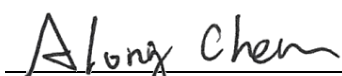


FCC Test Report

FCC ID : I88WAX650S
Equipment : 802.11ax (WiFi 6) Dual-Radio Unified Pro
Access Point
Model No. : WAX650S
Brand Name : ZYXEL
Applicant : Zyxel Communications Corporation
Address : No.2 Industry East RD. IX, Hsinchu Science
Park, Hsinchu 30075, Taiwan, R.O.C
Standard : 47 CFR FCC Part 15.407
Received Date : Aug. 01, 2019
Tested Date : Aug. 07 ~ Sep. 16, 2019

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:



Along Chen / Assistant Manager

Approved by:



Gary Chang / Manager



Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Local Support Equipment List	10
1.3	Test Setup Chart	10
1.4	The Equipment List	12
1.5	Testing Applied Standards	14
1.6	Deviation from Test Standard and Measurement Procedure.....	14
1.7	Measurement Uncertainty	14
2	TEST CONFIGURATION.....	15
2.1	Testing Condition	15
2.2	The Worst Test Modes and Channel Details	16
3	TRANSMITTER TEST RESULTS	18
3.1	Conducted Emissions.....	18
3.2	Emission Bandwidth	27
3.3	RF Output Power.....	36
3.4	Peak Power Spectral Density	42
3.5	Transmitter Radiated and Band Edge Emissions	52
3.6	Frequency Stability.....	99
4	TEST LABORATORY INFORMATION	101

Release Record

Report No.	Version	Description	Issued Date
FR980101AN	Rev. 01	Initial issue	Nov. 05, 2019

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 2.962MHz 42.67 (Margin -3.33dB) - AV	Pass
15.407(b) 15.209	Radiated Emissions	[dBuV/m at 3m]: 5650.00MHz 67.95 (Margin -0.25dB) - PK	Pass
15.407(a)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(e)	6dB bandwidth	Meet the requirement of limit	Pass
15.407(a)	RF Output Power	Max Power [dBm]: Non-beamforming mode 5150~5250MHz: 29.50 5725~5850MHz: 29.96 Beamforming mode 5150~5250MHz: 23.48 5725~5850MHz: 23.66	Pass
15.407(a)	Peak Power Spectral Density	Meet the requirement of limit	Pass
15.407(g)	Frequency Stability	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	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.

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
5150-5250 5725-5850	a	5180-5240 5745-5825	36-48 [4] 149-165 [5]	4	6-54 Mbps
5150-5250 5725-5850	n (HT20)	5180-5240 5745-5825	36-48 [4] 149-165 [5]	4	MCS 0-31
5150-5250 5725-5850	n (HT40)	5190-5230 5755-5795	38-46 [2] 151-159 [2]	4	MCS 0-31
5150-5250 5725-5850	ac (VHT20)	5180-5240 5745-5825	36-48 [4] 149-165 [5]	4	MCS 0-9
5150-5250 5725-5850	ac (VHT40)	5190-5230 5755-5795	38-46 [2] 151-159 [2]	4	MCS 0-9
5150-5250 5725-5850	ac (VHT80)	5210 5775	42 [1] 155 [1]	4	MCS 0-9
5150-5250 5725-5850	ax (HE20)	5180-5240 5745-5825	36-48 [4] 149-165 [5]	4	MCS 0-11
5150-5250 5725-5850	ax (HE40)	5190-5230 5755-5795	38-46 [2] 151-159 [2]	4	MCS 0-11
5150-5250 5725-5850	ax (HE80)	5210 5775	42 [1] 155 [1]	4	MCS 0-11
Note 1: Chip feature: OFDM/OFDMA- BPSK, QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulation. Note 2: Operating modes of this device are listed as above table. Note 3: 802.11ax supports beamforming function.					

1.1.2 Radio Details

Radio	Function
1	Wi-Fi 2.4GHz, 4T4R
2	Wi-Fi 5GHz, 4T4R
3	Wi-Fi 2.4GHz & 5GHz, RX only
4	Bluetooth LE only

1.1.3 Antenna Details

For Radio 2

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	AD442 R1.3	PIFA	Ipex	0	3.51	4.22	4.61	4.68
2	AD442 R1.3	PIFA	Ipex	0	3.51	4.22	4.61	4.68
3	AD442 R1.3	PIFA	Ipex	0	3.51	4.22	4.61	4.68
4	AD442 R1.3	PIFA	Ipex	0	3.51	4.22	4.61	4.68

For Radio 3

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	AD442 R1.3	PIFA	Ipex	5.7	6.9			
2	AD442 R1.3	PIFA	Ipex	5.7	6.9			

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter 30~57Vdc from POE
--------------------------	---

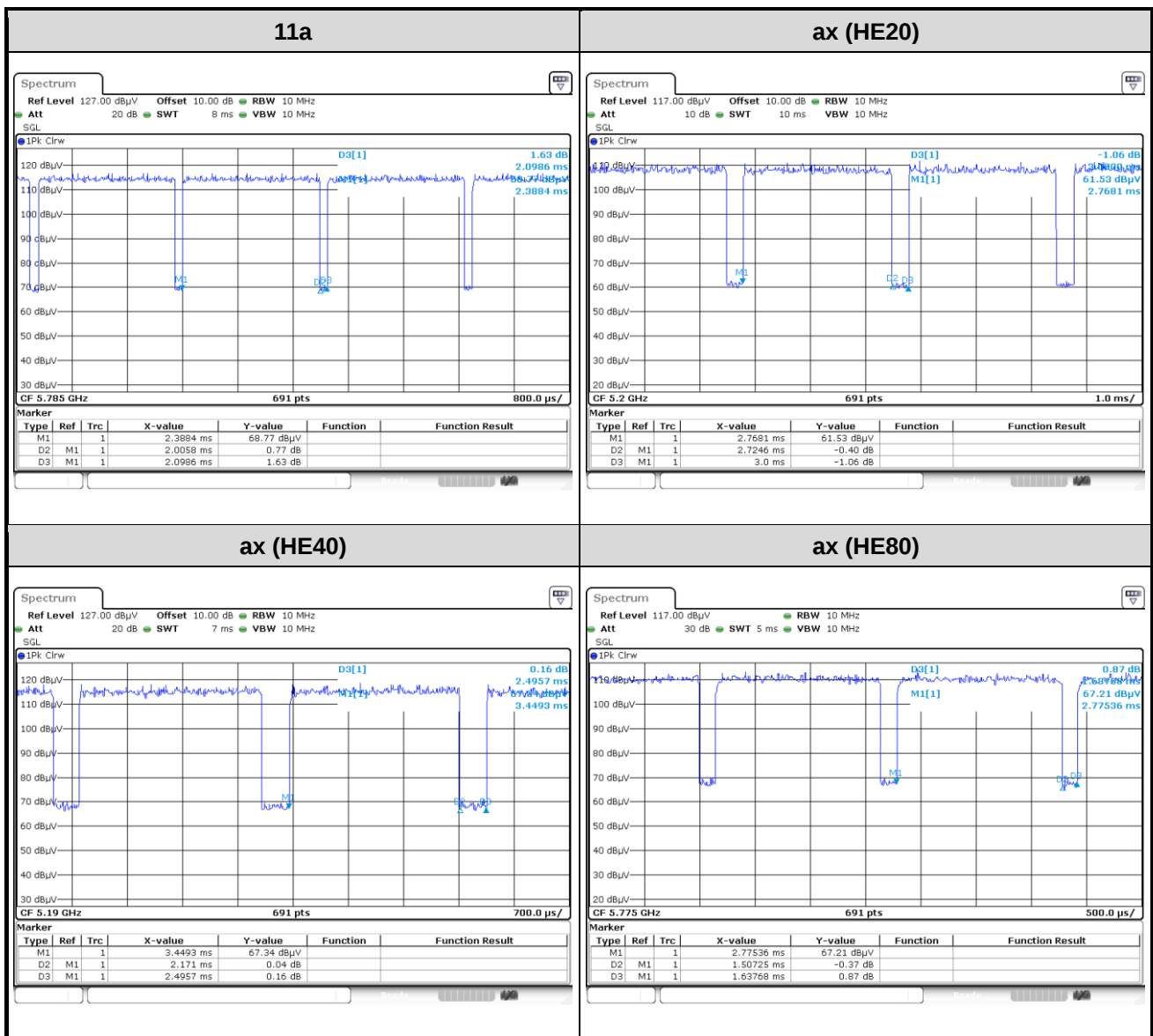
Note: The above power supply is not bundled in market.

1.1.5 Channel List

802.11a / n HT20 / ac VHT20 / ax HE20		802.11n HT40 / ac VHT40 / ax HE40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	38	5190
40	5200	46	5230
44	5220	151	5755
48	5240	159	5795
149	5745	802.11ac VHT80 / ax HE80	
153	5765	155	5775
157	5785	-	-
161	5805	-	-
165	5825	-	-

1.1.6 Test Tool and Duty Cycle

Test Tool	QSPR, v5.0-00170		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11a	95.58%	0.20
	ax (HE20)	90.82%	0.42
	ax (HE40)	86.99%	0.61
	ax (HE80)	92.04%	0.36



1.1.7 Power Index of Test Tool

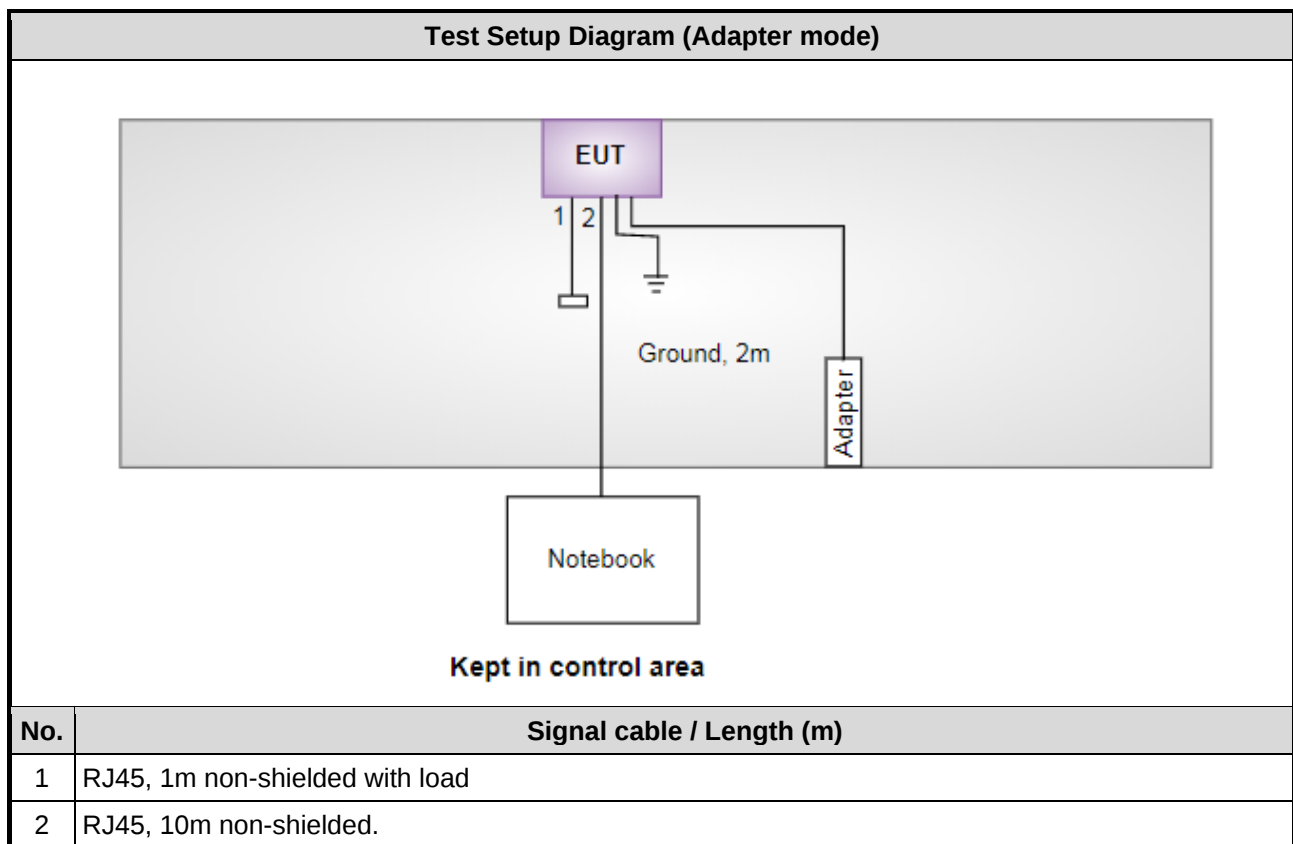
For Frequency band 5150-5250 MHz		
Modulation Mode	Test Frequency (MHz)	Power Index
11a	5180	20.5
11a	5200	20.5
11a	5240	20.5
ax (HE20)	5180	20
ax (HE20)	5200	21
ax (HE20)	5240	20.5
ax (HE40)	5190	17
ax (HE40)	5230	23.5
ax (HE80)	5210	15

For Frequency band 5725~5850 MHz		
Modulation Mode	Test Frequency (MHz)	Power Index
11a	5745	23.5
11a	5785	23.5
11a	5825	23.5
ax (HE20)	5745	23.5
ax (HE20)	5785	23.5
ax (HE20)	5825	23.5
ax (HE40)	5755	21.5
ax (HE80)	5795	22
ax (HE80)	5775	20

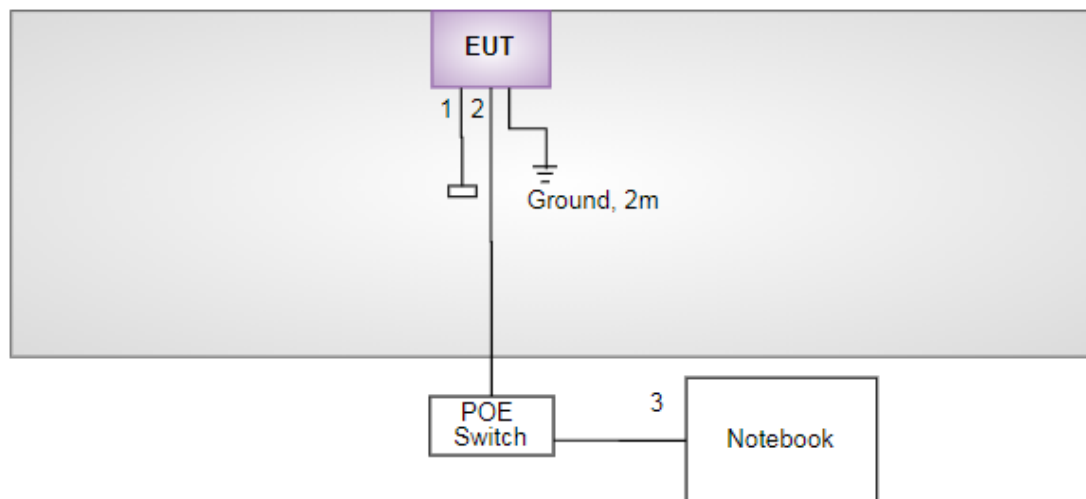
1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E6440	DoC	---
2	POE Switch	ZYXEL	XS1930-12HP	---	Provided by applicant.
3	Adapter	APD	WA-30P12R	---	Provided by applicant.

1.3 Test Setup Chart



Test Setup Diagram (POE mode)



Kept in control area

No.	Signal cable / Length (m)
1	RJ45, 1m non-shielded with load
2	RJ45, 10m non-shielded.
3	RJ45, 1m non-shielded.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Sep. 16, 2019				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Jan. 08, 2019	Jan. 07, 2020
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 05, 2018	Nov. 04, 2019
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 23, 2018	Oct. 22, 2019
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 3 / (03CH03-WS)				
Tested Date	Aug. 15 ~ Aug. 30, 2019				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101499	Jan. 07, 2019	Jan. 06, 2020
Receiver	R&S	ESR3	101658	Dec. 11, 2018	Dec. 10, 2019
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 17, 2019	Apr. 16, 2020
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Jan. 07, 2019	Jan. 06, 2020
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2018	Nov. 14, 2019
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 09, 2018	Nov. 08, 2019
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 08, 2018	Oct. 07, 2019
Preamplifier	EMC	EMC02325	980187	Aug. 14, 2019	Aug. 13, 2020
Preamplifier	Agilent	83017A	MY53270014	Aug. 07, 2019	Aug. 06, 2020
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Oct. 01, 2018	Sep. 30, 2019
RF cable-8M	EMC	EMC104-SM-SM-8000	181107	Oct. 01, 2018	Sep. 30, 2019
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Oct. 01, 2018	Sep. 30, 2019
LF cable-0.8M	EMC	EMC8D-NM-NM-8000	EMC8D-NM-NM-800-001	Oct. 01, 2018	Sep. 30, 2019
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Oct. 01, 2018	Sep. 30, 2019
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Oct. 01, 2018	Sep. 30, 2019
Measurement Software	SENSE-15247_DTS	V5.9	--	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Aug. 07 ~ Sep. 10, 2019				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Apr. 17, 2019	Apr. 16, 2020
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Dec. 05, 2018	Dec. 04, 2019
Power Meter	Anritsu	ML2495A	1241002	Oct. 09, 2018	Oct. 08, 2019
Power Sensor	Anritsu	MA2411B	1207366	Oct. 09, 2018	Oct. 08, 2019
AC POWER SOURCE	APC	AFC-500W	F312060012	Nov. 29, 2018	Nov. 28, 2019
Measurement Software	Sporton	SENSE-15247_DTS	V5.9	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Testing Applied Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.407

ANSI C63.10-2013

FCC KDB 789033 D02 General UNII Test Procedures New Rules

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

1.6 Deviation from Test Standard and Measurement Procedure

None

1.7 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 ($k=2$))

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	± 34.130 Hz
Conducted power	± 0.808 dB
Frequency error	$\pm 1 \times 10^{-9}$
Power density	± 0.583 dB
Conducted emission	± 2.715 dB
AC conducted emission	± 2.92 dB
Radiated emission ≤ 1 GHz	± 3.96 dB
Radiated emission > 1 GHz	± 4.51 dB
Time	$\pm 0.1\%$
Temperature	± 0.4 °C

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	24°C / 62%	Alex Tsai
Radiated Emissions	03CH03-WS	24-25°C / 61-63%	Roger Lu Brad Wu
RF Conducted	TH01-WS	22°C / 65%	Roger Lu

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Frequency band 5150~5250 MHz				
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	ax (HE40)	5230	MCS 0	1, 2
Radiated Emissions ≤1GHz	ax (HE40)	5230	MCS 0	1, 2
RF Output Power	11a	5180 / 5200 / 5240	6 Mbps	1
	ax (HE20)	5180 / 5200 / 5240	MCS 0	
	ax (HE40)	5190 / 5230	MCS 0	
	ax (HE80)	5210	MCS 0	
RF Output Power	ax (HE20)	5180 / 5200 / 5240	MCS 0	3
	ax (HE40)	5190 / 5230	MCS 0	
	ax (HE80)	5210	MCS 0	
Radiated Emissions >1GHz Emission Bandwidth Peak Power Spectral Density	11a	5180 / 5200 / 5240	6 Mbps	1
	ax (HE20)	5180 / 5200 / 5240	MCS 0	
	ax (HE40)	5190 / 5230	MCS 0	
	ax (HE80)	5210	MCS 0	
Frequency Stability	Un-modulation	5200	---	---
NOTE: 1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The Z-plane results were found as the worst case and were shown in this report. 2. The EUT had been tested by following test configurations. 1) Configuration 1: Adapter mode , Radio 2 / Non-Beamforming 2) Configuration 2: POE mode , Radio 2 / Non-Beamforming 3) Configuration 3: Adapter mode , Radio 2 / Beamforming				

Frequency band 5725-5850 MHz				
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	11a	5745	6 Mbps	1, 2
Radiated Emissions ≤1GHz	11a	5745	6 Mbps	1, 2
RF Output Power	11a	5745 / 5785 / 5825	6 Mbps	1
	ax (HE20)	5745 / 5785 / 5825	MCS 0	
	ax (HE40)	5755 / 5795	MCS 0	
	ax (HE80)	5775	MCS 0	
RF Output Power	ax (HE20)	5745 / 5785 / 5825	MCS 0	3
	ax (HE40)	5755 / 5795	MCS 0	
	ax (HE80)	5775	MCS 0	
Radiated Emissions >1GHz Emission Bandwidth 6dB bandwidth Peak Power Spectral Density	11a	5745 / 5785 / 5825	6 Mbps	1
	ax (HE20)	5745 / 5785 / 5825	MCS 0	
	ax (HE40)	5755 / 5795	MCS 0	
	ax (HE80)	5775	MCS 0	
Frequency Stability	Un-modulation	5785	---	---
NOTE: 1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The Z-plane results were found as the worst case and were shown in this report. 2. The EUT had been tested by following test configurations. 1) Configuration 1: Adapter mode , Radio 2 / Non-Beamforming 2) Configuration 2: POE mode , Radio 2 / Non-Beamforming 3) Configuration 3: Adapter mode , Radio 2 / Beamforming				

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

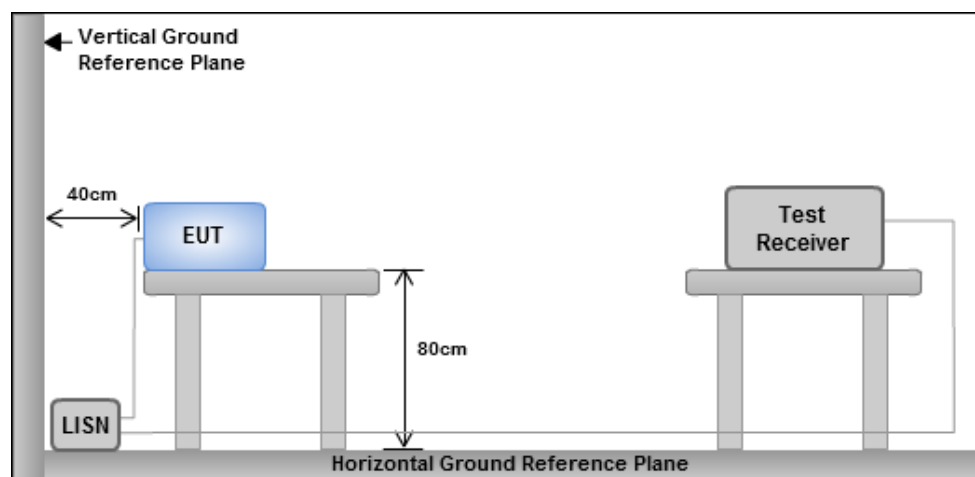
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

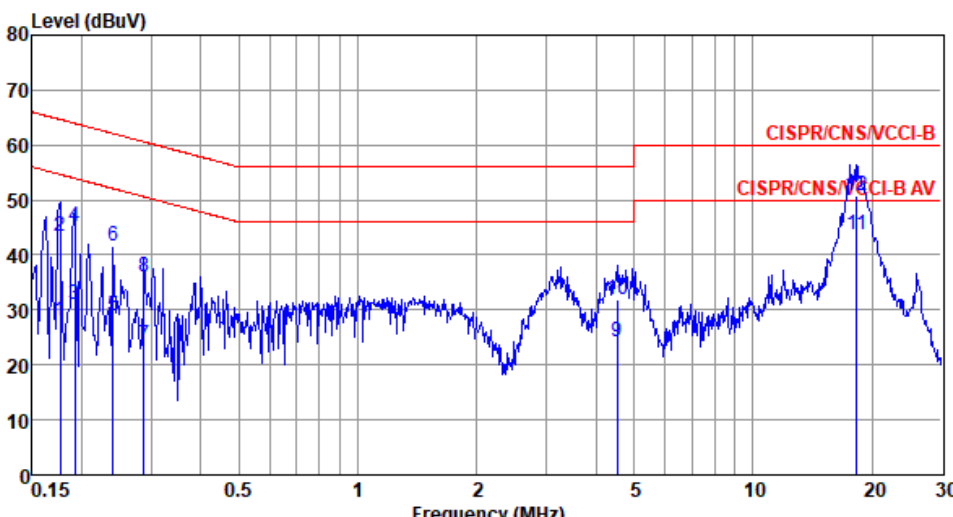
3.1.3 Test Setup



- Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

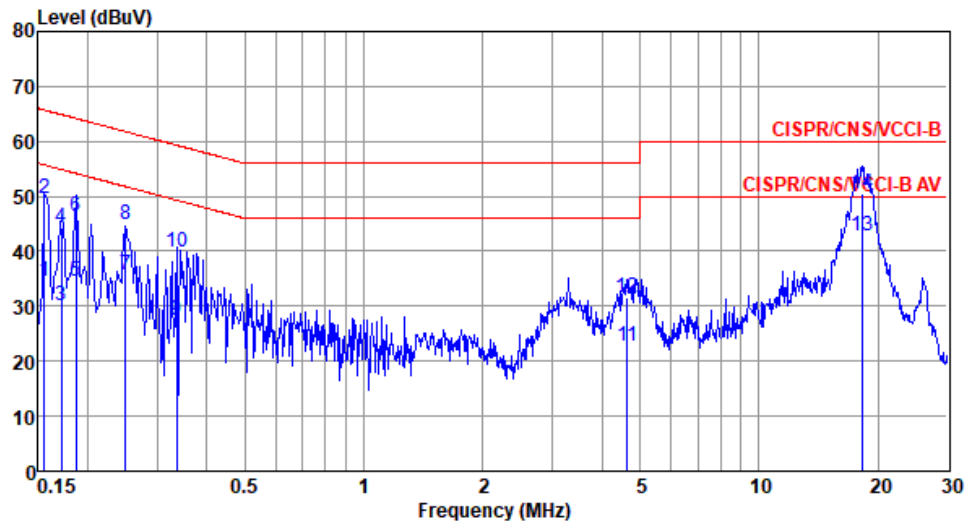
Modulation	ax (HE40)	Test Freq. (MHz)	5230
Power Phase	Line	Test Configuration	1



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.177	28.05	54.64	-26.59	18.29	9.54	0.06	Average
2	0.177	43.41	64.64	-21.23	33.65	9.54	0.06	QP
3	0.192	31.09	53.93	-22.84	21.30	9.54	0.07	Average
4	0.192	45.23	63.93	-18.70	35.44	9.54	0.07	QP
5	0.240	28.81	52.08	-23.27	18.98	9.55	0.07	Average
6	0.240	41.48	62.08	-20.60	31.65	9.55	0.07	QP
7	0.288	23.71	50.59	-26.88	13.84	9.56	0.08	Average
8	0.288	35.87	60.59	-24.72	26.00	9.56	0.08	QP
9	4.525	24.10	46.00	-21.90	13.80	9.62	0.30	Average
10	4.525	31.97	56.00	-24.03	21.67	9.62	0.30	QP
11*	18.328	43.61	50.00	-6.39	32.79	9.66	0.59	Average
12	18.328	50.83	60.00	-9.17	40.01	9.66	0.59	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 Note 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

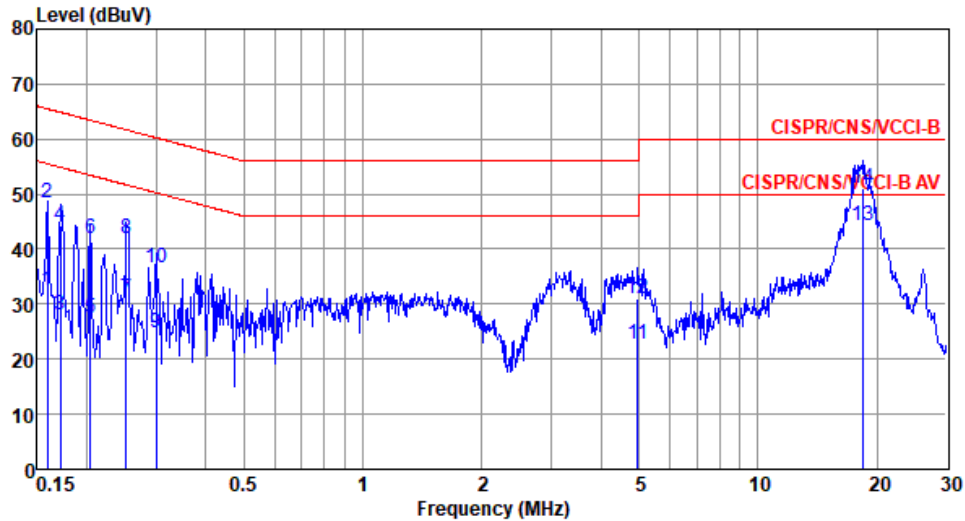
Modulation	ax (HE40)	Test Freq. (MHz)	5230
Power Phase	Neutral	Test Configuration	1



