FCC CERTIFICATION TEST REPORT

Applicant	:	BYD Auto Industry Company Limited
Address of Applicant	:	No.3001, 3007, HengPing Road, Pingshan, Shenzhen, Guangdong, P.R. China
Manufacturer	:	BYD Auto Industry Company Limited
Address of Manufacturer	:	No.3001, 3007, HengPing Road, Pingshan, Shenzhen, Guangdong, P.R. China
Equipment under Test	:	In-vehicle Multimedia Host
Model No.	:	MTCD03
FCC ID	:	SD4-MTCD03
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart E, ANSI C63.10:2020, 789033 D02 General U-NII Test Procedures New Rules v02r01
Report No.	:	DDT-RE24101411-1E10
Issue Date	:	2025/01/12
Issue By	:	Guangdong Dongdian Testing Service Co., Ltd. Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

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Test Report Declare

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Test Standard Used:

FCC Rules and Regulations Part 15 Subpart E,

ANSI C63.10:2020,

789033 D02 General U-NII Test Procedures New Rules v02r01

We Declare:

The equipment described above is tested by Guangdong Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangdong Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Report No.:	DDT-RE24101411-1E10		
Date of Receipt:	2024/10/23	**Date of Test:**	2024/10/23~2024/11/13

Prepared By:

Jacky Huang

Jacky Huang/Engineer

Approved By:

Damon Hu

Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	2025/01/13	

1. Summary of Test Results

No.	Test Parameter	Clause No.	Condition	Result
1	6/26db Bandwidth and 99% Bandwidth	FCC 15.407 (e)	/	Pass
2	Output Power	FCC 15.407 (a)	/	Pass
3	Power Spectral Density	FCC 15.407 (a)	/	Pass
4	Frequency Stability Measurement	FCC 15.407 (g)	/	Pass
5	Radiated Emission	FCC 15.407 (b); FCC 15.209; FCC 15.205	/	Pass
6	Band Edge Compliance	FCC 15.407 (b); FCC 15.209; FCC 15.205	/	Pass
7	Dynamic Frequency Selection	FCC 15.407 (h)	/	Pass
8	Power Line Conducted Emissions	FCC Part 15: 15.207(a)	/	N/A
9	Antenna Requirement	FCC Part 15: 15.203	/	Pass
Note: N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device or no need to test according to standard.				

2. General Test Information

2.1. Description of EUT

EUT Name	:	In-vehicle Multimedia Host
Model Number	:	MTCD03
EUT Function Description	:	Please reference user manual of this device
Power Supply	:	DC 12V
Radio Technology	:	IEEE 802.11a/n/ac
Operation frequency	:	5180 MHz to 5240 MHz, 5260 MHz to 5320 MHz, 5500 MHz to 5720 MHz, 5745 MHz to 5825 MHz
Modulation	:	IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Type	:	External PCB Antenna
Max Antenna Gain (dBi)	:	5150MHz-5250MHz: 3.02 5250MHz-5350MHz: 2.56 5470MHz-5725MHz: 2.88 5725MHz-5850MHz: 3.99
DFS Operation mode	:	Slave without radar detection

Note: This EUT support Bluetooth BR/EDR/LE, 2.4G WIFI, 5G WIFI, GSM, WCDMA and LTE, this report only for 5G WIFI.

Channel information					
IEEE 802.11a IEEE 802.11n (HT20) IEEE 802.11ac (VHT20)		IEEE 802.11n (HT40) IEEE 802.11ac (VHT40)		IEEE 802.11ac (VHT80)	
UNII-1					
CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230	/	/
44	5220	/	/	/	/
48	5240	/	/	/	/
UNII-2A					
52	5260	54	5270	58	5290
56	5280	62	5310		/
60	5300	/	/	/	/
64	5320	/	/	/	/
UNII-2C					
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590	138	5690

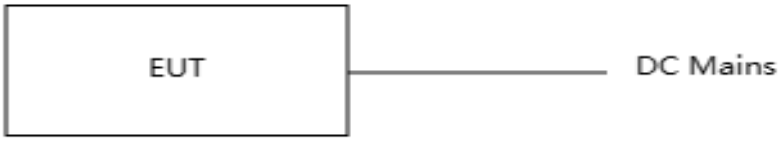
112	5560	126	5630	/	/
116	5580	134	5670	/	/
120	5600	142	5710	/	/
124	5620	/	/	/	/
128	5640	/	/	/	/
132	5660	/	/	/	/
136	5680	/	/	/	/
140	5700	/	/	/	/
144	5720	/	/	/	/
UNII-3					
149	5745	151	5755	155	5775
153	5765	159	5795	/	/
157	5785	/	/	/	/
161	5805	/	/	/	/
165	5825	/	/	/	/

Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.2. Accessories of EUT

Accessories	Manufacturer	Model number	Description
Power connecting cable	N/A	N/A	length: 2.5m, unshielded
MIC cable	N/A	N/A	length: 2.2m, unshielded
Power amplifier cable	N/A	N/A	length: 2.0m, unshielded
Camera/recorder cable	N/A	N/A	length: 2.0m, shielded
SIM cable	N/A	N/A	length: 0.8m, shielded
Bluetooth/WIFI antenna	N/A	N/A	length: 2.0m, shielded
FM/AM/DAB antenna	N/A	N/A	length: 4.2m, shielded
GNSS antenna	N/A	N/A	length: 2.2m, shielded

2.3. Block diagram of EUT configuration for test

Configuration diagram


2.4. Decision of final test mode

According pre-test, the worst test modes were reported as below:

Test software: QRCT.exe

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table.

The pathloss of external cable: 2 dB (According to the manufacturer's claims)

Tested mode, channel, and data rate information				
Mode	Setting Tx Power	data rate (Mpbs) (see Note)	Channel	Frequency (MHz)
IEEE 802.11a	10	6	Low: CH36	5180
	10	6	Middle: CH40	5200
	10	6	High: CH48	5240
	10	6	Low: CH52	5260
	10	6	Middle: CH56	5280
	10	6	High: CH64	5320
	10	6	Low: CH100	5500
	10	6	Middle: CH116	5580
	10	6	High: CH140	5700
	10	6	High: CH144	5720
	10	6	Low: CH149	5745
	10	6	Middle: CH157	5785
	10	6	High: CH165	5825
IEEE 802.11n HT20	10	MCS 0	Low: CH36	5180
	10	MCS 0	Middle: CH40	5200
	10	MCS 0	High: CH48	5240
	10	MCS 0	Low: CH52	5260

	10	MCS 0	Middle: CH56	5280
	10	MCS 0	High: CH64	5320
	10	MCS 0	Low: CH100	5500
	10	MCS 0	Middle: CH116	5580
	10	MCS 0	High: CH140	5700
	10	MCS 0	High: CH144	5720
	10	MCS 0	Low: CH149	5745
	10	MCS 0	Middle: CH157	5785
	10	MCS 0	High: CH165	5825
IEEE 802.11n HT40	10	MCS 0	Low: CH38	5190
	10	MCS 0	Middle: CH46	5230
	10	MCS 0	High: CH54	5270
	10	MCS 0	Low: CH62	5310
	10	MCS 0	Middle: CH102	5510
	10	MCS 0	High: CH110	5550
	10	MCS 0	Low: CH134	5670
	10	MCS 0	Low: CH142	5710
	10	MCS 0	Middle: CH151	5755
	10	MCS 0	High: CH159	5795
IEEE 802.11ac VHT20	10	MCS 0	Low: CH36	5180
	10	MCS 0	Middle: CH40	5200
	10	MCS 0	High: CH48	5240
	10	MCS 0	Low: CH52	5260
	10	MCS 0	Middle: CH56	5280
	10	MCS 0	High: CH64	5320
	10	MCS 0	Low: CH100	5500
	10	MCS 0	Middle: CH116	5580
	10	MCS 0	High: CH140	5700
	10	MCS 0	High: CH144	5720
	10	MCS 0	Low: CH149	5745
	10	MCS 0	Middle: CH157	5785
	10	MCS 0	High: CH165	5825
IEEE 802.11ac VHT40	10	MCS 0	Low: CH38	5190
	10	MCS 0	Middle: CH46	5230
	10	MCS 0	High: CH54	5270
	10	MCS 0	Low: CH62	5310
	10	MCS 0	Middle: CH102	5510
	10	MCS 0	High: CH110	5550
	10	MCS 0	Low: CH134	5670

	10	MCS 0	Low: CH142	5710
	10	MCS 0	Middle: CH151	5755
	10	MCS 0	High: CH159	5795
IEEE 802.11ac VHT80	10	MCS 0	CH42	5210
	10	MCS 0	CH58	5290
	10	MCS 0	CH106	5530
	10	MCS 0	CH122	5610
	10	MCS 0	CH122	5690
	10	MCS 0	CH155	5775
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.				

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	+15℃ to +35 ℃
Humidity range:	20% to 75%
Pressure range:	86 kPa to106 kPa

Note: The specific temperature and humidity information of each test item refers to the temperature and humidity record in the corresponding test data.

2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808.

Tel.: +86-0769-38826678, http://www.dgddt.com, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2.8. Measurement uncertainty

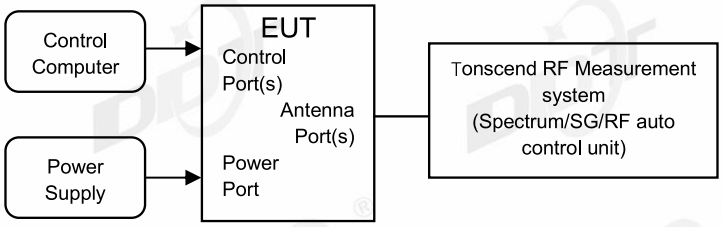
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Frequencies Stability	6.7×10^{-8} (Antenna couple method)
	5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.40 dB (3.6 GHz ≤ f < 8 GHz)
	1.66 dB (8 GHz ≤ f < 26.5 GHz)
Uncertainty for radio frequency (RBW < 20 kHz)	3×10^{-8}
Temperature	0.4 ℃
Humidity	2 %
Uncertainty for Radiation Emission test (9 kHz – 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz - 40 GHz)	4.10 dB (1 - 6 GHz)
	4.40 dB (6 GHz - 18 GHz)
	3.54 dB (18 GHz - 26 GHz)
	4.30 dB (26 GHz - 40 GHz)
Uncertainty for Power line conduction emission test	3.34dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date	Cal. Interval
☒RF Connected Test (RF Measurement System 4#)					
Signal &Spectrum Analyzer	R&S	FSV3044	101173	2025/03/31	1 Year
Wideband Radio Communication Tester	R&S	CMW500	168801	2025/03/31	1 Year
MXG Vector Signal Generator	Agilent	N5182A	MY48180737	2025/03/31	1 Year
PSG Vector Signal Generator	Agilent	E8267D	US49060192	2025/08/25	1 Year
RF Control Unit	Tonsend	JS0806-2	21I8060485	2025/03/31	1 Year
TEMP&HUMI Programmable Chamber	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2025/04/22	1 Year
Test Software	Tonscend	JS1120-3	Ver.3.2.22	N/A	N/A

4. 26dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

FCC Part15, Subpart E/ RSS-247		
Test Item	Limit	Frequency Range (MHz)
26 dB Bandwidth	---	5150 - 5250
	---	5250 - 5350
	---	For FCC: 5470 - 5725 For IC: 5470 - 5600 5650 - 5725

4.3. Test procedure

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

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	approximately 1% of the emission bandwidth.
VBW	> RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

4.4. Test result

Test Engineer:	Zoe	Test Site:	RF Measurement System 4#
Ambient Condition:	23.6℃, 48.4%RH	Test Date:	2024.10.23-2024.11.04
Test Power Supply:	DC 12V	Sample Number:	S24101411-001

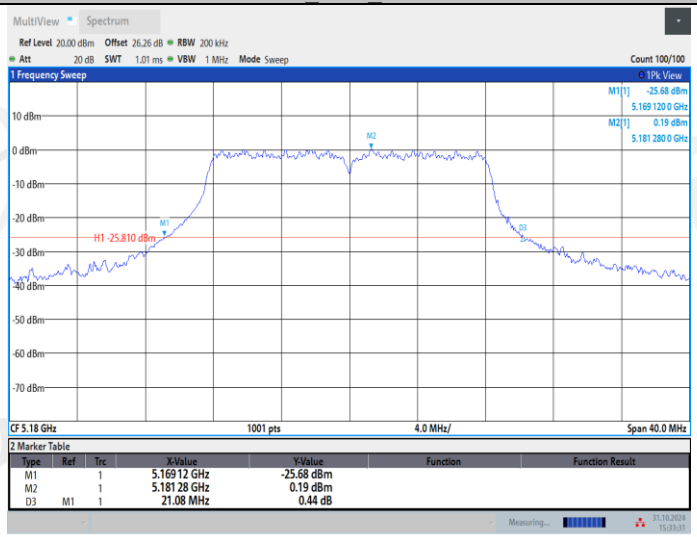
Test Mode	Antenna	Frequency [MHz]	26db EBW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11A	Ant1	5180	21.08	5169.12	5190.20	---	---
		5200	21.20	5189.20	5210.40	---	---
		5240	21.52	5229.16	5250.68	---	---
		5260	21.32	5249.04	5270.36	---	---
		5280	21.28	5269.16	5290.44	---	---
		5320	21.04	5309.24	5330.28	---	---
		5500	21.32	5489.00	5510.32	---	---
		5580	21.68	5569.24	5590.92	---	---
		5700	21.52	5688.80	5710.32	---	---
		5720	21.16	5709.20	5730.36	---	---
		5720_UNII-2C	15.8	5709.20	5725	---	---
		5720_UNII-3	5.36	5725	5730.36	---	---
		5745	21.28	5734.28	5755.56	---	---
		5785	21.08	5774.28	5795.36	---	---
		5825	21.68	5813.76	5835.44	---	---
11N20SISO	Ant1	5180	21.76	5169.04	5190.80	---	---
		5200	21.76	5189.04	5210.80	---	---
		5240	21.96	5228.92	5250.88	---	---
		5260	22.32	5248.68	5271.00	---	---
		5280	22.20	5268.68	5290.88	---	---
		5320	22.16	5308.68	5330.84	---	---
		5500	22.04	5489.04	5511.08	---	---
		5580	22.28	5568.80	5591.08	---	---
		5700	22.76	5688.28	5711.04	---	---

