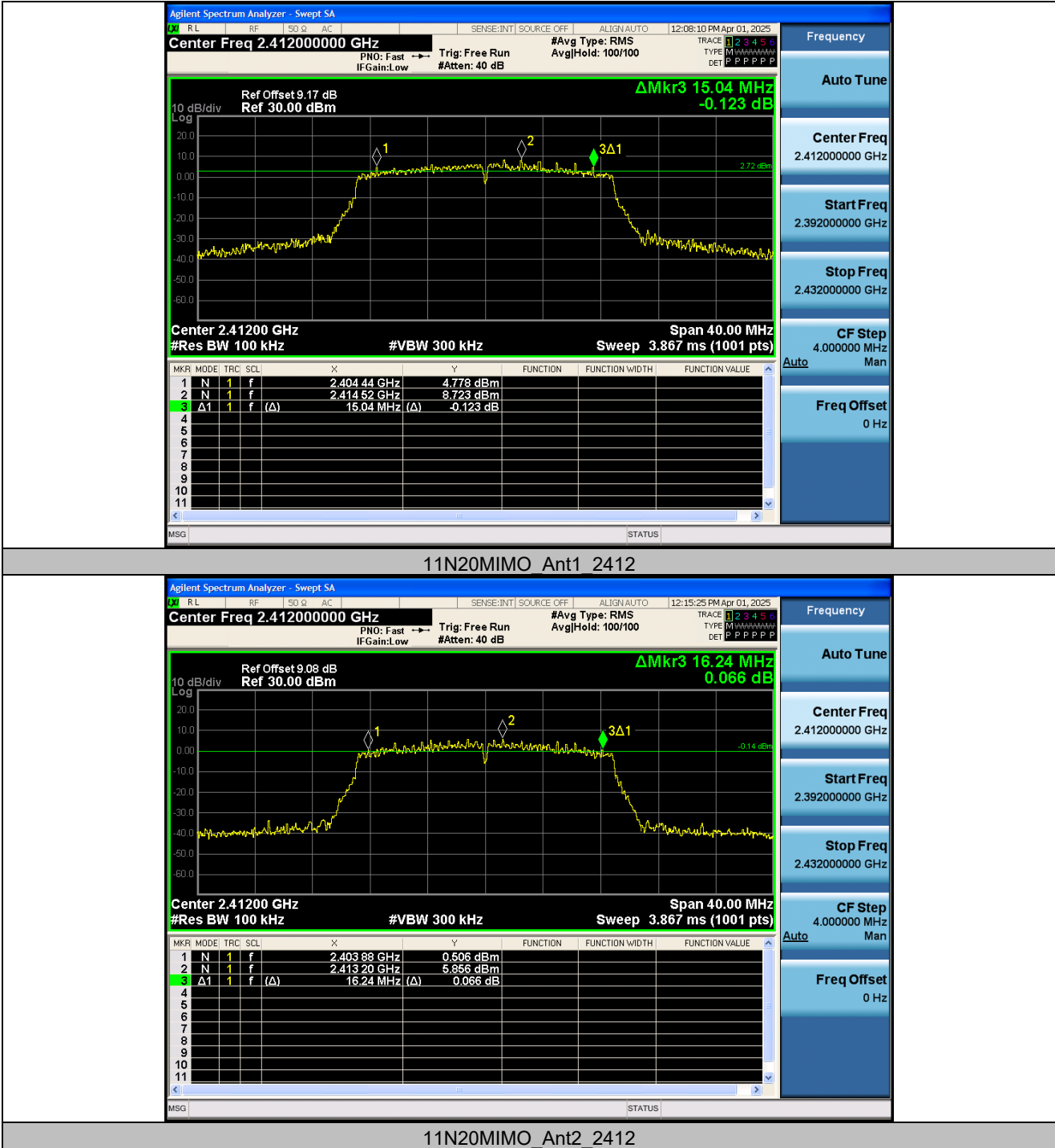
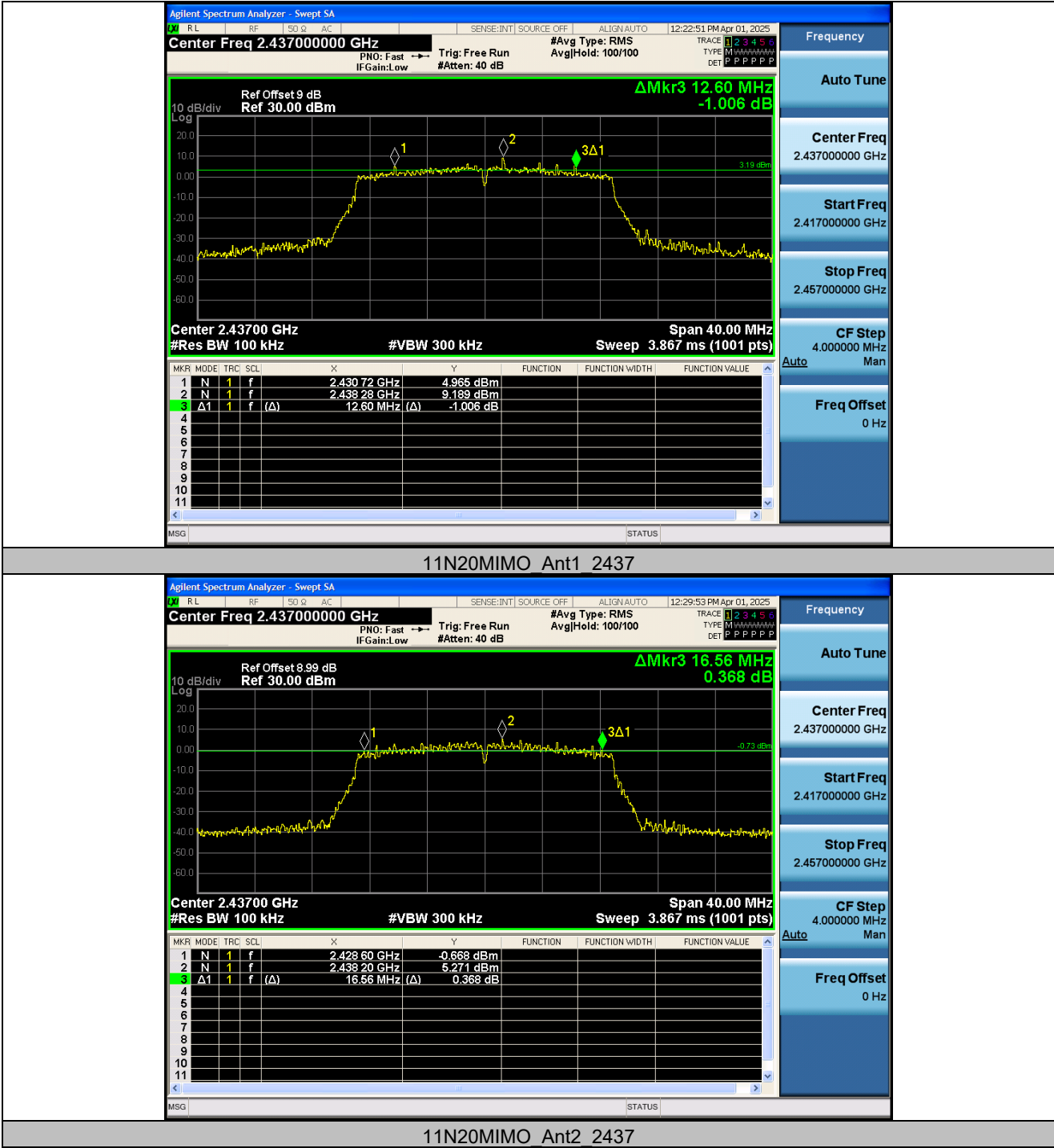
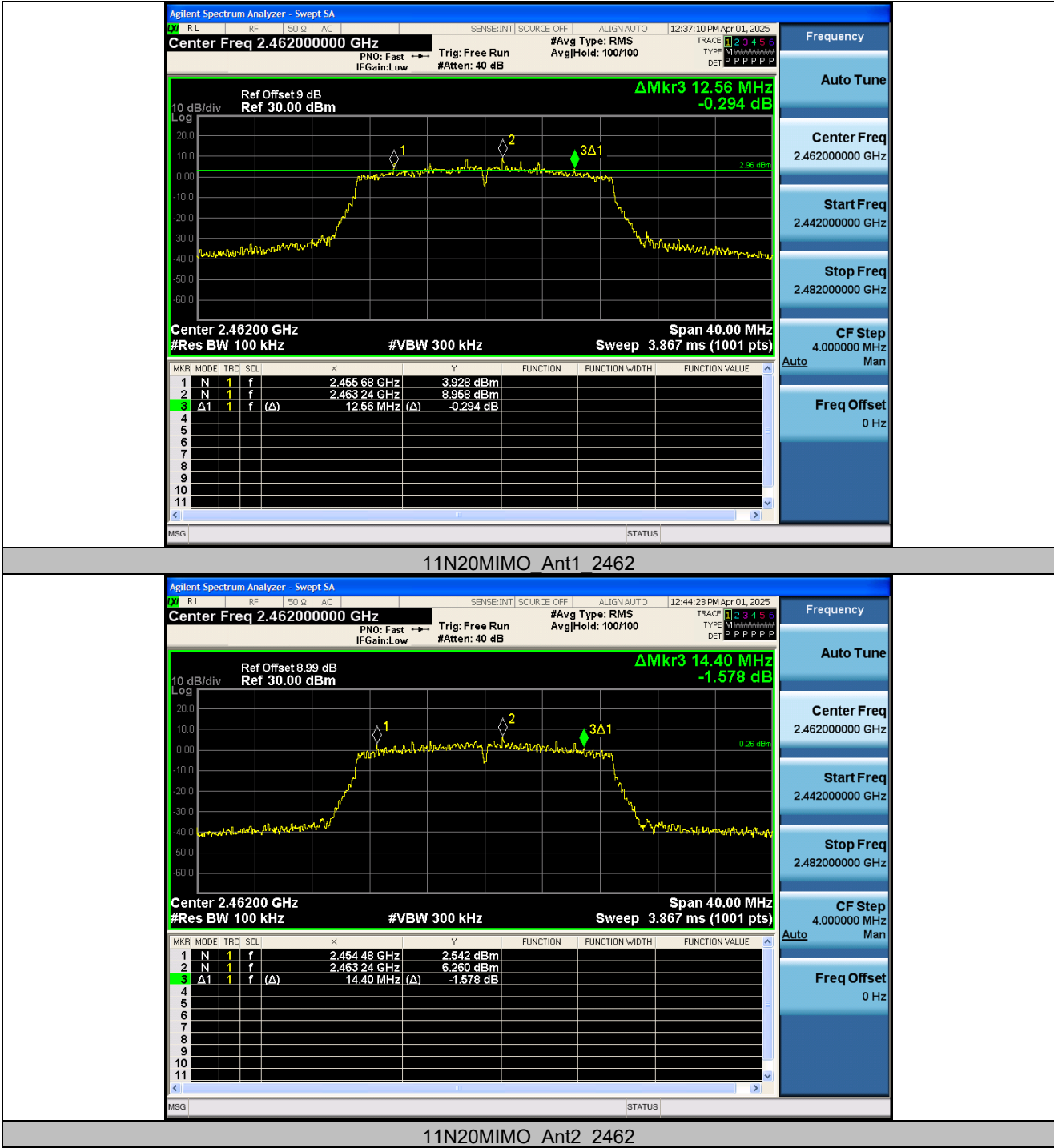
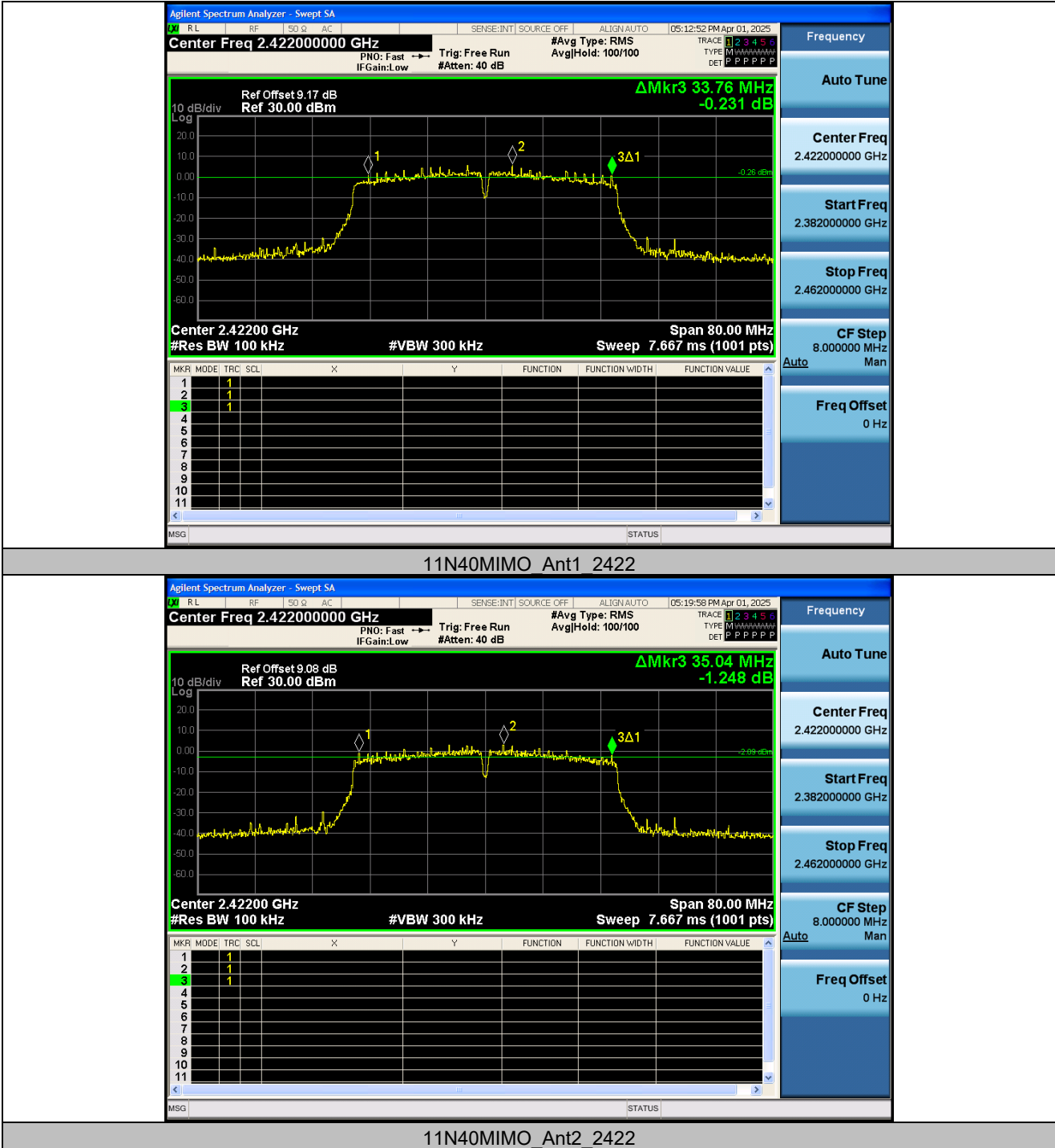
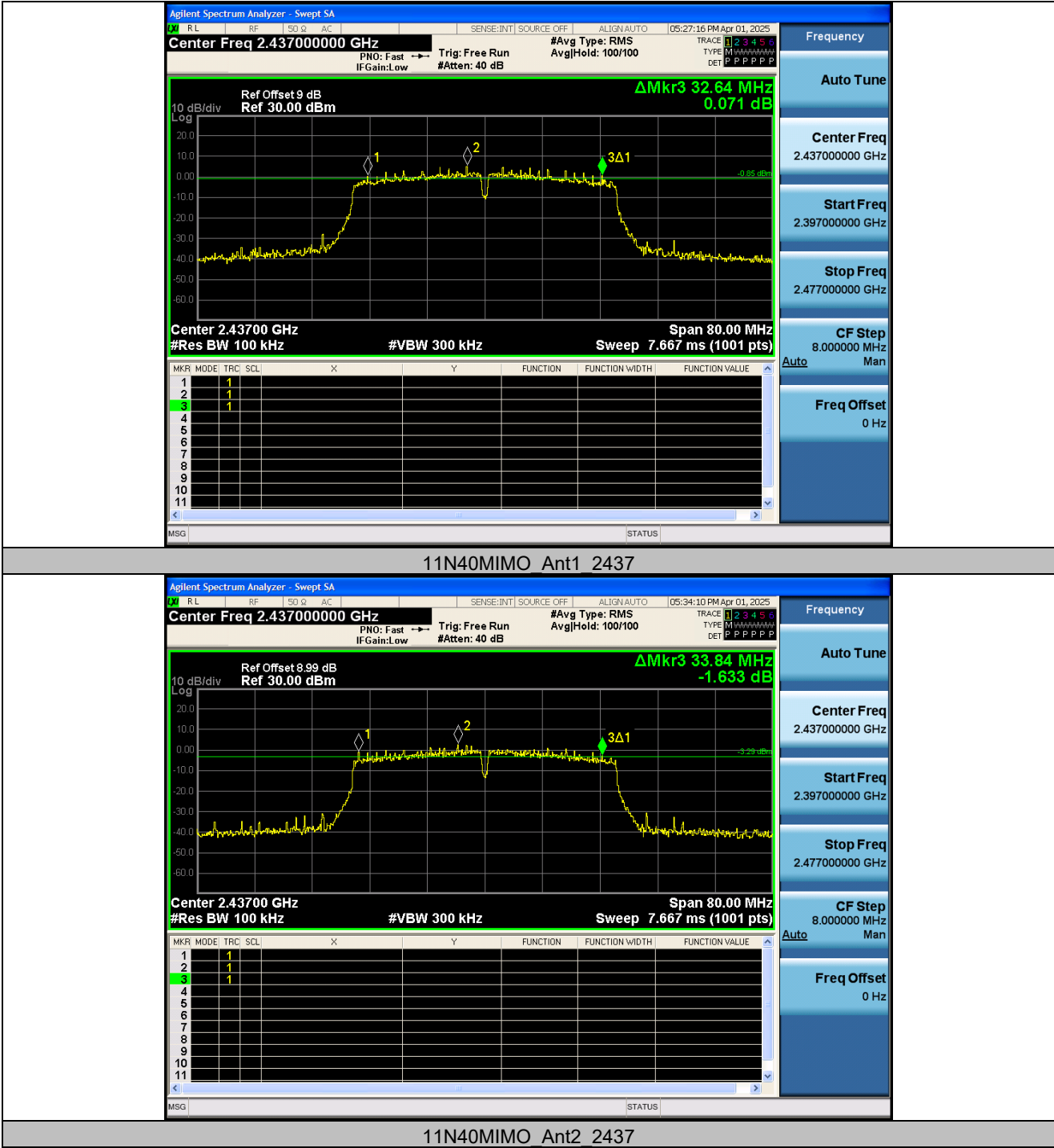


