

FCC TEST REPORT

Application No: ZR/2020/B0030

Applicant: Sony Mobile Communications, Inc.

Address of Applicant: 4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan

Manufacturer: Sony Mobile Communications, Inc.

Address of Manufacturer: 4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan

EUT Description: GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS and NFC

Trade Mark: Sony

FCC ID: PY7-10933K

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 v04

Test Method: KDB 662911 D01 Multiple Transmitter Output v02r01
KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices

Date of Receipt: 2020/11/19

Date of Test: 2020/11/19 to 2020/12/18

Date of Issue: 2020/12/20

Test Result:	PASS *
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. * 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		2020/12/20		Original

Authorized for issue by:			
Tested By		 <hr/> (Mike Hu) /Project Engineer	
Checked By		 <hr/> (David Chen) /Reviewer	



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2 Test Summary

Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
Emission Bandwidth	5150-5250	15.403(i) 15.407(a)(1)	No limit.	Clause 4.4 Clause 4.5	Pass
	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
	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
	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).	Clause 4.7	Pass



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Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
			F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).		
	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: §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		



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Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
			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
AC Power Line Conducted Emissions	5150-5250 5250-5350 5470-5725 5725-5850	15.207		Clause 4.2	Pass
Frequency Stability	5150-5250 5250-5350 5470-5600 5650-5725 5725-5850	15.209		Clause 4.9	Pass
Dynamic Frequency Selection	5250-5350 5470-5725	47 CFR Part 15, Subpart E 15.407	Channel Move Time:10 Seconds	Clause 4.10	Pass
			Transmission Time: milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.		
			Non-occupancy period: Minimum 30 minutes		



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3 General Information

3.1 Client Information

Applicant:	Sony Mobile Communications, Inc.
Address of Applicant:	4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan
Manufacturer:	Sony Mobile Communications, Inc.
Address of Manufacturer:	4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan

3.2 Test Location

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

3.3 Test Facility

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

- **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 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.



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3.4 General Description of EUT

EUT Description:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS and NFC	
Trade Mark:	Sony	
S/N:	001265ADNVM2	
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),	
Operation Frequency:	All	fc = 5000 MHz + N * 5 MHz, where: -fc = "Operating Frequency" in MHz, -N = "Channel Number".
	5150-5250 MHz (U-NII)	N = 36 to 48 with step of 4 for the 20 MHz channel bandwidth. N = 38 to 46 with step of 8 for the 40 MHz channel bandwidth. N = 42 for the 80 MHz channel bandwidth.
	5250-5350 MHz (U-NII)	N = 52 to 64 with step of 4 for the 20 MHz channel bandwidth. N = 54 to 62 with step of 8 for the 40 MHz channel bandwidth. N = 58 for the 80 MHz channel bandwidth.
	5470-5650 MHz (U-NII) (for FCC)	N = 100 to 128 with step of 4 for the 20 MHz channel bandwidth. N = 102 to 126 with step of 8 for the 40 MHz channel bandwidth. N = 106 to 122 with step of 16 for the 80 MHz channel bandwidth.
	5650-5725 MHz (U-NII)	N = 132 to 144 with step of 4 for the 20 MHz channel bandwidth. N = 134 to 142 with step of 8 for the 40 MHz channel bandwidth. N = 138 for the 80 MHz channel bandwidth.
	5725-5850MHz(U-NII)	N = 149 to 165 with step of 4 for the 20 MHz channel bandwidth. N = 151 to 159 with step of 8 for the 40 MHz channel bandwidth. N = 155 for the 80 MHz channel bandwidth.
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	
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:	-3.0dBi,	



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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)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5500
	The Middle channel	5600
	The Highest channel	5720
IEEE 802.11n/ac 40MHz	The Lowest channel	5510
	The Middle channel	5670
	The Highest channel	5710



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IEEE 802.11ac 80MHz	The Lowest channel	5530
	The Highest channel	5690

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

3.5 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	55 % RH
Atmospheric Pressure:	101.32 KPa
Test mode:	
Modulation	Data Rate
802.11a	6Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

3.6 Description of Support Units

The EUT has been tested independent unit.



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4 Test results and Measurement Data

4.1 Antenna Requirement

Test Requirement:	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 -3.0dBi.	

4.2 Conducted Emissions

Test Requirement:	47 CFR Part 15 Section 15.407(b)		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	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.			
Test Procedure:	<ol style="list-style-type: none"> 1) The mains terminal disturbance voltage test was conducted in a shielded room. 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. 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, 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. 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. 		



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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>

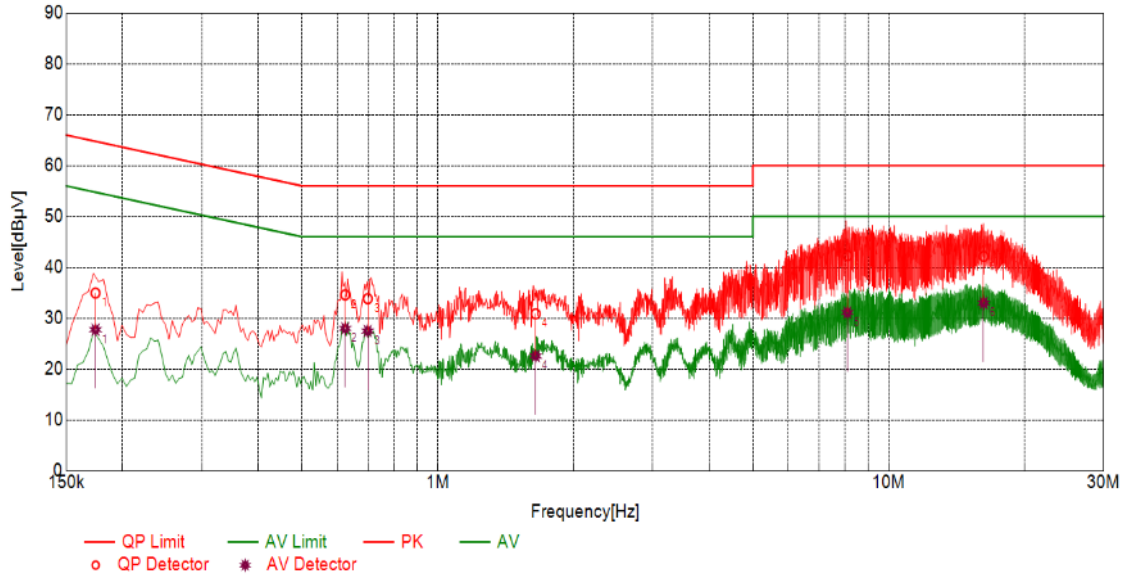


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Measurement Data

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.

Live Line:



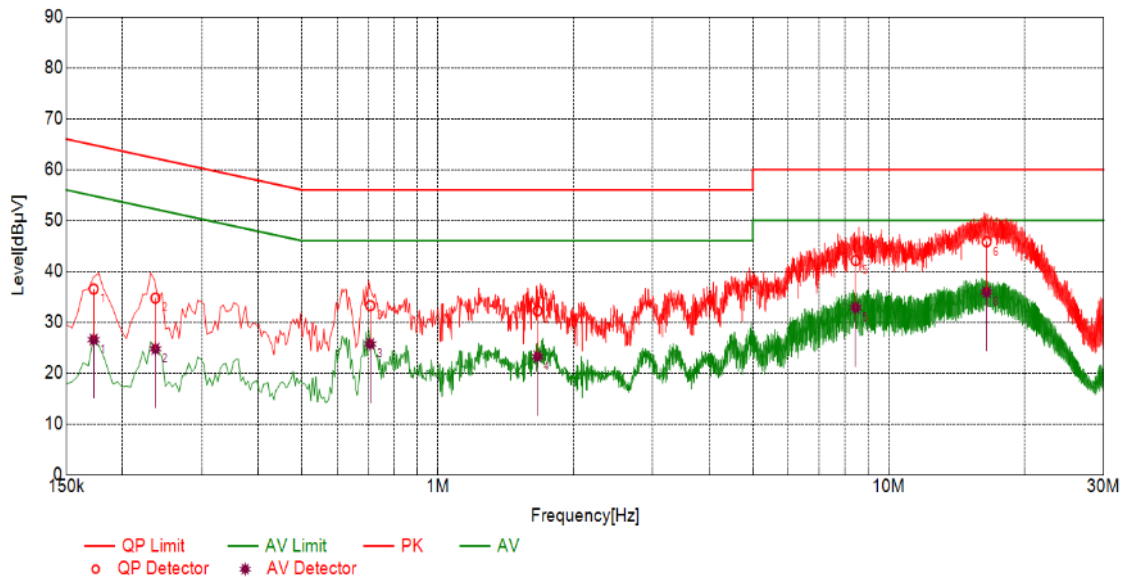
Test Graph

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	0.1742	10.10	34.95	64.76	29.81	27.73	54.76	27.03	L
2	0.6236	10.10	34.59	56.00	21.41	27.99	46.00	18.01	L
3	0.6997	10.10	33.83	56.00	22.17	27.49	46.00	18.51	L
4	1.6493	10.10	30.86	56.00	25.14	22.58	46.00	23.42	L
5	8.1026	10.10	42.31	60.00	17.69	31.11	50.00	18.89	L
6	16.2502	10.11	42.15	60.00	17.85	33.00	50.00	17.00	L



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Neutral Line:



Test Graph

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	0.1726	10.10	36.53	64.84	28.31	26.58	54.84	28.26	N
2	0.2366	10.10	34.73	62.22	27.49	24.76	52.22	27.46	N
3	0.7088	10.10	33.25	56.00	22.75	25.73	46.00	20.27	N
4	1.6648	10.10	32.22	56.00	23.78	23.24	46.00	22.76	N
5	8.4523	10.10	42.13	60.00	17.87	32.86	50.00	17.14	N
6	16.4925	10.11	45.83	60.00	14.17	35.91	50.00	14.09	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

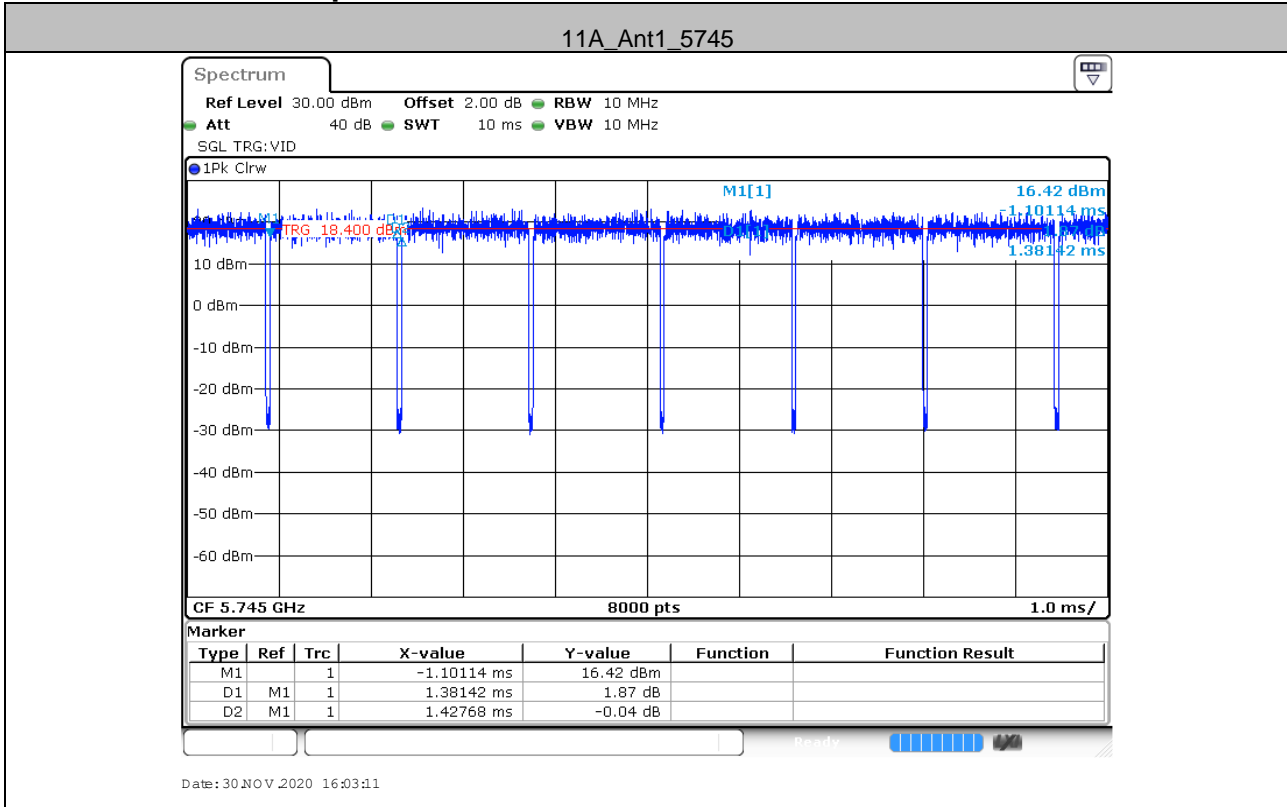
Test Mode	TX Freq. [MHz]	Duty cycle [%]	Duty cycle Correction Factor[dB]
11A	Ant 1: CH149, CH157, CH165	96.50	0.15
11N20	Ant 1: CH149, CH157, CH165	96.27	0.17
11N40	Ant 1: CH151, CH159	92.75	0.33
11AC20	Ant 1: CH149, CH157, CH165	96.30	0.16
11AC40	Ant 1: CH151, CH159	94.20	0.26
11AC80	Ant 1: CH155	86.49	0.63

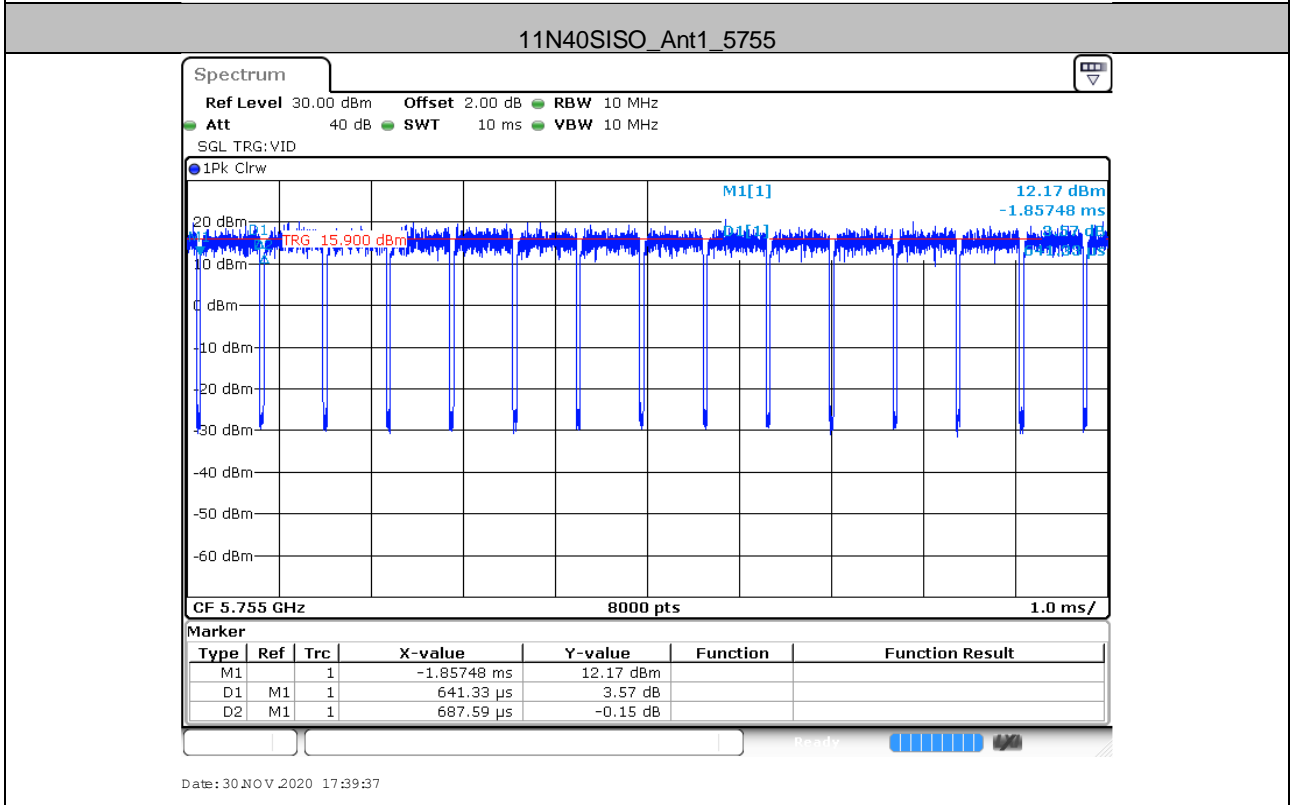
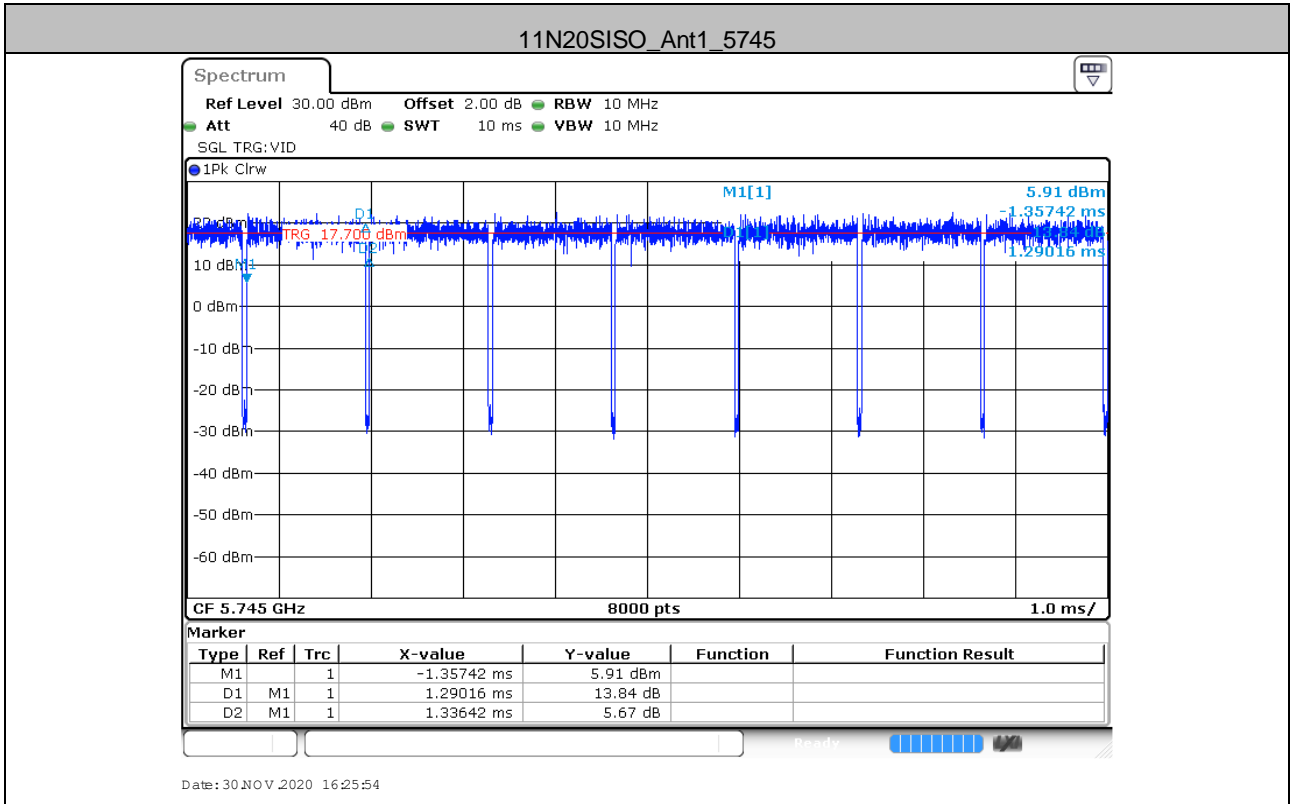


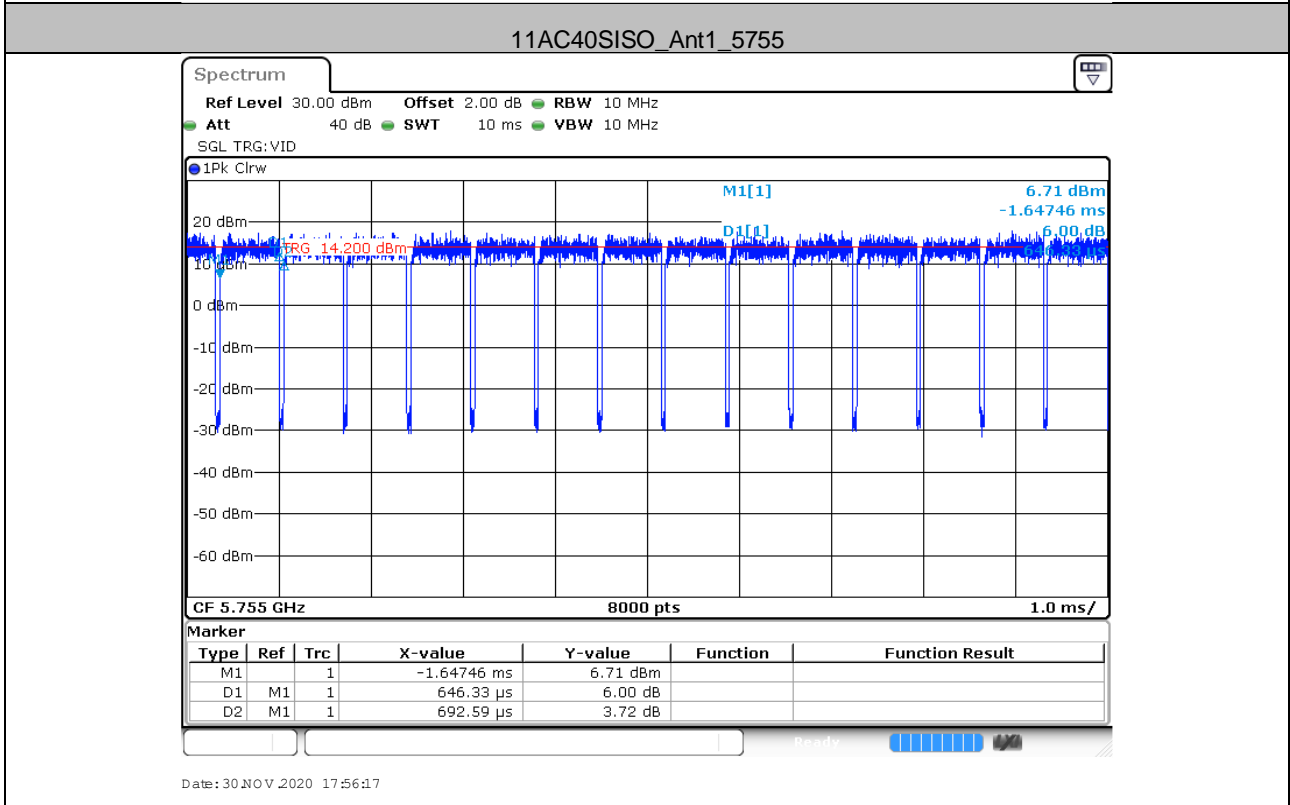
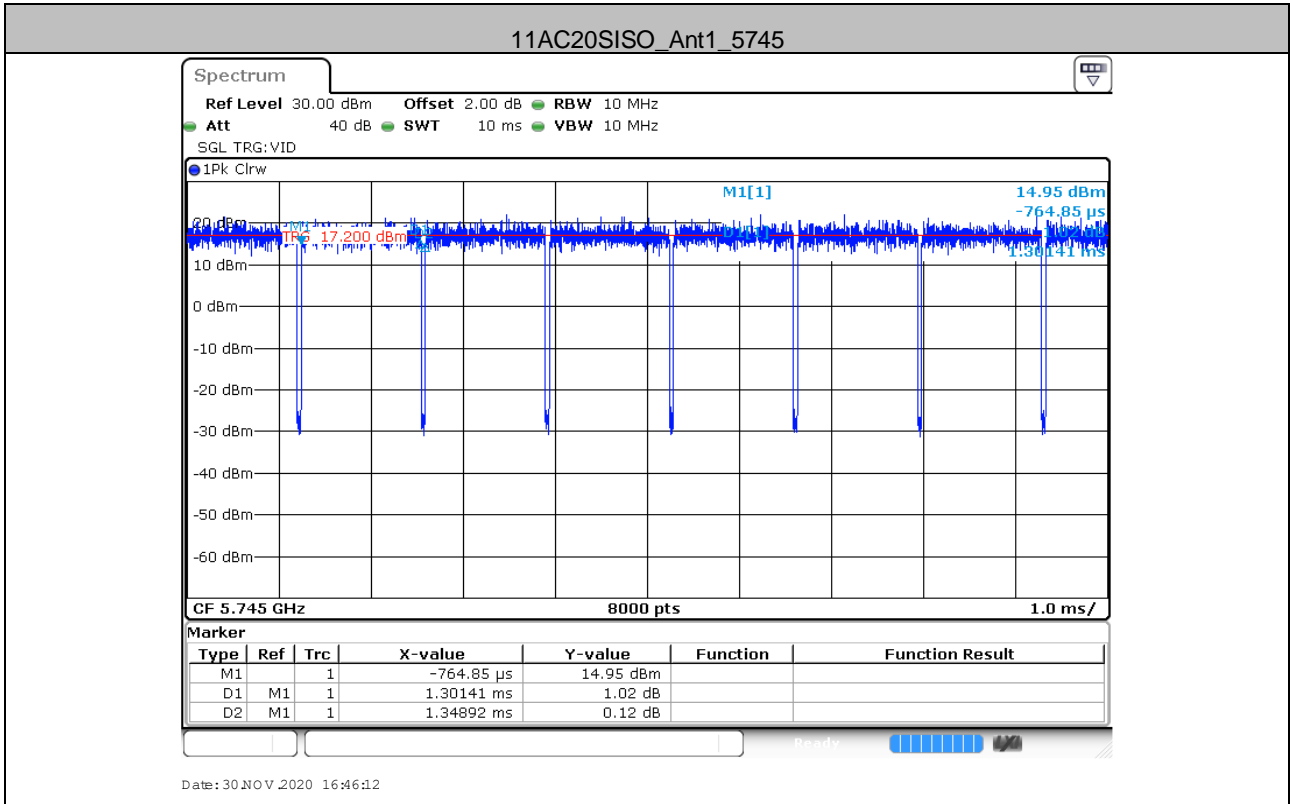
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4.3.1 Test plots

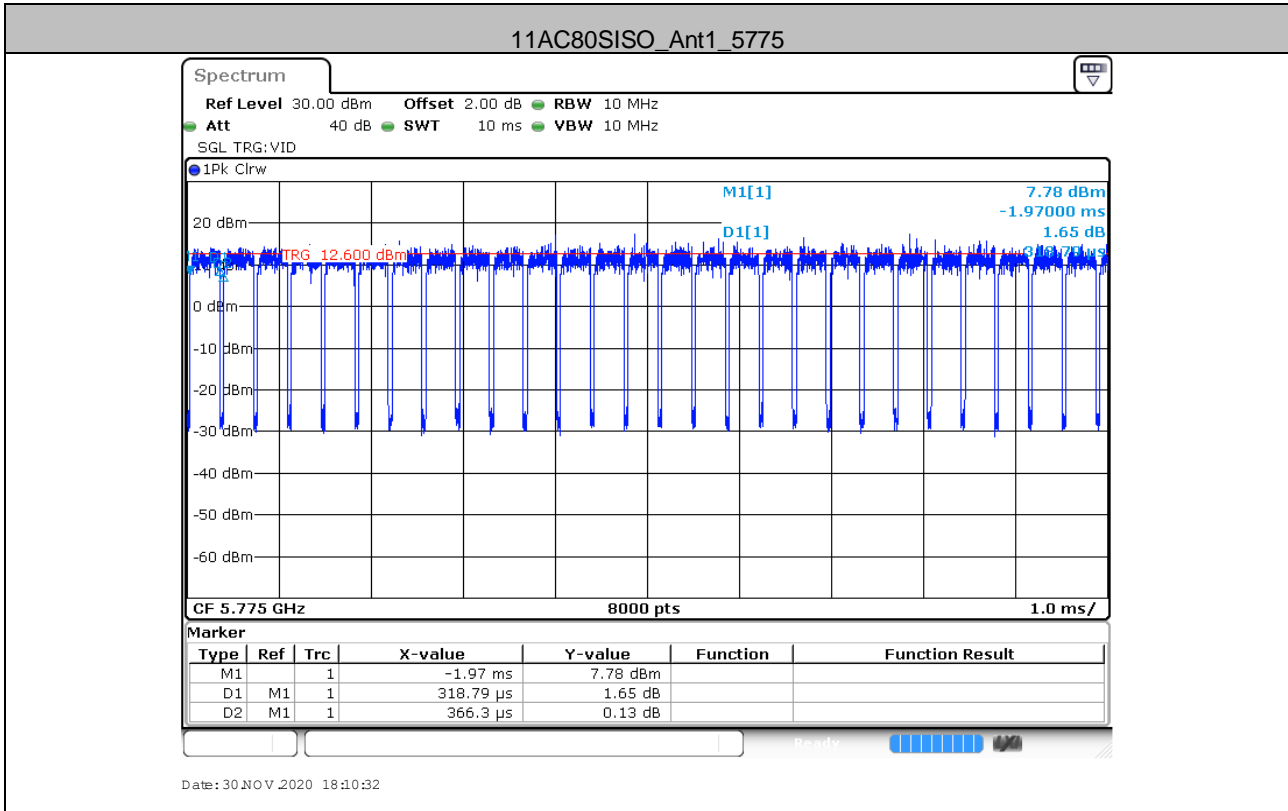






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4.4 Conducted Output Power

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 $11 + 10\log B$
	5470-5725MHz	The lesser of 250mW(24dBm) or $11 + 10\log B$
	5725-5850MHz	Not exceed 1W(30dBm)
	*Where B is the 26dB emission bandwidth in MHz	
Test Results:	Pass	



Measurement Data:

Test Mode	Test Channel	Frequency [MHz]	Antenna Port	Meas. Level (Cond.) [dBm]	Meas. Level (EIRP) [dBm]	Verdict
11A20	36	5180	ANT 1	12.94	9.94	PASS
	40	5200	ANT 1	14.60	11.6	PASS
	48	5240	ANT 1	14.00	11	PASS
	52	5260	ANT 1	12.64	9.64	PASS
	60	5300	ANT 1	14.47	11.47	PASS
	64	5320	ANT 1	14.48	11.48	PASS
	100	5500	ANT 1	14.90	11.9	PASS
	116	5580	ANT 1	15.11	12.11	PASS
	140	5700	ANT 1	15.03	12.03	PASS
	144(BandII-C)	5720	ANT 1	6.20	3.20	PASS
	144(BandIII)	5720	ANT 1	13.92	10.92	PASS
	149	5745	ANT 1	15.13	12.13	PASS
	157	5785	ANT 1	15.02	12.02	PASS
	165	5825	ANT 1	15.05	12.05	PASS
11N20	36	5180	ANT 1	14.13	11.13	PASS
	40	5200	ANT 1	13.88	10.88	PASS
	48	5240	ANT 1	14.04	11.04	PASS
	52	5260	ANT 1	13.38	10.38	PASS
	60	5300	ANT 1	12.67	9.67	PASS
	64	5320	ANT 1	12.83	9.83	PASS
	100	5500	ANT 1	14.13	11.13	PASS
	116	5580	ANT 1	13.67	10.67	PASS
	140	5700	ANT 1	14.18	11.18	PASS
	144(BandII-C)	5720	ANT 1	6.41	3.41	PASS
	144(BandIII)	5720	ANT 1	13.71	10.71	PASS
	149	5745	ANT 1	14.41	11.41	PASS
	157	5785	ANT 1	14.50	11.5	PASS
	165	5825	ANT 1	14.31	11.31	PASS
11N40	38	5190	ANT 1	12.34	9.34	PASS
	46	5230	ANT 1	13.16	10.16	PASS
	54	5270	ANT 1	14.13	11.13	PASS
	62	5310	ANT 1	13.28	10.28	PASS
	102	5510	ANT 1	13.87	10.87	PASS



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	110	5550	ANT 1	14.07	11.07	PASS
	134	5670	ANT 1	14.16	11.16	PASS
	142(BandII-C)	5710	ANT1	1.03	-2.03	PASS
	142(BandIII)	5710	ANT1	13.63	10.63	PASS
	151	5755	ANT 1	14.35	11.35	PASS
	159	5795	ANT 1	14.49	11.49	PASS
11AC20	36	5180	ANT 1	10.95	7.95	PASS
	40	5200	ANT 1	10.94	7.94	PASS
	48	5240	ANT 1	13.50	10.5	PASS
	52	5260	ANT 1	13.58	10.58	PASS
	60	5300	ANT 1	13.72	10.72	PASS
	64	5320	ANT 1	13.73	10.73	PASS
	100	5500	ANT 1	13.70	10.7	PASS
	116	5580	ANT 1	13.67	10.67	PASS
	140	5700	ANT 1	13.83	10.83	PASS
	144(BandII-C)	5720	ANT 1	5.45	2.45	PASS
	144(BandIII)	5720	ANT 1	12.73	9.73	PASS
	149	5745	ANT 1	13.65	10.65	PASS
	157	5785	ANT 1	13.66	10.66	PASS
	165	5825	ANT 1	13.55	10.55	PASS
11AC40	38	5190	ANT 1	12.09	9.09	PASS
	46	5230	ANT 1	12.12	9.12	PASS
	54	5270	ANT 1	12.49	9.49	PASS
	62	5310	ANT 1	13.27	10.27	PASS
	102	5510	ANT 1	12.29	9.29	PASS
	110	5550	ANT 1	11.19	8.19	PASS
	134	5670	ANT 1	12.11	9.11	PASS
	142(BandII-C)	5710	ANT1	-0.01	-3.01	PASS
	142(BandIII)	5710	ANT1	12.60	11.60	PASS
	151	5755	ANT 1	12.49	9.49	PASS
	159	5795	ANT 1	12.59	9.59	PASS
11AC80	42	5210	ANT 1	13.04	10.04	PASS
	58	5290	ANT 1	13.23	10.23	PASS
	106	5530	ANT 1	13.34	10.34	PASS
	122	5610	ANT 1	13.55	10.55	PASS
	138(BandII-C)	5690	ANT1	-2.65	-5.65	PASS



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	138(BandIII)	5690	ANT1	13.13	10.13	PASS
	155	5775	ANT 1	13.56	10.56	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:	Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(HT20); MCS0 of rate is the worst case of 802.11ac(HT40); MCS0 of rate is the worst case of 802.11ac(HT80). Only the worst case is recorded in the report.
Limit:	No restriction limits
Test Results:	Pass



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	20.310	PASS
	40	5200	ANT 1	20.310	PASS
	48	5240	ANT 1	20.400	PASS
	52	5260	ANT 1	20.280	PASS
	60	5300	ANT 1	20.280	PASS
	64	5320	ANT 1	20.340	PASS
	100	5500	ANT 1	20.400	PASS
	116	5580	ANT 1	20.280	PASS
	140	5700	ANT 1	20.370	PASS
	144	5720	ANT 1	15.305	PASS
	149	5745	ANT 1	20.430	PASS
	157	5785	ANT 1	20.430	PASS
	165	5825	ANT 1	20.280	PASS
11N20	36	5180	ANT 1	20.730	PASS
	40	5200	ANT 1	20.700	PASS
	48	5240	ANT 1	20.640	PASS
	52	5260	ANT 1	20.670	PASS
	60	5300	ANT 1	20.730	PASS
	64	5320	ANT 1	20.640	PASS
	100	5500	ANT 1	20.640	PASS
	116	5580	ANT 1	20.670	PASS
	140	5700	ANT 1	20.550	PASS
	144	5720	ANT 1	15.305	PASS
	149	5745	ANT 1	20.640	PASS
	157	5785	ANT 1	20.670	PASS
165	5825	ANT 1	20.670	PASS	
11N40	38	5190	ANT 1	41.040	PASS
	46	5230	ANT 1	41.520	PASS
	54	5270	ANT 1	40.980	PASS
	62	5310	ANT 1	41.220	PASS
	102	5510	ANT 1	41.100	PASS
	110	5550	ANT 1	40.980	PASS
	134	5670	ANT 1	41.160	PASS



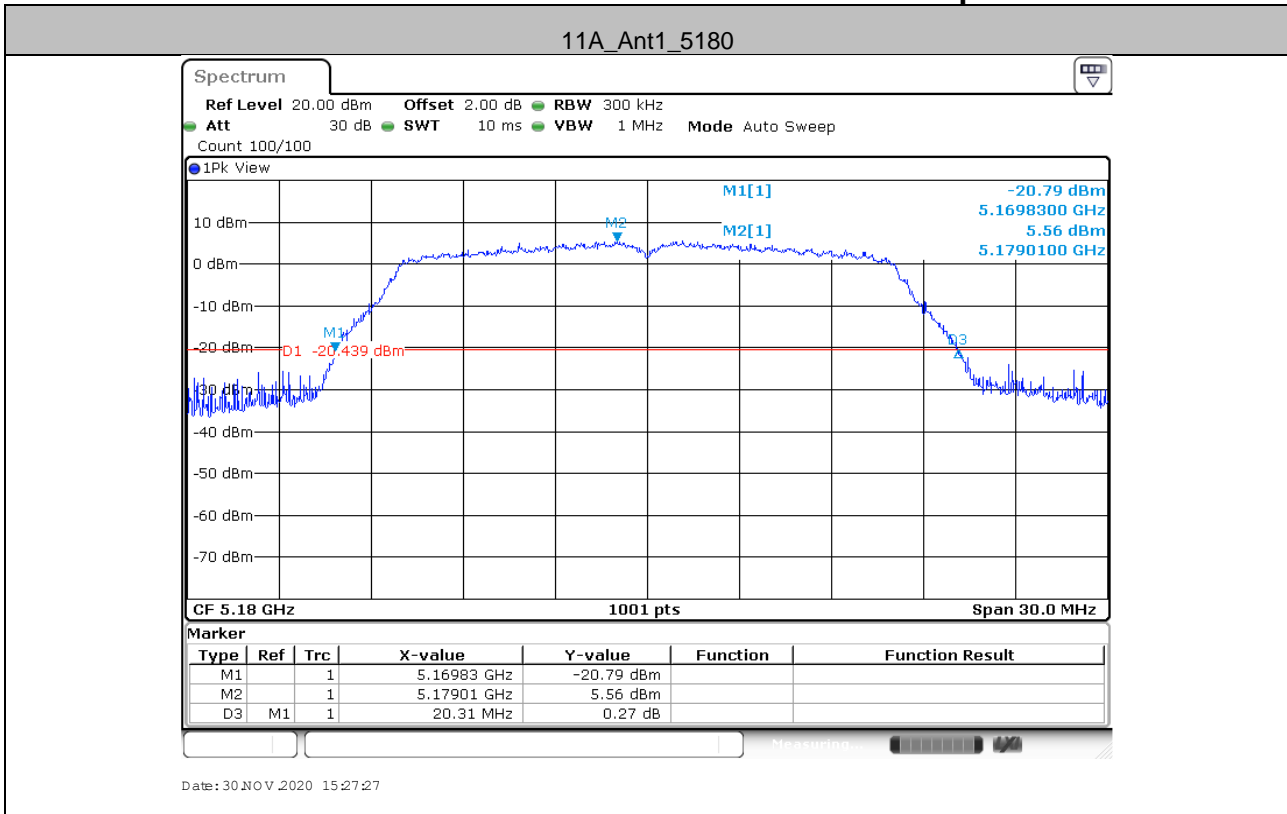
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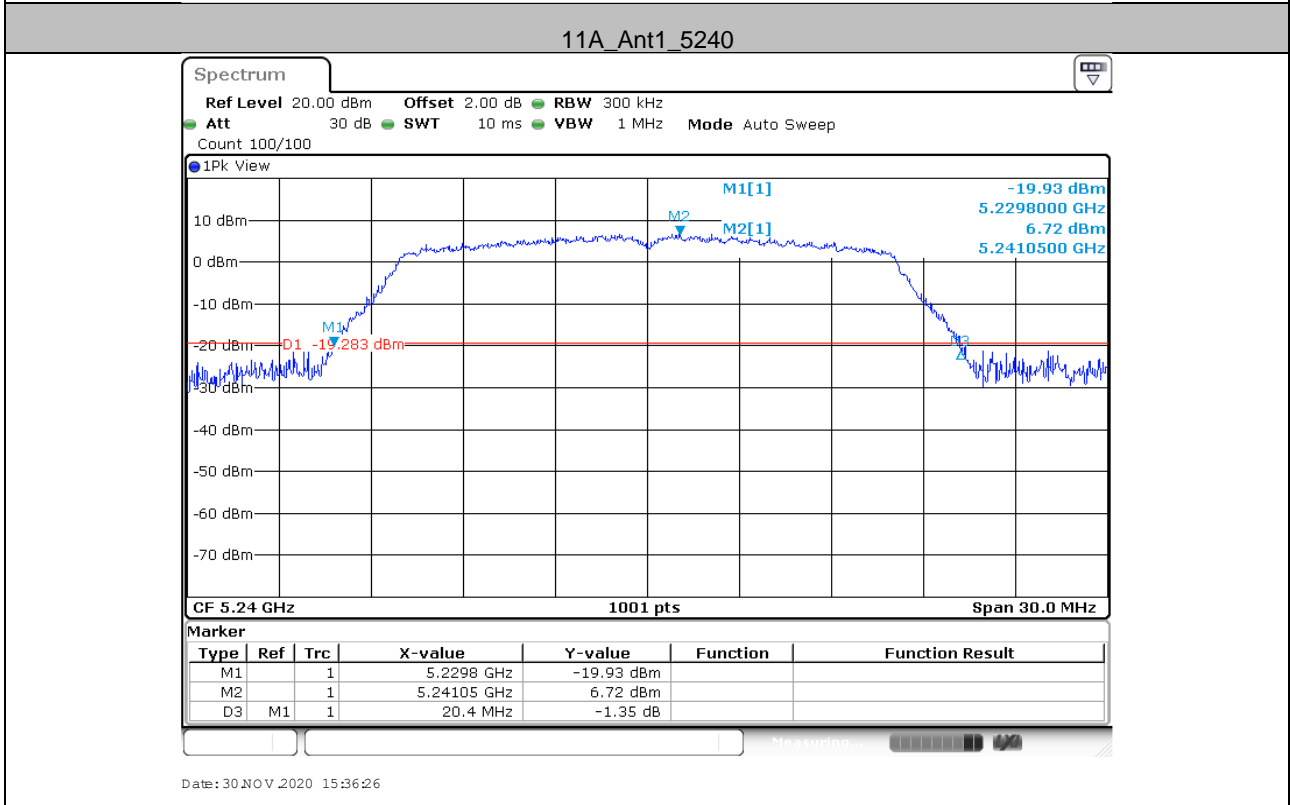
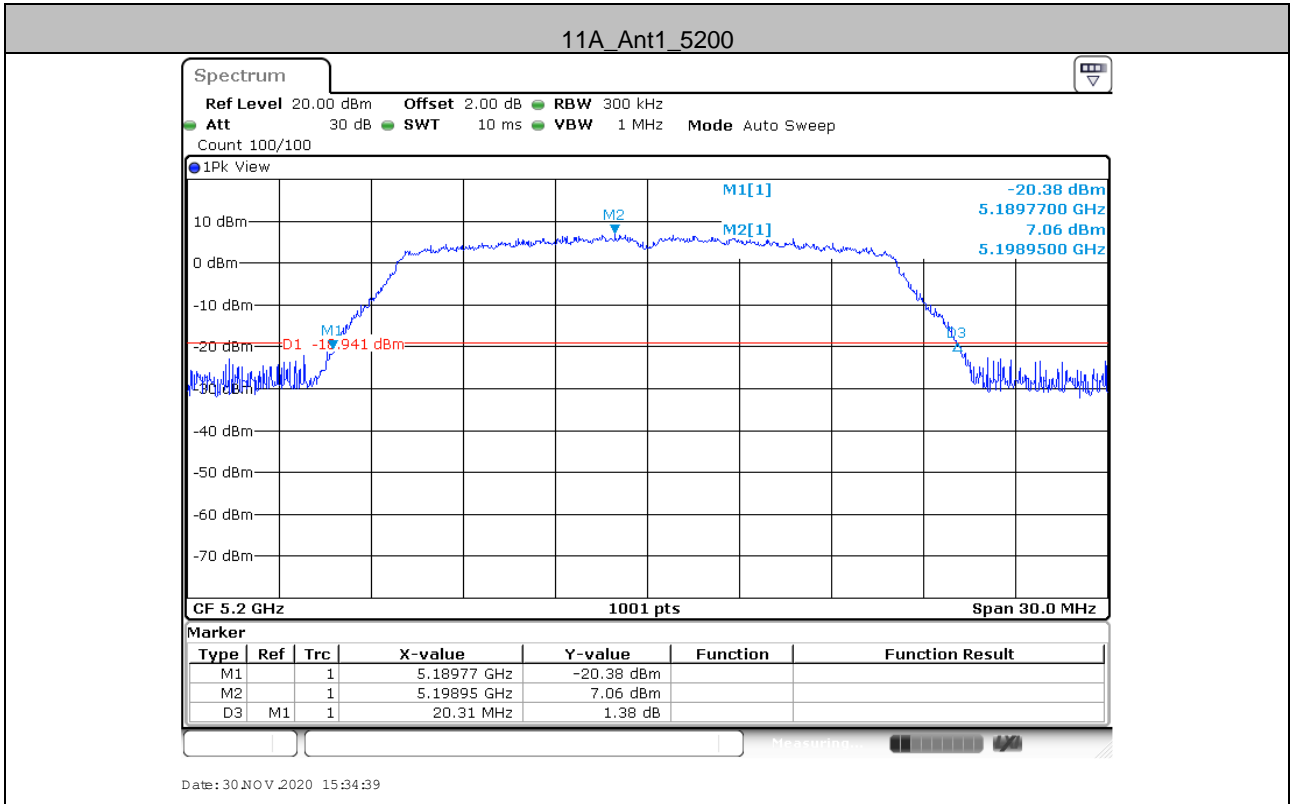
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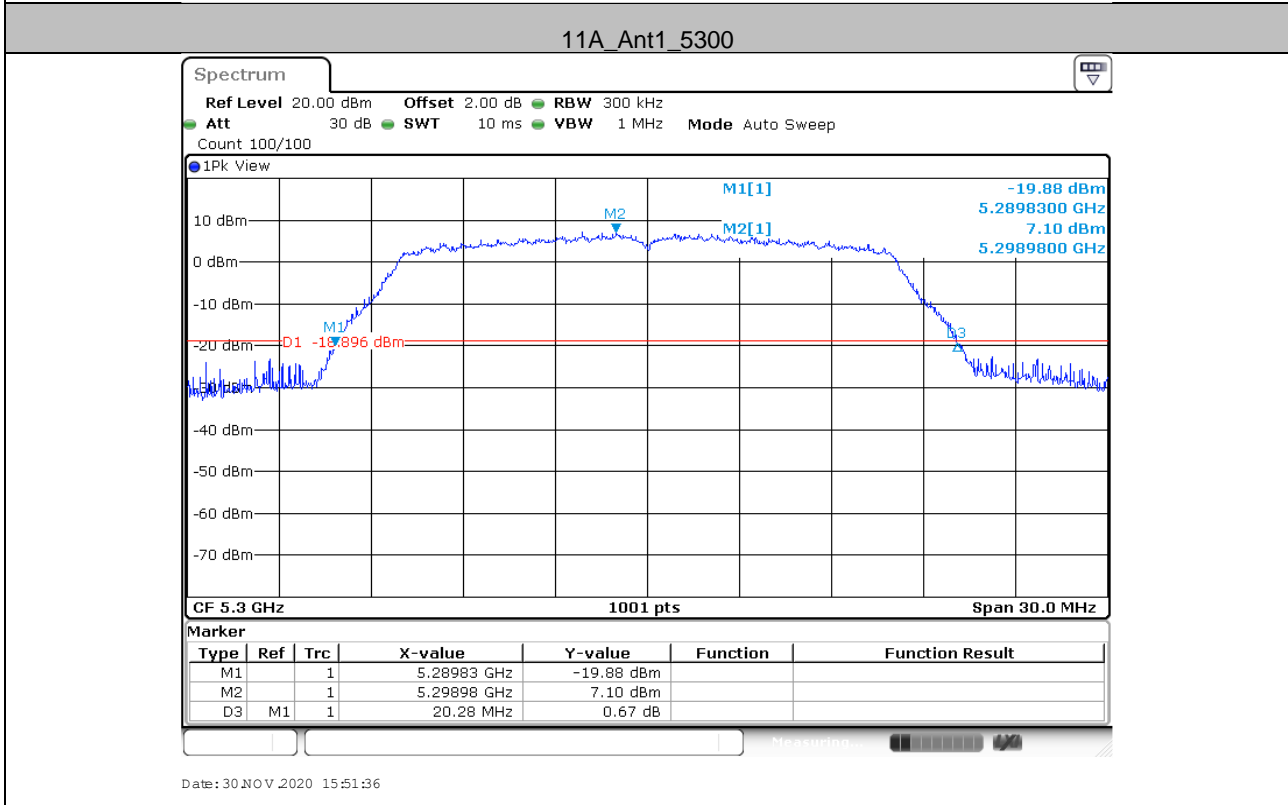
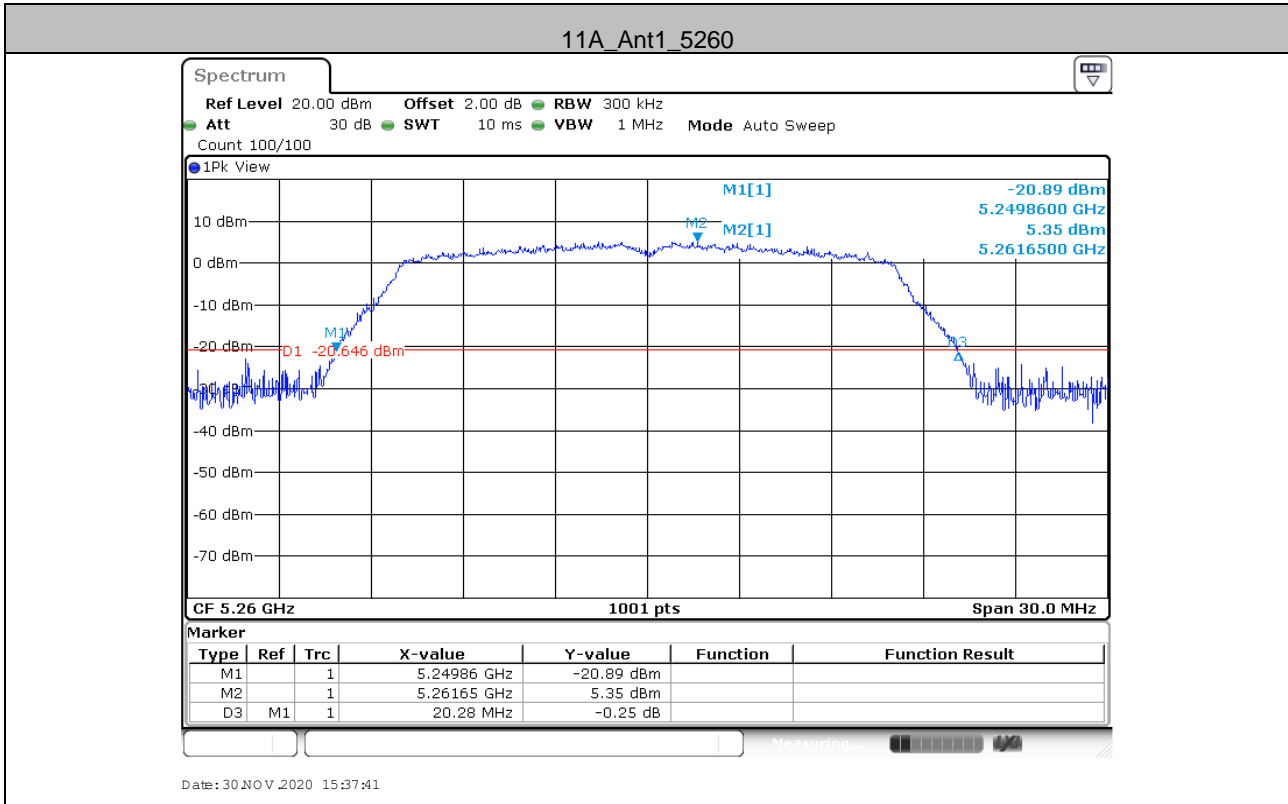
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	151	5755	ANT 1	41.160	PASS
	159	5795	ANT 1	40.860	PASS
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	40	5200	ANT 1	20.670	PASS
	48	5240	ANT 1	20.550	PASS
	52	5260	ANT 1	20.610	PASS
	60	5300	ANT 1	20.640	PASS
	64	5320	ANT 1	20.580	PASS
	100	5500	ANT 1	20.550	PASS
	116	5580	ANT 1	20.640	PASS
	140	5700	ANT 1	20.610	PASS
	144	5720	ANT 1	15.305	PASS
	149	5745	ANT 1	20.550	PASS
	157	5785	ANT 1	20.670	PASS
	165	5825	ANT 1	20.550	PASS
	11AC40	38	5190	ANT 1	40.920
46		5230	ANT 1	41.160	PASS
54		5270	ANT 1	41.100	PASS
62		5310	ANT 1	40.860	PASS
102		5510	ANT 1	41.160	PASS
110		5550	ANT 1	41.100	PASS
134		5670	ANT 1	40.980	PASS
142		5710	ANT 1	35.045	PASS
151		5755	ANT 1	41.160	PASS
159		5795	ANT 1	41.100	PASS
11AC80	42	5210	ANT 1	81.600	PASS
	58	5290	ANT 1	81.240	PASS
	106	5530	ANT 1	81.360	PASS
	122	5610	ANT 1	81.720	PASS
	138	5690	ANT 1	75.140	PASS
	155	5775	ANT 1	81.600	PASS

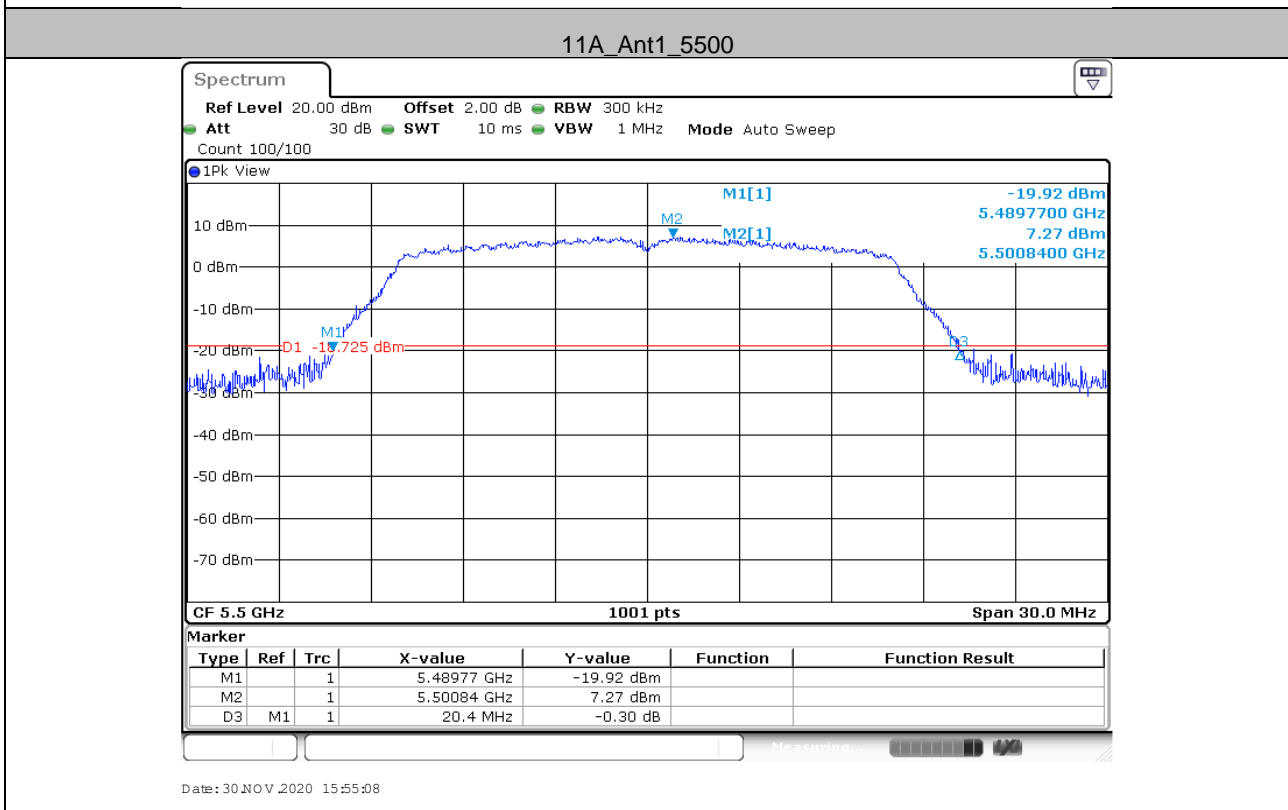
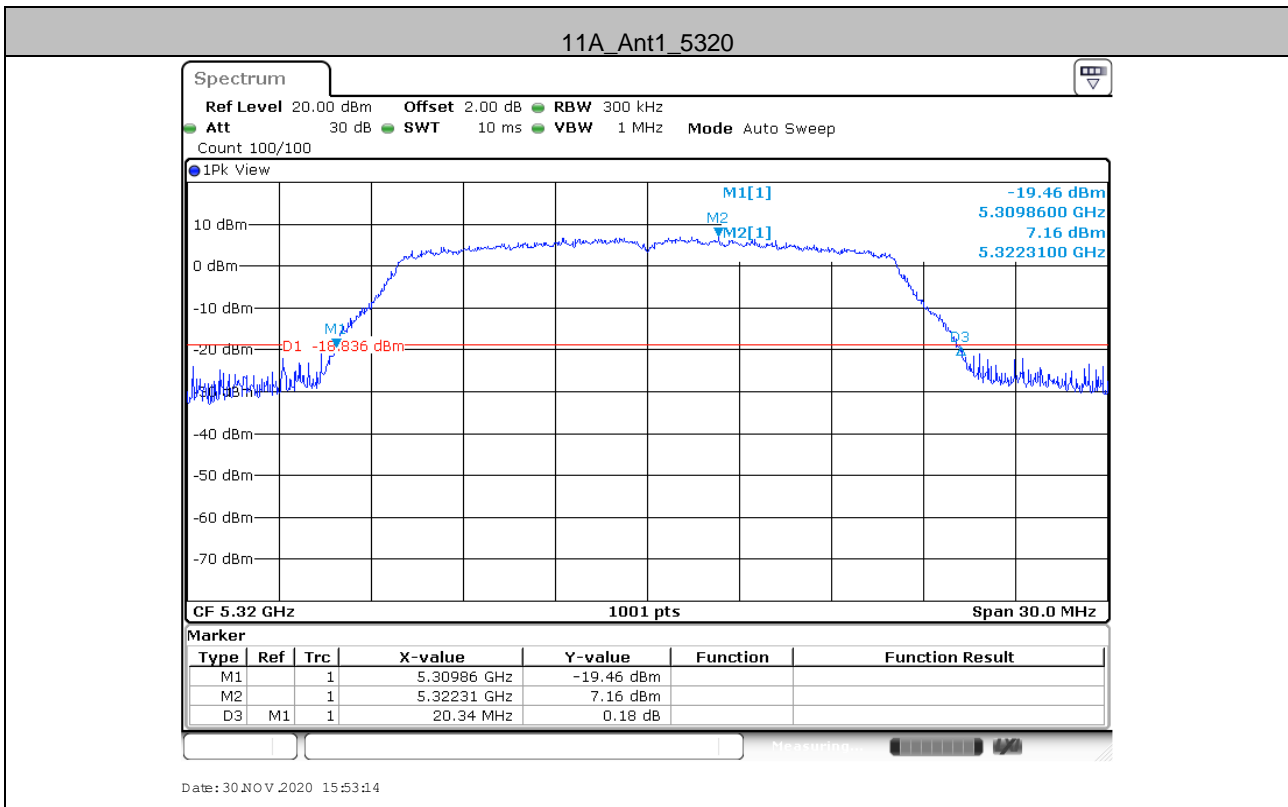


