

Test Report

Applicant: Zhejiang Hanshow Technology Co., Ltd.
Address of Applicant: Bld. 33, No. 966 xiuyuan Rd., BeiKeJian Innovation Park, XiuZhou District, Jiaxing, Zhejiang, China
Manufacturer: Zhejiang Hanshow Technology Co., Ltd.
Address of Manufacturer: Bld. 33, No. 966 xiuyuan Rd., BeiKeJian Innovation Park, XiuZhou District, Jiaxing, Zhejiang, China
Factory: Dongguan AoJinKe Electronic Technology Co.,Ltd
Address of Factory: 2nd Floor,Building A,No.8,Juxiang 1 Road,Qiufu Road Community,Dalang Town,Dongguan, China
Equipment Under Test (EUT):
EUT Name: Digital signage
Model No.: HS-AT2301, HS-AT2303, HS-AT2311, HS-AT2313, HSAT2321, HS-AT2323, HS-AT2331, HS-AT2333, HS-AT2351, HSAT2353, HS-AT2391, HS-AT2393
FCC ID: 2AHB5-AT2301
Standards: 47 CFR Part 15, Subpart C
Date of Receipt: 2020-02-24
Date of Test: 2020-02-24 to 2020-03-03
Date of Issue: 2020-03-03
Test Result : **PASS***

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

Authorized Signature:



Robinson Lo

Laboratory Manager

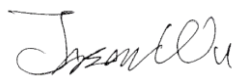
This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
GTS202002000019F01	Rev.01	Initial report	2020-03-03

Prepared By:



Date:

2020-03-03

Project Engineer

Check By:



Date:

2020-03-03

Reviewer

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
Conducted Peak & Average Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10 2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS

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4 General Information

4.1 General Description of EUT

Product Name:	Digital signage
Model No.:	HS-AT2301, HS-AT2303, HS-AT2311, HS-AT2313, HSAT2321, HS-AT2323, HS-AT2331, HS-AT2333, HS-AT2351, HSAT2353, HS-AT2391, HS-AT2393
Test Model No.:	HS-AT2311
Remark:	All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are colour and model name for commercial purpose.
Serial No.:	200700005195000155
Hardware version:	V04
Software version:	8171090000241
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps IEEE for 802.11g : 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps IEEE for 802.11n(HT20) : 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps IEEE for 802.11n(HT40) : 13.5Mbps/27Mbps/40.5Mbps/54Mbps/81Mbps/108Mbps/121.5Mbps/135Mbps
Product Type:	☒ Mobile ☐ Portable ☐ Fix Location
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	FPC antenna
Antenna Gain:	5.0dBi@2.4G
Power Supply:	INPUT: 100-240V~50/60Hz 1.0A Max OUTPUT: 12V---2.0A

Operation Frequency each of channel(802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		
Operation Frequency each of channel(802.11n HT40)							
Channel	Frequency	Channel	Frequency	Channel	Frequency		
1	2422MHz	4	2437MHz	7	2452MHz		
2	2427MHz	5	2442MHz				
3	2432MHz	6	2447MHz				

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

For 802.11b/g/n (HT20):

Channel	Frequency
The Lowest channel	2412MHz
The Middle channel	2437MHz
The Highest channel	2462MHz

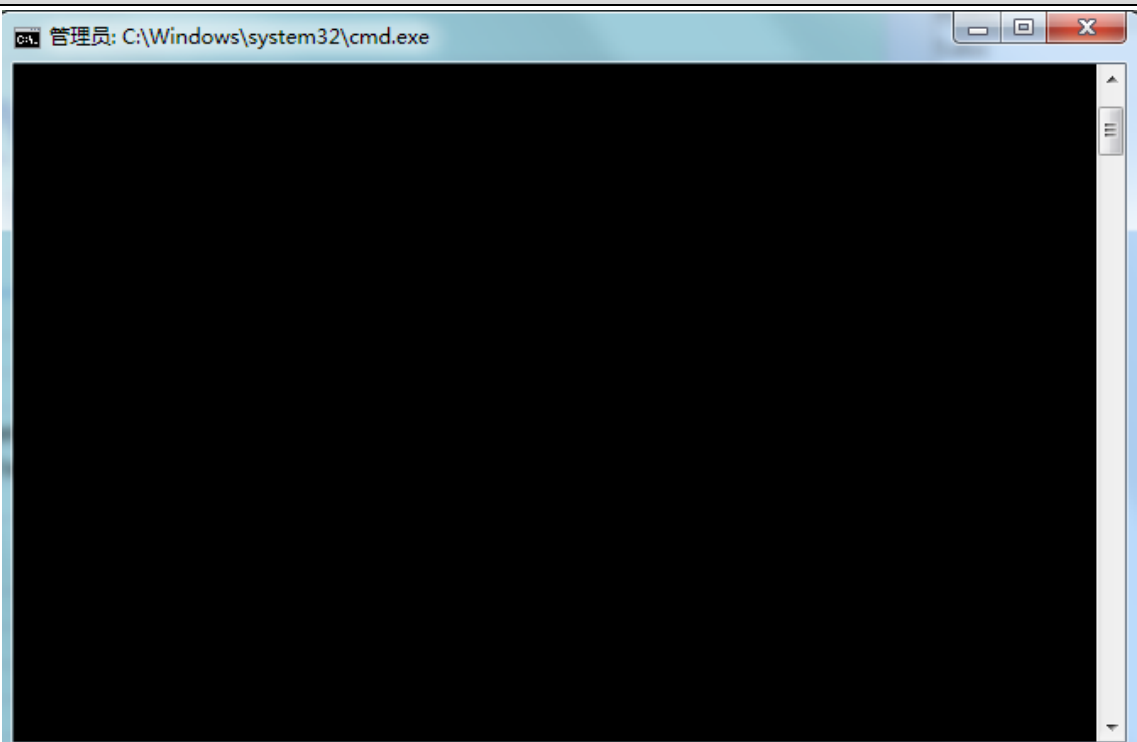
For 802.11n (HT40):

Channel	Frequency
The Lowest channel	2422MHz
The Middle channel	2437MHz
The Highest channel	2452MHz

Note:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.2 Test Environment and Mode

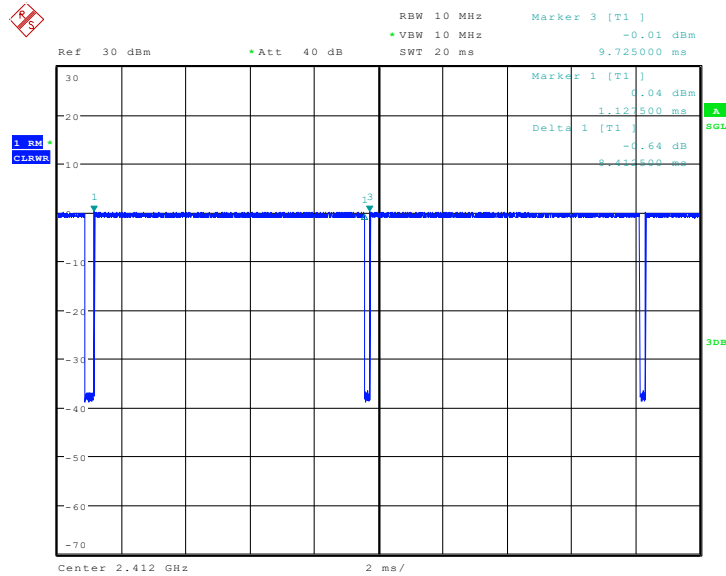
Operating Environment:	
Radiated Emissions:	
Temperature:	23.9 °C
Humidity:	51 % RH
Atmospheric Pressure:	1015 mbar
Conducted Emissions:	
Temperature:	24.4 °C
Humidity:	49 % RH
Atmospheric Pressure:	1015 mbar
Radio conducted item test (RF Conducted test room):	
Temperature:	22.9 °C
Humidity:	67 % RH
Atmospheric Pressure:	1015 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.
Run Software:	
	

Operated Mode for Worst Duty Cycle:		
Test Mode	Duty Cycle(x)	Average correction factor(dB)
IEEE802.11b	97.85%	0.09
IEEE802.11g	85.41%	0.68
IEEE802.11n (HT20)	77.46%	1.11
IEEE802.11n (HT40)	69.61%	1.57

Remark:

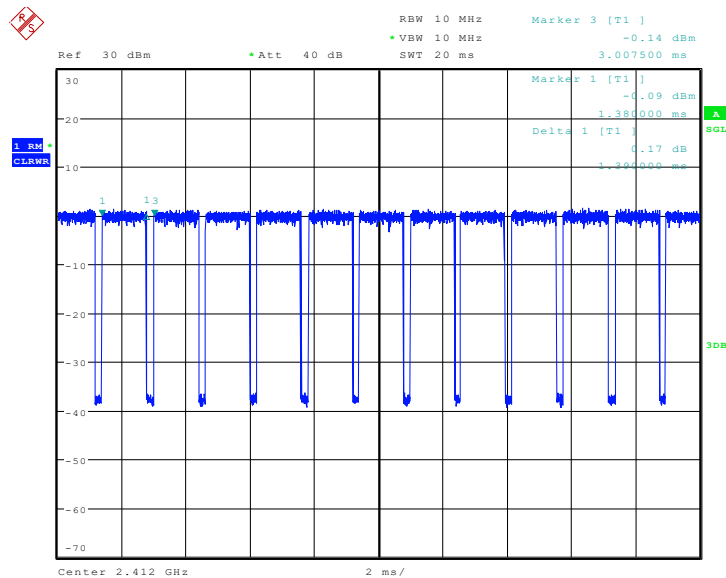
- 1) Duty cycle= On Time/ Period;
- 2) Duty Cycle factor = $10 * \log(1/ \text{Duty cycle})$;

Test Graph_ IEEE802.11b Duty Cycle:



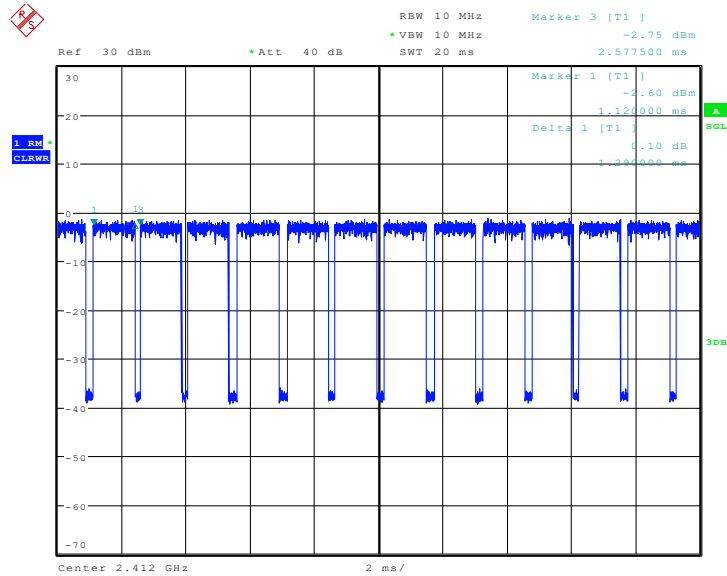
Date: 28.FEB.2020 10:04:26

Test Graph_ IEEE802.11g Duty Cycle:



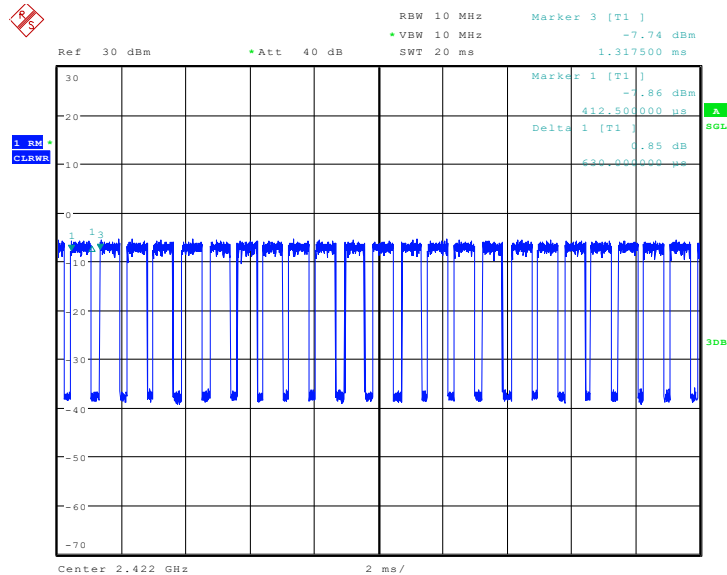
Date: 28.FEB.2020 10:24:01

Test Graph_ IEEE802.11 n (HT20) Duty Cycle:



Date: 28.FEB.2020 10:39:47

Test Graph_ IEEE802.11 n (HT40) Duty Cycle:



Date: 28.FEB.2020 11:02:35

4.3 Description of Support Units

The EUT has been tested with associated equipment below.

1) Support equipment

Description	Manufacturer	Model No.
PC	Lenovo	ThinkPad E450c
Adapter	Supplied by client	GO24-120200-AC

2) Cable

Cable No.	Description	Manufacturer	Cable Type/Length	Supplied by
/	/	/	/	/

4.4 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

4.5 Test Facility

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

● FCC —Registration No.: 381383

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383.

● IC —Registration No.: 9079A

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A

● NVLAP (LAB CODE:600179-0)

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

4.6 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	5.12dB	(1)
2	Radiated Emission (Above 1GHz)	4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	3.34dB	(1)
4	Radio Frequency	3×10^{-8}	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8℃	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	Frequency Error	5.5 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.

4.10 Equipment List

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 26 2019	June. 25 2020
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 26 2019	June. 25 2020
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 26 2019	June. 25 2020
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 26 2019	June. 25 2020
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 26 2019	June. 25 2020
9	Coaxial Cable	GTS	N/A	GTS211	June. 26 2019	June. 25 2020
10	Coaxial cable	GTS	N/A	GTS210	June. 26 2019	June. 25 2020
11	Coaxial Cable	GTS	N/A	GTS212	June. 26 2019	June. 25 2020
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 26 2019	June. 25 2020
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 26 2019	June. 25 2020
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 26 2019	June. 25 2020
15	Band filter	Amindeon	82346	GTS219	June. 26 2019	June. 25 2020
16	Power Meter	Anritsu	ML2495A	GTS540	June. 26 2019	June. 25 2020
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 26 2019	June. 25 2020
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 26 2019	June. 25 2020
19	Splitter	Agilent	11636B	GTS237	June. 26 2019	June. 25 2020
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 26 2019	June. 25 2020
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 26 2019	June. 25 2020

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 26 2019	June. 25 2020
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 26 2019	June. 25 2020
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 26 2019	June. 25 2020
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 26 2019	June. 25 2020
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	June. 26 2019	June. 25 2020

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 26 2019	June. 25 2020
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 26 2019	June. 25 2020
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 26 2019	June. 25 2020
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 26 2019	June. 25 2020
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 26 2019	June. 25 2020
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 26 2019	June. 25 2020
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 26 2019	June. 25 2020

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 26 2019	June. 25 2020
2	Barometer	ChangChun	DYM3	GTS255	June. 26 2019	June. 25 2020

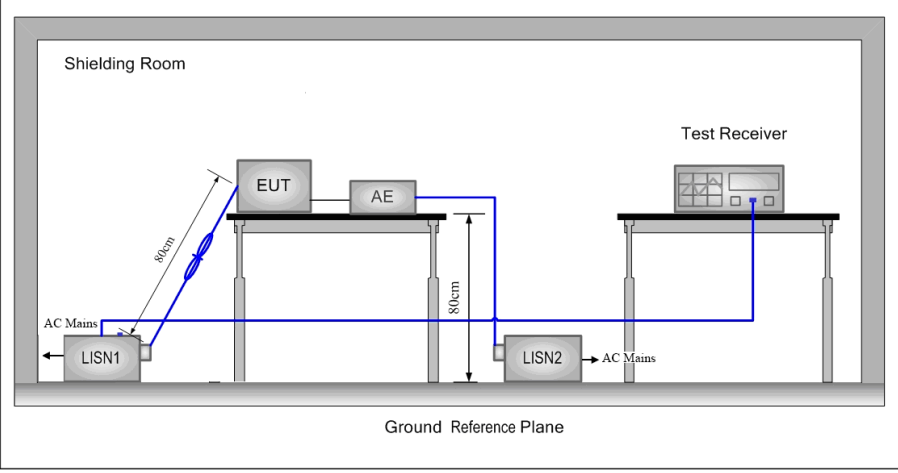
5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
The antenna is FPC antenna. The best case gain of the antenna is 5.0dBi, reference to the appendix II for details.	

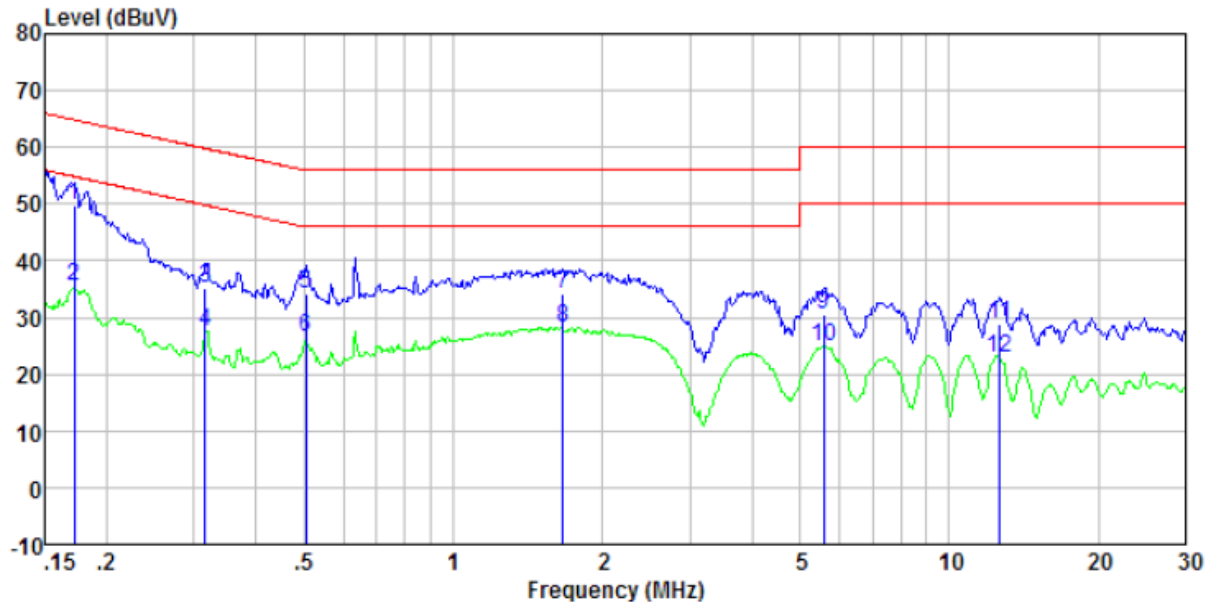
5.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
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:	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.		

Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate of 802.11b at highest channel is the worst case. Only the worst case is recorded in the report.
Test Voltage:	AC120V/60Hz
Test Results:	Pass

Measurement Data

Live Line:

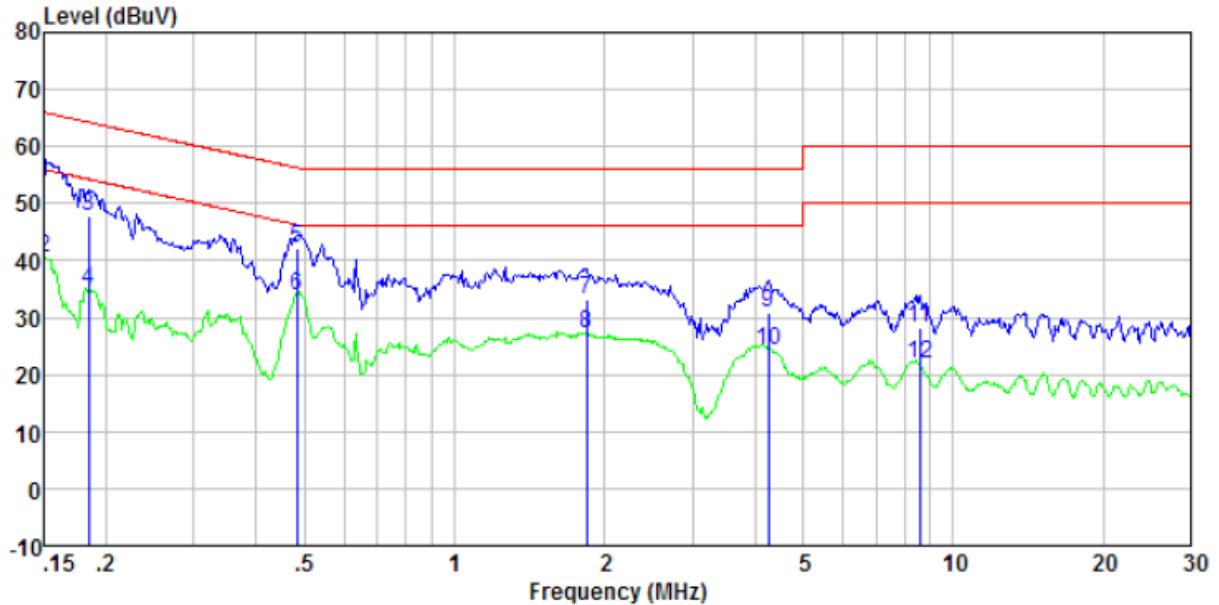


Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.17	29.16	20.40	0.09	49.65	64.86	-15.21	QP
0.17	14.89	20.40	0.09	35.38	54.86	-19.48	Average
0.32	14.63	20.39	0.10	35.12	59.80	-24.68	QP
0.32	7.13	20.39	0.10	27.62	49.80	-22.18	Average
0.50	13.68	20.31	0.11	34.10	56.00	-21.90	QP
0.50	6.08	20.31	0.11	26.50	46.00	-19.50	Average
1.66	13.83	20.20	0.17	34.20	56.00	-21.80	QP
1.66	7.67	20.20	0.17	28.04	46.00	-17.96	Average
5.59	10.03	20.20	0.17	30.40	60.00	-29.60	QP
5.59	4.45	20.20	0.17	24.82	50.00	-25.18	Average
12.65	8.49	20.20	0.21	28.90	60.00	-31.10	QP
12.65	2.63	20.20	0.21	23.04	50.00	-26.96	Average

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral Line:

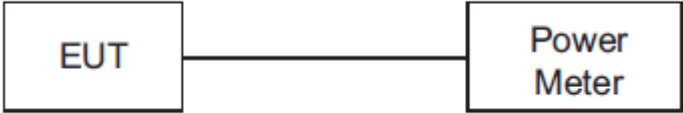


Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	33.42	20.40	0.07	53.89	66.00	-12.11	QP
0.15	20.05	20.40	0.07	40.52	56.00	-15.48	Average
0.18	27.29	20.40	0.10	47.79	64.28	-16.49	QP
0.18	14.32	20.40	0.10	34.82	54.28	-19.46	Average
0.48	21.68	20.32	0.11	42.11	56.27	-14.16	QP
0.48	13.32	20.32	0.11	33.75	46.27	-12.52	Average
1.84	12.86	20.20	0.17	33.23	56.00	-22.77	QP
1.84	6.81	20.20	0.17	27.18	46.00	-18.82	Average
4.27	10.54	20.20	0.18	30.92	56.00	-25.08	QP
4.27	3.95	20.20	0.18	24.33	46.00	-21.67	Average
8.59	7.72	20.20	0.19	28.11	60.00	-31.89	QP
8.59	1.57	20.20	0.19	21.96	50.00	-28.04	Average

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

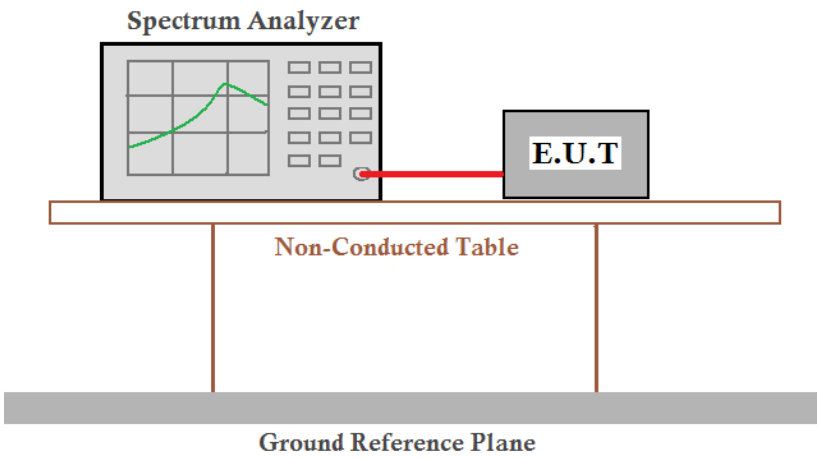
5.3 Conducted Peak & Average Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10: 2013
Test Setup:	 <pre> graph LR EUT[EUT] --- PM[Power Meter] </pre>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40) Only the worst case is recorded in the report.
Limit:	30dBm
Test Results:	Pass

Measurement Data

802.11b mode				
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)	Limit (dBm)	Result
Lowest	15.42	12.45	30.00	Pass
Middle	15.71	12.82	30.00	Pass
Highest	15.56	12.98	30.00	Pass
802.11g mode				
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)	Limit (dBm)	Result
Lowest	17.61	10.43	30.00	Pass
Middle	17.37	10.3	30.00	Pass
Highest	17.46	10.5	30.00	Pass
802.11n(HT20)mode				
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)	Limit (dBm)	Result
Lowest	16.33	9.1	30.00	Pass
Middle	16.98	9.75	30.00	Pass
Highest	17.36	9.67	30.00	Pass
802.11n(HT40)mode				
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)	Limit (dBm)	Result
Lowest	15.15	8.76	30.00	Pass
Middle	15.77	9.29	30.00	Pass
Highest	15.75	9.01	30.00	Pass
Remark:				
1. Average Output Power was for reference only				
2. Average Output Power had added duty cycle factor				

