





# **FCC Test Report**

FCC ID : 2AEUPBHALP021

Equipment : Wi-Fi enabled Video Doorbell

Brand Name : RING

Model Name : Video Doorbell Pro

Applicant : Ring, Inc

1523 26th St, Santa Monica, CA 90404, USA

Manufacturer : Chicony Electronics (Dong Guan ) Co.,Ltd.

San Zhong Guan Li Qu, Qingxi Town, Dongguan City

Guangdong 523651 China

Standard : 47 CFR FCC Part 15.407

The product was received on Apr. 24, 2018, and testing was started from May 01, 2018 and completed on May 08, 2018. We, SPORTON INTERTIONAL 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 INTERTIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

TEL: 886-3-3273456 FAX: 886-3-3270973

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APPENDIX B. TEST RESULTS OF EMISSION BANDWIDTH

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**PHOTOGRAPHS OF EUT v01** 

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History of this test report

Report No.	Version	Description	Issued Date
FR842412AN	01	Initial issue of report	May 25, 2018

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## **Summary of Test Result**

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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	-

Reviewed by: Sam Tsai

Report Producer: Jackson Tsai

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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)	5180-5240	36-48 [4]
5725-5850		5745-5825	149-165 [5]
5150-5250	n (HT40)	5190-5230	38-46 [2]
5725-5850		5755-5795	151-159 [2]

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Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	1TX
5.725-5.85GHz	802.11a	20	1TX
5.15-5.25GHz	802.11n HT20	20	1TX
5.725-5.85GHz	802.11n HT20	20	1TX
5.15-5.25GHz	802.11n HT40	40	1TX
5.725-5.85GHz	802.11n HT40	40	1TX

#### Note:

• 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

BWch is the nominal channel bandwidth.

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#### 1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector
1	1	=	Ring Wifi Antenna	PIFA Antenna	Fixed on board

2.4	4G	5	G	В	Т
Frequency (MHz)	Gain (dBi)	Frequency (MHz)	Gain (dBi)	Frequency (MHz)	Gain (dBi)
2412	1.37	5180	1.4	2402	1.37
2417	1.37	5200	1.4	2440 / 2441	1.08
2422	1.37	5240	2.5	2480	1.09
2427	1.08	5190	1.4	-	-
2432	1.08	5230	2.5	-	-
2437	1.08	5745	3.12	-	-
2442	1.08	5785	2.65	-	-
2447	1.08	5825	1.67	-	-
2452	1.08	5755	3.12	-	-
2457	1.08	5795	2.65	=	-
2462	1.08	-	-	-	-

#### For 2.4 GHz function:

For IEEE 802.11b/g/n mode (1TX/1RX)

Only Ant. 1 (port 1) can be used as transmitting/receiving antenna.

#### For 5 GHz function:

For IEEE 802.11a/n mode (1TX/1RX)

Only Ant. 1 (port 1) can be used as transmitting/receiving antenna.

#### For Bluetooth function:

For Bluetooth mode (1TX/1RX)

Only Ant. 1 (port 1) can be used as transmitting/receiving antenna.

### 1.1.3 EUT Information

	Operational Condition							
EU1	Power T	ype	Fro	m Battery / Trans	sformer			
	Γ Function	Outdoor			Indoor			
	runction	ı		Fixed P2P			$\boxtimes$	Client
Bea	mforming	Function		With beamform	ing		$\boxtimes$	Without beamforming
					Type of	EUT		
$\boxtimes$	Stand-alo	ne						
	Combined	d (EUT where	e the	radio part is full	y integra	ated wit	hin a	nother device)
	Combined	d Equipment	- Bra	and Name / Mod	el No.:			
	Plug-in radio (EUT intended for a variety of host systems)							
	Host System - Brand Name / Model No.:							
	Other:							

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### 1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11a	0.956	0.195	2.069m	1k
802.11n HT20	0.952	0.214	1.925m	1k
802.11n HT40	0.898	0.467	950u	3k

### 1.1.5 Table for Multiple Listing

Difference	Description			
SKU #1				
SKU #2	The compile is the come and could the color is different			
SKU #3	The sample is the same one, only the color is different.			
SKU #4				
Note. For more detailed features description, please refer to the specifications or user's manual.				

## 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
- KDB 789033 D02 v02r01

## 1.3 Testing Location Information

	Testing Location								
$\boxtimes$	HWA YA ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)								
		TEL :	886-3-327-3456	FAX : 886-3-327-0973					
			Test site Designation	on No. TW1190 with FCC.					
	JHUBEI	ADD :	No.8, Ln. 724, Bo'ai St	, Zhubei City, Hsinchu County, Taiwan (R.O.C.)					
	TEL: 886-3-656-9065 FAX: 886-3-656-9085								
	Test site Designation No. TW0006 with FCC.								

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Daniel	22.8°C / 53%	02/May/2018
RF Conducted	TH07-HY	Andy	22.5°C / 63%	08/May/2018
Radiated	03CH09-HY	Jerry	23.5°C / 55%	02/May/2018

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## 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)

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Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 °C	Confidence levels of 95%
Humidity	4 %	Confidence levels of 95%

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2 Test Configuration of EUT

## 2.1 Test Condition

Condition Item	Abbreviation/Remark	Remark
TnomVnom	Tnom	20°C
	Vnom	120V

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## 2.2 Test Channel Mode

Test Software	DoS
---------------	-----

Mode	Power Setting
802.11a_Nss1,(6Mbps)_1TX	-
5180MHz	68
5200MHz	68
5240MHz	68
5745MHz	68
5785MHz	68
5825MHz	68
802.11n HT20_Nss1,(MCS0)_1TX	-
5180MHz	68
5200MHz	68
5240MHz	68
5745MHz	68
5785MHz	68
5825MHz	68
802.11n HT40_Nss1,(MCS0)_1TX	-
5190MHz	58
5230MHz	68
5755MHz	68
5795MHz	68

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#### **The Worst Case Measurement Configuration** 2.3

Ti	ne 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	СТХ
1	AC mode

Ti	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	

Th	e Worst Case Mode for Fo	ollowing Conformance Te	sts
Tests Item	Unwanted Emissions		
Test Condition	regardless of spatial multi	antenna assembly (multiple plexing MIMO configuratior antenna gain of each anter	n), the radiated test should
Operating Mode < 1GHz	CTX		
1	AC mode		
Operating Mode > 1GHz	CTX		
	X Plane	Y Plane	Z Plane
Orthogonal Planes of EUT			
Worst Planes of EUT	V		

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### 2.4 Accessories

			Accessor	ries	
ı	Dottom/	Brand Name	Fuji	Model Name	334060
	Battery	Power Rating	3.8 Vdc, 300 mAh	Туре	Li-ion

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Reminder: Regarding to more detail and other information, please refer to user manual.

## 2.5 Support Equipment

		Support Equipment -	- RF Conducted	
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5410	DoC
2	Adapter for NB	DELL	HA65NM130	DoC
3	Transformer	TRIAD	VPL24-1100	DoC

Note: Support equipment No.3 was provided by customer.

		Support Equipment – R	adiated Emission	
No.	Equipment	Brand Name	Model Name	FCC ID
1	Transformer	TRIAD	VPL24-1100	-

Note: Support equipment No.1 was provided by customer.

		Support Equipment –	AC Conduction	
No.	Equipment	Brand Name	Model Name	FCC ID
1	Transformer	TRIAD	VPL24-1100	-

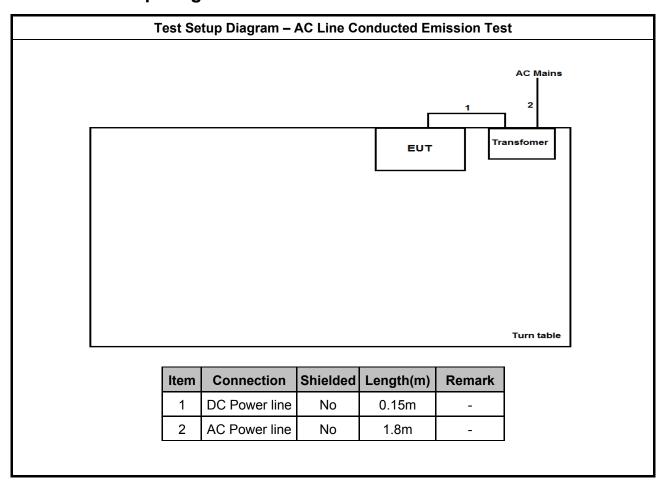
Note: Support equipment No.1 was provided by customer.

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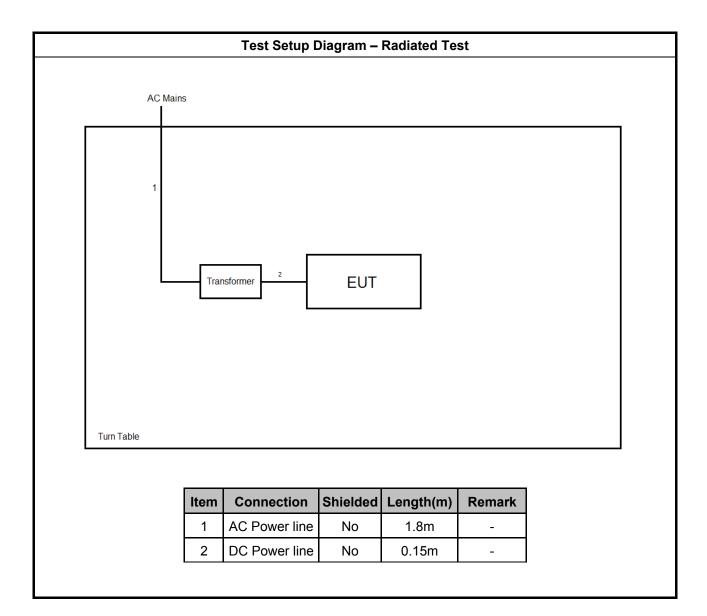
#### **Test Setup Diagram** 2.6



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#### **Transmitter Test Result** 3

#### **AC Power-line Conducted Emissions** 3.1

### 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

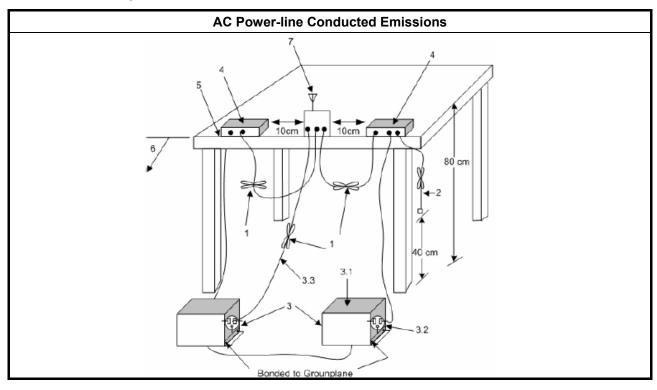
### 3.1.2 Measuring Instruments

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

#### **Test Procedures** 3.1.3

	Test Method
Refer as ANSI C63.10-2013, cla	use 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

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3.2 Emission Bandwidth

### 3.2.1 Emission Bandwidth Limit

	Emission Bandwidth Limit							
UN	JNII 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.							

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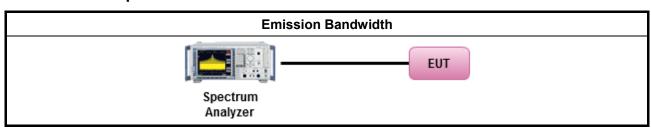
## 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

	Test Method							
•	For the emission bandwidth shall be measured using one of the options below:							
	Refer as KDB 789033, clause C for EBW and clause D for OBW measurement.							
		Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.						
		Refer as IC RSS-Gen, clause 6.7 for bandwidth testing.						

### 3.2.4 Test Setup



### 3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

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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 (Pout) shall not exceed the lesser of 1 W. If GTX > 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 (Pout) 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 (Pout) 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<sub>Out</sub>) 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 (Pout) 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 (Pout) 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 (Pout) shall not exceed the lesser of 1 W. **P**<sub>Out</sub> = maximum conducted output power in dBm, $G_{TX}$ = the maximum transmitting antenna directional gain in dBi.

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3.3.2 Measuring Instruments

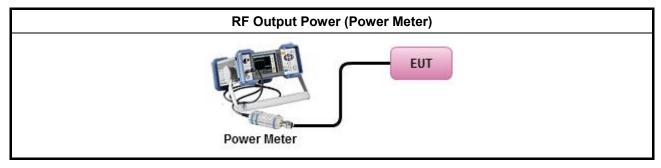
Refer a test equipment and calibration data table in this test report.

### 3.3.3 Test Procedures

	Test Method
•	Maximum Conducted Output Power
	Duty cycle ≥ 98%
	Refer as KDB 789033, clause E Method SA-2 (spectral trace averaging).
	Duty cycle < 98%
	Refer as 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 KDB 789033, clause E Method PM (using an RF average power meter).
•	For conducted measurement.
	If the EUT supports multiple transmit chains using options given below: Refer as 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 <sub>total</sub> = P <sub>1</sub> + P <sub>2</sub> + + P <sub>n</sub> (calculated in linear unit [mW] and transfer to log unit [dBm]) EIRP <sub>total</sub> = P <sub>total</sub> + DG

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## 3.3.4 Test Setup



## 3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

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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<sub>TX</sub> > 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= $11 - (G_{TX} - 6)$ . 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.

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#### 3.4.2 Measuring Instruments

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

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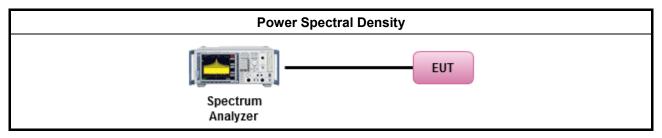


3.4.3 Test Procedures

		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 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	cycle ≥ 98%									
		Refer as KDB 789033, clause E Method SA-2 (spectral trace averaging).									
	Duty	cycle < 98%									
	$\boxtimes$	Refer as 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:									
		Measure and sum the spectra across the outputs. Refer as 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.									
	•	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 $									

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## 3.4.4 Test Setup



## 3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D

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#### 3.5 **Unwanted Emissions**

#### Transmitter Radiated Unwanted Emissions Limit 3.5.1

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

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

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	5.650-5700 GHz: e.i.r.p27 ~ 10 dBm [68.2 ~ 105.2 dBuV/m@3m] 5.700-5720 GHz: e.i.r.p. 10 ~ 15.6 dBm [105.2 ~ 110.8 dBuV/m@3m] 5.720-5725 GHz: e.i.r.p. 15.6 ~ 27 dBm [110.8 ~ 122.2 dBuV/m@3m] 5.850-5.855 GHz: e.i.r.p. 27 ~ 15.6 dBm [122.2 ~ 110.8 dBuV/m@3m] 5.855-5.875 GHz: e.i.r.p. 15.6 ~ 10 dBm [110.8 ~ 105.2 dBuV/m@3m] 5.875-5.925 GHz: e.i.r.p. 10 ~ -27 dBm [105.2 ~ 68.2dBuV/m@3m] Other un-restricted band: e.i.r.p27 dBm [68.2 dBuV/m@3m]						

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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#### 3.5.2 Measuring Instruments

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

#### 3.5.3 Test Procedures

#### **Test Method**

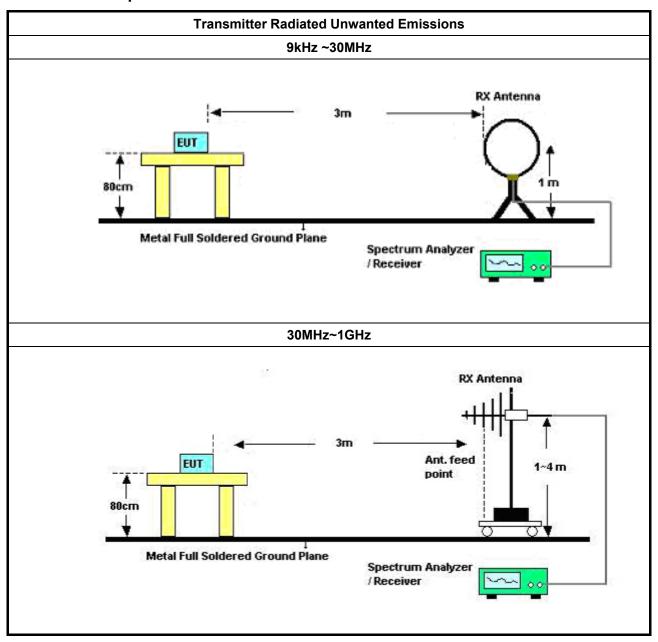
- Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, 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 ≥ 98 or duty factor].
- For the transmitter unwanted emissions shall be measured using following options below:
  - Refer as KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
  - Refer as KDB 789033, clause G)1) for unwanted emissions into restricted bands.
    - Refer as KDB 789033, G)6) Method VB (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW.
    - Refer as KDB 789033, clause G)5) (ANSI C63.10, clause 4.1.4.2.2), 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.

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#### 3.5.4 **Test Setup**

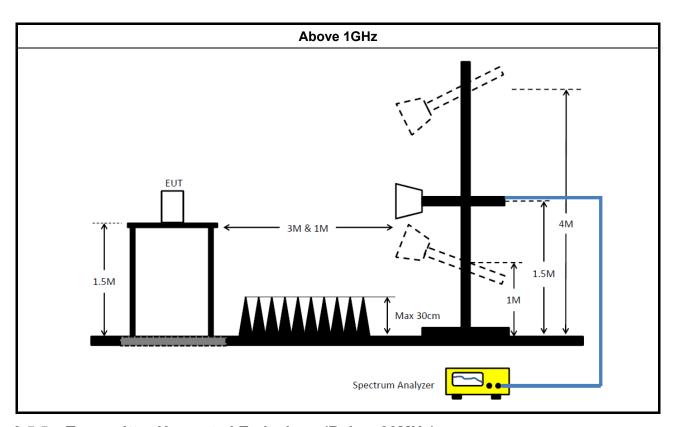


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## 3.5.5 Transmitter Unwanted Emissions (Below 30MHz)

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

### 3.5.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E

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3.6 Test Equipment and Calibration Data

### **Instrument for AC Conduction**

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	Rohde & Schwarz	ESCS 30	ESCS 30 838251/003 9		13/Jun/2017	12/Jun/2018
LISN	R&S	ENV216	101295	9 kHz ~ 30 MHz	17/Nov/2017	16/Nov/2018
RF Cable-CON	ON HUBER+SUHNER RG213.		07611832020001	9 kHz ~ 30 MHz	06/Oct/2017	05/Oct/2018
AC POWER	APC	AFC-11005G	F310050055	47 Hz ~ 63 Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2017	11/Oct/2018

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NCR : Non-Calibration Require

#### **Instrument for Radiated Test**

Instrument	nent Manufacturer Model No. Serial No. Spec.		Spec.	Calibration Date	Calibration Due Date	
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30 MHz ~ 1 GHz	23/Apr/2018	22/Apr/2019
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1 GHz ~ 18 GHz	20/Jun/2017	19/Jun/2018
Microwave Preamplifier	Agilent	8449B	3008A02326	1 GHz ~ 26.5 GHz	17/Jul/2017	16/Jul/2018
Amplifier	EMC	EMC9135	980232	9 kHz ~ 1 GHz	27/Apr/2018	26/Apr/2019
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10 Hz ~ 44 GHz	20/Jul/2017	19/Jul/2018
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D & MTJ6102-05	35418 / 3	30 MHz ~ 1 GHz	09/Sep/2017	08/Sep/2018
Double Ridged Guide Horn Antenna	SCHWARZBECK	ARZBECK BBHA 9120 D BBI		1 GHz ~ 18 GHz	30/Apr/2018	29/Apr/2019
Broadband Horn Antenna	SCHWARZBECK	CHWARZBECK BBHA 9170 BBHA		18 GHz ~ 40 GHz	09/Feb/2018	08/Feb/2019
Preamplifier	Preamplifier MITEQ TTA1840-35-H		1864481	18 GHz ~ 40 GHz	24/Aug/2017	23/Aug/2018
Loop Antenna	TESEQ	HLA 6120	31244	9k – 30 MHz	29/Mar/2018	28/Mar/2019
RF Cable-R03m	Jye Bao	RG142	CB031	9 kHz ~ 1 GHz	02/Feb/2018	01/Feb/2019
RF Cable-high	SUHNER	SUCOFLEX104	MY34918/4	1 GHz ~ 40 GHz	02/Feb/2018	01/Feb/2019

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## FCC Test Report

**Instrument for Conducted Test** 

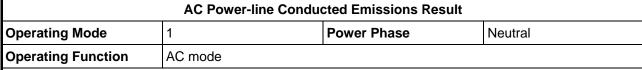
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101515	9 kHz ~ 40 GHz	08/Dec/2017	07/Dec/2018
Power Sensor	Anritsu	MA2411B	1339407	300 MHz ~ 40 GHz	10/May/2017	09/May/2018
Power Meter	Anritsu	ML2495A	1517010	300 MHz ~ 40 GHz	06/Nov/2017	05/Nov/2018
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10710/4	30 MHz ~ 26.5 GHz	25/Aug/2017	24/Aug/2018
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10709/4	30 MHz ~ 26.5 GHz	25/Aug/2017	24/Aug/2018
RF Cable-0.5m	HUBER+SUHNER	SUCOFLEX_104	MY10713/4	30 MHz ~ 26.5 GHz	25/Aug/2017	24/Aug/2018
Signal Generator	R&S	SMR40	100116	10 MHz ~ 40 GHz	27/Jul/2017	26/Jul/2018

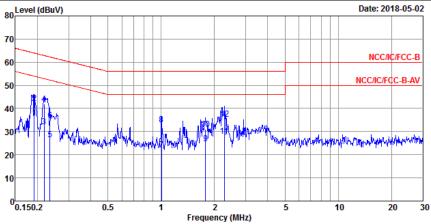
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### **AC Power-line Conducted Emissions**





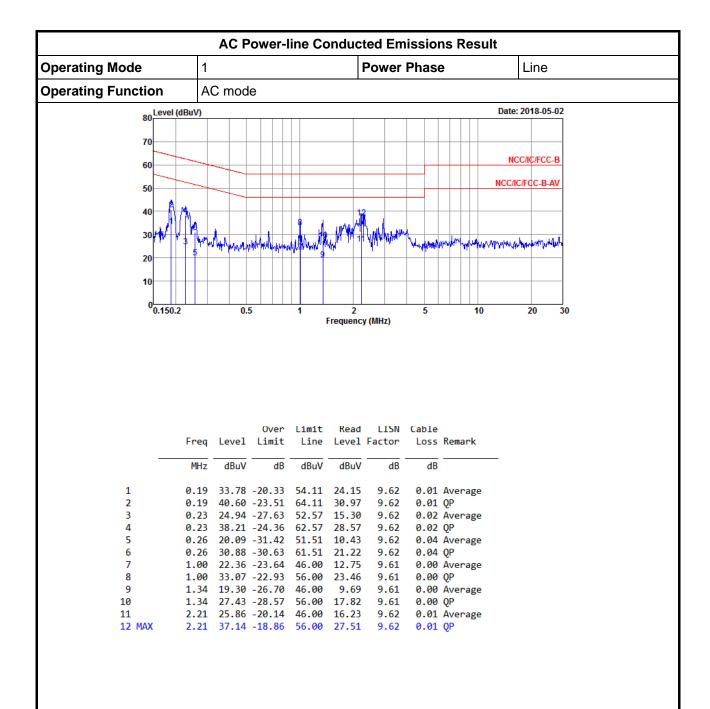
			0ver	Limit	Read	LISN	Cable	
	Freq	Level	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
	0.40	36.04	47.07	F2 00	06.30	0.60	0.04	
1	0.19	36.01	-17.97	53.98	26.38	9.62	0.01	Average
2	0.19	42.30	-21.68	63.98	32.67	9.62	0.01	QP
3	0.22	32.04	-20.84	52.88	22.41	9.62	0.01	Average
4	0.22	42.05	-20.83	62.88	32.42	9.62	0.01	QP
5	0.24	26.63	-25.63	52.26	16.99	9.62	0.02	Average
6	0.24	34.94	-27.32	62.26	25.30	9.62	0.02	QP
7	1.00	22.18	-23.82	46.00	12.56	9.62	0.00	Average
8	1.00	33.20	-22.80	56.00	23.58	9.62	0.00	QP
9	1.78	24.85	-21.15	46.00	15.22	9.63	0.00	Average
10	1.78	31.03	-24.97	56.00	21.40	9.63	0.00	QP
11 MAX	2.27	28.17	-17.83	46.00	18.52	9.63	0.02	Average
12	2.27	35.40	-20.60	56.00	25.75	9.63	0.02	OP

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.)

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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.)

