



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT2405-1, XT2405V
FCC ID : IHDT56AN6
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System
TEST DATE(S) : Jan. 26, 2024 ~ Mar. 06, 2024

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.

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (ShenZhen)

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People's Republic of China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR411619C	Rev. 01	Initial issue of report	Mar. 22, 2024



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Report Only	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.04 dB at 2389.95 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 13.05 dB at 21.71 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	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/manufacture 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 Applicant

Motorola Mobility LLC

222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC

222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2405-1, XT2405V
FCC ID	IHDT56AN6
IMEI Code	Conducted: 353533390038597/353533390038605 353533390042979/353533390042987 Conduction: 353533390042995/353533390043001 Radiation: 353533390042094/353533390042102
HW Version	DVT2
SW Version	U2UAN34.50
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. The two models XT2405-1, XT2405V is only for market segment purpose, no other difference.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	<MIMO Ant.3+5> 802.11b : 25.93 dBm (0.3917 W) 802.11g : 27.43 dBm (0.5534 W) 802.11n HT20 : 27.46 dBm (0.5572 W) 802.11n HT40 : 25.24 dBm (0.3342 W) 802.11ax HE20 : 27.51 dBm (0.5636 W) 802.11ax HE40 : 25.00 dBm (0.3162 W)
99% Occupied Bandwidth	802.11b : 16.304 MHz 802.11g : 22.138 MHz 802.11n HT20 : 22.897 MHz 802.11n HT40 : 41.159 MHz 802.11ax HE20 : 21.219 MHz 802.11ax HE40 : 40.040 MHz
Antenna Type / Gain	<Ant.3> PIFA Antenna type with gain -5.00 dBi <Ant.5> PIFA Antenna type with gain -7.00 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)

Note:

1. The device supports WLAN MIMO CDD mode.
2. For WLAN SISO & MIMO mode, the whole testing has assessed only MIMO mode by referring to the higher normal output power.
3. 802.11ax support OFDMA full RU tone and partial RU tone, both full RU and partial RU-left (for low CH) and partial RU-right (for high CH) test output power, the full RU power/PSD > partial RU, therefore the full RU perform full, and partial RU verify bandedge/spurious.

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	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 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH03-SZ	CN1256	421272

1.7 Test Software

Item	Site	Manufacturer	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:

- ♦ 47 CFR Part 15 Subpart C §15.247
- ♦ FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ♦ 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.

1.9 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	Brand Name	Motorola (Chenyang)	Model Name	MC-681N
AC Adapter 2(US)	Brand Name	Motorola (Acbel)	Model Name	MC-681N
Battery	Brand Name	Motorola (NVT)	Model Name	QC50
USB Cable 1	Brand Name	Motorola (Saibao)	Model Name	SC18D71644
USB Cable 2	Brand Name	Motorola (Saibao)	Model Name	SC18D86731
USB Cable 3	Brand Name	Motorola (Luxshare)	Model Name	SC18E08104
USB Cable 4	Brand Name	Motorola (Luxshare)	Model Name	SC18E08103
Wireless Earphones	Brand Name	Motorola	Model Name	XT2441-1

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 (X plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437	-	-



2.2 Test Mode

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

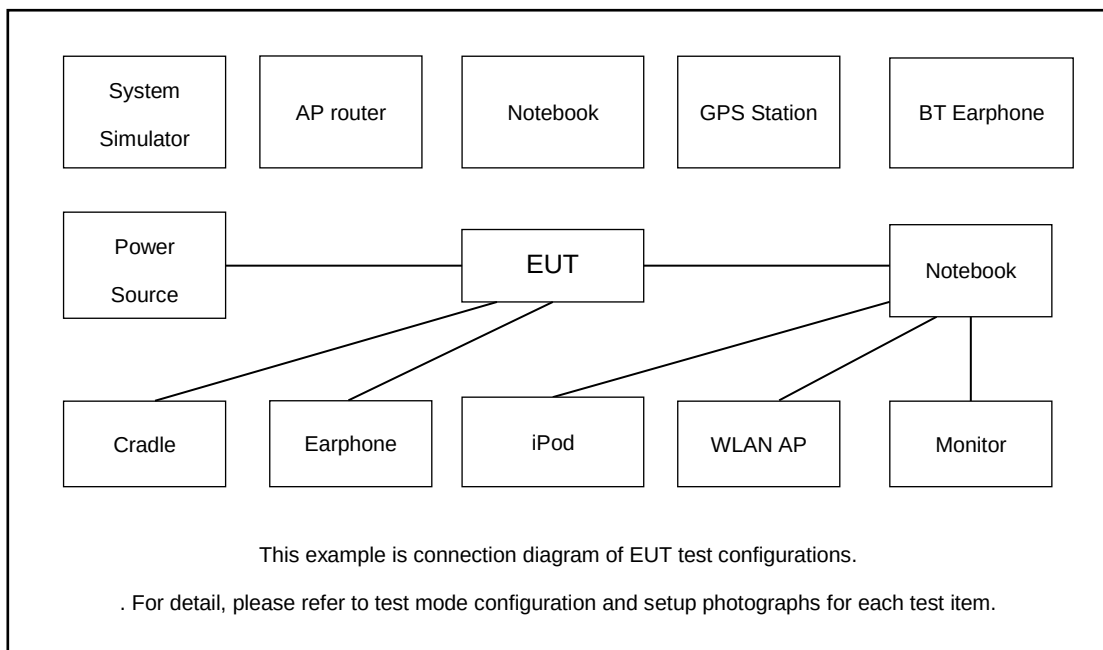
MIMO Antenna

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :GSM850 Idle + WLAN Link(2.4G) + NFC TX + USB Cable 1(charging from Adapter 1) + Battery
Remark: Radiated Test Cases were performance with Adapter 1 and USB Cable 1.	

Co-location
2400-2483.5_802.11ax HE20_CH01_Full RU_TX + LTE B41 Link

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station(LTE)	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
3.	Bluetooth Earphone	Samsung	EO-MG900	PYAHS-107W	N/A	N/A
4.	NFC Card	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 was provided and enabled to make EUT continuous 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 1.3 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 1.3 + 10 = 11.3 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

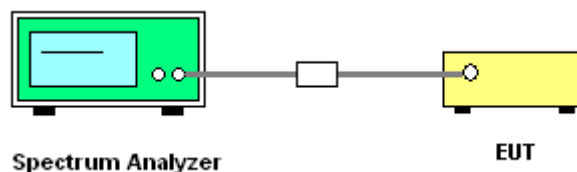
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.8
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1%~5% of OBW and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

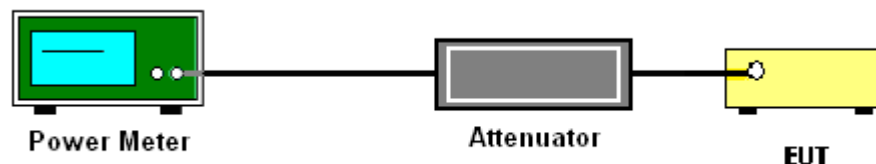
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.1 Method AVGPM method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

3.3.2 Measuring Instruments

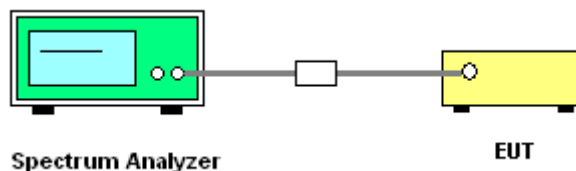
The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. 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.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

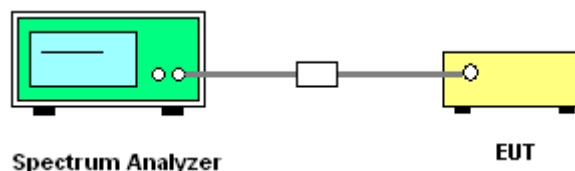
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.11
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Please refer to Appendix A.

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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

3.5.2 Measuring Instruments

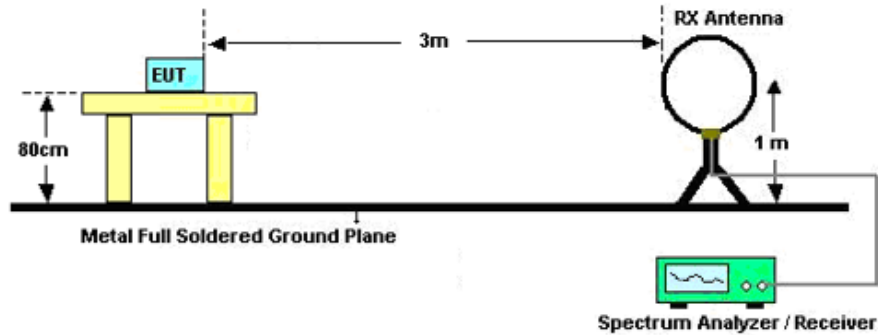
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

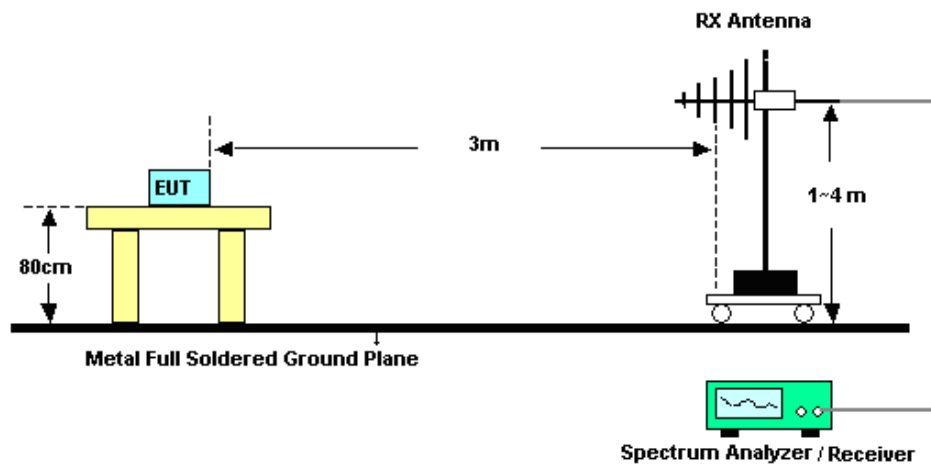
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. 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.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
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 peak 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.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - 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.

3.5.4 Test Setup

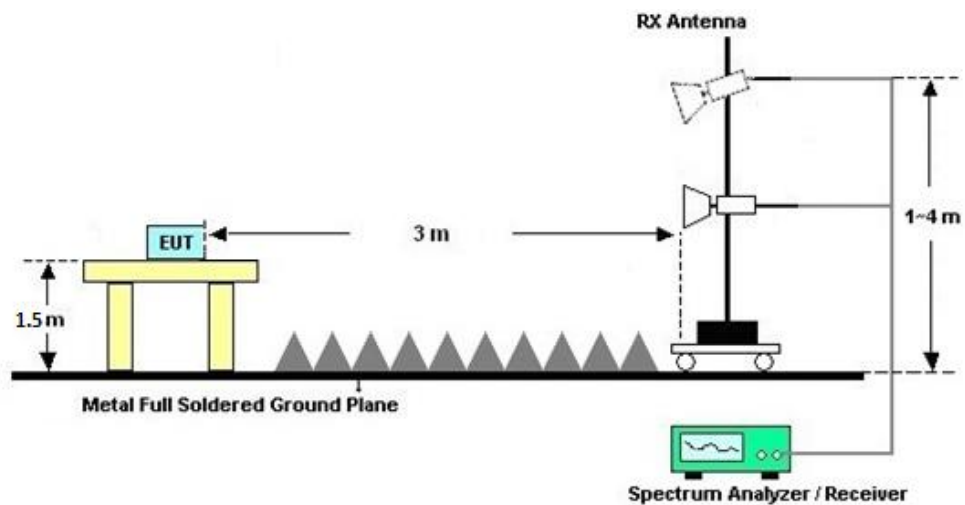
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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 a comparison data of both open-field test site and semi-Anechoic chamber, 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 Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C

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 (dB μ V)	
	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.

