



FCC RF Test Report

APPLICANT : Ascom (Sweden) AB
EQUIPMENT : Myco 4 WiFi, Myco 4 Slim
BRAND NAME : ascom
MODEL NAME : SH4-AABC, SH4-AABB, SH4-ABBC, SH4-ABBB
FCC ID : BXZSH4
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : 15E 6 GHz Low Power Indoor Client (6XD)
TEST DATE(S) : Feb. 06, 2023 ~ Apr. 26, 2023

We, Sporton International Inc. (ShenZhen), 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. (ShenZhen), the test report shall not be reproduced except in full.

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Approved by: Jason Jia



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People's Republic of China



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History of this test report

Report No.	Version	Description	Issued Date
FR2D0705F	01	Initial issue of report	Jun. 27, 2023

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403(i)	26dB Emission Bandwidth	Pass	-
3.1	2.1049 15.407(a)(10)	99% Bandwidth	Pass	-
3.2	15.407(a)(8)	Maximum Conducted Output Power	Reporting only	-
3.2	15.407(a)(8)	Fundamental Maximum EIRP	Pass	-
3.3	15.407(a)(8)	Fundamental Power Spectral Density	Pass	-
3.4	15.407(b)(6)	In-Band Emissions (Channel Mask)	Pass	-
3.5	15.407(d)(6)	Contention Based Protocol	Pass	
3.6	15.407(b)	Unwanted Emissions	Pass	Under limit 0.33 dB at 7328.610 MHz
3.7	15.207	AC Conducted Emission	Pass	Under limit 13.54 dB at 0.65 MHz
3.8	15.203 15.407(a)	Antenna Requirement	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 Applicant

Ascom (Sweden) AB

Grimbodalen 2, SE-417 49 Gothenburg, Sweden

1.2 Manufacturer

Ascom (Sweden) AB

Grimbodalen 2, SE-417 49 Gothenburg, Sweden

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Myco 4 WiFi, Myco 4 Slim
Brand Name	ascom
Model Name	SH4-AABC, SH4-AABB, SH4-ABBC, SH4-ABBB
FCC ID	BXZSH4
SN Code	Conducted: 2211c95e Conduction: 32fa7a52 Radiation: TI00000630 CBP: 2211c95e
HW Version	V0.50
SW Version	SH4_ASCOM_A12
EUT Stage	Production Unit

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. There are two SKUs under test, SKU 2 and SKU 3. The differences can be referred to the SH4-AABC, SH4-AABB, SH4-ABBC, SH4-ABBB_Operational Description of Product Equality Declaration which is exhibit separately. Each SKU has different IR/Scanner/Antenna configurations, the details are shown as below. According to the differences, we choose SKU2_Sample 1 to perform full test, and SKU3_Sample 3 verify the RSE worst case.

SKU	IR	Scanner	2.4G BT/WIFI Antenna
SKU2_Sample 1	Yes	Yes	Same
SKU2_Sample 2	No	Yes	Same
SKU3_Sample 3	No	No	Different

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	U-NII-5: 5925 MHz ~ 6425 MHz U-NII-6: 6425 MHz ~ 6525 MHz U-NII-7: 6525 MHz ~ 6875 MHz U-NII-8: 6875 MHz ~ 7125 MHz
Maximum EIRP	<5925 MHz ~ 7125 MHz > <MIMO Ant.3+10> 802.11a : 8.03 dBm / 0.0064 W 802.11ax HE20 : 8.28 dBm / 0.0067 W 802.11ax HE40 : 9.63 dBm / 0.0092 W 802.11ax HE80 : 12.40 dBm / 0.0174 W 802.11ax HE160 : 13.52 dBm / 0.0225 W
99% Bandwidth	802.11a : 16.663 MHz 802.11ax HE20 : 19.021 MHz 802.11ax HE40 : 37.962 MHz 802.11ax HE80 : 77.842 MHz 802.11ax HE160 : 158.242 MHz
Antenna Type / Gain	<5925 MHz ~ 6425 MHz > <Ant. 3> : PIFA Antenna with gain -2.8 dBi <Ant. 10> : PIFA Antenna with gain -2.8 dBi <6425 MHz ~ 6525 MHz > <Ant. 3> : PIFA Antenna with gain -2.7 dBi <Ant. 10> : PIFA Antenna with gain -2.7 dBi <6525 MHz ~ 6875 MHz > <Ant. 3> : PIFA Antenna with gain -2.6 dBi <Ant. 10> : PIFA Antenna with gain -2.6 dBi <6875 MHz ~ 7125 MHz > <Ant. 3> : PIFA Antenna with gain -2.9 dBi <Ant. 10> : PIFA Antenna with gain -2.9 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) 802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM / 4096QAM)

Remark:

1. WLAN MIMO support CDD mode, for WLAN SISO & MIMO (CDD) mode, the whole testing has assessed only MIMO mode to cover SISO mode.
2. The EUT does not support channel puncturing mode.
3. The EUT support CH233 by manufacturer declared.
4. U-NII-5/-6/-7/-8 can't transmit simultaneously.
5. 802.11ax support full RU tone and partial RU 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 to cover partial RU.



1.5 Modification of EUT

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

1.6 Testing Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-SZ TH01-SZ DFS01-SZ	CN1256	421272

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103 TEL: +86-755-33202398		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH03-SZ	CN1256	421272

1.7 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH03-SZ	AUDIX	E3	6.2009-8-24
2.	CO01-SZ	AUDIX	E3	6.120613b



1.8 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 v01r01
- ♦ 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 (Y 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, 6, 7, 8>

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							



BW 20M	Channel	97	101	105	109	113	117	121	125
	Freq. (MHz)	6435	6455	6475	6495	6515	6535	6555	6575
BW 40M	Channel	99		107		115		123	
	Freq. (MHz)	6445		6485		6525		6565	
BW 80M	Channel	103				119			
	Freq. (MHz)	6465				6545			
BW 160M	Channel	111							
	Freq. (MHz)	6505							

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	185	189
	Freq. (MHz)	6755	6775	6795	6815	6835	6855	6875	6895
BW 40M	Channel	163		171		179		187	
	Freq. (MHz)	6765		6805		6845		6885	
BW 80M	Channel	167				183			
	Freq. (MHz)	6785				6865			
BW 160M	Channel	175							
	Freq. (MHz)	6825							

BW 20M	Channel	193	197	201	205	209	213	217	221
	Freq. (MHz)	6915	6935	6955	6975	6995	7015	7035	7055
BW 40M	Channel	195		203		211		219	
	Freq. (MHz)	6925		6965		7005		7045	
BW 80M	Channel	199				215			
	Freq. (MHz)	6945				7025			
BW 160M	Channel	207							
	Freq. (MHz)	6985							

BW 20M	Channel	225	229	233
	Freq. (MHz)	7075	7095	7115
BW 40M	Channel	227		
	Freq. (MHz)	7085		

2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

MIMO Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802.11ax HE80	MCS0
802.11ax HE160	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : BT Link + WLAN Link(6G) + USB Cable(Charging from Adapter) + Battery 1
Remark: For Radiated Test Cases, the tests were performed with Adapter and USB Cable.	

Ch. #		5925-6425 MHz UNII-5	6425-6525 MHz UNII-6	6525-6875 MHz UNII-7	6875-7125 MHz UNII-8
		802.11ax HE20	802.11ax HE20	802.11ax HE20	802.11ax HE20
L	Low	001	097	117	189
M	Middle	045	105	149	209
H	High	093	113	181	229/233
Straddle		-	-	-	185

Ch. #		5925-6425 MHz UNII-5	6425-6525 MHz UNII-6	6525-6875 MHz UNII-7	6875-7125 MHz UNII-8
		802.11ax HE40	802.11ax HE40	802.11ax HE40	802.11ax HE40
L	Low	003	099	123	195
M	Middle	043	-	147	203
H	High	091	107	179	227
Straddle		-	115	-	187

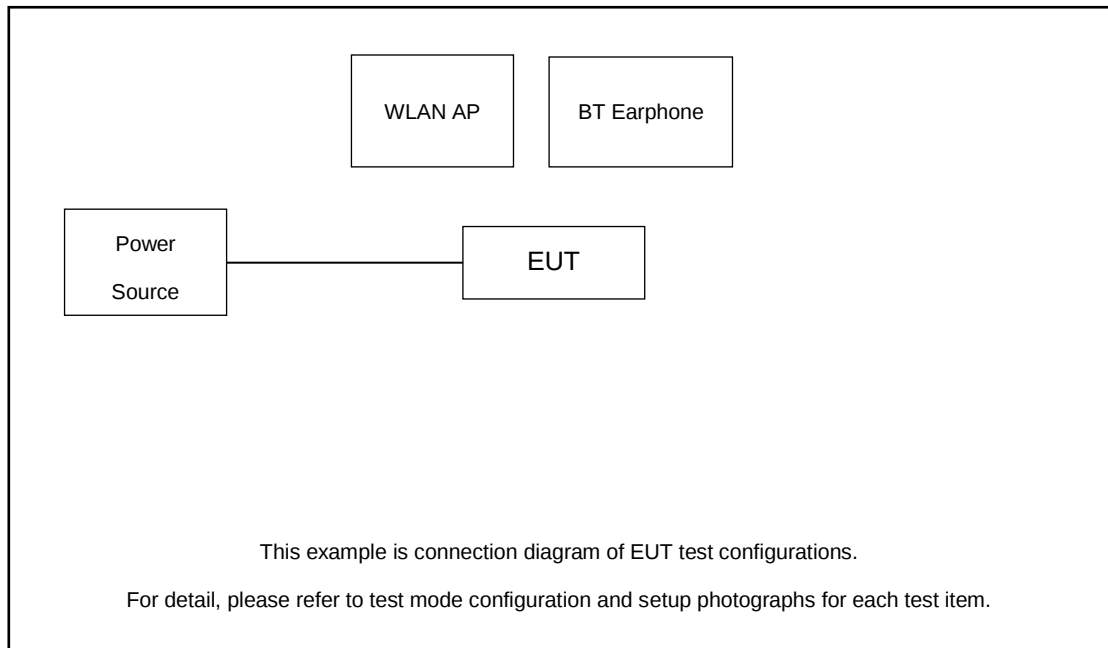
Ch. #		5925-6425 MHz UNII-5	6425-6525 MHz UNII-6	6525-6875 MHz UNII-7	6875-7125 MHz UNII-8
		802.11ax HE80	802.11ax HE80	802.11ax HE80	802.11ax HE80
L	Low	007	103	135	199
M	Middle	039		151	-
H	High	087		167	215
Straddle		-	119	183	-

Ch. #		5925-6425 MHz UNII-5	6425-6525 MHz UNII-6	6525-6875 MHz UNII-7	6875-7125 MHz UNII-8
		802.11ax HE160	802.11ax HE160	802.11ax HE160	802.11ax HE160
L	Low	015	-	143	207
M	Middle	047			
H	High	079			
Straddle		-	111	175	-

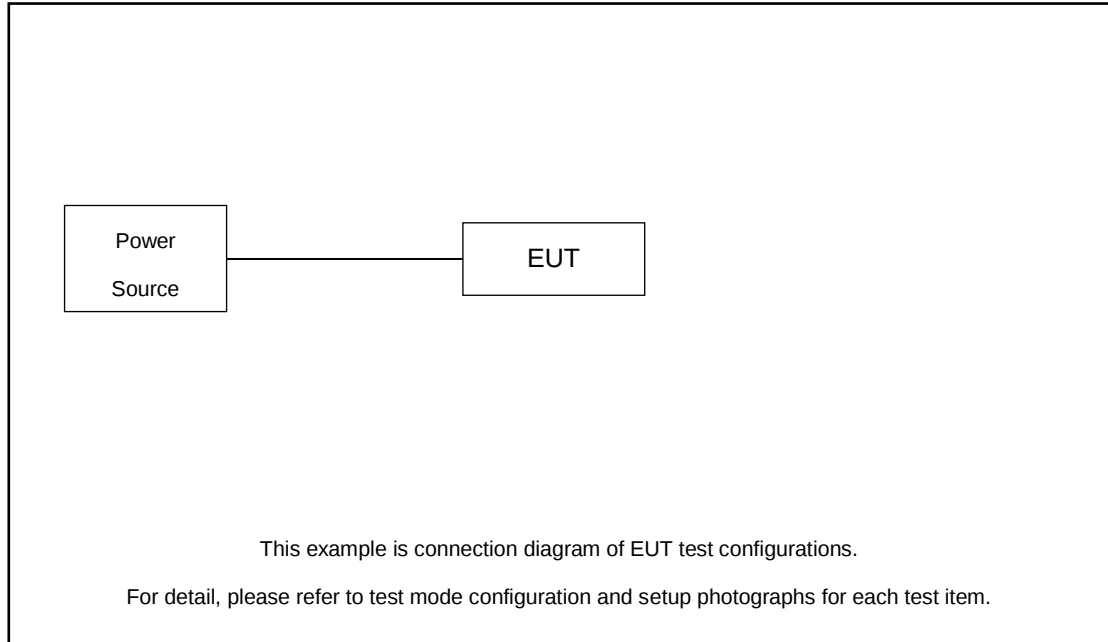
Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System

For AC 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.	Bluetooth Earphone	Samsung	EO-MG900	PYAHS-107W	N/A	N/A
2.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
3.	Adapter	N/A	N/A	N/A	N/A	N/A
4.	USB Cable	N/A	N/A	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 5.86 dB and 10dB attenuator.