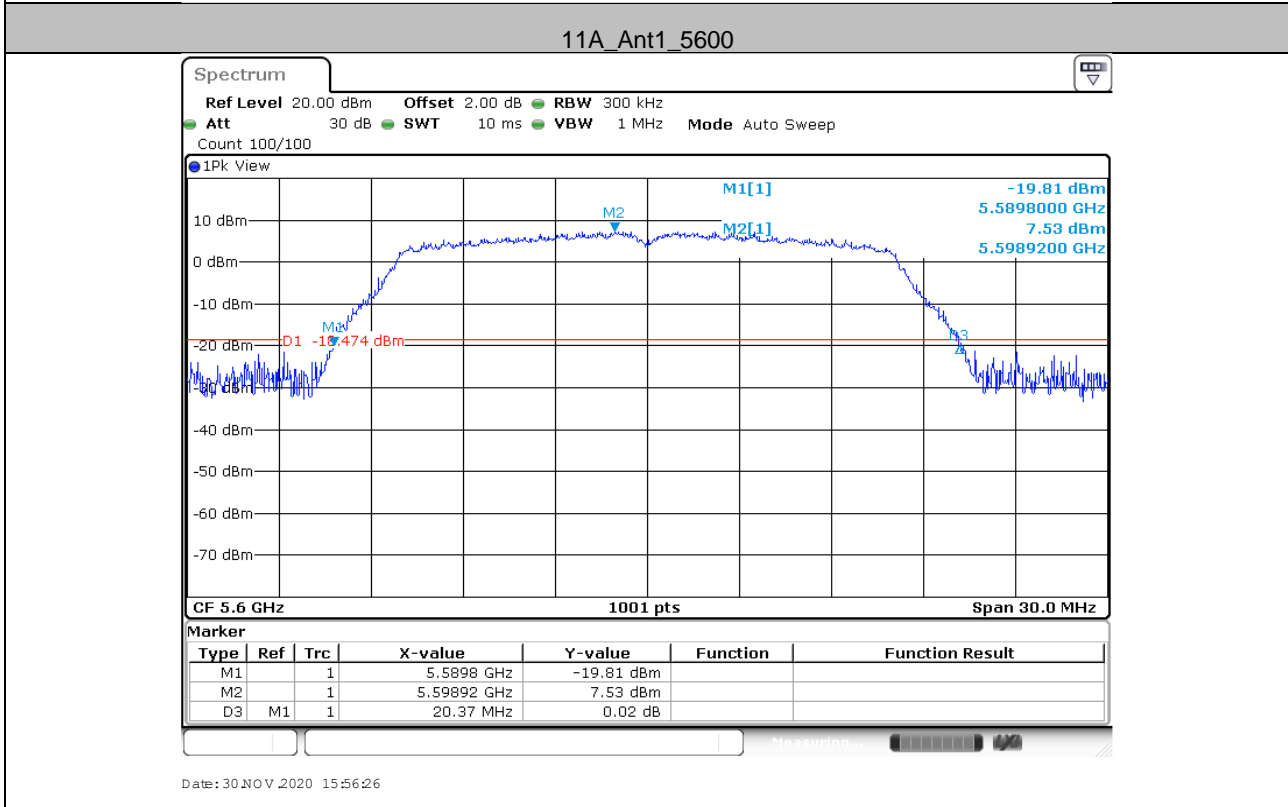
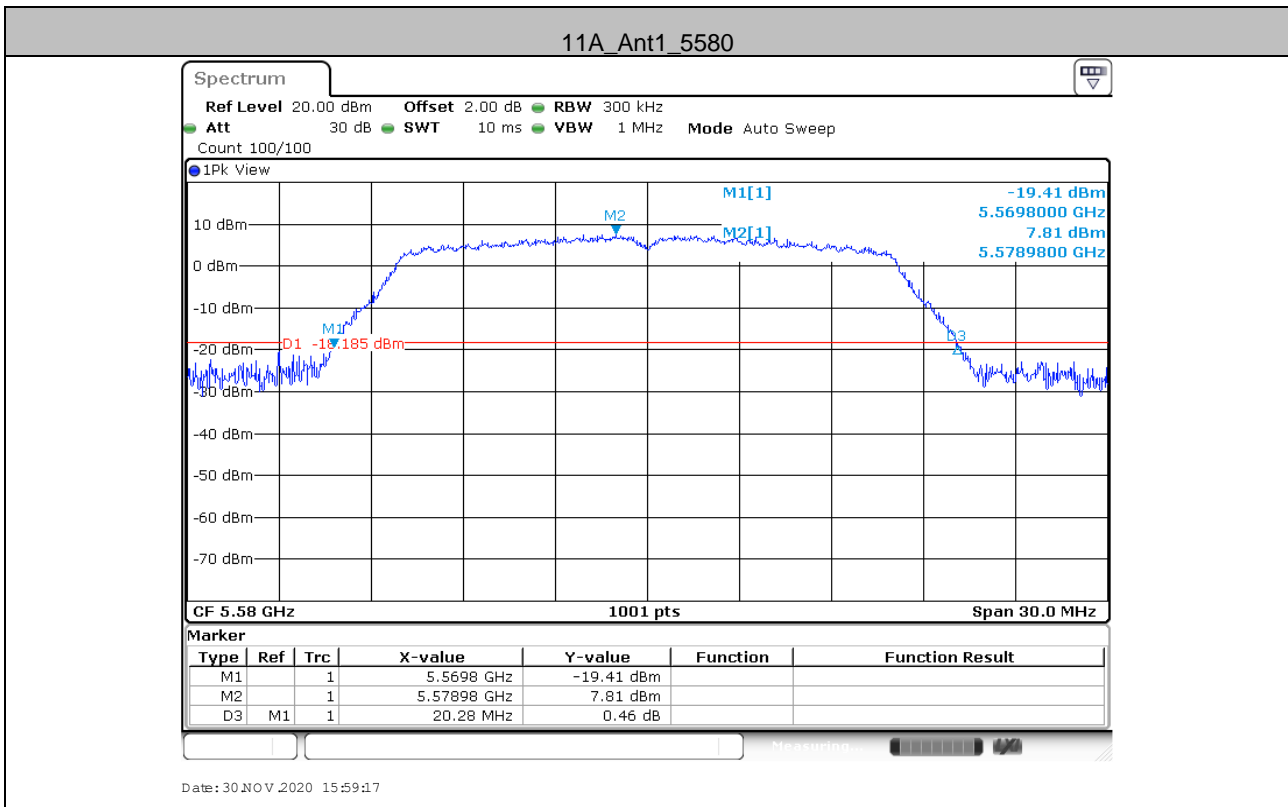
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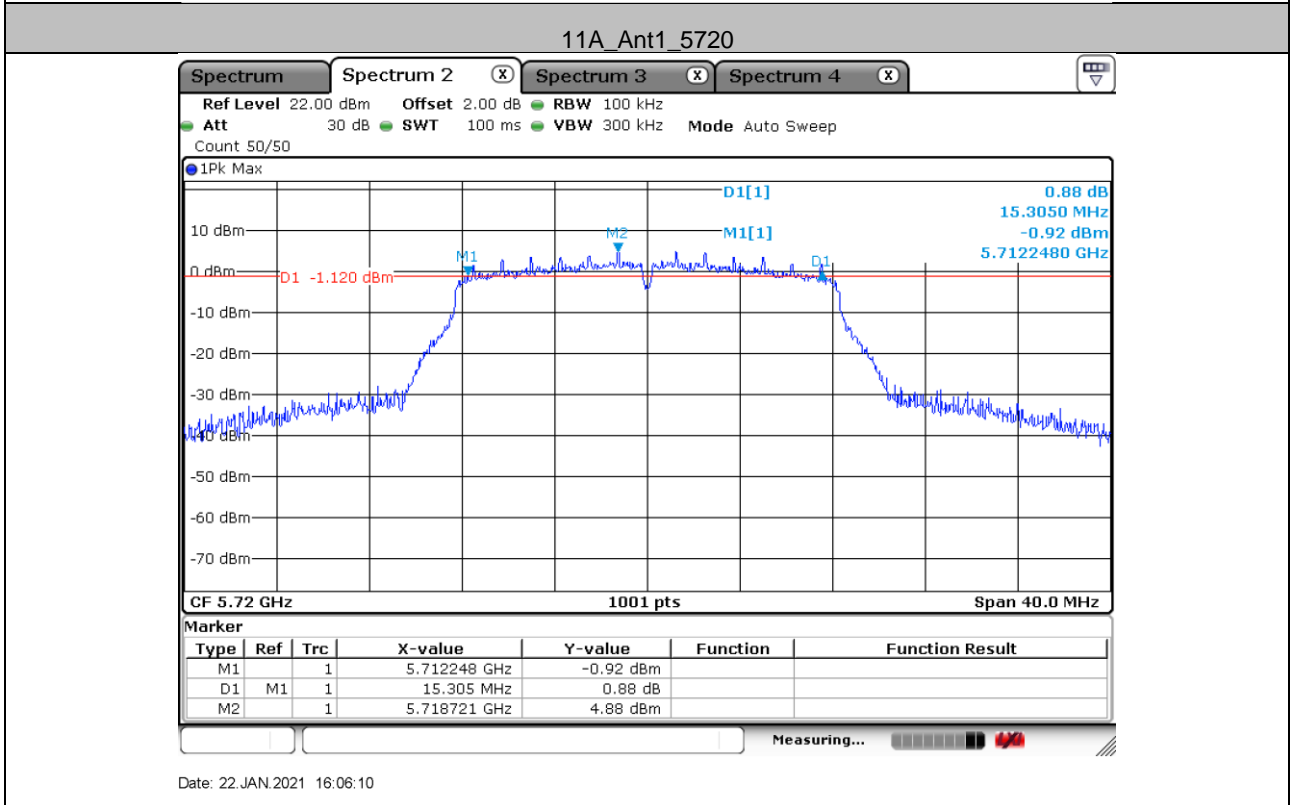
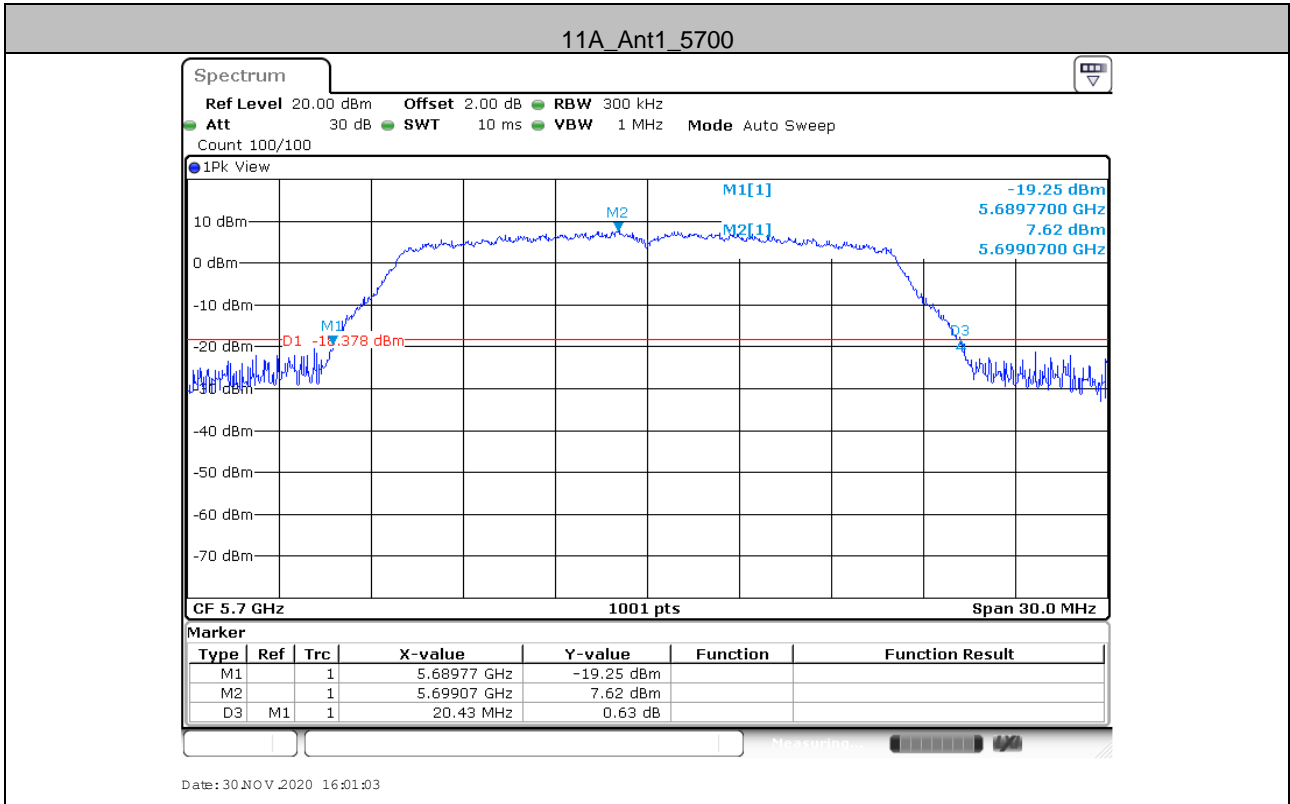






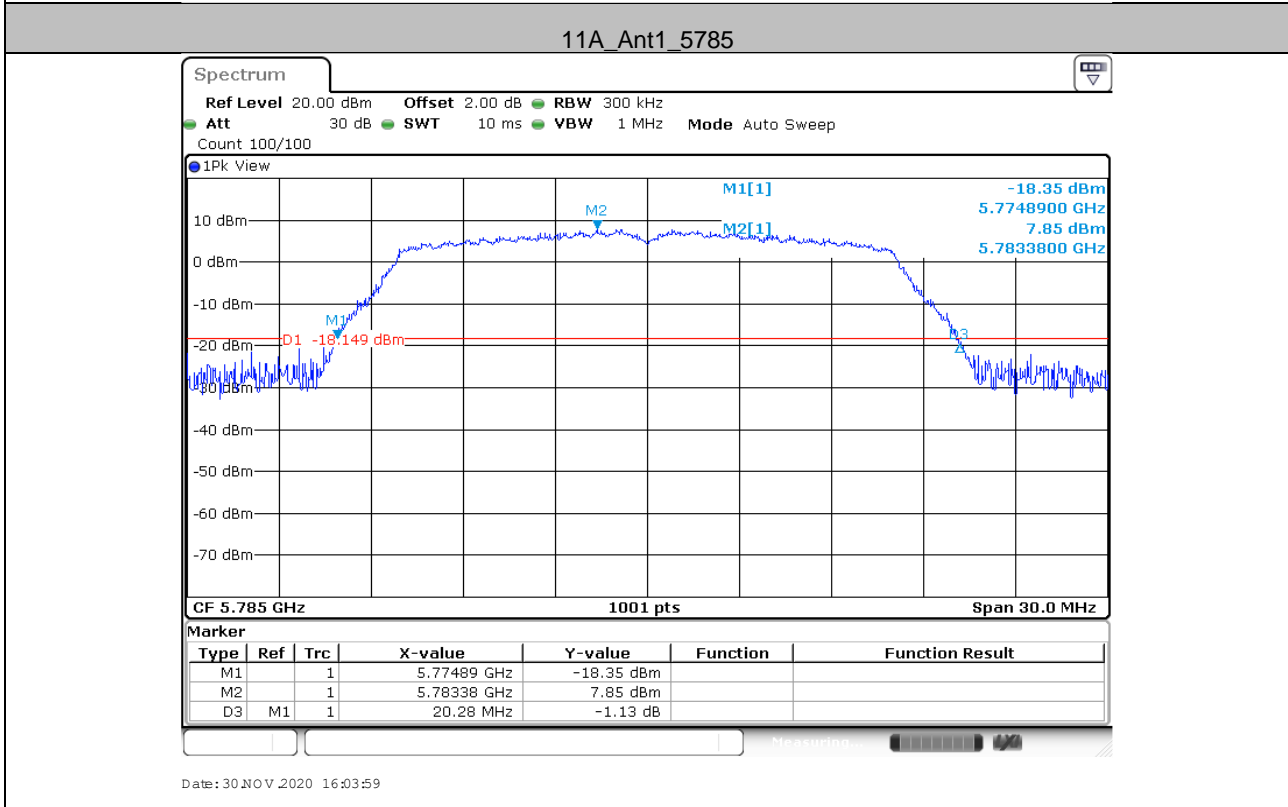
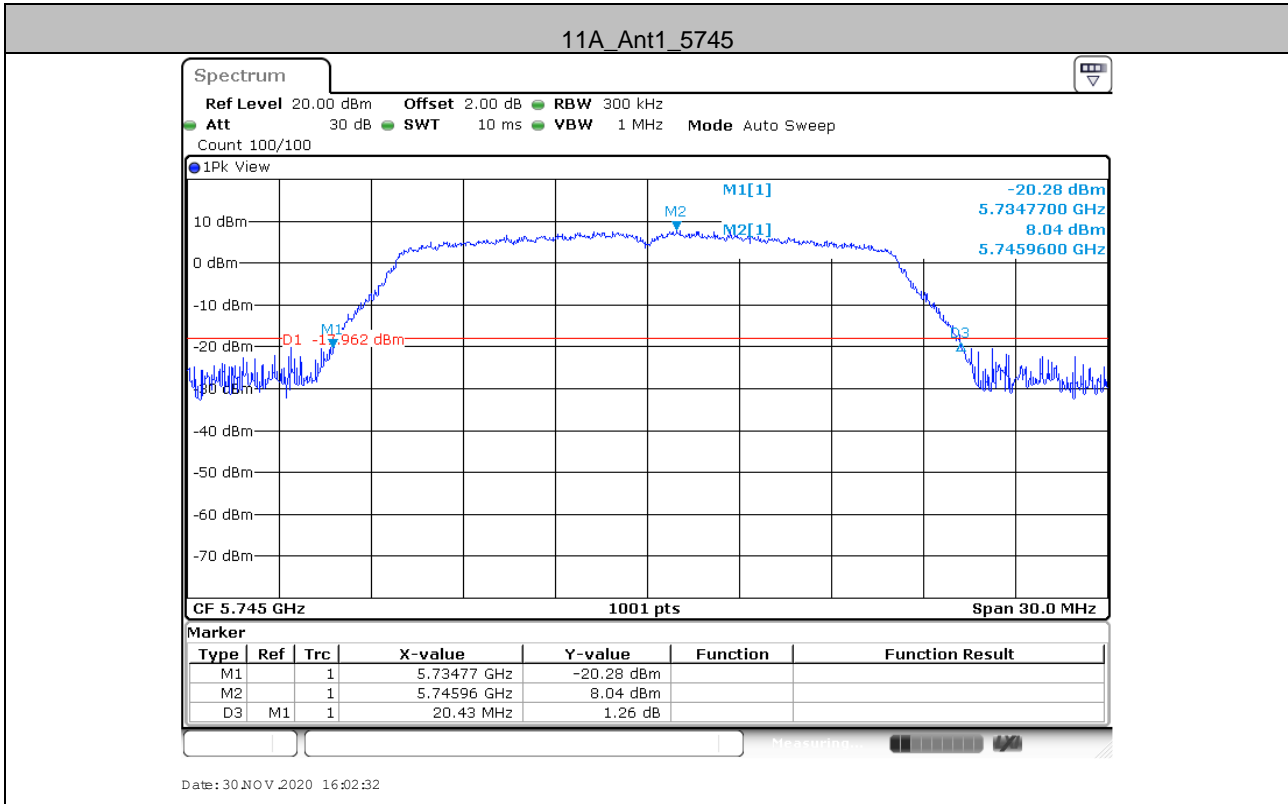


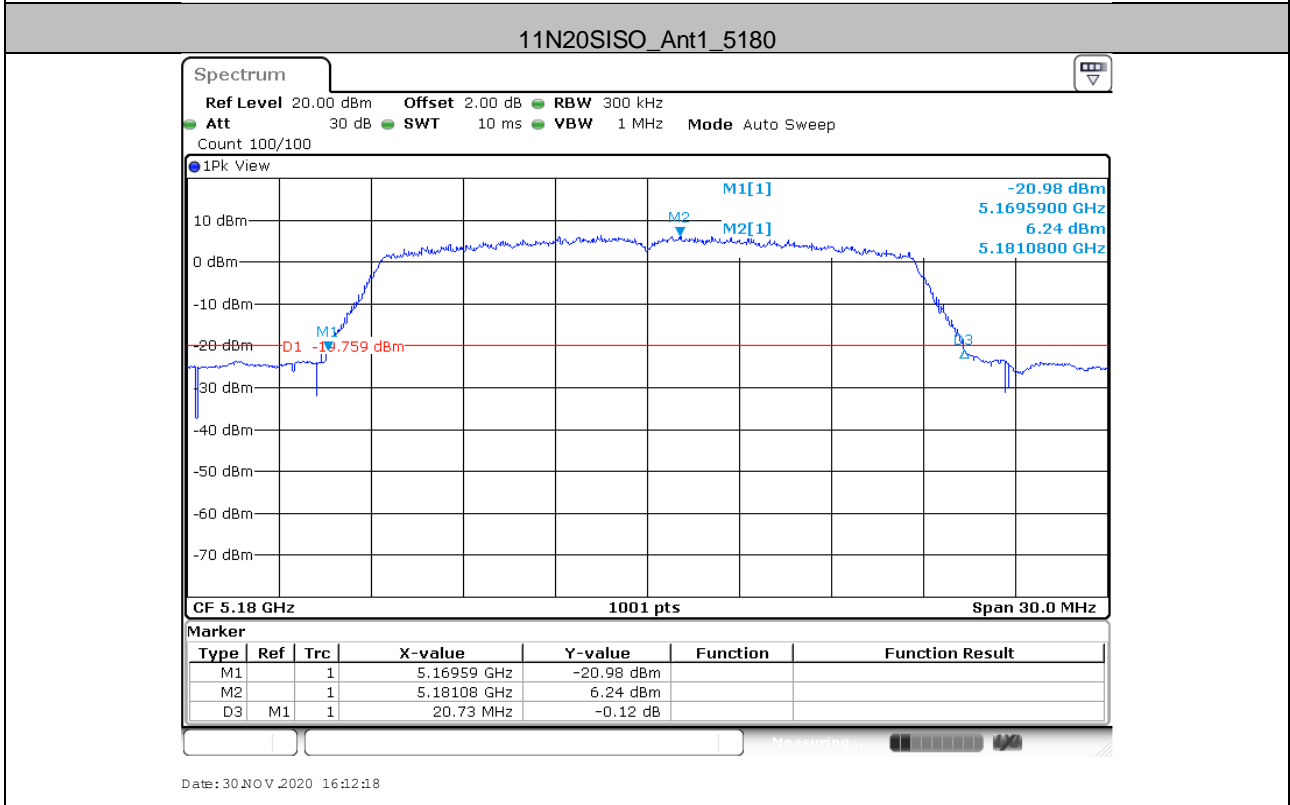
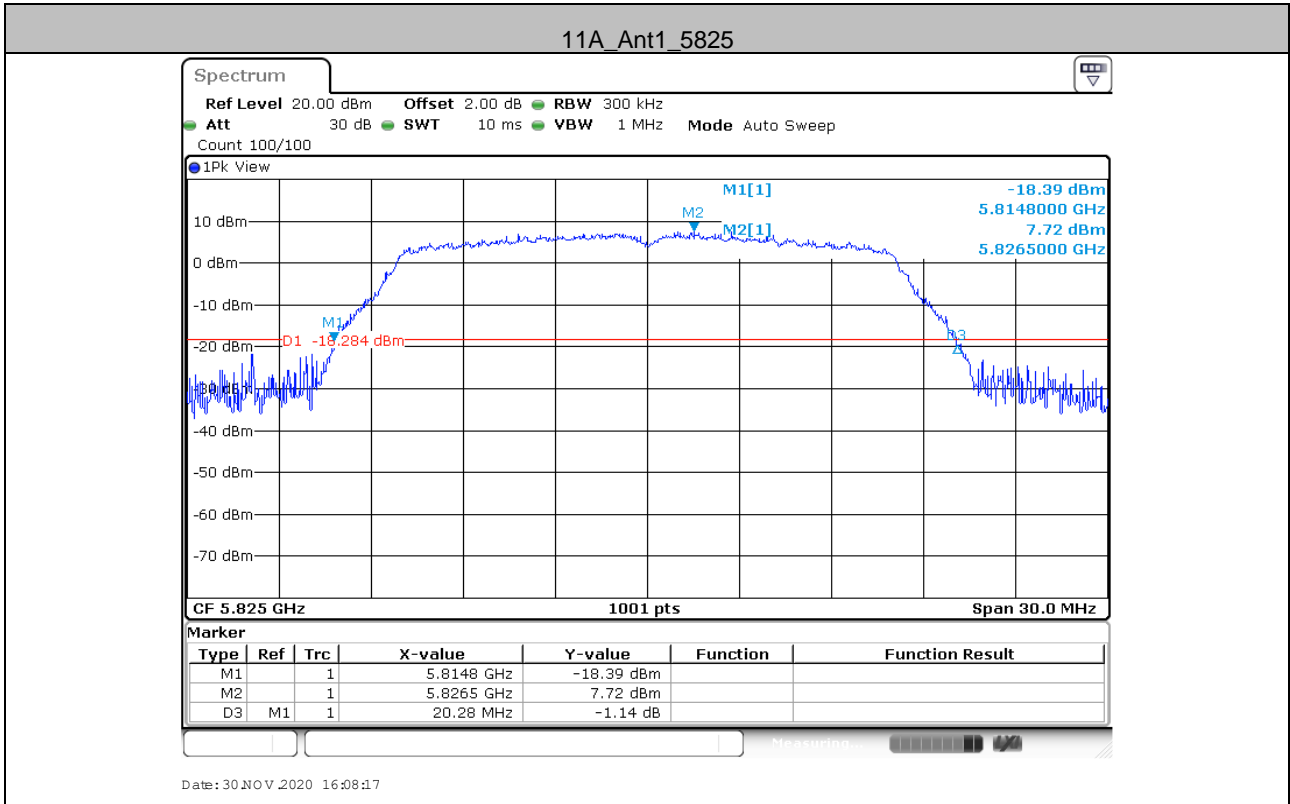




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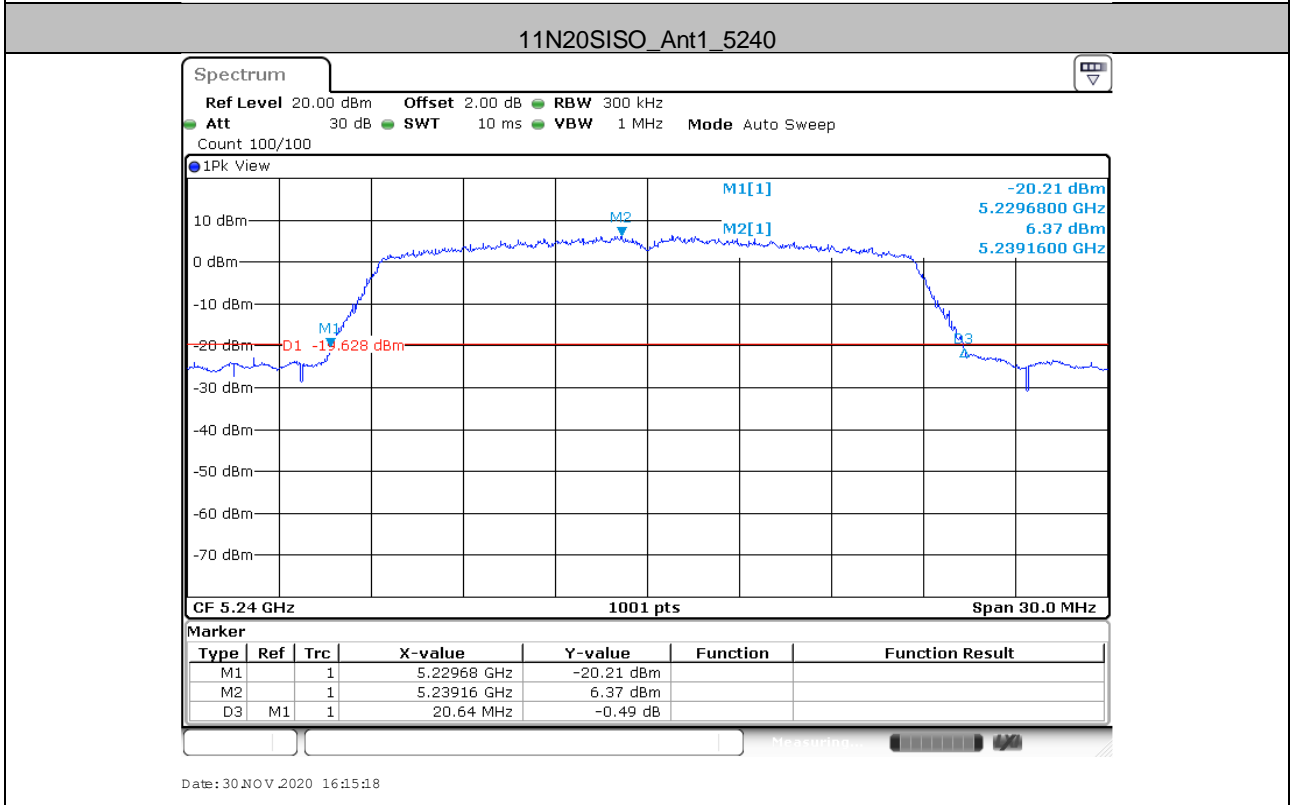
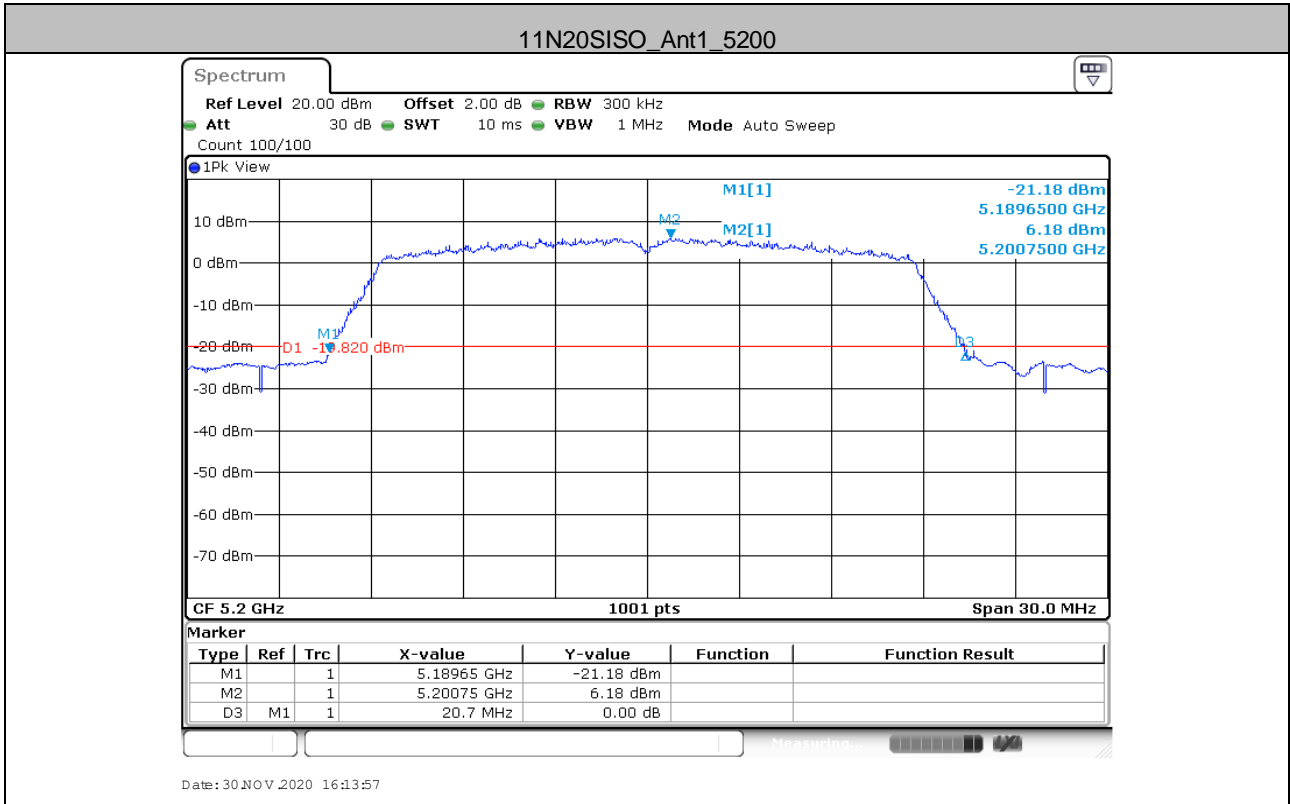
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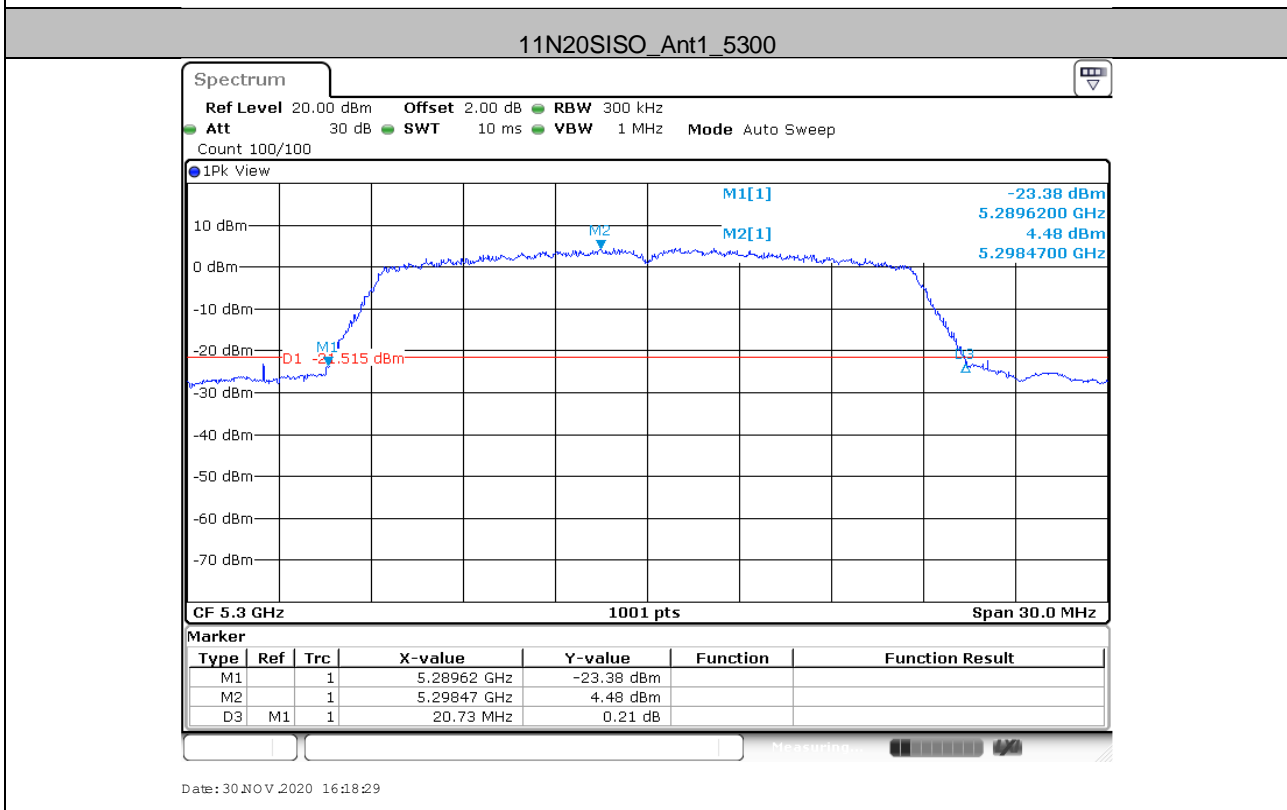
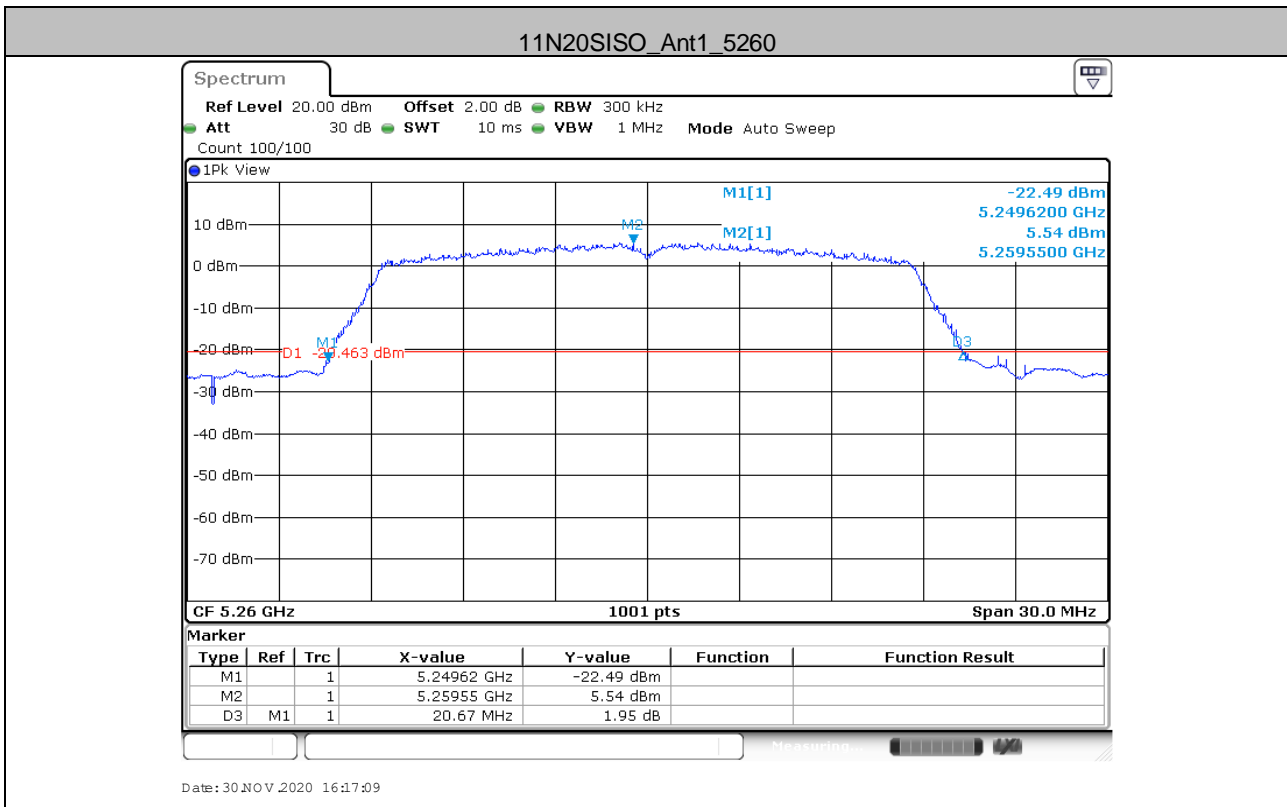


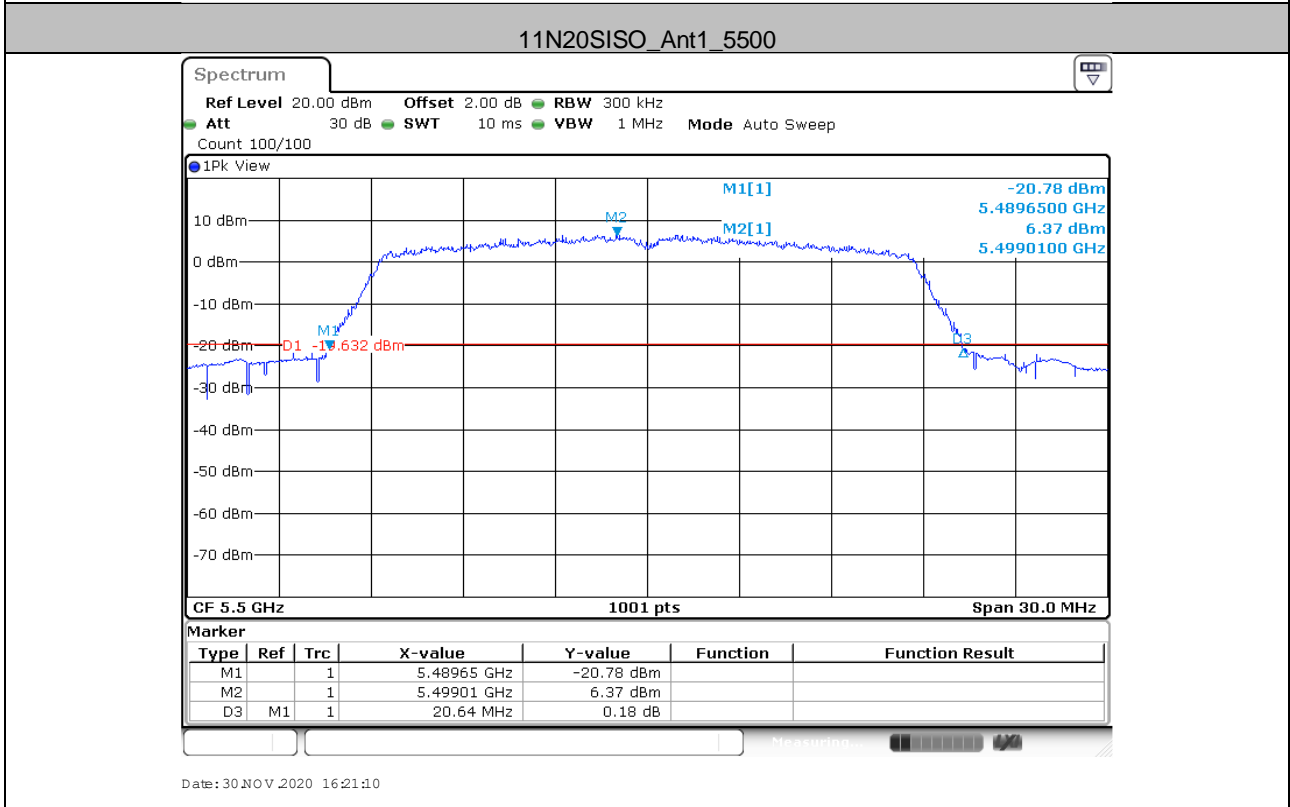
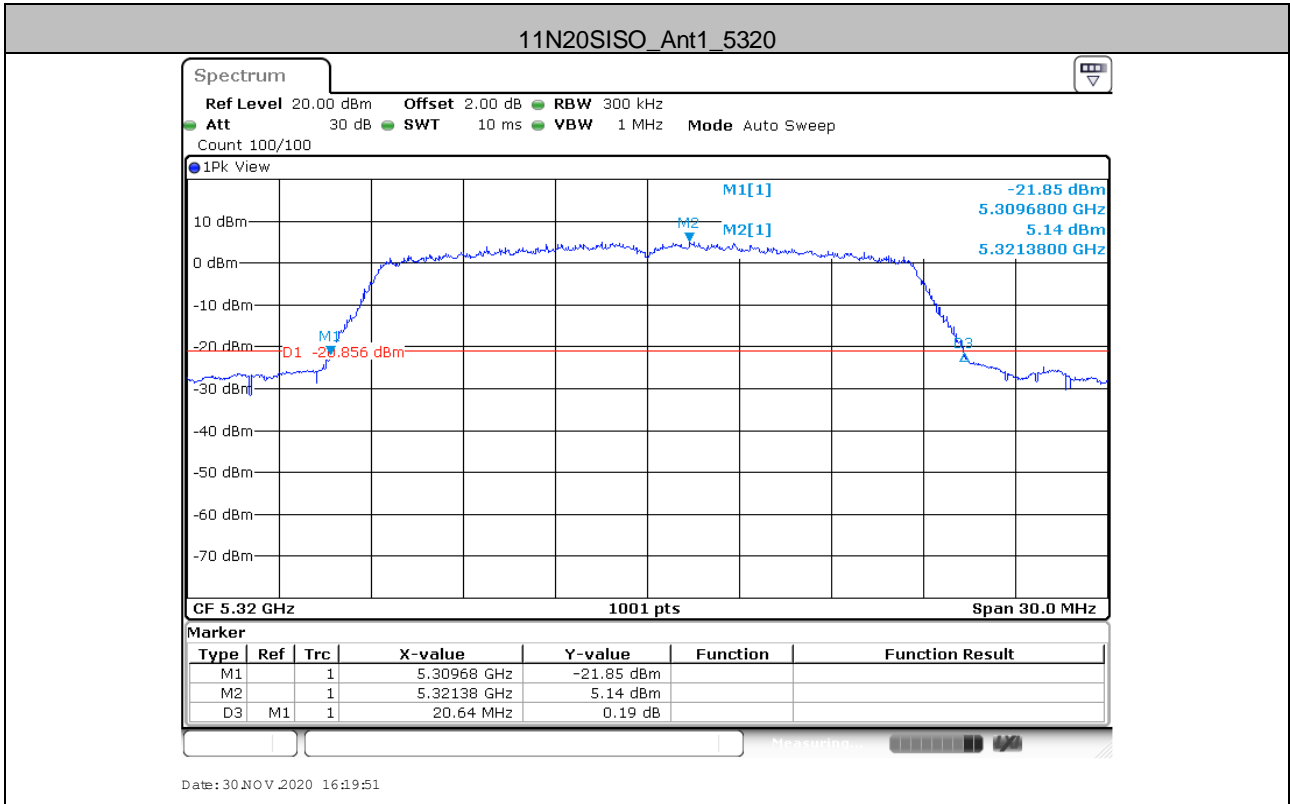


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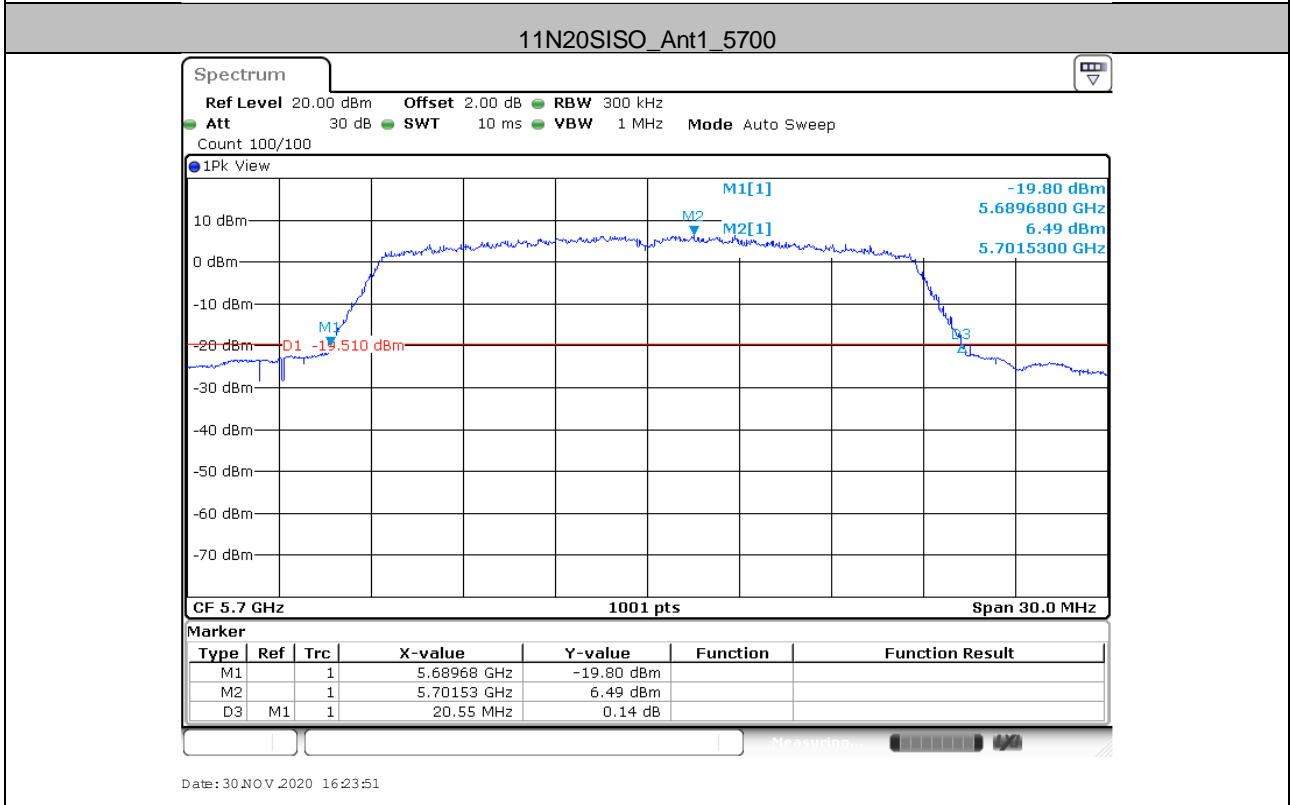
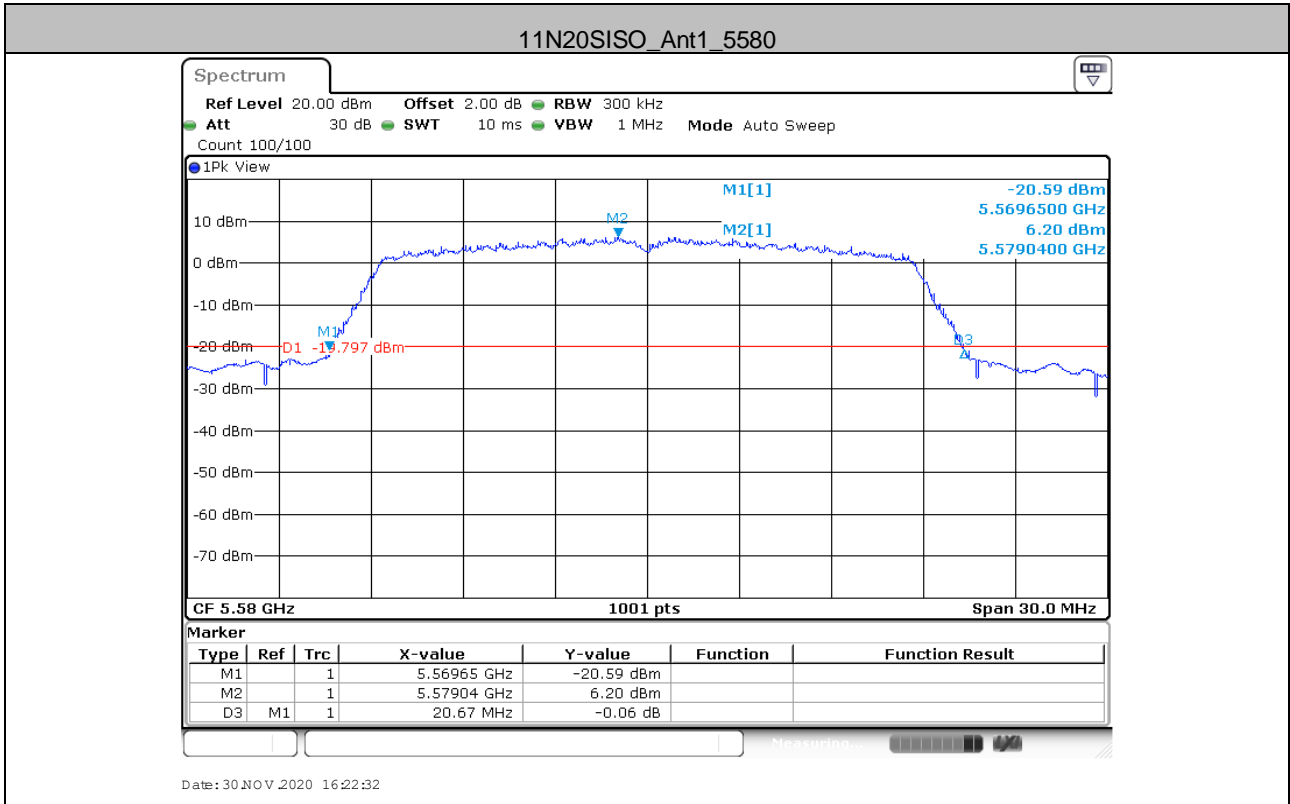


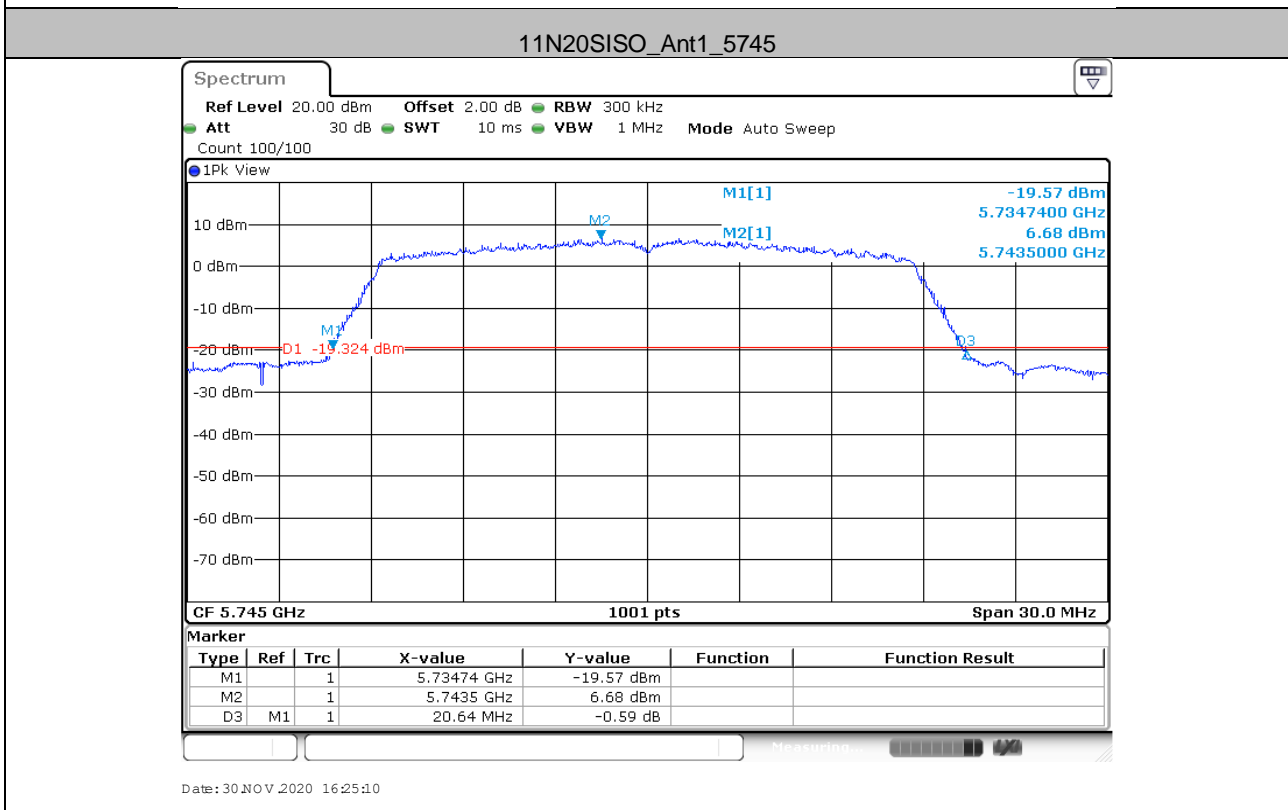
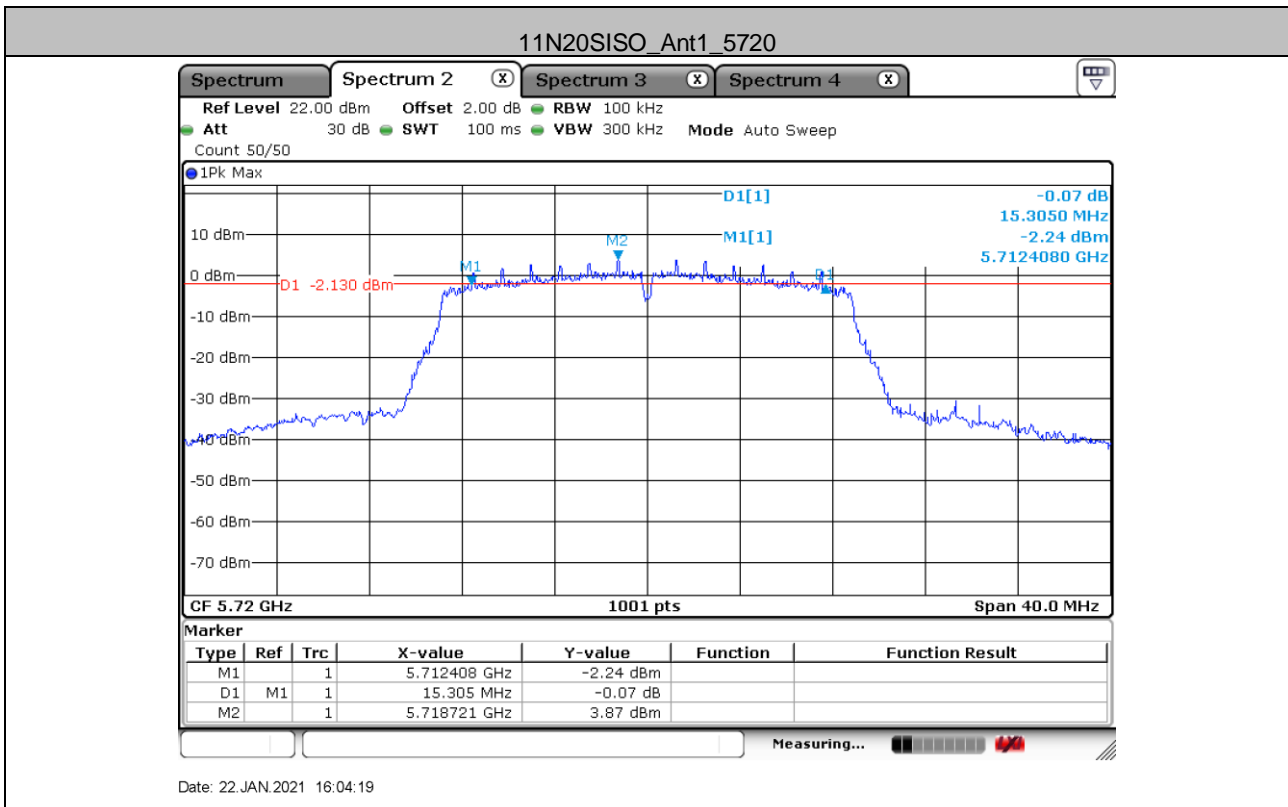




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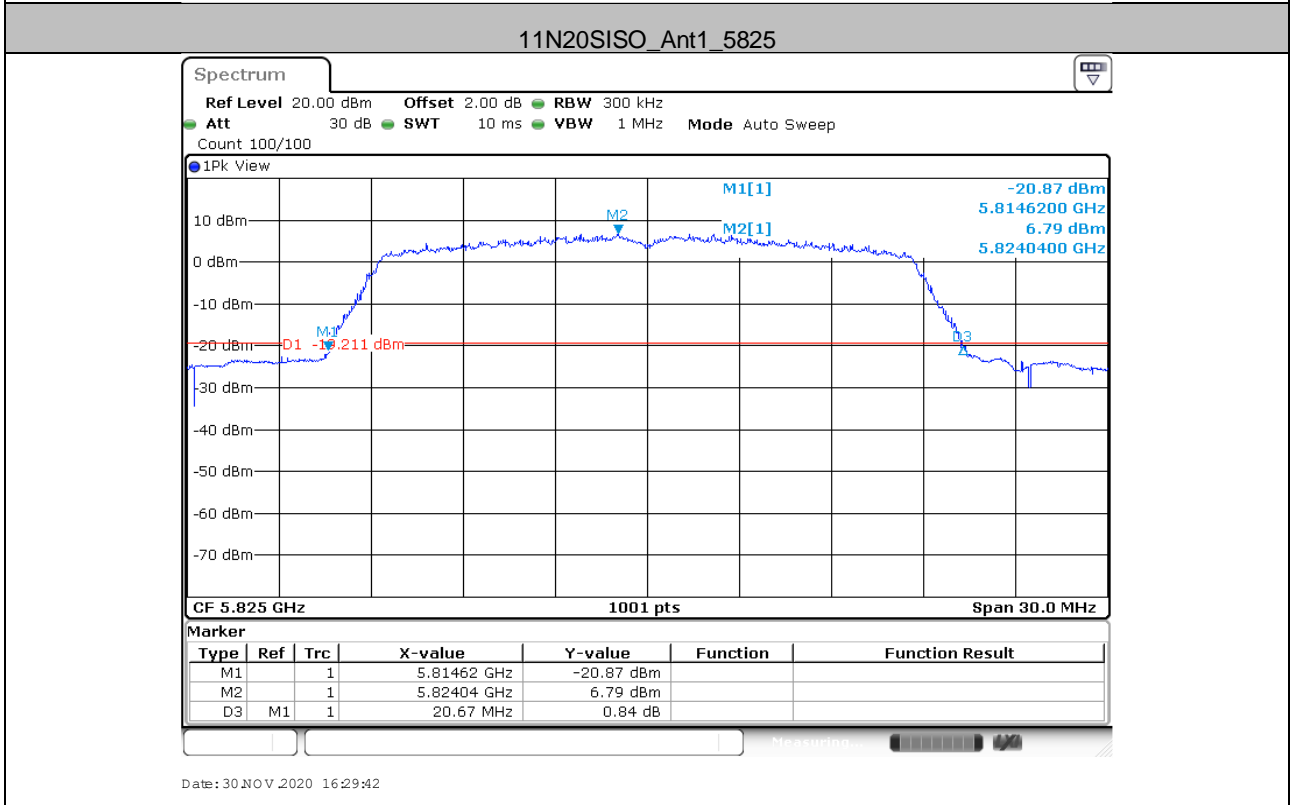
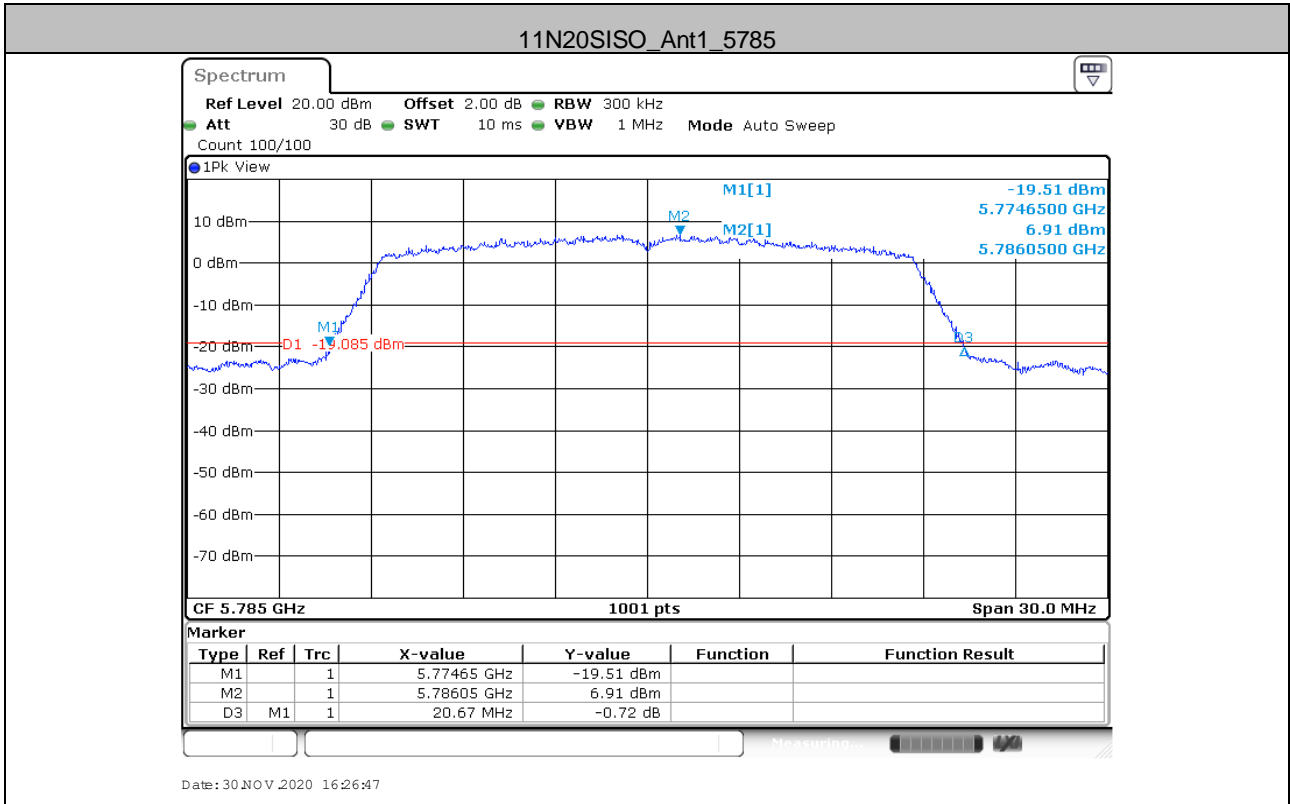
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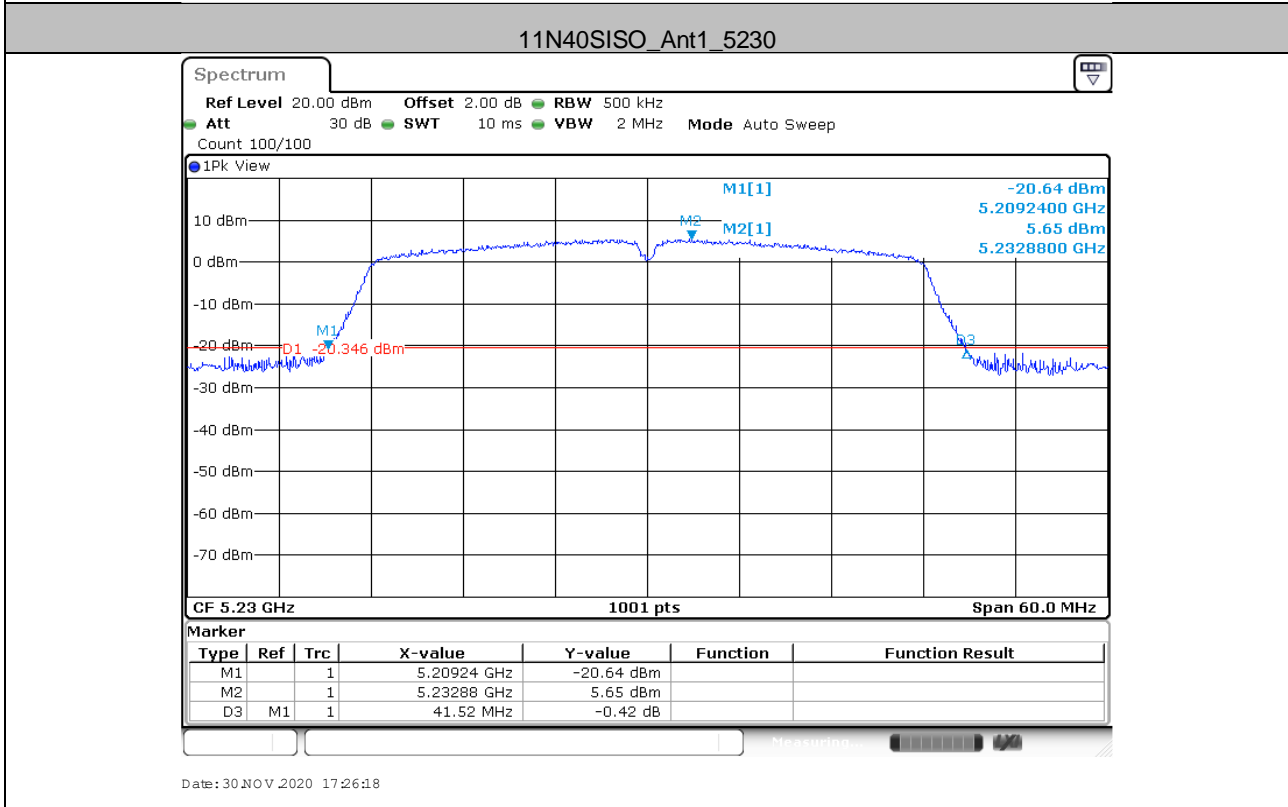
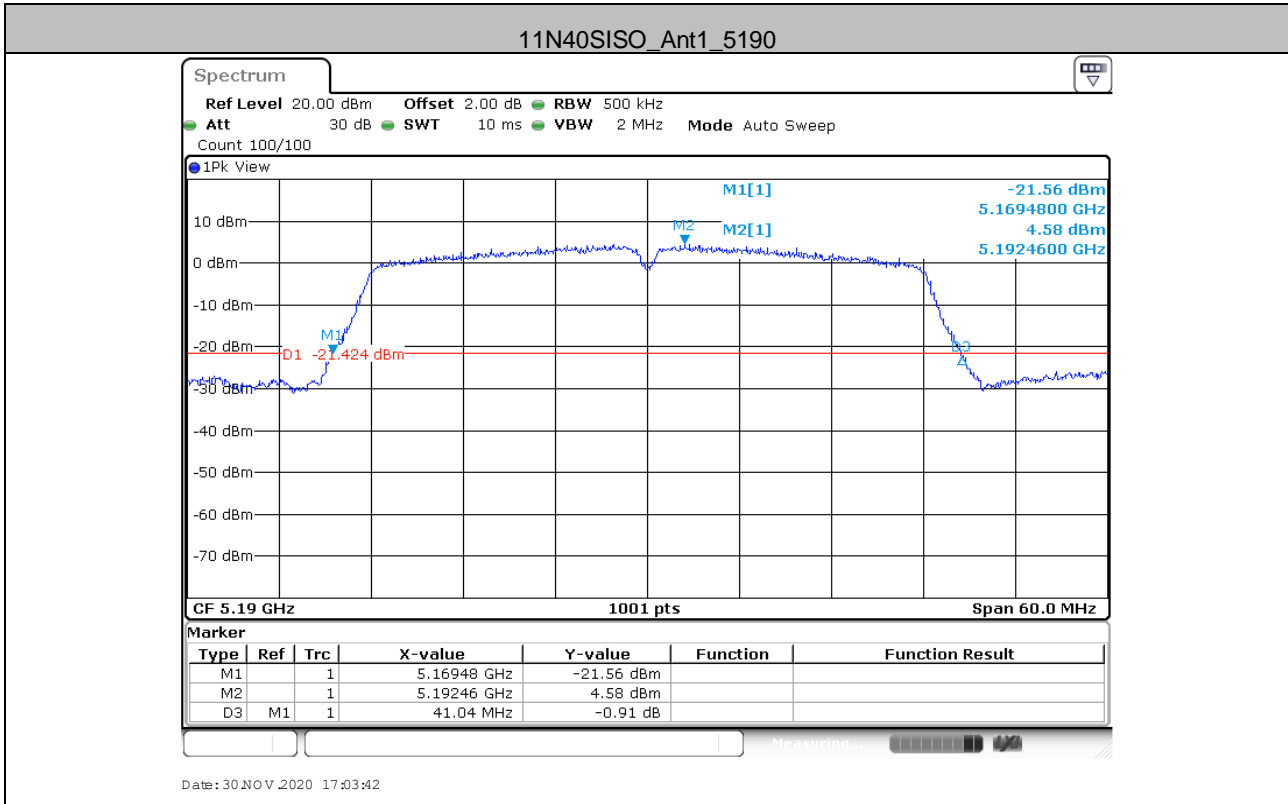