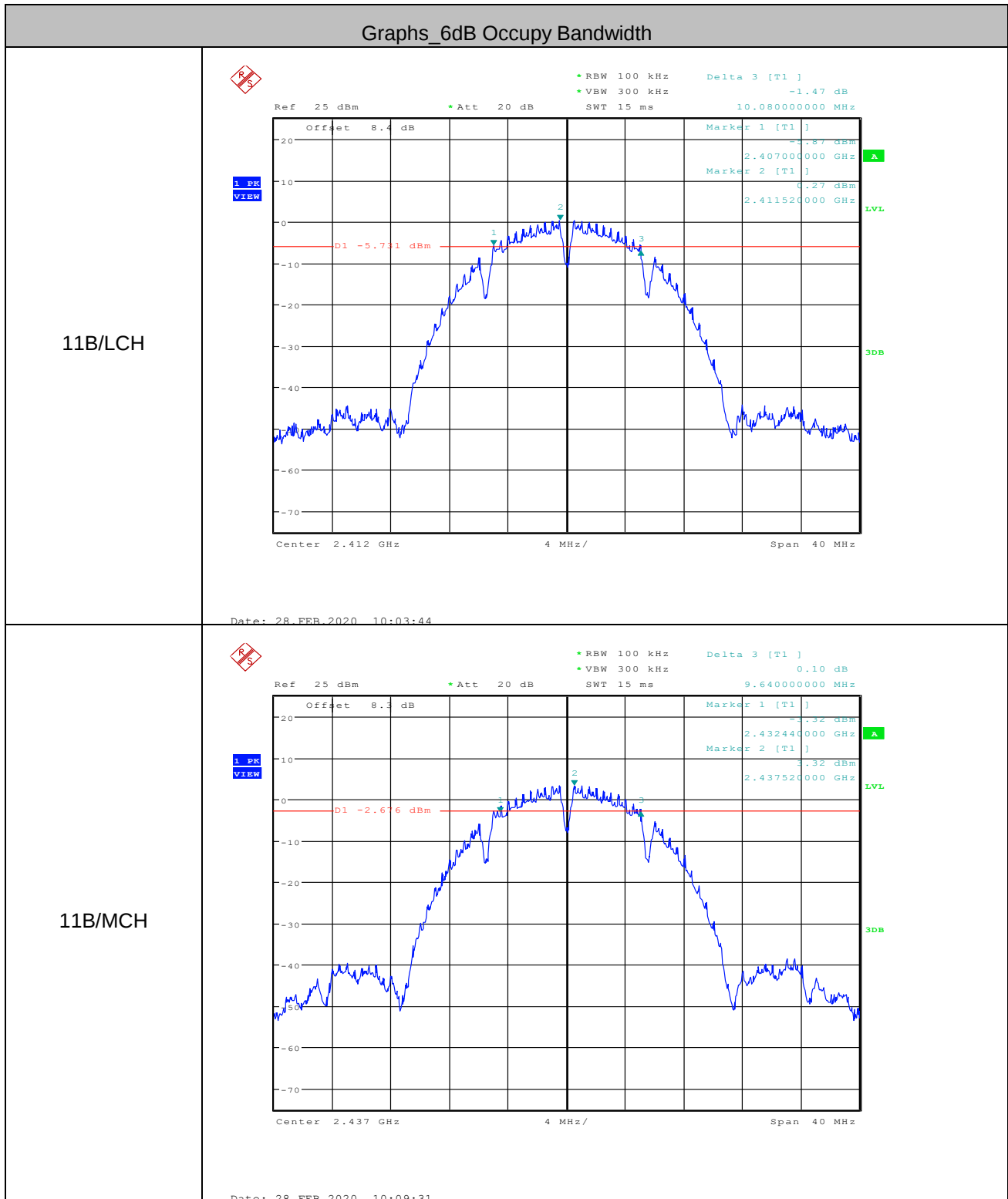
5.4 6dB Occupy Bandwidth

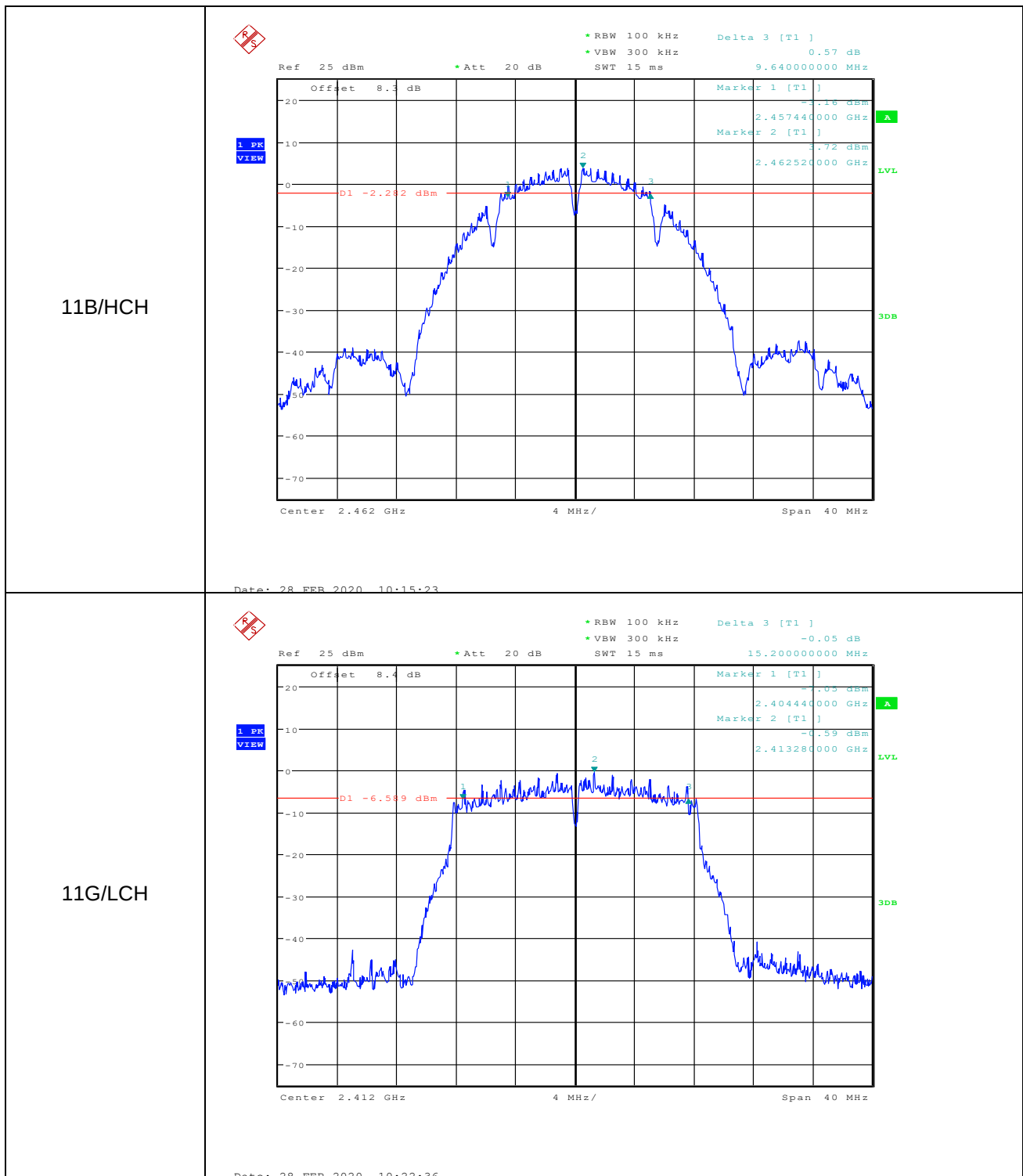
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40) Only the worst case is recorded in the report.
Limit:	≥ 500 kHz
Test Results:	Pass

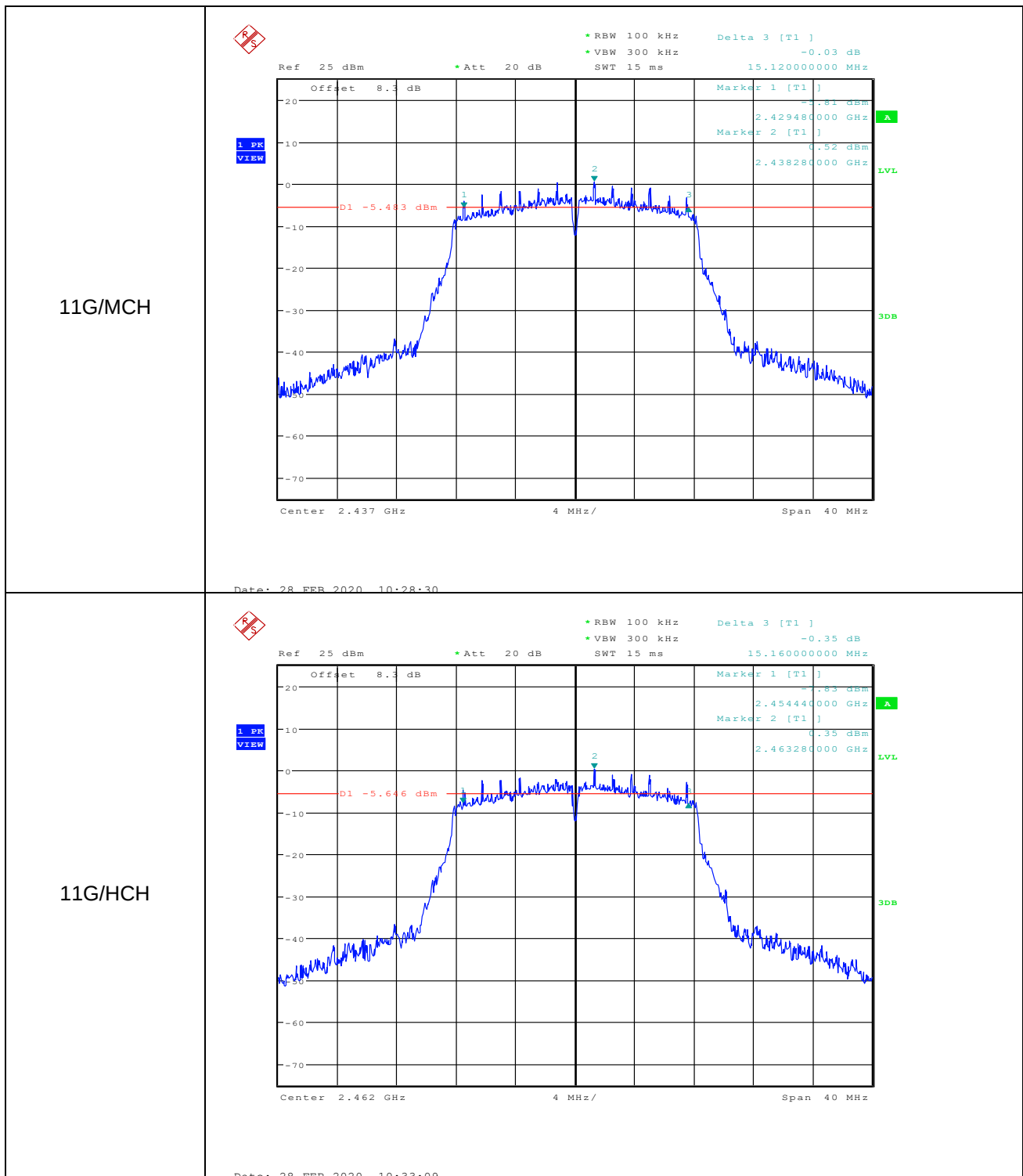
Measurement Data

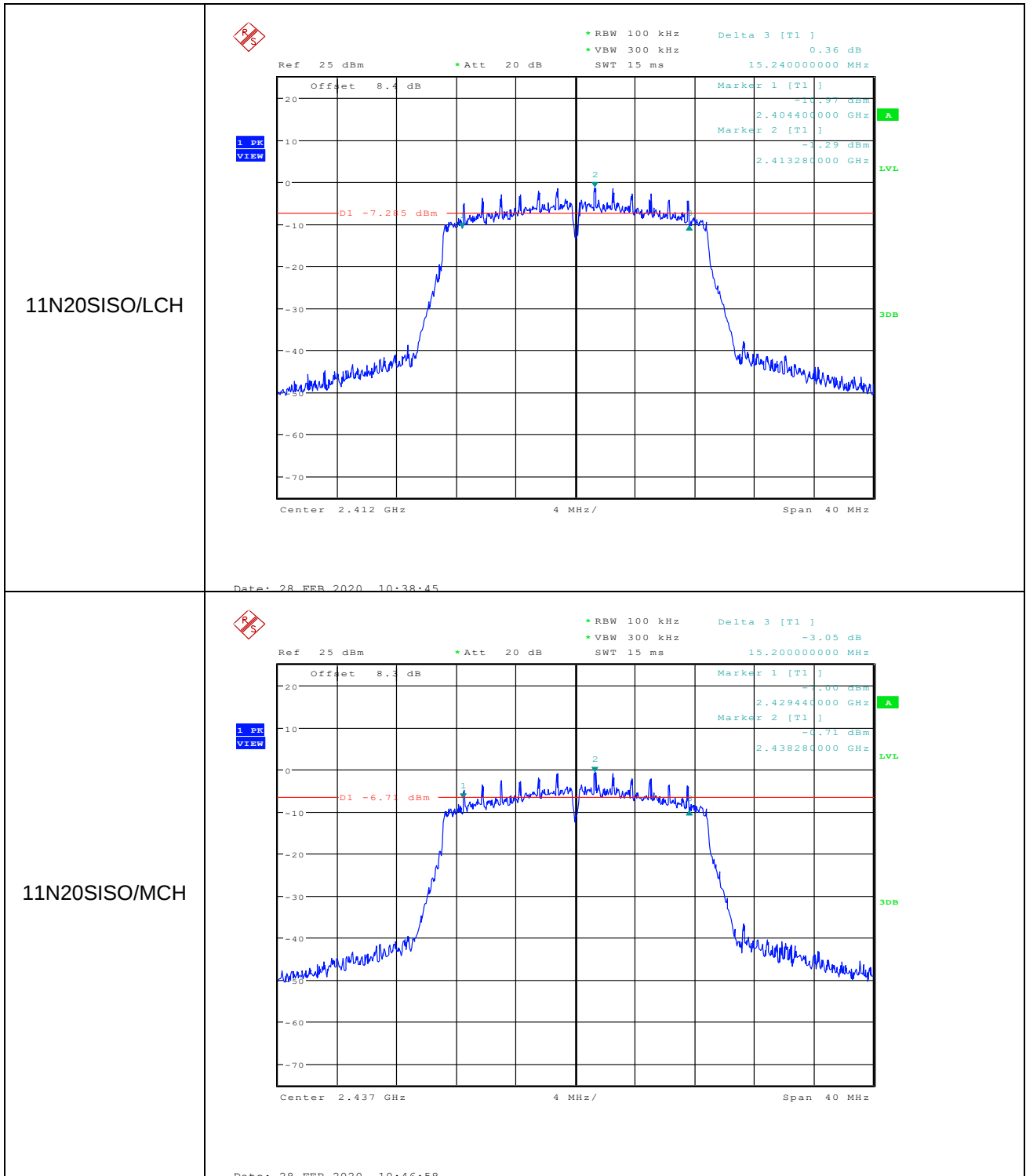
802.11b mode				
Test channel	6dB Occupy Bandwidth (MHz)	99% OBW [MHz]	Limit (MHz)	Result
Lowest	10.080	14.280	≥0.5	Pass
Middle	9.640	14.320	≥0.5	Pass
Highest	9.640	14.400	≥0.5	Pass
802.11g mode				
Test channel	6dB Occupy Bandwidth (MHz)	99% OBW [MHz]	Limit (MHz)	Result
Lowest	15.200	16.560	≥0.5	Pass
Middle	15.120	16.720	≥0.5	Pass
Highest	15.160	16.720	≥0.5	Pass
802.11n(HT20) mode				
Test channel	6dB Occupy Bandwidth (MHz)	99% OBW [MHz]	Limit (MHz)	Result
Lowest	15.240	17.680	≥0.5	Pass
Middle	15.200	17.600	≥0.5	Pass
Highest	15.200	17.640	≥0.5	Pass
802.11n(HT40)mode				
Test channel	6dB Occupy Bandwidth (MHz)	99% OBW [MHz]	Limit (MHz)	Result
Lowest	35.280	36.080	≥0.5	Pass
Middle	35.280	36.000	≥0.5	Pass
Highest	35.280	36.080	≥0.5	Pass
Remark:				
1. 99% OBW was for reference only				

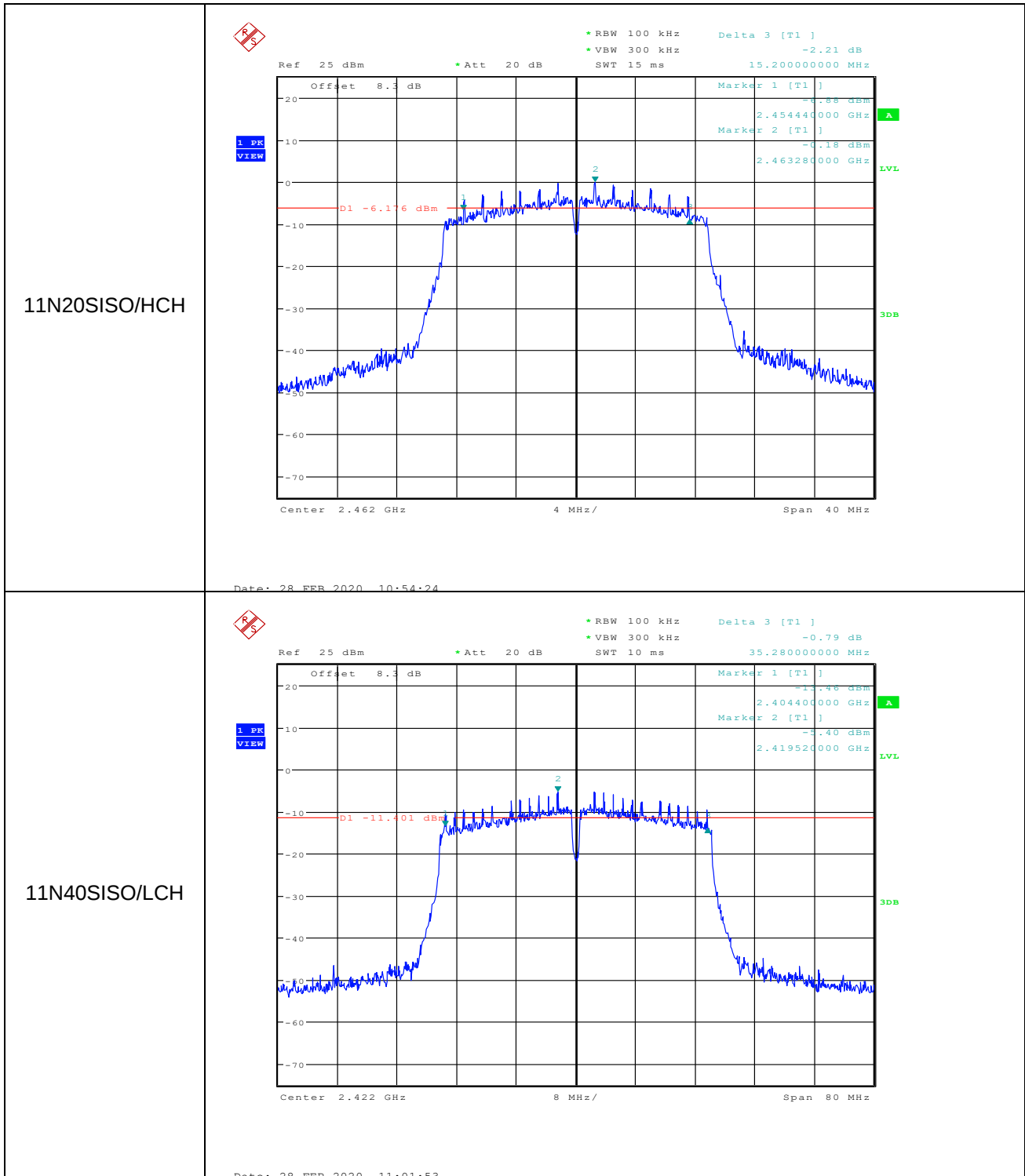
Test plot as follows:

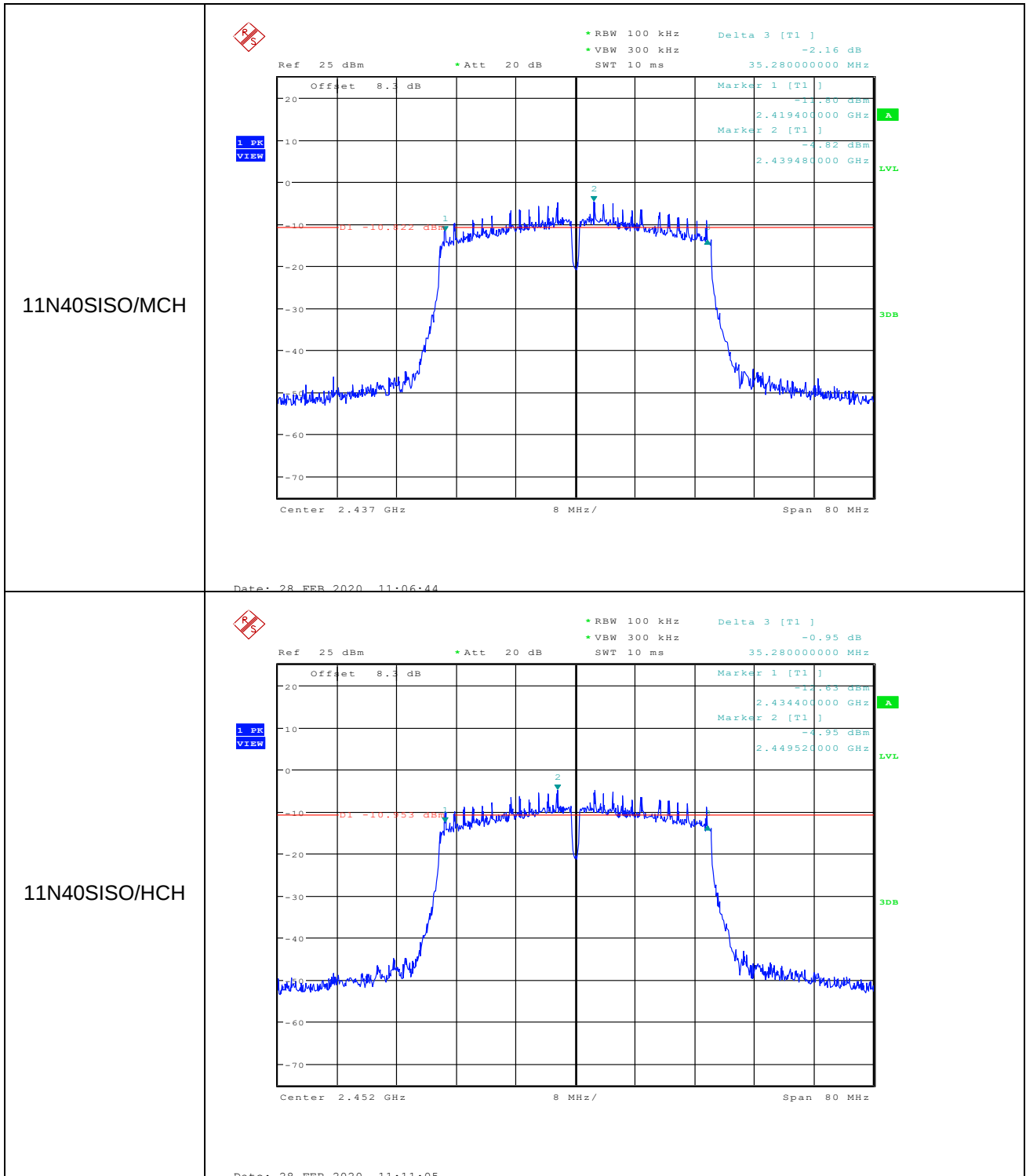


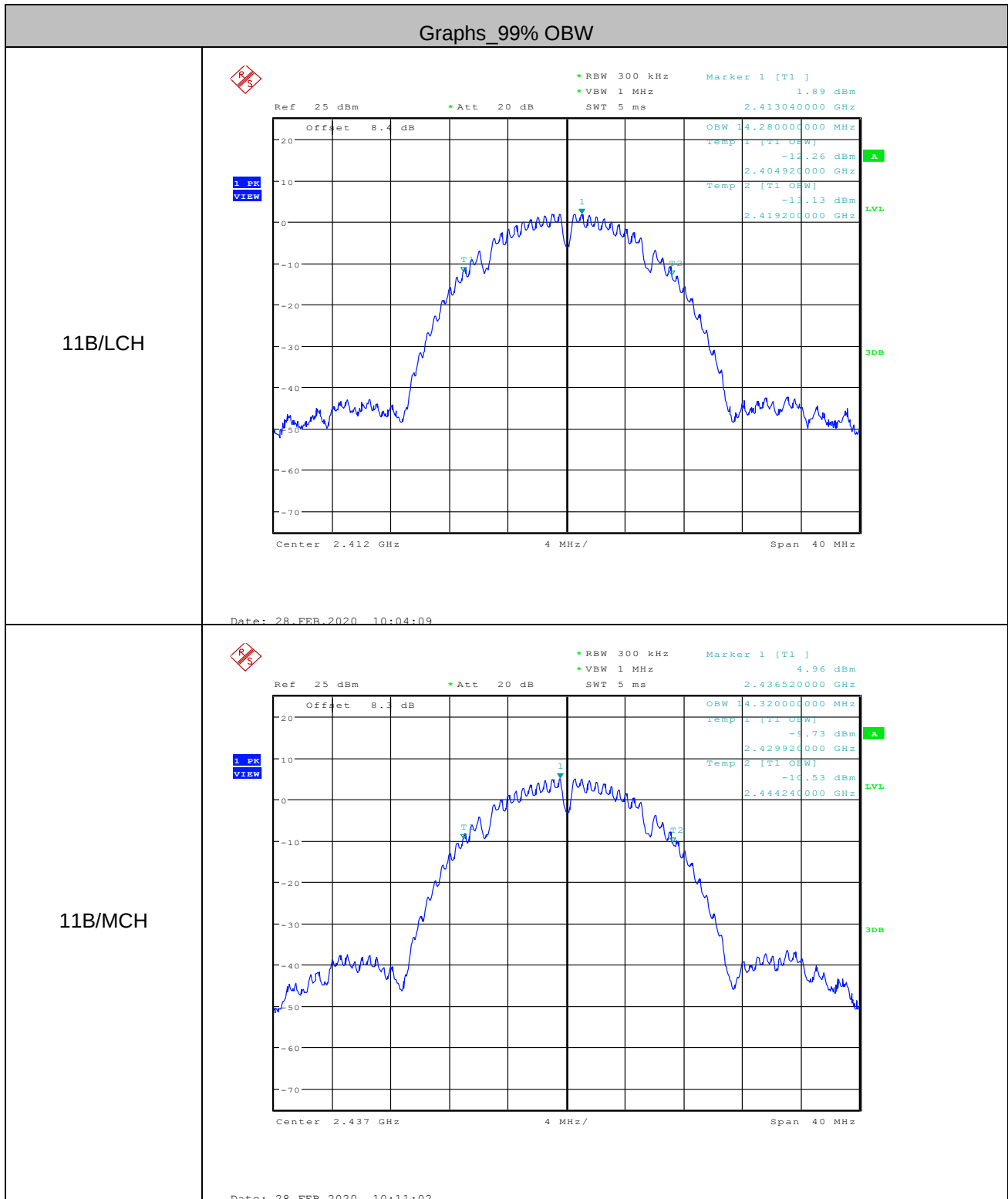


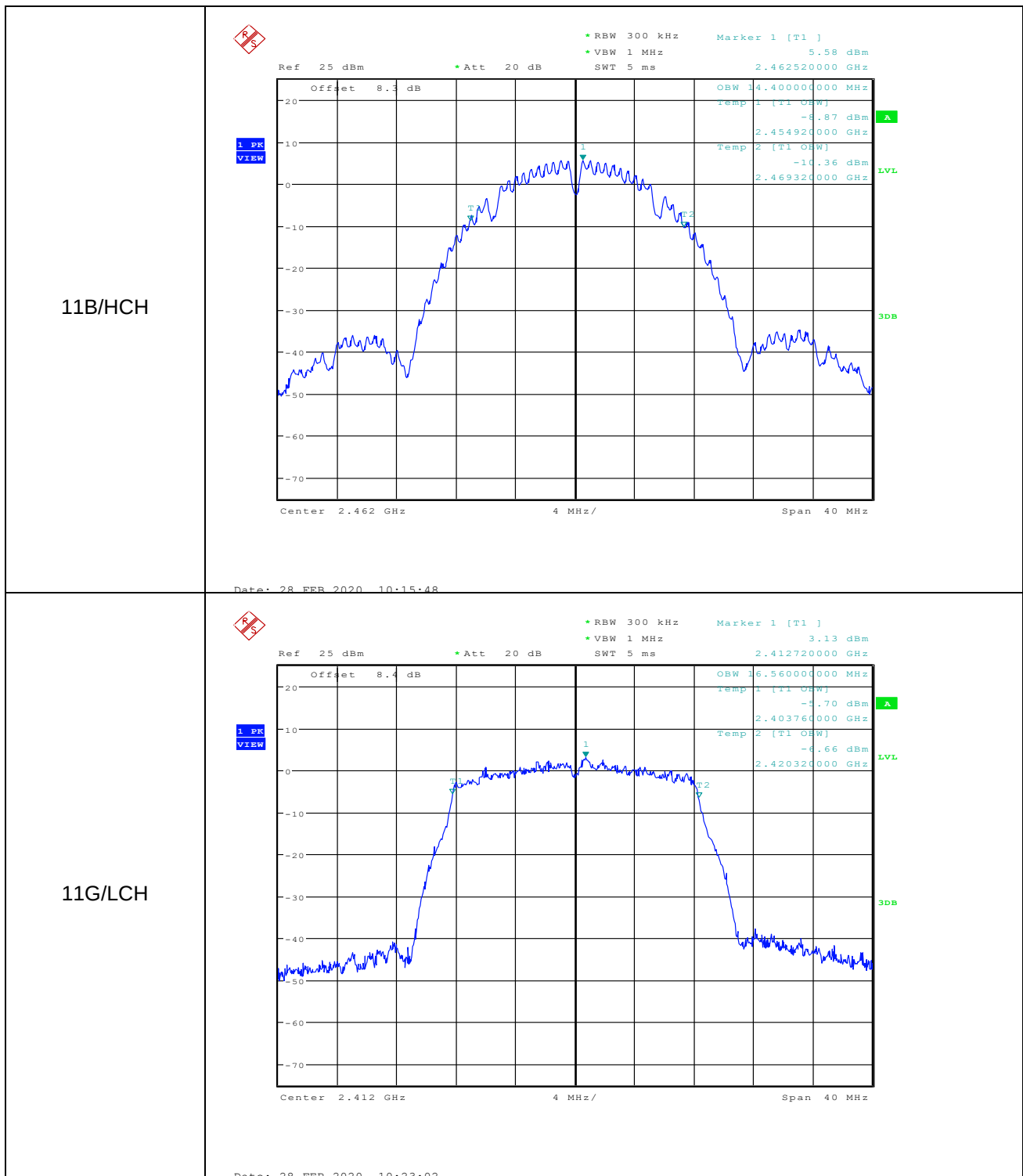


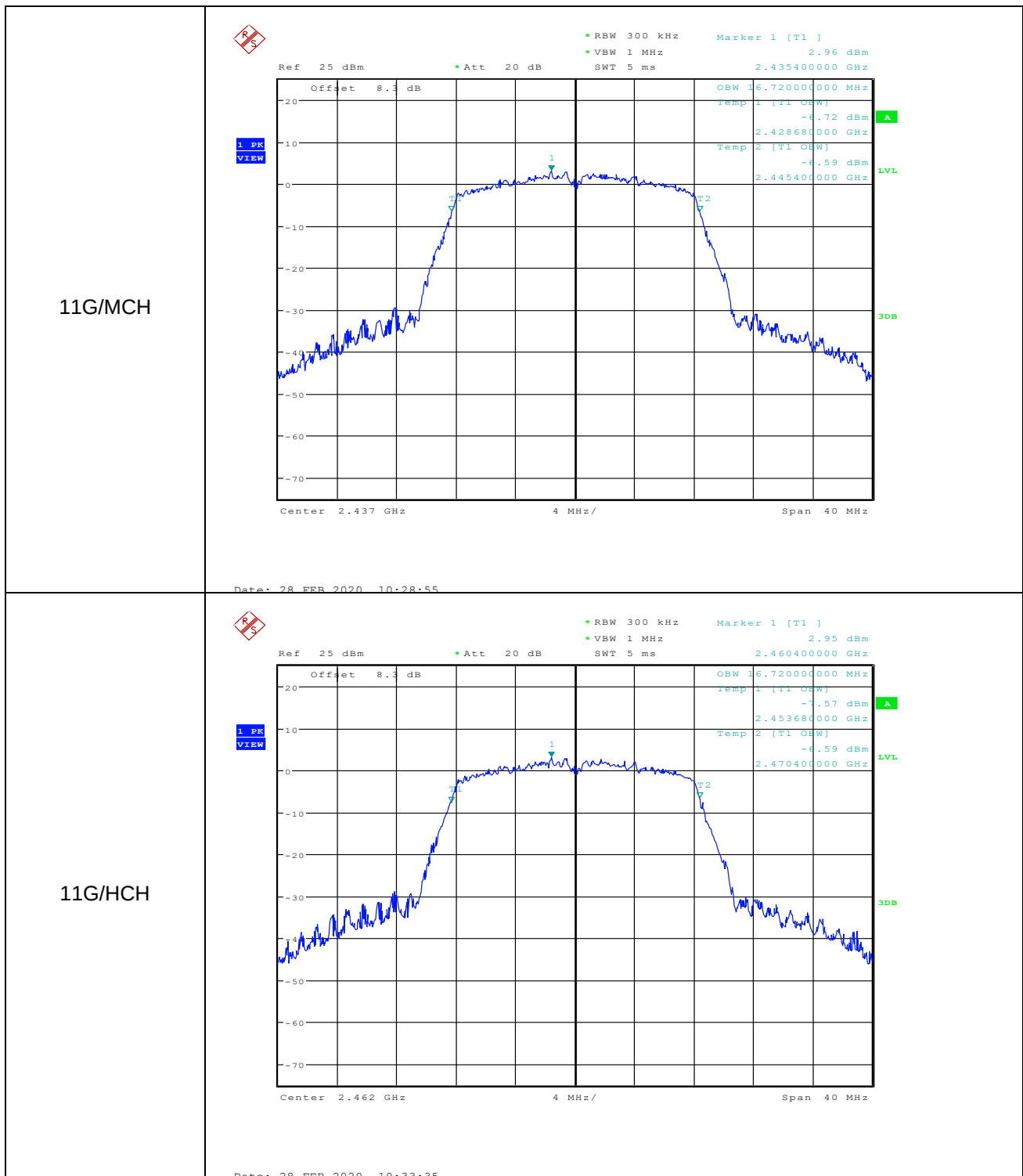


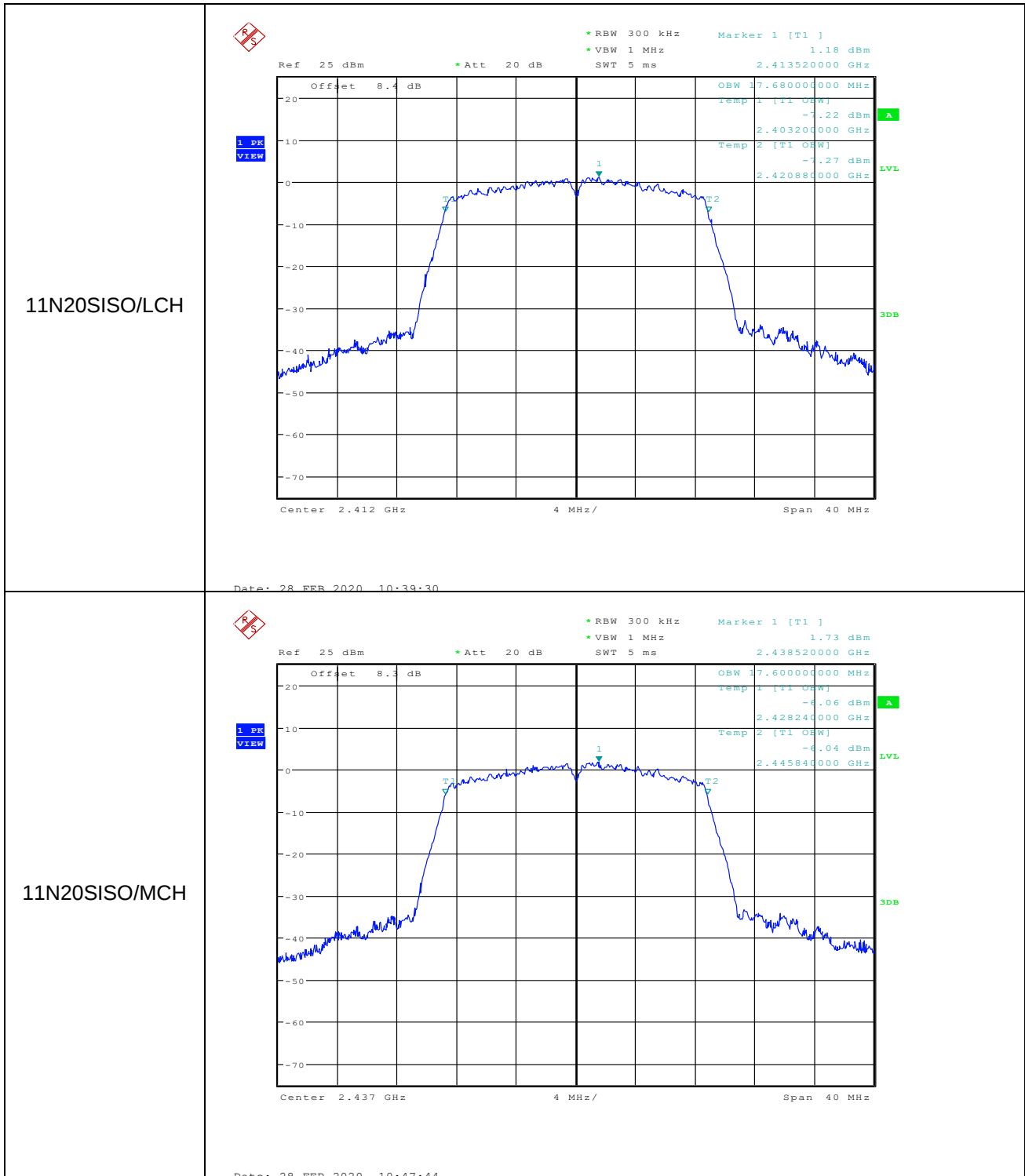


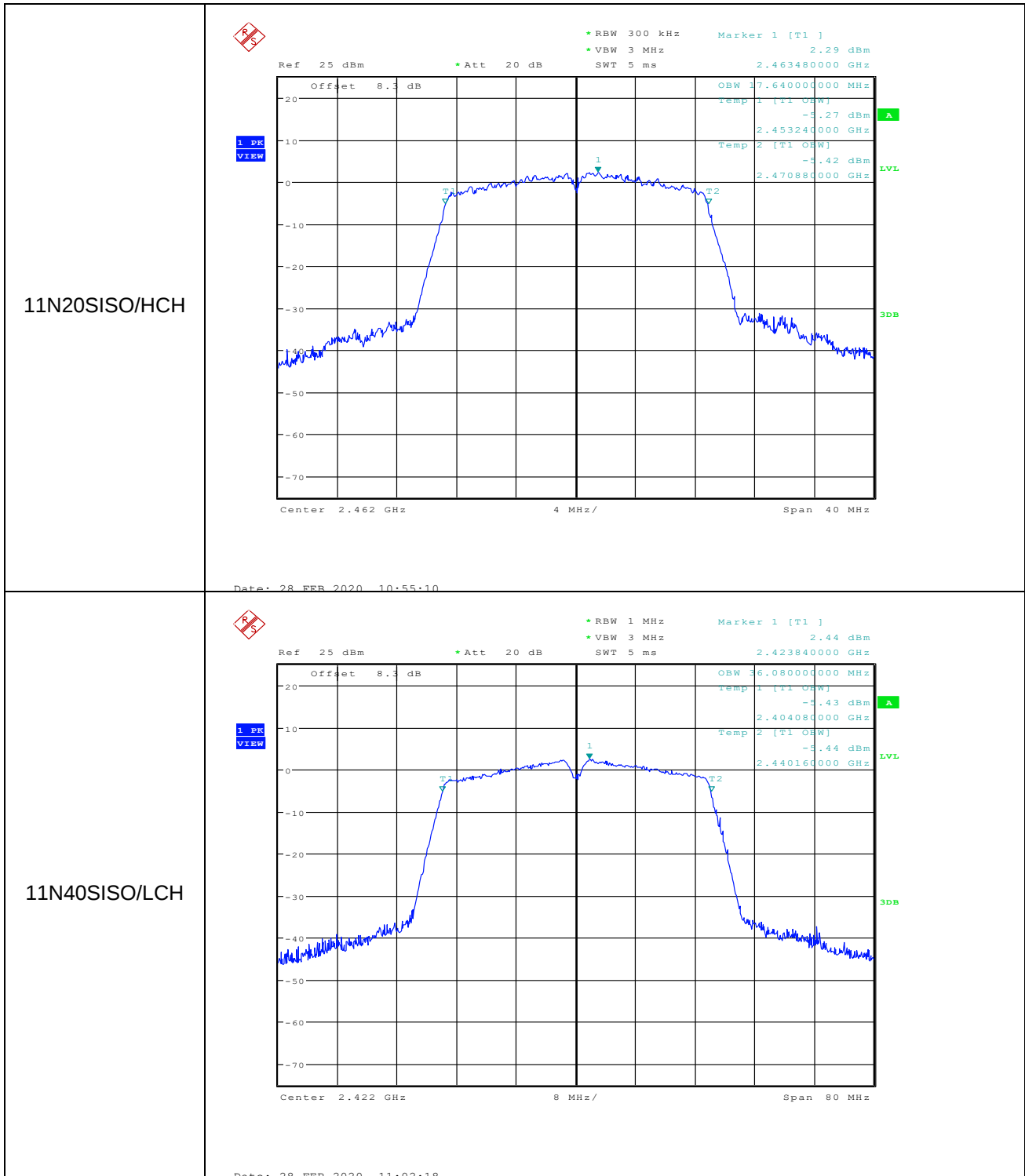


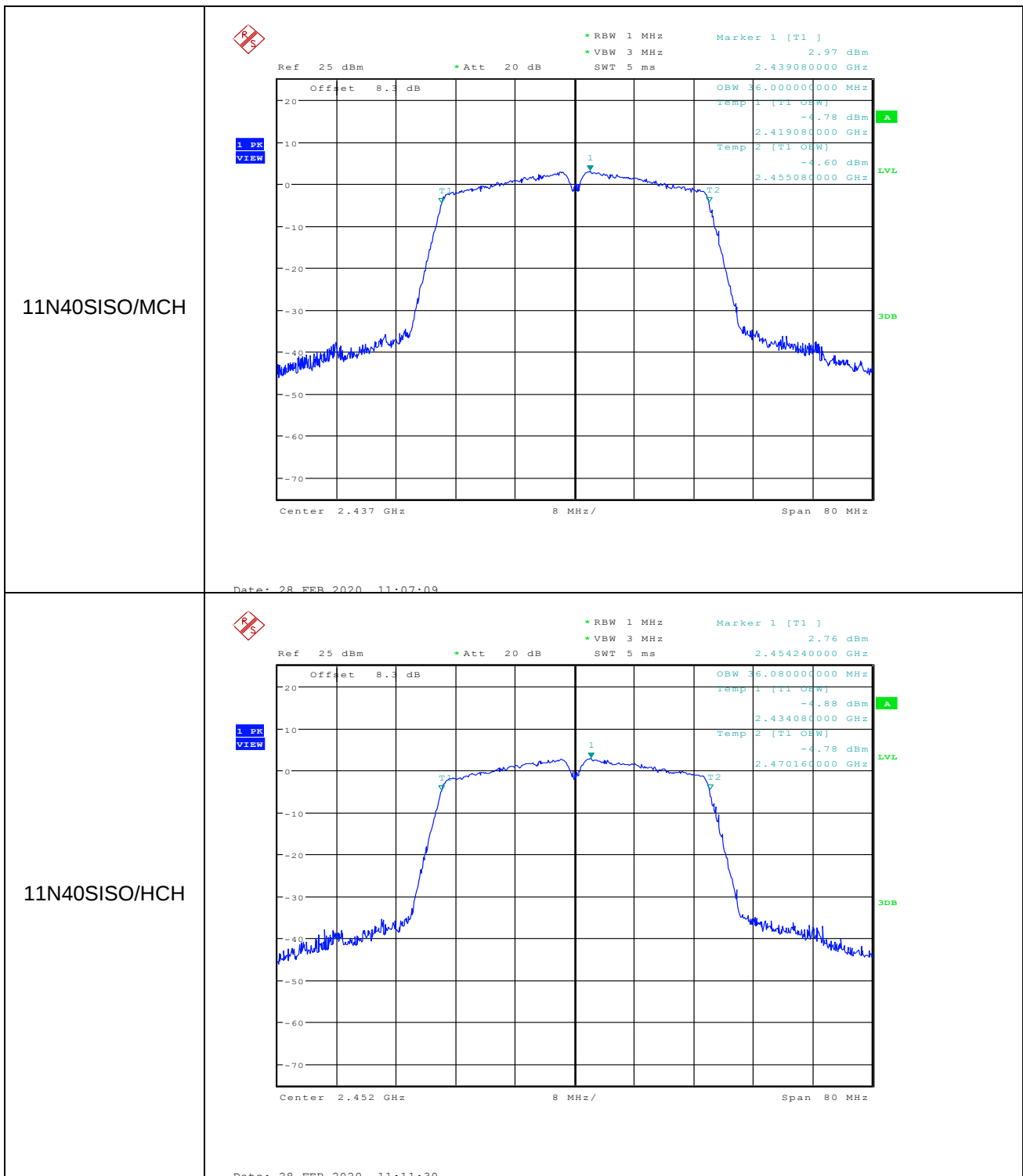




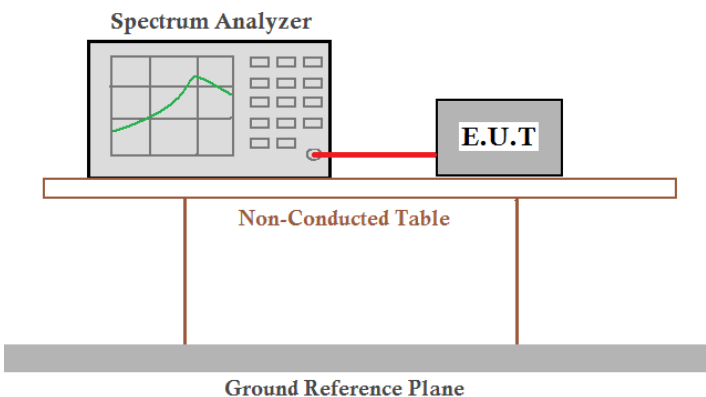








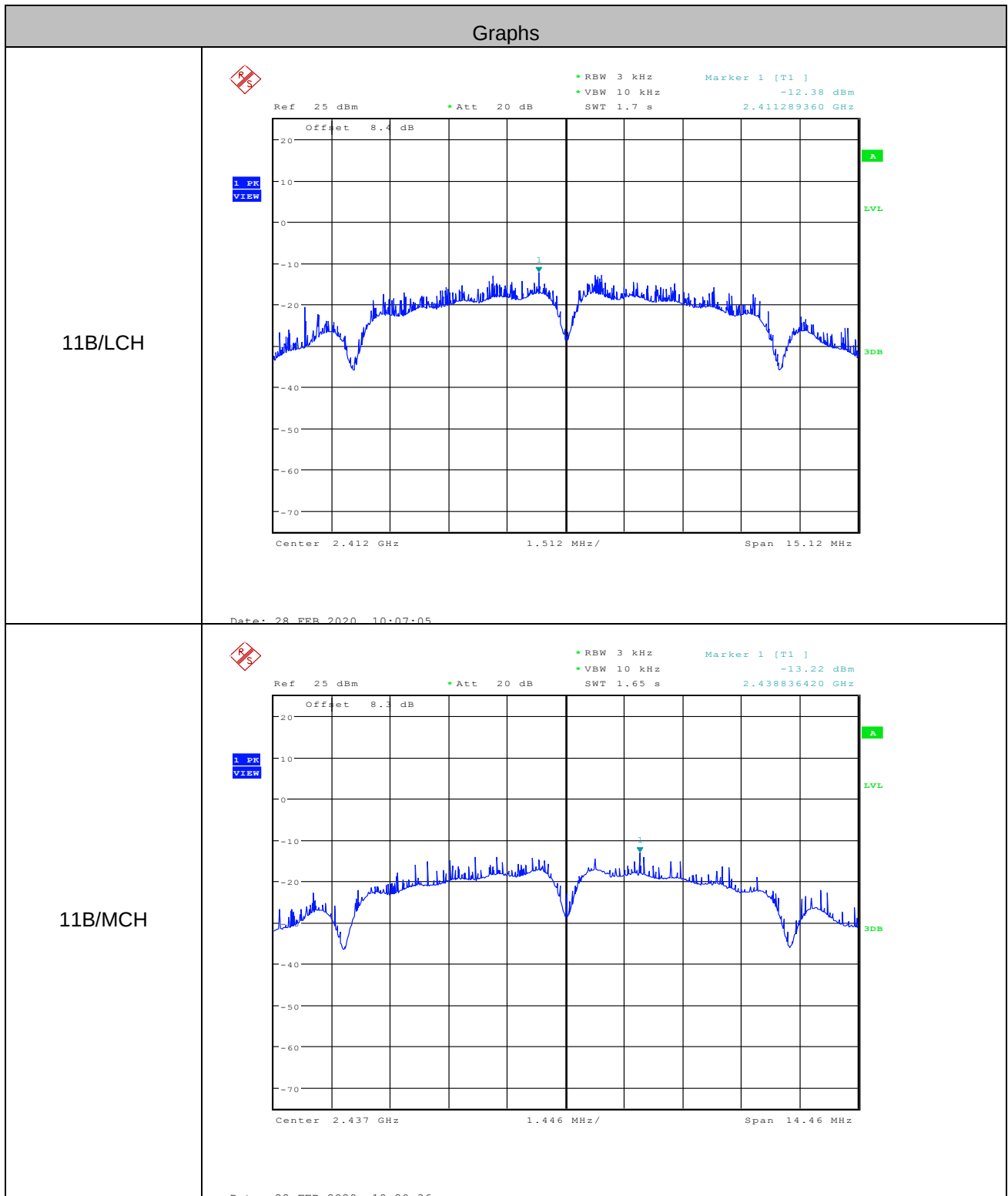
5.5 Power Spectral Density

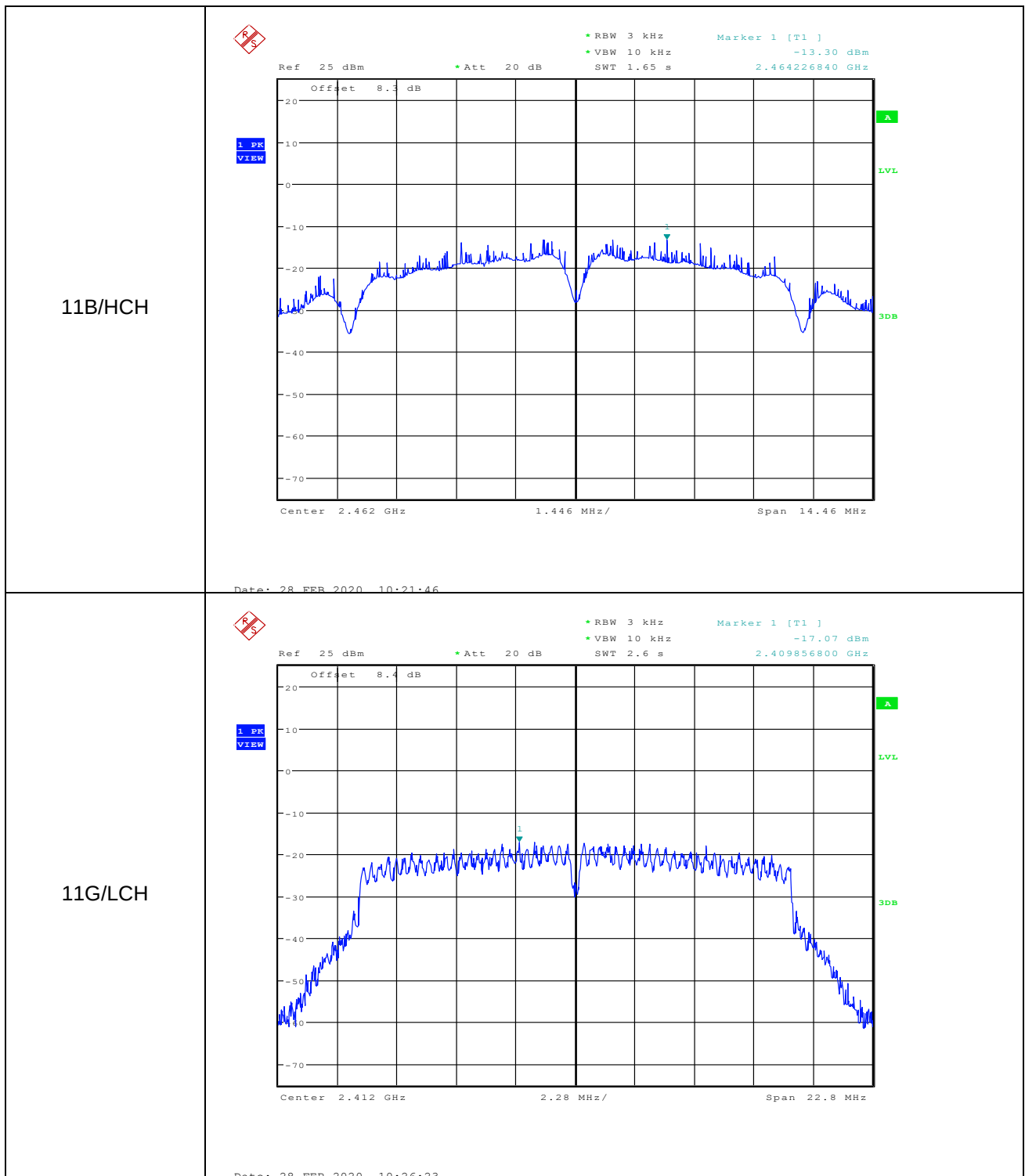
Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40) Only the worst case is recorded in the report.
Limit:	≤8.00dBm/3kHz
Test Results:	Pass