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Appendix B EBW Result

**Summary** 

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
5.15-5.25GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	39.05M	18.141M	18M1D1D	37.8M	17.391M
802.11n HT20_Nss1,(MCS0)_1TX	40.85M	18.291M	18M3D1D	39.8M	17.941M
802.11n HT40_Nss1,(MCS0)_1TX	82.4M	37.081M	37M1D1D	65.55M	36.082M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	15.075M	17.166M	17M2D1D	13.8M	16.892M
802.11n HT20_Nss1,(MCS0)_1TX	15.075M	17.991M	18M0D1D	13M	17.791M
802.11n HT40_Nss1,(MCS0)_1TX	32.55M	39.73M	39M7D1D	32.4M	37.131M

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 B

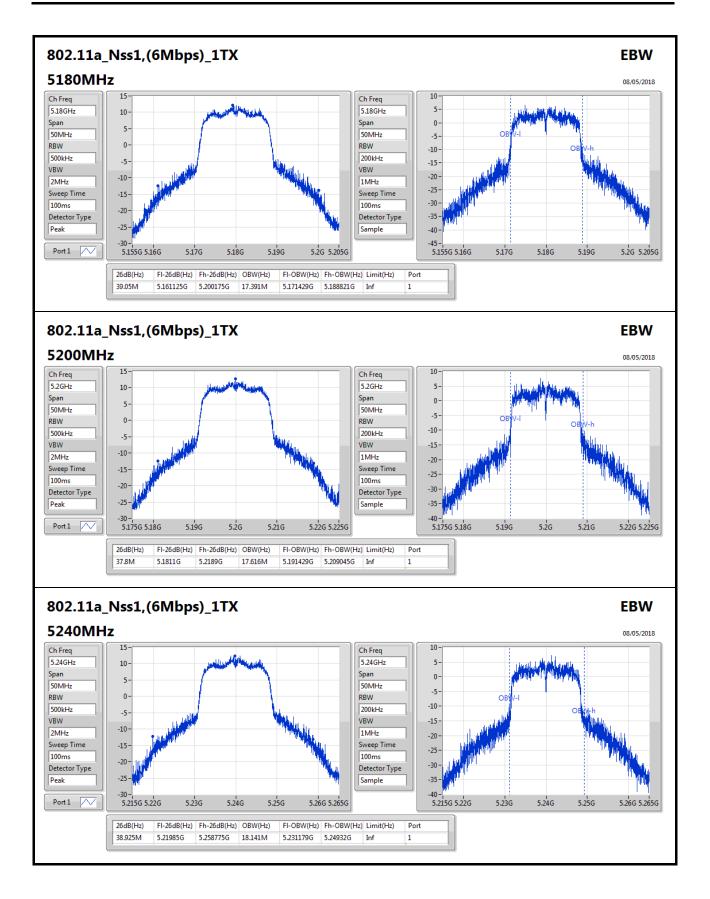
#### Result

Mode	Result	Limit	Port 1-N dB	Port 1-OBW
		(Hz)	(Hz)	(Hz)
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-
5180MHz_TnomVnom	Pass	Inf	39.05M	17.391M
5200MHz_TnomVnom	Pass	Inf	37.8M	17.616M
5240MHz_TnomVnom	Pass	Inf	38.925M	18.141M
5745MHz_TnomVnom	Pass	500k	13.8M	17.166M
5785MHz_TnomVnom	Pass	500k	15M	16.892M
5825MHz_TnomVnom	Pass	500k	15.075M	16.892M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
5180MHz_TnomVnom	Pass	Inf	39.8M	17.941M
5200MHz_TnomVnom	Pass	Inf	39.85M	17.966M
5240MHz_TnomVnom	Pass	Inf	40.85M	18.291M
5745MHz_TnomVnom	Pass	500k	13M	17.991M
5785MHz_TnomVnom	Pass	500k	15.075M	17.791M
5825MHz_TnomVnom	Pass	500k	14.95M	17.816M
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-
5190MHz_TnomVnom	Pass	Inf	65.55M	36.082M
5230MHz_TnomVnom	Pass	Inf	82.4M	37.081M
5755MHz_TnomVnom	Pass	500k	32.4M	39.73M
5795MHz_TnomVnom	Pass	500k	32.55M	37.131M

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;

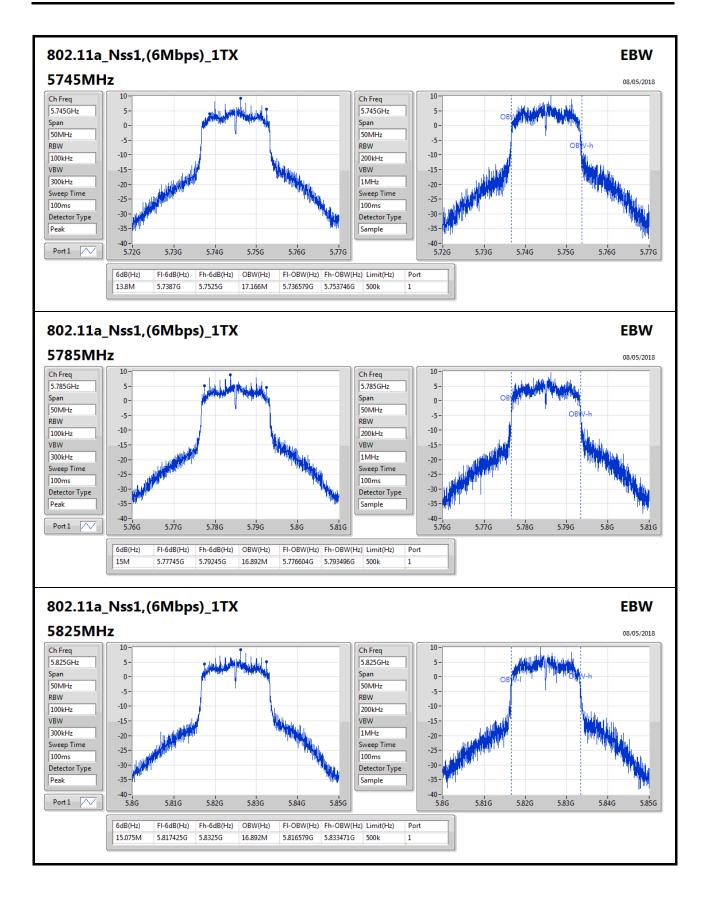
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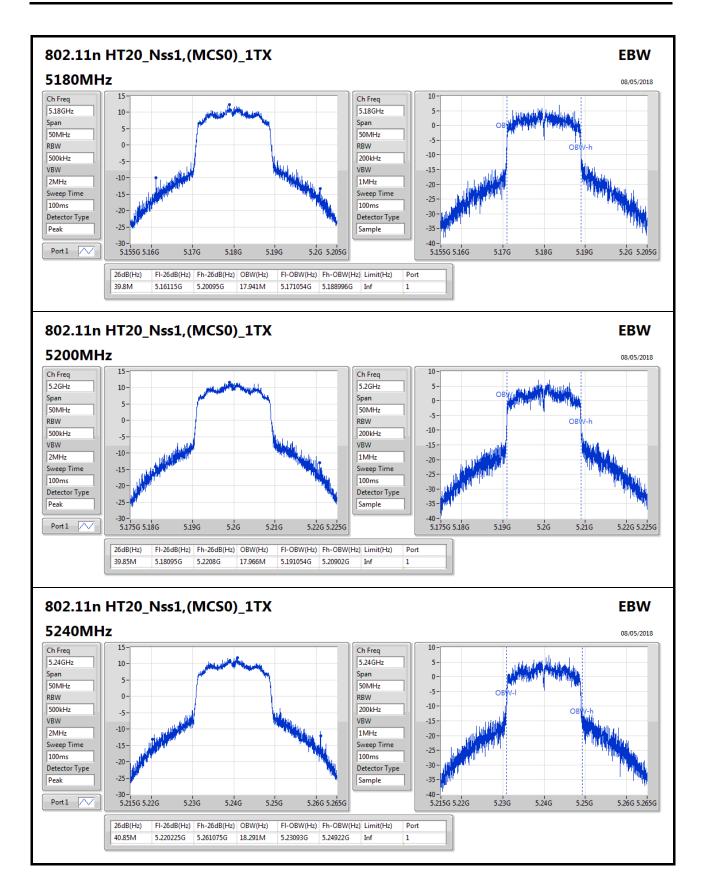
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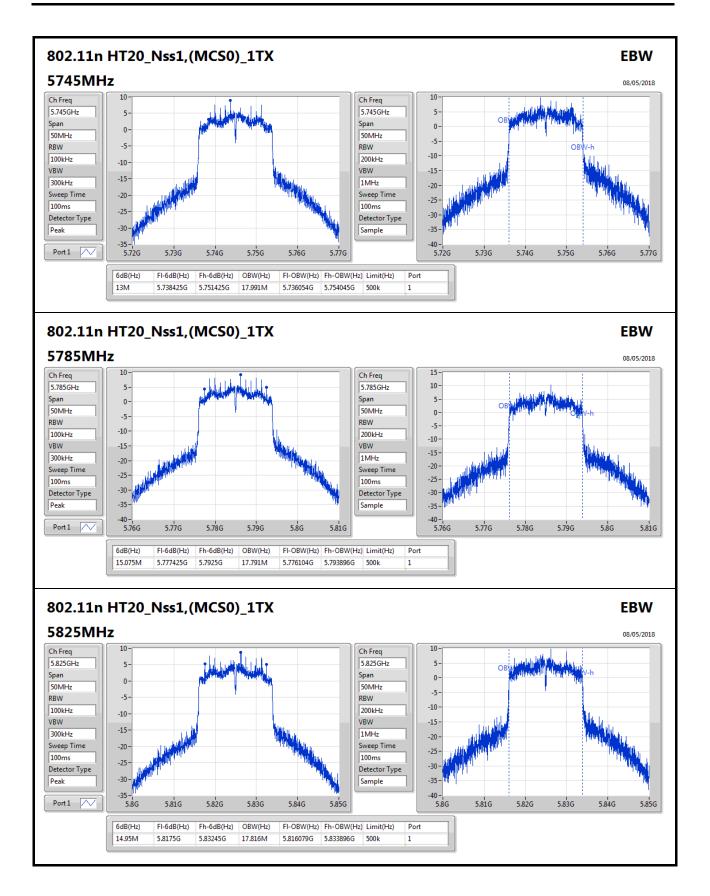
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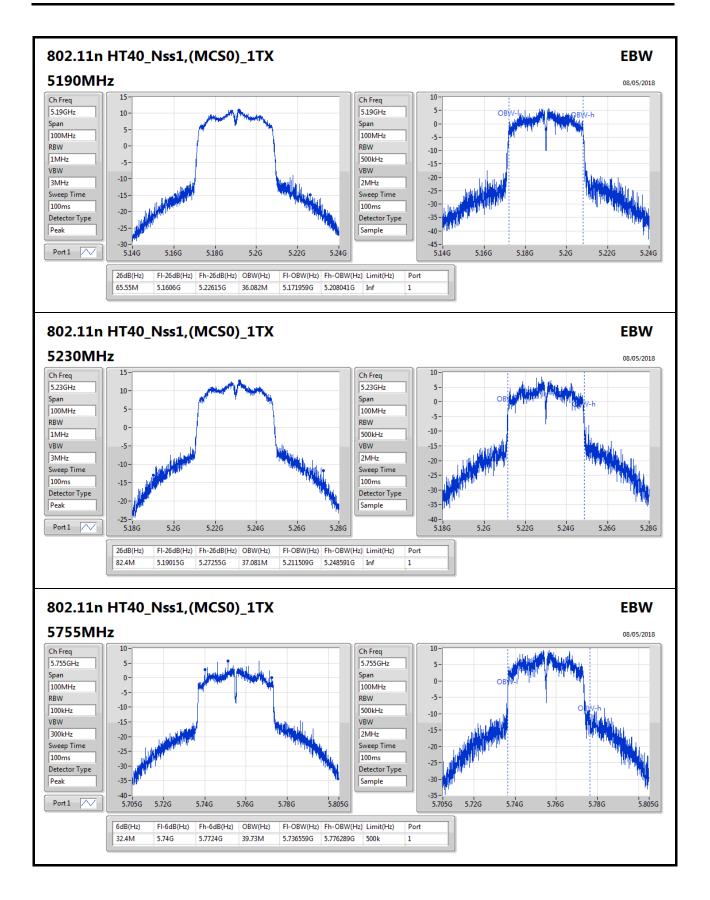
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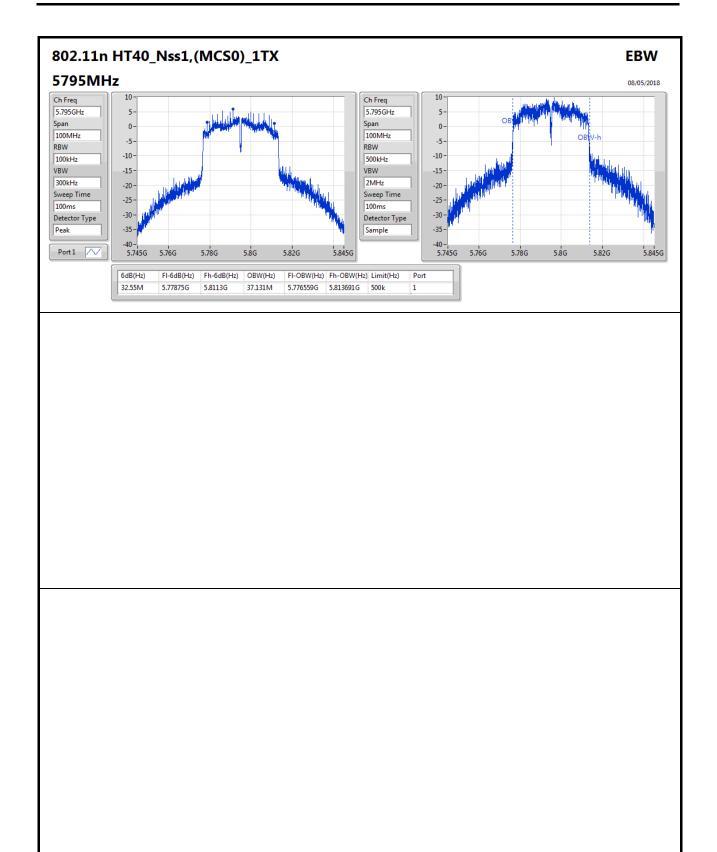




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SPORTON LAB.

Appendix B EBW Result



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Power Result Appendix C

Summary

Mode	Total Power	Total Power	EIRP	EIRP
	(dBm)	(W)	(dBm)	(W)
5.15-5.25GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	17.23	0.05284	19.56	0.09036
802.11n HT20_Nss1,(MCS0)_1TX	17.18	0.05224	19.54	0.08995
802.11n HT40_Nss1,(MCS0)_1TX	17.01	0.05023	19.51	0.08933
5.725-5.85GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	18.53	0.07129	21.33	0.13583
802.11n HT20_Nss1,(MCS0)_1TX	18.49	0.07063	21.61	0.14488
802.11n HT40_Nss1,(MCS0)_1TX	19.05	0.08035	22.17	0.16482

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Power Result Appendix C

### Result

Mode	Result	DG	Port 1	Total Power	Power Limit	EIRP	EIRP Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	1.40	17.18	17.18	24.00	18.58	30.00
5200MHz_TnomVnom	Pass	1.40	17.23	17.23	24.00	18.63	30.00
5240MHz_TnomVnom	Pass	2.50	17.06	17.06	24.00	19.56	30.00
5745MHz_TnomVnom	Pass	3.12	18.21	18.21	30.00	21.33	36.00
5785MHz_TnomVnom	Pass	2.65	18.19	18.19	30.00	20.84	36.00
5825MHz_TnomVnom	Pass	1.67	18.53	18.53	30.00	20.20	36.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	1.40	17.10	17.10	24.00	18.50	30.00
5200MHz_TnomVnom	Pass	1.40	17.18	17.18	24.00	18.58	30.00
5240MHz_TnomVnom	Pass	2.50	17.04	17.04	24.00	19.54	30.00
5745MHz_TnomVnom	Pass	3.12	18.49	18.49	30.00	21.61	36.00
5785MHz_TnomVnom	Pass	2.65	18.41	18.41	30.00	21.06	36.00
5825MHz_TnomVnom	Pass	1.67	18.41	18.41	30.00	20.08	36.00
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
5190MHz_TnomVnom	Pass	1.40	15.50	15.50	24.00	16.90	30.00
5230MHz_TnomVnom	Pass	2.50	17.01	17.01	24.00	19.51	30.00
5755MHz_TnomVnom	Pass	3.12	19.05	19.05	30.00	22.17	36.00
5795MHz_TnomVnom	Pass	2.65	18.92	18.92	30.00	21.57	36.00

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

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PSD Result Appendix D

Summary

Mode	PD	EIRP PD
	(dBm/RBW)	(dBm/RBW)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_1TX	5.75	8.16
802.11n HT20_Nss1,(MCS0)_1TX	5.53	7.95
802.11n HT40_Nss1,(MCS0)_1TX	2.82	5.32
5.725-5.85GHz	-	-
802.11a_Nss1,(6Mbps)_1TX	6.05	9.00
802.11n HT20_Nss1,(MCS0)_1TX	5.67	8.79
802.11n HT40_Nss1,(MCS0)_1TX	3.57	6.69

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

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Appendix D **PSD Result** 

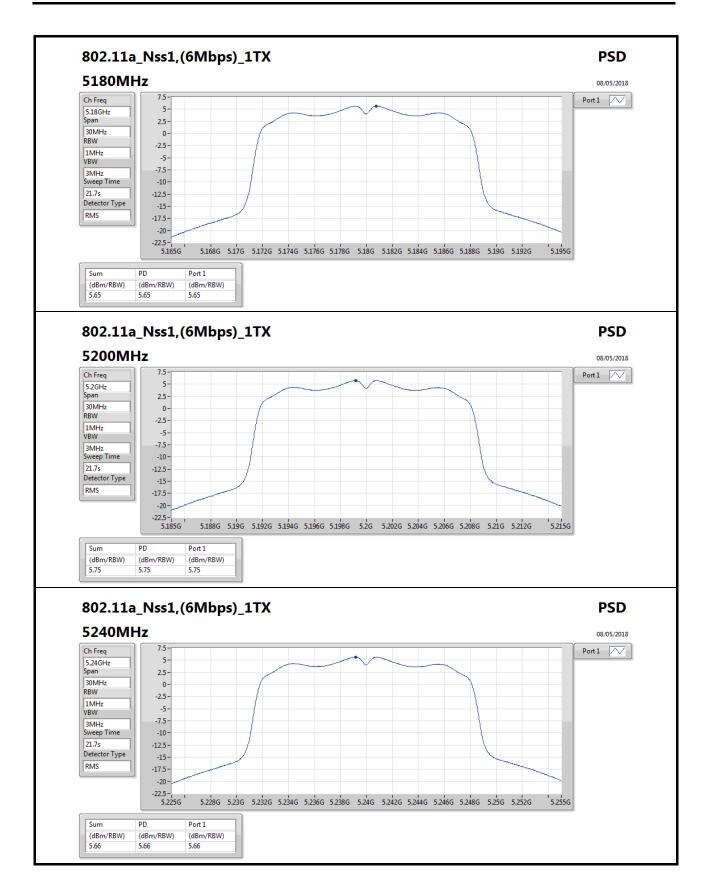
#### Result

Mode	Result	DG	Port 1	PD	PD Limit	EIRP PD	EIRP PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	1.40	5.65	5.65	11.00	7.05	17.00
5200MHz_TnomVnom	Pass	1.40	5.75	5.75	11.00	7.15	17.00
5240MHz_TnomVnom	Pass	2.50	5.66	5.66	11.00	8.16	17.00
5745MHz_TnomVnom	Pass	3.12	5.88	5.88	30.00	9.00	36.00
5785MHz_TnomVnom	Pass	2.65	6.05	6.05	30.00	8.70	36.00
5825MHz_TnomVnom	Pass	1.67	5.93	5.93	30.00	7.60	36.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	1.40	5.39	5.39	11.00	6.79	17.00
5200MHz_TnomVnom	Pass	1.40	5.53	5.53	11.00	6.93	17.00
5240MHz_TnomVnom	Pass	2.50	5.45	5.45	11.00	7.95	17.00
5745MHz_TnomVnom	Pass	3.12	5.67	5.67	30.00	8.79	36.00
5785MHz_TnomVnom	Pass	2.65	5.67	5.67	30.00	8.32	36.00
5825MHz_TnomVnom	Pass	1.67	5.62	5.62	30.00	7.29	36.00
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
5190MHz_TnomVnom	Pass	1.40	1.29	1.29	11.00	2.69	17.00
5230MHz_TnomVnom	Pass	2.50	2.82	2.82	11.00	5.32	17.00
5755MHz_TnomVnom	Pass	3.12	3.57	3.57	30.00	6.69	36.00
5795MHz_TnomVnom	Pass	2.65	3.44	3.44	30.00	6.09	36.00

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

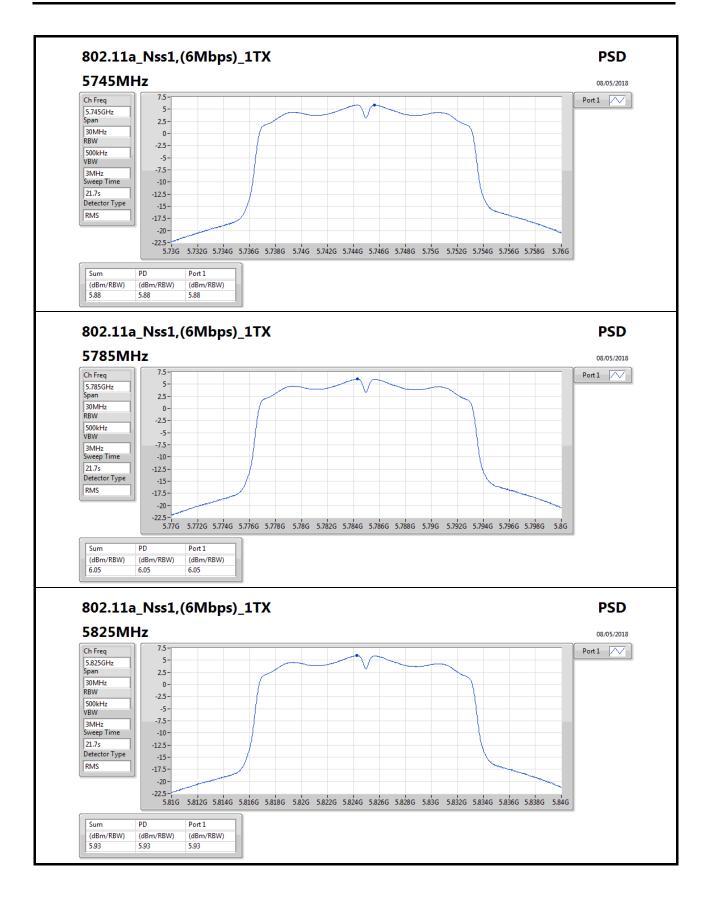
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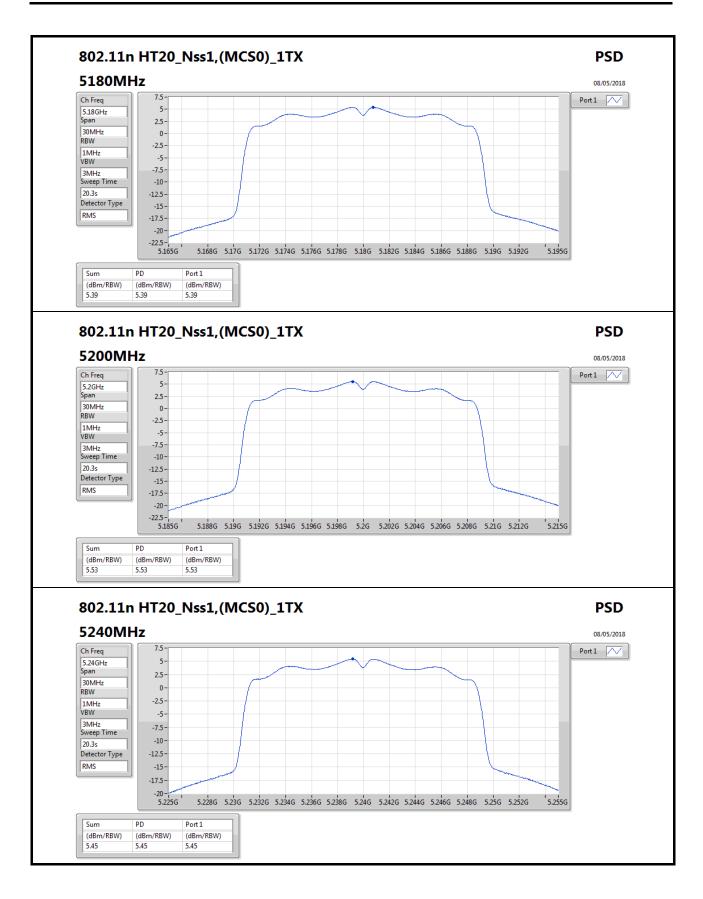




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Appendix D

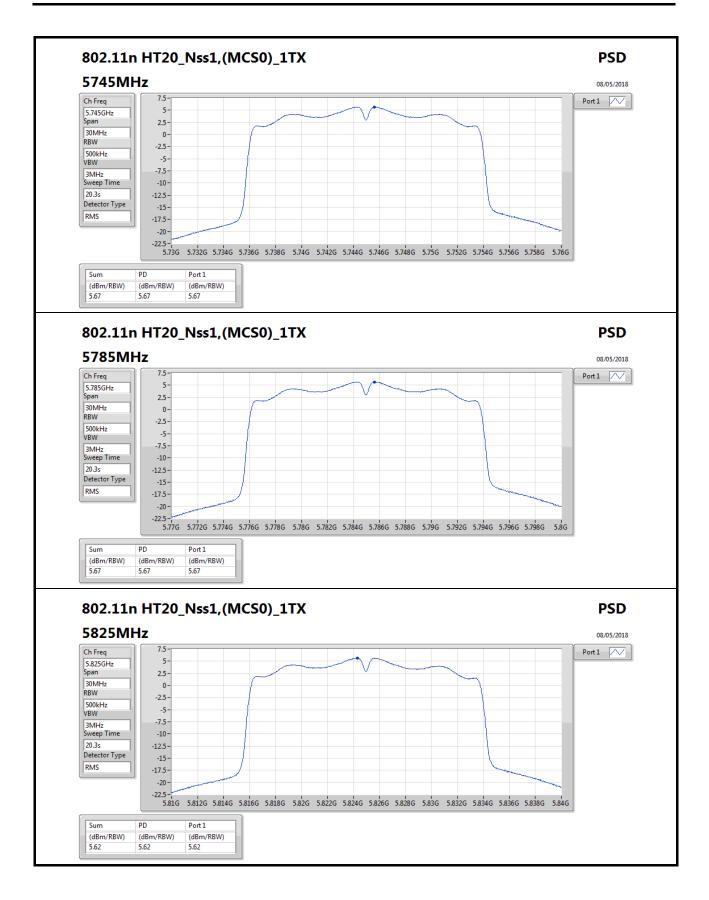




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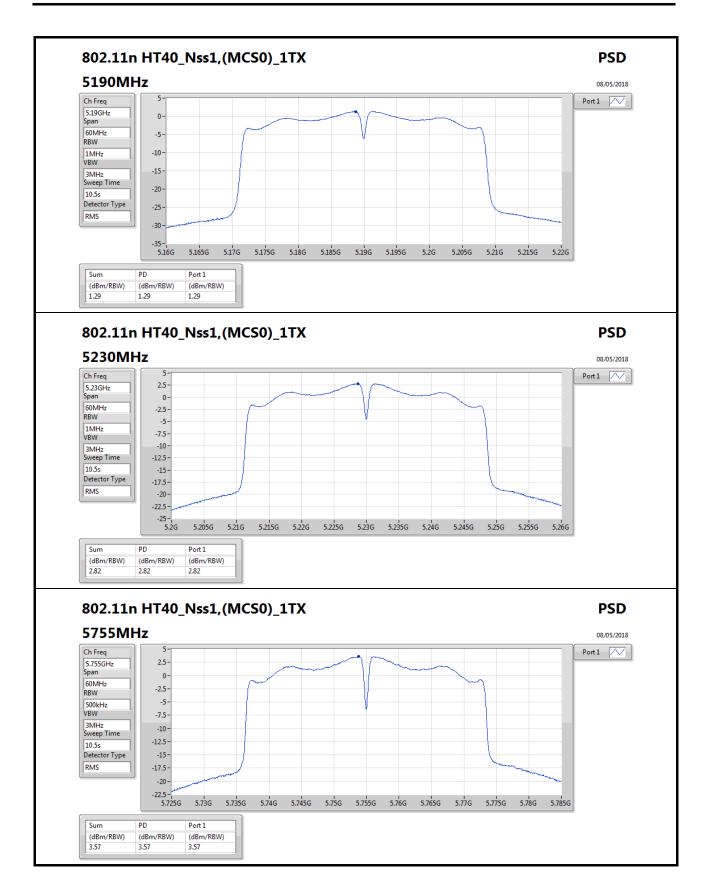
Appendix D





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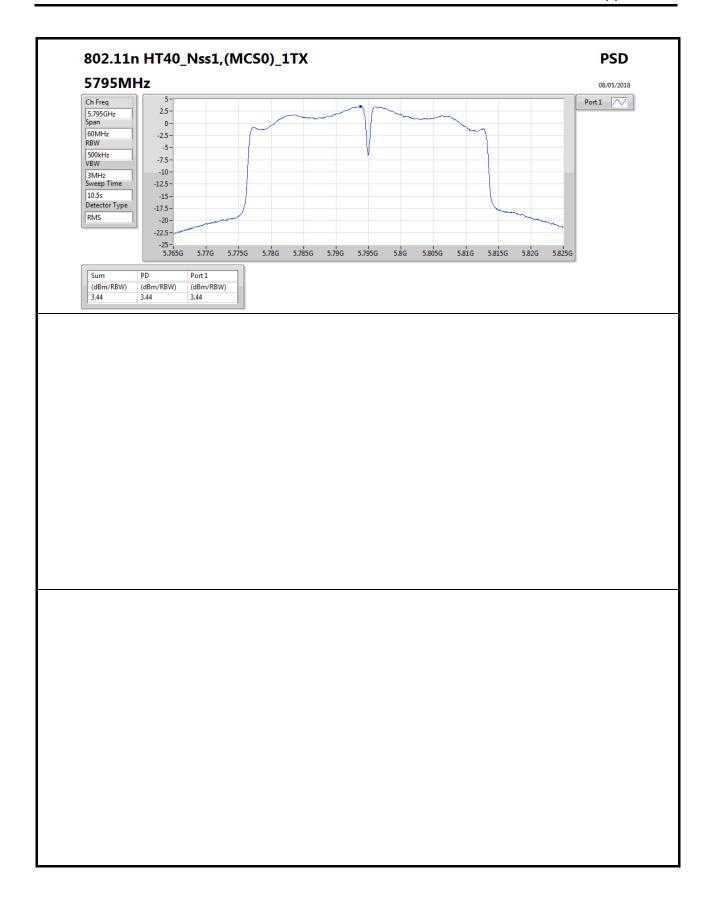




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SPORTON LAB.

