



Industrial Internet Innovation Center (Shanghai) Co.,Ltd.

SRD TEST REPORT

PRODUCT	Handheld Wireless Terminal
BRAND	SUNMI
MODEL	T8F1A
APPLICANT	Shanghai Sunmi Technology Co.,Ltd.
FCC ID	2AH25T8F1A
IC	22621-T8F1A
ISSUE DATE	February 19, 2025
STANDARD(S)	FCC Part15E, RSS-247 Issue 3, RSS-Gen Issue 5

Prepared by: Li Haisheng

李海生

Reviewed by: Yang Fan

杨帆

Approved by: Zhang Min

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1. Summary of Test Report

1.1 Test Standard(s)

No.	Test Standard	Title	Version
1	FCC Part15E	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	--
2	RSS-247 Issue 3	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices	2023
3	RSS-Gen Issue 5	General Requirements for Compliance of Radio Apparatus	2021

1.2 Reference Documents

No.	Test Standard	Title	Version
1	ANSI 63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
2	KDB 789033 D02 General UNII Test Procedures New Rules v02r01	Information Infrastructure (U-NII) Devices - Part 15, Subpart E	--

NOTE: The standard of KDB 789033 D02 General UNII Test Procedures New Rules v02r01 has not been accredited by A2LA

1.3 Summary of Test Results

No.	Measurement Items	FCC Rules	IC Rules	Verdict
1	Duty Cycle	15.407(a)	RSS-247 6.2	Pass
2	Maximum Output Power	15.407(a)	RSS-247 6.2	Pass
3	Power Spectral Density	15.407(a)	RSS-247 6.2	Pass
4	99% Occupied Bandwidth	N/A	RSS-247 6.2	Pass
5	-26dB Occupied Bandwidth	15. 407(a)	RSS-Gen 6.7	Pass
6	Band edge compliance	15.407(b)	RSS-247 6.2	Pass
7	Transmitter spurious emissions radiated	15.209 & 15.407(b)	RSS-Gen 8.9, RSS-247 6.2	Pass
8	Frequency Stability	15.407(g)	RSS-247 6.2	Pass
9	Transmit Power Control	15.407(h)	RSS-Gen 8.8	N/A
10	AC Powerline Conducted Emission	15.207	RSS Gen 6.8	Pass
11	Antenna requirement	15.203	RSS-247 6.2	Pass ^{Note 2}

Note 1:

The T8F1A manufactured by Shanghai Sunmi Technology Co.,Ltd. is a new product for testing. Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 1.3.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested

device specified in section 4 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 1 of this test report.

Note2:

5G RLAN used a Internal antenna with max Gain 0.92/-0.32/1.81 dBi that complied with 15.203 Requirements.

a. All the test data for each data were verified, but only the worst case was reported.

1.4 Data Provided by Applicant

No.	Item(s)	Data
1	Antenna gain of EUT	U-NII-1: 0.92 dBi U-NII-2A: -0.32 dBi U-NII-2C: 1.81 dBi
Note: The data of antenna gain is provided by the Antenna specification may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.		

2. General Information of The Laboratory

2.1 Testing Laboratory

Lab Name	Industrial Internet Innovation Center (Shanghai) Co.,Ltd.
Address	Building 4, No. 766, Jingang Road, Pudong, Shanghai, China
Telephone	021-68866880
FCC Registration No.	708870
FCC Designation No.	CN1364
IC Designation No.	10766A
CAB identifier	CN0067

2.2 Laboratory Environmental Requirements

Temperature	15℃~35℃
Relative Humidity	25%RH~75%RH
Atmospheric Pressure	86kPa~106kPa

2.3 Project Information

Project Manager	Gao Hongning
Test Date	November 29, 2024 to January 17, 2025

3. General Information of The Customer

3.1 Applicant

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Telephone	8618501703215

3.2 Manufacturer

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Telephone	8618501703215

4. General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

Product Name	Handheld Wireless Terminal
Model name	T8F1A
Date of Receipt	S05aa/S10aa: November 29,2024
EUT ID*	S05aa/S10aa
SN/IMEI	S05aa: L303E4BL00005 S10aa: L303E4BL00002
Supported Radio Technology and Bands	BT 5.2 BR/EDR/BLE WLAN 802.11b,g,n WLAN 802.11a,n,ac Hallow WI-FI 802.11ah GPS/GLONASS/Galileo/BDS NFC
Hardware Version	V00
Software Version	1.00.00.20241113_186_userdebug
HVIN	T8F1A
FCC ID	2AH25T8F1A
IC	22621-T8F1A
NOTE1: EUT ID is the internal identification code of the laboratory.	
NOTE2: Samples in the test report are provided by the customer. The test results are only applicable to the samples received by the laboratory.	

4.2 Internal Identification of AE used during the test

AE ID*	Description	Model	SN/Remark
CA01	Adapter	TPA-141A050200UU01	SHENZHEN TIANYIN ELECTRONICS CO., LTD. OUTPUT: 5V 2A
CB01	Adapter	UC13US	Jiangsu Chenyang Electron Co., Ltd. OUTPUT: 5V 2A
UA01	AC Cable	SSM-A033A	Saibao (Jiangxi) Industry Co., LTD
BA07	Battery	GYPA	HUNAN GAOYUAN BATTERY CO.,LTD. 5000mAh 3.87V
AE1	RF cable	N/A	Cable loss: 1dB
NOTE: *AE ID is the internal identification code of the laboratory.			

4.3 Additional Information

WLAN Frequency	FCC	IC
	UNII 1: 5150MHz-5240MHz UNII 2A: 5260MHz-5320MHz UNII 2C: 5500MHz-5700MHz	UNII 1: 5150MHz-5240MHz UNII 2A: 5260MHz-5320MHz UNII 2C: 5500-5580MHz, 5660-5700MHz
Occupied Channel Bandwidth	20 MHz: 802.11 a/n/ac 40 MHz: 802.11 n/ac 80 MHz: 802.11 ac	
WLAN type of modulation	OFDM	
NOTE: The test data with the frequencies in 5600-5650MHz are only used for FCC certification.		

Test frequency list:

UNII-1 and UNII-2A:

BW_20M	Channel	36	40	44	48	52	56	60	64
	Freq. (MHz)	5180	5200	5220	5240	5260	5280	5300	5320
BW_40M	Channel	38		46		54		62	
	Freq. (MHz)	5190		5230		5270		5310	
BW_80M	Channel	42				58			
	Freq. (MHz)	5210				5290			

UNII-2C:

BW_20M	Channel	100	104	108	112	116	120	124	128	132	136	140
	Freq. (MHz)	5500	5520	5540	5560	5580	5600	5620	5640	5660	5680	5700
BW_40M	Channel	102		110		118		126		134		/
	Freq. (MHz)	5510		5550		5590		5630		5670		/
BW_80M	Channel	106				122				/		
	Freq. (MHz)	5530				5610				/		

Note: "/" Represents empty

Note: This report is for WLAN UNII-1, UNII-2A and UNII-2C only.

Emissions Information:

TestMode	TestBand	Frequency Min(MHz)	Frequency Max(MHz)	Max OutPut Power (dBm)	Max OutPut Power (W)	OBW (KHz)	Necessary Bandwidth & Emission Classification
11A	UNII-1	5180	5240	15.44	0.035	17520	17M5D1D
11A	UNII-2A	5260	5320	15.08	0.0322	17400	17M4D1D
11A	UNII-2C	5500	5700	15.06	0.0321	17400	17M4D1D
11N20	UNII-1	5180	5240	15.12	0.0325	18480	18M5D1D
11N20	UNII-2A	5260	5320	14.82	0.0303	18320	18M3D1D

11N20	UNII-2C	5500	5700	14.87	0.0307	18400	18M4D1D
11N40	UNII-1	5190	5230	15.04	0.0319	36960	37M0D1D
11N40	UNII-2A	5270	5310	14.77	0.03	36800	36M8D1D
11N40	UNII-2C	5510	5670	15.17	0.0329	36880	36M9D1D
11AC20	UNII-1	5180	5240	14.29	0.0269	18240	18M2D1D
11AC20	UNII-2A	5260	5320	13.77	0.0238	18120	18M1D1D
11AC20	UNII-2C	5500	5700	13.81	0.024	18160	18M2D1D
11AC40	UNII-1	5190	5230	12.93	0.0196	36640	36M6D1D
11AC40	UNII-2A	5270	5310	12.69	0.0186	36560	36M6D1D
11AC40	UNII-2C	5510	5670	13.12	0.0205	36640	36M6D1D
11AC80	UNII-1	5210	5210	10.98	0.0125	75360	75M4D1D
11AC80	UNII-2A	5290	5290	10.91	0.0123	75040	75M0D1D
11AC80	UNII-2C	5530	5610	12.39	0.0173	75360	75M4D1D

5. Test Configuration Information

5.1 Laboratory Environmental Conditions

5.1.1 Permanent Facilities

Relative Humidity	Min. = 45 %, Max. = 55 %		
Atmospheric Pressure	101kPa		
Temperature	Normal	Minimum	Maximum
	25°C	-20°C	55°C
Working Voltage of EUT	Normal	Minimum	Maximum
	3.87V	3.4V	4.4V

5.2 Test Equipments Utilized

5.2.1 Conducted Test System

No.	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
1	Test Software	TS1120	10671	V3.2.22	N/A	Tonsce nd	N/A	N/A
2	Automatic control unit	JS0806-2	2218060621	N/A	N/A	Tonsce nd	2024-03-25	1 Year
3	Wireless communication comprehensive tester	CMW270	100919	V3.5.137	N/A	R&S	2024-07-25	1 Year
4	Spectrum Analyzer	FSQ40	200063	V4.75	N/A	R&S	2024-09-29	1 Year
5	Vector Signal Generator	SMU200A	104684	V03.20.286.21	N/A	R&S	2024-07-25	1 Year
6	Vector Signal Generator	SMBV100A	257904	V4.15.125.49	N/A	R&S	2023-12-19 2024-12-12	1 Year
7	Programmable Power Supply	Keithley 2303	4039070	N/A	N/A	Keithley	2024-06-07	1 Year
8	Temperature box	B-TF-107C	BTF107C-201804107	N/A	N/A	Boyi	2024-06-07	1 Year
9	Network test unit AP	GT-AXE11000	N2IG0X401637KWF	V3.0.0.4.386_45940	N/A	ASUS	N/A	N/A

5.2.2 Radiated Emission Test System

No	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
1	Universal Radio Communication Tester	CMU200	123126	V5.2.1	B12	R&S	2024-10-09	1 Year
2	Universal Radio Communication Tester	CMW500	104178	V3.7.20	1206.0600.00	R&S	2024-10-09	1 Year
3	EMI Test Receiver	ESU40	100307	V5.1-24-3	01	R&S	2023-12-19 2024-12-13	1 Year
4	TRILOG Broadband Antenna	VULB9163	01345	N/A	N/A	Schwarzbeck	2024-03-29	1 Year
5	Double-ridged Waveguide Antenna	ETS-3117	00135890	N/A	N/A	ETS	2024-03-16	1 Year
6	EMI Test Software	EMC32 V10.35.02	N/A	V10.35.02	N/A	R&S	N/A	N/A
7	Horn Antenna	3160-09	LM6321	N/A	N/A	R&S	2024-07-15	1 Year
8	Horn Antenna	3160-10	LM5942	N/A	N/A	R&S	2024-07-15	1 Year
9	Loop Antenna	AL-130R	121083	N/A	N/A	COM-POWER	2024-08-31	1 Year
10	Preamplifier	SCU08F1	8320024	N/A	N/A	R&S	2024-10-09	1 Year
11	Preamplifier	SCU18	10155	N/A	N/A	R&S	2024-10-09	1 Year
12	Preamplifier	SCU26	10025	N/A	N/A	R&S	2024-10-09	1 Year
13	Preamplifier	SCU40	10020	N/A	N/A	R&S	2024-10-09	1 Year
14	2-Line V-Network	ENV216	101380	N/A	N/A	R&S	2023-12-19 2024-12-13	1 Year
15	EMI Test Software	EMC32 V10.35.02	N/A	N/A	N/A	R&S	N/A	N/A
16	Test Receiver	ESCI	101235	V5.1-24-3	0	R&S	2023-12-19 2024-12-13	1 Year
17	Antenna Tower	TPMDC-LF	N/A	N/A	N/A	Top Precision	N/A	N/A
18	Antenna Tower	TPMDC-HF	N/A	N/A	N/A	Top Precision	N/A	N/A

5.2.3 Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω
Temperature	Min. = 15 °C, Max. = 35 °C

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (9.8 meters×6.7 meters×6.7 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB, 30MHz to 1GHz

5.3 Measurement Uncertainty

Measurement Uncertainty of Conduction test

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Emission Bandwidth	5150-5850MHz	95%	±1.9%
Maximum Conduct Output Power	5150-5850MHz	95%	± 1.18 dB
Power Spectral Density	5150-5850MHz	95%	±0.98 dB
Band Edge Measurements	5150-5850MHz	95%	±1.21dB
Unwanted Emissions Measurement	9kHz-40GHz	95%	9kHz-7GHz:±1.21dB 7GHz-40GHz: ±3.31dB

Frequency Stability	5150-5850MHz	95%	±1.9%
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Measurement Uncertainty of Radiation test

Measurement Items	Uncertainty(dB)
Radiated Emission 30MHz-1000MHz	±5.10
Radiated Emission 1000MHz-18000MHz	±5.66
Radiated Emission 18000MHz-40000MHz	±5.22
AC Powerline Conducted Emission	±4.38
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.	

6. Measurement Results

6.1. Duty Cycle

6.1.1. Measurement Limit and Method

Standard	Limit (dBm)
FCC 47 CFR Part 15.407(a)	NA
RSS-247 6.2	N/A

6.1.2. Test Procedure

The measurement method is made according to KDB 789033 B

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

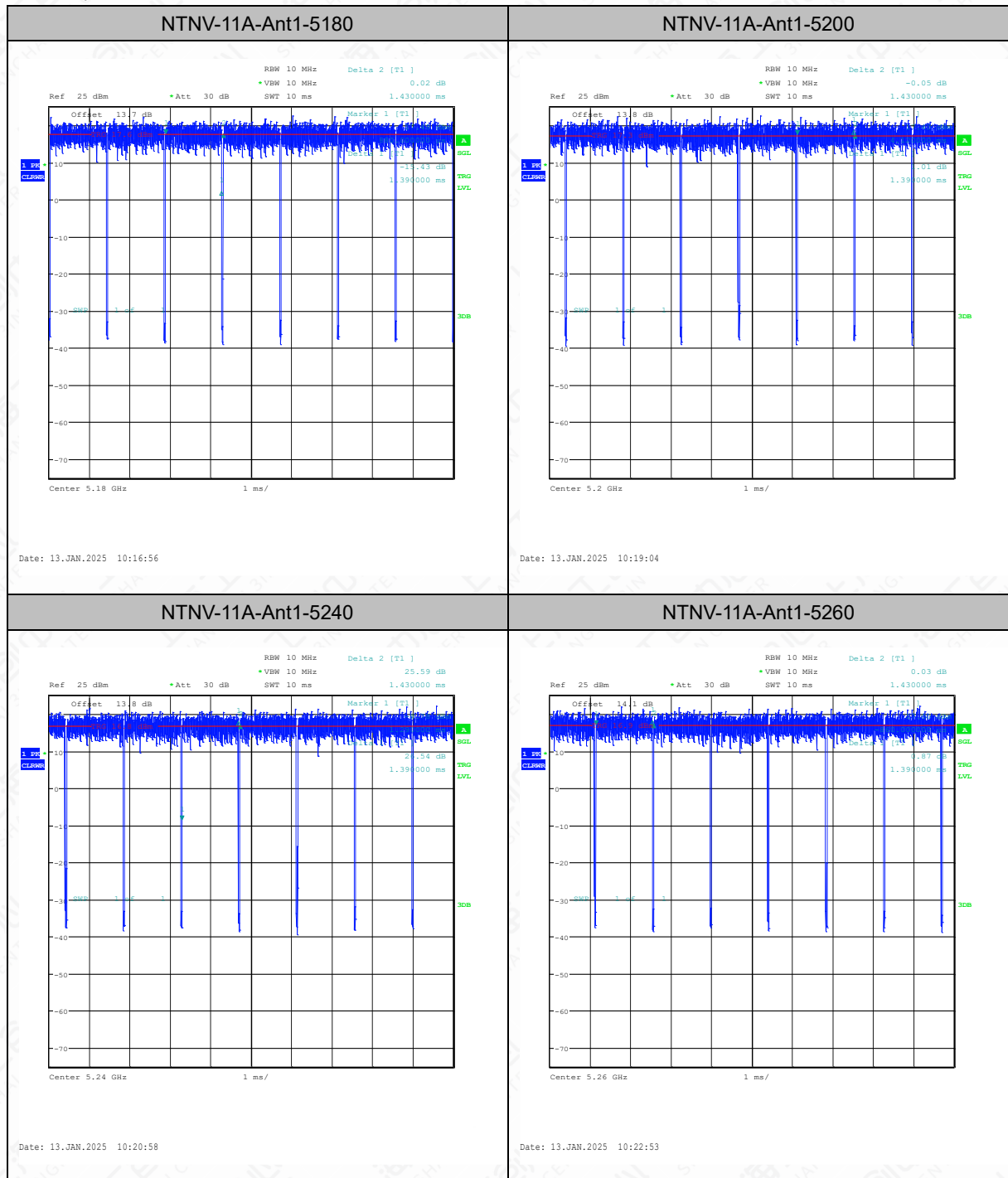
- A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal.
- The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission, Set RBW > EBW if possible; otherwise, set RBW to the largest available value. Set VBW > RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in II.B.1.a), and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T < 16.7$ microseconds.)

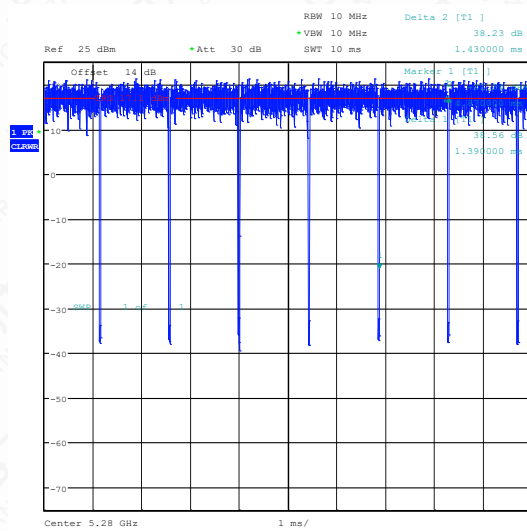
6.1.3. Measurement Results

Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11A	Ant1	5180	1.39	1.43	97.20
11A	Ant1	5200	1.39	1.43	97.20
11A	Ant1	5240	1.39	1.43	97.20
11A	Ant1	5260	1.39	1.43	97.20
11A	Ant1	5280	1.39	1.43	97.20
11A	Ant1	5320	1.39	1.43	97.20
11A	Ant1	5500	1.39	1.43	97.20
11A	Ant1	5580	1.39	1.43	97.20
11A	Ant1	5700	1.39	1.43	97.20
11N20SISO	Ant1	5180	1.30	1.33	97.74
11N20SISO	Ant1	5200	1.30	1.34	97.01
11N20SISO	Ant1	5240	1.30	1.34	97.01

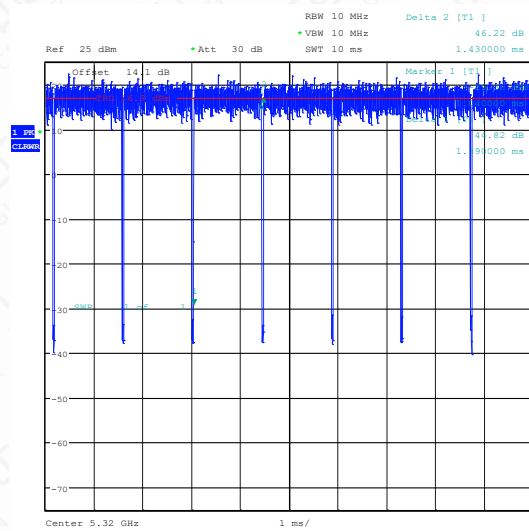
11N20SISO	Ant1	5260	1.30	1.33	97.74
11N20SISO	Ant1	5280	1.29	1.33	96.99
11N20SISO	Ant1	5320	1.30	1.33	97.74
11N20SISO	Ant1	5500	1.30	1.34	97.01
11N20SISO	Ant1	5580	1.30	1.33	97.74
11N20SISO	Ant1	5700	1.29	1.33	96.99
11N40SISO	Ant1	5190	0.65	0.68	95.59
11N40SISO	Ant1	5230	0.65	0.68	95.59
11N40SISO	Ant1	5270	0.65	0.69	94.20
11N40SISO	Ant1	5310	0.65	0.69	94.20
11N40SISO	Ant1	5510	0.65	0.68	95.59
11N40SISO	Ant1	5550	0.65	0.68	95.59
11N40SISO	Ant1	5670	0.64	0.68	94.12
11AC20SISO	Ant1	5180	1.31	1.34	97.76
11AC20SISO	Ant1	5200	1.31	1.35	97.04
11AC20SISO	Ant1	5240	1.31	1.35	97.04
11AC20SISO	Ant1	5260	1.31	1.34	97.76
11AC20SISO	Ant1	5280	1.31	1.35	97.04
11AC20SISO	Ant1	5320	1.31	1.35	97.04
11AC20SISO	Ant1	5500	1.31	1.35	97.04
11AC20SISO	Ant1	5580	1.31	1.34	97.76
11AC20SISO	Ant1	5700	1.32	1.35	97.78
11AC40SISO	Ant1	5190	0.66	0.69	95.65
11AC40SISO	Ant1	5230	0.65	0.69	94.20
11AC40SISO	Ant1	5270	0.65	0.69	94.20
11AC40SISO	Ant1	5310	0.65	0.69	94.20
11AC40SISO	Ant1	5510	0.65	0.69	94.20
11AC40SISO	Ant1	5550	0.66	0.69	95.65
11AC40SISO	Ant1	5670	0.65	0.69	94.20
11AC80SISO	Ant1	5210	0.32	0.35	91.43
11AC80SISO	Ant1	5290	0.33	0.36	91.67
11AC80SISO	Ant1	5530	0.32	0.36	88.89
11AC80SISO	Ant1	5610	0.33	0.36	91.67