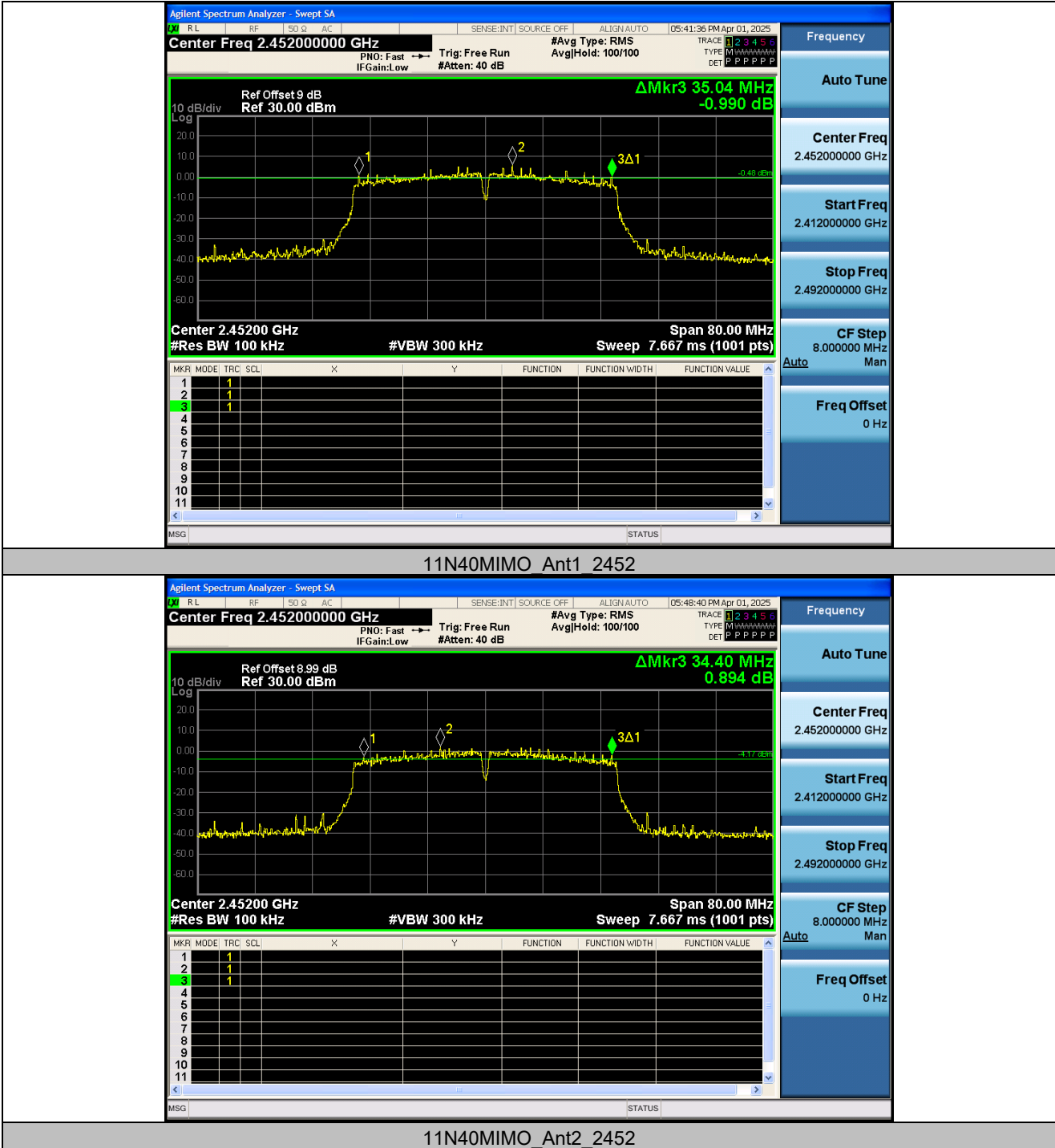






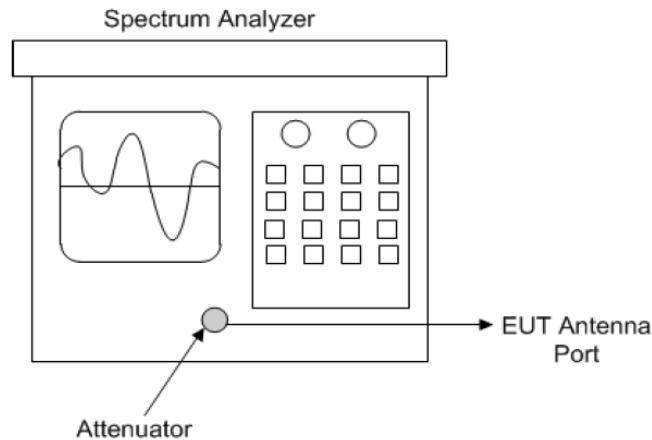






3.4 Occupied Bandwidth Measurement

3.4.1 Test Setup



3.4.2 Test Instruments

Refer to section 5 to get information of above instrument.

3.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to peak. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

3.4.4 Deviation from Test Standard

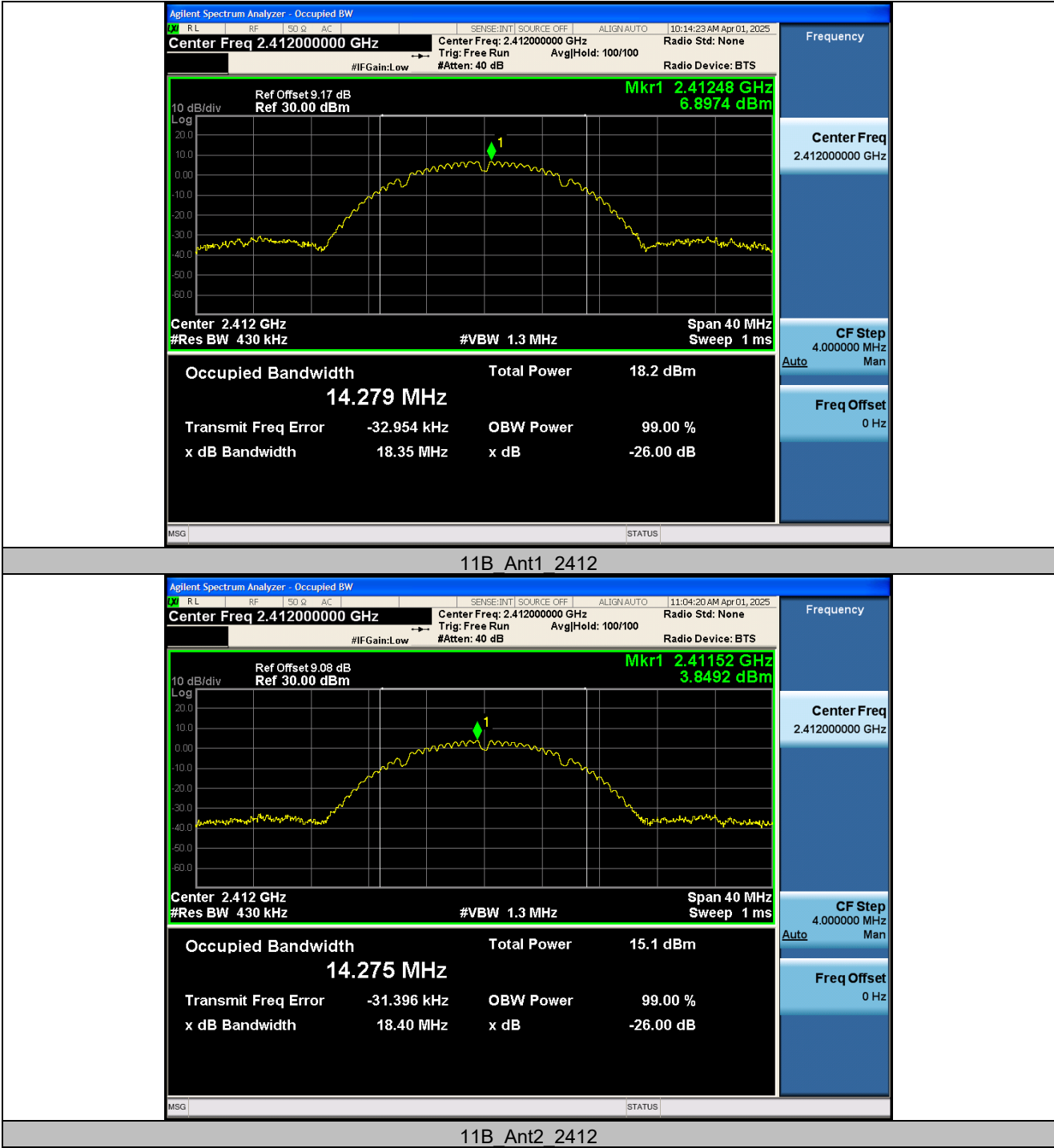
No deviation.