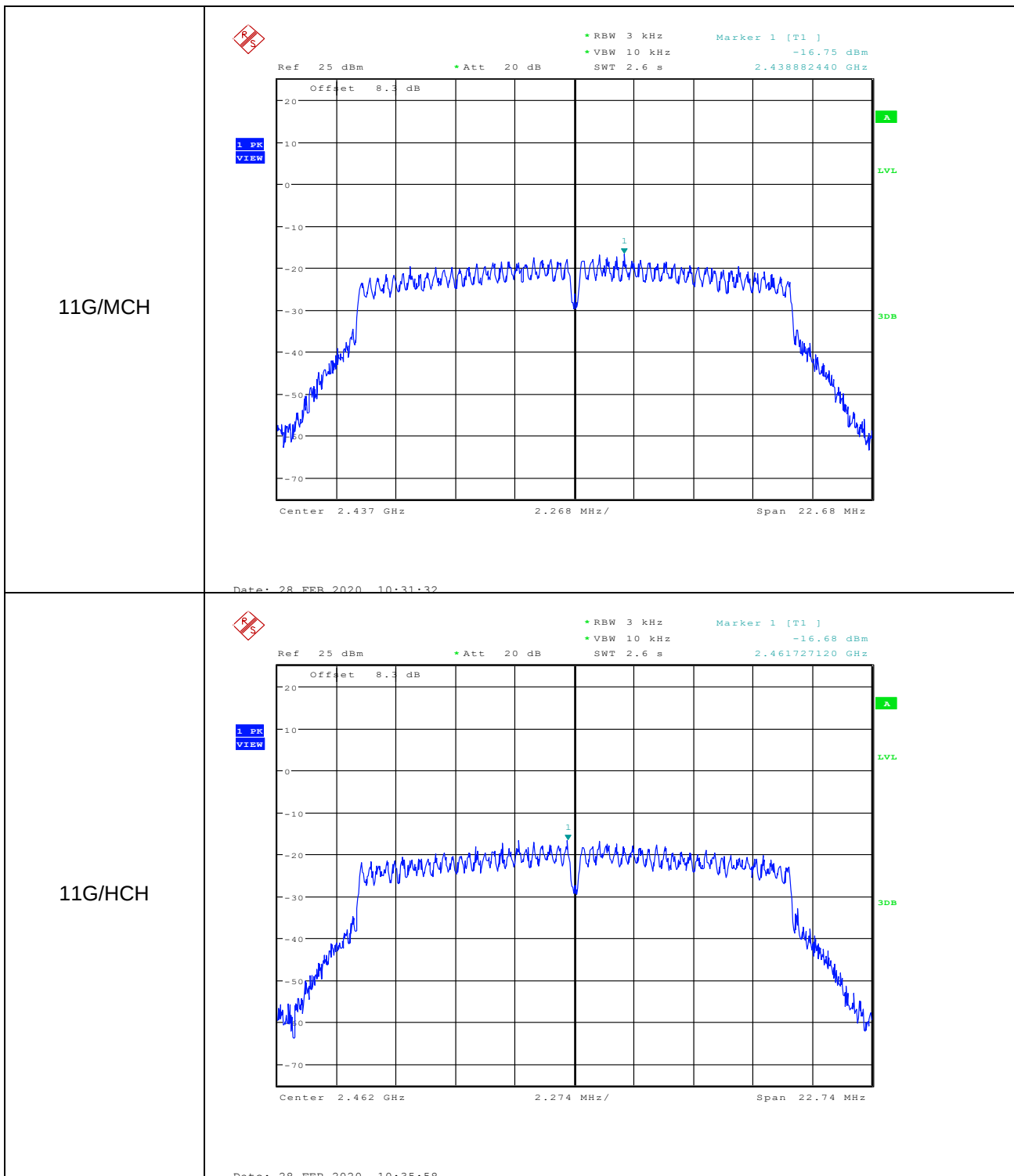
Measurement Data

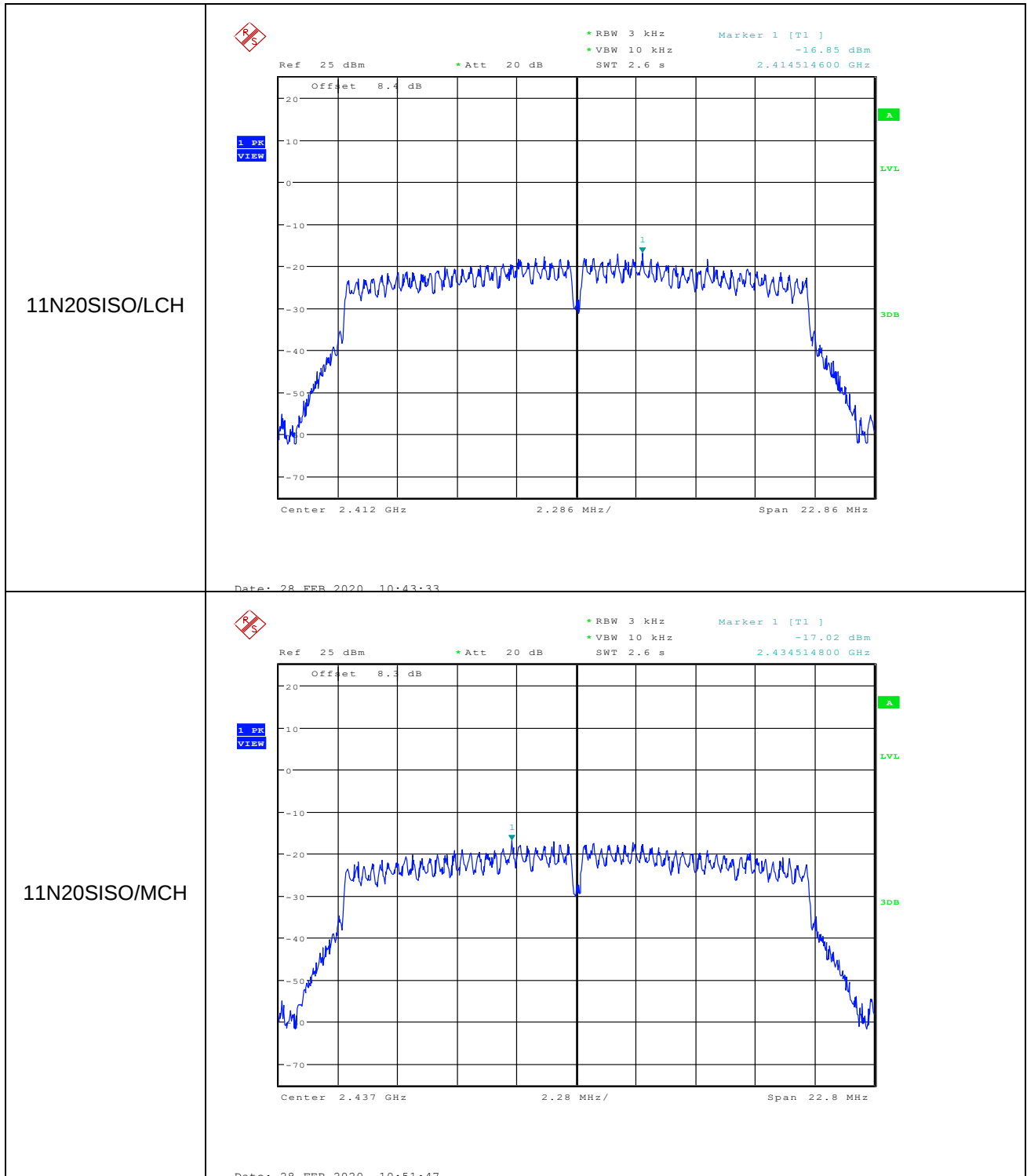
802.11b mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-12.380	≤8.00	Pass
Middle	-13.220	≤8.00	Pass
Highest	-13.300	≤8.00	Pass
802.11g mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-17.070	≤8.00	Pass
Middle	-16.750	≤8.00	Pass
Highest	-16.680	≤8.00	Pass
802.11n(HT20) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-16.850	≤8.00	Pass
Middle	-17.020	≤8.00	Pass
Highest	-16.890	≤8.00	Pass
802.11n(HT40) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-21.080	≤8.00	Pass
Middle	-21.410	≤8.00	Pass
Highest	-21.150	≤8.00	Pass

Test plot as follows:

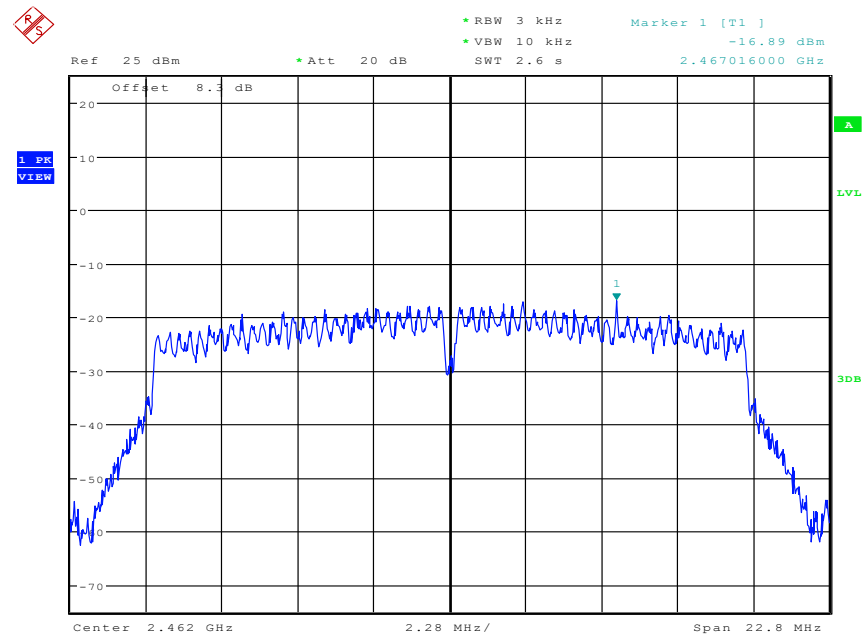






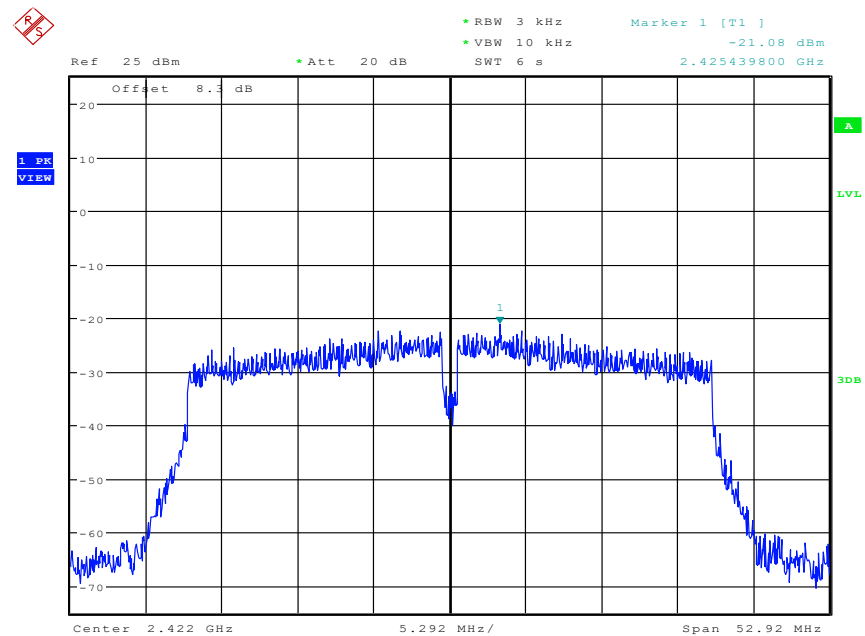


11N20SISO/HCH

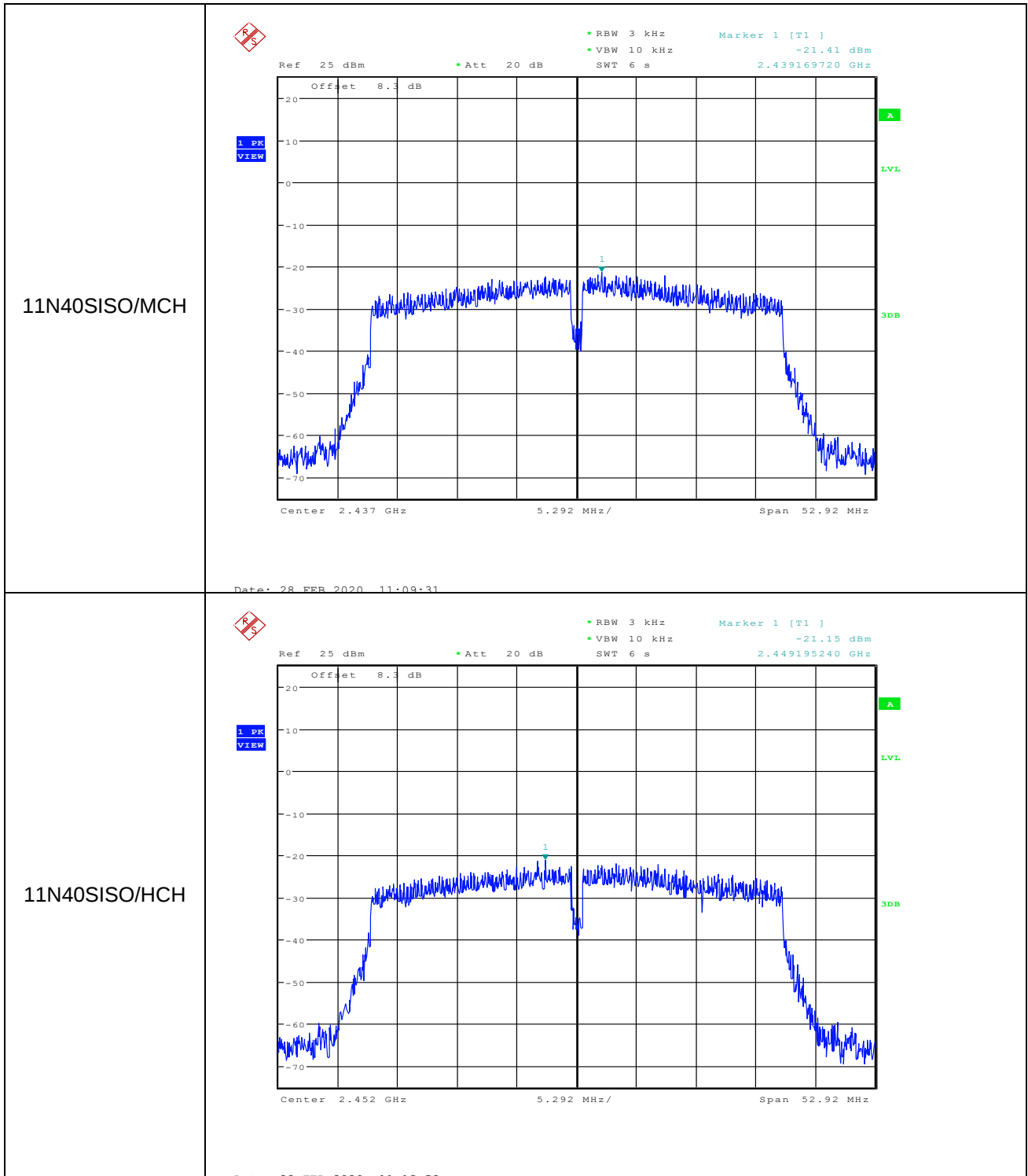


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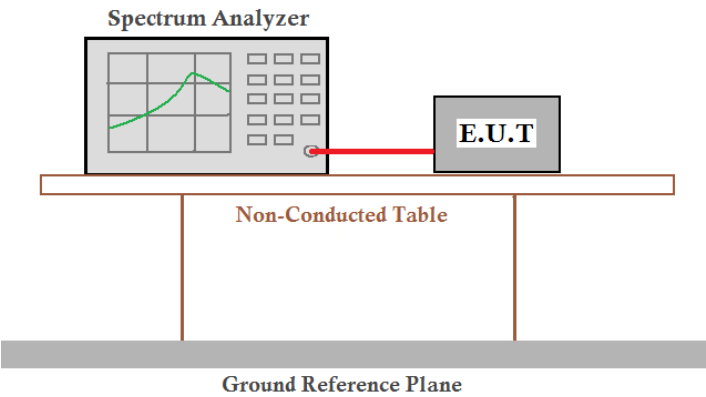
11N40SISO/LCH



Date: 28 FEB 2020 11:04:40



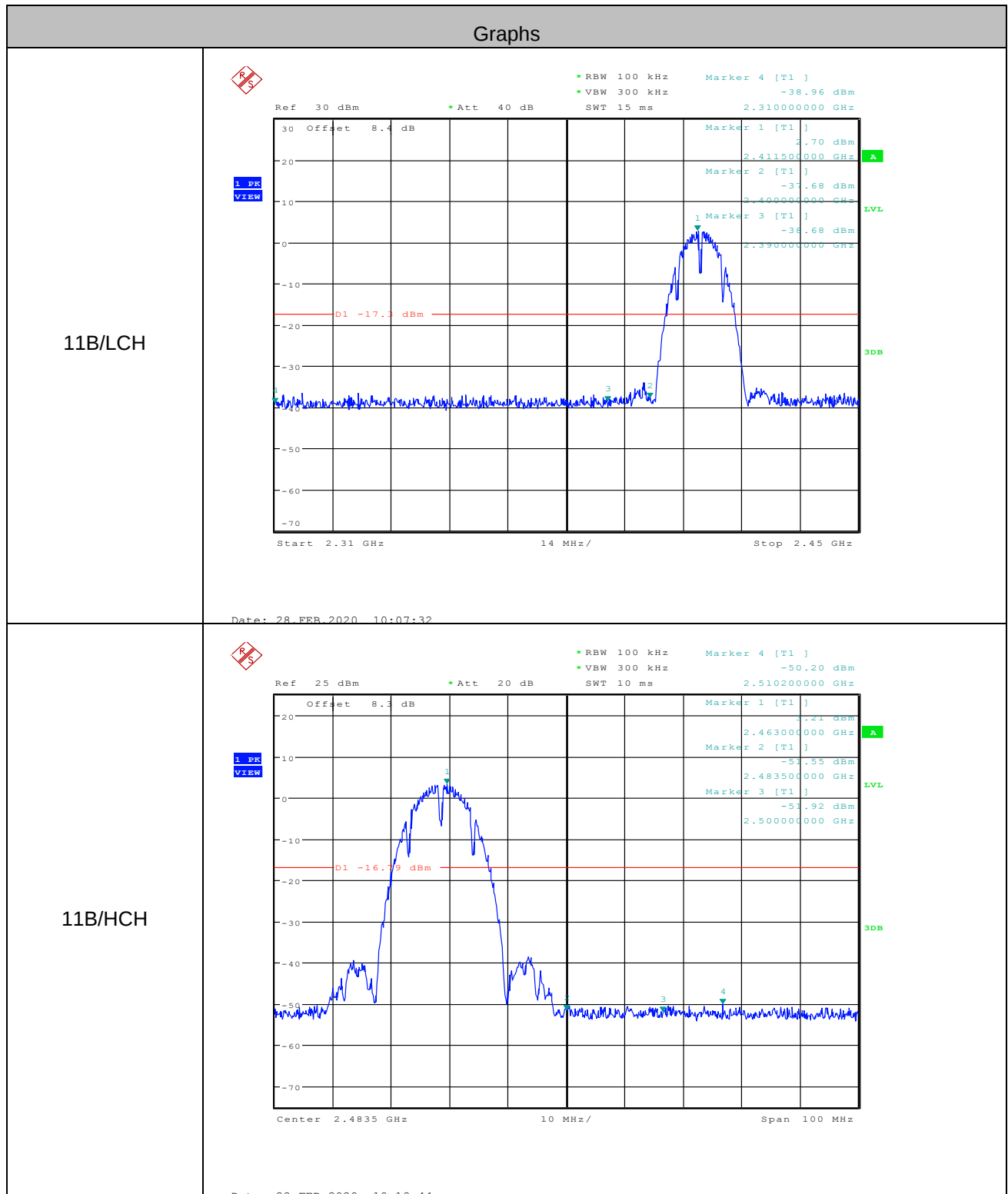
5.6 Band-edge for RF Conducted Emissions

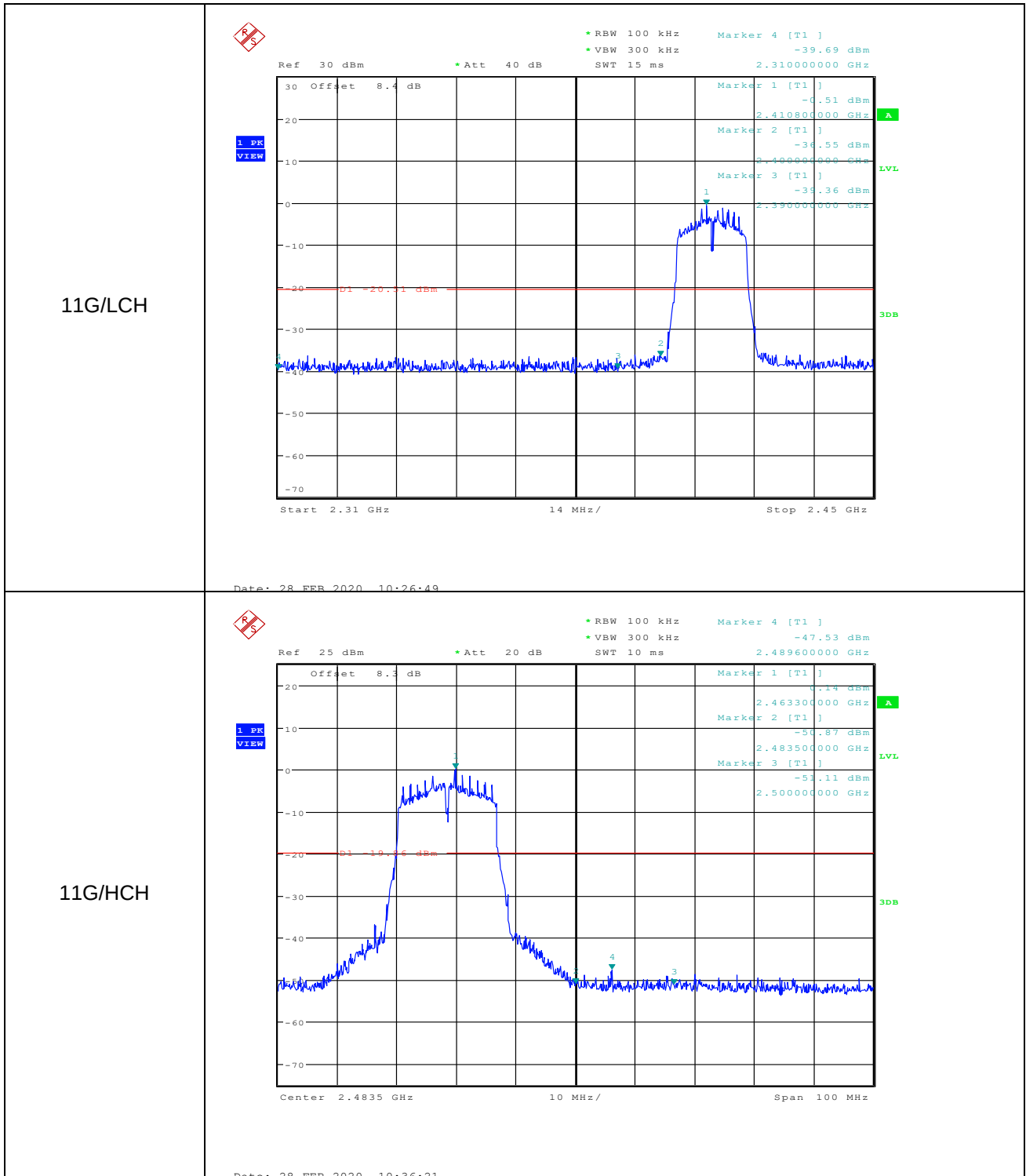
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40) Only the worst case is recorded in the report.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass

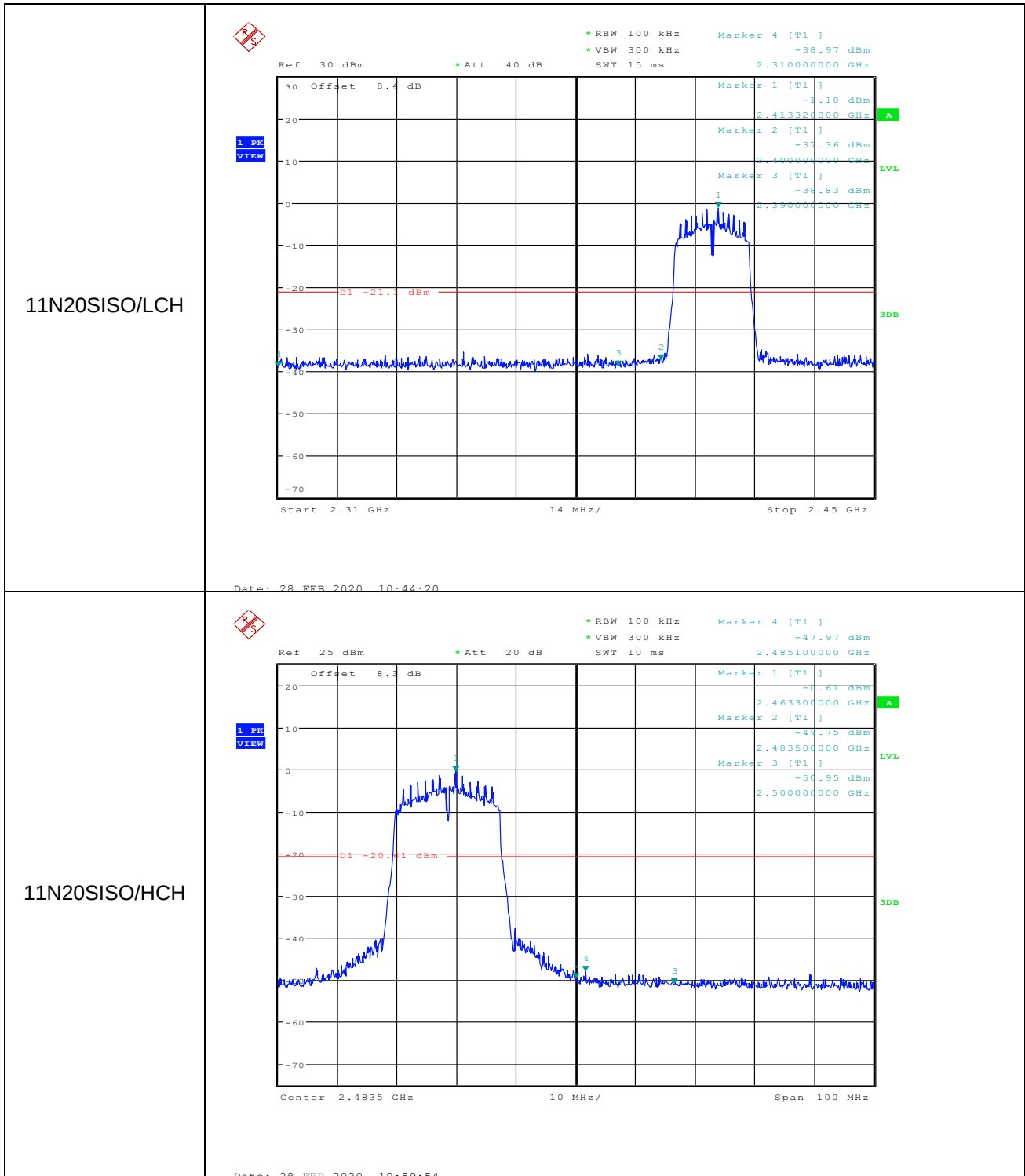
Test Data:

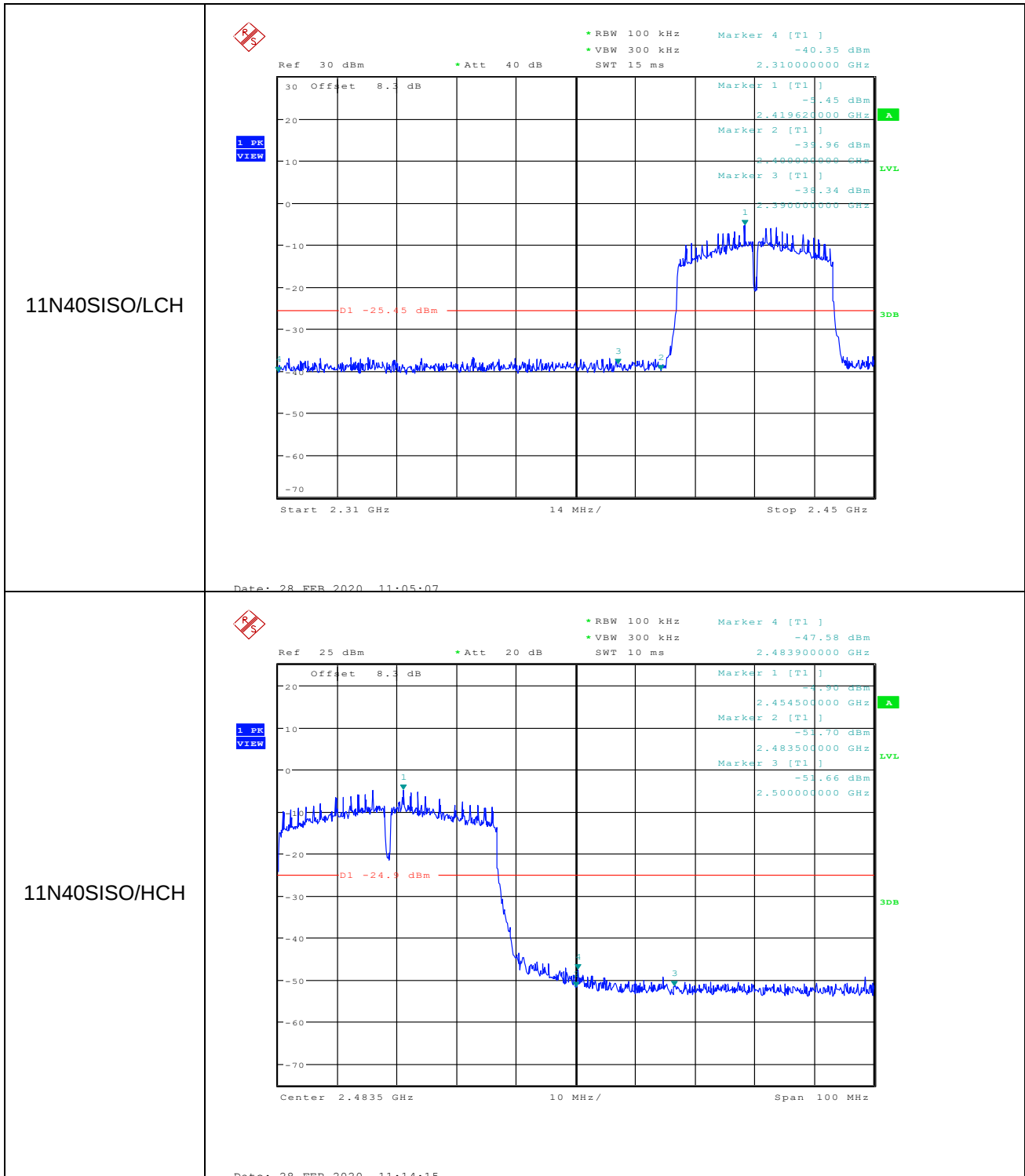
Test mode: 802.11b				
Test channel	Frequency(MHz)	Emission Level(dBm)	Limit(dBm)	Result
Lowest	2400	-37.680	-17.3	Pass
Highest	2483.5	-51.550	-16.79	Pass
Test mode: 802.11g				
Test channel	Frequency(MHz)	Emission Level(dBm)	Limit(dBm)	Result
Lowest	2400	-36.550	-20.51	Pass
Highest	2483.5	-50.870	-19.86	Pass
Test mode: 802.11n(HT20)				
Test channel	Frequency(MHz)	Emission Level(dBm)	Limit(dBm)	Result
Lowest	2400	-37.360	-21.1	Pass
Highest	2483.5	-49.750	-20.61	Pass
Test mode: 802.11n(HT40)				
Test channel	Frequency(MHz)	Emission Level(dBm)	Limit(dBm)	Result
Lowest	2400	-39.960	-25.45	Pass
Highest	2483.5	-51.700	-24.9	Pass

Test plot as follows:

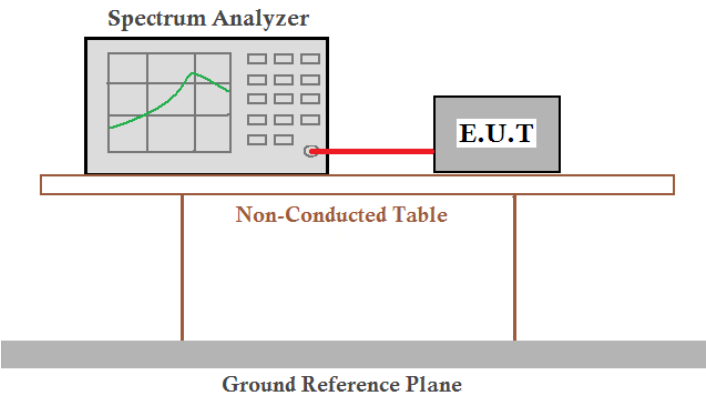




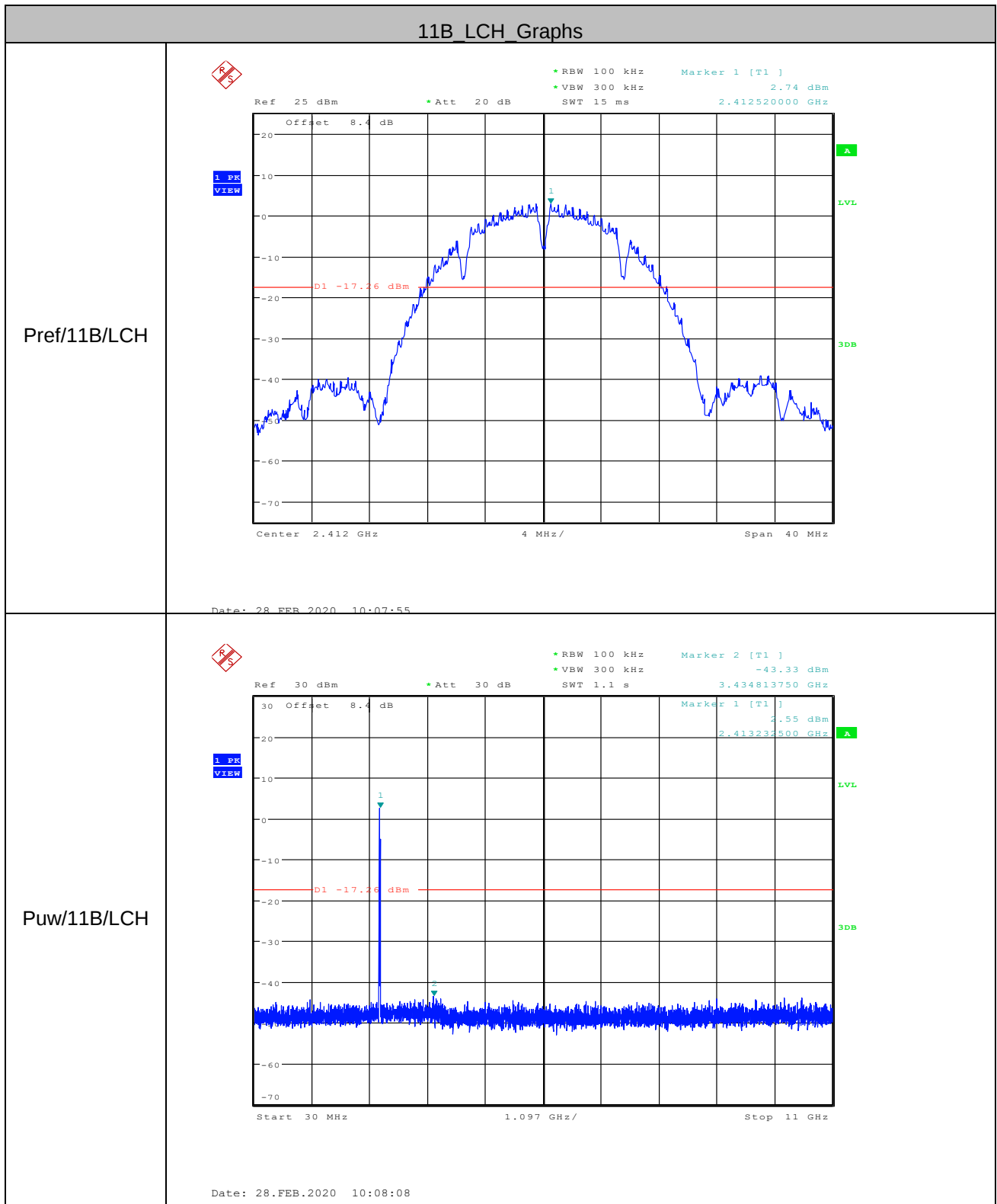


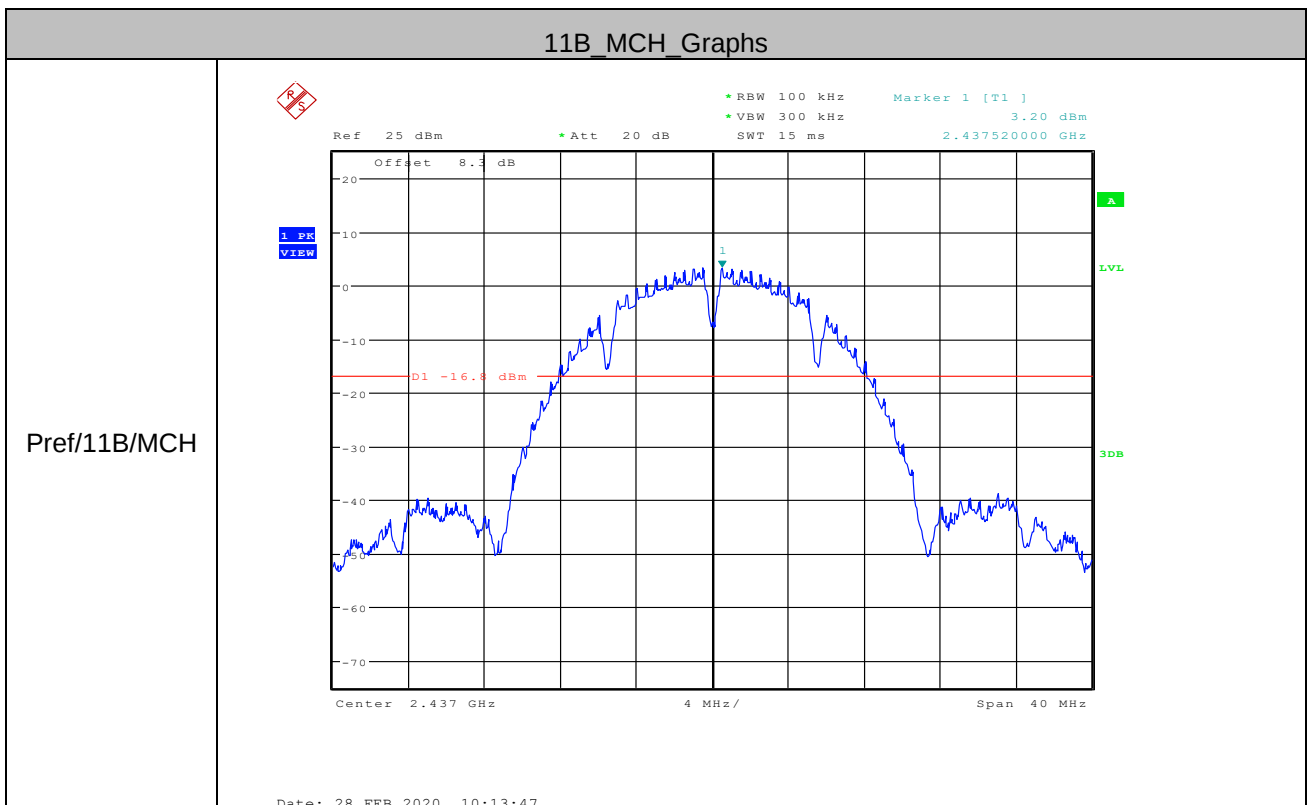
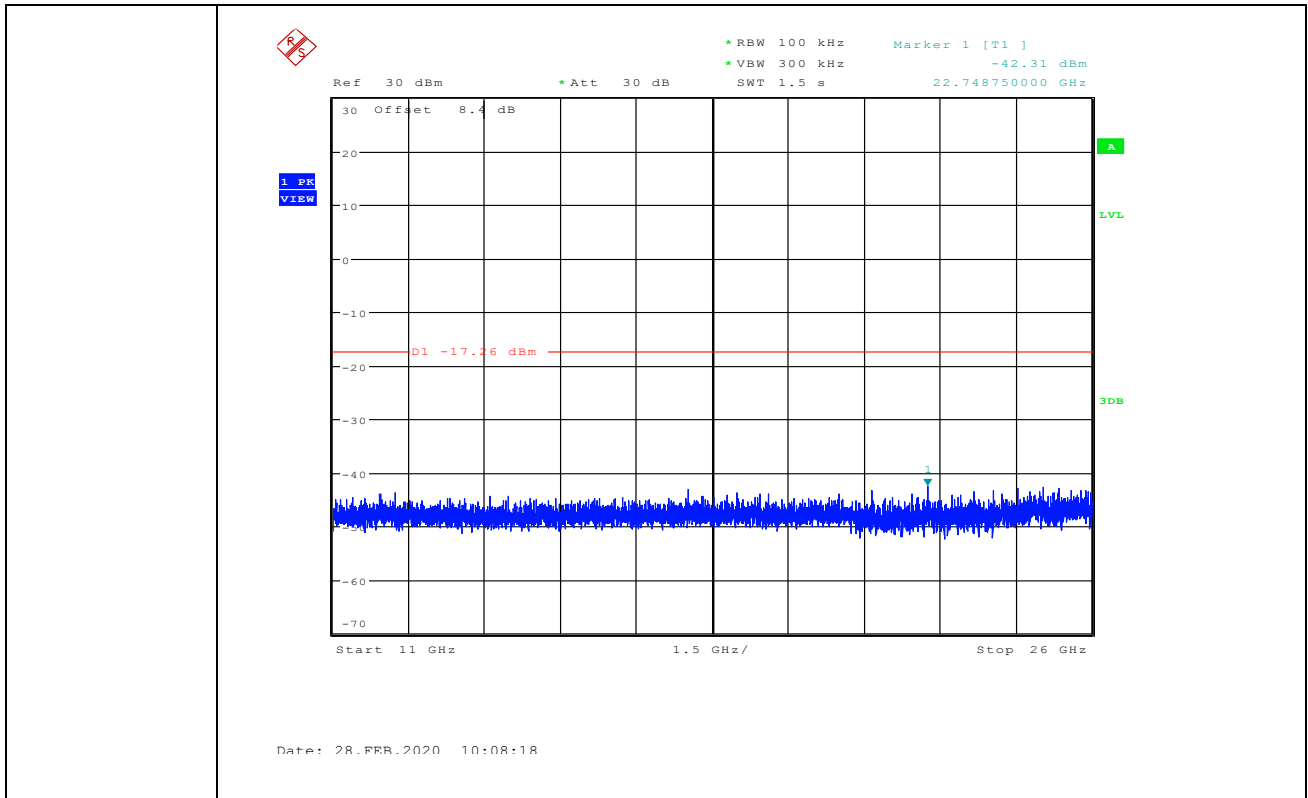


5.7 RF Conducted Spurious Emissions

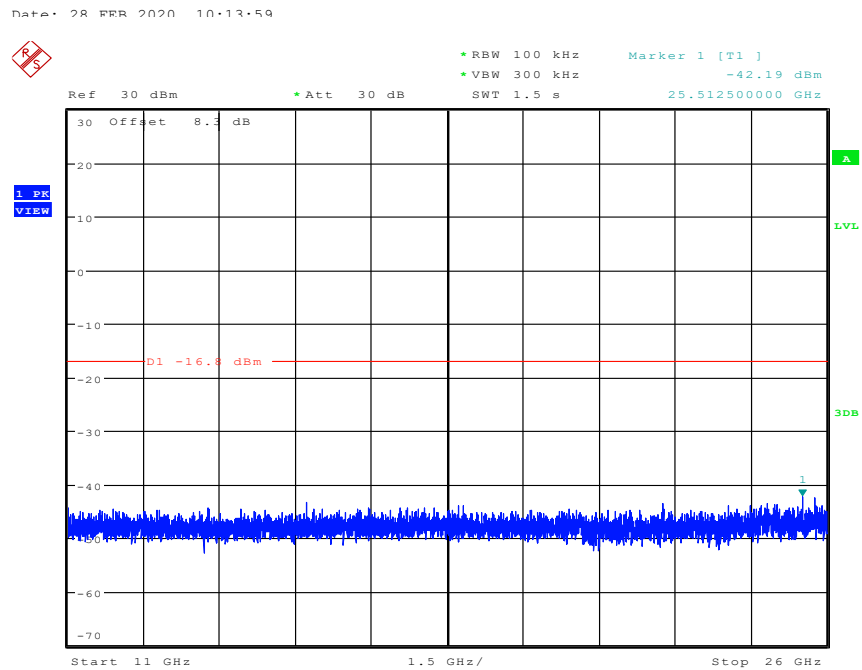
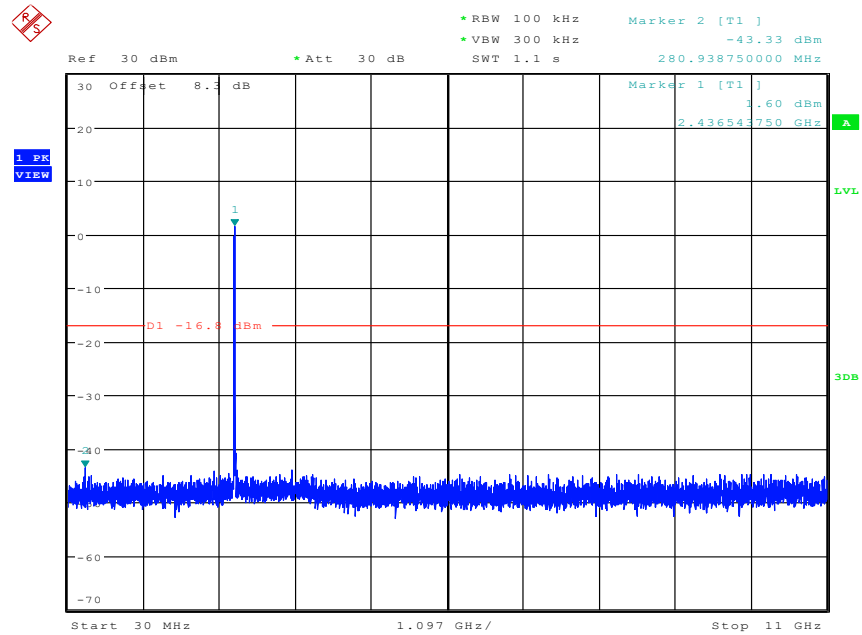
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40) Only the worst case is recorded in the report.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass

Test plot as follows:

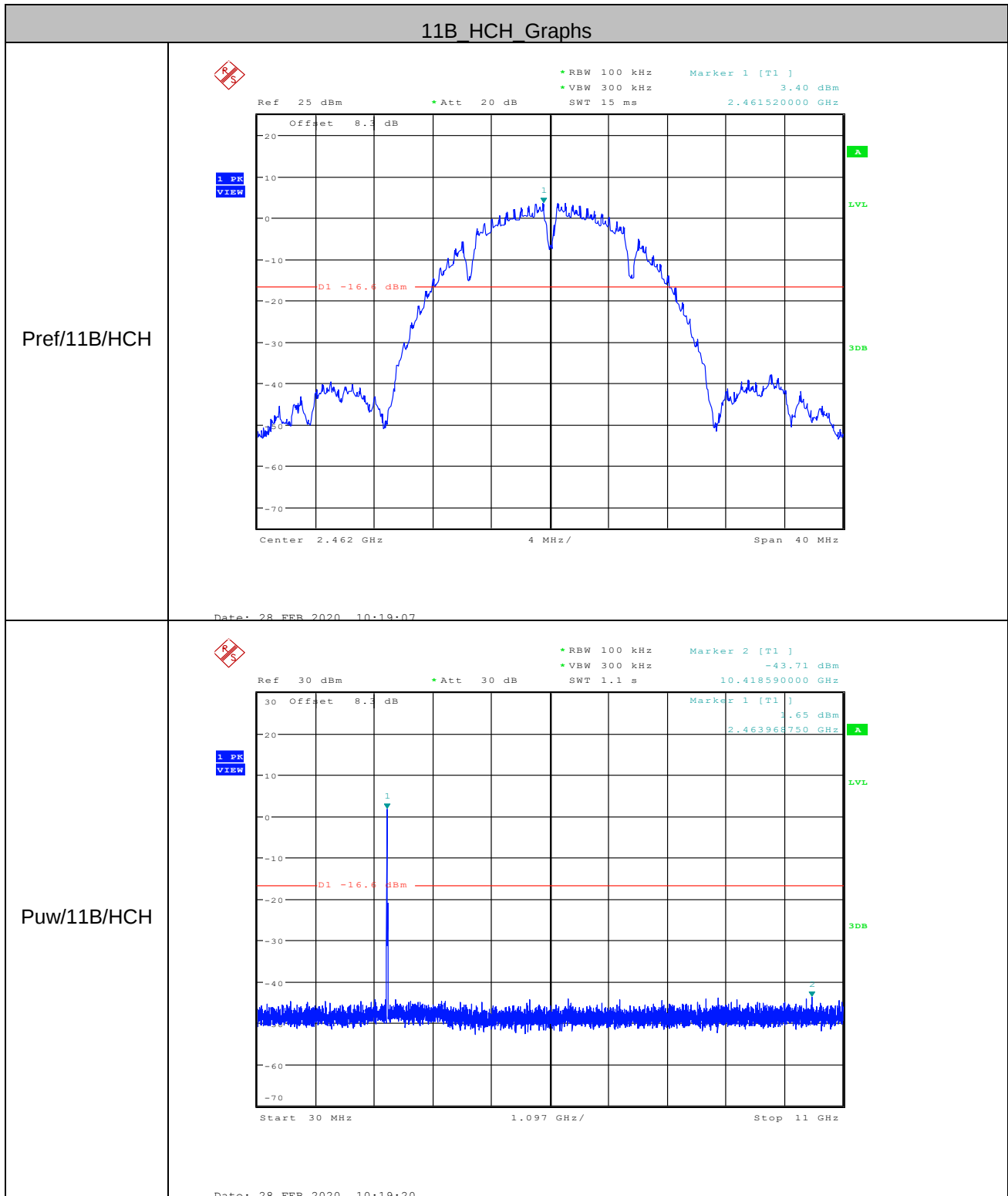


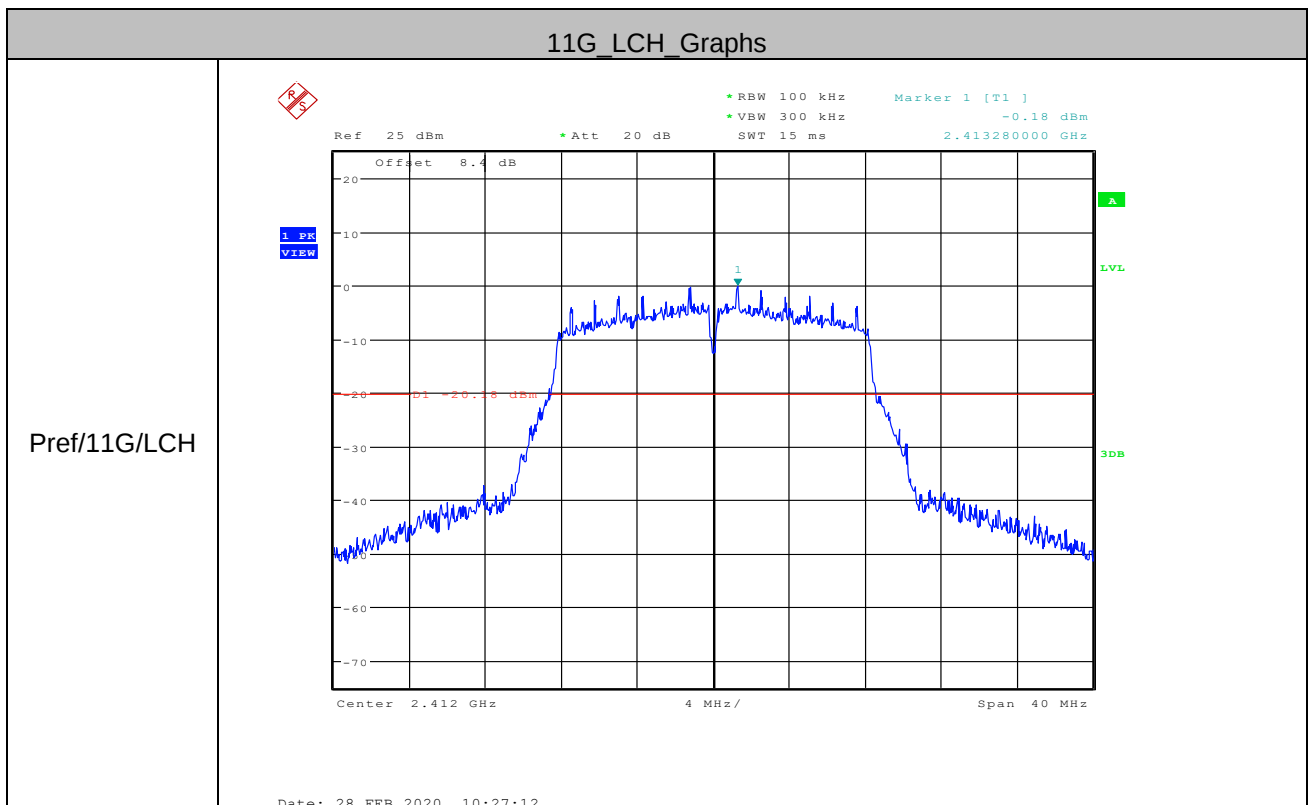
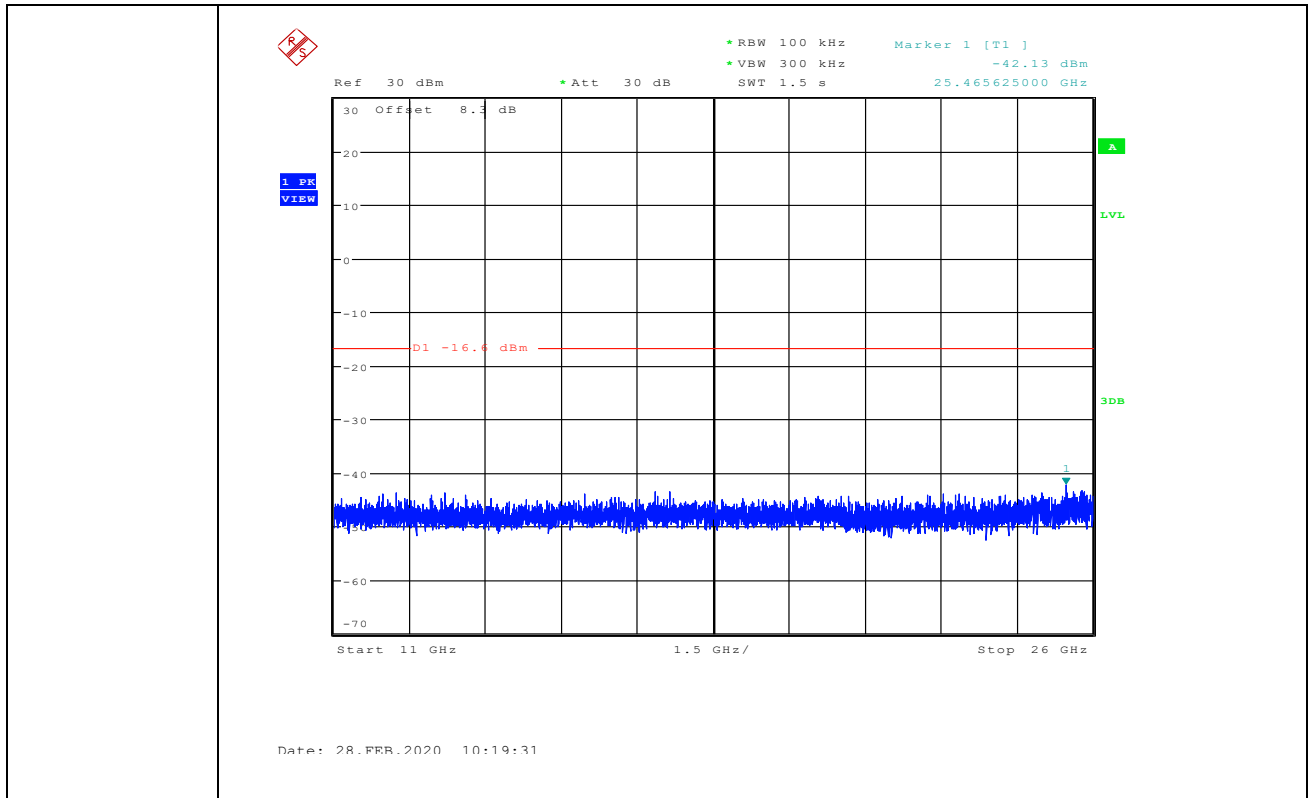