Test Graphs

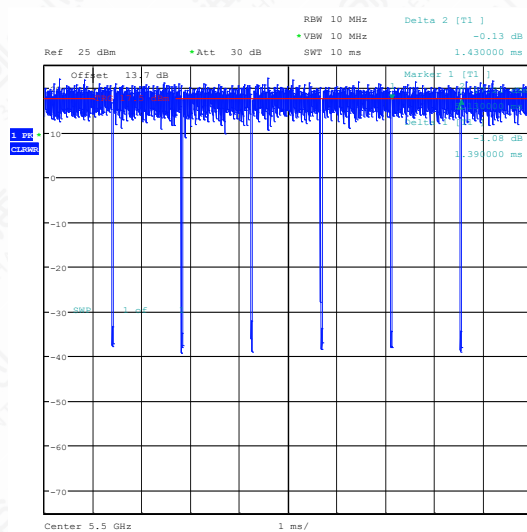


NTNV-11A-Ant1-5280


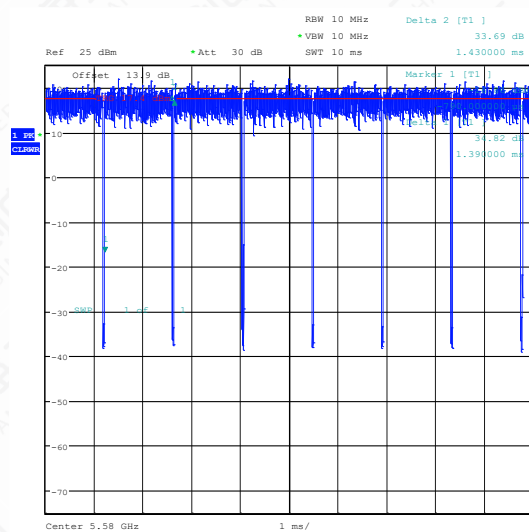
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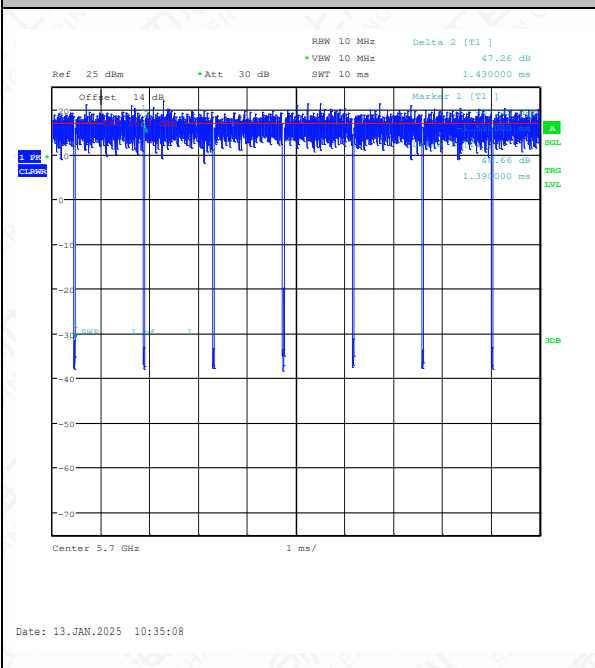
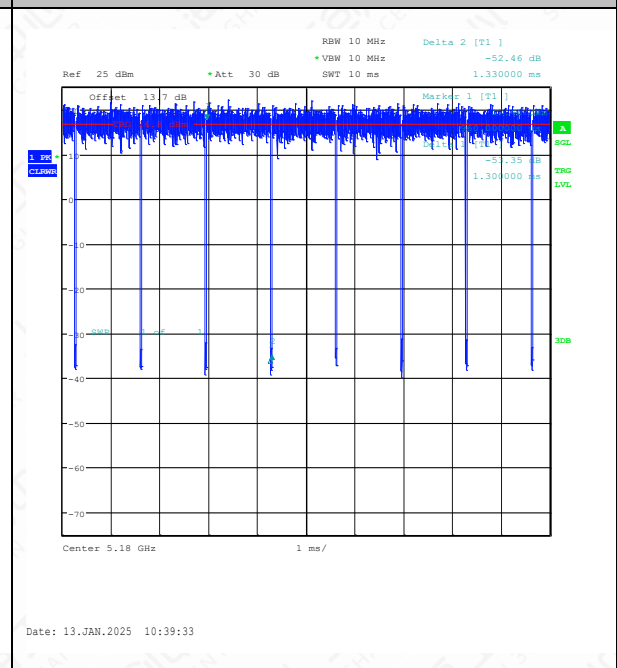
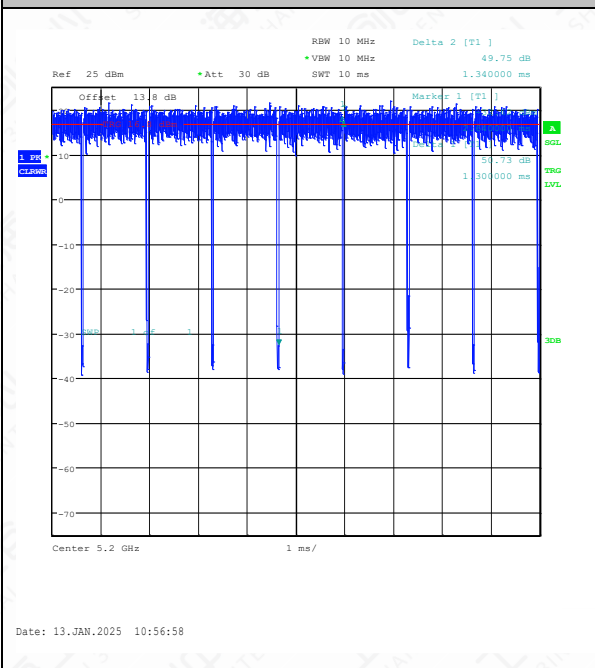
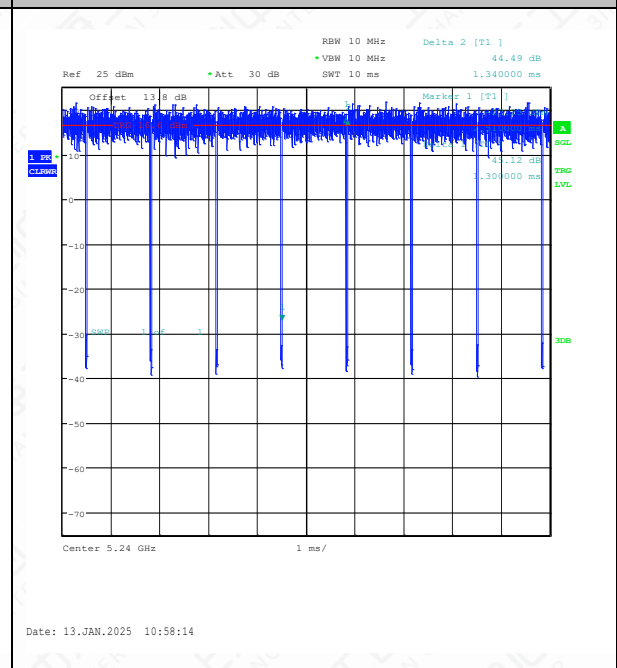
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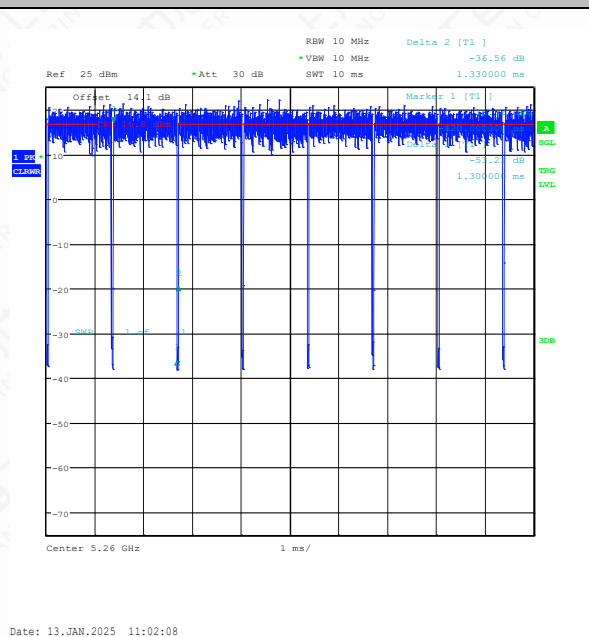
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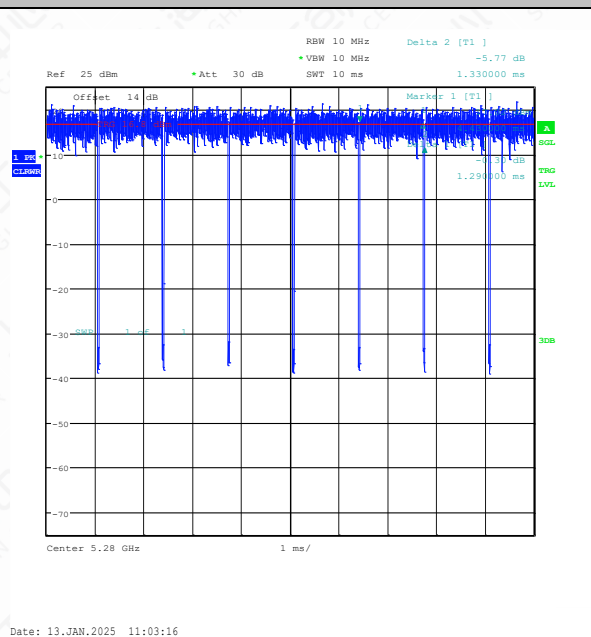
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NTNV-11A-Ant1-5700

NTNV-11N20SISO-Ant1-5180

NTNV-11N20SISO-Ant1-5200

NTNV-11N20SISO-Ant1-5240


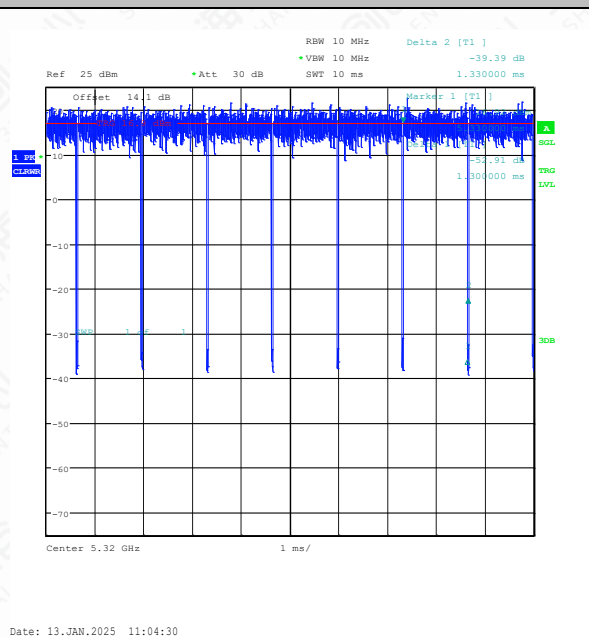
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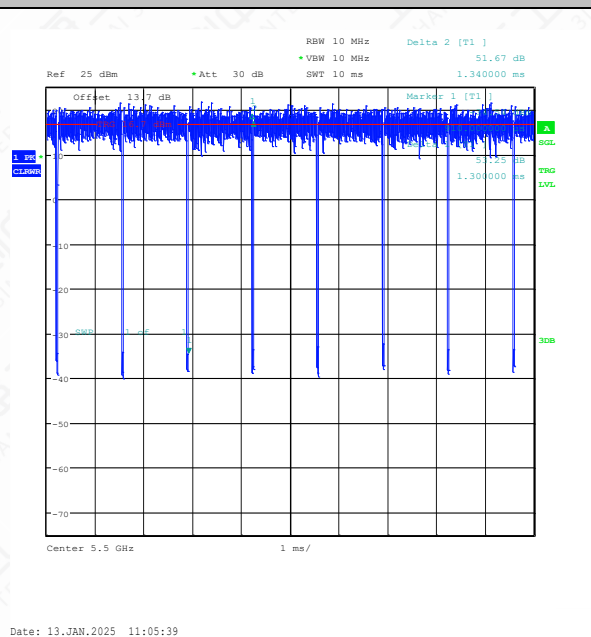
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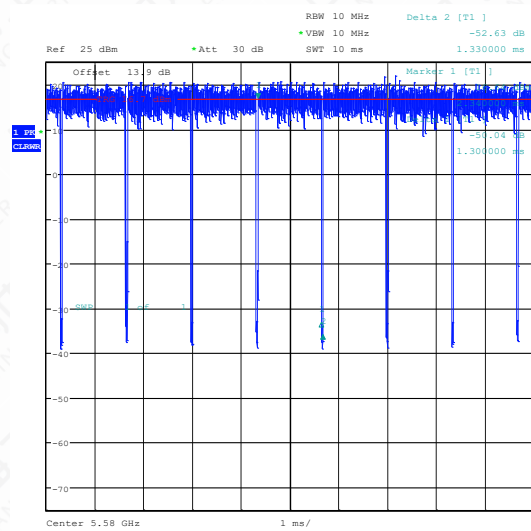
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NTNV-11N20SISO-Ant1-5500

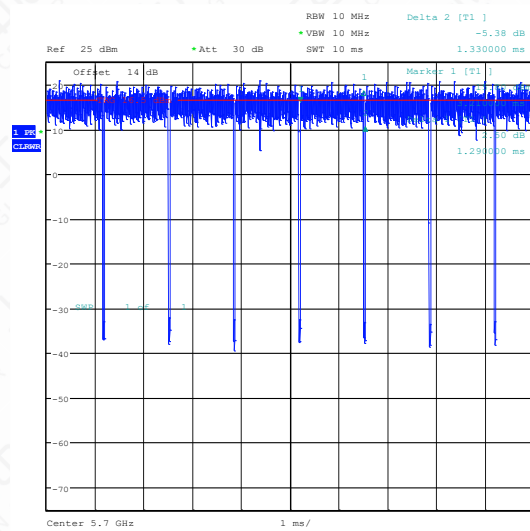


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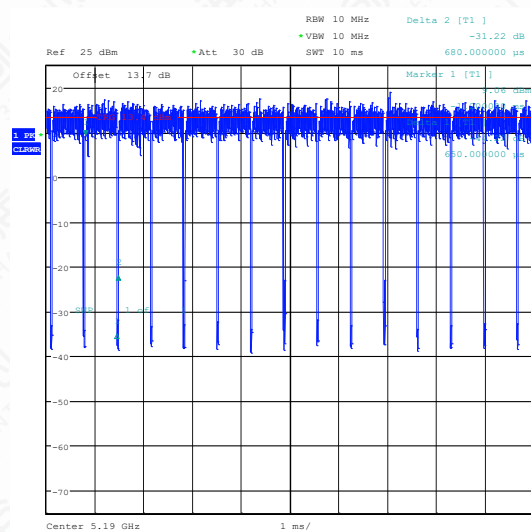
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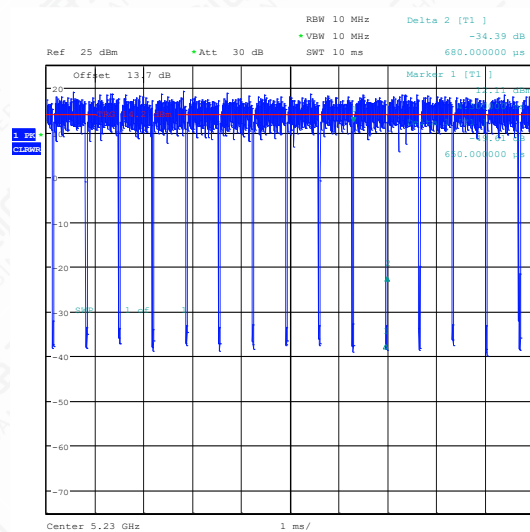
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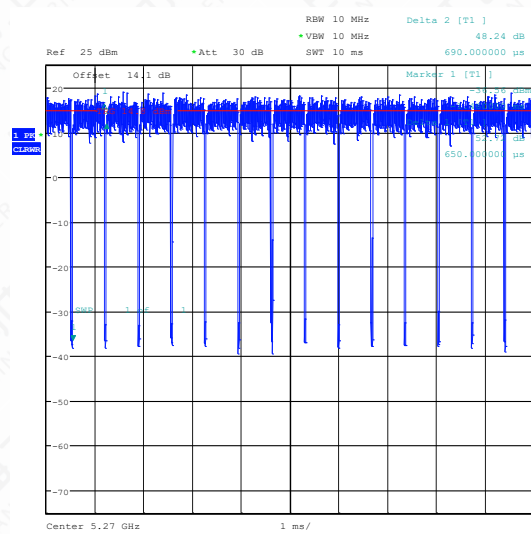
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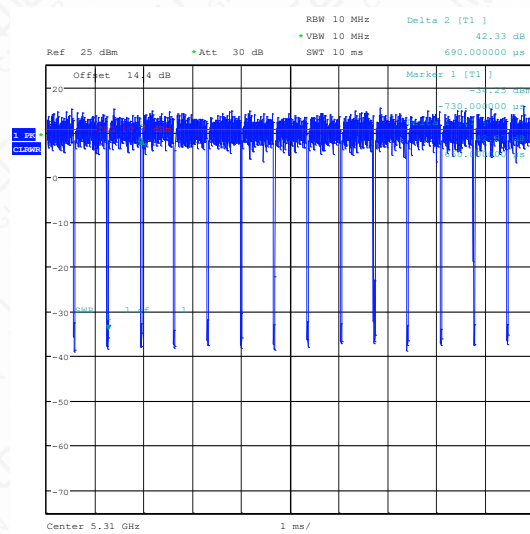
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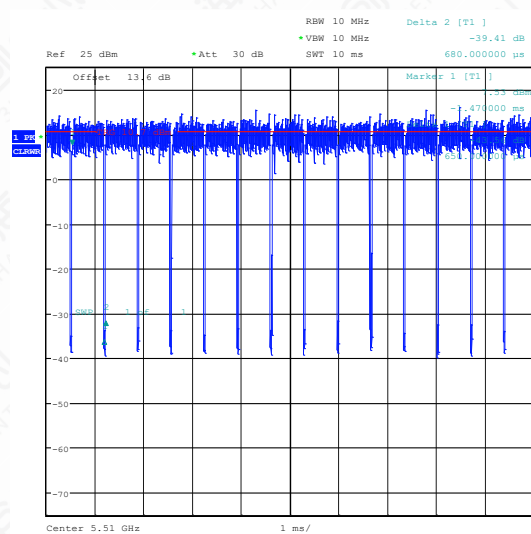
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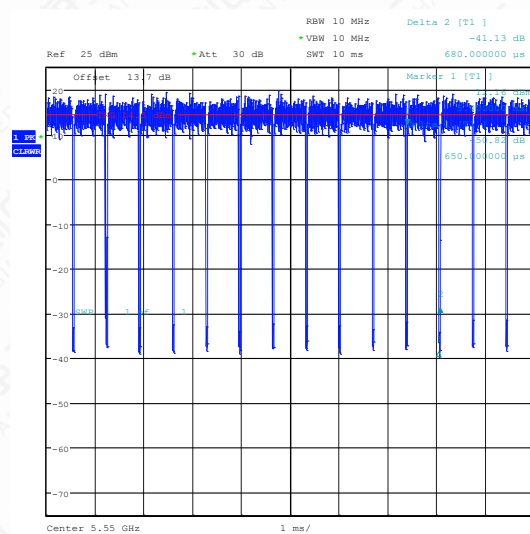
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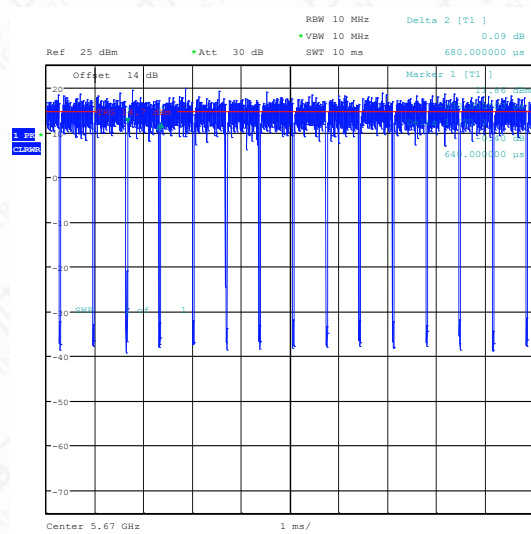