Appendix D



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# RSE TX below 1GHz Result

Appendix E

**Summary** 

Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth	Height (m)	Comments
5.725-5.85GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11n HT40_Nss1,(MCS0)_1TX	Pass	PK	276.38M	37.92	46.00	-8.08	-16.56	3	Vertical	360	1.00	-

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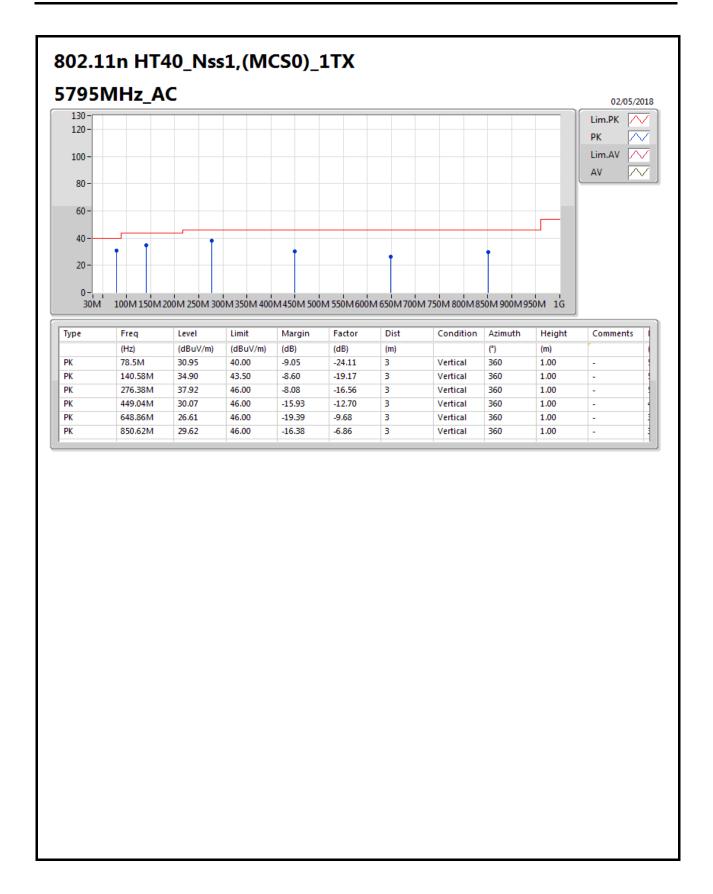
# RSE TX below 1GHz Result

### Result

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-	-	-	-	-	-
5795MHz	Pass	PK	78.5M	30.95	40.00	-9.05	-24.11	3	Vertical	360	1.00	-
5795MHz	Pass	PK	140.58M	34.90	43.50	-8.60	-19.17	3	Vertical	360	1.00	-
5795MHz	Pass	PK	276.38M	37.92	46.00	-8.08	-16.56	3	Vertical	360	1.00	-
5795MHz	Pass	PK	449.04M	30.07	46.00	-15.93	-12.70	3	Vertical	360	1.00	-
5795MHz	Pass	PK	648.86M	26.61	46.00	-19.39	-9.68	3	Vertical	360	1.00	-
5795MHz	Pass	PK	850.62M	29.62	46.00	-16.38	-6.86	3	Vertical	360	1.00	-
5795MHz	Pass	PK	80.44M	28.23	40.00	-11.77	-23.80	3	Horizontal	0	1.00	-
5795MHz	Pass	PK	148.34M	30.38	43.50	-13.12	-19.32	3	Horizontal	0	1.00	-
5795MHz	Pass	PK	256.98M	30.57	46.00	-15.43	-15.85	3	Horizontal	0	1.00	-
5795MHz	Pass	PK	365.62M	29.95	46.00	-16.05	-14.89	3	Horizontal	0	1.00	-
5795MHz	Pass	PK	483.96M	22.92	46.00	-23.08	-12.10	3	Horizontal	0	1.00	-
5795MHz	Pass	PK	825.4M	32.87	46.00	-13.13	-7.53	3	Horizontal	0	1.00	-

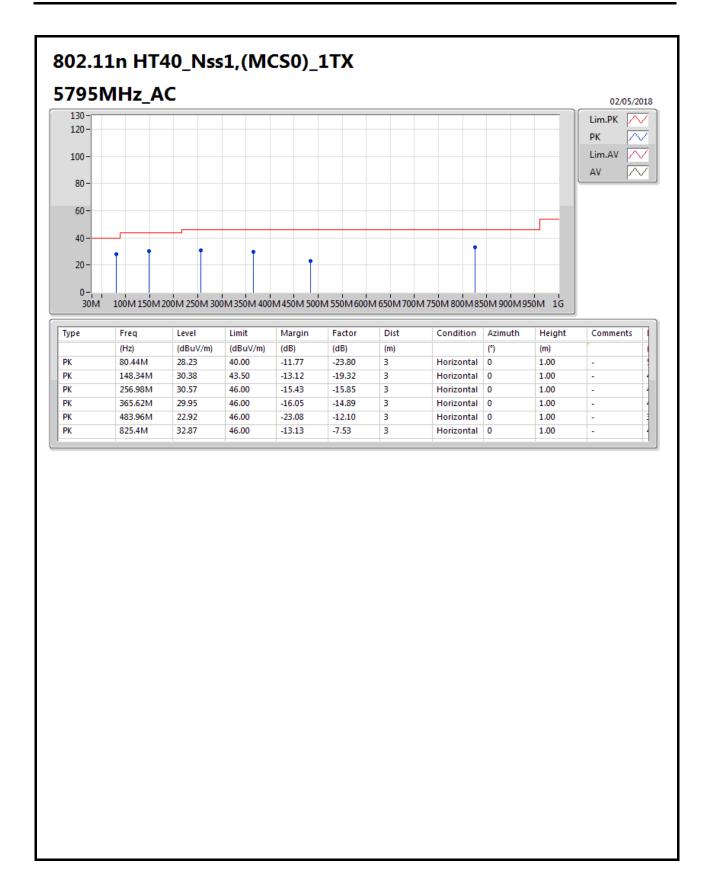
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Appendix E

Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
5.15-5.25GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	Pass	AV	5.1498G	52.52	54.00	-1.48	5.13	3	Vertical	249	1.23	-
802.11n HT20_Nss1,(MCS0)_1TX	Pass	AV	5.1498G	51.47	54.00	-2.53	5.13	3	Vertical	247	1.20	-
802.11n HT40_Nss1,(MCS0)_1TX	Pass	AV	5.149995G	53.67	54.00	-0.33	5.13	3	Vertical	256	1.22	-
5.725-5.85GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	Pass	AV	17.48376G	51.74	54.00	-2.26	20.95	3	Vertical	2	1.50	-
802.11n HT20_Nss1,(MCS0)_1TX	Pass	AV	17.4792G	51.74	54.00	-2.26	20.93	3	Vertical	151	1.50	-
802.11n HT40_Nss1,(MCS0)_1TX	Pass	AV	17.39124G	51.82	54.00	-2.18	20.49	3	Horizontal	195	1.50	-

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#### Result

Result	1	1		1	1		1	1	1	1	1	
Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	AV	5.1498G	52.52	54.00	-1.48	5.13	3	Vertical	249	1.23	-
5180MHz	Pass	AV	5.1804G	93.01	Inf	-Inf	5.17	3	Vertical	249	1.23	-
5180MHz	Pass	PK	5.1488G	65.93	74.00	-8.07	5.13	3	Vertical	249	1.23	-
5180MHz	Pass	PK	5.1798G	103.03	Inf	-Inf	5.17	3	Vertical	249	1.23	-
5180MHz	Pass	AV	5.1488G	51.69	54.00	-2.31	5.13	3	Horizontal	195	1.00	-
5180MHz	Pass	AV	5.1808G	93.02	Inf	-Inf	5.17	3	Horizontal	195	1.00	-
5180MHz	Pass	PK	5.148G	65.42	74.00	-8.58	5.13	3	Horizontal	195	1.00	-
5180MHz	Pass	PK	5.18G	102.95	Inf	-Inf	5.17	3	Horizontal	195	1.00	-
5180MHz	Pass	AV	15.54372G	47.89	54.00	-6.11	18.32	3	Vertical	20	1.50	-
5180MHz	Pass	PK	15.55392G	57.83	74.00	-16.17	18.29	3	Vertical	20	1.50	-
5180MHz	Pass	AV	15.52932G	47.60	54.00	-6.40	18.36	3	Horizontal	306	1.50	-
5180MHz	Pass	PK	15.55398G	57.98	74.00	-16.02	18.29	3	Horizontal	306	1.50	-
5200MHz	Pass	AV	5.149995G	47.01	54.00	-6.99	5.13	3	Vertical	255	1.22	-
5200MHz	Pass	AV	5.2012G	93.23	Inf	-Inf	5.19	3	Vertical	255	1.22	-
5200MHz	Pass	PK	5.1488G	60.66	74.00	-13.34	5.13	3	Vertical	255	1.22	-
5200MHz	Pass	PK	5.1996G	103.27	Inf	-Inf	5.19	3	Vertical	255	1.22	-
5200MHz	Pass	AV	5.1492G	47.12	54.00	-6.88	5.13	3	Horizontal	193	1.07	-
5200MHz	Pass	AV	5.2012G	92.48	Inf	-Inf	5.19	3	Horizontal	193	1.07	-
5200MHz	Pass	PK	5.1492G	60.19	74.00	-13.81	5.13	3	Horizontal	193	1.07	-
5200MHz	Pass	PK	5.2G	101.93	Inf	-Inf	5.19	3	Horizontal	193	1.07	-
5200MHz	Pass	AV	15.5865G	47.73	54.00	-6.27	18.21	3	Vertical	219	1.49	-
5200MHz	Pass	PK	15.59616G	58.03	74.00	-15.97	18.18	3	Vertical	219	1.49	
5200MHz	Pass	AV	15.60054G	47.74	54.00	-6.26	18.17	3	Horizontal	130	1.50	-
5200MHz	Pass	PK	15.59952G	58.12	74.00	-15.88	18.18	3	Horizontal	130	1.50	-
5240MHz	Pass	AV	5.1368G	45.01	54.00	-8.99	5.12	3	Vertical	252	1.26	-
5240MHz	Pass	AV	5.3654G	44.00	54.00	-10.00	5.38	3	Vertical	252	1.26	_
5240MHz	Pass	AV	5.2394G	93.88	Inf	-Inf	5.23	3	Vertical	252	1.26	_
5240MHz	Pass	PK	5.1422G	57.83	74.00	-16.17	5.13	3	Vertical	252	1.26	_
5240MHz	Pass	PK	5.3762G	57.62	74.00	-16.38	5.38	3	Vertical	252	1.26	_
5240MHz	Pass	PK	5.2388G	103.35	Inf	-Inf	5.23	3	Vertical	252	1.26	_
5240MHz	Pass	AV	5.099G	44.94	54.00	-9.06	5.08	3	Horizontal	190	1.17	
5240MHz	Pass	AV	5.3606G	44.08	54.00	-9.92	5.36	3	Horizontal	190	1.17	
5240MHz	Pass	AV	5.2406G	92.68	Inf	-Inf	5.23	3	Horizontal	190	1.17	-
5240MHz	Pass	PK	5.1362G	57.82	74.00	-16.18	5.12	3	Horizontal	190	1.17	_
5240MHz	Pass	PK	5.3588G	57.10	74.00	-16.90	5.36	3	Horizontal	190	1.17	
5240MHz	Pass	PK	5.24G	102.24	Inf	-Inf	5.23	3	Horizontal	190	1.17	
5240MHz	Pass	AV	15.72192G	48.26	54.00	-5.74	17.86	3	Vertical	128	1.50	
5240MHz	Pass	PK	15.72172G	58.55	74.00	-15.45	17.86	3	Vertical	128	1.50	-
5240MHz	Pass	AV	15.71666G 15.73074G	48.27	54.00	-5.73	17.83	3	Horizontal	172	1.50	
5240MHz	Pass	PK	15.73074G 15.70944G	58.24	74.00	-5.75	17.89	3	Horizontal	172	1.50	
5745MHz	Pass	AV	5.7462G	98.25	74.00 Inf	-15.76 -Inf	5.87	3	Vertical	243	1.13	<u> </u>
								3				<u> </u>
5745MHz	Pass	PK	5.5542G	57.44	68.20	-10.76	5.60		Vertical	243	1.13	<del>-</del>
5745MHz	Pass	PK	5.7438G	107.63	Inf	-Inf	5.87	3	Vertical	243	1.13	-
5745MHz	Pass	PK	5.9394G	57.92	68.20	-10.28	6.16	3	Vertical	243	1.13	-
5745MHz	Pass	AV	5.7462G	98.72	Inf	-Inf	5.87	3	Horizontal	187	1.01	-
5745MHz	Pass	PK	5.589G	57.74	68.20	-10.46	5.65	3	Horizontal	187	1.01	-
5745MHz	Pass	PK	5.7438G	107.94	Inf	-Inf	5.87	3	Horizontal	187	1.01	-

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Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
5745MHz	Pass	PK	5.9478G	58.01	68.20	-10.19	6.16	3	Horizontal	187	1.01	-
5745MHz	Pass	AV	17.2494G	50.04	54.00	-3.96	19.78	3	Vertical	294	1.50	-
5745MHz	Pass	PK	17.23242G	60.02	74.00	-13.98	19.69	3	Vertical	294	1.50	-
5745MHz	Pass	AV	17.24568G	49.99	54.00	-4.01	19.76	3	Horizontal	17	1.50	-
5745MHz	Pass	PK	17.24256G	61.01	74.00	-12.99	19.74	3	Horizontal	17	1.50	-
5785MHz	Pass	AV	5.7838G	97.90	Inf	-Inf	5.93	3	Vertical	243	1.10	-
5785MHz	Pass	PK	5.6374G	57.56	68.20	-10.64	5.72	3	Vertical	243	1.10	-
5785MHz	Pass	PK	5.785G	107.64	Inf	-Inf	5.93	3	Vertical	243	1.10	-
5785MHz	Pass	PK	5.9482G	57.41	68.20	-10.79	6.16	3	Vertical	243	1.10	-
5785MHz	Pass	AV	5.7862G	97.53	Inf	-Inf	5.93	3	Horizontal	183	1.01	_
5785MHz	Pass	PK	5.5666G	58.20	68.20	-10.00	5.62	3	Horizontal	183	1.01	_
5785MHz	Pass	PK	5.7862G	106.43	Inf	-Inf	5.93	3	Horizontal	183	1.01	
5785MHz	Pass	PK	5.9326G	57.39	68.20	-10.81	6.14	3	Horizontal	183	1.01	
												-
5785MHz	Pass	AV	17.36736G 17.36868G	50.81	54.00 74.00	-3.19	20.37	3	Vertical	37	1.50	-
5785MHz	Pass	PK		61.04	74.00	-12.96	20.37	3	Vertical	37	1.50	-
5785MHz	Pass	AV	17.36658G	50.95	54.00	-3.05	20.36	3	Vertical	182	1.49	-
5785MHz	Pass	PK	17.35158G	60.77	74.00	-13.23	20.29	3	Vertical	182	1.49	-
5825MHz	Pass	AV	5.825G	96.29	Inf	-Inf	5.99	3	Vertical	242	1.30	-
5825MHz	Pass	PK	5.5922G	57.37	68.20	-10.83	5.65	3	Vertical	242	1.30	-
5825MHz	Pass	PK	5.8238G	105.49	Inf	-Inf	5.99	3	Vertical	242	1.30	-
5825MHz	Pass	PK	5.9354G	57.88	68.20	-10.32	6.15	3	Vertical	242	1.30	-
5825MHz	Pass	AV	5.8238G	96.49	Inf	-Inf	5.99	3	Horizontal	184	1.01	-
5825MHz	Pass	PK	5.5958G	57.88	68.20	-10.32	5.67	3	Horizontal	184	1.01	-
5825MHz	Pass	PK	5.825G	105.93	Inf	-Inf	5.99	3	Horizontal	184	1.01	-
5825MHz	Pass	PK	5.933G	57.81	68.20	-10.39	6.14	3	Horizontal	184	1.01	-
5825MHz	Pass	AV	17.48376G	51.74	54.00	-2.26	20.95	3	Vertical	2	1.50	-
5825MHz	Pass	PK	17.4825G	62.55	74.00	-11.45	20.94	3	Vertical	2	1.50	-
5825MHz	Pass	AV	17.47338G	51.55	54.00	-2.45	20.90	3	Horizontal	127	1.50	-
5825MHz	Pass	PK	17.47224G	61.60	74.00	-12.40	20.89	3	Horizontal	127	1.50	-
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	AV	5.1498G	51.47	54.00	-2.53	5.13	3	Vertical	247	1.20	-
5180MHz	Pass	AV	5.1808G	92.74	Inf	-Inf	5.17	3	Vertical	247	1.20	-
5180MHz	Pass	PK	5.1456G	65.92	74.00	-8.08	5.13	3	Vertical	247	1.20	-
5180MHz	Pass	PK	5.181G	102.16	Inf	-Inf	5.17	3	Vertical	247	1.20	-
5180MHz	Pass	AV	5.149995G	51.33	54.00	-2.67	5.13	3	Horizontal	182	1.01	-
5180MHz	Pass	AV	5.179G	92.28	Inf	-Inf	5.17	3	Horizontal	182	1.01	-
5180MHz	Pass	PK	5.1482G	65.29	74.00	-8.71	5.13	3	Horizontal	182	1.01	
5180MHz	Pass	PK	5.1794G	101.64	Inf	-Inf	5.17	3	Horizontal	182	1.01	-
5180MHz	Pass	AV	15.55374G	47.76	54.00	-6.24	18.29	3	Vertical	116	1.50	-
5180MHz	Pass	PK	15.52776G	58.94	74.00	-15.06	18.36	3	Vertical	116	1.50	-
5180MHz	Pass	AV	15.5514G	47.79	54.00	-6.21	18.30	3	Horizontal	309	1.50	-
5180MHz	Pass	PK	15.54048G	58.34	74.00	-15.66	18.33	3	Horizontal	309	1.50	-
5200MHz	Pass	AV	5.149995G	47.60	54.00	-6.40	5.13	3	Vertical	244	1.31	
5200MHz	Pass	AV	5.1992G	92.95	Inf	-Inf	5.19	3	Vertical	244	1.31	-
5200MHz	Pass	PK	5.1472G	60.36	74.00	-13.64	5.13	3	Vertical	244	1.31	-
5200MHz	Pass	PK	5.198G	103.09	Inf	-13.04 -Inf	5.19	3	Vertical	244	1.31	_
5200MHz	Pass	AV	5.149995G	46.59	54.00	-7.41	5.13	3	Horizontal	181	1.04	_
5200MHz	Pass	AV	5.149993G 5.1992G	91.90	Inf	-7.41 -Inf	5.19	3	Horizontal	181	1.04	
												-
5200MHz	Pass	PK	5.1488G	60.22	74.00	-13.78	5.13	3	Horizontal	181	1.04	-

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Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
		,	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
5200MHz	Pass	PK	5.1992G	100.75	Inf	-Inf	5.19	3	Horizontal	181	1.04	-
5200MHz	Pass	AV	15.615G	47.94	54.00	-6.06	18.13	3	Vertical	71	1.50	-
5200MHz	Pass	PK	15.58776G	58.16	74.00	-15.84	18.21	3	Vertical	71	1.50	-
5200MHz	Pass	AV	15.61014G	47.93	54.00	-6.07	18.15	3	Horizontal	350	1.50	-
5200MHz	Pass	PK	15.60066G	58.37	74.00	-15.63	18.17	3	Horizontal	350	1.50	-
5240MHz	Pass	AV	5.1308G	45.05	54.00	-8.95	5.11	3	Vertical	245	1.26	-
5240MHz	Pass	AV	5.2406G	93.73	Inf	-Inf	5.23	3	Vertical	245	1.26	-
5240MHz	Pass	AV	5.3678G	44.13	54.00	-9.87	5.38	3	Vertical	245	1.26	-
5240MHz	Pass	PK	5.1464G	57.44	74.00	-16.56	5.13	3	Vertical	245	1.26	-
5240MHz	Pass	PK	5.2412G	103.02	Inf	-Inf	5.24	3	Vertical	245	1.26	-
5240MHz	Pass	PK	5.357G	56.69	74.00	-17.31	5.36	3	Vertical	245	1.26	-
5240MHz	Pass	AV	5.149995G	44.89	54.00	-9.11	5.13	3	Horizontal	182	1.17	-
5240MHz	Pass	AV	5.2406G	92.29	Inf	-Inf	5.23	3	Horizontal	182	1.17	_
5240MHz	Pass	AV	5.3552G	44.00	54.00	-10.00	5.36	3	Horizontal	182	1.17	_
5240MHz	Pass	PK	5.1098G	57.46	74.00	-16.54	5.09	3	Horizontal	182	1.17	-
5240MHz	Pass	PK	5.2406G	101.98	Inf	-10.54 -Inf	5.23	3	Horizontal	182	1.17	_
5240MHz	Pass	PK	5.3792G	56.32	74.00	-17.68	5.39	3	Horizontal	182	1.17	_
5240MHz	Pass	AV	15.71166G	48.25	54.00	-5.75	17.88	3	Vertical	51	0.00	
5240MHz	Pass	PK	15.7344G	59.09	74.00	-14.91	17.82	3	Vertical	51	0.00	_
5240MHz	Pass	AV	15.72402G	48.19	54.00	-5.81	17.85	3	Horizontal	158	1.50	-
5240MHz	Pass	PK	15.72402G	58.06	74.00	-15.94	17.88	3	Horizontal	158	1.50	-
				98.01				3				-
5745MHz 5745MHz	Pass	AV PK	5.7438G	58.40	Inf 68.20	-Inf -9.80	5.87 5.72	3	Vertical Vertical	235 235	1.13	-
	Pass	PK	5.6394G									-
5745MHz	Pass		5.745G	107.27	Inf	-Inf	5.87	3	Vertical	235	1.13	-
5745MHz	Pass	PK	5.9358G	58.52	68.20	-9.68	6.16	3	Vertical	235	1.13	-
5745MHz	Pass	AV	5.7462G	98.62	Inf	-Inf	5.87	3	Horizontal	179	1.01	-
5745MHz	Pass	PK	5.5002G	58.07	68.20	-10.13	5.52	3	Horizontal	179	1.01	-
5745MHz	Pass	PK	5.7462G	107.54	Inf	-Inf	5.87	3	Horizontal	179	1.01	-
5745MHz	Pass	PK	5.9322G	58.33	68.20	-9.87	6.14	3	Horizontal	179	1.01	-
5745MHz	Pass	AV	17.24442G	50.07	54.00	-3.93	19.75	3	Vertical	348	1.50	-
5745MHz	Pass	PK	17.23902G	60.38	74.00	-13.62	19.73	3	Vertical	348	1.50	-
5745MHz	Pass	AV	17.24916G	50.17	54.00	-3.83	19.78	3	Horizontal	81	1.02	-
5745MHz	Pass	PK	17.24658G	60.97	74.00	-13.03	19.76	3	Horizontal	81	1.02	-
5785MHz	Pass	AV	5.7838G	98.75	Inf	-Inf	5.93	3	Vertical	250	1.25	-
5785MHz	Pass	PK	5.5306G	57.99	68.20	-10.21	5.56	3	Vertical	250	1.25	-
5785MHz	Pass	PK	5.7838G	107.66	Inf	-Inf	5.93	3	Vertical	250	1.25	-
5785MHz	Pass	PK	5.9854G	57.78	68.20	-10.42	6.22	3	Vertical	250	1.25	-
5785MHz	Pass	AV	5.7838G	98.47	Inf	-Inf	5.93	3	Horizontal	40	1.14	-
5785MHz	Pass	PK	5.6194G	58.54	68.20	-9.66	5.69	3	Horizontal	40	1.14	-
5785MHz	Pass	PK	5.7838G	106.82	Inf	-Inf	5.93	3	Horizontal	40	1.14	-
5785MHz	Pass	PK	5.9446G	58.05	68.20	-10.15	6.15	3	Horizontal	40	1.14	-
5785MHz	Pass	AV	17.3607G	50.78	54.00	-3.22	20.33	3	Vertical	84	1.50	-
5785MHz	Pass	PK	17.34732G	61.32	74.00	-12.68	20.27	3	Vertical	84	1.50	-
5785MHz	Pass	AV	17.37G	50.89	54.00	-3.11	20.38	3	Horizontal	288	1.21	-
5785MHz	Pass	PK	17.34126G	61.52	74.00	-12.48	20.24	3	Horizontal	288	1.21	-
5825MHz	Pass	AV	5.8262G	97.90	Inf	-Inf	5.99	3	Vertical	251	1.02	-
5825MHz	Pass	PK	5.5514G	57.12	68.20	-11.08	5.60	3	Vertical	251	1.02	-
5825MHz	Pass	PK	5.8238G	107.27	Inf	-Inf	5.99	3	Vertical	251	1.02	-
5825MHz	Pass	PK	5.9762G	57.69	68.20	-10.51	6.21	3	Vertical	251	1.02	-

