FCC RF Test Report

FCC ID	:	UZ7PS30JP
EQUIPMENT	:	Personal Shopper
BRAND NAME	:	ZEBRA
MODEL NAME	:	PS30JP
APPLICANT	:	Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742
MANUFACTURER	:	Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	15E 6 GHz Low Power Dual Client (6CD)
TEST DATE(S)	:	Jan. 15, 2024 ~ Jan. 30, 2024

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
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People's Republic of China

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History of this test report

Report No.	Version	Description	Issued Date
FR3D0816B	01	Initial issue of report	Feb. 19, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403(i) 15.407(a)(10)	26dB Emission Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407(a)(7)	Maximum Conducted Output Power	Reporting only	-
3.2	15.407(a)(7)	Fundamental Maximum EIRP	Pass	-
3.3	15.407(a)(7)	Fundamental Power Spectral Density	Pass	-
3.4	15.407(b)(6)	In-Band Emissions (Channel Mask)	Pass	-
-	15.407(d)(6)	Contention Based Protocol	Pass	Refer to FR3D0816A
3.5	15.407(b)	Unwanted Emissions	Pass	Under limit 4.36 dB at 5892.60 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 5.28 dB at 0.524 MHz
3.7	15.203 15.407(a)	Antenna Requirement	Pass	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Personal Shopper
Brand Name	ZEBRA
Model Name	PS30JP
FCC ID	UZ7PS30JP
HW Version	EV2
SW Version	13-13-11.00-TG-U00-PRD-NEM-04
FW Version	FUSION_QA_6_1.1.0.004_T
MFD	13Dec23
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. WIFI 6E 6CD contains two separate reports. This report (FR3D0816B) is standard client mode for U-NII-5&7, and another report (FR3D0816A) is indoor client mode for U-NII-5~8.

Specification of Accessory				
Battery 1	**Brand Name**	Zebra	**Part Number**	BT-000355-0020
Battery 2	**Brand Name**	Zebra	**Part Number**	BT-000355-5020

Supported Unit used in test configuration and system				
1-slot cradle	**Brand Name**	Zebra	**Part Number**	CRD-MC18-1SLOT-01
Adapter	**Brand Name**	Zebra	**Part Number**	PWR-BGA12V108W0WW
Programming USB cable	**Brand Name**	Zebra	**Part Number**	CBL-PS30-USBCHG-01
Soft Holster	**Brand Name**	Zebra	**Part Number**	SG-PS20-SFTHLT-01

1.2 Product Specification of Equipment Under Test

<table>
<tr><th colspan="2">Standards-related Product Specification</th></tr>
<tr><td>Tx/Rx Frequency Range</td><td>U-NII-5: 5925 MHz ~ 6425 MHz
U-NII-7: 6525 MHz ~ 6875 MHz</td></tr>
<tr><td>Maximum EIRP</td><td><MIMO Ant.0+1>
<U-NII-5>
802.11a : 20.61 dBm / 0.1151 W
802.11ax HE20 : 20.47 dBm / 0.1114 W
802.11ax HE40 : 20.89 dBm / 0.1227 W
802.11ax HE80 : 20.67 dBm / 0.1167 W
802.11ax HE160 : 20.91 dBm / 0.1233 W
<U-NII-7>
802.11a : 15.83 dBm / 0.0383 W
802.11ax HE20 : 15.44 dBm / 0.0350 W
802.11ax HE40 : 15.83 dBm / 0.0383 W
802.11ax HE80 : 15.61 dBm / 0.0364 W
802.11ax HE160 : 15.85 dBm / 0.0385 W</td></tr>
<tr><td>99% Occupied Bandwidth</td><td>802.11a : 16.543 MHz
802.11ax HE20 : 18.941 MHz
802.11ax HE40 : 37.722 MHz
802.11ax HE80 : 77.203 MHz
802.11ax HE160 : 156.643 MHz</td></tr>
<tr><td>Antenna Type / Gain</td><td><5925 MHz ~ 6425 MHz >
<Ant. 0> : IFA Antenna with gain 2.90 dBi
<Ant. 1> : IFA Antenna with gain 4.00 dBi
<6525 MHz ~ 6875 MHz >
<Ant. 0> : IFA Antenna with gain 1.40 dBi
<Ant. 1> : IFA Antenna with gain 2.20 dBi</td></tr>
<tr><td>Type of Modulation</td><td>802.11a : OFDM (BPSK / QPSK / 16QAM / 64QAM)
802.11ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)</td></tr>
<tr><td>Antenna Function Description</td><td>
<table>
<tr><td></td><td>Ant. 0</td><td>Ant. 1</td></tr>
<tr><td>802.11 a/ax SISO</td><td>V</td><td>V</td></tr>
<tr><td>802.11 a/ax CDD</td><td colspan="2">V</td></tr>
<tr><td>802.11 ax SDM</td><td colspan="2">V</td></tr>
<tr><td>802.11 ax TxBF</td><td colspan="2">V</td></tr>
</table>
</td></tr>
</table>

Remark:

1. 802.11ax support full RU tone and partial RU tone(26/52/242/484/996-tone), both full RU and partial RU-left (for low CH) and partial RU-right (for high CH) are tested for conducted power/PSD/Channel Mask in appendix A, all the other test case were performed with full RU with its maximum power/PSD.
2. The EUT does not support channel puncturing mode.
3. WIFI MIMO support CDD & SDM & Tx Beamforming mode by manufacturer declared.
4. For WLAN SISO & MIMO(CDD) mode of 802.11a, the whole testing has assessed CDD mode by referring to the higher normal conducted power.

5. For WLAN SISO & MIMO(CDD) & MIMO(SDM) & Tx Beamforming mode of 802.11ax, the whole testing has assessed CDD mode by referring to the higher normal conducted power. CDD mode conducted power is set to 3dB higher than TXBF, Since the maximum array gain for two antenna system is 3dB. Hence, the TXBF compliance is met by testing CDD mode as worst mode for standard power mode
6. The device supports 1S2T (CDD & Tx Beamforming) and 2S2T (SDM) mode;
   1S2T: Nss=1, MIMO 2Tx; 2S2T: Nss=2, MIMO 2Tx.

1.3 Modification of EUT

No modifications are made to the EUT during all test items.

1.4 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CO01-KS 03CH08-KS TH01-KS	CN1257	314309

1.5 Test Software

Item	Site	Manufacture	Name	Version
1.	TH01-KS	Tonscend	JS1120-3 test system China_210602	3.3.10
2.	03CH08-KS	AUDIX	E3	210616
3.	CO01-KS	AUDIX	E3	6.2009-8-24

1.6 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 987594 D02 U-NII 6 GHz EMC Measurement v02r01
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

<U-NII-5>

BW 20M	**Channel**	1	5	9	13	17	21	25	29
	Freq. (MHz)	5955	5975	5995	6015	6035	6055	6075	6095
BW 40M	**Channel**	3		11		19		27	
	Freq. (MHz)	5965		6005		6045		6085	
BW 80M	**Channel**	7				23			
	Freq. (MHz)	5985				6065			
BW 160M	**Channel**	15							
	Freq. (MHz)	6025							

BW 20M	**Channel**	33	37	41	45	49	53	57	61
	Freq. (MHz)	6115	6135	6155	6175	6195	6215	6235	6255
BW 40M	**Channel**	35		43		51		59	
	Freq. (MHz)	6125		6165		6205		6245	
BW 80M	**Channel**	39				55			
	Freq. (MHz)	6145				6225			
BW 160M	**Channel**	47							
	Freq. (MHz)	6185							

BW 20M	**Channel**	65	69	73	77	81	85	89	93
	Freq. (MHz)	6275	6295	6315	6335	6355	6375	6395	6415
BW 40M	**Channel**	67		75		83		91	
	Freq. (MHz)	6285		6325		6365		6405	
BW 80M	**Channel**	71				87			
	Freq. (MHz)	6305				6385			
BW 160M	**Channel**	79							
	Freq. (MHz)	6345							

<U-NII- 7>

BW 20M	**Channel**	-	-	-	-	-	117	121	125
	Freq. (MHz)	-	-	-	-	-	6535	6555	6575
BW 40M	**Channel**	-		-		-		123	
	Freq. (MHz)	-		-		-		6565	
BW 80M	**Channel**	-				-			
	Freq. (MHz)	-				-			
BW 160M	**Channel**	-							
	Freq. (MHz)	-							

BW 20M	**Channel**	129	133	137	141	145	149	153	157
	Freq. (MHz)	6595	6615	6635	6655	6675	6695	6715	6735
BW 40M	**Channel**	131		139		147		155	
	Freq. (MHz)	6605		6645		6685		6725	
BW 80M	**Channel**	135				151			
	Freq. (MHz)	6625				6705			
BW 160M	**Channel**	143							
	Freq. (MHz)	6665							

BW 20M	**Channel**	161	165	169	173	177	181	-	-
	Freq. (MHz)	6755	6775	6795	6815	6835	6855	-	-
BW 40M	**Channel**	163		171		179		-	
	Freq. (MHz)	6765		6805		6845		-	
BW 80M	**Channel**	167				-			
	Freq. (MHz)	6785				-			
BW 160M	**Channel**	-							
	Freq. (MHz)	-							

2.2 Test Mode

Radiated Spurious Emission Test Modes

For Radiated Test Cases, The tests were performed with Adapter. All radiated test mode refer to Appendix C of this report.

Test Cases	
AC Conducted Emission	Mode 1 : WLAN 6G Link +BT Link + Single slot locking cradle + AC Adapter (PWR-BGA12V108W0WW)(Sanhua) + Fast Charge Mode @1.5AMP + DC Line Cord 1 (CBL-DC-394A1-01) + Battery 1 (BT-000355-0020)

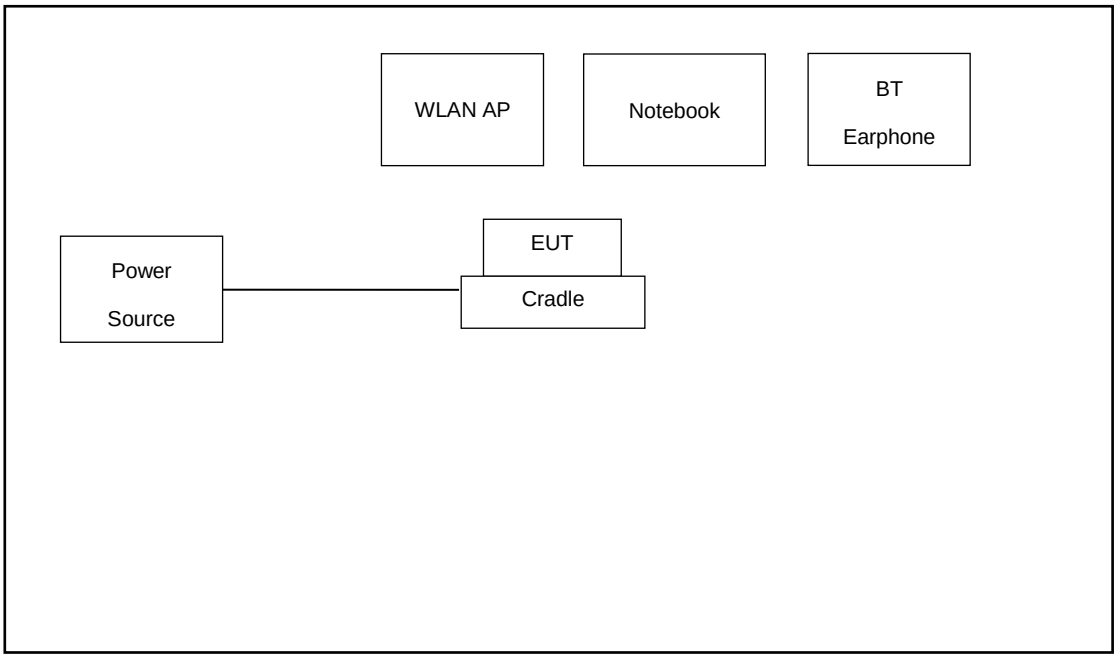
Ch. #		5925-6425 MHz UNII-5	6525-6875 MHz UNII-7	5925-6425 MHz UNII-5	6525-6875 MHz UNII-7
		802.11a/ax HE20	802.11a/ax HE20	802.11ax HE40	802.11ax HE40
L	Low	001	117	003	123
M	Middle	049	149	051	147
H	High	093	181	091	179

Ch. #		5925-6425 MHz UNII-5	6525-6875 MHz UNII-7	5925-6425 MHz UNII-5	6525-6875 MHz UNII-7
		802.11ax HE80	802.11ax HE80	802.11ax HE160	802.11ax HE160
L	Low	007	135	015	143
M	Middle	055	151	047	-
H	High	087	167	079	-

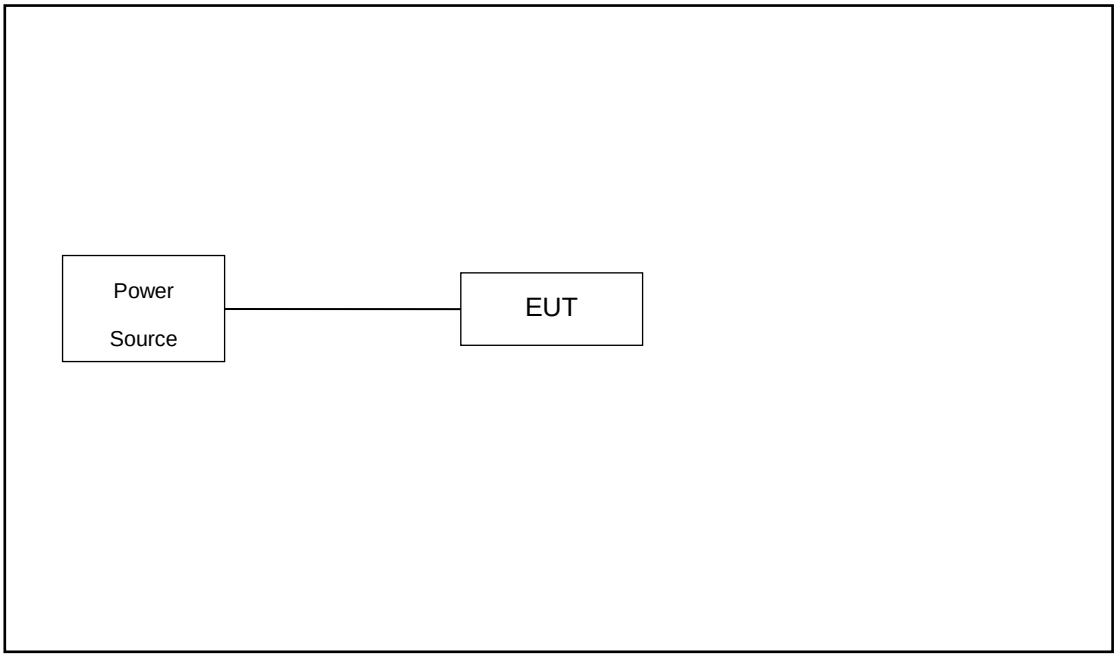
Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System

For Conducted Emission:



For Radiated Emission:



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded, 1.8m
2.	Notebook	Lenovo	V130-15IKB005	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
3.	Bluetooth Earphone	Lenovo	thinkplus-BH3	N/A	N/A	N/A

2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program (QRCT TX Tool) was provided and enabled to make EUT continuously transmit.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 5.07 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 5.07 + 10 = 15.07 (dB)

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Limit of 26dB & 99% Occupied Bandwidth

<FCC 14-30 CFR 15.407>

(a)(10) The maximum transmitter channel bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 megahertz.

3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
8. Measure and record the results in the test report.

3.1.4 Test Setup

3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Maximum conducted Output Power and Fundamental Maximum EIRP Measurement

3.2.1 Limit of Fundamental Maximum EIRP

<FCC 14-30 CFR 15.407>

(a)(7) For client devices, except for fixed client devices as defined in this subpart, operating under the control of a standard power access point in 5.925-6.425 GHz and 6.525-6.875 GHz bands, the maximum e.i.r.p. over the frequency band of operation must not exceed 30 dBm and the device must limit its power to no more than 6 dB below its associated standard power access point's authorized transmit power.

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

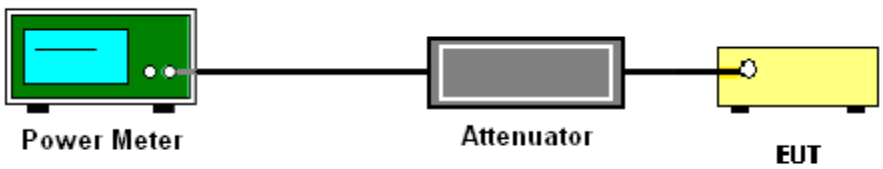
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, 10 log(1/x), where x is the duty cycle.
4. For MIMO mode, the measure-and-sum technique should be used for measuring the in-band transmit power of a device.

3.2.4 Test Setup



3.2.5 Test Result of Fundamental Maximum EIRP

Please refer to Appendix A.

3.3 Fundamental Power Spectral Density Measurement

3.3.1 Limit of Fundamental Power Spectral Density

<FCC 14-30 CFR 15.407>

(a)(7) For client devices, except for fixed client devices as defined in this subpart, operating under the control of a standard power access point in 5.925-6.425 GHz and 6.525-6.875 GHz bands, the maximum power spectral density must not exceed 17 dBm e.i.r.p. in any 1-megahertz band.

3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section F) Maximum power spectral density.

 # Method SA-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, attenuator loss and duty factor. Measure the PPSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (a): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

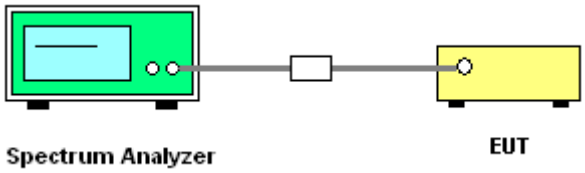
Method (b): Measure and sum spectral maxima across the outputs.

The measurement on each individual output were performed with the same span and number on each individual output. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs.

Method (c): Measure and add 10 log(N_{ANT}) dB, where N_{ANT} is the number of outputs.

The measurement on each individual output were performed with the same span and number on each individual output. The quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 In-Band Emissions (Channel Mask)

3.4.1 Limit of Unwanted Emissions

<FCC 14-30 CFR 15.407>

(b)(6) For transmitters operating within the 5.925-7.125 GHz bands: Power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel center, and by 40 dB at one- and one-half times the channel bandwidth away from channel center. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression, and at frequencies between one and one- and one-half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression. Emissions removed from the channel center by more than one- and one-half times the channel bandwidth must be suppressed by at least 40 dB.

3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

The testing follows FCC KDB 987594 D02 U-NII 6 GHz EMC Measurement.

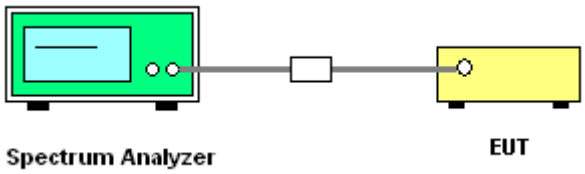
Section J) In-Band Emissions.

1. Take nominal bandwidth as reference channel bandwidth provided that 26 dB emission bandwidth is always larger than nominal bandwidth
2. Measure the power spectral density (which will be used for emissions mask reference) using the following procedure:
   a) Set the span to encompass the entire 26 dB EBW of the signal.
   b) Set RBW = same RBW used for 26 dB EBW measurement.
   c) Set VBW ≥ 3 X RBW
   d) Number of points in sweep ≥ [2 X span / RBW].
   e) Sweep time = auto.
   f) Detector = RMS (i.e., power averaging)
   g) Trace average at least 100 traces in power averaging (rms) mode.
   h) Use the peak search function on the instrument to find the peak of the spectrum.
3. Using the measuring equipment limit line function, develop the emissions mask based on the following requirements. The emissions power spectral density must be reduced below the peak power spectral density (in dB) as follows:
   a. Suppressed by 20 dB at 1 MHz outside of the channel edge.
   b. Suppressed by 28 dB at one channel bandwidth from the channel center.

c. Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.

