

DYNAMIC FREQUENCY SELECTION

DFS Test Report

APPLICANT : OnePlus Technology (Shenzhen) Co., Ltd.
EQUIPMENT : Mobile Phone
BRAND NAME : 1+, ONEPLUS
MODEL NAME : CPH2451
FCC ID : 2ABZ2-AA516
STANDARD : FCC Part 15 Subpart E
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure
TEST DATE(S) : Nov. 06, 2022 ~ Nov. 22, 2022

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

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

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (Kunshan)

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People's Republic of China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FZ2O2001	Rev. 01	Initial issue of report	Dec. 21, 2022

SUMMARY OF DYNAMIC FREQUENCY SELECTION TEST

UNII	Bandwidth and Channel	Description	Measured	Limit	Result
UNII Band 2-A 5250-5350MHz & UNII Band 2-C 5470-5725MHz	160MHz (CH50) 5250MHz	Channel Move Time	480.416ms	10 sec	Pass
		Channel Closing Transmission time	<200ms + 3.6ms (aggregate)	200 ms + aggregate of 60 ms over remaining 10 s period	Pass
		Non-Occupancy Period and Client Beacon Test	No transmission or Beacons occurred	30 minutes	Pass
	160MHz (CH114) 5570MHz	Channel Move Time	530.818ms	10 sec	Pass
		Channel Closing Transmission time	<200ms + 4.8ms (aggregate)	200 ms + aggregate of 60 ms over remaining 10 s period	Pass
		Non-Occupancy Period and Client Beacon Test	No transmission or Beacons occurred	30 minutes	Pass

Note: Since the product is client without radar detection function, only Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period Test are required to be performed.

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

OnePlus Technology (Shenzhen) Co., Ltd.

18C02, 18C03, 18C04, and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, Guangdong, P.R. China.

1.2. Manufacturer

OnePlus Technology (Shenzhen) Co., Ltd.

18C02, 18C03, 18C04, and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, Guangdong, P.R. China.

1.3. Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Phone
Brand Name	1+, ONEPLUS
Model Name	CPH2451
FCC ID	2ABZ2-AA516
IMEI Code	864921060035690/864921060035682
HW Version	11
SW Version	OxygenOS 13.0
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4. Product Specification of Equipment Under Test

Product Specification subjective to this standard	
DFS Function	Client without radar detection function
Tx/Rx Channel Frequency Range	5260 MHz ~ 5320 MHz 5500 MHz ~ 5700 MHz
EUT support WLAN function	802.11a 802.11n HT20/HT40 802.11ac VHT20/VHT40/VHT80/VHT160 802.11ax HE20/HE40/HE80/HE160 802.11be EHT20/EHT40/EHT80/EHT160
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) 802.11be: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM / 4096QAM)

Note: The device support channel puncturing function as below,

Puncturing 20MHz modes

BWs/channels	Tones		Index		For test modes configure
80MHz ch42/58/106/122 /155	484	242	66	62	1
80MHz ch42/58/106/122 /155	484	242	66	61	2
80MHz ch42/58/106/122 /155	484	242	65	64	3
80MHz ch42/58/106/122 /155	484	242	65	63	4

BWs/ channels	Tones			Index			For test modes configure
160MHz ch50/114	242-Left	484-Left	996-Right	62-Left	66-Left	67-Right	1
160MHz ch50/114	242-Left	484-Left	996-Right	61-Left	66-Left	67-Right	2
160MHz ch50/114	484-Left	242-Left	996-Right	65-Left	64-Left	67-Right	3
160MHz ch50/114	484-Left	242-Left	996-Right	65-Left	63-Left	67-Right	4
160MHz ch50/114	996-Left	242-Right	484-Right	67-Left	62-Right	66-Right	5
160MHz ch50/114	996-Left	242-Right	484-Right	67-Left	61-Right	66-Right	6
160MHz ch50/114	996-Left	484-Right	242-Right	67-Left	65-Right	64-Right	7
160MHz ch50/114	996-Left	484-Right	242-Right	67-Left	65-Right	63-Right	8

Puncturing 40MHz modes

BWs/channels	Tones		Index		For test modes configure
160MHz/ch50/114	484-Left	996-Right	66-Left	67-Right	1
160MHz/ch50/114	484-Left	996-Right	65-Left	67-Right	2
160MHz/ch50/114	996-Left	484-Right	67-Left	66-Right	3
160MHz/ch50/114	996-Left	484-Right	67-Left	65-Right	4

Only the worse cases are shown in this report.

1.5. Modification of EUT

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

1.6. Testing Site

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

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	DFS01-KS	CN1257	314309

1.7. Applied 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 905462 D02 UNII DFS Compliance Procedures New Rules v02
- FCC KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

1.8. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	HW / FW Version	Power Cord
1.	WLAN AP	Qualcomm	N/A	N/A	N/A	Shielded, 1.8 m
2.	Notebook	Lenovo	Edge E335	PPD-AR5B95	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2 Requirements and Parameters for DFS Test

2.1. Summary of Dynamic Frequency Selection Test

Bandwidth and Channel	Test Items	Limit
160MHz 5250MHz (CH50)		
160MHz (CH50) 5250MHz	Channel Move Time	10 sec
	Channel Closing Transmission time	200 ms + aggregate of 60 ms over remaining 10 s period
	Non-Occupancy Period and Client Beacon Test	30 minutes
160MHz 5570MHz (CH114)		
160MHz (CH114) 5570MHz	Channel Move Time	10 sec
	Channel Closing Transmission time	200 ms + aggregate of 60 ms over remaining 10 s period
	Non-Occupancy Period and Client Beacon Test	30 minutes

2.2. Applicability of DFS Requirements

EUT is client and operates as client without radar detection function.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes
Client Beacon Test	N/A	Yes	Yes

Additional requirements for devices with multiple bandwidth modes	Operational Mode	
	Master or Client With Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required

Note

Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

2.3. Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

The radar *Detection Threshold*, lowest antenna gain is the parameter of Interference radar DFS *detection threshold*, The Interference *Detection Threshold* is the (-62dBm) + (0) [dBi]+ 1 dB= -61 dBm.

2.4. DFS Response requirement values

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the 99% power bandwidth See Note 3.

Note 1: The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

- For the Short pulse radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate *Channel* changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 0 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.

2.5. Short Pulse Radar Test Waveforms

As the EUT is a Client Device with no Radar Detection, only one type radar pulse is required for the testing. Radar Pulse type 0 was used in the evaluation of the Client device for the purpose of measuring the Channel Move Time and the Channel Closing Transmission Time.

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	60%	30
1	1	Test A Test B	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{PRI_{\mu sec}} \right) \right\}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a

Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms.

If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

3 Calibration Setup and DFS Test Results

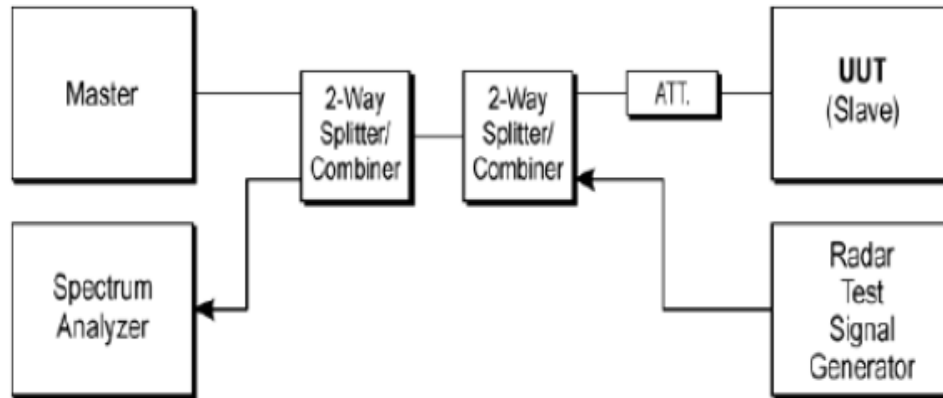
3.1. Calibration of Radar Waveform

3.1.1 Radar Waveform Calibration Procedure

The Interference **Radar Detection Threshold Level** is $(-62\text{dBm}) + (0) [\text{dBi}] + 1 \text{ dB} = -61\text{dBm}$ that had been taken into account the output power range and antenna gain. The following equipment setup was used to calibrate the radiated Radar Waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) at the frequency of the Radar Waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz to measure the type 0 radar waveform. The spectrum analyzer had offset to compensate and RF cable loss. The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was $(-62\text{dBm}) + (0) [\text{dBi}] + 1 \text{ dB} = -61 \text{ dBm}$. Capture the spectrum analyzer plots on short pulse radar waveform.

3.1.2 Test Setup

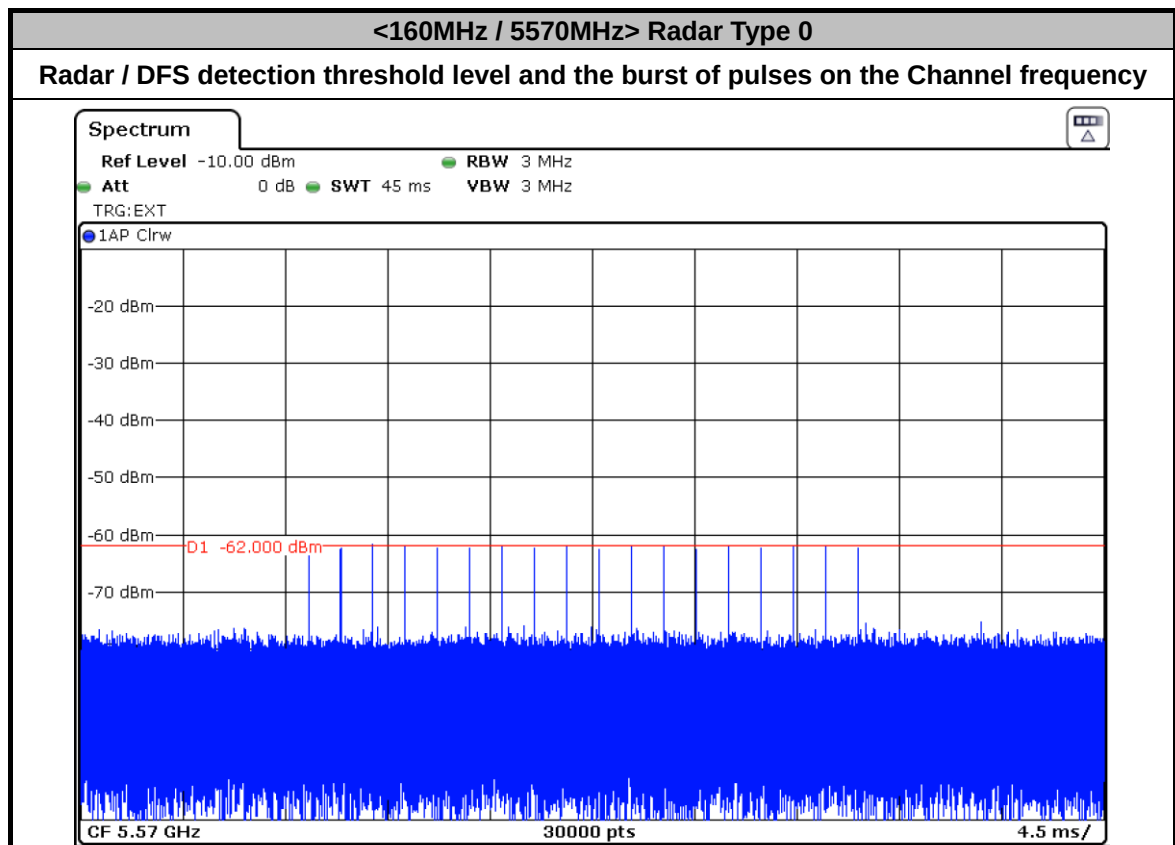
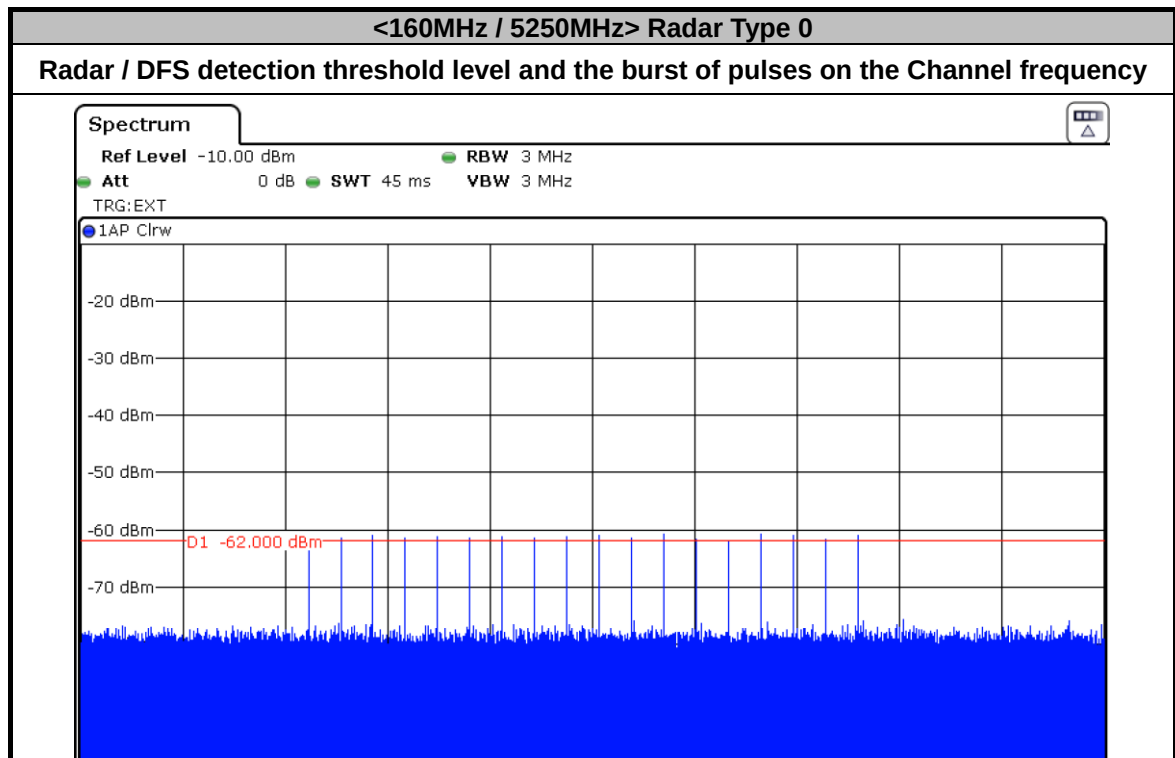
Conducted Test Setup



3.1.3 Calibration Deviation

There is no deviation with the original standard.

