Report No.: FR0D0706-01AB





RADIO TEST REPORT

FCC ID

: MSQ-RTAXJG00

Equipment

: AX5400 Dual Band WiFi Router

Brand Name

: ASUS

Model Name

: ZenWiFi XD6/ASUS ZenWiFi

XD6/RT-AX5400/XD6/XD6S/ZenWiFi XD6S/ASUS ZenWiFi XD6S

Applicant

: ASUSTEK COMPUTER INC.

1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

Manufacturer (1) : Datamax Electronics (DongGuan) Co., Ltd.

Niu Shan Foreign Economic Industrial Park, Dong Cheng

District, Dong Guan City, Guang Dong, China

Manufacturer (2) : Lukisen Electronic Corp.

3F., No. 236, Boai St., Shulin Dist., New Taipei City 23845, Taiwan

Manufacturer (3)

: Lih Rong Electronic Enterprise Co.,Ltd.

No. 486, Sec. 1, Wanshou Road, Guishan District, Taoyuan

City, Taiwan

Standard

: 47 CFR FCC Part 15.407

The product was received on Oct. 06, 2021, and testing was started from Oct. 06, 2021 and completed on Nov. 05, 2021. We, Sporton International Inc. Hsinchu 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 test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

TEL: 886-3-656-9065 FAX: 886-3-656-9085

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Appendix A. Test Results of AC Power-line Conducted Emissions

Appendix B. Test Results of Unwanted Emissions

Appendix C. Test Photos

Photographs of EUT v01

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History of this test report

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Report No.	Version	Description	Issued Date
FR0D0706-01AB	01	Initial issue of report	Nov. 16, 2021

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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(b)	Unwanted Emissions	PASS	-

Declaration of Conformity:

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

Comments and Explanations:

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

Reviewed by: Sam Chen Report Producer: Jessie Wei

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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		5180-5240	36-48 [4]
5250-5350	a, n (HT20), ac (VHT20),	5260-5320	52-64 [4]
5470-5725	ax (HEW20)	5500-5720	100-144 [12]
5725-5850		5745-5825	149-165 [5]
5150-5250		5190-5230	38-46 [2]
5250-5350	n (HT40), ac (VHT40),	5270-5310	54-62 [2]
5470-5725	ax (HEW40)	5510-5710	102-142 [6]
5725-5850		5755-5795	151-159 [2]
5150-5250		5210	42 [1]
5250-5350	ac (VHT80), ax (HEW80)	5290	58 [1]
5470-5725	ac (viiioo), ax (ii=vvoo)	5530-5690	106-138 [3]
5725-5850		5775	155 [1]
5150-5350	ac (VHT160),	5250	50 [1]
5470-5725	ax (HEW160)	5570	114 [1]

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Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	4
5.15-5.25GHz	802.11n HT20	20	4
5.15-5.25GHz	802.11n HT20-BF	20	4
5.15-5.25GHz	802.11ac VHT20	20	4
5.15-5.25GHz	802.11ac VHT20-BF	20	4
5.15-5.25GHz	802.11ax HEW20	20	4
5.15-5.25GHz	802.11ax HEW20-BF	20	4
5.15-5.25GHz	802.11n HT40	40	4
5.15-5.25GHz	802.11n HT40-BF	40	4
5.15-5.25GHz	802.11ac VHT40	40	4
5.15-5.25GHz	802.11ac VHT40-BF	40	4
5.15-5.25GHz	802.11ax HEW40	40	4
5.15-5.25GHz	802.11ax HEW40-BF	40	4
5.15-5.25GHz	802.11ac VHT80	80	4
5.15-5.25GHz	802.11ac VHT80-BF	80	4
5.15-5.25GHz	802.11ax HEW80	80	4

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Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11ax HEW80-BF	80	4
5.15-5.25GHz	802.11ac VHT160	160	4
5.15-5.25GHz	802.11ac VHT160-BF	160	4
5.15-5.25GHz	802.11ax HEW160	160	4
5.15-5.25GHz	802.11ax HEW160-BF	160	4
5.25-5.35GHz	802.11a	20	4
5.25-5.35GHz	802.11n HT20	20	4
5.25-5.35GHz	802.11n HT20-BF	20	4
5.25-5.35GHz	802.11ac VHT20	20	4
5.25-5.35GHz	802.11ac VHT20-BF	20	4
5.25-5.35GHz	802.11ax HEW20	20	4
5.25-5.35GHz	802.11ax HEW20-BF	20	4
5.25-5.35GHz	802.11n HT40	40	4
5.25-5.35GHz	802.11n HT40-BF	40	4
5.25-5.35GHz	802.11ac VHT40	40	4
5.25-5.35GHz	802.11ac VHT40-BF	40	4
5.25-5.35GHz	802.11ax HEW40	40	4
5.25-5.35GHz	802.11ax HEW40-BF	40	4
5.25-5.35GHz	802.11ac VHT80	80	4
5.25-5.35GHz	802.11ac VHT80-BF	80	4
5.25-5.35GHz	802.11ax HEW80	80	4
5.25-5.35GHz	802.11ax HEW80-BF	80	4
5.25-5.35GHz	802.11ac VHT160	160	4
5.25-5.35GHz	802.11ac VHT160-BF	160	4
5.25-5.35GHz	802.11ax HEW160	160	4
5.25-5.35GHz	802.11ax HEW160-BF	160	4
5.47-5.725GHz	802.11a	20	4
5.47-5.725GHz	802.11n HT20	20	4
5.47-5.725GHz	802.11n HT20-BF	20	4
5.47-5.725GHz	802.11ac VHT20	20	4
5.47-5.725GHz	802.11ac VHT20-BF	20	4
5.47-5.725GHz	802.11ax HEW20	20	4
5.47-5.725GHz	802.11ax HEW20-BF	20	4
5.47-5.725GHz	802.11n HT40	40	4
5.47-5.725GHz	802.11n HT40-BF	40	4
5.47-5.725GHz	802.11ac VHT40	40	4
5.47-5.725GHz	802.11ac VHT40-BF	40	4
5.47-5.725GHz	802.11ax HEW40	40	4
5.47-5.725GHz	802.11ax HEW40-BF	40	4
5.47-5.725GHz	802.11ac VHT80	80	4

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Band	Mode	BWch (MHz)	Nant
5.47-5.725GHz	802.11ac VHT80-BF	80	4
5.47-5.725GHz	802.11ax HEW80	80	4
5.47-5.725GHz	802.11ax HEW80-BF	80	4
5.47-5.725GHz	802.11ac VHT160	160	4
5.47-5.725GHz	802.11ac VHT160-BF	160	4
5.47-5.725GHz	802.11ax HEW160	160	4
5.47-5.725GHz	802.11ax HEW160-BF	160	4
5.725-5.85GHz	802.11a	20	4
5.725-5.85GHz	802.11n HT20	20	4
5.725-5.85GHz	802.11n HT20-BF	20	4
5.725-5.85GHz	802.11ac VHT20	20	4
5.725-5.85GHz	802.11ac VHT20-BF	20	4
5.725-5.85GHz	802.11ax HEW20	20	4
5.725-5.85GHz	802.11ax HEW20-BF	20	4
5.725-5.85GHz	802.11n HT40	40	4
5.725-5.85GHz	802.11n HT40-BF	40	4
5.725-5.85GHz	802.11ac VHT40	40	4
5.725-5.85GHz	802.11ac VHT40-BF	40	4
5.725-5.85GHz	802.11ax HEW40	40	4
5.725-5.85GHz	802.11ax HEW40-BF	40	4
5.725-5.85GHz	802.11ac VHT80	80	4
5.725-5.85GHz	802.11ac VHT80-BF	80	4
5.725-5.85GHz	802.11ax HEW80	80	4
5.725-5.85GHz	802.11ax HEW80-BF	80	4

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Note:

- 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40, VHT80 and VHT160 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- HEW20, HEW40, HEW80 and HEW160 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- BWch is the nominal channel bandwidth.