4. Adjust the span to encompass the entire mask as necessary.
5. Clear trace.
6. Trace average at least 100 traces in power averaging (rms) mode.
7. Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask.

3.4.4 Test Setup



3.4.5 Test Result

Please refer to Appendix A.

3.5 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

3.5.1 Limit of Unwanted Emissions

(1) For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of −27 dBm/MHz.

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27 (RMS)	68.2
- 7 (Peak)	88.2

Unwanted emissions outside of restricted bands are measured with a RMS detector.
In addition, 15.35(b) applies where the peak emissions must be limited to no more than 20 dB above the average limit

(2) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

Note: The following formula is used to convert the EIRP to field strength.

$$E=\frac{1000000\sqrt{30P}}{3}\ \mu V/m, \text{ where P is the eirp (Watts)}$$

3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

   Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

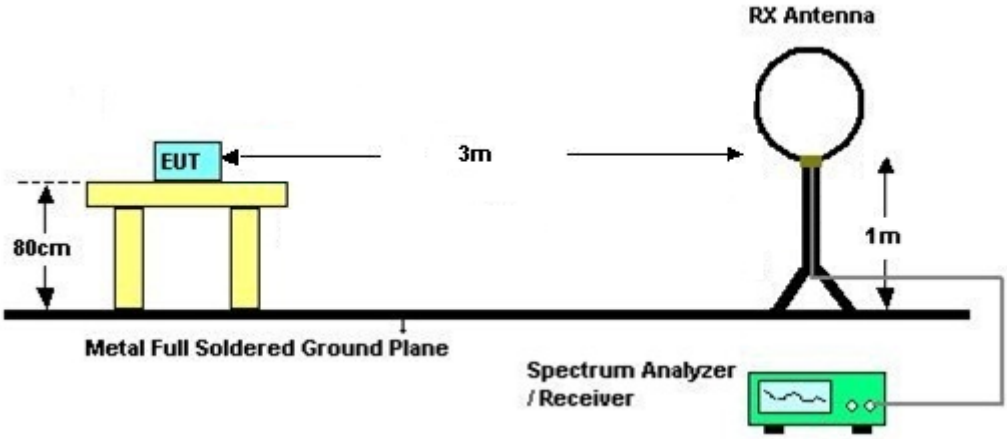
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

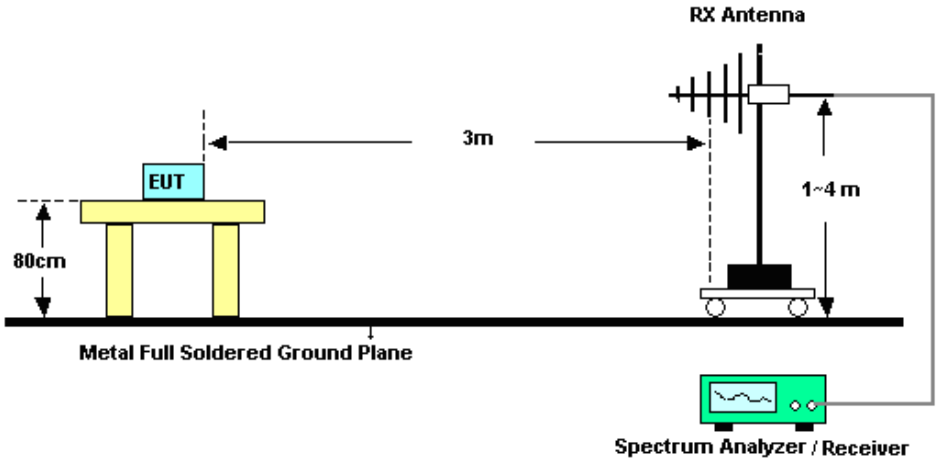
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.5.4 Test Setup

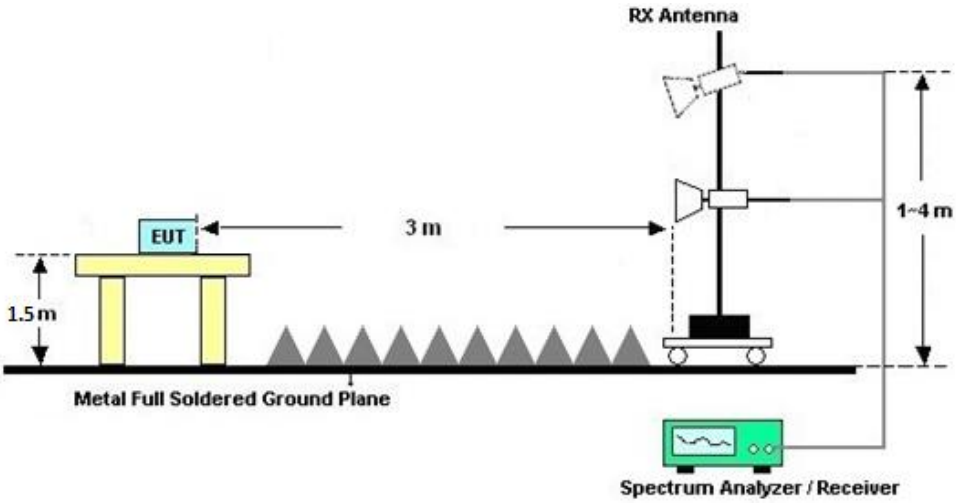
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C

3.5.7 Duty Cycle

Please refer to Appendix D.

3.5.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix C.

The emission level above 18GHz is checked that the emission level is noise floor only, so it is not reflected in the report.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

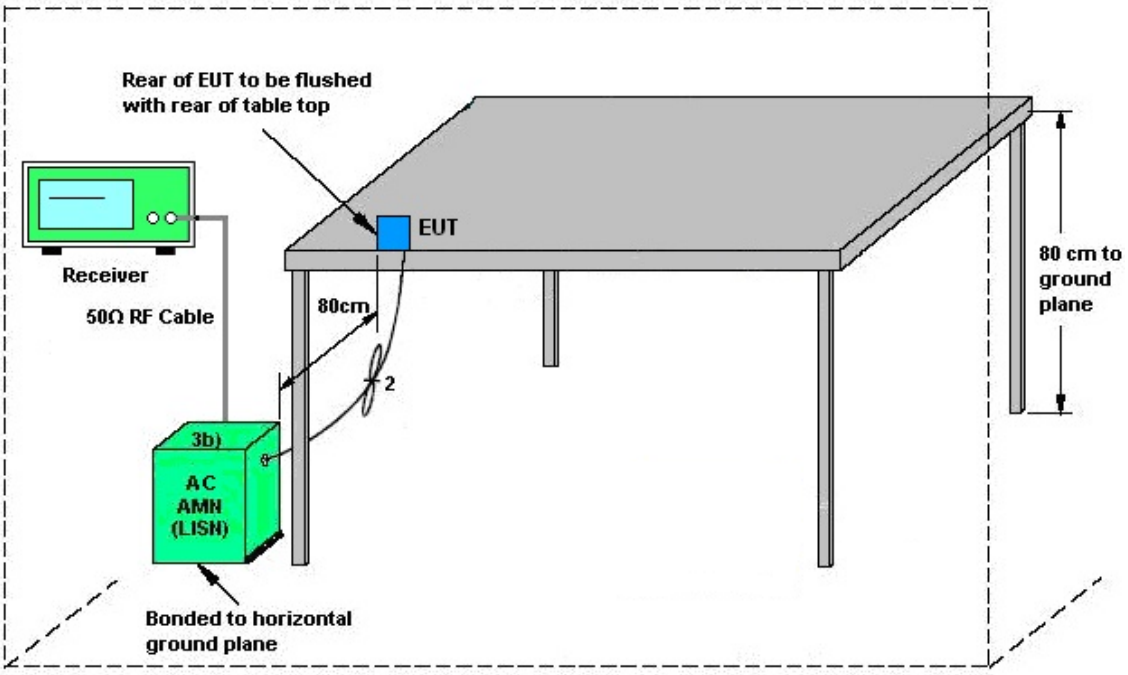
3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 Standard Applicable

§15.203: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used. The EUT complies with the requirement of 15.203.

3.7.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For 802.11a/ax mode, directional gain is calculated as

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e.,

Directional gain = $G_{ANT\ MAX}$(Ant.1 Gain, Ant.2 Gain,…) + Array Gain, as following table for Power, where Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

For PSD, the directional gain calculation is following,

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{Gn/20})^2 / N_{ANT}$] dBi, as following table for PSD.

N_{ANT} = number of transmit antennas

N_{SS} = number of spatial streams. (The worst case directional gain will occur when NSS = 1)

	Ant. 0 (dBi)	Ant. 1 (dBi)	for Power (dBi)	for PSD (dBi)
U-NII-5	2.90	4.00	4.00	6.48
U-NII-7	1.40	2.20	2.20	4.82

<SDM Modes> (spatial division multiplexing)

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For 802.11ax mode, directional gain is calculated as

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e.,

Directional gain = $G_{ANT\ MAX}$(Ant.1 Gain, Ant.2 Gain,…) + Array Gain, as following table for Power,

where Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

For PSD, the directional gain calculation is following,

Directional gain = 10 log[($10^{G1/10}$ + $10^{G2/10}$ + … + $10^{Gn/10}$)/N_{ANT}] dBi, as following table for PSD.

N_{ANT} = number of transmit antennas

	Ant. 0 (dBi)	Ant. 1 (dBi)	DG for Power (dBi)	DG for PSD (dBi)
U-NII-5	2.90	4.00	4.00	3.48
U-NII-7	1.40	2.20	2.20	1.82

<TXBF modes>

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For 802.11ax mode, directional gain is calculated as

$$Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

The directional gain calculation is following F)2)e)ii) of KDB 662911 D01 v02r01.

The directional gain “DG” is calculated as following table.

	Ant. 0 (dBi)	Ant. 1 (dBi)	DG for Power (dBi)	DG for PSD (dBi)
U-NII-5	2.90	4.00	6.48	6.48
U-NII-7	1.40	2.20	4.82	4.82

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Jan. 15, 2024~ Jan. 16, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Jan. 15, 2024~ Jan. 16, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Jan. 15, 2024~ Jan. 16, 2024	Jan. 01, 2025	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400023	3Hz~8.5GHz;Max 30dBm	Jan. 04, 2024	Jan. 30, 2024	Jan. 03, 2025	Radiation (03CH08-KS)
Spectrum Analyzer	R&S	FSV40	101932	10kHz~40GHz; Max 30dBm	Oct. 10, 2023	Jan. 30, 2024	Oct. 09, 2024	Radiation (03CH08-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Oct. 10, 2023	Jan. 30, 2024	Oct. 09, 2024	Radiation (03CH08-KS)
Bilog Antenna	TESEQ& VGT	CBL 61110	59915	30MHz-1GHz	Aug. 12, 2023	Jan. 30, 2024	Aug. 11, 2024	Radiation (03CH08-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Mar. 18, 2023	Jan. 30, 2024	Mar. 17, 2024	Radiation (03CH08-KS)
high gain Amplifier	EM	EM01G18GA	060845	1Ghz-18Ghz	Jan. 05, 2024	Jan. 30, 2024	Jan. 04, 2025	Radiation (03CH08-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2024	Jan. 30, 2024	Jan. 04, 2025	Radiation (03CH08-KS)
Amplifier	SONOMA	310N	413741	9KHz-1GHz	Jan. 05, 2024	Jan. 30, 2024	Jan. 04, 2025	Radiation (03CH08-KS)
Amplifier	EM	EM01G18GA	060834	1Ghz-18Ghz	Oct. 10, 2023	Jan. 30, 2024	Oct. 09, 2024	Radiation (03CH08-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 04, 2024	Jan. 30, 2024	Jan. 03, 2025	Radiation (03CH08-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Jan. 30, 2024	NCR	Radiation (03CH08-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Jan. 30, 2024	NCR	Radiation (03CH08-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Jan. 30, 2024	NCR	Radiation (03CH08-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 16, 2023	Jan. 19, 2024	May 15, 2024	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Jan. 19, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	May 16, 2023	Jan. 19, 2024	May 15, 2024	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Jan. 19, 2024	Oct. 10, 2024	Conduction (CO01-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	±2.26 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.46 dB
Conducted Power Spectral Density	±0.88 dB
Frequency	±0.4 ppm
Conducted Time	0.38%

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.84dB

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.32 dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.28 dB

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.90 dB

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.26 dB

---------- THE END ----------

Appendix A. Conducted Test Results

A1. Conducted Test Results

Test Engineer:	Jiang Jun	Temperature:	21~25	°C
Test Date:	2024.1.15~1.30	Relative Humidity:	51~54	%

<11a CDD mode>:

Report Number : FR3D0816B

TEST RESULTS DATA
EIRP Power Table

UNII-5 MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting	
					Ant 0	Ant 1	Ant 0	Ant 1	SUM	Ant 0	Ant 1	SUM			Ant 0	Ant 1
11a	6Mbps	2	001	5955	0.04	0.04	13.07	14.06	16.61	4.00		20.61	30.00	Pass	12.5	
11a	6Mbps	2	049	6195	0.04	0.04	13.20	13.76	16.50	4.00		20.50	30.00	Pass	12.5	
11a	6Mbps	2	093	6415	0.04	0.04	13.08	13.39	16.25	4.00		20.25	30.00	Pass	12.5	

Report Number : FR3D0816B

TEST RESULTS DATA
EIRP Power Table

UNII-7 MIMO															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting
					Ant 0	Ant 1	Ant 0	Ant 1	SUM	Ant 0	Ant 1	SUM			Ant 0 / Ant 1
11a	6Mbps	2	117	6535	0.04	0.04	10.81	10.40	13.63	2.20		15.83	30.00	Pass	10
11a	6Mbps	2	149	6695	0.04	0.04	10.57	10.39	13.50	2.20		15.70	30.00	Pass	10
11a	6Mbps	2	181	6855	0.04	0.04	10.18	10.64	13.43	2.20		15.63	30.00	Pass	10

<11ax CDD mode>:

Report Number : FR3D0816B

TEST RESULTS DATA
EIRP Power Table

UNII-5 MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting
						Ant 0	Ant 1	Ant 0	Ant 1	SUM	Ant 0	Ant 1	SUM			Ant 0 / Ant 1
HE20	MCS0	2	001	5955	Full	0.00	0.00	12.89	13.97	16.47	4.00		20.47	30.00	Pass	12.5
HE20	MCS0	2	001	5955	26/0	0.00	0.00	4.82	5.71	8.30	4.00		12.30	30.00	Pass	5
HE20	MCS0	2	001	5955	52/37	0.00	0.00	7.95	8.39	11.19	4.00		15.19	30.00	Pass	8
HE20	MCS0	2	001	5955	106/53	0.00	0.00	10.74	11.31	14.04	4.00		18.04	30.00	Pass	11
HE20	MCS0	2	049	6195	Full	0.00	0.00	12.97	13.73	16.38	4.00		20.38	30.00	Pass	12.5
HE20	MCS0	2	049	6195	26/0	0.00	0.00	4.28	5.02	7.68	4.00		11.68	30.00	Pass	4.5
HE20	MCS0	2	049	6195	52/37	0.00	0.00	7.22	8.38	10.85	4.00		14.85	30.00	Pass	8
HE20	MCS0	2	049	6195	106/53	0.00	0.00	10.15	11.23	13.73	4.00		17.73	30.00	Pass	11
HE20	MCS0	2	093	6415	Full	0.00	0.00	13.00	13.22	16.12	4.00		20.12	30.00	Pass	12.5
HE20	MCS0	2	093	6415	26/8	0.00	0.00	3.39	3.94	6.68	4.00		10.68	30.00	Pass	6
HE20	MCS0	2	093	6415	52/40	0.00	0.00	5.63	6.33	9.00	4.00		13.00	30.00	Pass	8.5
HE20	MCS0	2	093	6415	106/54	0.00	0.00	9.34	9.82	12.60	4.00		16.60	30.00	Pass	12
HE40	MCS0	2	003	5965	Full	0.00	0.00	13.50	14.11	16.83	4.00		20.83	30.00	Pass	12.5
HE40	MCS0	2	003	5965	242/61	0.00	0.00	11.32	11.97	14.67	4.00		18.67	30.00	Pass	11.5
HE40	MCS0	2	051	6205	Full	0.00	0.00	13.45	14.14	16.82	4.00		20.82	30.00	Pass	12.5
HE40	MCS0	2	051	6205	242/61	0.00	0.00	10.66	11.68	14.21	4.00		18.21	30.00	Pass	11.5
HE40	MCS0	2	091	6405	Full	0.00	0.00	13.37	14.33	16.89	4.00		20.89	30.00	Pass	12.5
HE40	MCS0	2	091	6405	242/62	0.00	0.00	9.98	11.34	13.72	4.00		17.72	30.00	Pass	11.5
HE80	MCS0	2	007	5985	Full	0.00	0.00	13.14	14.13	16.67	4.00		20.67	30.00	Pass	12.5
HE80	MCS0	2	007	5985	484/65	0.07	0.07	11.44	12.22	14.85	4.00		18.85	30.00	Pass	11.5
HE80	MCS0	2	055	6225	Full	0.00	0.00	13.04	13.88	16.49	4.00		20.49	30.00	Pass	12.5
HE80	MCS0	2	055	6225	484/65	0.07	0.07	11.93	12.81	15.40	4.00		19.40	30.00	Pass	11.5
HE80	MCS0	2	087	6385	Full	0.00	0.00	13.12	14.08	16.64	4.00		20.64	30.00	Pass	12.5
HE80	MCS0	2	087	6385	484/66	0.07	0.07	9.98	11.46	13.79	4.00		17.79	30.00	Pass	11.5
HE160	MCS0	2	015	6025	Full	0.00	0.00	13.28	14.38	16.88	4.00		20.88	30.00	Pass	12.5
HE160	MCS0	2	015	6025	996/67	0.07	0.07	10.74	11.56	14.18	4.00		18.18	30.00	Pass	11.5
HE160	MCS0	2	047	6185	Full	0.00	0.00	13.51	14.25	16.91	4.00		20.91	30.00	Pass	12.5
HE160	MCS0	2	047	6185	996/67	0.07	0.07	11.21	12.24	14.76	4.00		18.76	30.00	Pass	11.5
HE160	MCS0	2	079	6345	Full	0.00	0.00	13.33	14.40	16.91	4.00		20.91	30.00	Pass	12.5
HE160	MCS0	2	079	6345	996/68	0.07	0.07	10.18	11.68	14.00	4.00		18.00	30.00	Pass	11.5