3.1.4 Radar Waveform Calibration Result





3.2. In-Service Monitoring: Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

3.2.1 Limit of In-Service Monitoring

The EUT has In-Service Monitoring function to continuously monitor the radar signals, If radar is detected, it must leave the channel (Shutdown). The Channel Move Time to cease all transmissions on the current Channel upon detection of a Radar Waveform above the DFS Detection Threshold within 10 sec. The total duration of *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate *Channel* changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Non-Occupancy Period time is 30 minute during which a Channel will not be utilized after a Radar Waveform is detected on that Channel. The non-associated Client Beacon Test is during the 30 minutes observation time. The EUT should not make any transmissions in the DFS band after EUT power up.

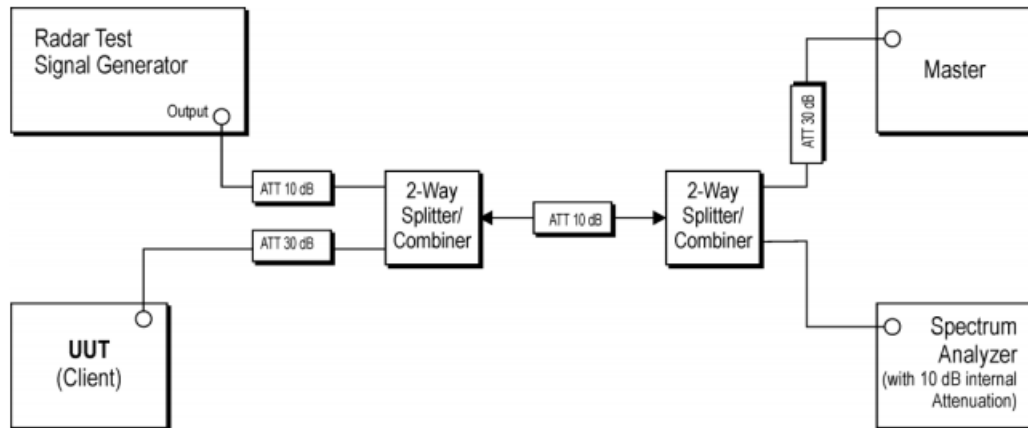
3.2.2 Test Procedures

1. The radar pulse generator is setup to provide a pulse at frequency that the Master and Client are operating. A type 0 radar pulse with a 1us pulse width and a 1428 us PRI is used for the testing.
2. The vector signal generator is adjusted to provide the radar burst (18 pulses) at a level of approximately -62dBm at the antenna of the Master device.
3. A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
4. A U-NII device operating as a Client Device will associate with the Master at Channel. The MPEG file "TestFile.mpg" specified by the FCC is streamed from the "file computer" through the Master to the Client Device and played in full motion video using Media Player Classic Ver. 6.4.8.6 in order to properly load the network for the entire period of the test.
5. When a radar Burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U-NII device. At time T0 the Radar Waveform generator sends a Burst of pulse of the radar waveform at Detection Threshold + 1dB.
6. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel. Measure and record the transmissions from the EUT during the observation time (Channel Move Time). One 12 seconds plot is reported for the Short Pulse Radar Types 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom in 600ms plot of the Short Pulse Radar Type.
7. Measurement of the aggregate duration of the Channel Closing Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: **Dwell (0.4ms) = S (12000ms) / B (30000)**; where Dwell is the dwell time per spectrum analyzer sampling bin, S is the sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: **C (ms) = N X Dwell (0.4 ms)**; where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.
8. Measure the EUT for more than 30 minutes following the channel move time to verify that no transmissions or beacons occur on this Channel.

3.2.3 Test Setup

UUT is a Client without Radar detection and Radar Test Waveforms are injected into the Master.

Conducted Test Setup



3.2.4 Test Deviation

There is no deviation with the original standard.

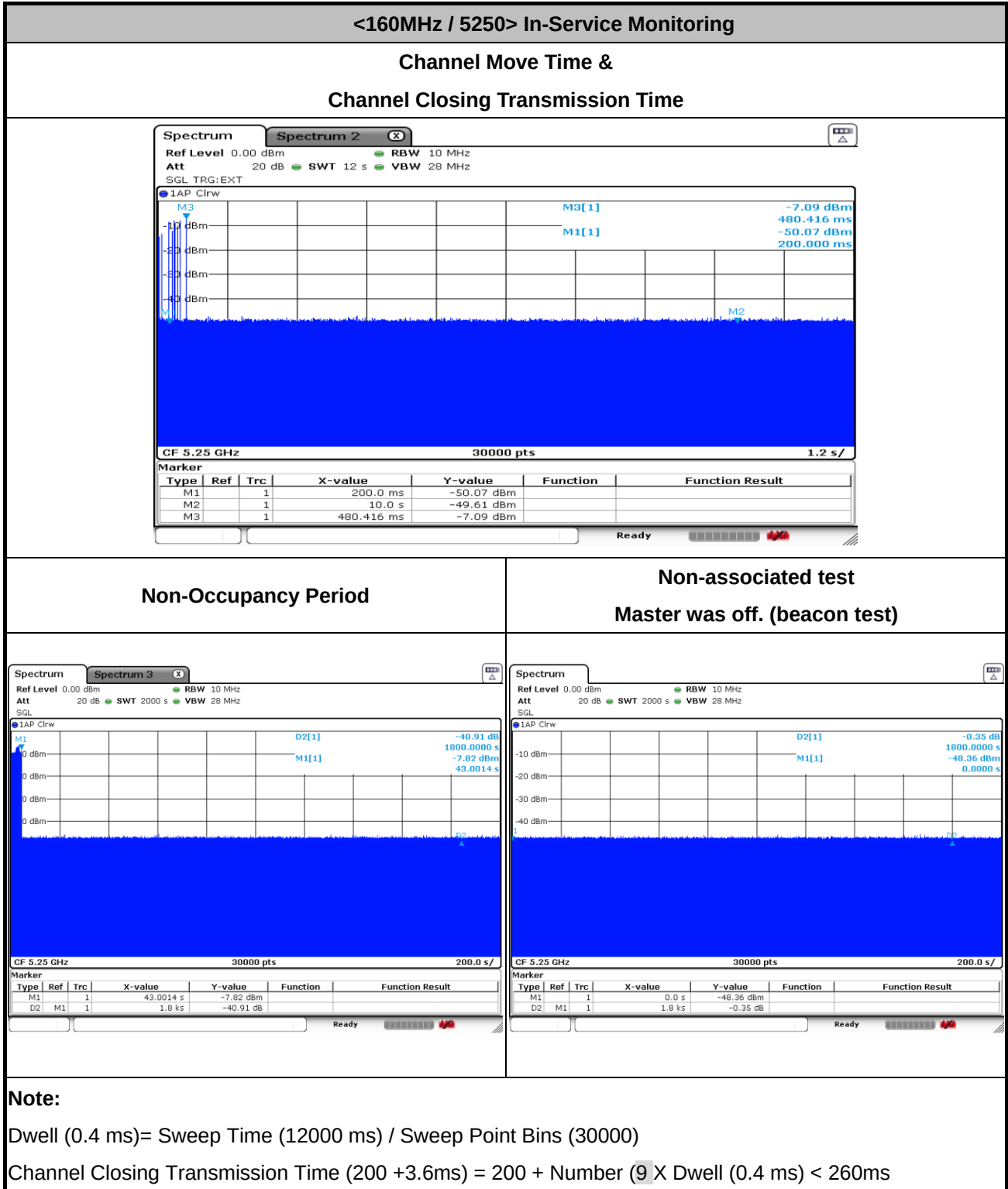
3.2.5 Result of Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period for Client Beacon Test

Test Mode :	Client without radar detection	Temperature :	22.1°C
Test Engineer :	Eloise Wang	Relative Humidity :	46%

BW / Channel	Test Item	Test Result	Limit	Pass/Fail
160MHz / 5250 MHz	Channel Move Time	480.416ms	< 10s	Pass
	Channel Closing Transmission Time	200ms + 3.6 ms	< 260ms	Pass
	Non-Occupancy Period	≥ 30	≥ 30 min	Pass
160MHz / 5570 MHz	Channel Move Time	530.818ms	< 10s	Pass
	Channel Closing Transmission Time	200ms + 4.8 ms	< 260ms	Pass
	Non-Occupancy Period	≥ 30	≥ 30 min	Pass

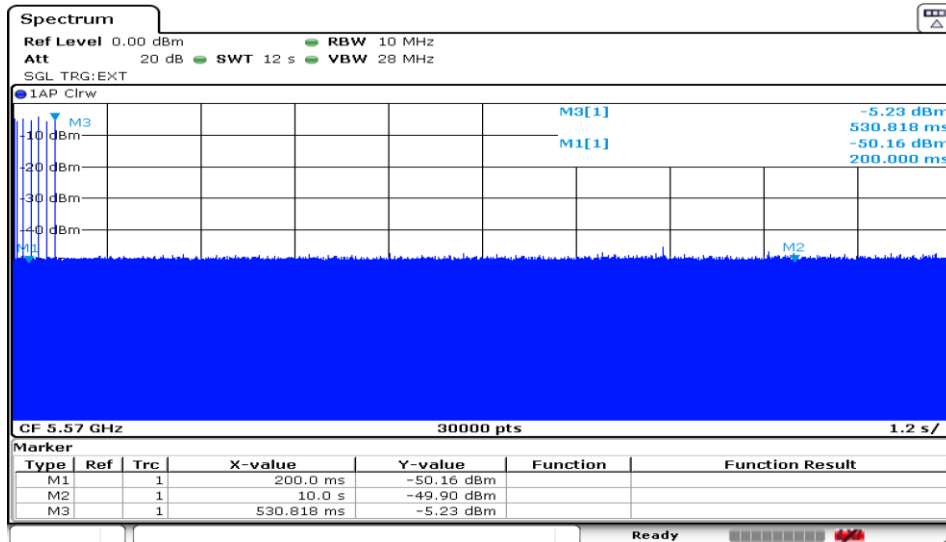
Note: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 seconds period. The aggregate duration of control signals will not count quiet periods in between transmissions.

