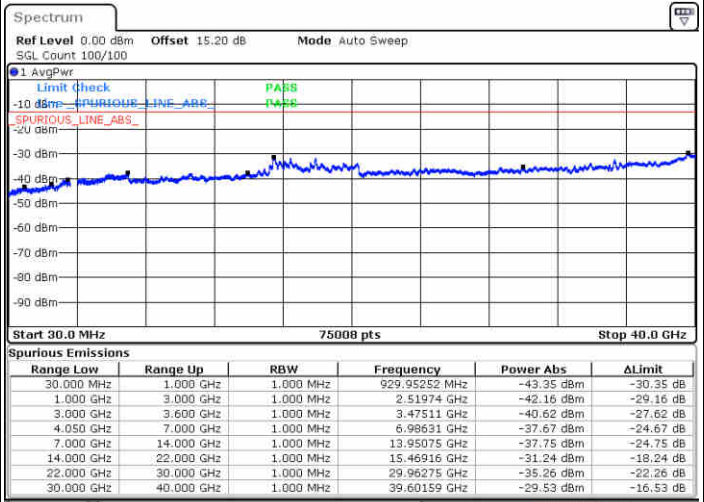
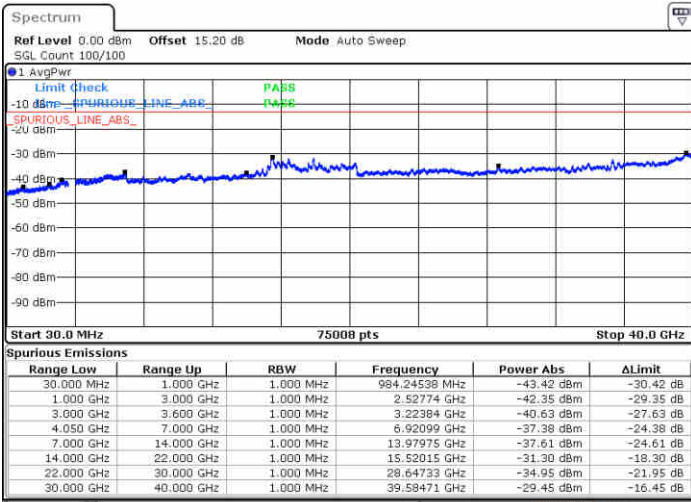




FR1 UL-MIMO n77 / 100MHz / CP-OFDM QPSK (M)

Lowest Channel / 1RB

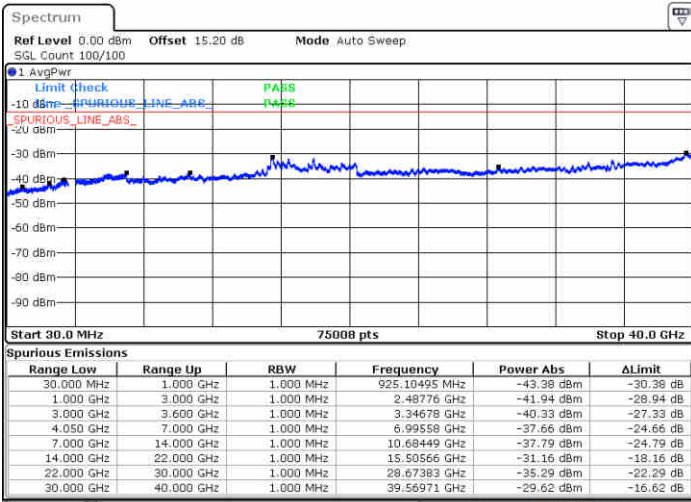
Middle Channel / 1RB



Date: 13.FEB.2021 10:09:02

Date: 13.FEB.2021 09:56:48

Highest Channel / 1RB



Date: 13.FEB.2021 10:23:06



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	0.0015	
30	Normal Voltage	0.0016	
20(Ref.)	Normal Voltage	0.0023	
10	Normal Voltage	0.0017	
0	Normal Voltage	0.0024	
-10	Normal Voltage	0.0025	
-20	Normal Voltage	0.0018	
-30	Normal Voltage	0.0015	
20	Maximum Voltage	0.0025	
20	Normal Voltage	0.0011	
20	Battery End Point	0.0025	

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 NSA-SCS 15K

## Peak-to-Average Ratio

Mode	FR1 N77 / 20MHz / DFT-S OFDM				
Mod.	PI/2 BPSK	PI/2 BPSK	QPSK	QPSK	Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	3.54	4.12	5.54	5.45	<b>PASS</b>
Middle CH	3.36	3.97	4.38	5.19	
Highest CH	3.25	3.88	4.26	5.25	



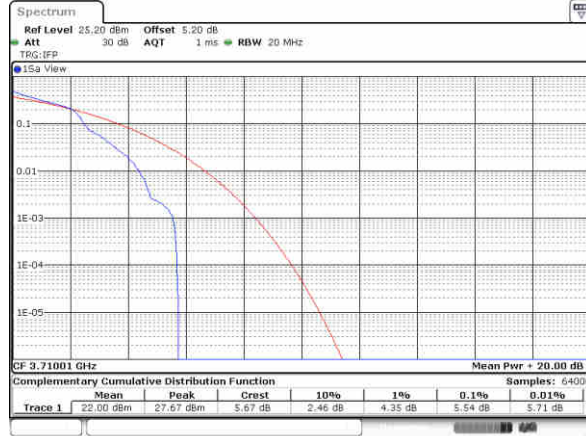
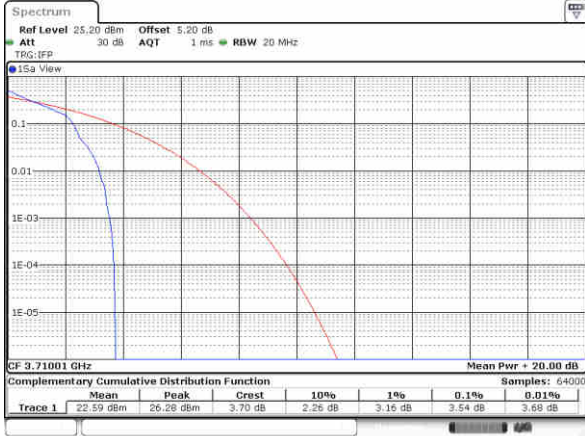
FR1 N77 / 20MHz / DFT-S OFDM

PI/2 BPSK

QPSK

Lowest Channel / 1RB

Lowest Channel / 1RB

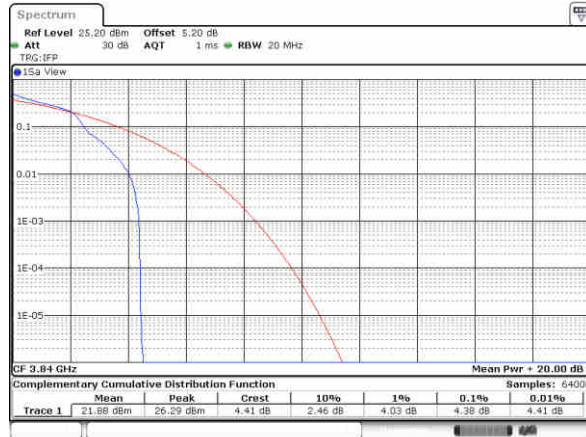
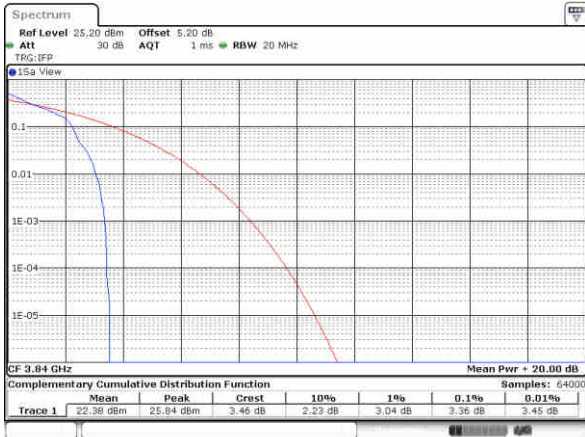


Date: 29, MAR, 2021 05:32:17

Date: 29, MAR, 2021 05:32:01

Middle Channel / 1 RB

Middle Channel / 1 RB

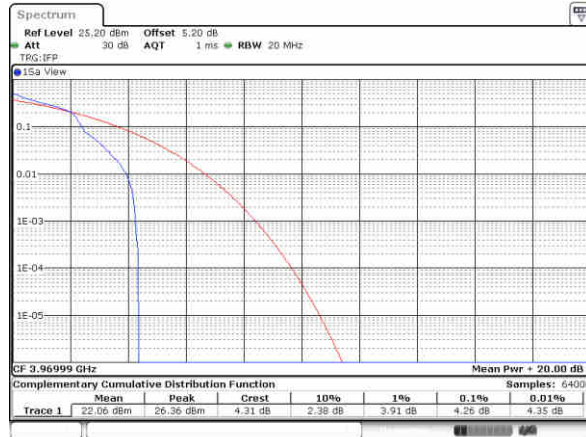
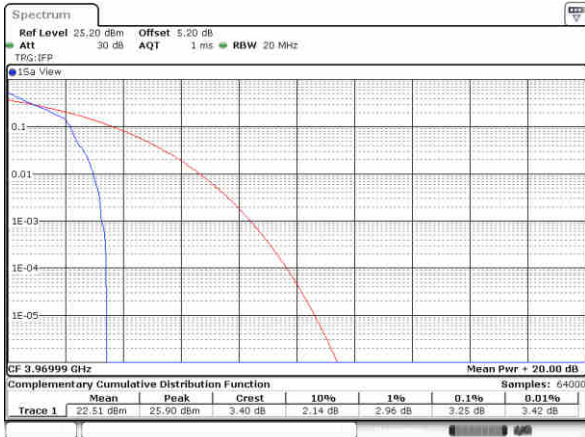


Date: 29, MAR, 2021 05:35:35

Date: 29, MAR, 2021 05:36:01

Highest Channel / 1 RB

Highest Channel / 1 RB



Date: 29, MAR, 2021 05:27:16

Date: 29, MAR, 2021 05:36:34



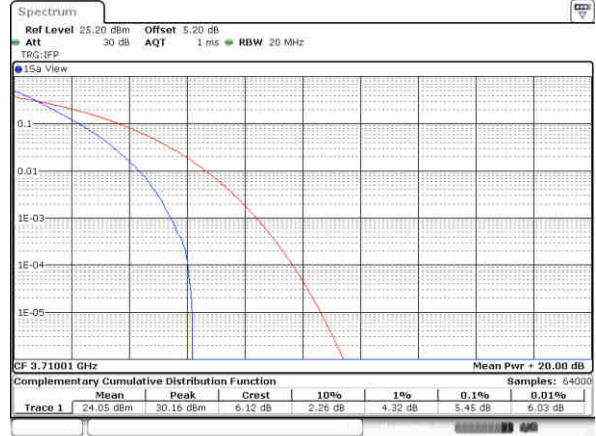
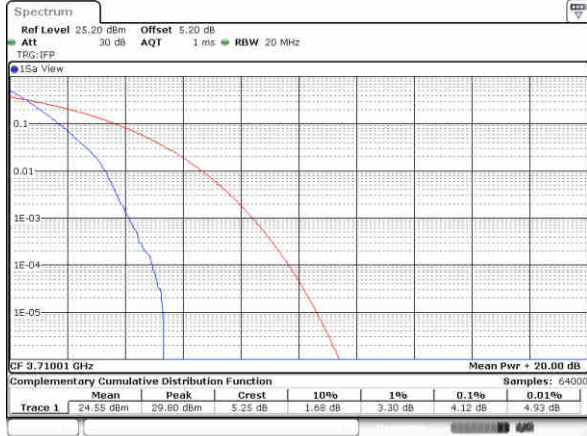
FR1 N77 / 20MHz / DFT-S OFDM

PI/2 BPSK

QPSK

Lowest Channel / Full RB

Lowest Channel / Full RB

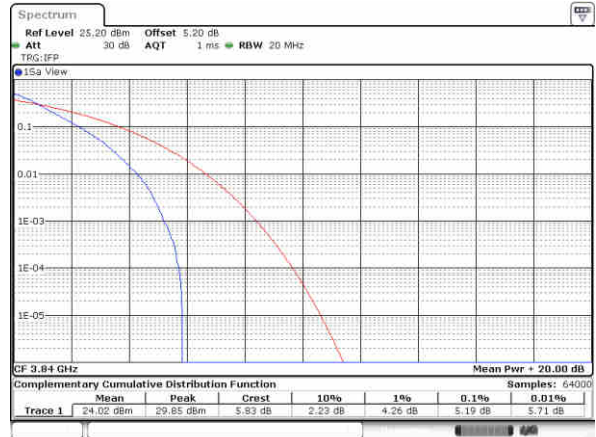
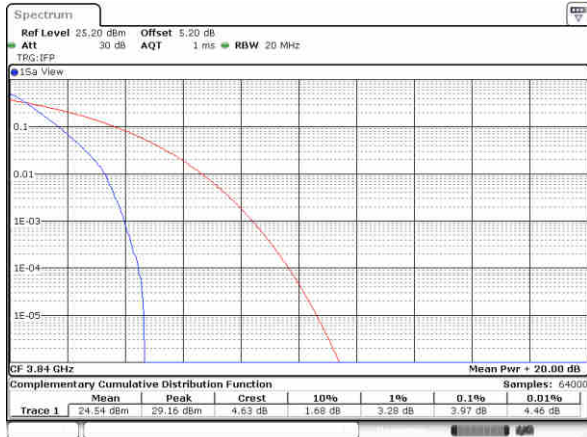