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1.1.2 Antenna Information

Set	Ant.	2.4GHz Port	5GHz Port	Bluetooth	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	1	2	ı	-	M.gear	C660-510545-A (SRF20201842)	PCB Antenna	I-PEX	
	2	-	2	-	M.gear	C660-510545-A (SRF20201842)	Dipole Antenna	I-PEX	
1	3	-	4	-	M.gear	C660-510545-A (SRF20201842)	Dipole Antenna	I-PEX	
	4	1	ı	-	M.gear	C660-510545-A (SRF20201842)	PCB Antenna	I-PEX	
	5	-	3	-	M.gear	C660-510545-A (SRF20201842)	Dipole Antenna	I-PEX	
	6	-	1	-	M.gear	C660-510545-A (SRF20201842)	Dipole Antenna	I-PEX	
	1	2	ı	-	PSA	RFPCA351314 IMAB702	PCB Antenna	I-PEX	Note 1
	2	-	2	-	PSA	RFPCA351314 IMAB702	Dipole Antenna	I-PEX	
2	3	-	4	-	PSA	RFPCA351314I MAB702	Dipole Antenna	I-PEX	
	4	1	ı	-	PSA	RFPCA351314I MAB702	PCB Antenna	I-PEX	
	5	-	3	-	PSA	RFPCA351314I MAB702	Dipole Antenna	I-PEX	
	6	-	1	-	PSA	RFPCA351314I MAB702	Dipole Antenna	I-PEX	
3	1	-	-	1	YAGEO	ANT3216A063R 2400A	Chip Antenna	N/A	

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Note 1:

Gain (dBi)																	
Set	Ant.	2.4GHz 5GHz Band 1			5G	5GHz Band 2 5GHz Band			nd 3	3 5GHz Band 4			Bluet				
		CDD	DG (Nss1)	DG (Nss2)	CDD	DG (Nss1)	DG (Nss2)	CDD	DG (Nss1)	DG (Nss2)	CDD	DG (Nss1)	DG (Nss2)	CDD	DG (Nss1)	DG (Nss2)	ooth
1	1~6	1.21	4.16	-	1.21	6.96	4.14	1.39	7.19	4.37	0.99	6.75	3.93	1.24	7.00	4.25	-
2	1~6	1.21	4.16	-	1.21	6.96	4.14	1.39	7.19	4.37	0.99	6.75	3.93	1.24	7.00	4.25	-
3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.69

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Note 2: The above information was declared by manufacturer.

Note 3: The EUT has two set of antenna and each set has six antennas for WALN. There are the same type, so only the set 1 antenna was selected to test and record in this report.

For 2.4GHz function:

IEEE 802.11b/g/n/VHT/ax (2TX/2RX):

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

Port 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:

IEEE 802.11a/n/ac/ax (4TX/4RX):

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

For Bluetooth Function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

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1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	0.931	0.31	4.372m	300
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	0.946	0.24	5.085m	300
802.11ax HEW80-BF_Nss2,(MCS0)_4TX	0.96	0.18	4.837m	300
802.11ax HEW160-BF_Nss2,(MCS0)_4TX	0.967	0.15	5.175m	300

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

1.1.4 EUT Operational Condition

EUT Power Type	Froi	From Power Adapter						
	\boxtimes			Without beamforming				
Beamforming Function	The product has beamforming function for n/VHT/ax in 2.4GHz and n/ac/ax in 5GHz.							
Weather Band	\boxtimes	With 5600~5650MHz		Without 5600~5650MHz				
Function		Outdoor P2M	\boxtimes	Indoor P2M				
i diletion		Fixed P2P		Client				
TPC Function	With TPC							
Test Software Version	Mtool_v3.2.1.1							

Note: The above information was declared by manufacturer.

1.1.5 Table for EUT supports functions

Function	Support Type	
AP Router	Master	
Bridge	Slave without radar detection	
Repeater	Master	
Mesh	Master	

Note: After evaluating, only AP Router was selected to test and record in the report.

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1.1.6 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	Description
ZenWiFi XD6	
ASUS ZenWiFi XD6	
RT-AX5400	All the models are identical the different model names carried as
XD6	 All the models are identical, the different model names served a marketing strategy.
XD6S	marketing strategy.
ZenWiFi XD6S	
ASUS ZenWiFi XD6S	

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1.1.7 Table for SKU Information

EUT	2.4GHz Chipset	Memory Size	LAN Ethernet port
SKU 1	BCM6750	RAM 512MB; Flash 256MB	RJ-45 for Gigabits / BaseT for LAN x 3
SKU 2	BCM6752	RAM 512MB; Flash 128MB	RJ-45 for Gigabits / BaseT for LAN x 1

Note1: There is only SKU 2 tested and recorded in this report.

Note2: The above information was declared by manufacturer.

1.1.8 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR0D0706AB Below is the table for the change of the product with respect to the original one.

	Modifications		Performance Checking
1.	Adding a new model name: XD6S.	After evaluating, it doesn't affect the test results.	
		1.	AC Power-line Conducted Emissions
		2.	Unwanted Emissions (For above 1GHz: After
2.	Adding SKU 2, the difference from SKU 1 is		evaluating, the worst case is found at 802.11ax
	only the 2.4G RF Chipset/Flash/quantity of LAN		20MHz 4T2S BF 5240MHz, 802.11ax 40MHz
	port, other parts and layout are the same.		4T2S BF 5755MHz, 802.11ax 80MHz 4T2S BF
			5610MHz, 802.11ax 160MHz 4T2S BF
			5250MHz, and retested these channel only.)

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Note 1: From the above models, model: XD6 was selected to test all items, and model: XD6S has been selected to test AC Power-line Conducted Emissions and Unwanted Emissions only.

Note 2: The above information was declared by manufacturer.

1.2 Applicable Standards

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

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

The following reference test guidance is not within the scope of accreditation of TAF.

- FCC KDB 412172 D01 v01r01
- FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location Information				
Test Lab. : Sporton	ı International Inc. Hsinchu L	aboratory		
Hsinchu	ADD: No.8, Ln. 724, Bo'ai	St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)		
(TAF: 3787)	TEL: 886-3-656-9065	FAX: 886-3-656-9085		
	Test site Designation No.	TW3787 with FCC.		

Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date	
Radiated below 1GHz	03CH05-CB	Stim Sung	24.3~25.4 / 55~58	Oct. 06, 2021~	
Radiated above 1GHz	03CH06-CB	Stim Sung	23.9~24.8 / 55~58	Oct. 27, 2021	
AC Conduction	CO01-CB	Peter Wu	22~23 / 61~62	Nov. 05, 2021	

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	4.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.5 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.2 dB	Confidence levels of 95%

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2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	-
5240MHz	108
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	-
5755MHz	99
802.11ax HEW80-BF_Nss2,(MCS0)_4TX	-
5610MHz	87
802.11ax HEW160-BF_Nss2,(MCS0)_4TX	-
5250MHz Straddle 5.15-5.25GHz	77
5250MHz Straddle 5.25-5.35GHz	77

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2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests			
Tests Item AC power-line conducted emissions			
Condition AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz			
Operating Mode	Operating Mode Normal Link		
The EUT performed testing at power adapter 1 and power adapter 2. After evaluating, power adapter 1 has been evaluated to be the worst case, thus the measurement will follow same test configuration.			
1	AP router – EUT (SKU 2) + Adapter 1		

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Th	The Worst Case Mode for Following Conformance Tests			
Tests Item	Unwanted Emissions			
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.			
Operating Mode < 1GHz	CTX			
1	EUT (SKU 2)_WLAN 2.4GHz + Adapter 1			
2	EUT (SKU 2)_WLAN 2.4GHz + Adapter 2			
Mode 1 has been evaluate follow this same test mode	ed to be the worst case among Mode 1~2, thus measurement for Mode 3~4 will a.			
3	EUT (SKU 2)_WLAN 5GHz + Adapter 1			
4	EUT (SKU 2)_Bluetooth + Adapter 1			
For operating mode 1 is th	e worst case and it was record in this test report.			
Operating Mode > 1GHz	CTX			
1	EUT (SKU 2)			

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

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2.3 EUT Operation during Test

For CTX Mode:

non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

beamforming mode:

For Radiated Mode:

During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

- 1. During the test, the EUT operation to normal function.
- 2. Executed command fixed test channel under DOS [ver 17.10.157.23].
- 3. Executed "LanTest20" to link with the remote workstation to transmit and receive packet by WLAN AP and transmit duty cycle no less than 98%.

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For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

Accessories						
Equipment Name	Brand Name	Model Name	Rating			
Adapter 1	LEI	MU24D1120200-A1	INPUT: 100-240V ~ 50/60Hz, 0.7A OUTPUT: 12V, 2A			
Adapter 2	DVE	DSA-24PFS-12 FUS 120200	INPUT: 100-240V ~ 50/60Hz, 0.8A OUTPUT: 12.0V, 2.0A, 24.0W			
	Others					
RJ-45 cable 1: Non-shielded, 2m						
Wall-mounted rack*1						

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2.5 Support Equipment

For AC Conduction:

	Support Equipment					
No.	No. Equipment Brand Name Model Name FCC ID					
Α	LAN NB	DELL	E6430	N/A		
В	2.4G NB	DELL	E6430	N/A		
С	5G NB	DELL	E6430	N/A		
D	WAN NB	DELL	E6430	N/A		

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For Radiated (below 1GHz):

Support Equipment								
No.	Equipment	FCC ID						
Α	Notebook	DELL	E4300	N/A				

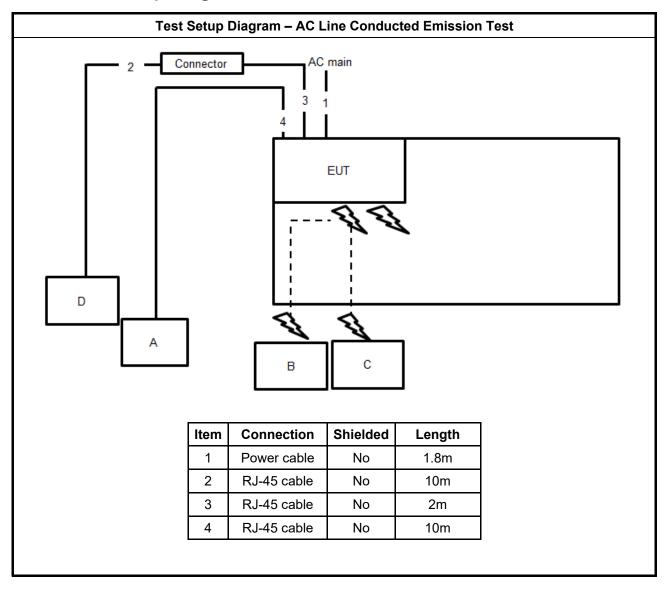
For Radiated (above 1GHz):

	Support Equipment									
No.	Equipment	Brand Name	Model Name	FCC ID						
Α	Notebook	DELL	E4300	N/A						
В	WLAN AP (for2.4G+5G)	ASUS	RT-AX88U	MSQ-RTAXHP00						
С	Notebook	DELL	E4300	N/A						

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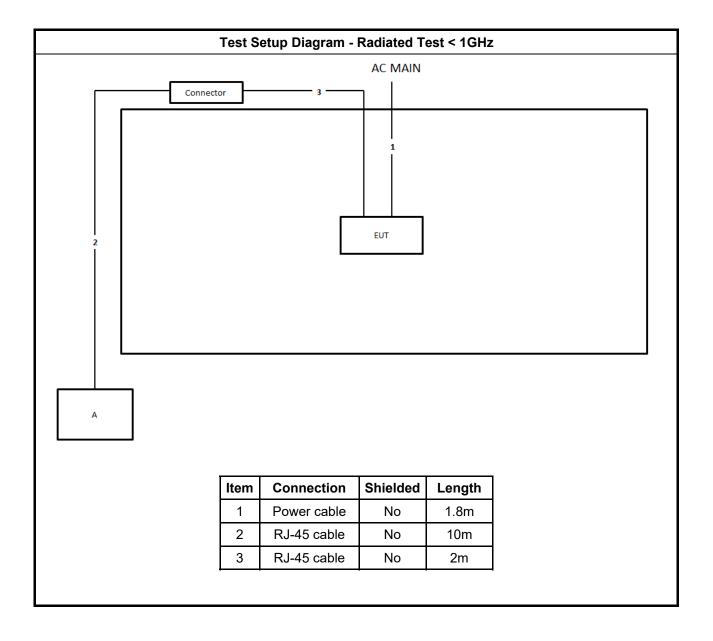
Test Setup Diagram 2.6



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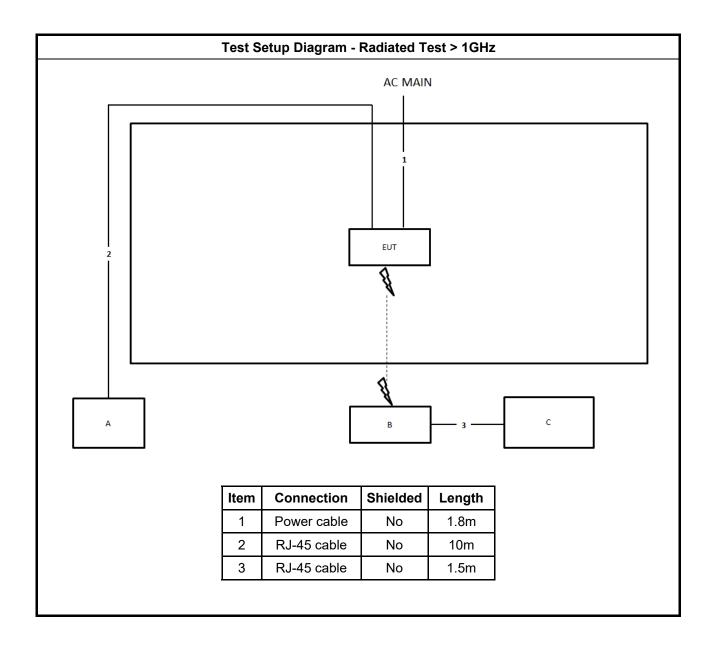
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3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit								
Frequency Emission (MHz) Quasi-Peak Average								
0.15-0.5	66 - 56 *	56 - 46 *						
0.5-5	56	46						
5-30	60	50						
Note 1: * Decreases with the logarithm of the frequency.								

