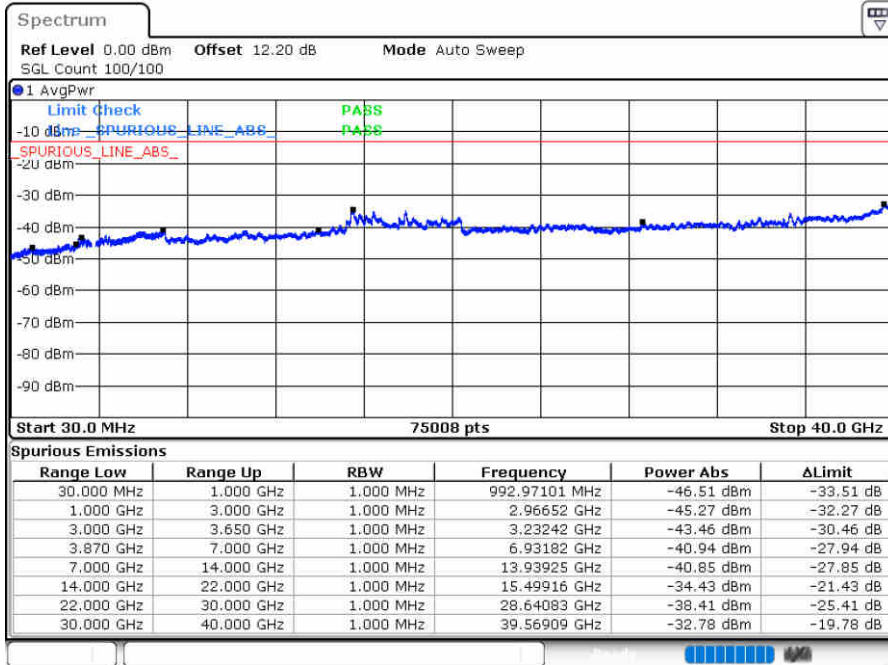




FR1 n78 / 100MHz / DFT-S OFDM / BPSK

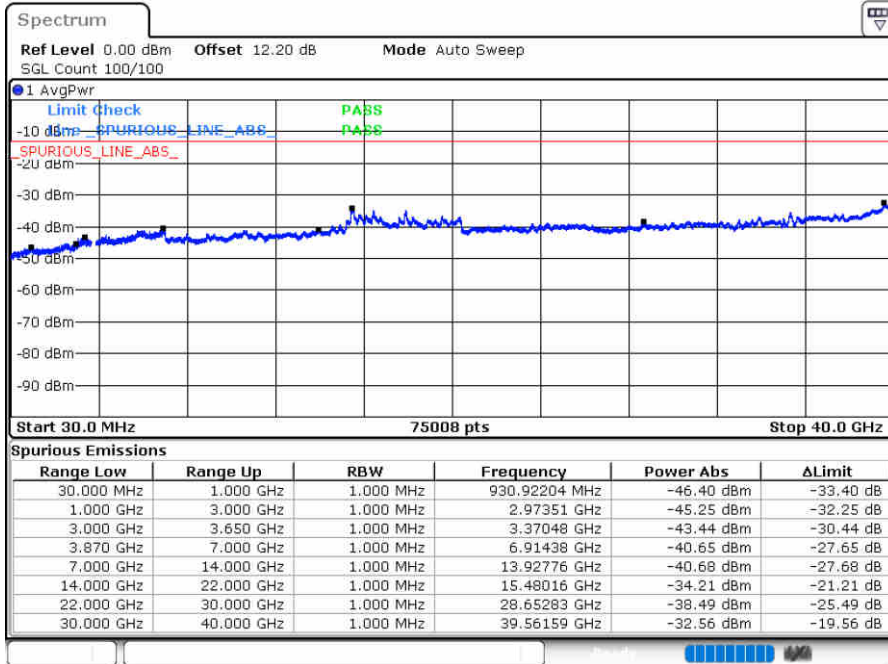
Middle Channel / 1RB



Date: 11.FEB.2021 00:25:07

FR1 n78 / 100MHz / DFT-S OFDM / QPSK

Middle Channel / 1RB



Date: 11.FEB.2021 00:26:24



Frequency Stability

Test Conditions		NR n78 (BPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 20MHz	Within Band
		Deviation (ppm)	Result
50	Normal Voltage	0.0018	PASS
40	Normal Voltage	0.0022	
30	Normal Voltage	0.0012	
20(Ref.)	Normal Voltage	0.0013	
10	Normal Voltage	0.0035	
0	Normal Voltage	0.0012	
-10	Normal Voltage	0.0019	
-20	Normal Voltage	0.0025	
-30	Normal Voltage	0.0017	
20	Maximum Voltage	0.0019	
20	Normal Voltage	0.0013	
20	Battery End Point	0.0018	

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 n78 UL_MIMO HPUE -SCS 15K

Peak-to-Average Ratio

Mode	FR1 UL-MIMO n78 / 20MHz / CP-OFDM (M2)				
Mod.	QPSK	QPSK			Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	6.58	8.46			PASS
Middle CH	6.58	8.38			
Highest CH	6.52	8.38			

Mode	FR1 UL-MIMO n78 / 20MHz / CP-OFDM (M)				
Mod.	QPSK	QPSK			Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	6.36	8.32			PASS
Middle CH	7.30	8.26			
Highest CH	7.30	8.09			



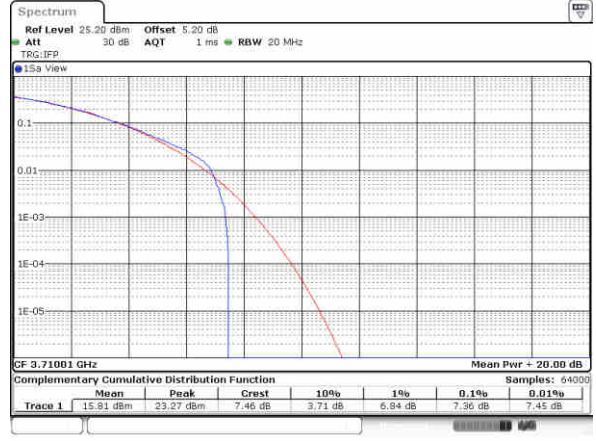
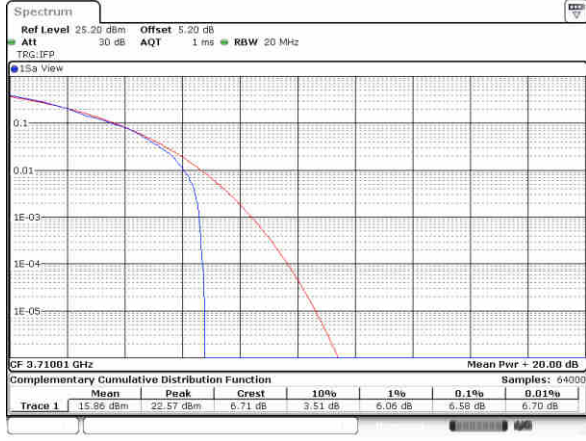
FR1 UL-MIMO n78 / 20MHz / CP-OFDM

QPSK(M2)

QPSK(M)

Lowest Channel / 1RB

Lowest Channel / 1RB

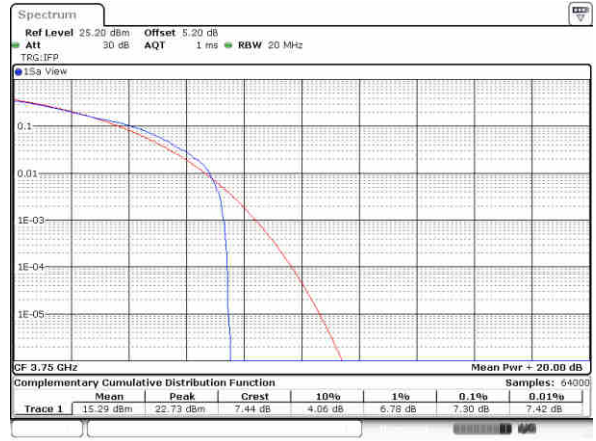
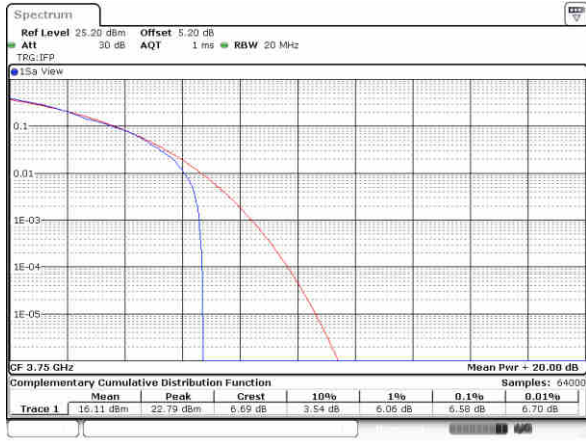


Date: 4.FEB.2021 21:09:17

Date: 3.FEB.2021 06:37:49

Middle Channel / 1 RB

Middle Channel / 1 RB

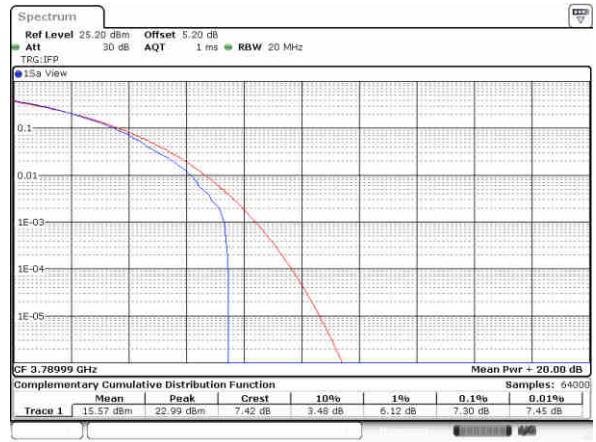
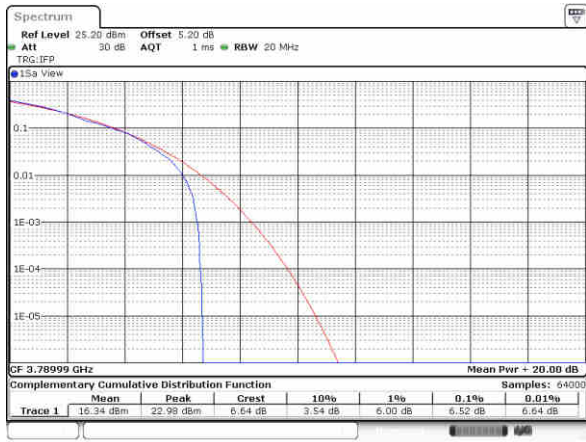


Date: 4.FEB.2021 21:08:17

Date: 3.FEB.2021 06:15:25

Highest Channel / 1 RB

Highest Channel / 1 RB



Date: 4.FEB.2021 21:49:05

Date: 3.FEB.2021 06:41:55



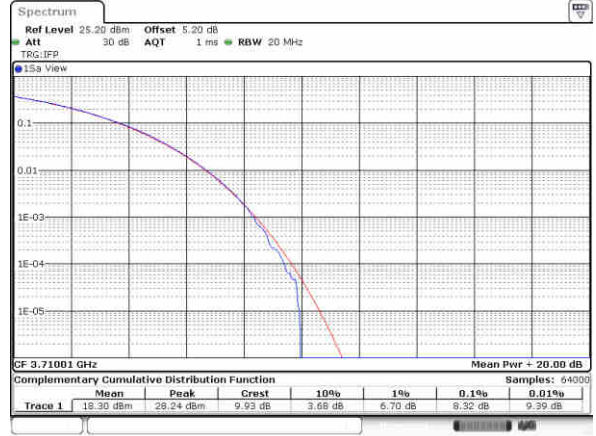
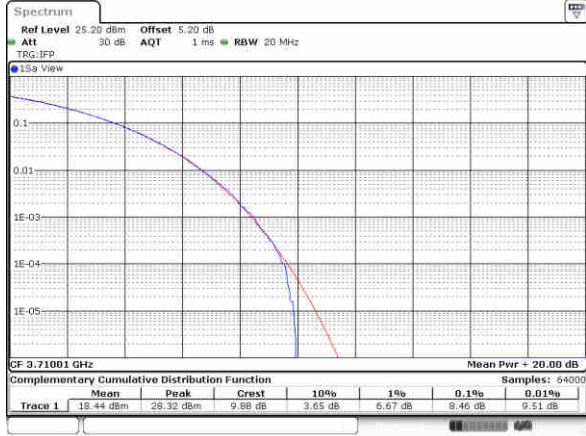
FR1 UL-MIMO n78 / 20MHz / CP-OFDM

QPSK(M2)

QPSK(M)

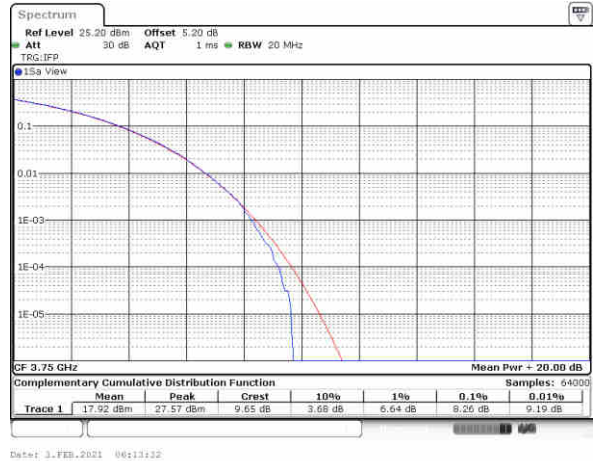
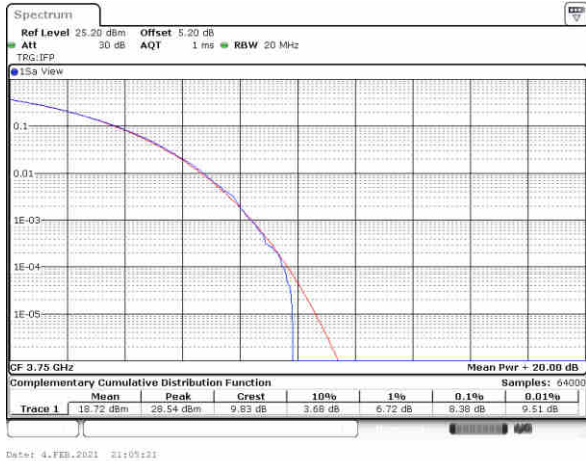
Lowest Channel / Full RB

Lowest Channel / Full RB



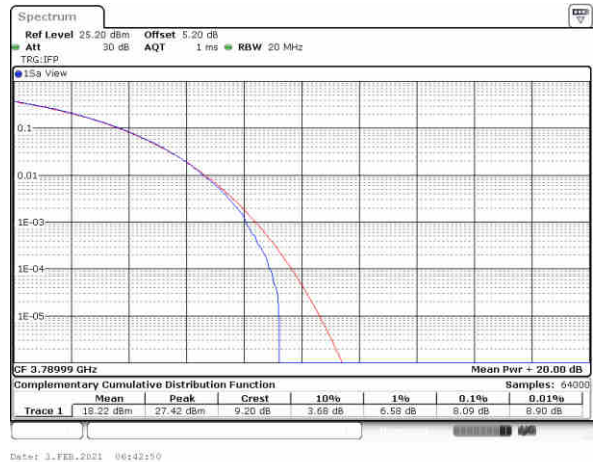
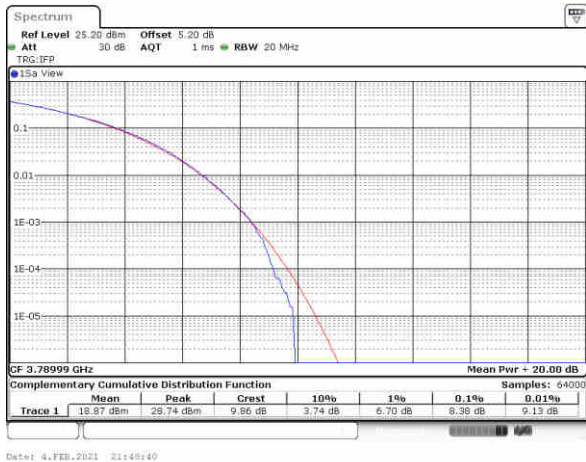
Middle Channel / Full RB

Middle Channel / Full RB



Highest Channel / Full RB

Highest Channel / Full RB



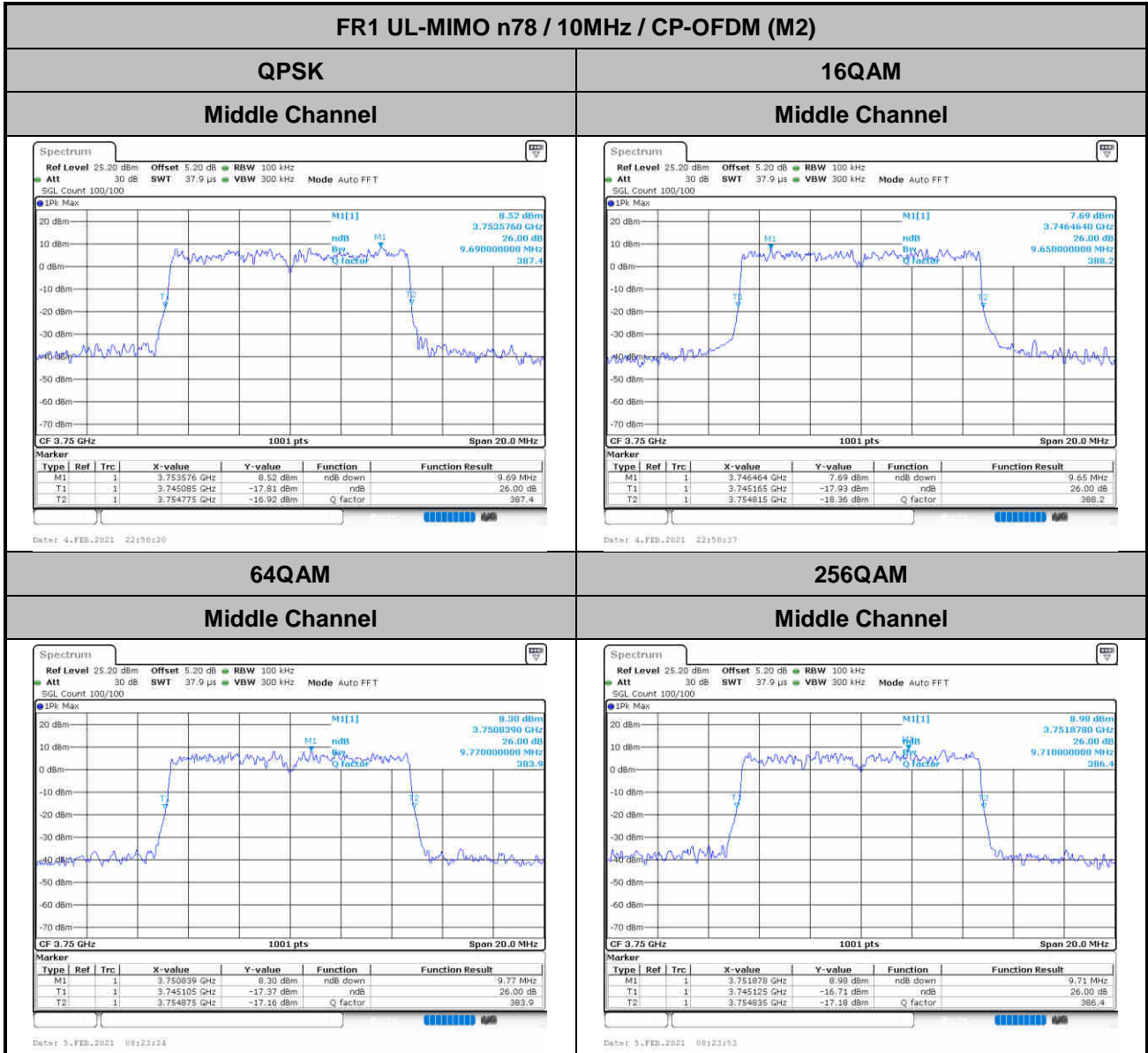


26dB Bandwidth

Mode	FR1 UL-MIMO n78 : 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	9.69	9.65	9.77	9.69	9.71	9.67	9.75	9.75

Mode	FR1 UL-MIMO n78 : 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	14.83	14.86	14.83	14.83	14.92	14.83	14.80	14.86

Mode	FR1 UL-MIMO n78 : 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	19.66	19.7	19.74	19.94	19.74	19.7	19.94	19.7