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line dBuV	Limit dB	Level dBuV	factor dB	loss dB	Remark
1	0.156	34.57	55.69	-21.12	24.84	9.57	0.05	Average
2	0.156	49.46	65.69	-16.23	39.73	9.57	0.05	QP
3	0.171	30.12	54.90	-24.78	20.37	9.57	0.06	Average
4	0.171	44.17	64.90	-20.73	34.42	9.57	0.06	QP
5	0.186	34.59	54.20	-19.61	24.81	9.58	0.07	Average
6	0.186	46.32	64.20	-17.88	36.54	9.58	0.07	QP
7	0.249	35.80	51.78	-15.98	26.01	9.59	0.07	Average
8	0.249	44.92	61.78	-16.86	35.13	9.59	0.07	QP
9	0.336	27.47	49.31	-21.84	17.66	9.60	0.08	Average
10	0.336	39.99	59.31	-19.32	30.18	9.60	0.08	QP
11	4.647	22.78	46.00	-23.22	12.53	9.67	0.31	Average
12	4.647	31.53	56.00	-24.47	21.28	9.67	0.31	QP
13*	18.232	42.88	50.00	-7.12	32.07	9.80	0.59	Average
14	18.232	50.36	60.00	-9.64	39.55	9.80	0.59	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

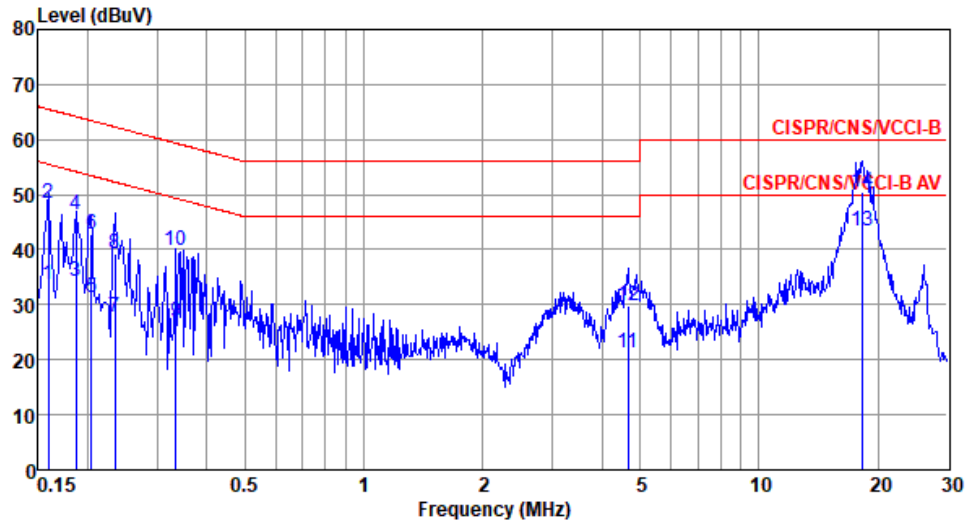
Modulation	11a	Test Freq. (MHz)	5745
Power Phase	Line	Test Configuration	1



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	32.51	55.52	-23.01	22.80	9.53	0.05	Average
2	0.159	48.35	65.52	-17.17	38.64	9.53	0.05	QP
3	0.171	28.10	54.90	-26.80	18.36	9.53	0.06	Average
4	0.171	44.19	64.90	-20.71	34.45	9.53	0.06	QP
5	0.204	27.58	53.45	-25.87	17.78	9.54	0.07	Average
6	0.204	42.06	63.45	-21.39	32.26	9.54	0.07	QP
7	0.252	30.91	51.69	-20.78	21.08	9.55	0.07	Average
8	0.252	41.79	61.69	-19.90	31.96	9.55	0.07	QP
9	0.300	24.80	50.24	-25.44	14.93	9.56	0.08	Average
10	0.300	36.68	60.24	-23.56	26.81	9.56	0.08	QP
11	4.952	22.69	46.00	-23.31	12.37	9.62	0.32	Average
12	4.952	31.12	56.00	-24.88	20.80	9.62	0.32	QP
13*	18.524	44.24	50.00	-5.76	33.42	9.66	0.59	Average
14	18.524	50.95	60.00	-9.05	40.13	9.66	0.59	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

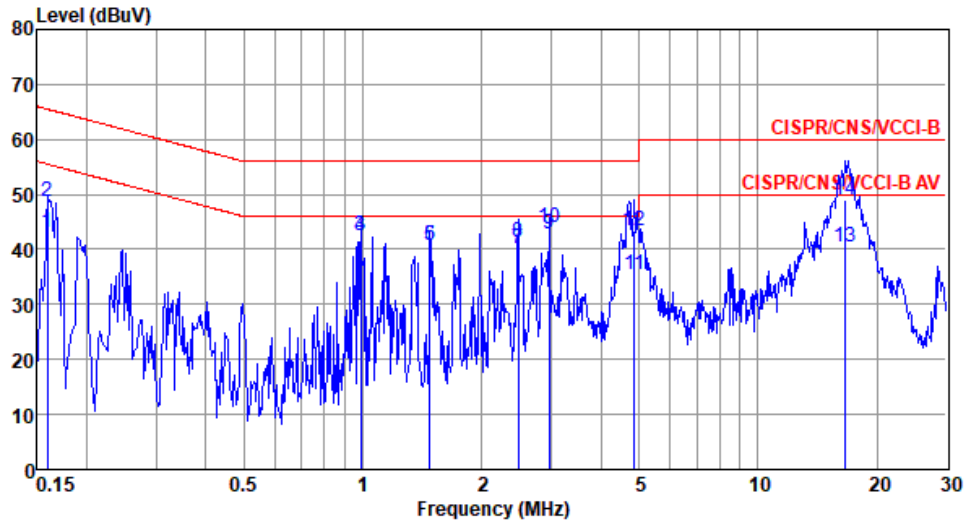
Modulation	11a	Test Freq. (MHz)	5745
Power Phase	Neutral	Test Configuration	1



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line	Limit	Level	factor	loss	Remark
			dBuV	dB	dBuV	dB	dB	
1	0.159	33.71	55.52	-21.81	23.97	9.57	0.05	Average
2	0.159	48.35	65.52	-17.17	38.61	9.57	0.05	QP
3	0.186	34.13	54.20	-20.07	24.35	9.58	0.07	Average
4	0.186	46.28	64.20	-17.92	36.50	9.58	0.07	QP
5	0.204	31.38	53.45	-22.07	21.59	9.58	0.07	Average
6	0.204	42.94	63.45	-20.51	33.15	9.58	0.07	QP
7	0.234	27.84	52.30	-24.46	18.04	9.59	0.07	Average
8	0.234	39.23	62.30	-23.07	29.43	9.59	0.07	QP
9	0.334	26.74	49.35	-22.61	16.93	9.60	0.08	Average
10	0.334	39.89	59.35	-19.46	30.08	9.60	0.08	QP
11	4.672	21.18	46.00	-24.82	10.93	9.67	0.31	Average
12	4.672	29.91	56.00	-26.09	19.66	9.67	0.31	QP
13*	18.328	43.33	50.00	-6.67	32.52	9.80	0.59	Average
14	18.328	50.61	60.00	-9.39	39.80	9.80	0.59	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

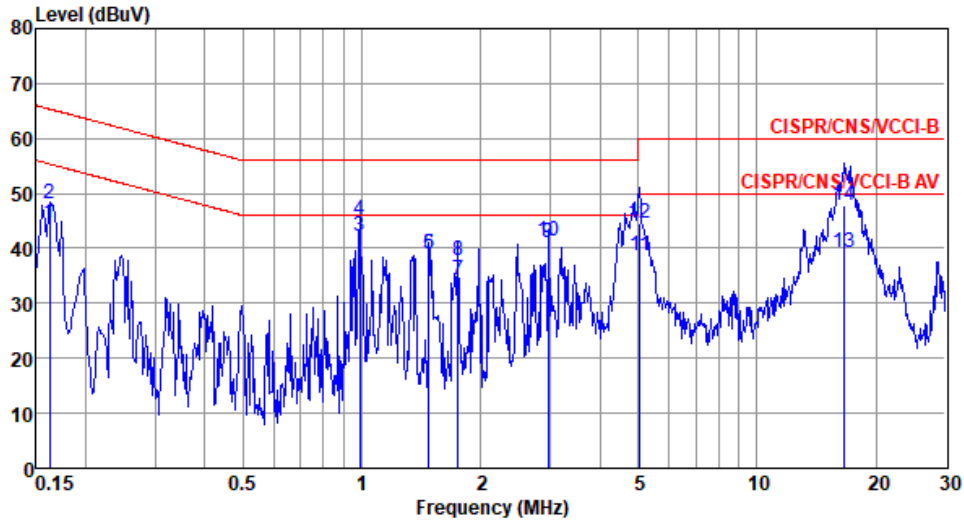
Modulation	ax (HE40)	Test Freq. (MHz)	5230
Power Phase	Line	Test Configuration	2



	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	LISN factor dB	cable loss dB	Remark
1	0.159	43.18	55.52	-12.34	33.60	9.53	0.05	Average
2	0.159	48.73	65.52	-16.79	39.15	9.53	0.05	QP
3	0.989	42.44	46.00	-3.56	32.74	9.60	0.10	Average
4	0.989	42.64	56.00	-13.36	32.94	9.60	0.10	QP
5	1.480	40.66	46.00	-5.34	30.93	9.60	0.13	Average
6	1.480	40.75	56.00	-15.25	31.02	9.60	0.13	QP
7	2.474	40.26	46.00	-5.74	30.46	9.60	0.20	Average
8	2.474	41.36	56.00	-14.64	31.56	9.60	0.20	QP
9*	2.962	42.67	46.00	-3.33	32.83	9.61	0.23	Average
10	2.962	44.08	56.00	-11.92	34.24	9.61	0.23	QP
11	4.874	35.40	46.00	-10.60	25.47	9.62	0.31	Average
12	4.874	43.28	56.00	-12.72	33.35	9.62	0.31	QP
13	16.661	40.46	50.00	-9.54	30.23	9.66	0.57	Average
14	16.661	49.00	60.00	-11.00	38.77	9.66	0.57	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBUV) – Limit Line (dBUV).

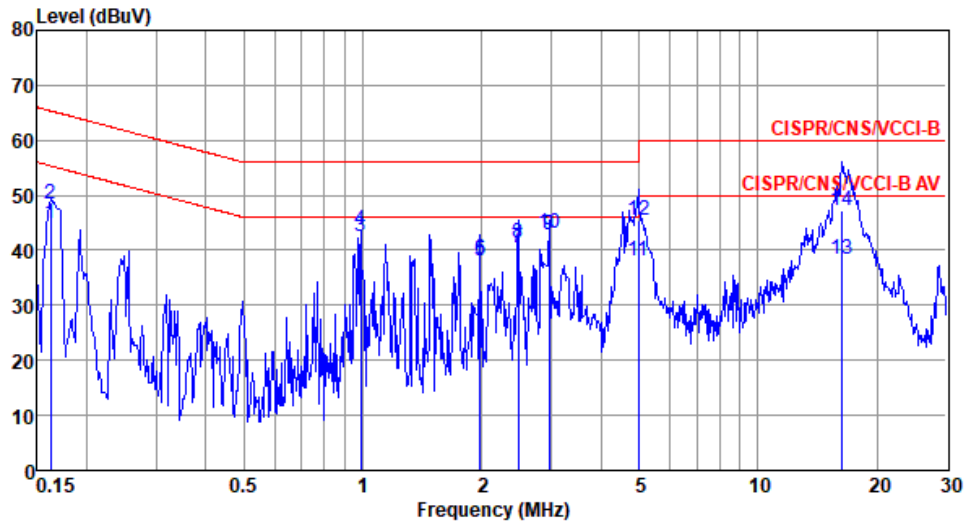
Modulation	ax (HE40)	Test Freq. (MHz)	5230
Power Phase	Neutral	Test Configuration	2



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.162	44.47	55.34	-10.87	34.84	9.57	0.06	Average
2	0.162	48.10	65.34	-17.24	38.47	9.57	0.06	QP
3*	0.989	42.19	46.00	-3.81	32.45	9.64	0.10	Average
4	0.989	45.27	56.00	-10.73	35.53	9.64	0.10	QP
5	1.480	38.83	46.00	-7.17	29.05	9.65	0.13	Average
6	1.480	38.89	56.00	-17.11	29.11	9.65	0.13	QP
7	1.753	34.18	46.00	-11.82	24.38	9.65	0.15	Average
8	1.753	37.90	56.00	-18.10	28.10	9.65	0.15	QP
9	2.962	40.94	46.00	-5.06	31.05	9.66	0.23	Average
10	2.962	41.30	56.00	-14.70	31.41	9.66	0.23	QP
11	5.058	38.78	50.00	-11.22	28.79	9.67	0.32	Average
12	5.058	44.70	60.00	-15.30	34.71	9.67	0.32	QP
13	16.661	39.36	50.00	-10.64	29.01	9.78	0.57	Average
14	16.661	47.72	60.00	-12.28	37.37	9.78	0.57	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

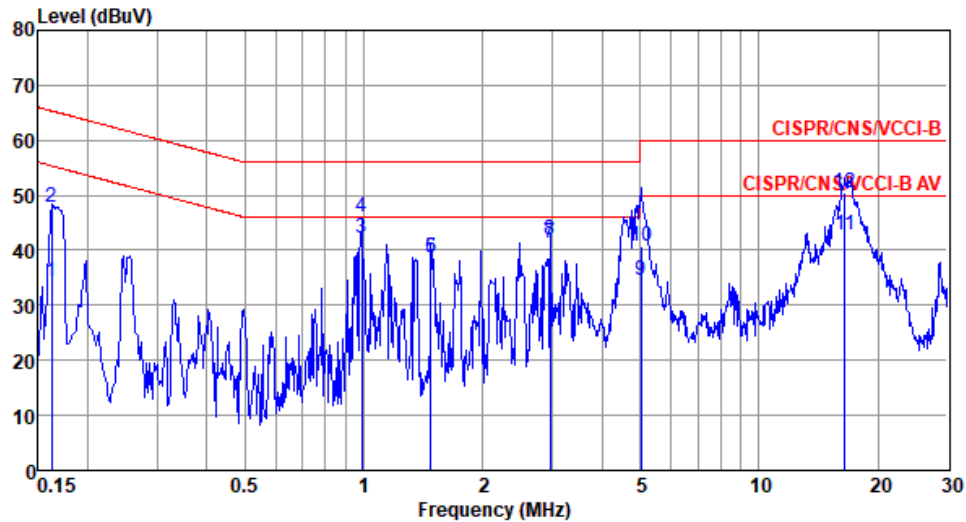
Modulation	11a	Test Freq. (MHz)	5745
Power Phase	Line	Test Configuration	2



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line	Limit	Level	factor	loss	Remark
			dBuV	dB	dBuV	dB	dB	
1	0.162	44.94	55.34	-10.40	35.35	9.53	0.06	Average
2	0.162	48.31	65.34	-17.03	38.72	9.53	0.06	QP
3	0.989	42.48	46.00	-3.52	32.78	9.60	0.10	Average
4	0.989	43.60	56.00	-12.40	33.90	9.60	0.10	QP
5	1.980	38.14	46.00	-7.86	28.38	9.60	0.16	Average
6	1.980	38.51	56.00	-17.49	28.75	9.60	0.16	QP
7	2.474	40.48	46.00	-5.52	30.68	9.60	0.20	Average
8	2.474	41.41	56.00	-14.59	31.61	9.60	0.20	QP
9*	2.962	42.66	46.00	-3.34	32.82	9.61	0.23	Average
10	2.962	43.01	56.00	-12.99	33.17	9.61	0.23	QP
11	4.978	38.10	46.00	-7.90	28.16	9.62	0.32	Average
12	4.978	45.52	56.00	-10.48	35.58	9.62	0.32	QP
13	16.312	38.48	50.00	-11.52	28.25	9.66	0.57	Average
14	16.312	47.27	60.00	-12.73	37.04	9.66	0.57	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation	11a	Test Freq. (MHz)	5745
Power Phase	Neutral	Test Configuration	2



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line	Limit	Level	factor	loss	Remark
			dBuV	dB	dBuV	dB	dB	
1	0.162	34.21	55.34	-21.13	24.58	9.57	0.06	Average
2	0.162	47.91	65.34	-17.43	38.28	9.57	0.06	QP
3*	0.989	42.26	46.00	-3.74	32.52	9.64	0.10	Average
4	0.989	46.18	56.00	-9.82	36.44	9.64	0.10	QP
5	1.480	38.62	46.00	-7.38	28.84	9.65	0.13	Average
6	1.480	38.65	56.00	-17.35	28.87	9.65	0.13	QP
7	2.962	41.21	46.00	-4.79	31.32	9.66	0.23	Average
8	2.962	41.89	56.00	-14.11	32.00	9.66	0.23	QP
9	5.031	34.49	50.00	-15.51	24.50	9.67	0.32	Average
10	5.031	40.80	60.00	-19.20	30.81	9.67	0.32	QP
11	16.486	42.68	50.00	-7.32	32.33	9.78	0.57	Average
12	16.486	50.41	60.00	-9.59	40.06	9.78	0.57	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 Emission Bandwidth

3.2.1 Limit of Emission Bandwidth

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

3.2.2 Test Procedures

26dB Bandwidth

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW, Detector = Peak.
3. Trace mode = max hold.
4. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

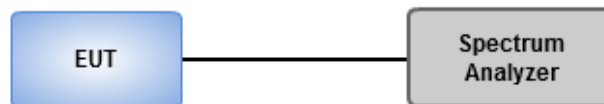
Occupied Bandwidth

1. Set RBW = 1 % to 5 % of the OBW.
2. Set VBW $\geq$ 3 RBW.
3. Sample detection and single sweep mode shall be used.
4. Use the 99 % power bandwidth function of the instrument.

6dB Bandwidth

1. Set RBW = 100kHz, VBW = 300kHz.
2. Detector = Peak, Trace mode = max hold.
3. Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.2.3 Test Setup



3.2.4 Test Result of Emission Bandwidth

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
5.15-5.25GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4T X	19.13M	16.353M	16M4D1D	18.623M	16.353M
802.11ax HEW20_Nss1,(MCS0)_4TX	21.812M	18.886M	18M9D1D	20.797M	18.886M
802.11ax HEW40_Nss1,(MCS0)_4TX	48.116M	37.916M	37M9D1D	43.043M	37.771M
802.11ax HEW80_Nss1,(MCS0)_4TX	82.319M	77.279M	77M3D1D	81.449M	76.99M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4T X	16.304M	16.498M	16M5D1D	3.13M	3.357M
802.11ax HEW20_Nss1,(MCS0)_4TX	18.913M	19.03M	19M0D1D	4.348M	4.399M
802.11ax HEW40_Nss1,(MCS0)_4TX	37.971M	37.916M	37M9D1D	3.884M	3.994M
802.11ax HEW80_Nss1,(MCS0)_4TX	77.681M	77.279M	77M3D1D	3.942M	4.052M

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

Max-OBW = Maximum 99% occupied bandwidth;

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

Min-OBW = Minimum 99% occupied bandwidth;

Result

Mode	Result	Limit (Hz)	Port 1 -N dB (Hz)	Port 1- OBW (Hz)	Port 2 -N dB (Hz)	Port 2- OBW (Hz)	Port 3 -N dB (Hz)	Port 3- OBW (Hz)	Port 4 -N dB (Hz)	Port 4- OBW (Hz)
802.11a_ Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	18.768M	16.353M	18.768M	16.353M	19.13M	16.353M	19.13M	16.353M
5200MHz	Pass	Inf	18.841M	16.353M	19.058M	16.353M	19.13M	16.353M	18.986M	16.353M
5240MHz	Pass	Inf	18.841M	16.353M	18.986M	16.353M	18.768M	16.353M	18.623M	16.353M
5745MHz	Pass	500k	16.304M	16.353M	16.014M	16.353M	16.304M	16.425M	16.304M	16.353M
5785MHz	Pass	500k	15.58M	16.281M	16.304M	16.425M	15.942M	16.353M	16.304M	16.353M
5825MHz	Pass	500k	15.145M	16.281M	16.304M	16.353M	16.304M	16.498M	16.304M	16.353M
802.11ax HEW20_ Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	21.304M	18.886M	21.449M	18.886M	21.304M	18.886M	20.797M	18.886M
5200MHz	Pass	Inf	21.304M	18.886M	20.942M	18.886M	21.014M	18.886M	21.087M	18.886M
5240MHz	Pass	Inf	21.304M	18.886M	21.449M	18.886M	21.812M	18.886M	21.232M	18.886M
5745MHz	Pass	500k	18.913M	18.886M	18.913M	18.958M	18.841M	19.03M	18.913M	18.886M
5785MHz	Pass	500k	18.841M	18.886M	18.913M	18.958M	18.841M	18.958M	18.913M	18.958M
5825MHz	Pass	500k	18.841M	18.958M	18.913M	18.958M	18.913M	18.958M	18.768M	18.958M
802.11ax HEW40_ Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	Inf	44.348M	37.916M	43.043M	37.916M	44.058M	37.916M	44.348M	37.771M
5230MHz	Pass	Inf	48.116M	37.771M	46.522M	37.916M	46.957M	37.916M	47.536M	37.916M
5755MHz	Pass	500k	37.971M	37.771M	37.971M	37.771M	37.826M	37.771M	37.826M	37.771M
5795MHz	Pass	500k	37.971M	37.771M	37.971M	37.916M	37.681M	37.771M	37.971M	37.771M
802.11ax HEW80_ Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	82.319M	76.99M	82.319M	76.99M	81.449M	77.279M	81.739M	76.99M
5775MHz	Pass	500k	75.652M	77.279M	77.681M	77.279M	74.493M	76.99M	76.522M	76.99M

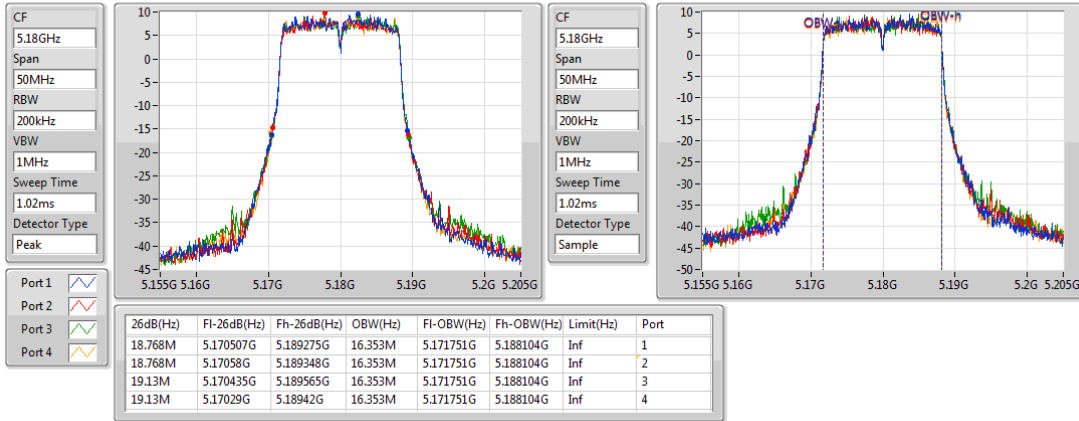
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band

Port X-OBW = Port X 99% occupied bandwidth;

802.11a_Nss1,(6Mbps)_4TX

EBW

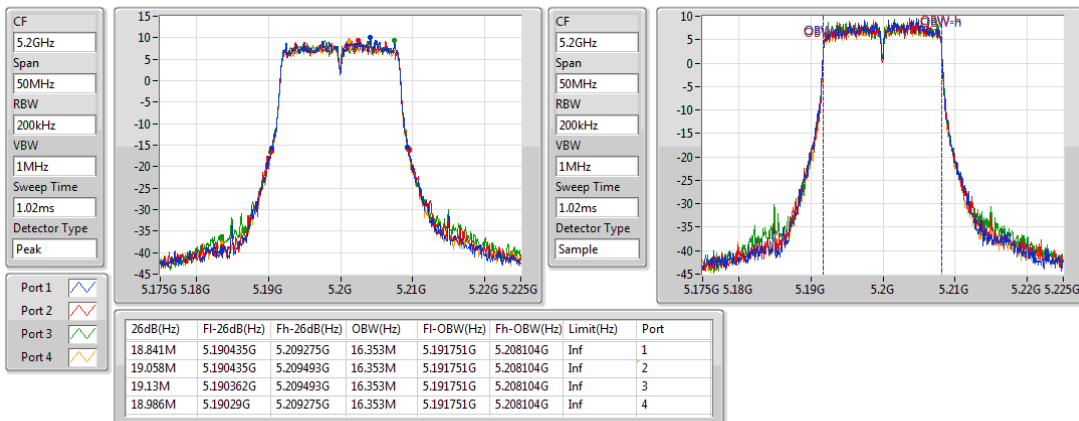
5180MHz



802.11a_Nss1,(6Mbps)_4TX

EBW

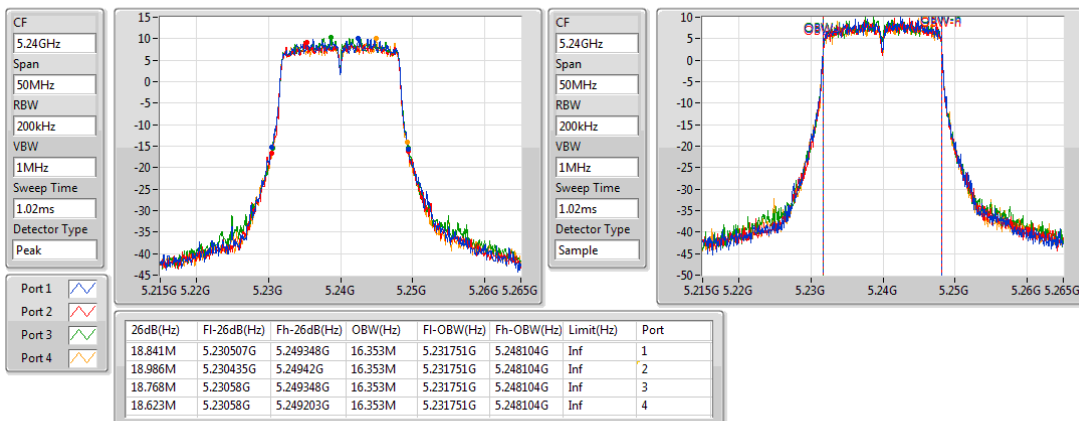
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802.11a_Nss1,(6Mbps)_4TX

EBW

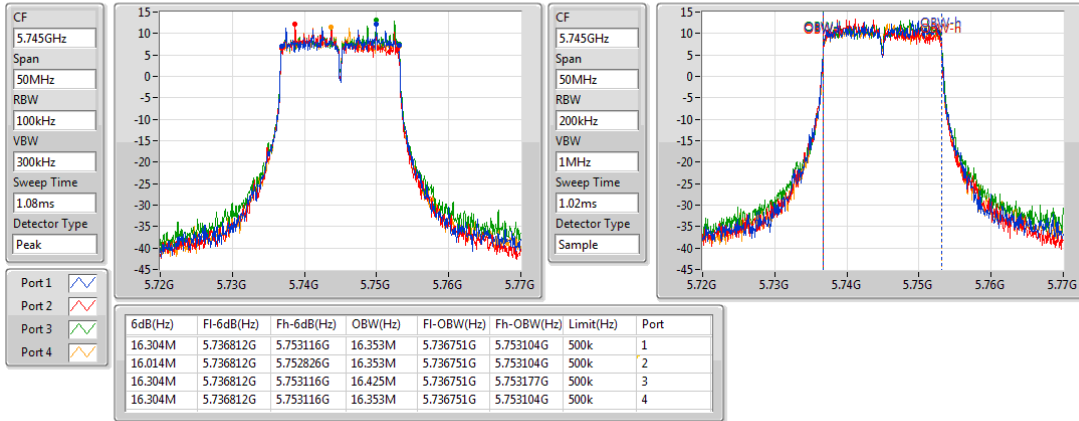
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802.11a_Nss1,(6Mbps)_4TX