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3.1.2 Measuring Instruments

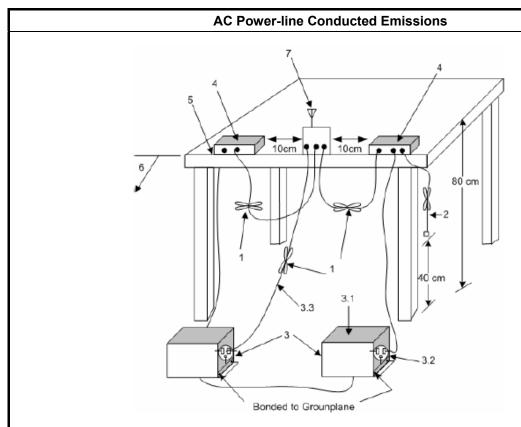
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

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3.1.4 **Test Setup**



-Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.

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- -The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- 3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
- 3.1—All other equipment powered from additional LISN(s).
- 3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment. 3.3—LISN at least 80 cm from nearest part of EUT chassis.
- 4—Non-EUT components of EUT system being tested.
- -Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop. -Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground
- —Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

Measurement Results Calculation

The measured Level is calculated using:

- Corrected Reading: LISN Factor (LISN) + Attenuator (AT/AUX) + Cable Loss (CL) + Read Level (Raw) = Level
- Margin = -Limit + Level

Test Result of AC Power-line Conducted Emissions 3.1.6

Refer as Appendix A

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3.2 Unwanted Emissions

3.2.1 Transmitter Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz limit										
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)							
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300							
0.490~1.705	24000/F(kHz)	33.8 - 23	30							
1.705~30.0	30	29	30							
30~88	100	40	3							
88~216	150	43.5	3							
216~960	200	46	3							
Above 960	500	54	3							

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- 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.
- 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.

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	Un-restricted band emissions above 1GHz Limit
Operating Band	Limit
⊠ 5.15 - 5.25 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]
⊠ 5.25 - 5.35 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]
⊠ 5.47 - 5.725 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]
⊠ 5.725 - 5.85 GHz	all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
□ 5.85 - 5.895 GHz	(i) For an indoor access point or subordinate device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of 15 dBm/MHz and shall decrease linearly to an e.i.r.p. of - 7 dBm/MHz at or above 5.925 GHz. (ii) For a client device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of -5 dBm/MHz and shall decrease linearly to an e.i.r.p. of -27 dBm/MHz at or above 5.925 GHz. (iii) For a client device or indoor access point or subordinate device, all emissions below 5.725 GHz shall not exceed an e.i.r.p. of -27 dBm/MHz at 5.65 GHz increasing linearly to 10 dBm/ MHz at 5.7 GHz, and from 5.7 GHz increasing linearly to a level of 15.6 dBm/MHz at 5.725 GHz.

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Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

3.2.2 Measuring Instruments

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

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3.2.3 Test Procedures

Test Method

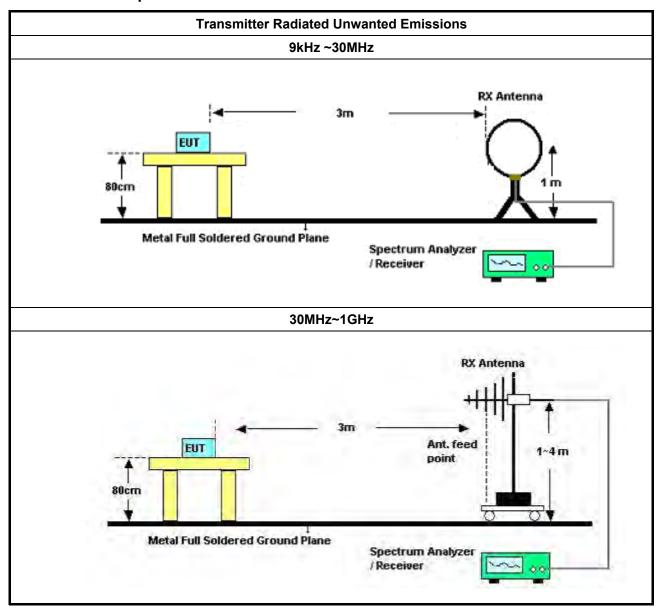
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- Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
- For the transmitter unwanted emissions shall be measured using following options below:
 - Refer as FCC KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
 - Refer as FCC KDB 789033, clause G)1) for unwanted emissions into restricted bands.
 - Refer as FCC KDB 789033, G)6) Method AD (Trace Averaging).
 - Refer as FCC KDB 789033, G)6) Method VB (Reduced VBW).
 - Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
 - Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
 - Refer as FCC KDB 789033, clause G)5) measurement procedure peak limit.
 - Refer as 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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Test Setup 3.2.4



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Above 1GHz

BUT

3M & 1M

1.5M

Max 30cm

Spectrum Analyzer

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3.2.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

3.2.6 Transmitter Unwanted Emissions (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

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

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10th harmonic or 40 GHz, whichever is appropriate.

3.2.7 Test Result of Transmitter Unwanted Emissions

Refer as Appendix B

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4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.4GHz	Mar. 03, 2021	Mar. 02, 2022	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-1 6-2	04083	150kHz ~ 100MHz	Jan. 06, 2021	Jan. 05, 2022	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Mar. 07, 2021	Mar. 06, 2022	Conduction (CO01-CB)
Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Jan. 30, 2021	Jan. 29, 2022	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01 9kHz ~ 30MHz May 19, 2021 May 18, 202		May 18, 2022	Conduction (CO01-CB)	
Software	SPORTON	SENSE	V5.10 - N.C.R. N.C.R.		Conduction (CO01-CB)		
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 09, 2021	Aug. 08, 2022	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 26, 2021	Mar. 25, 2022	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	Apr. 27, 2021	Apr. 26, 2022	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Nov. 10, 2020	Nov. 09, 2021	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 21, 2021	Jun. 20, 2022	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 14, 2021	Apr. 13, 2022	Radiation (03CH05-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH05-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH06-CB	1GHz ~18GHz 3m	Oct. 01, 2021	Sep. 30, 2022	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1292	1GHz~18GHz	Aug. 04, 2021	Aug. 03, 2022	Radiation (03CH06-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 05, 2021	Aug. 04, 2022	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 06, 2021	May 05, 2022	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 13, 2021	Jul. 12, 2022	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Dec. 15, 2020	Dec. 14, 2021	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-05	1GHz~18GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (03CH06-CB)

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Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-05+24	1GHz~18GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 15, 2021	Jul. 14, 2022	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 15, 2021	Jul. 14, 2022	Radiation (03CH06-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH06-CB)

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Note: Calibration Interval of instruments listed above is one year. NCR means Non-Calibration required.

