

Equipment : RF Module

Brand Name : Kontron

Model No. : WUBM-273ACN

FCC ID : 2AATH-WUBM273ACN

Standard : 47 CFR FCC Part 15.247

Operating Band : 2400 MHz – 2483.5 MHz

Function : ☐ Point-to-multipoint; ☐ Point-to-point

Applicant/ : Kontron Europe GmbH

Manufacturer Lise-Meitner-Str. 3-5 86156 Augsburg Germany

The product sample received on Jul. 04, 2017 and completely tested on Aug. 31, 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 full.

Phoenix Chen

SPORTON INTERNATIONAL INC.

lac-MRA



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# **Summary of Test Result**

	Conformance Test Specifications							
Report Clause	Ref. Std. Clause	Description	Limit	Result				
1.1.2	15.203	Antenna Requirement	FCC 15.203	Complied				
3.1	15.207	AC Power-line Conducted Emissions	FCC 15.207	Complied				
3.2	15.247(a)	DTS Bandwidth	≥500kHz	Complied				
3.3	15.247(b)	Maximum Conducted Output Power	Power [dBm]:30	Complied				
3.4	15.247(e)	Power Spectral Density	PSD [dBm/3kHz]:8	Complied				
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	Non-Restricted Bands: > 30 dBc	Complied				
3.6	15.247(d)	Emissions in Restricted Frequency Bands	Restricted Bands: FCC 15.209	Complied				

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# **Revision History**

Report No.	Version	Description	Issued Date
FR742220AC	Rev. 01	Initial issue of report	Sep. 08, 2017

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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
2400-2483.5	b, g, n (HT20)	2412-2462	1-11 [11]
2400-2483.5	n (HT40)	2422-2452	3-9 [7]

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Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	1TX(Port 2)
2.4-2.4835GHz	802.11g	20	1TX(Port 2)
2.4-2.4835GHz	802.11n HT20	20	2TX
2.4-2.4835GHz	802.11n HT40	40	2TX

#### Note:

- ◆ 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- BWch is the nominal channel bandwidth.

#### 1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1 1 KONTRON		423-0569-00 WIFI ANTENNA	PIFA Antenna	Murata	2
'	'	KONTRON	250MM KAI1207300	PIFA Antenna	Murata	2
2	2	KONTDON	423-0570-00 WIFI ANTENNA	DIEA Antonno	Murata	2
2	2	KONTRON	610MM KAI1207300	PIFA Antenna	Murata	2

Note: 1: 802.11b/g only includes 1TX and Port 2 for emission.

Note: 2: 802.11n used two antennas are for signal transmitting and receiving.(2T2R Spatial Multiplexing

MIMO configuration)

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1.1.3 EUT Information

	Operational Condition							
EU	T Power T	уре	Fro	m host system				
Bea	amforming	g Function		With beamform	ing [	$\times$	Without beamforming	
				,	Type of	EU	TT	
$\boxtimes$	Stand-alone							
	Combine	d (EUT where	e the	radio part is full	y integra	atec	within another device)	
	Combine	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
802.11b	0.856	0.675	8.686m	300
802.11g	0.661	1.798	1.433m	1k
802.11n HT20	0.87	0.605	1.349m	1k
802.11n HT40	0.531	2.749	636.25u	3k

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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
- KDB 558074 D01 v04
- KDB 662911 D01 v02r01

## 1.3 Testing Location Information

	Testing Location						
$\boxtimes$	HWA YA	ADD	:	No. 52, Huaya 1st Rd.,	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)		
	TEL : 886-3-327-3456						
				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
RF Conducted	TH07-HY	Ryan	22.5°C / 64%	31/Aug/2017
Radiated	03CH09-HY	Terry	20.4°C / 58%	31/Aug/2017
AC Conduction	CO04-HY	Bear	23.8°C / 55%	24/Jul/2017

# 1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	2.1 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	2.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	2.9 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%

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2 Test Configuration of EUT

# 2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	5V

# 2.2 Test Channel Mode

Test Software Version	MT7662 QAV1.0.3.2
-----------------------	-------------------

Mode	Power Setting
802.11b_Nss1,(1Mbps)_1TX	-
2412MHz	26
2437MHz	25
2462MHz	3F
802.11g_Nss1,(6Mbps)_1TX	-
2412MHz	26
2437MHz	3F
2462MHz	26
802.11n HT20_Nss1,(MCS0)_2TX	-
2412MHz	25,23
2437MHz	3F,3D
2462MHz	23,21
802.11n HT40_Nss1,(MCS0)_2TX	-
2422MHz	1F,1D
2437MHz	26,24
2452MHz	22,20

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# 2.3 The Worst Case Measurement Configuration

TI	The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions Emissions in Non-restricted Frequency Bands	
Condition	AC power-line conducted measurement for line and neutral	
Operating Mode	Normal Link	
1	USB mode	

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

The Worst Case Mode for Following Conformance Tests				
Tests Item	Emissions in Restricted From	Emissions in Restricted Frequency Bands		
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	СТХ			
1	USB mode			
Operating Mode > 1GHz	CTX			
	X Plane	Y Plane	Z Plane	
Orthogonal Planes of EUT				
Worst Planes of EUT			V	

The Worst Case Mode for Following Conformance Tests		
Tests Item	Simultaneous Transmission Analysis	
Operating Mode WLAN 2.4GHz + WLAN 5GHz		
Refer to Sporton Test Report No.: FA742220 for Co-location RF Exposure Evaluation.		

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# 2.4 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

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Support Equipment – Radiated Emission				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5530	-
2	Adapter for NB	DELL	LA65NS2-01	-

Support Equipment – AC Conduction				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5530	-
2	Adapter for NB	DELL	LA65NS2-01	-

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2.5 Test Setup Diagram

#### Test Setup Diagram - AC Line Conducted Emission Test AC mains TU3 Adapter Trun Table Item Connection Shielded Length(m) Remark AC Power cable No 1.8m 1 2 DC Power cable No 1.5m 3 USB cable No 2m 4 RF cable No 0.6m 5 RF cable No 0.25m

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#### **Test Setup Diagram - Radiated Test** AC mains Ant EUT Trun Table Shielded Length(m) Item Connection Remark 1 AC Power cable No 1.8m 2 DC Power cable 1.5m No USB cable 3 No 2m RF cable 4 No 0.6m 5 RF cable 0.25m No

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# 3 Transmitter Test Result

## 3.1 AC Power-line Conducted Emissions

### 3.1.1 AC Power-line Conducted Emissions Limit

AC POWE	er-line Conducted Emissions L	
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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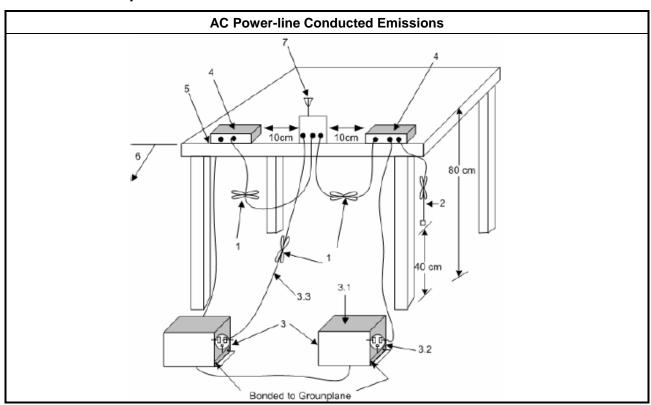
## 3.1.2 Measuring Instruments

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

#### 3.1.3 Test Procedures

Test Method	
Refer as ANSI C63.10-2013, clause 6.2 for AC power-line cond	lucted 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 DTS Bandwidth

### 3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
■ 6 dB bandwidth ≥ 500 kHz.

## 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

	Test Method						
•	For the emission bandwidth shall be measured using one of the options below:						
	Refer as KDB 558074, clause 8.1 Option 1 for 6 dB bandwidth measurement.						
	Refer as KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement.						
	Refer as RSS-Gen, clause 6.6 for for occupied bandwidth testing.						
	Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.						

## 3.2.4 Test Setup

Emission Bandwidth	
Spectrum Analyzer	

## 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

Maxim	num Conducted Output Power Limit							
•	If $G_{TX} \le 6$ dBi, then $P_{Out} \le 30$ dBm (1 W)							
-	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm							
•	■ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm							
•	Smart antenna system (SAS):							
	- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm							
	- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm							
	- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm							
e.i.r.p.	Power Limit:							
<b>2</b> 4	400-2483.5 MHz Band							
•	Point-to-multipoint systems (P2M): P <sub>eirp</sub> ≤ 36 dBm (4 W)							
•	Point-to-point systems (P2P): $P_{eirp} \le MAX(36, [P_{Out} + G_{TX}]) dBm$							
-	Smart antenna system (SAS)							
	- Single beam: P <sub>eirp</sub> ≤ MAX(36, P <sub>Out</sub> + G <sub>TX</sub> ) dBm							
	- Overlap beam: P <sub>eirp</sub> ≤ MAX(36, P <sub>Out</sub> + G <sub>TX</sub> ) dBm							
	- Aggregate power on all beams: P <sub>eirp</sub> ≤ MAX(36, [P <sub>Out</sub> + G <sub>TX</sub> + 8]) dBm							
	maximum peak conducted output power or maximum conducted output power in dBm, 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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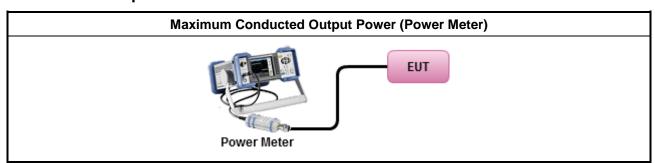
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### 3.3.3 Test Procedures

	Test Method
•	Maximum Peak Conducted Output Power
	☐ Refer as KDB 558074, clause 9.1.1 Option 1 (RBW ≥ EBW method).
	Refer as KDB 558074, clause 9.1.2 Option 2 (integrated band power method)
	☐ Refer as KDB 558074, clause 9.1.3 Option 3 (peak power meter for VBW ≥ DTS BW)
•	Maximum Average Conducted Output Power
	Duty cycle ≥ 98%
	Refer as KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
	Duty cycle < 98%
	Refer as KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
	Refer as KDB 558074, clause 9.2.3.1 Method AVGPM (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

## 3.3.4 Test Setup



# 3.3.5 Test Result of Maximum Conducted Output Power

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## 3.4 Power Spectral Density

#### 3.4.1 Power Spectral Density Limit

#### **Power Spectral Density Limit**

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Power Spectral Density (PSD) ≤ 8 dBm/3kHz

#### 3.4.2 Measuring Instruments

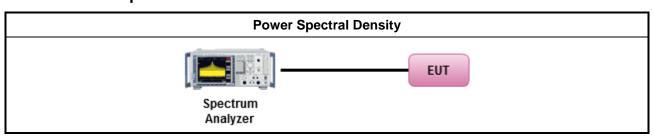
Refer a test equipment and calibration data table in this test report.

#### 3.4.3 Test Procedures

#### **Test Method**

- Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
  - Refer as KDB 558074, clause 10.2 Method PKPSD (RBW=3-100kHz; Detector=peak).
- 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.

#### 3.4.4 Test Setup



#### 3.4.5 Test Result of Power Spectral Density

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## 3.5 Emissions in Non-restricted Frequency Bands

#### 3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit					
RF output power procedure Limit (dB)					
Peak output power procedure	20				
Average output power procedure	30				

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- Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
- Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

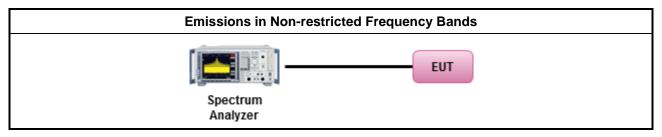
## 3.5.2 Measuring Instruments

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

#### 3.5.3 Test Procedures

Test Method	
<ul> <li>Refer as KDB 558074, clause 11 for unwanted emissions into non-restricted bands.</li> </ul>	

### 3.5.4 Test Setup



### 3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

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## 3.6 Emissions in Restricted Frequency Bands

#### 3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit										
Frequency Range (MHz) Field Strength (uV/m) Field Strength (dBuV/m) Measure Distance										
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.

#### 3.6.2 Measuring Instruments

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

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#### 3.6.3 Test Procedures

#### **Test Method**

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- The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
- Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
- For the transmitter unwanted emissions shall be measured using following options below:
  - Refer as KDB 558074, clause 12 for unwanted emissions into restricted bands.
    - Refer as KDB 558074, clause 12.2.5.3 (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW≥1/T.
    - Refer as KDB 558074, clause 12.2.4 measurement procedure peak limit.
- For the transmitter band-edge emissions shall be measured using following options below:
  - Refer as KDB 558074 clause 13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
  - Refer as KDB 558074, clause 13.2 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
  - Refer as KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
- For conducted and cabinet radiation measurement, refer as KDB 558074, clause 12.2.2.
  - For conducted unwanted emissions into restricted bands (absolute emission limits).
     Devices with multiple transmit chains using options given below:
    - (1) Measure and sum the spectra across the outputs or
    - (2) Measure and add 10 log(N) dB
  - For KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

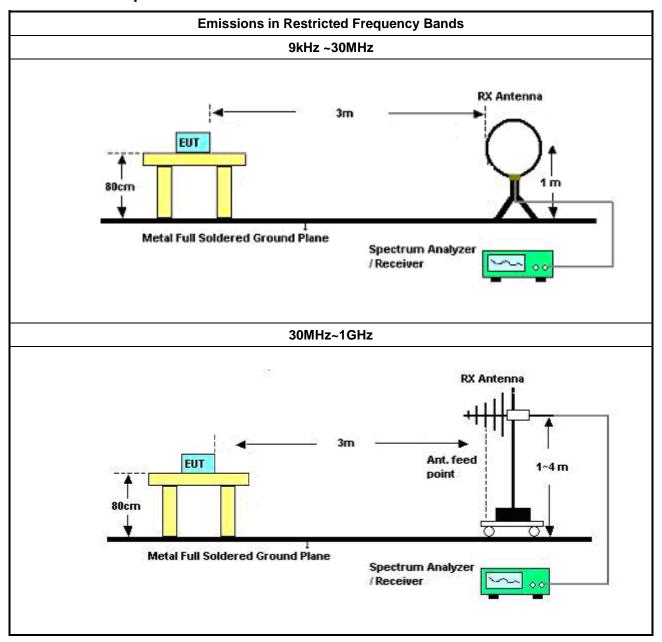
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3.6.4 Test Setup

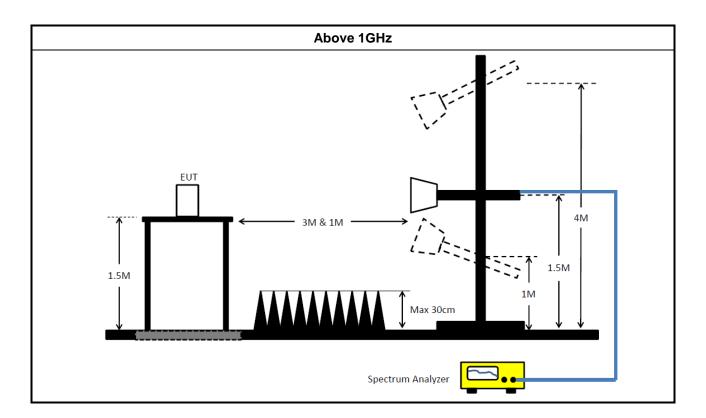


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## 3.6.5 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

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

## 3.6.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

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# 4 Test Equipment and Calibration Data

### **Instrument for AC Conduction**

Instrument Manufacturer		Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR3	102052	9KHz ~ 3.6GHz	29/Apr/2017	28/Apr/2018
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	15/Nov/2016	14/Nov/2017
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	24/Oct/2016	23/Oct/2017
LISN (Support Unit) SCHWARZBECK MESS-ELEKTRO NIK		NSLK 8127	8127-477	9kHz ~ 30MHz	14/ Feb/2017	13/Feb/2018
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	R&S	ESH3-Z2	100921	10 kHz ~ 30 MHz	21/Oct/2016	20/Oct/2017

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NCR : Non-Calibration Require

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

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	25/Apr/2017	24/Apr/2018
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	28/Jun/2017	27/Jun/2018
Amplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	25/Apr/2017	24/Apr/2018
Amplifier	EMC	EMC9135	980232	9KHz~1GHz	25/Apr/2017	24/Apr/2018
Spectrum Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	04/Jul/2017	03/Jul/2018
Bilog Antenna	TESEQ	CBL 6111D	35418 30MHz~1GHz		01/Oct/2016	30/Sep/2017
Horn Antenna	SCHWARZBECK	BBHA 9120D	BBHA9120D 1534	1GHz~18GHz	28/Apr/2017	27/Apr/2018
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170614	18GHz ~ 40GHz	06/Feb/2017	05/Feb/2018
Loop Antenna	R&S	HFH2-Z2	100330	9 kHz~30 MHz	10/Nov/2016	09/Nov/2017
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	21/Sep/2016	20/Sep/2017
Receiver	R&S	ESU-26	100422/026	20Hz ~ 26.5GHz	21/Sep/2016	20/Sep/2017
RF Cable-high	Jye Bao	RG142	03CH09-HY	1GHz ~ 40GHz	21/Sep/2016	20/Sep/2017

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**Instrument for Conducted Test** 

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101500	101500 9kHz~40GHz		27/Jun/2018
Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	27/Oct/2016	26/Oct/2017
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	27/Oct/2016	26/Oct/2017
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	27/Jul/2017	26/Jul/2018
RF Cable-0.2m	HUBER+SUHN ER	SUCOFLEX_104	MY10709/4	30MHz ~ 26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.2m	HUBER+SUHN ER	SUCOFLEX_104	MY10710/4	30MHz ~ 26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.5m	HUBER+SUHN ER	SUCOFLEX_104	MY10713/4	30MHz ~ 26.5GHz	02/Oct/2016	01/Oct/2017

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FCC ID: 2AATH-WUBM273ACN

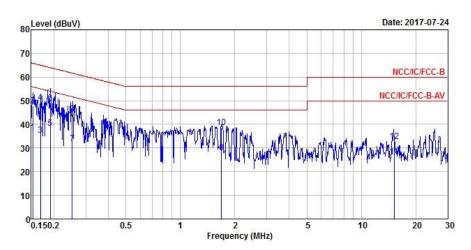
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AC Power-line Conducted Emissions Result					
Operating Mode	1	Power Phase	Neutral		
Operating Function	USB mode				



		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	87	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.15	36.62	-19.22	55.84	26.80	9.60	0.22	Average
2		0.15	47.81	-18.03	65.84	37.99	9.60	0.22	QP
3		0.17	35.30	-19.74	55.04	25.42	9.63	0.25	Average
4		0.17	49.36	-15.68	65.04	39.48	9.63	0.25	QP
5		0.19	38.46	-15.54	54.00	28.51	9.66	0.29	Average
6	MAX	0.19	48.98	-15.02	64.00	39.03	9.66	0.29	QP
7		0.25	32.01	-19.67	51.68	22.12	9.66	0.23	Average
8		0.25	44.30	-17.38	61.68	34.41	9.66	0.23	QP
9		1.69	28.02	-17.98	46.00	18.13	9.64	0.25	Average
10		1.69	38.53	-17.47	56.00	28.64	9.64	0.25	QP
11		15.21	26.33	-23.67	50.00	16.30	9.83	0.20	Average
12		15.21	32.77	-27.23	60.00	22.74	9.83	0.20	QP

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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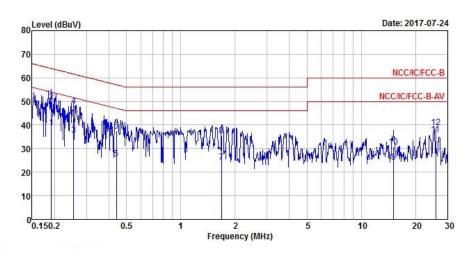
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AC Power-line Conducted Emissions Result								
Operating Mode	Operating Mode   1   Power Phase   Line							
Operating Function	Operating Function USB mode							



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
10 <u></u>	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19	38.96	-15.02	53.98	29.02	9.65	0.29	Average
2	0.19	49.91	-14.07	63.98	39.97	9.65	0.29	QP
3	0.25	35.82	-15.78	51.60	25.93	9.66	0.23	Average
4 MAX	0.25	48.15	-13.45	61.60	38.26	9.66	0.23	QP
5	0.44	25.65	-21.42	47.07	15.87	9.68	0.10	Average
6	0.44	37.39	-19.68	57.07	27.61	9.68	0.10	QP
7	1.68	24.34	-21.66	46.00	14.34	9.75	0.25	Average
8	1.68	35.41	-20.59	56.00	25.41	9.75	0.25	QP
9	15.14	24.15	-25.85	50.00	14.11	9.84	0.20	Average
10	15.14	30.56	-29.44	60.00	20.52	9.84	0.20	QP
11	25.87	36.01	-13.99	50.00	25.86	9.93	0.22	Average
12	25.87	39.02	-20.98	60.00	28.87	9.93	0.22	QP

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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EBW Result Appendix B

**Summary** 

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-
2.4-2.4835GHz	10.05M	16.617M	16M6G1D	9.075M	12.469M
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-
2.4-2.4835GHz	16.3M	27.811M	27M8D1D	15.9M	16.542M
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-
2.4-2.4835GHz	17.25M	25.662M	25M7D1D	16.05M	17.591M
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-
2.4-2.4835GHz	35.4M	36.132M	36M1D1D	33.8M	35.982M

