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Test Report

Report No.: CQASZ20231102033E-02
Applicant: TOPDON TECHNOLOGY Co., Ltd.
Address of Applicant: Unit 2005 20/F, Qianhai Shimao Tower, Qianhai Shenzhen-Hong kong Cooperation Zone Shenzhen China
Equipment Under Test (EUT):
Product: Techview Glasses
Model No.: TG001
Teat Model No.: TG001
Brand Name: **TOPDON**
FCC ID: 2AVYW-TG001
Standards: 47 CFR Part 15, Subpart E
KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Date of Receipt: 2023-11-10
Date of Test: 2023-11-10 to 2023-11-29
Date of Issue: 2024-01-23
Test Result: **PASS***

*In the configuration tested, the EUT complied with the standards specified above.

Tested By: Lewis Zhou

(Lewis Zhou)

Reviewed By: Timo Lei

(Timo Lei)

Approved By: Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20231102033E-02	Rev.01	Initial report	2024-01-23

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10-2013; KDB789033	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart E Section 15.207	ANSI C63.10-2013; KDB789033	PASS
Maximum Conducted Output Power	47 CFR Part 15 Subpart C Section 15.407 (a)	ANSI C63.10-2013; KDB789033	PASS
Emission Bandwidth	47 CFR Part 15 Subpart C Section 15.407 (a)(e)	ANSI C63.10-2013; KDB789033	PASS
Maximum Power Spectral Density	47 CFR Part 15 Subpart E Section 15.407 (a)	ANSI C63.10-2013; KDB789033	PASS
Band Edge Measurements	47 CFR Part 15 Subpart C Section 15.209 & 15.407(b)	ANSI C63.10-2013; KDB789033	PASS
Frequency stability	47 CFR Part 15 Subpart E Section 15.407 (g)	ANSI C63.10-2013; KDB789033	PASS
Operation in the absence of information to the transmit	47 CFR Part 15 Subpart E Section 15.407 (c)	47 CFR Part 15 Subpart E	PASS
Radiated Spurious Emissions	47 CFR Part 15 Subpart E Section 15.407 (b)	ANSI C63.10-2013; KDB789033	PASS

Remark:

The tested sample(s) and the sample information are provided by the client.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

CH: In this whole report CH means channel.

Volt: In this whole report Volt means Voltage.

Temp: In this whole report Temp means Temperature.

Humid: In this whole report Humid means humidity.

Press: In this whole report Press means Pressure.

N/A: In this whole report not application

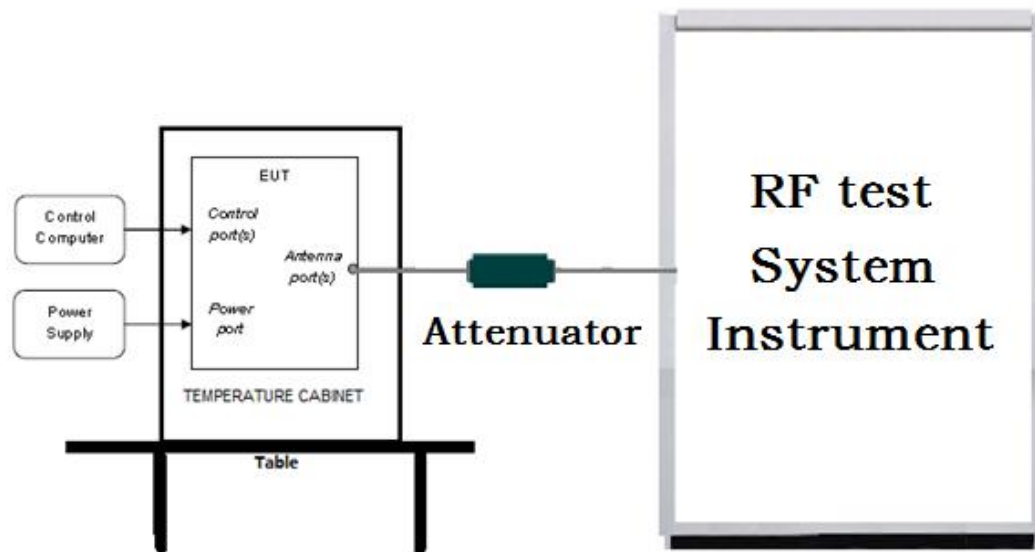
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4 Test Requirement

4.1 Test setup

4.1.1 For Conducted test setup



4.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

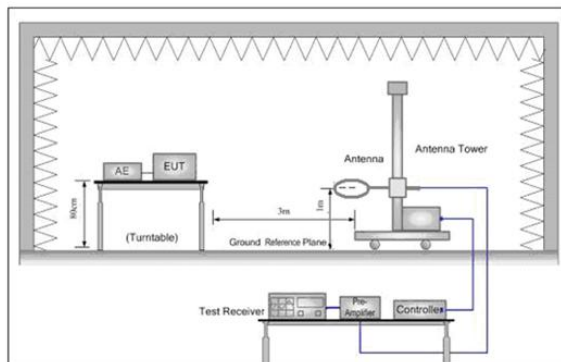


Figure 1. Below 30MHz

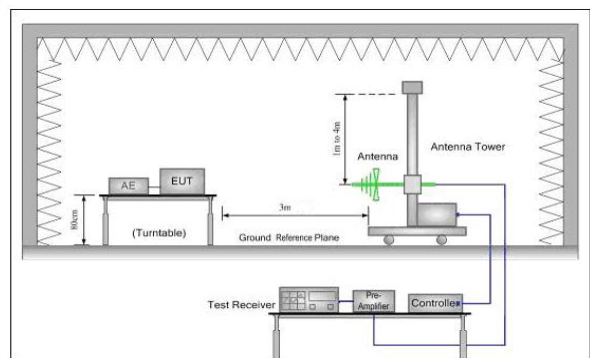


Figure 2. 30MHz to 1GHz

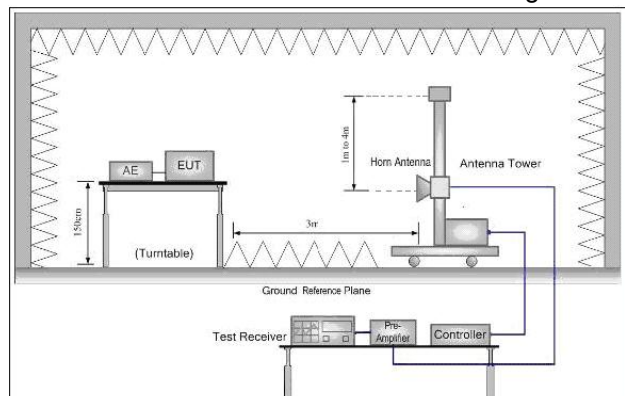
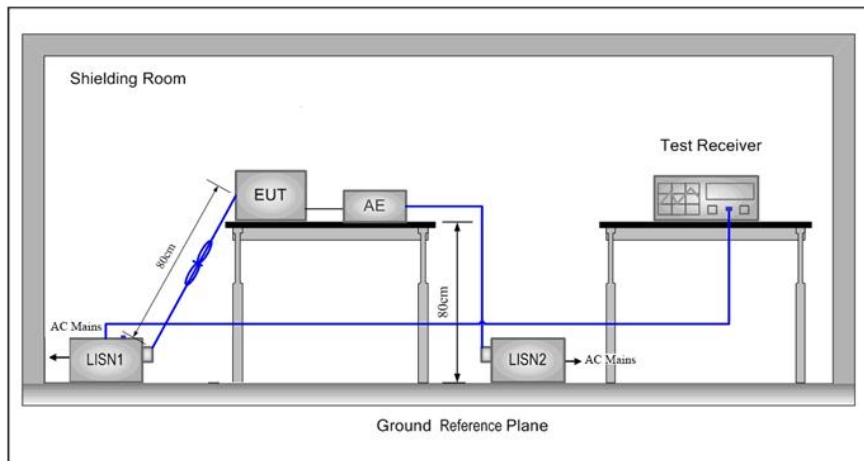