3.2.6 Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period for Client Beacon Test Plots



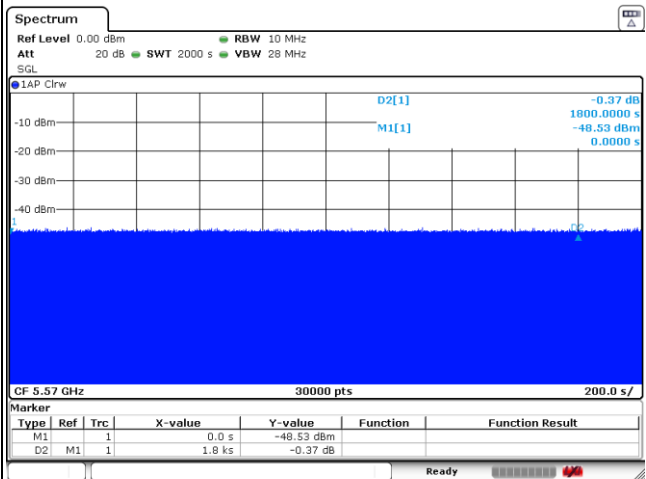
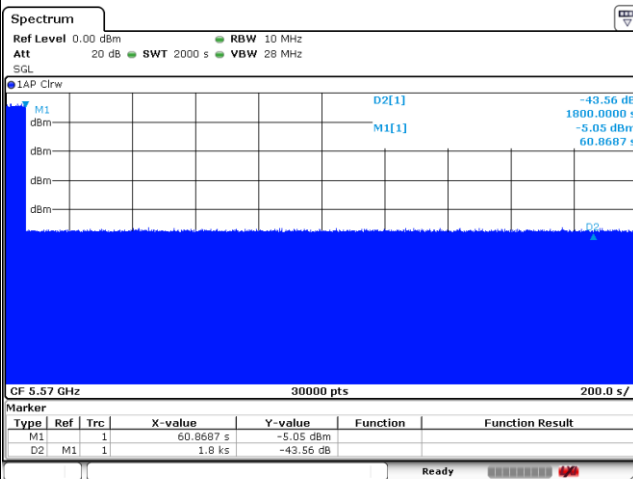
<160MHz / 5570> In-Service Monitoring

Channel Move Time &
Channel Closing Transmission Time



Non-Occupancy Period

Non-associated test
Master was off. (beacon test)

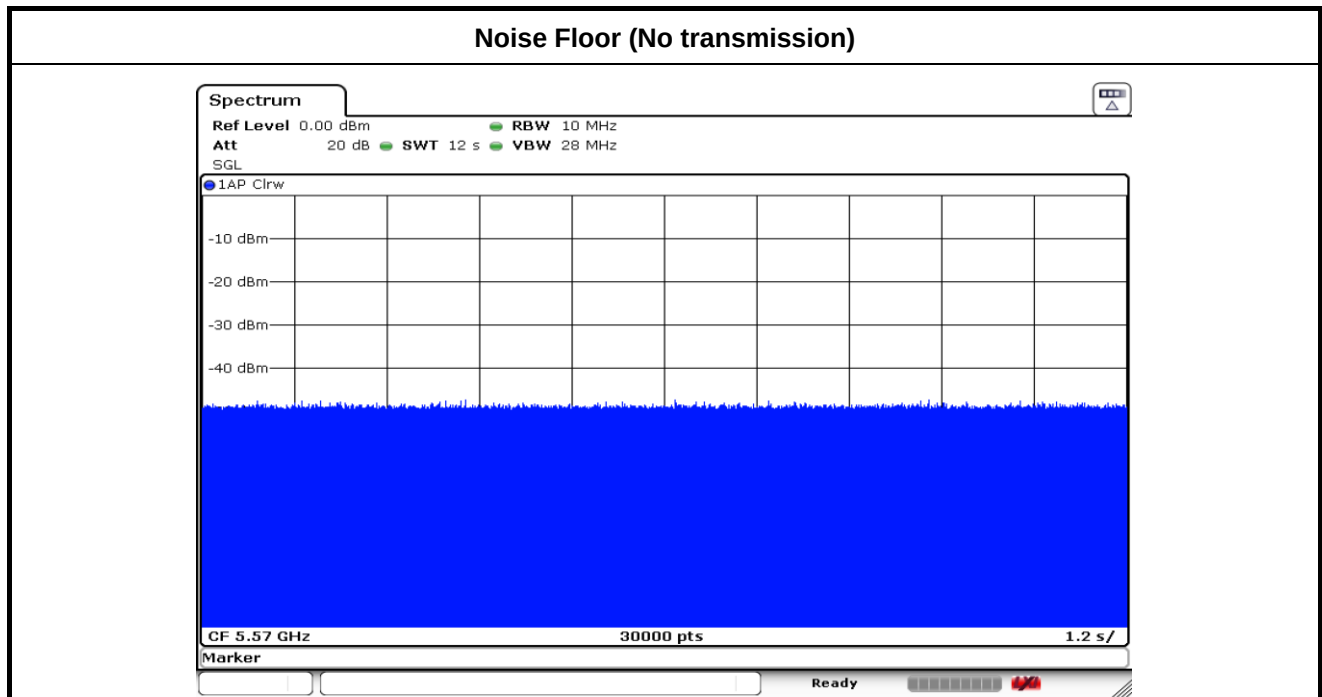


Note:

Dwell (0.4 ms)= Sweep Time (12000 ms) / Sweep Point Bins (30000)

Channel Closing Transmission Time (200 +4.8ms) = 200 + Number (12X Dwell (0.4 ms) < 260ms

3.2.7 Data Traffic and Noise Floor Plots





4 Verify channel puncturing

4.1 According to KDB inquiry for DFS test cases

- a. Check 99% OBW or 26dB emissions bandwidth of non-punctured channel
- b. DUT transmitting by using FTM (Factory Test Mode) control and the BW should be within the non-punctured channels, and punctured regions should meet -27 dBm/MHz EIRP AVG.

4.1.1 Combinations of channel puncturing

80 MHz punctured by 20MHz; 160 MHz punctured by 20MHz, 160 MHz punctured by 40MHz

4.2 Test results

4.2.1 Non-Punctured Channel 99% Occupied Bandwidth Check

Test Mode	Antenna	Freq (MHz)	Puncturing	configure	OCB [MHz]	FL [MHz]	FH [MHz]
11BE80MIMO	Ant10	5290	Puncturing 20M	1	59.141	5269.86	5329.001
	Ant13	5290	Puncturing 20M	1	58.501	5270.34	5328.841
	Ant10	5290	Puncturing 20M	2	19.221	5250.8492	5270.0699
		5290	Puncturing 20M		38.282	5290.8292	5329.1109
	Ant13	5290	Puncturing 20M	2	19.101	5250.8492	5269.95
		5290	Puncturing 20M		38.282	5290.8292	5329.031
	Ant10	5290	Puncturing 20M	3	38.122	5250.8891	5289.011
		5290	Puncturing 20M		19.101	5309.97	5329.0709
	Ant13	5290	Puncturing 20M	3	38.681	5250.8092	5289.4905
		5290	Puncturing 20M		19.341	5309.8501	5329.1908
	Ant10	5290	Puncturing 20M	4	58.821	5250.999	5309.82
	Ant13	5290	Puncturing 20M	4	58.821	5250.999	5309.82
	Ant10	5530	Puncturing 20M	1	58.981	5510.02	5569.001
	Ant13	5530	Puncturing 20M	1	58.981	5510.18	5569.161
	Ant10	5530	Puncturing 20M	2	19.580	5490.8492	5510.4296
		5530	Puncturing 20M		38.362	5530.8292	5569.1908
	Ant13	5530	Puncturing 20M	2	19.341	5490.8492	5510.1898
		5530	Puncturing 20M		38.761	5530.3497	5569.1109
	Ant10	5530	Puncturing 20M	3	38.202	5490.969	5529.1708
		5530	Puncturing 20M		19.021	5550.0899	5569.1109
	Ant13	5530	Puncturing 20M	3	38.521	5490.8891	5529.4106
		5530	Puncturing 20M		19.221	5549.9301	5569.1508
	Ant10	5530	Puncturing 20M	4	59.141	5490.679	5549.82
	Ant13	5530	Puncturing 20M	4	58.981	5490.999	5549.98
	Ant10	5610	Puncturing 20M	1	59.981	5590.18	5649.161



	Ant13	5610	Puncturing 20M	1	59.301	5589.7	5649.001
	Ant10	5610	Puncturing 20M	2	19.181	5570.8492	5590.03
		5610	Puncturing 20M		38.282	5610.7493	5649.031
	Ant13	5610	Puncturing 20M	2	19.660	5570.7692	5590.4296
		5610	Puncturing 20M		38.521	5610.5894	5649.1109
	Ant10	5610	Puncturing 20M	3	38.681	5570.8092	5609.4905
		5610	Puncturing 20M		19.500	5629.6903	5649.1908
	Ant13	5610	Puncturing 20M	3	38.521	5570.969	5609.4905
		5610	Puncturing 20M		19.421	5629.7303	5649.1508
11BE160MIMO	Ant10	5610	Puncturing 20M	4	58.821	5570.839	5629.66
	Ant13	5610	Puncturing 20M	4	59.141	5570.839	5629.98
	Ant10	5250	Puncturing 20M	5	78.162	5171.049	5249.211
		5250	Puncturing 20M		59.221	5269.89	5329.111
	Ant13	5250	Puncturing 20M	5	78.162	5170.889	5249.051
		5250	Puncturing 20M		59.580	5269.65	5329.231
	Ant10	5250	Puncturing 20M	6	98.302	5171.209	5269.51
		5250	Puncturing 20M		38.761	5290.5095	5329.2707
	Ant13	5250	Puncturing 20M	6	98.102	5171.209	5269.311
		5250	Puncturing 20M		38.521	5290.5894	5329.1109
	Ant10	5250	Puncturing 20M	7	118.442	5170.889	5289.331
		5250	Puncturing 20M		19.700	5309.4905	5329.1908
	Ant13	5250	Puncturing 20M	7	118.202	5171.369	5289.57
		5250	Puncturing 20M		19.341	5309.97	5329.3107
	Ant10	5250	Puncturing 20M	8	137.782	5171.359	5309.141
	Ant13	5250	Puncturing 20M	8	138.422	5171.039	5309.461
	Ant10	5250	Puncturing 40M	3	78.162	5170.729	5248.891
		5250	Puncturing 40M		38.761	5290.4296	5329.1908
	Ant13	5250	Puncturing 40M	3	78.002	5170.889	5248.891



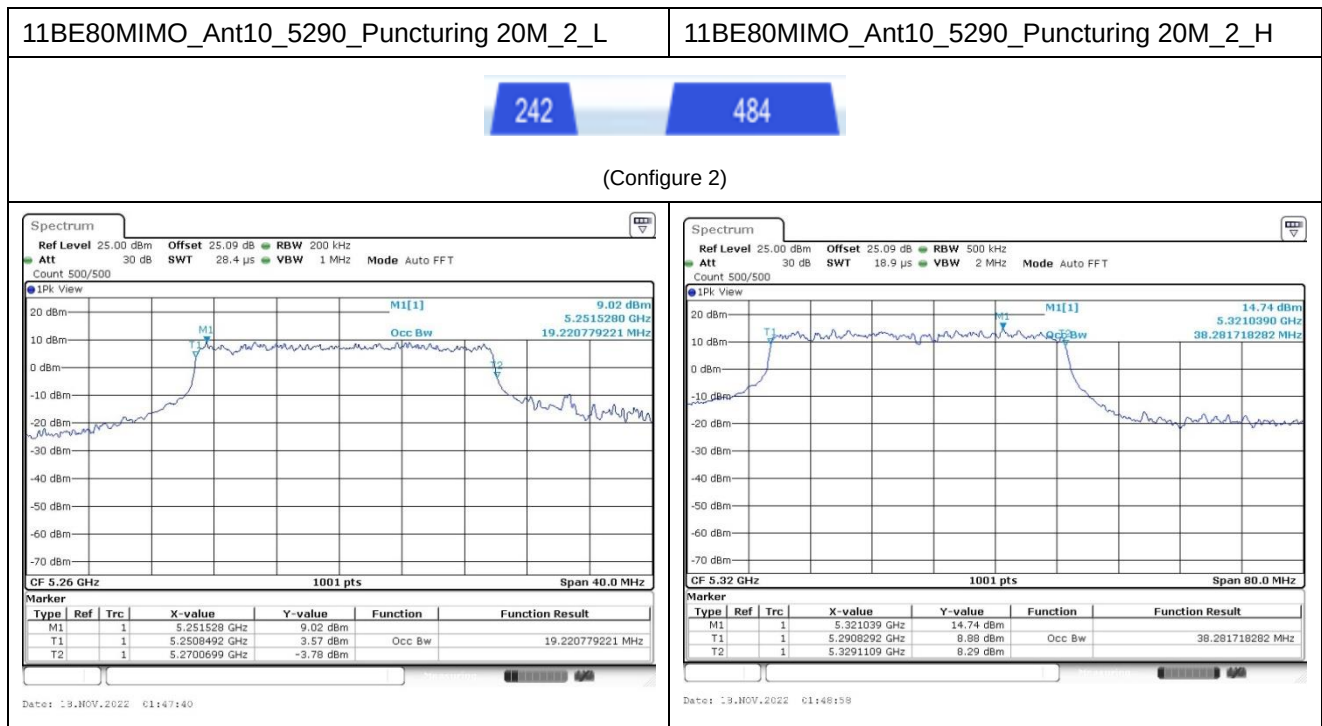
		5250	Puncturing 40M		38.521	5290.5894	5329.1109
	Ant10	5250	Puncturing 40M	4	117.962	5171.359	5289.321
	Ant13	5250	Puncturing 40M	4	117.962	5171.039	5289.001
	Ant10	5570	Puncturing 20M	1	138.741	5510.22	5648.961
	Ant13	5570	Puncturing 20M	1	138.102	5510.539	5648.641
	Ant10	5570	Puncturing 20M	2	19.341	5490.8092	5510.1499
		5570	Puncturing 20M		117.482	5531.149	5648.631
	Ant13	5570	Puncturing 20M	2	19.181	5490.7692	5509.95
		5570	Puncturing 20M		117.483	5531.149	5648.631
	Ant10	5570	Puncturing 20M	3	38.122	5490.969	5529.0909
		5570	Puncturing 20M		98.701	5550.29	5648.991
	Ant13	5570	Puncturing 20M	3	38.282	5490.8891	5529.1708
		5570	Puncturing 20M		98.701	5550.49	5649.191
	Ant10	5570	Puncturing 20M	4	59.101	5490.889	5549.99
		5570	Puncturing 20M		78.162	5570.949	5649.111
	Ant13	5570	Puncturing 20M	4	59.101	5490.769	5549.87
		5570	Puncturing 20M		78.322	5570.789	5649.111
	Ant10	5570	Puncturing 20M	5	78.162	5491.049	5569.211
		5570	Puncturing 20M		59.221	5590.01	5649.231
	Ant13	5570	Puncturing 20M	5	78.002	5491.049	5569.051
		5570	Puncturing 20M		59.101	5590.01	5649.111
	Ant10	5570	Puncturing 20M	6	98.501	5491.209	5589.71
		5570	Puncturing 20M		38.761	5610.5894	5649.3506
	Ant13	5570	Puncturing 20M	6	98.701	5491.009	5589.71
		5570	Puncturing 20M		39.481	5609.8701	5649.3506
	Ant10	5570	Puncturing 20M	7	120.120	5491.129	5611.249
		5570	Puncturing 20M		19.381	5629.8102	5649.1908
	Ant13	5570	Puncturing 20M	7	119.161	5489.69	5608.851