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Conducted Emissions at Powerline

Appendix A

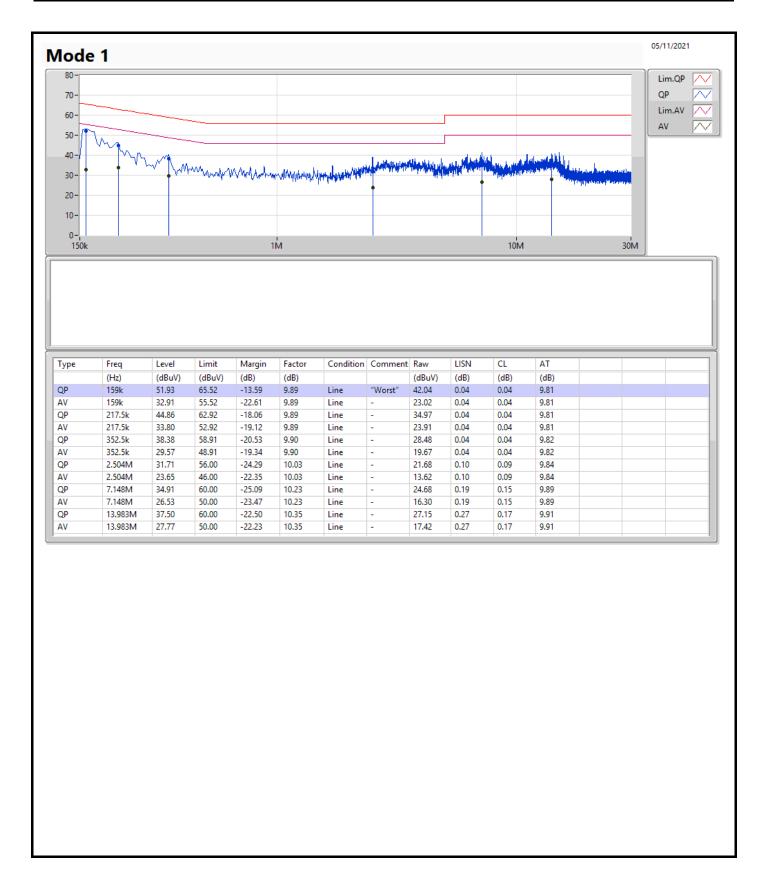
Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	150k	53.29	66.00	-12.71	Neutral

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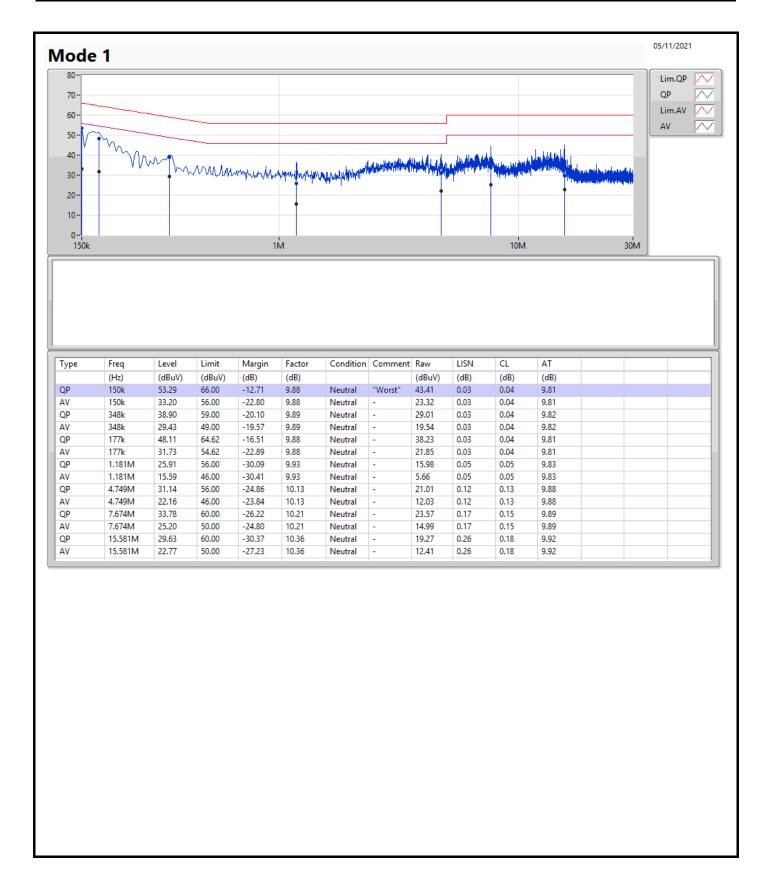




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Radiated Emissions below 1GHz

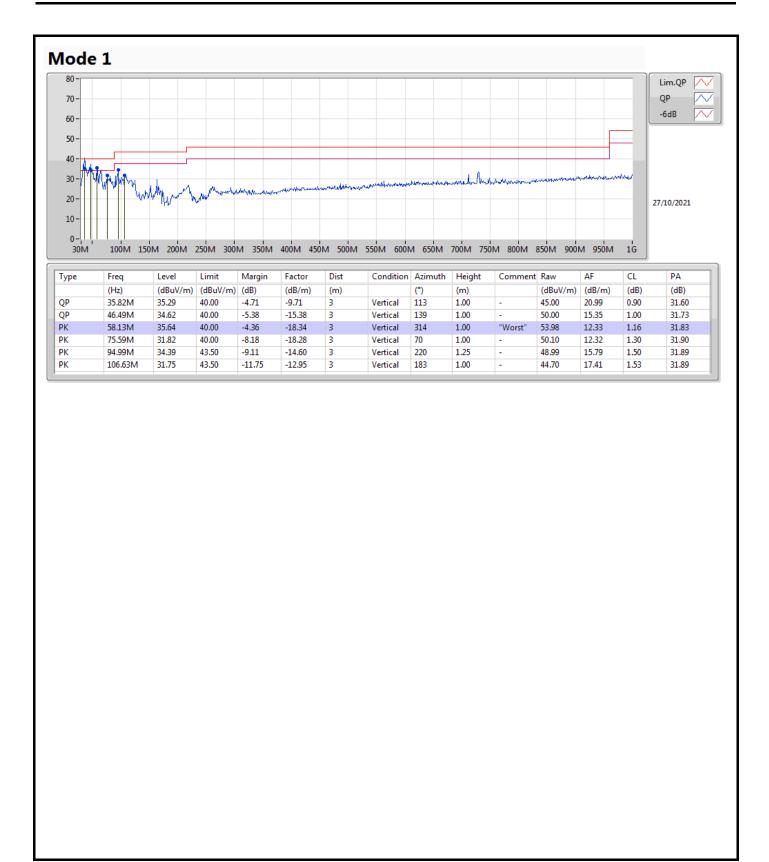
Appendix B.1

Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	PK	58.13M	35.64	40.00	-4.36	Vertical

