FCC RF Test Report

APPLICANT	:	Sonim Technologies, Inc.
EQUIPMENT	:	Smartphone
BRAND NAME	:	Sonim
MODEL NAME	:	X802
FCC ID	:	WYPS3111
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure
TEST DATE(S)	:	Jan. 01, 2025 ~ Feb. 20, 2025

We, Sporton International Inc. (ShenZhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Fly Liang

Approved by: Fly Liang

ACCREDITED
Cert #5145.01

Sporton International Inc. (ShenZhen)

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People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR4O2403E	Rev. 01	Initial issue of report	May 22, 2025

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit for U-NII-1/2A/2C	Limit for U-NII-3	Result	Remark
3.1	2.1049 & 15.403(i)	6dB, 26dB & 99% Bandwidth	-	6dB Bandwidth > 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 24 dBm	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 11 dBm/MHz	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b) & 15.209(a)	15.407(b)(4)(i) &15.209(a)	Pass	Under limit 0.05 dB at 5149.53 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	15.207(a)	Pass	Under limit 10.96 dB at 0.52 MHz
3.6	15.203 & 15.407(a)	Antenna Requirement	15.203 & 15.407(a)	15.203 & 15.407(a)	Pass	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Applicant

Sonim Technologies, Inc.
4445 Eastgate Mall,Suite200,San Diego,CA92121,USA

1.2 Manufacturer

Sonim Technologies, Inc.
4445 Eastgate Mall,Suite200,San Diego,CA92121,USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smartphone
Brand Name	Sonim
Model Name	X802
FCC ID	WYPS3111
HW Version	V1.0
SW Version	X80.0-01-14.0-42.18.00
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5720 MHz 5745 MHz ~ 5825 MHz
Maximum Output Power to Antenna	**MIMO <Ant. 10 + 11>** **<5180 MHz ~ 5240 MHz>** 802.11a : 21.07 dBm / 0.1279 W 802.11n HT20 : 20.61 dBm / 0.1151 W 802.11n HT40 : 21.19 dBm / 0.1315 W 802.11ac VHT20: 20.14 dBm / 0.1033 W 802.11ac VHT40: 20.45 dBm / 0.1109 W 802.11ac VHT80: 17.19 dBm / 0.0524 W 802.11ac VHT160: 15.09 dBm / 0.0323 W 802.11ax HE20: 21.21 dBm / 0.1321 W 802.11ax HE40: 21.84 dBm / 0.1528 W 802.11ax HE80: 17.37 dBm / 0.0546 W 802.11ax HE160: 15.19 dBm / 0.0330 W **<5260 MHz ~ 5320 MHz>** 802.11a : 22.32 dBm / 0.1706 W 802.11n HT20 : 21.96 dBm / 0.1570 W 802.11n HT40 : 21.95 dBm / 0.1567 W 802.11ac VHT20: 21.81 dBm / 0.1517 W 802.11ac VHT40: 21.28 dBm / 0.1343 W 802.11ac VHT80: 16.67 dBm / 0.0465 W 802.11ax HE20: 22.50 dBm / 0.1778 W 802.11ax HE40: 22.20 dBm / 0.1660 W 802.11ax HE80: 16.72 dBm / 0.0470 W **<5500 MHz ~ 5720 MHz >** 802.11a : 22.18 dBm / 0.1652 W 802.11n HT20 : 21.78 dBm / 0.1507 W 802.11n HT40 : 21.58 dBm / 0.1439 W 802.11ac VHT20: 21.45 dBm / 0.1396 W 802.11ac VHT40: 21.33 dBm / 0.1358 W 802.11ac VHT80: 21.19 dBm / 0.1315 W 802.11ac VHT160: 17.04 dBm / 0.0506 W 802.11ax HE20: 22.02 dBm / 0.1592 W 802.11ax HE40: 21.93 dBm / 0.1560 W 802.11ax HE80: 21.27 dBm / 0.1340 W 802.11ax HE160: 17.19 dBm / 0.0524 W **<5745 MHz ~ 5825 MHz>** 802.11a : 13.60 dBm / 0.0229 W 802.11n HT20 : 13.78 dBm / 0.0239 W 802.11n HT40 : 13.84 dBm / 0.0242 W 802.11ac VHT20: 13.72 dBm / 0.0236 W 802.11ac VHT40: 13.77 dBm / 0.0238 W 802.11ac VHT80: 13.42 dBm / 0.0220 W 802.11ax HE20: 14.05 dBm / 0.0254 W 802.11ax HE40: 13.86 dBm / 0.0243 W 802.11ax HE80: 13.48 dBm / 0.0223 W

99% Occupied Bandwidth	**MIMO <Ant. 10 + 11>** **<5180 MHz ~ 5250 MHz>** 802.11a : 17.898 MHz 802.11n HT20 : 18.886 MHz 802.11n HT40 : 38.892 MHz 802.11ac VHT80 : 79.416 MHz 802.11ac VHT160 : 180.366 MHz 802.11ax HE20: 19.994 MHz 802.11ax HE40: 39.964 MHz 802.11ax HE80: 79.720 MHz 802.11ax HE160: 172.719 MHz **<5260 MHz ~ 5320 MHz>** 802.11a : 19.686 MHz 802.11n HT20 : 19.314 MHz 802.11n HT40 : 38.180 MHz 802.11ac VHT80 : 79.560 MHz 802.11ax HE20: 19.974 MHz 802.11ax HE40: 40.524 MHz 802.11ax HE80: 79.896 MHz **<5500 MHz ~ 5720 MHz>** 802.11a : 16.850 MHz 802.11n HT20 : 17.990 MHz 802.11n HT40 : 36.732 MHz 802.11ac VHT80 : 79.656 MHz 802.11ac VHT160 : 159.984 MHz 802.11ax HE20: 19.926 MHz 802.11ax HE40: 39.692 MHz 802.11ax HE80: 79.608 MHz 802.11ax HE160: 163.536 MHz **<5745 MHz ~ 5825 MHz>** 802.11a : 17.258 MHz 802.11n HT20 : 18.262 MHz 802.11n HT40 : 37.108 MHz 802.11ac VHT80 : 79.928 MHz 802.11ax HE20: 19.834 MHz 802.11ax HE40: 39.220 MHz 802.11ax HE80: 79.928 MHz
Antenna Type / Gain	**<5180 MHz ~ 5240 MHz>** <Ant. 10> : PIFA Antenna with gain 0.71 dBi <Ant. 11> : PIFA Antenna with gain -4.31 dBi **<5260 MHz ~ 5320 MHz>** <Ant. 10> : PIFA Antenna with gain 2.30 dBi <Ant. 11> : PIFA Antenna with gain -4.31 dBi **<5500 MHz ~ 5720 MHz>** <Ant. 10> : PIFA Antenna with gain 3.78 dBi <Ant. 11> : PIFA Antenna with gain -7.22 dBi **<5745 MHz ~ 5825 MHz>** <Ant. 10> : PIFA Antenna with gain 2.40 dBi <Ant. 11> : PIFA Antenna with gain -8.28 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) 802.11ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)

Note:

1. For 802.11n/ac mode, the whole testing has assessed only 802.11n HT20/HT40 by referring to

their higher conducted power.

2. WLAN MIMO only support STBC mode, for WLAN SISO & MIMO (STBC) mode, the whole testing has assessed only MIMO mode to cover SISO mode.
3. 802.11ax support full RU tone and partial RU tone, both full RU and partial RU-left (for low CH) and partial RU-right (for high CH) are tested for conducted power/PSD/RSE, the full RU power > partial RU, therefore the full RU perform full test and Partial RU verified power/PSD/RSE

1.5 Modification of EUT

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

1.6 Testing Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	TH01-SZ CO02-SZ 03CH04-SZ	CN1256	421272

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-SZ	AUDIX	E3	6.2009-8-24
2.	CO02-SZ	AUDIX	E3	6.120613b

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5180-5240 MHz U-NII-1	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42#	5210	50##	5250

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5260-5320 MHz U-NII-2A	52	5260	60	5300
	54*	5270	62*	5310
	56	5280	64	5320
	58#	5290	-	-

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5500-5720MHz U-NII-2C	100	5500	112	5560
	102*	5510	116	5580
	104	5520	132	5660
	106#	5530	134*	5670
	108	5540	136	5680
	110*	5550	140	5700

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5745-5825 MHz U-NII-3	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155#	5775	165	5825

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
TDWR Channel	118*	5590	124	5620
	120	5600	126*	5630
	122#	5610	128	5640
	-	-	114##	5570

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
Straddle Channel	138#	5690	144	5720
	142*	5710	-	-

Note:

1. The above Frequency and Channel in "*" are 40MHz bandwidth.
2. The above Frequency and Channel in "#" are 80MHz bandwidth.
3. The above Frequency and Channel in "##" are 160MHz bandwidth.

2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

MIMO Mode

Modulation	Data Rate
802.11a	**6 Mbps**
802.11n HT20	**MCS8**
802.11n HT40	**MCS8**
802.11ac VHT80	**MCS8**
802.11ac VHT160	**MCS8**
802.11ax HE20	**MCS8**
802.11ax HE40	**MCS8**
802.11ax HE80	**MCS8**
802.11ax HE160	**MCS8**

AC Conducted Emission	Mode 1 : WCDMA B5 Idle + BT Link + WLAN Link(5G) + Battery + USB Cable (Charging from Adapter)
Remark: For Radiated Test Cases, The tests were performance with Adapter and USB Cable.	

RSE Co-location
802.11ax HE40 CH38 5190MHz + BLE_2M CH00 + LTE Band48 Link

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		20M BW	20M BW	20M BW	20M BW
L	Low	36	52	100	149
M	Middle	44	60	116	157
H	High	48	64	140	165
Straddle		-	-	144	-

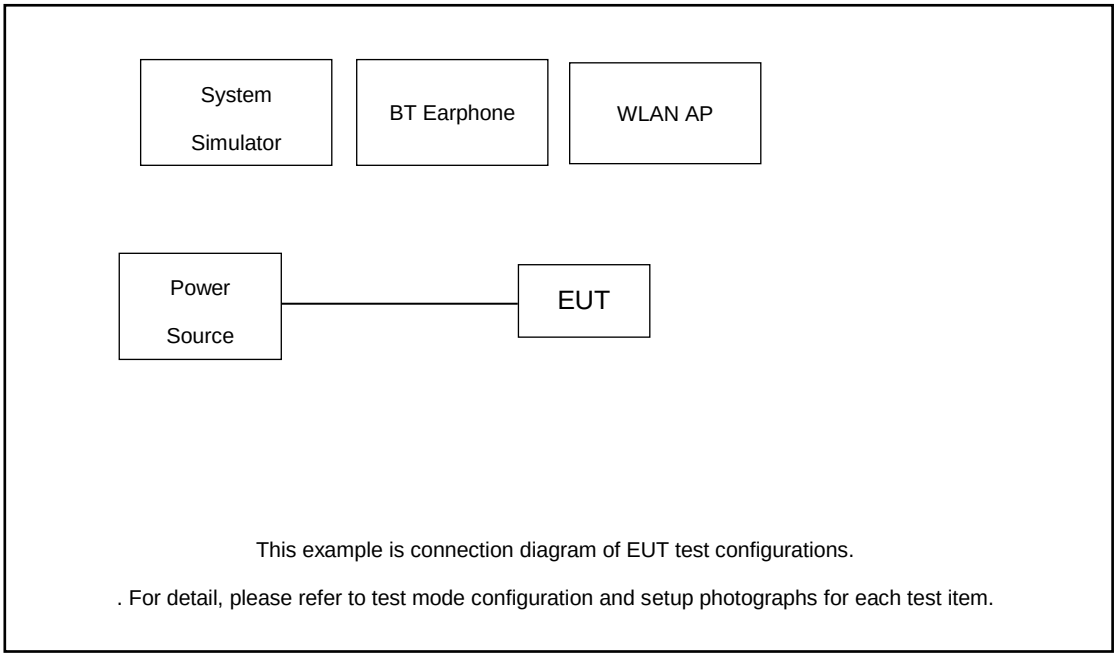
Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		40M BW	40M BW	40M BW	40M BW
L	Low	38	54	102	151
M	Middle	-	-	110	-
H	High	46	62	134	159
Straddle		-	-	142	-

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		80M BW	80M BW	80M BW	80M BW
L	Low	-	-	106	-
M	Middle	42	58	-	155
H	High	-	-	-	-
Straddle		-	-	138	-

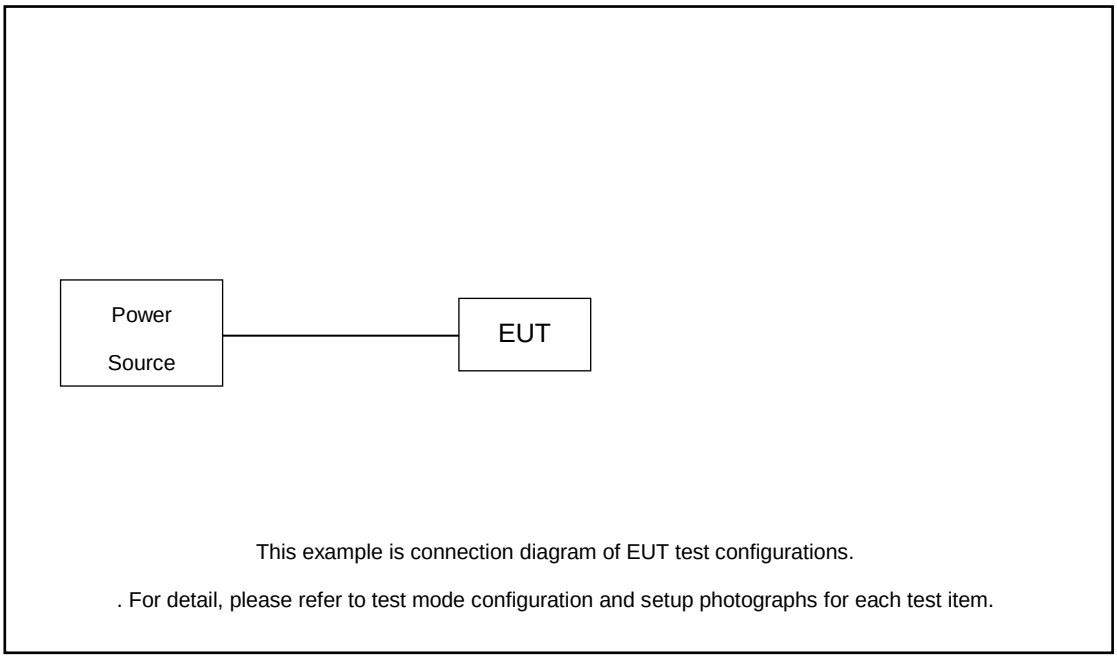
Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		160M BW		160M BW	160M BW
M	Middle	50		114	-

2.3 Connection Diagram of Test System

AC Conducted Emission:



Radiated Emission:



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
3.	Bluetooth Earphone	Samsung	EO-MG900	PYAHS-107W	N/A	N/A

2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuously transmit.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.53 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.53 + 10 = 14.53 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

26dB and 99% Occupied bandwidth are reporting only.

3.1.2 Measuring Instruments

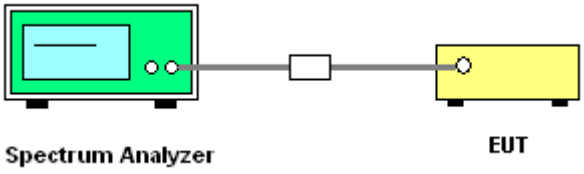
The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

☒	Section C) Bandwidth Measurement 1. Emission Bandwidth (EBW) and 99% OBW
	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 peak 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.** For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set to 1%~5% of the OBW and set the Video bandwidth (VBW) ≥ 3 * RBW. **7.** Measure and record the results in the test report.
☒	Section C) Bandwidth Measurement 2. Minimum Emission Bandwidth for the band 5.725 - 5.85 GHz
	1. Set RBW = 100kHz. **2.** Set the VBW ≥ 3 x RBW. **3.** Detector = Peak. **4.** Trace mode = max hold **5.** Measure the maximum width of the emission that is 6 dB down from the peak of the emission. **6.** Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For mobile and portable 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.

For the 5.25–5.725 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 $\log_{10}$ B, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, 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 permitted e.i.r.p. of 1 W.

.

3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

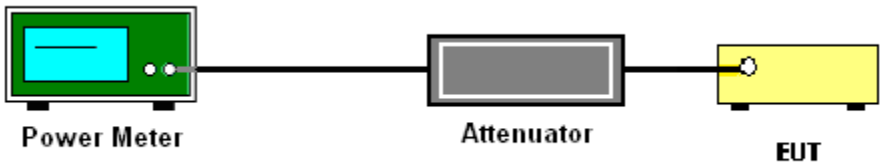
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, 10 log(1/x), where x is the duty cycle.
4. For MIMO mode, the measure-and-sum technique should be used for measuring the in-band transmit power of a device.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

U-NII-1																
Mod.	Data Rate	NTX	CH.	RU Config	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail	Power Setting
						Ant 11	Ant 10	Ant 11	Ant 10	SUM	Ant 11	Ant 10	Ant 11	Ant 10		
11a	6Mbps	2	36	Full	5180	0.00	0.00	16.22	16.35	19.30	24.00		0.71		Pass	16.5
11a	6Mbps	2	44	Full	5220	0.00	0.00	18.07	18.04	21.07	24.00		0.71		Pass	18.5
11a	6Mbps	2	48	Full	5240	0.00	0.00	17.69	17.65	20.68	24.00		0.71		Pass	18
HT20	MCS8	2	36	Full	5180	0.00	0.00	14.34	14.57	17.47	24.00		0.71		Pass	15
HT20	MCS8	2	44	Full	5220	0.00	0.00	17.66	17.54	20.61	24.00		0.71		Pass	18.5
HT20	MCS8	2	48	Full	5240	0.00	0.00	17.29	17.28	20.30	24.00		0.71		Pass	18
HT40	MCS8	2	38	Full	5190	0.00	0.00	14.72	15.13	17.94	24.00		0.71		Pass	15
HT40	MCS8	2	46	Full	5230	0.00	0.00	18.11	18.25	21.19	24.00		0.71		Pass	18.5
VHT20	MCS8	2	36	Full	5180	0.00	0.00	12.42	14.24	16.43	24.00		0.71		Pass	15
VHT20	MCS8	2	44	Full	5220	0.00	0.00	17.64	16.56	20.14	24.00		0.71		Pass	18.5
VHT20	MCS8	2	48	Full	5240	0.00	0.00	17.28	16.41	19.88	24.00		0.71		Pass	18
VHT40	MCS8	2	38	Full	5190	0.00	0.00	14.45	15.12	17.81	24.00		0.71		Pass	15
VHT40	MCS8	2	46	Full	5230	0.00	0.00	18.02	16.76	20.45	24.00		0.71		Pass	18.5
VHT80	MCS8	2	42	Full	5210	0.00	0.00	14.39	13.95	17.19	24.00		0.71		Pass	14.5
VHT160	MCS8	2	50	Full	5250	0.00	0.00	12.59	11.51	15.09	24.00		0.71		Pass	12.5
HE20	MCS8	2	36	Full	5180	0.00	0.00	14.44	16.25	18.45	24.00		0.71		Pass	17
			44	Full	5220	0.00	0.00	18.52	17.56	21.08	24.00		0.71		Pass	19
			48	Full	5240	0.00	0.00	18.77	17.55	21.21	24.00		0.71		Pass	19
HE40	MCS8	2	38	Full	5190	0.00	0.00	14.76	15.40	18.10	24.00		0.71		Pass	16
			46	Full	5230	0.00	0.00	19.30	18.30	21.84	24.00		0.71		Pass	19.5
HE80	MCS8	2	42	Full	5210	0.00	0.00	14.55	14.16	17.37	24.00		0.71		Pass	14.5
HE160	MCS8	2	50	Full	5250	0.00	0.00	12.73	11.56	15.19	24.00		0.71		Pass	12.5

U-NII-2A																
Mod.	Data Rate	NTX	CH.	RU Config	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail	Power Setting
						Ant 11	Ant 10	Ant 11	Ant 10	SUM	Ant 11	Ant 10	Ant 11	Ant 10			
11a	6Mbps	2	52	Full	5260	0.00	0.00	19.49	19.13	22.32	23.98		2.30		26.99	Pass	19.5
11a	6Mbps	2	60	Full	5300	0.00	0.00	19.37	19.18	22.29	23.98		2.30		26.99	Pass	19.5
11a	6Mbps	2	64	Full	5320	0.00	0.00	16.19	16.09	19.15	23.98		2.30		26.99	Pass	16
HT20	MCS8	2	52	Full	5260	0.00	0.00	18.97	18.88	21.94	23.98		2.30		26.99	Pass	19.5
HT20	MCS8	2	60	Full	5300	0.00	0.00	18.98	18.92	21.96	23.98		2.30		26.99	Pass	19.5
HT20	MCS8	2	64	Full	5320	0.00	0.00	15.34	15.35	18.36	23.98		2.30		26.99	Pass	15.5
HT40	MCS8	2	54	Full	5270	0.00	0.00	18.90	18.98	21.95	23.98		2.30		26.99	Pass	19
HT40	MCS8	2	62	Full	5310	0.00	0.00	15.71	15.70	18.72	23.98		2.30		26.99	Pass	15.5
VHT20	MCS8	2	52	Full	5260	0.00	0.00	18.91	18.52	21.73	23.98		2.30		26.99	Pass	19.5
VHT20	MCS8	2	60	Full	5300	0.00	0.00	18.95	18.65	21.81	23.98		2.30		26.99	Pass	19.5
VHT20	MCS8	2	64	Full	5320	0.00	0.00	15.32	15.14	18.24	23.98		2.30		26.99	Pass	15.5
VHT40	MCS8	2	54	Full	5270	0.00	0.00	18.55	17.96	21.28	23.98		2.30		26.99	Pass	19
VHT40	MCS8	2	62	Full	5310	0.00	0.00	15.36	15.38	18.38	23.98		2.30		26.99	Pass	15.5
VHT80	MCS8	2	58	Full	5290	0.00	0.00	14.02	13.27	16.67	23.98		2.30		26.99	Pass	13.5
HE20	MCS8	2	52	Full	5260	0.00	0.00	19.43	19.03	22.24	23.98		2.30		26.99	Pass	20
			60	Full	5300	0.00	0.00	19.77	19.18	22.50	23.98		2.30		26.99	Pass	20
			64	Full	5320	0.00	0.00	16.14	15.65	18.91	23.98		2.30		26.99	Pass	16
HE40	MCS8	2	54	Full	5270	0.00	0.00	19.37	19.00	22.20	23.98		2.30		26.99	Pass	19.5
			62	Full	5310	0.00	0.00	16.19	15.90	19.06	23.98		2.30		26.99	Pass	16
HE80	MCS8	2	58	Full	5290	0.00	0.00	14.05	13.35	16.72	23.98		2.30		26.99	Pass	13.5