**Max-N dB** = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth; **Min-N dB** = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

#### Result

Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-
2412MHz	Pass	500k			9.975M	12.719M
2437MHz	Pass	500k			9.075M	12.469M
2462MHz	Pass	500k			10.05M	16.617M
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-
2412MHz	Pass	500k			15.9M	16.592M
2437MHz	Pass	500k			16.3M	27.811M
2462MHz	Pass	500k			16.275M	16.542M
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.65M	17.616M	16.625M	17.616M
2437MHz	Pass	500k	16.25M	25.662M	16.05M	17.941M
2462MHz	Pass	500k	16.25M	17.591M	17.25M	17.591M
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	35.4M	35.982M	35.1M	35.982M
2437MHz	Pass	500k	35M	36.032M	33.8M	36.132M
2452MHz	Pass	500k	35.1M	36.032M	35.15M	36.032M

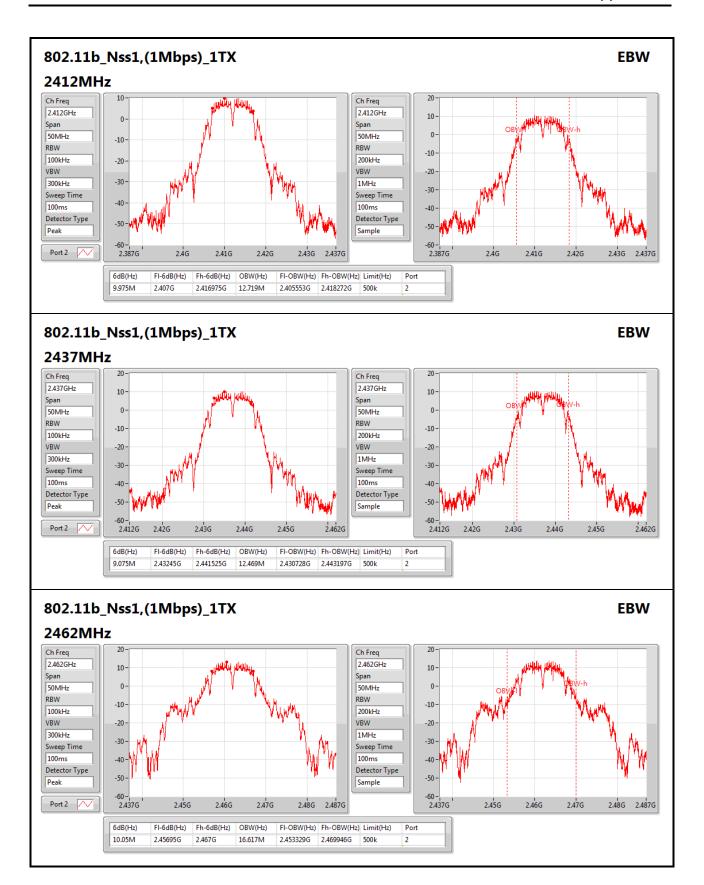
Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

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Appendix B EBW Result



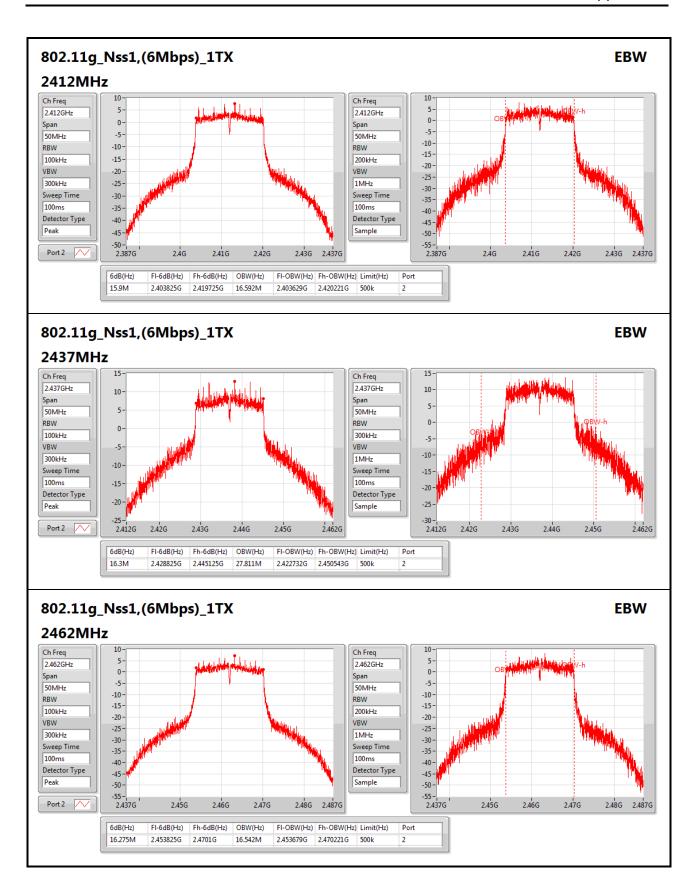
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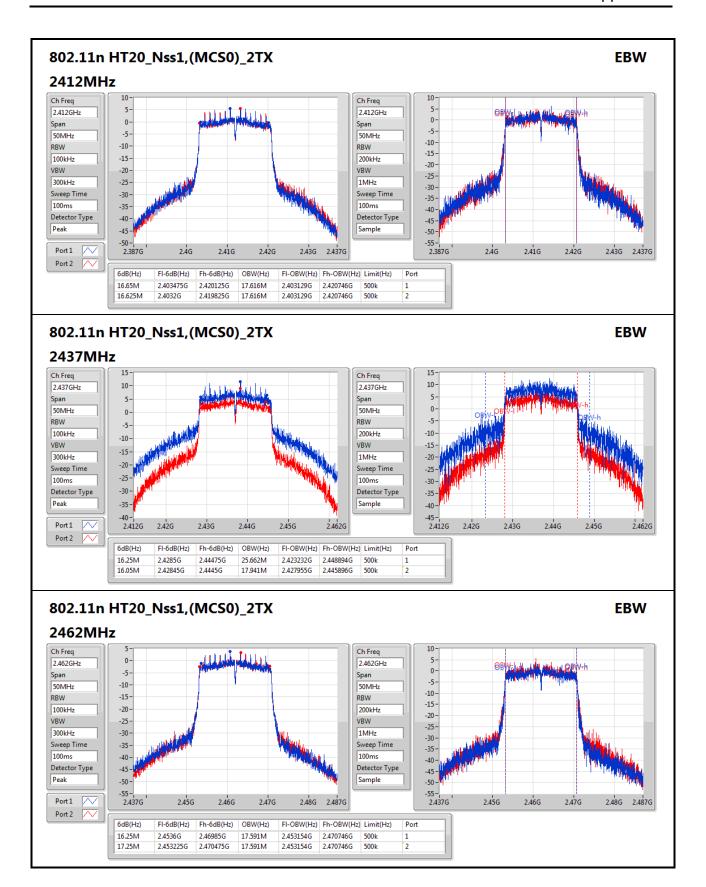
SPORTON LAB.

Appendix B EBW Result



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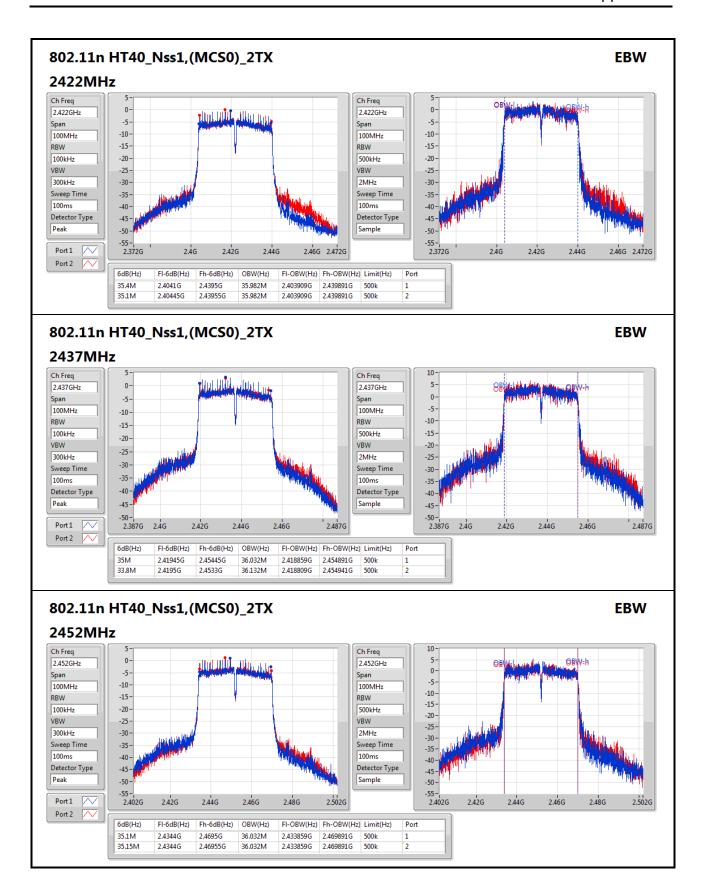


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EBW Result Appendix B



SPORTON INTERNATIONAL INC.

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AV Power Result Appendix C

Summary

Mode	Total Power	Total Power
	(dBm)	(W)
802.11b_Nss1,(1Mbps)_1TX	-	-
2.4-2.4835GHz	23.66	0.23227
802.11g_Nss1,(6Mbps)_1TX	-	-
2.4-2.4835GHz	23.42	0.21979
802.11n HT20_Nss1,(MCS0)_2TX	-	-
2.4-2.4835GHz	22.20	0.16596
802.11n HT40_Nss1,(MCS0)_2TX	-	-
2.4-2.4835GHz	19.45	0.08810

#### Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-
2412MHz	Pass	2.00		20.14	20.14	30.00
2437MHz	Pass	2.00		20.01	20.01	30.00
2462MHz	Pass	2.00		23.66	23.66	30.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-
2412MHz	Pass	2.00		18.61	18.61	30.00
2437MHz	Pass	2.00		23.42	23.42	30.00
2462MHz	Pass	2.00		18.29	18.29	30.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	2.00	16.24	16.04	19.15	30.00
2437MHz	Pass	2.00	19.17	19.21	22.20	30.00
2462MHz	Pass	2.00	15.06	15.16	18.12	30.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	2.00	13.38	13.43	16.42	30.00
2437MHz	Pass	2.00	16.38	16.49	19.45	30.00
2452MHz	Pass	2.00	14.40	14.66	17.54	30.00

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

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Appendix D **PSD Result** 

**Summary** 

Mode	PD
	(dBm/RBW)
802.11b_Nss1,(1Mbps)_1TX	-
2.4-2.4835GHz	-2.12
802.11g_Nss1,(6Mbps)_1TX	-
2.4-2.4835GHz	-3.49
802.11n HT20_Nss1,(MCS0)_2TX	-
2.4-2.4835GHz	-5.65
802.11n HT40_Nss1,(MCS0)_2TX	-
2.4-2.4835GHz	-10.13

RBW=3kHz.

#### Result

Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-
2412MHz	Pass	2.00		-3.86	-3.86	8.00
2437MHz	Pass	2.00		-5.66	-5.66	8.00
2462MHz	Pass	2.00		-2.12	-2.12	8.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-
2412MHz	Pass	2.00		-8.15	-8.15	8.00
2437MHz	Pass	2.00		-3.49	-3.49	8.00
2462MHz	Pass	2.00		-7.33	-7.33	8.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.01	-9.15	-10.05	-7.68	8.00
2437MHz	Pass	5.01	-6.21	-7.00	-5.65	8.00
2462MHz	Pass	5.01	-11.08	-11.73	-9.08	8.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	5.01	-15.75	-15.05	-13.74	8.00
2437MHz	Pass	5.01	-12.56	-12.68	-10.13	8.00
2452MHz	Pass	5.01	-14.10	-13.89	-12.20	8.00

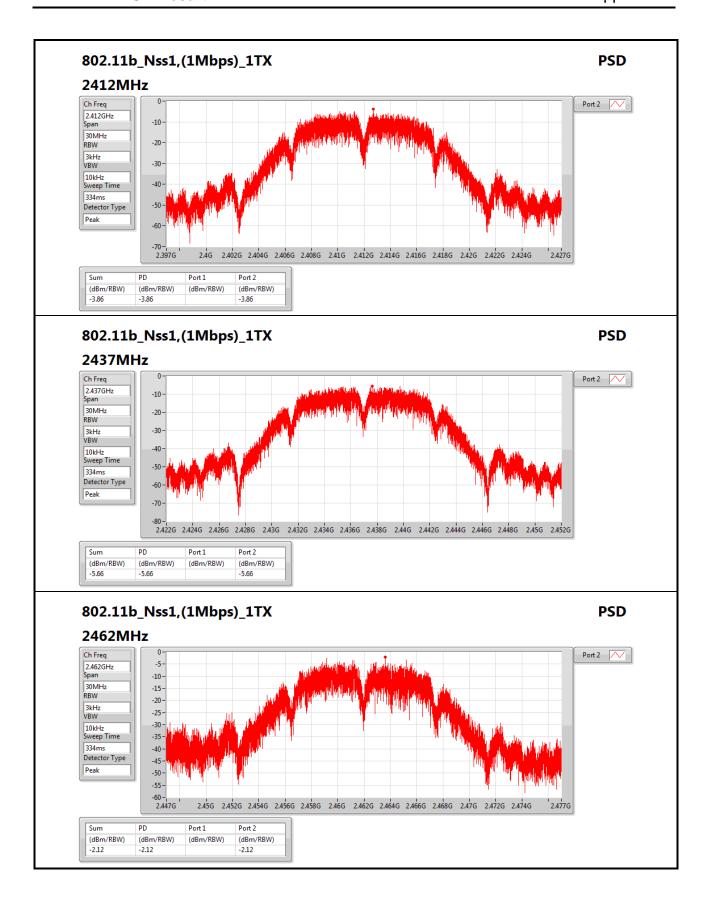
DG = Directional Gain; RBW=3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;

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PSD Result Appendix D

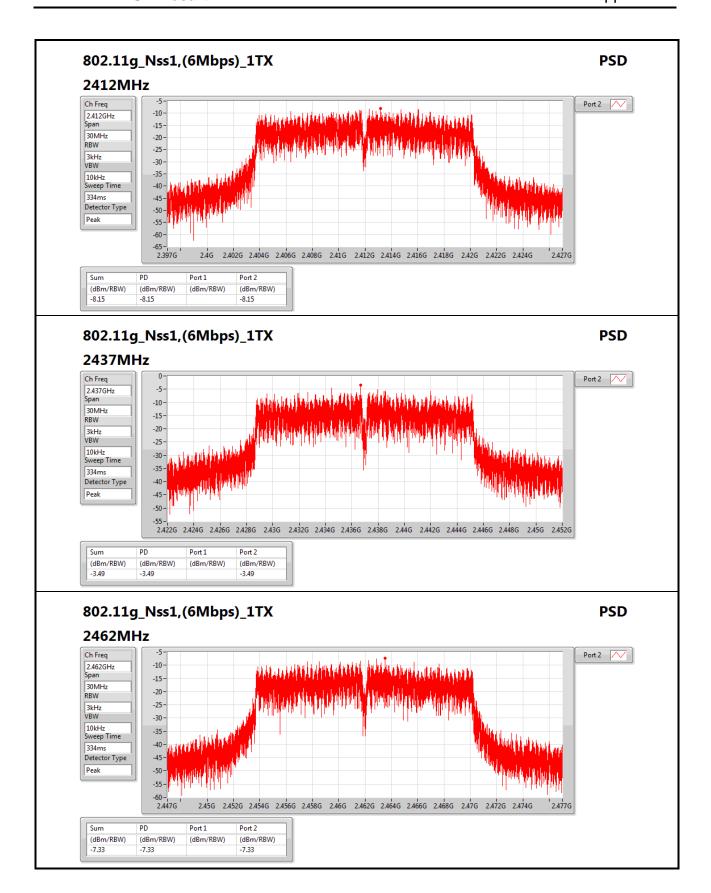


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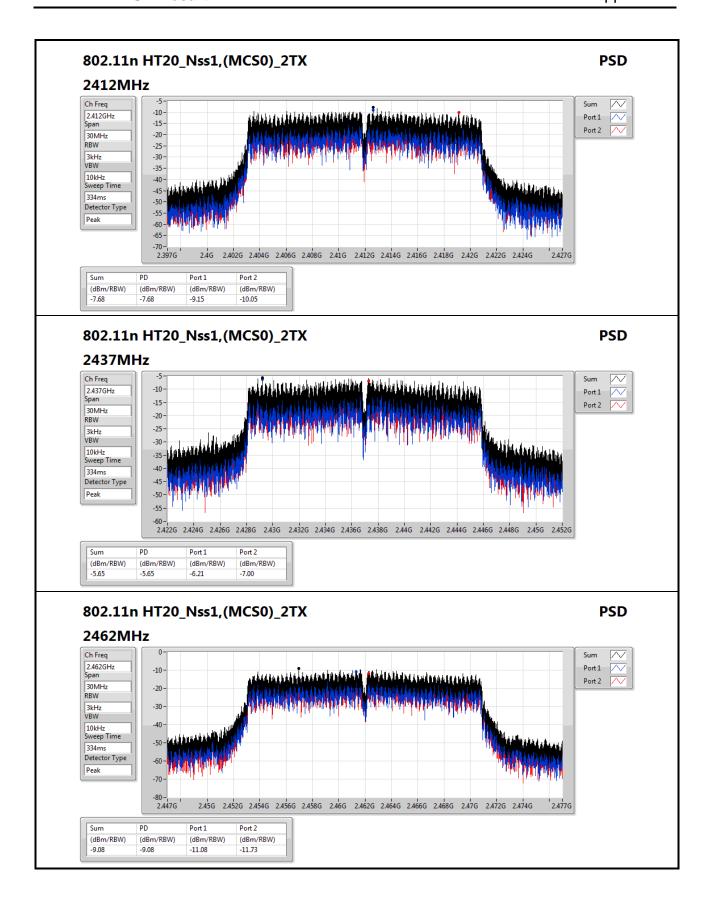
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PSD Result Appendix D



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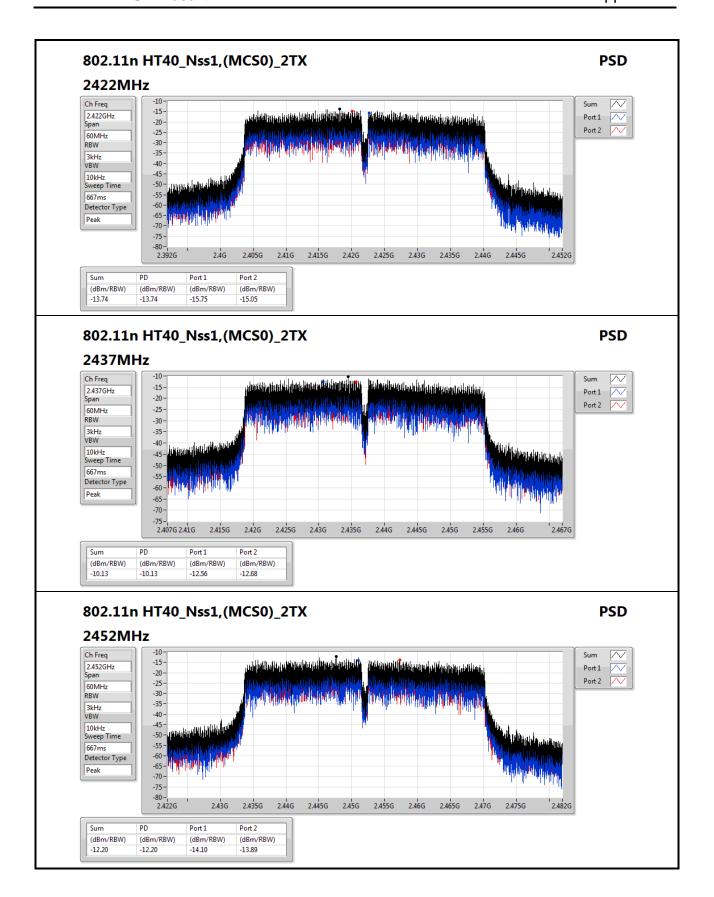


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PSD Result Appendix D



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# **CSE Non-restricted Band Result**

Appendix E

Summary

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
802.11g_Nss1,(6Mbps)_1TX	-					-		-		-	-	-	-
2.4-2.4835GHz	Pass	2.441917G	9.88	-20.12	147.665M	-39.96	2.39984G	-20.13	2.50454G	-55.31	3.214652G	-52.46	2