		5720	21.96	5708.88	5730.84	---	---
		5720_UNII-2C	16.12	5708.88	5725	---	---
		5720_UNII-3	5.84	5725	5730.84	---	---
		5745	22.28	5733.60	5755.88	---	---
		5785	22.44	5773.52	5795.96	---	---
		5825	22.24	5813.56	5835.80	---	---
11N40SISO	Ant1	5190	43.20	5168.24	5211.44	---	---
		5230	43.20	5208.24	5251.44	---	---
		5270	43.28	5248.24	5291.52	---	---
		5310	43.44	5288.16	5331.60	---	---
		5510	43.12	5488.32	5531.44	---	---
		5550	43.04	5528.40	5571.44	---	---
		5670	45.60	5645.84	5691.44	---	---
		5710	43.76	5687.76	5731.52	---	---
		5710_UNII-2C	37.24	5687.76	5725	---	---
		5710_UNII-3	6.52	5725	5731.52	---	---
		5755	43.52	5732.76	5776.28	---	---
		5795	44.08	5772.52	5816.60	---	---
11AC20SISO	Ant1	5180	22.08	5169.00	5191.08	---	---
		5200	22.12	5188.92	5211.04	---	---
		5240	22.04	5228.80	5250.84	---	---
		5260	22.64	5248.64	5271.28	---	---
		5280	22.60	5268.64	5291.24	---	---
		5320	22.36	5308.76	5331.12	---	---
		5500	22.48	5488.76	5511.24	---	---
		5580	22.32	5568.60	5590.92	---	---
		5700	22.16	5688.68	5710.84	---	---
		5720	22.28	5708.68	5730.96	---	---
		5720_UNII-2C	16.32	5708.68	5725	---	---
		5720_UNII-3	5.96	5725	5730.96	---	---

		5745	22.44	5733.72	5756.16	---	---
		5785	22.04	5773.76	5795.80	---	---
		5825	22.16	5813.68	5835.84	---	---
11AC40SISO	Ant1	5190	43.20	5168.40	5211.60	---	---
		5230	43.28	5208.24	5251.52	---	---
		5270	43.28	5248.16	5291.44	---	---
		5310	43.28	5288.16	5331.44	---	---
		5510	43.04	5488.40	5531.44	---	---
		5550	43.20	5528.32	5571.52	---	---
		5670	45.36	5646.08	5691.44	---	---
		5710	45.68	5685.76	5731.44	---	---
		5710_UNII-2C	39.24	5685.76	5725	---	---
		5710_UNII-3	6.44	5725	5731.44	---	---
		5755	43.36	5733.00	5776.36	---	---
		5795	45.60	5770.92	5816.52	---	---
11AC80SISO	Ant1	5210	87.68	5166.80	5254.48	---	---
		5290	86.72	5246.64	5333.36	---	---
		5530	87.20	5486.96	5574.16	---	---
		5610	86.08	5567.12	5653.20	---	---
		5690	87.52	5646.48	5734.00	---	---
		5690_UNII-2C	78.52	5646.48	5725	---	---
		5690_UNII-3	9	5725	5734.00	---	---
		5775	92.00	5726.52	5818.52	---	---

4.5. Test graphs

11A_Ant1_5180



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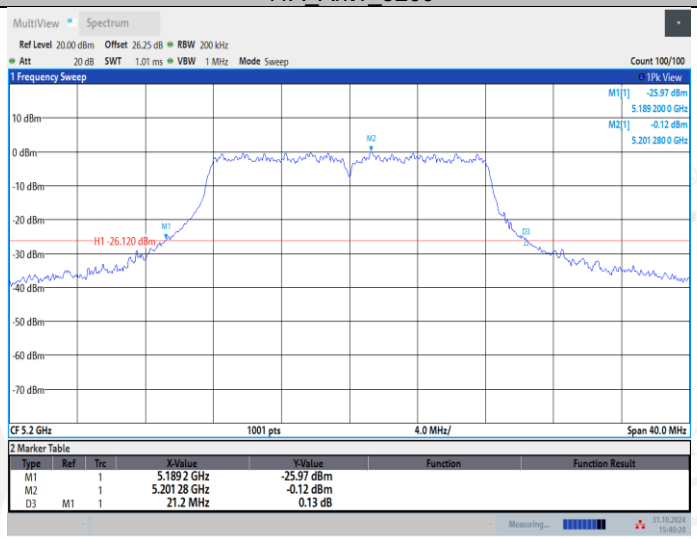

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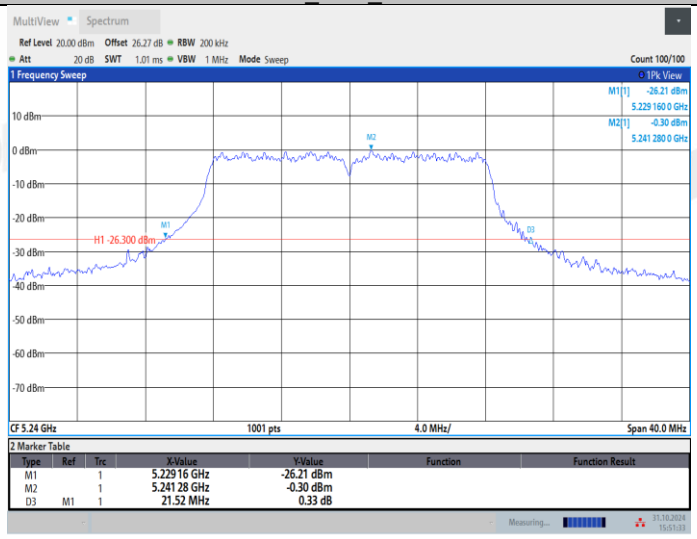

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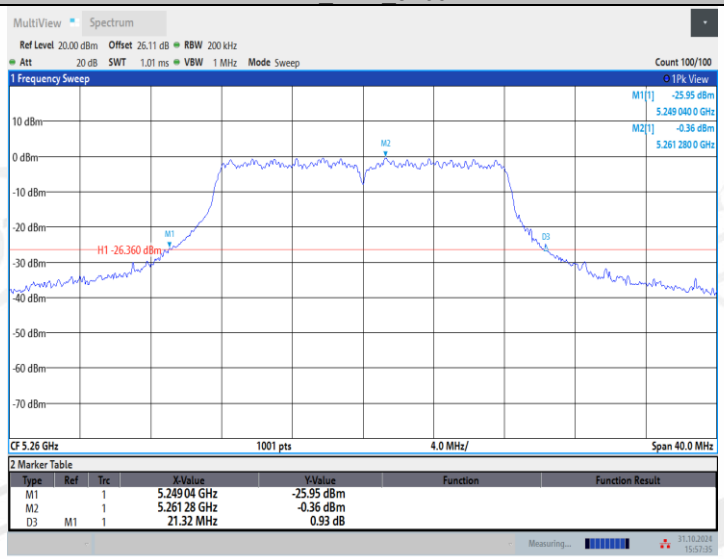

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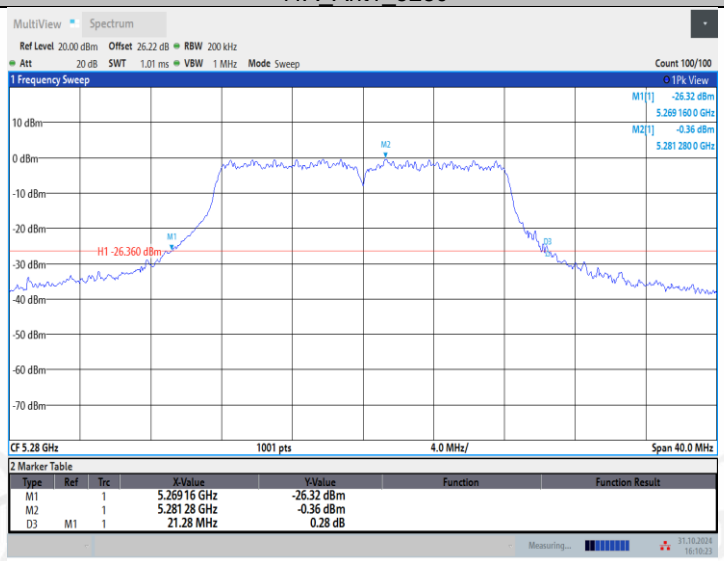

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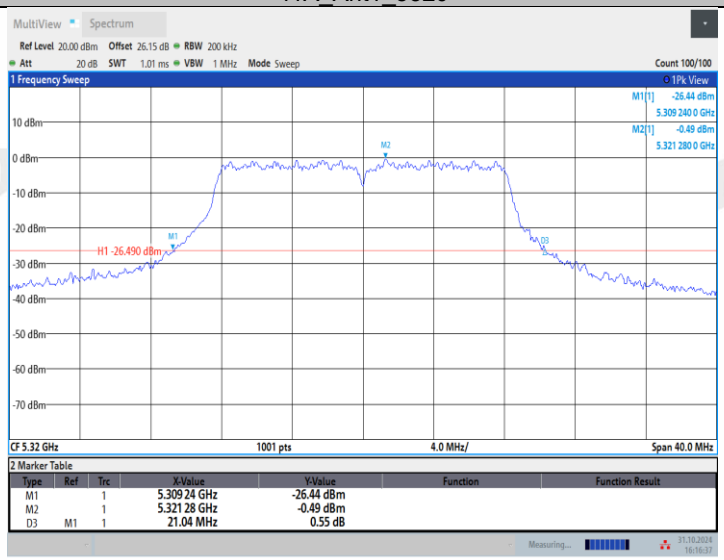

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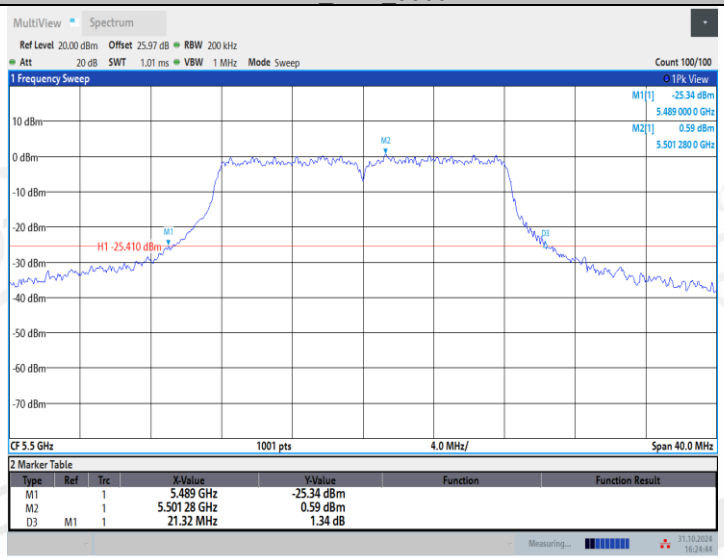

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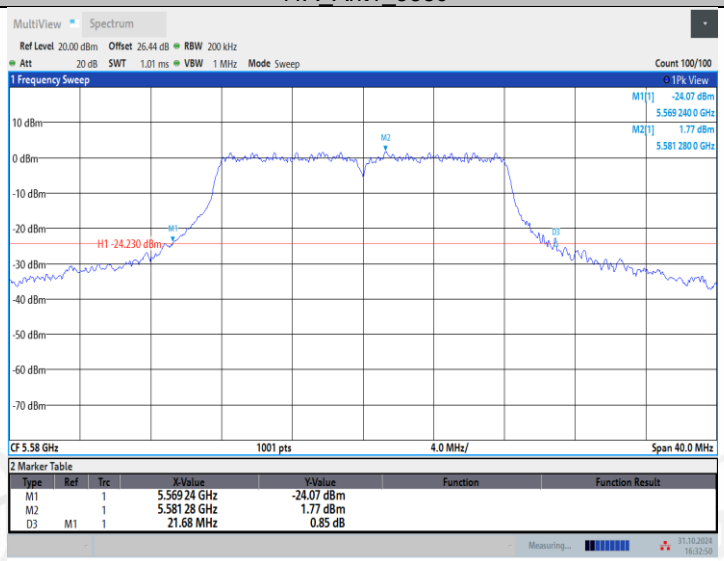

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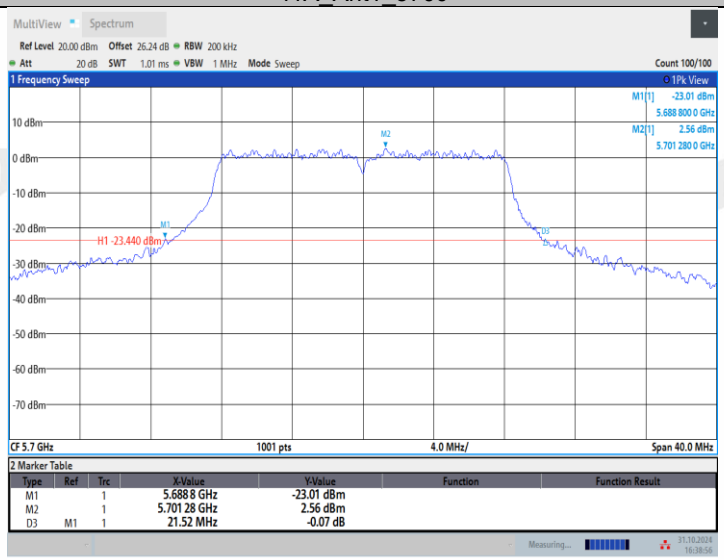
11A_Ant1_5700