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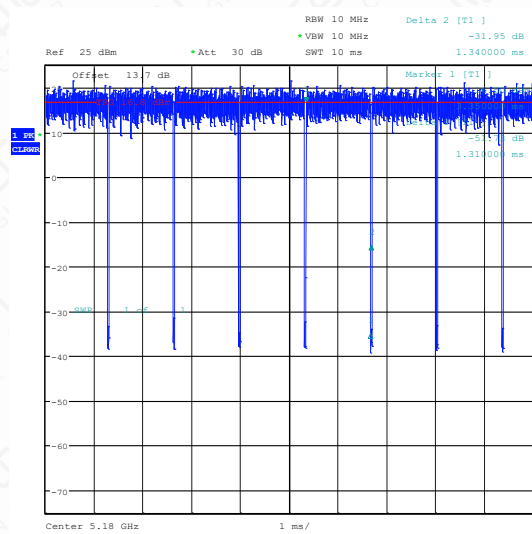
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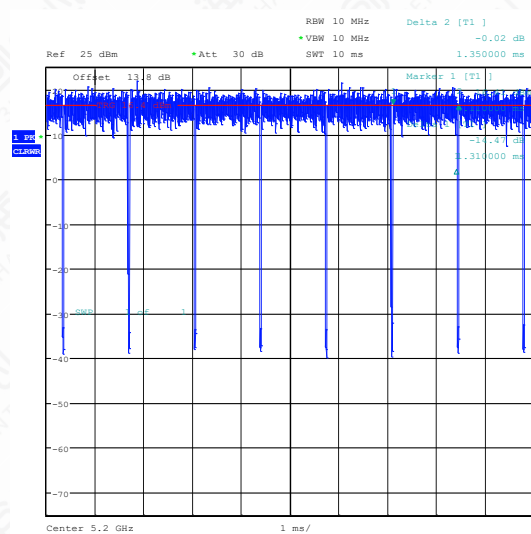
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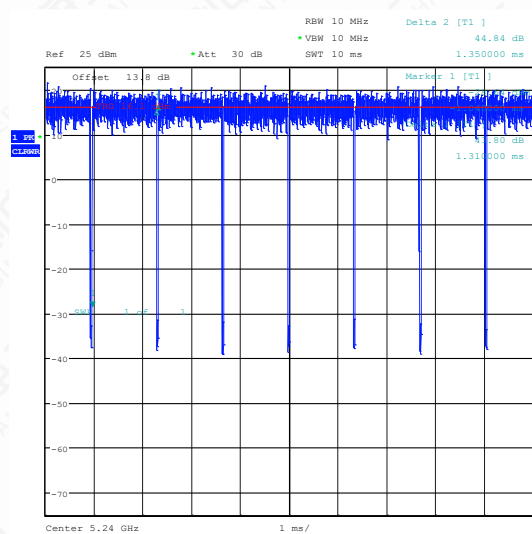
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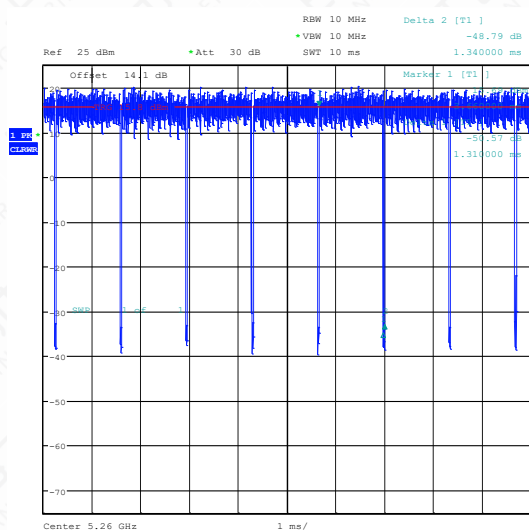
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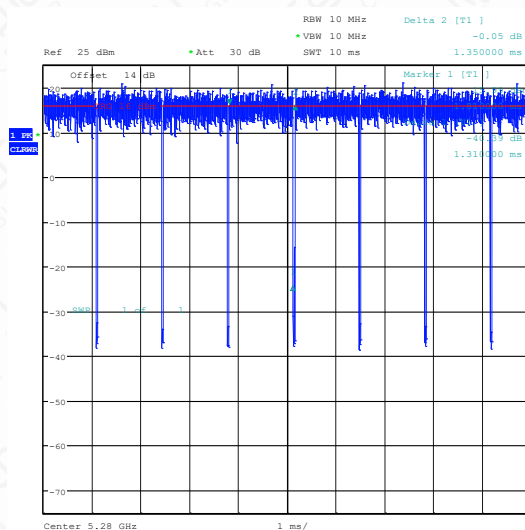
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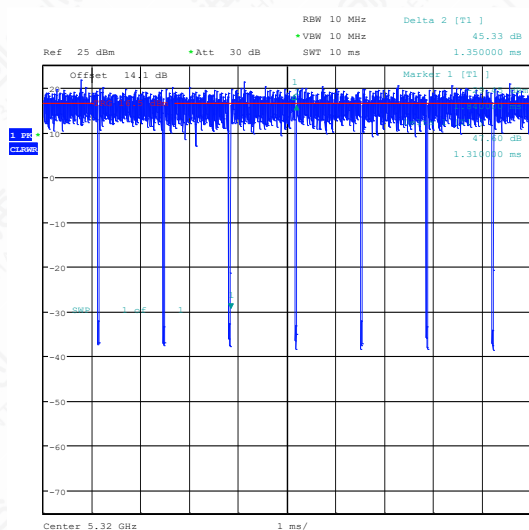
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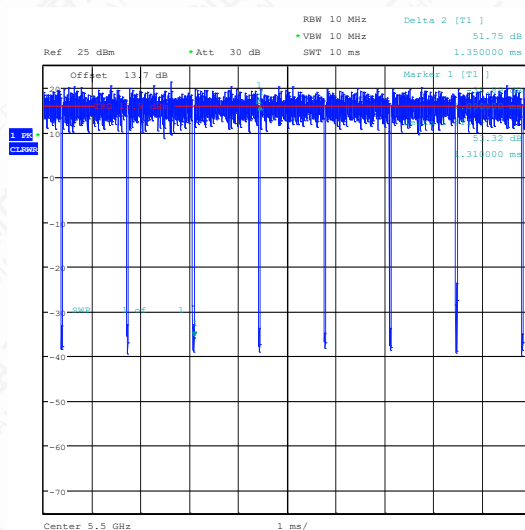
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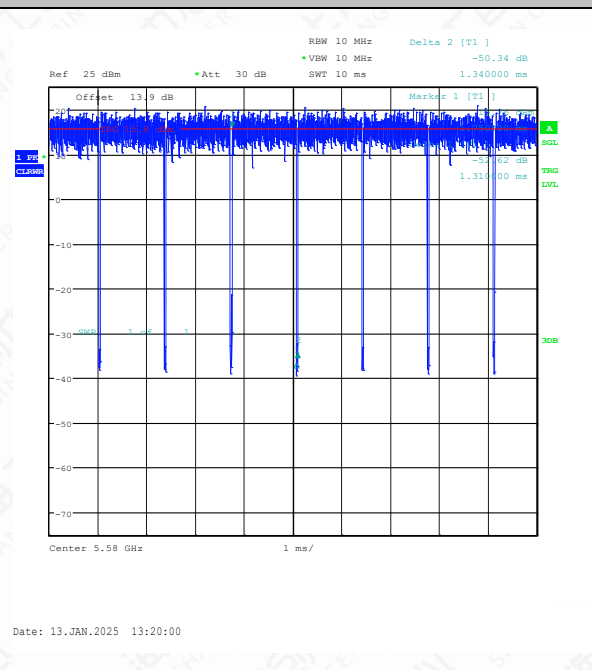
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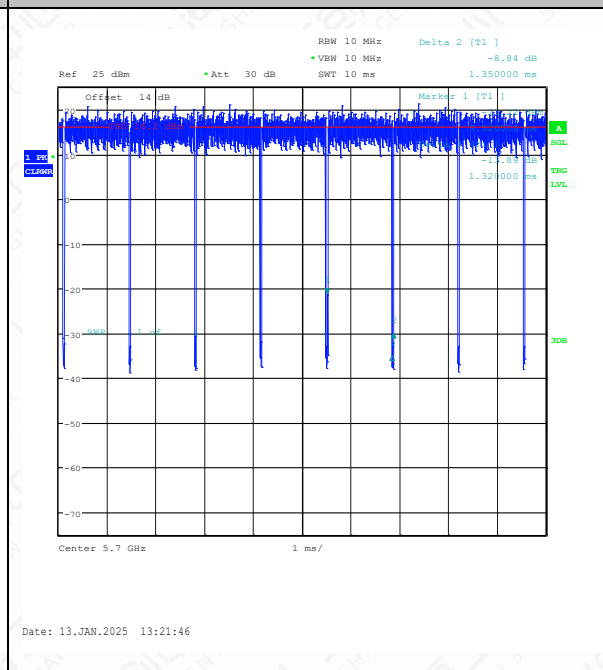
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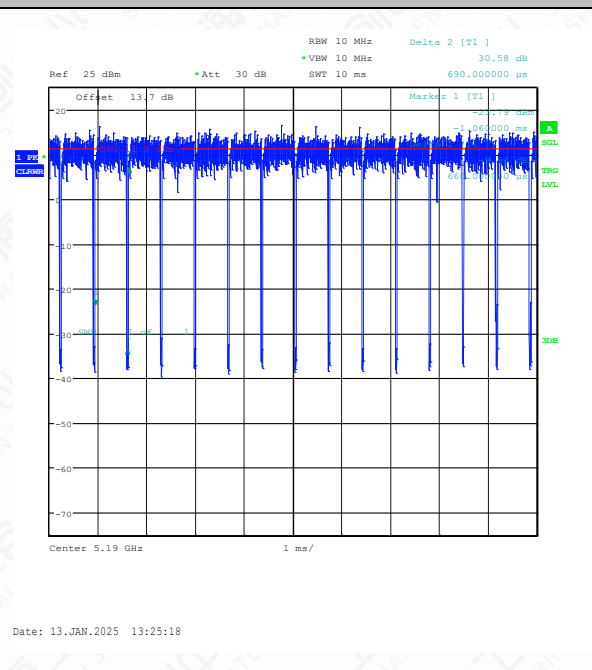
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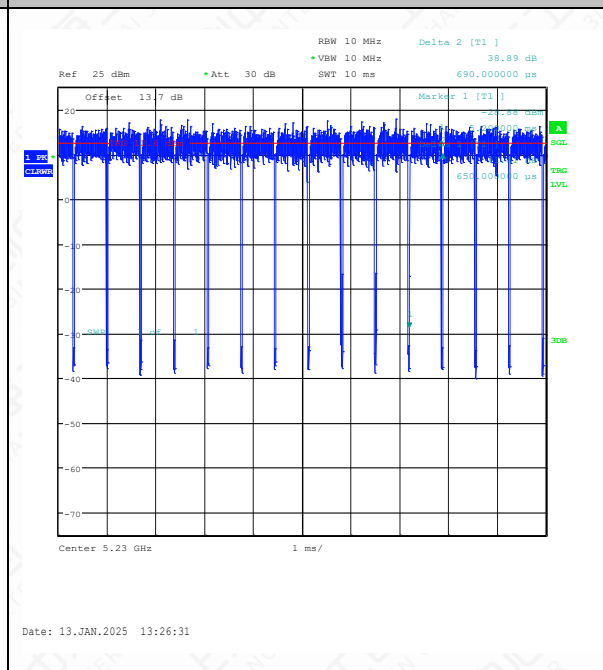
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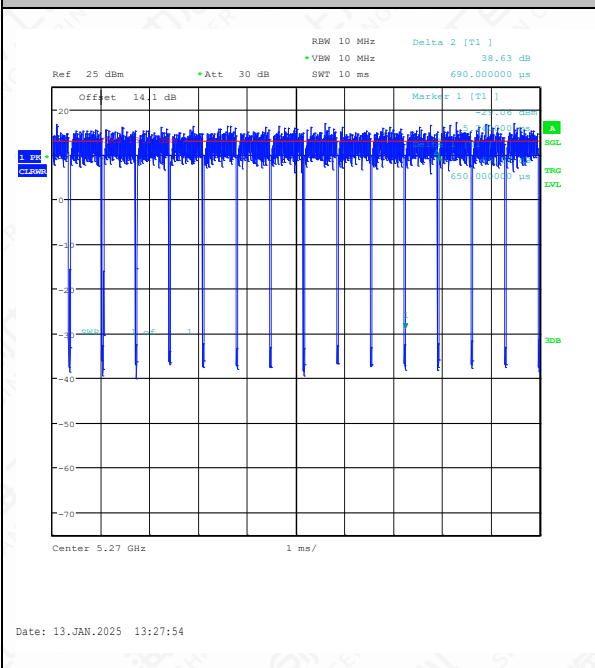
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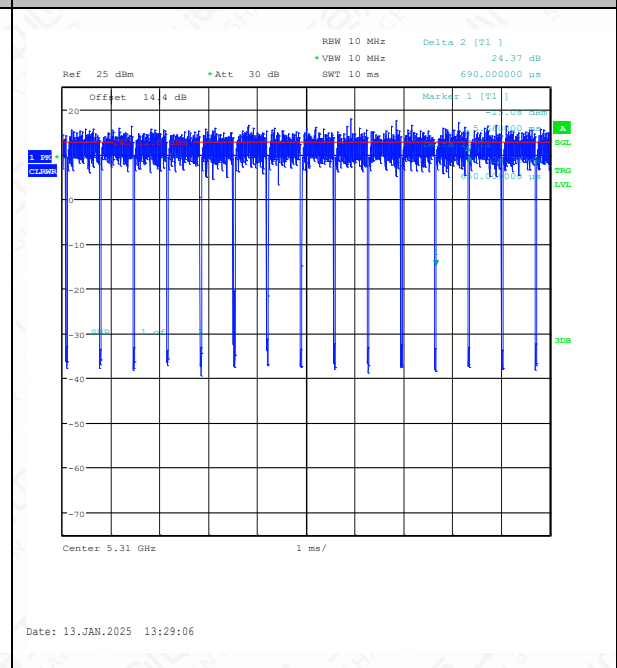
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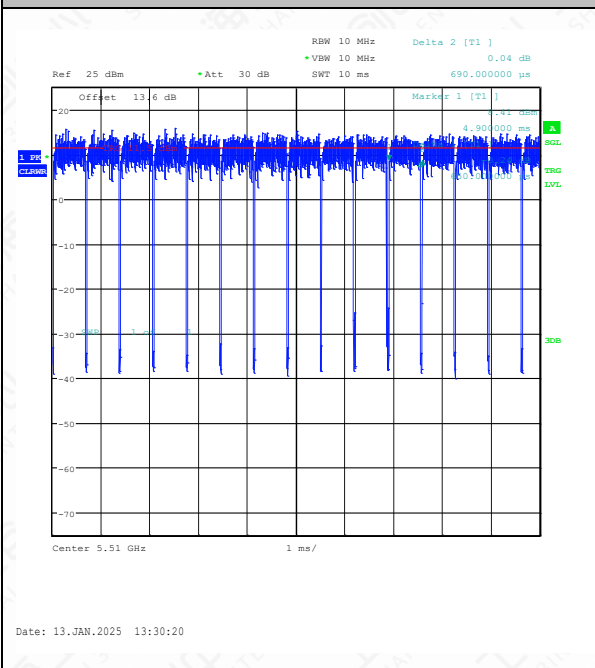
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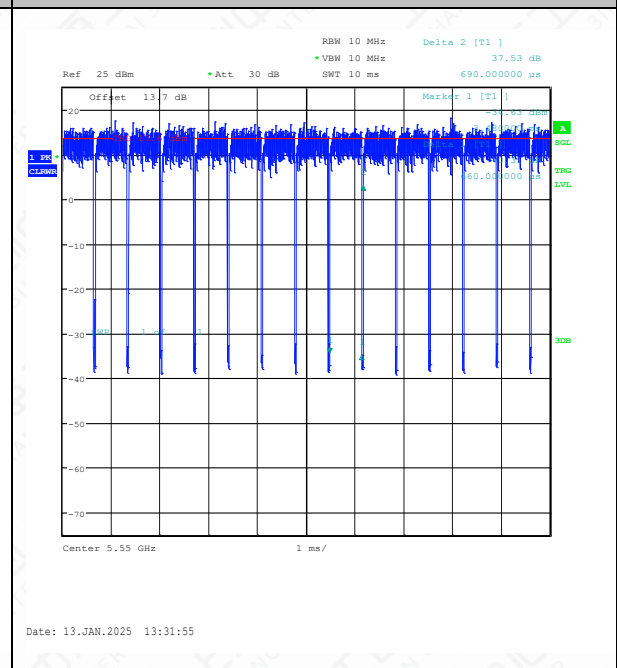
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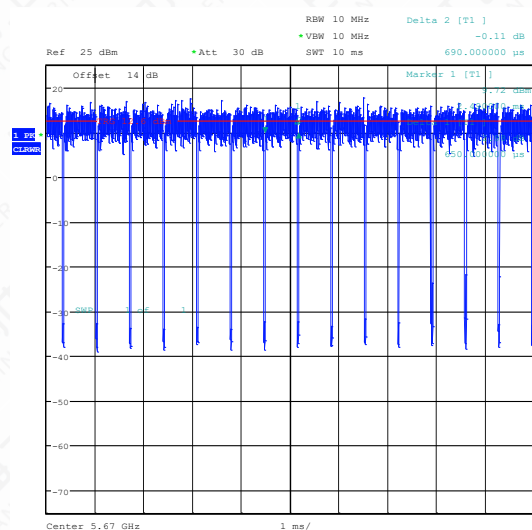
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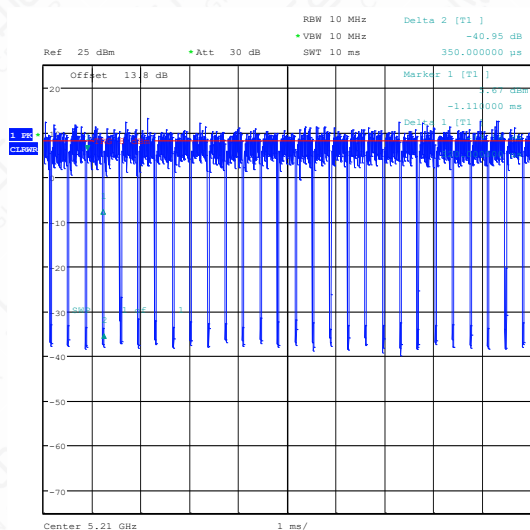


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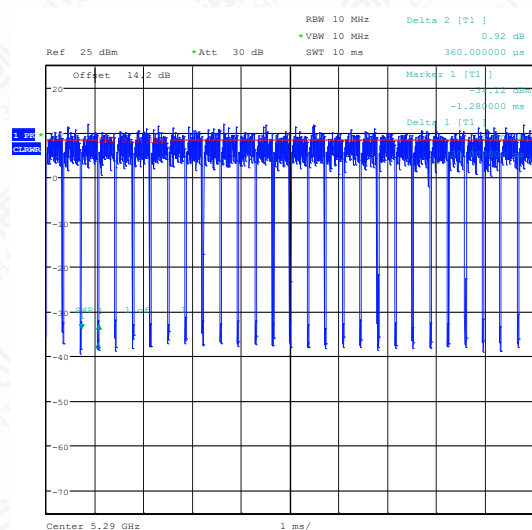
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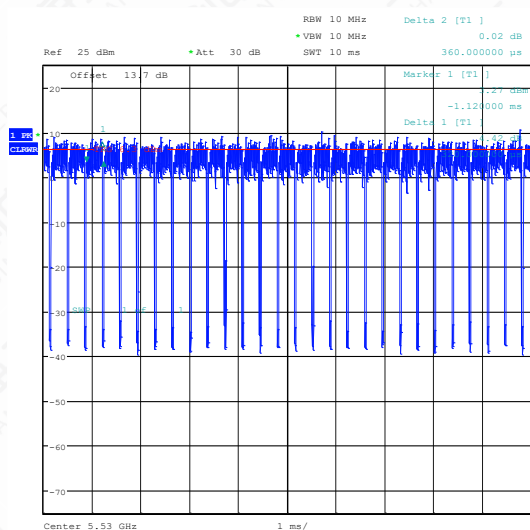
Date: 13.JAN.2025 13:34:52

NTNV-11AC80SISO-Ant1-5290



Date: 13.JAN.2025 13:36:24

NTNV-11AC80SISO-Ant1-5530



Date: 13.JAN.2025 13:38:07



6.2. Maximum Output Power-Conducted

6.2.1. Measurement Limit and Method

Standard	Limit (dBm)
FCC 47 CFR Part 15.407(a)(1)(iv)	For client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
RSS-247 6.2	5150-5250 MHz: For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band. 5250-5350 MHz: The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. 5470-5600 MHz and 5650-5725 MHz: The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum

6.2.2. Test Procedure

The measurement method SA-2 is made according to KDB 789033 E

Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

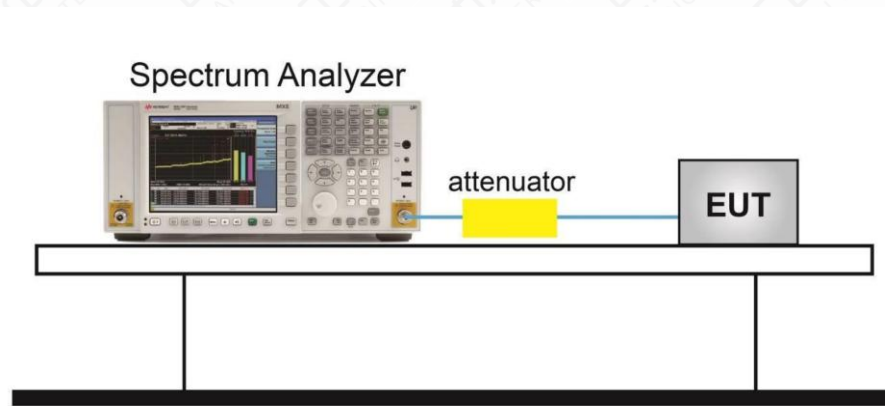
1. Measure the duty cycle, x, of the transmitter output signal as described in II.B.
2. Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
3. Set RBW = 1 MHz. (iv) Set VBW ≥ 3 MHz.
4. Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto.
6. Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be

averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.

9. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

Add $10 \log (1/x)$, where x is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \log (1/0.25) = 6 \text{ dB}$ if the duty cycle is 25%

6.2.3. Test setup



6.2.4. Measurement Result

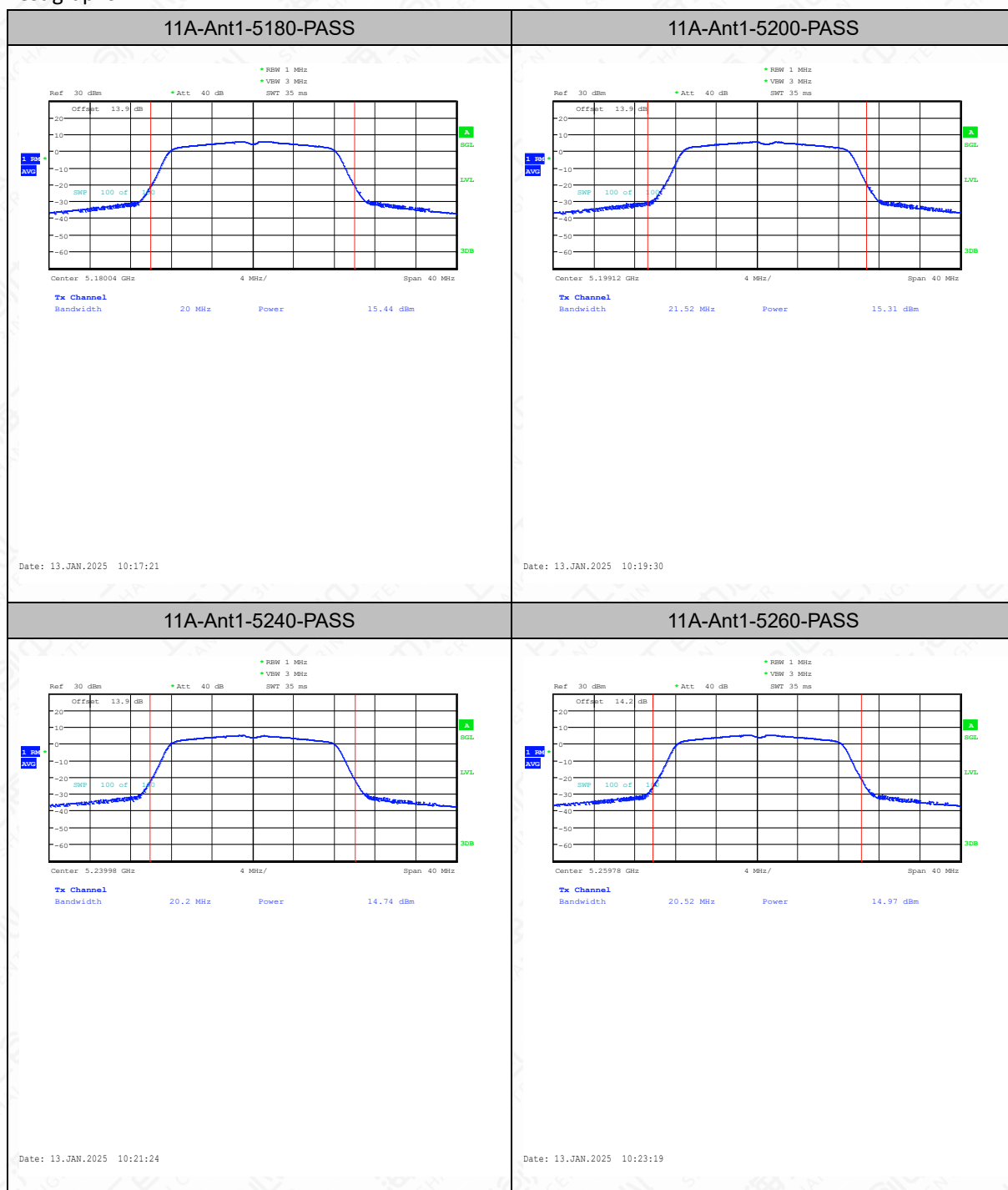
Test Mode	Frequency [MHz]	Set Power	Channel Power [dBm]	Duty Cycle [%]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11A	5180	18	15.32	97.20	0.12	15.44	≤23.98	0.92	16.36	22.43	PASS
11A	5200	18	15.19	97.20	0.12	15.31	≤23.98	0.92	16.23	22.42	PASS
11A	5240	17.5	14.62	97.20	0.12	14.74	≤23.98	0.92	15.66	22.44	PASS
11A	5260	18	14.85	97.20	0.12	14.97	≤23.98	-0.32	14.65	29.41	PASS
11A	5280	18	14.96	97.20	0.12	15.08	≤23.98	-0.32	14.76	29.40	PASS
11A	5320	18	14.69	97.20	0.12	14.81	≤23.98	-0.32	14.49	29.39	PASS
11A	5500	18	14.94	97.20	0.12	15.06	≤23.98	1.81	16.87	29.41	PASS
11A	5580	18	14.61	97.20	0.12	14.73	≤23.98	1.81	16.54	29.41	PASS
11A	5700	18	13.69	97.20	0.12	13.81	≤23.98	1.81	15.62	29.40	PASS
11N20SISO	5180	18	15.02	97.74	0.10	15.12	≤23.98	0.92	16.04	22.63	PASS
11N20SISO	5200	18	14.85	97.01	0.13	14.98	≤23.98	0.92	15.90	22.65	PASS
11N20SISO	5240	18	14.80	97.01	0.13	14.93	≤23.98	0.92	15.85	22.67	PASS
11N20SISO	5260	18	14.61	97.74	0.10	14.71	≤23.98	-0.32	14.39	29.63	PASS
11N20SISO	5280	18	14.69	96.99	0.13	14.82	≤23.98	-0.32	14.50	29.62	PASS
11N20SISO	5320	18	14.45	97.74	0.10	14.55	≤23.98	-0.32	14.23	29.61	PASS

11N20SISO	5500	18	14.74	97.01	0.13	14.87	≤23.98	1.81	16.68	29.64	PASS
11N20SISO	5580	18	14.46	97.74	0.10	14.56	≤23.98	1.81	16.37	29.65	PASS
11N20SISO	5700	18	13.50	96.99	0.13	13.63	≤23.98	1.81	15.44	29.64	PASS
11N40SISO	5190	16	12.98	95.59	0.20	13.18	≤23.98	0.92	14.10	23.01	PASS
11N40SISO	5230	18	14.84	95.59	0.20	15.04	≤23.98	0.92	15.96	23.01	PASS
11N40SISO	5270	18	14.51	94.20	0.26	14.77	≤23.98	-0.32	14.45	30	PASS
11N40SISO	5310	17	11.08	94.20	0.26	11.34	≤23.98	-0.32	11.02	30	PASS
11N40SISO	5510	16	10.40	95.59	0.20	10.60	≤23.98	1.81	12.41	30	PASS
11N40SISO	5550	18	14.97	95.59	0.20	15.17	≤23.98	1.81	16.98	30	PASS
11N40SISO	5670	18	14.91	94.12	0.26	15.17	≤23.98	1.81	16.98	30	PASS
11AC20SISO	5180	17	14.19	97.76	0.10	14.29	≤23.98	0.92	15.21	22.58	PASS
11AC20SISO	5200	17	14.03	97.04	0.13	14.16	≤23.98	0.92	15.08	22.61	PASS
11AC20SISO	5240	17	13.89	97.04	0.13	14.02	≤23.98	0.92	14.94	22.59	PASS
11AC20SISO	5260	17	13.53	97.76	0.10	13.63	≤23.98	-0.32	13.31	29.58	PASS
11AC20SISO	5280	17	13.64	97.04	0.13	13.77	≤23.98	-0.32	13.45	29.57	PASS
11AC20SISO	5320	17	13.48	97.04	0.13	13.61	≤23.98	-0.32	13.29	29.58	PASS
11AC20SISO	5500	17	13.68	97.04	0.13	13.81	≤23.98	1.81	15.62	29.59	PASS
11AC20SISO	5580	17	13.41	97.76	0.10	13.51	≤23.98	1.81	15.32	29.59	PASS
11AC20SISO	5700	17	13.35	97.78	0.10	13.45	≤23.98	1.81	15.26	29.57	PASS
11AC40SISO	5190	16	11.24	95.65	0.19	11.43	≤23.98	0.92	12.35	23.01	PASS
11AC40SISO	5230	16	12.67	94.20	0.26	12.93	≤23.98	0.92	13.85	23.01	PASS
11AC40SISO	5270	16	12.40	94.20	0.26	12.66	≤23.98	-0.32	12.34	30	PASS
11AC40SISO	5310	16	12.43	94.20	0.26	12.69	≤23.98	-0.32	12.37	30	PASS
11AC40SISO	5510	15	11.32	94.20	0.26	11.58	≤23.98	1.81	13.39	30	PASS
11AC40SISO	5550	16	12.93	95.65	0.19	13.12	≤23.98	1.81	14.93	30	PASS
11AC40SISO	5670	16	12.73	94.20	0.26	12.99	≤23.98	1.81	14.80	30	PASS
11AC80SISO	5210	14	10.59	91.43	0.39	10.98	≤23.98	0.92	11.90	23.01	PASS
11AC80SISO	5290	14	10.53	91.67	0.38	10.91	≤23.98	-0.32	10.59	30	PASS
11AC80SISO	5530	14	8.28	88.89	0.51	8.79	≤23.98	1.81	10.60	30	PASS
11AC80SISO	5610	15.5	12.01	91.67	0.38	12.39	≤23.98	1.81	14.20	30	PASS

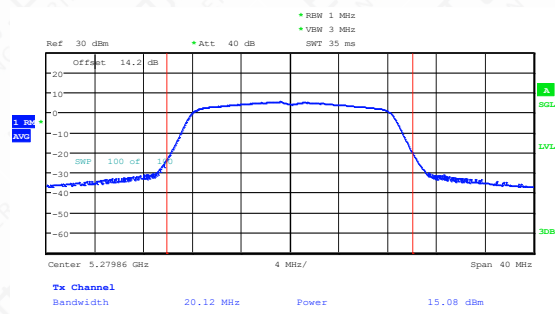
Note:

- 1.The Duty Cycle Factor is compensated in the graph.
2. In the graph, the Center frequency = (Low frequency of 26dB OBW + High frequency of 26dB OBW) /2.
- 3.The 11a data rate 6Mbps is selected as worse condition, 11n/11ac data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