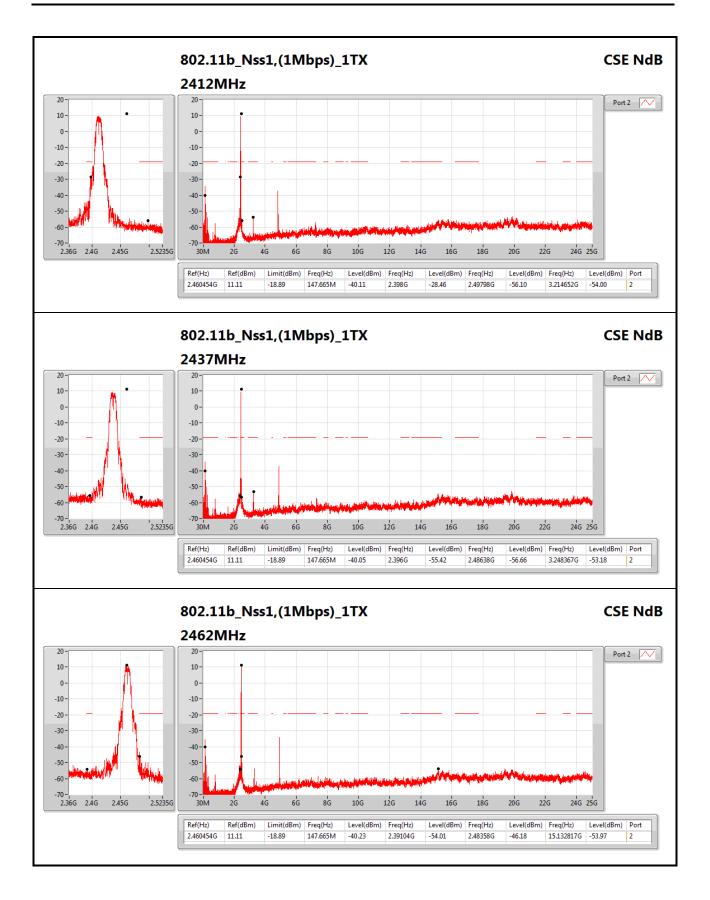
### Result

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.460454G	11.11	-18.89	147.665M	-40.11	2.398G	-28.46	2.49798G	-56.10	3.214652G	-54.00	2
2437MHz	Pass	2.460454G	11.11	-18.89	147.665M	-40.05	2.396G	-55.42	2.48638G	-56.66	3.248367G	-53.18	2
2462MHz	Pass	2.460454G	11.11	-18.89	147.665M	-40.23	2.39104G	-54.01	2.48358G	-46.18	15.132817G	-53.97	2
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.441917G	9.88	-20.12	147.665M	-39.96	2.39984G	-20.13	2.50454G	-55.31	3.214652G	-52.46	2
2437MHz	Pass	2.441917G	9.88	-20.12	147.665M	-40.11	2.39984G	-44.60	2.48534G	-52.46	15.099102G	-53.19	2
2462MHz	Pass	2.441917G	9.88	-20.12	147.665M	-40.02	2.39536G	-53.25	2.48358G	-34.59	3.282082G	-52.21	2
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.435905G	6.42	-23.58	2.309905G	-55.94	2.39888G	-26.05	2.49166G	-56.29	24.727472G	-53.72	1
2412MHz	Pass	2.435905G	6.42	-23.58	2.300585G	-56.67	2.39952G	-24.18	2.4987G	-56.66	3.214652G	-52.72	2
2437MHz	Pass	2.435905G	6.42	-23.58	2.305245G	-56.48	2.39976G	-41.93	2.48358G	-49.92	15.014815G	-53.76	1
2437MHz	Pass	2.435905G	6.42	-23.58	2.307575G	-55.89	2.39968G	-46.31	2.48414G	-52.30	6.95418G	-53.98	2
2462MHz	Pass	2.435905G	6.42	-23.58	2.300585G	-57.20	2.39104G	-54.47	2.48414G	-42.70	15.10753G	-53.40	1
2462MHz	Pass	2.435905G	6.42	-23.58	2.30874G	-54.80	2.39168G	-53.43	2.48358G	-40.14	3.282082G	-53.35	2
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.431897G	3.31	-26.69	2.30397G	-55.78	2.39584G	-32.94	2.48974G	-55.26	6.916181G	-53.85	1
2422MHz	Pass	2.431897G	3.31	-26.69	2.309695G	-57.20	2.39728G	-33.12	2.52702G	-56.64	6.963859G	-53.67	2
2437MHz	Pass	2.431897G	3.31	-26.69	2.302825G	-54.21	2.39952G	-31.11	2.48398G	-42.14	6.983491G	-53.22	1
2437MHz	Pass	2.431897G	3.31	-26.69	2.305115G	-54.31	2.39888G	-29.07	2.48382G	-42.43	3.247813G	-51.91	2
2452MHz	Pass	2.431897G	3.31	-26.69	2.302825G	-56.74	2.39792G	-43.25	2.4891G	-37.28	15.130745G	-54.38	1
2452MHz	Pass	2.431897G	3.31	-26.69	2.30397G	-56.21	2.39616G	-49.32	2.48878G	-36.14	6.980686G	-52.29	2

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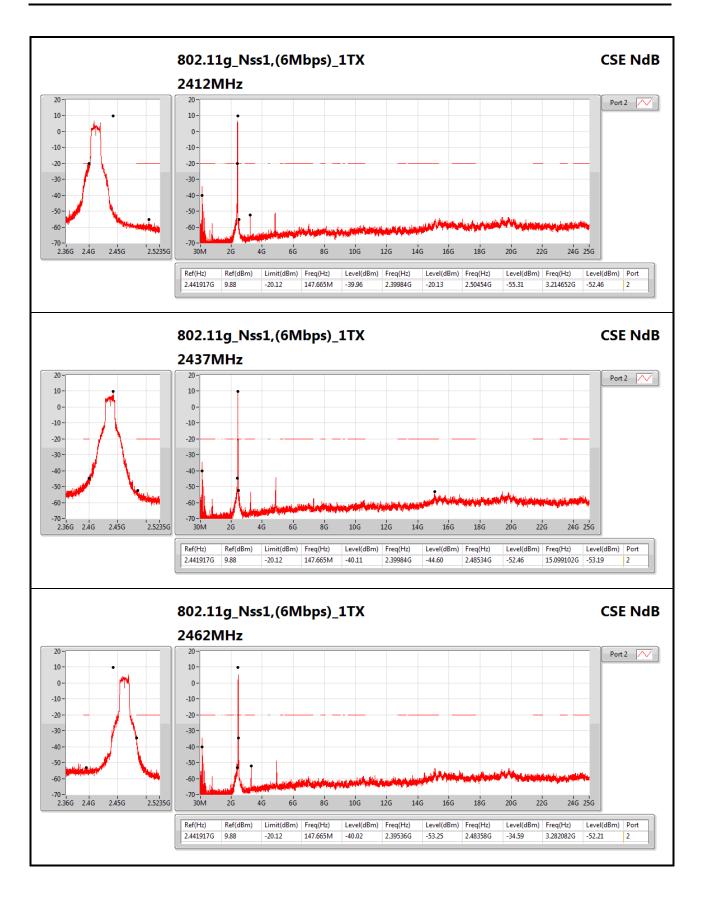
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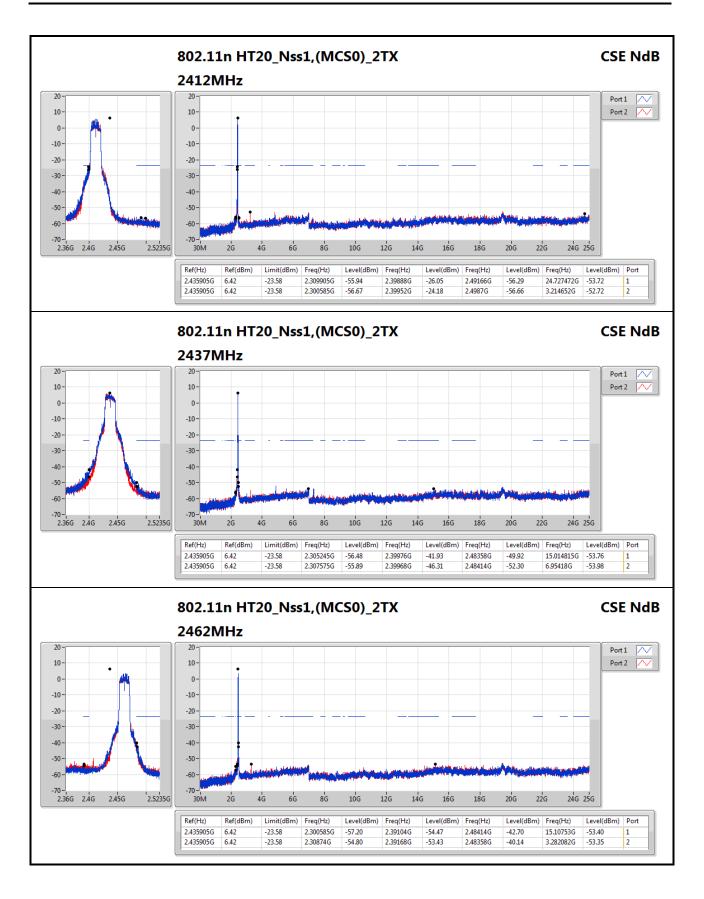
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : E2 of E5





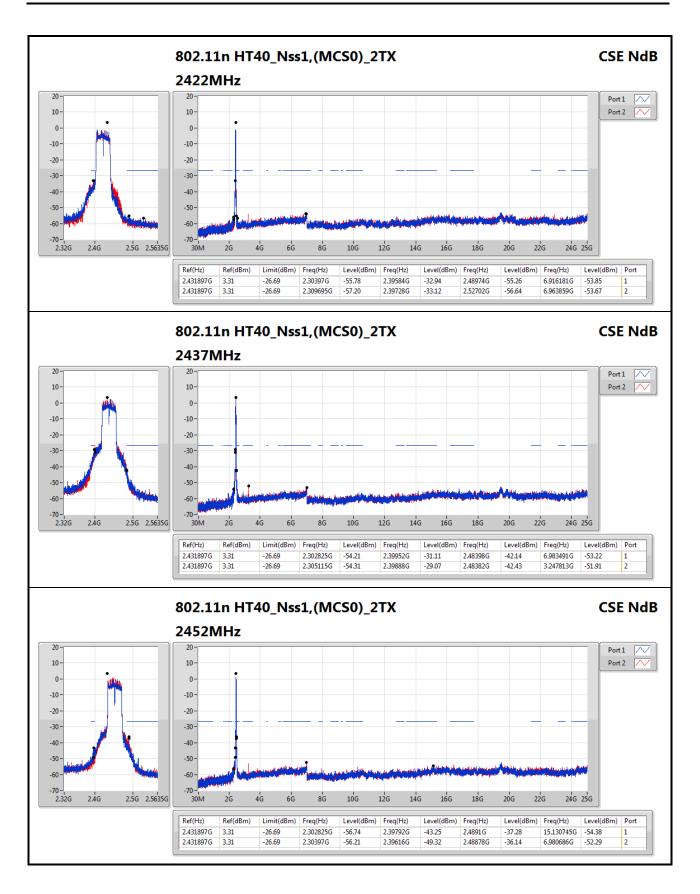
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : E3 of E5





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# RSE TX below 1GHz Result

Appendix F.1

742220

**Summary** 

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)_2TX	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	QP	235.64M	39.13	46.00	-6.87	-13.02	3	Horizontal	360	1.00	-

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# RSE TX below 1GHz Result

Appendix F.1

742220

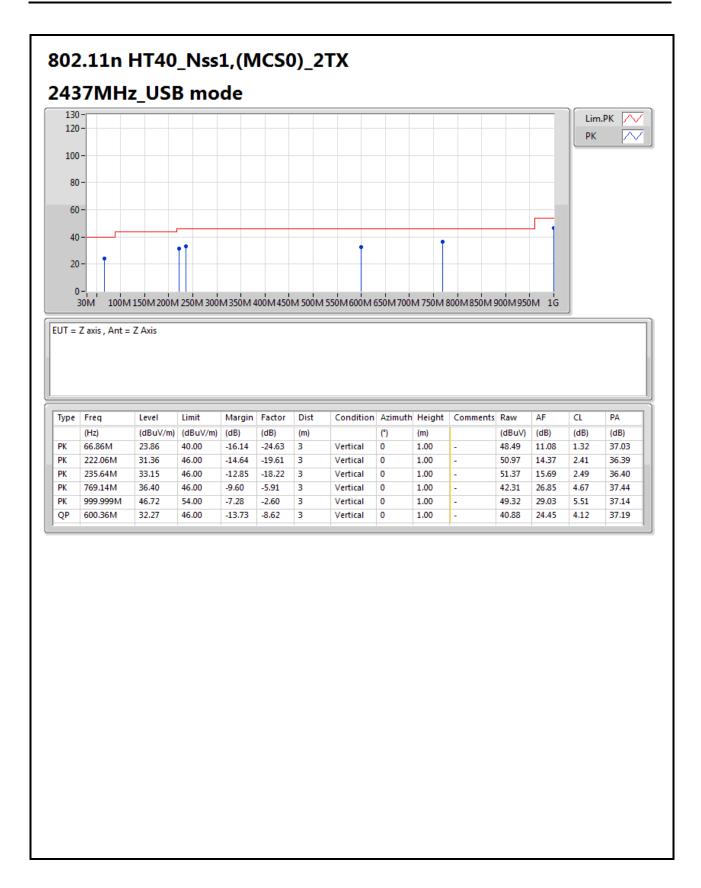
### Result

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)_2TX	-	-	-	-	-	-	-	-	-	-	-	-
2437MHz	Pass	PK	167.74M	32.86	43.50	-10.64	-13.36	3	Horizontal	360	1.00	-
2437MHz	Pass	PK	266.68M	39.00	46.00	-7.00	-12.86	3	Horizontal	360	1.00	-
2437MHz	Pass	PK	491.72M	33.46	46.00	-12.54	-11.71	3	Horizontal	360	1.00	-
2437MHz	Pass	PK	598.42M	36.75	46.00	-9.25	-11.17	3	Horizontal	360	1.00	-
2437MHz	Pass	PK	769.14M	30.75	46.00	-15.25	-10.30	3	Horizontal	360	1.00	-
2437MHz	Pass	QP	235.64M	39.13	46.00	-6.87	-13.02	3	Horizontal	360	1.00	-
2437MHz	Pass	PK	66.86M	23.86	40.00	-16.14	-24.63	3	Vertical	0	1.00	-
2437MHz	Pass	PK	222.06M	31.36	46.00	-14.64	-19.61	3	Vertical	0	1.00	-
2437MHz	Pass	PK	235.64M	33.15	46.00	-12.85	-18.22	3	Vertical	0	1.00	-
2437MHz	Pass	PK	769.14M	36.40	46.00	-9.60	-5.91	3	Vertical	0	1.00	-
2437MHz	Pass	PK	999.999M	46.72	54.00	-7.28	-2.60	3	Vertical	0	1.00	-
2437MHz	Pass	QP	600.36M	32.27	46.00	-13.73	-8.62	3	Vertical	0	1.00	-

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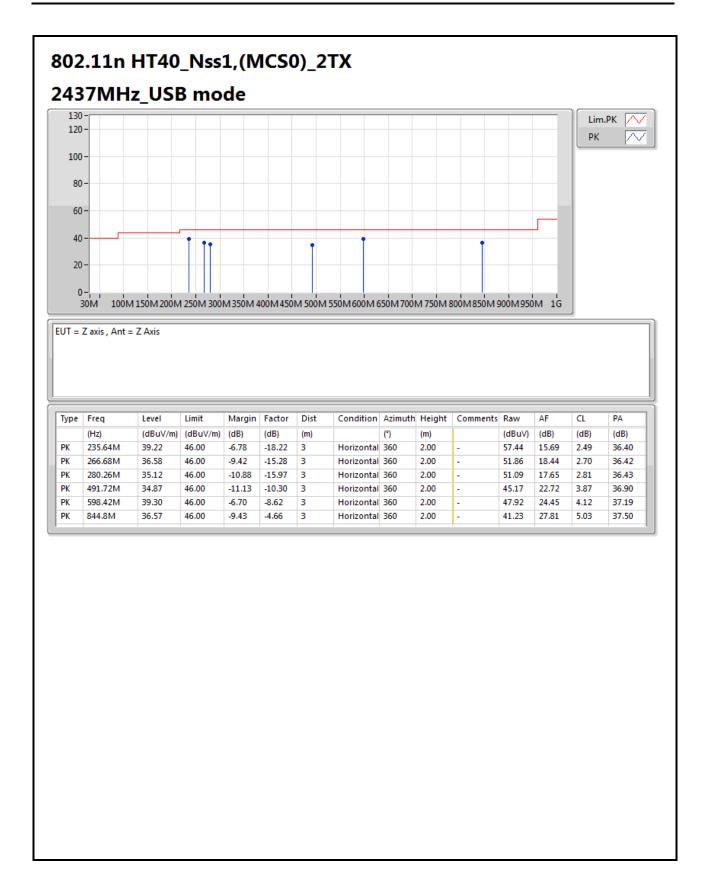
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Appendix F.2

742220

**Summary** 

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)_2TX	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	AV	2.39G	53.88	54.00	-0.12	31.17	3	Horizontal	84	1.00	-

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Appendix F.2

### Result

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
802.11b_(1Mbps)_1TX	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	AV	2.387217G	47.40	54.00	-6.60	30.93	3	Horizontal	229	1.82	-
2412MHz	Pass	AV	2.413739G	97.25	Inf	-Inf	31.02	3	Horizontal	229	1.82	-
2412MHz	Pass	PK	2.387507G	57.82	74.00	-16.18	30.93	3	Horizontal	229	1.82	-
2412MHz	Pass	PK	2.414754G	99.92	Inf	-Inf	31.02	3	Horizontal	229	1.82	-
2412MHz	Pass	AV	2.387072G	46.73	54.00	-7.27	30.92	3	Vertical	322	3.44	-
2412MHz	Pass	AV	2.413739G	97.56	Inf	-Inf	31.02	3	Vertical	322	3.44	-
2412MHz	Pass	PK	2.372435G	57.80	74.00	-16.20	30.87	3	Vertical	322	3.44	-
2412MHz	Pass	PK	2.414754G	100.19	Inf	-Inf	31.02	3	Vertical	322	3.44	-
2412MHz	Pass	AV	4.823935G	53.63	54.00	-0.37	2.16	3	Horizontal	323	2.15	-
2412MHz	Pass	PK	4.823928G	55.23	74.00	-18.77	2.16	3	Horizontal	323	2.15	-
2412MHz	Pass	AV	4.823935G	53.37	54.00	-0.63	2.16	3	Vertical	0	2.97	-
2412MHz	Pass	PK	4.823942G	55.43	74.00	-18.57	2.16	3	Vertical	0	2.97	-
2437MHz	Pass	AV	2.33758G	46.48	54.00	-7.52	30.75	3	Horizontal	219	1.35	-
2437MHz	Pass	AV	2.338159G	46.66	54.00	-7.34	30.75	3	Horizontal	219	1.35	-
2437MHz	Pass	AV	2.438739G	98.56	Inf	-Inf	31.11	3	Horizontal	219	1.35	-
2437MHz	Pass	AV	2.438739G	98.59	Inf	-Inf	31.11	3	Horizontal	219	1.35	-
2437MHz	Pass	AV	2.483502G	46.51	54.00	-7.49	31.27	3	Horizontal	219	1.35	-
2437MHz	Pass	AV	2.494971G	46.47	54.00	-7.53	31.31	3	Horizontal	219	1.35	-
2437MHz	Pass	PK	2.35758G	57.09	74.00	-16.91	30.82	3	Vertical	321	3.30	-
2437MHz	Pass	PK	2.369464G	56.80	74.00	-17.20	30.86	3	Vertical	321	3.30	-
2437MHz	Pass	PK	2.439609G	101.34	Inf	-Inf	31.11	3	Vertical	321	3.30	-
2437MHz	Pass	PK	2.439609G	101.35	Inf	-Inf	31.11	3	Vertical	321	3.30	-
2437MHz	Pass	PK	2.49642G	56.69	74.00	-17.31	31.32	3	Vertical	321	3.30	-
2437MHz	Pass	PK	2.499029G	57.40	74.00	-16.60	31.33	3	Vertical	321	3.30	-
2437MHz	Pass	AV	4.873935G	52.94	54.00	-1.06	2.32	3	Horizontal	324	1.11	-
2437MHz	Pass	PK	4.873935G	54.88	74.00	-19.12	2.32	3	Horizontal	324	1.11	-
2437MHz	Pass	AV	4.873935G	53.84	54.00	-0.16	2.32	3	Vertical	4	2.90	-
2437MHz	Pass	PK	4.873957G	55.67	74.00	-18.33	2.32	3	Vertical	4	2.90	-
2462MHz	Pass	AV	2.463739G	102.35	Inf	-Inf	31.20	3	Horizontal	292	1.29	-
2462MHz	Pass	AV	2.483502G	52.60	54.00	-1.40	31.27	3	Horizontal	292	1.29	-
2462MHz	Pass	PK	2.464754G	105.08	Inf	-Inf	31.20	3	Horizontal	292	1.29	-
2462MHz	Pass	PK	2.483594G	59.82	74.00	-14.18	31.27	3	Horizontal	292	1.29	-
2462MHz	Pass	AV	2.463739G	100.43	Inf	-Inf	31.20	3	Vertical	330	3.24	-
2462MHz	Pass	AV	2.483502G	50.74	54.00	-3.26	31.27	3	Vertical	330	3.24	-
2462MHz	Pass	PK	2.464754G	103.06	Inf	-Inf	31.20	3	Vertical	330	3.24	-
2462MHz	Pass	PK	2.493884G	59.85	74.00	-14.15	31.31	3	Vertical	330	3.24	-
2462MHz	Pass	AV	4.923935G	37.98	54.00	-16.02	2.48	3	Horizontal	324	1.50	-
2462MHz	Pass	PK	4.923942G	44.68	74.00	-29.32	2.48	3	Horizontal	324	1.50	-
2462MHz	Pass	AV	4.923942G	36.59	54.00	-17.41	2.48	3	Vertical	291	1.03	-
2462MHz	Pass	PK	4.923949G	45.87	74.00	-28.13	2.48	3	Vertical	291	1.03	-
802.11g_(6Mbps)_1TX	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	AV	2.389998G	53.84	54.00	-0.16	30.93	3	Horizontal	230	1.46	-
2412MHz	Pass	AV	2.41258G	91.28	Inf	-Inf	31.02	3	Horizontal	230	1.46	-
2412MHz	Pass	PK	2.389998G	71.78	74.00	-2.22	30.93	3	Horizontal	230	1.46	-
2412MHz	Pass	PK	2.413884G	102.20	Inf	-Inf	31.02	3	Horizontal	230	1.46	-
2412MHz	Pass	AV	2.389998G	51.86	54.00	-2.14	30.93	3	Vertical	357	2.70	-
2412MHz	Pass	AV	2.412725G	87.63	Inf	-Inf	31.02	3	Vertical	357	2.70	-

SPORTON INTERNATIONAL INC.