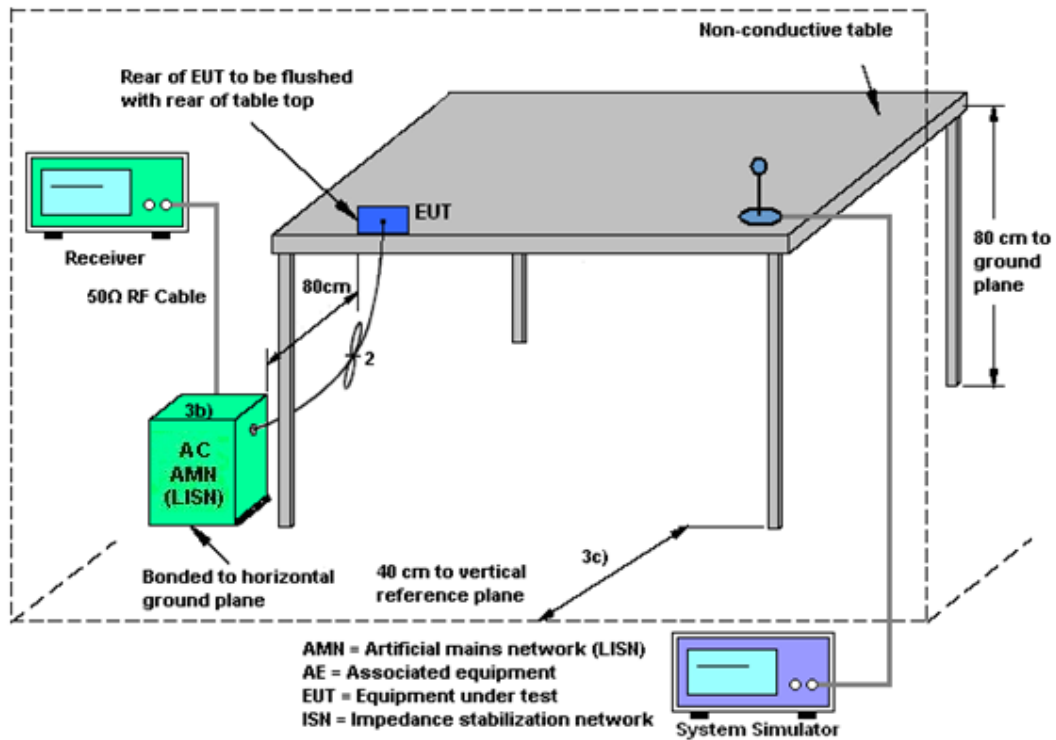
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 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, and it 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 (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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 rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT}/N_{SS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain G_{ANT} is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain "DG" is calculated as following table.

<CDD Modes>						
	Ant. 3 (dBi)	Ant. 5 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4 GHz	-5.00	-7.00	-5.00	-2.93	0.00	0.00

Power Limit Reduction = $DG(\text{Power}) - 6\text{dBi}$, (min = 0)

PSD Limit Reduction = $DG(\text{PSD}) - 6\text{dBi}$, (min = 0)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 06, 2023	Feb. 08, 2024 ~Mar. 06, 2024	Apr. 05, 2024	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 29, 2023	Feb. 08, 2024 ~Mar. 06, 2024	Dec. 28, 2024	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Aug. 21, 2023	Feb. 08, 2024 ~Mar. 06, 2024	Aug. 20, 2024	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 04, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Apr. 03, 2024	Radiation (03CH03-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 04, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Apr. 03, 2024	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jul. 28, 2022	Jan. 26, 2024 ~Mar. 06, 2024	Jul. 27, 2024	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz-2GHz	Aug. 20, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Aug. 19, 2025	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Apr. 08, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Apr. 07, 2024	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 08, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Apr. 07, 2024	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz~3000MHz	Oct. 18, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 18, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Dec. 27, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Dec. 26, 2024	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 07, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Jul.06, 2024	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010002729	1 N/A	Oct. 18, 2023	Jan. 26, 2024 ~Mar. 06, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jan. 26, 2024 ~Mar. 06, 2024	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jan. 26, 2024 ~Mar. 06, 2024	NCR	Radiation (03CH03-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 06, 2023	Feb. 07, 2024	Jul. 05, 2024	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Aug. 21, 2023	Feb. 07, 2024	Aug. 20, 2024	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 16, 2023	Feb. 07, 2024	Oct. 15, 2024	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 07, 2023	Feb. 07, 2024	Jul. 06, 2024	Conduction (CO01-SZ)

NCR: No Calibration Required

5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	±1.34 dB
Occupied Channel Bandwidth	±0.012 MHz
Conducted Power	±1.34 dB
Conducted Power Spectral Density	±1.32 dB
Frequency	±1.3 Hz

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

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 (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.9dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

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



Appendix A. Conducted Test Results

A1. Conducted Test Results

Test Engineer:	Chen Ran	Temperature:	21~25	°C
Test Date:	2024/2/8~2024/3/6	Relative Humidity:	51~54	%

TEST RESULTS DATA
Peak Output Power

2.4GHz Band MIMO																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant3	Ant5	SUM	Ant3	Ant5	Ant3	Ant5	Ant3	Ant5	Ant3	Ant5	
11b	1Mbps	2	1	2412	23.32	22.19	25.80	30.00		-5.00		20.80		36.00		Pass
11b	1Mbps	2	6	2437	23.37	22.42	25.93	30.00		-5.00		20.93		36.00		Pass
11b	1Mbps	2	11	2462	22.68	22.11	25.41	30.00		-5.00		20.41		36.00		Pass
11g	6Mbps	2	1	2412	23.37	22.37	25.91	30.00		-5.00		20.91		36.00		Pass
11g	6Mbps	2	6	2437	24.32	24.51	27.43	30.00		-5.00		22.43		36.00		Pass
11g	6Mbps	2	10	2457	22.14	22.32	25.24	30.00		-5.00		20.24		36.00		Pass
11g	6Mbps	2	11	2462	20.42	20.62	23.53	30.00		-5.00		18.53		36.00		Pass
HT20	MCS0	2	1	2412	22.08	21.06	24.61	30.00		-5.00		19.61		36.00		Pass
HT20	MCS0	2	6	2437	24.35	24.54	27.46	30.00		-5.00		22.46		36.00		Pass
HT20	MCS0	2	10	2457	23.11	23.25	26.19	30.00		-5.00		21.19		36.00		Pass
HT20	MCS0	2	11	2462	19.84	20.18	23.02	30.00		-5.00		18.02		36.00		Pass
HT40	MCS0	2	3	2422	20.77	20.04	23.43	30.00		-5.00		18.43		36.00		Pass
HT40	MCS0	2	4	2427	22.31	22.15	25.24	30.00		-5.00		20.24		36.00		Pass
HT40	MCS0	2	6	2437	21.24	21.25	24.26	30.00		-5.00		19.26		36.00		Pass
HT40	MCS0	2	7	2442	19.74	19.83	22.80	30.00		-5.00		17.80		36.00		Pass
HT40	MCS0	2	8	2447	18.88	18.81	21.86	30.00		-5.00		16.86		36.00		Pass
HT40	MCS0	2	9	2452	18.28	18.18	21.24	30.00		-5.00		16.24		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant3	Ant5	SUM	Ant3	Ant5	Ant3	Ant5	Ant3	Ant5	Ant3	Ant5	
11b	1Mbps	2	1	2412	20.60	20.00	23.32	30.00		-5.00		18.32		36.00		Pass
11b	1Mbps	2	6	2437	20.70	20.00	23.37	30.00		-5.00		18.37		36.00		Pass
11b	1Mbps	2	11	2462	19.80	19.50	22.66	30.00		-5.00		17.66		36.00		Pass
11g	6Mbps	2	1	2412	18.00	18.00	21.01	30.00		-5.00		16.01		36.00		Pass
11g	6Mbps	2	6	2437	19.20	19.00	22.11	30.00		-5.00		17.11		36.00		Pass
11g	6Mbps	2	10	2457	16.10	16.20	19.16	30.00		-5.00		14.16		36.00		Pass
11g	6Mbps	2	11	2462	14.40	14.50	17.46	30.00		-5.00		12.46		36.00		Pass
HT20	MCS0	2	1	2412	16.60	16.60	19.61	30.00		-5.00		14.61		36.00		Pass
HT20	MCS0	2	6	2437	19.30	19.10	22.21	30.00		-5.00		17.21		36.00		Pass
HT20	MCS0	2	10	2457	17.10	17.10	20.11	30.00		-5.00		15.11		36.00		Pass
HT20	MCS0	2	11	2462	14.00	14.10	17.06	30.00		-5.00		12.06		36.00		Pass
HT40	MCS0	2	3	2422	14.10	14.00	17.06	30.00		-5.00		12.06		36.00		Pass
HT40	MCS0	2	4	2427	16.30	16.20	19.26	30.00		-5.00		14.26		36.00		Pass
HT40	MCS0	2	6	2437	14.40	14.30	17.36	30.00		-5.00		12.36		36.00		Pass
HT40	MCS0	2	7	2442	13.50	13.50	16.51	30.00		-5.00		11.51		36.00		Pass
HT40	MCS0	2	8	2447	12.60	12.40	15.51	30.00		-5.00		10.51		36.00		Pass
HT40	MCS0	2	9	2452	12.20	11.90	15.06	30.00		-5.00		10.06		36.00		Pass

Setting	
Ant3	Ant5
20.00	
20.00	
19.50	
18.00	
19.00	
16.00	
14.50	
16.50	
19.00	
17.00	
14.00	
14.50	
16.50	
14.50	
13.50	
12.50	
12.00	

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Peak Output Power

2.4GHz Band MIMO																	
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	RU Config.	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant3	Ant5	SUM	Ant3	Ant5	Ant3	Ant5	Ant3	Ant5	Ant3	Ant5	
HE20	MCS0	2	1	2412	Full	21.82	22.04	24.94	30.00		-5.00		19.94		36.00		Pass
HE20	MCS0	2	1	2412	26/0	17.80	18.61	21.23	30.00		-5.00		16.23		36.00		Pass
HE20	MCS0	2	1	2412	52/37	19.85	20.65	23.28	30.00		-5.00		18.28		36.00		Pass
HE20	MCS0	2	1	2412	106/53	21.64	21.55	24.61	30.00		-5.00		19.61		36.00		Pass
HE20	MCS0	2	6	2437	Full	24.43	24.57	27.51	30.00		-5.00		22.51		36.00		Pass
HE20	MCS0	2	10	2457	Full	22.54	22.68	25.62	30.00		-5.00		20.62		36.00		Pass
HE20	MCS0	2	11	2462	Full	19.91	20.26	23.10	30.00		-5.00		18.10		36.00		Pass
HE20	MCS0	2	11	2462	26/8	15.52	16.72	19.17	30.00		-5.00		14.17		36.00		Pass
HE20	MCS0	2	11	2462	52/40	17.77	18.36	21.09	30.00		-5.00		16.09		36.00		Pass
HE20	MCS0	2	11	2462	106/54	19.18	19.53	22.37	30.00		-5.00		17.37		36.00		Pass
HE40	MCS0	2	3	2422	Full	22.27	21.70	25.00	30.00		-5.00		20.00		36.00		Pass
HE40	MCS0	2	6	2437	Full	21.87	21.78	24.84	30.00		-5.00		19.84		36.00		Pass
HE40	MCS0	2	7	2442	Full	20.67	20.54	23.62	30.00		-5.00		18.62		36.00		Pass
HE40	MCS0	2	8	2447	Full	19.48	19.22	22.36	30.00		-5.00		17.36		36.00		Pass
HE40	MCS0	2	9	2452	Full	18.84	18.45	21.66	30.00		-5.00		16.66		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																	
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant3	Ant5	SUM	Ant3	Ant5	Ant3	Ant5	Ant3	Ant5	Ant3	Ant5	
HE20	MCS0	2	1	2412	Full	15.10	15.30	18.21	30.00		-5.00		13.21		36.00		Pass
HE20	MCS0	2	1	2412	26/0	5.60	9.10	10.70	30.00		-5.00		5.70		36.00		Pass
HE20	MCS0	2	1	2412	52/37	8.25	11.25	13.01	30.00		-5.00		8.01		36.00		Pass
HE20	MCS0	2	1	2412	106/53	11.31	13.35	15.46	30.00		-5.00		10.46		36.00		Pass
HE20	MCS0	2	6	2437	Full	18.30	18.10	21.21	30.00		-5.00		16.21		36.00		Pass
HE20	MCS0	2	10	2457	Full	15.70	15.50	18.61	30.00		-5.00		13.61		36.00		Pass
HE20	MCS0	2	11	2462	Full	13.20	13.30	16.26	30.00		-5.00		11.26		36.00		Pass
HE20	MCS0	2	11	2462	26/8	3.40	5.76	7.75	30.00		-5.00		2.75		36.00		Pass
HE20	MCS0	2	11	2462	52/40	5.93	8.24	10.25	30.00		-5.00		5.25		36.00		Pass
HE20	MCS0	2	11	2462	106/54	9.34	10.83	13.16	30.00		-5.00		8.16		36.00		Pass
HE40	MCS0	2	3	2422	Full	15.20	15.10	18.16	30.00		-5.00		13.16		36.00		Pass
HE40	MCS0	2	6	2437	Full	14.30	14.20	17.26	30.00		-5.00		12.26		36.00		Pass
HE40	MCS0	2	7	2442	Full	13.10	13.00	16.06	30.00		-5.00		11.06		36.00		Pass
HE40	MCS0	2	8	2447	Full	12.00	11.80	14.91	30.00		-5.00		9.91		36.00		Pass
HE40	MCS0	2	9	2452	Full	11.80	11.50	14.66	30.00		-5.00		9.66		36.00		Pass

Setting	
Ant3	Ant5
15.00	
7.00	
9.50	
12.00	
18.00	
15.50	
13.00	
4.50	
7.00	
9.50	
15.50	
14.00	
13.00	
12.00	
12.00	

Note: Measured power (dBm) has offset with cable loss.



