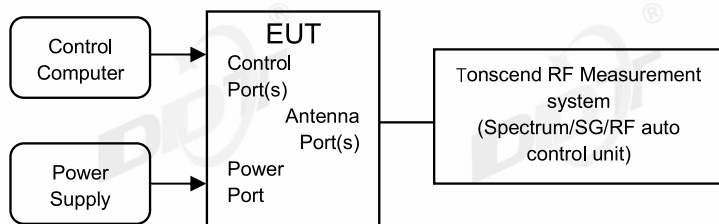


6. Conducted Output Power

6.1. Block diagram of test setup



6.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.9.2.3.
- (2) Connect EUT's antenna output to RF power meter by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously, If the transmitter does not transmit continuously, measure the duty cycle, D, of the transmitter output signal.
- (4) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
- (5) Adjust the measurement in dBm by adding $[10 \log (1 / D)]$, where D is the duty cycle.
- (6) Record the RF average power of each antenna port.

6.4. Test result average

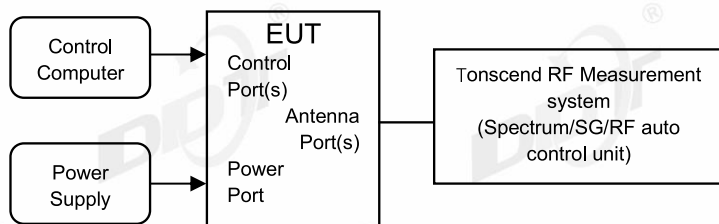
Test Engineer:	Zoe	Test Site:	RF Measurement System 3#
Ambient Condition:	22.6-23.1℃, 45.1-47.3%RH	Test Date:	2023.12.01-2023.12.04
Test Power Supply:	DC 12V from external adapter	Sample Number:	S23111603-02

Test Mode	Antenna	Frequency [MHz]	Average power [dBm]	Duty Cycle [%]	DC Factor [dB]	Result [dBm]	Limit [dBm]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11B	Ant1	2412	16.35	99.29	0.03	16.38	≤30.0	20.28	≤36.0	PASS
	Ant2	2412	15.87	99.29	0.03	15.90	≤30.0	19.80	≤36.0	PASS
	Ant1	2437	17.01	99.29	0.03	17.04	≤30.0	20.94	≤36.0	PASS
	Ant2	2437	16.00	99.29	0.03	16.03	≤30.0	19.93	≤36.0	PASS
	Ant1	2462	17.49	99.29	0.03	17.52	≤30.0	21.42	≤36.0	PASS
	Ant2	2462	16.39	99.29	0.03	16.42	≤30.0	20.32	≤36.0	PASS
11G	Ant1	2412	11.41	95.86	0.18	11.59	≤30.0	15.49	≤36.0	PASS
	Ant2	2412	10.81	95.86	0.18	10.99	≤30.0	14.89	≤36.0	PASS
	Ant1	2437	12.02	95.86	0.18	12.20	≤30.0	16.10	≤36.0	PASS
	Ant2	2437	10.85	95.89	0.18	11.03	≤30.0	14.93	≤36.0	PASS
	Ant1	2462	12.50	95.89	0.18	12.68	≤30.0	16.58	≤36.0	PASS
	Ant2	2462	11.34	95.86	0.18	11.52	≤30.0	15.42	≤36.0	PASS
11N20 MIMO	Ant1	2412	6.68	91.89	0.37	7.05	≤30.0	10.95	≤36.0	PASS
	Ant2	2412	6.30	91.89	0.37	6.67	≤30.0	10.57	≤36.0	PASS
	total	2412	---	---	---	9.87	≤30.0	13.77	≤36.0	PASS
	Ant1	2437	7.43	91.89	0.37	7.80	≤30.0	11.70	≤36.0	PASS
	Ant2	2437	6.44	91.78	0.37	6.81	≤30.0	10.71	≤36.0	PASS
	total	2437	---	---	---	10.34	≤30.0	14.24	≤36.0	PASS
	Ant1	2462	7.97	91.89	0.37	8.34	≤30.0	12.24	≤36.0	PASS
	Ant2	2462	6.96	91.78	0.37	7.33	≤30.0	11.23	≤36.0	PASS
	total	2462	---	---	---	10.87	≤30.0	14.77	≤36.0	PASS
	total	2412-2462	---	---	---	10.34	≤30.0	14.24	≤36.0	PASS
11N40 MIMO	Ant1	2422	6.37	85.00	0.71	7.08	≤30.0	10.98	≤36.0	PASS
	Ant2	2422	6.12	85.37	0.69	6.81	≤30.0	10.71	≤36.0	PASS
	total	2422	---	---	---	9.96	≤30.0	13.86	≤36.0	PASS
	Ant1	2437	7.04	85.37	0.69	7.73	≤30.0	11.63	≤36.0	PASS
	Ant2	2437	5.97	85.37	0.69	6.66	≤30.0	10.56	≤36.0	PASS
	total	2437	---	---	---	10.24	≤30.0	14.14	≤36.0	PASS
	Ant1	2452	7.04	85.37	0.69	7.73	≤30.0	11.63	≤36.0	PASS
	Ant2	2452	6.18	85.37	0.69	6.87	≤30.0	10.77	≤36.0	PASS
total	2452	---	---	---	10.33	≤30.0	14.23	≤36.0	PASS	
11AX20 MIMO	Ant1	2412	6.98	90.32	0.44	7.42	≤30.0	11.32	≤36.0	PASS
	Ant2	2412	6.69	90.32	0.44	7.13	≤30.0	11.03	≤36.0	PASS
	total	2412	---	---	---	10.29	≤30.0	14.19	≤36.0	PASS
	Ant1	2437	7.39	90.32	0.44	7.83	≤30.0	11.73	≤36.0	PASS
	Ant2	2437	6.72	90.32	0.44	7.16	≤30.0	11.06	≤36.0	PASS
	total	2437	---	---	---	10.52	≤30.0	14.42	≤36.0	PASS
	Ant1	2462	8.03	90.32	0.44	8.47	≤30.0	12.37	≤36.0	PASS
	Ant2	2462	7.22	90.32	0.44	7.66	≤30.0	11.56	≤36.0	PASS
total	2462	---	---	---	11.09	≤30.0	14.99	≤36.0	PASS	
11AX40 MIMO	Ant1	2422	5.81	84.21	0.75	6.56	≤30.0	10.46	≤36.0	PASS
	Ant2	2422	4.84	84.21	0.75	5.59	≤30.0	9.49	≤36.0	PASS
	total	2422	---	---	---	9.11	≤30.0	13.01	≤36.0	PASS
	Ant1	2437	5.81	84.21	0.75	6.56	≤30.0	10.46	≤36.0	PASS
	Ant2	2437	5.20	84.21	0.75	5.95	≤30.0	9.85	≤36.0	PASS
	total	2437	---	---	---	9.28	≤30.0	13.18	≤36.0	PASS
	Ant1	2452	5.77	84.21	0.75	6.52	≤30.0	10.42	≤36.0	PASS
	Ant2	2452	5.27	84.21	0.75	6.02	≤30.0	9.92	≤36.0	PASS
total	2452	---	---	---	9.29	≤30.0	13.19	≤36.0	PASS	

Note: EIRP (dBm)=Conducted Output Power (dBm)+ Antenna Gain (dBi)

7. Power Spectral Density

7.1. Block diagram of test setup



7.2. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

7.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.10.5.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for Power Spectral Density measurement:

Center frequency	DTS Channel center frequency
RBW:	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW:	$\geq 3\text{RBW}$
Span	1.5 times the DTS bandwidth
Detector Mode:	RMS
Sweep time:	auto
Trace mode	max hold
Trace	Employ trace averaging (rms) mode over a minimum of 100 traces.

- (5) Add $[10 \log (1 / D)]$, where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time.
- (6) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

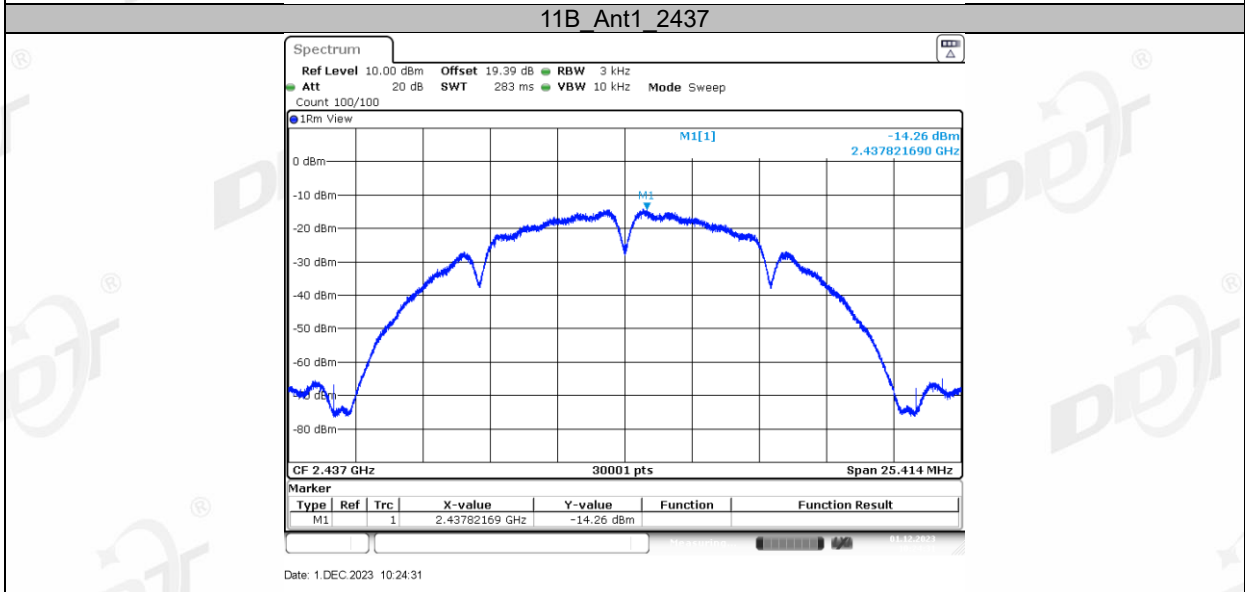
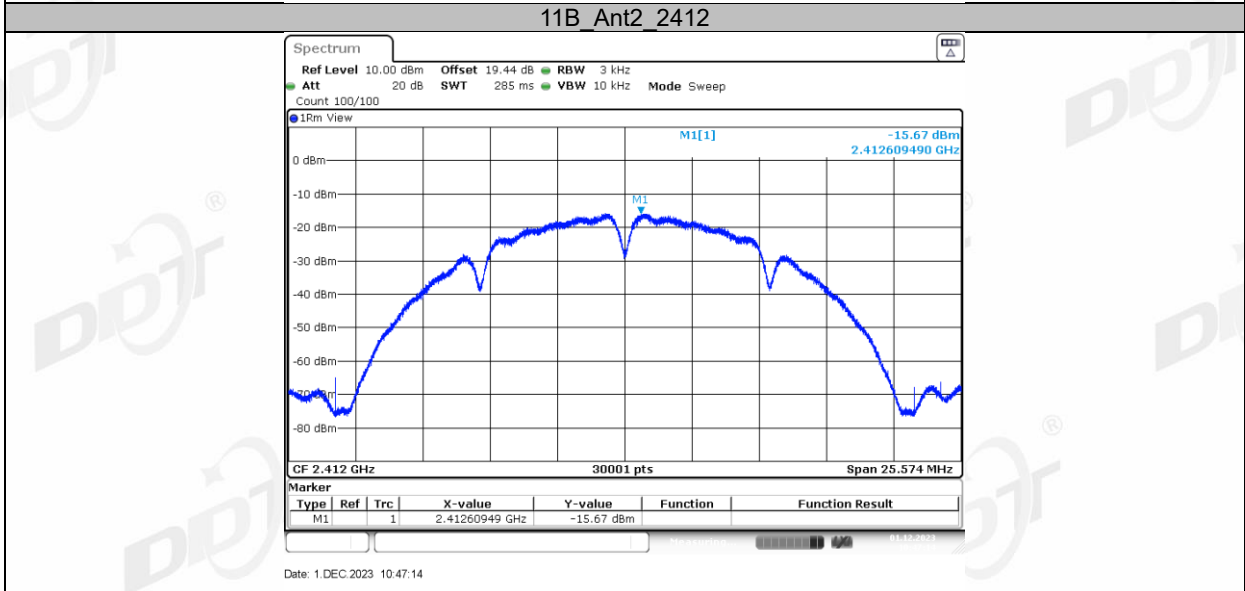
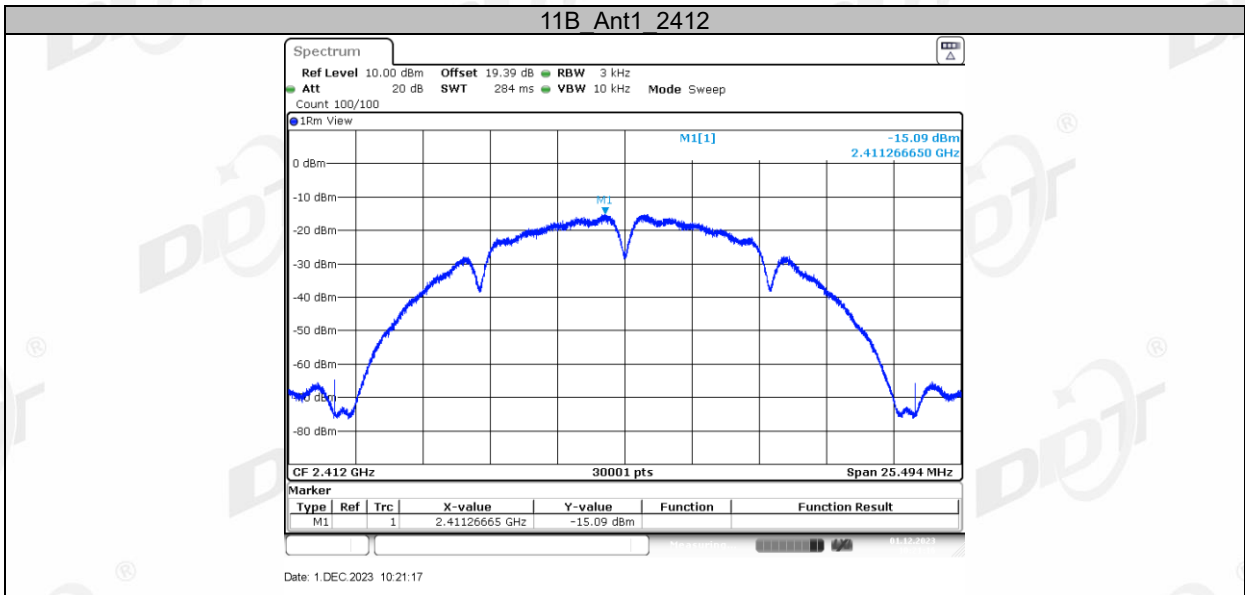
7.4. Test result

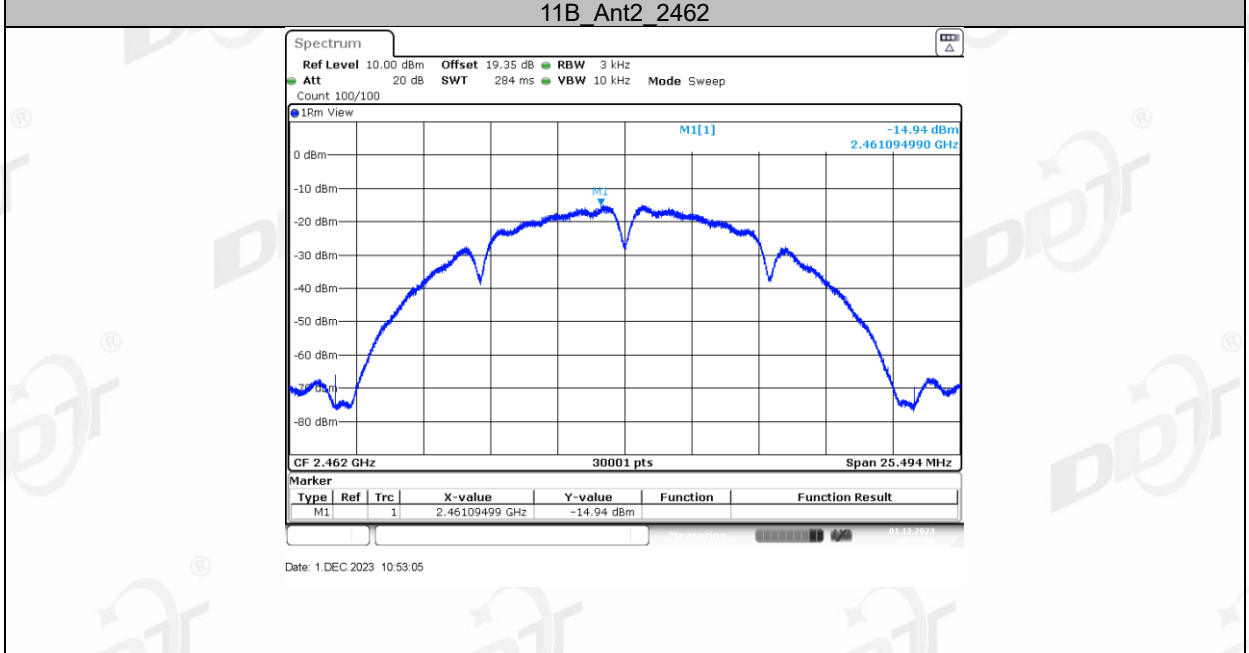
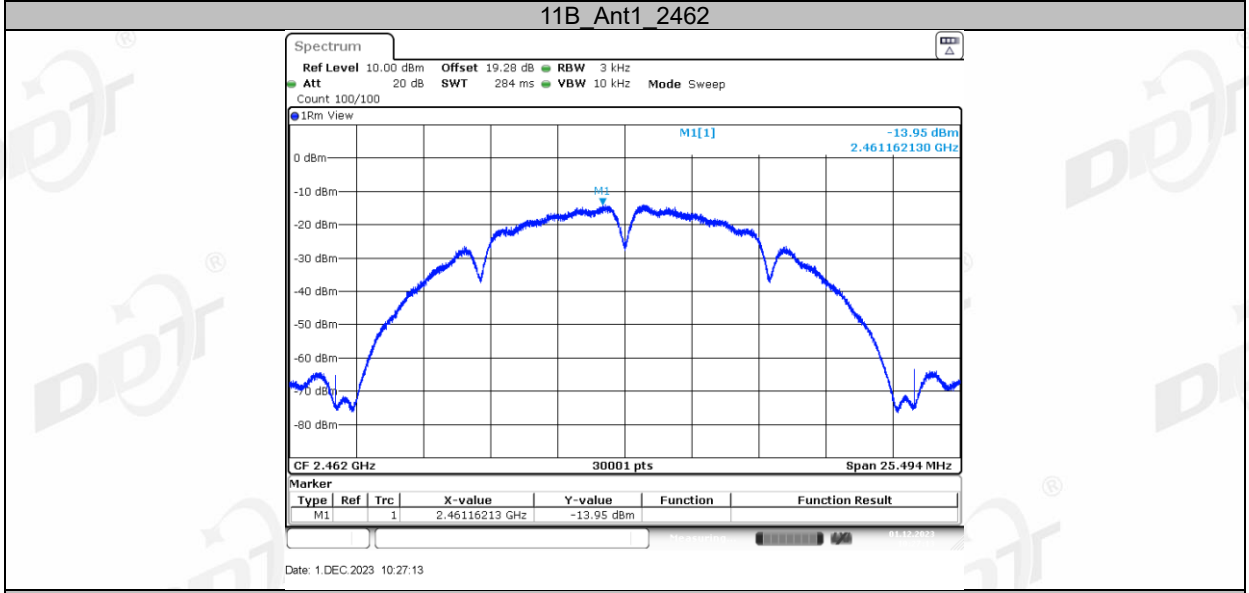
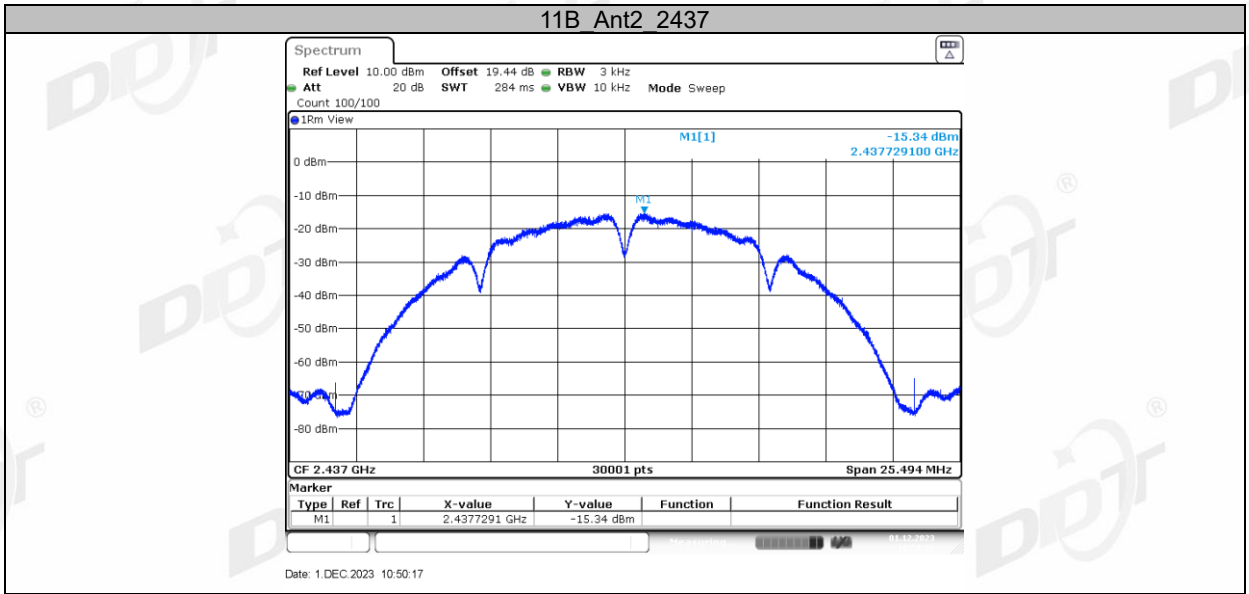
Test Engineer:	Zoe	Test Site:	RF Measurement System 3#
Ambient Condition:	22.6-23.1℃, 45.1-47.3%RH	Test Date:	2023.12.01-2023.12.04
Test Power Supply:	DC 12V from external adapter	Sample Number:	S23111603-02