Report Number : FR3D0816B

TEST RESULTS DATA
EIRP Power Table

UNII-7 MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting
						Ant 0	Ant 1	Ant 0	Ant 1	SUM	Ant 0	Ant 1	SUM			Ant 0 / Ant 1
HE20	MCS0	2	117	6535	Full	0.00	0.00	10.44	10.01	13.24	2.20		15.44	30.00	Pass	10
HE20	MCS0	2	117	6535	26/0	0.00	0.00	1.35	1.31	4.34	2.20		6.54	30.00	Pass	1.5
HE20	MCS0	2	117	6535	52/37	0.00	0.00	3.98	3.99	7.00	2.20		9.20	30.00	Pass	4.5
HE20	MCS0	2	117	6535	106/53	0.00	0.00	7.43	7.46	10.46	2.20		12.66	30.00	Pass	8
HE20	MCS0	2	149	6695	Full	0.00	0.00	10.17	10.09	13.14	2.20		15.34	30.00	Pass	10
HE20	MCS0	2	149	6695	26/0	0.00	0.00	0.84	1.01	3.94	2.20		6.14	30.00	Pass	1.5
HE20	MCS0	2	149	6695	52/37	0.00	0.00	3.62	3.96	6.80	2.20		9.00	30.00	Pass	4.5
HE20	MCS0	2	149	6695	106/53	0.00	0.00	7.11	7.38	10.26	2.20		12.46	30.00	Pass	8
HE20	MCS0	2	181	6855	Full	0.00	0.00	9.78	10.33	13.07	2.20		15.27	30.00	Pass	10
HE20	MCS0	2	181	6855	26/8	0.00	0.00	0.43	1.78	4.17	2.20		6.37	30.00	Pass	2
HE20	MCS0	2	181	6855	52/40	0.00	0.00	3.41	4.59	7.05	2.20		9.25	30.00	Pass	5
HE20	MCS0	2	181	6855	106/54	0.00	0.00	6.95	8.17	10.61	2.20		12.81	30.00	Pass	8.5
HE40	MCS0	2	123	6565	Full	0.00	0.00	10.84	10.39	13.63	2.20		15.83	30.00	Pass	10
HE40	MCS0	2	123	6565	242/61	0.00	0.00	7.91	8.18	11.06	2.20		13.26	30.00	Pass	9
HE40	MCS0	2	147	6685	Full	0.00	0.00	10.60	10.53	13.58	2.20		15.78	30.00	Pass	10
HE40	MCS0	2	147	6685	242/61	0.00	0.00	7.88	8.29	11.10	2.20		13.30	30.00	Pass	9
HE40	MCS0	2	179	6845	Full	0.00	0.00	10.29	10.46	13.39	2.20		15.59	30.00	Pass	10
HE40	MCS0	2	179	6845	242/62	0.00	0.00	7.21	8.13	10.70	2.20		12.90	30.00	Pass	9
HE80	MCS0	2	135	6625	Full	0.00	0.00	10.71	10.06	13.41	2.20		15.61	30.00	Pass	10
HE80	MCS0	2	135	6625	484/65	0.07	0.07	8.15	8.19	11.18	2.20		13.38	30.00	Pass	9
HE80	MCS0	2	151	6705	Full	0.00	0.00	10.37	10.26	13.33	2.20		15.53	30.00	Pass	10
HE80	MCS0	2	151	6705	484/65	0.07	0.07	7.92	8.44	11.20	2.20		13.40	30.00	Pass	9
HE80	MCS0	2	167	6785	Full	0.00	0.00	10.28	10.39	13.35	2.20		15.55	30.00	Pass	10
HE80	MCS0	2	167	6785	484/66	0.07	0.07	7.59	8.01	10.81	2.20		13.01	30.00	Pass	9
HE160	MCS0	2	143	6665	Full	0.00	0.00	10.75	10.53	13.65	2.20		15.85	30.00	Pass	10
HE160	MCS0	2	143	6665	996/68	0.07	0.07	7.99	8.41	11.21	2.20		13.41	30.00	Pass	9

<11ax SDM mode>:

Report Number : FR3D0816B

TEST RESULTS DATA
EIRP Power Table

UNII-5 MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting
						Ant 0	Ant 1	Ant 0	Ant 1	SUM	Ant 0	Ant 1	SUM			Ant 0 / Ant 1
HE20	MCS0	2	001	5955	Full	0.00	0.00	12.86	13.93	16.44	4.00		20.44	30.00	Pass	12.5
HE20	MCS0	2	001	5955	26/0	0.00	0.00	4.78	5.68	8.26	4.00		12.26	30.00	Pass	5
HE20	MCS0	2	001	5955	52/37	0.00	0.00	7.93	8.37	11.17	4.00		15.17	30.00	Pass	8
HE20	MCS0	2	001	5955	106/53	0.00	0.00	10.71	11.27	14.01	4.00		18.01	30.00	Pass	11
HE20	MCS0	2	049	6195	Full	0.00	0.00	12.92	13.70	16.34	4.00		20.34	30.00	Pass	12.5
HE20	MCS0	2	049	6195	26/0	0.00	0.00	4.24	5.00	7.65	4.00		11.65	30.00	Pass	4.5
HE20	MCS0	2	049	6195	52/37	0.00	0.00	7.16	8.34	10.80	4.00		14.80	30.00	Pass	8
HE20	MCS0	2	049	6195	106/53	0.00	0.00	10.12	11.17	13.69	4.00		17.69	30.00	Pass	11
HE20	MCS0	2	093	6415	Full	0.00	0.00	12.96	13.19	16.09	4.00		20.09	30.00	Pass	12.5
HE20	MCS0	2	093	6415	26/8	0.00	0.00	3.37	3.90	6.65	4.00		10.65	30.00	Pass	6
HE20	MCS0	2	093	6415	52/40	0.00	0.00	5.60	6.27	8.96	4.00		12.96	30.00	Pass	8.5
HE20	MCS0	2	093	6415	106/54	0.00	0.00	9.30	9.80	12.57	4.00		16.57	30.00	Pass	12
HE40	MCS0	2	003	5965	Full	0.00	0.00	13.46	14.08	16.79	4.00		20.79	30.00	Pass	12.5
HE40	MCS0	2	003	5965	242/61	0.00	0.00	11.30	11.92	14.63	4.00		18.63	30.00	Pass	11.5
HE40	MCS0	2	051	6205	Full	0.00	0.00	13.42	14.10	16.78	4.00		20.78	30.00	Pass	12.5
HE40	MCS0	2	051	6205	242/61	0.00	0.00	10.62	11.63	14.16	4.00		18.16	30.00	Pass	11.5
HE40	MCS0	2	091	6405	Full	0.00	0.00	13.35	14.30	16.86	4.00		20.86	30.00	Pass	12.5
HE40	MCS0	2	091	6405	242/62	0.00	0.00	9.95	11.32	13.70	4.00		17.70	30.00	Pass	11.5
HE80	MCS0	2	007	5985	Full	0.00	0.00	13.12	14.12	16.66	4.00		20.66	30.00	Pass	12.5
HE80	MCS0	2	007	5985	484/65	0.07	0.07	11.41	12.20	14.83	4.00		18.83	30.00	Pass	11.5
HE80	MCS0	2	055	6225	Full	0.00	0.00	13.00	13.84	16.45	4.00		20.45	30.00	Pass	12.5
HE80	MCS0	2	055	6225	484/65	0.07	0.07	11.91	12.78	15.37	4.00		19.37	30.00	Pass	11.5
HE80	MCS0	2	087	6385	Full	0.00	0.00	13.09	14.05	16.61	4.00		20.61	30.00	Pass	12.5
HE80	MCS0	2	087	6385	484/66	0.07	0.07	9.93	11.41	13.74	4.00		17.74	30.00	Pass	11.5
HE160	MCS0	2	015	6025	Full	0.00	0.00	13.27	14.33	16.84	4.00		20.84	30.00	Pass	12.5
HE160	MCS0	2	015	6025	996/67	0.07	0.07	10.72	11.53	14.15	4.00		18.15	30.00	Pass	11.5
HE160	MCS0	2	047	6185	Full	0.00	0.00	13.48	14.23	16.88	4.00		20.88	30.00	Pass	12.5
HE160	MCS0	2	047	6185	996/67	0.07	0.07	11.17	12.23	14.74	4.00		18.74	30.00	Pass	11.5
HE160	MCS0	2	079	6345	Full	0.00	0.00	13.31	14.36	16.88	4.00		20.88	30.00	Pass	12.5
HE160	MCS0	2	079	6345	996/68	0.07	0.07	10.17	11.63	13.97	4.00		17.97	30.00	Pass	11.5

Report Number : FR3D0816B

TEST RESULTS DATA
EIRP Power Table

UNII-7 MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting
						Ant 0	Ant 1	Ant 0	Ant 1	SUM	Ant 0	Ant 1	SUM			Ant 0 / Ant 1
HE20	MCS0	2	117	6535	Full	0.00	0.00	10.39	9.99	13.20	2.20		15.40	30.00	Pass	10
HE20	MCS0	2	117	6535	26/0	0.00	0.00	1.32	1.28	4.31	2.20		6.51	30.00	Pass	1.5
HE20	MCS0	2	117	6535	52/37	0.00	0.00	3.97	3.95	6.97	2.20		9.17	30.00	Pass	4.5
HE20	MCS0	2	117	6535	106/53	0.00	0.00	7.41	7.44	10.44	2.20		12.64	30.00	Pass	8
HE20	MCS0	2	149	6695	Full	0.00	0.00	10.14	10.04	13.10	2.20		15.30	30.00	Pass	10
HE20	MCS0	2	149	6695	26/0	0.00	0.00	0.80	0.98	3.90	2.20		6.10	30.00	Pass	1.5
HE20	MCS0	2	149	6695	52/37	0.00	0.00	3.57	3.92	6.76	2.20		8.96	30.00	Pass	4.5
HE20	MCS0	2	149	6695	106/53	0.00	0.00	7.07	7.35	10.22	2.20		12.42	30.00	Pass	8
HE20	MCS0	2	181	6855	Full	0.00	0.00	9.76	10.32	13.06	2.20		15.26	30.00	Pass	10
HE20	MCS0	2	181	6855	26/8	0.00	0.00	0.40	1.76	4.14	2.20		6.34	30.00	Pass	2
HE20	MCS0	2	181	6855	52/40	0.00	0.00	3.36	4.53	6.99	2.20		9.19	30.00	Pass	5
HE20	MCS0	2	181	6855	106/54	0.00	0.00	6.92	8.12	10.57	2.20		12.77	30.00	Pass	8.5
HE40	MCS0	2	123	6565	Full	0.00	0.00	10.80	10.35	13.59	2.20		15.79	30.00	Pass	10
HE40	MCS0	2	123	6565	242/61	0.00	0.00	7.86	8.16	11.02	2.20		13.22	30.00	Pass	9
HE40	MCS0	2	147	6685	Full	0.00	0.00	10.54	10.50	13.53	2.20		15.73	30.00	Pass	10
HE40	MCS0	2	147	6685	242/61	0.00	0.00	7.85	8.24	11.06	2.20		13.26	30.00	Pass	9
HE40	MCS0	2	179	6845	Full	0.00	0.00	10.24	10.42	13.34	2.20		15.54	30.00	Pass	10
HE40	MCS0	2	179	6845	242/62	0.00	0.00	7.17	8.08	10.66	2.20		12.86	30.00	Pass	9
HE80	MCS0	2	135	6625	Full	0.00	0.00	10.68	10.02	13.37	2.20		15.57	30.00	Pass	10
HE80	MCS0	2	135	6625	484/65	0.07	0.07	8.12	8.17	11.15	2.20		13.35	30.00	Pass	9
HE80	MCS0	2	151	6705	Full	0.00	0.00	10.33	10.23	13.29	2.20		15.49	30.00	Pass	10
HE80	MCS0	2	151	6705	484/65	0.07	0.07	7.90	8.40	11.16	2.20		13.36	30.00	Pass	9
HE80	MCS0	2	167	6785	Full	0.00	0.00	10.25	10.37	13.32	2.20		15.52	30.00	Pass	10
HE80	MCS0	2	167	6785	484/66	0.07	0.07	7.57	7.98	10.79	2.20		12.99	30.00	Pass	9
HE160	MCS0	2	143	6665	Full	0.00	0.00	10.71	10.49	13.61	2.20		15.81	30.00	Pass	10
HE160	MCS0	2	143	6665	996/68	0.07	0.07	7.97	8.38	11.19	2.20		13.39	30.00	Pass	9

Emission Bandwidth

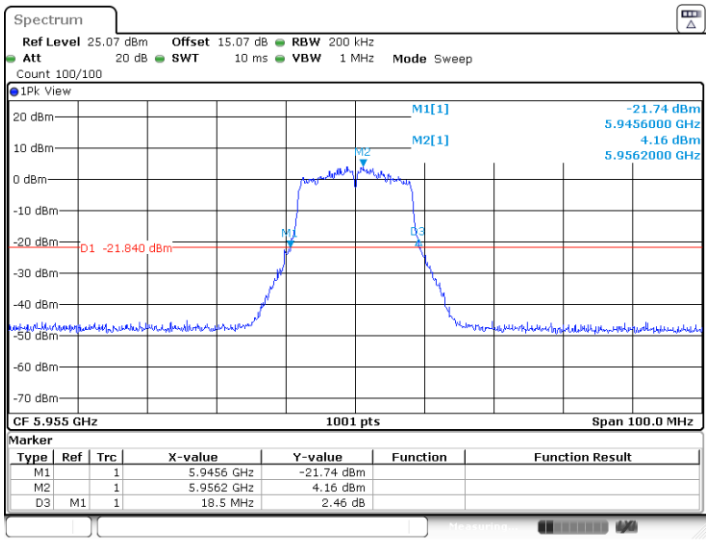
Test Result

TestMode	Antenna	Freq(MHz)	26dB EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A-CDD	Ant0	5955	18.50	5945.60	5964.10	≤320	PASS
	Ant1	5955	18.80	5945.60	5964.40	≤320	PASS
	Ant0	6195	18.70	6185.50	6204.20	≤320	PASS
	Ant1	6195	19.20	6185.30	6204.50	≤320	PASS
	Ant0	6415	19.20	6405.50	6424.70	≤320	PASS
	Ant1	6415	19.00	6405.40	6424.40	≤320	PASS
	Ant0	6535	18.80	6525.40	6544.20	≤320	PASS
	Ant1	6535	19.10	6525.30	6544.40	≤320	PASS
	Ant0	6695	18.70	6685.50	6704.20	≤320	PASS
	Ant1	6695	19.10	6685.30	6704.40	≤320	PASS
	Ant0	6855	18.50	6845.70	6864.20	≤320	PASS
	Ant1	6855	18.80	6845.50	6864.30	≤320	PASS
11AX20MIMO	Ant0	5955	20.70	5944.60	5965.30	≤320	PASS
	Ant1	5955	20.30	5944.80	5965.10	≤320	PASS
	Ant0	6195	20.60	6184.70	6205.30	≤320	PASS
	Ant1	6195	20.70	6184.60	6205.30	≤320	PASS
	Ant0	6415	20.80	6404.50	6425.30	≤320	PASS
	Ant1	6415	20.50	6404.80	6425.30	≤320	PASS
	Ant0	6535	20.60	6524.70	6545.30	≤320	PASS
	Ant1	6535	20.80	6524.60	6545.40	≤320	PASS
	Ant0	6695	20.80	6684.60	6705.40	≤320	PASS
	Ant1	6695	20.70	6684.60	6705.30	≤320	PASS
	Ant0	6855	20.70	6844.70	6865.40	≤320	PASS
	Ant1	6855	20.70	6844.50	6865.20	≤320	PASS
11AX40MIMO	Ant0	5965	40.20	5944.80	5985.00	≤320	PASS
	Ant1	5965	40.00	5945.00	5985.00	≤320	PASS
	Ant0	6205	40.40	6184.80	6225.20	≤320	PASS
	Ant1	6205	40.60	6184.60	6225.20	≤320	PASS
	Ant0	6405	40.20	6385.00	6425.20	≤320	PASS
	Ant1	6405	40.00	6384.80	6424.80	≤320	PASS
	Ant0	6565	40.20	6544.80	6585.00	≤320	PASS
	Ant1	6565	40.20	6544.80	6585.00	≤320	PASS
	Ant0	6685	40.20	6664.80	6705.00	≤320	PASS
	Ant1	6685	40.00	6665.00	6705.00	≤320	PASS
	Ant0	6845	40.20	6824.80	6865.00	≤320	PASS
	Ant1	6845	40.40	6824.80	6865.20	≤320	PASS
11AX80MIMO	Ant0	5985	81.60	5944.20	6025.80	≤320	PASS
	Ant1	5985	81.60	5943.80	6025.40	≤320	PASS

	Ant0	6225	82.00	6183.80	6265.80	≤320	PASS
	Ant1	6225	81.20	6184.20	6265.40	≤320	PASS
	Ant0	6385	81.20	6344.20	6425.40	≤320	PASS
	Ant1	6385	81.20	6344.20	6425.40	≤320	PASS
	Ant0	6625	81.60	6584.20	6665.80	≤320	PASS
	Ant1	6625	81.60	6584.20	6665.80	≤320	PASS
	Ant0	6705	81.60	6664.20	6745.80	≤320	PASS
	Ant1	6705	82.00	6663.80	6745.80	≤320	PASS
	Ant0	6785	82.00	6743.80	6825.80	≤320	PASS
	Ant1	6785	82.00	6744.20	6826.20	≤320	PASS
11AX160MIMO	Ant0	6025	165.60	5942.60	6108.20	≤320	PASS
	Ant1	6025	166.40	5941.80	6108.20	≤320	PASS
	Ant0	6185	164.00	6102.60	6266.60	≤320	PASS
	Ant1	6185	165.60	6101.80	6267.40	≤320	PASS
	Ant0	6345	164.80	6262.60	6427.40	≤320	PASS
	Ant1	6345	164.00	6262.60	6426.60	≤320	PASS
	Ant0	6665	164.80	6582.60	6747.40	≤320	PASS
	Ant1	6665	165.60	6583.40	6749.00	≤320	PASS

Test Graphs

11A-CDD_Ant0_5955



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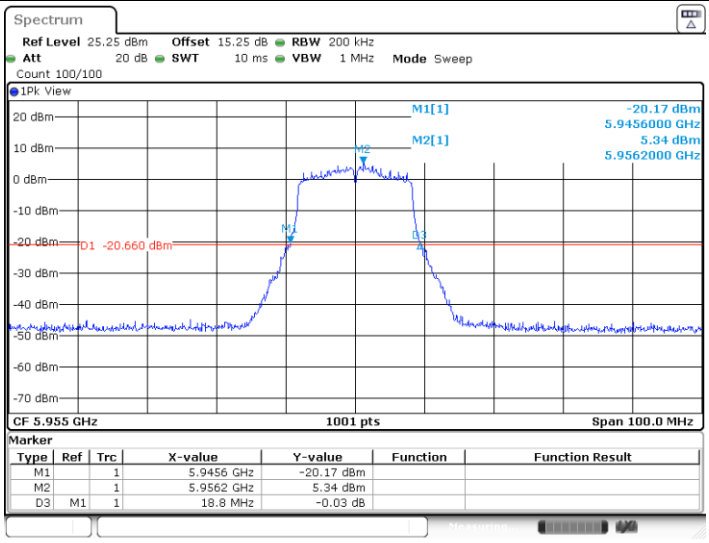
11A-CDD_Ant1_5955



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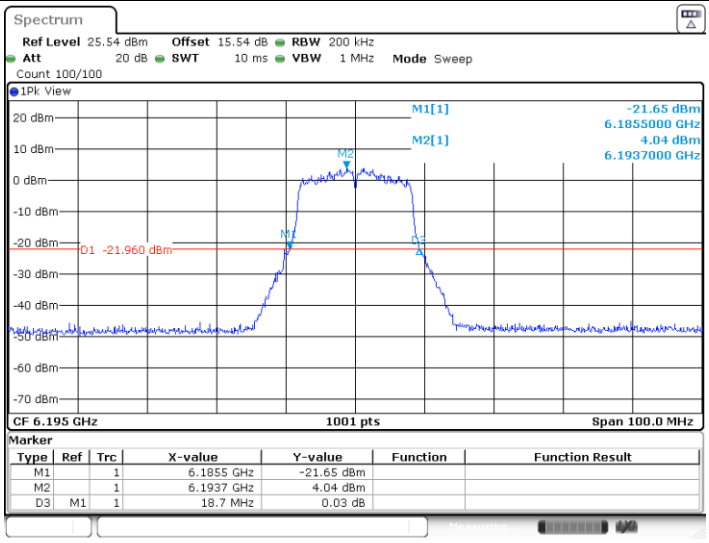