Date: 29, MAR, 2021 05:33:00

Date: 29, MAR, 2021 05:33:43

Middle Channel / Full RB

Middle Channel / Full RB

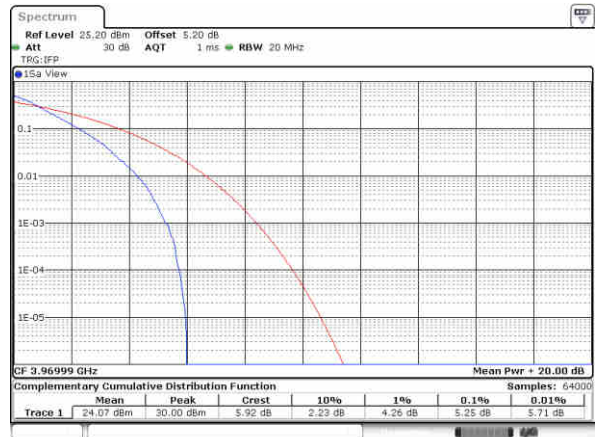
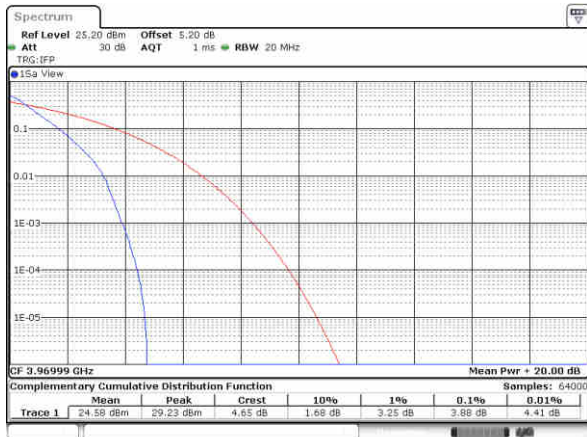


Date: 29, MAR, 2021 05:35:01

Date: 29, MAR, 2021 05:34:26

Highest Channel / Full RB

Highest Channel / Full RB



Date: 29, MAR, 2021 05:37:47

Date: 29, MAR, 2021 05:38:19

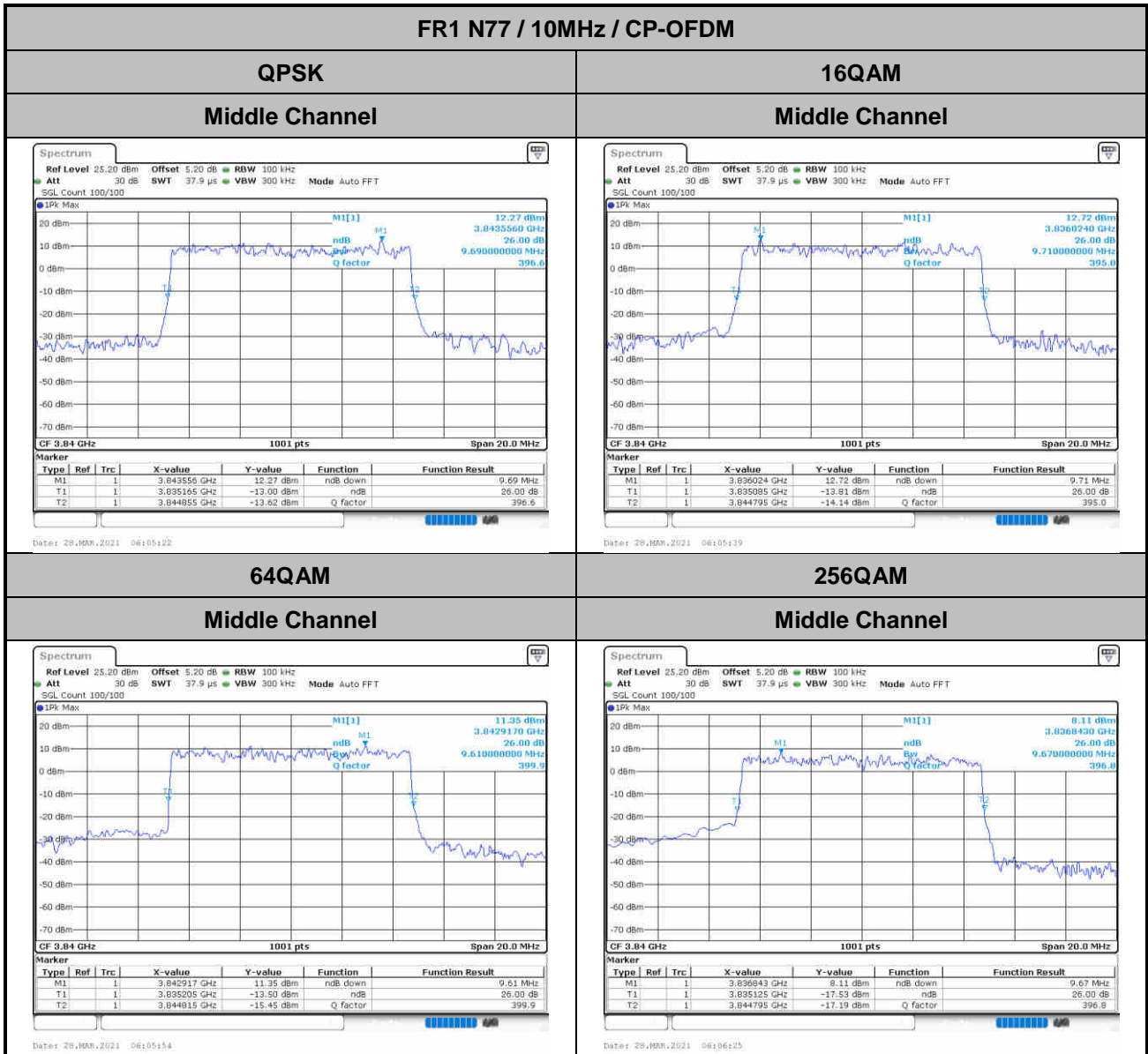


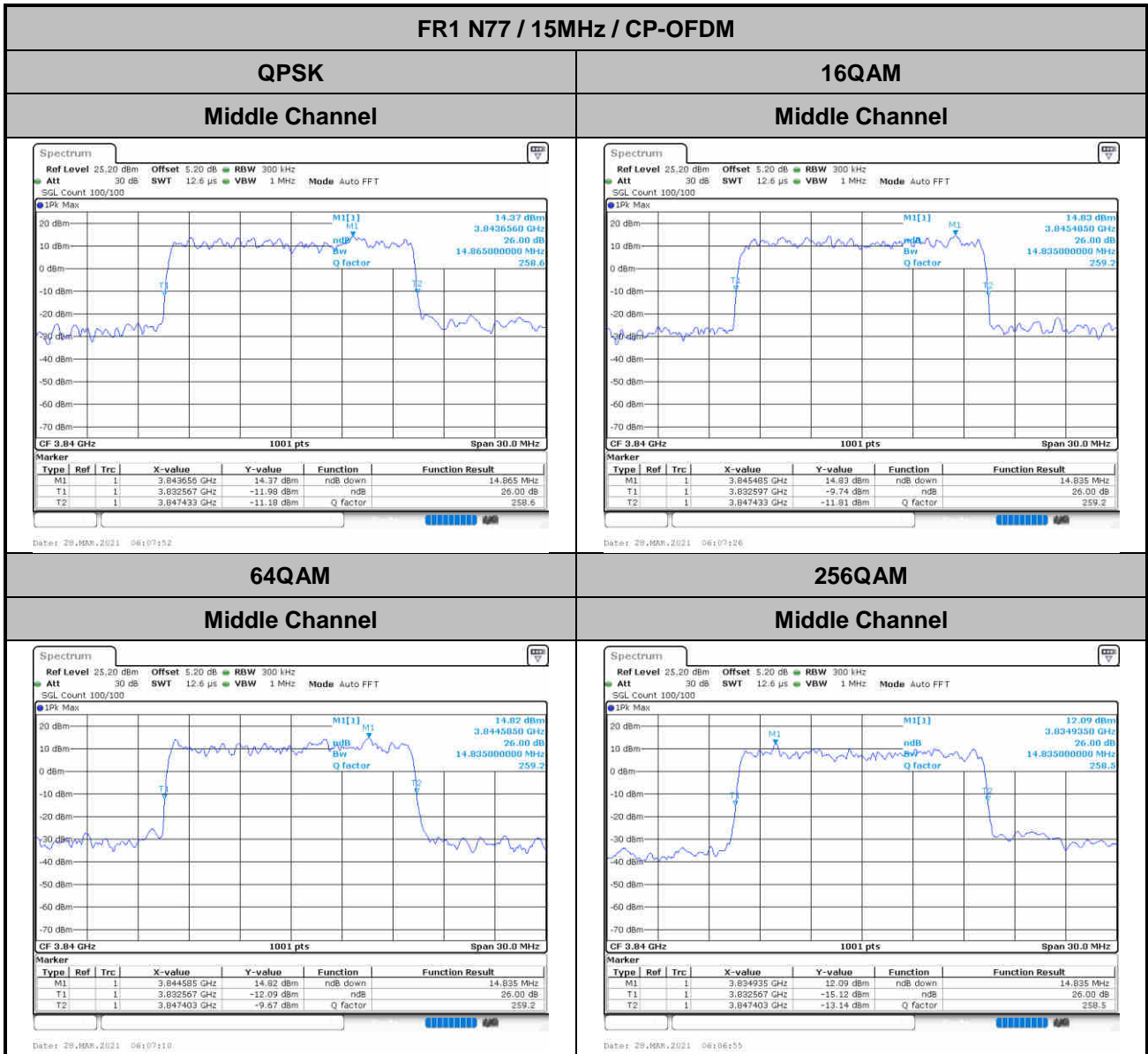
**26dB Bandwidth**

Mode	FR1 N77 : 26dB BW(MHz) / CP-OFDM							
BW	10MHz	10MHz	10MHz	10MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	9.69	9.71	9.61	9.67				

Mode	FR1 N77 : 26dB BW(MHz) / CP-OFDM							
BW	15MHz	15MHz	15MHz	15MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	14.87	14.84	14.84	14.84				

Mode	FR1 N77 : 26dB BW(MHz) / CP-OFDM							
BW	20MHz	20MHz	20MHz	20MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	19.86	19.74	19.70	19.70				









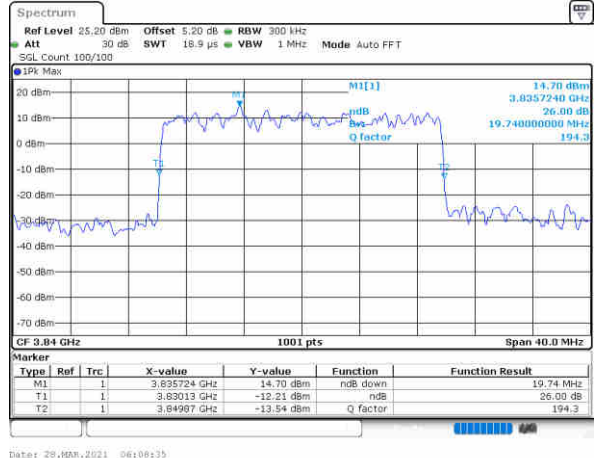
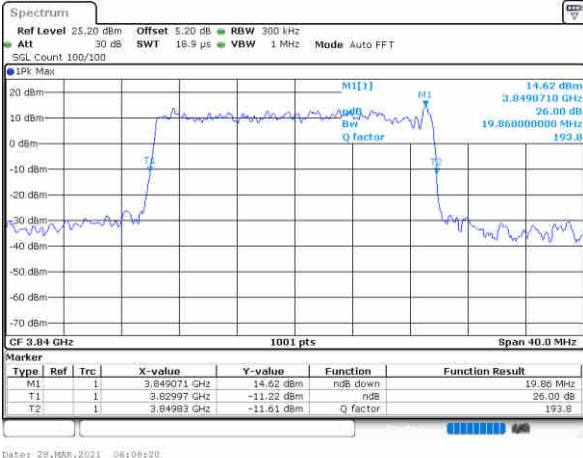
FR1 N77 / 20MHz / CP-OFDM