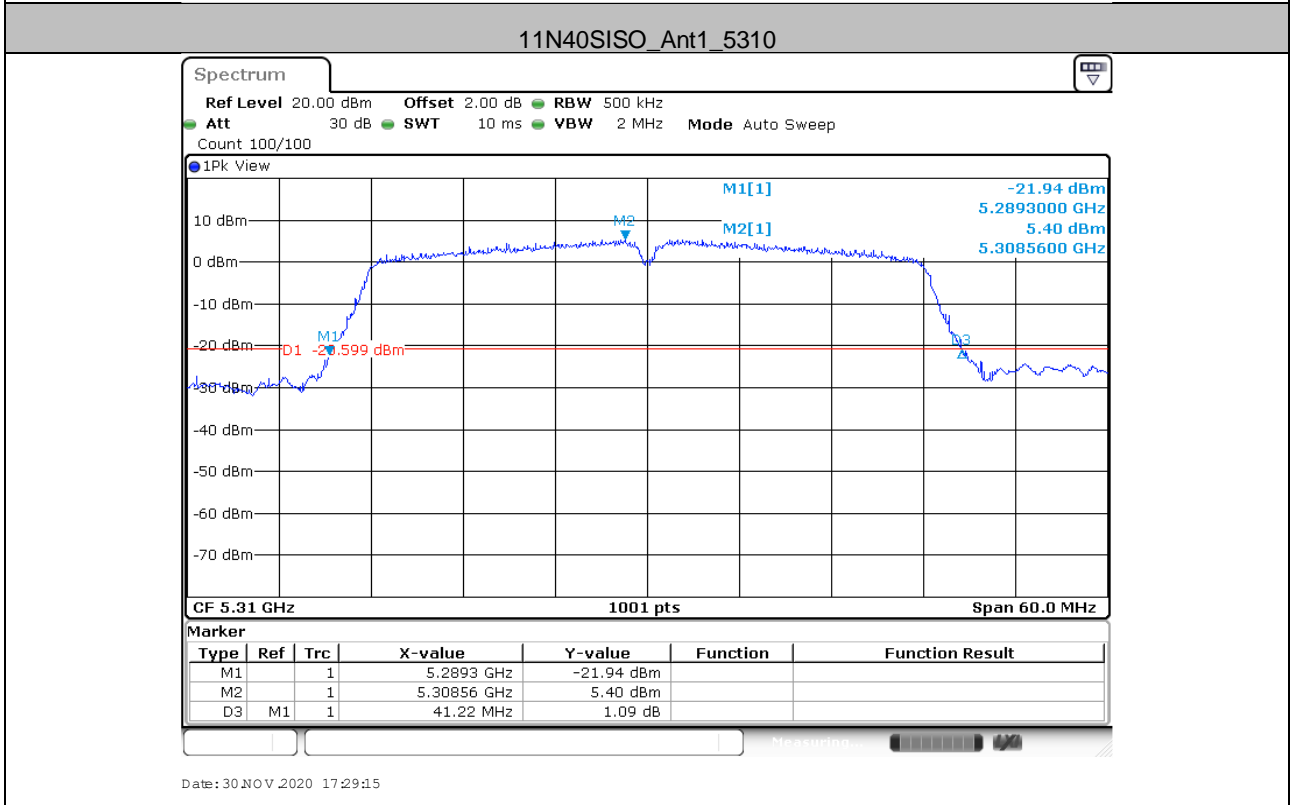
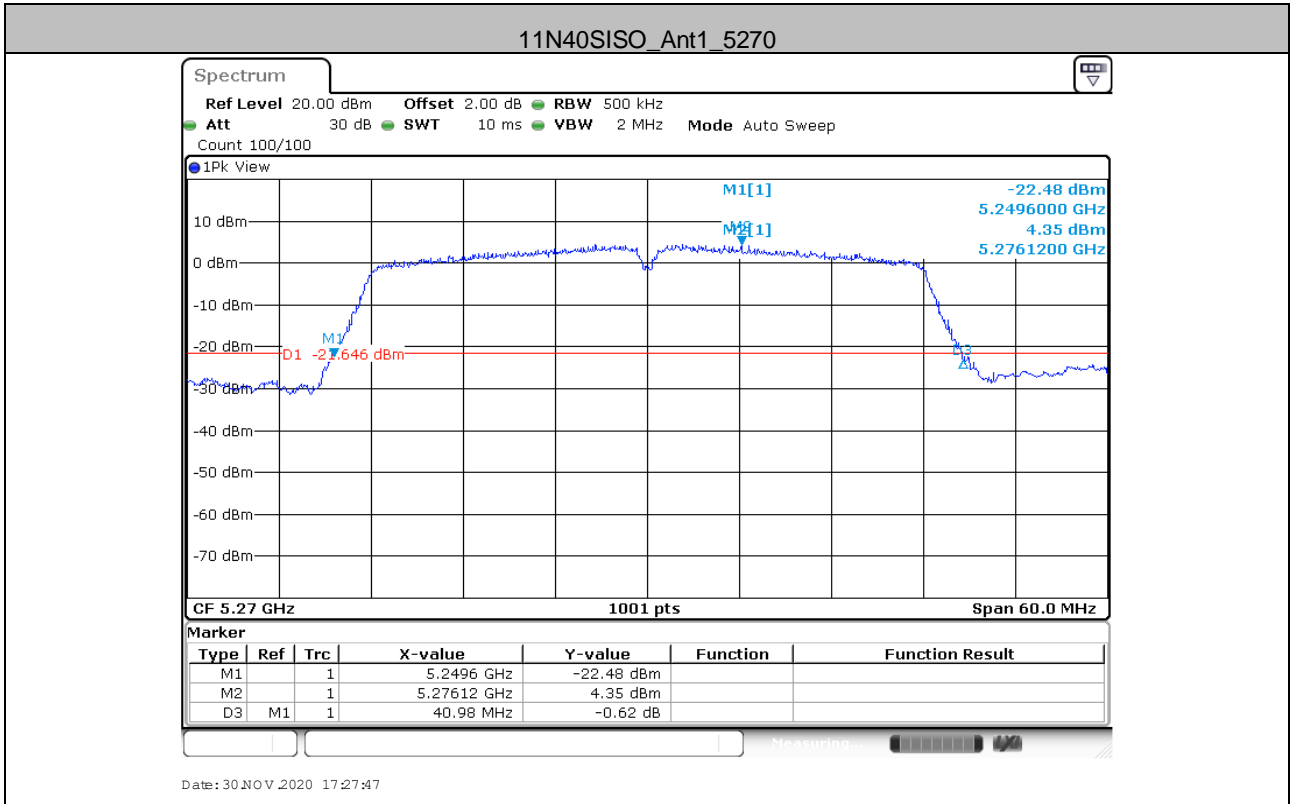


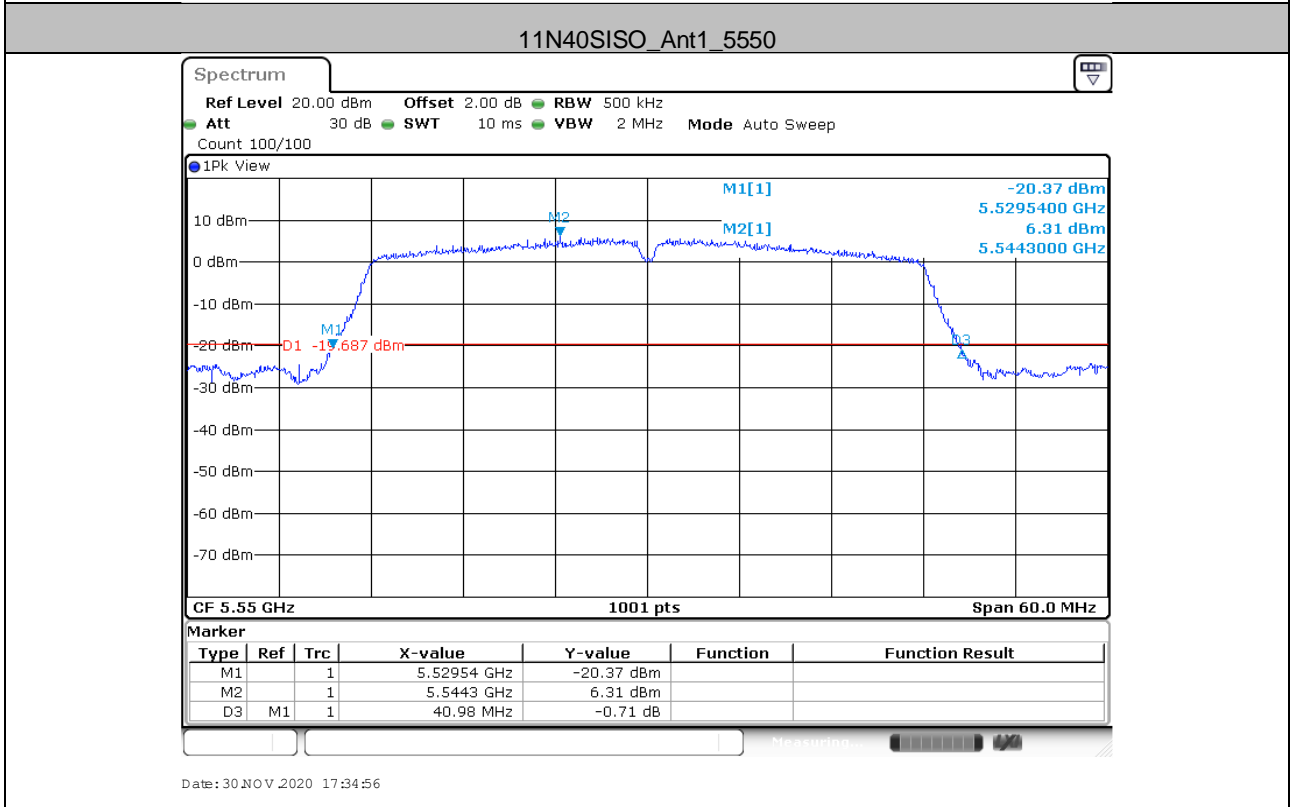
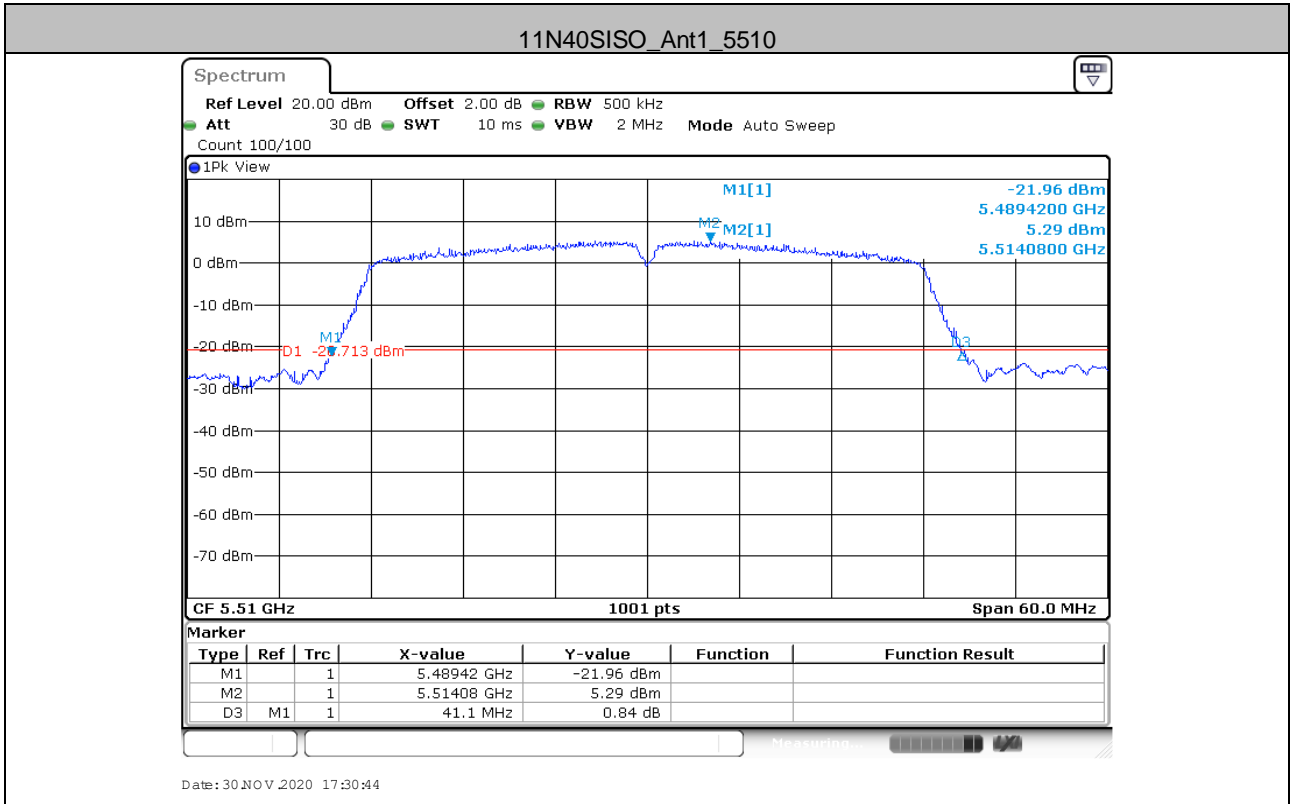
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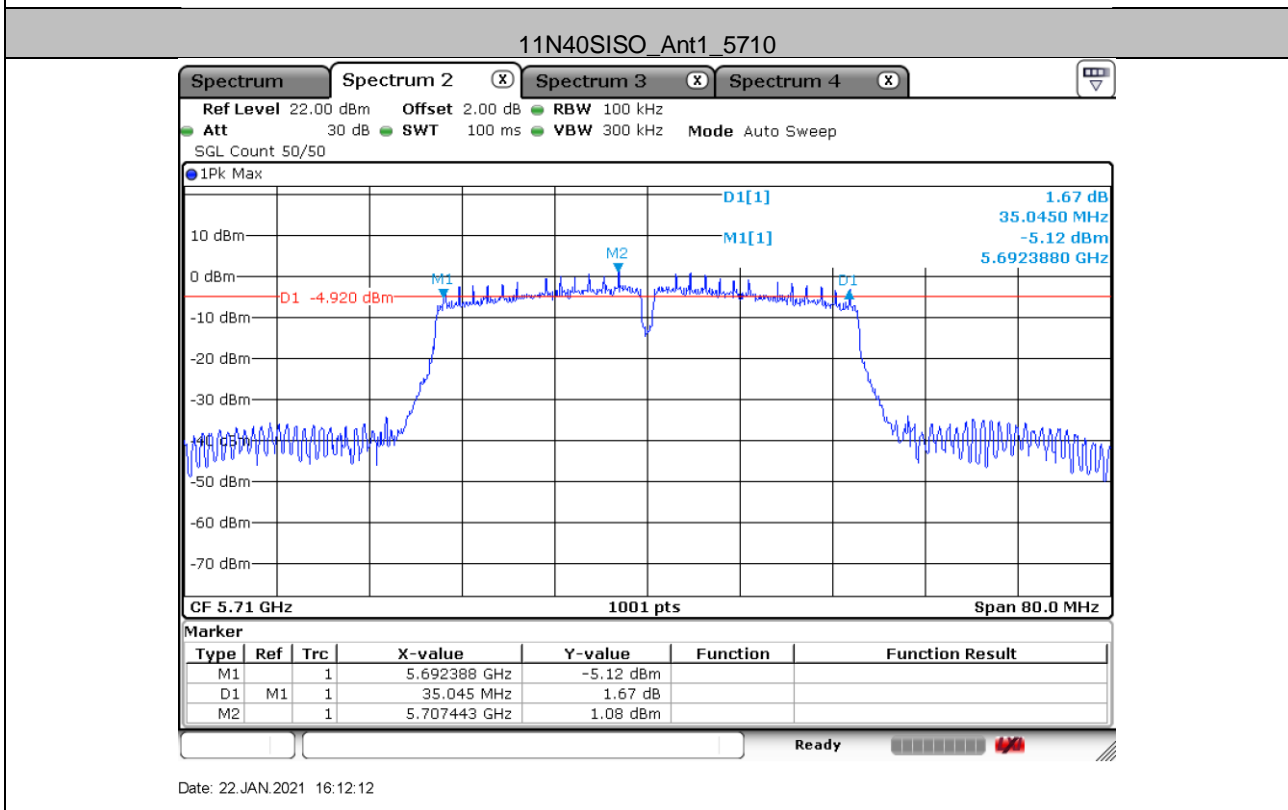
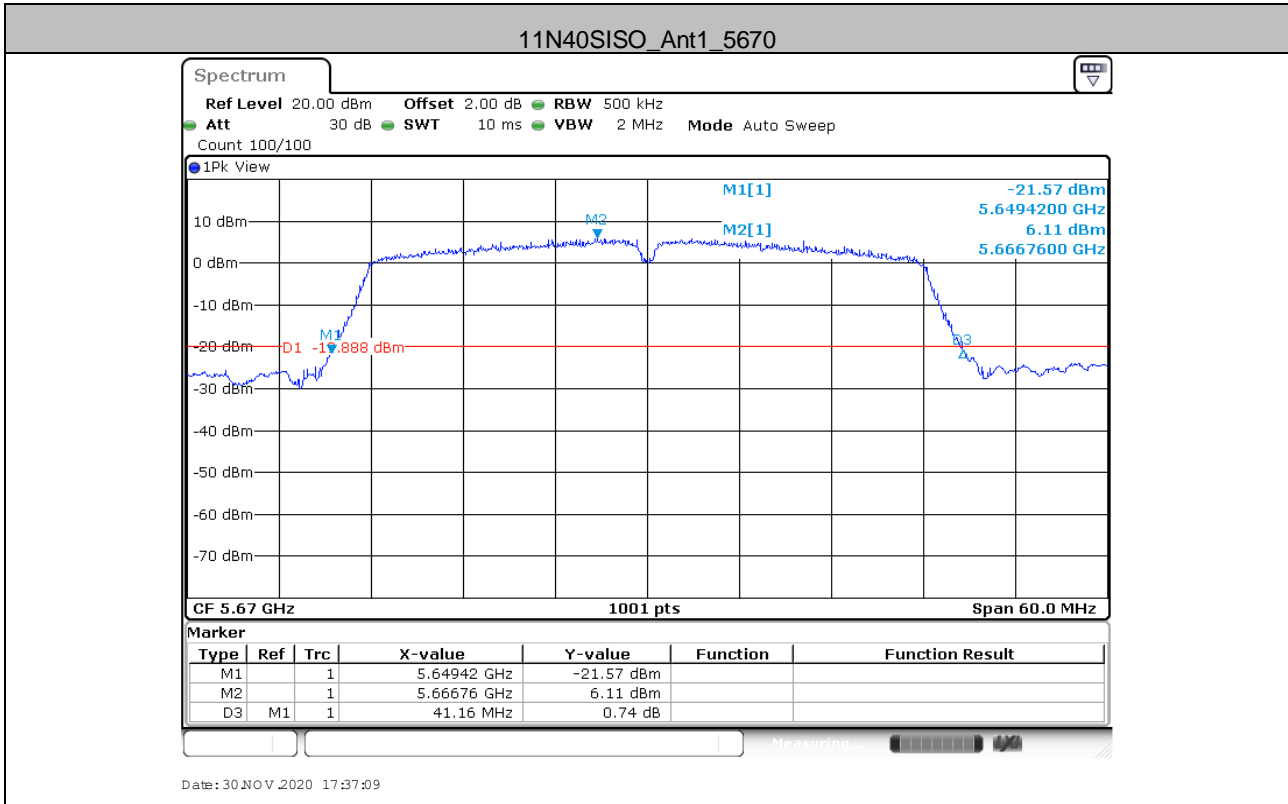
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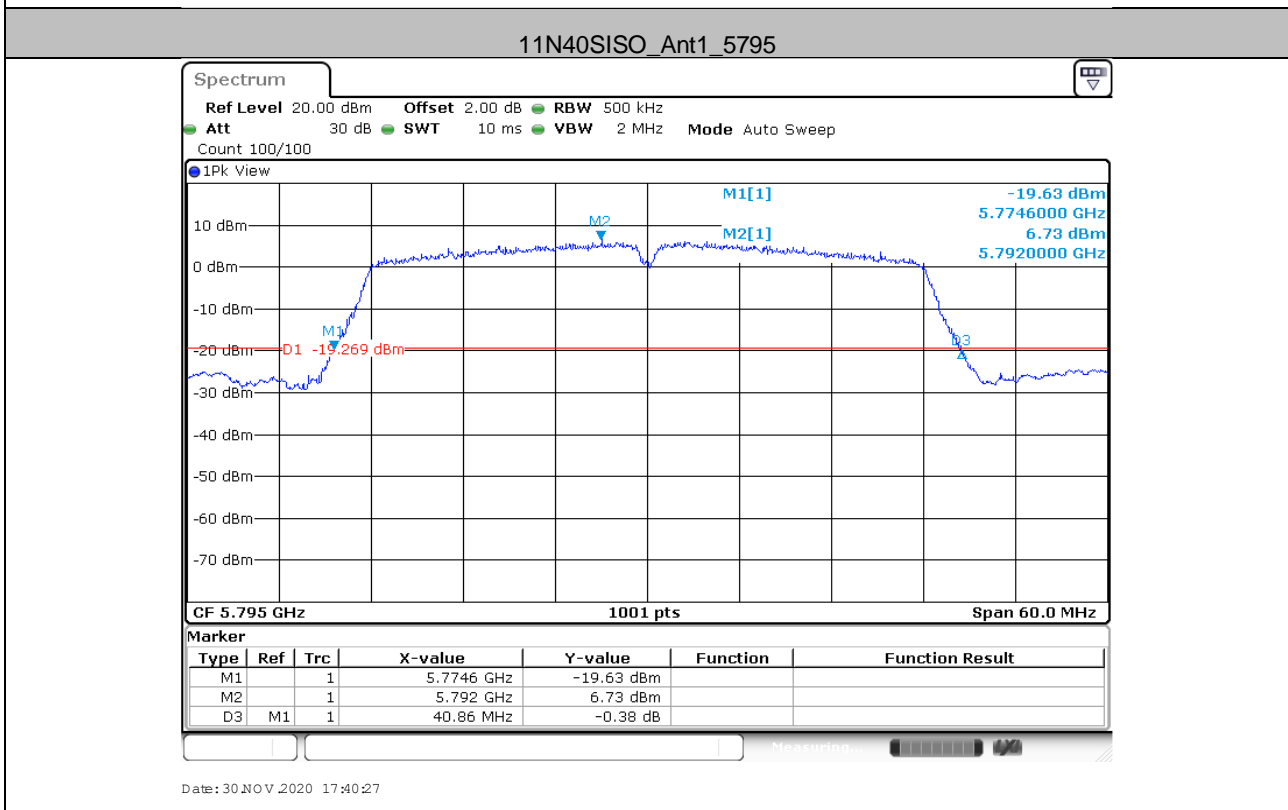
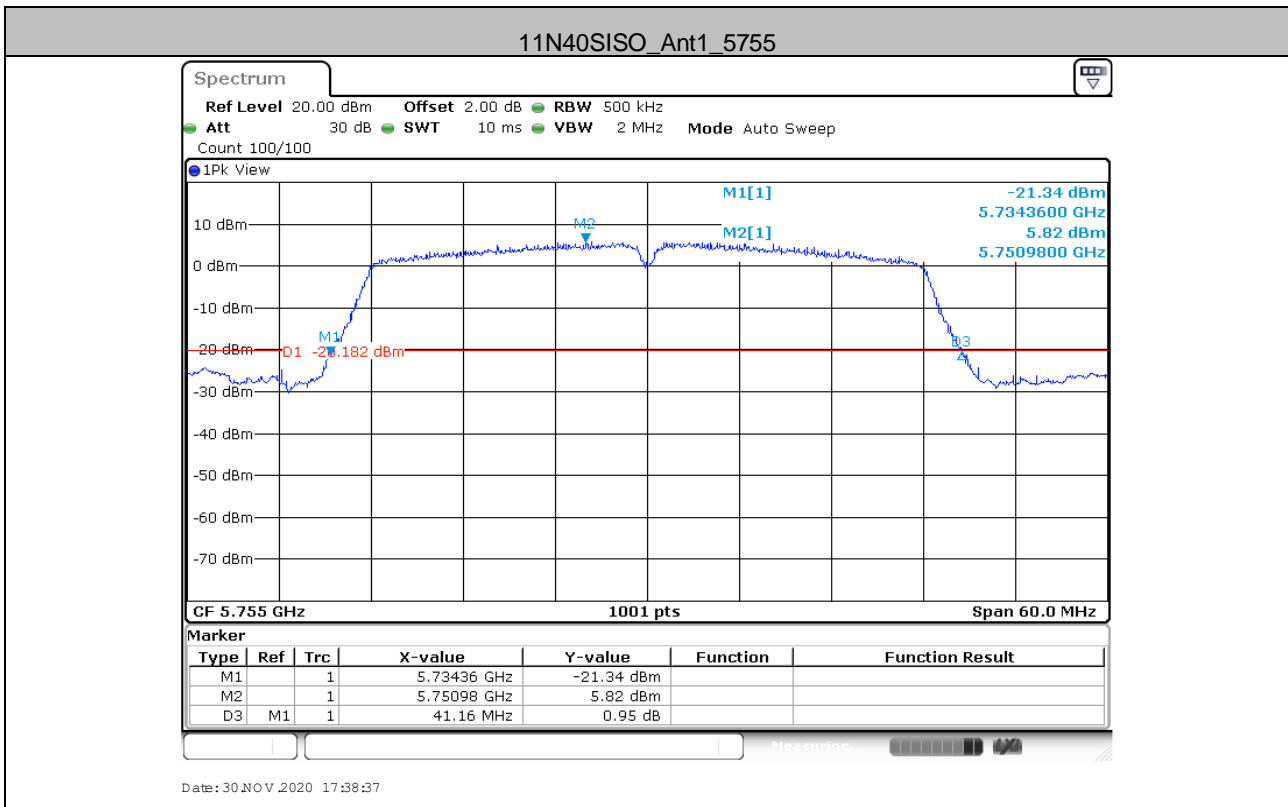


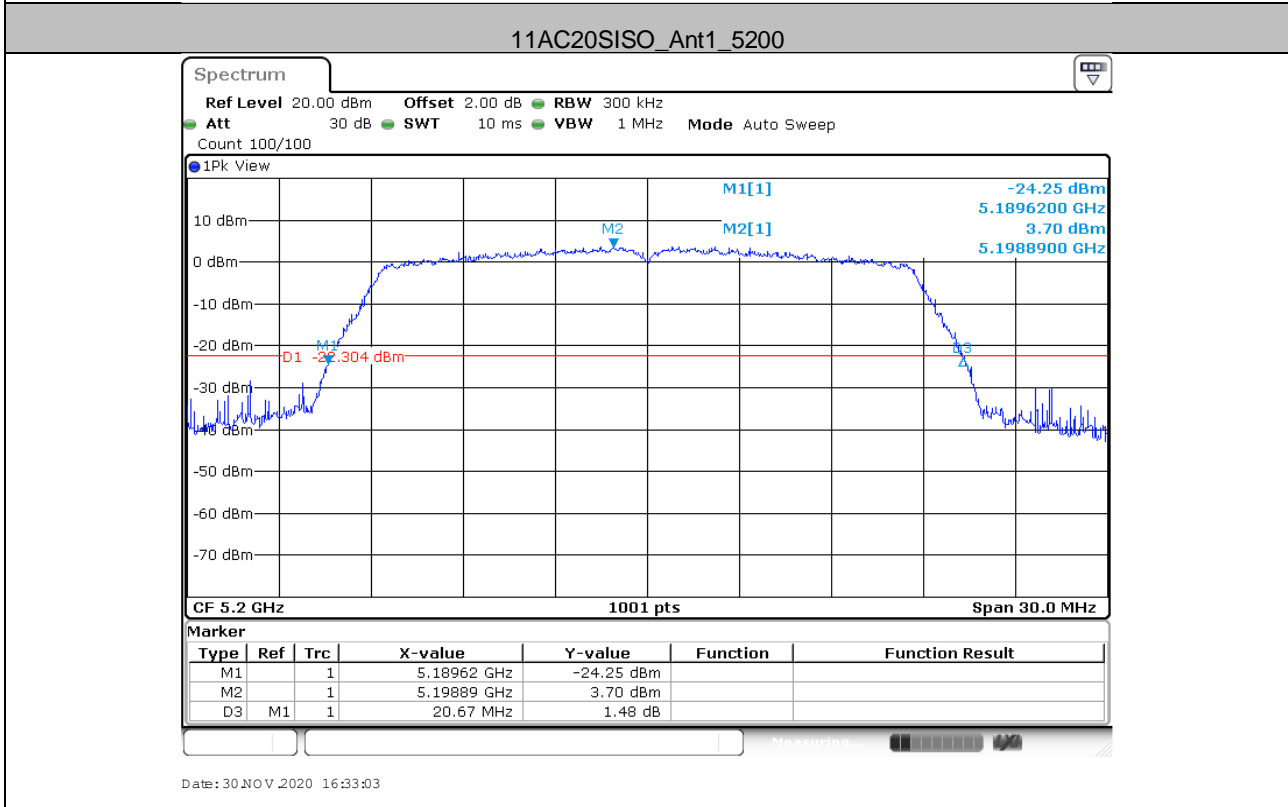
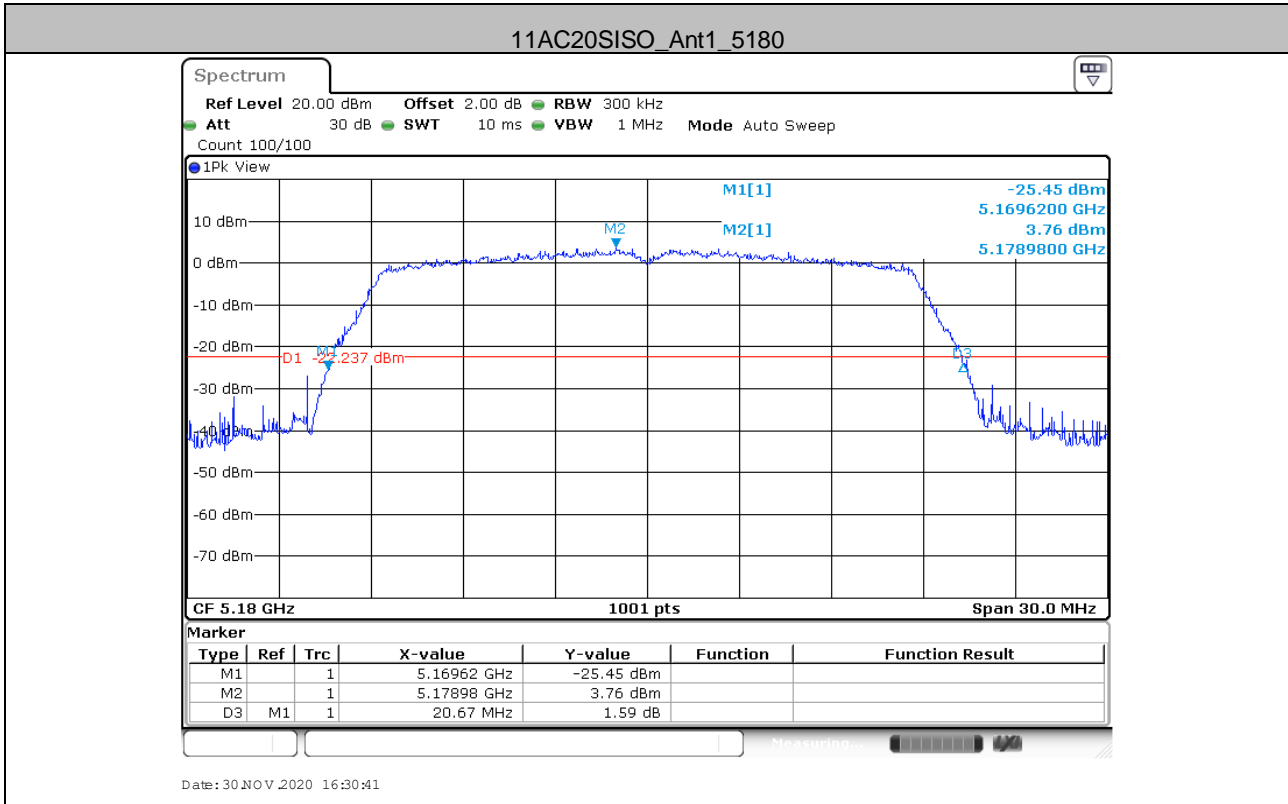


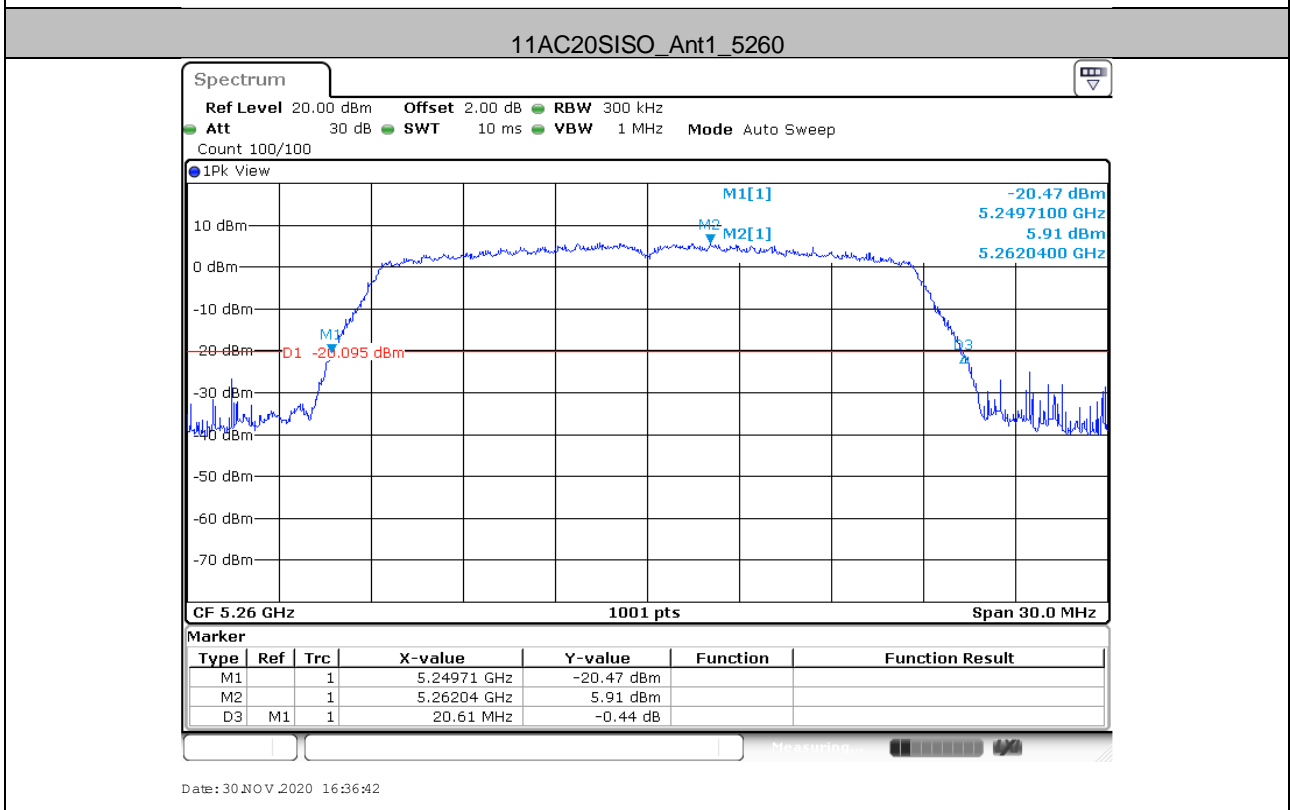
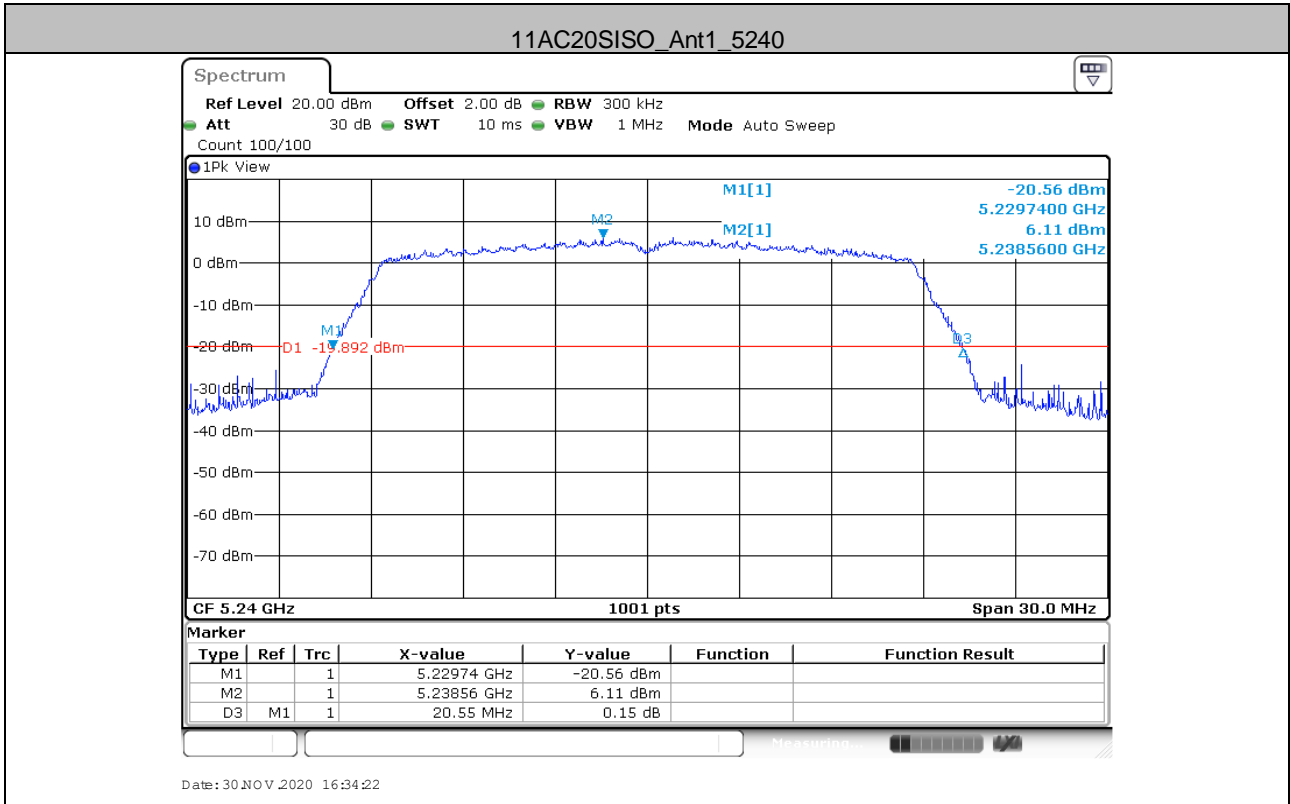


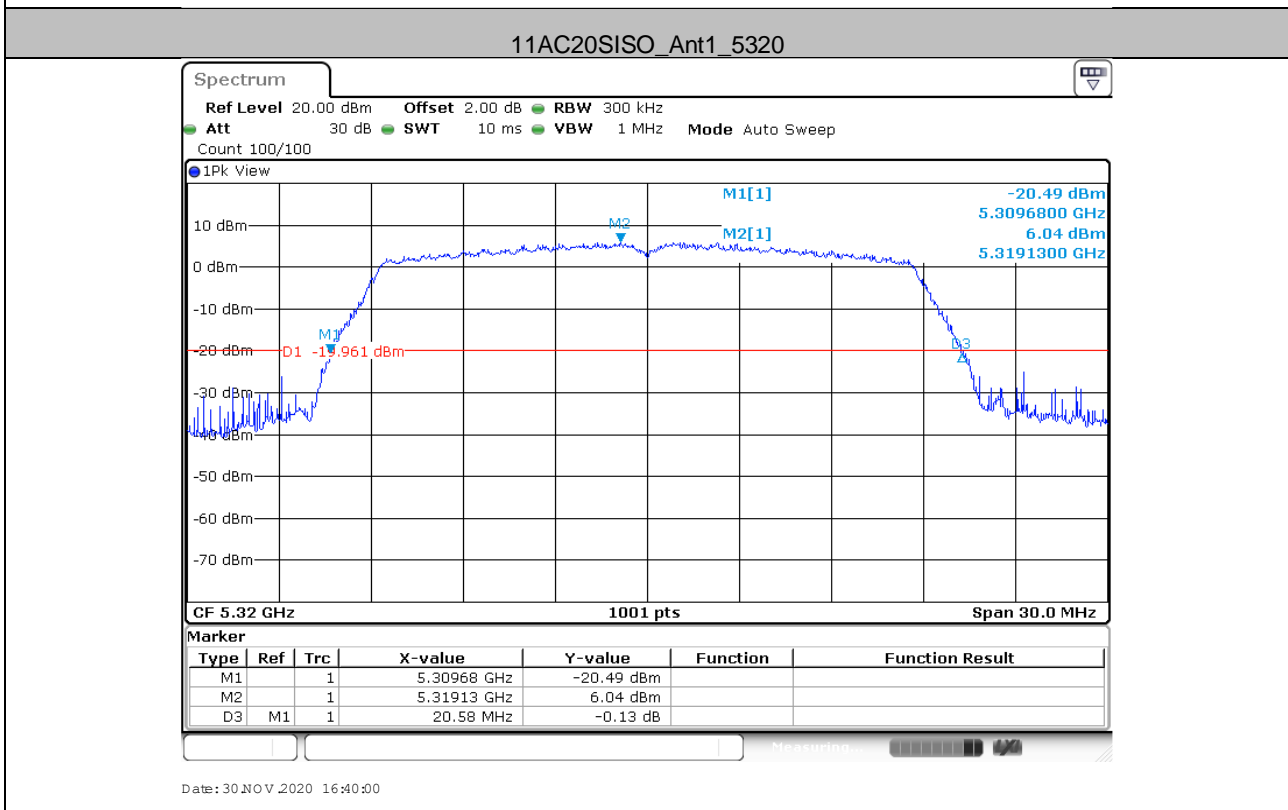
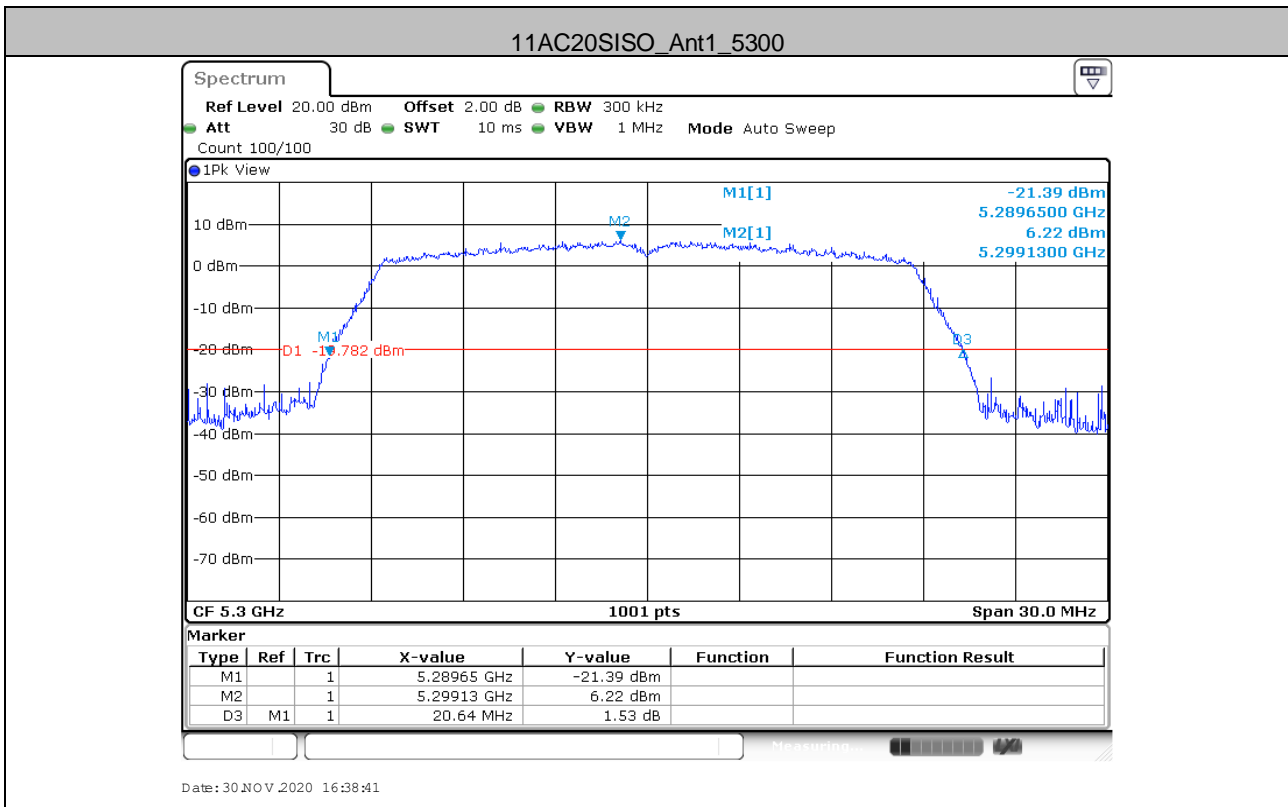


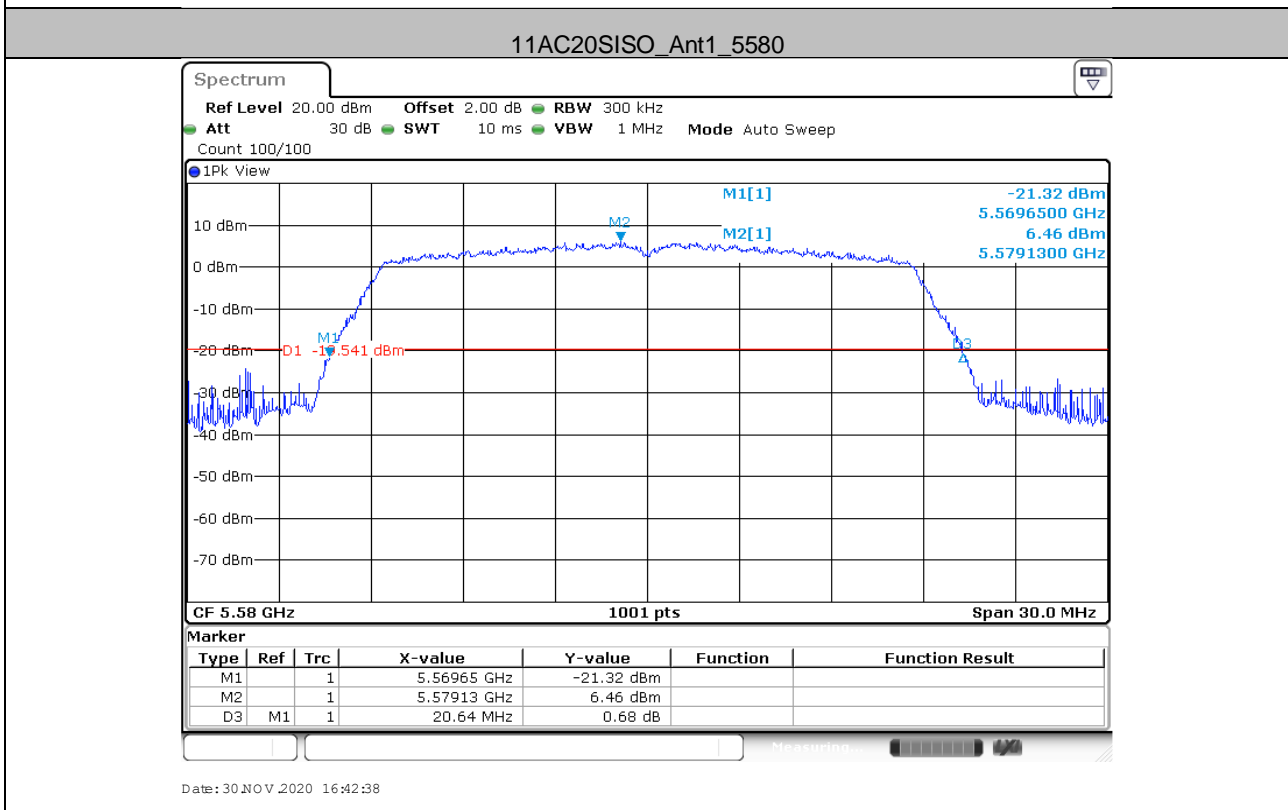
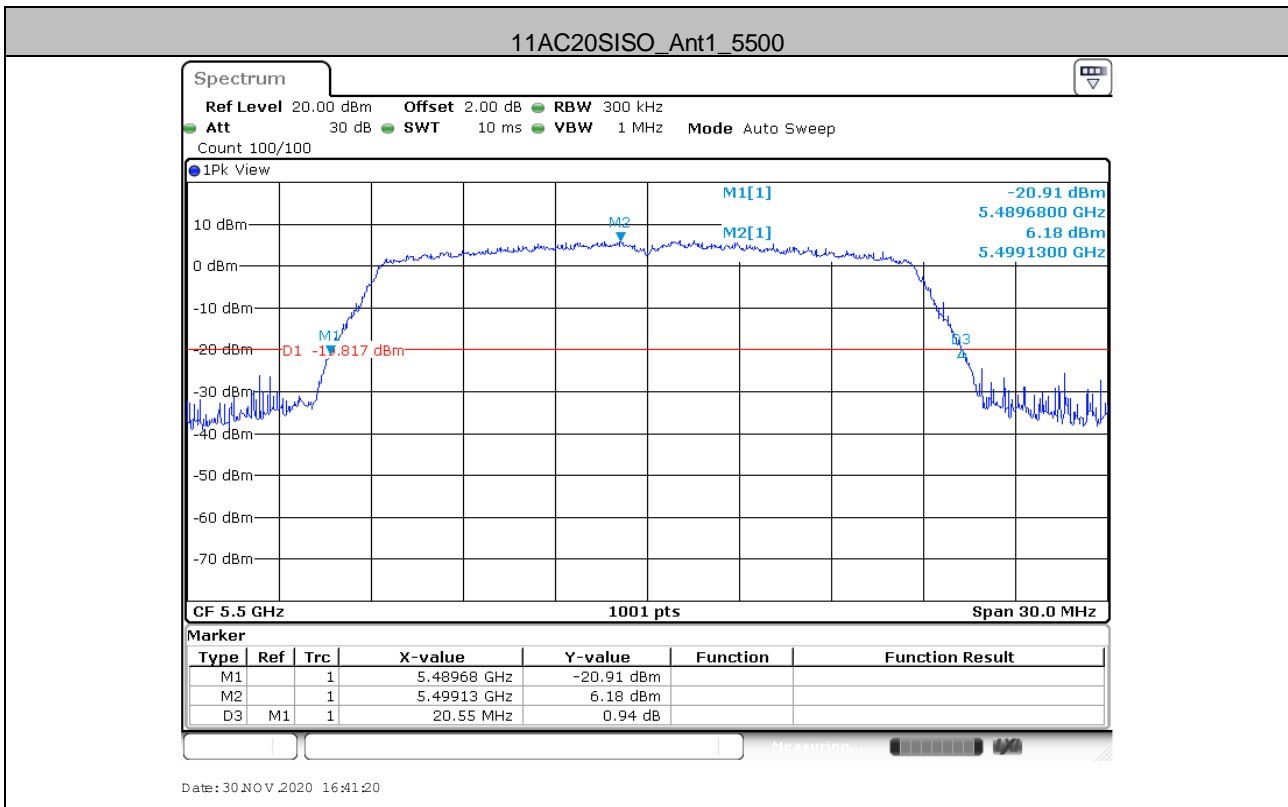


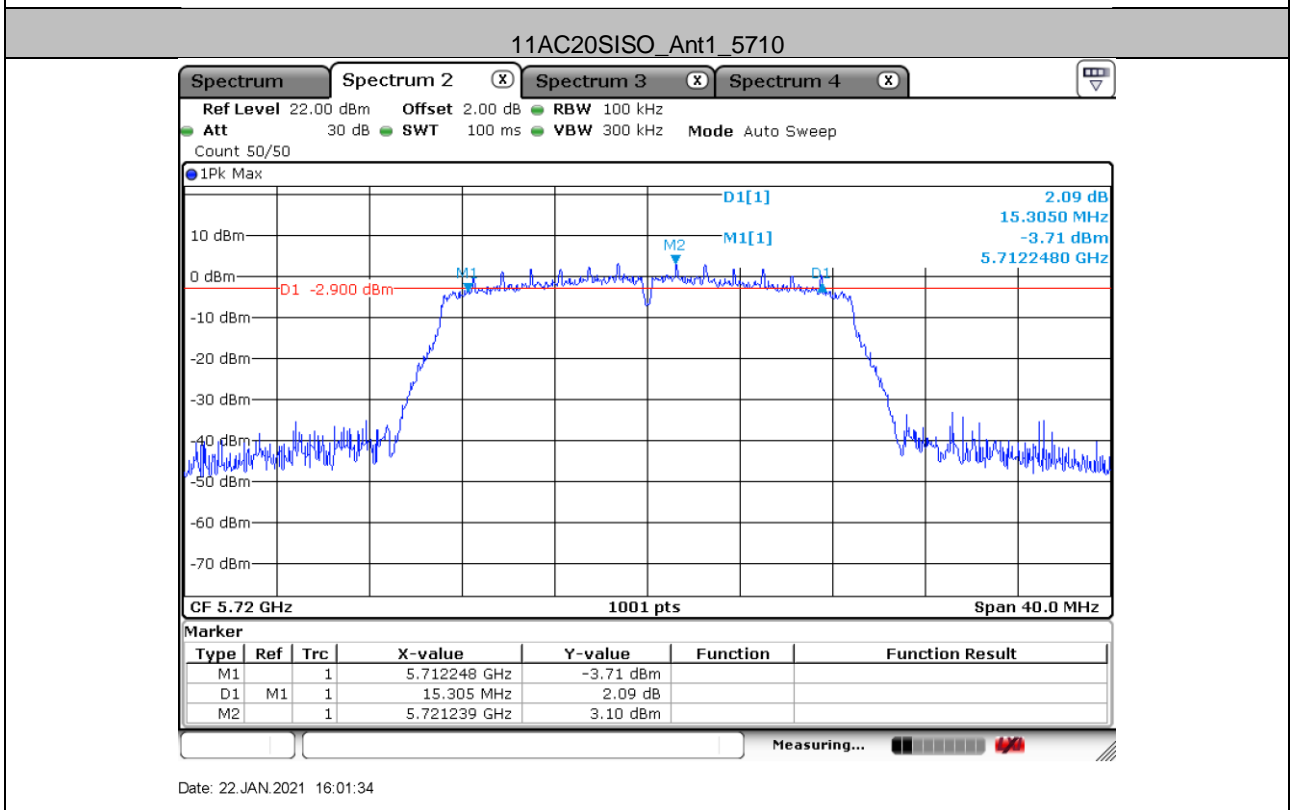
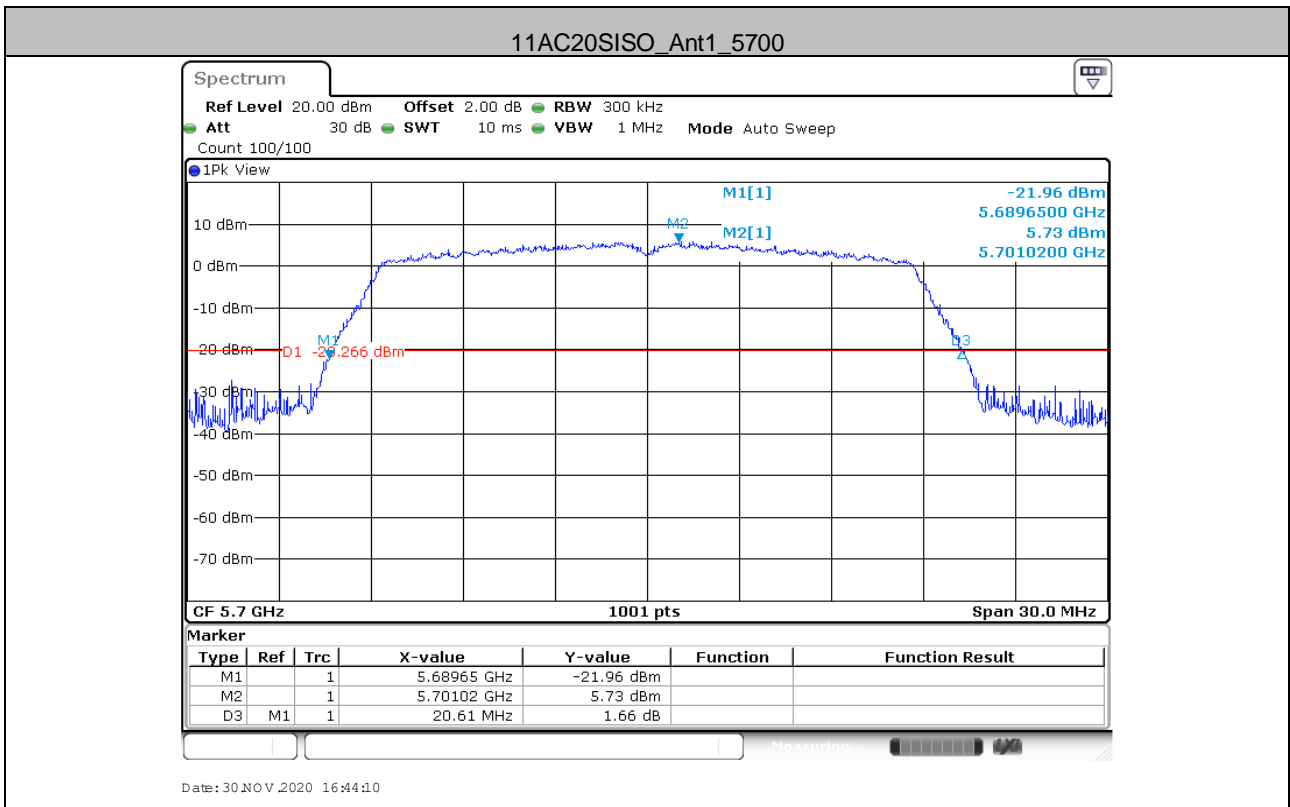






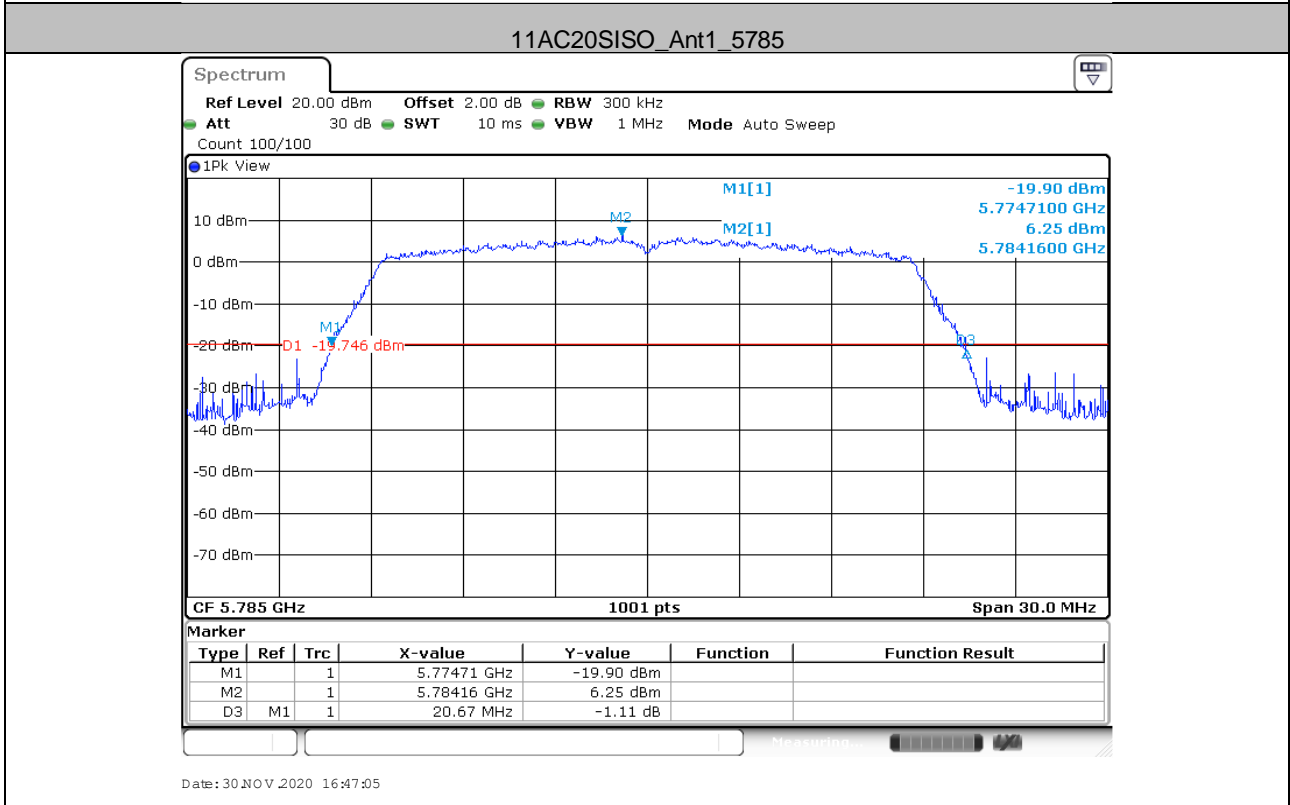
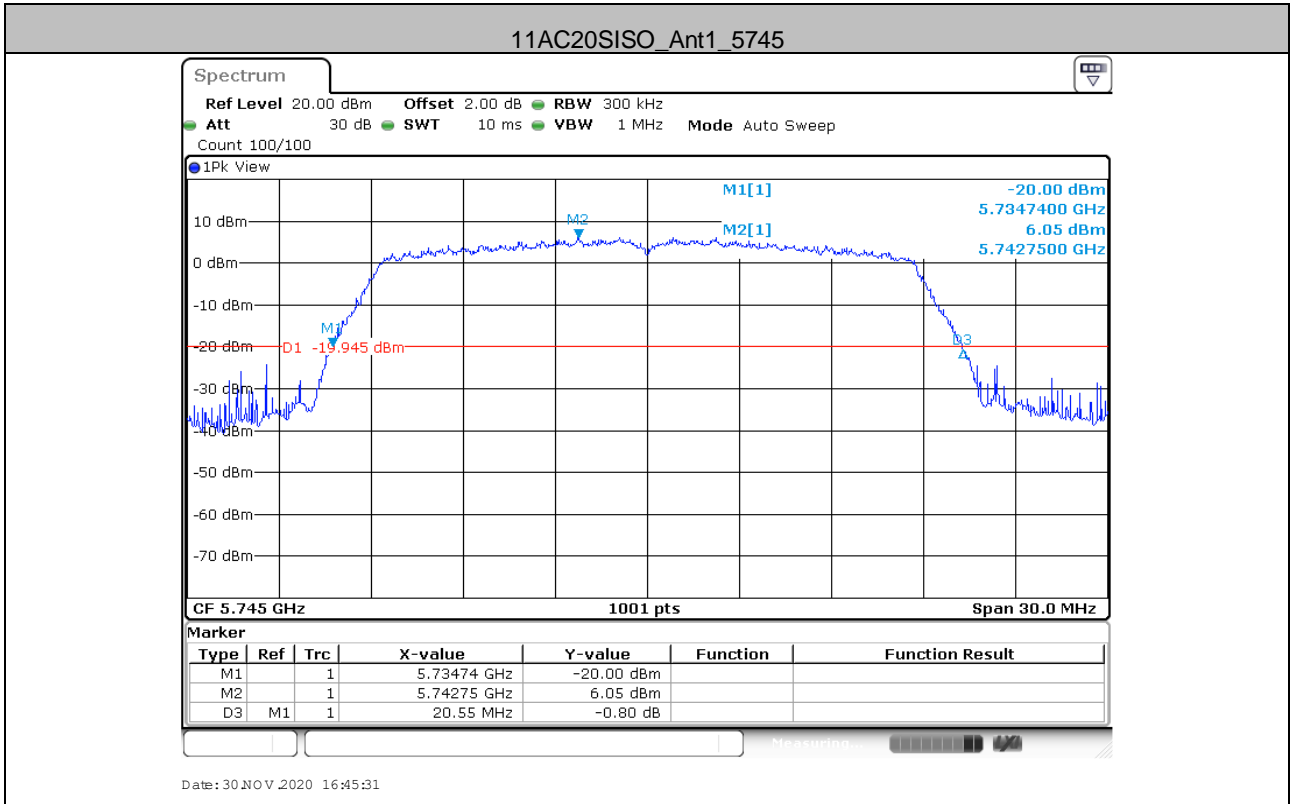


