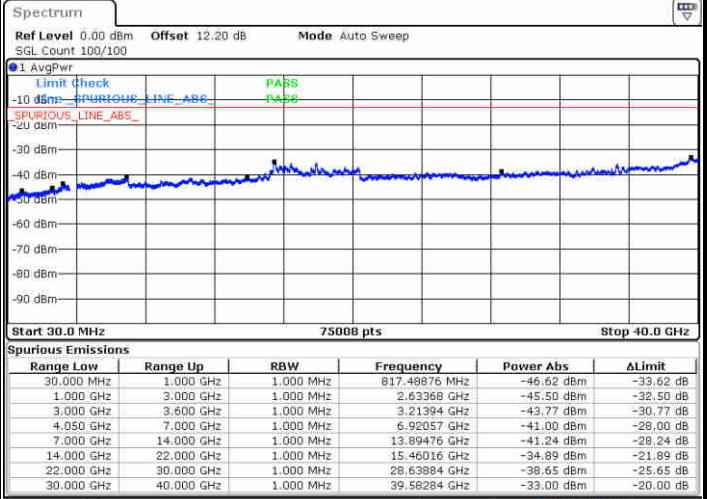
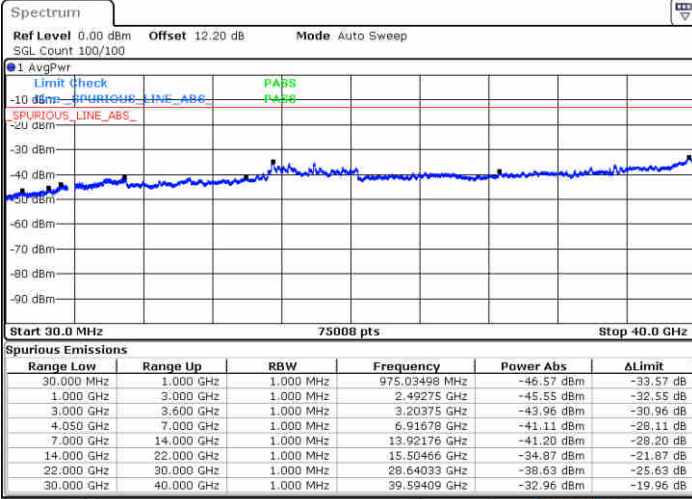




FR1 n77 / 50MHz / DFT-S OFDM / QPSK

Lowest Channel / 1RB

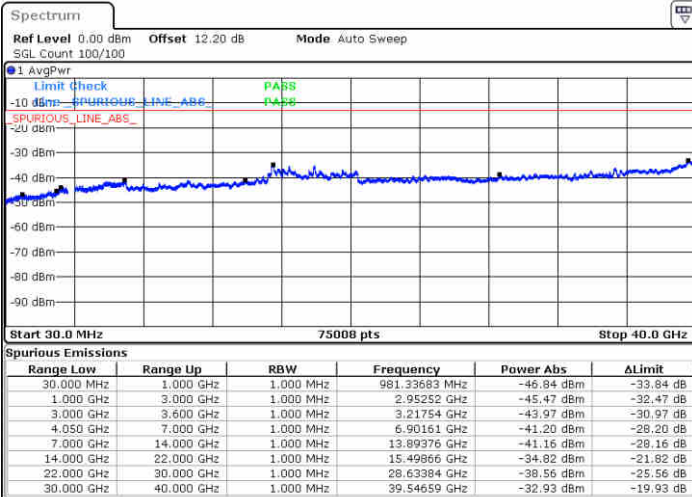
Middle Channel / 1RB



Date: 9.FEB.2021 20:55:33

Date: 9.FEB.2021 20:53:50

Highest Channel / 1RB



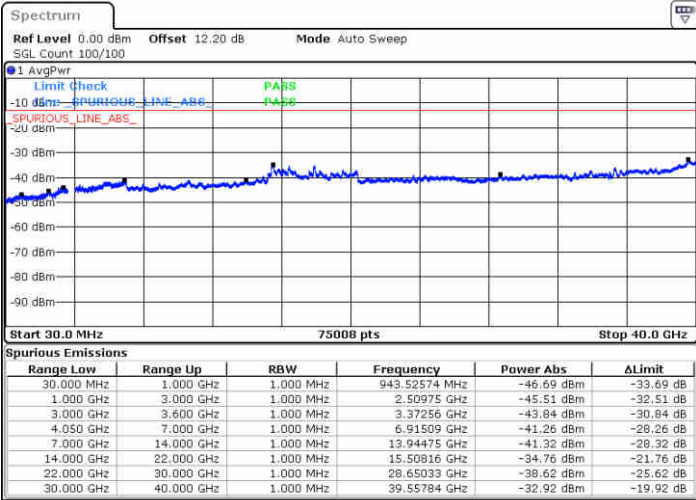
Date: 9.FEB.2021 21:51:47



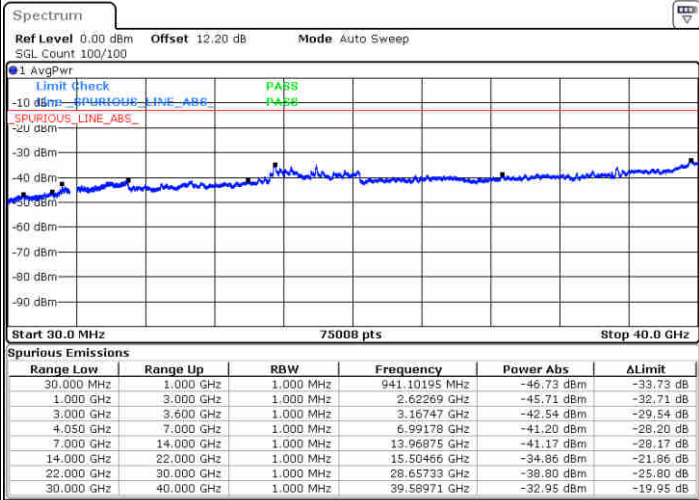
FR1 n77 / 100MHz / DFT-S OFDM / BPSK

Lowest Channel / 1RB

Middle Channel / 1RB

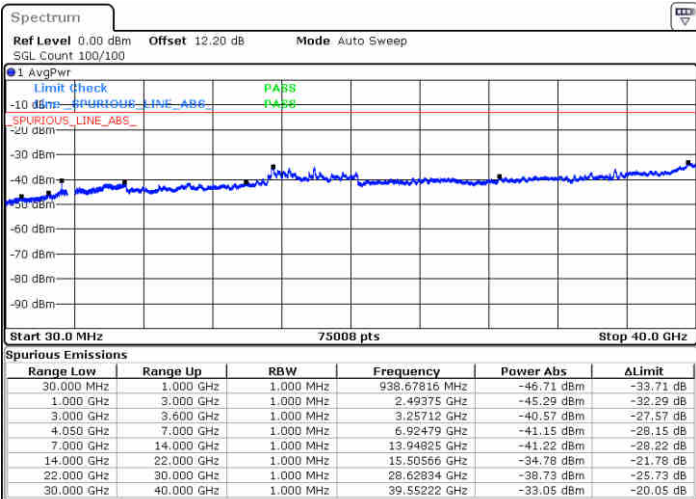


Date: 9.FEB.2021 20:16:48



Date: 9.FEB.2021 20:01:12

Highest Channel / 1RB



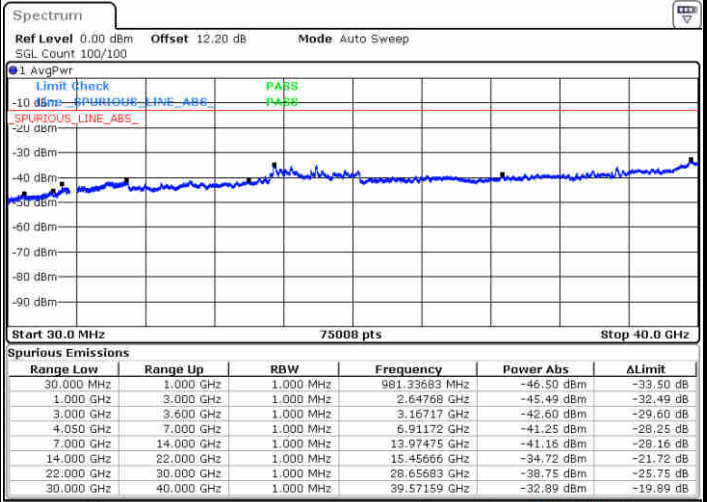
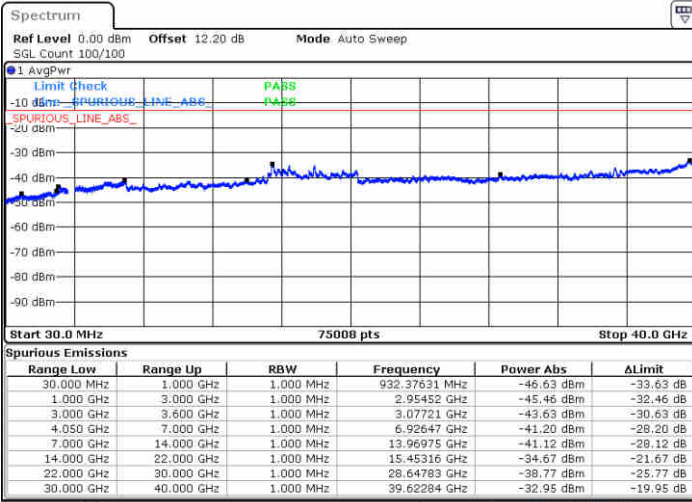
Date: 9.FEB.2021 19:58:56



FR1 n77 / 20MHz / DFT-S OFDM / QPSK

Lowest Channel / 1RB

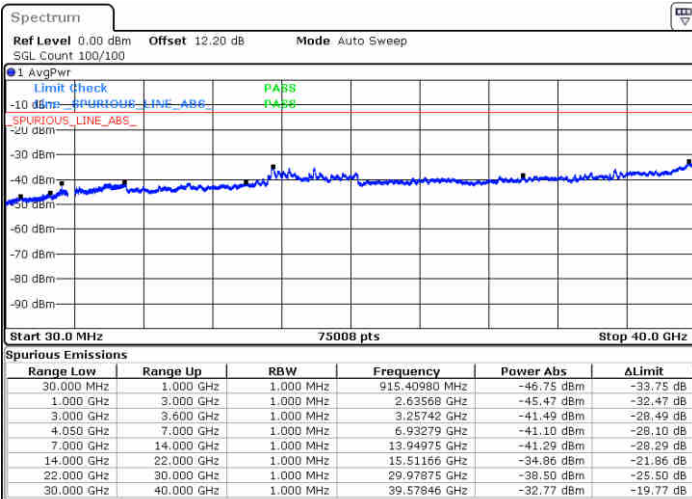
Middle Channel / 1RB



Date: 9.FEB.2021 20:07:36

Date: 9.FEB.2021 20:02:47

Highest Channel / 1RB



Date: 9.FEB.2021 19:47:39

**Frequency Stability**

Test Conditions		NR n77 (BPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 20MHz	Within Band
		Deviation (ppm)	Result
50	Normal Voltage	0.0029	PASS
40	Normal Voltage	0.0017	
30	Normal Voltage	0.0012	
20(Ref.)	Normal Voltage	0.0031	
10	Normal Voltage	0.0013	
0	Normal Voltage	0.0012	
-10	Normal Voltage	0.0022	
-20	Normal Voltage	0.0015	
-30	Normal Voltage	0.0029	
20	Maximum Voltage	0.0019	
20	Normal Voltage	0.0025	
20	Battery End Point	0.0015	

**Note:**

1. Normal Voltage =3.3 V. ; Battery End Point (BEP) =3.14 V. ; Maximum Voltage =4.4 V.
2. Note: The frequency fundamental emissions stay within the authorized frequency block.



### 5G NR n77 UL\_MIMO HPUE -SCS 15K

#### Peak-to-Average Ratio

Mode	FR1 UL-MIMO n77 / 20MHz / CP-OFDM (M2)				
Mod.	QPSK	QPSK			Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	7.83	8.46			PASS
Middle CH	7.8	8.35			
Highest CH	7.42	8.32			

Mode	FR1 UL-MIMO n77 / 20MHz / CP-OFDM (M)				
Mod.	QPSK	QPSK			Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	7.01	8.41			PASS
Middle CH	7.33	8.38			
Highest CH	7.07	8.12			



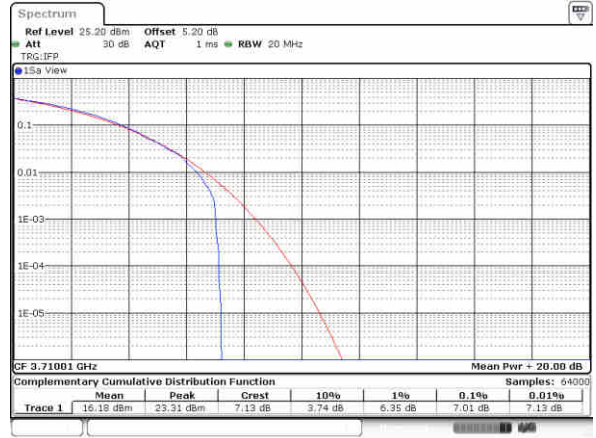
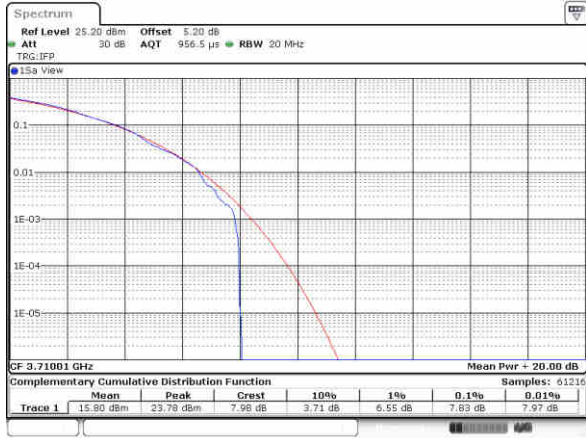
FR1 UL-MIMO n77 / 20MHz / CP-OFDM

QPSK(M2)

QPSK(M)

Lowest Channel / 1RB

Lowest Channel / 1RB

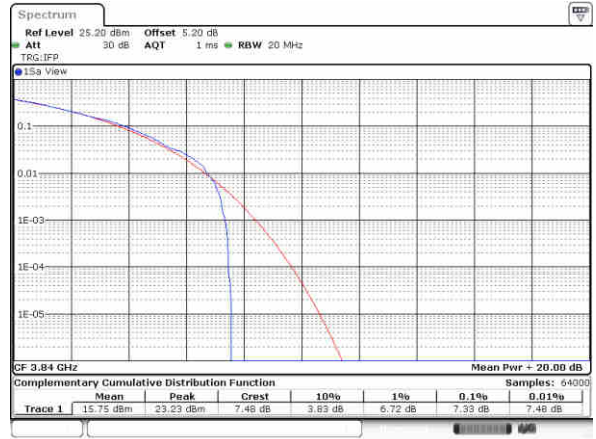
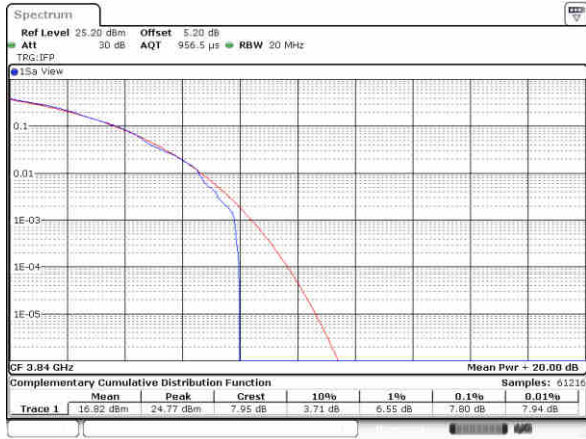


Date: 13.FEB.2021 17:51:10

Date: 13.FEB.2021 05:13:38

Middle Channel / 1 RB

Middle Channel / 1 RB

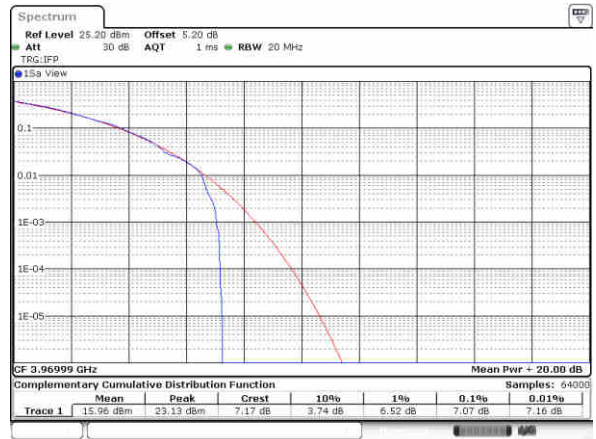
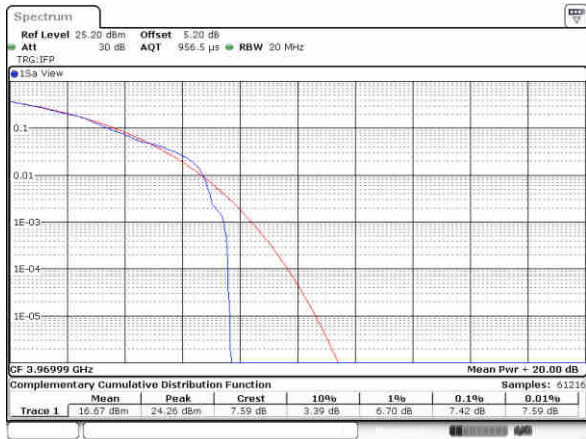


Date: 13.FEB.2021 17:46:01

Date: 13.FEB.2021 05:40:46

Highest Channel / 1 RB

Highest Channel / 1 RB



Date: 13.FEB.2021 18:22:52

Date: 13.FEB.2021 05:46:18





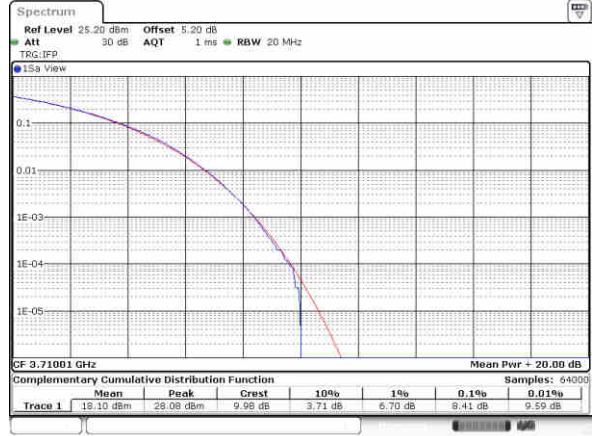
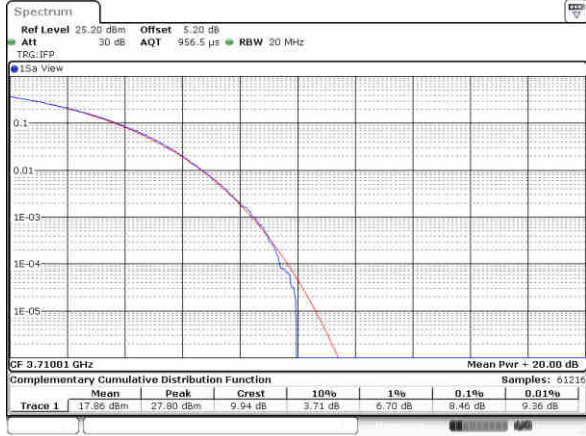
FR1 UL-MIMO n77 / 20MHz / CP-OFDM

QPSK(M2)

QPSK(M)

Lowest Channel / Full RB

Lowest Channel / Full RB

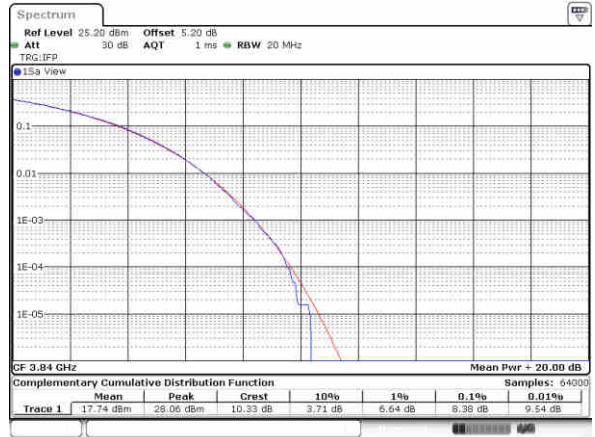
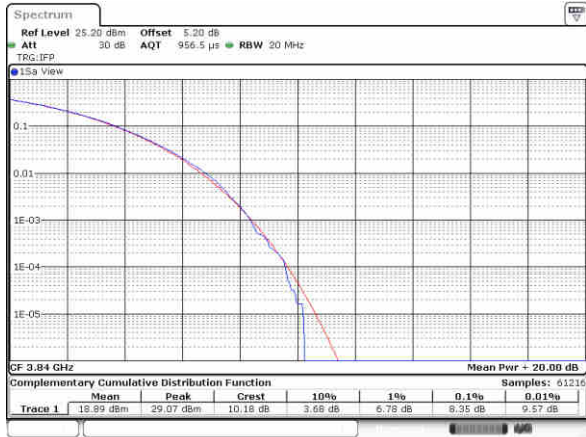