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

$$= 5.86 + 10 = 15.86 \text{ (dB)}$$

3 Test Result

3.1 26dB Emission Bandwidth & 99% Bandwidth Measurement

3.1.1 Limit of 26dB Emission Bandwidth & 99% 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.

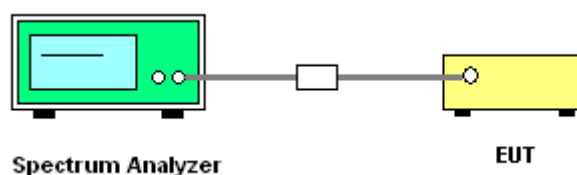
3.1.2 Measuring Instruments

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 26dB 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) $\geq 3 * RBW$.
8. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 26dB Emission Bandwidth & 99% 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)(8) For client devices operating under the control of an indoor access point in the 5.925-7.125 GHz bands, the maximum e.i.r.p. over the frequency band of operation must not exceed 24 dBm.

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

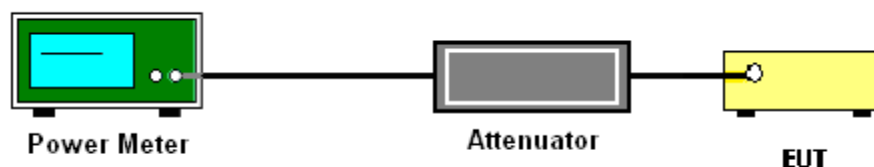
3.2.3 Test Procedures

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)(8) For client devices operating under the control of an indoor access point in the 5.925-7.125 GHz bands, the maximum power spectral density must not exceed -1 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 $\geq$ 3 MHz.
 - Number of points in sweep $\geq$ 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.

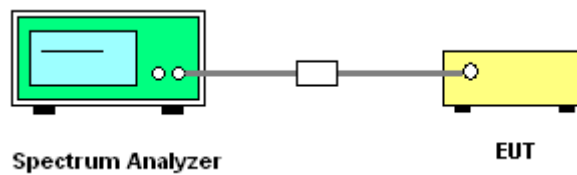
Method (b): Measure and sum spectral maxima across the outputs.

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 $10 \log(N_{\text{ANT}})$ 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 $10 \log(N_{\text{ANT}})$ 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

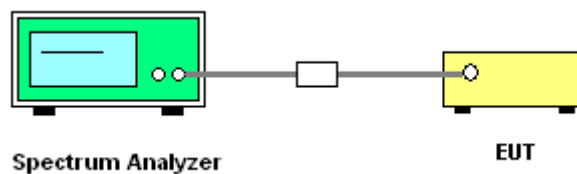
The testing follows FCC KDB 987594 D02 U-NII 6GHz EMC Measurement v01r01.

Section J) In-Band Emissions.

1. Take nominal bandwidth as reference channel bandwidth provided that 26dB 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 26dB EBW of the signal.
 - b) Set RBW = same RBW used for 26dB EBW measurement.
 - c) Set VBW $\geq 3 \times$ RBW
 - d) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$.
 - 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 Contention Based Protocol

3.5.1 Limit of Contention Based Protocol

<FCC 14-30 CFR 15.407>

(d)(6) Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band must employ a contention-based protocol.

FCC KDB 987594 D02 U-NII 6GHz EMC Measurement v01r01

Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62 dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel and stay off the channel as long as detected radio frequency power is equal to or greater than the threshold (-62 dBm). The -62 dBm (or lower) threshold is referenced to a 0 dBi antenna gain. To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel. For example, an 802.11 device that plans to transmit a 40 MHz- wide signal (on a primary 20 MHz channel and a secondary 20 MHz channel) must detect energy throughout the entire 40 MHz channel. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty.

Table 1. Criteria to determine number of times detection threshold test may be performed

If	Number of Tests	Placement of Incumbent Transmission
$BW_{EUT} \leq BW_{Inc}$	Once	Tune incumbent and EUT transmissions ($f_{c1} = f_{c2}$)
$BW_{Inc} < BW_{EUT} \leq 2BW_{Inc}$	Once	Incumbent transmission is contained within BW_{EUT}
$2BW_{Inc} < BW_{EUT} \leq 4BW_{Inc}$	Twice. Incumbent transmission is contained within BW_{EUT}	Incumbent transmission is located as closely as possible to the lower edge and upper edge, respectively, of the EUT channel
$BW_{EUT} > 4BW_{Inc}$	Three times	Incumbent transmission is located as closely as possible to the lower edge of the EUT channel, in the middle of EUT channel, and as closely as possible to the upper edge of the EUT channel

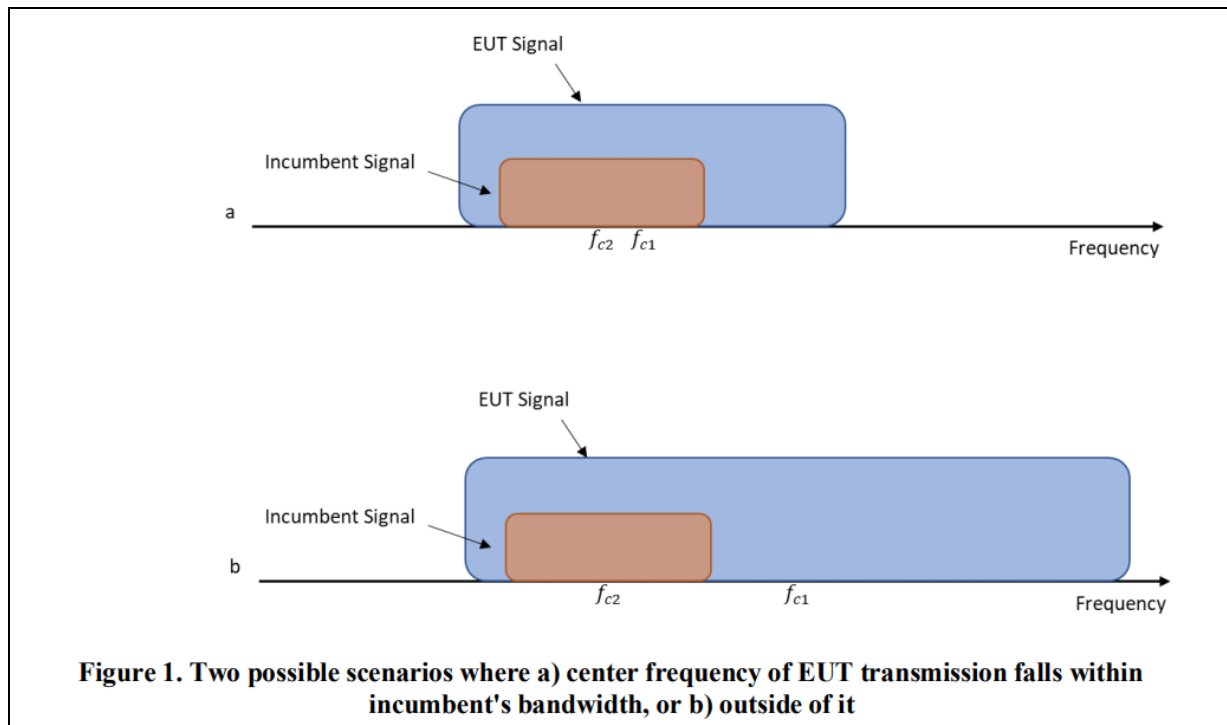
where:

BW_{EUT} : Transmission bandwidth of EUT signal

BW_{Inc} : Transmission bandwidth of the simulated incumbent signal (10 MHz wide AWGN signal)

f_{c1} : Center frequency of EUT transmission

f_{c2} : Center frequency of simulated incumbent signal



3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

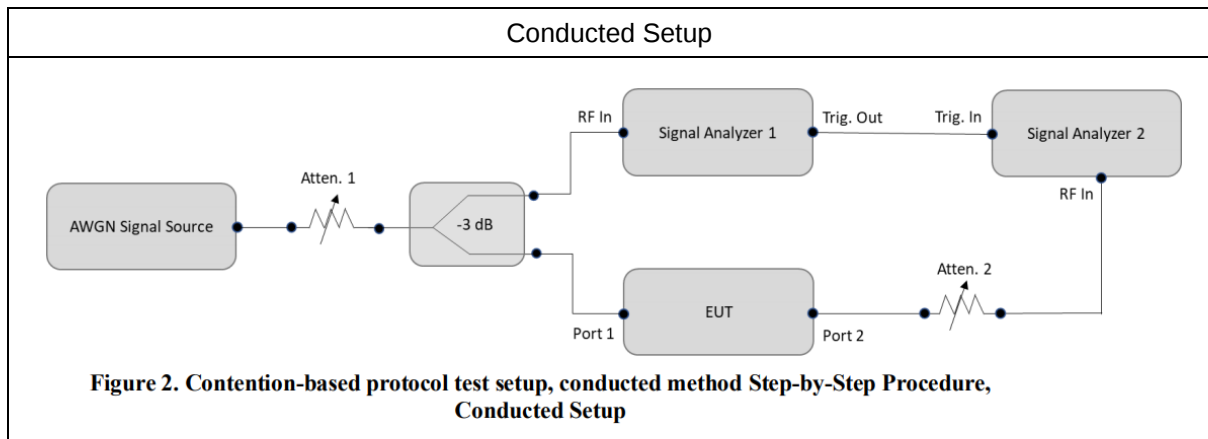
3.5.3 Test Procedures

Refer to KDB 987594 D02 v01r01.

1. To ensure EUT reliably detects an incumbent signal in both scenarios shown in Figure 1, the detection threshold test may be repeated more than once with the incumbent signal (having center frequency f_{c2}) tuned to different center frequencies within the UT transmission bandwidth. The criteria specified in Table 1 determines how many times the detection threshold test must be performed
2. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
3. Monitor the signal analyzer to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
4. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.

5. Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 2, choose a different center frequency for the AWGN signal and repeat the process.
6. EUT was driven in MIMO mode, the interferer signal was injected to both chains to monitor the performance, while the interferer level is determined according to the lowest antenna gain among both antennas.