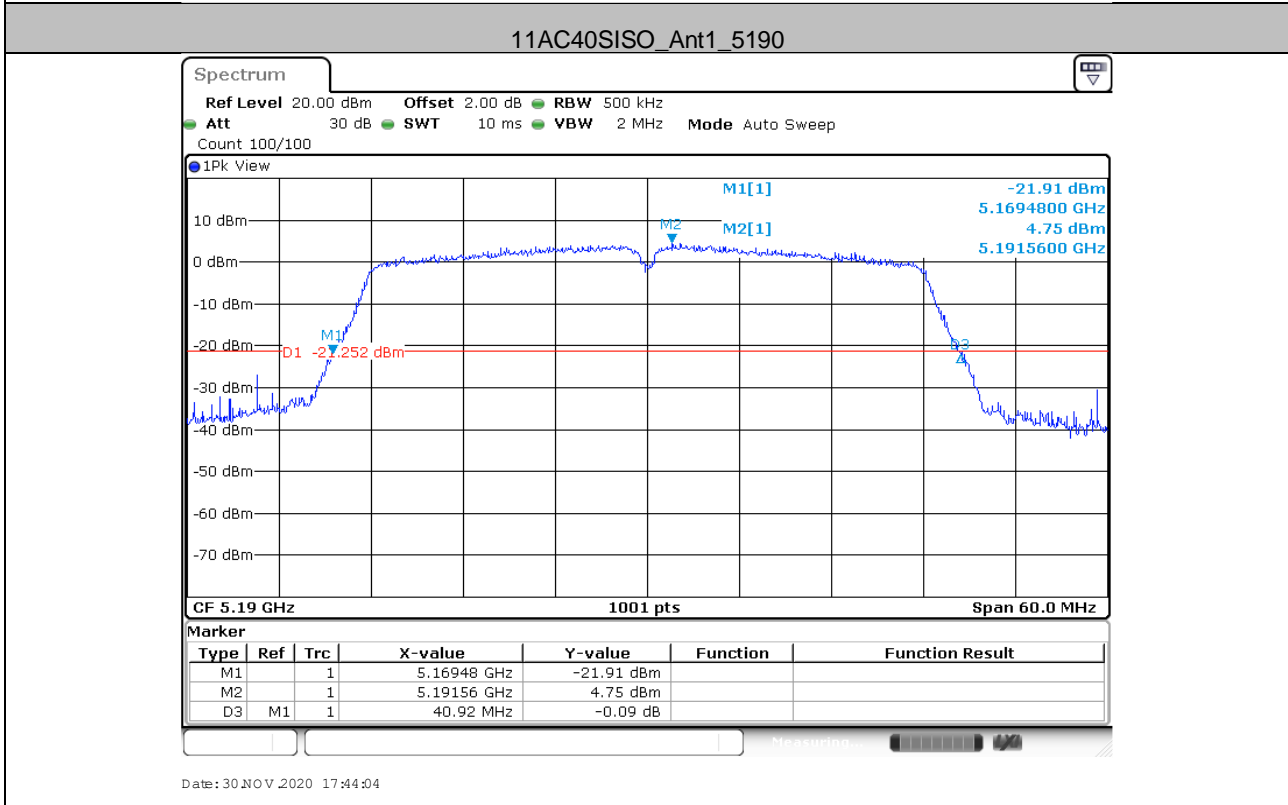
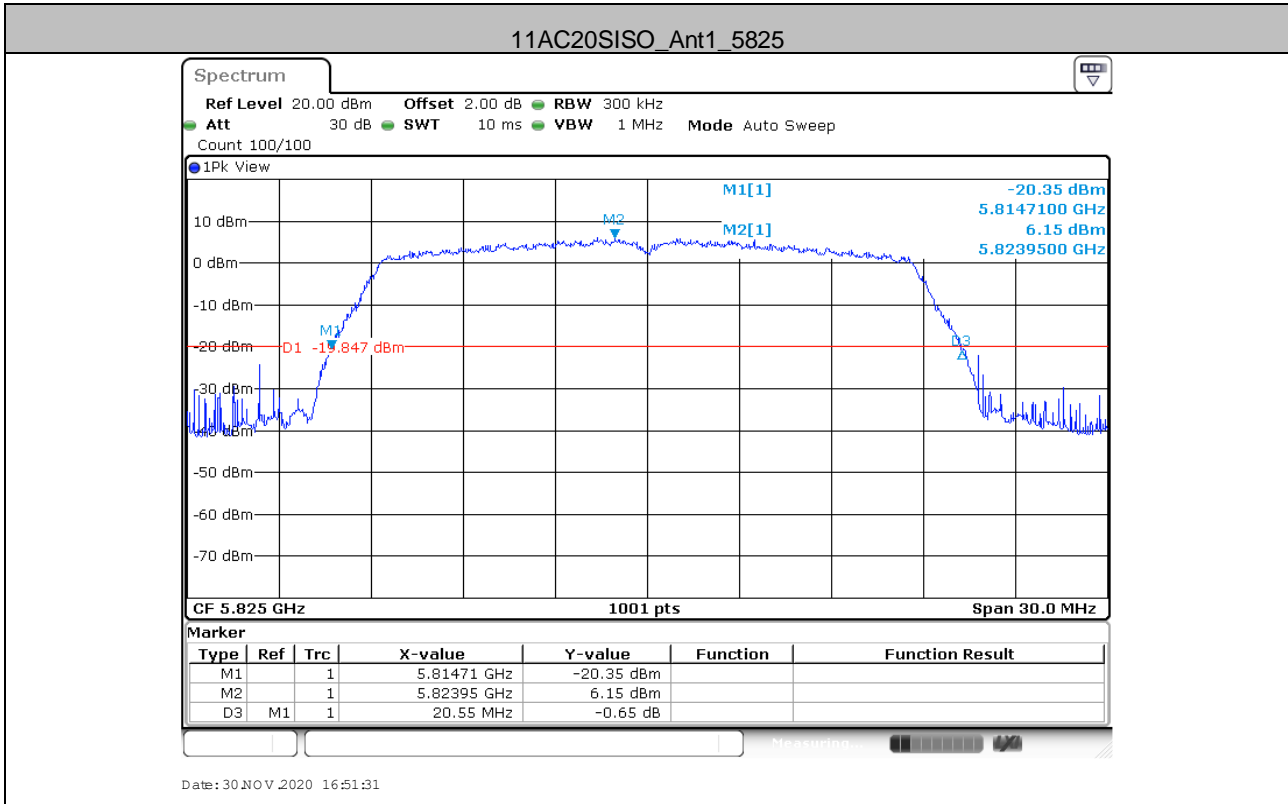


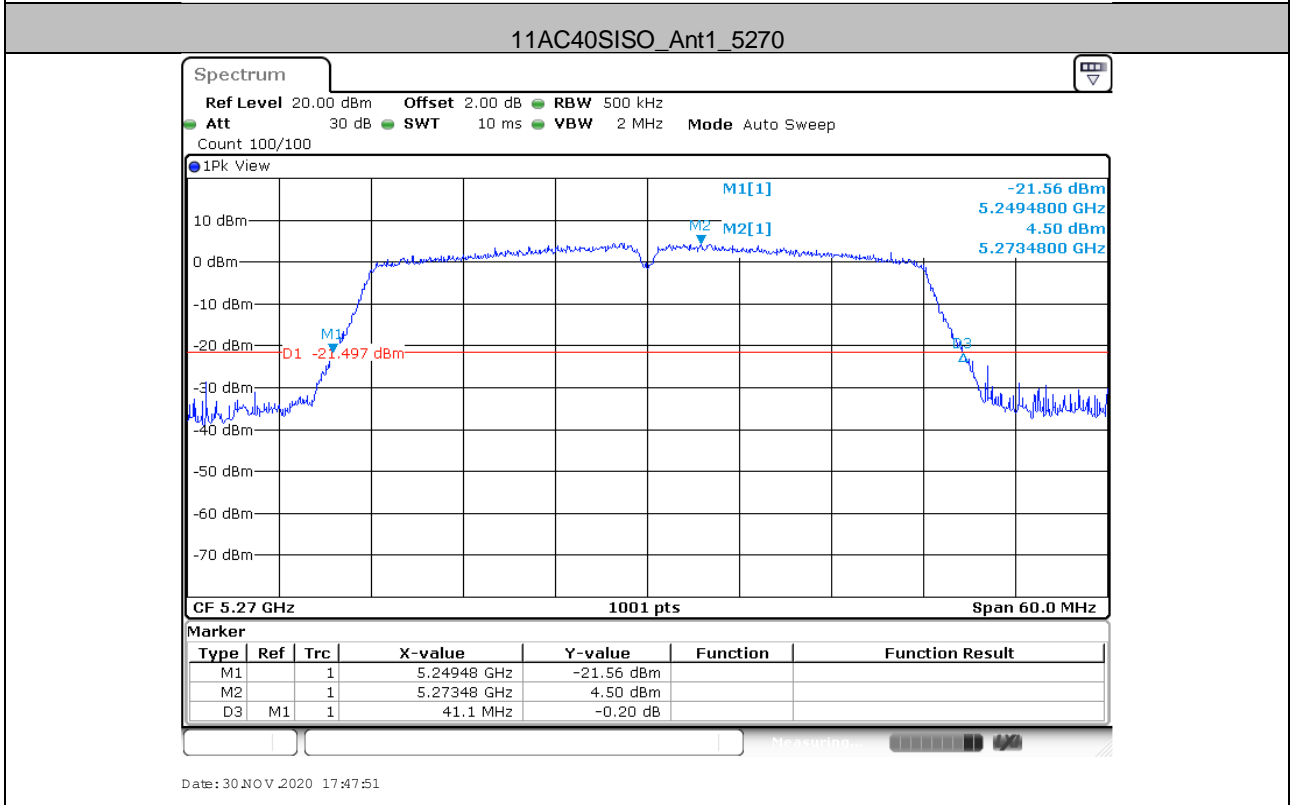
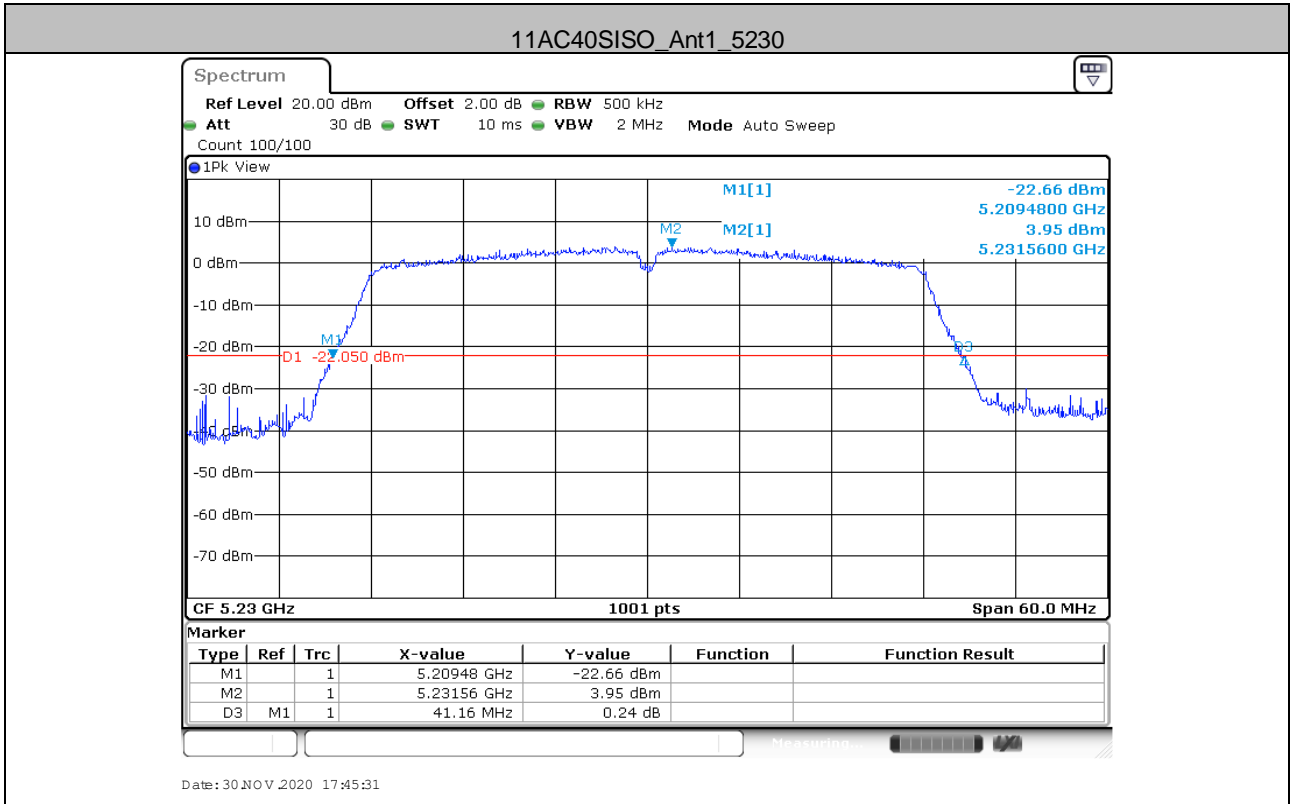


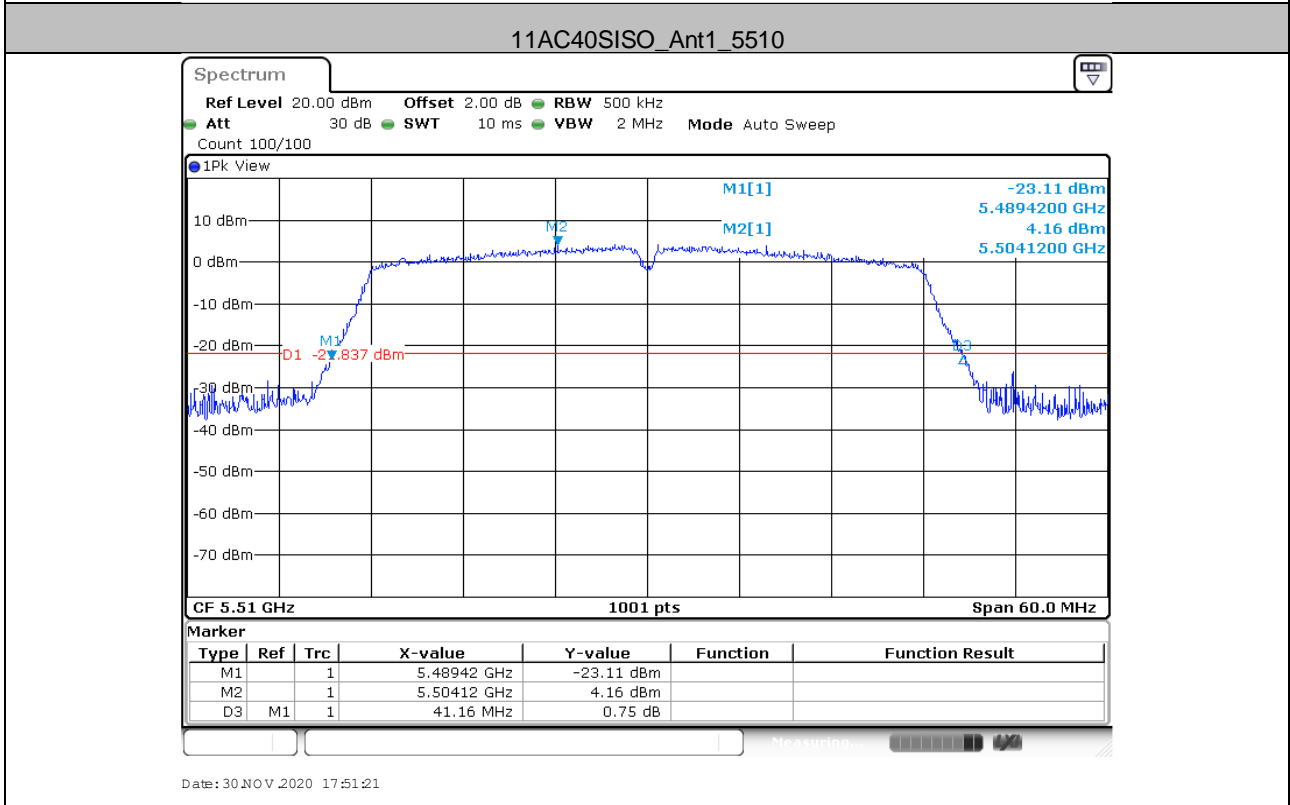
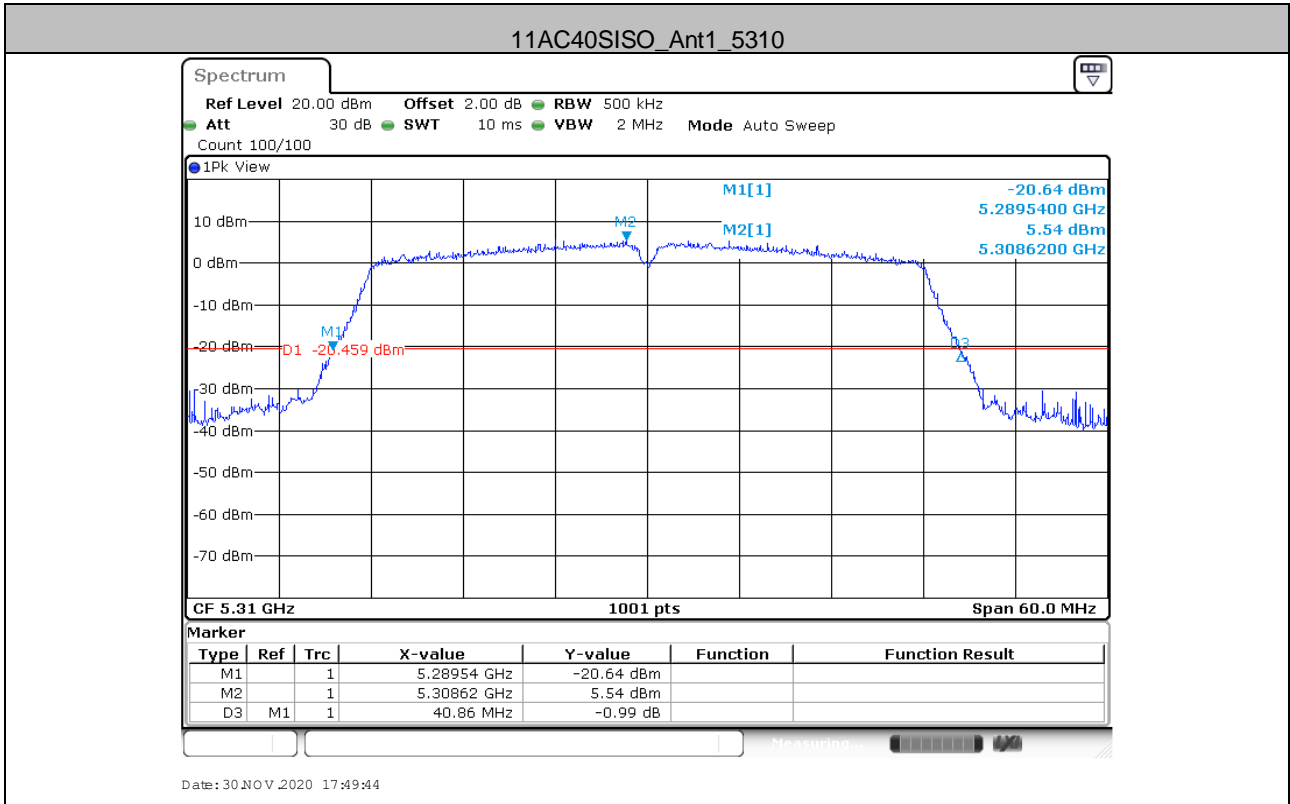
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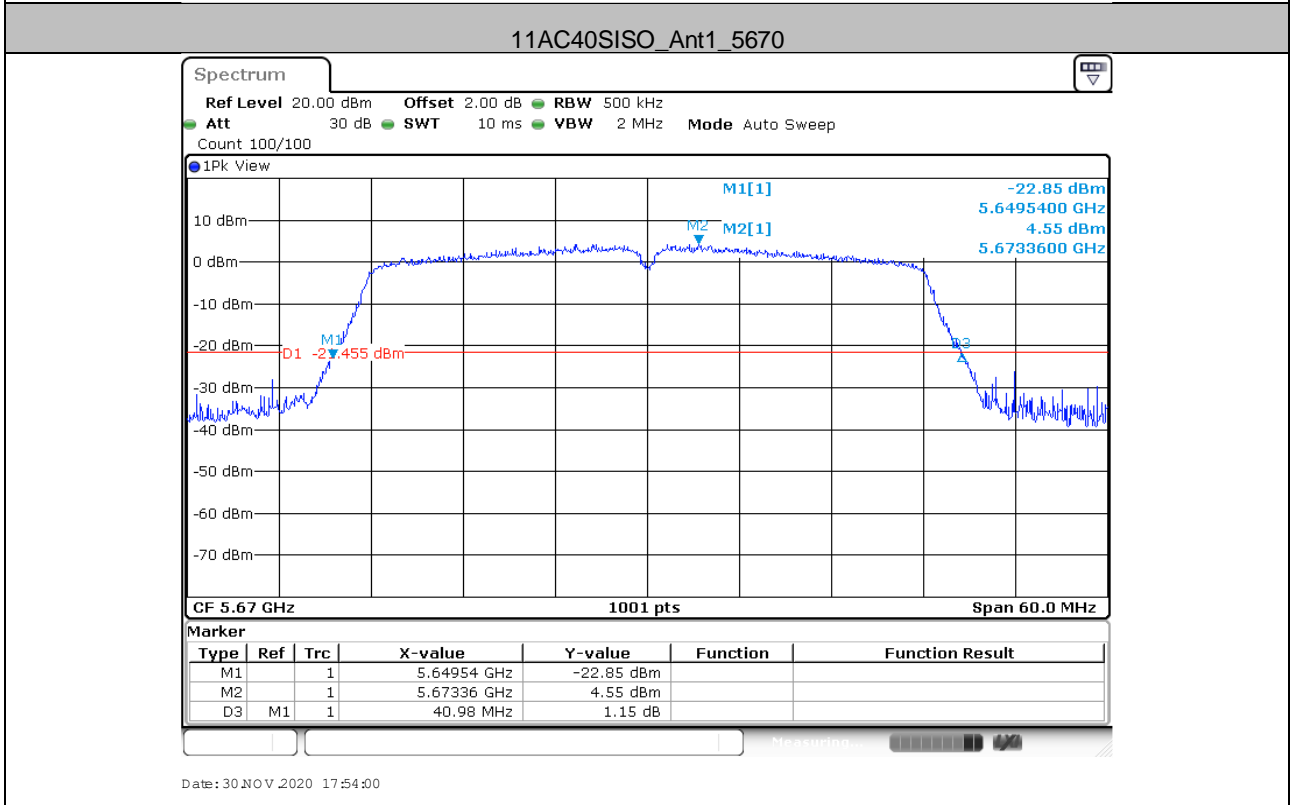
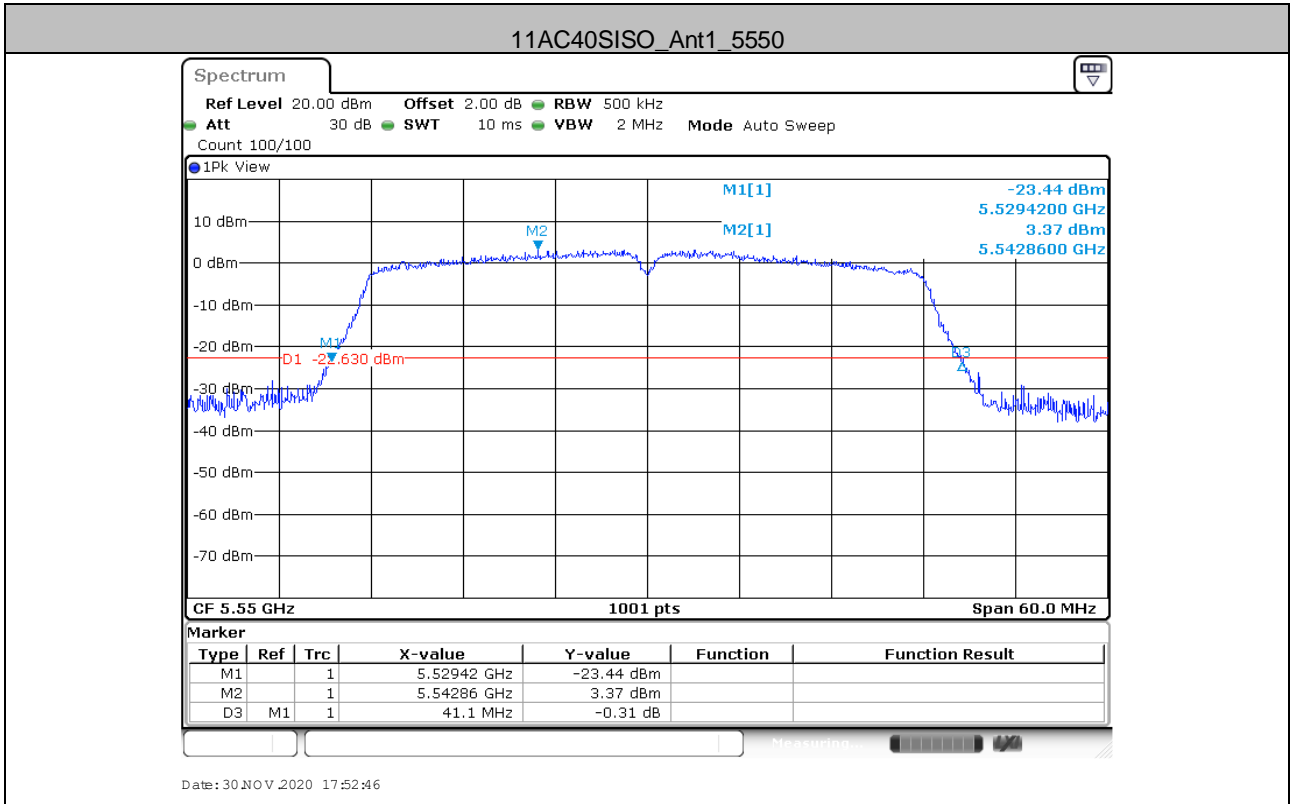
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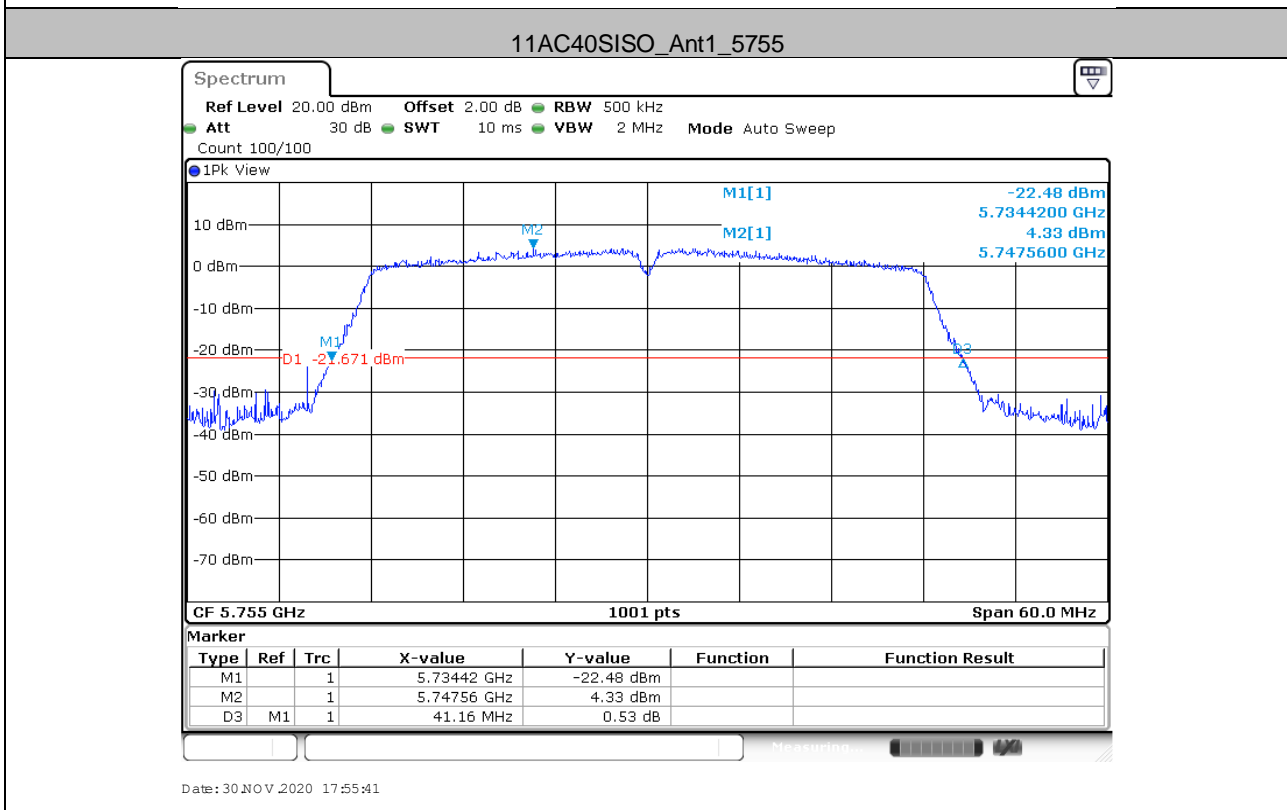
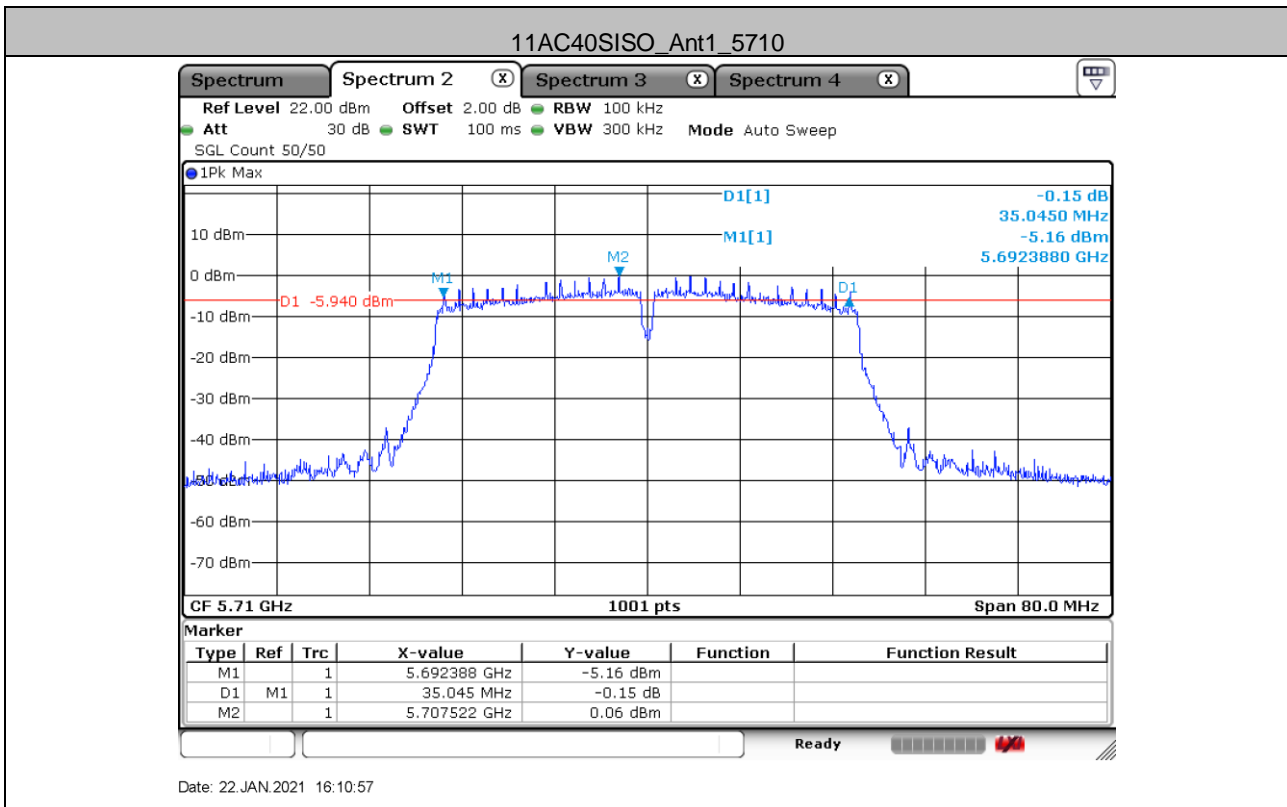






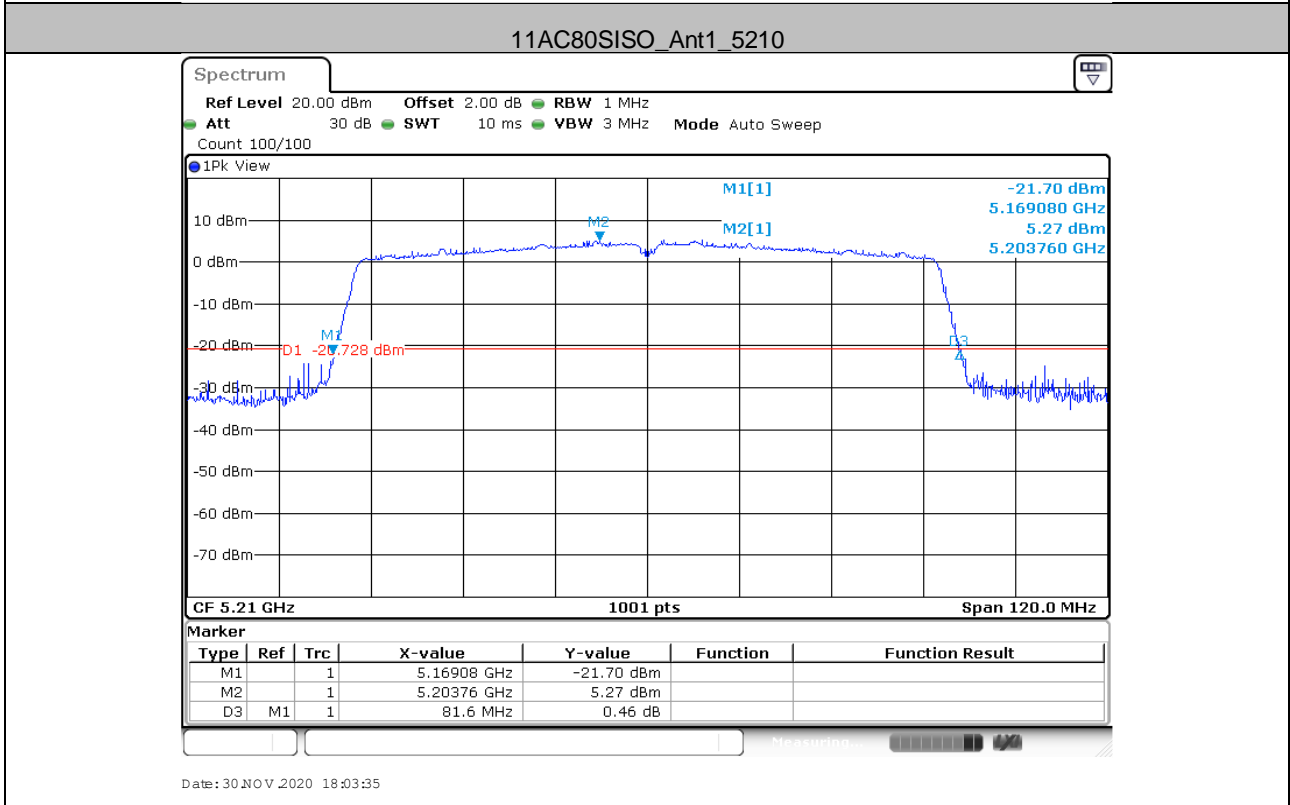
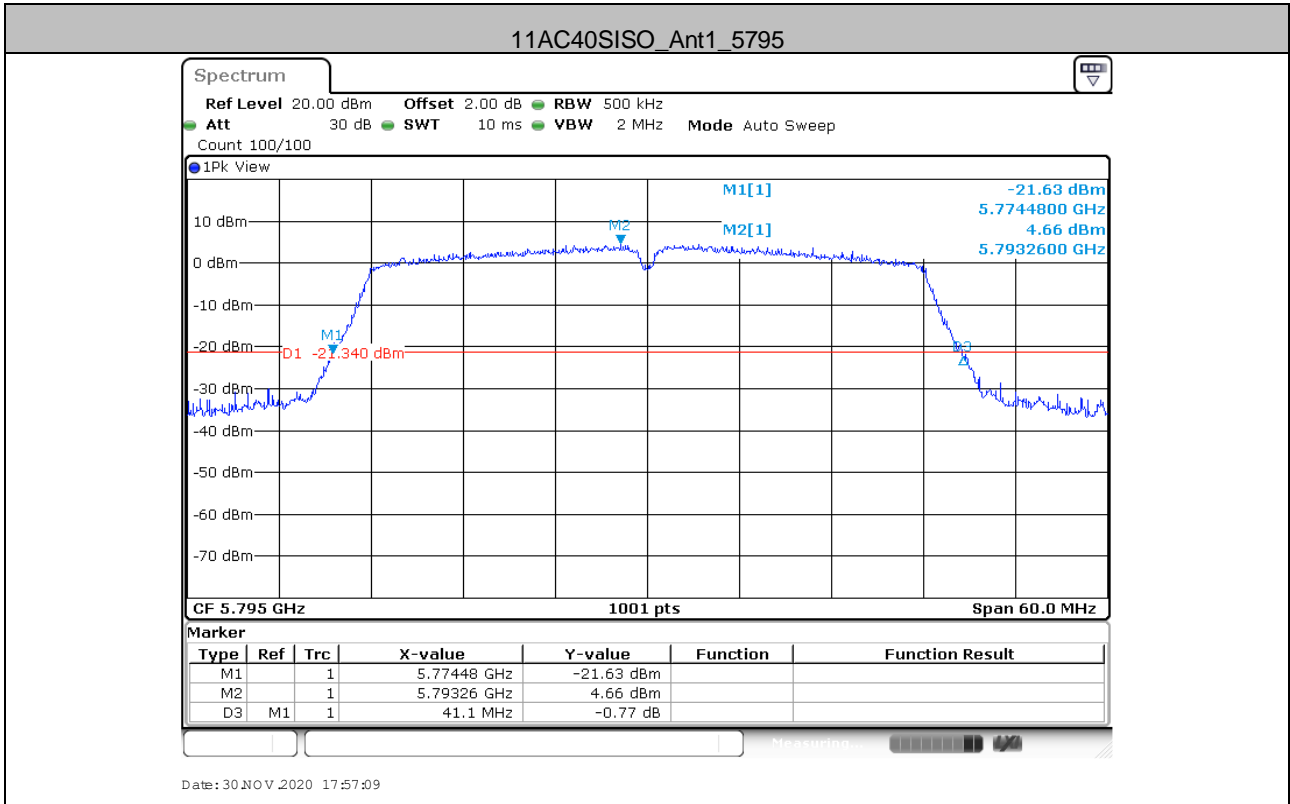
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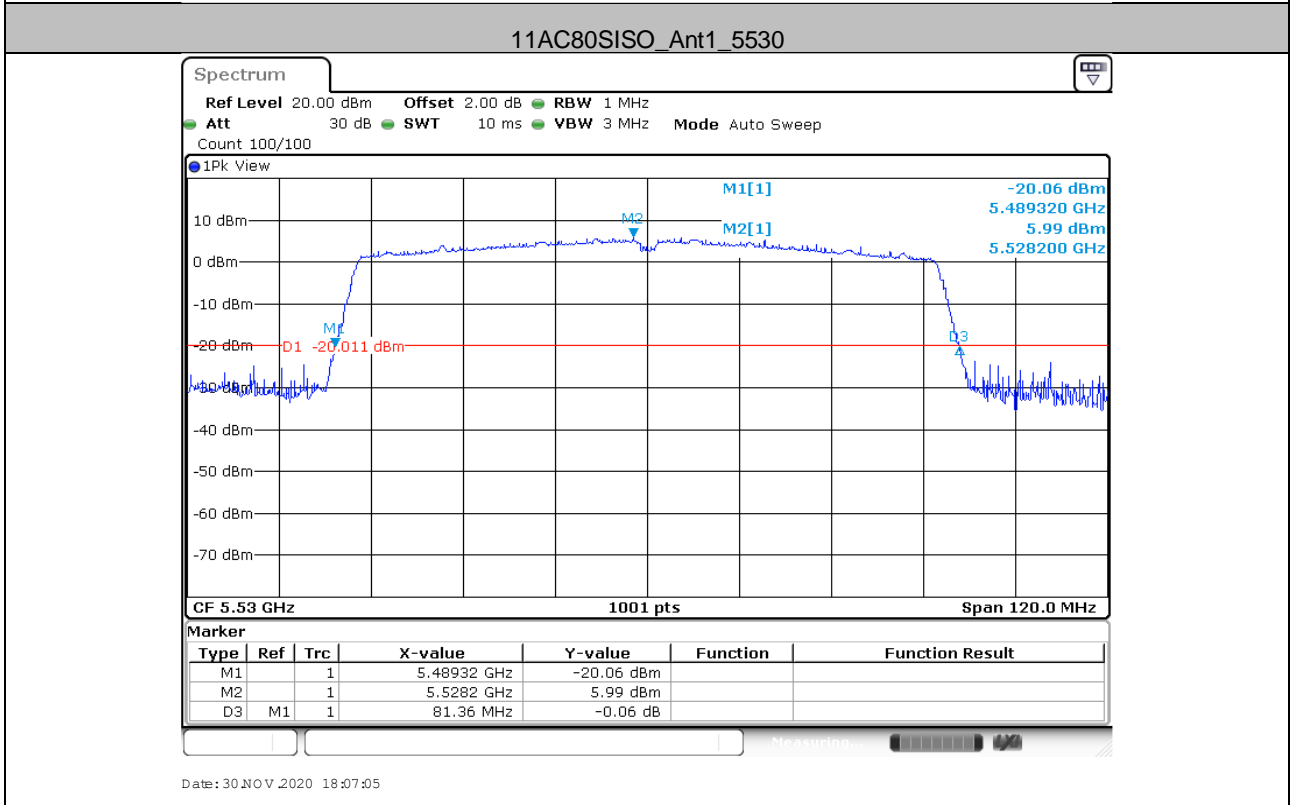
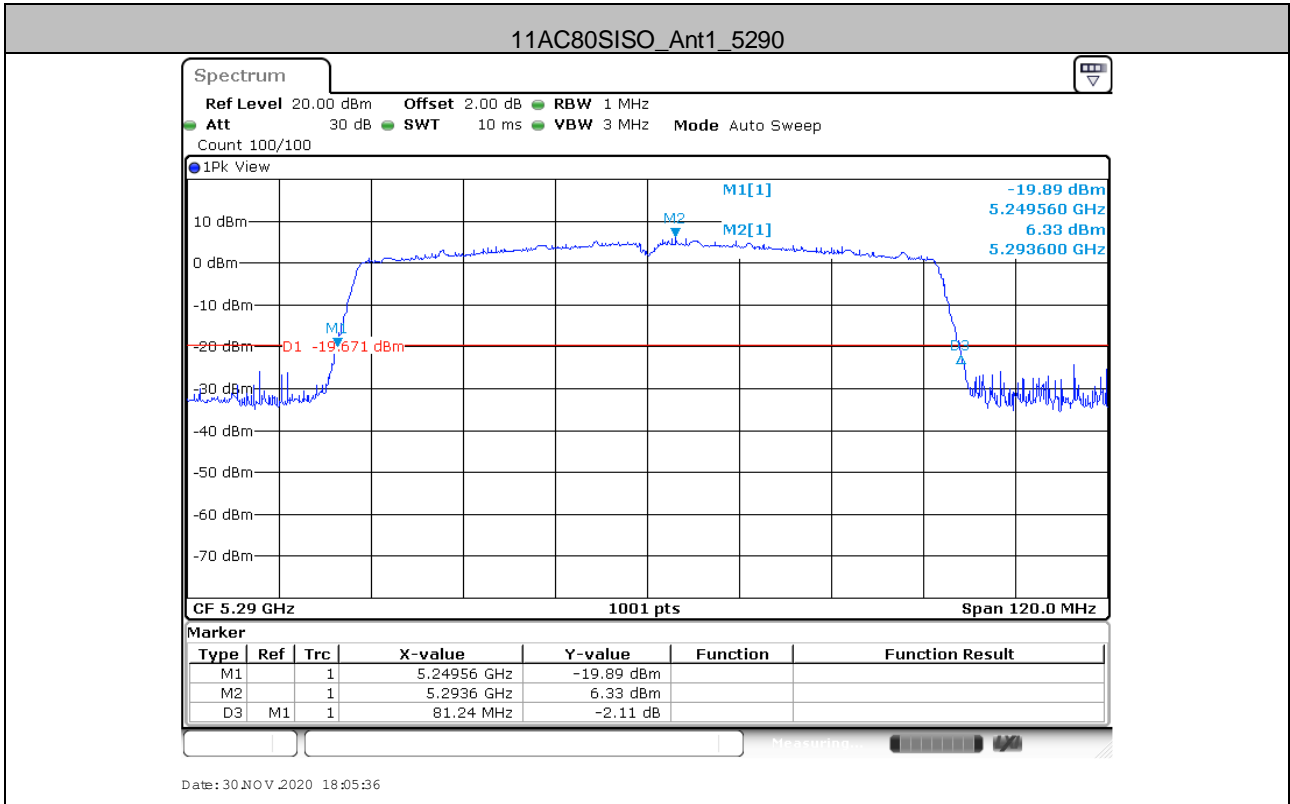
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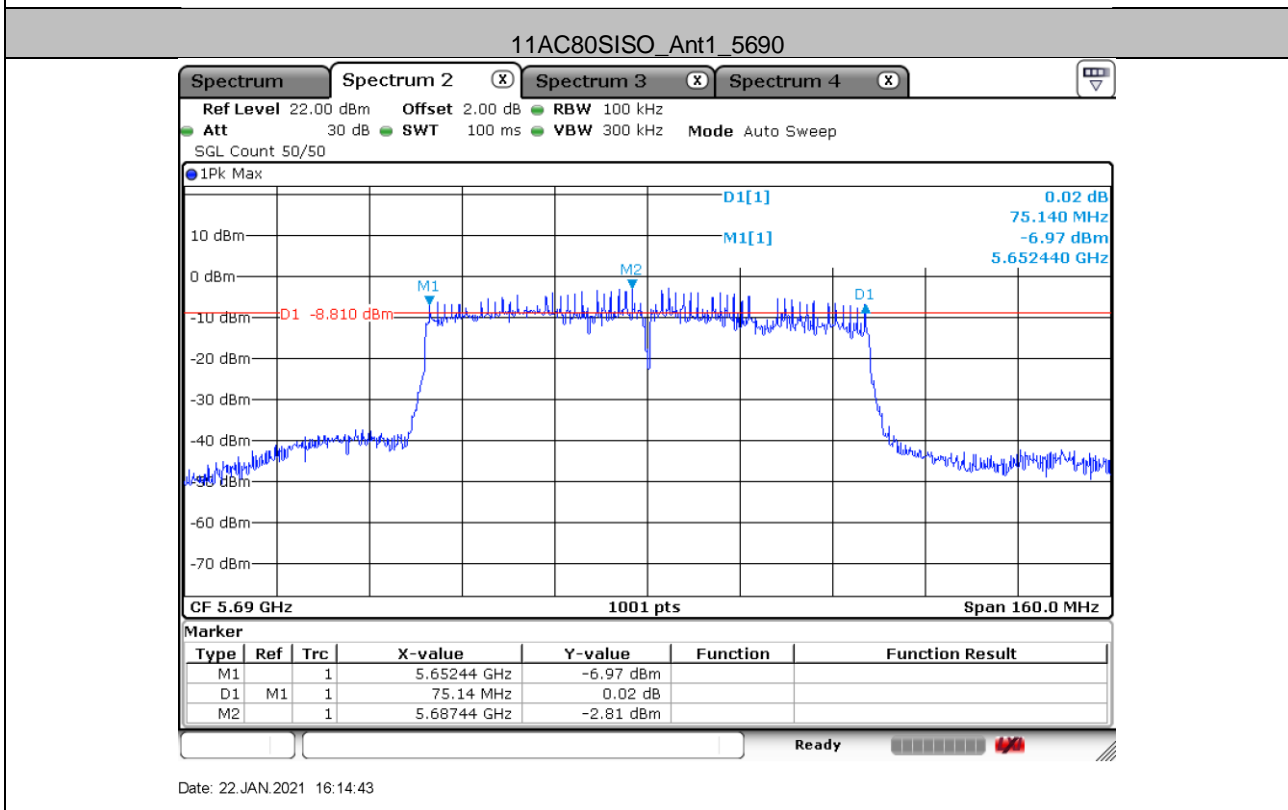
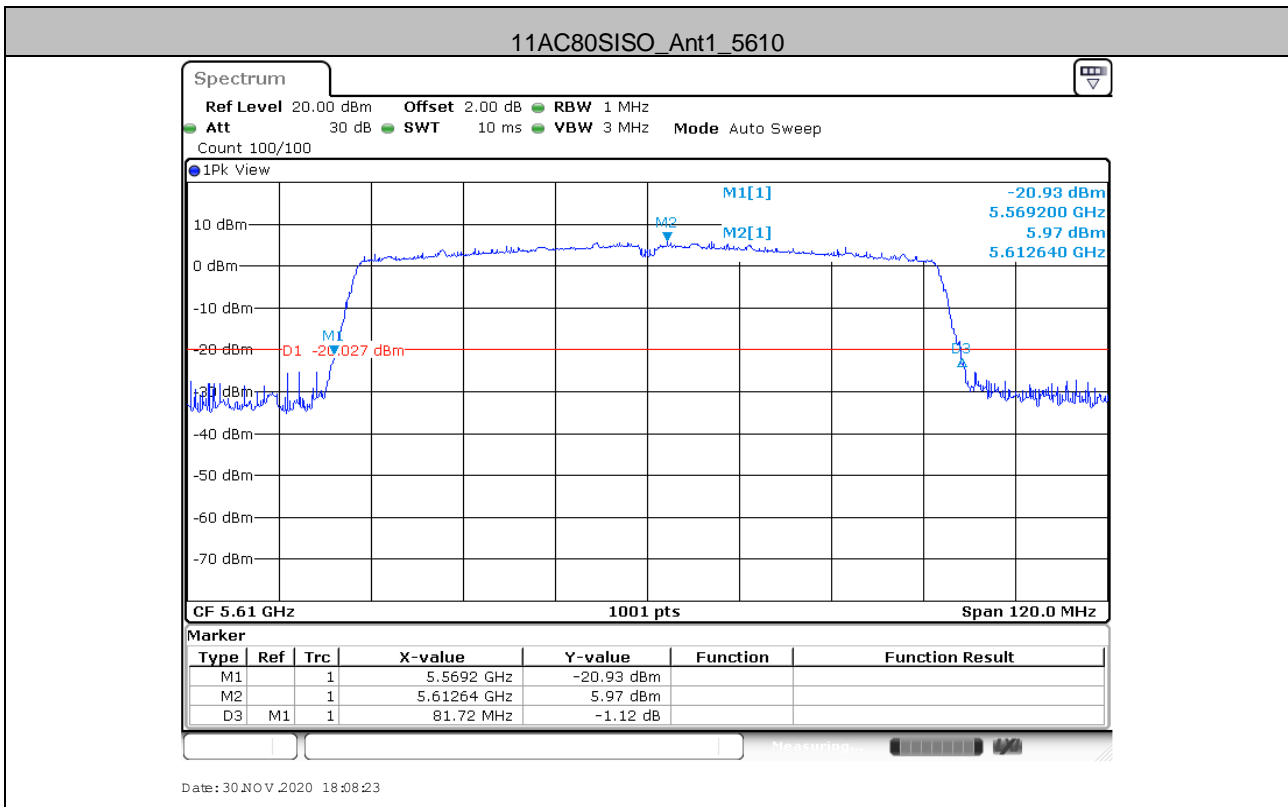
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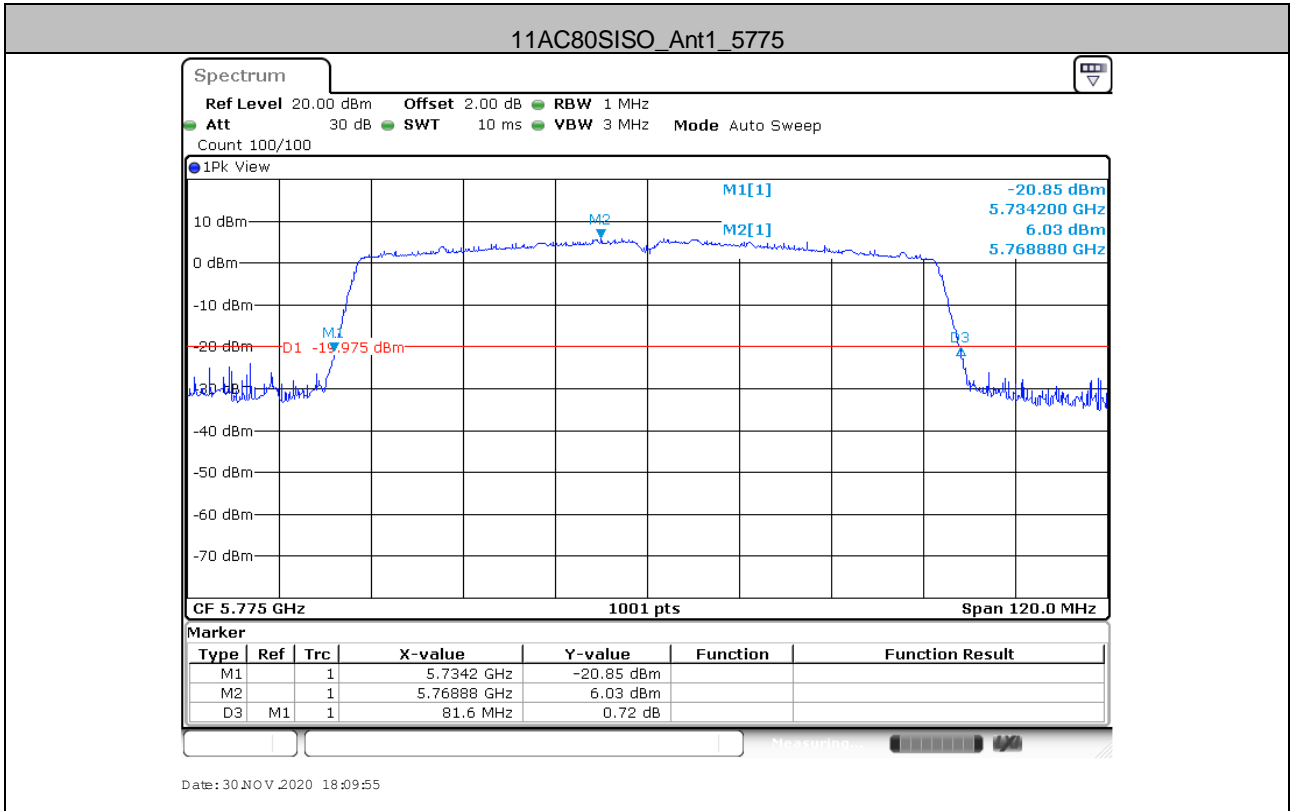
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4.6 6dB Emission Bandwidth

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"> 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(HT20); MCS0 of rate is the worst case of 802.11ac(HT40); MCS0 of rate is the worst case of 802.11ac(HT80). <p>Only the worst case is recorded in the report.</p>	
Limit:	Frequency Band	Limit
	5725-5850MHz	At least 500kHz
Test Results:	Pass	



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4.6.1 Test Results for 6dB Emission Bandwidth

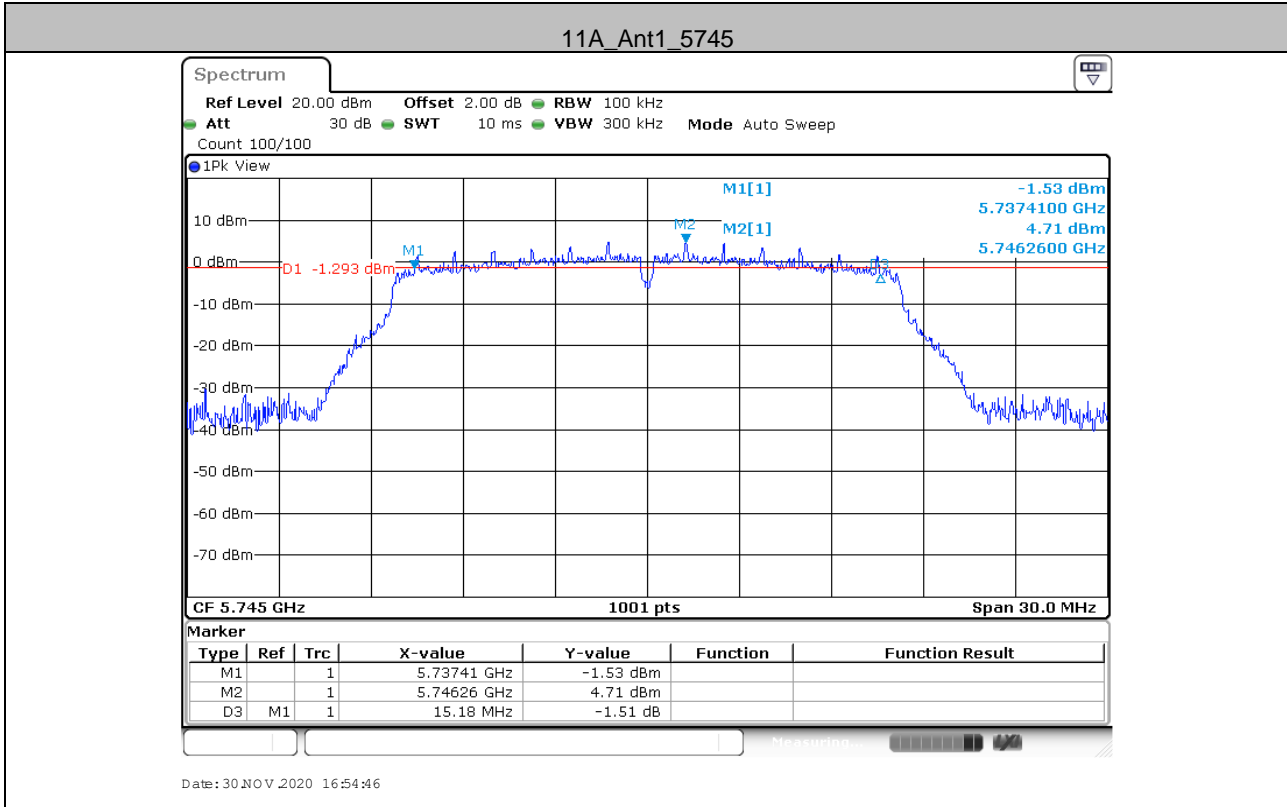
Test Mode	Test Channel	Frequency [MHz]	ANT	6dB Emission Bandwidth [MHz]	Verdict
11A20	149	5745	ANT 1	15.180	PASS
	157	5785	ANT 1	15.210	PASS
	165	5825	ANT 1	15.210	PASS
11N20	149	5745	ANT 1	15.180	PASS
	157	5785	ANT 1	15.120	PASS
	165	5825	ANT 1	15.150	PASS
11N40	151	5755	ANT 1	35.280	PASS
	159	5795	ANT 1	35.280	PASS
11AC20	149	5745	ANT 1	15.210	PASS
	157	5785	ANT 1	15.210	PASS
	165	5825	ANT 1	15.210	PASS
11AC40	151	5755	ANT 1	35.280	PASS
	159	5795	ANT 1	35.280	PASS
11AC80	155	5775	ANT 1	75.360	PASS