Puw/11B/MCH

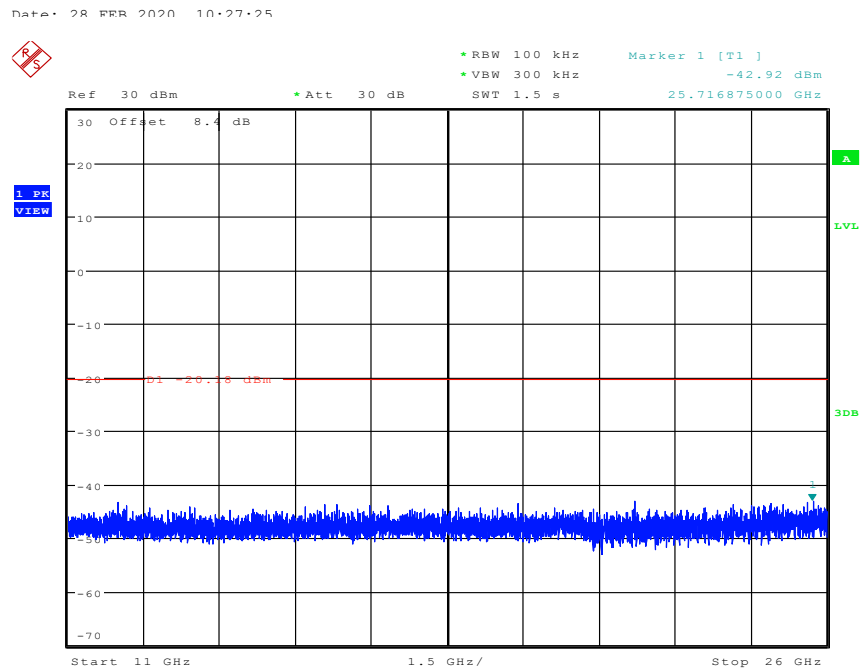
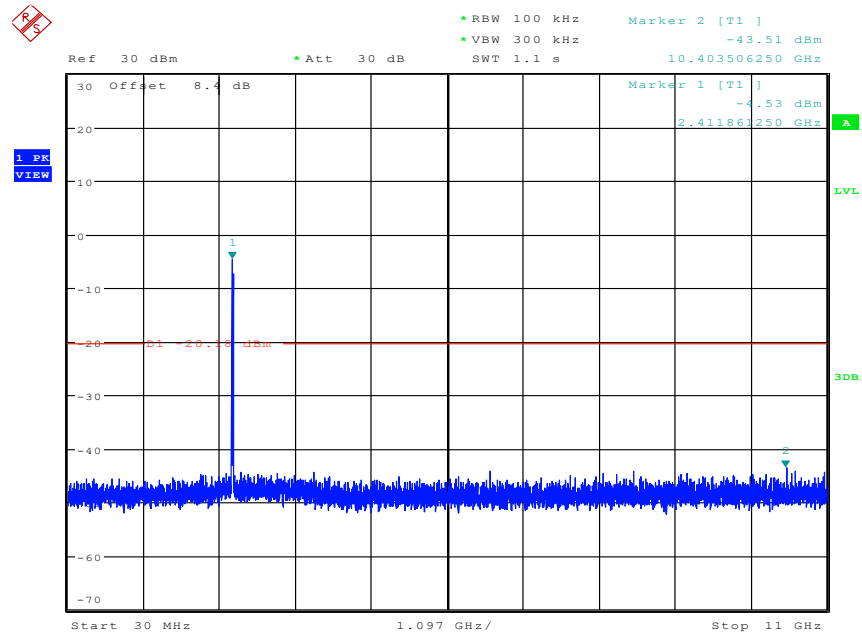


Date: 28.FEB.2020 10:14:10

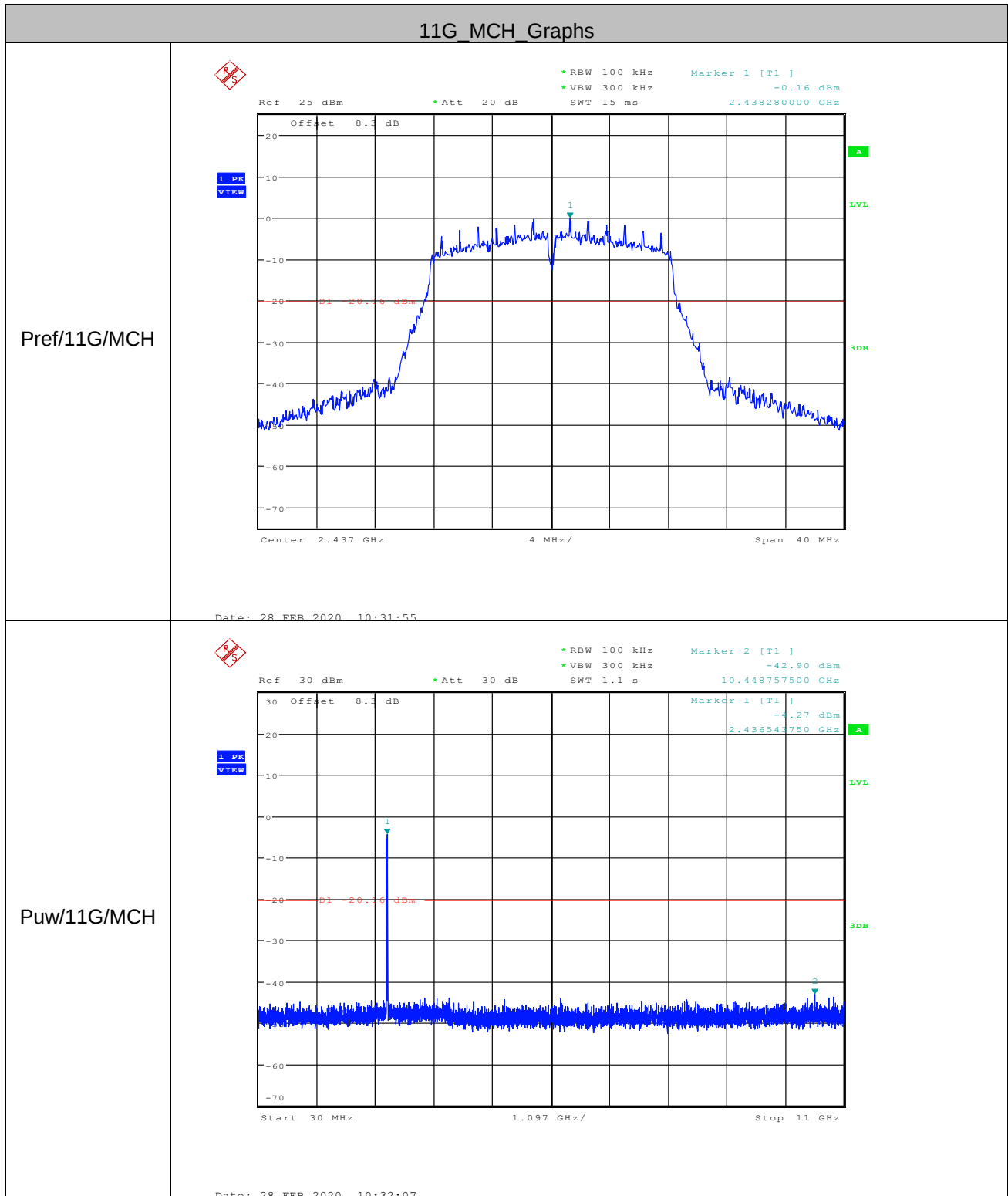


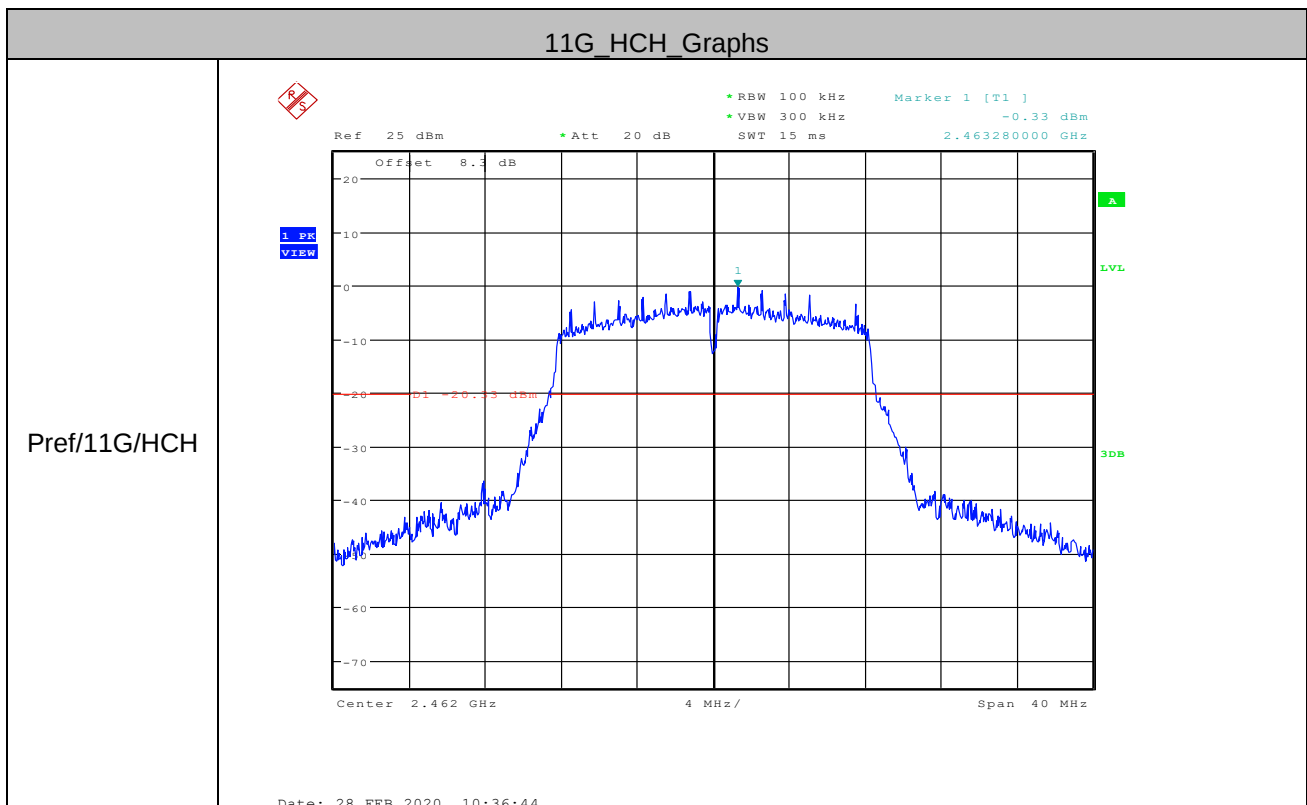
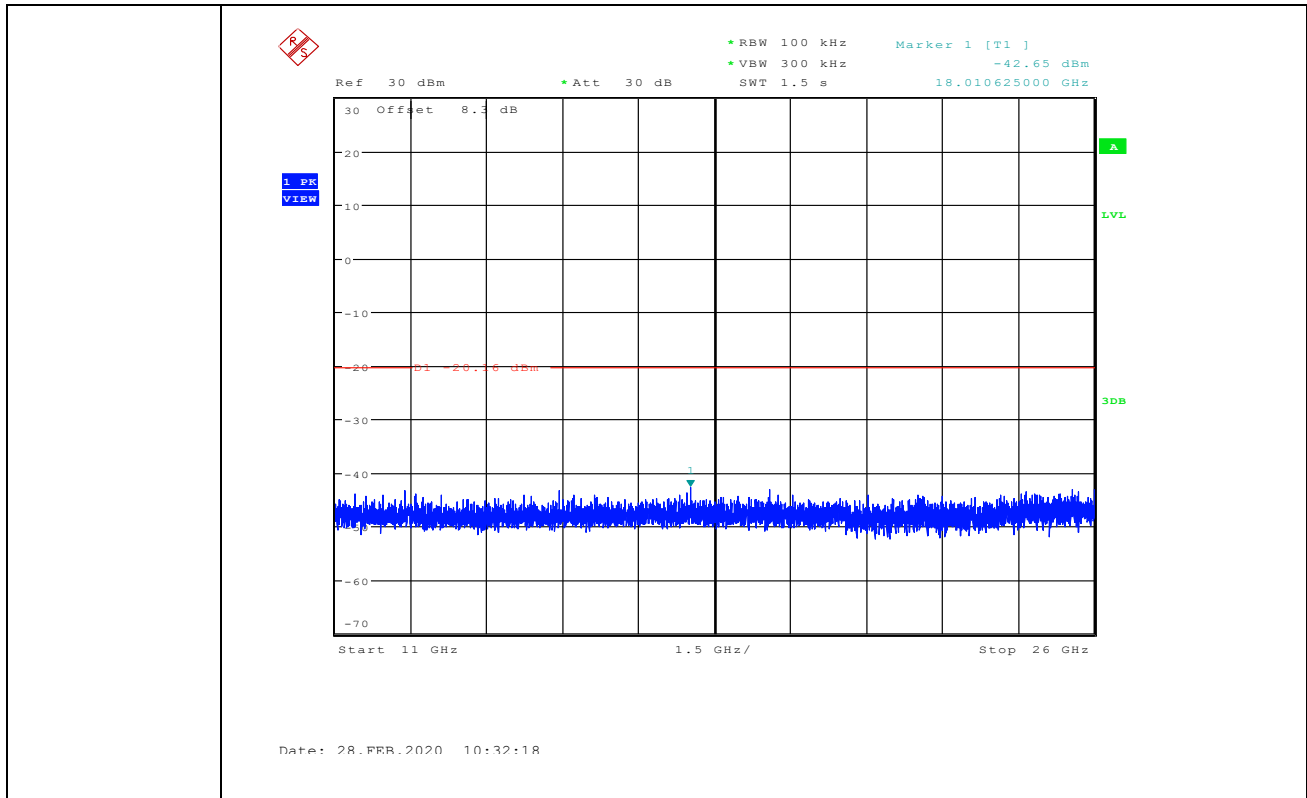


Puw/11G/LCH



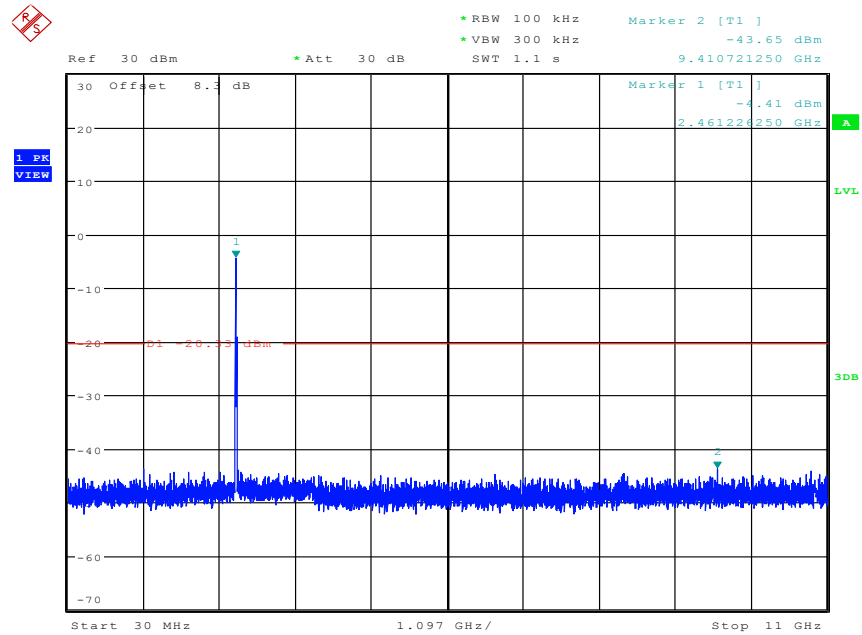
Date: 28.FEB.2020 10:27:35



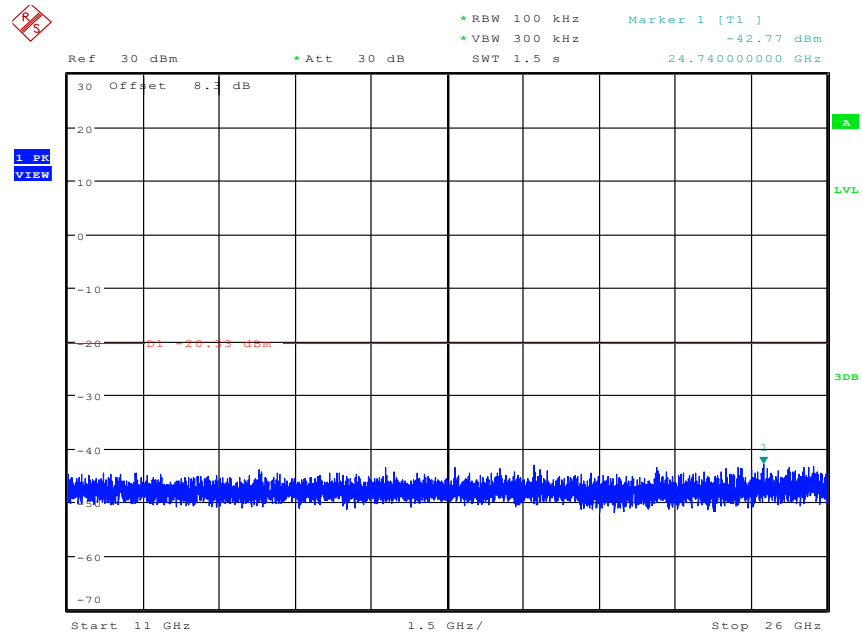


Pref/11G/HCH

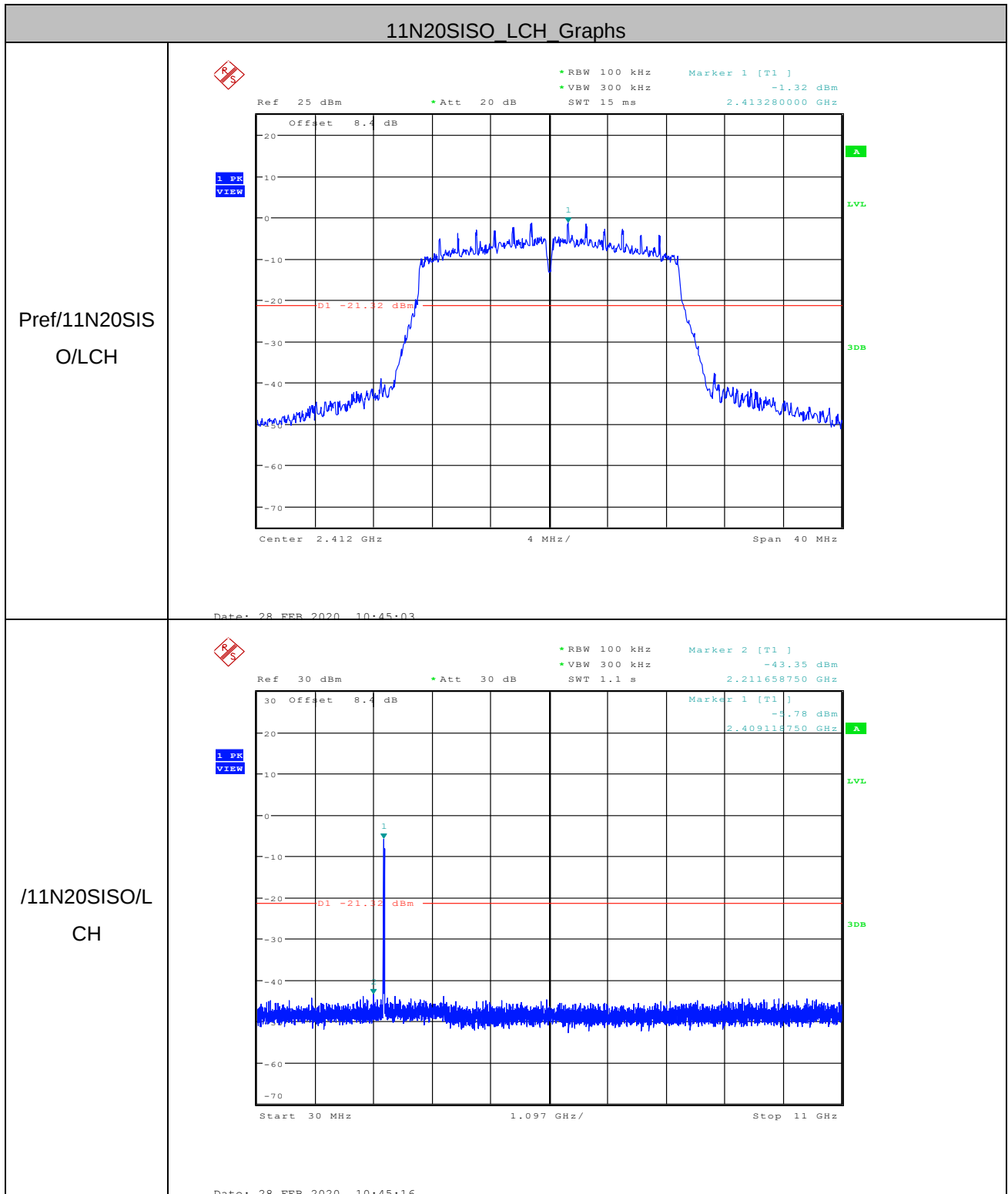
Puw/11G/HCH

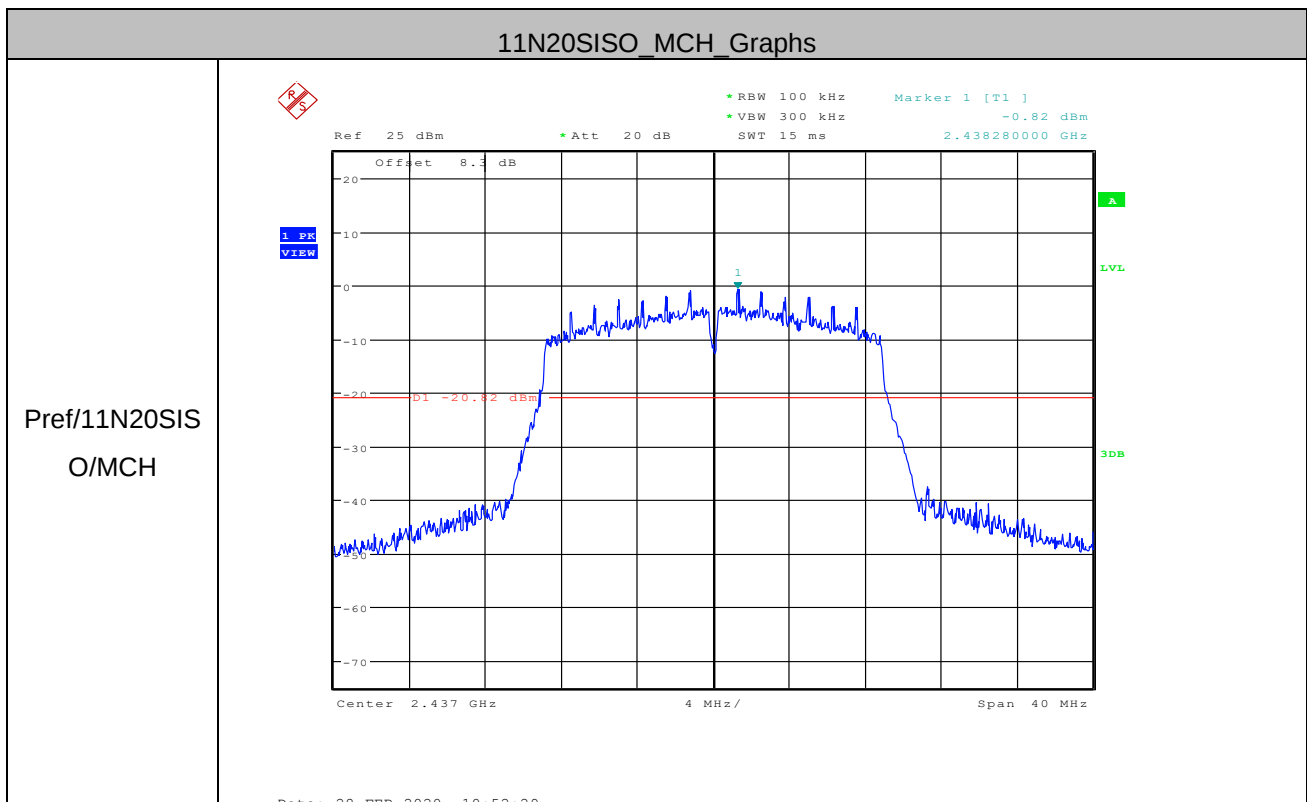
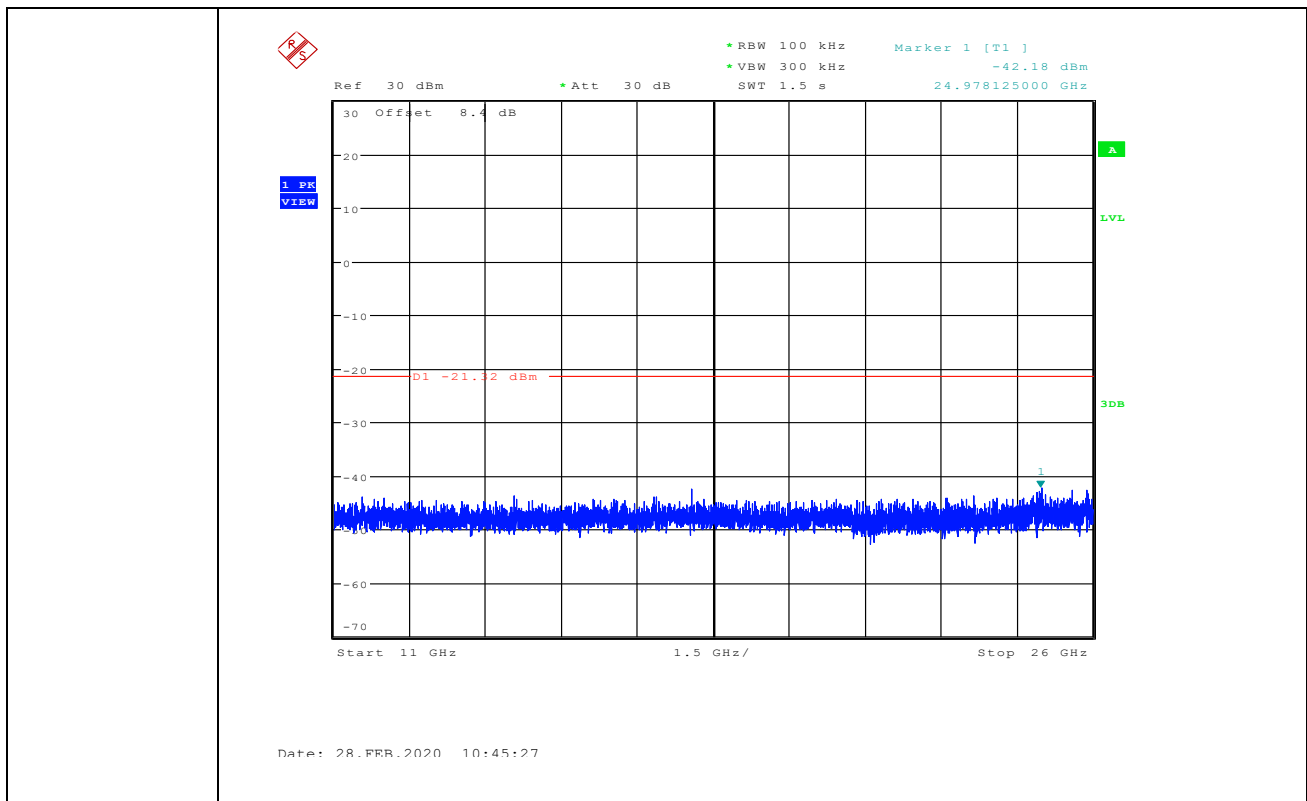