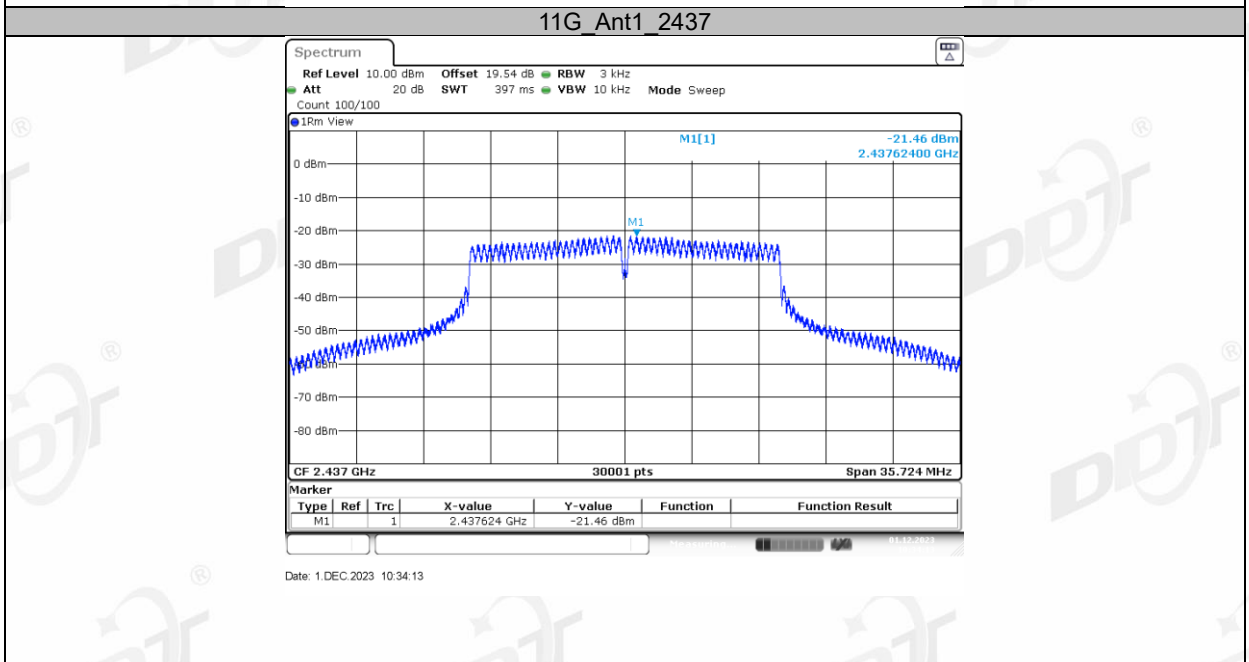
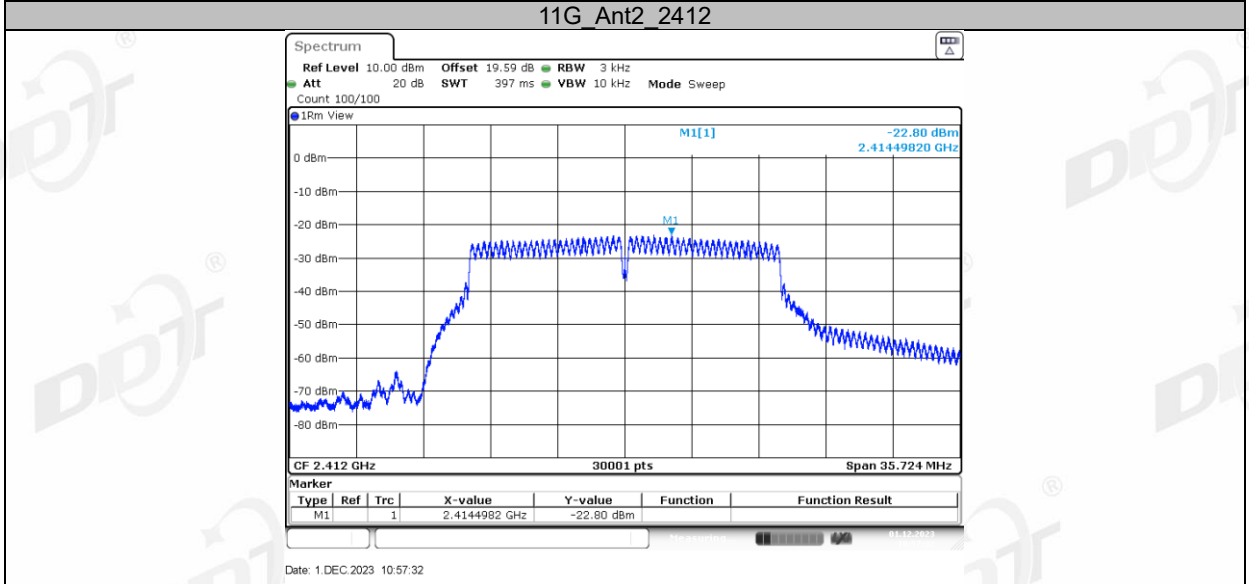
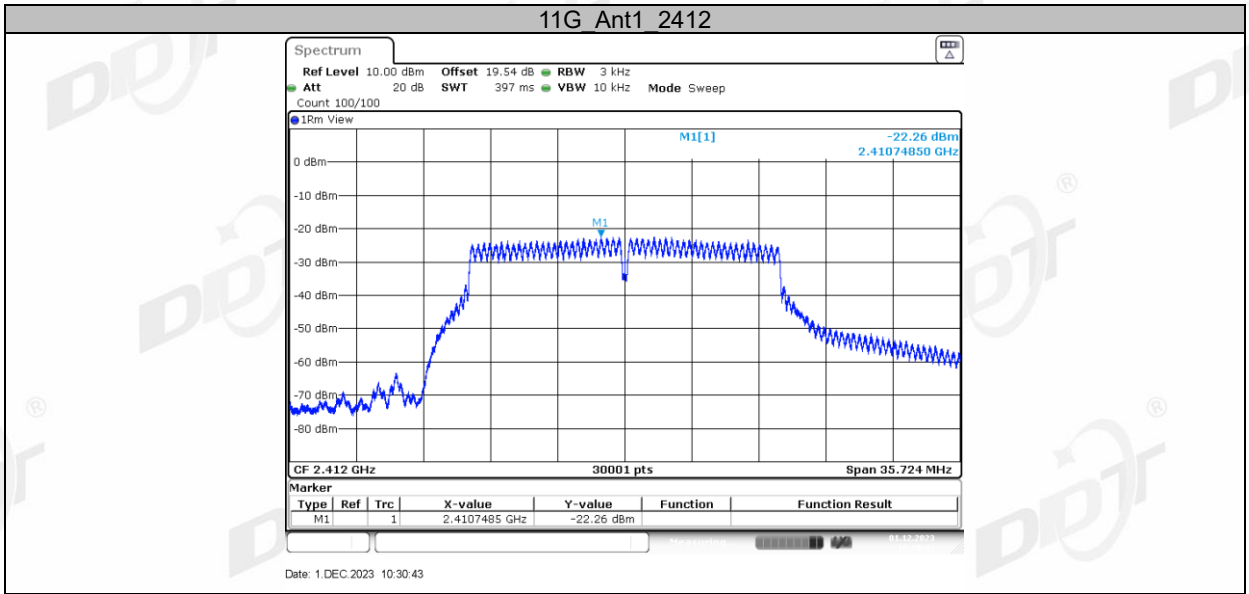
Test Mode	Antenna	Frequency [MHz]	Result [dBm/3-100kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-15.09	≤8.00	PASS
	Ant2	2412	-15.67	≤8.00	PASS
	Ant1	2437	-14.26	≤8.00	PASS
	Ant2	2437	-15.34	≤8.00	PASS
	Ant1	2462	-13.95	≤8.00	PASS
	Ant2	2462	-14.94	≤8.00	PASS
11G	Ant1	2412	-22.26	≤8.00	PASS
	Ant2	2412	-22.80	≤8.00	PASS
	Ant1	2437	-21.46	≤8.00	PASS
	Ant2	2437	-22.44	≤8.00	PASS
	Ant1	2462	-20.87	≤8.00	PASS
	Ant2	2462	-22.08	≤8.00	PASS
11N20MIMO	Ant1	2412	-26.68	≤8.00	PASS
	Ant2	2412	-26.10	≤8.00	PASS
	total	2412	-23.37	≤8.00	PASS
	Ant1	2437	-25.32	≤8.00	PASS
	Ant2	2437	-25.38	≤8.00	PASS
	total	2437	-22.34	≤8.00	PASS
	Ant1	2462	-24.97	≤8.00	PASS
	Ant2	2462	-25.77	≤8.00	PASS
total	2462	-22.34	≤8.00	PASS	
11N40MIMO	Ant1	2422	-30.39	≤8.00	PASS
	Ant2	2422	-30.55	≤8.00	PASS
	total	2422	-27.46	≤8.00	PASS
	Ant1	2437	-29.75	≤8.00	PASS
	Ant2	2437	-30.56	≤8.00	PASS
	total	2437	-27.13	≤8.00	PASS
	Ant1	2452	-29.82	≤8.00	PASS
	Ant2	2452	-30.63	≤8.00	PASS
total	2452	-27.20	≤8.00	PASS	
11AX20MIMO	Ant1	2412	-25.47	≤8.00	PASS
	Ant2	2412	-25.16	≤8.00	PASS
	total	2412	-22.30	≤8.00	PASS
	Ant1	2437	-24.50	≤8.00	PASS
	Ant2	2437	-25.51	≤8.00	PASS
	total	2437	-21.97	≤8.00	PASS
	Ant1	2462	-24.11	≤8.00	PASS
	Ant2	2462	-24.59	≤8.00	PASS
total	2462	-21.33	≤8.00	PASS	
11AX40MIMO	Ant1	2422	-31.35	≤8.00	PASS
	Ant2	2422	-32.23	≤8.00	PASS
	total	2422	-28.76	≤8.00	PASS
	Ant1	2437	-31.26	≤8.00	PASS
	Ant2	2437	-31.81	≤8.00	PASS
	total	2437	-28.52	≤8.00	PASS
	Ant1	2452	-31.14	≤8.00	PASS
	Ant2	2452	-31.41	≤8.00	PASS
total	2452	-28.26	≤8.00	PASS	

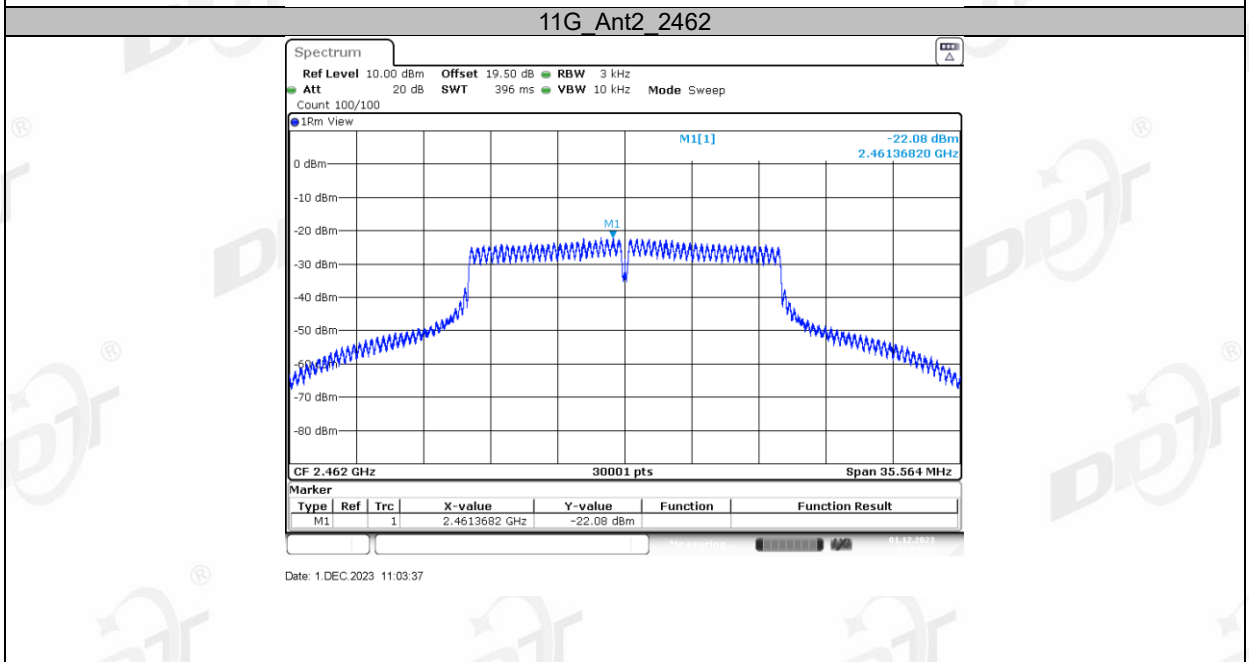
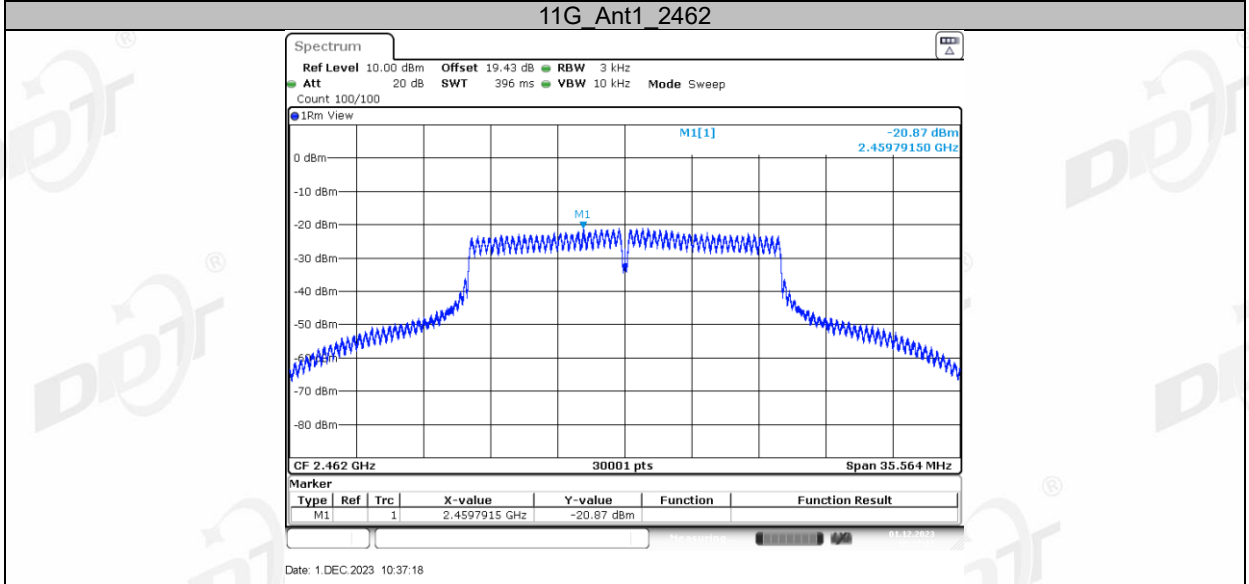
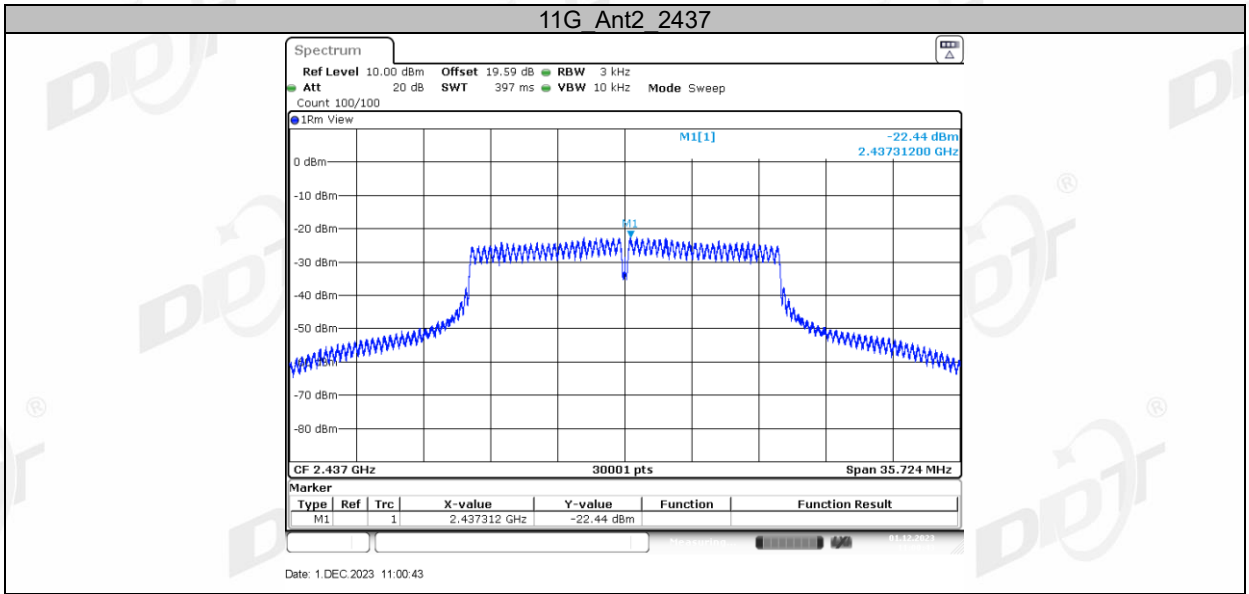
Note: The Duty Cycle Factor is compensated in the graph.

