



## FCC TEST REPORT

**Application No:** ZR/2020/70008  
**Applicant:** OnePlus Technology (shenzhen) Co., Ltd.  
**Address of Applicant:** 18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China.  
**Manufacturer:** OnePlus Technology (shenzhen) Co., Ltd.  
**Address of Manufacturer:** 18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China.  
**EUT Description:** Smart Phone  
**Model No.:** BE2011, BE2012, BE2015  
**Trade Mark:** ONEPLUS  
**FCC ID:** 2ABZ2-EF164  
**Standards:** 47 CFR FCC Part 2, Subpart J  
 47 CFR FCC Part 15, Subpart C  
 47 CFR FCC Part 15, Subpart E  
 KDB 789033 D02 General UNII Test Procedures New Rules v02  
 FCC KDB 558074 D01 DTS Meas Guidance v0502  
 KDB 662911 D01 Multiple Transmitter Output v02r01  
**Test Method:** KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02  
 KDB 905462 D03 Client Without DFS New Rules v01r02  
 ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices  
**Date of Receipt:** 2020/8/10  
**Date of Test:** 2020/8/10 to 2020/10/15  
**Date of Issue:** 2021/4/19

<b>Test Result:</b>	<b>PASS *</b>
---------------------	---------------

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

Authorized Signature:

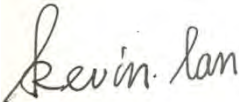

Derek Yang  
Wireless Laboratory Manager



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# 1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/10/15		Original
02		2021/4/19	Kevin.Lan	1.Add test site Information 2.Modify data conversion error of antenna height 3.Update equipment list

<b>Authorized for issue by:</b>	
<b>Prepared By</b>	 _____ <b>(Kevin.Lan) /Engineer</b>
<b>Checked By</b>	 _____ <b>(David Chen) /Reviewer</b>



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## 2 Test Summary

Test Item	Band	FCC Rule	Requirements	Test Result	Verdict	Test Lab*
Emission Bandwidth	5150-5250	15.403(i) 15.407(a)(1)	No limit.	Clause 4.4 Clause 4.5	Pass	A
	5250-5350	15.403(i) 15.407(a)(2)				
	5470-5725	15.403(i) 15.407(a)(2)				
	5725-5850	15.403(i) 15.407(e)	≥ 500 kHz.			
Occupied Bandwidth	5150-5250	KDB 789033 D02§ D	No limit.		Pass	A
	5250-5350					
	5470-5725					
	5725-5850					
Duty Cycle	5150-5850	--	No limit.			
Maximum Conducted Output Power	5150-5250	15.407(a)(1) 15.407(a)(4)	FCC < 250mW (avg during transmission)	Clause 4.3	Pass	A
	5250-5350	15.407(a)(2) 15.407(a)(4)	<MIN{250mW, 11dBm+10*Ig(EBW)} (avg during transmission)			
	5470-5725	15.407(a)(2) 15.407(a)(4)	<MIN{250mW, 11dBm+10*Ig(EBW)} (avg during transmission)			
	5725-5850	15.407(a)(3)	< 1W (avg during transmission)			
maximum Power Spectral Density	5150-5250	15.407(a)(1) 15.407(a)(4)	<11dBm/MHz (avg during transmission)	Clause 4.6		
	5250-5350	15.407(a)(2) 15.407(a)(4)	<11dBm/MHz (avg during transmission)			
	5470-5725	15.407(a)(2) 15.407(a)(4)	<11dBm/MHz (avg during transmission)			
	5725-5850	15.407(a)(3) 15.407(a)(4)	<30dBm/500KHz (avg during transmission)			
Unwanted Emissions that fall Outside of the Restricted Bands(Radiated)	5150-5250	15.407(b)(1) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.15-5.35 GHz). F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).	Clause 4.7	Pass	B
	5250-5350	15.407(b)(2) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.25-5.35 GHz). F≥1GHz & in-restricted:			



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Test Item	Band	FCC Rule	Requirements	Test Result	Verdict	Test Lab*
			§15.209/§7.2.5 limit (AV&PK).			
	5470-5750	15.407(b)(3) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.47-5.725 GHz). F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).			
	5725-5850	15.407(b)(4) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP) F≥1GHz & out-restricted:(QP) a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges; b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges; c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges. F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).			
Unwanted Emissions in the Restricted Bands (Radiated)	5150-5250 5250-5350 5470-5725 5725-5850	15.209		Clause 4.8	Pass	B
AC Power Line Conducted Emissions	5150-5250 5250-5350 5470-5725 5725-5850	15.207		Clause 4.2	Pass	B
Frequency Stability	5150-5250 5250-	15.209		Clause 4.9	Pass	A



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Test Item	Band	FCC Rule	Requirements	Test Result	Verdict	Test Lab*
	5350 5470-5600 5650-5725 5725-5850					
Dynamic Frequency Selection	5250-5350 5470-5725	47 CFR Part 15, Subpart E 15.407	Channel Move Time:10 Seconds	Clause 4.10	Pass	A
			Transmission Time: milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.			
			Non-occupancy period: Minimum 30 minutes			

Remark: All test were performed by Lab A and B.  
Parts of test items above were subcontracted to Lab B.  
Lab A SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch  
Lab B SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.



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### 3 General Information

#### 3.1 Client Information

Applicant:	OnePlus Technology (shenzhen) Co., Ltd.
Address of Applicant:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen,China.
Manufacturer:	OnePlus Technology (shenzhen) Co., Ltd.
Address of Manufacturer:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen,China.

#### 3.2 Test Location

##### Lab A:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
Post code:	518057
Test Engineer	Dee Zheng, Mike Hu

##### Lab B:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086
Test Engineer	Ben Huang, Lean Chen

#### 3.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

##### Lab A:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have



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been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

**• FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

**• Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

**Lab B:**

**• A2LA (Certificate No. 4854.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

**• FCC –Designation Number: CN1271**

### 3.4 General Description of EUT

EUT Description:	Smart Phone
Model No.:	BE2011, BE2012, BE2015
Trade Mark:	ONEPLUS
Hardware Version:	44
Software Version:	10.5.5.BE82CB
IEEE 802.11 WLAN Mode Supported:	<input checked="" type="checkbox"/> 802.11a (20 MHz channel bandwidth) ; <input checked="" type="checkbox"/> 802.11n (20 MHz channel bandwidth); <input checked="" type="checkbox"/> 802.11n (40 MHz channel bandwidth); <input checked="" type="checkbox"/> 802.11ac (20 MHz channel bandwidth); <input checked="" type="checkbox"/> 802.11ac (40 MHz channel bandwidth); <input checked="" type="checkbox"/> 802.11ac (80 MHz channel bandwidth); <input type="checkbox"/> 802.11ac (160 MHz channel bandwidth),
Operation Frequency:	IEEE 802.11n(HT20/40)/ ac(HT20/40/80/): 5150MHz to 5250MHz IEEE 802.11n(HT20/40)/ ac(HT20/40/80/160): 5250MHz to 5350MHz IEEE 802.11n(HT20/40)/ ac(HT20/40/80/160): 5470MHz to 5725MHz IEEE 802.11n(HT20/40)/ ac(HT20/40/80): 5725MHz to 5850MHz
Type of Modulation:	OFDM
DFS mode:	<input type="checkbox"/> Master <input type="checkbox"/> Slave with radar detection <input checked="" type="checkbox"/> Slave without radar detection



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Sample Type:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated
Antenna Ports	<input checked="" type="checkbox"/> Ant 1, <input type="checkbox"/> Ant 2, <input type="checkbox"/> Ant 3
Smart System	<input checked="" type="checkbox"/> SISO (for 802.11a/n/ac), <input type="checkbox"/> MIMO (for 802.11n/ac), <input type="checkbox"/> Diversity (for 802.11a): Tx & Rx
Antenna Gain:	-1.1dBi,
Power Supply	<input checked="" type="checkbox"/> AC/DC Adapter; <input type="checkbox"/> PoE; <input type="checkbox"/> Other:

**Remark:**

In FCC 15.31, for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table, and the selected channel to perform the test as below:

Frequency Range of Operation Operating Frequency Range (in each Band)	Number of Measurement Frequencies Required	Location of Measurement Frequency in Band of Operation
1 MHz or less	1	centre
1 MHz to 10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near centre

**For UNII Band I:**

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5180
	The Middle channel	5200
	The Highest channel	5240
IEEE 802.11n/ac 40MHz	The Lowest channel	5190
	The Highest channel	5230
IEEE 802.11ac 80MHz	The Middle channel	5210

**For UNII Band II-A:**

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5260
	The Middle channel	5280
	The Highest channel	5320
IEEE 802.11n/ac 40MHz	The Lowest channel	5270
	The Highest channel	5310
IEEE 802.11ac 80MHz	The Middle channel	5290

**For UNII Band II-C:**

Mode	Channel	Frequency(MHz)
------	---------	----------------



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IEEE 802.11a/n/ac 20MHz	The Lowest channel	5500
	The Middle channel	5580
	The Highest channel	5700
IEEE 802.11n/ac 40MHz	The Lowest channel	5510
	The Middle channel	5500
	The Highest channel	5670
IEEE 802.11ac 80MHz	The Lowest channel	5500
	The Highest channel	5580

For UNII Band III:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5745
	The Middle channel	5785
	The Highest channel	5825
IEEE 802.11n/ac 40MHz	The Lowest channel	5755
	The Highest channel	5795
IEEE 802.11ac 80MHz	The Middle channel	5775

The mobile phone BE2012 and BE2015 and BE2011 are GSM/CDMA/WCDMA/LTE mobile phone. The differences between BE2012 and BE2015 and BE2011 are showed in the following table. They only have different model name, other parts of the mobile phone are the same, including Chipsets, the appearance, Bluetooth mode, Wifi mode, Adapter, Battery, and so on.

Model name	BE2012	BE2011	BE2015
Type	Object of reference	New model	New model
GSM bands	/	The same	The same
WCDMA bands	/	The same	The same
LTE bands	/	The same	The same
SIM card	/	The same	The same
External camera	/	The same	The same
Internal camera	/	The same	The same
FLASH	/	The same	The same
Mainboard	/	The same	The same
PCB layout	/	The same	The same
Appearance	/	The same	The same



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Bluetooth mode	/	The same	The same
WLAN mode	/	The same	The same
BT/ WLAN antenna	/	The same	The same
GSM/ WCDMA /LTE antenna	/	The same	The same
Adapter	/	The same	The same
Battery	/	The same	The same
Chipset	/	The same	The same
Memory	/	The same	The same
RF Parameter	/	The same	The same
Dimension	/	The same	The same

**Note:**

Model No.: BE2011, BE2012, BE2015.

Only the BE2012 was tested, since they only have different model name, other parts of the mobile phone are the same, including Chipsets, the appearance, Bluetooth mode, Wi-Fi mode, Adapter, Battery, and so on.



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### 3.5 Test Environment and Mode

<b>Operating Environment:</b>	
Temperature:	25.0 °C
Humidity:	55 % RH
Atmospheric Pressure:	101.32 KPa
<b>Test mode:</b>	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.



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## 4 Test results and Measurement Data

### 4.1 Antenna Requirement

<b>Test Requirement:</b>	47 CFR Part 15 Section 15.203
The antenna is integrated antenna and no consideration of replacement. The best case gain of the antenna is -1.1dBi.	

### 4.2 Conducted Emissions

<b>Test Requirement:</b>	47 CFR Part 15 Section 15.407(b)		
<b>Test Method:</b>	ANSI C63.10: 2013		
<b>Test Frequency Range:</b>	150kHz to 30MHz		
<b>Limit:</b>	Frequency range (MHz)	Limit (dBuV)	
		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.			
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</li> <li>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</li> <li>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</li> <li>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</li> </ol>		



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<p>Test Setup:</p>	
<p>Exploratory Test Mode:</p>	<p>Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.</p>
<p>Final Test Mode:</p>	<p>Through Pre-scan, find the 6Mbps of rate of 802.11a at lowest channel is the worst case. Only the worst case is recorded in the report.</p>
<p>Instruments Used:</p>	<p>Refer to section 5.10 for details</p>
<p>Test Results:</p>	<p>Pass</p>

**Measurement Data**

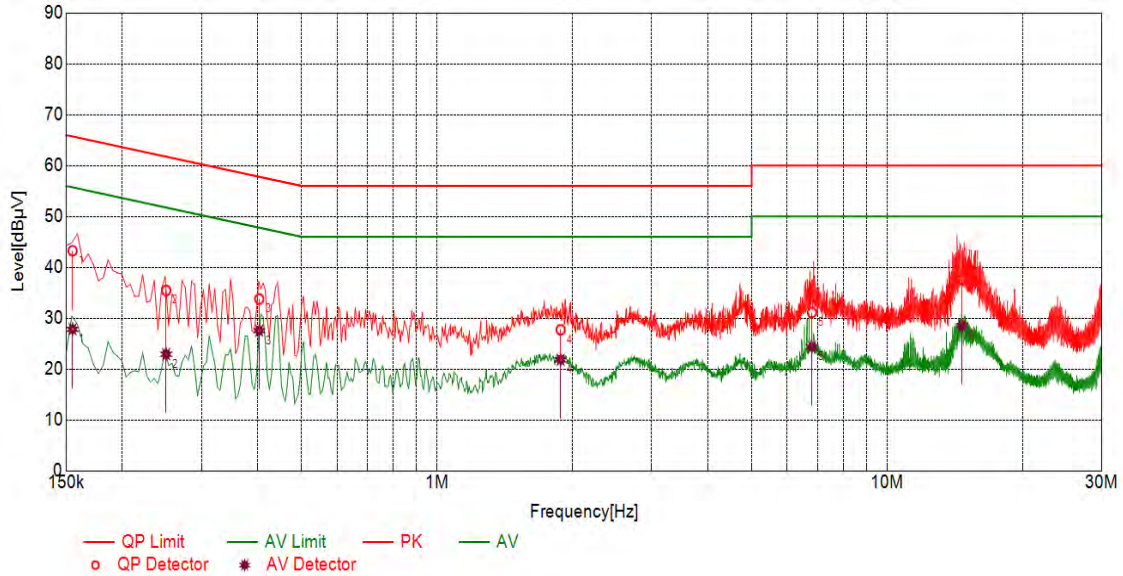
An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.



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Live Line:



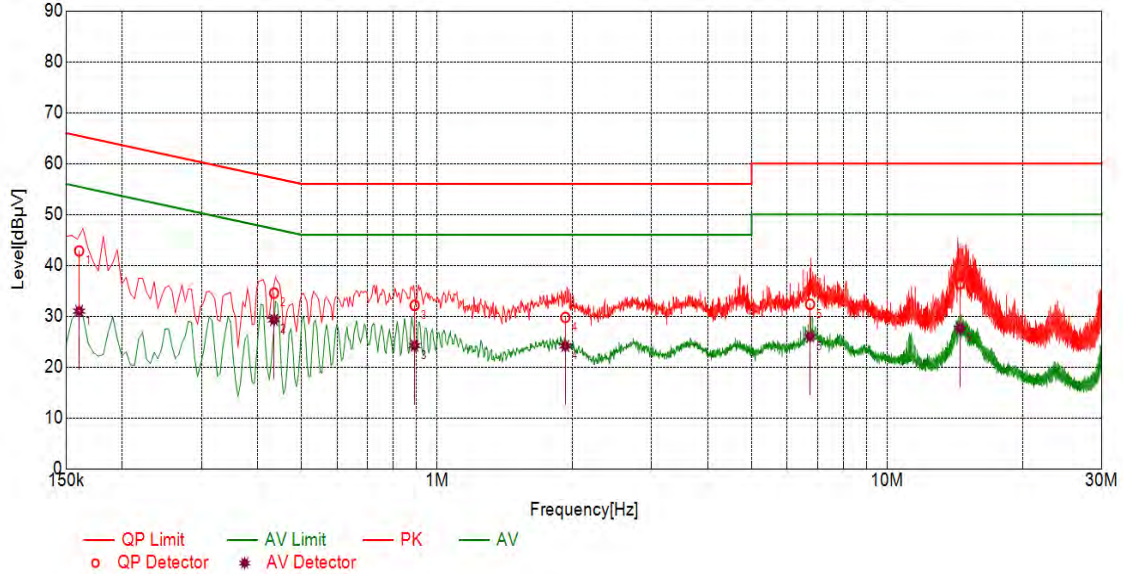
Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Type
1	0.1551	10.10	43.26	65.72	22.46	27.82	55.72	27.90	L
2	0.2503	10.10	35.45	61.75	26.30	22.91	51.75	28.84	L
3	0.4030	10.10	33.79	57.79	24.00	27.55	47.79	20.24	L
4	1.8825	10.10	27.73	56.00	28.27	21.80	46.00	24.20	L
5	6.8078	10.10	31.14	60.00	28.86	24.32	50.00	25.68	L
6	14.6808	10.11	37.60	60.00	22.40	28.54	50.00	21.46	L



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Neutral Line:



Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Type
1	0.1604	10.10	42.83	65.44	22.61	31.00	55.44	24.44	N
2	0.4347	10.10	34.54	57.16	22.62	29.30	47.16	17.86	N
3	0.8921	10.10	32.13	56.00	23.87	24.22	46.00	21.78	N
4	1.9286	10.10	29.76	56.00	26.24	24.15	46.00	21.85	N
5	6.7453	10.10	32.34	60.00	27.66	26.00	50.00	24.00	N
6	14.5162	10.11	36.33	60.00	23.67	27.64	50.00	22.36	N

Remarks:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.



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### 4.3 Duty Cycle

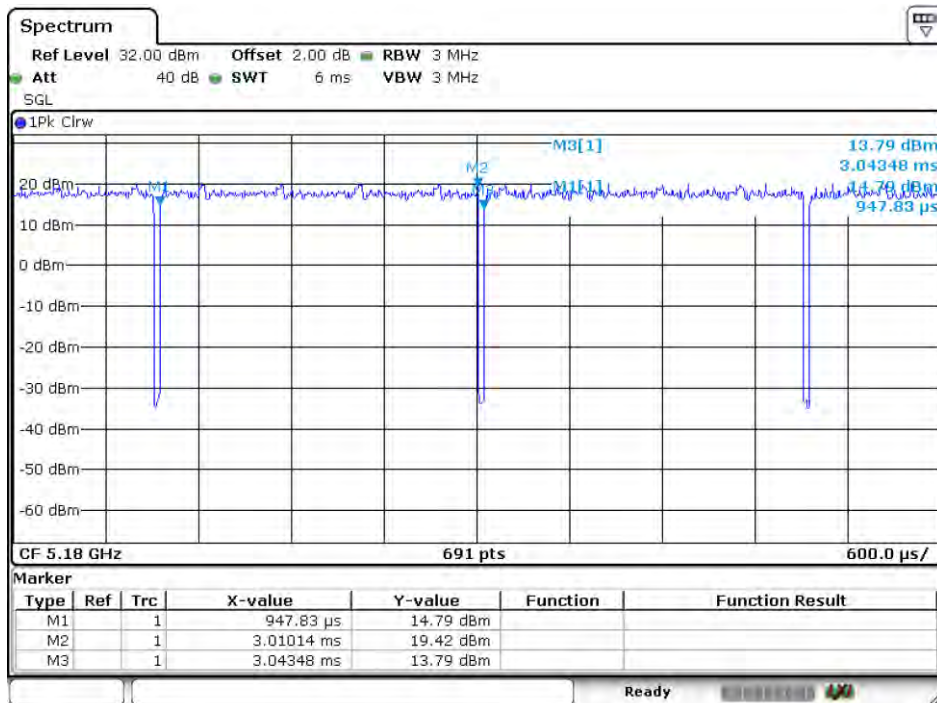
#### 4.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
11A	Ant 1: CH149, CH157, CH165	98.90
11N20	Ant 1: CH149, CH157, CH165	95.33
11N40	Ant 1: CH151, CH159	90.79
11AC20	Ant 1: CH149, CH157, CH165	95.16
11AC40	Ant 1: CH151, CH159	91.25
11AC80	Ant 1: CH155	87.13

#### 4.3.1 Test Plots

##### 4.3.1.1 ANT1

##### 4.3.1.1.1 11A

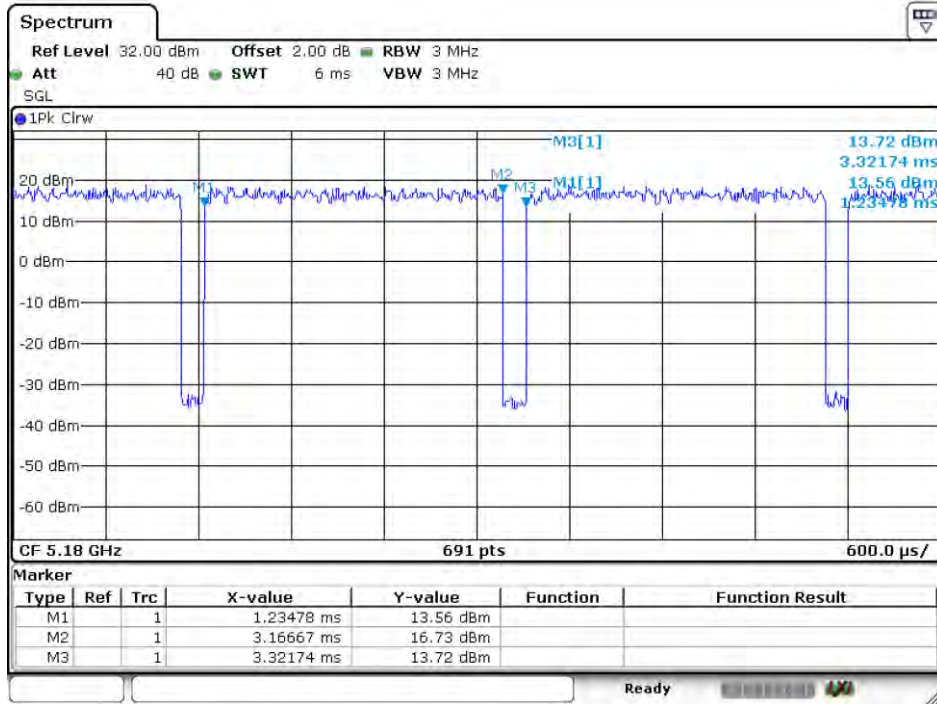


Date: 27.AUG.2020 15:58:05



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**4.3.1.1.2 11N20**



Date: 27.AUG.2020 16:01:10



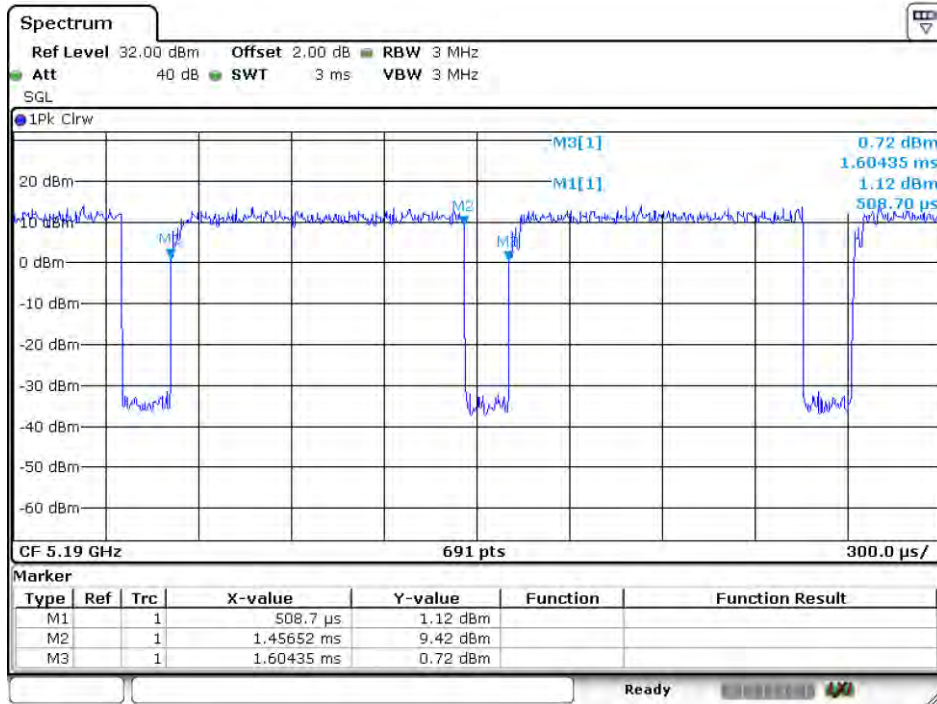
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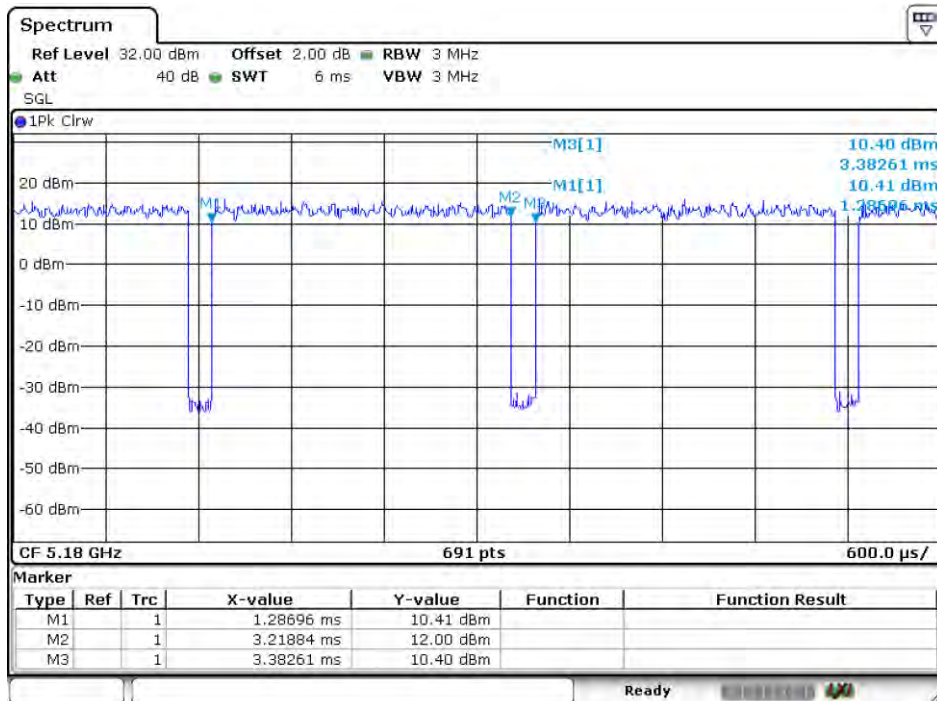


**4.3.1.1.3 11N40**



Date: 27.AUG.2020 16:05:08

**4.3.1.1.4 11AC20**



Date: 27.AUG.2020 16:02:47

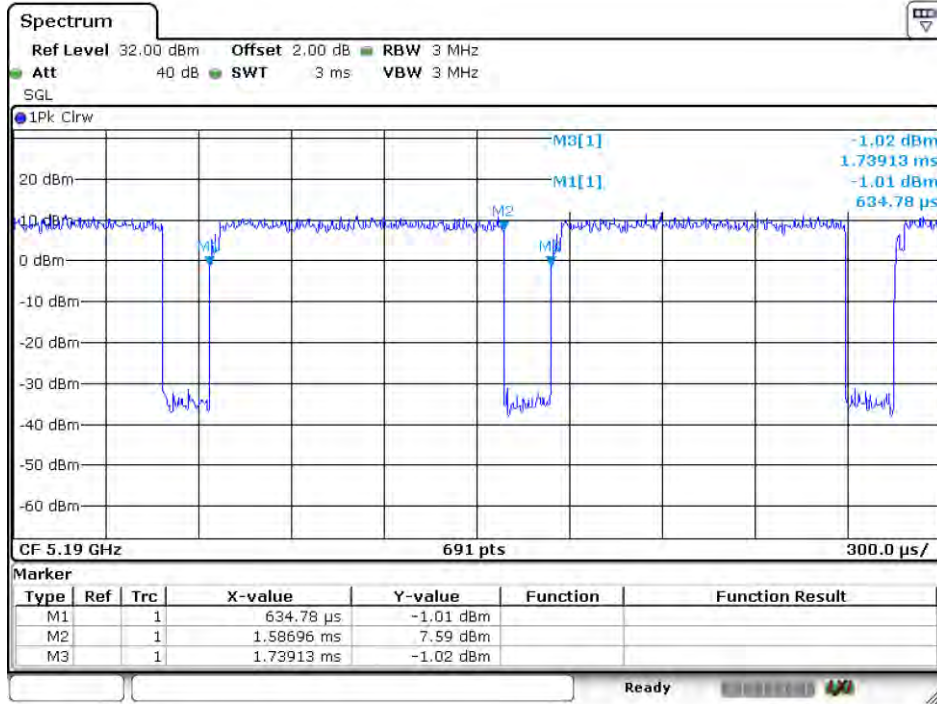


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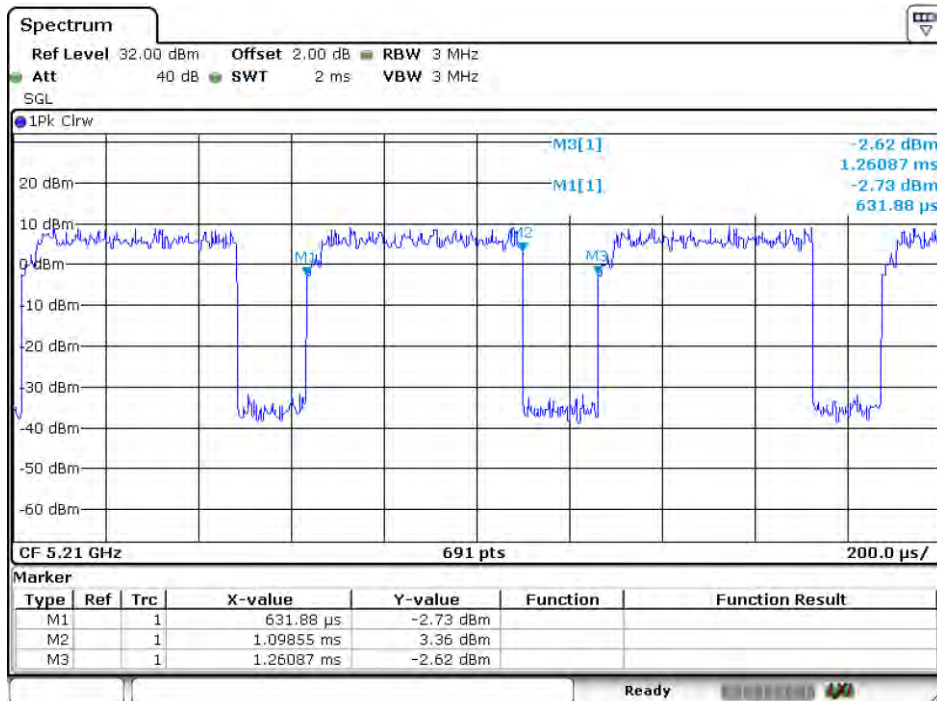