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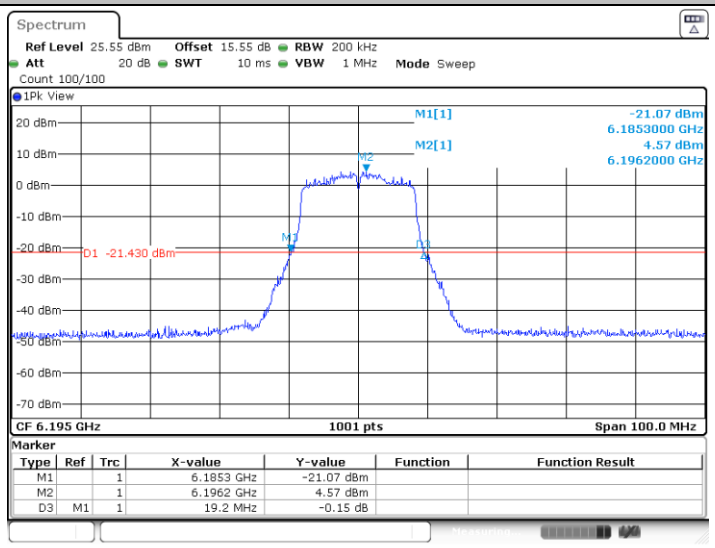

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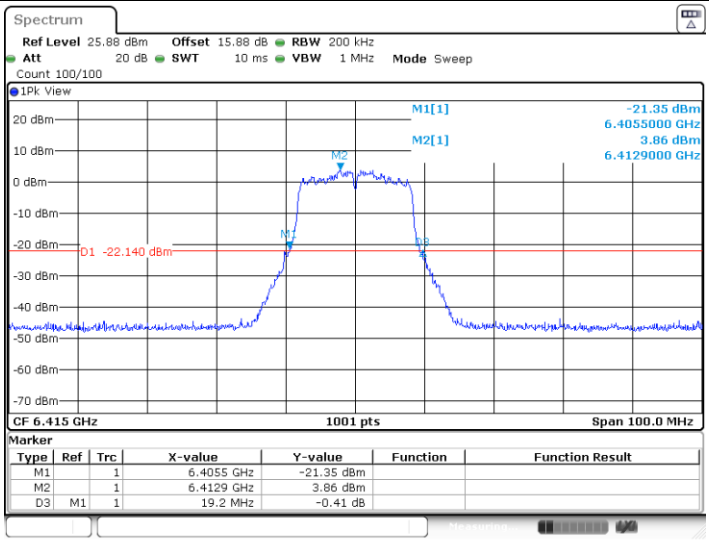

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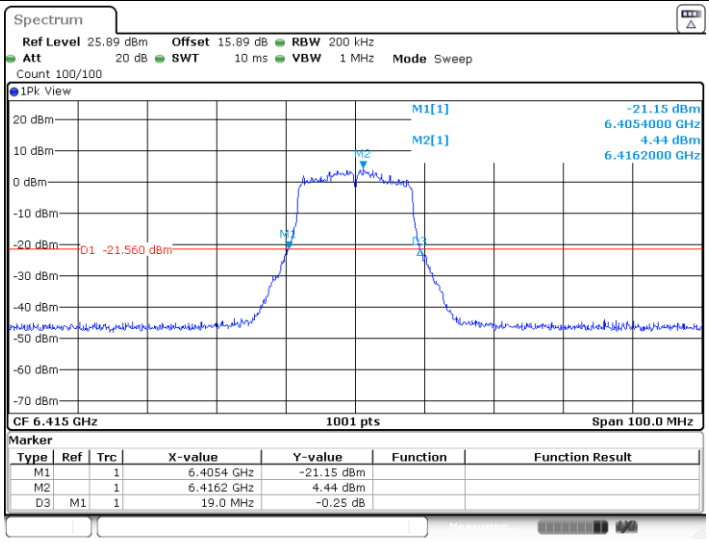

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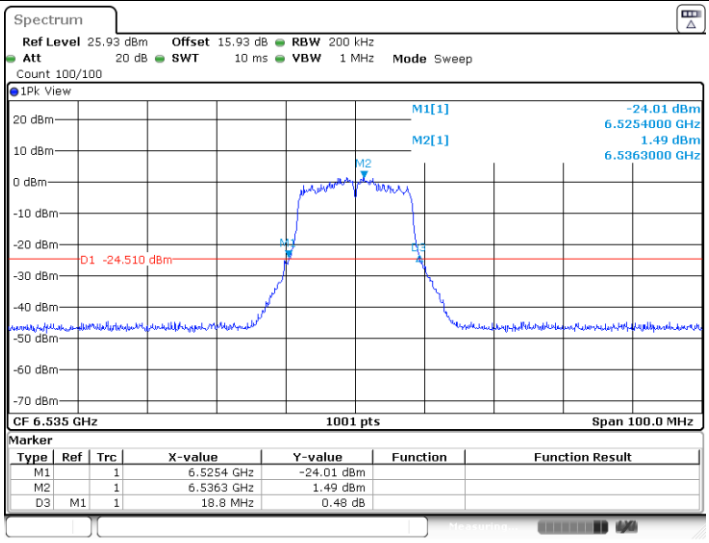

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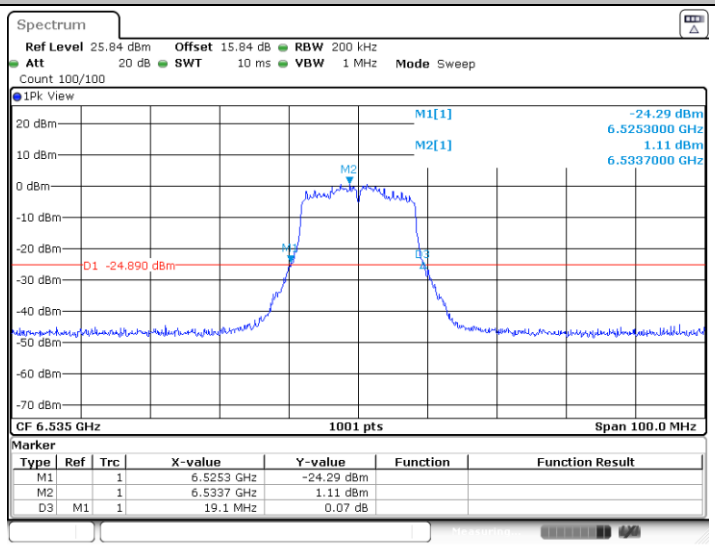
11A-CDD_Ant1_6535


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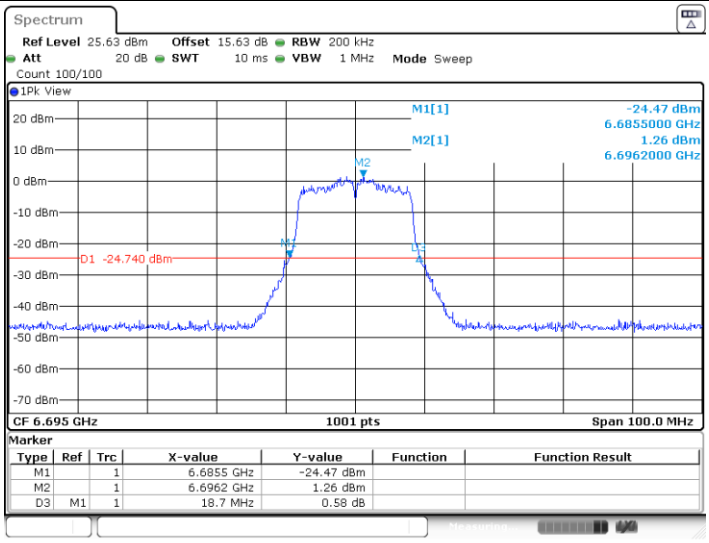

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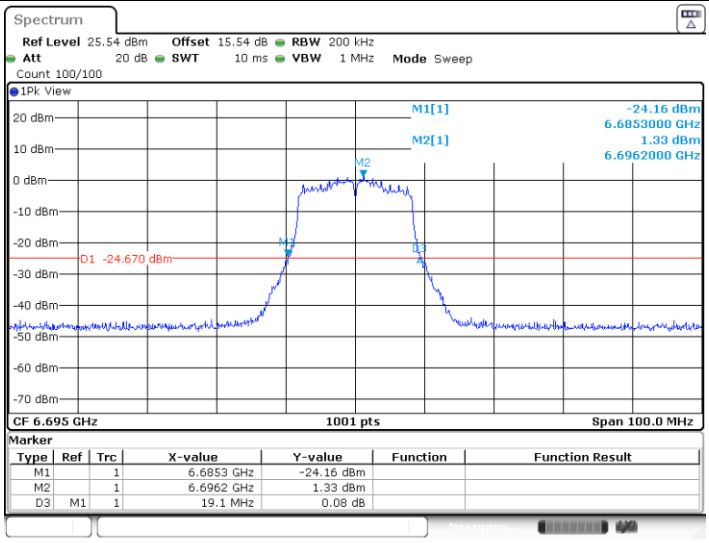

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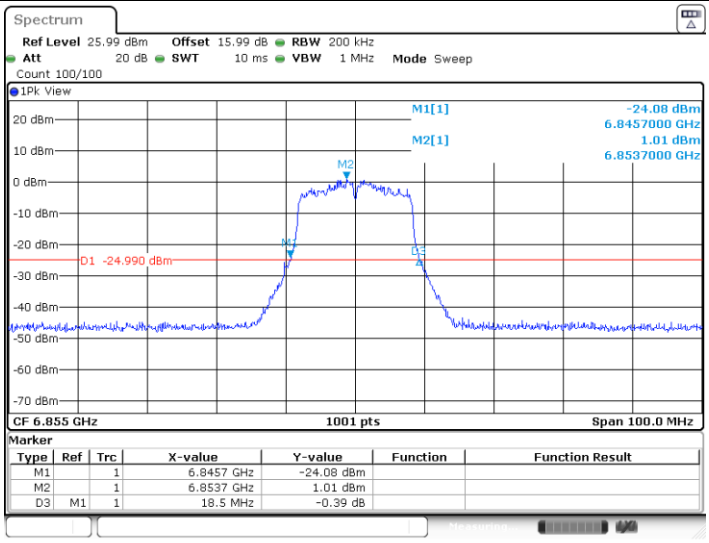

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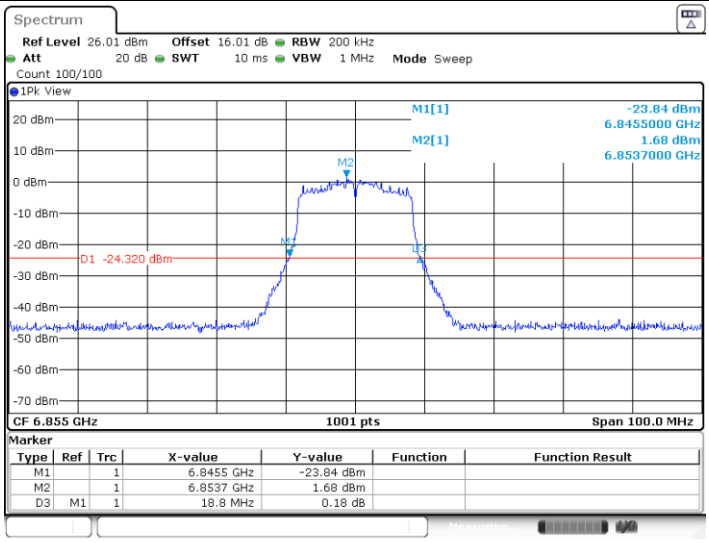

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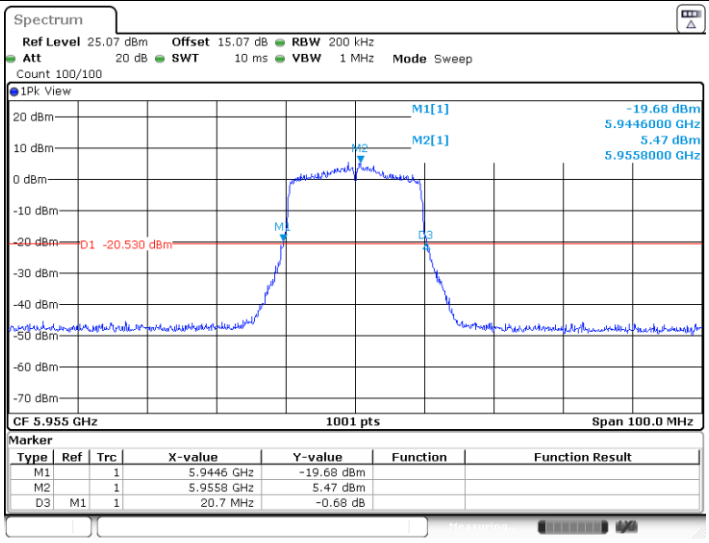
11AX20MIMO_Ant0_5955


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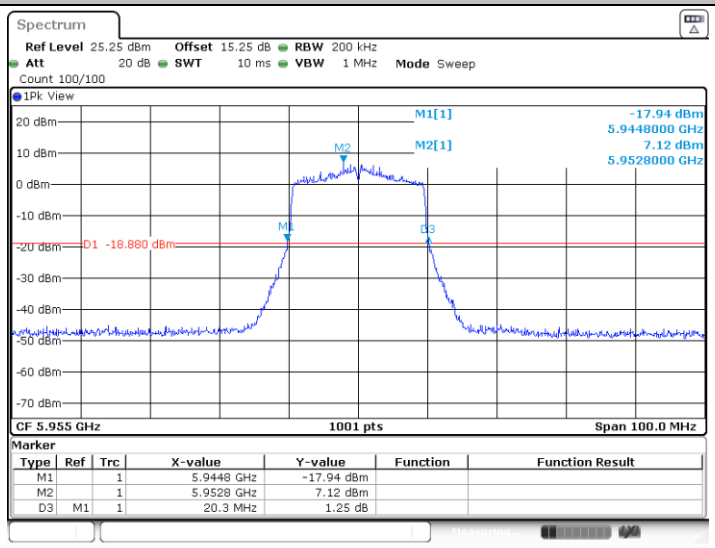

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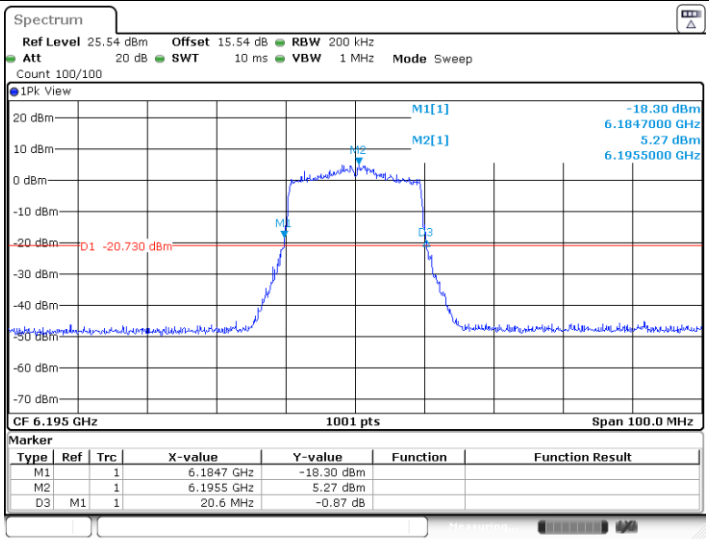

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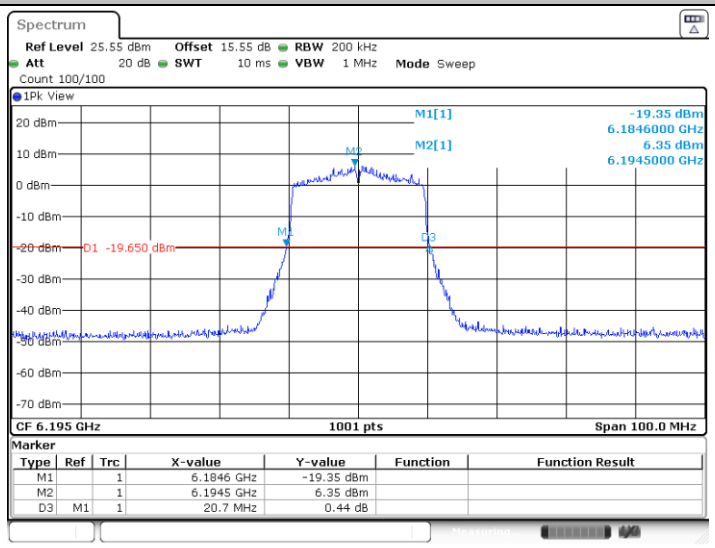

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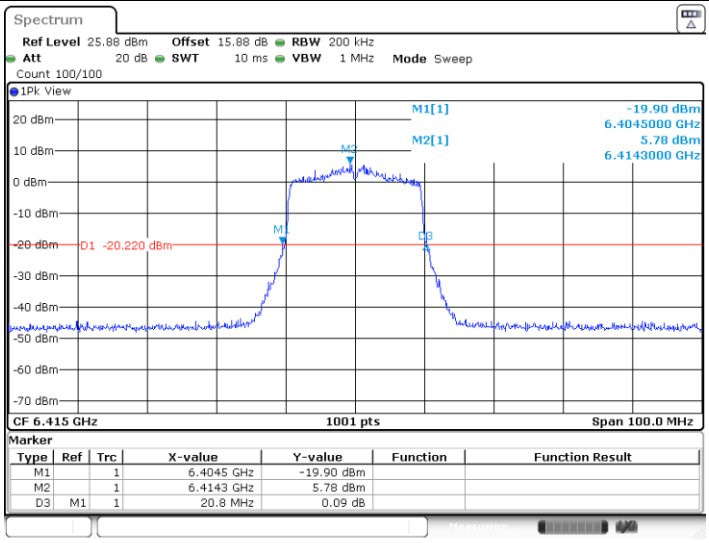
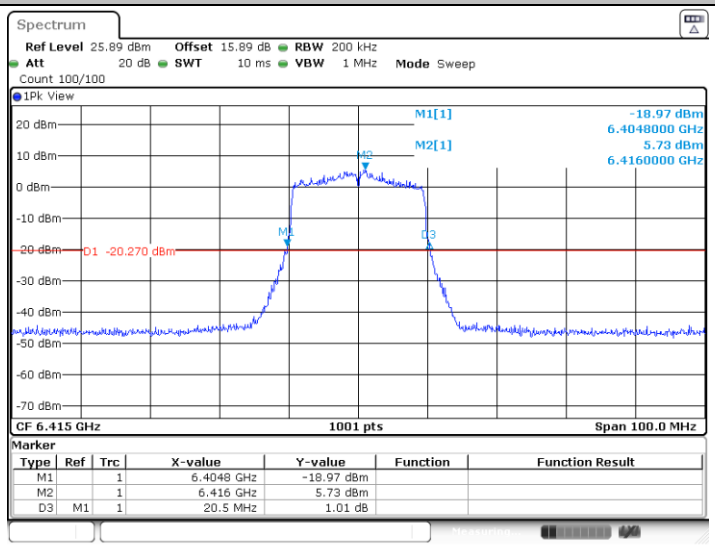
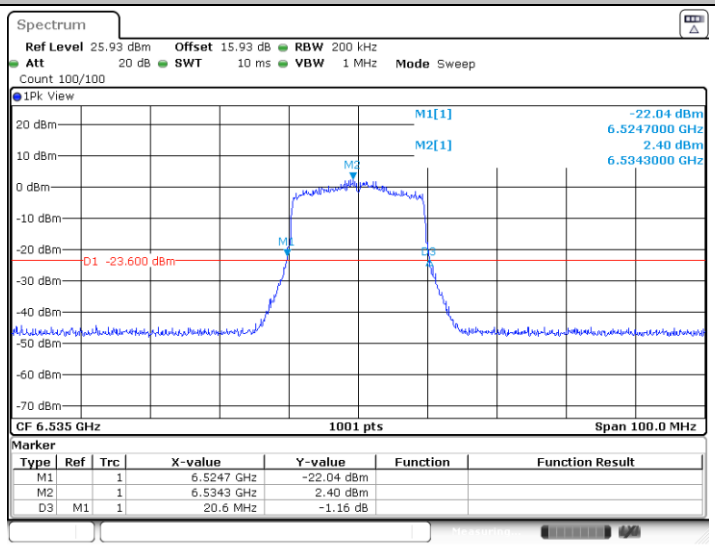
11AX20MIMO_Ant0_6415