		5570	Puncturing 20M		19.341	5629.8501	5649.1908
	Ant10	5570	Puncturing 20M	8	138.741	5491.039	5629.78
	Ant13	5570	Puncturing 20M	8	139.061	5491.039	5630.1
	Ant10	5570	Puncturing 40M	1	118.601	5530.36	5648.961
	Ant13	5570	Puncturing 40M	1	117.962	5530.999	5648.961
	Ant10	5570	Puncturing 40M	2	38.521	5490.7293	5529.2507
		5570	Puncturing 40M		77.842	5571.109	5648.951
	Ant13	5570	Puncturing 40M	2	38.282	5490.8891	5529.1708
		5570	Puncturing 40M		77.842	5571.109	5648.951
	Ant10	5570	Puncturing 40M	3	78.002	5490.889	5568.891
		5570	Puncturing 40M		38.841	5610.2697	5649.1109
	Ant13	5570	Puncturing 40M	3	78.322	5490.569	5568.891
		5570	Puncturing 40M		38.442	5610.6693	5649.1109
	Ant10	5570	Puncturing 40M	4	117.642	5491.359	5609.001
	Ant13	5570	Puncturing 40M	4	117.962	5491.359	5609.321

Note: "L"+"H"= one channel Puncturing BW

Ex:

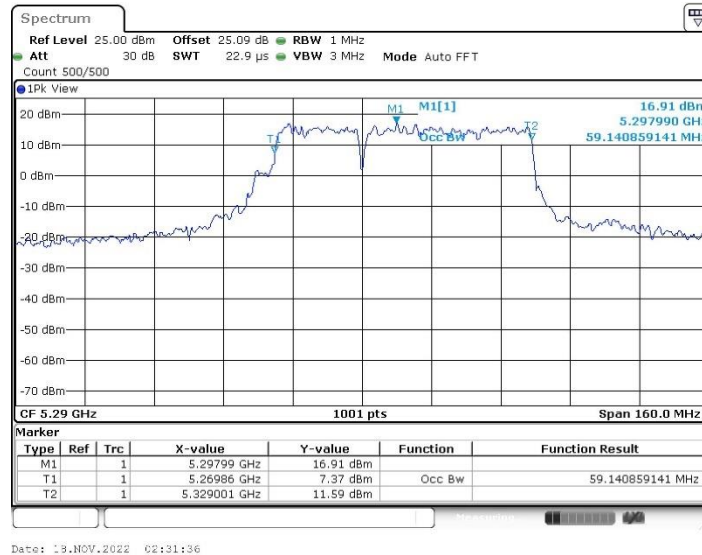




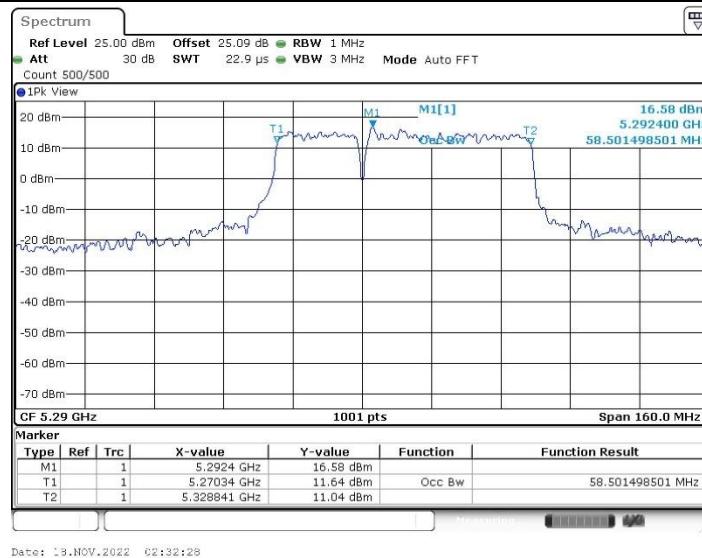
Check the 99% OBW of Non-Puncturing channel not falling into 20M Puncturing portion.

Test Graphs:

11BE80MIMO_Ant10_5290_Puncturing 20M_1

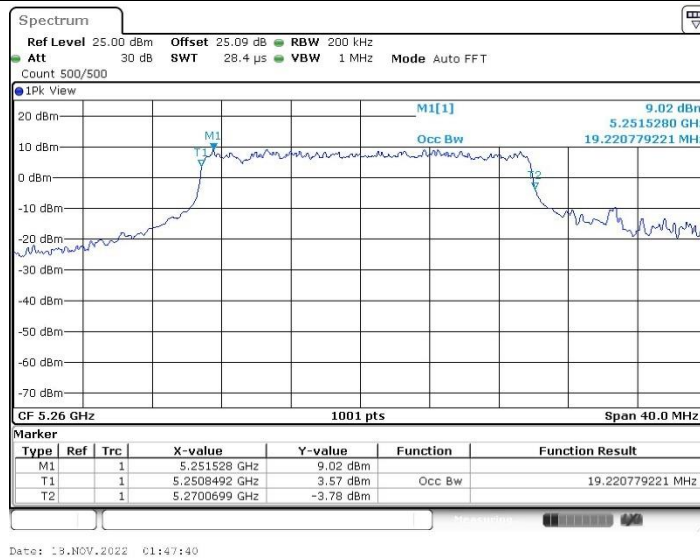


11BE80MIMO_Ant13_5290_Puncturing 20M_1

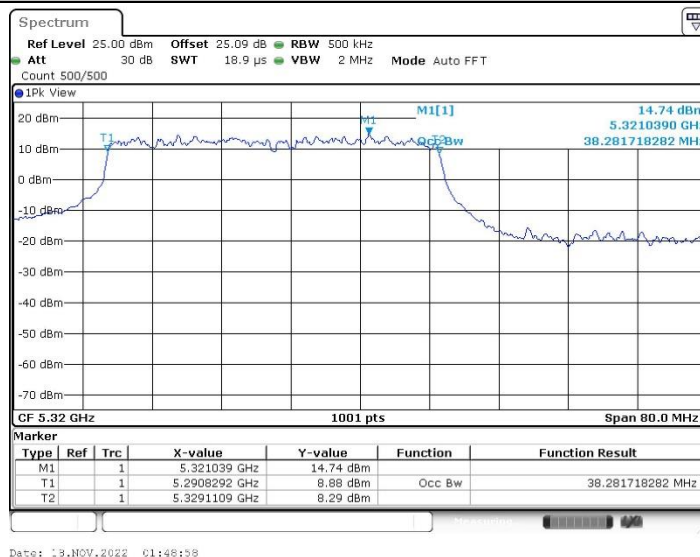


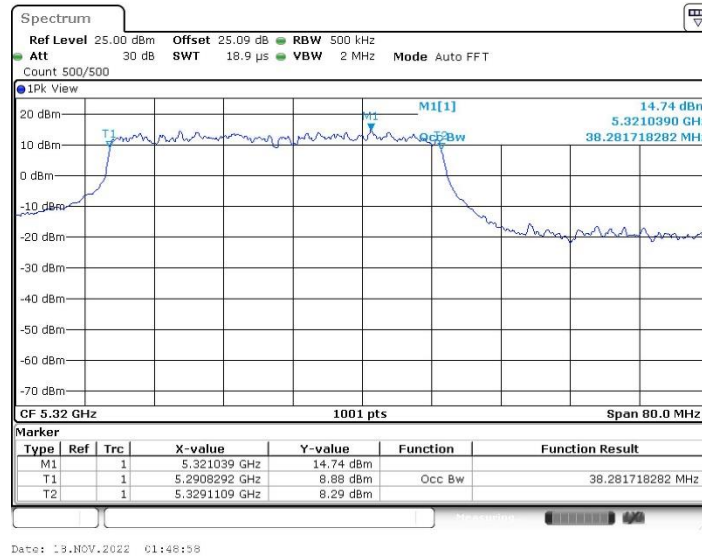
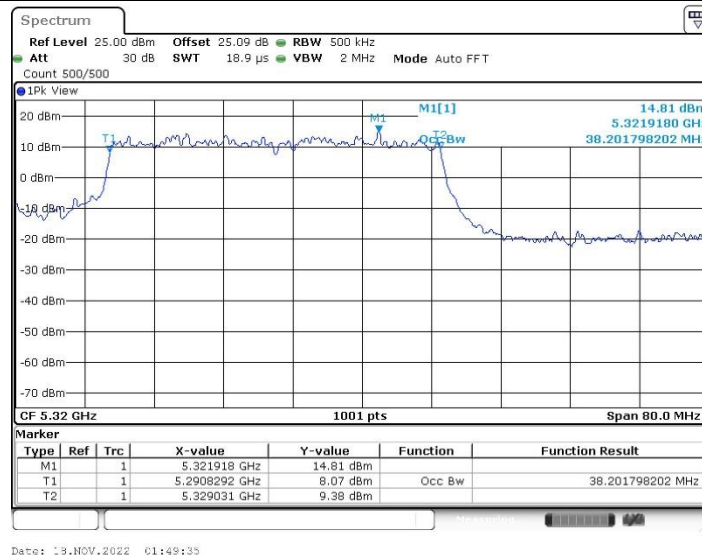


11BE80MIMO_Ant10_5290_Puncturing 20M_2_L



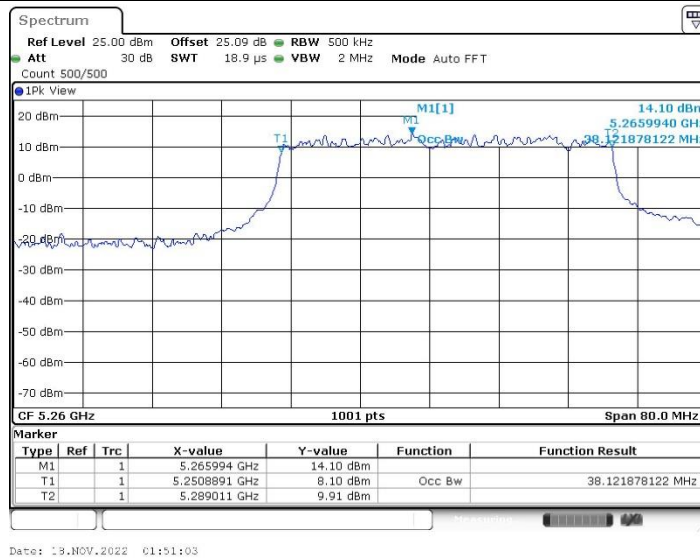
11BE80MIMO_Ant13_5290_Puncturing 20M_2_L



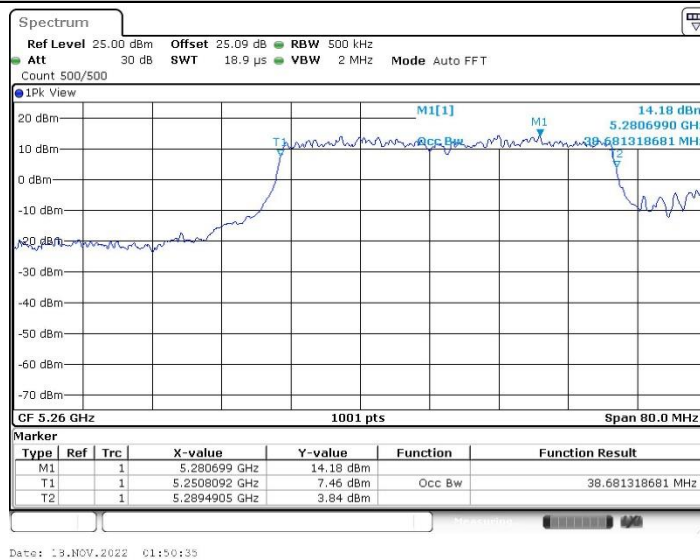
**11BE80MIMO_Ant10_5290_Puncturing 20M_2_H****11BE80MIMO_Ant13_5290_Puncturing 20M_2_H**