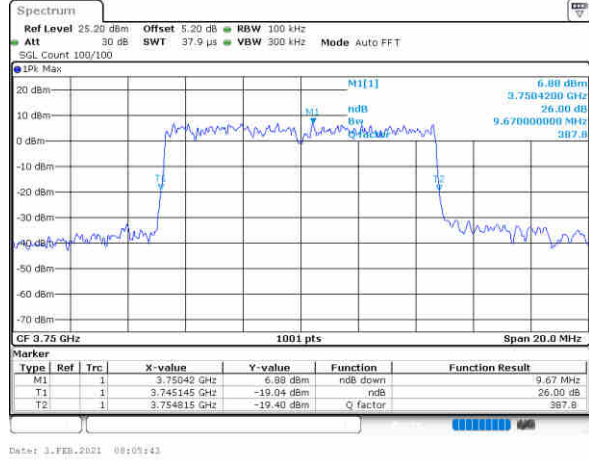
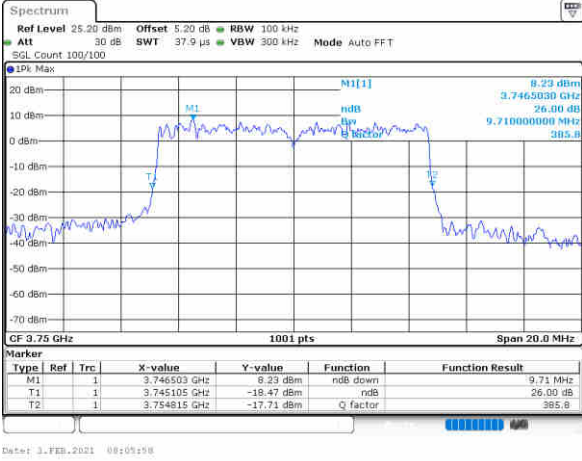
FR1 UL-MIMO n78 / 10MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel

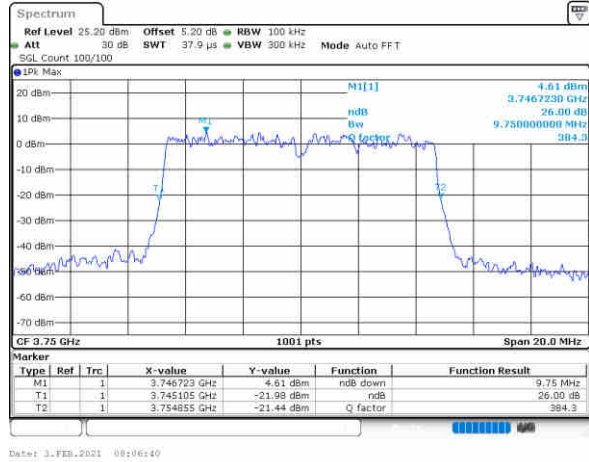
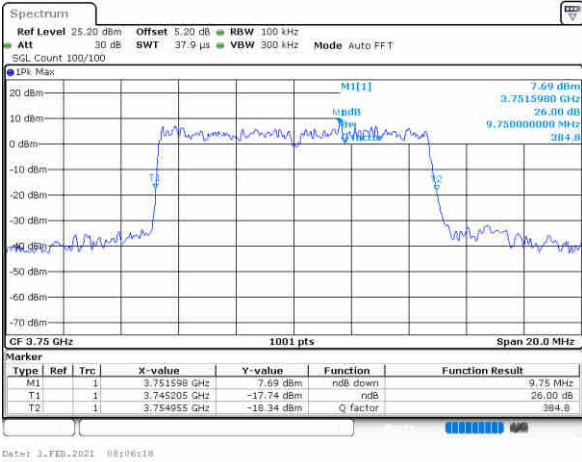


64QAM

256QAM

Middle Channel

Middle Channel





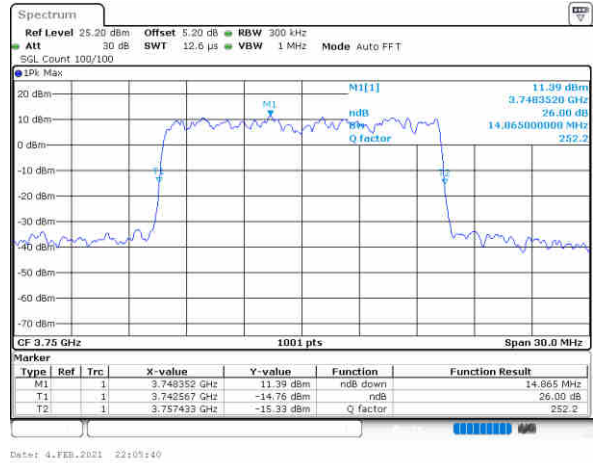
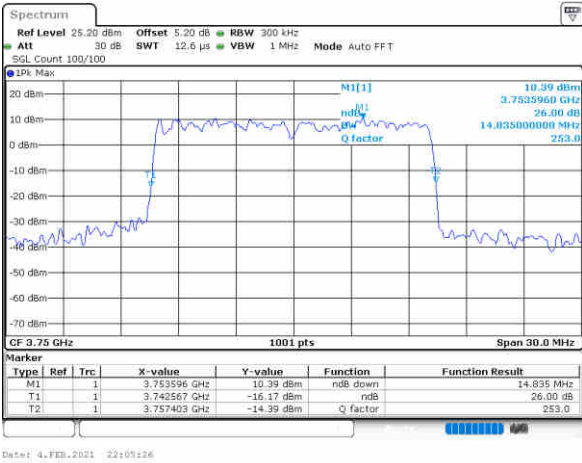
FR1 UL-MIMO n78 / 15MHz / CP-OFDM (M2)

QPSK

16QAM

Middle Channel

Middle Channel

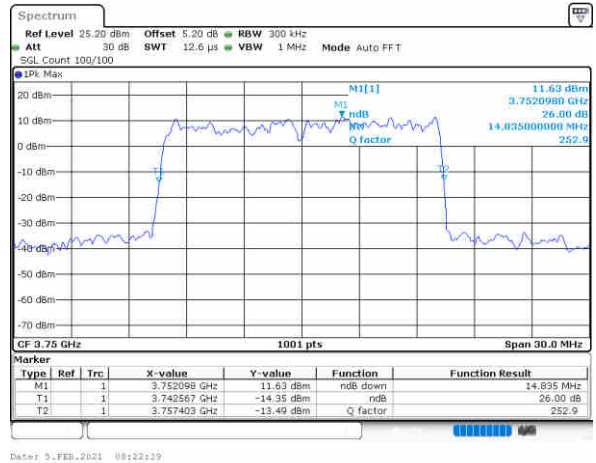
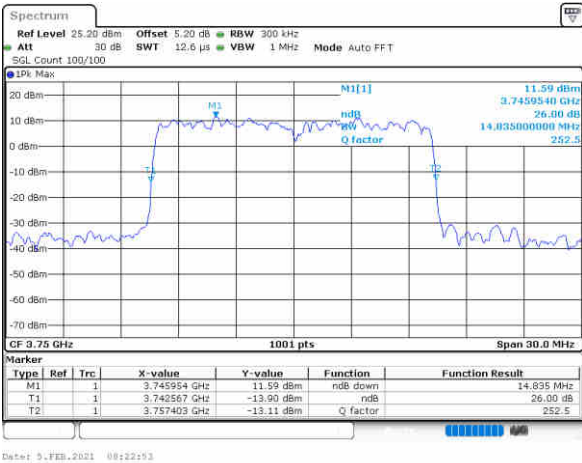


64QAM

256QAM

Middle Channel

Middle Channel





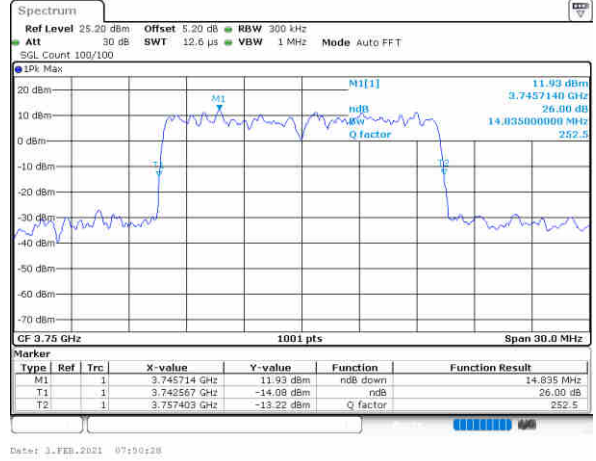
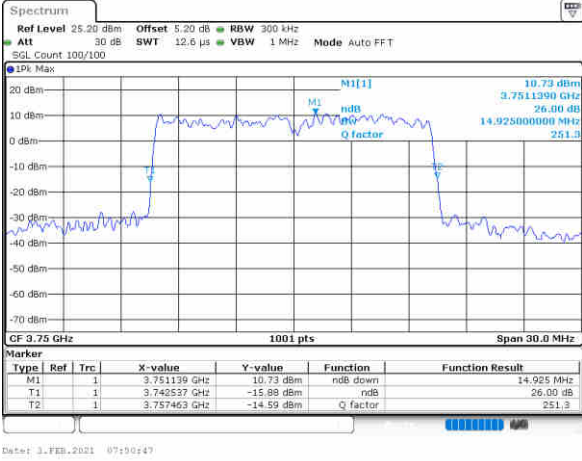
FR1 UL-MIMO n78 / 15MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel

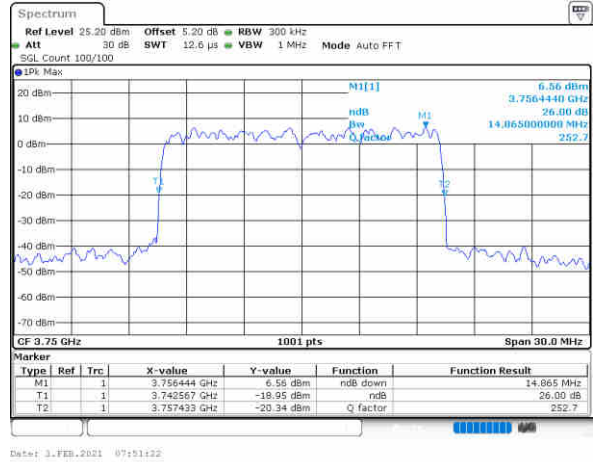
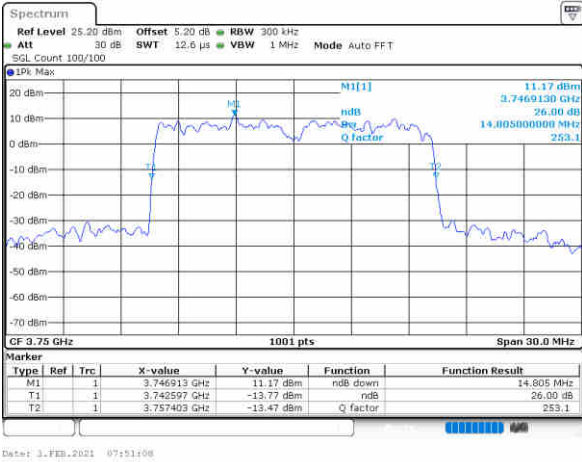


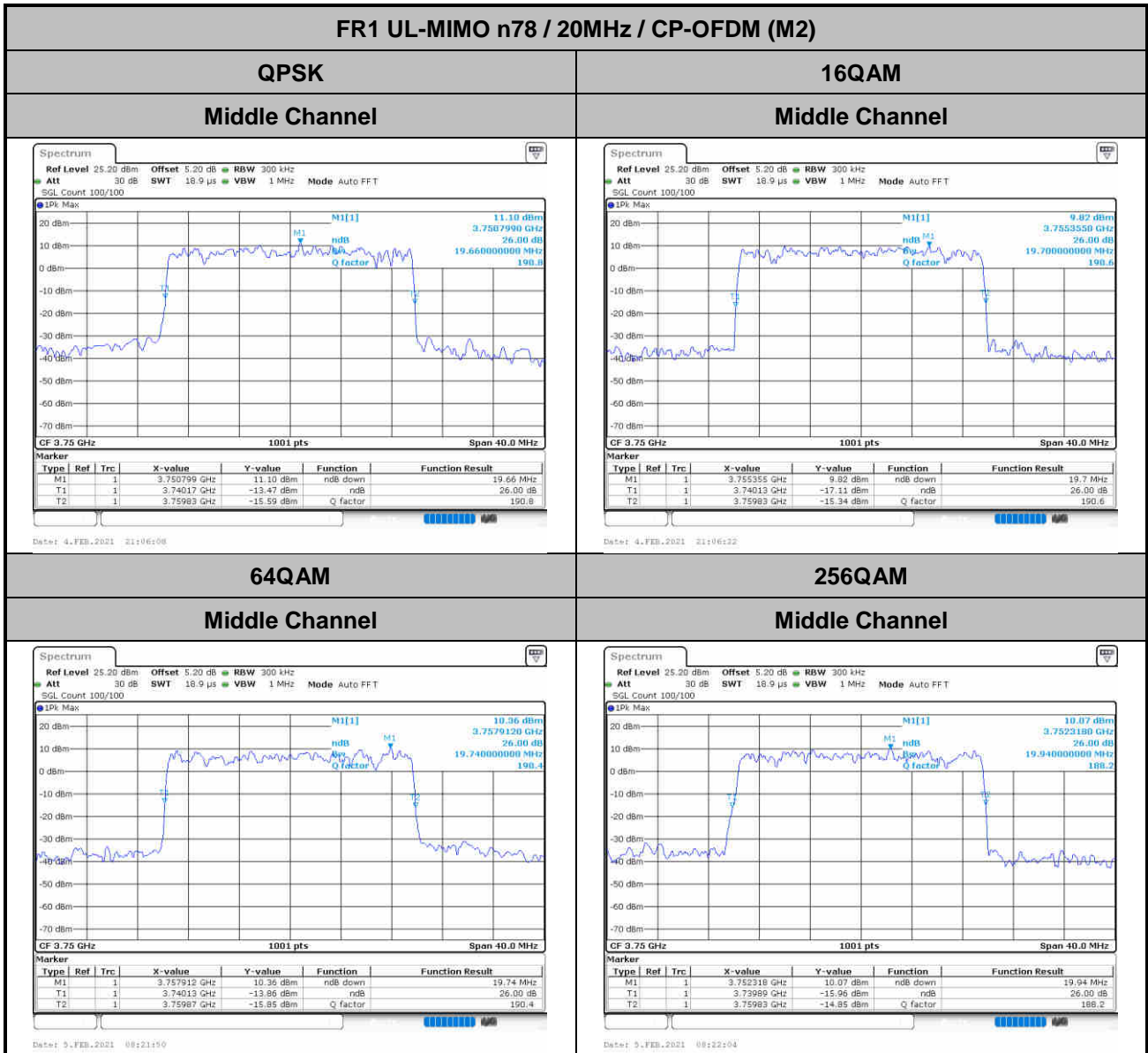
64QAM

256QAM

Middle Channel

Middle Channel







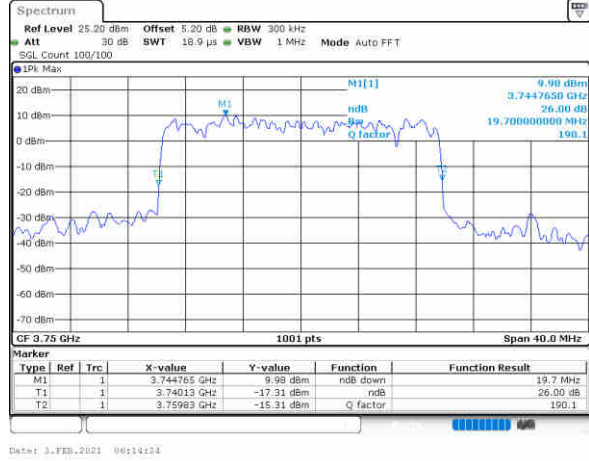
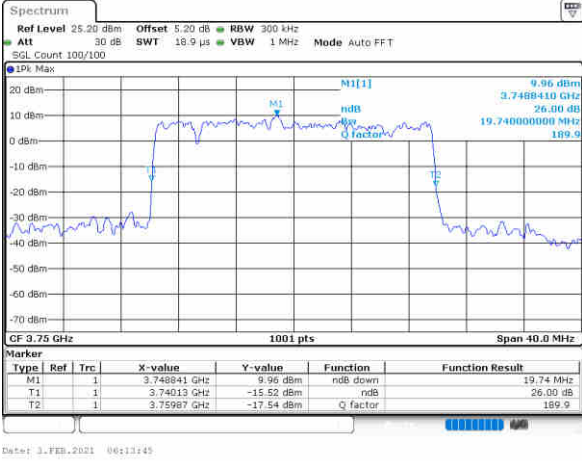
FR1 UL-MIMO n78 / 20MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel

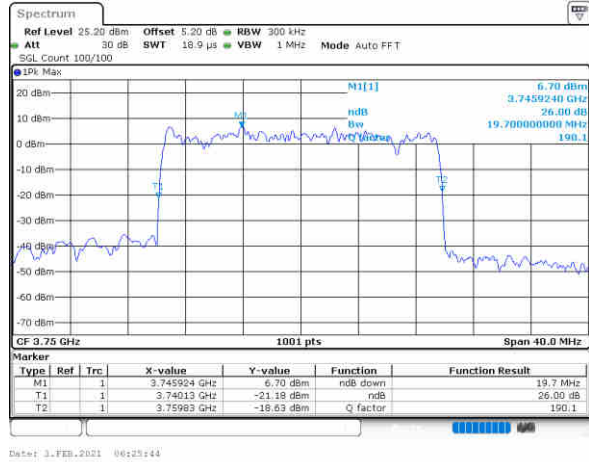
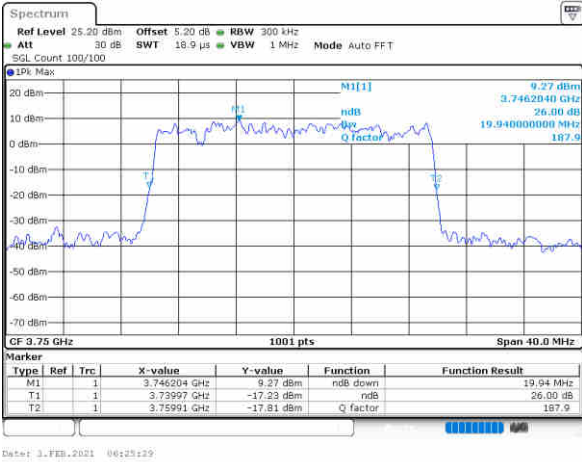


64QAM

256QAM

Middle Channel

Middle Channel





Occupied Bandwidth

Mode	FR1 UL-MIMO n78 : 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	9.27	9.29	9.29	9.29	9.27	9.29	9.29	9.31

Mode	FR1 UL-MIMO n78 : 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	14.15	14.18	14.15	14.15	14.18	14.12	14.15	14.12

Mode	FR1 UL-MIMO n78 : 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	18.78	18.98	18.98	18.94	18.94	18.98	18.98	18.90



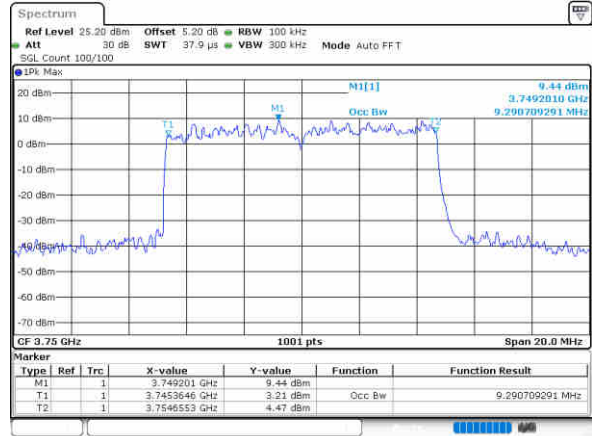
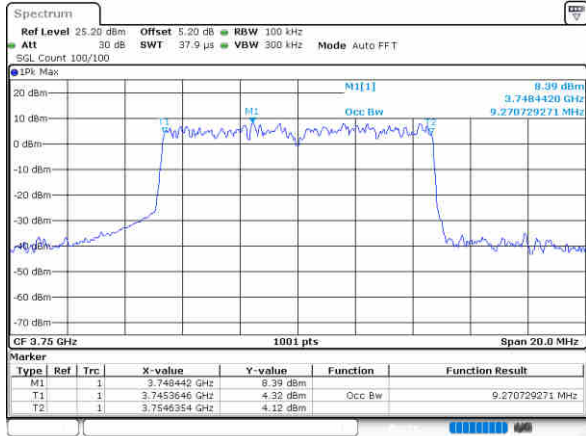
FR1 UL-MIMO n78 / 10MHz / CP-OFDM (M2)