U-NII-2C																
Mod.	Data Rate	NTX	CH.	RU Config	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail	Power Setting
						Ant 11	Ant 10	Ant 11	Ant 10	SUM	Ant 11	Ant 10	Ant 11	Ant 10			
11a	6Mbps	2	100	Full	5500	0.00	0.00	17.22	17.30	20.27	23.98		3.78		26.99	Pass	17.5
11a	6Mbps	2	116	Full	5580	0.00	0.00	19.00	19.11	22.07	23.98		3.78		26.99	Pass	19.5
11a	6Mbps	2	140	Full	5700	0.00	0.00	16.80	16.84	19.83	23.98		3.78		26.99	Pass	17
11a	6Mbps	2	144	Full	5720	0.00	0.00	19.02	19.31	22.18	23.98		3.78		26.99	Pass	19.5
HT20	MCS8	2	100	Full	5500	0.00	0.00	15.96	15.83	18.91	23.98		3.78		26.99	Pass	16.5
HT20	MCS8	2	116	Full	5580	0.00	0.00	17.15	17.18	20.18	23.98		3.78		26.99	Pass	18
HT20	MCS8	2	140	Full	5700	0.00	0.00	16.44	16.69	19.58	23.98		3.78		26.99	Pass	17
HT20	MCS8	2	144	Full	5720	0.00	0.00	18.49	19.03	21.78	23.98		3.78		26.99	Pass	19.5
HT40	MCS8	2	102	Full	5510	0.00	0.00	16.32	16.30	19.32	23.98		3.78		26.99	Pass	16.5
HT40	MCS8	2	110	Full	5550	0.00	0.00	18.56	18.58	21.58	23.98		3.78		26.99	Pass	19
HT40	MCS8	2	134	Full	5670	0.00	0.00	18.38	18.73	21.57	23.98		3.78		26.99	Pass	19
HT40	MCS8	2	142	Full	5710	0.00	0.00	18.04	18.25	21.16	23.98		3.78		26.99	Pass	18.5
VHT20	MCS8	2	100	Full	5500	0.00	0.00	15.95	15.45	18.72	23.98		3.78		26.99	Pass	16.5
VHT20	MCS8	2	116	Full	5580	0.00	0.00	16.66	15.37	19.07	23.98		3.78		26.99	Pass	18
VHT20	MCS8	2	140	Full	5700	0.00	0.00	15.86	16.65	19.28	23.98		3.78		26.99	Pass	17
VHT20	MCS8	2	144	Full	5720	0.00	0.00	17.89	18.93	21.45	23.98		3.78		26.99	Pass	19.5
VHT40	MCS8	2	102	Full	5510	0.00	0.00	16.25	15.80	19.04	23.98		3.78		26.99	Pass	16.5
VHT40	MCS8	2	110	Full	5550	0.00	0.00	18.53	18.10	21.33	23.98		3.78		26.99	Pass	19
VHT40	MCS8	2	134	Full	5670	0.00	0.00	17.60	18.50	21.08	23.98		3.78		26.99	Pass	19
VHT40	MCS8	2	142	Full	5710	0.00	0.00	17.13	18.03	20.61	23.98		3.78		26.99	Pass	18.5
VHT80	MCS8	2	106	Full	5530	0.00	0.00	15.37	15.00	18.20	23.98		3.78		26.99	Pass	15.5
VHT80	MCS8	2	122	Full	5610	0.00	0.00	18.03	17.06	20.58	23.98		3.78		26.99	Pass	19
VHT80	MCS8	2	138	Full	5690	0.00	0.00	18.03	18.33	21.19	23.98		3.78		26.99	Pass	19
VHT160	MCS8	2	114	Full	5570	0.00	0.00	14.31	13.73	17.04	23.98		3.78		26.99	Pass	14.5
HE20	MCS8	2	100	Full	5500	0.00	0.00	16.01	15.85	18.94	23.98		3.78		26.99	Pass	16.5
			116	Full	5580	0.00	0.00	18.64	17.38	21.07	23.98		3.78		26.99	Pass	20
			140	Full	5700	0.00	0.00	16.66	16.73	19.71	23.98		3.78		26.99	Pass	17
			144	Full	5720	0.00	0.00	18.52	19.45	22.02	23.98		3.78		26.99	Pass	20
HE40	MCS8	2	102	Full	5510	0.00	0.00	16.98	16.33	19.68	23.98		3.78		26.99	Pass	17
			110	Full	5550	0.00	0.00	19.16	18.66	21.93	23.98		3.78		26.99	Pass	19.5
			134	Full	5670	0.00	0.00	18.42	19.03	21.75	23.98		3.78		26.99	Pass	19.5
			142	Full	5710	0.00	0.00	18.34	19.09	21.74	23.98		3.78		26.99	Pass	19.5
HE80	MCS8	2	106	Full	5530	0.00	0.00	15.43	15.05	18.25	23.98		3.78		26.99	Pass	15.5
			122	Full	5610	0.00	0.00	18.20	17.32	20.79	23.98		3.78		26.99	Pass	19
			138	Full	5690	0.00	0.00	18.18	18.34	21.27	23.98		3.78		26.99	Pass	19
HE160	MCS8	2	114	Full	5570	0.00	0.00	14.38	13.98	17.19	23.98		3.78		26.99	Pass	14.5

U-NII-3																
Mod.	Data Rate	NTX	CH.	RU Config	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail	Power Setting
						Ant 11	Ant 10	Ant 11	Ant 10	SUM	Ant 11	Ant 10	Ant 11	Ant 10		
11a	6Mbps	2	149	Full	5745	0.00	0.00	10.94	10.20	13.60	30.00		2.40		Pass	11
11a	6Mbps	2	157	Full	5785	0.00	0.00	10.85	10.06	13.48	30.00		2.40		Pass	11
11a	6Mbps	2	165	Full	5825	0.00	0.00	10.60	10.00	13.32	30.00		2.40		Pass	11
HT20	MCS8	2	149	Full	5745	0.00	0.00	11.11	10.40	13.78	30.00		2.40		Pass	11.5
HT20	MCS8	2	157	Full	5785	0.00	0.00	11.13	10.30	13.75	30.00		2.40		Pass	11.5
HT20	MCS8	2	165	Full	5825	0.00	0.00	10.88	10.11	13.52	30.00		2.40		Pass	11.5
HT40	MCS8	2	151	Full	5755	0.00	0.00	10.79	10.10	13.47	30.00		2.40		Pass	11
HT40	MCS8	2	159	Full	5795	0.00	0.00	11.28	10.33	13.84	30.00		2.40		Pass	11.5
VHT20	MCS8	2	149	Full	5745	0.00	0.00	10.83	10.09	13.49	30.00		2.40		Pass	11
VHT20	MCS8	2	157	Full	5785	0.00	0.00	11.12	10.26	13.72	30.00		2.40		Pass	11.5
VHT20	MCS8	2	165	Full	5825	0.00	0.00	10.85	10.07	13.49	30.00		2.40		Pass	11.5
VHT40	MCS8	2	151	Full	5755	0.00	0.00	10.71	10.08	13.42	30.00		2.40		Pass	11
VHT40	MCS8	2	159	Full	5795	0.00	0.00	11.21	10.25	13.77	30.00		2.40		Pass	11.5
VHT80	MCS8	2	155	Full	5775	0.00	0.00	10.79	10.00	13.42	30.00		2.40		Pass	11
HE20	MCS8	2	149	Full	5745	0.00	0.00	10.89	10.22	13.58	30.00		2.40		Pass	11
HE20	MCS8	2	157	Full	5785	0.00	0.00	11.60	10.40	14.05	30.00		2.40		Pass	11.5
HE20	MCS8	2	165	Full	5825	0.00	0.00	11.17	10.23	13.74	30.00		2.40		Pass	11.5
HE40	MCS8	2	151	Full	5755	0.00	0.00	10.81	10.12	13.49	30.00		2.40		Pass	11
HE40	MCS8	2	159	Full	5795	0.00	0.00	11.30	10.34	13.86	30.00		2.40		Pass	11.5
HE80	MCS8	2	155	Full	5775	0.00	0.00	10.87	10.03	13.48	30.00		2.40		Pass	11

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

For the 5.25–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. Section F) Maximum power spectral density.

For devices operating in the bands UNII-1/2A/2C

 # Method SA-2 #

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

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

For devices operating in the band UNII-3

 # Method SA-2 #

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

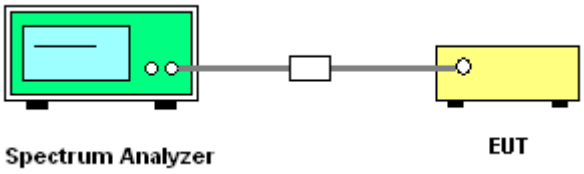
- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 500KHz (or 300 kHz if the SA can’t set RBW=500KHz).
- Set VBW ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- If the SA can’t set RBW=500KHz, then add 10 log(500kHz/RBW) to the test result.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

   Method (a): Measure and sum the spectra across the outputs.

   The total final Power Spectral Density is the bin-by-bin summation to obtain the combined spectrum. For the device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 GHz band:
15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(3) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table,

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

(4) EIRP (dBm)	Field Strength at 3m (dBµV/m)
- 27	68.2

Note: The following formula is used to convert the EIRP to field strength.

$$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.7$$

where

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBµV/m

d_{Meas} is the measurement distance, in m

3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

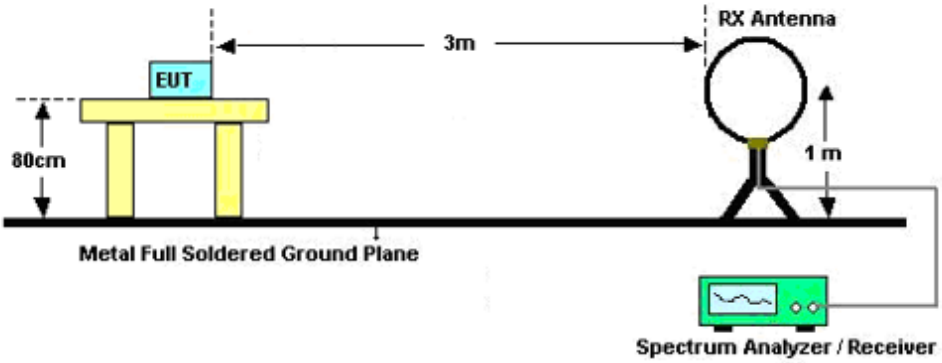
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

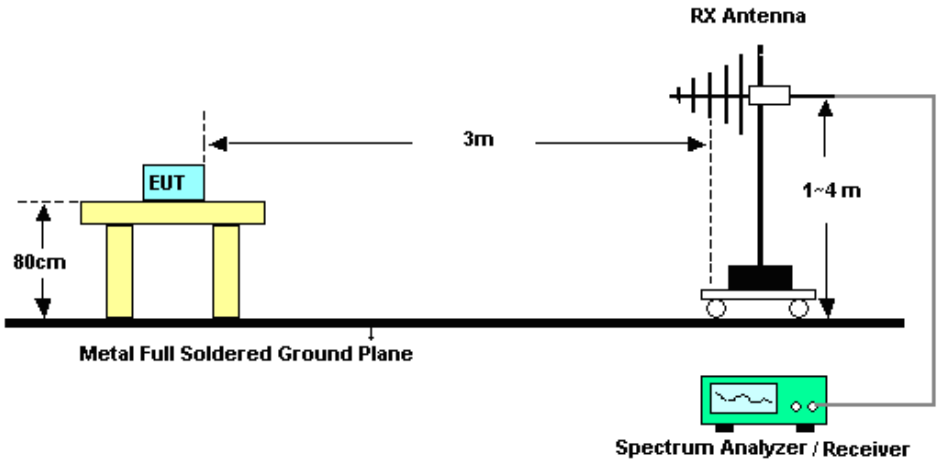
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on.
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

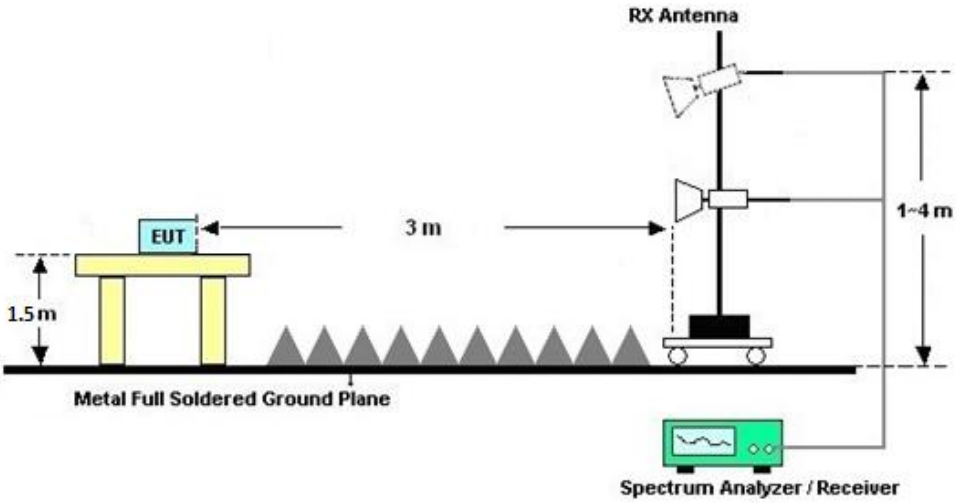
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.4.7 Duty Cycle

Please refer to Appendix D.

3.4.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix C.

3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

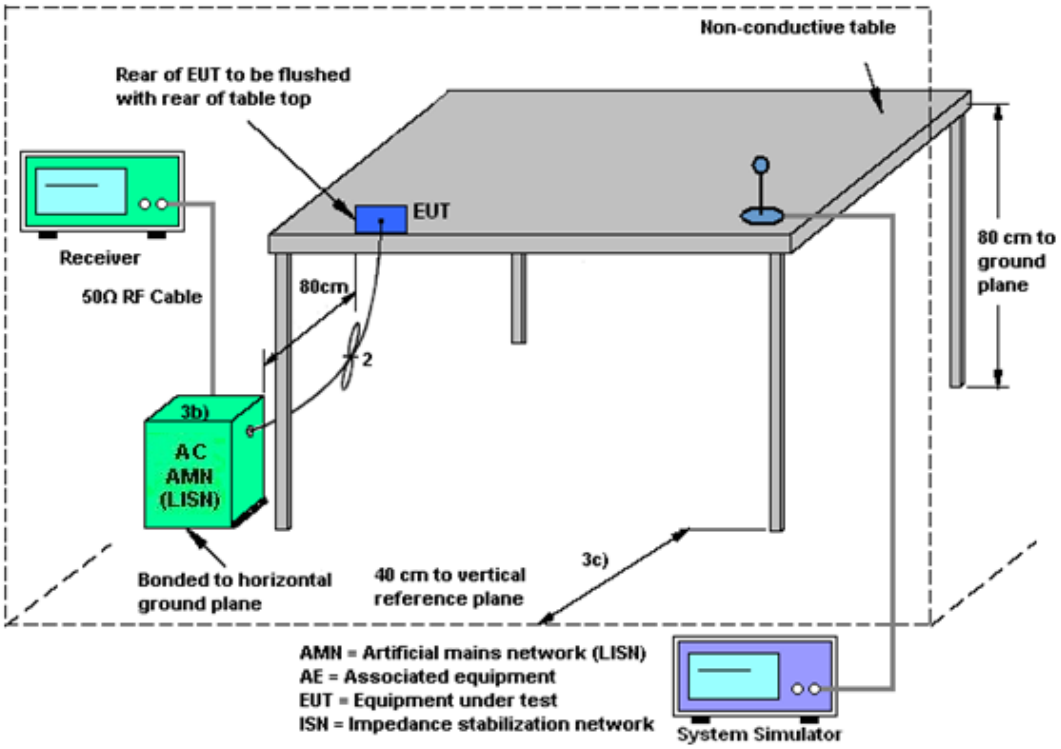
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Antenna Requirements

3.6.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

<STBC Modes>

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e.,

Directional gain = $G_{ANT\ MAX}$(Ant.1 Gain, Ant.2 Gain,…) + Array Gain, as following table for Power,

where Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

For PSD, the directional gain calculation is following,

Directional gain = $G_{ANT\ MAX}$(Ant.1 Gain, Ant.2 Gain,…).

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

<STBC Modes>

	Ant. 11 (dBi)	Ant. 10 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
UNII-1	-4.31	0.71	0.71	0.71	0.00	0.00
UNII-2A	-4.31	2.30	2.30	2.30	0.00	0.00
UNII-2C	-7.22	3.78	3.78	3.78	0.00	0.00
UNII-3	-8.28	2.40	2.40	1.62	0.00	0.00

Power limit reduction = Composite gain – 6dBi, (min = 0)

PSD limit reduction = Composite gain + PSD Array gain – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Oct. 14, 2024	Jan. 01, 2025~ Feb. 20, 2025	Oct. 13, 2025	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 03, 2024	Jan. 01, 2025~ Feb. 20, 2025	Jul. 02, 2025	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2E	101141	9kHz~30MHz	Dec. 28, 2024	Jan. 01, 2025~ Feb. 20, 2025	Dec. 27, 2025	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	May 09, 2024	Jan. 01, 2025~ Feb. 20, 2025	May 08, 2025	Radiation (03CH04-SZ)
Double Ridge Guide Antenna	ETS-Lindgren	Burgeon-3117	00240057	1GHz~18GHz	Jul. 13, 2024	Jan. 01, 2025~ Feb. 20, 2025	Jul. 12, 2025	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Jul. 04, 2024	Jan. 01, 2025~ Feb. 20, 2025	Jul. 03, 2025	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 18, 2024	Jan. 01, 2025~ Feb. 20, 2025	Oct. 17, 2025	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 14, 2024	Jan. 01, 2025~ Feb. 20, 2025	Oct. 13, 2025	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 03, 2024	Jan. 01, 2025~ Feb. 20, 2025	Jul. 02, 2025	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY57280136	500MHz~26.5GHz	Jul. 03, 2024	Jan. 01, 2025~ Feb. 20, 2025	Jul. 02, 2025	Radiation (03CH04-SZ)
AC Power Source	APC	AFV-S-600B	F119050019	N/A	Oct. 14, 2024	Jan. 01, 2025~ Feb. 20, 2025	Oct. 13, 2025	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jan. 01, 2025~ Feb. 20, 2025	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jan. 01, 2025~ Feb. 20, 2025	NCR	Radiation (03CH04-SZ)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 09, 2024	Jan. 21, 2025~ Jan. 23, 2025	Apr. 08, 2025	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 25, 2024	Jan. 21, 2025~ Jan. 23, 2025	Dec. 24, 2025	Conducted (TH01-SZ)
Power Sensor	Anritsu	MA24440A	11707	50MHz-40GHz	Jan. 02, 2025	Jan. 21, 2025~ Jan. 23, 2025	Jan. 01, 2026	Conducted (TH01-SZ)
DC Power Supply	TTI	PL330P	290070	Max 32V，3A	Oct.14,2024	Jan. 21, 2025~ Jan. 23, 2025	Oct. 13, 2025	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 03, 2024	Jan. 21, 2025~ Jan. 23, 2025	Jul. 02, 2025	Conducted (TH01-SZ)
EMI Receiver	R&S	ESR7	102297	9kHz~7GHz;	Jul. 03, 2024	Feb. 11, 2025	Jul. 02, 2025	Conduction (CO02-SZ)
AC LISN	R&S	ENV216	101499	9kHz~30MHz	Jul. 03, 2024	Feb. 11, 2025	Jul. 02, 2025	Conduction (CO02-SZ)
AC Power Source	CHROMA	61601	616010002470	100Vac~250Vac	Dec.25, 2024	Feb. 11, 2025	Dec. 24, 2025	Conduction (CO02-SZ)
Thermo meter	Anymetre	JR593	#14	- 10℃ ~ 50℃ 10%RH~99%RH	Jul. 05, 2024	Feb. 11, 2025	Jul. 04, 2025	Conduction (CO02-SZ)

NCR: No Calibration Required

5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	±1.34 dB
Occupied Channel Bandwidth	±0.012 MHz
Conducted Power	±1.34 dB
Conducted Power Spectral Density	±1.32 dB
Frequency	±1.3 Hz

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.5 dB

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1 dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1 dB

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.8 dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1 dB

---------- THE END ----------

Appendix A. Conducted Test Results

Ambient Condition: 24-26 ℃, 45-55 %RH	
Test Date: 2025.01.21~2025.01.23	**Test Engineer:** Chen ZhiQiang

Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	26dB EBW [MHz]	FL[MHz]	FH[MHz]
11A	Ant11	5180	20.50	5169.60	5190.10
	Ant10	5180	24.70	5167.30	5192.00
	Ant11	5220	19.80	5210.20	5230.00
	Ant10	5220	33.70	5203.80	5237.50
	Ant11	5240	19.80	5230.10	5249.90
	Ant10	5240	30.80	5225.10	5255.90
	Ant11	5260	21.70	5249.50	5271.20
	Ant10	5260	40.10	5240.10	5280.20
	Ant11	5300	21.10	5289.50	5310.60
	Ant10	5300	35.90	5281.70	5317.60
	Ant11	5320	20.90	5309.60	5330.50
	Ant10	5320	33.70	5303.90	5337.60
	Ant11	5500	19.80	5490.10	5509.90
	Ant10	5500	21.30	5489.50	5510.80
	Ant11	5580	19.80	5570.20	5590.00
	Ant10	5580	21.60	5569.00	5590.60
	Ant11	5700	19.70	5690.20	5709.90
	Ant10	5700	22.40	5689.00	5711.40
	Ant11	5720	19.80	5710.10	5729.90
	Ant10	5720	22.60	5708.90	5731.50
	Ant11	5745	19.60	5735.10	5754.70
	Ant10	5745	19.80	5735.10	5754.90
	Ant11	5785	19.50	5775.30	5794.80
	Ant10	5785	19.40	5775.20	5794.60
	Ant11	5825	19.90	5815.10	5835.00
	Ant10	5825	19.90	5815.00	5834.90
11N20MIMO	Ant11	5180	20.80	5169.70	5190.50
	Ant10	5180	24.20	5167.90	5192.10
	Ant11	5220	21.10	5209.40	5230.50
	Ant10	5220	33.60	5202.60	5236.20
	Ant11	5240	20.70	5229.80	5250.50
	Ant10	5240	31.50	5224.50	5256.00
	Ant11	5260	21.80	5249.40	5271.20
	Ant10	5260	41.90	5239.10	5281.00
	Ant11	5300	21.40	5289.40	5310.80
	Ant10	5300	38.80	5281.00	5319.80