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Appendix F.2

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
mode	Result	Type	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)	Condition	(°)	(m)	Comments
2412MHz	Pass	PK	2.389536G	66.02	74.00	-7.98	30.93	3	Vertical	357	2.70	_
2412MHz	Pass	PK	2.413594G	99.18	Inf	-7.30 -Inf	31.02	3	Vertical	357	2.70	-
2412MHz	Pass	AV	4.823045G	38.41	54.00	-15.59	2.16	3	Horizontal	322	2.63	_
2412MHz	Pass	PK	4.825563G	50.43	74.00	-23.57	2.10	3	Horizontal	322	2.63	_
2412MHz	Pass	AV	4.823088G	38.48	54.00	-15.52	2.17	3	Vertical	3	2.78	-
2412MHz	Pass	PK	4.826127G	51.56	74.00	-22.44	2.10	3	Vertical	3	2.78	-
2437MHz	Pass	AV	2.33787G	46.52	54.00	-7.48	30.75	3		74	1.49	-
2437MHz									Horizontal			-
	Pass	AV	2.43787G	96.08	Inf	-Inf	31.11	3	Horizontal	74	1.49	-
2437MHz	Pass	AV	2.483667G	46.82	54.00	-7.18	31.27	3	Horizontal	74	1.49	-
2437MHz	Pass	PK	2.363957G	57.57	74.00	-16.43	30.84	3	Horizontal	74	1.49	-
2437MHz	Pass	PK	2.43787G	104.67	Inf	-Inf	31.11	3	Horizontal	74	1.49	-
2437MHz	Pass	PK	2.485116G	57.67	74.00	-16.33	31.28	3	Horizontal	74	1.49	-
2437MHz	Pass	AV	2.33758G	46.43	54.00	-7.57	30.75	3	Vertical	355	3.69	-
2437MHz	Pass	AV	2.43787G	94.59	Inf	-Inf	31.11	3	Vertical	355	3.69	-
2437MHz	Pass	AV	2.483502G	46.70	54.00	-7.30	31.27	3	Vertical	355	3.69	-
2437MHz	Pass	PK	2.371203G	58.51	74.00	-15.49	30.87	3	Vertical	355	3.69	-
2437MHz	Pass	PK	2.43787G	104.42	Inf	-Inf	31.11	3	Vertical	355	3.69	-
2437MHz	Pass	PK	2.490043G	58.56	74.00	-15.44	31.29	3	Vertical	355	3.69	-
2437MHz	Pass	AV	4.875172G	37.74	54.00	-16.26	2.32	3	Horizontal	265	2.25	-
2437MHz	Pass	PK	4.873262G	49.75	74.00	-24.25	2.32	3	Horizontal	265	2.25	-
2437MHz	Pass	AV	4.874868G	38.56	54.00	-15.44	2.32	3	Vertical	324	1.11	-
2437MHz	Pass	PK	4.877821G	51.35	74.00	-22.65	2.33	3	Vertical	324	1.11	-
2462MHz	Pass	AV	2.46287G	95.49	Inf	-Inf	31.20	3	Horizontal	284	1.03	-
2462MHz	Pass	AV	2.483502G	53.67	54.00	-0.33	31.27	3	Horizontal	284	1.03	-
2462MHz	Pass	PK	2.463159G	104.34	Inf	-Inf	31.20	3	Horizontal	284	1.03	-
2462MHz	Pass	PK	2.484029G	65.83	74.00	-8.17	31.27	3	Horizontal	284	1.03	-
2462MHz	Pass	AV	2.46258G	93.31	Inf	-Inf	31.20	3	Vertical	327	2.94	-
2462MHz	Pass	AV	2.483502G	51.69	54.00	-2.31	31.27	3	Vertical	327	2.94	-
2462MHz	Pass	PK	2.460261G	103.81	Inf	-Inf	31.19	3	Vertical	327	2.94	-
2462MHz	Pass	PK	2.483594G	72.79	74.00	-1.21	31.27	3	Vertical	327	2.94	-
2462MHz	Pass	AV	4.920093G	32.55	54.00	-21.45	2.46	3	Horizontal	283	3.57	-
2462MHz	Pass	PK	4.917314G	45.07	74.00	-28.93	2.46	3	Horizontal	283	3.57	-
2462MHz	Pass	AV	4.920353G	31.47	54.00	-22.53	2.47	3	Vertical	313	2.16	-
2462MHz	Pass	PK	4.919572G	42.36	74.00	-31.64	2.46	3	Vertical	313	2.16	-
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	AV	2.39G	53.10	54.00	-0.90	31.17	3	Horizontal	200	1.55	-
2412MHz	Pass	AV	2.4112G	92.05	Inf	-Inf	31.25	3	Horizontal	200	1.55	-
2412MHz	Pass	PK	2.3892G	69.27	74.00	-4.73	31.17	3	Horizontal	200	1.55	-
2412MHz	Pass	PK	2.4094G	100.69	Inf	-Inf	31.25	3	Horizontal	200	1.55	-
2412MHz	Pass	AV	2.39G	50.52	54.00	-3.48	31.17	3	Vertical	121	1.00	-
2412MHz	Pass	AV	2.4112G	87.95	Inf	-Inf	31.25	3	Vertical	121	1.00	-
2412MHz	Pass	PK	2.39G	66.31	74.00	-7.69	31.17	3	Vertical	121	1.00	-
2412MHz	Pass	PK	2.409G	95.80	Inf	-Inf	31.24	3	Vertical	121	1.00	-
2412MHz	Pass	AV	4.824G	34.90	54.00	-19.10	2.48	3	Horizontal	249	1.50	_
2412MHz	Pass	PK	4.824G	46.56	74.00	-27.44	2.48	3	Horizontal	249	1.50	_
2412MHz	Pass	AV	4.824G	34.60	54.00	-19.40	2.48	3	Vertical	245	1.01	-
2412MHz	Pass	PK	4.824G	46.02	74.00	-19.40	2.48	3	Vertical	245	1.01	
2437MHz	Pass	AV	2.389998G	48.96	54.00	-5.04	31.17	3	Horizontal	82	1.77	
2437MHz 2437MHz		AV	2.389998G 2.4378G	100.84		-5.04 -Inf		3		82	1.77	-
2431 NITIZ	Pass	AV	2.43/00	100.04	Inf	-1111	31.35	ა	Horizontal	02	1.77	-

SPORTON INTERNATIONAL INC.

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Appendix F.2

			1	1			1	1			1	1
Mode	Result	Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
2437MHz	Pass	AV	2.483502G	51.58	54.00	-2.42	31.53	3	Horizontal	82	1.77	-
2437MHz	Pass	PK	2.3874G	60.65	74.00	-13.35	31.16	3	Horizontal	82	1.77	-
2437MHz	Pass	PK	2.439G	108.52	Inf	-Inf	31.36	3	Horizontal	82	1.77	-
2437MHz	Pass	PK	2.4854G	62.76	74.00	-11.24	31.53	3	Horizontal	82	1.77	-
2437MHz	Pass	AV	2.389998G	46.86	54.00	-7.14	31.17	3	Vertical	182	1.43	-
2437MHz	Pass	AV	2.4382G	92.79	Inf	-Inf	31.36	3	Vertical	182	1.43	-
2437MHz	Pass	AV	2.4862G	47.89	54.00	-6.11	31.54	3	Vertical	182	1.43	-
2437MHz	Pass	PK	2.3818G	58.05	74.00	-15.95	31.14	3	Vertical	182	1.43	-
2437MHz	Pass	PK	2.439G	101.26	Inf	-Inf	31.36	3	Vertical	182	1.43	-
2437MHz	Pass	PK	2.485G	59.79	74.00	-14.21	31.53	3	Vertical	182	1.43	-
2437MHz	Pass	AV	4.874G	38.84	54.00	-15.16	2.55	3	Horizontal	117	1.04	-
2437MHz	Pass	PK	4.874G	50.39	74.00	-23.61	2.55	3	Horizontal	117	1.04	-
2437MHz	Pass	AV	4.874G	39.78	54.00	-14.22	2.55	3	Vertical	222	1.01	-
2437MHz	Pass	PK	4.874G	51.40	74.00	-22.60	2.55	3	Vertical	222	1.01	-
2462MHz	Pass	AV	2.463G	95.65	Inf	-Inf	31.45	3	Horizontal	85	1.09	-
2462MHz	Pass	AV	2.483502G	52.91	54.00	-1.09	31.53	3	Horizontal	85	1.09	-
2462MHz	Pass	PK	2.4592G	104.74	Inf	-Inf	31.43	3	Horizontal	85	1.09	-
2462MHz	Pass	PK	2.4836G	68.78	74.00	-5.22	31.53	3	Horizontal	85	1.09	-
2462MHz	Pass	AV	2.4612G	89.10	Inf	-Inf	31.44	3	Vertical	118	1.01	-
2462MHz	Pass	AV	2.483502G	49.48	54.00	-4.52	31.53	3	Vertical	118	1.01	-
2462MHz	Pass	PK	2.4588G	97.34	Inf	-Inf	31.43	3	Vertical	118	1.01	-
2462MHz	Pass	PK	2.483502G	64.75	74.00	-9.25	31.53	3	Vertical	118	1.01	-
2462MHz	Pass	AV	4.924G	36.17	54.00	-17.83	2.63	3	Horizontal	178	1.08	-
2462MHz	Pass	PK	4.924G	46.81	74.00	-27.19	2.63	3	Horizontal	178	1.08	-
2462MHz	Pass	AV	4.924G	36.22	54.00	-17.78	2.63	3	Vertical	224	1.03	-
2462MHz	Pass	PK	4.924G	48.45	74.00	-25.55	2.63	3	Vertical	224	1.03	-
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	AV	2.39G	53.88	54.00	-0.12	31.17	3	Horizontal	84	1.00	-
2422MHz	Pass	AV	2.424G	87.65	Inf	-Inf	31.30	3	Horizontal	84	1.00	-
2422MHz	Pass	AV	2.4856G	47.54	54.00	-6.46	31.54	3	Horizontal	84	1.00	-
2422MHz	Pass	PK	2.3864G	67.97	74.00	-6.03	31.16	3	Horizontal	84	1.00	-
2422MHz	Pass	PK	2.4248G	97.44	Inf	-Inf	31.30	3	Horizontal	84	1.00	-
2422MHz	Pass	PK	2.4864G	58.82	74.00	-15.18	31.54	3	Horizontal	84	1.00	-
2422MHz	Pass	AV	2.39G	48.33	54.00	-5.67	31.17	3	Vertical	181	1.18	-
2422MHz	Pass	AV	2.4384G	80.51	Inf	-Inf	31.36	3	Vertical	181	1.18	-
2422MHz	Pass	AV	2.4968G	47.57	54.00	-6.43	31.58	3	Vertical	181	1.18	-
2422MHz	Pass	PK	2.3876G	60.16	74.00	-13.84	31.16	3	Vertical	181	1.18	-
2422MHz	Pass	PK	2.4388G	89.22	Inf	-Inf	31.36	3	Vertical	181	1.18	-
2422MHz	Pass	PK	2.4964G	58.61	74.00	-15.39	31.58	3	Vertical	181	1.18	-
2422MHz	Pass	AV	4.844G	35.14	54.00	-18.86	2.51	3	Horizontal	360	1.50	-
2422MHz	Pass	PK	4.844G	47.23	74.00	-26.77	2.51	3	Horizontal	360	1.50	-
2422MHz	Pass	AV	4.844G	34.80	54.00	-19.20	2.51	3	Vertical	0	1.50	-
2422MHz	Pass	PK	4.844G	47.43	74.00	-26.57	2.51	3	Vertical	0	1.50	-
2437MHz	Pass	AV	2.389998G	52.00	54.00	-2.00	31.17	3	Horizontal	84	1.10	-
2437MHz	Pass	AV	2.453G	93.65	Inf	-Inf	31.41	3	Horizontal	84	1.10	-
2437MHz	Pass	AV	2.483502G	53.76	54.00	-0.24	31.53	3	Horizontal	84	1.10	-
2437MHz	Pass	PK	2.3894G	69.79	74.00	-4.21	31.17	3	Horizontal	84	1.10	-
2437MHz	Pass	PK	2.4414G	102.29	Inf	-Inf	31.37	3	Horizontal	84	1.10	-
2437MHz	Pass	PK	2.483502G	68.39	74.00	-5.61	31.53	3	Horizontal	84	1.10	-
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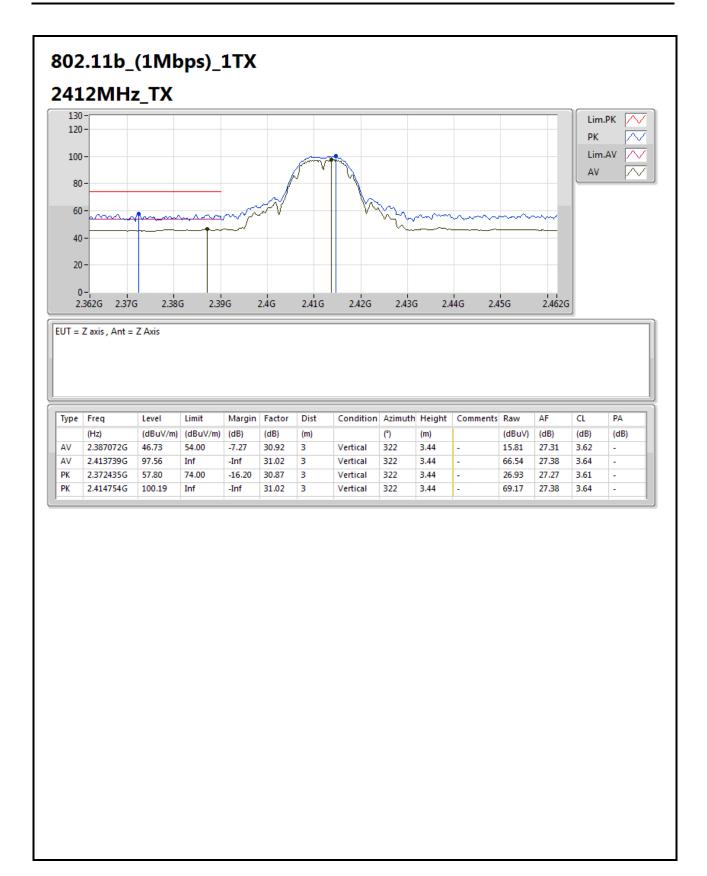
Appendix F.2

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
2437MHz	Pass	AV	2.389998G	49.45	54.00	-4.55	31.17	3	Vertical	117	1.19	-
2437MHz	Pass	AV	2.4478G	87.05	Inf	-Inf	31.39	3	Vertical	117	1.19	-
2437MHz	Pass	AV	2.4838G	49.17	54.00	-4.83	31.53	3	Vertical	117	1.19	-
2437MHz	Pass	PK	2.3882G	64.47	74.00	-9.53	31.16	3	Vertical	117	1.19	-
2437MHz	Pass	PK	2.445G	96.28	Inf	-Inf	31.38	3	Vertical	117	1.19	-
2437MHz	Pass	PK	2.485G	64.43	74.00	-9.57	31.53	3	Vertical	117	1.19	-
2437MHz	Pass	AV	4.874G	35.68	54.00	-18.32	2.55	3	Horizontal	137	1.00	-
2437MHz	Pass	PK	4.874G	47.10	74.00	-26.90	2.55	3	Horizontal	137	1.00	-
2437MHz	Pass	AV	4.874G	35.03	54.00	-18.97	2.55	3	Vertical	37	1.20	-
2437MHz	Pass	PK	4.874G	47.23	74.00	-26.77	2.55	3	Vertical	37	1.20	-
2452MHz	Pass	AV	2.3892G	46.81	54.00	-7.19	31.17	3	Horizontal	85	1.13	-
2452MHz	Pass	AV	2.4536G	91.84	Inf	-Inf	31.41	3	Horizontal	85	1.13	-
2452MHz	Pass	AV	2.4836G	53.42	54.00	-0.58	31.53	3	Horizontal	85	1.13	-
2452MHz	Pass	PK	2.378G	58.08	74.00	-15.92	31.12	3	Horizontal	85	1.13	-
2452MHz	Pass	PK	2.45G	100.75	Inf	-Inf	31.40	3	Horizontal	85	1.13	-
2452MHz	Pass	PK	2.4836G	69.46	74.00	-4.54	31.53	3	Horizontal	85	1.13	-
2452MHz	Pass	AV	2.3892G	46.70	54.00	-7.30	31.17	3	Vertical	117	1.16	-
2452MHz	Pass	AV	2.4504G	85.52	Inf	-Inf	31.40	3	Vertical	117	1.16	-
2452MHz	Pass	AV	2.4836G	49.65	54.00	-4.35	31.53	3	Vertical	117	1.16	-
2452MHz	Pass	PK	2.3576G	57.79	74.00	-16.21	31.04	3	Vertical	117	1.16	-
2452MHz	Pass	PK	2.4496G	95.20	Inf	-Inf	31.40	3	Vertical	117	1.16	-
2452MHz	Pass	PK	2.4836G	63.56	74.00	-10.44	31.53	3	Vertical	117	1.16	-
2452MHz	Pass	AV	4.844G	35.96	54.00	-18.04	2.51	3	Horizontal	0	1.50	-
2452MHz	Pass	PK	4.844G	46.47	74.00	-27.53	2.51	3	Horizontal	0	1.50	-
2452MHz	Pass	AV	4.844G	34.75	54.00	-19.25	2.51	3	Vertical	360	1.50	-
2452MHz	Pass	PK	4.844G	46.03	74.00	-27.97	2.51	3	Vertical	360	1.50	-