Ambient Condition: 24~26 °C, 45~55 %RH

Test Date: 2024/02/08 ~ 2024/3/6

Test Engineer: Zhang Xue Yi

DTS Bandwidth

Test Result

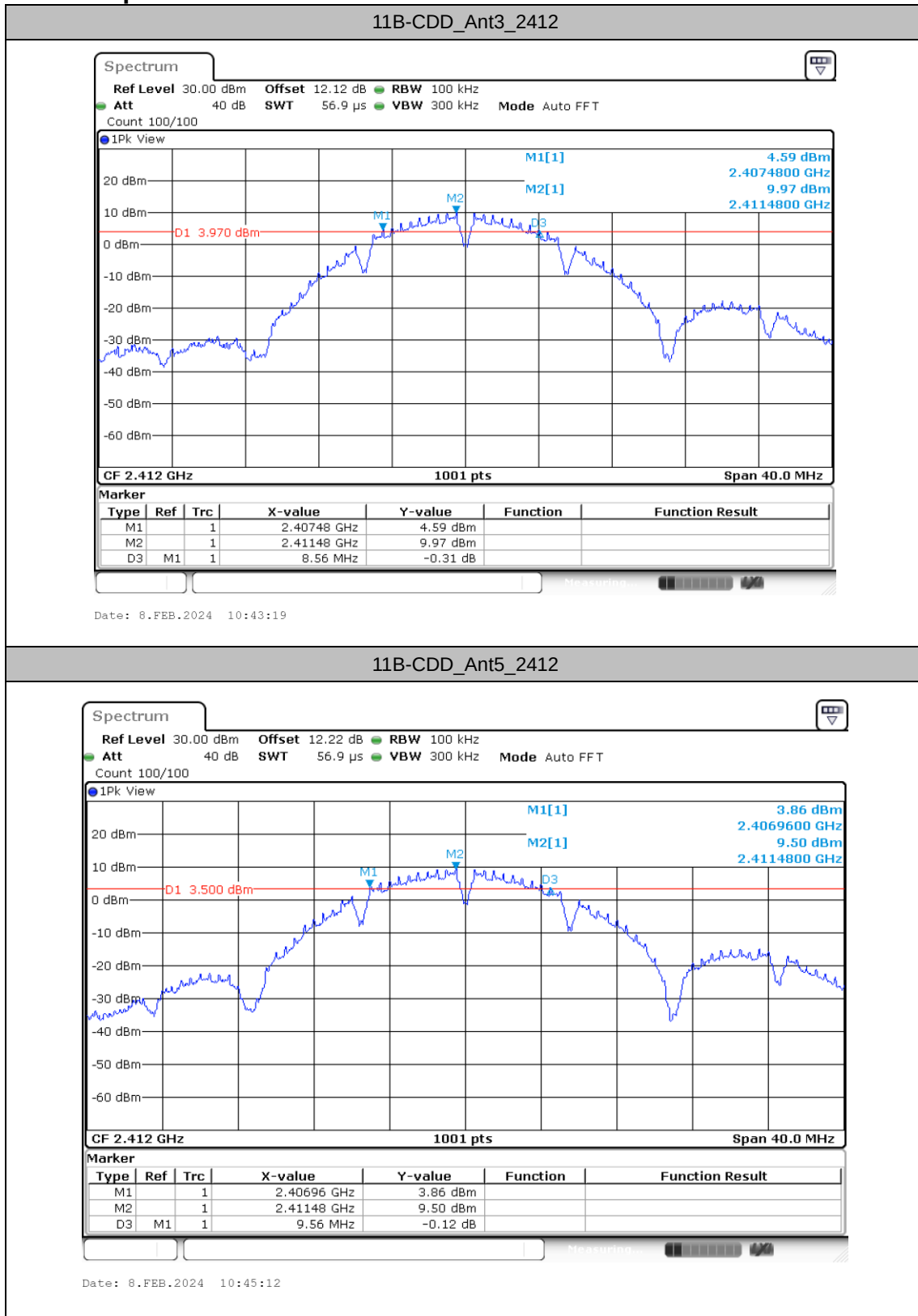
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant3	2412	8.56	2407.48	2416.04	0.5	PASS
	Ant5	2412	9.56	2406.96	2416.52	0.5	PASS
	Ant3	2437	9.52	2432.00	2441.52	0.5	PASS
	Ant5	2437	9.04	2432.48	2441.52	0.5	PASS
	Ant3	2462	8.60	2457.44	2466.04	0.5	PASS
	Ant5	2462	8.60	2457.44	2466.04	0.5	PASS
11G-CDD	Ant3	2412	16.04	2403.84	2419.88	0.5	PASS
	Ant5	2412	16.04	2404.08	2420.12	0.5	PASS
	Ant3	2437	16.32	2428.84	2445.16	0.5	PASS
	Ant5	2437	16.32	2428.84	2445.16	0.5	PASS
	Ant3	2462	16.32	2453.84	2470.16	0.5	PASS
	Ant5	2462	16.36	2453.80	2470.16	0.5	PASS
11N20MIMO	Ant3	2412	17.60	2403.20	2420.80	0.5	PASS
	Ant5	2412	16.32	2403.24	2419.56	0.5	PASS
	Ant3	2437	16.68	2428.20	2444.88	0.5	PASS
	Ant5	2437	16.92	2428.84	2445.76	0.5	PASS
	Ant3	2462	17.60	2453.20	2470.80	0.5	PASS
	Ant5	2462	17.60	2453.20	2470.80	0.5	PASS
11N40MIMO	Ant3	2422	36.32	2403.84	2440.16	0.5	PASS
	Ant5	2422	36.32	2403.84	2440.16	0.5	PASS
	Ant3	2437	35.68	2418.84	2454.52	0.5	PASS
	Ant5	2437	35.92	2418.84	2454.76	0.5	PASS
	Ant3	2452	36.40	2433.76	2470.16	0.5	PASS
	Ant5	2452	36.32	2433.84	2470.16	0.5	PASS
11AX20MIMO	Ant3	2412	18.88	2402.60	2421.48	0.5	PASS
	Ant5	2412	18.92	2402.52	2421.44	0.5	PASS
	Ant3	2437	18.40	2427.72	2446.12	0.5	PASS
	Ant5	2437	17.44	2428.60	2446.04	0.5	PASS
	Ant3	2462	18.08	2453.00	2471.08	0.5	PASS
	Ant5	2462	18.72	2452.52	2471.24	0.5	PASS

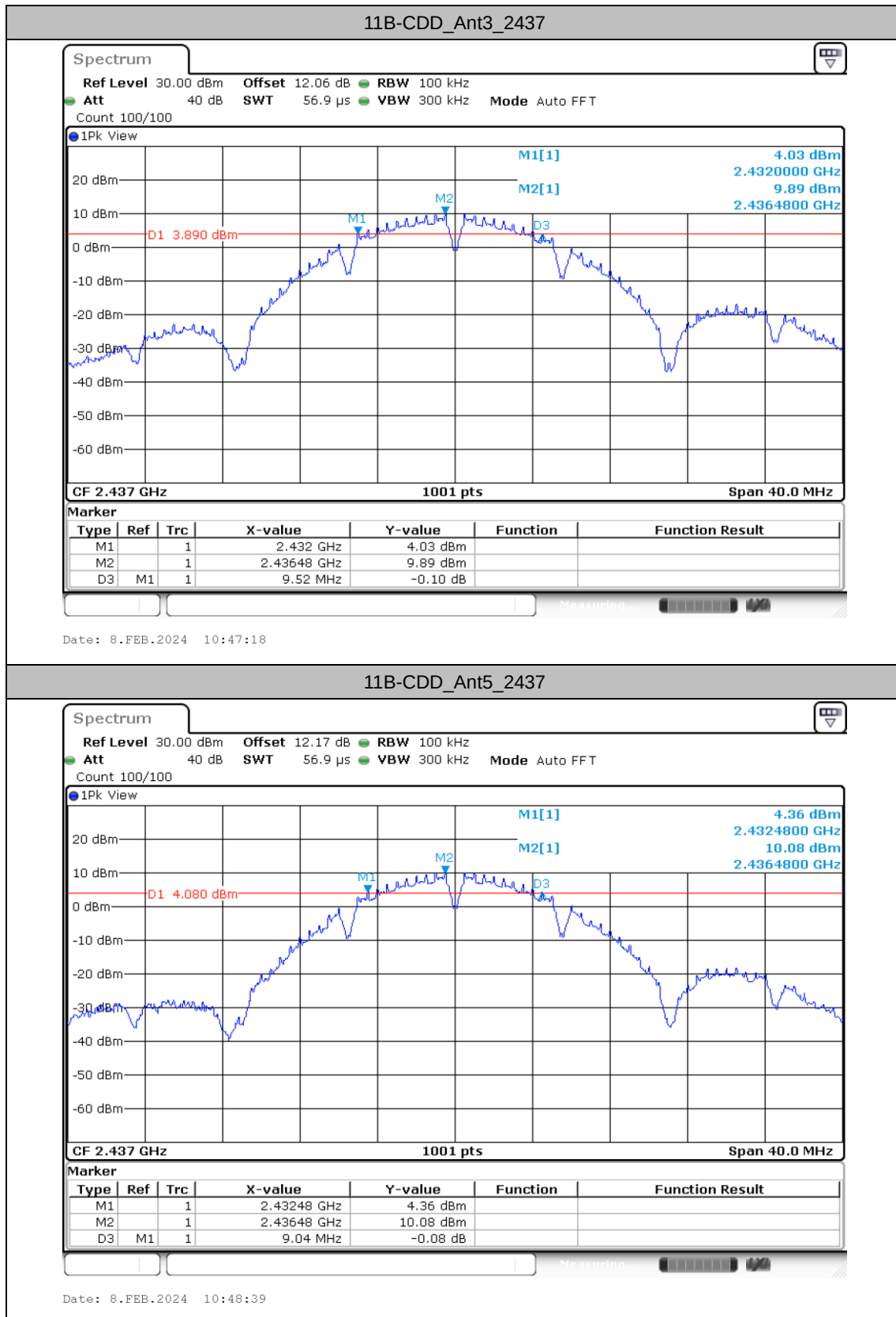


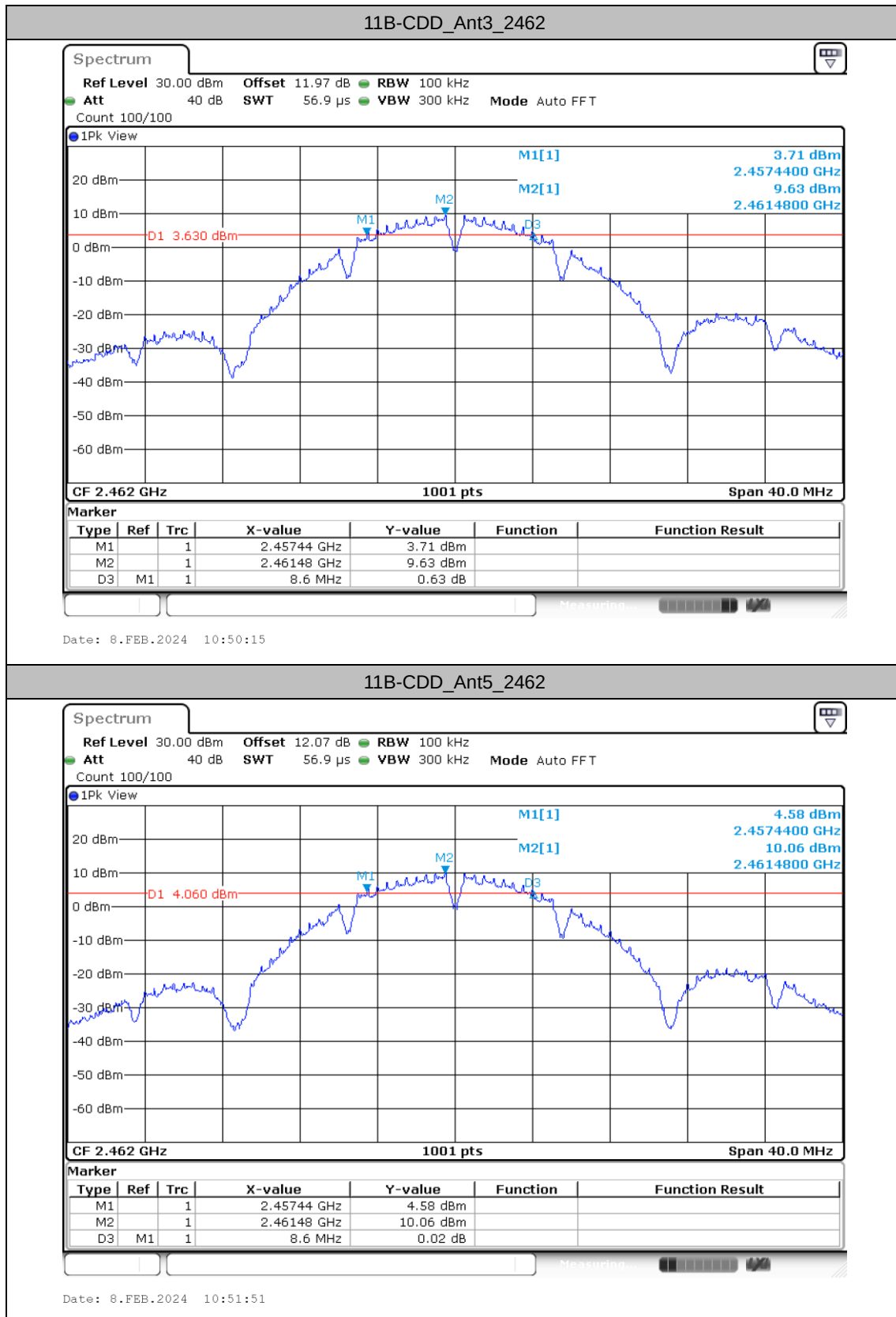
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11AX40MIMO	Ant3	2422	36.40	2403.44	2439.84	0.5	PASS
	Ant5	2422	37.36	2403.20	2440.56	0.5	PASS
	Ant3	2437	37.28	2418.04	2455.32	0.5	PASS
	Ant5	2437	37.28	2418.28	2455.56	0.5	PASS
	Ant3	2452	36.80	2432.96	2469.76	0.5	PASS
	Ant5	2452	38.00	2432.96	2470.96	0.5	PASS