QPSK

16QAM

Middle Channel

Middle Channel



Date: 4.FEB.2021 22:58:15

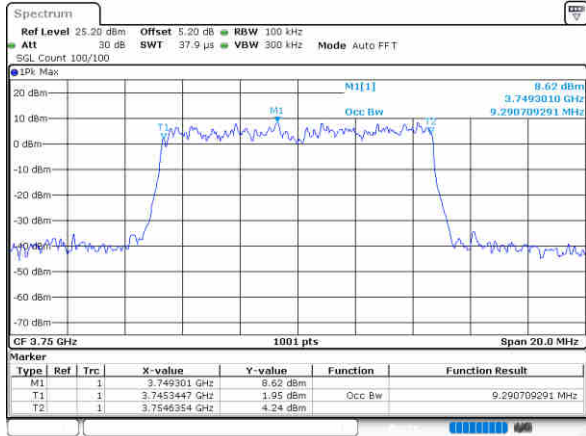
Date: 4.FEB.2021 22:58:42

64QAM

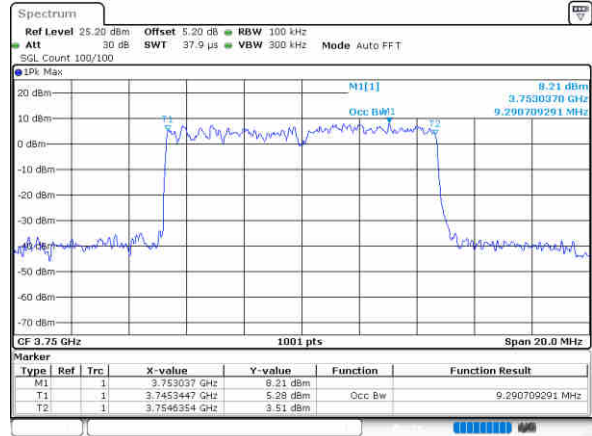
256QAM

Middle Channel

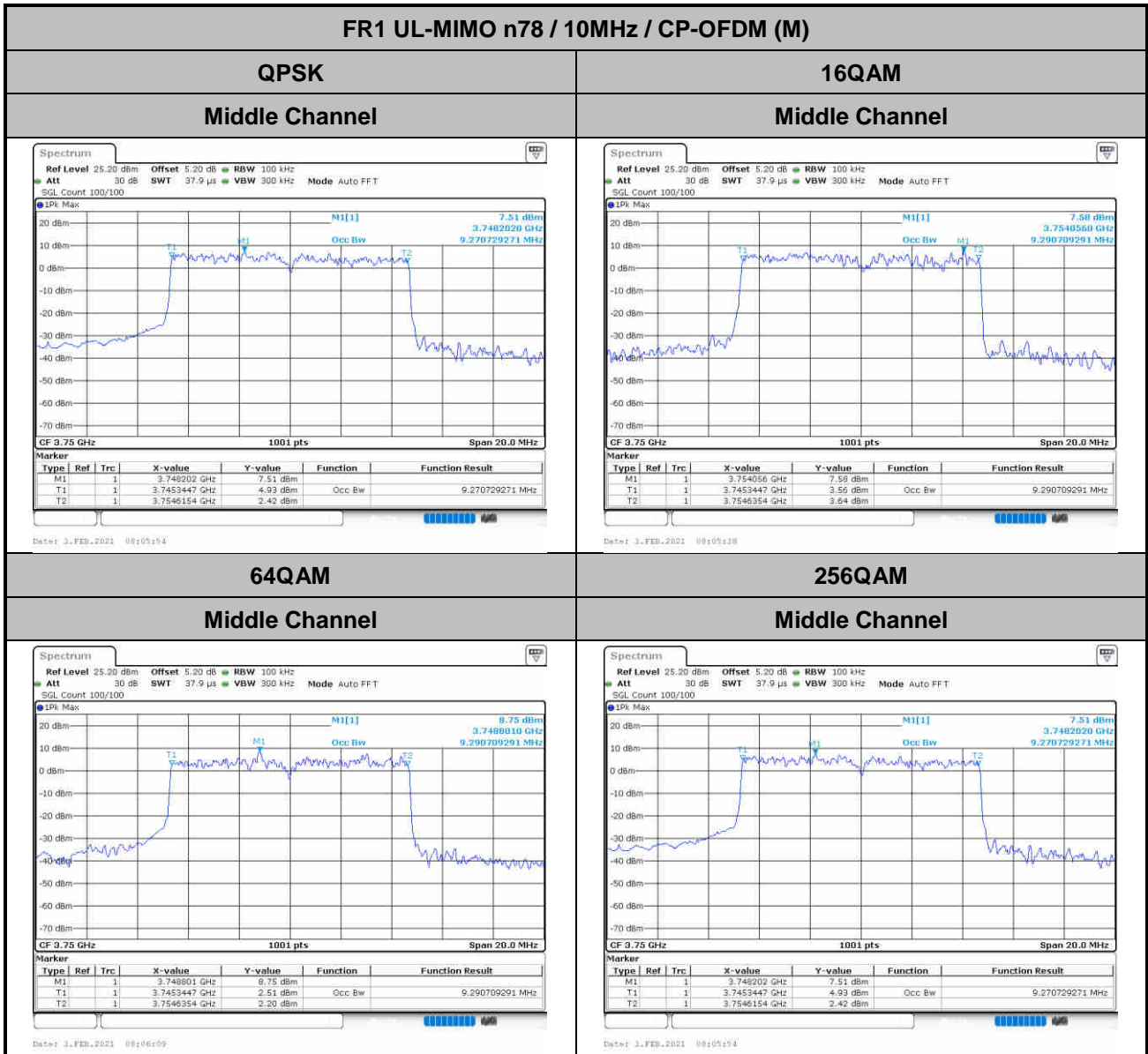
Middle Channel

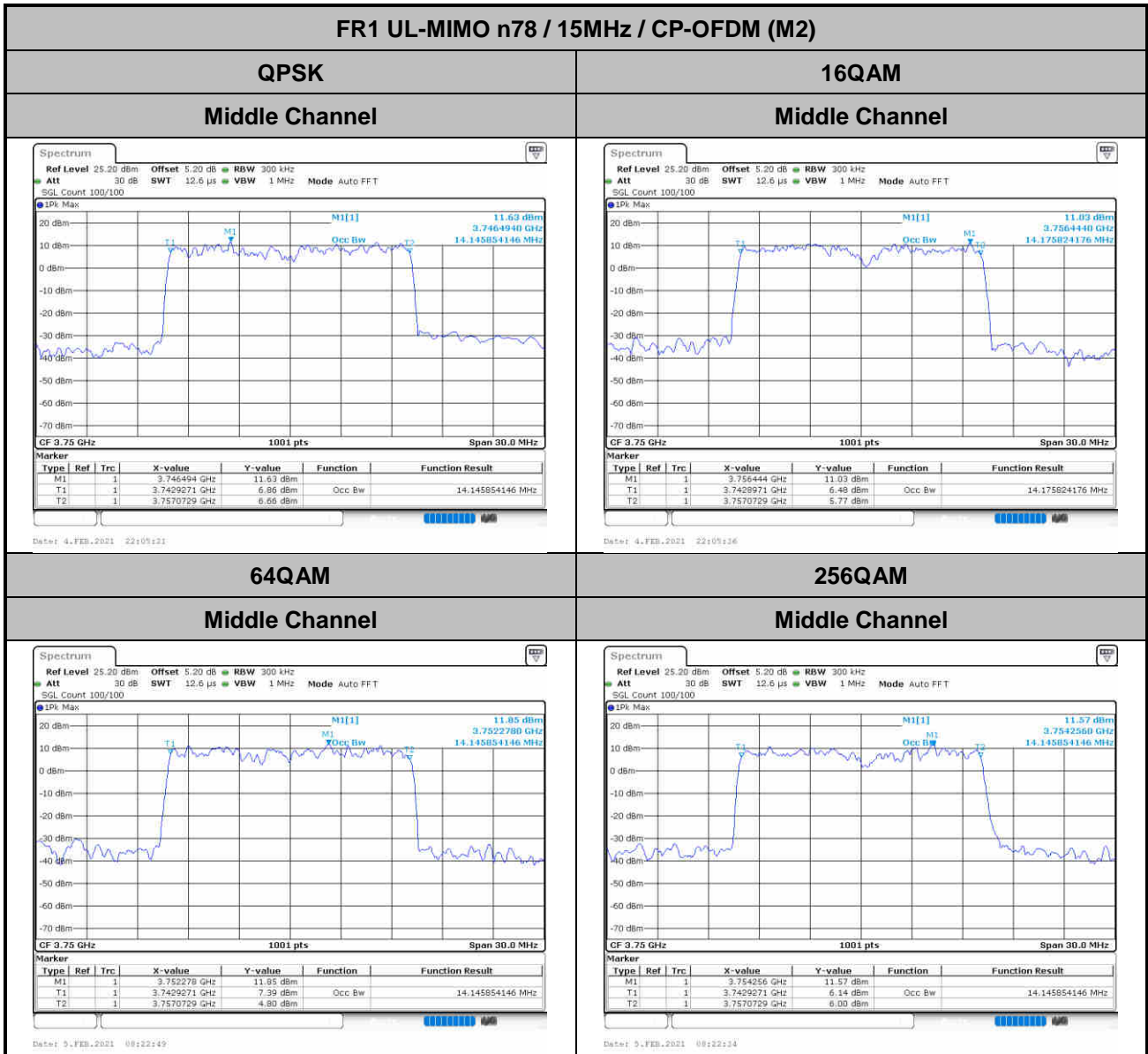


Date: 5.FEB.2021 08:23:19



Date: 5.FEB.2021 08:23:40







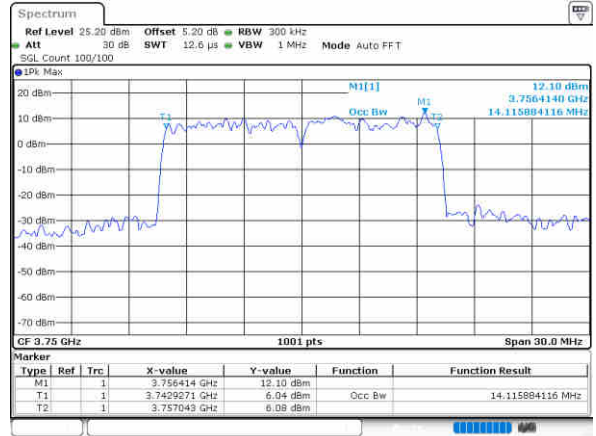
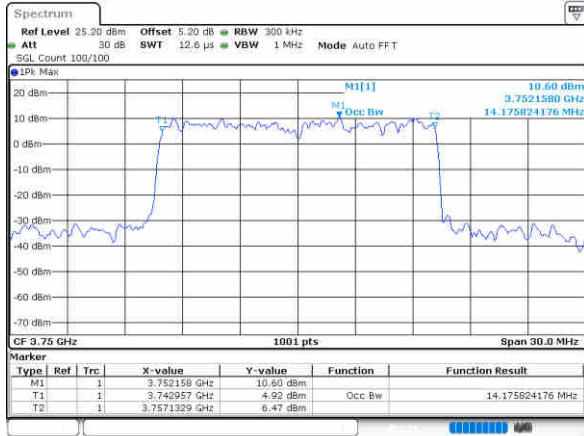
FR1 UL-MIMO n78 / 15MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel



Date: 3.FEB.2021 07:50:42

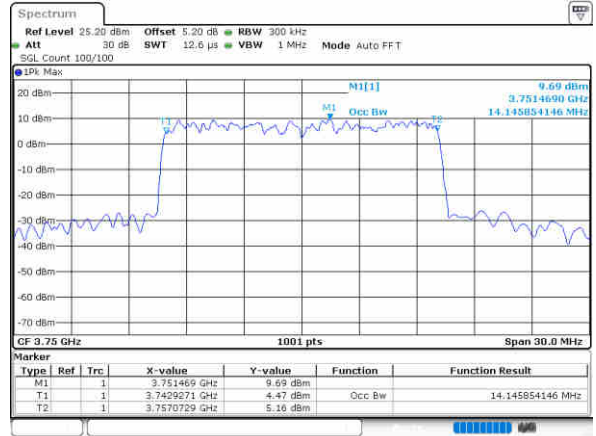
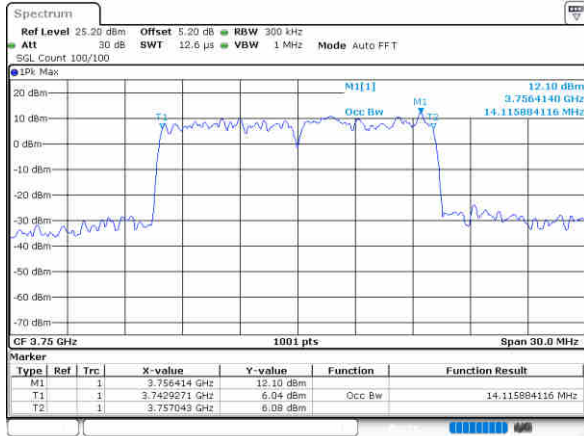
Date: 3.FEB.2021 07:50:24

64QAM

256QAM

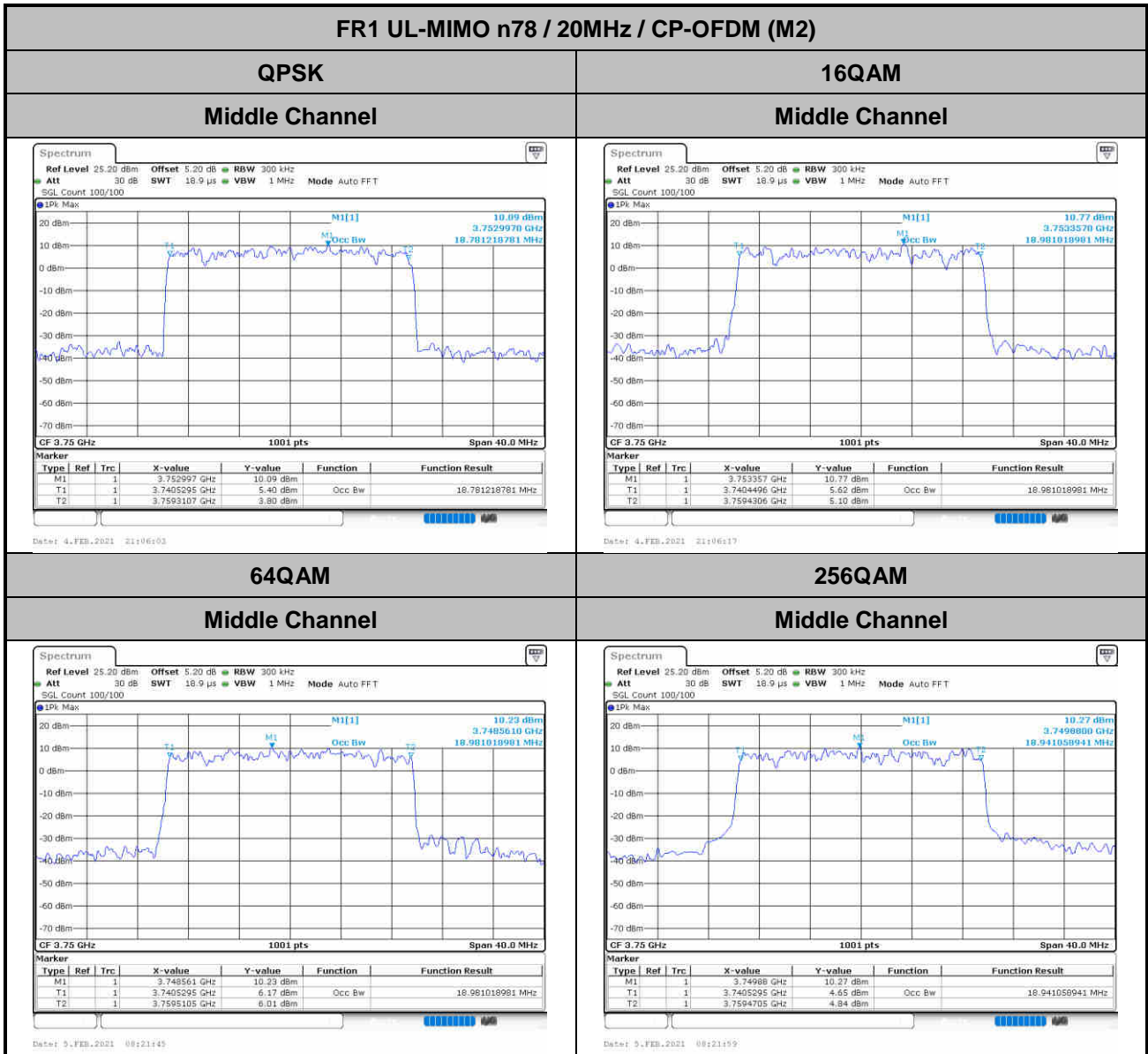
Middle Channel

Middle Channel



Date: 3.FEB.2021 07:50:24

Date: 3.FEB.2021 07:51:02





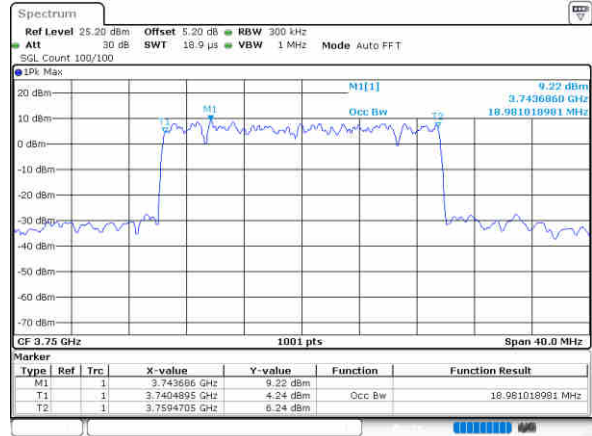
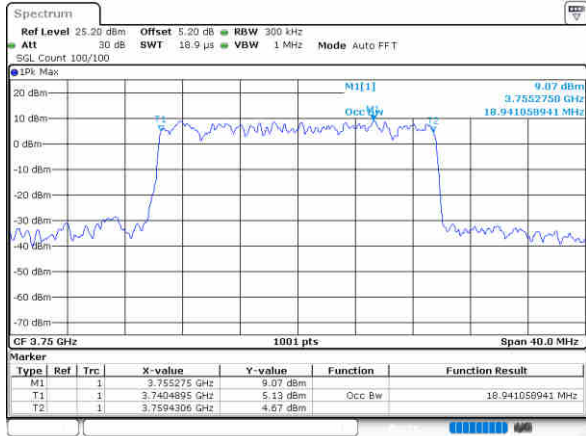
FR1 UL-MIMO n78 / 20MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel



Date: 3.FEB.2021 06:13:41

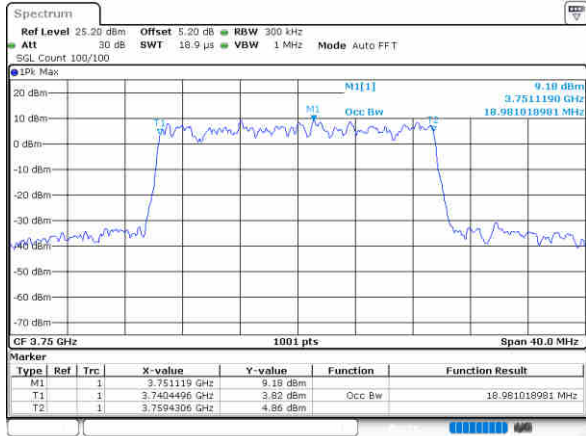
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64QAM

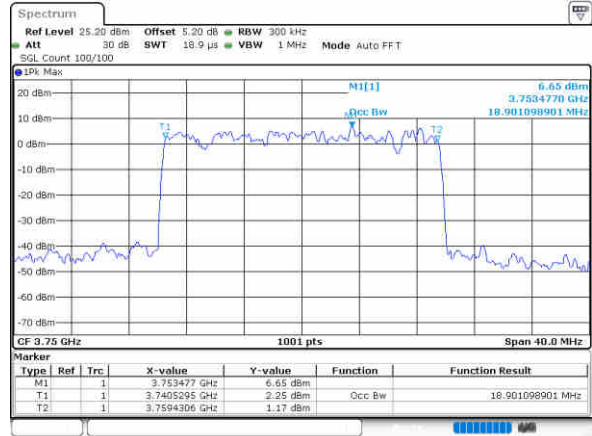
256QAM

Middle Channel

Middle Channel



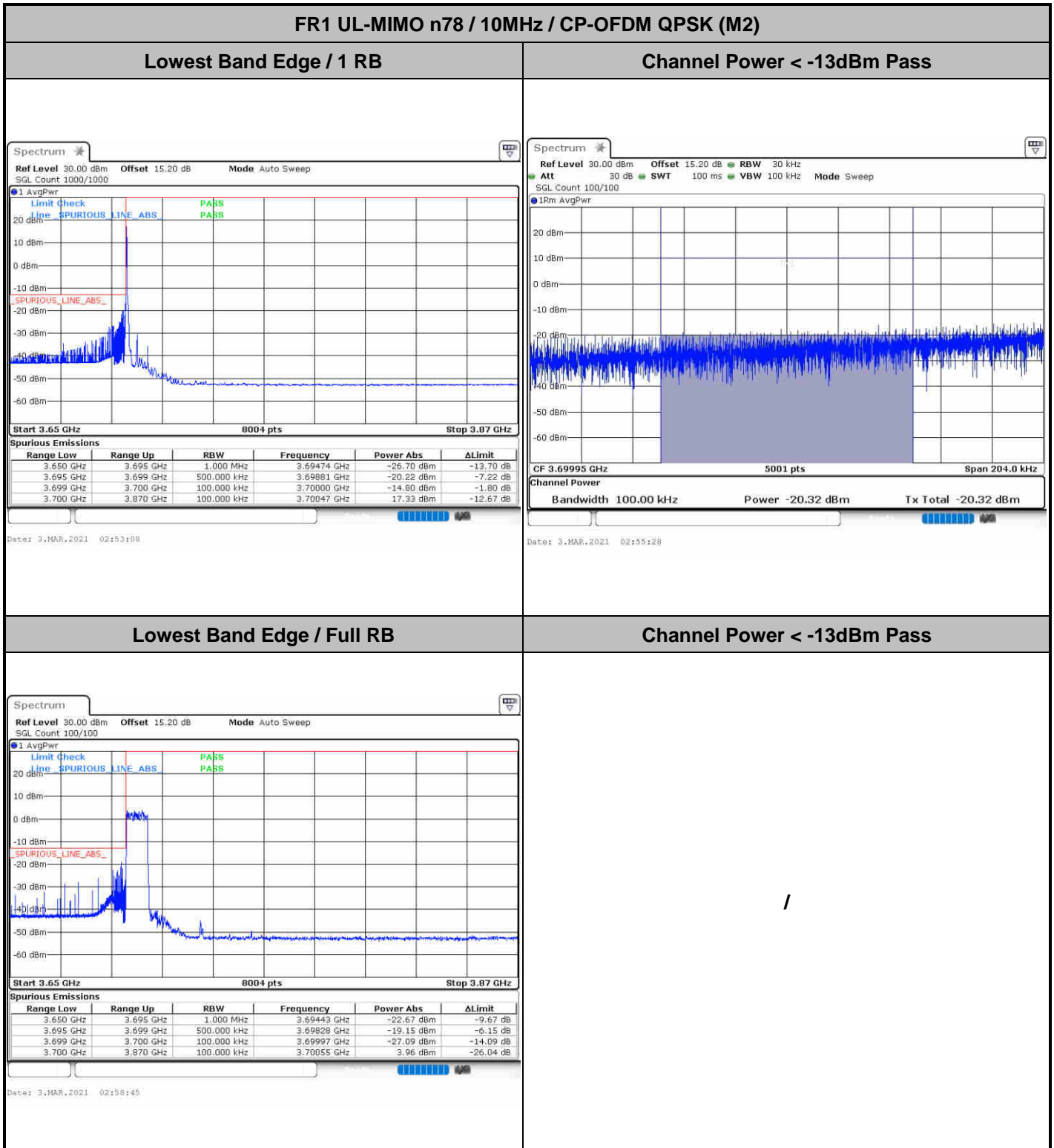
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Date: 3.FEB.2021 06:25:39