Test graphs

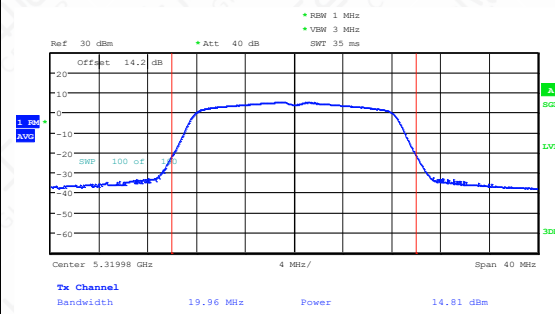


11A-Ant1-5280-PASS



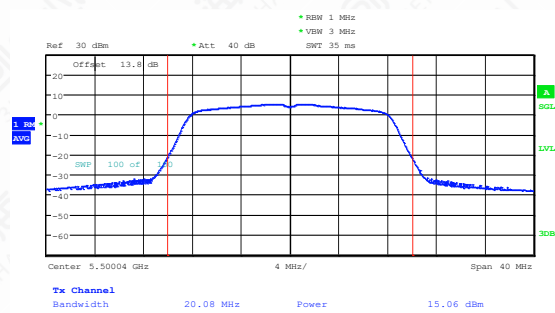
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11A-Ant1-5320-PASS



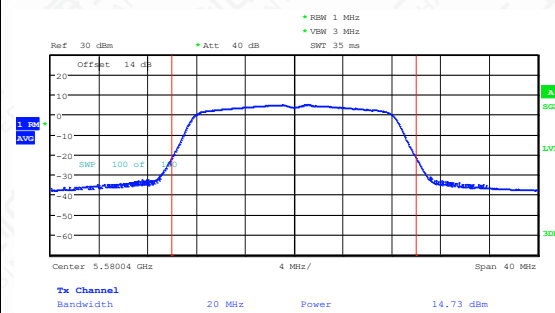
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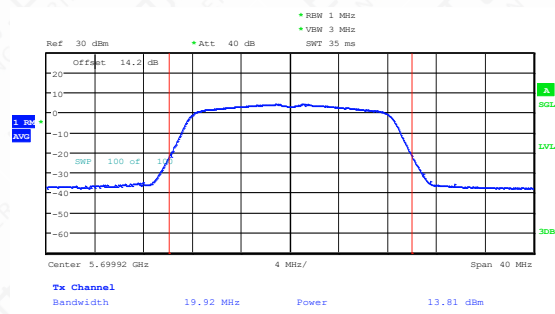
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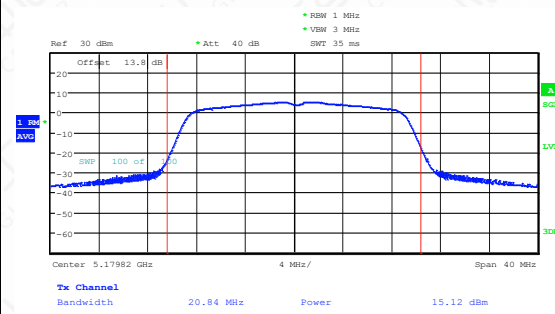
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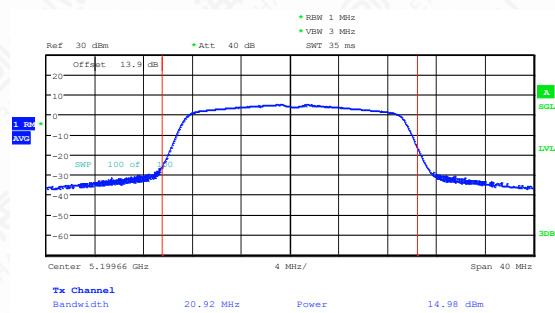
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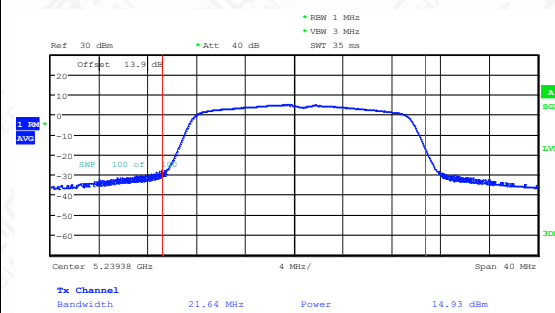
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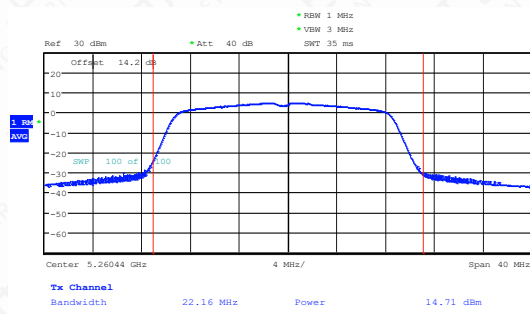
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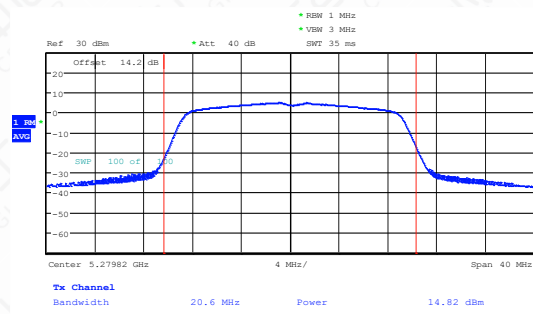
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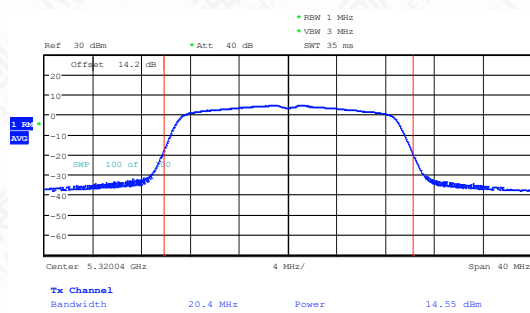
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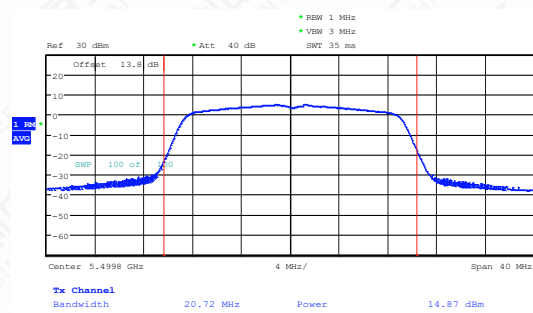
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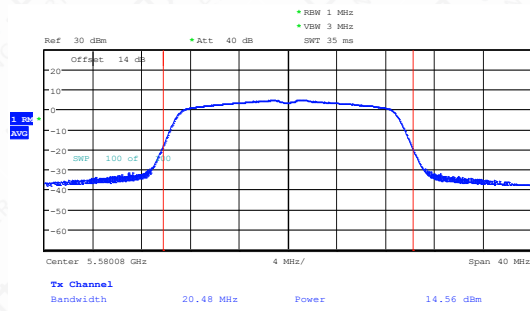
Date: 13.JAN.2025 11:04:56

11N20SISO-Ant1-5500-PASS



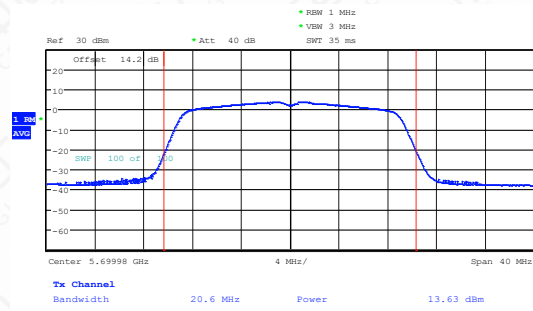
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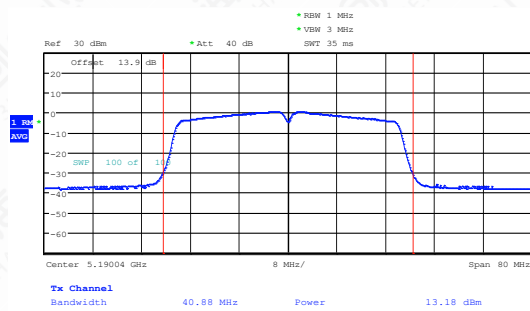
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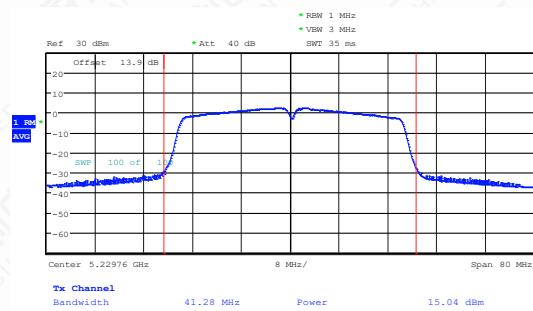
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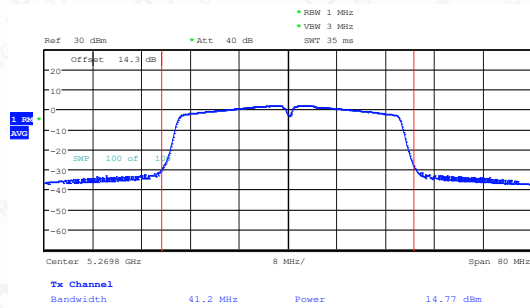
Date: 13.JAN.2025 11:12:12

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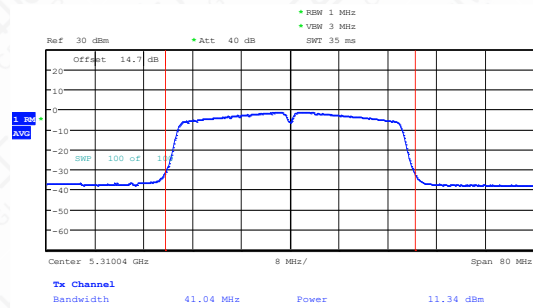
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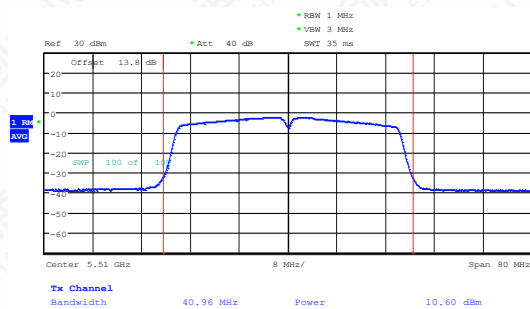
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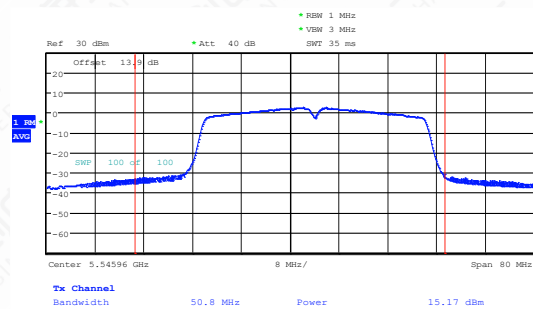
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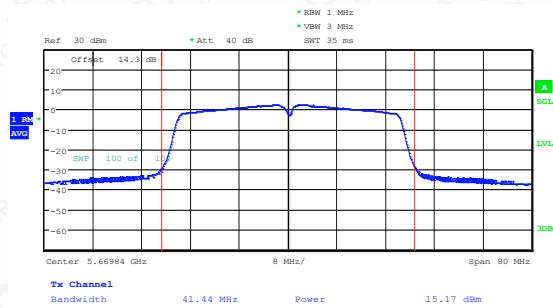
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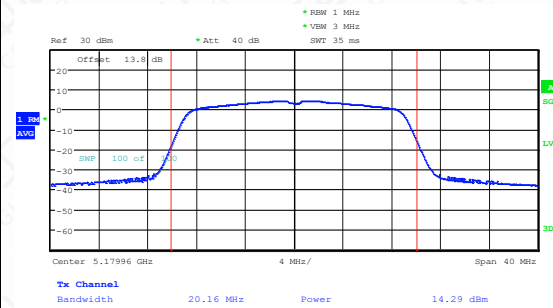
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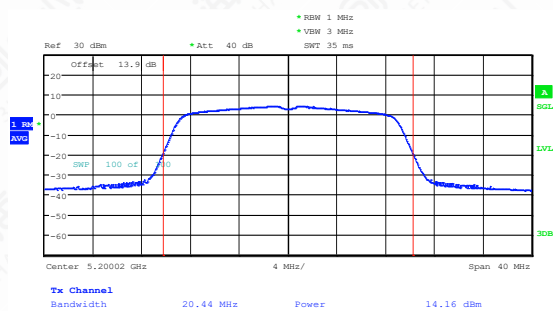
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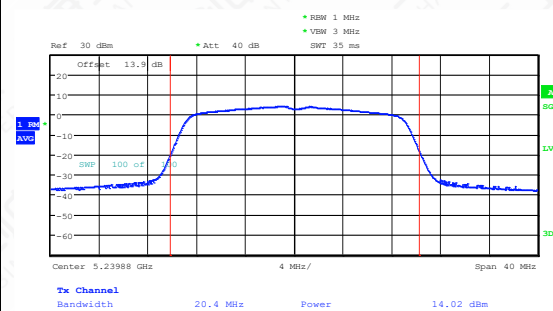
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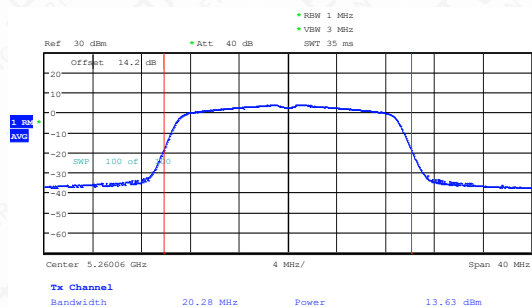
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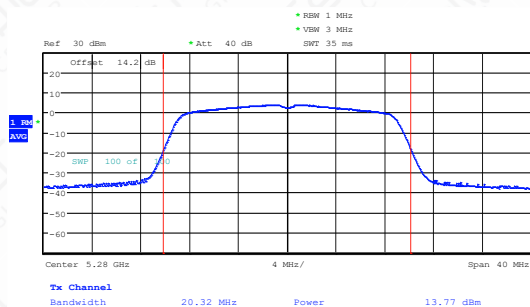
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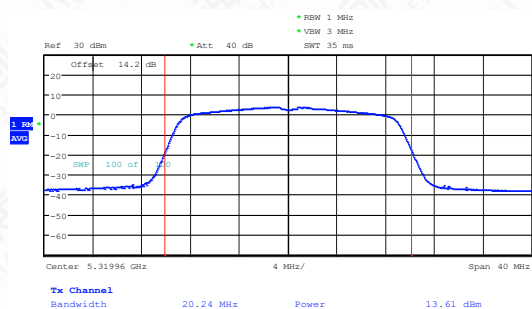
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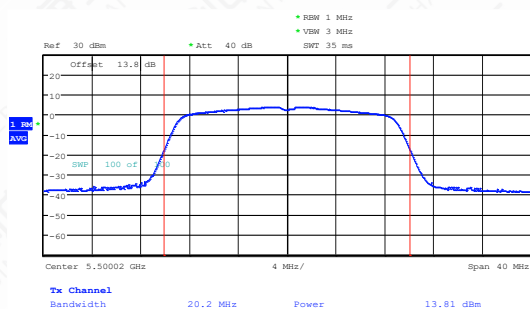
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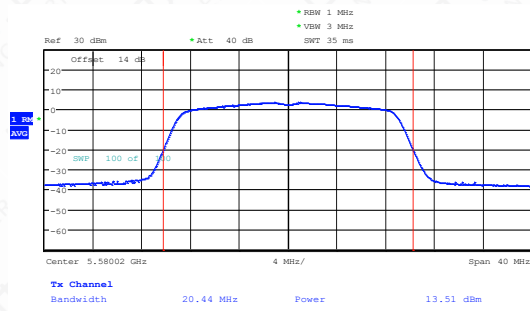
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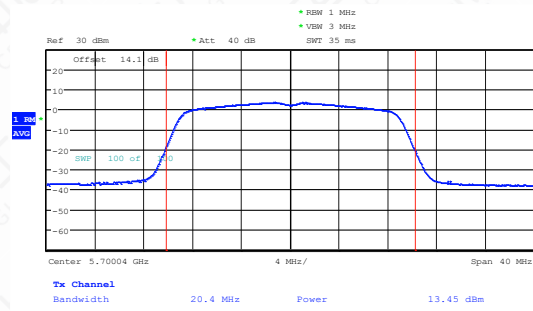
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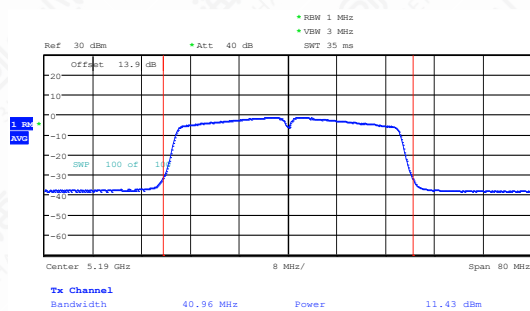
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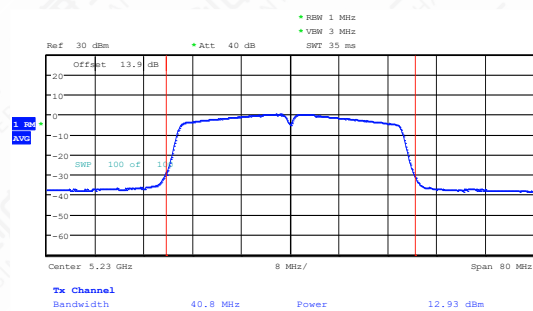
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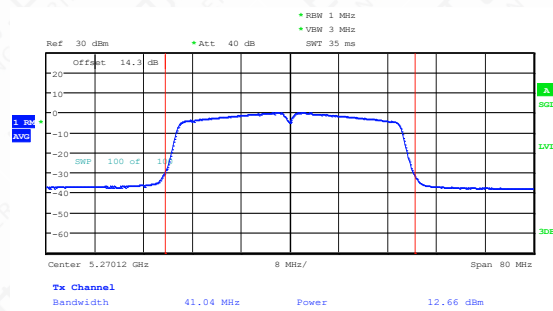
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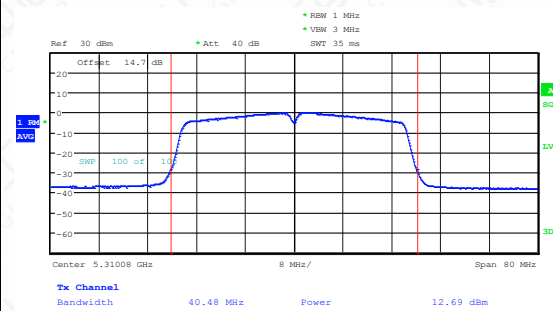
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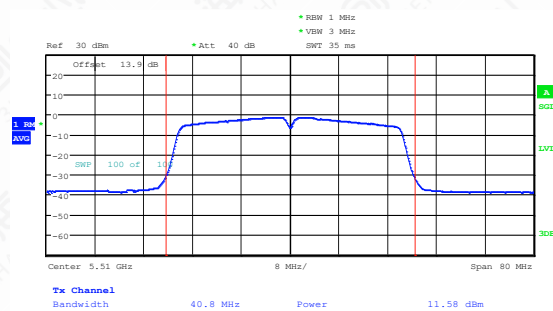
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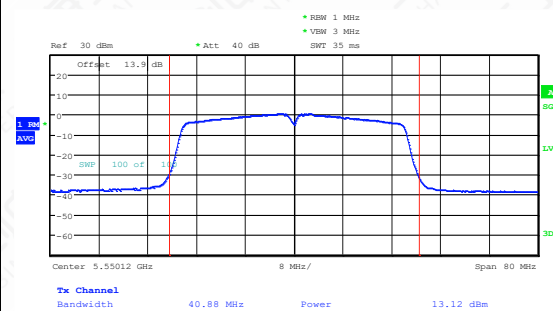
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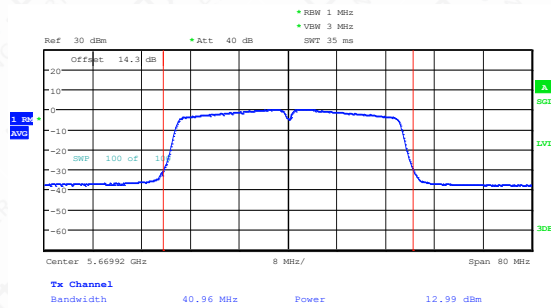
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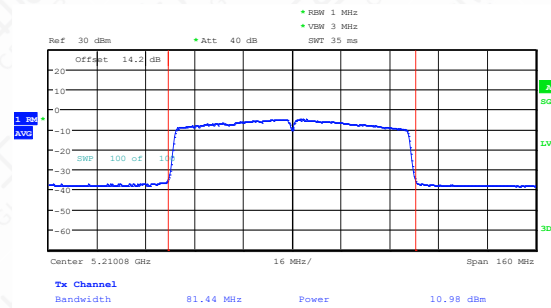
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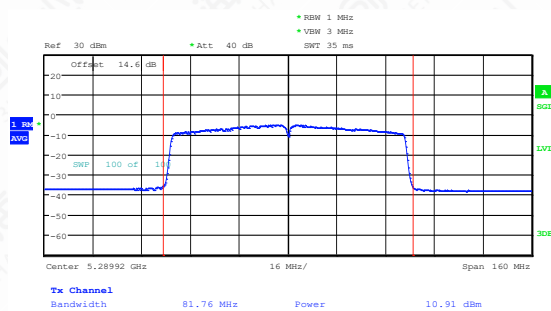
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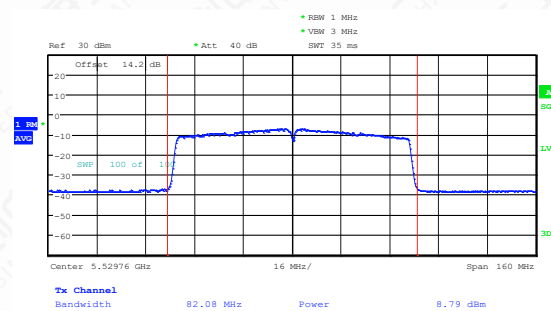
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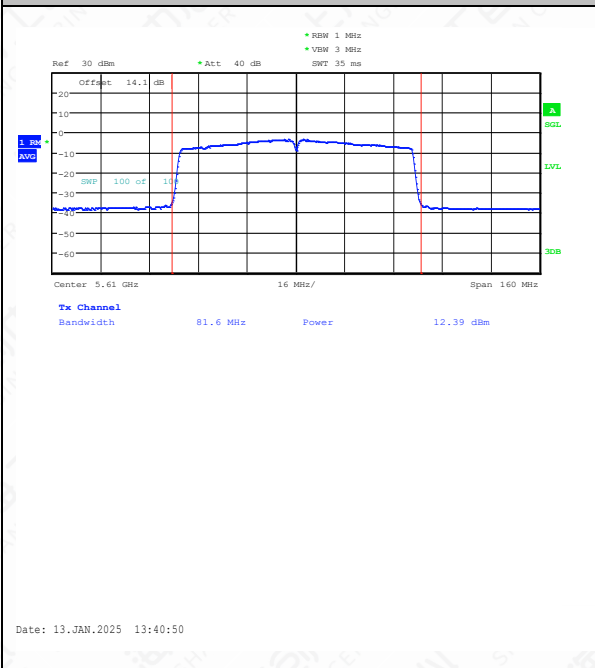
11AC80SISO-Ant1-5530-PASS



Date: 13.JAN.2025 13:38:41

11AC80SISO-Ant1-5610-PASS

/



6.3. Peak Power Spectral Density

6.3.1. Measurement Limit

Standard	Limit (dBm)
FCC 47 CFR Part 15.407(a)(1)(iv)	≤11
RSS-247 6.2	5150-5250 MHz: The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band. 5250-5350 MHz: The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. 5470-5600 MHz and 5650-5725 MHz: The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

6.3.2. Test Procedure

The measurement method is made according to KDB 789033 F

- Create an average power spectrum for the EUT operating mode being tested by following the instructions in II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...." (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
- Use the peak search function on the instrument to find the peak of the spectrum and record its value.
- Make the following adjustments to the peak value of the spectrum, if applicable:
 - If Method SA-2 or SA-2 Alternative was used, add $10 \log (1/x)$, where x is the duty cycle, to the peak of the spectrum.
 - If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
- The result is the Maximum PSD over 1 MHz reference bandwidth.
- For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the

specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW $\geq 1/T$, where T is defined in II.B.I.a).

b) Set VBW ≥ 3 RBW.