	Ant11	5320	21.80	5309.20	5331.00
	Ant10	5320	34.90	5303.40	5338.30
	Ant11	5500	21.20	5489.50	5510.70
	Ant10	5500	22.10	5489.00	5511.10
	Ant11	5580	21.00	5569.40	5590.40
	Ant10	5580	22.10	5569.10	5591.20
	Ant11	5700	20.80	5689.60	5710.40
	Ant10	5700	24.70	5687.30	5712.00
	Ant11	5720	21.00	5709.80	5730.80
	Ant10	5720	24.00	5708.00	5732.00
	Ant11	5745	20.30	5734.80	5755.10
	Ant10	5745	20.50	5734.70	5755.20
	Ant11	5785	20.80	5774.40	5795.20
	Ant10	5785	20.80	5774.50	5795.30
	Ant11	5825	20.70	5814.60	5835.30
	Ant10	5825	20.80	5814.50	5835.30
11N40MIMO	Ant11	5190	41.00	5169.80	5210.80
	Ant10	5190	81.80	5146.60	5228.40
	Ant11	5230	40.80	5209.60	5250.40
	Ant10	5230	86.00	5188.00	5274.00
	Ant11	5270	41.20	5249.80	5291.00
	Ant10	5270	88.00	5226.20	5314.20
	Ant11	5310	41.20	5289.60	5330.80
	Ant10	5310	77.40	5272.20	5349.60
	Ant11	5510	40.60	5489.80	5530.40
	Ant10	5510	40.00	5490.00	5530.00
	Ant11	5550	41.00	5529.40	5570.40
	Ant10	5550	41.40	5529.60	5571.00
	Ant11	5670	41.00	5649.40	5690.40
	Ant10	5670	40.60	5649.80	5690.40
	Ant11	5710	41.00	5689.40	5730.40
	Ant10	5710	42.40	5689.20	5731.60
	Ant11	5755	40.40	5734.60	5775.00
	Ant10	5755	39.60	5735.20	5774.80
	Ant11	5795	40.40	5774.80	5815.20
	Ant10	5795	40.20	5775.00	5815.20
11AC80MIMO	Ant11	5210	97.20	5166.40	5263.60
	Ant10	5210	151.20	5134.40	5285.60
	Ant11	5290	114.00	5234.00	5348.00
	Ant10	5290	162.80	5210.40	5373.20
	Ant11	5530	90.00	5485.60	5575.60
	Ant10	5530	93.60	5479.60	5573.20
	Ant11	5610	88.00	5565.60	5653.60

	Ant10	5610	86.40	5566.40	5652.80
	Ant11	5690	93.60	5644.00	5737.60
	Ant10	5690	124.80	5628.80	5753.60
	Ant11	5775	87.60	5730.60	5818.20
	Ant10	5775	88.00	5730.20	5818.20
11AC160MIMO	Ant11	5250	295.20	5121.20	5416.40
	Ant10	5250	335.20	5109.20	5444.40
	Ant11	5570	238.40	5438.00	5676.40
	Ant10	5570	316.80	5414.80	5731.60
11AX20MIMO	Ant11	5180	23.00	5168.50	5191.50
	Ant10	5180	39.40	5160.50	5199.90
	Ant11	5220	22.90	5208.40	5231.30
	Ant10	5220	44.70	5196.10	5240.80
	Ant11	5240	23.30	5228.80	5252.10
	Ant10	5240	39.00	5221.40	5260.40
	Ant11	5260	26.20	5248.10	5274.30
	Ant10	5260	46.60	5238.50	5285.10
	Ant11	5300	38.60	5281.60	5320.20
	Ant10	5300	45.50	5277.80	5323.30
	Ant11	5320	38.50	5302.00	5340.50
	Ant10	5320	44.30	5299.30	5343.60
	Ant11	5500	23.70	5488.30	5512.00
	Ant10	5500	27.50	5485.60	5513.10
	Ant11	5580	22.80	5568.40	5591.20
	Ant10	5580	22.40	5569.00	5591.40
	Ant11	5700	22.80	5688.40	5711.20
	Ant10	5700	39.10	5681.10	5720.20
	Ant11	5720	22.70	5708.40	5731.10
	Ant10	5720	43.40	5698.10	5741.50
	Ant11	5745	22.70	5733.30	5756.00
	Ant10	5745	22.70	5733.50	5756.20
	Ant11	5785	22.30	5773.70	5796.00
	Ant10	5785	22.10	5773.60	5795.70
	Ant11	5825	22.40	5813.40	5835.80
	Ant10	5825	22.10	5813.70	5835.80
11AX40MIMO	Ant11	5190	44.60	5168.00	5212.60
	Ant10	5190	83.00	5146.40	5229.40
	Ant11	5230	63.00	5205.00	5268.00
	Ant10	5230	87.80	5188.40	5276.20
	Ant11	5270	66.80	5239.00	5305.80
	Ant10	5270	94.60	5227.00	5321.60
	Ant11	5310	84.40	5267.20	5351.60
	Ant10	5310	83.20	5270.20	5353.40

	Ant11	5510	57.20	5478.80	5536.00
	Ant10	5510	66.20	5477.00	5543.20
	Ant11	5550	57.80	5526.00	5583.80
	Ant10	5550	61.60	5518.80	5580.40
	Ant11	5670	45.20	5647.40	5692.60
	Ant10	5670	77.60	5629.80	5707.40
	Ant11	5710	55.40	5687.80	5743.20
	Ant10	5710	83.00	5669.20	5752.20
	Ant11	5755	42.40	5733.80	5776.20
	Ant10	5755	43.40	5733.20	5776.60
	Ant11	5795	42.40	5773.80	5816.20
	Ant10	5795	44.00	5772.80	5816.80
11AX80MIMO	Ant11	5210	104.80	5167.20	5272.00
	Ant10	5210	165.60	5126.00	5291.60
	Ant11	5290	105.60	5238.40	5344.00
	Ant10	5290	156.00	5217.60	5373.60
	Ant11	5530	92.40	5485.60	5578.00
	Ant10	5530	114.00	5474.80	5588.80
	Ant11	5610	86.00	5566.00	5652.00
	Ant10	5610	95.20	5558.80	5654.00
	Ant11	5690	87.20	5646.00	5733.20
	Ant10	5690	139.60	5617.20	5756.80
	Ant11	5775	88.00	5731.40	5819.40
	Ant10	5775	86.40	5730.60	5817.00
11AX160MIMO	Ant11	5250	312.80	5118.00	5430.80
	Ant10	5250	306.40	5103.60	5410.00
	Ant11	5570	326.40	5399.60	5726.00
	Ant10	5570	304.00	5415.60	5719.60

Test Graphs

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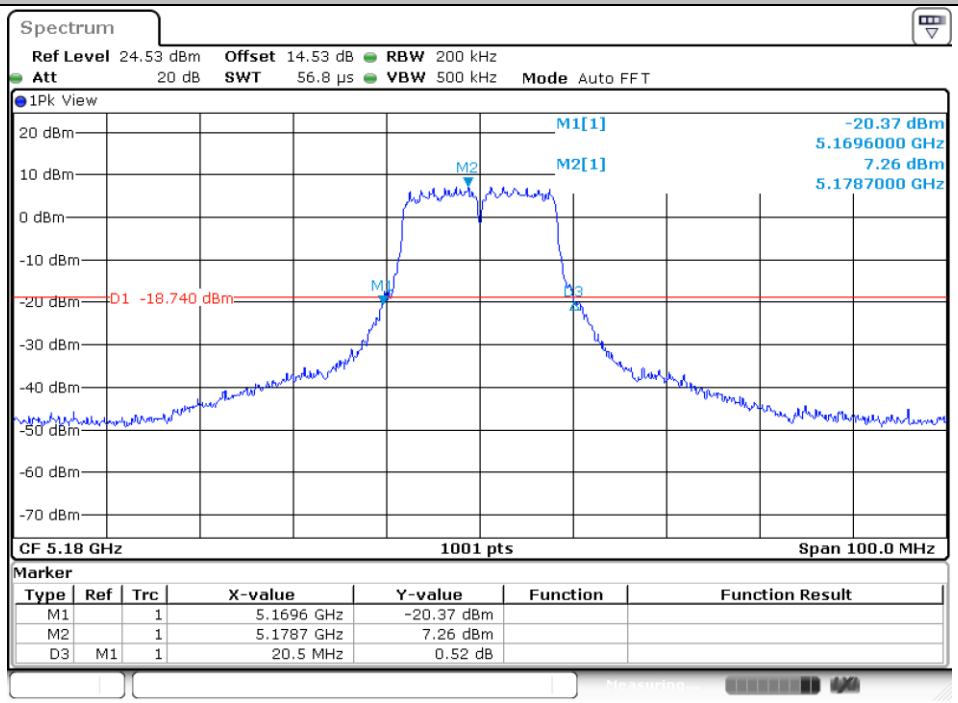

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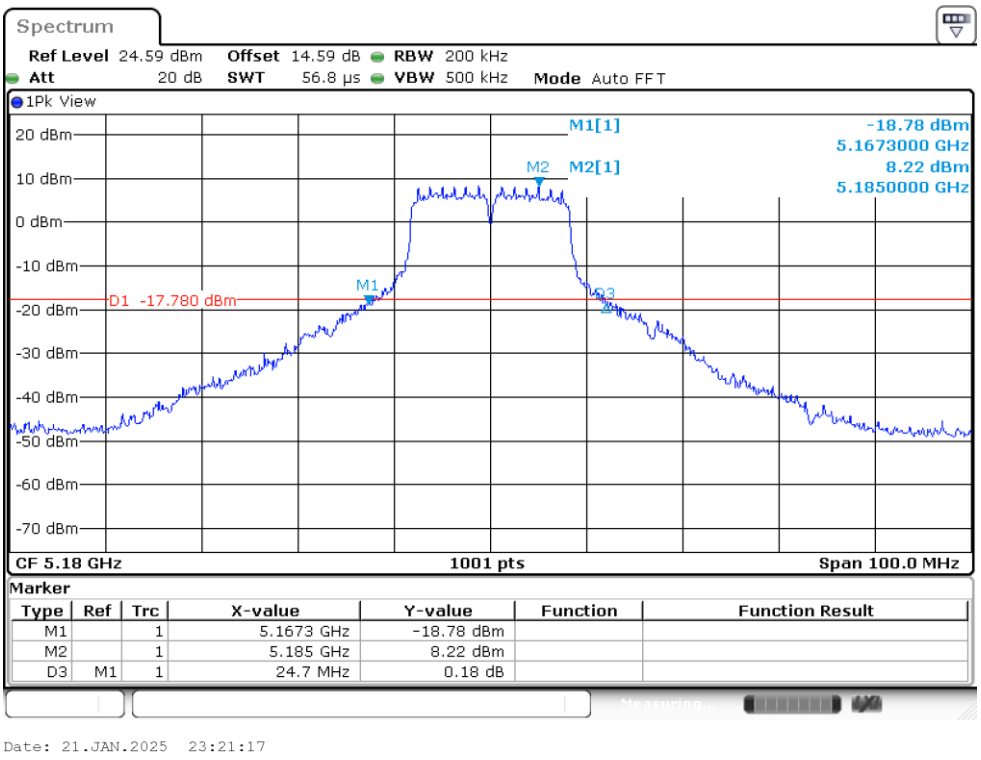

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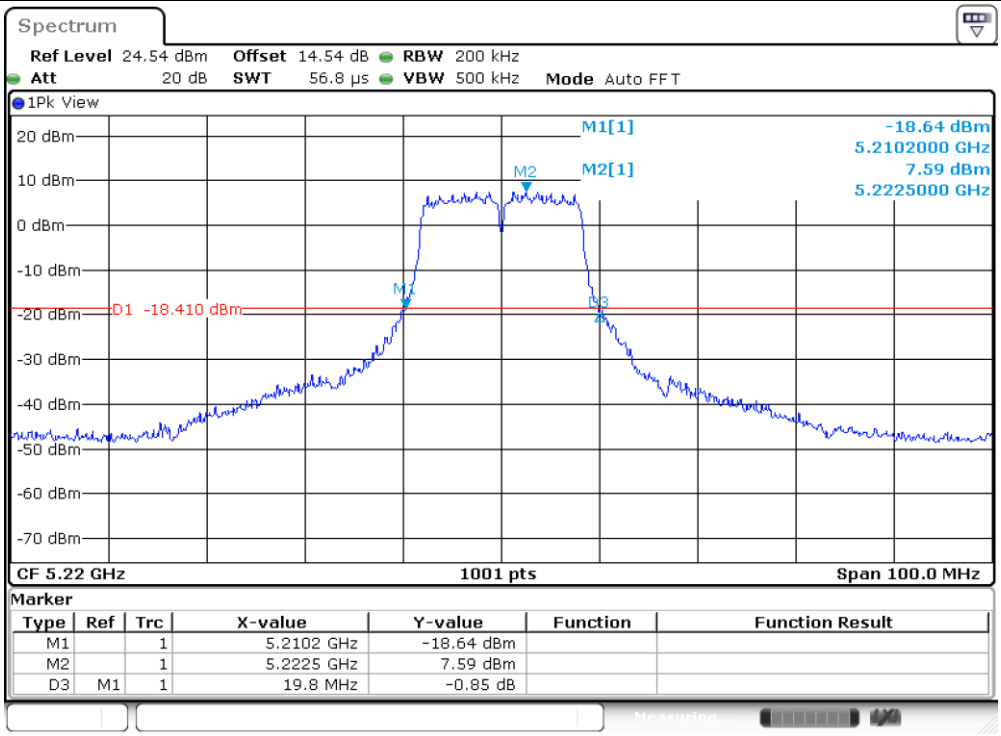

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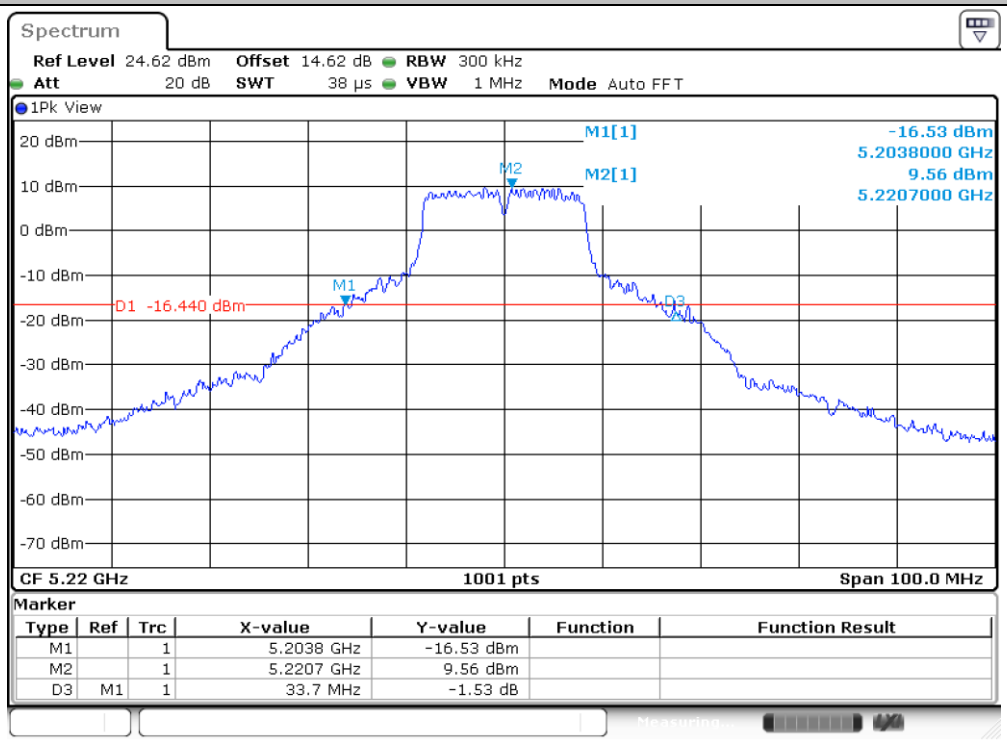

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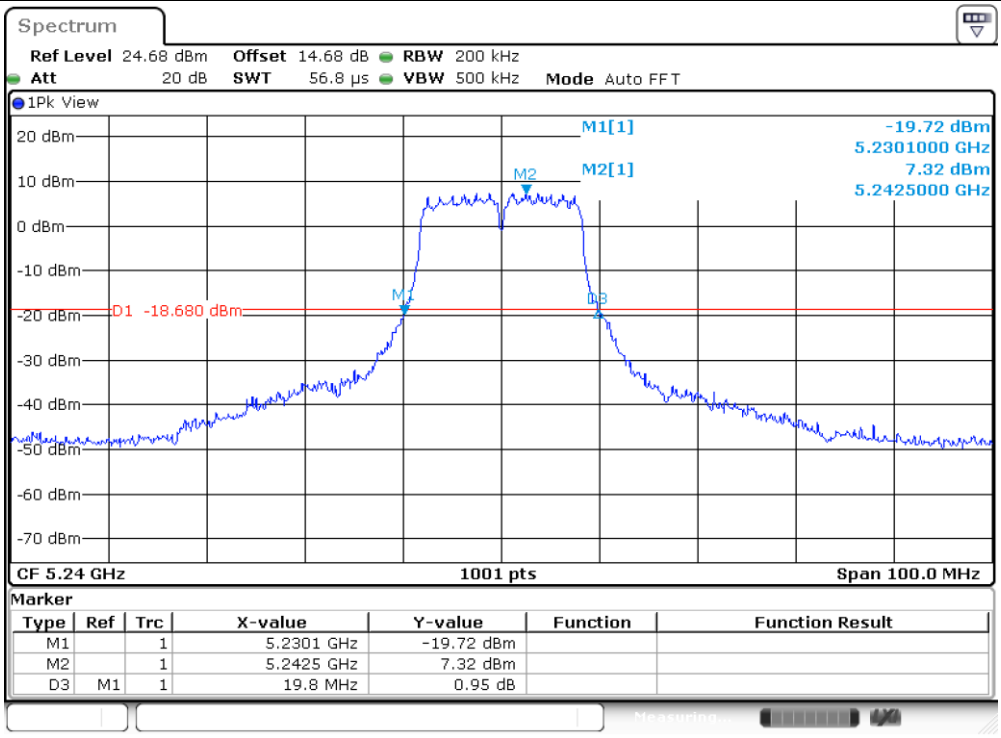

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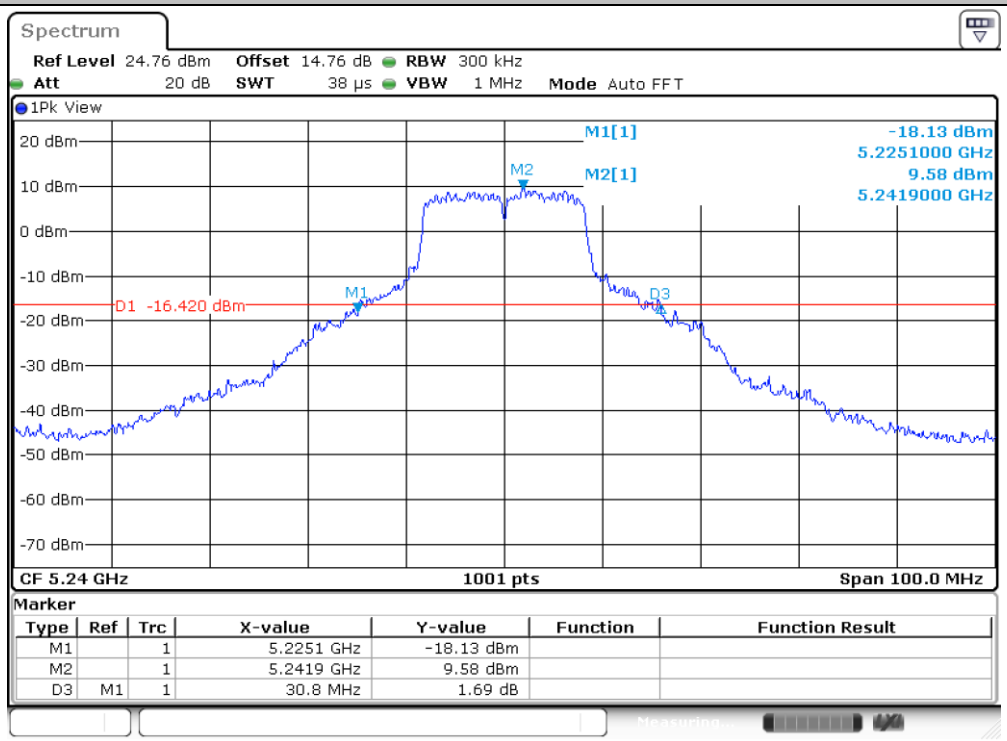

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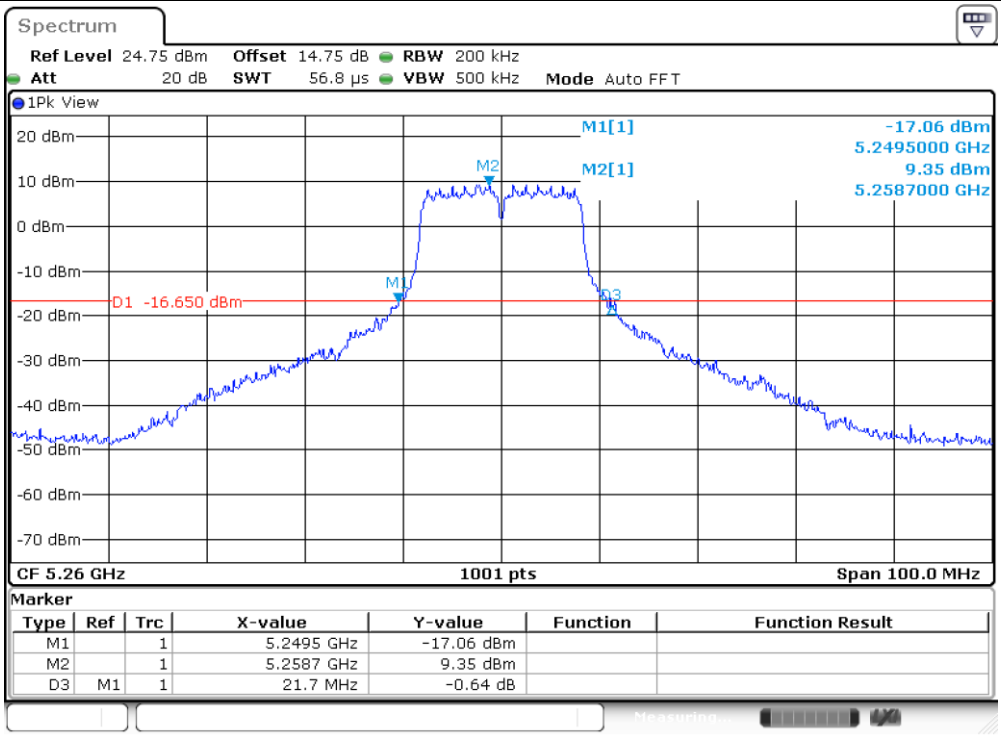