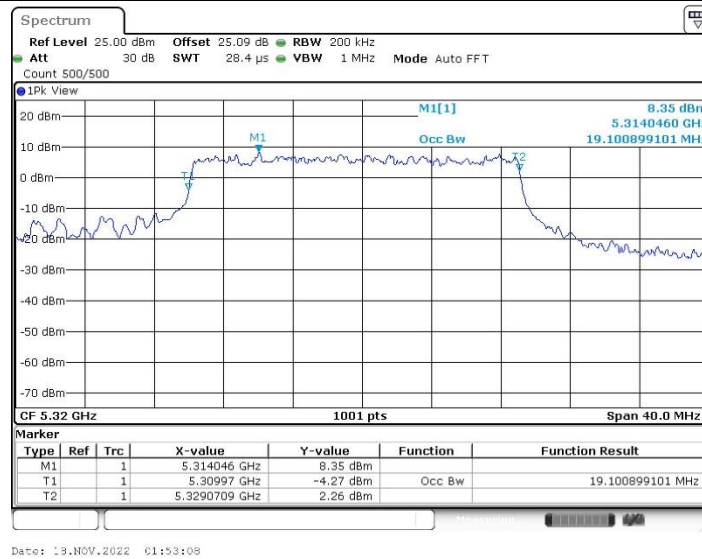
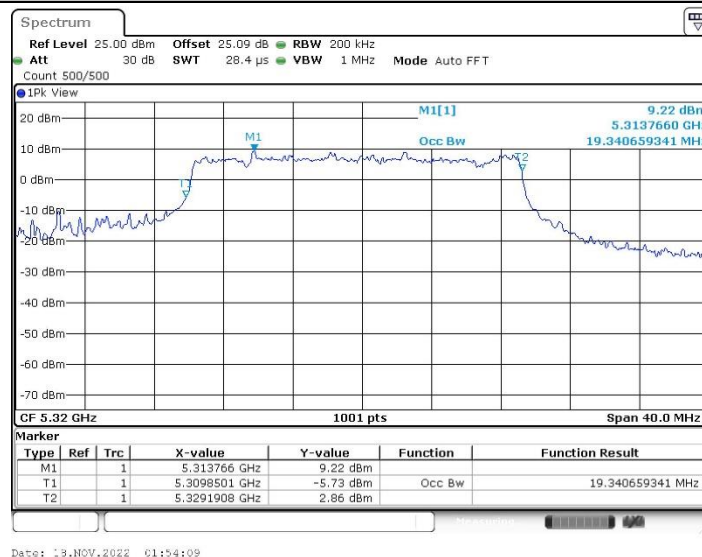


11BE80MIMO_Ant10_5290_Puncturing 20M_3_L



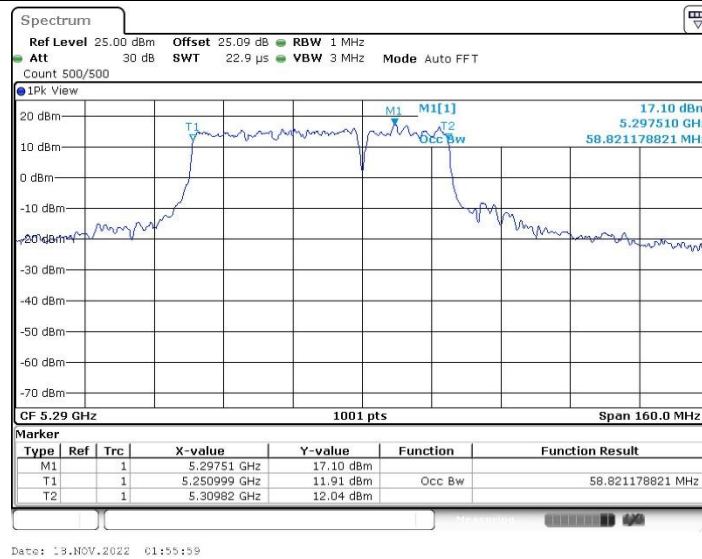
11BE80MIMO_Ant13_5290_Puncturing 20M_3_L



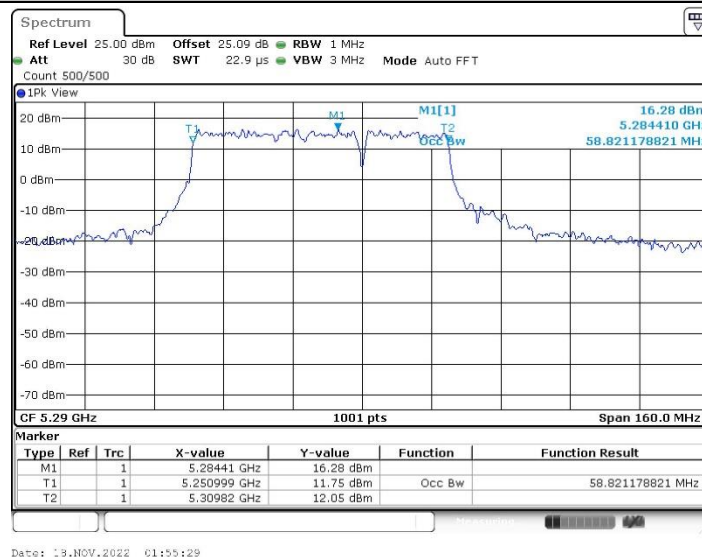
**11BE80MIMO_Ant10_5290_Puncturing 20M_3_H****11BE80MIMO_Ant13_5290_Puncturing 20M_3_H**