### 4.3.1.1.5 11AC40



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### 4.3.1.1.6 11AC80



Date: 27.AUG.2020 16:09:16



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### 4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10: 2013	
Test Setup:		
Test Instruments:	Refer to section 5.10 for details	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	<p>Through Pre-scan, find that</p> <p>6Mbps of rate is the worst case of 802.11a;</p> <p>MCS0 of rate is the worst case of 802.11n(HT20);</p> <p>MCS0 of rate is the worst case of 802.11n(HT40);</p> <p>MCS0 of rate is the worst case of 802.11ac(HT20);</p> <p>MCS0 of rate is the worst case of 802.11ac(HT40);</p> <p>MCS0 of rate is the worst case of 802.11ac(HT80)</p> <p>Only the worst case is recorded in the report.</p>	
Limit:	Frequency Band	Limit
	5150-5250MHz	Not exceed 250mW(24dBm)
	5250-5350MHz	The lesser of 250mW(24dBm) or 11+ 10logB
	5470-5725MHz	The lesser of 250mW(24dBm) or 11+ 10logB
	5725-5850MHz	Not exceed 1W(30dBm)
		*Where B is the 26dB emission bandwidth in MHz
Test Results:	Pass	



**4.4.1 Test Results for Conducted Output Power**

Test Mode	Test Channel	Frequency [MHz]	Antenna Port	Meas. Level (Cond.) [dBm]	Meas. Level (EIRP.) [dBm]	Verdict
11A20	36	5180	ANT 1	18.82	17.72	PASS
	44	5220	ANT 1	18.68	17.58	PASS
	48	5240	ANT 1	18.55	17.45	PASS
	52	5260	ANT 1	18.53	17.43	PASS
	60	5300	ANT 1	18.63	17.53	PASS
	64	5320	ANT 1	18.66	17.56	PASS
	100	5500	ANT 1	18.68	17.58	PASS
	116	5580	ANT 1	18.53	17.43	PASS
	140	5700	ANT 1	18.76	17.66	PASS
	144(BandII-C)	5720	ANT 1	17.68	16.58	PASS
	144(BandIII)	5720	ANT 1	10.91	9.81	PASS
	149	5745	ANT 1	18.89	17.79	PASS
	157	5785	ANT 1	18.98	17.88	PASS
	165	5825	ANT 1	18.96	17.86	PASS
11N20	36	5180	ANT 1	17.67	16.57	PASS
	44	5220	ANT 1	17.48	16.38	PASS
	48	5240	ANT 1	17.37	16.27	PASS
	52	5260	ANT 1	17.31	16.21	PASS
	60	5300	ANT 1	17.47	16.37	PASS
	64	5320	ANT 1	17.56	16.46	PASS
	100	5500	ANT 1	17.48	16.38	PASS
	116	5580	ANT 1	17.37	16.27	PASS
	140	5700	ANT 1	17.62	16.52	PASS
	144(BandII-C)	5720	ANT 1	16.06	15.06	PASS
	144(BandIII)	5720	ANT 1	9.85	8.75	PASS
	149	5745	ANT 1	17.7	16.6	PASS
	157	5785	ANT 1	17.83	16.73	PASS
	165	5825	ANT 1	17.77	16.67	PASS



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11N40	38	5190	ANT 1	17.34	16.24	PASS
	46	5230	ANT 1	17.14	16.04	PASS
	54	5270	ANT 1	17	15.9	PASS
	62	5310	ANT 1	17.11	16.01	PASS
	102	5510	ANT 1	17.13	16.03	PASS
	110	5550	ANT 1	17.13	16.03	PASS
	134	5670	ANT 1	16.93	15.83	PASS
	142(BandII-C)	5710	ANT 1	15.87	14.77	PASS
	142(BandIII)	5710	ANT 1	5.38	4.28	PASS
	151	5755	ANT 1	17.25	16.15	PASS
	159	5795	ANT 1	17.32	16.22	PASS
11AC20	36	5180	ANT 1	14.55	13.45	PASS
	44	5220	ANT 1	14.38	13.28	PASS
	48	5240	ANT 1	14.17	13.07	PASS
	52	5260	ANT 1	14.18	13.08	PASS
	60	5300	ANT 1	14.3	13.2	PASS
	64	5320	ANT 1	14.32	13.22	PASS
	100	5500	ANT 1	14.32	13.22	PASS
	116	5580	ANT 1	14.16	13.06	PASS
	140	5700	ANT 1	15.54	14.44	PASS
	144(BandII-C)	5720	ANT 1	13.99	12.89	PASS
	144(BandIII)	5720	ANT 1	7.82	6.72	PASS
	149	5745	ANT 1	15.61	14.51	PASS
	157	5785	ANT 1	15.71	14.61	PASS
	165	5825	ANT 1	15.64	14.54	PASS
11AC40	38	5190	ANT 1	15.1	14	PASS
	46	5230	ANT 1	14.86	13.76	PASS
	54	5270	ANT 1	14.71	13.61	PASS
	62	5310	ANT 1	14.82	13.72	PASS
	102	5510	ANT 1	14.85	13.75	PASS
	110	5550	ANT 1	14.8	13.7	PASS
	134	5670	ANT 1	14.64	13.54	PASS



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	142(BandII-C)	5710	ANT 1	14.86	13.76	PASS
	142(BandIII)	5710	ANT 1	4.36	3.26	PASS
	151	5755	ANT 1	16.1	15	PASS
	159	5795	ANT 1	16.21	15.11	PASS
11AC80	42	5210	ANT 1	15.64	14.54	PASS
	58	5290	ANT 1	15.19	14.09	PASS
	106	5530	ANT 1	15.33	14.23	PASS
	122	5610	ANT 1	15.26	14.16	PASS
	138(BandII-C)	5690	ANT 1	14.97	13.87	PASS
	138(BandIII)	5690	ANT 1	1.59	0.49	PASS
	155	5775	ANT 1	16.76	15.66	PASS



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### 4.5 26dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(a)
Test Method:	ANSI C63.10: 2013
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	<p>Through Pre-scan, find the</p> <ul style="list-style-type: none"> <li>6Mbps of rate is the worst case of 802.11a;</li> <li>MCS0 of rate is the worst case of 802.11n(HT20);</li> <li>MCS0 of rate is the worst case of 802.11n(HT40);</li> <li>MCS0 of rate is the worst case of 802.11ac(HT20);</li> <li>MCS0 of rate is the worst case of 802.11ac(HT40);</li> <li>MCS0 of rate is the worst case of 802.11ac(HT80).</li> </ul> <p>Only the worst case is recorded in the report.</p>
Limit:	No restriction limits
Test Results:	Pass



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**4.5.1 Test Results for 26dB Emission Bandwidth**

Test Mode	Test Channel	Frequency [MHz]	Antenna Port	26dB Emission Bandwidth [MHz]	Verdict
11A20	36	5180	ANT 1	22.77	PASS
	44	5220	ANT 1	23.07	PASS
	48	5240	ANT 1	22.83	PASS
	60	5300	ANT 1	23.16	PASS
	52	5260	ANT 1	22.38	PASS
	64	5320	ANT 1	22.74	PASS
	100	5500	ANT 1	23.07	PASS
	116	5580	ANT 1	23.61	PASS
	140	5700	ANT 1	23.43	PASS
	144	5720	ANT 1	21.82	PASS
11N20	36	5180	ANT 1	23.82	PASS
	44	5220	ANT 1	23.82	PASS
	48	5240	ANT 1	23.88	PASS
	52	5260	ANT 1	23.52	PASS
	60	5300	ANT 1	23.64	PASS
	64	5320	ANT 1	23.34	PASS
	100	5500	ANT 1	23.61	PASS
	116	5580	ANT 1	23.64	PASS
	140	5700	ANT 1	23.85	PASS
144	5720	ANT 1	22.86	PASS	
11N40	38	5190	ANT 1	42.12	PASS
	46	5230	ANT 1	42.12	PASS
	54	5270	ANT 1	42.24	PASS
	62	5310	ANT 1	42.06	PASS
	102	5510	ANT 1	41.76	PASS
	110	5550	ANT 1	41.88	PASS
	134	5670	ANT 1	42.12	PASS
	142	5710	ANT 1	41.80	PASS
11AC20	36	5180	ANT 1	23.7	PASS
	44	5220	ANT 1	23.61	PASS
	48	5240	ANT 1	23.46	PASS
	52	5260	ANT 1	23.52	PASS
	60	5300	ANT 1	23.94	PASS
	64	5320	ANT 1	23.43	PASS
	100	5500	ANT 1	23.58	PASS
116	5580	ANT 1	23.64	PASS	



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	140	5700	ANT 1	23.61	PASS
	144	5720	ANT 1	22.82	PASS
11AC40	38	5190	ANT 1	41.88	PASS
	46	5230	ANT 1	41.7	PASS
	54	5270	ANT 1	42	PASS
	62	5310	ANT 1	41.88	PASS
	102	5510	ANT 1	42.12	PASS
	110	5550	ANT 1	41.94	PASS
	134	5670	ANT 1	42.06	PASS
	142	5710	ANT 1	41.80	PASS
	11AC80	42	5210	ANT 1	85.92
58		5290	ANT 1	84.16	PASS
106		5530	ANT 1	84.48	PASS
122		5610	ANT 1	84.64	PASS
138		5690	ANT 1	84.24	PASS



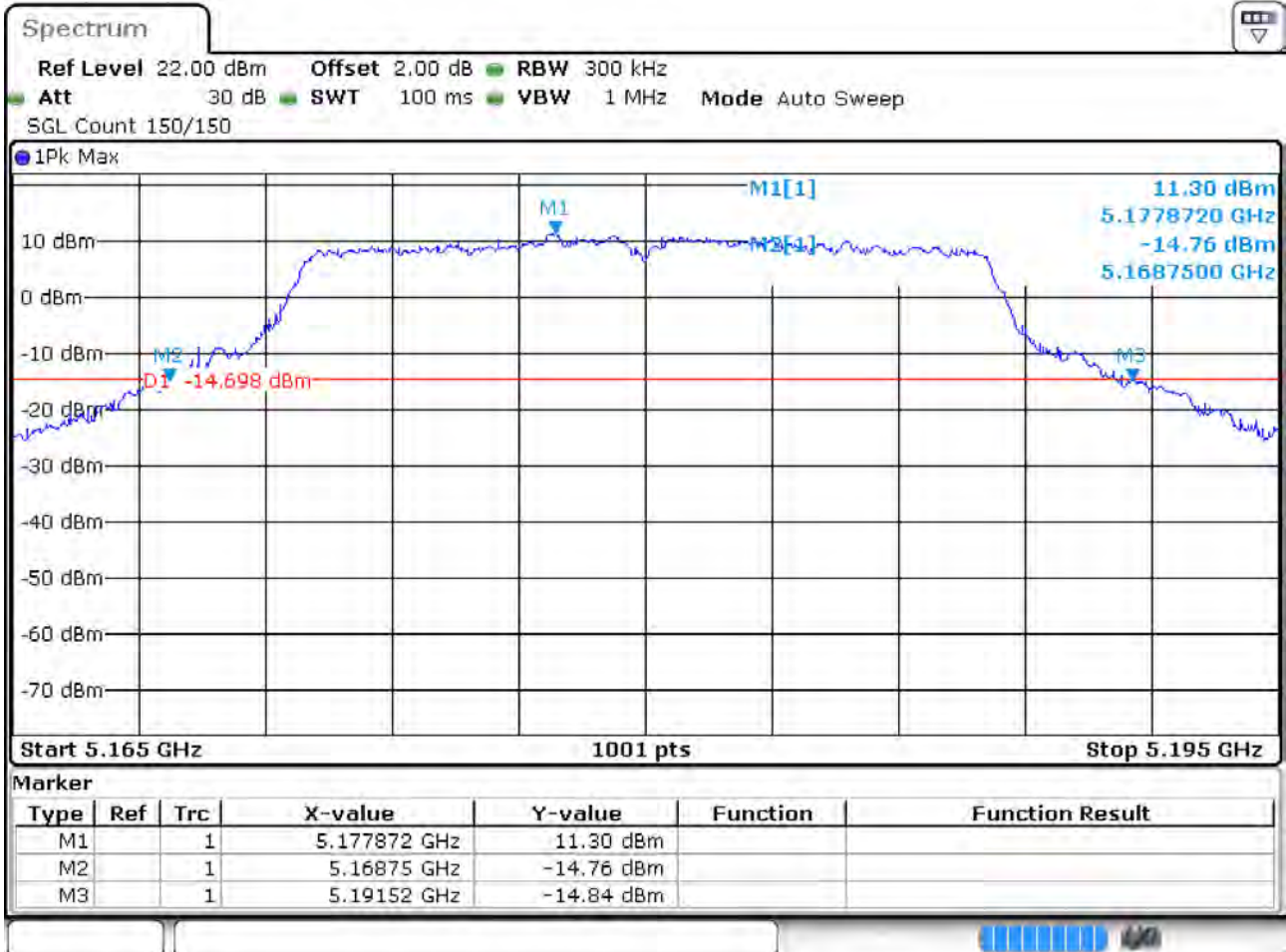
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4.5.2 Plots for 26dB Emission Bandwidth  
11A20\_36 ANT 1

4.5.2.1

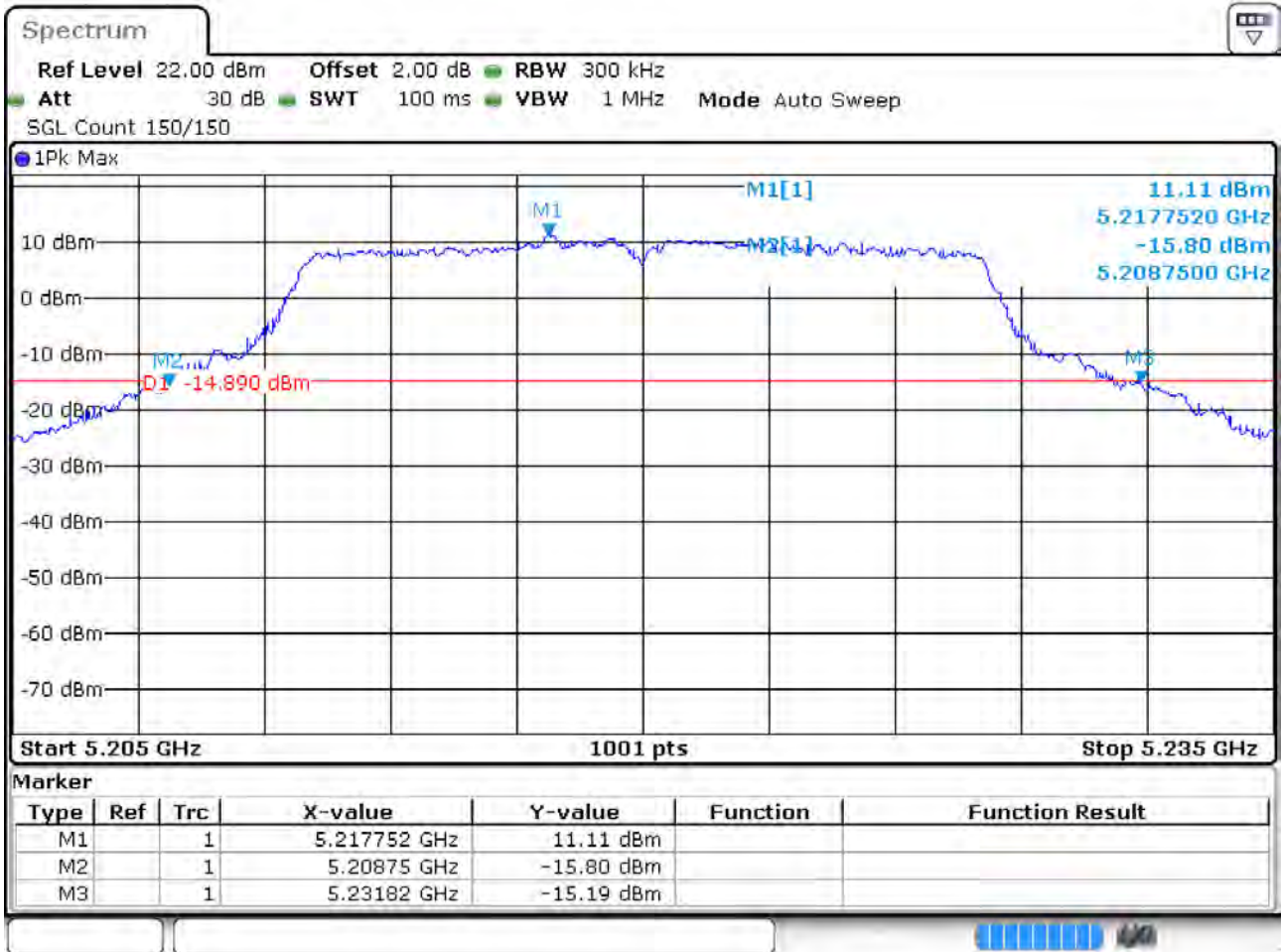


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**4.5.2.2 11A20\_44 ANT 1**



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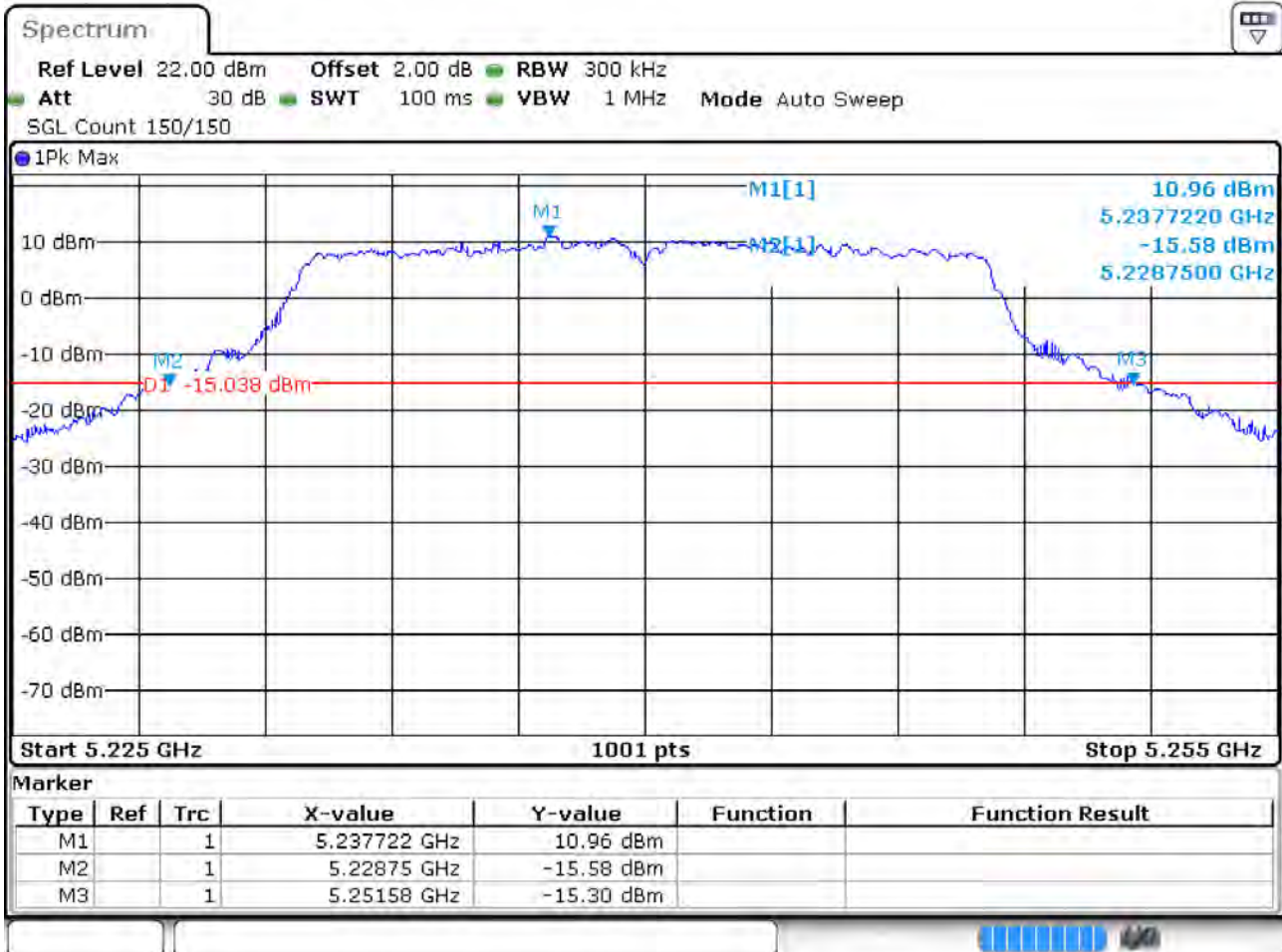
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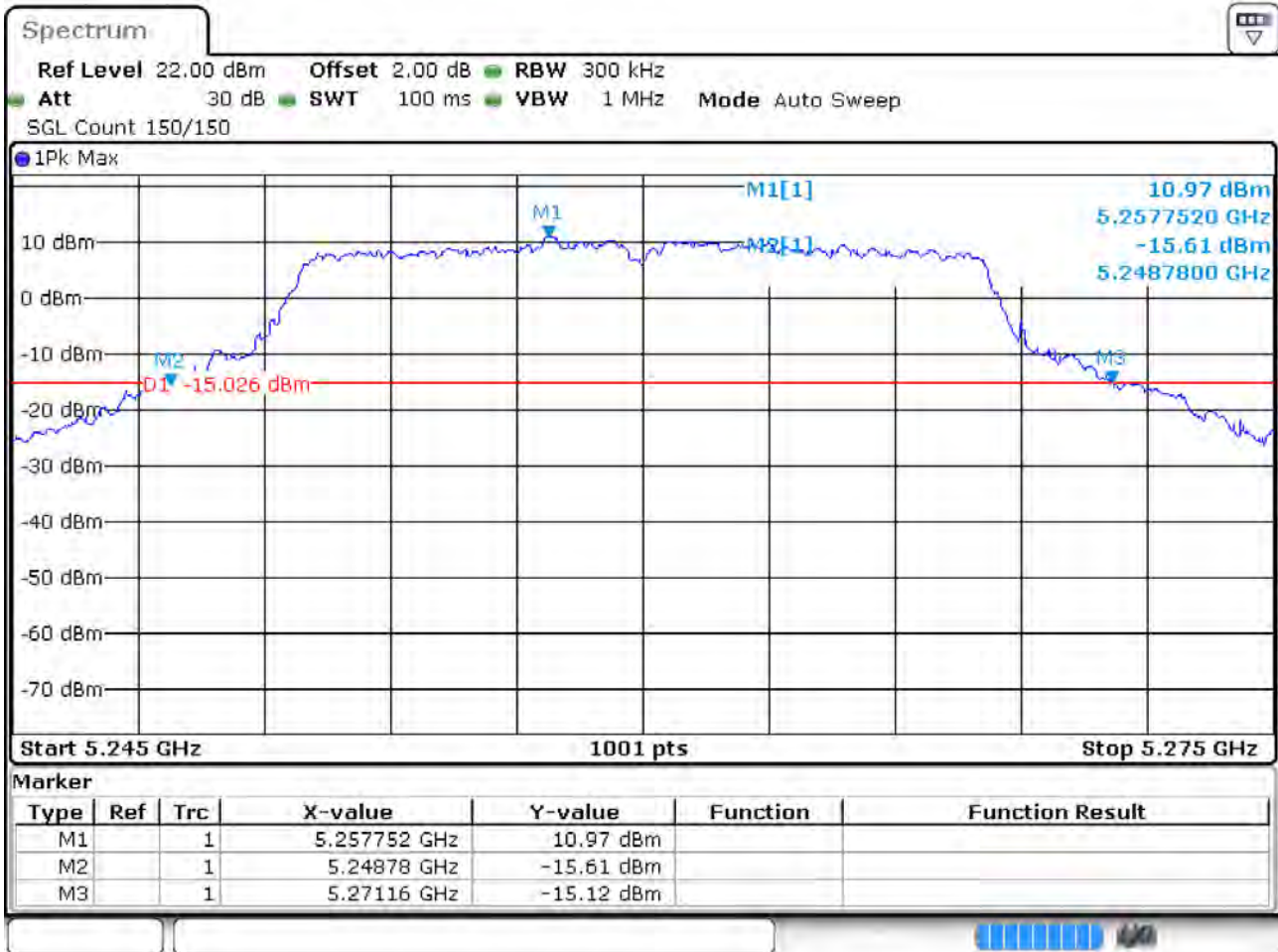
4.5.2.3 11A20\_48 ANT 1



Date: 27.AUG.2020 16:21:36



**4.5.2.4 11A20\_52 ANT 1**



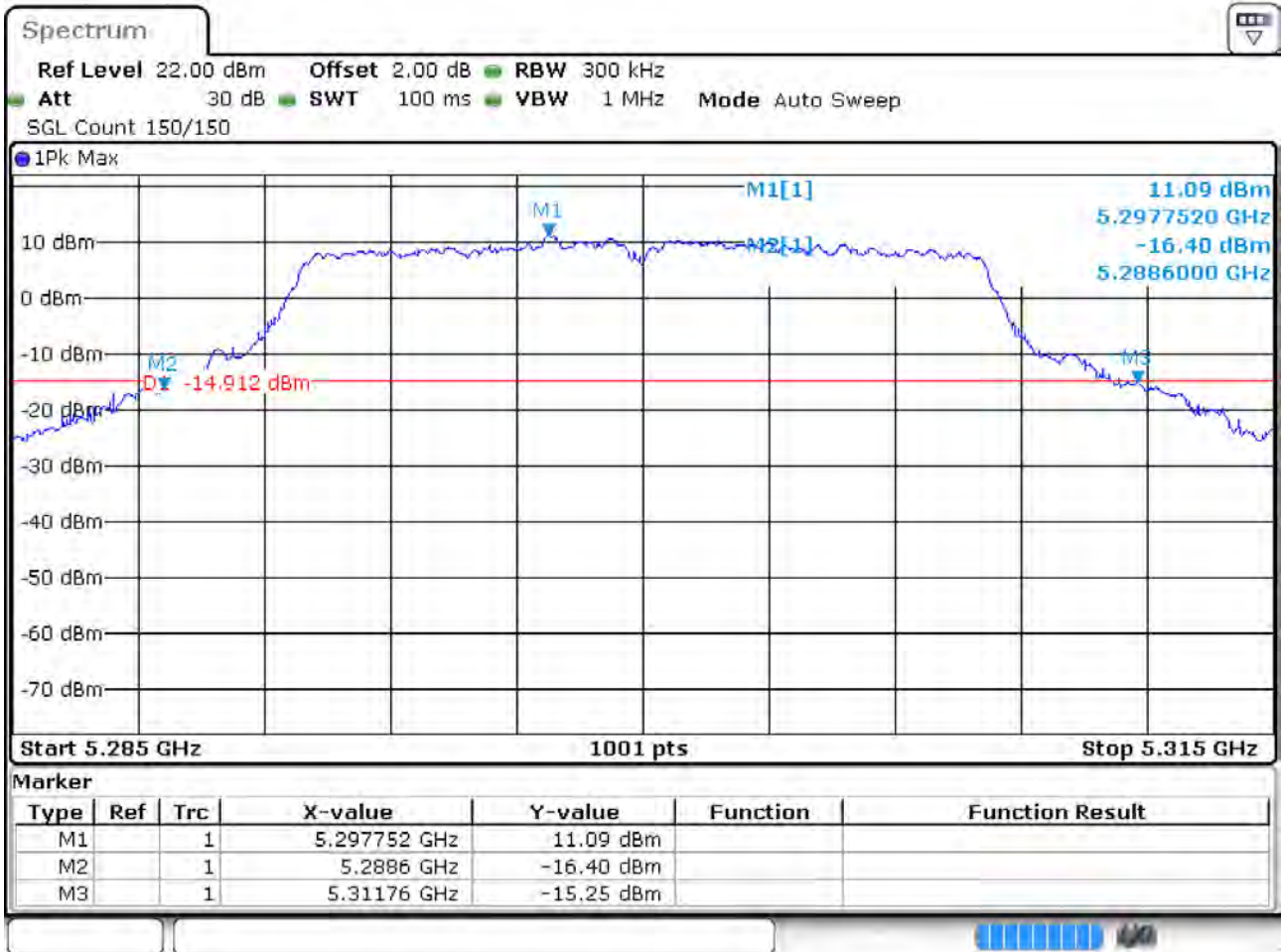
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4.5.2.5 11A20\_60 ANT 1

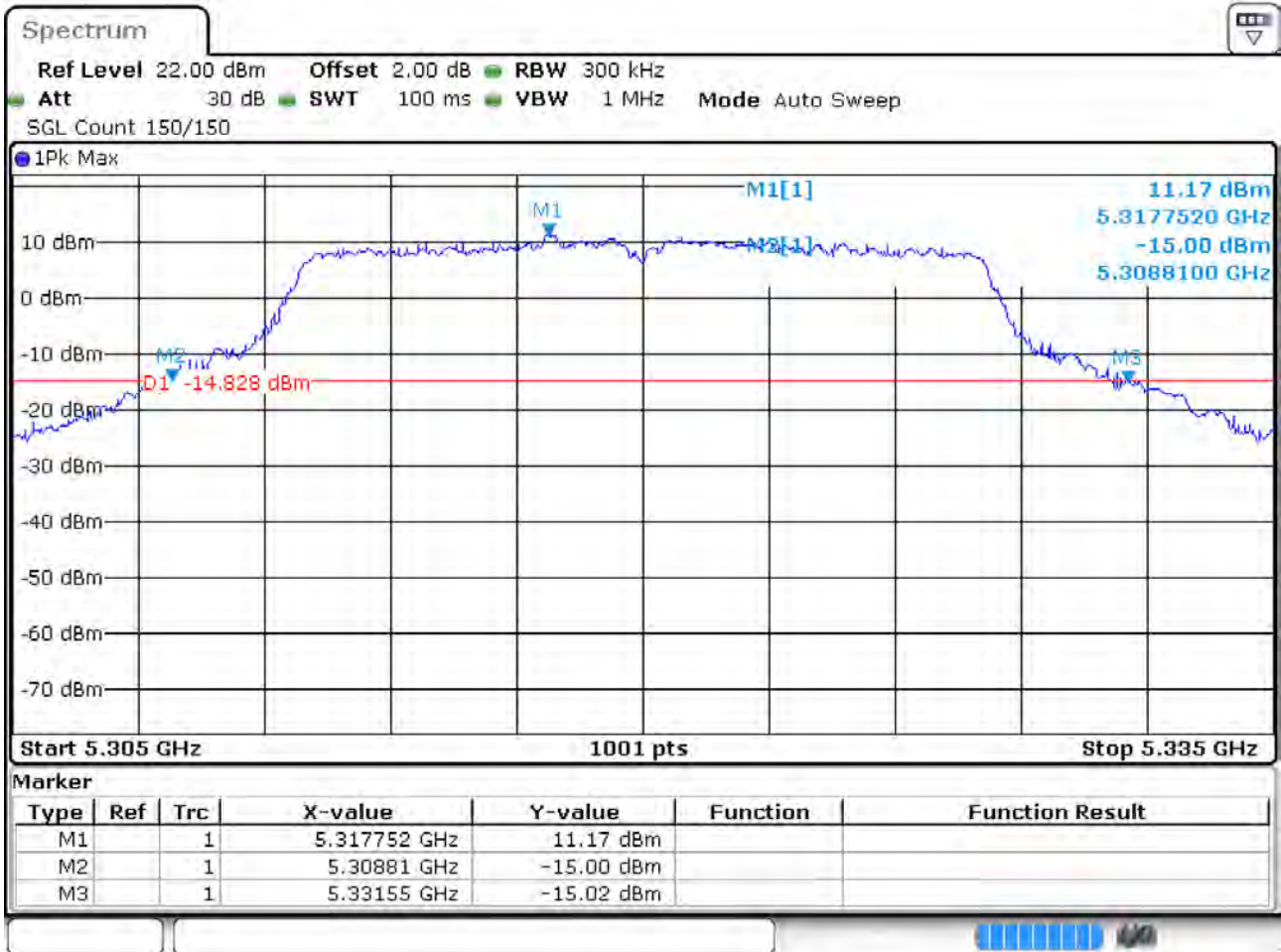


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4.5.2.6 11A20\_64 ANT 1



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**4.5.2.7 11A20\_100 ANT 1**