Conducted Band Edge

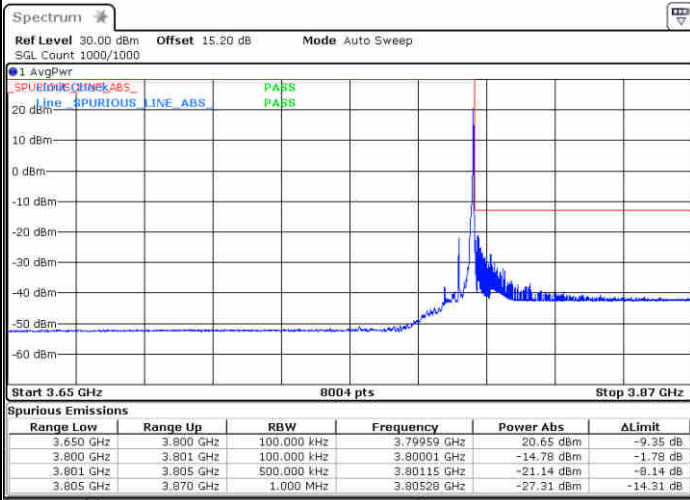




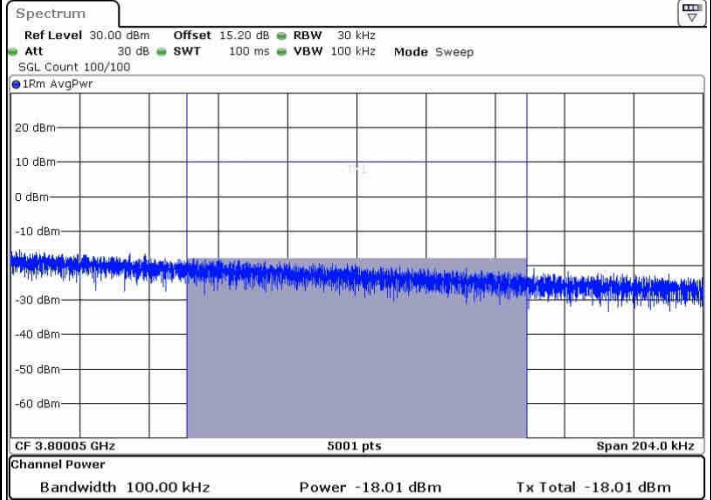
FR1 UL-MIMO n78 / 10MHz / CP-OFDM QPSK (M2)

Highest Band Edge / 1 RB

Channel Power < -13dBm Pass



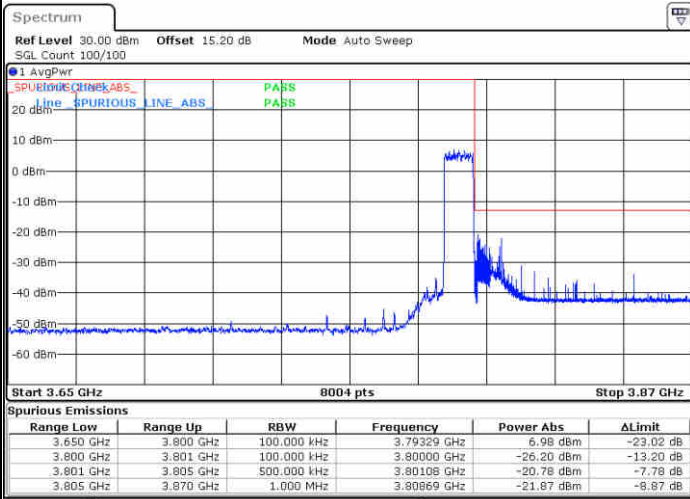
Date: 11.FEB.2021 01:53:19



Date: 11.FEB.2021 01:57:28

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



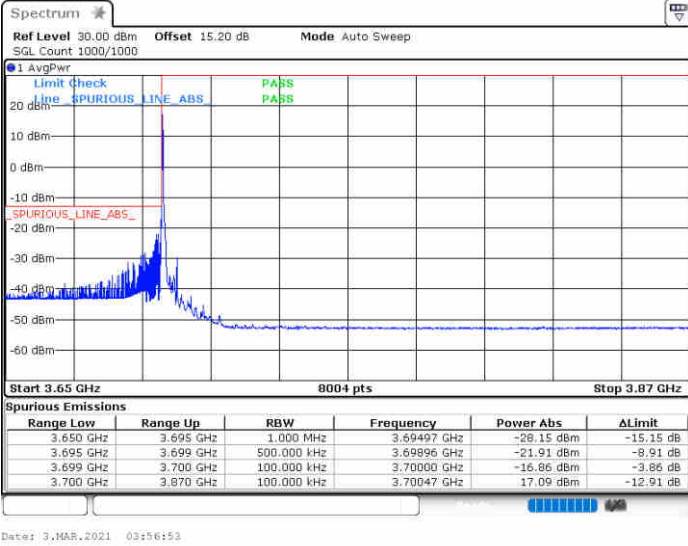
Date: 11.FEB.2021 01:51:00



FR1 UL-MIMO n78 / 10MHz / CP-OFDM QPSK (M)

Lowest Band Edge / 1 RB

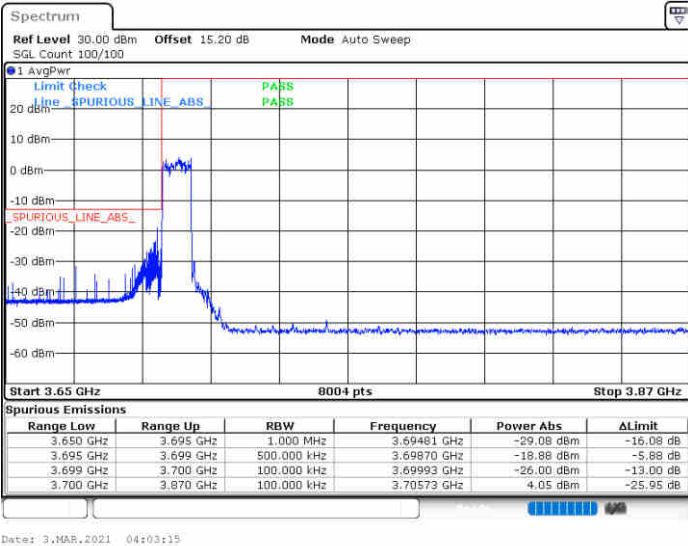
Channel Power < -13dBm Pass



/

Lowest Band Edge / Full RB

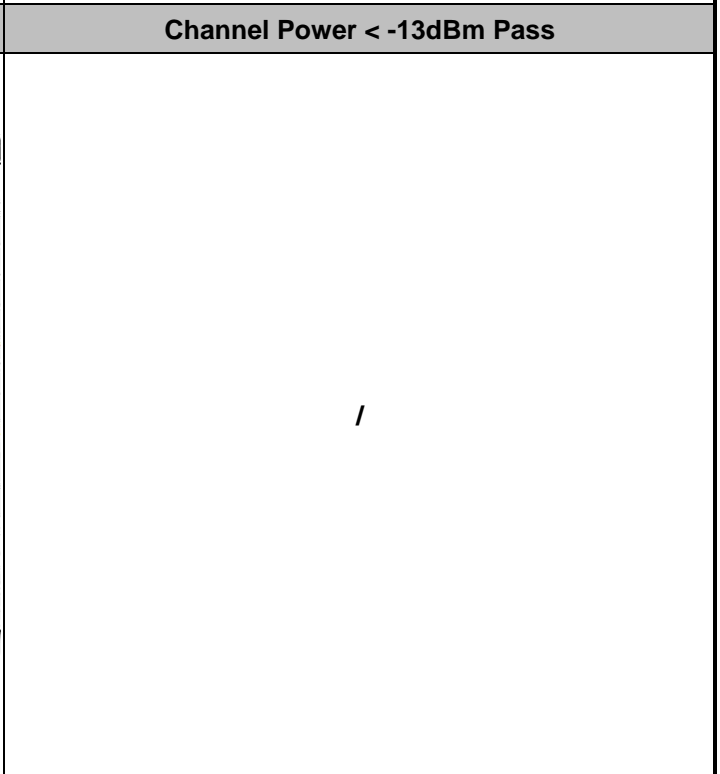
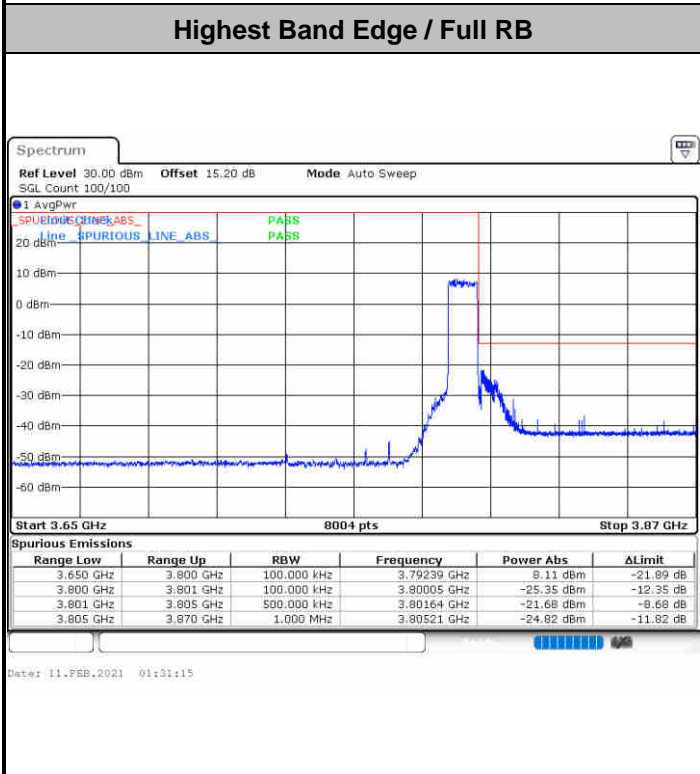
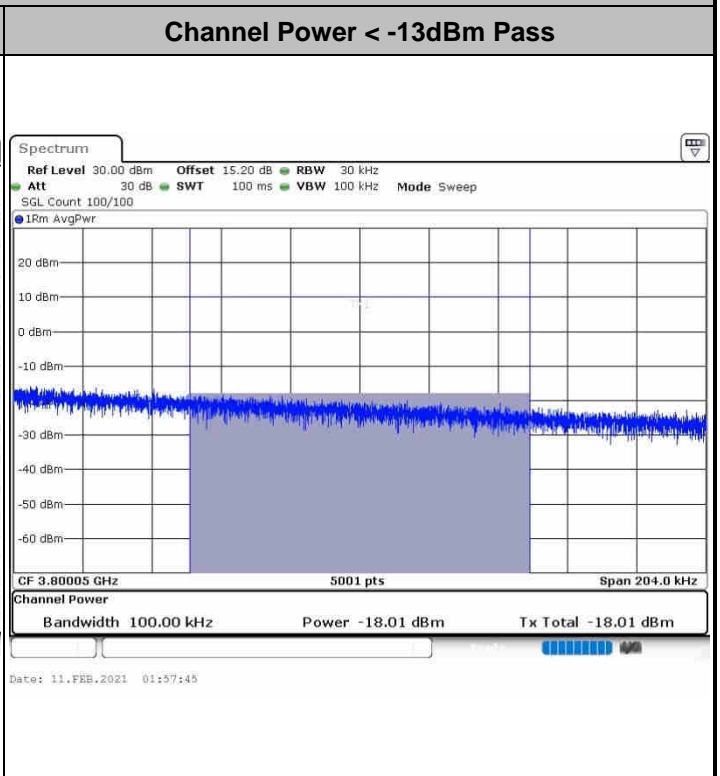
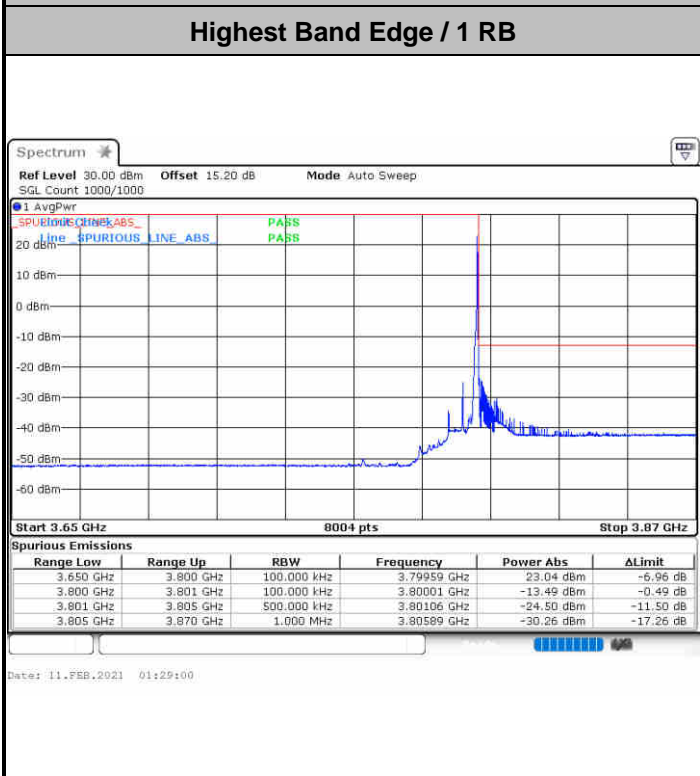
Channel Power < -13dBm Pass



/



FR1 UL-MIMO n78 / 10MHz / CP-OFDM QPSK (M)

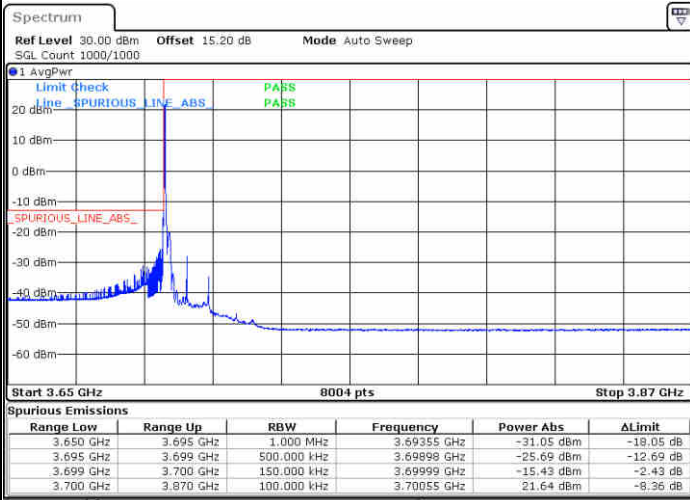




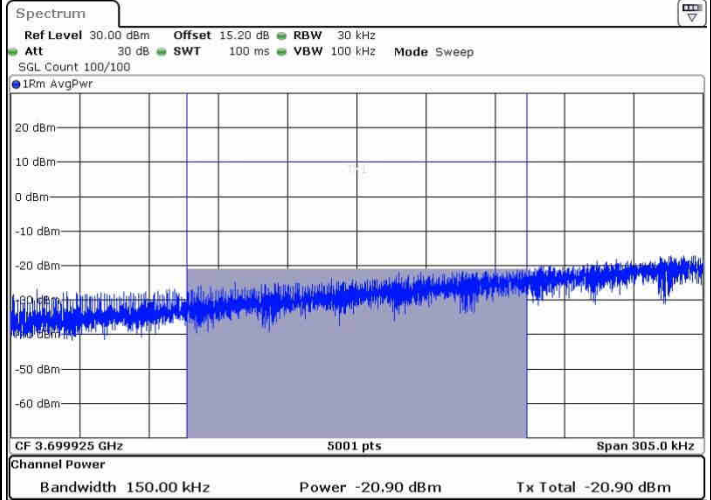
FR1 UL-MIMO n78 / 15MHz / CP-OFDM QPSK (M2)

Lowest Band Edge / 1 RB

Channel Power < -13dBm Pass



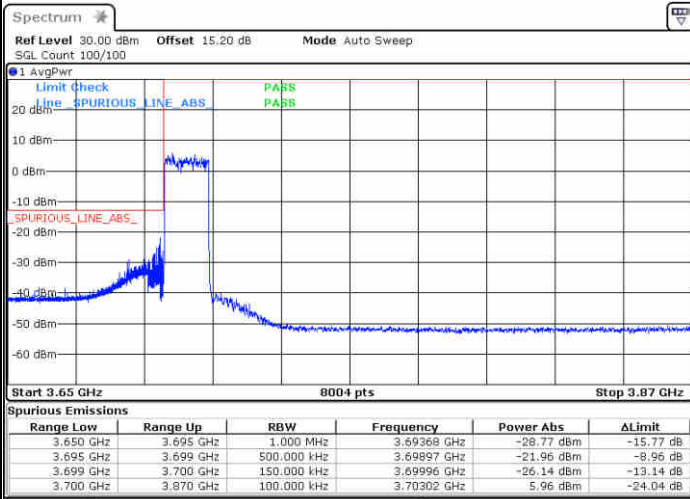
Date: 12.MAR.2021 05:16:02



Date: 12.MAR.2021 05:22:54

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



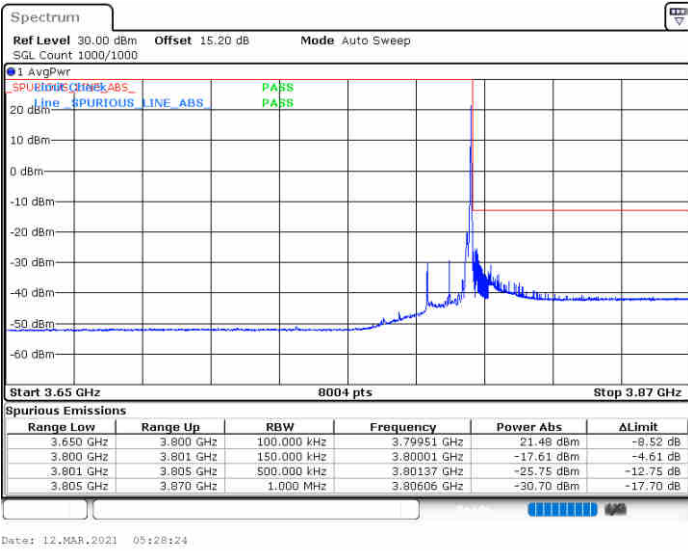
Date: 12.MAR.2021 05:13:20



FR1 UL-MIMO n78 /15MHz / CP-OFDM QPSK (M2)