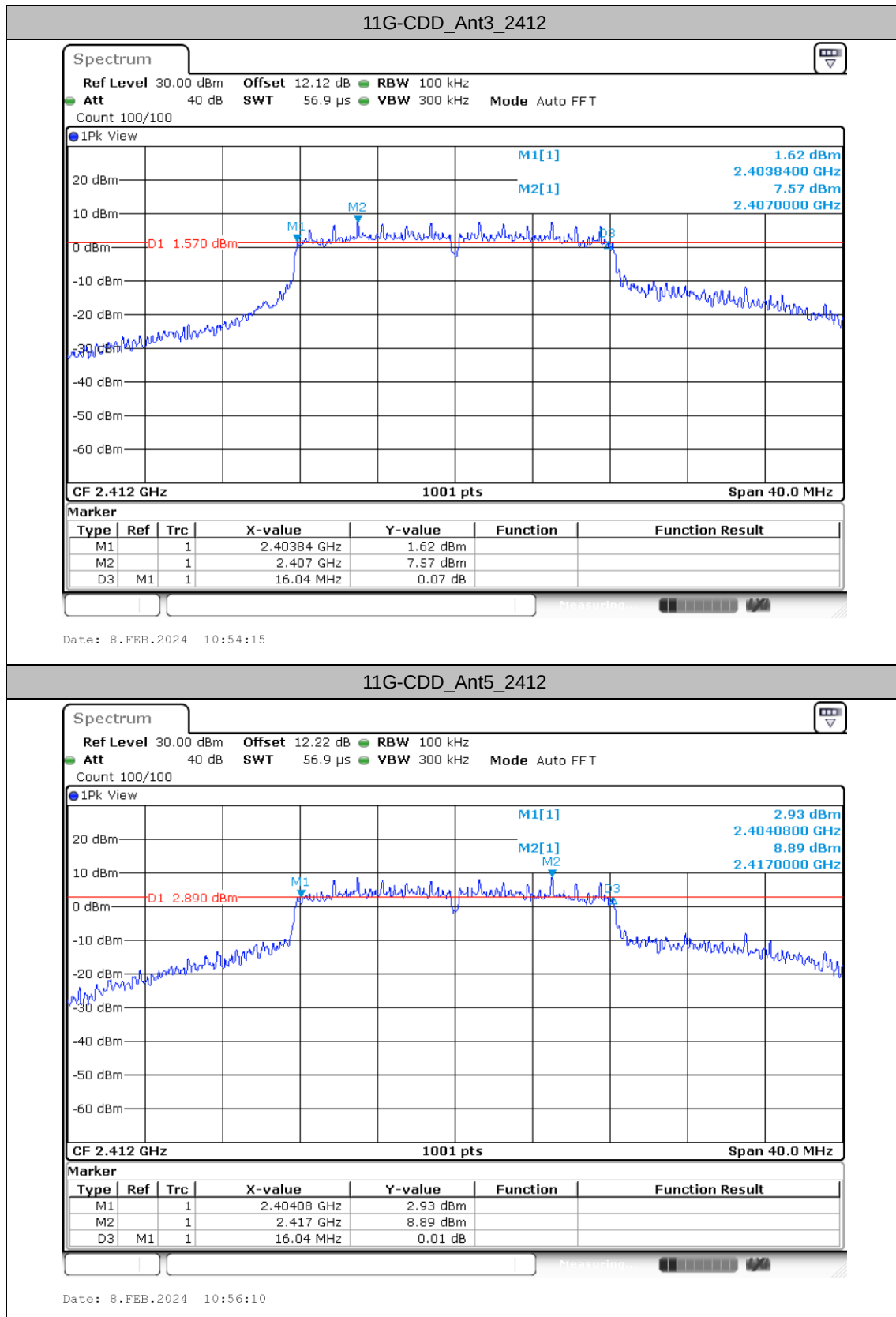


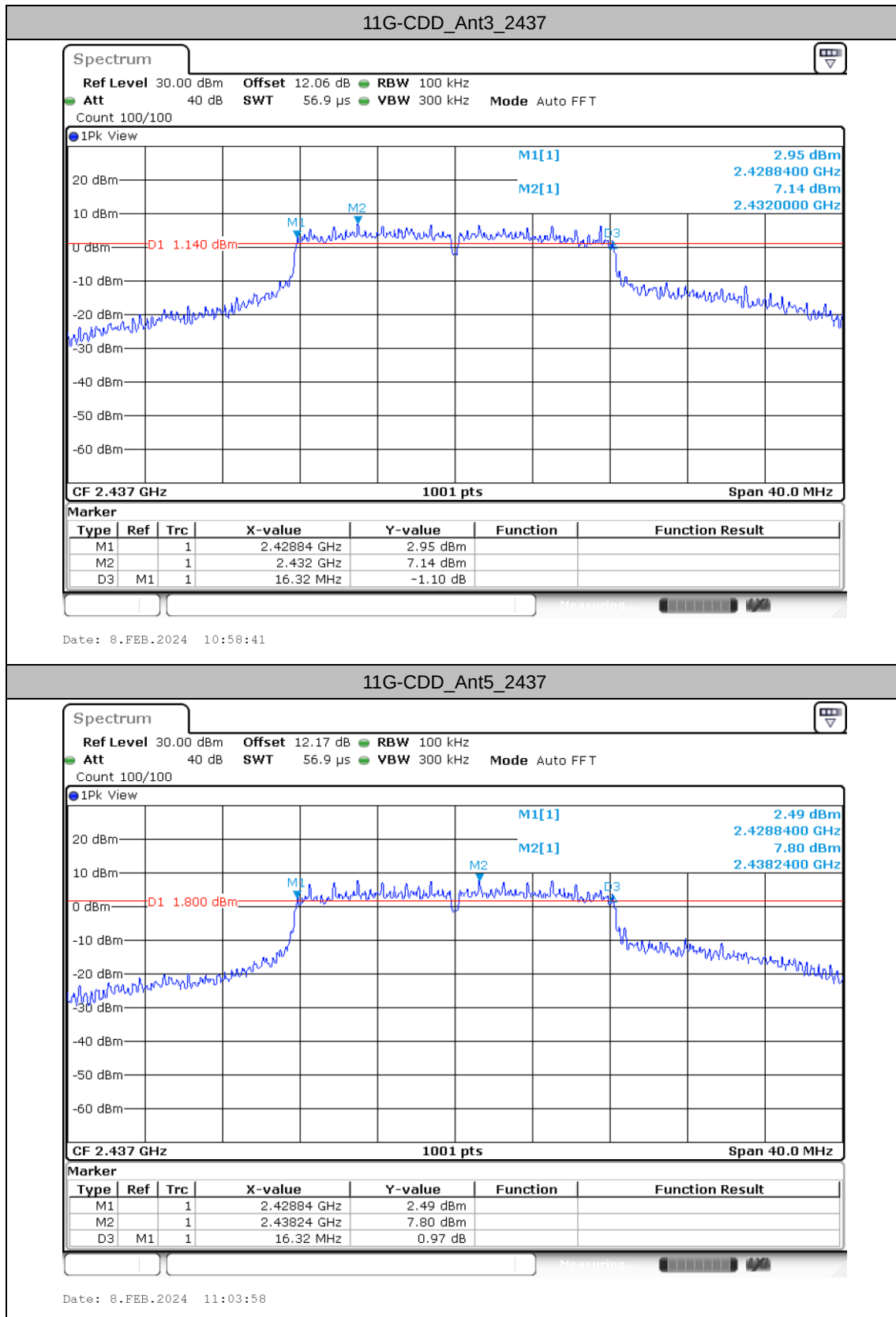
Test Graphs

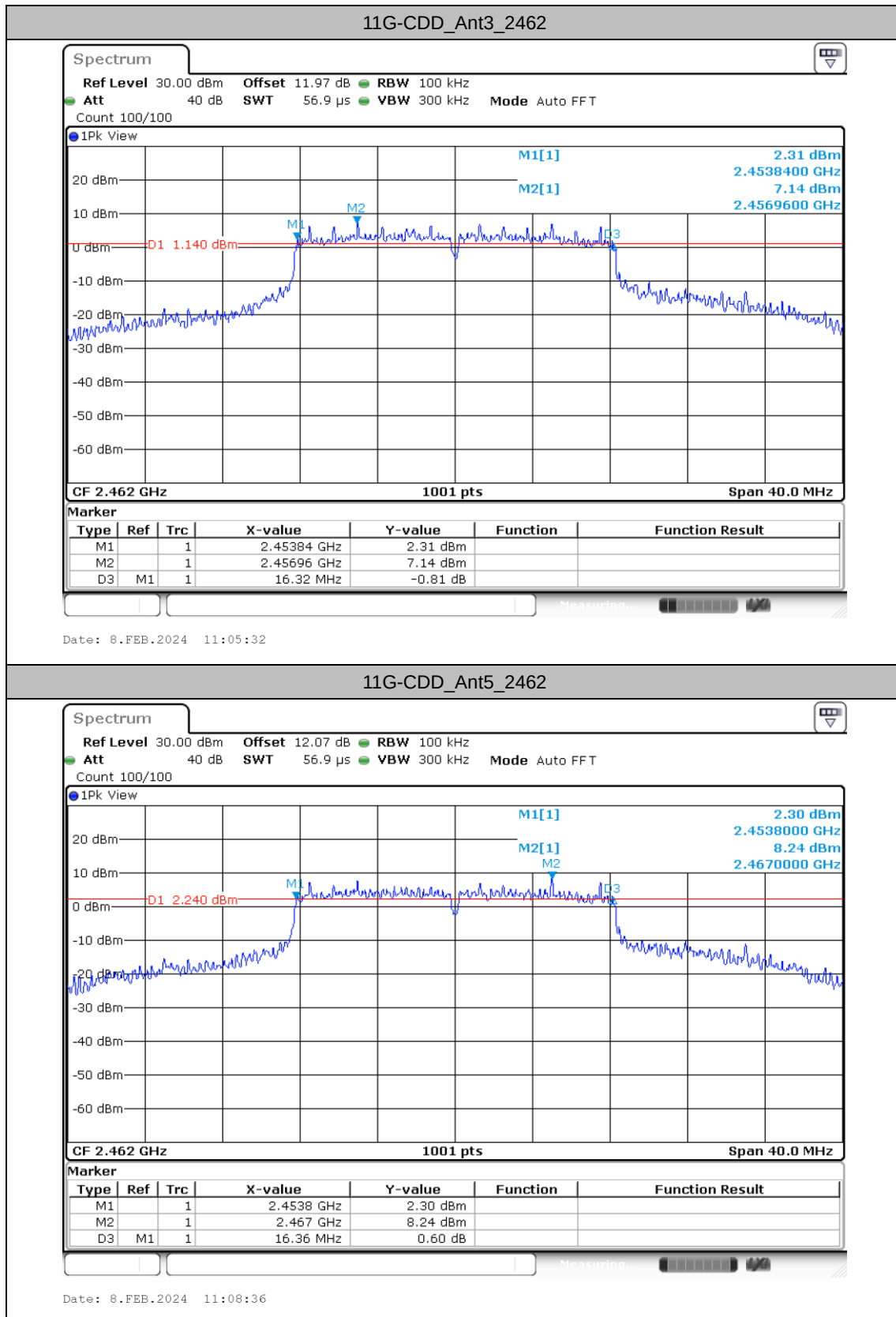