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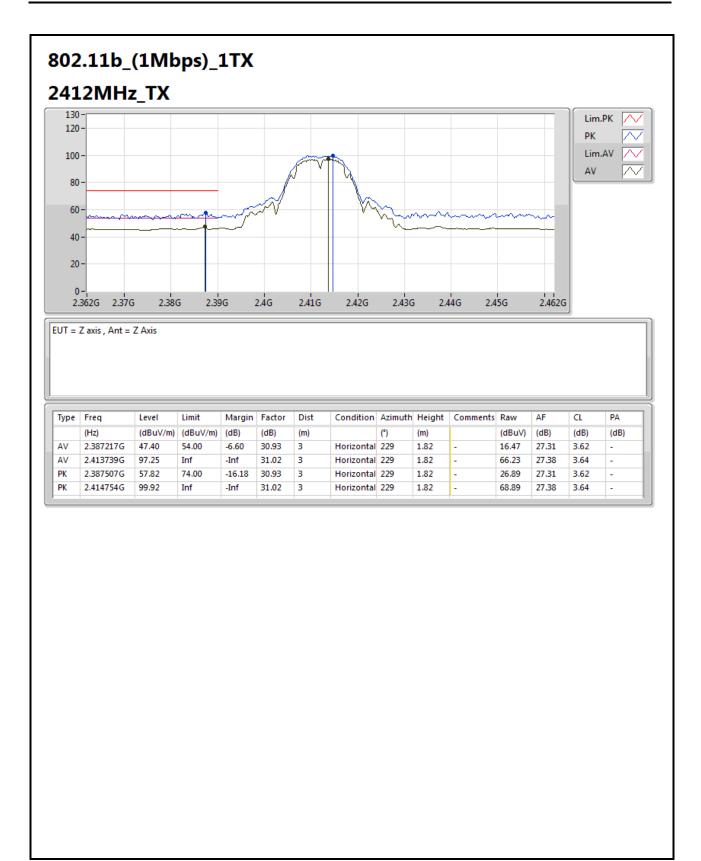
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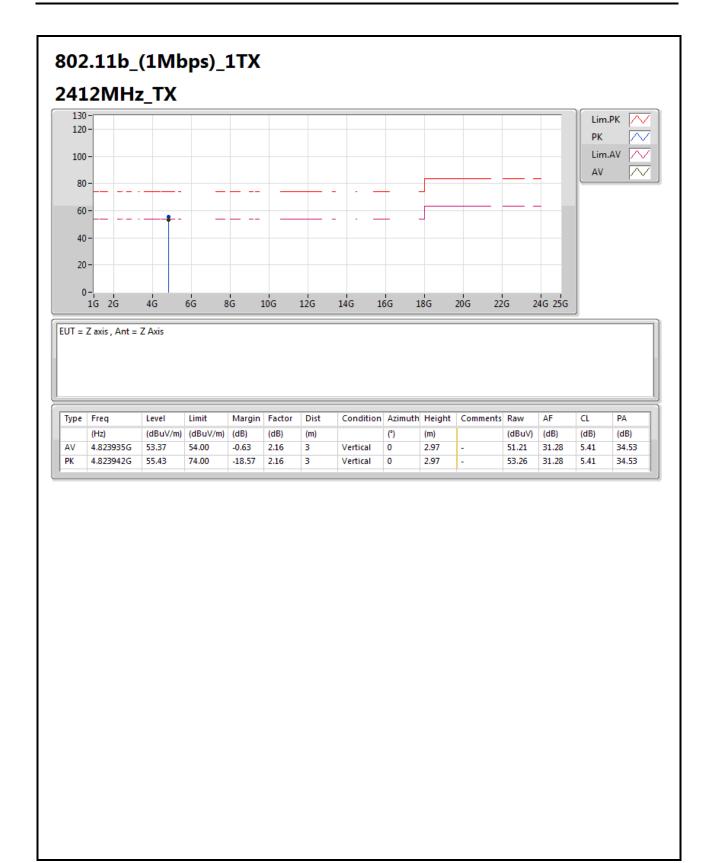
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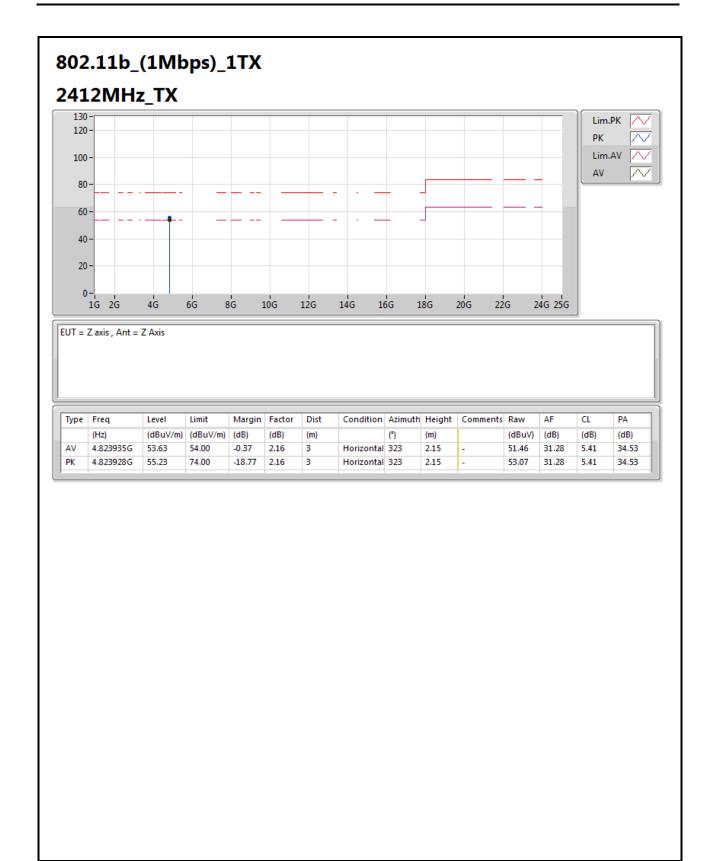
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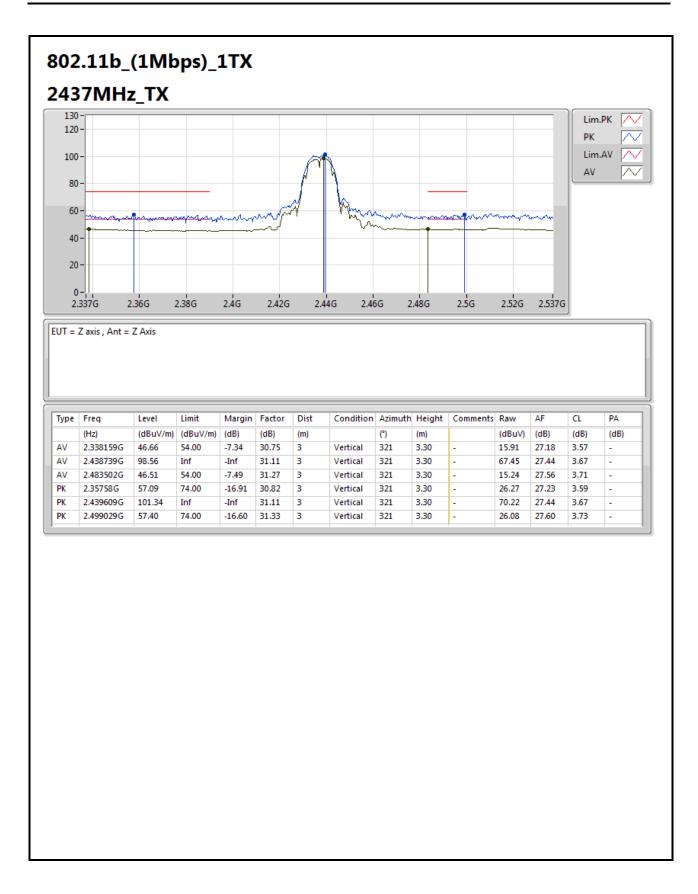
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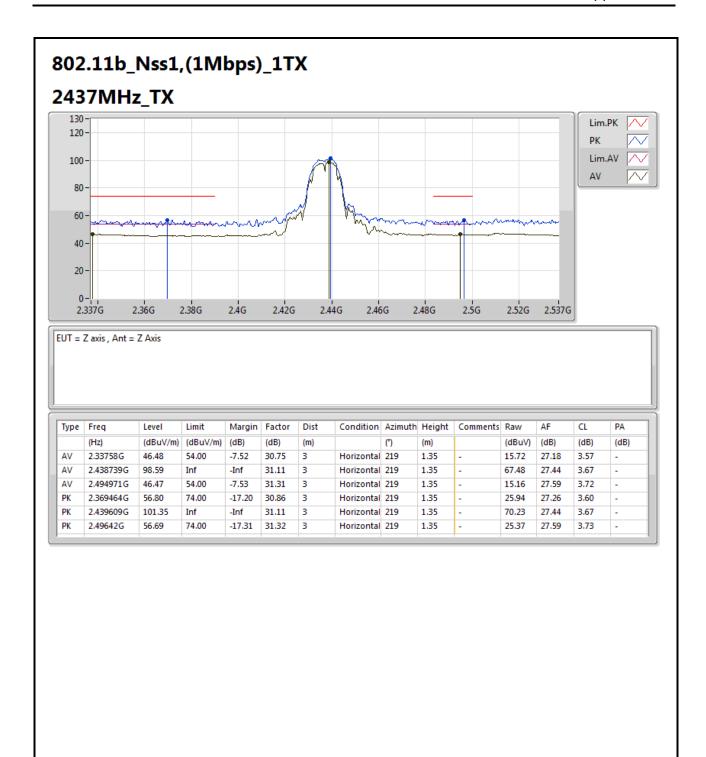
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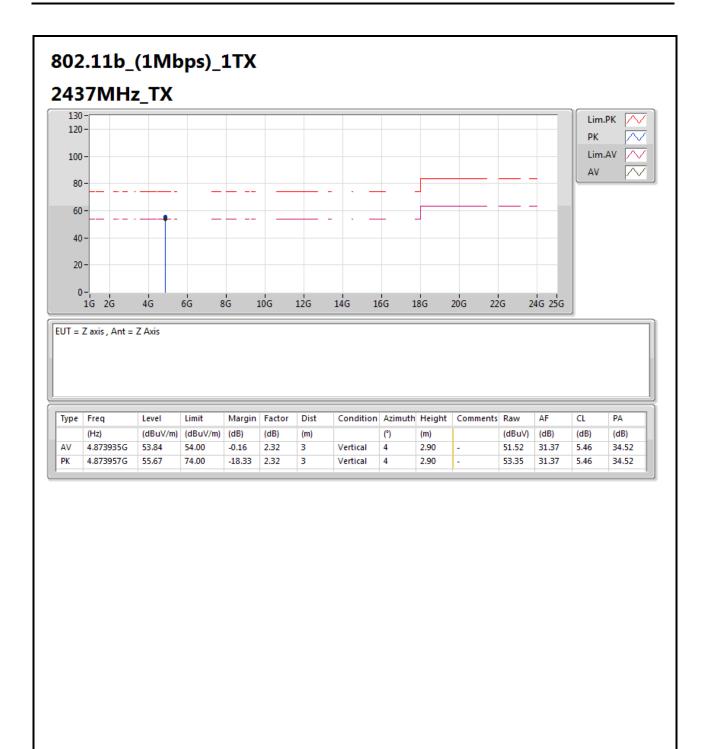
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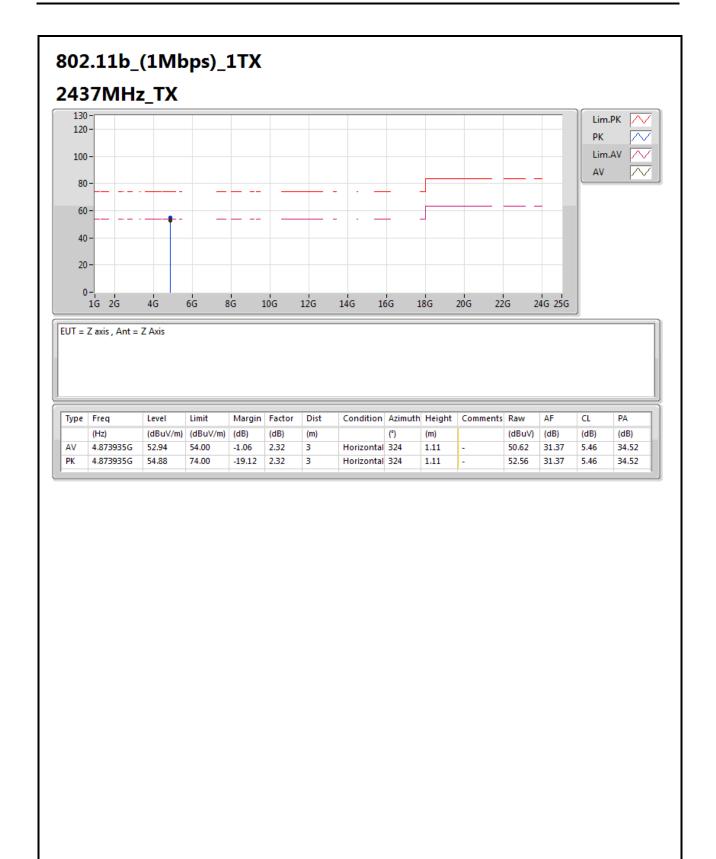
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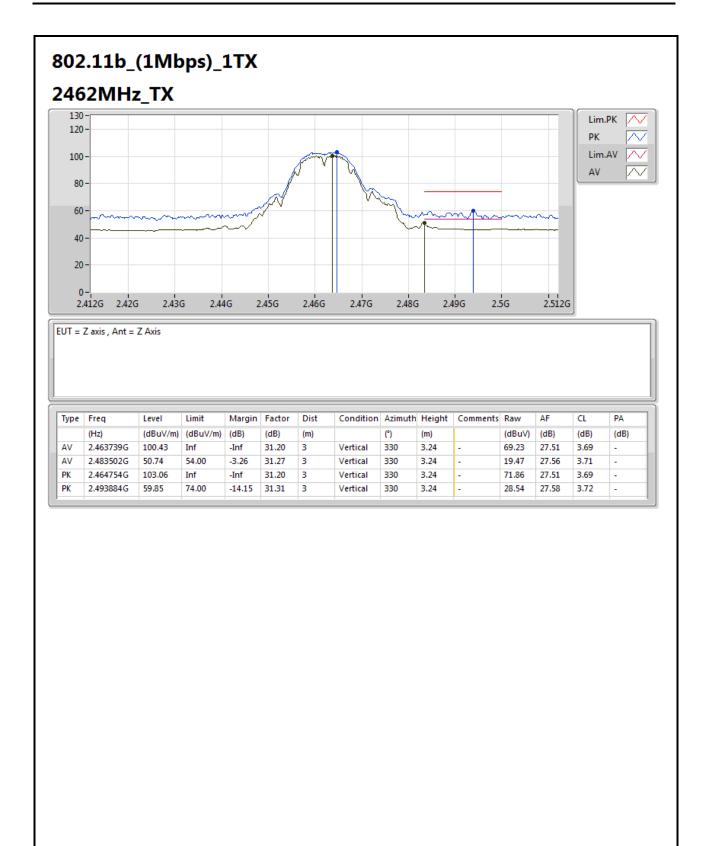
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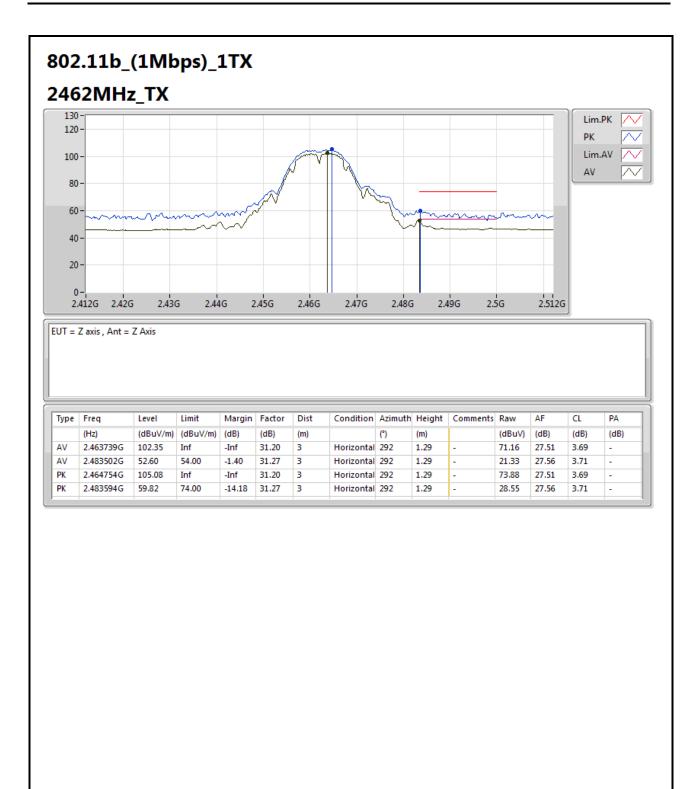
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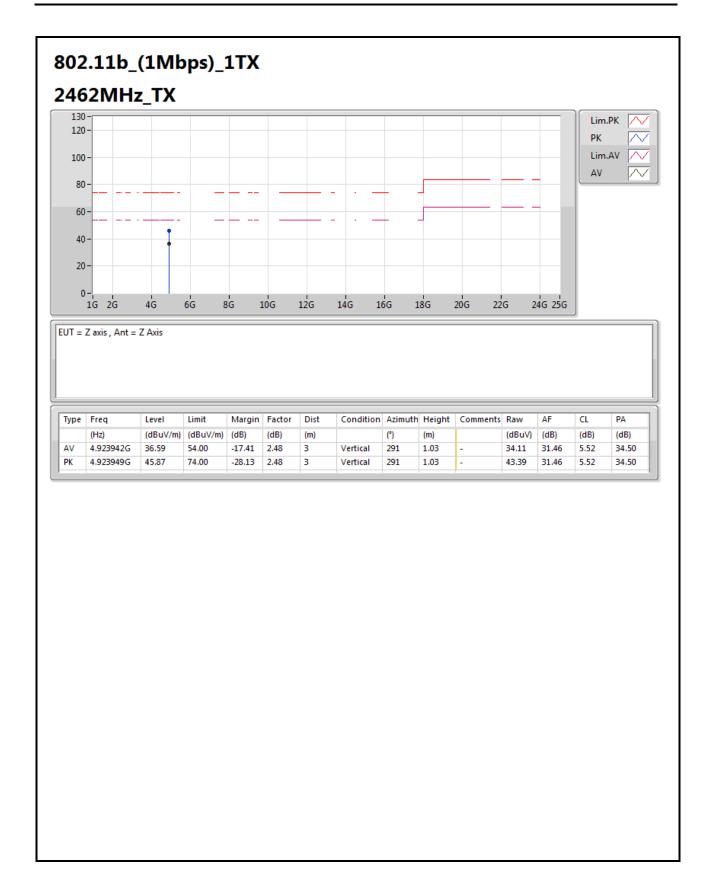
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F14 of F53





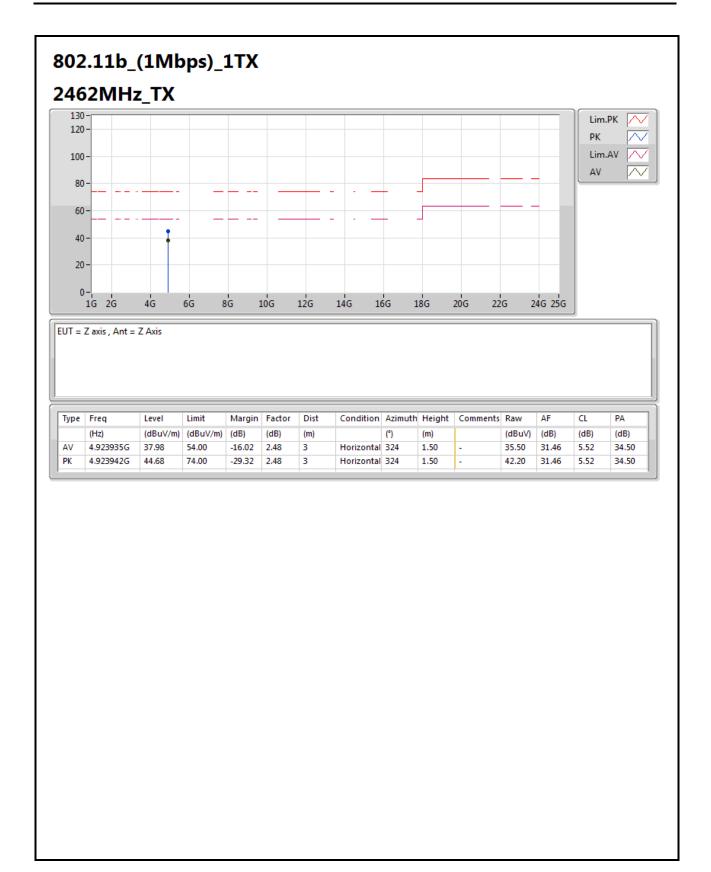
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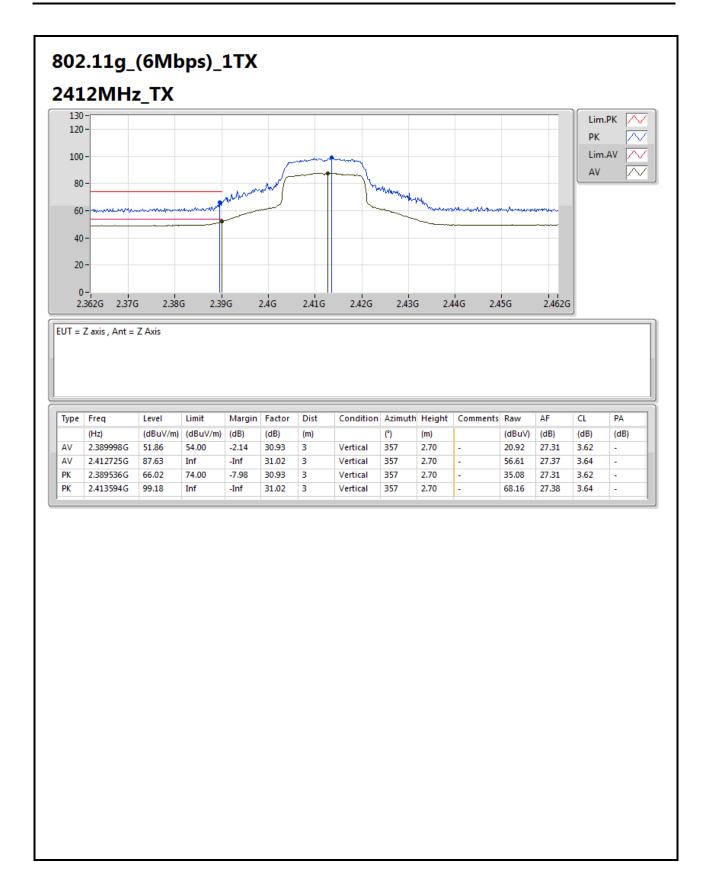
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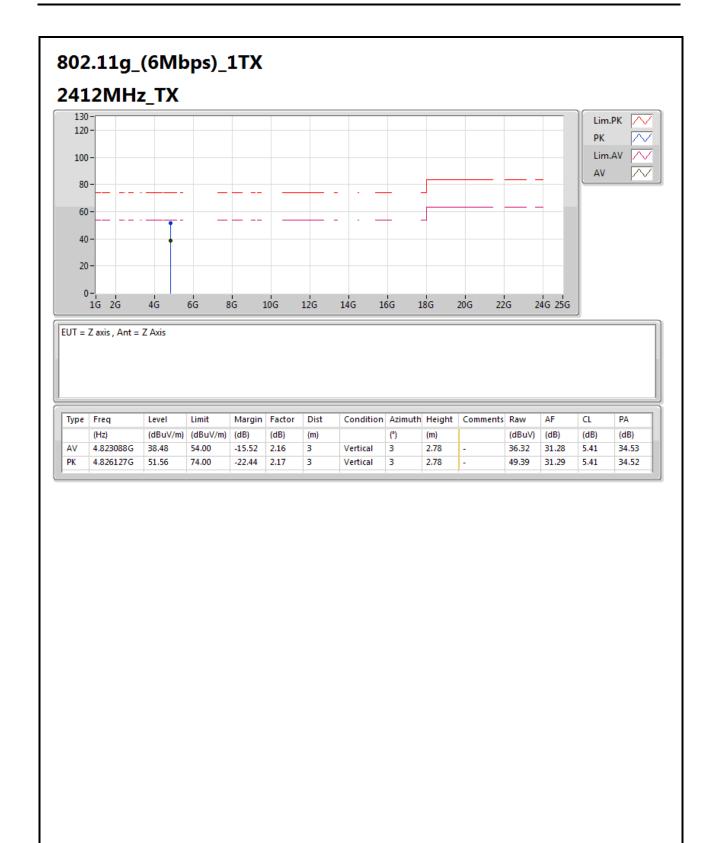
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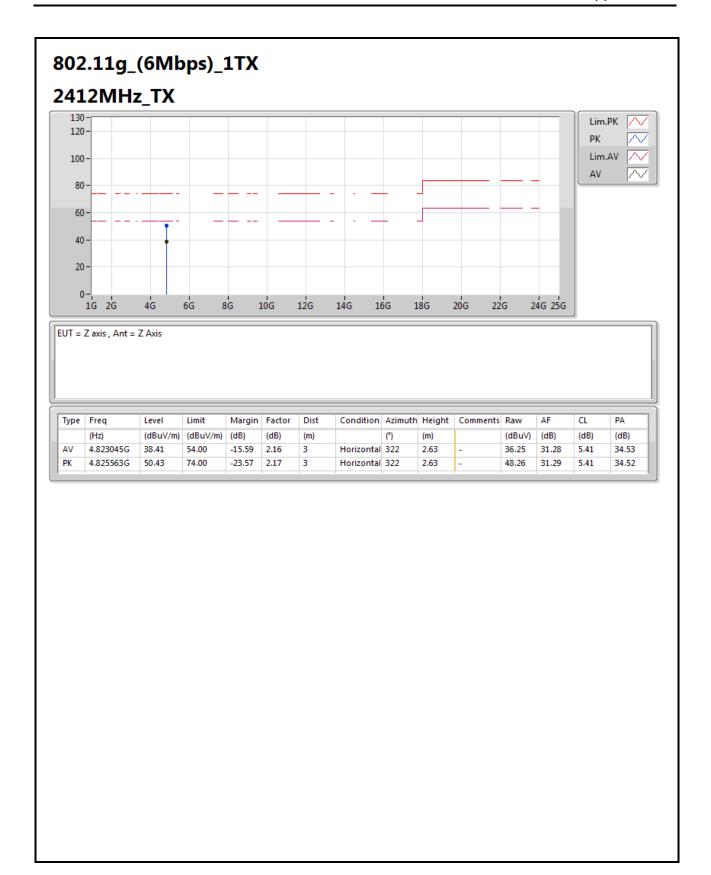
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F19 of F53