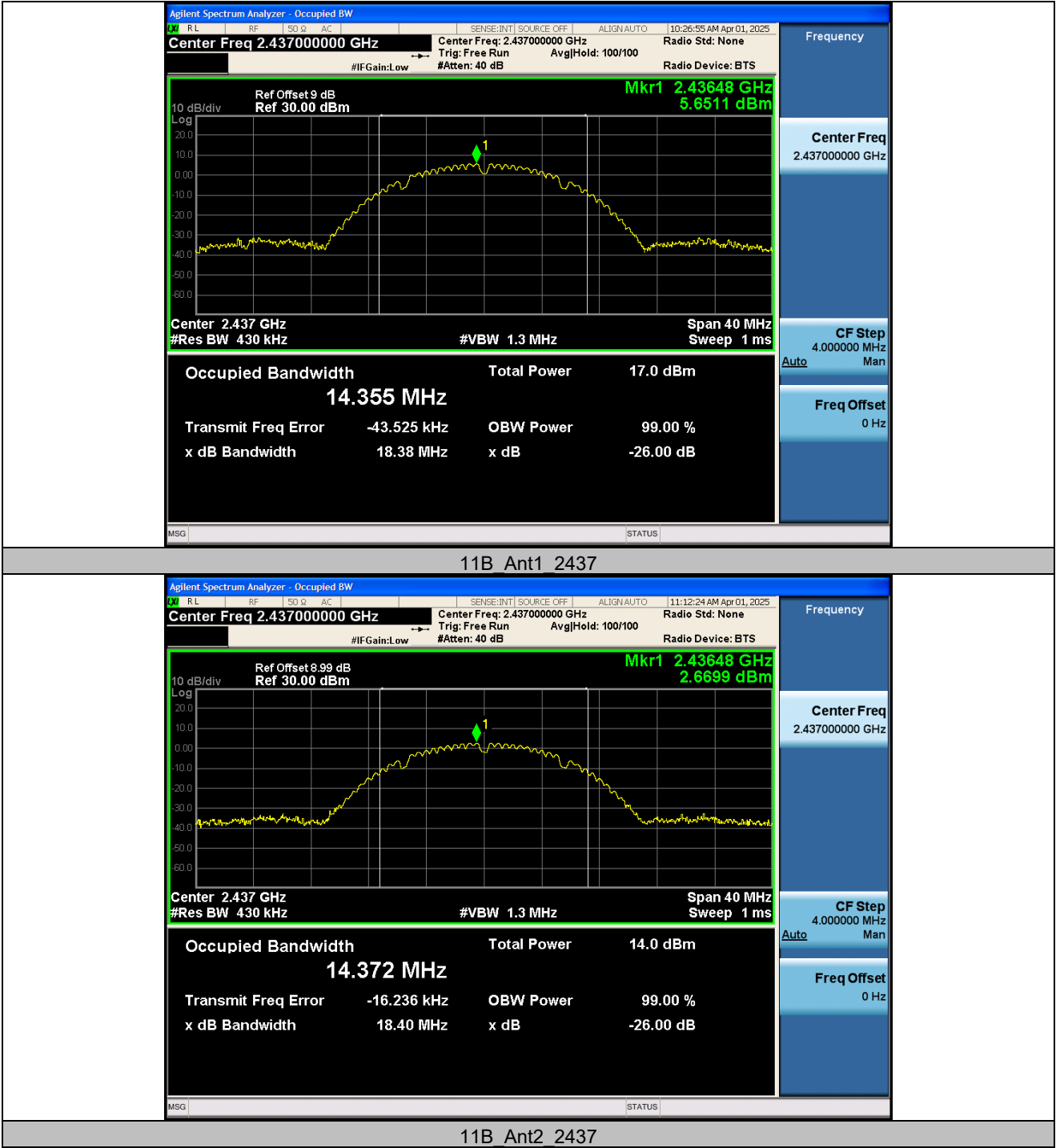
3.4.5 EUT Operating Conditions

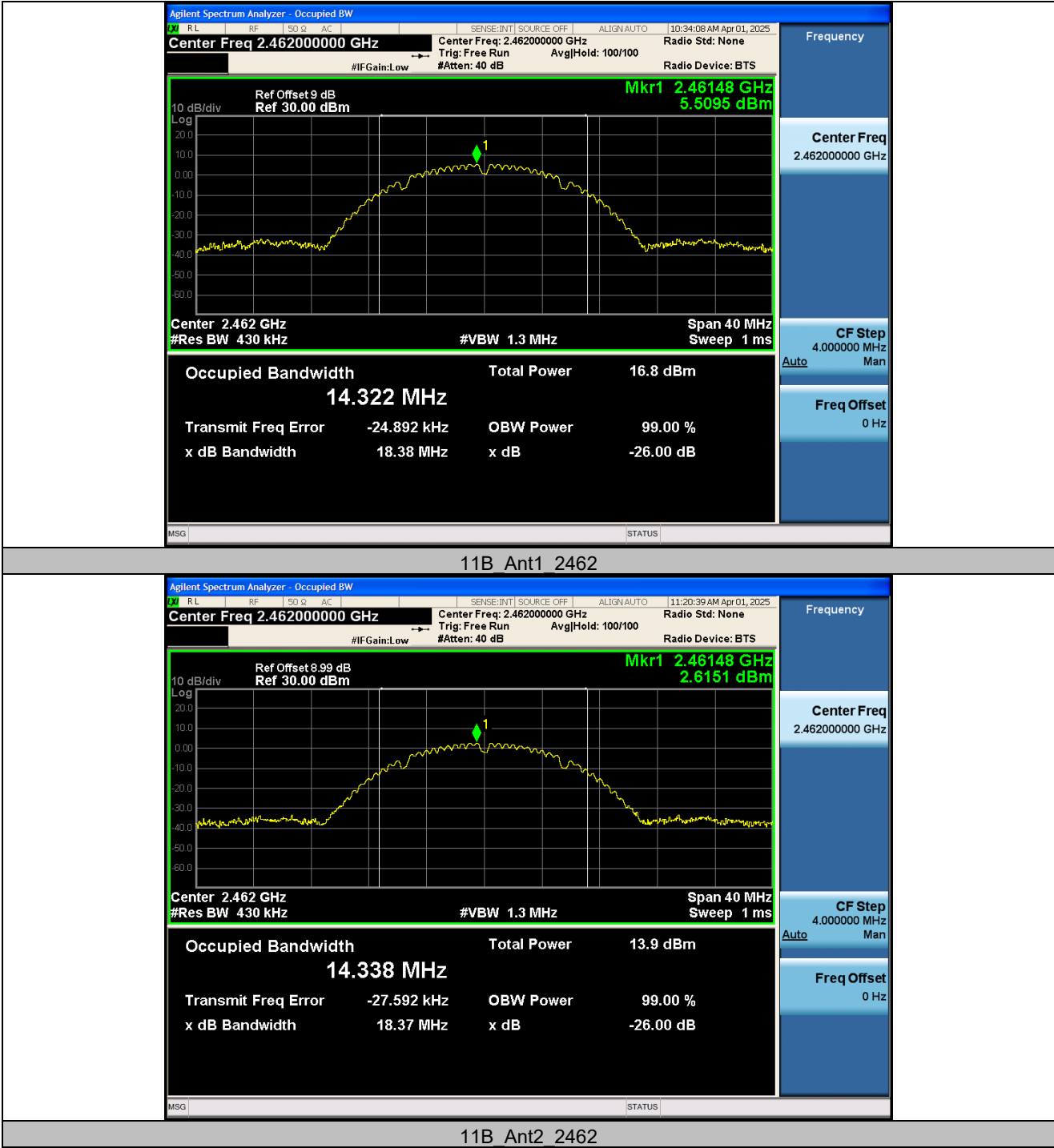
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

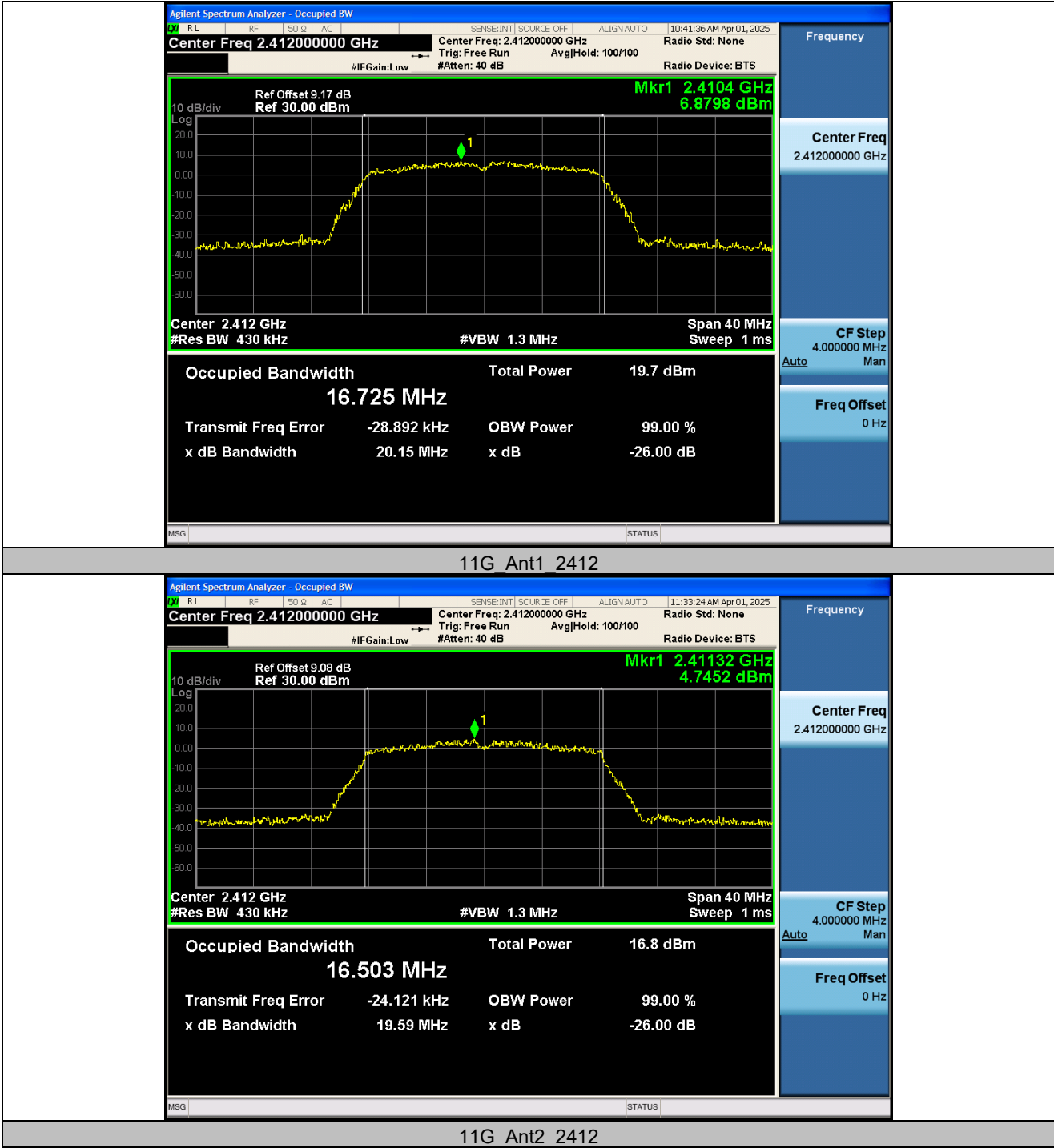
3.4.6 Test Results

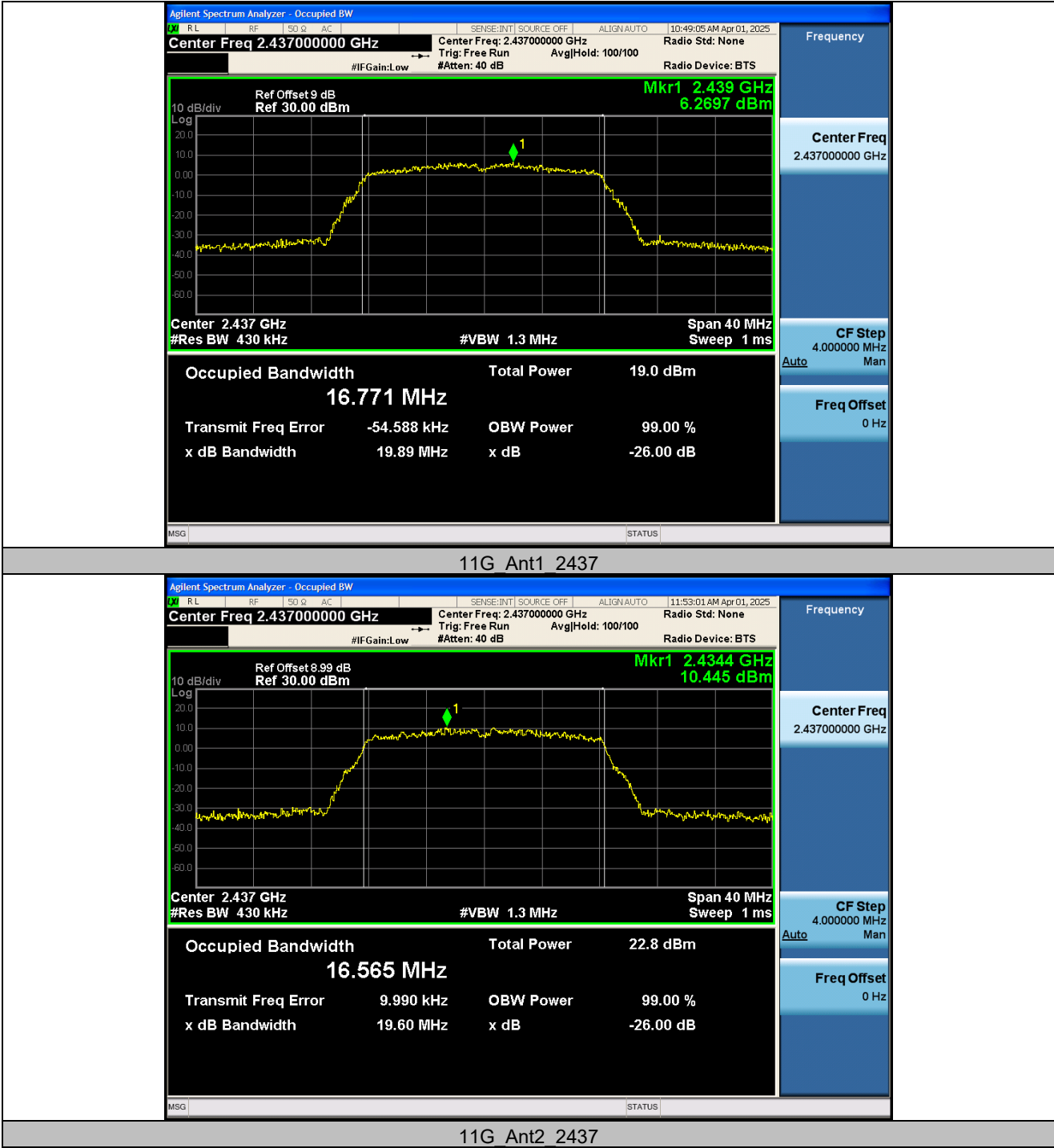
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	14.279	2404.828	2419.107	---	---
	Ant2	2412	14.275	2404.831	2419.106	---	---
	Ant1	2437	14.355	2429.779	2444.134	---	---
	Ant2	2437	14.372	2429.798	2444.170	---	---
	Ant1	2462	14.322	2454.814	2469.136	---	---
	Ant2	2462	14.338	2454.803	2469.141	---	---
11G	Ant1	2412	16.725	2403.609	2420.334	---	---
	Ant2	2412	16.503	2403.724	2420.227	---	---
	Ant1	2437	16.771	2428.560	2445.331	---	---
	Ant2	2437	16.565	2428.727	2445.292	---	---
	Ant1	2462	16.695	2453.629	2470.324	---	---
	Ant2	2462	16.514	2453.734	2470.248	---	---
11N20MIMO	Ant1	2412	17.716	2403.155	2420.871	---	---
	Ant2	2412	17.520	2403.261	2420.781	---	---
	Ant1	2437	17.752	2428.143	2445.895	---	---
	Ant2	2437	17.528	2428.267	2445.795	---	---
	Ant1	2462	17.737	2453.093	2470.830	---	---
	Ant2	2462	17.520	2453.231	2470.751	---	---
11N40MIMO	Ant1	2422	35.844	2404.073	2439.917	---	---
	Ant2	2422	35.941	2404.012	2439.953	---	---
	Ant1	2437	35.877	2419.031	2454.908	---	---
	Ant2	2437	36.089	2418.909	2454.998	---	---
	Ant1	2452	35.829	2434.049	2469.878	---	---
	Ant2	2452	36.013	2433.954	2469.967	---	---