Date: 13.FEB.2021 18:08:06

Date: 13.FEB.2021 05:13:10

Middle Channel / Full RB

Middle Channel / Full RB

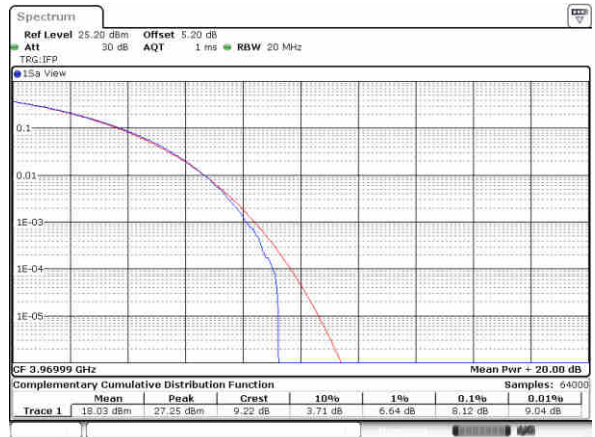
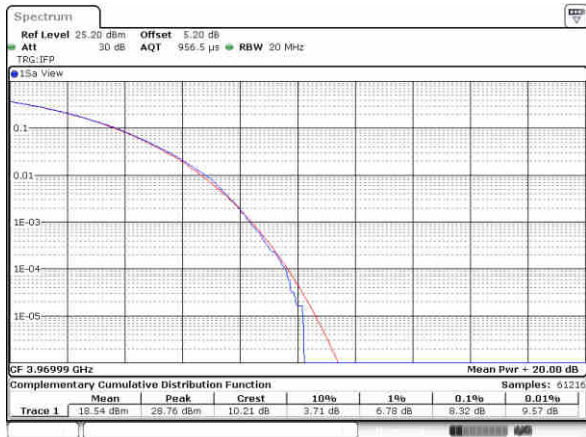


Date: 13.FEB.2021 17:43:39

Date: 13.FEB.2021 05:13:10

Highest Channel / Full RB

Highest Channel / Full RB



Date: 13.FEB.2021 18:09:02

Date: 13.FEB.2021 05:14:44



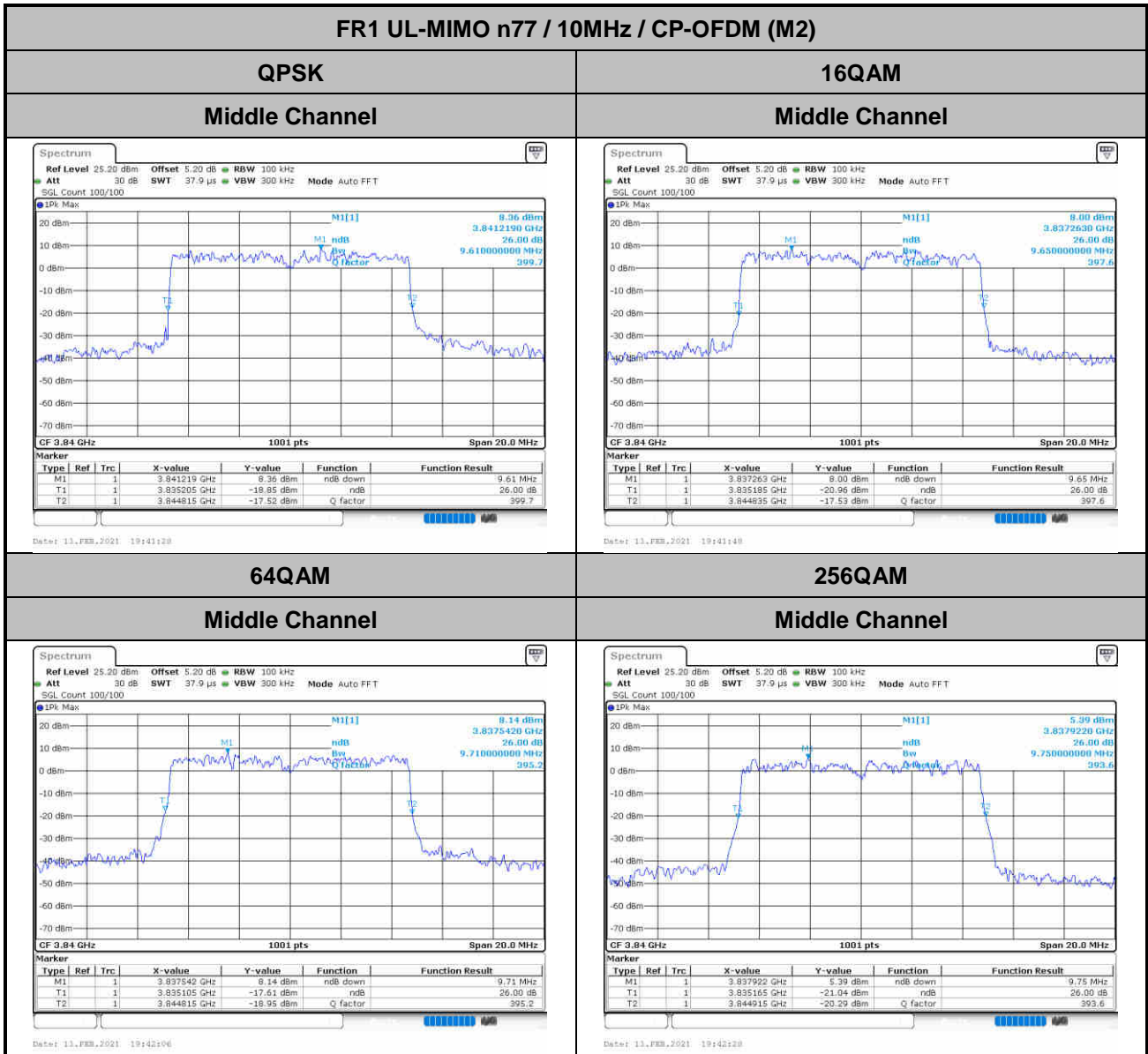
**26dB Bandwidth**

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	10MHz	10MHz	10MHz	10MHz	10MHz	10MHz	10MHz	10MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	9.61	9.65	9.71	9.75	9.73	9.75	9.61	9.73

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	15MHz	15MHz	15MHz	15MHz	15MHz	15MHz	15MHz	15MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	14.93	14.84	14.84	14.87	14.90	14.84	14.84	14.96

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	20MHz	20MHz	20MHz	20MHz	20MHz	20MHz	20MHz	20MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	19.7	19.66	19.82	19.82	19.78	19.82	19.78	19.66







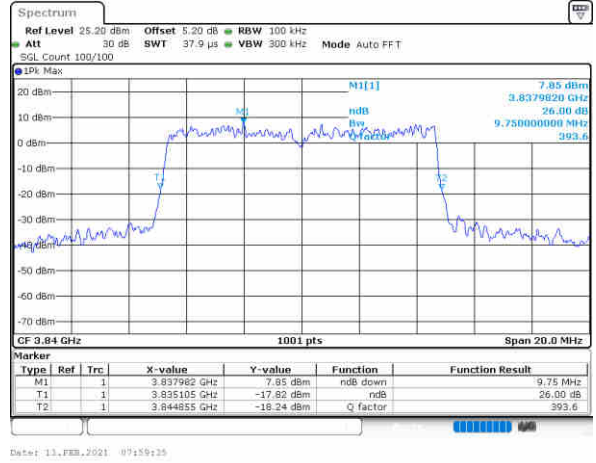
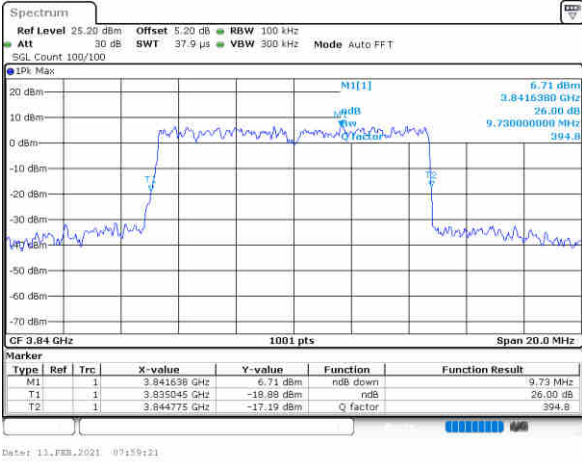
FR1 UL-MIMO n77 / 10MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel

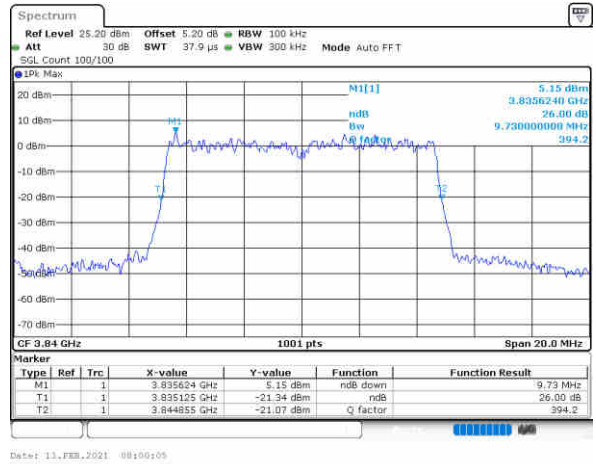
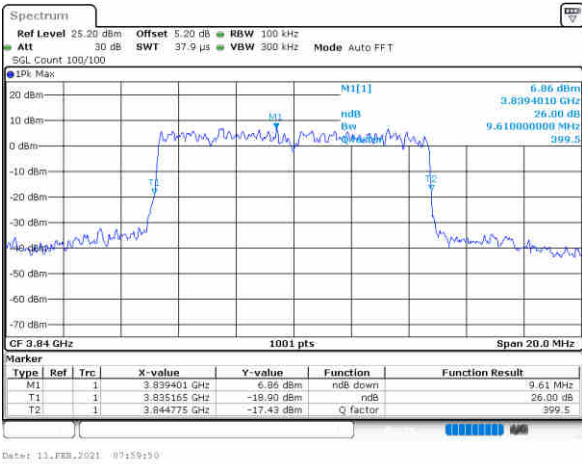


64QAM

256QAM

Middle Channel

Middle Channel





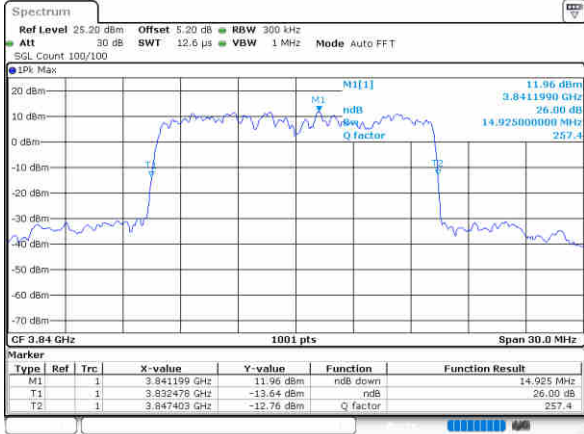
FR1 UL-MIMO n77 / 15MHz / CP-OFDM (M2)

QPSK

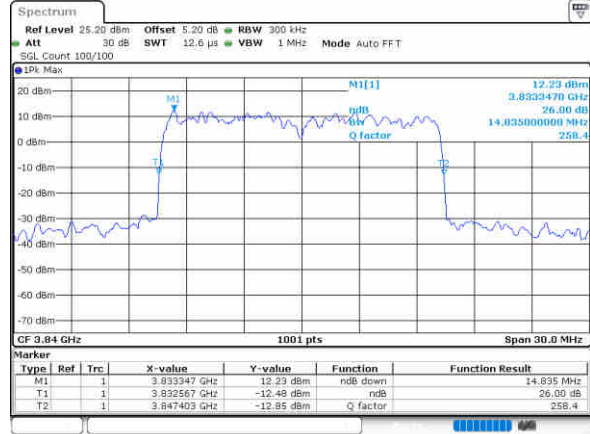
16QAM

Middle Channel

Middle Channel



Date: 13.FEB.2021 18:24:12



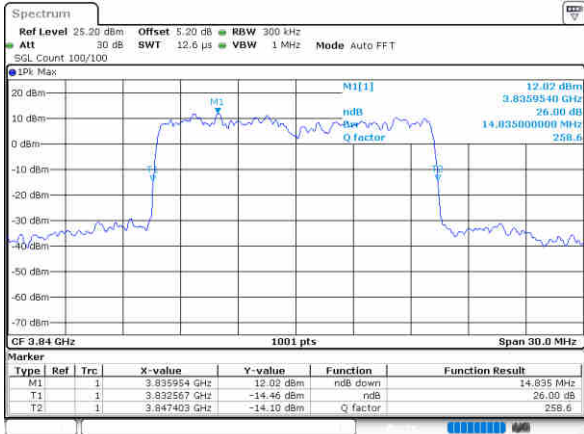
Date: 13.FEB.2021 18:24:28

64QAM

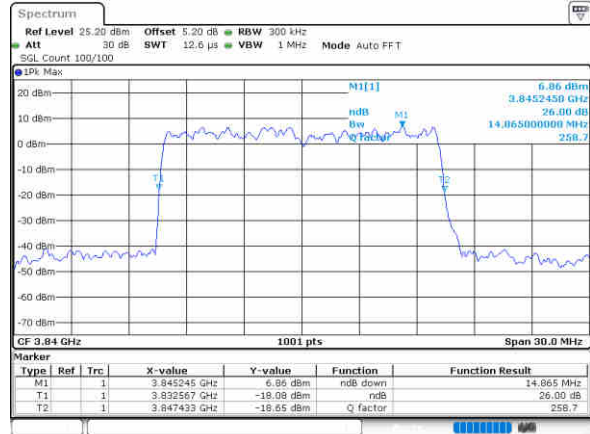
256QAM

Middle Channel

Middle Channel



Date: 13.FEB.2021 18:24:47



Date: 13.FEB.2021 18:25:06



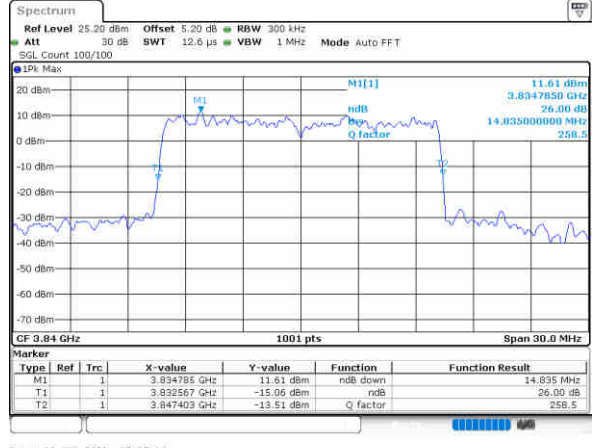
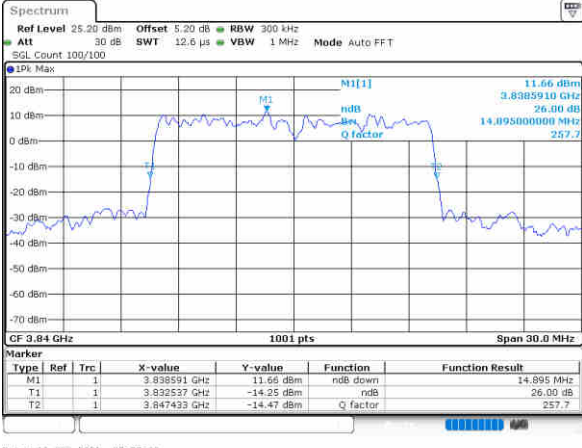
FR1 UL-MIMO n77 / 15MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel

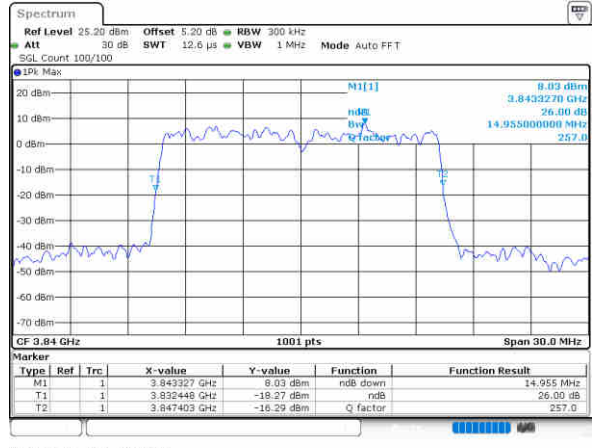
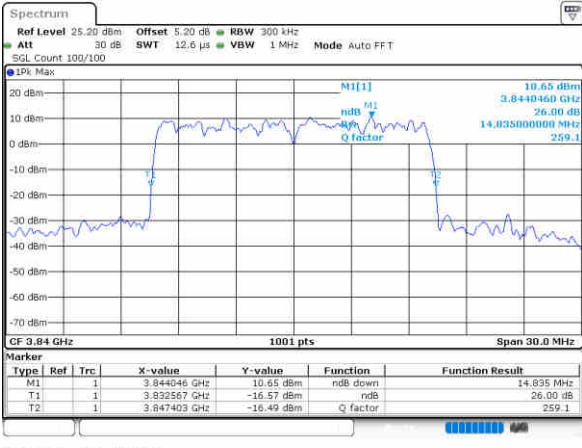


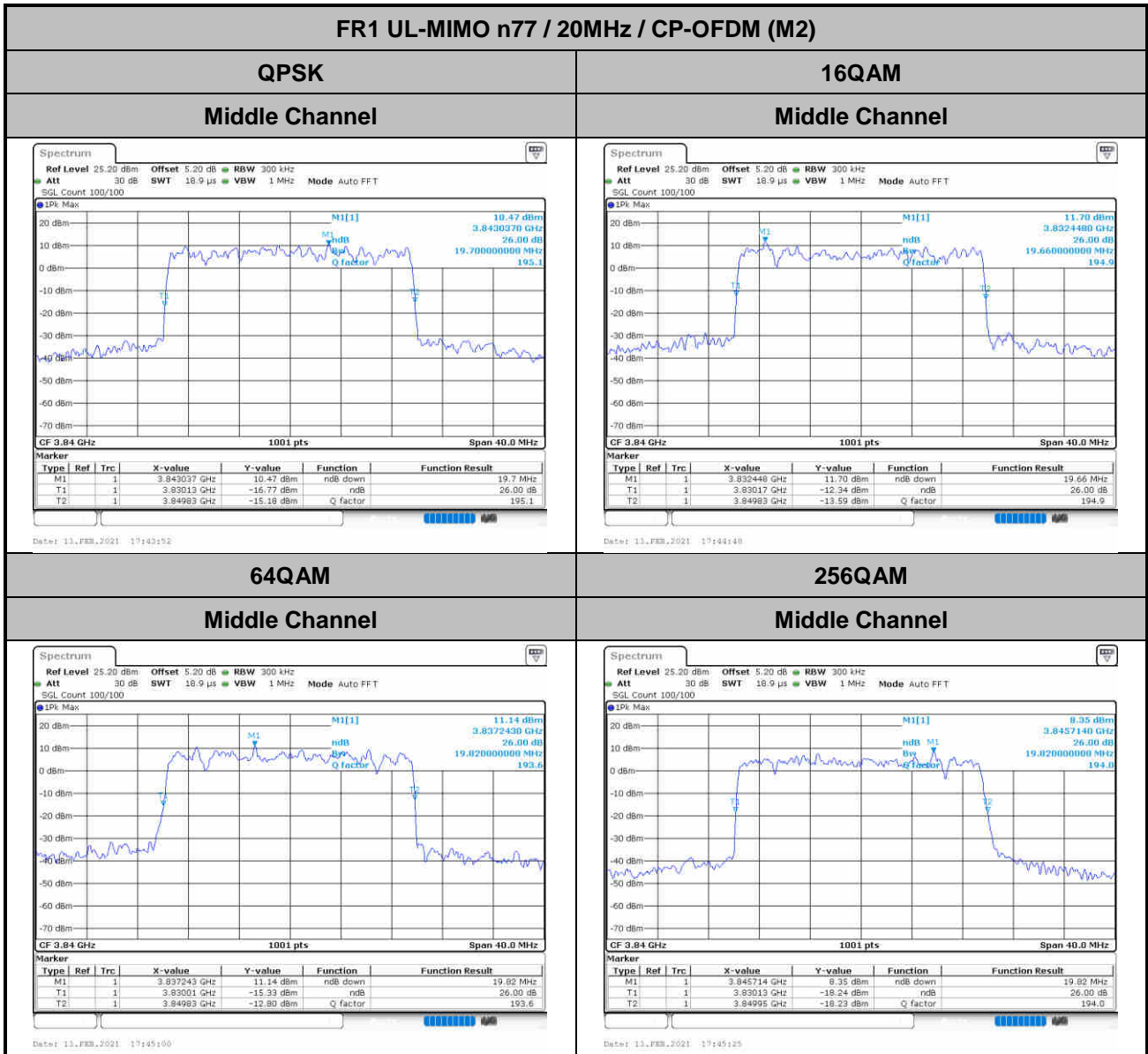
64QAM

256QAM

Middle Channel

Middle Channel







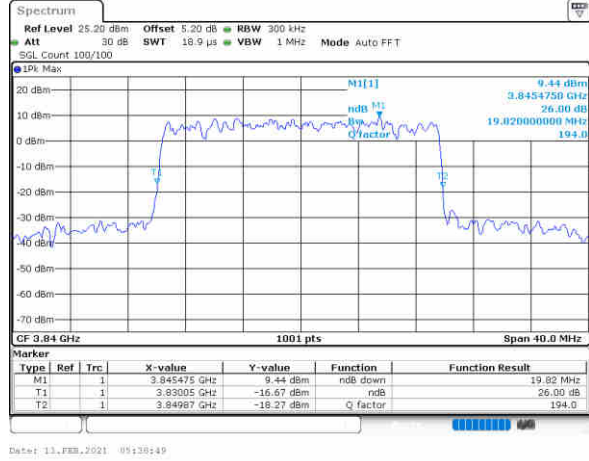
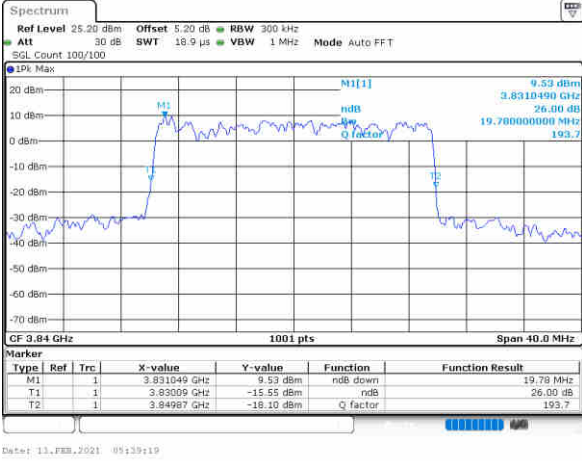
FR1 UL-MIMO n77 / 20MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel