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FOOTABLE					Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
EOOEMIL-			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
5825MHz	Pass	AV	5.8262G	97.85	Inf	-Inf	5.99	3	Horizontal	85	1.08	-
5825MHz	Pass	PK	5.6006G	57.23	68.20	-10.97	5.66	3	Horizontal	85	1.08	-
5825MHz	Pass	PK	5.8202G	107.15	Inf	-Inf	5.98	3	Horizontal	85	1.08	-
5825MHz	Pass	PK	5.9294G	56.87	68.20	-11.33	6.14	3	Horizontal	85	1.08	-
5825MHz	Pass	AV	17.4792G	51.74	54.00	-2.26	20.93	3	Vertical	151	1.50	-
5825MHz	Pass	PK	17.4684G	61.84	74.00	-12.16	20.87	3	Vertical	151	1.50	-
5825MHz	Pass	AV	17.46636G	51.72	54.00	-2.28	20.86	3	Horizontal	1	1.50	-
5825MHz	Pass	PK	17.48796G	61.78	74.00	-12.22	20.97	3	Horizontal	1	1.50	-
802.11n HT40_Nss1,(MCS0)_1TX		-	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	AV	5.149995G	53.67	54.00	-0.33	5.13	3	Vertical	256	1.22	-
5190MHz	Pass	AV	5.1912G	90.53	Inf	-Inf	5.18	3	Vertical	256	1.22	-
5190MHz	Pass	PK	5.1484G	62.97	74.00	-11.03	5.13	3	Vertical	256	1.22	-
5190MHz	Pass	PK	5.1876G	98.04	Inf	-Inf	5.18	3	Vertical	256	1.22	-
5190MHz	Pass	AV	5.149995G	53.11	54.00	-0.89	5.13	3	Horizontal	197	1.07	-
5190MHz	Pass	AV	5.1884G	88.74	Inf	-Inf	5.18	3	Horizontal	197	1.07	
5190MHz	Pass	PK	5.1456G	63.10	74.00	-10.90	5.13	3	Horizontal	197	1.07	-
5190MHz	Pass	PK	5.192G	96.61	Inf	-Inf	5.18	3	Horizontal	197	1.07	-
5190MHz	Pass	AV	15.57606G	48.87	54.00	-5.13	18.24	3	Vertical	63	1.50	-
5190MHz	Pass	PK	15.5793G	58.72	74.00	-15.28	18.23	3	Vertical	63	1.50	-
5190MHz	Pass	AV	15.56742G	48.99	54.00	-5.01	18.26	3	Horizontal	113	1.50	-
5190MHz	Pass	PK	15.56784G	58.43	74.00	-15.57	18.26	3	Horizontal	113	1.50	-
5230MHz	Pass	AV	5.1492G	48.06	54.00	-5.94	5.13	3	Vertical	254	1.18	-
5230MHz	Pass	AV	5.2284G	92.60	Inf	-Inf	5.22	3	Vertical	254	1.18	-
5230MHz	Pass	PK	5.1452G	57.75	74.00	-16.25	5.13	3	Vertical	254	1.18	-
5230MHz	Pass	PK	5.2276G	99.99	Inf	-Inf	5.22	3	Vertical	254	1.18	-
5230MHz	Pass	AV	5.1496G	47.63	54.00	-6.37	5.13	3	Horizontal	197	1.07	-
5230MHz	Pass	AV	5.232G	90.69	Inf	-Inf	5.23	3	Horizontal	197	1.07	-
5230MHz	Pass	PK	5.1452G	58.25	74.00	-15.75	5.13	3	Horizontal	197	1.07	-
5230MHz	Pass	PK	5.2308G	98.02	Inf	-Inf	5.22	3	Horizontal	197	1.07	-
5230MHz	Pass	AV	15.70284G	49.21	54.00	-4.79	17.91	3	Vertical	252	0.00	-
5230MHz	Pass	PK	15.69198G	58.89	74.00	-15.11	17.93	3	Vertical	252	0.00	-
5230MHz	Pass	AV	15.69102G	49.29	54.00	-4.71	17.94	3	Horizontal	204	1.50	-
5230MHz	Pass	PK	15.69222G	59.26	74.00	-14.74	17.93	3	Horizontal	204	1.50	-
5755MHz	Pass	AV	5.7526G	98.14	Inf	-Inf	5.88	3	Vertical	250	1.14	-
5755MHz	Pass	PK	5.6482G	60.52	68.20	-7.68	5.73	3	Vertical	250	1.14	
5755MHz	Pass	PK	5.7526G	106.00	Inf	-Inf	5.88	3	Vertical	250	1.14	-
5755MHz	Pass	PK	5.9626G	57.77	68.20	-10.43	6.18	3	Vertical	250	1.14	-
5755MHz	Pass	AV	5.7538G	97.12	Inf	-Inf	5.89	3	Horizontal	85	1.10	-
5755MHz	Pass	PK	5.6494G	58.26	68.20	-9.94	5.73	3	Horizontal	85	1.10	-
5755MHz	Pass	PK	5.7574G	104.91	Inf	-Inf	5.89	3	Horizontal	85	1.10	
5755MHz	Pass	PK	5.9314G	57.89	68.20	-10.31	6.14	3	Horizontal	85	1.10	-
5755MHz	Pass	AV	17.27826G	50.95	54.00	-3.05	19.92	3	Vertical	58	1.50	-
5755MHz	Pass	PK	17.2701G	61.24	74.00	-12.76	19.88	3	Vertical	58	1.50	-
5755MHz	Pass	AV	17.26764G	51.20	54.00	-2.80	19.87	3	Horizontal	186	1.50	-
5755MHz	Pass	PK	17.2632G	60.68	74.00	-13.32	19.85	3	Horizontal	186	1.50	-
5795MHz	Pass	AV	5.7962G	96.74	Inf	-Inf	5.95	3	Vertical	251	1.14	-
5795MHz	Pass	PK	5.531G	57.37	68.20	-10.83	5.56	3	Vertical	251	1.14	-
5795MHz	Pass	PK	5.7938G	104.27	Inf	-Inf	5.94	3	Vertical	251	1.14	-
5795MHz	Pass	PK	5.9618G	59.09	68.20	-9.11	6.18	3	Vertical	251	1.14	

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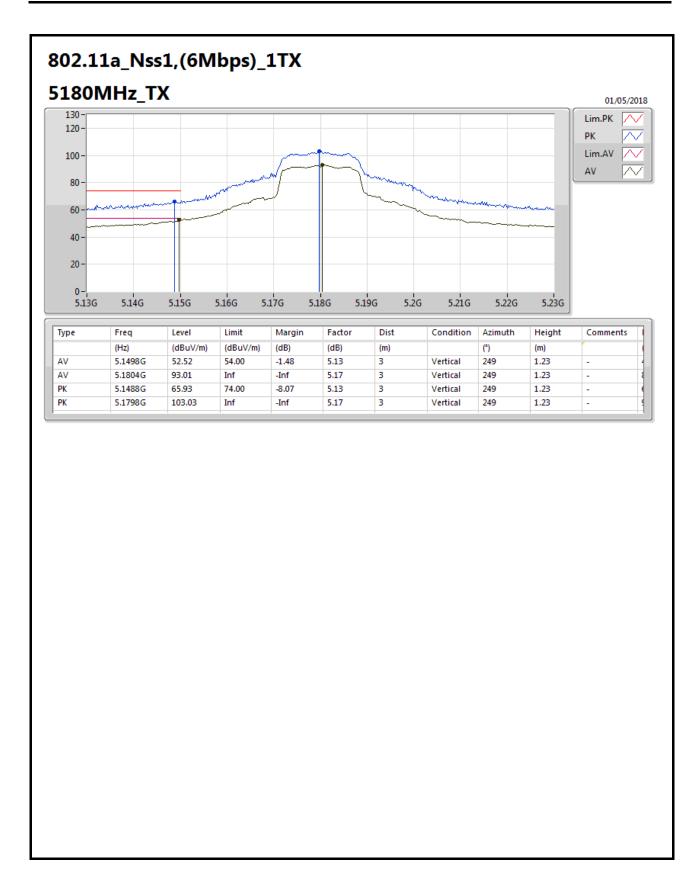


Appendix E

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
5795MHz	Pass	AV	5.7938G	95.79	Inf	-Inf	5.94	3	Horizontal	85	1.00	-
5795MHz	Pass	PK	5.6318G	57.79	68.20	-10.41	5.71	3	Horizontal	85	1.00	-
5795MHz	Pass	PK	5.7962G	103.68	Inf	-Inf	5.95	3	Horizontal	85	1.00	-
5795MHz	Pass	PK	5.927G	59.91	68.20	-8.29	6.14	3	Horizontal	85	1.00	-
5795MHz	Pass	AV	17.38314G	51.57	54.00	-2.43	20.45	3	Vertical	196	1.50	-
5795MHz	Pass	PK	17.37648G	61.21	74.00	-12.79	20.41	3	Vertical	196	1.50	-
5795MHz	Pass	AV	17.39124G	51.82	54.00	-2.18	20.49	3	Horizontal	195	1.50	-
5795MHz	Pass	PK	17.37438G	61.34	74.00	-12.66	20.40	3	Horizontal	195	1.50	-