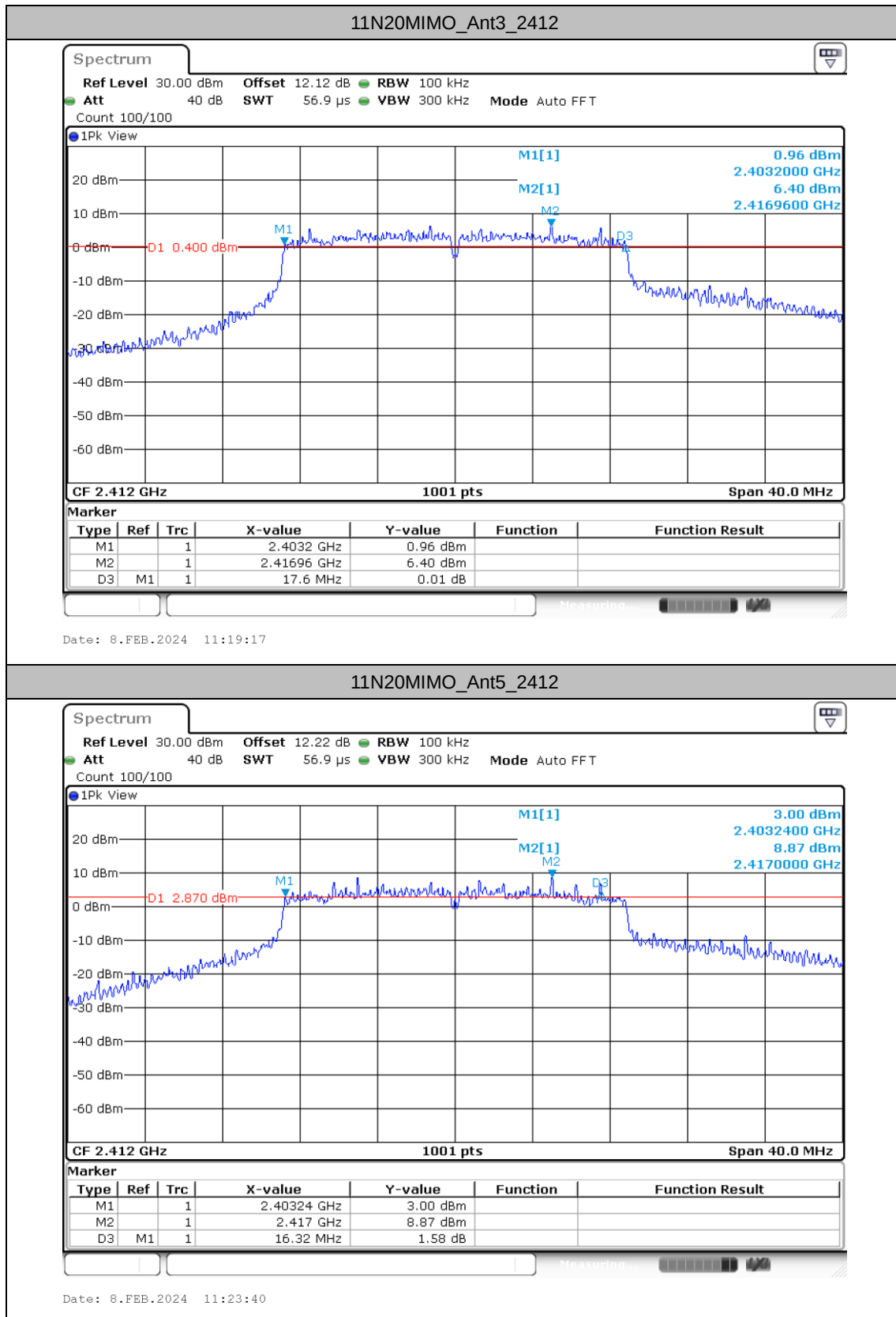


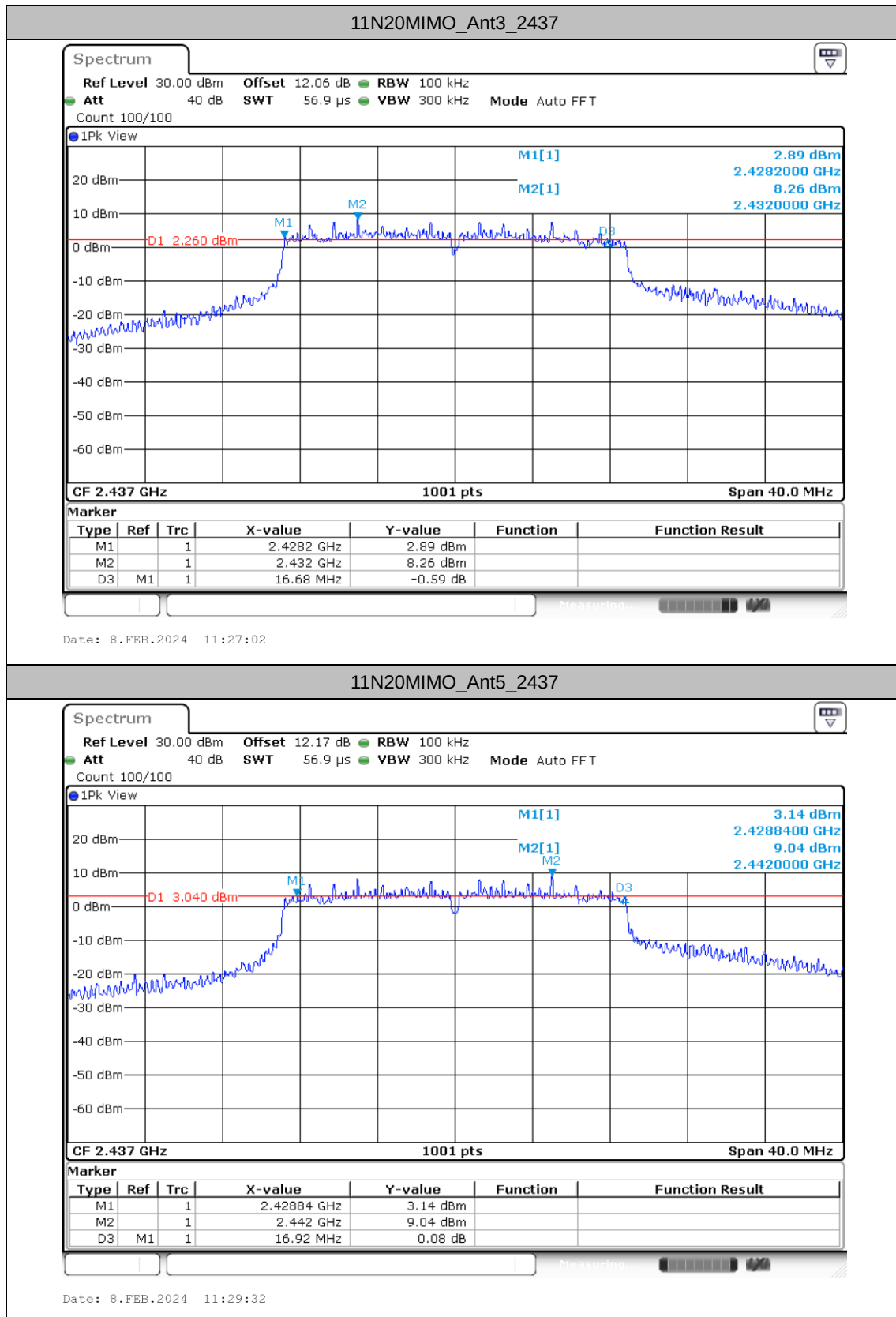


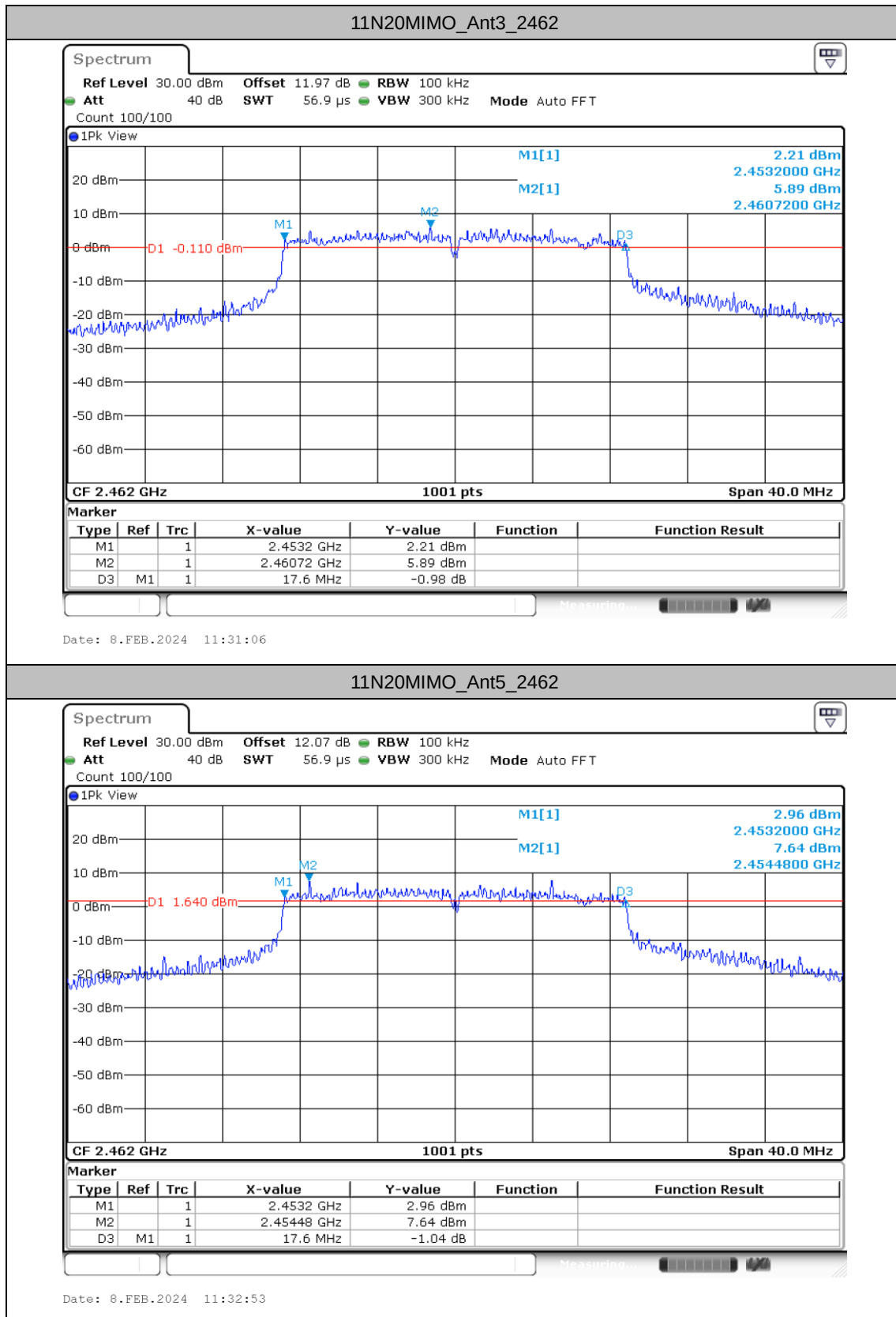


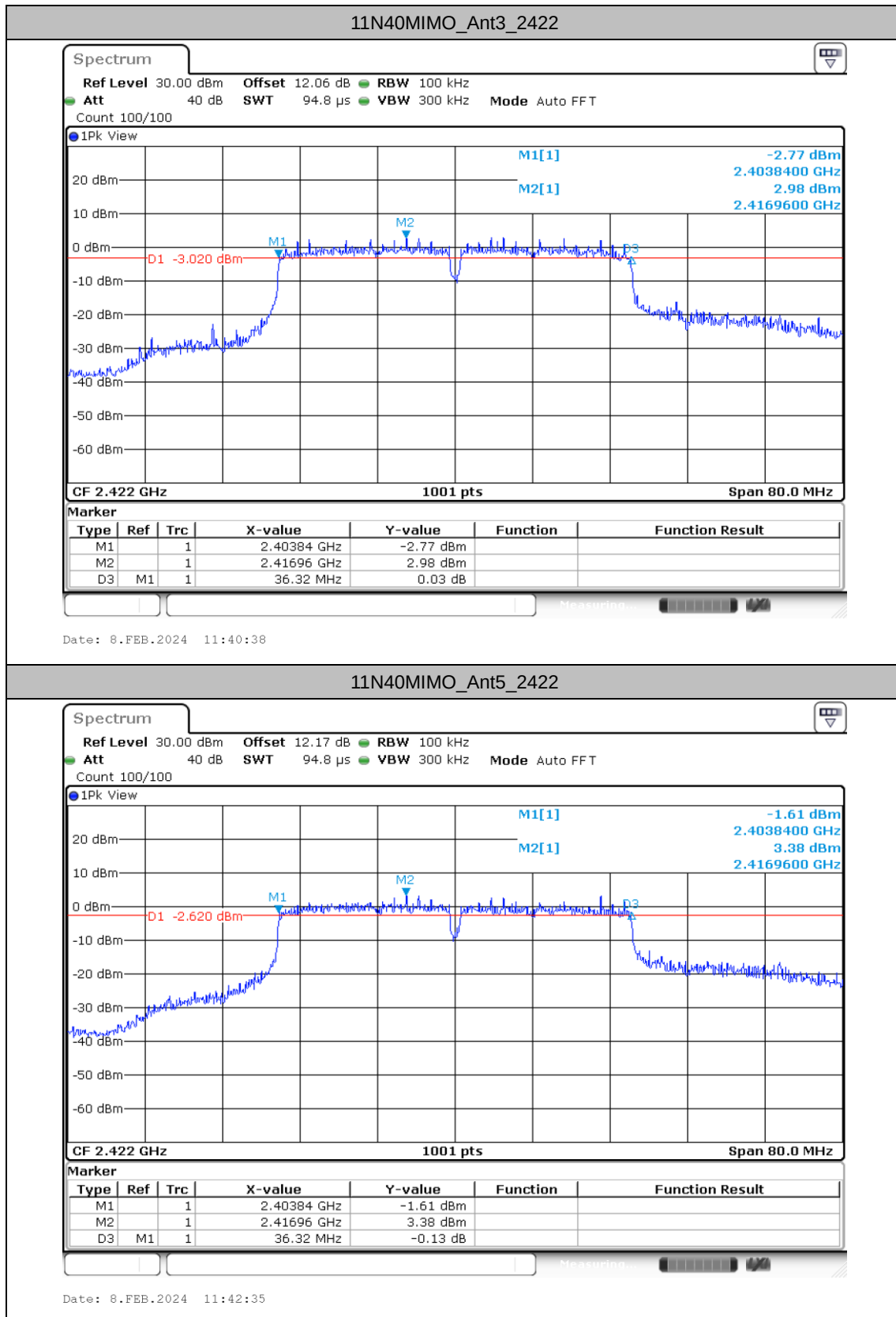