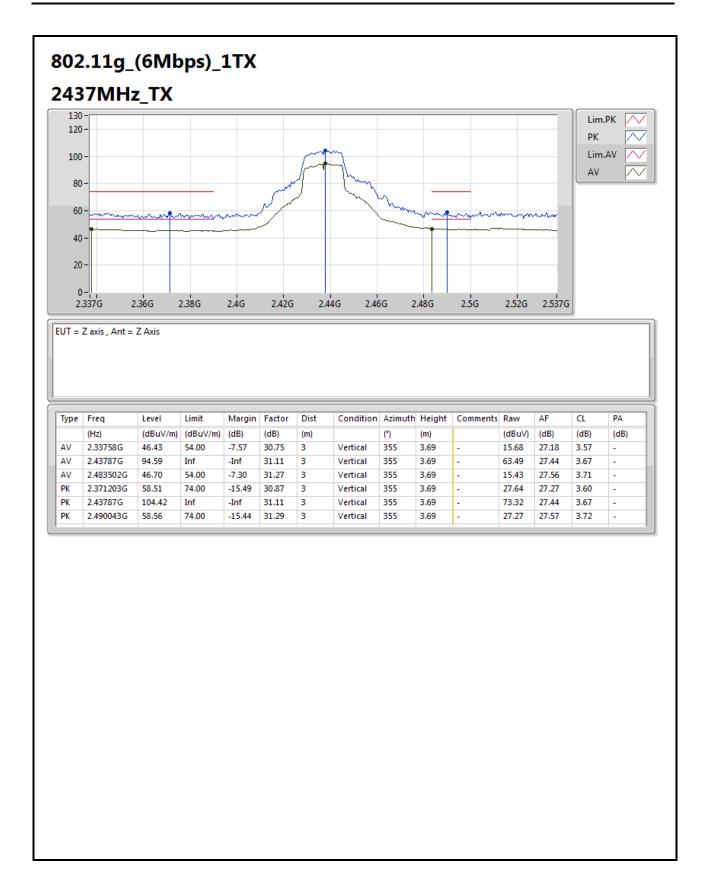
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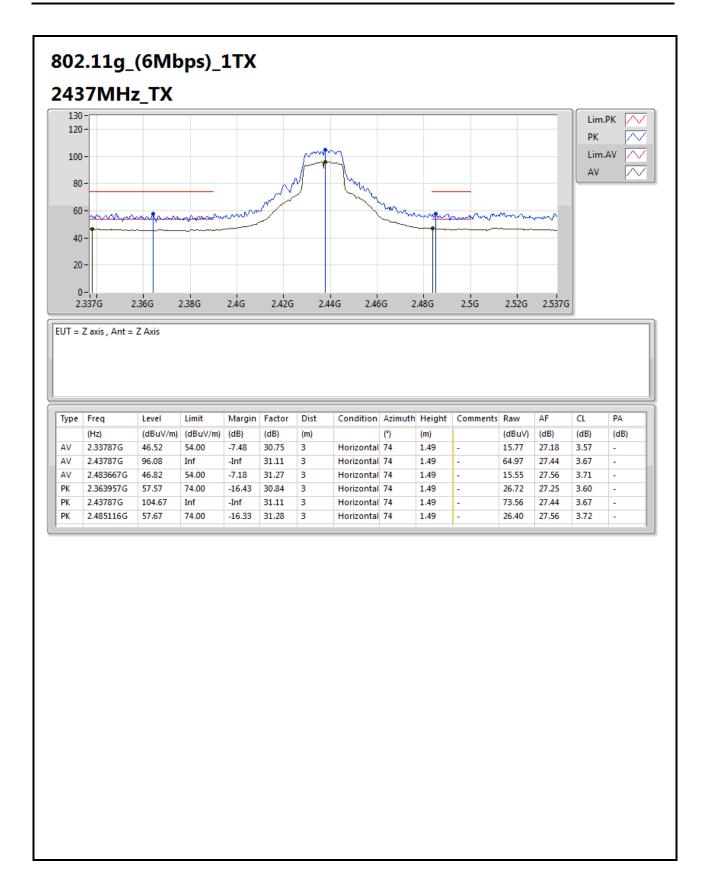
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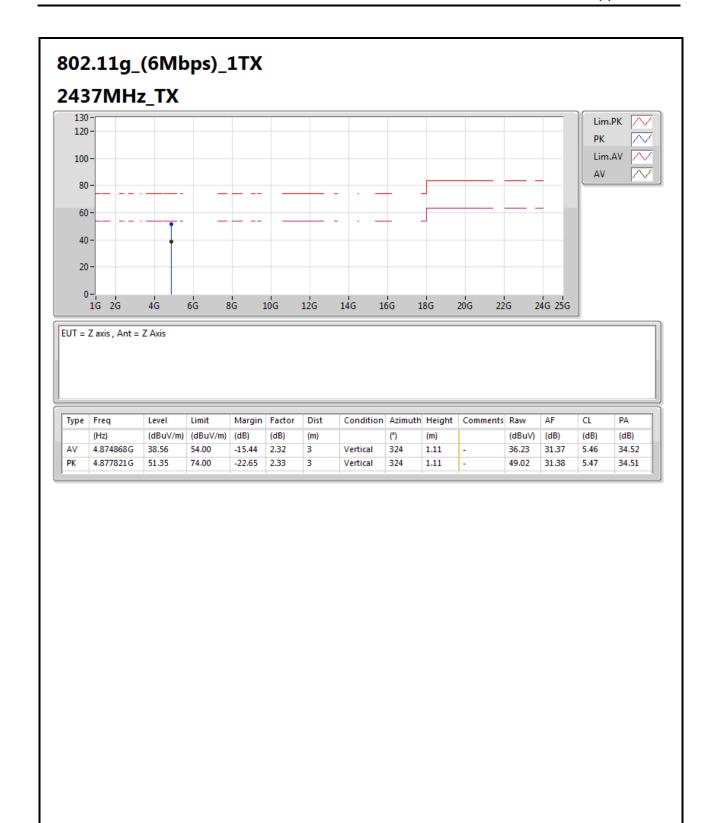
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F22 of F53





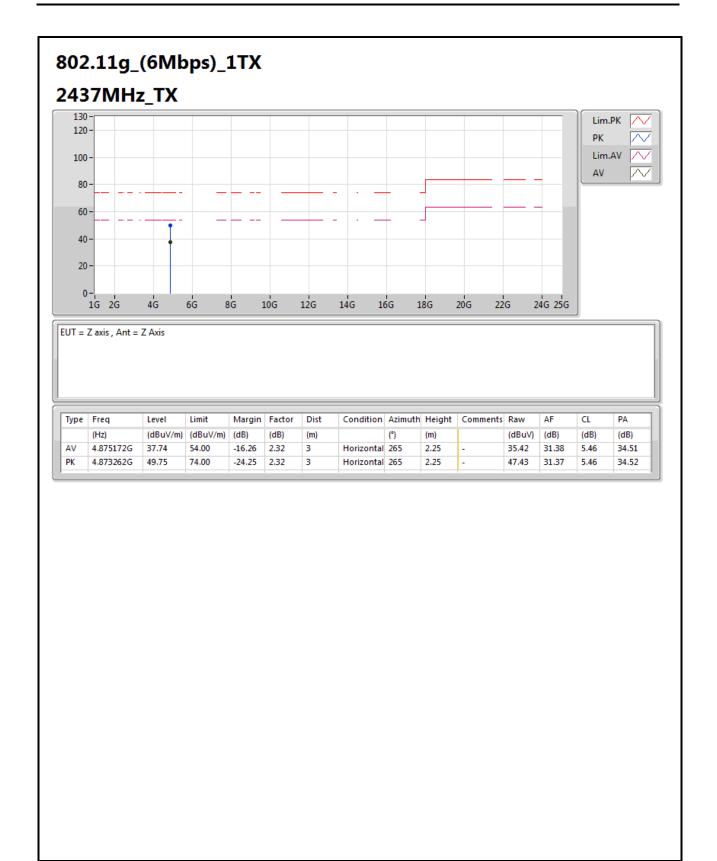
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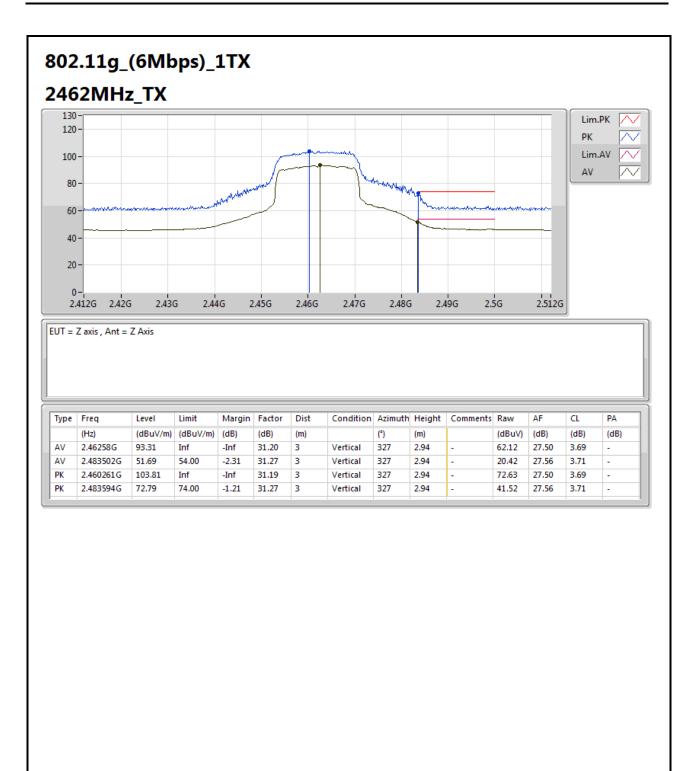
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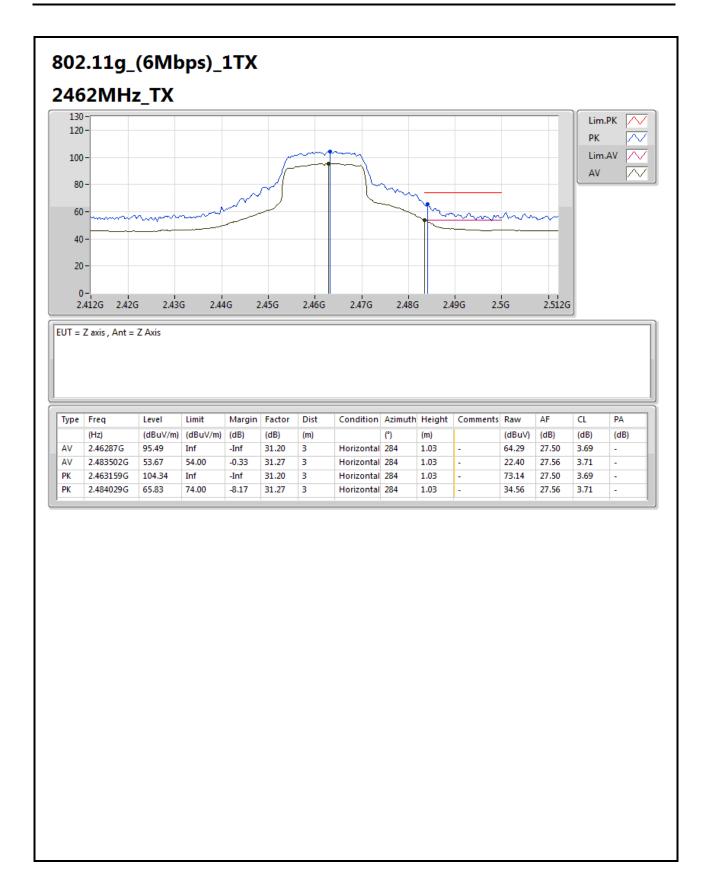
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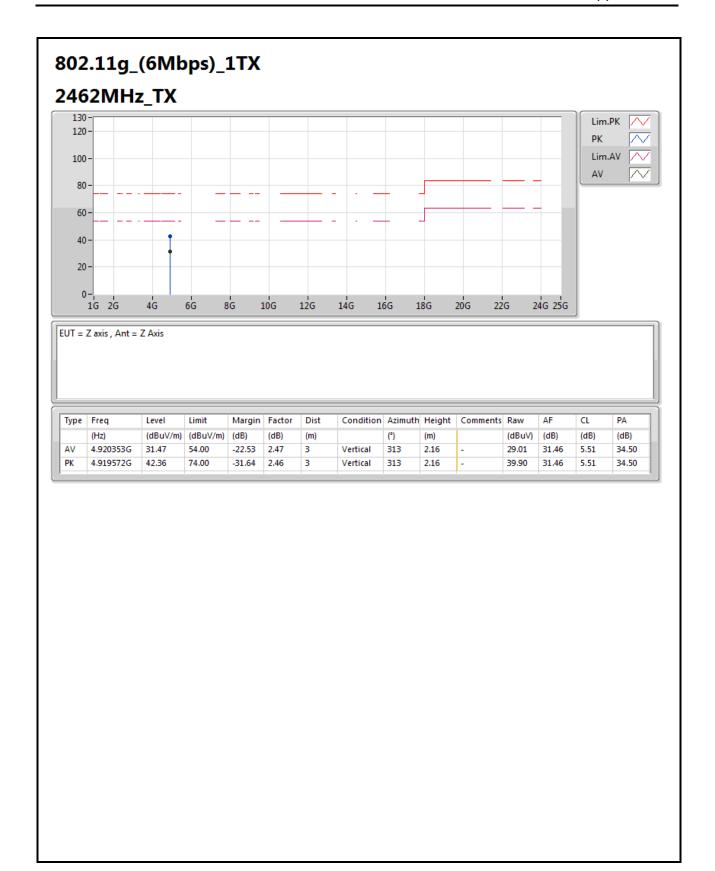
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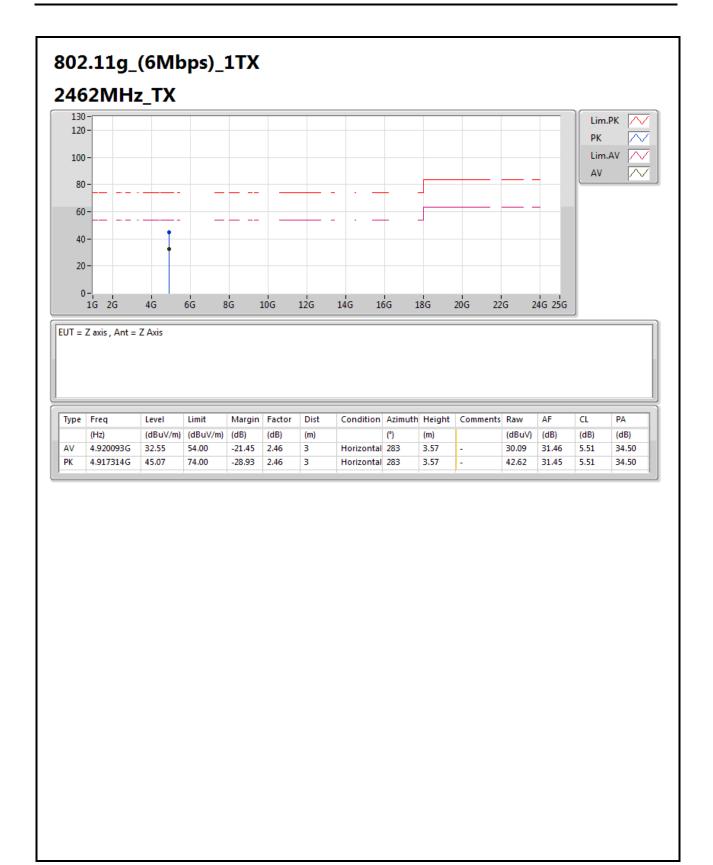
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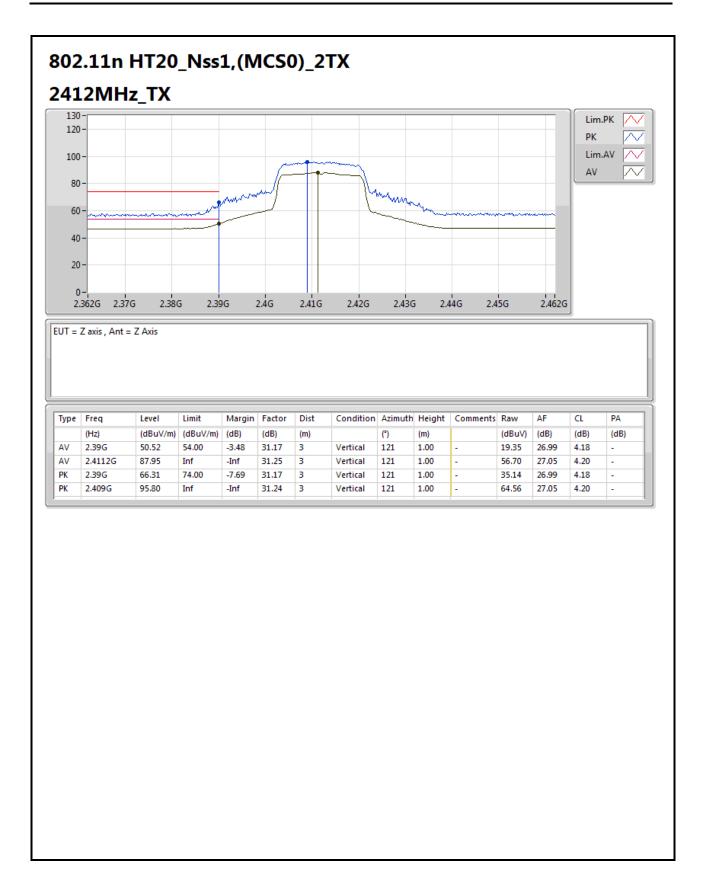
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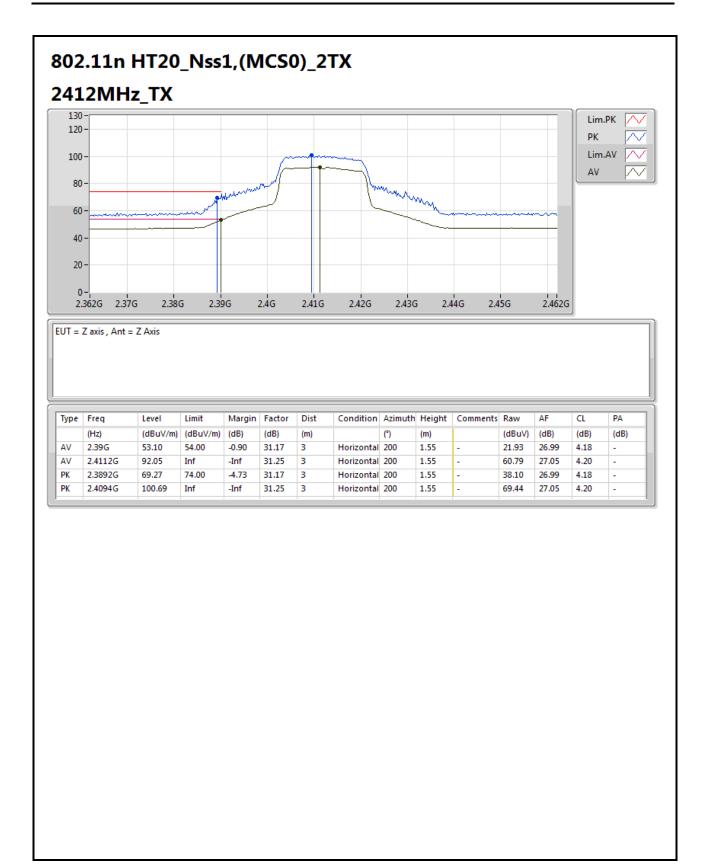
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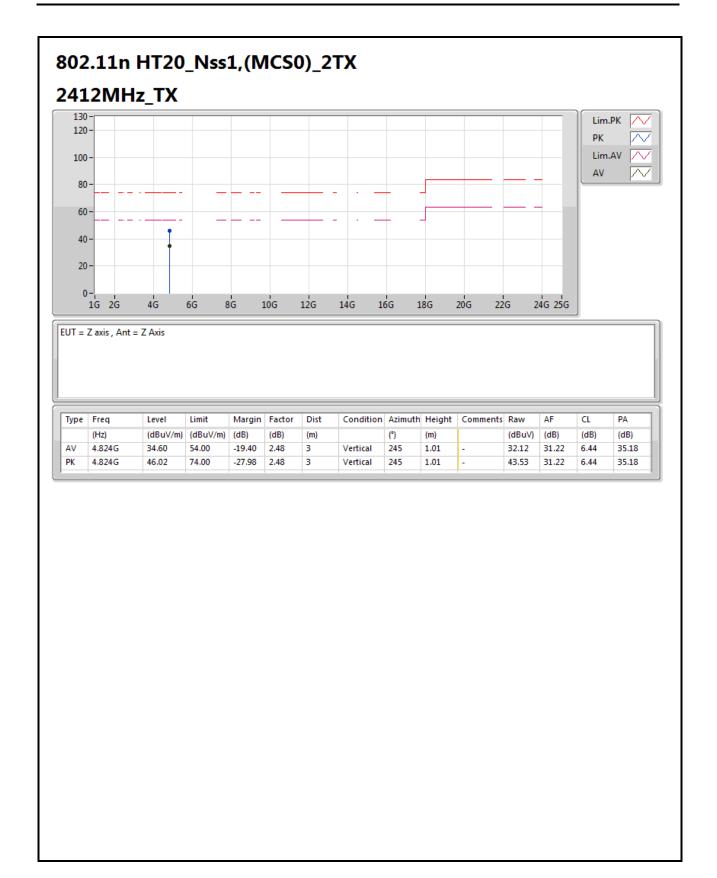
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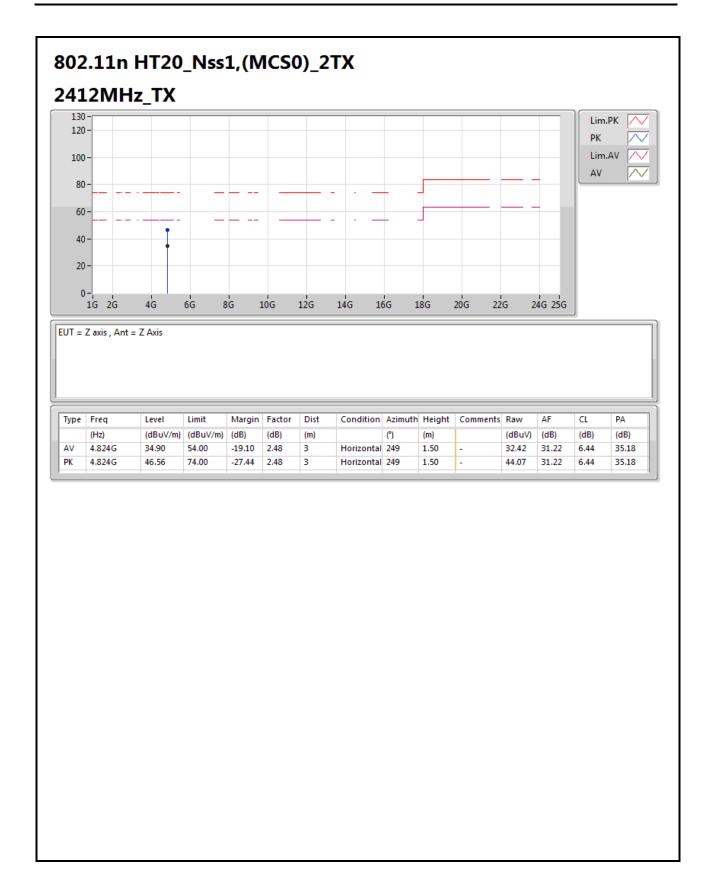
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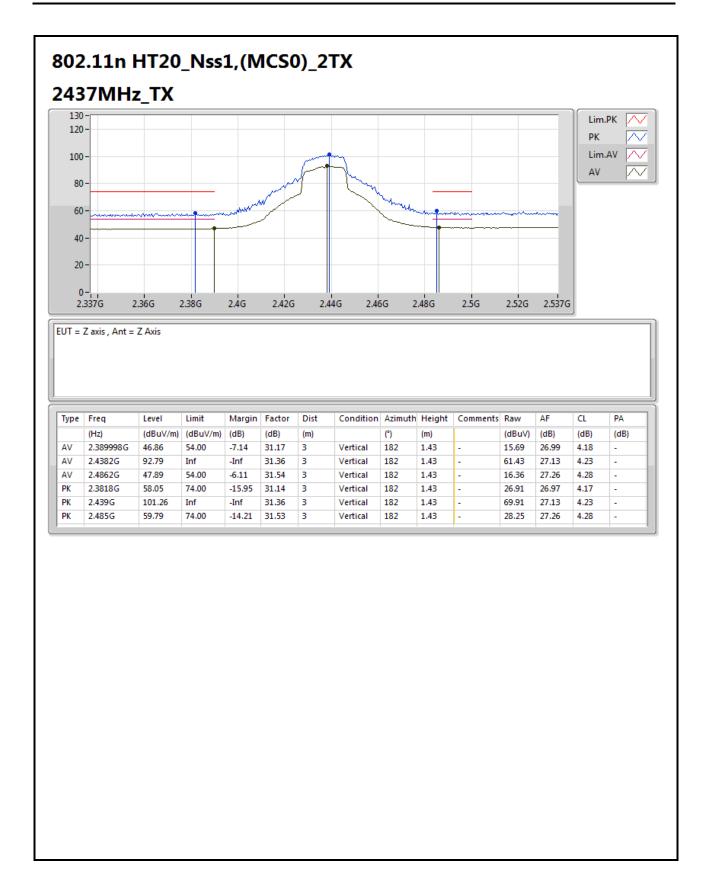
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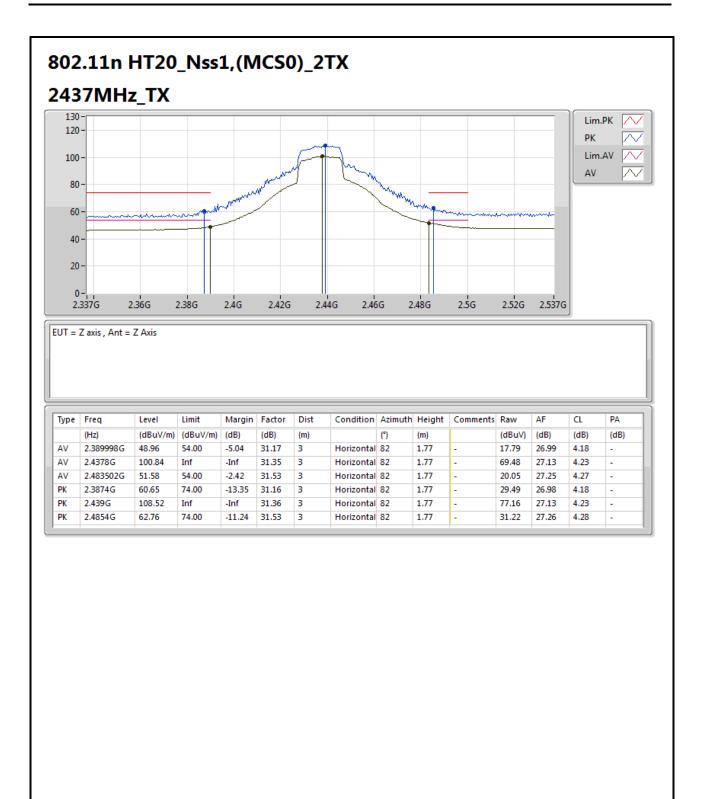
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F33 of F53