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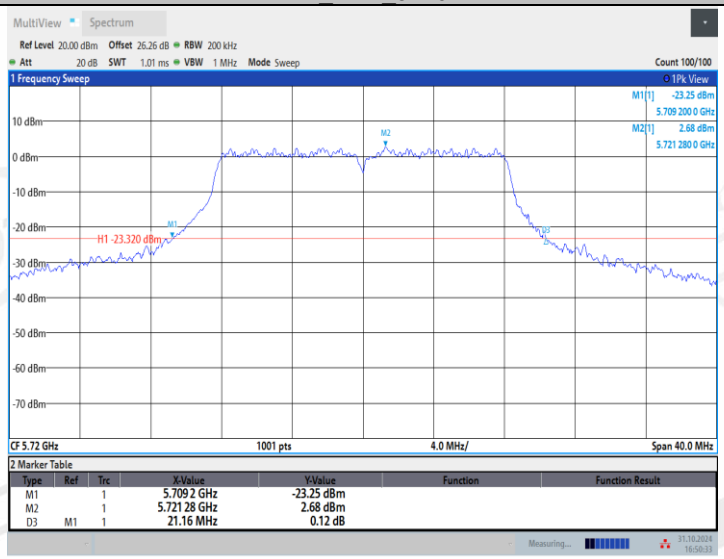
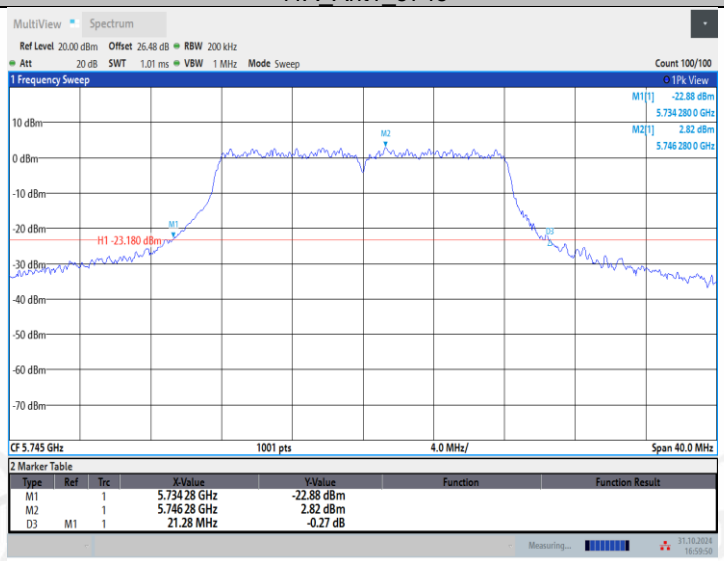
11A_Ant1_5720



11A_Ant1_5745



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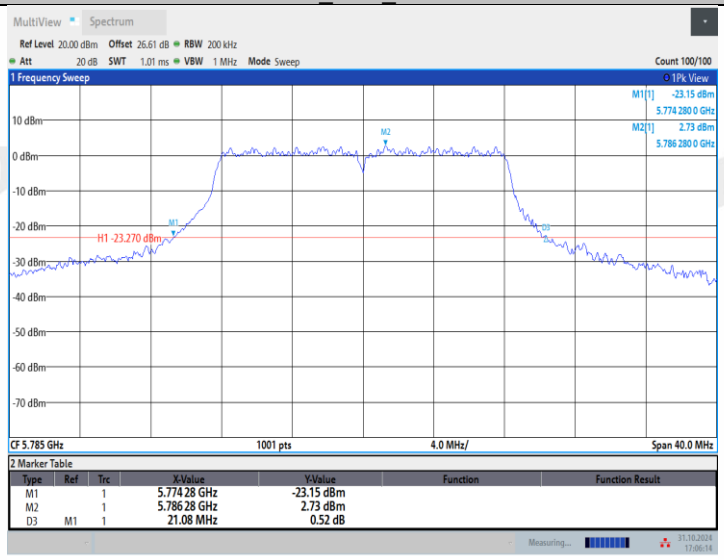

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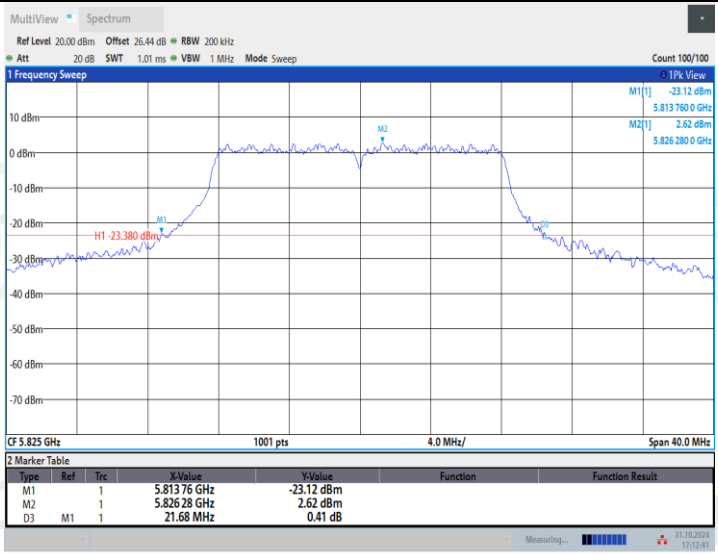

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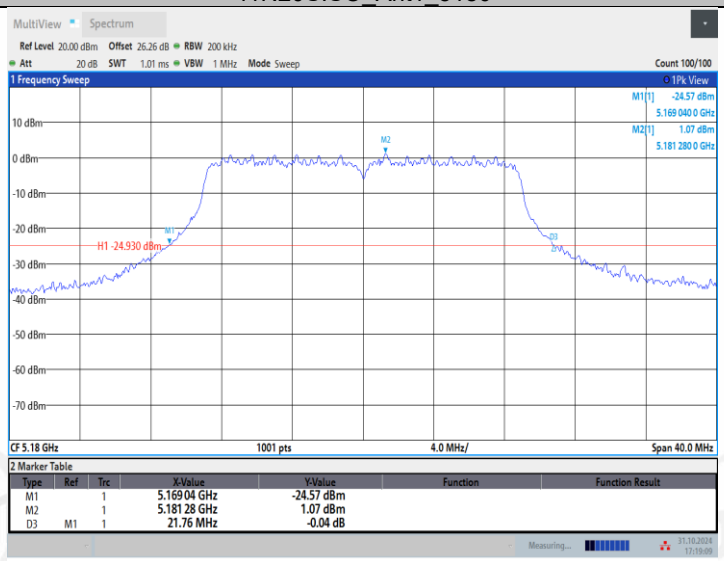

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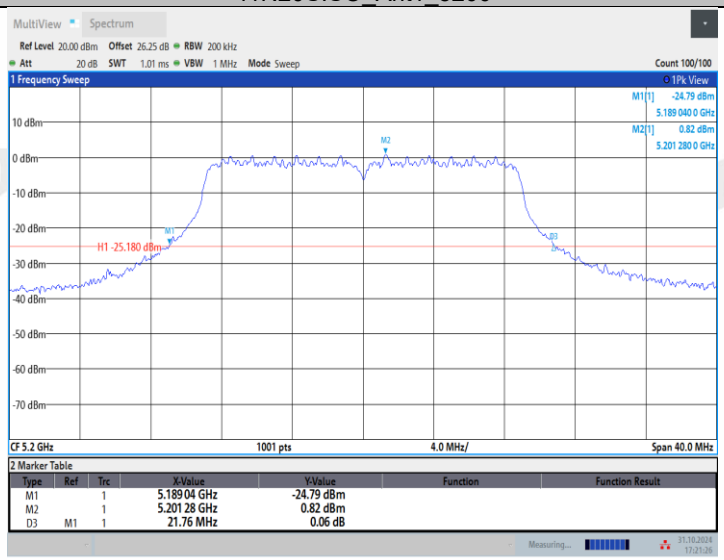

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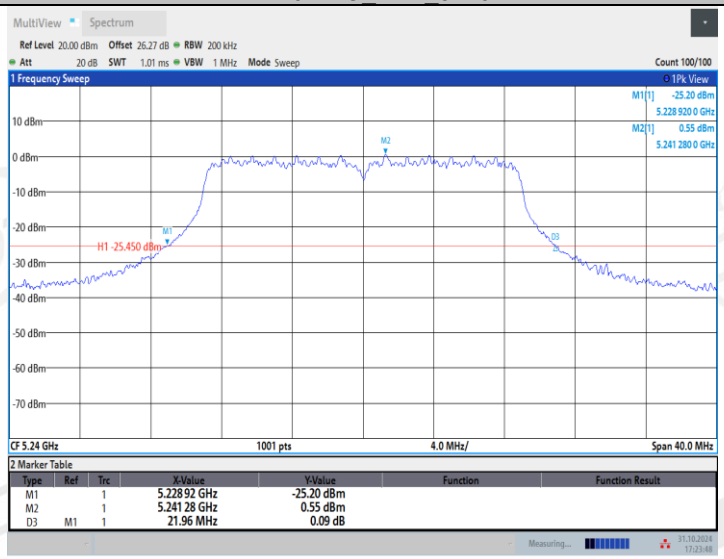

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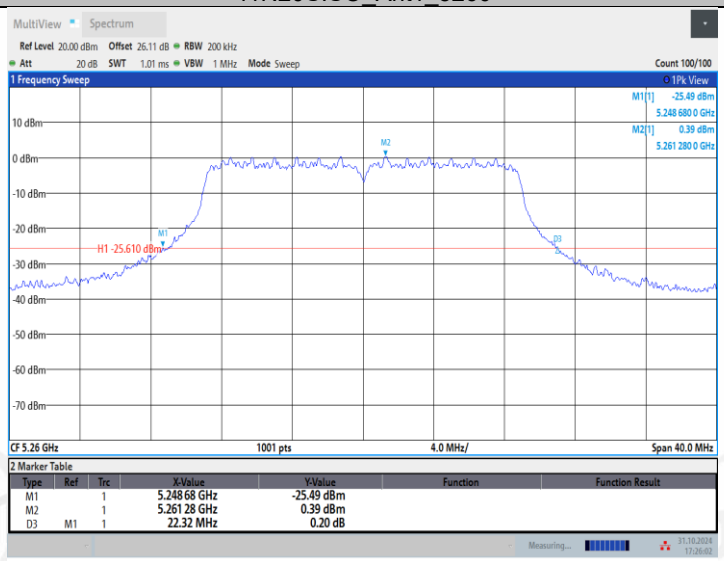

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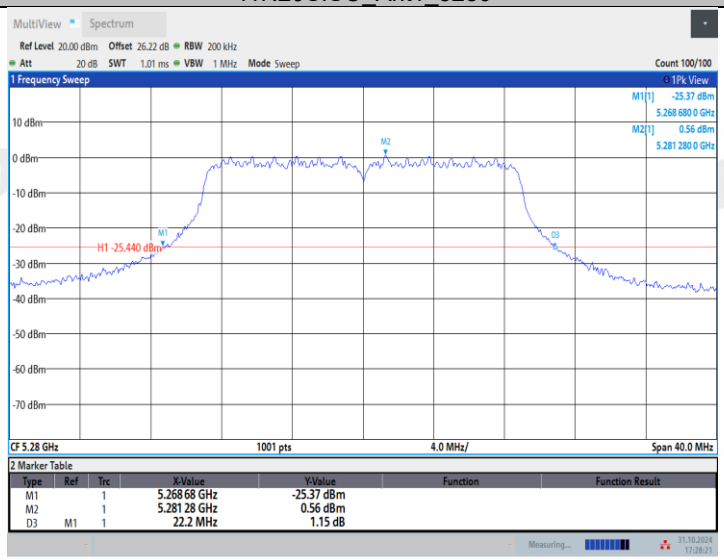

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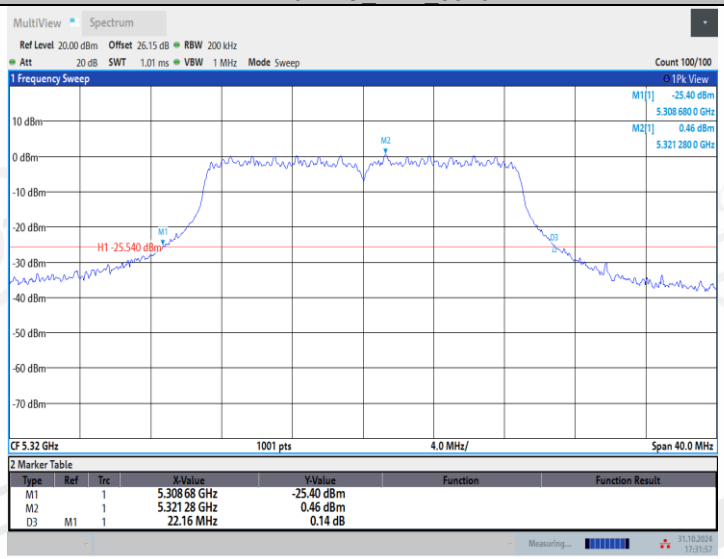

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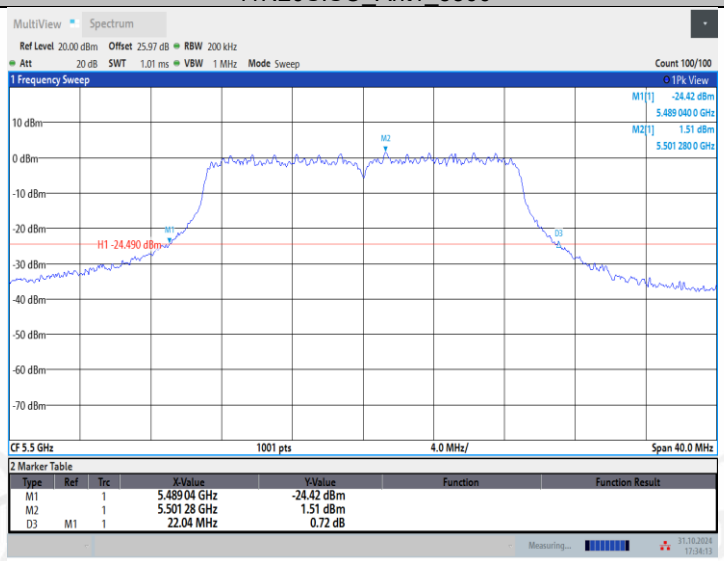