EBW

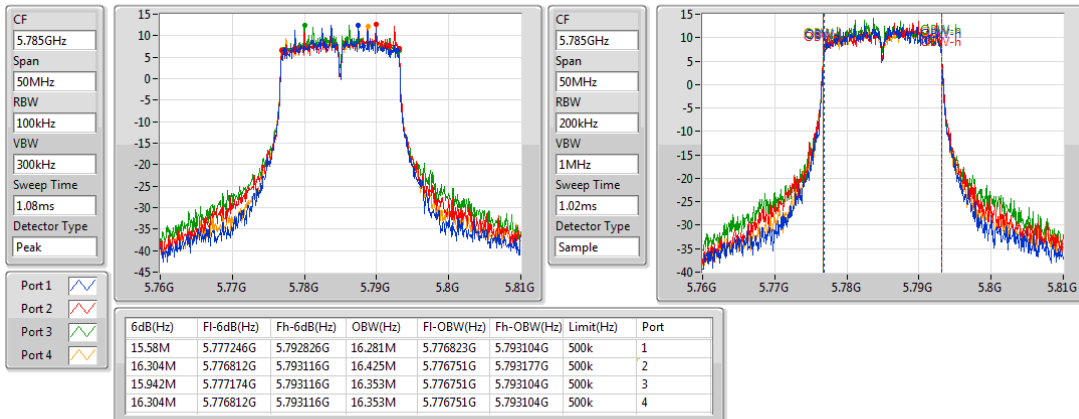
5745MHz



802.11a_Nss1,(6Mbps)_4TX

EBW

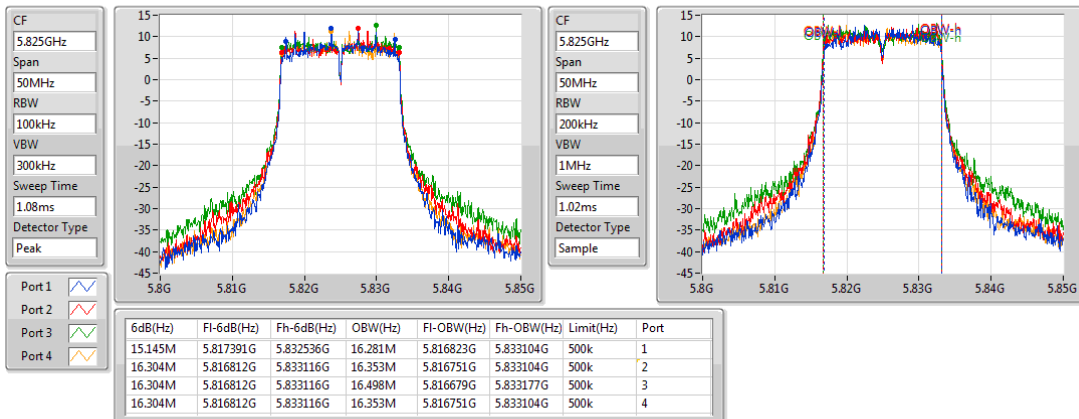
5785MHz



802.11a_Nss1,(6Mbps)_4TX

EBW

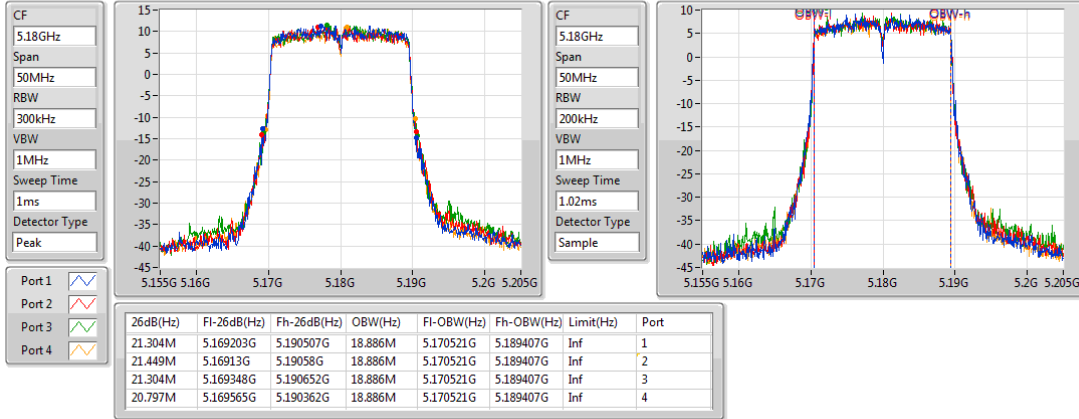
5825MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

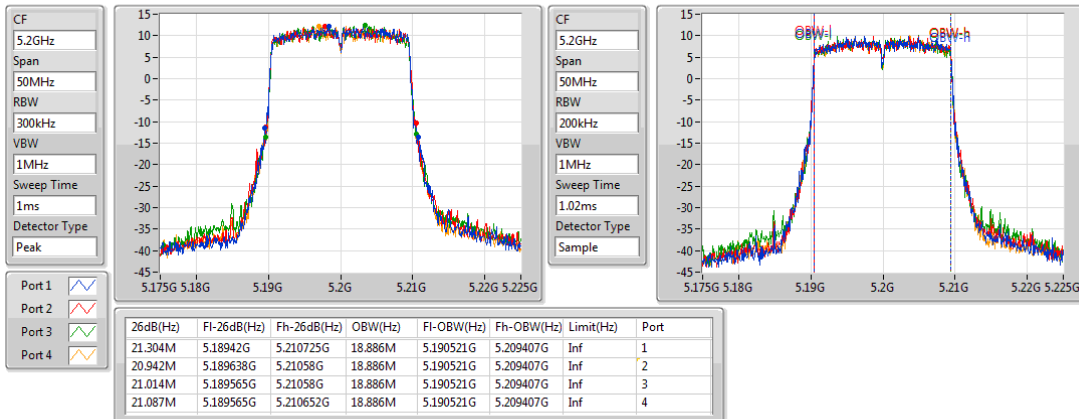
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802.11ax HEW20_Nss1,(MCS0)_4TX

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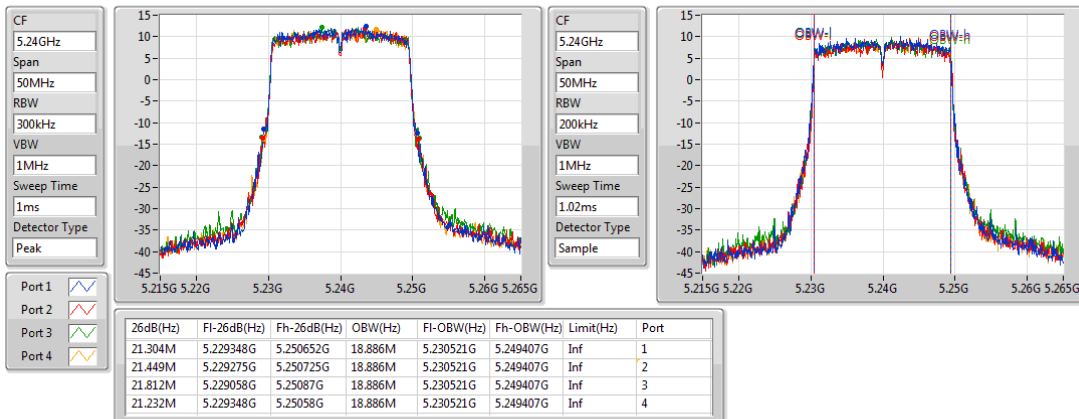
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802.11ax HEW20_Nss1,(MCS0)_4TX

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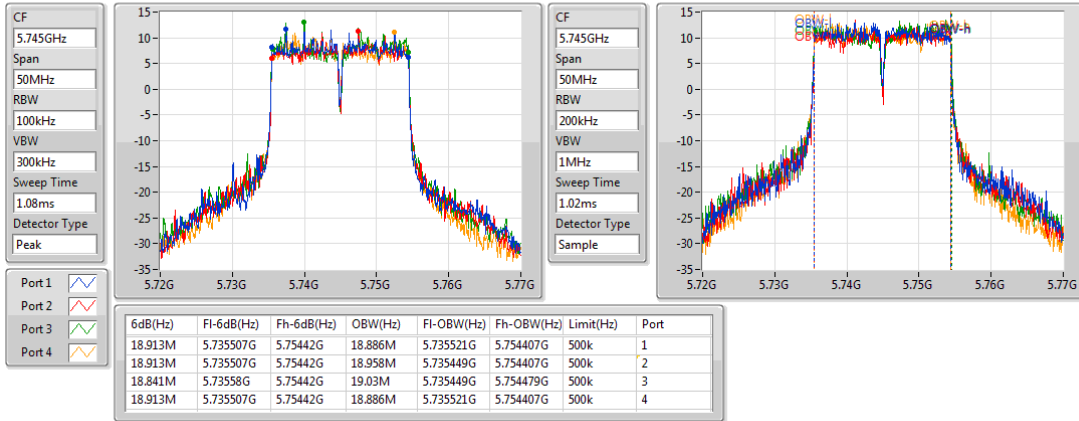
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802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

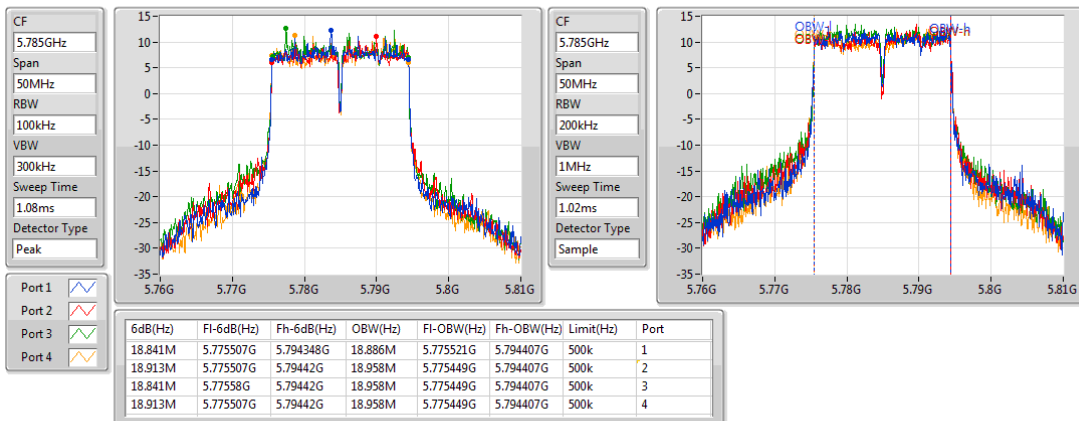
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802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

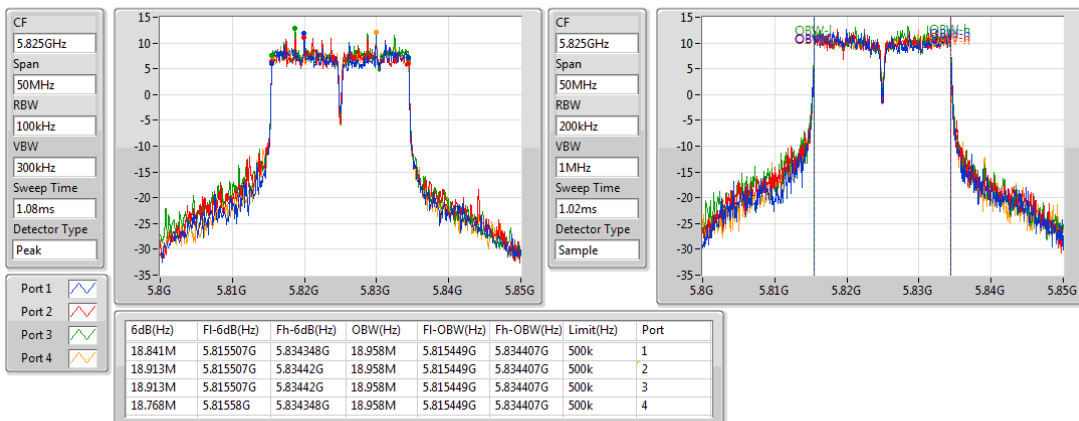
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802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

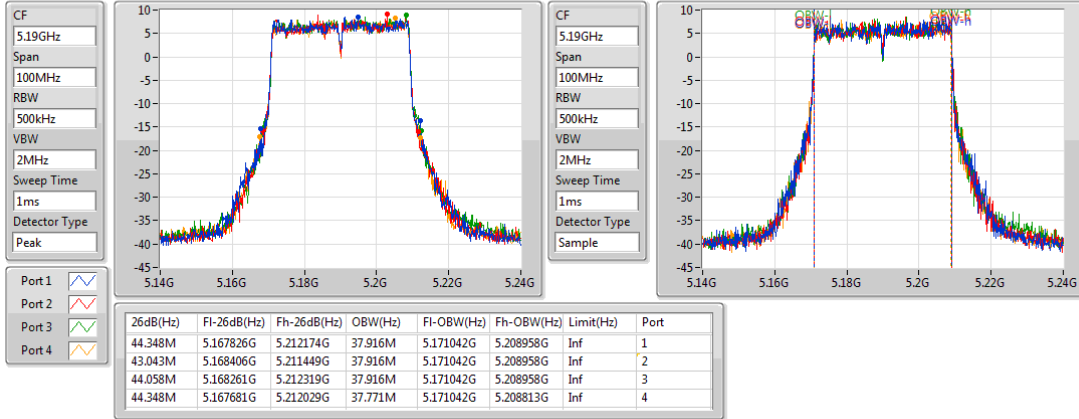
5825MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

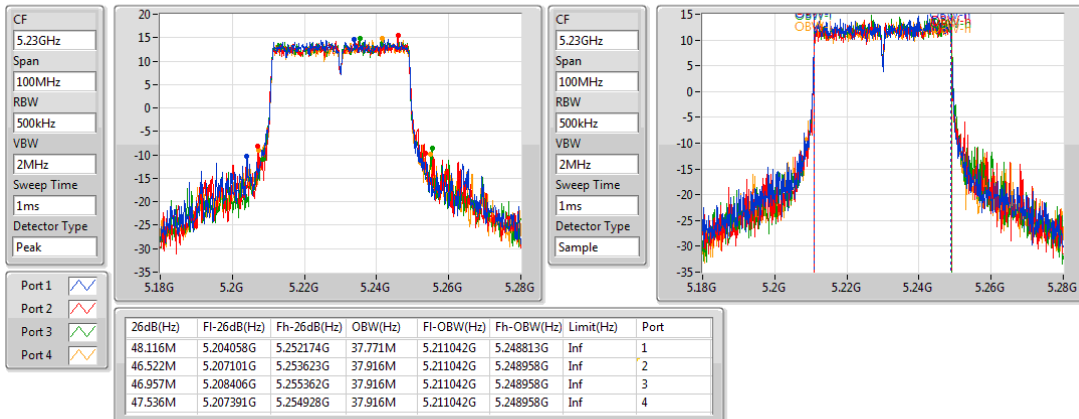
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802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

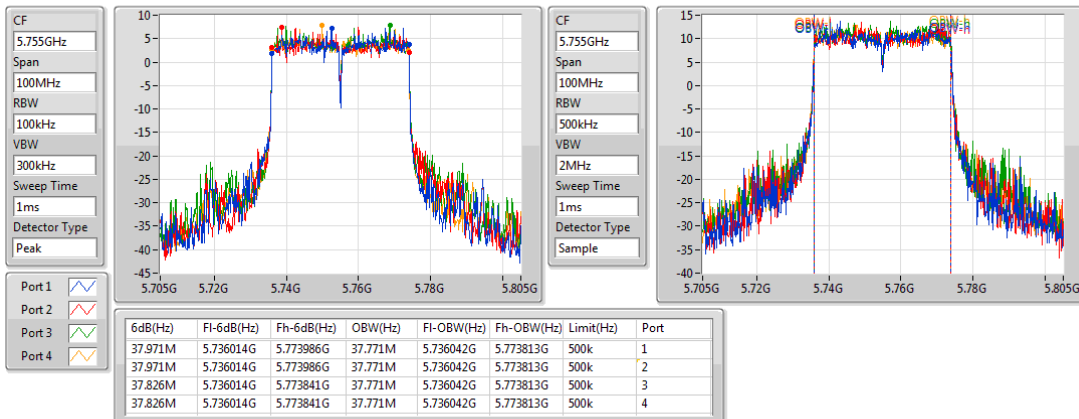
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802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

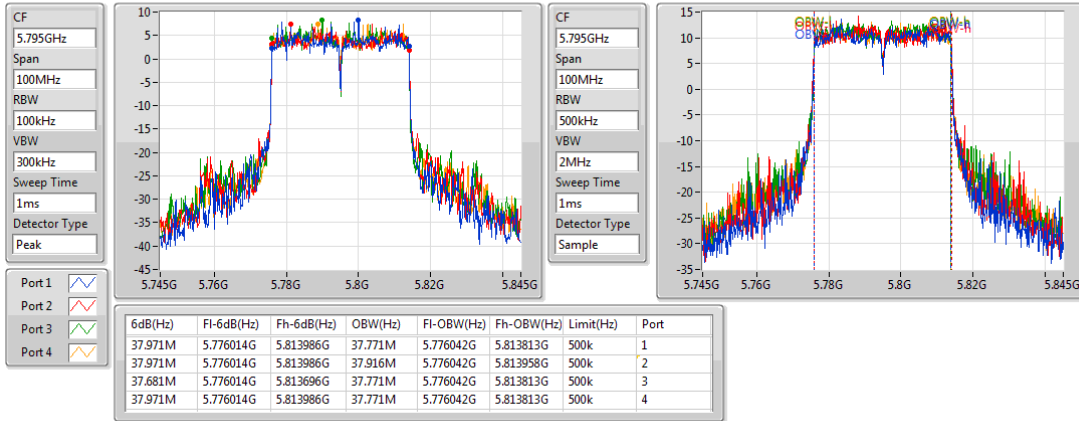
5755MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

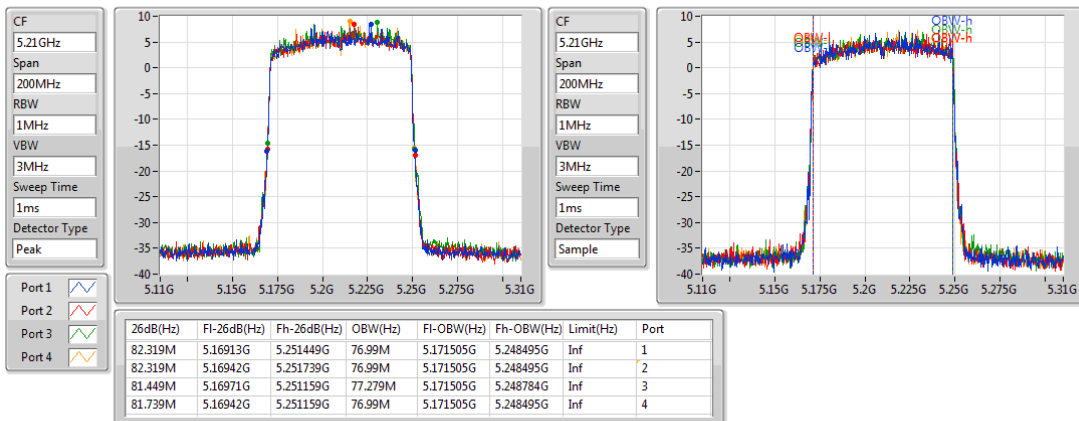
5795MHz



802.11ax HEW80_Nss1,(MCS0)_4TX

EBW

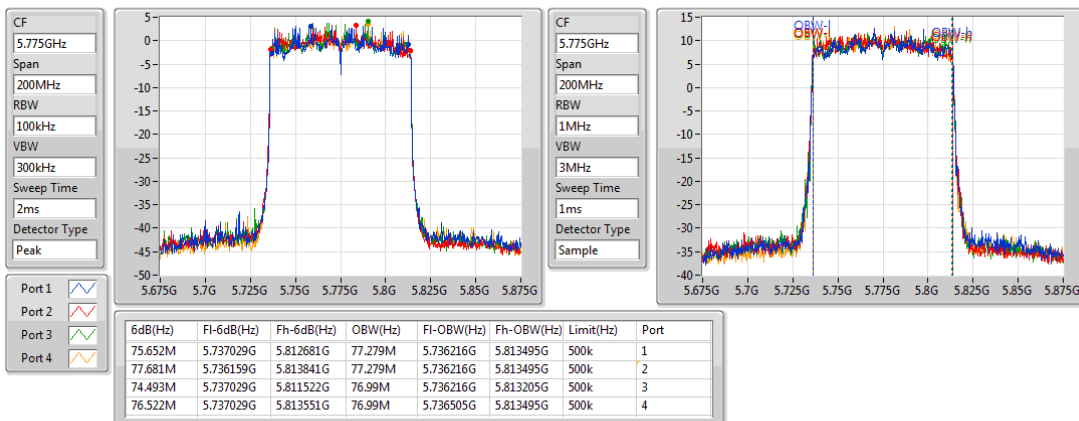
5210MHz



802.11ax HEW80_Nss1,(MCS0)_4TX

EBW

5775MHz



3.3 RF Output Power

3.3.1 Limit of RF Output Power

Frequency band 5150-5250 MHz		
Operating Mode		Limit
☐	Outdoor access point	Conducted Power: 1 W The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm)
☒	Indoor access point	Conducted Power: 1 W
☐	Fixed point-to-point access points	Conducted Power: 1 W
☐	Client devices	Conducted Power: 250 mW

Frequency Band (MHz)	Limit
☒ 5725 ~ 5850	Conducted Power: 1 W
Note: "B" is the 26dB emission bandwidth in MHz.	

3.3.2 Test Procedures

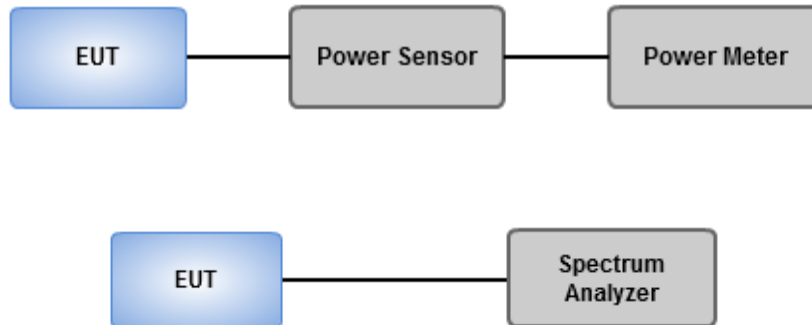
Method PM-G (Measurement using a gated RF average power meter)

Measurements is performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Spectrum analyzer (For channel that extends across the 5.725 GHz boundary)

1. Set RBW = 1MHz, VBW = 3MHz, Sweep time = Auto, Detector = RMS.
2. Trace average at least 100 traces in power averaging mode.
3. Compute power by integrating the spectrum across the 26 dB EBW.
4. Add $10 \log(1/X)$, X:duty cycle) if duty cycle is <98%).

3.3.3 Test Setup



3.3.4 Test Result of Maximum Conducted Output Power

Non-beamforming mode

Summary

Mode	Total Power (dBm)	Total Power (W)	EIRP (dBm)	EIRP (W)
5.15-5.25GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	26.79	0.47753	30.30	1.07152
802.11ax HEW20_Nss1,(MCS0)_4TX	26.96	0.49659	30.47	1.11429
802.11ax HEW40_Nss1,(MCS0)_4TX	29.50	0.89125	33.01	1.99986
802.11ax HEW80_Nss1,(MCS0)_4TX	21.50	0.14125	25.01	0.31696
5.725-5.85GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	29.96	0.99083	34.64	2.91072
802.11ax HEW20_Nss1,(MCS0)_4TX	29.68	0.92897	34.36	2.72898
802.11ax HEW40_Nss1,(MCS0)_4TX	28.52	0.71121	33.20	2.08930
802.11ax HEW80_Nss1,(MCS0)_4TX	26.86	0.48529	31.54	1.42561

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11a_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	3.51	20.48	20.32	20.38	20.09	26.34	30.00	29.85	36.00
5200MHz	Pass	3.51	20.66	20.38	20.69	20.35	26.54	30.00	30.05	36.00
5240MHz	Pass	3.51	20.99	20.67	20.9	20.48	26.79	30.00	30.30	36.00
5745MHz	Pass	4.68	23.95	23.75	24.22	23.84	29.96	30.00	34.64	36.00
5785MHz	Pass	4.68	23.65	23.85	24.16	23.69	29.86	30.00	34.54	36.00
5825MHz	Pass	4.68	23.36	23.35	24.02	23.42	29.57	30.00	34.25	36.00
802.11ax HEW20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	3.51	20.31	20.23	20.26	20.29	26.29	30.00	29.80	36.00
5200MHz	Pass	3.51	21.03	20.82	21.06	20.85	26.96	30.00	30.47	36.00
5240MHz	Pass	3.51	20.73	20.24	20.55	20.43	26.51	30.00	30.02	36.00
5745MHz	Pass	4.68	23.84	23.35	23.95	23.47	29.68	30.00	34.36	36.00
5785MHz	Pass	4.68	23.62	23.23	23.51	23.13	29.40	30.00	34.08	36.00
5825MHz	Pass	4.68	22.91	23.25	23.64	23.05	29.24	30.00	33.92	36.00
802.11ax HEW40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	3.51	17.31	17.32	17.45	17.26	23.36	30.00	26.87	36.00
5230MHz	Pass	3.51	23.72	23.26	23.56	23.36	29.50	30.00	33.01	36.00
5755MHz	Pass	4.68	22.03	21.83	22.37	22.13	28.11	30.00	32.79	36.00
5795MHz	Pass	4.68	22.19	22.52	22.68	22.61	28.52	30.00	33.20	36.00
802.11ax HEW80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	3.51	15.37	15.35	15.76	15.43	21.50	30.00	25.01	36.00
5775MHz	Pass	4.68	20.54	20.96	20.98	20.86	26.86	30.00	31.54	36.00

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

Beamforming mode

Summary

Mode	Total Power (dBm)	Total Power (W)	EIRP (dBm)	EIRP (W)
5.15-5.25GHz	-	-	-	-
802.11ax HEW20-BF_ Nss1,(MCS0)_4TX	20.94	0.12417	30.47	1.11429
802.11ax HEW40-BF_ Nss1,(MCS0)_4TX	23.48	0.22284	33.01	1.99986
802.11ax HEW80-BF_ Nss1,(MCS0)_4TX	15.48	0.03532	25.01	0.31696
5.725-5.85GHz	-	-	-	-
802.11ax HEW20-BF_ Nss1,(MCS0)_4TX	23.66	0.23227	34.36	2.72898
802.11ax HEW40-BF_ Nss1,(MCS0)_4TX	22.50	0.17783	33.20	2.08930
802.11ax HEW80-BF_ Nss1,(MCS0)_4TX	20.84	0.12134	31.54	1.42561

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	9.53	14.29	14.21	14.24	14.27	20.27	26.47	29.80	36.00
5200MHz	Pass	9.53	15.01	14.8	15.04	14.83	20.94	26.47	30.47	36.00
5240MHz	Pass	9.53	14.71	14.22	14.53	14.41	20.49	26.47	30.02	36.00
5745MHz	Pass	10.70	17.82	17.33	17.93	17.45	23.66	25.30	34.36	36.00
5785MHz	Pass	10.70	17.6	17.21	17.49	17.11	23.38	25.30	34.08	36.00
5825MHz	Pass	10.70	16.89	17.23	17.62	17.03	23.22	25.30	33.92	36.00
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	9.53	11.29	11.3	11.43	11.24	17.34	26.47	26.87	36.00
5230MHz	Pass	9.53	17.7	17.24	17.54	17.34	23.48	26.47	33.01	36.00
5755MHz	Pass	10.70	16.01	15.81	16.35	16.11	22.09	25.30	32.79	36.00
5795MHz	Pass	10.70	16.17	16.5	16.66	16.59	22.50	25.30	33.20	36.00
802.11ax HEW80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	9.53	9.35	9.33	9.74	9.41	15.48	26.47	25.01	36.00
5775MHz	Pass	10.70	14.52	14.94	14.96	14.84	20.84	25.30	31.54	36.00

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

Note:

1. D.F is duty factor.
2. Test result is bin-by-bin summing measured value of each TX port.
3. 5150-5250 MHz
4TX
Directional gain = $3.51 + 10 * \log(4/1) = 9.53 \text{ dBi} > 6 \text{ dBi}$.
Limit shall be reduced to $30 \text{ dBm} - (9.53 \text{ dBi} - 6 \text{ dBi}) = 26.47 \text{ dBm}$.
4. 5725-5850 MHz / 4TX
Directional gain = $4.68 + 10 * \log(4/1) = 10.70 \text{ dBi} > 6 \text{ dBi}$.
Limit shall be reduced to $30 \text{ dBm} - (10.70 \text{ dBi} - 6 \text{ dBi}) = 25.30 \text{ dBm}$.