3.5.4 Test Setup



3.5.5 Support Unit used in test configuration and system

Instrument	Brand Name	Model No.	Characteristics
WLAN AP	ASUS	GT-AXE11000	Dual Band AP
Notebook	DELL	Inspiron 15-7570	LAN



3.5.6 Test Summary of Contention Based Protocol Test

Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Injected AWGN Level (dBm)	Detection Rate (%)	Regulated Threshold level (dBm)	Adjusted Power (dBm)	Margin (dB)
UNII Band 5	6135	20	6135	-71.10	100	-62	-68.30	6.30
				Result: Stop Transmission				
				-72.10	<90	-62	-69.30	7.30
				Result: Minimal Operation				
				-73.10	=0	-62	-70.30	8.30
				Result: Normal Operation				
	6185	160	6110	-72.10	100	-62	-69.30	7.30
				Result: Stop Transmission				
				-73.10	<90	-62	-70.30	8.30
				Result: Minimal Operation				
				-74.10	=0	-62	-71.30	9.30
				Result: Normal Operation				
			6185	-67.86	100	-62	-65.06	3.06
				Result: Stop Transmission				
				-68.86	<90	-62	-66.06	4.06
				Result: Minimal Operation				
				-69.86	=0	-62	-67.06	5.06
				Result: Normal Operation				
			6260	-71.68	100	-62	-68.88	6.88
				Result: Stop Transmission				
				-72.68	<90	-62	-69.88	7.88
				Result: Minimal Operation				
				-73.68	=0	-62	-70.88	8.88
				Result: Normal Operation				

Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain (Antenna 3, gain = -2.8dBi)

Note 2: Path Loss between antenna and RF connector is negligible. (0 dB)

Note 3: Margin = Regulated Threshold level - Adjusted Power



Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Injected AWGN Level (dBm)	Detection Rate (%)	Regulated Threshold level (dBm)	Adjusted Power (dBm)	Margin (dB)
UNII Band 6	6455	20	6455	-72.34	100	-62	-69.64	7.64
					Result: Stop Transmission			
				-73.34	<90	-62	-70.64	8.64
					Result: Minimal Operation			
				-74.34	=0	-62	-71.64	9.64
					Result: Normal Operation			
	6505	160	6430	-70.98	100	-62	-68.28	6.28
					Result: Stop Transmission			
				-71.98	<90	-62	-69.28	7.28
					Result: Minimal Operation			
				-72.98	=0	-62	-70.28	8.28
					Result: Normal Operation			
			6505	-67.75	100	-62	-65.05	3.05
					Result: Stop Transmission			
				-68.75	<90	-62	-66.05	4.05
					Result: Minimal Operation			
				-69.75	=0	-62	-67.05	5.05
					Result: Normal Operation			
			6580	-71.80	100	-62	-69.10	7.10
					Result: Stop Transmission			
				-72.80	<90	-62	-70.10	8.10
					Result: Minimal Operation			
				-73.80	=0	-62	-71.10	9.10
					Result: Normal Operation			

Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain (Antenna 3, gain = -2.7dBi)

Note 2: Path Loss between antenna and RF connector is negligible. (0 dB)

Note 3: Margin = Regulated Threshold level - Adjusted Power



Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Injected AWGN Level (dBm)	Detection Rate (%)	Regulated Threshold level (dBm)	Adjusted Power (dBm)	Margin (dB)
UNII Band 7	6695	20	6695	-71.72	100	-62	-69.12	7.12
				Result: Stop Transmission				
				-72.72	<90	-62	-70.12	8.12
				Result: Minimal Operation				
				-73.72	=0	-62	-71.12	9.12
				Result: Normal Operation				
	6665	160	6590	-70.65	100	-62	-68.05	6.05
				Result: Stop Transmission				
				-71.65	<90	-62	-69.05	7.05
				Result: Minimal Operation				
				-72.65	=0	-62	-70.05	8.05
				Result: Normal Operation				
			6665	-66.93	100	-62	-64.33	2.33
				Result: Stop Transmission				
				-67.93	<90	-62	-65.33	3.33
				Result: Minimal Operation				
				-68.93	=0	-62	-66.33	4.33
				Result: Normal Operation				
			6740	-71.60	100	-62	-69.00	7.00
				Result: Stop Transmission				
				-72.60	<90	-62	-70.00	8.00
				Result: Minimal Operation				
				-73.60	=0	-62	-71.00	9.00
				Result: Normal Operation				

Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain (Antenna 3, gain = -2.6dBi)

Note 2: Path Loss between antenna and RF connector is negligible. (0 dB)

Note 3: Margin = Regulated Threshold level - Adjusted Power



Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Injected AWGN Level (dBm)	Detection Rate (%)	Regulated Threshold level (dBm)	Adjusted Power (dBm)	Margin (dB)
UNII Band 8	7015	20	7015	-69.64	100	-62	-66.74	4.74
					Result: Stop Transmission			
				-70.64	<90	-62	-67.74	5.74
					Result: Minimal Operation			
				-71.64	=0	-62	-68.74	6.74
					Result: Normal Operation			
	6985	160	6910	-68.99	100	-62	-66.09	4.09
					Result: Stop Transmission			
				-69.99	<90	-62	-67.09	5.09
					Result: Minimal Operation			
				-70.99	=0	-62	-68.09	6.09
					Result: Normal Operation			
			6985	-65.55	100	-62	-62.65	0.65
					Result: Stop Transmission			
				-66.55	<90	-62	-63.65	1.65
					Result: Minimal Operation			
				-67.55	=0	-62	-64.65	2.65
					Result: Normal Operation			
			7060	-68.25	100	-62	-65.35	3.35
					Result: Stop Transmission			
				-69.25	<90	-62	-66.35	4.35
					Result: Minimal Operation			
				-70.25	=0	-62	-67.35	5.35
					Result: Normal Operation			

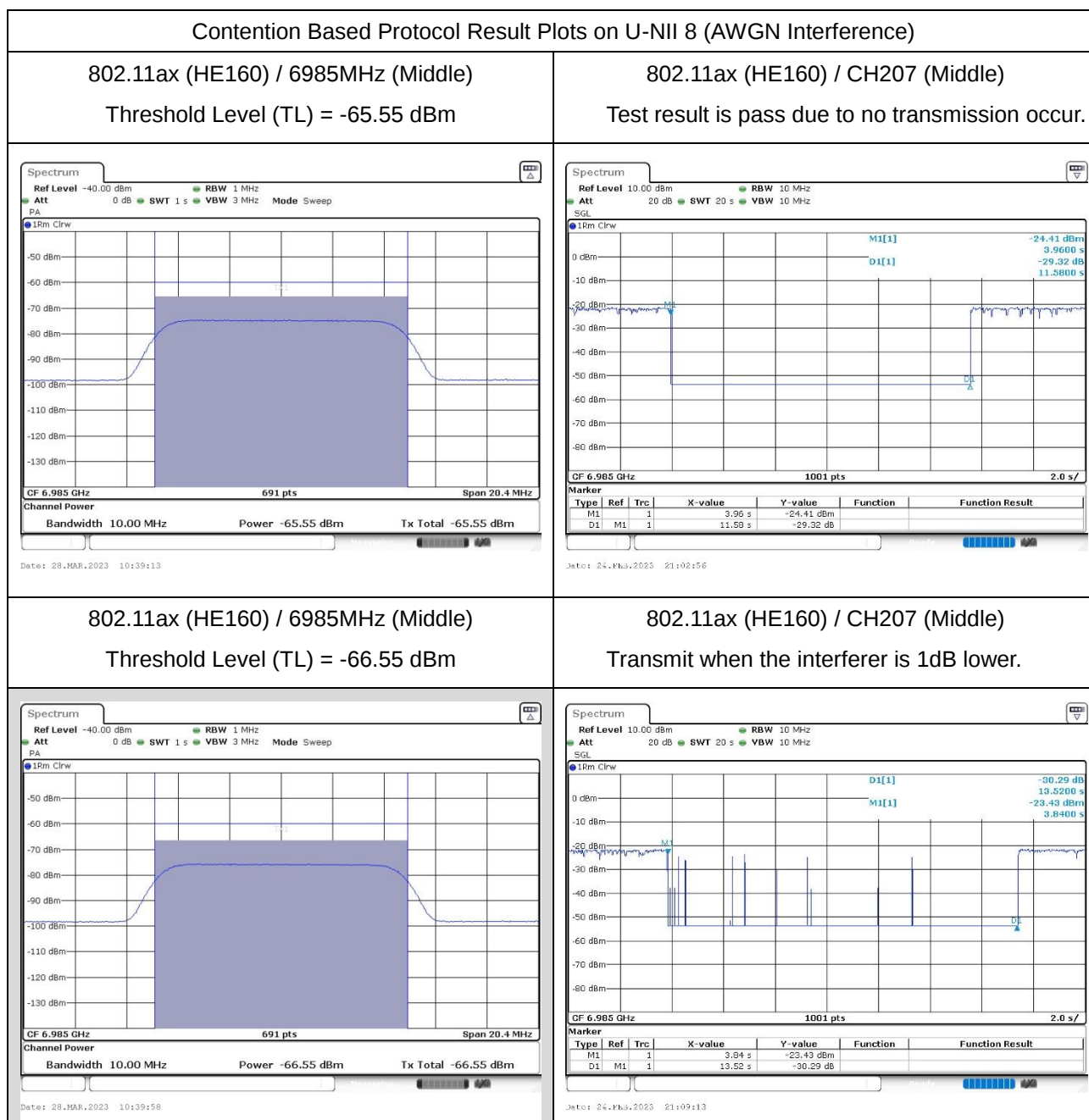
Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain (Antenna 3, gain = -2.9dBi)

Note 2: Path Loss between antenna and RF connector is negligible. (0 dB)

Note 3: Margin = Regulated Threshold level - Adjusted Power



3.5.7 Worst Case Plots of Contention Based Protocol



Remark: M1: Injection of AWGN signal, D1: Removal of AWGN signal

3.6 Unwanted Emissions Measurement

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

3.6.1 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)	68.3
- 7 (Peak)	88.3

According 987594 D02 U-NII 6GHz EMC Measurement v01r01 section G:

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.

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

3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

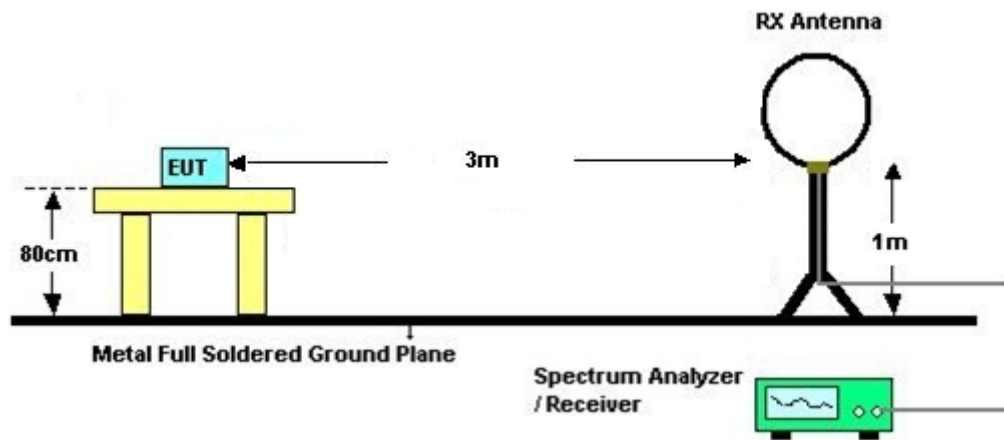


3.6.3 Test Procedures

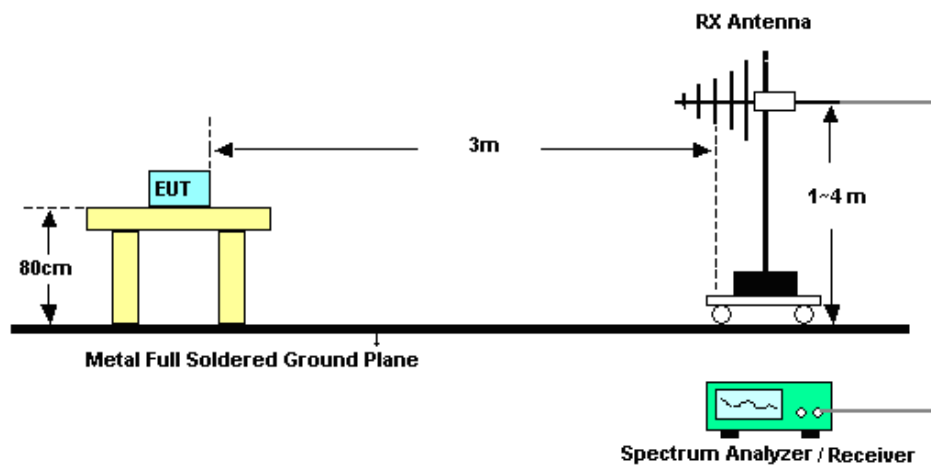
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 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 $\geq$ 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.

3.6.4 Test Setup

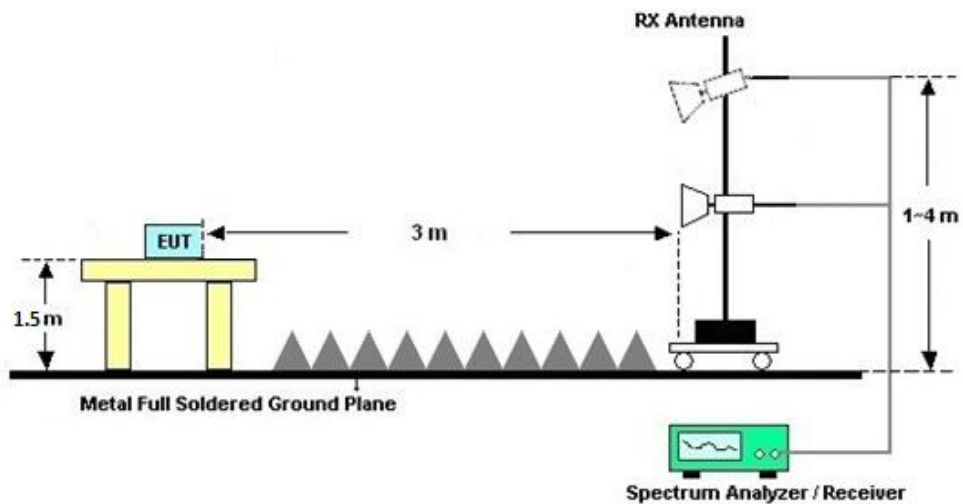
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



**3.6.5 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.

3.6.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C

3.6.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix C.