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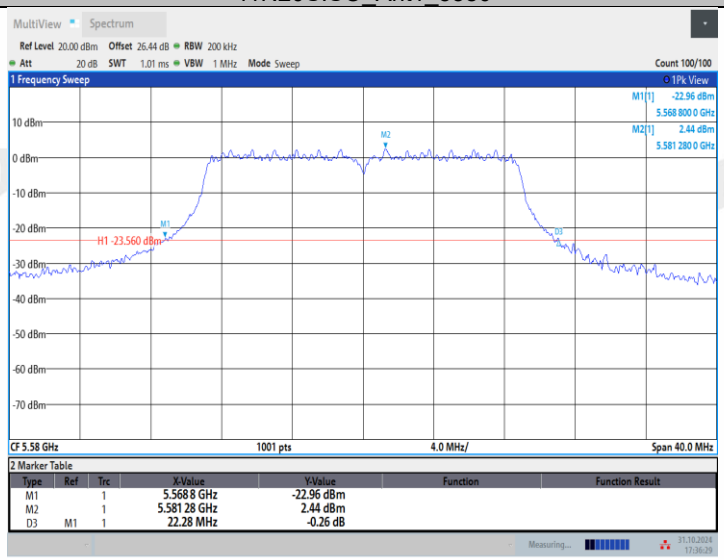

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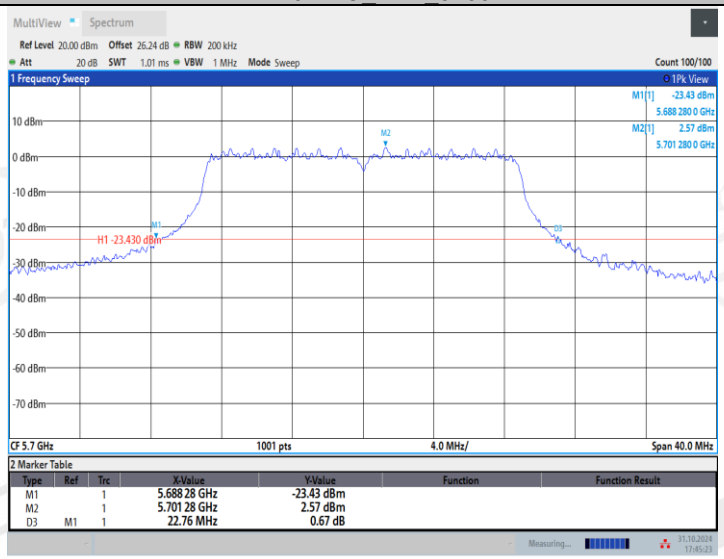

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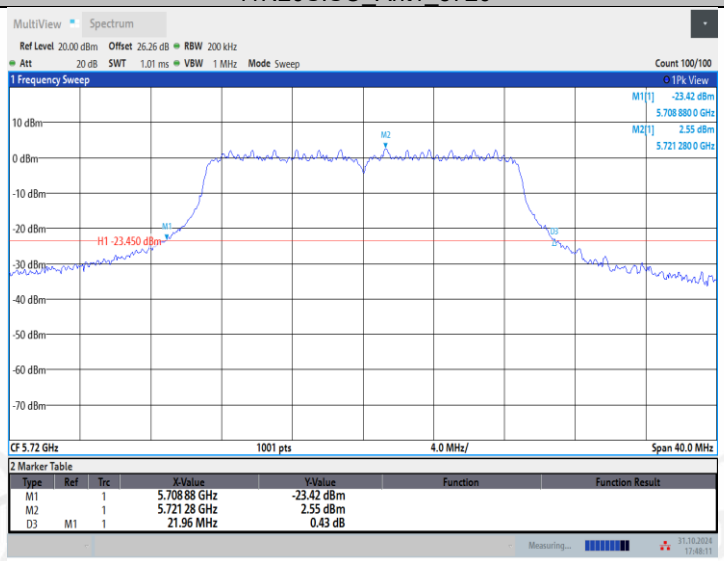

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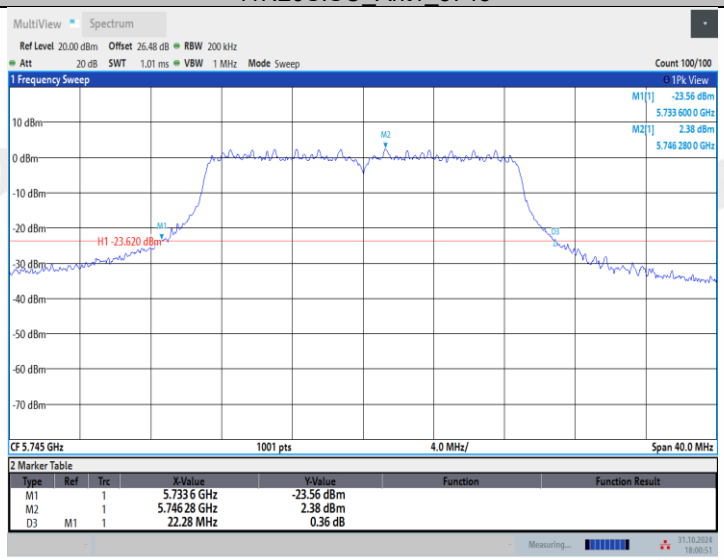

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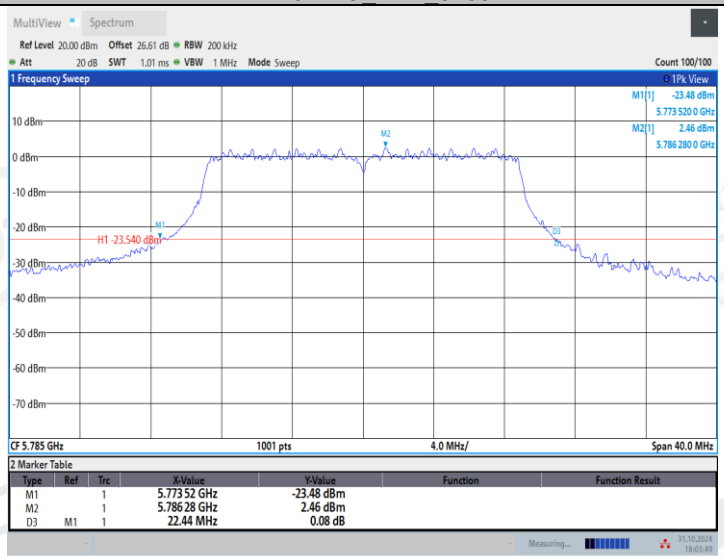

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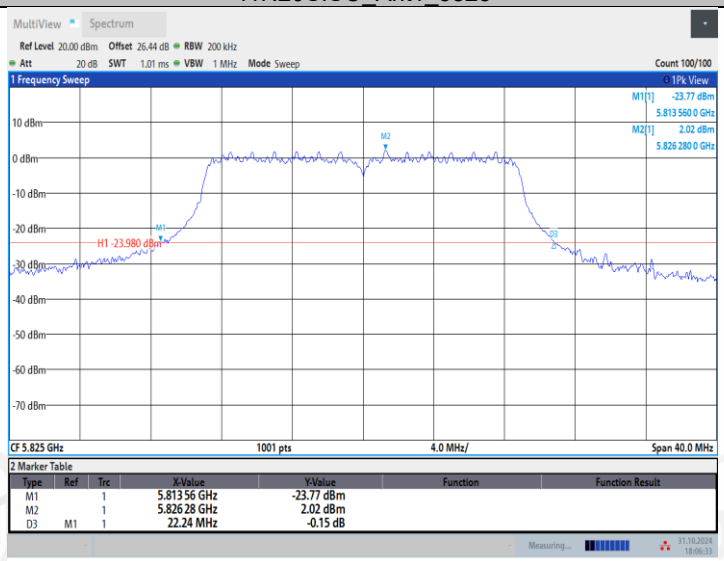

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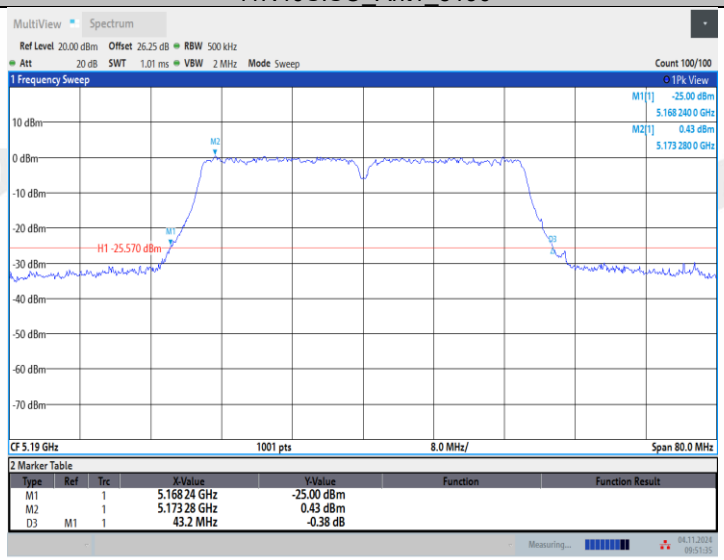

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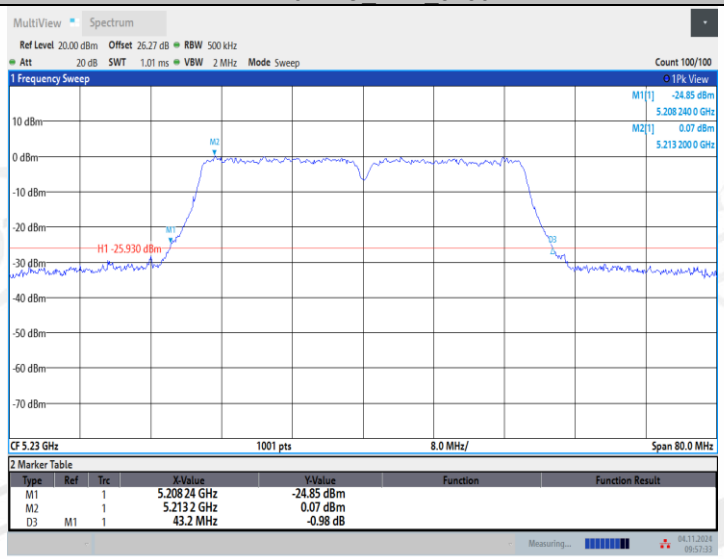

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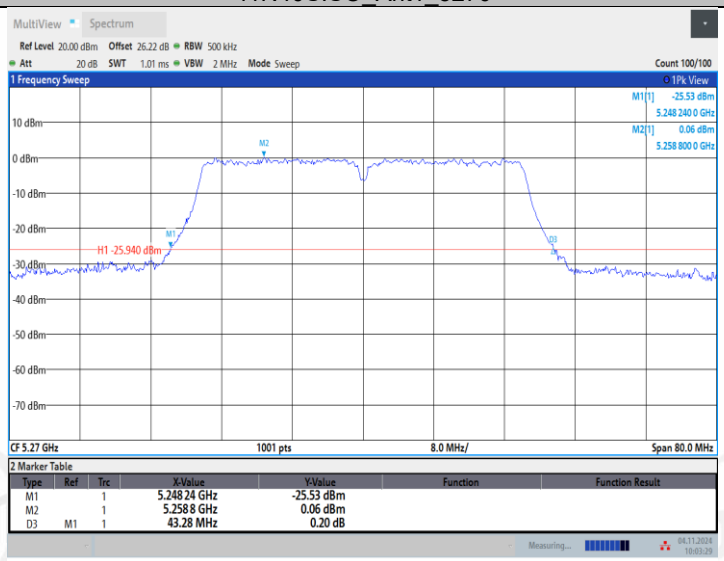

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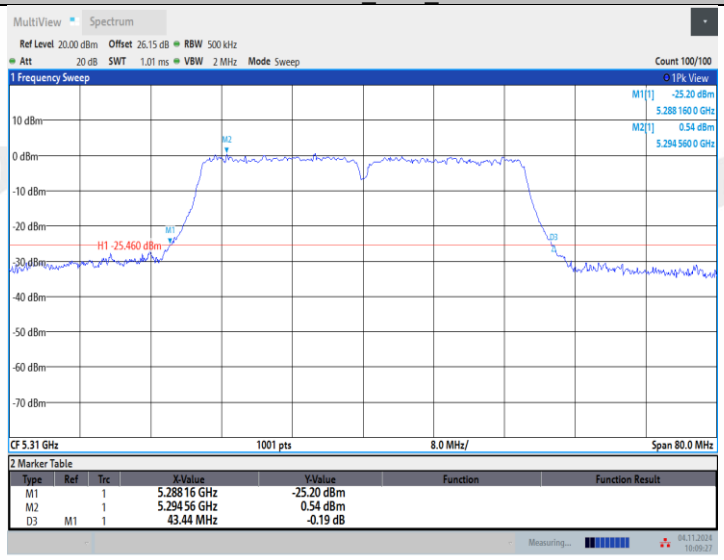

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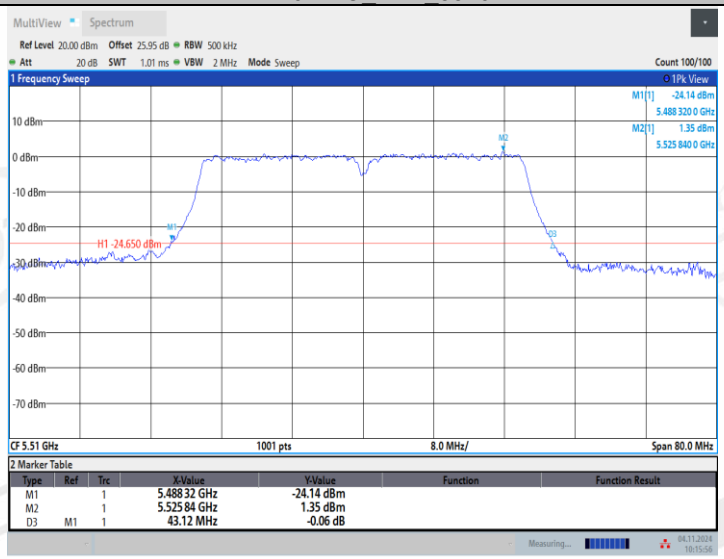