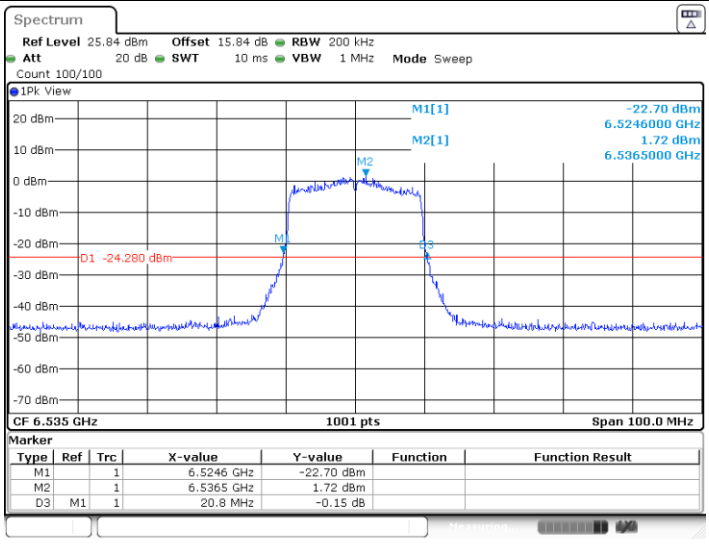
Date: 15.JAN.2024 19:32:13

11AX20MIMO_Ant1_6415


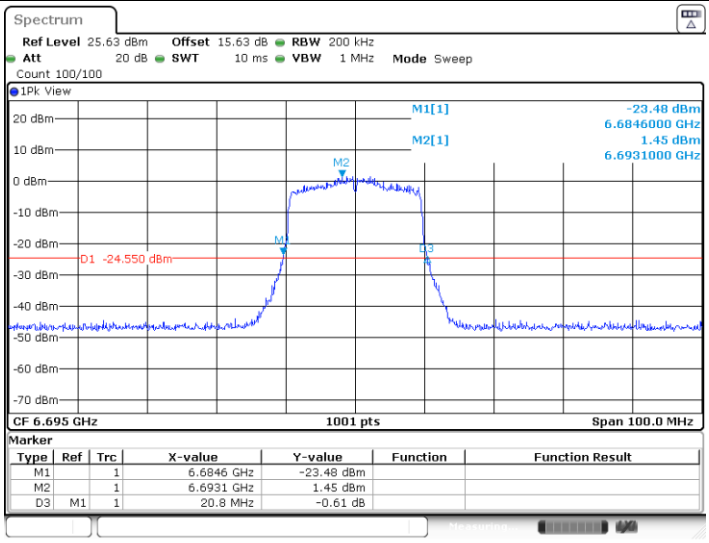
Date: 15.JAN.2024 19:33:02

11AX20MIMO_Ant0_6535


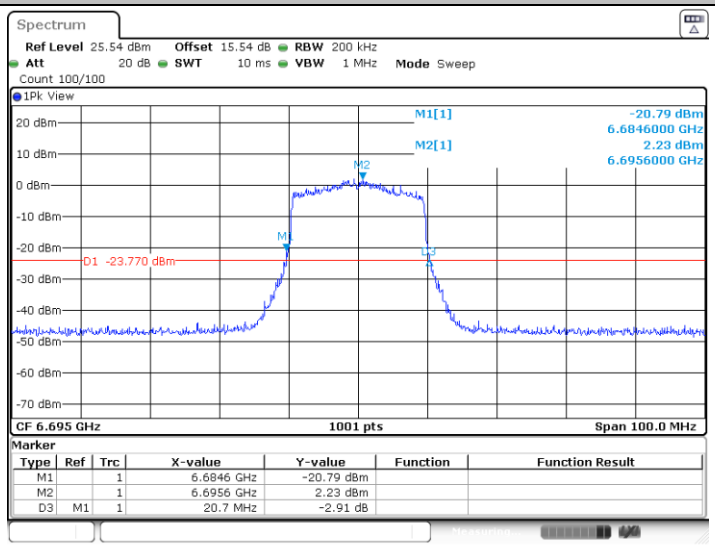
Date: 15.JAN.2024 19:40:54

11AX20MIMO_Ant1_6535


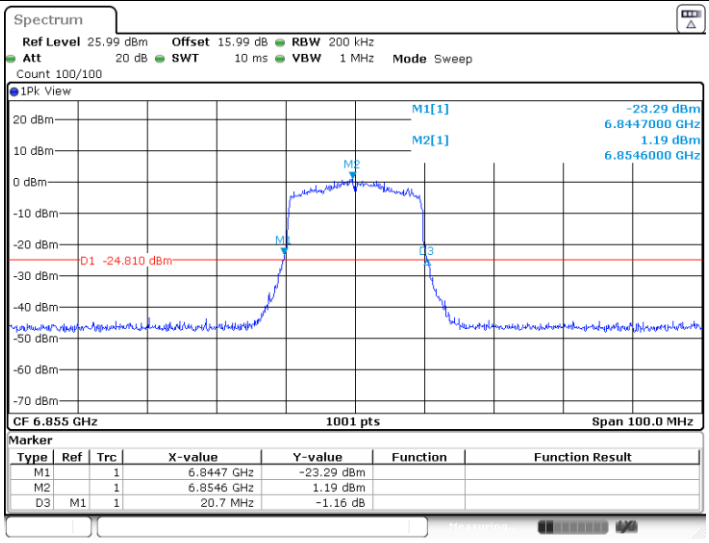
Date: 15.JAN.2024 19:41:43

11AX20MIMO_Ant0_6695


Date: 15.JAN.2024 19:42:53

11AX20MIMO_Ant1_6695


Date: 15.JAN.2024 19:43:40

11AX20MIMO_Ant0_6855


Date: 15.JAN.2024 19:44:44

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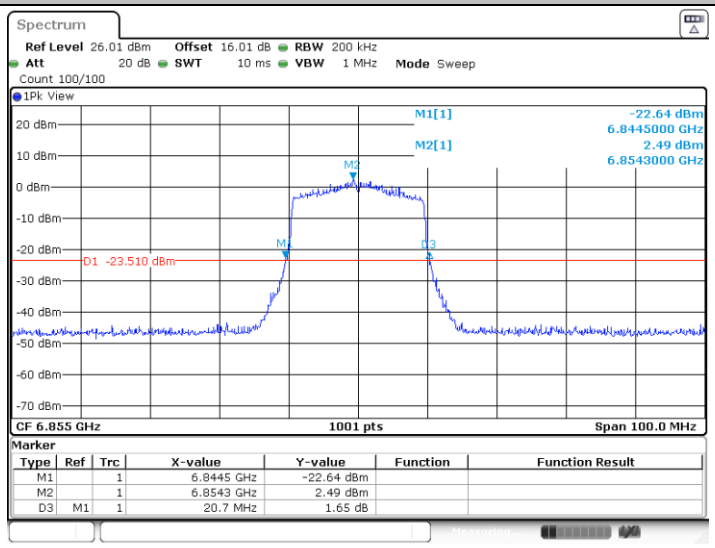
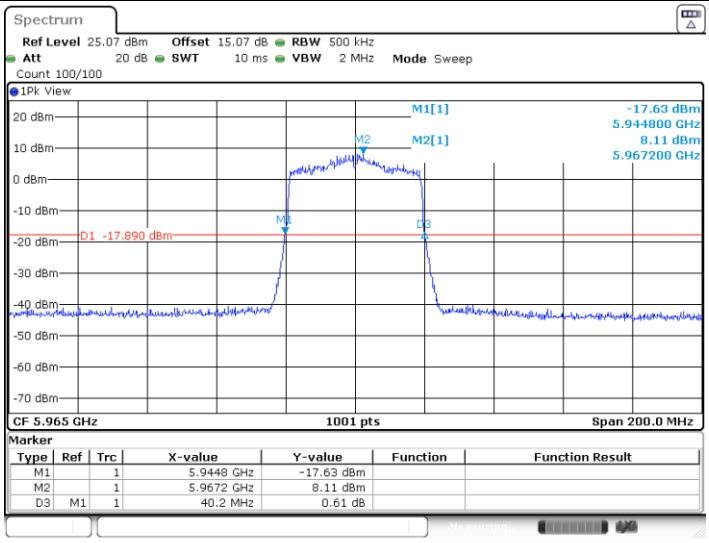


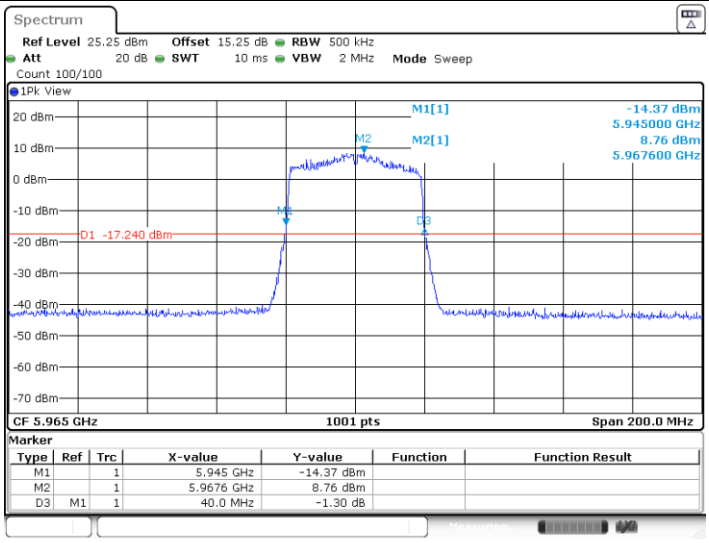
Date: 15.JAN.2024 19:45:30

11AX40MIMO_Ant0_5965

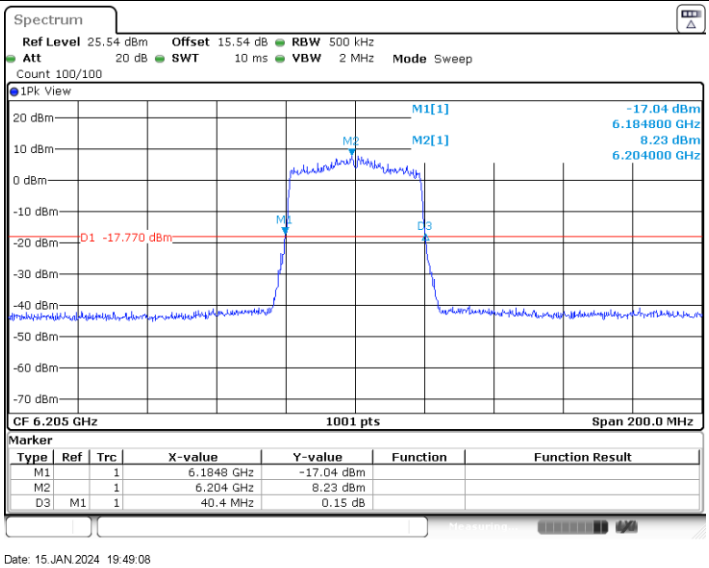


Date: 15.JAN.2024 19:46:54

11AX40MIMO_Ant1_5965



Date: 15.JAN.2024 19:47:41

11AX40MIMO_Ant0_6205


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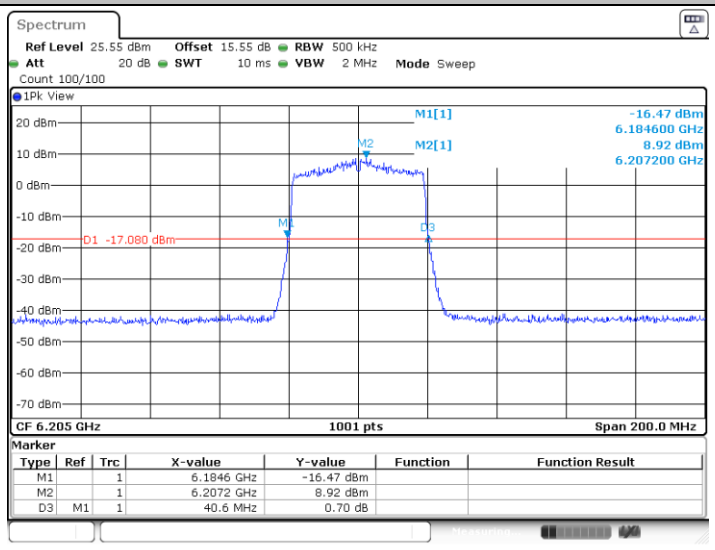

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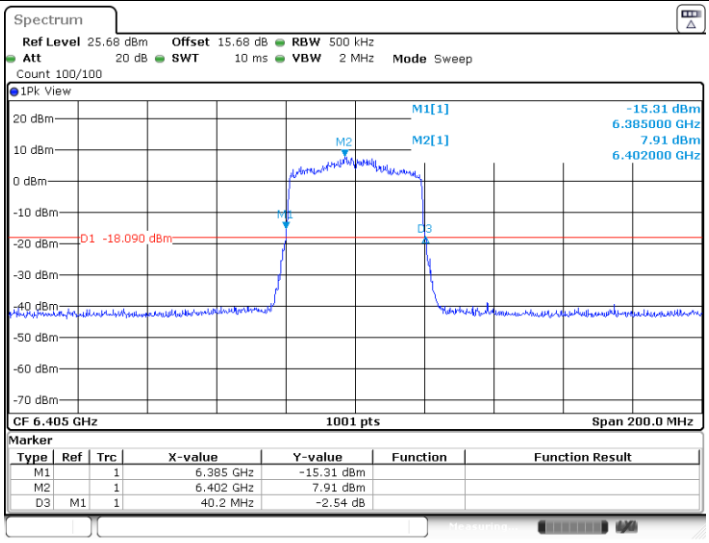

Date: 15.JAN.2024 19:51:18

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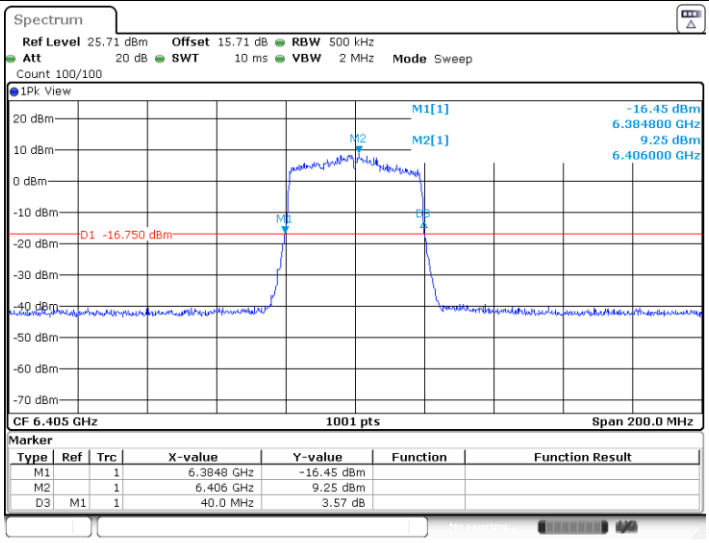

Date: 15.JAN.2024 19:52:05

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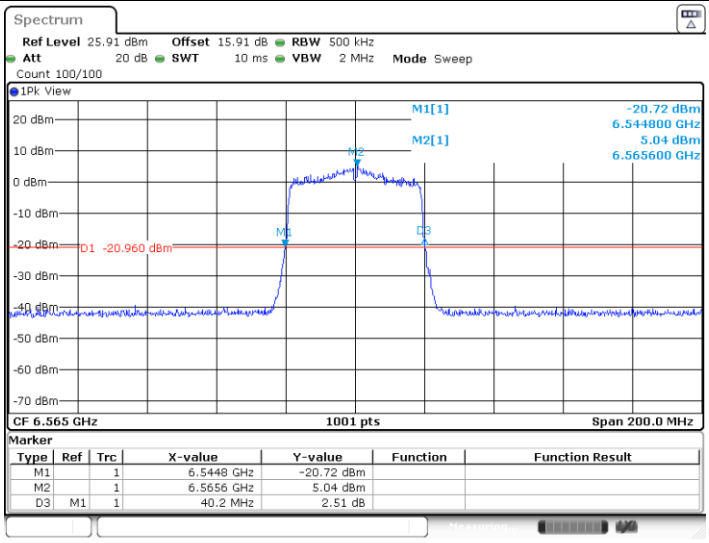

Date: 15.JAN.2024 19:59:28

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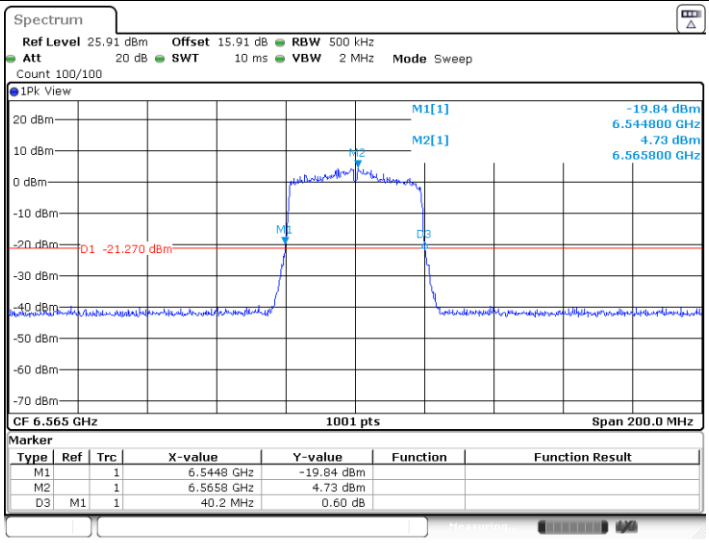

Date: 15.JAN.2024 20:00:16

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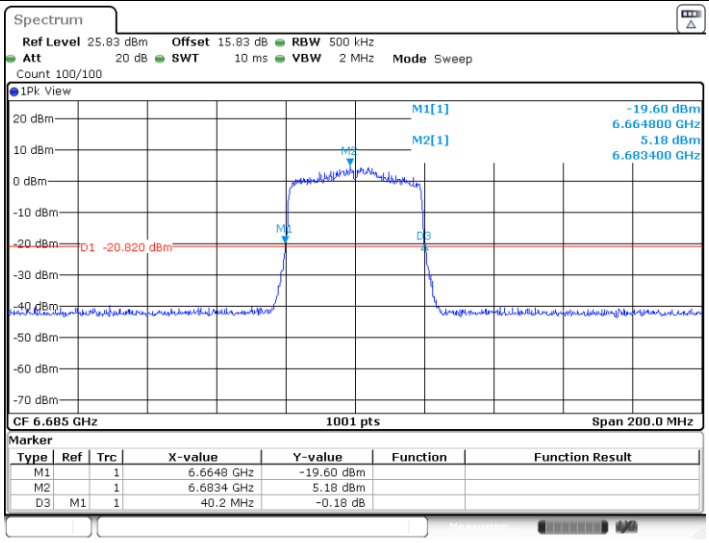