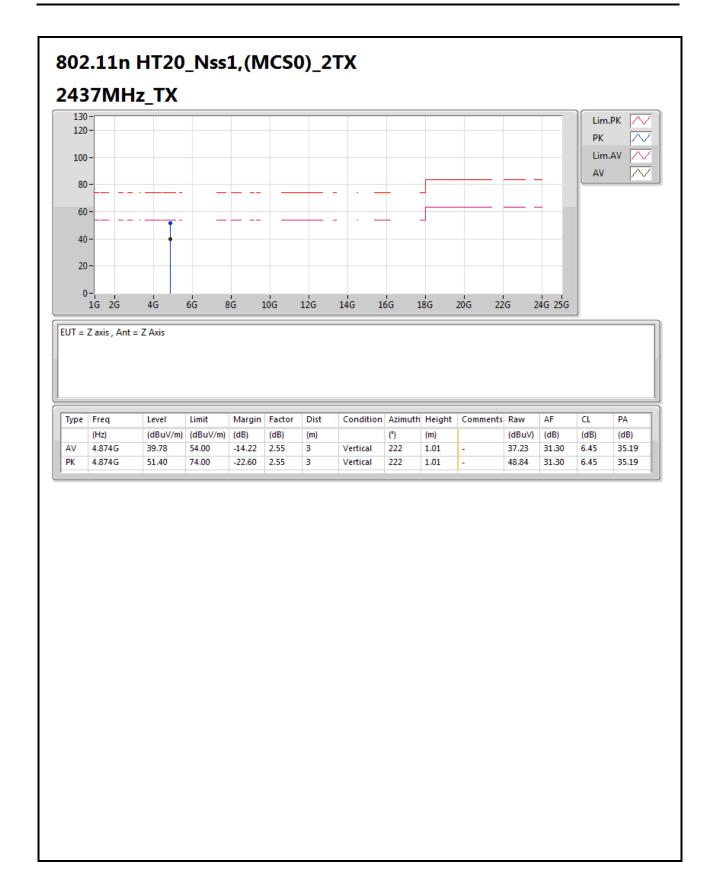
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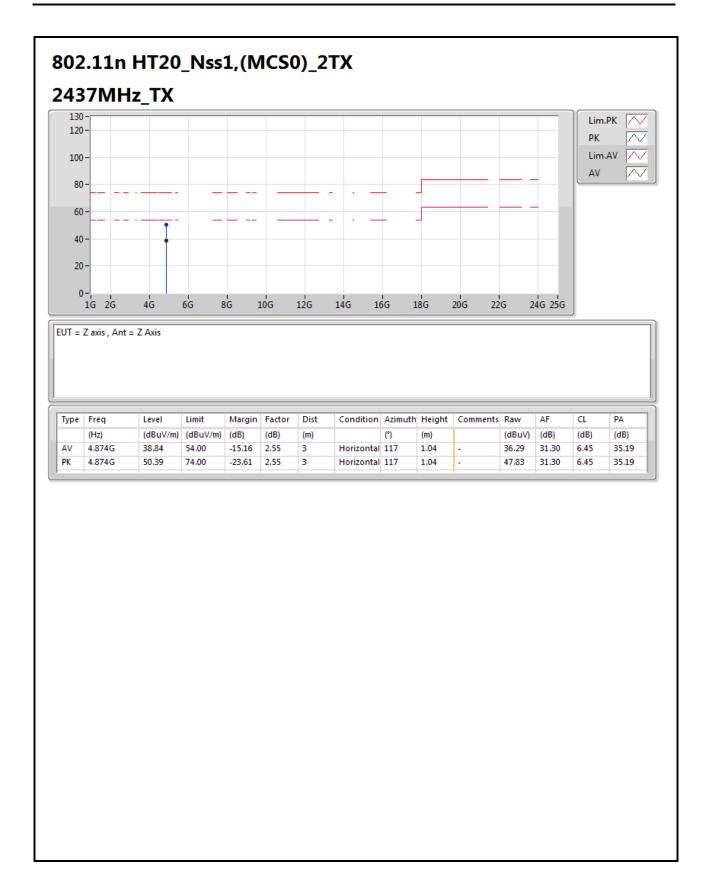
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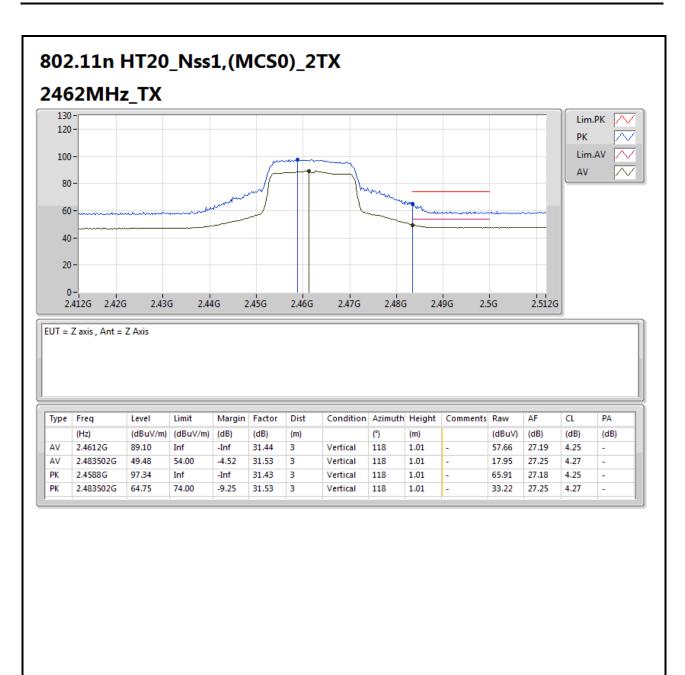
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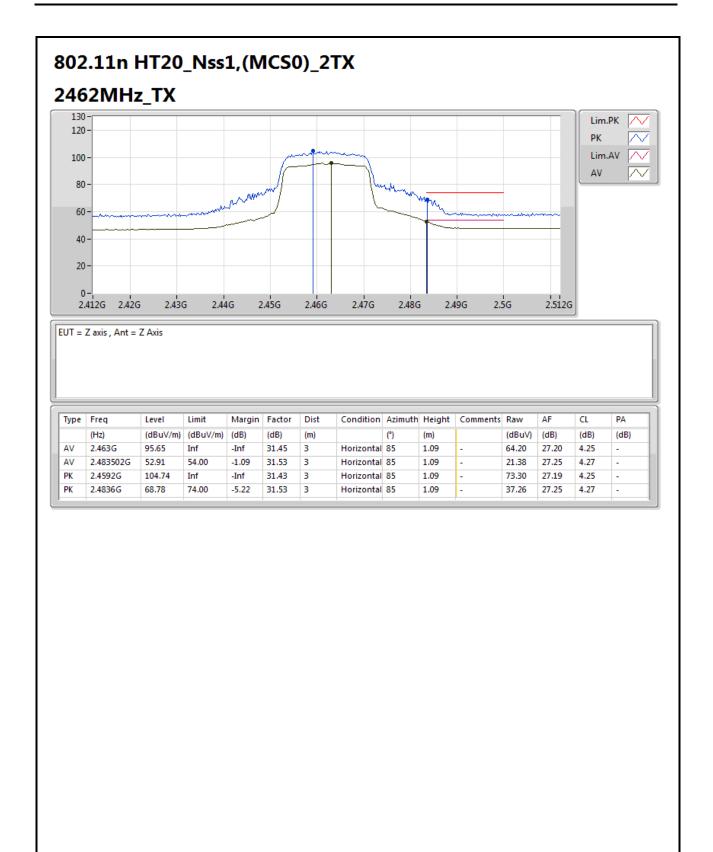
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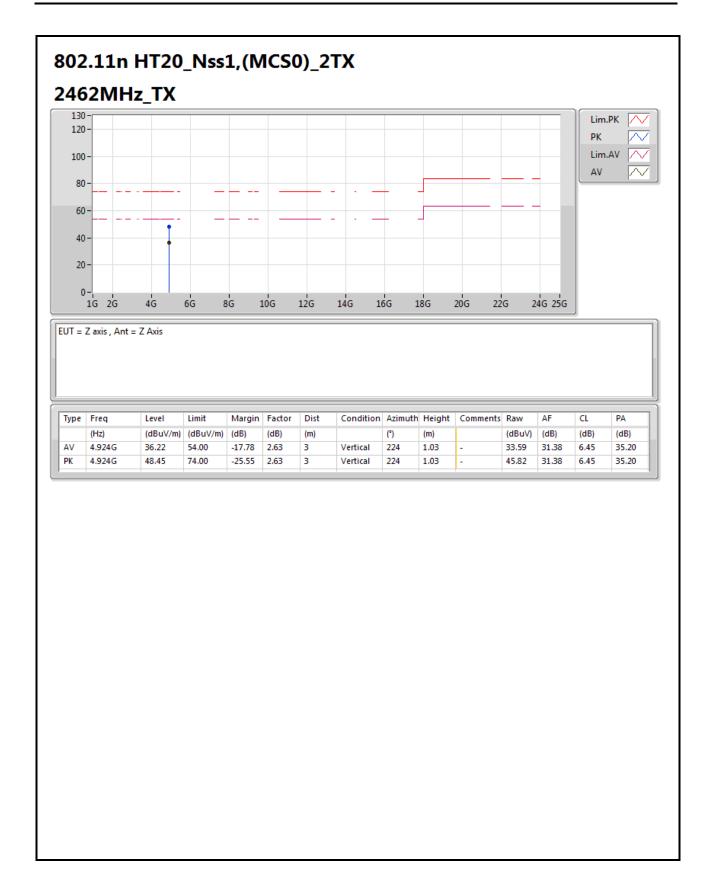
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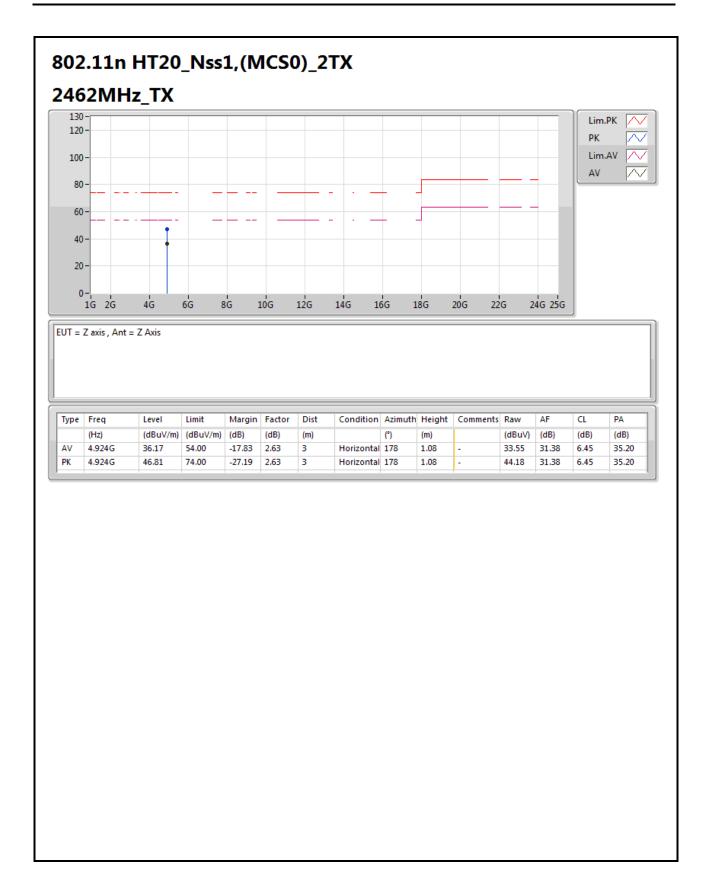
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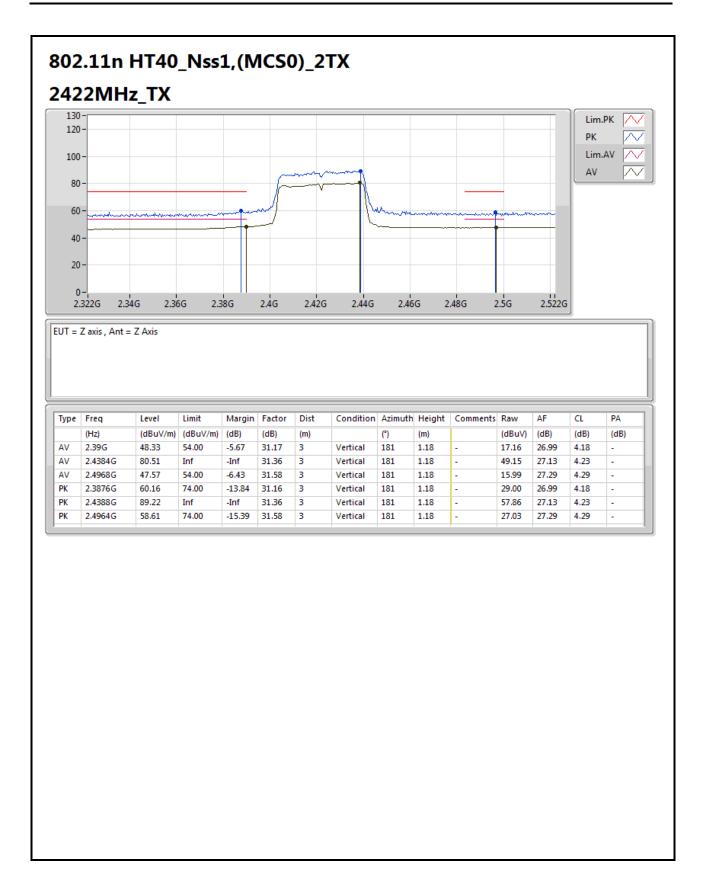
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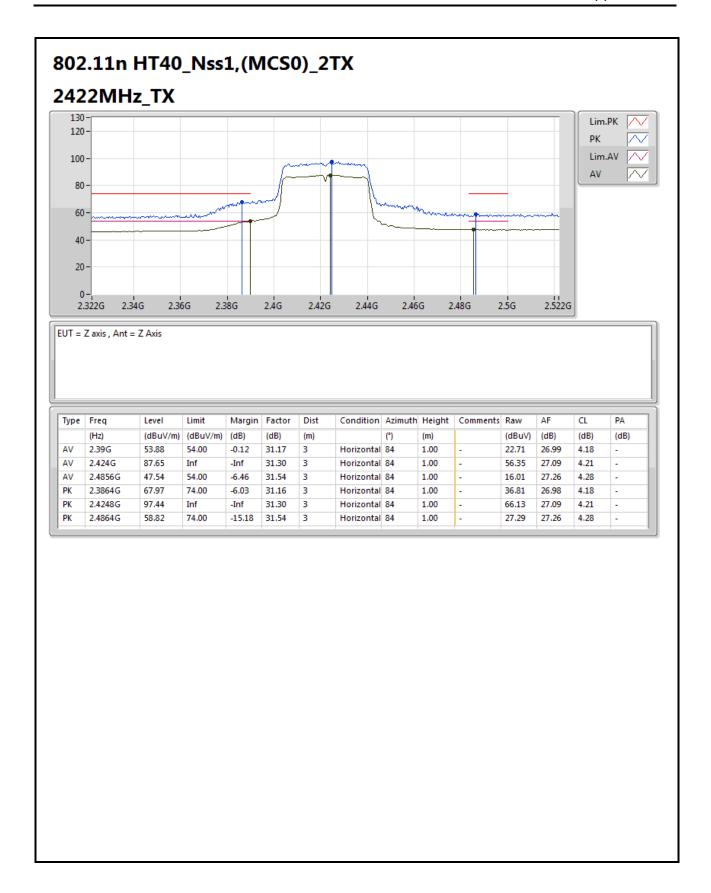
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F41 of F53