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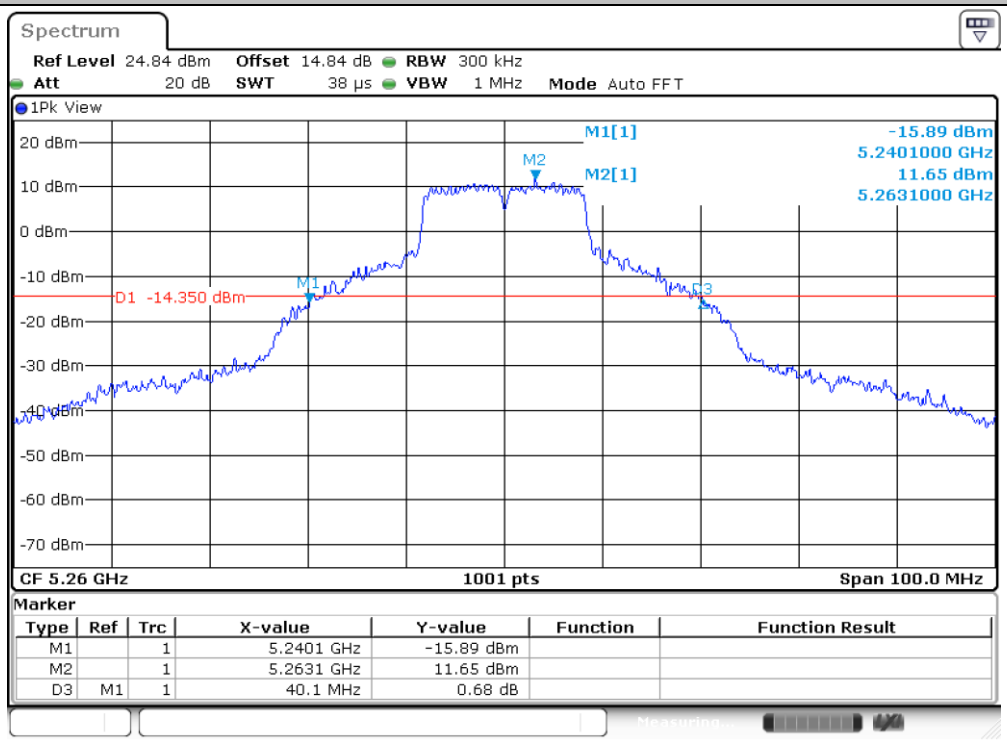

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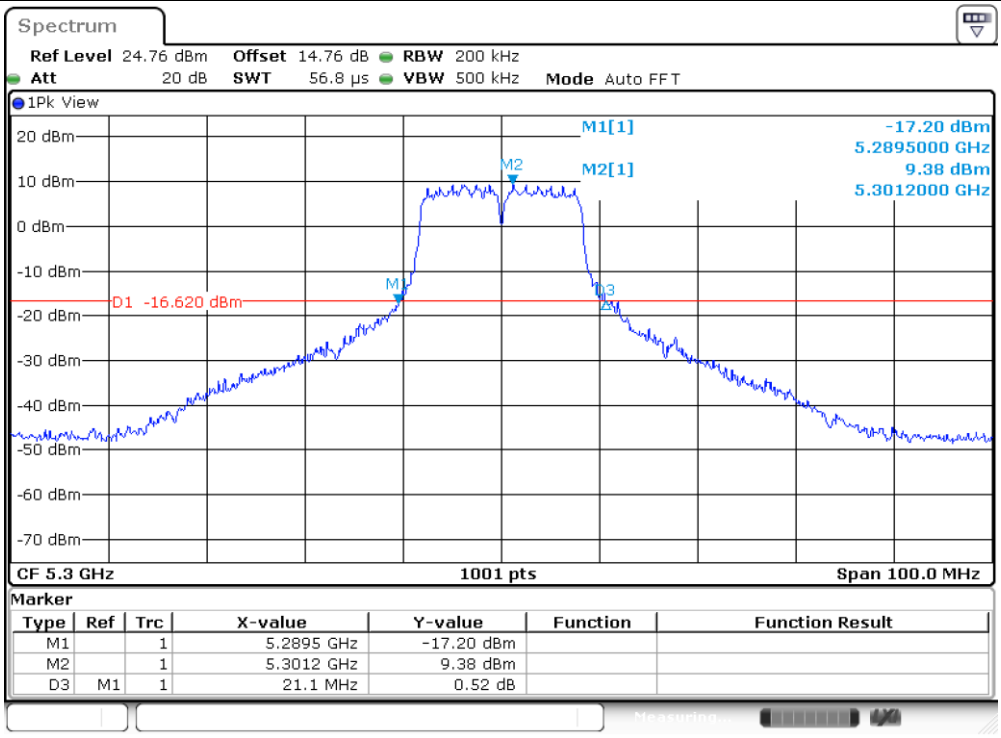

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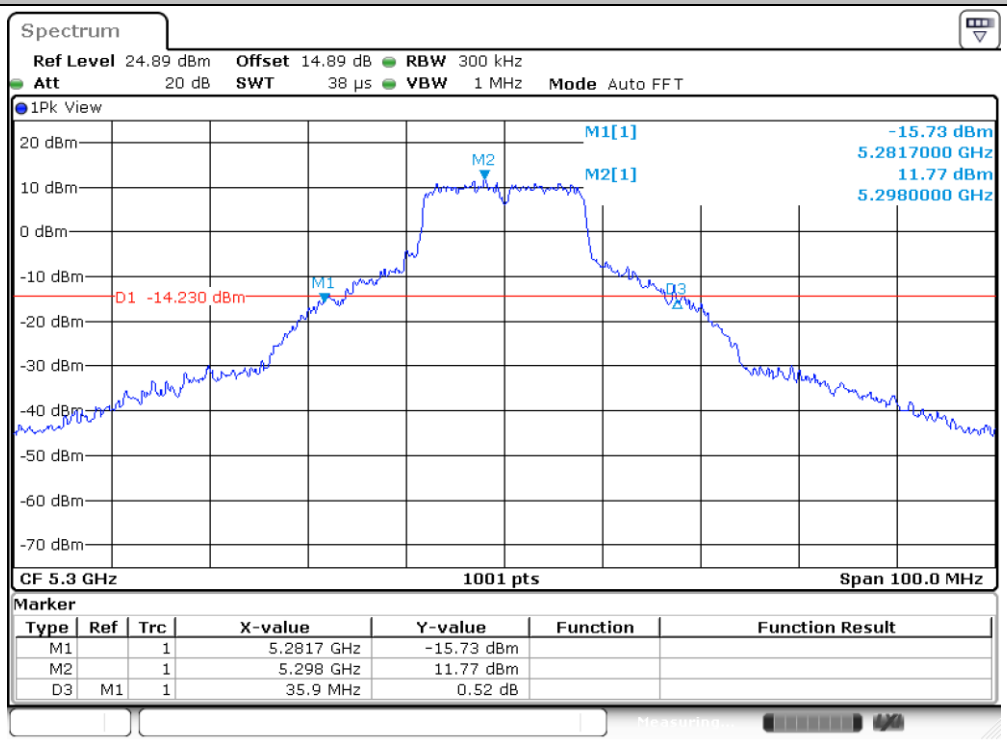

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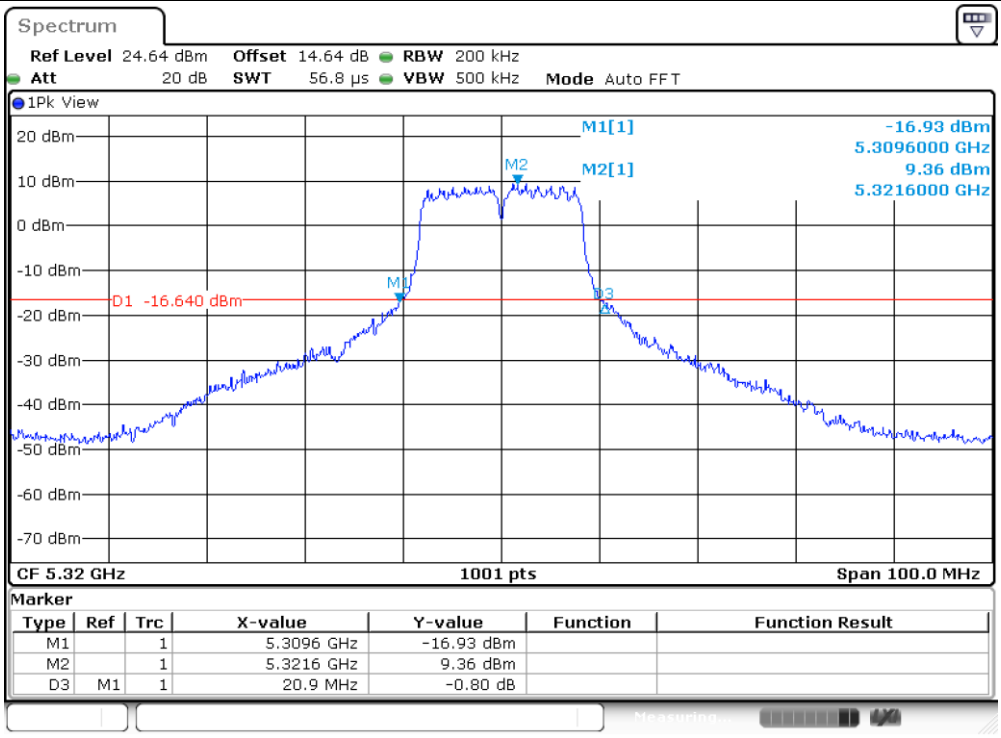

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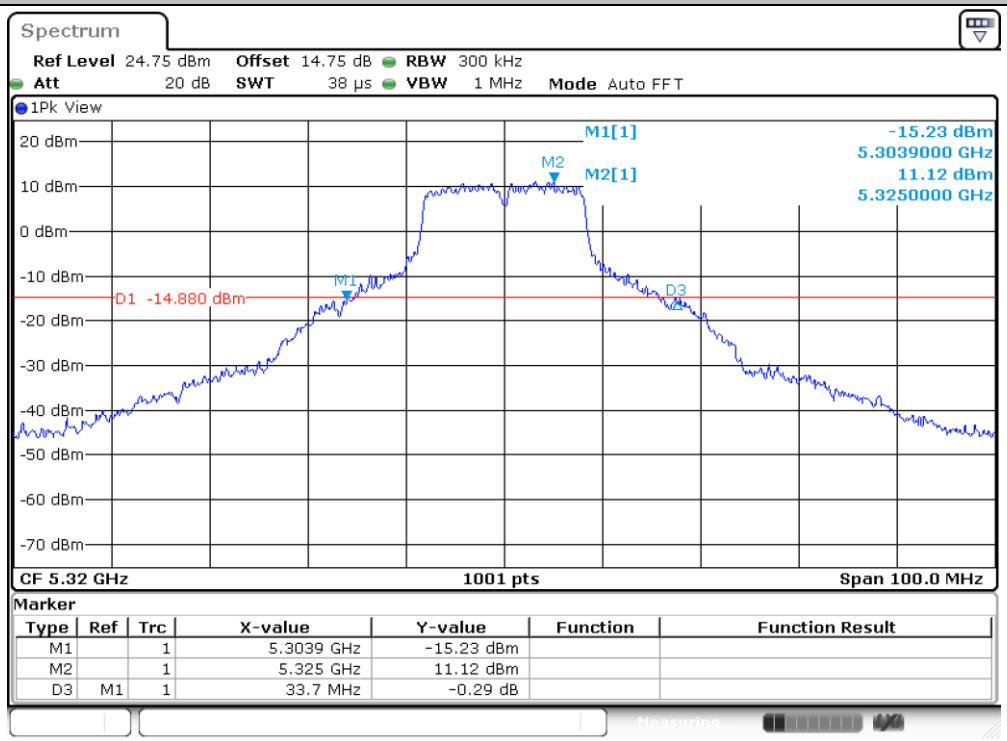

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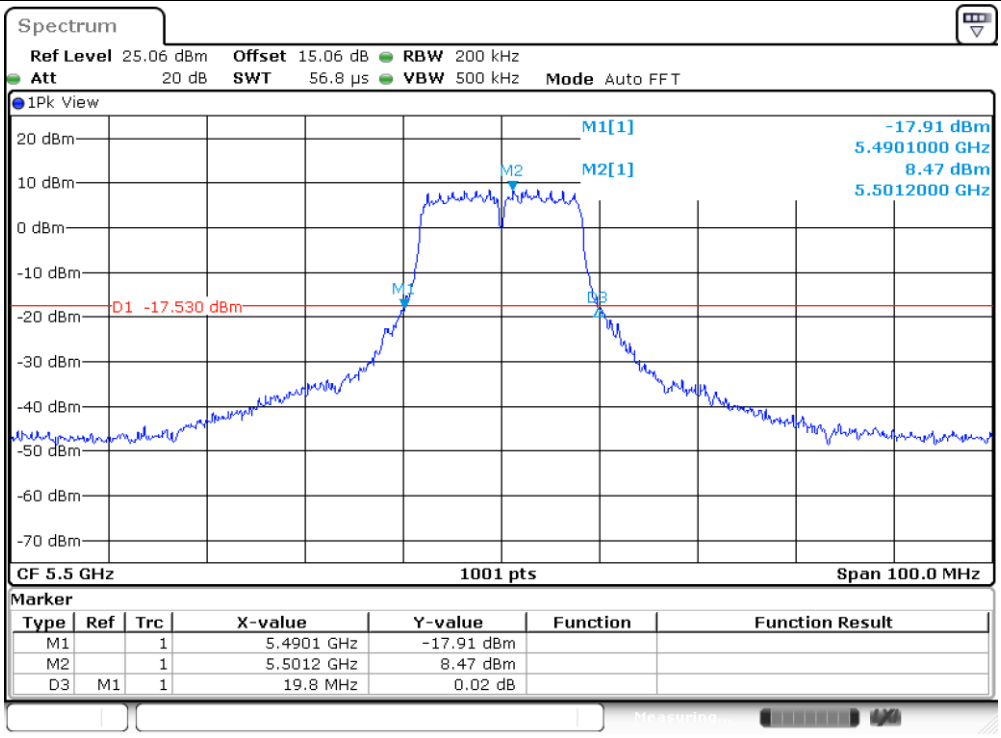

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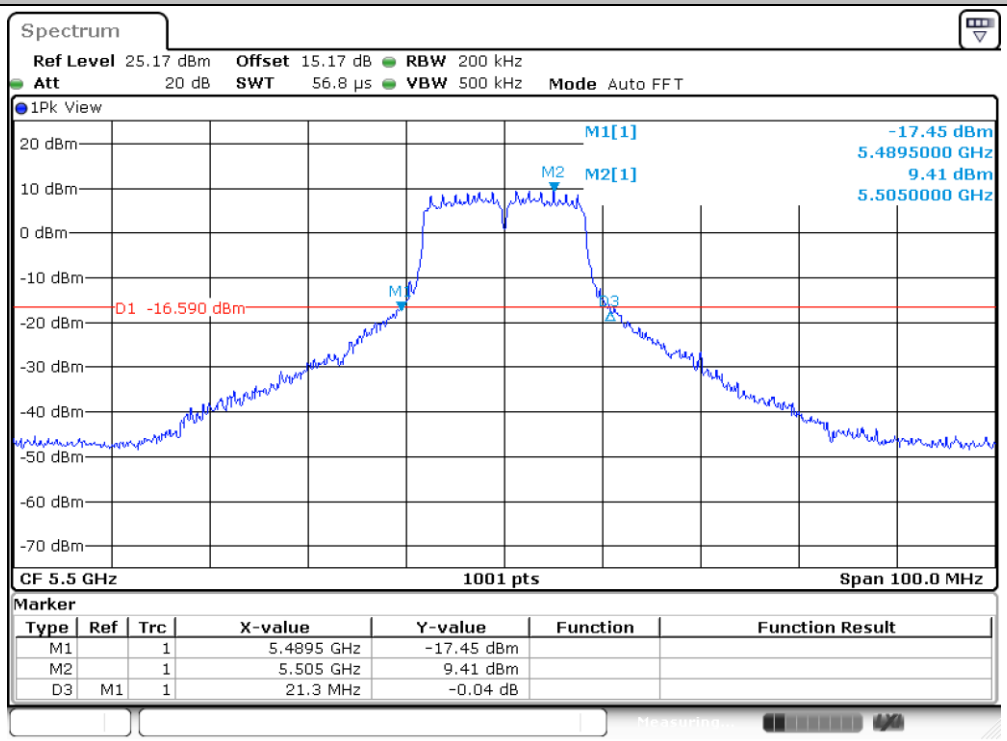

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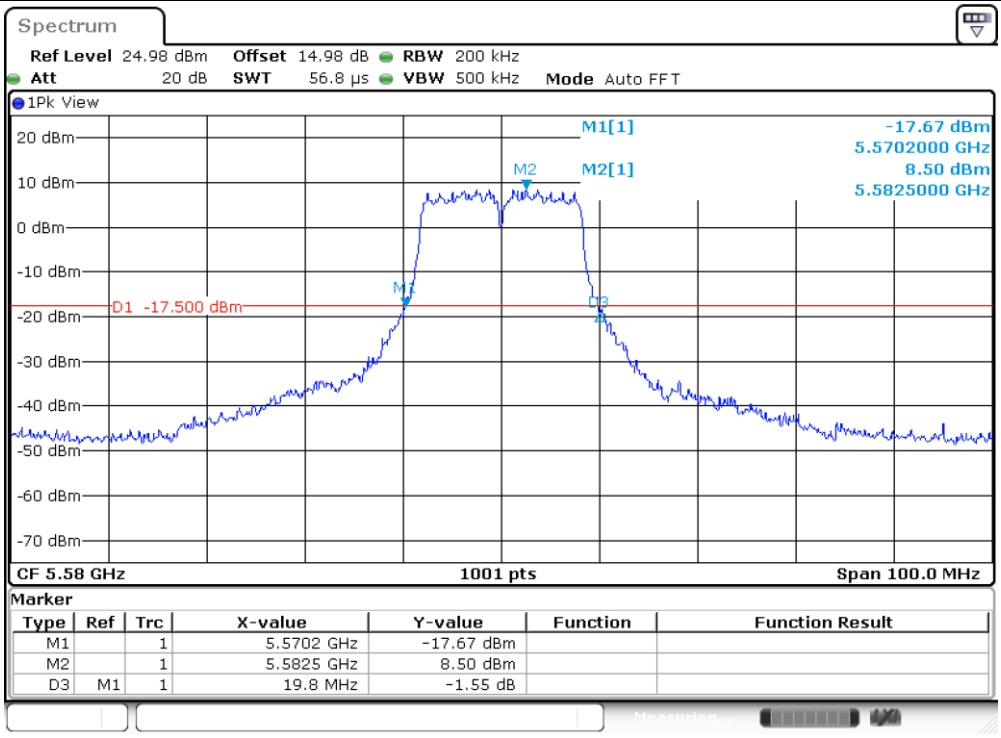
11A_Ant11_5580



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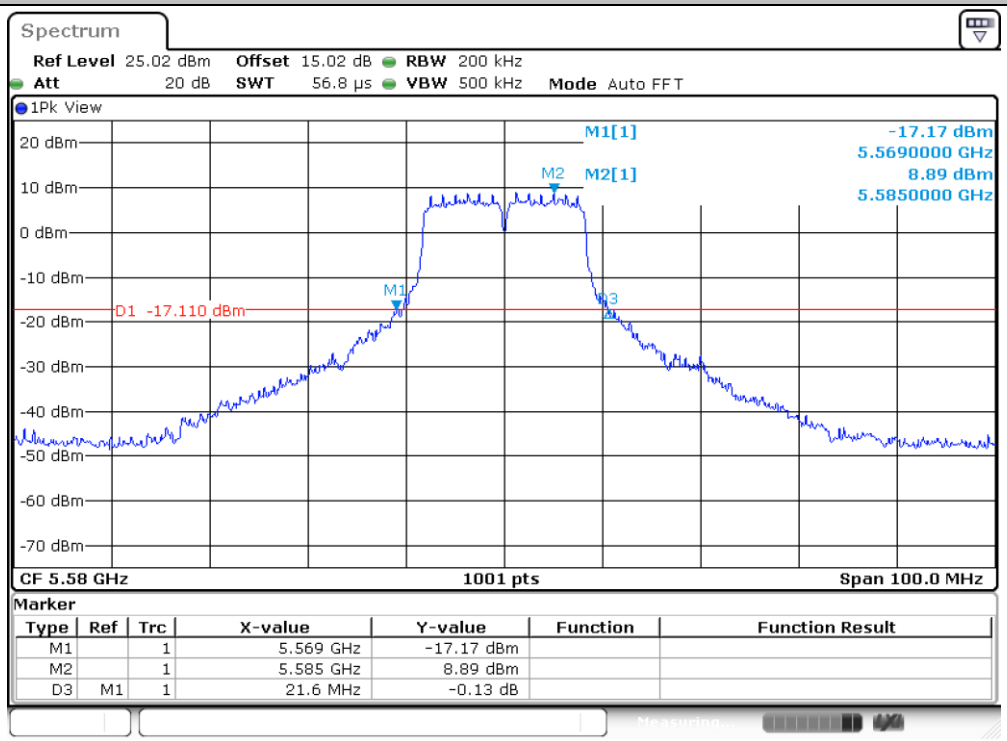

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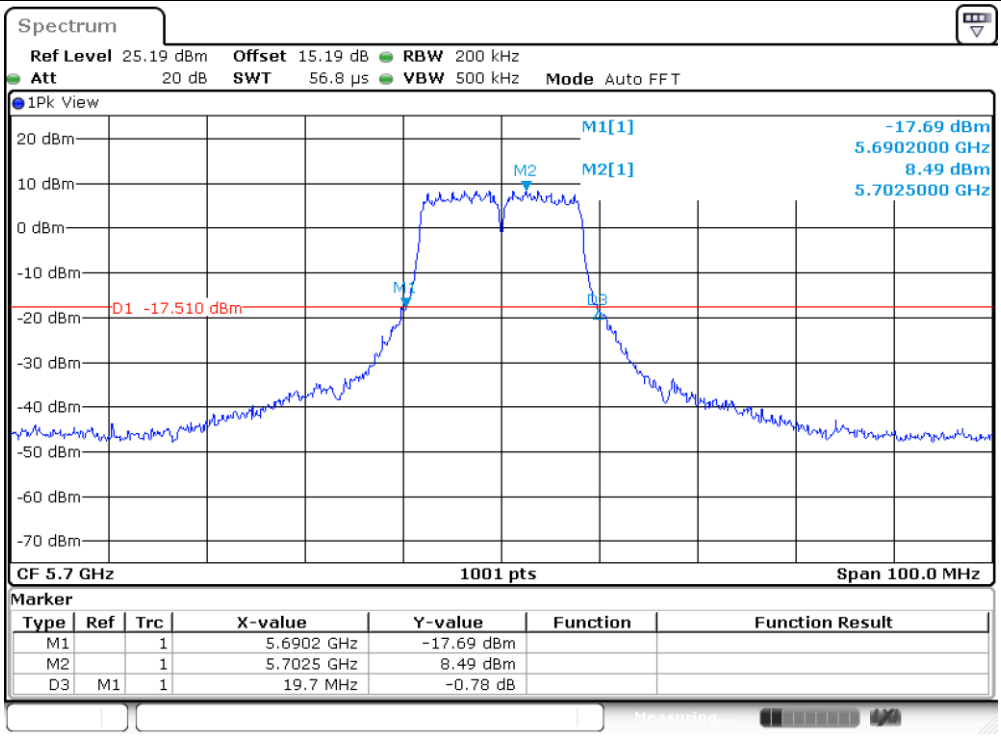
11A_Ant11_5700