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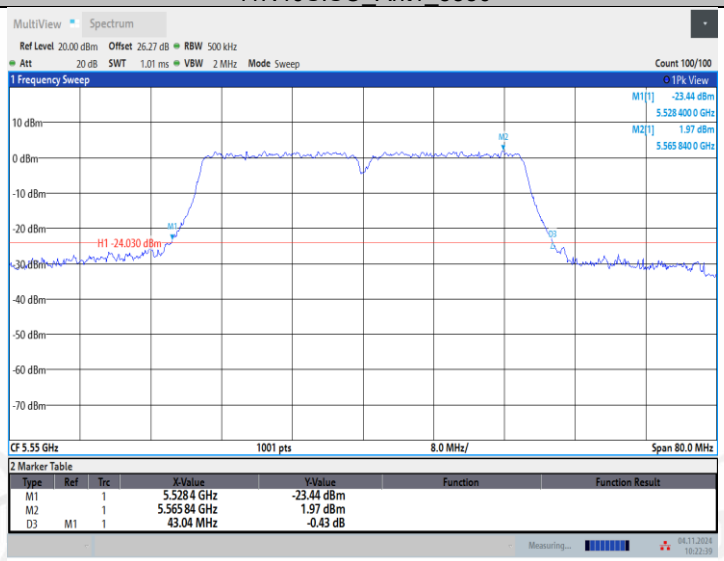

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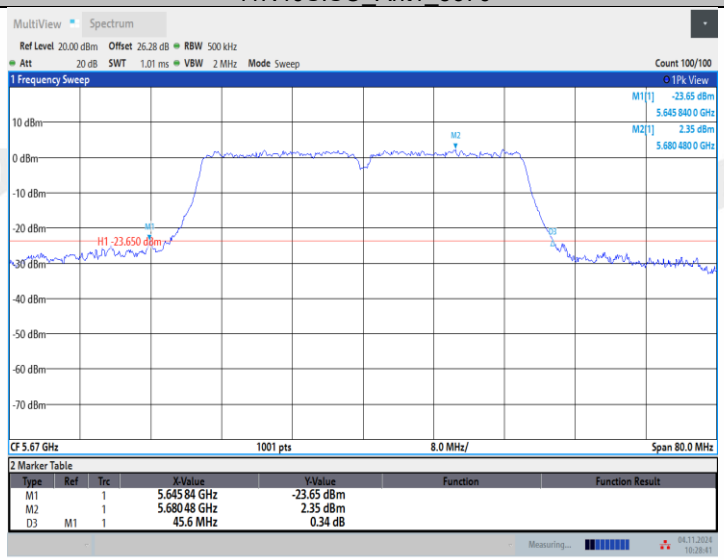

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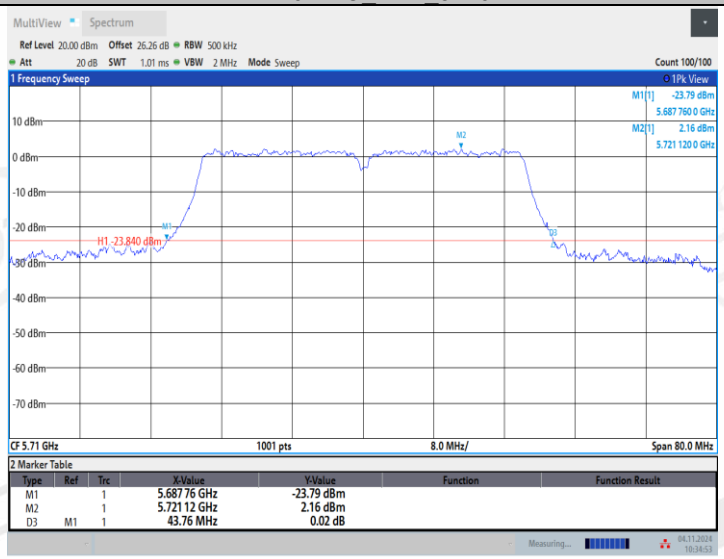

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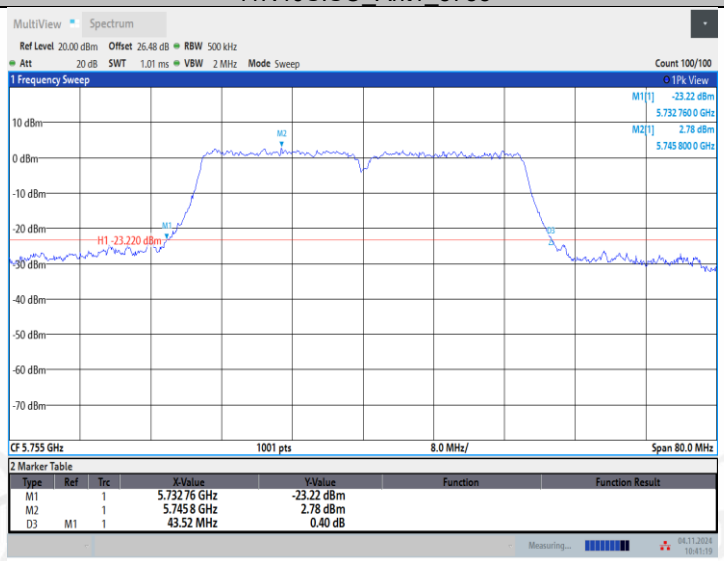

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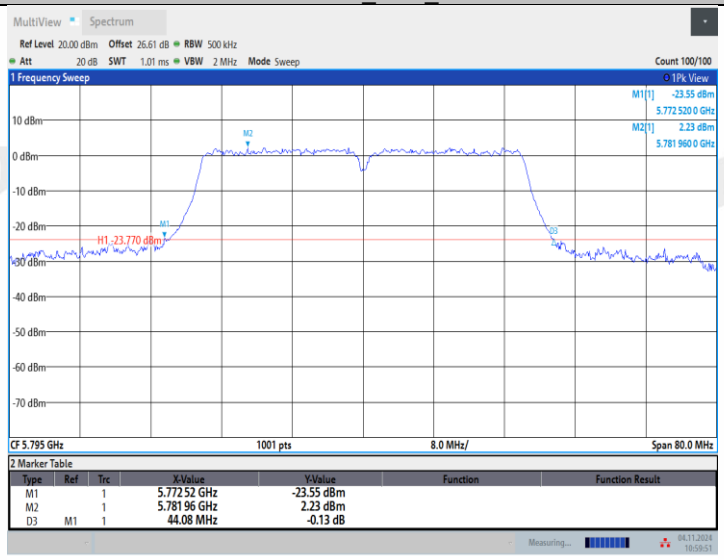

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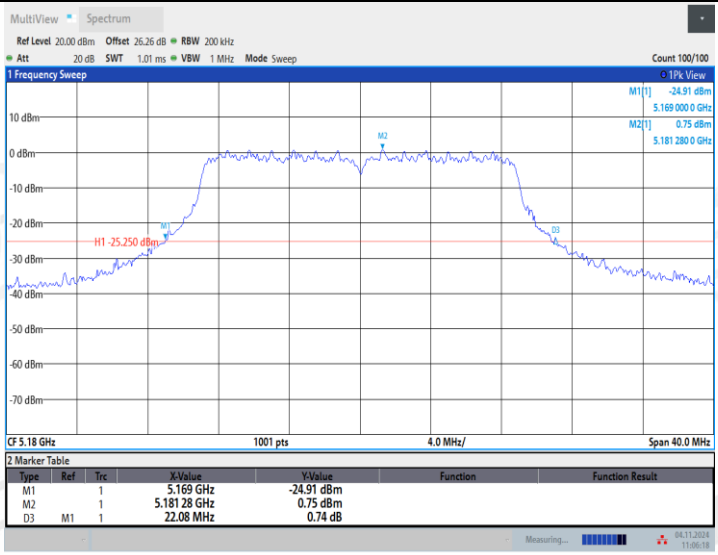

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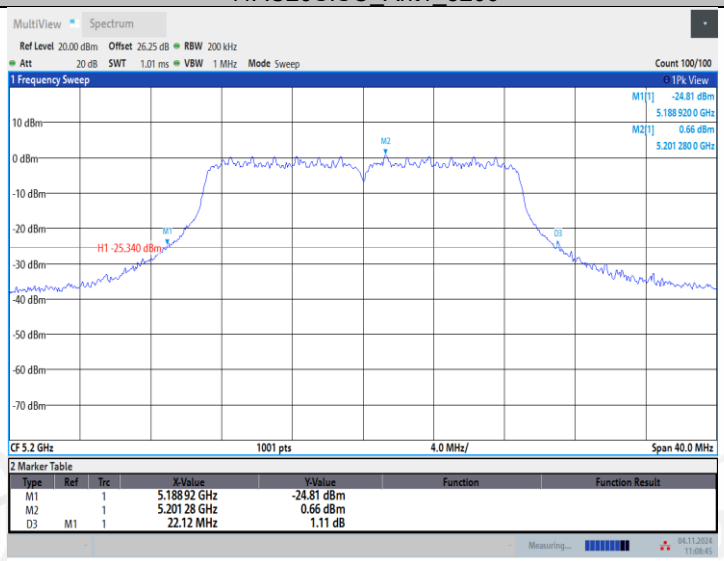

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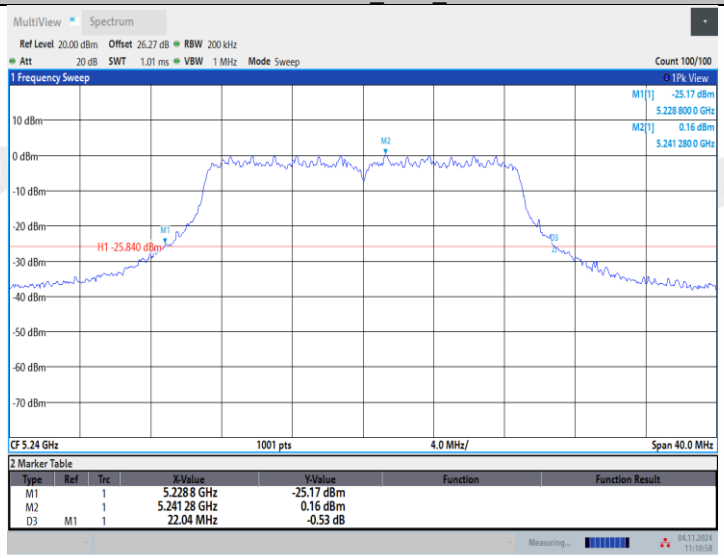

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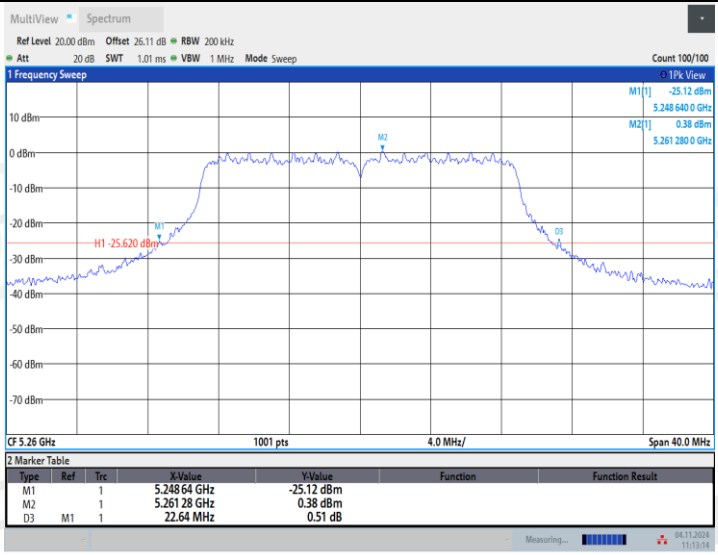

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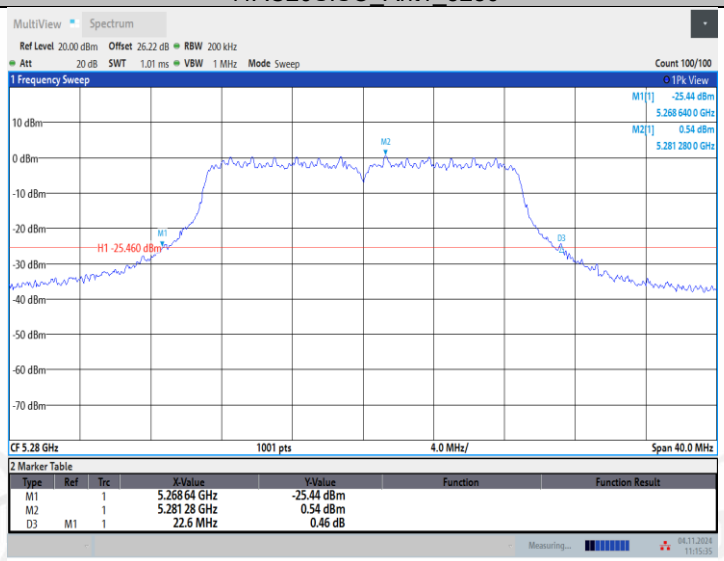

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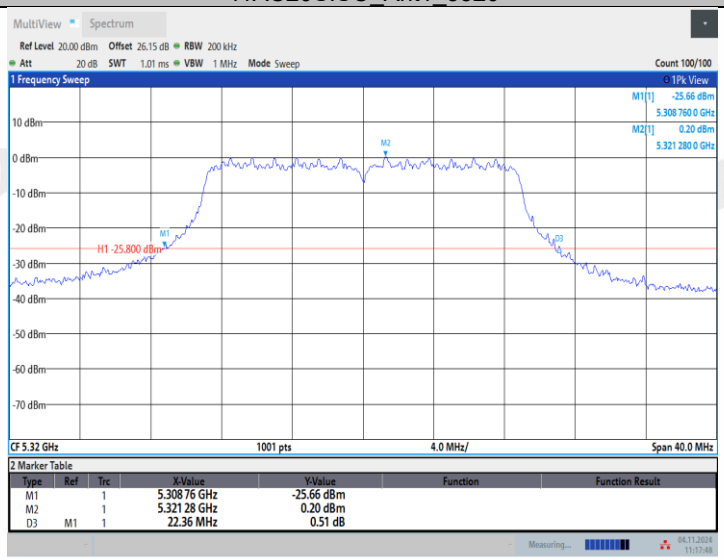

