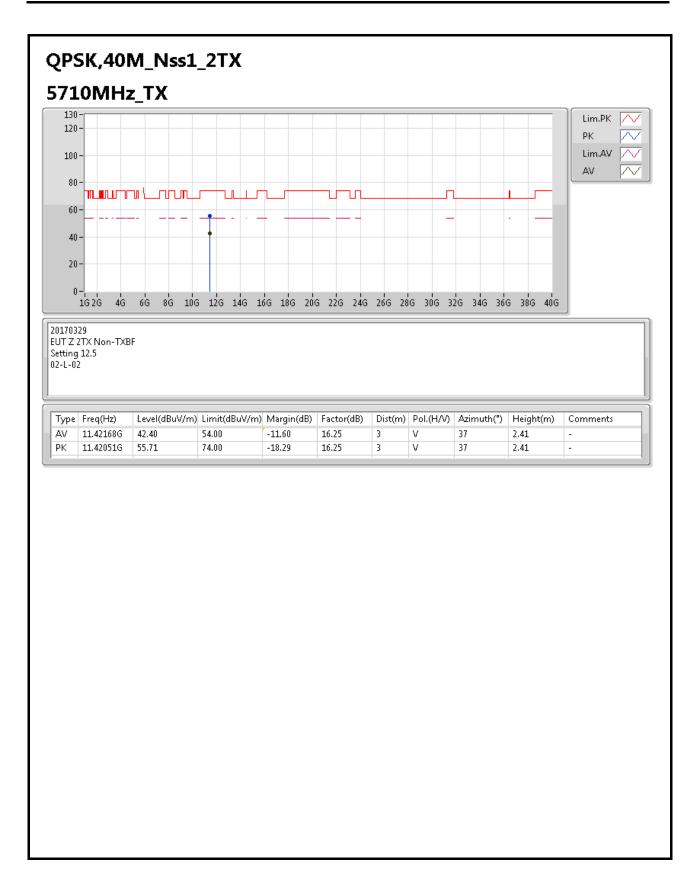




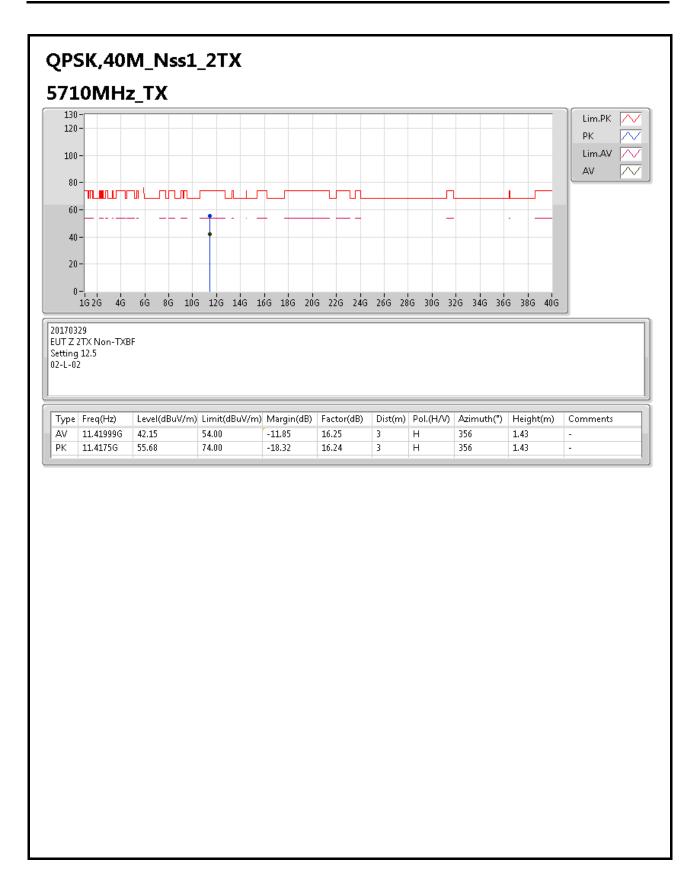














FS Result Appendix E

Mode: 10 MHz / Ant 1 Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
ΛΛ	5300 MHz			
(V)	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5299.9944	5299.9939	5299.9938	5299.9934
110.00	5299.9934	5299.9930	5299.9924	5299.9916
93.50	5299.9932	5299.9929	5299.9922	5299.9917
Max. Deviation (MHz)	0.0068	0.0071	0.0078	0.0084
Max. Deviation (ppm)	1.28	1.34	1.47	1.58
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5300 MHz			
(℃)	0 Minute	2 Minute	5 Minute	10 Minute
-40	5299.9988	5299.9979	5299.9975	5299.9965
-30	5299.9973	5299.9970	5299.9963	5299.9959
-20	5299.9968	5299.9960	5299.9951	5299.9944
-10	5299.9966	5299.9961	5299.9952	5299.9949
0	5299.9955	5299.9952	5299.9947	5299.9944
10	5299.9941	5299.9933	5299.9924	5299.9914
20	5299.9934	5299.9926	5299.9921	5299.9915
30	5299.9891	5299.9888	5299.9879	5299.9872
40	5299.9881	5299.9880	5299.9878	5299.9868
50	5299.9865	5299.9859	5299.9852	5299.9842
60	5299.9864	5299.9860	5299.9858	5299.9849
70	5299.9860	5299.9856	5299.9855	5299.9846
Max. Deviation (MHz)	0.0140	0.0144	0.0145	0.0154