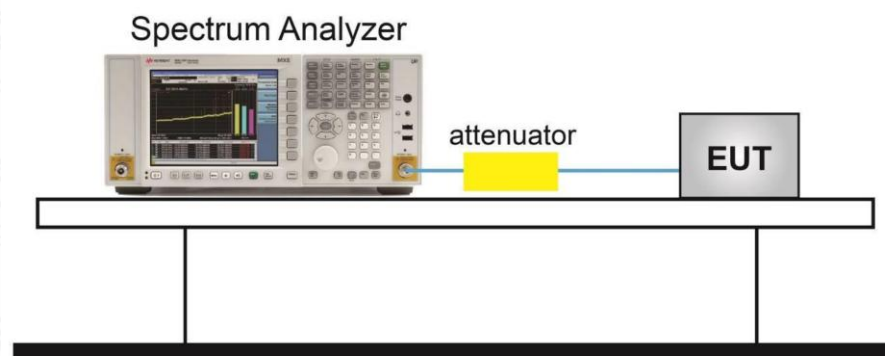
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500 \text{ kHz}/\text{RBW})$ to the measured result, whereas RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log (1\text{MHz}/\text{RBW})$ to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for steps 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

6.3.3. Test setup



6.3.4. Measurement Results

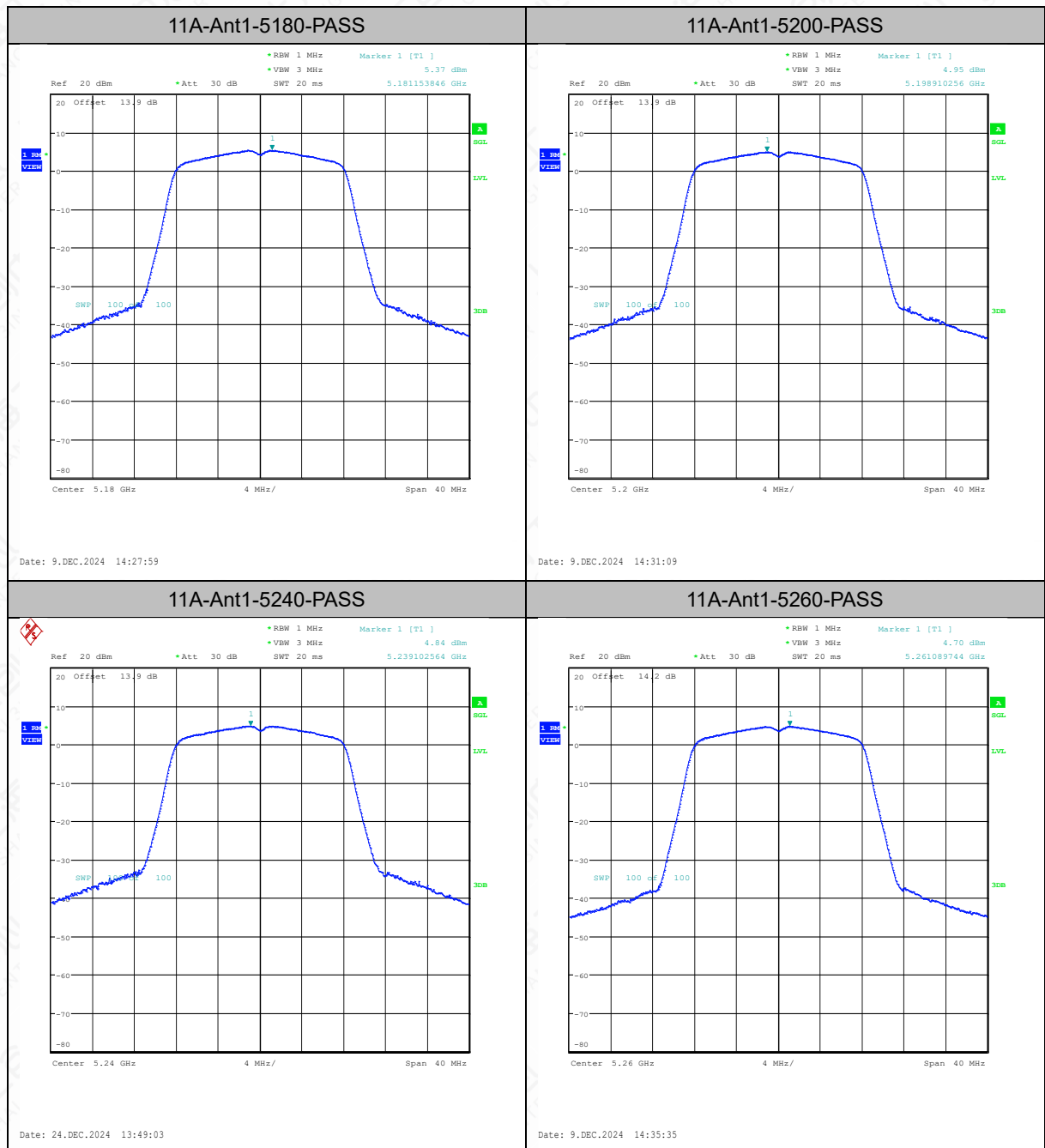
TestMode	Frequency [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11A	5180	5.37	≤ 11.00	-0.54	4.83	≤ 10.00	PASS
11A	5200	4.95	≤ 11.00	-0.54	4.41	≤ 10.00	PASS
11A	5240	4.84	≤ 11.00	-0.54	4.30	≤ 10.00	PASS
11A	5260	4.70	≤ 11.00	-0.65	4.05	---	PASS
11A	5280	4.91	≤ 11.00	-0.65	4.26	---	PASS
11A	5320	3.16	≤ 11.00	-0.65	2.51	---	PASS

11A	5500	3.76	≤11.00	1.81	5.57	---	PASS
11A	5580	4.61	≤11.00	1.81	6.42	---	PASS
11A	5700	4.67	≤11.00	1.81	6.48	---	PASS
11N20SISO	5180	4.62	≤11.00	-0.54	4.08	≤10.00	PASS
11N20SISO	5200	4.36	≤11.00	-0.54	3.82	≤10.00	PASS
11N20SISO	5240	4.82	≤11.00	-0.54	4.28	≤10.00	PASS
11N20SISO	5260	4.16	≤11.00	-0.65	3.51	---	PASS
11N20SISO	5280	4.32	≤11.00	-0.65	3.67	---	PASS
11N20SISO	5320	2.71	≤11.00	-0.65	2.06	---	PASS
11N20SISO	5500	3.30	≤11.00	1.81	5.11	---	PASS
11N20SISO	5580	4.67	≤11.00	1.81	6.48	---	PASS
11N20SISO	5700	4.32	≤11.00	1.81	6.13	---	PASS
11N40SISO	5190	0.23	≤11.00	-0.54	-0.31	≤10.00	PASS
11N40SISO	5230	1.41	≤11.00	-0.54	0.87	≤10.00	PASS
11N40SISO	5270	1.32	≤11.00	-0.65	0.67	---	PASS
11N40SISO	5310	0.07	≤11.00	-0.65	-0.58	---	PASS
11N40SISO	5510	-1.71	≤11.00	1.81	0.10	---	PASS
11N40SISO	5550	1.47	≤11.00	1.81	3.28	---	PASS
11N40SISO	5670	0.97	≤11.00	1.81	2.78	---	PASS
11AC20SISO	5180	3.44	≤11.00	-0.54	2.90	≤10.00	PASS
11AC20SISO	5200	4.26	≤11.00	-0.54	3.72	≤10.00	PASS
11AC20SISO	5240	3.33	≤11.00	-0.54	2.79	≤10.00	PASS
11AC20SISO	5260	3.13	≤11.00	-0.65	2.48	---	PASS
11AC20SISO	5280	3.32	≤11.00	-0.65	2.67	---	PASS
11AC20SISO	5320	1.69	≤11.00	-0.65	1.04	---	PASS
11AC20SISO	5500	2.41	≤11.00	1.81	4.22	---	PASS
11AC20SISO	5580	3.33	≤11.00	1.81	5.14	---	PASS
11AC20SISO	5700	3.50	≤11.00	1.81	5.31	---	PASS
11AC40SISO	5190	-0.14	≤11.00	-0.54	-0.68	≤10.00	PASS
11AC40SISO	5230	0.11	≤11.00	-0.54	-0.43	≤10.00	PASS
11AC40SISO	5270	0.07	≤11.00	-0.65	-0.58	---	PASS
11AC40SISO	5310	-0.75	≤11.00	-0.65	-1.40	---	PASS
11AC40SISO	5510	-2.53	≤11.00	1.81	-0.72	---	PASS
11AC40SISO	5550	0.19	≤11.00	1.81	2.00	---	PASS
11AC40SISO	5670	-0.30	≤11.00	1.81	1.51	---	PASS
11AC80SISO	5210	-4.85	≤11.00	-0.54	-5.39	≤10.00	PASS
11AC80SISO	5290	-4.54	≤11.00	-0.65	-5.19	---	PASS
11AC80SISO	5530	-5.90	≤11.00	1.81	-4.09	---	PASS
11AC80SISO	5610	-3.23	≤11.00	1.81	-1.42	---	PASS

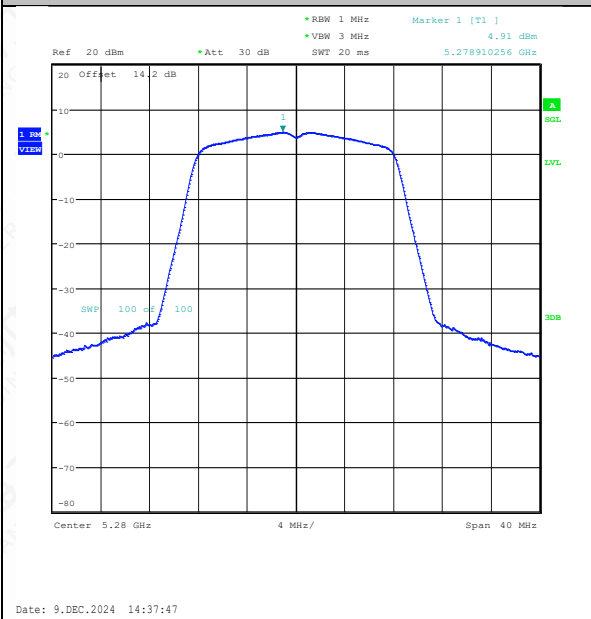
Note:

1. EIRP= Power Spectral Density(dBm/MHz)+Antenna gain(dBi)
2. The Duty Cycle Factor is compensated in the graph.

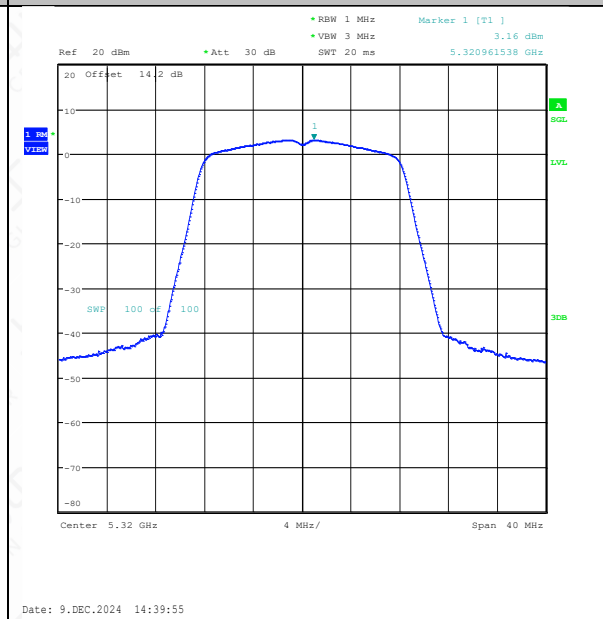
Test Graphs



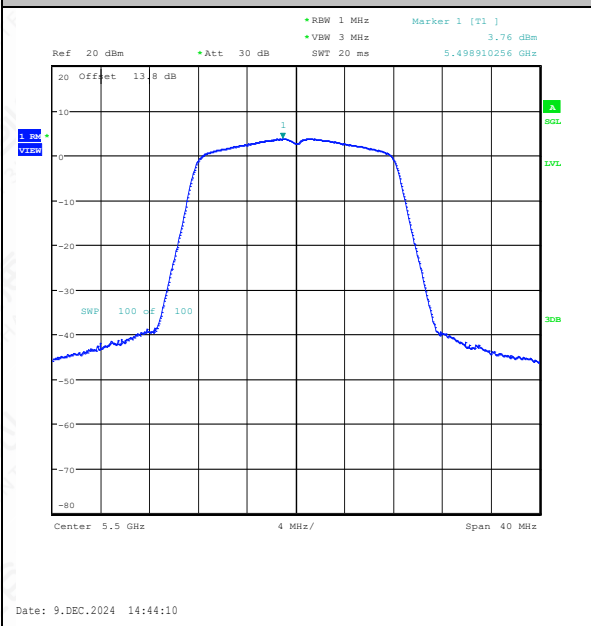
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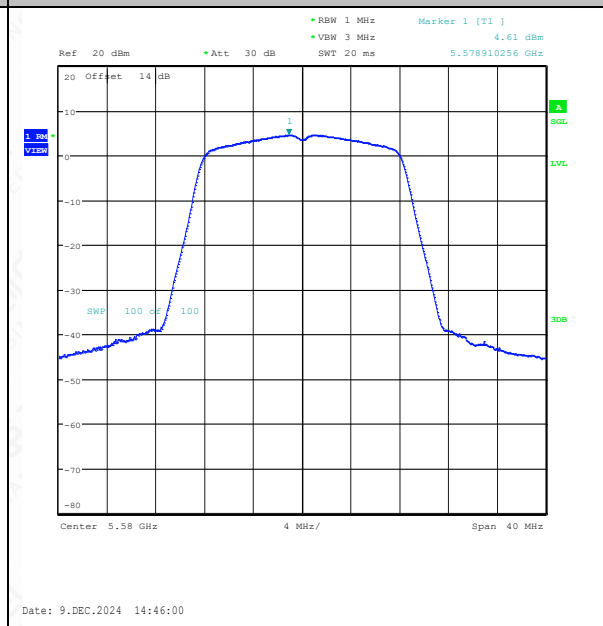
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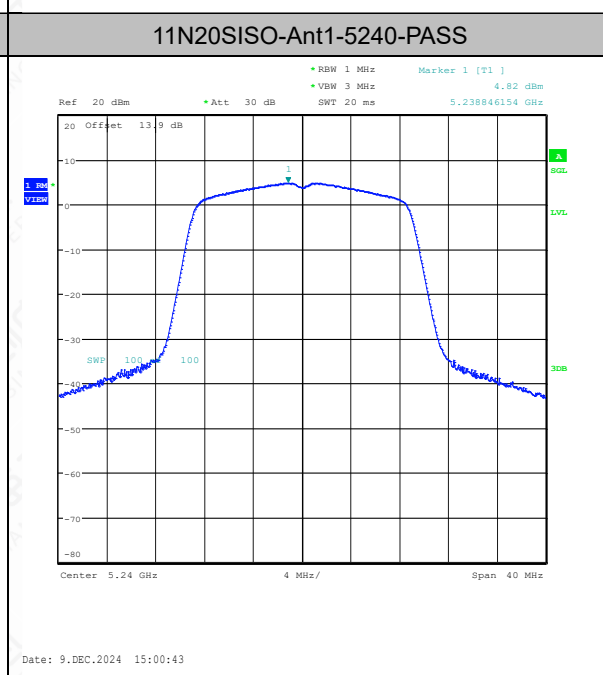
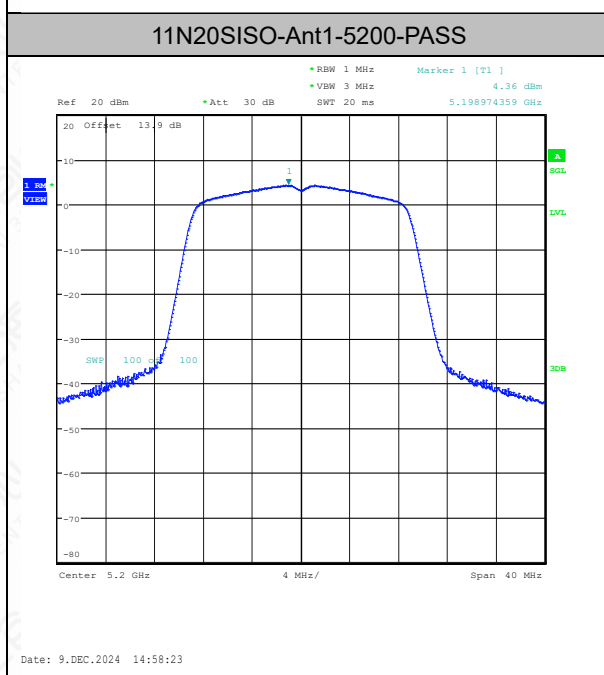
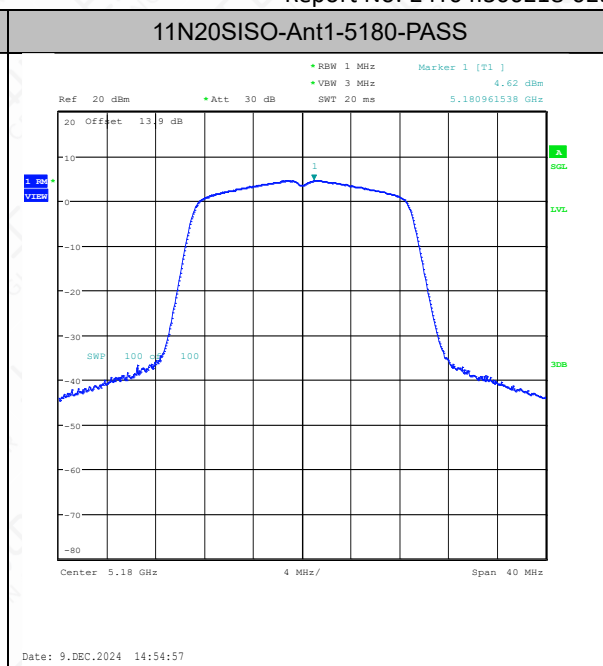
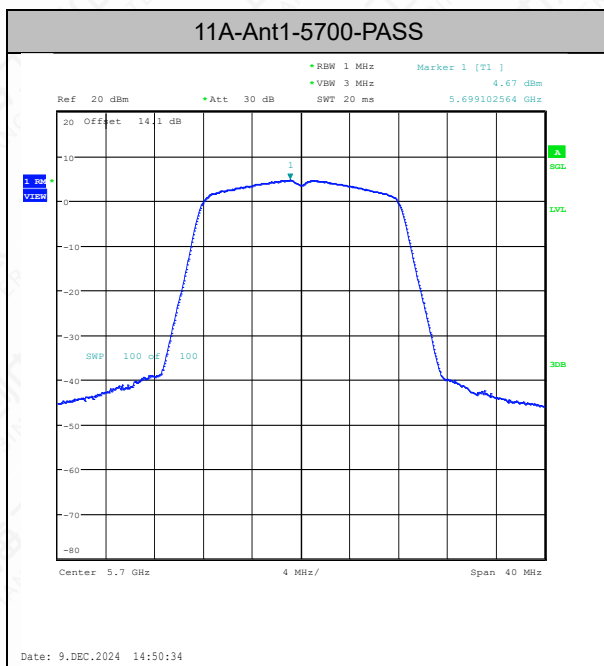


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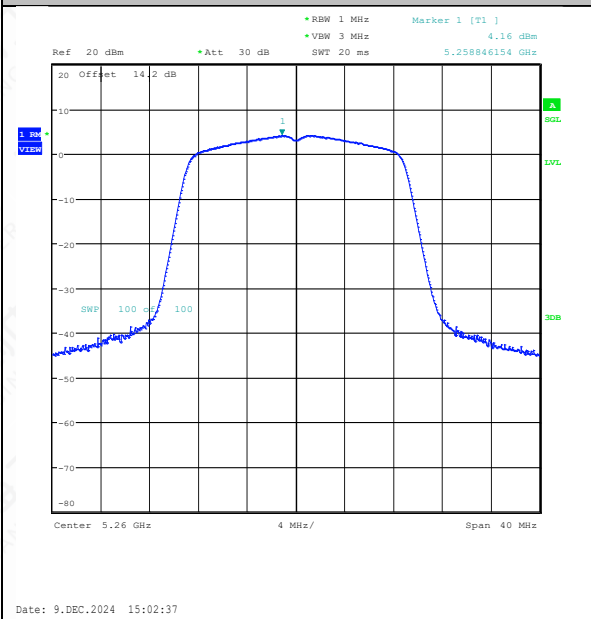


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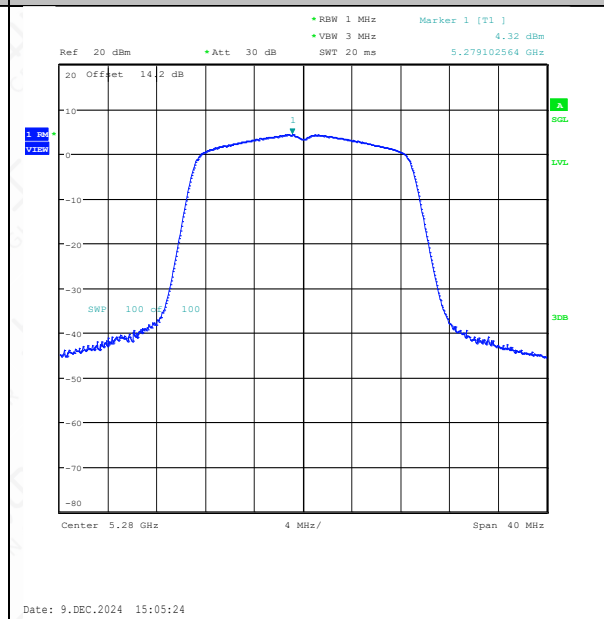