QPSK

16QAM

Middle Channel

Middle Channel



Date: 29.MAR.2021 06:08:20

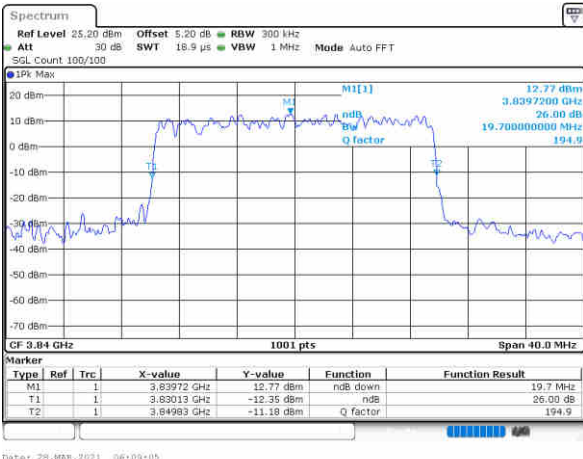
Date: 29.MAR.2021 06:10:33

64QAM

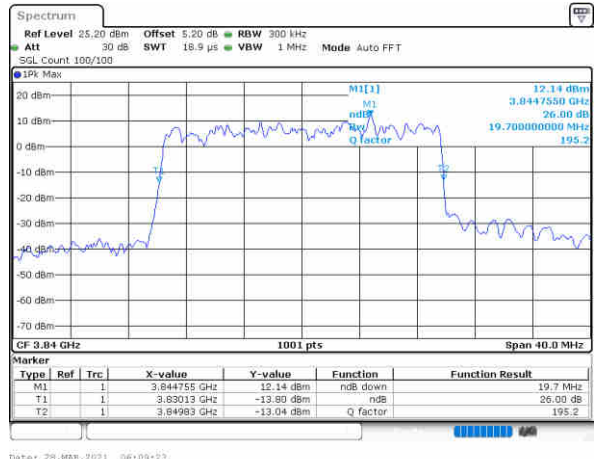
256QAM

Middle Channel

Middle Channel



Date: 29.MAR.2021 06:09:05



Date: 29.MAR.2021 06:10:23

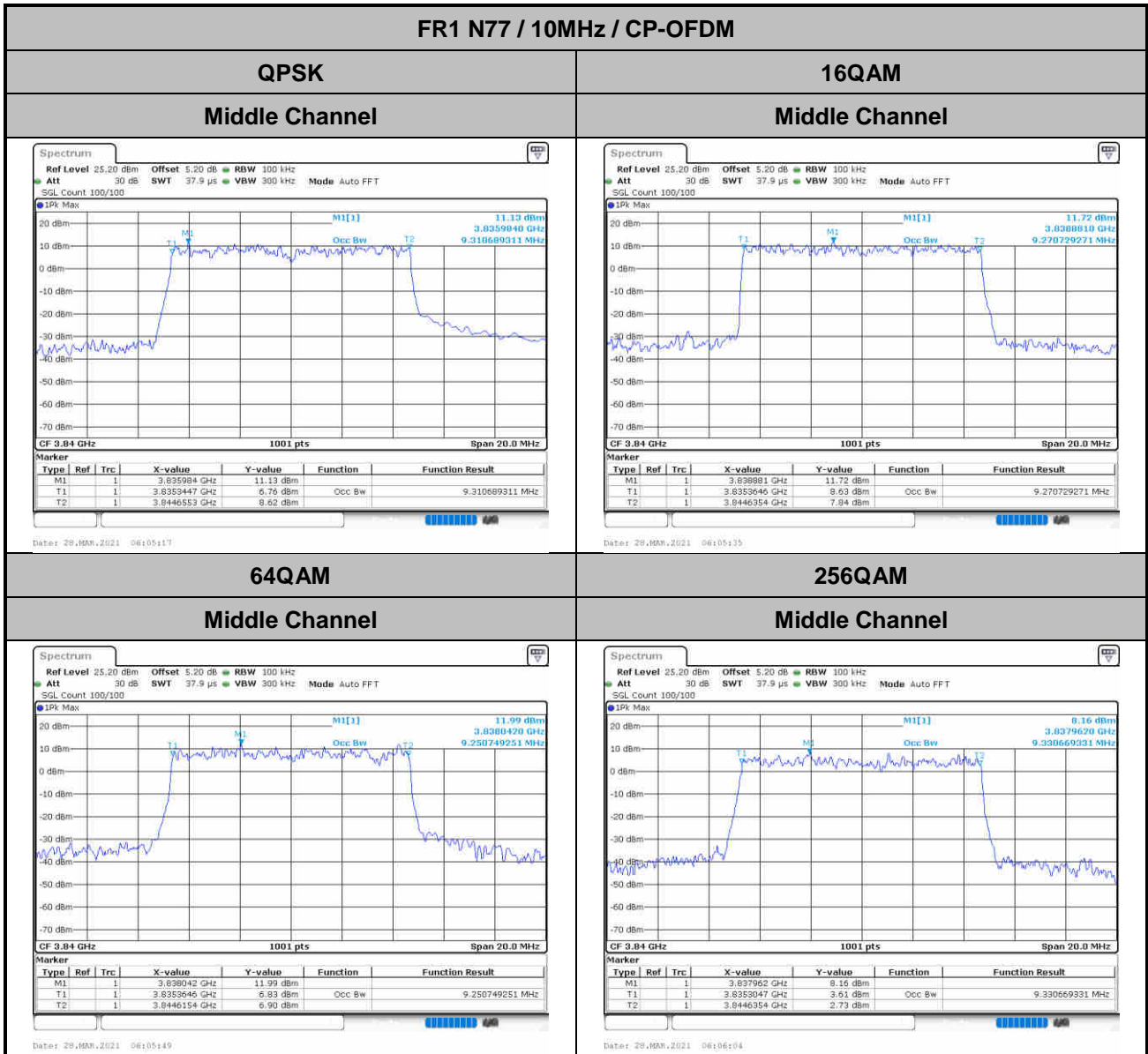


### Occupied Bandwidth

Mode	FR1 N77 : OBW(MHz) / CP-OFDM							
BW	10MHz	10MHz	10MHz	10MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	9.31	9.27	9.25	9.33				

Mode	FR1 N77 : OBW(MHz) / CP-OFDM							
BW	15MHz	15MHz	15MHz	15MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	14.15	14.12	14.15	14.06				

Mode	FR1 N77 : OBW(MHz) / CP-OFDM							
BW	20MHz	20MHz	20MHz	20MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	18.90	19.06	19.02	18.86				





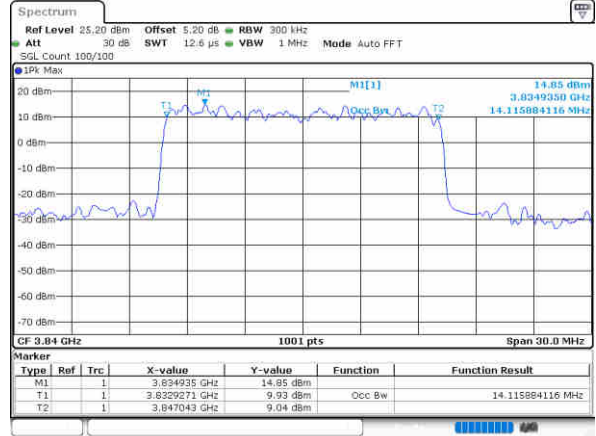
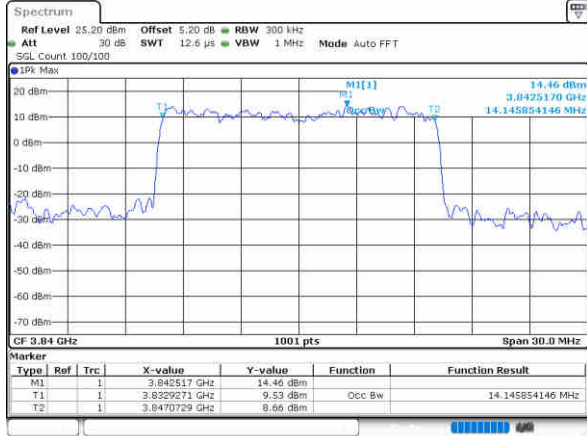
FR1 N77 / 15MHz / CP-OFDM

QPSK

16QAM

Middle Channel

Middle Channel



Date: 29, MAR, 2021 06:07:47

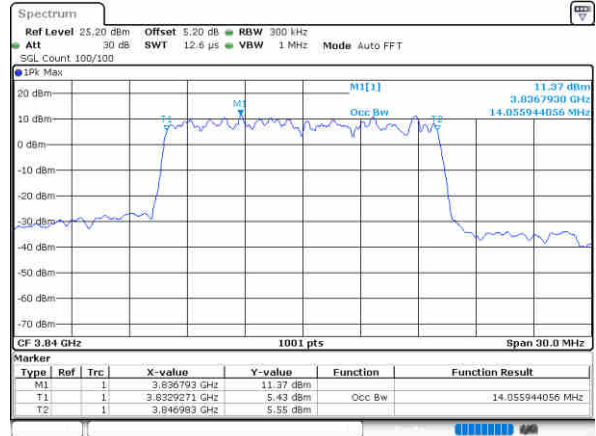
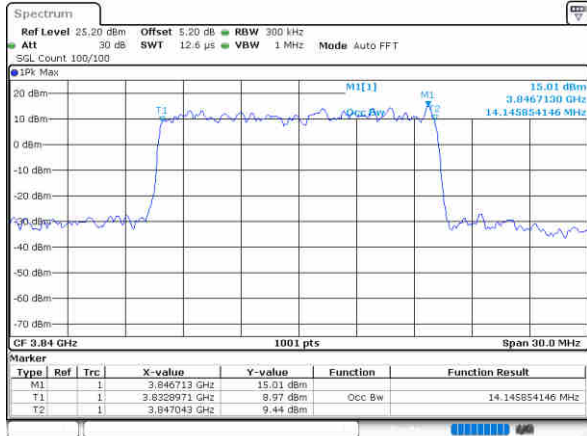
Date: 29, MAR, 2021 06:07:21