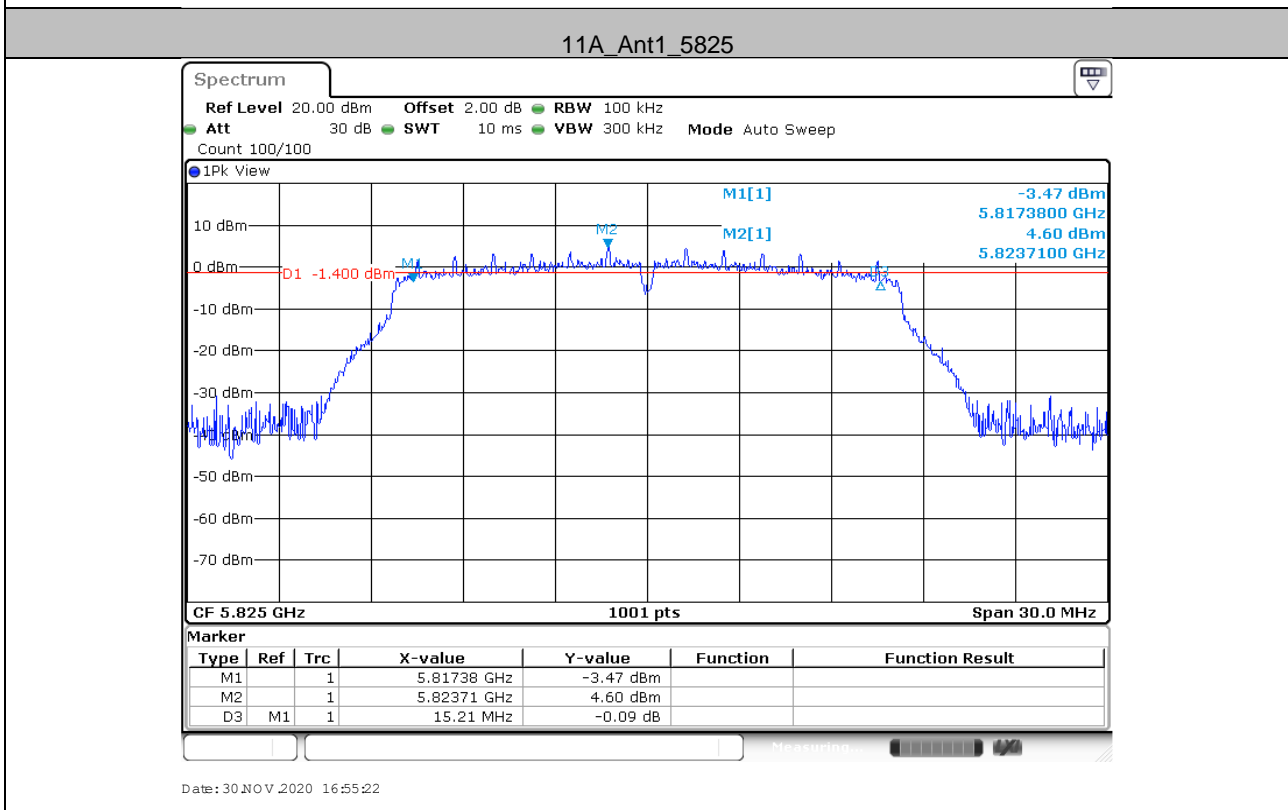
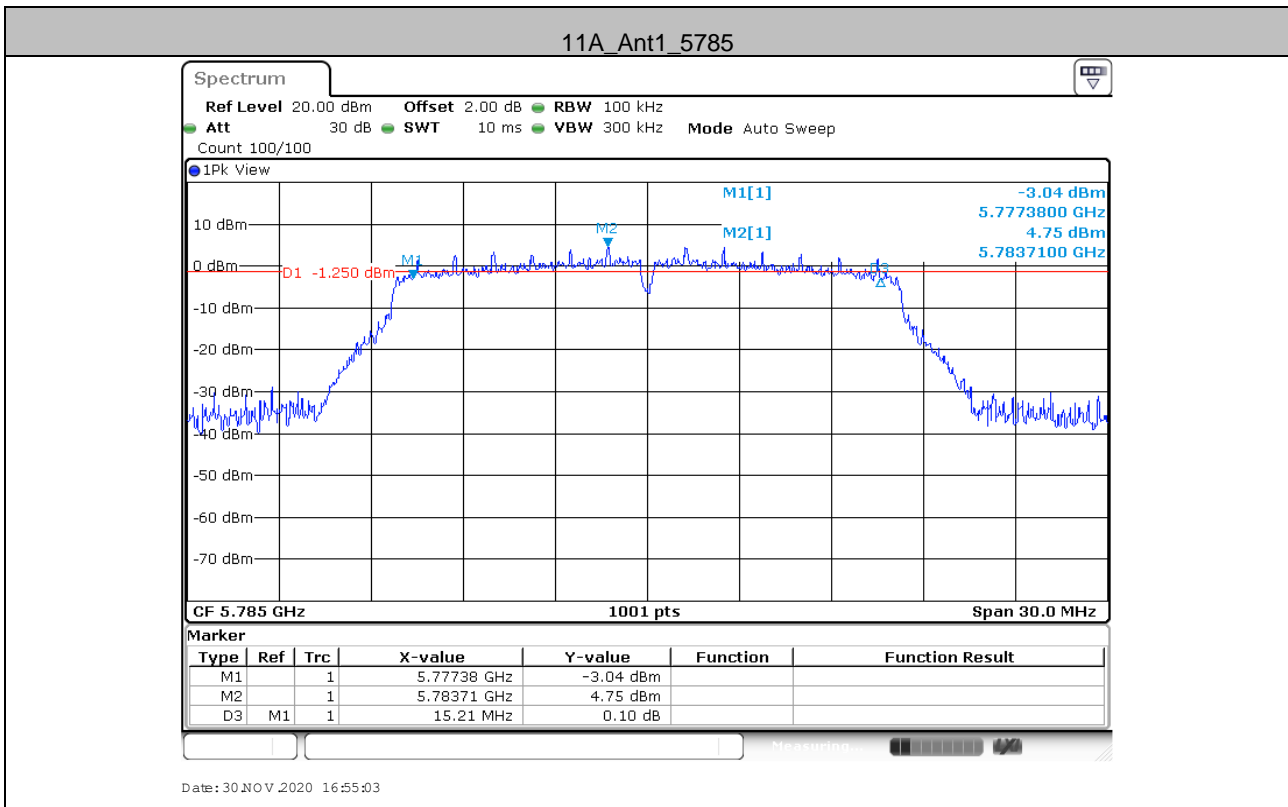


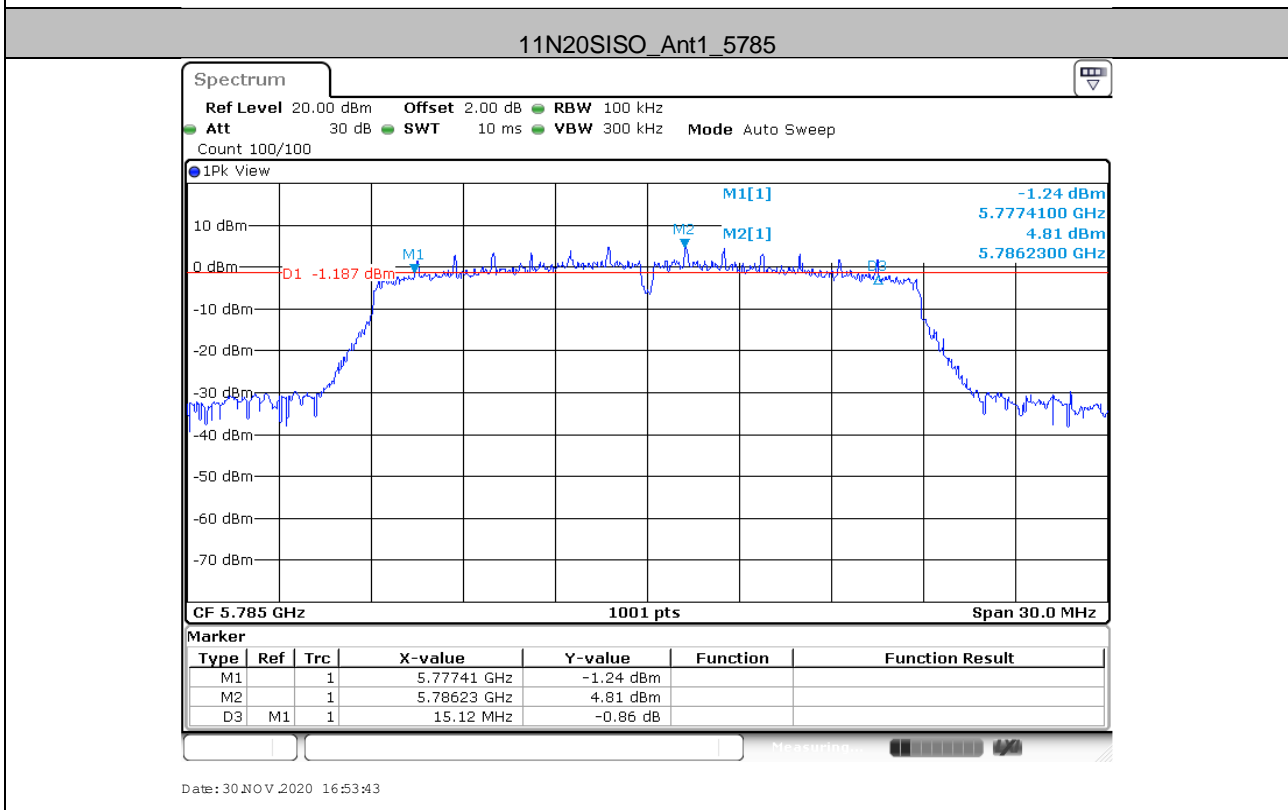
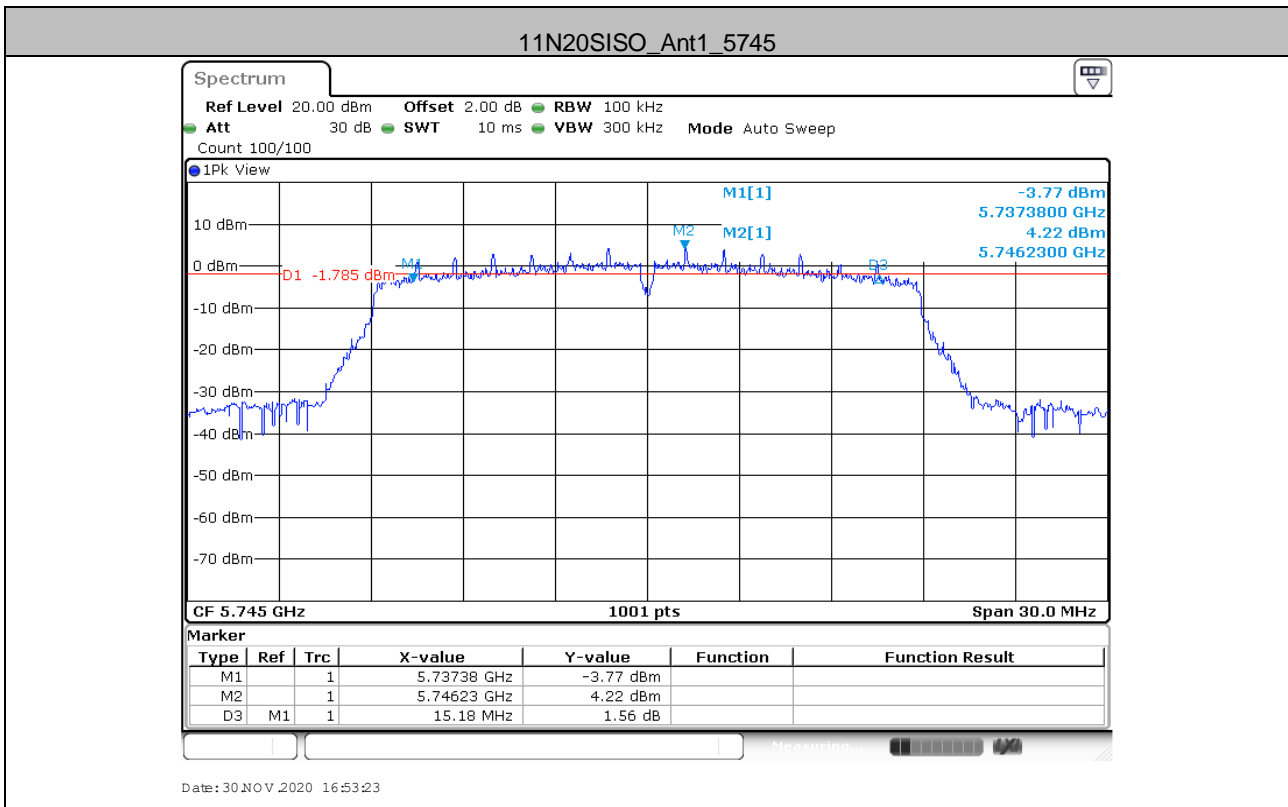
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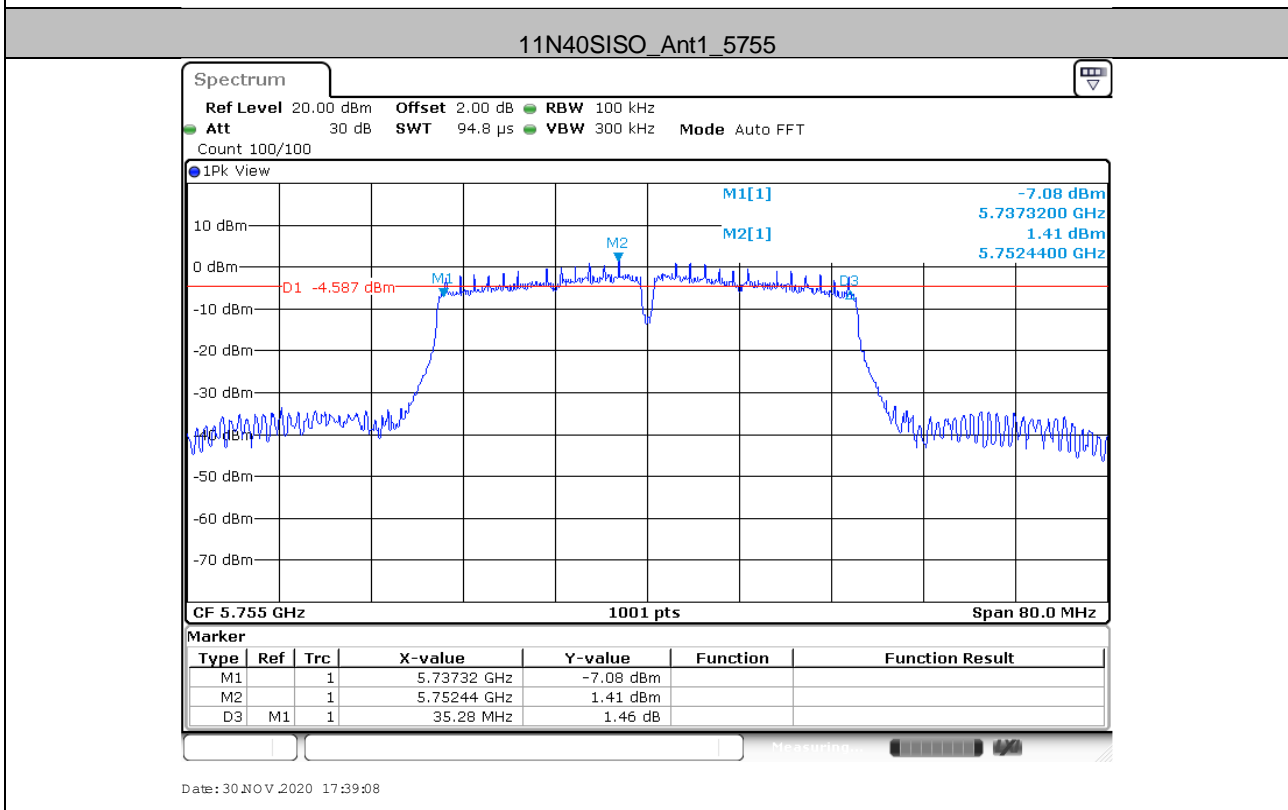
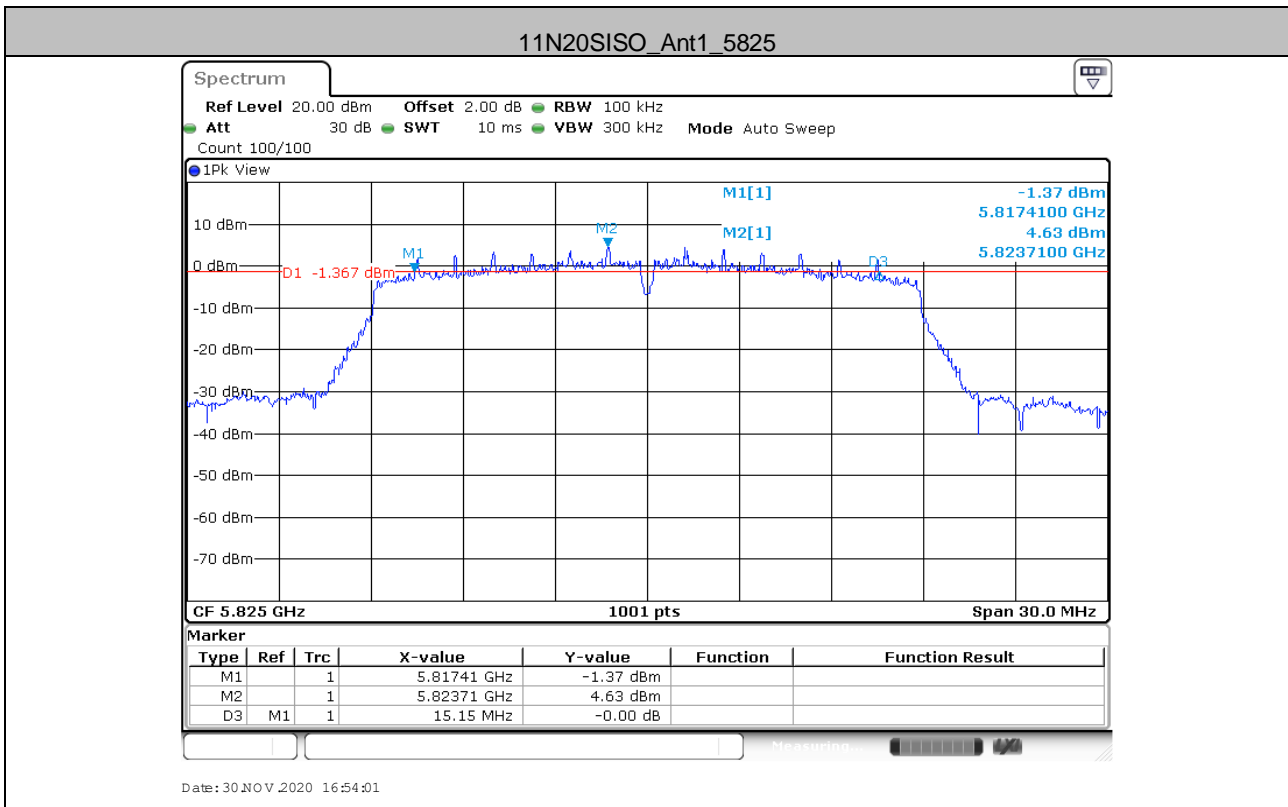
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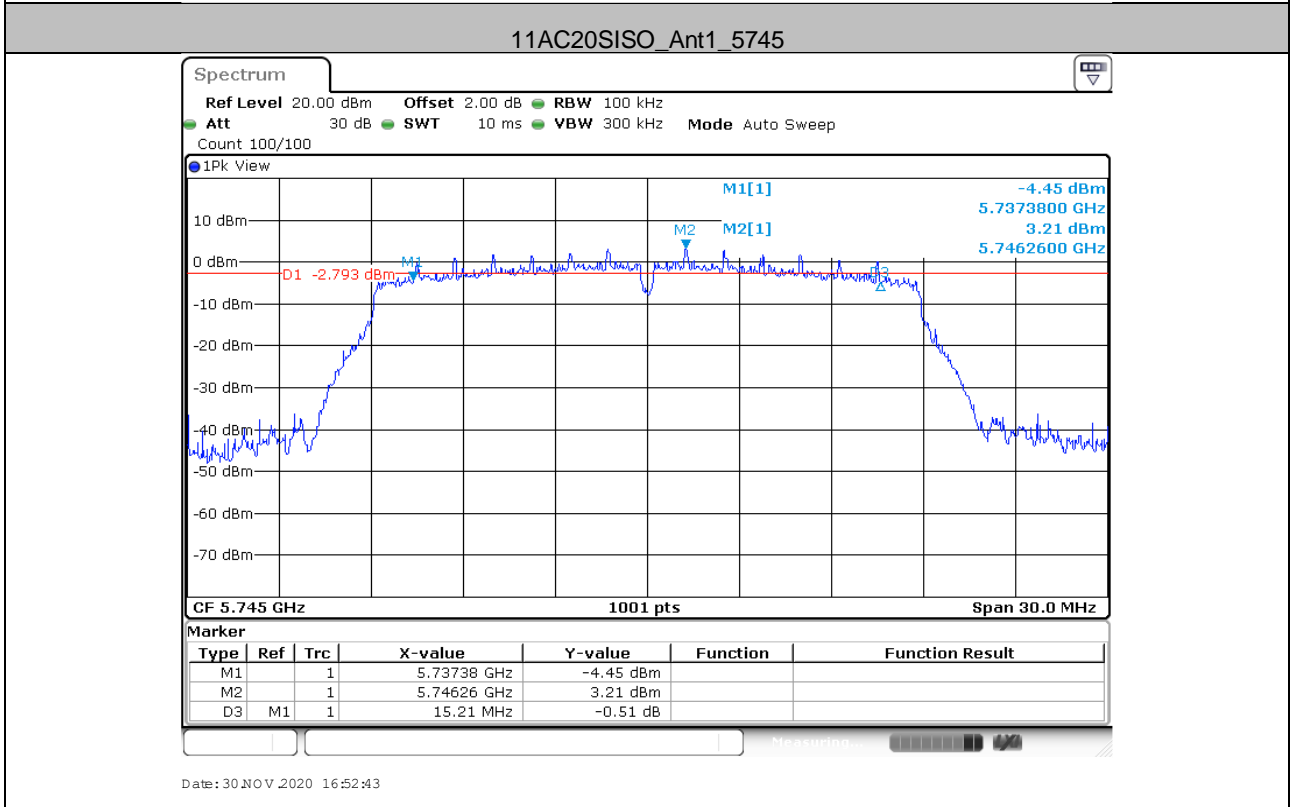
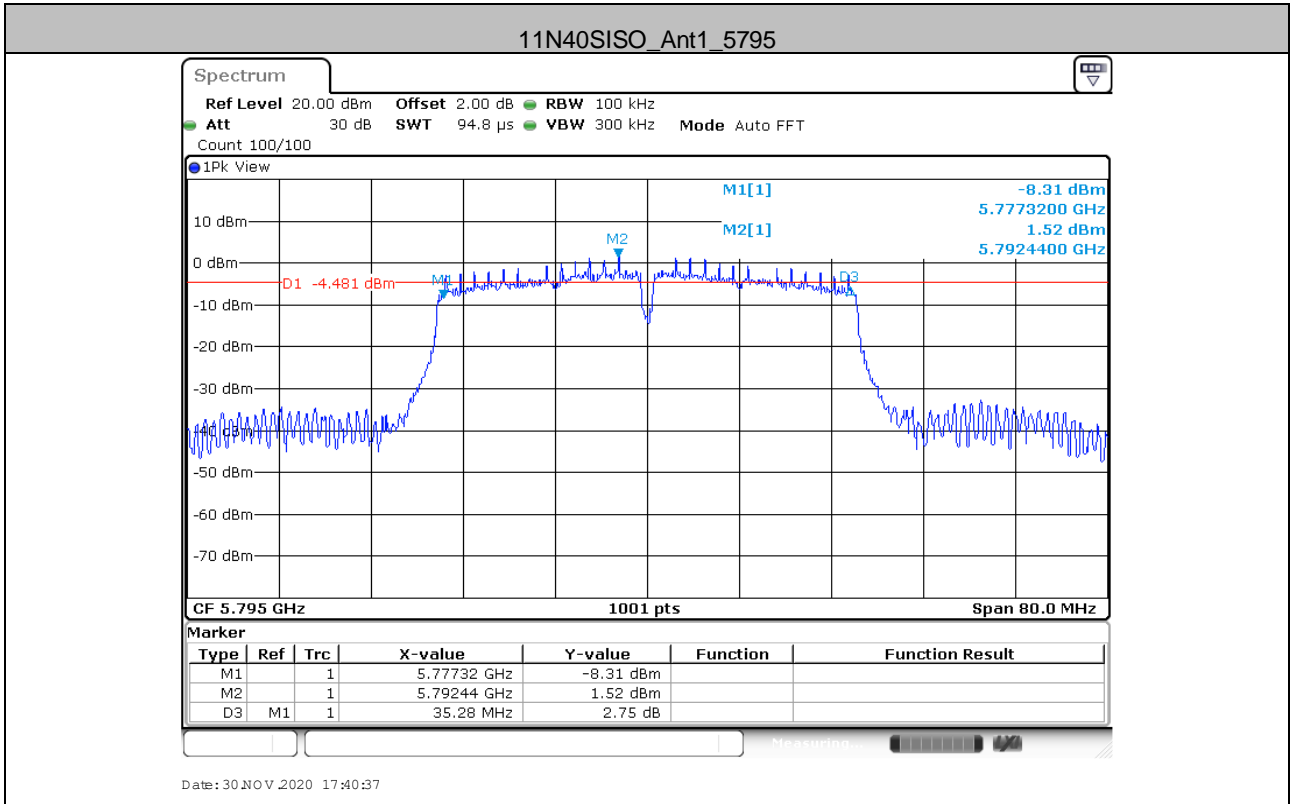
4.6.2 Plots for 6dB Emission Bandwidth

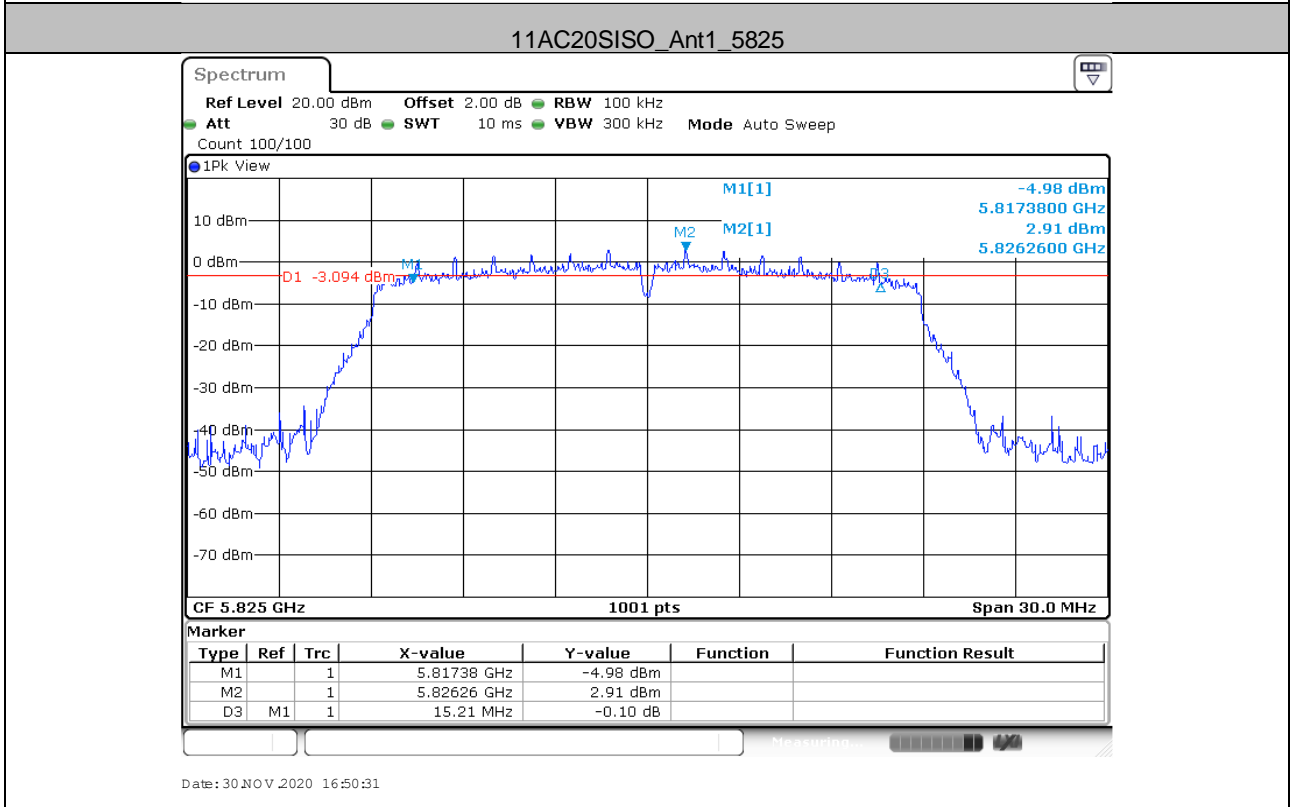
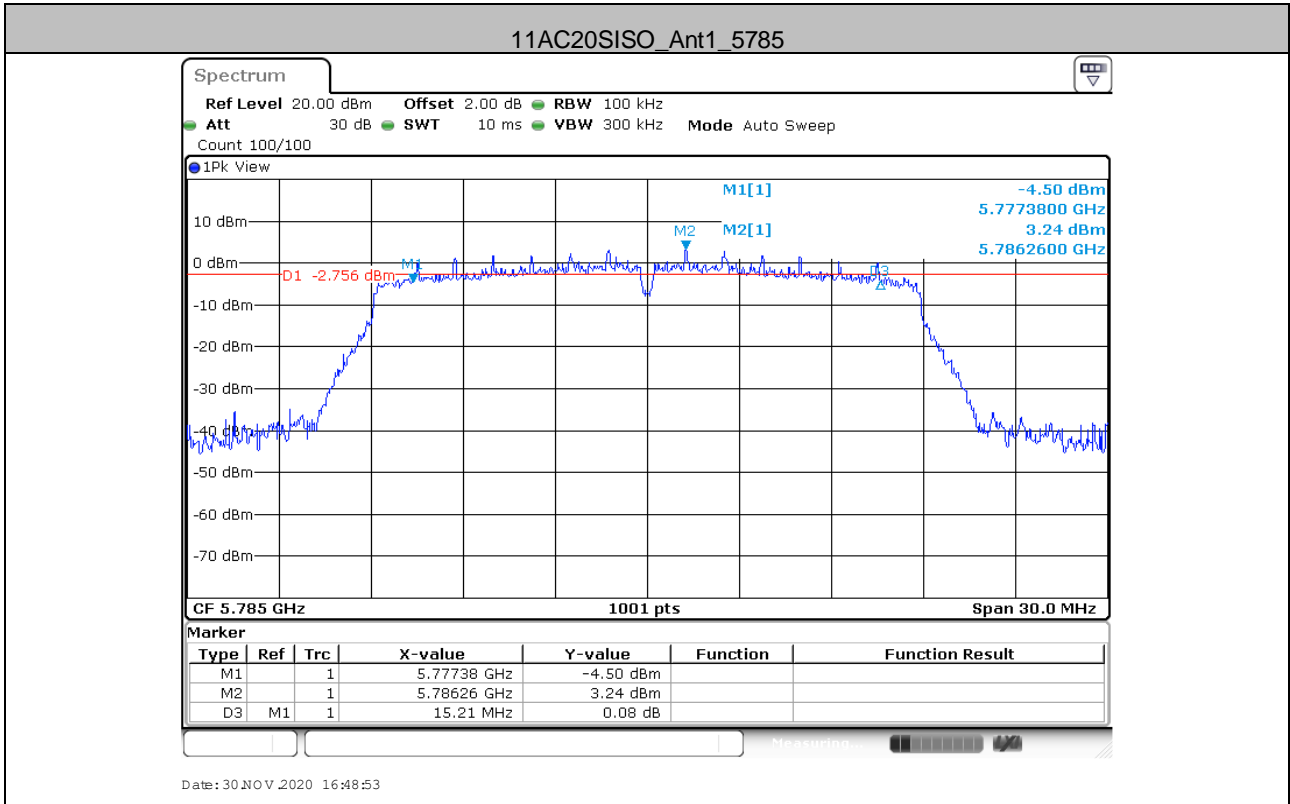




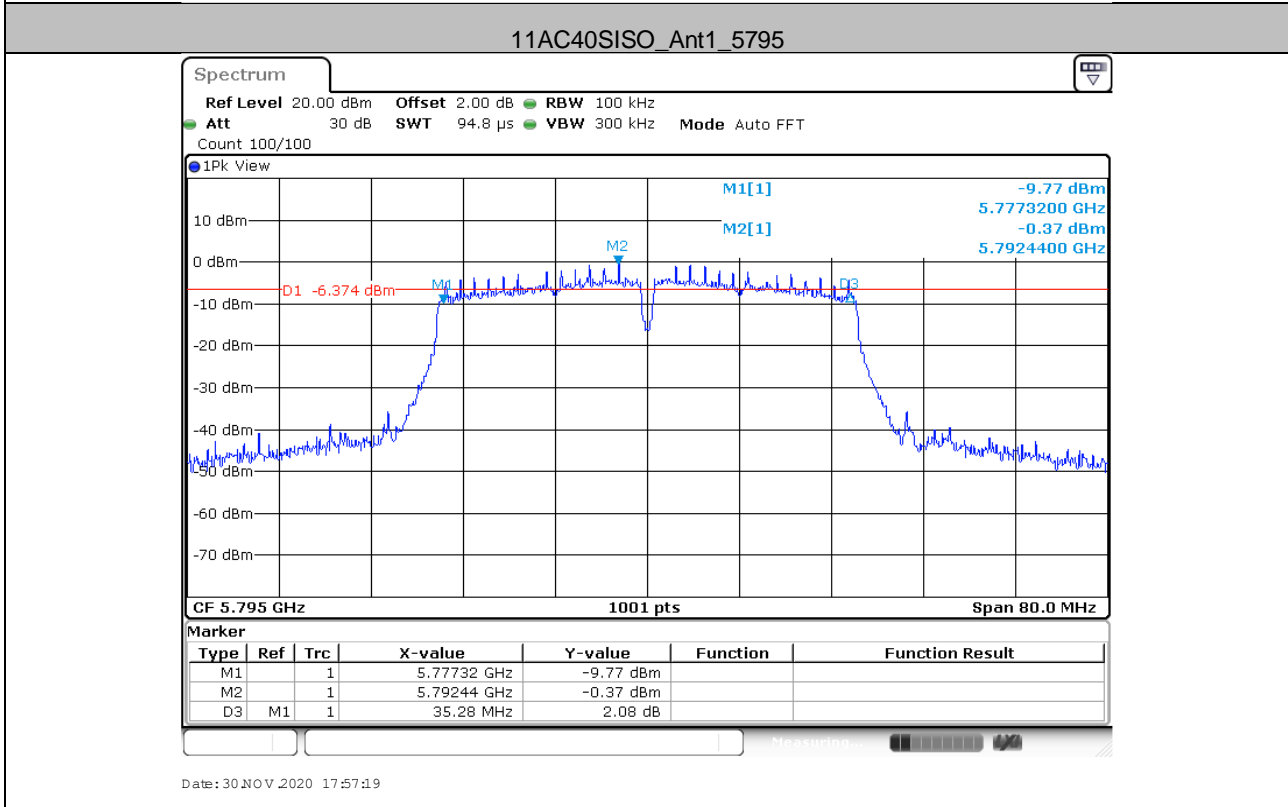
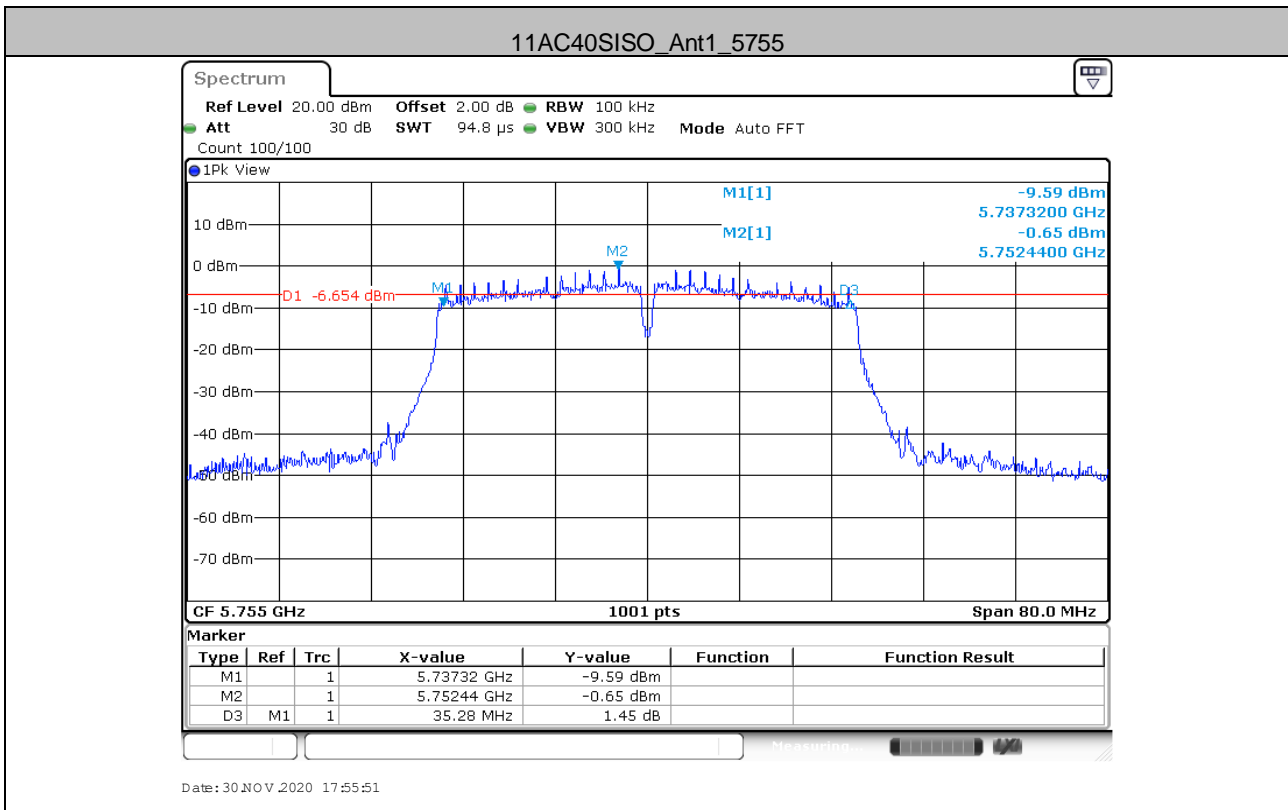


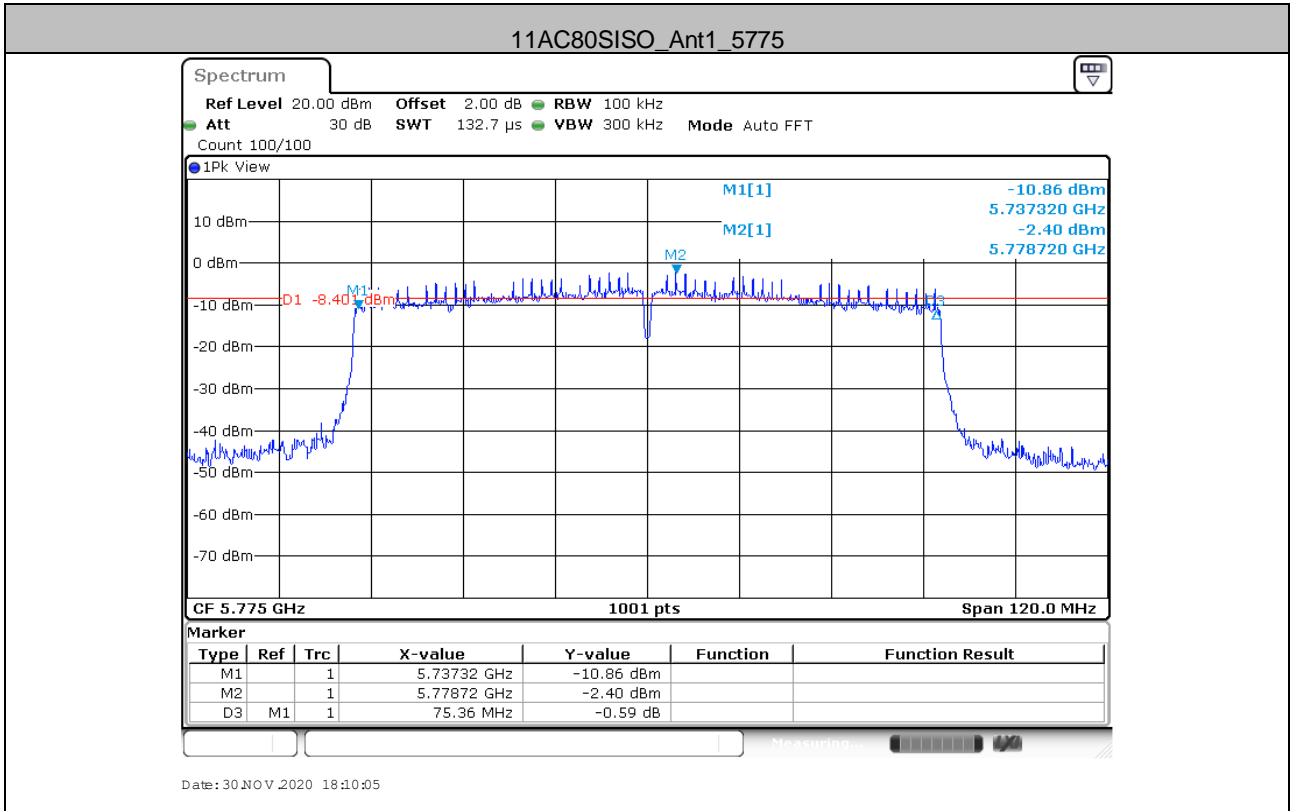






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4.7 99% Occupied Bandwidth

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:	Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(HT20); MCS0 of rate is the worst case of 802.11ac(HT40); MCS0 of rate is the worst case of 802.11ac(HT80). Only the worst case is recorded in the report.
Limit:	No restriction limits
Test Results:	Pass



4.7.1 Test Results for 99% Occupied Bandwidth

Test Mode	Test Channel	Frequency [MHz]	Antenna Port	Occupied Bandwidth [MHz]	Verdict
11A20	36	5180	ANT 1	16.723	PASS
	40	5200	ANT 1	16.783	PASS
	48	5240	ANT 1	16.783	PASS
	52	5260	ANT 1	16.753	PASS
	60	5300	ANT 1	16.753	PASS
	64	5320	ANT 1	16.753	PASS
	100	5500	ANT 1	16.753	PASS
	116	5580	ANT 1	16.813	PASS
	140	5700	ANT 1	16.783	PASS
	144	5720	ANT 1	16.729	PASS
	149	5745	ANT 1	16.753	PASS
	157	5785	ANT 1	16.753	PASS
	165	5825	ANT 1	16.753	PASS
11N20	36	5180	ANT 1	17.772	PASS
	40	5200	ANT 1	17.772	PASS
	48	5240	ANT 1	17.772	PASS
	52	5260	ANT 1	17.772	PASS
	60	5300	ANT 1	17.772	PASS
	64	5320	ANT 1	17.772	PASS
	100	5500	ANT 1	17.772	PASS
	116	5580	ANT 1	17.772	PASS
	140	5700	ANT 1	17.742	PASS
	144	5720	ANT 1	17.771	PASS
	149	5745	ANT 1	17.772	PASS
157	5785	ANT 1	17.772	PASS	
165	5825	ANT 1	17.802	PASS	
11N40	38	5190	ANT 1	36.144	PASS
	46	5230	ANT 1	36.204	PASS
	54	5270	ANT 1	36.204	PASS
	62	5310	ANT 1	36.144	PASS
	102	5510	ANT 1	36.144	PASS
	110	5550	ANT 1	36.204	PASS



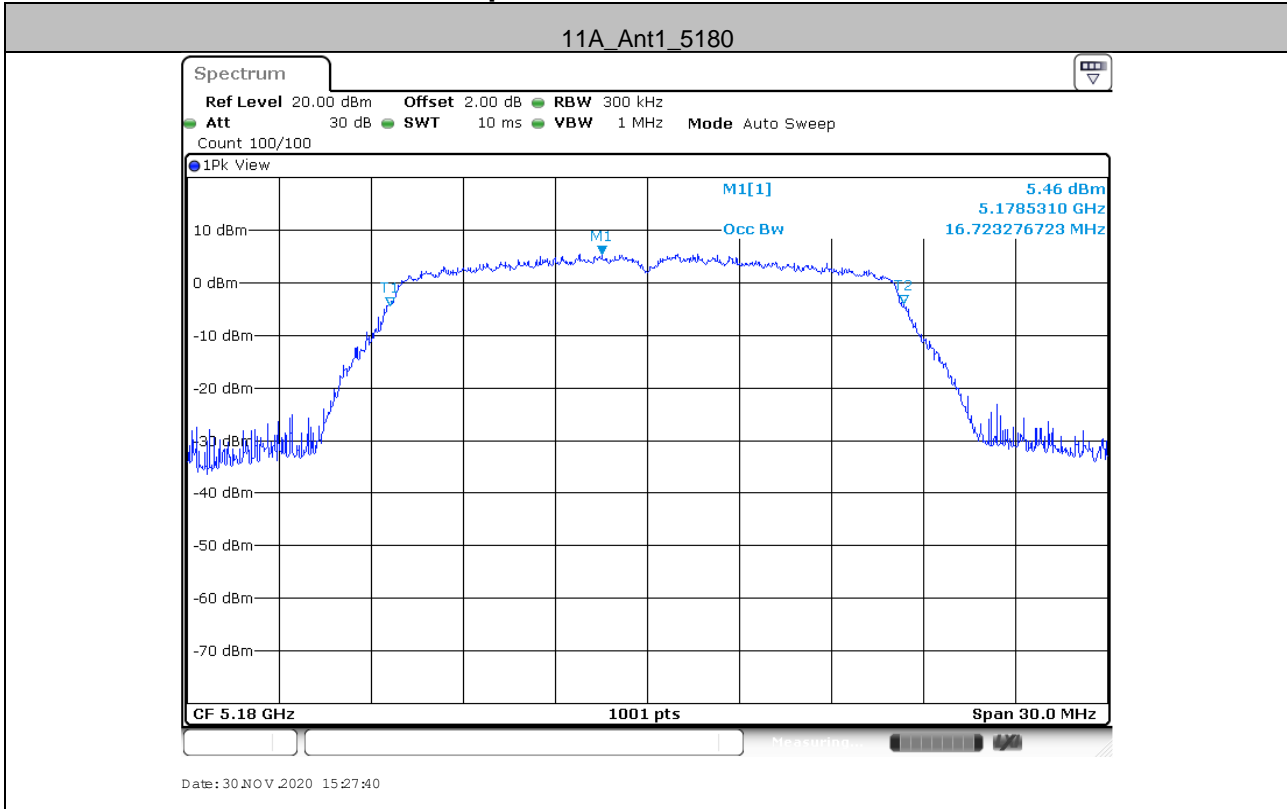
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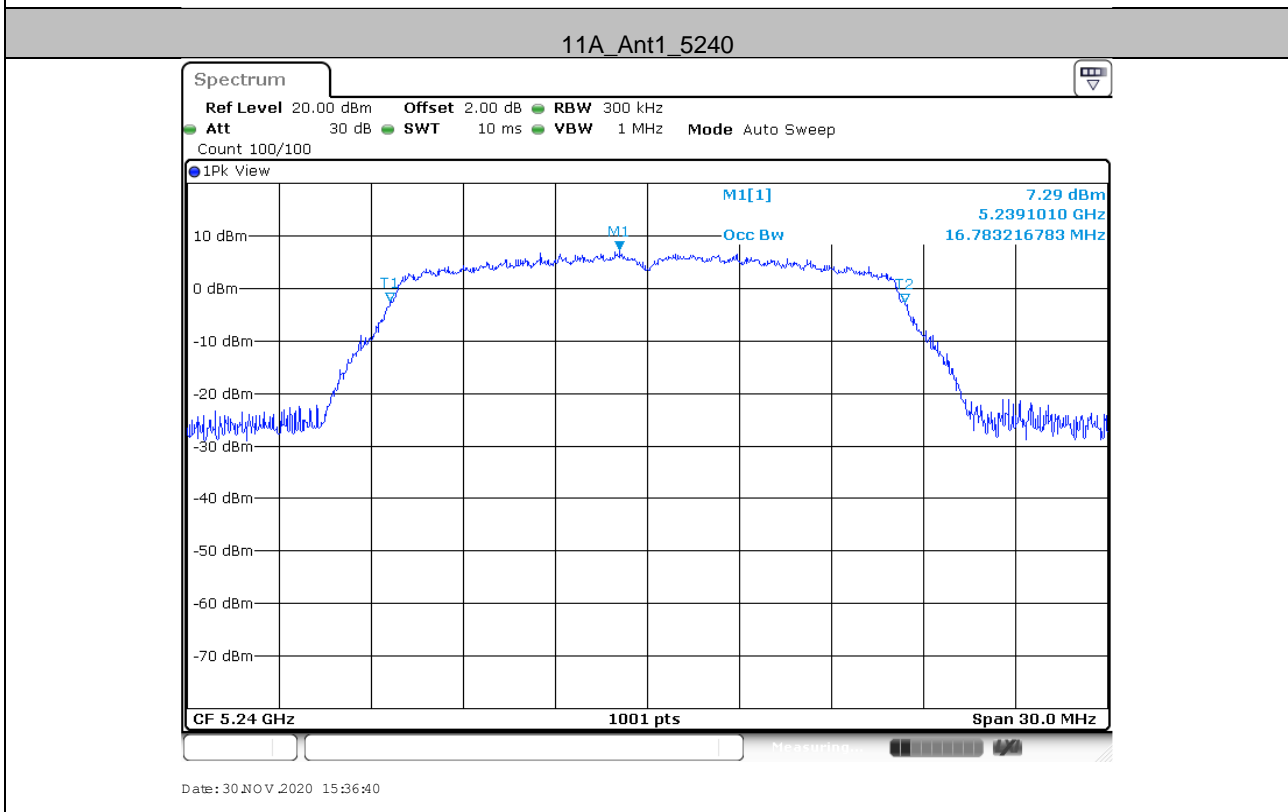
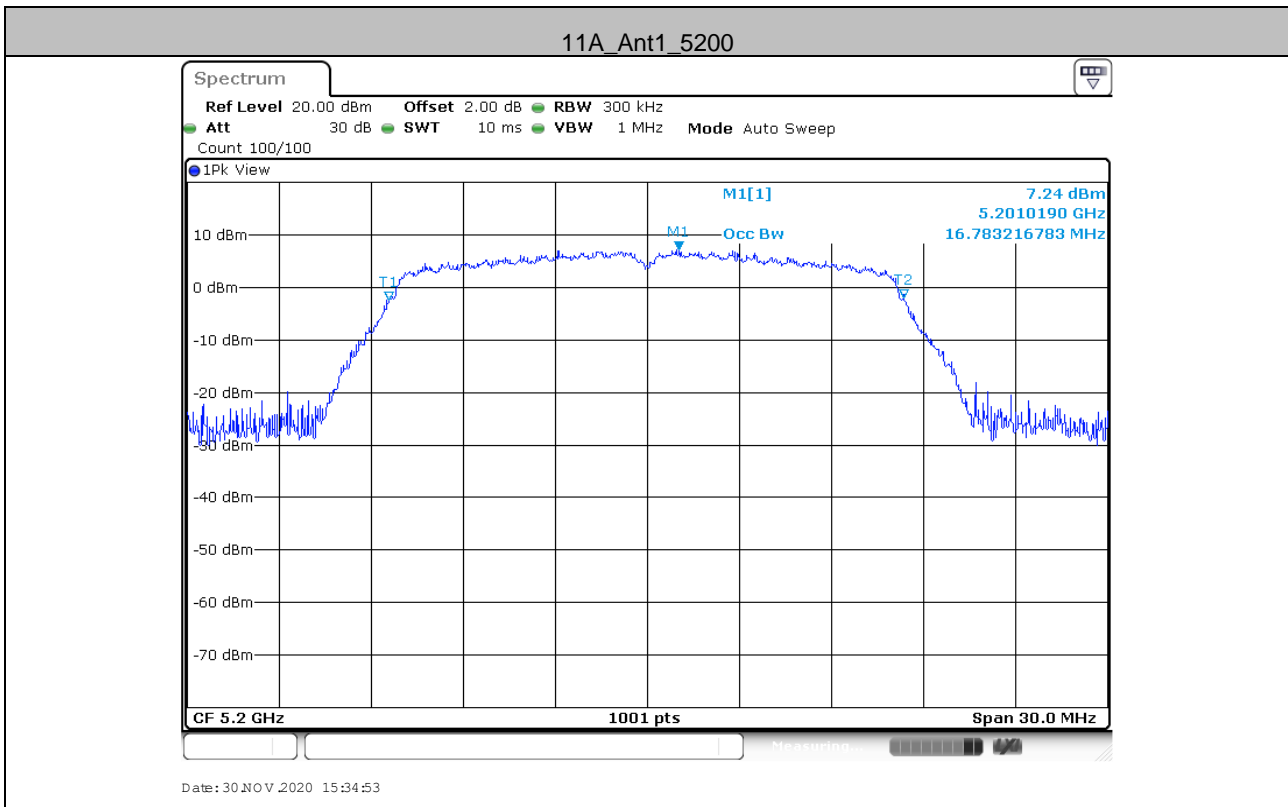
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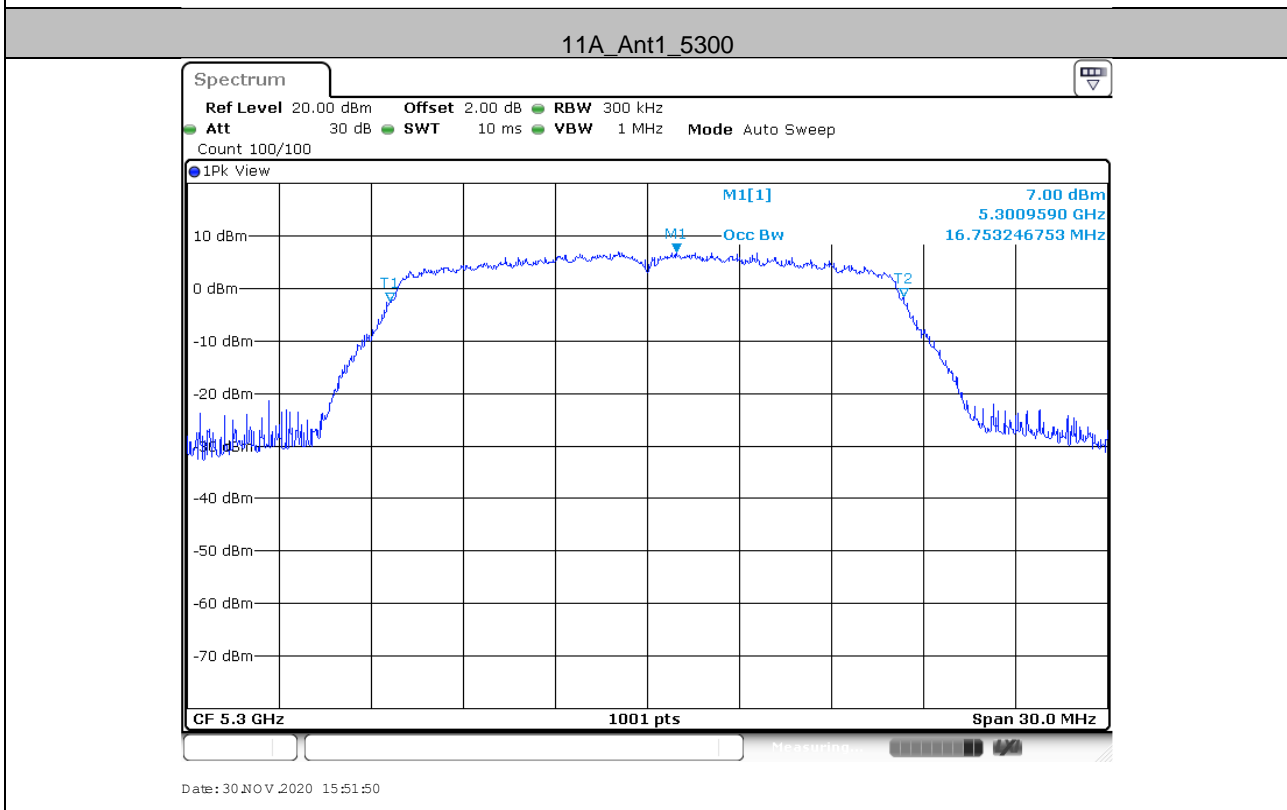
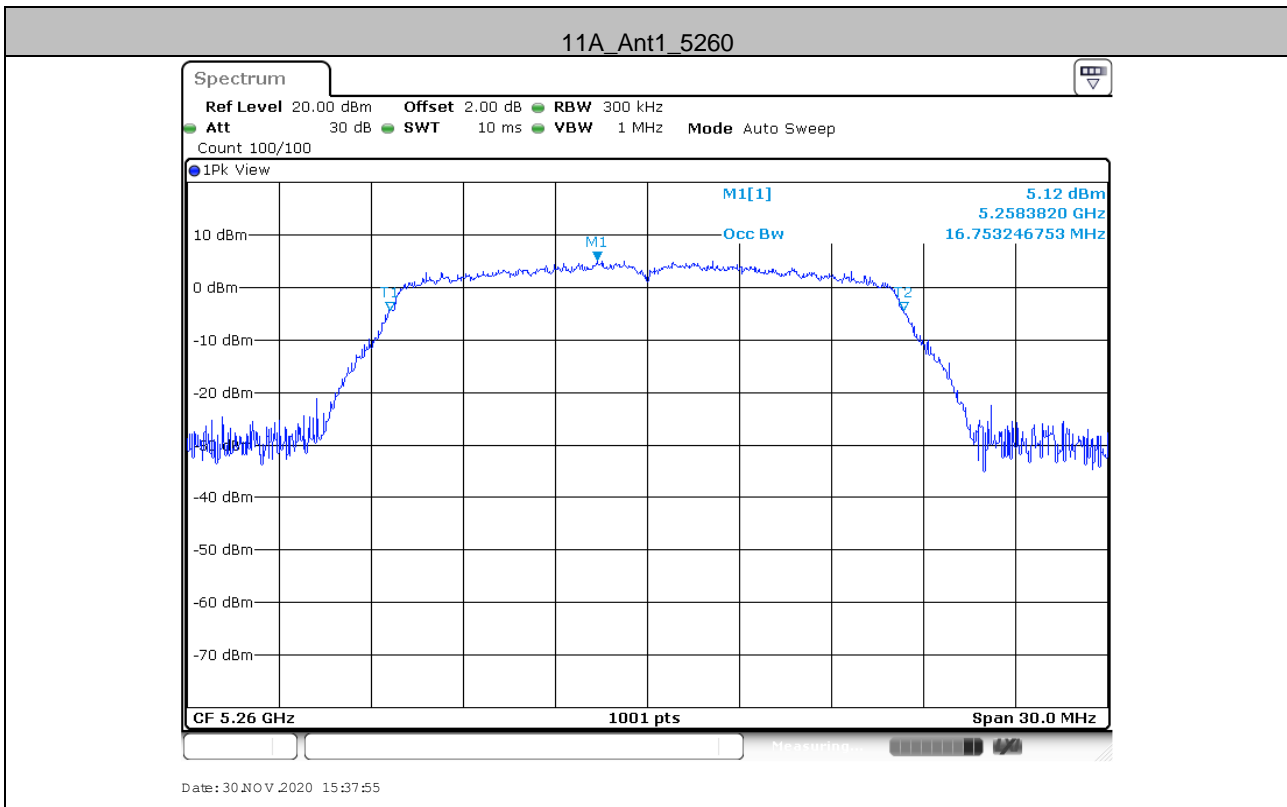
	134	5670	ANT 1	36.144	PASS
	142	5710	ANT 1	36.122	PASS
	151	5755	ANT 1	36.144	PASS
	159	5795	ANT 1	36.144	PASS
11AC20	36	5180	ANT 1	17.712	PASS
	40	5200	ANT 1	17.742	PASS
	48	5240	ANT 1	17.742	PASS
	52	5260	ANT 1	17.742	PASS
	60	5300	ANT 1	17.712	PASS
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	149	5745	ANT 1	17.742	PASS
	157	5785	ANT 1	17.742	PASS
	165	5825	ANT 1	17.712	PASS
11AC40	38	5190	ANT 1	36.084	PASS
	46	5230	ANT 1	36.144	PASS
	54	5270	ANT 1	36.144	PASS
	62	5310	ANT 1	36.084	PASS
	102	5510	ANT 1	36.144	PASS
	110	5550	ANT 1	36.204	PASS
	134	5670	ANT 1	36.084	PASS
	142	5710	ANT 1	36.122	PASS
	151	5755	ANT 1	36.144	PASS
159	5795	ANT 1	36.144	PASS	
11AC80	42	5210	ANT 1	75.285	PASS
	58	5290	ANT 1	75.165	PASS
	106	5530	ANT 1	75.165	PASS
	122	5610	ANT 1	75.285	PASS
	138	5690	ANT 1	76.179	PASS
	155	5775	ANT 1	75.165	PASS

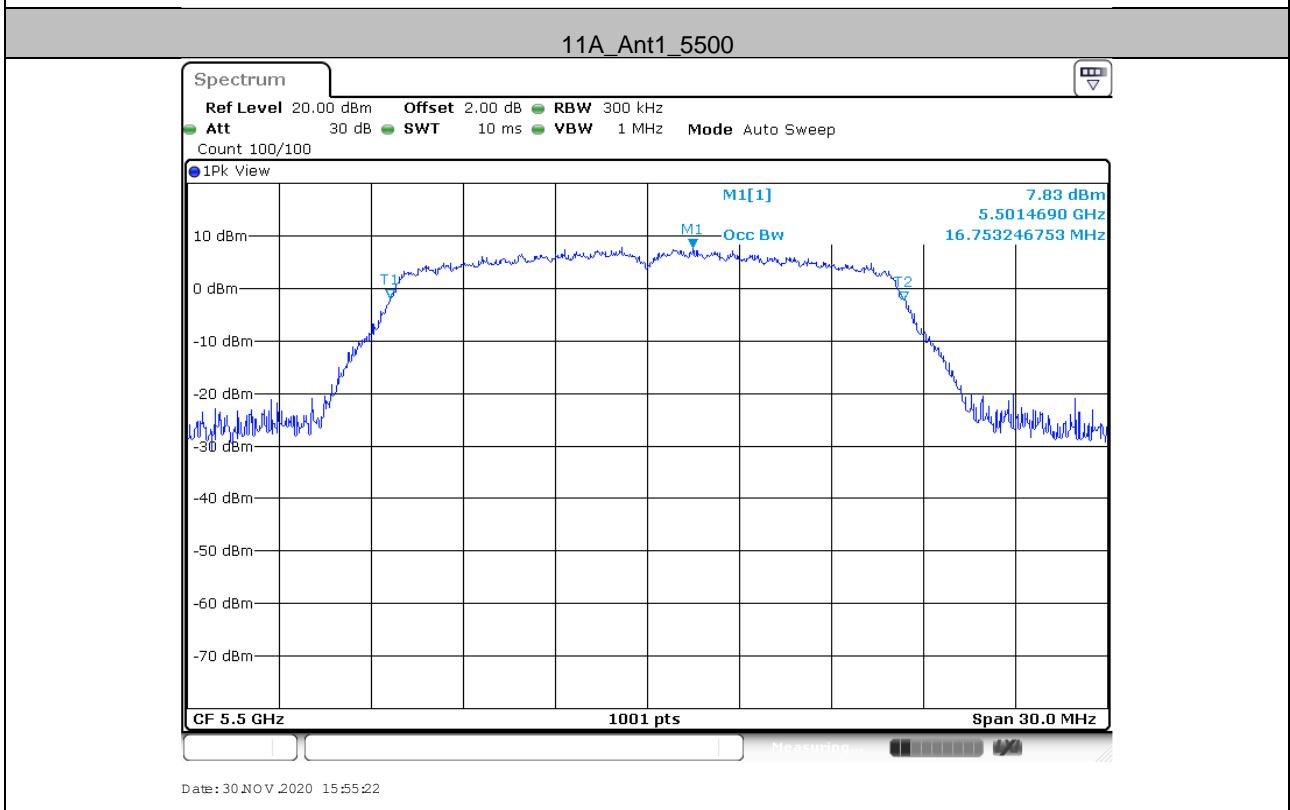
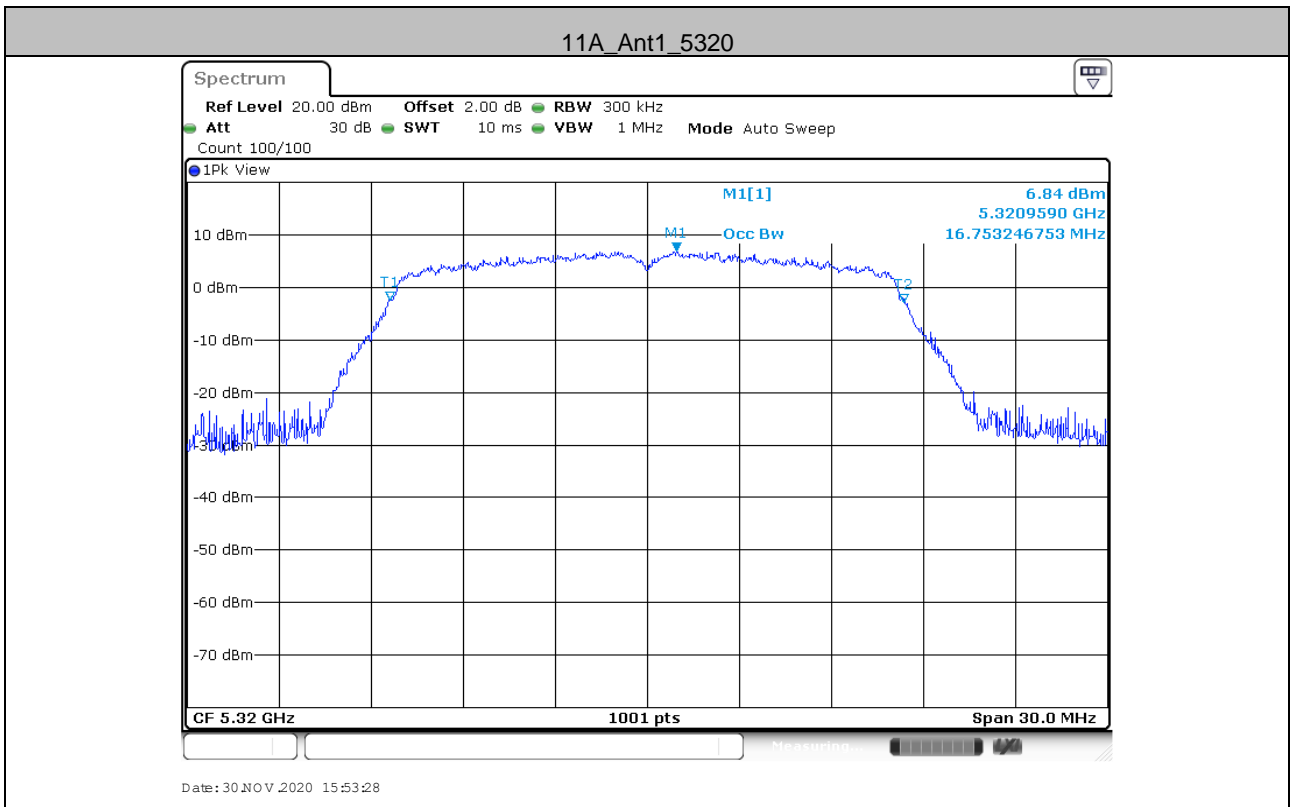