11BE80MIMO_Ant10_5290_Puncturing 20M_4

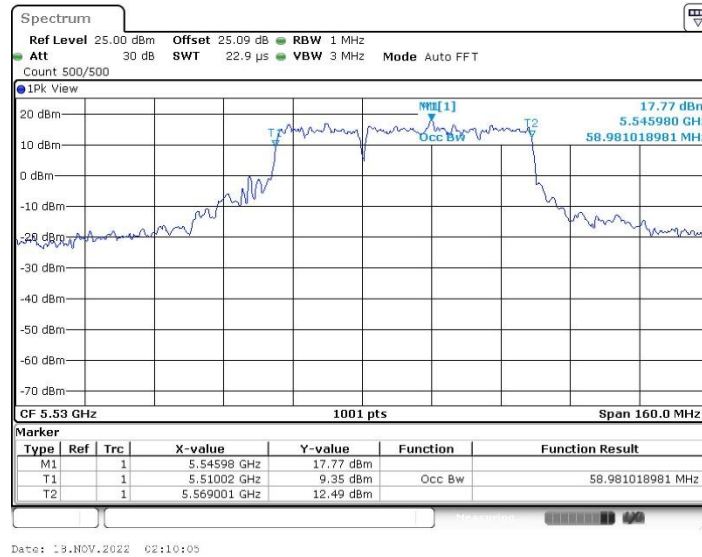


11BE80MIMO_Ant13_5290_Puncturing 20M_4

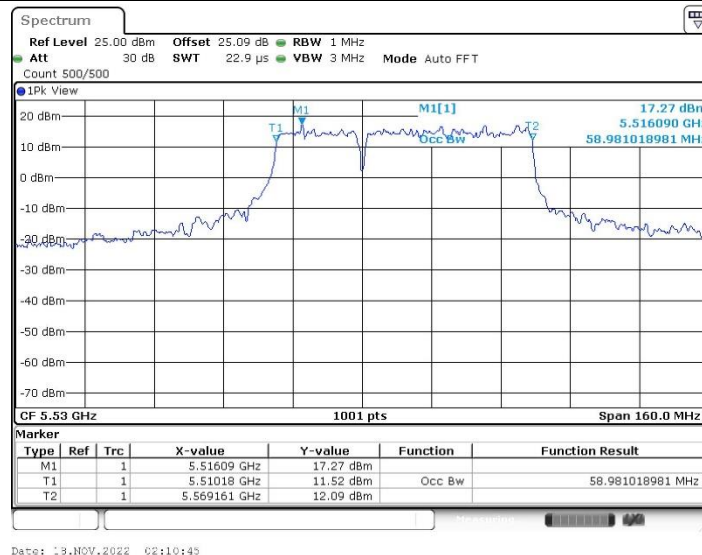




11BE80MIMO_Ant10_5530_Puncturing 20M_1

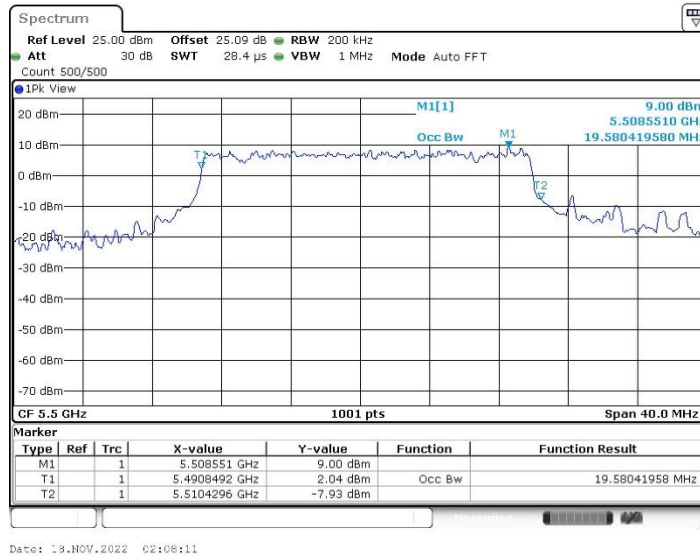


11BE80MIMO_Ant13_5530_Puncturing 20M_1

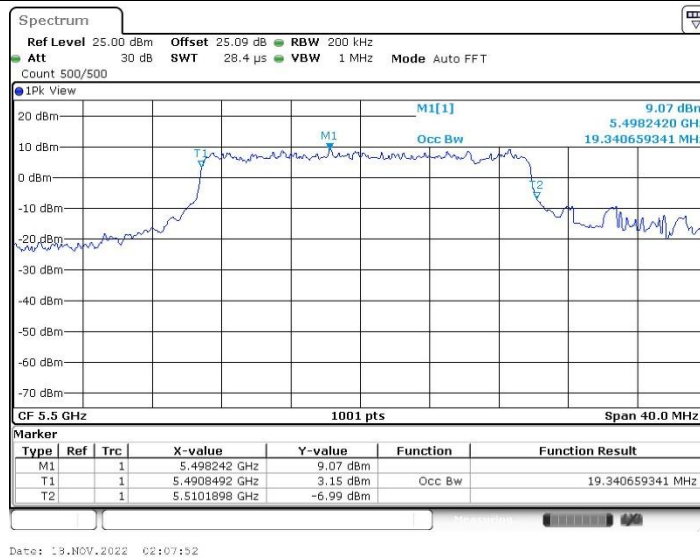




11BE80MIMO_Ant10_5530_Puncturing 20M_2_L

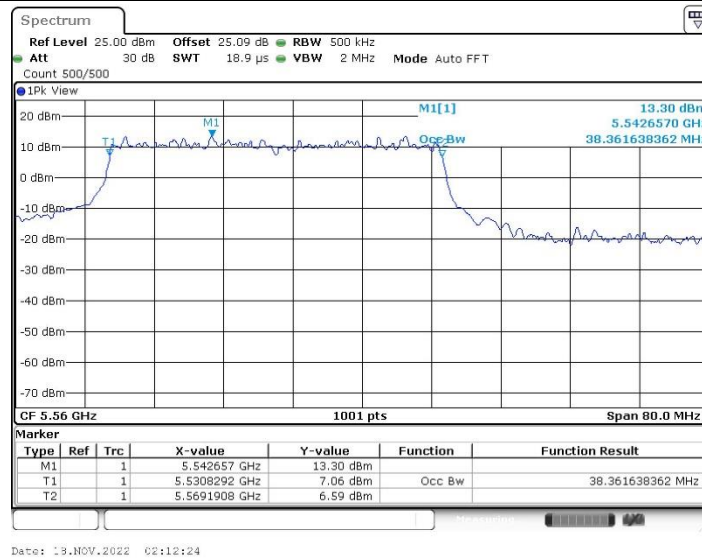


11BE80MIMO_Ant13_5530_Puncturing 20M_2_L

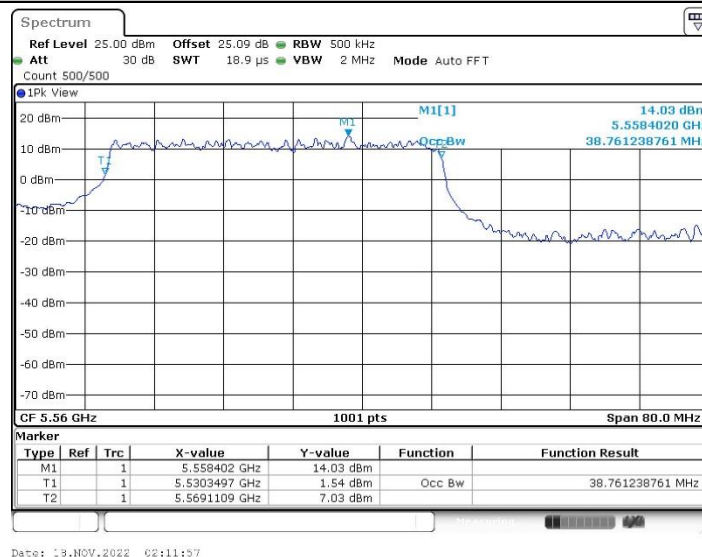




11BE80MIMO_Ant10_5530_Puncturing 20M_2_H

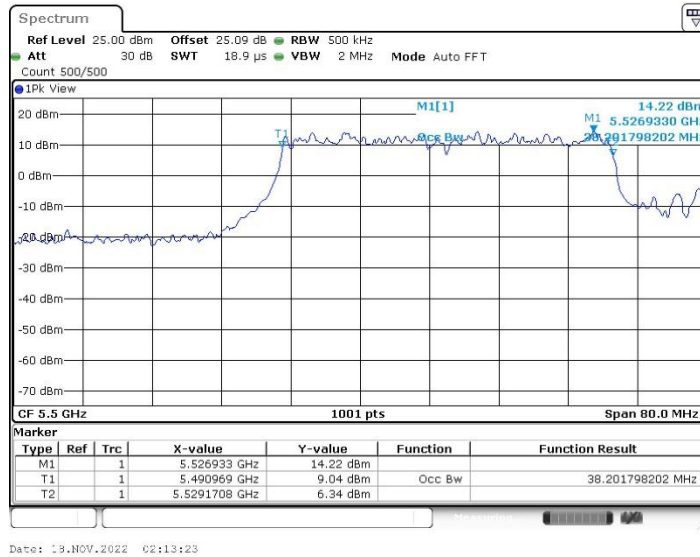


11BE80MIMO_Ant13_5530_Puncturing 20M_2_H

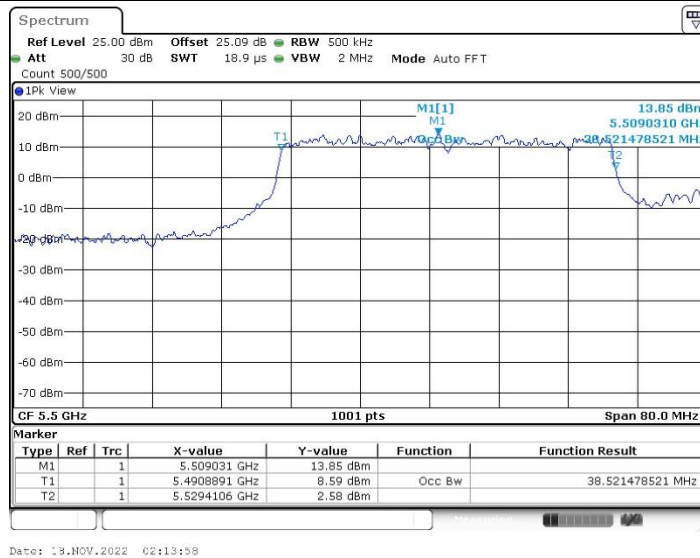




11BE80MIMO_Ant10_5530_Puncturing 20M_3_L

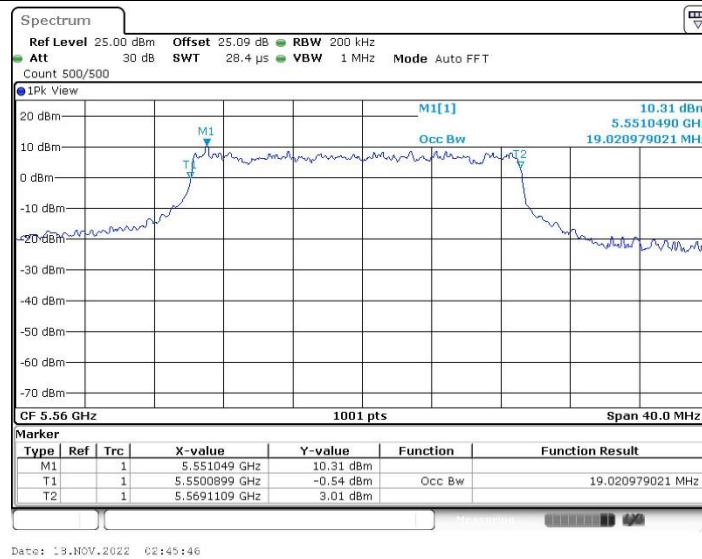


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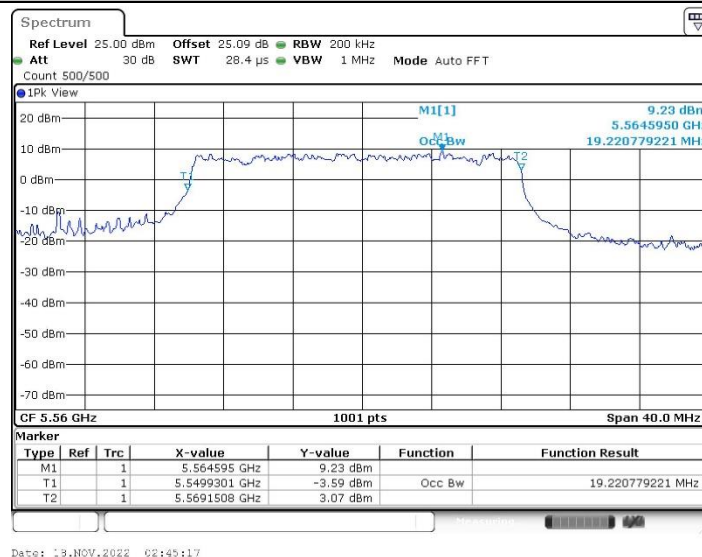




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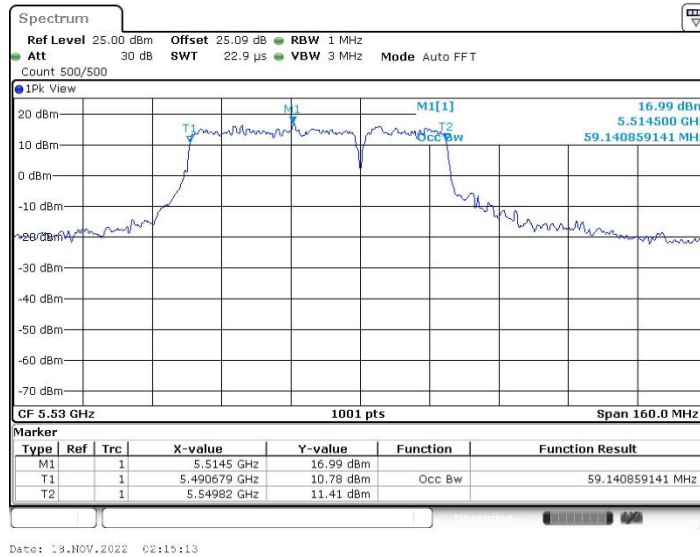


11BE80MIMO_Ant13_5530_Puncturing 20M_3_H

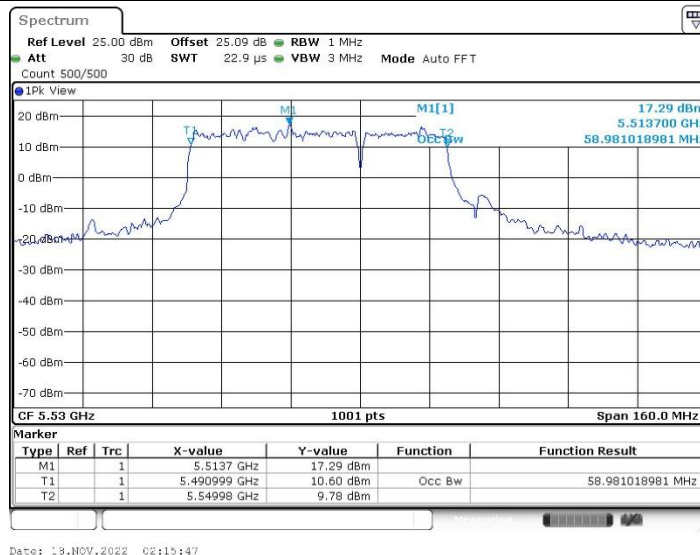




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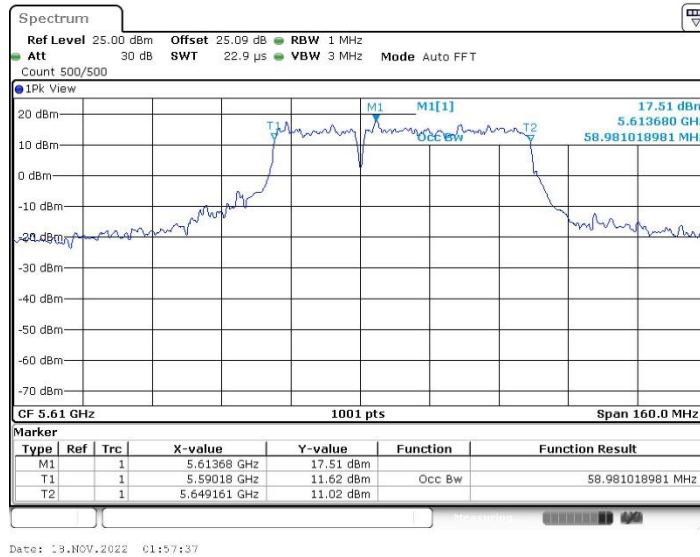


11BE80MIMO_Ant13_5530_Puncturing 20M_4

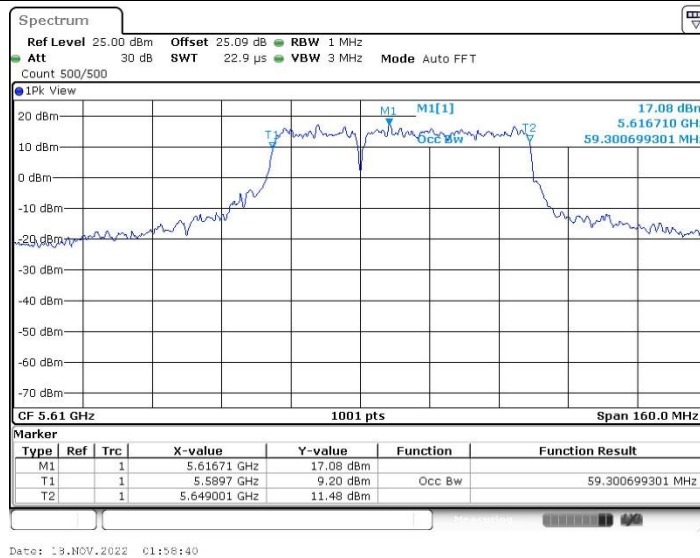




11BE80MIMO_Ant10_5610_Puncturing 20M_1

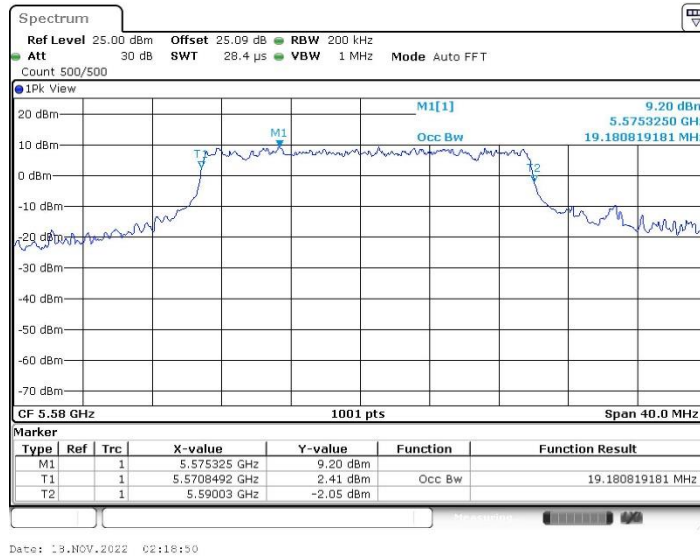


11BE80MIMO_Ant13_5610_Puncturing 20M_1

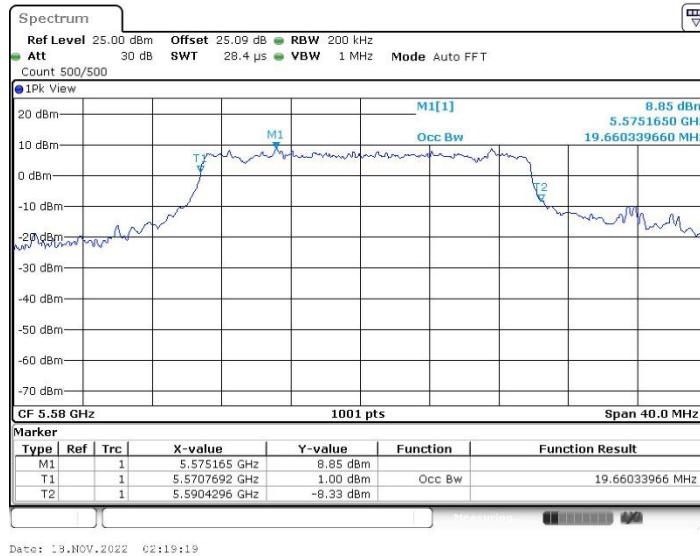




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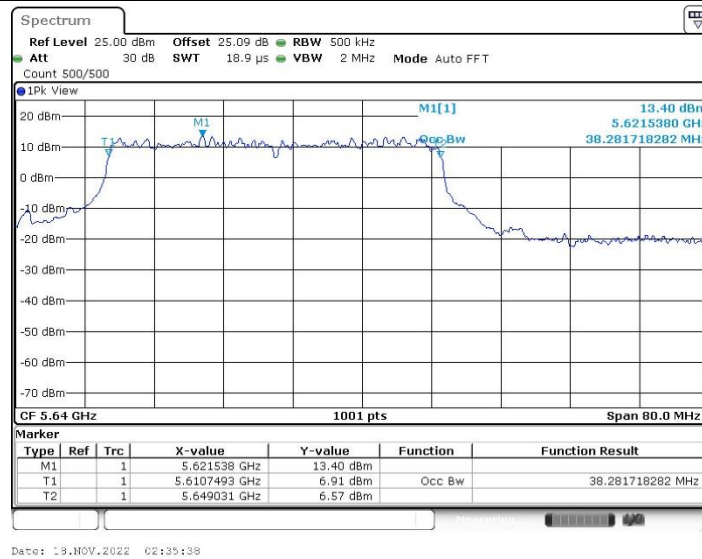