Date: 15.JAN.2024 20:02:56

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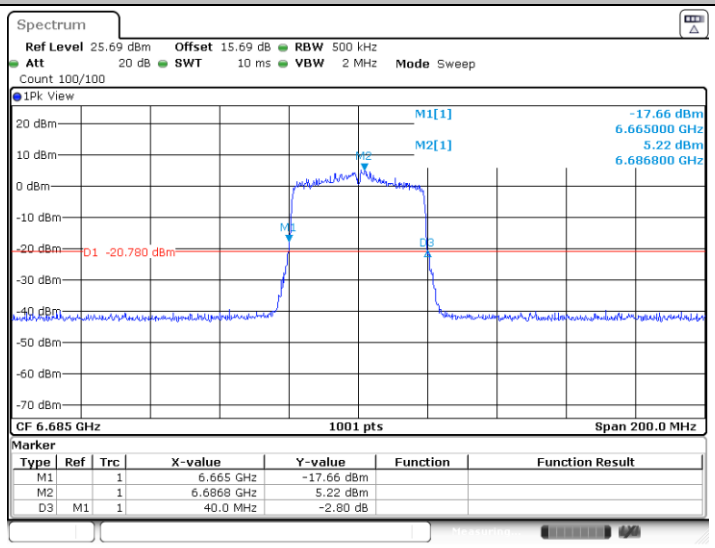
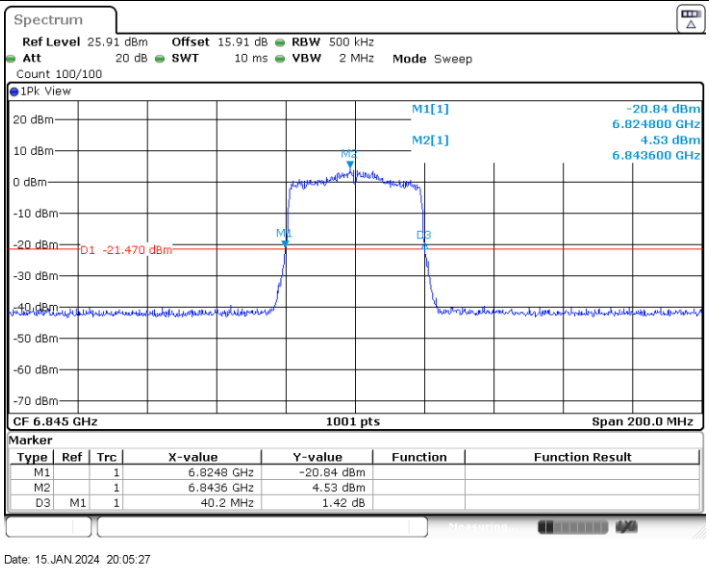


Date: 15.JAN.2024 20:03:44

11AX40MIMO_Ant0_6845


Date: 15.JAN.2024 20:05:27

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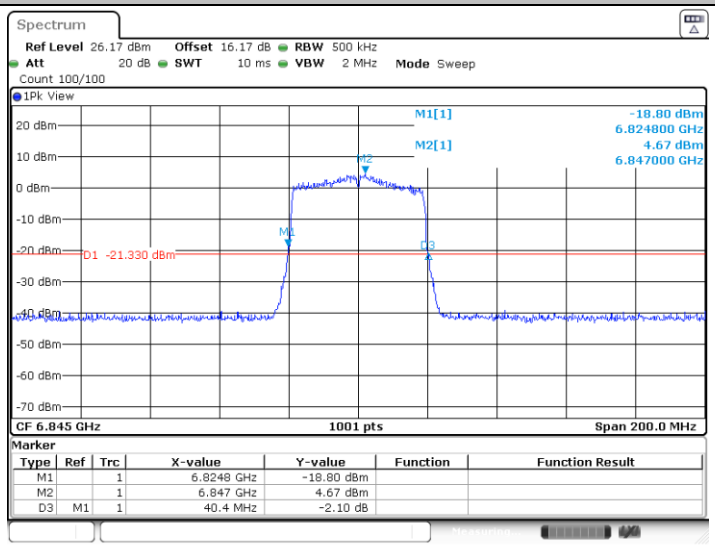

Date: 15.JAN.2024 20:06:14

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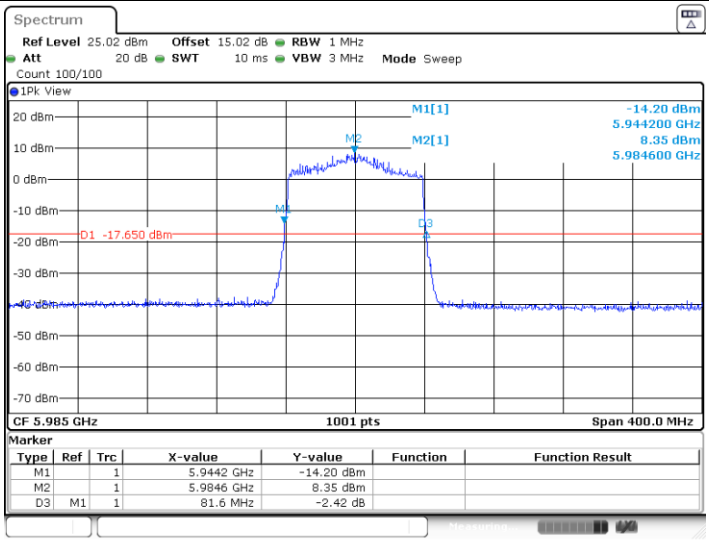

Date: 15.JAN.2024 20:07:39

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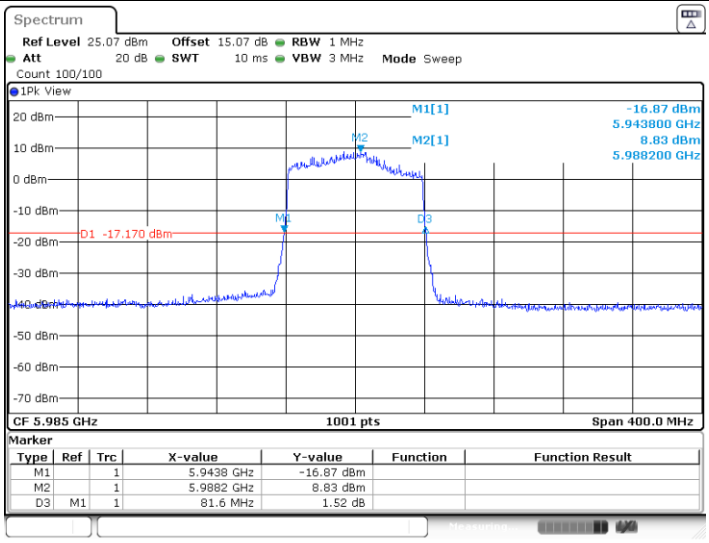

Date: 15.JAN.2024 20:08:26

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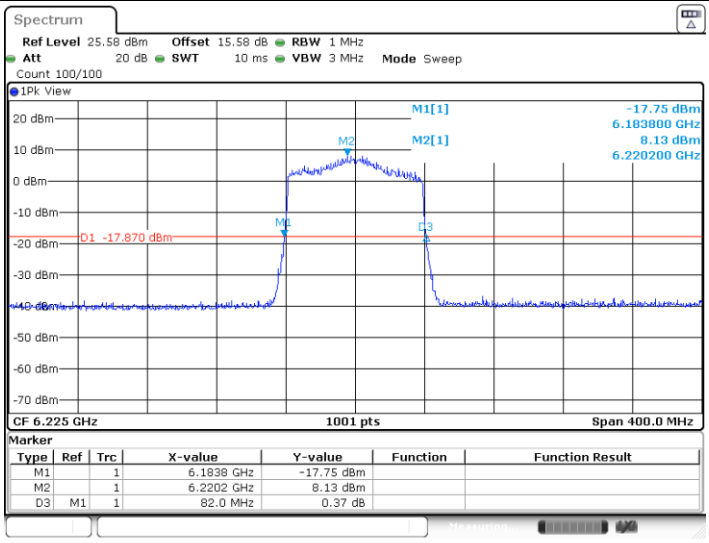

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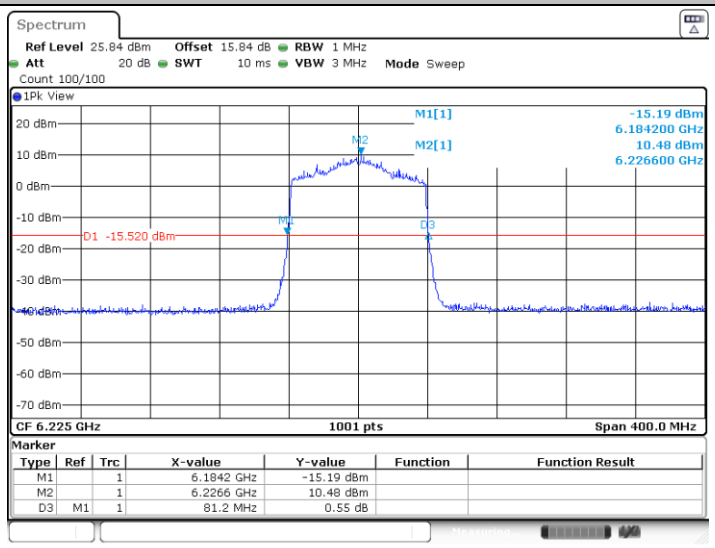

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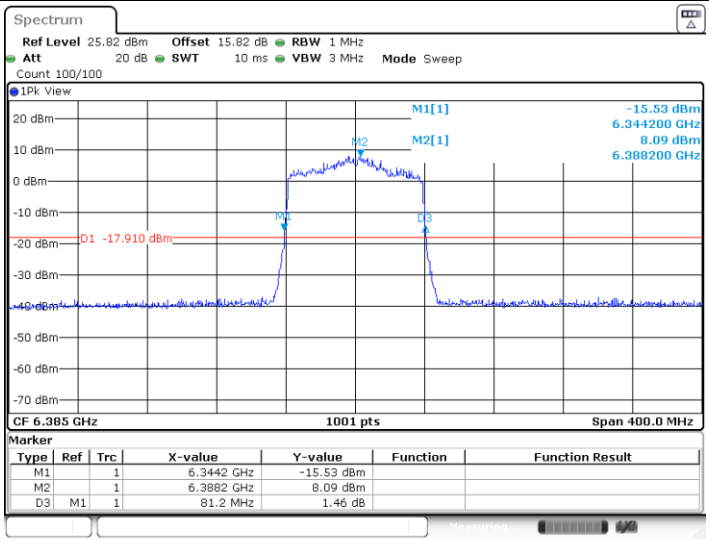

Date: 15.JAN.2024 20:20:10

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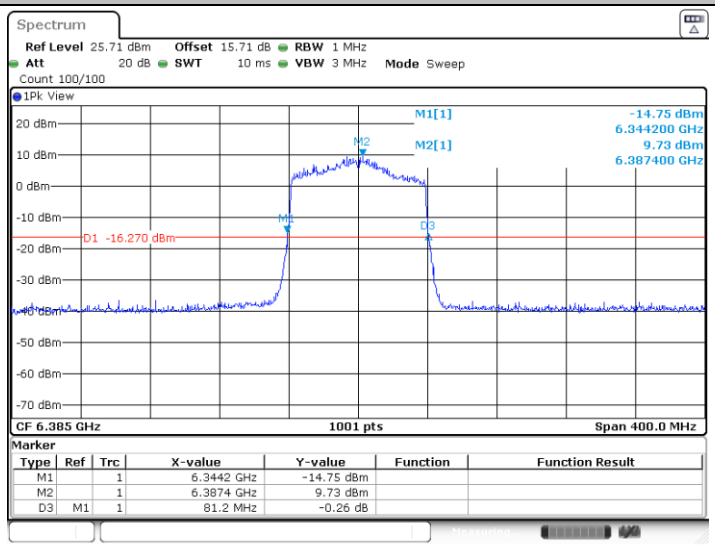

Date: 15.JAN.2024 20:20:56

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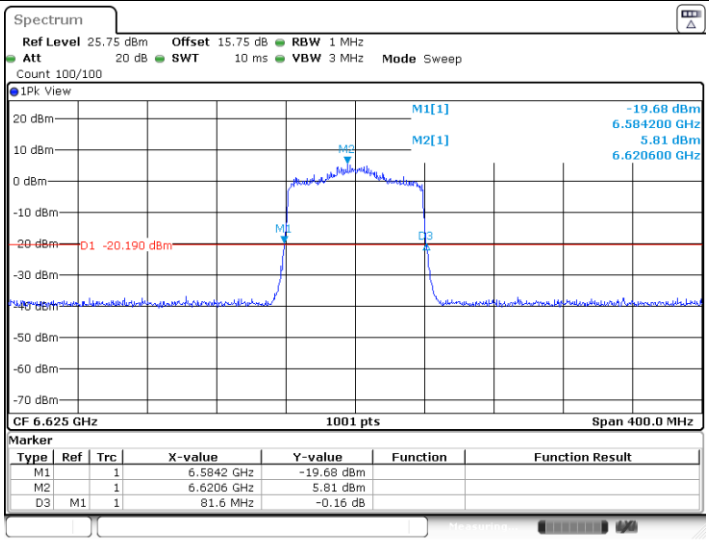
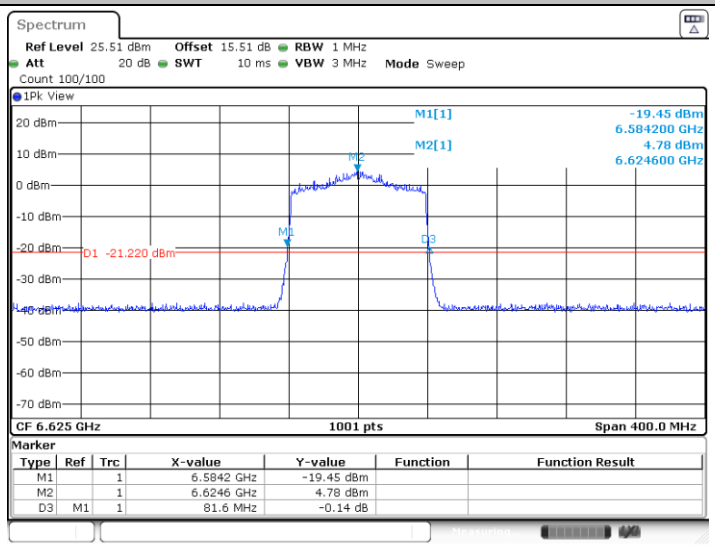
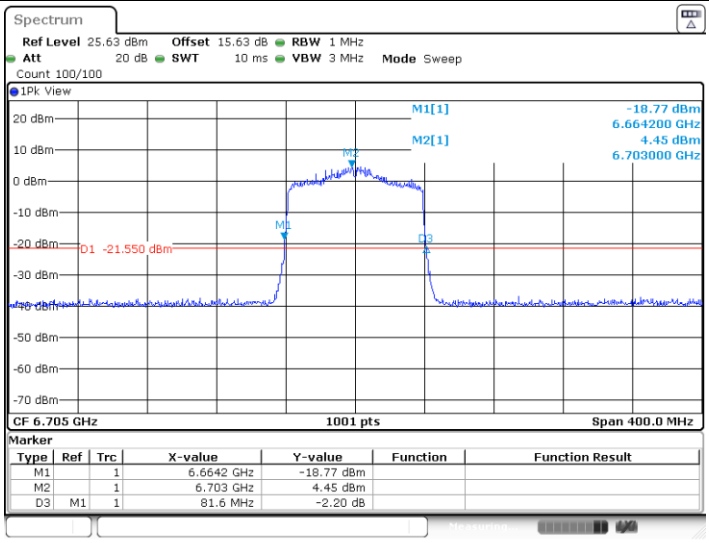


Date: 15.JAN.2024 20:29:33

11AX80MIMO_Ant1_6625


Date: 15.JAN.2024 20:30:19

11AX80MIMO_Ant0_6705


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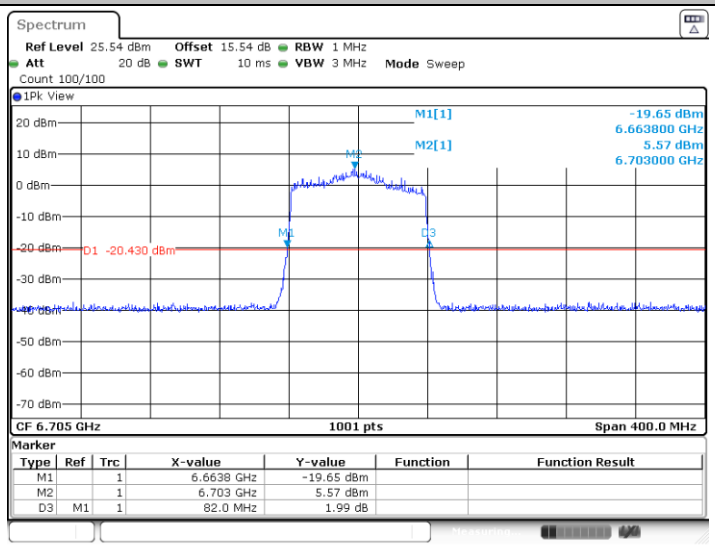

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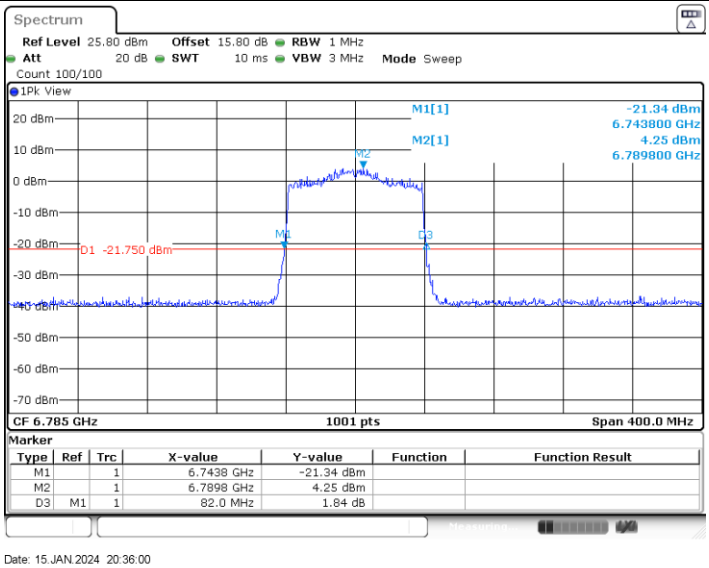

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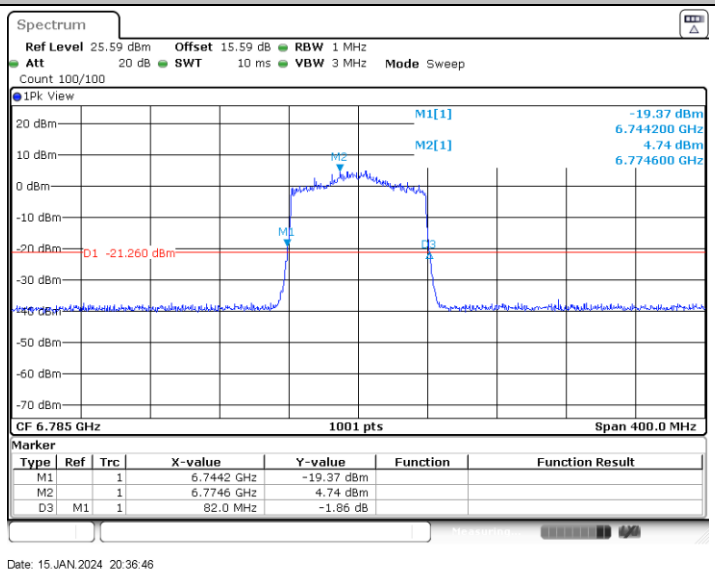