4.7.2 Plots for 99% Occupied Bandwidth



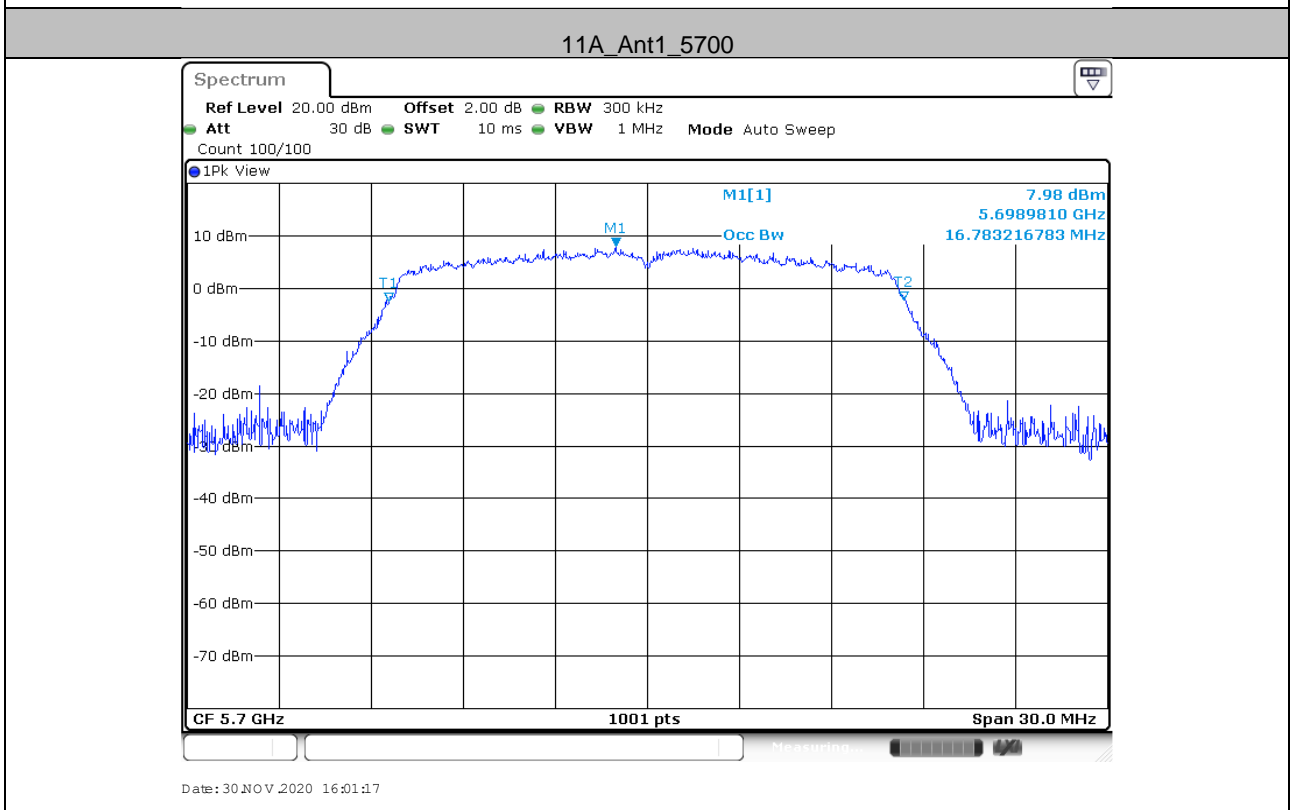
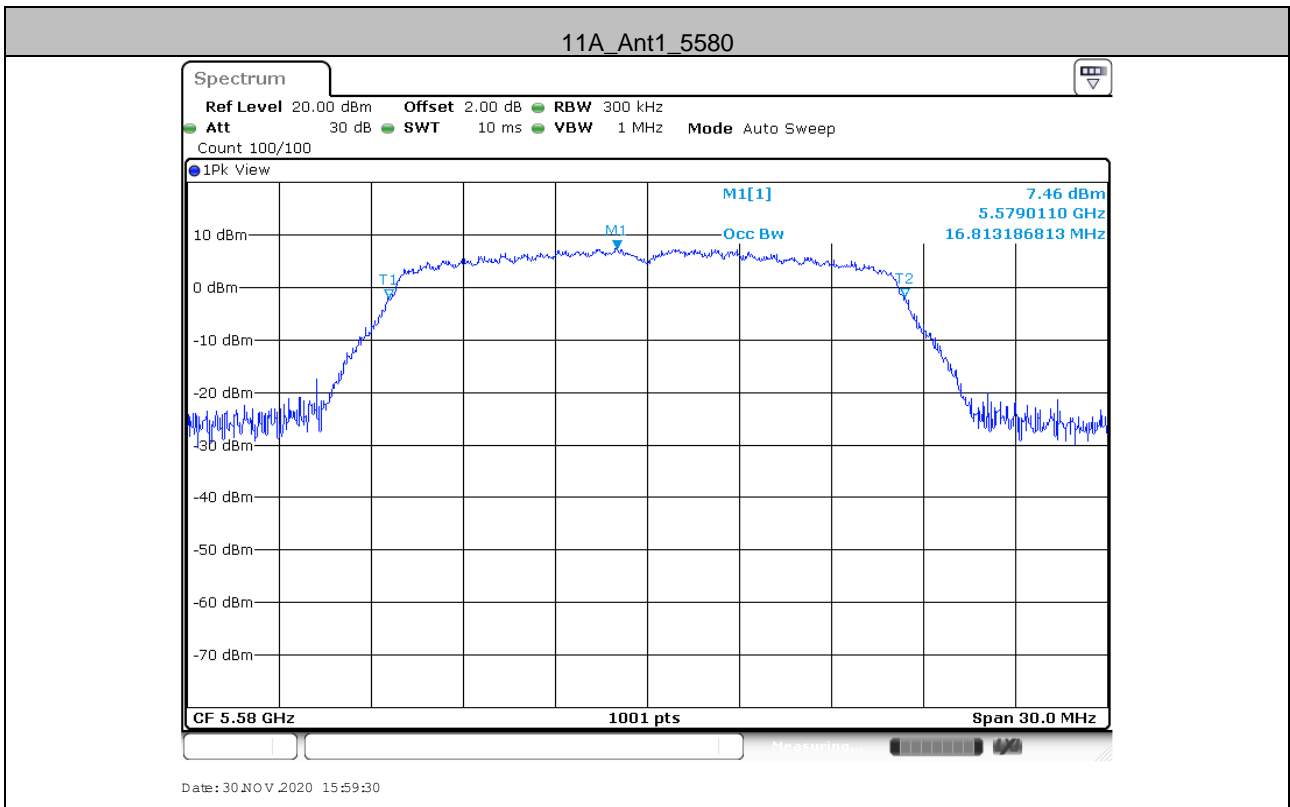


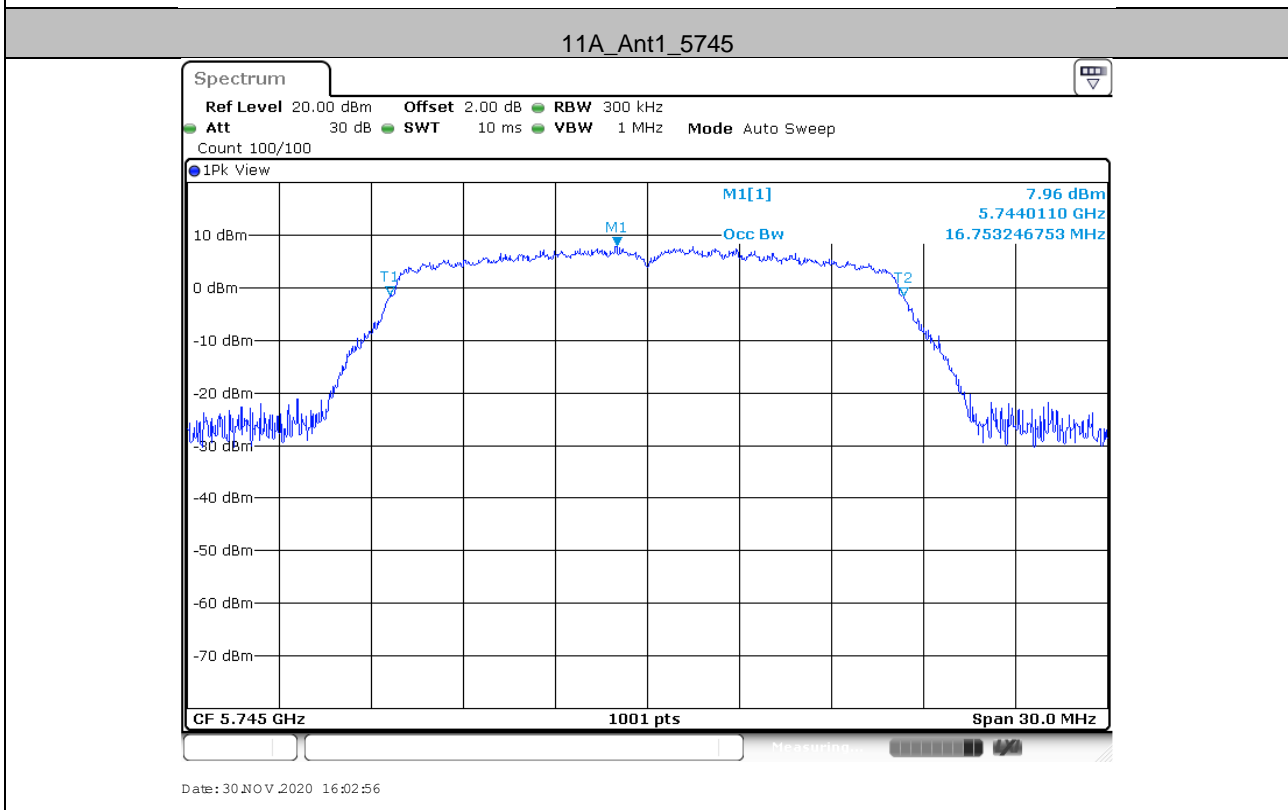
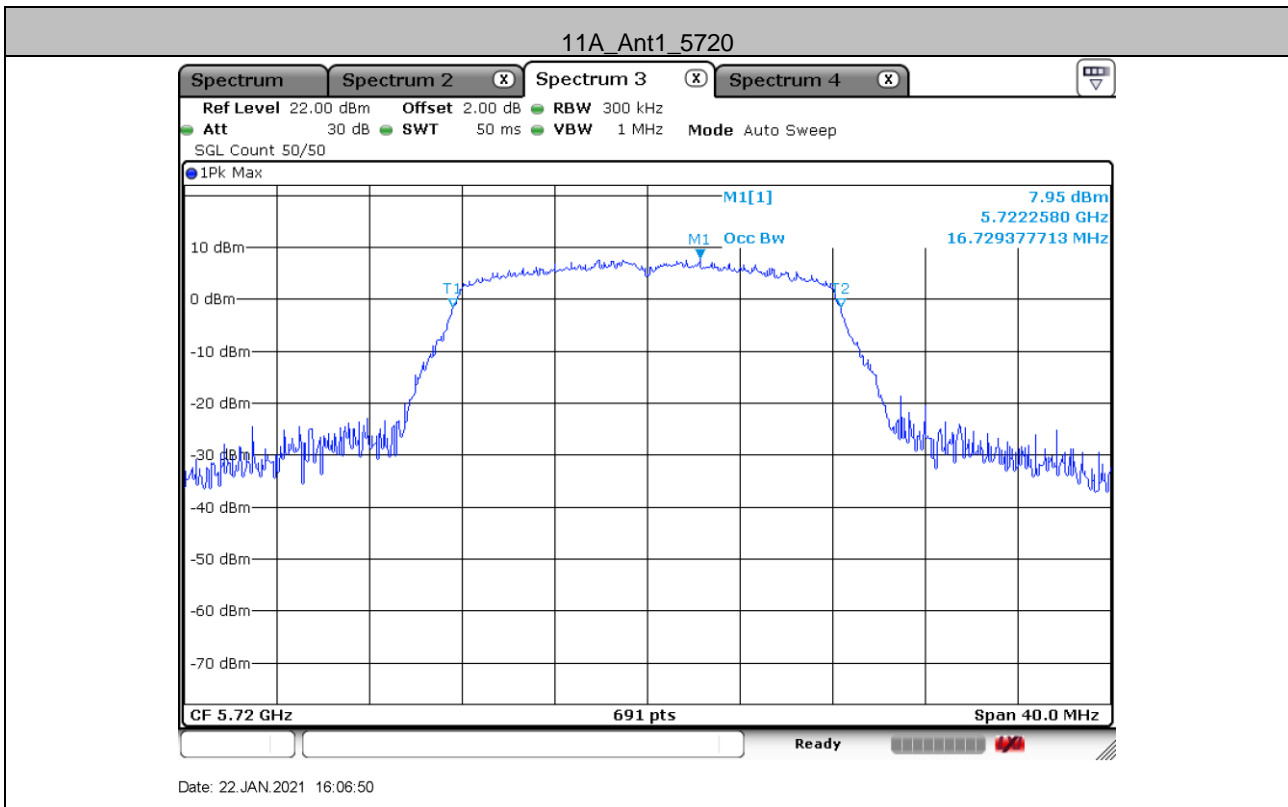


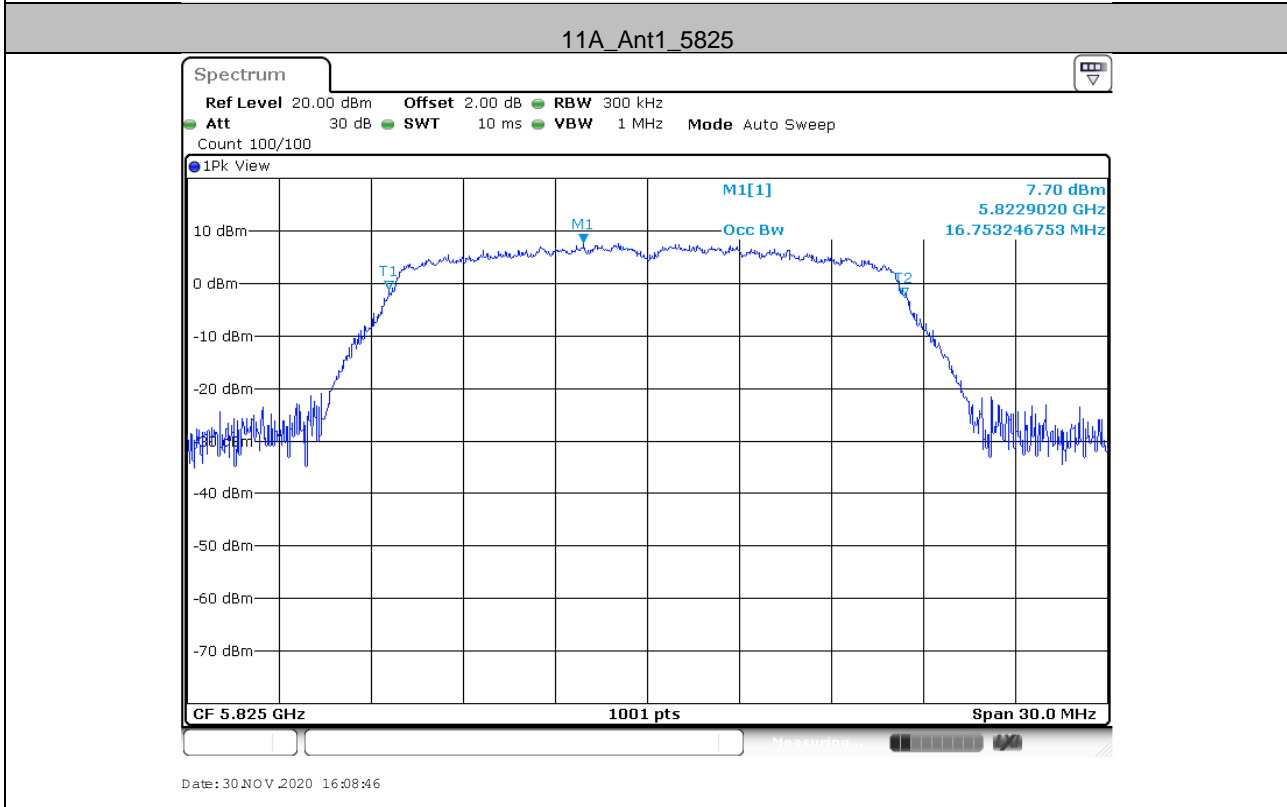
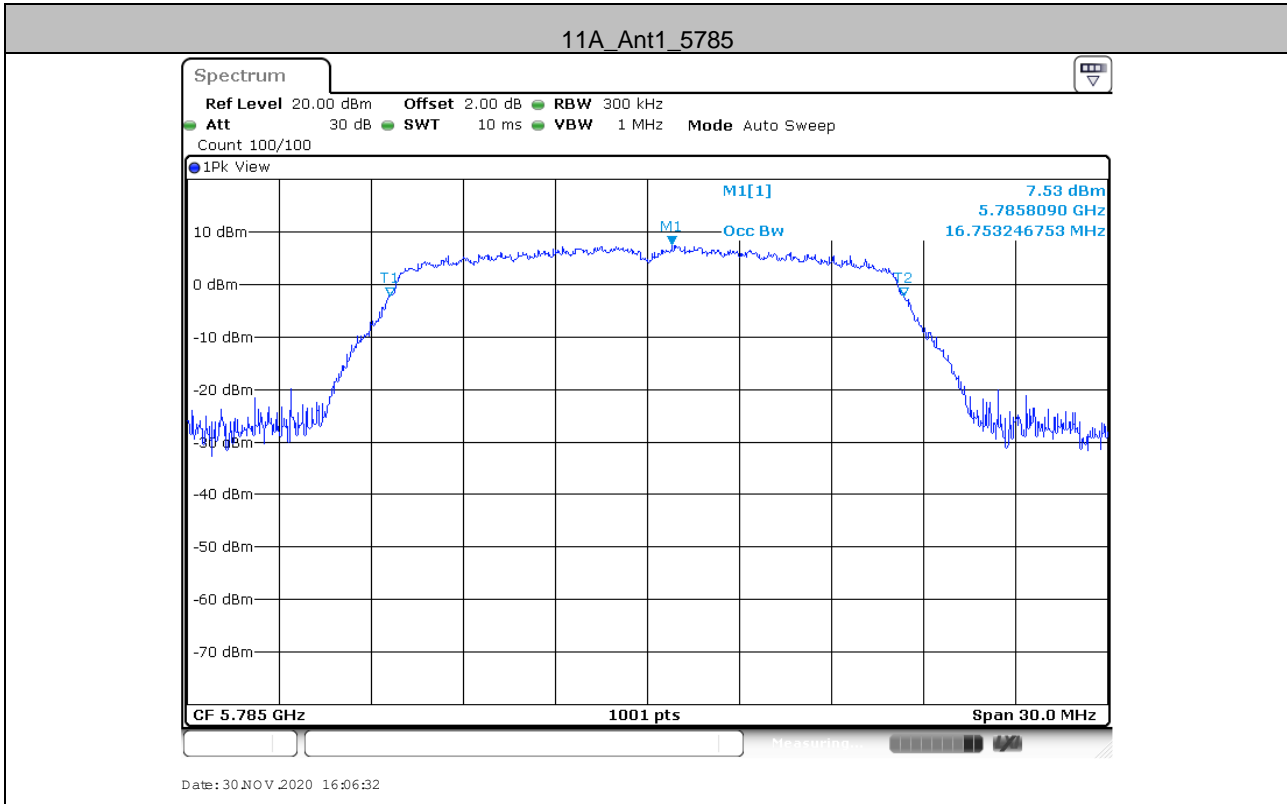


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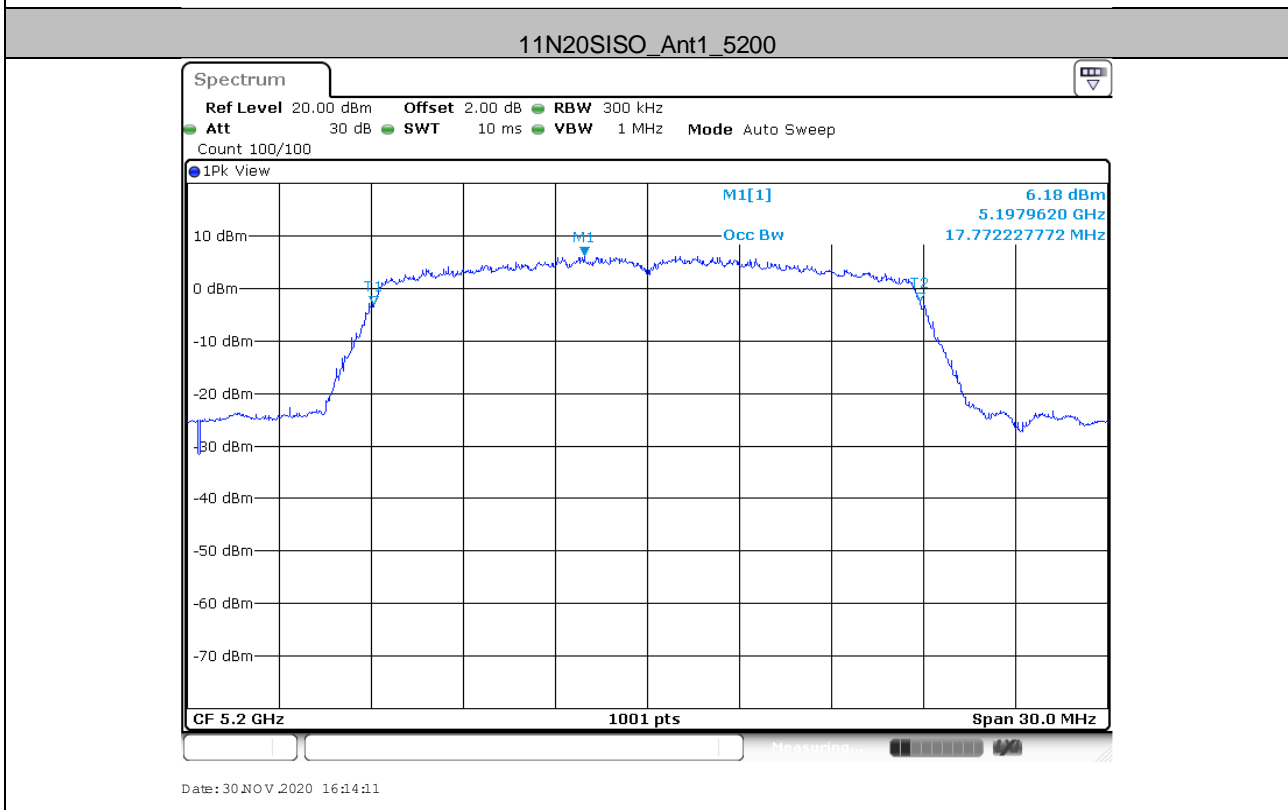
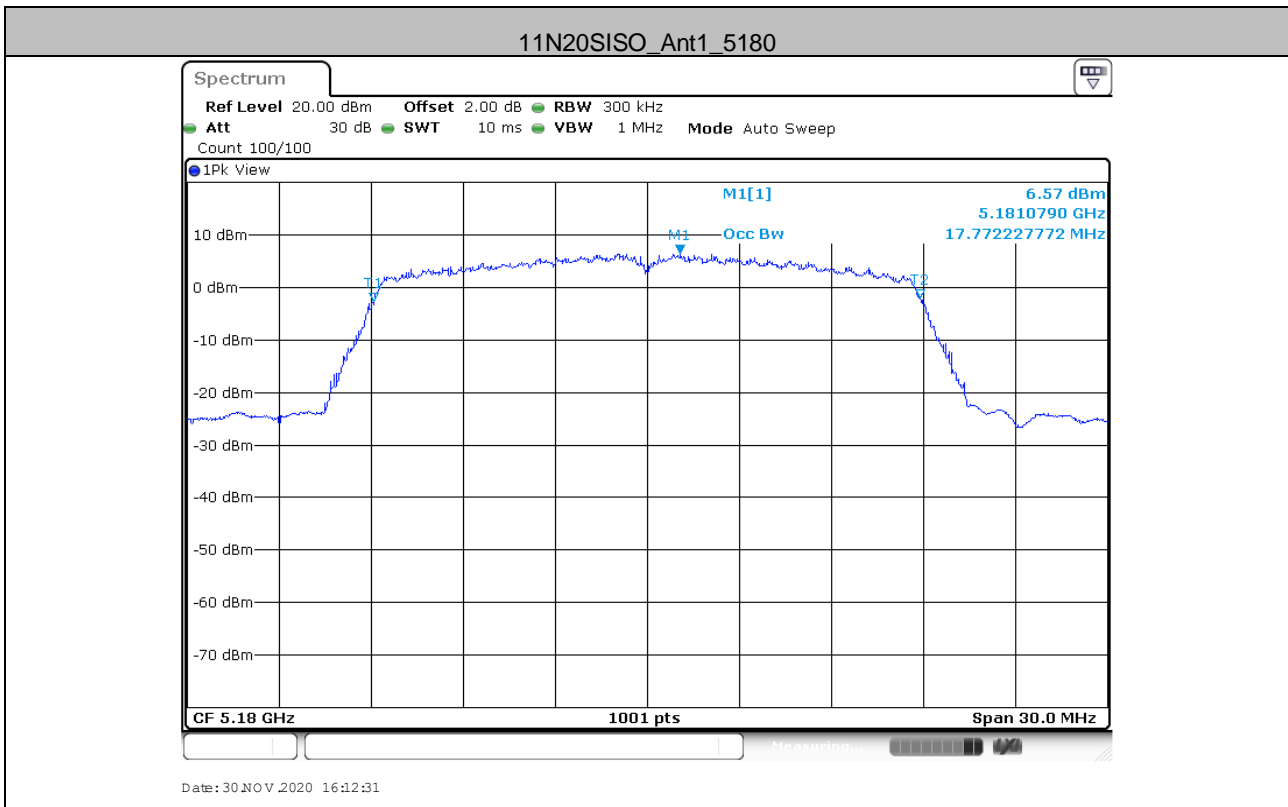






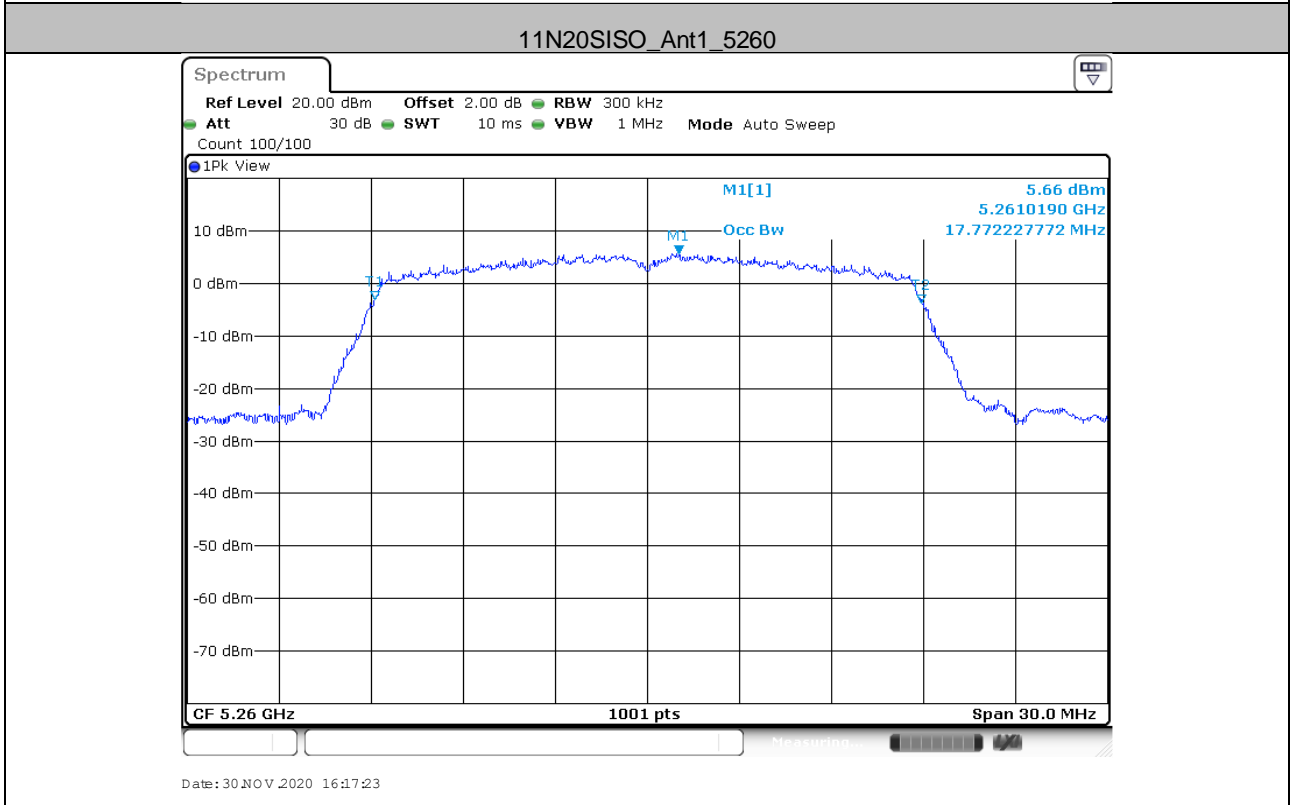
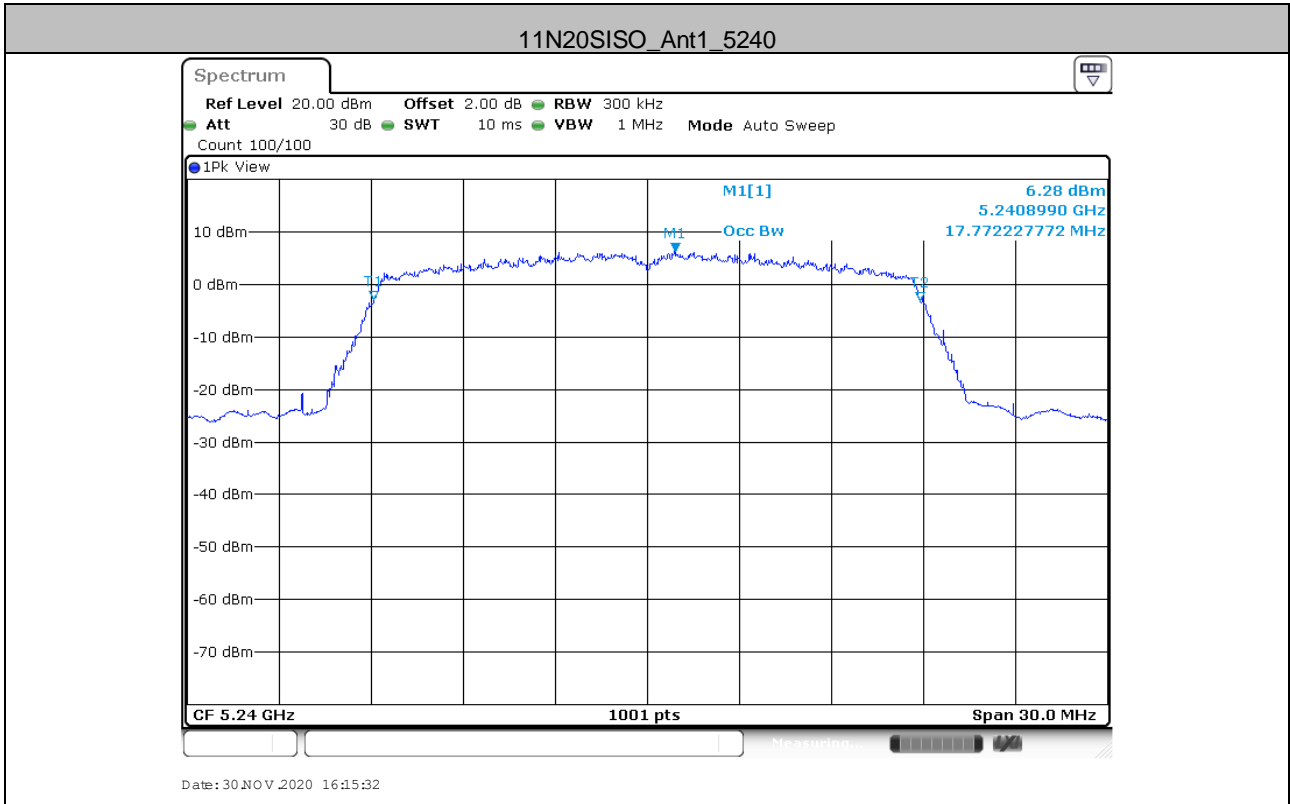
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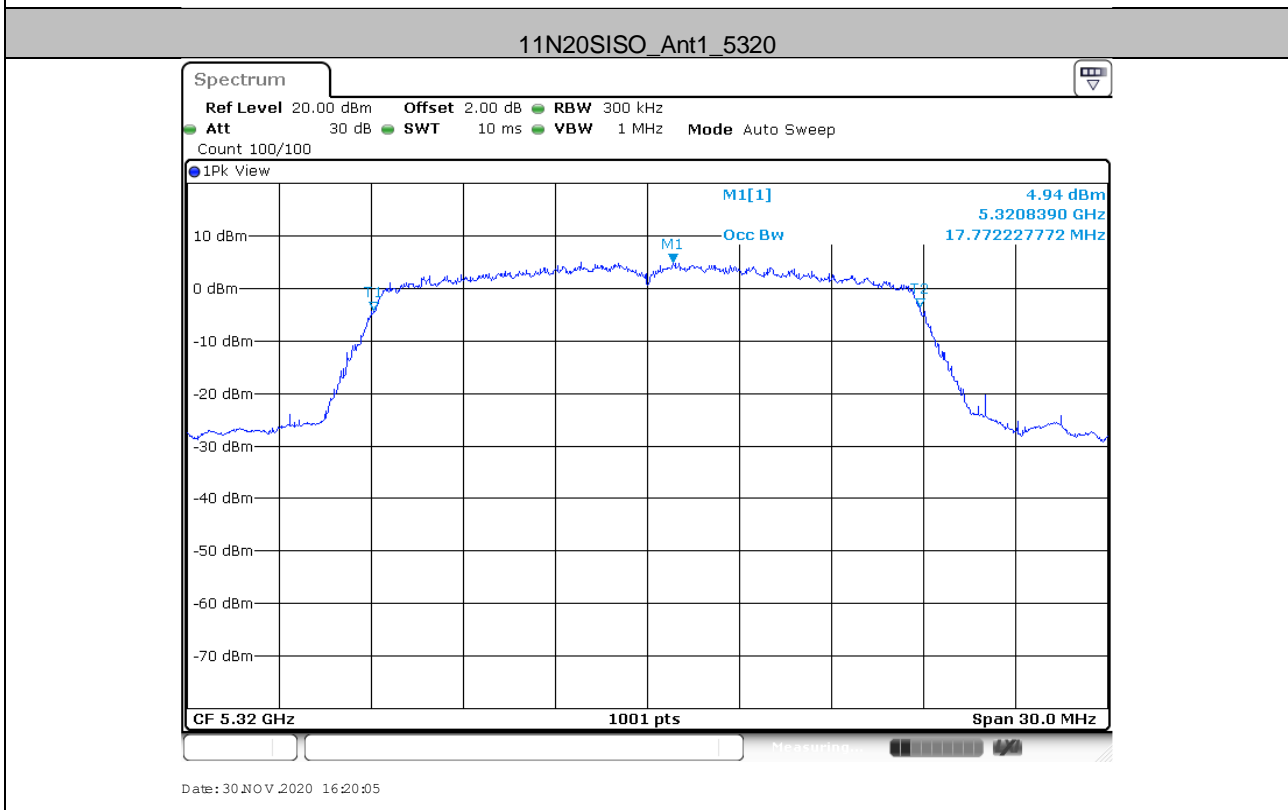
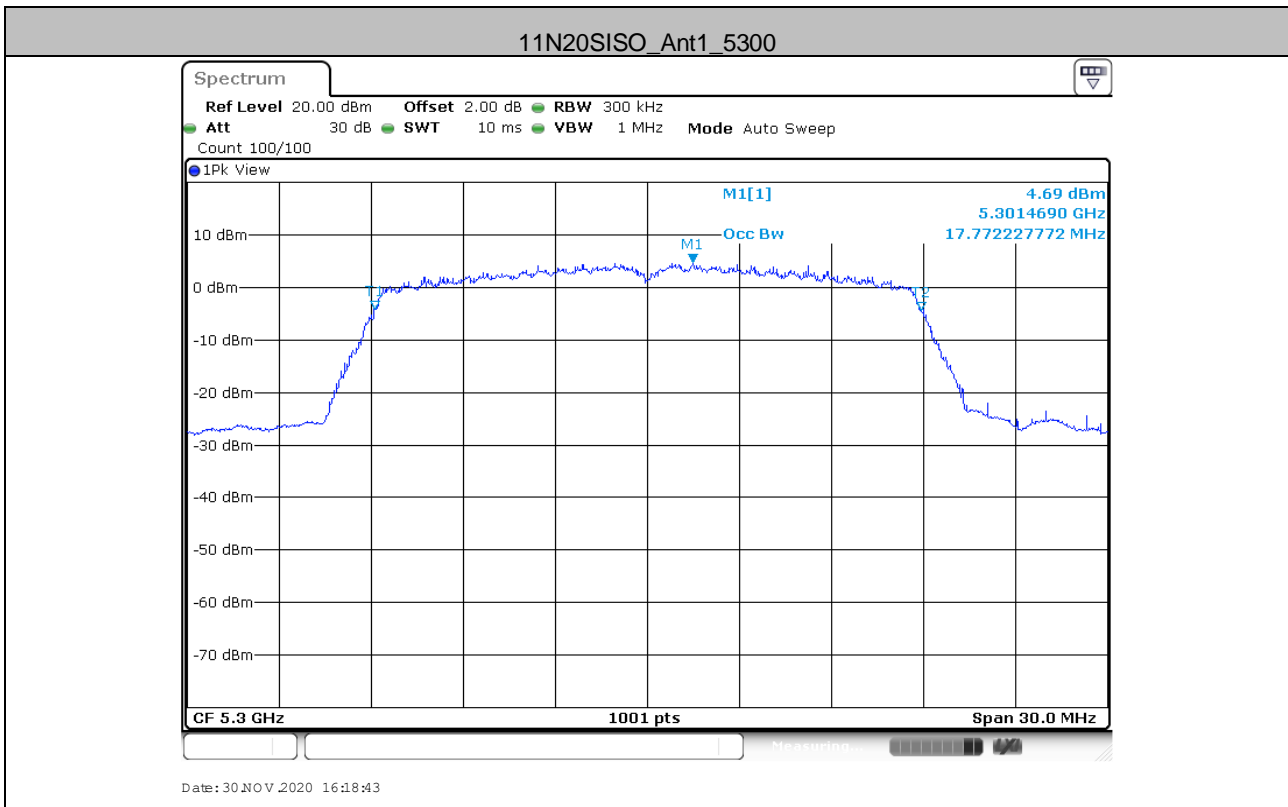
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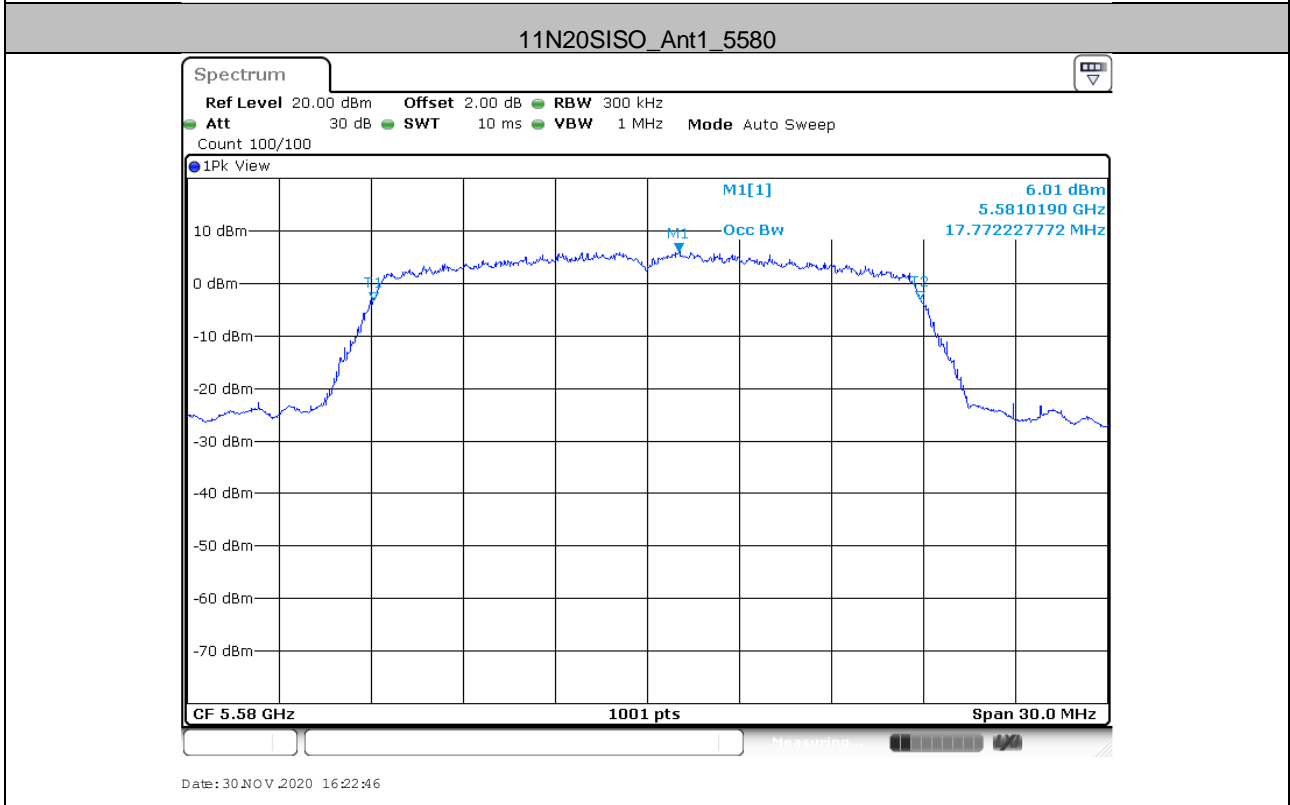
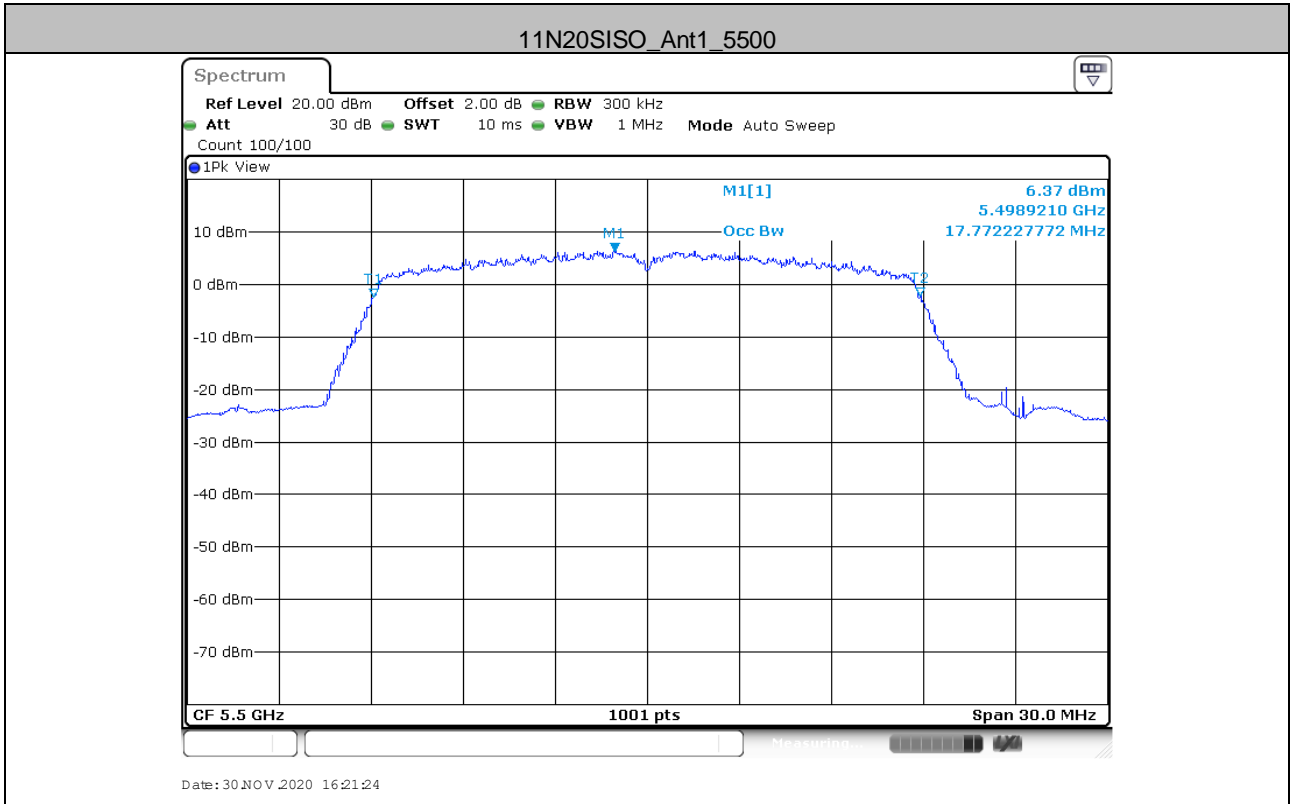


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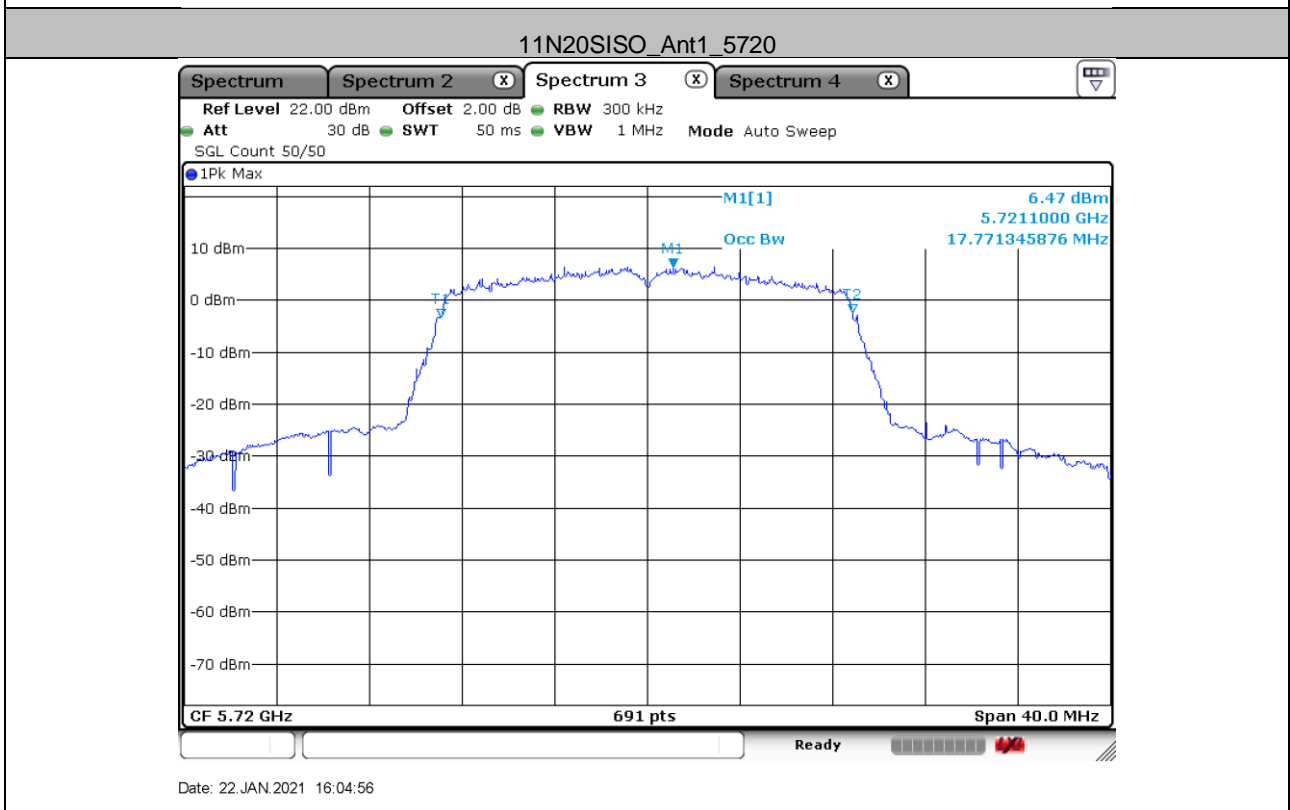
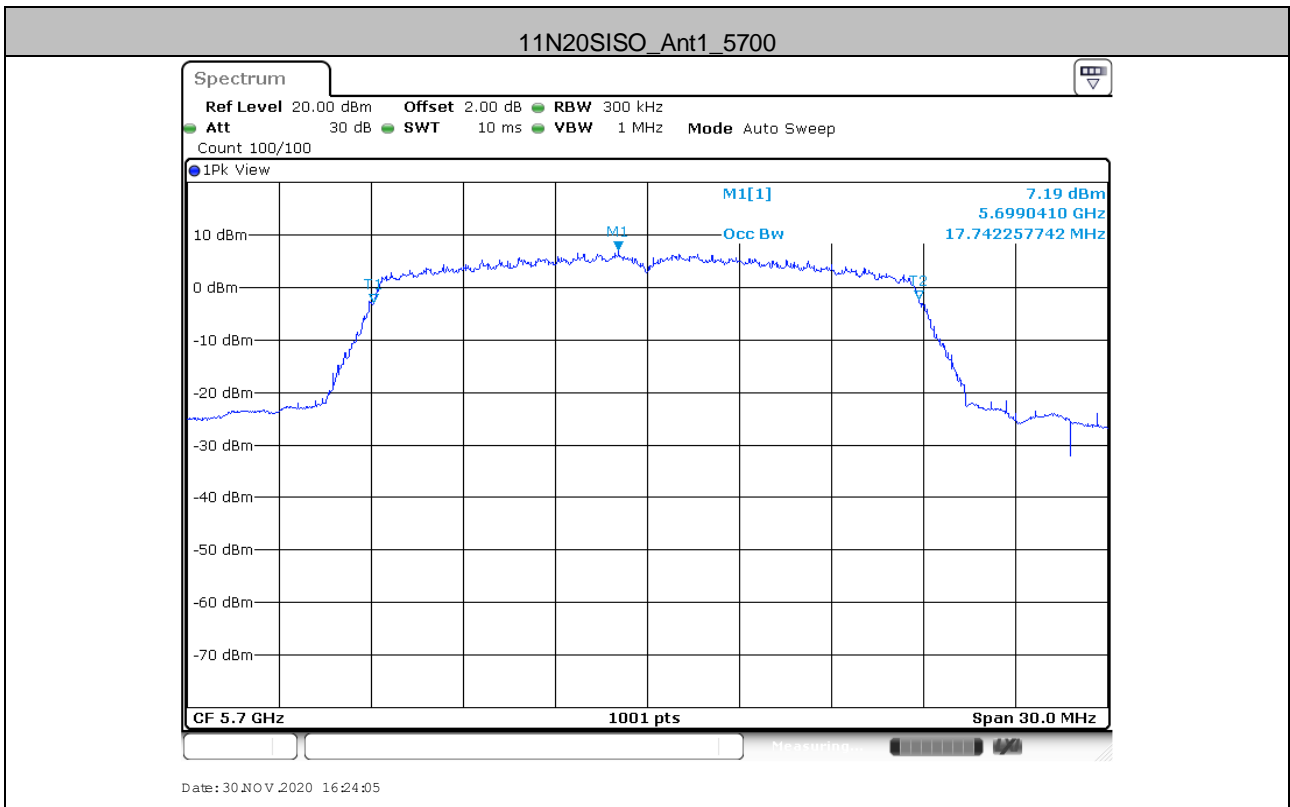


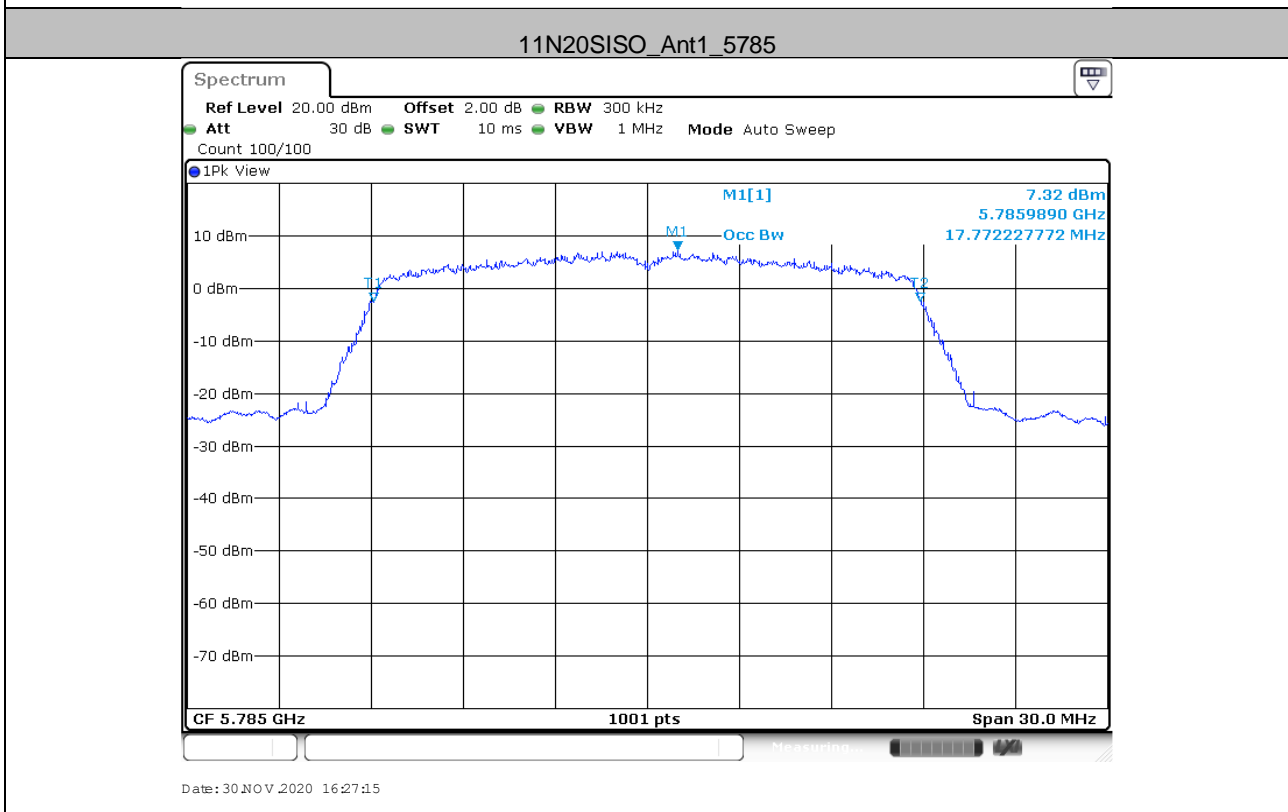
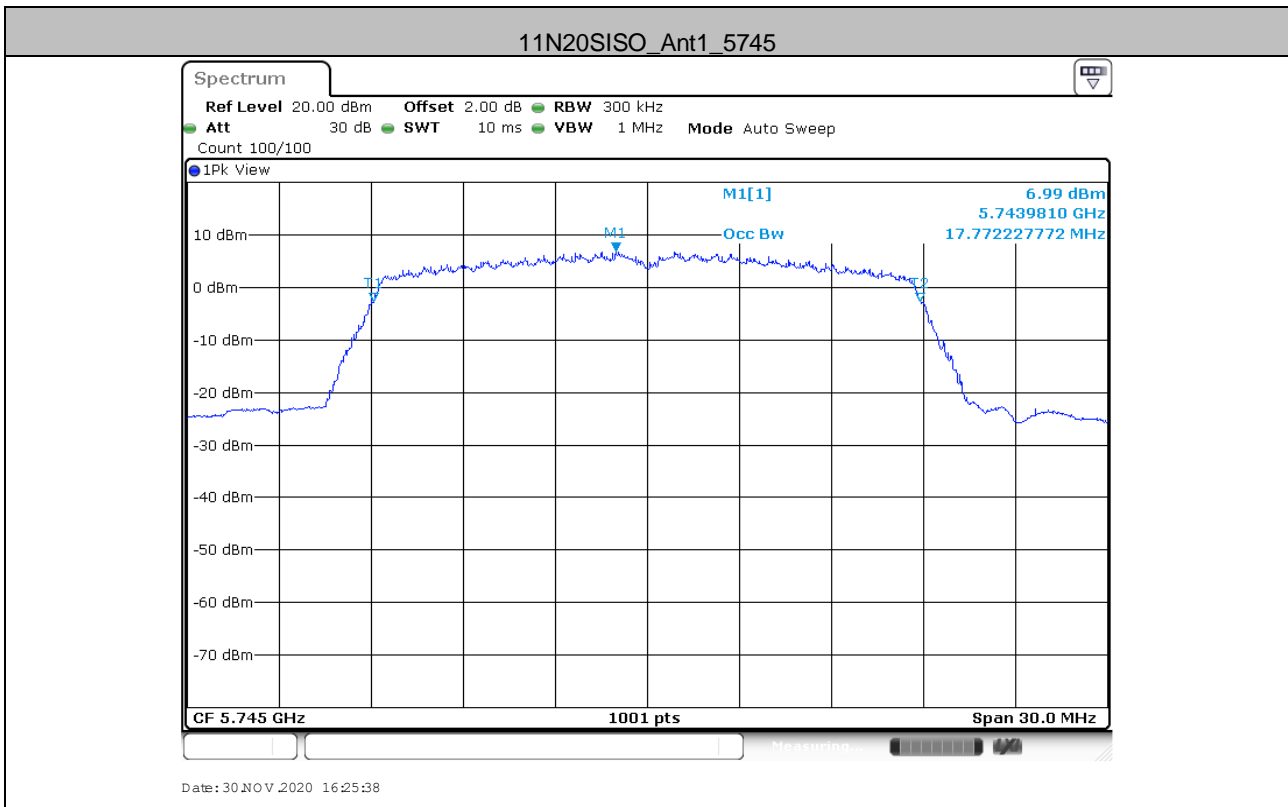


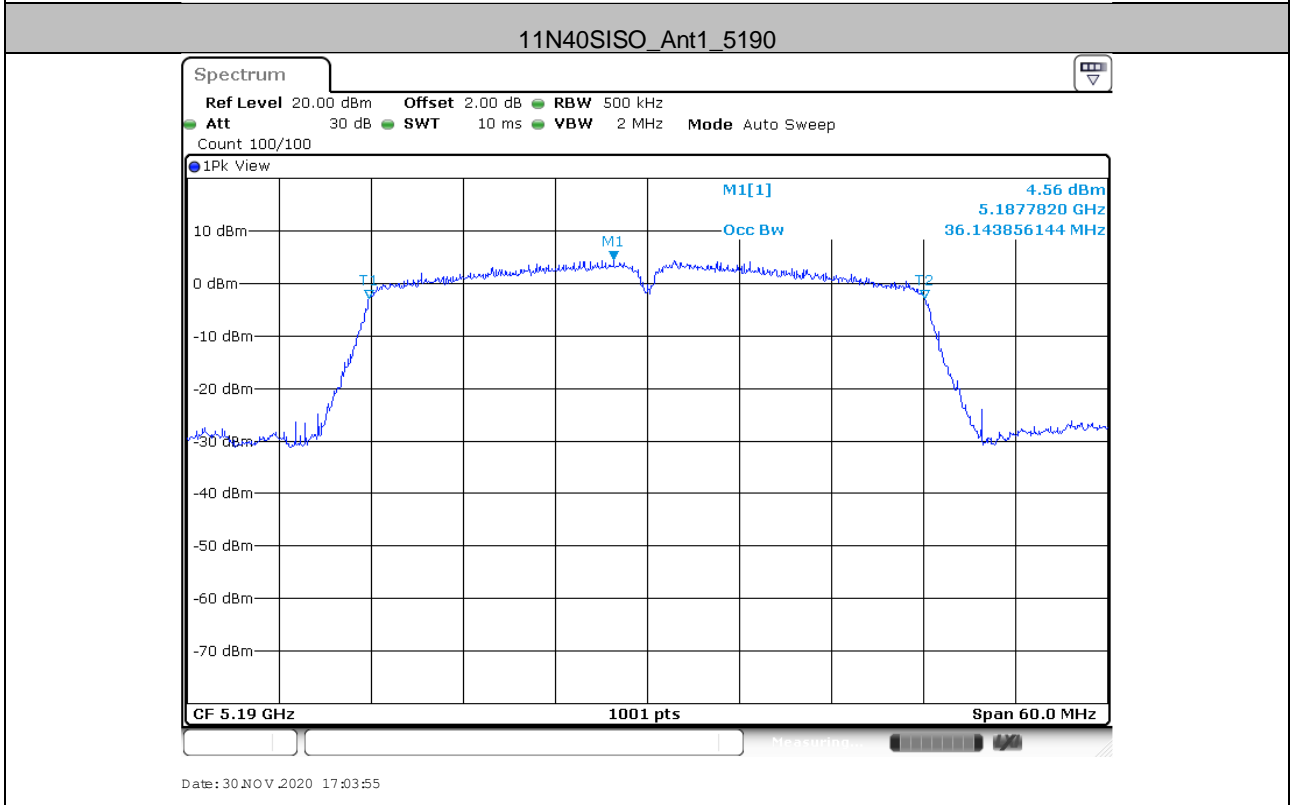
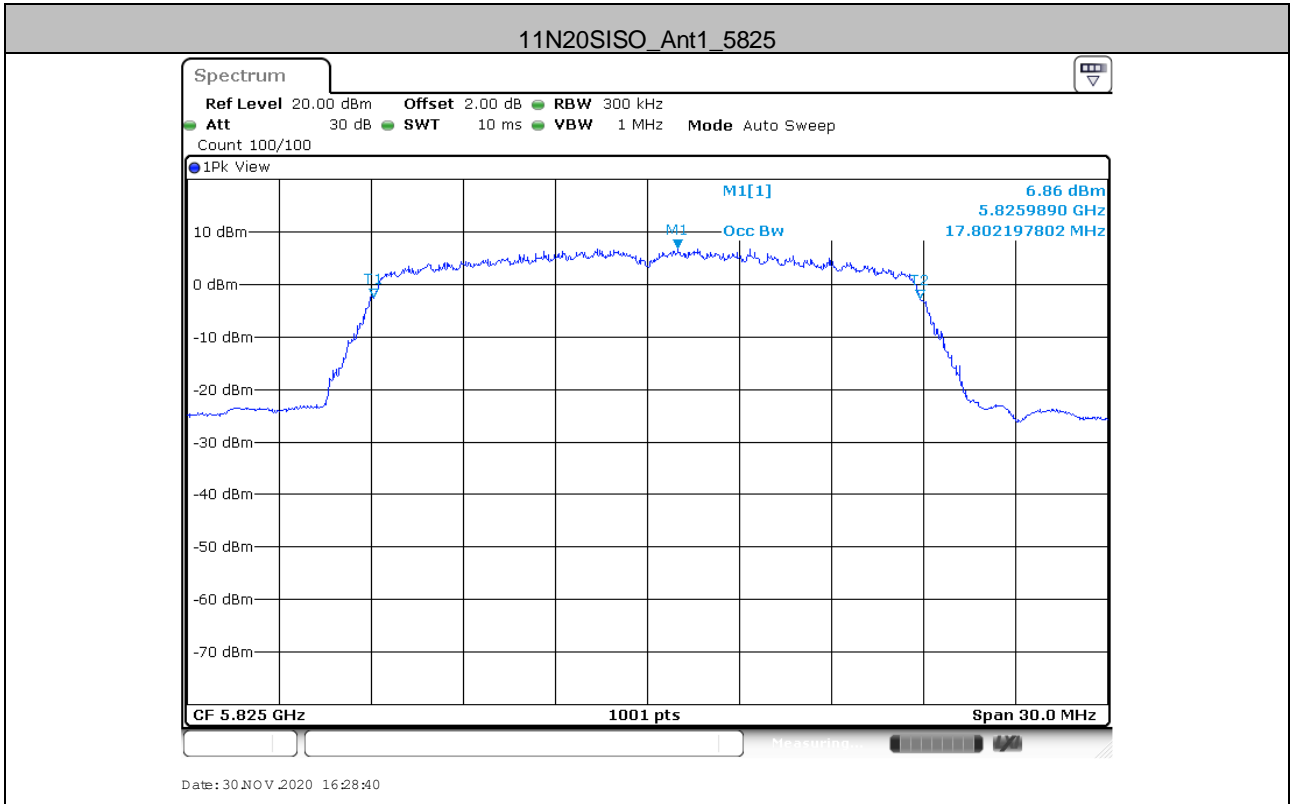