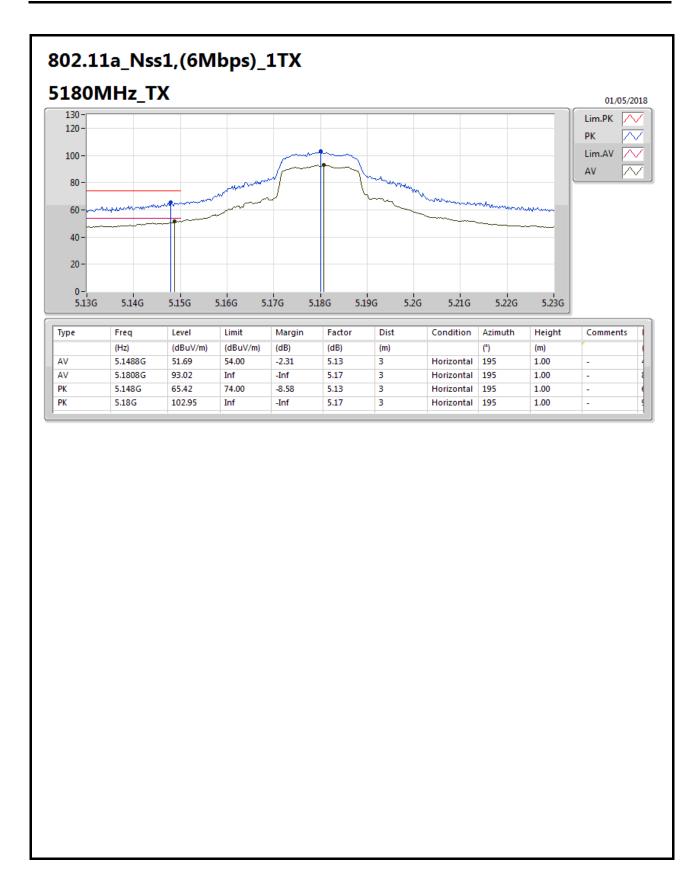
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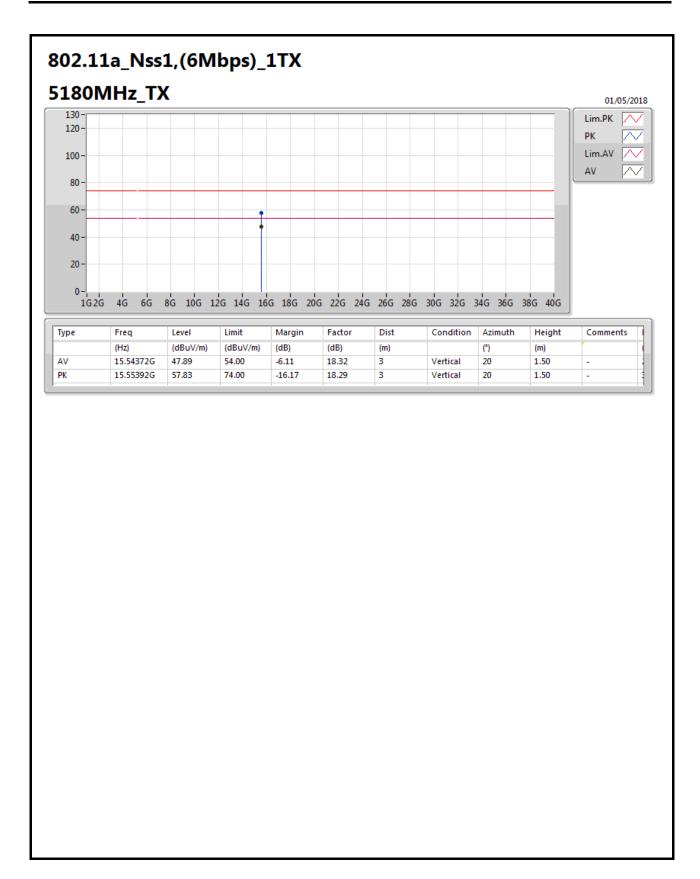
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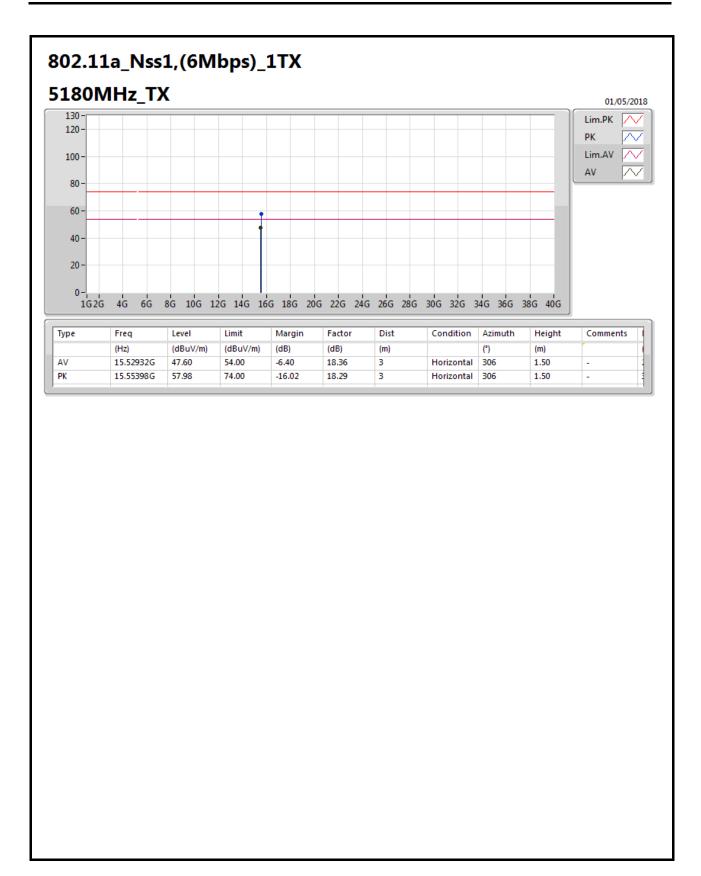
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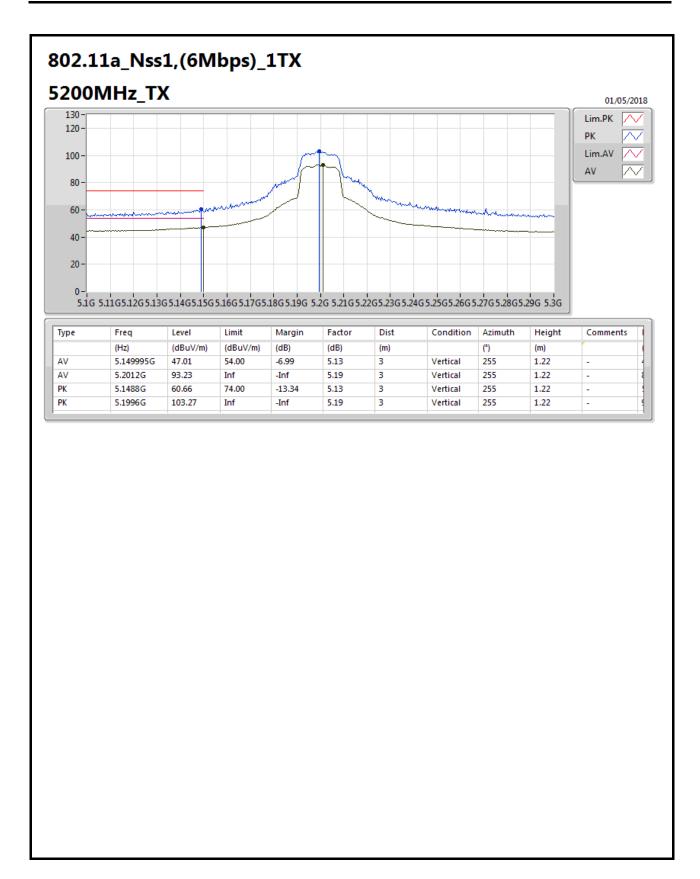
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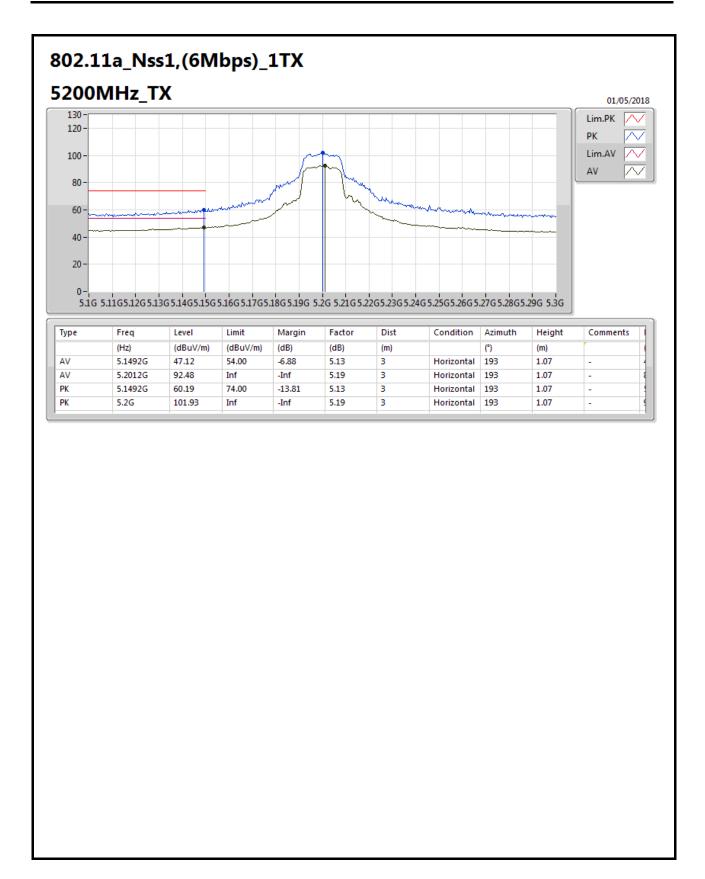
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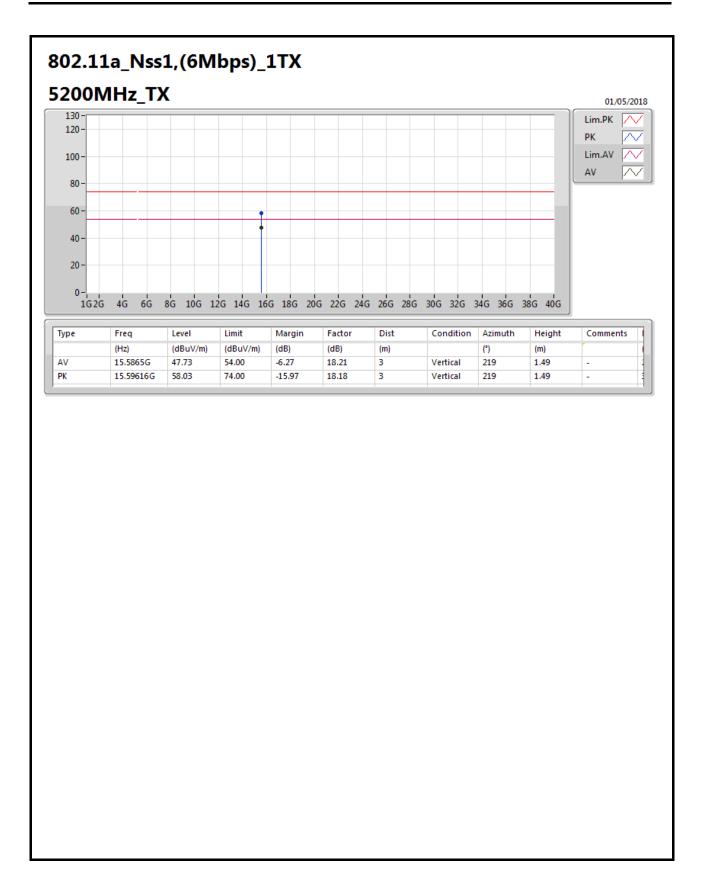
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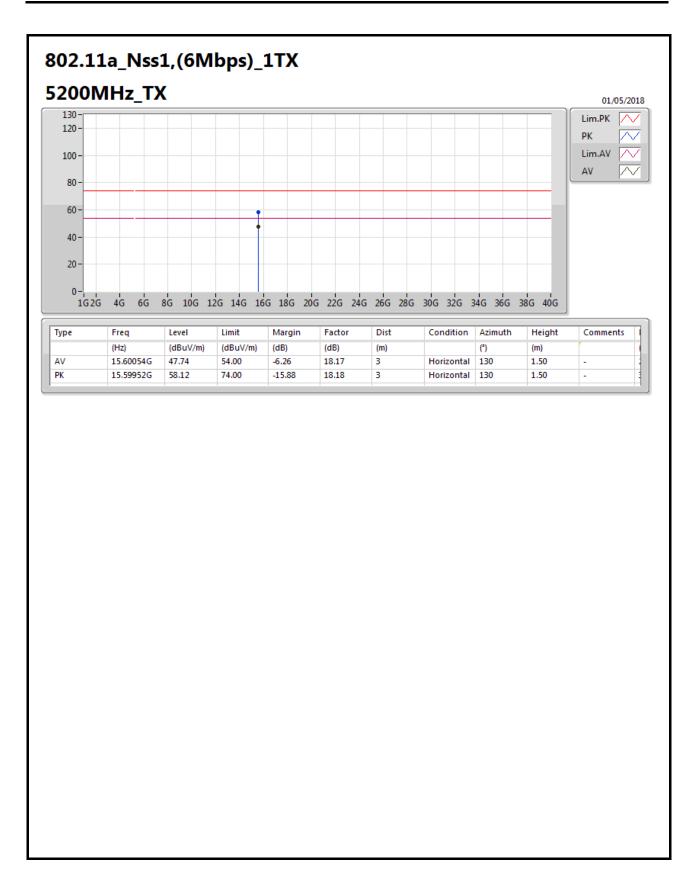
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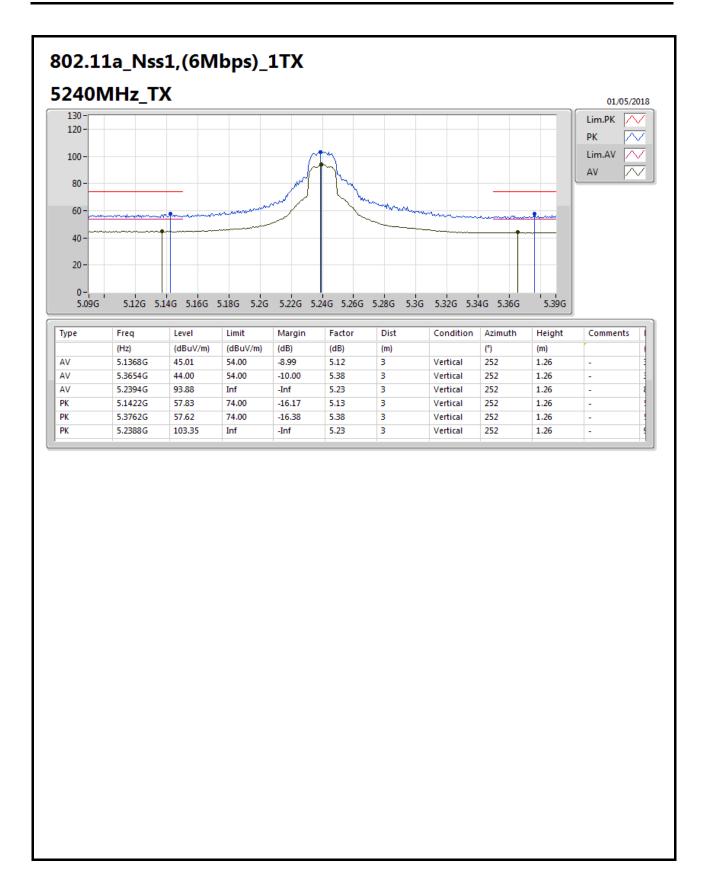
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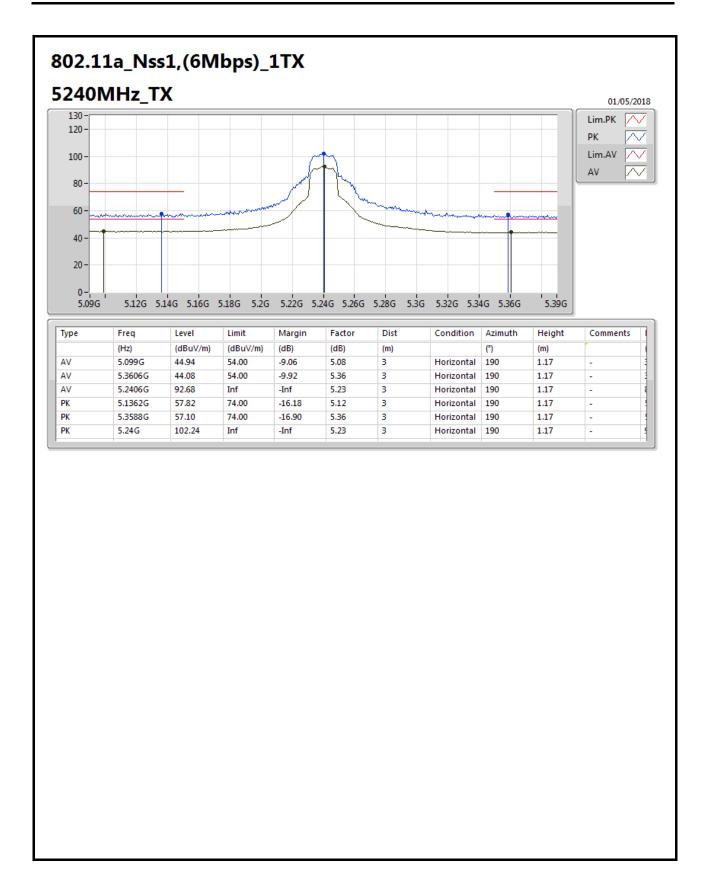
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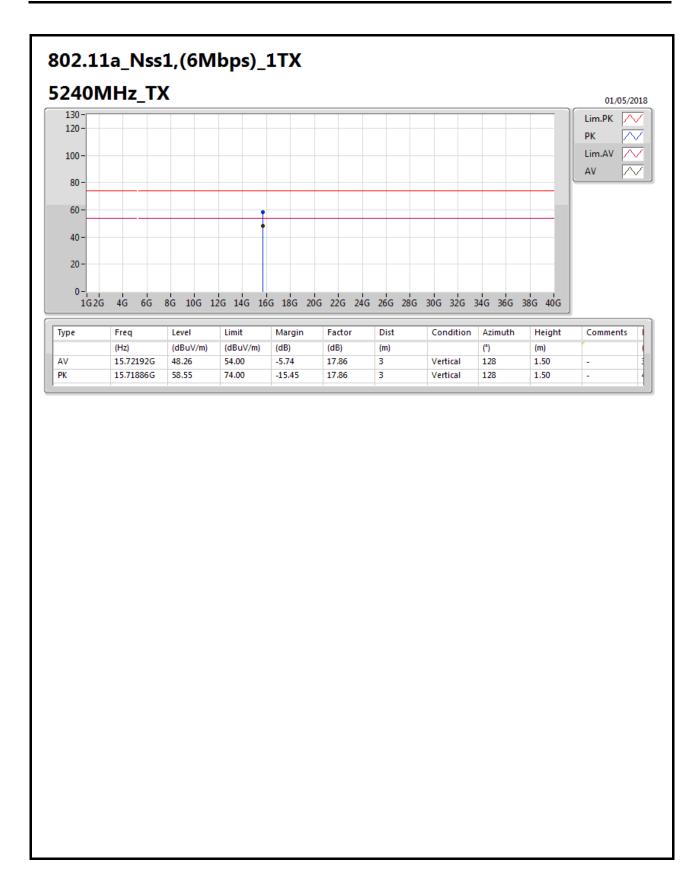
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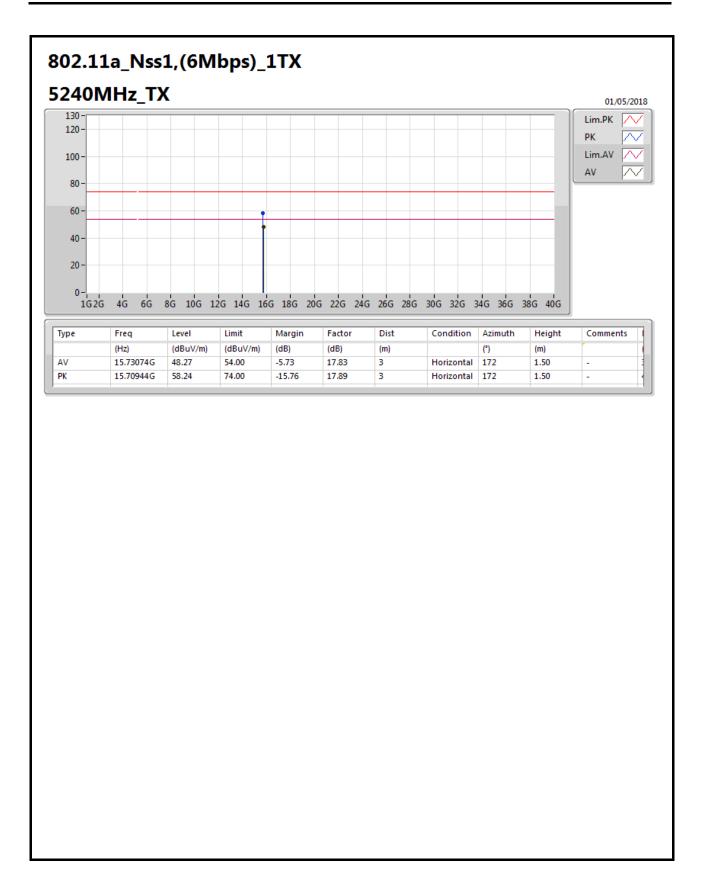
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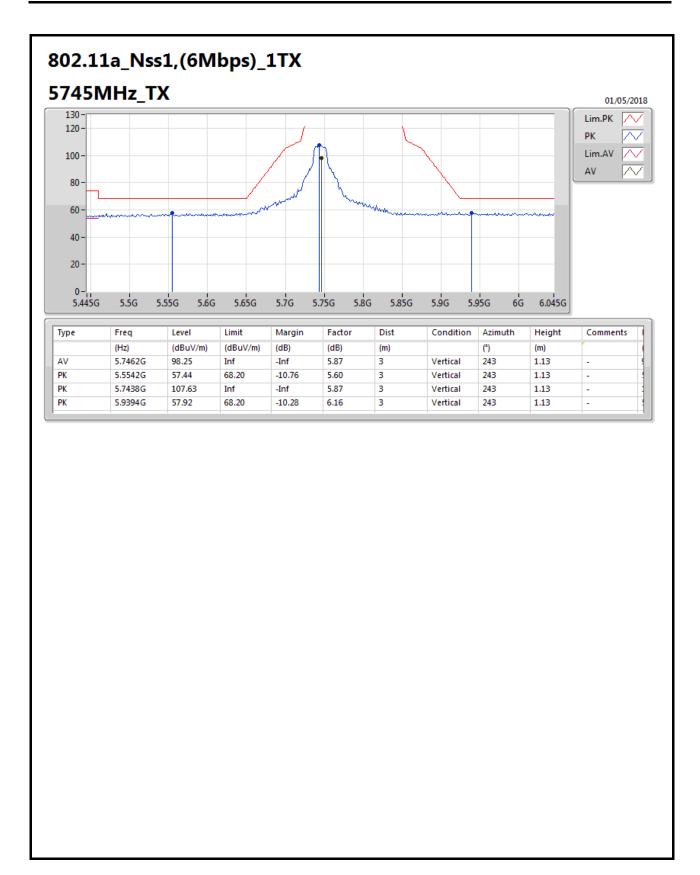
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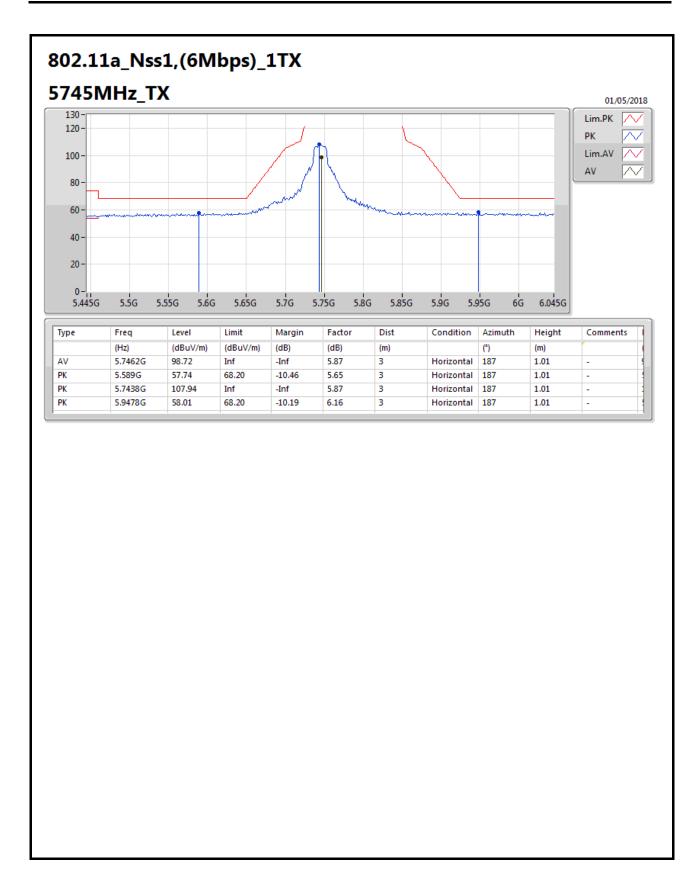
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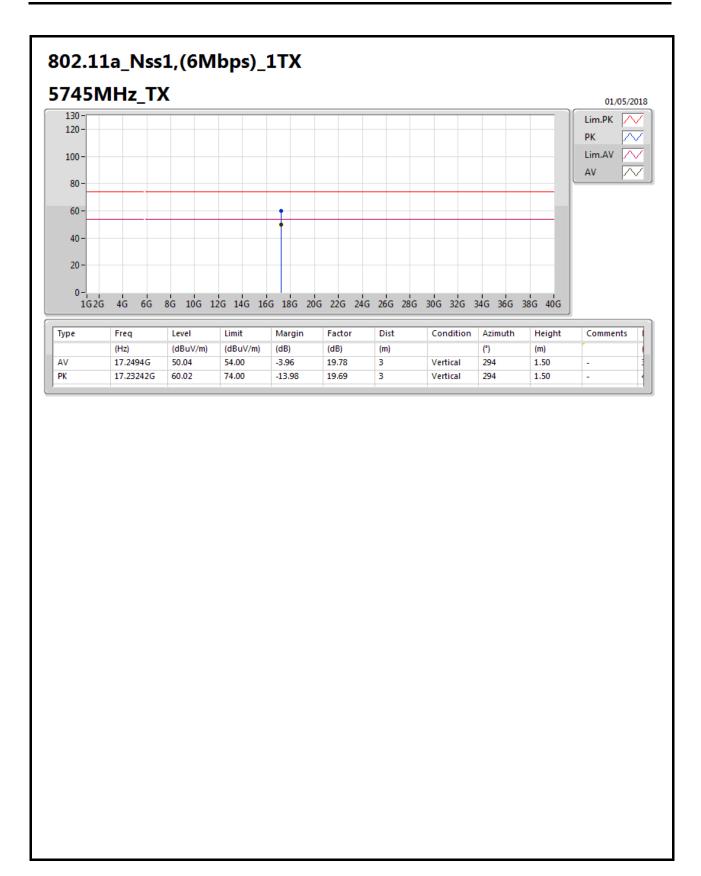
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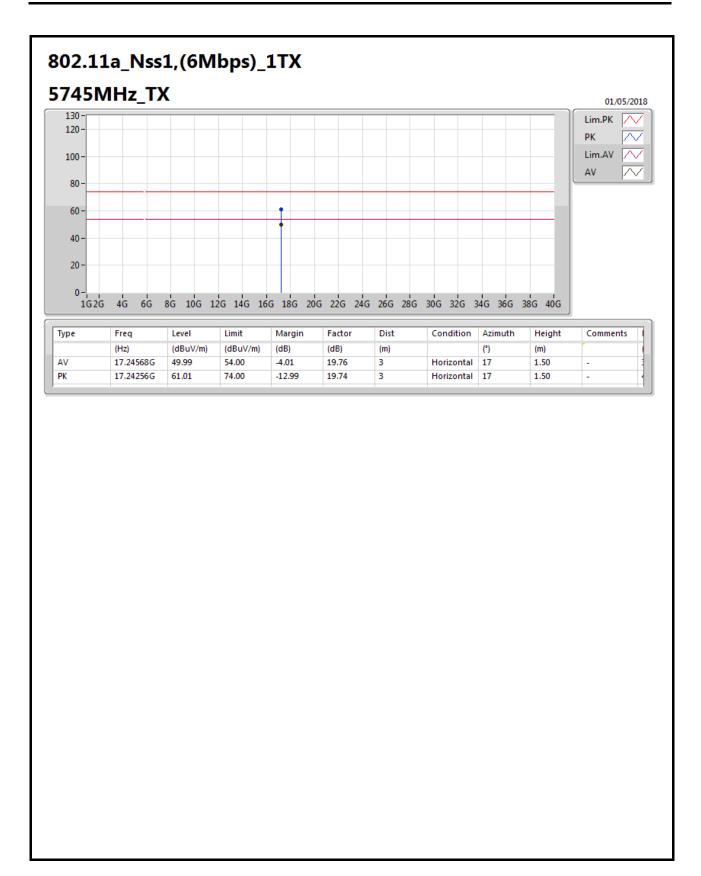
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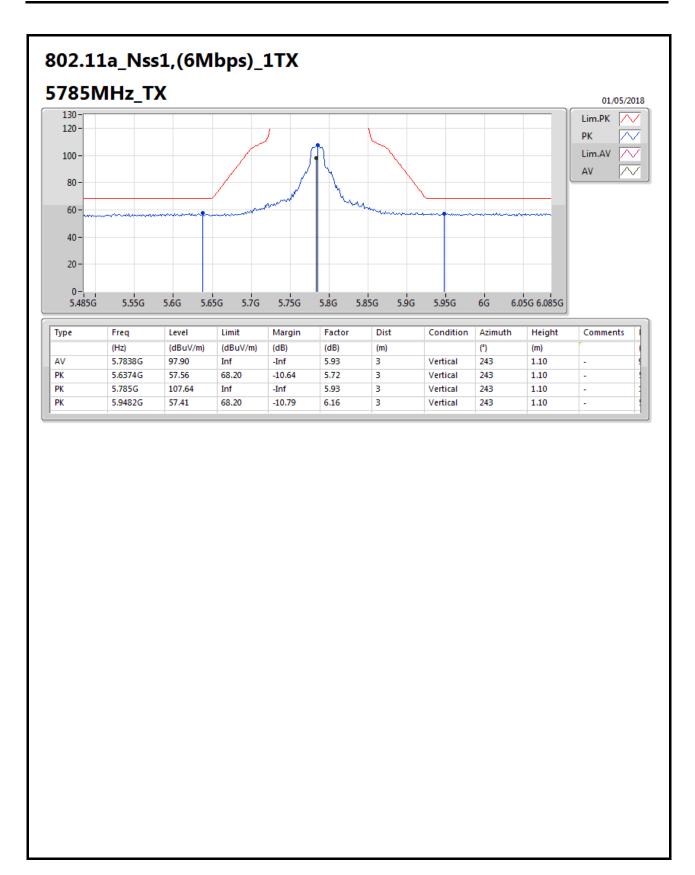