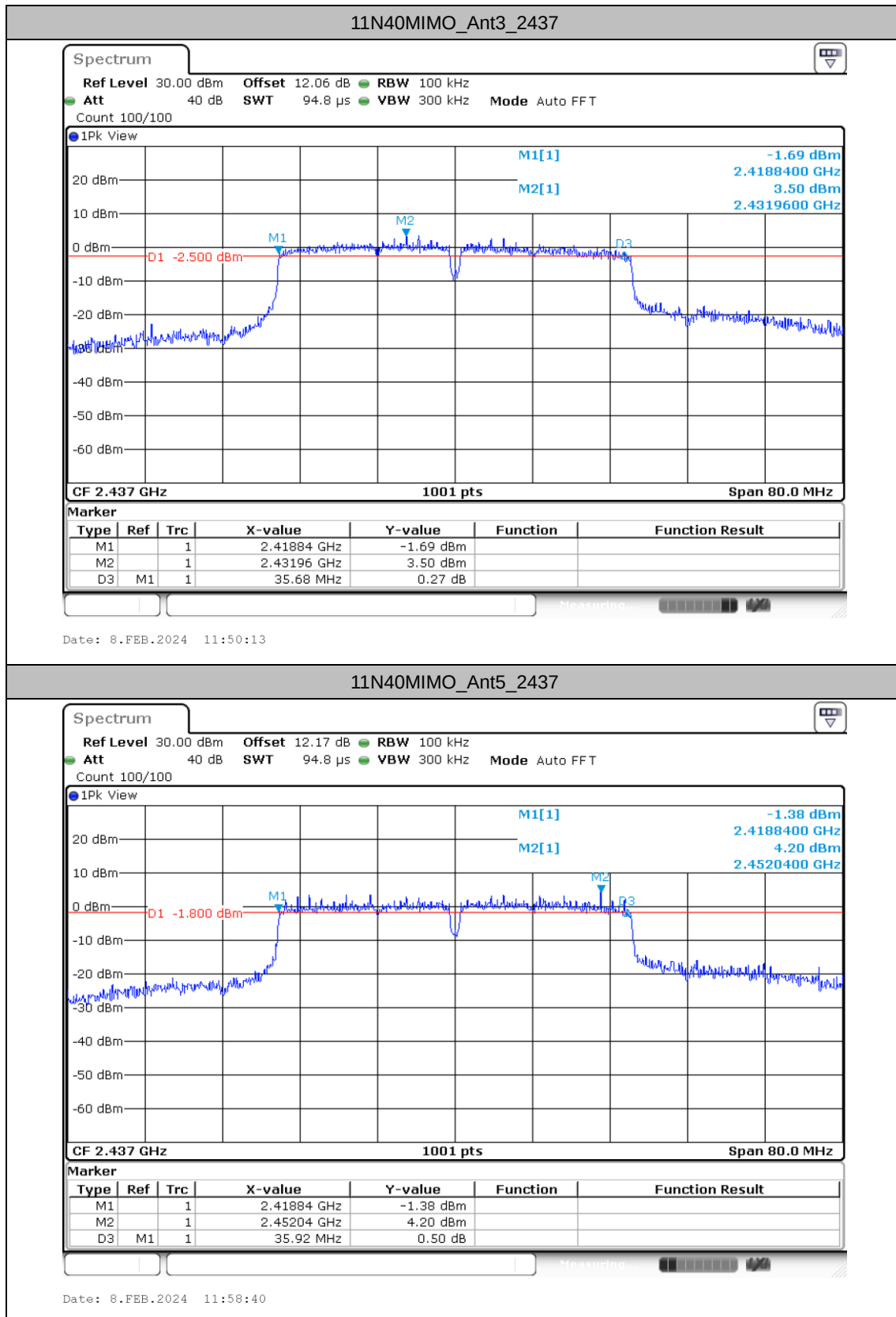


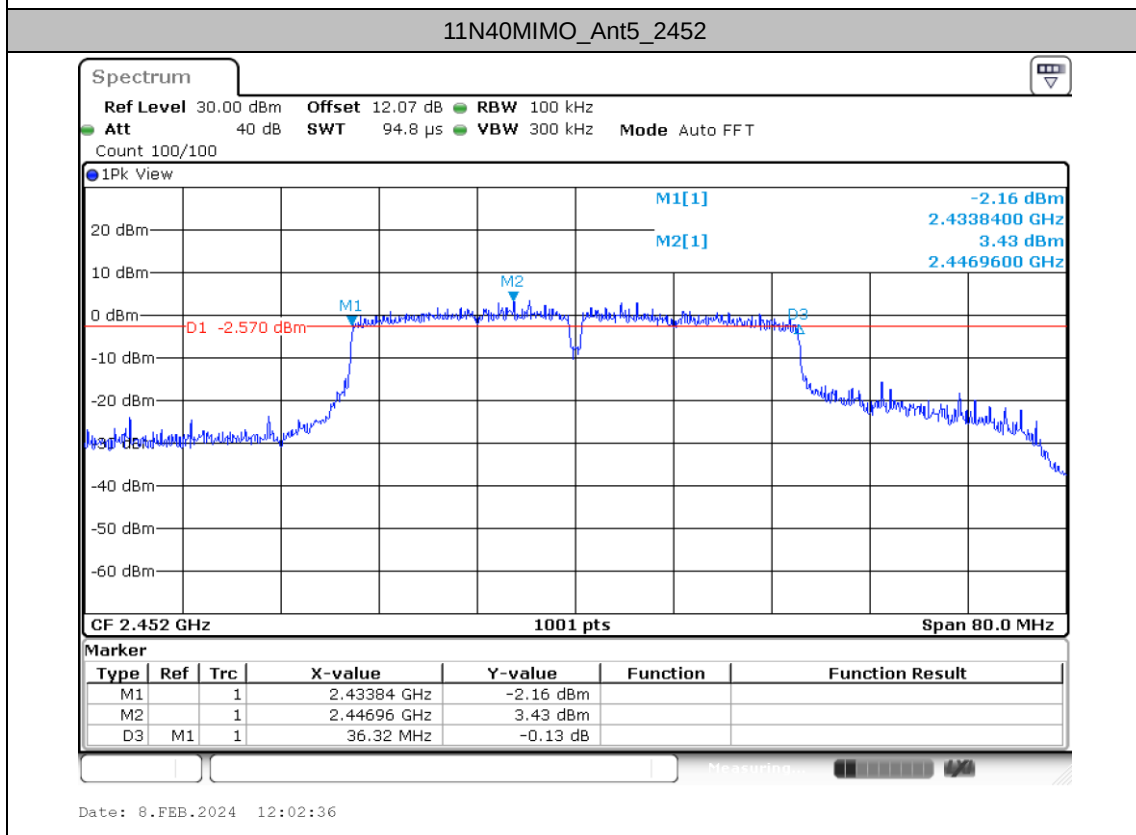
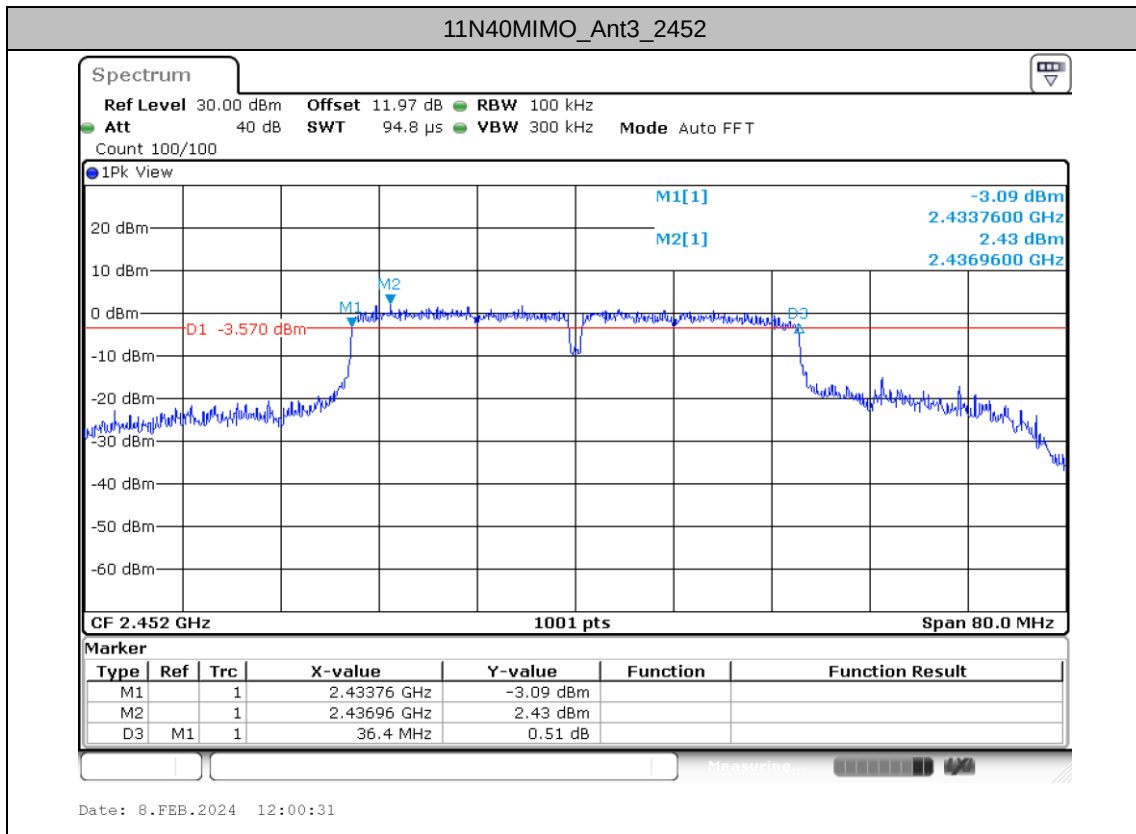