3.4 Peak Power Spectral Density

3.4.1 Limit of Peak Power Spectral Density

Frequency band 5150-5250 MHz		
Operating Mode		Limit
☐	Outdoor access point	17 dBm / MHz
☒	Indoor access point	17 dBm / MHz
☐	Fixed point-to-point access points	17 dBm / MHz
☐	Client devices	11 dBm / MHz

Frequency Band (MHz)		Limit
☒	5725 ~ 5850	30 dBm /500 kHz

3.4.2 Test Procedures

For 5150 ~ 5250 MHz

Duty cycle $\geq 98\%$

1. Set RBW = 1 MHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.
2. Trace average 100 traces.
3. Use the peak marker function to determine the maximum amplitude level.

Duty cycle $< 98\%$

1. Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
2. Set sweep time $\geq 10 * (\text{number of points in sweep}) * (\text{total on/off period of the transmitted signal})$.
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log(1/x)$, where x is the duty cycle.

For 5725 ~ 5850 MHz

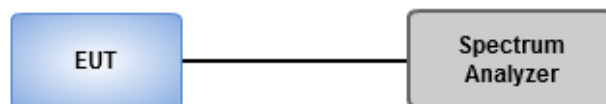
Duty cycle $\geq 98\%$

1. Set RBW = 500 kHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.
2. Trace average 100 traces.
3. Use the peak marker function to determine the maximum amplitude level.

Duty cycle $< 98\%$

1. Set RBW = 500 kHz, VBW = 3 MHz, Detector = RMS.
2. Set sweep time $\geq 10 * (\text{number of points in sweep}) * (\text{total on/off period of the transmitted signal})$.
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log(1/x)$, where x is the duty cycle.

3.4.3 Test Setup



3.4.4 Test Result of Peak Power Spectral Density

Summary

Mode	PD (dBm/RBW)	EIRP PD (dBm/RBW)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_4TX	13.34	22.87
802.11ax HEW20_Nss1,(MCS0)_4TX	13.36	22.89
802.11ax HEW40_Nss1,(MCS0)_4TX	13.31	22.84
802.11ax HEW80_Nss1,(MCS0)_4TX	1.87	11.40
5.725-5.85GHz	-	-
802.11a_Nss1,(6Mbps)_4TX	15.22	25.92
802.11ax HEW20_Nss1,(MCS0)_4TX	14.33	25.03
802.11ax HEW40_Nss1,(MCS0)_4TX	10.01	20.71
802.11ax HEW80_Nss1,(MCS0)_4TX	5.76	16.46

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

Result

Mode	Result	DG (dBi)	Port 1 (dBm/ RBW)	Port 2 (dBm/ RBW)	Port 3 (dBm/ RBW)	Port 4 (dBm/ RBW)	PD (dBm/ RBW)	PD Limit (dBm/ RBW)	EIRP PD (dBm/ RBW)	EIRP PD Limit (dBm/ RBW)
802.11a Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	9.53	7.47	7.28	7.23	7.08	13.21	13.47	22.74	23.00
5200MHz	Pass	9.53	7.37	6.99	7.23	6.87	13.11	13.47	22.64	23.00
5240MHz	Pass	9.53	7.56	7.20	7.67	7.10	13.34	13.47	22.87	23.00
5745MHz	Pass	10.70	9.24	9.09	9.78	9.29	15.22	25.30	25.92	36.00
5785MHz	Pass	10.70	9.02	9.18	9.76	9.27	15.10	25.30	25.80	36.00
5825MHz	Pass	10.70	8.72	8.76	8.95	8.40	14.32	25.30	25.02	36.00
802.11ax HEW20_ Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	9.53	6.48	6.41	6.65	6.05	12.32	13.47	21.85	23.00
5200MHz	Pass	9.53	7.45	7.29	7.60	7.30	13.36	13.47	22.89	23.00
5240MHz	Pass	9.53	7.48	7.08	7.35	7.20	13.26	13.47	22.79	23.00
5745MHz	Pass	10.70	8.58	8.17	9.19	8.38	14.06	25.30	24.76	36.00
5785MHz	Pass	10.70	8.58	8.21	9.12	8.34	14.33	25.30	25.03	36.00
5825MHz	Pass	10.70	7.79	7.96	8.62	7.77	13.90	25.30	24.60	36.00
802.11ax HEW40_ Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	9.53	0.40	0.46	0.82	0.30	6.48	13.47	16.01	23.00
5230MHz	Pass	9.53	7.51	6.96	7.80	7.23	13.31	13.47	22.84	23.00
5755MHz	Pass	10.70	3.80	3.93	4.29	3.71	9.67	25.30	20.37	36.00
5795MHz	Pass	10.70	3.91	4.37	4.75	4.19	10.01	25.30	20.71	36.00
802.11ax HEW80_ Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	9.53	-4.10	-4.11	-3.72	-4.10	1.87	13.47	11.40	23.00
5775MHz	Pass	10.70	-0.19	0.08	0.38	-0.12	5.76	25.30	16.46	36.00

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

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port Xpower density;

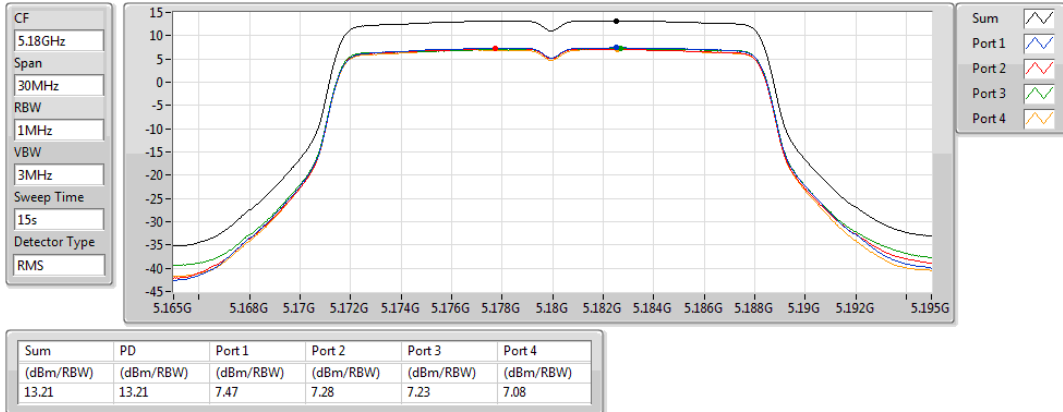
Note:

1. D.F is duty factor.
2. Test result is bin-by-bin summing measured value of each TX port.
3. 5150-5250 MHz
4TX
Directional gain = $3.51 + 10 * \log(4/1) = 9.53 \text{ dBi} > 6 \text{ dBi}$.
Limit shall be reduced to 17 dBm – (9.53 dBi – 6 dBi) = 13.47 dBm.
4. 5725-5850 MHz
Directional gain = $4.68 + 10 * \log(4/1) = 10.70 \text{ dBi} > 6 \text{ dBi}$.
Limit shall be reduced to 30 dBm – (10.70 dBi – 6 dBi) = 25.30dBm.

802.11a_Nss1,(6Mbps)_4TX

PSD

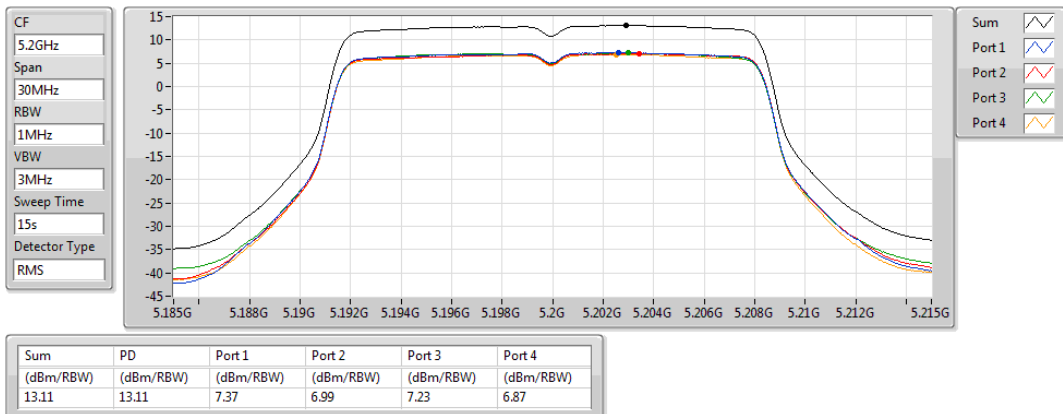
5180MHz



802.11a_Nss1,(6Mbps)_4TX

PSD

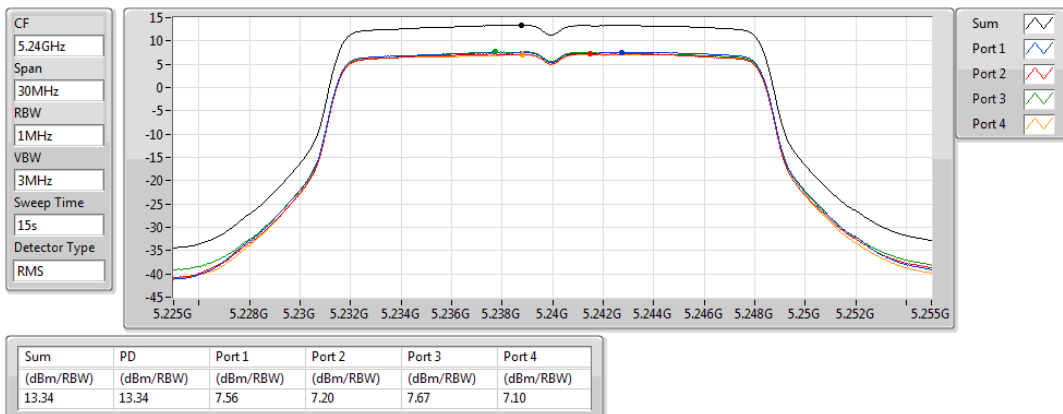
5200MHz



802.11a_Nss1,(6Mbps)_4TX

PSD

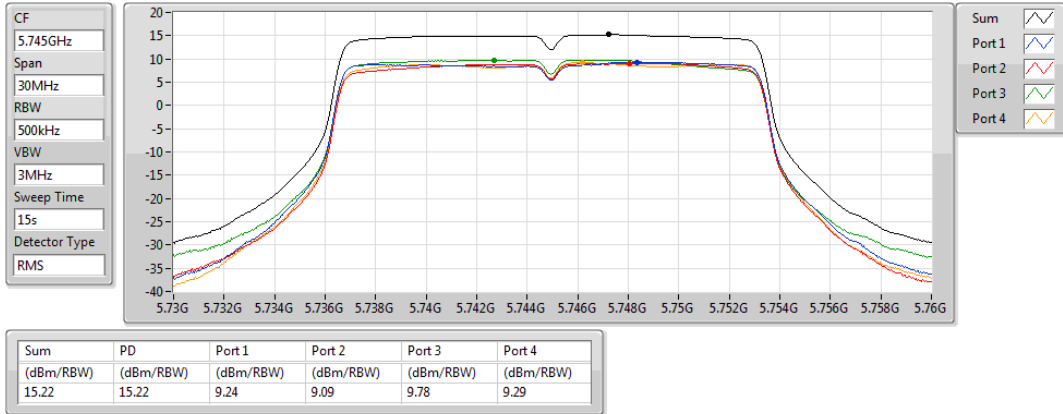
5240MHz



802.11a_Nss1,(6Mbps)_4TX

PSD

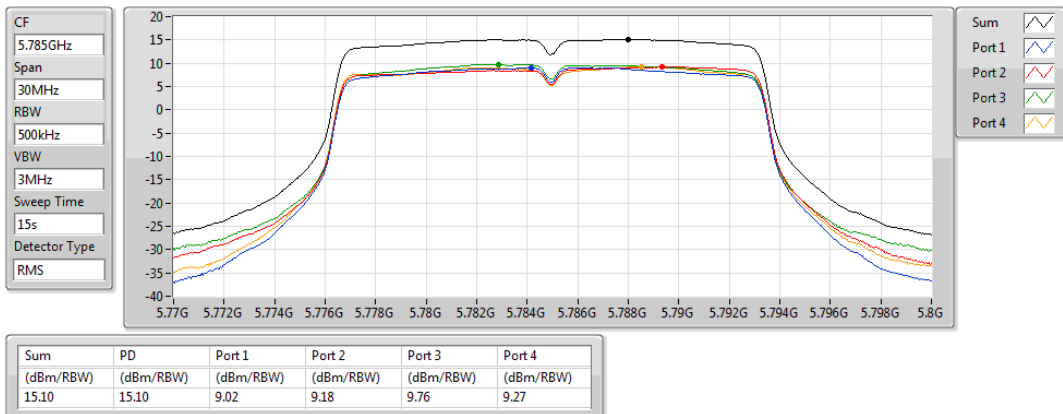
5745MHz



802.11a_Nss1,(6Mbps)_4TX

PSD

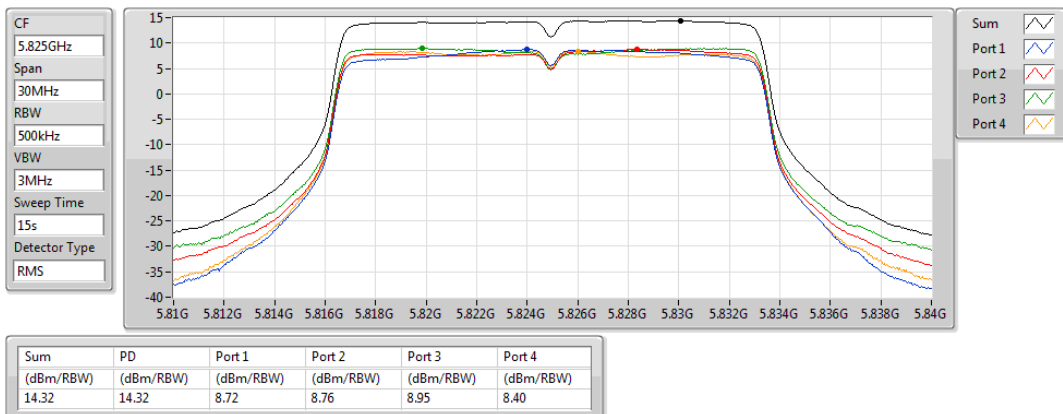
5785MHz



802.11a_Nss1,(6Mbps)_4TX

PSD

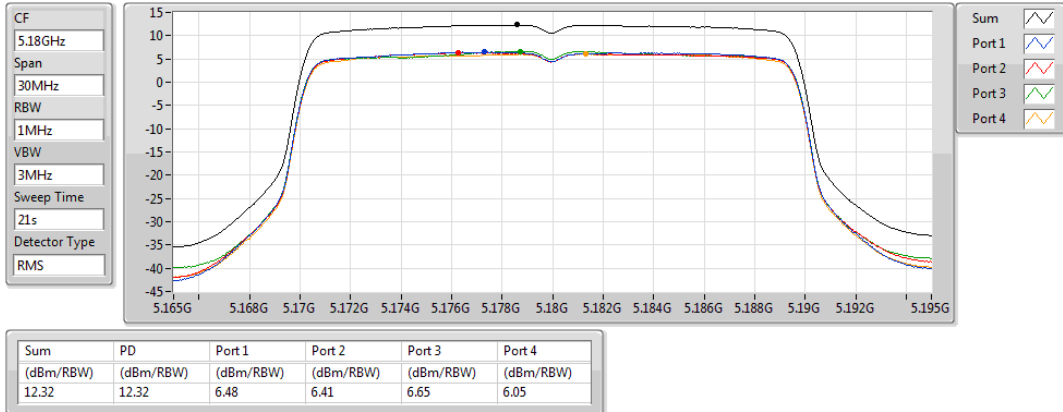
5825MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

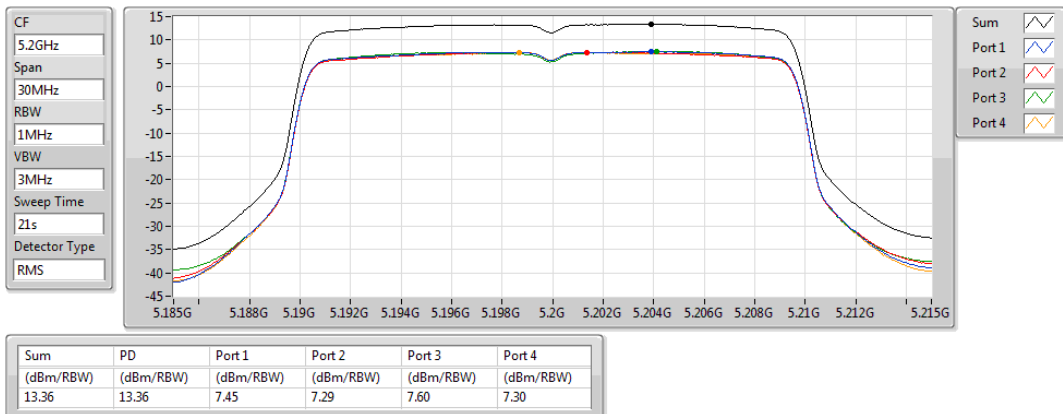
5180MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

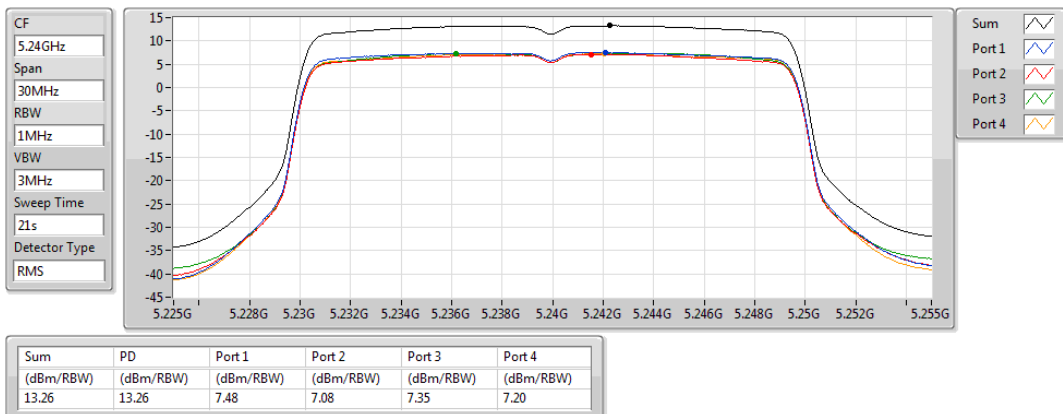
5200MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

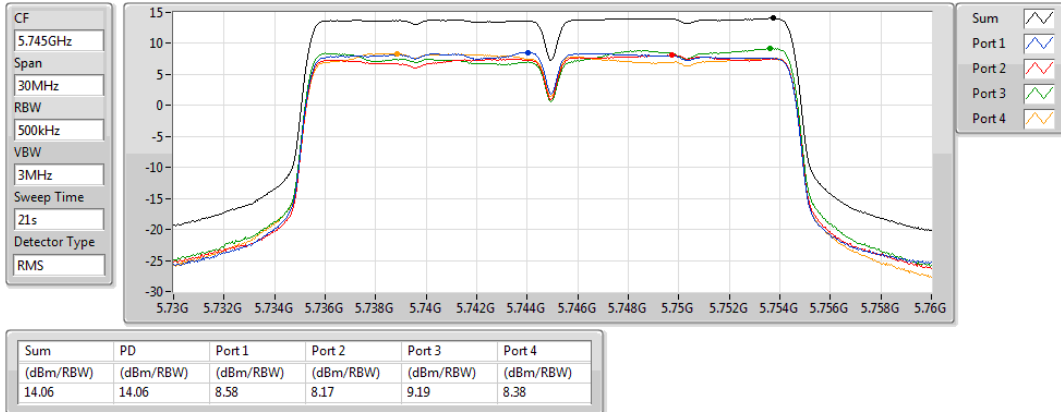
5240MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

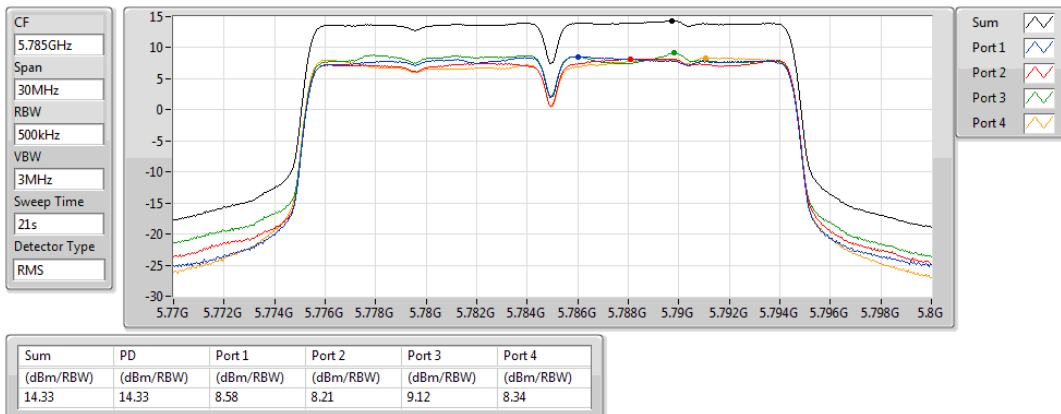
5745MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

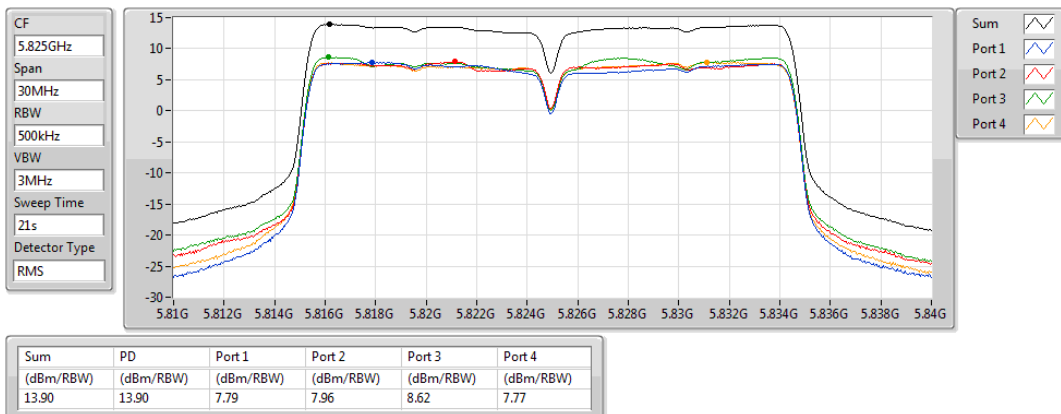
5785MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

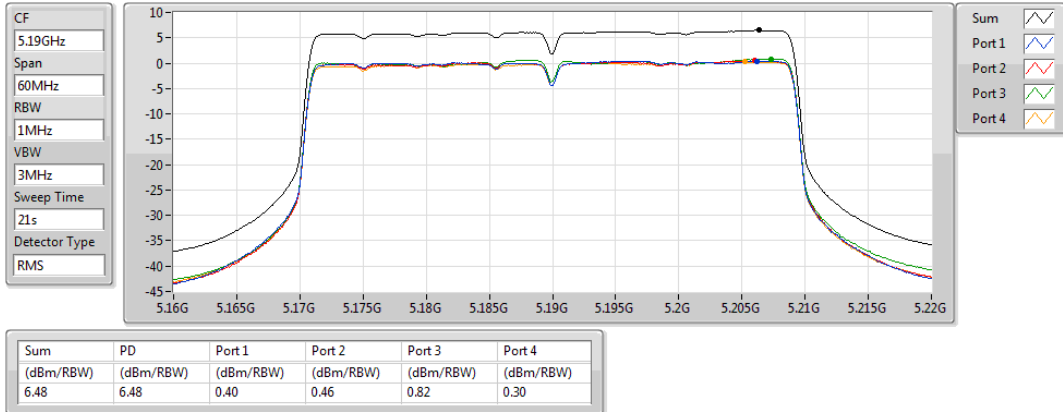
5825MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

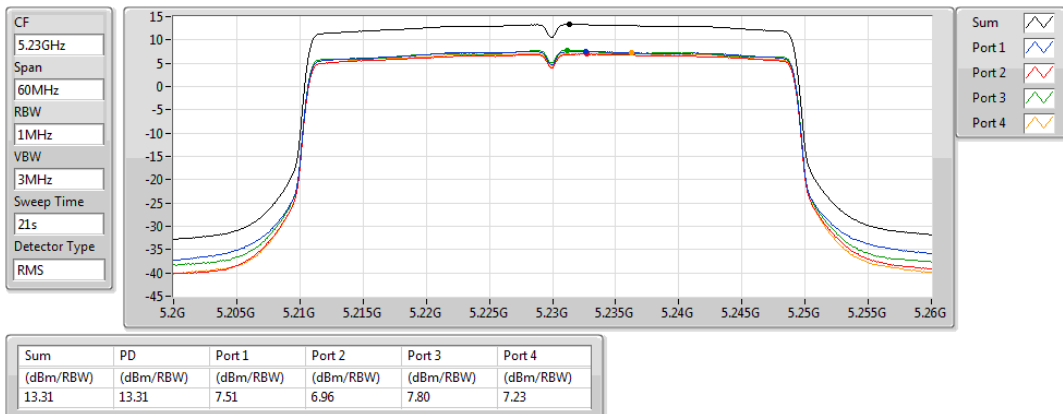
5190MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

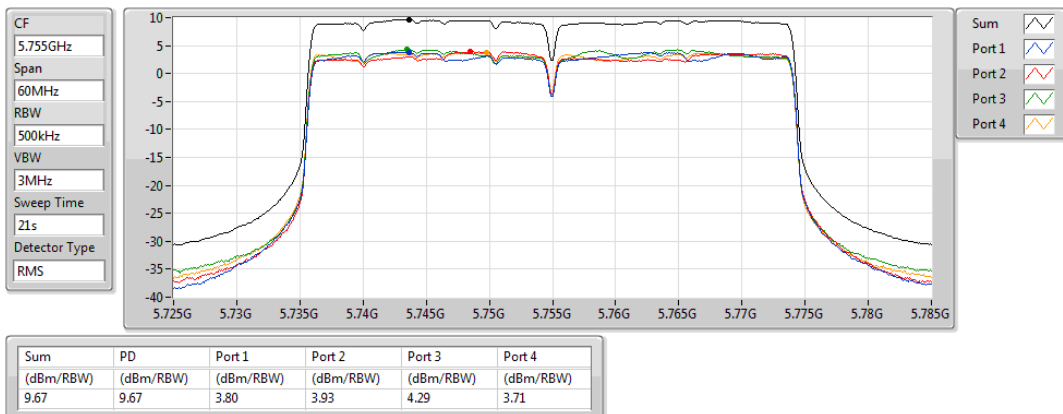
5230MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

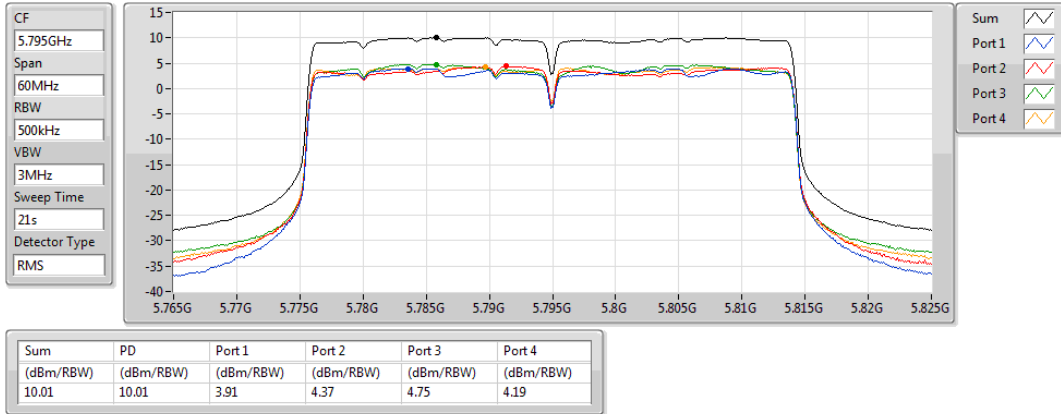
5755MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