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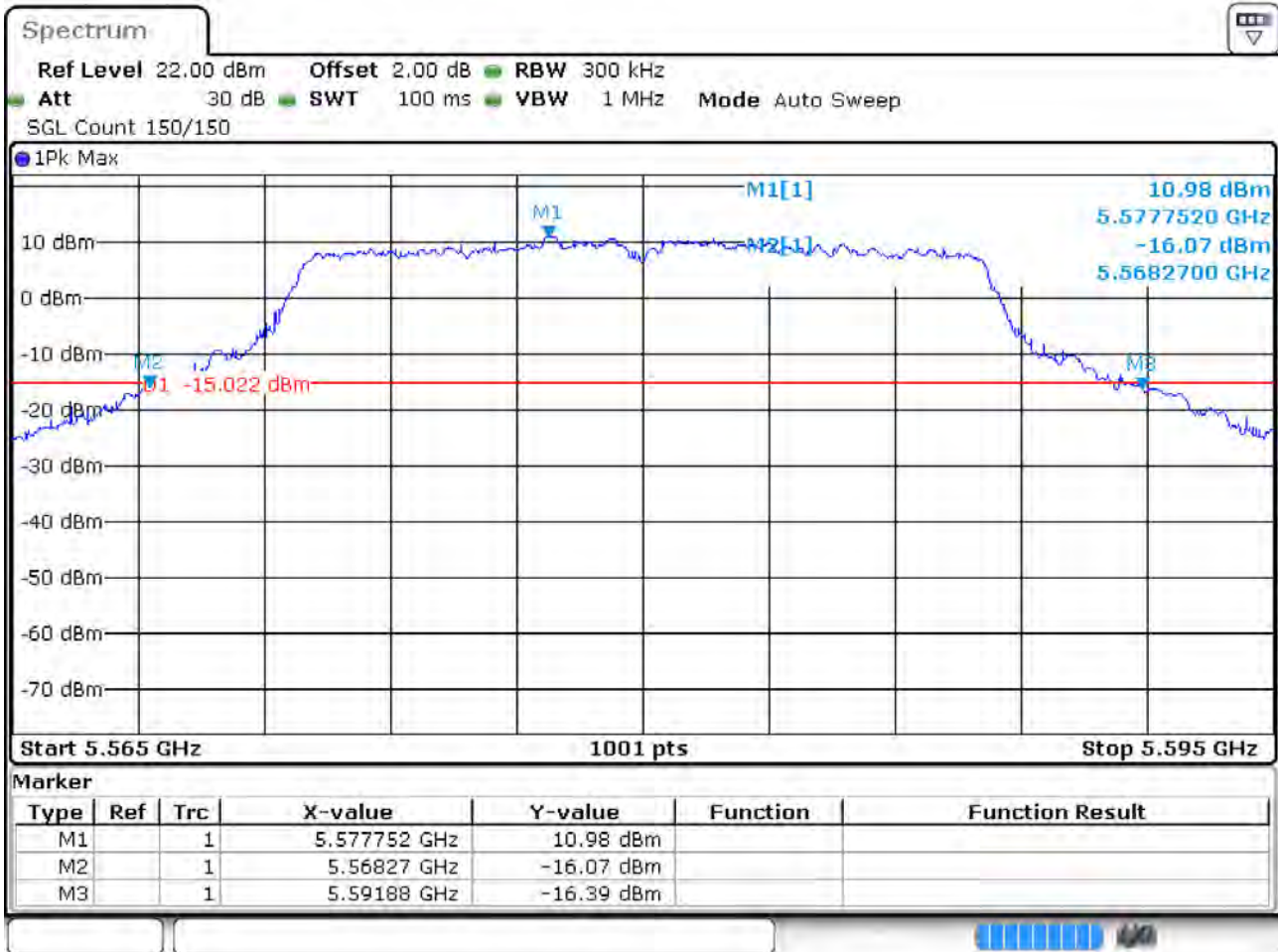
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4.5.2.8 11A20\_116 ANT 1



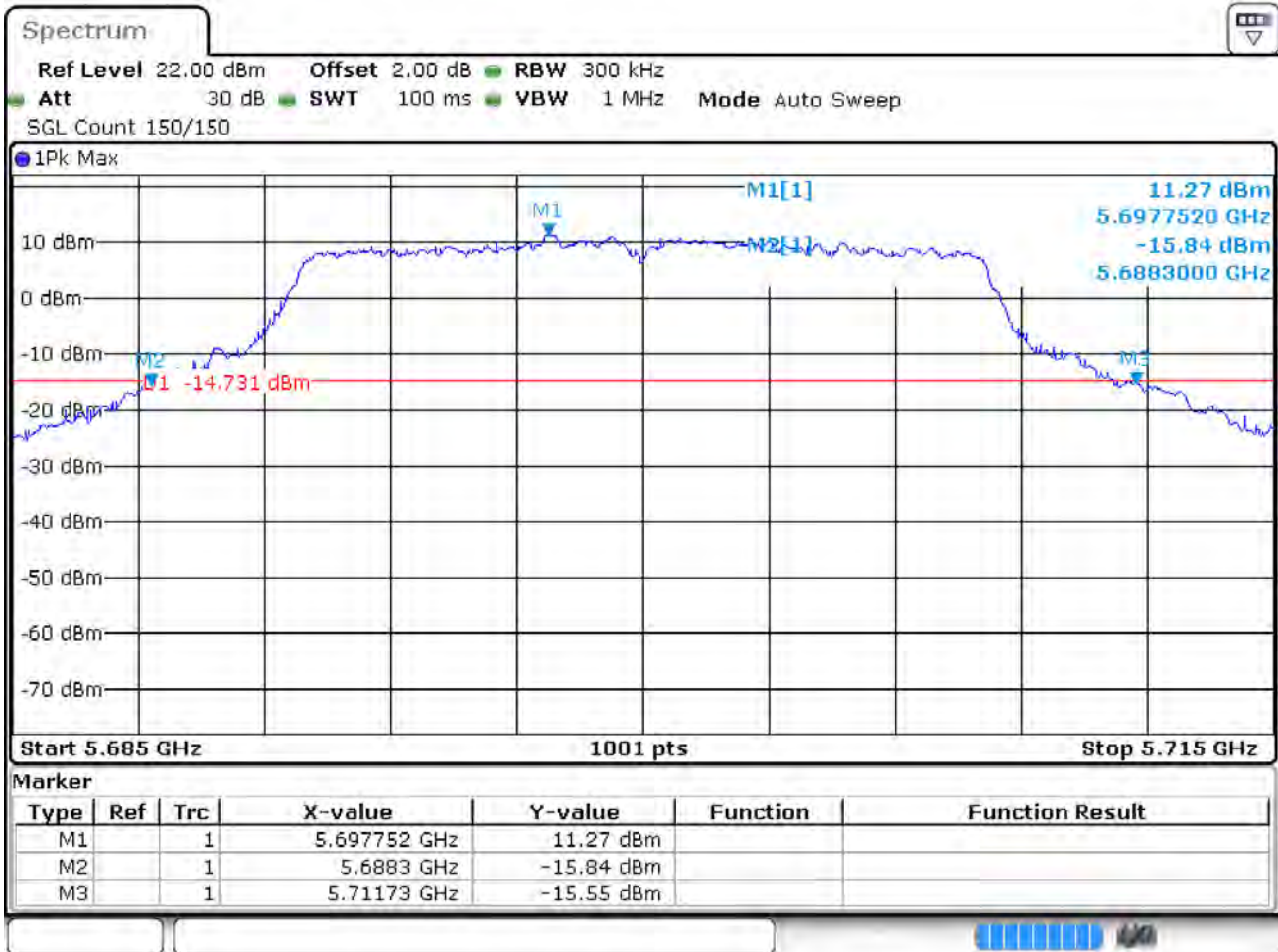
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4.5.2.9 11A20\_140 ANT 1

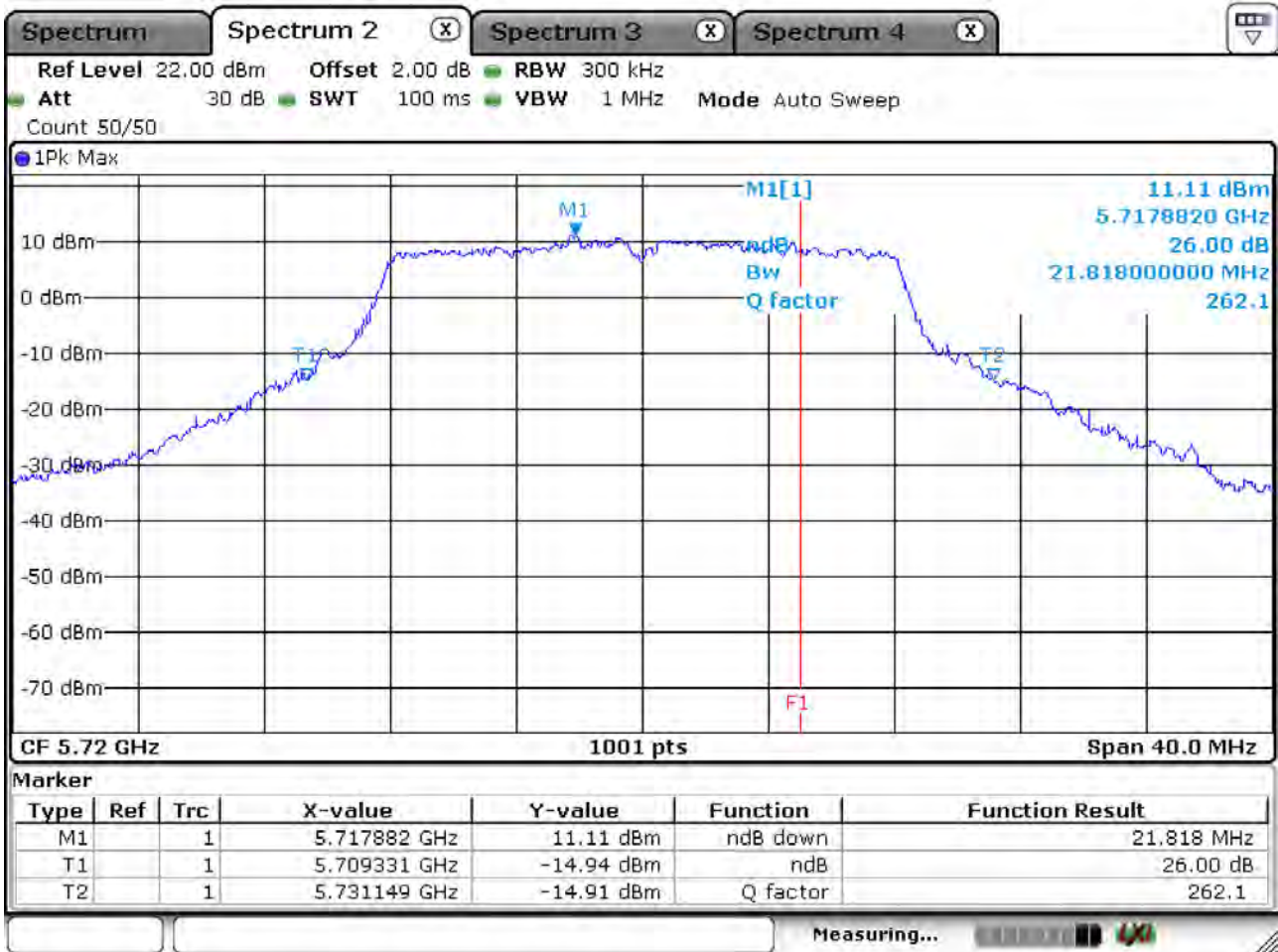


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**4.5.2.10 11A20\_144 ANT 1**



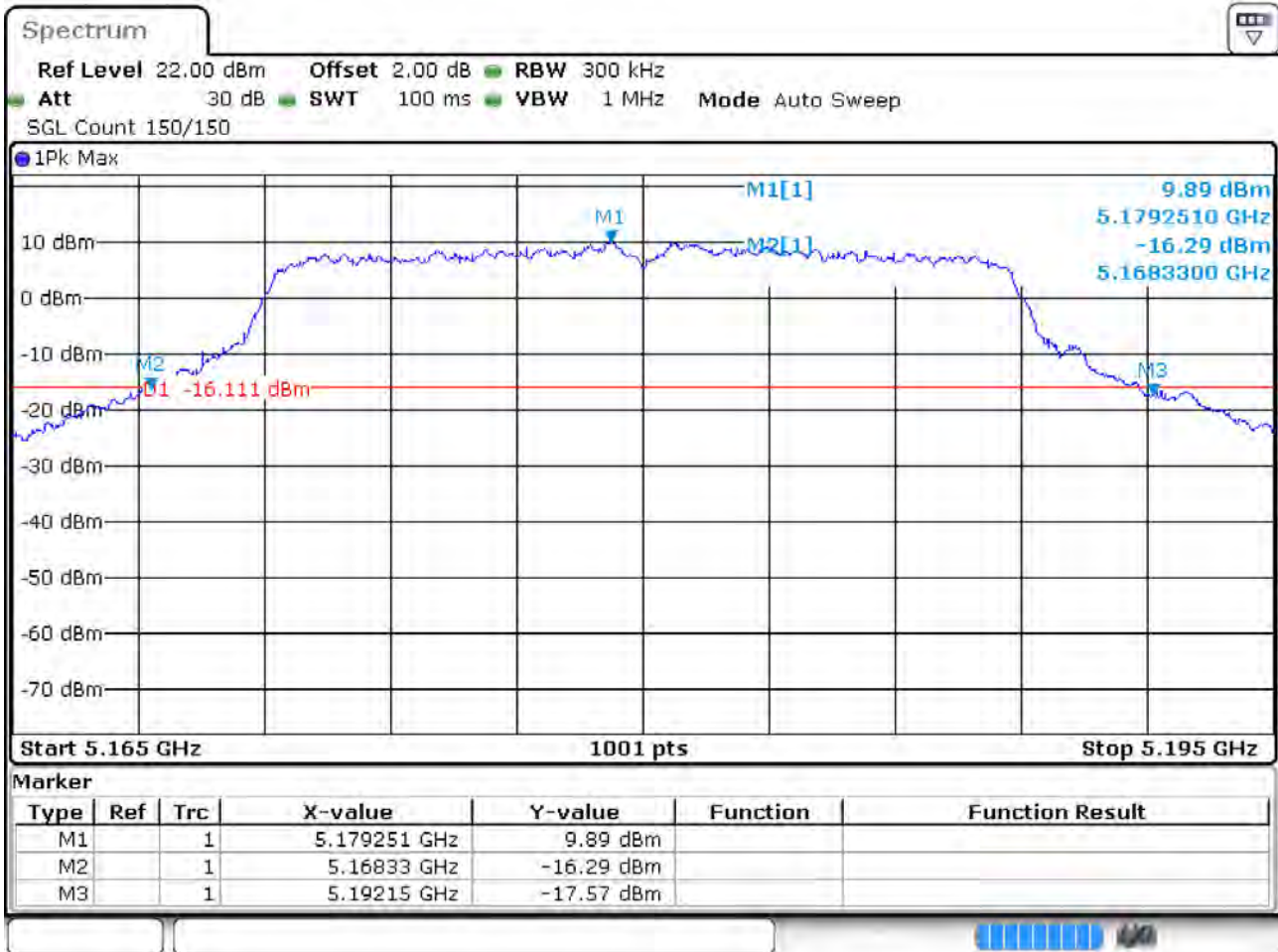
Date: 13.OCT.2020 17:10:18



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4.5.2.11 11N20\_36 ANT 1

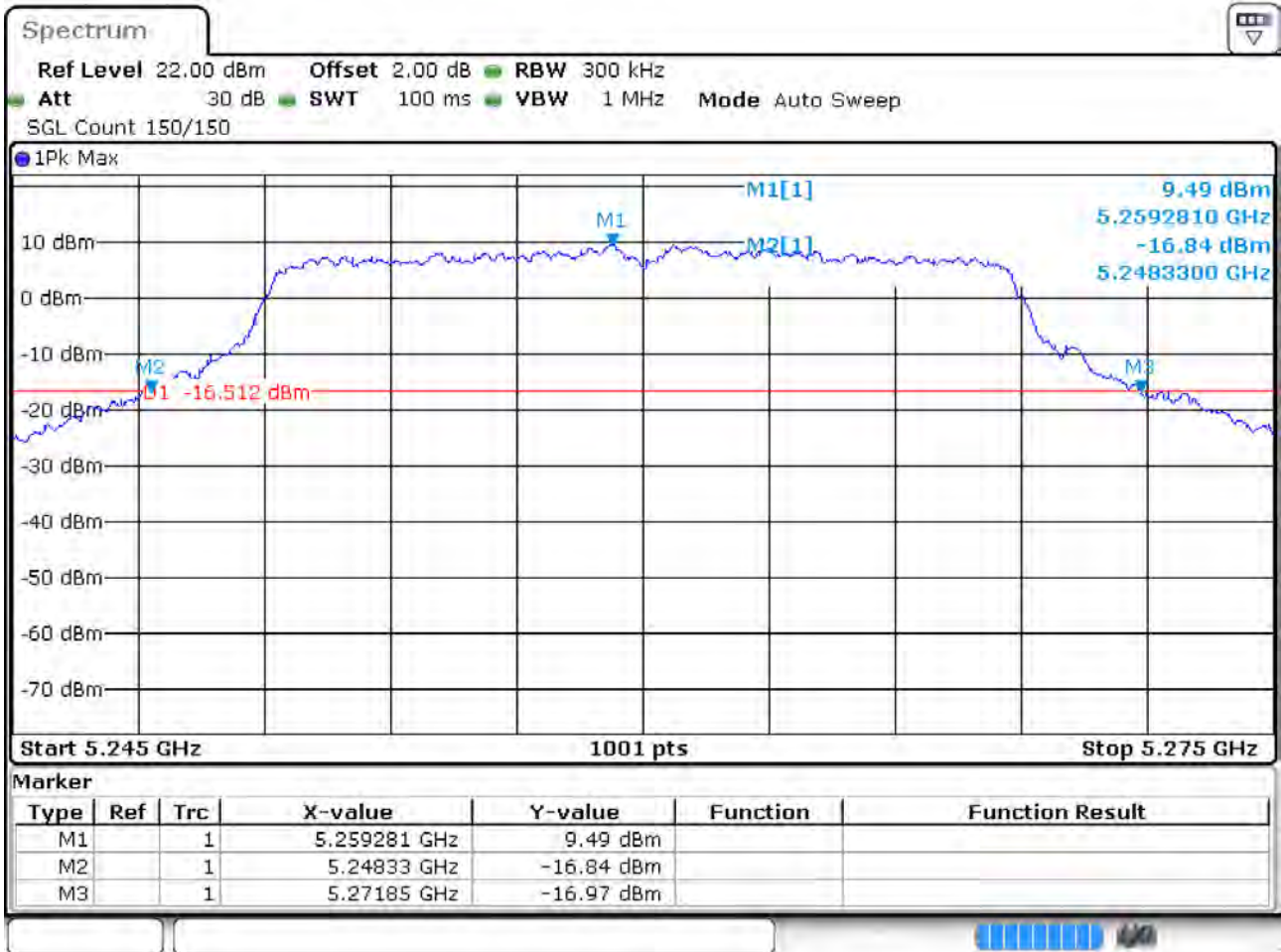


Date: 27.AUG.2020 16:38:15



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4.5.2.12 11N20\_52 ANT 1



Date: 27.AUG.2020 16:42:47

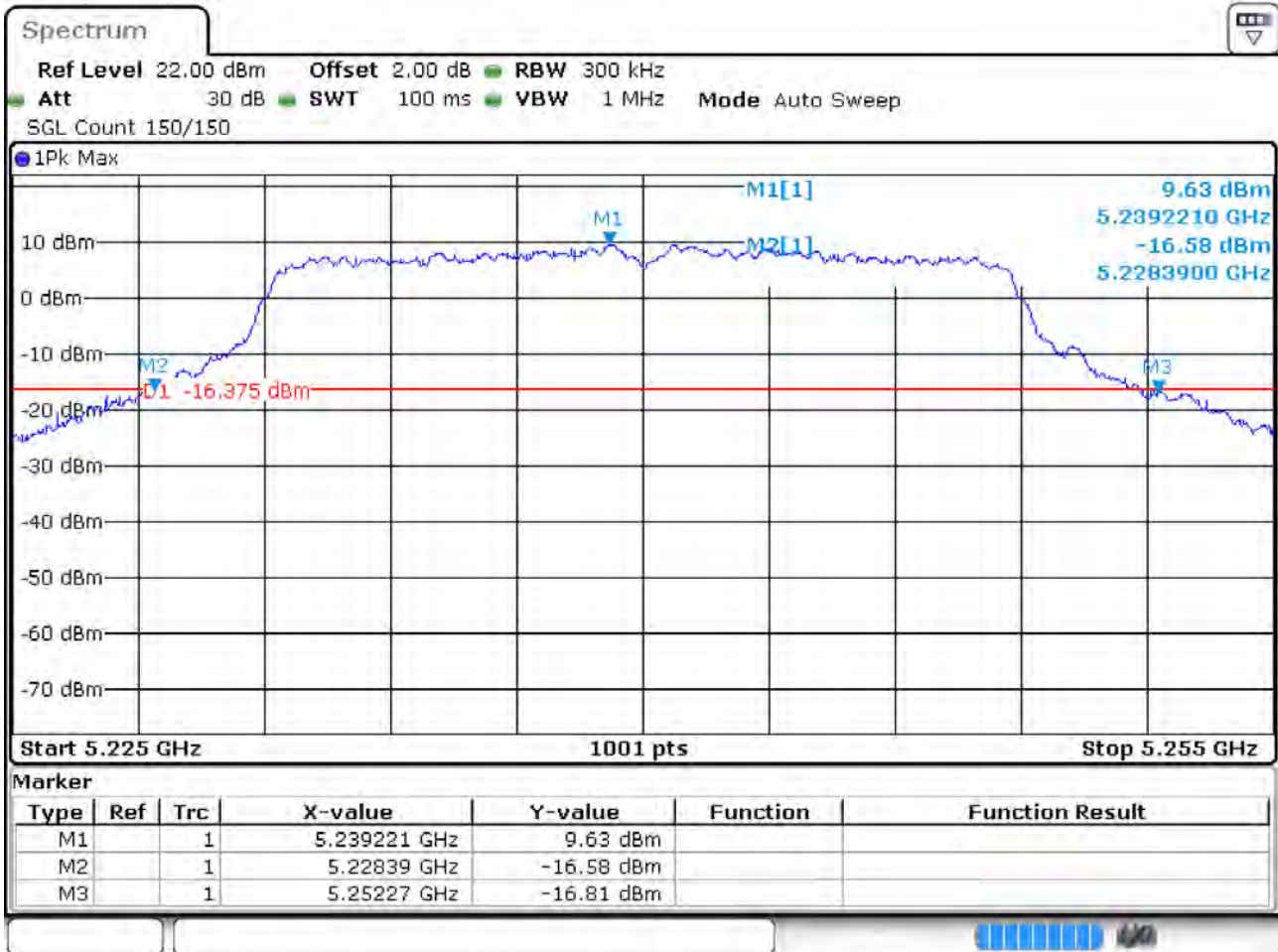


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4.5.2.13 11N20\_48 ANT 1

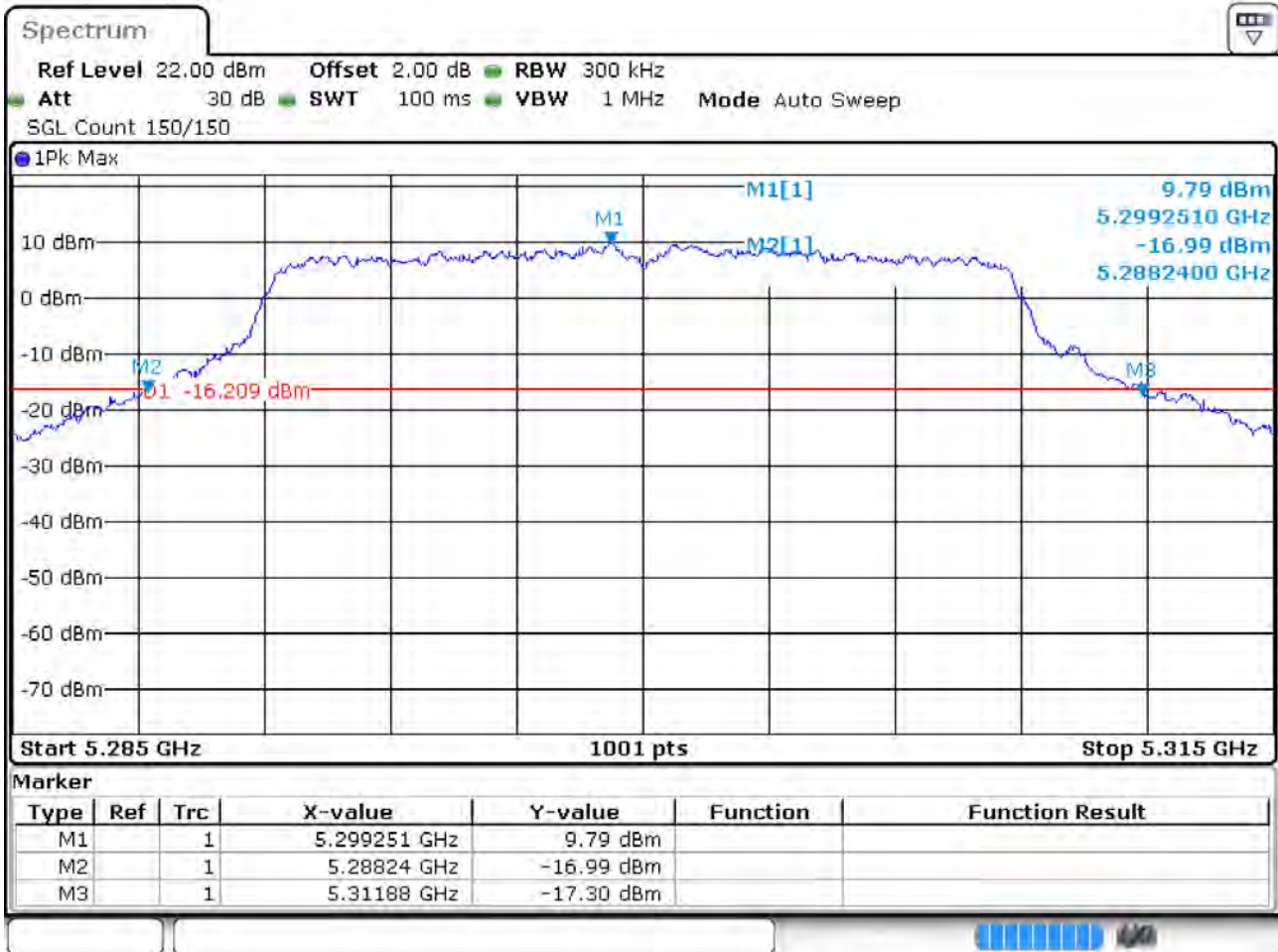


Date: 27.AUG.2020 16:41:08



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**4.5.2.14 11N20\_60 ANT 1**

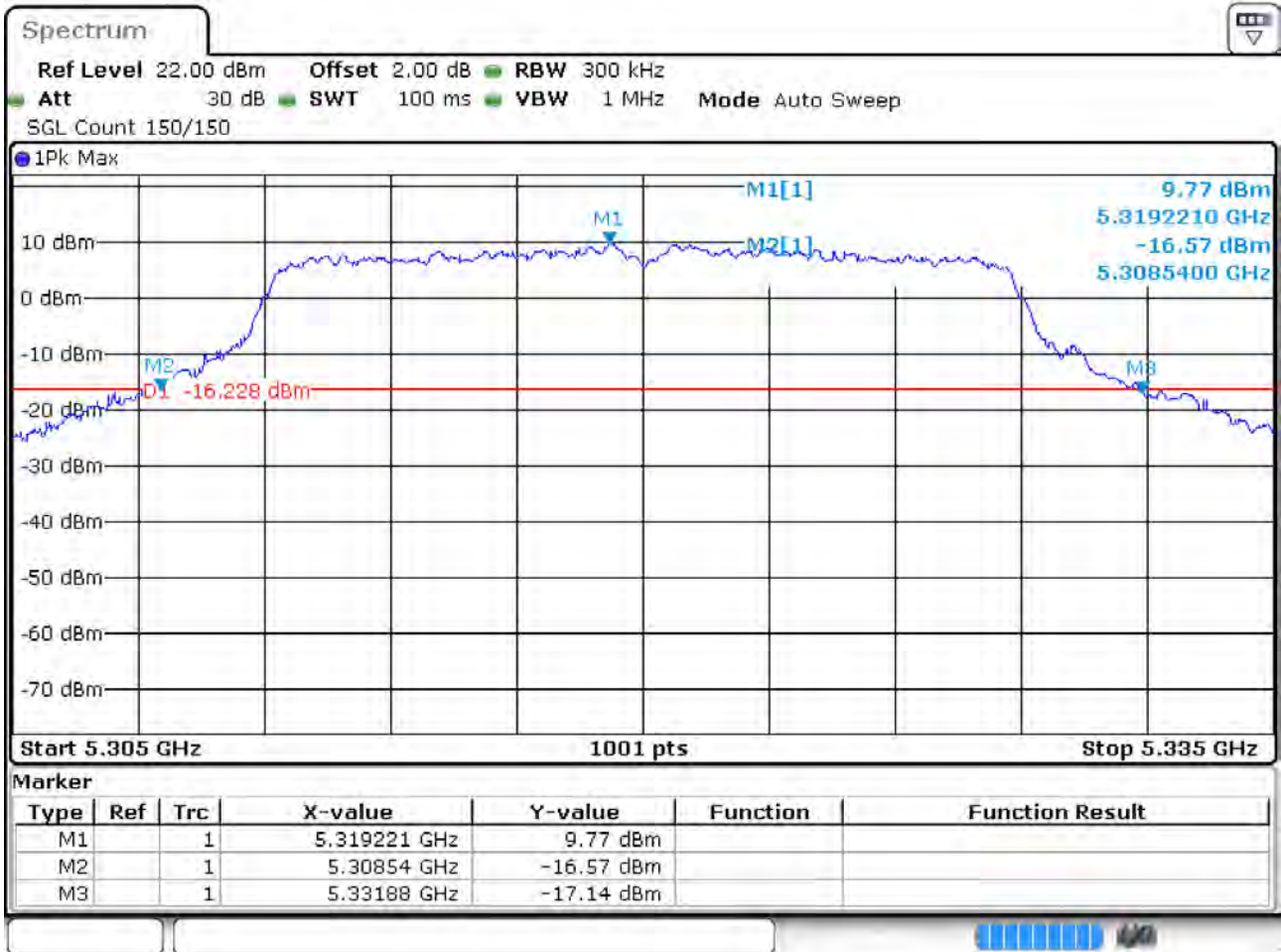


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**4.5.2.15 11N20\_64 ANT 1**