Date: 28.FEB.2020 10:36:56



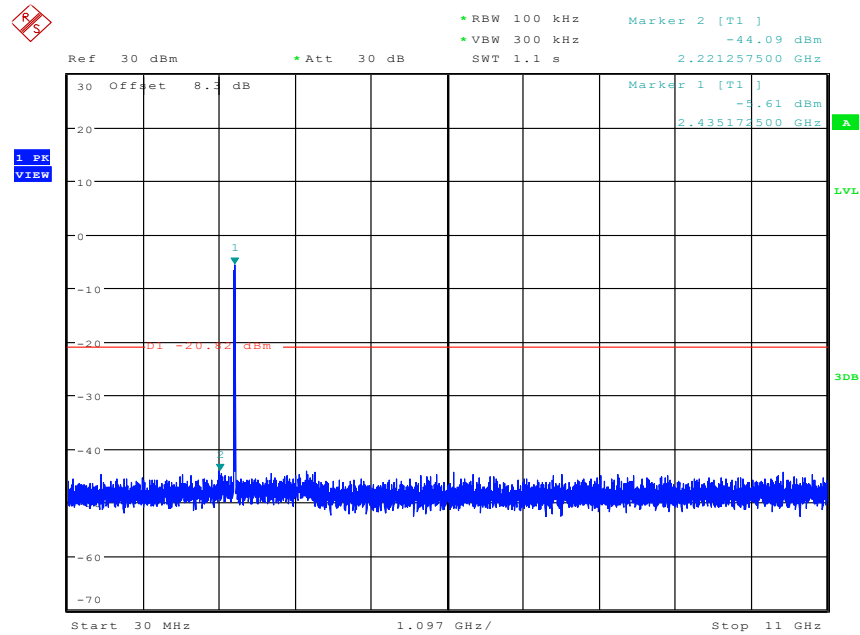
Date: 28.FEB.2020 10:37:07



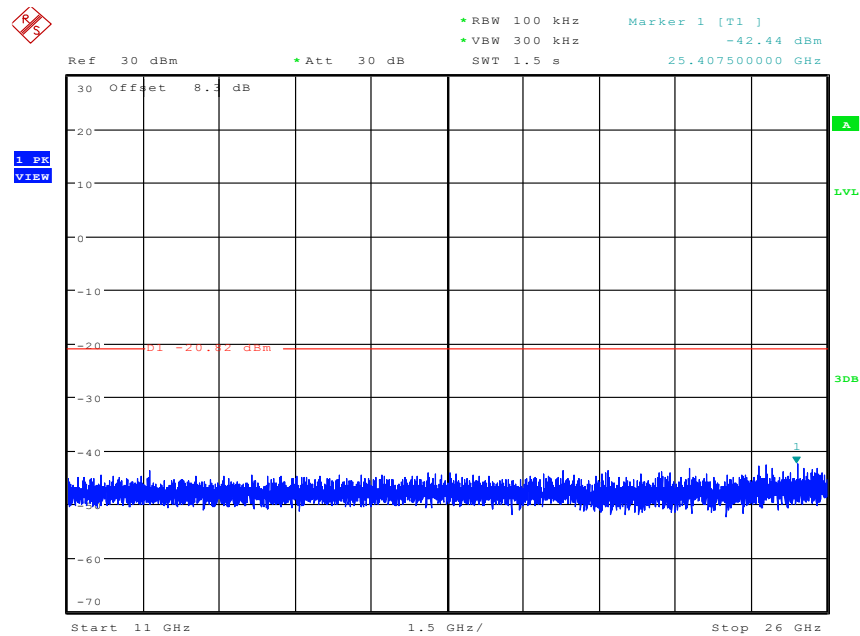


Pref/11N20SIS
O/MCH

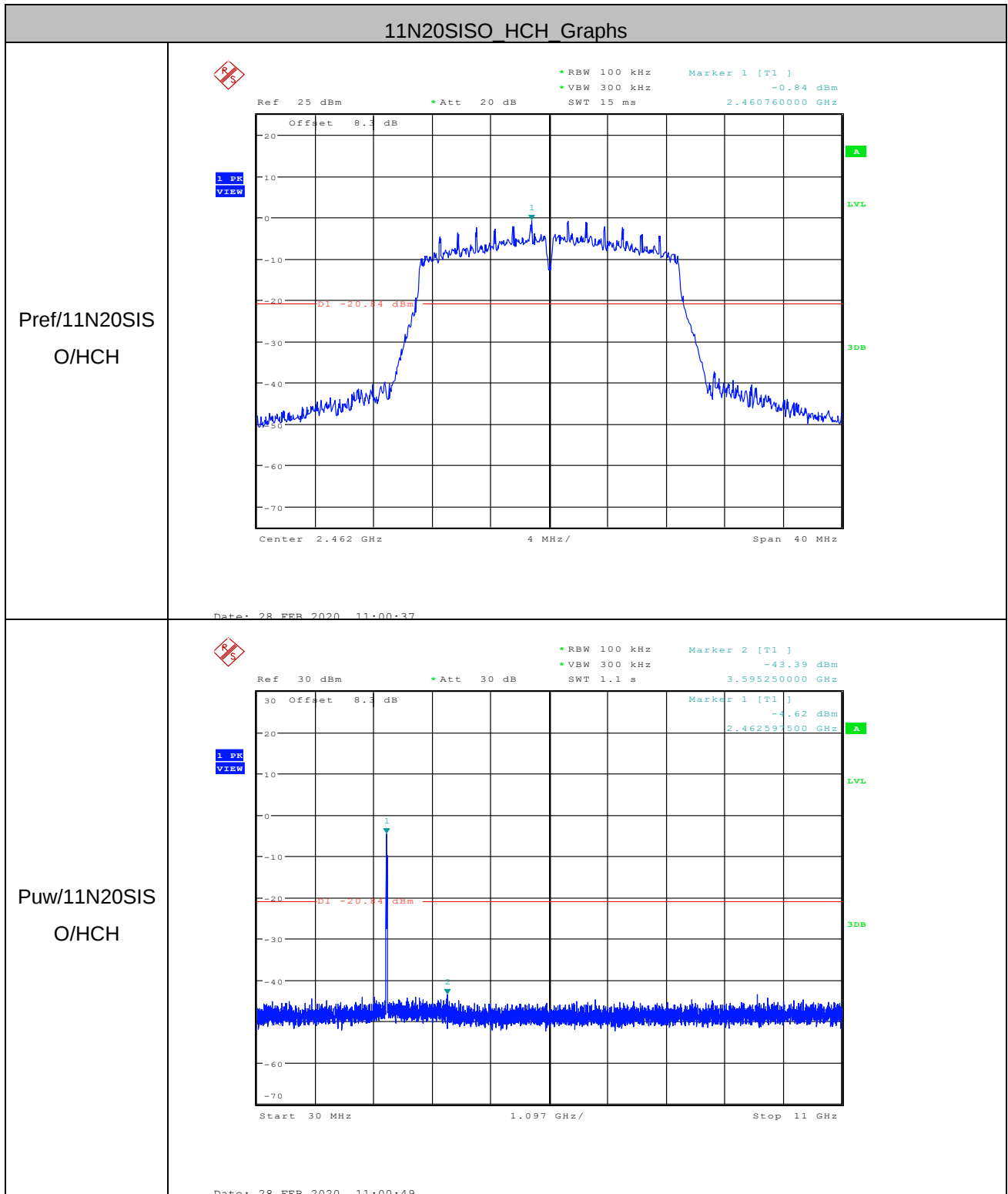
Puw/11N20SIS
O/MCH

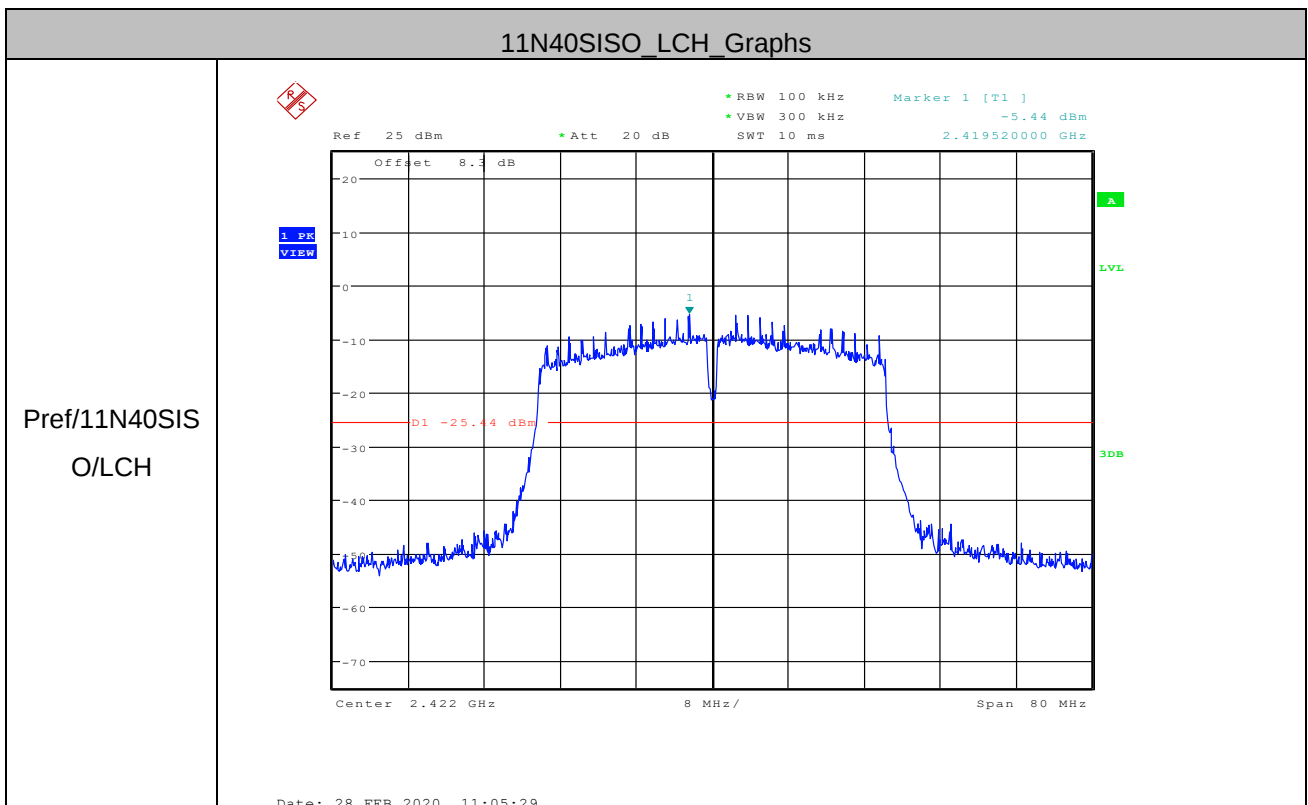
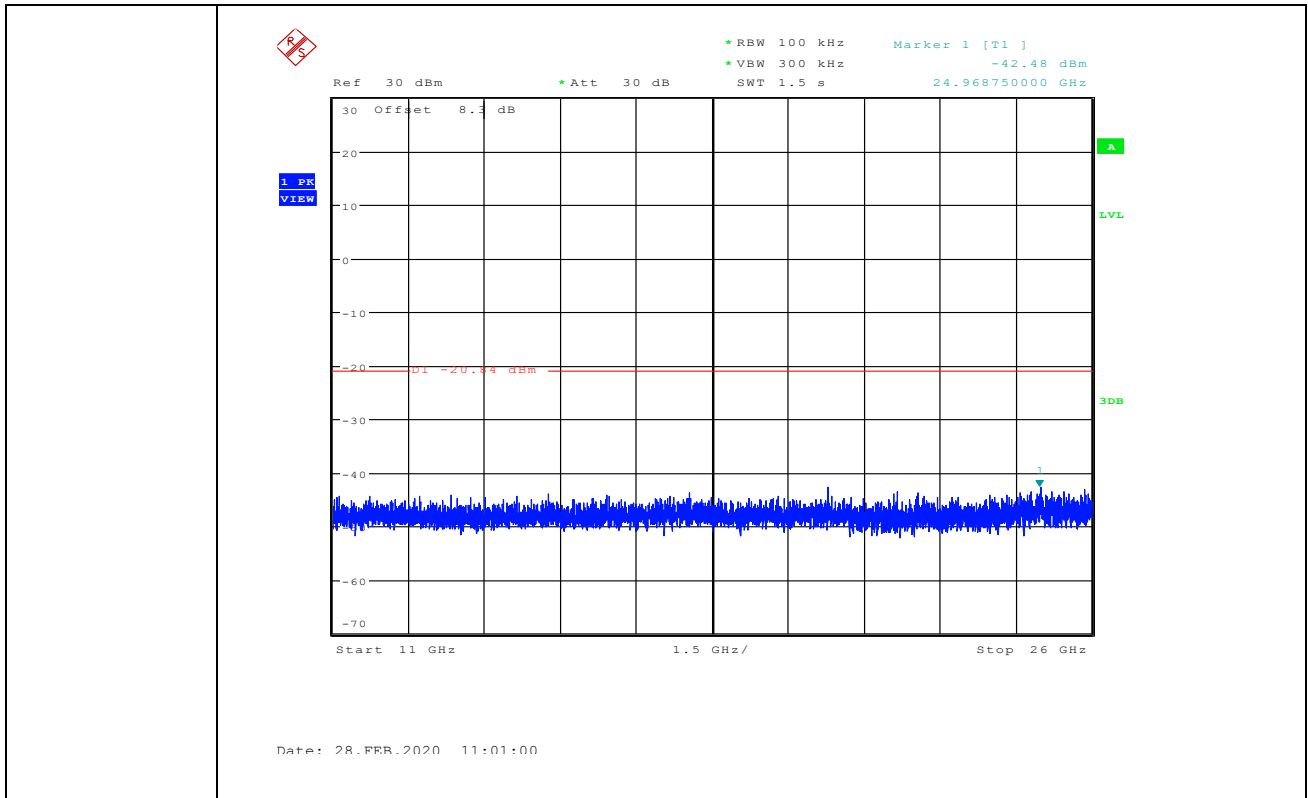


Date: 28 FEB 2020 10:52:42



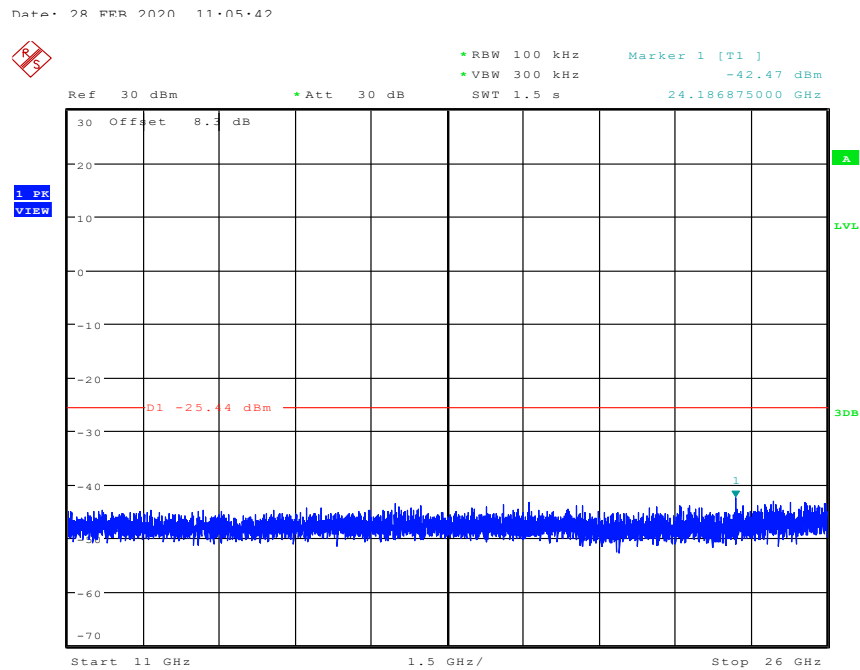
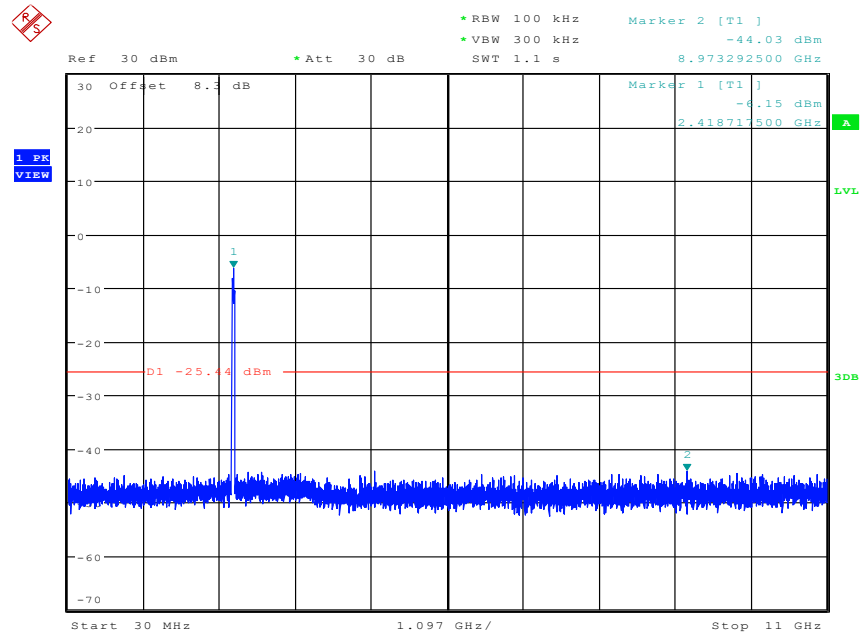
Date: 28.FEB.2020 10:52:53