3.7 AC Conducted Emission Measurement

3.7.1 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.

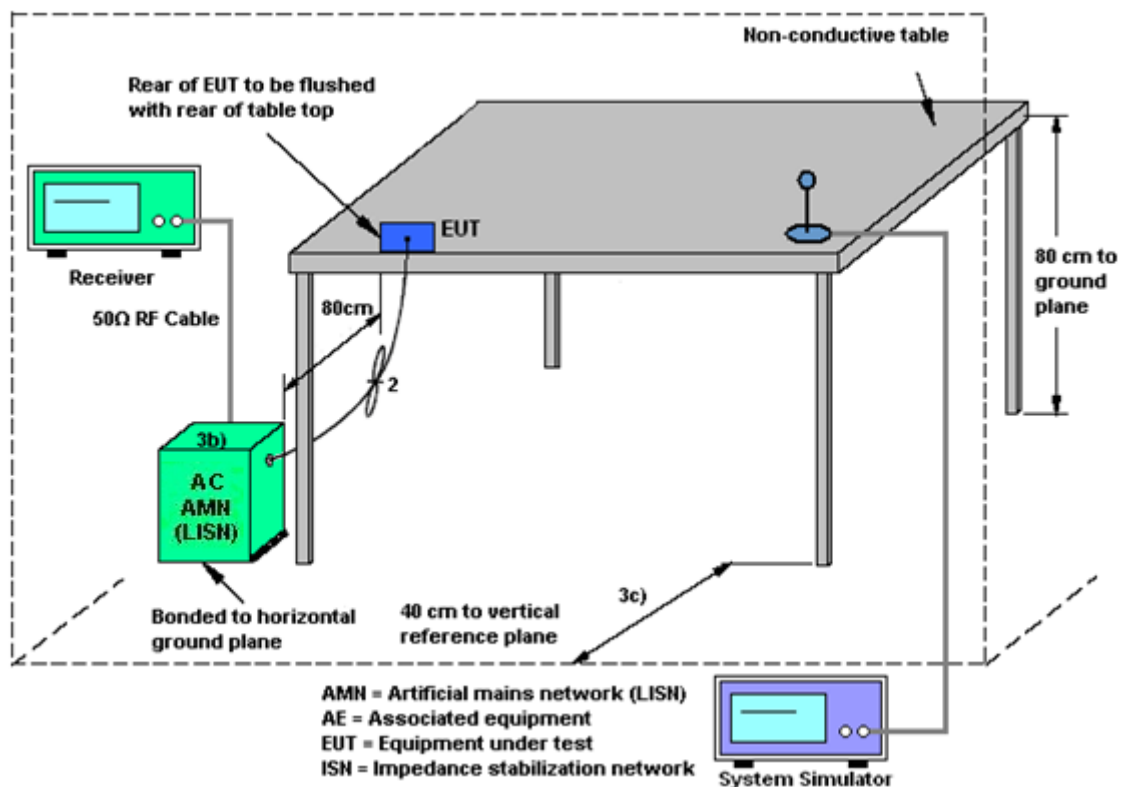
3.7.2 Measuring Instruments

See list of measuring equipment of this test report.

3.7.3 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.

3.7.4 Test Setup



3.7.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.8 Antenna Requirements

3.8.1 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.

3.8.2 Antenna Anti-Replacement Construction

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

3.8.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

For power, the directional gain G_{ANT} is set equal to the antenna having the highest gain, i.e.,

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

For PSD, the directional gain calculation is following,

Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_n/20})^2 / N_{ANT}]$ 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 $N_{SS} = 1$)

For completely uncorrelated transmissions, directional gain is calculated as,

Directional gain = $G_{ANT\ MAX}(Ant.1\ Gain, Ant.2\ Gain, \dots)$, as following table

<CDD Modes>				
			DG for Power	DG for PSD
	Ant. 1 (dBi)	Ant. 2 (dBi)	(dBi)	(dBi)
U-NII-5	-2.80	-2.80	-2.80	0.21
U-NII-6	-2.70	-2.70	-2.70	0.31
U-NII-7	-2.60	-2.60	-2.60	0.41
U-NII-8	-2.90	-2.90	-2.90	0.11



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	101078	10Hz~40GHz	Apr. 07, 2022	Mar. 16, 2023~ Apr. 26, 2023	Apr. 06, 2023	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 06, 2023		Apr. 05, 2024	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 27, 2022	Mar. 16, 2023~ Apr. 26, 2023	Dec. 26, 2023	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1542004	50MHz Bandwidth	Dec. 27, 2022	Mar. 16, 2023~ Apr. 26, 2023	Dec. 26, 2023	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 05, 2022	Mar. 25, 2023~ Apr. 02, 2023	Apr. 04, 2023	Radiation (03CH03-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 05, 2022	Mar. 25, 2023~ Apr. 02, 2023	Apr. 04, 2023	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jul. 28, 2022	Mar. 25, 2023~ Apr. 02, 2023	Jul. 27, 2024	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz~2GHz	Aug. 09, 2021	Mar. 25, 2023~ Apr. 02, 2023	Aug. 08, 2023	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Apr. 09, 2022	Mar. 25, 2023~ Apr. 02, 2023	Apr. 08, 2023	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 06, 2022	Mar. 25, 2023~ Apr. 02, 2023	Jul. 05, 2023	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz~40GHz	Apr. 09, 2022	Mar. 25, 2023~ Apr. 02, 2023	Apr. 08, 2023	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz~3000MHz	Oct. 19, 2022	Mar. 25, 2023~ Apr. 02, 2023	Oct. 18, 2023	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 19, 2022	Mar. 25, 2023~ Apr. 02, 2023	Oct. 18, 2023	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5G Hz	Dec. 26, 2022	Mar. 25, 2023~ Apr. 02, 2023	Dec. 25, 2023	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010002729	1 N/A	Nov. 10, 2022	Mar. 25, 2023~ Apr. 02, 2023	Nov. 09, 2023	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Mar. 25, 2023~ Apr. 02, 2023	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Mar. 25, 2023~ Apr. 02, 2023	NCR	Radiation (03CH03-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 07, 2022	Feb. 06, 2023	Jul. 06, 2023	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Sep. 15, 2022	Feb. 06, 2023	Sep. 14, 2023	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 17, 2022	Feb. 06, 2023	Oct. 16, 2023	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 07, 2022	Feb. 06, 2023	Jul. 06, 2023	Conduction (CO01-SZ)
Signal Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 07, 2022	Feb. 24, 2023~ Mar. 28, 2023	Apr. 06, 2023	CBP (DFS01-SZ)
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200424	9kHz~6GHz	Apr. 05, 2022	Feb. 24, 2023~ Mar. 28, 2023	Apr. 04, 2023	CBP (DFS01-SZ)
Combiner	TOJOIN	PS-2AM-0460	SZE14011007	0.4~6GHz	Sep. 04, 2022	Feb. 24, 2023~ Mar. 28, 2023	Sep. 03, 2023	CBP (DFS01-SZ)

NCR: No Calibration Required



5 Uncertainty of Evaluation

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	±1.34 dB
Conducted Emissions	±1.34 dB
Occupied Channel Bandwidth	0.012MHz
Conducted Power Spectral Density	±1.32 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.7dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.9dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB
---	-------

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



Appendix A. Conducted Test Results

A1. Conducted Test Results

Test Engineer:	Zhang Xue Yi	Temperature:	21~25	°C
Test Date:	2023/3/16~2023/4/26	Relative Humidity:	51~54	%

TEST RESULTS DATA
EIRP Power Table

U-NII-5 MIMO													
Mod.	Data Rate	NTX	Freq. (MHz)	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
				Ant 3	Ant 10	Ant 3	Ant 10	SUM	Ant 3	Ant 10	SUM		
11a	6Mbps	2	5955	0.04	0.04	4.16	6.25	8.34	-2.80		5.54	24.00	Pass
11a	6Mbps	2	6175	0.04	0.04	6.27	5.83	9.07	-2.80		6.27	24.00	Pass
11a	6Mbps	2	6415	0.04	0.04	6.31	4.84	8.65	-2.80		5.85	24.00	Pass

TEST RESULTS DATA
EIRP Power Table

U-NII-6 MIMO													
Mod.	Data Rate	NTX	Freq. (MHz)	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
				Ant 3	Ant 10	Ant 3	Ant 10	SUM	Ant 3	Ant 10	SUM		
11a	6Mbps	2	6435	0.04	0.04	6.10	4.93	8.57	-2.70		5.87	24.00	Pass
11a	6Mbps	2	6475	0.04	0.04	6.17	4.53	8.44	-2.70		5.74	24.00	Pass
11a	6Mbps	2	6515	0.04	0.04	5.02	5.31	8.18	-2.70		5.48	24.00	Pass

TEST RESULTS DATA
EIRP Power Table

U-NII-7 MIMO													
Mod.	Data Rate	NTX	Freq. (MHz)	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
				Ant 3	Ant 10	Ant 3	Ant 10	SUM	Ant 3	Ant 10	SUM		
11a	6Mbps	2	6535	0.04	0.04	4.70	4.85	7.79	-2.60		5.19	24.00	Pass
11a	6Mbps	2	6695	0.04	0.04	5.09	4.30	7.73	-2.60		5.13	24.00	Pass
11a	6Mbps	2	6855	0.04	0.04	4.59	5.52	8.09	-2.60		5.49	24.00	Pass

TEST RESULTS DATA
EIRP Power Table

U-NII-8 MIMO													
Mod.	Data Rate	NTX	Freq. (MHz)	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
				Ant 3	Ant 10	Ant 3	Ant 10	SUM	Ant 3	Ant 10	SUM		
11a	6Mbps	2	6875	0.04	0.04	5.06	5.97	8.55	-2.90		5.65	24.00	Pass
11a	6Mbps	2	6895	0.04	0.04	5.20	6.49	8.91	-2.90		6.01	24.00	Pass
11a	6Mbps	2	6995	0.04	0.04	4.56	6.98	8.95	-2.90		6.05	24.00	Pass
11a	6Mbps	2	7095	0.04	0.04	7.36	8.41	10.93	-2.90		8.03	24.00	Pass
11a	6Mbps	2	7115	0.04	0.04	7.38	7.29	10.35	-2.90		7.45	24.00	Pass

TEST RESULTS DATA
EIRP Power Table

U-NII-5 MIMO														
Mod.	Data Rate	NTX	Freq. (MHz)	RU Config.	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant 3	Ant 10	Ant 3	Ant 10	SUM	Ant 3	Ant 10	SUM		
HE20	MCS0	2	5955	Full	0.02	0.01	4.58	6.50	8.65	-2.80		5.85	24.00	Pass
HE20	MCS0	2	5955	26/0	0.02	0.01	-3.25	-2.46	0.17	-2.80		-2.63	24.00	Pass
HE20	MCS0	2	5955	52/37	0.02	0.01	-1.27	0.76	2.87	-2.80		0.07	24.00	Pass
HE20	MCS0	2	5955	106/53	0.02	0.01	0.96	3.89	5.68	-2.80		2.88	24.00	Pass
HE20	MCS0	2	6175	Full	0.02	0.01	6.76	6.24	9.52	-2.80		6.72	24.00	Pass
HE20	MCS0	2	6415	Full	0.02	0.01	6.79	5.29	9.11	-2.80		6.31	24.00	Pass
HE20	MCS0	2	6415	26/8	0.02	0.01	-2.49	-3.25	0.15	-2.80		-2.65	24.00	Pass
HE20	MCS0	2	6415	52/40	0.02	0.01	0.76	-0.36	3.24	-2.80		0.44	24.00	Pass
HE20	MCS0	2	6415	106/54	0.02	0.01	3.77	1.99	5.98	-2.80		3.18	24.00	Pass
HE40	MCS0	2	5965	Full	0.02	0.01	7.63	9.58	11.72	-2.80		8.92	24.00	Pass
HE40	MCS0	2	6165	Full	0.02	0.01	9.58	9.25	12.43	-2.80		9.63	24.00	Pass
HE40	MCS0	2	6405	Full	0.02	0.01	9.75	7.89	11.93	-2.80		9.13	24.00	Pass
HE80	MCS0	2	5985	Full	0.02	0.03	11.01	13.12	15.20	-2.80		12.40	24.00	Pass
HE80	MCS0	2	6145	Full	0.02	0.03	11.58	11.89	14.75	-2.80		11.95	24.00	Pass
HE80	MCS0	2	6385	Full	0.02	0.03	11.49	12.59	15.09	-2.80		12.29	24.00	Pass
HE160	MCS0	2	6025	Full	0.04	0.04	11.01	10.99	14.01	-2.80		11.21	24.00	Pass
HE160	MCS0	2	6185	Full	0.04	0.04	13.35	13.27	16.32	-2.80		13.52	24.00	Pass
HE160	MCS0	2	6345	Full	0.04	0.04	11.58	13.12	15.43	-2.80		12.63	24.00	Pass