Date: 27.AUG.2020 16:46:00



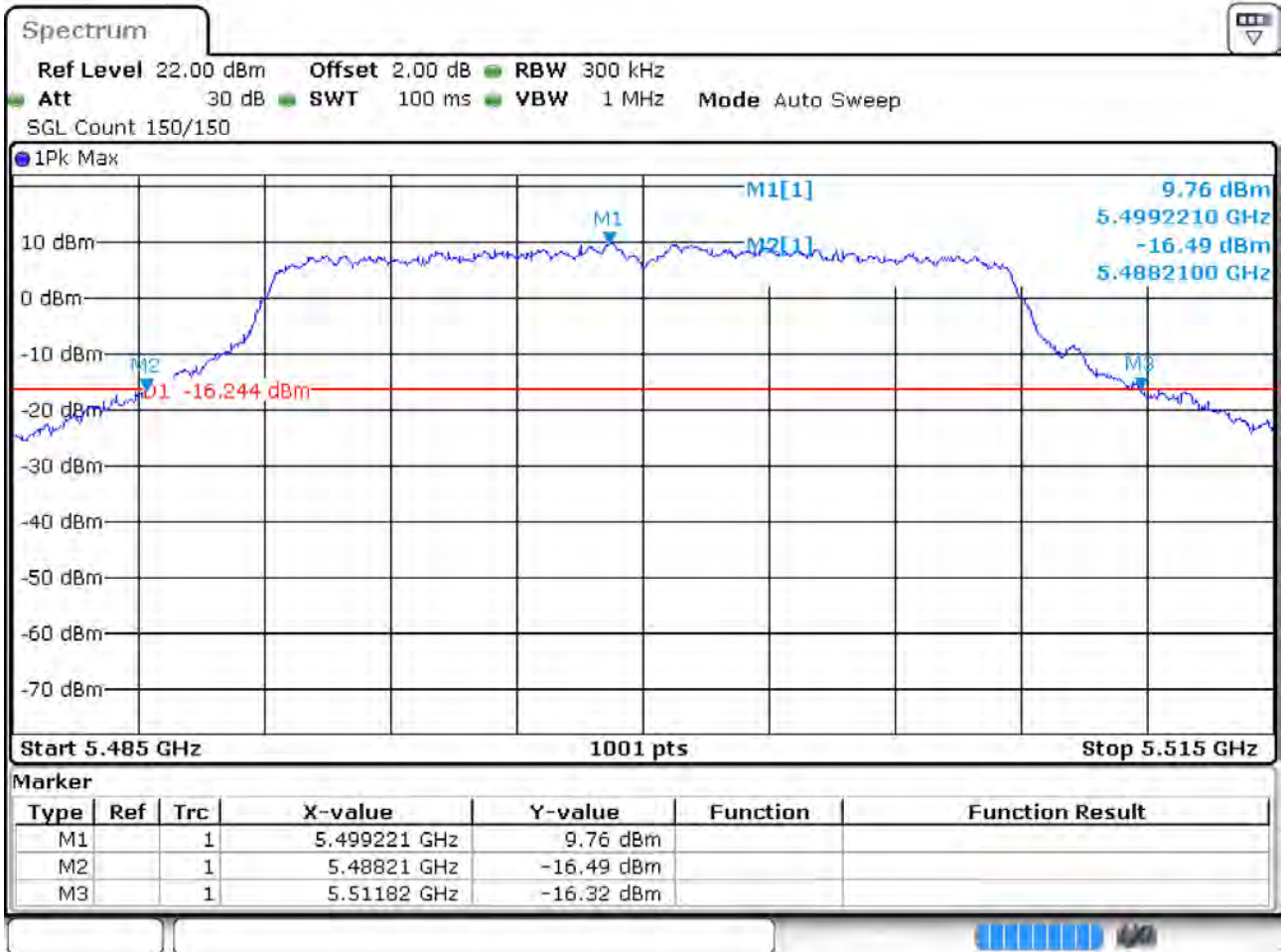
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4.5.2.16 11N20\_100 ANT 1



Date: 27.AUG.2020 16:47:37

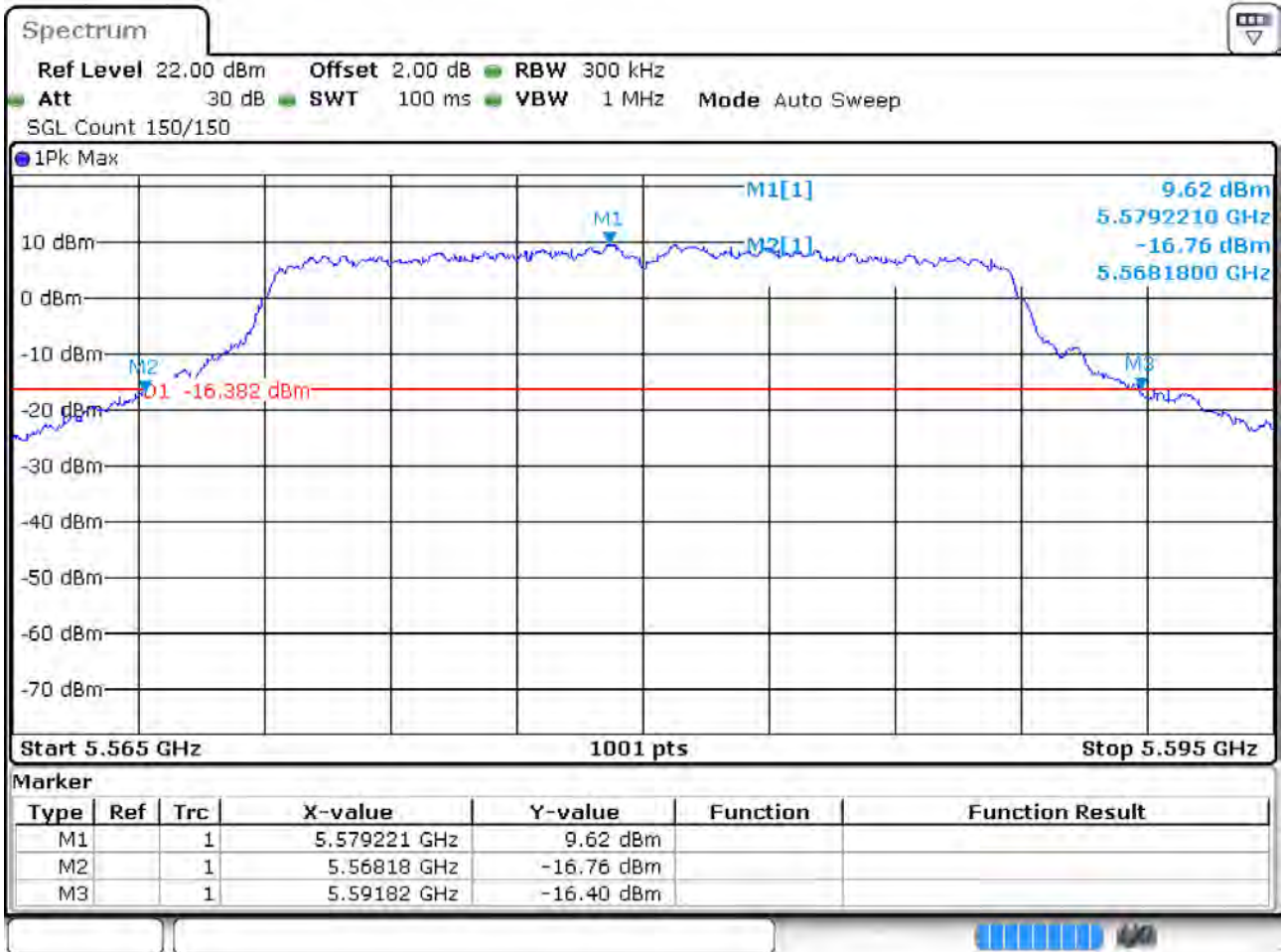


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**4.5.2.17 11N20\_116 ANT 1**

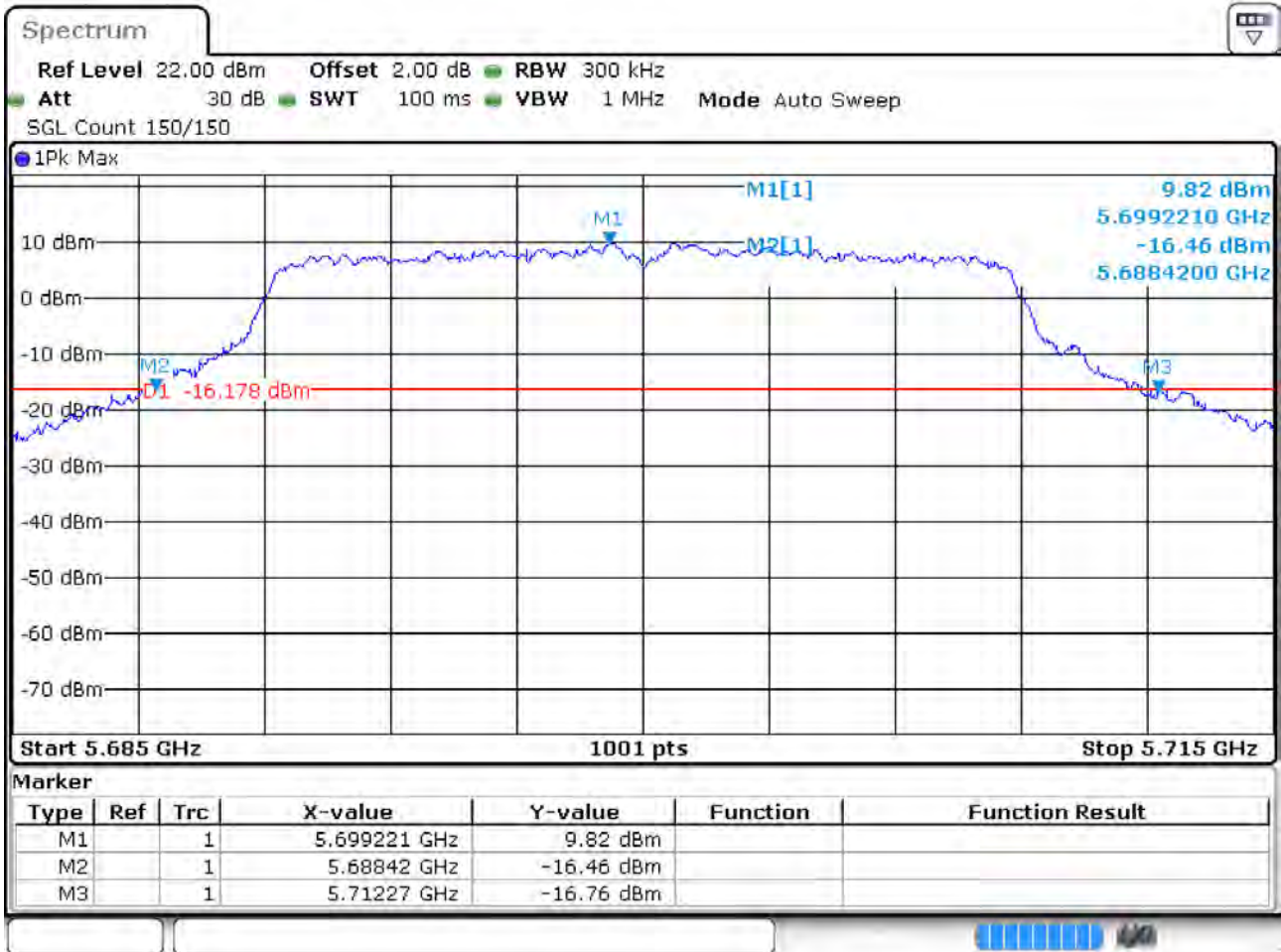


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**4.5.2.18 11N20\_140 ANT 1**



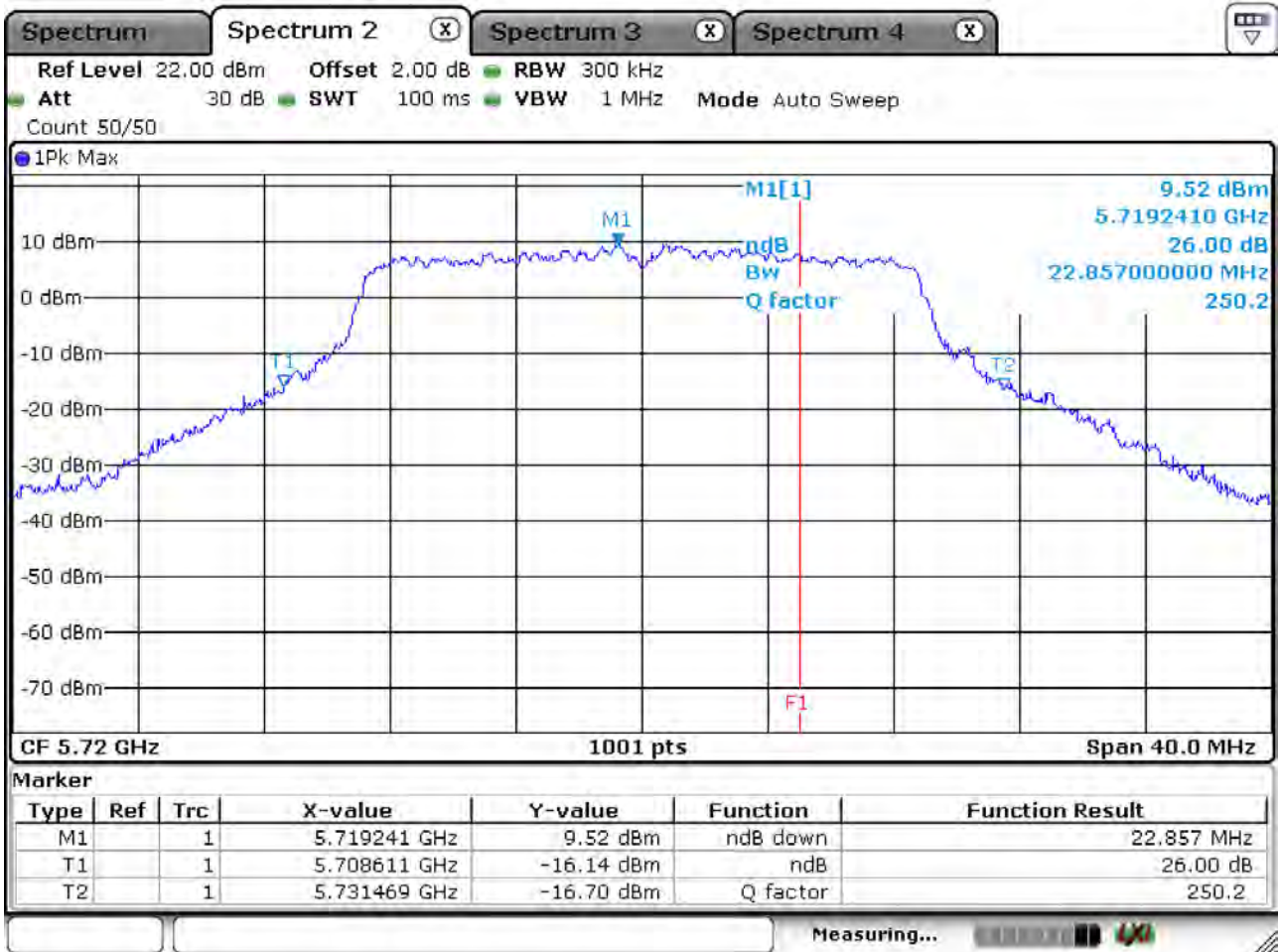
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4.5.2.19 11N20\_144 ANT 1



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4.5.2.20 11N40\_38 ANT 1



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4.5.2.21 11N40\_46 ANT 1



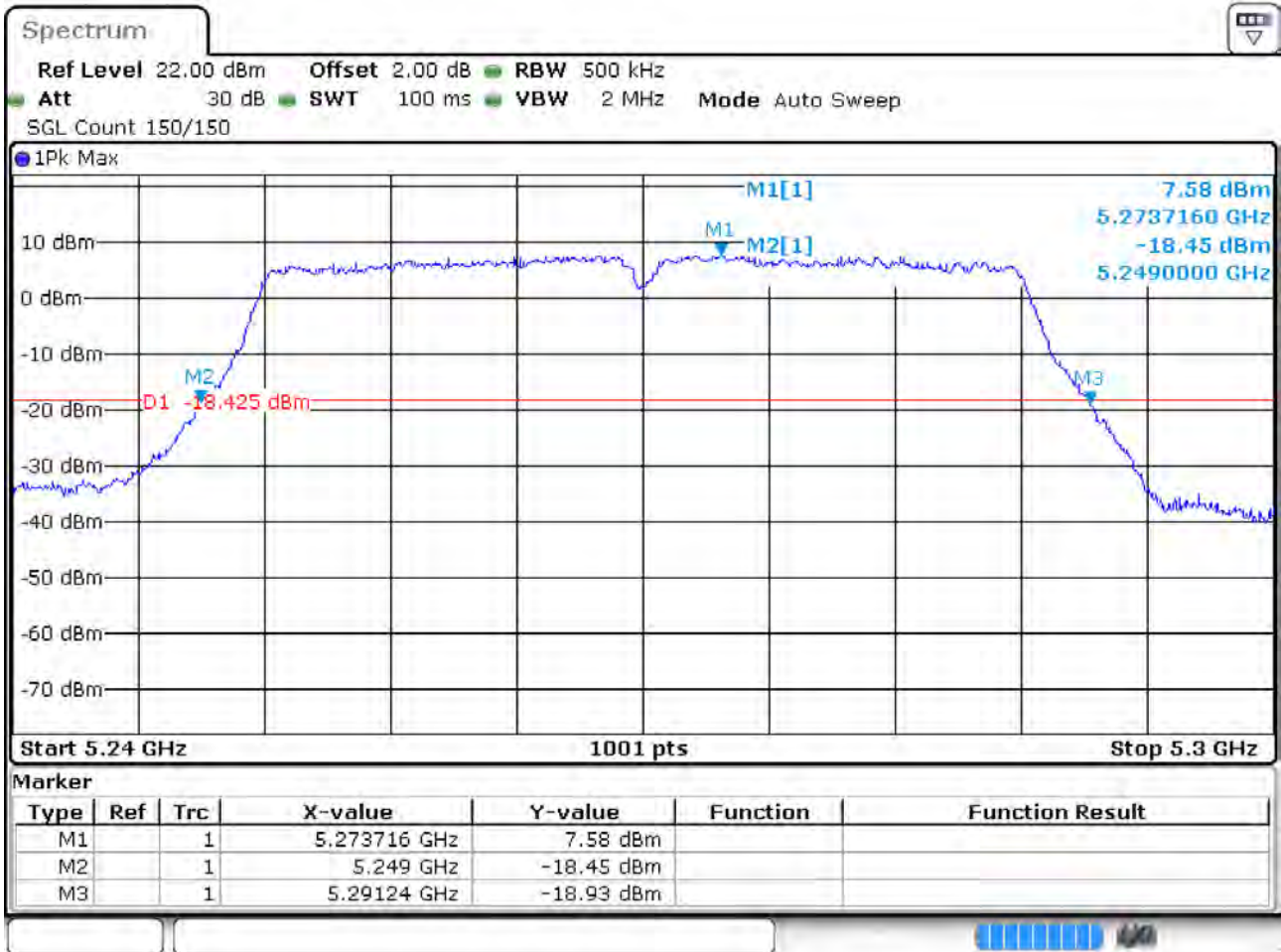
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4.5.2.22 11N40\_54 ANT 1



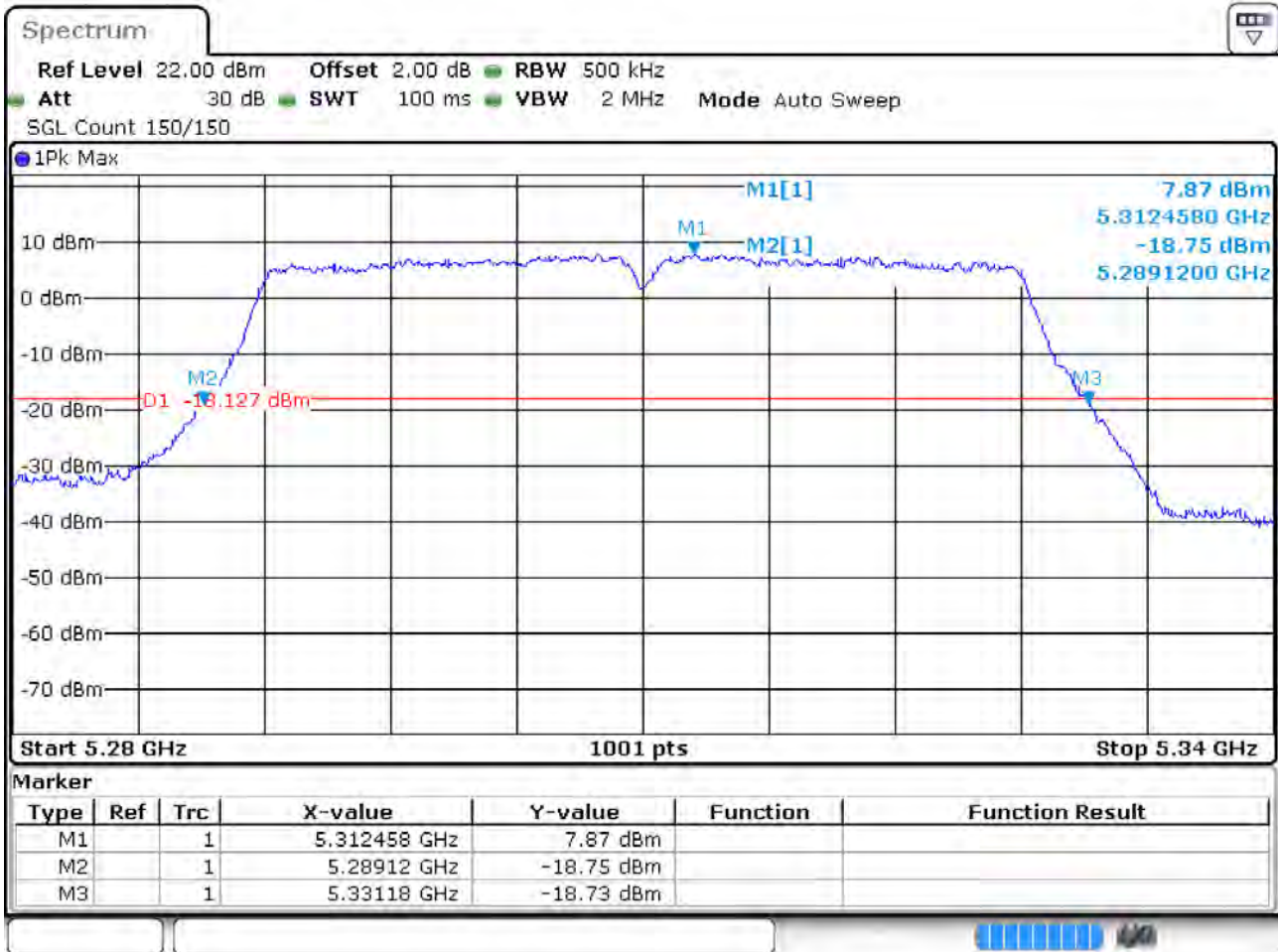
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4.5.2.23 11N40\_62 ANT 1



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**4.5.2.24 11N40\_102 ANT 1**



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4.5.2.25 11N40\_110 ANT 1



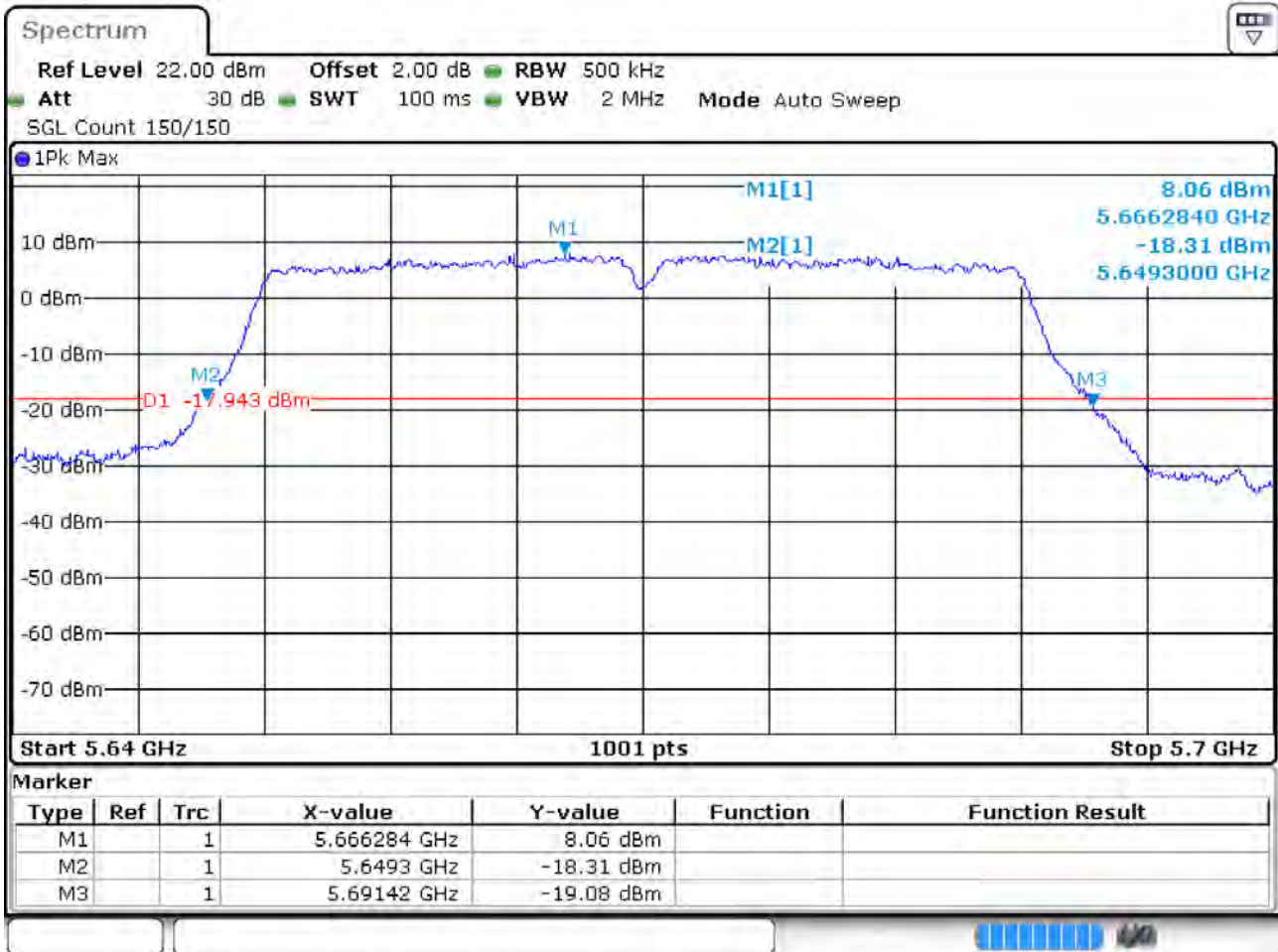
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4.5.2.26 11N40\_134 ANT 1