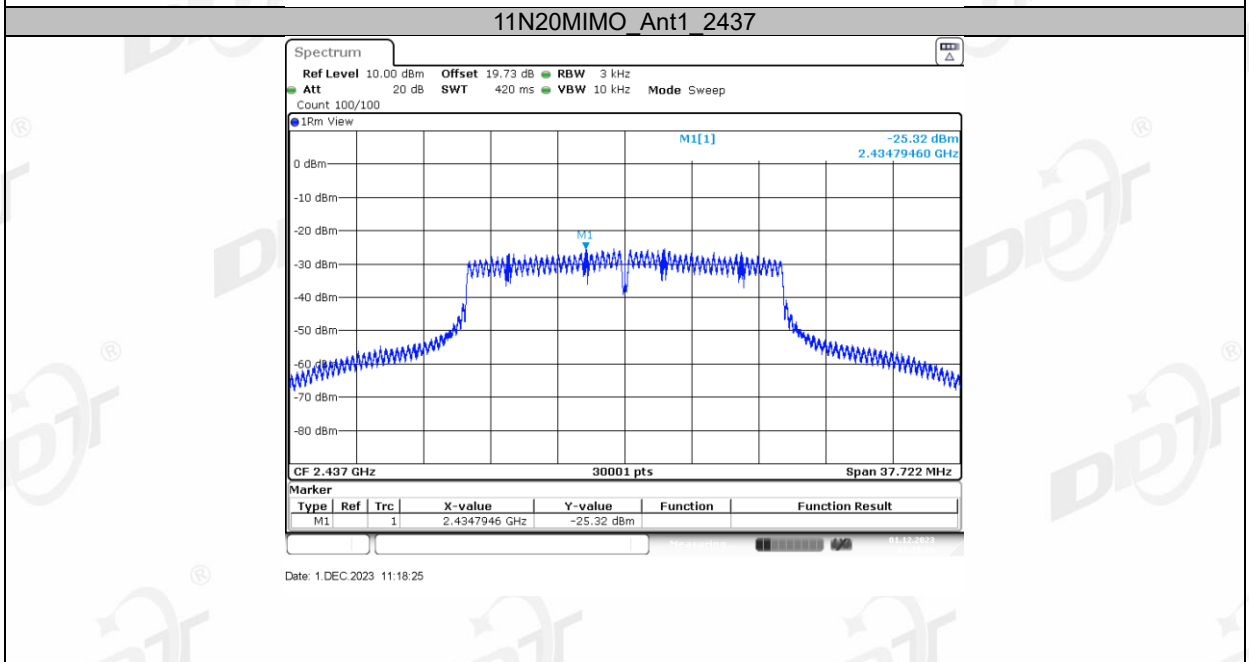
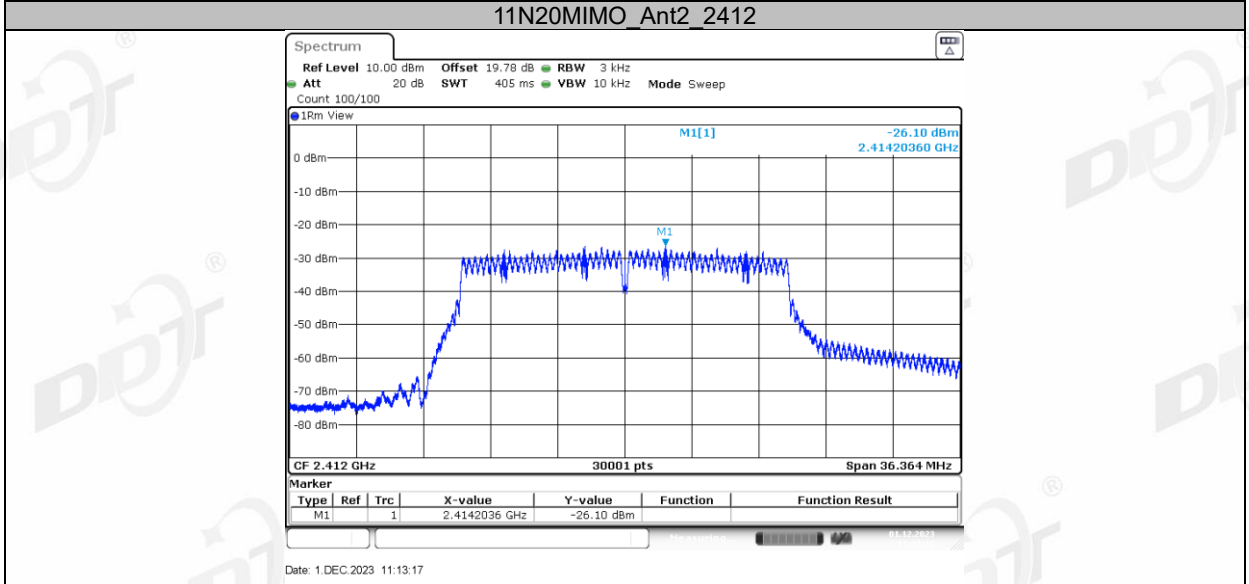
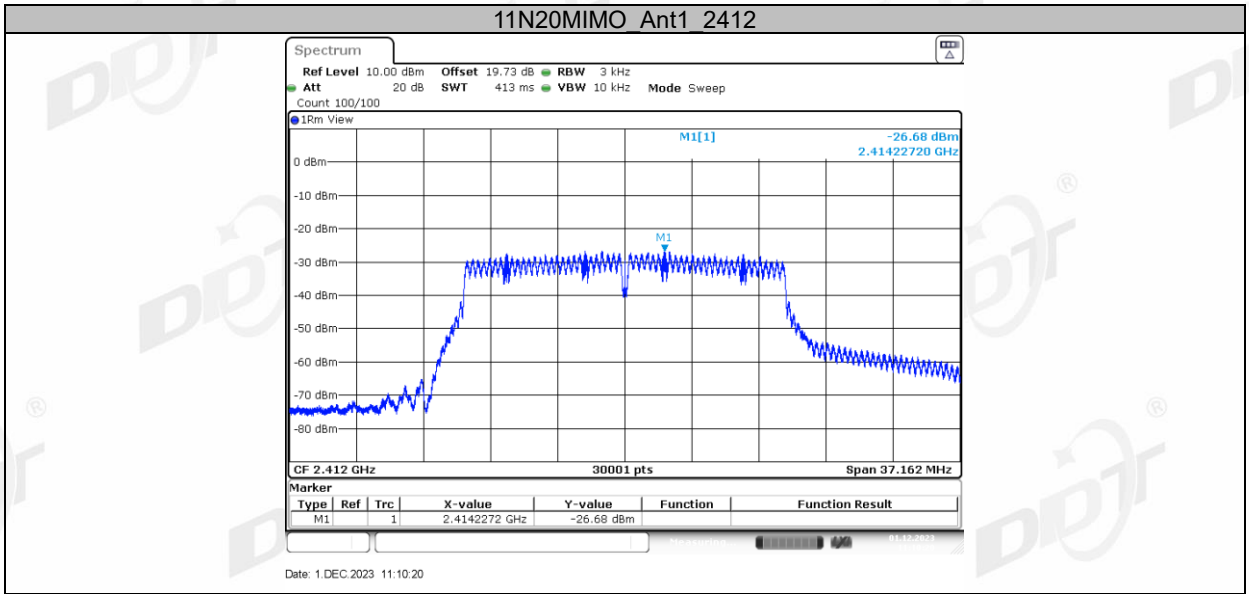
7.5. Test graphs

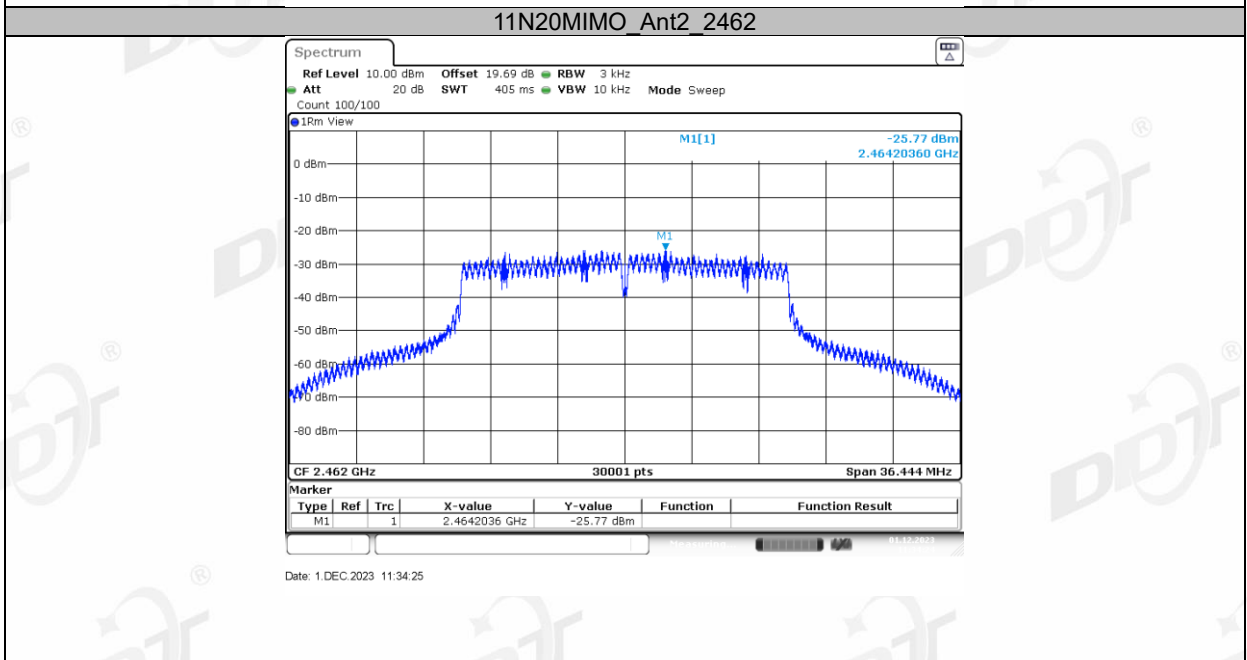
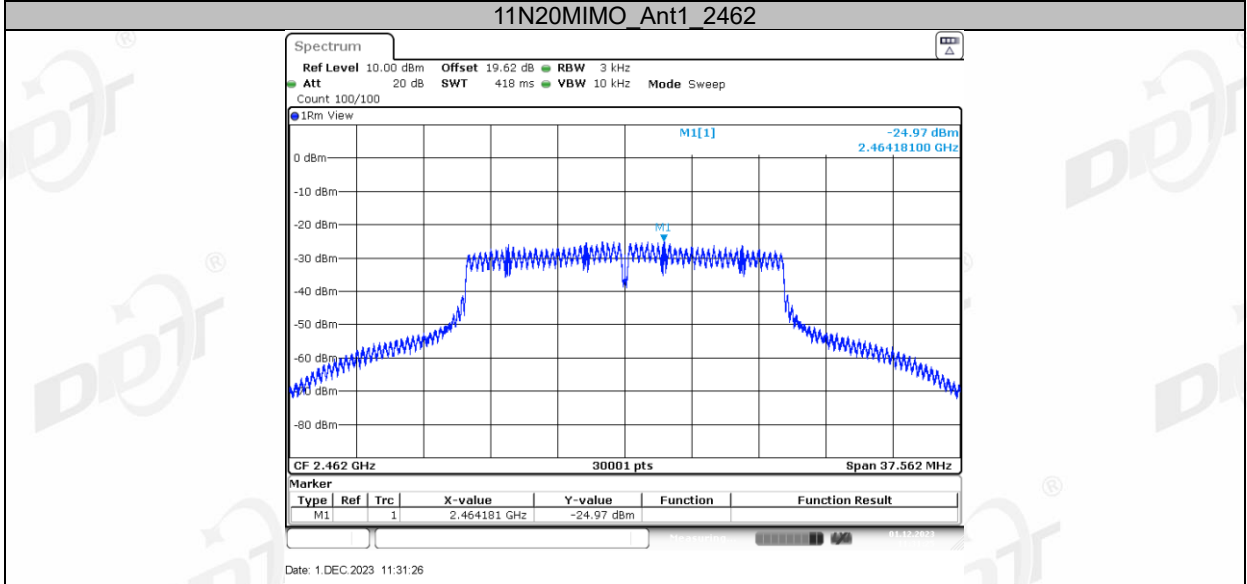
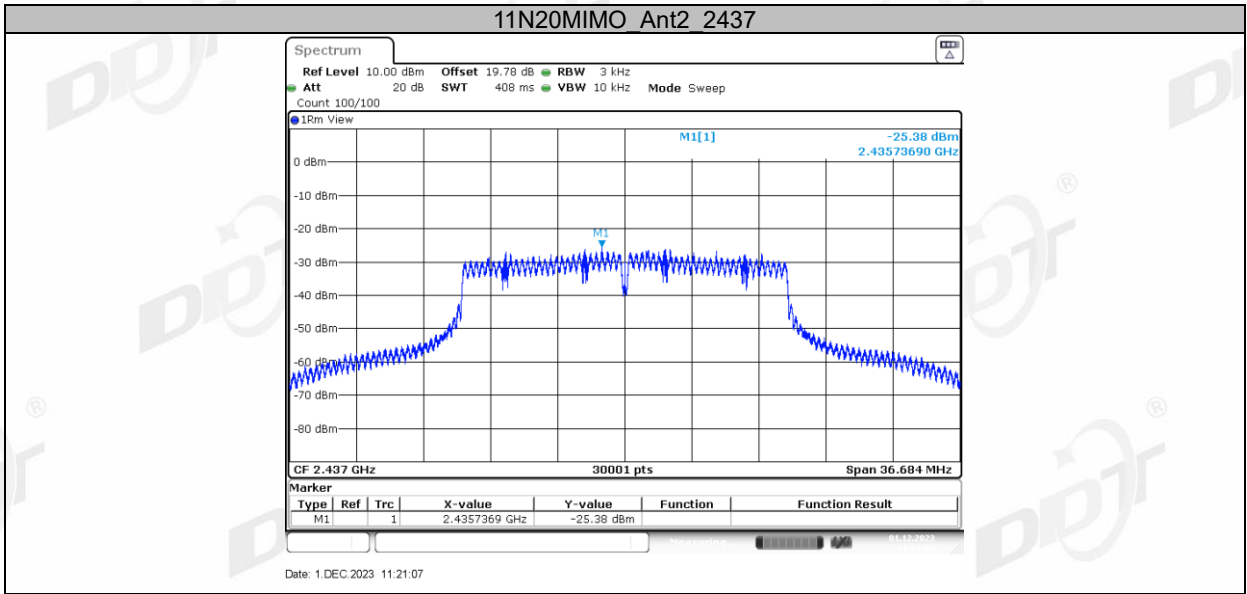


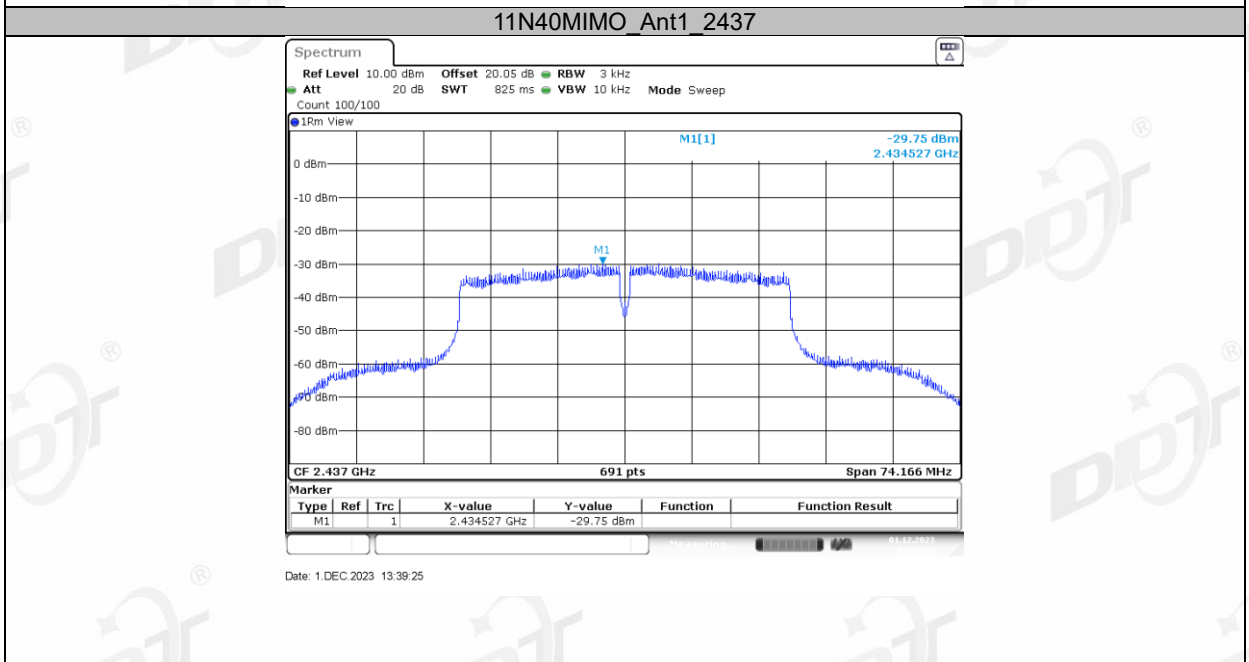
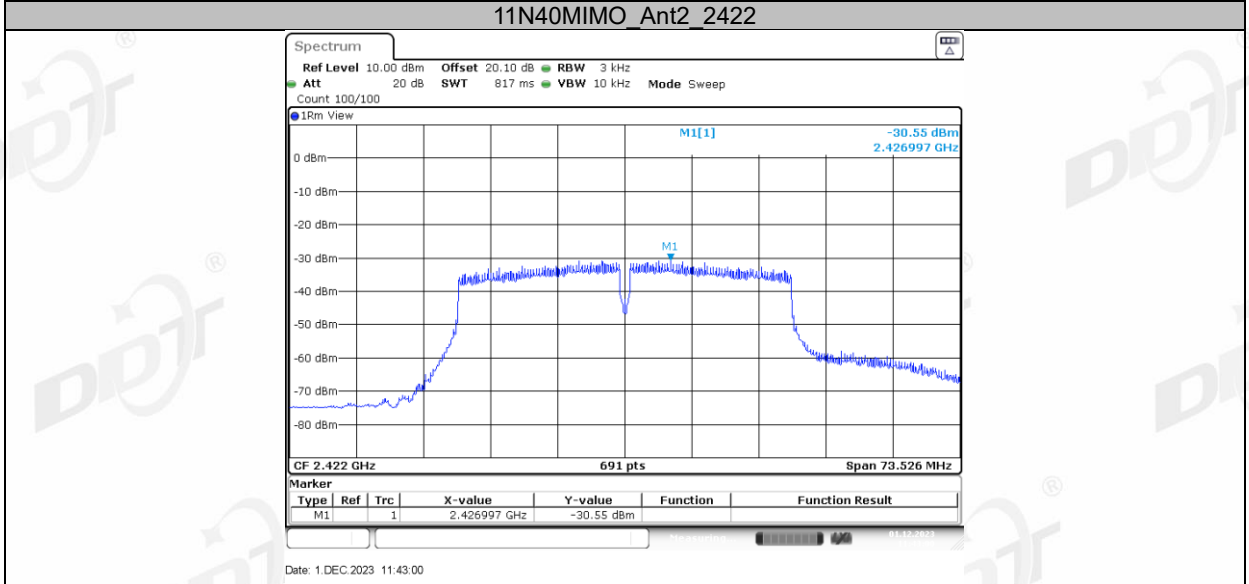
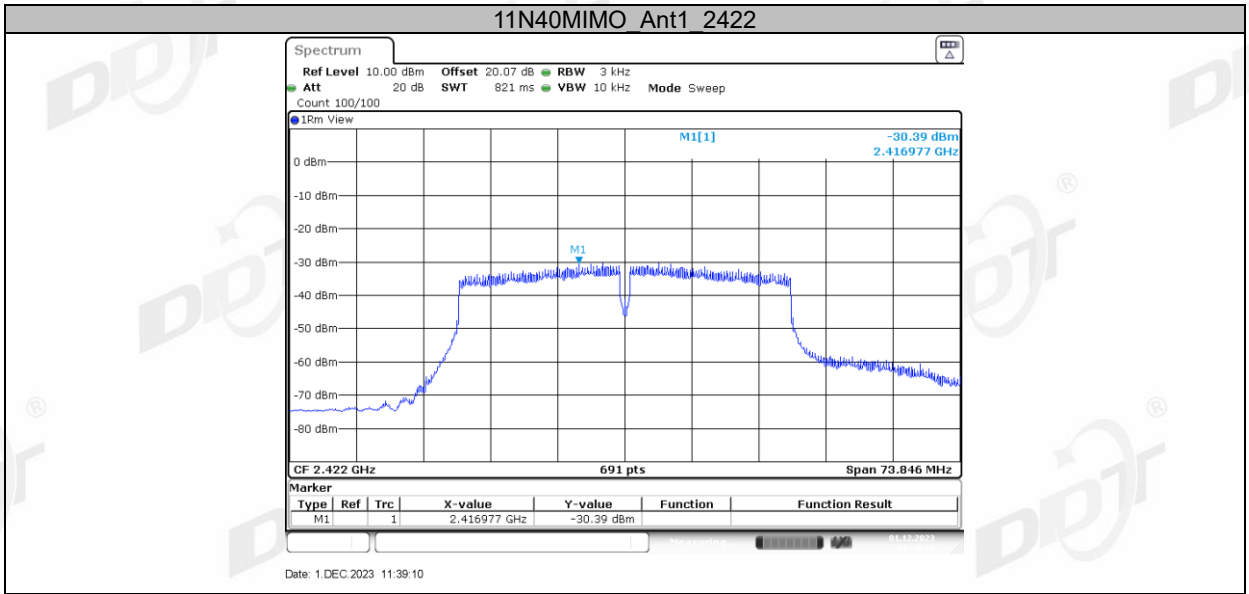