Highest Band Edge / 1 RB

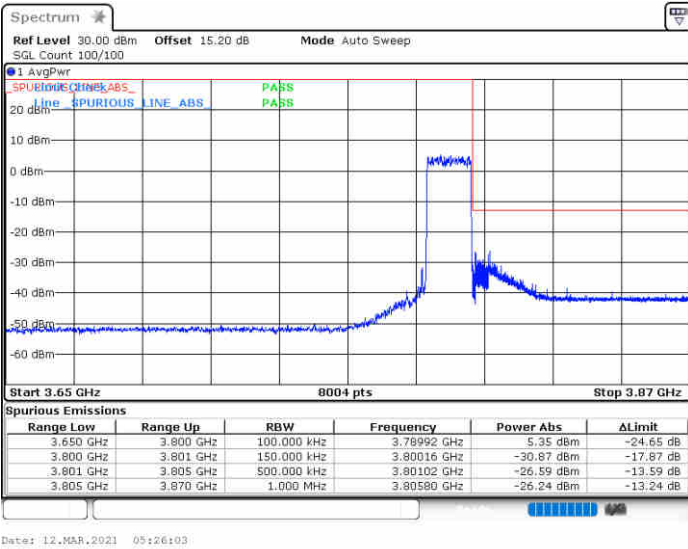
Channel Power < -13dBm Pass



/

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



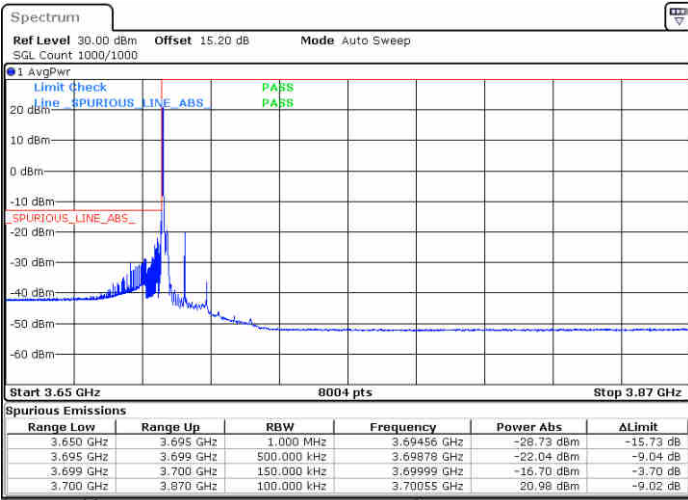
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FR1 UL-MIMO n78 / 15MHz / CP-OFDM QPSK (M)

Lowest Band Edge / 1 RB

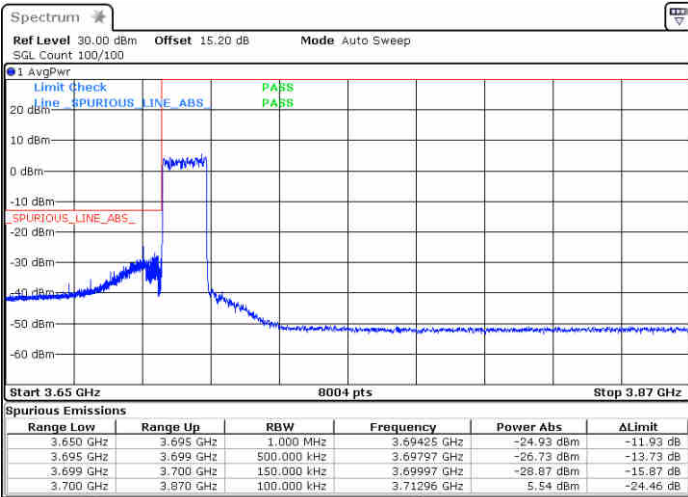
Channel Power < -13dBm Pass



Date: 12.MAR.2021 11:24:02

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



Date: 12.MAR.2021 11:24:26



FR1 UL-MIMO n78 /15MHz / CP-OFDM QPSK (M)

Highest Band Edge / 1 RB

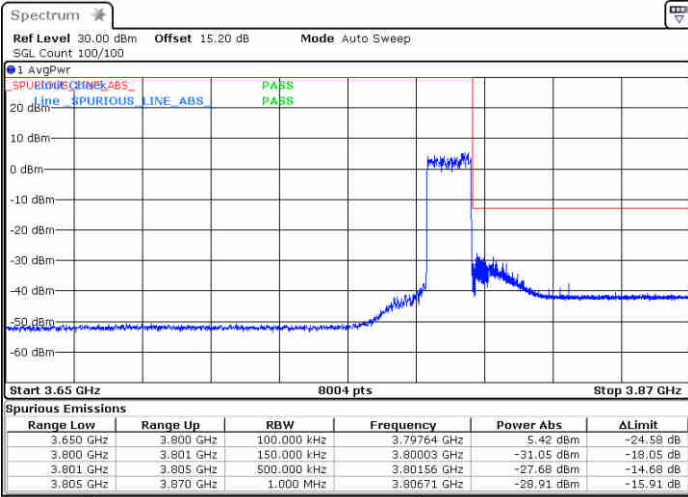
Channel Power < -13dBm Pass



Date: 12.MAR.2021 11:19:18

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



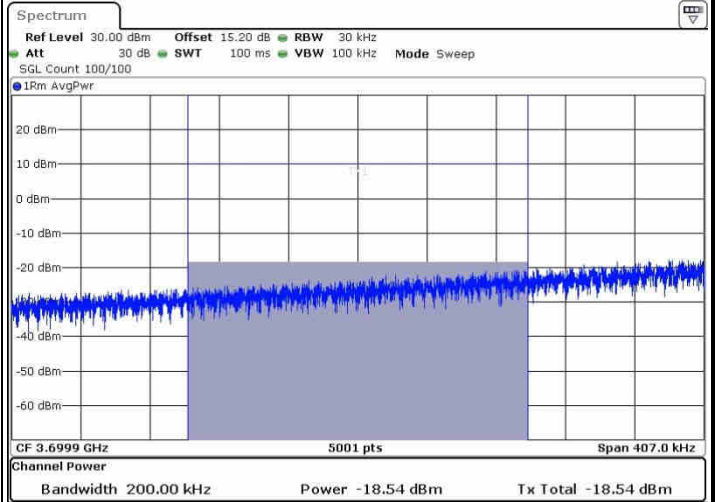
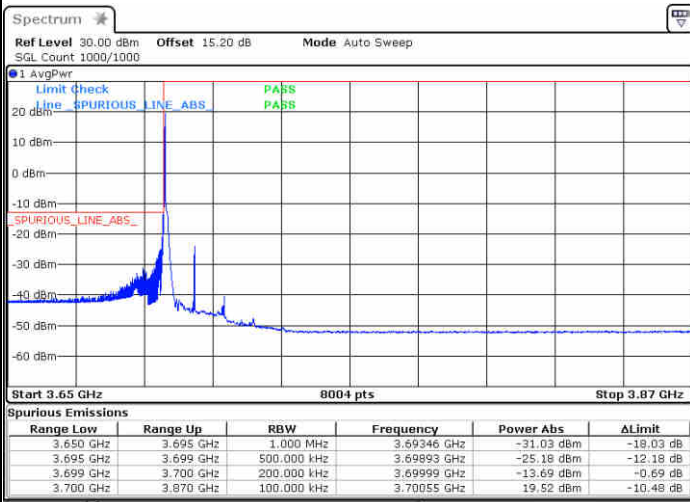
Date: 12.MAR.2021 11:18:21



FR1 UL-MIMO n78 / 20MHz / CP-OFDM QPSK (M2)

Lowest Band Edge / 1 RB

Channel Power < -13dBm Pass

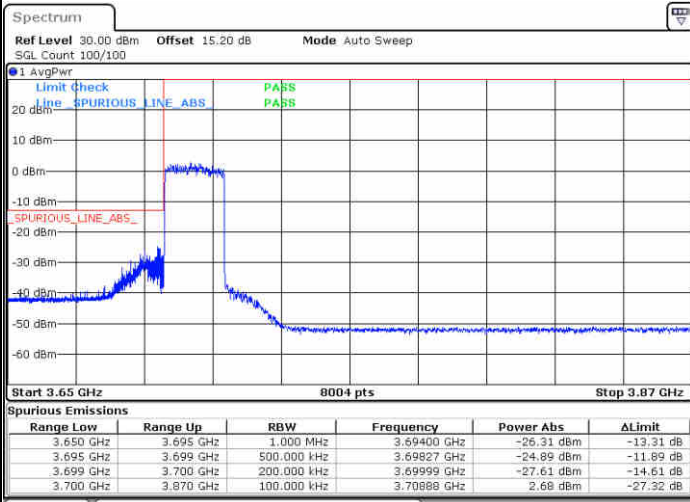


Date: 14.MAR.2021 02:21:06

Date: 14.MAR.2021 02:16:02

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



Date: 14.MAR.2021 02:30:59

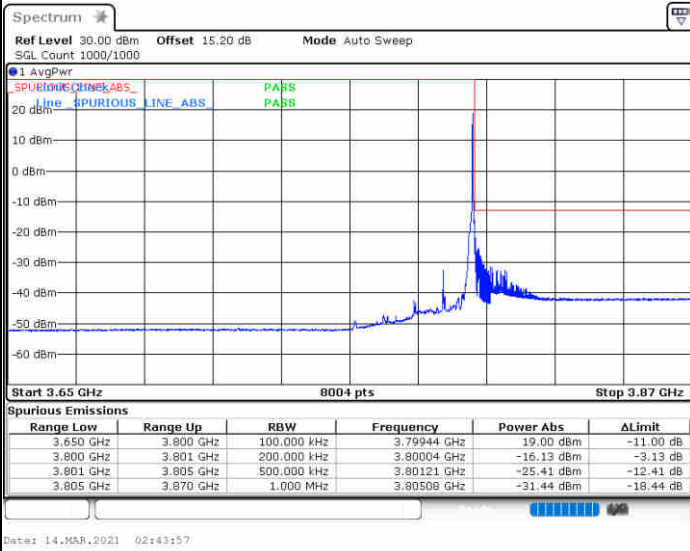
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FR1 UL-MIMO n78 / 20MHz / CP-OFDM QPSK (M2)

Highest Band Edge / 1 RB

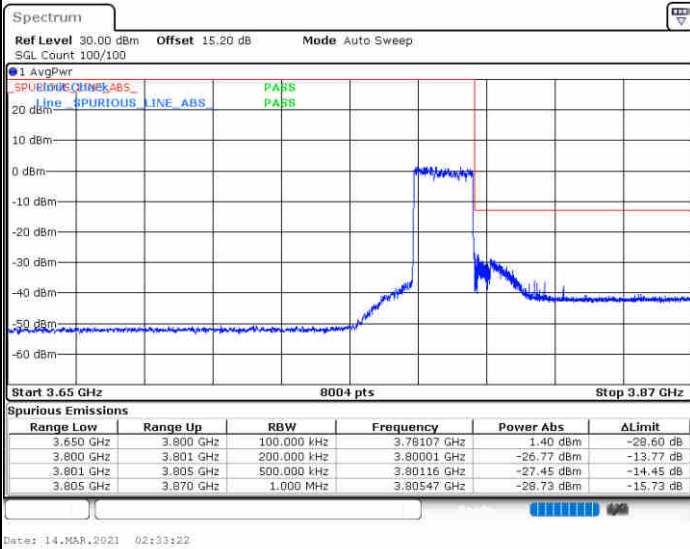
Channel Power < -13dBm Pass



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Highest Band Edge / Full RB

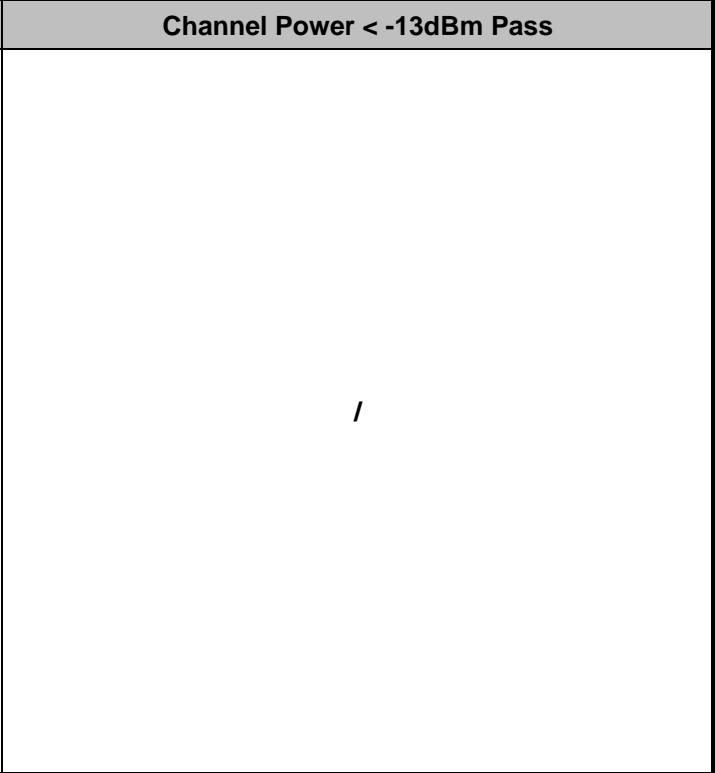
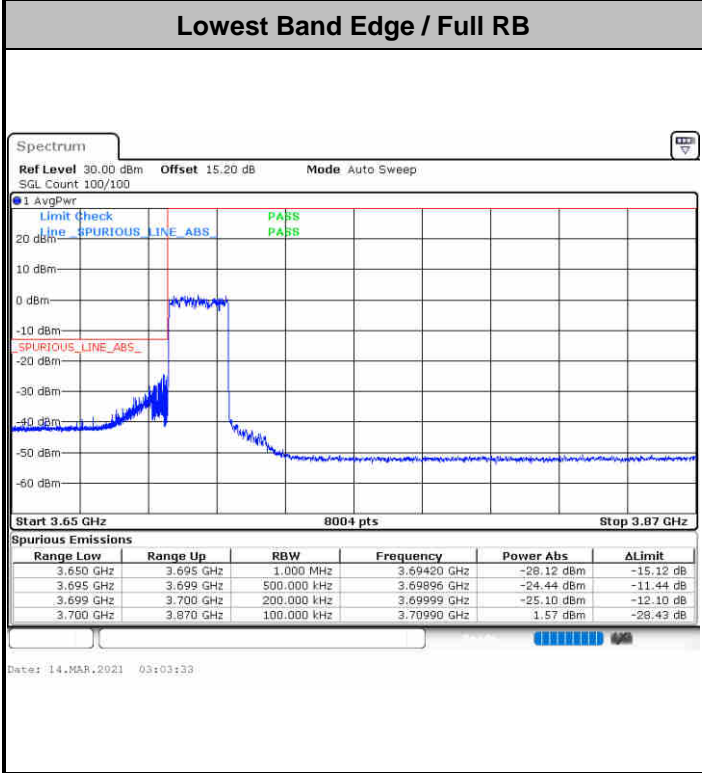
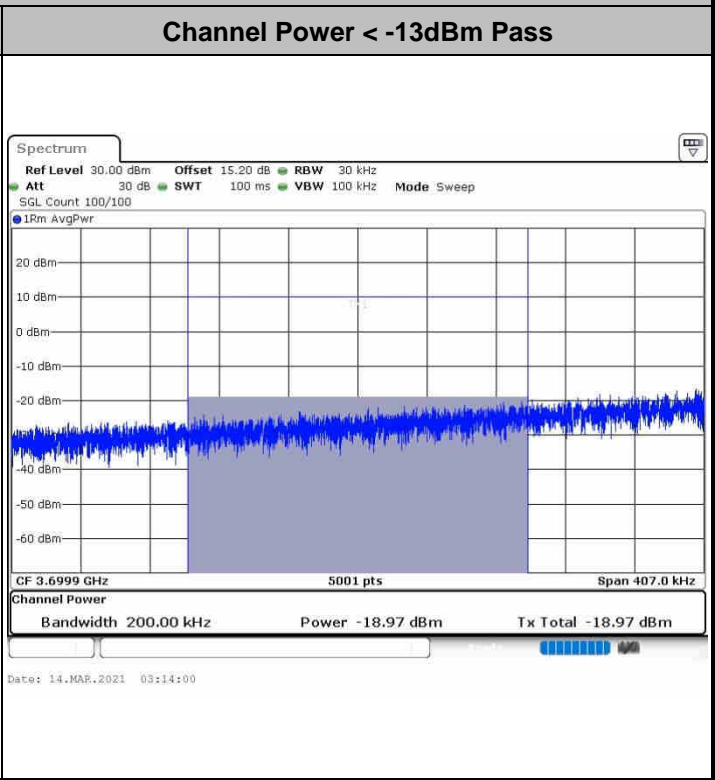
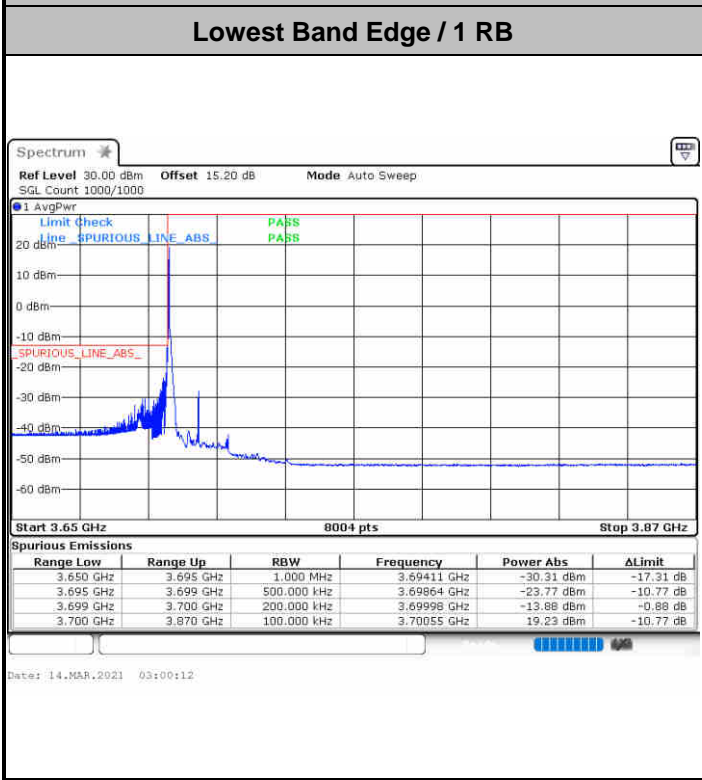
Channel Power < -13dBm Pass



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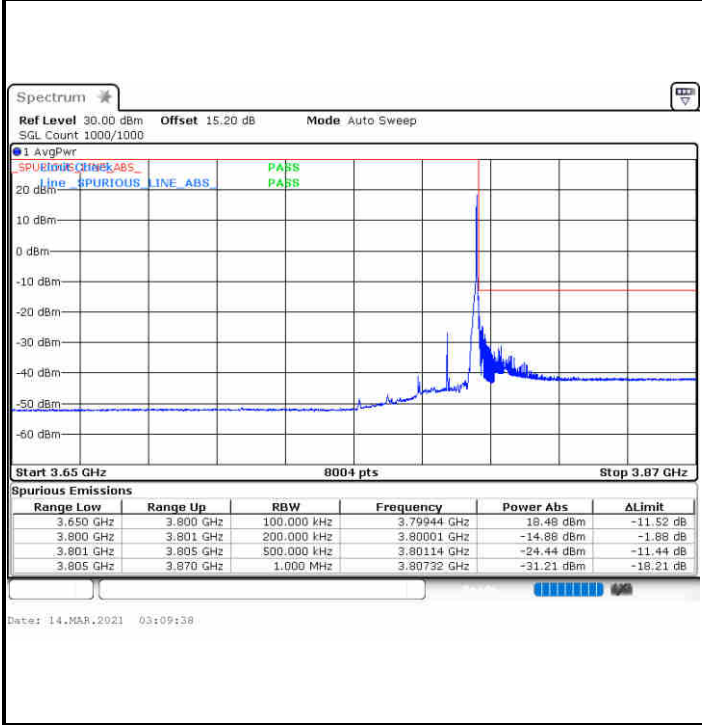
FR1 UL-MIMO n78 / 20MHz / CP-OFDM QPSK (M)



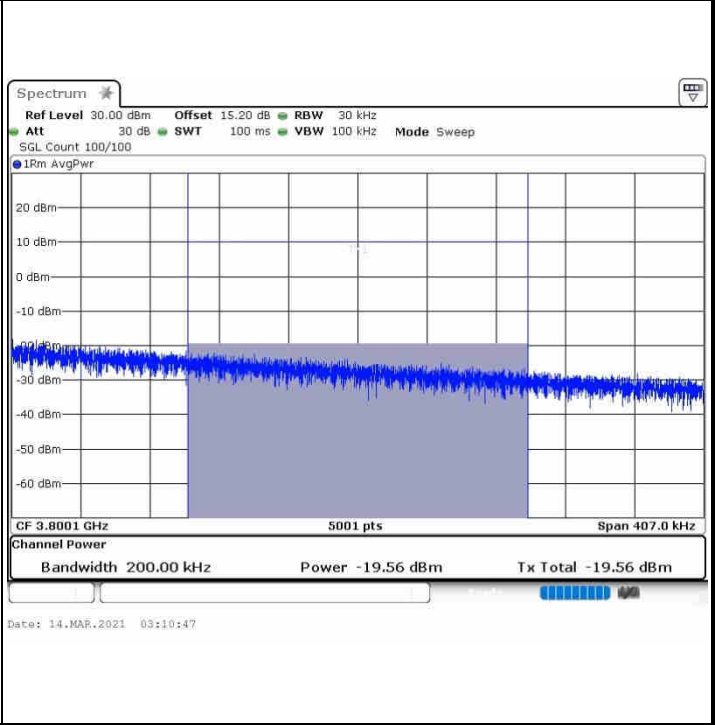


FR1 UL-MIMO n78 / 20MHz / CP-OFDM QPSK (M)