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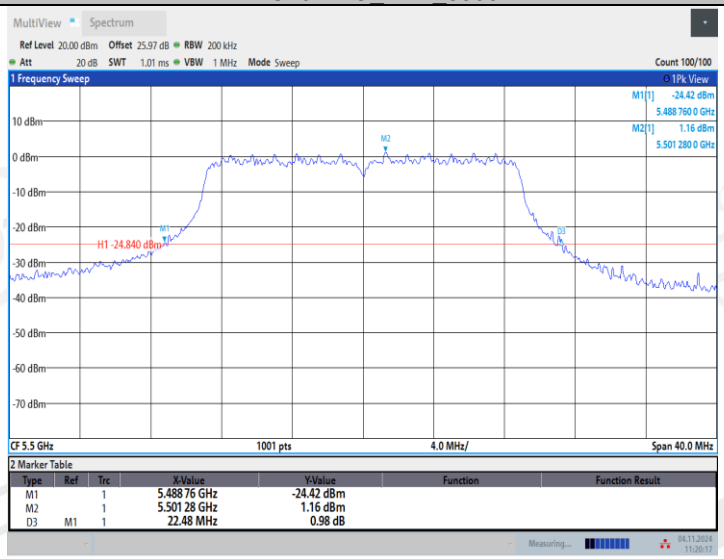

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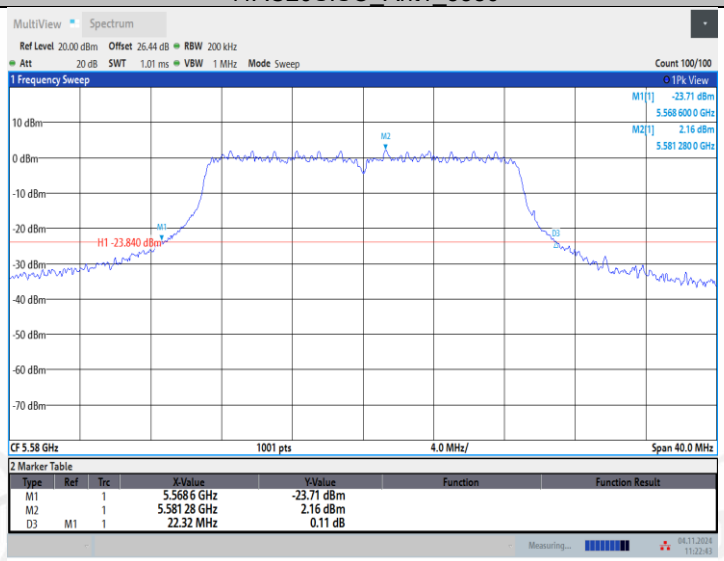

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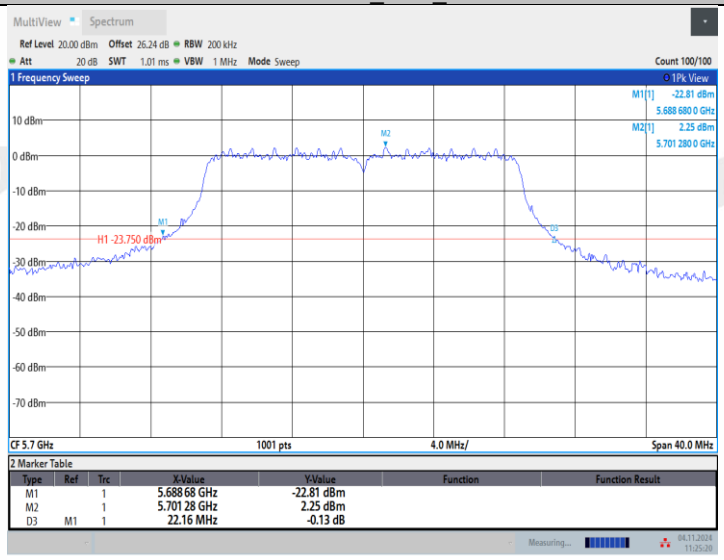

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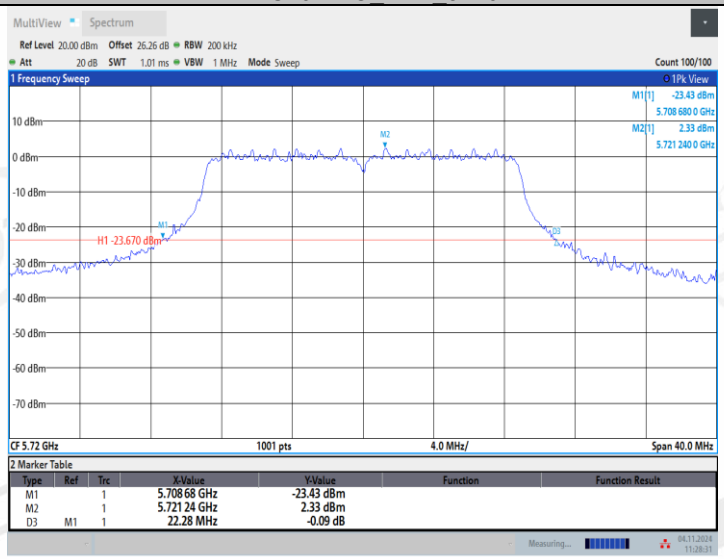

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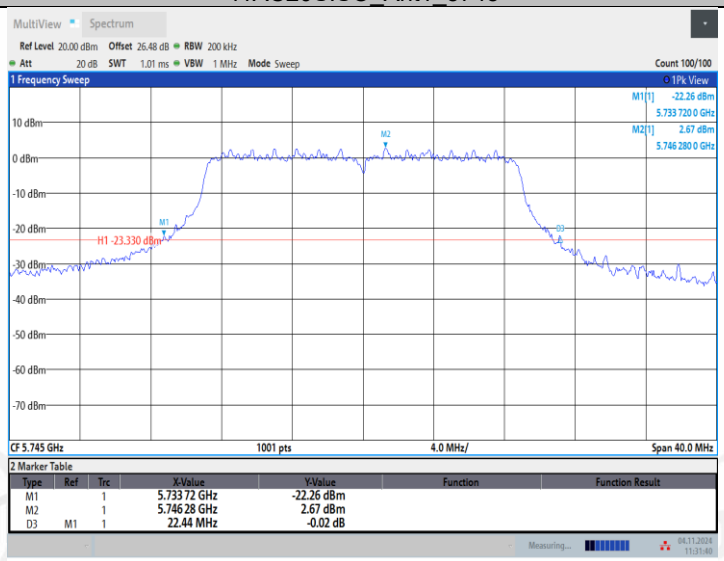

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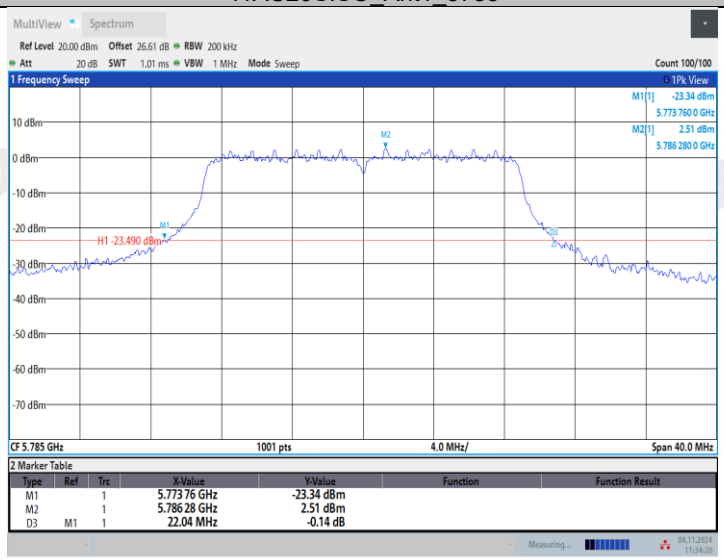

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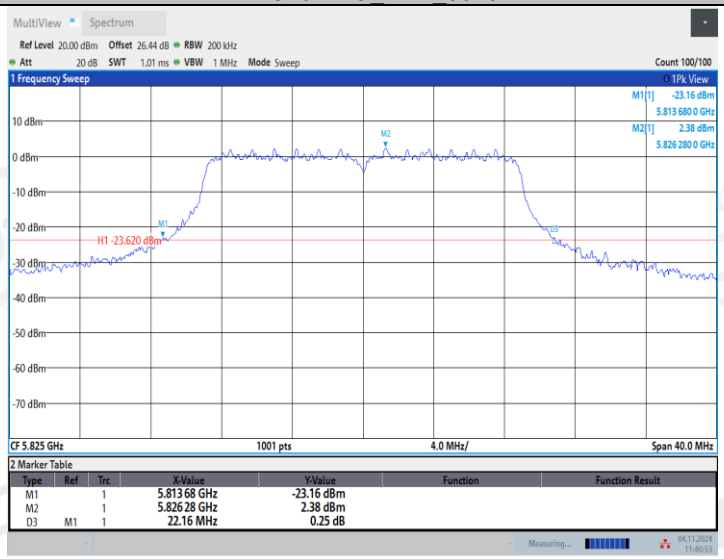

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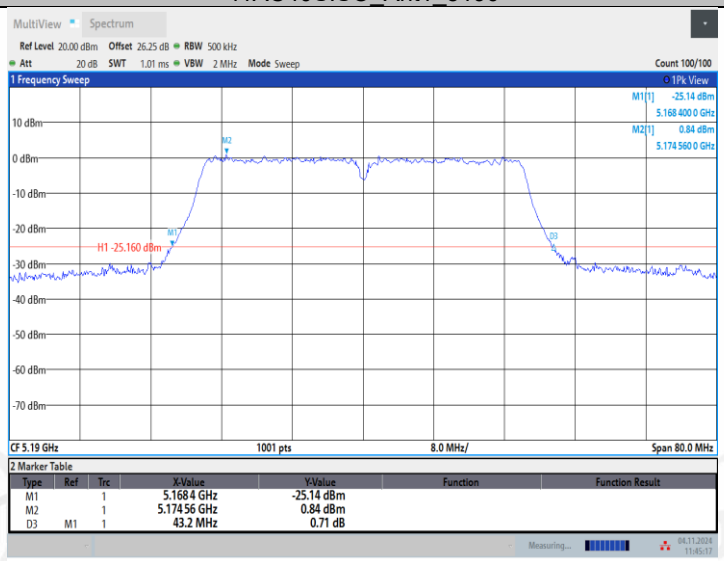

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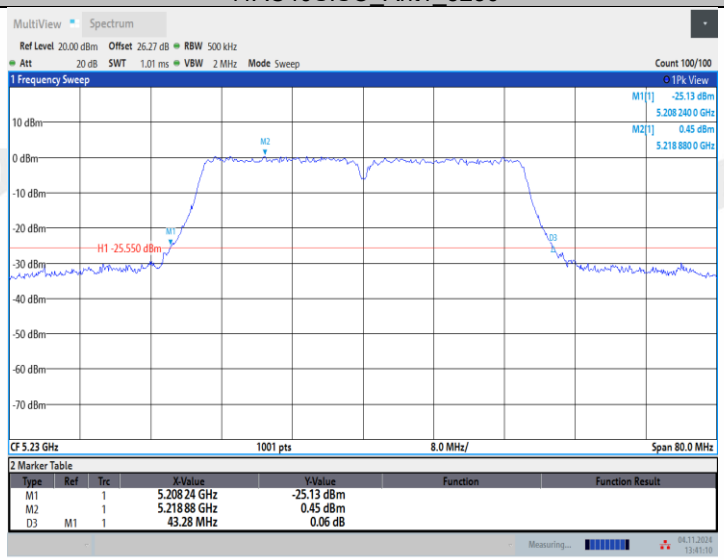

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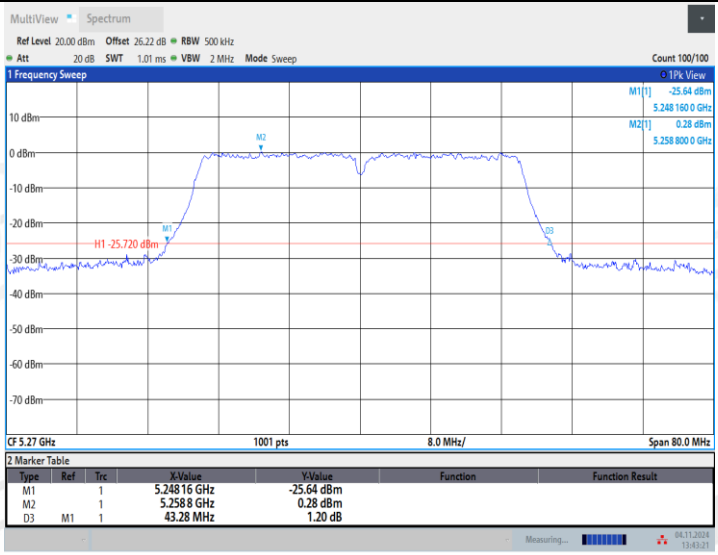

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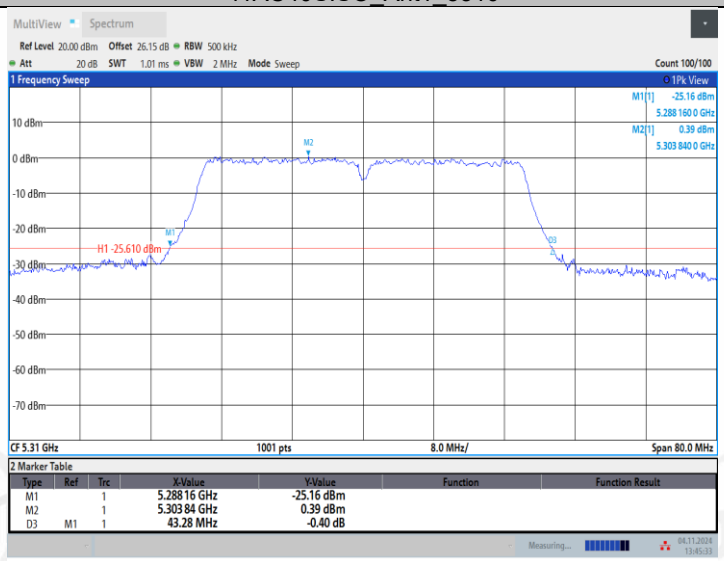