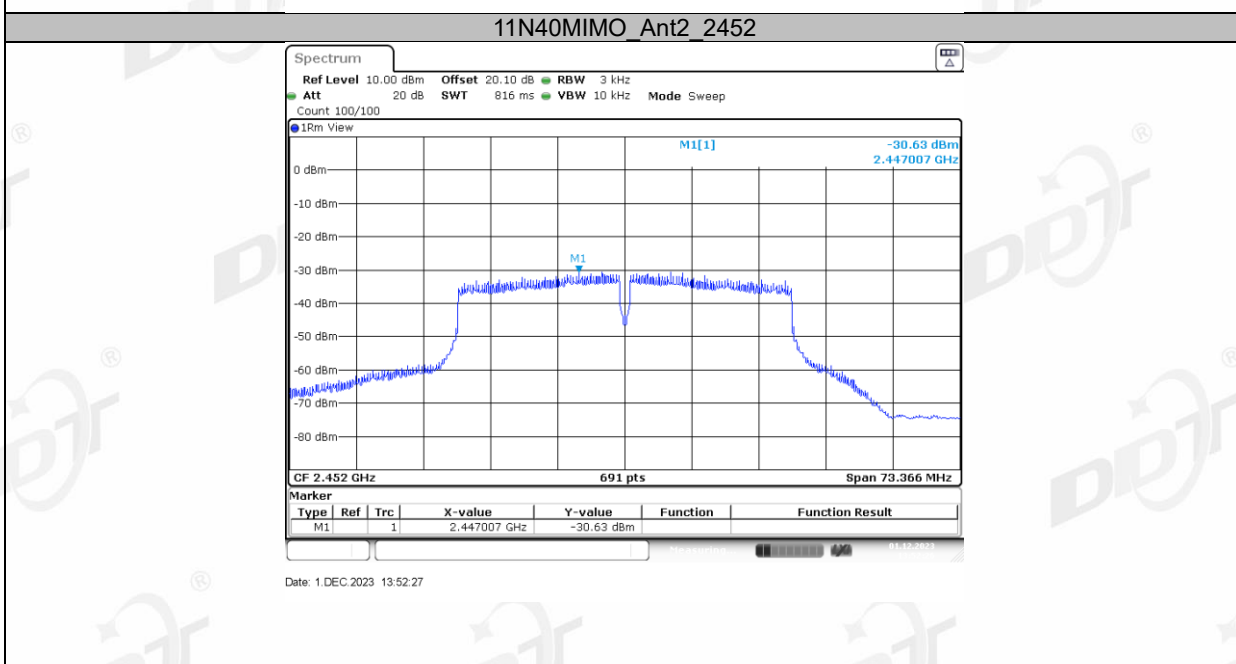
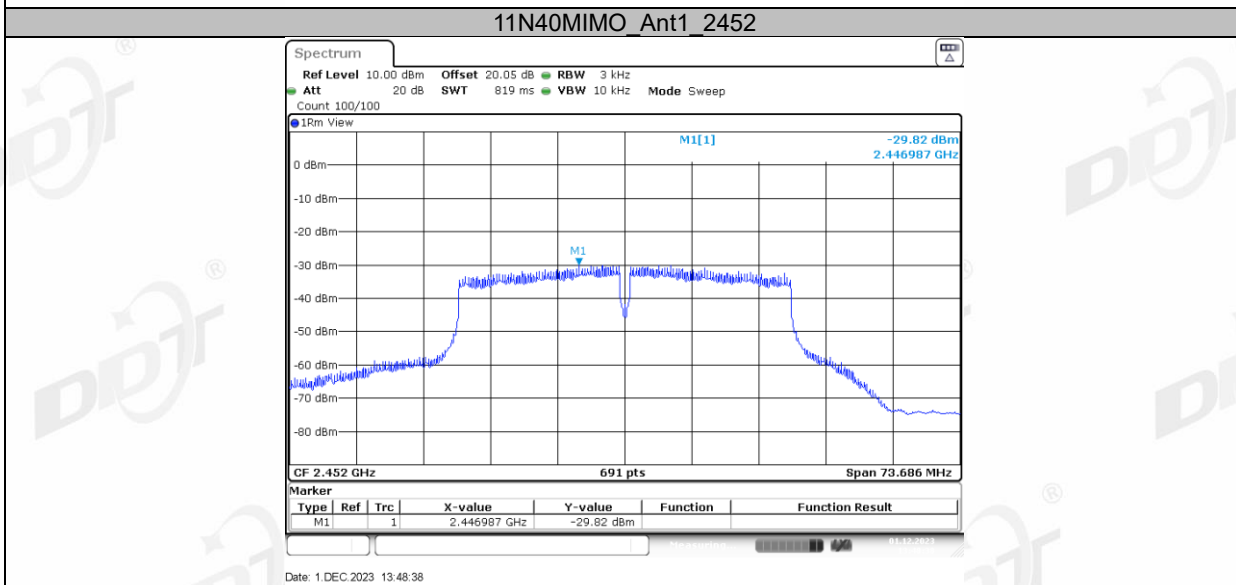
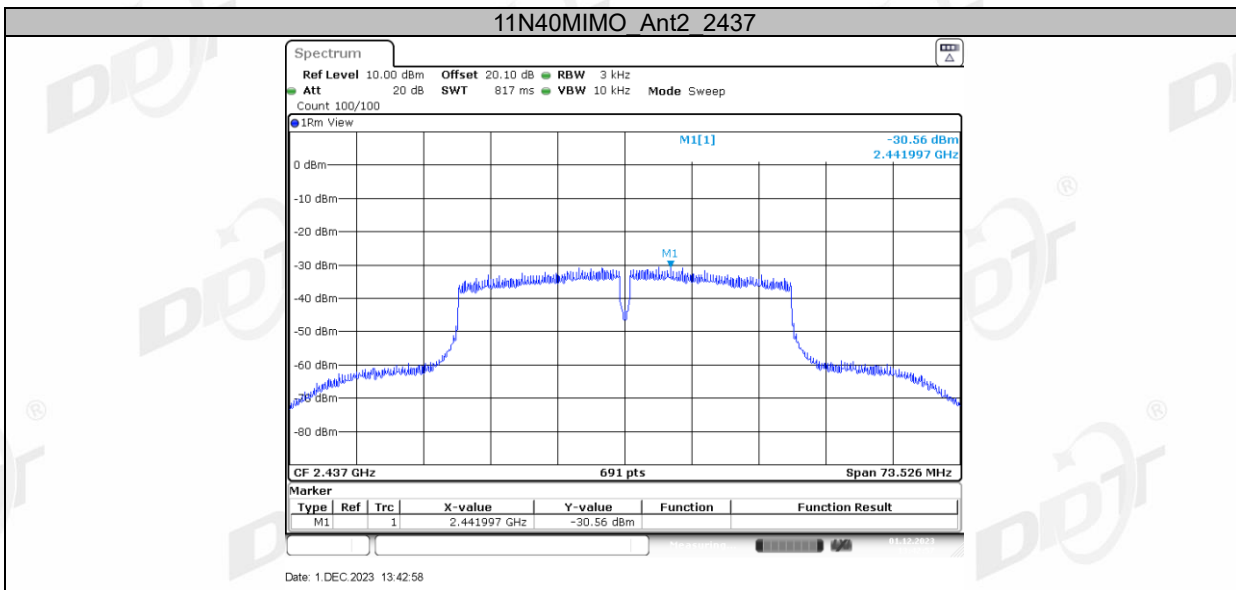


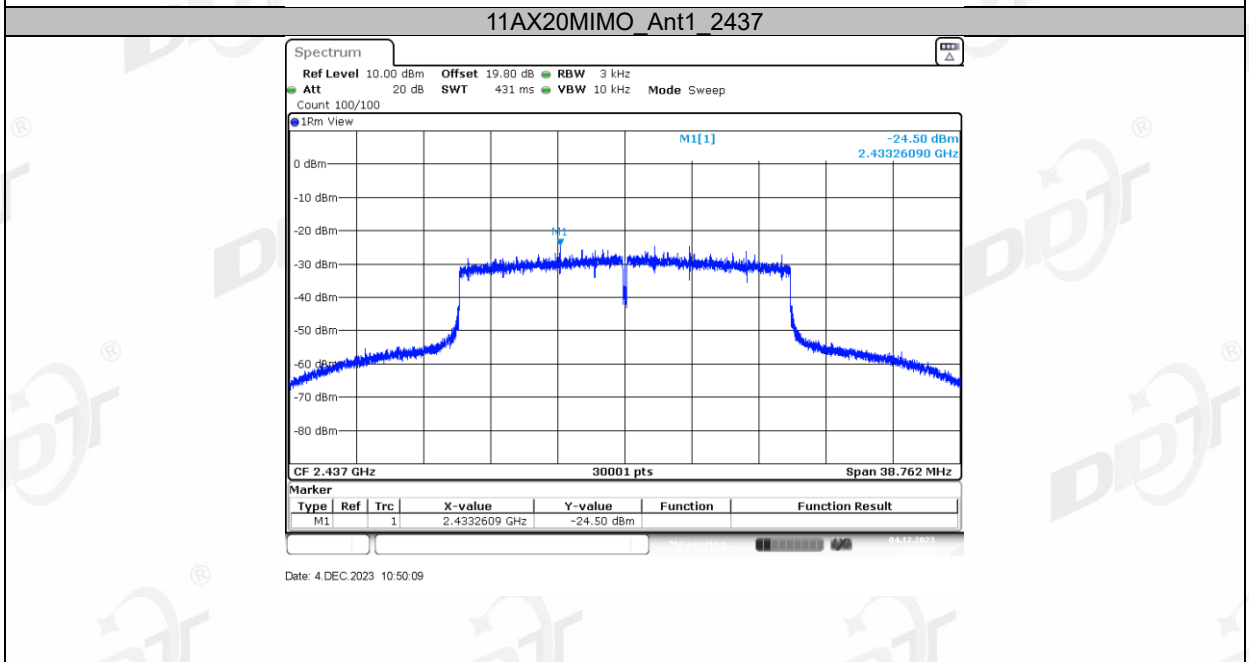
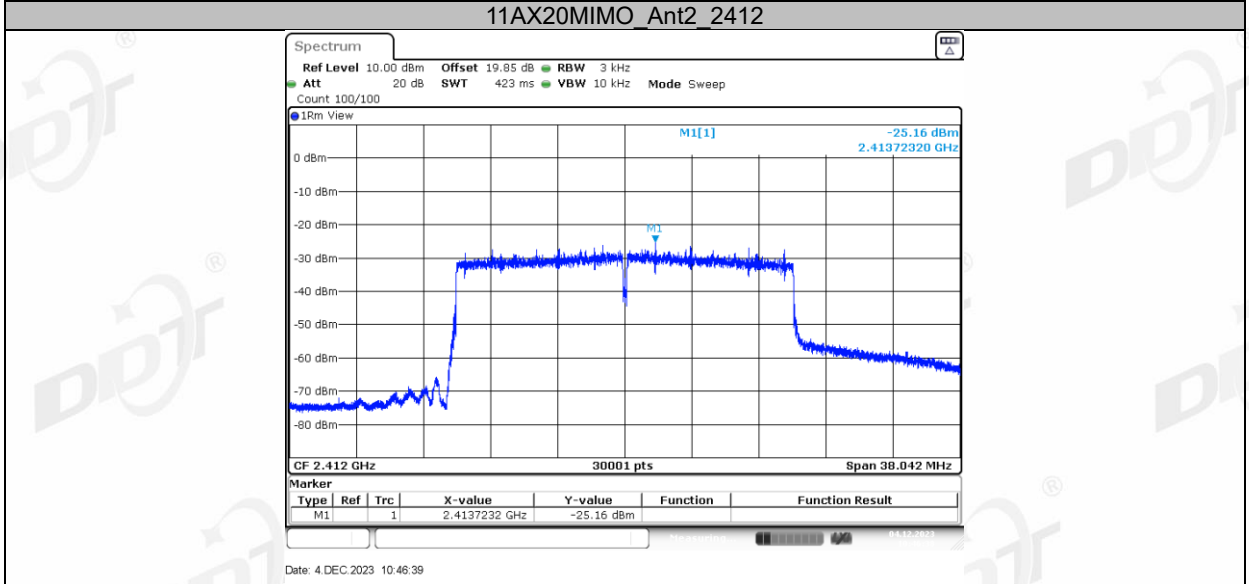
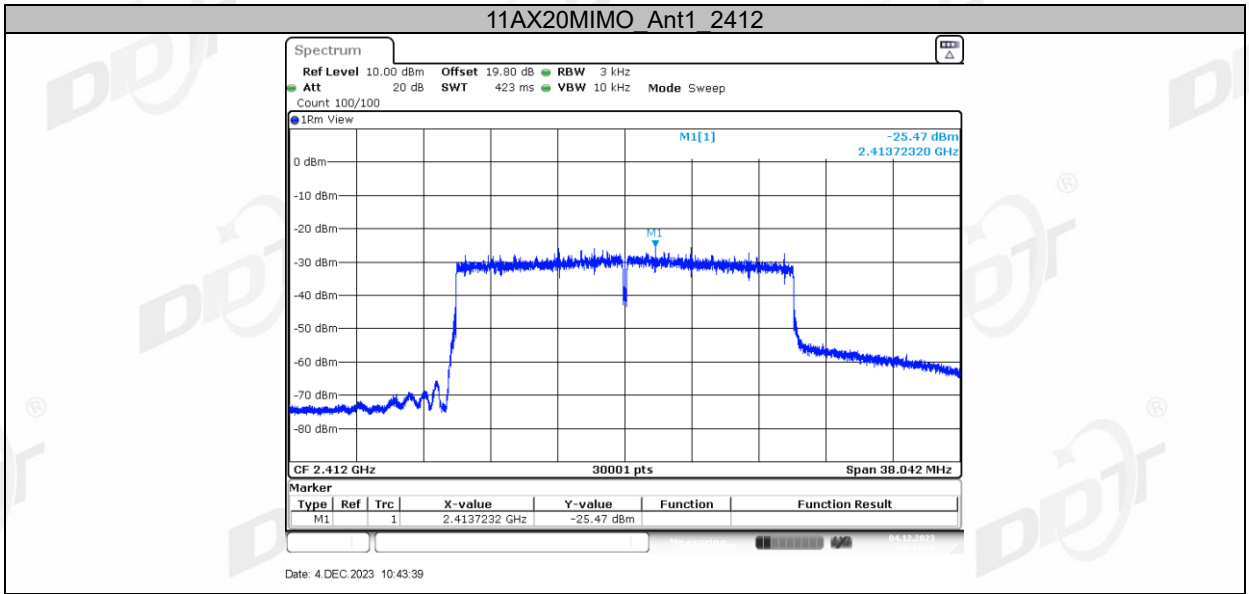