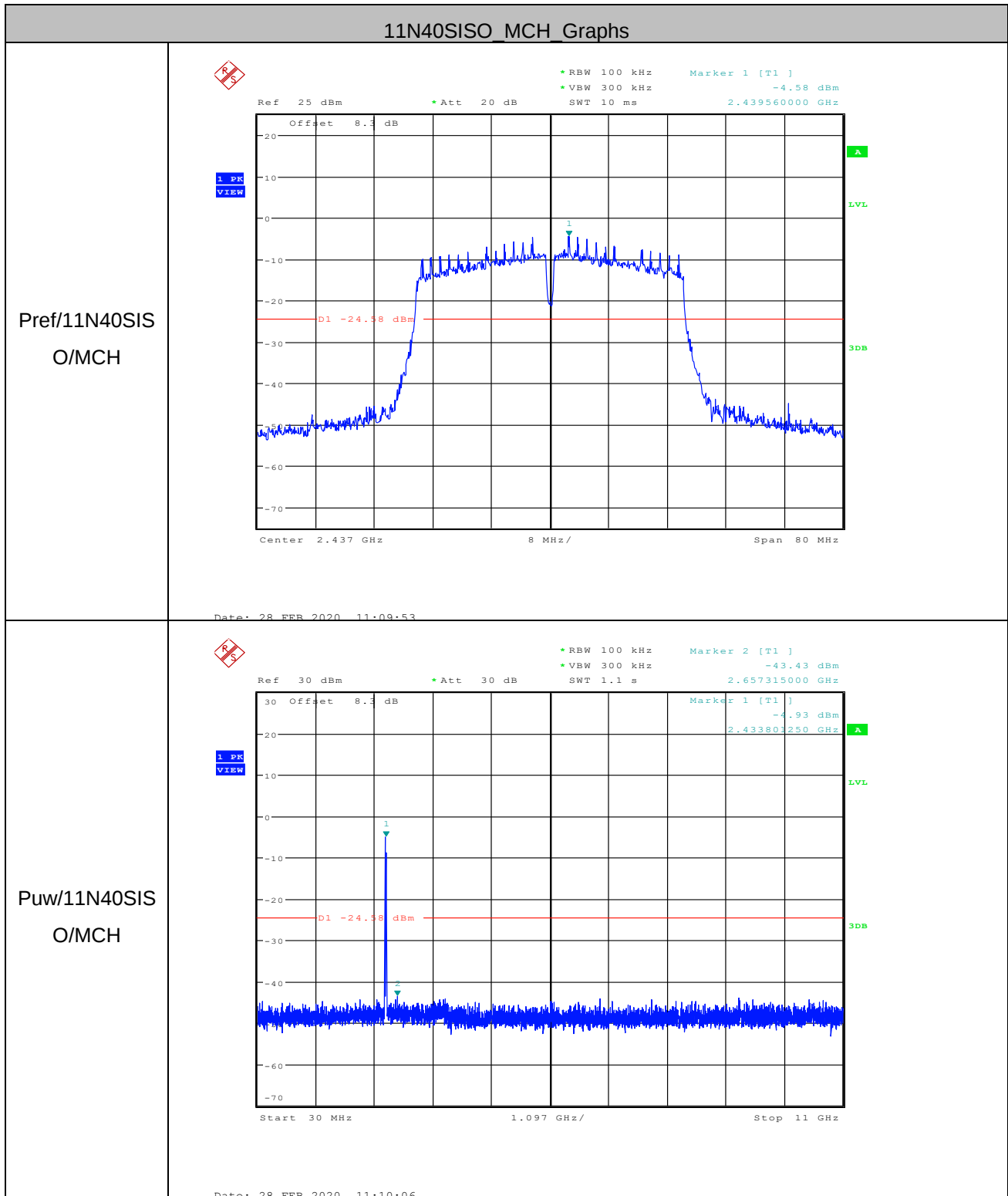


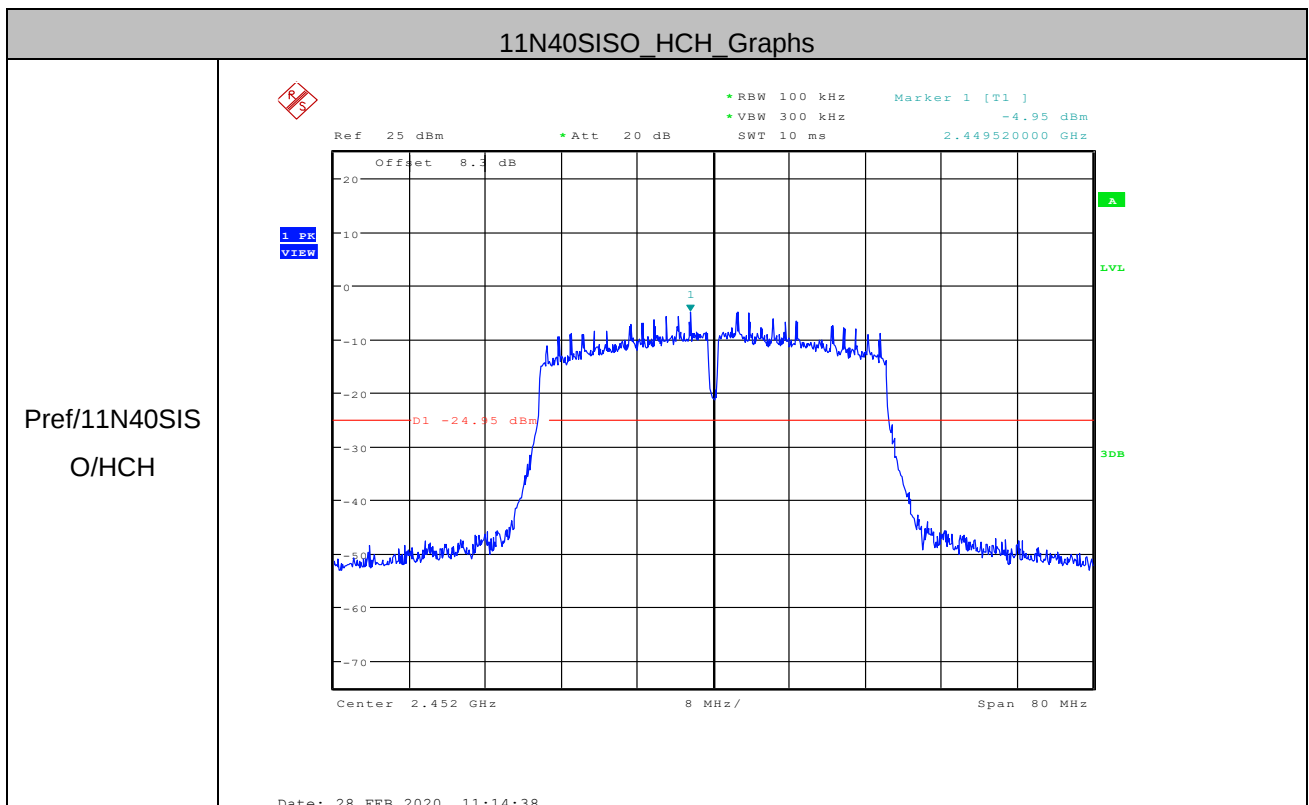
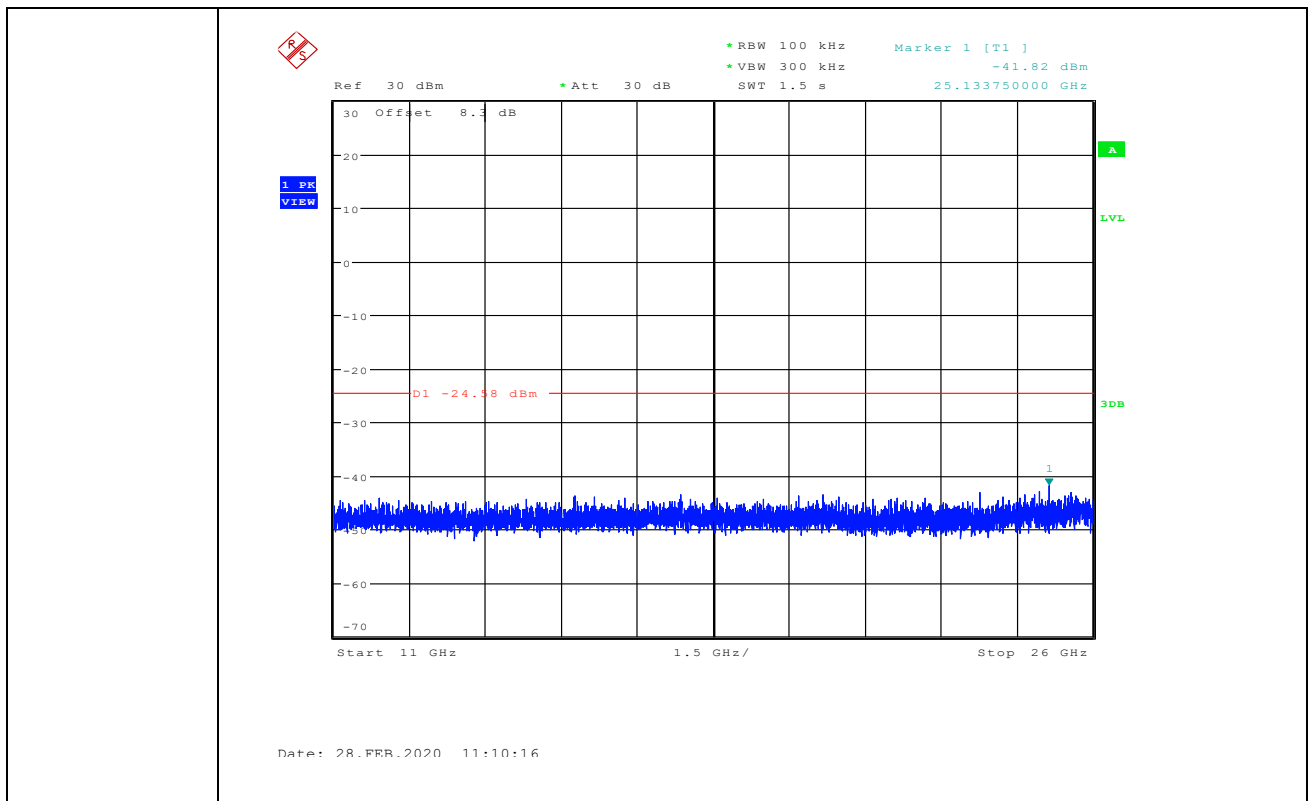
Pref/11N40SIS
O/LCH

Puw/11N40SIS
O/LCH

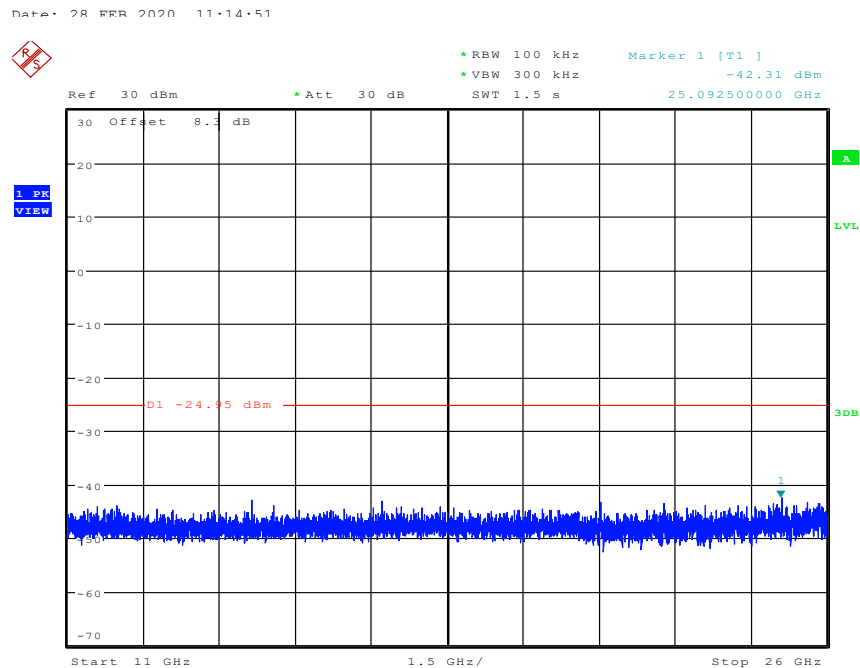
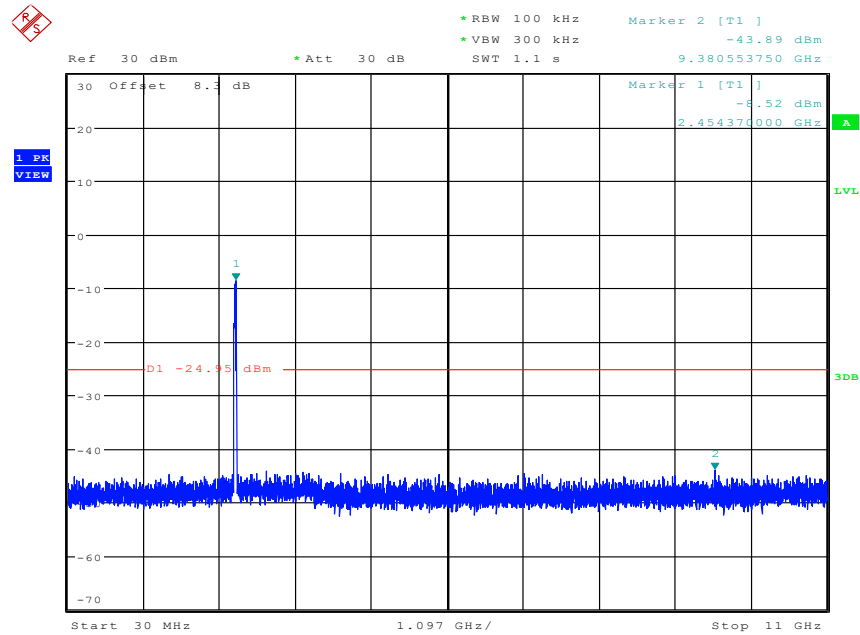


Date: 28.FEB.2020 11:05:52





Puw/11N40SIS
O/HCH



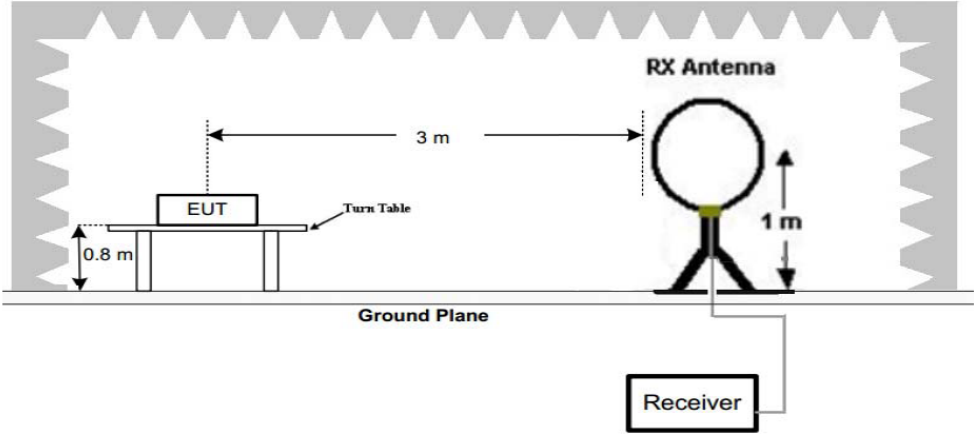
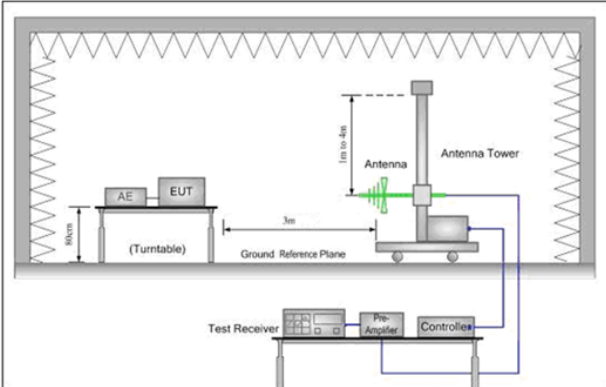
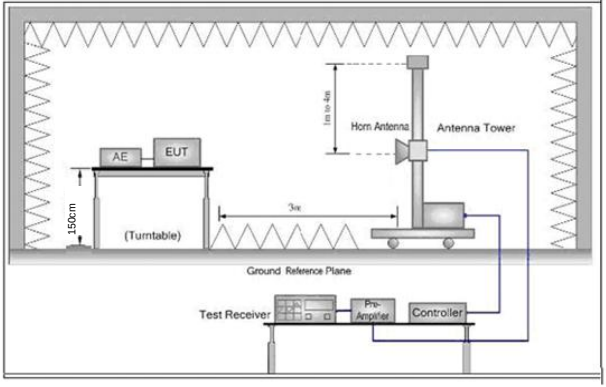
Date: 28.FEB.2020 11:15:01

Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.

5.8 Radiated Spurious Emissions

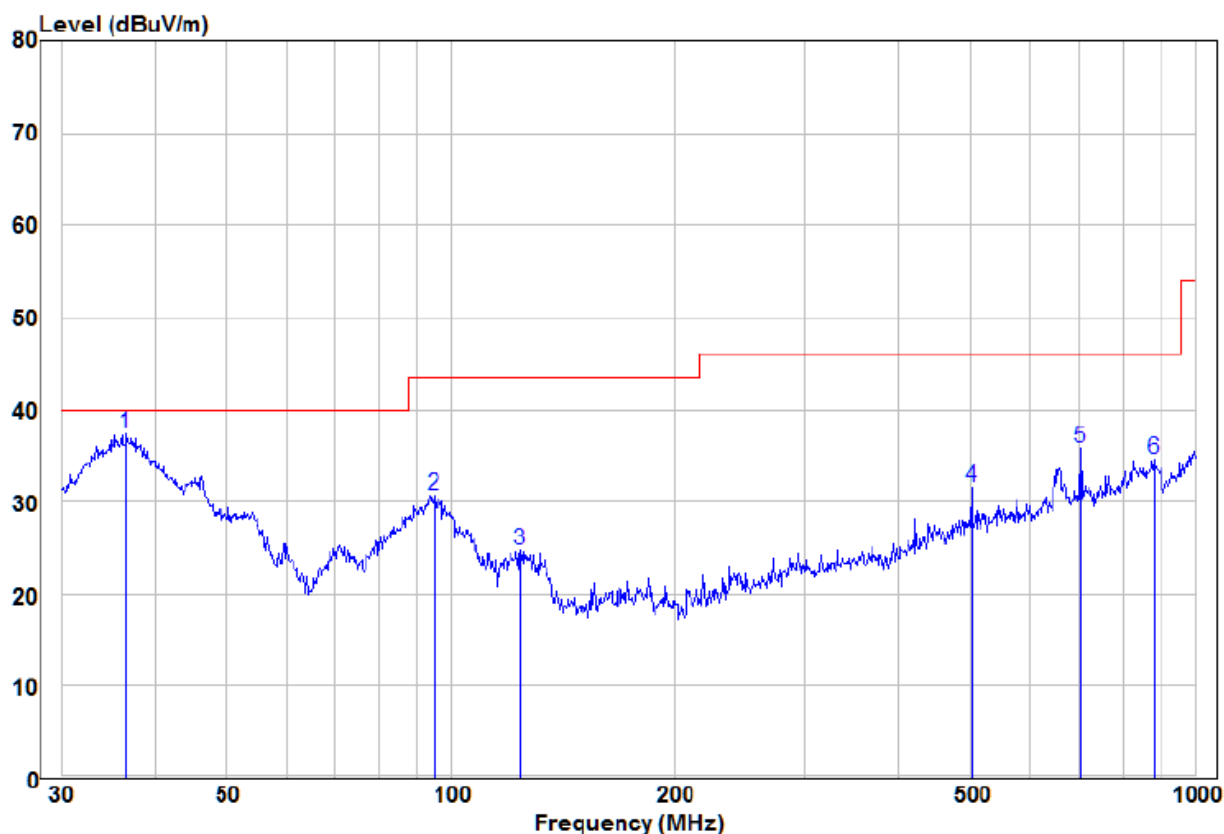
Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 2013				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

Test Setup:	
	 Figure 1. Below 30MHz
 Figure 2. 30MHz to 1GHz	 Figure 3. Above 1 GHz
Test Procedure:	1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. Note: For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

	d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40) For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11b at highest channel is the worst case. Only the worst case is recorded in the report.
Test Results:	Pass

5.8.1 Radiated emission below 1GHz

30MHz~1GHz		
Test mode:	Transmitting	Vertical



		Read		Limit	Over		
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Pol/Phase
1	pp	36.64	23.32	14.01	37.33	40.00	-2.67 Peak
2		94.76	20.43	10.32	30.75	43.50	-12.75 Peak
3		124.13	14.27	10.54	24.81	43.50	-18.69 Peak
4		501.18	13.31	18.29	31.60	46.00	-14.40 Peak
5		701.76	14.78	21.10	35.88	46.00	-10.12 Peak
6		881.41	10.76	23.92	34.68	46.00	-11.32 Peak

Remark:

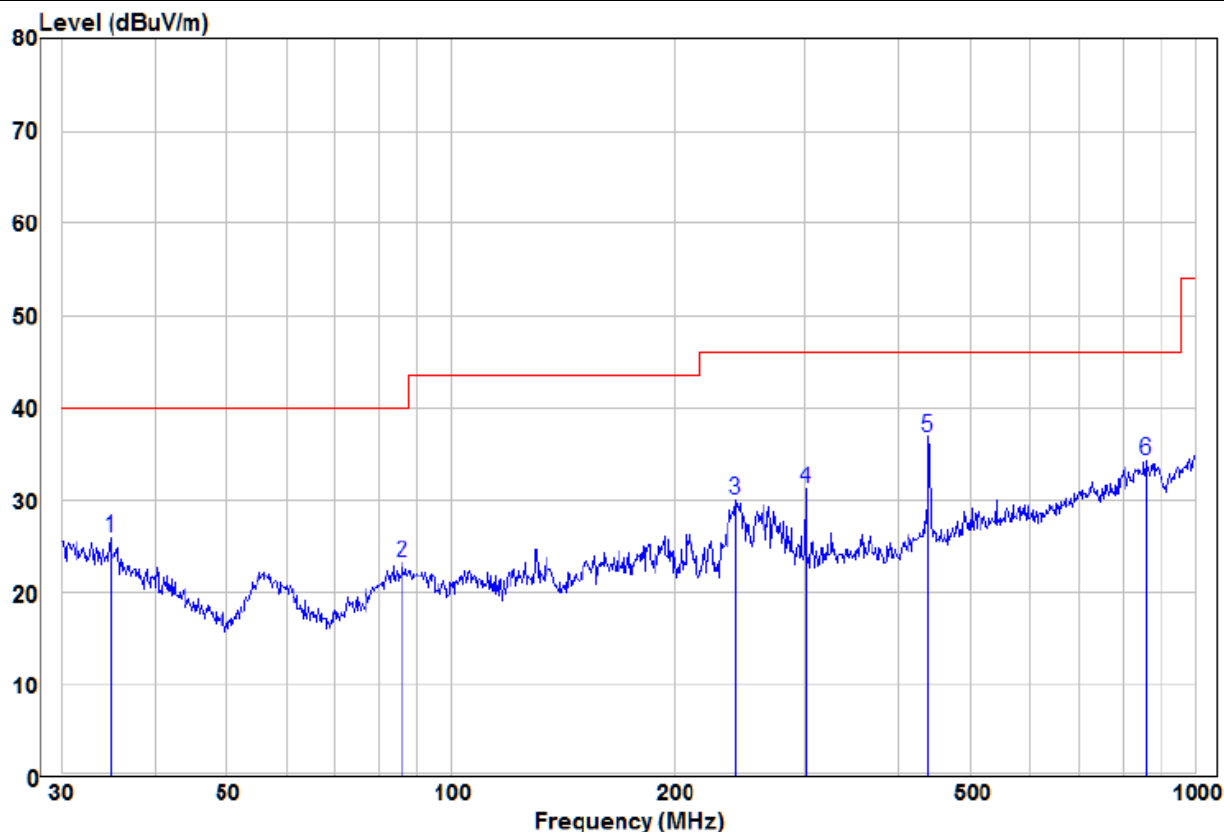
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

Test mode:	Transmitting	Horizontal
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	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	34.76	11.29	14.68	25.97	40.00	-14.03	Peak	HORIZONTAL
2	85.90	13.30	9.92	23.22	40.00	-16.78	Peak	HORIZONTAL
3	241.68	18.36	11.68	30.04	46.00	-15.96	Peak	HORIZONTAL
4	300.37	17.46	13.74	31.20	46.00	-14.80	Peak	HORIZONTAL
5 pp	438.66	20.44	16.37	36.81	46.00	-9.19	Peak	HORIZONTAL
6	860.04	10.31	24.01	34.32	46.00	-11.68	Peak	HORIZONTAL

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

5.8.2 Transmitter emission above 1GHz

Test mode:		802.11b(1Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4824.000	53.02	-4.26	48.76	74	-25.24	peak	H
4824.000	37.65	-4.26	33.39	54	-20.61	AVG	H
7236.000	50.51	1.18	51.69	74	-22.31	peak	H
7236.000	37.70	1.18	38.88	54	-15.12	AVG	H
4824.000	56.10	-4.26	51.84	74	-22.16	peak	V
4824.000	38.36	-4.26	34.10	54	-19.90	AVG	V
7236.000	50.77	1.18	51.95	74	-22.05	peak	V
7236.000	35.40	1.18	36.58	54	-17.42	AVG	V

Test mode:		802.11b(1Mbps)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4874.000	52.96	-4.12	48.84	74	-25.16	peak	H
4874.000	36.57	-4.12	32.45	54	-21.55	AVG	H
7311.000	49.35	1.46	50.81	74	-23.19	peak	H
7311.000	36.88	1.46	38.34	54	-15.66	AVG	H
4874.000	53.58	-4.12	49.46	74	-24.54	peak	V
4874.000	37.85	-4.12	33.73	54	-20.27	AVG	V
7311.000	48.51	1.46	49.97	74	-24.03	peak	V
7311.000	35.17	1.46	36.63	54	-17.37	AVG	V

Test mode:		802.11b(1Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4924.000	52.32	-4.03	48.29	74	-25.71	peak	H
4924.000	37.89	-4.03	33.86	54	-20.14	AVG	H
7386.000	50.91	1.66	52.57	74	-21.43	peak	H
7386.000	36.94	1.66	38.60	54	-15.40	AVG	H
4924.000	55.12	-4.03	51.09	74	-22.91	peak	V
4924.000	38.56	-4.03	34.53	54	-19.47	AVG	V
7386.000	50.44	1.66	52.10	74	-21.90	peak	V
7386.000	37.49	1.66	39.15	54	-14.85	AVG	V

Remark:

- 1) The 1Mbps of rate of 802.11b is the worst case.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$
- 3) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

5.9 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10 2013		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-88MHz	40.0	Quasi-peak Value
	88MHz-216MHz	43.5	Quasi-peak Value
	216MHz-960MHz	46.0	Quasi-peak Value
	960MHz-1GHz	54.0	Quasi-peak Value
	Above 1GHz	54.0	Average Value
		74.0	Peak Value
Test Setup:			

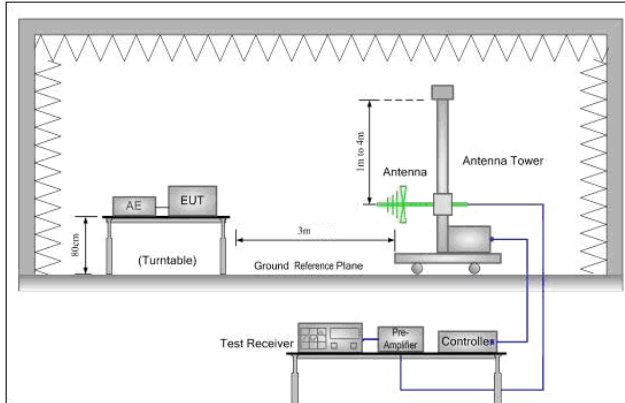


Figure 1. 30MHz to 1GHz

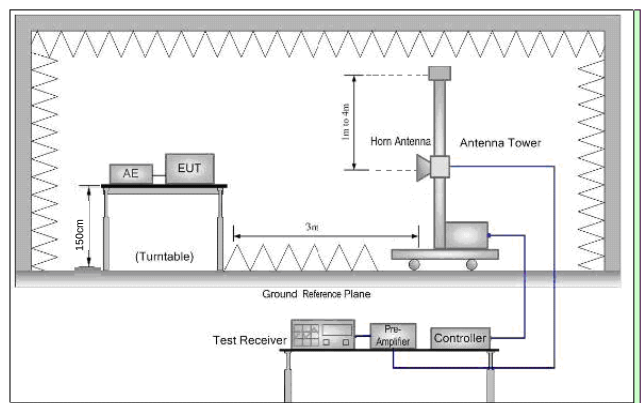


Figure 2. Above 1 GHz

Test Procedure:	a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. Note: For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the
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	measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel g. Test the EUT in the lowest channel , the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40) Only the worst case is recorded in the report.
Test Results:	Pass

Test data:

Worse case mode:		802.11b(1Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	58.80	-9.2	49.60	74	-24.40	peak	H
2390.000	44.55	-9.2	35.35	54	-18.65	AVG	H
2400.000	60.23	-9.39	50.84	74	-23.16	peak	H
2400.000	46.84	-9.39	37.45	54	-16.55	AVG	H
2390.000	59.23	-9.2	50.03	74	-23.97	peak	V
2390.000	44.87	-9.2	35.67	54	-18.33	AVG	V
2400.000	59.29	-9.39	49.90	74	-24.10	peak	V
2400.000	46.47	-9.39	37.08	54	-16.92	AVG	V

Worse case mode:		802.11b(1Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2483.500	58.18	-9.29	48.89	74	-25.11	peak	H
2483.500	43.92	-9.29	34.63	54	-19.37	AVG	H
2483.500	58.21	-9.29	48.92	74	-25.08	peak	V
2483.500	46.01	-9.29	36.72	54	-17.28	AVG	V

Worse case mode:		802.11g(6Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	59.19	-9.2	49.99	74	-24.01	peak	H
2390.000	44.30	-9.2	35.10	54	-18.90	AVG	H
2400.000	59.57	-9.39	50.18	74	-23.82	peak	H
2400.000	46.60	-9.39	37.21	54	-16.79	AVG	H
2390.000	58.34	-9.2	49.14	74	-24.86	peak	V
2390.000	44.37	-9.2	35.17	54	-18.83	AVG	V
2400.000	59.75	-9.39	50.36	74	-23.64	peak	V
2400.000	46.32	-9.39	36.93	54	-17.07	AVG	V

Worse case mode:		802.11g(6Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2483.500	57.88	-9.29	48.59	74	-25.41	peak	H
2483.500	43.55	-9.29	34.26	54	-19.74	AVG	H
2483.500	58.37	-9.29	49.08	74	-24.92	peak	V
2483.500	46.24	-9.29	36.95	54	-17.05	AVG	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	58.50	-9.2	49.30	74	-24.70	peak	H
2390.000	44.76	-9.2	35.56	54	-18.44	AVG	H
2400.000	59.24	-9.39	49.85	74	-24.15	peak	H
2400.000	46.65	-9.39	37.26	54	-16.74	AVG	H
2390.000	59.20	-9.2	50.00	74	-24.00	peak	V
2390.000	44.22	-9.2	35.02	54	-18.98	AVG	V
2400.000	59.45	-9.39	50.06	74	-23.94	peak	V
2400.000	46.07	-9.39	36.68	54	-17.32	AVG	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2483.500	57.73	-9.29	48.44	74	-25.56	peak	H
2483.500	44.31	-9.29	35.02	54	-18.98	AVG	H
2483.500	58.01	-9.29	48.72	74	-25.28	peak	V
2483.500	45.80	-9.29	36.51	54	-17.49	AVG	V

Worse case mode:		802.11n(HT40)(13.5Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	H/V
2390.000	58.90	-9.2	49.70	74	-24.30	peak	H
2390.000	44.27	-9.2	35.07	54	-18.93	AVG	H
2400.000	59.35	-9.39	49.96	74	-24.04	peak	H
2400.000	46.10	-9.39	36.71	54	-17.29	AVG	H
2390.000	59.18	-9.2	49.98	74	-24.02	peak	V
2390.000	44.31	-9.2	35.11	54	-18.89	AVG	V
2400.000	60.05	-9.39	50.66	74	-23.34	peak	V
2400.000	46.22	-9.39	36.83	54	-17.17	AVG	V

Worse case mode:		802.11n(HT40)(13.5Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	H/V
2483.500	58.26	-9.29	48.97	74	-25.03	peak	H
2483.500	43.85	-9.29	34.56	54	-19.44	AVG	H
2483.500	57.83	-9.29	48.54	74	-25.46	peak	V
2483.500	45.52	-9.29	36.23	54	-17.77	AVG	V

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

6 Photographs - EUT Test Setup

Reference to the **appendix II** for details.

7 Photographs - EUT Constructional Details

Reference to the **appendix II** for details.

THE END