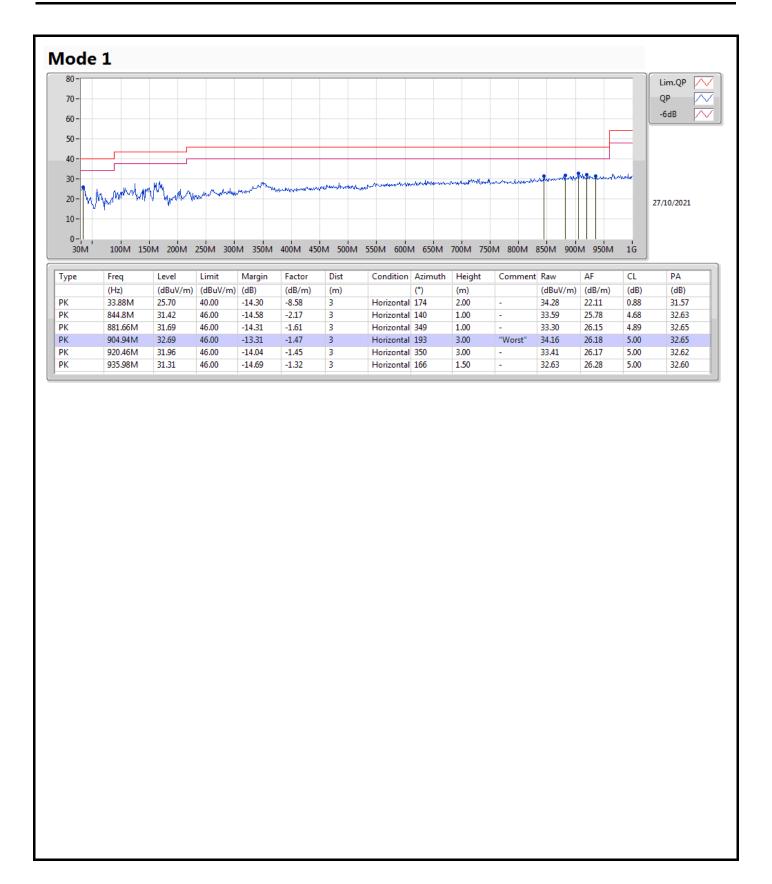
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RSE TX above 1GHz

Appendix B.2

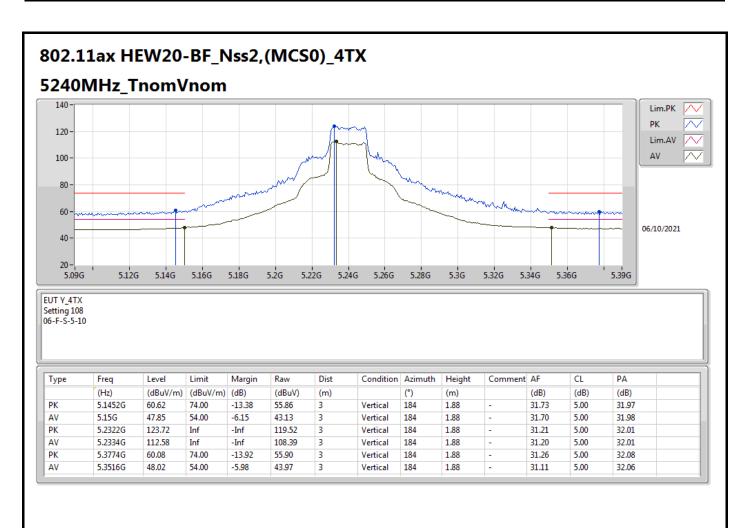
Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
5.47-5.725GHz	-		-	-	-	-	-				=
802.11ax HEW80-BF_Nss2,(MCS0)_4TX	Pass	PK	5.741G	67.92	68.20	-0.28	3	Vertical	4.1	1.80	-

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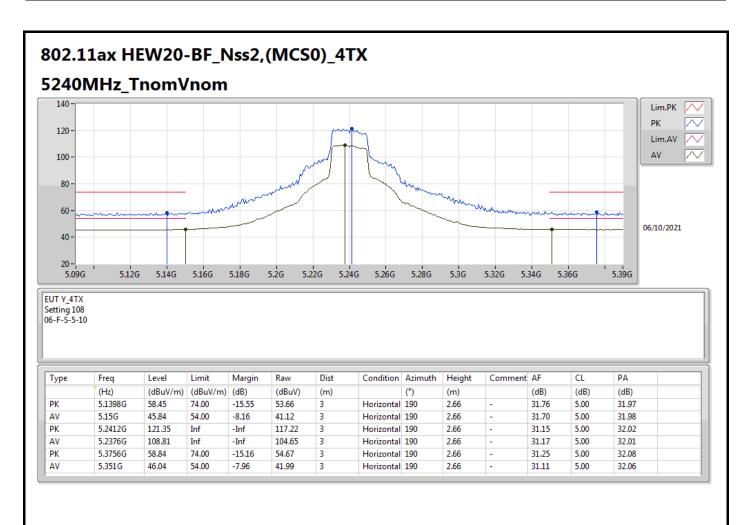