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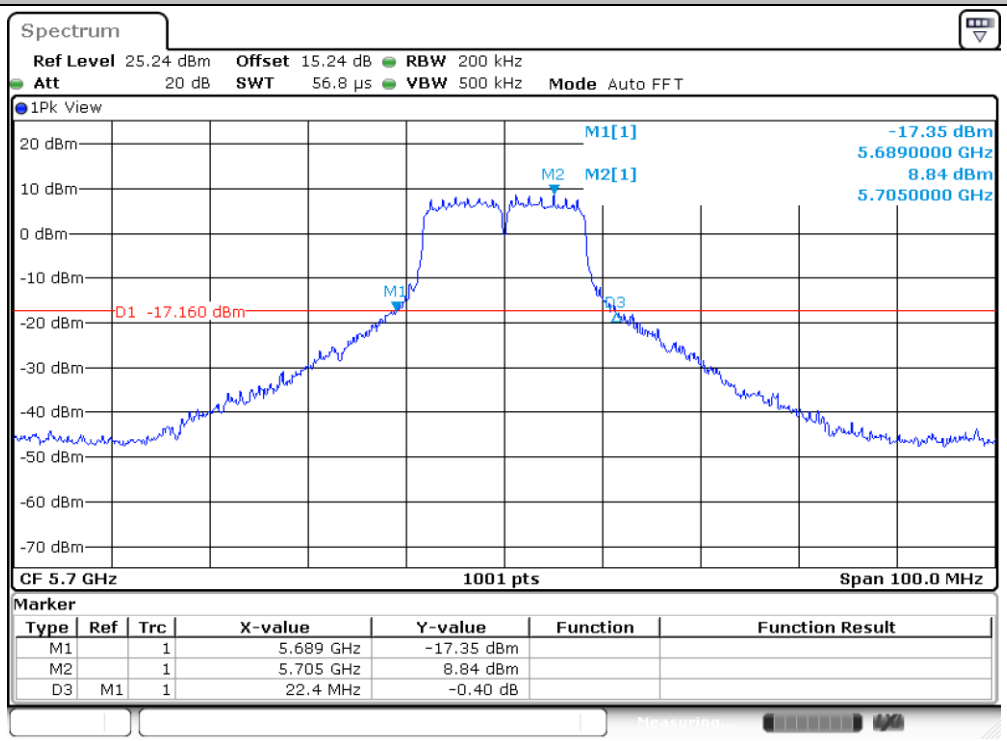

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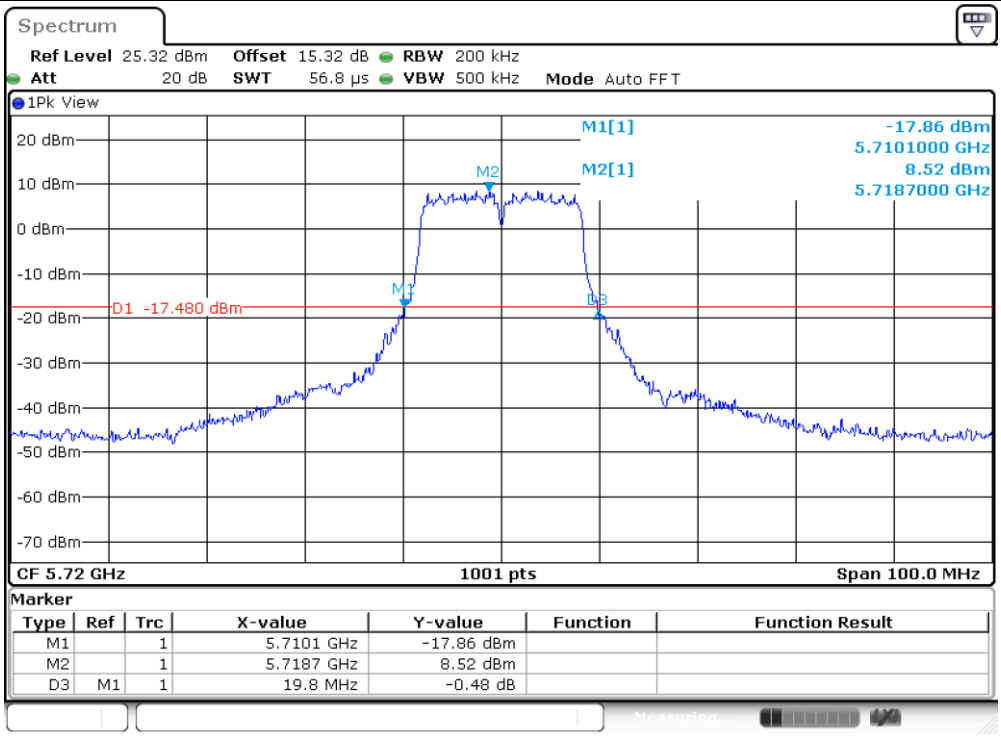

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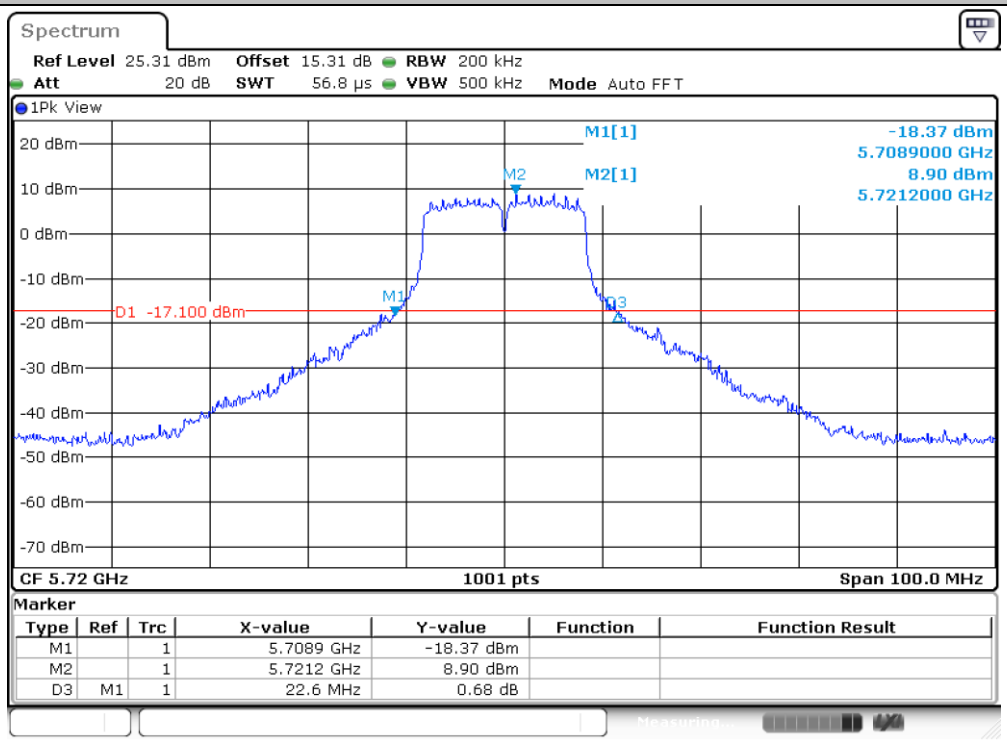

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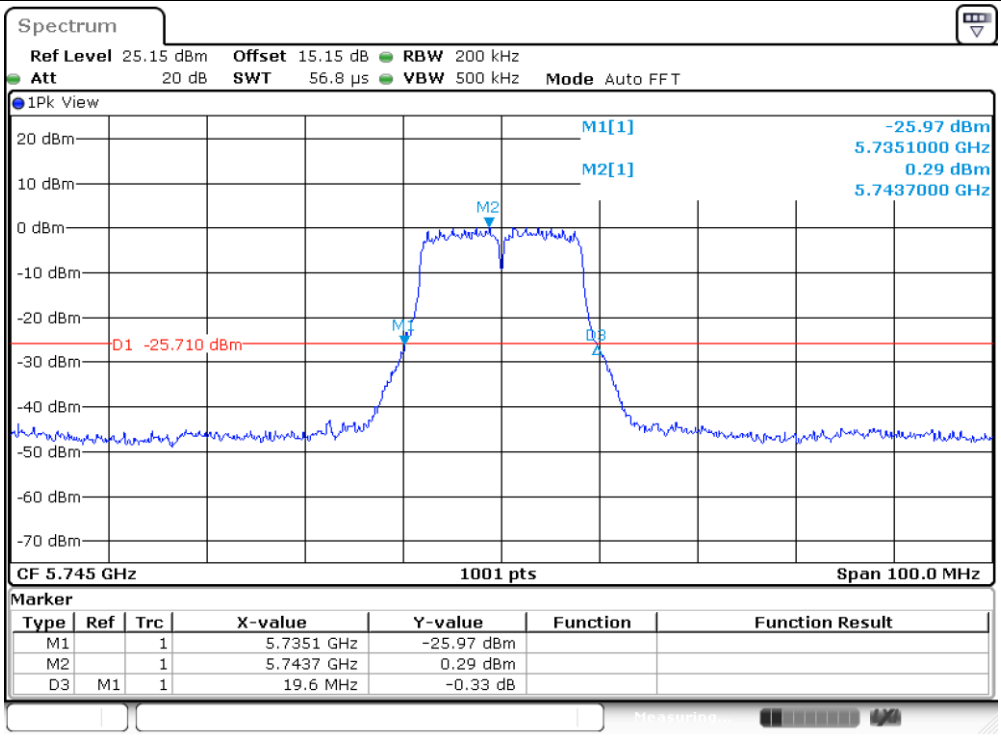

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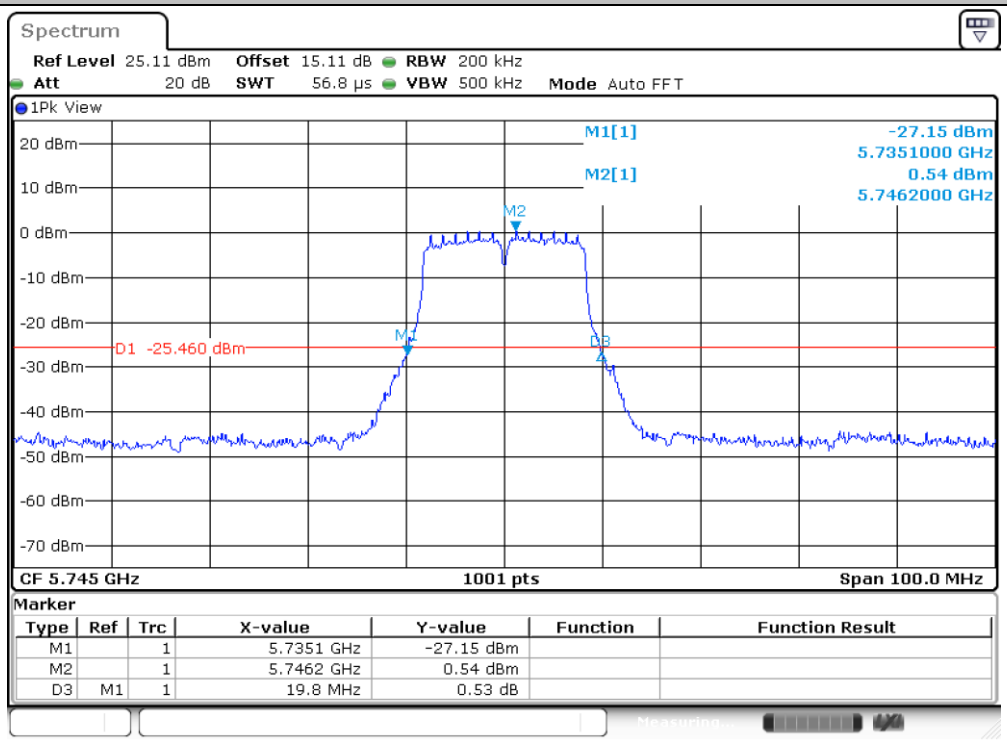

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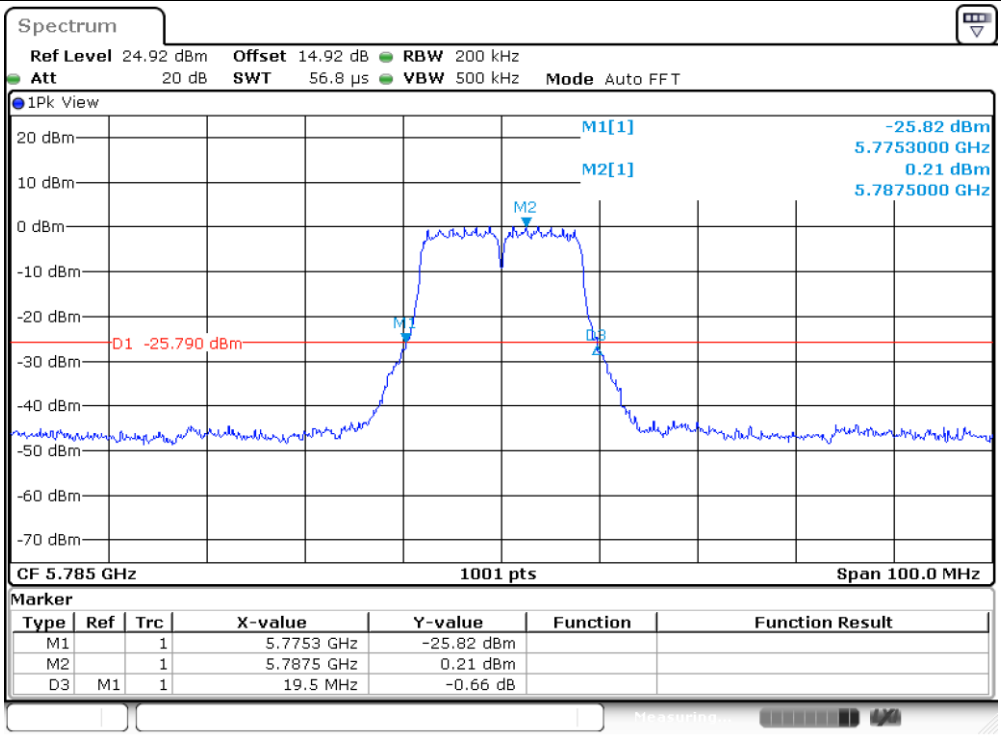

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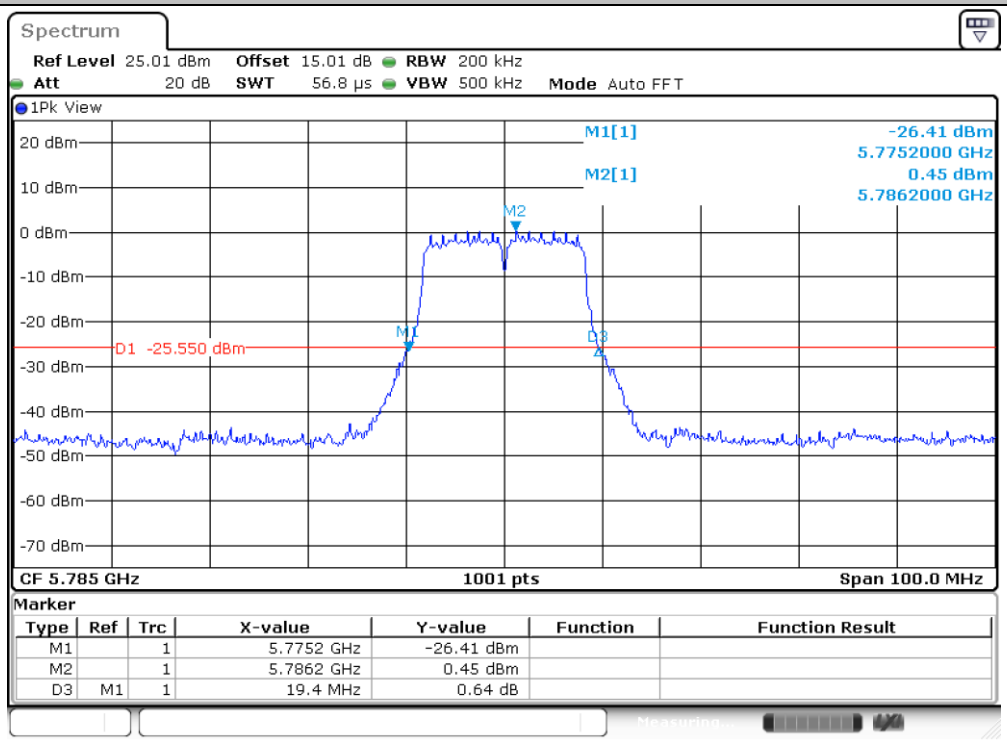

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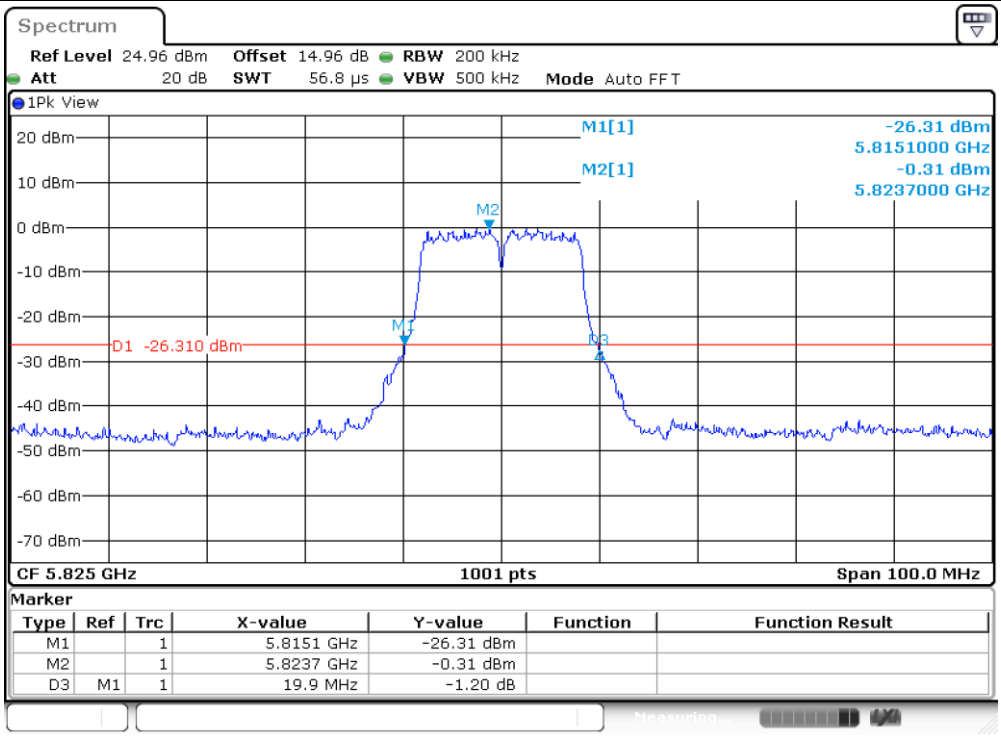

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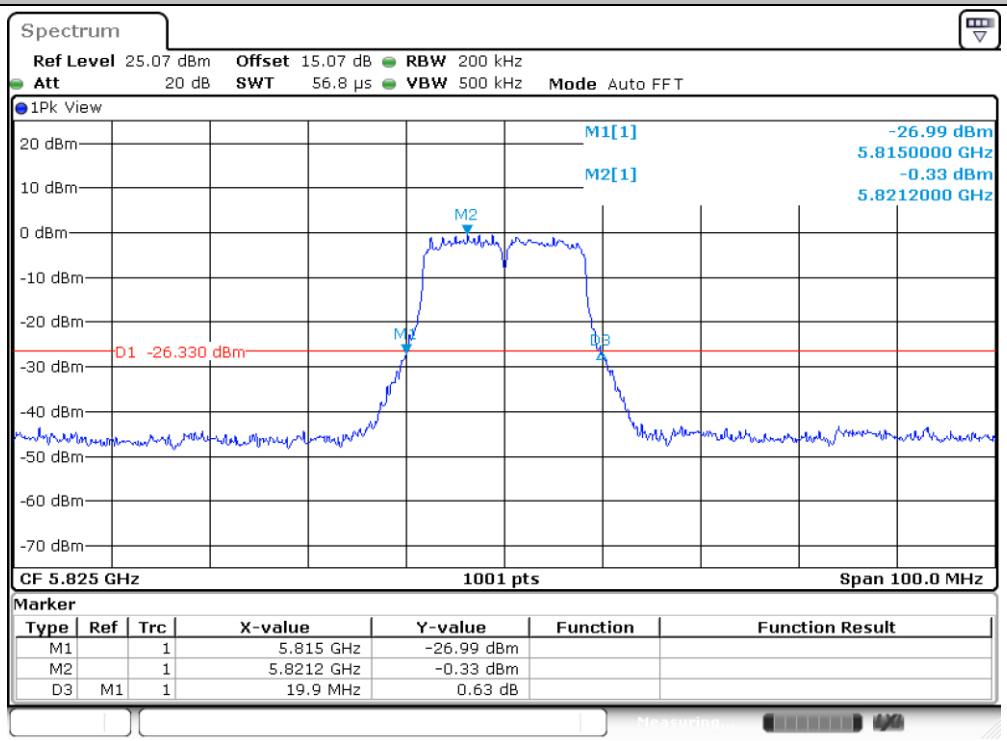

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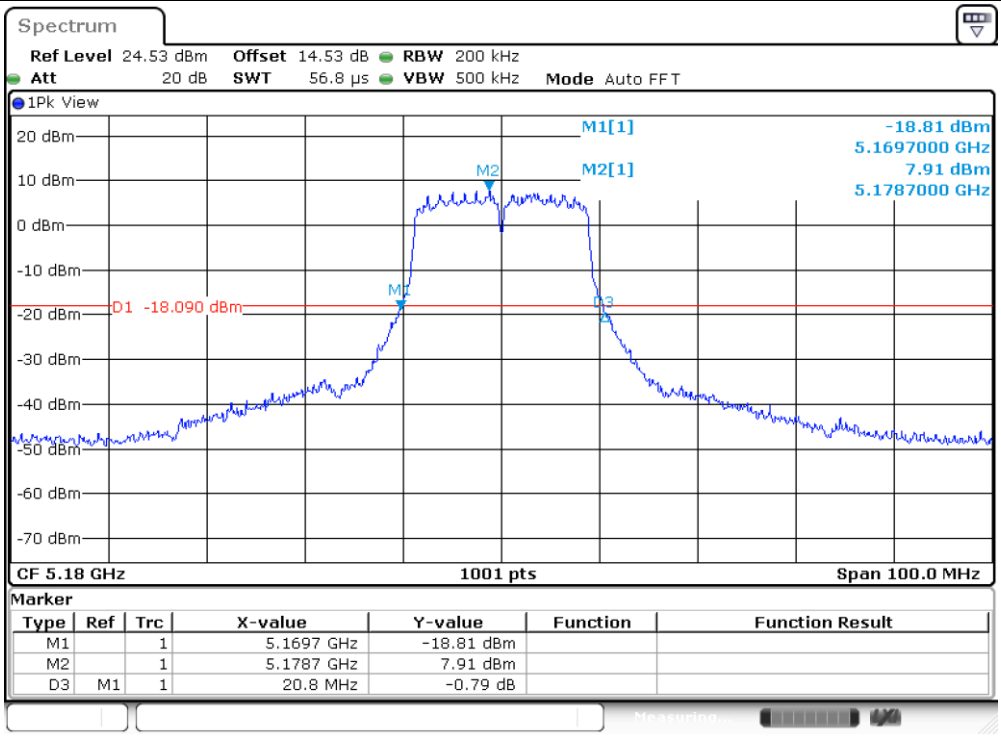