Date: 13.FEB.2021 05:13:19

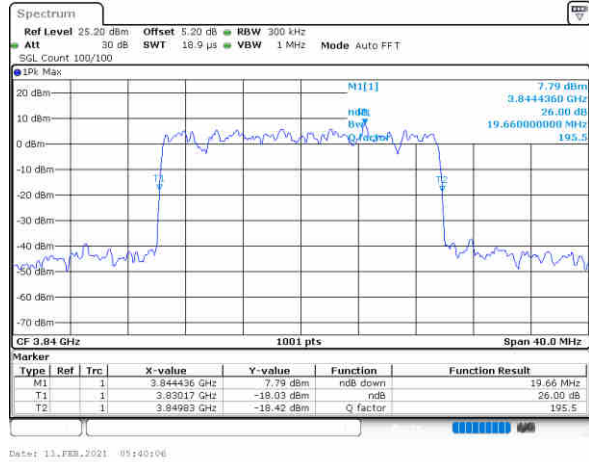
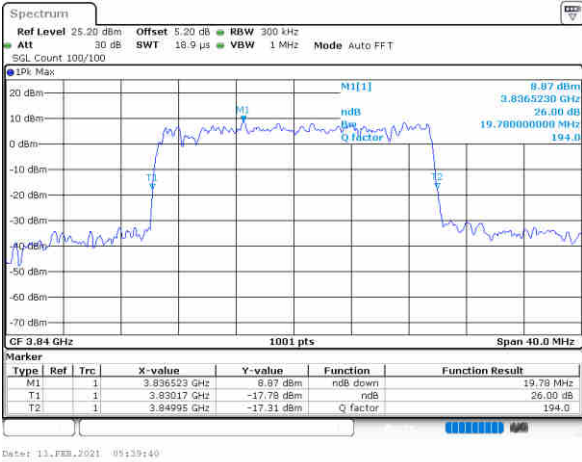
Date: 13.FEB.2021 05:13:49

64QAM

256QAM

Middle Channel

Middle Channel



Date: 13.FEB.2021 05:13:40

Date: 13.FEB.2021 05:40:06



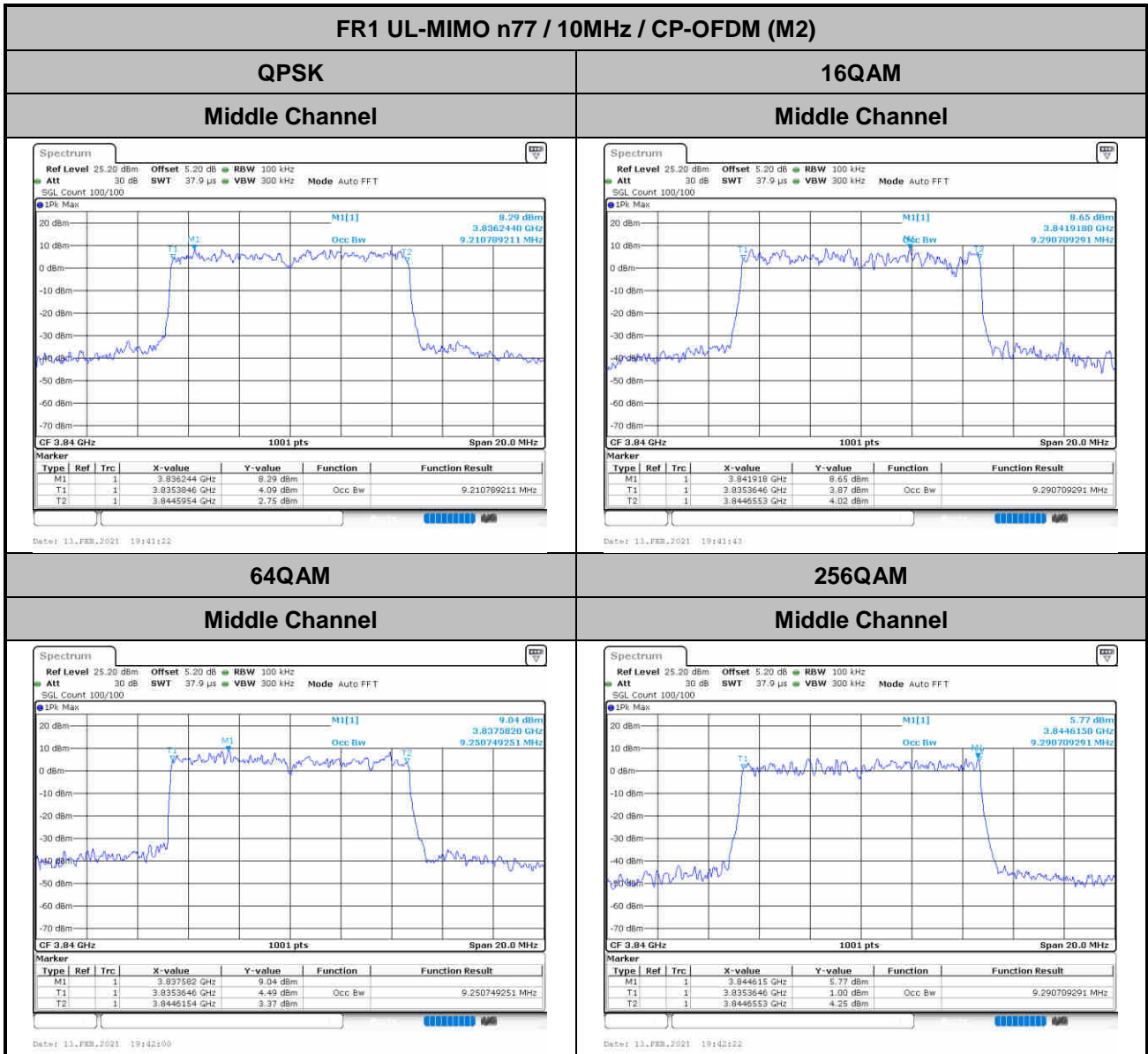


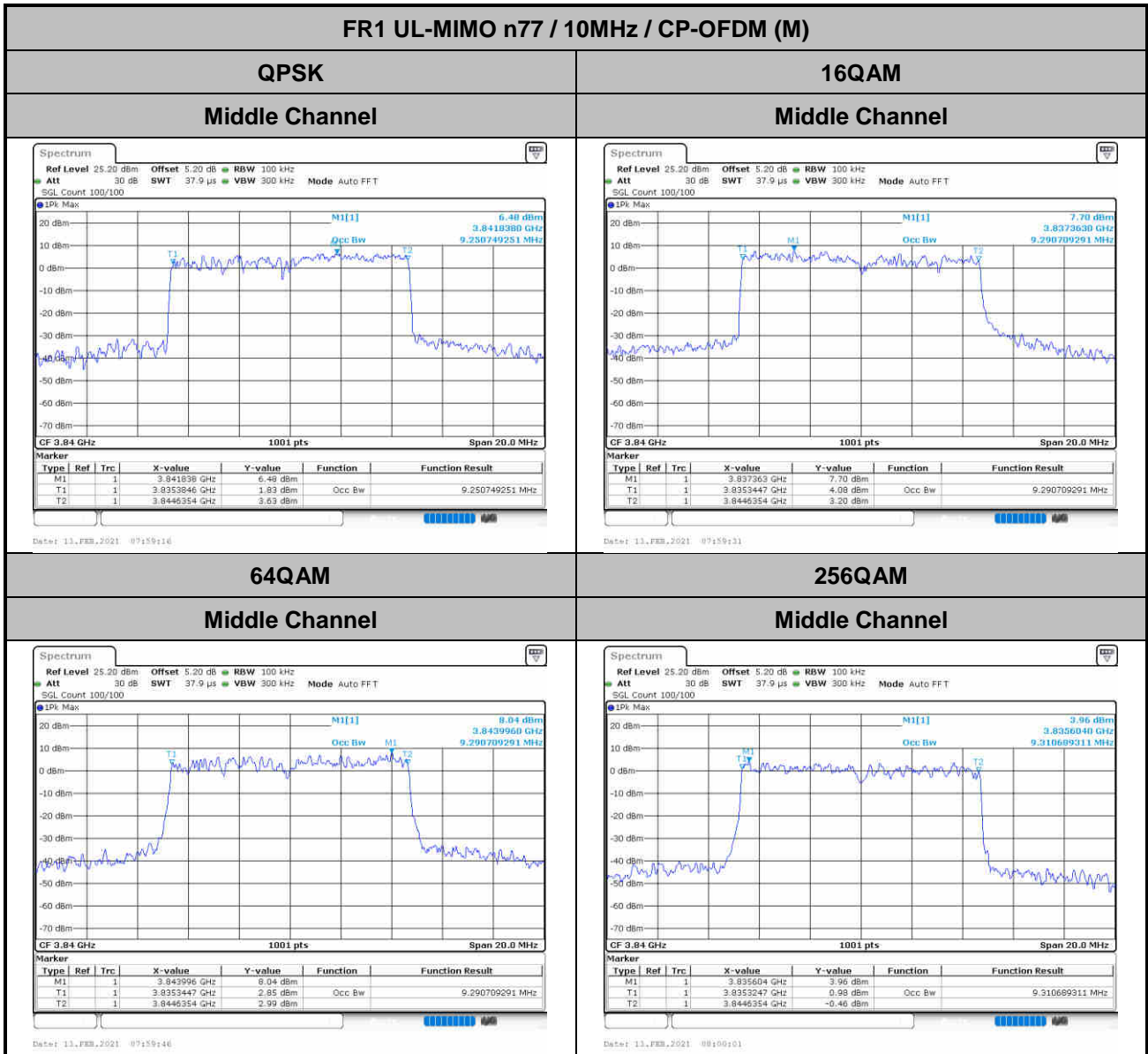
### Occupied Bandwidth

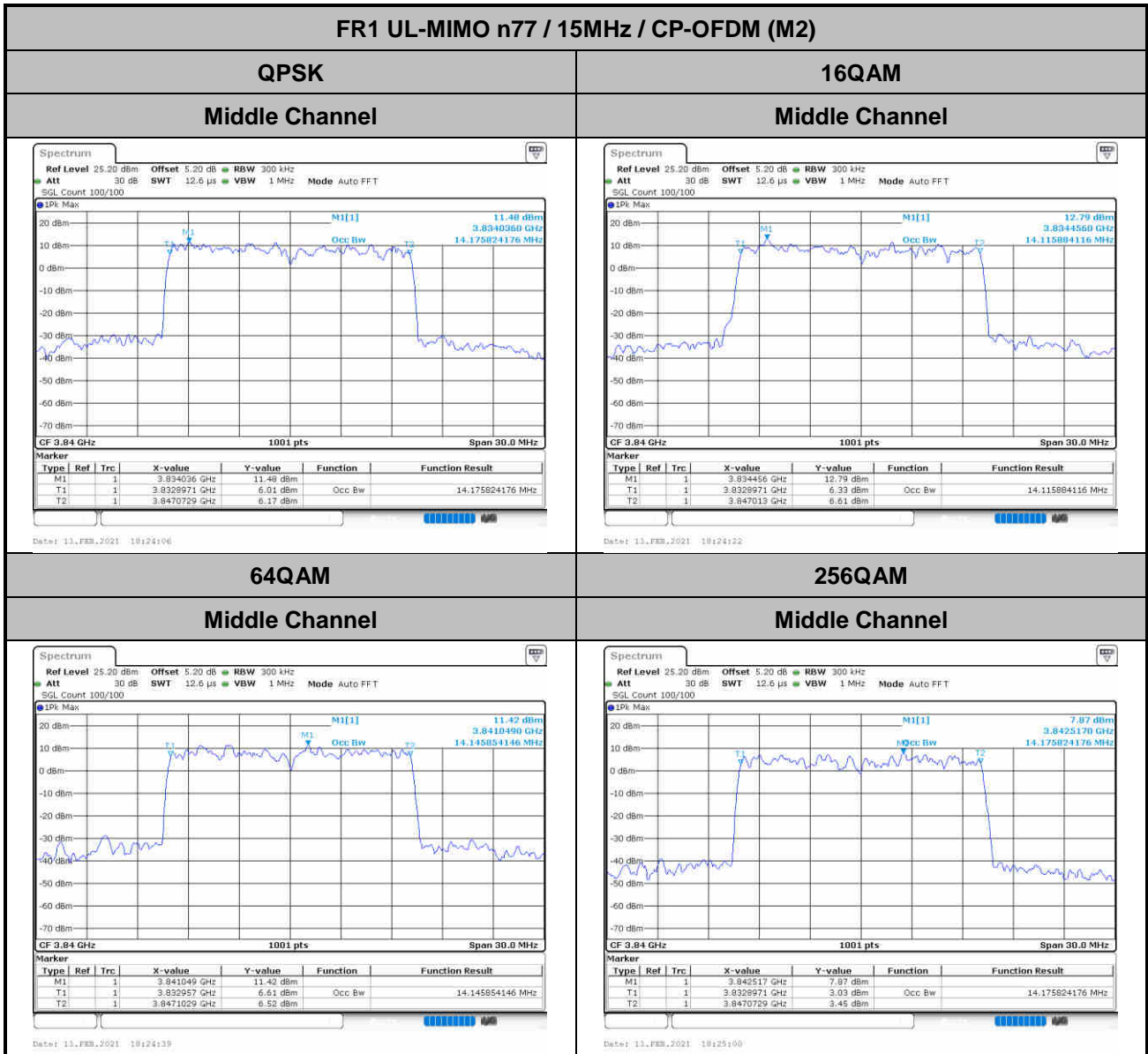
Mode	FR1 UL-MIMO n77 : OBW(MHz) / CP-OFDM							
	M2				M			
BW	10MHz	10MHz	10MHz	10MHz	10MHz	10MHz	10MHz	10MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	9.21	9.29	9.25	9.29	9.25	9.29	9.29	9.31

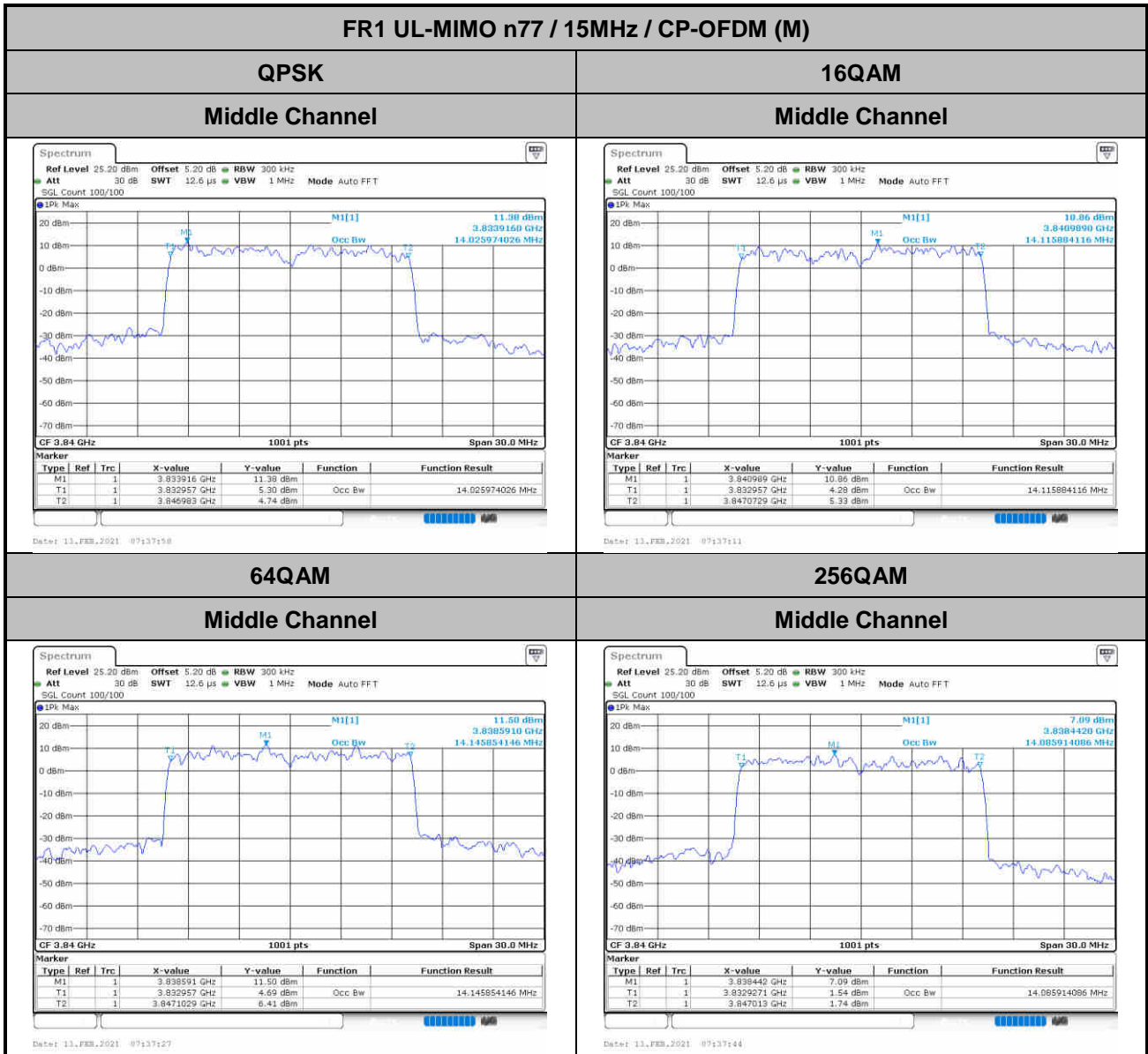
Mode	FR1 UL-MIMO n77 : OBW(MHz) / CP-OFDM							
	M2				M			
BW	15MHz	15MHz	15MHz	15MHz	15MHz	15MHz	15MHz	15MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	14.18	14.12	14.15	14.18	14.03	14.12	14.15	14.09