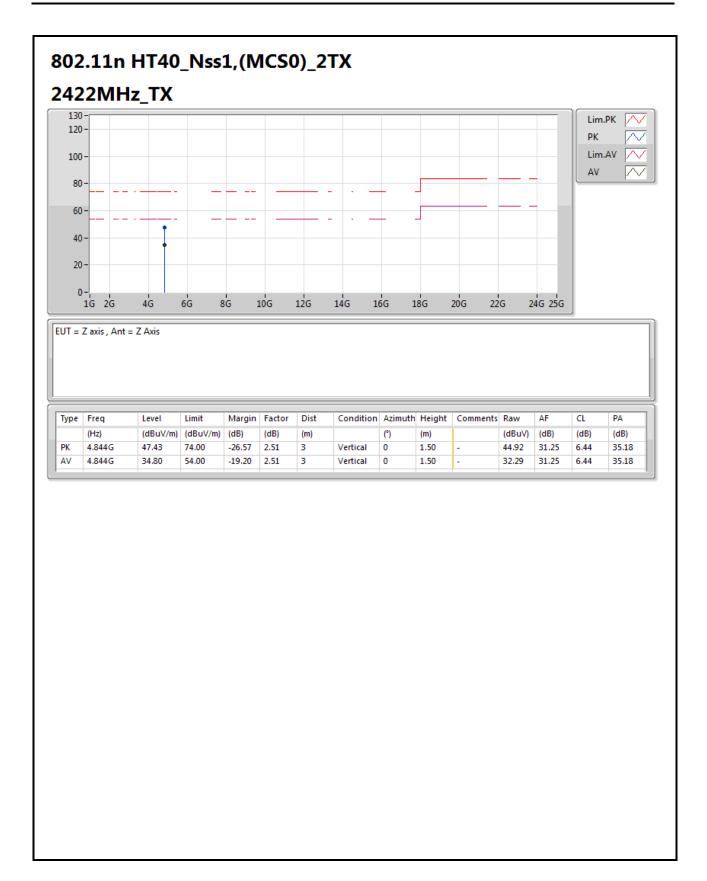
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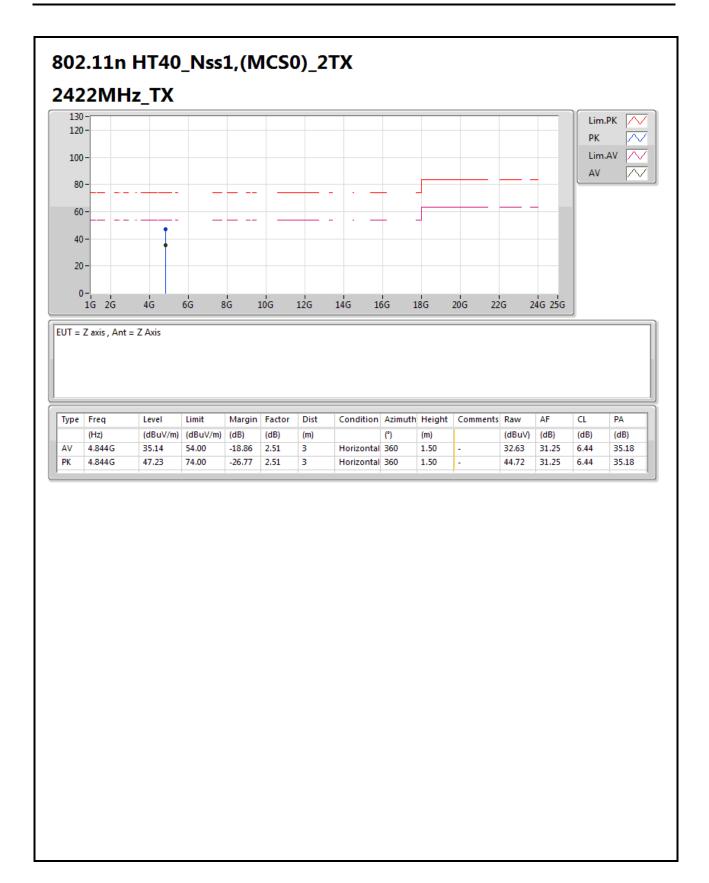
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : F43 of F53





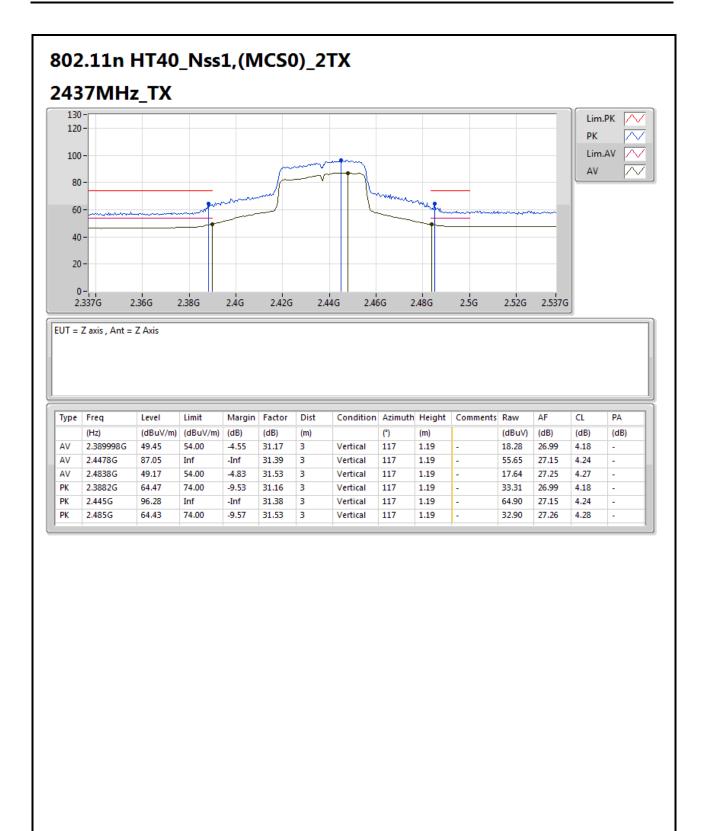
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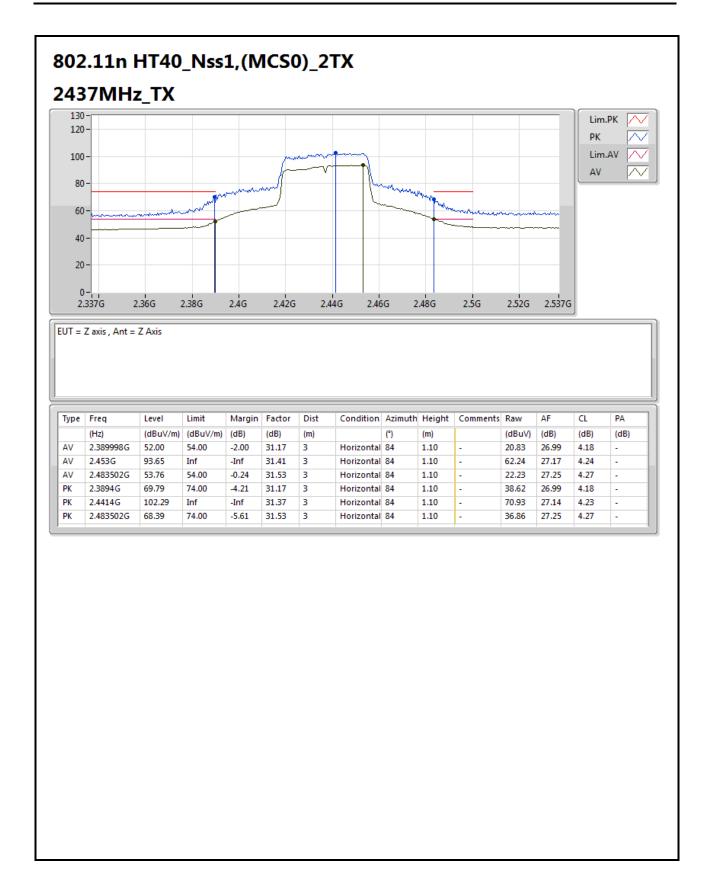
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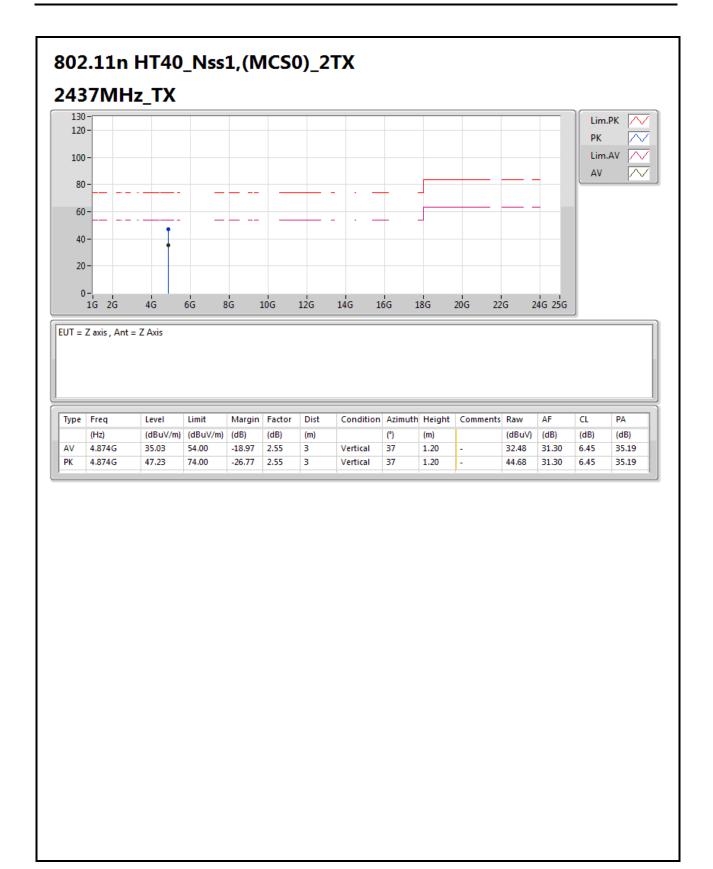
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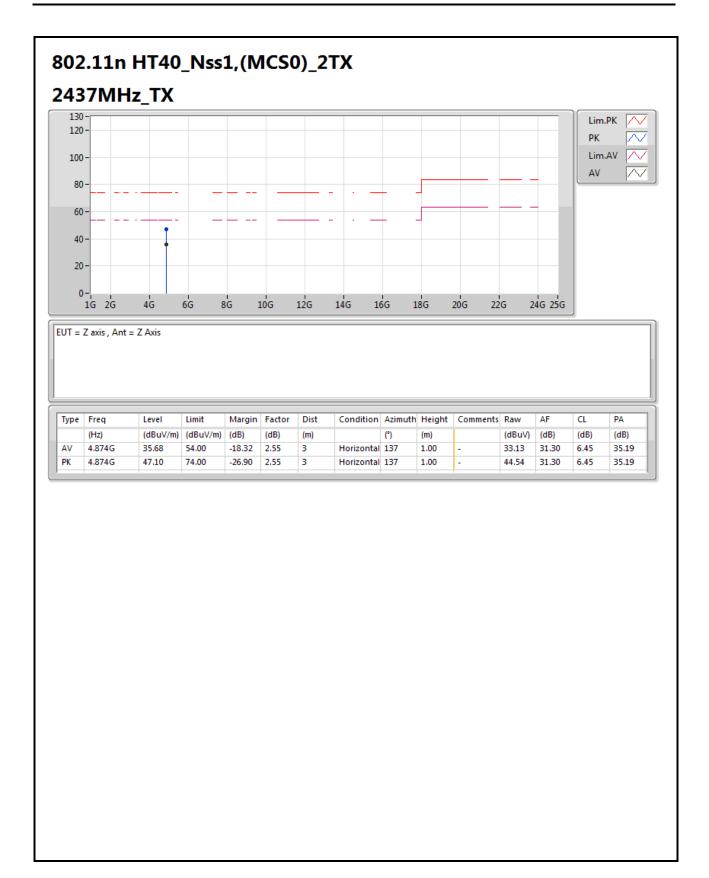
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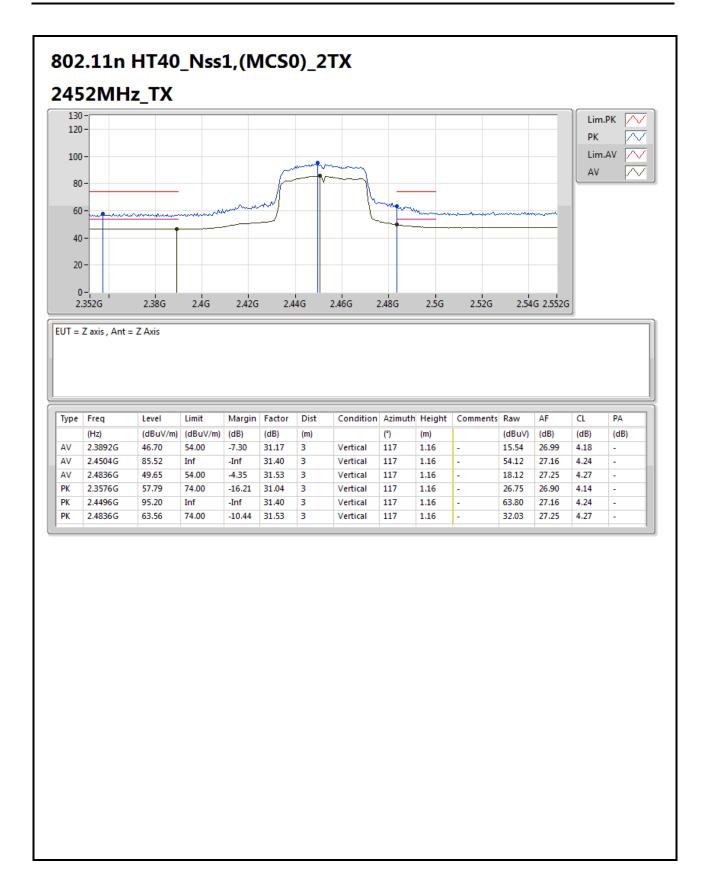
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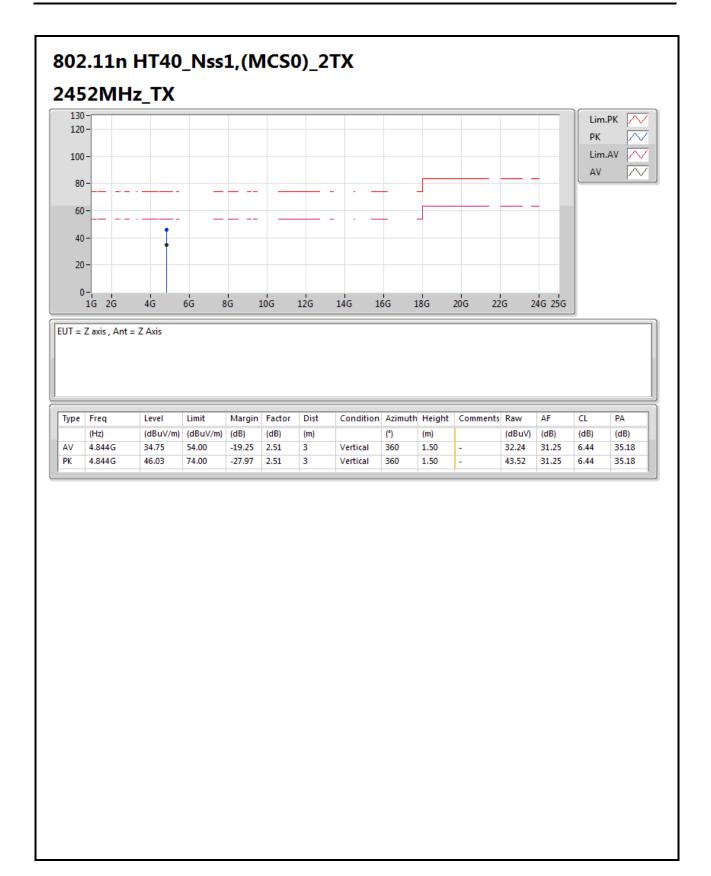
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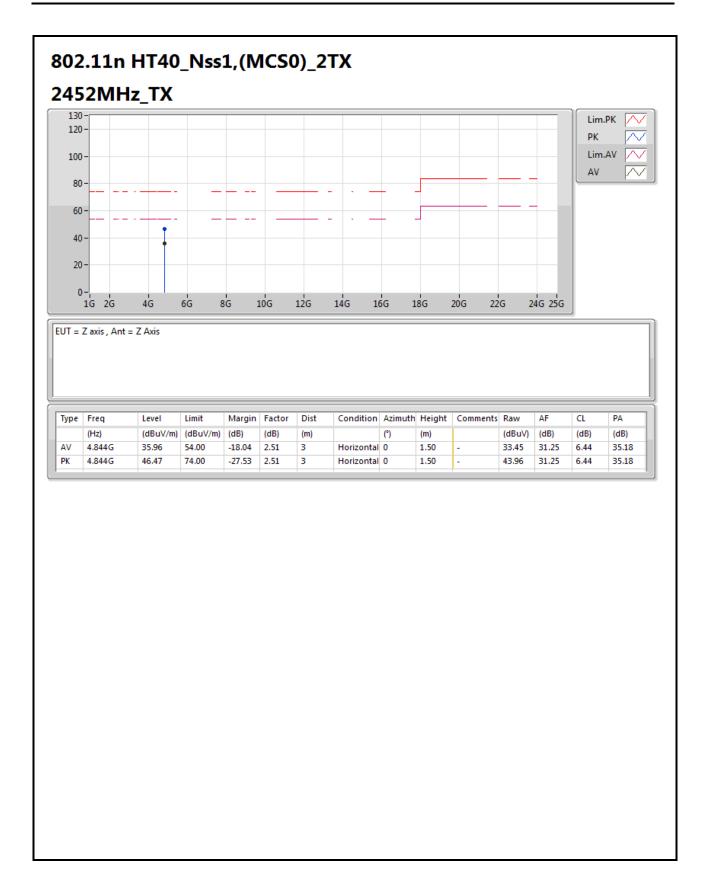
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