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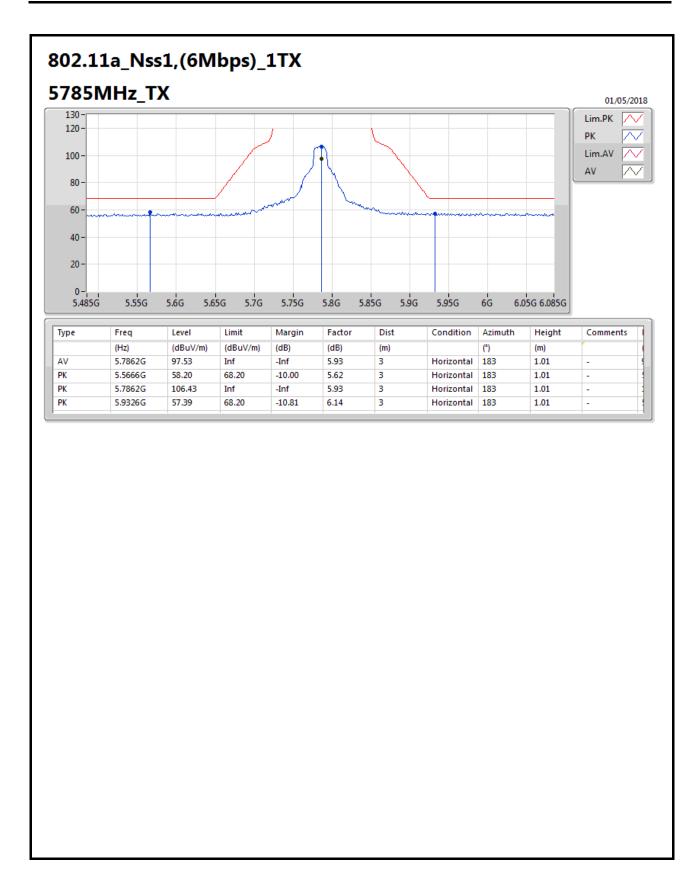
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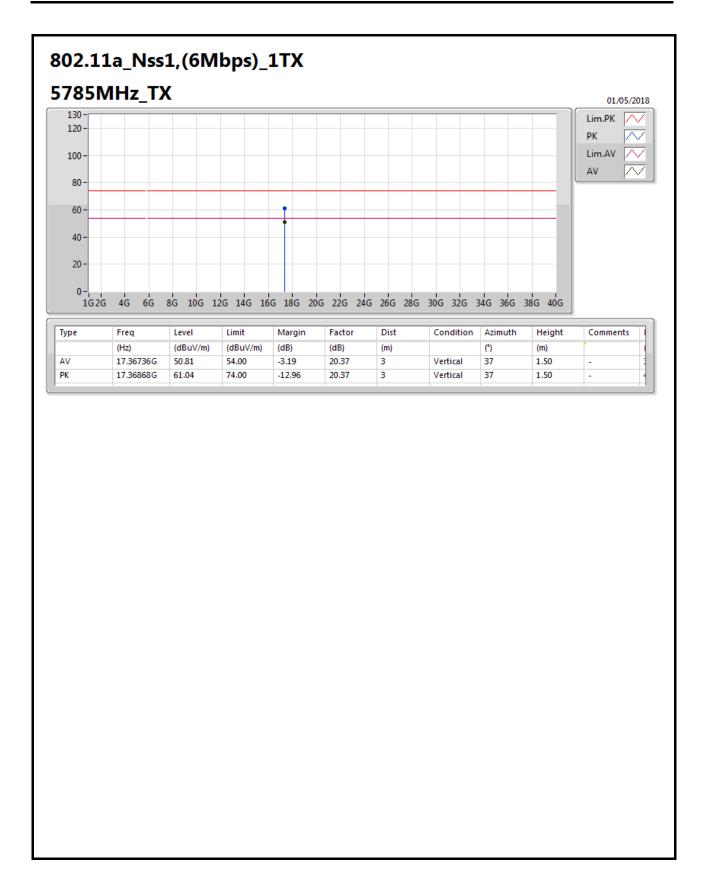
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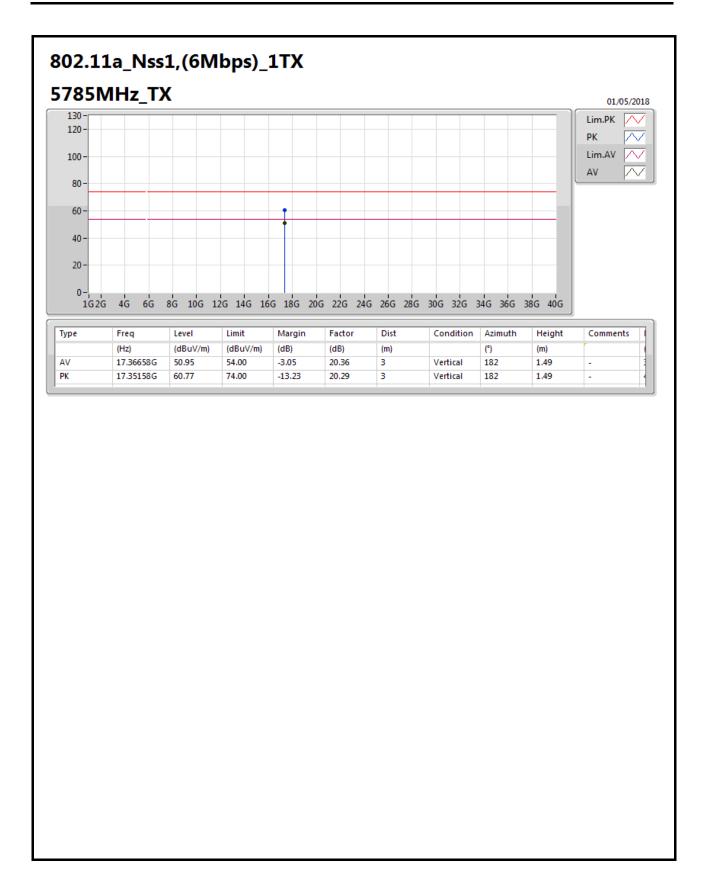
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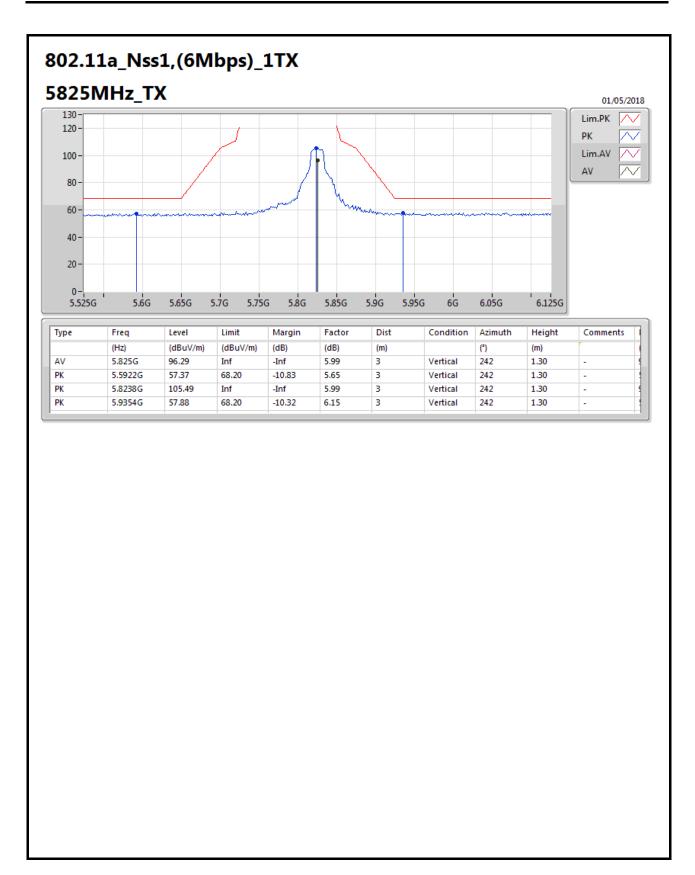
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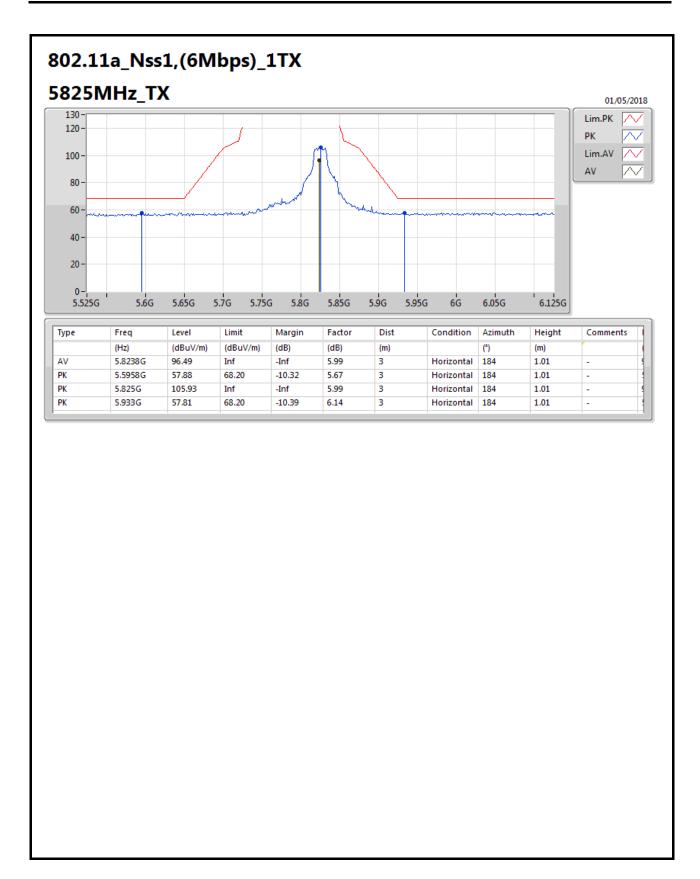
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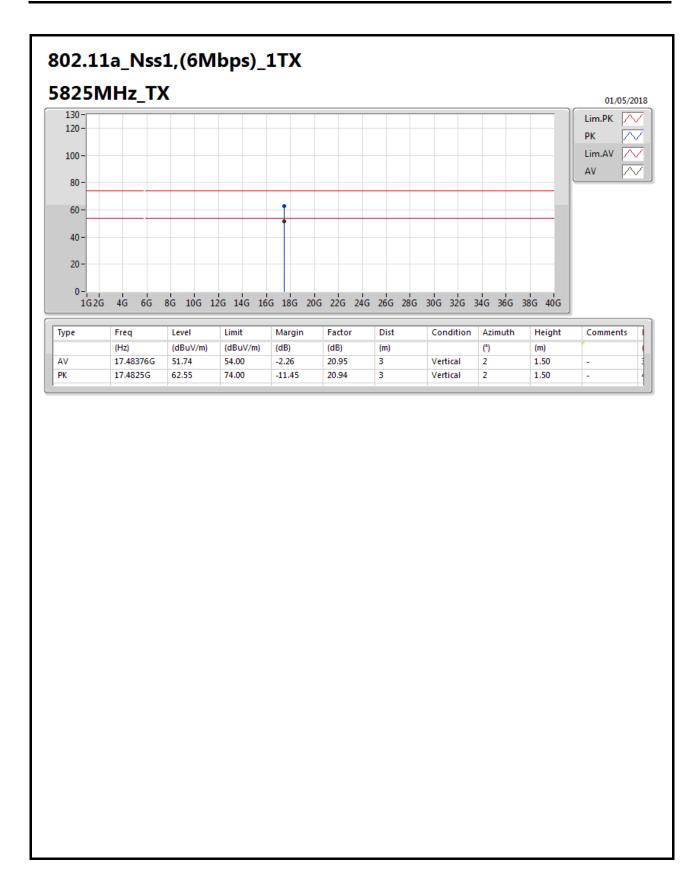
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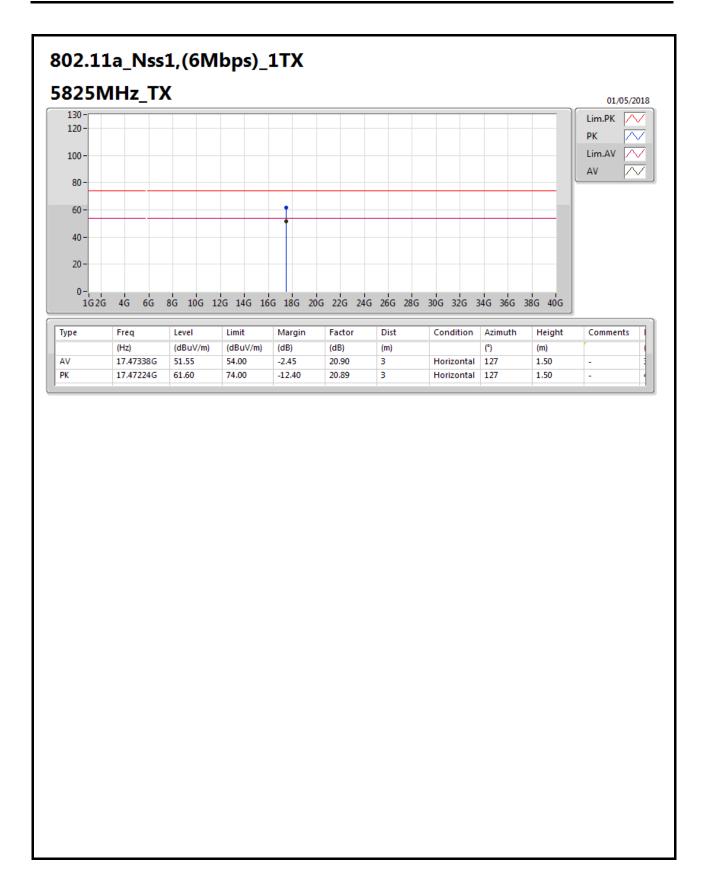
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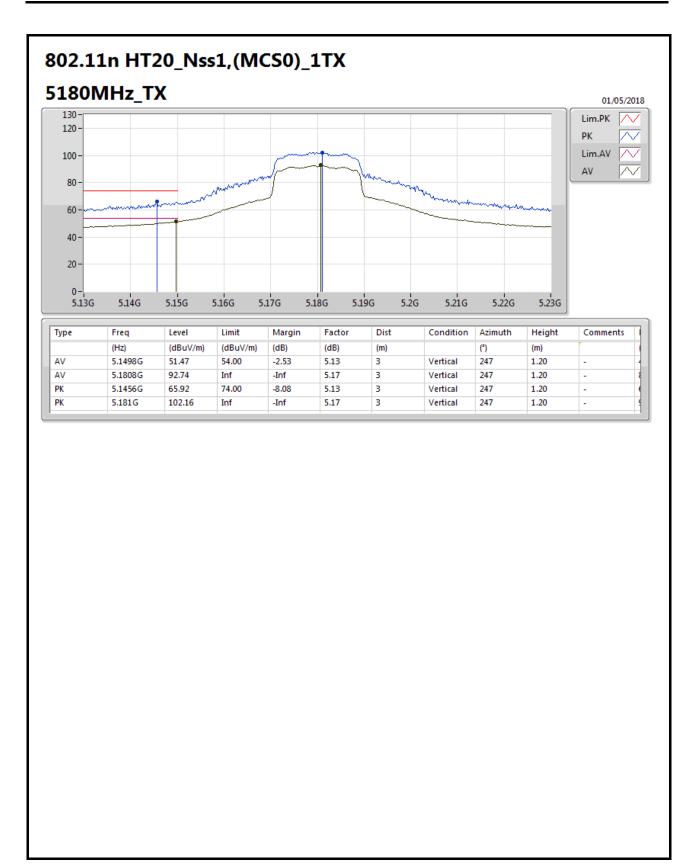
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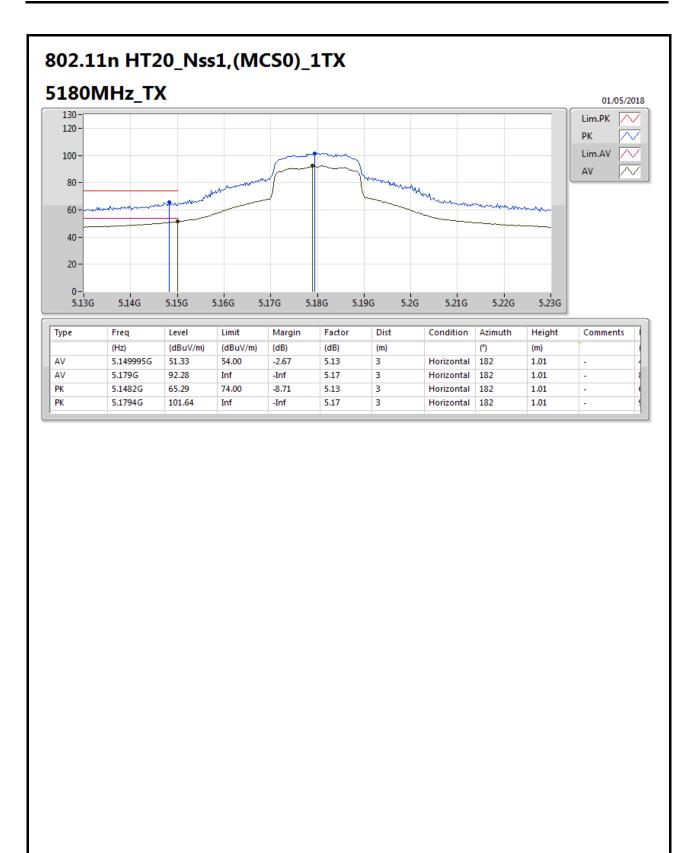
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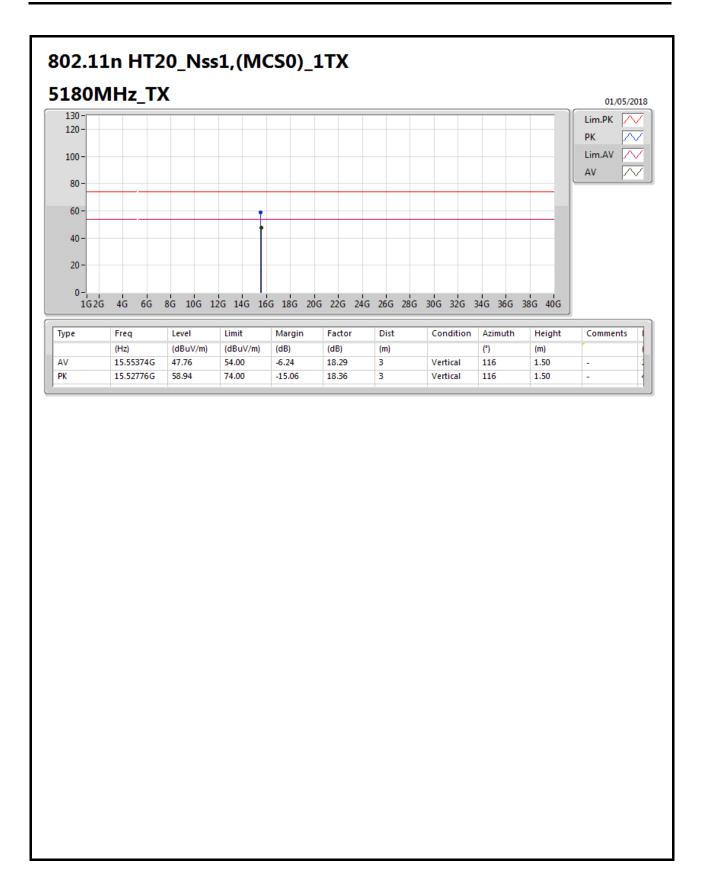
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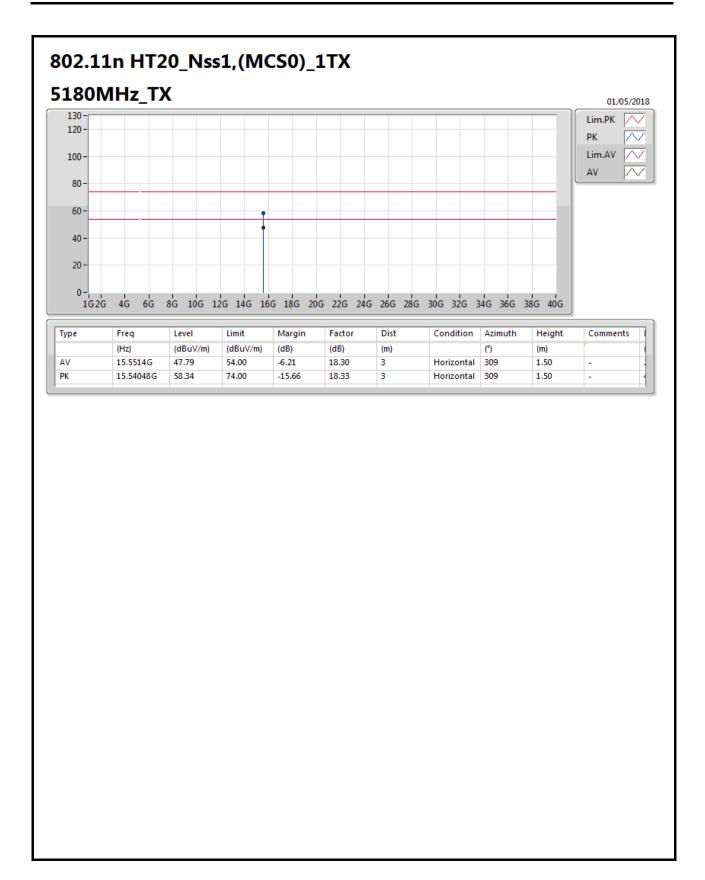
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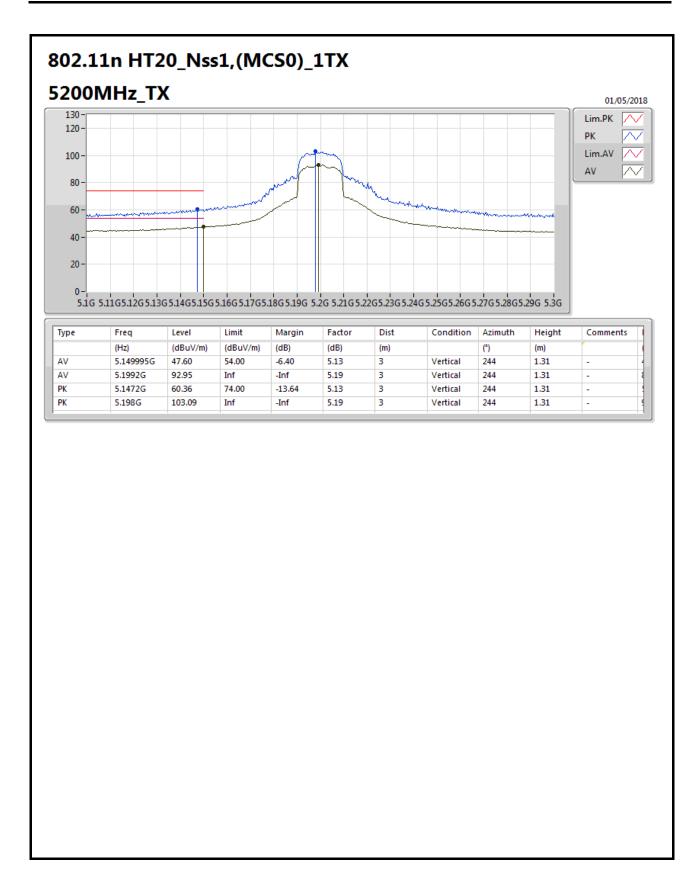
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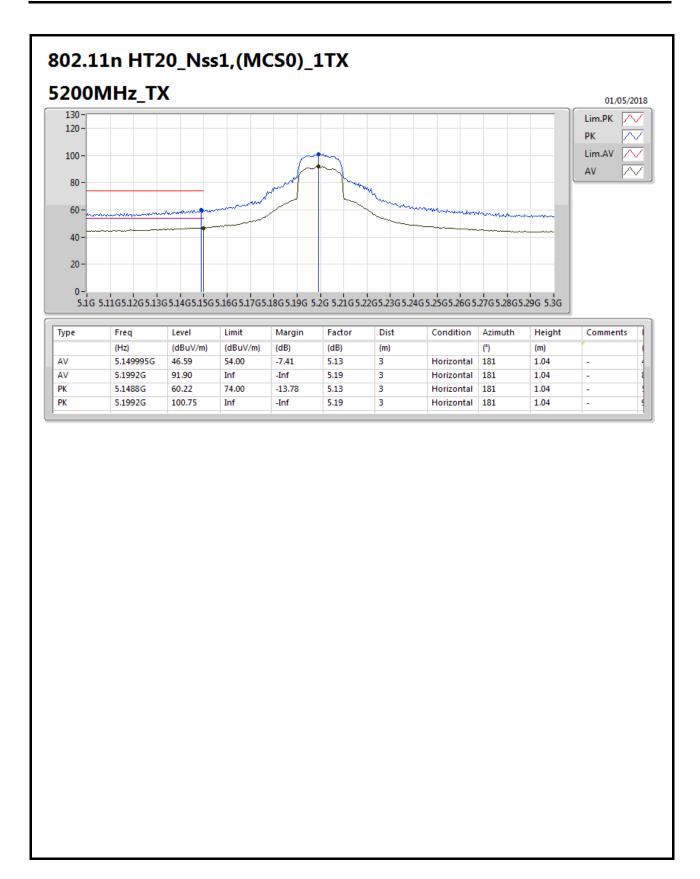
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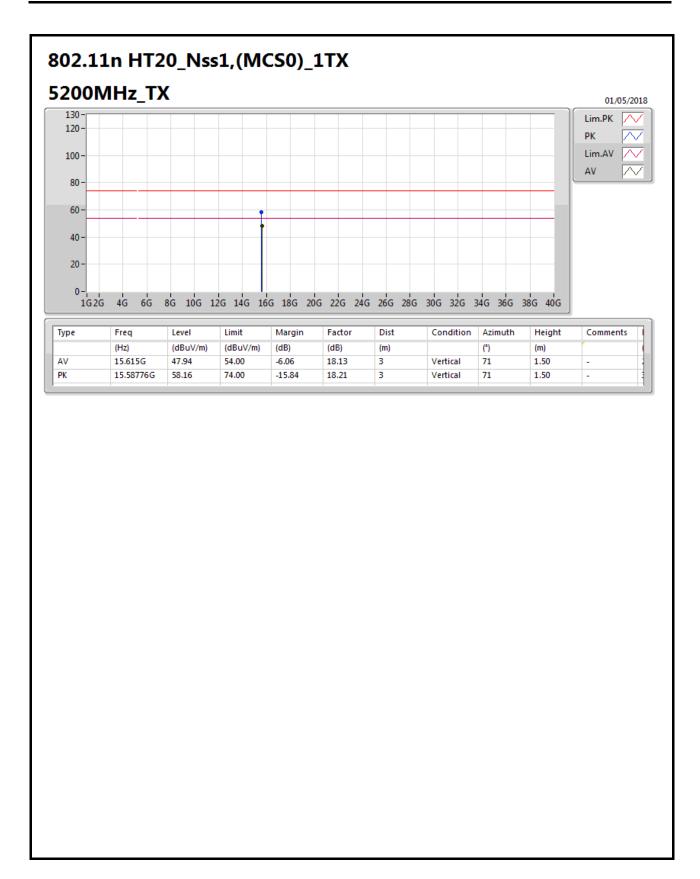
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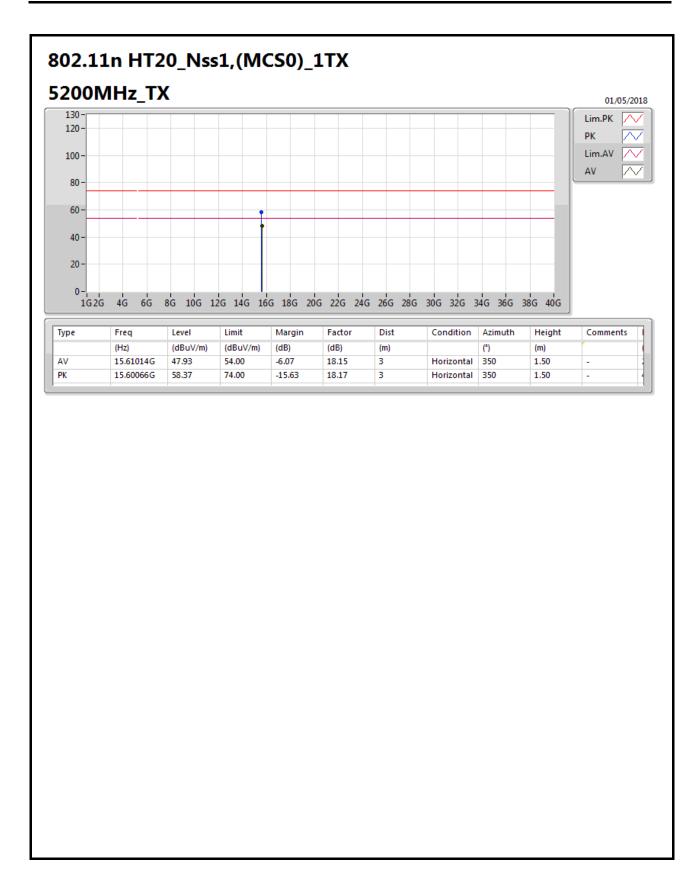
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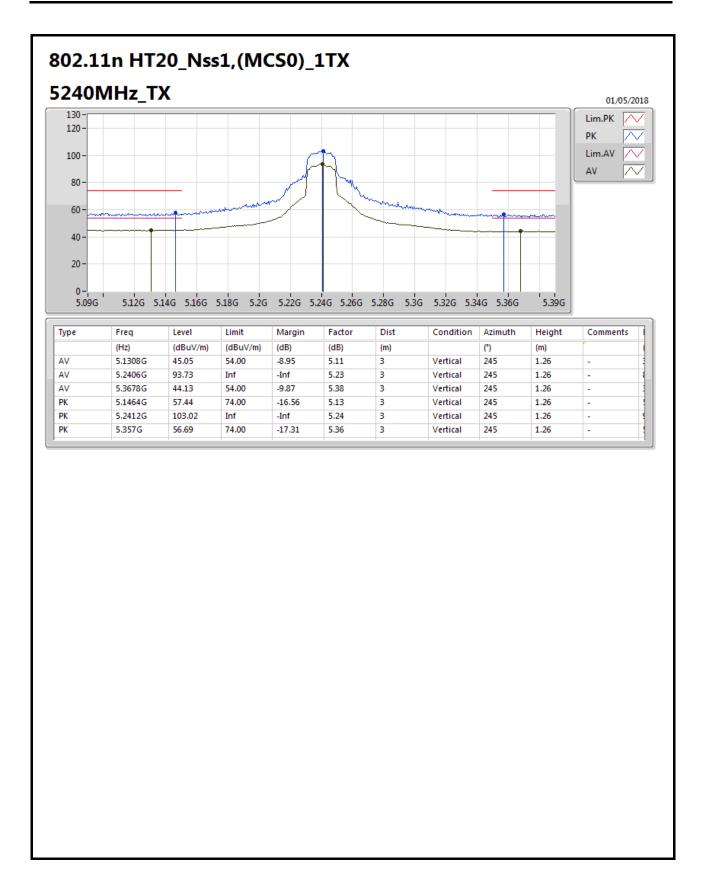