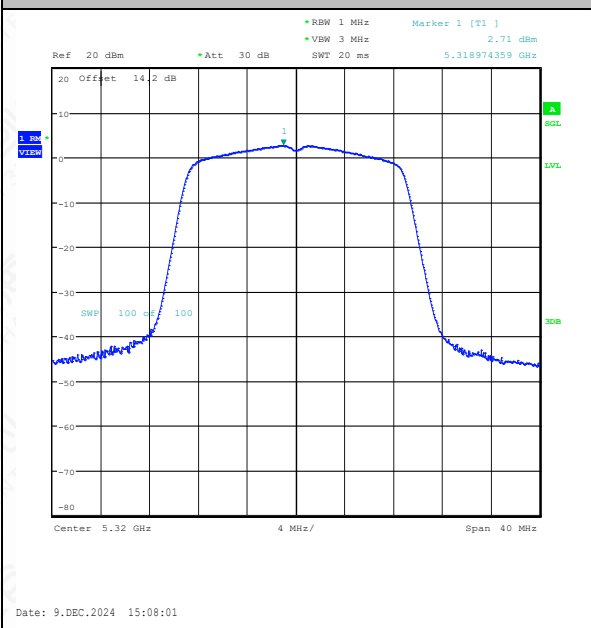
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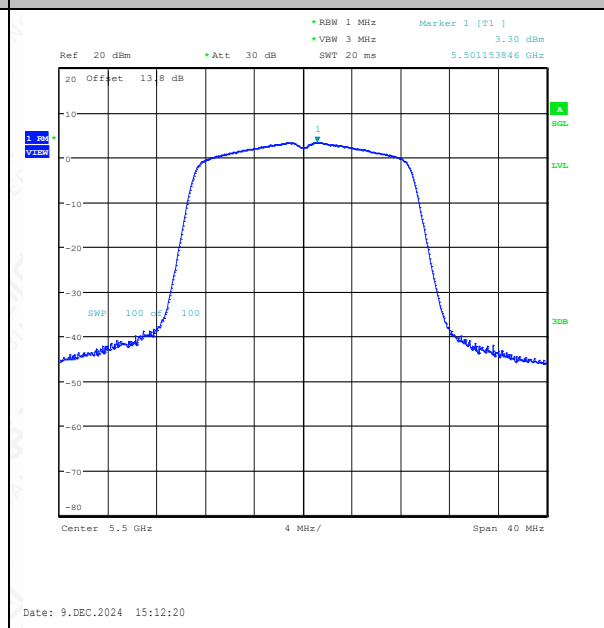
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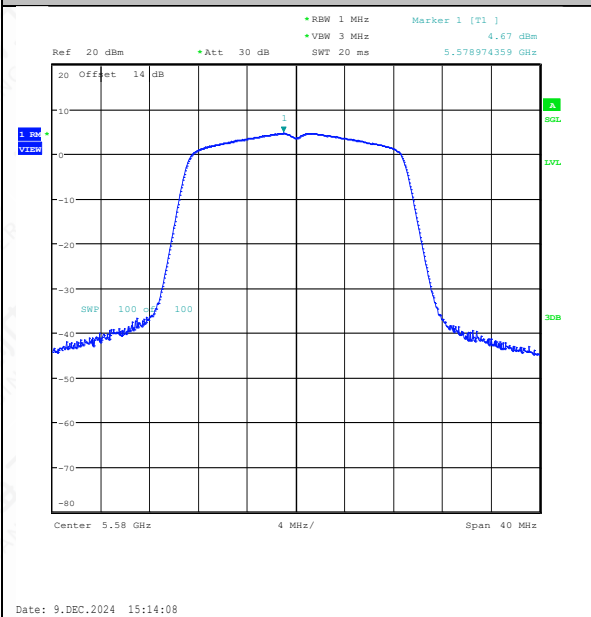
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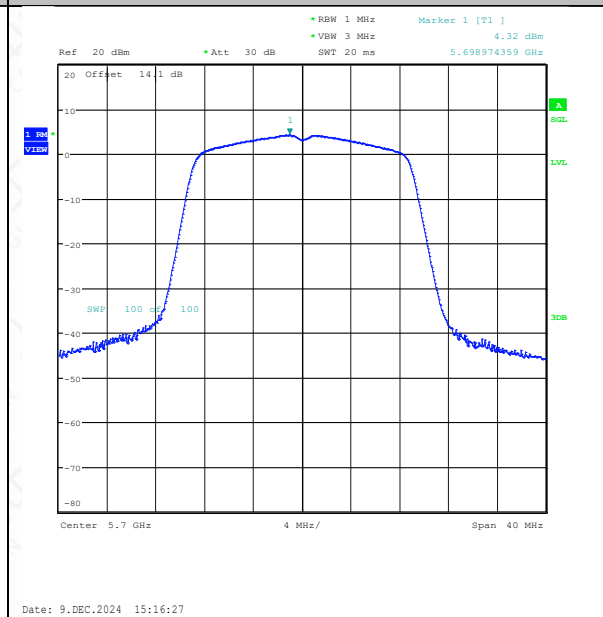
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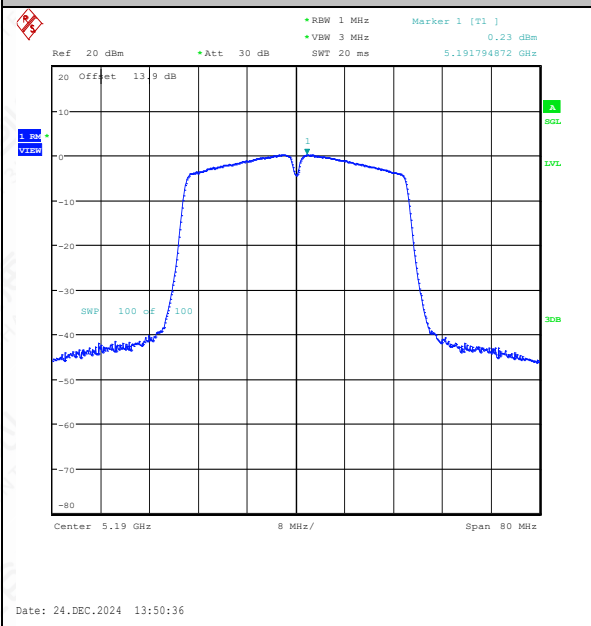
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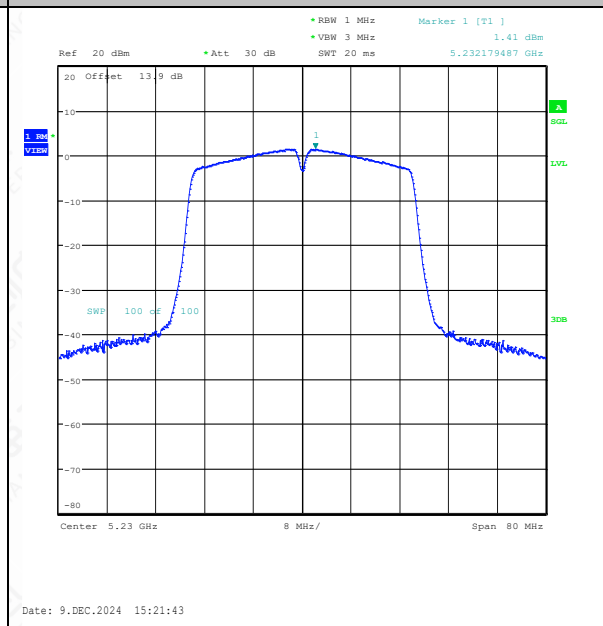
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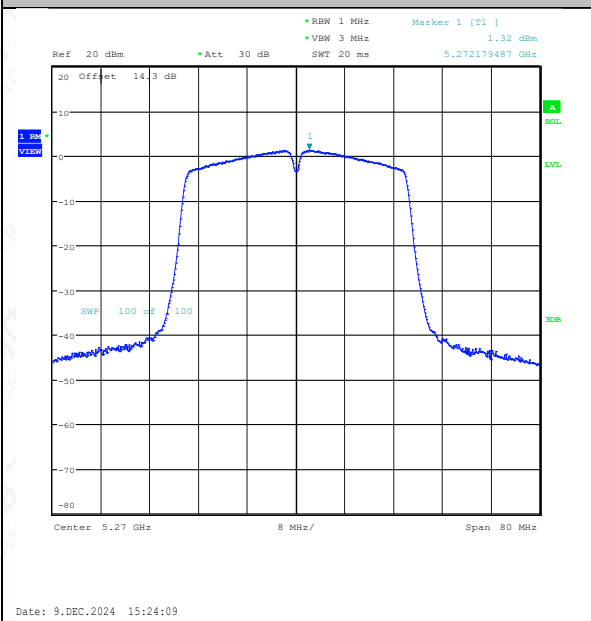
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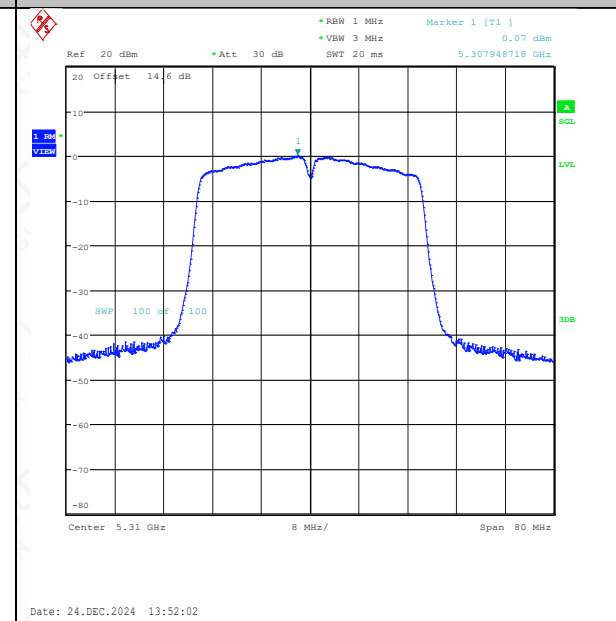
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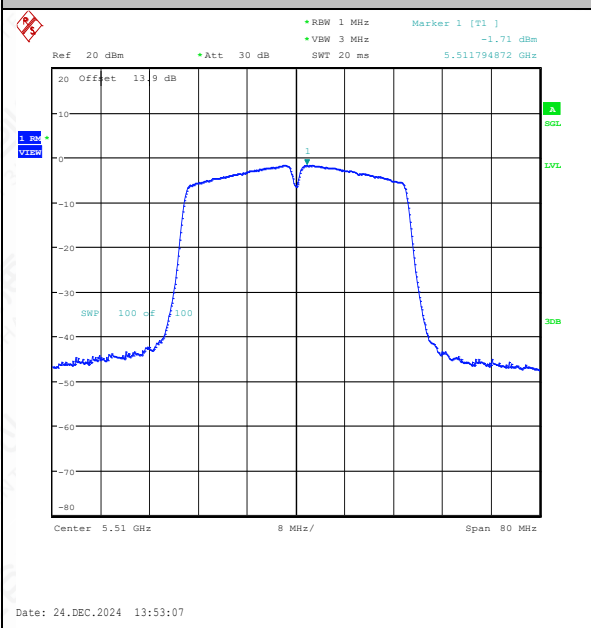
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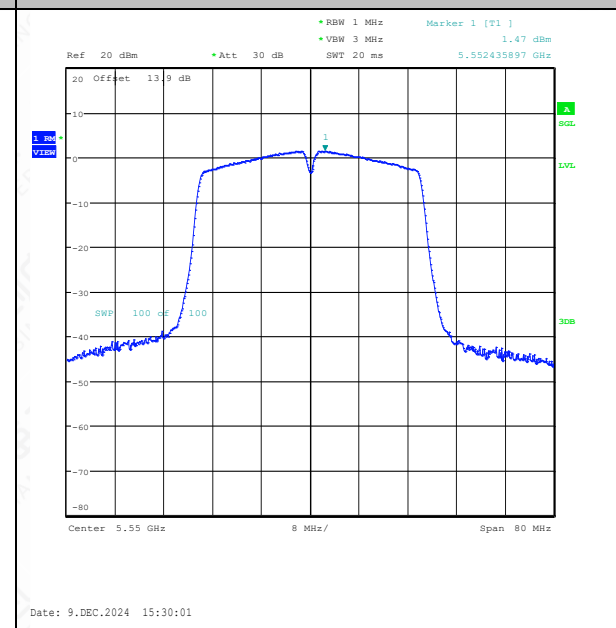
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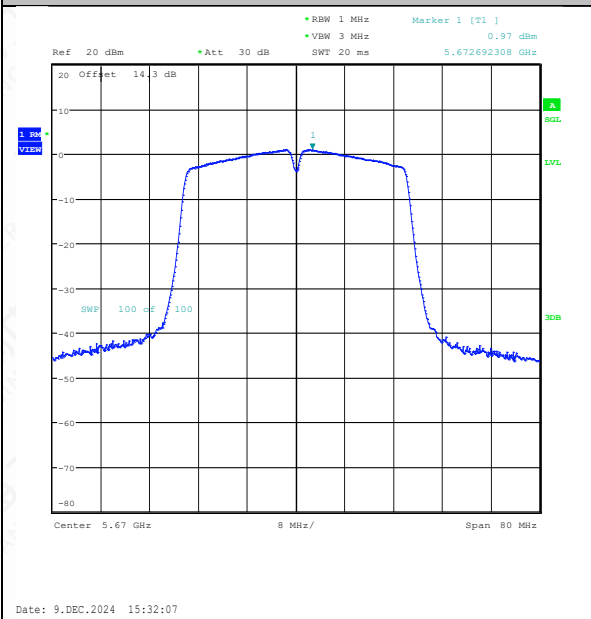
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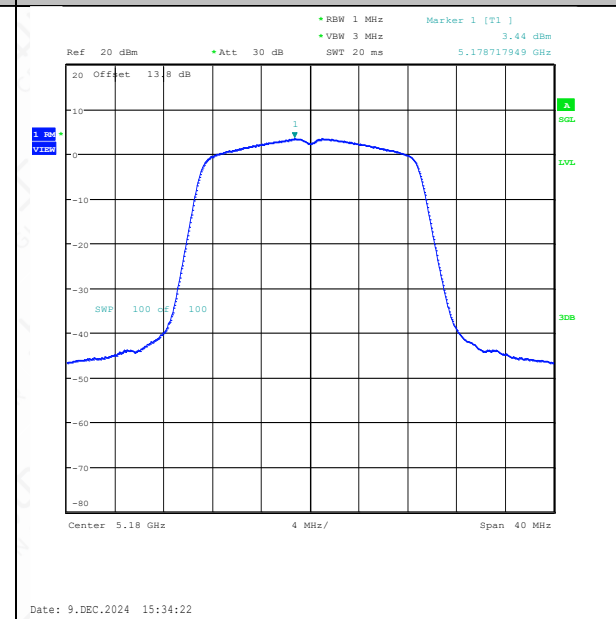
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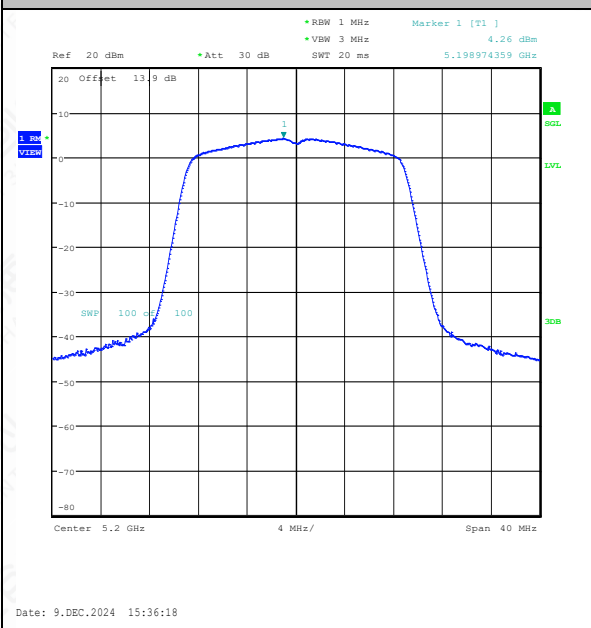
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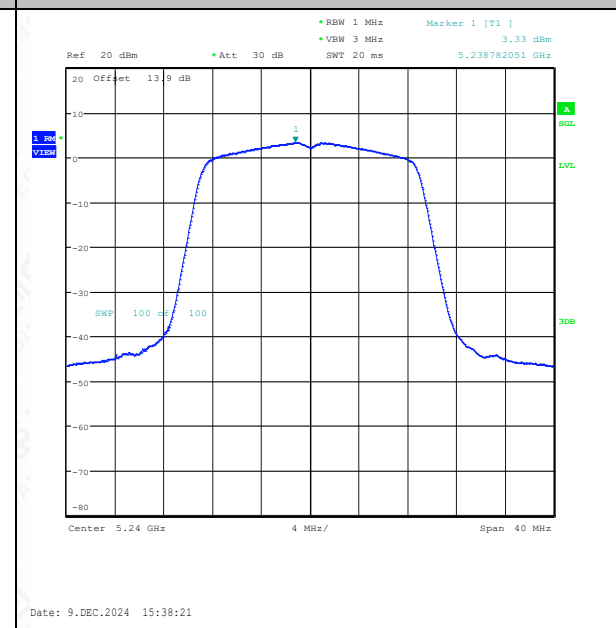
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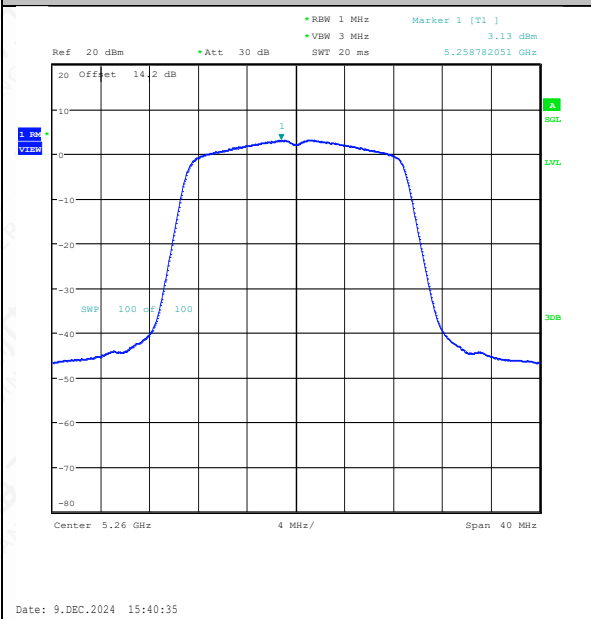
11AC20SISO-Ant1-5200-PASS



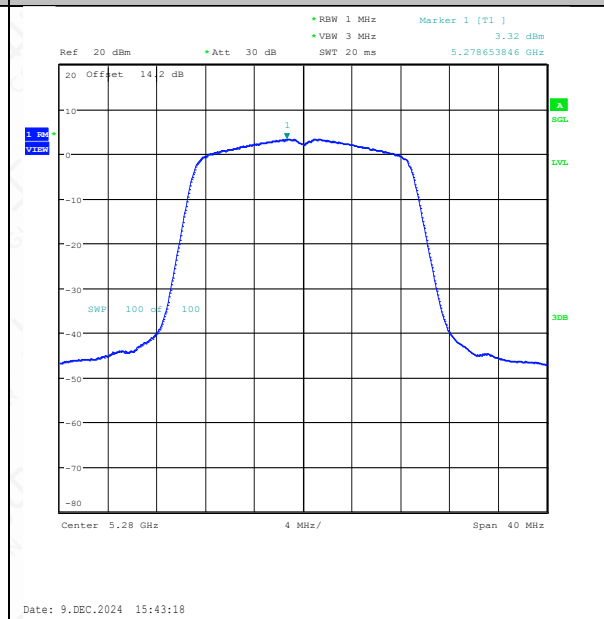
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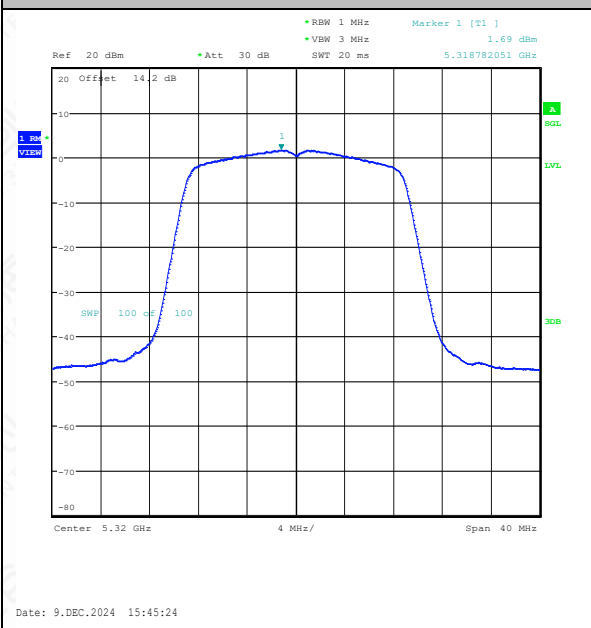
11AC20SISO-Ant1-5260-PASS



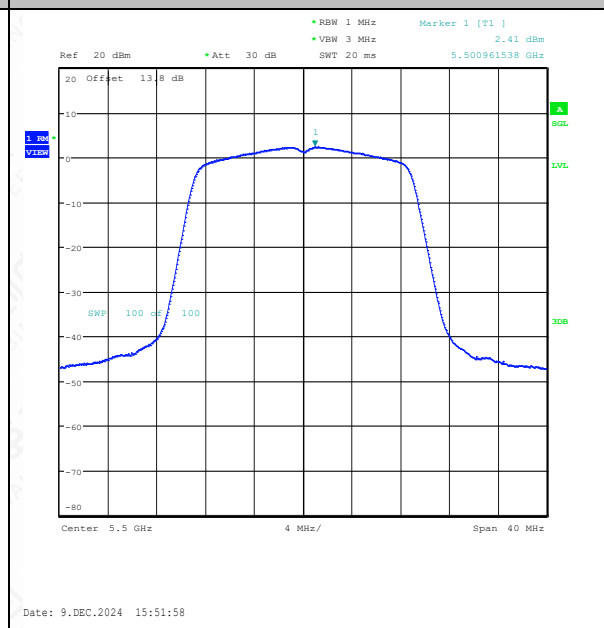
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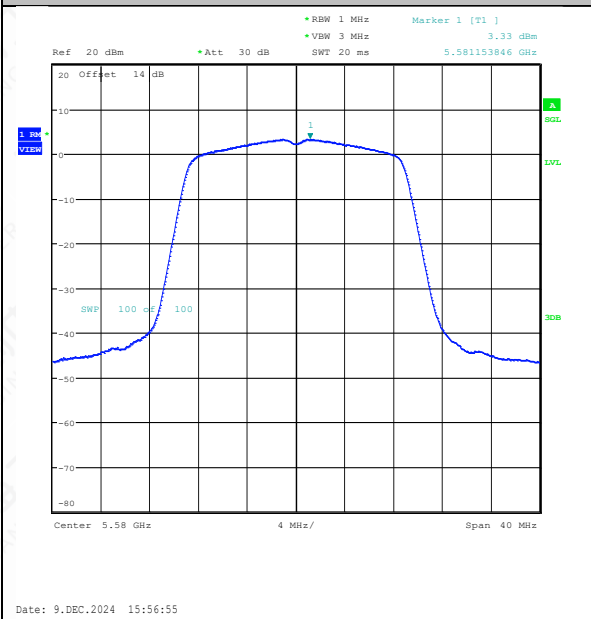
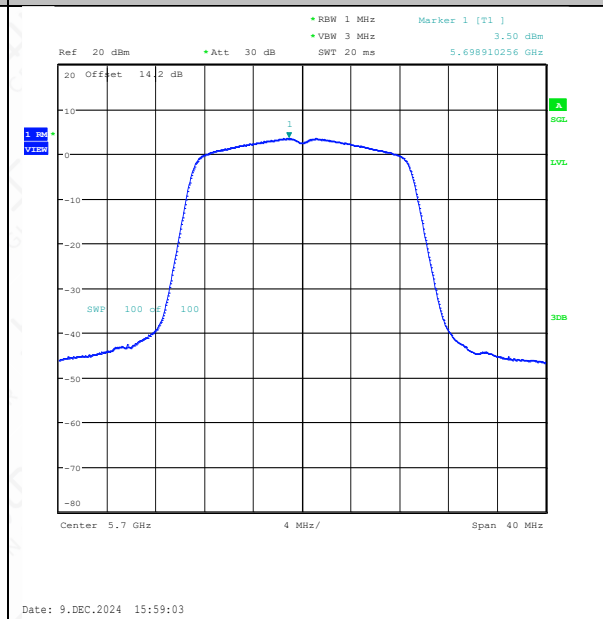
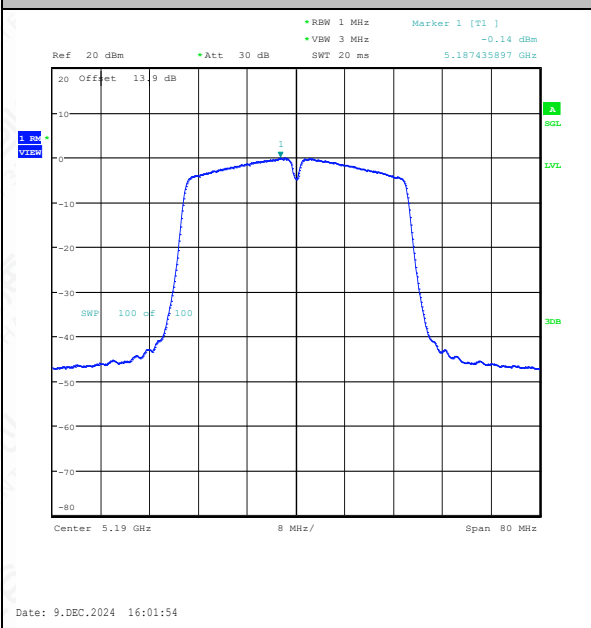
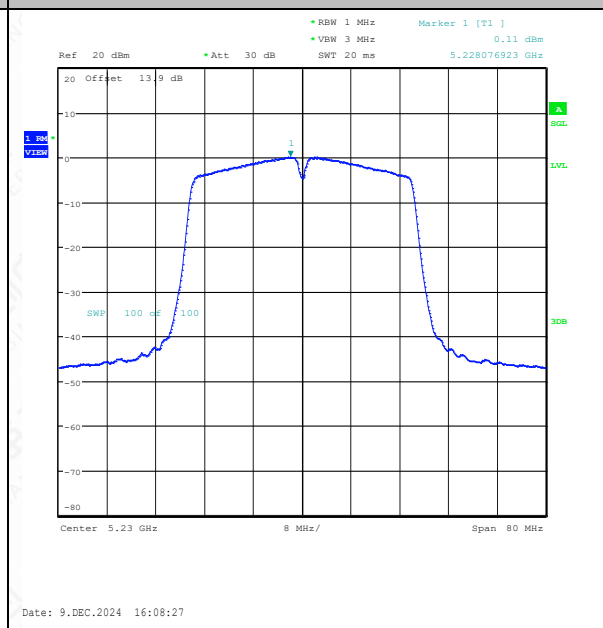


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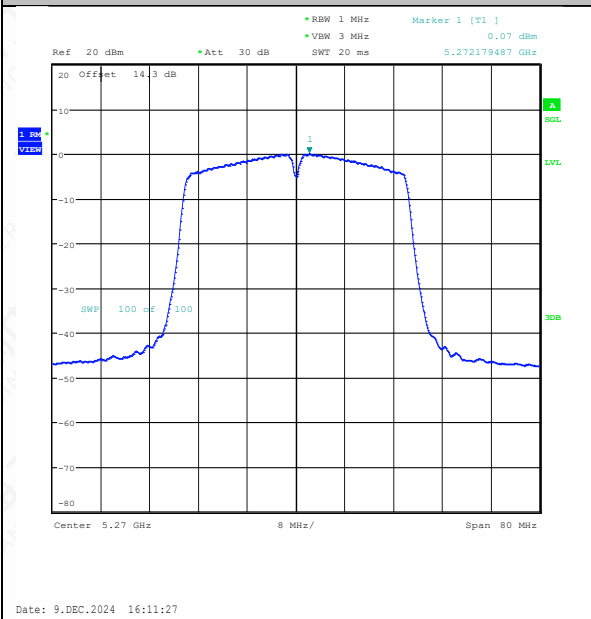