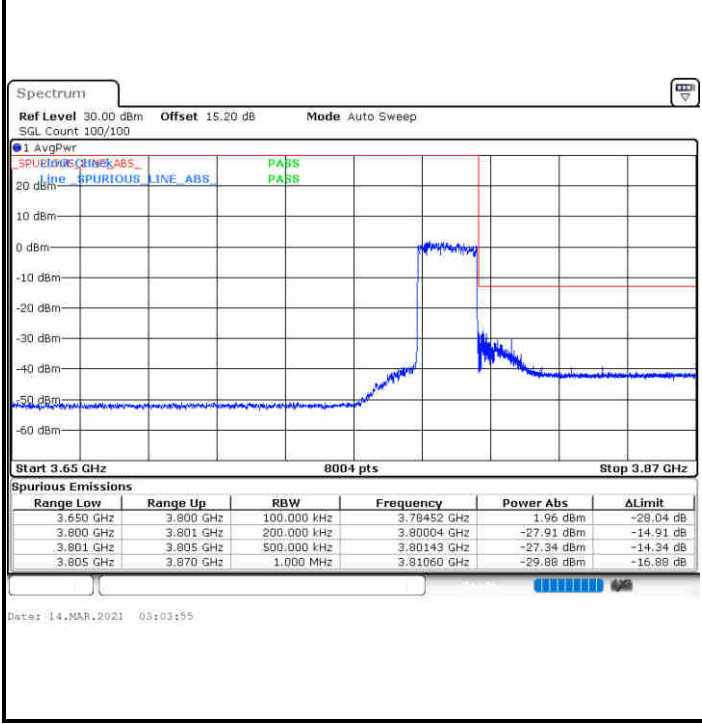
Highest Band Edge / 1 RB



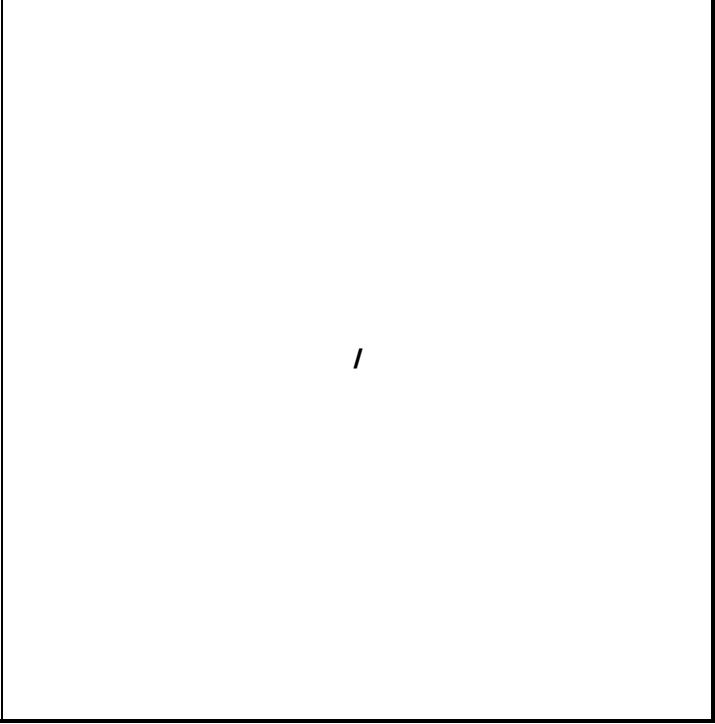
Channel Power < -13dBm Pass



Highest Band Edge / Full RB



Channel Power < -13dBm Pass



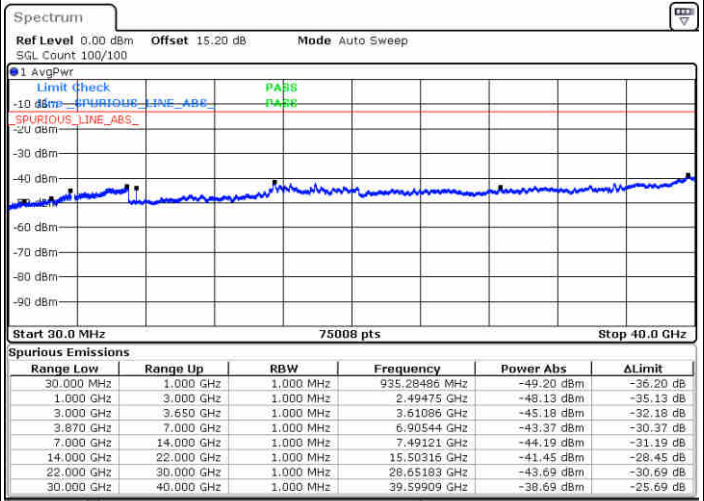
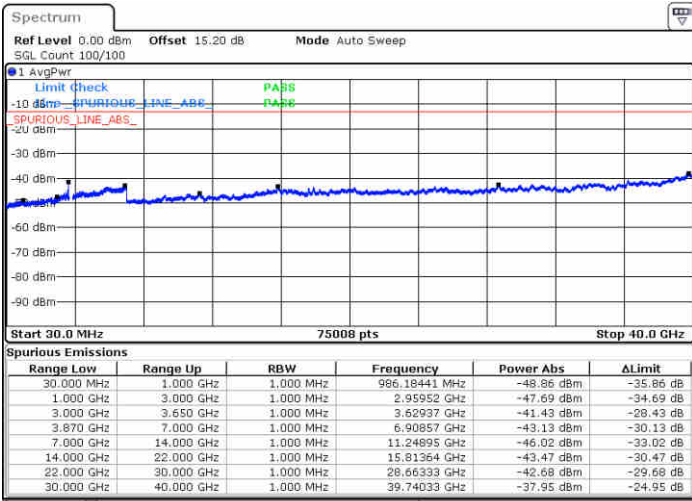


Conducted Spurious Emission

FR1 UL-MIMO n78 / 10MHz / CP-OFDM QPSK (M2)

Lowest Channel / 1RB

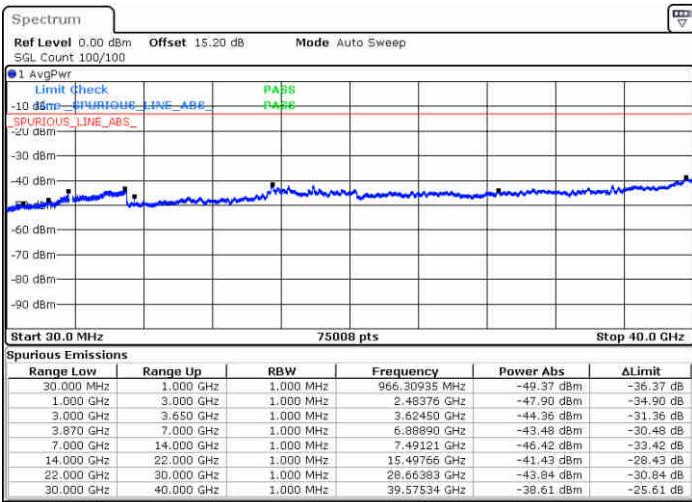
Middle Channel / 1RB



Date: 3.MAR.2021 03:04:56

Date: 4.FEB.2021 22:53:06

Highest Channel / 1RB

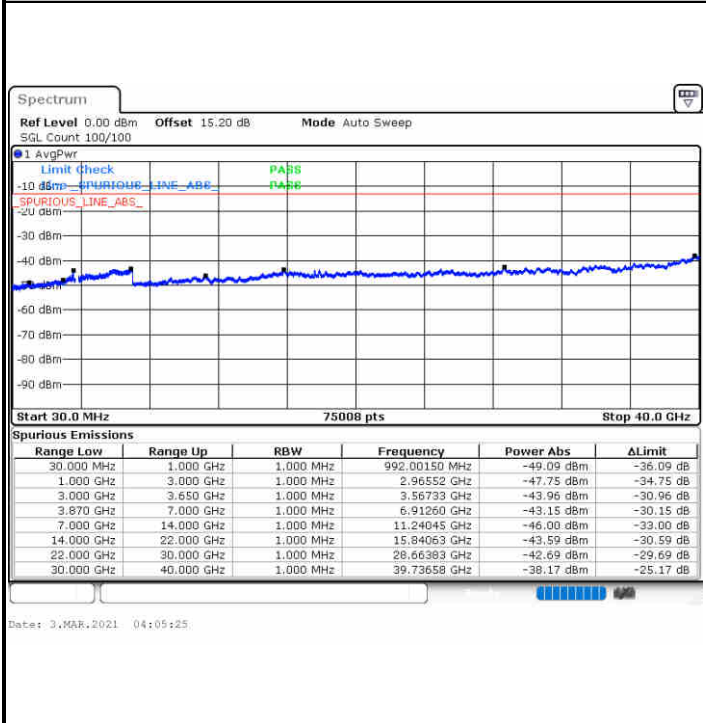


Date: 4.FEB.2021 22:57:38

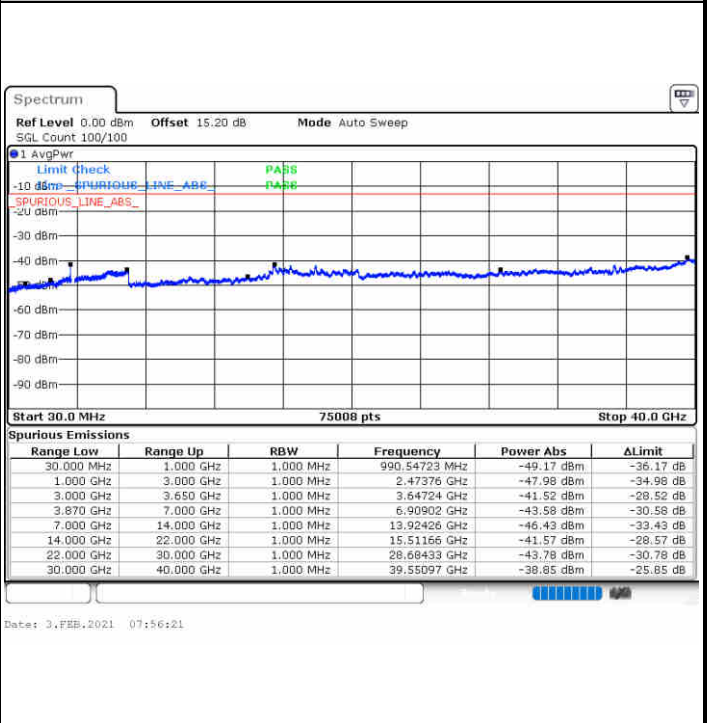


FR1 UL-MIMO n78 / 10MHz / CP-OFDM QPSK (M)

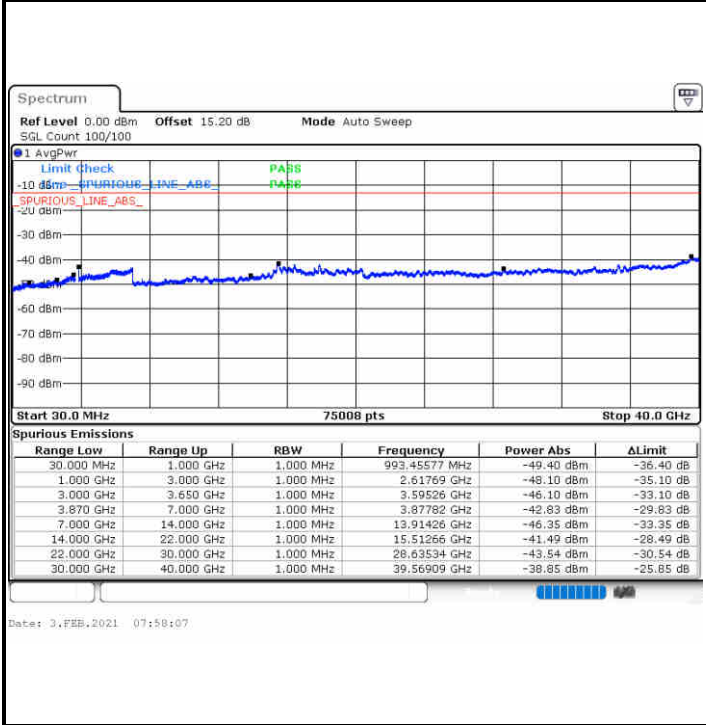
Lowest Channel / 1RB



Middle Channel / 1RB



Highest Channel / 1RB

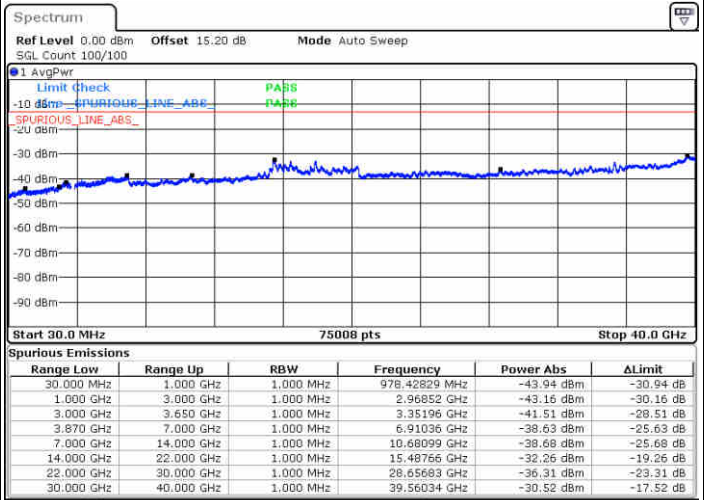
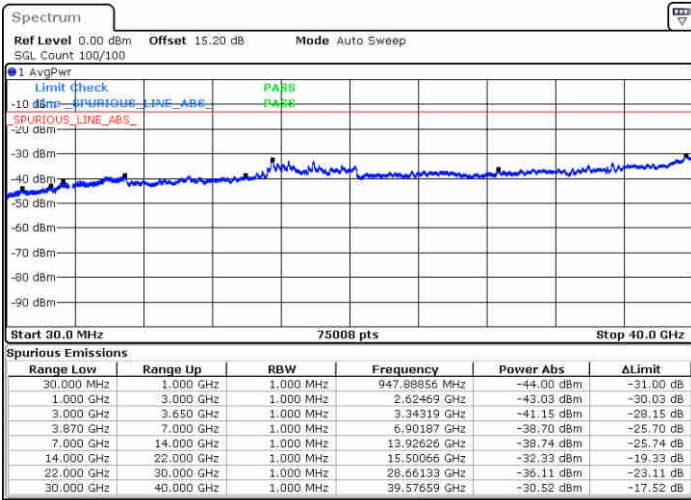




FR1 UL-MIMO n78 / 15MHz / CP-OFDM QPSK (M2)

Lowest Channel / 1RB

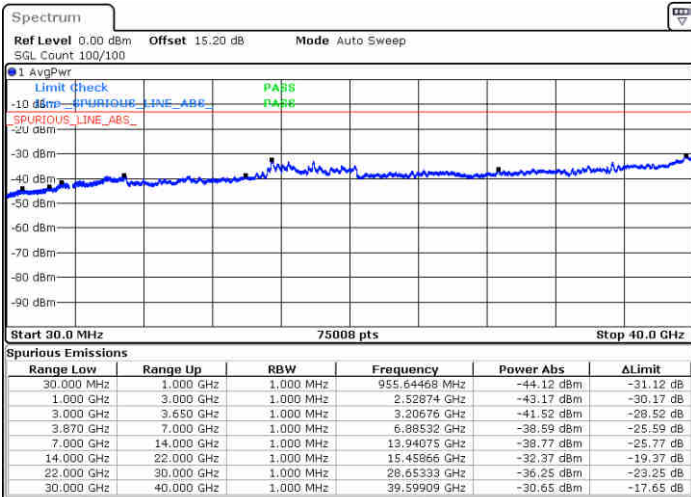
Middle Channel / 1RB



Date: 4.FEB.2021 22:48:36

Date: 4.FEB.2021 22:44:59

Highest Channel / 1RB



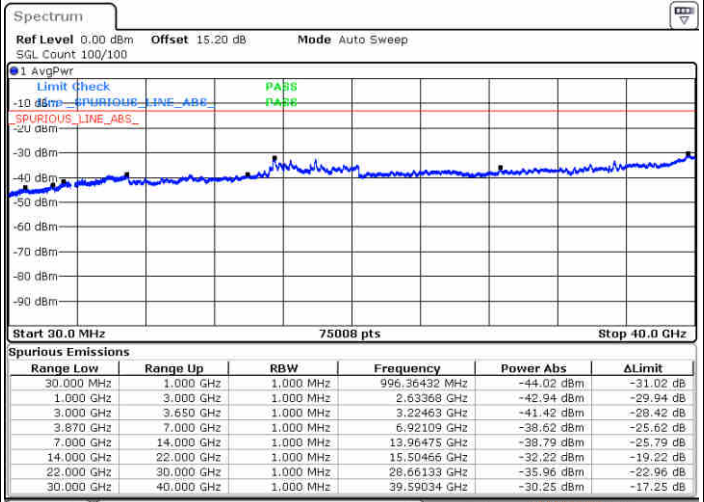
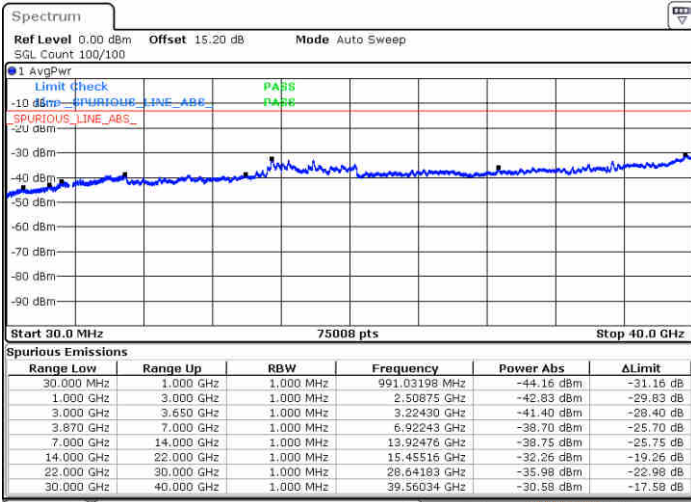
Date: 4.FEB.2021 22:49:40



FR1 UL-MIMO n78 / 15MHz / CP-OFDM QPSK (M)

Lowest Channel / 1RB

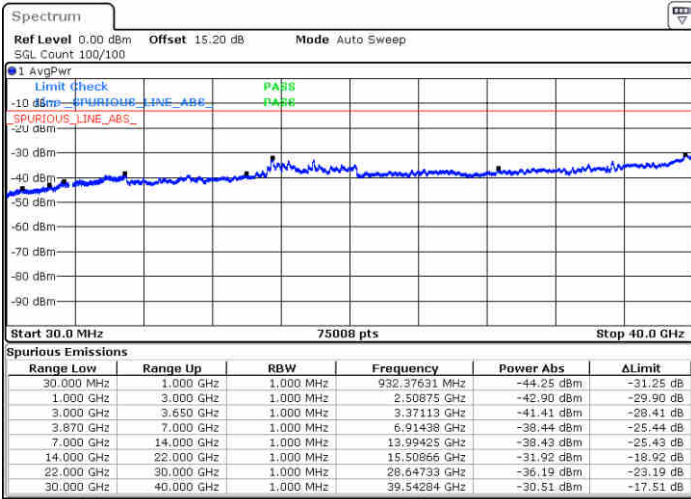
Middle Channel / 1RB



Date: 3.FEB.2021 07:37:32

Date: 3.FEB.2021 07:33:37

Highest Channel / 1RB



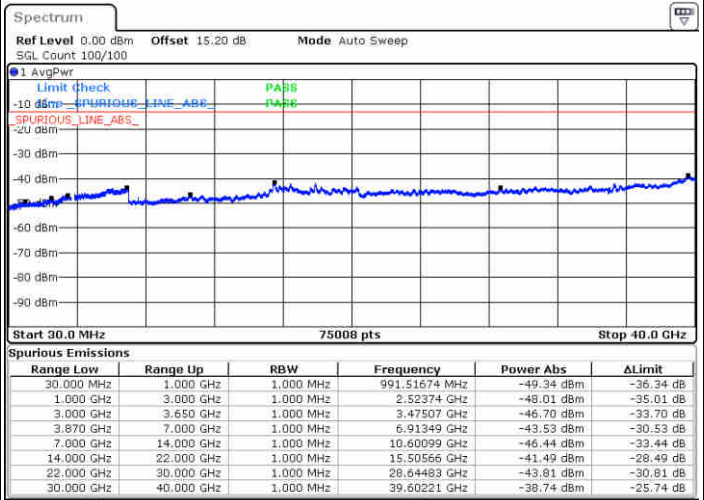
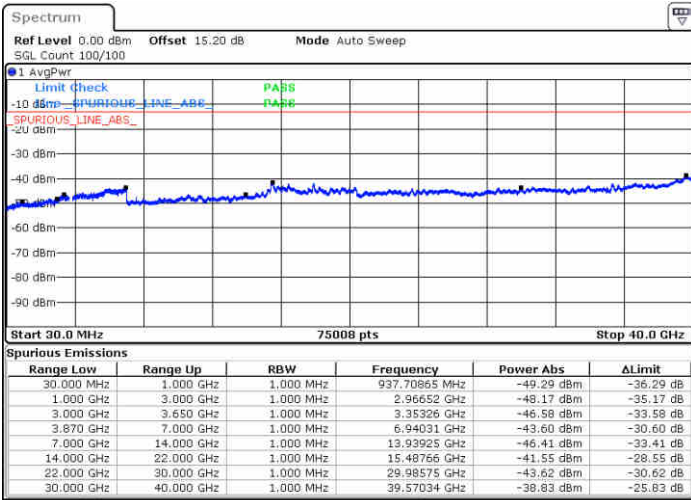
Date: 3.FEB.2021 07:39:17