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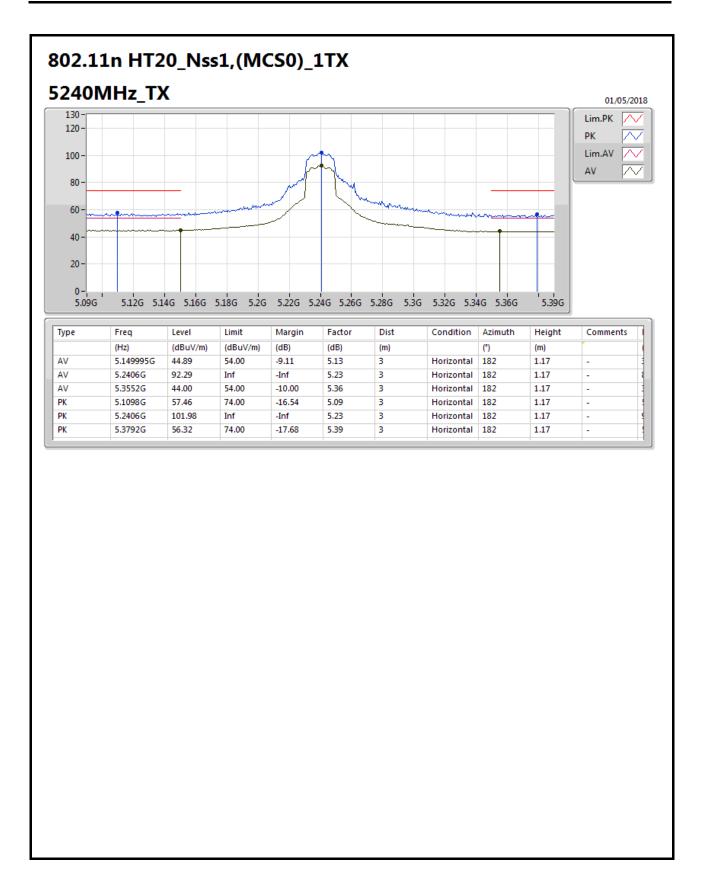
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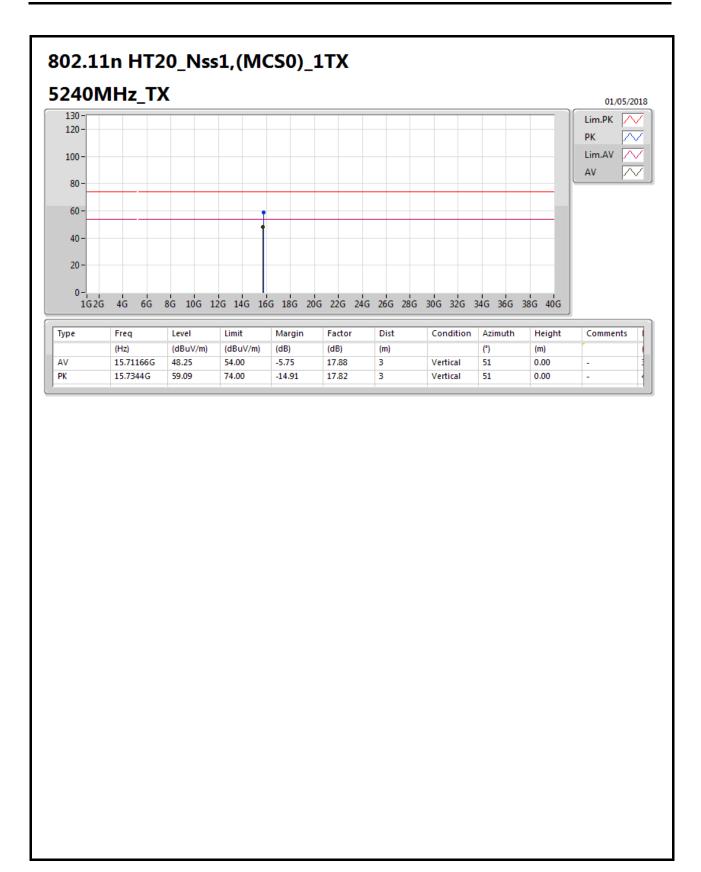
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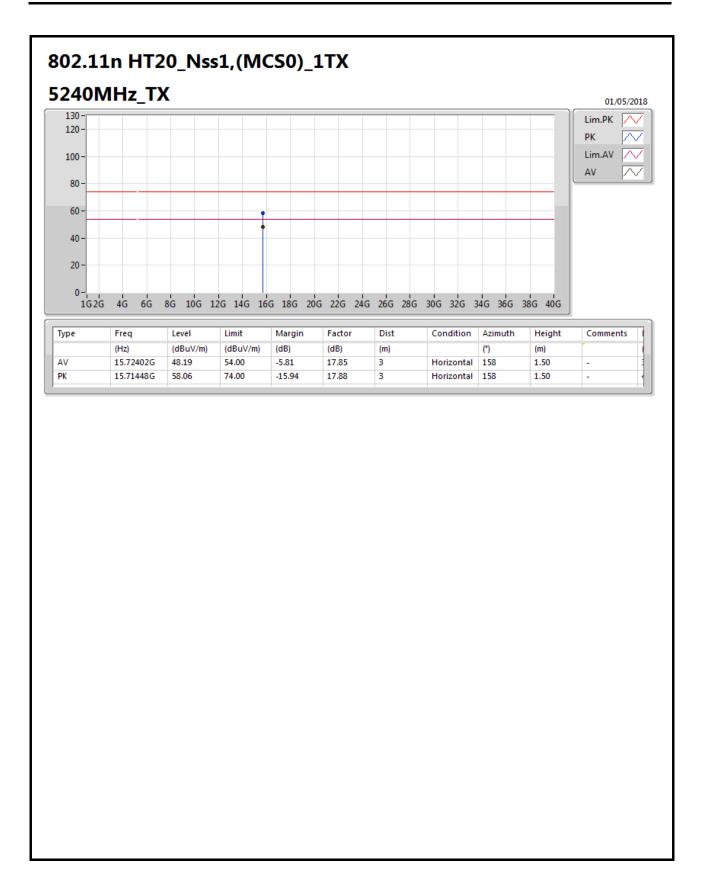
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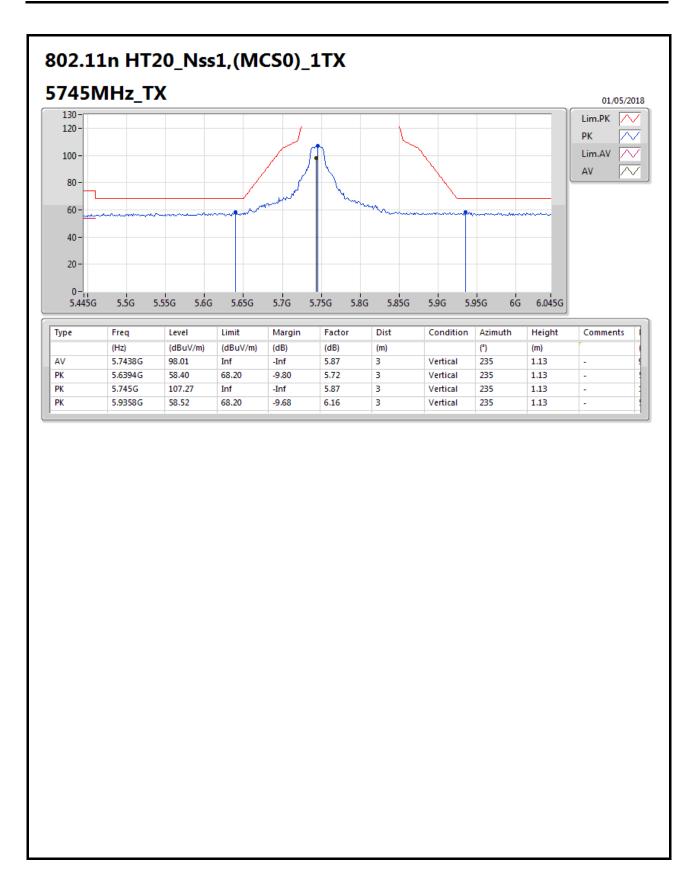
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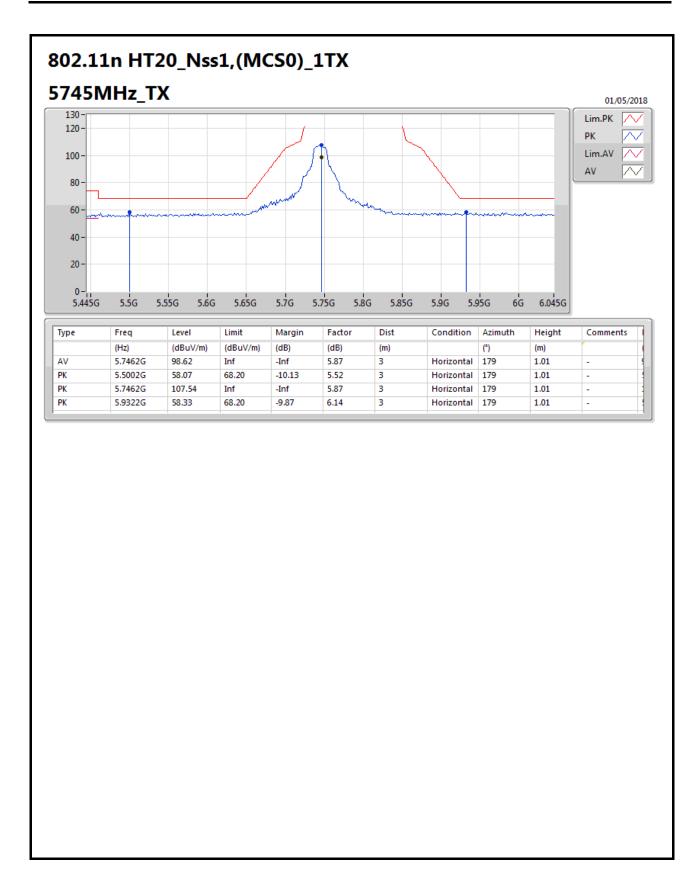
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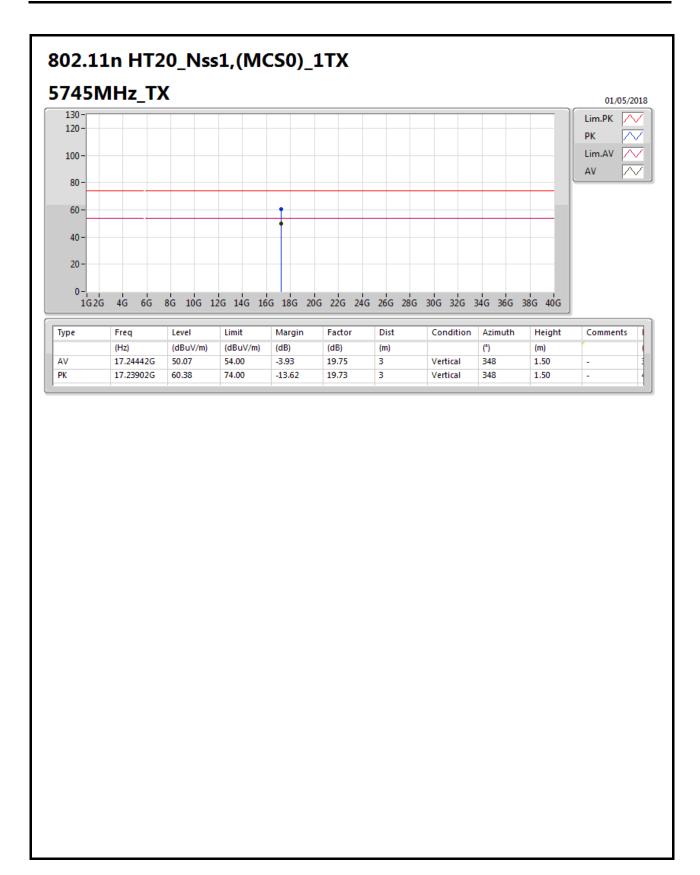
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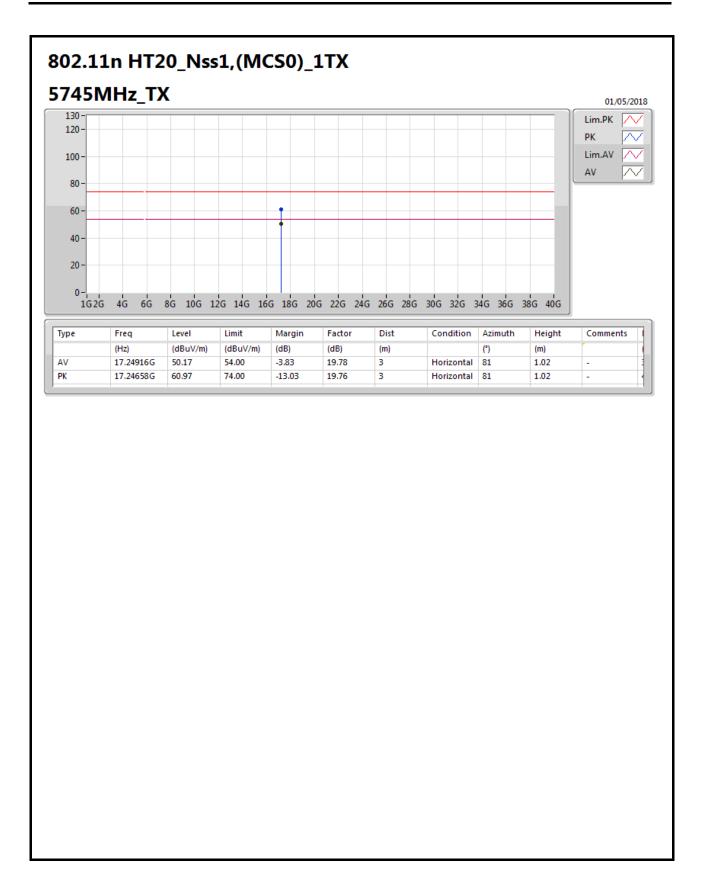
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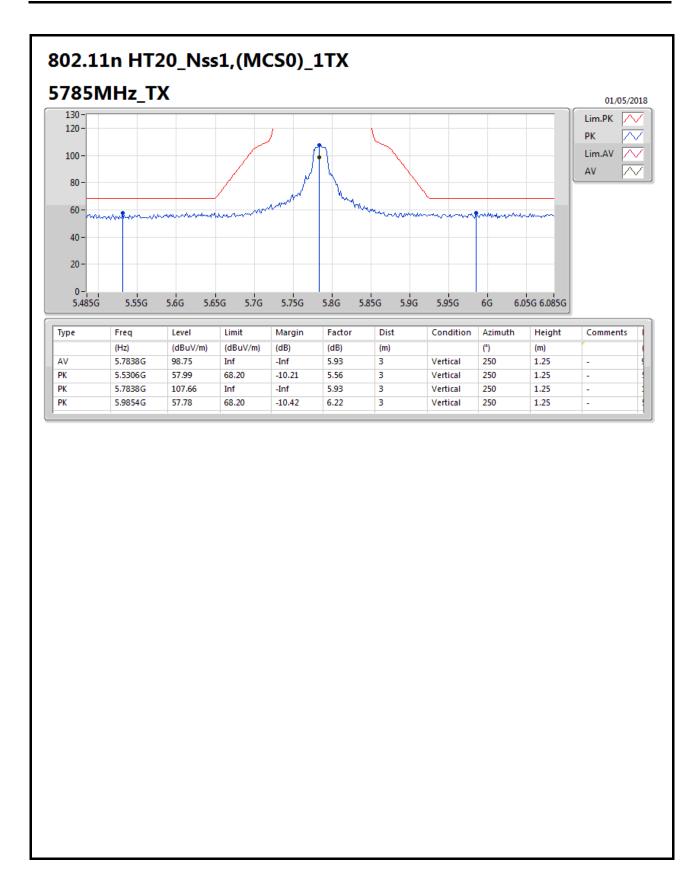
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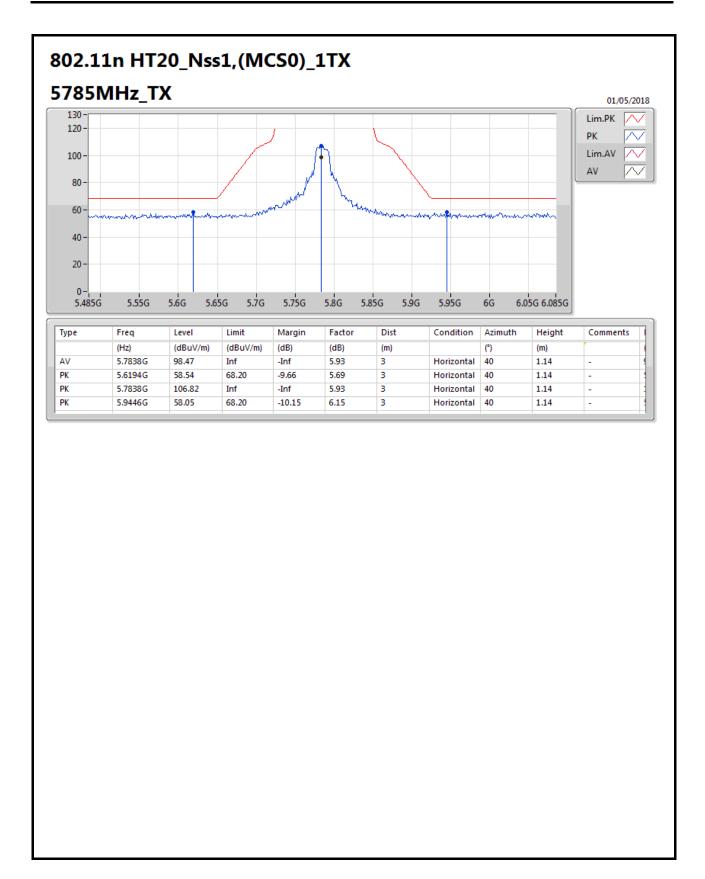
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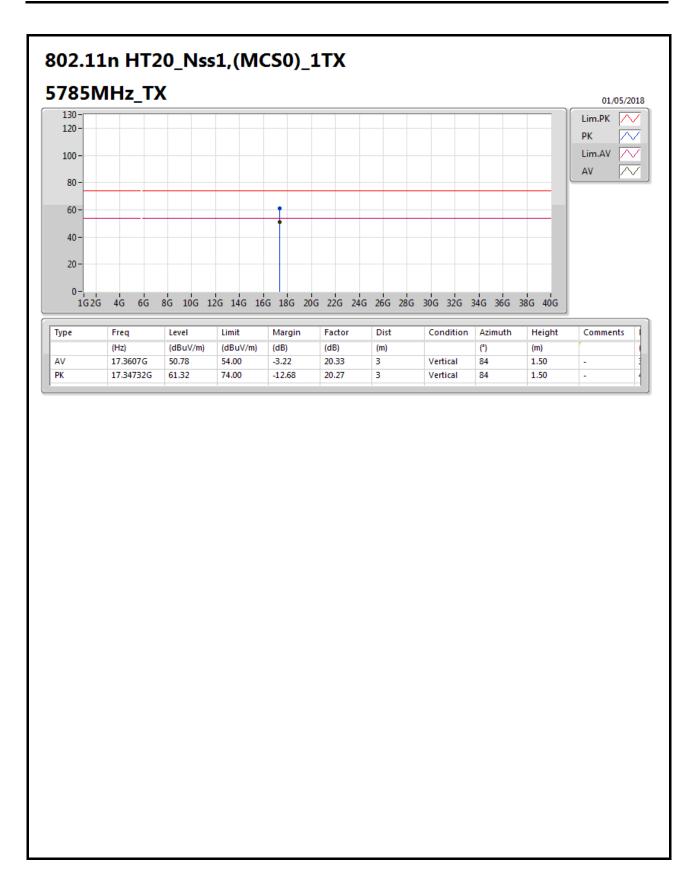
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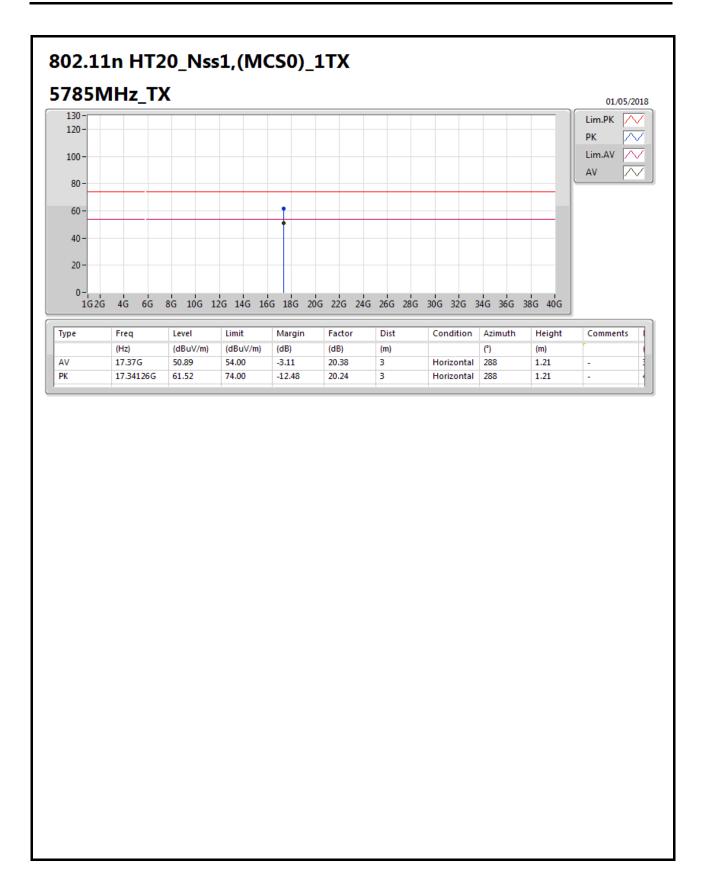
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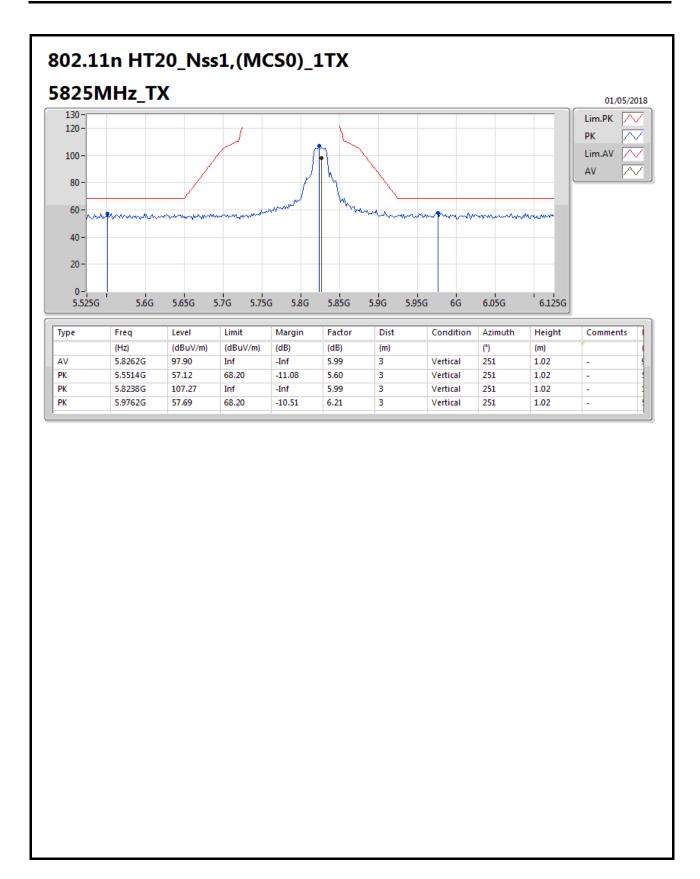
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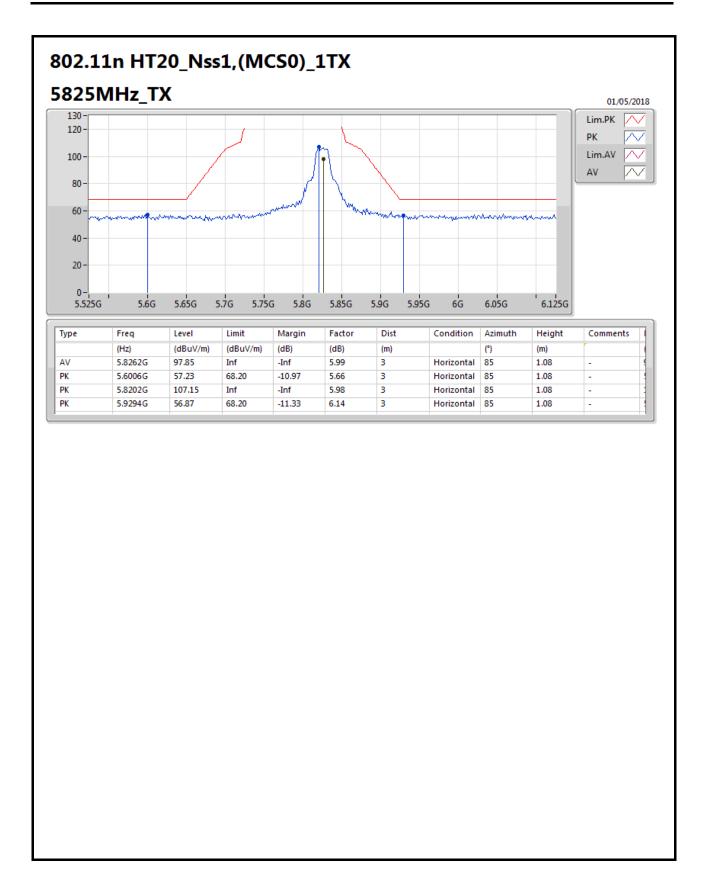
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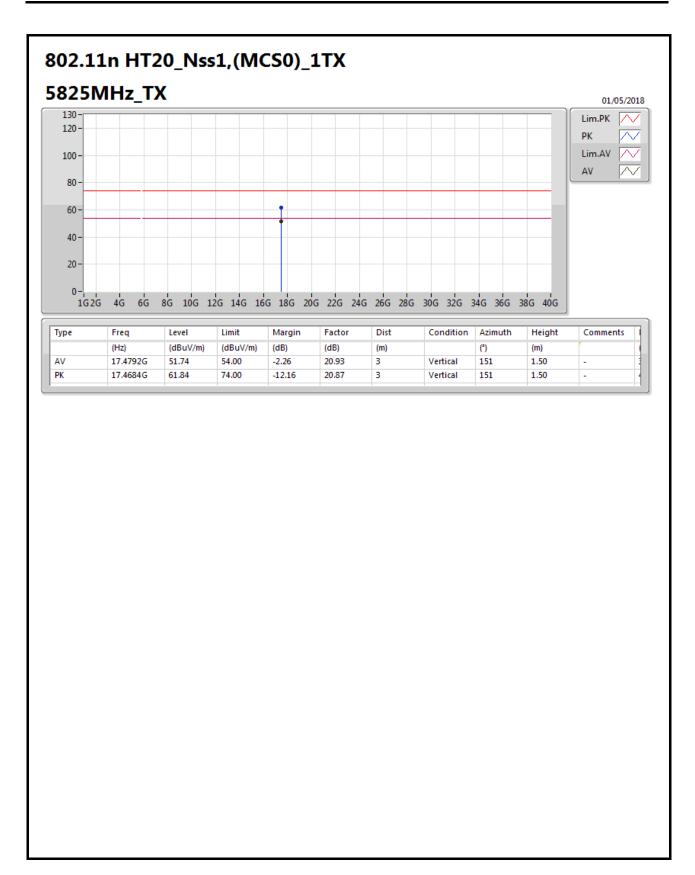
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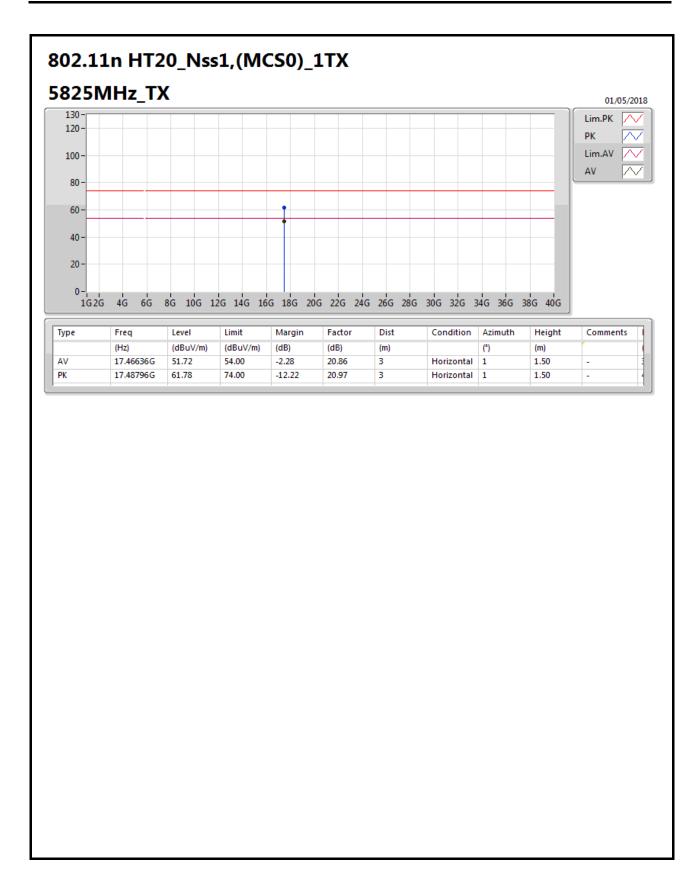
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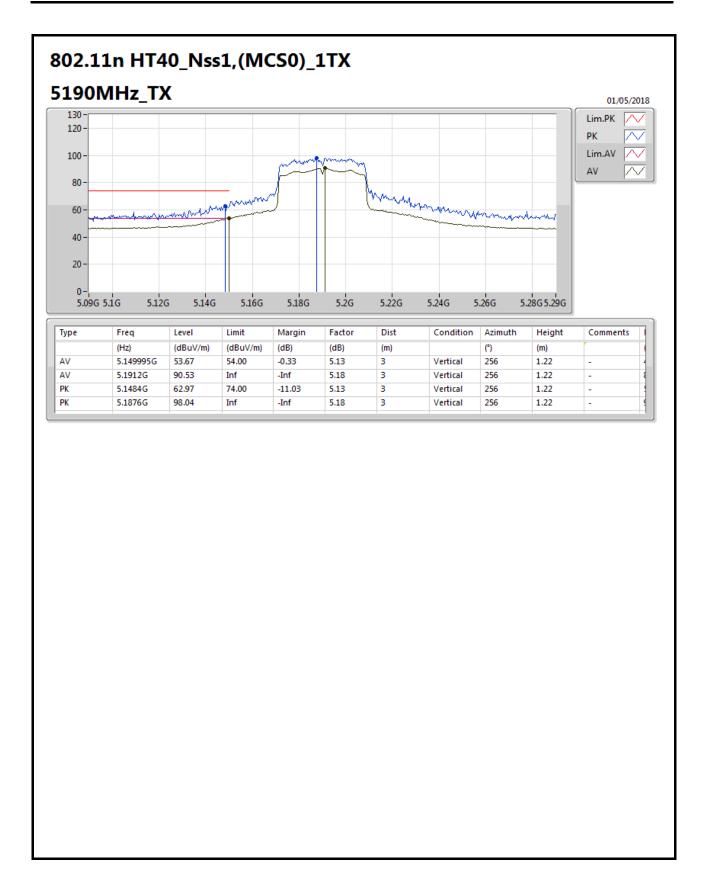