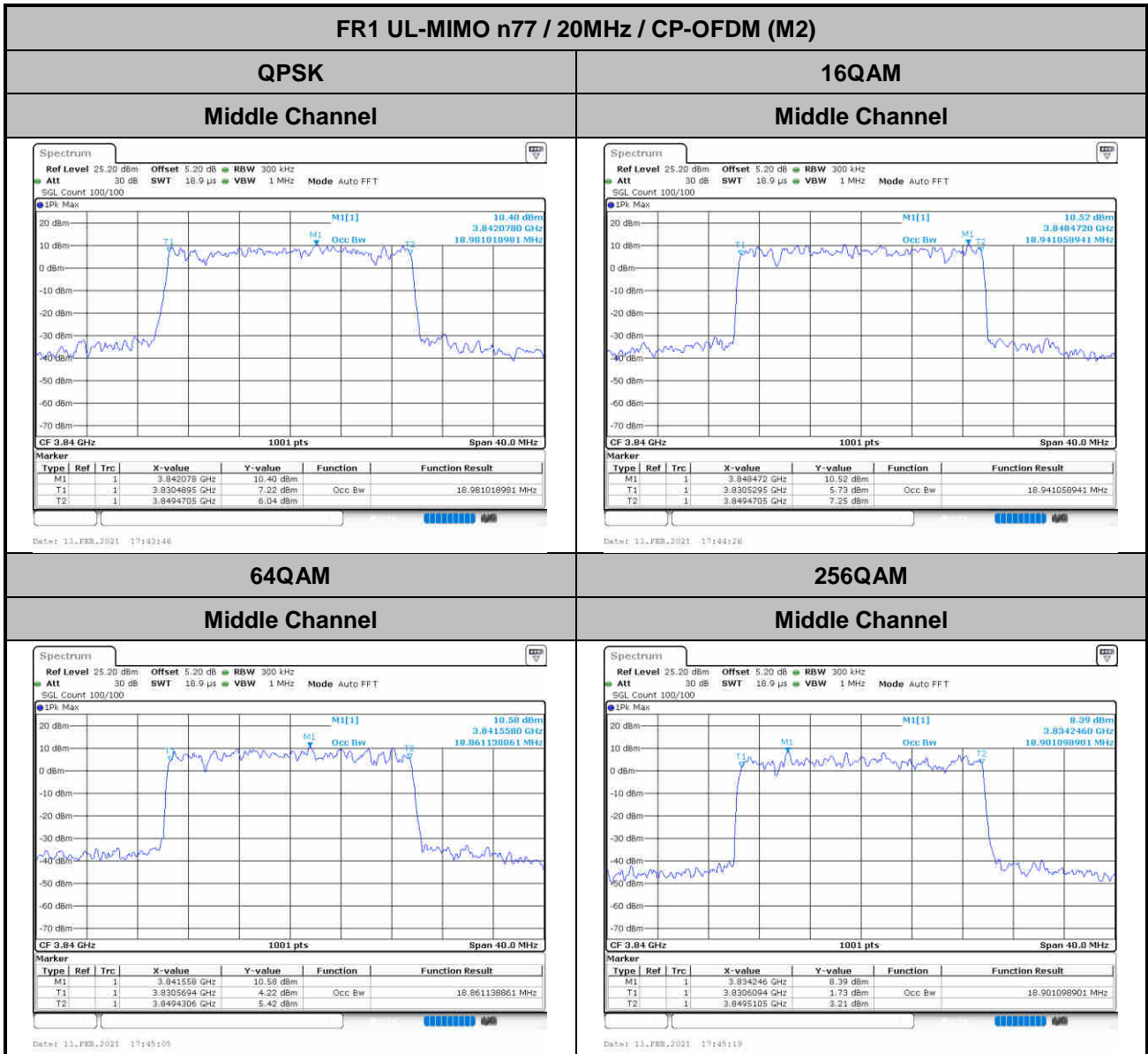
Mode	FR1 UL-MIMO n77 : OBW(MHz) / CP-OFDM							
	M2				M			
BW	20MHz	20MHz	20MHz	20MHz	20MHz	20MHz	20MHz	20MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	18.98	18.94	18.86	18.90	18.86	18.98	18.98	18.86















FR1 UL-MIMO n77 / 20MHz / CP-OFDM (M)

QPSK

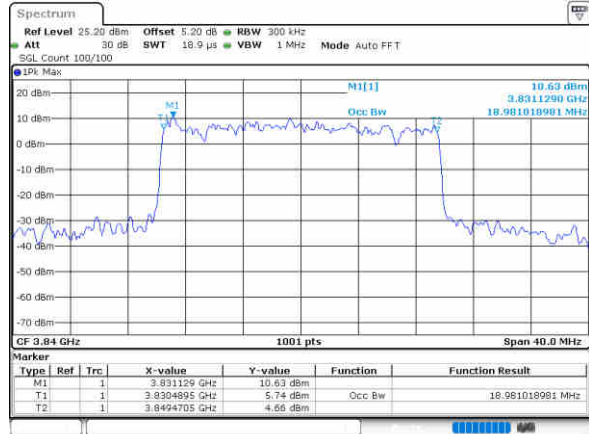
16QAM

Middle Channel

Middle Channel



Date: 13.FEB.2021 05:13:15



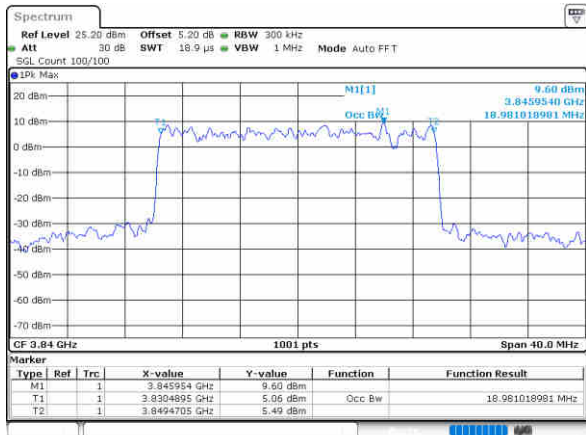
Date: 13.FEB.2021 05:13:45

64QAM

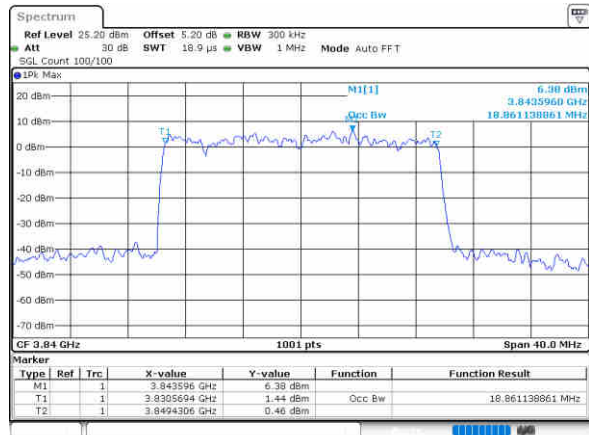
256QAM

Middle Channel

Middle Channel



Date: 13.FEB.2021 05:13:25

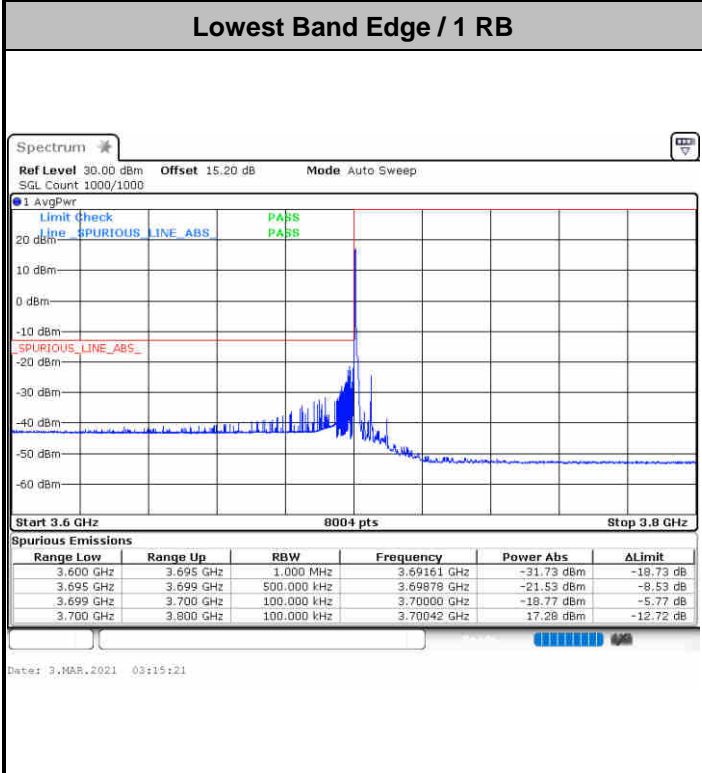


Date: 13.FEB.2021 05:13:54

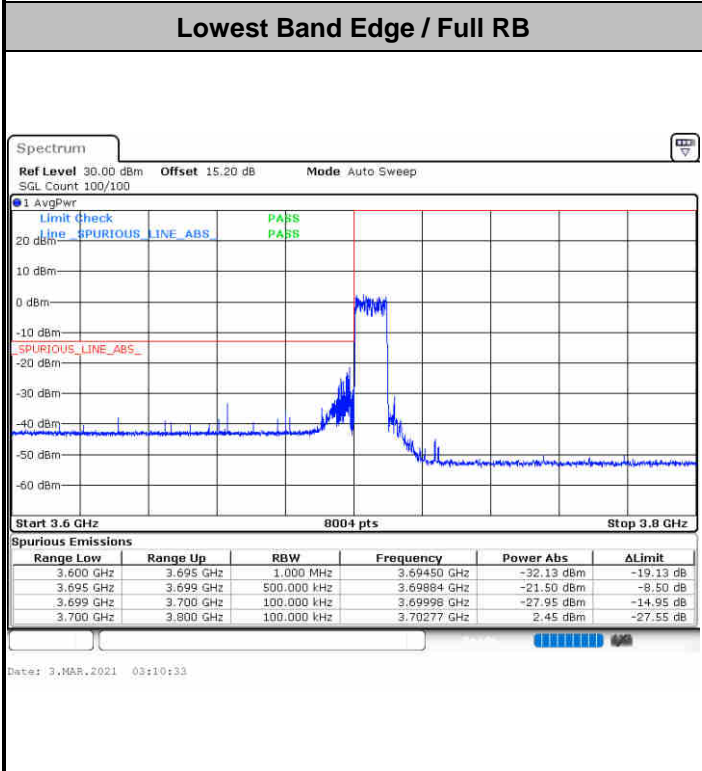


# Conducted Band Edge

## FR1 UL-MIMO n77 / 10MHz / CP-OFDM QPSK (M2)



Channel Power < -13dBm Pass



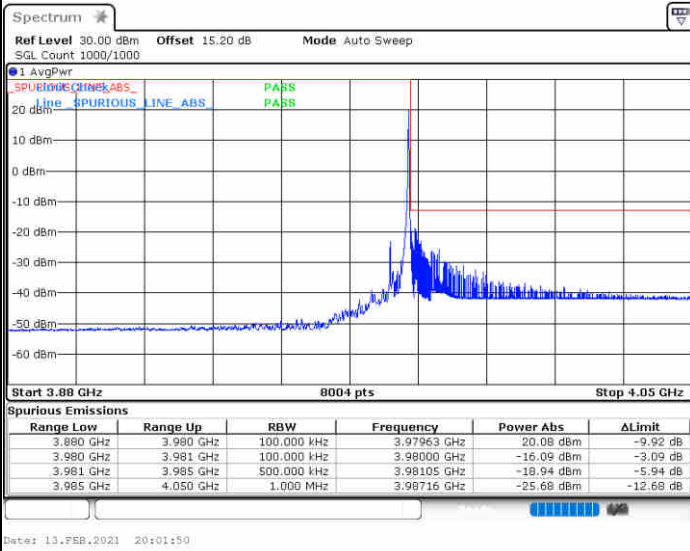
Channel Power < -13dBm Pass



FR1 UL-MIMO n77 / 10MHz / CP-OFDM QPSK (M2)

Highest Band Edge / 1 RB

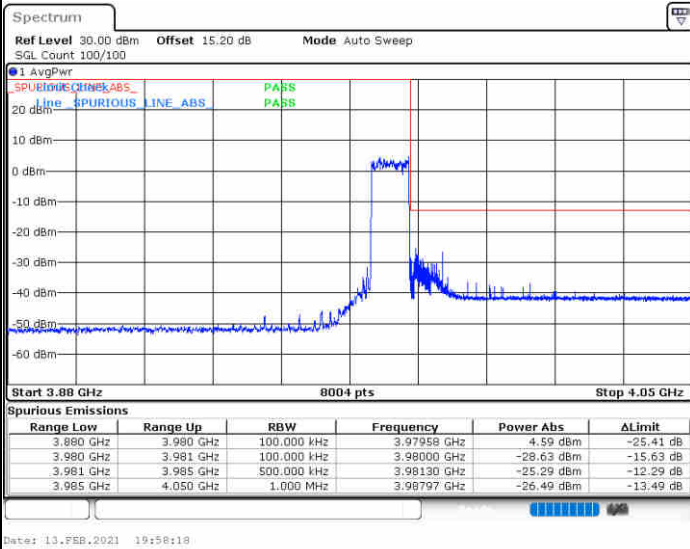
Channel Power < -13dBm Pass



/

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



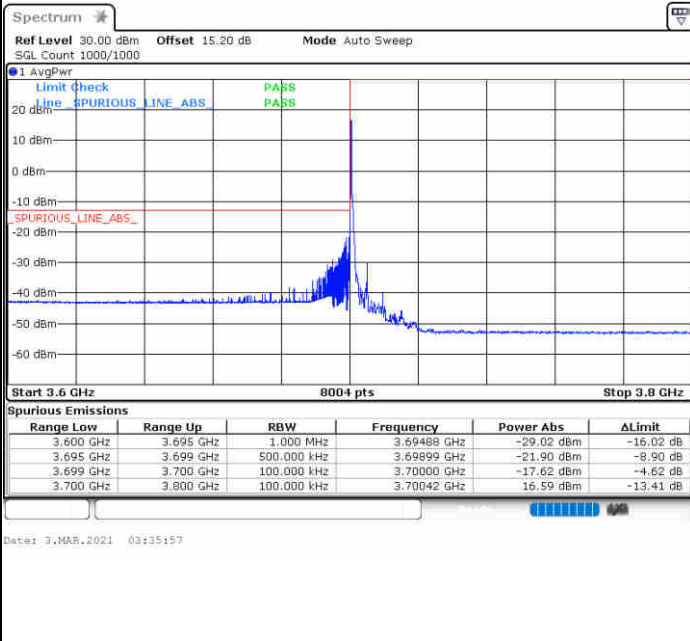
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FR1 UL-MIMO n77 / 10MHz / CP-OFDM QPSK (M)

Lowest Band Edge / 1 RB

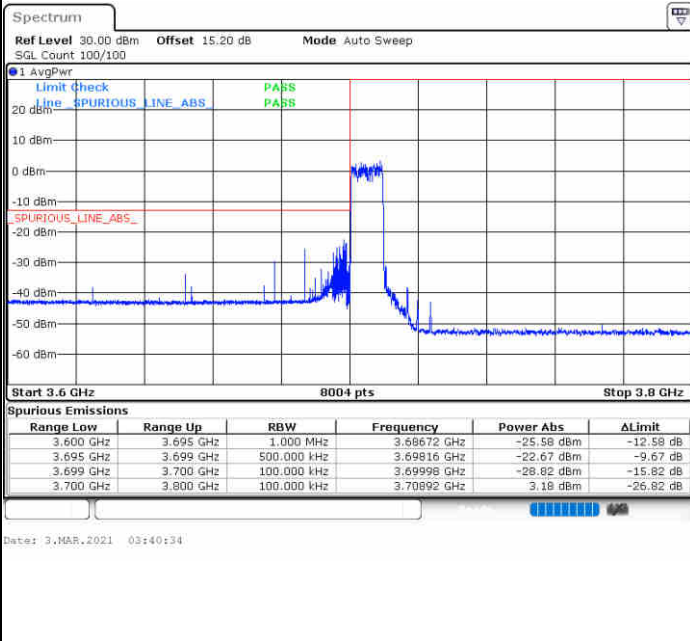
Channel Power < -13dBm Pass



/

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass

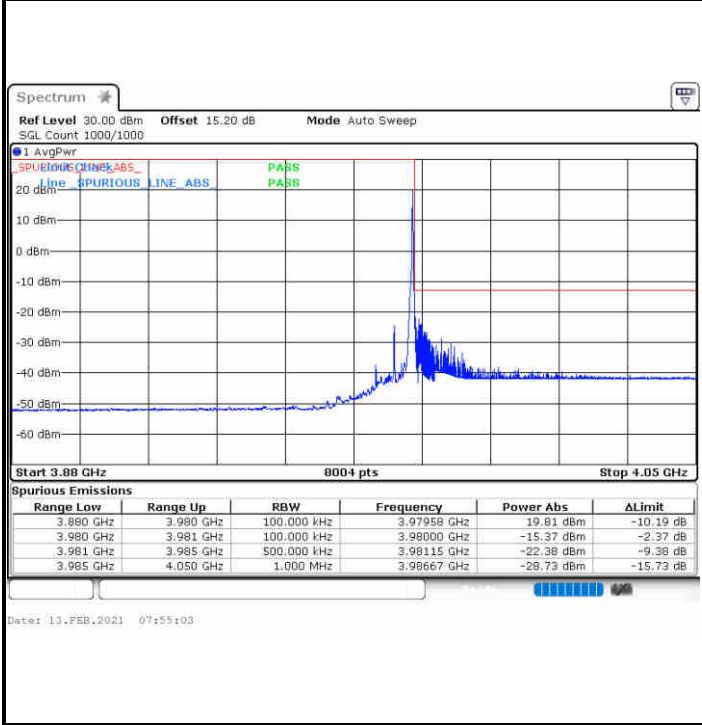


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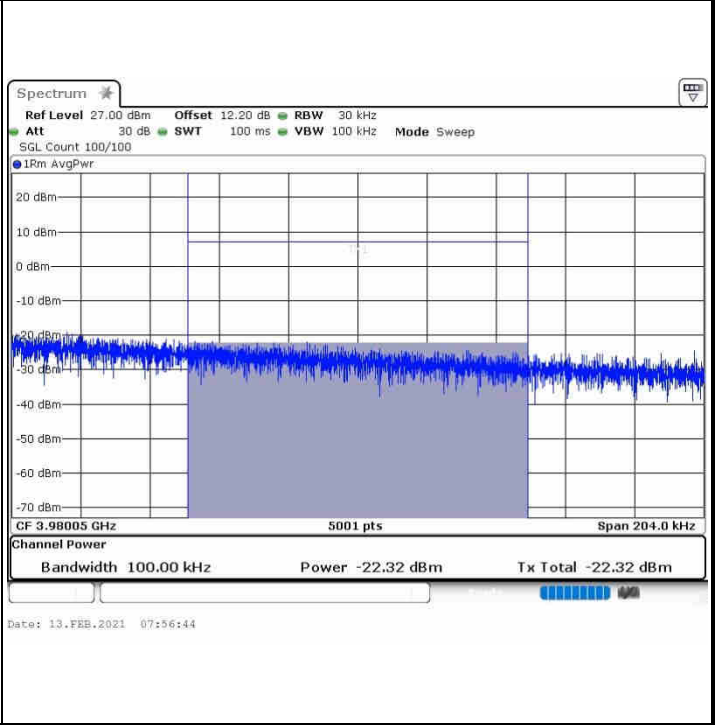