FR1 UL-MIMO n78 / 20MHz / CP-OFDM QPSK (M2)

Lowest Channel / 1RB

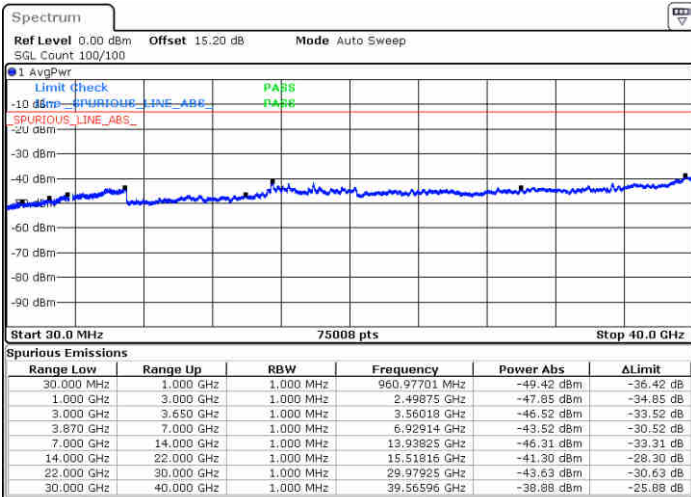
Middle Channel / 1RB



Date: 4.FEB.2021 22:03:09

Date: 4.FEB.2021 22:01:51

Highest Channel / 1RB



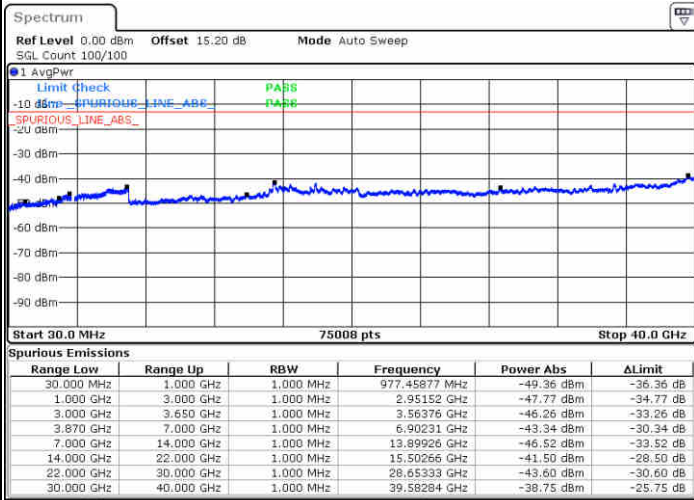
Date: 4.FEB.2021 21:54:03



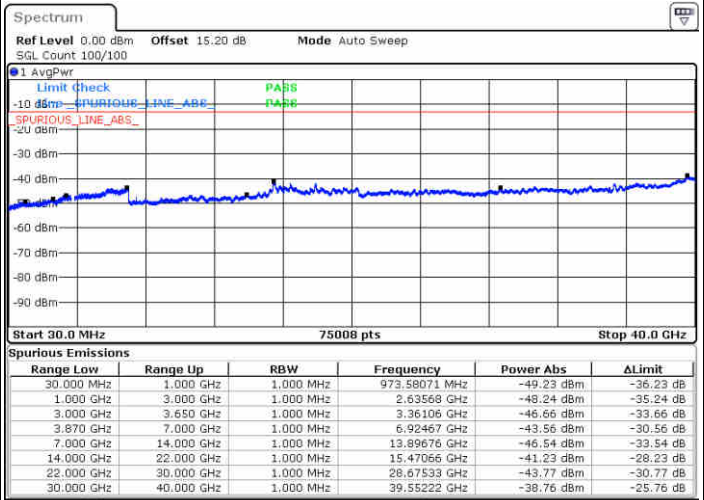
FR1 UL-MIMO n78 / 20MHz / CP-OFDM QPSK (M)

Lowest Channel / 1RB

Middle Channel / 1RB

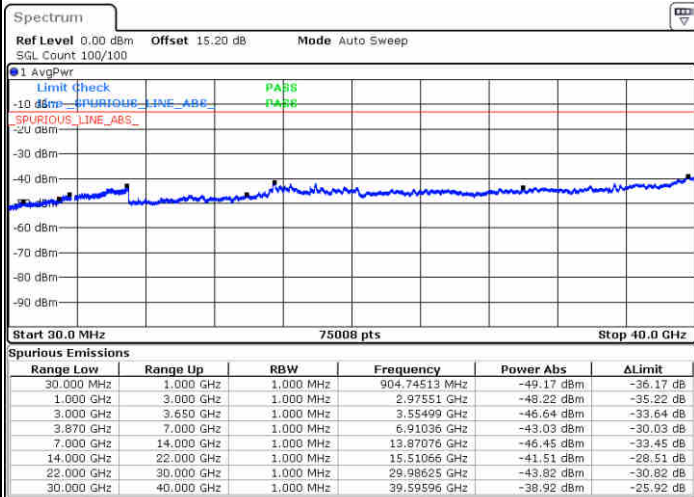


Date: 3.FEB.2021 06:30:49



Date: 3.FEB.2021 06:23:49

Highest Channel / 1RB



Date: 3.FEB.2021 06:47:08



Frequency Stability

Test Conditions		NR UL-MIMO n78 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 20MHz	Within Band
		Deviation (ppm)	Result
50	Normal Voltage	0.0016	PASS
40	Normal Voltage	0.0020	
30	Normal Voltage	0.0021	
20(Ref.)	Normal Voltage	0.0015	
10	Normal Voltage	0.0006	
0	Normal Voltage	0.0013	
-10	Normal Voltage	0.0027	
-20	Normal Voltage	0.0010	
-30	Normal Voltage	0.0015	
20	Maximum Voltage	0.0010	
20	Normal Voltage	0.0027	
20	Battery End Point	0.0022	

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 n78 UL_MIMO HPUE -SCS 30K

Peak-to-Average Ratio

Mode	FR1 UL-MIMO n78 / 10MHz / CP-OFDM (M2)				
Mod.	QPSK	QPSK			Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	7.86	8.17			PASS
Middle CH	8.49	8.52			
Highest CH	7.94	8.32			

Mode	FR1 UL-MIMO n78 / 10MHz / CP-OFDM (M)				
Mod.	QPSK	QPSK			Limit: 13dB
RB Size	1RB	Full RB			Result
Lowest CH	7.65	8.32			PASS
Middle CH	7.57	8.12			
Highest CH	7.45	7.94			



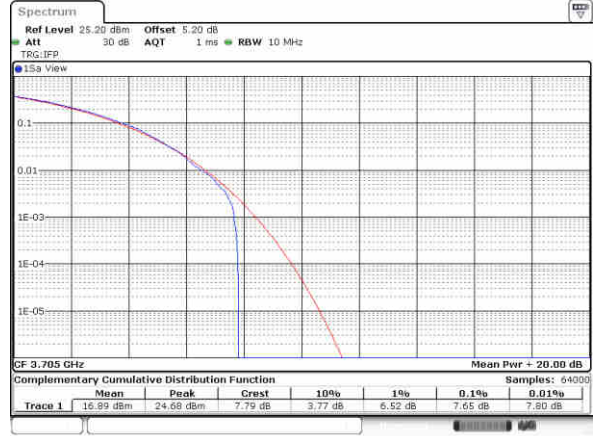
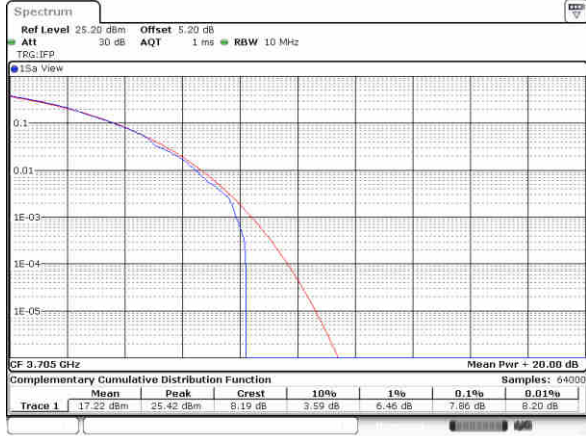
FR1 UL-MIMO n78 / 20MHz / CP-OFDM

QPSK(M2)

QPSK(M)

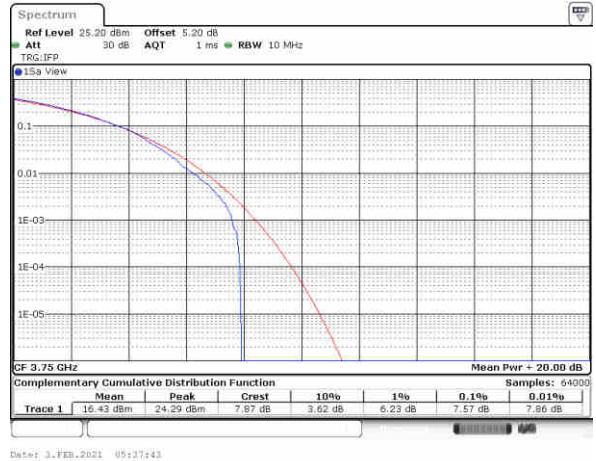
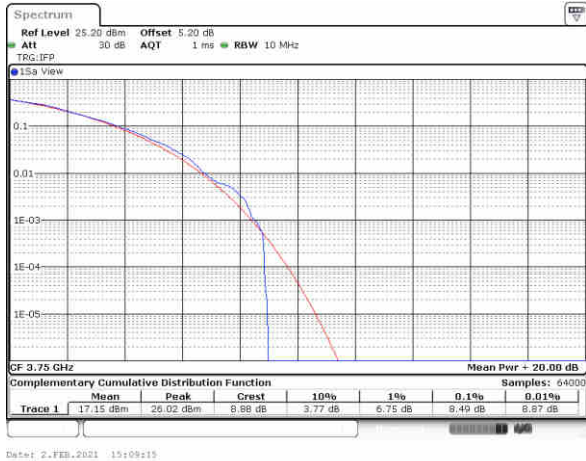
Lowest Channel / 1RB

Lowest Channel / 1RB



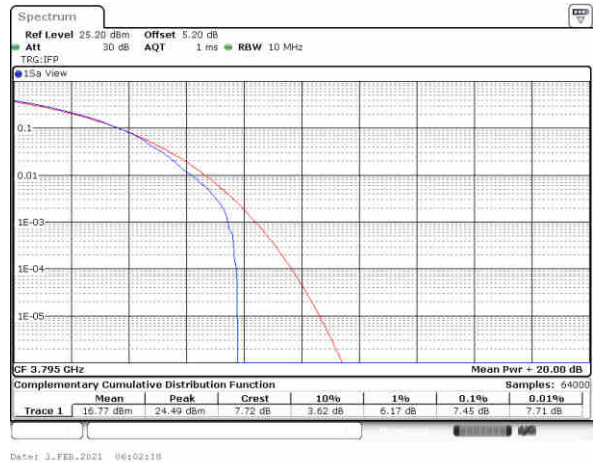
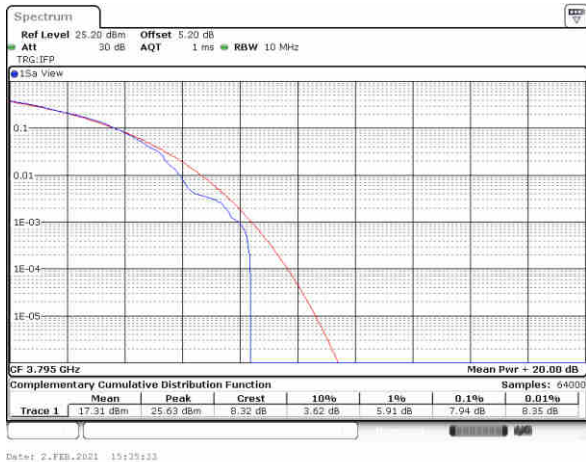
Middle Channel / 1 RB

Middle Channel / 1 RB



Highest Channel / 1 RB

Highest Channel / 1 RB





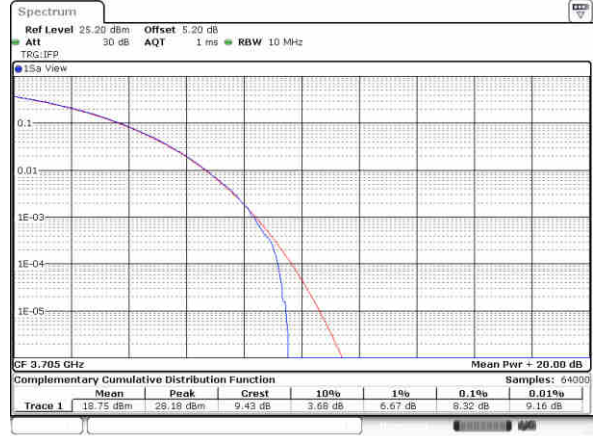
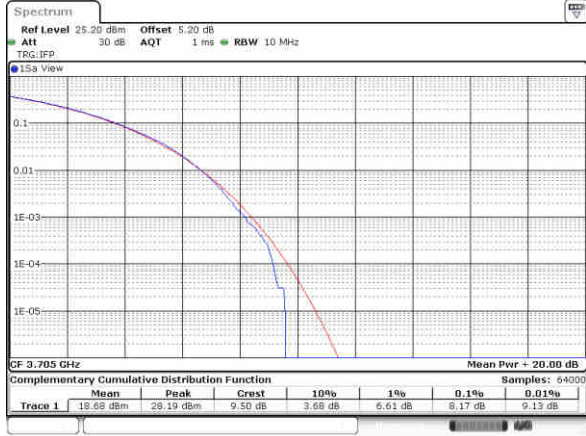
FR1 UL-MIMO n78 / 20MHz / CP-OFDM

QPSK(M2)

QPSK(M)

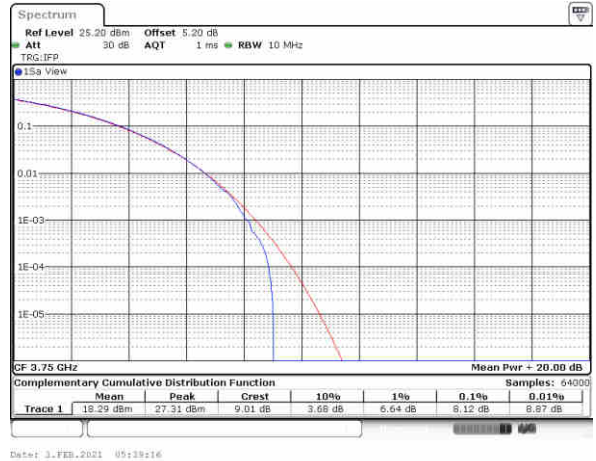
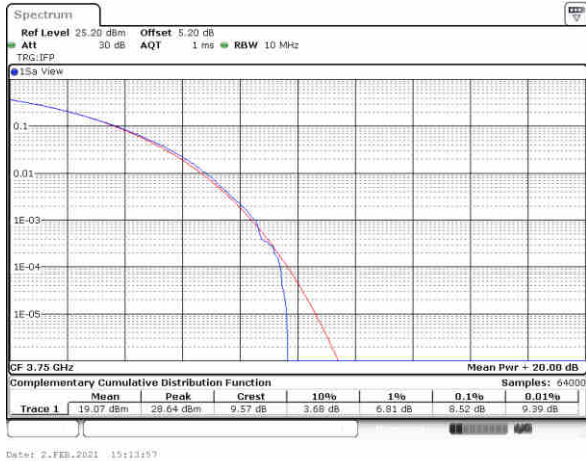
Lowest Channel / Full RB

Lowest Channel / Full RB



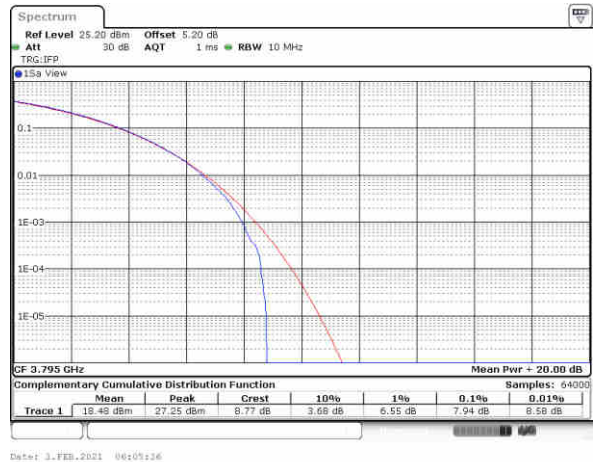
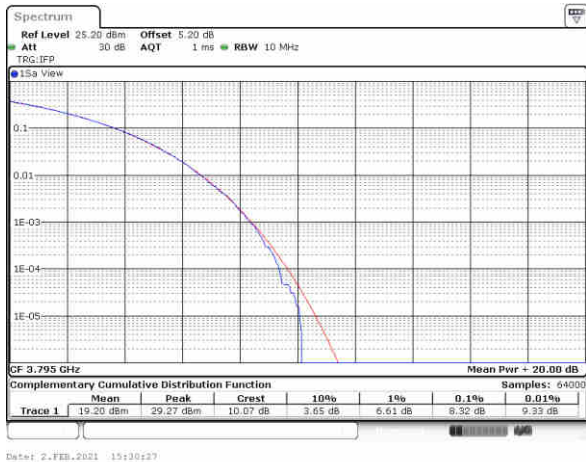
Middle Channel / Full RB

Middle Channel / Full RB



Highest Channel / Full RB

Highest Channel / Full RB





26dB Bandwidth

Mode	FR1 UL-MIMO n78 : 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	8.97	9.07	9.15	9.15	9.25	8.97	9.19	9.27

Mode	FR1 UL-MIMO n78 : 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	14.29	14.32	14.32	14.32	14.38	14.41	14.44	14.29

Mode	FR1 UL-MIMO n78 : 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	19.18	19.14	19.10	18.98	19.34	19.26	19.06	18.94

Mode	FR1 UL-MIMO n78 : 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	40.2	40.36	40.44	40.28	40.2	40.519	40.36	40.59

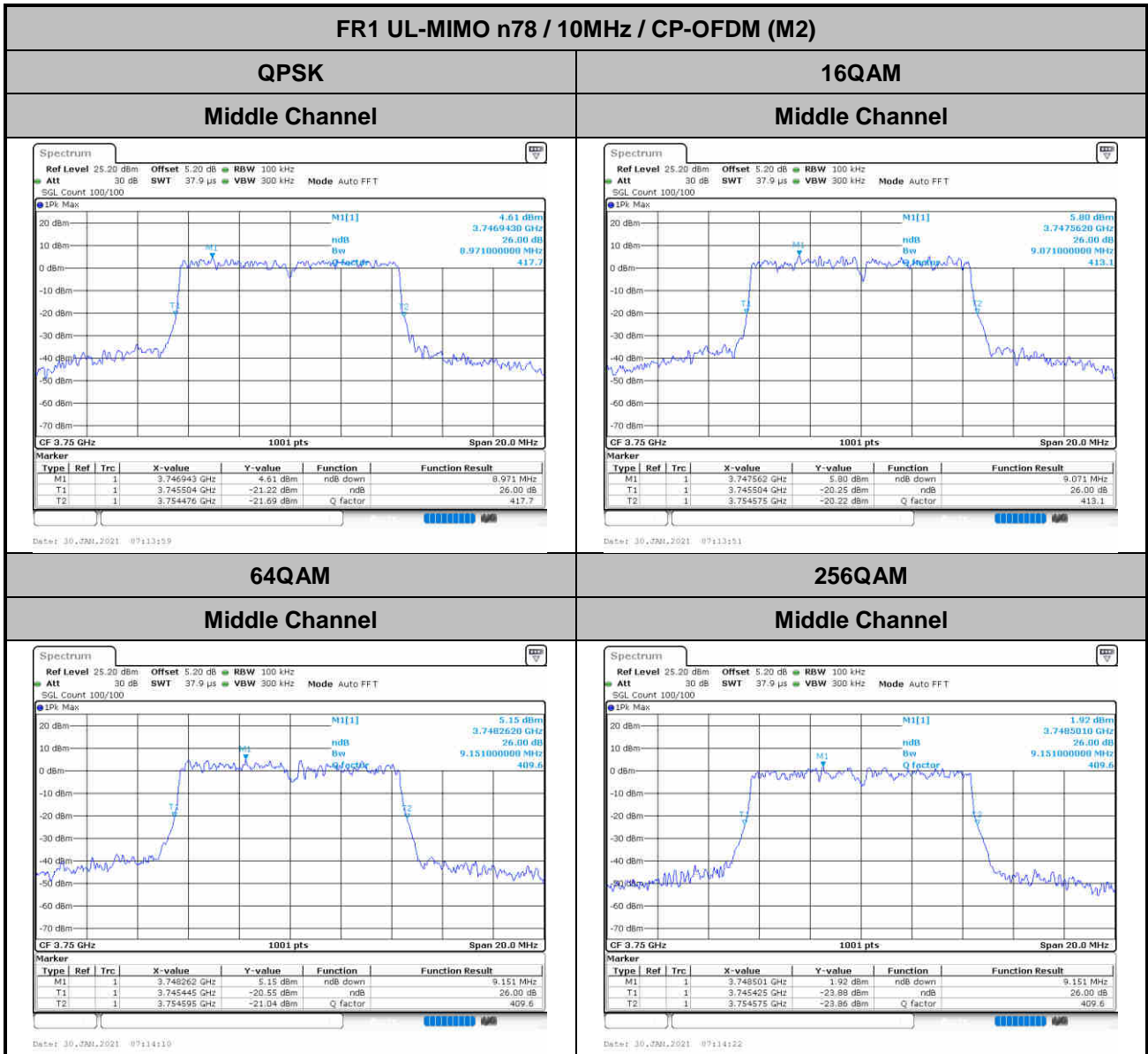
Mode	FR1 UL-MIMO n78 : 26dB BW(MHz) / CP-OFDM							
	M2				M			
BW	50MHz	50MHz	50MHz	50MHz	50MHz	50MHz	50MHz	50MHz
Mod.	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
Middle CH	49.75	49.65	49.75	49.75	49.75	49.75	49.55	49.75