64QAM

256QAM

Middle Channel

Middle Channel



Date: 29, MAR, 2021 06:07:06

Date: 29, MAR, 2021 06:06:49



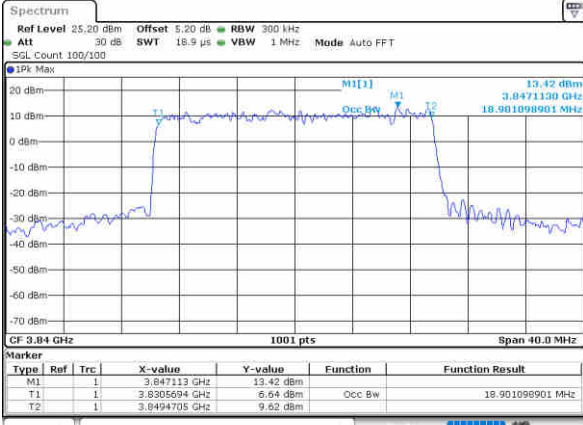
FR1 N77 / 20MHz / CP-OFDM

QPSK

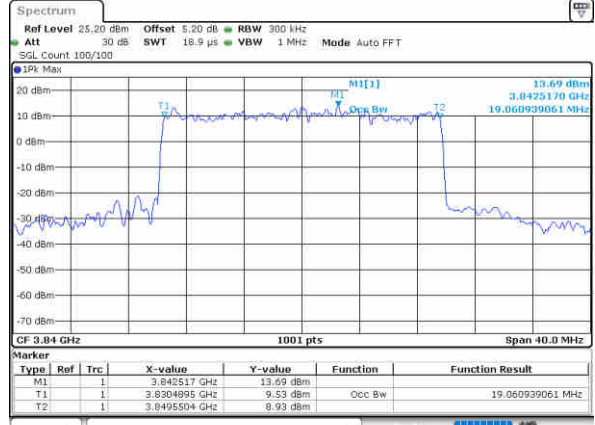
16QAM

Middle Channel

Middle Channel



Date: 29.MAR.2021 06:08:10



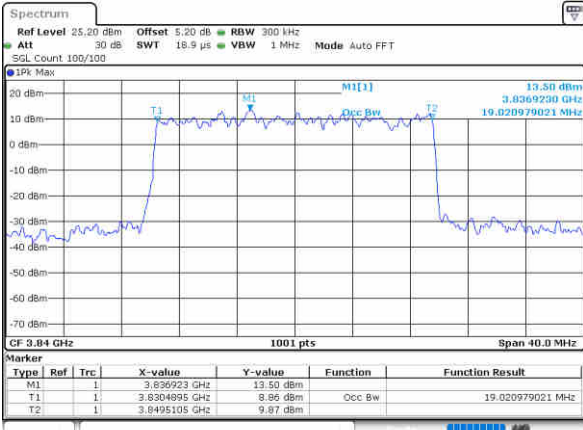
Date: 29.MAR.2021 06:10:30

64QAM

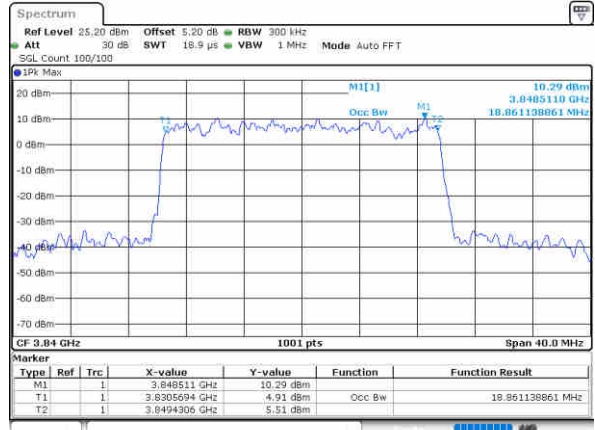
256QAM

Middle Channel

Middle Channel



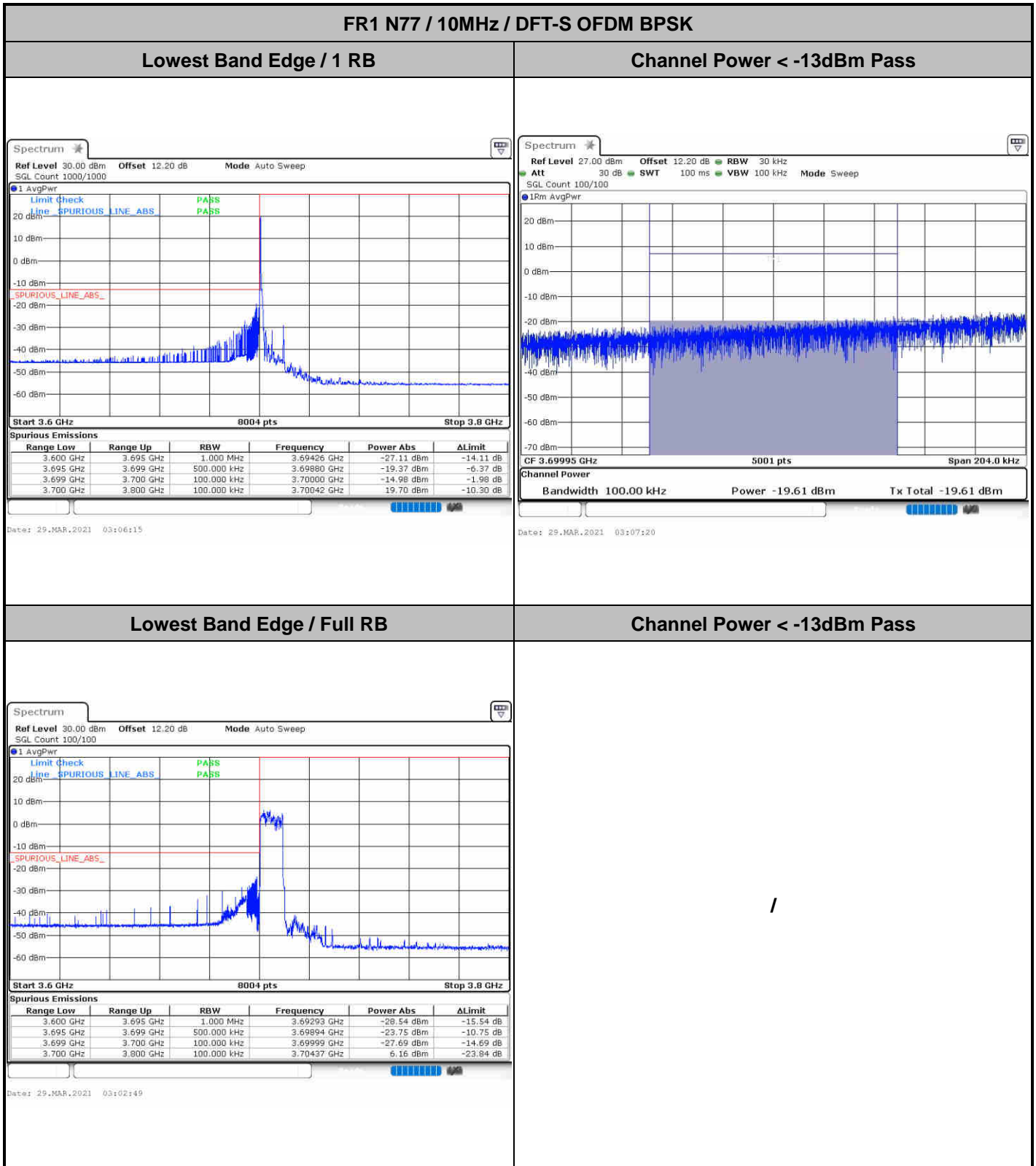
Date: 29.MAR.2021 06:08:48



Date: 29.MAR.2021 06:10:17



# Conducted Band Edge

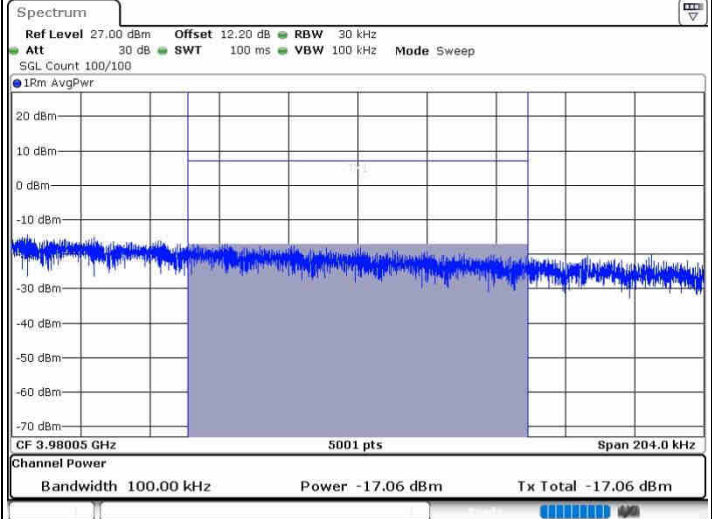




FR1 N77 / 10MHz / DFT-S OFDM BPSK

Highest Band Edge / 1 RB

Channel Power < -13dBm Pass

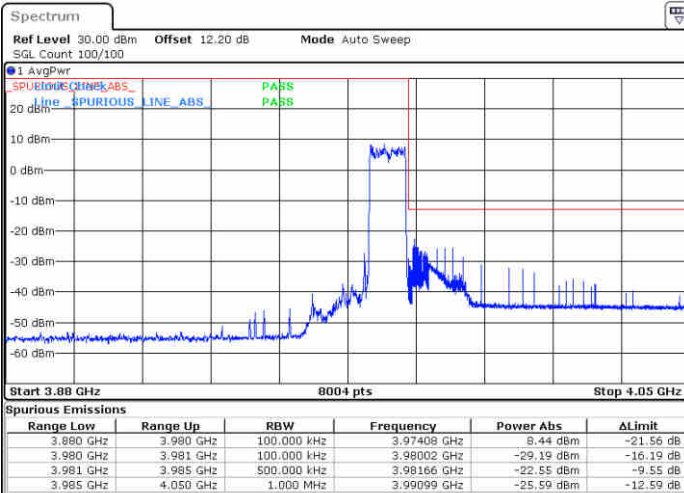


Date: 28.MAR.2021 04:45:57

Date: 28.MAR.2021 04:50:16

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



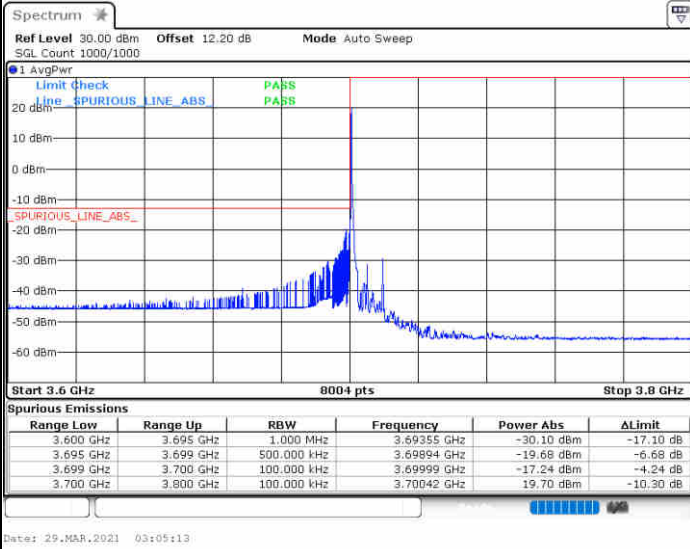
Date: 28.MAR.2021 04:50:33



FR1 N77 / 10MHz / DFT-S OFDM QPSK

Lowest Band Edge / 1 RB

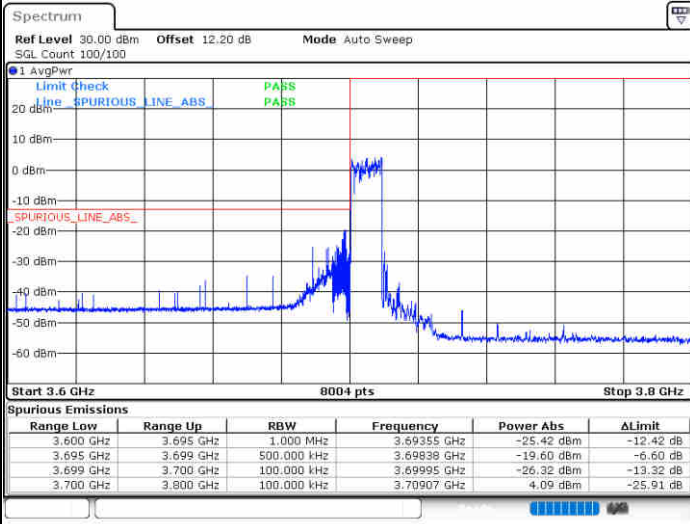
Channel Power < -13dBm Pass



Date: 29.MAR.2021 03:05:13

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



Date: 29.MAR.2021 03:03:56

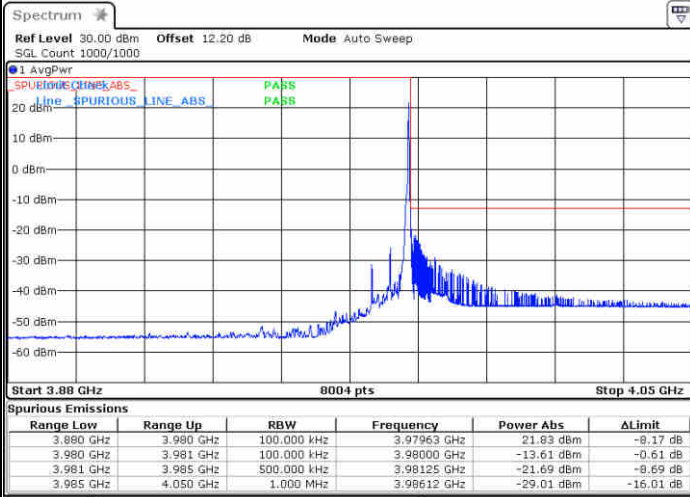




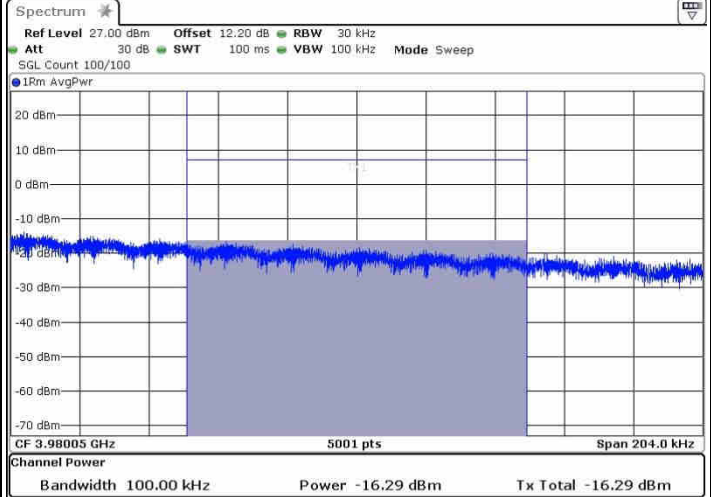
FR1 N77 / 10MHz / DFT-S OFDM QPSK

Highest Band Edge / 1 RB

Channel Power < -13dBm Pass



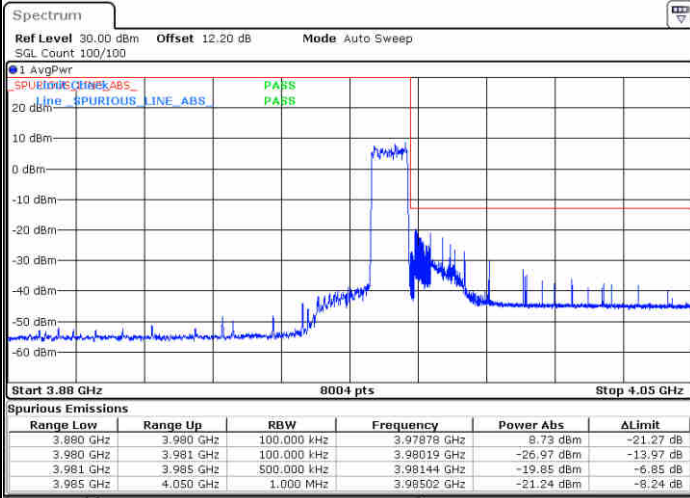
Date: 28.MAR.2021 04:47:06



Date: 28.MAR.2021 04:49:13

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



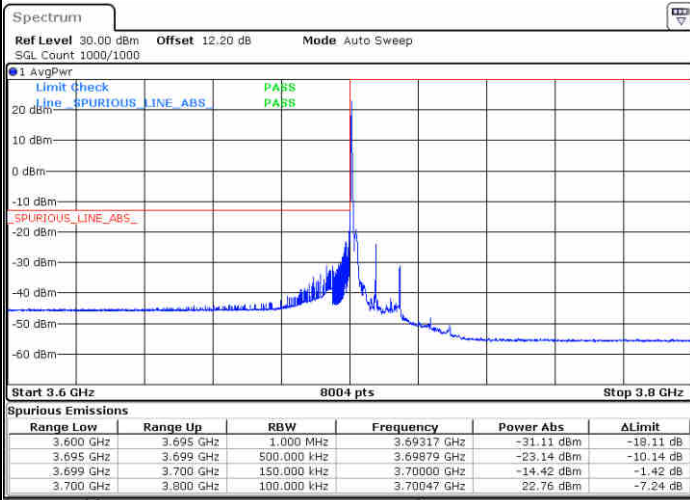
Date: 28.MAR.2021 04:52:42



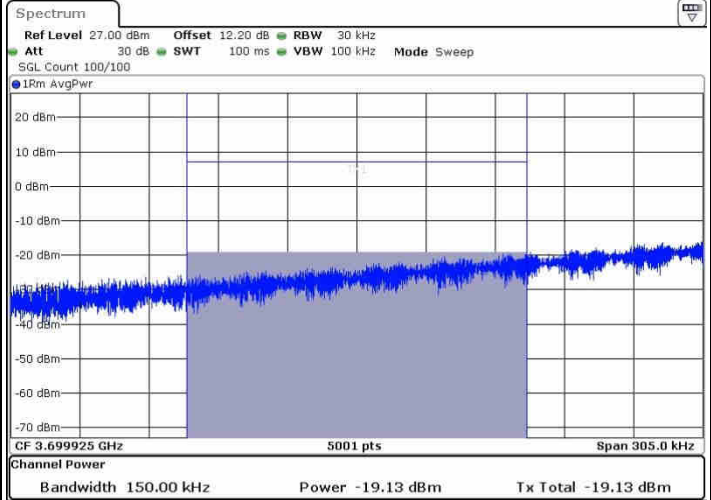
FR1 N77 / 15MHz / DFT-S OFDM BPSK

Lowest Band Edge / 1 RB

Channel Power < -13dBm Pass



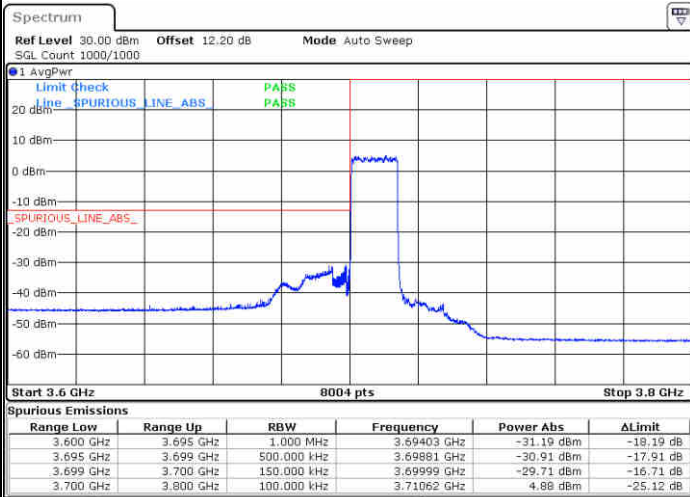
Date: 28.MAR.2021 04:56:19



Date: 28.MAR.2021 05:07:25

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



Date: 28.MAR.2021 04:55:21

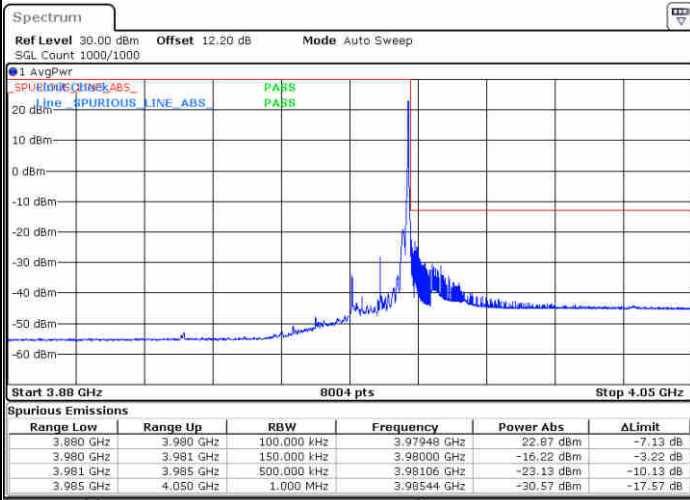
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FR1 N77 / 15MHz / DFT-S OFDM BPSK