**FR1 UL-MIMO n77 / 10MHz / CP-OFDM QPSK (M)**

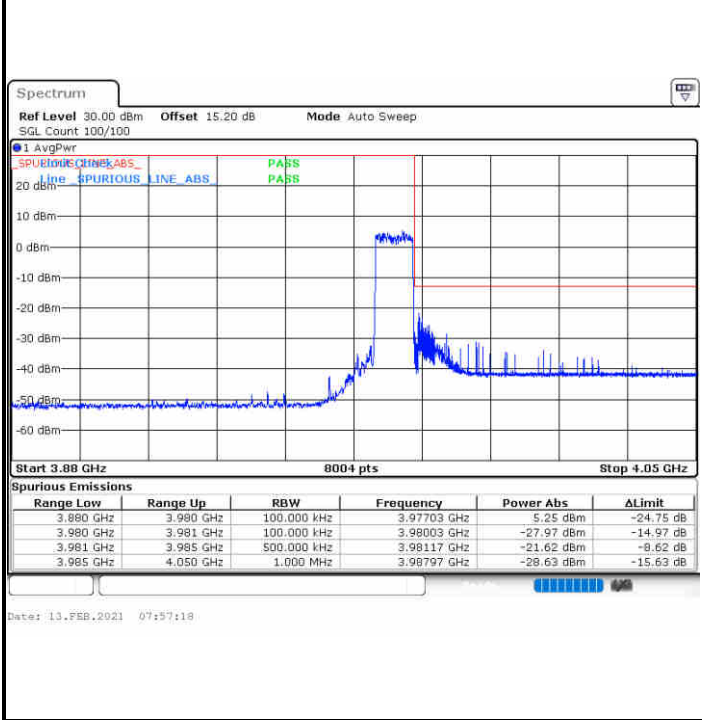
**Highest Band Edge / 1 RB**



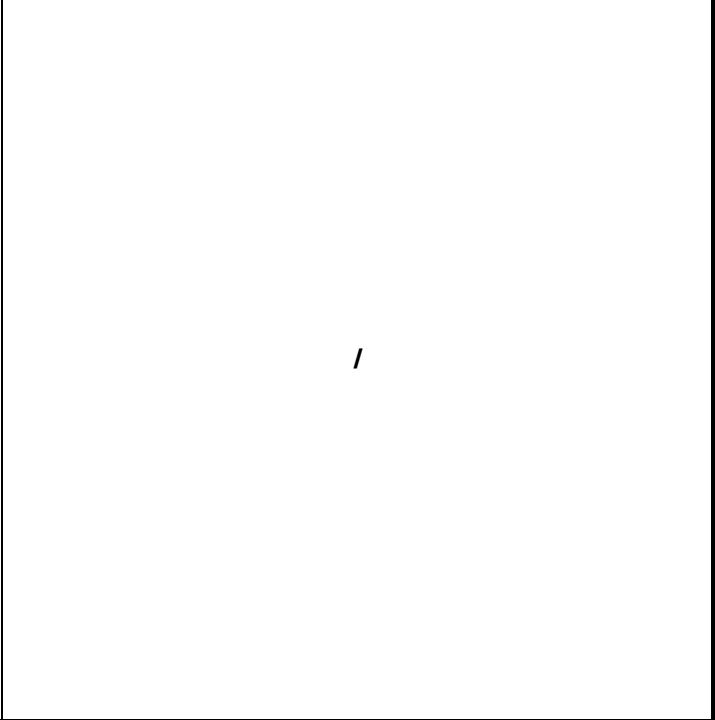
**Channel Power < -13dBm Pass**



**Highest Band Edge / Full RB**



**Channel Power < -13dBm Pass**

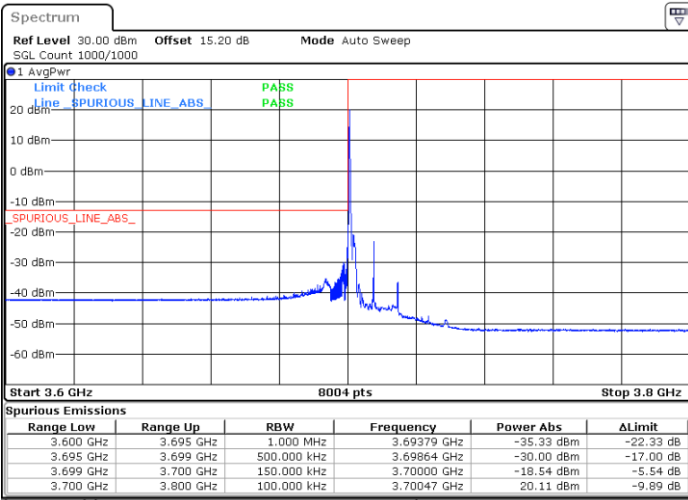




FR1 UL-MIMO n77 / 15MHz / CP-OFDM QPSK (M2)

Lowest Band Edge / 1 RB

Channel Power < -13dBm Pass

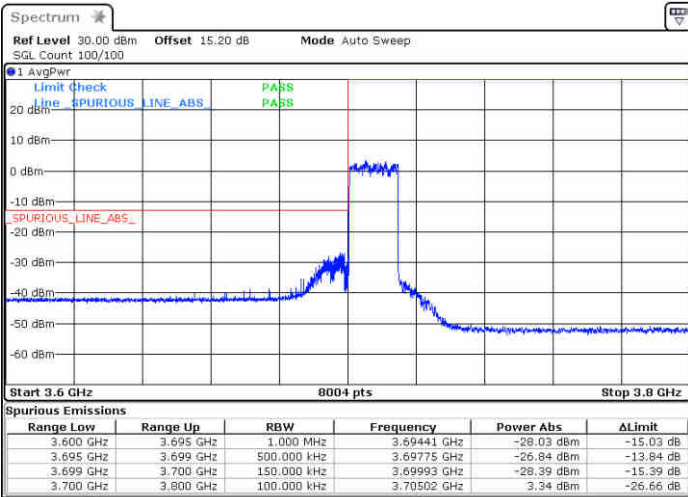


/

Date: 12.MAR.2021 07:42:23

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



/

Date: 12.MAR.2021 07:44:03

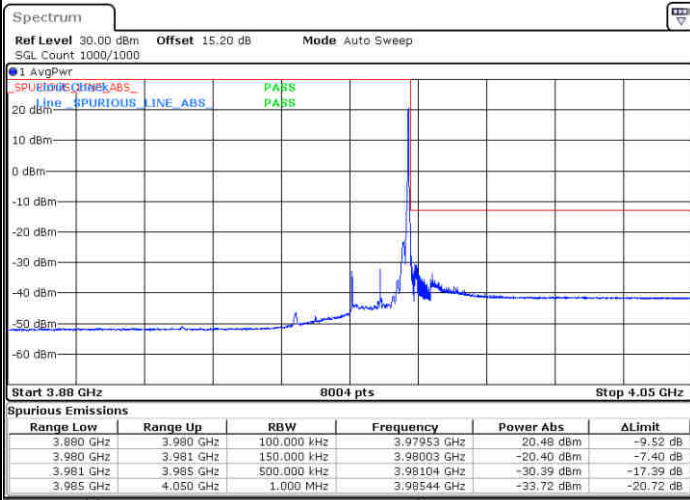




FR1 UL-MIMO n77 / 15MHz / CP-OFDM QPSK (M2)

Highest Band Edge / 1 RB

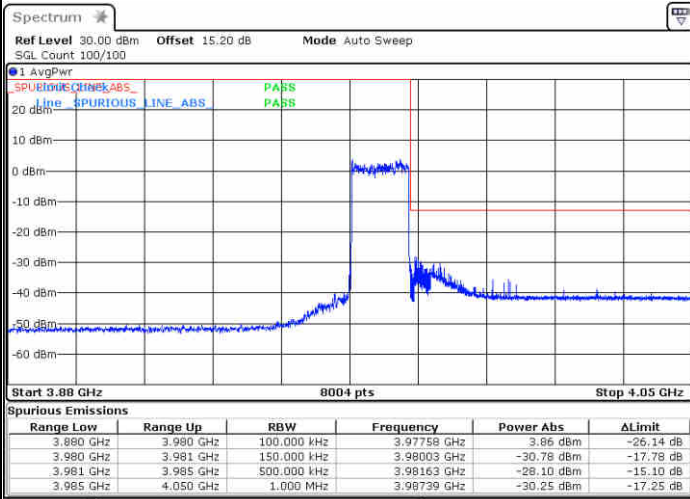
Channel Power < -13dBm Pass



Date: 12.MAR.2021 07:51:32

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



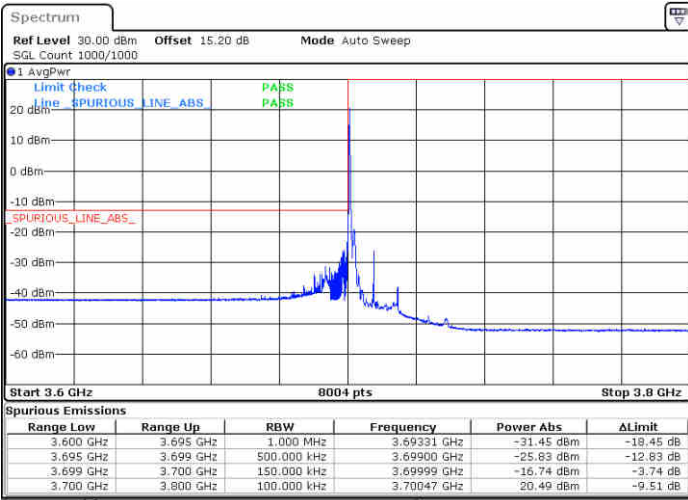
Date: 12.MAR.2021 07:46:06



FR1 UL-MIMO n77 / 15MHz / CP-OFDM QPSK (M)

Lowest Band Edge / 1 RB

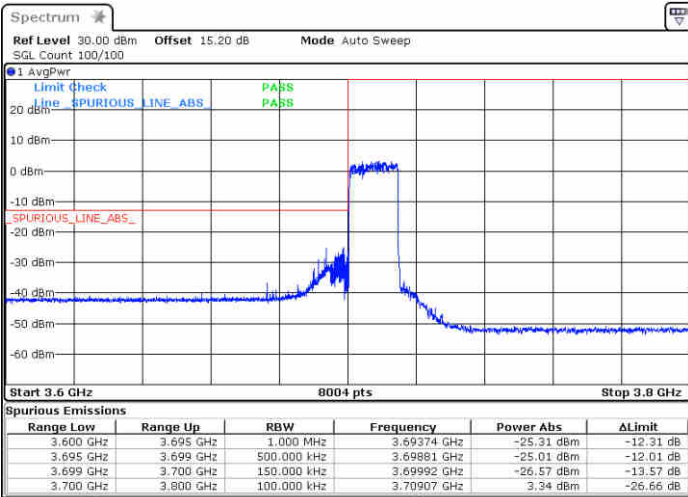
Channel Power < -13dBm Pass



Date: 12.MAR.2021 09:20:38

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



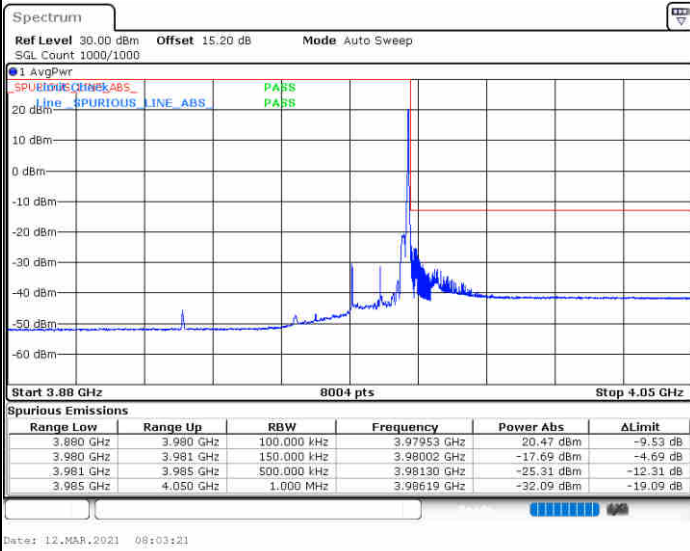
Date: 12.MAR.2021 09:13:59



FR1 UL-MIMO n77 / 15MHz / CP-OFDM QPSK (M)

Highest Band Edge / 1 RB

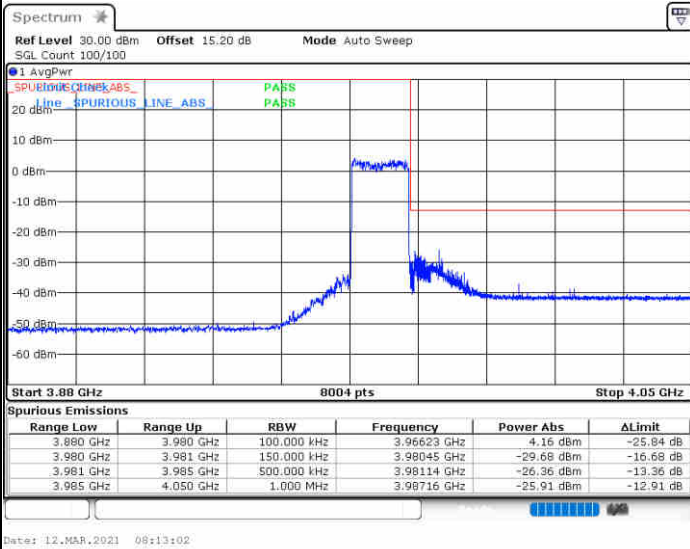
Channel Power < -13dBm Pass



/

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



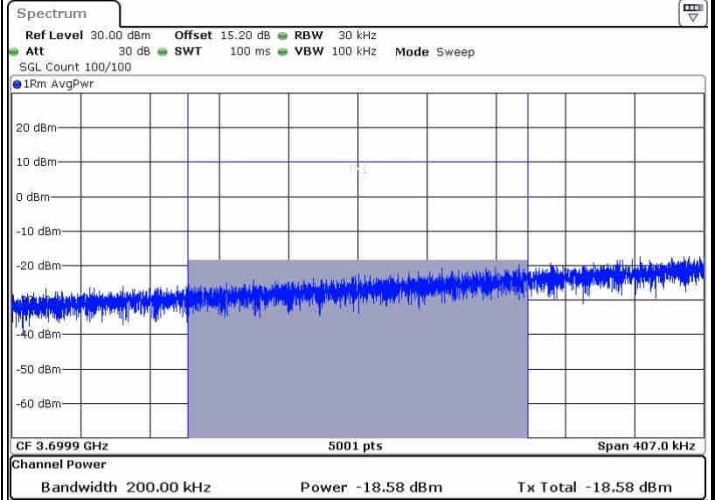
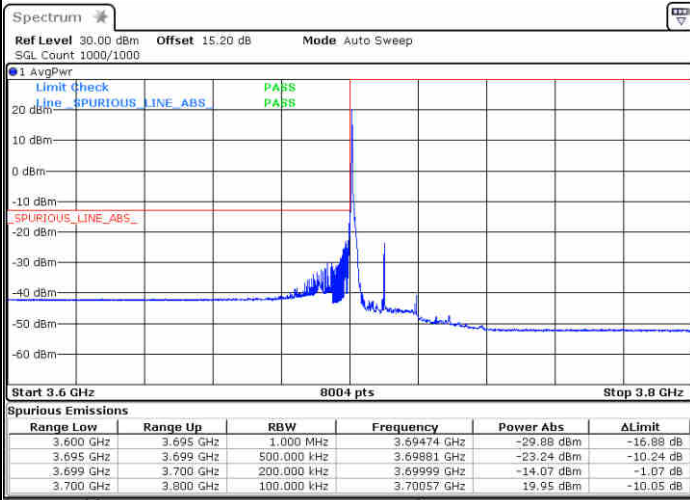
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FR1 UL-MIMO n77 / 20MHz / CP-OFDM QPSK (M2)

Lowest Band Edge / 1 RB

Channel Power < -13dBm Pass

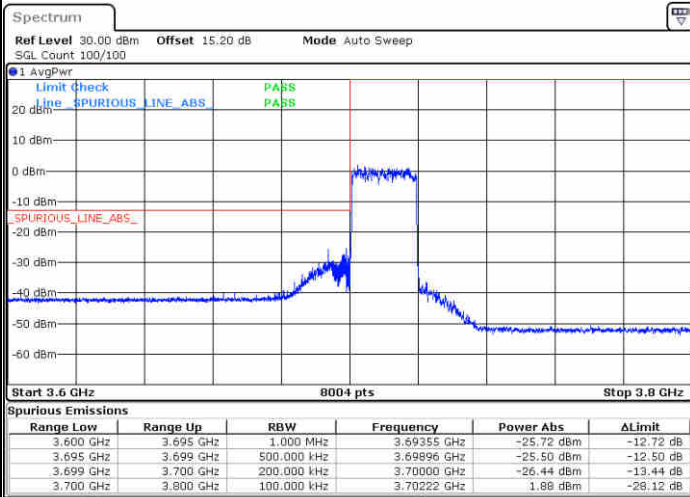


Date: 14.MAR.2021 01:55:44

Date: 14.MAR.2021 02:05:18

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



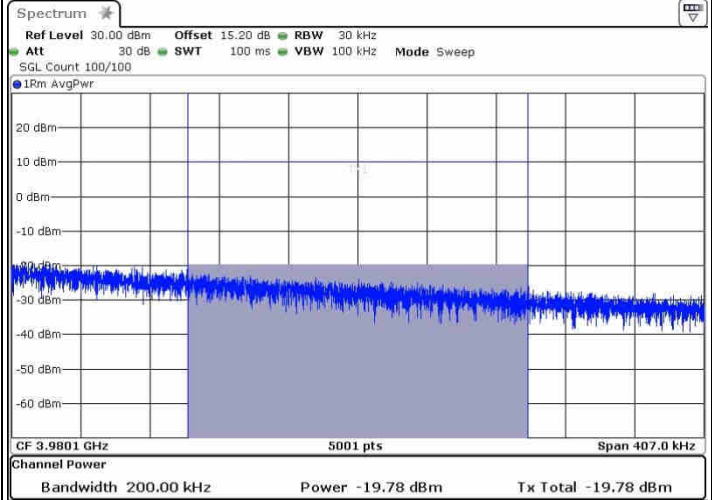
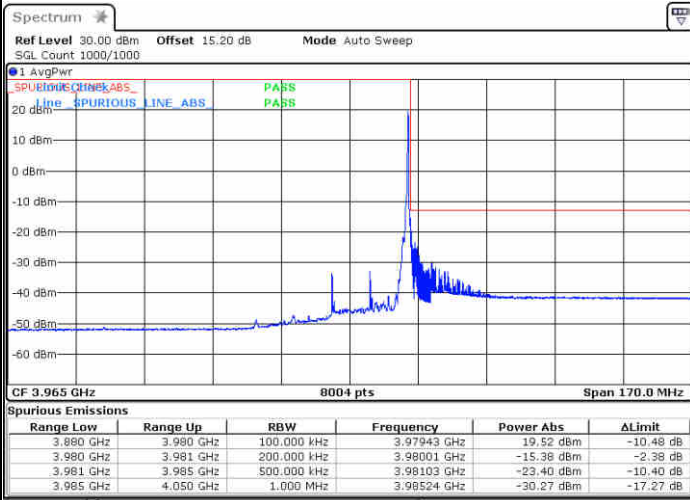
Date: 14.MAR.2021 01:59:46



FR1 UL-MIMO n77 / 20MHz / CP-OFDM QPSK (M2)