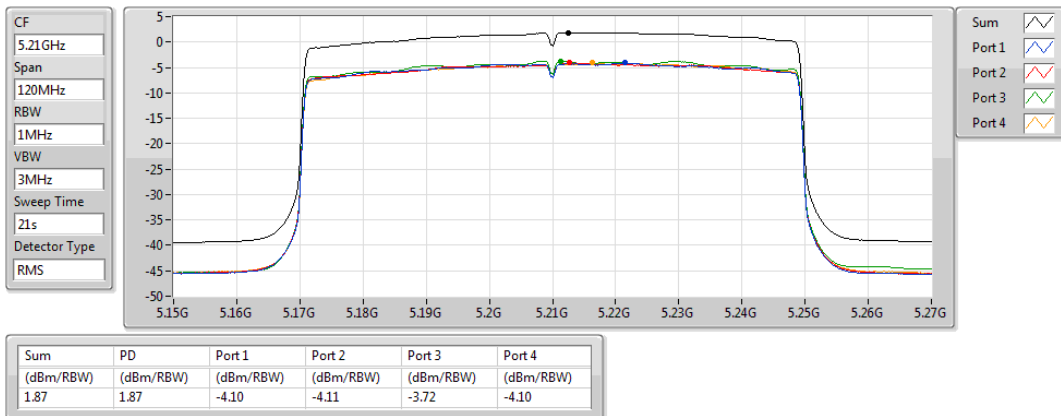
5795MHz



802.11ax HEW80_Nss1,(MCS0)_4TX

PSD

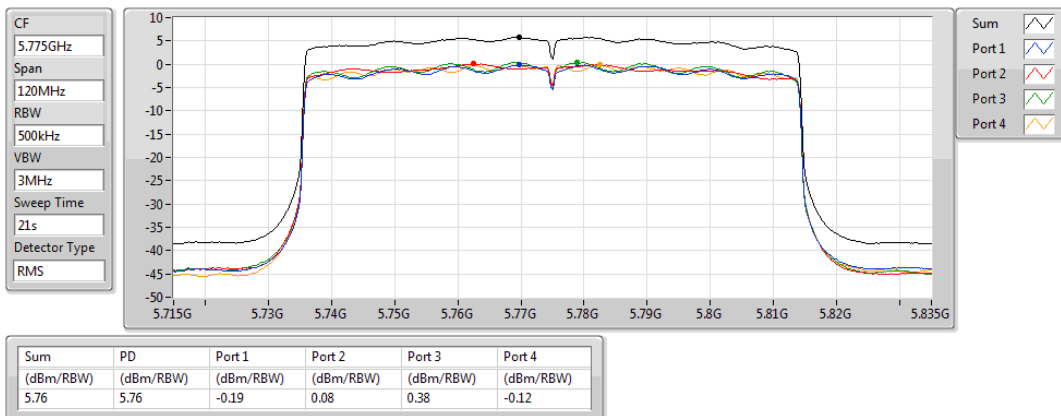
5210MHz



802.11ax HEW80_Nss1,(MCS0)_4TX

PSD

5775MHz



3.5 Transmitter Radiated and Band Edge Emissions

3.5.1 Limit of Transmitter Radiated and Band Edge Emissions

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9~90 kHz, 110~490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

Un-restricted band emissions above 1GHz Limit	
Operating Band	Limit
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.850 GHz	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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

3.5.2 Test Procedures

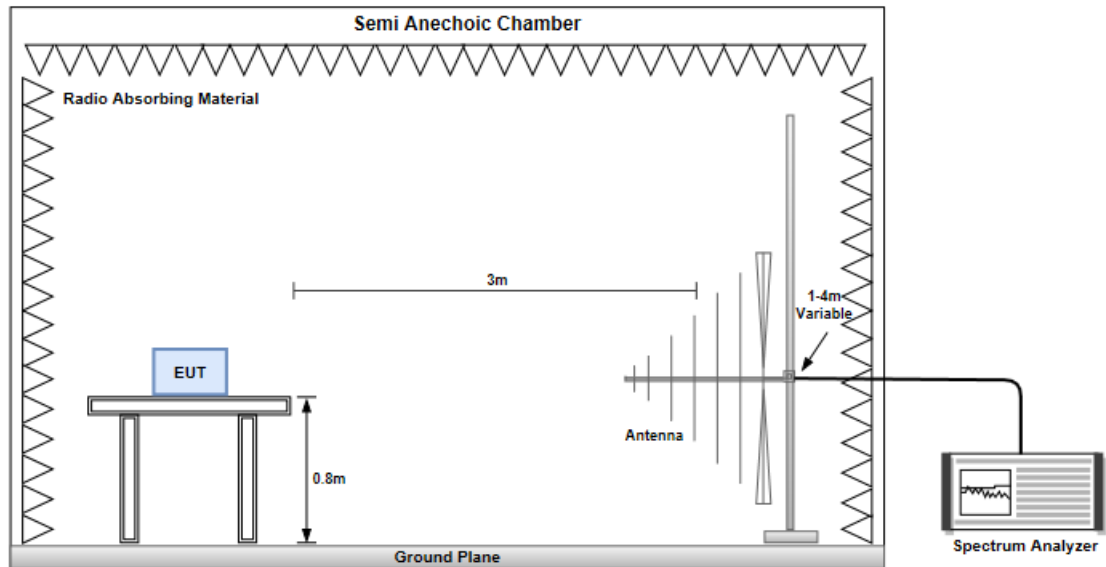
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

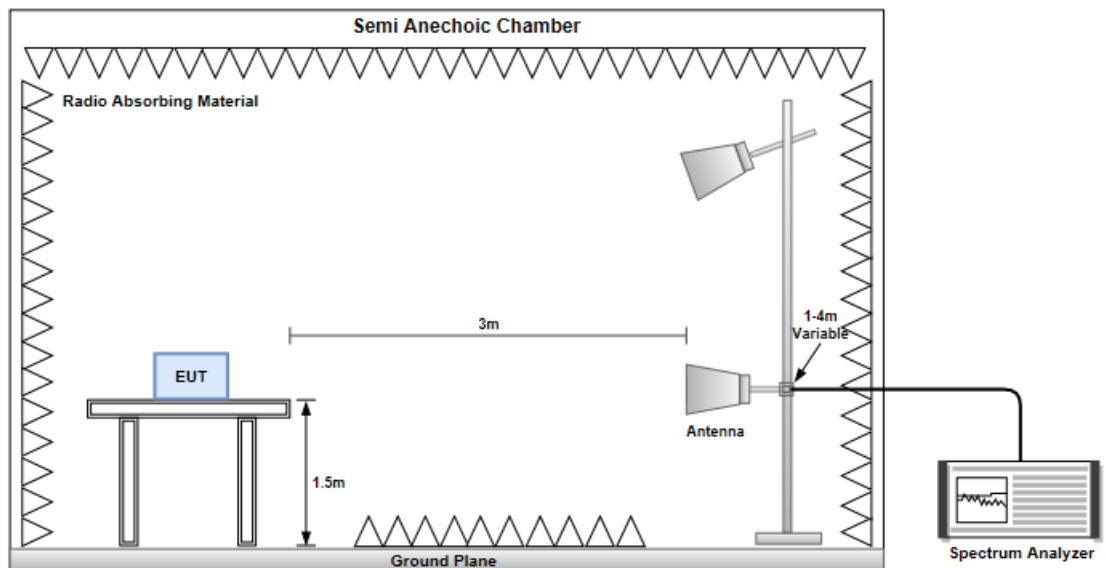
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.5.3 Test Setup

Radiated Emissions below 1 GHz

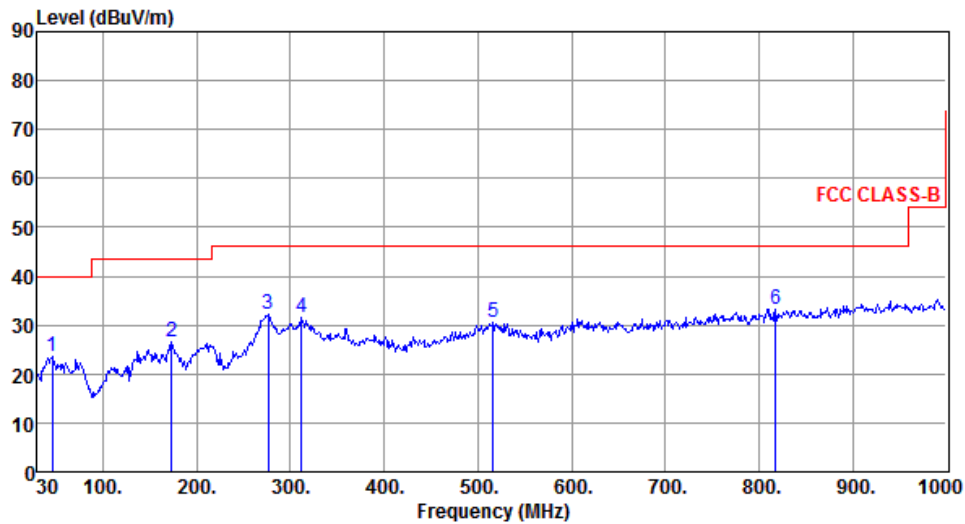


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	ax (HE40)	Test Freq. (MHz)	5230
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	45.52	23.66	40.00	-16.34	32.37	-8.71	Peak	---	---
2	173.56	26.43	43.50	-17.07	35.91	-9.48	Peak	---	---
3	276.38	32.07	46.00	-13.93	41.04	-8.97	Peak	---	---
4	312.27	31.48	46.00	-14.52	39.34	-7.86	Peak	---	---
5	515.97	30.61	46.00	-15.39	33.38	-2.77	Peak	---	---
6	817.64	33.30	46.00	-12.70	30.38	2.92	Peak	---	---

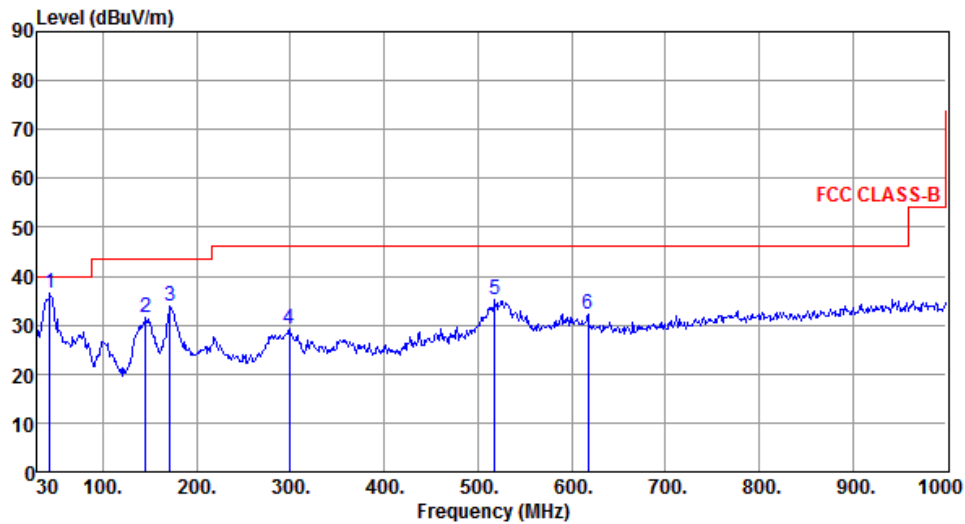
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	ax (HE40)	Test Freq. (MHz)	5230
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	43.58	36.65	40.00	-3.35	45.58	-8.93	Peak	---	---
2	145.43	31.58	43.50	-11.92	40.54	-8.96	Peak	---	---
3	171.62	33.85	43.50	-9.65	43.09	-9.24	Peak	---	---
4	298.69	29.30	46.00	-16.70	37.65	-8.35	Peak	---	---
5	517.91	35.11	46.00	-10.89	37.84	-2.73	Peak	---	---
6	617.82	32.27	46.00	-13.73	32.64	-0.37	Peak	---	---

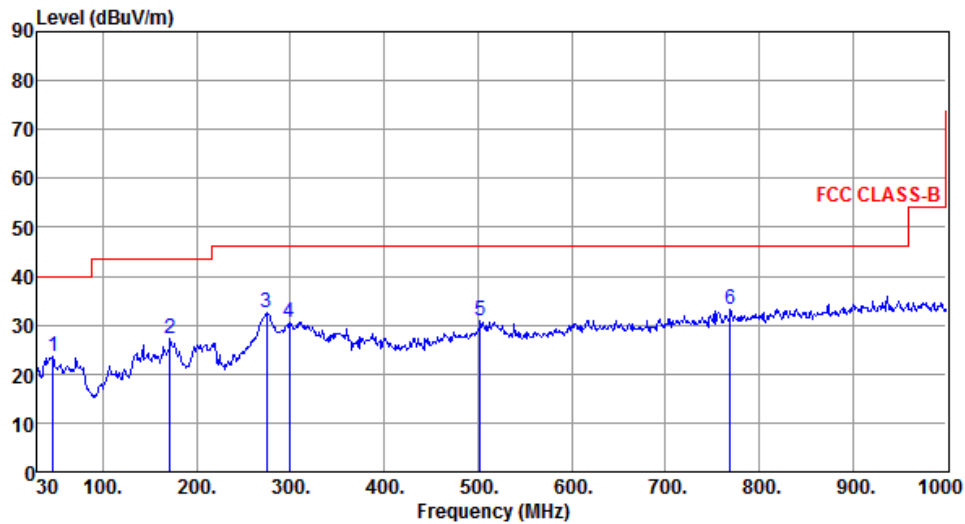
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	46.49	23.68	40.00	-16.32	32.33	-8.65	Peak	---	---
2	171.62	27.07	43.50	-16.43	36.31	-9.24	Peak	---	---
3	274.44	32.56	46.00	-13.44	41.62	-9.06	Peak	---	---
4	298.69	30.54	46.00	-15.46	38.89	-8.35	Peak	---	---
5	502.39	30.86	46.00	-15.14	33.94	-3.08	Peak	---	---
6	769.14	33.10	46.00	-12.90	30.68	2.42	Peak	---	---

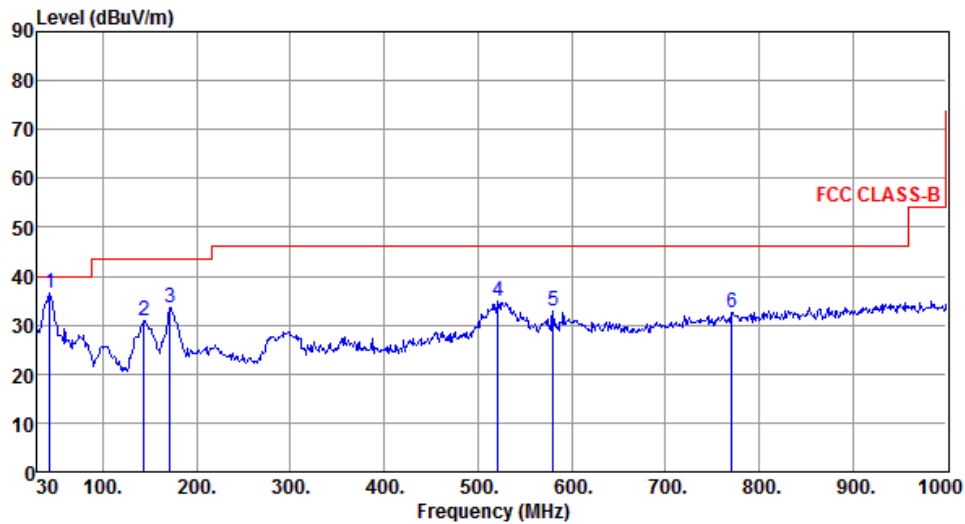
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	43.58	36.40	40.00	-3.60	45.33	-8.93	Peak	---	---
2	143.49	30.86	43.50	-12.64	39.81	-8.95	Peak	---	---
3	171.62	33.66	43.50	-9.84	42.90	-9.24	Peak	---	---
4	521.79	34.93	46.00	-11.07	37.58	-2.65	Peak	---	---
5	579.99	32.75	46.00	-13.25	34.27	-1.52	Peak	---	---
6	771.08	32.49	46.00	-13.51	30.06	2.43	Peak	---	---

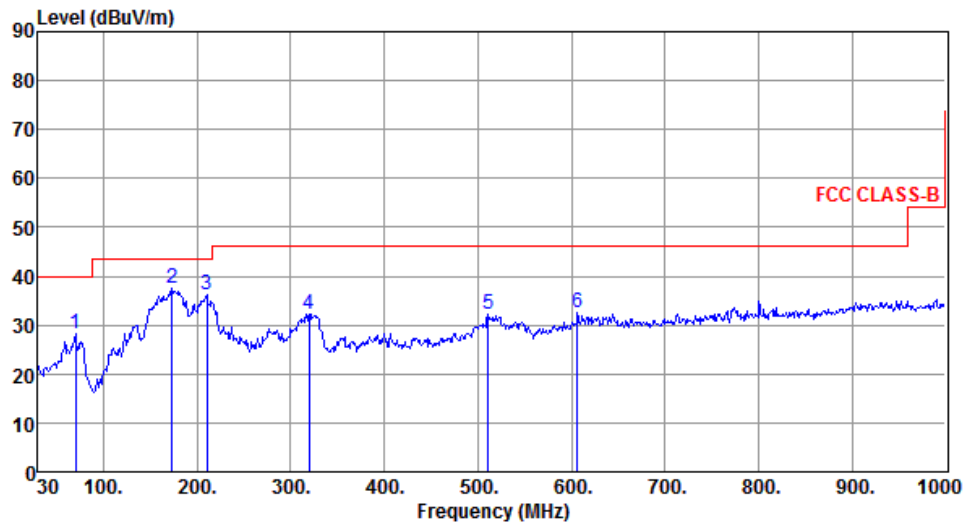
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	ax (HE40)	Test Freq. (MHz)	5230
Polarization	Horizontal	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	69.77	28.21	40.00	-11.79	39.08	-10.87	Peak	---	---
2	173.56	37.61	43.50	-5.89	47.09	-9.48	Peak	---	---
3	210.42	36.22	43.50	-7.28	48.25	-12.03	Peak	---	---
4	320.03	32.23	46.00	-13.77	39.85	-7.62	Peak	---	---
5	511.12	32.05	46.00	-13.95	34.94	-2.89	Peak	---	---
6	606.18	32.40	46.00	-13.60	32.90	-0.50	Peak	---	---

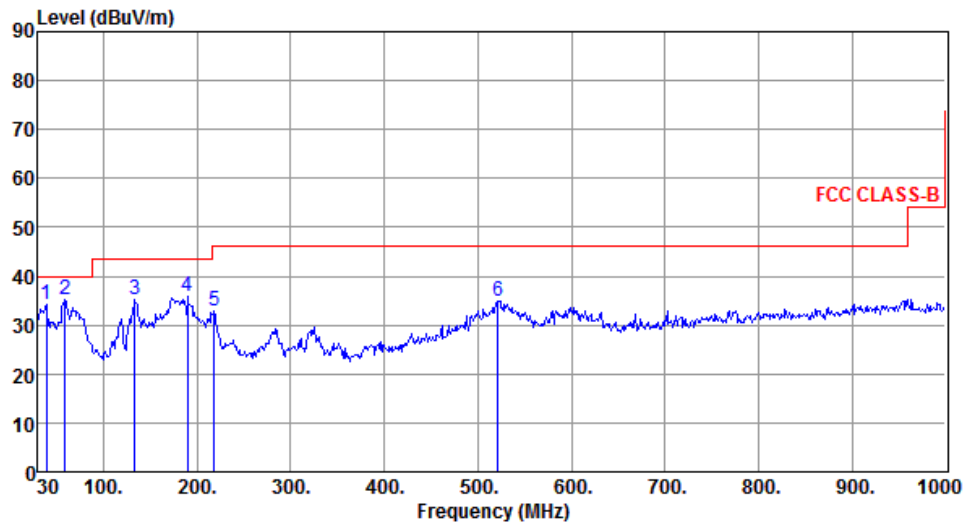
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	ax (HE40)	Test Freq. (MHz)	5230
Polarization	Vertical	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	38.73	34.31	40.00	-5.69	43.72	-9.41	Peak	---	---
2	59.10	35.30	40.00	-4.70	44.56	-9.26	Peak	---	---
3	133.79	35.16	43.50	-8.34	44.93	-9.77	Peak	---	---
4	190.05	35.70	43.50	-7.80	47.09	-11.39	Peak	---	---
5	218.18	32.97	46.00	-13.03	45.12	-12.15	Peak	---	---
6	521.79	34.95	46.00	-11.05	37.60	-2.65	Peak	---	---

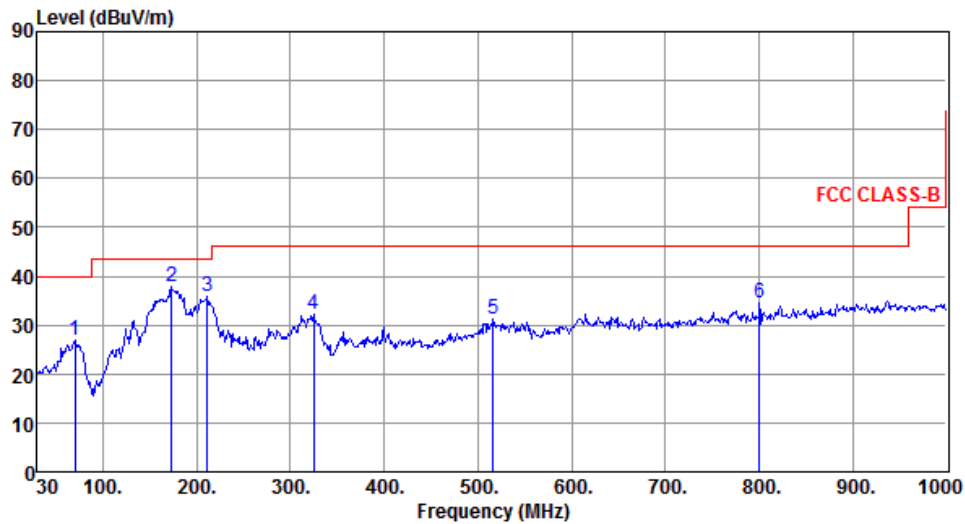
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	69.77	26.89	40.00	-13.11	37.76	-10.87	Peak	---	---
2	173.56	37.83	43.50	-5.67	47.31	-9.48	Peak	---	---
3	211.39	35.77	43.50	-7.73	47.82	-12.05	Peak	---	---
4	324.88	32.20	46.00	-13.80	39.59	-7.39	Peak	---	---
5	515.97	31.13	46.00	-14.87	33.90	-2.77	Peak	---	---
6	800.18	34.66	46.00	-11.34	31.97	2.69	Peak	---	---

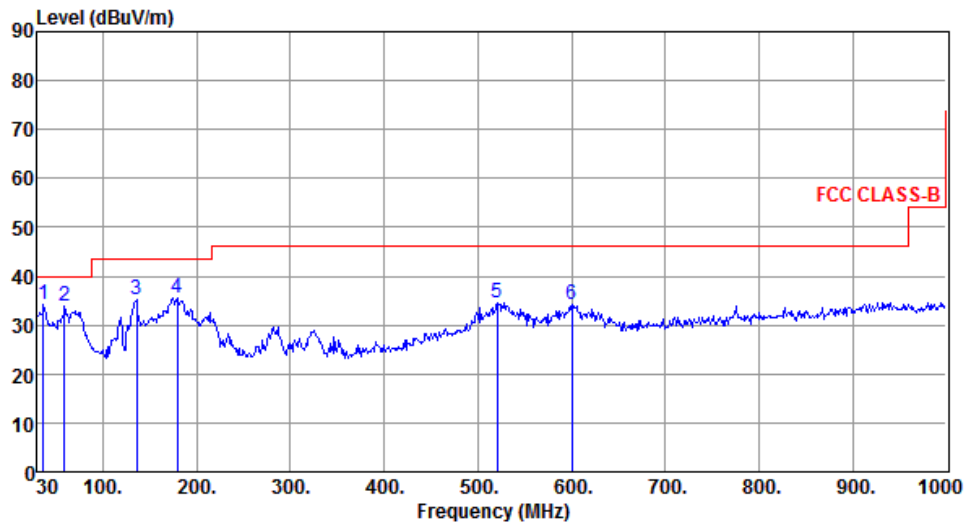
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	36.79	34.28	40.00	-5.72	44.08	-9.80	Peak	---	---
2	59.10	33.85	40.00	-6.15	43.11	-9.26	Peak	---	---
3	135.73	35.18	43.50	-8.32	44.81	-9.63	Peak	---	---
4	179.38	35.37	43.50	-8.13	45.54	-10.17	Peak	---	---
5	520.82	34.69	46.00	-11.31	37.36	-2.67	Peak	---	---
6	600.36	34.16	46.00	-11.84	34.90	-0.74	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

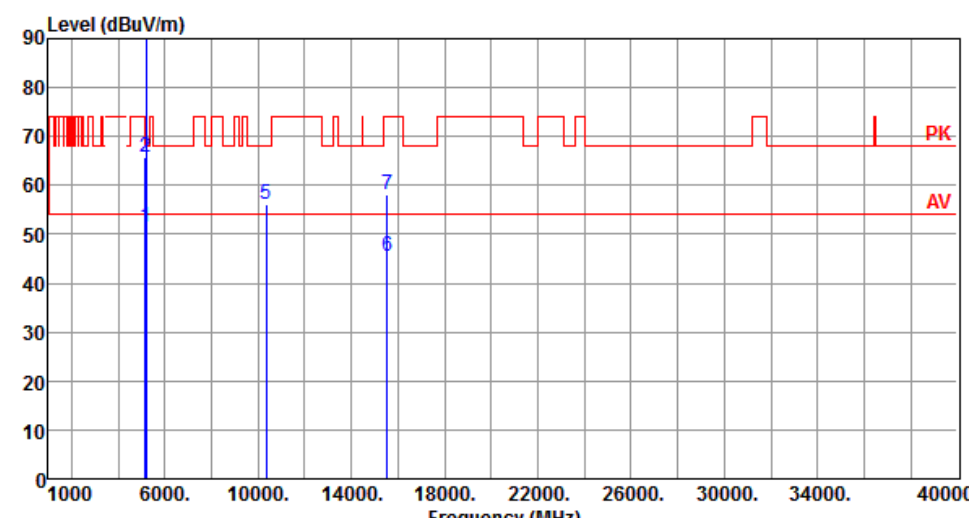
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11a

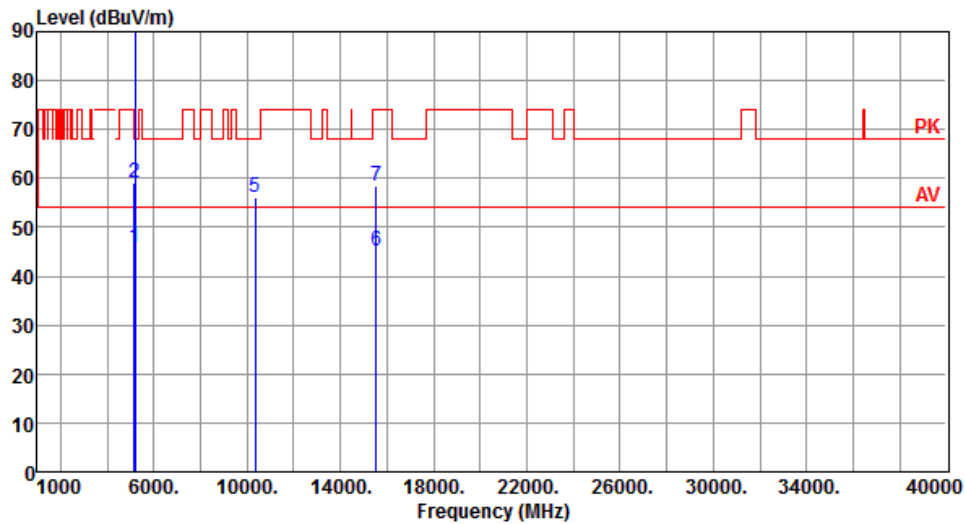
Modulation	11a	Test Freq. (MHz)	5180
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	51.54	54.00	-2.46	44.08	7.46	Average	106	298
2	5150.00	65.84	74.00	-8.16	58.38	7.46	Peak	106	298
3 *	5180.00	111.28			104.05	7.23	Average	185	293
4 *	5180.00	121.17			113.94	7.23	Peak	185	293
5	10360.00	55.97	68.20	-12.23	39.30	16.67	Peak	180	93
6	15540.00	45.34	54.00	-8.66	27.83	17.51	Average	110	16
7	15540.00	58.13	74.00	-15.87	40.62	17.51	Peak	110	16