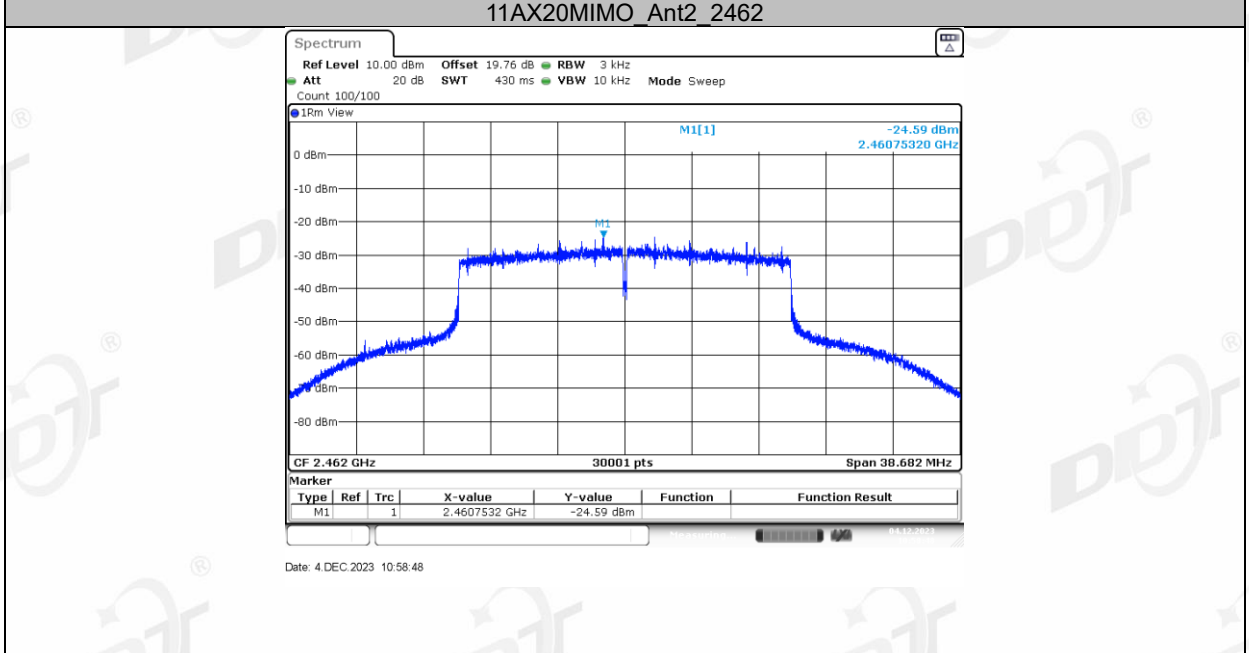
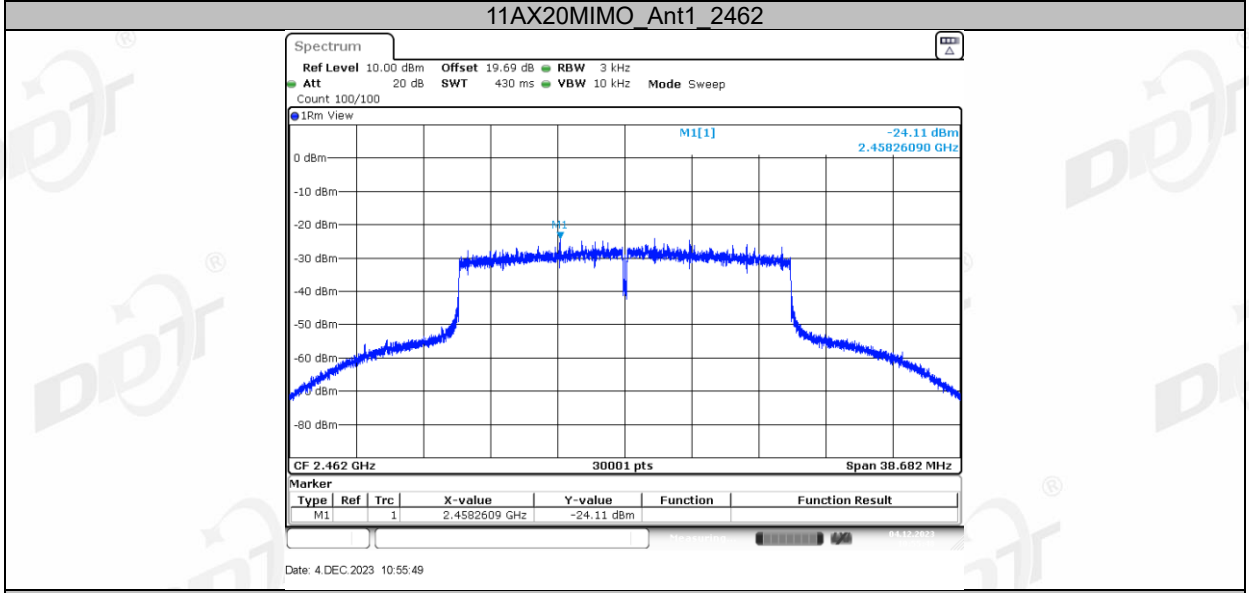
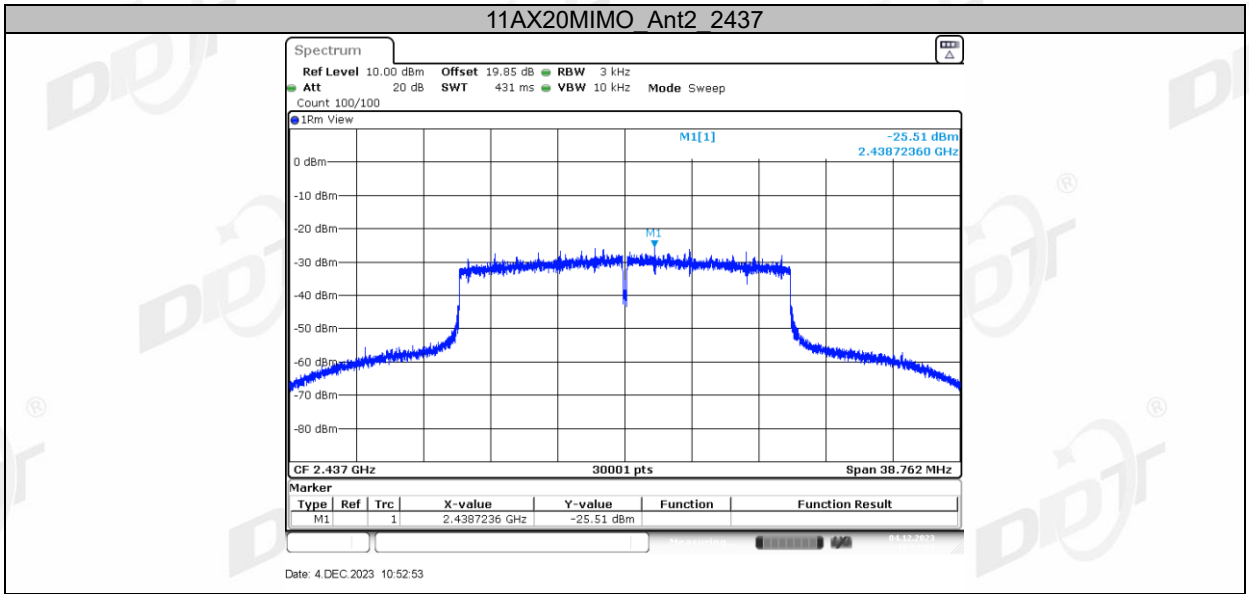


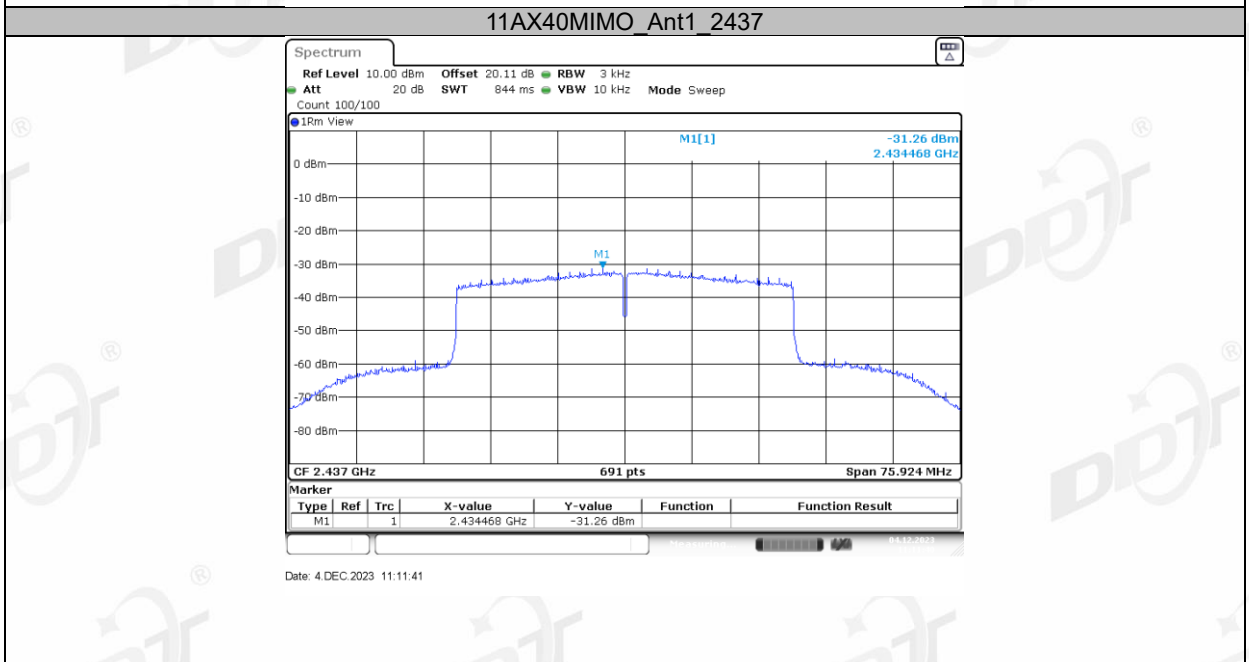
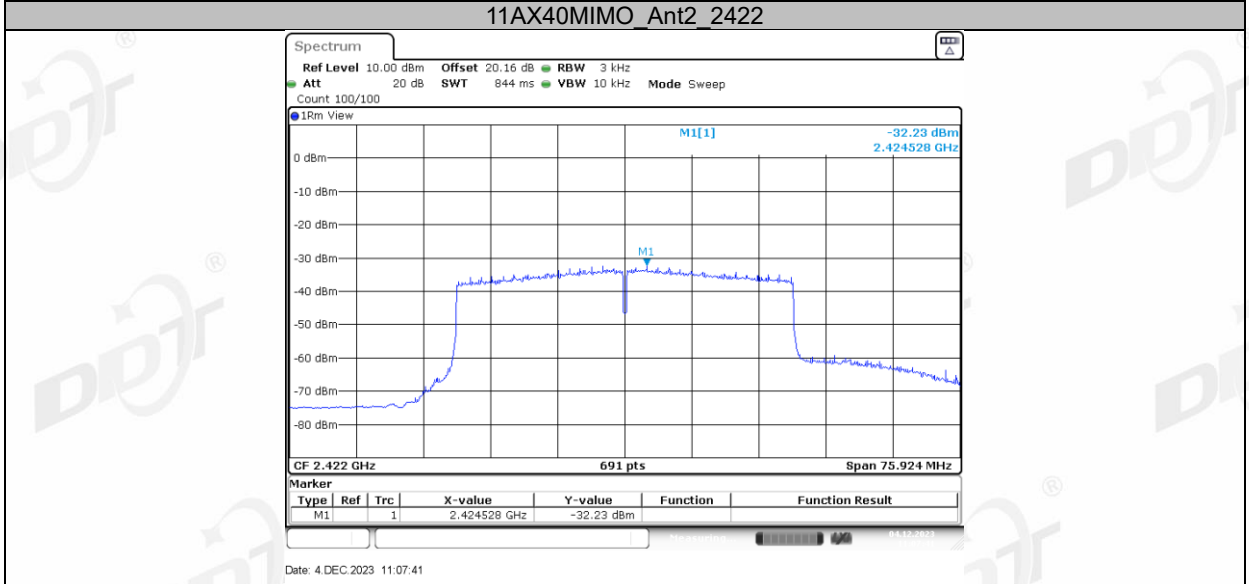
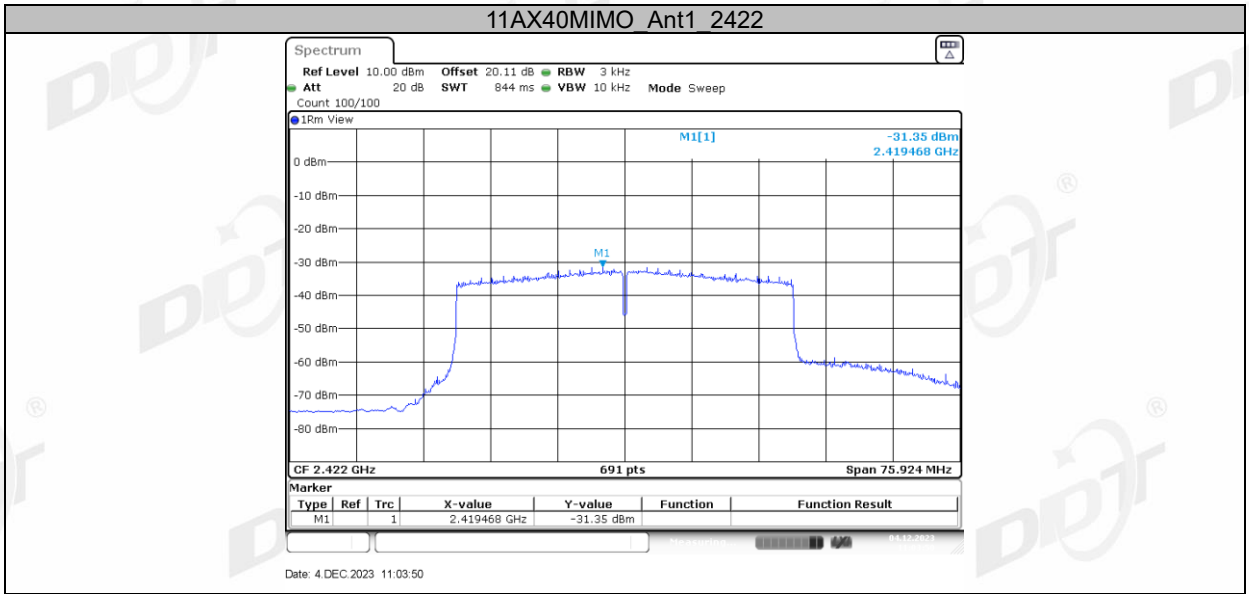


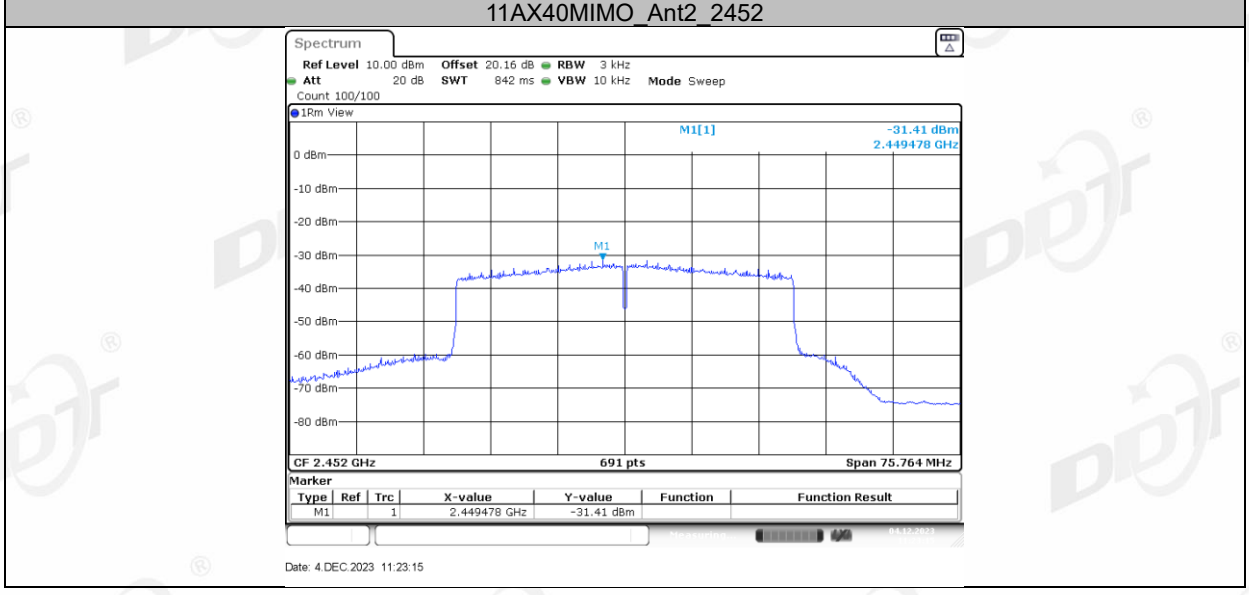
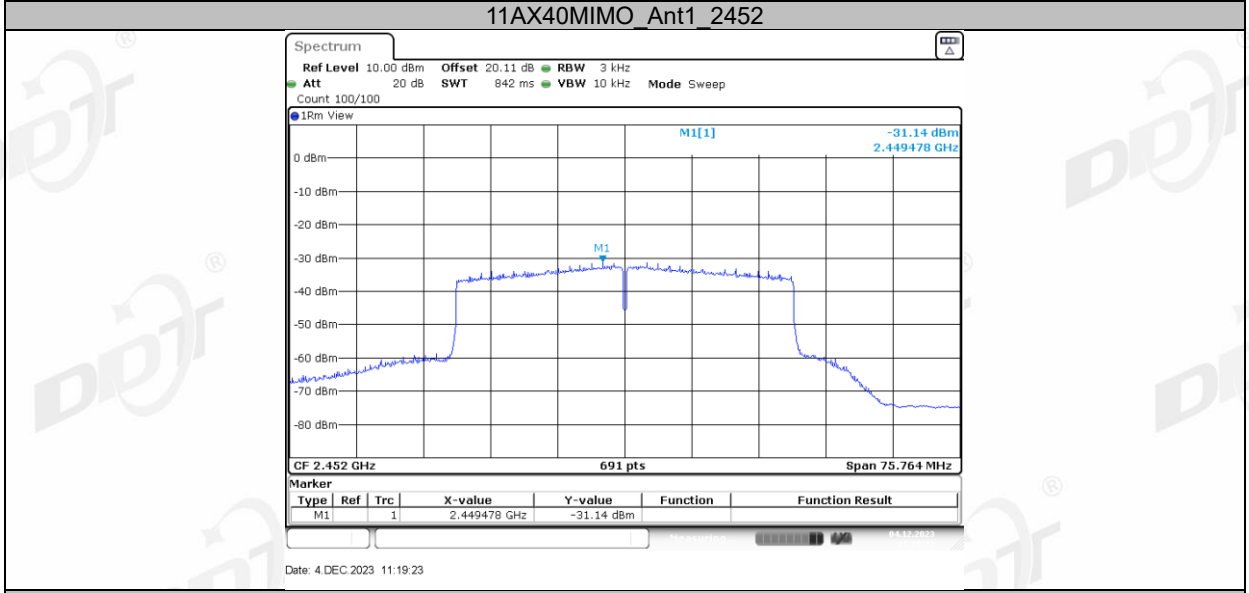
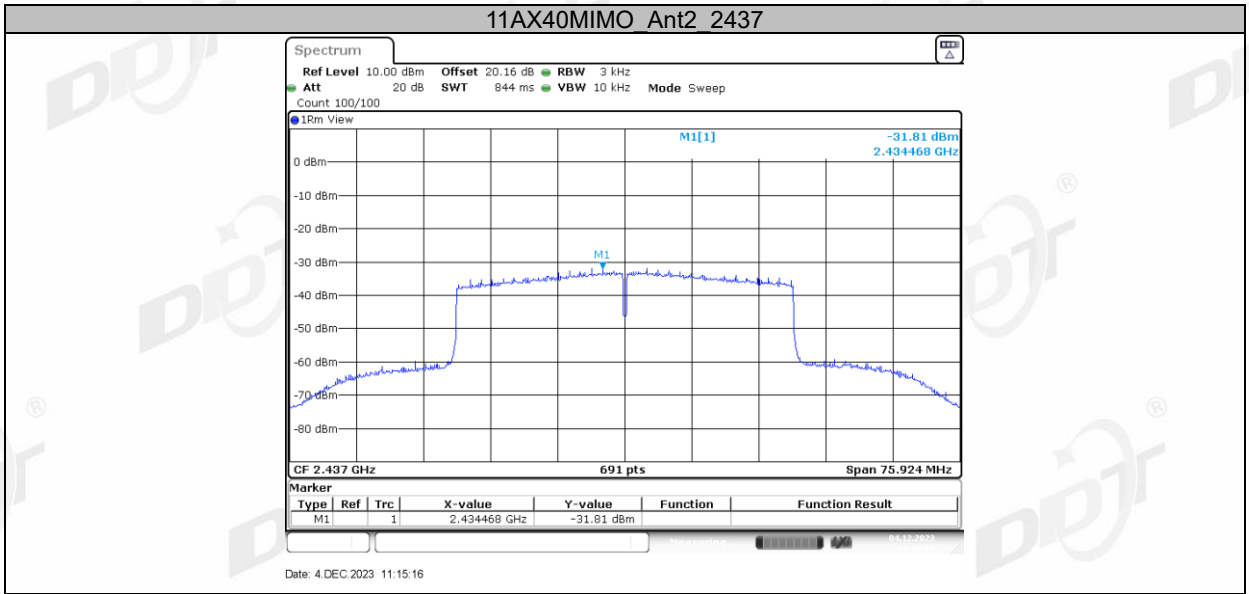






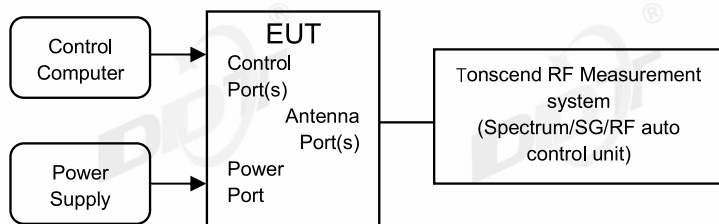






8. Band Edge Compliance (Conducted Method)

8.1. Block diagram of test setup



8.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

8.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Establish a reference level by using the following procedure:

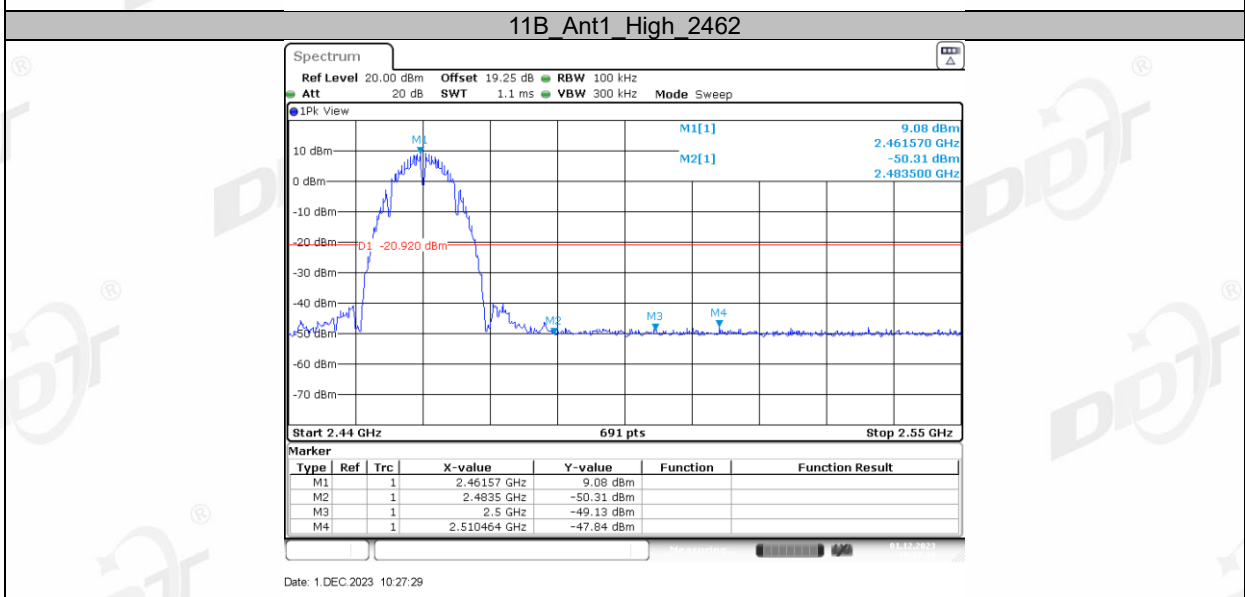
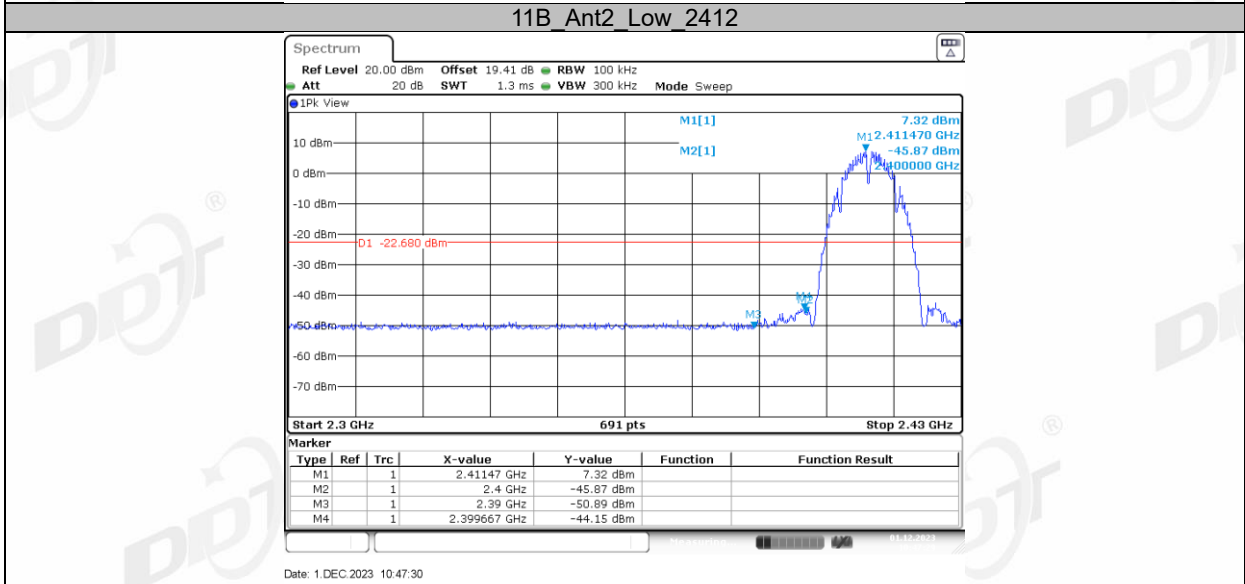
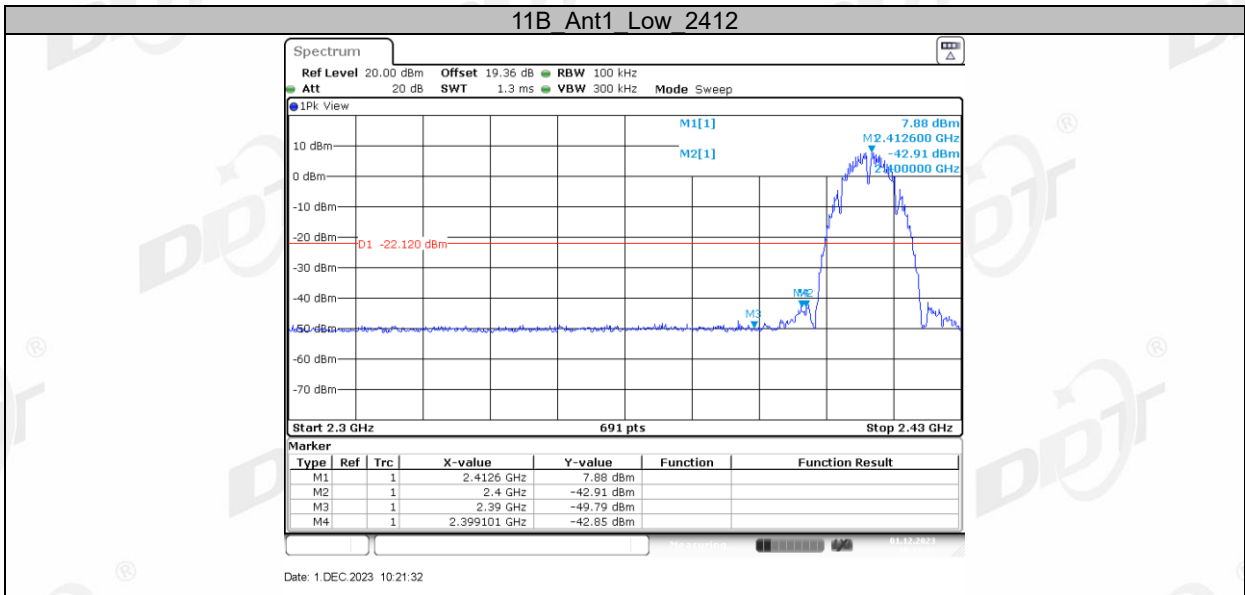
RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold
- (3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.
- (4) Then mark the maximum amplitude of all unwanted emissions outside of the authorized frequency band.

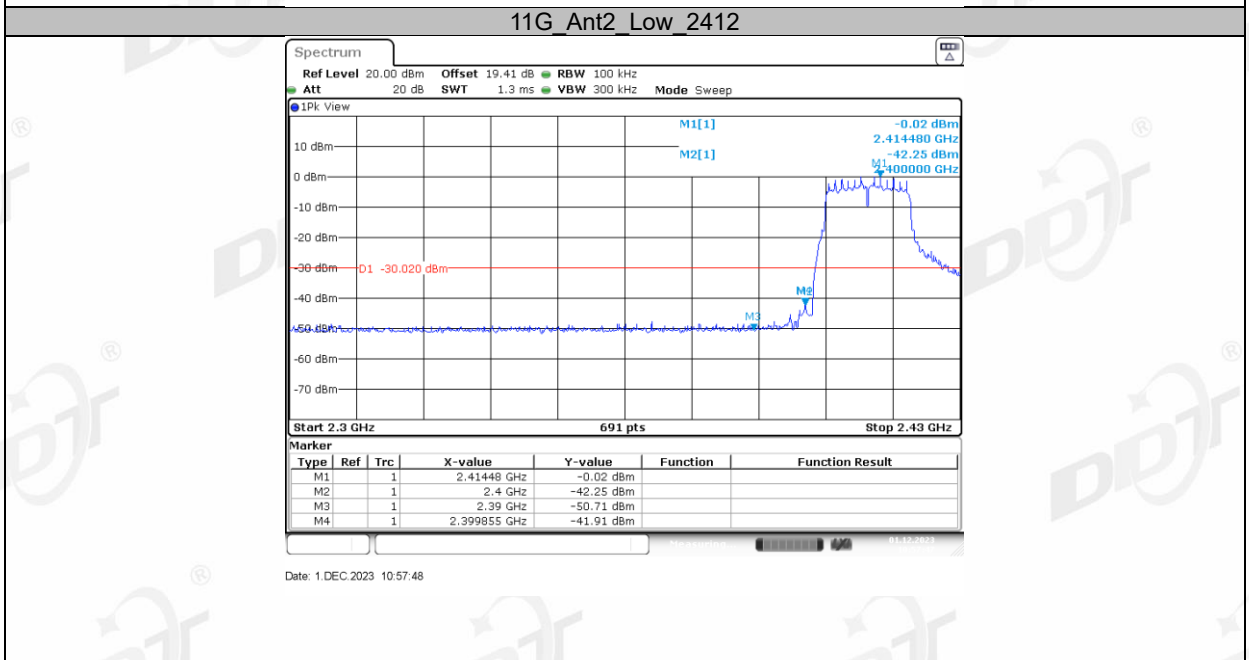
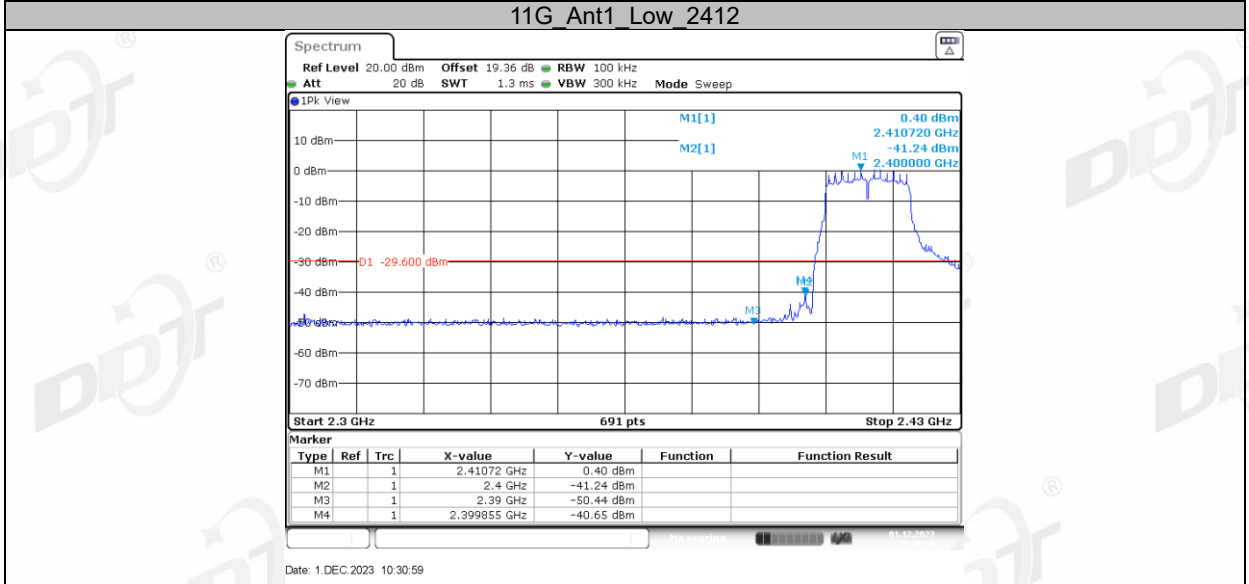
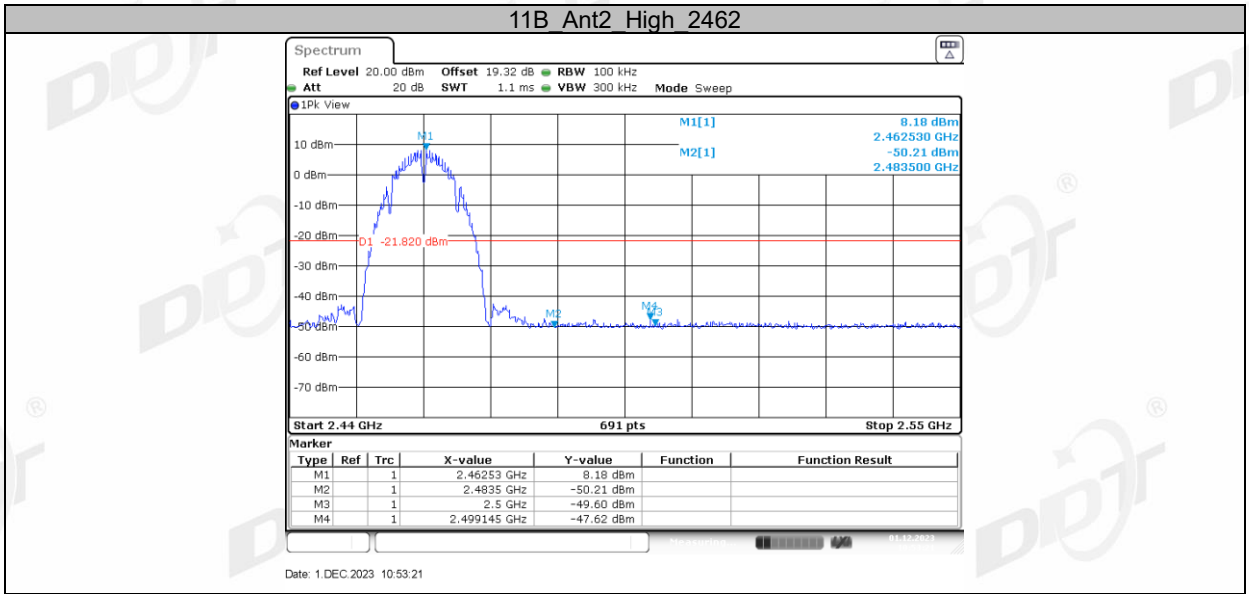
8.4. Test result

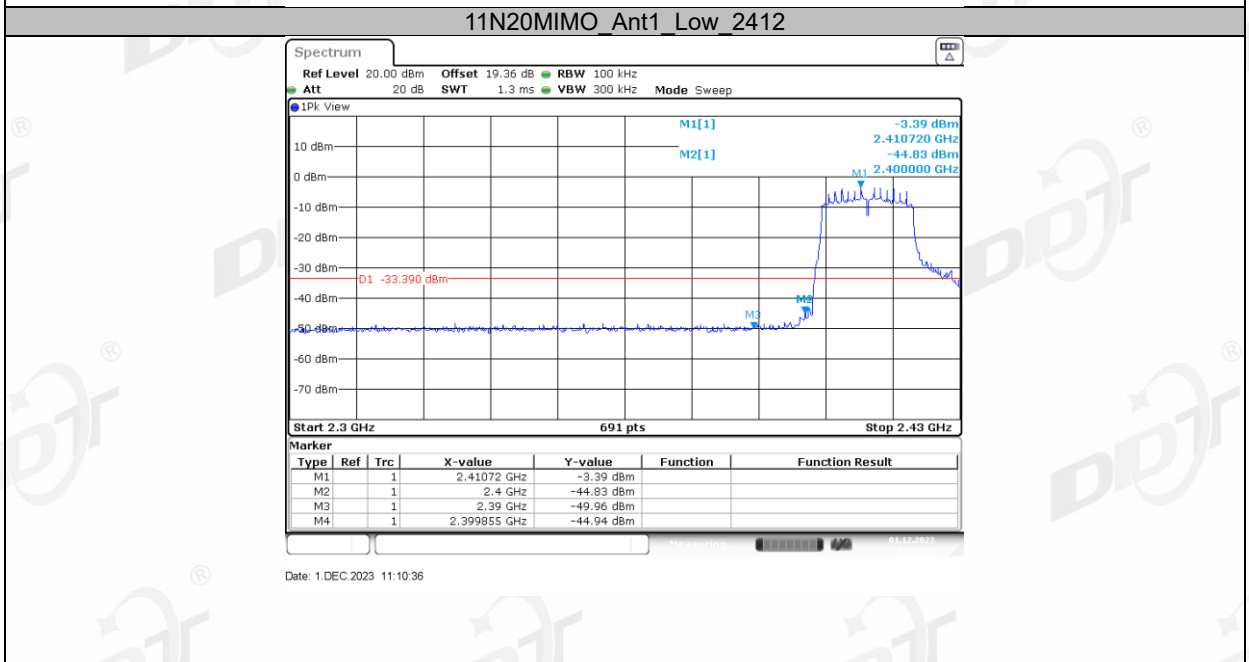
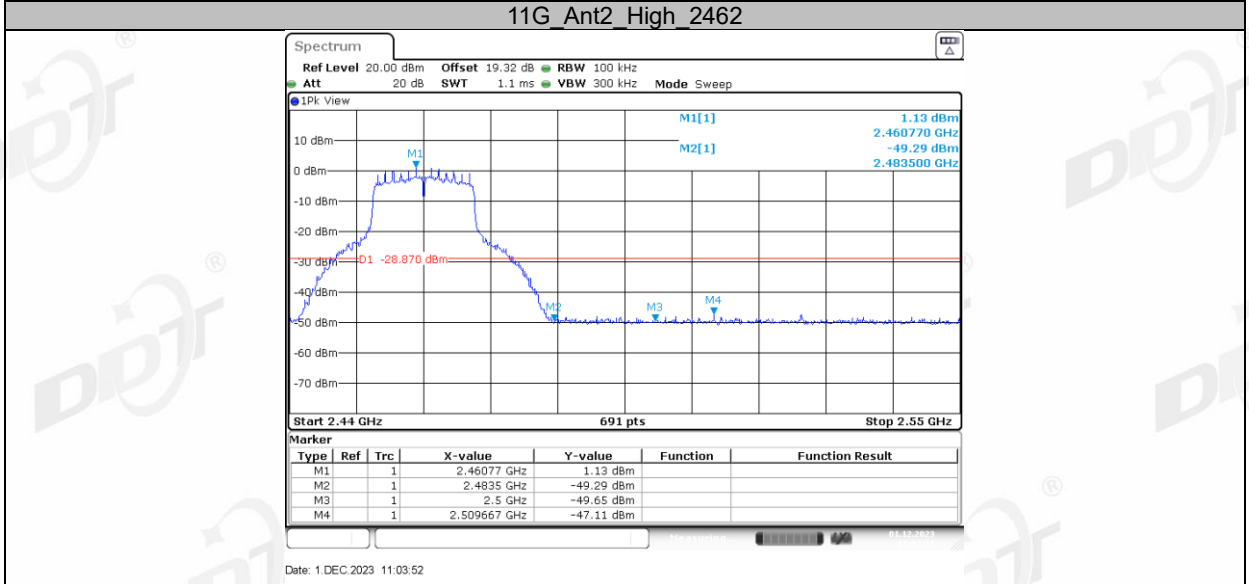
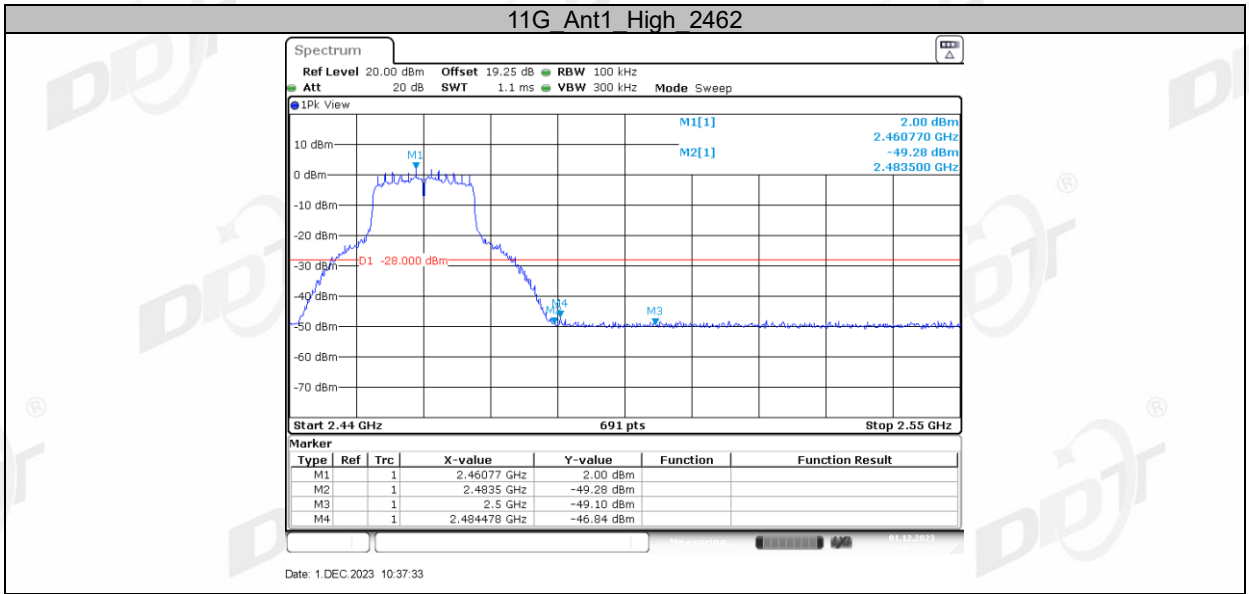
Test Engineer:	Zoe	Test Site:	RF Measurement System 3#
Ambient Condition:	22.6-23.1℃, 45.1-47.3%RH	Test Date:	2023.12.01-2023.12.04
Test Power Supply:	DC 12V from external adapter	Sample Number:	S23111603-02