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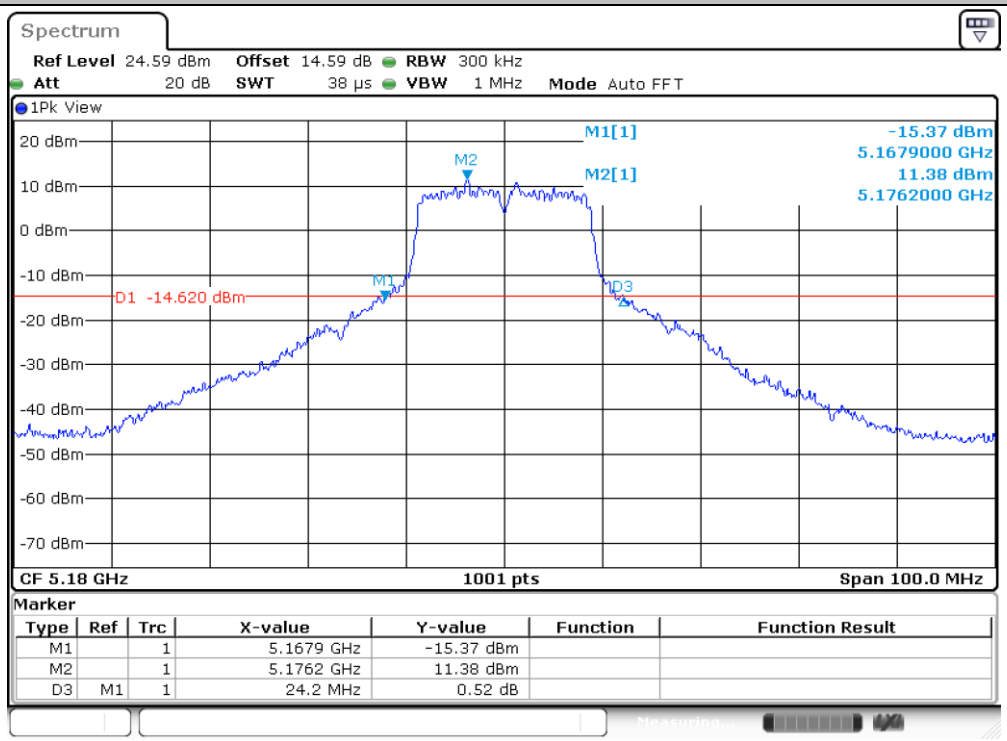

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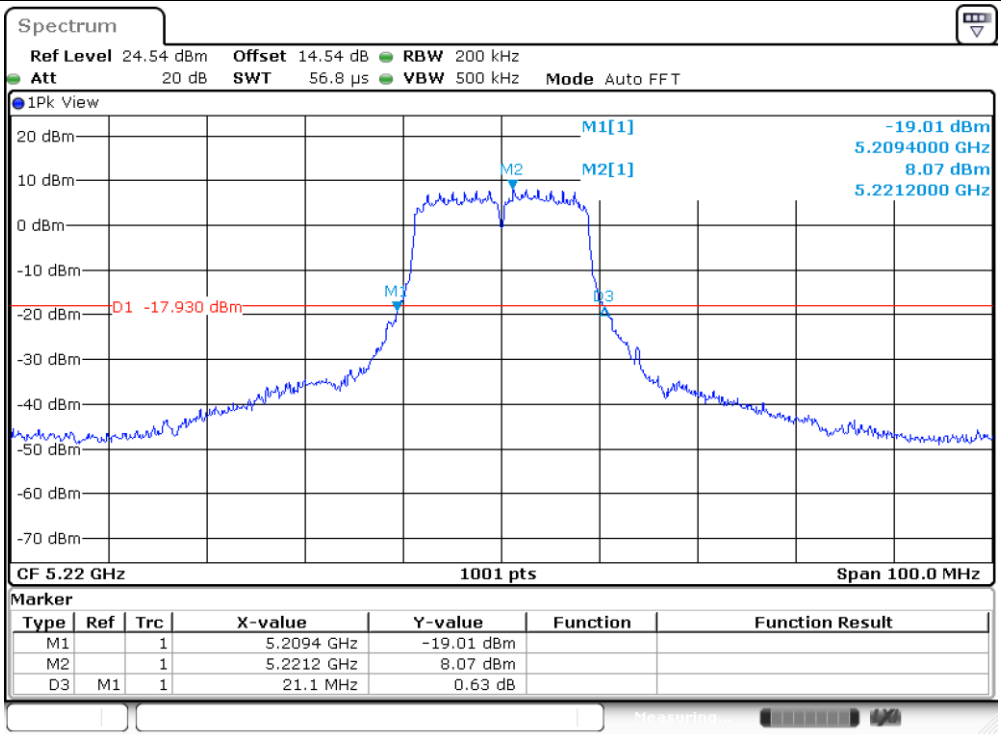
11N20MIMO_Ant11_5220



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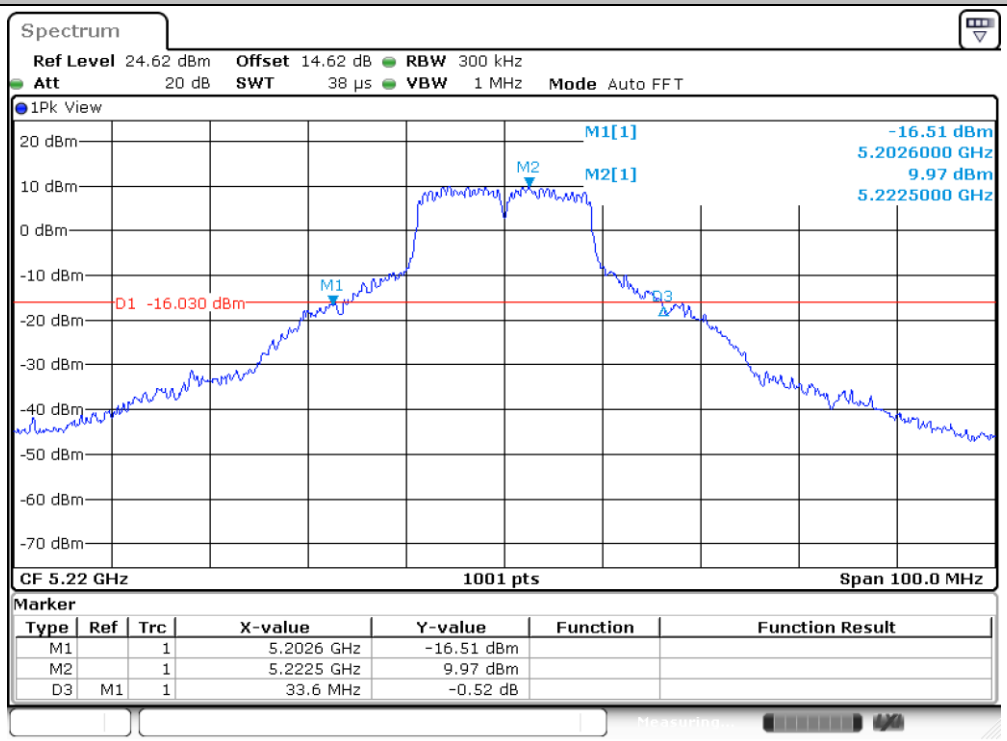

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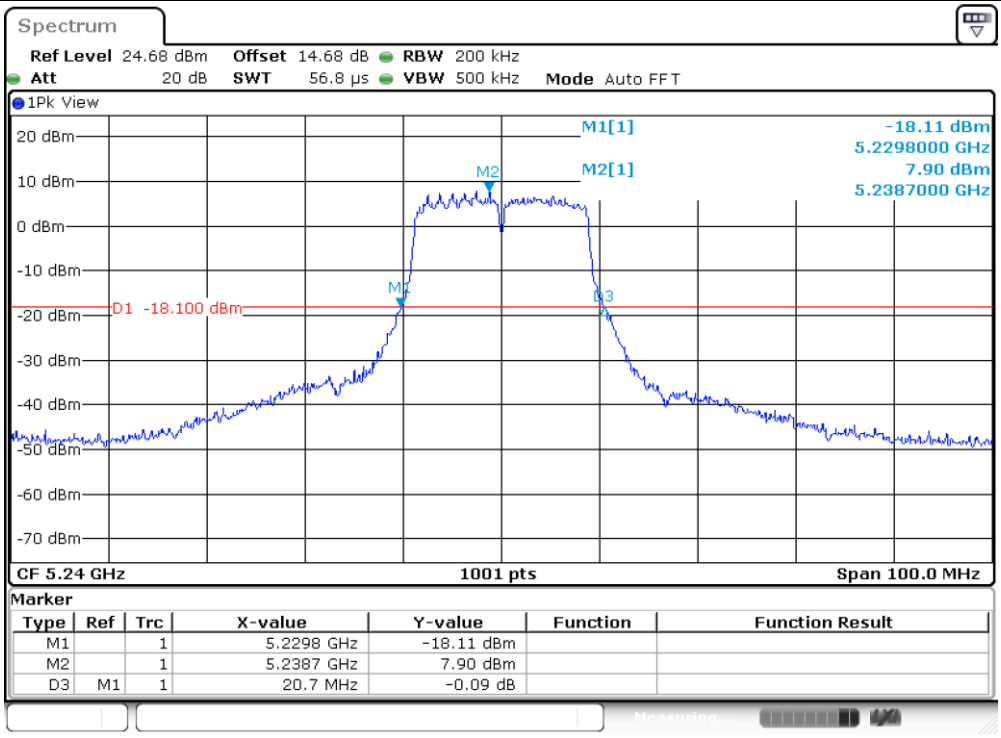

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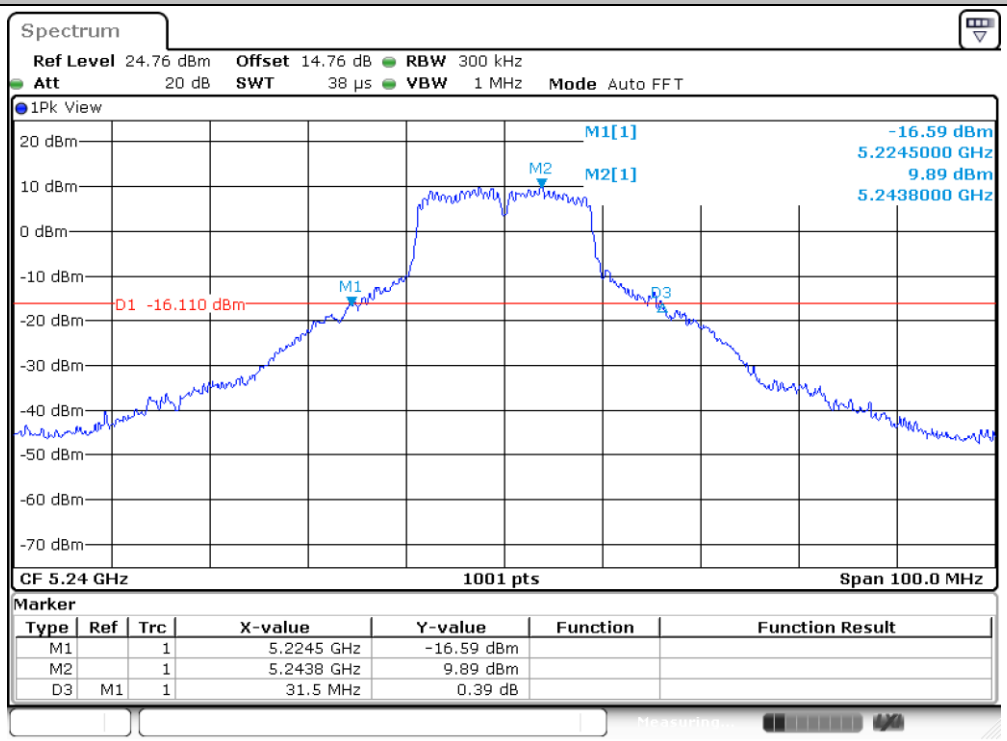

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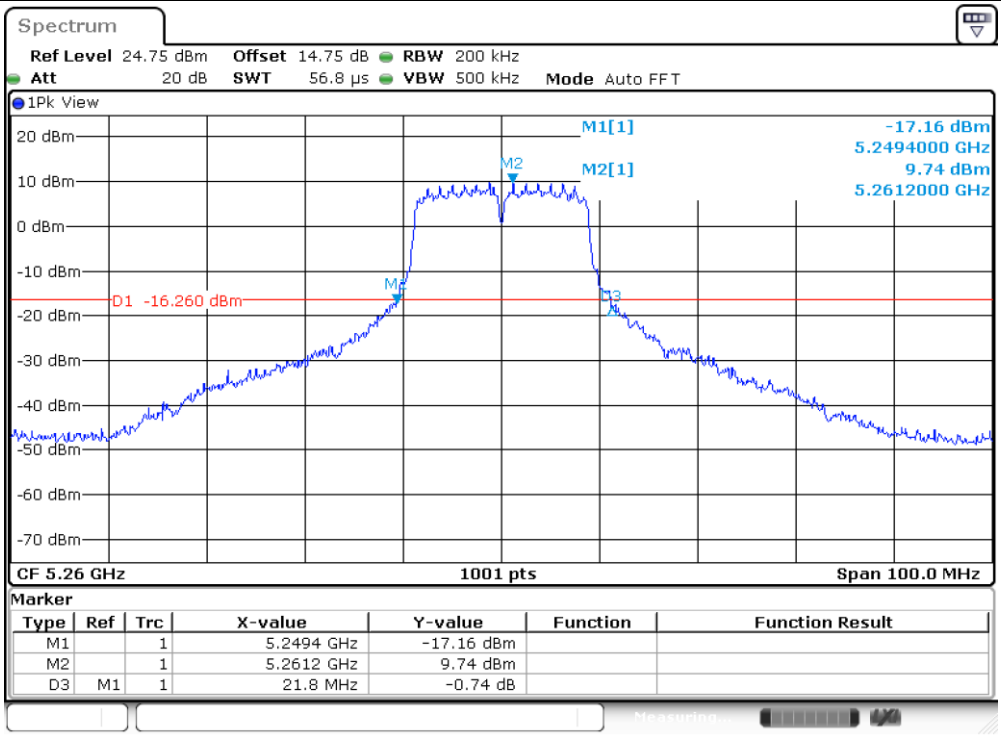

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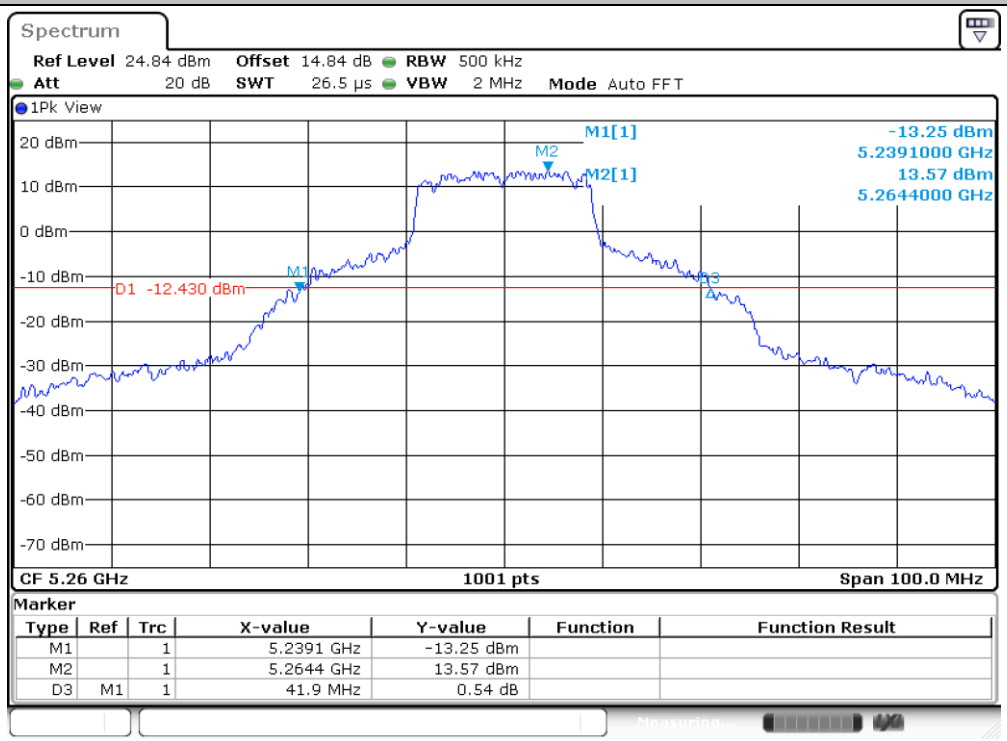

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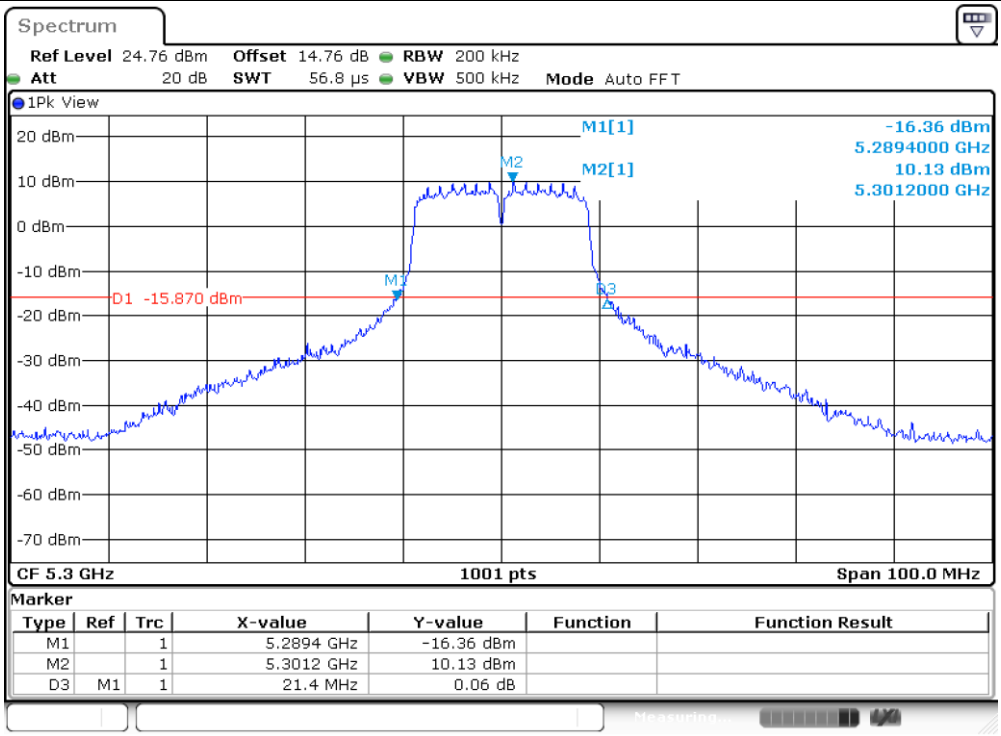

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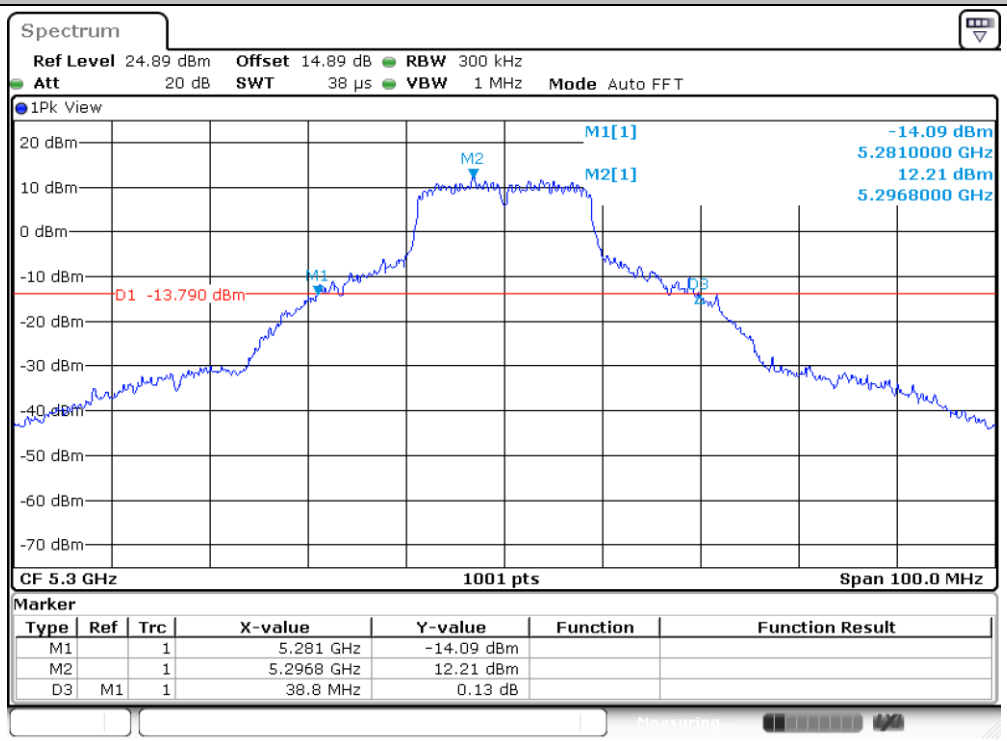

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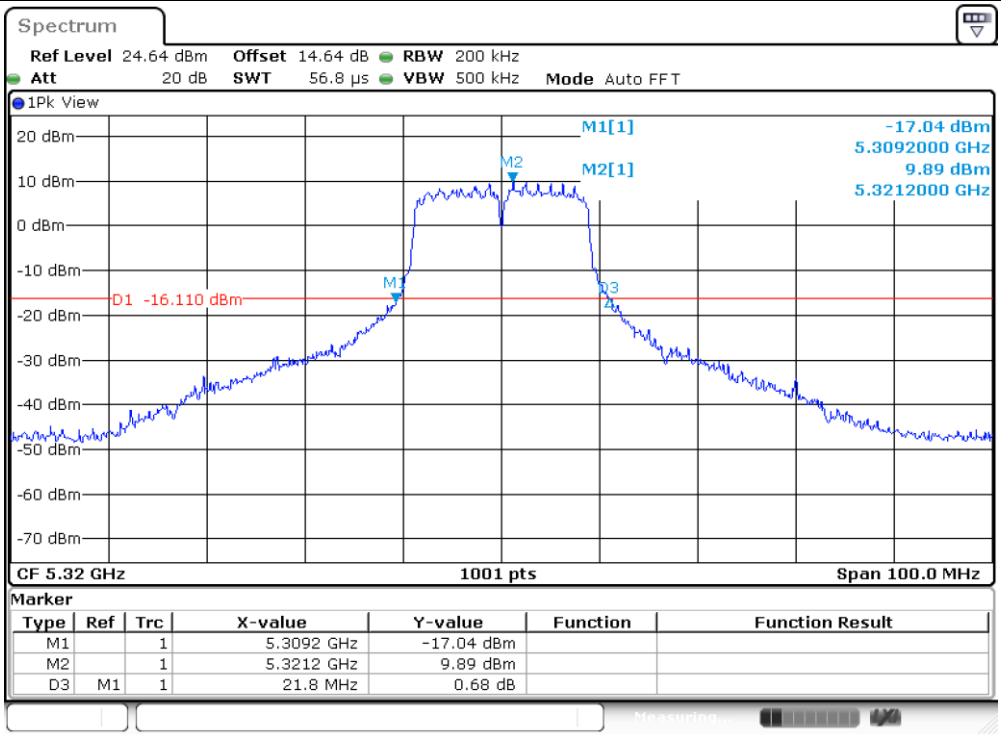