Mode	FR1 UL-MIMO n78 : 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	60.18	60.54	60.3	60.42	60.54	60.42	60.42	60.42



Mode	FR1 UL-MIMO n78 : 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	79.92	79.76	79.92	79.92	79.92	79.92

Mode	FR1 UL-MIMO n78 : 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	100.3	100.5	100.9	100.3	100.5	100.3





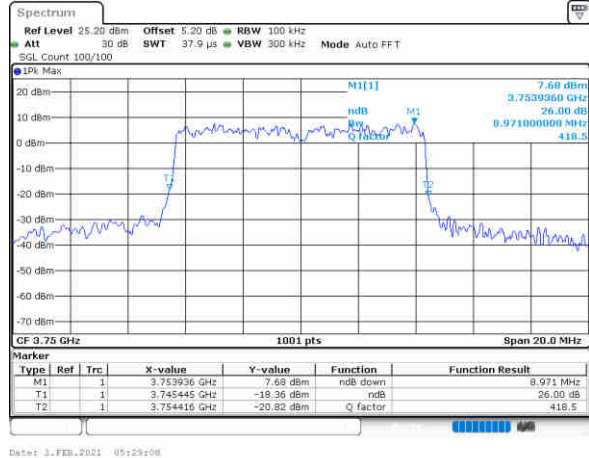
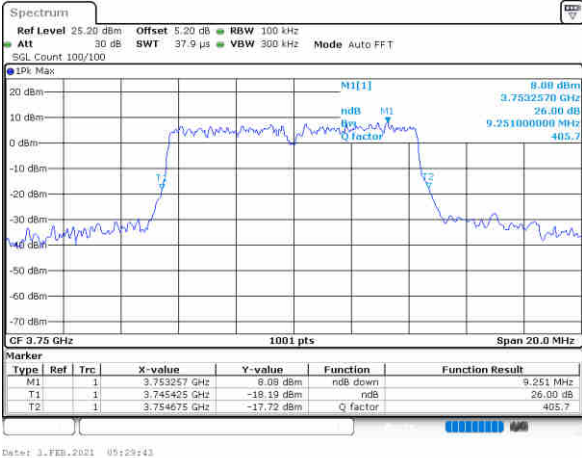
FR1 UL-MIMO n78 / 10MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel



Date: 3.FEB.2021 09:29:43

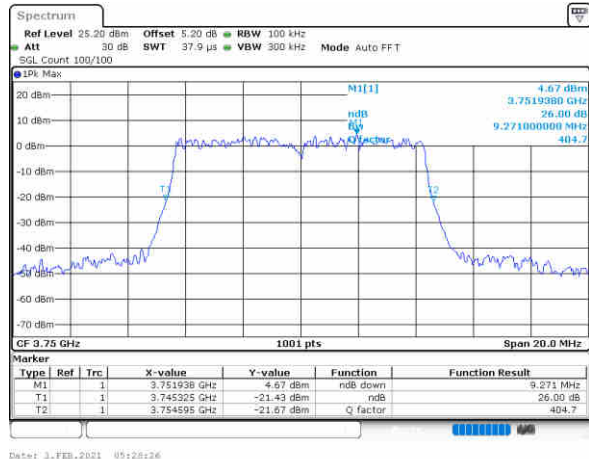
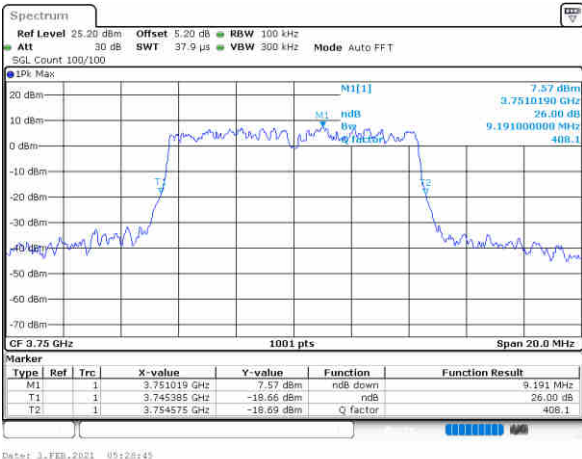
Date: 3.FEB.2021 09:29:08

64QAM

256QAM

Middle Channel

Middle Channel



Date: 3.FEB.2021 09:28:45

Date: 3.FEB.2021 09:28:36



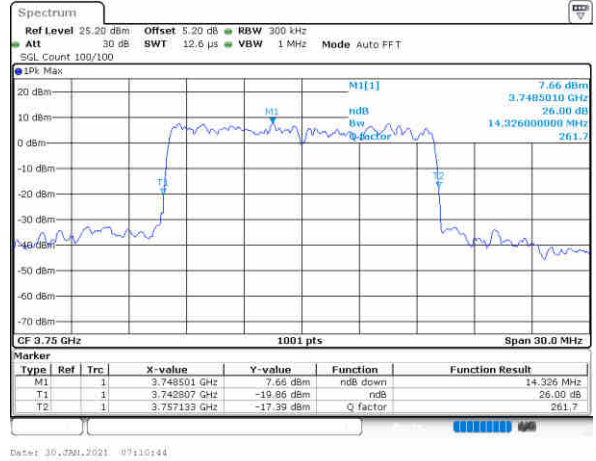
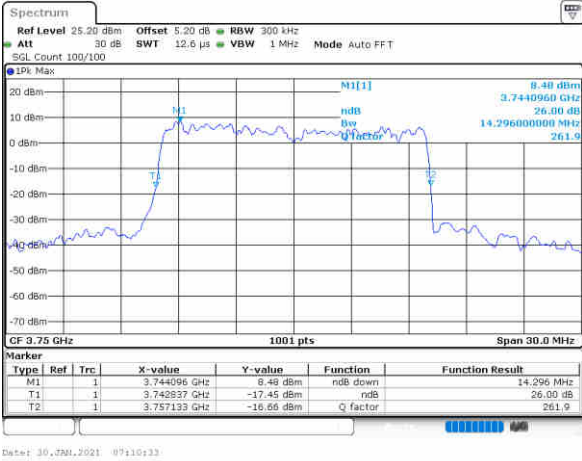
FR1 UL-MIMO n78 / 15MHz / CP-OFDM (M2)

QPSK

16QAM

Middle Channel

Middle Channel

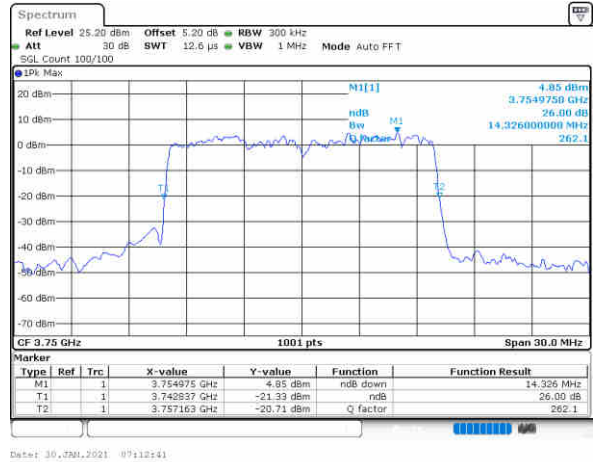
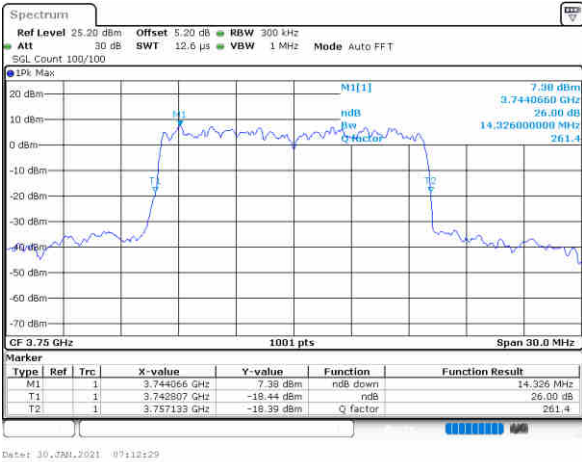


64QAM

256QAM

Middle Channel

Middle Channel





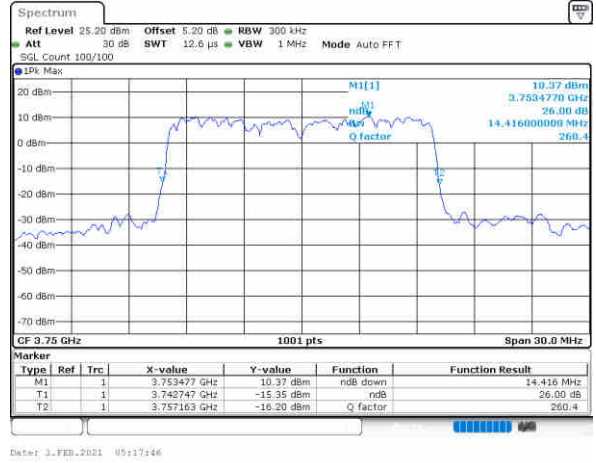
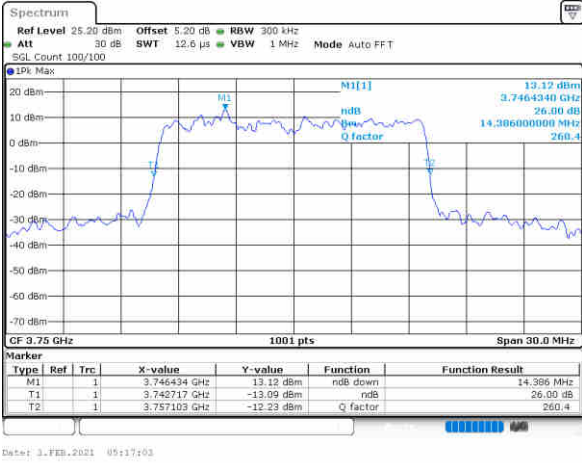
FR1 UL-MIMO n78 / 15MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel

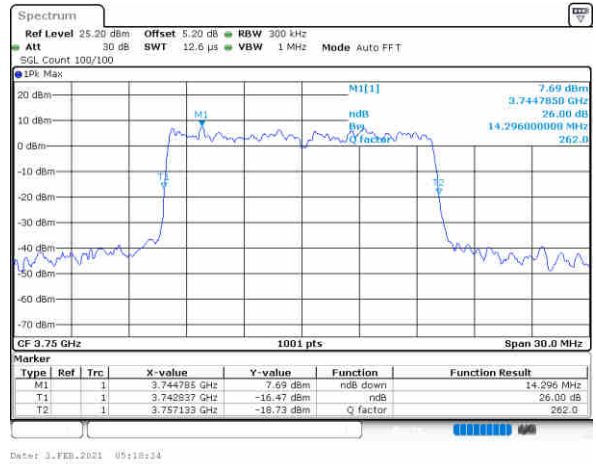
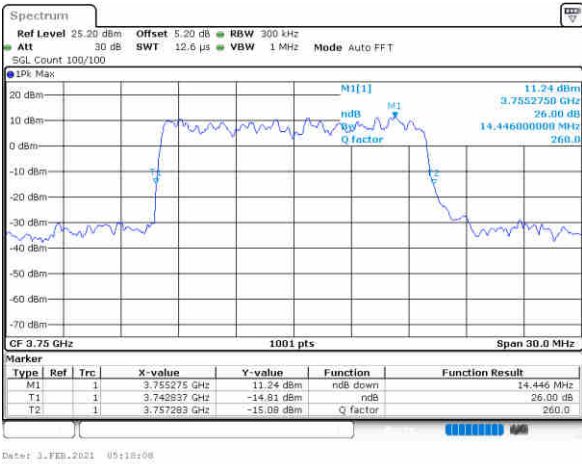


64QAM

256QAM

Middle Channel

Middle Channel





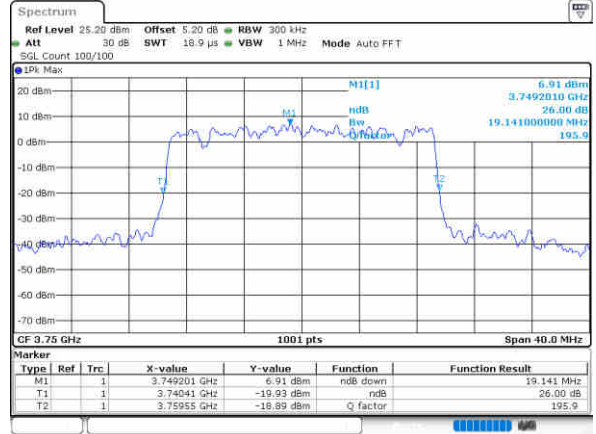
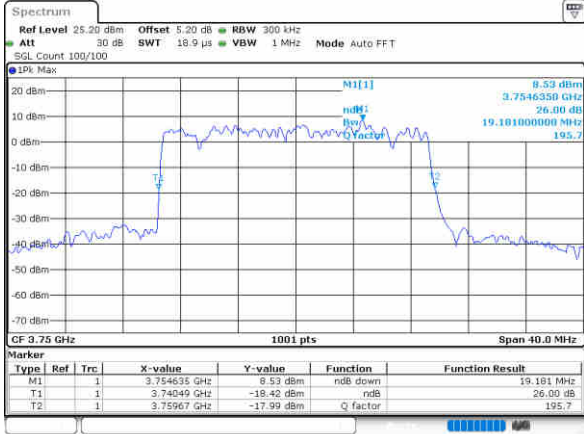
FR1 UL-MIMO n78 / 20MHz / CP-OFDM (M2)

QPSK

16QAM

Middle Channel

Middle Channel

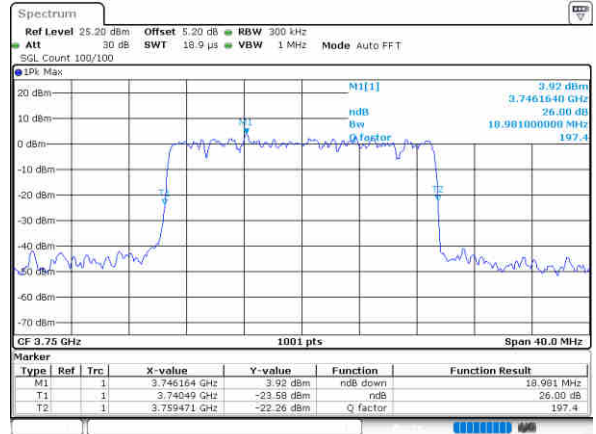
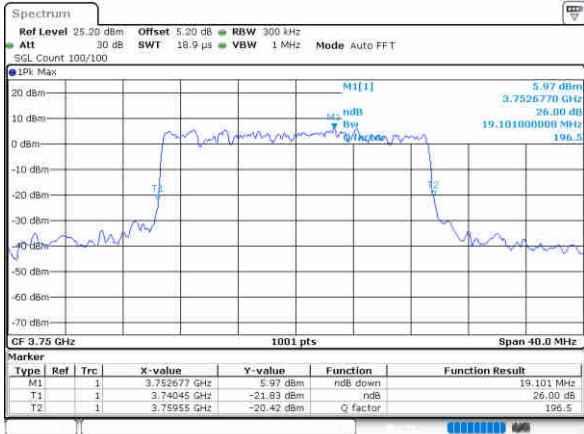


64QAM

256QAM

Middle Channel

Middle Channel





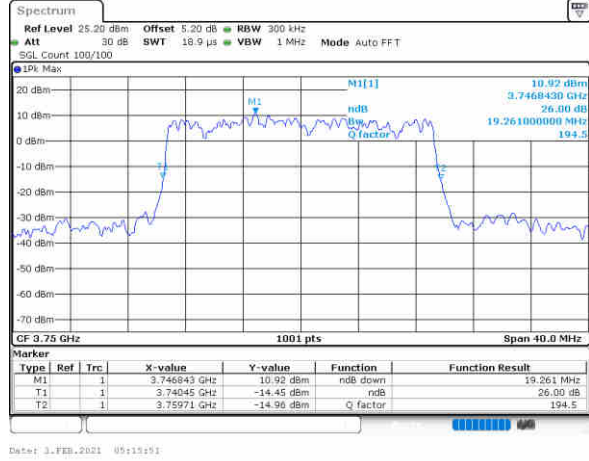
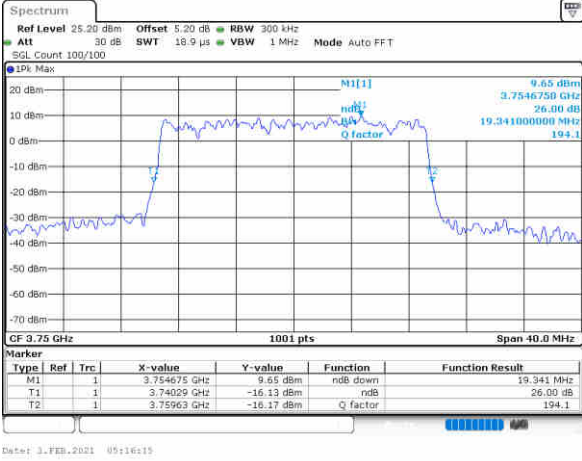
FR1 UL-MIMO n78 / 20MHz / CP-OFDM (M)

QPSK

16QAM

Middle Channel

Middle Channel



Date: 3.FEB.2021 09:16:15

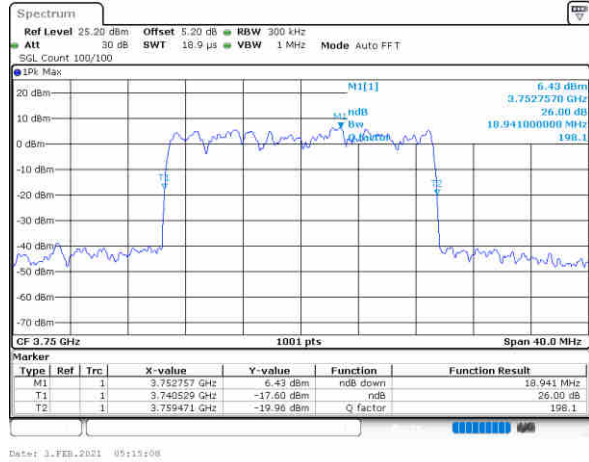
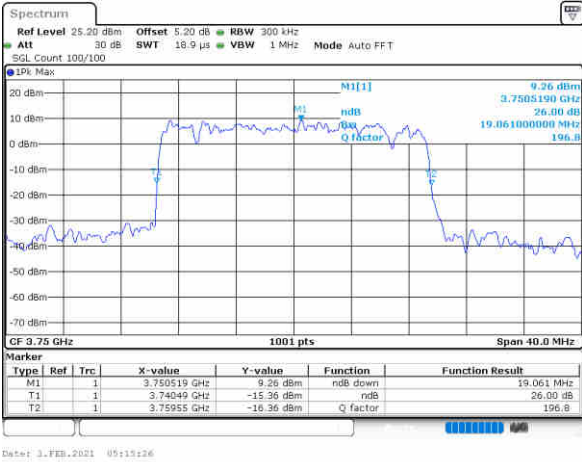
Date: 3.FEB.2021 09:15:51

64QAM

256QAM

Middle Channel

Middle Channel



Date: 3.FEB.2021 09:15:26

Date: 3.FEB.2021 09:15:06