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).
 Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11a	Test Freq. (MHz)	5180
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	45.94	54.00	-8.06	38.48	7.46	Average	100	27
2	5150.00	59.19	74.00	-14.81	51.73	7.46	Peak	100	27
3 *	5180.00	103.23			96.00	7.23	Average	100	27
4 *	5180.00	112.31			105.08	7.23	Peak	100	27
5	10360.00	56.18	68.20	-12.02	39.51	16.67	Peak	100	27
6	15540.00	45.15	54.00	-8.85	27.64	17.51	Average	145	51
7	15540.00	58.60	74.00	-15.40	41.09	17.51	Peak	145	51

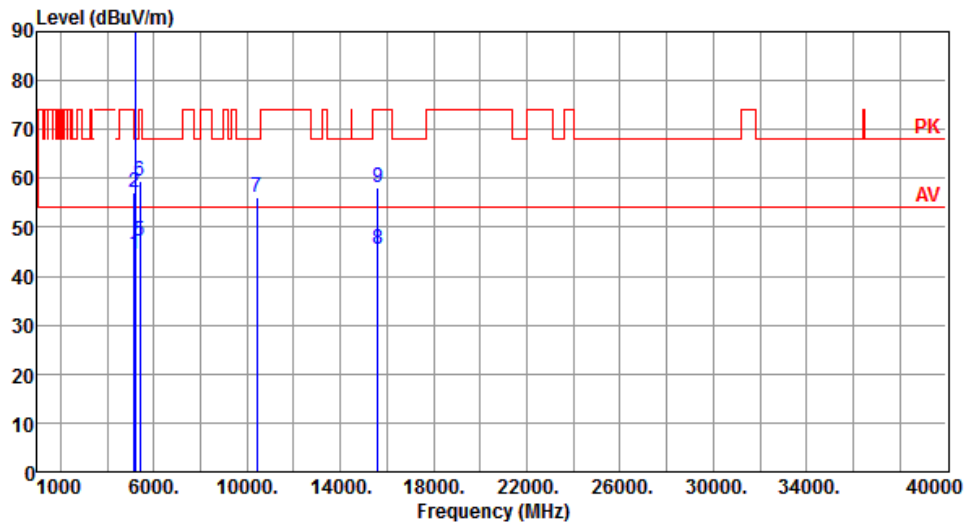
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11a	Test Freq. (MHz)	5200
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	44.46	54.00	-9.54	37.00	7.46	Average	169	293
2	5150.00	57.05	74.00	-16.95	49.59	7.46	Peak	169	293
3 *	5200.00	112.03			104.95	7.08	Average	169	293
4 *	5200.00	122.10			115.02	7.08	Peak	169	293
5	5394.00	47.24	54.00	-6.76	40.13	7.11	Average	169	293
6	5394.00	59.59	74.00	-14.41	52.48	7.11	Peak	169	293
7	10400.00	56.12	68.20	-12.08	39.21	16.91	Peak	180	96
8	15600.00	45.45	54.00	-8.55	28.11	17.34	Average	110	18
9	15600.00	58.26	74.00	-15.74	40.92	17.34	Peak	110	18

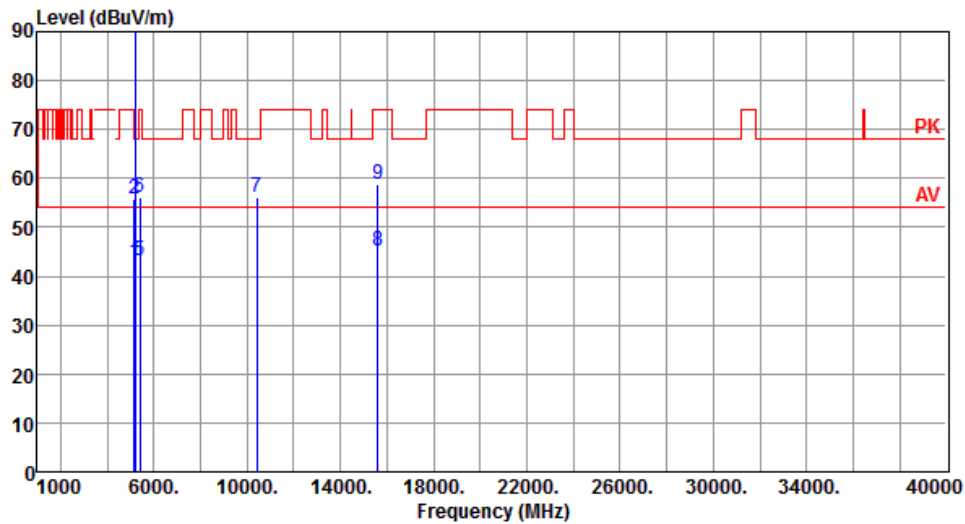
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11a	Test Freq. (MHz)	5200
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.84	54.00	-11.16	35.38	7.46	Average	101	28
2	5150.00	55.86	74.00	-18.14	48.40	7.46	Peak	101	28
3 *	5200.00	103.04			95.96	7.08	Average	101	28
4 *	5200.00	112.24			105.16	7.08	Peak	101	28
5	5394.00	43.29	54.00	-10.71	36.18	7.11	Average	101	28
6	5394.00	56.07	74.00	-17.93	48.96	7.11	Peak	101	28
7	10400.00	56.22	68.20	-11.98	39.31	16.91	Peak	105	21
8	15600.00	45.24	54.00	-8.76	27.90	17.34	Average	141	42
9	15600.00	58.65	74.00	-15.35	41.31	17.34	Peak	141	42

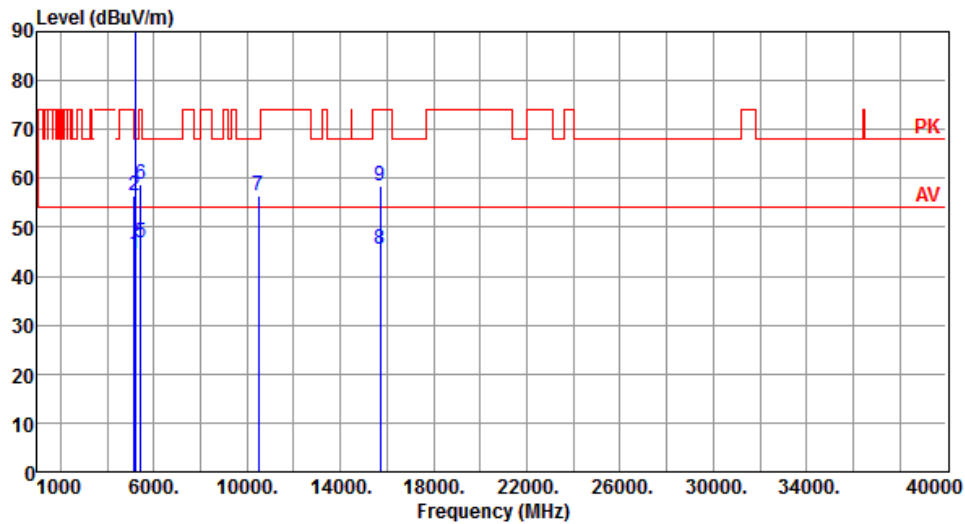
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11a	Test Freq. (MHz)	5240
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	44.38	54.00	-9.62	36.92	7.46	Average	171	301
2	5150.00	56.59	74.00	-17.41	49.13	7.46	Peak	171	301
3 *	5240.00	111.51			104.56	6.95	Average	171	301
4 *	5240.00	121.81			114.86	6.95	Peak	171	301
5	5439.00	46.88	54.00	-7.12	39.57	7.31	Average	171	301
6	5439.00	58.72	74.00	-15.28	51.41	7.31	Peak	171	301
7	10480.00	56.35	68.20	-11.85	39.46	16.89	Peak	182	91
8	15720.00	45.56	54.00	-8.44	28.49	17.07	Average	108	24
9	15720.00	58.41	74.00	-15.59	41.34	17.07	Peak	108	24

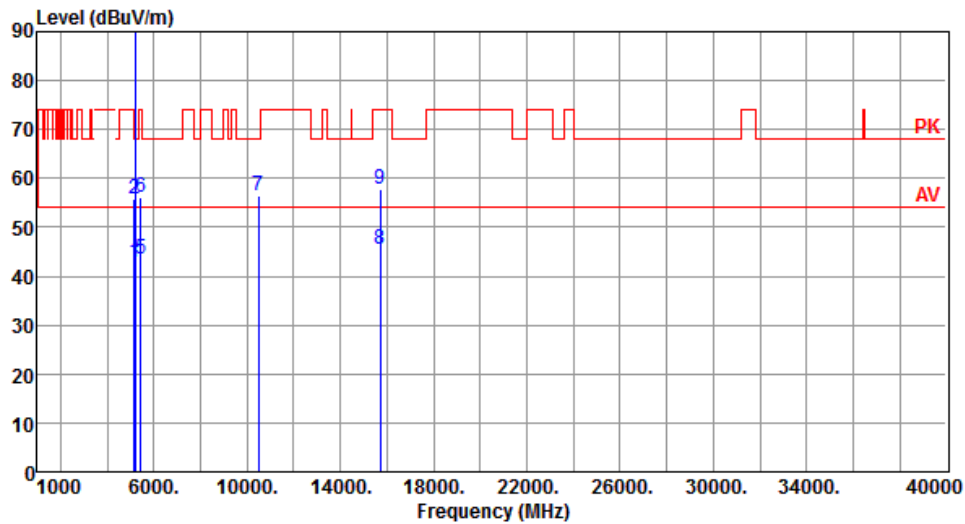
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11a	Test Freq. (MHz)	5240
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.75	54.00	-11.25	35.29	7.46	Average	100	31
2	5150.00	55.63	74.00	-18.37	48.17	7.46	Peak	100	31
3 *	5240.00	102.84			95.89	6.95	Average	100	31
4 *	5240.00	111.86			104.91	6.95	Peak	100	31
5	5439.00	43.36	54.00	-10.64	36.05	7.31	Average	100	31
6	5439.00	56.14	74.00	-17.86	48.83	7.31	Peak	100	31
7	10480.00	56.34	68.20	-11.86	39.45	16.89	Peak	106	19
8	15720.00	45.44	54.00	-8.56	28.37	17.07	Average	139	55
9	15720.00	57.82	74.00	-16.18	40.75	17.07	Peak	139	55

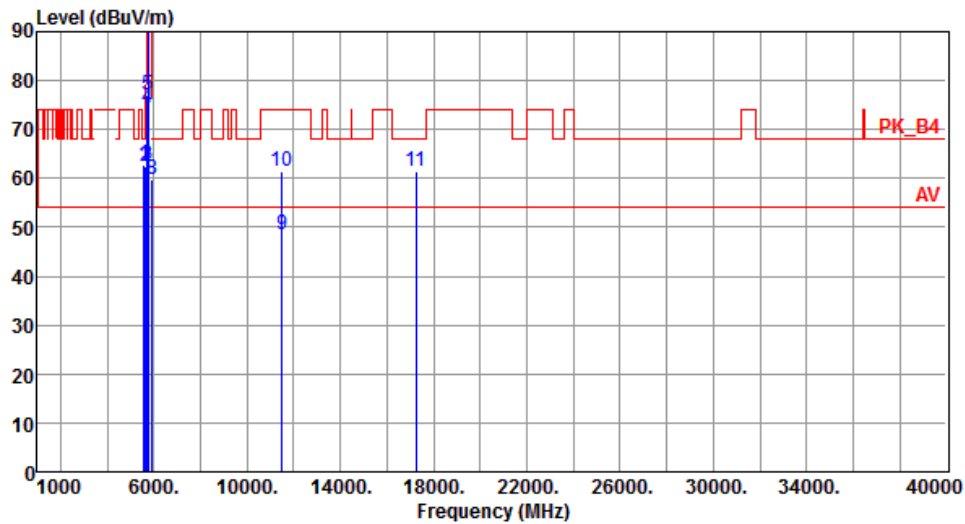
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	62.65	68.20	-5.55	55.17	7.48	Peak	144	285
2	5650.00	62.58	68.20	-5.62	55.19	7.39	Peak	144	285
3	5700.00	62.60	105.20	-42.60	54.89	7.71	Peak	144	285
4	5720.00	74.49	110.80	-36.31	66.73	7.76	Peak	144	285
5	5725.00	77.18	122.20	-45.02	69.41	7.77	Peak	144	285
6 *	5745.00	114.45			106.63	7.82	Average	144	285
7 *	5745.00	125.24			117.42	7.82	Peak	144	285
8	5925.00	59.94	68.20	-8.26	51.64	8.30	Peak	144	285
9	11490.00	48.44	54.00	-5.56	31.38	17.06	Average	100	13
10	11490.00	61.36	74.00	-12.64	44.30	17.06	Peak	100	13
11	17235.00	61.34	68.20	-6.86	42.56	18.78	Peak	100	69

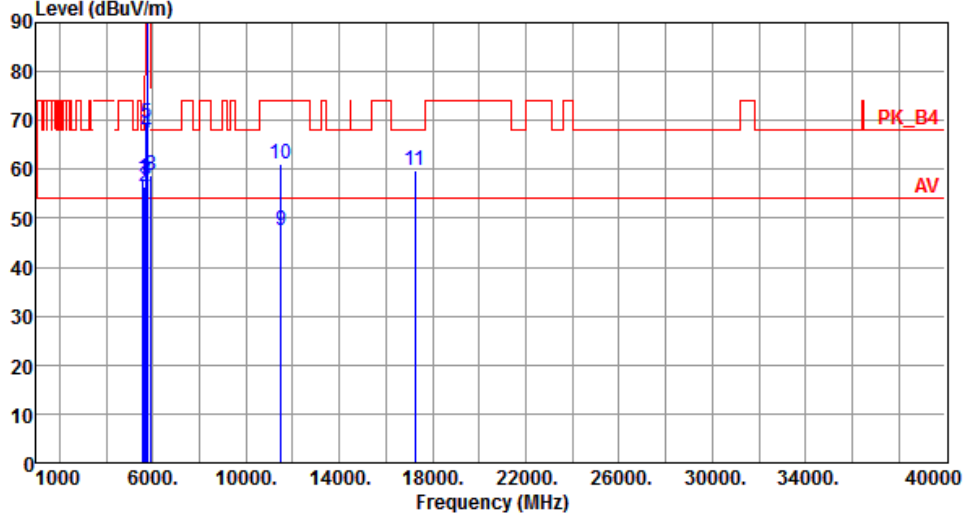
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

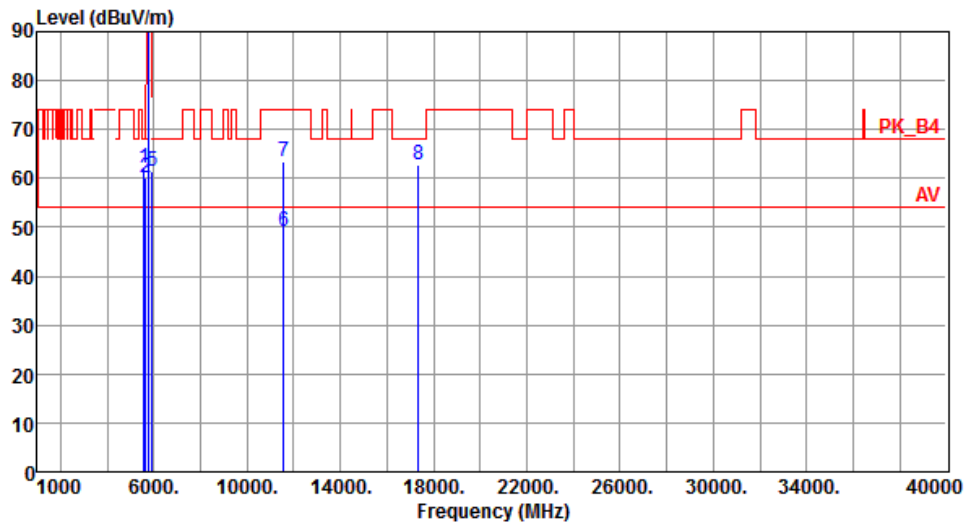
Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	58.24	68.20	-9.96	50.76	7.48	Peak	189	24
2	5650.00	56.45	68.20	-11.75	49.06	7.39	Peak	189	24
3	5700.00	57.85	105.20	-47.35	50.14	7.71	Peak	189	24
4	5720.00	67.48	110.80	-43.32	59.72	7.76	Peak	189	24
5	5725.00	69.36	122.20	-52.84	61.59	7.77	Peak	189	24
6 *	5745.00	105.21			97.39	7.82	Average	189	24
7 *	5745.00	115.96			108.14	7.82	Peak	189	24
8	5925.00	58.66	68.20	-9.54	50.36	8.30	Peak	189	24
9	11490.00	47.65	54.00	-6.35	30.59	17.06	Average	212	6
10	11490.00	61.08	74.00	-12.92	44.02	17.06	Peak	212	6
11	17235.00	59.68	68.20	-8.52	40.90	18.78	Peak	100	341

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
 Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	62.26	68.20	-5.94	54.78	7.48	Peak	196	295
2	5650.00	60.23	68.20	-7.97	52.84	7.39	Peak	196	295
3 *	5785.00	114.98	---	---	107.07	7.91	Average	196	295
4 *	5785.00	125.53	---	---	117.62	7.91	Peak	196	295
5	5925.00	61.41	68.20	-6.79	53.11	8.30	Peak	196	295
6	11570.00	49.01	54.00	-4.99	32.09	16.92	Average	100	295
7	11570.00	63.47	74.00	-10.53	46.55	16.92	Peak	100	295
8	17355.00	62.88	68.20	-5.32	43.47	19.41	Peak	100	73

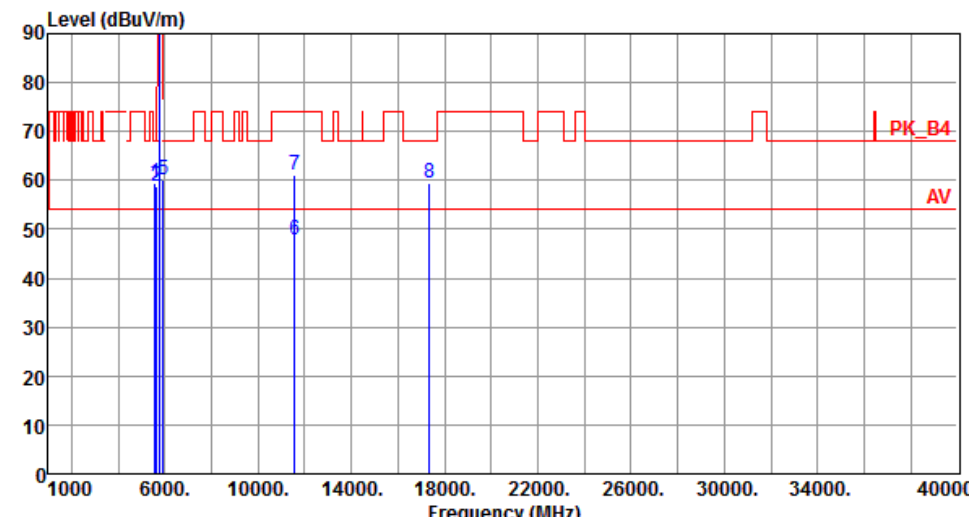
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

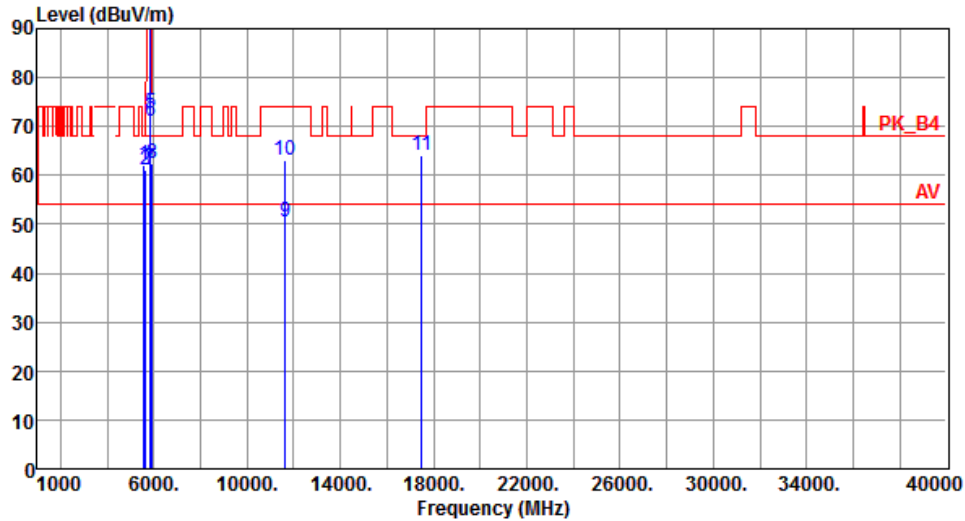
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	59.48	68.20	-8.72	52.00	7.48	Peak	190	21
2	5650.00	58.84	68.20	-9.36	51.45	7.39	Peak	190	21
3 *	5785.00	105.43			97.52	7.91	Average	190	21
4 *	5785.00	116.06			108.15	7.91	Peak	190	21
5	5925.00	60.15	68.20	-8.05	51.85	8.30	Peak	190	21
6	11570.00	47.93	54.00	-6.07	31.01	16.92	Average	210	3
7	11570.00	61.14	74.00	-12.86	44.22	16.92	Peak	210	3
8	17355.00	59.30	68.20	-8.90	39.89	19.41	Peak	100	323

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).
Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	62.24	68.20	-5.96	54.76	7.48	Peak	178	308
2	5650.00	61.01	68.20	-7.19	53.62	7.39	Peak	178	308
3 *	5825.00	115.27			107.23	8.04	Average	178	308
4 *	5825.00	124.97			116.93	8.04	Peak	178	308
5	5850.00	72.85	122.20	-49.35	64.70	8.15	Peak	178	308
6	5855.00	71.14	110.80	-39.66	62.98	8.16	Peak	178	308
7	5875.00	61.48	105.20	-43.72	53.28	8.20	Peak	178	308
8	5925.00	62.48	68.20	-5.72	54.18	8.30	Peak	178	308
9	11650.00	50.46	54.00	-3.54	33.77	16.69	Average	100	3
10	11650.00	62.95	74.00	-11.05	46.26	16.69	Peak	100	3
11	17475.00	64.11	68.20	-4.09	44.10	20.01	Peak	100	76

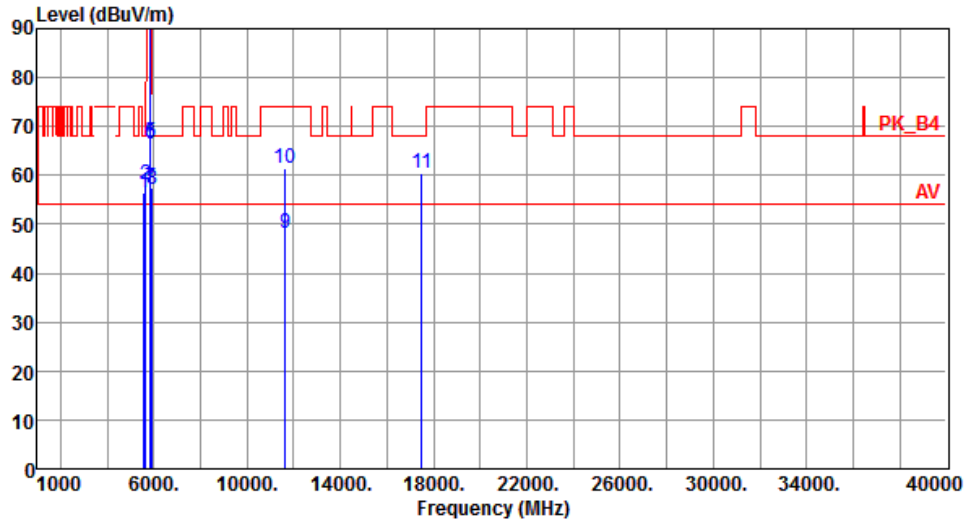
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	56.49	68.20	-11.71	49.01	7.48	Peak	190	24
2	5650.00	58.14	68.20	-10.06	50.75	7.39	Peak	190	24
3 *	5825.00	105.21			97.17	8.04	Average	190	24
4 *	5825.00	115.75			107.71	8.04	Peak	190	24
5	5850.00	66.91	122.20	-55.29	58.76	8.15	Peak	190	24
6	5855.00	66.49	110.80	-44.31	58.33	8.16	Peak	190	24
7	5875.00	57.49	105.20	-47.71	49.29	8.20	Peak	190	24
8	5925.00	57.28	68.20	-10.92	48.98	8.30	Peak	190	24
9	11650.00	48.26	54.00	-5.74	31.57	16.69	Average	211	5
10	11650.00	61.34	74.00	-12.66	44.65	16.69	Peak	211	5
11	17475.00	60.58	68.20	-7.62	40.57	20.01	Peak	105	336

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

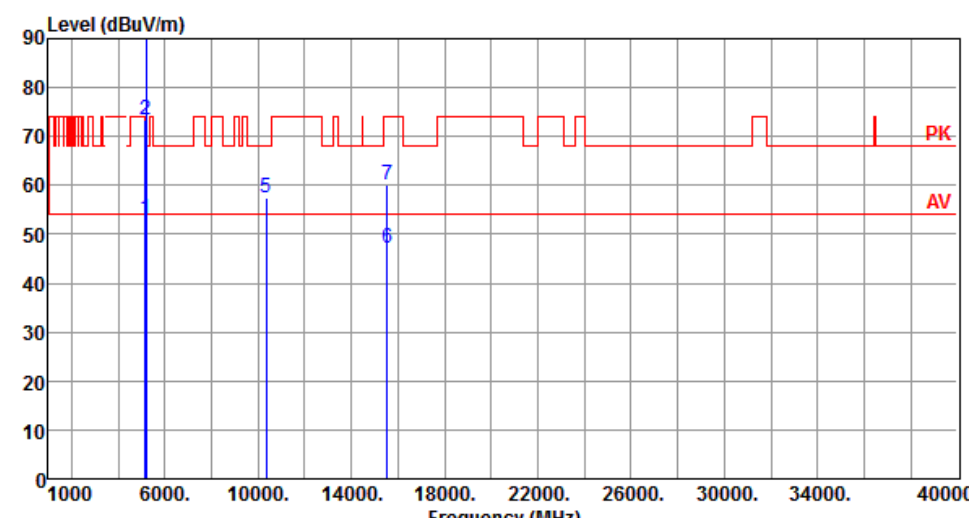
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for ax (HE20)

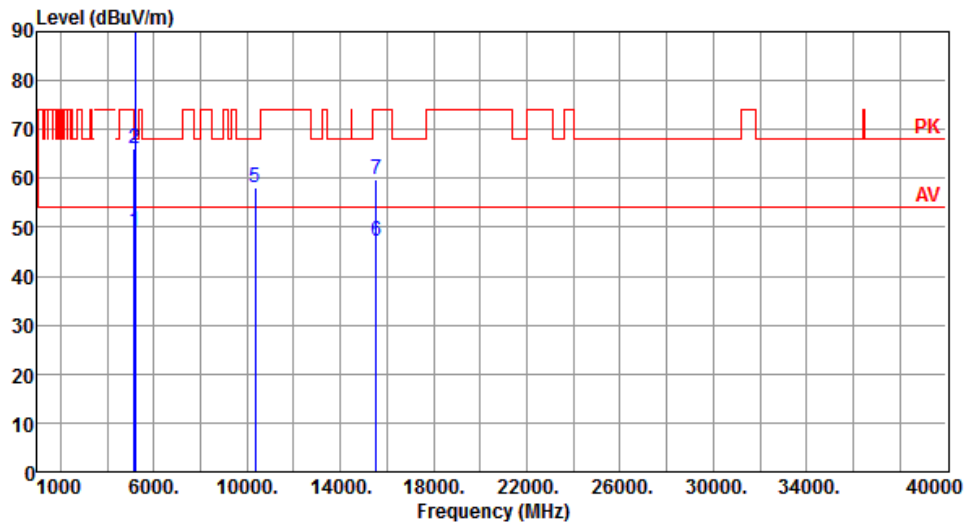
Modulation	ax (HE20)	Test Freq. (MHz)	5180
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	53.29	54.00	-0.71	45.83	7.46	Average	178	294
2	5150.00	73.56	74.00	-0.44	66.10	7.46	Peak	178	294
3 *	5180.00	111.76			104.53	7.23	Average	178	294
4 *	5180.00	123.44			116.21	7.23	Peak	178	294
5	10360.00	57.46	68.20	-10.74	40.79	16.67	Peak	185	98
6	15540.00	47.28	54.00	-6.72	29.77	17.51	Average	119	25
7	15540.00	60.13	74.00	-13.87	42.62	17.51	Peak	119	25