TEST RESULTS DATA
EIRP Power Table

U-NII-6 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
						Ant 3	Ant 10	Ant 3	Ant 10	SUM	Ant 3	Ant 10	SUM		
HE20	MCS0	2	097	6435	Full	0.02	0.01	6.93	5.96	9.48	-2.70		6.78	24.00	Pass
HE20	MCS0	2	097	6435	26/0	0.02	0.01	-1.26	-4.22	0.51	-2.70		-2.19	24.00	Pass
HE20	MCS0	2	097	6435	52/37	0.02	0.01	1.75	-1.70	3.37	-2.70		0.67	24.00	Pass
HE20	MCS0	2	097	6435	106/53	0.02	0.01	3.71	1.58	5.78	-2.70		3.08	24.00	Pass
HE20	MCS0	2	105	6475	Full	0.02	0.01	6.38	5.08	8.79	-2.70		6.09	24.00	Pass
HE20	MCS0	2	113	6515	Full	0.02	0.01	5.83	5.99	8.92	-2.70		6.22	24.00	Pass
HE20	MCS0	2	113	6515	26/8	0.02	0.01	-2.17	-3.03	0.43	-2.70		-2.27	24.00	Pass
HE20	MCS0	2	113	6515	52/40	0.02	0.01	0.99	-0.01	3.53	-2.70		0.83	24.00	Pass
HE20	MCS0	2	113	6515	106/54	0.02	0.01	4.69	2.59	6.77	-2.70		4.07	24.00	Pass
HE40	MCS0	2	099	6445	Full	0.02	0.01	9.73	7.98	11.95	-2.70		9.25	24.00	Pass
HE40	MCS0	2	107	6485	Full	0.02	0.01	9.23	7.87	11.61	-2.70		8.91	24.00	Pass
HE40	MCS0	2	115	6525	Full	0.02	0.01	8.72	8.54	11.64	-2.70		8.94	24.00	Pass
HE80	MCS0	2	103	6465	Full	0.02	0.03	12.18	10.60	14.47	-2.70		11.77	24.00	Pass
HE80	MCS0	2	119	6545	Full	0.02	0.03	11.55	10.42	14.03	-2.70		11.33	24.00	Pass
HE160	MCS0	2	111	6505	Full	0.04	0.04	11.70	12.20	14.97	-2.70		12.27	24.00	Pass

TEST RESULTS DATA
EIRP Power Table

U-NII-7 MIMO														
Mod.	Data Rate	NTX	Freq. (MHz)	RU Config.	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant 3	Ant 10	Ant 3	Ant 10	SUM	Ant 3	Ant 10	SUM		
HE20	MCS0	2	6535	Full	0.02	0.01	5.19	5.26	8.23	-2.60		5.63	24.00	Pass
HE20	MCS0	2	6535	26/0	0.02	0.01	-2.20	-3.47	0.22	-2.60		-2.38	24.00	Pass
HE20	MCS0	2	6535	52/37	0.02	0.01	0.94	-0.47	3.30	-2.60		0.70	24.00	Pass
HE20	MCS0	2	6535	106/53	0.02	0.01	3.20	2.91	6.06	-2.60		3.46	24.00	Pass
HE20	MCS0	2	6695	Full	0.02	0.01	5.54	4.81	8.20	-2.60		5.60	24.00	Pass
HE20	MCS0	2	6855	Full	0.02	0.01	5.16	6.07	8.65	-2.60		6.05	24.00	Pass
HE20	MCS0	2	6855	26/8	0.02	0.01	-4.03	-1.56	0.39	-2.60		-2.21	24.00	Pass
HE20	MCS0	2	6855	52/40	0.02	0.01	-1.68	1.18	2.99	-2.60		0.39	24.00	Pass
HE20	MCS0	2	6855	106/54	0.02	0.01	1.52	3.01	5.34	-2.60		2.74	24.00	Pass
HE40	MCS0	2	6565	Full	0.02	0.01	8.00	8.69	11.37	-2.60		8.77	24.00	Pass
HE40	MCS0	2	6685	Full	0.02	0.01	8.61	7.97	11.31	-2.60		8.71	24.00	Pass
HE40	MCS0	2	6845	Full	0.02	0.01	8.47	9.01	11.76	-2.60		9.16	24.00	Pass
HE80	MCS0	2	6625	Full	0.02	0.03	11.94	11.24	14.61	-2.60		12.01	24.00	Pass
HE80	MCS0	2	6705	Full	0.02	0.03	11.49	10.84	14.19	-2.60		11.59	24.00	Pass
HE80	MCS0	2	6785	Full	0.02	0.03	11.12	11.35	14.25	-2.60		11.65	24.00	Pass
HE80	MCS0	2	6865	Full	0.02	0.03	10.79	12.28	14.61	-2.60		12.01	24.00	Pass
HE160	MCS0	2	6665	Full	0.04	0.04	12.50	12.00	15.27	-2.60		12.67	24.00	Pass
HE160	MCS0	2	6825	Full	0.04	0.04	11.66	12.80	15.28	-2.60		12.68	24.00	Pass

TEST RESULTS DATA
EIRP Power Table

U-NII-8 MIMO														
Mod.	Data Rate	NTX	Freq. (MHz)	RU Config.	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant 3	Ant 10	Ant 3	Ant 10	SUM	Ant 3	Ant 10	SUM		
HE20	MCS0	2	6875	Full	0.02	0.01	5.98	6.81	9.42	-2.90		6.52	24.00	Pass
HE20	MCS0	2	6875	26/0	0.02	0.01	-2.32	-2.92	0.40	-2.90		-2.50	24.00	Pass
HE20	MCS0	2	6875	52/37	0.02	0.01	0.09	0.09	3.10	-2.90		0.20	24.00	Pass
HE20	MCS0	2	6875	106/53	0.02	0.01	1.98	3.50	5.81	-2.90		2.91	24.00	Pass
HE20	MCS0	2	6895	Full	0.02	0.01	6.46	7.42	9.97	-2.90		7.07	24.00	Pass
HE20	MCS0	2	6895	26/0	0.02	0.01	-1.74	-2.09	1.10	-2.90		-1.80	24.00	Pass
HE20	MCS0	2	6895	52/37	0.02	0.01	0.76	0.77	3.77	-2.90		0.87	24.00	Pass
HE20	MCS0	2	6895	106/53	0.02	0.01	2.74	4.13	6.50	-2.90		3.60	24.00	Pass
HE20	MCS0	2	6995	Full	0.02	0.01	5.41	7.83	9.79	-2.90		6.89	24.00	Pass
HE20	MCS0	2	7095	Full	0.02	0.01	7.72	8.59	11.18	-2.90		8.28	24.00	Pass
HE20	MCS0	2	7095	26/8	0.02	0.01	-2.38	0.48	2.29	-2.90		-0.61	24.00	Pass
HE20	MCS0	2	7095	52/40	0.02	0.01	0.83	3.73	5.53	-2.90		2.63	24.00	Pass
HE20	MCS0	2	7095	106/54	0.02	0.01	3.57	6.36	8.19	-2.90		5.29	24.00	Pass
HE20	MCS0	2	7115	Full	0.02	0.01	-7.18	-5.96	-3.52	-2.90		-6.42	24.00	Pass
HE20	MCS0	2	7115	26/8	0.02	0.01	-15.01	-12.37	-10.48	-2.90		-13.38	24.00	Pass
HE20	MCS0	2	7115	52/40	0.02	0.01	-12.25	-9.90	-7.91	-2.90		-10.81	24.00	Pass
HE20	MCS0	2	7115	106/54	0.02	0.01	-9.55	-8.27	-5.86	-2.90		-8.76	24.00	Pass
HE40	MCS0	2	6885	Full	0.02	0.01	9.43	9.29	12.37	-2.90		9.47	24.00	Pass
HE40	MCS0	2	6925	Full	0.02	0.01	9.28	8.61	11.97	-2.90		9.07	24.00	Pass
HE40	MCS0	2	6965	Full	0.02	0.01	8.67	8.93	11.81	-2.90		8.91	24.00	Pass
HE40	MCS0	2	7085	Full	0.02	0.01	8.82	10.02	12.47	-2.90		9.57	24.00	Pass
HE80	MCS0	2	6945	Full	0.02	0.03	11.08	13.00	15.16	-2.90		12.26	24.00	Pass
HE80	MCS0	2	7025	Full	0.02	0.03	7.83	9.43	11.71	-2.90		8.81	24.00	Pass
HE160	MCS0	2	6985	Full	0.04	0.04	5.91	8.26	10.25	-2.90		7.35	24.00	Pass



26dB Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	26dB EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A-CDD	Ant3	5955	18.44	5945.72	5964.16	320	PASS
	Ant10	5955	18.84	5945.56	5964.40	320	PASS
	Ant3	6175	19.72	6164.76	6184.48	320	PASS
	Ant10	6175	18.92	6165.56	6184.48	320	PASS
	Ant3	6415	18.44	6405.72	6424.16	320	PASS
	Ant10	6415	18.76	6405.72	6424.48	320	PASS
	Ant3	6435	18.52	6425.80	6444.32	320	PASS
	Ant10	6435	18.68	6425.84	6444.52	320	PASS
	Ant3	6475	18.56	6465.72	6484.28	320	PASS
	Ant10	6475	18.64	6465.60	6484.24	320	PASS
	Ant3	6515	18.40	6505.80	6524.20	320	PASS
	Ant10	6515	19.16	6505.12	6524.28	320	PASS
	Ant3	6535	18.40	6525.76	6544.16	320	PASS
	Ant10	6535	18.84	6525.56	6544.40	320	PASS
	Ant3	6695	18.32	6685.80	6704.12	320	PASS
	Ant10	6695	18.72	6685.72	6704.44	320	PASS
	Ant3	6855	18.32	6845.68	6864.00	320	PASS
	Ant10	6855	18.72	6845.72	6864.44	320	PASS
	Ant3	6875	18.48	6865.72	6884.20	320	PASS
	Ant10	6875	18.72	6865.76	6884.48	320	PASS
	Ant3	6895	18.60	6885.68	6904.28	320	PASS
	Ant10	6895	18.80	6885.72	6904.52	320	PASS
	Ant3	6995	18.32	6985.76	7004.08	320	PASS
	Ant10	6995	18.80	6985.60	7004.40	320	PASS
	Ant3	7095	18.64	7085.60	7104.24	320	PASS
	Ant10	7095	19.00	7085.36	7104.36	320	PASS
	Ant3	7115	18.56	7105.76	7124.32	320	PASS
	Ant10	7115	18.76	7105.64	7124.40	320	PASS
11AX20MIMO	Ant3	5955	20.80	5944.48	5965.28	320	PASS
	Ant10	5955	20.80	5944.64	5965.44	320	PASS
	Ant3	6175	20.88	6164.52	6185.40	320	PASS
	Ant10	6175	21.20	6164.48	6185.68	320	PASS
	Ant3	6415	20.52	6404.60	6425.12	320	PASS
	Ant10	6415	20.96	6404.52	6425.48	320	PASS
	Ant3	6435	20.84	6424.60	6445.44	320	PASS
	Ant10	6435	20.72	6424.80	6445.52	320	PASS
	Ant3	6475	20.72	6464.60	6485.32	320	PASS
	Ant10	6475	20.76	6464.56	6485.32	320	PASS
	Ant3	6515	20.84	6504.52	6525.36	320	PASS
	Ant10	6515	20.76	6504.52	6525.28	320	PASS
	Ant3	6535	20.88	6524.48	6545.36	320	PASS