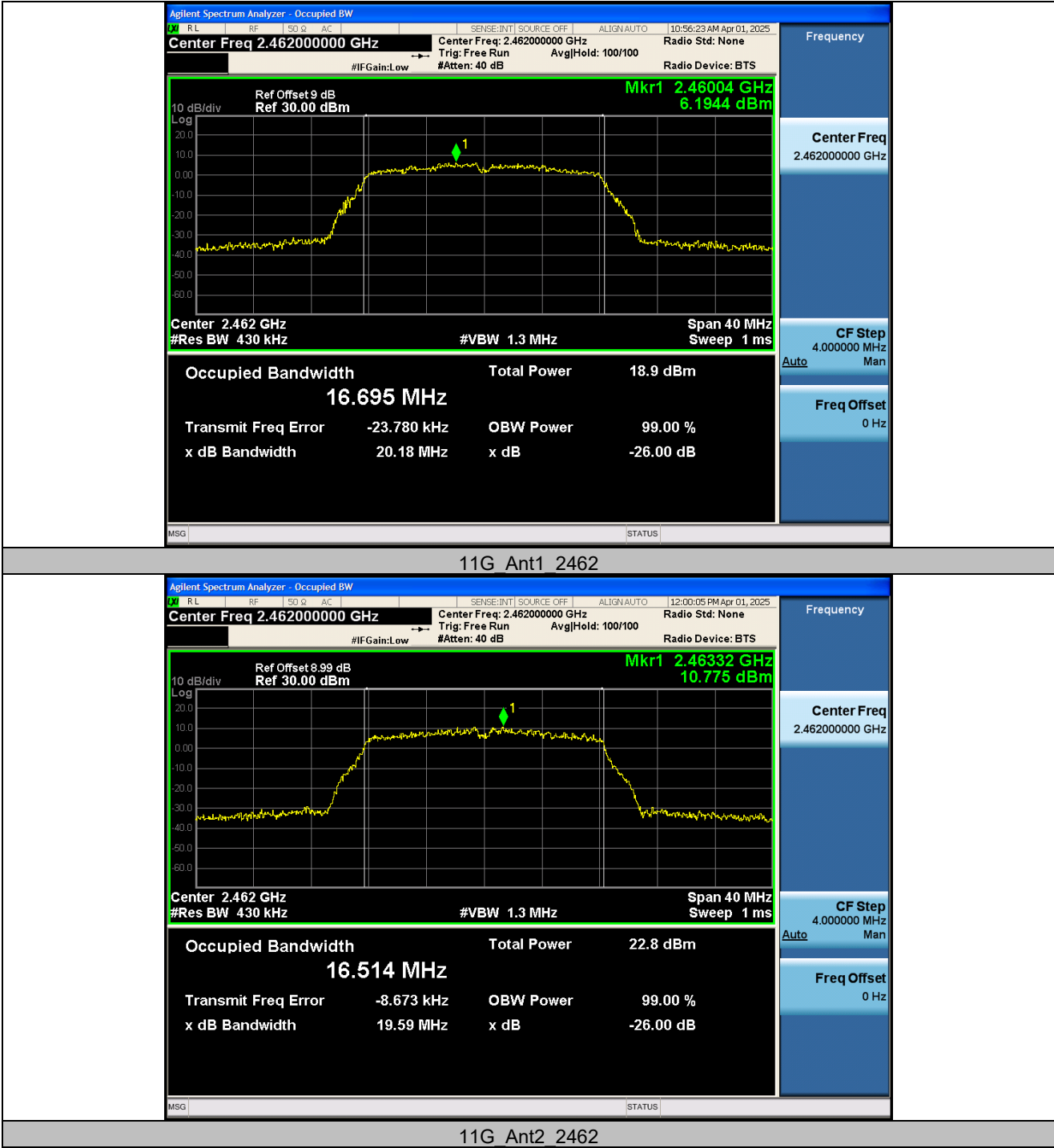


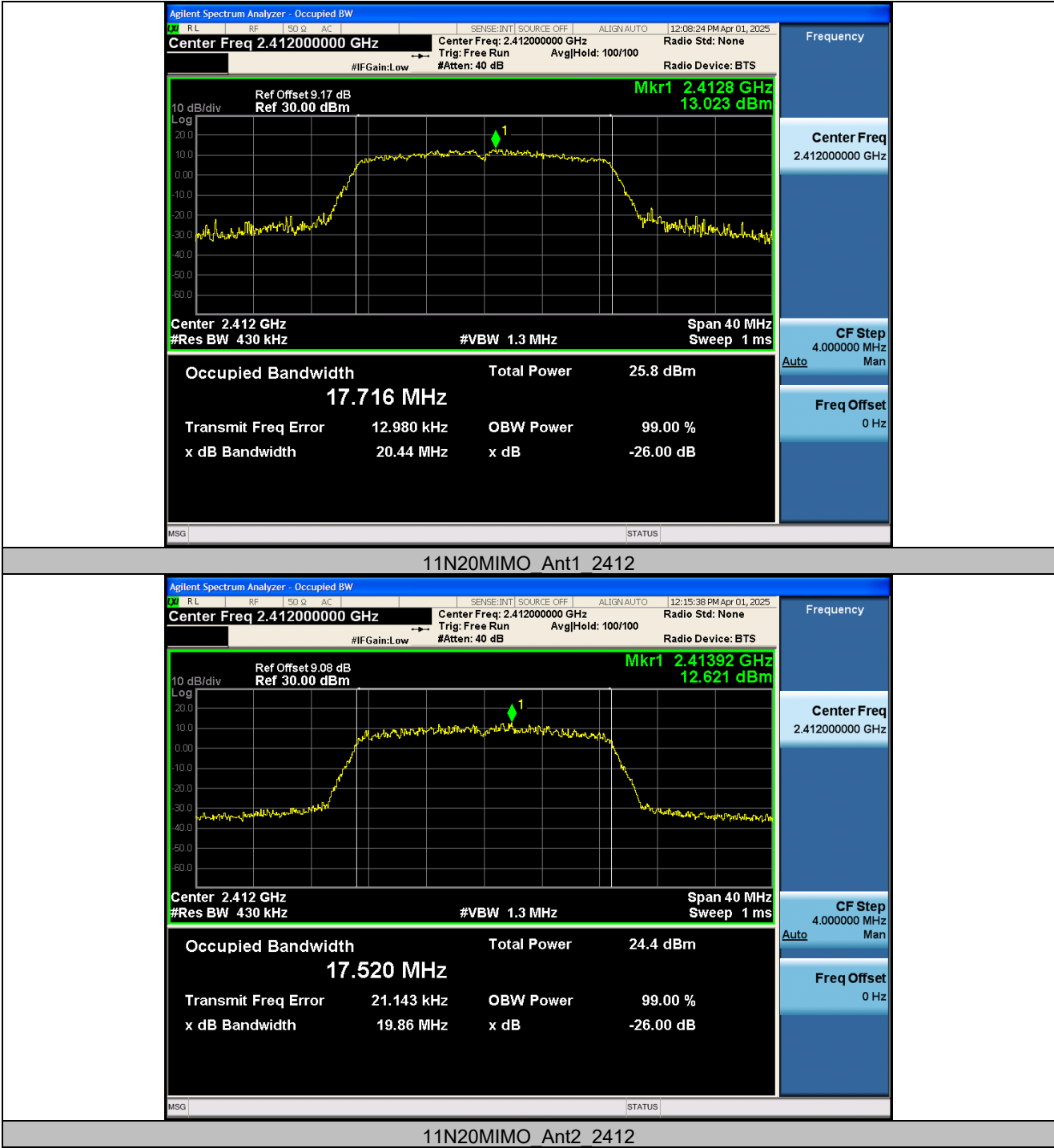


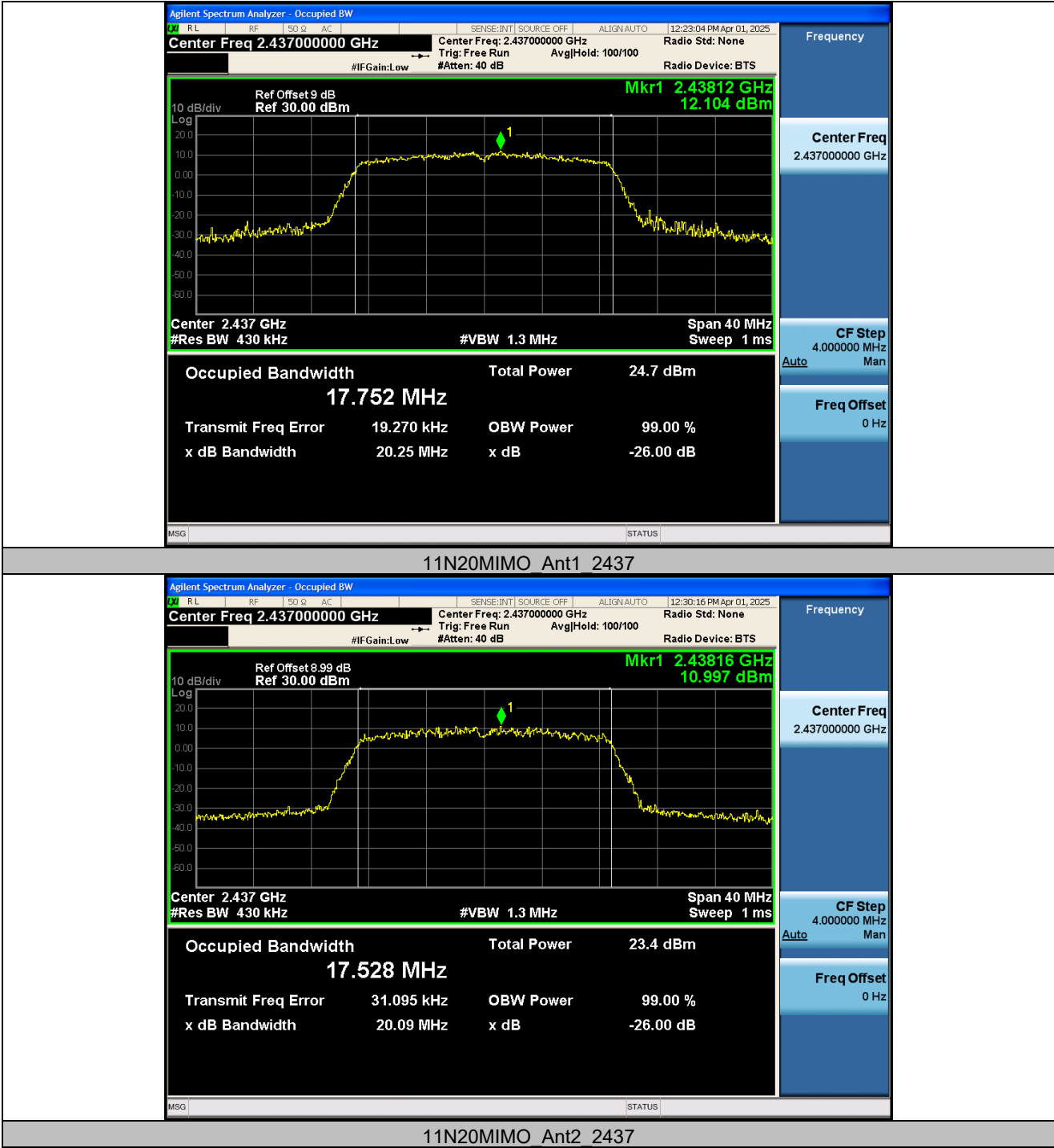


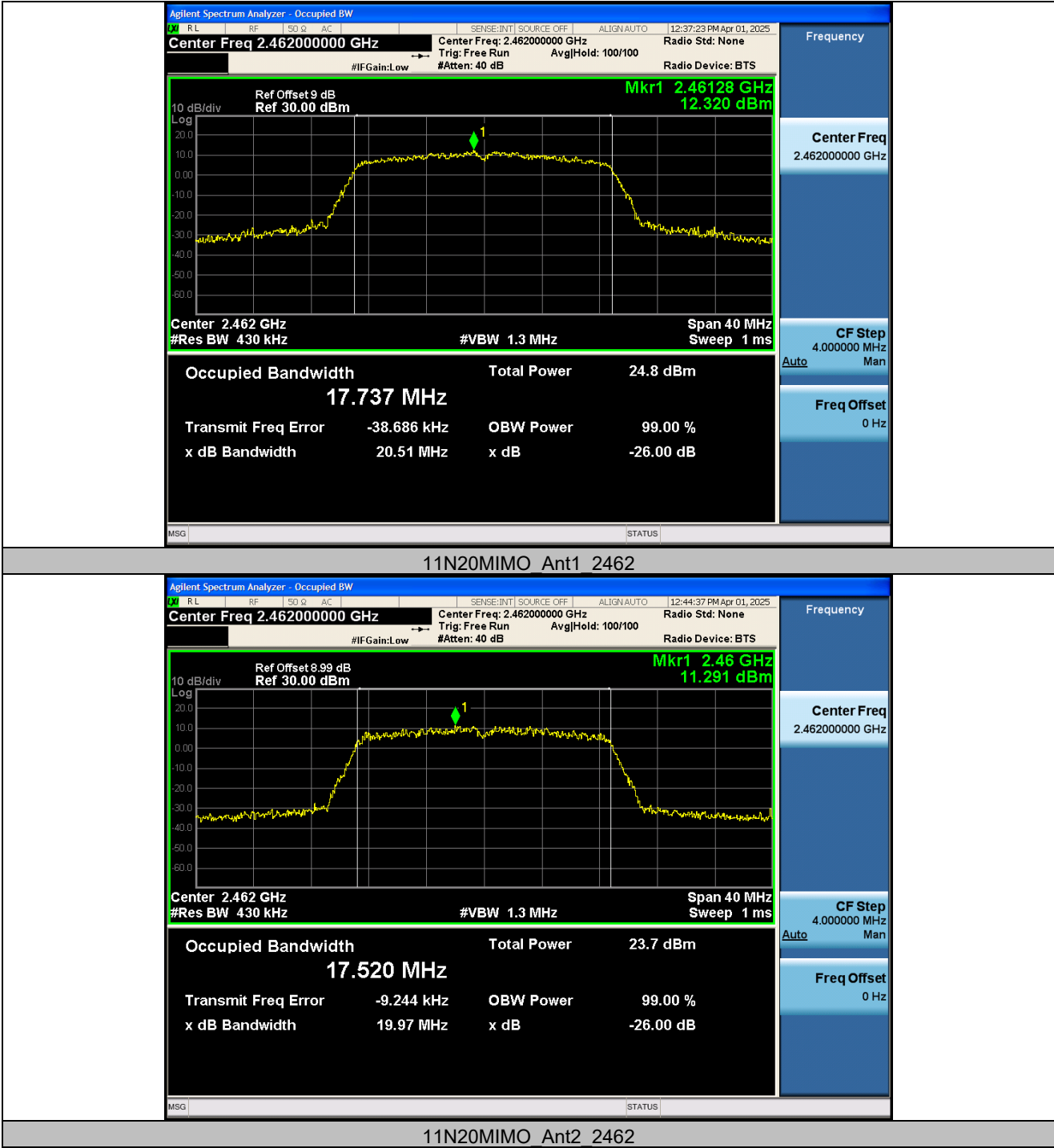


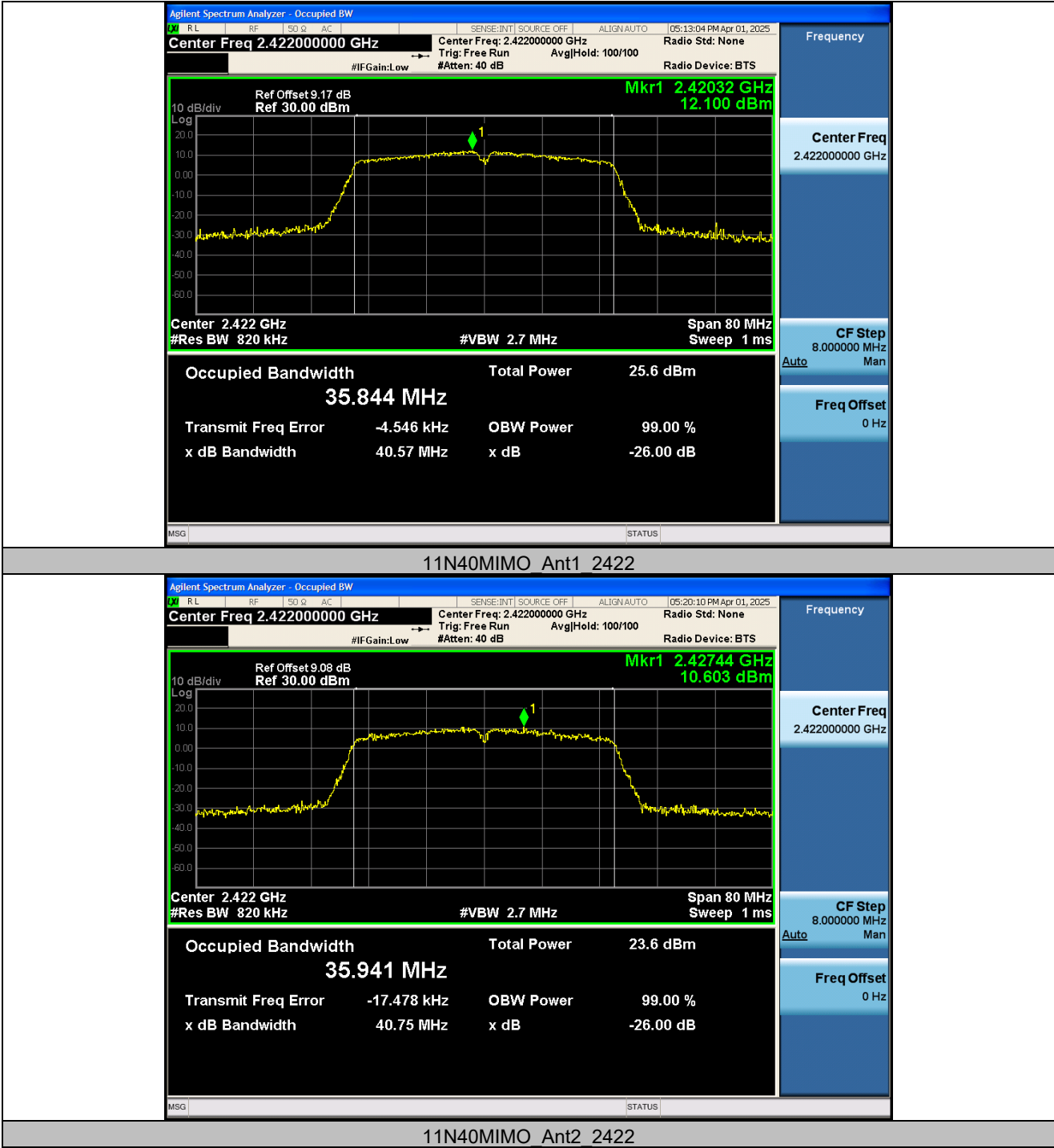


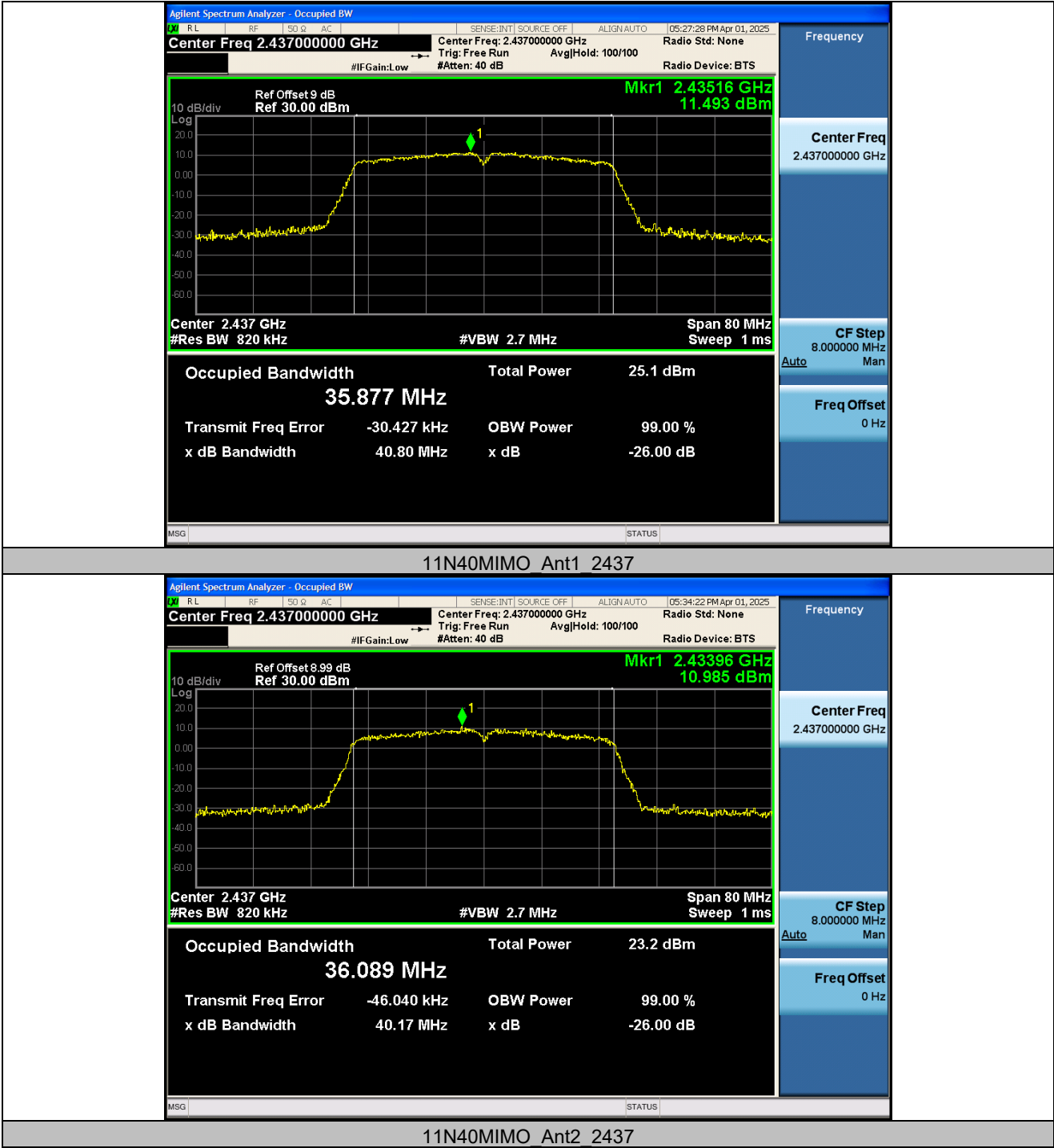


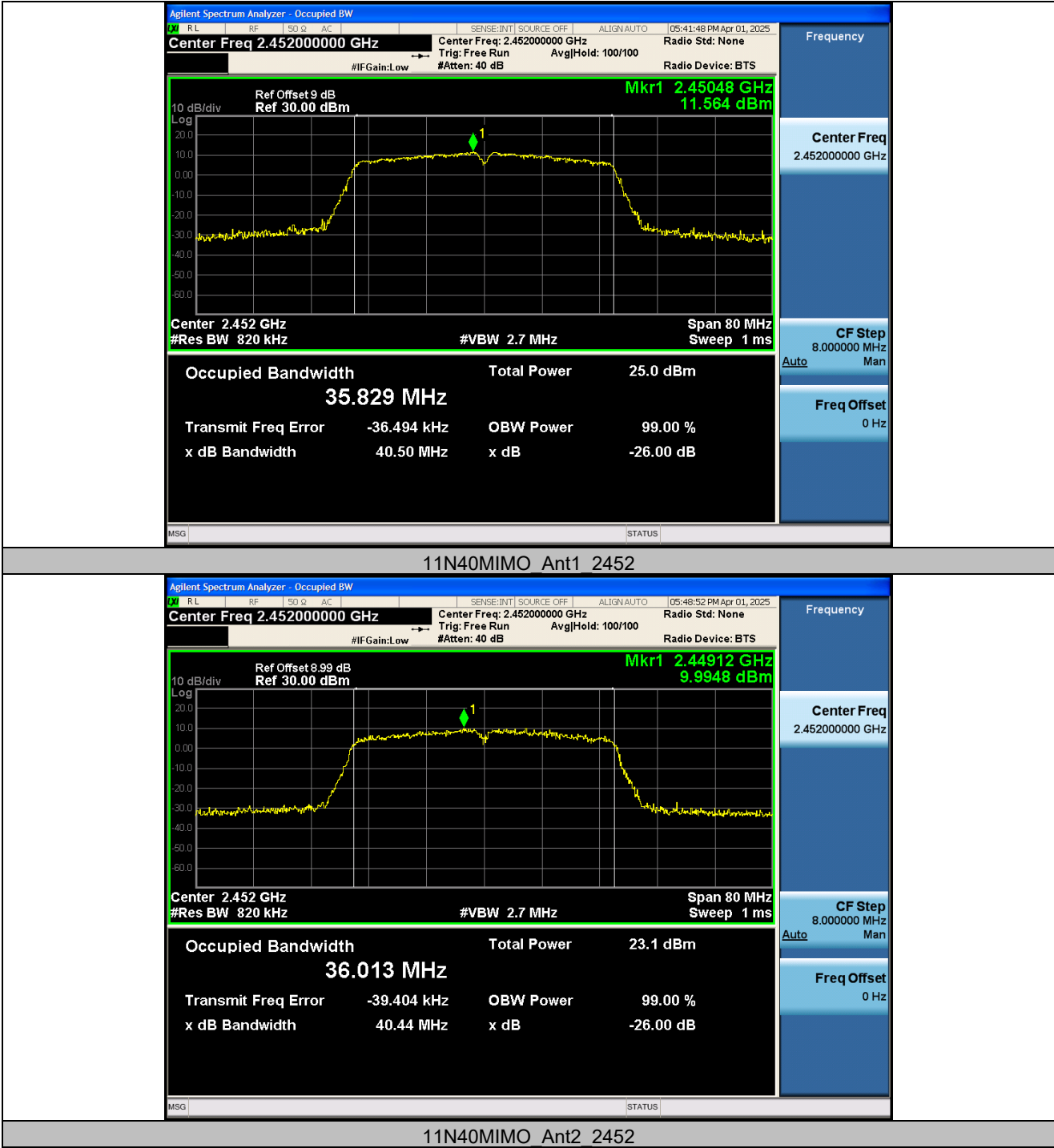












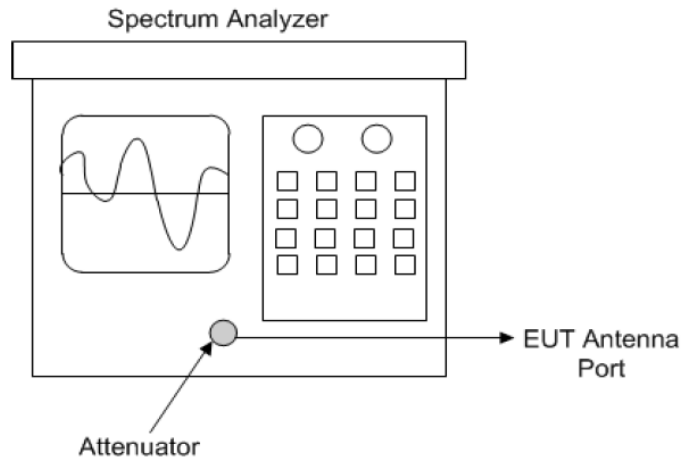
3.5 Conducted Output Power Measurement

3.5.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

3.5.2 Test Setup

- Measurement using a spectrum analyzer (SA) Subclause 11.9.2.2 of ANSI C63.10 is applicable



Spectrum analyzer output power test configuration

3.5.3 Test Instruments

Refer to section 5 to get information of above instrument.

3.5.4 Test Procedures

Measurement using a spectrum analyzer (SA), Selection of test method:

The proper test method is selected based on the following criteria:

- Method AVGSA-1 or method AVGSA-1A (alternative)** shall be applied if either of the following conditions can be satisfied:
 - 1) The EUT transmits continuously (or with a $D > 98\%$).
 - 2) Sweep triggering can be implemented in such a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the instrument configured as in method AVGSA-1) is equal to or shorter than the duration T of each transmission from the EUT, and if those transmissions exhibit full power throughout their durations.
- Method AVGSA-2 or method AVGSA-2A (alternative)** shall be applied if the conditions of the preceding item a) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than +2%.