11AC20SISO-Ant1-5500-PASS

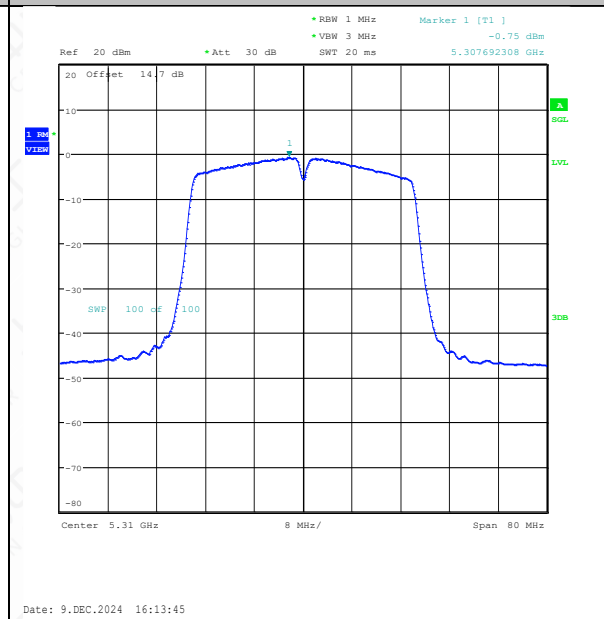


11AC20SISO-Ant1-5580-PASS

11AC20SISO-Ant1-5700-PASS

11AC40SISO-Ant1-5190-PASS

11AC40SISO-Ant1-5230-PASS


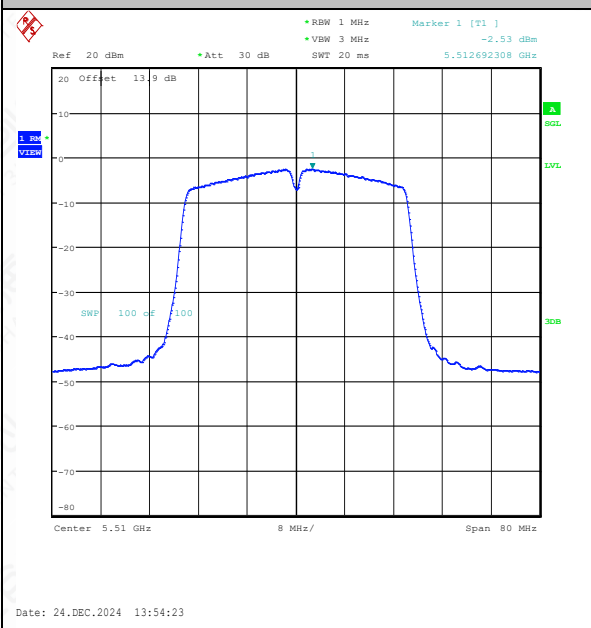
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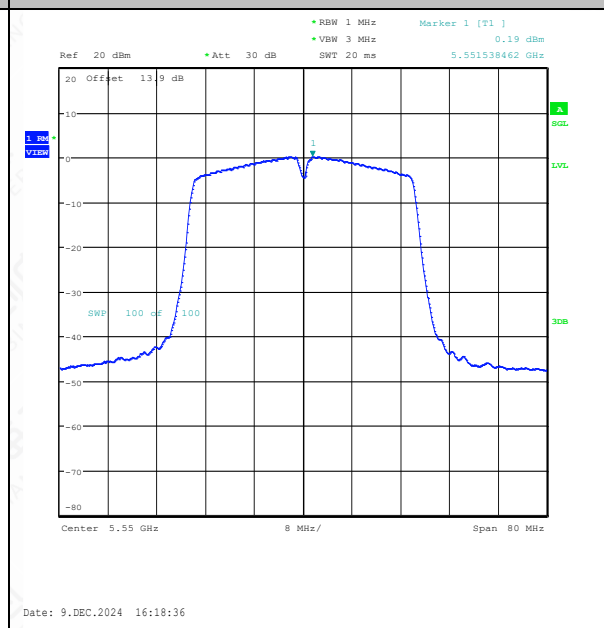
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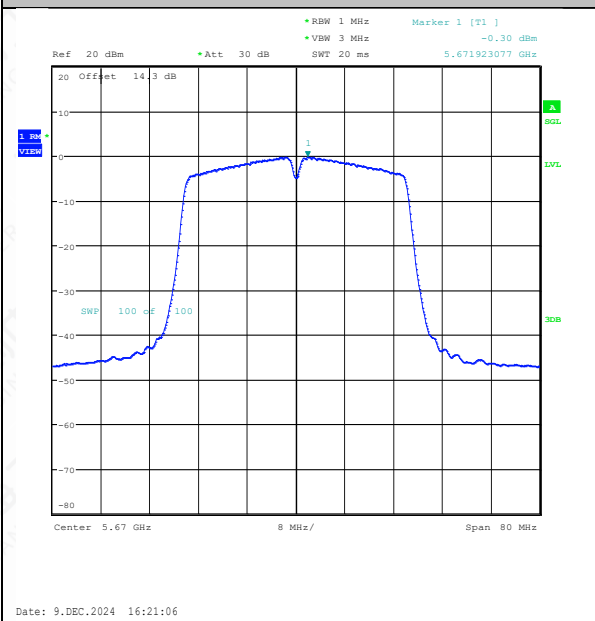
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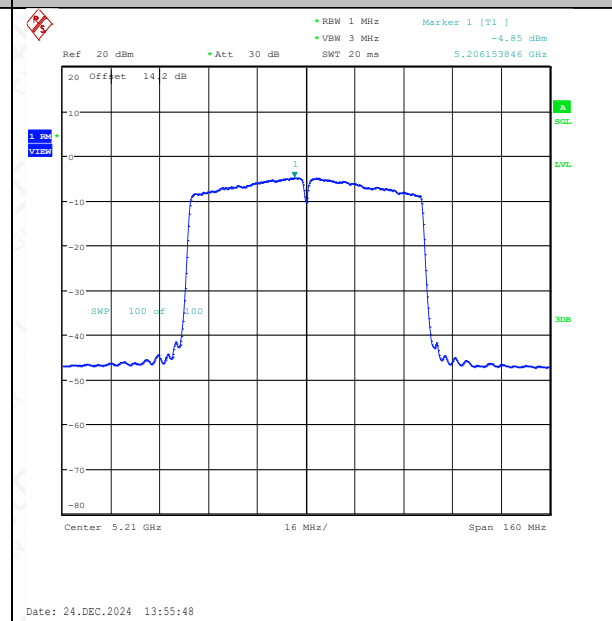
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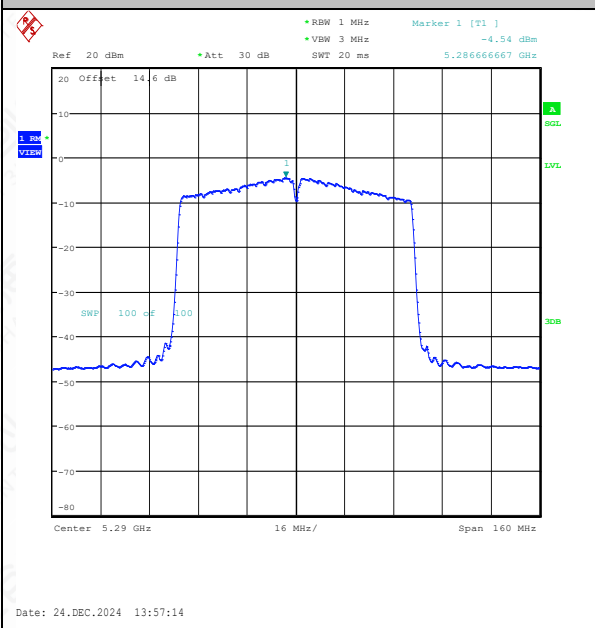
11AC40SISO-Ant1-5670-PASS



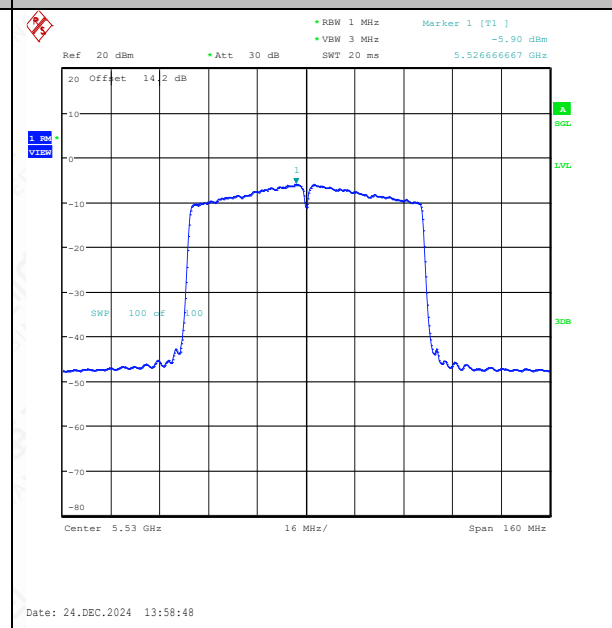
11AC80SISO-Ant1-5210-PASS



11AC80SISO-Ant1-5290-PASS



11AC80SISO-Ant1-5530-PASS



11AC80SISO-Ant1-5610-PASS

/



6.4. Occupied 26dB Bandwidth(conducted)

6.4.1 Measurement Limit

Standard	Limit(MHz)
FCC 47 CFR Part 15.407(a)	N/A
RSS-247 6.2	N/A

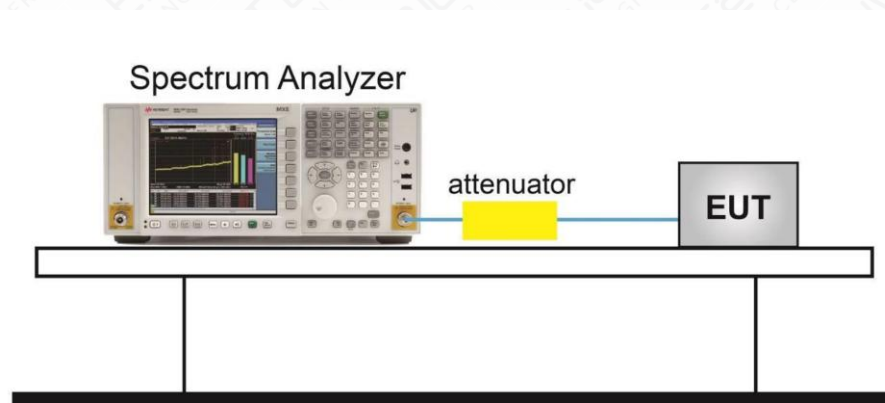
6.4.2 Test Procedure

The measurement method is made according to KDB 789033 C

1. Set RBW = approximately 1% of the emission bandwidth
2. Set the VBW > RBW
3. Detector = Peak.
4. Trace mode = max hold.
5. 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%.

6.4.3 Test Setup

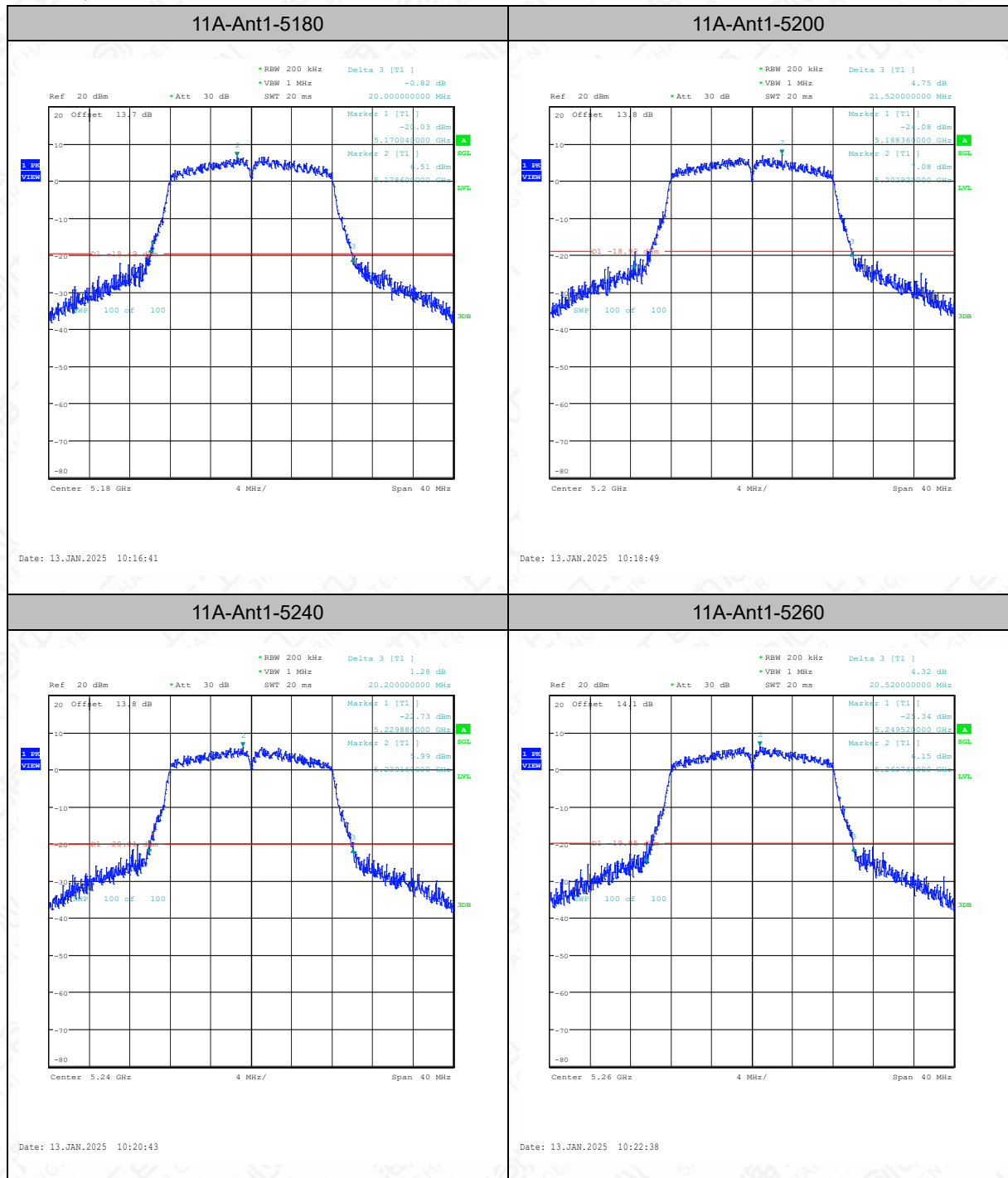


6.4.4 Measurement Results

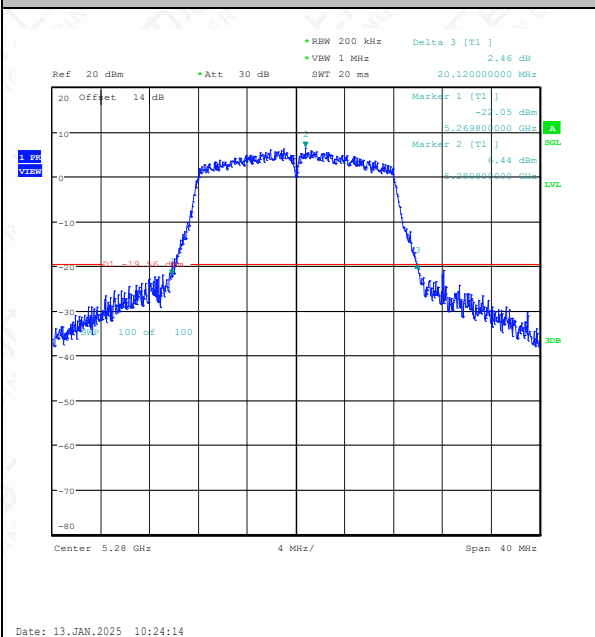
TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	20.00	5170.04	5190.04	---	---
11A	Ant1	5200	21.52	5188.36	5209.88	---	---
11A	Ant1	5240	20.20	5229.88	5250.08	---	---
11A	Ant1	5260	20.52	5249.52	5270.04	---	---
11A	Ant1	5280	20.12	5269.80	5289.92	---	---
11A	Ant1	5320	19.96	5310.00	5329.96	---	---
11A	Ant1	5500	20.08	5490.00	5510.08	---	---
11A	Ant1	5580	20.00	5570.04	5590.04	---	---

11A	Ant1	5700	19.92	5689.96	5709.88	---	---
11N20SISO	Ant1	5180	20.84	5169.40	5190.24	---	---
11N20SISO	Ant1	5200	20.92	5189.20	5210.12	---	---
11N20SISO	Ant1	5240	21.64	5228.56	5250.20	---	---
11N20SISO	Ant1	5260	22.16	5249.36	5271.52	---	---
11N20SISO	Ant1	5280	20.60	5269.52	5290.12	---	---
11N20SISO	Ant1	5320	20.40	5309.84	5330.24	---	---
11N20SISO	Ant1	5500	20.72	5489.44	5510.16	---	---
11N20SISO	Ant1	5580	20.48	5569.84	5590.32	---	---
11N20SISO	Ant1	5700	20.60	5689.68	5710.28	---	---
11N40SISO	Ant1	5190	40.88	5169.60	5210.48	---	---
11N40SISO	Ant1	5230	41.28	5209.12	5250.40	---	---
11N40SISO	Ant1	5270	41.20	5249.20	5290.40	---	---
11N40SISO	Ant1	5310	41.04	5289.52	5330.56	---	---
11N40SISO	Ant1	5510	40.96	5489.52	5530.48	---	---
11N40SISO	Ant1	5550	50.80	5520.56	5571.36	---	---
11N40SISO	Ant1	5670	41.44	5649.12	5690.56	---	---
11AC20SISO	Ant1	5180	20.16	5169.88	5190.04	---	---
11AC20SISO	Ant1	5200	20.44	5189.80	5210.24	---	---
11AC20SISO	Ant1	5240	20.40	5229.68	5250.08	---	---
11AC20SISO	Ant1	5260	20.28	5249.92	5270.20	---	---
11AC20SISO	Ant1	5280	20.32	5269.84	5290.16	---	---
11AC20SISO	Ant1	5320	20.24	5309.84	5330.08	---	---
11AC20SISO	Ant1	5500	20.20	5489.92	5510.12	---	---
11AC20SISO	Ant1	5580	20.44	5569.80	5590.24	---	---
11AC20SISO	Ant1	5700	20.40	5689.84	5710.24	---	---
11AC40SISO	Ant1	5190	40.96	5169.52	5210.48	---	---
11AC40SISO	Ant1	5230	40.80	5209.60	5250.40	---	---
11AC40SISO	Ant1	5270	41.04	5249.60	5290.64	---	---
11AC40SISO	Ant1	5310	40.48	5289.84	5330.32	---	---
11AC40SISO	Ant1	5510	40.80	5489.60	5530.40	---	---
11AC40SISO	Ant1	5550	40.88	5529.68	5570.56	---	---
11AC40SISO	Ant1	5670	40.96	5649.44	5690.40	---	---
11AC80SISO	Ant1	5210	81.44	5169.36	5250.80	---	---
11AC80SISO	Ant1	5290	81.76	5249.04	5330.80	---	---
11AC80SISO	Ant1	5530	82.08	5488.72	5570.80	---	---
11AC80SISO	Ant1	5610	81.60	5569.20	5650.80	---	---

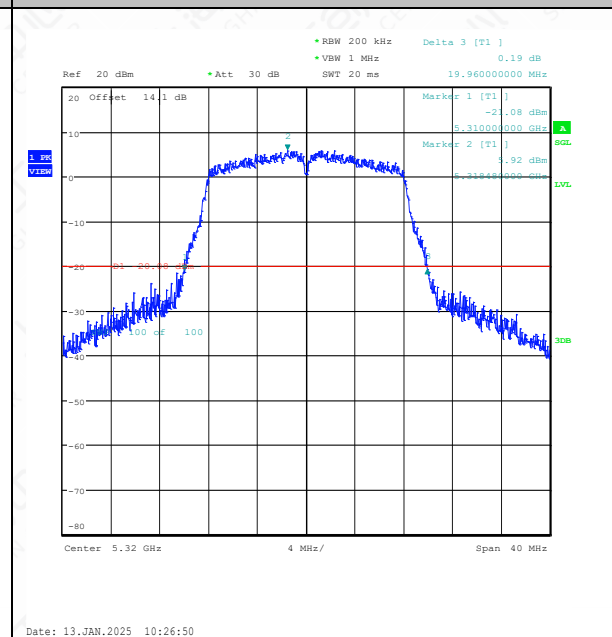
Test Graphs



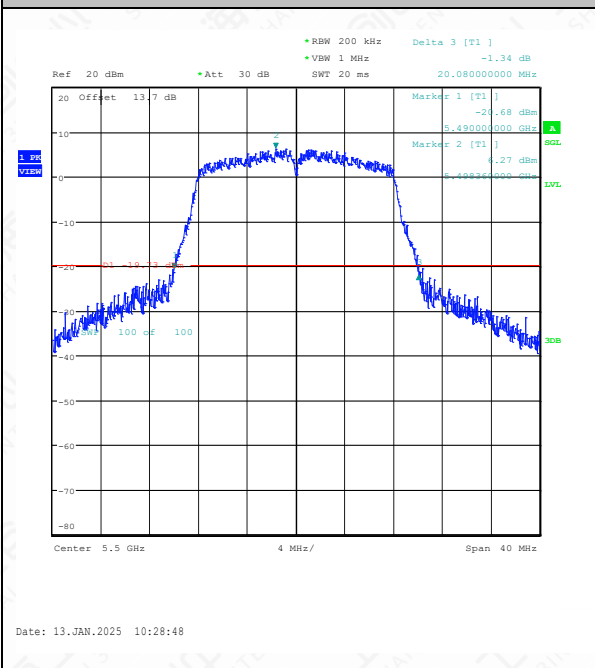
11A-Ant1-5280



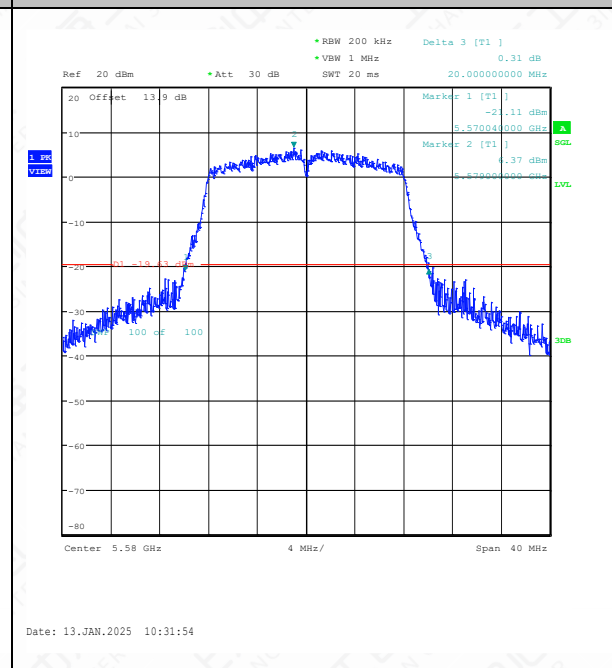
11A-Ant1-5320



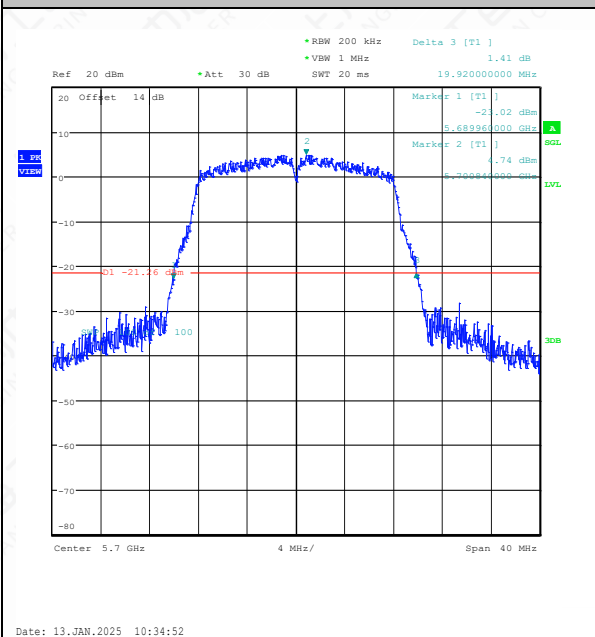
11A-Ant1-5500



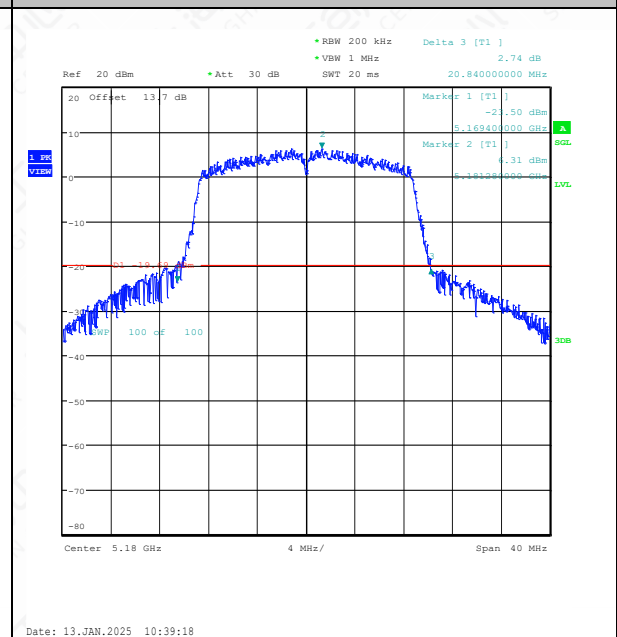
11A-Ant1-5580



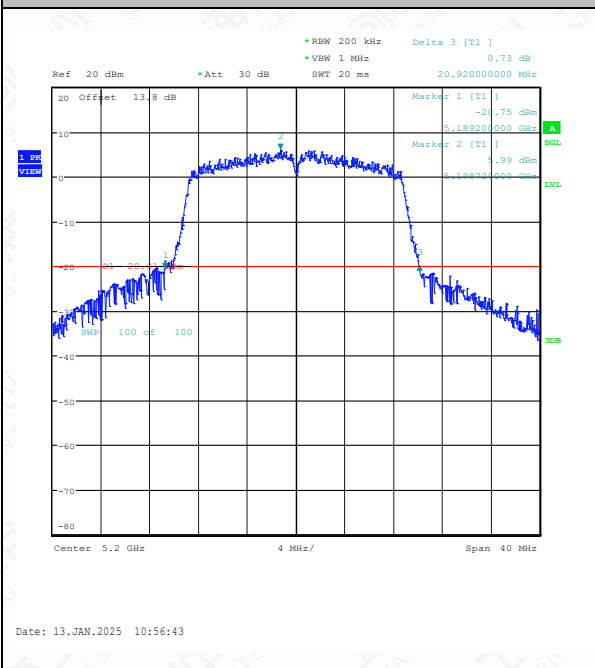
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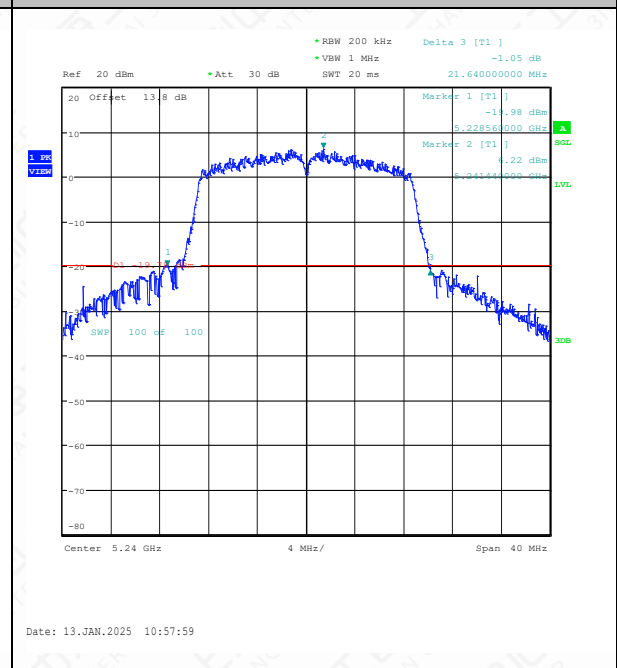
11N20SISO-Ant1-5180