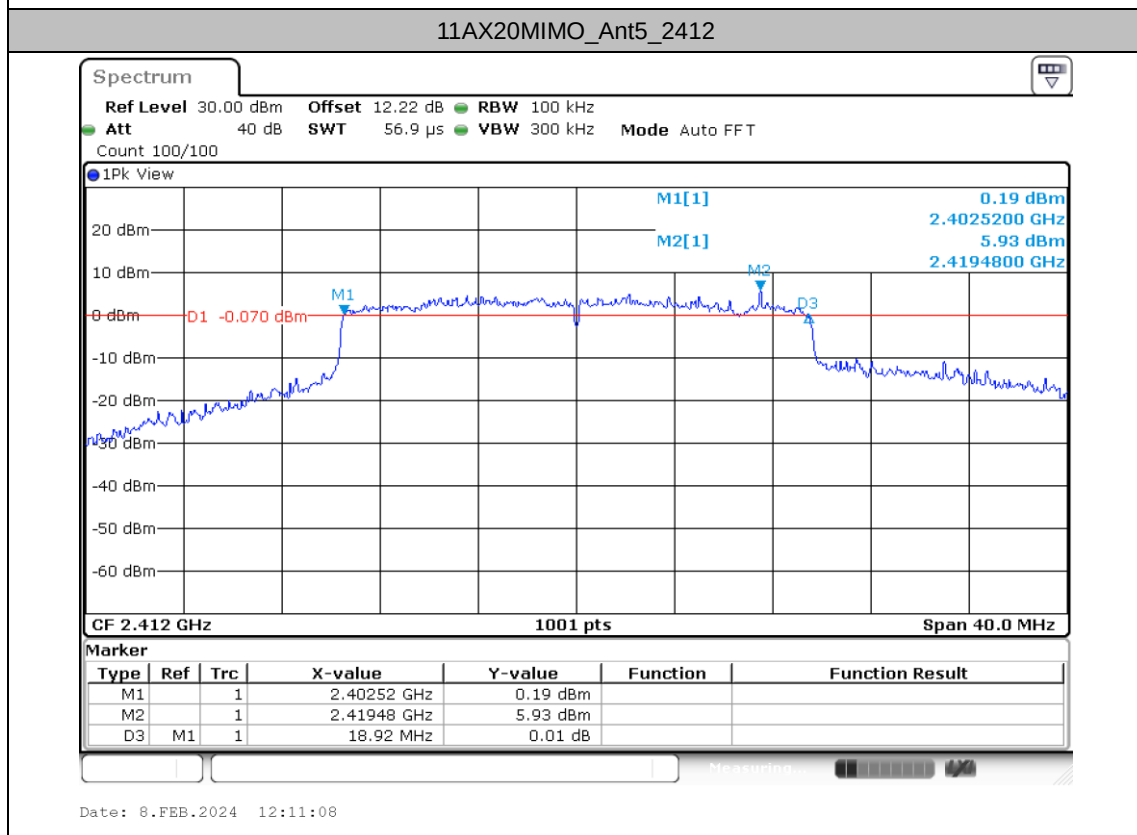
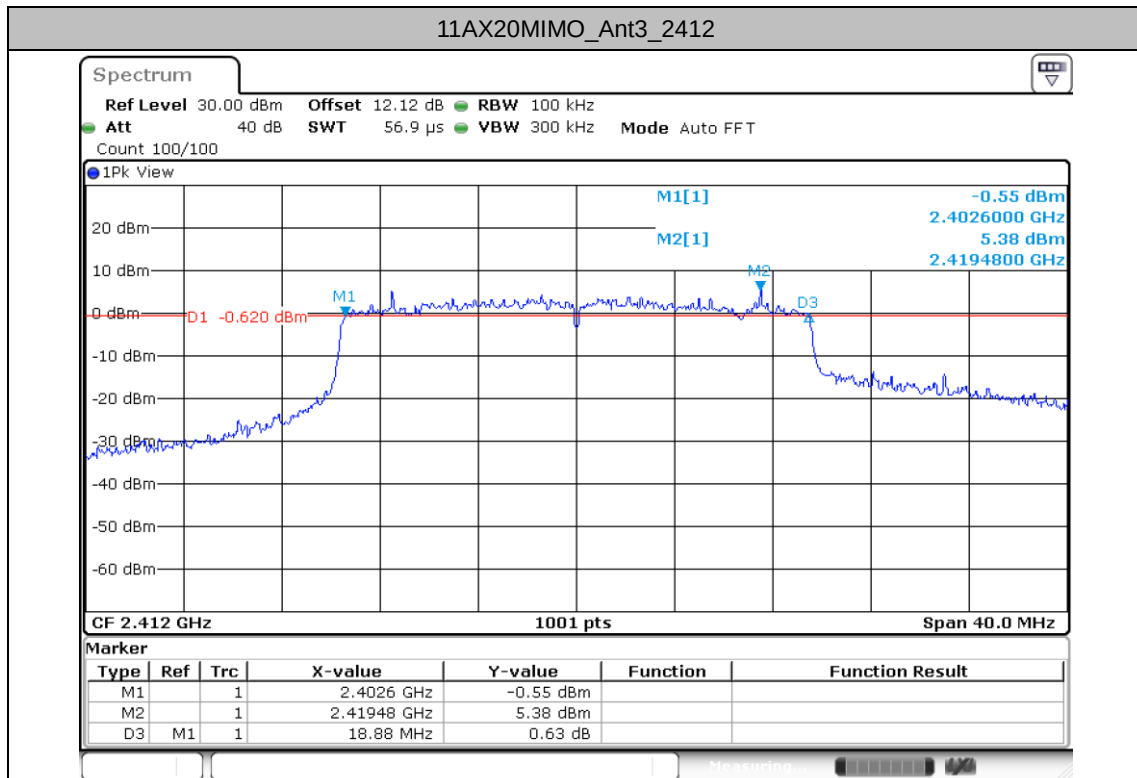