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
 Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5180
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	49.15	54.00	-4.85	41.69	7.46	Average	100	195
2	5150.00	65.93	74.00	-8.07	58.47	7.46	Peak	100	195
3 *	5180.00	102.77			95.54	7.23	Average	100	195
4 *	5180.00	115.04			107.81	7.23	Peak	100	195
5	10360.00	58.11	68.20	-10.09	41.44	16.67	Peak	110	25
6	15540.00	47.19	54.00	-6.81	29.68	17.51	Average	133	38
7	15540.00	59.81	74.00	-14.19	42.30	17.51	Peak	133	38

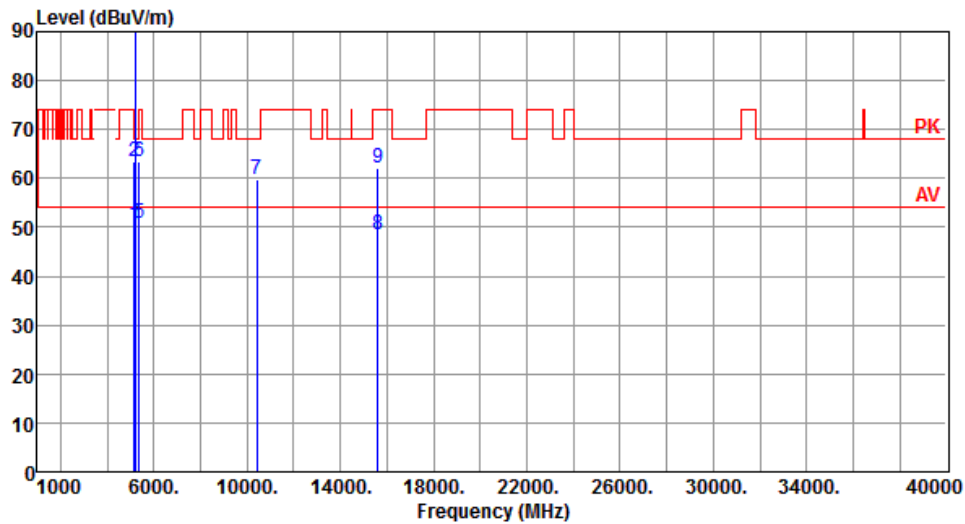
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5200
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	50.32	54.00	-3.68	42.86	7.46	Average	178	288
2	5150.00	63.41	74.00	-10.59	55.95	7.46	Peak	178	288
3 *	5200.00	112.22	---	---	105.14	7.08	Average	178	288
4 *	5200.00	124.43	---	---	117.35	7.08	Peak	178	288
5	5350.00	50.91	54.00	-3.09	44.02	6.89	Average	178	288
6	5350.00	63.40	74.00	-10.60	56.51	6.89	Peak	178	288
7	10400.00	59.85	68.20	-8.35	42.94	16.91	Peak	100	230
8	15600.00	48.36	54.00	-5.64	31.02	17.34	Average	100	50
9	15600.00	61.99	74.00	-12.01	44.65	17.34	Peak	100	50

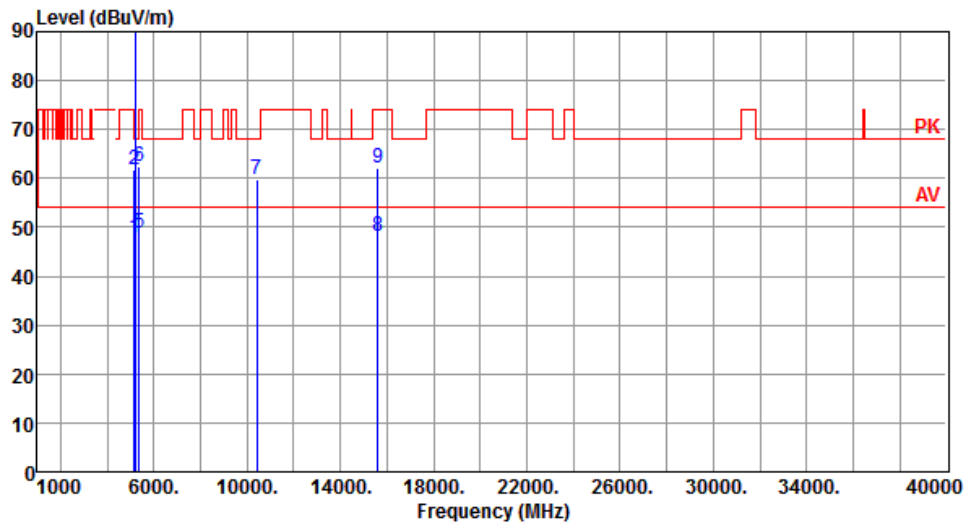
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5200
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	47.68	54.00	-6.32	40.22	7.46	Average	101	194
2	5150.00	61.85	74.00	-12.15	54.39	7.46	Peak	101	194
3 *	5200.00	103.72			96.64	7.08	Average	101	194
4 *	5200.00	115.90			108.82	7.08	Peak	101	194
5	5350.00	48.68	54.00	-5.32	41.79	6.89	Average	101	194
6	5350.00	62.44	74.00	-11.56	55.55	6.89	Peak	101	194
7	10400.00	59.87	68.20	-8.33	42.96	16.91	Peak	100	196
8	15600.00	48.29	54.00	-5.71	30.95	17.34	Average	100	30
9	15600.00	62.21	74.00	-11.79	44.87	17.34	Peak	100	30

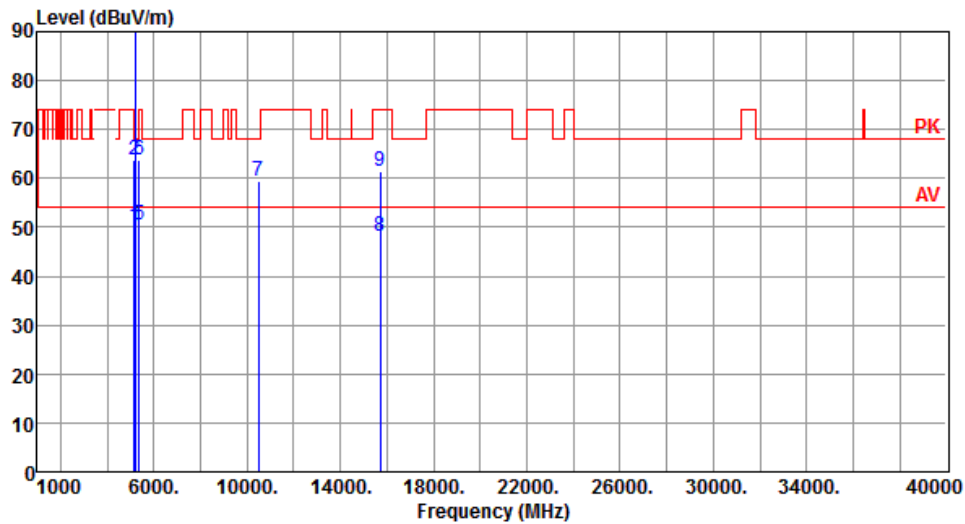
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5240
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	50.27	54.00	-3.73	42.81	7.46	Average	176	306
2	5150.00	63.71	74.00	-10.29	56.25	7.46	Peak	176	306
3 *	5240.00	111.87			104.92	6.95	Average	176	306
4 *	5240.00	123.89			116.94	6.95	Peak	176	306
5	5350.00	50.54	54.00	-3.46	43.65	6.89	Average	176	306
6	5350.00	63.90	74.00	-10.10	57.01	6.89	Peak	176	306
7	10480.00	59.45	68.20	-8.75	42.56	16.89	Peak	105	236
8	15720.00	48.14	54.00	-5.86	31.07	17.07	Average	105	63
9	15720.00	61.52	74.00	-12.48	44.45	17.07	Peak	105	63

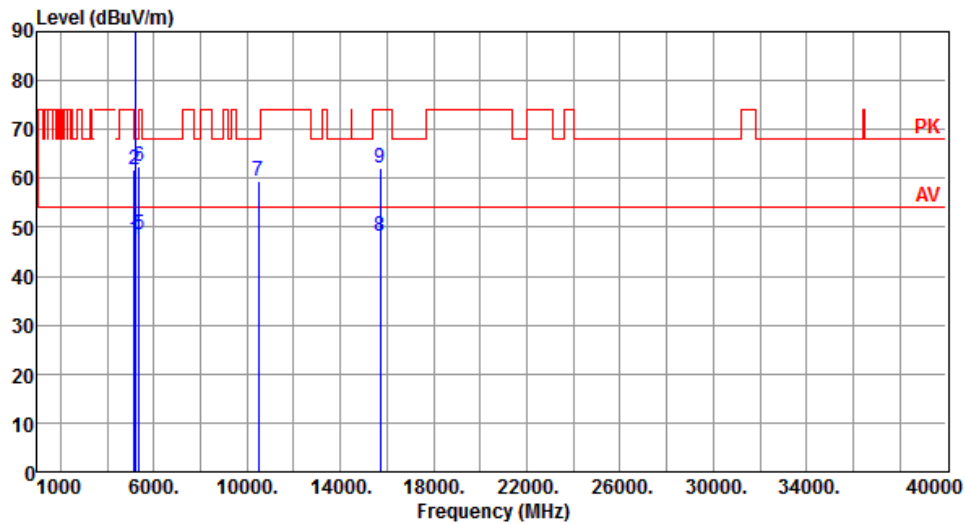
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5240
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	47.52	54.00	-6.48	40.06	7.46	Average	105	199
2	5150.00	61.65	74.00	-12.35	54.19	7.46	Peak	105	199
3 *	5240.00	103.54			96.59	6.95	Average	105	199
4 *	5240.00	115.48			108.53	6.95	Peak	105	199
5	5350.00	48.51	54.00	-5.49	41.62	6.89	Average	105	199
6	5350.00	62.39	74.00	-11.61	55.50	6.89	Peak	105	199
7	10480.00	59.45	68.20	-8.75	42.56	16.89	Peak	100	251
8	15720.00	48.03	54.00	-5.97	30.96	17.07	Average	110	64
9	15720.00	61.95	74.00	-12.05	44.88	17.07	Peak	110	64

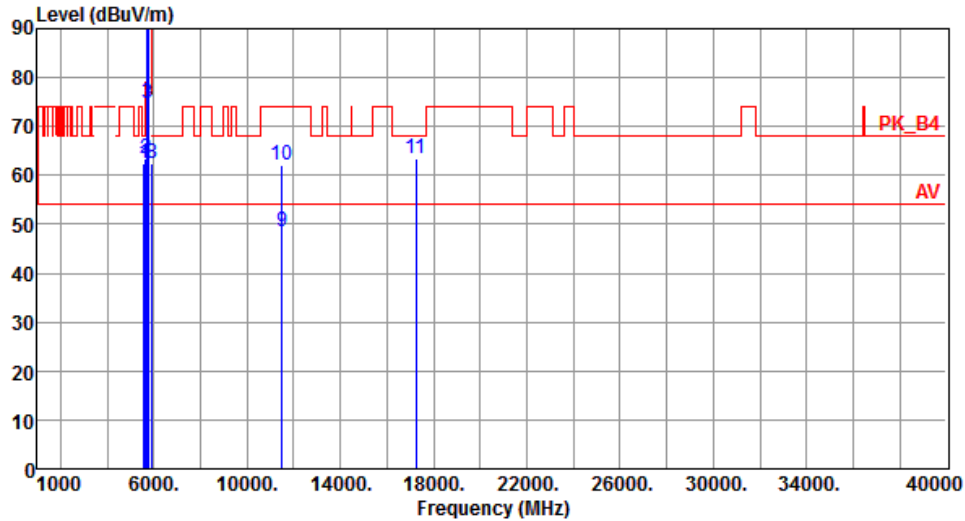
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5745
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	62.59	68.20	-5.61	55.11	7.48	Peak	185	300
2	5650.00	63.28	68.20	-4.92	55.89	7.39	Peak	185	300
3	5700.00	74.66	105.20	-30.54	66.95	7.71	Peak	185	300
4	5720.00	88.70	110.80	-22.10	80.94	7.76	Peak	185	300
5	5725.00	97.00	122.20	-25.20	89.23	7.77	Peak	185	300
6 *	5745.00	115.05			107.23	7.82	Average	185	300
7 *	5745.00	127.70			119.88	7.82	Peak	185	300
8	5925.00	62.42	68.20	-5.78	54.12	8.30	Peak	185	300
9	11490.00	48.55	54.00	-5.45	31.49	17.06	Average	102	5
10	11490.00	62.12	74.00	-11.88	45.06	17.06	Peak	102	5
11	17235.00	63.55	68.20	-4.65	44.77	18.78	Peak	115	69

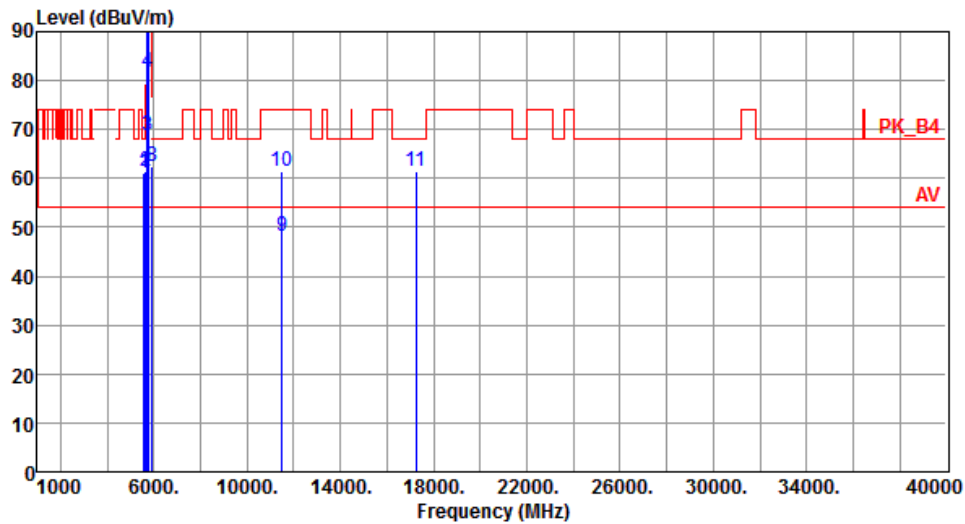
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5745
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	61.09	68.20	-7.11	53.61	7.48	Peak	193	31
2	5650.00	61.58	68.20	-6.62	54.19	7.39	Peak	193	31
3	5700.00	68.59	105.20	-36.61	60.88	7.71	Peak	193	31
4	5720.00	81.61	110.80	-29.19	73.85	7.76	Peak	193	31
5	5725.00	90.16	122.20	-32.04	82.39	7.77	Peak	193	31
6 *	5745.00	106.12			98.30	7.82	Average	193	31
7 *	5745.00	118.30			110.48	7.82	Peak	193	31
8	5925.00	62.58	68.20	-5.62	54.28	8.30	Peak	193	31
9	11490.00	48.21	54.00	-5.79	31.15	17.06	Average	146	22
10	11490.00	61.45	74.00	-12.55	44.39	17.06	Peak	146	22
11	17235.00	61.34	68.20	-6.86	42.56	18.78	Peak	100	40

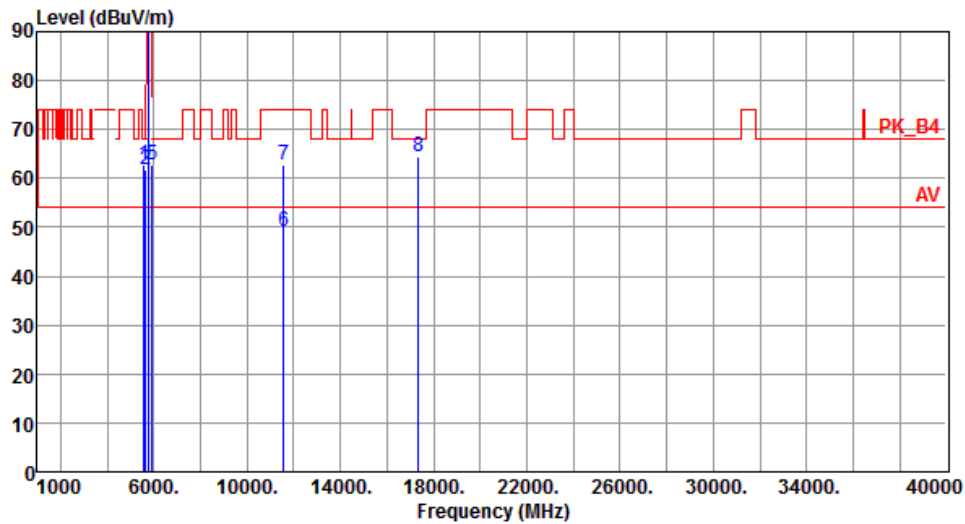
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5785
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	62.73	68.20	-5.47	55.25	7.48	Peak	189	307
2	5650.00	61.70	68.20	-6.50	54.31	7.39	Peak	189	307
3 *	5785.00	114.80	---	---	106.89	7.91	Average	189	307
4 *	5785.00	127.40	---	---	119.49	7.91	Peak	189	307
5	5925.00	62.66	68.20	-5.54	54.36	8.30	Peak	189	307
6	11570.00	49.05	54.00	-4.95	32.13	16.92	Average	100	7
7	11570.00	62.86	74.00	-11.14	45.94	16.92	Peak	100	7
8	17355.00	64.59	68.20	-3.61	45.18	19.41	Peak	118	75

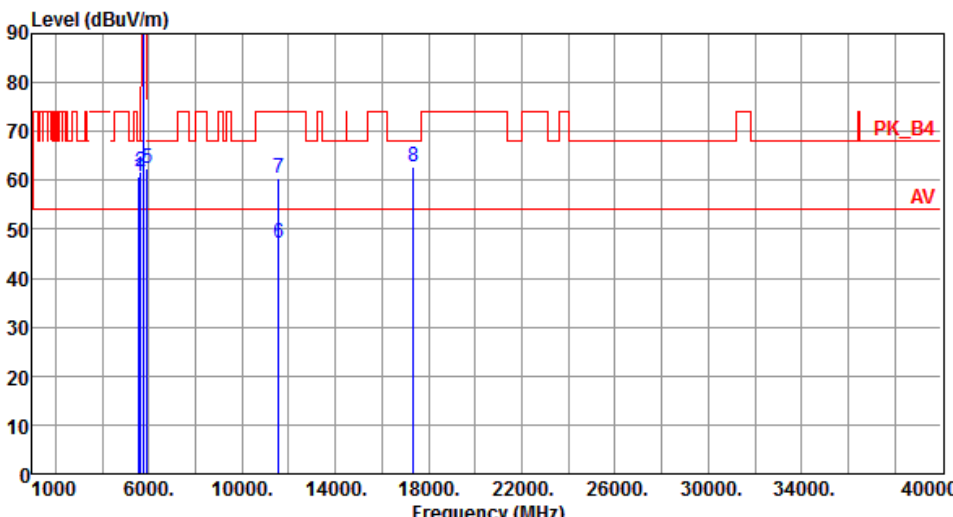
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

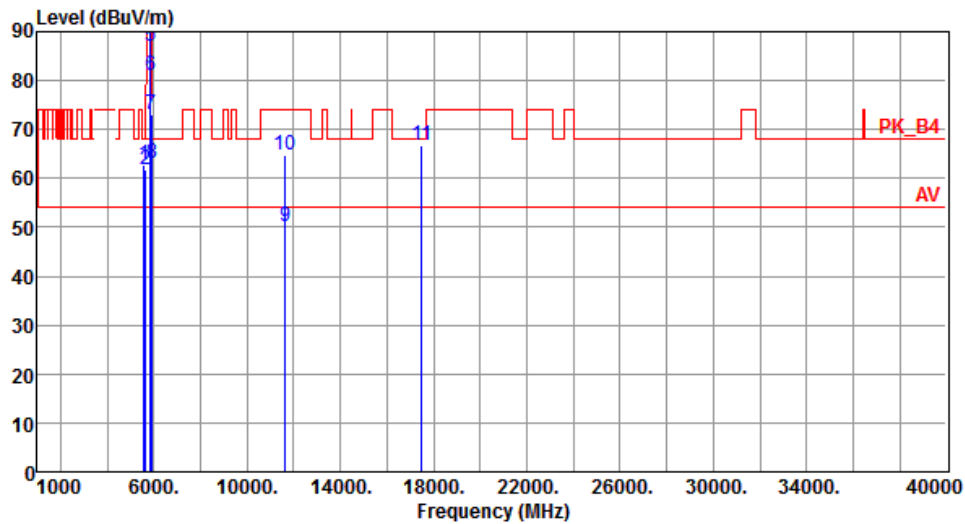
Modulation	ax (HE20)	Test Freq. (MHz)	5785
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	60.82	68.20	-7.38	53.34	7.48	Peak	189	26
2	5650.00	61.64	68.20	-6.56	54.25	7.39	Peak	189	26
3 *	5785.00	105.86			97.95	7.91	Average	189	26
4 *	5785.00	118.17			110.26	7.91	Peak	189	26
5	5925.00	62.48	68.20	-5.72	54.18	8.30	Peak	189	26
6	11570.00	47.18	54.00	-6.82	30.26	16.92	Average	155	15
7	11570.00	60.54	74.00	-13.46	43.62	16.92	Peak	155	15
8	17355.00	62.62	68.20	-5.58	43.21	19.41	Peak	100	60

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5825
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	62.78	68.20	-5.42	55.30	7.48	Peak	183	305
2	5650.00	61.65	68.20	-6.55	54.26	7.39	Peak	183	305
3 *	5825.00	114.74			106.70	8.04	Average	183	305
4 *	5825.00	126.93			118.89	8.04	Peak	183	305
5	5850.00	86.89	122.20	-35.31	78.74	8.15	Peak	183	305
6	5855.00	81.06	110.80	-29.74	72.90	8.16	Peak	183	305
7	5875.00	73.09	105.20	-32.11	64.89	8.20	Peak	183	305
8	5925.00	63.26	68.20	-4.94	54.96	8.30	Peak	183	305
9	11650.00	50.29	54.00	-3.71	33.60	16.69	Average	101	6
10	11650.00	64.62	74.00	-9.38	47.93	16.69	Peak	101	6
11	17475.00	66.77	68.20	-1.43	46.76	20.01	Peak	123	72

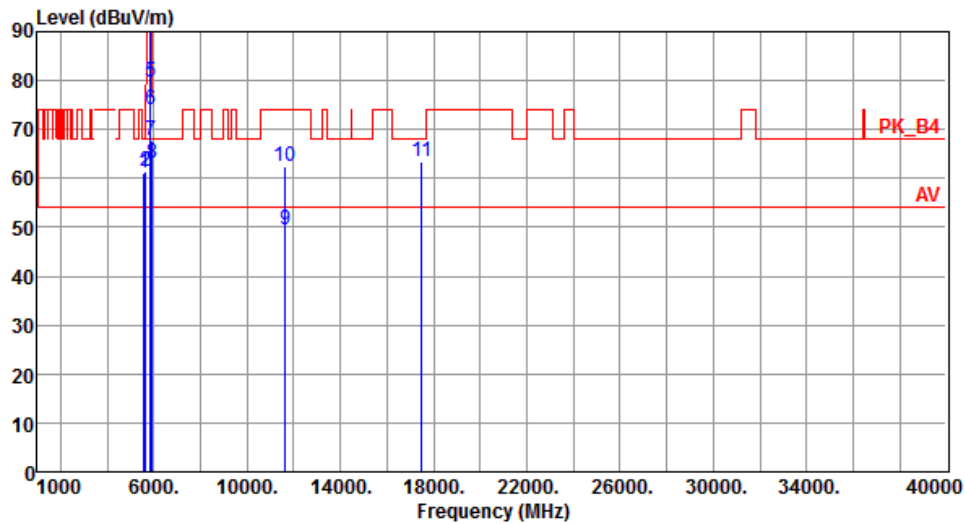
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE20)	Test Freq. (MHz)	5825
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5568.00	61.03	68.20	-7.17	53.55	7.48	Peak	192	30
2	5650.00	61.52	68.20	-6.68	54.13	7.39	Peak	192	30
3 *	5825.00	105.49			97.45	8.04	Average	192	30
4 *	5825.00	117.89			109.85	8.04	Peak	192	30
5	5850.00	79.77	122.20	-42.43	71.62	8.15	Peak	192	30
6	5855.00	73.96	110.80	-36.84	65.80	8.16	Peak	192	30
7	5875.00	67.82	105.20	-37.38	59.62	8.20	Peak	192	30
8	5925.00	63.12	68.20	-5.08	54.82	8.30	Peak	192	30
9	11650.00	49.35	54.00	-4.65	32.66	16.69	Average	156	14
10	11650.00	62.44	74.00	-11.56	45.75	16.69	Peak	156	14
11	17475.00	63.47	68.20	-4.73	43.46	20.01	Peak	100	50

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

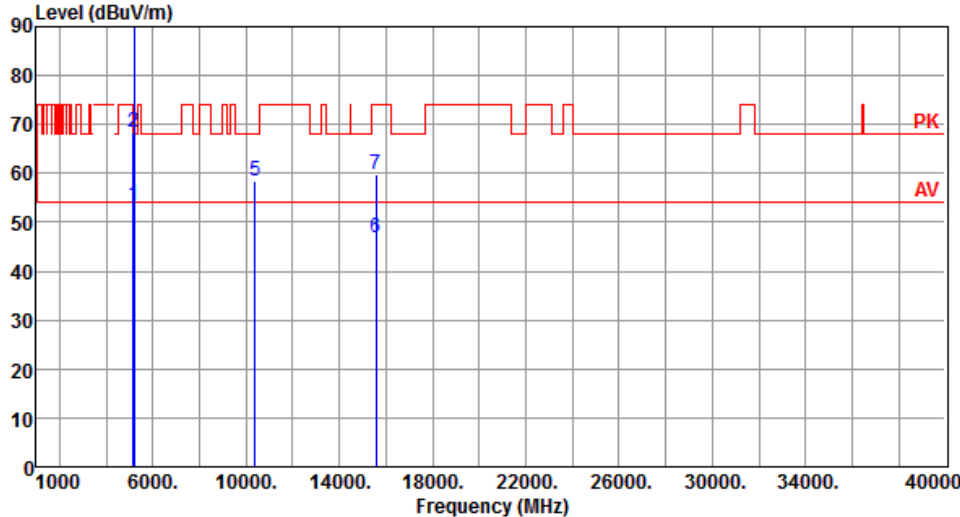
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for ax (HE40)

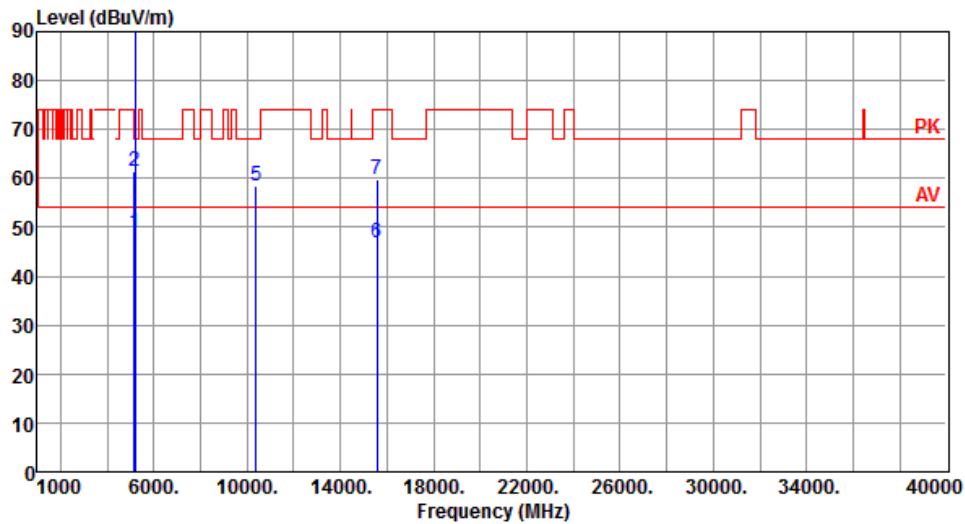
Modulation	ax (HE40)	Test Freq. (MHz)	5190
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	53.59	54.00	-0.41	46.13	7.46	Average	173	295
2	5150.00	68.31	74.00	-5.69	60.85	7.46	Peak	173	295
3 *	5180.00	106.53			99.30	7.23	Average	173	295
4 *	5180.00	119.04			111.81	7.23	Peak	173	295
5	10380.00	58.35	68.20	-9.85	41.56	16.79	Peak	100	20
6	15570.00	46.95	54.00	-7.05	29.53	17.42	Average	100	40
7	15570.00	59.88	74.00	-14.12	42.46	17.42	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE40)	Test Freq. (MHz)	5190
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	48.69	54.00	-5.31	41.23	7.46	Average	100	196
2	5150.00	61.58	74.00	-12.42	54.12	7.46	Peak	100	196
3 *	5180.00	97.52	---	---	90.29	7.23	Average	100	196
4 *	5180.00	107.57	---	---	100.34	7.23	Peak	100	196
5	10380.00	58.48	68.20	-9.72	41.69	16.79	Peak	100	40
6	15570.00	46.85	54.00	-7.15	29.43	17.42	Average	100	35
7	15570.00	59.94	74.00	-14.06	42.52	17.42	Peak	100	35