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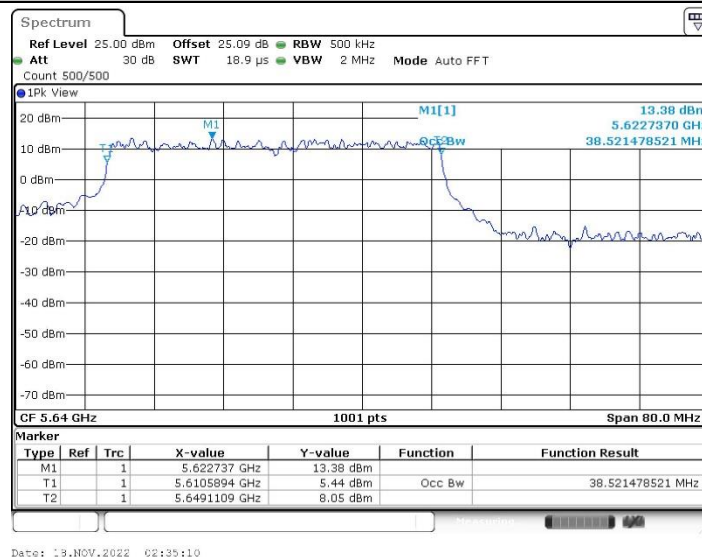




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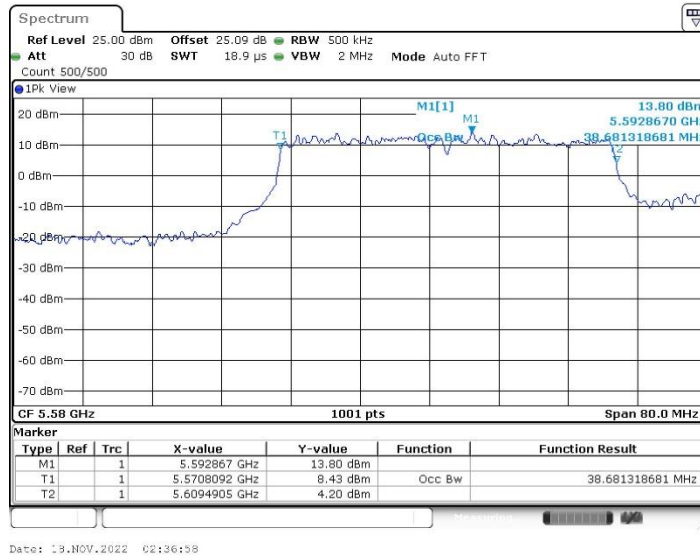


11BE80MIMO_Ant13_5610_Puncturing 20M_2_H

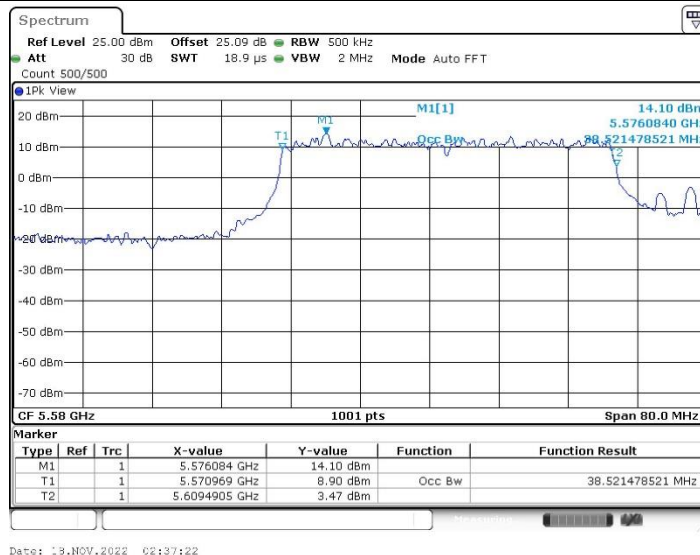




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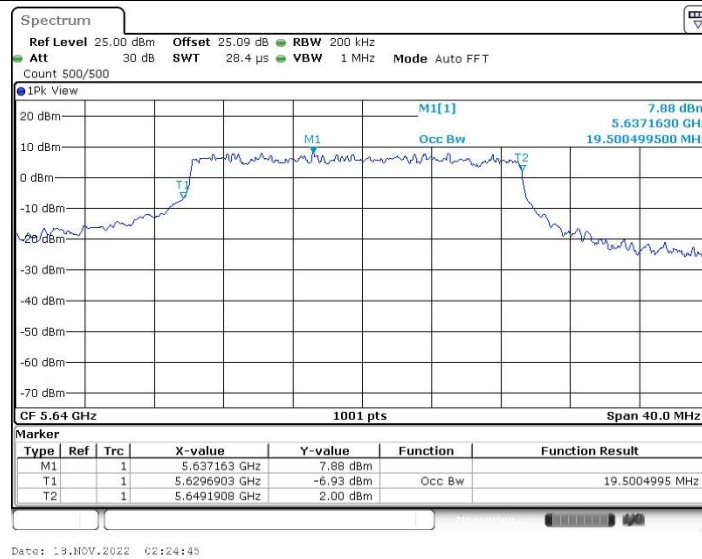


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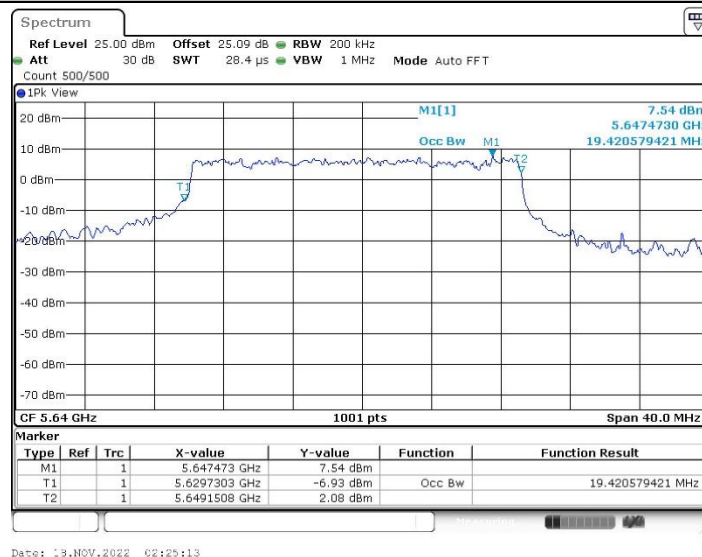




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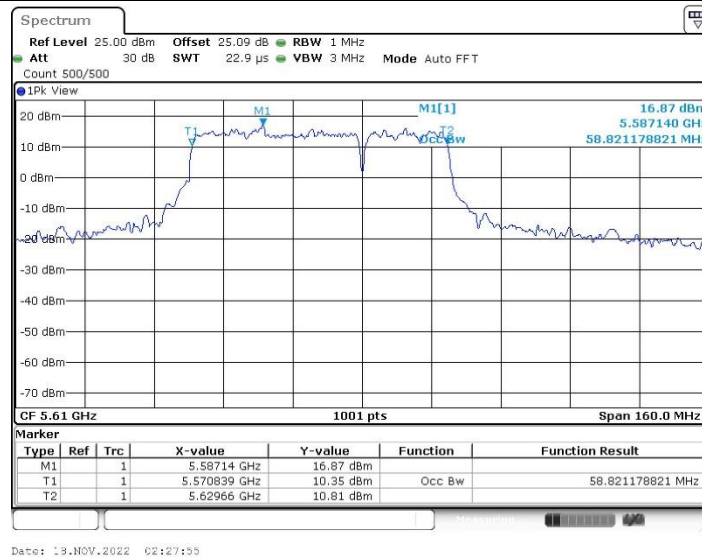


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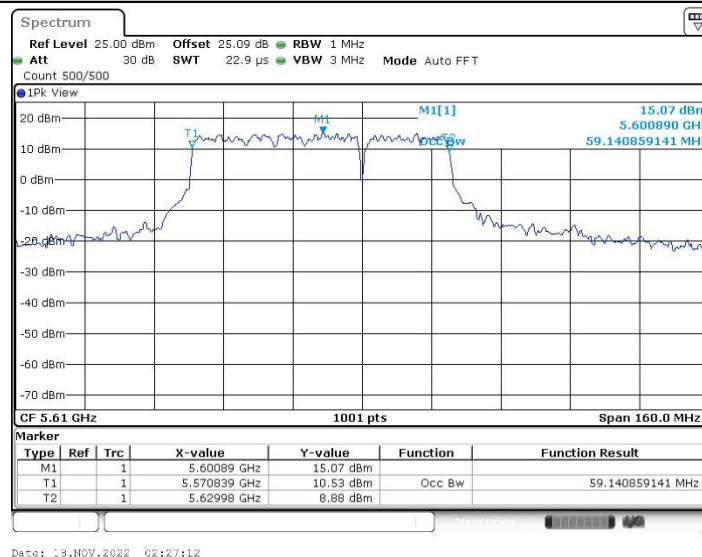




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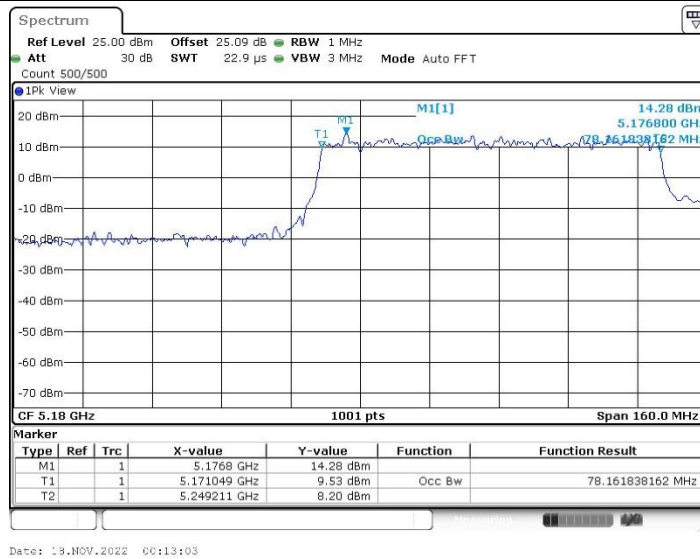


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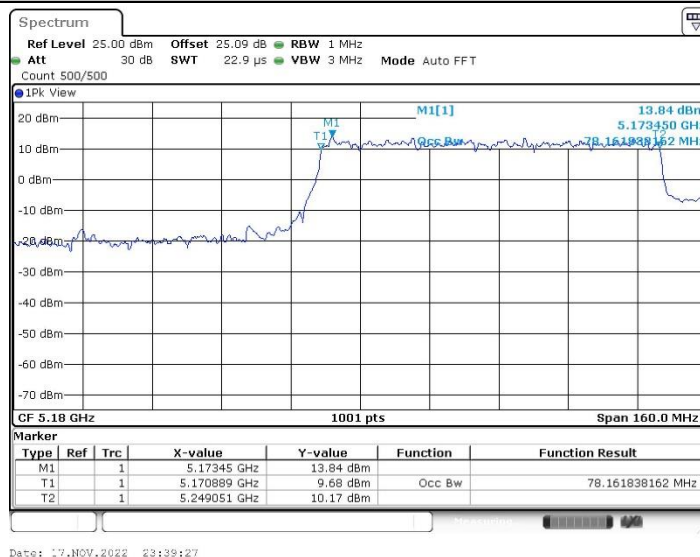