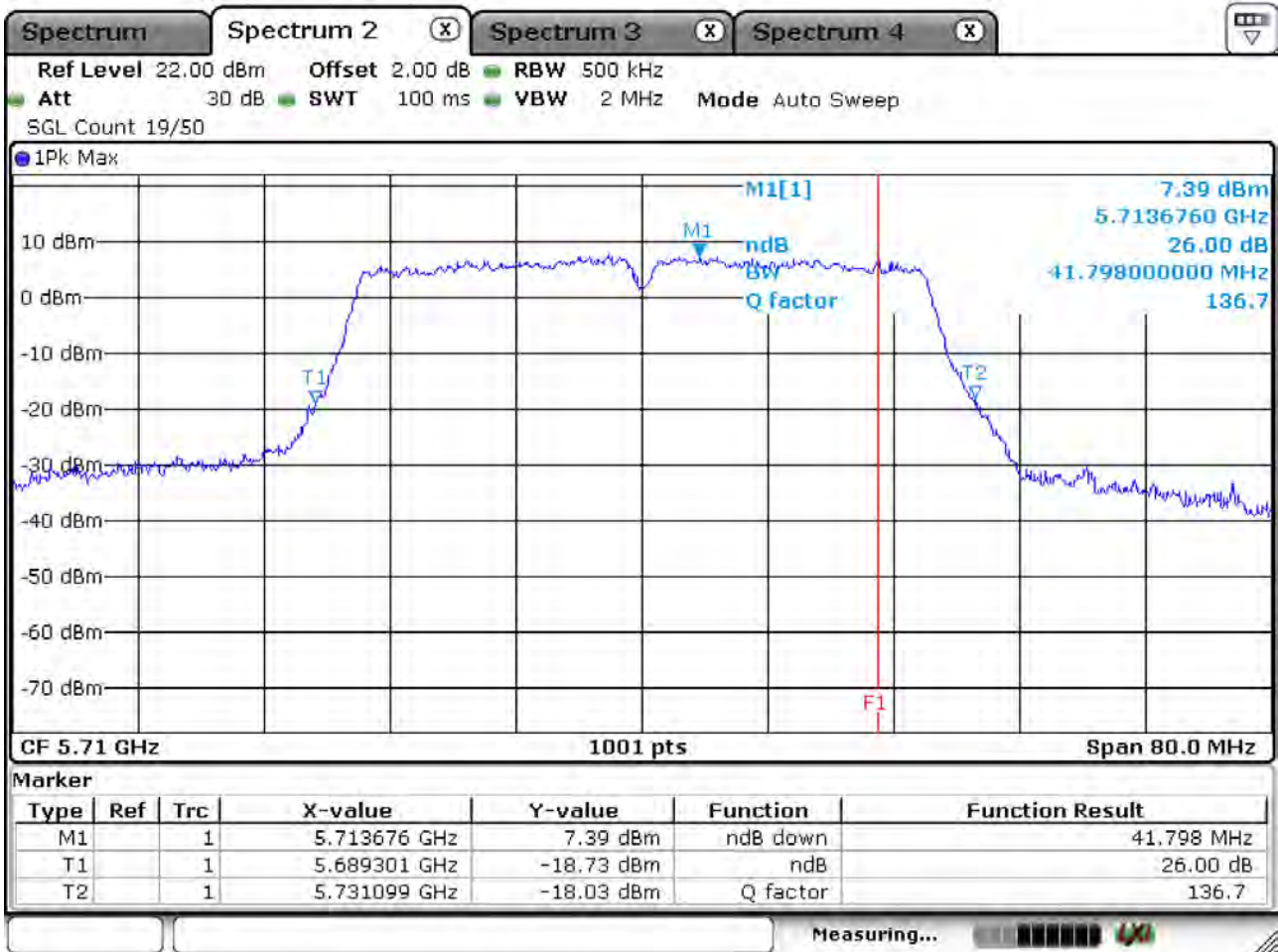


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4.5.2.27 11N40\_142 ANT 1



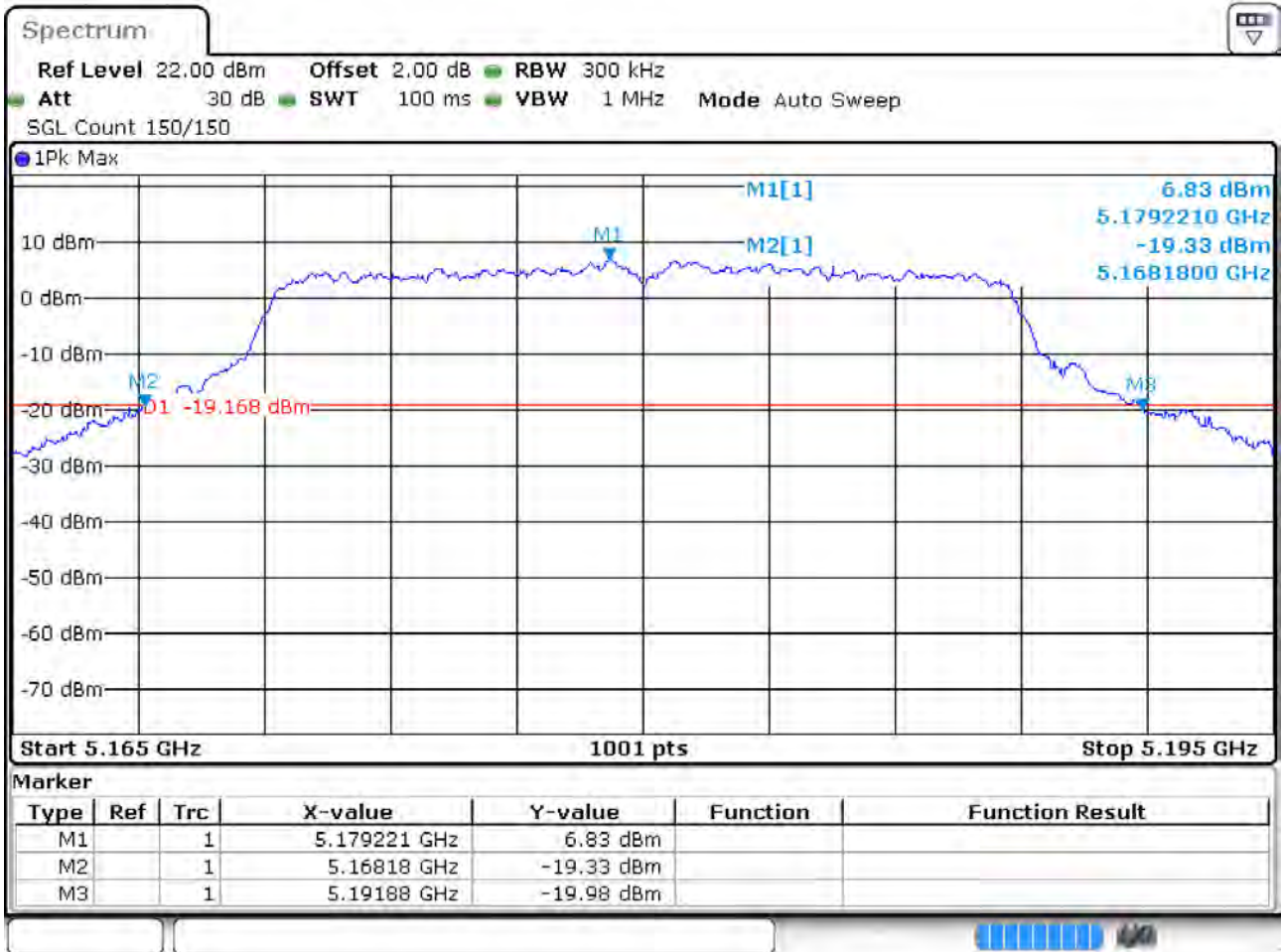
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4.5.2.28 11AC20\_36 ANT 1



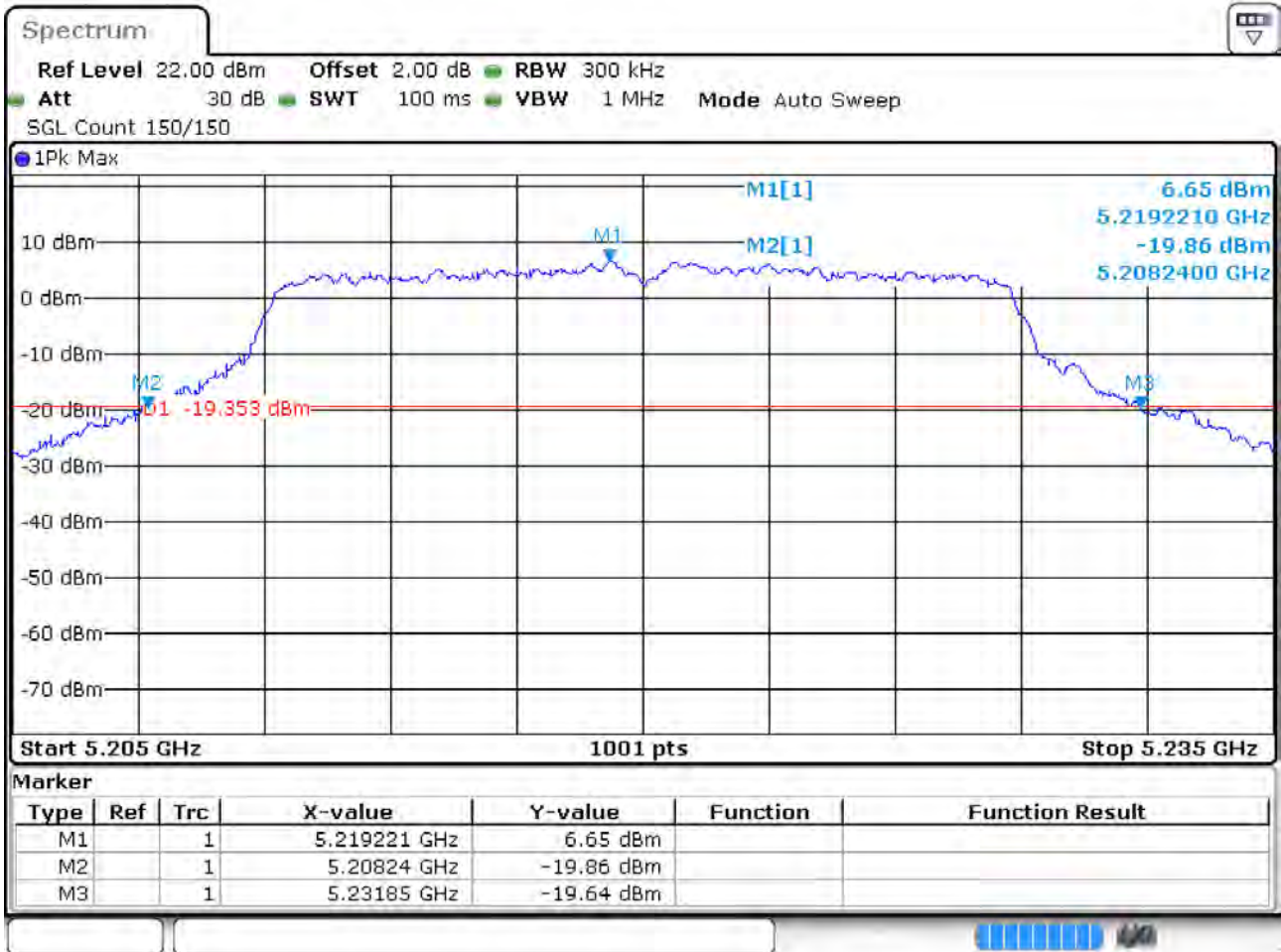
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**4.5.2.29 11AC20\_44 ANT 1**

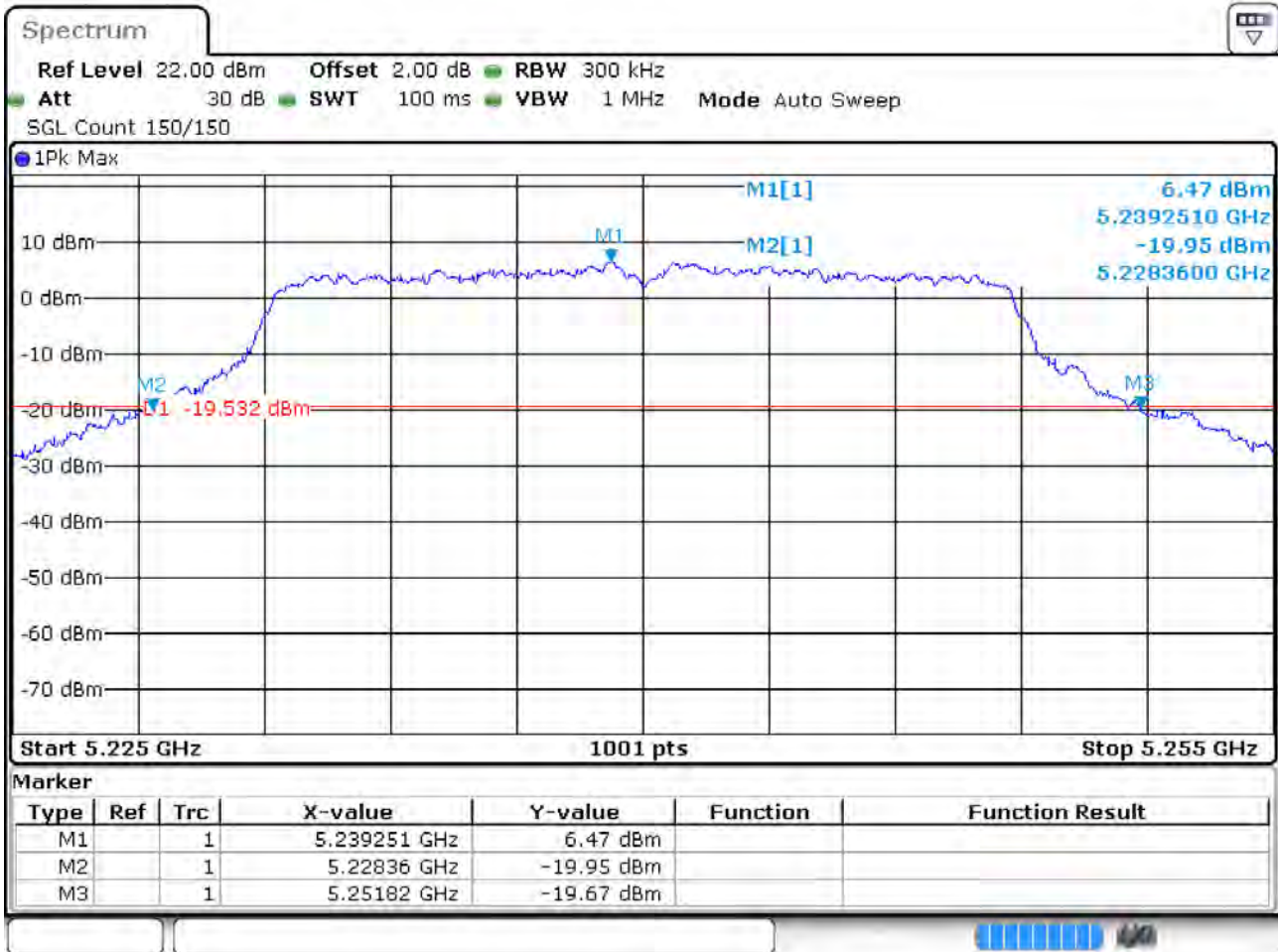


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4.5.2.30 11AC20\_48 ANT 1



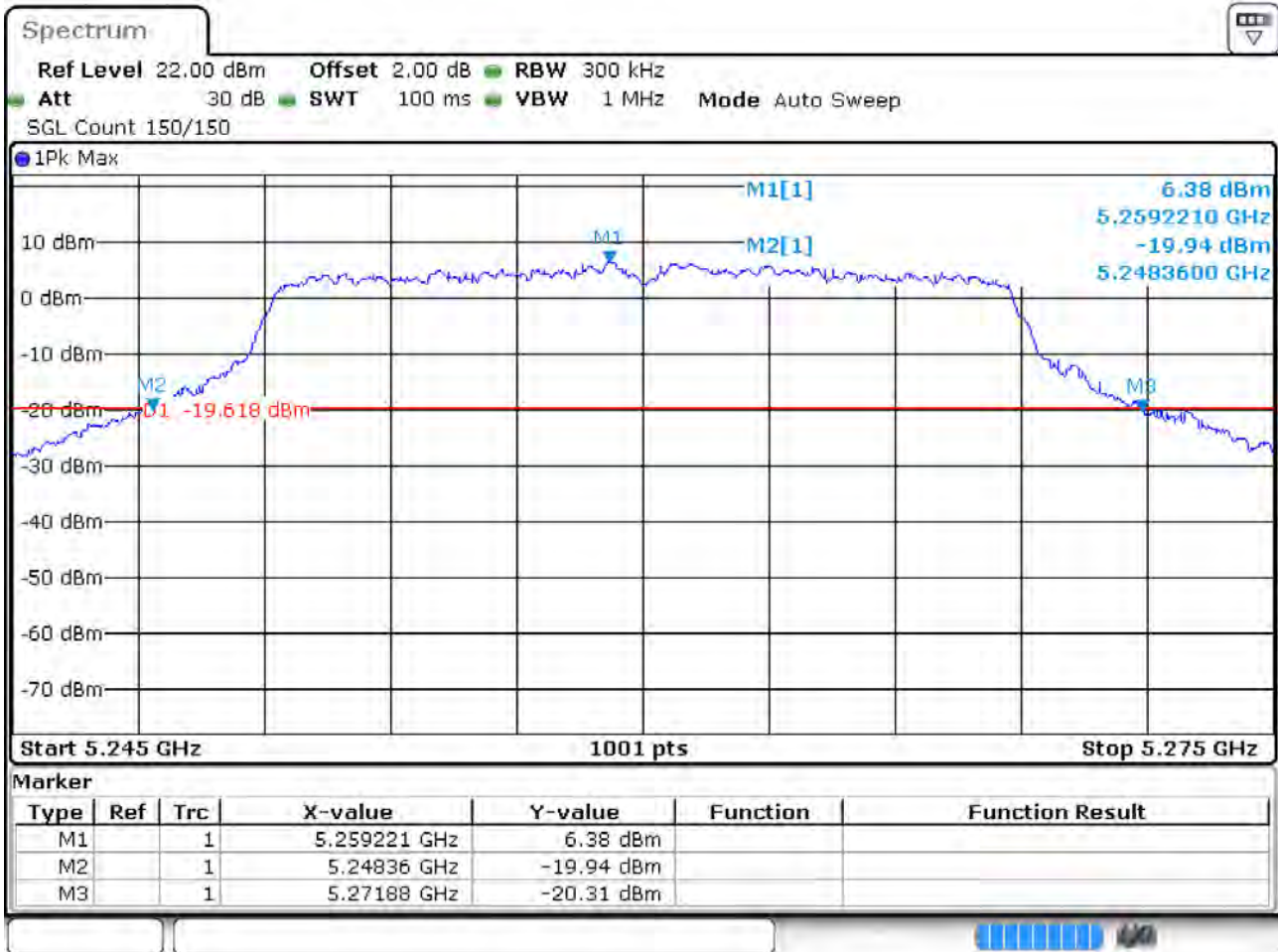
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**4.5.2.31 11AC20\_52 ANT 1**



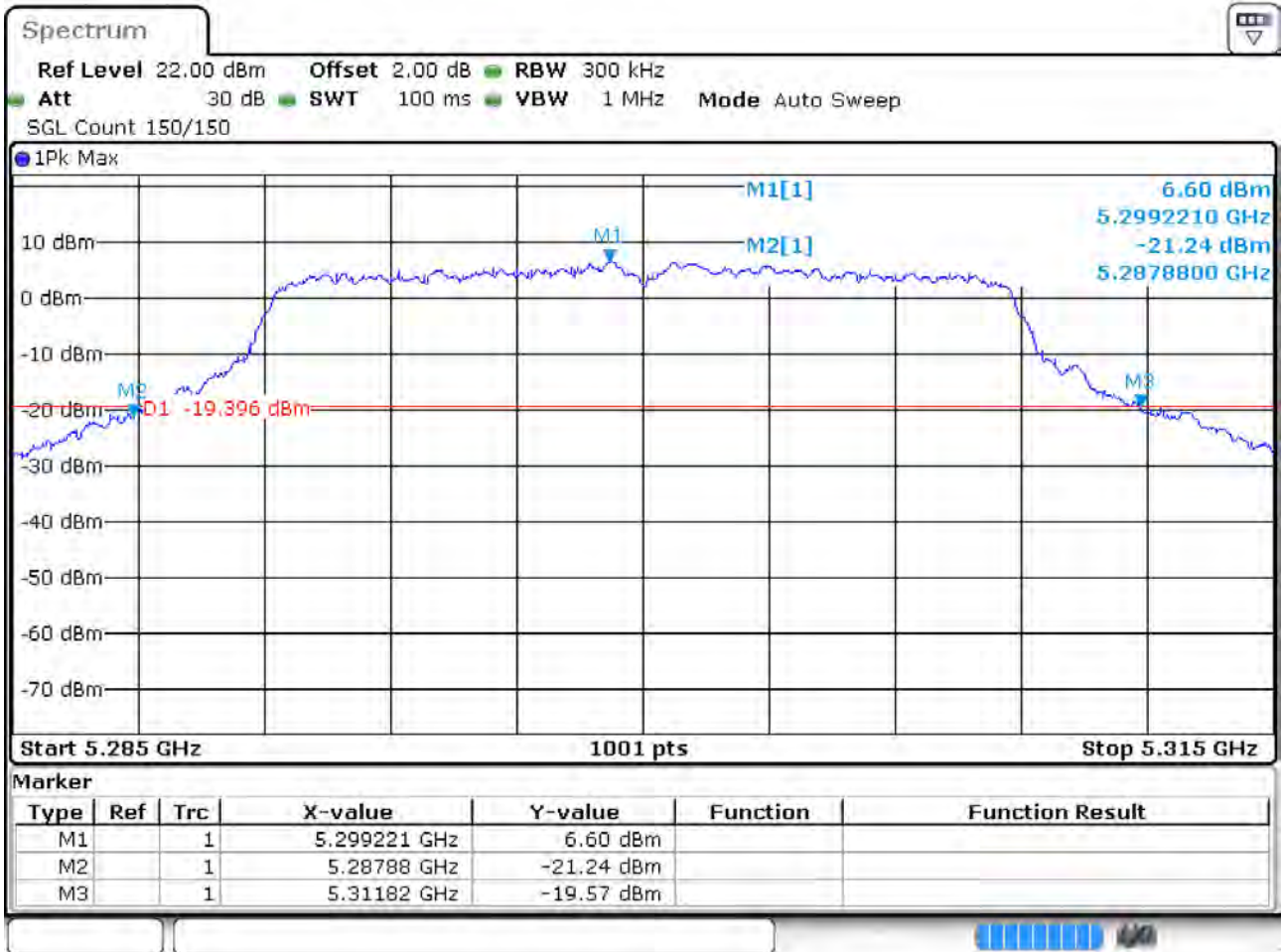
Date: 27.AUG.2020 17:20:18



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4.5.2.32 11AC20\_60 ANT 1

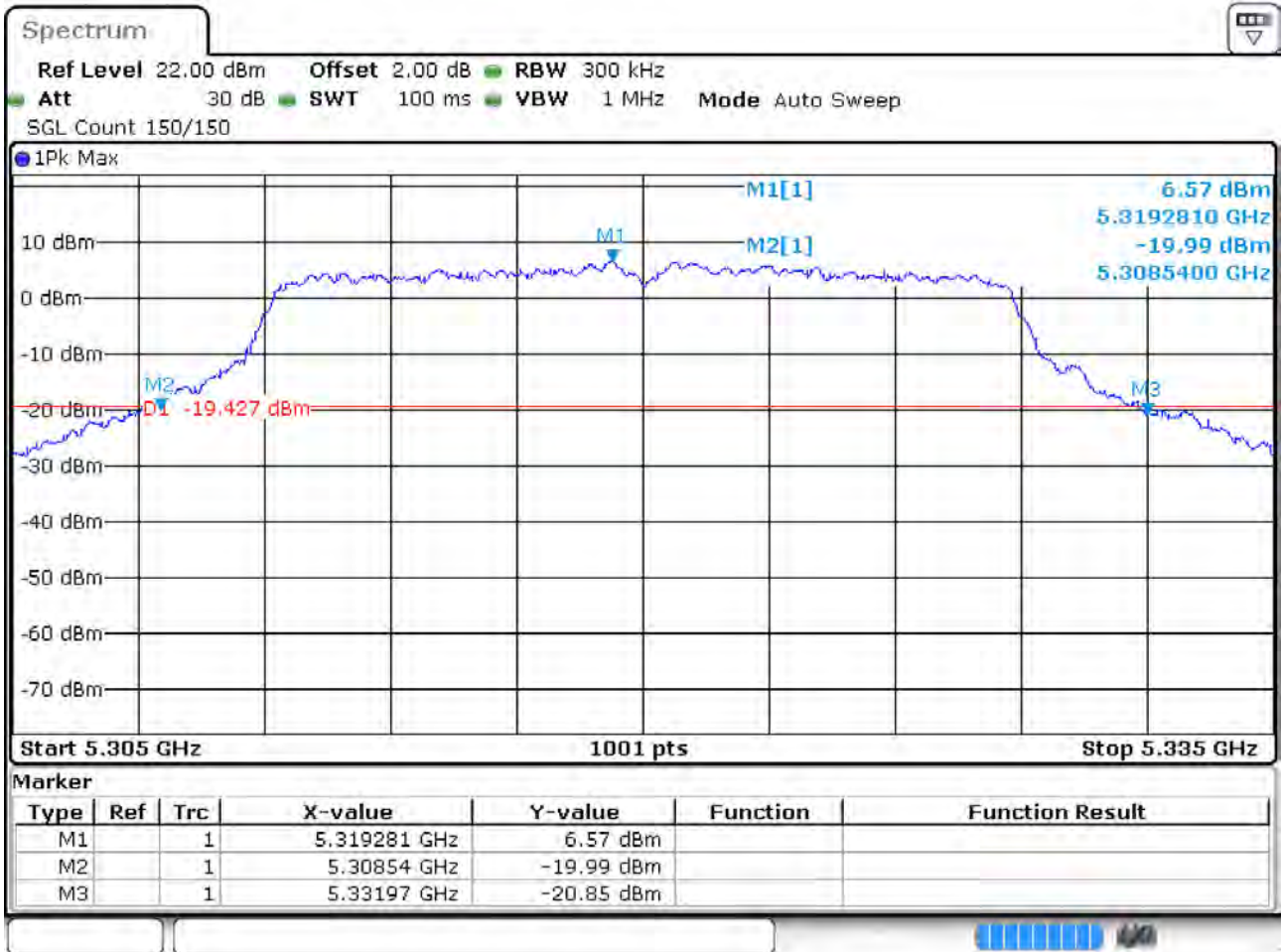


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4.5.2.33 11AC20\_64 ANT 1



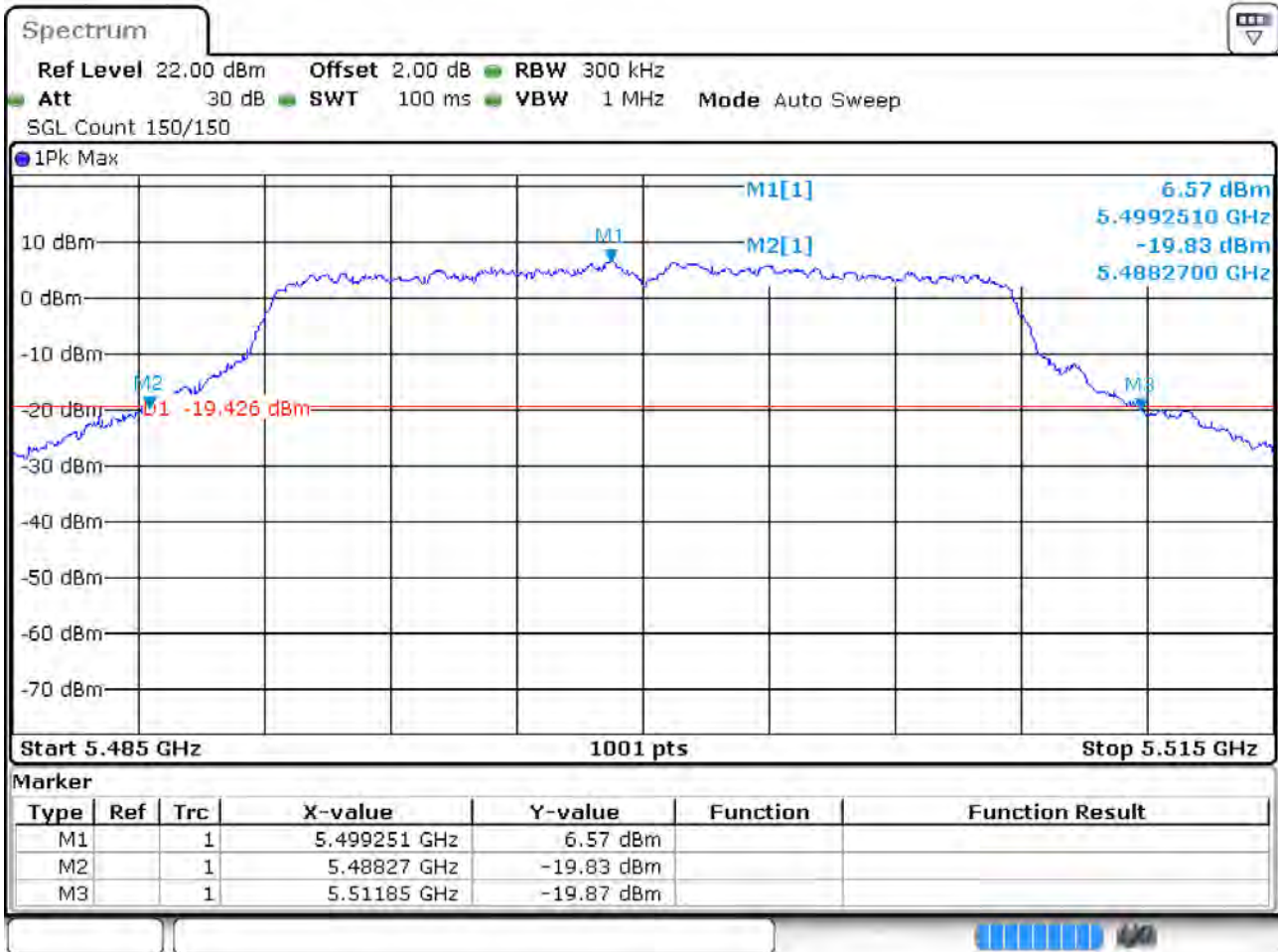
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4.5.2.34 11AC20\_100 ANT 1



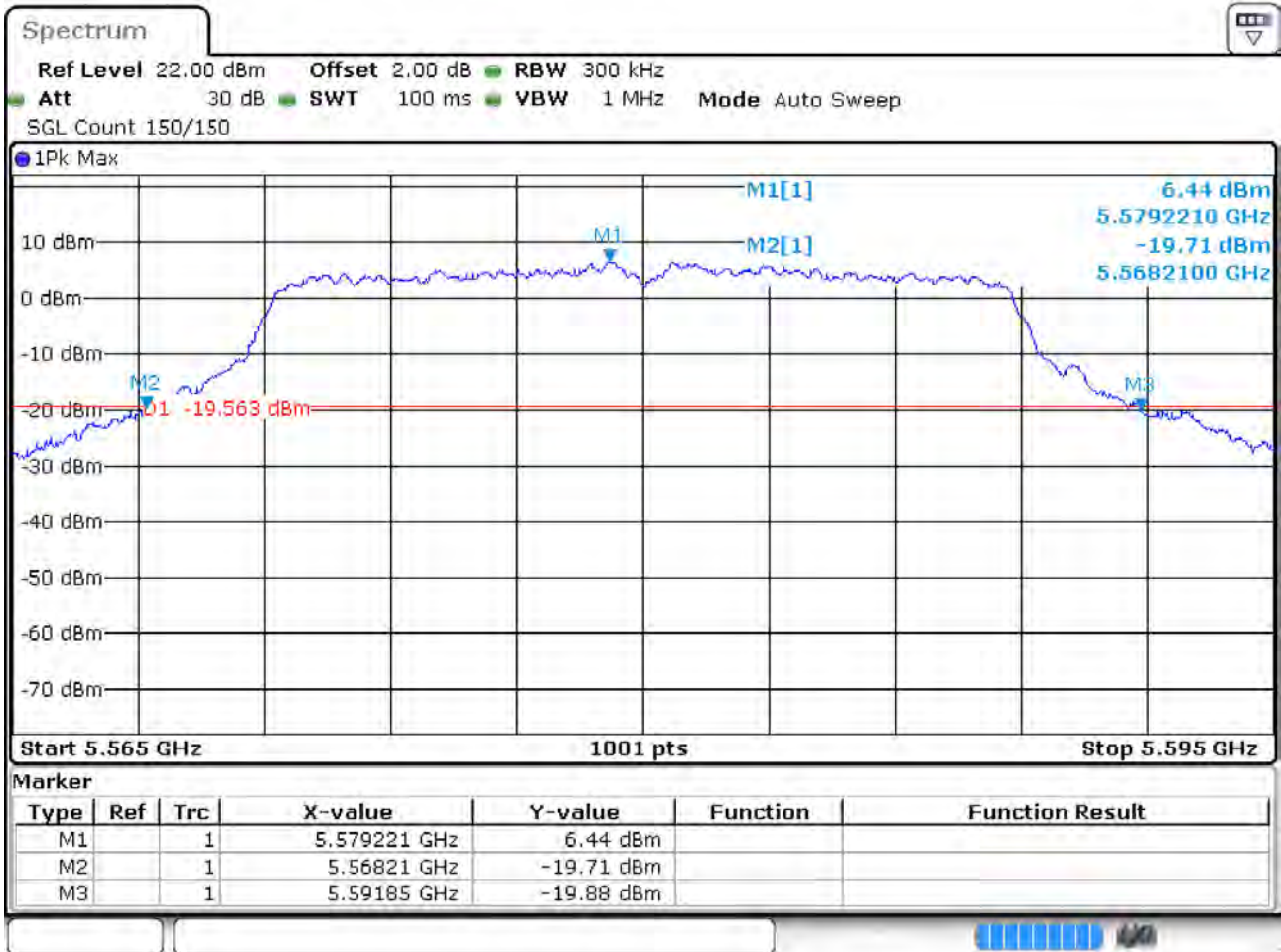
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4.5.2.35 11AC20\_116 ANT 1