- Method AVGSA-3 or method AVGSA-3A (alternative)** shall be applied if the conditions of the preceding item a) and item b) cannot be achieved.

Method AVGSA-3 or method AVGSA-3A:

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c) SA Setting:
 - 1* Set span to at least 1.5 times the OBW
 - 2* Set sweep trigger to "free run."
 - 3* Set RBW= 1% to 5% of the OBW. not to exceed 1MHz.
 - 4* Set VBW $\geq 3 \times$ RBW
 - 5* Number of points in sweep $\geq 2 \times$ span /RBW. (This gives bin-to-bin spacing $\leq$ RBW / 2. so that narrowband signals are not lost between frequency bins).
 - 6* Sweep time $\leq$ (number of points in sweep) $\times$ T. where T is defined in 11.6. If this gives a sweep time less than the auto sweep time of the instrument. then method AVGSA-3 shall not be used (use AVGSA-3A). The purpose of this step is so that the averaging time in each bin is less than or equal to the minimum time of a transmission.
 - 7* Detector =RMS (power averaging).
 - 8* Trace mode =max hold.
 - 9* Allow max hold to run for at least 60 s or longer as needed to allow the trace to stabilize.
 - 10* Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function. then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW
- d. Measure the captured power within the band and recording the plot.
- e. Repeat above procedures until all frequencies required were complete.

3.5.5 Deviation from Test Standard

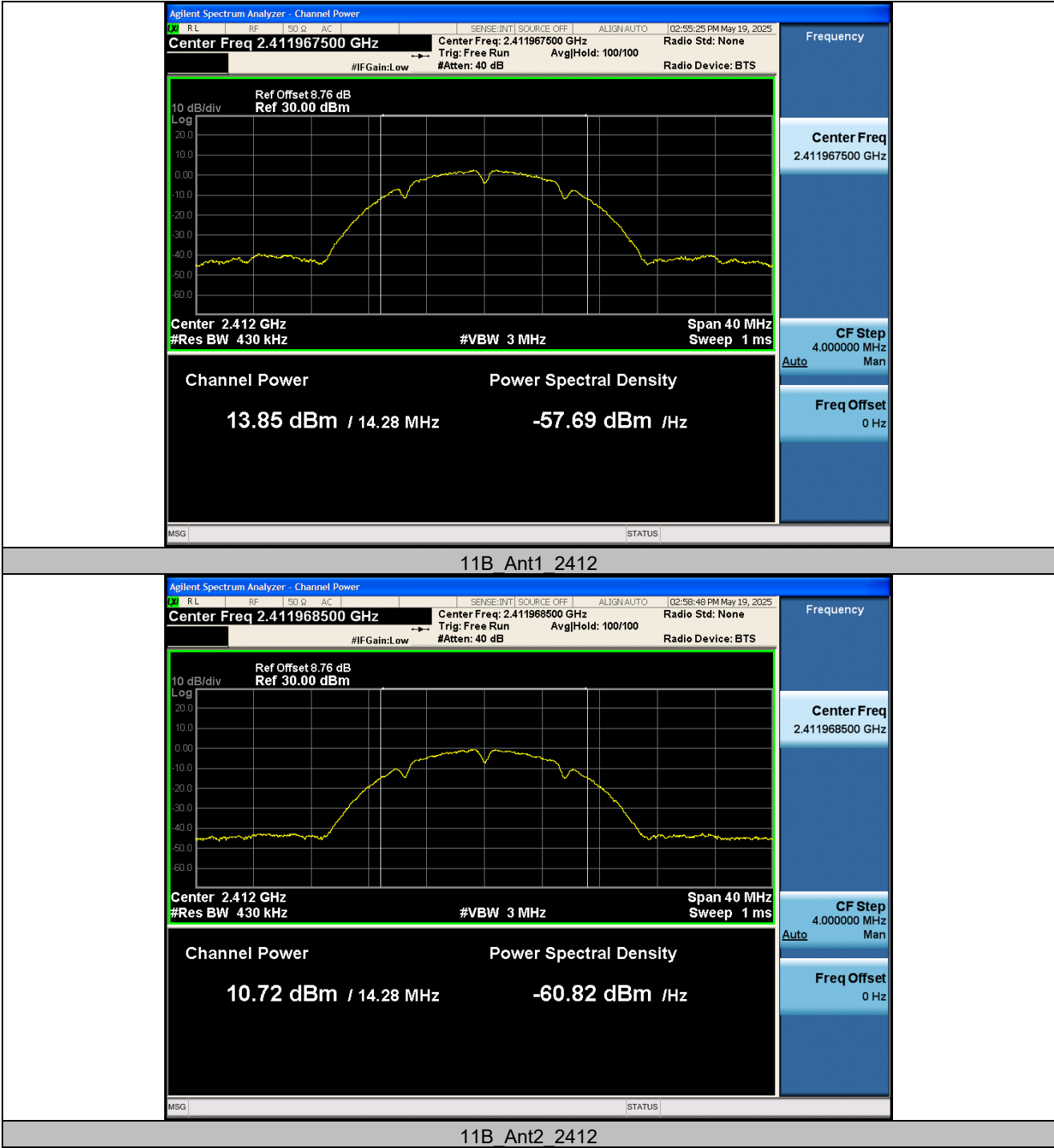
No deviation.