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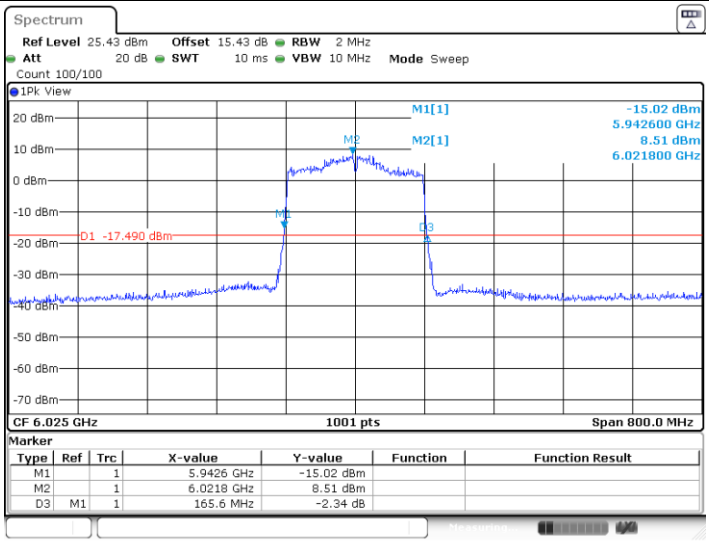

Date: 15.JAN.2024 20:45:46

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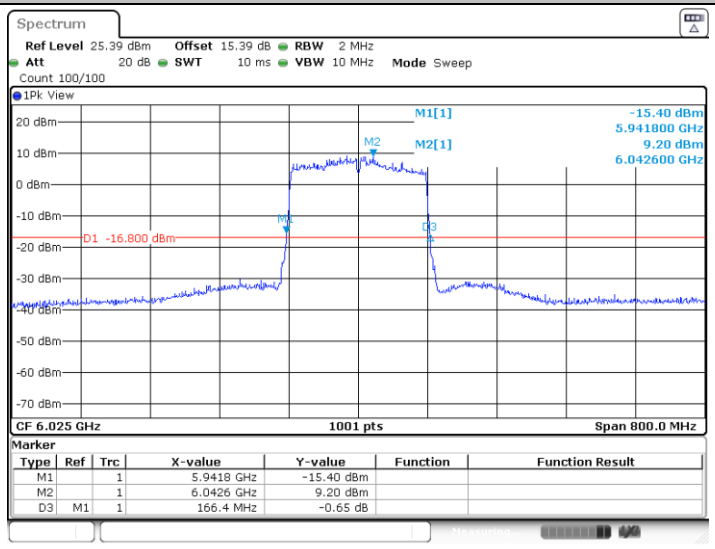

Date: 15.JAN.2024 20:46:33

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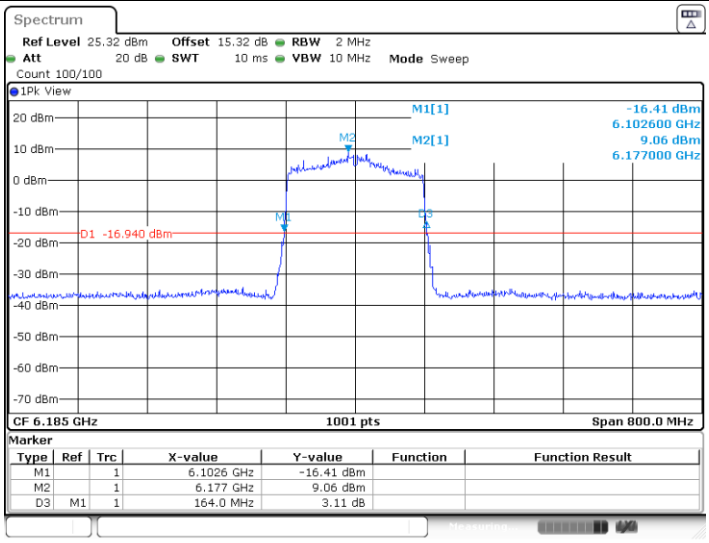

Date: 15.JAN.2024 20:47:50

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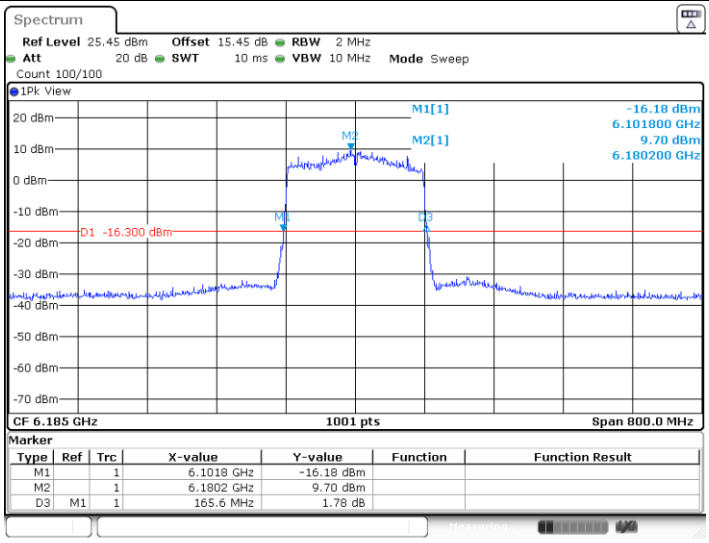

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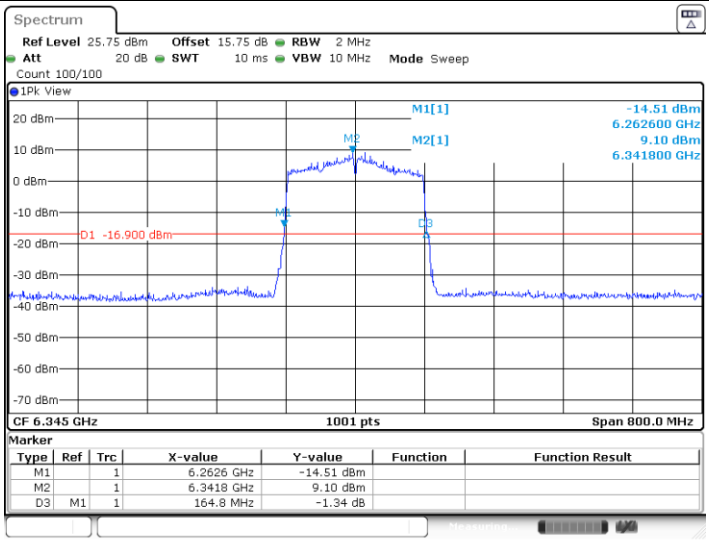

Date: 15.JAN.2024 20:49:52

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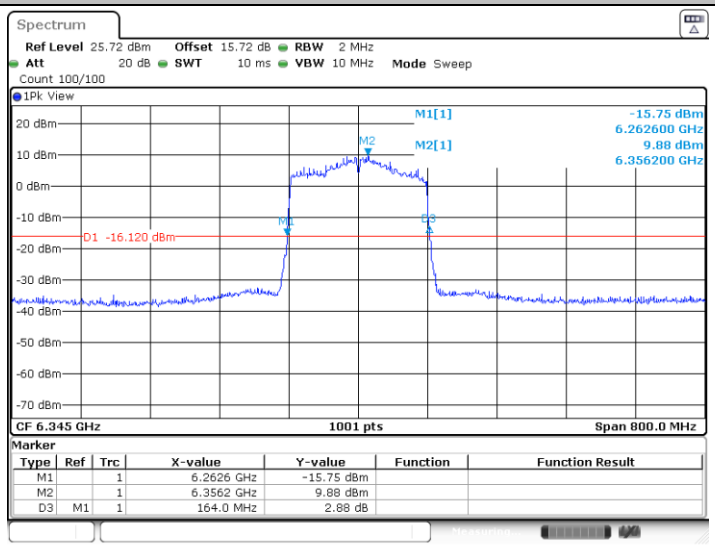
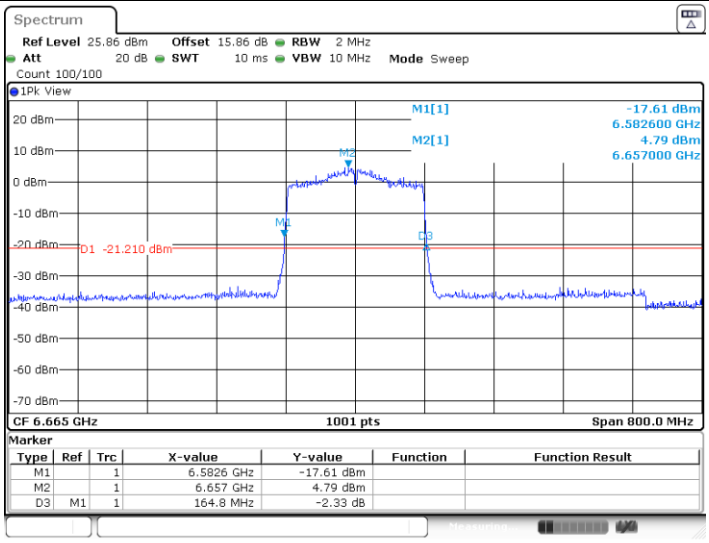
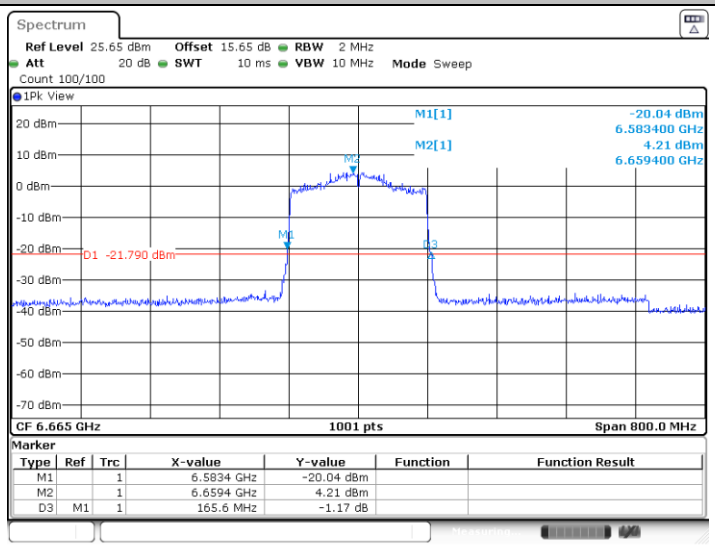


Date: 15.JAN.2024 20:50:39

11AX160MIMO_Ant0_6665


Date: 15.JAN.2024 20:54:00

11AX160MIMO_Ant1_6665


Date: 15.JAN.2024 20:54:46

Occupied channel bandwidth

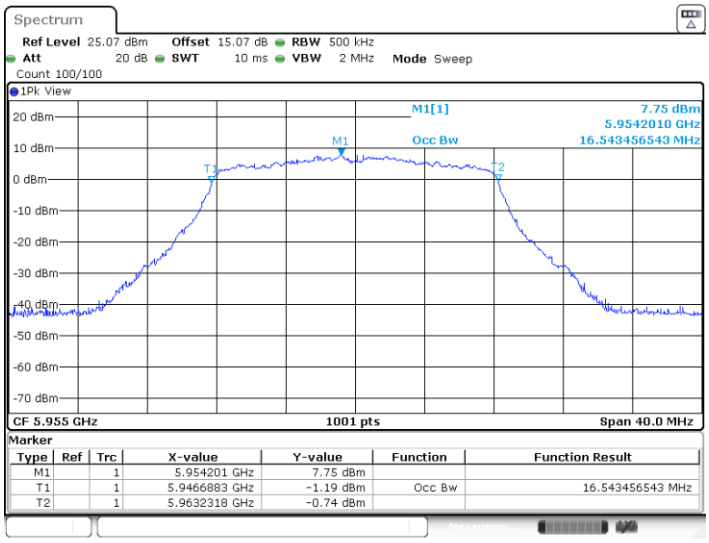
Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
11A-CDD	Ant0	5955	16.543	5946.6883	5963.2318
	Ant1	5955	16.503	5946.7283	5963.2318
	Ant0	6195	16.503	6186.6883	6203.1918
	Ant1	6195	16.543	6186.7283	6203.2717
	Ant0	6415	16.543	6406.6883	6423.2318
	Ant1	6415	16.543	6406.6883	6423.2318
	Ant0	6535	16.543	6526.6883	6543.2318
	Ant1	6535	16.543	6526.6883	6543.2318
	Ant0	6695	16.543	6686.6883	6703.2318
	Ant1	6695	16.543	6686.6883	6703.2318
	Ant0	6855	16.543	6846.6883	6863.2318
	Ant1	6855	16.543	6846.6883	6863.2318
11AX20MIMO	Ant0	5955	18.901	5945.5295	5964.4306
	Ant1	5955	18.901	5945.5295	5964.4306
	Ant0	6195	18.901	6185.4895	6204.3906
	Ant1	6195	18.901	6185.5295	6204.4306
	Ant0	6415	18.861	6405.5295	6424.3906
	Ant1	6415	18.901	6405.4895	6424.3906
	Ant0	6535	18.861	6525.5295	6544.3906
	Ant1	6535	18.901	6525.4895	6544.3906
	Ant0	6695	18.861	6685.5295	6704.3906
	Ant1	6695	18.901	6685.4895	6704.3906
	Ant0	6855	18.861	6845.5694	6864.4306
	Ant1	6855	18.941	6845.4895	6864.4306
11AX40MIMO	Ant0	5965	37.642	5946.1389	5983.7812
	Ant1	5965	37.642	5946.1389	5983.7812
	Ant0	6205	37.722	6186.0589	6223.7812
	Ant1	6205	37.722	6186.1389	6223.8611
	Ant0	6405	37.642	6386.1389	6423.7812
	Ant1	6405	37.642	6386.0589	6423.7013
	Ant0	6565	37.722	6546.0589	6583.7812
	Ant1	6565	37.722	6546.0589	6583.7812
	Ant0	6685	37.642	6666.1389	6703.7812
	Ant1	6685	37.722	6666.0589	6703.7812
	Ant0	6845	37.642	6826.1389	6863.7812
	Ant1	6845	37.642	6826.0589	6863.7013
11AX80MIMO	Ant0	5985	76.723	5946.6384	6023.3616
	Ant1	5985	76.723	5946.3187	6023.0420

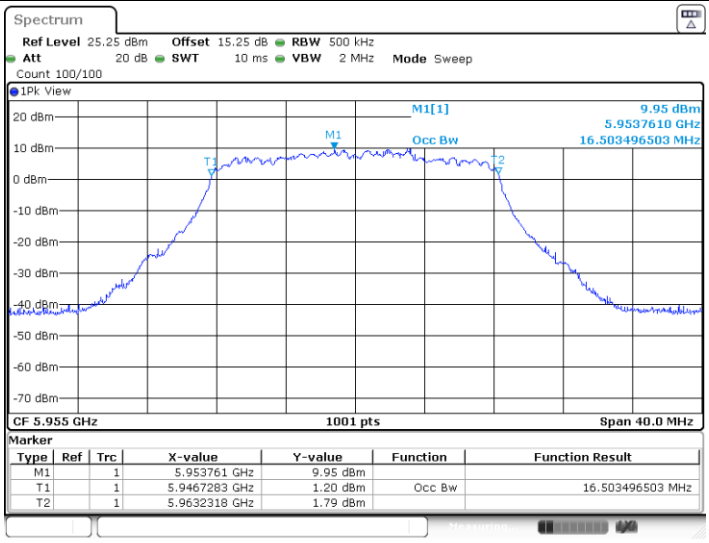
	Ant0	6225	76.883	6186.3187	6263.2018
	Ant1	6225	76.563	6186.4785	6263.0420
	Ant0	6385	76.883	6346.4785	6423.3616
	Ant1	6385	76.404	6346.6384	6423.0420
	Ant0	6625	76.883	6586.4785	6663.3616
	Ant1	6625	76.883	6586.6384	6663.5215
	Ant0	6705	76.883	6666.4785	6743.3616
	Ant1	6705	77.043	6666.3187	6743.3616
	Ant0	6785	76.883	6746.4785	6823.3616
	Ant1	6785	76.883	6746.4785	6823.3616
	Ant0	6865	77.043	6826.3187	6903.3616
	Ant1	6865	77.203	6826.1588	6903.3616
11AX160MIMO	Ant0	6025	156.324	5946.6783	6103.0020
	Ant1	6025	156.643	5946.3586	6103.0020
	Ant0	6185	156.324	6106.3586	6262.6823
	Ant1	6185	156.324	6106.3586	6262.6823
	Ant0	6345	156.324	6266.6783	6423.0020
	Ant1	6345	155.684	6266.6783	6422.3626
	Ant0	6665	156.643	6586.6783	6743.3217
	Ant1	6665	155.684	6586.9980	6742.6823
	Ant0	6825	156.643	6746.6783	6903.3217
	Ant1	6825	155.684	6746.9980	6902.6823

Test Graphs

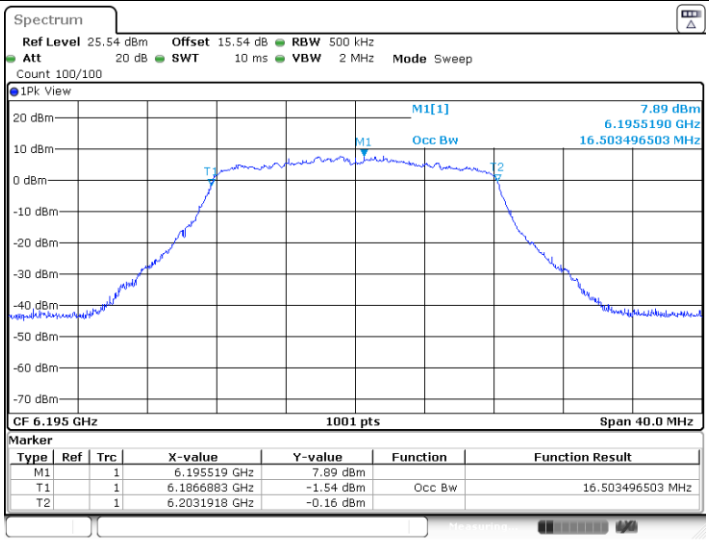
11A-CDD_Ant0_5955



11A-CDD_Ant1_5955

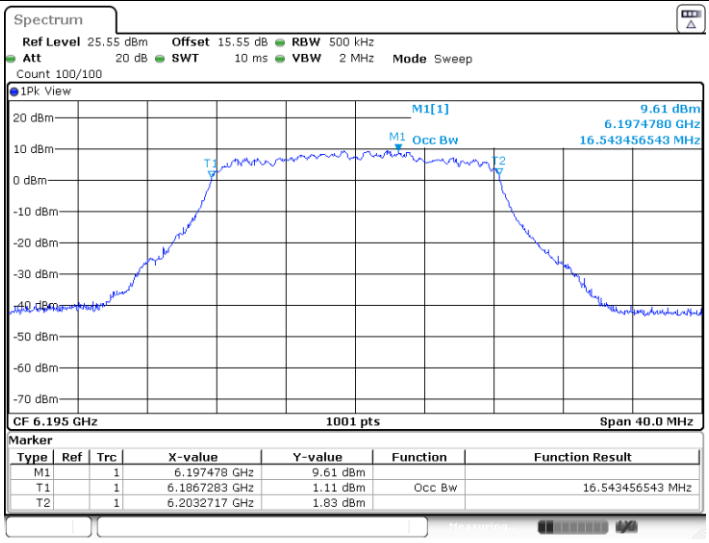


11A-CDD_Ant0_6195



Date: 15.JAN.2024 18:11:43

11A-CDD_Ant1_6195



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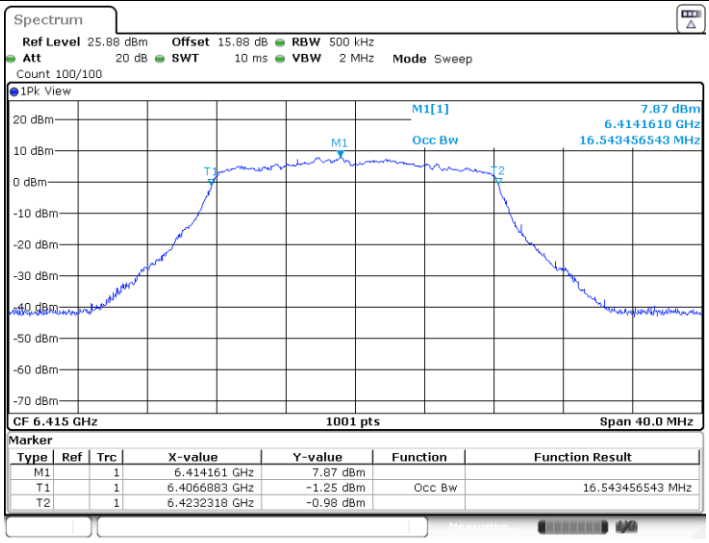
11A-CDD_Ant0_6415