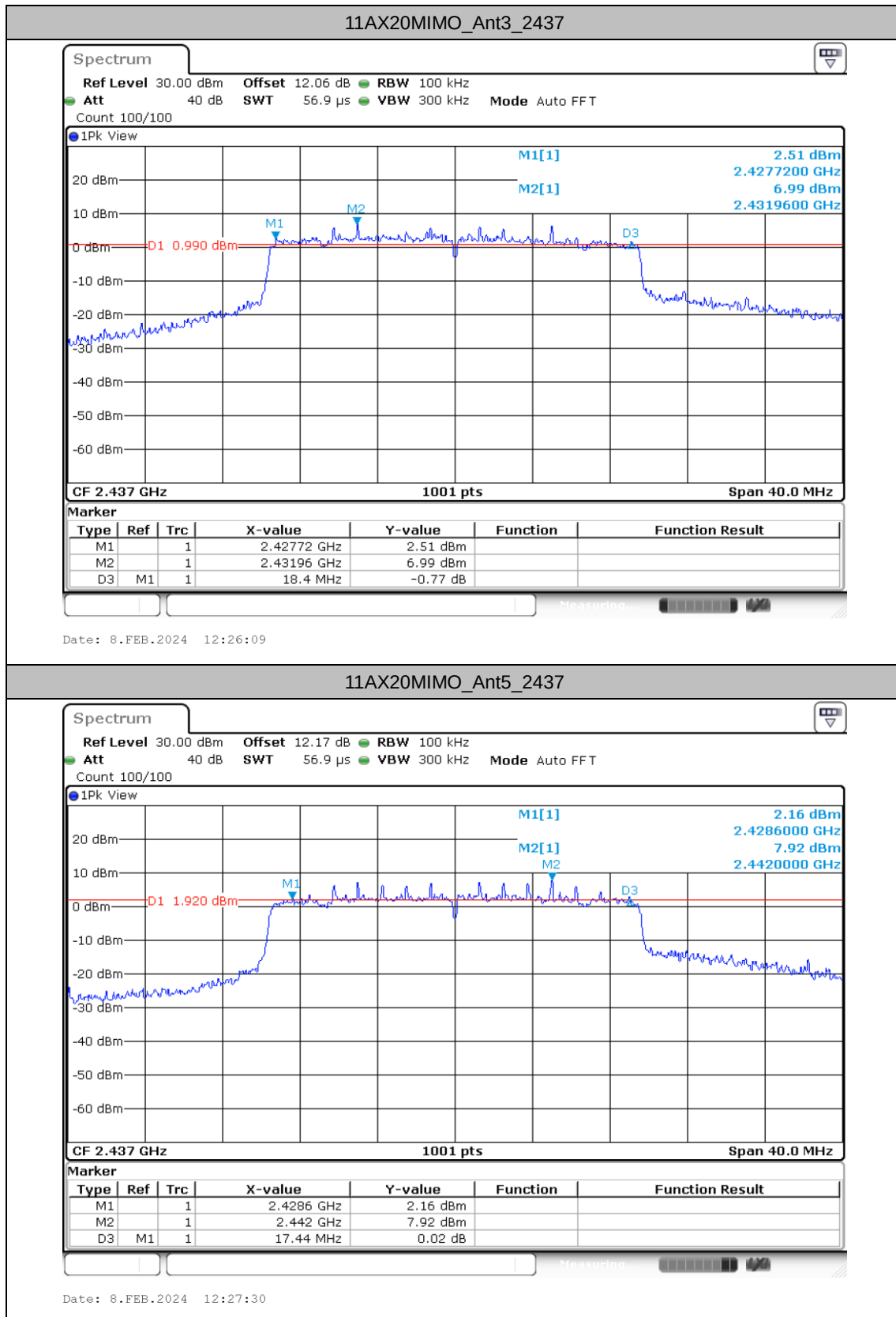


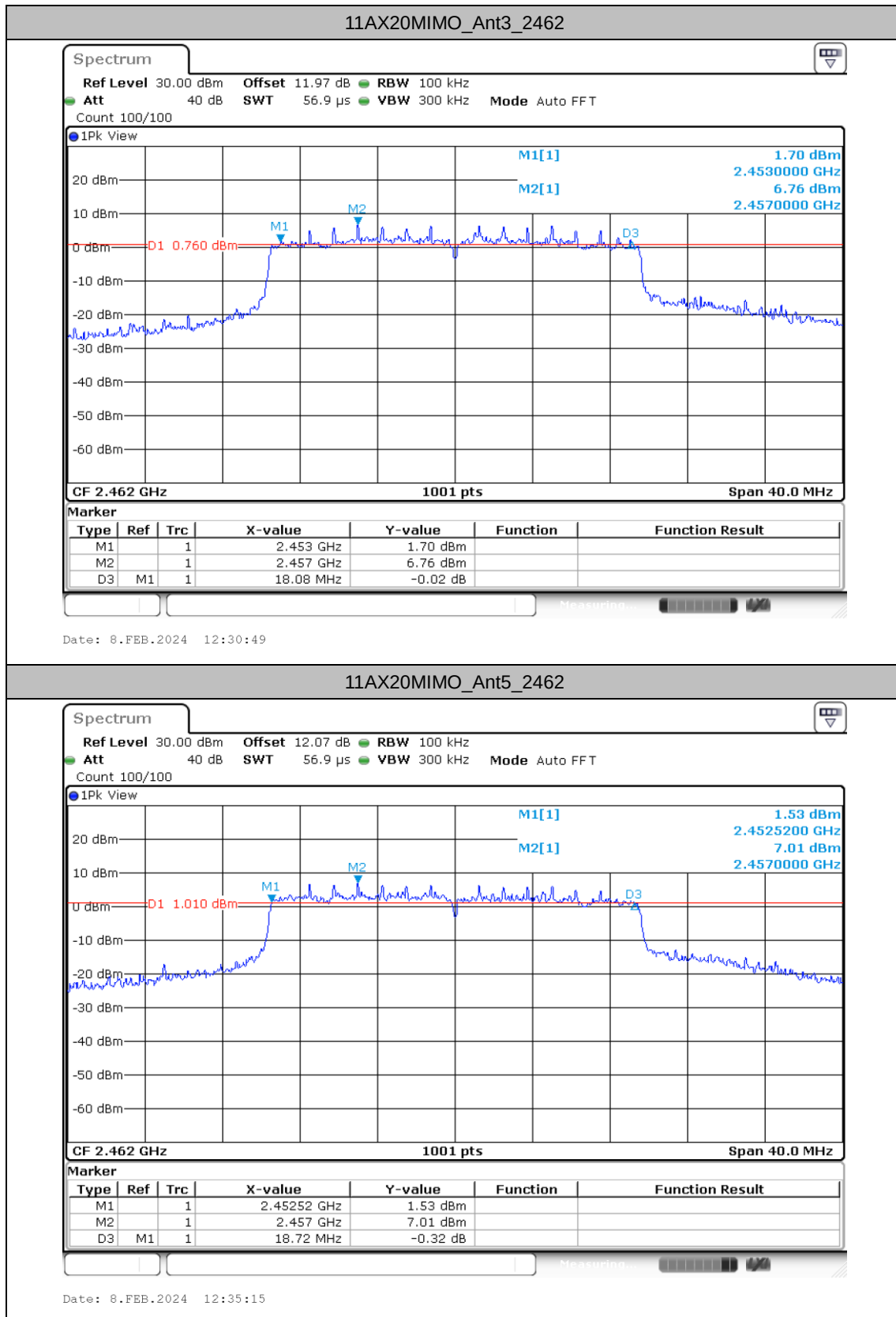


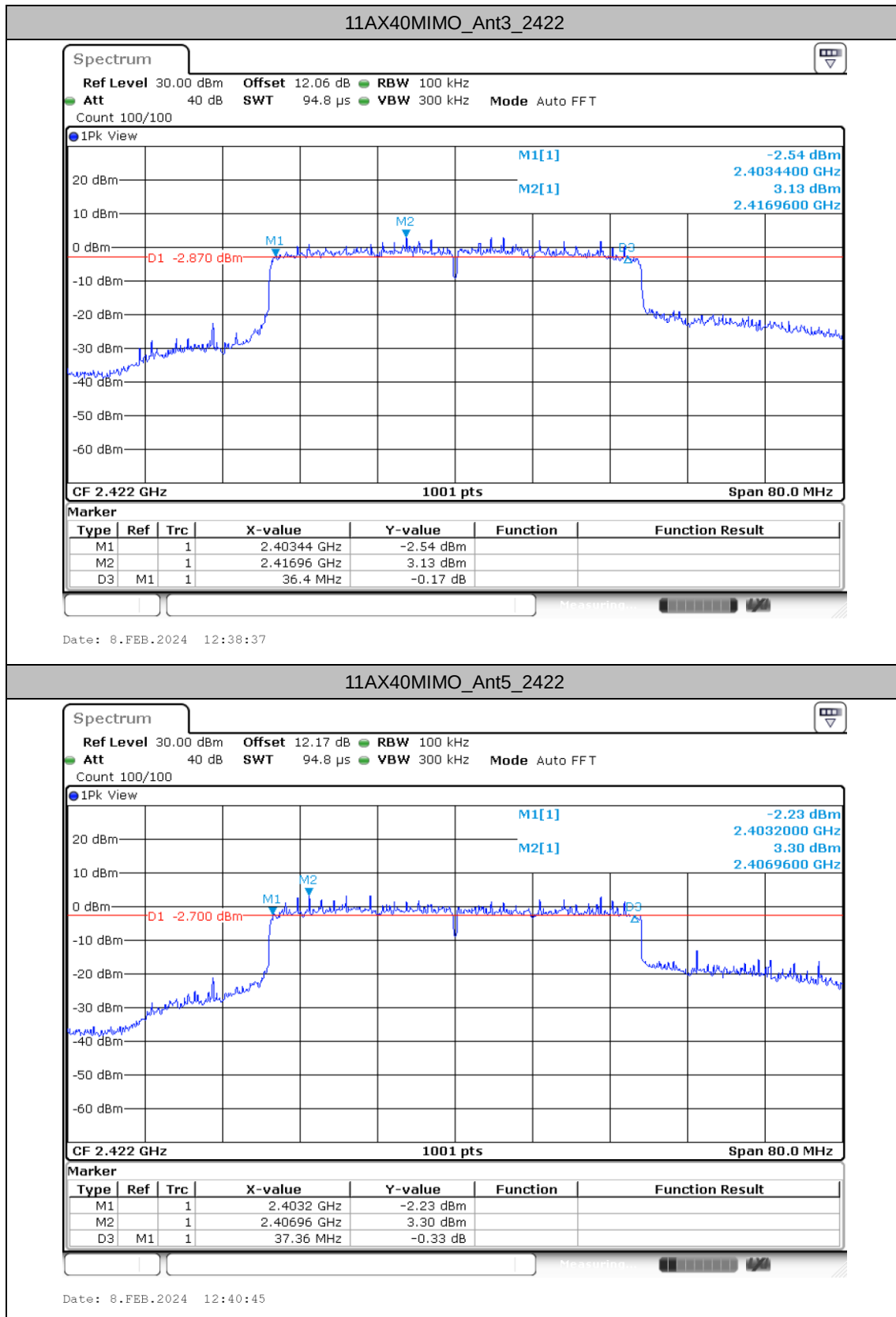


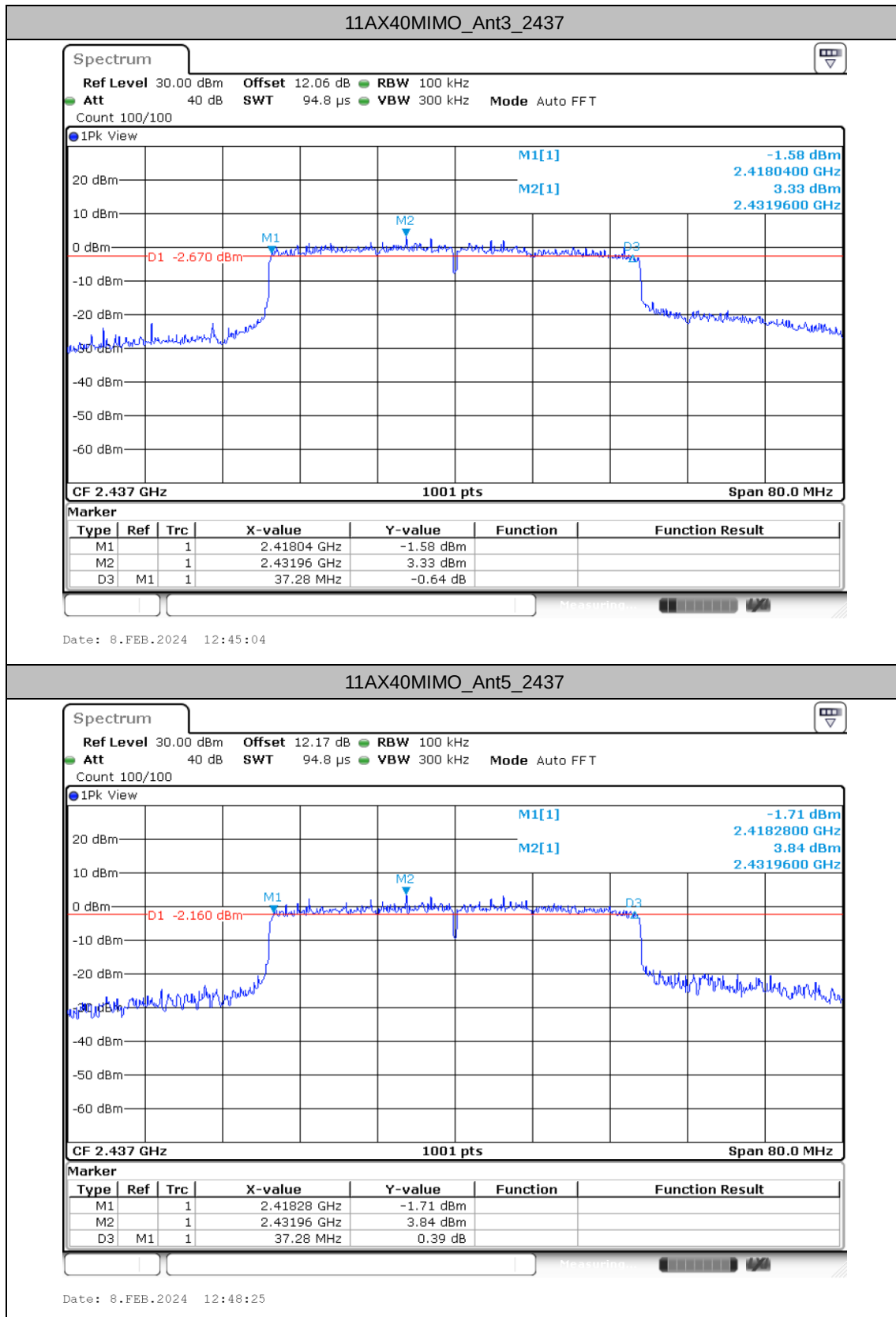


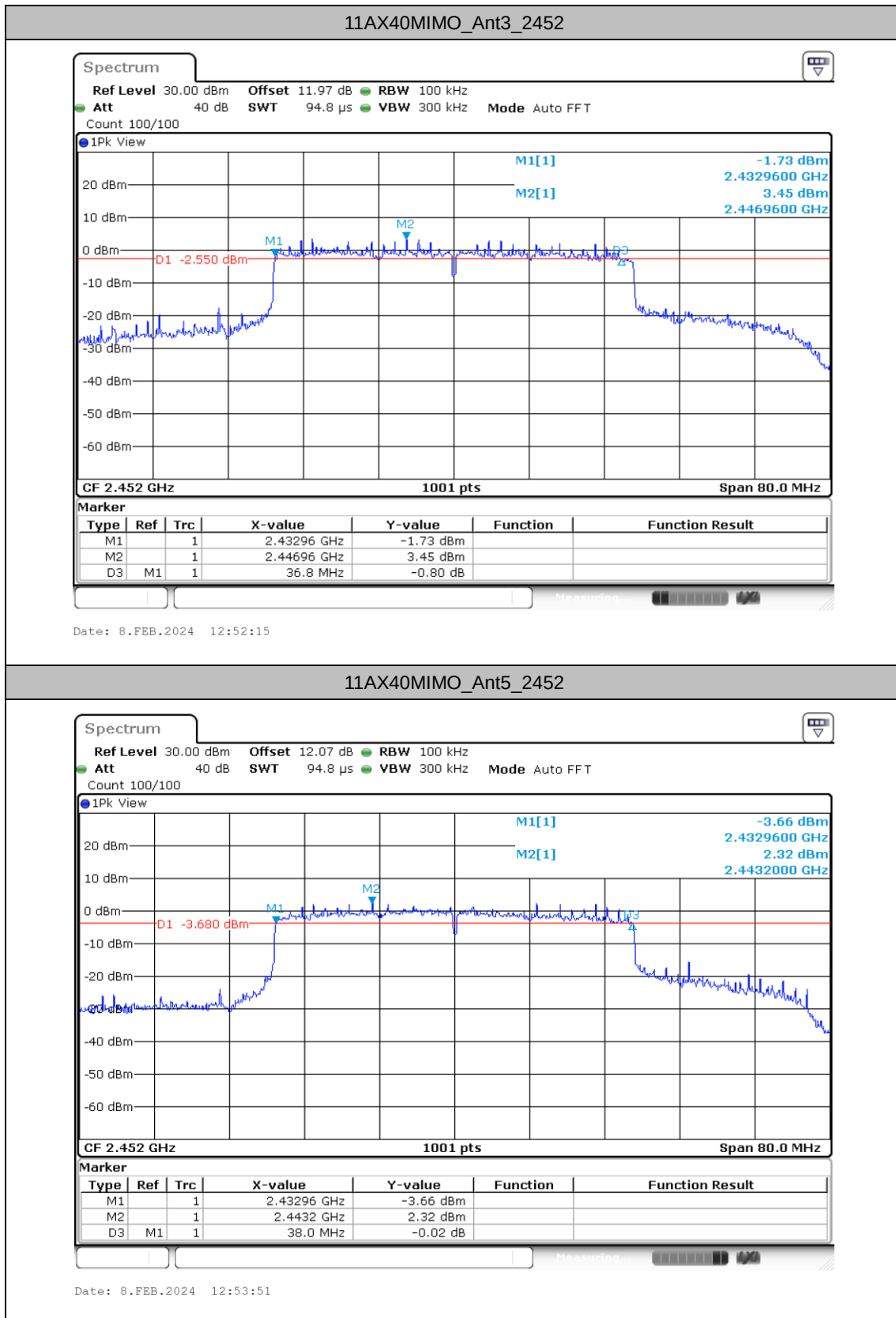














Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
11B-CDD	Ant3	2412	14.905	2404.8871	2419.7922
	Ant5	2412	16.304	2404.1678	2420.4715
	Ant3	2437	15.504	2429.4076	2444.9121
	Ant5	2437	14.785	2429.9670	2444.7522
	Ant3	2462	14.865	2454.7273	2469.5924
	Ant5	2462	15.185	2454.4476	2469.6324
11G-CDD	Ant3	2412	20.3	2402.0899	2422.3896
	Ant5	2412	22.138	2403.0889	2425.2268
	Ant3	2437	20.779	2428.3287	2449.1079
	Ant5	2437	20.42	2428.6084	2449.0280
	Ant3	2462	19.94	2453.3686	2473.3087
	Ant5	2462	19.66	2453.3287	2472.9890
11N20MIMO	Ant3	2412	21.019	2403.0090	2424.0280
	Ant5	2412	22.897	2402.7692	2425.6663
	Ant3	2437	21.099	2427.8492	2448.9481
	Ant5	2437	21.139	2428.0490	2449.1878
	Ant3	2462	20.02	2452.8092	2472.8292
	Ant5	2462	20.579	2452.6494	2473.2288
11N40MIMO	Ant3	2422	36.763	2403.9381	2440.7013
	Ant5	2422	41.159	2403.7782	2444.9371
	Ant3	2437	37.562	2418.6983	2456.2607
	Ant5	2437	37.722	2418.6983	2456.4206
	Ant3	2452	37.323	2433.4585	2470.7812
	Ant5	2452	36.763	2433.6983	2470.4615
11AX20MIMO	Ant3	2412	19.7	2402.4496	2422.1499
	Ant5	2412	21.219	2402.4096	2423.6284
	Ant3	2437	19.66	2427.2498	2446.9101
	Ant5	2437	19.54	2427.4096	2446.9500
	Ant3	2462	19.381	2452.4096	2471.7902
	Ant5	2462	19.54	2452.3297	2471.8701
11AX40MIMO	Ant3	2422	38.202	2402.9790	2441.1808
	Ant5	2422	40.04	2402.9790	2443.0190
	Ant3	2437	38.282	2417.8991	2456.1808
	Ant5	2437	38.042	2417.8991	2455.9411
	Ant3	2452	38.601	2432.6593	2471.2607
	Ant5	2452	38.202	2433.0589	2471.2607



Test Graphs