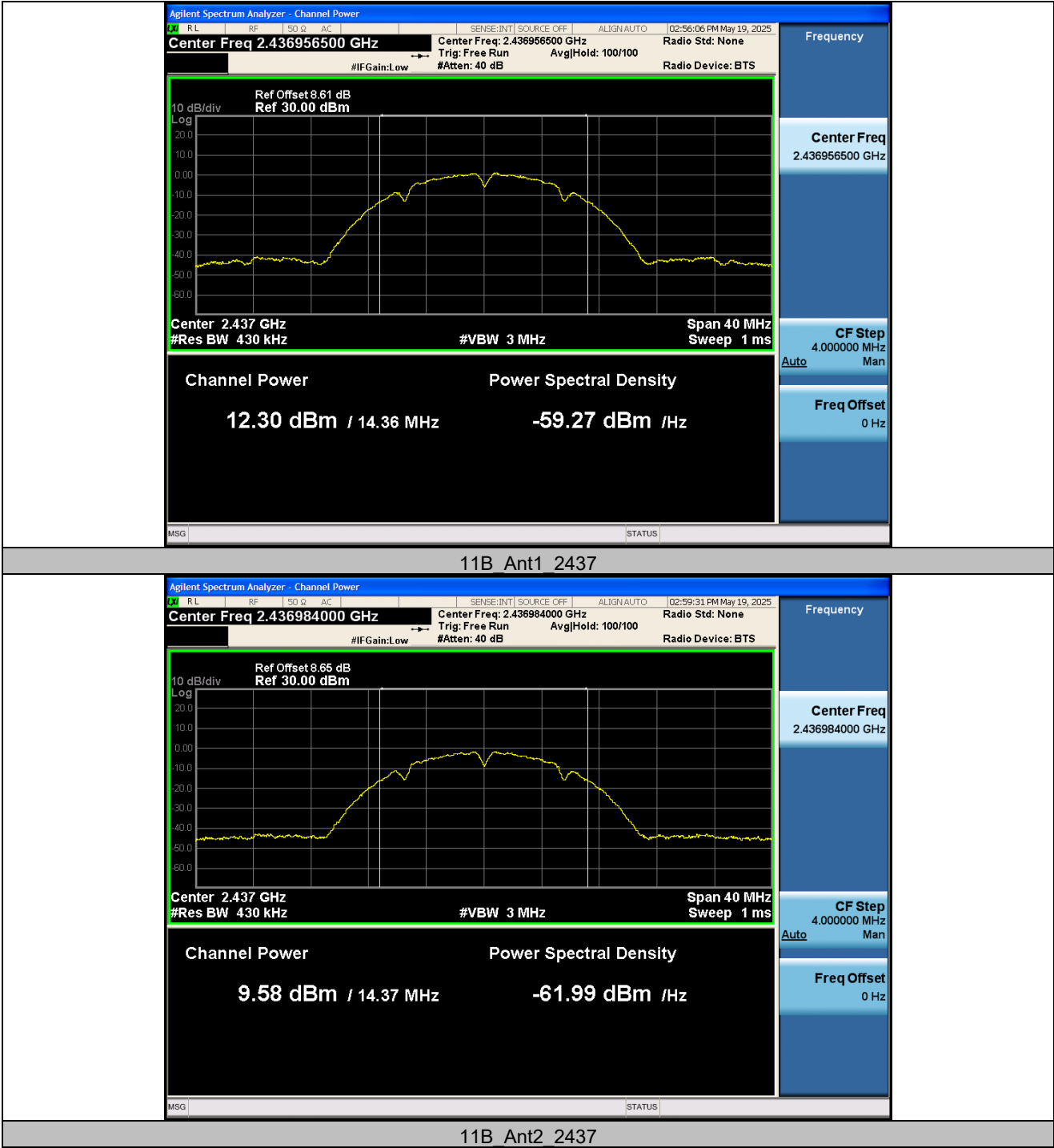
3.5.6 EUT Operating Conditions

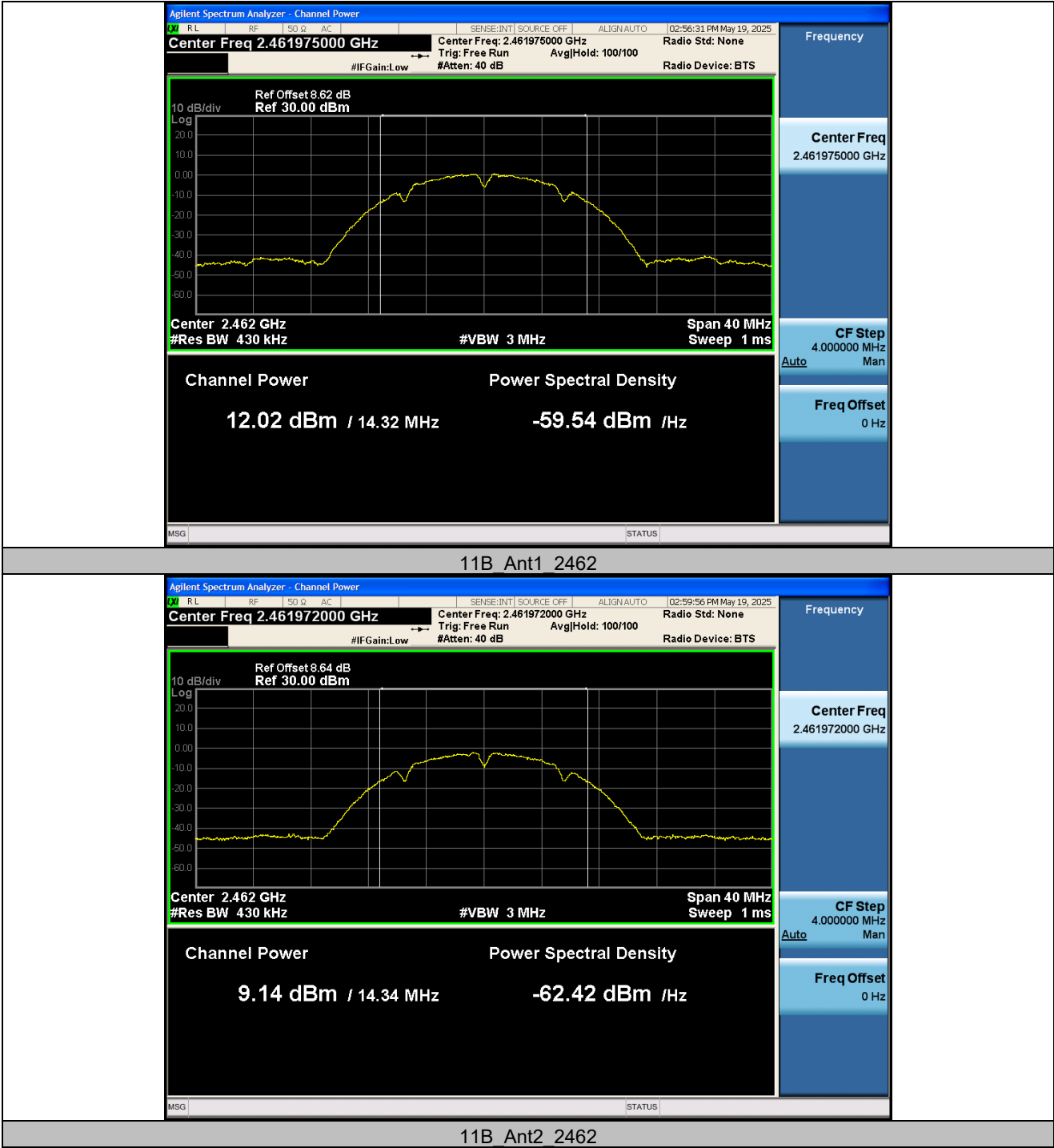
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

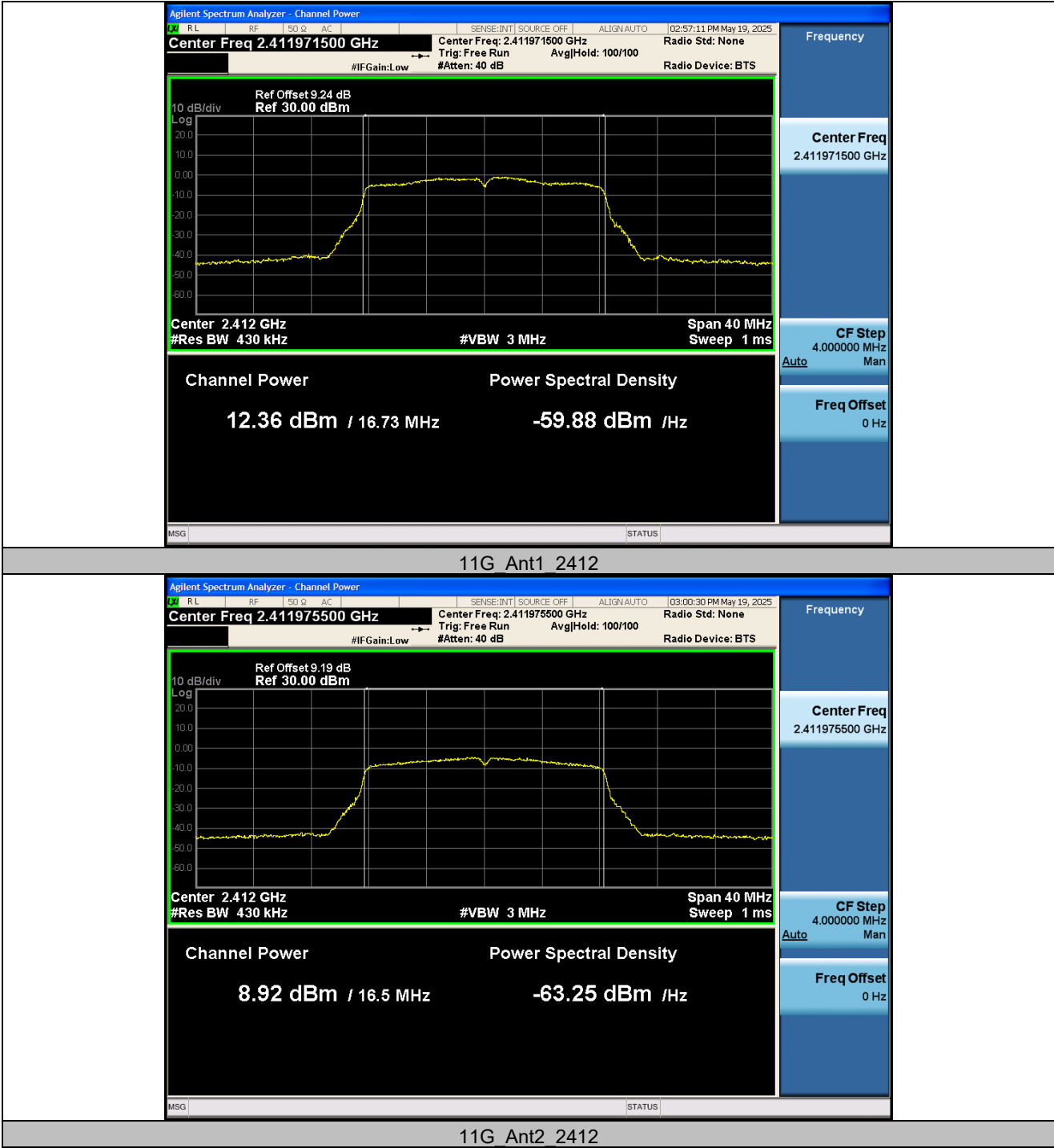
3.5.7 Test Results

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	13.85	≤30.00	PASS
	Ant2	2412	10.72	≤30.00	PASS
	Ant1	2437	12.30	≤30.00	PASS
	Ant2	2437	9.58	≤30.00	PASS
	Ant1	2462	12.02	≤30.00	PASS
	Ant2	2462	9.14	≤30.00	PASS
11G	Ant1	2412	12.36	≤30.00	PASS
	Ant2	2412	8.92	≤30.00	PASS
	Ant1	2437	11.12	≤30.00	PASS
	Ant2	2437	7.85	≤30.00	PASS
	Ant1	2462	11.01	≤30.00	PASS
	Ant2	2462	7.74	≤30.00	PASS
11N20MIMO	Ant1	2412	12.08	≤30.00	PASS
	Ant2	2412	8.79	≤30.00	PASS
	total	2412	13.75	≤30.00	PASS
	Ant1	2437	11.19	≤30.00	PASS
	Ant2	2437	7.66	≤30.00	PASS
	total	2437	12.78	≤30.00	PASS
	Ant1	2462	10.49	≤30.00	PASS
	Ant2	2462	7.42	≤30.00	PASS
	total	2462	12.23	≤30.00	PASS
11N40MIMO	Ant1	2422	11.47	≤30.00	PASS
	Ant2	2422	7.93	≤30.00	PASS
	total	2422	13.06	≤30.00	PASS
	Ant1	2437	11.05	≤30.00	PASS
	Ant2	2437	7.33	≤30.00	PASS
	total	2437	12.59	≤30.00	PASS
	Ant1	2452	10.76	≤30.00	PASS
	Ant2	2452	7.14	≤30.00	PASS
	total	2452	12.33	≤30.00	PASS