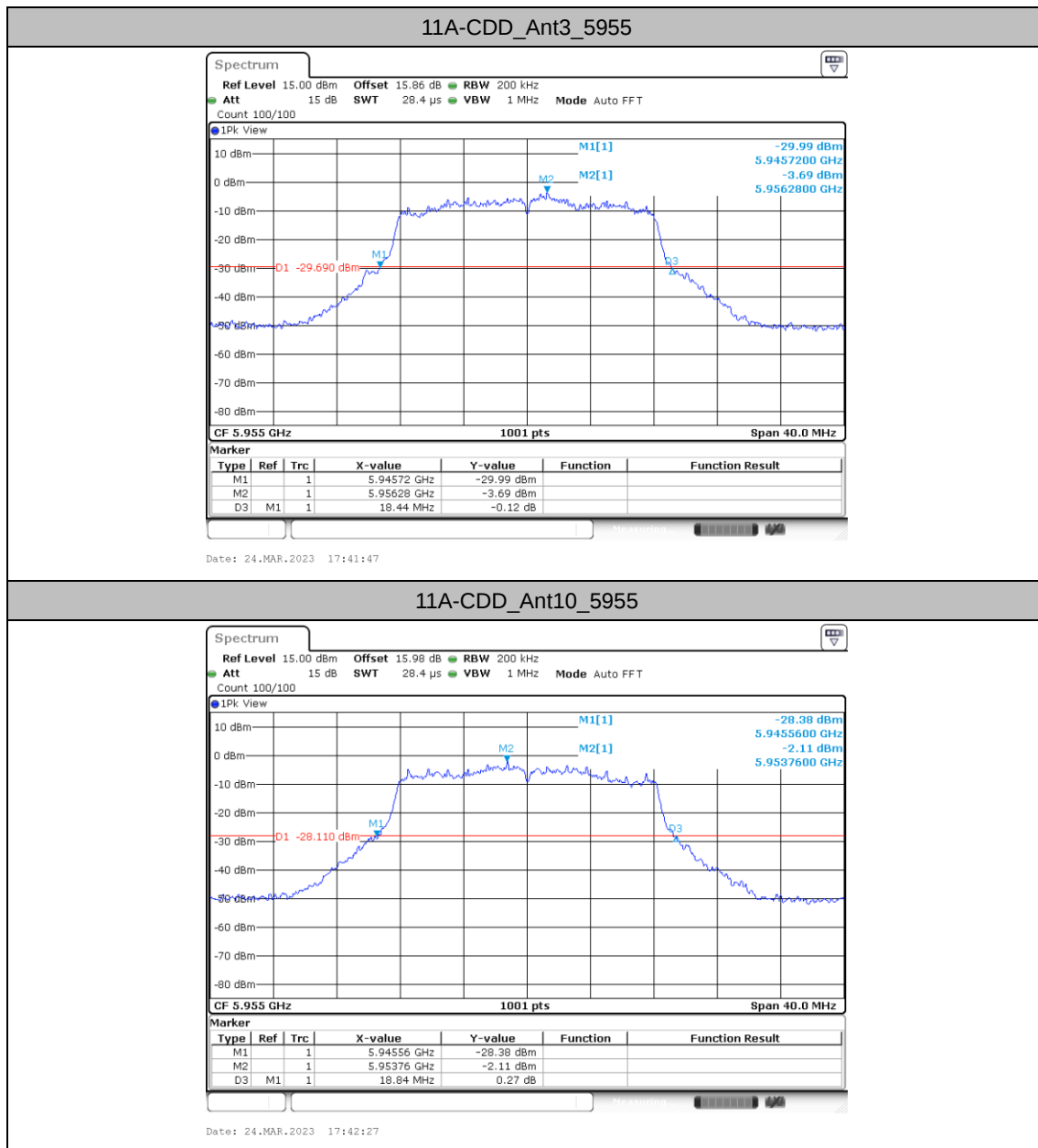
	Ant10	6535	20.84	6524.44	6545.28	320	PASS
	Ant3	6695	20.64	6684.60	6705.24	320	PASS
	Ant10	6695	21.00	6684.52	6705.52	320	PASS
	Ant3	6855	20.60	6844.64	6865.24	320	PASS
	Ant10	6855	20.64	6844.72	6865.36	320	PASS
	Ant3	6875	20.60	6864.56	6885.16	320	PASS
	Ant10	6875	20.52	6864.84	6885.36	320	PASS
	Ant3	6895	20.60	6884.76	6905.36	320	PASS
	Ant10	6895	20.40	6884.84	6905.24	320	PASS
	Ant3	6995	20.24	6984.80	7005.04	320	PASS
	Ant10	6995	20.52	6984.72	7005.24	320	PASS
	Ant3	7095	20.40	7084.80	7105.20	320	PASS
	Ant10	7095	20.76	7084.52	7105.28	320	PASS
	Ant3	7115	20.44	7104.72	7125.16	320	PASS
	Ant10	7115	20.68	7104.68	7125.36	320	PASS
11AX40MIMO	Ant3	5965	40.08	5944.92	5985.00	320	PASS
	Ant10	5965	40.64	5944.60	5985.24	320	PASS
	Ant3	6165	40.32	6144.84	6185.16	320	PASS
	Ant10	6165	40.24	6145.08	6185.32	320	PASS
	Ant3	6405	40.16	6384.84	6425.00	320	PASS
	Ant10	6405	40.56	6384.60	6425.16	320	PASS
	Ant3	6445	40.32	6424.76	6465.08	320	PASS
	Ant10	6445	40.00	6425.16	6465.16	320	PASS
	Ant3	6485	40.32	6464.84	6505.16	320	PASS
	Ant10	6485	40.24	6464.84	6505.08	320	PASS
	Ant3	6525	40.24	6504.84	6545.08	320	PASS
	Ant10	6525	40.56	6504.68	6545.24	320	PASS
	Ant3	6565	40.40	6544.76	6585.16	320	PASS
	Ant10	6565	40.40	6544.84	6585.24	320	PASS
	Ant3	6685	40.48	6664.68	6705.16	320	PASS
	Ant10	6685	40.24	6664.84	6705.08	320	PASS
	Ant3	6845	40.40	6824.52	6864.92	320	PASS
	Ant10	6845	39.76	6825.08	6864.84	320	PASS
	Ant3	6885	40.24	6864.92	6905.16	320	PASS
	Ant10	6885	40.08	6865.16	6905.24	320	PASS
	Ant3	6925	40.32	6904.84	6945.16	320	PASS
	Ant10	6925	40.16	6904.92	6945.08	320	PASS
	Ant3	6965	40.16	6944.84	6985.00	320	PASS
	Ant10	6965	40.40	6944.68	6985.08	320	PASS
	Ant3	7085	40.48	7064.60	7105.08	320	PASS
	Ant10	7085	40.48	7064.68	7105.16	320	PASS
11AX80MIMO	Ant3	5985	81.60	5943.56	6025.16	320	PASS
	Ant10	5985	82.24	5944.20	6026.44	320	PASS
	Ant3	6145	81.92	6104.04	6185.96	320	PASS
	Ant10	6145	80.96	6105.00	6185.96	320	PASS
	Ant3	6385	81.28	6343.88	6425.16	320	PASS
	Ant10	6385	81.76	6343.56	6425.32	320	PASS