Highest Band Edge / 1 RB

Channel Power < -13dBm Pass

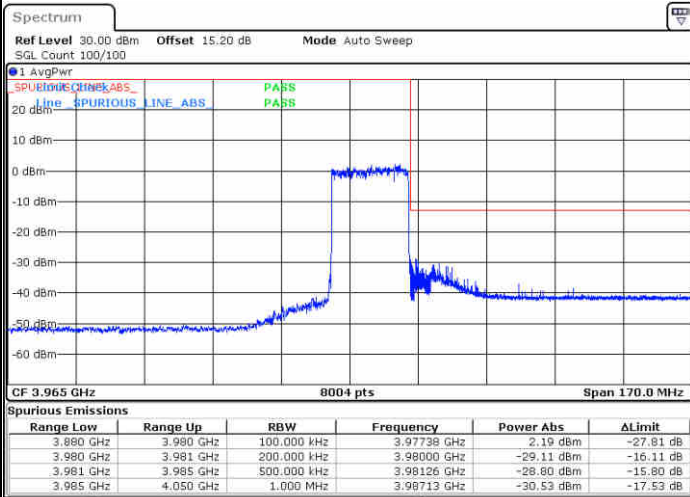


Date: 14.MAR.2021 02:10:29

Date: 14.MAR.2021 02:06:40

Highest Band Edge / Full RB

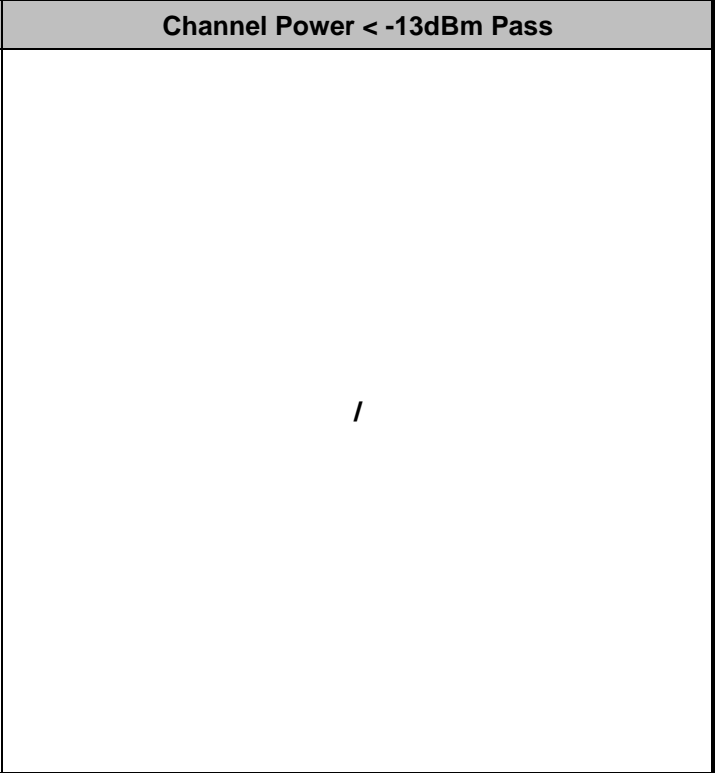
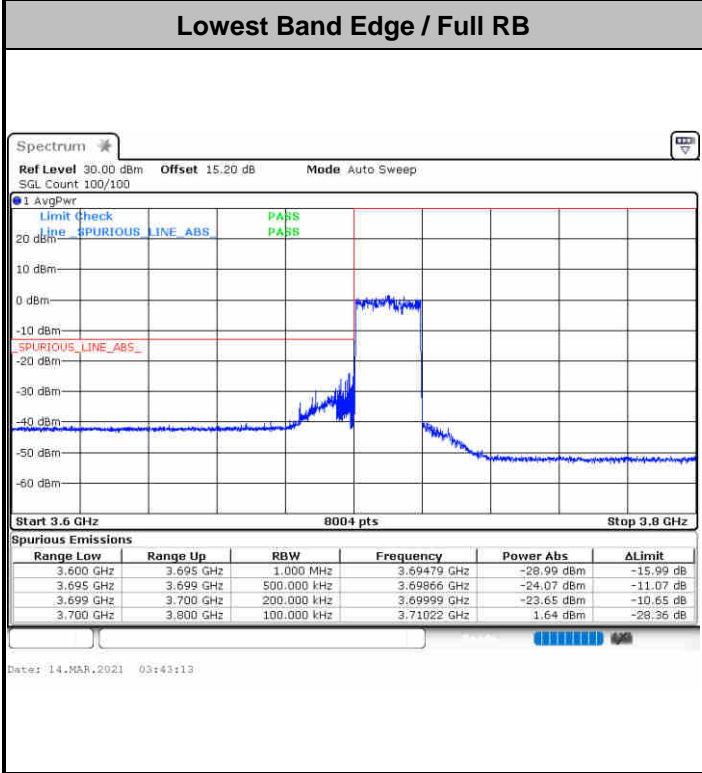
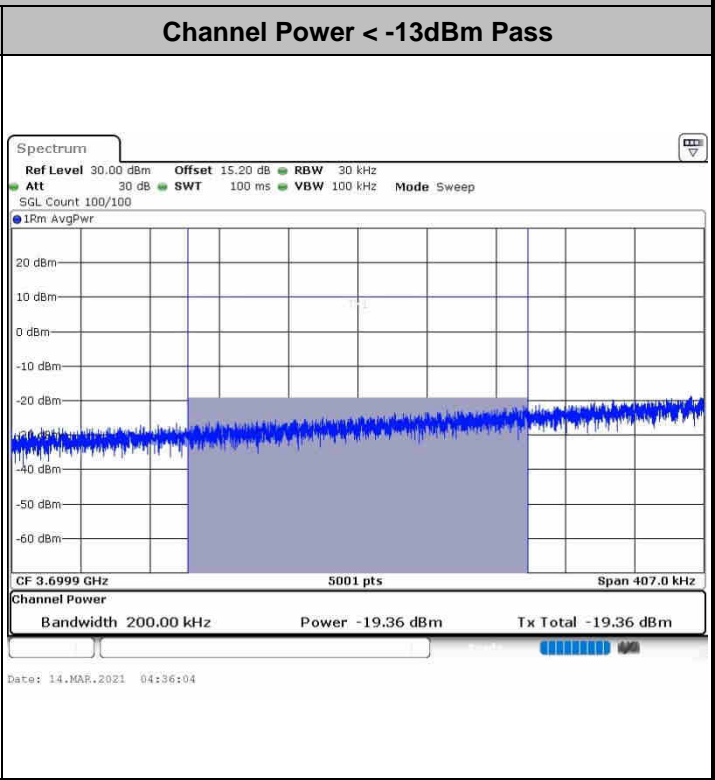
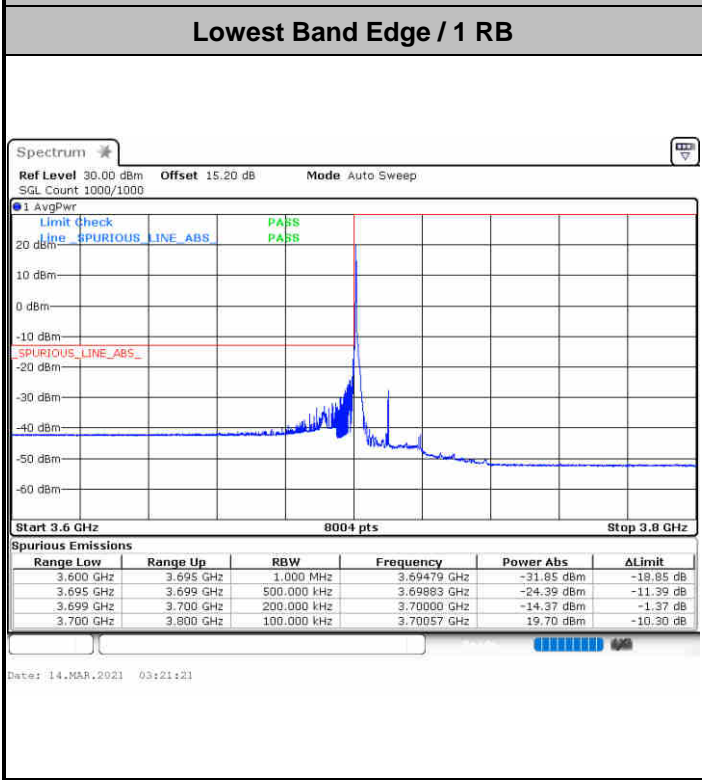
Channel Power < -13dBm Pass



Date: 14.MAR.2021 02:00:29



**FR1 UL-MIMO n77 / 20MHz / CP-OFDM QPSK (M)**



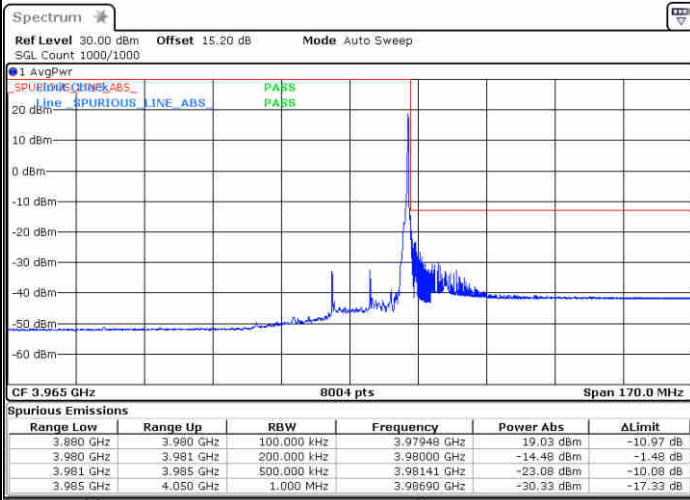




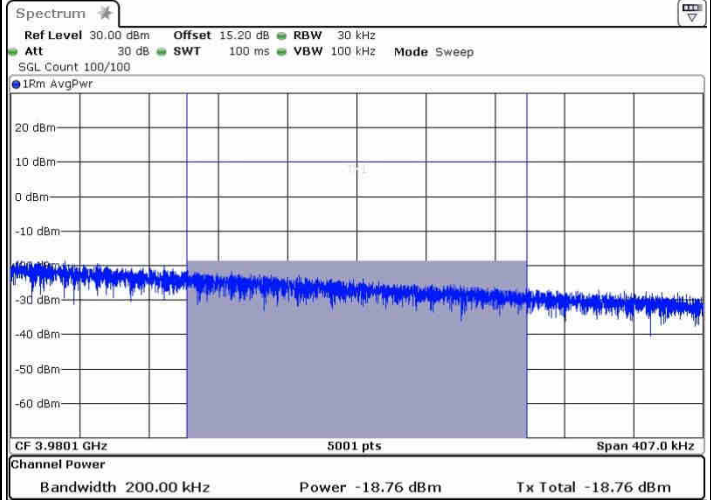
FR1 UL-MIMO n77 / 20MHz / CP-OFDM QPSK (M)

Highest Band Edge / 1 RB

Channel Power < -13dBm Pass



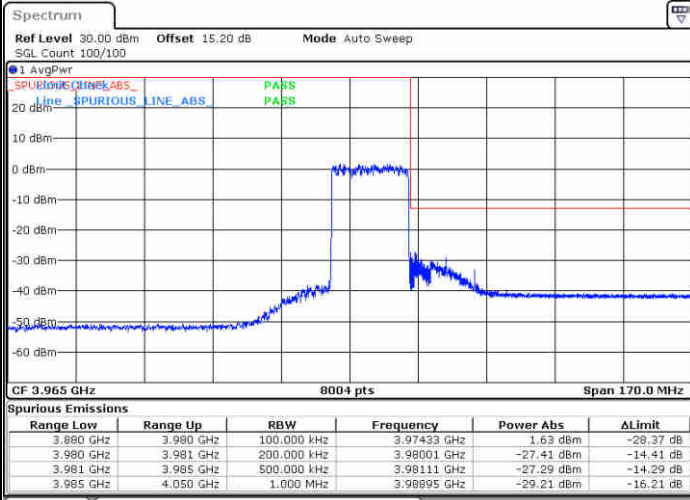
Date: 14.MAR.2021 03:58:18



Date: 14.MAR.2021 04:17:39

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



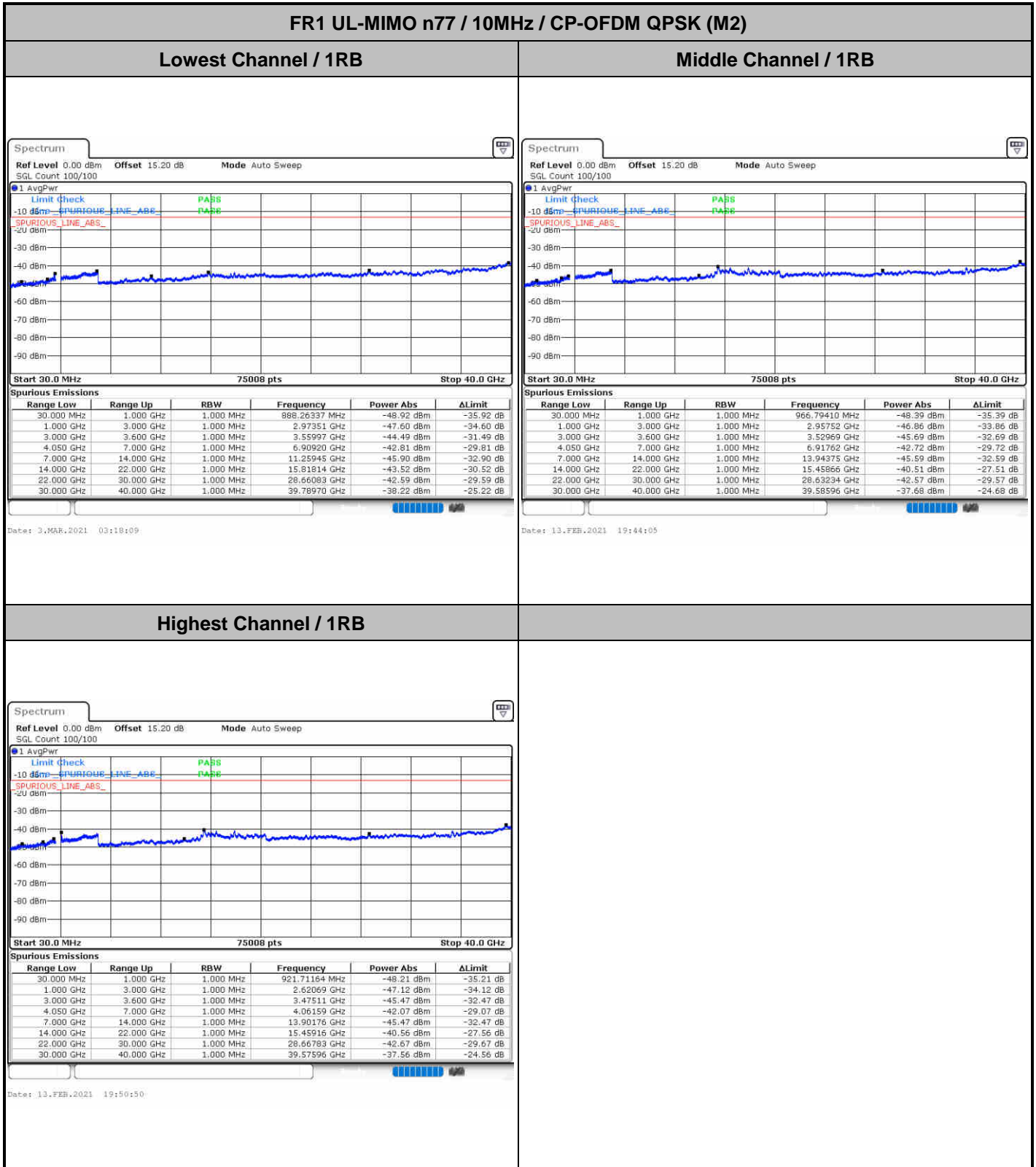
Date: 14.MAR.2021 03:48:30

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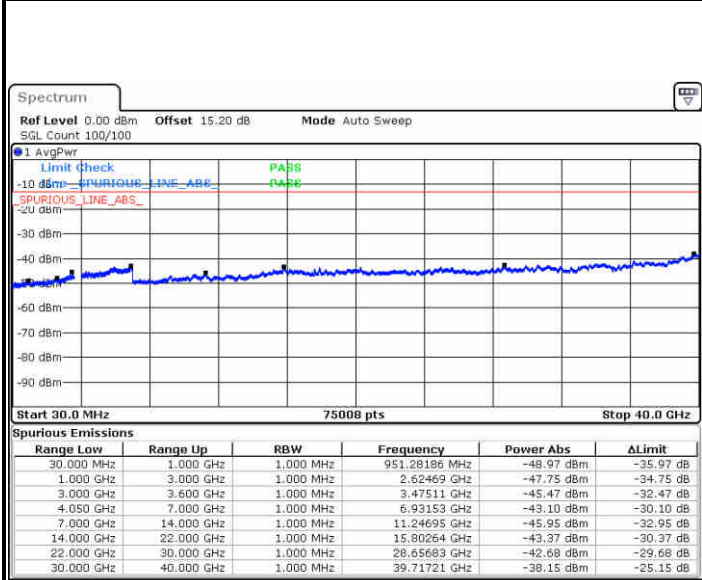
# Conducted Spurious Emission





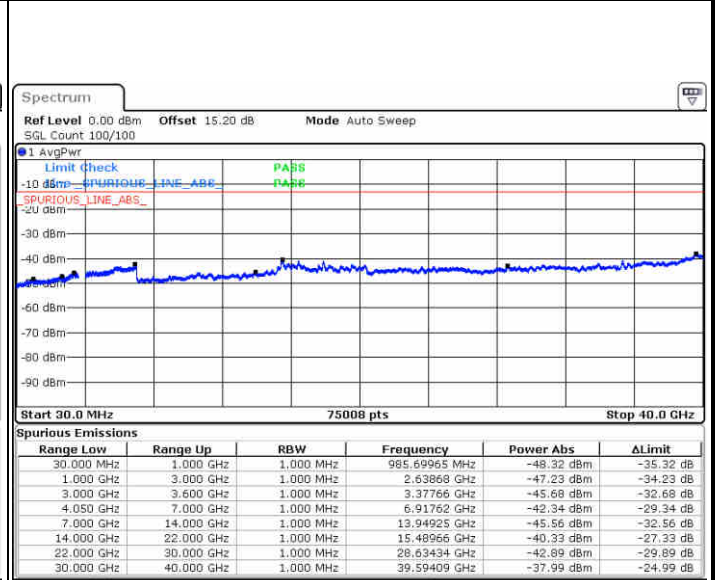
FR1 UL-MIMO n77 / 10MHz / CP-OFDM QPSK (M)

Lowest Channel / 1RB



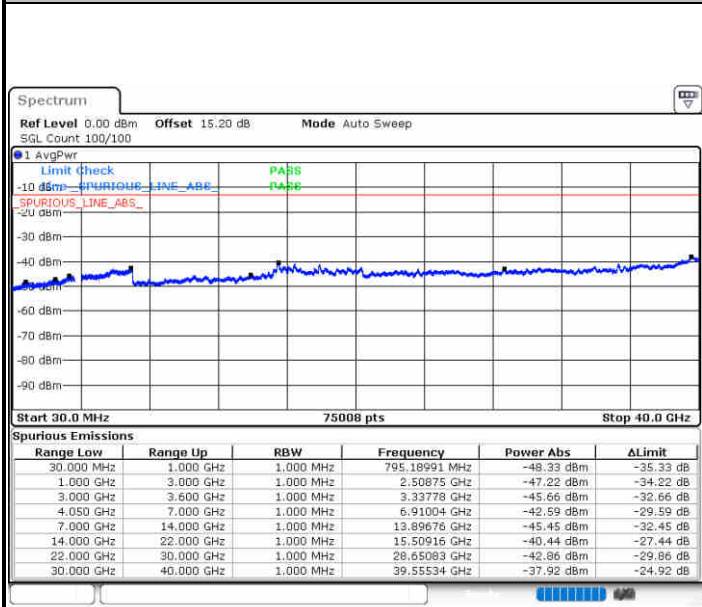
Date: 3.MAR.2021 03:27:22

Middle Channel / 1RB



Date: 13.FEB.2021 07:46:51

Highest Channel / 1RB



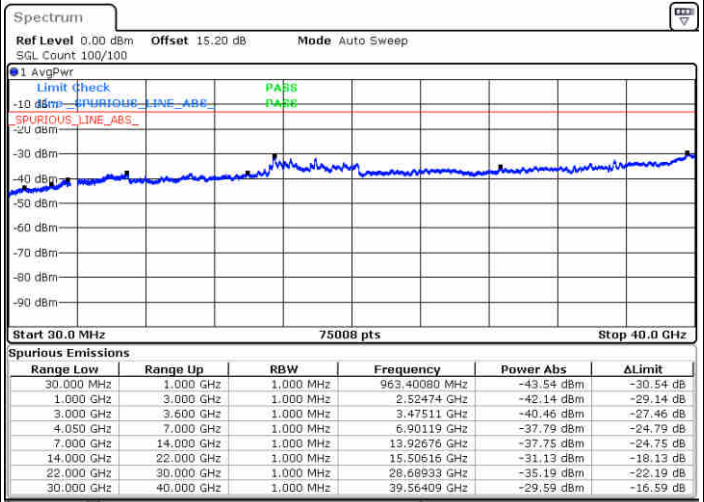
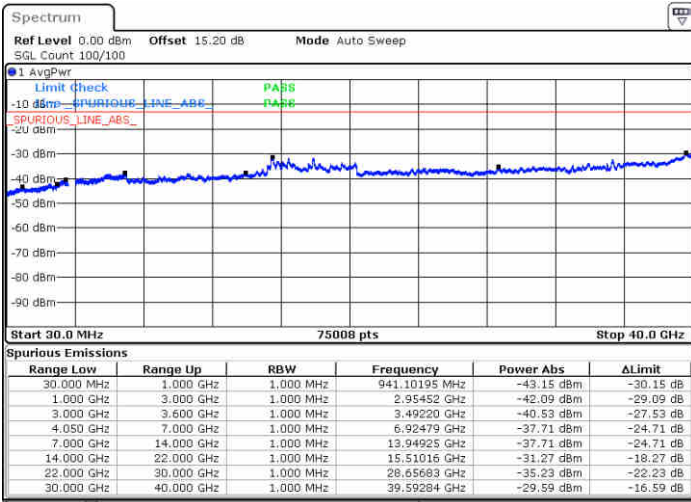
Date: 13.FEB.2021 07:50:22



FR1 UL-MIMO n77 / 15MHz / CP-OFDM QPSK (M2)