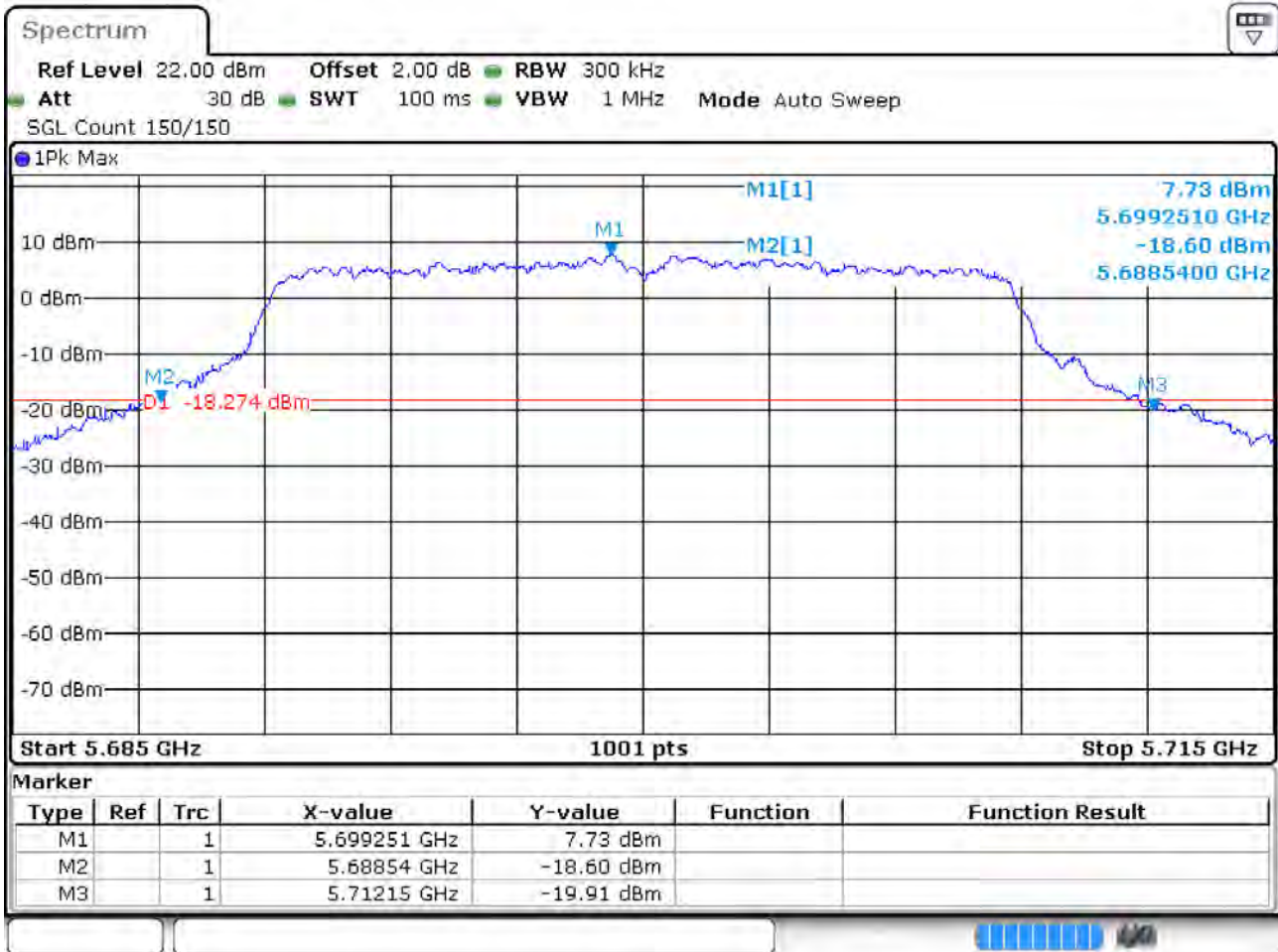


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4.5.2.36 11AC20\_140 ANT 1



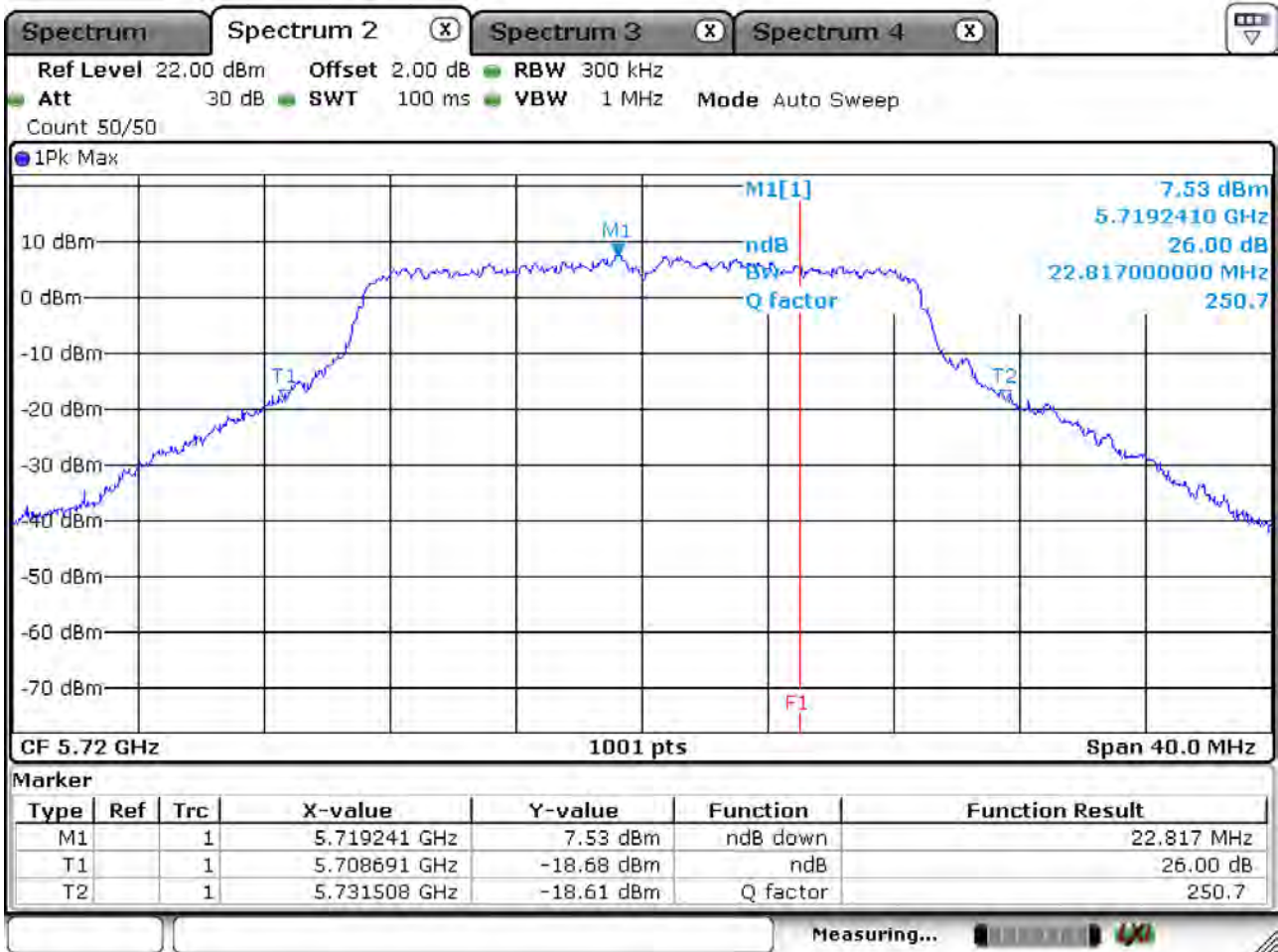
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4.5.2.37 11AC20\_144 ANT 1



Date: 13.OCT.2020 17:13:22



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4.5.2.38 11AC40\_38 ANT 1

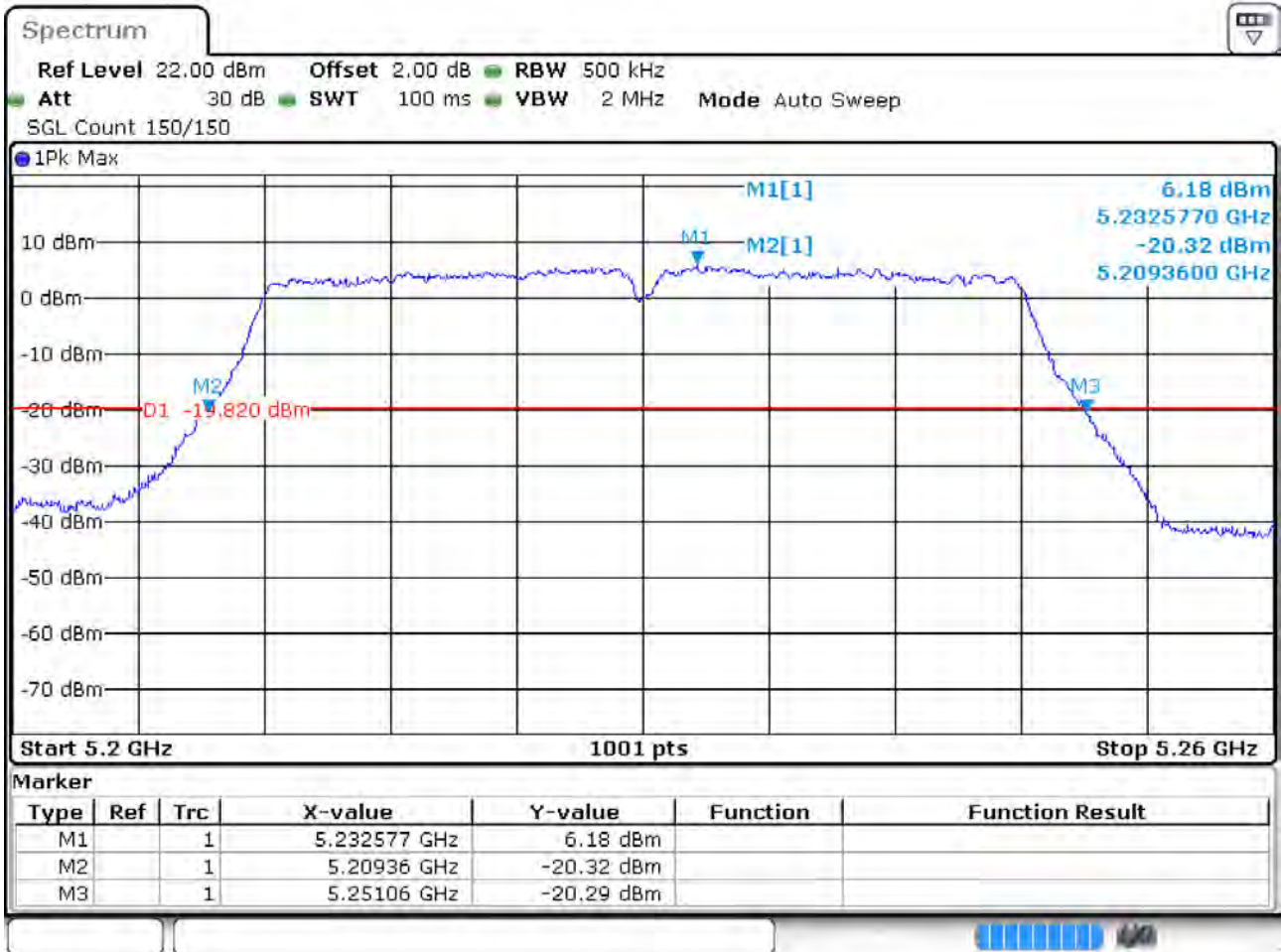


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**4.5.2.39 11AC40\_46 ANT 1**



Date: 27.AUG.2020 17:36:08



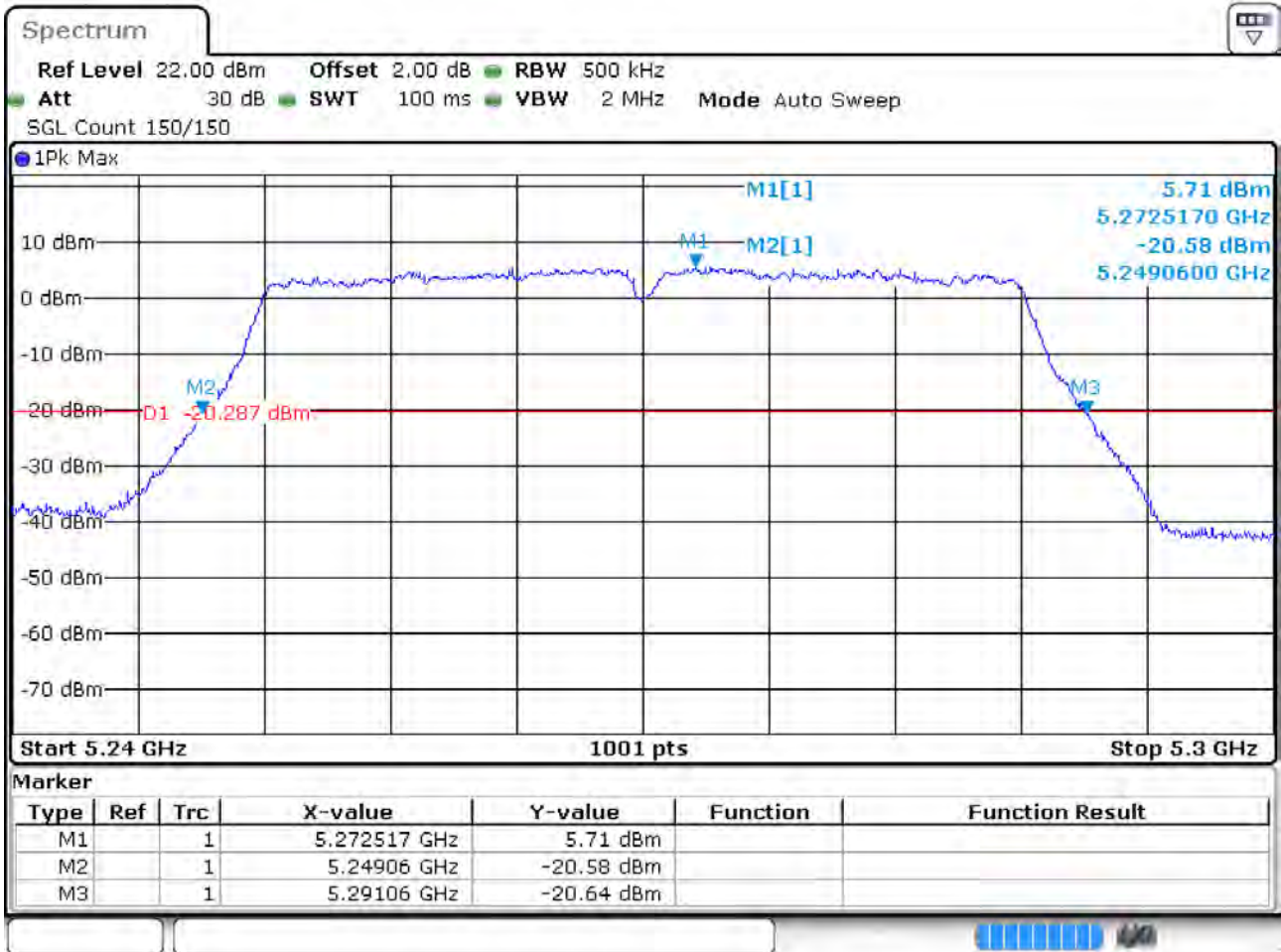
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**4.5.2.40 11AC40\_54 ANT 1**



Date: 27.AUG.2020 17:37:50

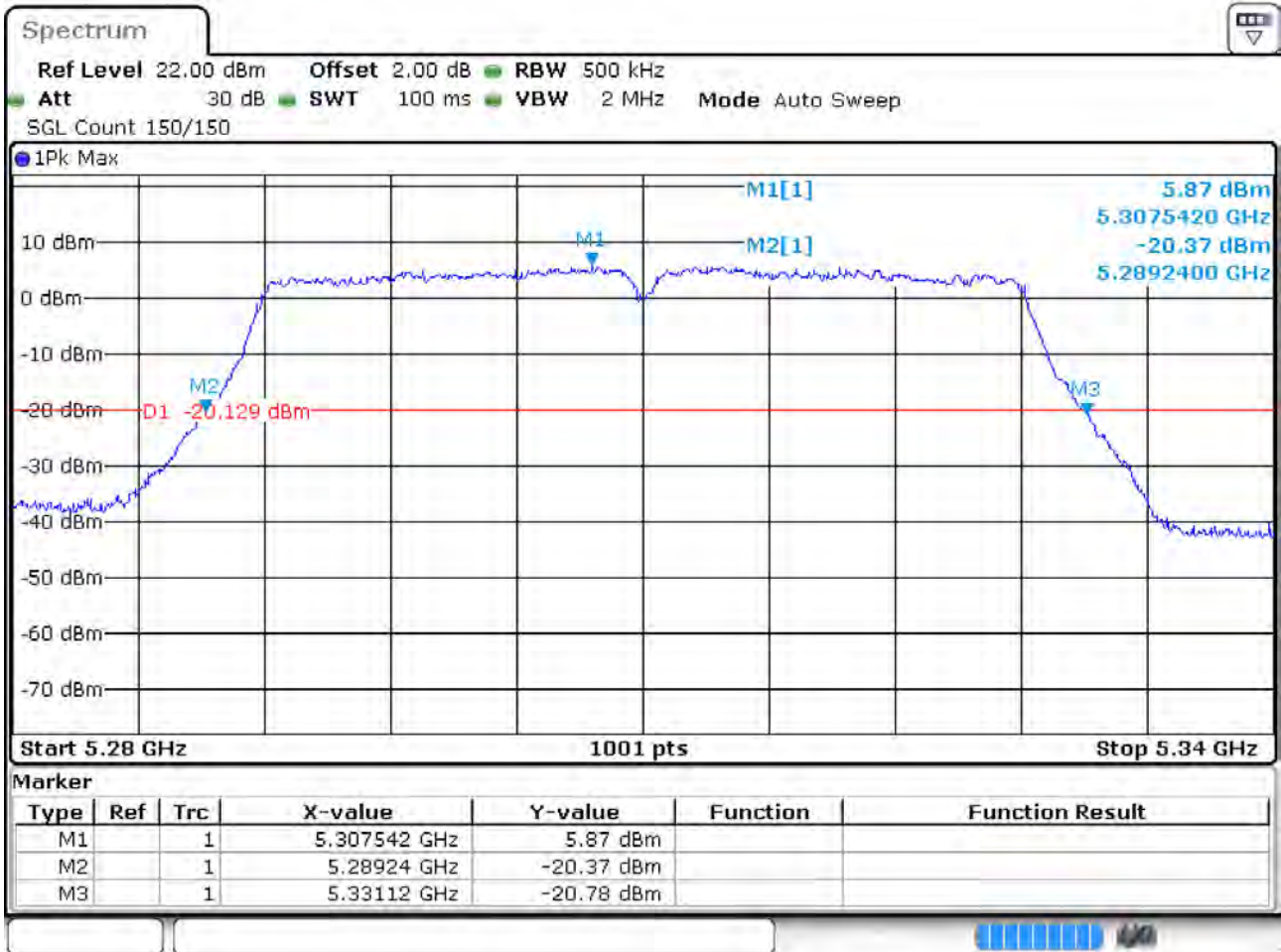


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**4.5.2.41 11AC40\_62 ANT 1**



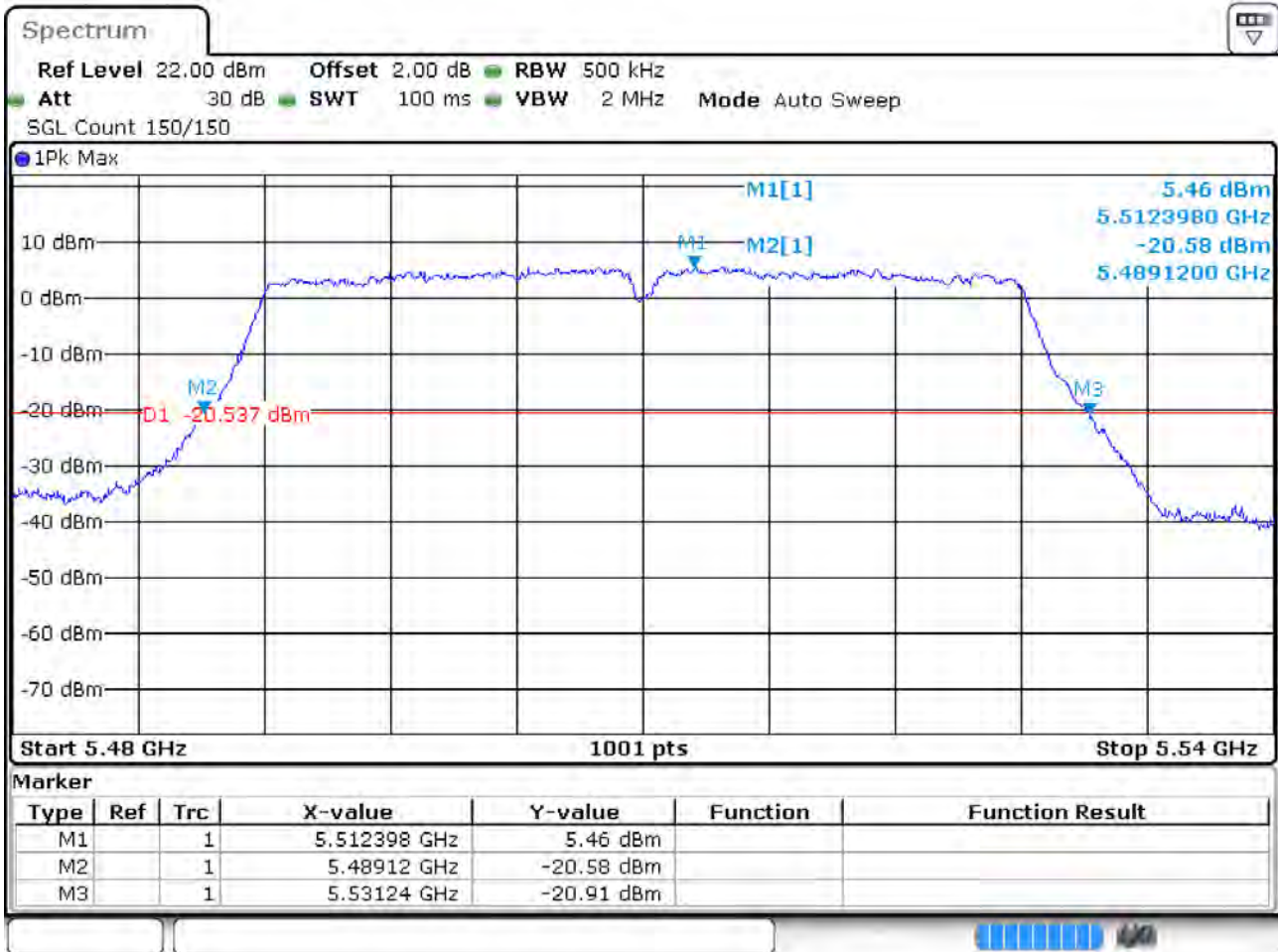
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4.5.2.42 11AC40\_102 ANT 1



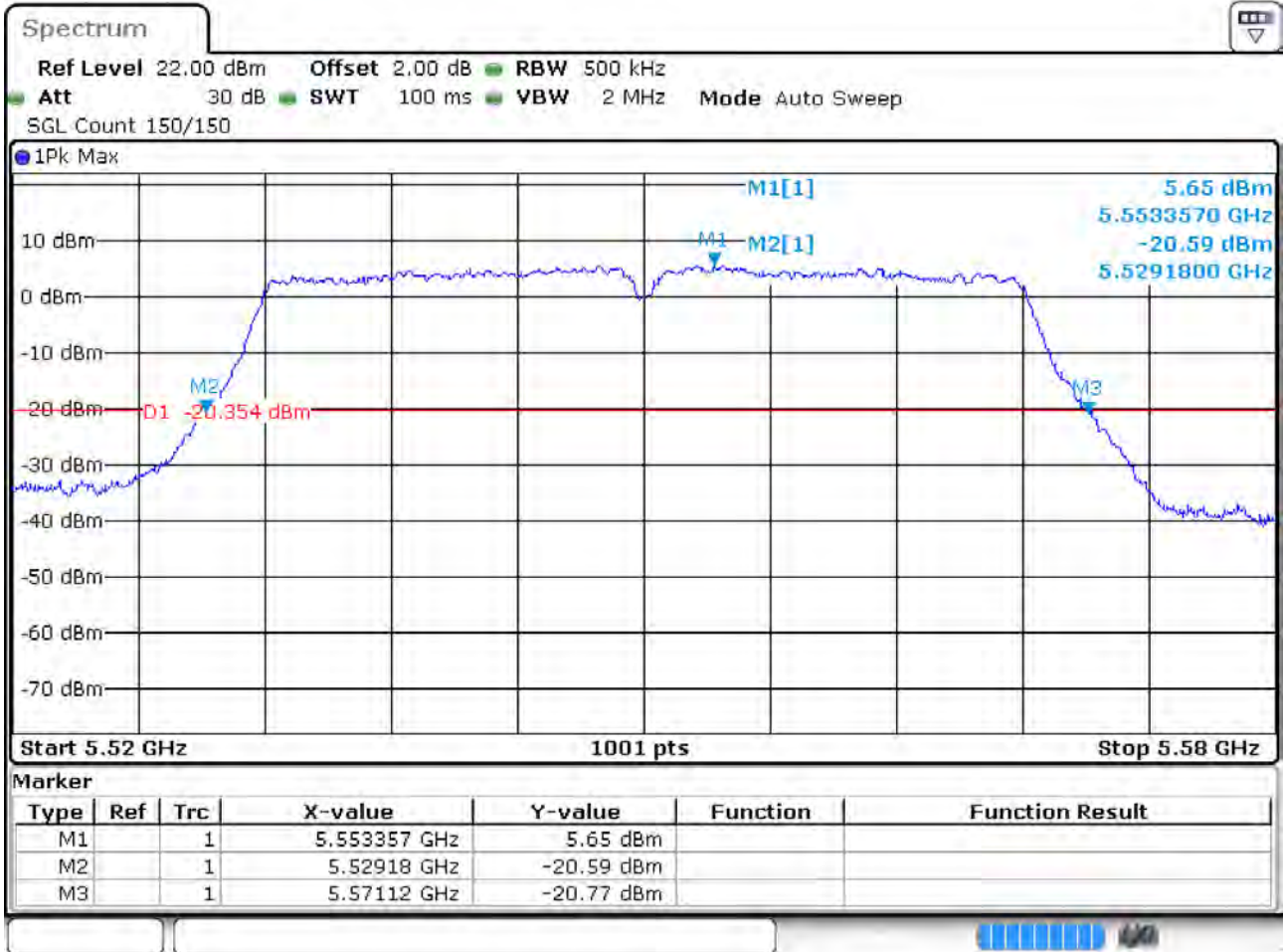
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4.5.2.43 11AC40\_110 ANT 1



Date: 27.AUG.2020 17:43:57

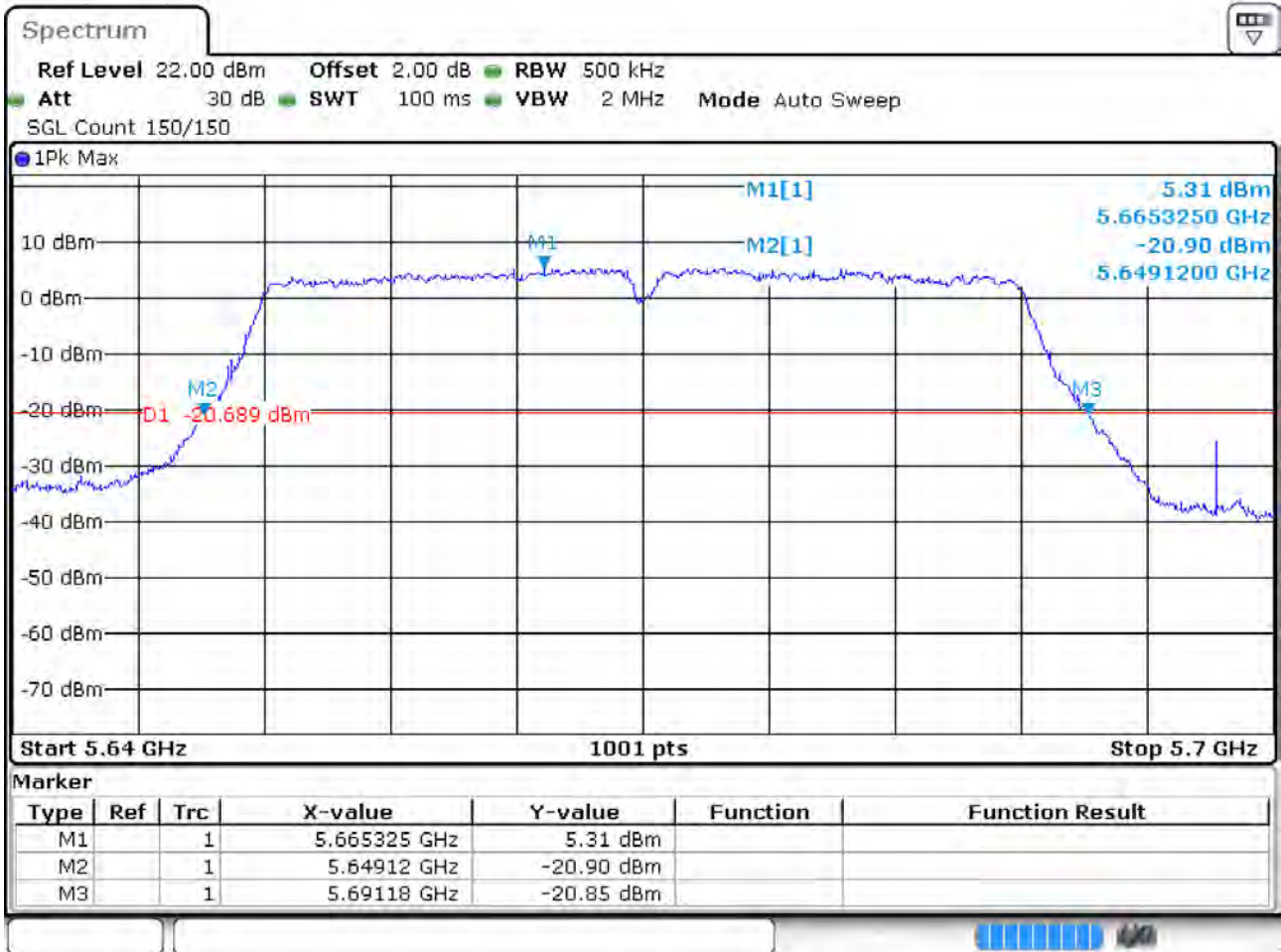


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**4.5.2.44 11AC40\_134 ANT 1**