Highest Band Edge / 1 RB

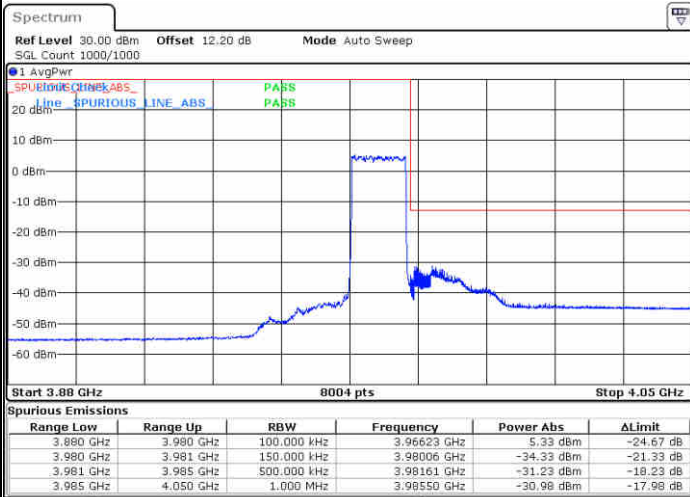
Channel Power < -13dBm Pass



Date: 28\_MAR\_2021 04:59:42

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



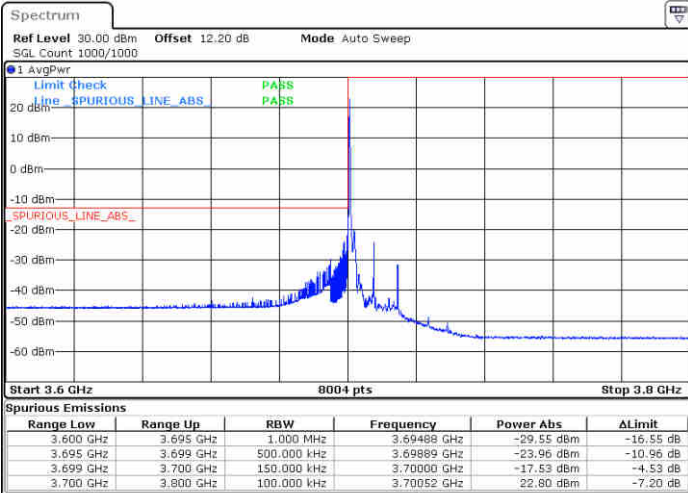
Date: 28\_MAR\_2021 05:02:32



FR1 N77 / 15MHz / DFT-S OFDM QPSK

Lowest Band Edge / 1 RB

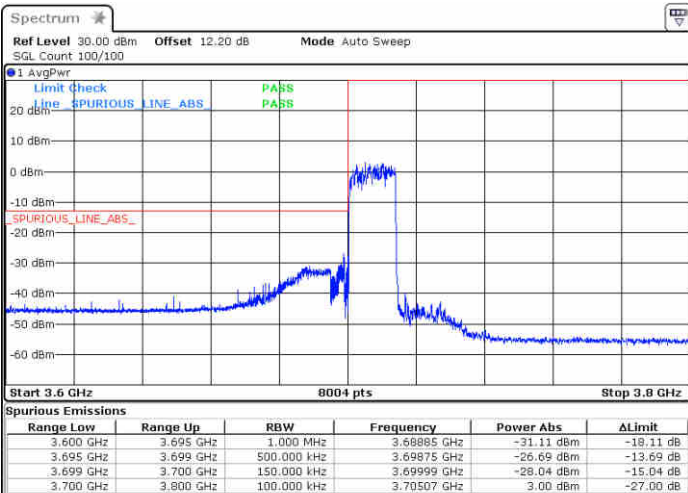
Channel Power < -13dBm Pass



Date: 28\_MAR.2021 04:57:12

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



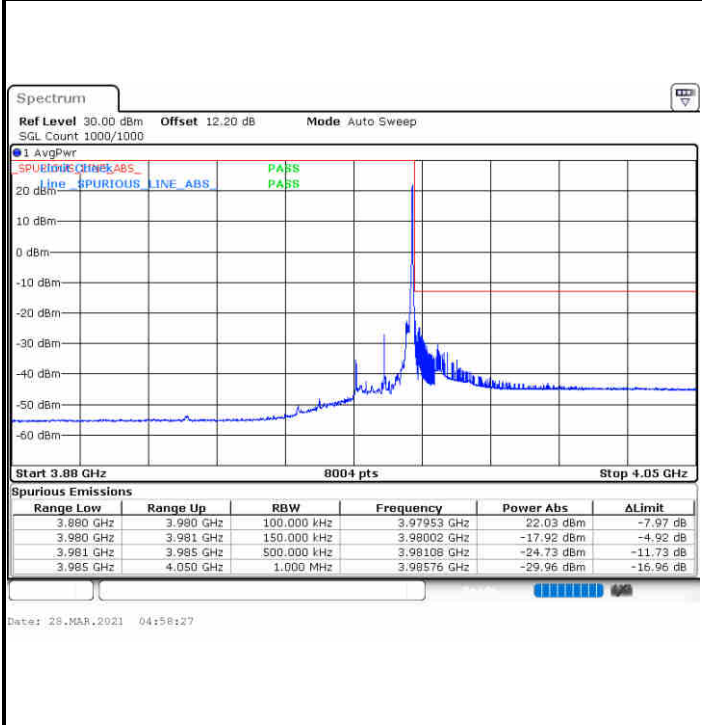
Date: 28\_MAR.2021 04:54:01



**FR1 N77 / 15MHz / DFT-S OFDM QPSK**

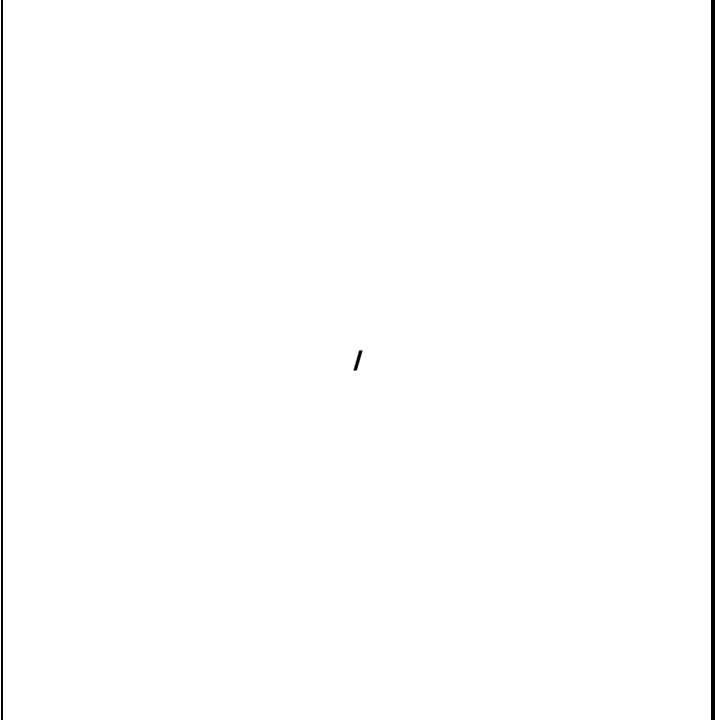
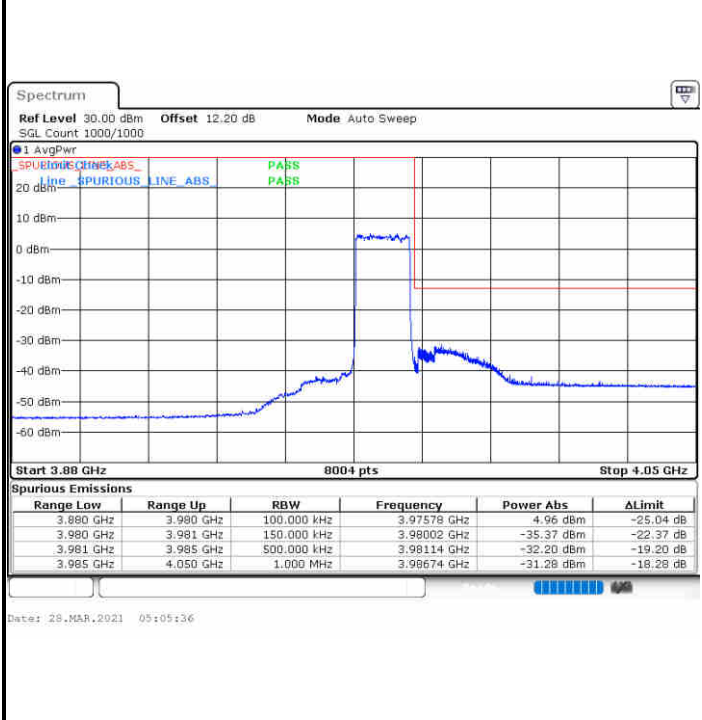
**Highest Band Edge / 1 RB**

**Channel Power < -13dBm Pass**



**Highest Band Edge / Full RB**

**Channel Power < -13dBm Pass**

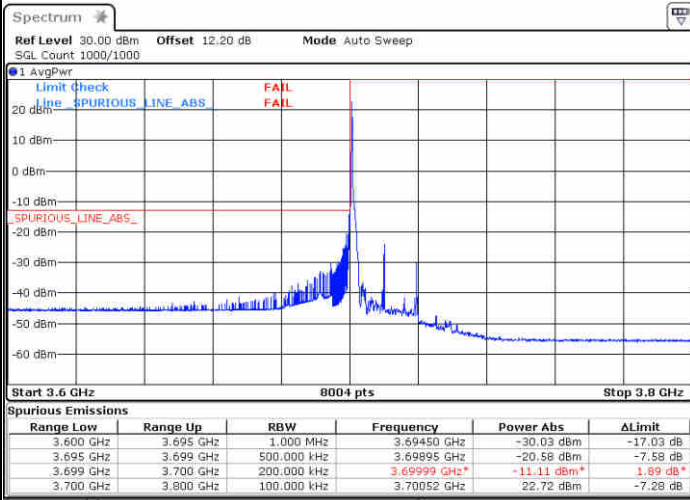




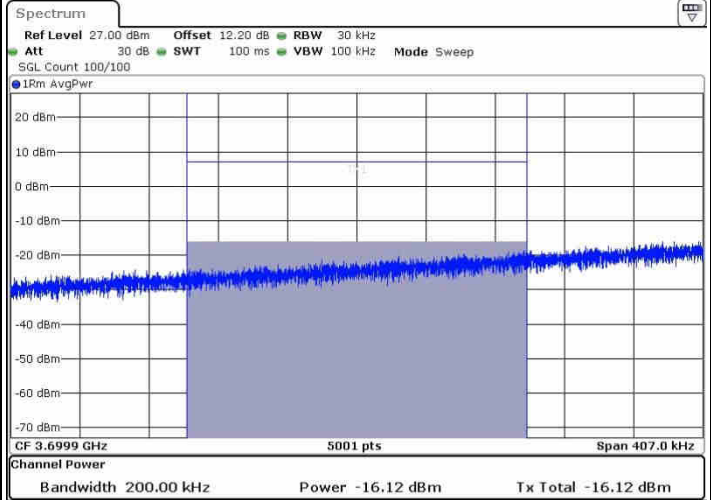
FR1 N77 / 20MHz / DFT-S OFDM BPSK

Lowest Band Edge / 1 RB

Channel Power < -13dBm Pass



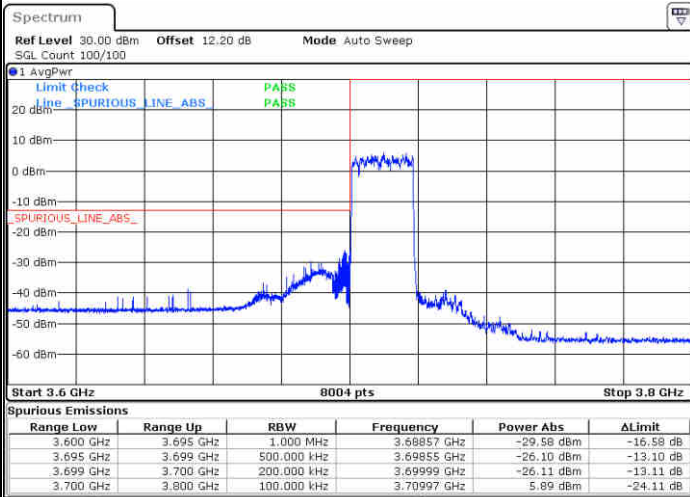
Date: 28.MAR.2021 05:16:16



Date: 28.MAR.2021 05:30:55

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



Date: 28.MAR.2021 05:08:13

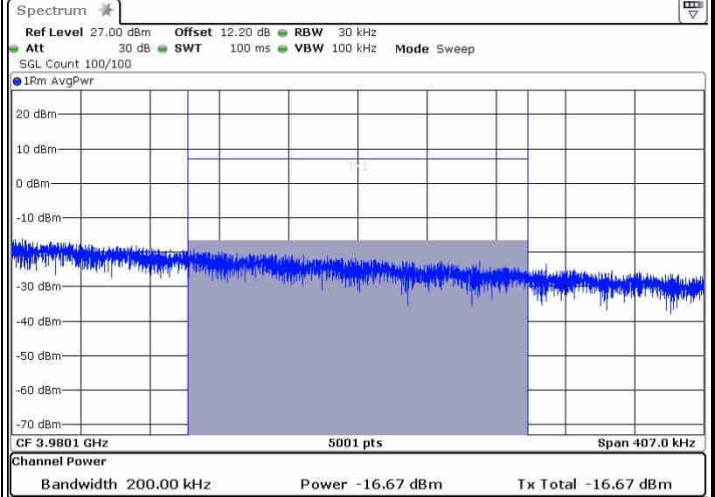
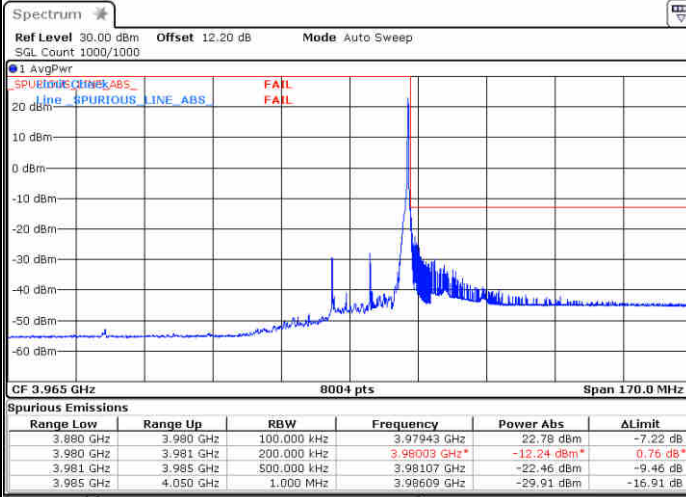
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FR1 N77 / 20MHz / DFT-S OFDM BPSK