11BE160MIMO_Ant10_5250_Puncturing 20M_5_L

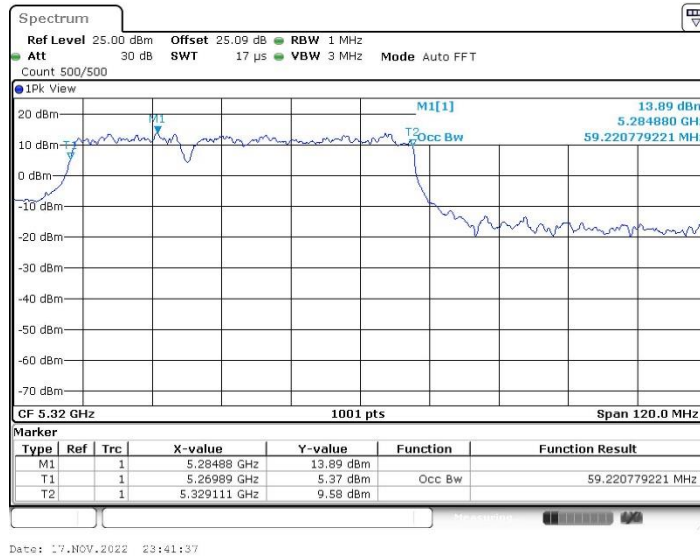


11BE160MIMO_Ant13_5250_Puncturing 20M_5_L

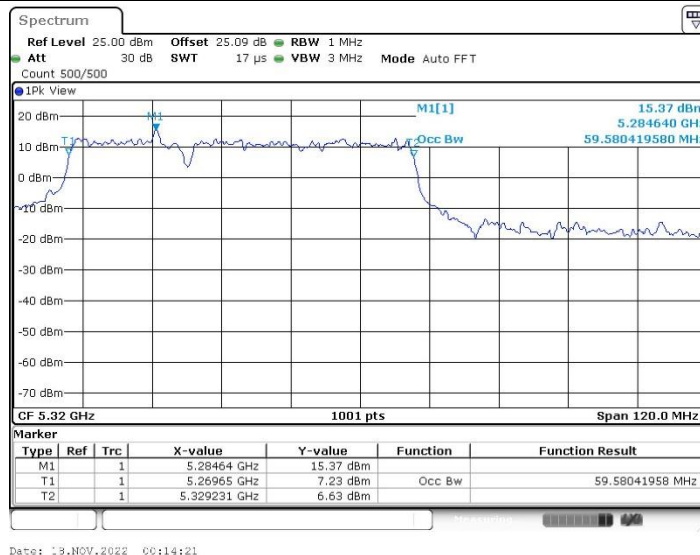




11BE160MIMO_Ant10_5250_Puncturing 20M_5_H

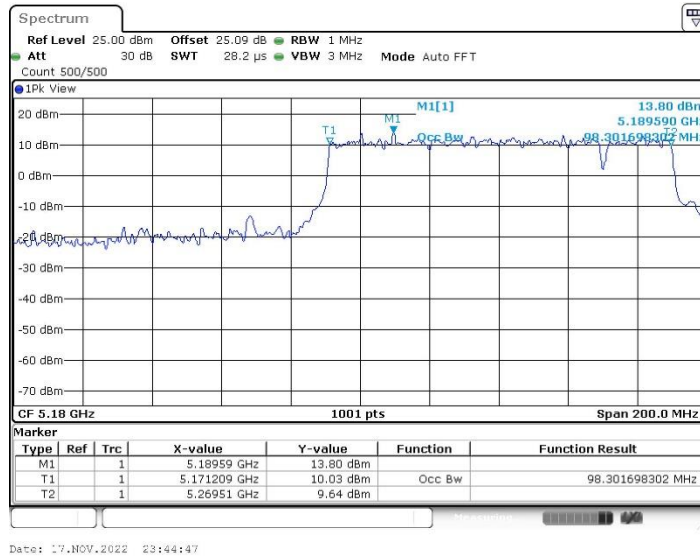


11BE160MIMO_Ant13_5250_Puncturing 20M_5_H

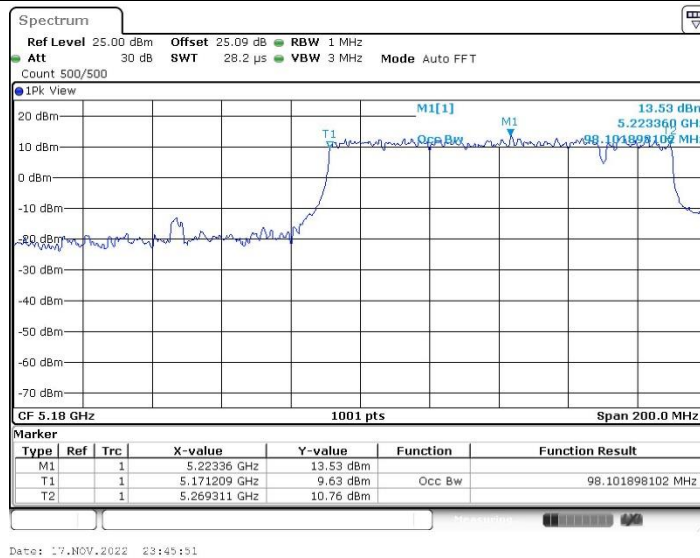




11BE160MIMO_Ant10_5250_Puncturing 20M_6_L

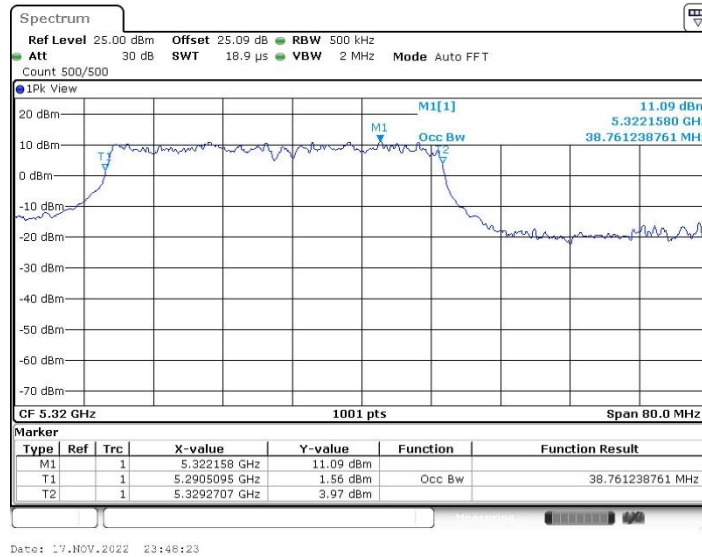


11BE160MIMO_Ant13_5250_Puncturing 20M_6_L

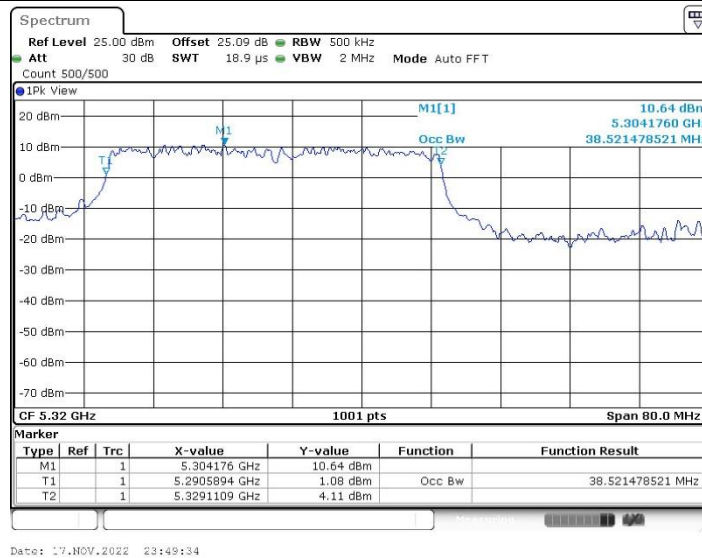




11BE160MIMO_Ant10_5250_Puncturing 20M_6_H

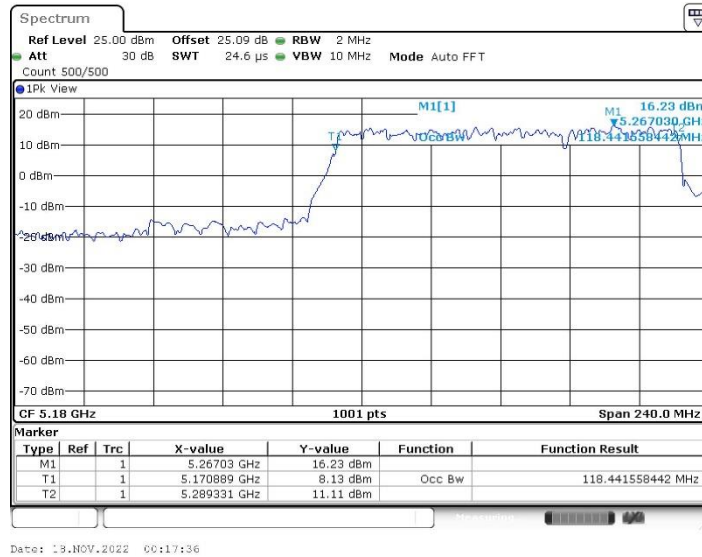


11BE160MIMO_Ant13_5250_Puncturing 20M_6_H

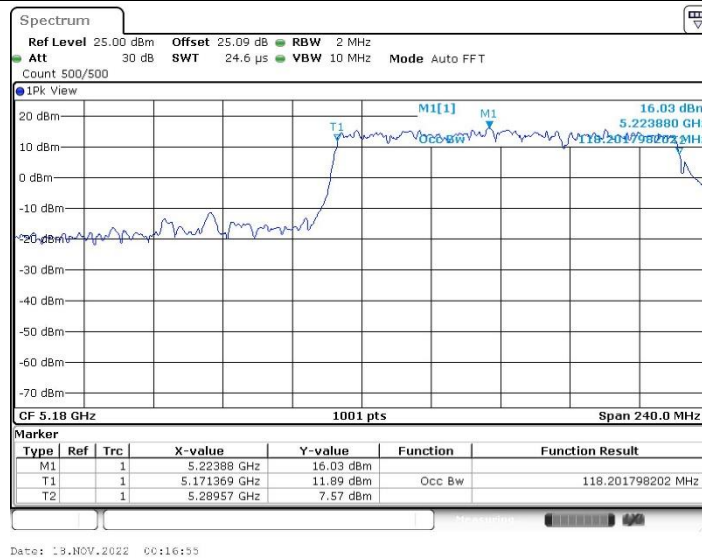




11BE160MIMO_Ant10_5250_Puncturing 20M_7_L

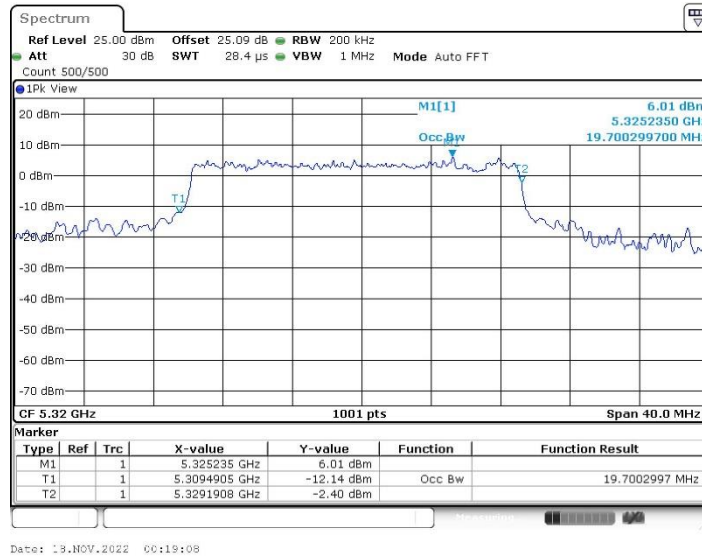


11BE160MIMO_Ant13_5250_Puncturing 20M_7_L

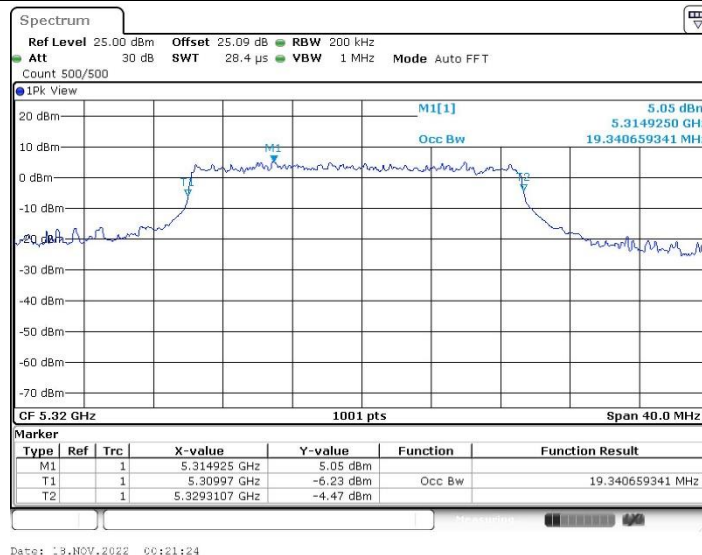




11BE160MIMO_Ant10_5250_Puncturing 20M_7_H

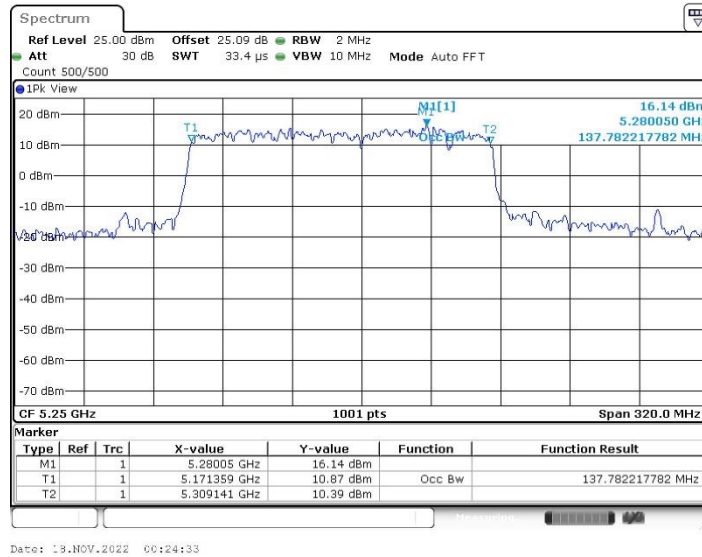


11BE160MIMO_Ant13_5250_Puncturing 20M_7_H





11BE160MIMO_Ant10_5250_Puncturing 20M_8



11BE160MIMO_Ant13_5250_Puncturing 20M_8