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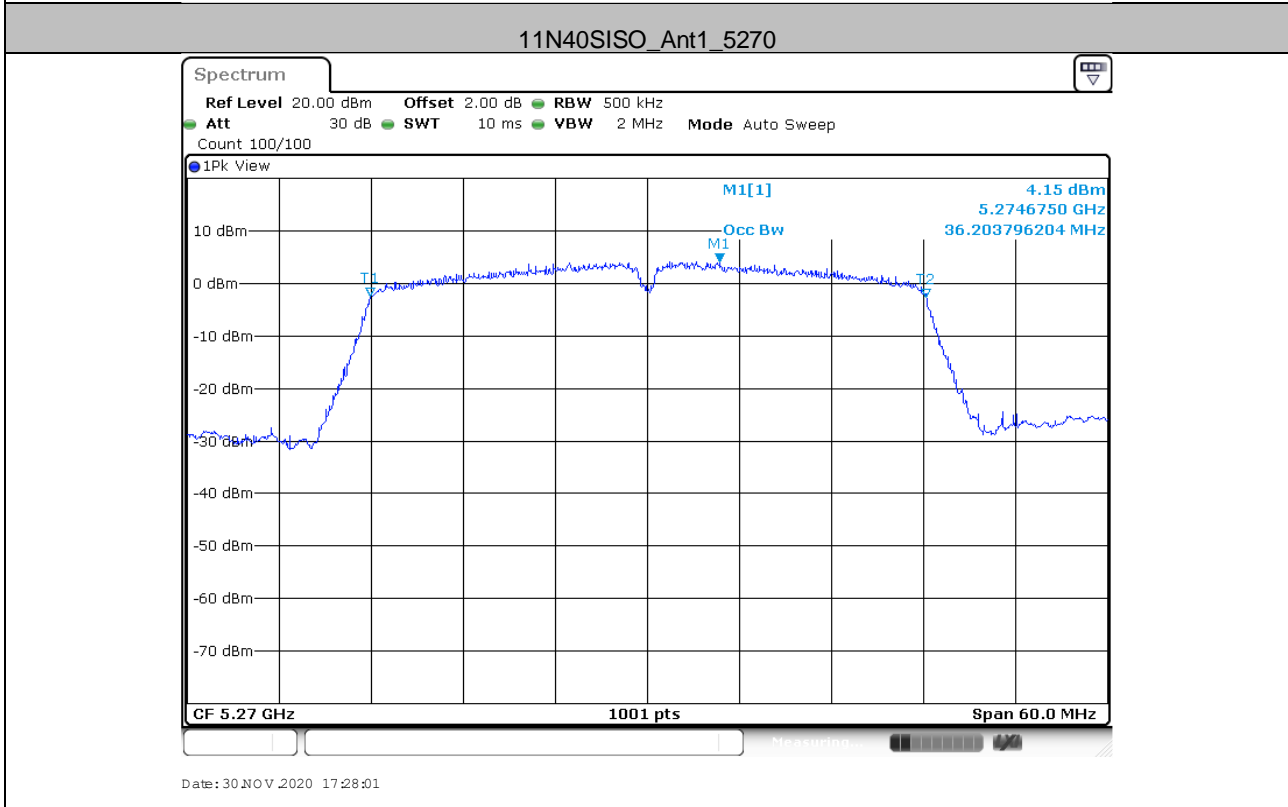
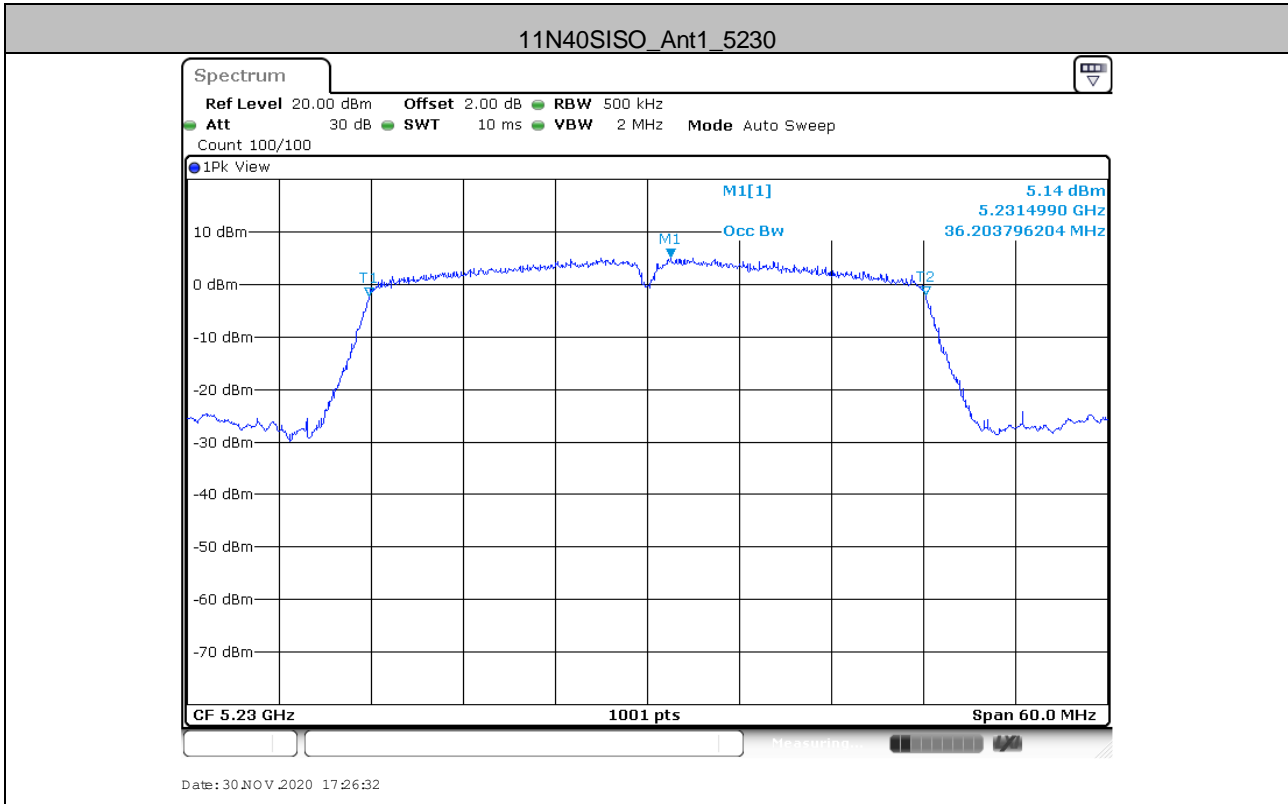


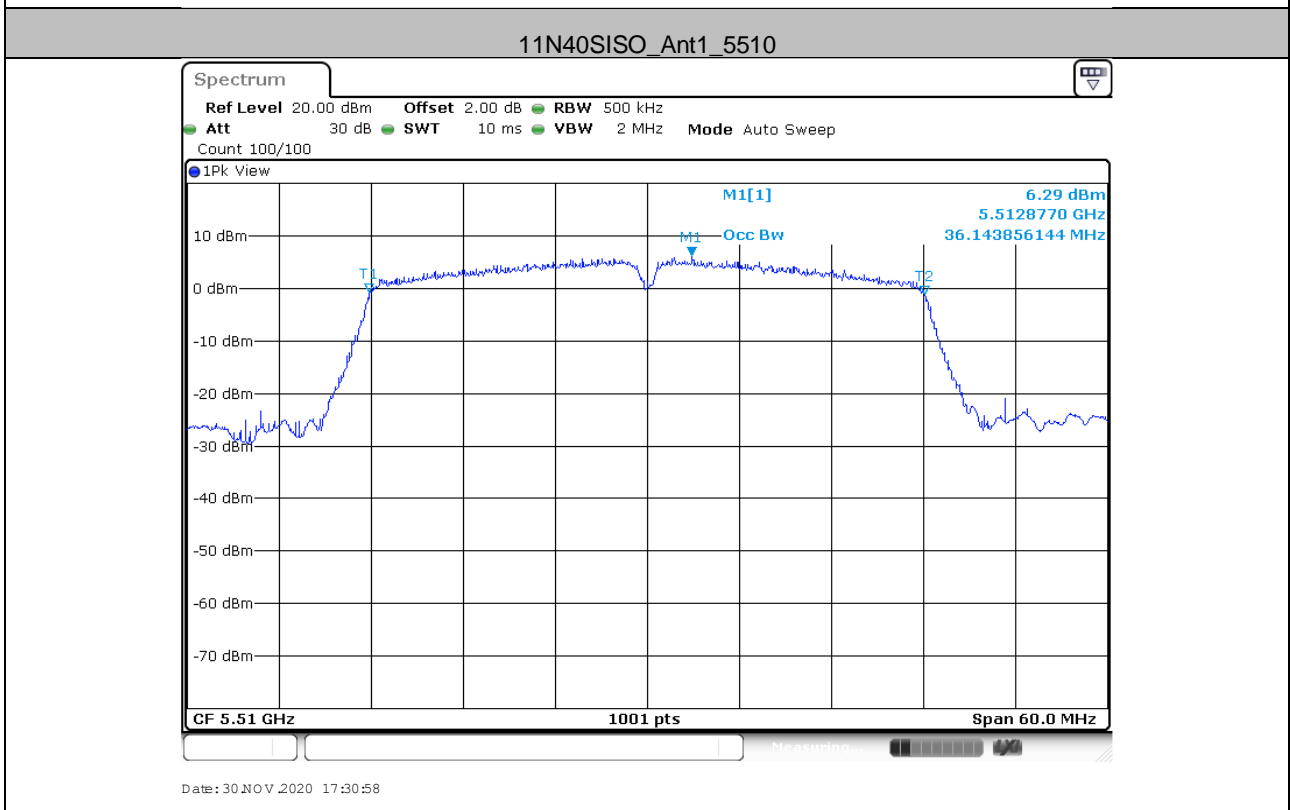
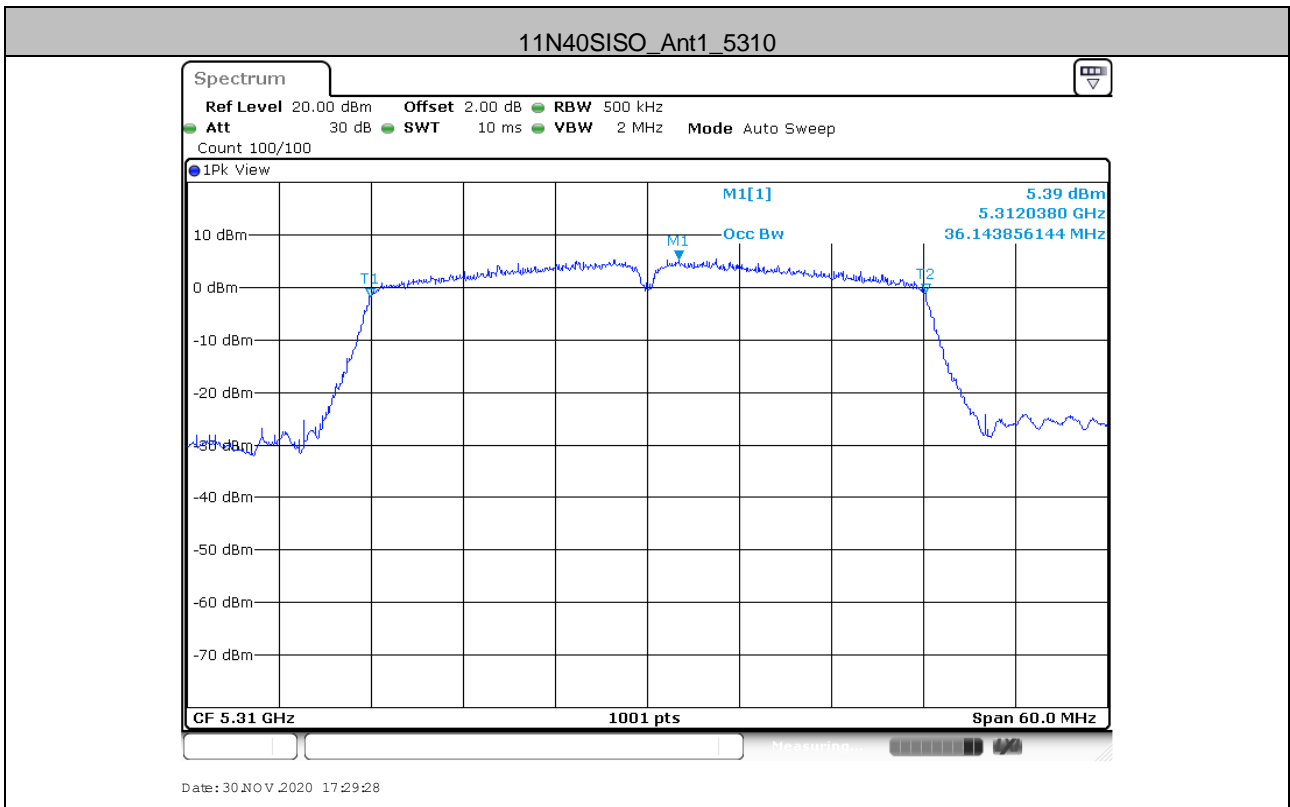


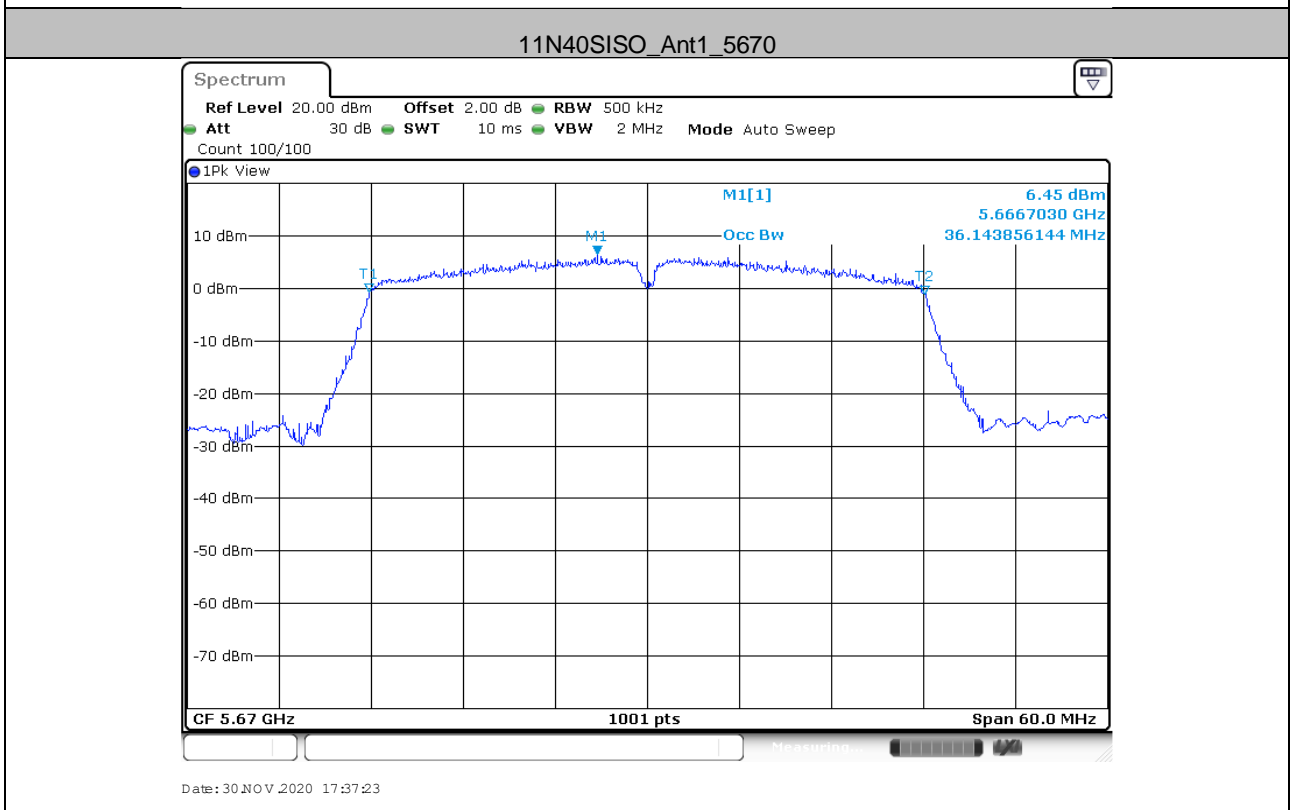
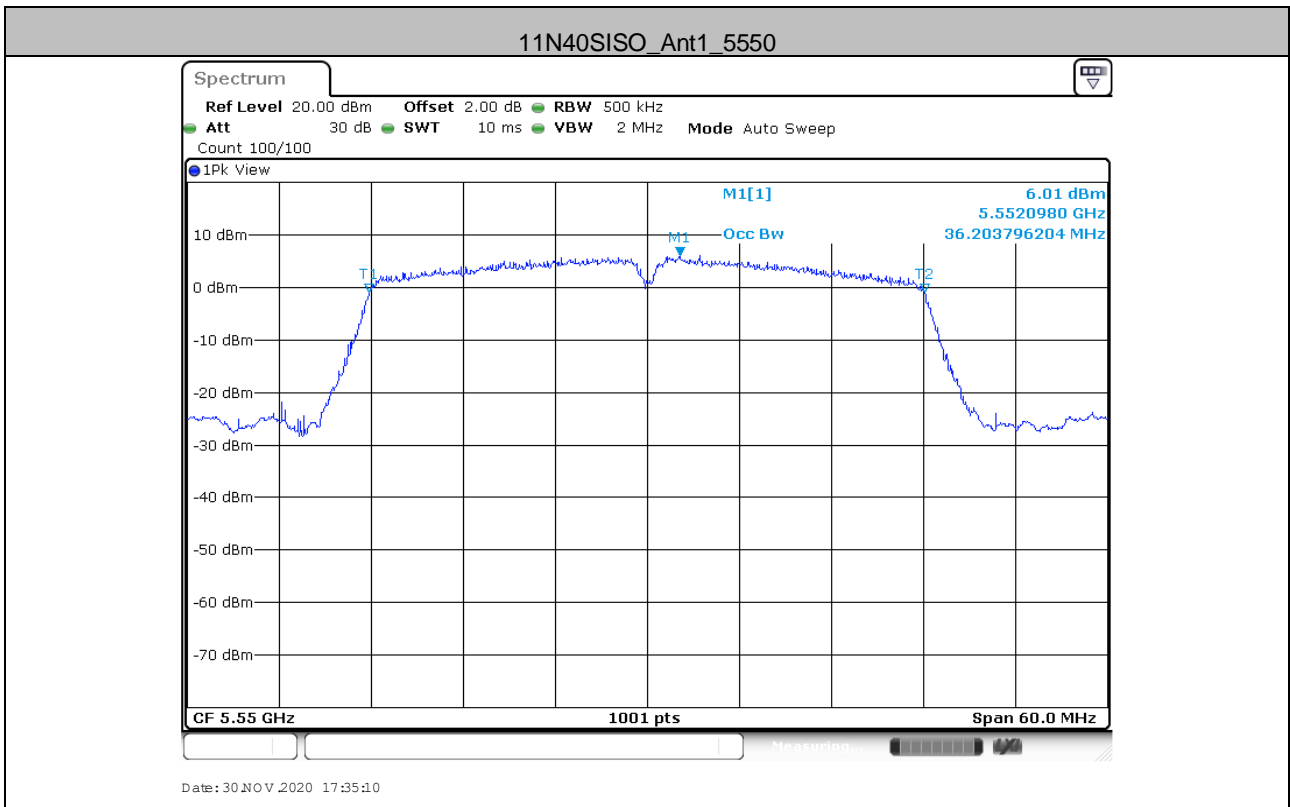


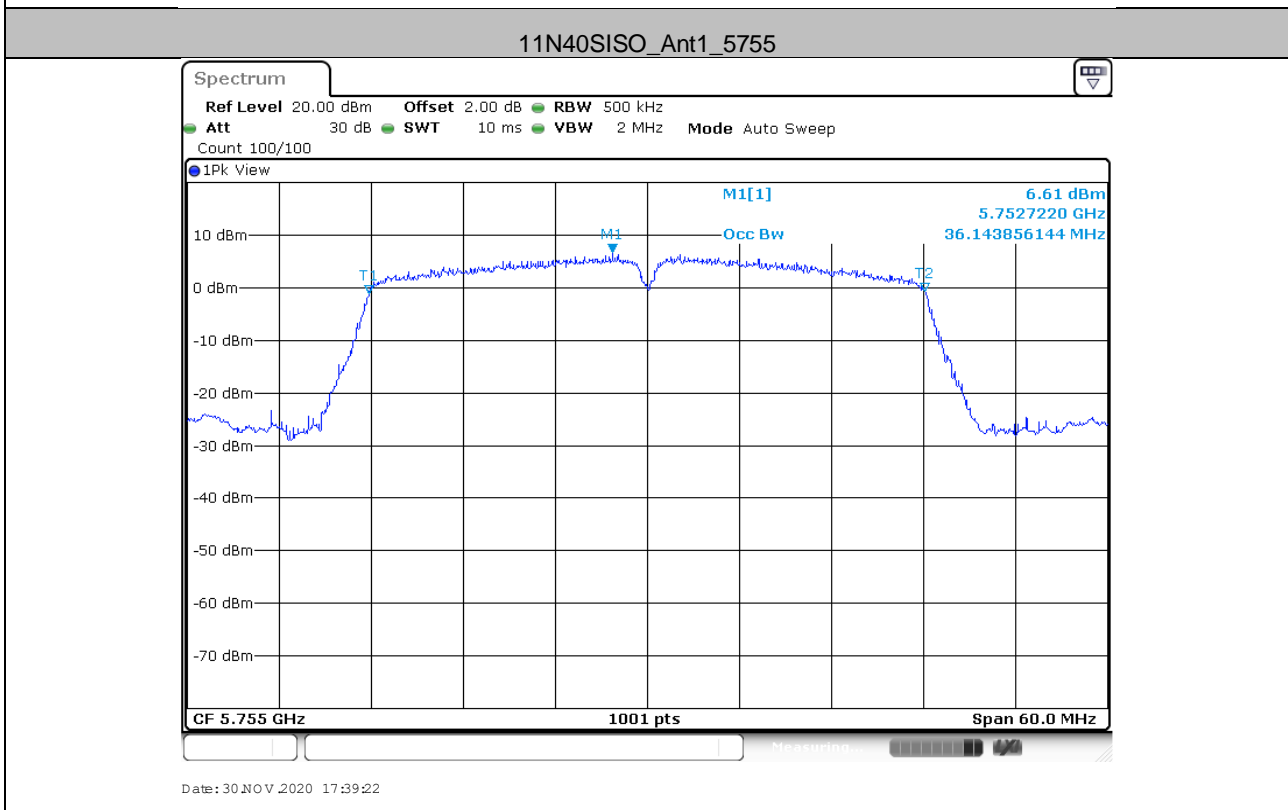
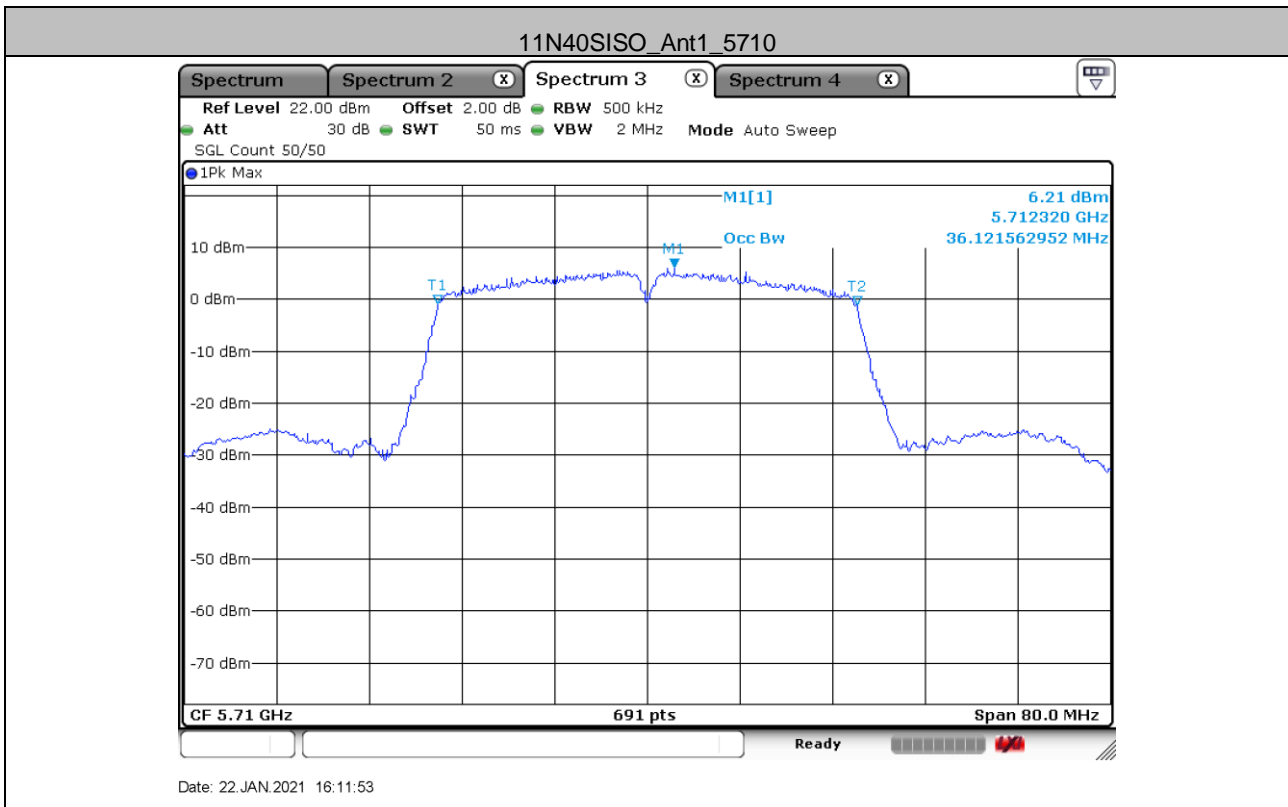
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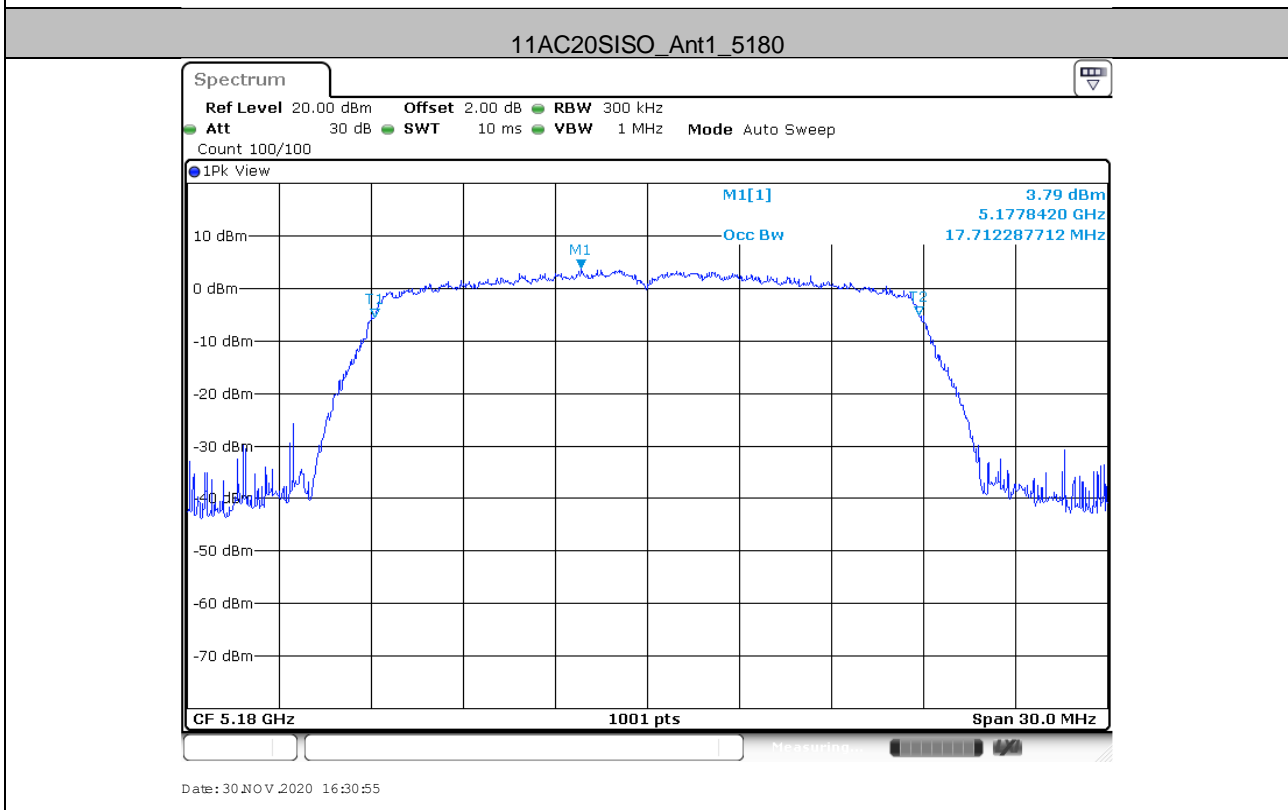
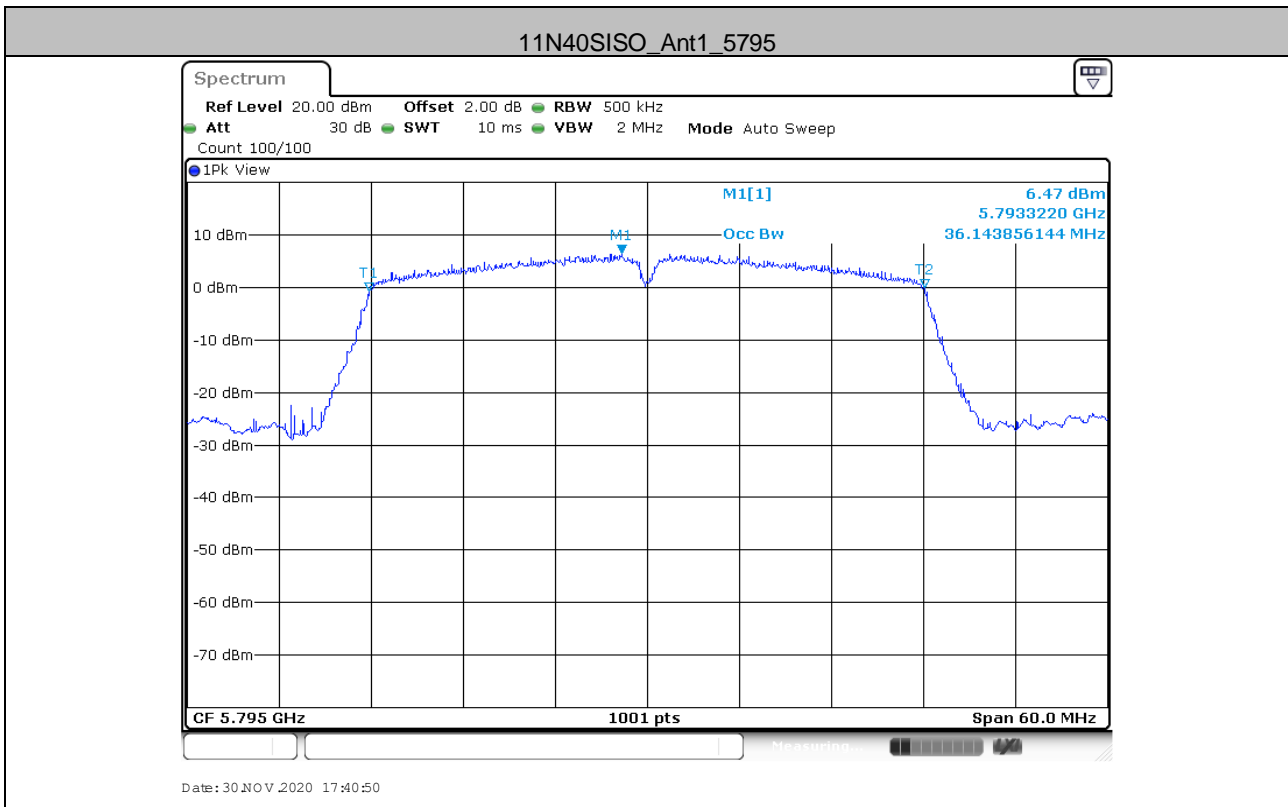
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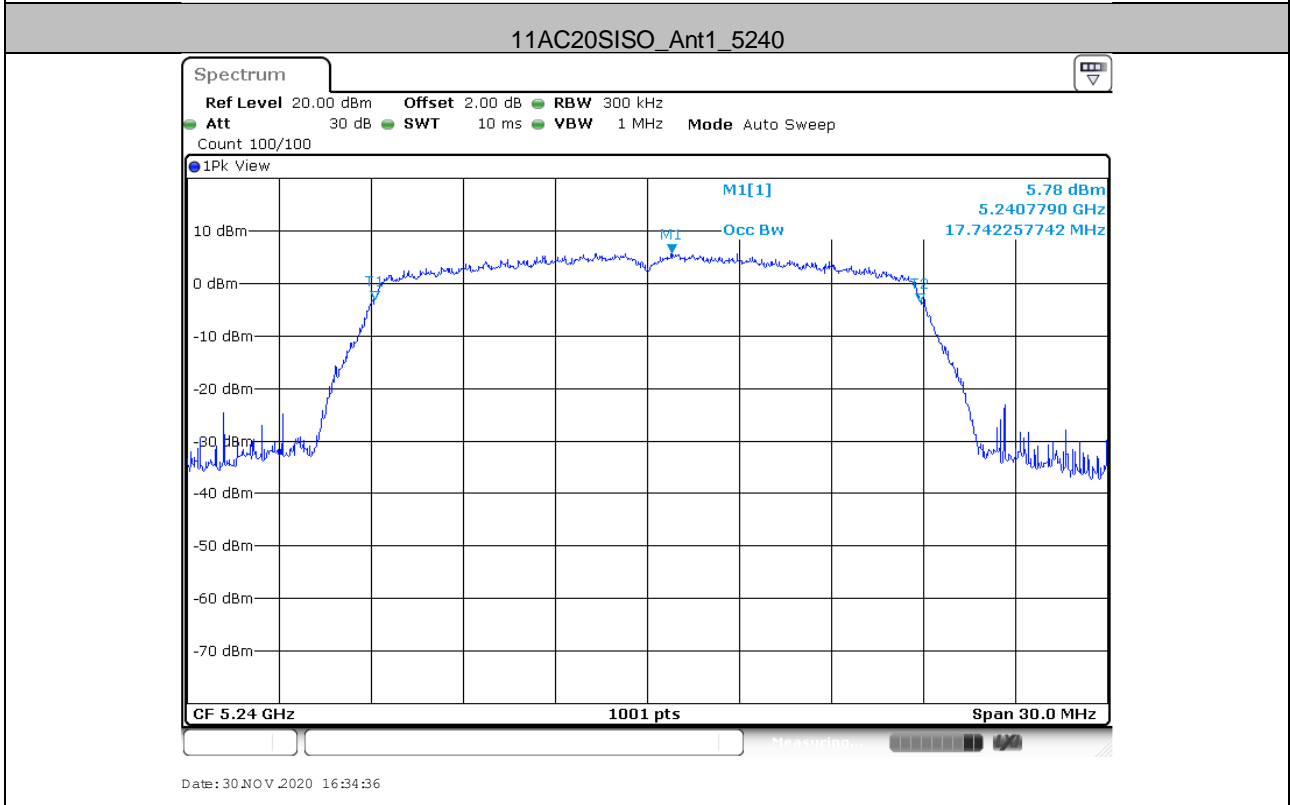
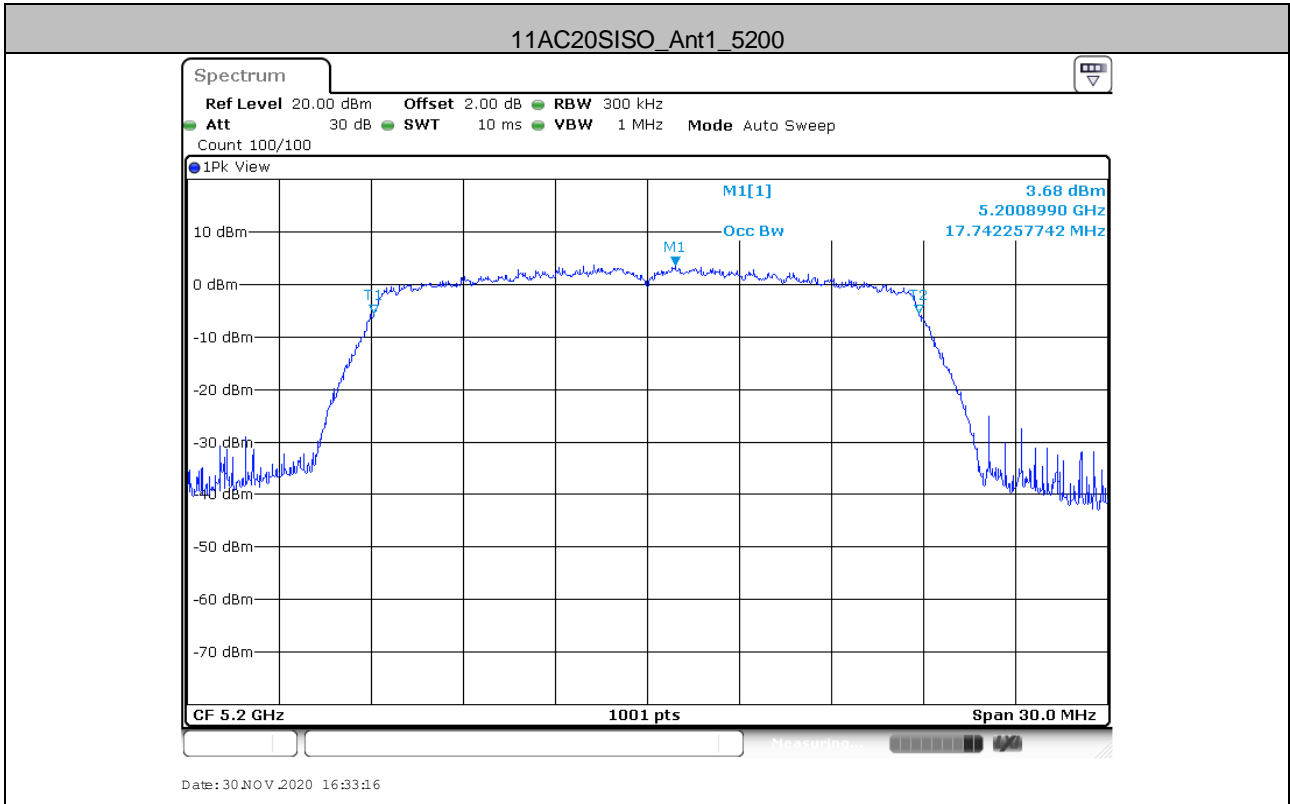


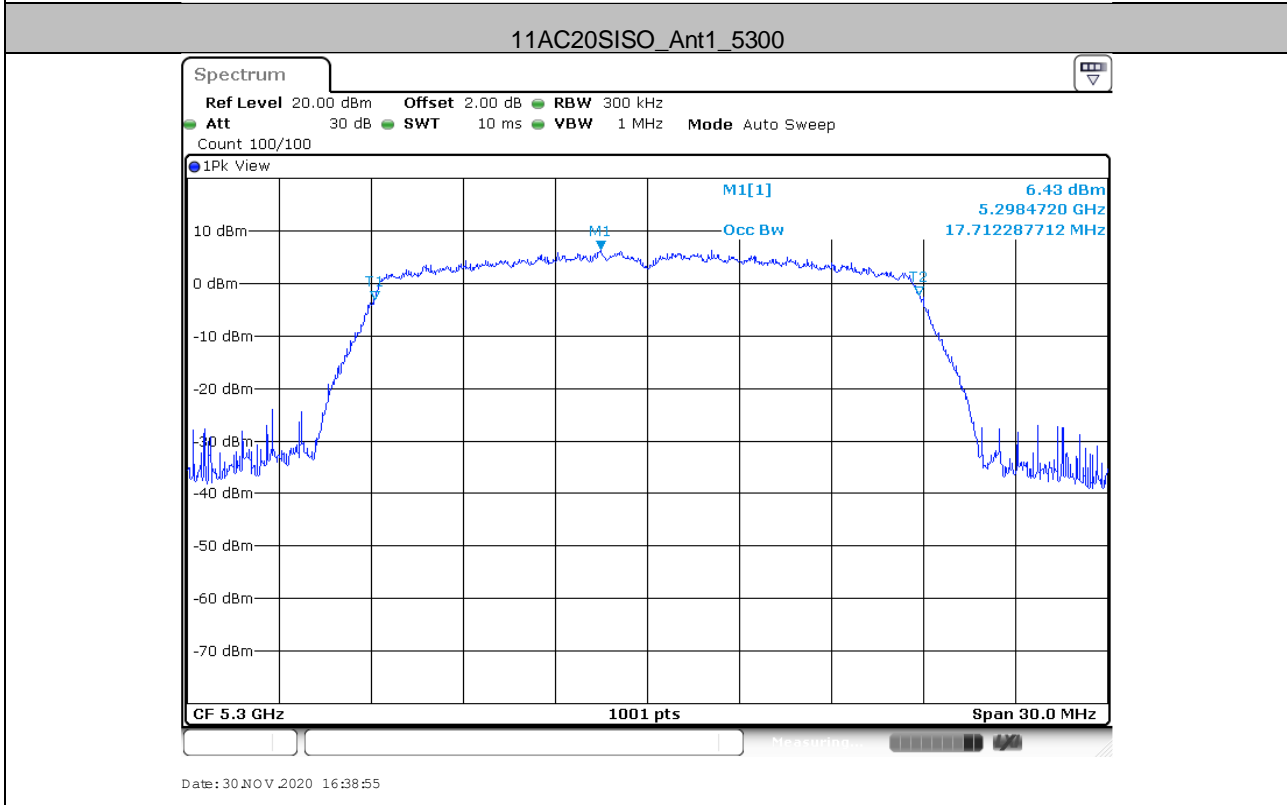
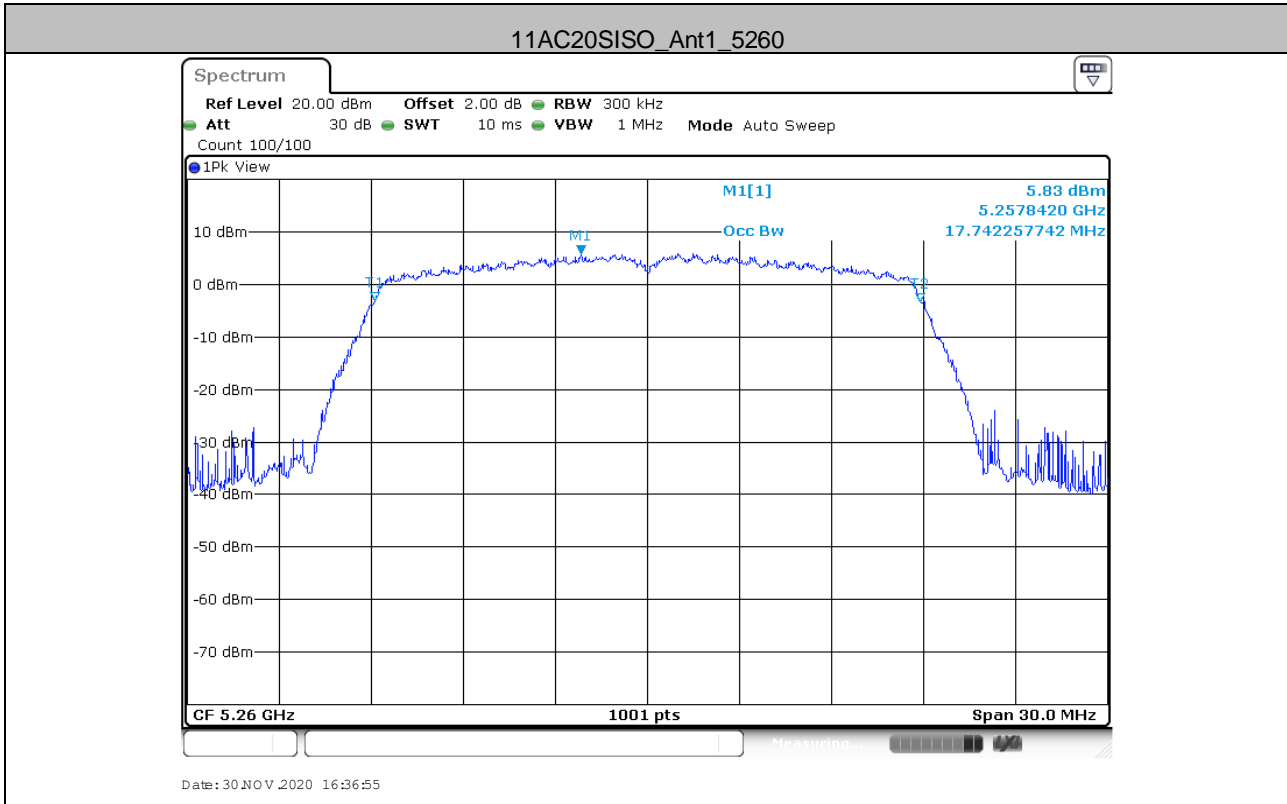


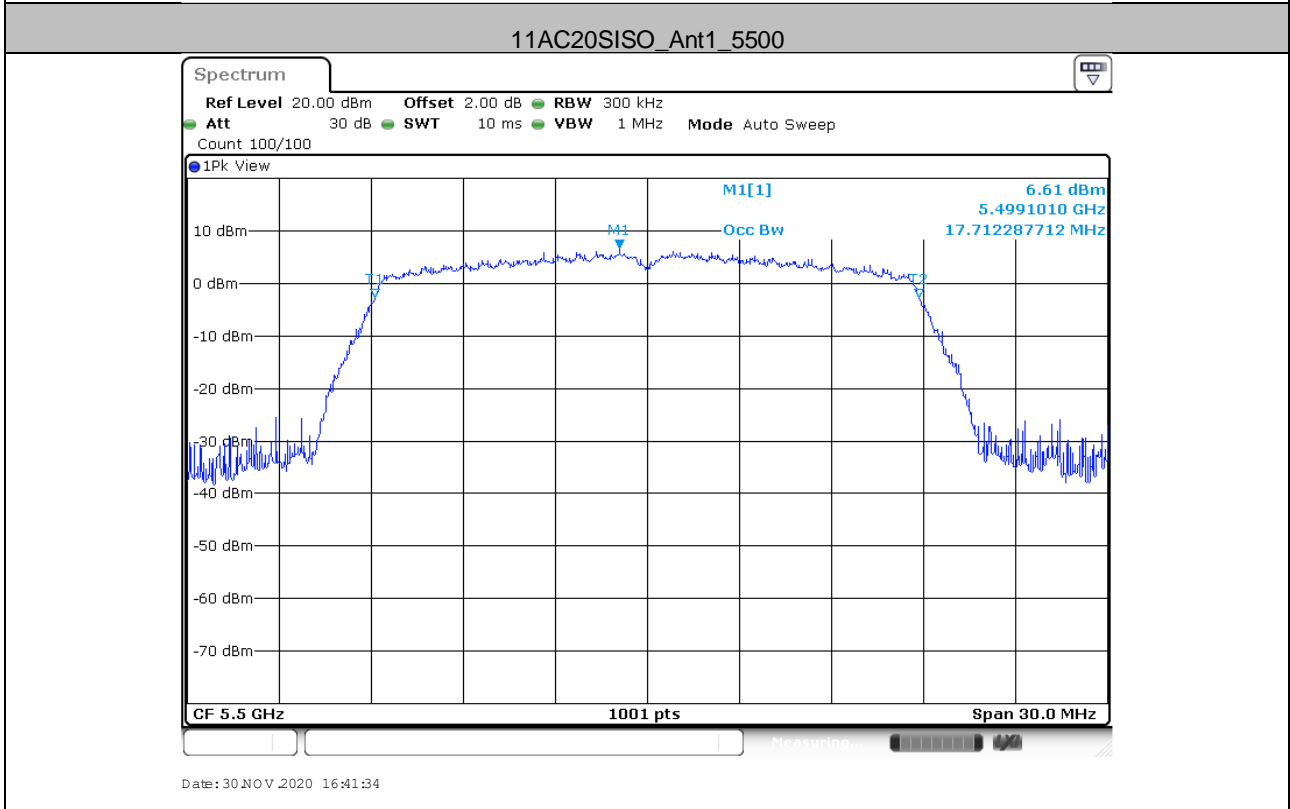
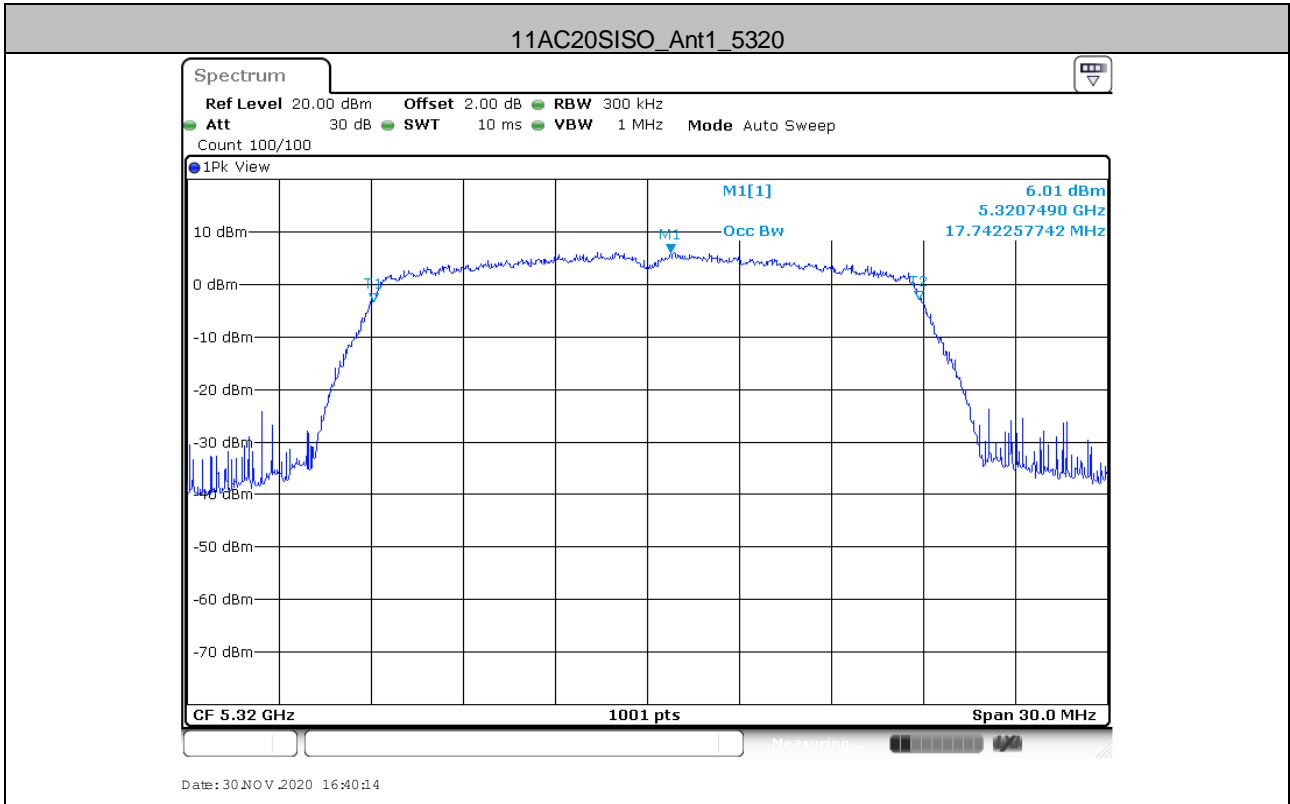


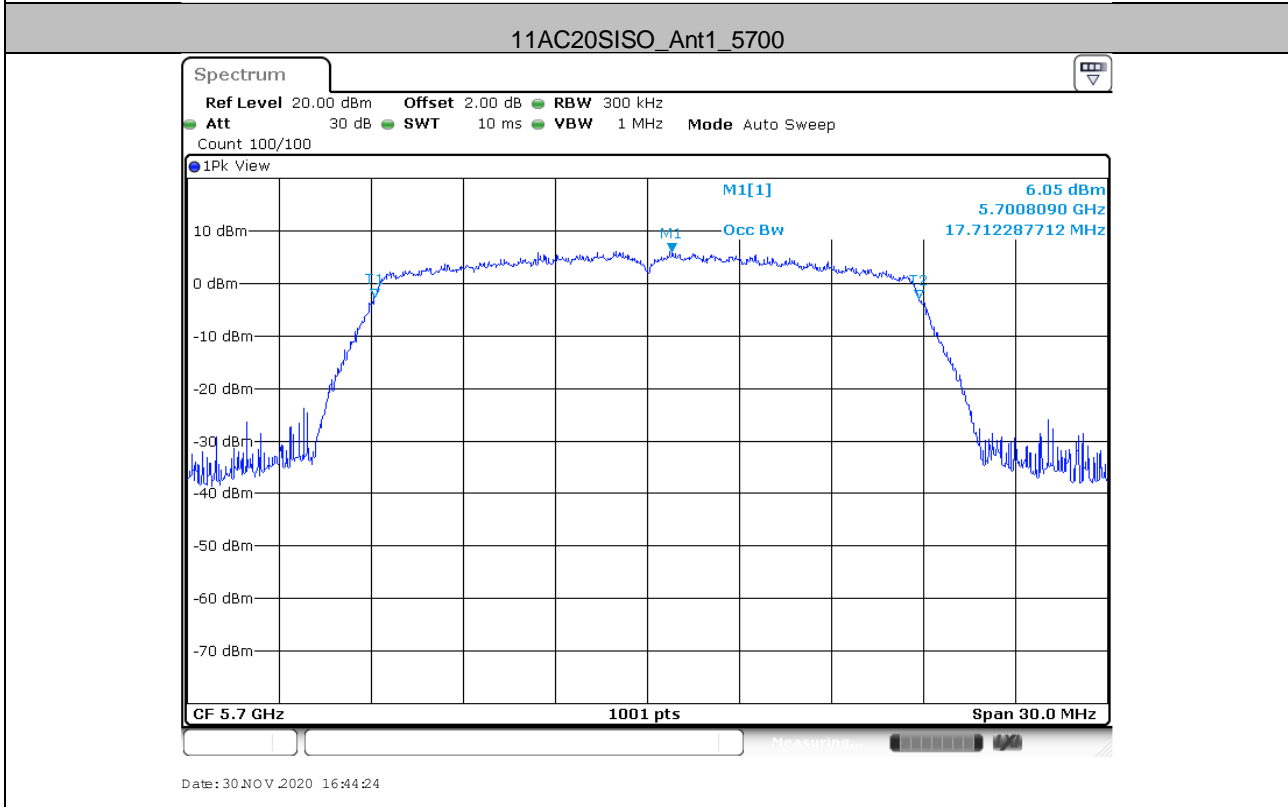
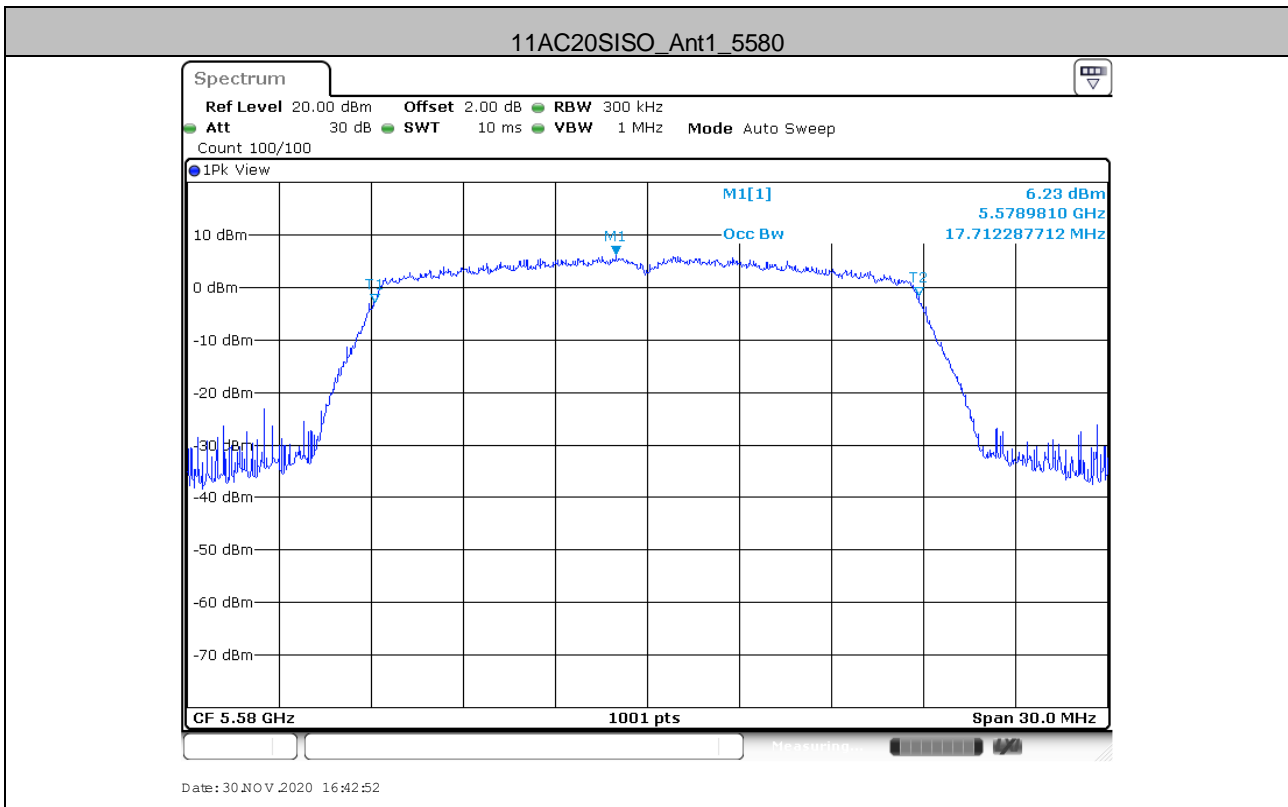


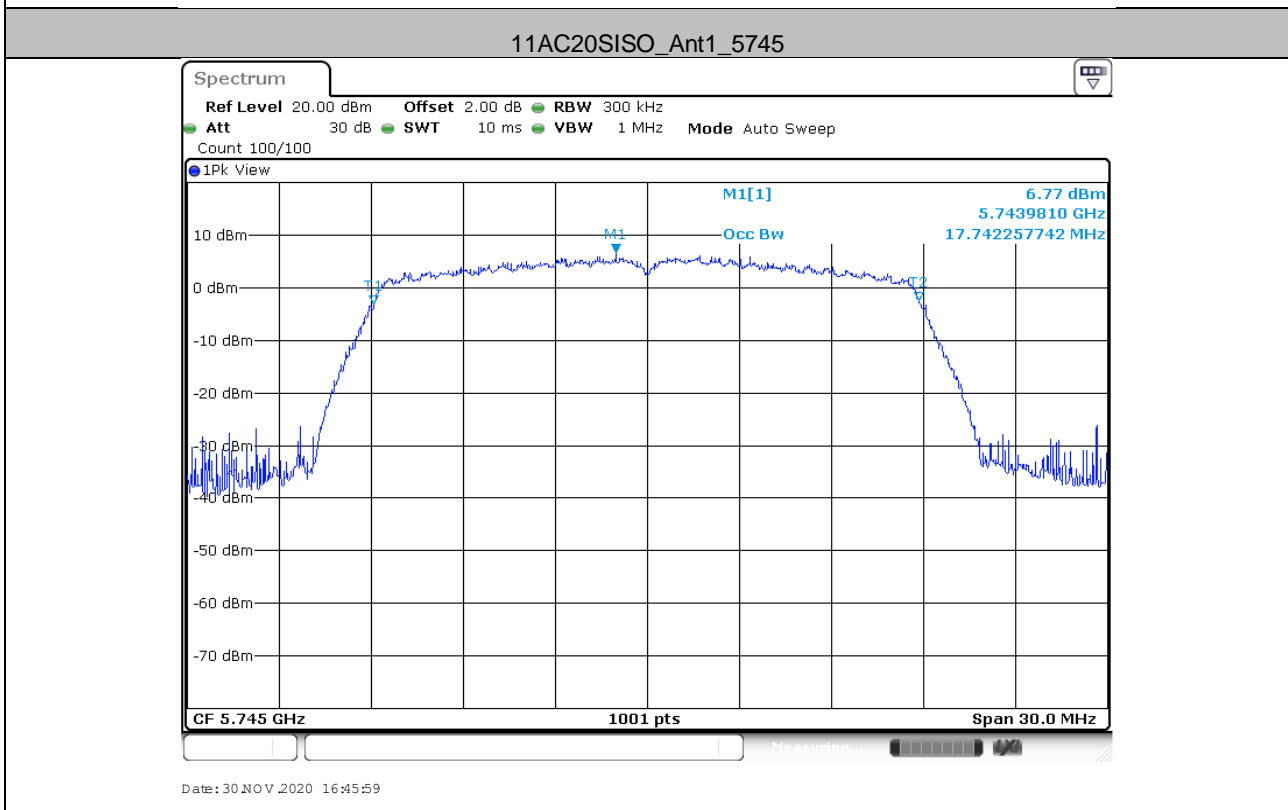
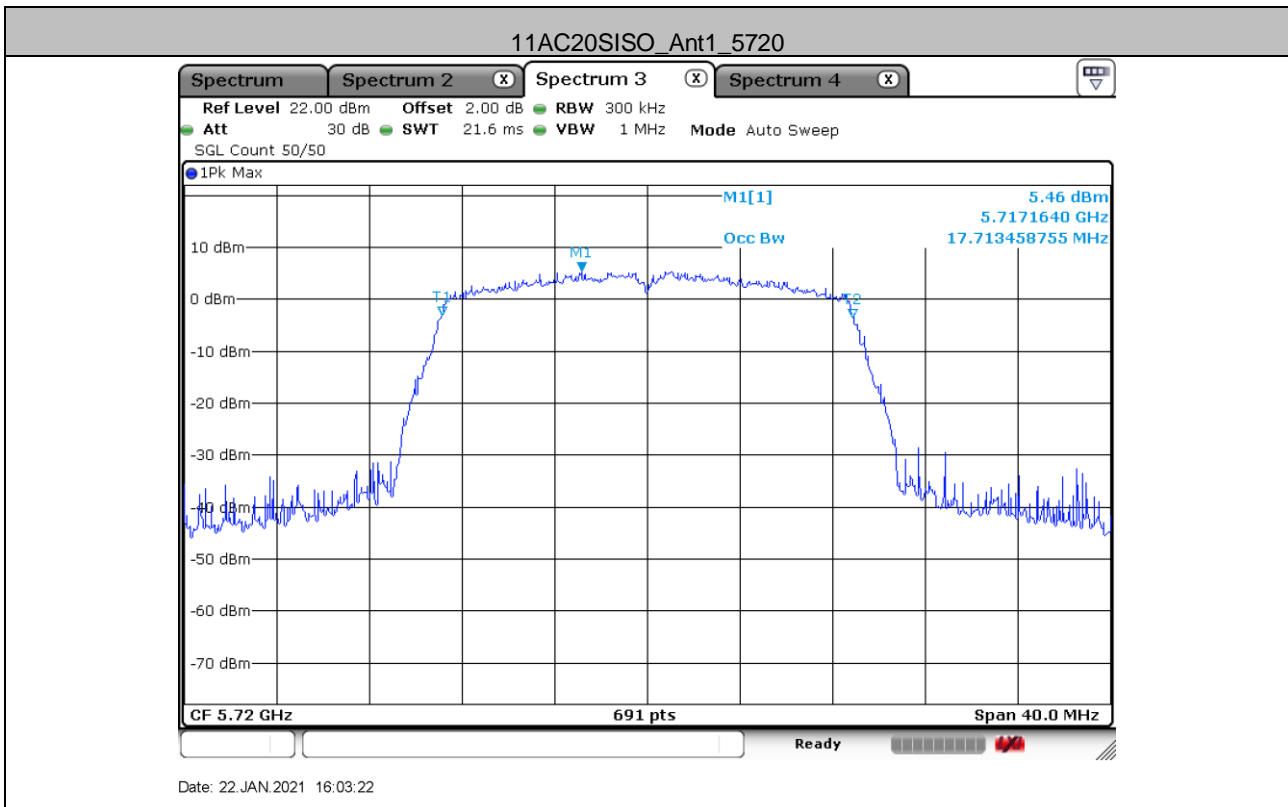