Figure 3. Above 1GHz

4.1.3 For Conducted Emissions test setup

Conducted Emissions setup



4.2 Test Environment

Operating Environment:		
Conducted Emissions:		
Temperature:	25.6 °C	
Humidity:	60 % RH	
Atmospheric Pressure:	1009 mbar	
Radiated Emissions:		
Temperature:	25.5 °C	
Humidity:	54 % RH	
Atmospheric Pressure:	1009mbar	
Radio conducted item test (RF Conducted test room):		
Temperature:	25.3 °C	
Humidity:	50 % RH	
Atmospheric Pressure:	1009 mbar	
Test Condition	Temperature (°C)	Voltage (V)
TN/VN	+15 to +35	7.6
TL/VL	0	6.84
TH/VL	50	6.84
TL/VH	0	8.36
TH/VH	50	8.36
Remark:		
1)The EUT just work in such extreme temperature of 0 °C to 50 °C and the extreme voltage of 6.84V to 8.36V, so here the EUT is tested in the temperature of 0 °C to 50 °C and the voltage of 6.84V to 8.36V.		
2)VN: Normal Voltage; TN: Normal Temperature;		
TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;		
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.		

4.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
802.11a/n/ac(20M)	5150MHz ~5250 MHz	Channel 36	Channel 40	Channel 48
		5180MHz	5200MHz	5240MHz
802.11n/ac(40M)	5150MHz ~5250 MHz	Channel 38	N/A	Channel 46
		5190MHz	N/A	5230MHz
802.11ac(80M)	5150MHz ~5250 MHz	N/A	Channel 42	N/A
		N/A	5210MHz	N/A
802.11a/n/ac(20M)	5725MHz ~5850 MHz	Channel 149	Channel 157	Channel 165
		5745MHz	5785MHz	5825MHz
802.11n/ac(40M)	5725MHz ~5850 MHz	Channel 151	N/A	Channel 159
		5755MHz	N/A	5795MHz
802.11ac(80M)	5725MHz ~5850 MHz	N/A	Channel 155	N/A
		N/A	5775MHz	N/A

Run Software:

```
C:\WINDOWS\system32\cmd.exe

remount partitions read-write. if a reboot is required, -R will
will automatically reboot the device.
reboot [bootloader|recovery|sideload|sideload-auto-reboot]
reboot the device; defaults to booting system image but
supports bootloader and recovery too. sideload reboots
into recovery and automatically starts sideload mode,
sideload-auto-reboot is the same but reboots after sideloading.
sideload OTAPACKAGE      sideload the given full OTA package
root                     restart adbd with root permissions
unroot                   restart adbd without root permissions
usb                       restart adbd listening on USB
tcpip PORT               restart adbd listening on TCP on PORT

internal debugging:
start-server             ensure that there is a server running
kill-server              kill the server if it is running
reconnect                kick connection from host side to force reconnect
reconnect device         kick connection from device side to force reconnect
reconnect offline        reset offline/unauthorized devices to force reconnect

environment variables:
$ADB_TRACE
    comma-separated list of debug info to log:
    all, adb, sockets, packets, rx, usb, sync, sysdeps, transport, jdwp
$ADB_VENDOR_KEYS         colon-separated list of keys (files or directories)
$ANDROID_SERIAL          serial number to connect to (see -s)
$ANDROID_LOG_TAGS        tags to be used by logcat (see logcat --help)
$ADB_LOCAL_TRANSPORT_MAX_PORT max emulator scan port (default 5585, 16 emus)

C:\Users\RF>
```

Test mode:

Pre-scan under all rate at lowest channel for Ant1

Through Pre-scan, 6Mbps is the worst case of 802.11a (20M); MCS0 is the worst case of 802.11n (20M); MCS0 is the worst case of 802.11ac (20M); MCS0 is the worst case of 802.11n(40M); MCS0 is the worst case of 802.11ac (40M); MCS0 is the worst case of 802.11ac(80M).

5 General Information

5.1 Client Information

Applicant:	TOPDON TECHNOLOGY Co., Ltd.
Address of Applicant:	Unit 2005 20/F, Qianhai Shimao Tower, Qianhai Shenzhen-Hong kong Cooperation Zone Shenzhen China
Manufacturer:	TOPDON TECHNOLOGY Co., Ltd.
Address of Manufacturer:	Unit 2005 20/F, Qianhai Shimao Tower, Qianhai Shenzhen-Hong kong Cooperation Zone Shenzhen China
Factory:	TOPDON TECHNOLOGY Co., Ltd.
Address of Factory:	Unit 2005 20/F, Qianhai Shimao Tower, Qianhai Shenzhen-Hong kong Cooperation Zone Shenzhen China

5.2 General Description of EUT

Product Name:	Techview Glasses
Model No.:	TG001
Test Model No.:	TG001
Trade Mark:	TOPDON
Software Version:	V1.0
Hardware Version:	V1.0
EUT Power Supply:	Li-ion battery: DC 3.7V 7800mAh, Charge by DC 5V for adapter
EUT Supports Radios application:	2.4GHz: Wi-Fi: 802.11b/g/n(HT20): 2412MHz~2462MHz; 5GHz: Wi-Fi: U-NII-1: 5.15-5.25GHz; U-NII-3: 5.725-5.850GHz
EUT Type:	Client devices

5.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11a/n/ac(20M): 5180MHz ~5240 MHz IEEE802.11n/ac(40M): 5190MHz ~5230 MHz IEEE802.11ac(80M): 5210 MHz IEEE 802.11a/n/ac(20M): 5745MHz ~5825 MHz IEEE802.11n/ac(40M): 5755MHz ~5795 MHz IEEE802.11ac(80M): 5775 MHz
Channel Numbers:	IEEE 802.11a/n/ac(20M): 5180MHz ~5240MHz/ 4 channel IEEE 802.11n/ac(40M): 5190MHz ~5230MHz/ 2 channel IEEE 802.11ac(80M): 5210MHz/ 1 channel IEEE 802.11a/n/ac(20M): 5745MHz ~5825MHz/ 5 channel IEEE 802.11n/ac(40M): 5755MHz ~5795MHz/ 2 channel IEEE 802.11ac(80M): 5775MHz/ 1 channel
Type of Modulation:	OFDM
Sample Type:	☐ Mobile ☒ Portable
Test Software of EUT:	Adb
Antenna Type:	FPC antenna
Antenna gain:	1.73dBi@5GHz: Wi-Fi: U-NII-1, 3.43dBi@5GHz: Wi-Fi: U-NII-3
Cable loss:	1.0 dB