Highest Band Edge / 1 RB

Channel Power < -13dBm Pass



Date: 28.MAR.2021 05:18:53

Date: 28.MAR.2021 05:24:21

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



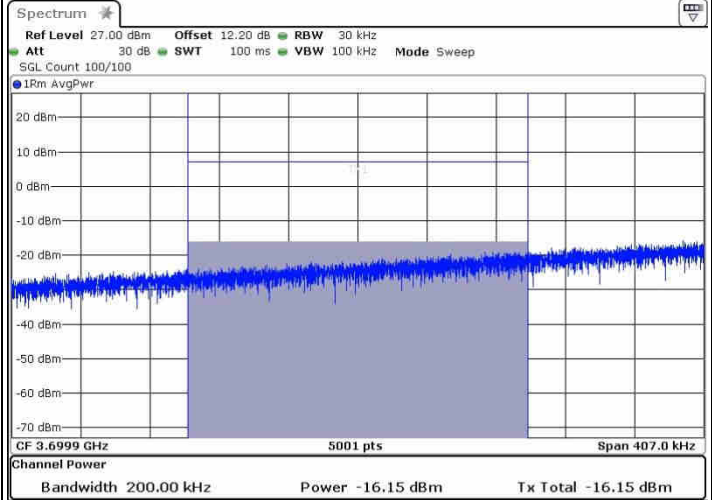
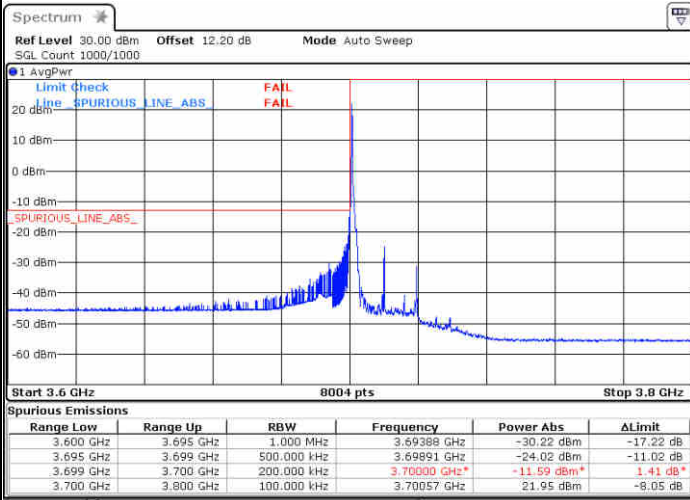
Date: 28.MAR.2021 05:22:58



FR1 N77 / 20MHz / DFT-S OFDM QPSK

Lowest Band Edge / 1 RB

Channel Power < -13dBm Pass

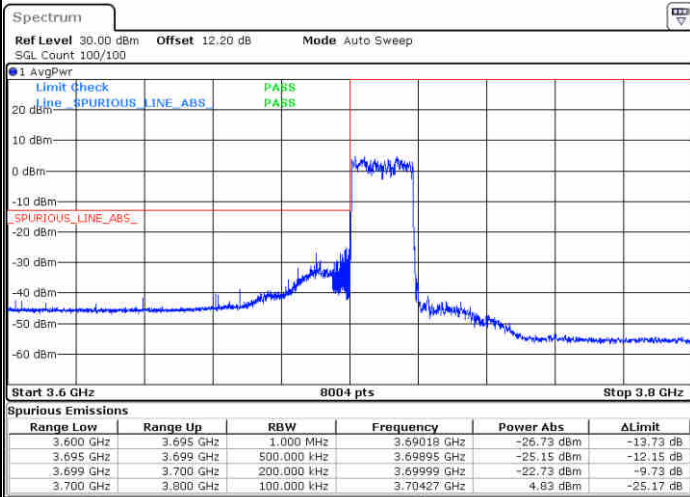


Date: 28.MAR.2021 05:12:03

Date: 28.MAR.2021 05:30:29

Lowest Band Edge / Full RB

Channel Power < -13dBm Pass



Date: 28.MAR.2021 05:09:45

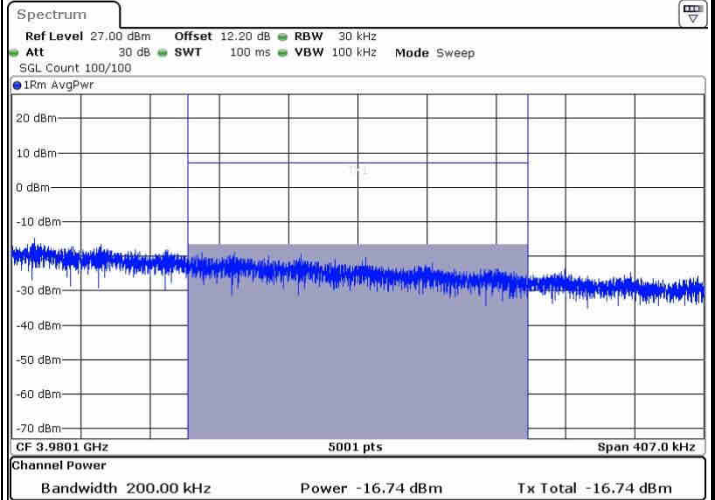
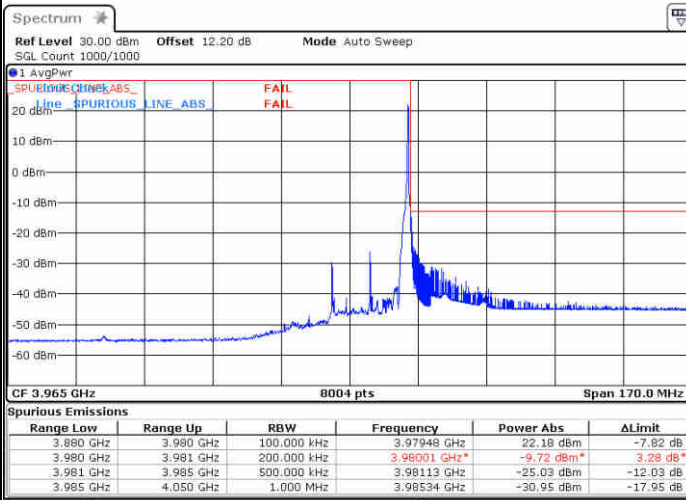




FR1 N77 / 20MHz / DFT-S OFDM QPSK

Highest Band Edge / 1 RB

Channel Power < -13dBm Pass

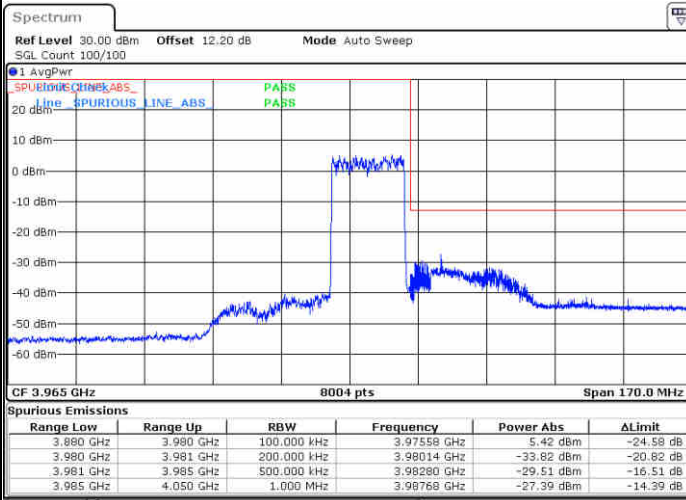


Date: 28.MAR.2021 05:20:22

Date: 28.MAR.2021 05:28:32

Highest Band Edge / Full RB

Channel Power < -13dBm Pass



Date: 28.MAR.2021 05:21:45

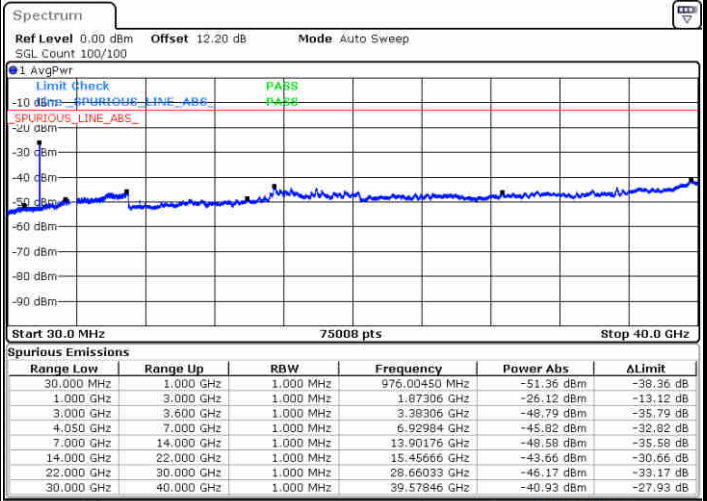
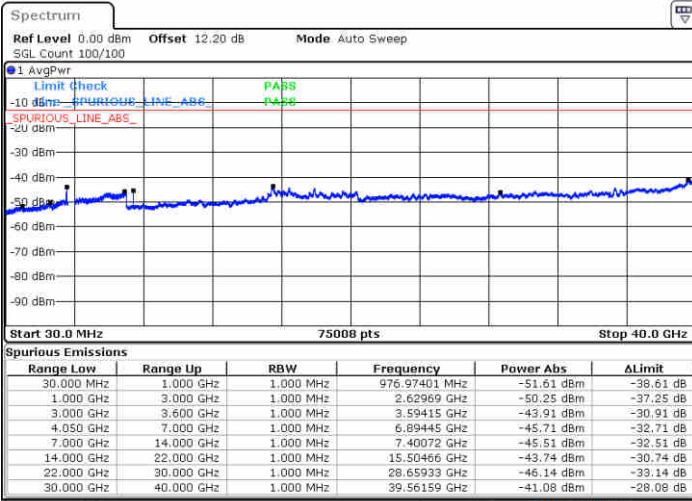