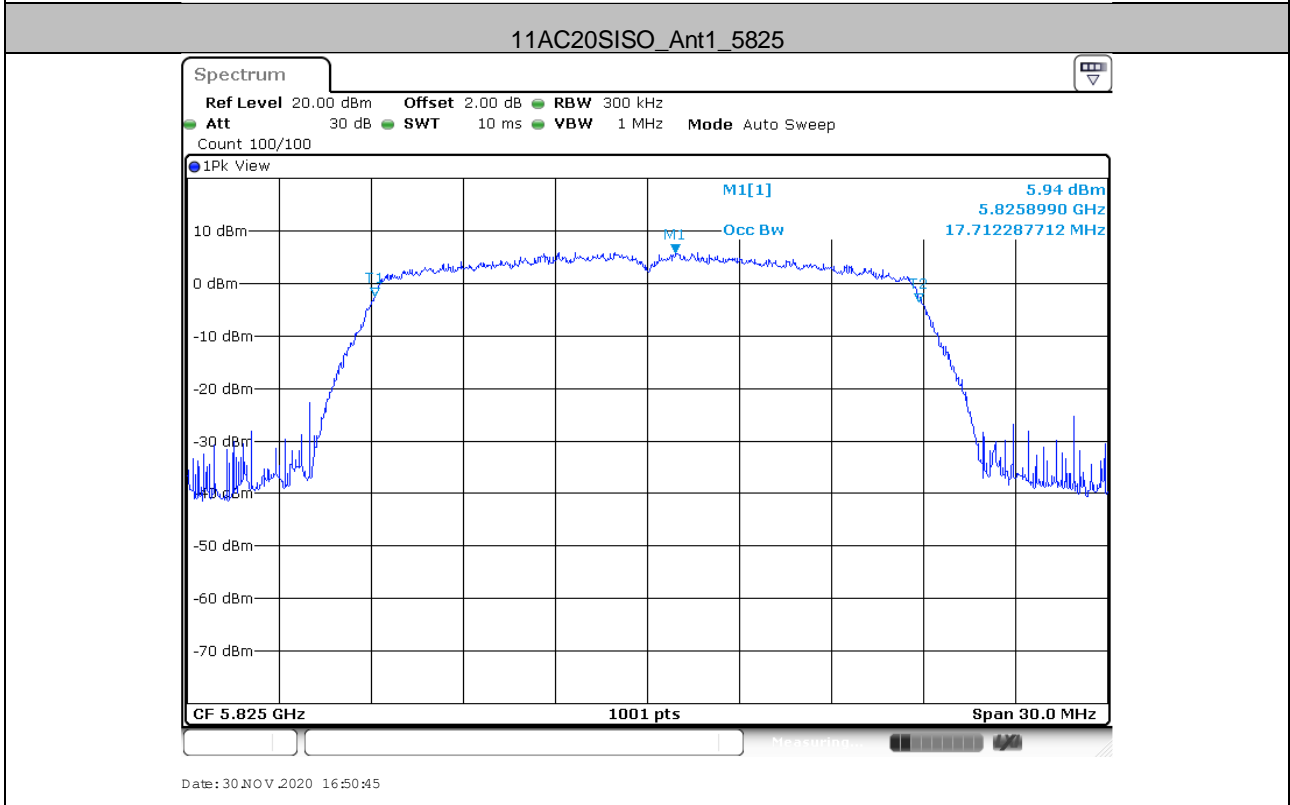
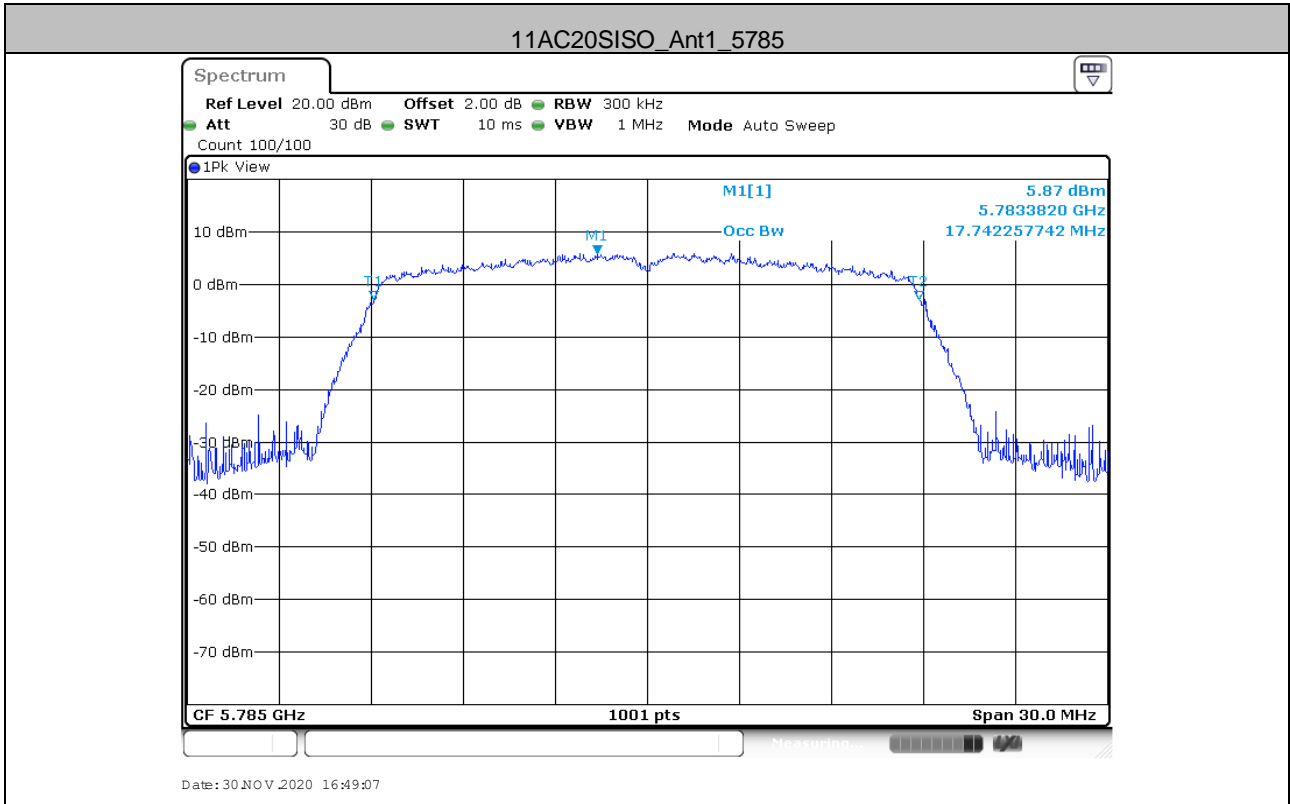


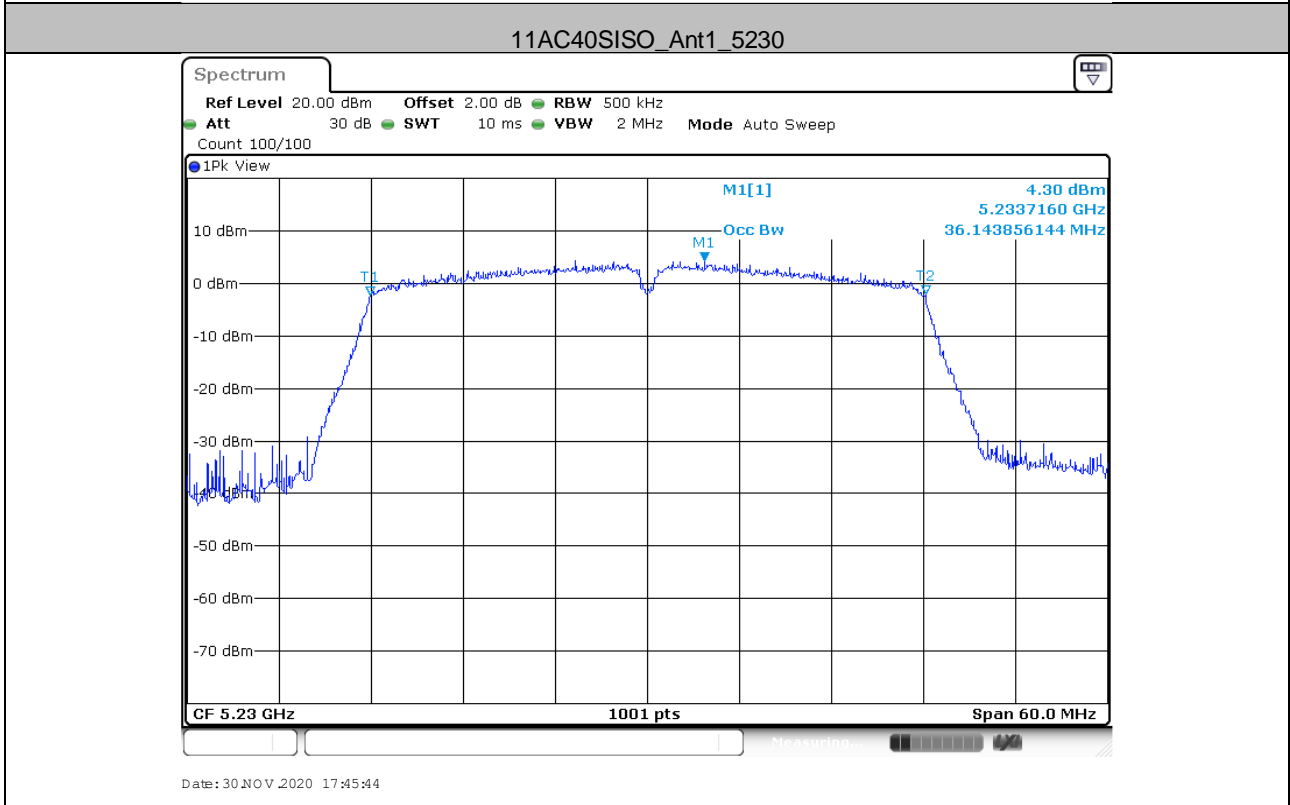
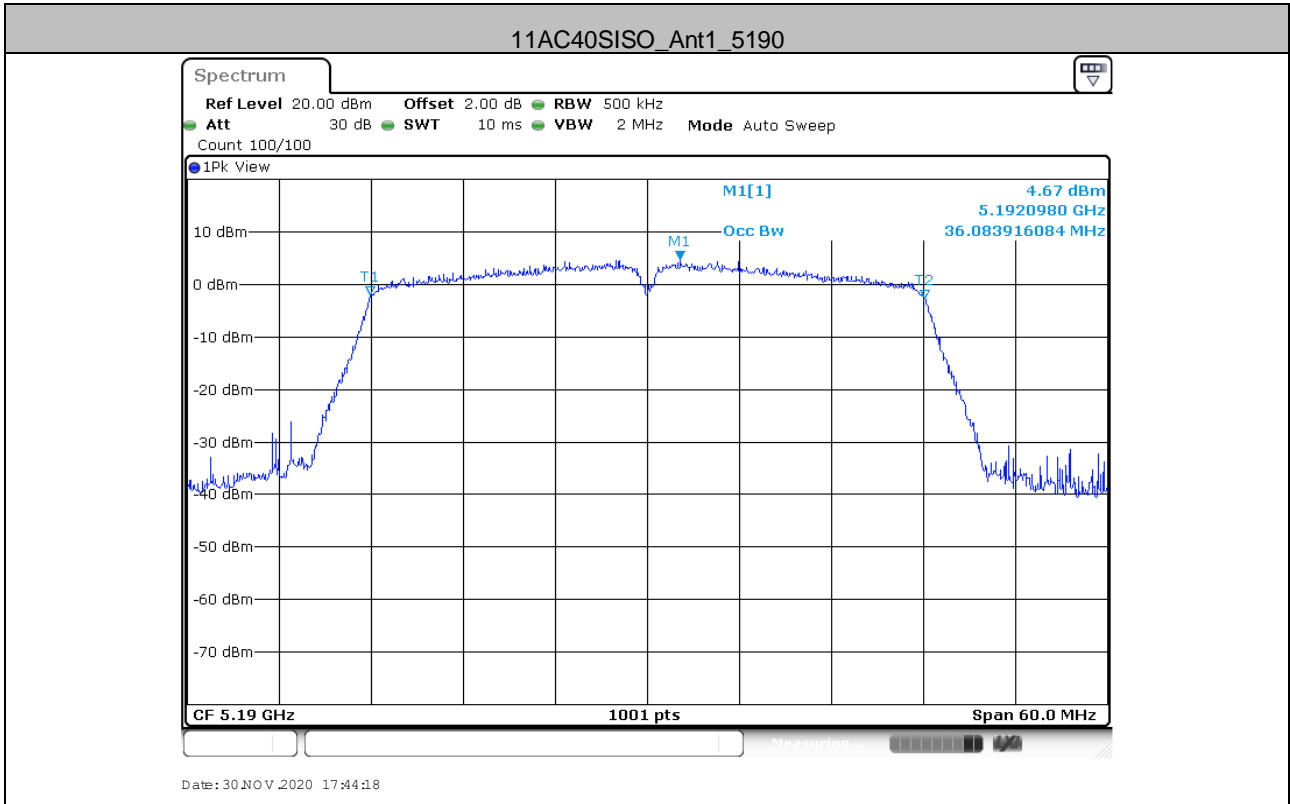






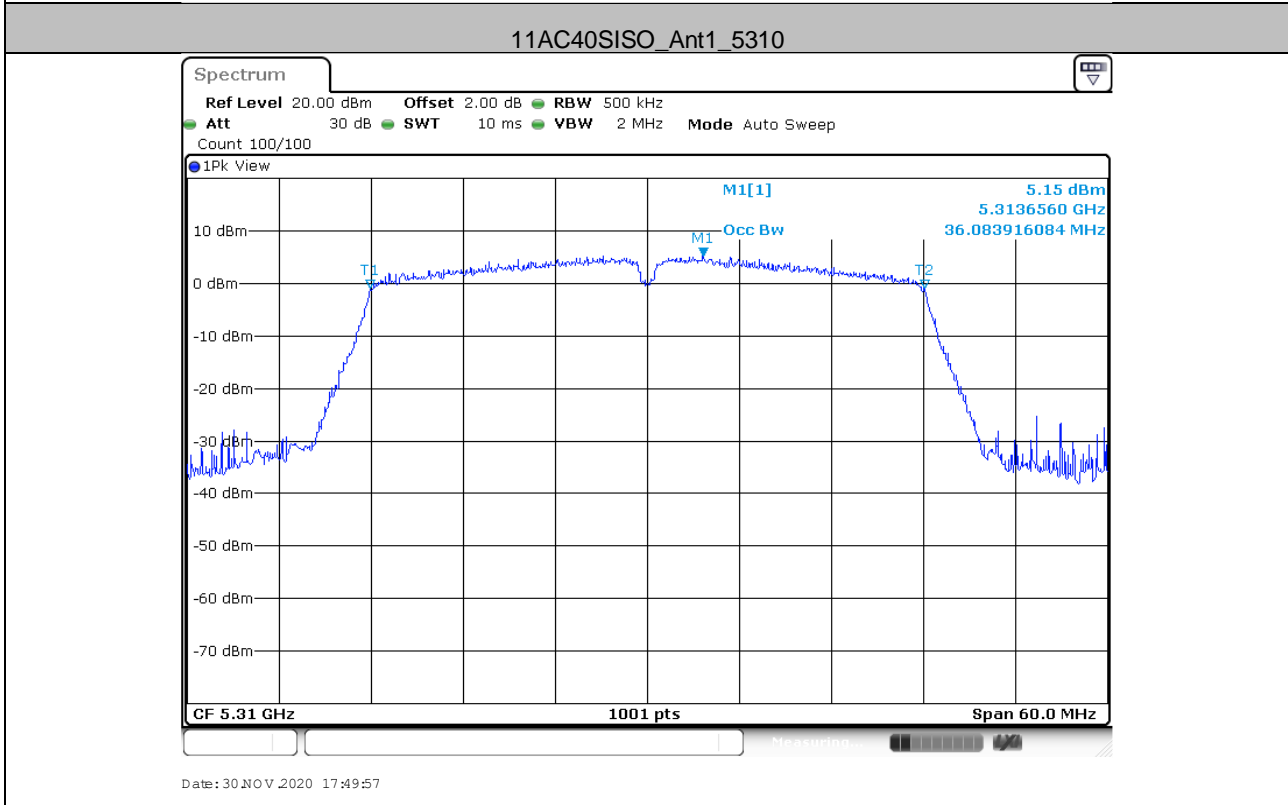
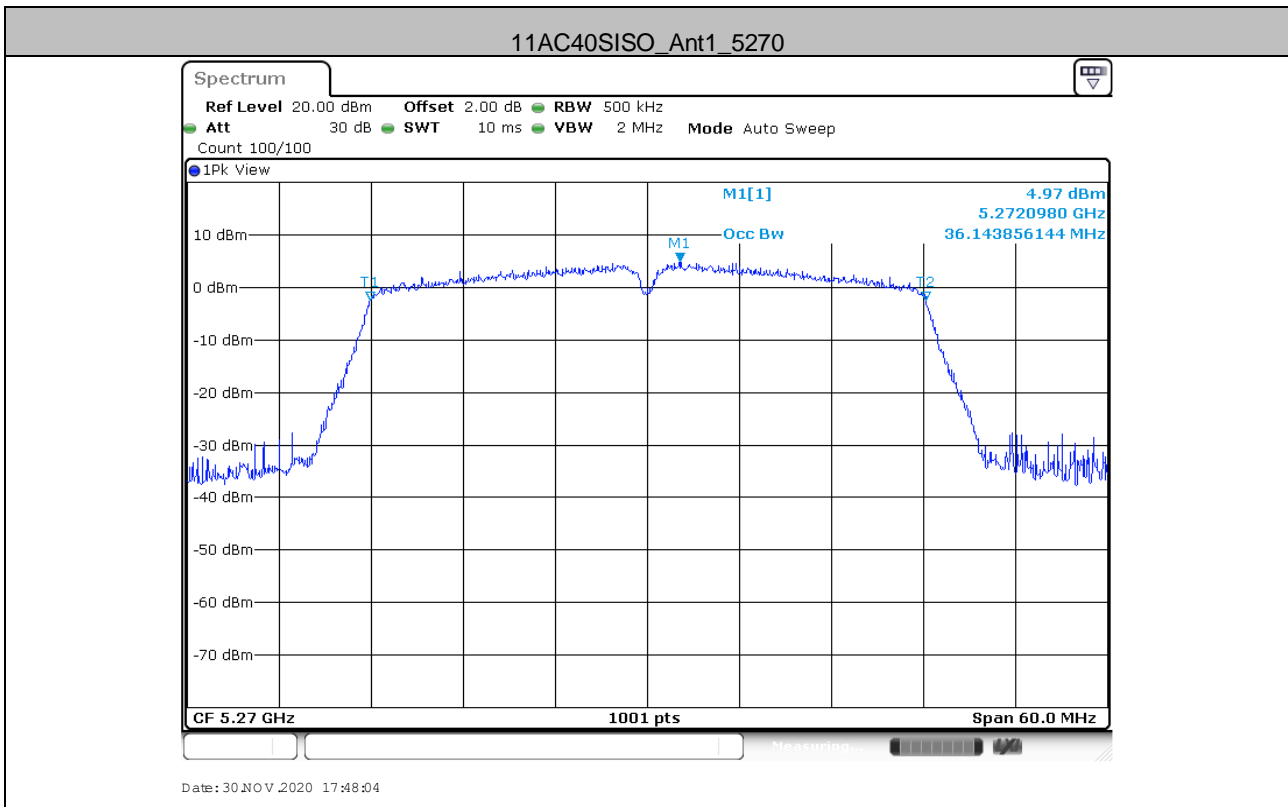


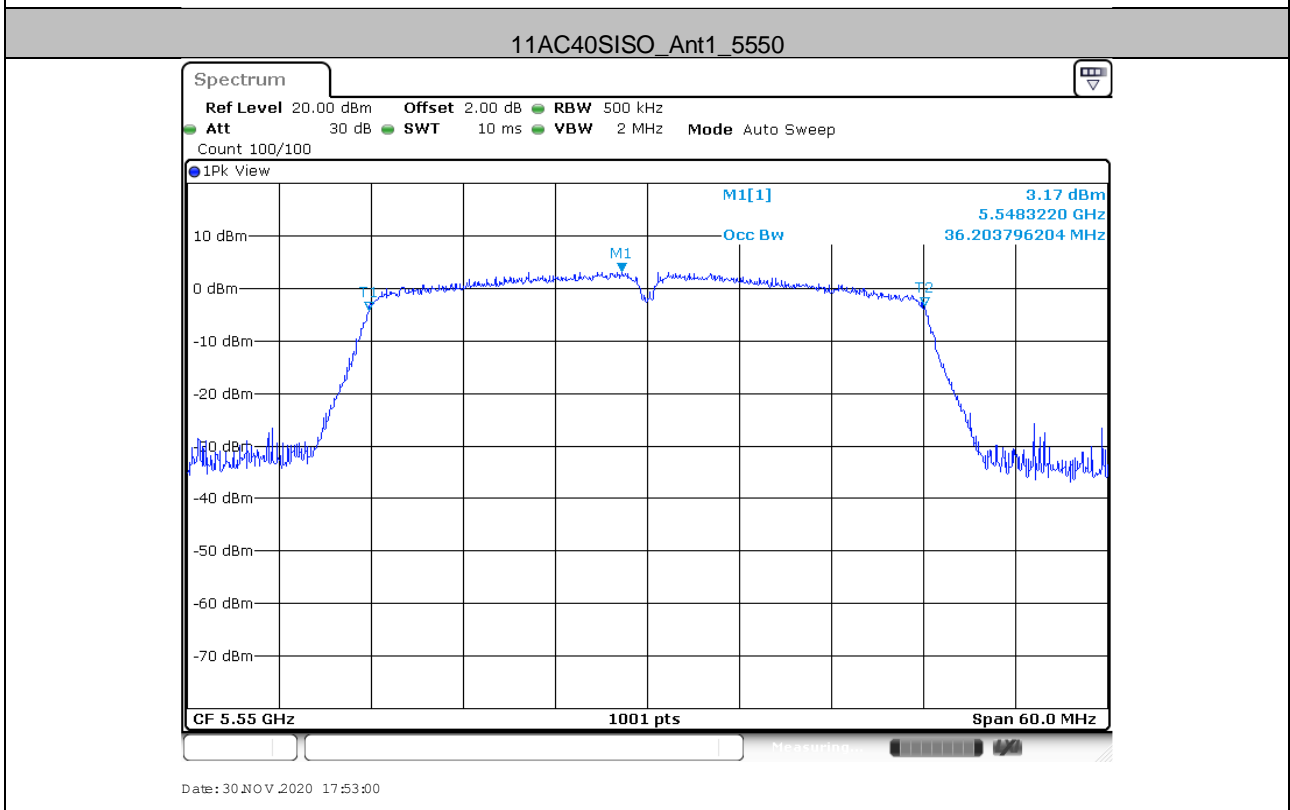
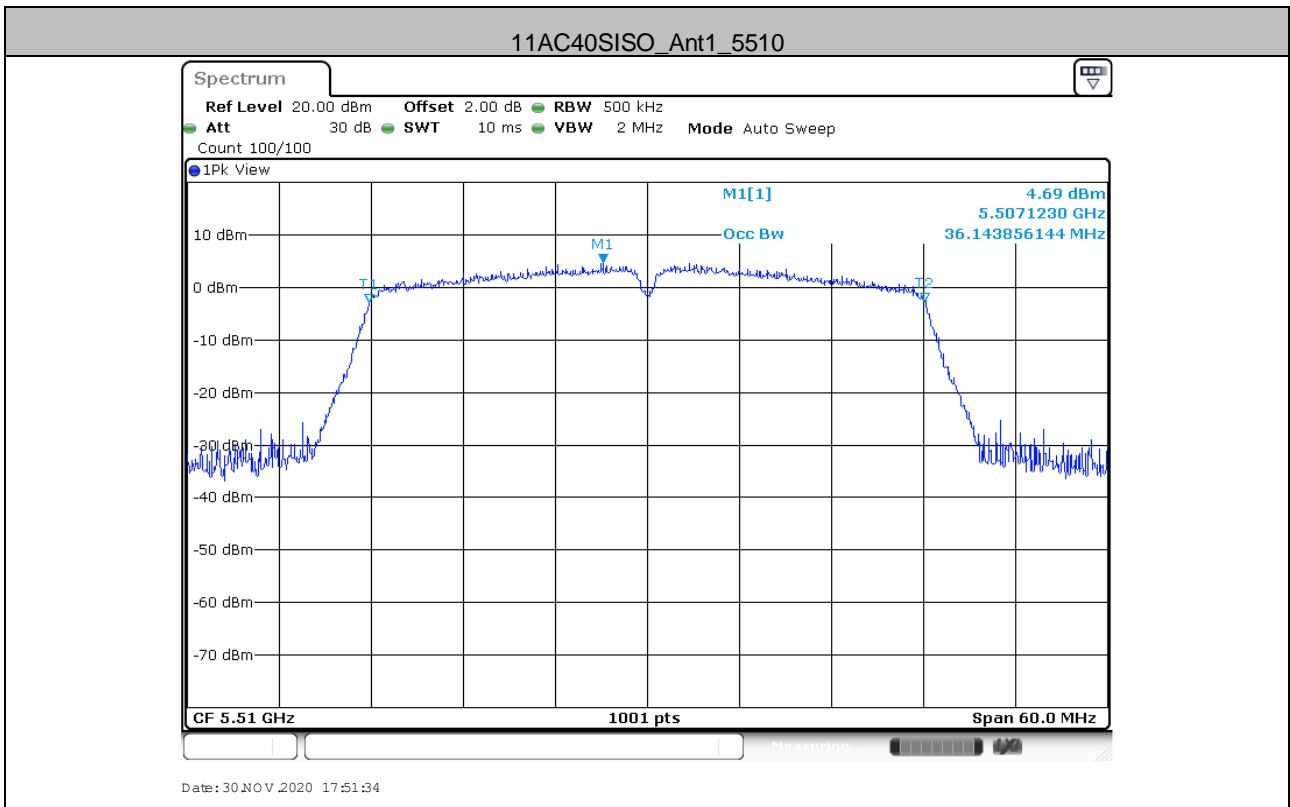


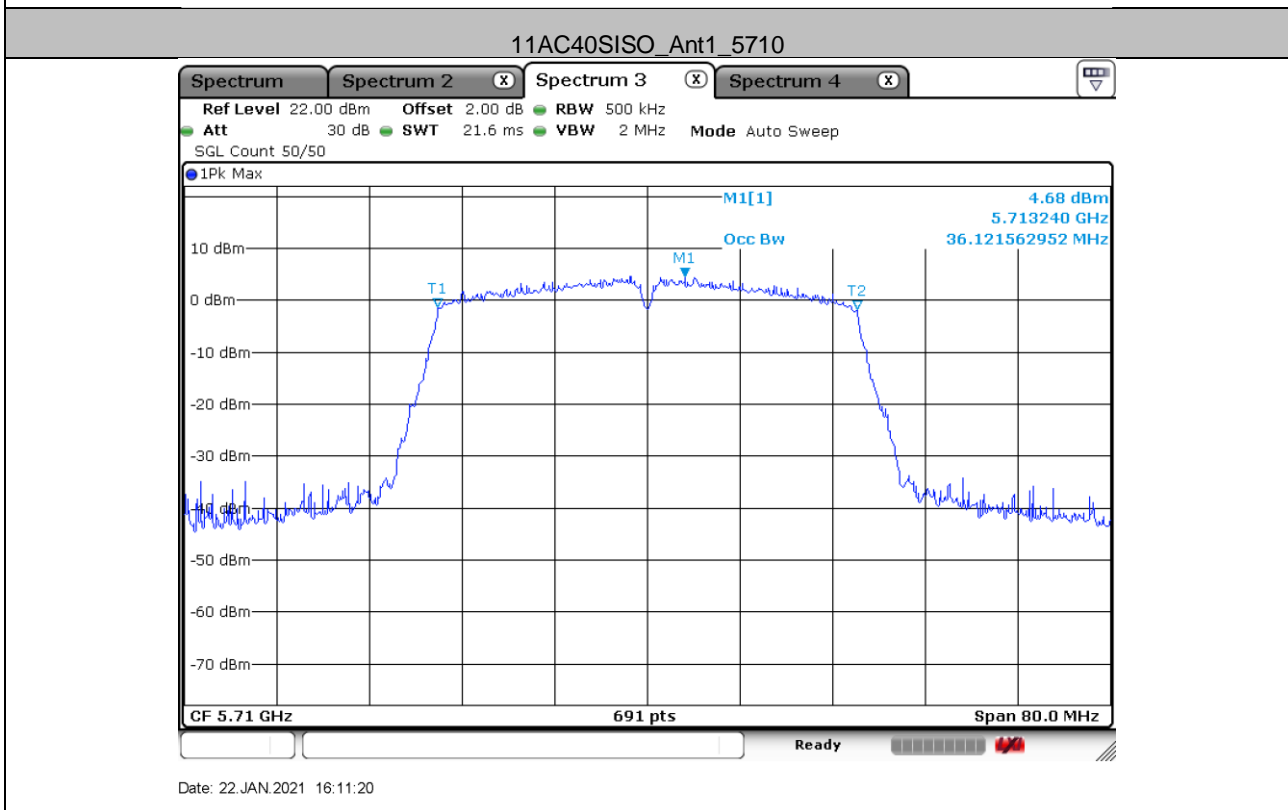
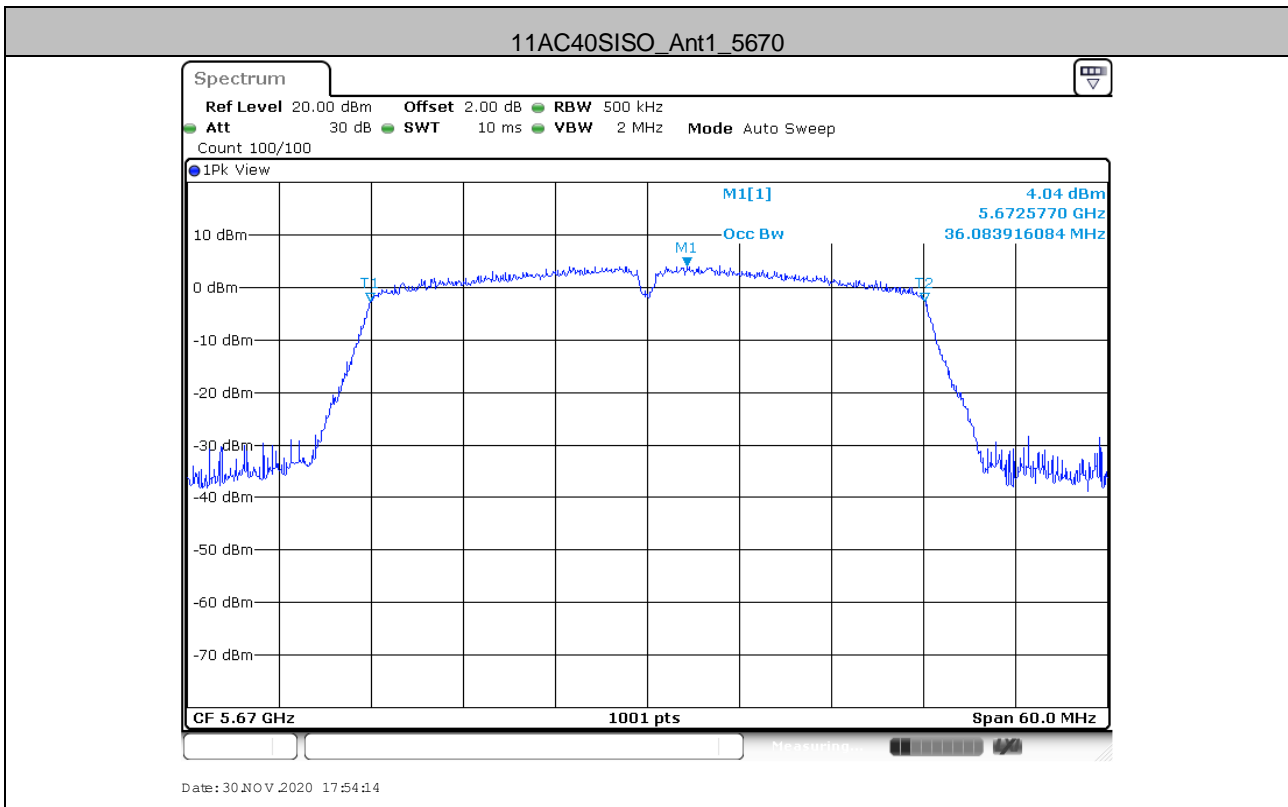


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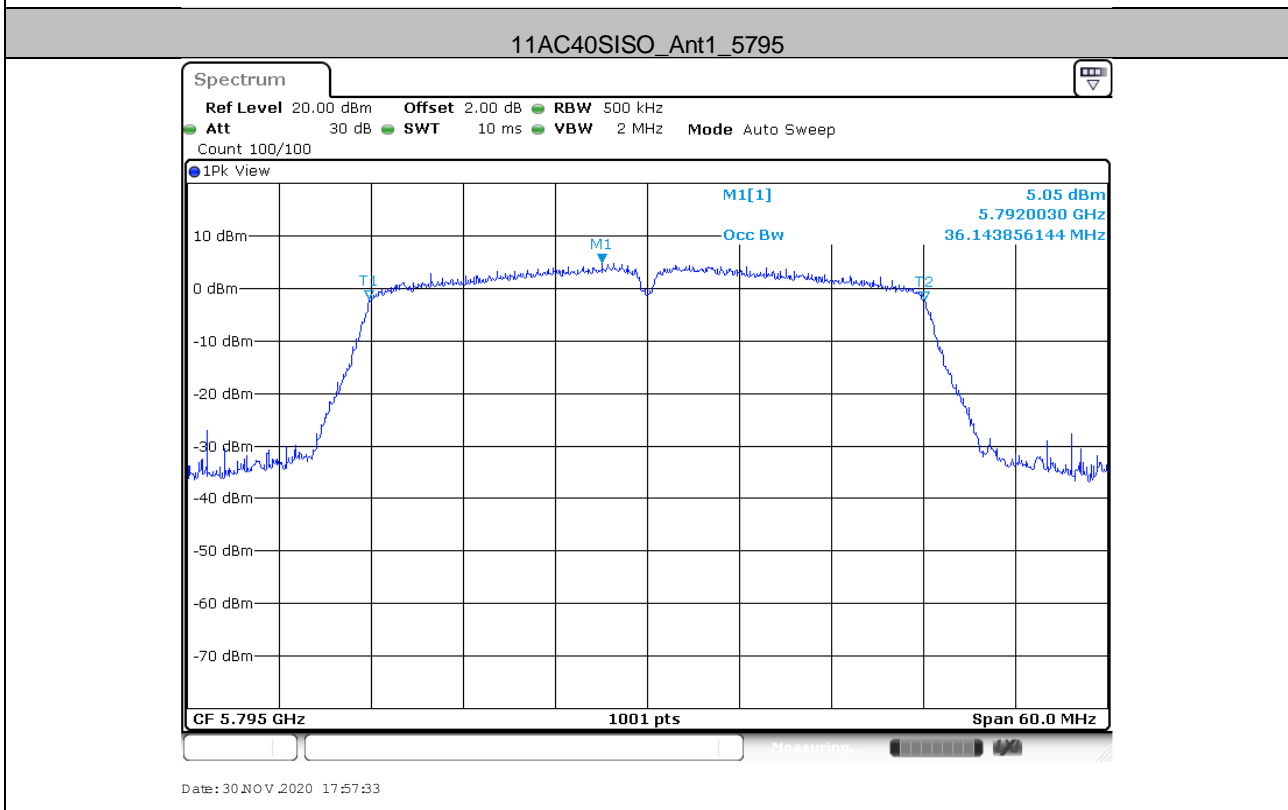
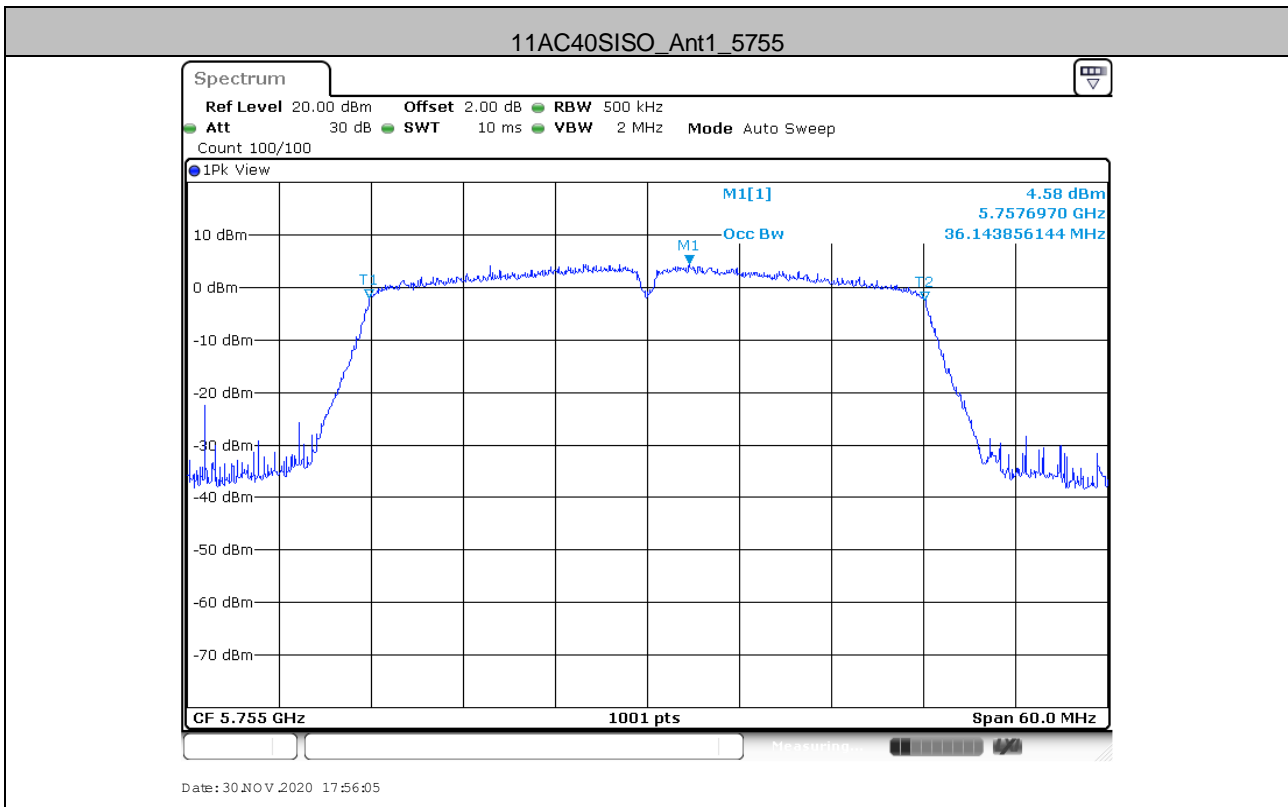






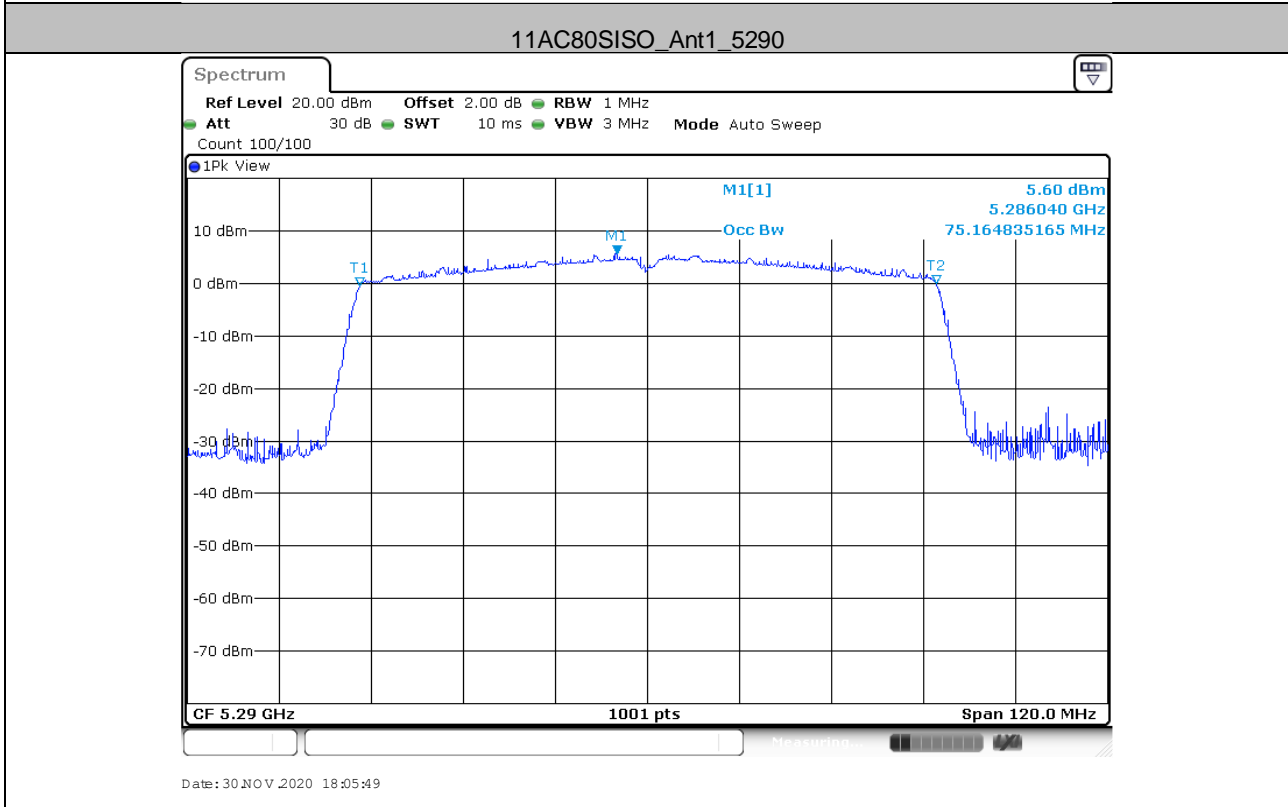
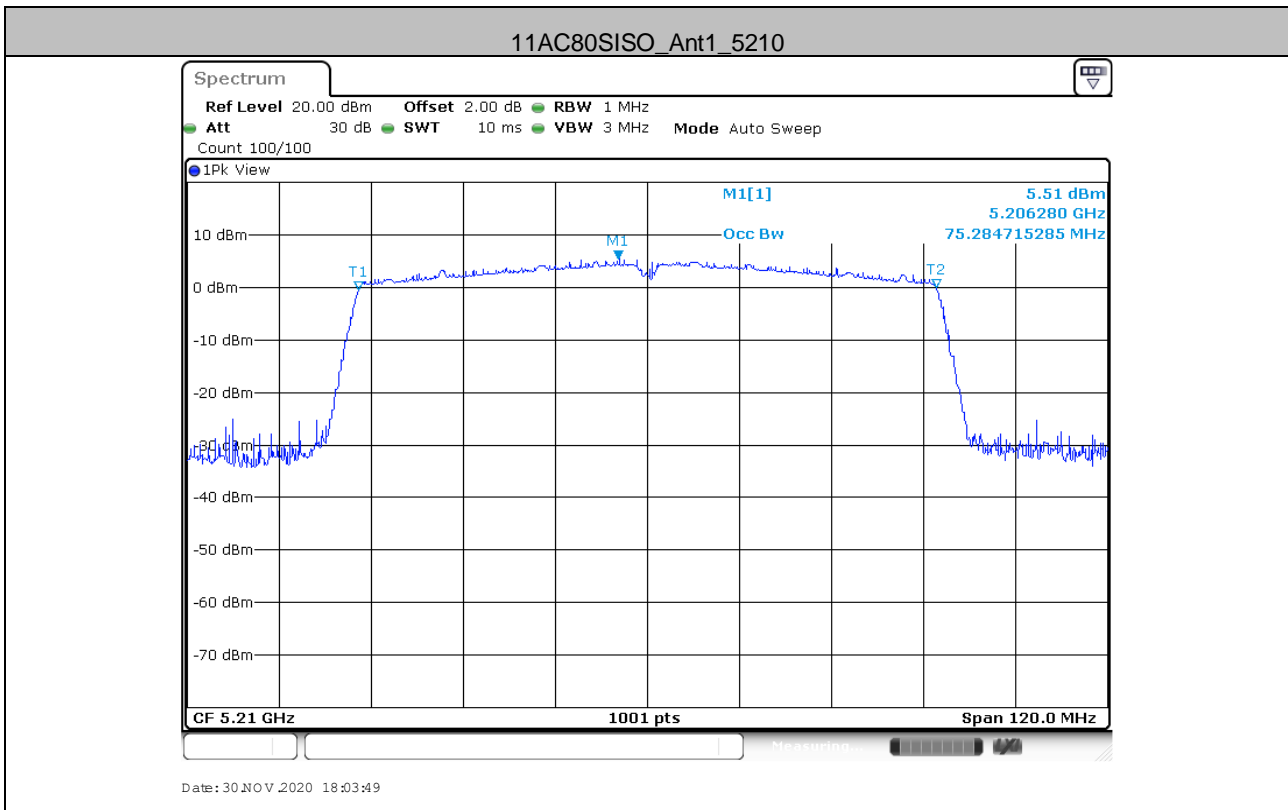
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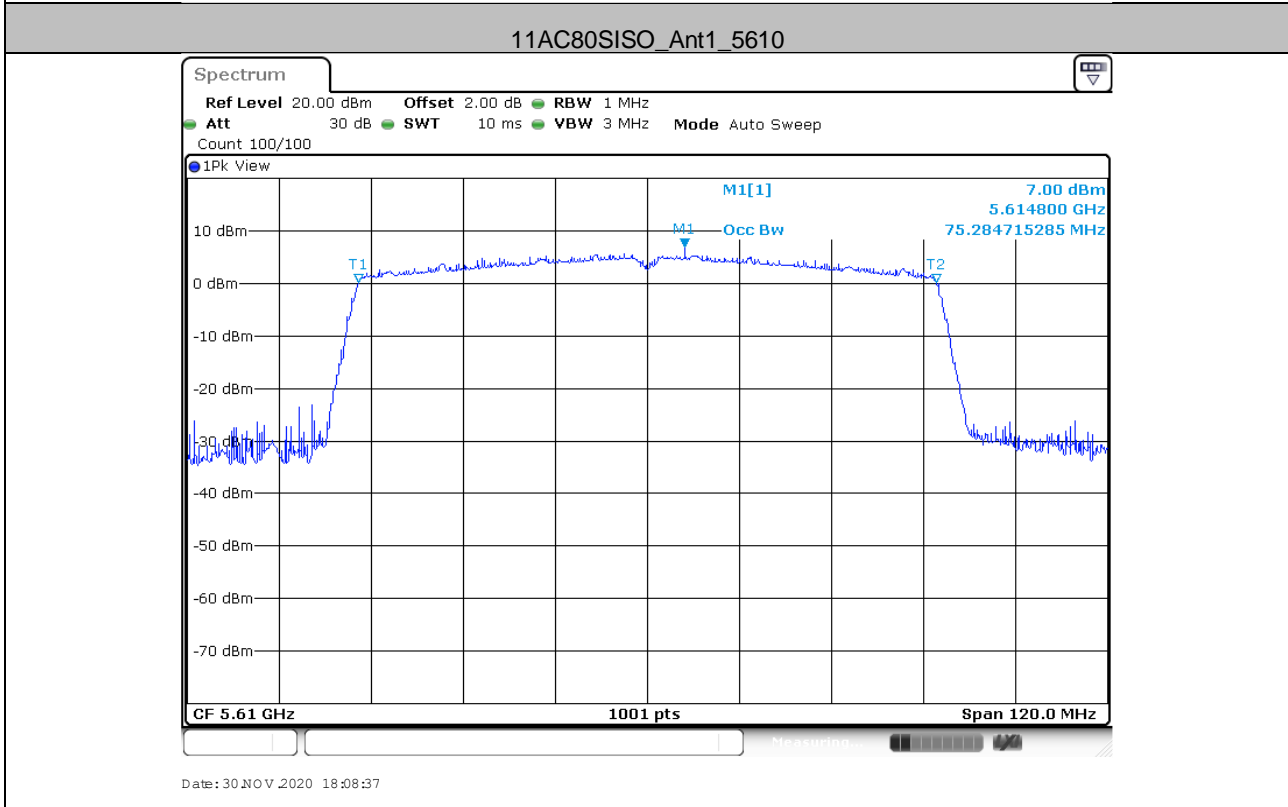
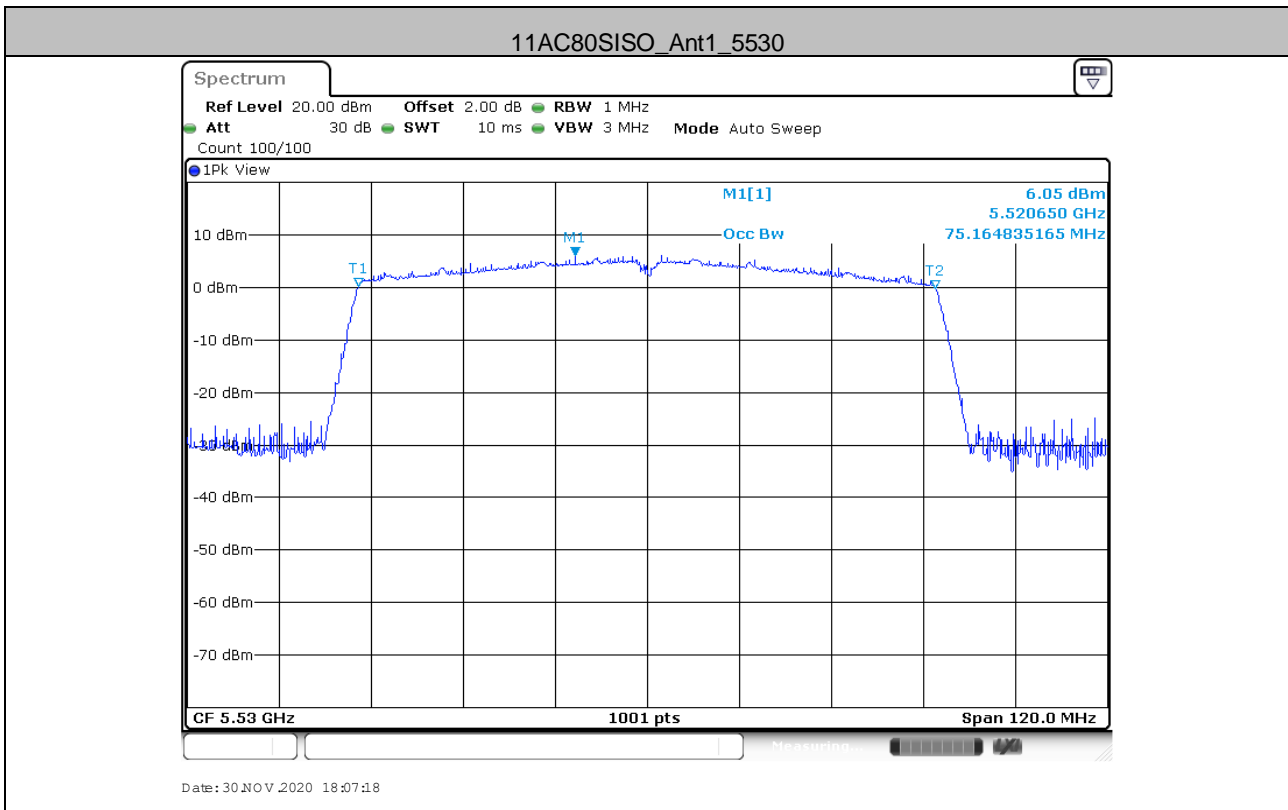
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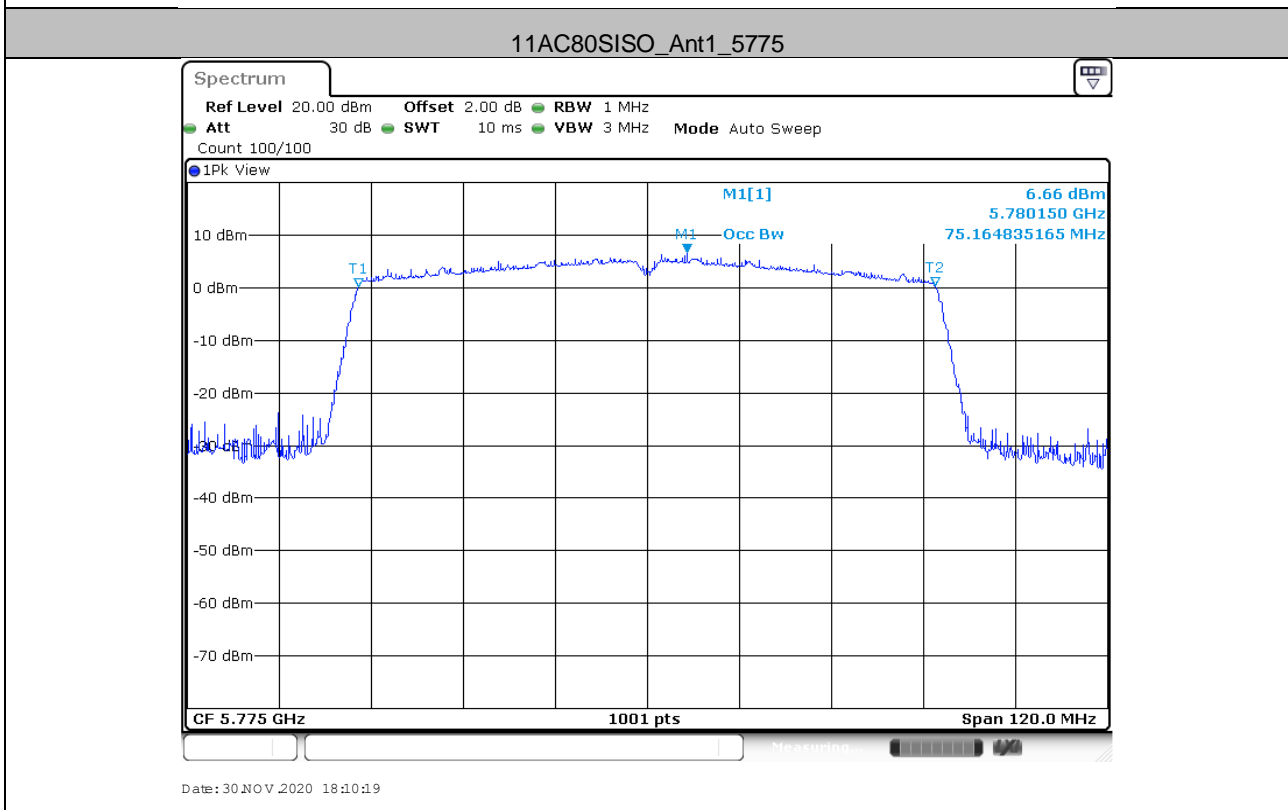
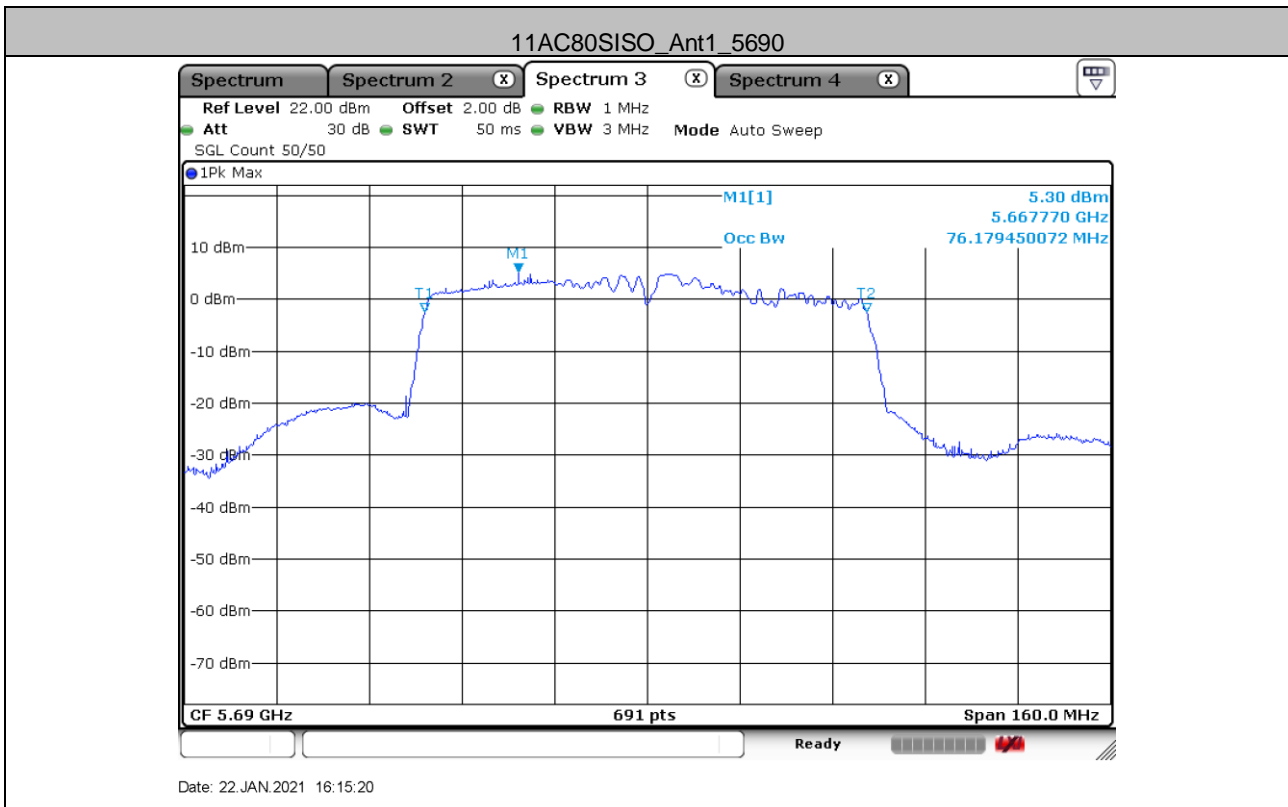


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4.8 Power Spectral Density

Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10: 2013 KDB 789033 D02 v02r01, Section F.	
Test Setup:	<p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>	
Test Instruments:	Refer to section 5.10 for details	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(HT20); MCS0 of rate is the worst case of 802.11ac(HT40); MCS0 of rate is the worst case of 802.11ac(HT80). Only the worst case is recorded in the report.	
Limit:	Frequency Band	Limit
	5150-5250MHz	The power spectral density less than 11dBm/1MHz
	5250-5350MHz	The power spectral density less than 11dBm/1MHz
	5470-5725MHz	The power spectral density less than 11dBm/1MHz
	5725-5850MHz	The power spectral density less than <30dBm/500KHz
Test Results:	Pass	



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Measurement Data: Test Mode	Test Channel	Frequency [MHz]	Corr'd Level(Cond.) [dBm/1MHz(For UNII Band I/II)/500KHz(For UNII Band III)]	Verdict
11A20	36	5180	2.44	PASS
	40	5200	4	PASS
	48	5240	3.63	PASS
	52	5260	2.89	PASS
	60	5300	3.92	PASS
	64	5320	3.91	PASS
	100	5500	4.35	PASS
	116	5580	4.5	PASS
	140	5700	4.45	PASS
	144(BandII-C)	5720	4.93	PASS
	144(BandIII)	5720	0.34	PASS
	149	5745	4.47	PASS
	157	5785	4.58	PASS
	165	5825	4.49	PASS
11N20	36	5180	3.42	PASS
	40	5200	3.15	PASS
	48	5240	3.22	PASS
	52	5260	2.73	PASS
	60	5300	2.14	PASS
	64	5320	2.11	PASS
	100	5500	3.41	PASS
	116	5580	2.93	PASS
	140	5700	3.39	PASS
	144(BandII-C)	5720	4.63	PASS
	144(BandIII)	5720	0.17	PASS
	149	5745	3.62	PASS
	157	5785	3.78	PASS
	165	5825	3.58	PASS
11N40	38	5190	-1.06	PASS
	46	5230	-0.13	PASS
	54	5270	0.94	PASS
	62	5310	-0.23	PASS
	102	5510	0.6	PASS
	110	5550	0.92	PASS
	134	5670	0.74	PASS
	142(BandII-C)	5710	1.49	PASS
	142(BandIII)	5710	-4.82	PASS
	151	5755	0.87	PASS
159	5795	1.15	PASS	
11AC20	36	5180	0.01	PASS
	40	5200	0.18	PASS
	48	5240	2.69	PASS



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	52	5260	2.84	PASS
	60	5300	3.02	PASS
	64	5320	2.97	PASS
	100	5500	2.97	PASS
	116	5580	2.88	PASS
	140	5700	2.97	PASS
	144(BandII-C)	5720	3.69	PASS
	144(BandIII)	5720	-0.48	PASS
	149	5745	3.04	PASS
	157	5785	2.95	PASS
	165	5825	2.76	PASS
11AC40	38	5190	-1.42	PASS
	46	5230	-1.34	PASS
	54	5270	-1.01	PASS
	62	5310	-0.04	PASS
	102	5510	-0.97	PASS
	110	5550	-2.12	PASS
	134	5670	-1.12	PASS
	142(BandII-C)	5710	0.38	PASS
	142(BandIII)	5710	-6.12	PASS
		151	5755	-1.01
	159	5795	-0.74	PASS
11AC80	42	5210	-3.84	PASS
	58	5290	-3.42	PASS
	106	5530	-3.22	PASS
	122	5610	-3.2	PASS
	138(BandII-C)	5690	-1.58	PASS
	138(BandIII)	5690	-7.9	PASS
		155	5775	-3.1