Agilent Spectrum Analyzer - Channel Power

RLRF

SENSE:INTI SOURCE OFF

ALIGN:AUTO

03:00:30 PM May 19, 2025

Center Freq 2.411975500 GHz

Center Freq: 2.411975500 GHz

Trig: Free Run

Avg/Hold: 100/100

Radio Std: None

#IF Gain: Low

#Atten: 40 dB

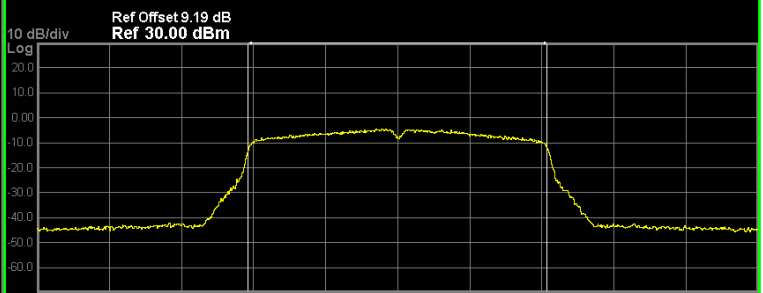
Radio Device: BTS

Ref Offset 9.19 dB

Ref 30.00 dBm

10 dB/div

Log



Center 2.412 GHz

#Res BW 430 kHz

#VBW 3 MHz

Span 40 MHz

Sweep 1 ms

Channel Power

Power Spectral Density

8.92 dBm / 16.5 MHz

-63.25 dBm /Hz

MSG

STATUS

11G Ant2 2412

Frequency

Center Freq

2.411975500 GHz

CF Step

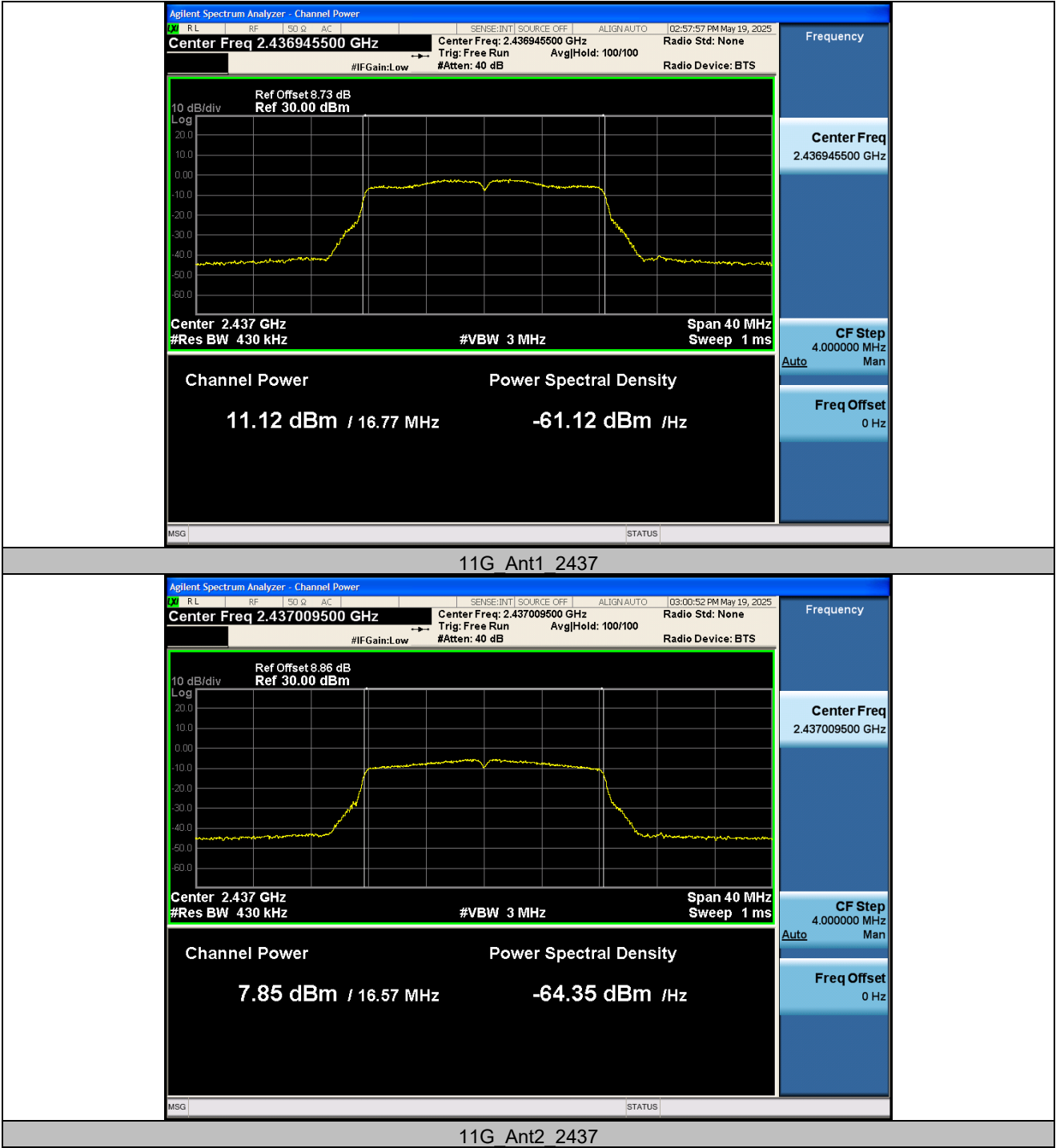
4.000000 MHz

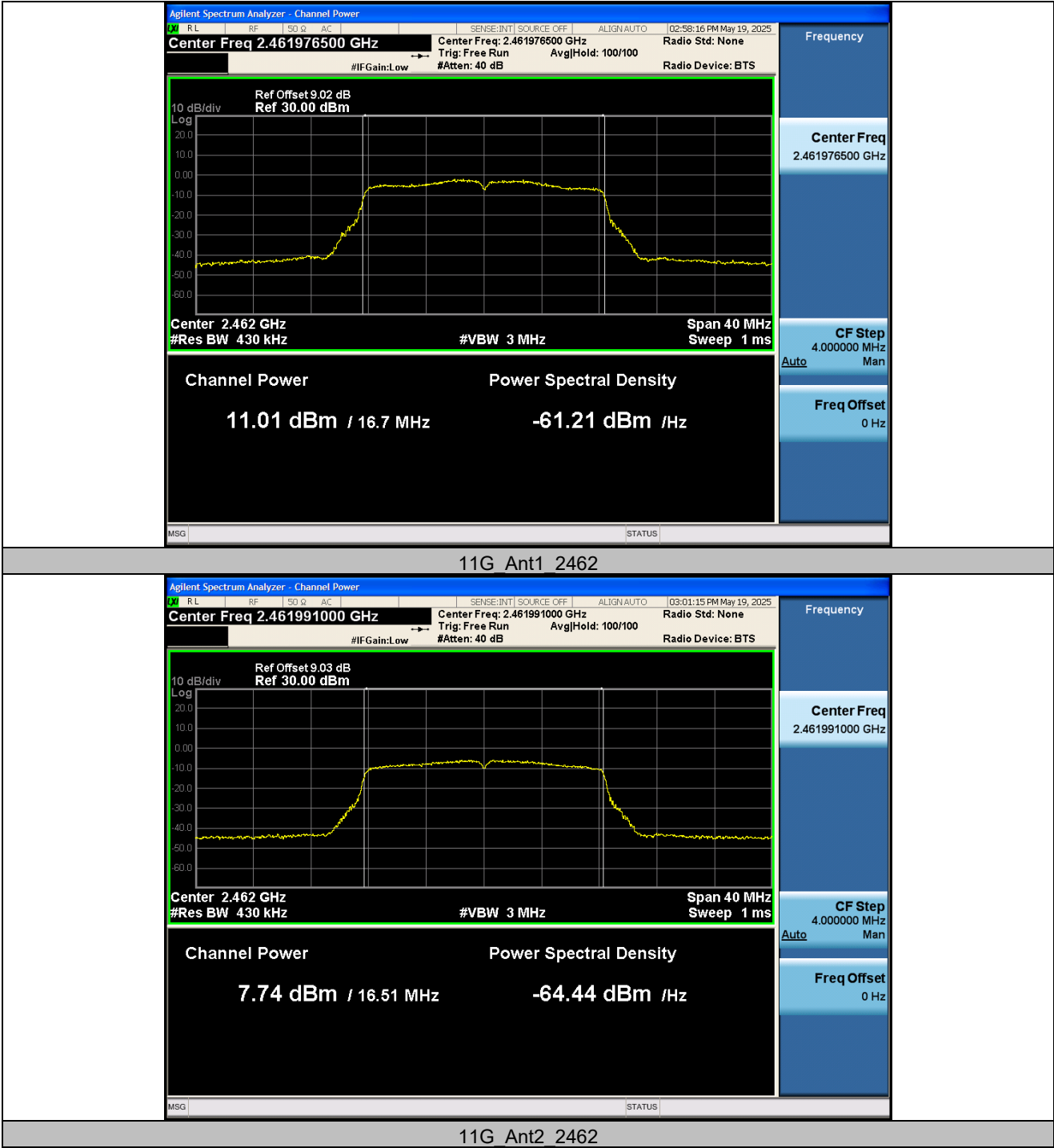
Man

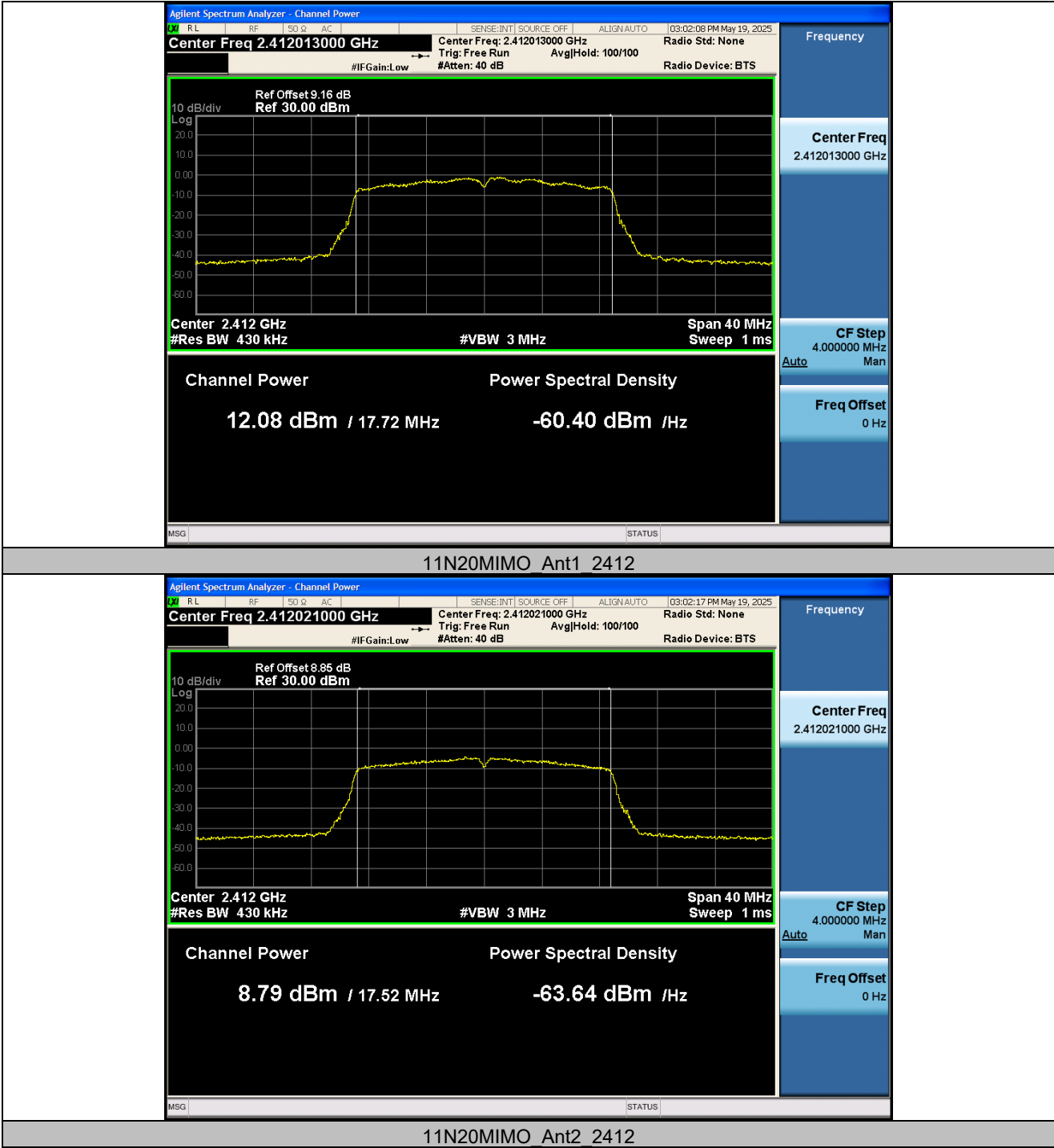
Auto

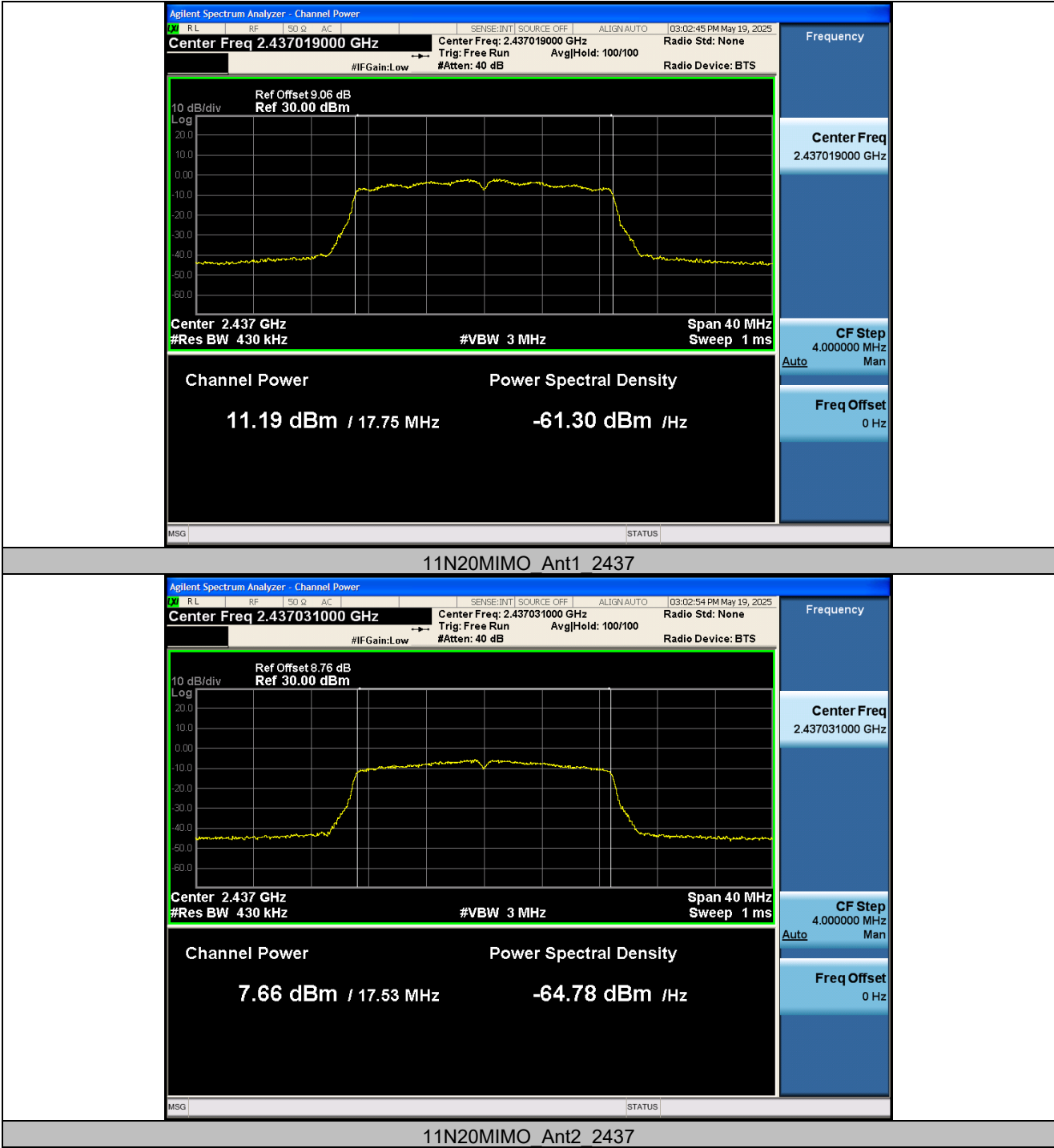
Freq Offset

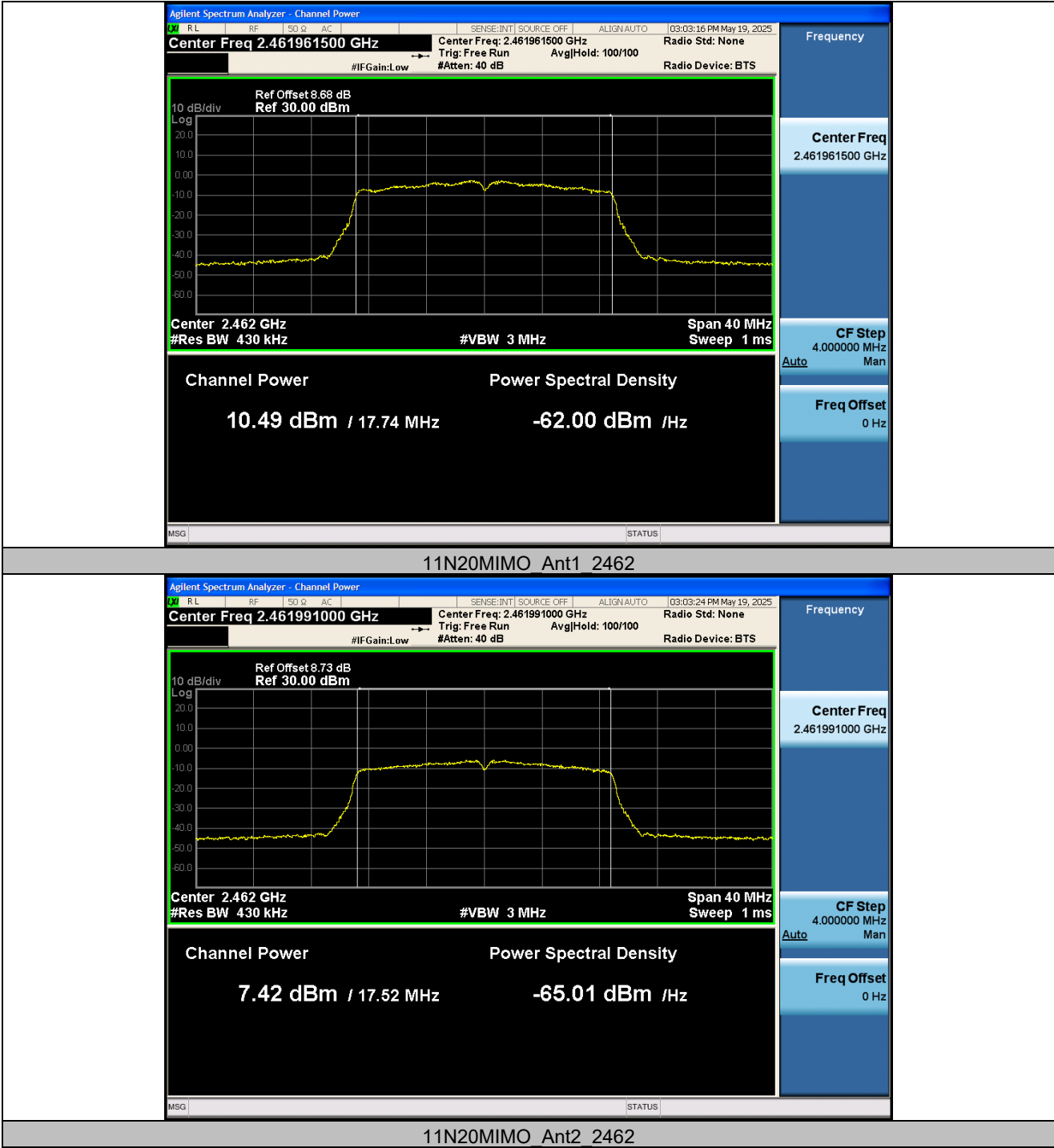
0 Hz

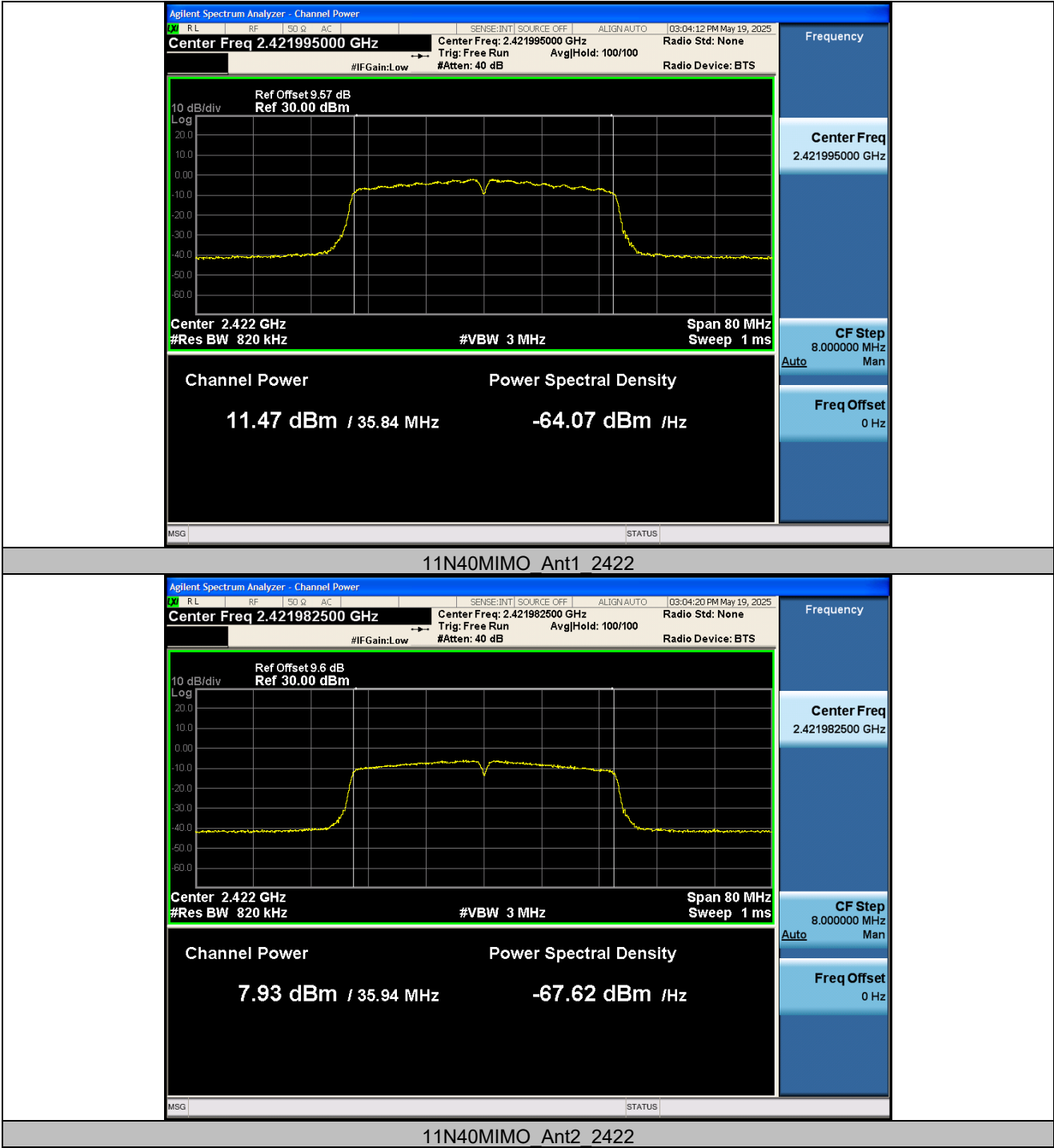












11N40MIMO Ant1 2422

Agilent Spectrum Analyzer - Channel Power

RL

RF

SO

Q

AC

SENSE:INTI SOURCE:OFF ALIGN:AUTO 03:04:20 PM May 19, 2025

Center Freq 2.421982500 GHz

Center Freq: 2.421982500 GHz

Trig: Free Run

Avg/Hold: 100/100

Radio Std: None

#IF Gain: Low

#Atten: 40 dB

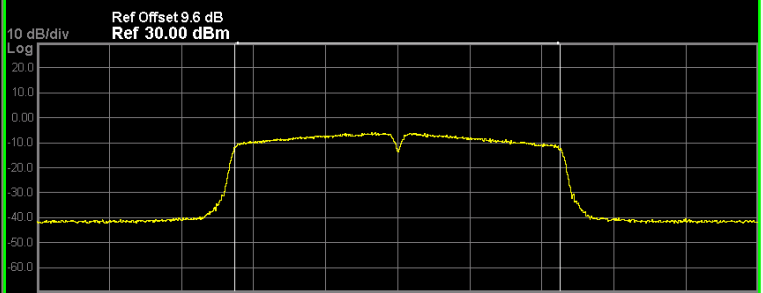
Radio Device: BTS

Ref Offset 9.6 dB

Ref 30.00 dBm

10 dB/div

Log



Center 2.422 GHz

#Res BW 820 kHz

#VBW 3 MHz

Span 80 MHz

Sweep 1 ms

Channel Power

Power Spectral Density

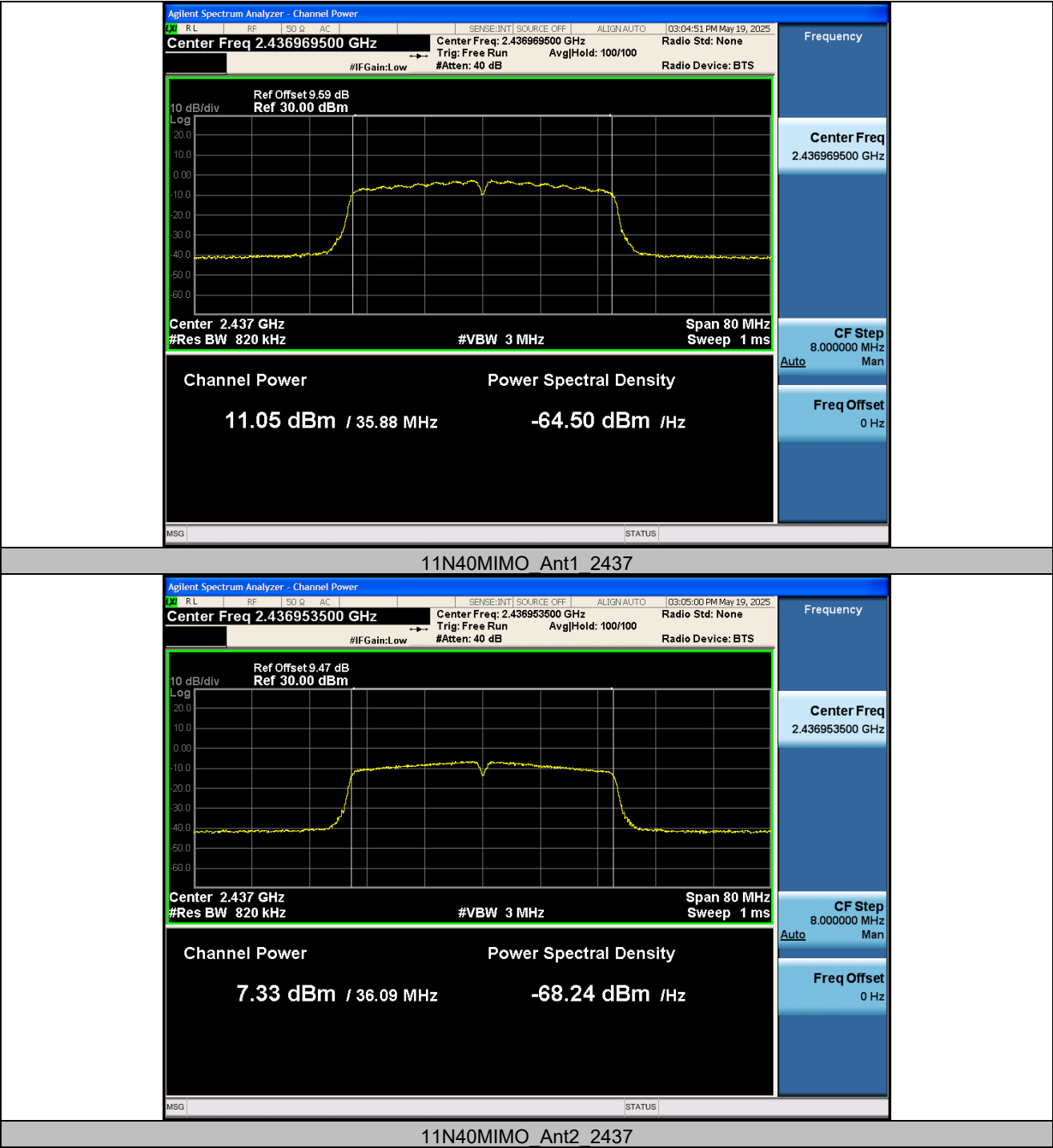
7.93 dBm / 35.94 MHz

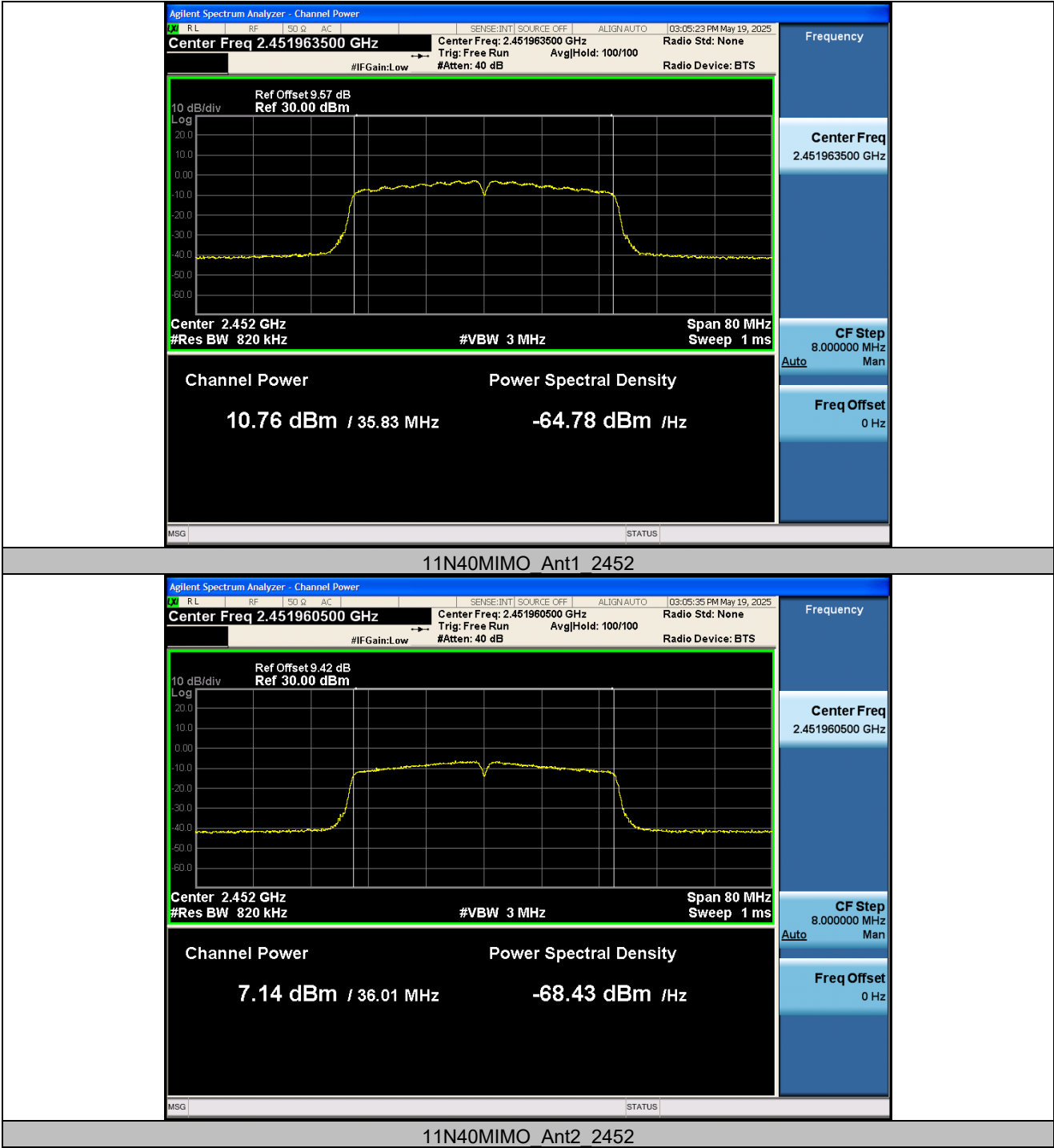
-67.62 dBm / Hz

MSG

STATUS

11N40MIMO Ant2 2422





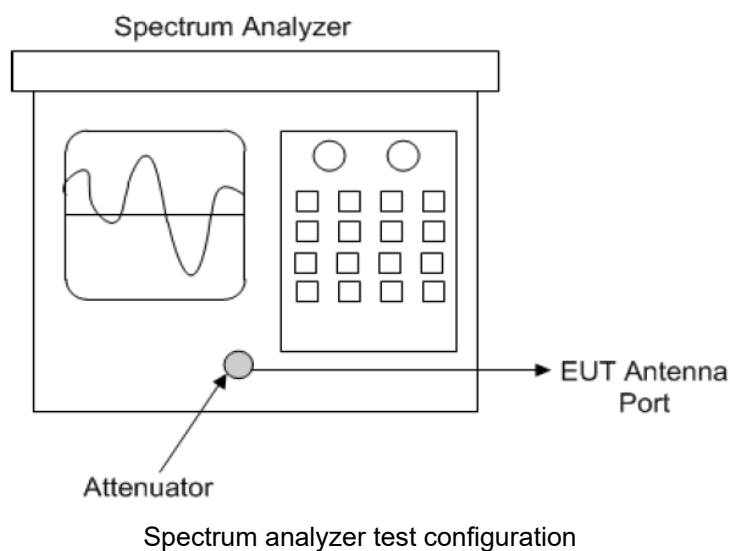
3.6 Power Spectral Density Measurement

3.6.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm/3kHz.

3.6.2 Test Setup

- DTS maximum power spectral density level in the fundamental emission Subclause 11.10 of ANSI C63.10 is applicable



3.6.3 Test Instruments

Refer to section 5 to get information of above instrument.

3.6.4 Test Procedure

- Method AVGPS-1 or method AVGPS-1A (alternative)** shall be applied if either of the following conditions can be satisfied:
 - 1) The EUT transmits continuously (or with a $D \geq 98\%$).
 - 2) Sweep triggering can be implemented in such a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep is equal to or shorter than the duration I of each transmission from the EUT, and if those transmissions exhibit full power throughout these durations.