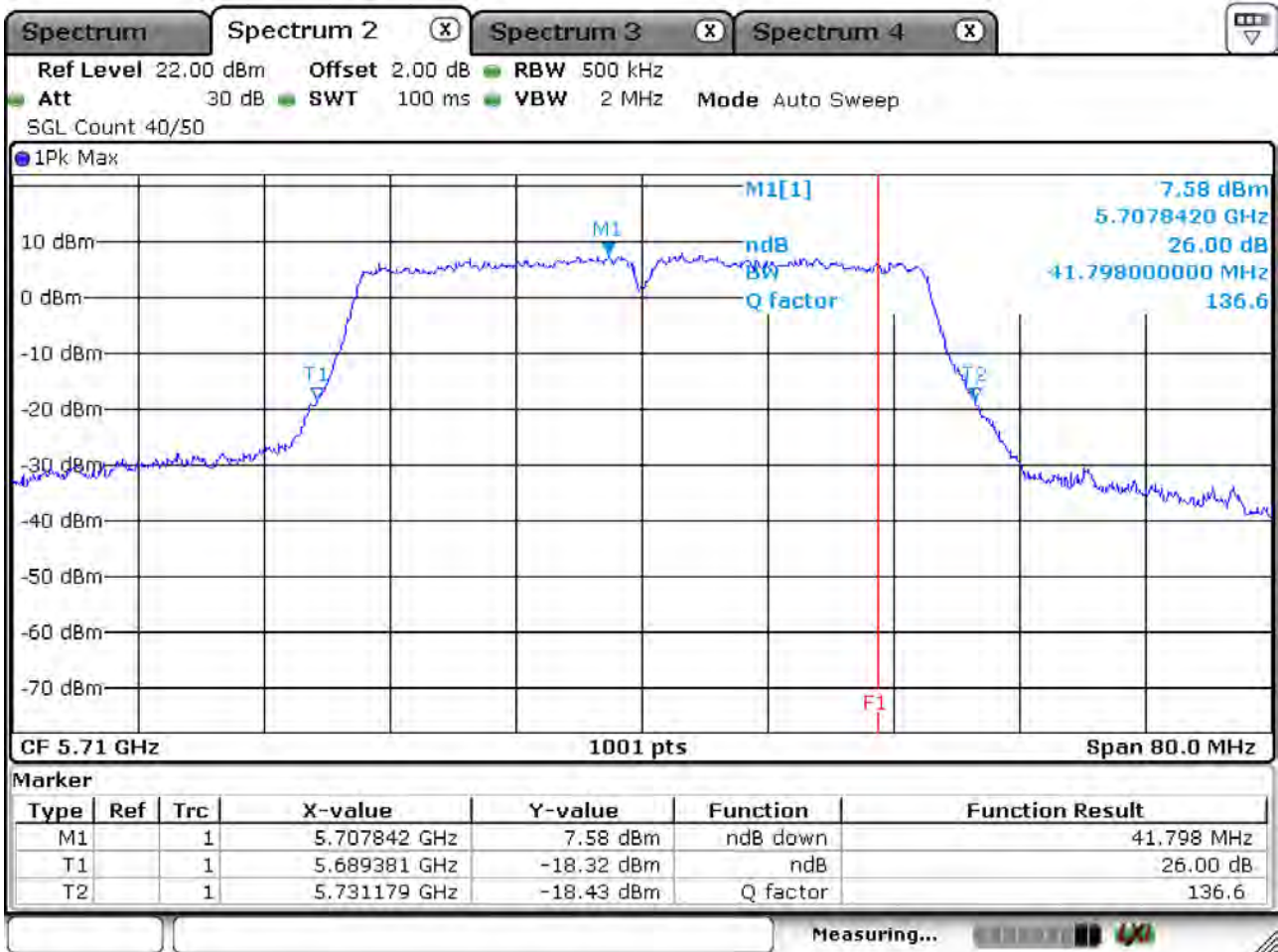


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4.5.2.45 11AC40\_142 ANT 1



Date: 13.OCT.2020 17:22:52



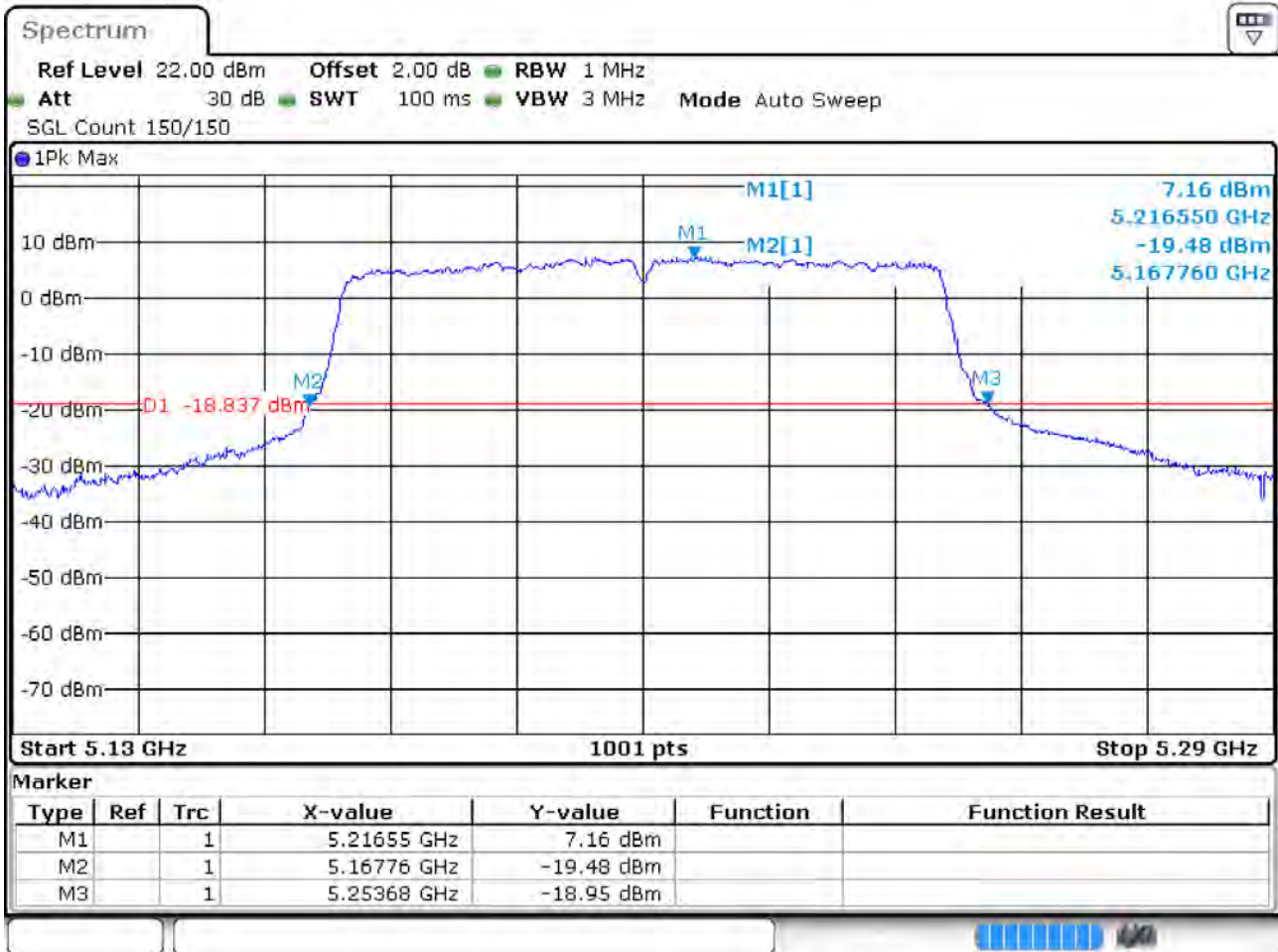
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4.5.2.46 11AC80\_42 ANT 1



Date: 27.AUG.2020 17:51:52





**4.5.2.47 11AC80\_58 ANT 1**



Date: 27.AUG.2020 17:53:45



**4.5.2.48 11AC80\_106 ANT 1**



Date: 27.AUG.2020 17:55:30



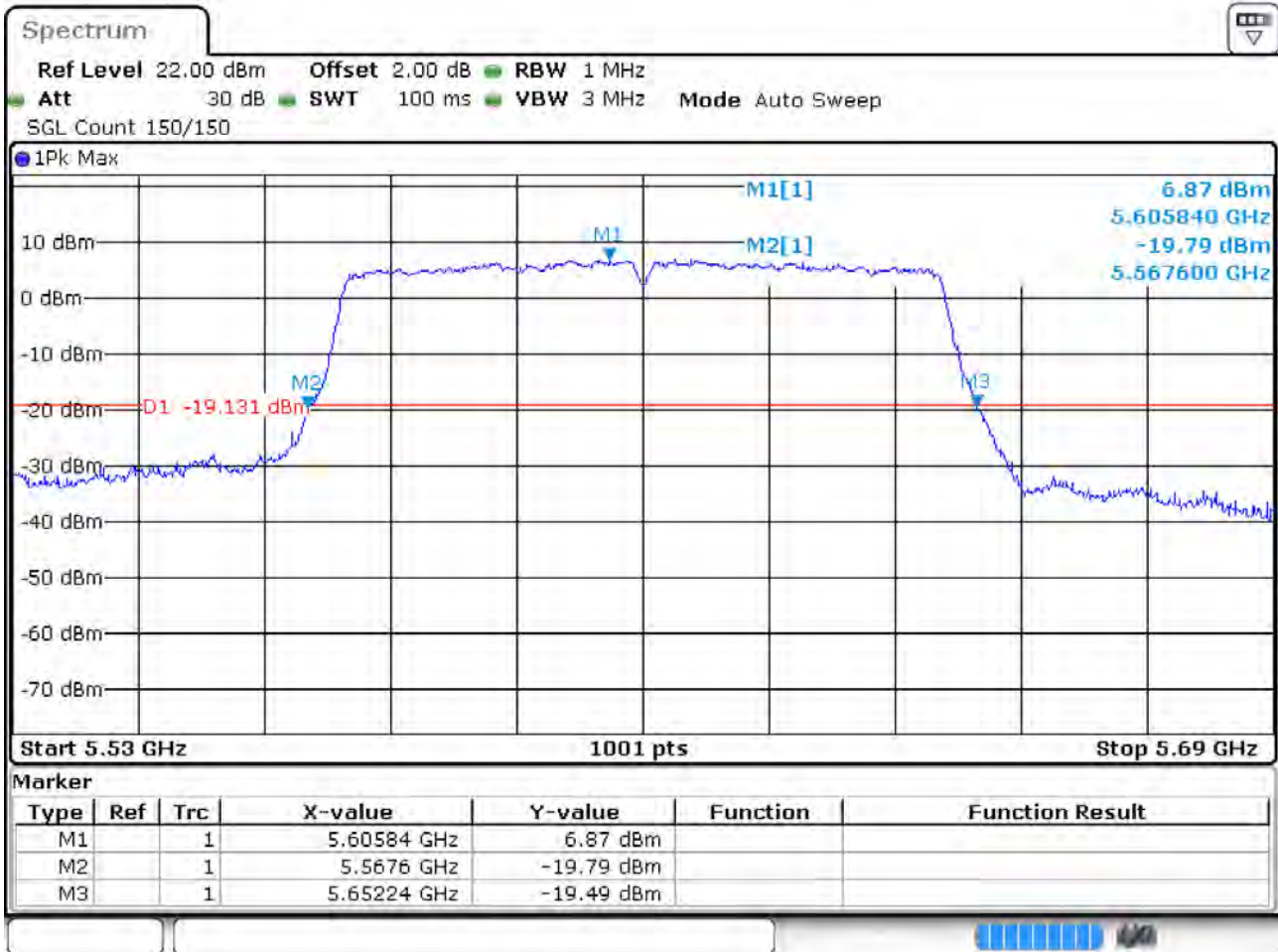
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4.5.2.49 11AC80\_122 ANT 1

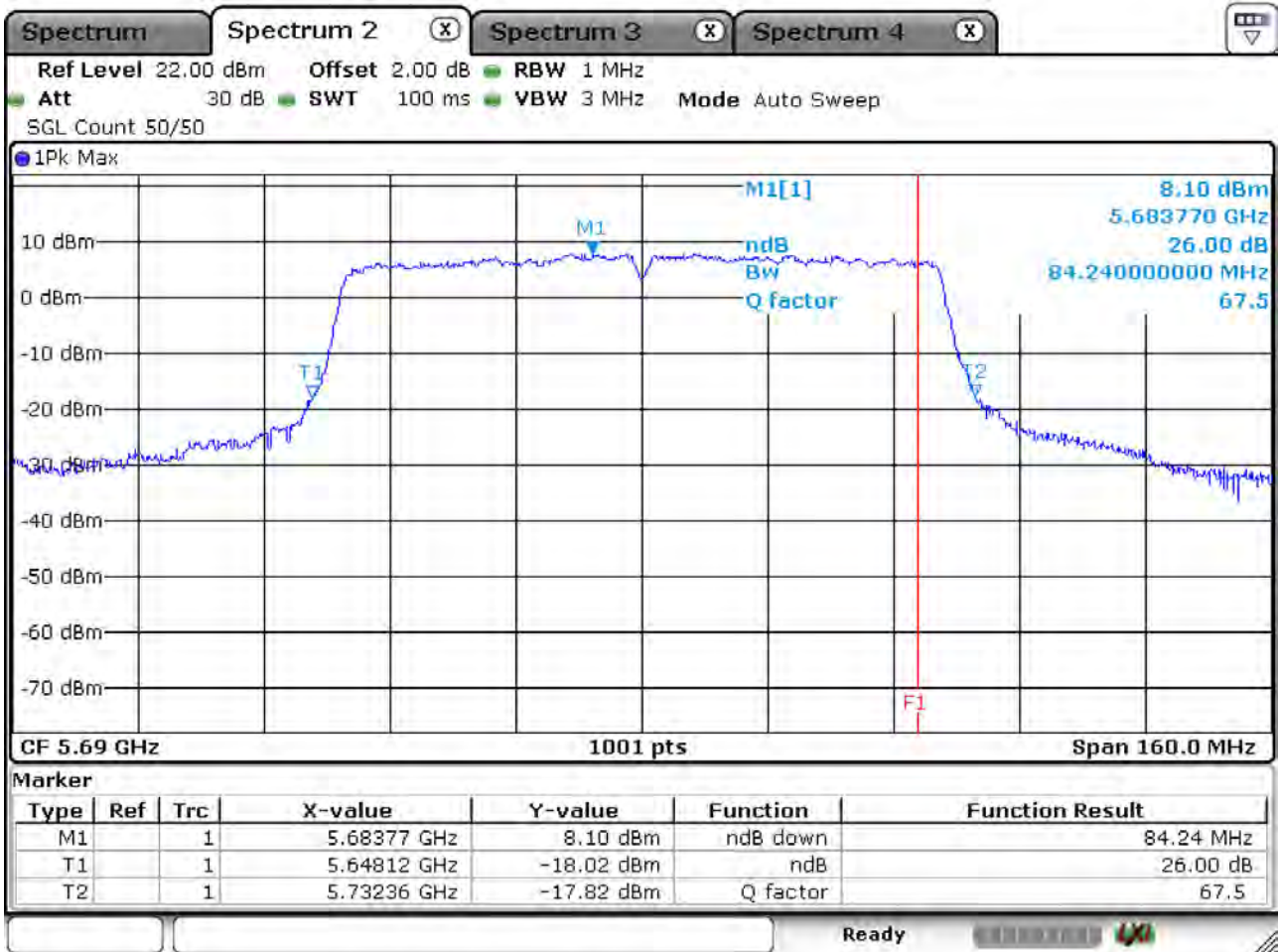


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4.5.2.50 11AC80\_138 ANT 1



Date: 13.OCT.2020 17:29:07



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### 4.6 6dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(e)	
Test Method:	ANSI C63.10: 2013	
Test Setup:		
Test Instruments:	Refer to section 5.10 for details	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	<p>Through Pre-scan, find the</p> <ul style="list-style-type: none"> <li>6Mbps of rate is the worst case of 802.11a;</li> <li>MCS0 of rate is the worst case of 802.11n(HT20);</li> <li>MCS0 of rate is the worst case of 802.11n(HT40);</li> <li>MCS0 of rate is the worst case of 802.11ac(HT20);</li> <li>MCS0 of rate is the worst case of 802.11ac(HT40);</li> <li>MCS0 of rate is the worst case of 802.11ac(HT80).</li> </ul> <p>Only the worst case is recorded in the report.</p>	
Limit:	Frequency Band	Limit
	5725-5850MHz	At least 500kHz
Test Results:	Pass	



**4.6.1 Test Results for 6dB Emission Bandwidth**

Test Mode	Test Channel	Frequency [MHz]	ANT	6dB Emission Bandwidth [MHz]	Verdict
11A20	144	5720	ANT 1	16.26	PASS
	149	5745	ANT 1	15.57	PASS
	165	5825	ANT 1	15.6	PASS
11N20	144	5720	ANT 1	16.74	PASS
	149	5745	ANT 1	16.02	PASS
	165	5825	ANT 1	16.05	PASS
11N40	142	5710	ANT 1	35.68	PASS
	151	5755	ANT 1	35.28	PASS
	159	5795	ANT 1	35.28	PASS
11AC20	142	5710	ANT 1	15.94	PASS
	149	5745	ANT 1	16.59	PASS
	165	5825	ANT 1	16.59	PASS
11AC40	142	5710	ANT 1	35.76	PASS
	151	5755	ANT 1	35.46	PASS
	159	5795	ANT 1	35.28	PASS
11AC80	138	5690	ANT 1	75.28	PASS
	155	5775	ANT 1	75.52	PASS



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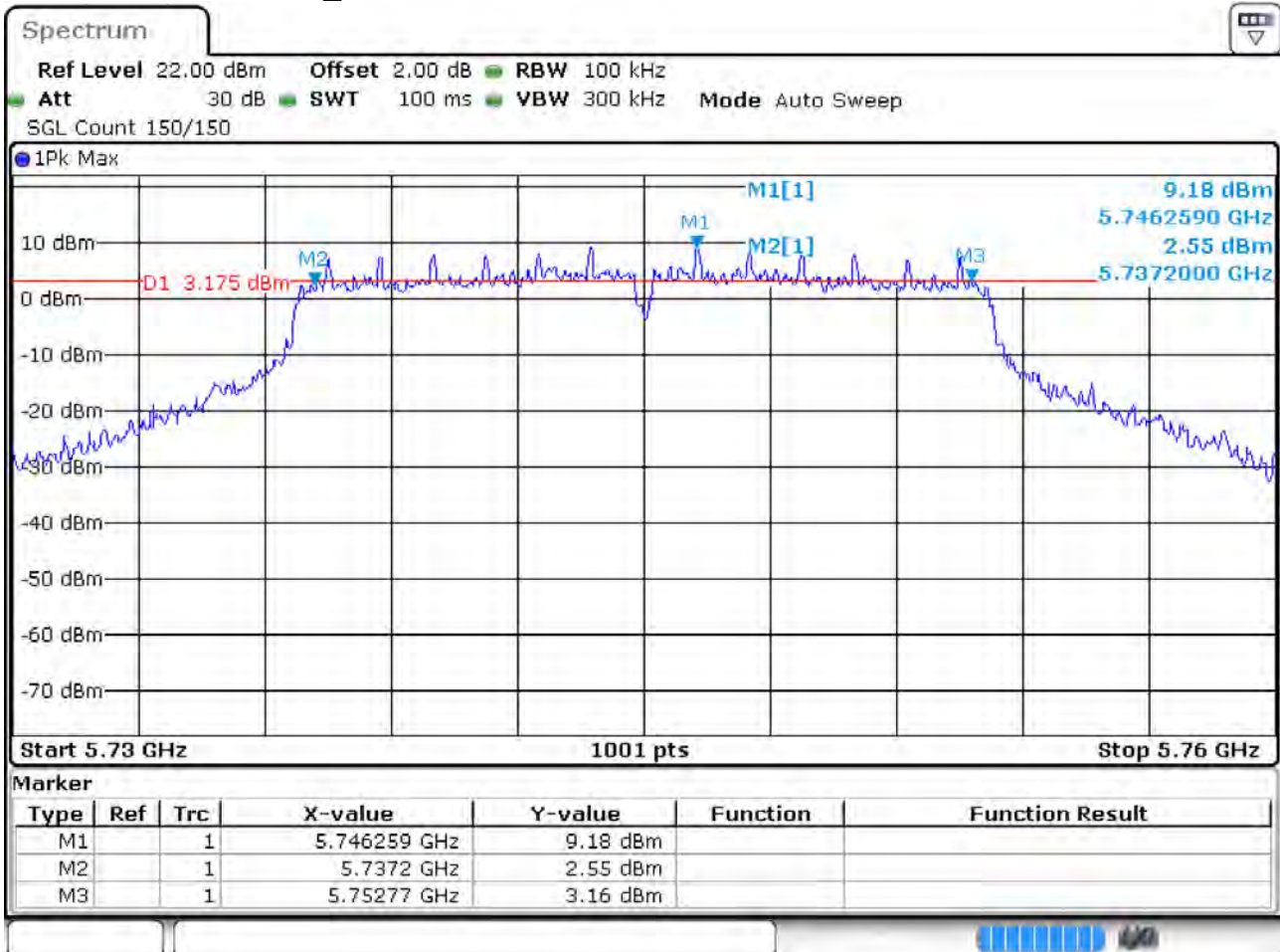
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**4.6.2 Plots for 6dB Emission Bandwidth**

**4.6.2.1 11A20\_144 ANT 1**

**4.6.2.2 11A20\_149 ANT 1**



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4.6.2.3 11A20\_165 ANT 1



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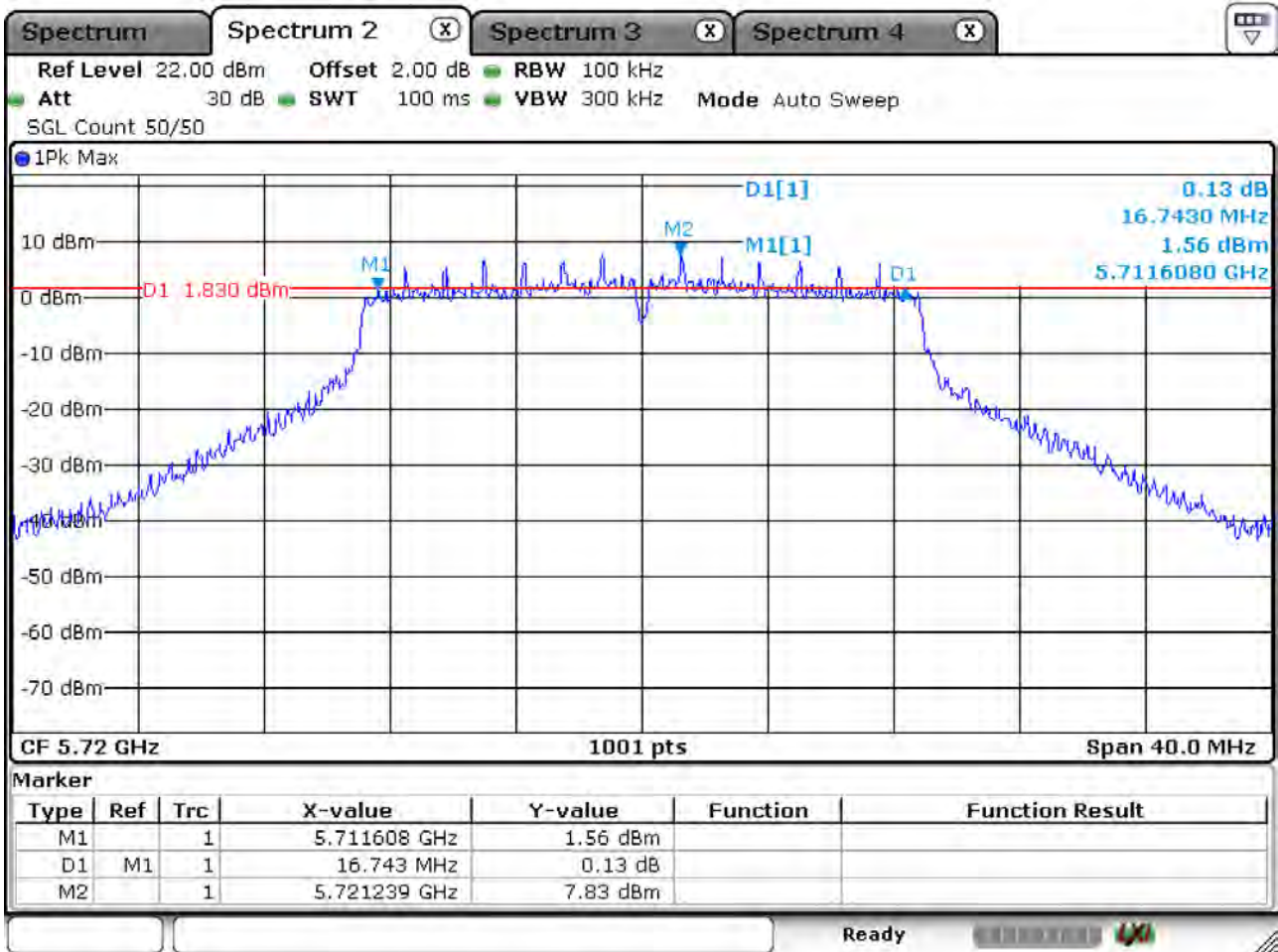


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4.6.2.4 11N20\_144 ANT 1



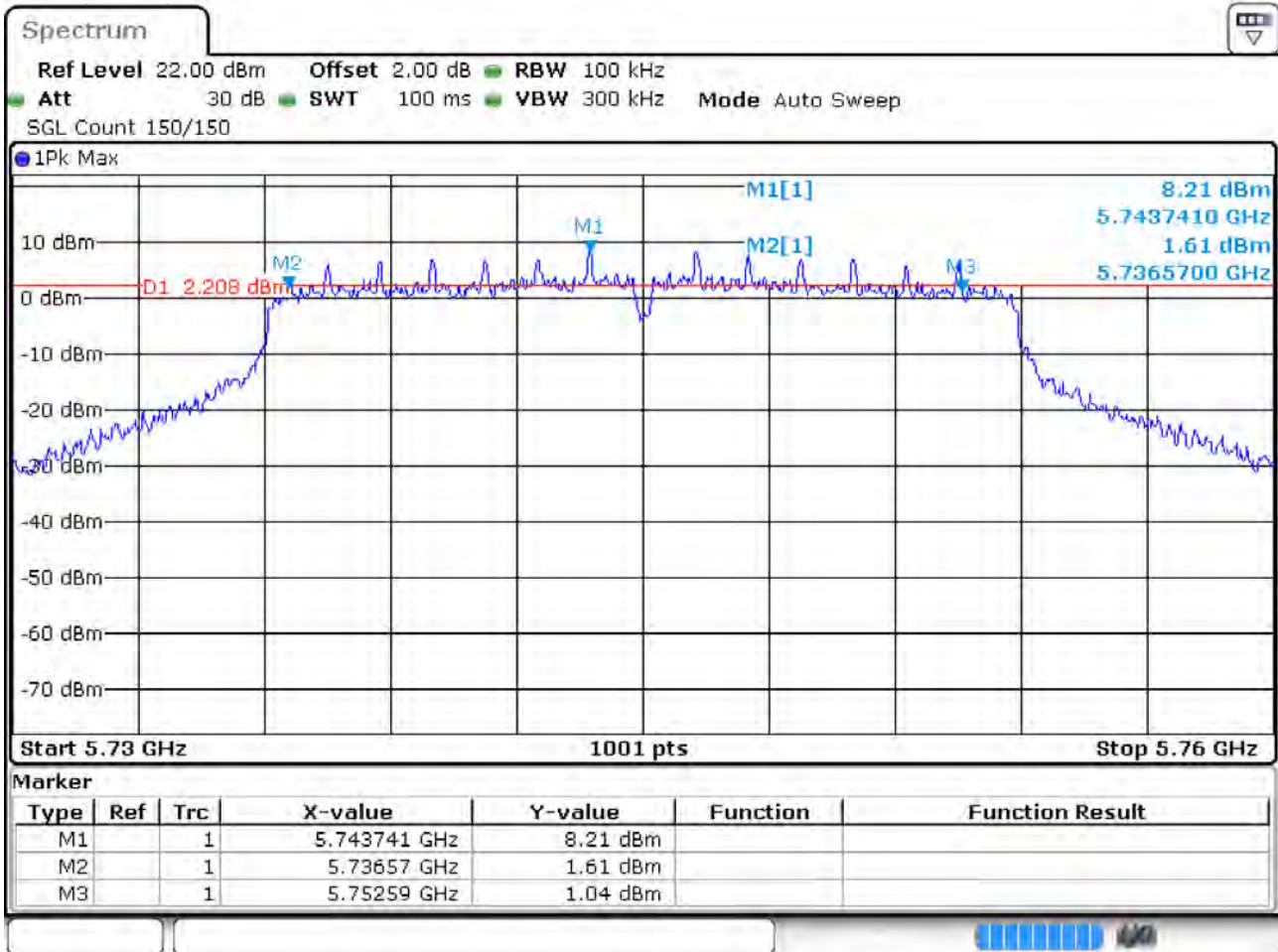
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**4.6.2.5 11N20\_149 ANT 1**