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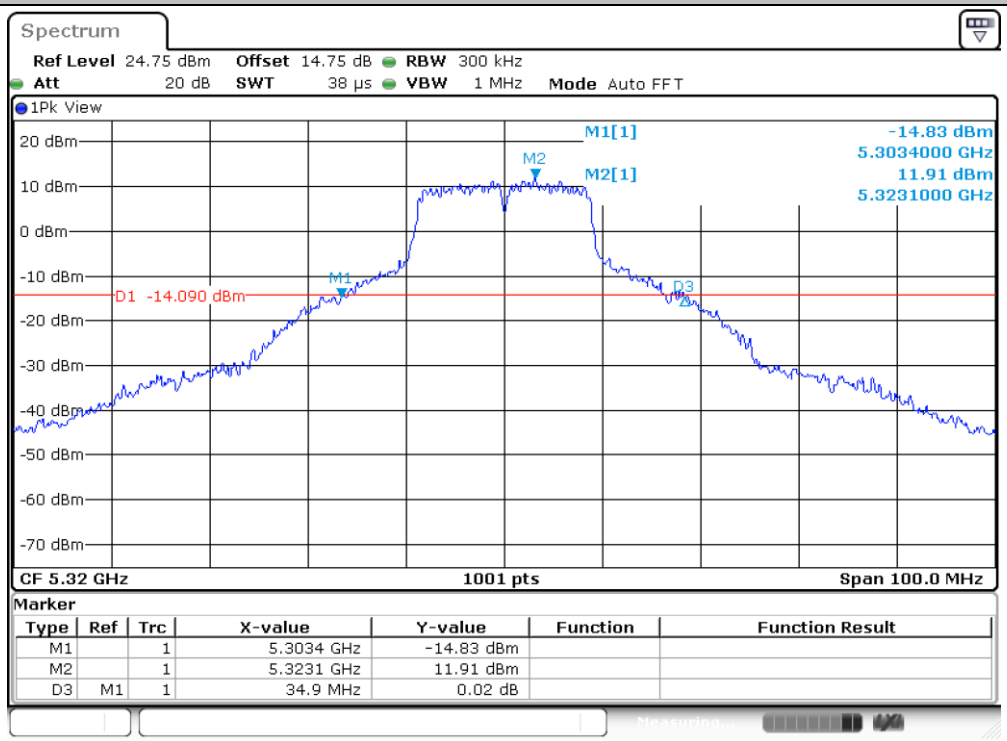

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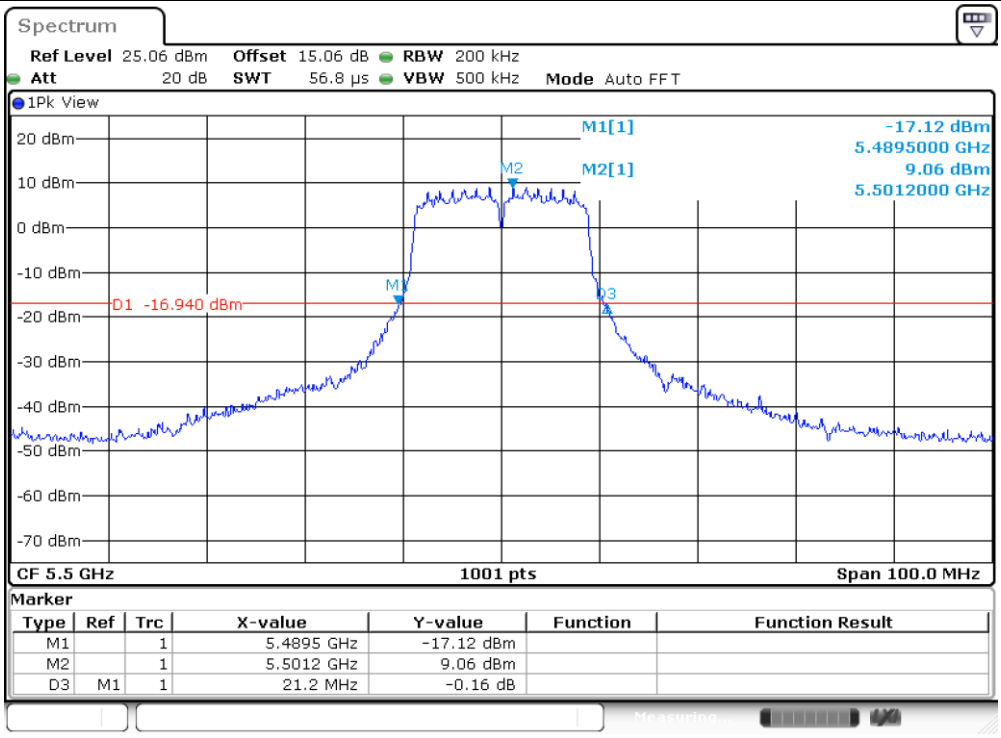

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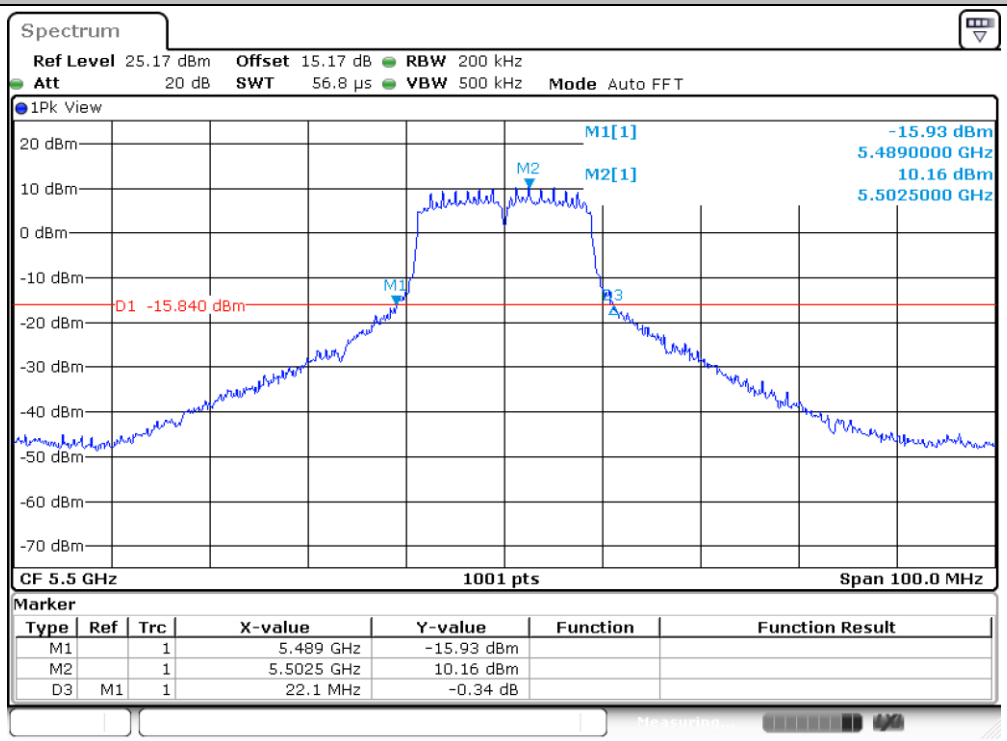

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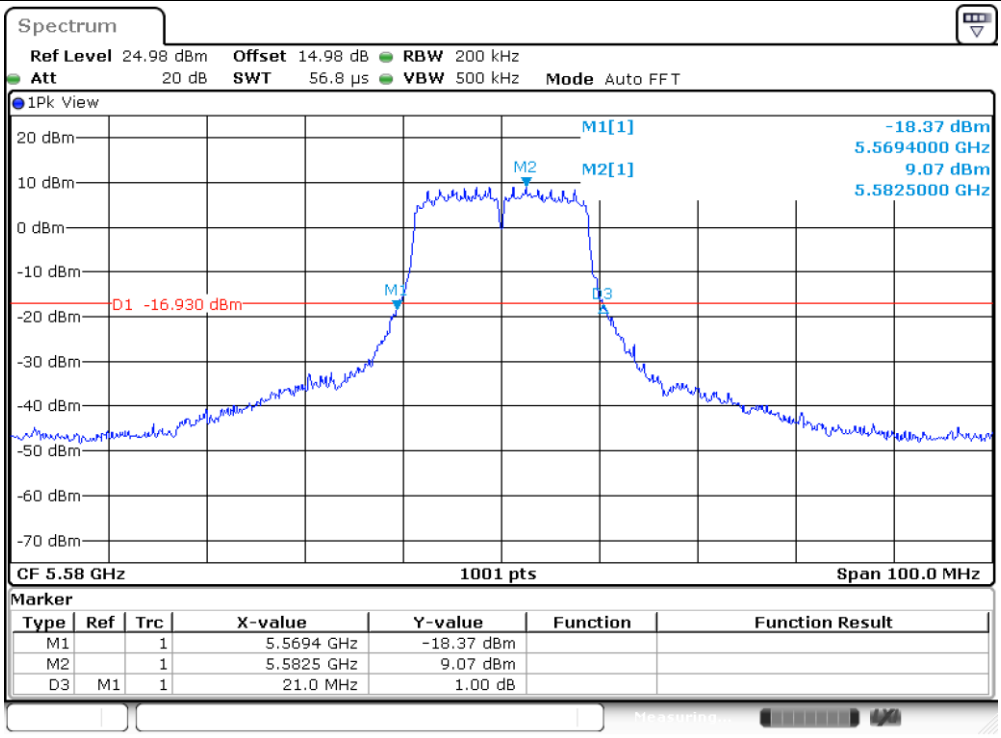

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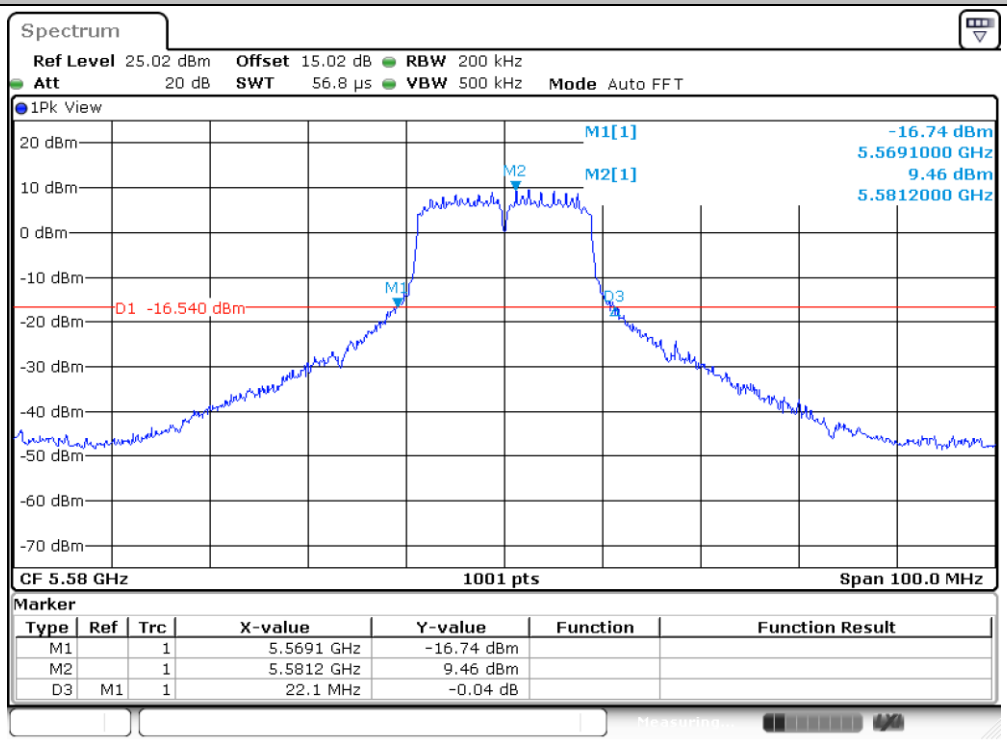

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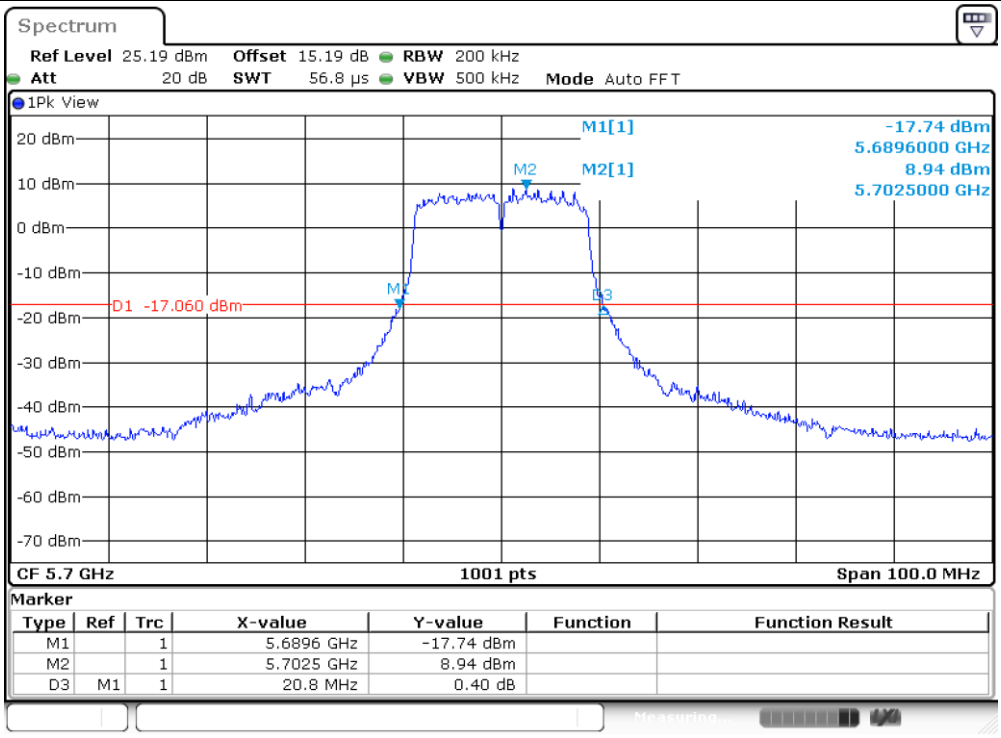

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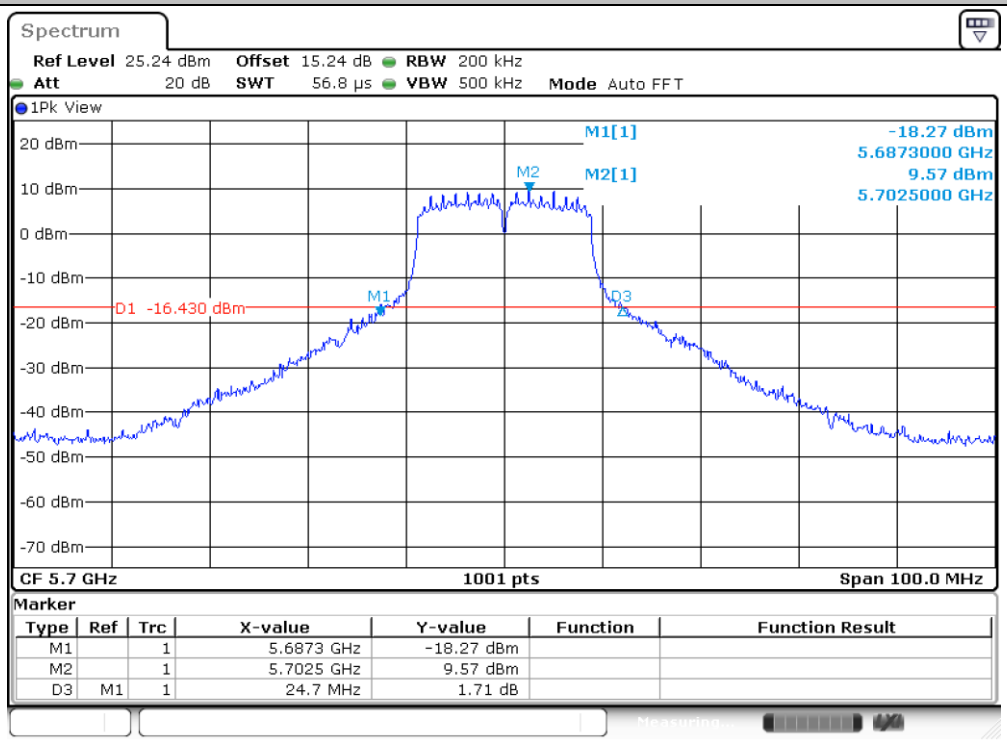

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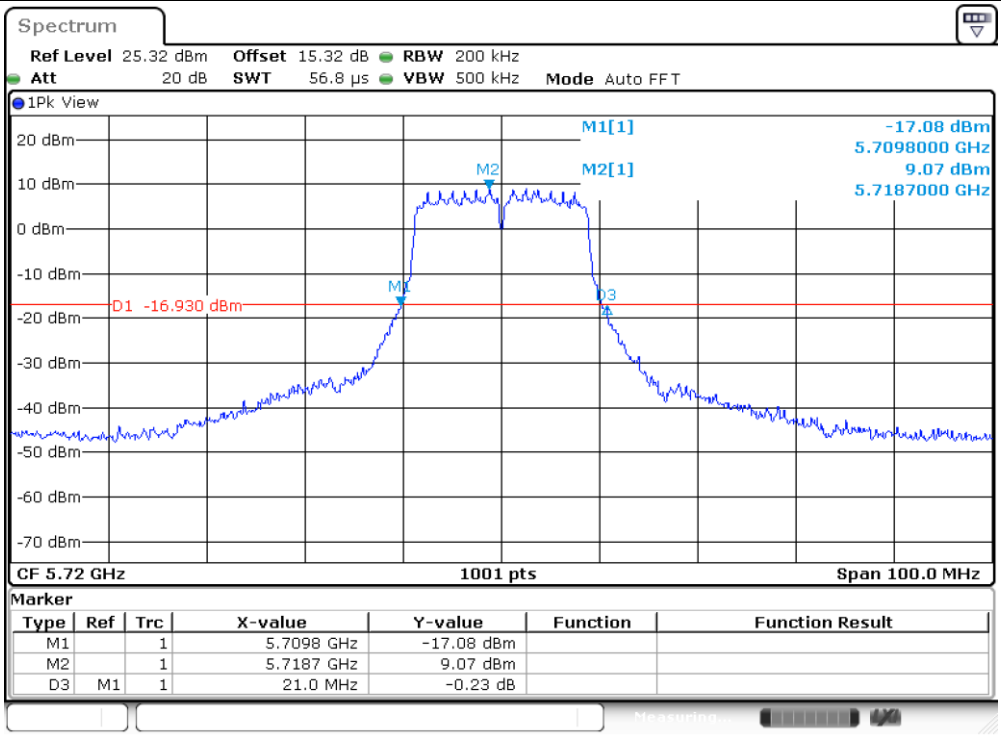

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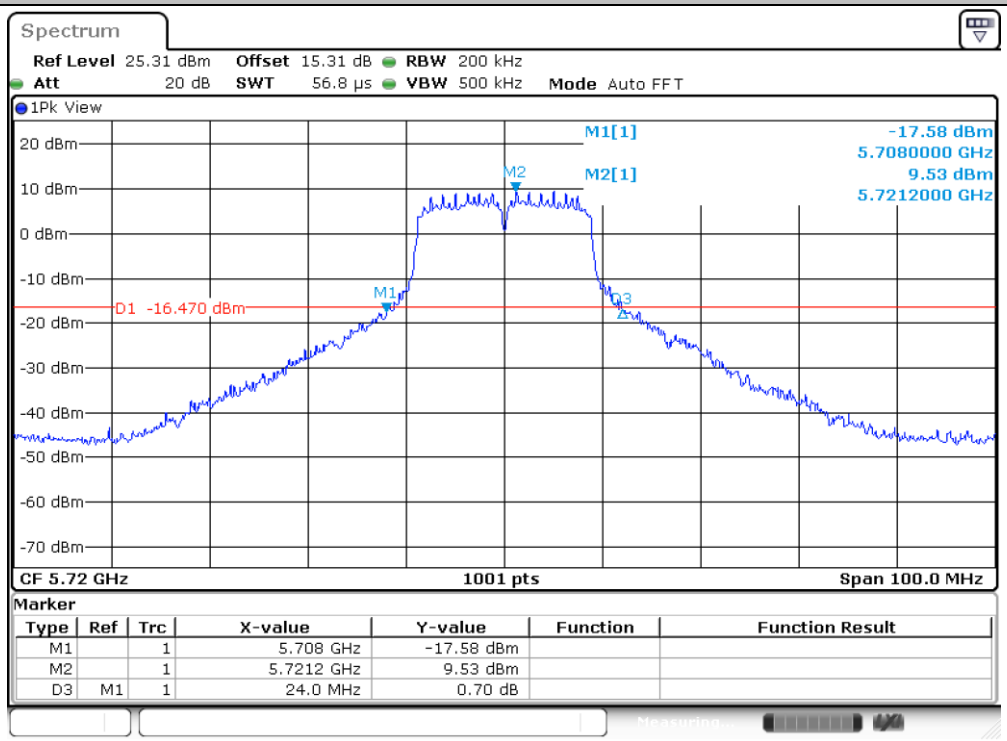