Max. Deviation (ppm)	2.64	2.72	2.74	2.91
Result	Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
ΛΛ	5595 MHz			
(V)	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5594.9940	5594.9934	5594.9926	5594.9923
110.00	5594.9934	5594.9932	5594.9922	5594.9920
93.50	5594.9931	5594.9930	5594.9926	5594.9920
Max. Deviation (MHz)	0.0069	0.0070	0.0078	0.0080
Max. Deviation (ppm)	1.23	1.25	1.39	1.43
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5595 MHz			
(C)	0 Minute	2 Minute	5 Minute	10 Minute
-40	5594.9975	5594.9969	5594.9963	5594.9959
-30	5594.9987	5594.9977	5594.9973	5594.9963
-20	5594.9972	5594.9969	5594.9960	5594.9951
-10	5594.9955	5594.9947	5594.9940	5594.9937
0	5594.9954	5594.9953	5594.9947	5594.9945
10	5594.9936	5594.9932	5594.9922	5594.9919
20	5594.9934	5594.9927	5594.9919	5594.9911
30	5594.9891	5594.9890	5594.9882	5594.9880
40	5594.9883	5594.9877	5594.9869	5594.9859
50	5594.9879	5594.9873	5594.9864	5594.9861
60	5594.9880	5594.9876	5594.9867	5594.9862
70	5594.9876	5594.9866	5594.9856	5594.9851
Max. Deviation (MHz)	0.0124	0.0134	0.0144	0.0149
Max. Deviation (ppm)	2.22	2.39	2.57	2.66
Result		Pa	ass	