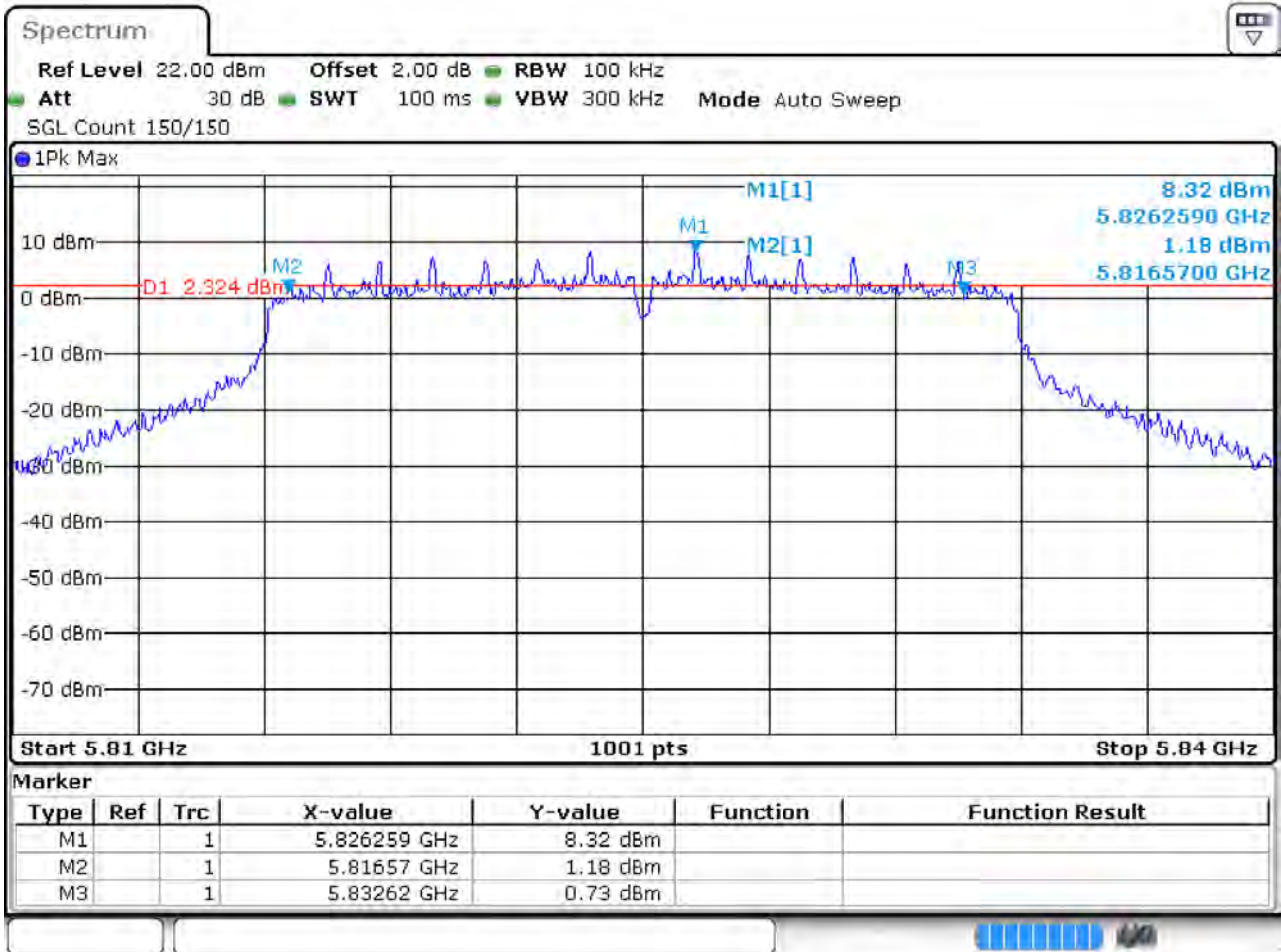
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**4.6.2.6 11N20\_165 ANT 1**



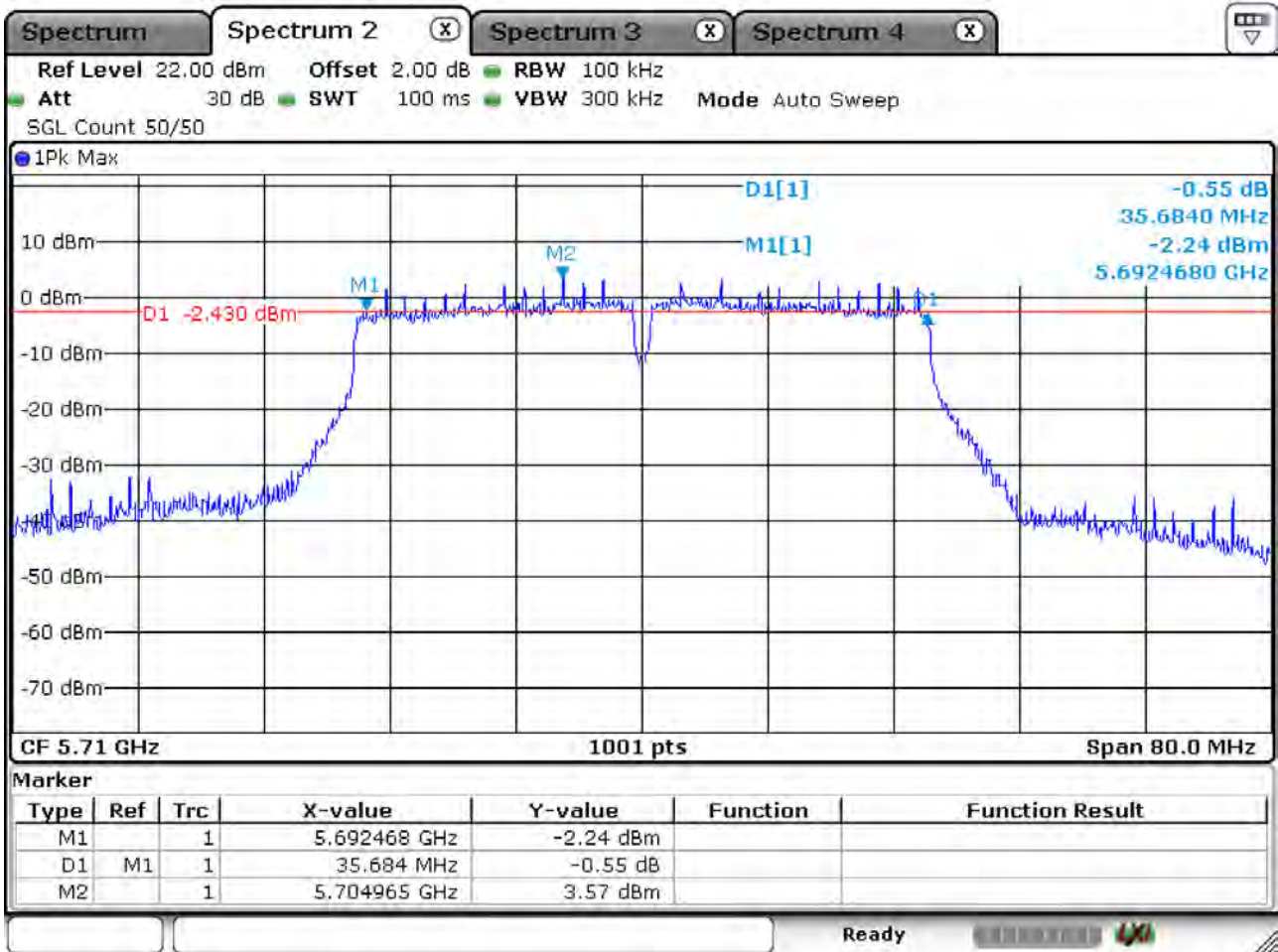
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4.6.2.7 11N40\_142 ANT 1



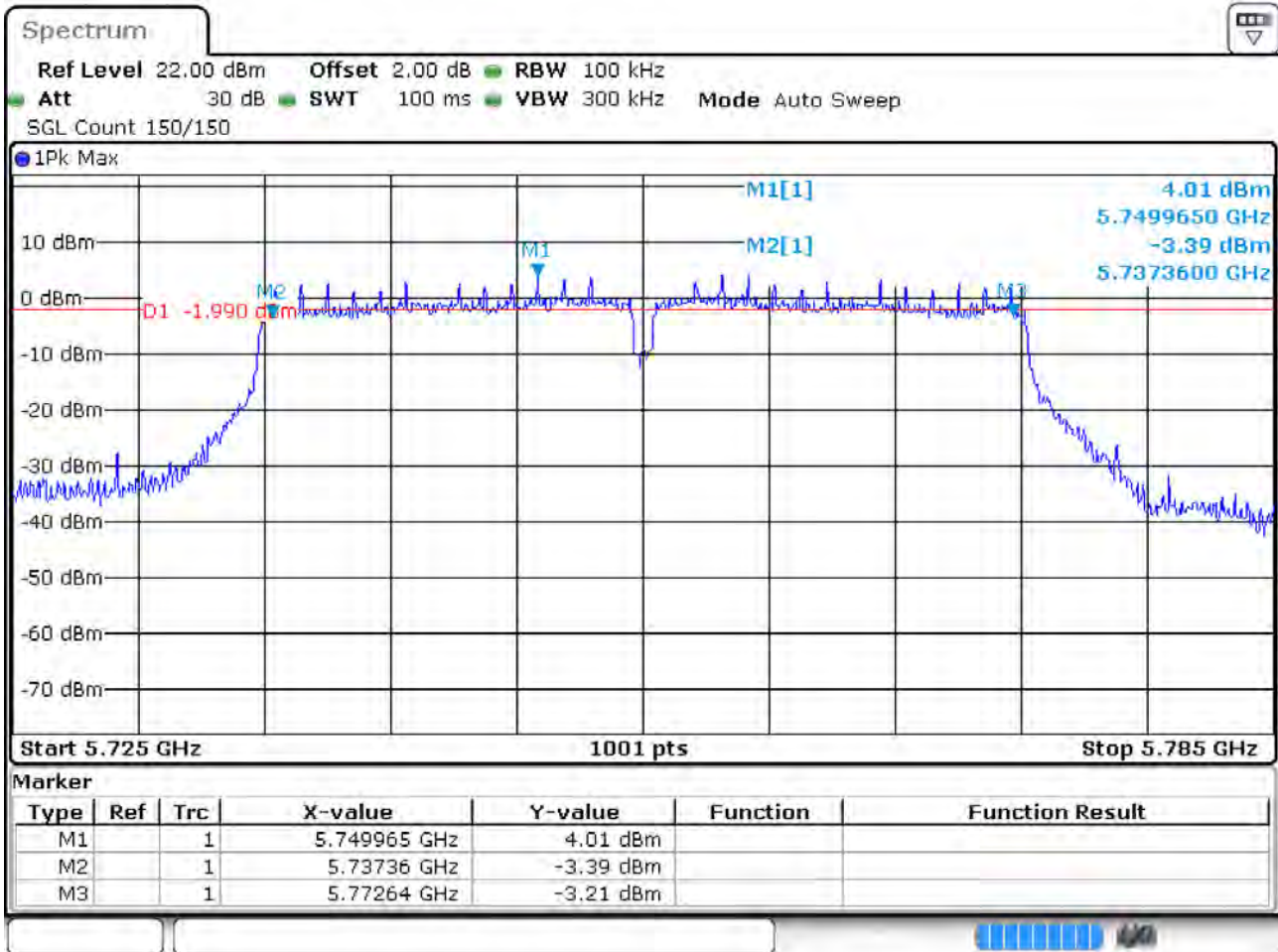
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4.6.2.8 11N40\_151 ANT 1

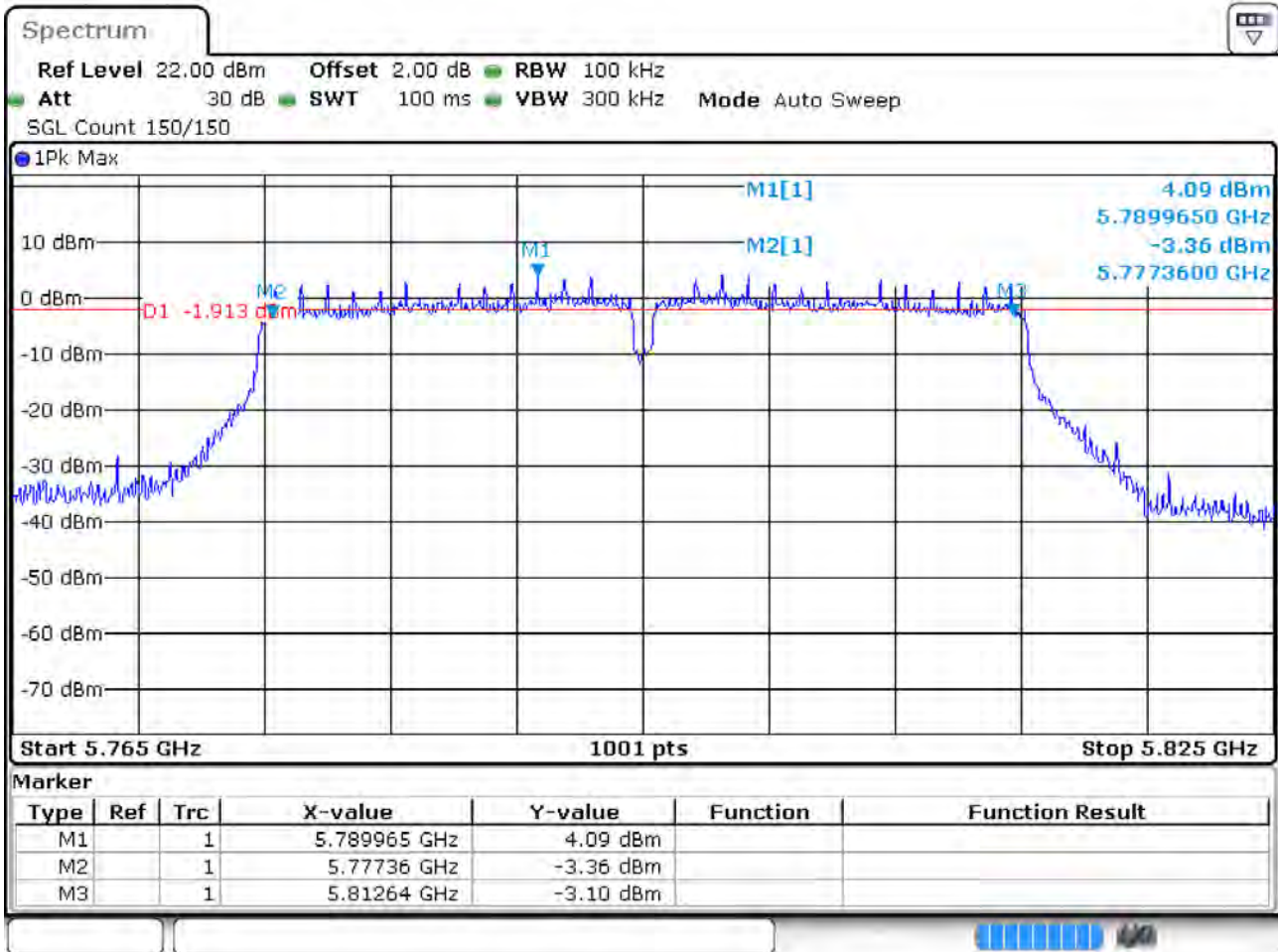


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**4.6.2.9 11N40\_159 ANT 1**



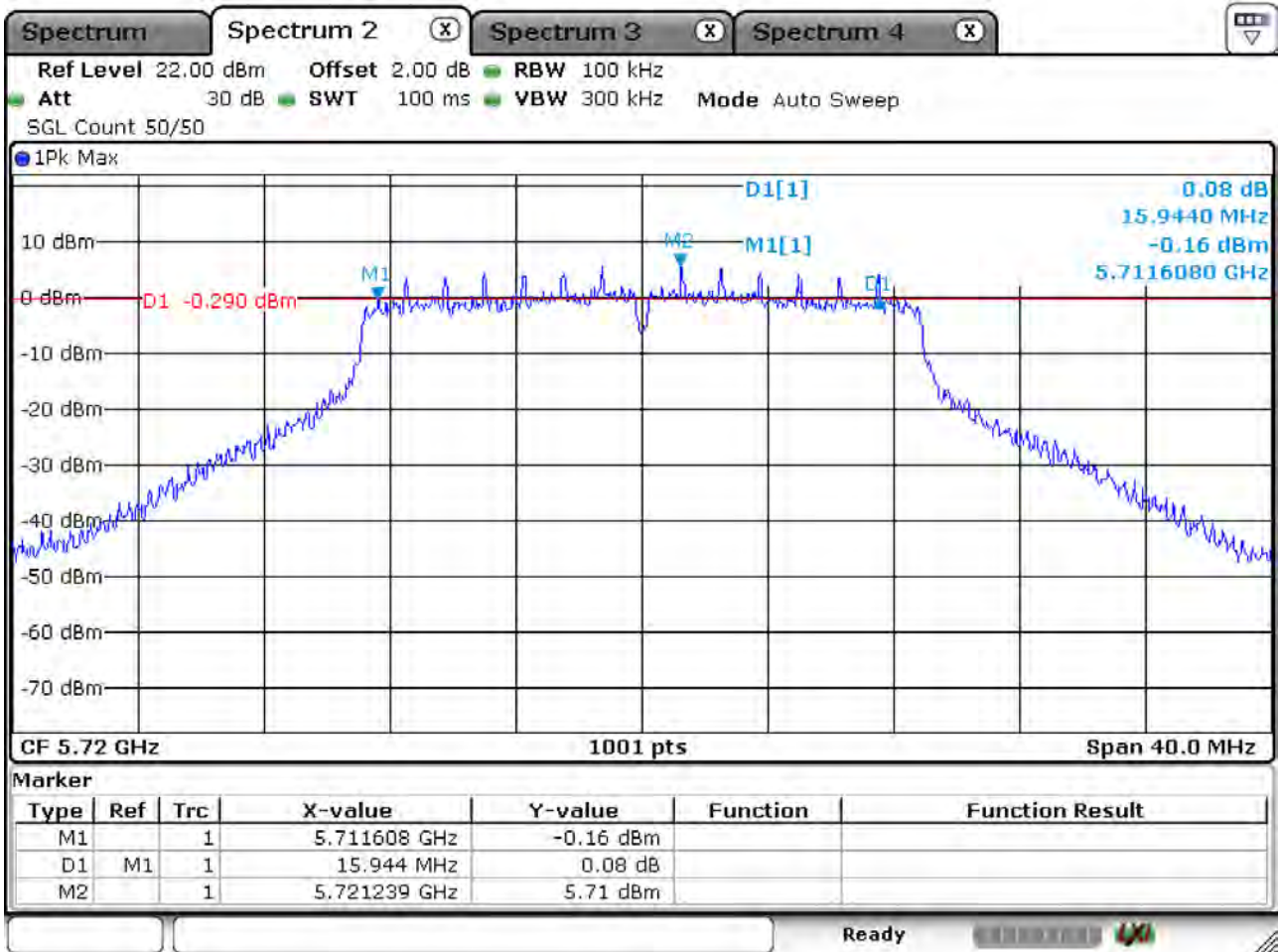
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4.6.2.10 11AC20\_144 ANT 1



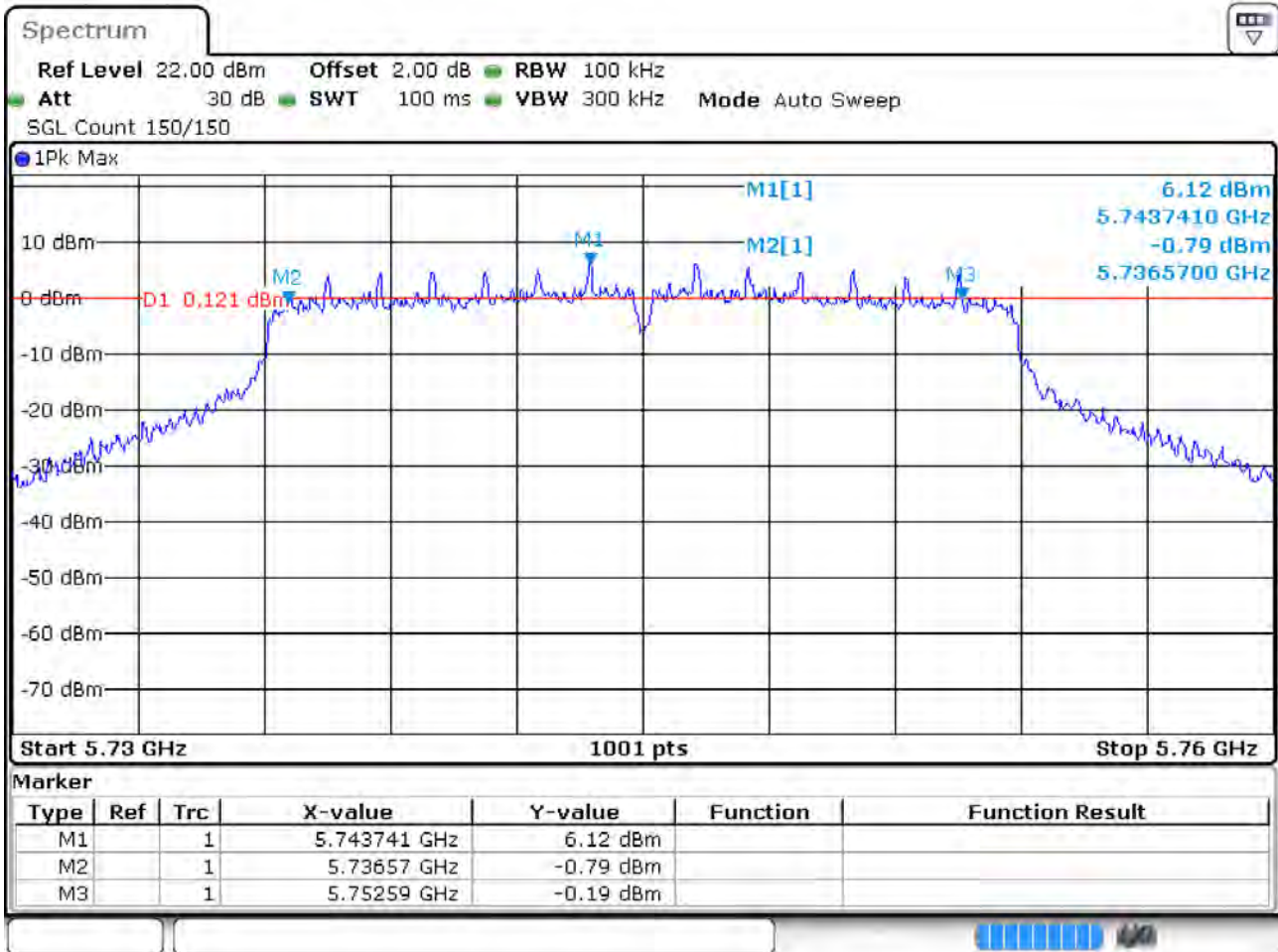
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4.6.2.11 11AC20\_149 ANT 1

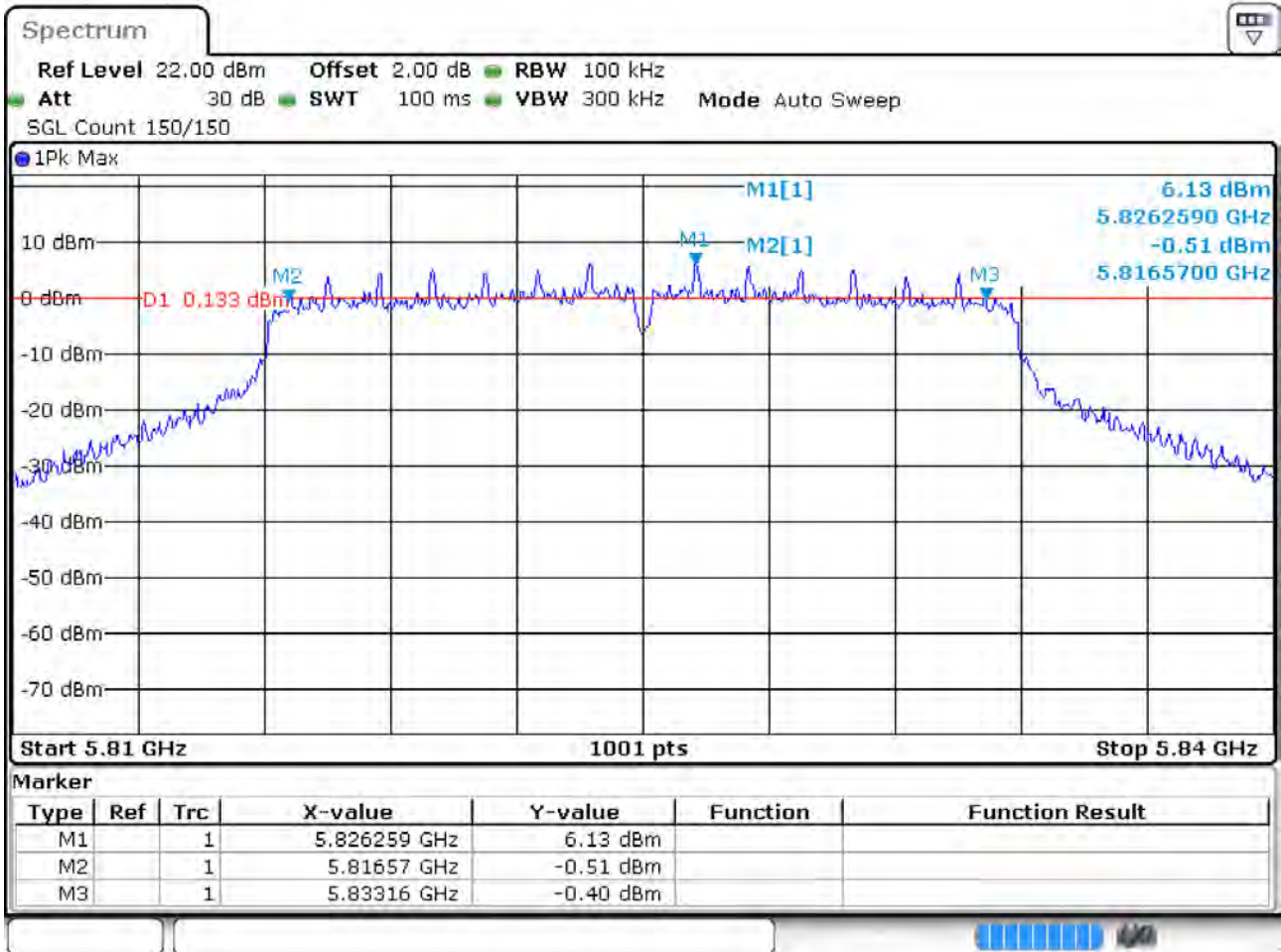


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4.6.2.12 11AC20\_165 ANT 1



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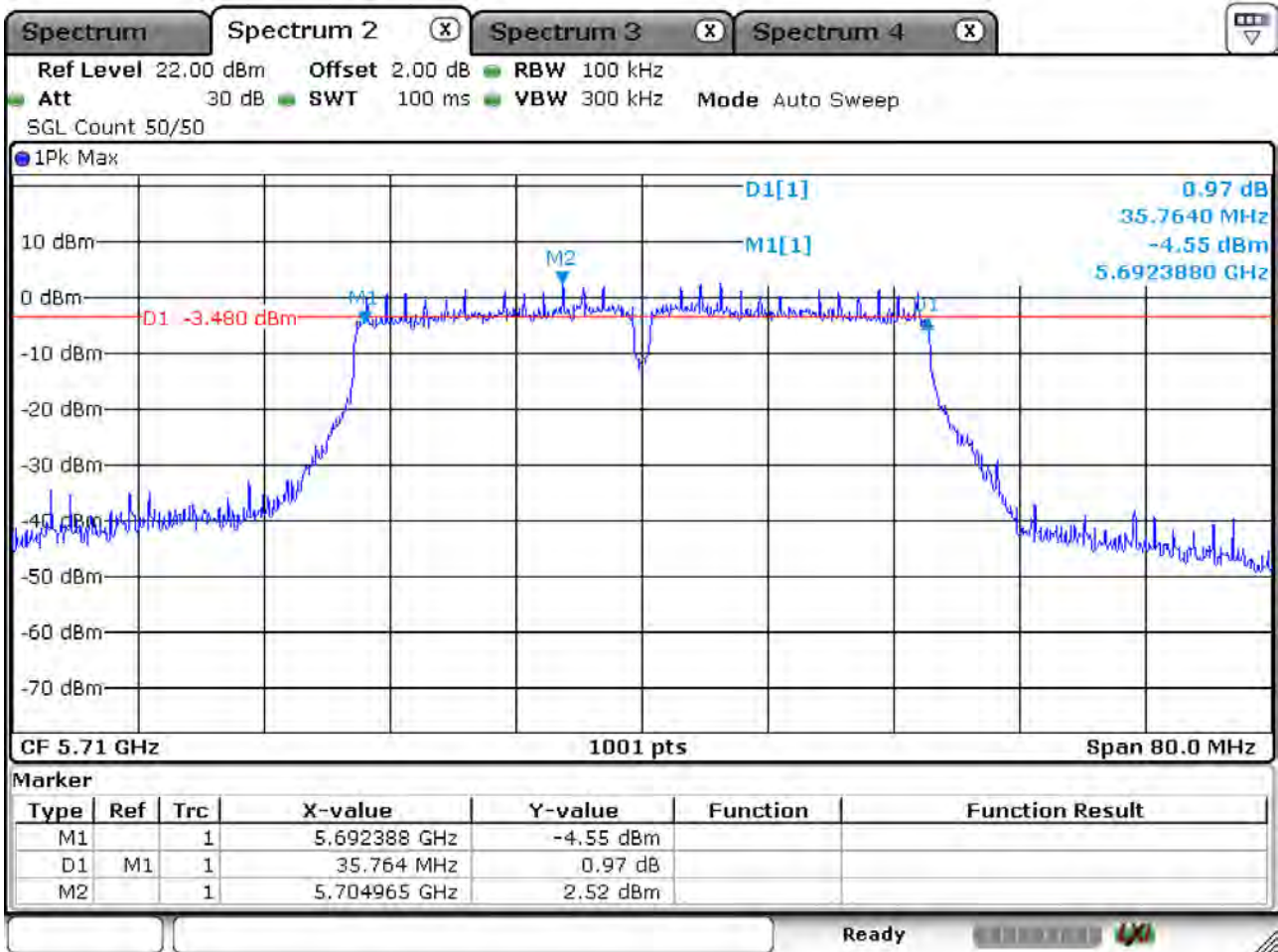


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