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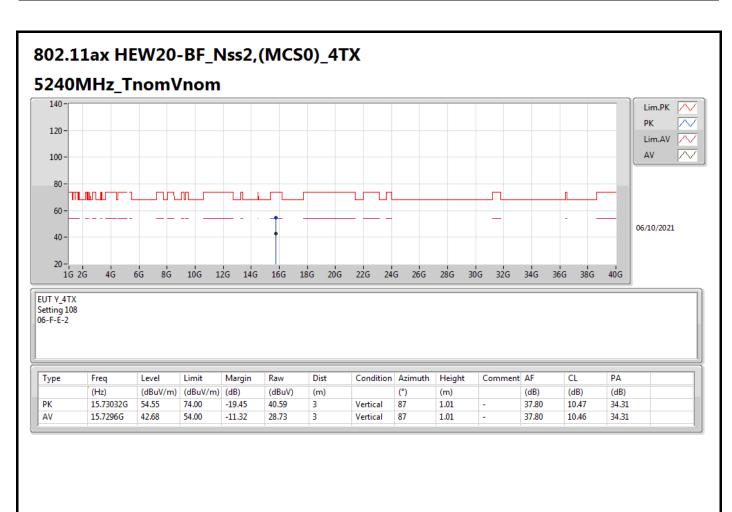
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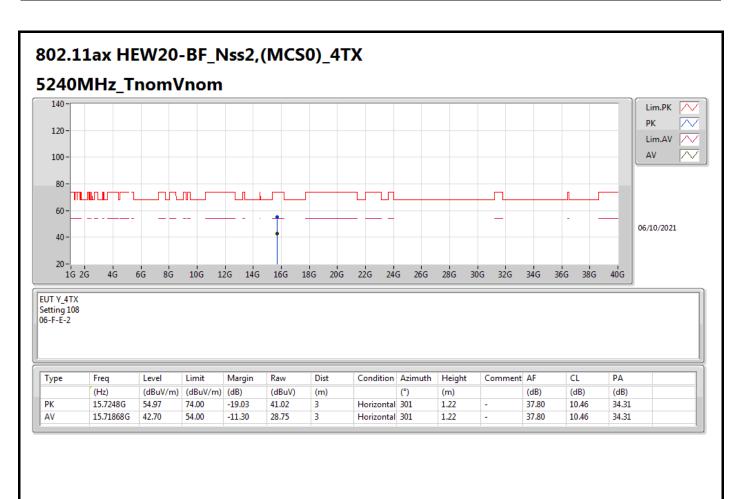
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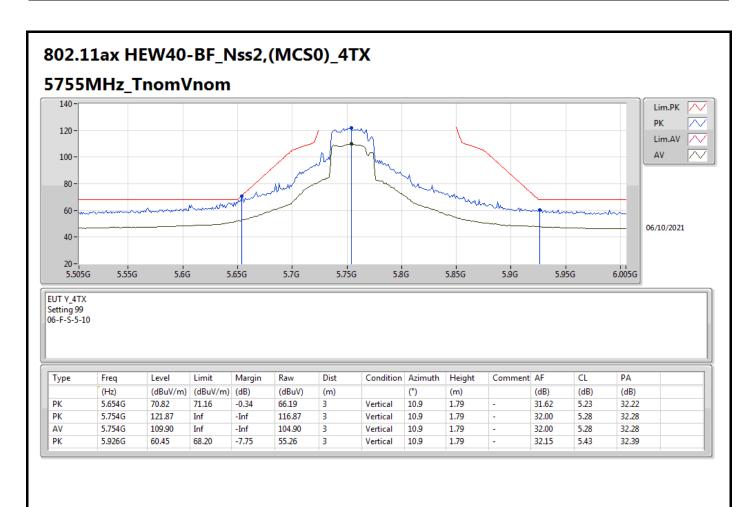
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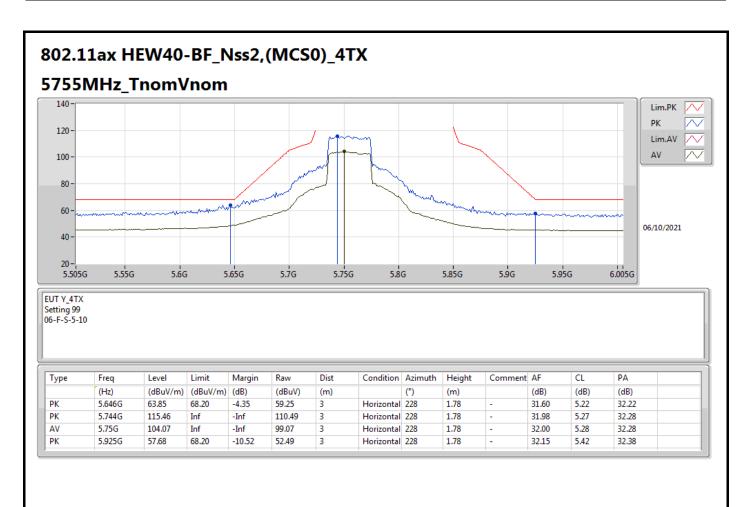
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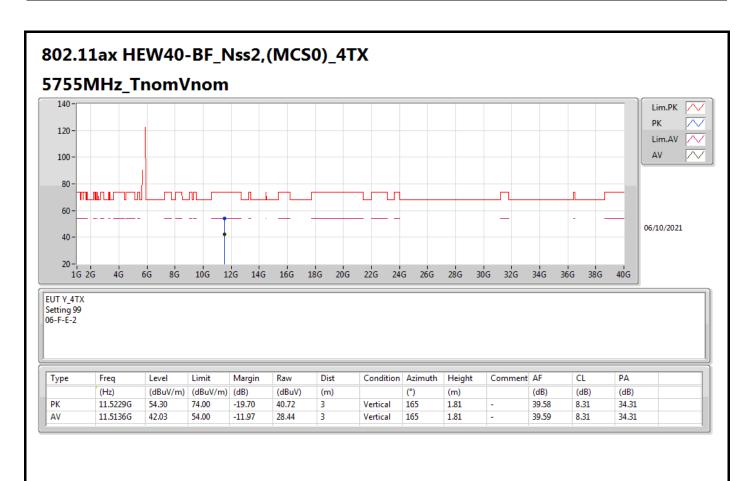
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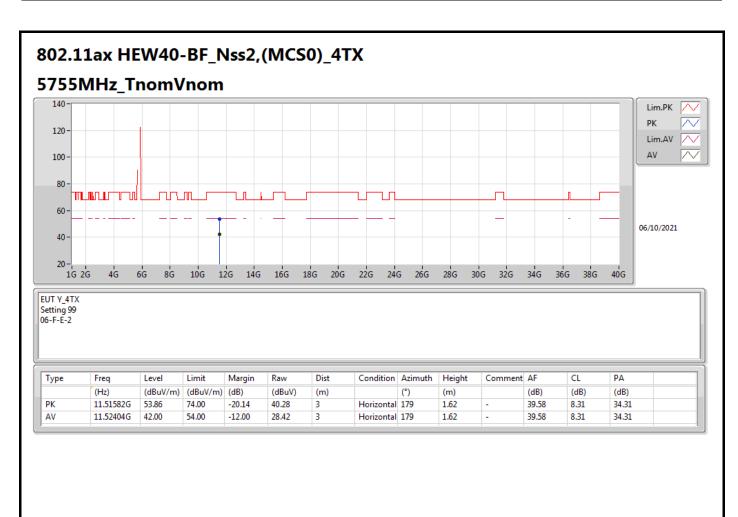




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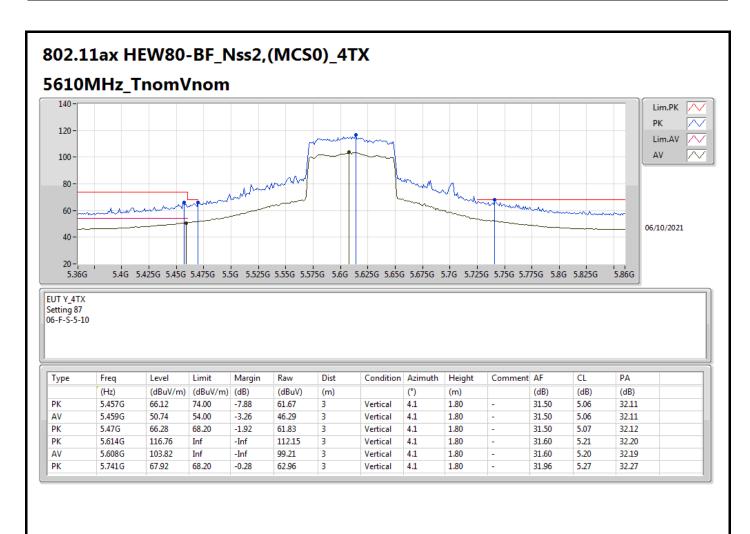