# Conducted Spurious Emission

FR1 N77 / 10MHz / DFT-S OFDM / BPSK

Lowest Channel / 1RB

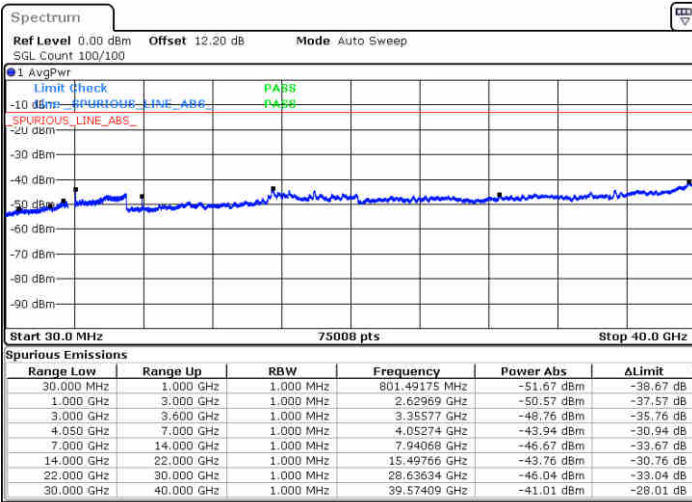
Middle Channel / 1RB



Date: 29.MAR.2021 03:08:28

Date: 28.MAR.2021 04:39:00

Highest Channel / 1RB



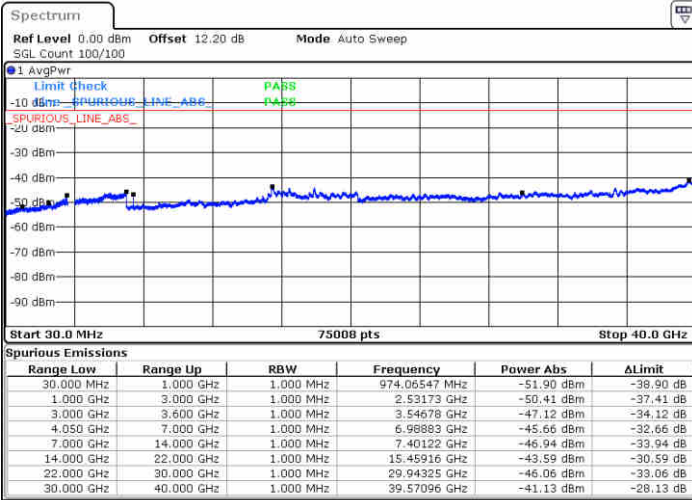
Date: 28.MAR.2021 04:19:11



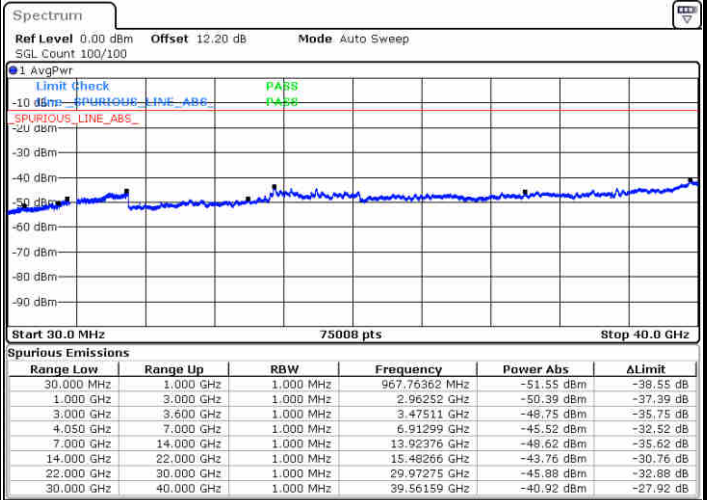
FR1 N77 / 10MHz / DFT-S OFDM / QPSK

Lowest Channel / 1RB

Middle Channel / 1RB

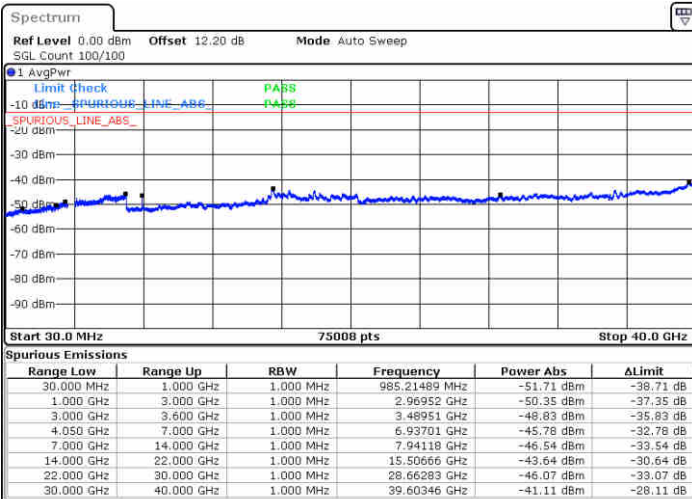


Date: 29.MAR.2021 03:09:47



Date: 28.MAR.2021 04:15:15

Highest Channel / 1RB



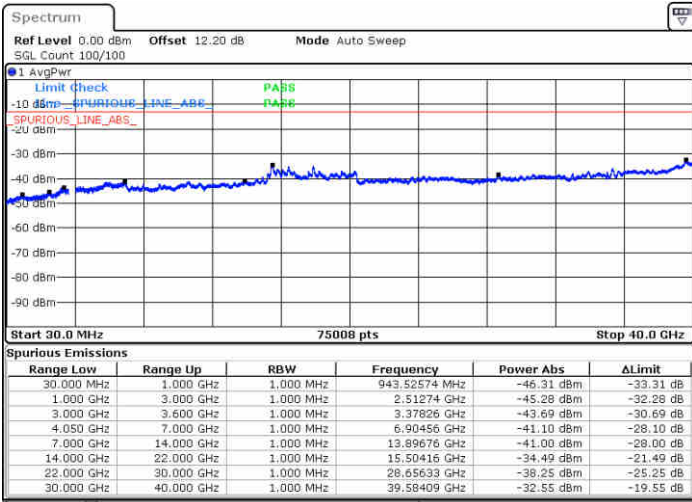
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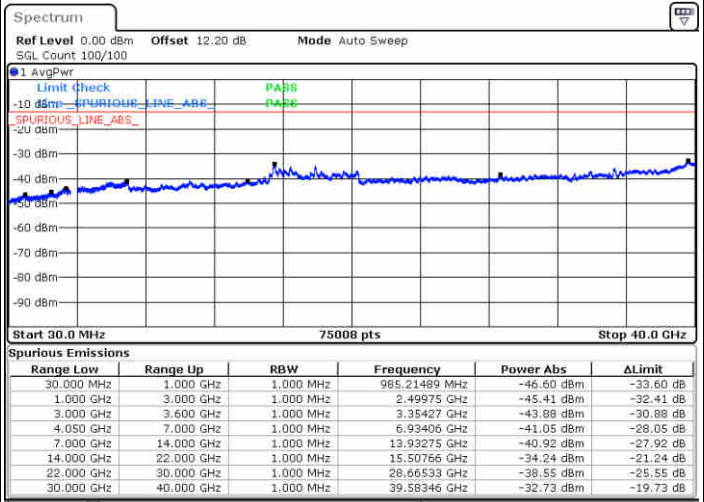
FR1 N77 / 15MHz / DFT-S OFDM / BPSK

Lowest Channel / 1RB

Middle Channel / 1RB

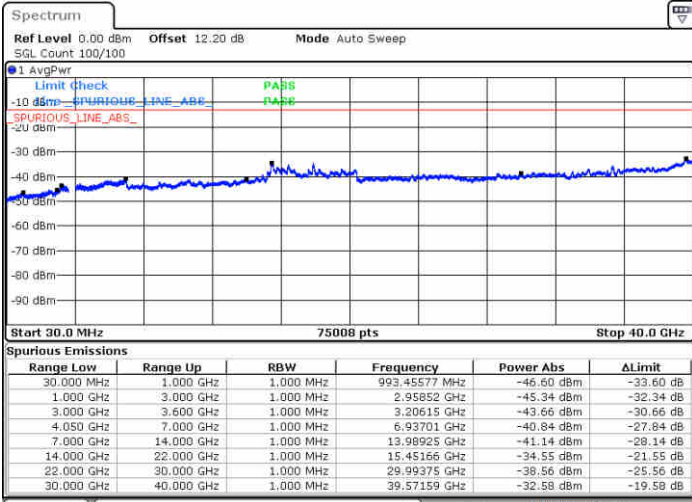


Date: 28.MAR.2021 03:32:38



Date: 28.MAR.2021 04:08:56

Highest Channel / 1RB



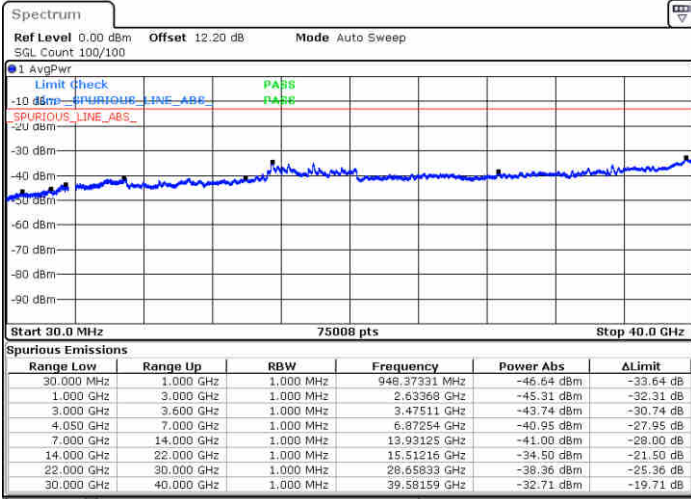
Date: 28.MAR.2021 04:10:59



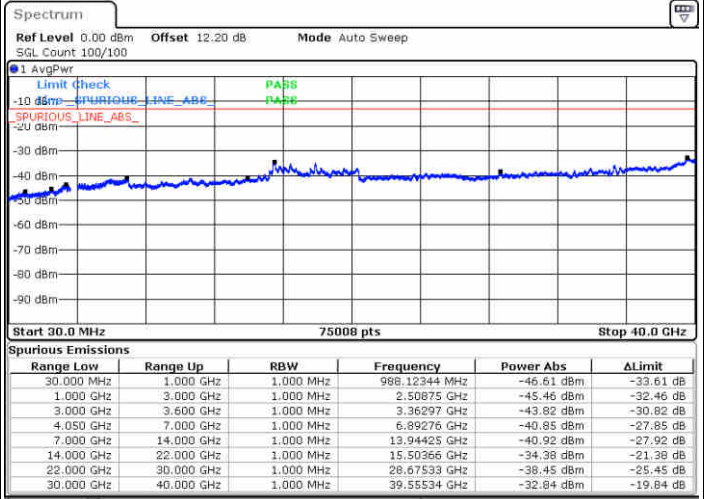
FR1 N77 / 15MHz / DFT-S OFDM / QPSK

Lowest Channel / 1RB

Middle Channel / 1RB

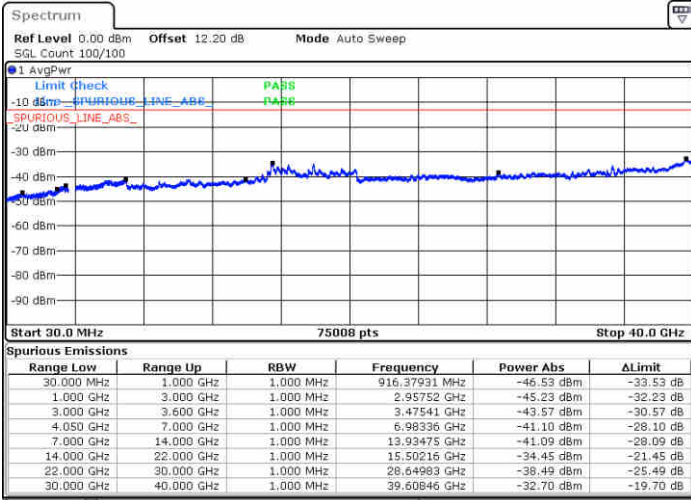


Date: 28.MAR.2021 03:33:56



Date: 28.MAR.2021 03:35:17

Highest Channel / 1RB



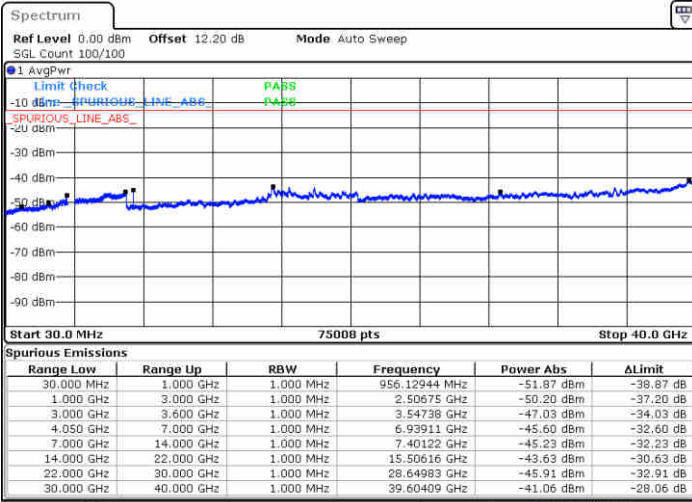
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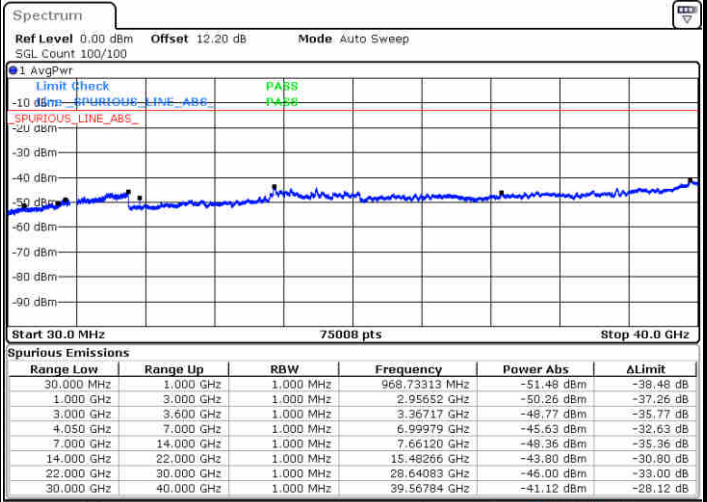
FR1 N77 / 20MHz / DFT-S OFDM / BPSK

Lowest Channel / 1RB

Middle Channel / 1RB

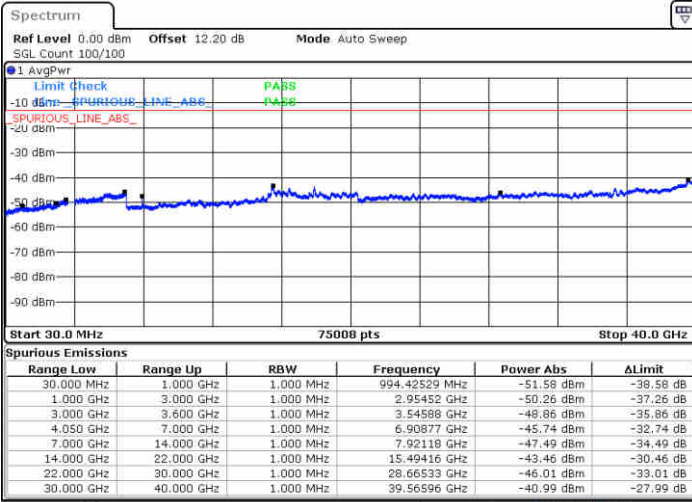


Date: 28.MAR.2021 02:41:25



Date: 28.MAR.2021 03:17:05

Highest Channel / 1RB



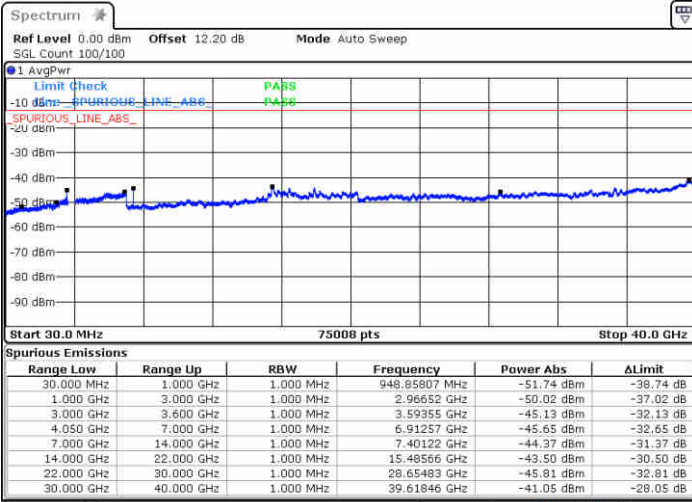
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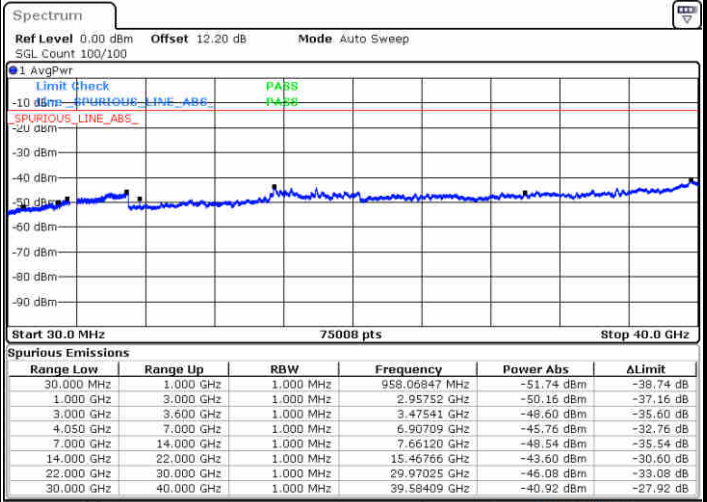
FR1 N77 / 20MHz / DFT-S OFDM / QPSK