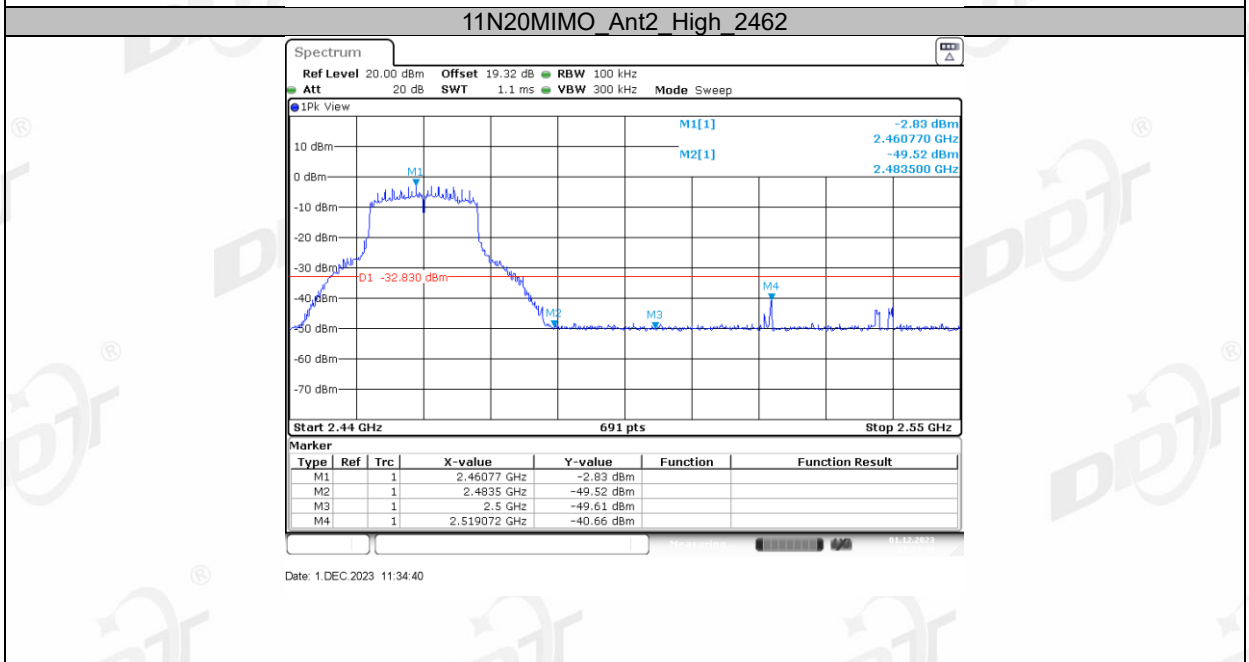
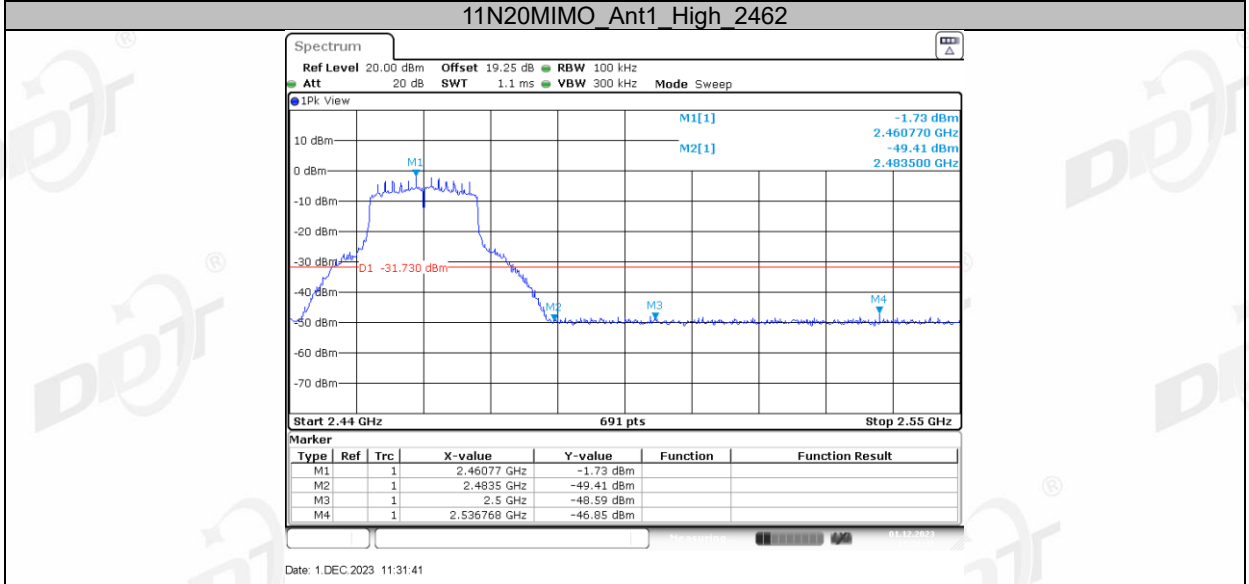
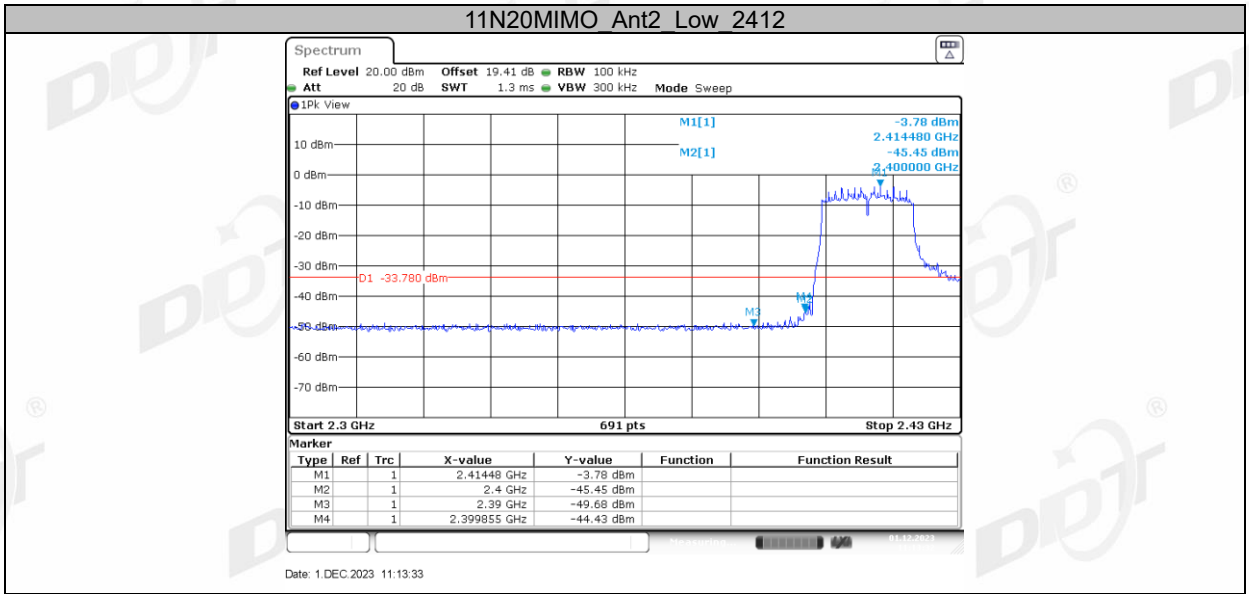
EUT Set Mode	CH or Frequency	Result (dBm)	EUT Set Mode	CH or Frequency	Result (dBm)
11b	CH1	Pass	11g	CH1	Pass
	CH11	Pass		CH11	Pass
11n HT 20	CH1	Pass	11n HT 40	CH3	Pass
	CH11	Pass		CH9	Pass
11ax HE 20	CH1	Pass	11ax HE 40	CH3	Pass
	CH11	Pass		CH9	Pass

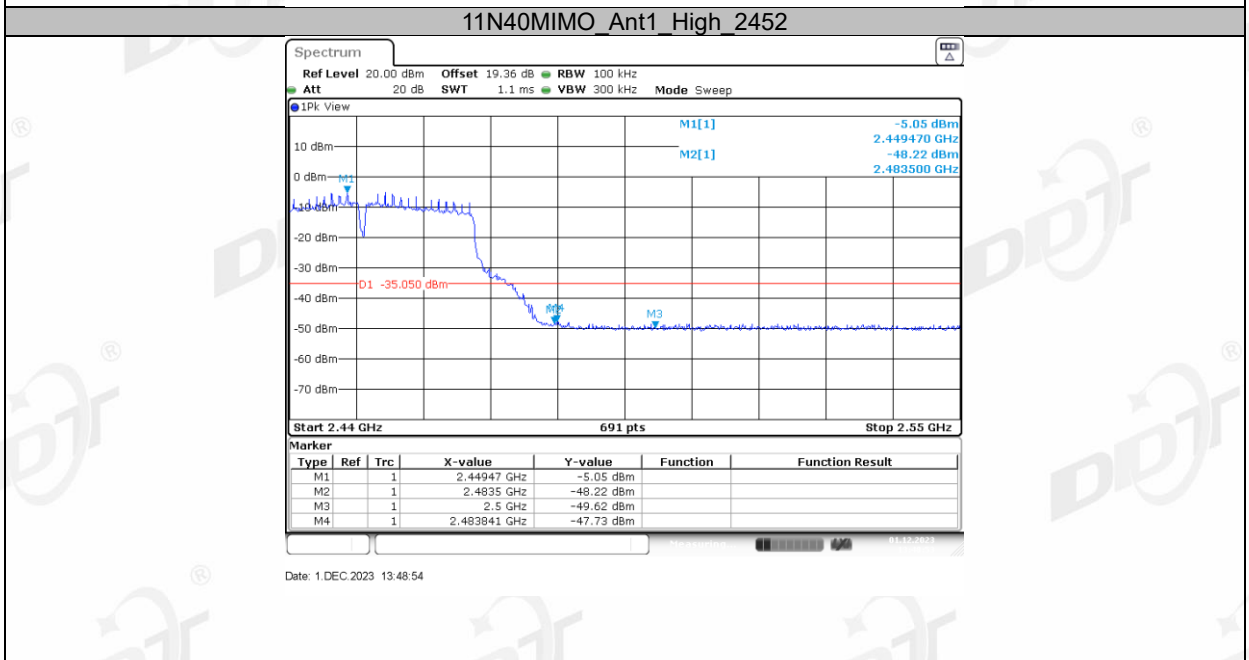
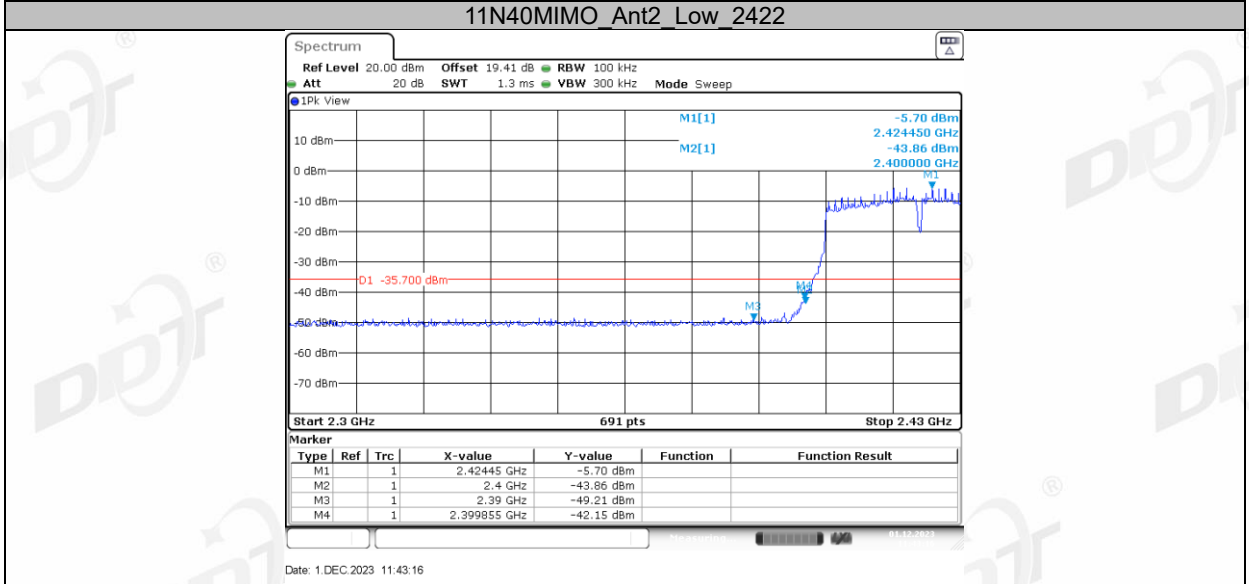
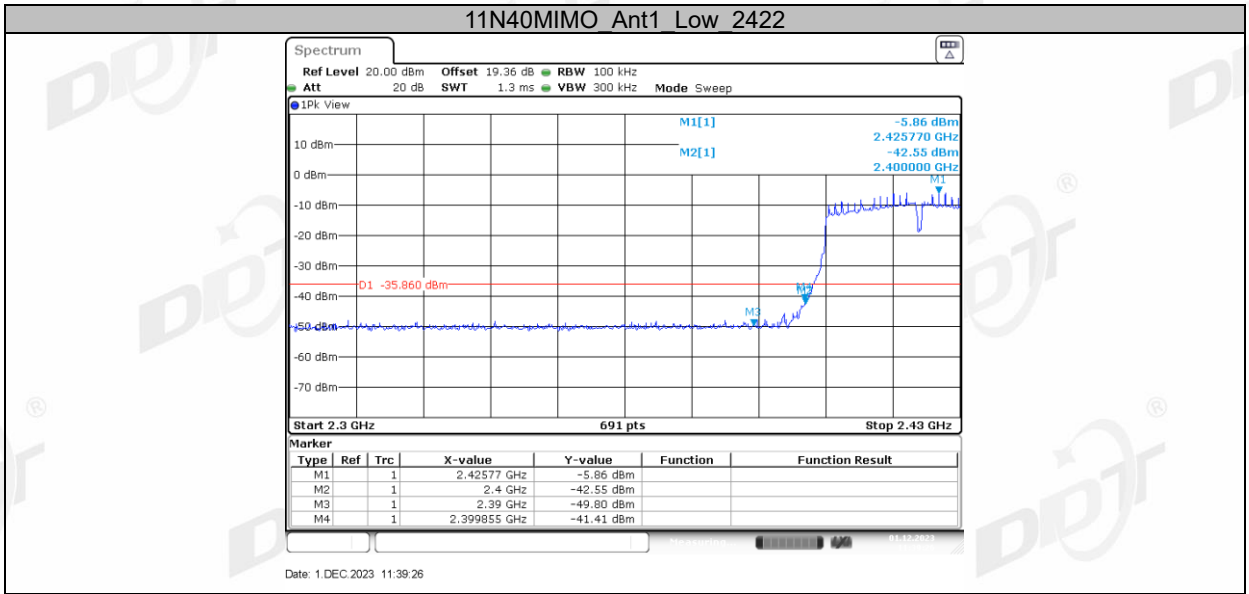
8.5. Test graphs