Operation Frequency each of channel

For 802.11a/n/ac(20M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz
For 802.11a/n/ac(20M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz	NA	NA

For 802.11n/ac(40M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz
For 802.11n/ac(40M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

For 802.11ac(80M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
42	5210MHz	NA	NA
For 802.11ac(80M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	Channel	Frequency
155	5775MHz	NA	NA

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
Adapter	/	/	/	CQA

5.5 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua New District, Shenzhen, Guangdong, China

5.6 Test Facility

• **A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• **FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

5.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	3×10^{-8}
2	RF power, conducted	0.86dB
3	Radiated Spurious emission test	5.12dB (Below 1GHz)
		4.6dB (Above 1GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.8°C
6	Humidity test	2.0%
7	DC power voltages	0.5%

6 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2023/09/08	2024/09/07
Spectrum analyzer	R&S	FSU26	CQA-038	2023/09/08	2024/09/07
Spectrum analyzer	R&S	FSU40	CQA-075	2023/09/08	2024/09/07
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2023/09/08	2024/09/07
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2023/09/08	2024/09/07
Preamplifier	EMCI	EMC184055SE	CQA-089	2023/09/08	2024/09/07
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2021/09/16	2024/09/15
Bilog Antenna	R&S	HL562	CQA-011	2021/09/16	2024/09/15
Horn Antenna	R&S	HF906	CQA-012	2021/09/16	2024/09/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/09/16	2024/09/15
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2023/09/08	2024/09/07
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2023/09/08	2024/09/07
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2023/09/08	2024/09/07
Antenna Connector	CQA	RFC-01	CQA-080	2023/09/08	2024/09/07
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2023/09/08	2024/09/07
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2023/09/08	2024/09/07
Power meter	R&S	NRVD	CQA-029	2023/09/08	2024/09/07
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2023/09/08	2024/09/07
EMI Test Receiver	R&S	ESR7	CQA-005	2023/09/08	2024/09/07
LISN	R&S	ENV216	CQA-003	2023/09/08	2024/09/07
Coaxial cable	CQA	N/A	CQA-C009	2023/09/08	2024/09/07
DC power	KEYSIGHT	E3631A	CQA-028	2023/09/08	2024/09/07

Test software:

	Manufacturer	Software brand
Radiated Emissions test software	Tonscend	JS1120-3
Conducted Emissions test software	Audix	e3
RF Conducted test software	Audix	e3

7 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15E	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
3	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	Guidelines for compliance testing of unlicensed national information infrastructure (U-NII) device part 15, subpart E
4	KDB 662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

Appendix A): Emission Bandwidth

26dB Emission bandwidth

Test Requirement: 47 CFR Part 15, Subpart C 15.407 (a)

Test Method: KDB 789033 D02 II C 1

6 dB bandwidth (5.725-5.85 GHz band)

Test Requirement 47 CFR Part 15, Subpart C 15.407 (e)

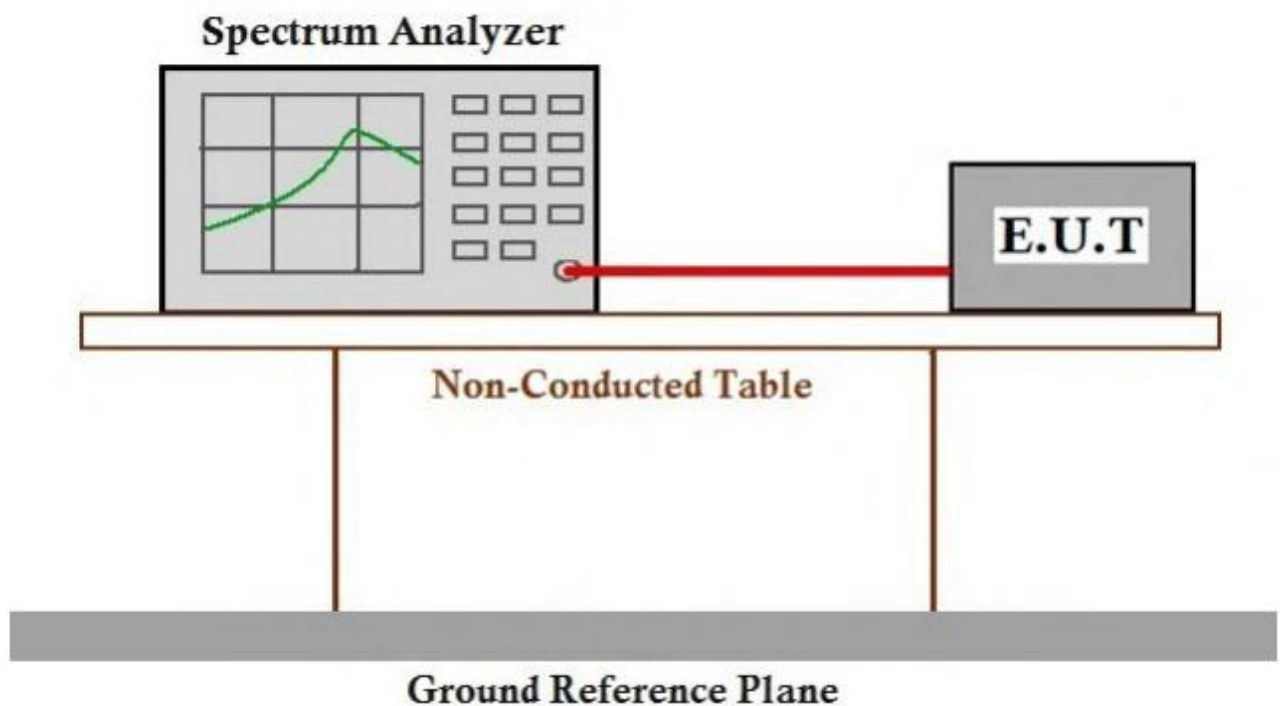
Test Method: KDB 789033 D02 II C 2

Limit: ≥ 500 kHz

Test Procedure:

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Test Setup Diagram



Result Table

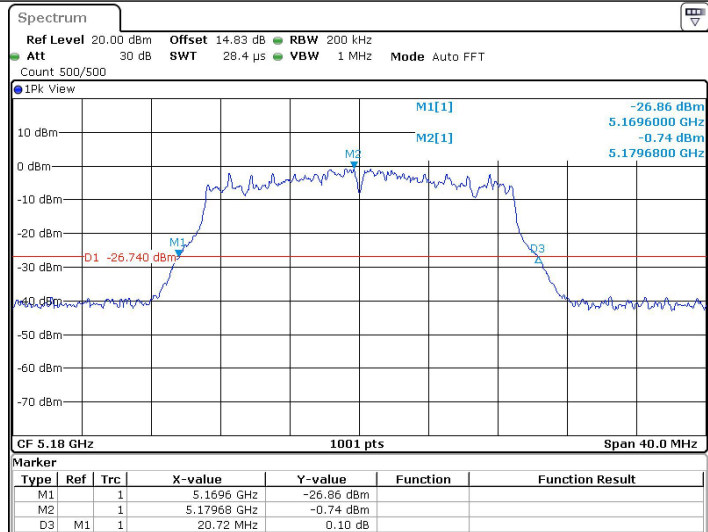
Test Mode	Antenna	Channel	EBW[MHz]	Verdict
11A	Ant1	5180	20.72	PASS
11A	Ant1	5200	20.80	PASS
11A	Ant1	5240	20.48	PASS
11A	Ant1	5745	20.84	PASS
11A	Ant1	5785	20.96	PASS
11A	Ant1	5825	20.80	PASS
11N20	Ant1	5180	20.72	PASS
11N20	Ant1	5200	20.68	PASS
11N20	Ant1	5240	20.96	PASS
11N20	Ant1	5745	20.72	PASS
11N20	Ant1	5785	20.88	PASS
11N20	Ant1	5825	20.72	PASS
11N40	Ant1	5190	39.20	PASS
11N40	Ant1	5230	39.76	PASS
11N40	Ant1	5755	39.28	PASS
11N40	Ant1	5795	39.20	PASS
11AC20	Ant1	5180	20.92	PASS
11AC20	Ant1	5200	21.04	PASS
11AC20	Ant1	5240	21.08	PASS
11AC20	Ant1	5745	21.32	PASS
11AC20	Ant1	5785	21.08	PASS
11AC20	Ant1	5825	20.92	PASS
11AC40	Ant1	5190	40.00	PASS
11AC40	Ant1	5230	40.08	PASS
11AC40	Ant1	5755	39.28	PASS
11AC40	Ant1	5795	40.32	PASS
11AC80	Ant1	5210	80.64	PASS
11AC80	Ant1	5775	80.96	PASS

TestMode	Freq(MHz)	6db EBW [MHz]	Limit[MHz]	Verdict
11A	5745	17.28	0.5	PASS
	5785	17.64	0.5	PASS
	5825	17.52	0.5	PASS
11N20SISO	5745	17.64	0.5	PASS
	5785	17.60	0.5	PASS
	5825	17.52	0.5	PASS
11N40SISO	5755	35.44	0.5	PASS
	5795	35.20	0.5	PASS
11AC20SISO	5745	17.24	0.5	PASS
	5785	17.04	0.5	PASS
	5825	16.60	0.5	PASS
11AC40SISO	5755	35.20	0.5	PASS
	5795	35.76	0.5	PASS
11AC80SISO	5775	75.20	0.5	PASS

Test Graph

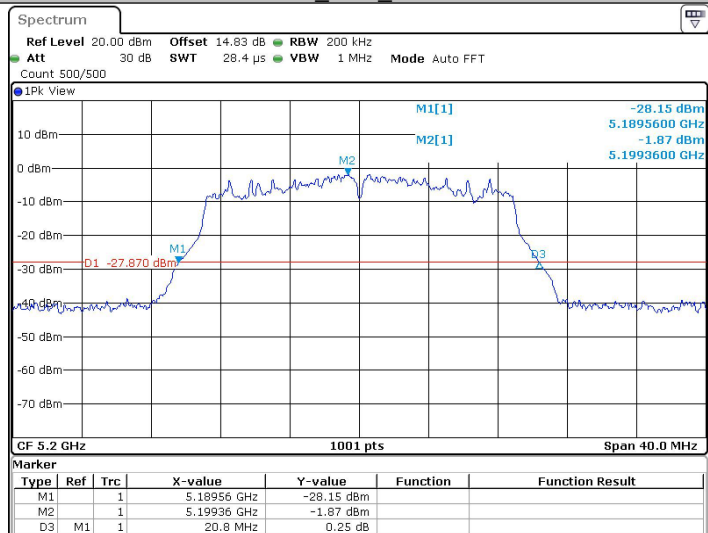
EBW:

11A_Ant1_5180



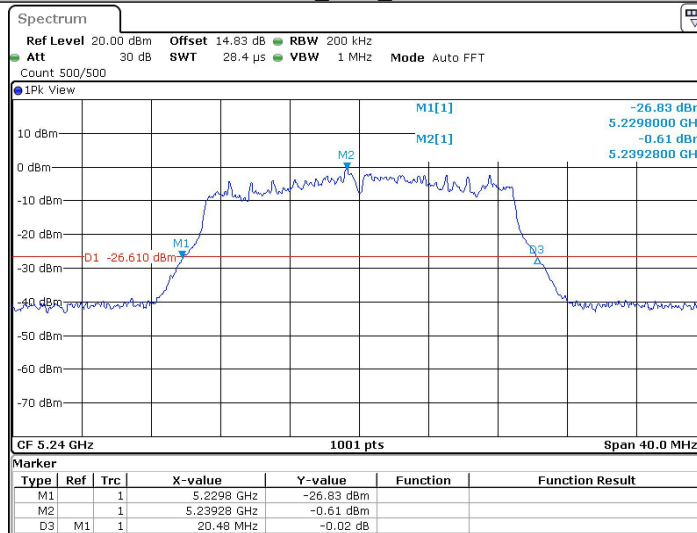
Date: 21 NOV. 2023 18:29:11

11A_Ant1_5200



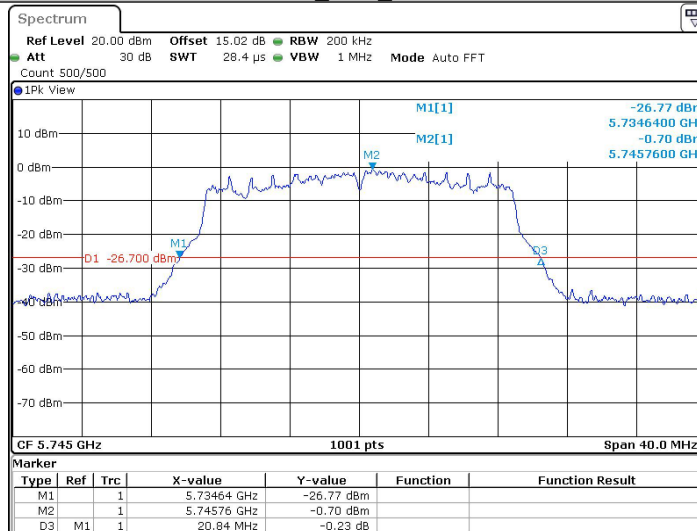
Date: 21 NOV. 2023 18:32:28

11A_Ant1_5240



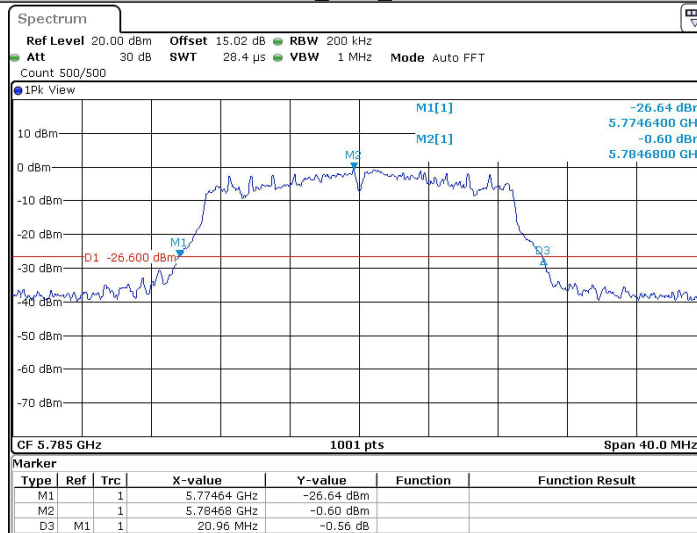
Date: 21 NOV. 2023 18:33:55

11A_Ant1_5745



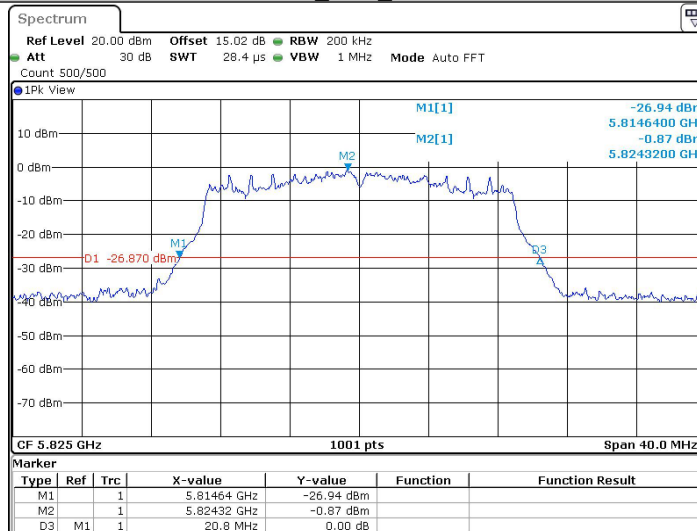
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11A_Ant1_5785