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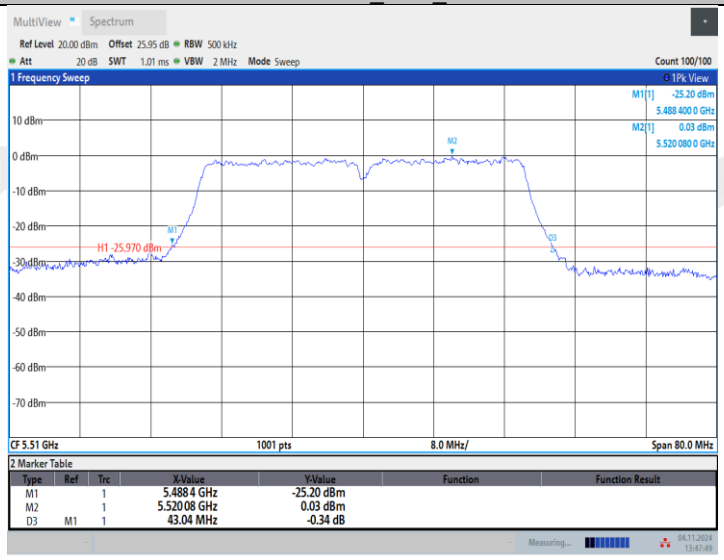

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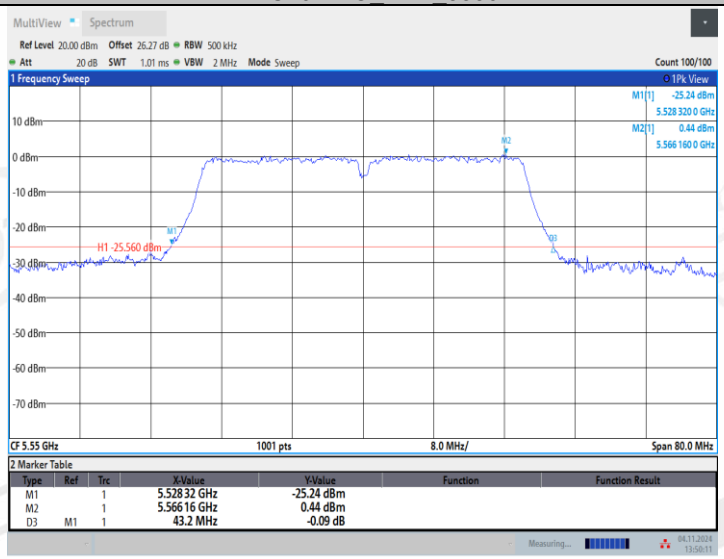

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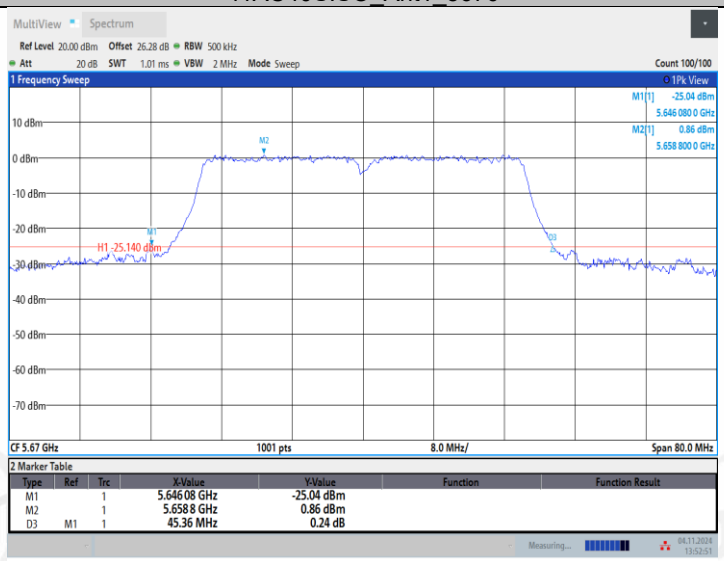

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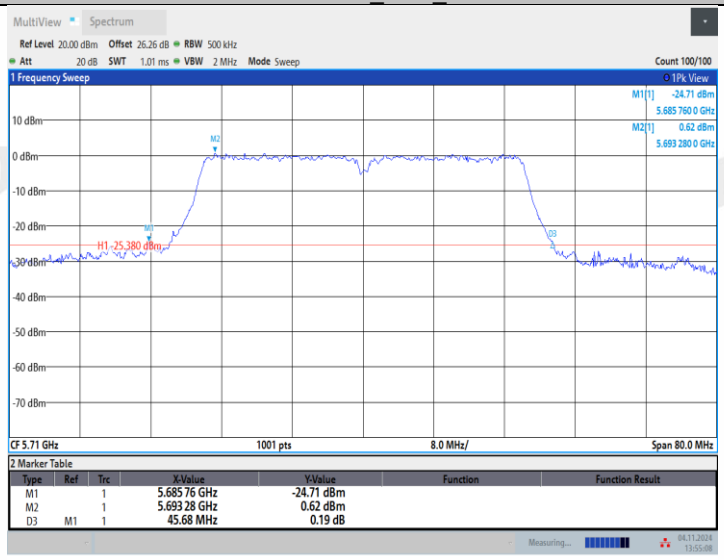

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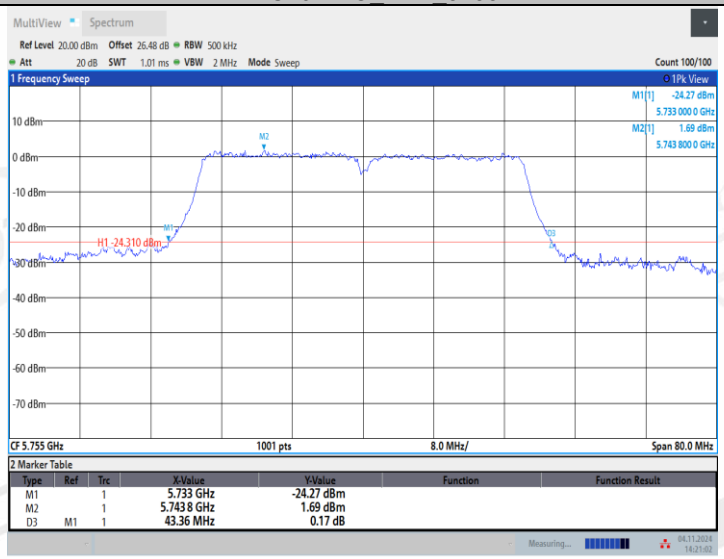

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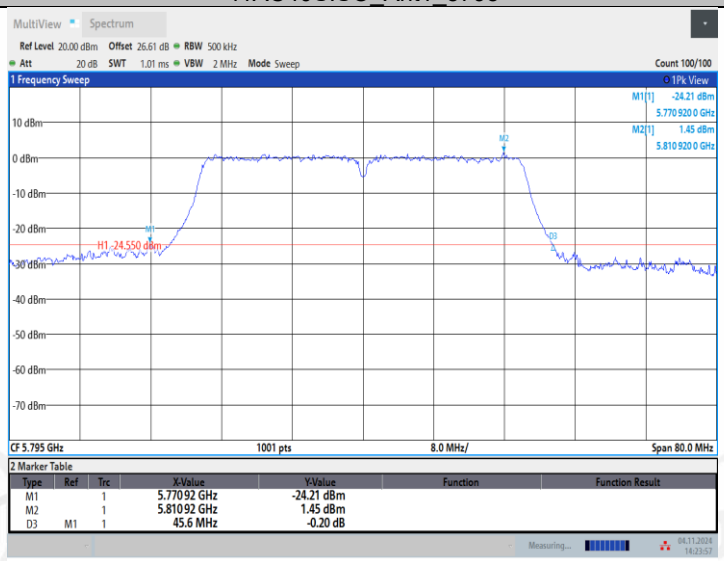

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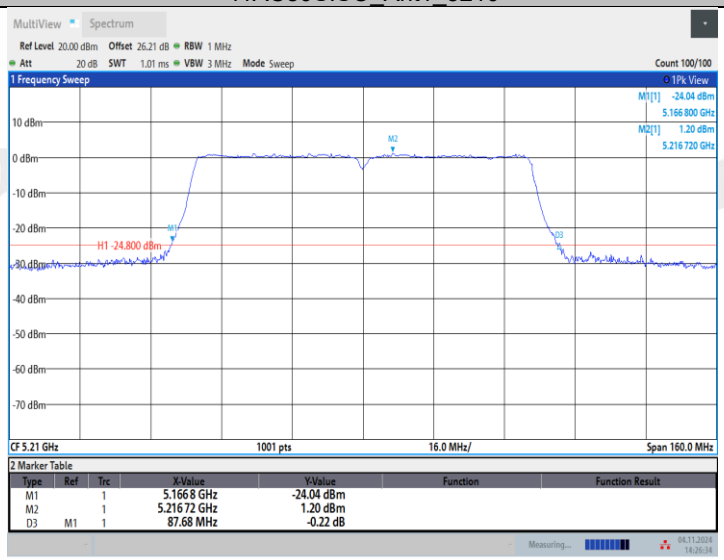

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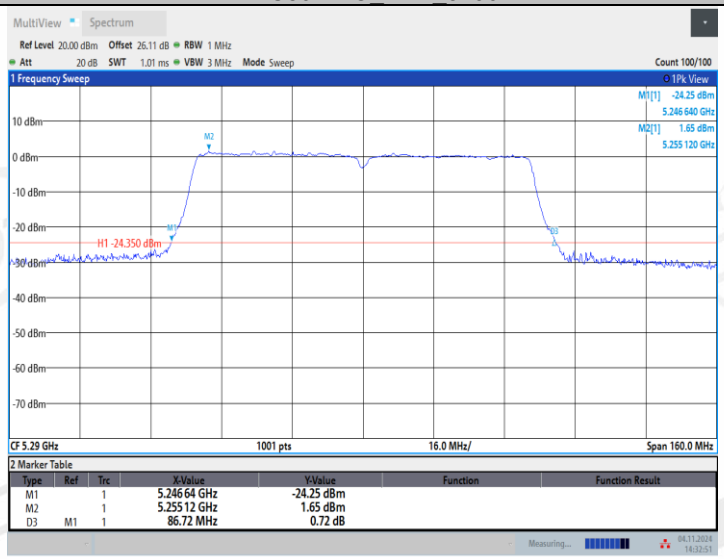

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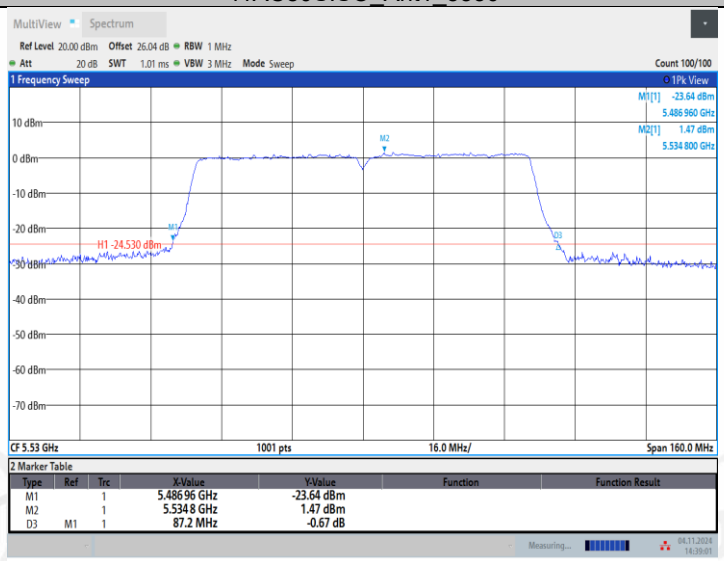

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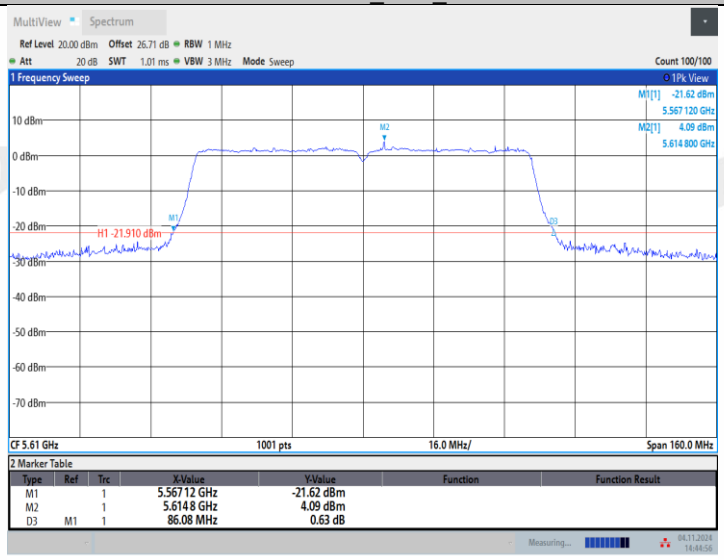