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FS Result Appendix E

Mode: 40 MHz / Ant 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
0.0	5270 MHz			
(V)	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5269.9942	5269.9933	5269.9929	5269.9926
110.00	5269.9934	5269.9926	5269.9921	5269.9917
93.50	5269.9932	5269.9928	5269.9921	5269.9920
Max. Deviation (MHz)	0.0068	0.0074	0.0079	0.0083
Max. Deviation (ppm)	1.29	1.40	1.50	1.57
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5270 MHz			
(℃)	0 Minute	2 Minute	5 Minute	10 Minute
-40	5269.9992	5269.9983	5269.9978	5269.9968
-30	5269.9980	5269.9977	5269.9975	5269.9968
-20	5269.9978	5269.9976	5269.9970	5269.9962
-10	5269.9971	5269.9968	5269.9961	5269.9956
0	5269.9970	5269.9961	5269.9952	5269.9943
10	5269.9950	5269.9940	5269.9931	5269.9929
20	5269.9934	5269.9931	5269.9927	5269.9923
30	5269.9891	5269.9889	5269.9880	5269.9876
40	5269.9884	5269.9874	5269.9867	5269.9859
50	5269.9882	5269.9874	5269.9867	5269.9865
60	5269.9864	5269.9861	5269.9851	5269.9841
70	5269.9877	5269.9875	5269.9871	5269.9868
Max. Deviation (MHz)	0.0136	0.0139	0.0149	0.0159
Max. Deviation (ppm)	2.58	2.64	2.83	3.02
Result	Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz) 5550 MHz			
ΛΛ				
(V)	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5549.9943	5549.9937	5549.9933	5549.9925
110.00	5549.9934	5549.9931	5549.9921	5549.9917
93.50	5549.9927	5549.9925	5549.9920	5549.9918
Max. Deviation (MHz)	0.0073	0.0075	0.0080	0.0083
Max. Deviation (ppm)	1.32	1.35	1.44	1.50
Result	Pass			

Temperature vs. Frequency Stability

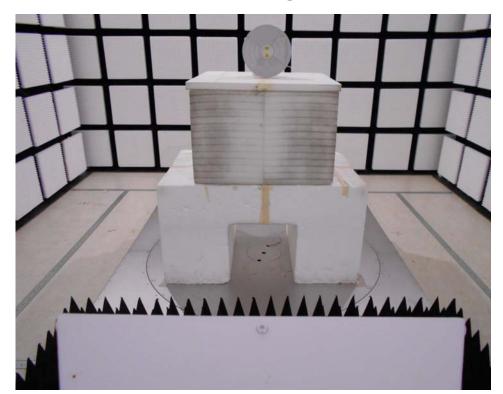
Temperature	Measurement Frequency (MHz)			
(°C)	5550 MHz			
(℃)	0 Minute	2 Minute	5 Minute	10 Minute
-40	5549.9998	5549.9996	5549.9995	5549.9988
-30	5549.9985	5549.9979	5549.9972	5549.9965
-20	5549.9976	5549.9973	5549.9966	5549.9961
-10	5549.9968	5549.9960	5549.9953	5549.9944
0	5549.9966	5549.9957	5549.9954	5549.9951
10	5549.9946	5549.9937	5549.9936	5549.9927
20	5549.9934	5549.9930	5549.9925	5549.9917
30	5549.9891	5549.9882	5549.9872	5549.9871
40	5549.9875	5549.9873	5549.9872	5549.9866
50	5549.9871	5549.9870	5549.9860	5549.9851
60	5549.9852	5549.9842	5549.9836	5549.9827
70	5549.9849	5549.9843	5549.9833	5549.9827
Max. Deviation (MHz)	0.0151	0.0158	0.0167	0.0173
Max. Deviation (ppm)	2.72	2.85	3.01	3.12
Result	Pass			

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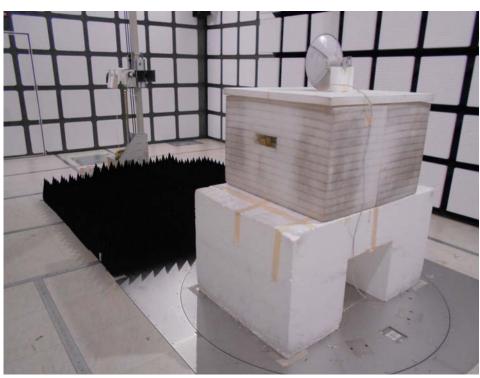


Test Photos Appendix F

1. Photographs of Radiated Emissions Test Configuration



FRONT VIEW



REAR VIEW

SPORTON INTERNATIONAL INC.