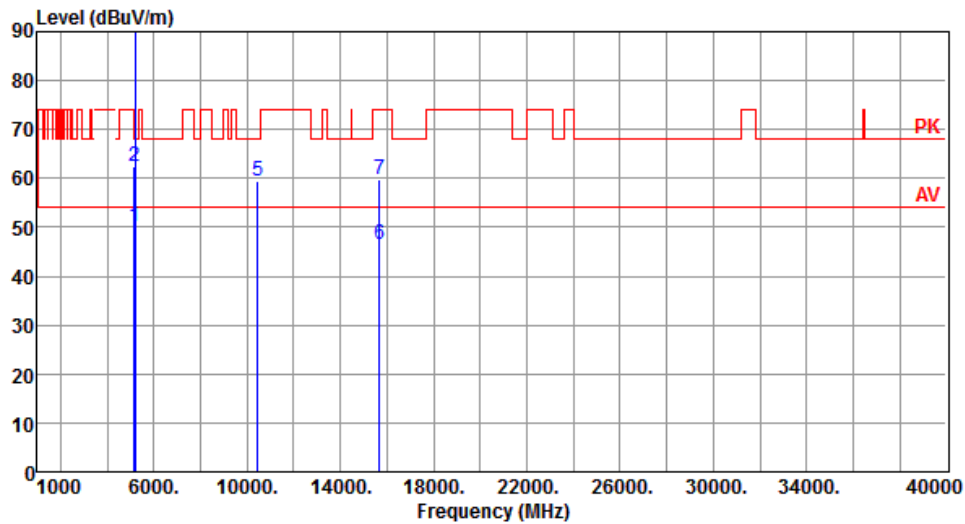
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE40)	Test Freq. (MHz)	5230
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	50.13	54.00	-3.87	42.67	7.46	Average	175	296
2	5150.00	62.31	74.00	-11.69	54.85	7.46	Peak	175	296
3 *	5230.00	112.59			105.61	6.98	Average	175	296
4 *	5230.00	124.94			117.96	6.98	Peak	175	296
5	10460.00	59.45	68.20	-8.75	42.56	16.89	Peak	100	50
6	15690.00	46.45	54.00	-7.55	29.26	17.19	Average	100	20
7	15690.00	59.76	74.00	-14.24	42.57	17.19	Peak	100	20

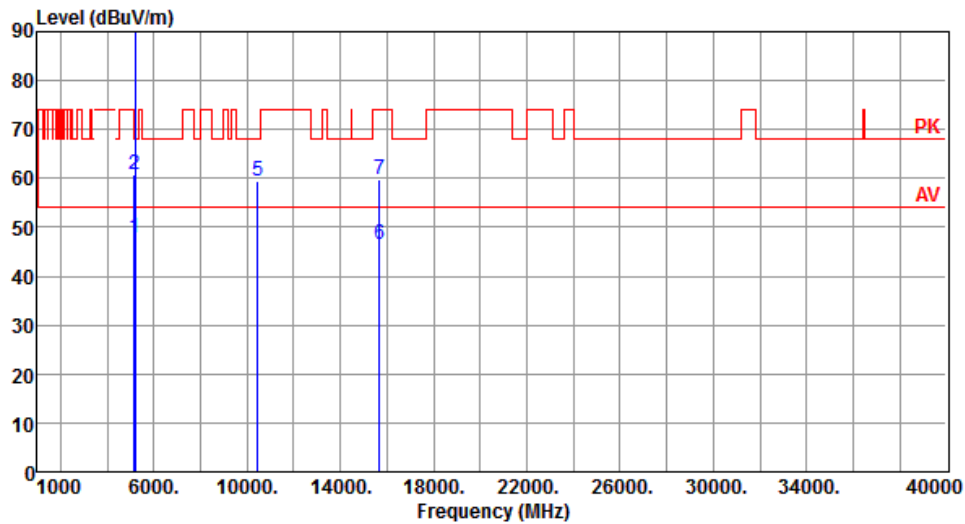
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE40)	Test Freq. (MHz)	5230
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	47.71	54.00	-6.29	40.25	7.46	Average	100	191
2	5150.00	60.72	74.00	-13.28	53.26	7.46	Peak	100	191
3 *	5230.00	103.60			96.62	6.98	Average	100	191
4 *	5230.00	113.66			106.68	6.98	Peak	100	191
5	10460.00	59.34	68.20	-8.86	42.45	16.89	Peak	100	80
6	15690.00	46.50	54.00	-7.50	29.31	17.19	Average	100	40
7	15690.00	59.81	74.00	-14.19	42.62	17.19	Peak	100	40

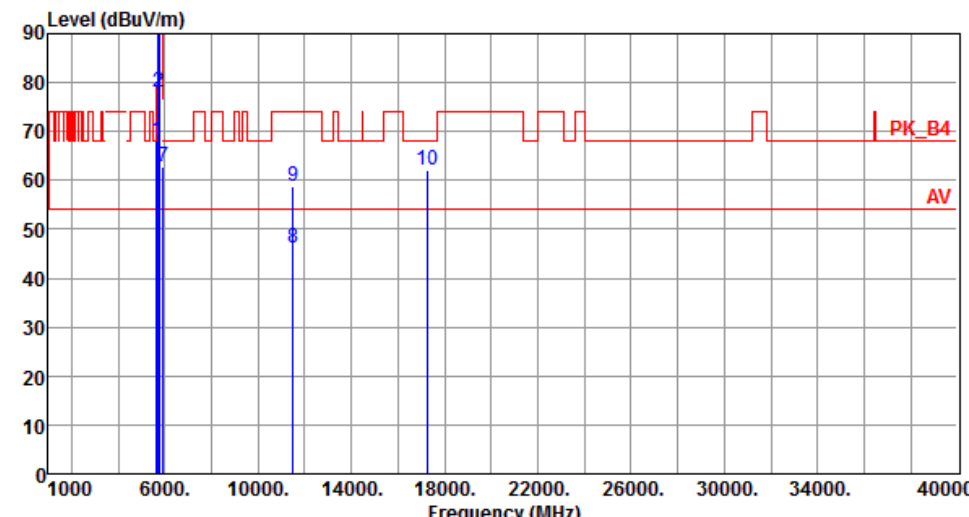
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

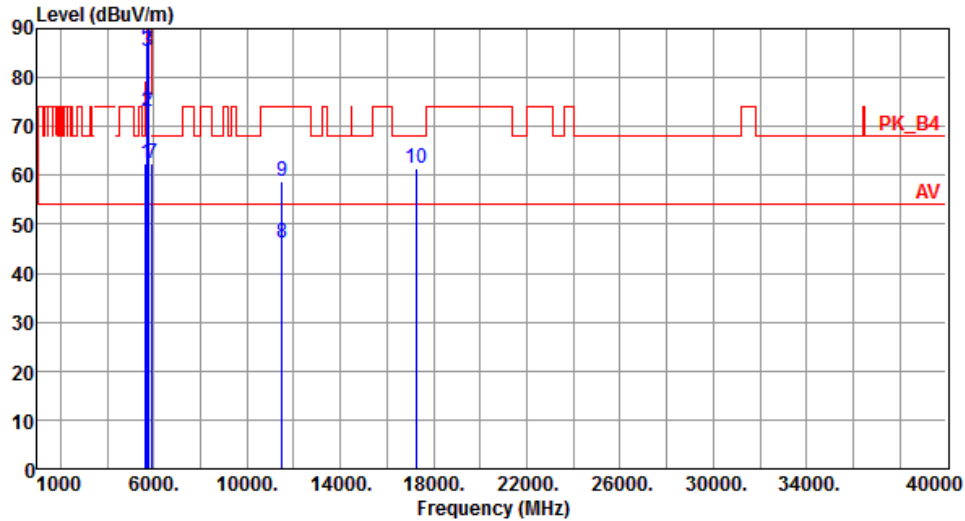
Modulation	ax (HE40)	Test Freq. (MHz)	5755
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	67.95	68.20	-0.25	60.56	7.39	Peak	185	300
2	5700.00	78.05	105.20	-27.15	70.34	7.71	Peak	185	300
3	5720.00	92.27	110.80	-18.53	84.51	7.76	Peak	185	300
4	5725.00	94.31	122.20	-27.89	86.54	7.77	Peak	185	300
5 *	5755.00	110.45			102.62	7.83	Average	185	300
6 *	5755.00	123.02			115.19	7.83	Peak	185	300
7	5925.00	62.92	68.20	-5.28	54.62	8.30	Peak	185	300
8	11510.00	46.32	54.00	-7.68	29.26	17.06	Average	100	40
9	11510.00	58.64	74.00	-15.36	41.58	17.06	Peak	100	40
10	17265.00	62.03	68.20	-6.17	43.12	18.91	Peak	100	50

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
 Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE40)	Test Freq. (MHz)	5755
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	62.51	68.20	-5.69	55.12	7.39	Peak	188	31
2	5700.00	72.97	105.20	-32.23	65.26	7.71	Peak	188	31
3	5720.00	85.40	110.80	-25.40	77.64	7.76	Peak	188	31
4	5725.00	87.45	122.20	-34.75	79.68	7.77	Peak	188	31
5 *	5755.00	103.29			95.46	7.83	Average	188	31
6 *	5755.00	113.86			106.03	7.83	Peak	188	31
7	5925.00	62.50	68.20	-5.70	54.20	8.30	Peak	188	31
8	11510.00	46.19	54.00	-7.81	29.13	17.06	Average	100	60
9	11510.00	58.68	74.00	-15.32	41.62	17.06	Peak	100	60
10	17265.00	61.47	68.20	-6.73	42.56	18.91	Peak	100	90

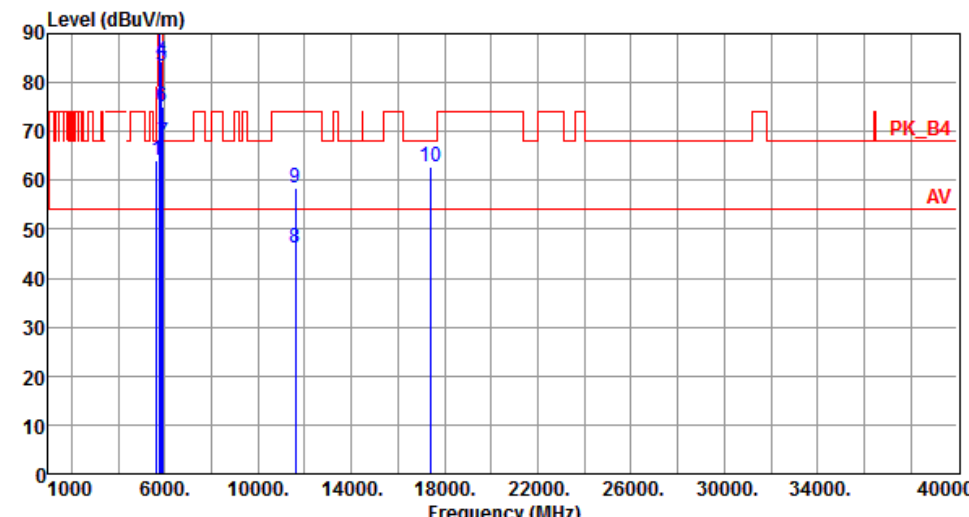
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

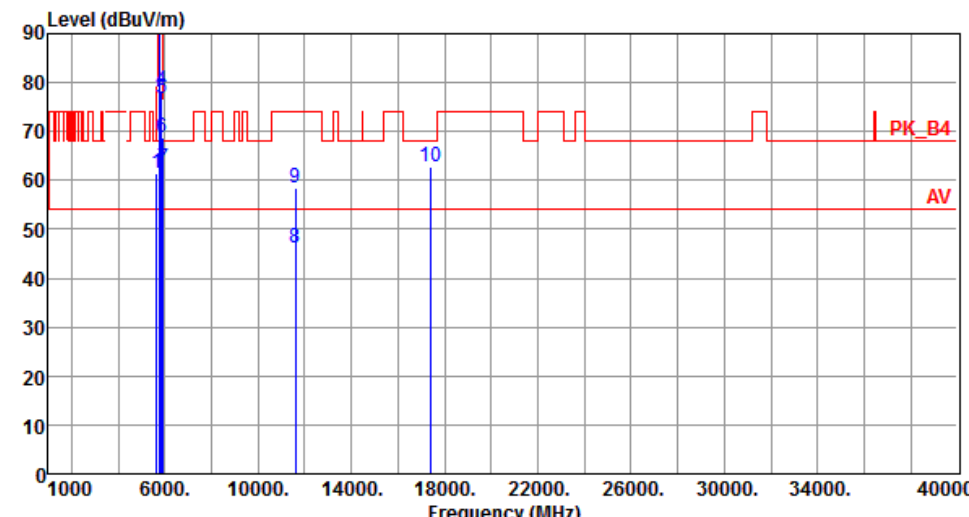
Modulation	ax (HE40)	Test Freq. (MHz)	5795
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	64.01	68.20	-4.19	56.62	7.39	Peak	189	292
2	* 5795.00	111.25			103.32	7.93	Average	189	292
3	* 5795.00	123.34			115.41	7.93	Peak	189	292
4	5850.00	84.40	122.20	-37.80	76.25	8.15	Peak	189	292
5	5855.00	83.45	110.80	-27.35	75.29	8.16	Peak	189	292
6	5875.00	75.09	105.20	-30.11	66.89	8.20	Peak	189	292
7	5925.00	67.74	68.20	-0.46	59.44	8.30	Peak	189	292
8	11590.00	46.14	54.00	-7.86	29.26	16.88	Average	100	30
9	11590.00	58.46	74.00	-15.54	41.58	16.88	Peak	100	30
10	17385.00	62.89	68.20	-5.31	43.29	19.60	Peak	100	50

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
 Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE40)	Test Freq. (MHz)	5795
Polarization	Vertical	Test Configuration	1

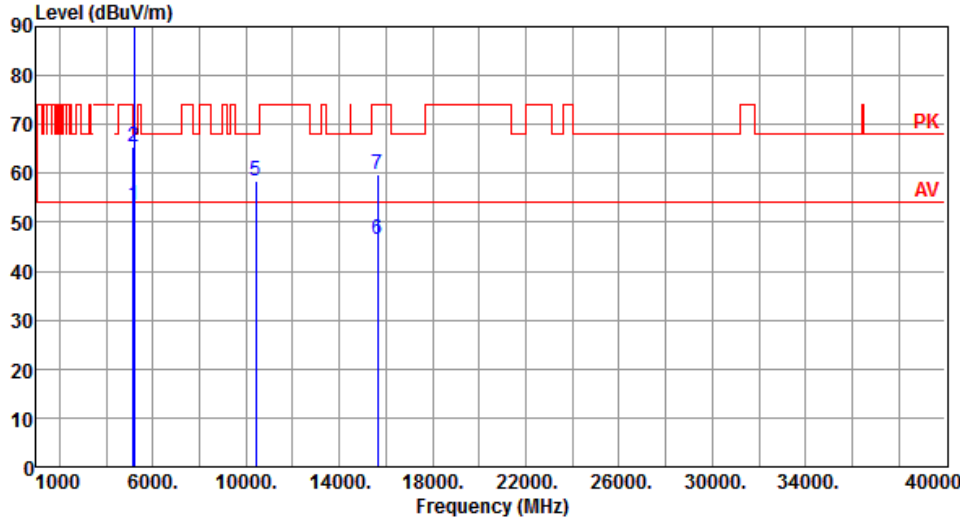


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	61.41	68.20	-6.79	54.02	7.39	Peak	186	25
2	* 5795.00	103.38			95.45	7.93	Average	186	25
3	* 5795.00	114.31			106.38	7.93	Peak	186	25
4	5850.00	78.46	122.20	-43.74	70.31	8.15	Peak	186	25
5	5855.00	76.61	110.80	-34.19	68.45	8.16	Peak	186	25
6	5875.00	68.65	105.20	-36.55	60.45	8.20	Peak	186	25
7	5925.00	62.56	68.20	-5.64	54.26	8.30	Peak	186	25
8	11590.00	46.19	54.00	-7.81	29.31	16.88	Average	100	40
9	11590.00	58.30	74.00	-15.70	41.42	16.88	Peak	100	40
10	17385.00	62.80	68.20	-5.40	43.20	19.60	Peak	100	60

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: "*" is Peak / Average value of fundamental frequency

3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for ax (HE80)

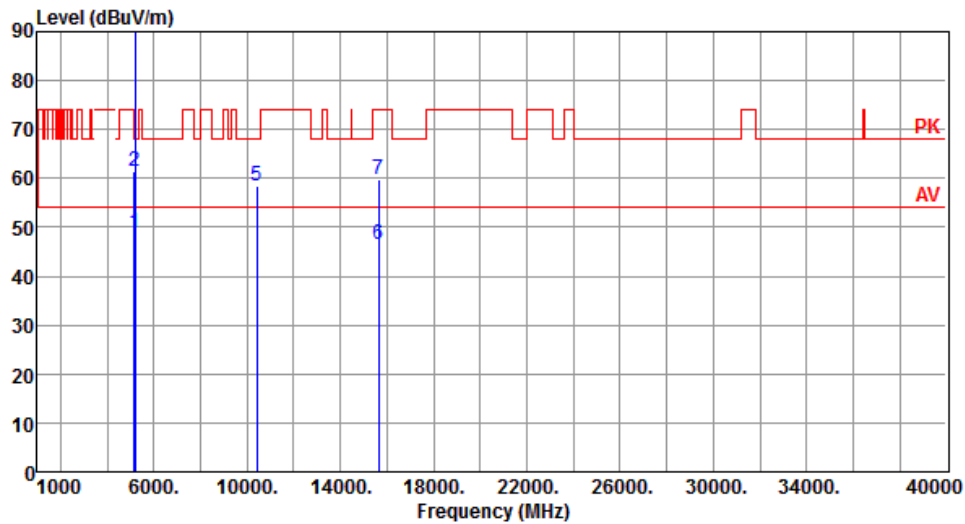
Modulation	ax (HE80)	Test Freq. (MHz)	5210
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	53.58	54.00	-0.42	46.12	7.46	Average	195	295
2	5150.00	65.59	74.00	-8.41	58.13	7.46	Peak	195	295
3 *	5210.00	102.02			94.97	7.05	Average	195	295
4 *	5210.00	114.41			107.36	7.05	Peak	195	295
5	10420.00	58.46	68.20	-9.74	41.56	16.90	Peak	100	30
6	15630.00	46.41	54.00	-7.59	29.12	17.29	Average	100	40
7	15630.00	59.82	74.00	-14.18	42.53	17.29	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
 Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE80)	Test Freq. (MHz)	5210
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	48.69	54.00	-5.31	41.23	7.46	Average	100	195
2	5150.00	61.58	74.00	-12.42	54.12	7.46	Peak	100	195
3 *	5210.00	92.67			85.62	7.05	Average	100	195
4 *	5210.00	103.26			96.21	7.05	Peak	100	195
5	10420.00	58.59	68.20	-9.61	41.69	16.90	Peak	100	50
6	15630.00	46.34	54.00	-7.66	29.05	17.29	Average	100	60
7	15630.00	59.90	74.00	-14.10	42.61	17.29	Peak	100	60

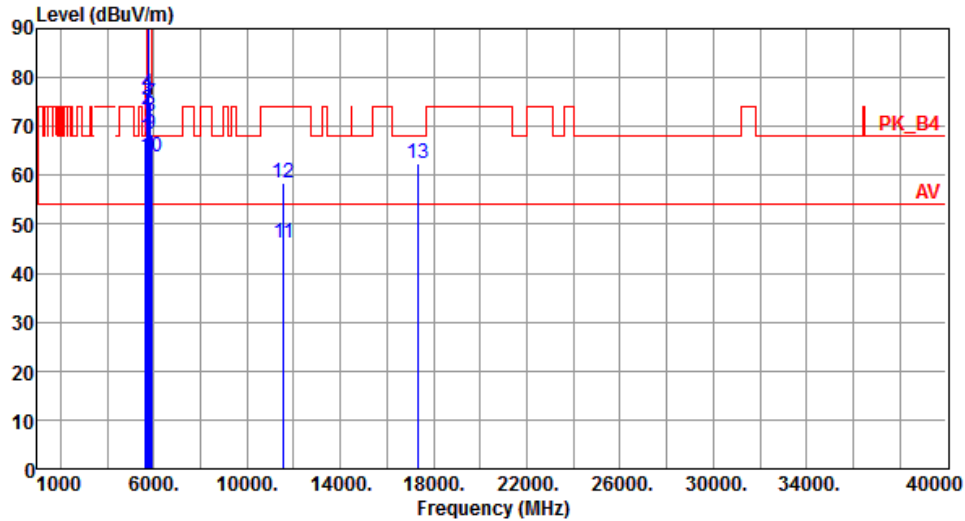
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE80)	Test Freq. (MHz)	5775
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	67.81	68.20	-0.39	60.42	7.39	Peak	169	295
2	5700.00	73.43	105.20	-31.77	65.72	7.71	Peak	169	295
3	5720.00	75.33	110.80	-35.47	67.57	7.76	Peak	169	295
4	5725.00	76.87	122.20	-45.33	69.10	7.77	Peak	169	295
5 *	5775.00	107.62			99.74	7.88	Average	169	295
6 *	5775.00	119.89			112.01	7.88	Peak	169	295
7	5850.00	74.87	122.20	-47.33	66.72	8.15	Peak	169	295
8	5855.00	72.06	110.80	-38.74	63.90	8.16	Peak	169	295
9	5875.00	68.34	105.20	-36.86	60.14	8.20	Peak	169	295
10	5925.00	63.88	68.20	-4.32	55.58	8.30	Peak	169	295
11	11550.00	46.23	54.00	-7.77	29.26	16.97	Average	100	40
12	11550.00	58.55	74.00	-15.45	41.58	16.97	Peak	100	40
13	17325.00	62.48	68.20	-5.72	43.27	19.21	Peak	100	90

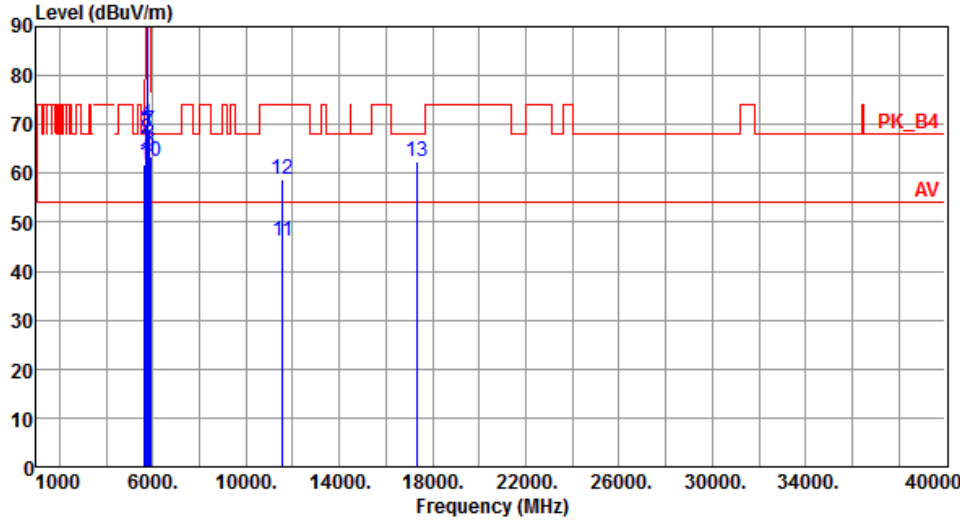
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax (HE80)	Test Freq. (MHz)	5775
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	61.65	68.20	-6.55	54.26	7.39	Peak	188	39
2	5700.00	67.24	105.20	-37.96	59.53	7.71	Peak	188	39
3	5720.00	68.34	110.80	-42.46	60.58	7.76	Peak	188	39
4	5725.00	70.03	122.20	-52.17	62.26	7.77	Peak	188	39
5	* 5775.00	98.50			90.62	7.88	Average	188	39
6	* 5775.00	109.11			101.23	7.88	Peak	188	39
7	5850.00	68.78	122.20	-53.42	60.63	8.15	Peak	188	39
8	5855.00	66.02	110.80	-44.78	57.86	8.16	Peak	188	39
9	5875.00	63.49	105.20	-41.71	55.29	8.20	Peak	188	39
10	5925.00	62.42	68.20	-5.78	54.12	8.30	Peak	188	39
11	11550.00	46.10	54.00	-7.90	29.13	16.97	Average	100	50
12	11550.00	58.66	74.00	-15.34	41.69	16.97	Peak	100	50
13	17325.00	62.37	68.20	-5.83	43.16	19.21	Peak	100	50

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: "*" is Peak / Average value of fundamental frequency

3.6 Frequency Stability

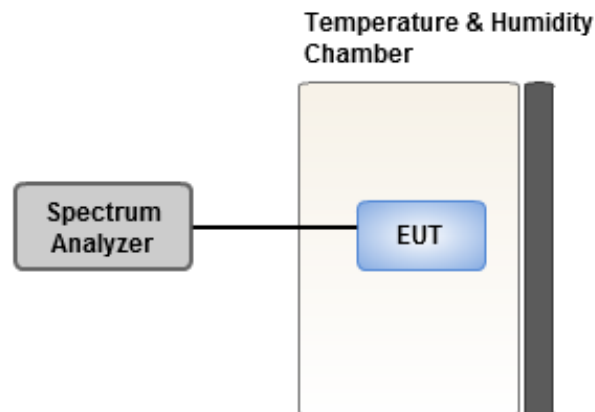
3.6.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

3.6.2 Test Procedures

1. The EUT is installed in an environment test chamber with external power source.
2. Set the chamber to operate at 20 centigrade and external power source to output at nominal voltage of EUT.
3. A sufficient stabilization period at each temperature is used prior to each frequency measurement.
4. When temperature is stabled, measure the frequency stability.
5. The test shall be performed under normal and extreme condition for temperature and voltage.

3.6.3 Test Setup



3.6.4 Test Result of Frequency Stability

Frequency: 5200 MHz	Frequency Drift (ppm)			
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes
T20°C Vmax	-2.53	-2.74	-2.51	-1.89
T20°C Vmin	-2.08	-2.10	-1.86	-1.74
T50°C Vnom	-5.26	-5.16	-4.94	-5.00
T40°C Vnom	-3.16	-2.57	-2.77	-2.26
T30°C Vnom	-4.34	-4.45	-4.76	-4.61
T20°C Vnom	-4.11	-3.54	-3.22	-3.84
T10°C Vnom	1.54	1.00	1.46	1.87
T0°C Vnom	1.23	2.14	2.10	1.47
T-10°C Vnom	1.43	1.43	2.02	1.28
T-20°C Vnom	3.39	3.90	4.00	4.00
T-30°C Vnom	3.34	3.69	3.97	2.85
Vnom [Vac]: 120		Vmax [Vac]: 138		Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50		Tmin [°C]: -30

Frequency: 5785 MHz	Frequency Drift (ppm)			
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes
T20°C Vmax	-3.38	-3.69	-3.10	-3.71
T20°C Vmin	-2.79	-2.13	-3.25	-2.46
T50°C Vnom	-6.71	-6.18	-6.53	-6.03
T40°C Vnom	-3.58	-3.25	-3.14	-2.80
T30°C Vnom	-5.10	-5.30	-5.01	-4.65
T20°C Vnom	-2.96	-2.34	-3.03	-2.84
T10°C Vnom	0.15	0.25	0.31	0.38
T0°C Vnom	0.16	0.47	0.45	0.24
T-10°C Vnom	0.07	0.29	-0.01	-0.20
T-20°C Vnom	2.25	2.76	2.47	2.70
T-30°C Vnom	3.03	2.81	3.48	3.13
Vnom [Vac]: 120		Vmax [Vac]: 138		Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50		Tmin [°C]: -30

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

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Kwei Shan

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No. 3-1, Lane 6, Wen San 3rd St.,
Kwei Shan District, Tao Yuan City
333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

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St., Kwei Shan District, Tao Yuan
City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

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