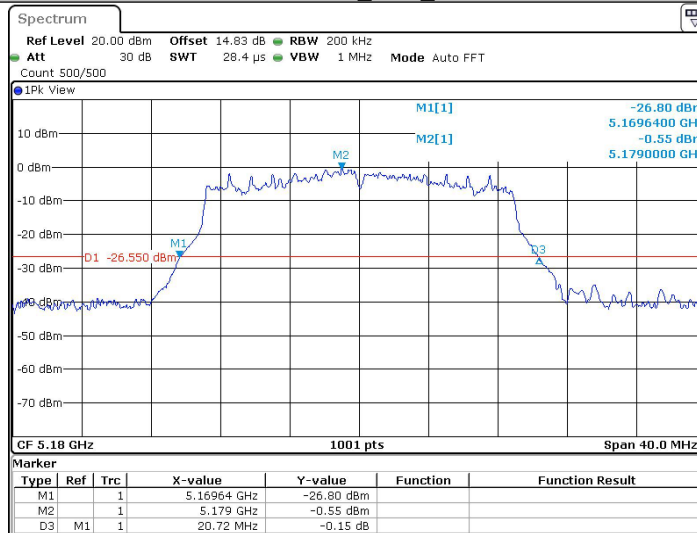
Date: 21 NOV. 2023 18:39:03

11A_Ant1_5825



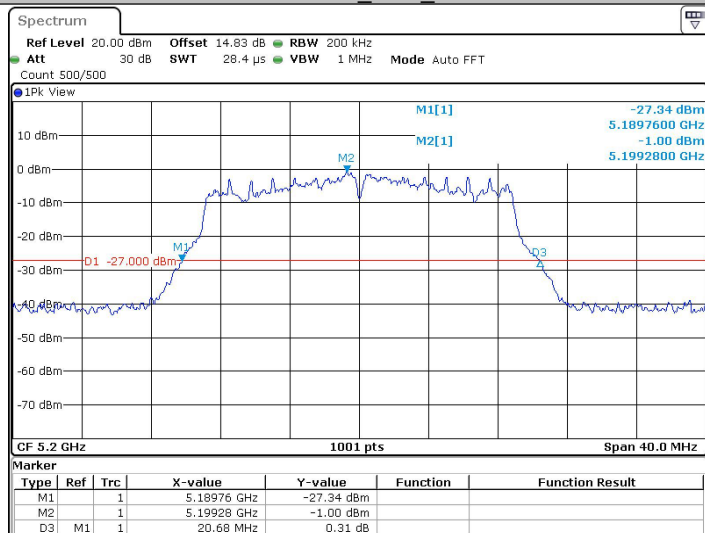
Date: 21 NOV. 2023 18:40:43

11N20SISO_Ant1_5180



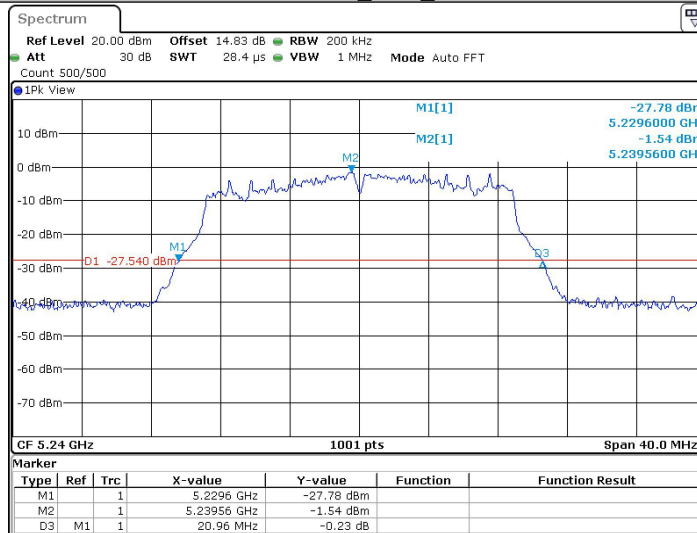
Date: 21 NOV. 2023 18:43:54

11N20SISO_Ant1_5200



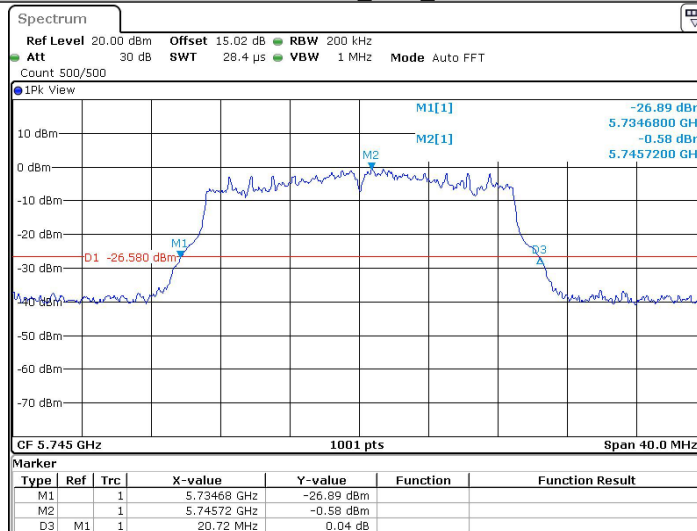
Date: 21 NOV. 2023 18:46:27

11N20SISO_Ant1_5240



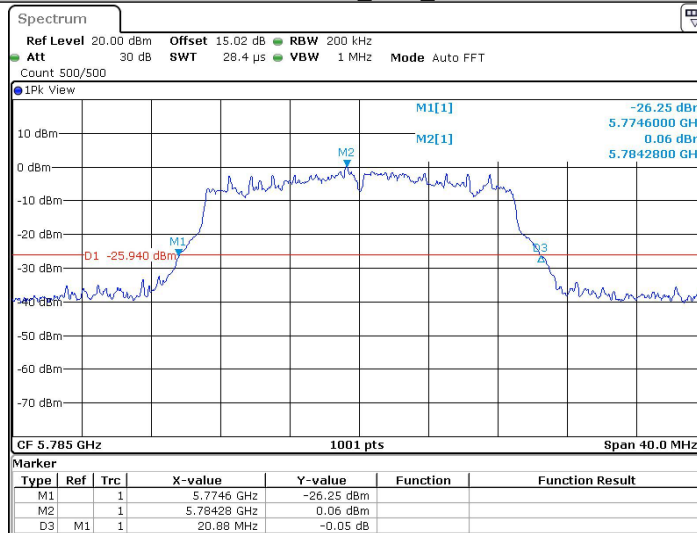
Date: 21 NOV. 2023 18:48:13

11N20SISO_Ant1_5745



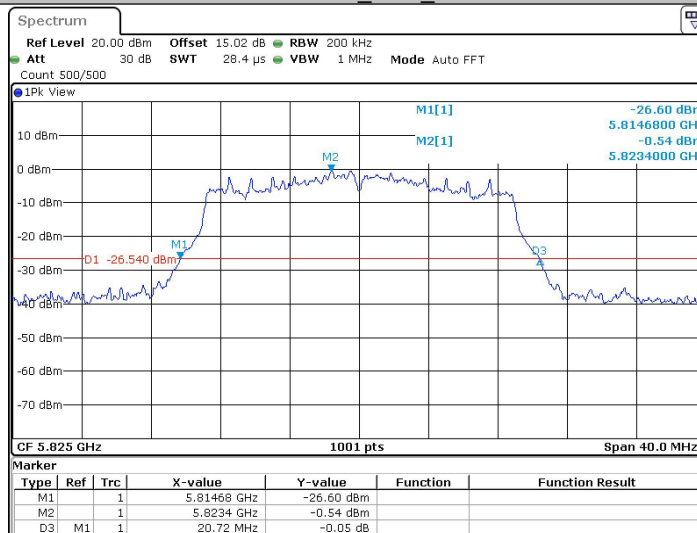
Date: 21 NOV. 2023 18:50:55

11N20SISO_Ant1_5785



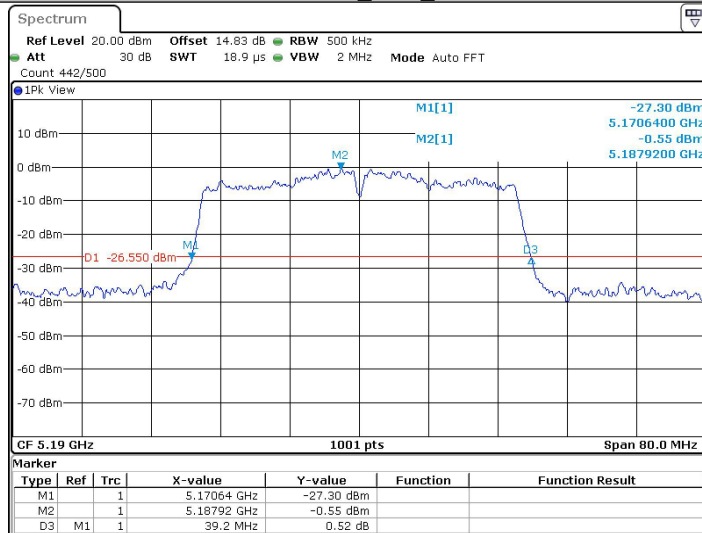
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11N20SISO_Ant1_5825



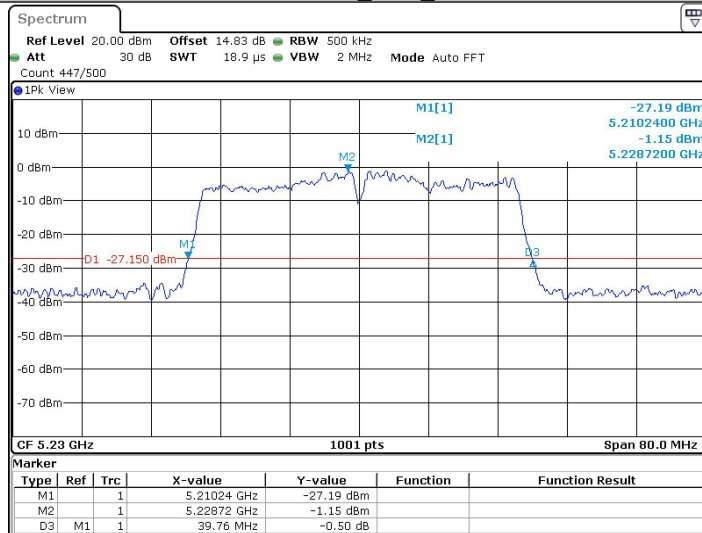
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11N40SISO_Ant1_5190



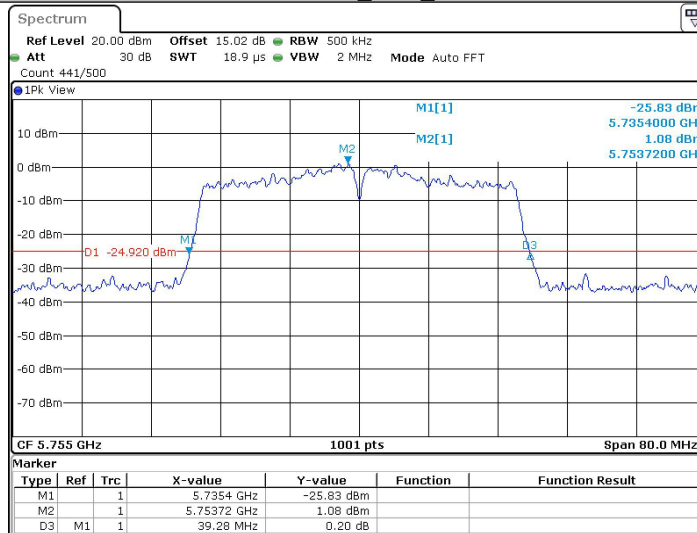
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11N40SISO_Ant1_5230