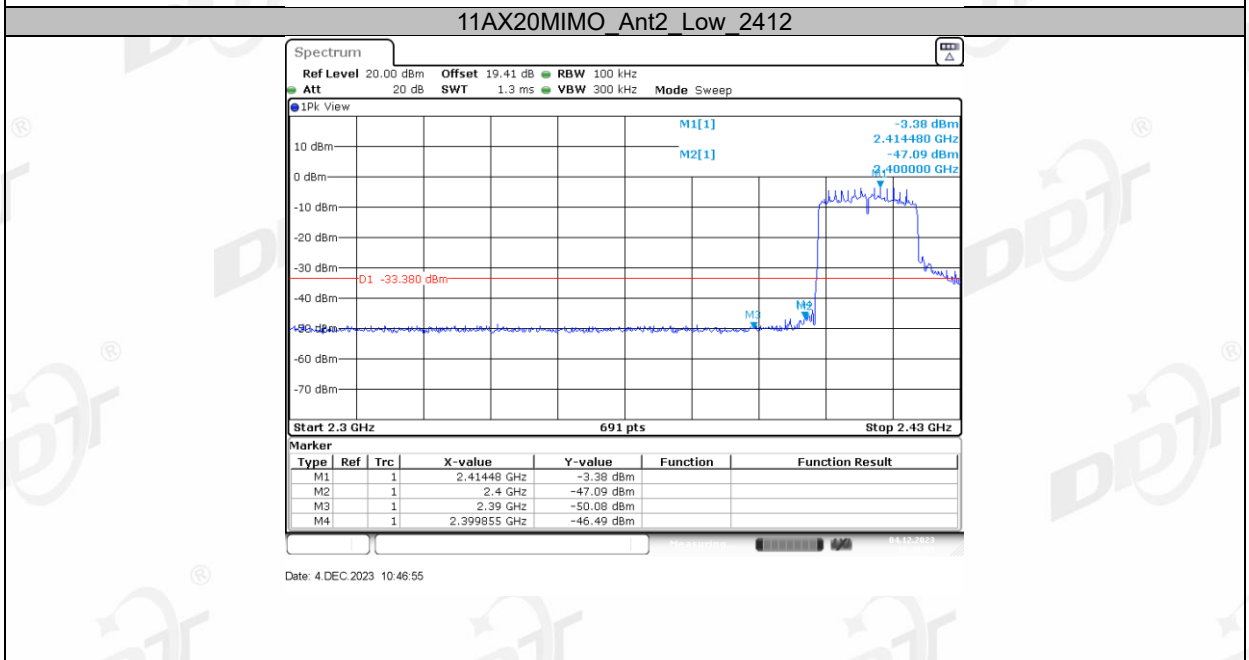
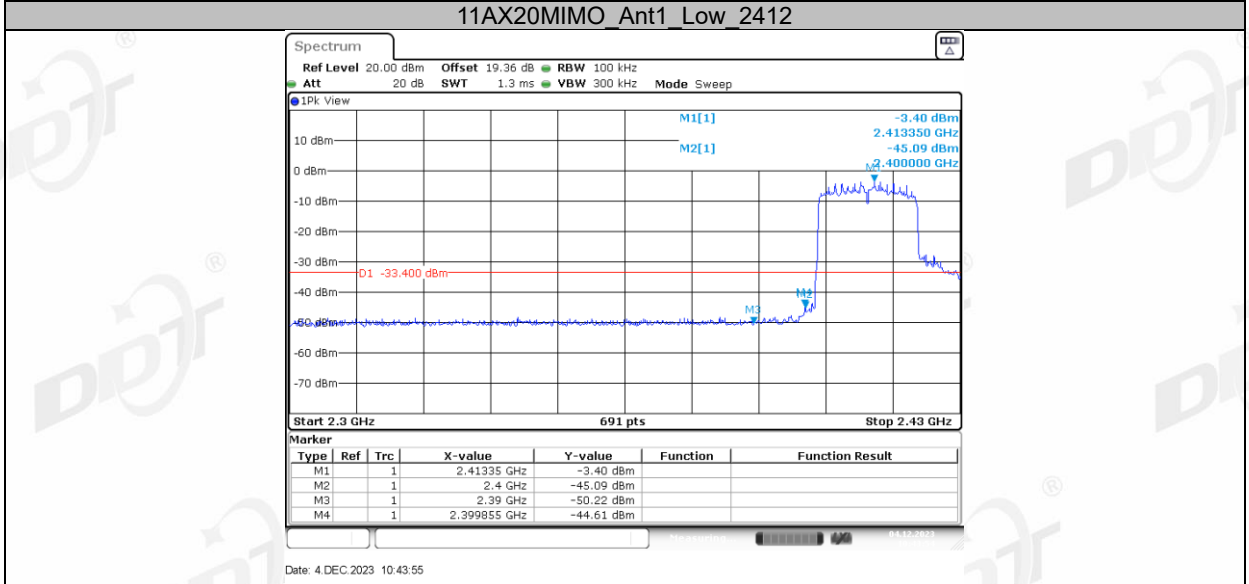
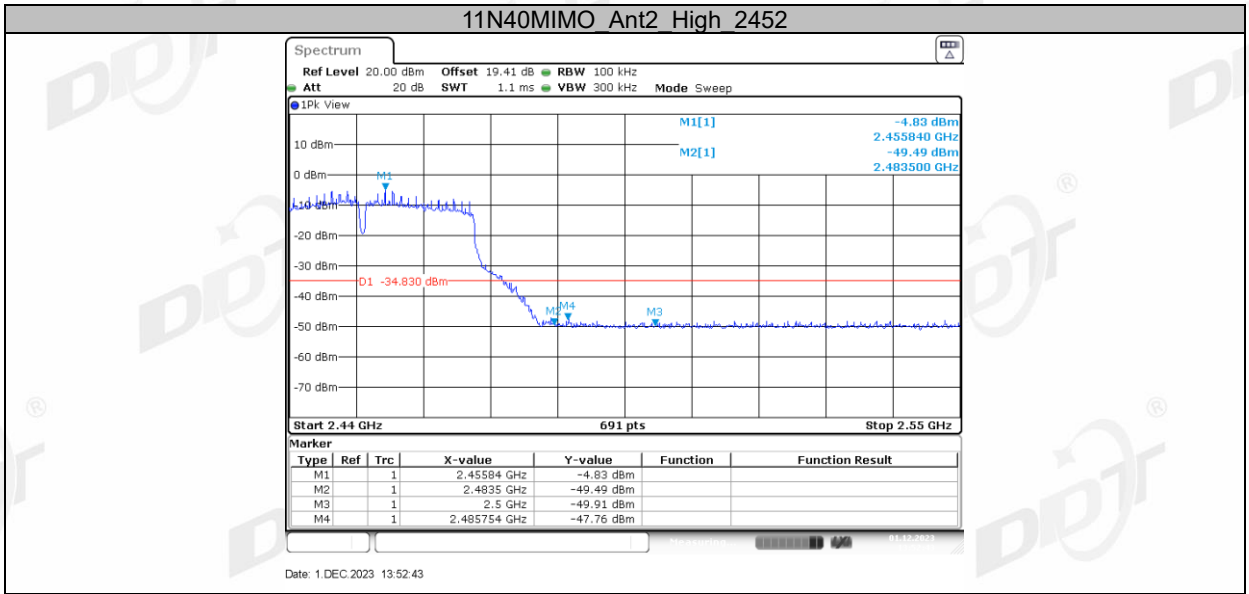


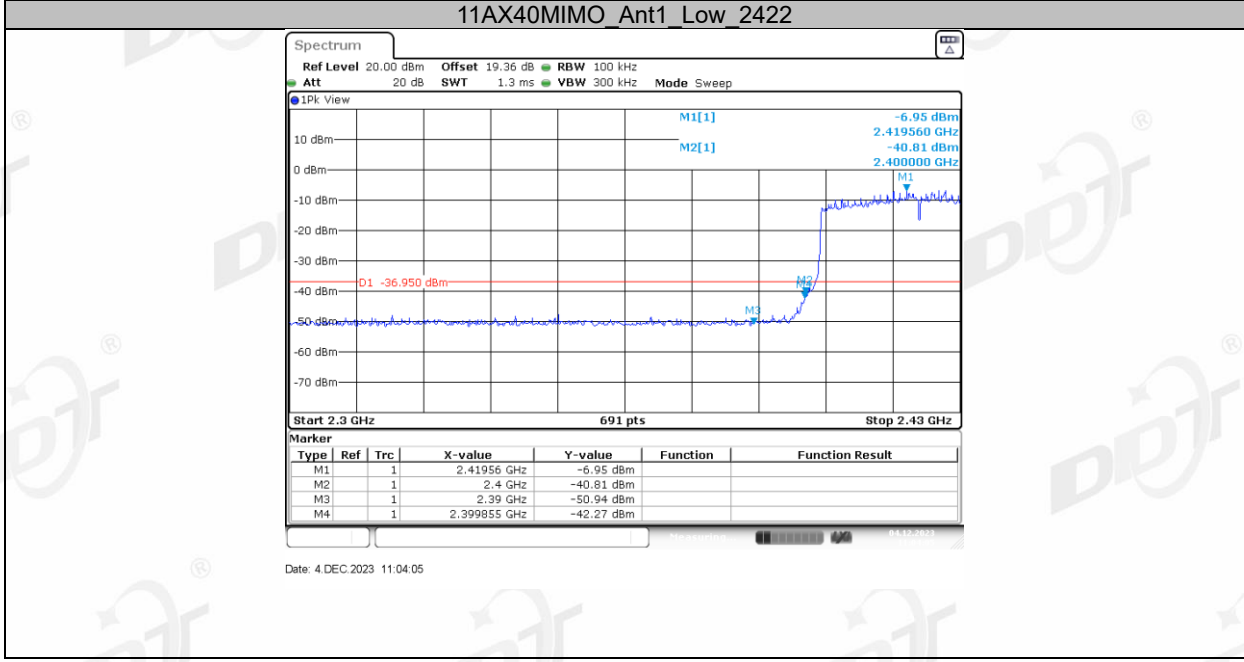
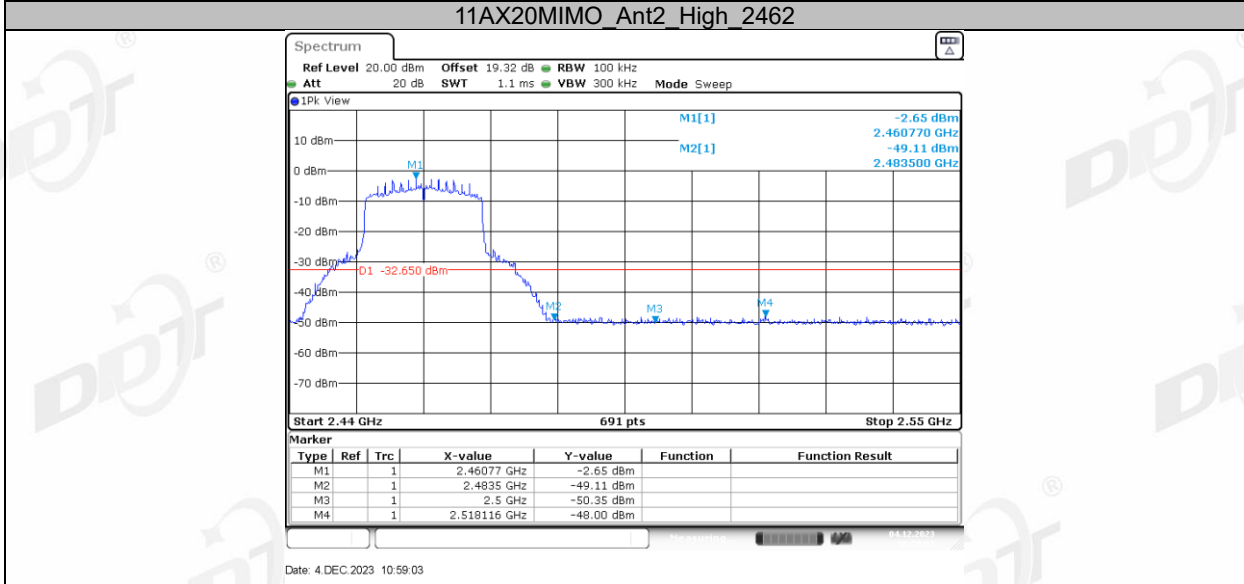
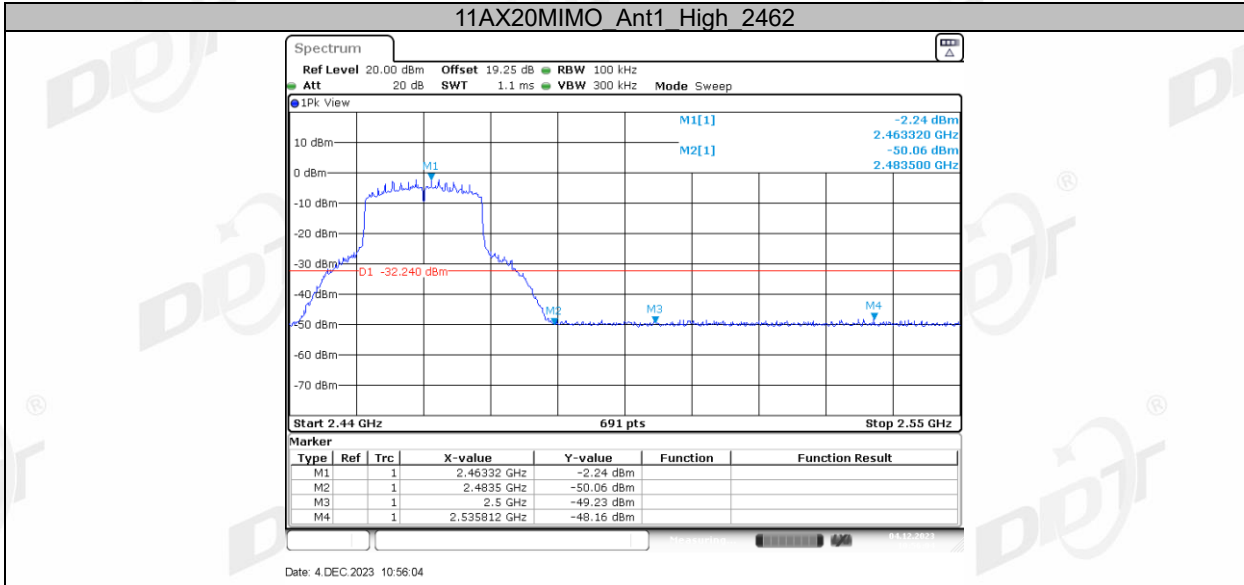


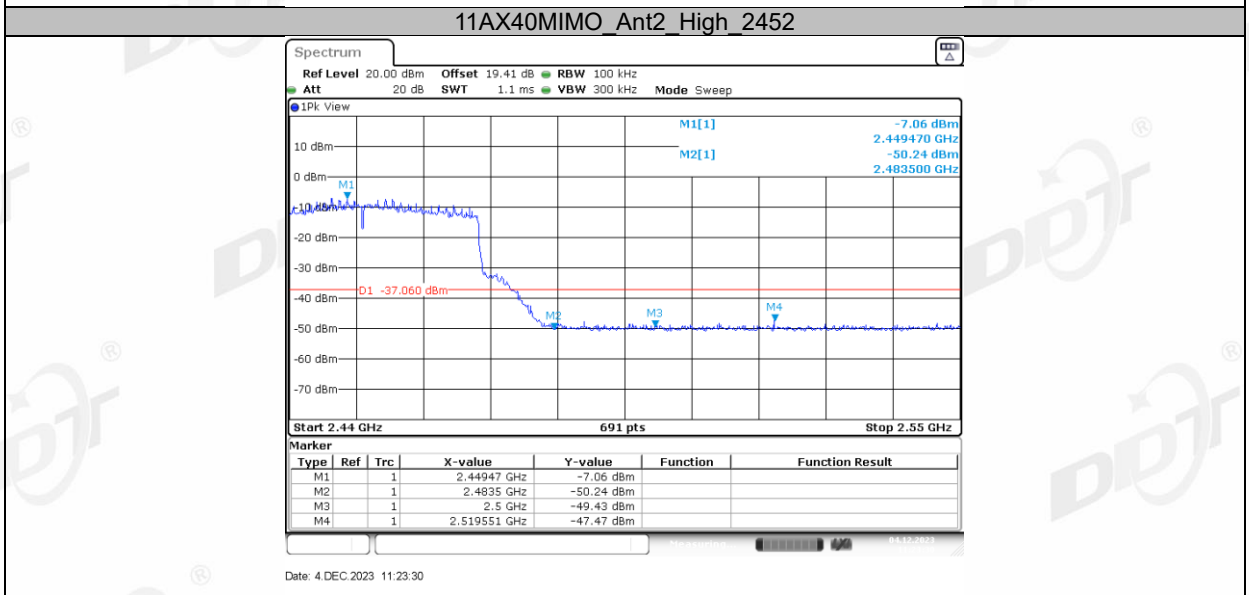
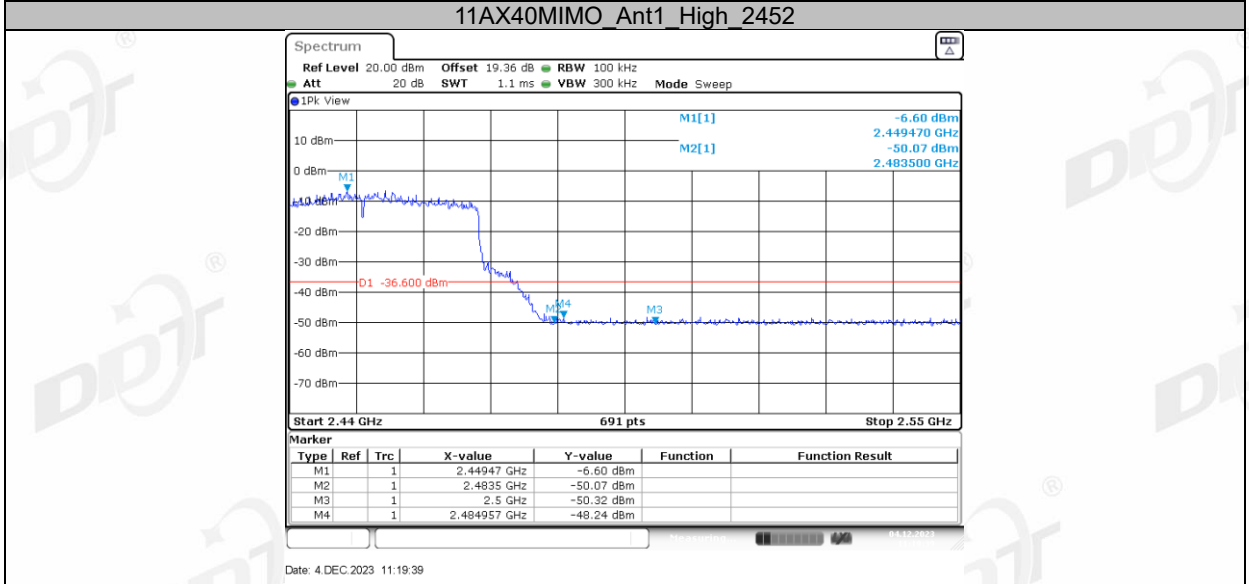
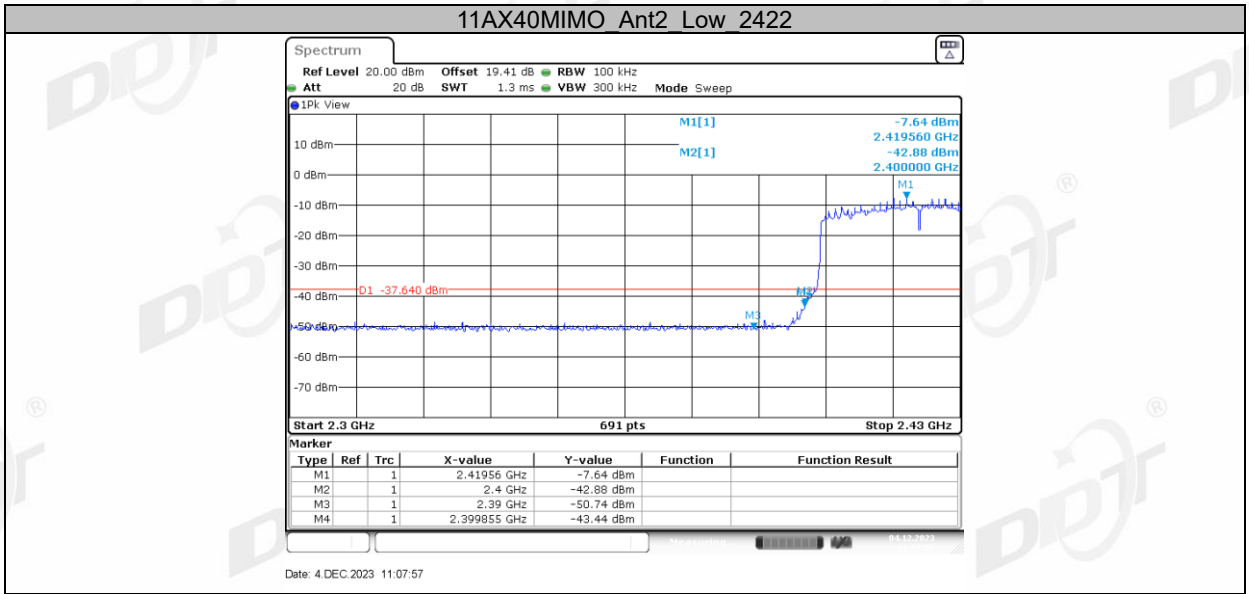






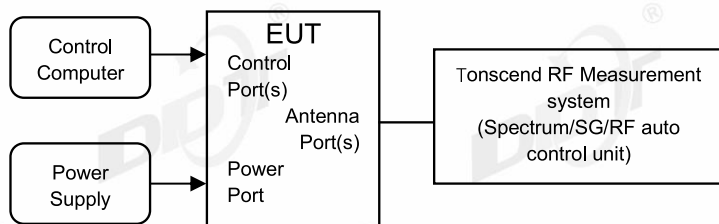






9. RF Conducted Spurious Emissions

9.1. Block diagram of test setup



9.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

9.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

Center frequency	Test frequency
RBW:	100 kHz
VBW:	300 kHz
Span	Wide enough to capture the peak level of the in-band emission
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(4) Set the spectrum analyzer as follows:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{Span}/\text{RBW}$
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

9.4. Test result

Test Engineer:	Zoe	Test Site:	RF Measurement System 3#
Ambient Condition:	22.6-23.1℃, 45.1-47.3%RH	Test Date:	2023.12.01-2023.12.04
Test Power Supply:	DC 12V from external adapter	Sample Number:	S23111603-02

EUT Set Mode	CH or Frequency	Result (dBm)	EUT Set Mode	CH or Frequency	Result (dBm)
11b	CH1	Pass	11g	CH1	Pass
	CH11	Pass		CH11	Pass
11n HT 20	CH1	Pass	11n HT 40	CH3	Pass
	CH11	Pass		CH9	Pass
11ax HE 20	CH1	Pass	11ax HE 40	CH3	Pass
	CH11	Pass		CH9	Pass