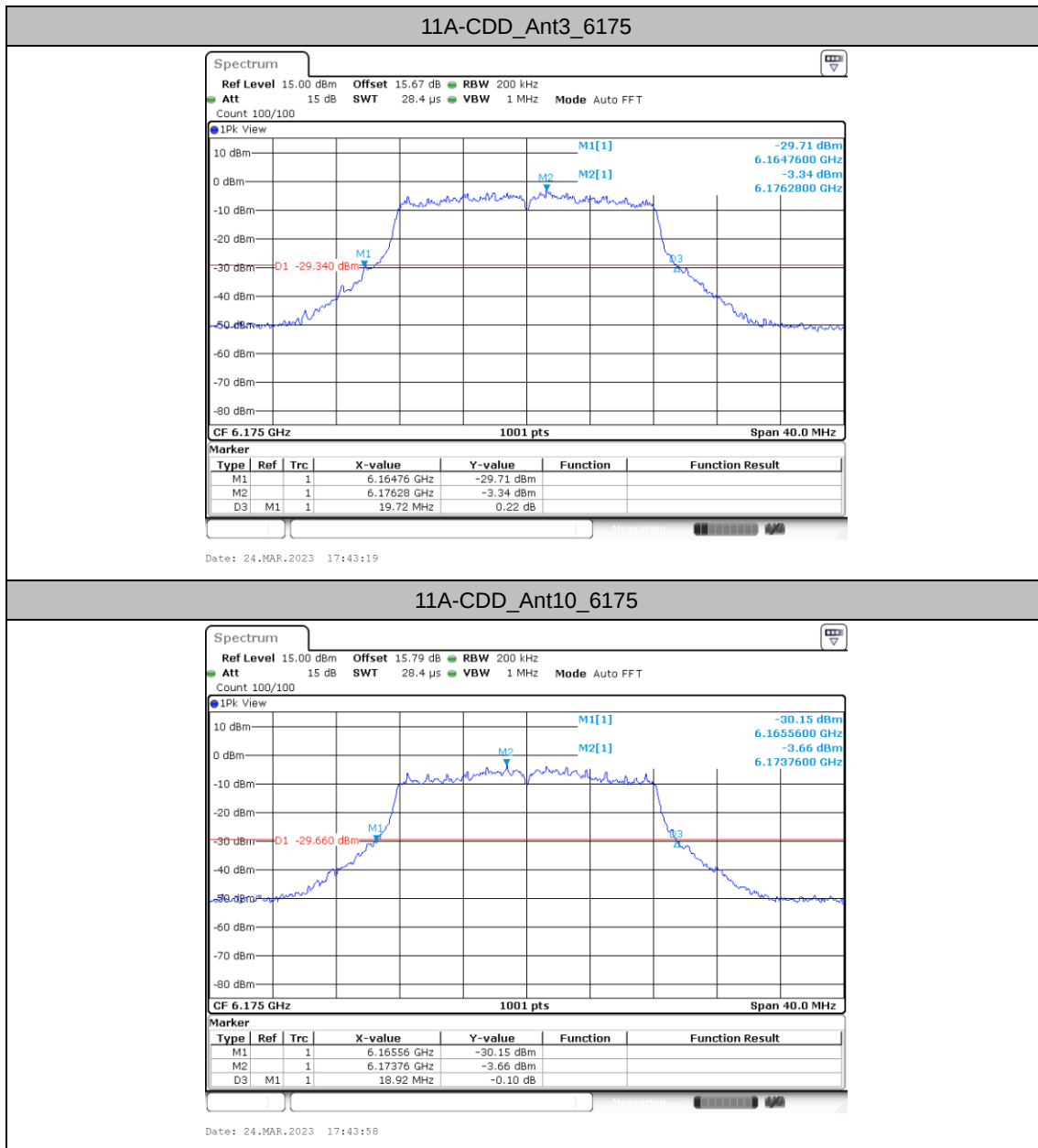


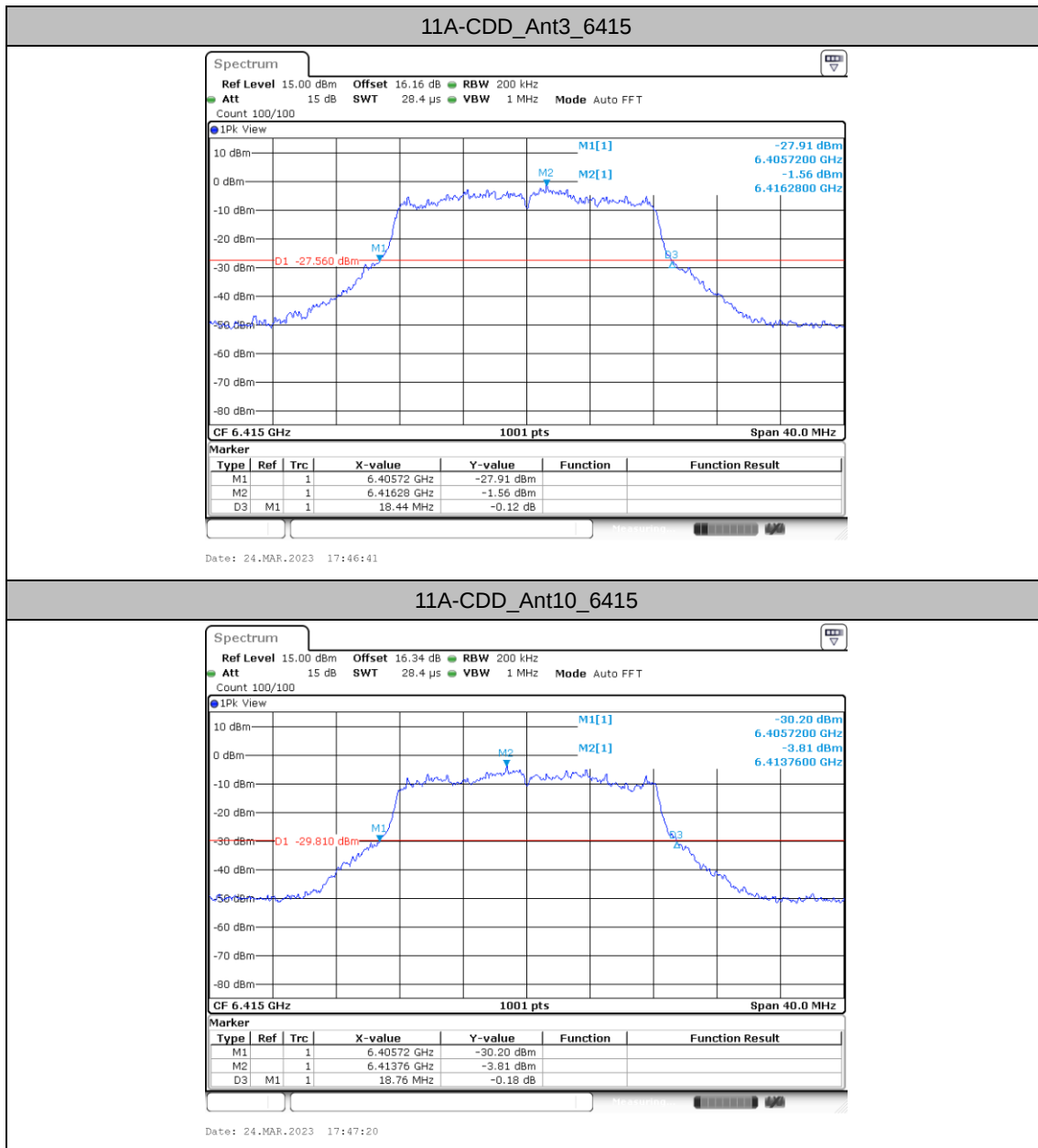
	Ant3	6465	80.48	6424.68	6505.16	320	PASS
	Ant10	6465	80.48	6425.00	6505.48	320	PASS
	Ant3	6545	81.60	6504.20	6585.80	320	PASS
	Ant10	6545	82.72	6503.72	6586.44	320	PASS
	Ant3	6625	82.40	6583.88	6666.28	320	PASS
	Ant10	6625	80.32	6584.84	6665.16	320	PASS
	Ant3	6705	81.44	6663.88	6745.32	320	PASS
	Ant10	6705	82.24	6663.72	6745.96	320	PASS
	Ant3	6785	80.96	6744.20	6825.16	320	PASS
	Ant10	6785	81.28	6743.88	6825.16	320	PASS
	Ant3	6865	81.12	6824.36	6905.48	320	PASS
	Ant10	6865	81.76	6824.20	6905.96	320	PASS
	Ant3	6945	80.48	6904.68	6985.16	320	PASS
	Ant10	6945	81.92	6903.72	6985.64	320	PASS
	Ant3	7025	81.60	6983.72	7065.32	320	PASS
	Ant10	7025	80.48	6984.84	7065.32	320	PASS
11AX160MIMO	Ant3	6025	164.48	5943.08	6107.56	320	PASS
	Ant10	6025	162.56	5943.72	6106.28	320	PASS
	Ant3	6185	163.84	6103.08	6266.92	320	PASS
	Ant10	6185	163.20	6103.72	6266.92	320	PASS
	Ant3	6345	165.12	6262.76	6427.88	320	PASS
	Ant10	6345	161.60	6264.36	6425.96	320	PASS
	Ant3	6505	163.20	6423.72	6586.92	320	PASS
	Ant10	6505	164.16	6422.76	6586.92	320	PASS
	Ant3	6665	163.20	6583.40	6746.60	320	PASS
	Ant10	6665	168.00	6582.44	6750.44	320	PASS
	Ant3	6825	164.48	6742.76	6907.24	320	PASS
	Ant10	6825	165.76	6742.44	6908.20	320	PASS
	Ant3	6985	164.48	6901.48	7065.96	320	PASS
	Ant10	6985	164.80	6902.12	7066.92	320	PASS