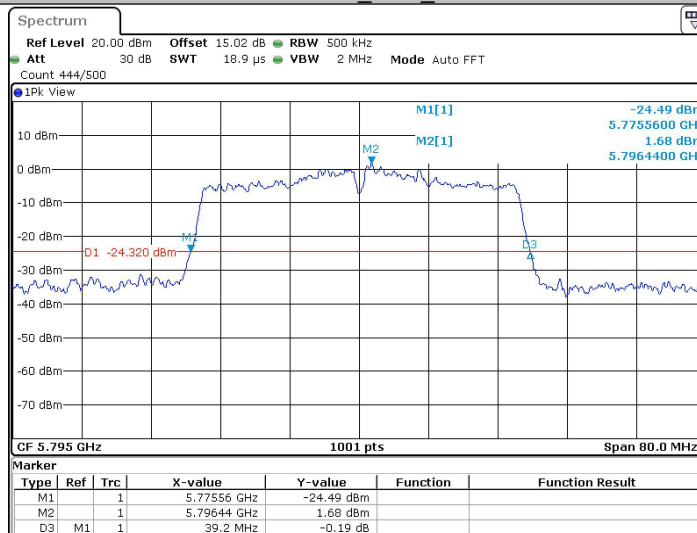
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11N40SISO_Ant1_5755



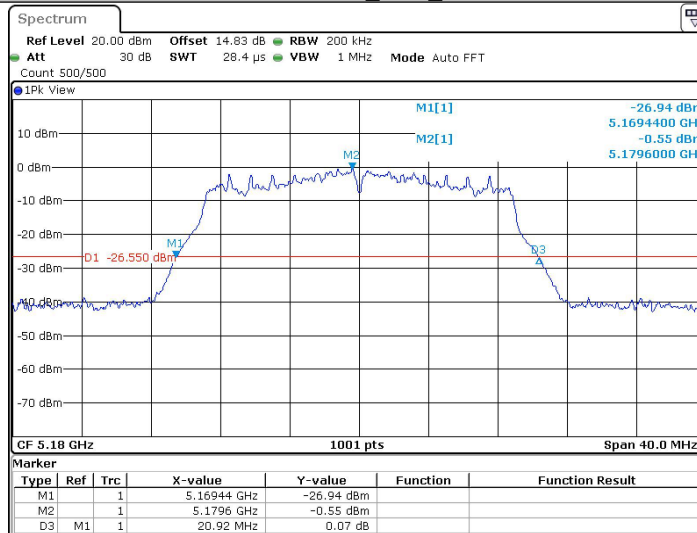
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11N40SISO_Ant1_5795



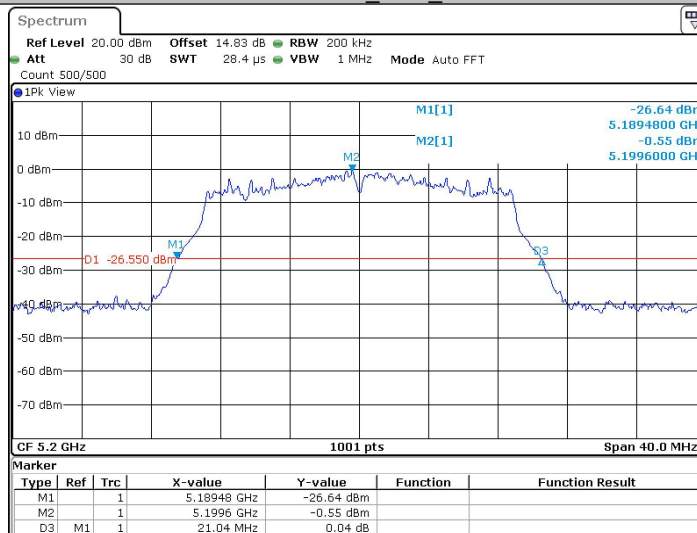
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11AC20SISO_Ant1_5180



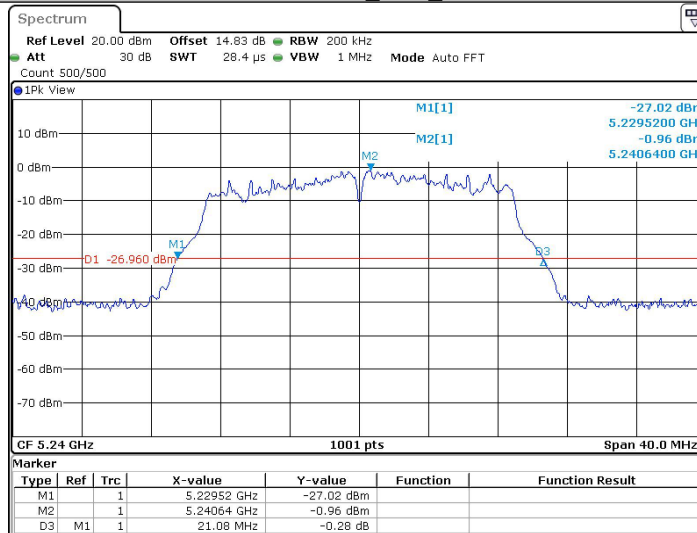
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11AC20SISO_Ant1_5200



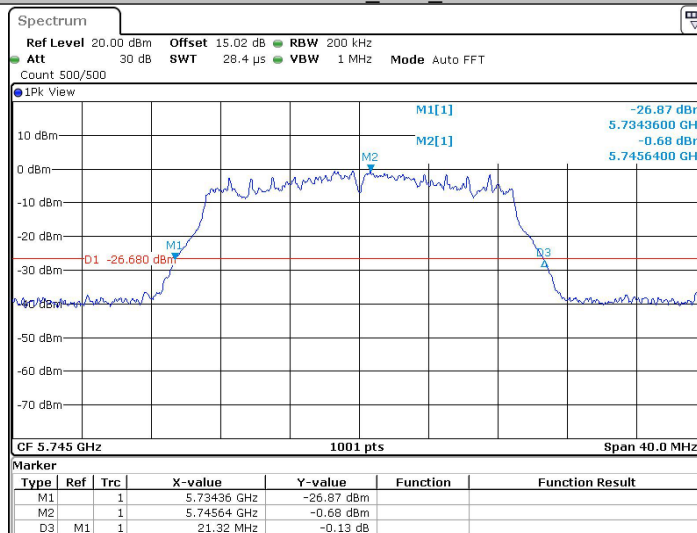
Date: 21 NOV. 2023 19:15:39

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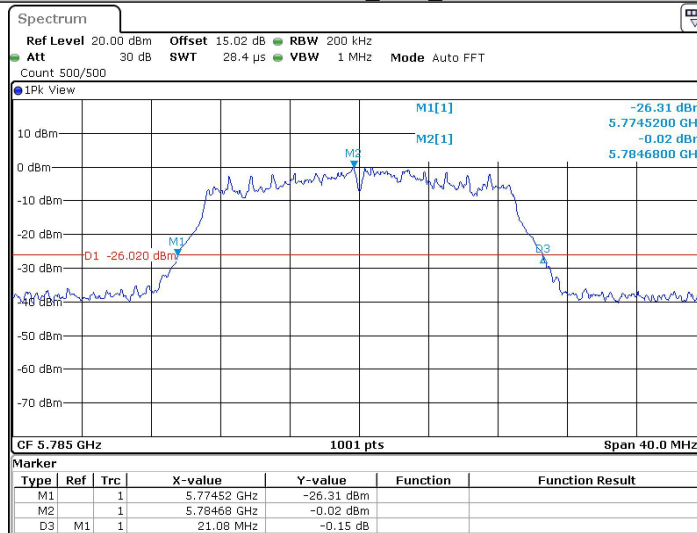
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11AC20SISO_Ant1_5745