Lowest Channel / 1RB

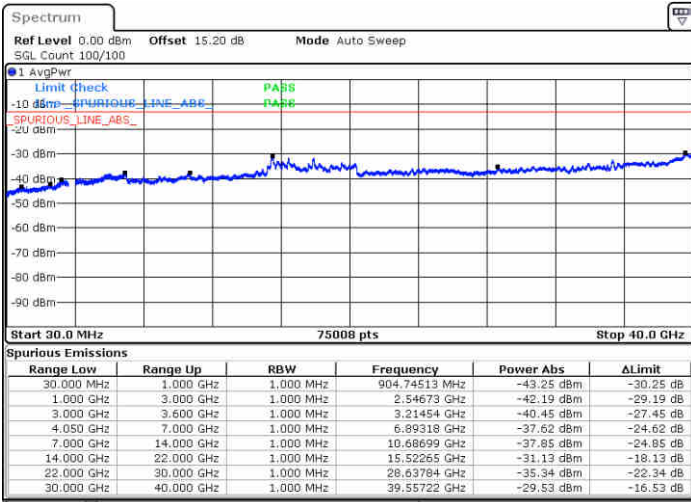
Middle Channel / 1RB



Date: 13.FEB.2021 19:15:24

Date: 13.FEB.2021 19:26:40

Highest Channel / 1RB



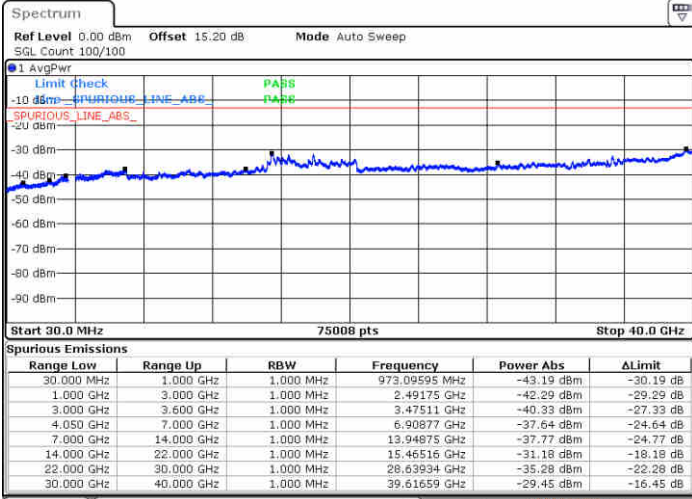
Date: 13.FEB.2021 19:30:45



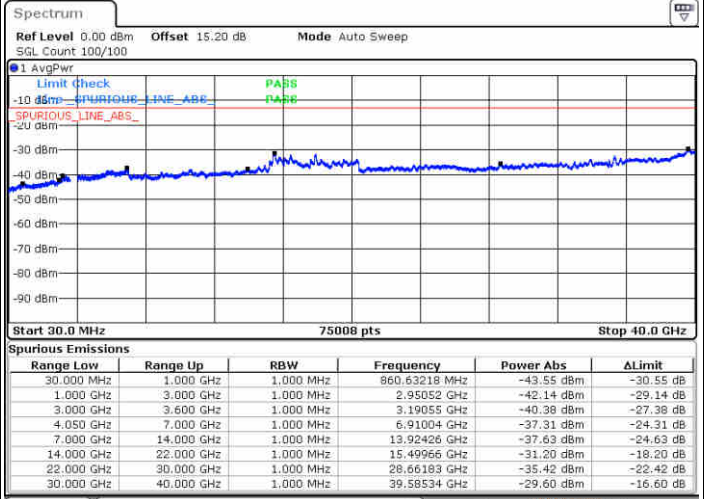
FR1 UL-MIMO n77 / 15MHz / CP-OFDM QPSK (M)

Lowest Channel / 1RB

Middle Channel / 1RB

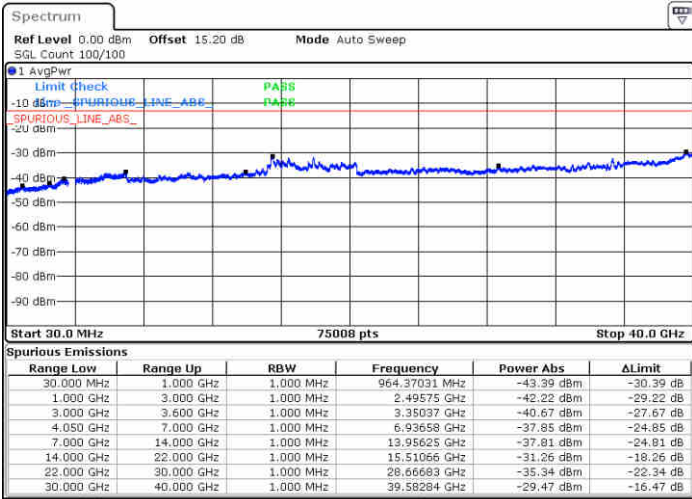


Date: 13.FEB.2021 06:01:19



Date: 13.FEB.2021 06:03:38

Highest Channel / 1RB



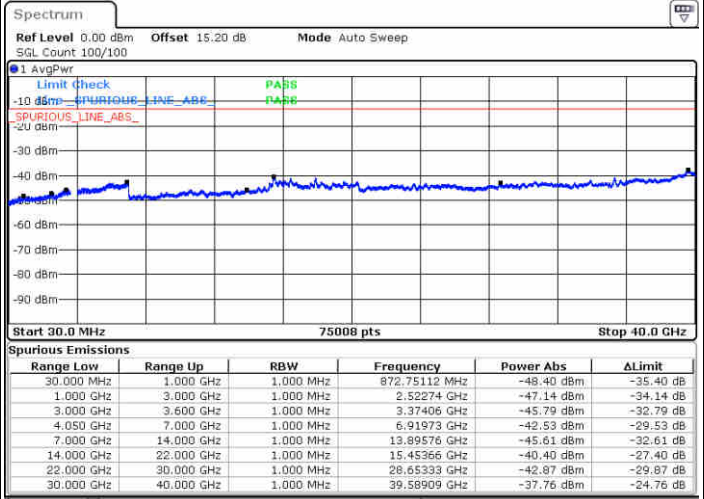
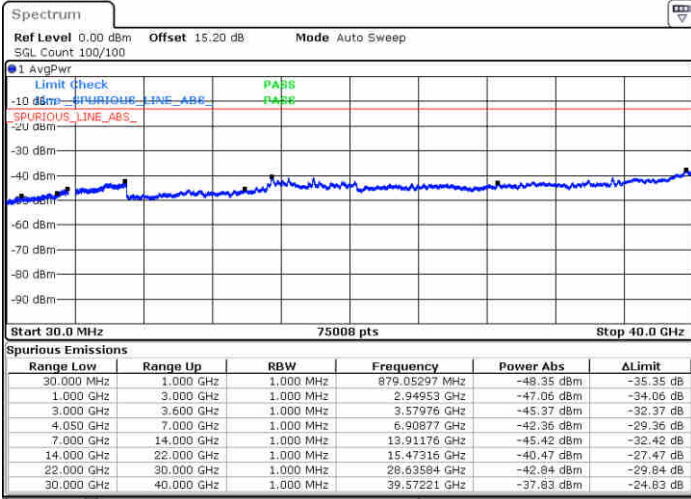
Date: 13.FEB.2021 06:15:40



FR1 UL-MIMO n77 / 20MHz / CP-OFDM QPSK (M2)

Lowest Channel / 1RB

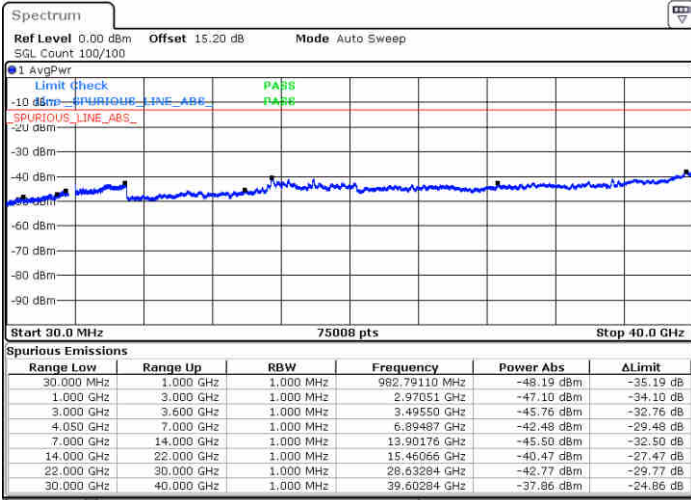
Middle Channel / 1RB



Date: 13.FEB.2021 18:01:51

Date: 13.FEB.2021 17:50:00

Highest Channel / 1RB

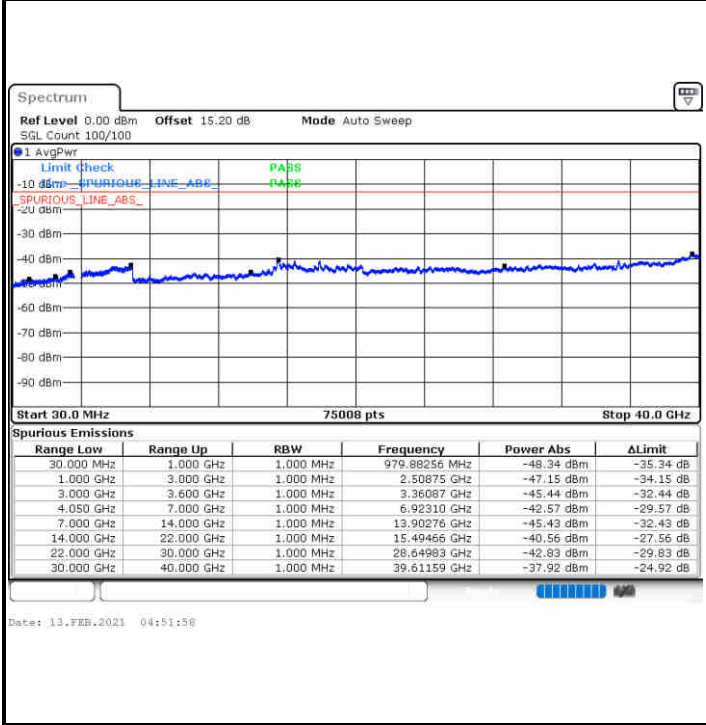


Date: 13.FEB.2021 18:12:32

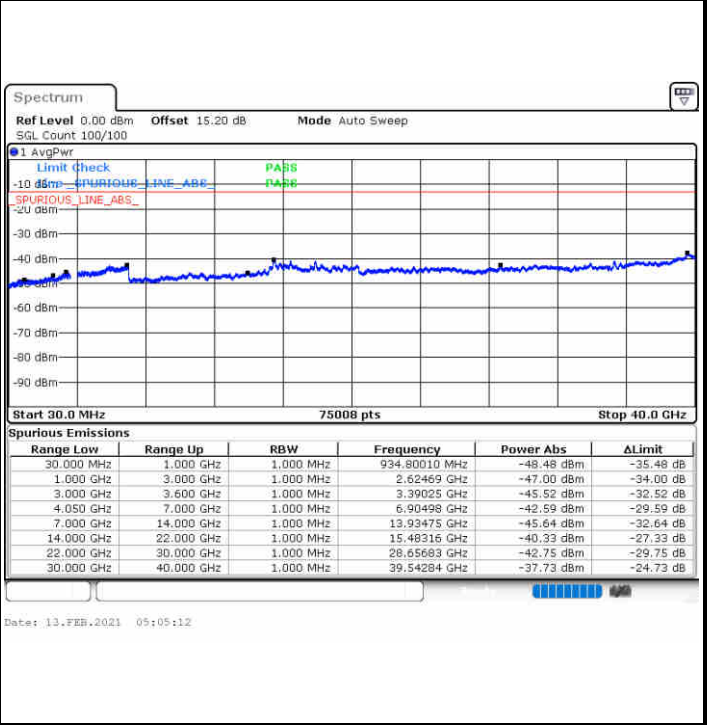


**FR1 UL-MIMO n77 / 20MHz / CP-OFDM QPSK (M)**

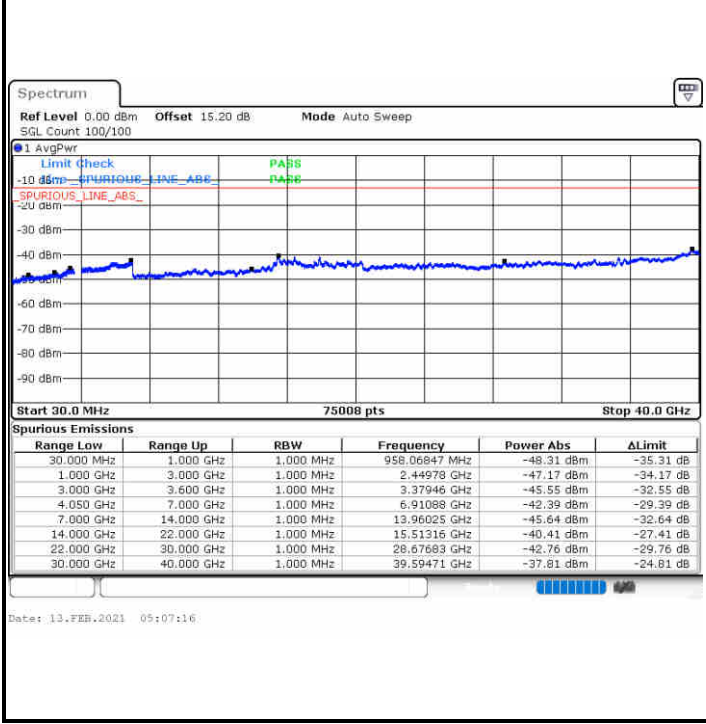
**Lowest Channel / 1RB**



**Middle Channel / 1RB**



**Highest Channel / 1RB**







### Frequency Stability

Test Conditions		NR UL-MIMO n77 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 20MHz	Within Band
		Deviation (ppm)	Result
50	Normal Voltage	0.0025	PASS
40	Normal Voltage	0.0019	
30	Normal Voltage	0.0024	
20(Ref.)	Normal Voltage	0.0015	
10	Normal Voltage	0.0019	
0	Normal Voltage	0.0023	
-10	Normal Voltage	0.0014	
-20	Normal Voltage	0.0017	
-30	Normal Voltage	0.0012	
20	Maximum Voltage	0.0025	
20	Normal Voltage	0.0026	
20	Battery End Point	0.0013	

**Note:**

1. Normal Voltage =3.3 V. ; Battery End Point (BEP) =3.14 V. ; Maximum Voltage =4.4 V.
2. Note: The frequency fundamental emissions stay within the authorized frequency block.





### 5G NR n77 UL\_MIMO HPUE -SCS 30K

#### Peak-to-Average Ratio

Mode	FR1 UL-MIMO n77 / 10MHz / CP-OFDM (M2)				
Mod.	QPSK	QPSK			Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	7.65	8.35			PASS
Middle CH	7.45	8.38			
Highest CH	7.13	8.32			

Mode	FR1 UL-MIMO n77 / 10MHz / CP-OFDM (M)				
Mod.	QPSK	QPSK			Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	8.29	8.58			PASS
Middle CH	7.39	8.61			
Highest CH	7.86	8.17			



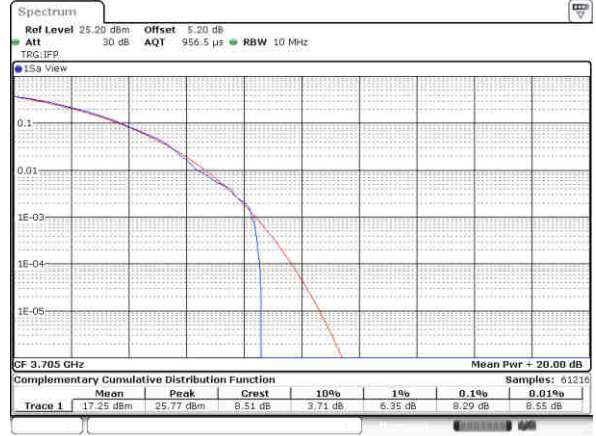
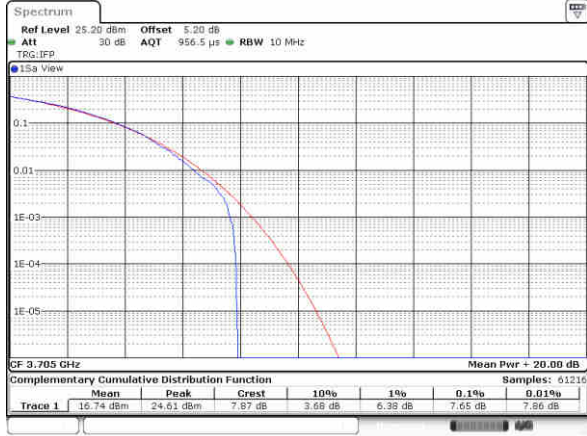
FR1 UL-MIMO n77 / 10MHz / CP-OFDM

QPSK(M2)

QPSK(M)

Lowest Channel / 1RB

Lowest Channel / 1RB

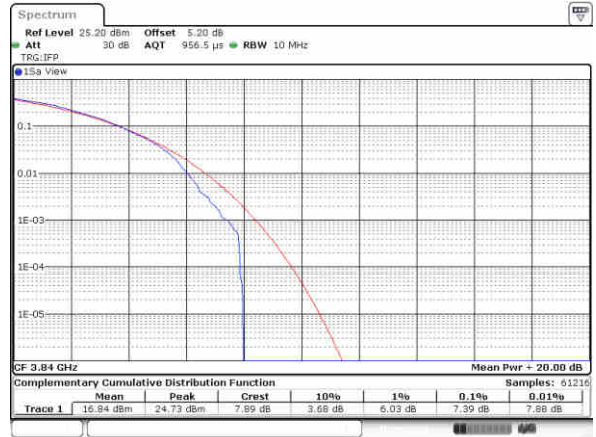
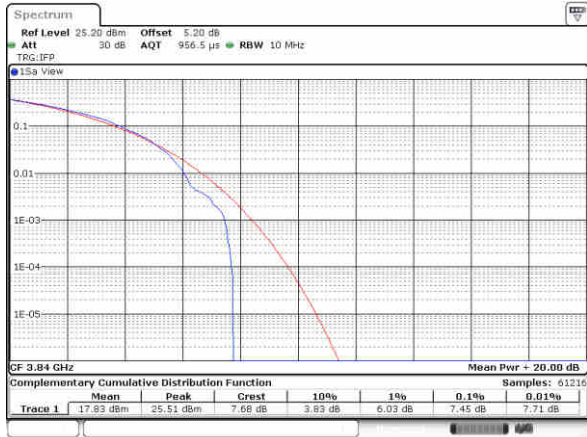


Date: 13\_FEB\_2021 16:38:56

Date: 13\_FEB\_2021 12:13:28

Middle Channel / 1 RB

Middle Channel / 1 RB

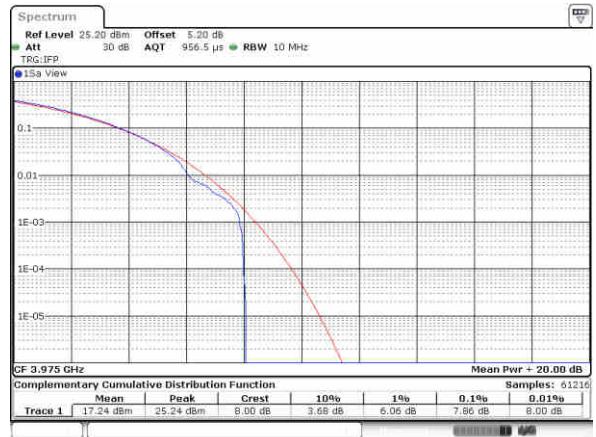
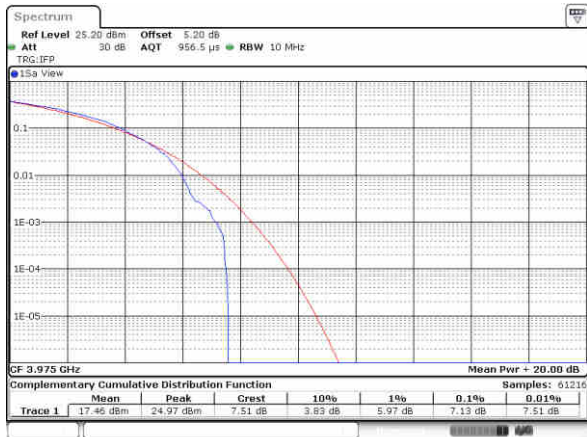


Date: 13\_FEB\_2021 16:25:58

Date: 13\_FEB\_2021 12:07:29

Highest Channel / 1 RB

Highest Channel / 1 RB



Date: 13\_FEB\_2021 17:14:41

Date: 13\_FEB\_2021 12:48:04



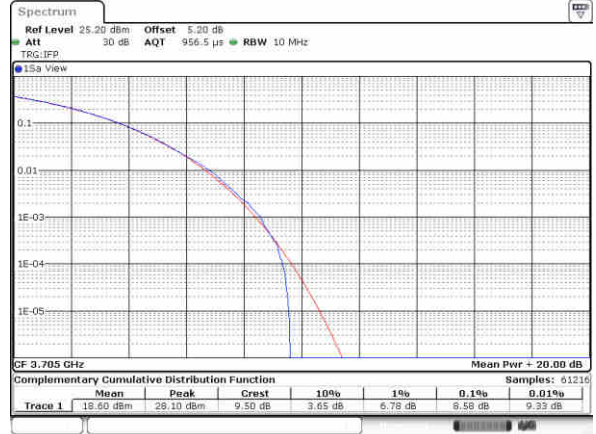
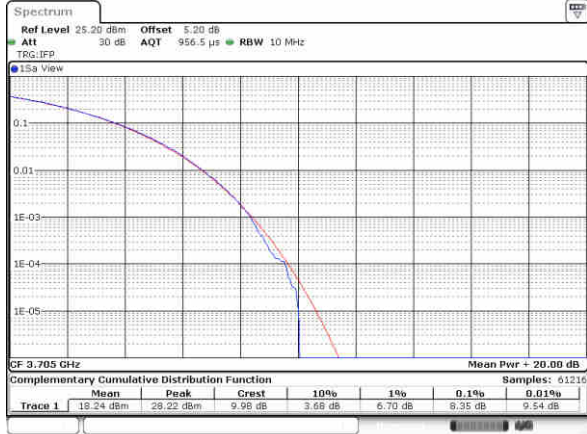
FR1 UL-MIMO n77 / 10MHz / CP-OFDM