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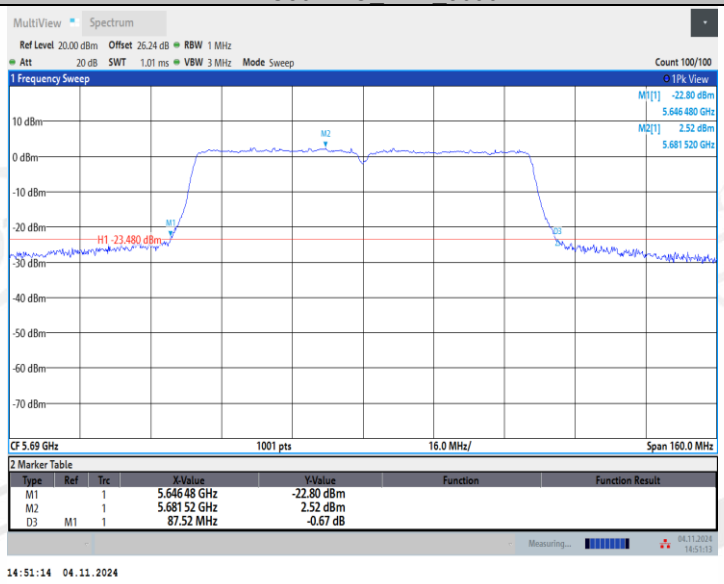
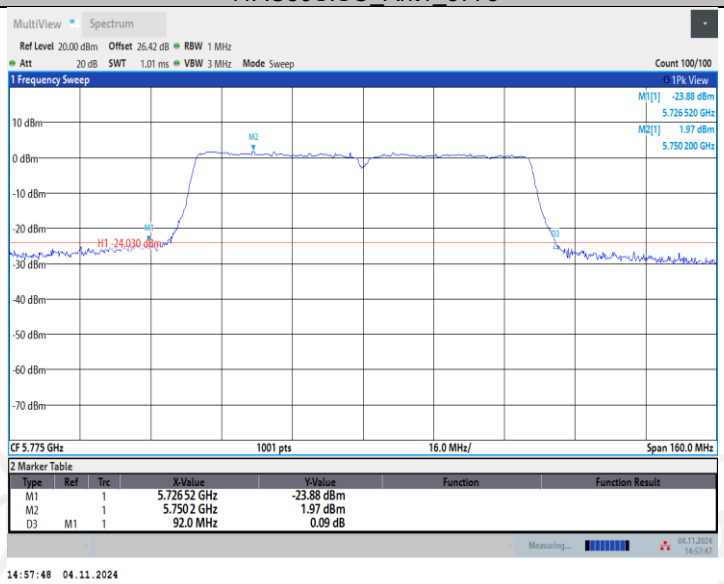
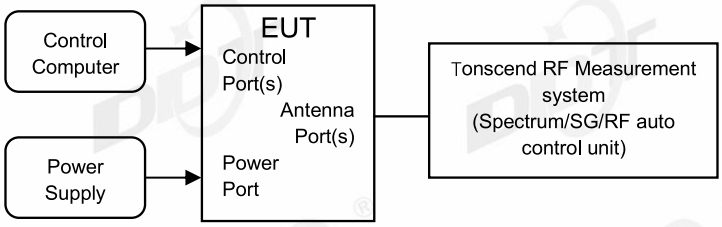


11AC80SISO_Ant1_5775



5. 6dB Bandwidth

5.1. Block diagram of test setup



5.2. Limits

FCC Part15, Subpart E/ RSS-247		
Test Item	Limit	Frequency Range (MHz)
6 dB Bandwidth	Minimum 500 kHz	5725 - 5850

5.3. Test procedure

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

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth: RBW=100 kHz For 26 dB Bandwidth: approximately 1% of the emission bandwidth.
VBW	For 6 dB Bandwidth: VBW=300 kHz For 26 dB Bandwidth: >3 RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

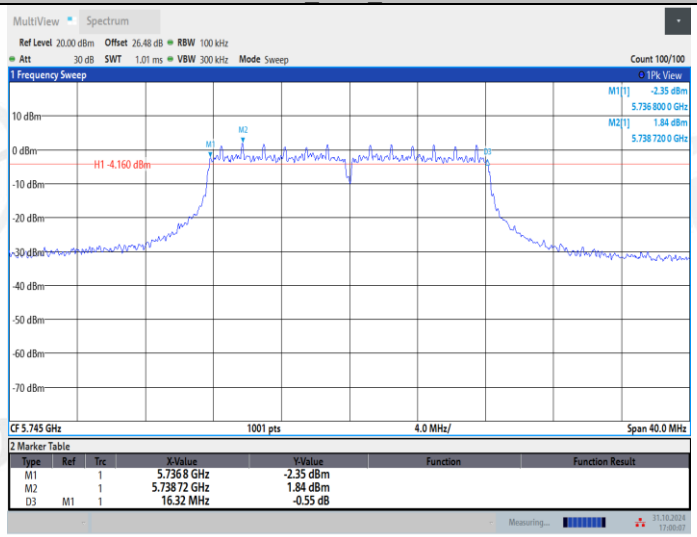
5.4. Test result B4

Test Engineer:	Zoe	Test Site:	RF Measurement System 4#
Ambient Condition:	23.6℃, 48.4%RH	Test Date:	2024.10.23-2024.11.04
Test Power Supply:	DC 12V	Sample Number:	S24101411-001

Test Mode	Antenna	Frequency [MHz]	6db EBW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11A	Ant1	5745	16.32	5736.80	5753.12	0.5	PASS
		5785	16.32	5776.80	5793.12	0.5	PASS
		5825	16.32	5816.80	5833.12	0.5	PASS
11N20SISO	Ant1	5745	17.60	5736.16	5753.76	0.5	PASS
		5785	17.60	5776.16	5793.76	0.5	PASS
		5825	17.60	5816.16	5833.76	0.5	PASS
11N40SISO	Ant1	5755	36.32	5736.84	5773.16	0.5	PASS
		5795	36.32	5776.84	5813.16	0.5	PASS
11AC20SISO	Ant1	5745	17.60	5736.16	5753.76	0.5	PASS
		5785	17.60	5776.16	5793.76	0.5	PASS
		5825	17.60	5816.16	5833.76	0.5	PASS
11AC40SISO	Ant1	5755	36.32	5736.84	5773.16	0.5	PASS
		5795	36.32	5776.84	5813.16	0.5	PASS
11AC80SISO	Ant1	5775	75.84	5736.76	5812.60	0.5	PASS

5.5. Test graphs B4

11A_Ant1_5745



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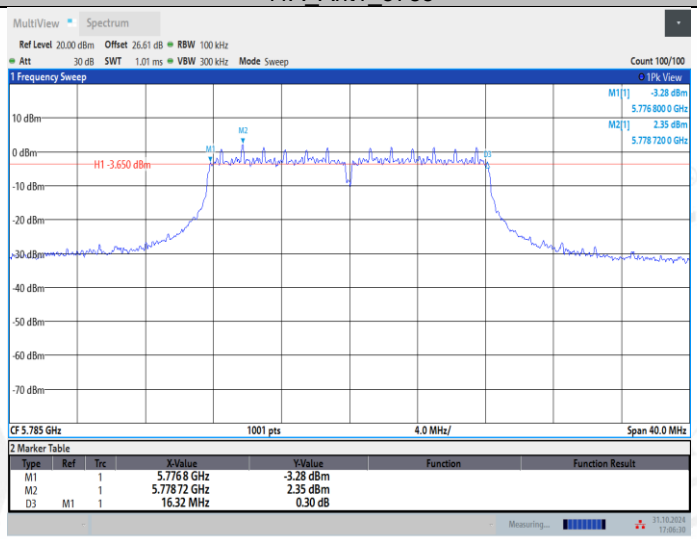

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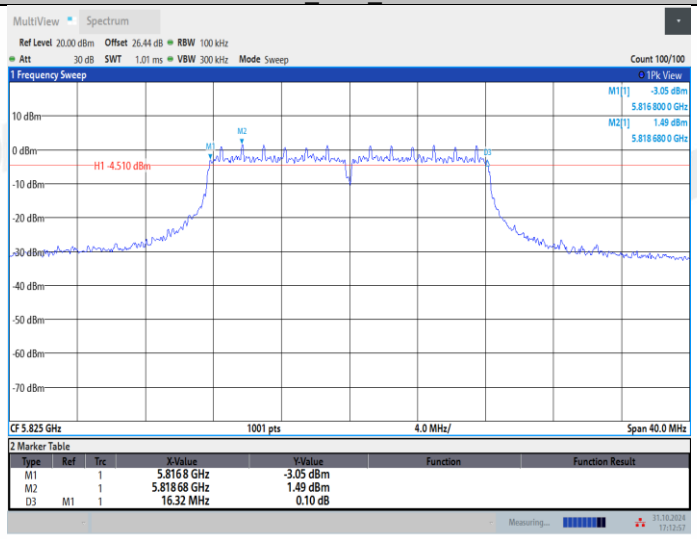

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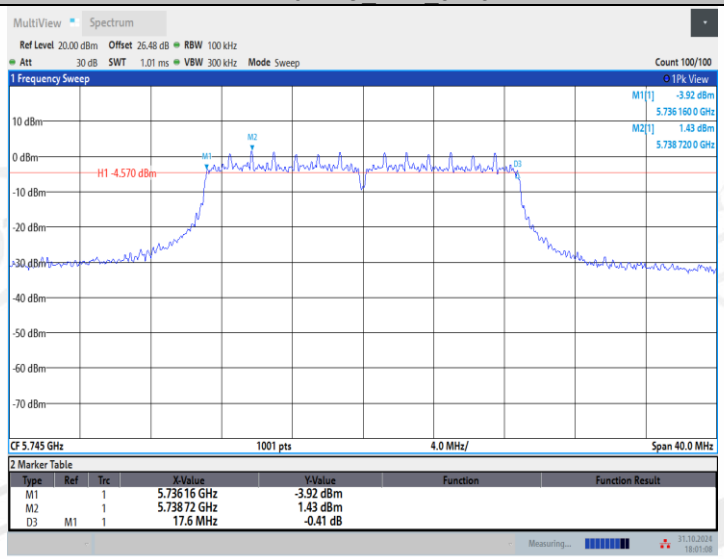

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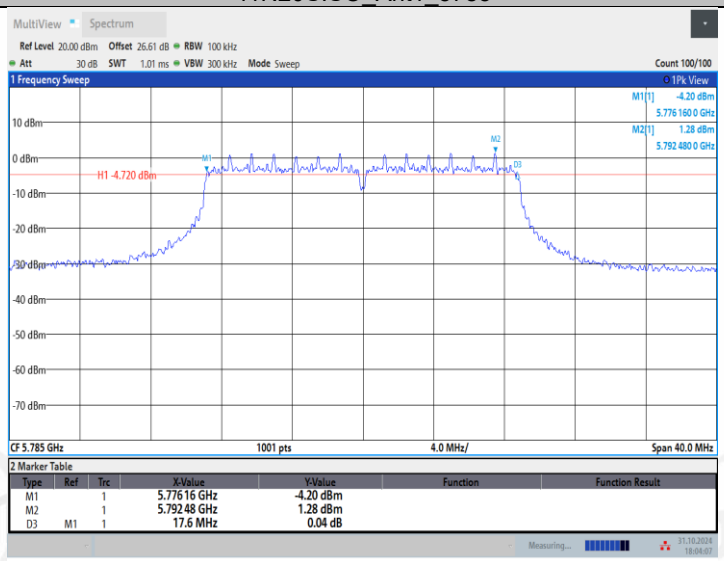

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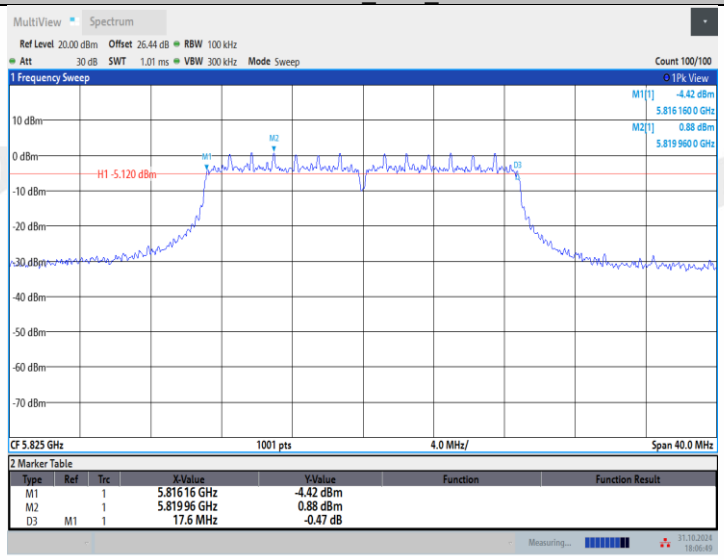

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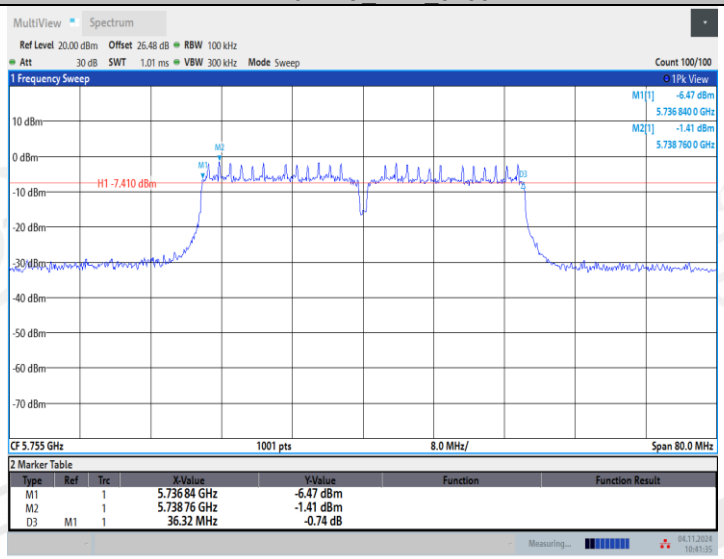

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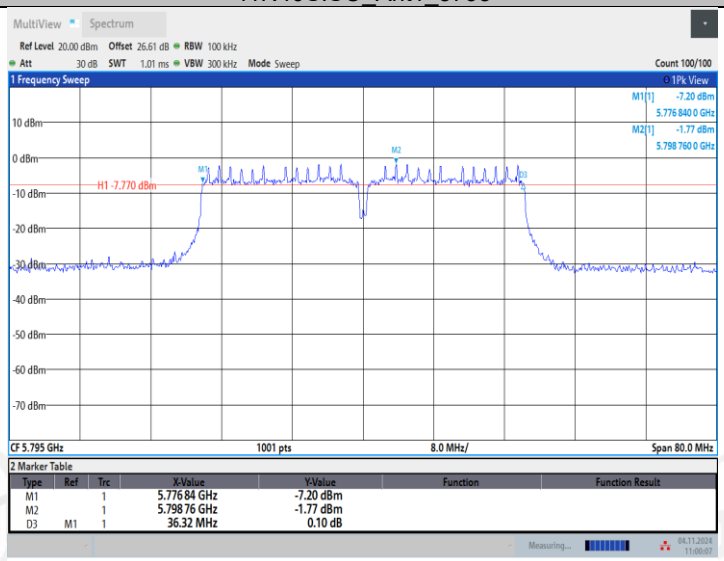

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