- Method AVGPS-2 or method AVGPS-2A (alternative)** shall be applied if the conditions of the preceding item a) cannot be achieved. and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than $\pm 2\%$.
- Method AVGPS-3 or method AVGPS-3A (alternative)** shall be applied if the conditions of the preceding paragraphs a) and b) cannot be achieved.

Method AVGPSD-3:

Method AVGPSD-3 uses mms detection across ON and OFF times of the EUT with max hold. The following procedure is applicable when the EUT cannot be configured to transmit continuously (i.e. $D < 98\%$), when sweep triggering/signal gating cannot be used to measure only when the EUT is transmitting at its maximum power control level. and when the transmission duty cycle is not constant (i.e., duty cycle variations exceed $\pm 2\%$),

SA Setting:

- a. Set the instrument span to a minimum of 1.5 times the OBW.
 - b. Set sweep trigger to "free run."
 - c. Set the RBW = 3 kHz, VBW = 10 kHz,
 - d. Detector = RMS (power averaging).
 - e. Sweep time = Auto couple,
 - f. Allow max hold to run for at least 60 s or longer as needed to allow the trace to stabilize.
 - g. Use the peak marker function to determine the maximum PSD level
- If the measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

3.6.5 Deviation from Test Standard

No deviation.

3.6.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.6.7 Test Results

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-11.68	≤8.00	PASS
	Ant2	2412	-16.98	≤8.00	PASS
	Ant1	2437	-17.69	≤8.00	PASS
	Ant2	2437	-15.35	≤8.00	PASS
	Ant1	2462	-12.02	≤8.00	PASS
	Ant2	2462	-18.62	≤8.00	PASS
11G	Ant1	2412	-17.5	≤8.00	PASS
	Ant2	2412	-20.54	≤8.00	PASS
	Ant1	2437	-17.74	≤8.00	PASS
	Ant2	2437	-14.94	≤8.00	PASS
	Ant1	2462	-18.49	≤8.00	PASS
	Ant2	2462	-15.09	≤8.00	PASS
11N20MIMO	Ant1	2412	-12.02	≤8.00	PASS
	Ant2	2412	-14.36	≤8.00	PASS
	total	2412	-10.02	≤8.00	PASS
	Ant1	2437	-12.92	≤8.00	PASS
	Ant2	2437	-15.6	≤8.00	PASS
	total	2437	-11.05	≤8.00	PASS
	Ant1	2462	-13.08	≤8.00	PASS
	Ant2	2462	-14.84	≤8.00	PASS
	total	2462	-10.86	≤8.00	PASS
11N40MIMO	Ant1	2422	-14.66	≤8.00	PASS
	Ant2	2422	-17.04	≤8.00	PASS
	total	2422	-12.68	≤8.00	PASS
	Ant1	2437	-14.68	≤8.00	PASS
	Ant2	2437	-17.42	≤8.00	PASS
	total	2437	-12.83	≤8.00	PASS
	Ant1	2452	-15.14	≤8.00	PASS
	Ant2	2452	-17.46	≤8.00	PASS
	total	2452	-13.14	≤8.00	PASS