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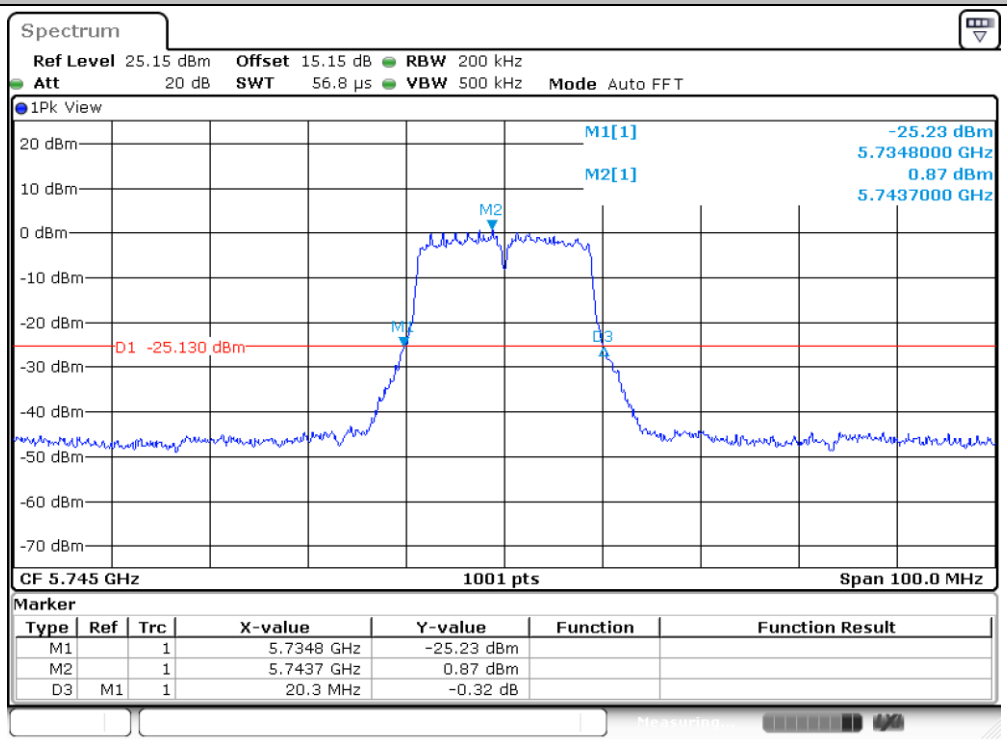

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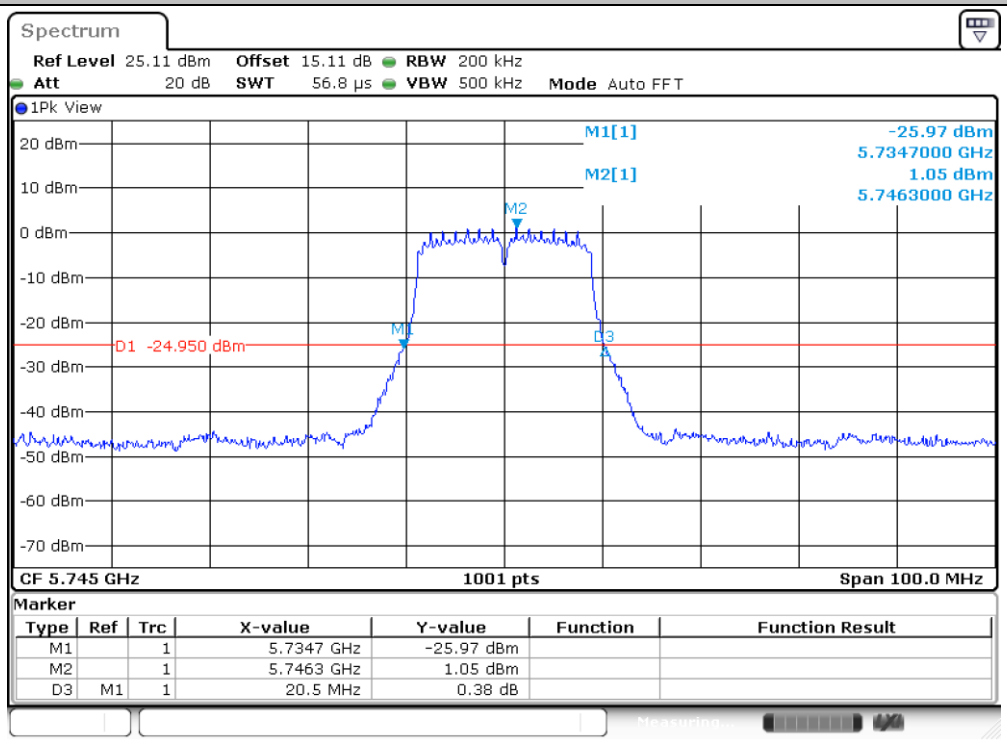

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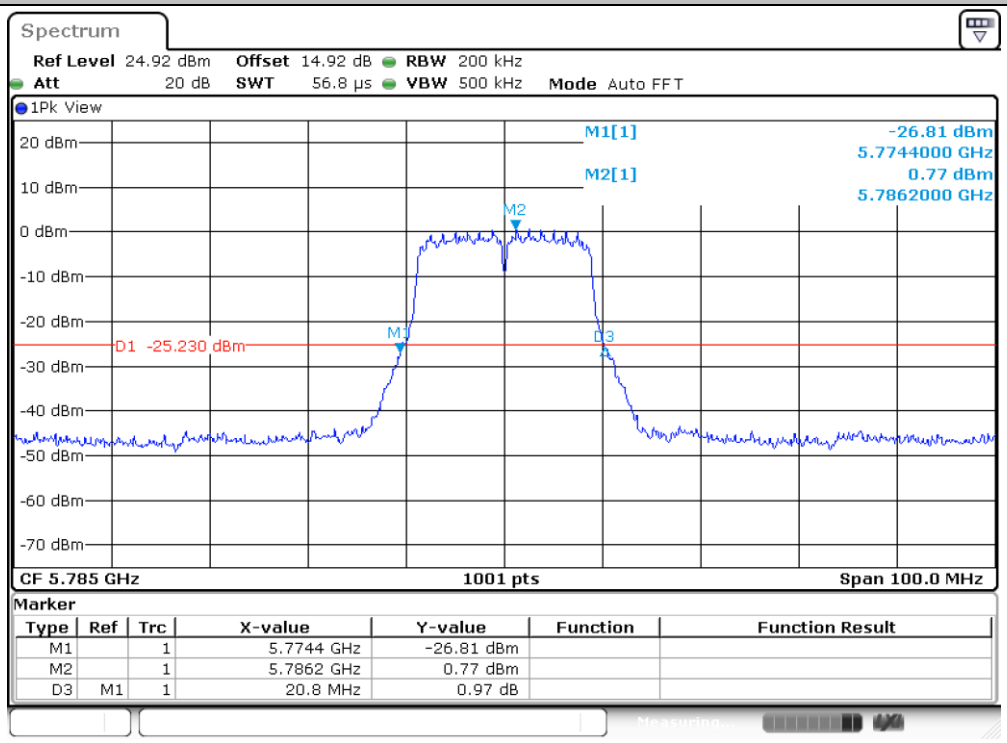

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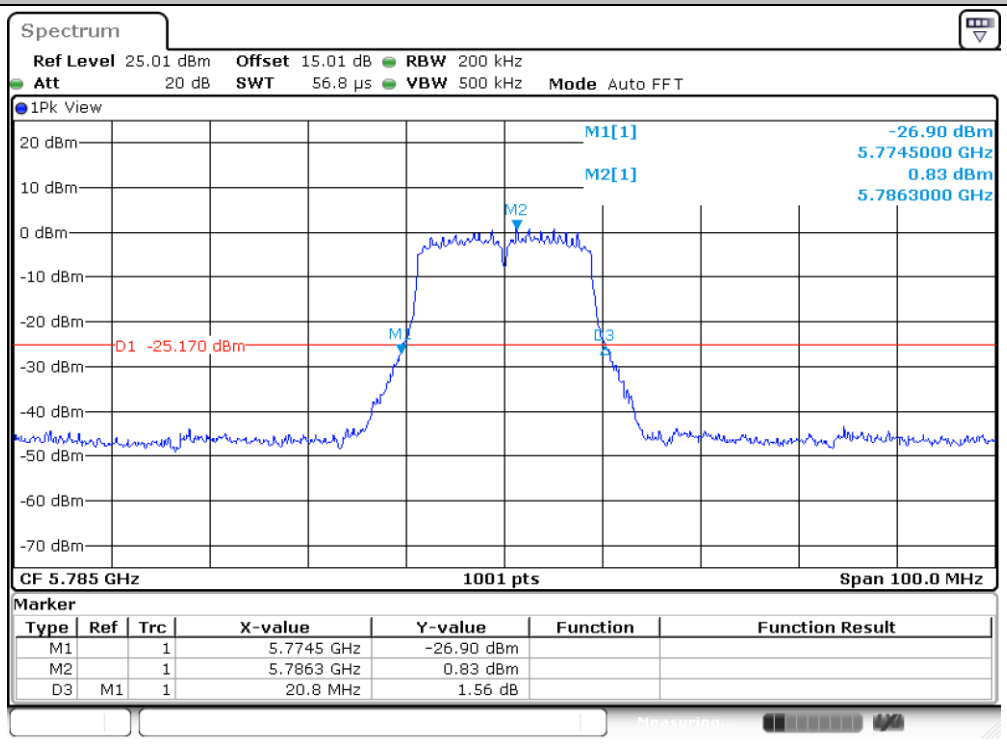

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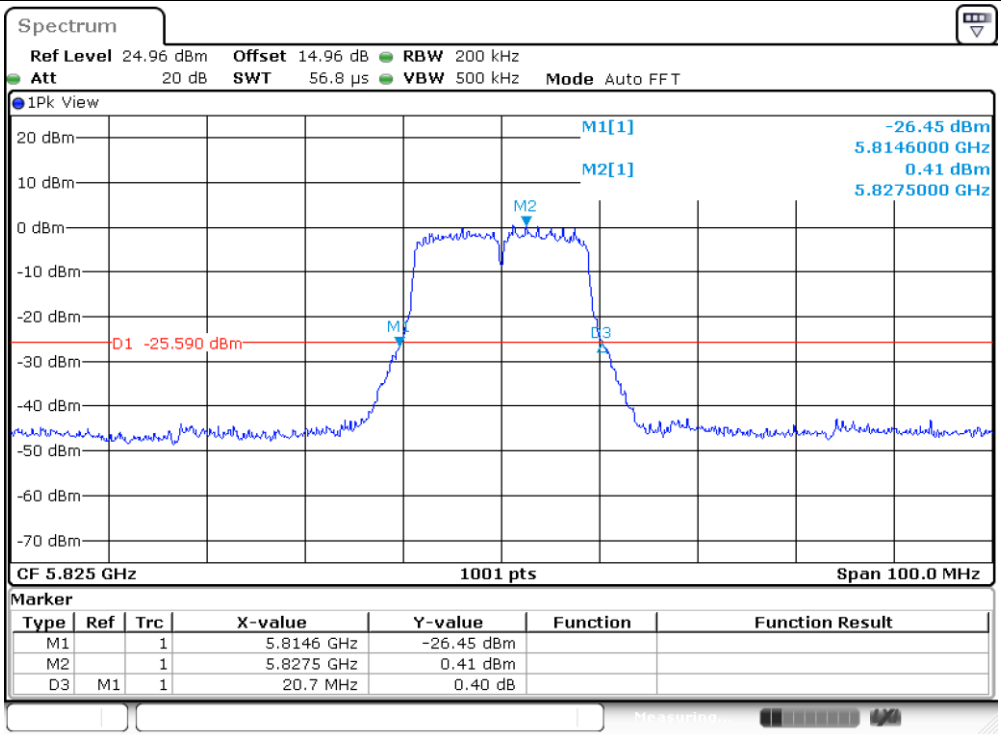

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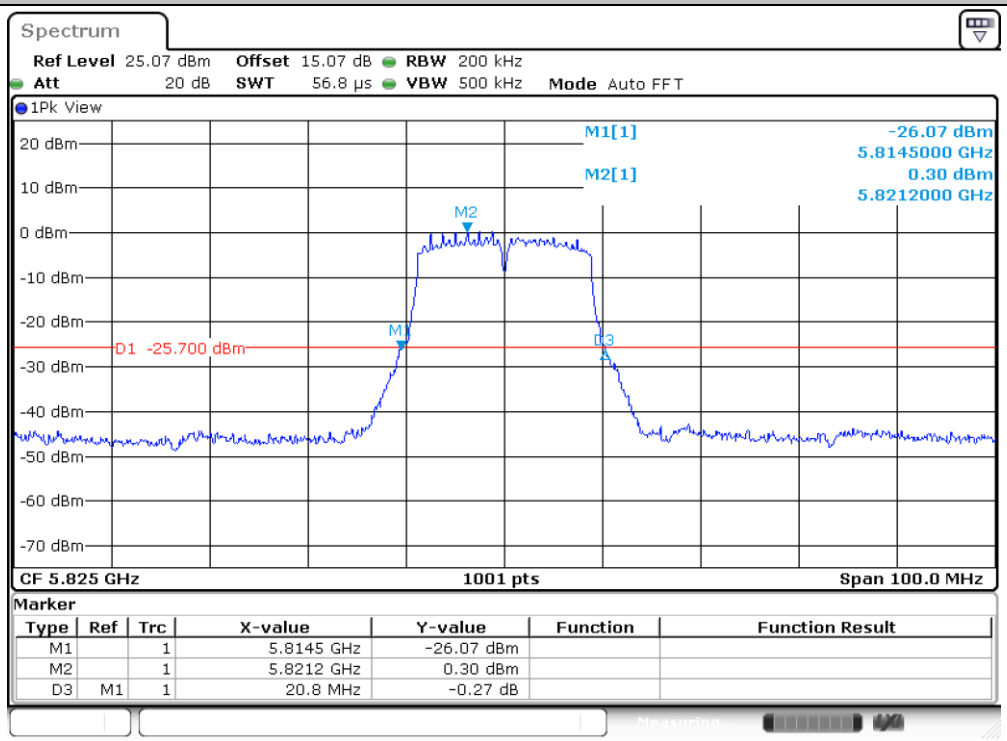

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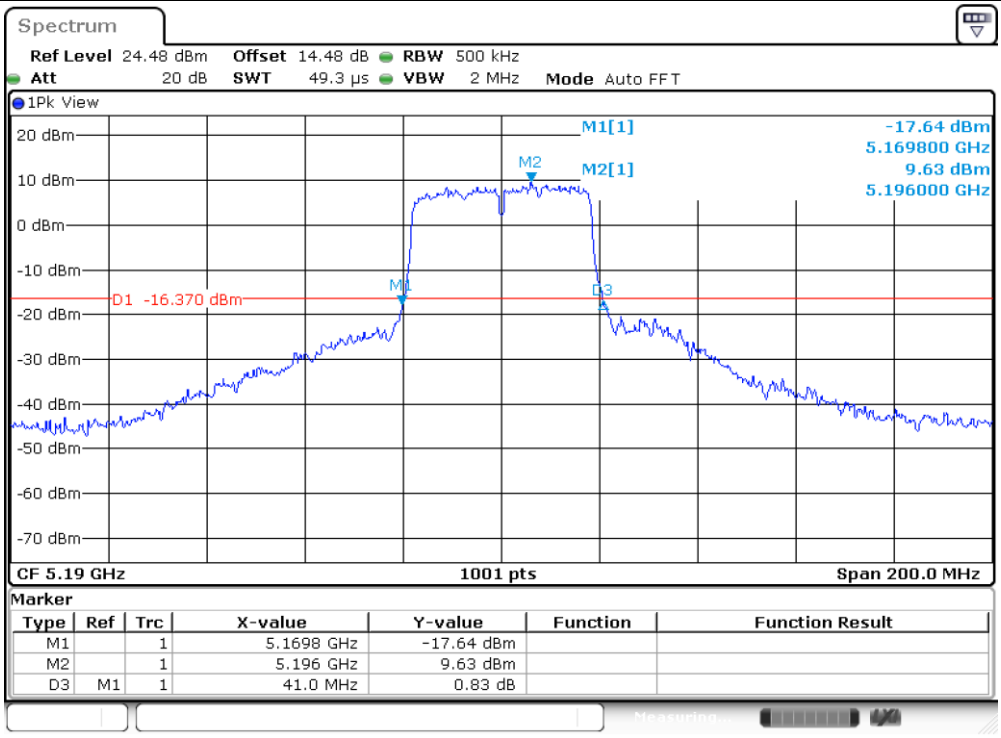

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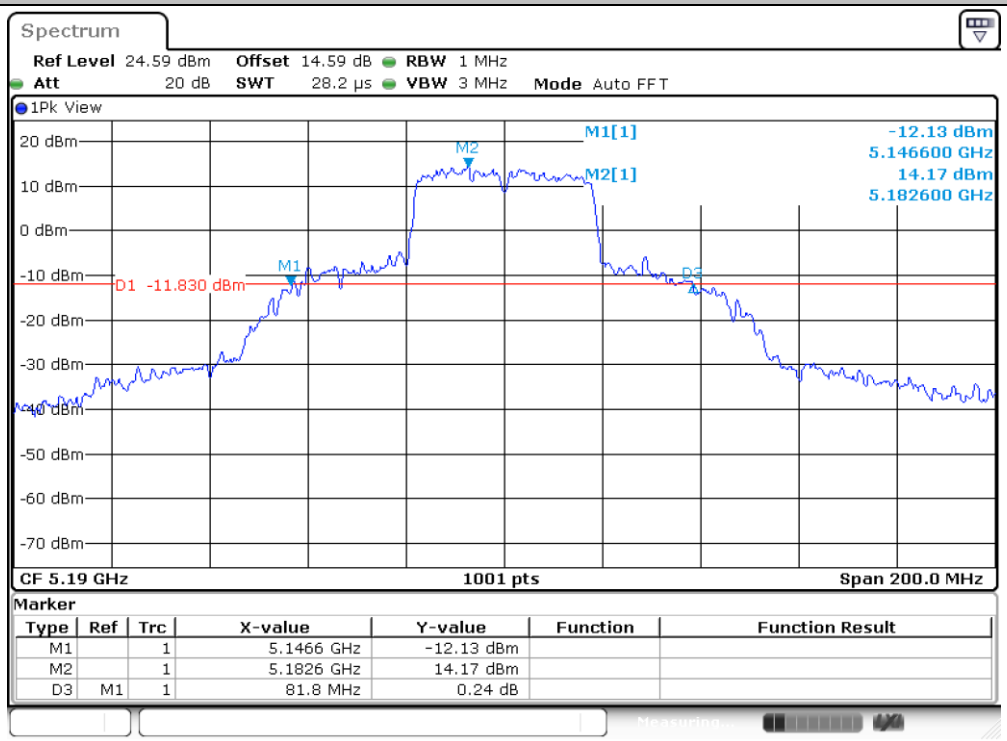

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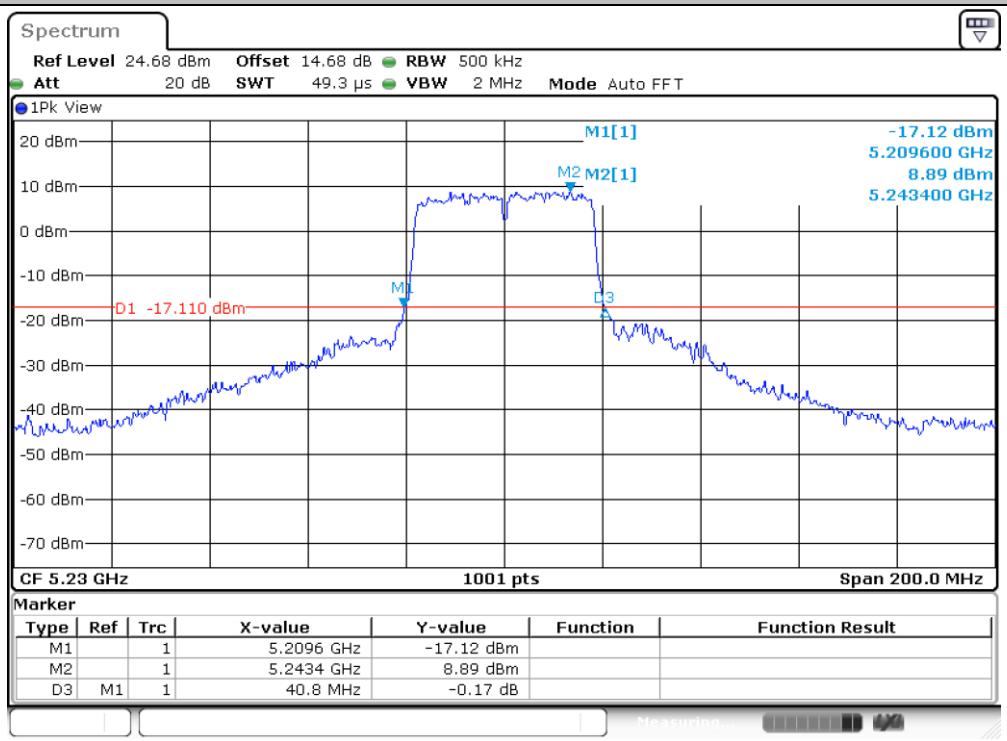

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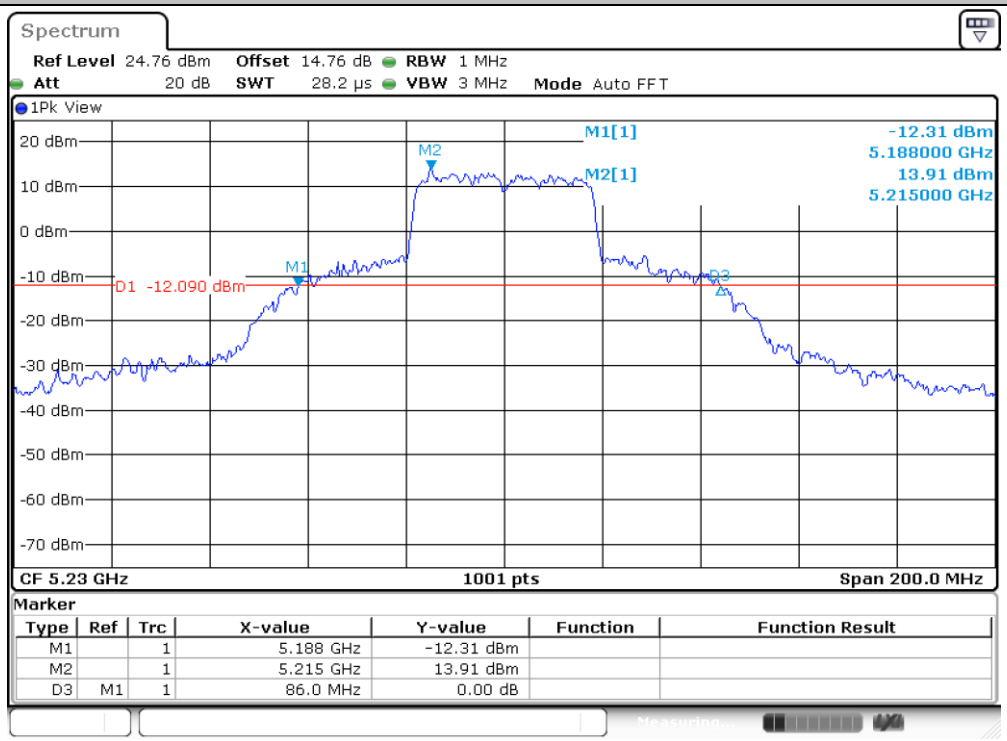

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