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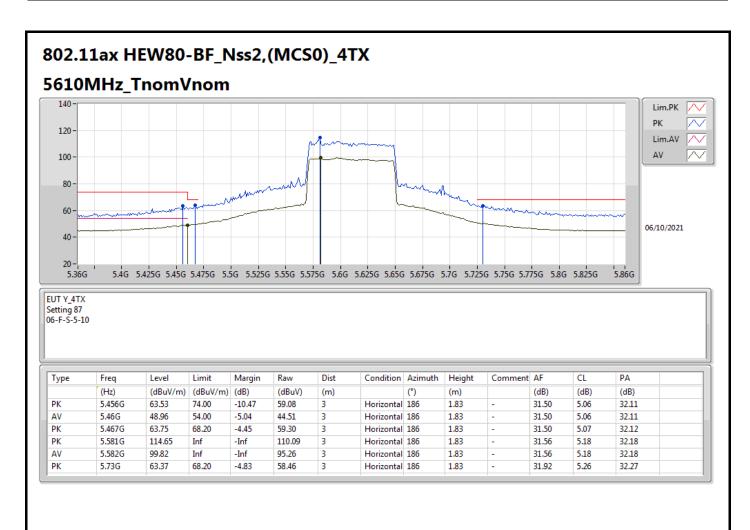
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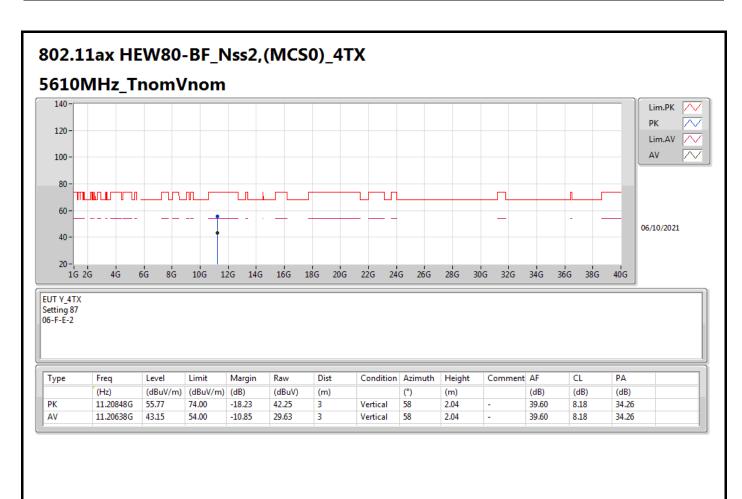
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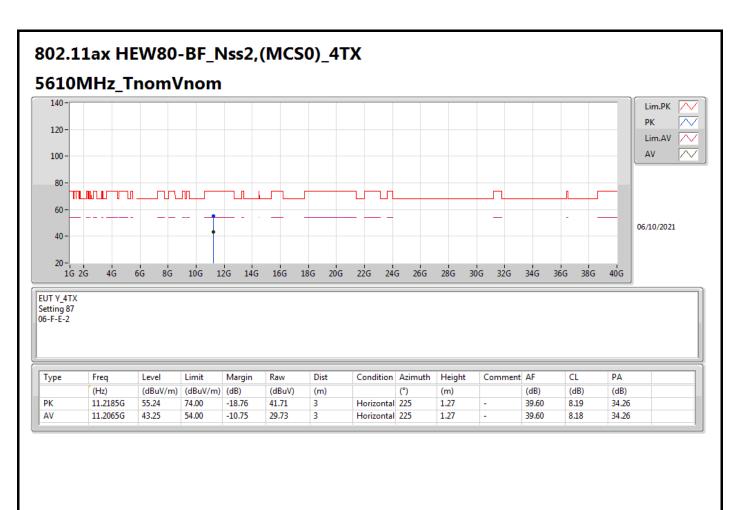
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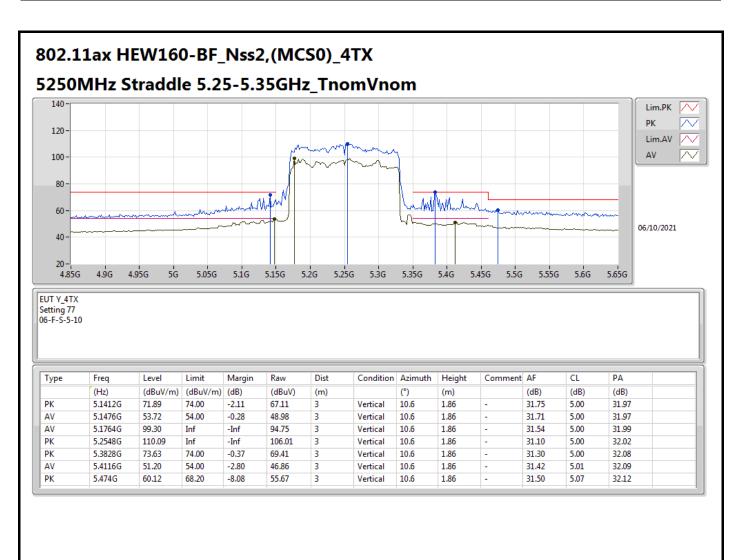
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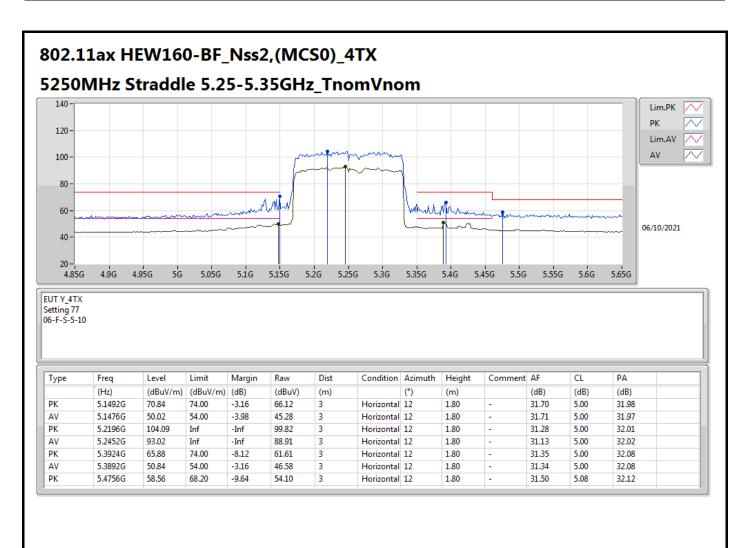
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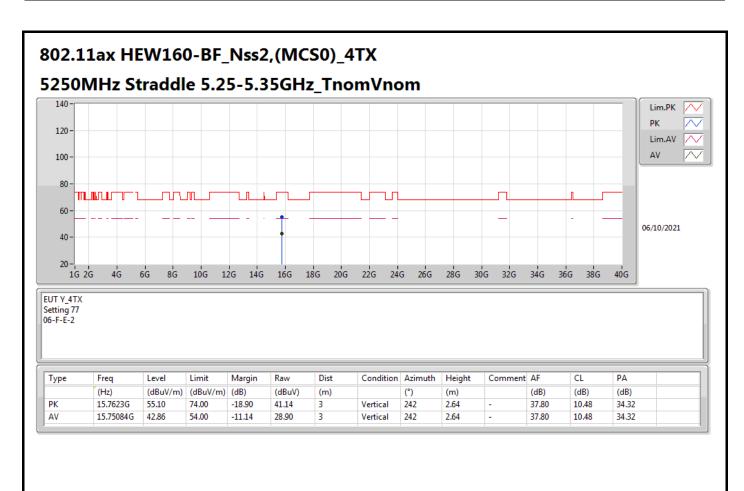
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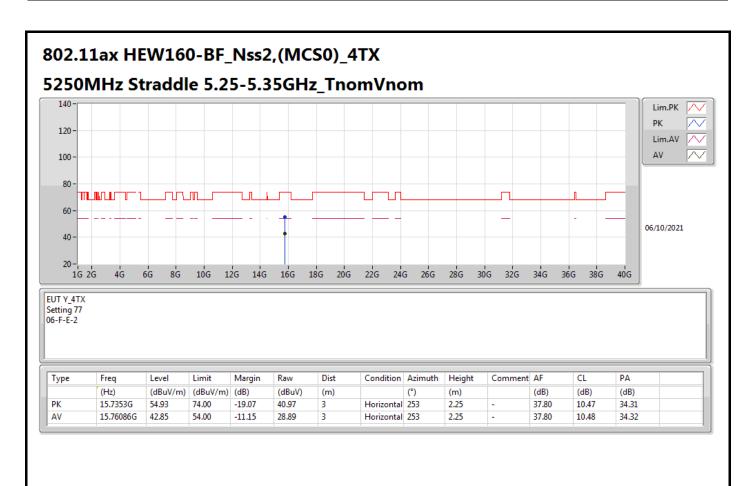
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