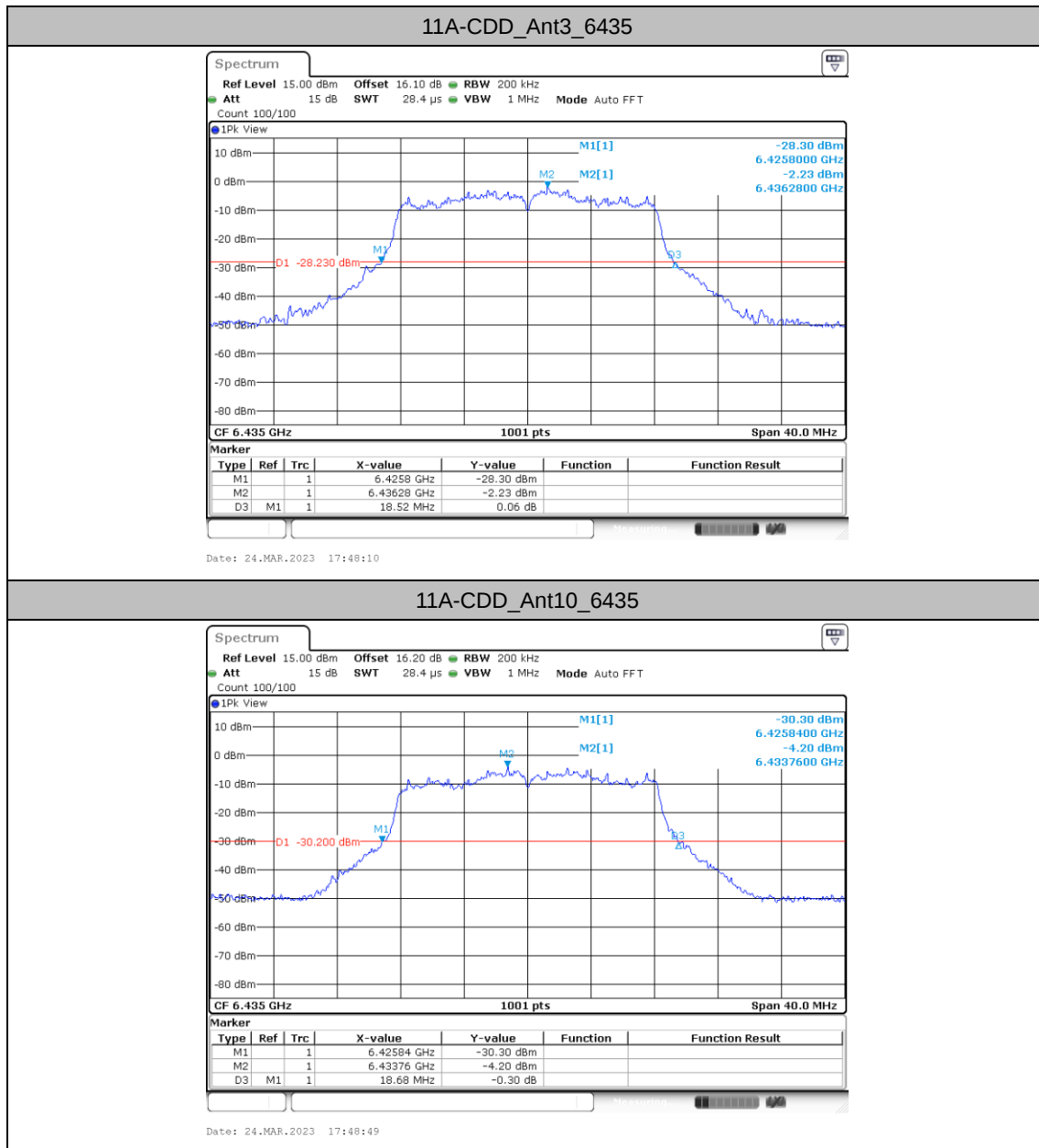


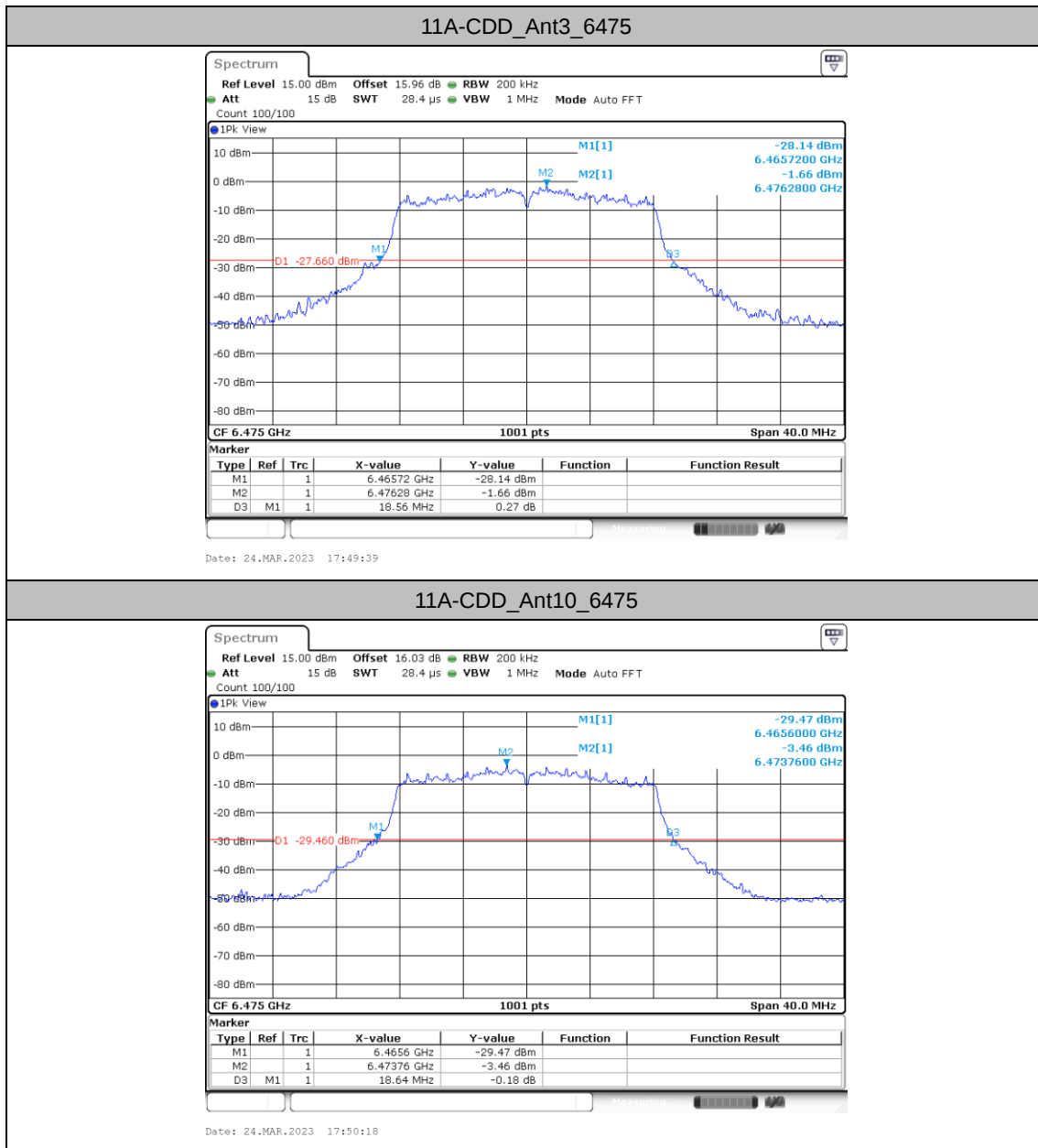
Test Graphs

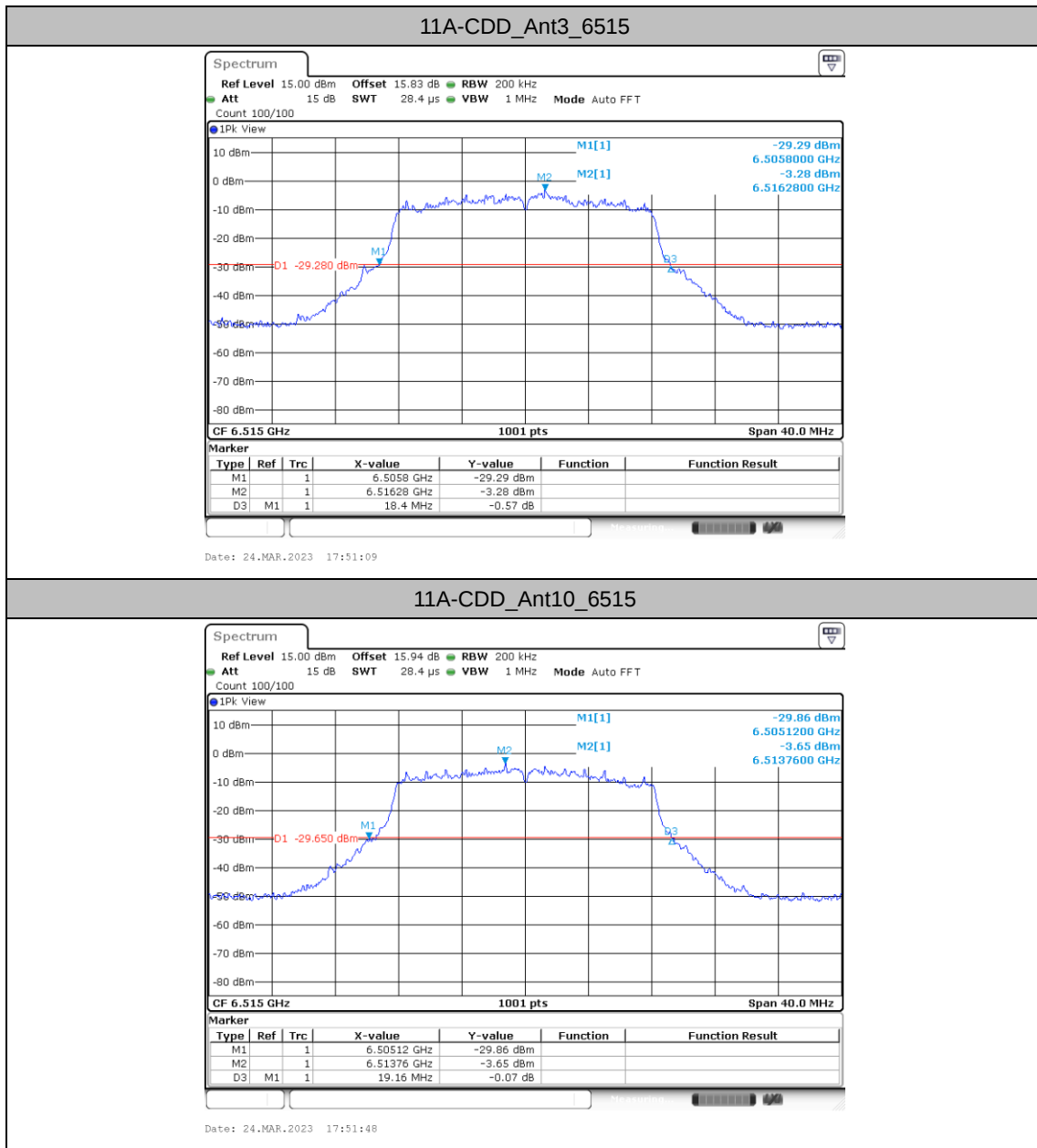


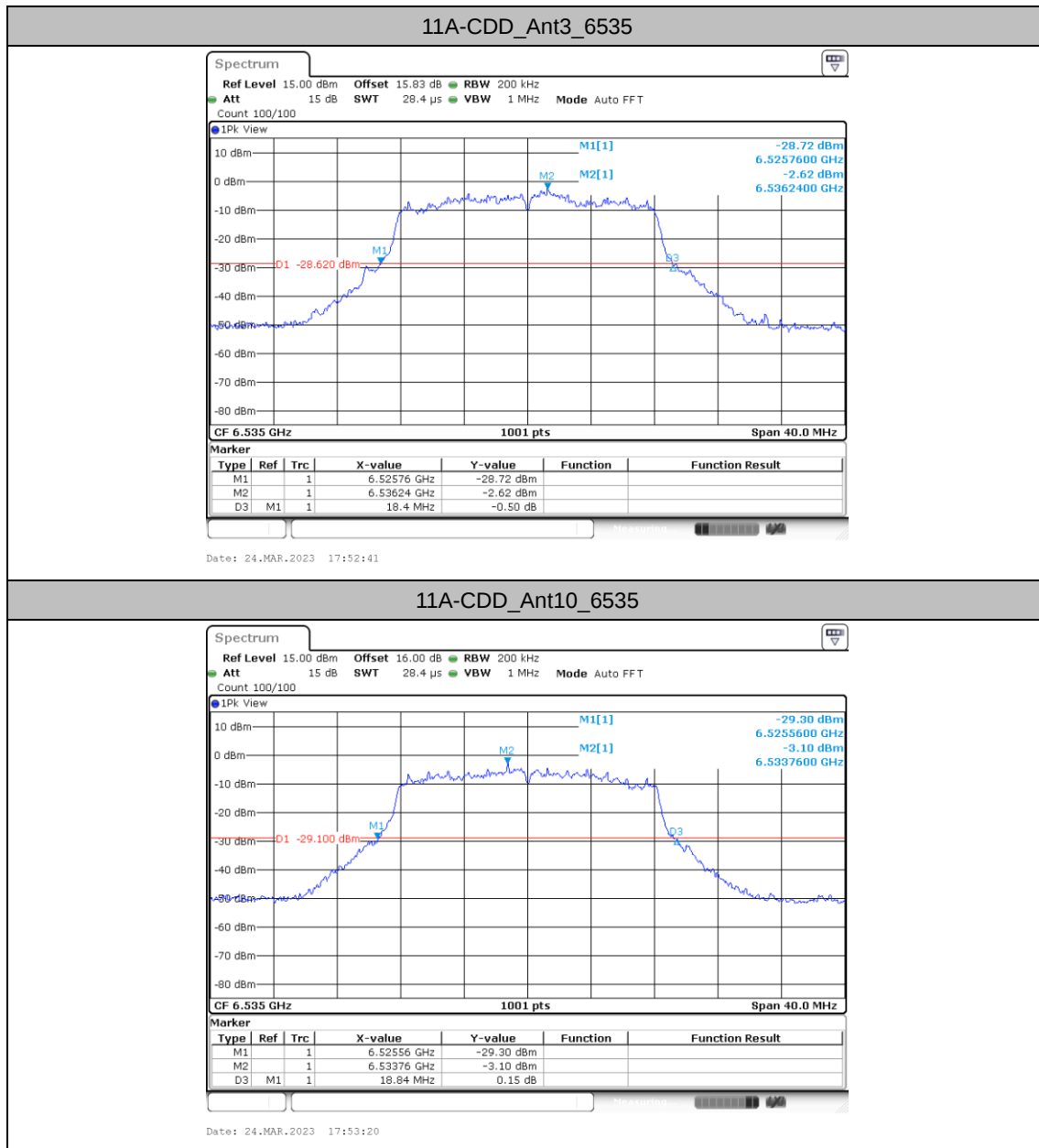


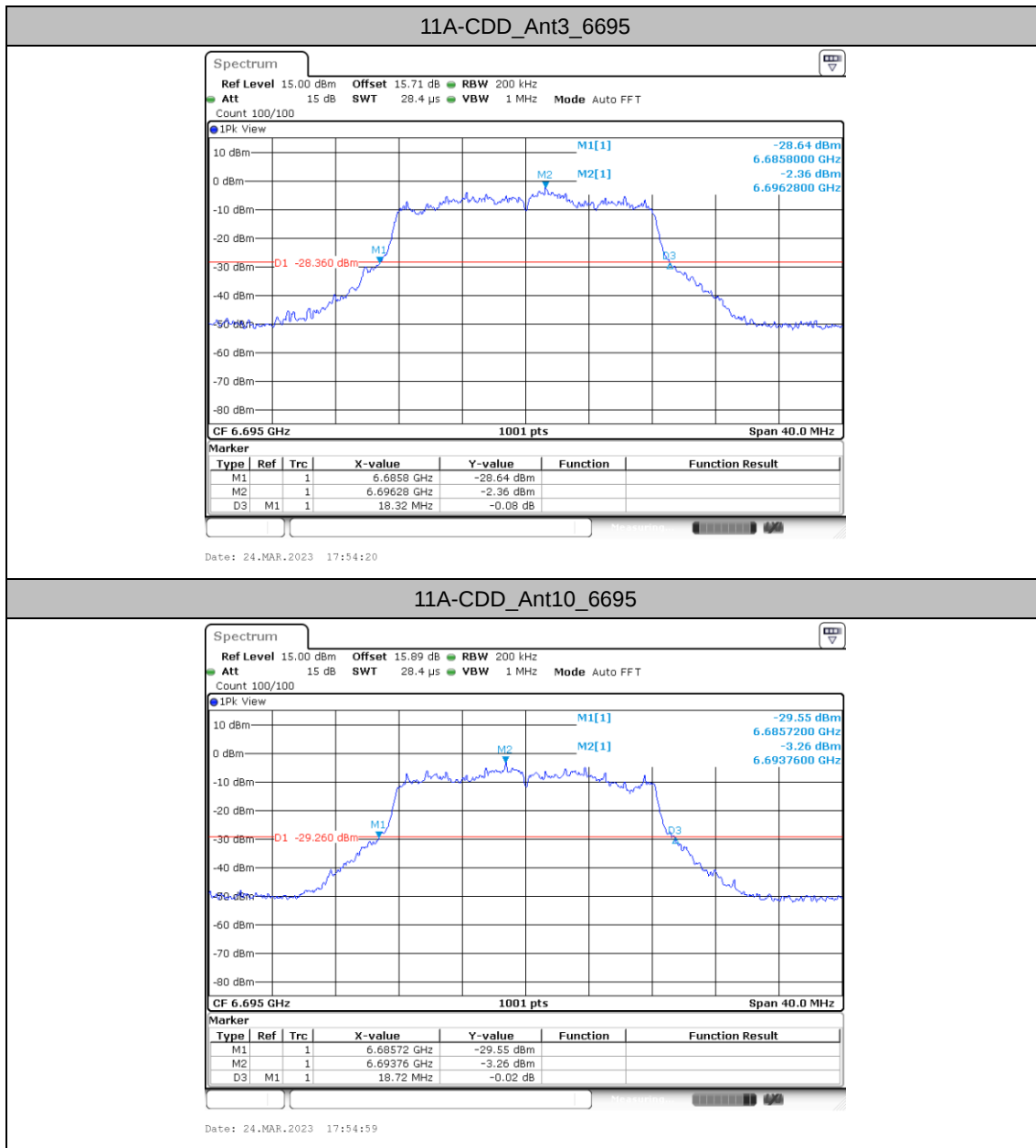






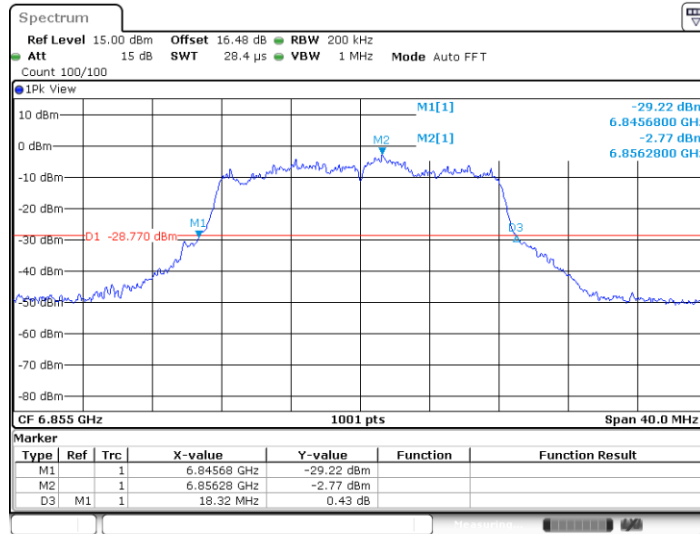






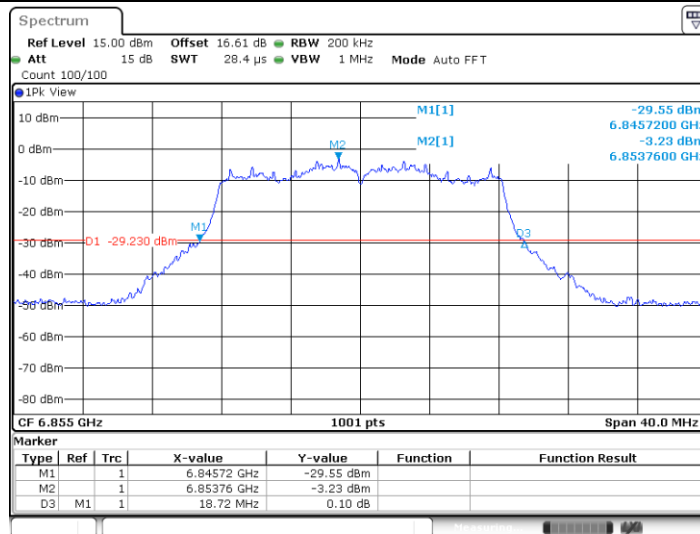


11A-CDD_Ant3_6855



Date: 24.MAR.2023 17:56:03

11A-CDD_Ant10_6855



Date: 24.MAR.2023 17:56:42