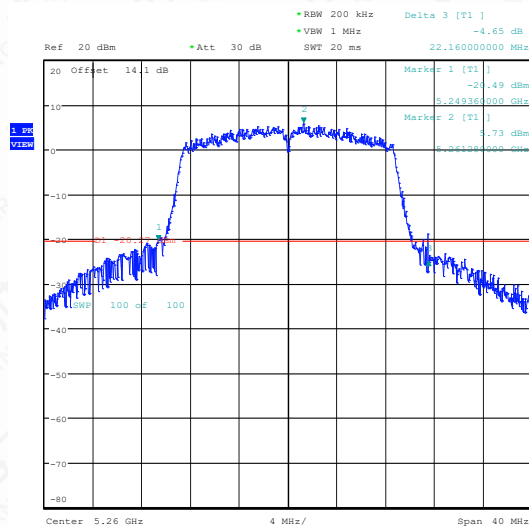
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11N20SISO-Ant1-5240

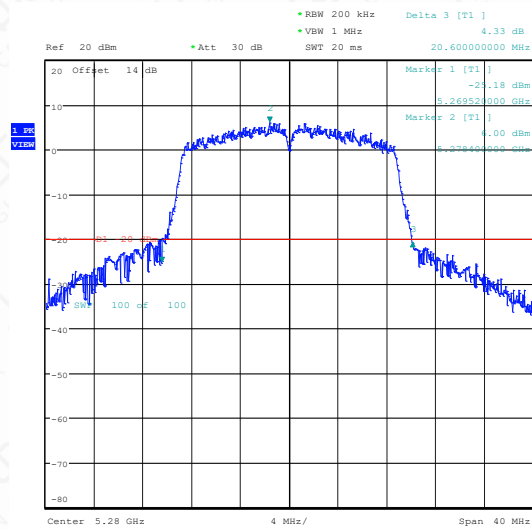


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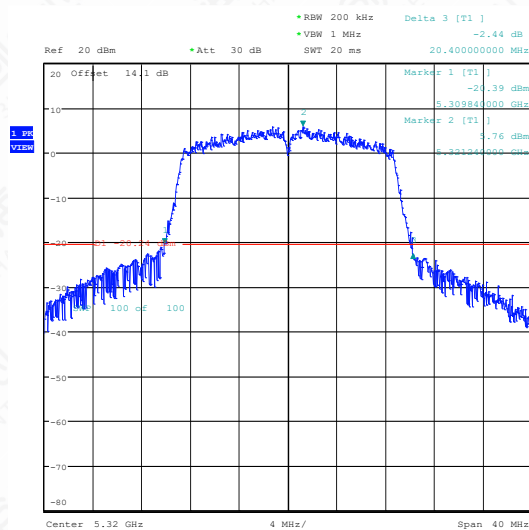
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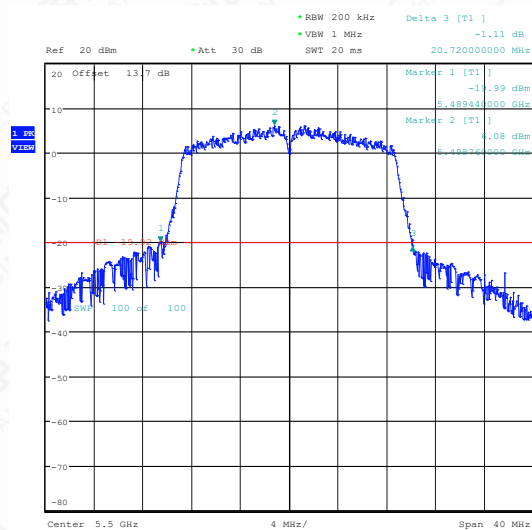
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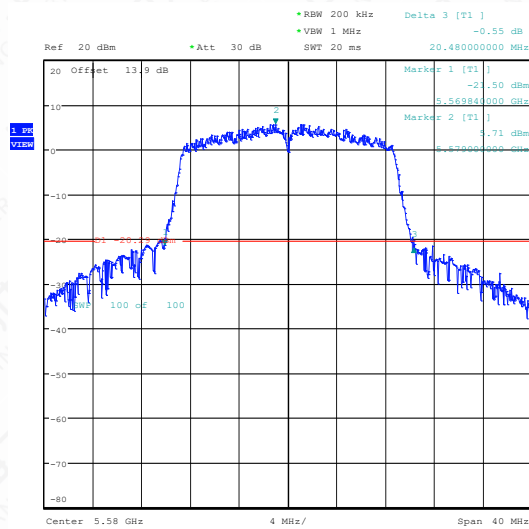
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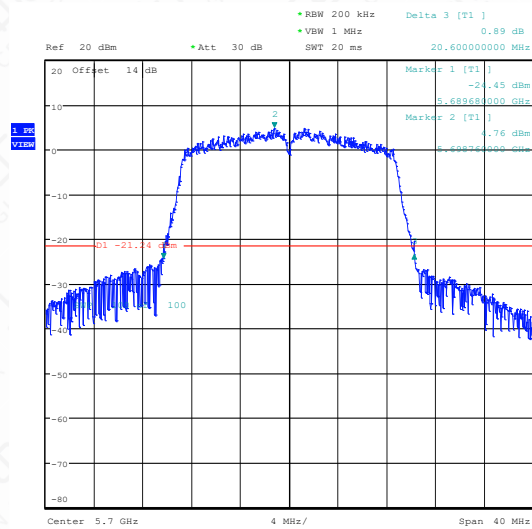
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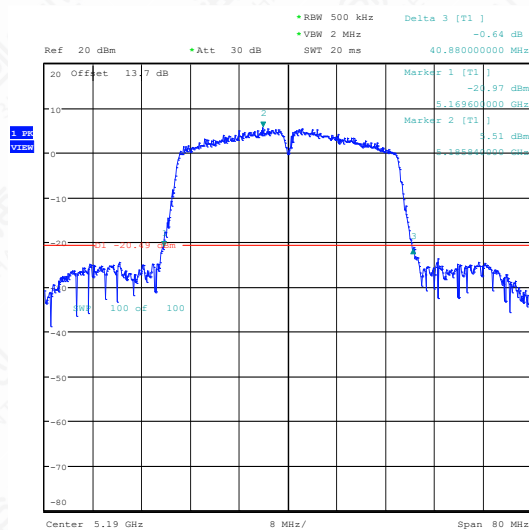
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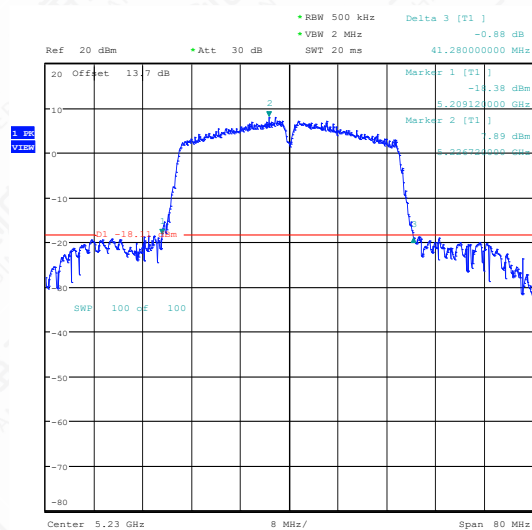
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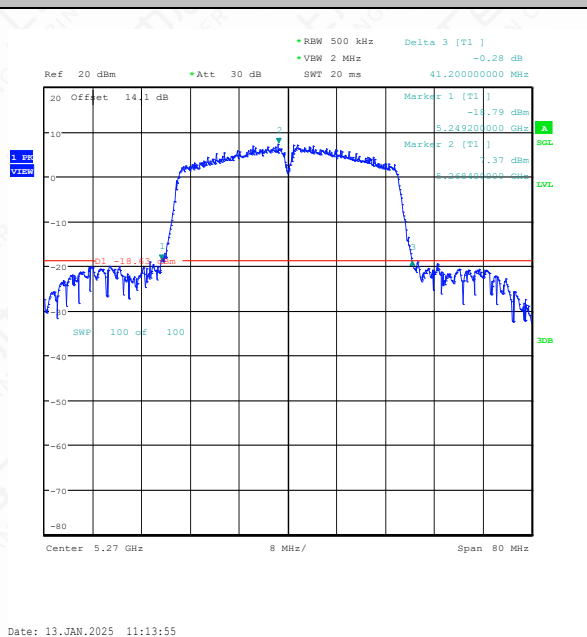
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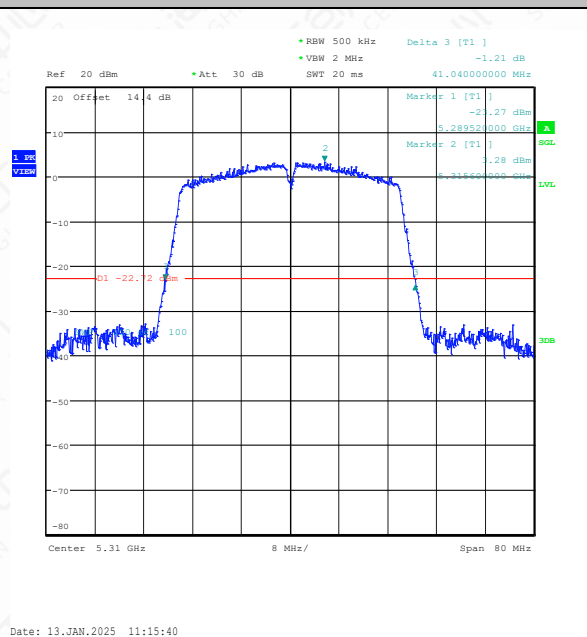


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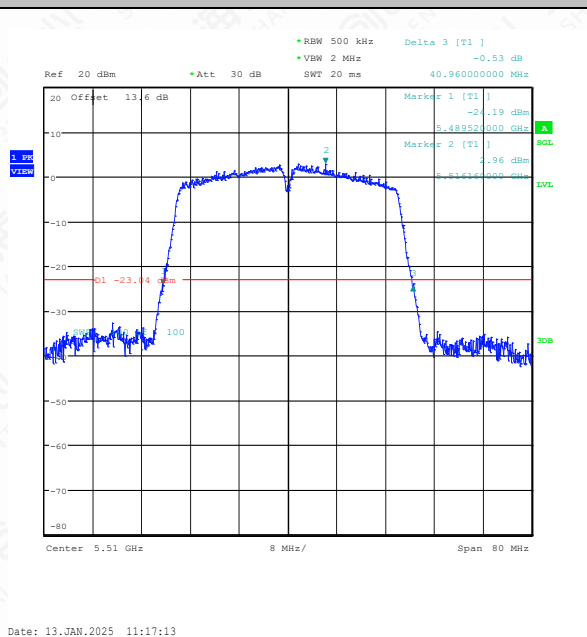
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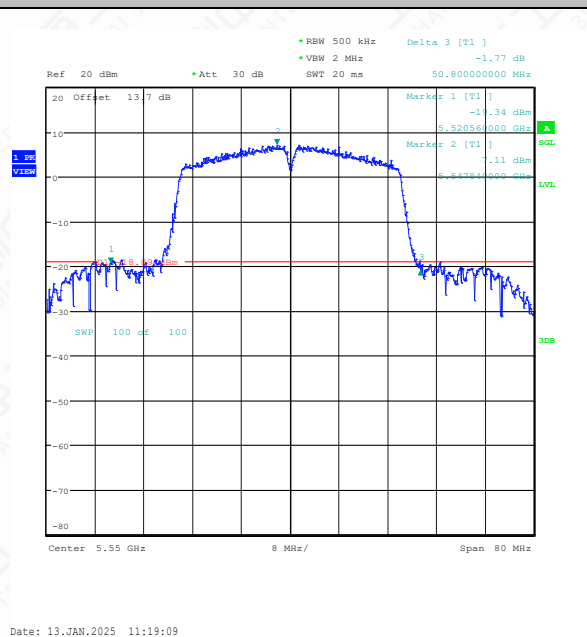
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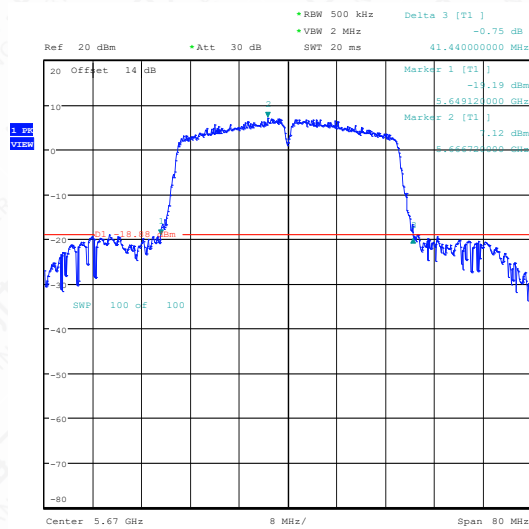
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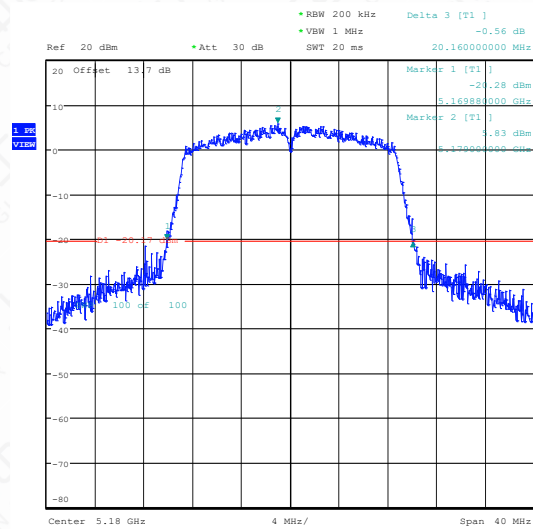


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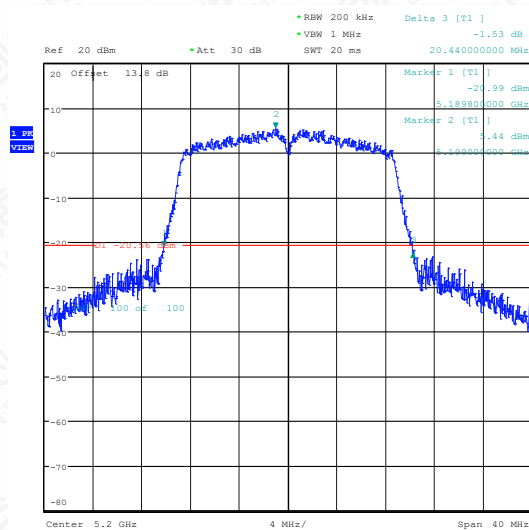
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11AC20SISO-Ant1-5180



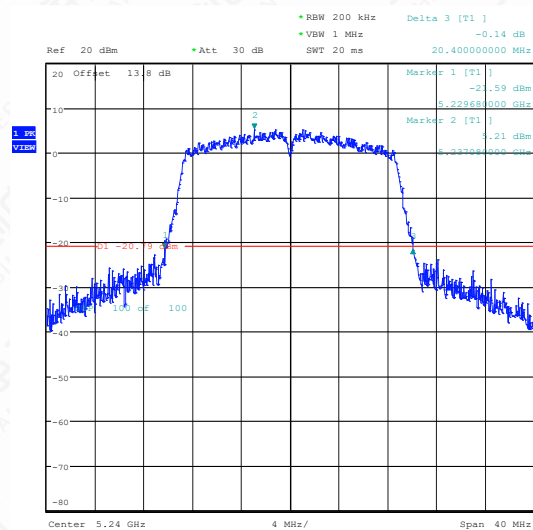
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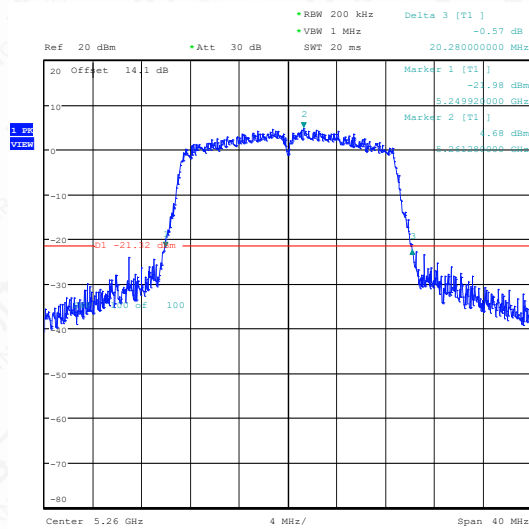
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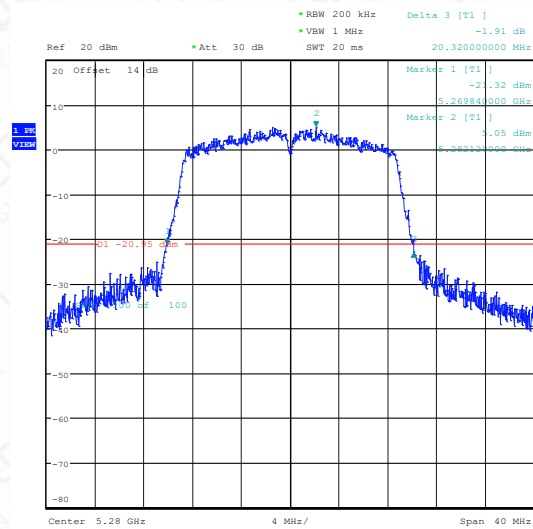
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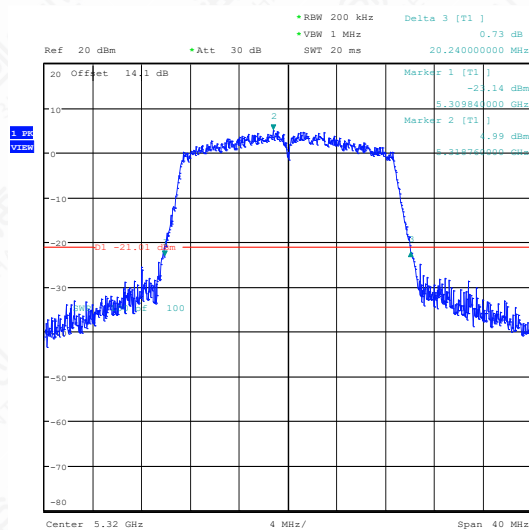
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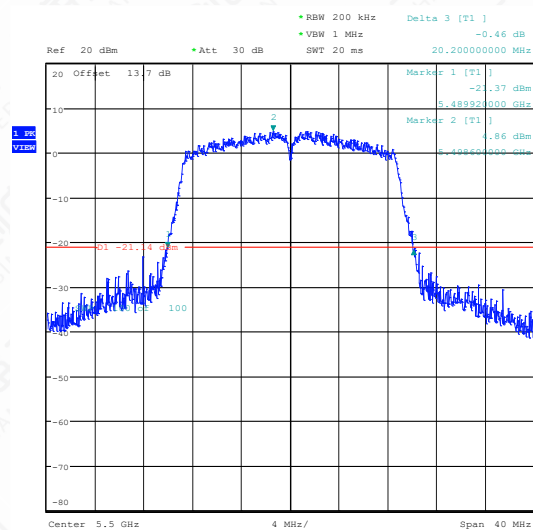
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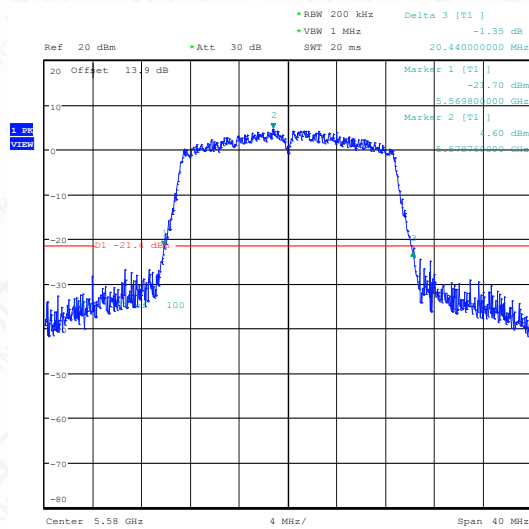
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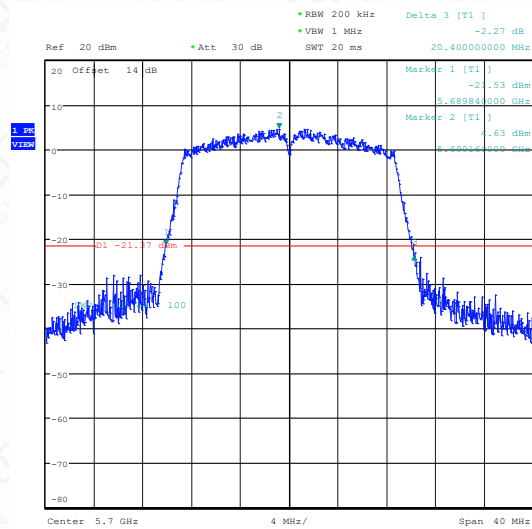
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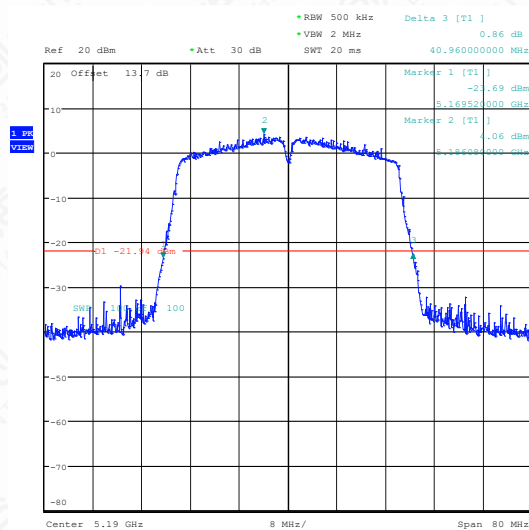
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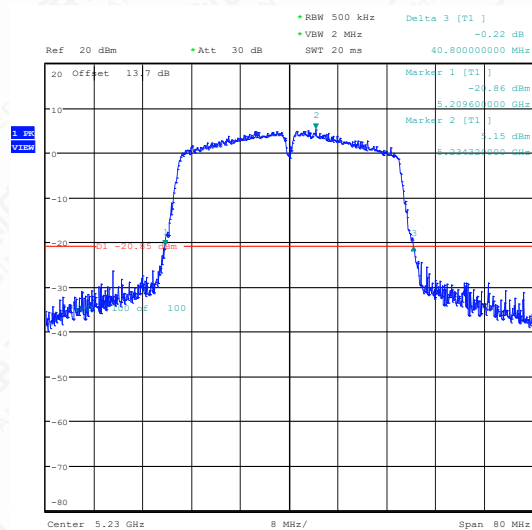
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Date: 13.JAN.2025 13:25:03

11AC40SISO-Ant1-5230



Date: 13.JAN.2025 13:26:16