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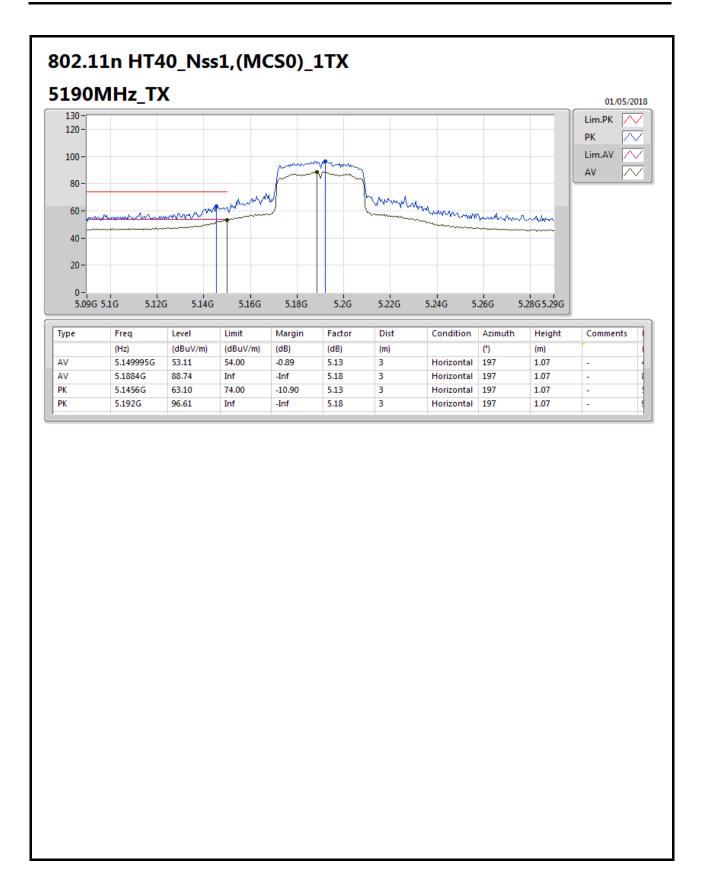
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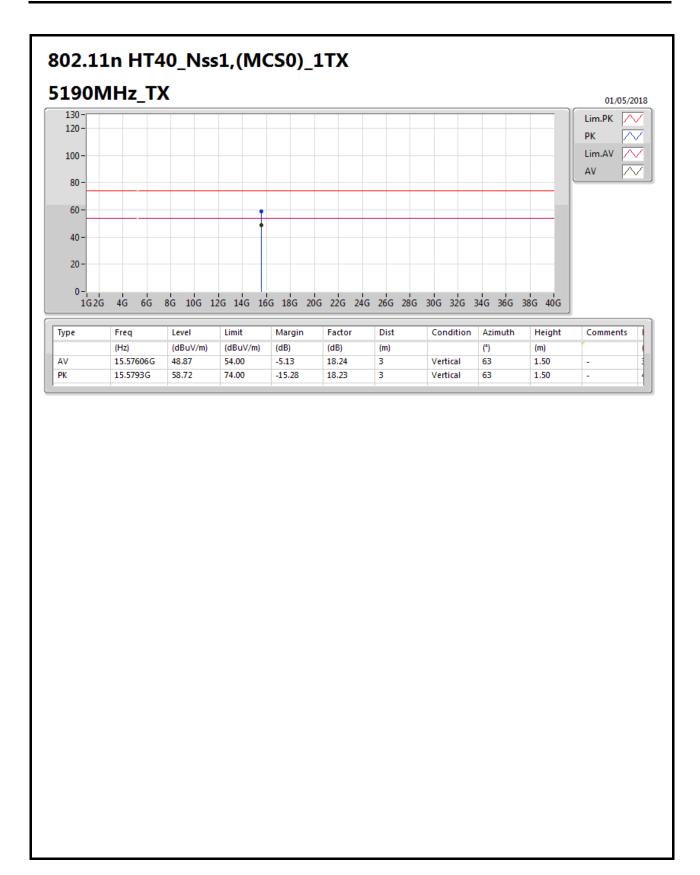
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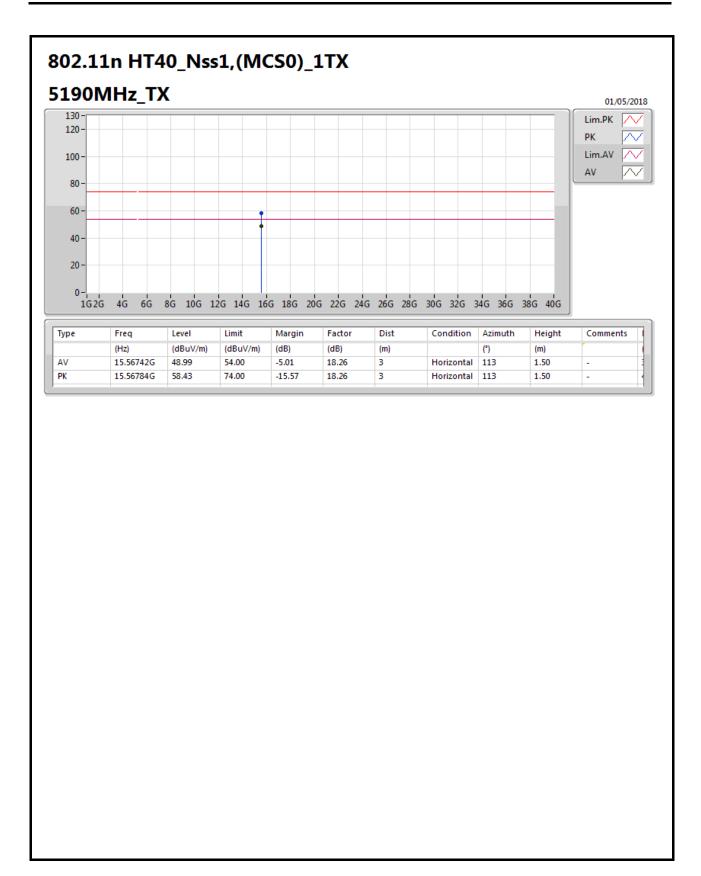
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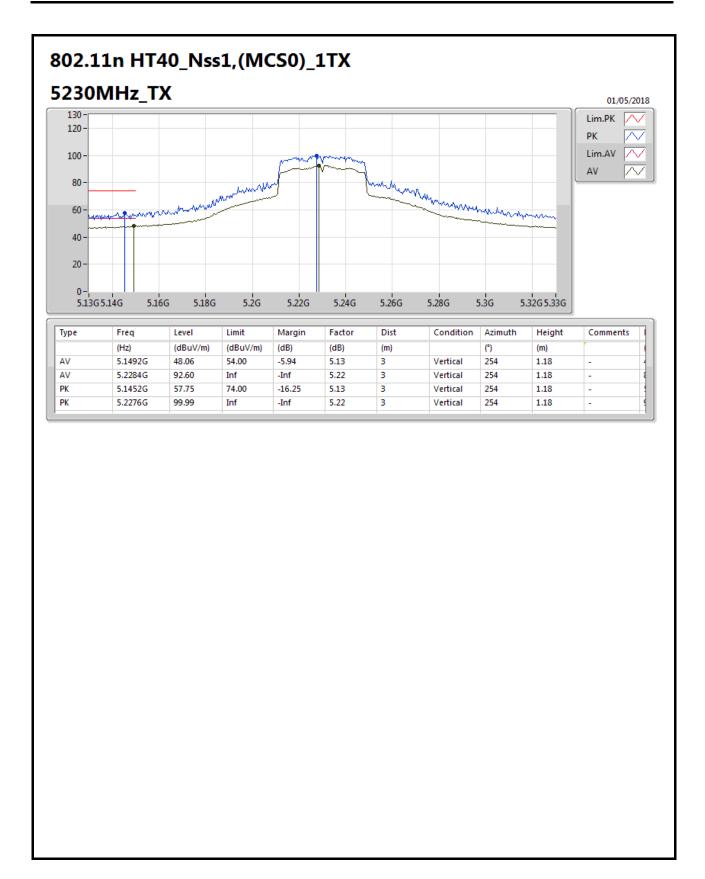
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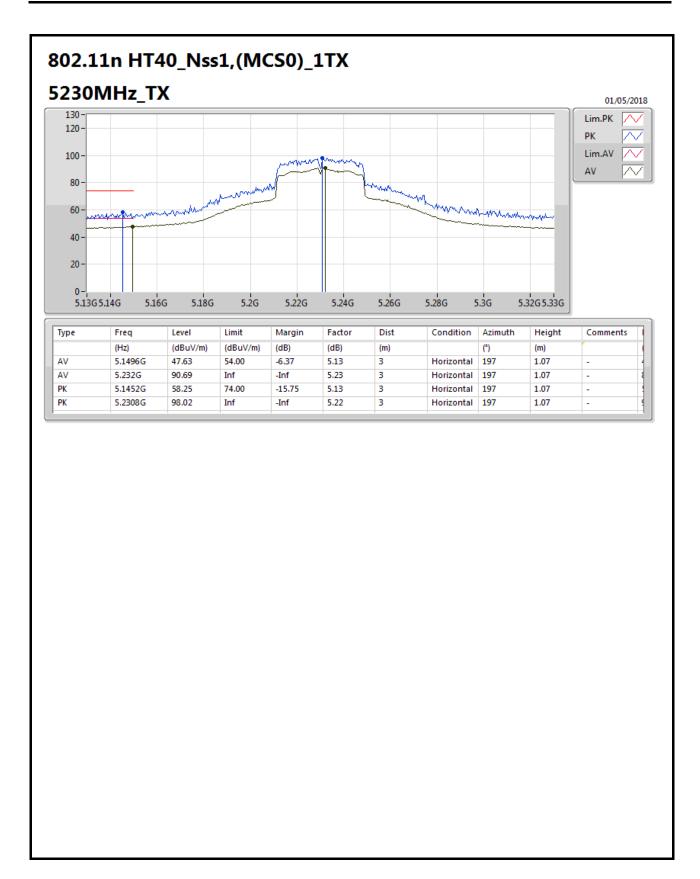
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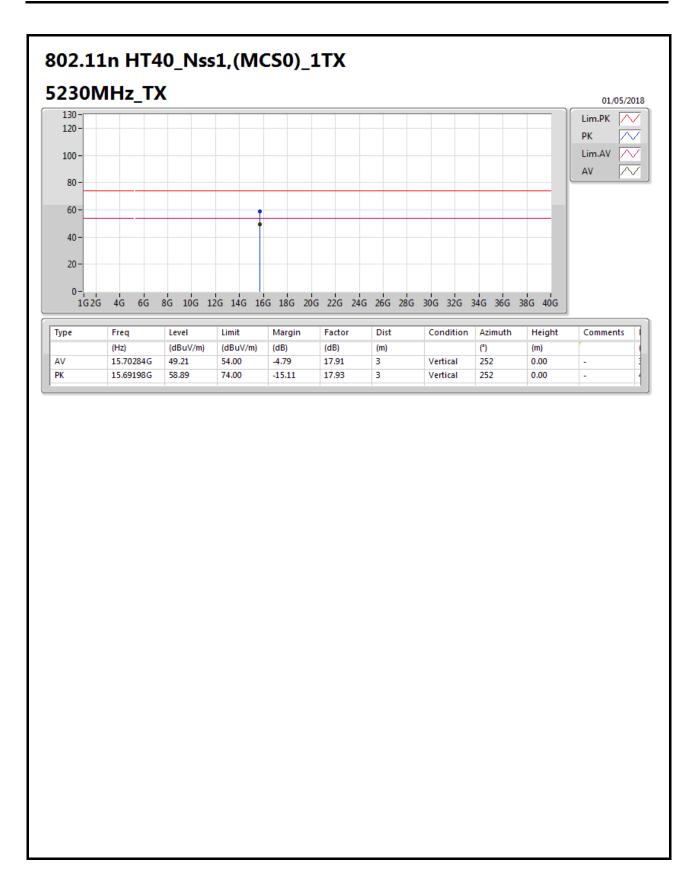
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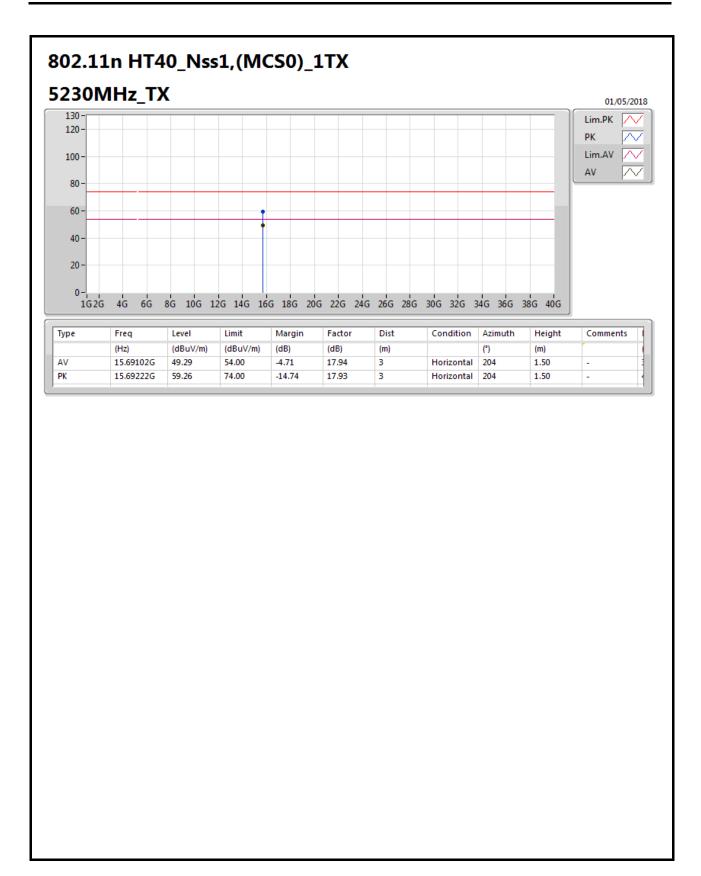
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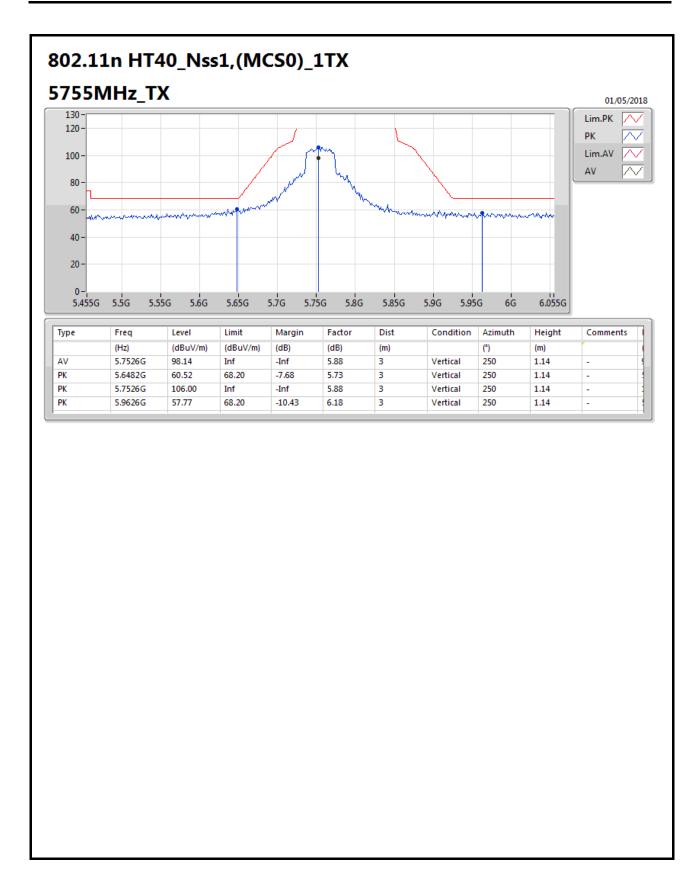
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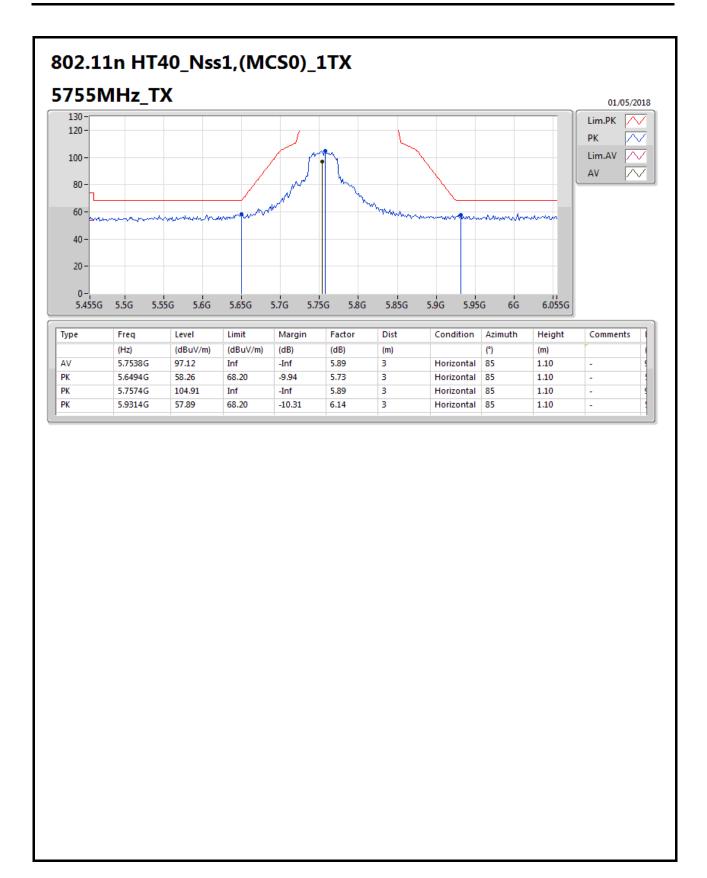
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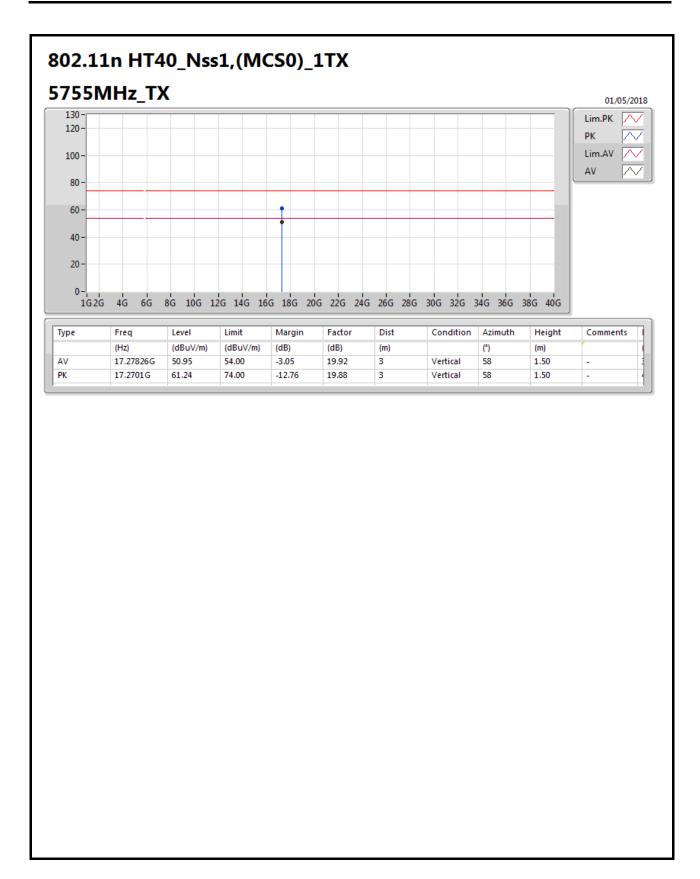
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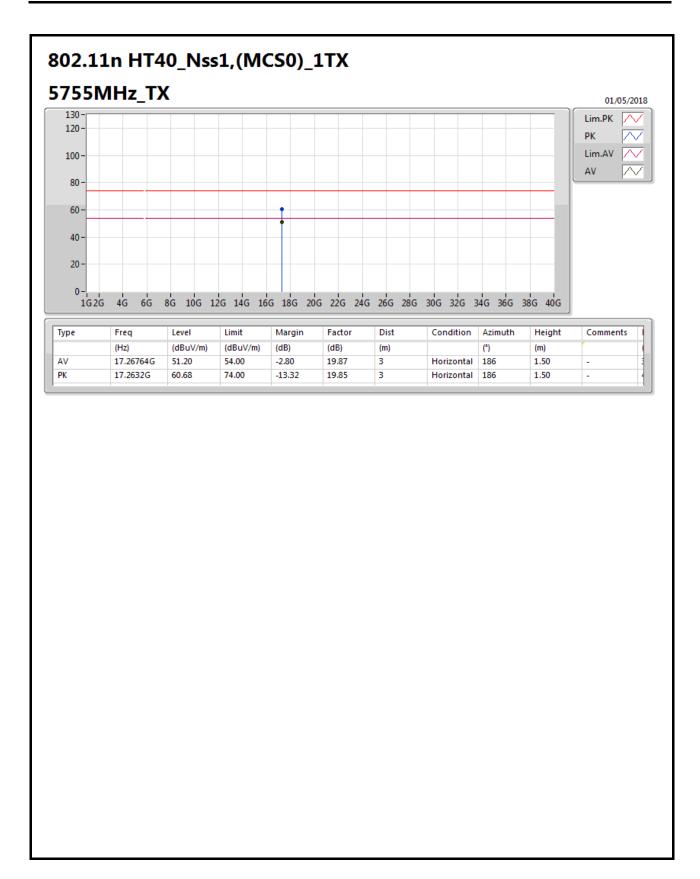
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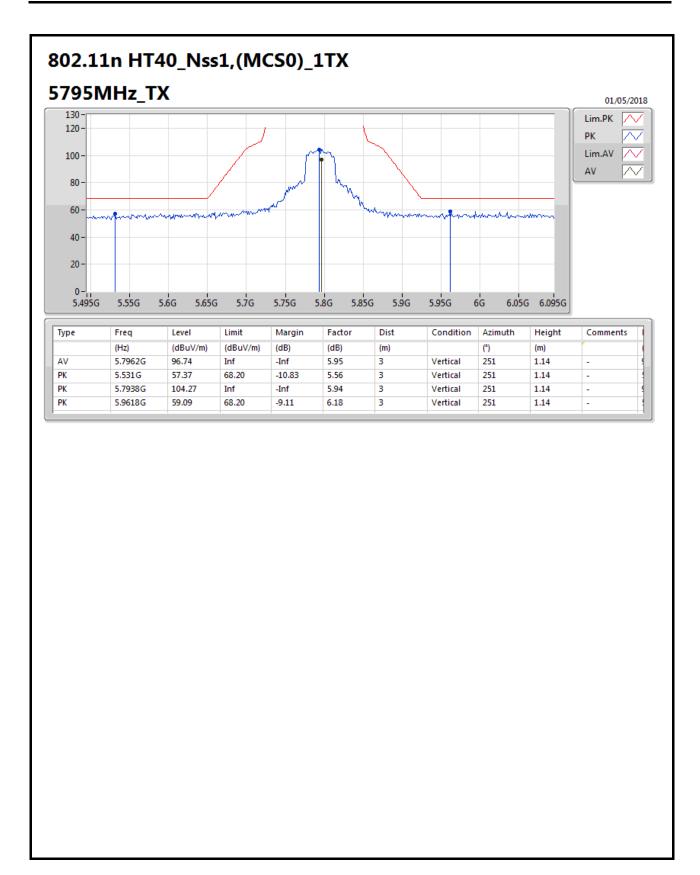
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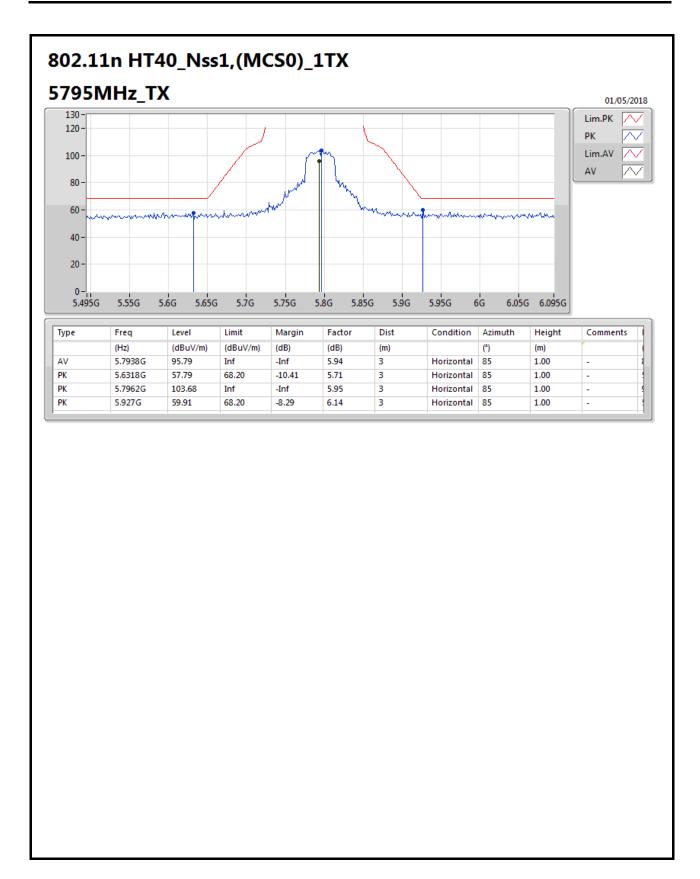
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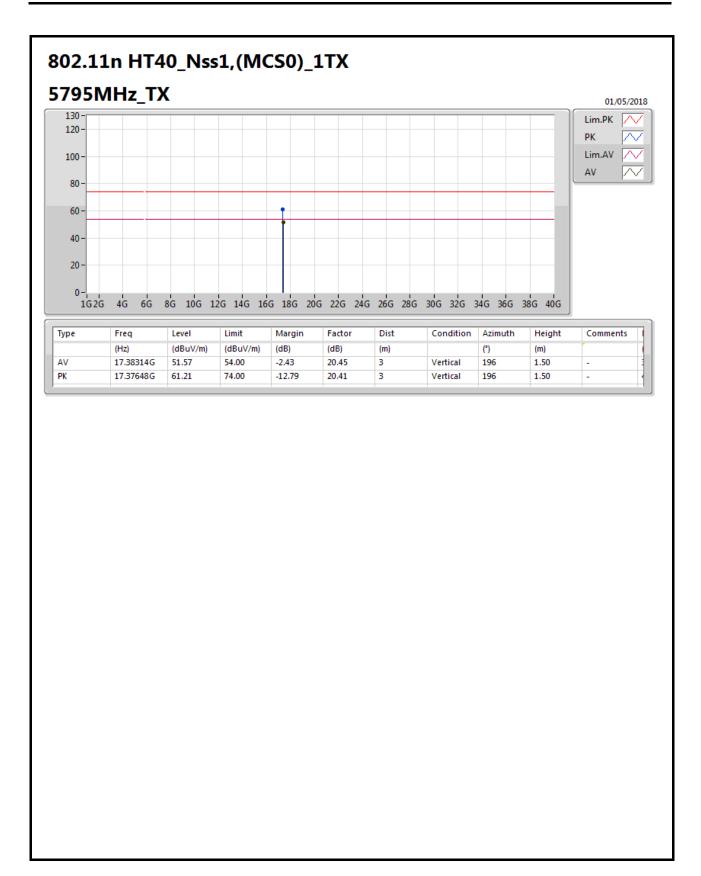
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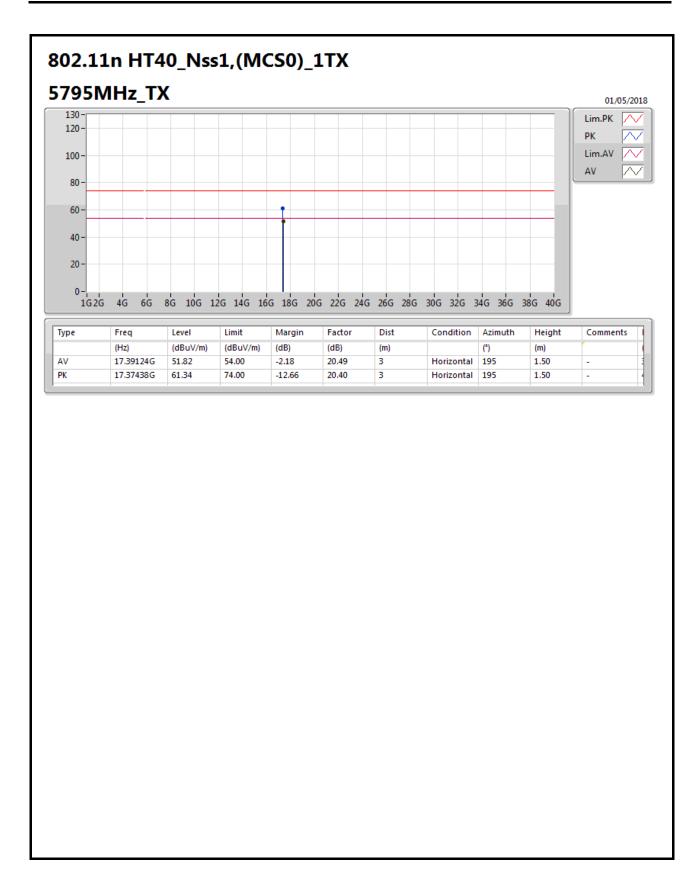
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