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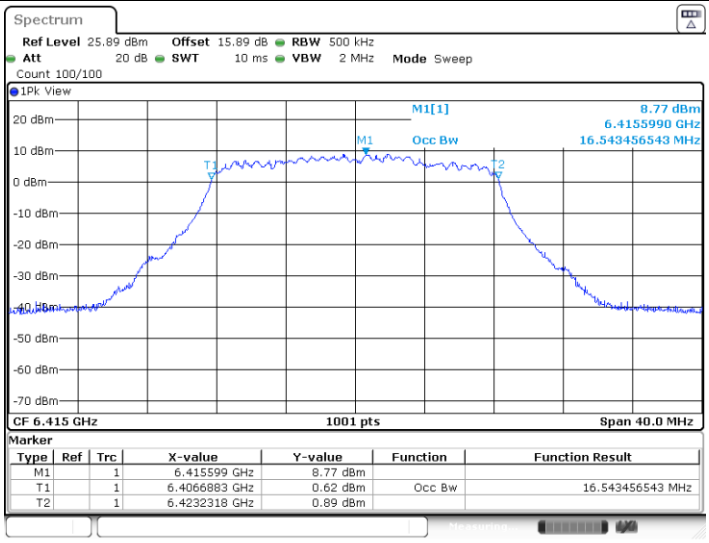

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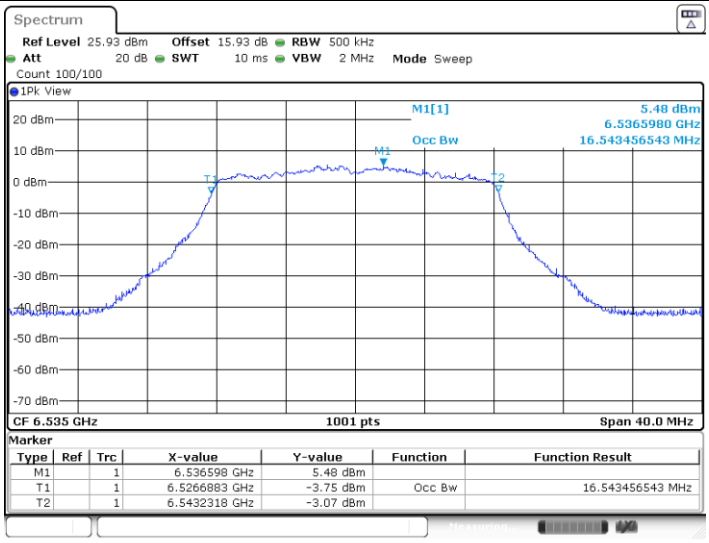

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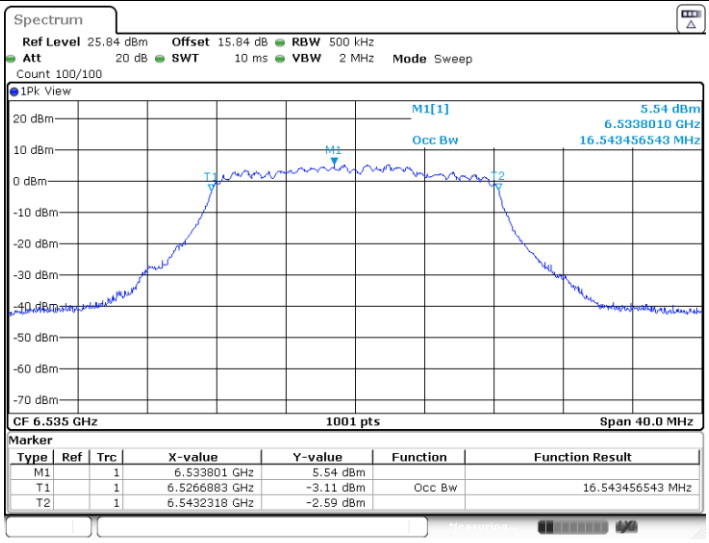

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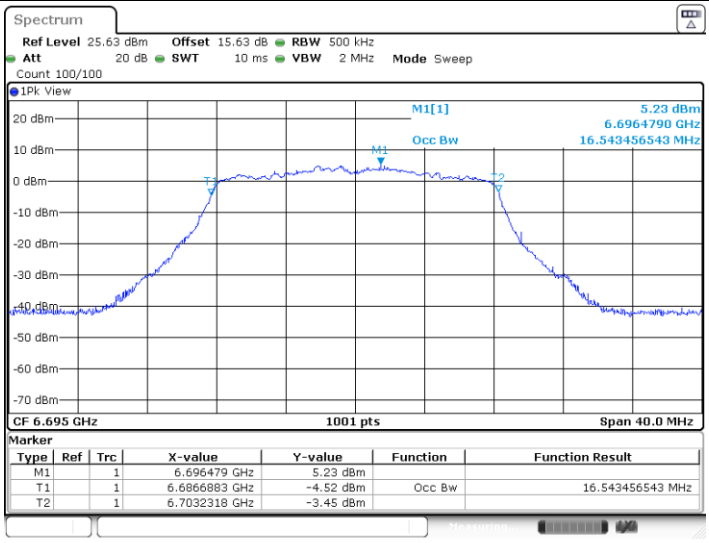

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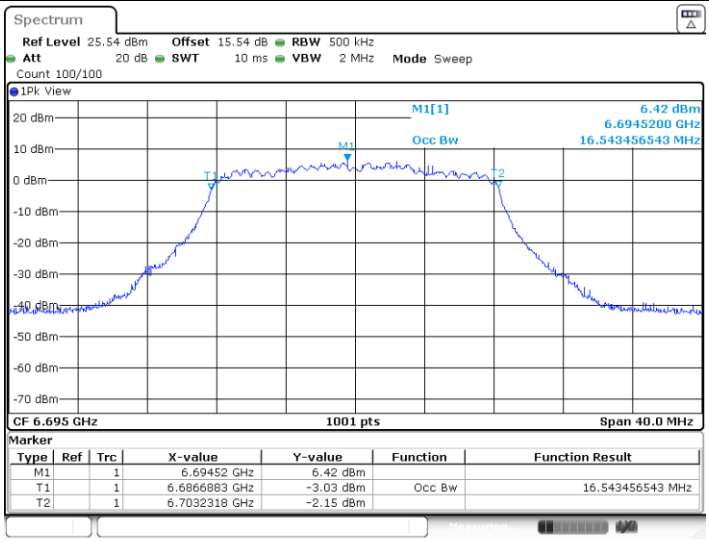

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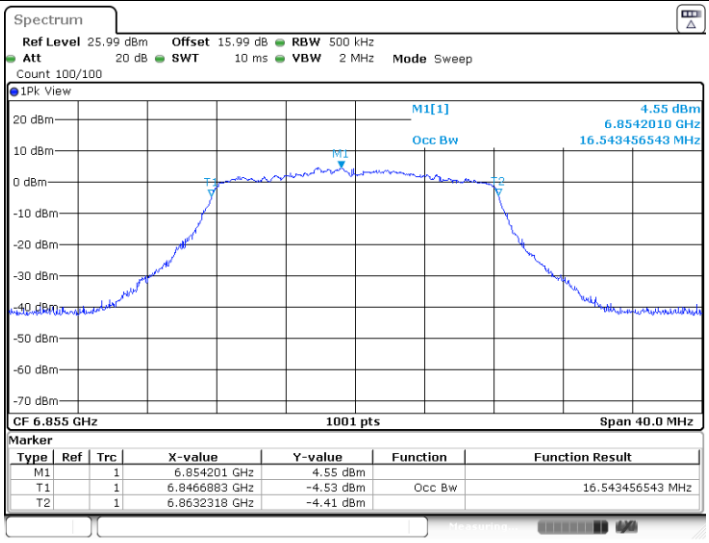
11A-CDD_Ant0_6855


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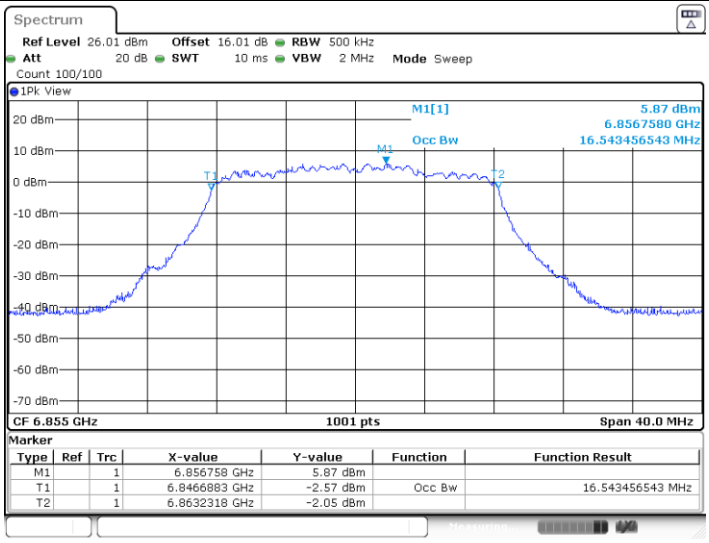
11A-CDD_Ant1_6855


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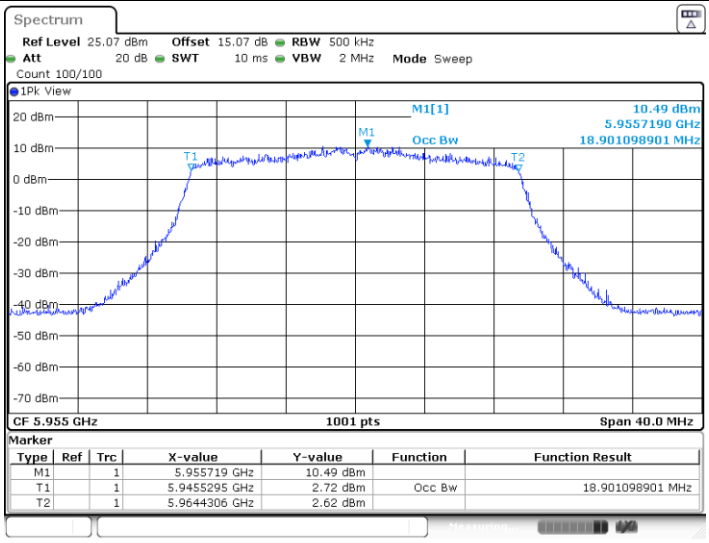

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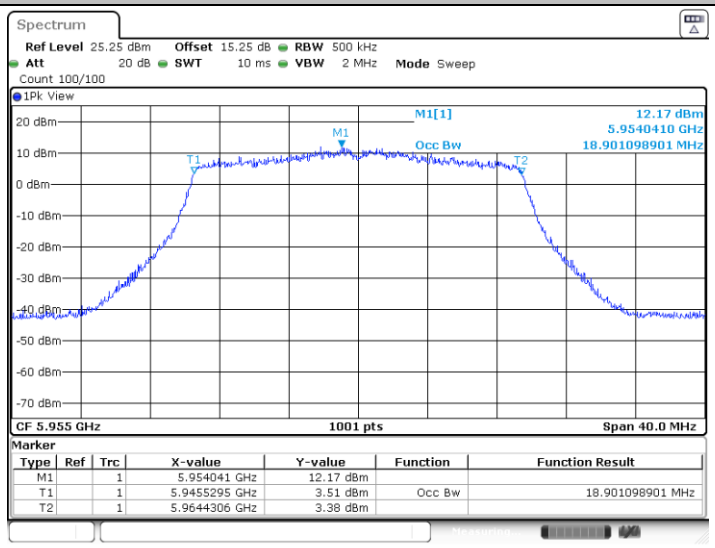

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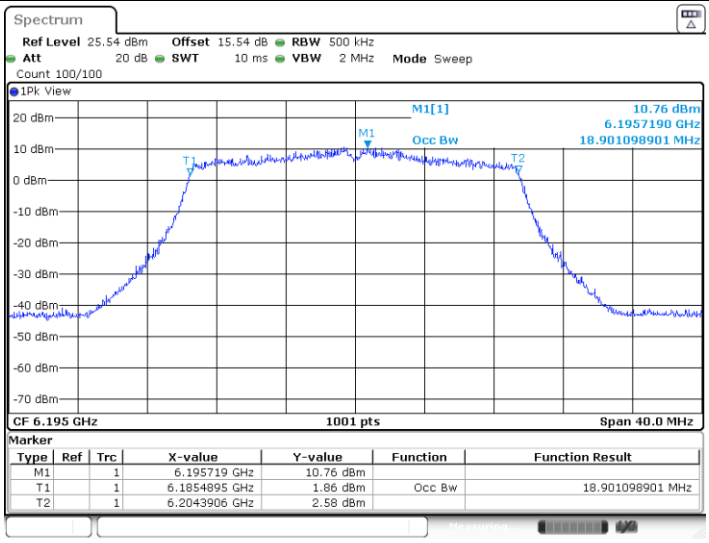

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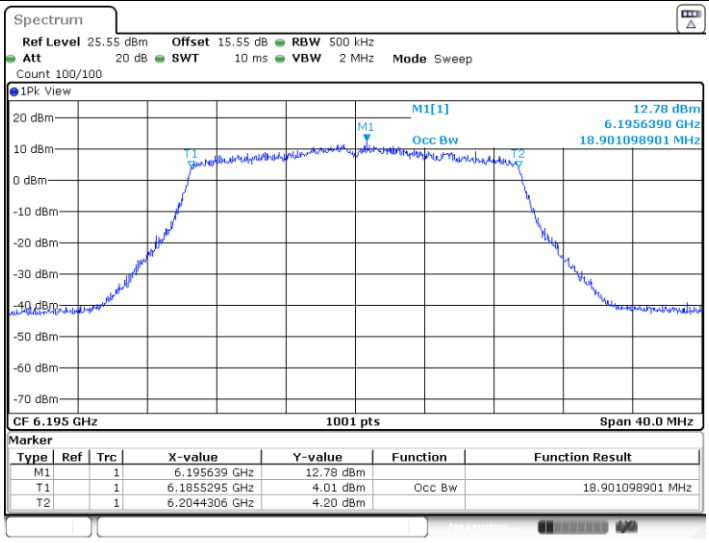

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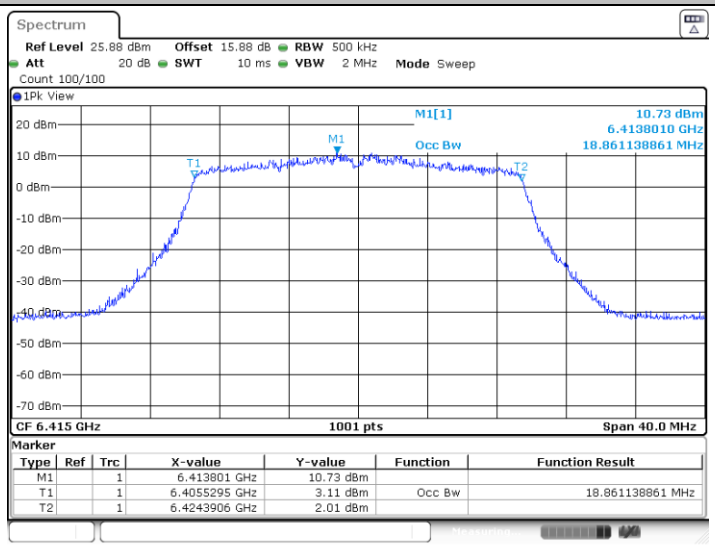

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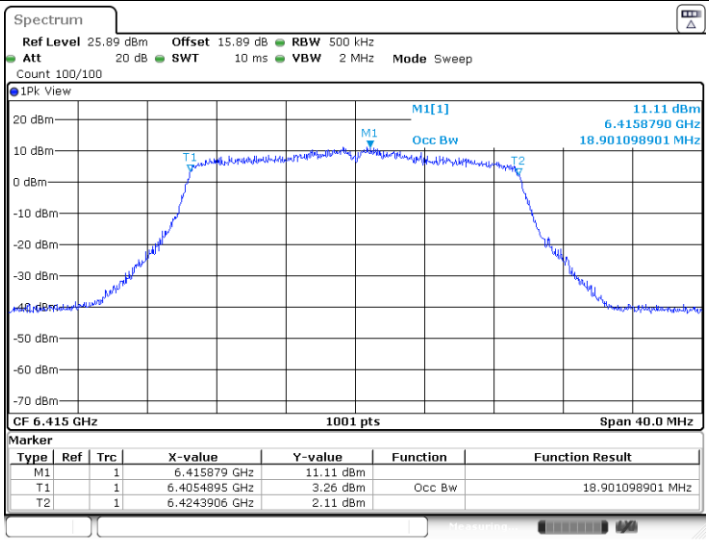

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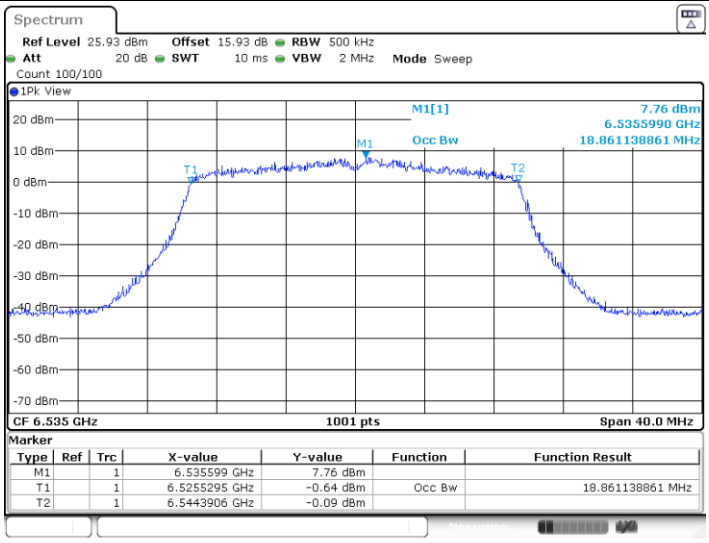

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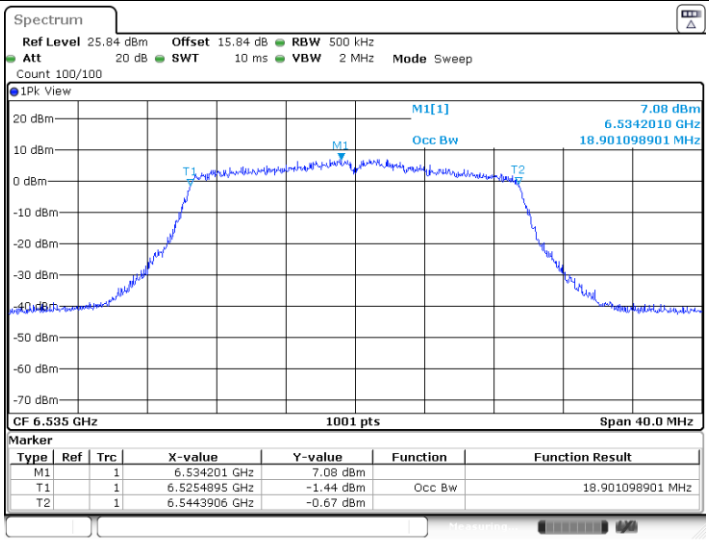

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