QPSK(M2)

QPSK(M)

Lowest Channel / Full RB

Lowest Channel / Full RB

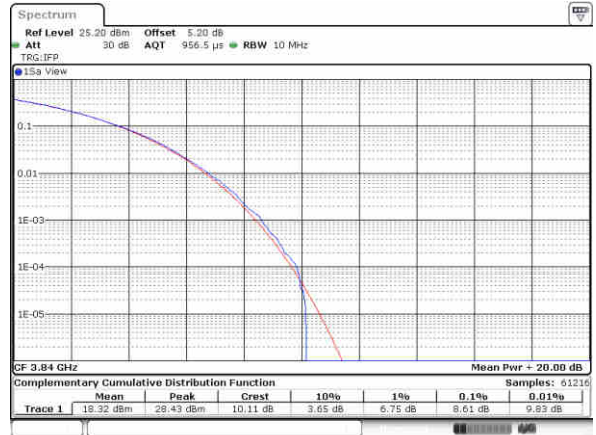
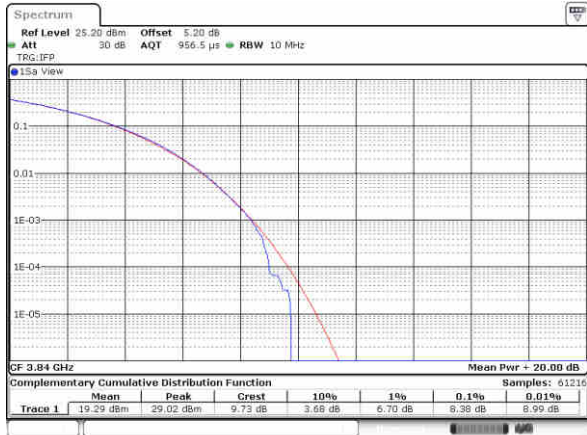


Date: 13\_FEB\_2021 16:46:17

Date: 13\_FEB\_2021 12:43:14

Middle Channel / Full RB

Middle Channel / Full RB

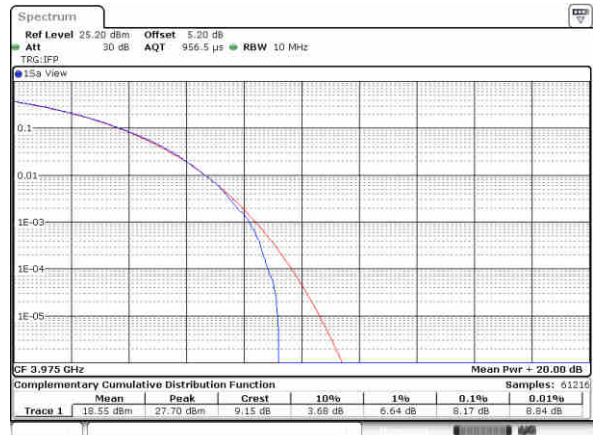
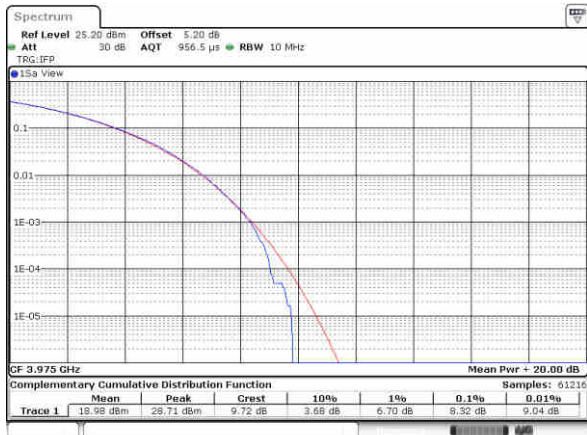


Date: 13\_FEB\_2021 16:23:25

Date: 13\_FEB\_2021 12:05:28

Highest Channel / Full RB

Highest Channel / Full RB



Date: 13\_FEB\_2021 17:07:35

Date: 13\_FEB\_2021 12:46:17



26dB Bandwidth

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	10MHz	10MHz	10MHz	10MHz	10MHz	10MHz	10MHz	10MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	9.23	9.11	9.15	9.15	9.33	9.07	9.11	9.29

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	15MHz	15MHz	15MHz	15MHz	15MHz	15MHz	15MHz	15MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	14.33	14.30	14.27	14.39	14.42	14.75	14.57	14.54

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	20MHz	20MHz	20MHz	20MHz	20MHz	20MHz	20MHz	20MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	18.98	18.94	19.26	19.02	19.30	18.98	19.10	19.02

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	40MHz	40MHz	40MHz	40MHz	40MHz	40MHz	40MHz	40MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	40.28	40.28	40.12	40.2	40.2	40.12	40.36	40.36

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	50MHz	50MHz	50MHz	50MHz	50MHz	50MHz	50MHz	50MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	49.65	49.75	50.15	49.75	49.65	49.75	49.65	49.75

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	60MHz	60MHz	60MHz	60MHz	60MHz	60MHz	60MHz	60MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	60.42	60.42	60.3	60.54	60.42	60.54	60.3	60.42



Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	80MHz	80MHz	80MHz	80MHz	80MHz	80MHz	80MHz	80MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	79.92	79.92	80.08	79.92	80.08	80.08	79.92	79.76

Mode	FR1 UL-MIMO n77 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	100MHz	100MHz	100MHz	100MHz	100MHz	100MHz	100MHz	100MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	100.3	100.5	100.1	100.3	100.3	100.3	100.1	100.3





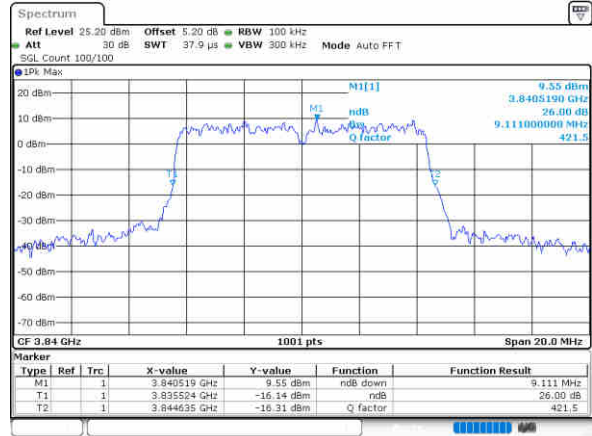
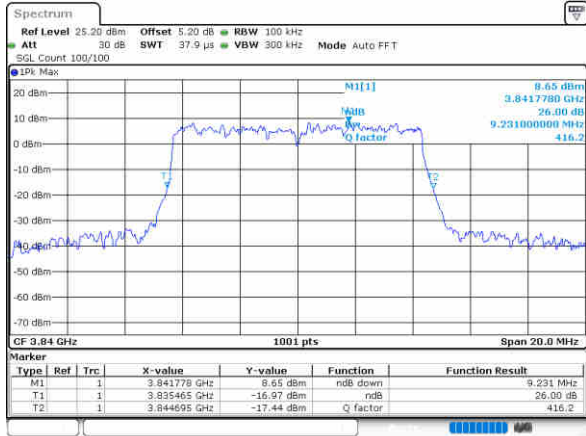
FR1 UL-MIMO n77 / 10MHz / CP-OFDM (M2)

QPSK

16QAM

Middle Channel

Middle Channel



Date: 13.FEB.2021 16:21:57

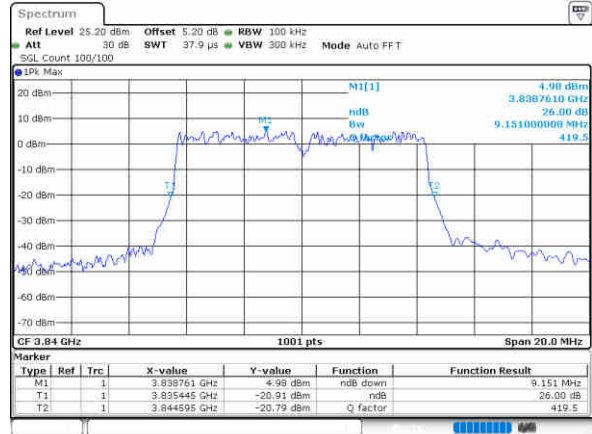
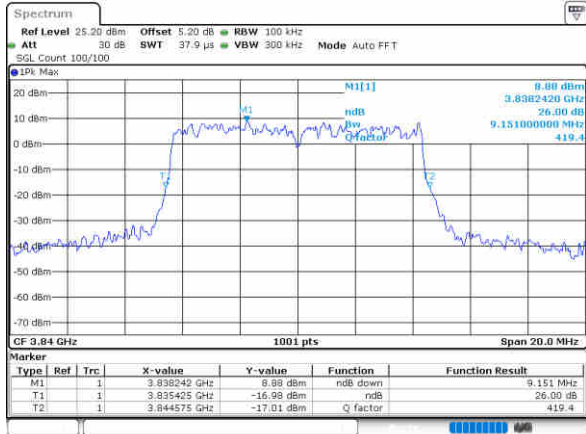
Date: 13.FEB.2021 16:22:17

64QAM

256QAM

Middle Channel

Middle Channel



Date: 13.FEB.2021 16:23:58

Date: 13.FEB.2021 16:25:24



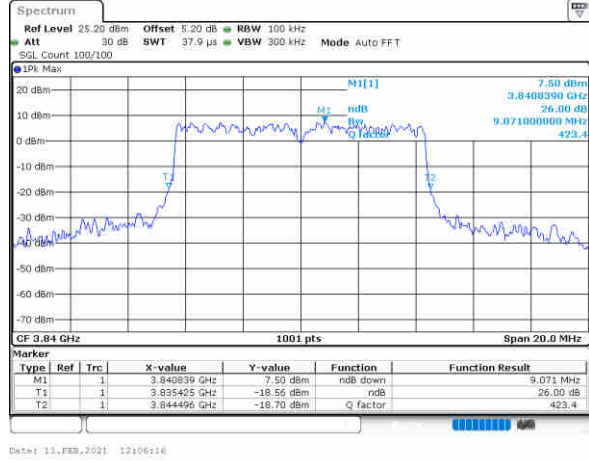
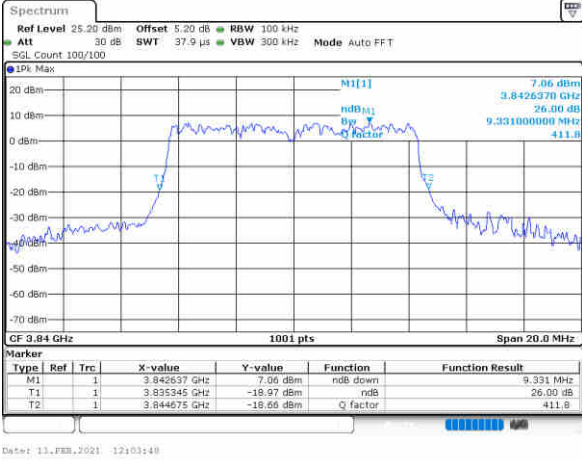
FR1 UL-MIMO n77 / 10MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel

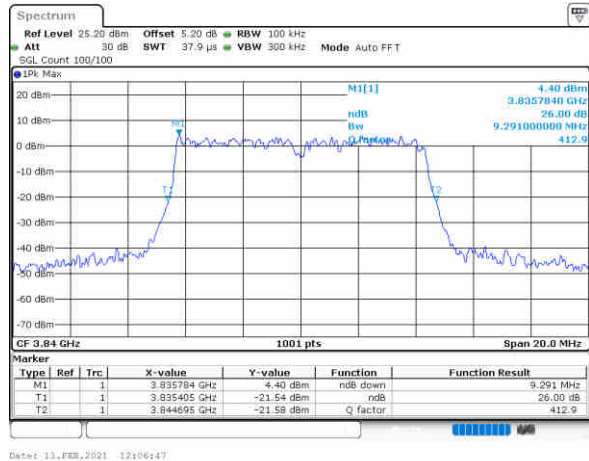
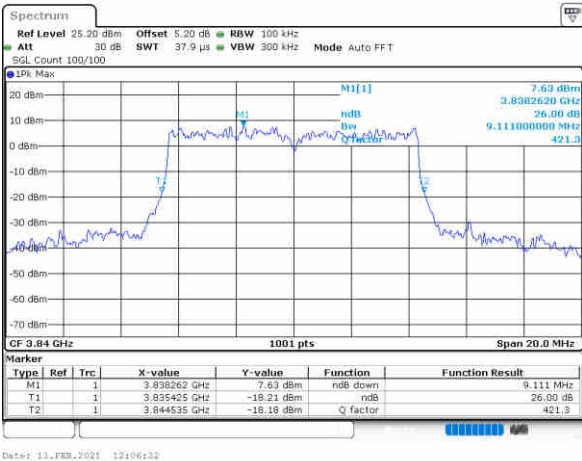


64QAM

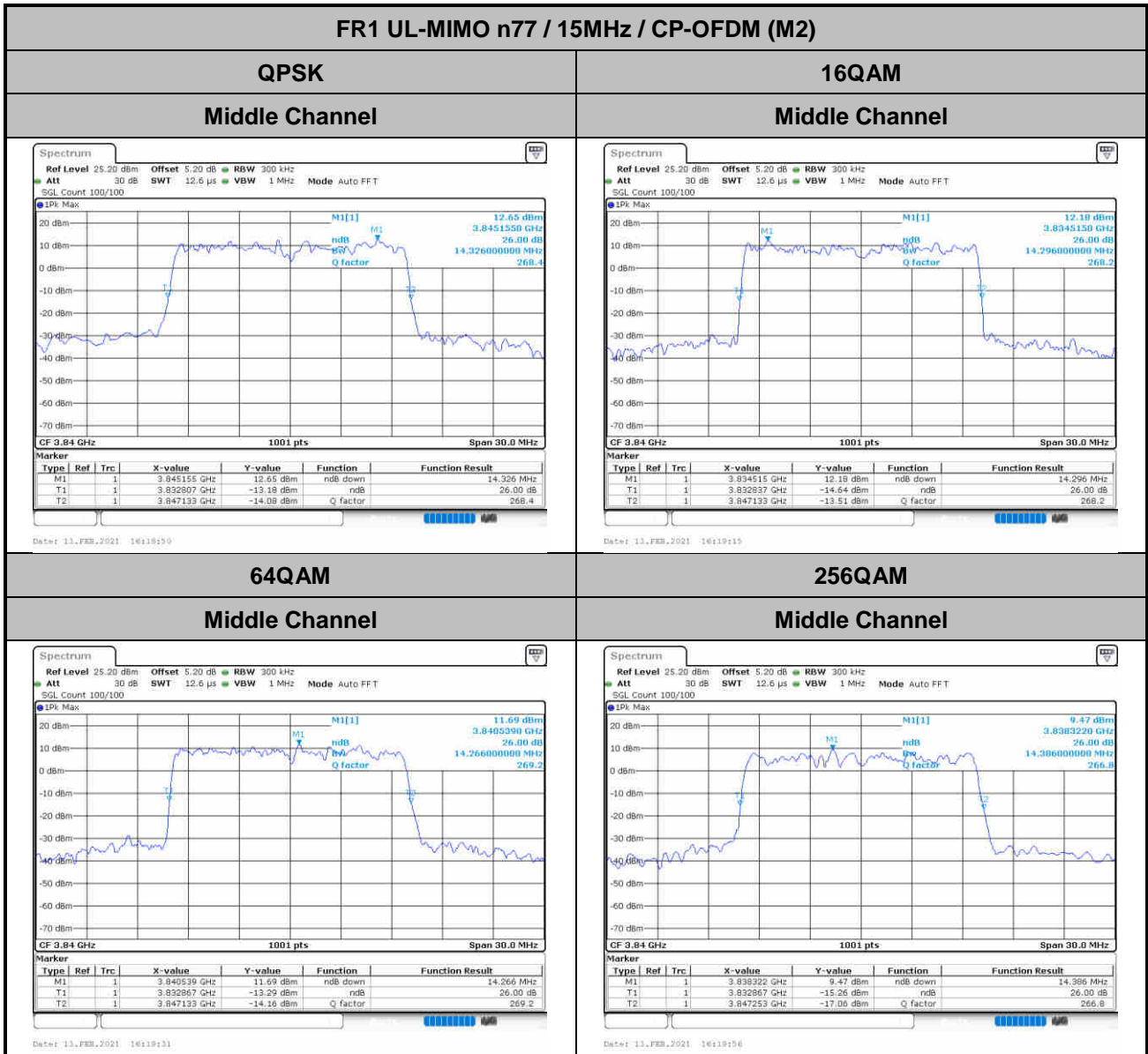
256QAM

Middle Channel

Middle Channel









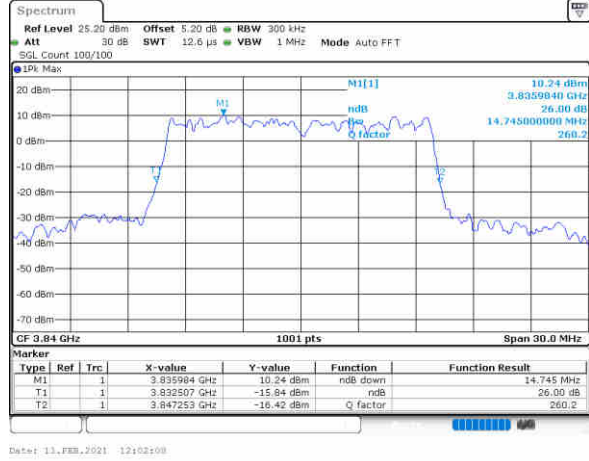
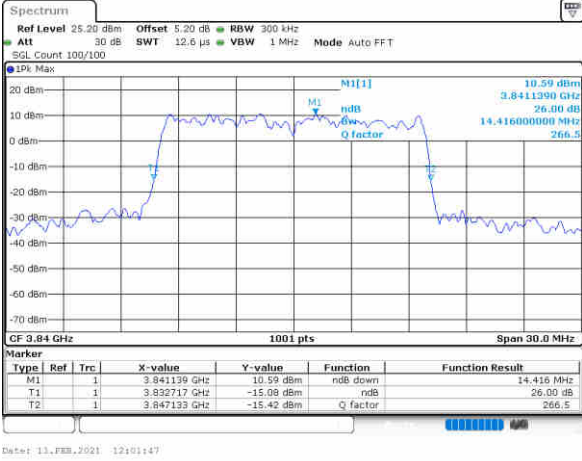
FR1 UL-MIMO n77 / 15MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel



Date: 13\_FEB\_2021 12:01:47

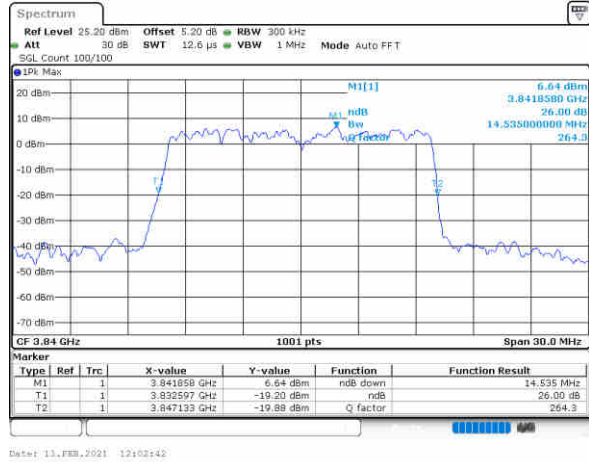
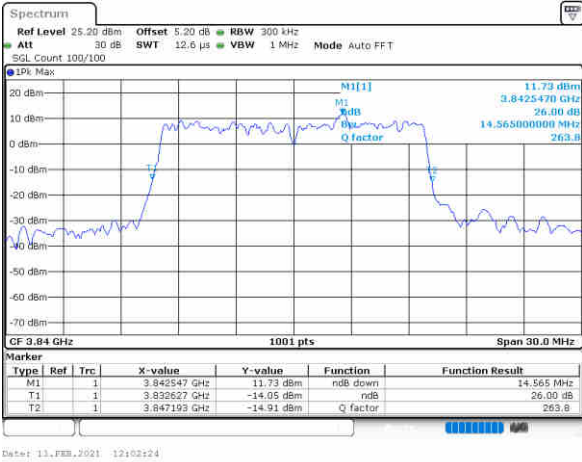
Date: 13\_FEB\_2021 12:02:08

64QAM

256QAM

Middle Channel

Middle Channel



Date: 13\_FEB\_2021 12:02:24

Date: 13\_FEB\_2021 12:02:42