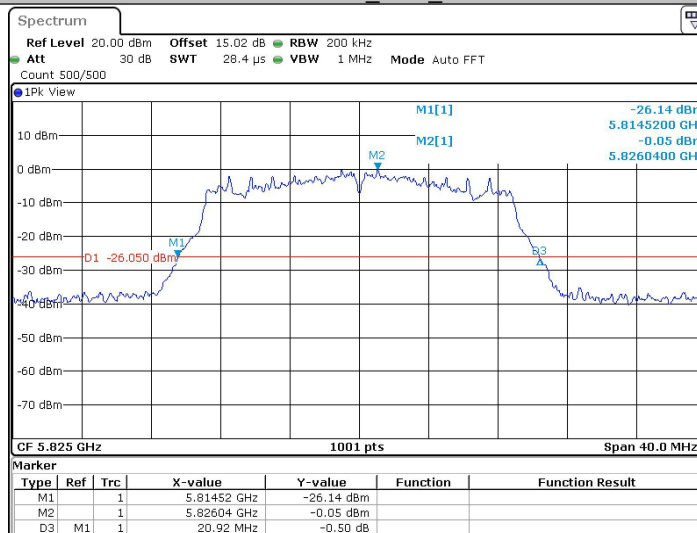
Date: 21 NOV. 2023 19:19:51

11AC20SISO_Ant1_5785



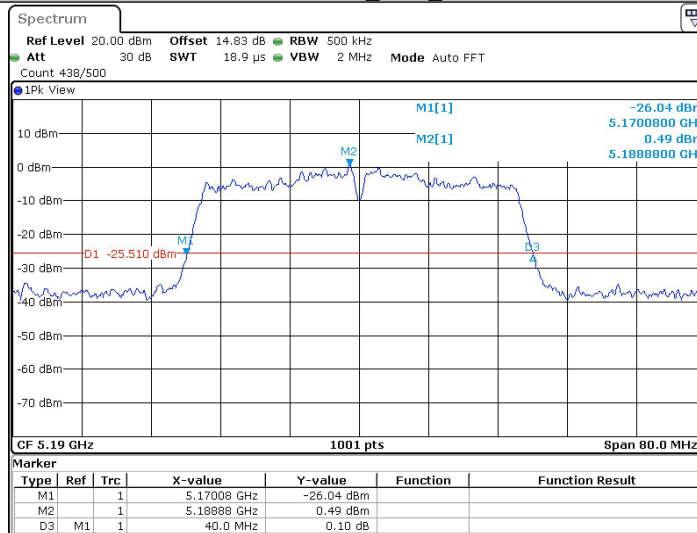
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11AC20SISO_Ant1_5825



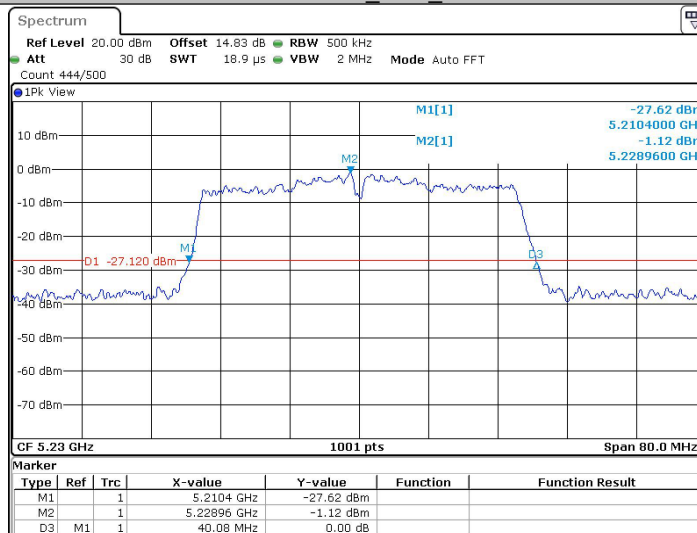
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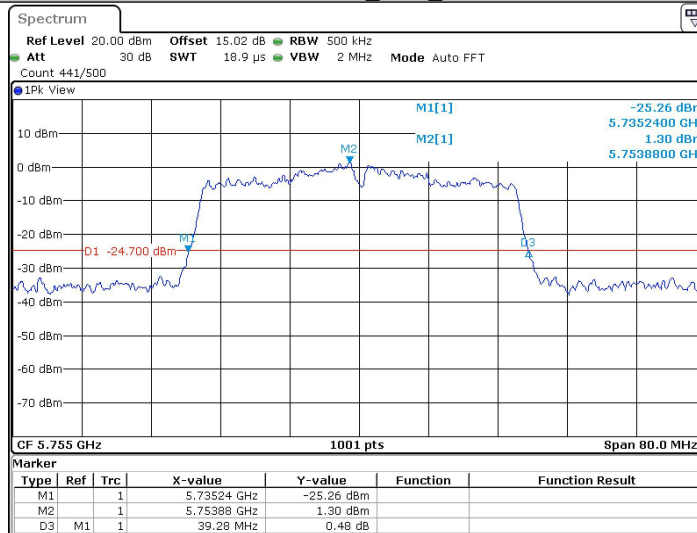
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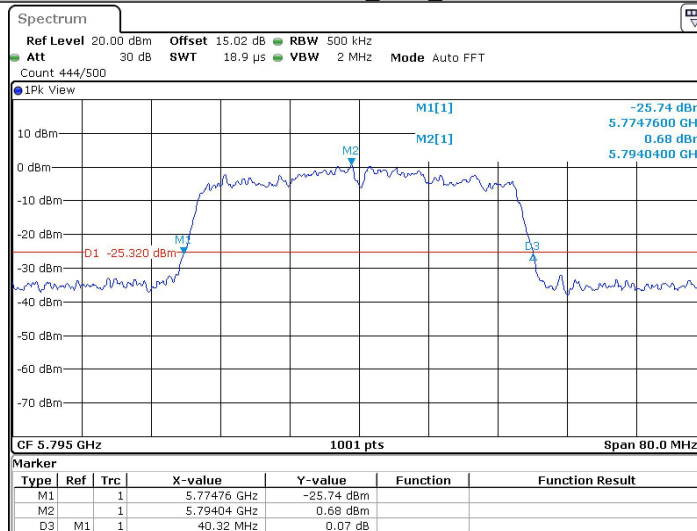
Date: 21 NOV. 2023 19:46:22

11AC40SISO_Ant1_5755



Date: 21.NOV.2023 20:11:11

11AC40SISO_Ant1_5795



Date: 21.NOV.2023 20:14:34