Lowest Channel / 1RB

Middle Channel / 1RB

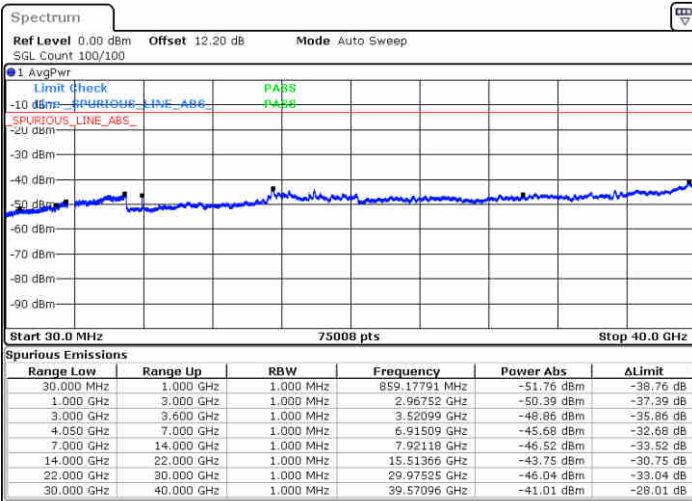


Date: 28.MAR.2021 02:31:14



Date: 28.MAR.2021 03:15:33

Highest Channel / 1RB



Date: 28.MAR.2021 03:18:59



Frequency Stability

Test Conditions		NR N77 (BPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 20MHz	Within Band
		Deviation (ppm)	Result
50	Normal Voltage	0.0015	PASS
40	Normal Voltage	0.0001	
30	Normal Voltage	0.0006	
20(Ref.)	Normal Voltage	0.0019	
10	Normal Voltage	0.0002	
0	Normal Voltage	0.0009	
-10	Normal Voltage	0.0013	
-20	Normal Voltage	0.0002	
-30	Normal Voltage	0.0019	
20	Maximum Voltage	0.0009	
20	Normal Voltage	0.0015	
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 NSA-SCS 30K

### Peak-to-Average Ratio

Mode	FR1 n77 / 10MHz / DFT-S OFDM				
Mod.	PI/2 BPSK	PI/2 BPSK	QPSK	QPSK	Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	7.86	6.78	8.29	8.23	<b>PASS</b>
Middle CH	6.84	7.77	7.45	9.39	
Highest CH	6.87	6.67	7.59	8.17	



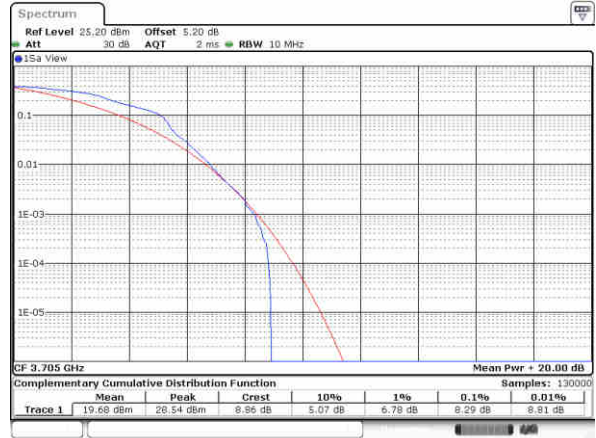
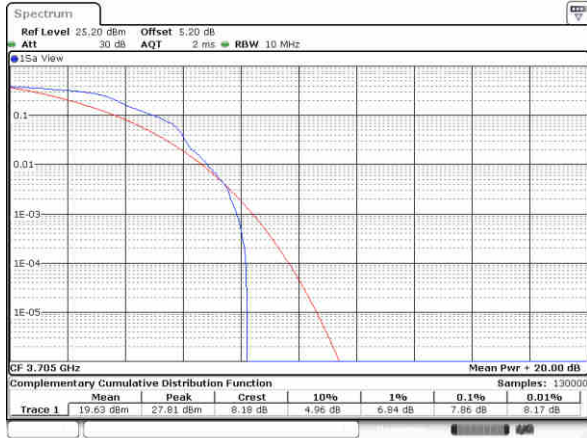
FR1 n77 / 10MHz / DFT-S OFDM

PI/2 BPSK

QPSK

Lowest Channel / 1RB

Lowest Channel / 1RB

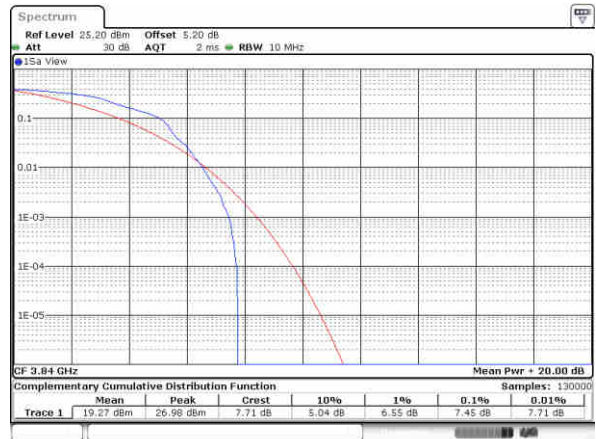
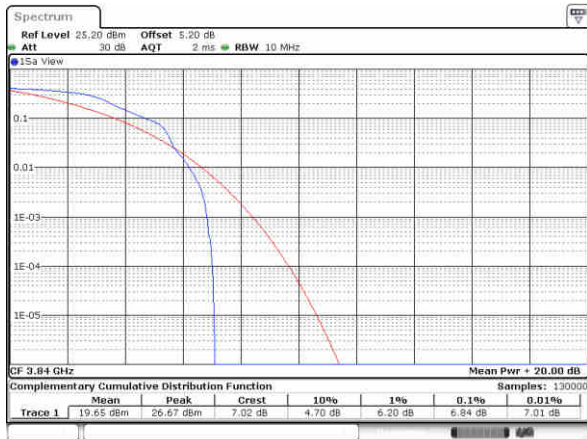


Date: 4.MAR.2021 14:12:42

Date: 4.MAR.2021 14:15:54

Middle Channel / 1 RB

Middle Channel / 1 RB

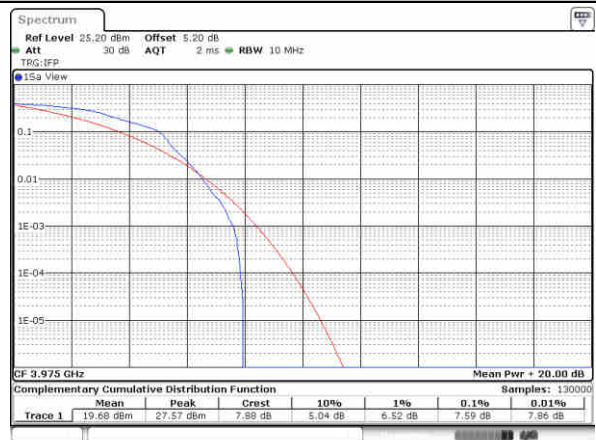
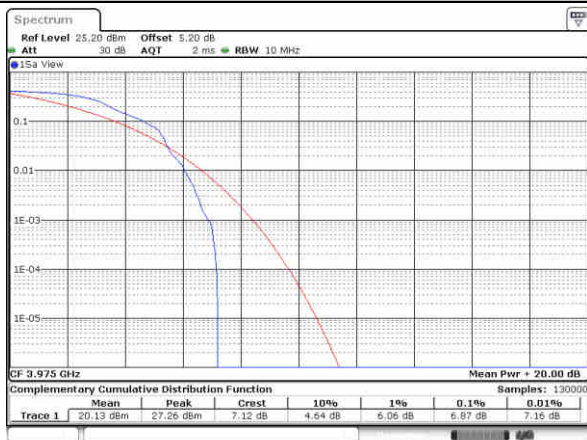


Date: 4.MAR.2021 14:19:04

Date: 4.MAR.2021 14:16:16

Highest Channel / 1 RB

Highest Channel / 1 RB



Date: 4.MAR.2021 14:28:01

Date: 4.MAR.2021 14:28:30



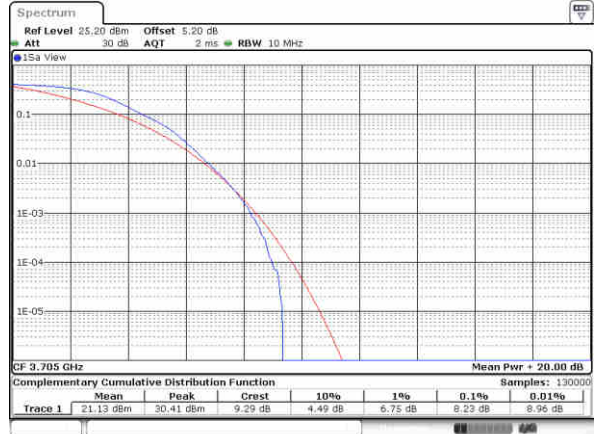
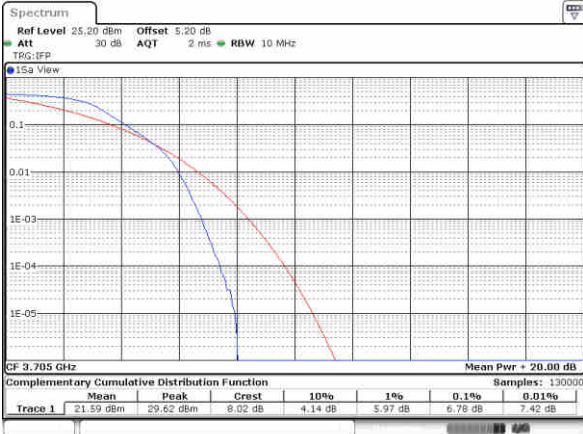
FR1 n77 / 10MHz / DFT-S OFDM

PI/2 BPSK

QPSK

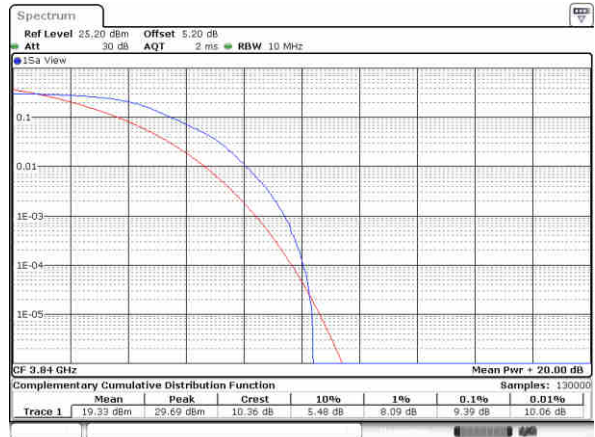
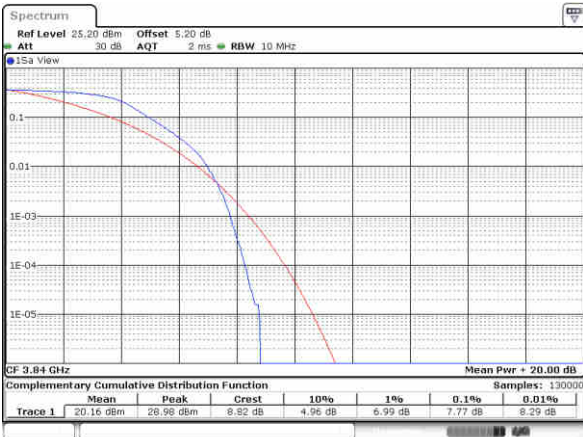
Lowest Channel / Full RB

Lowest Channel / Full RB



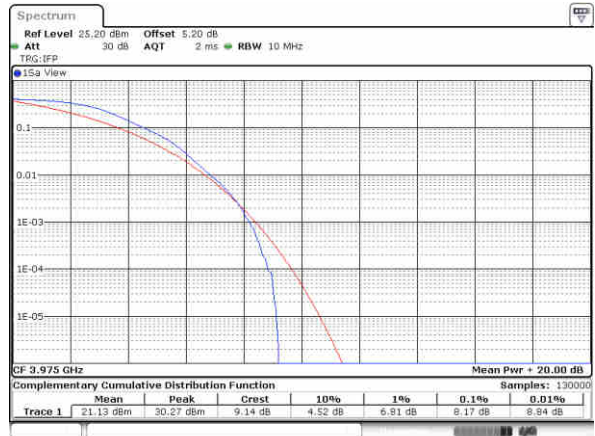
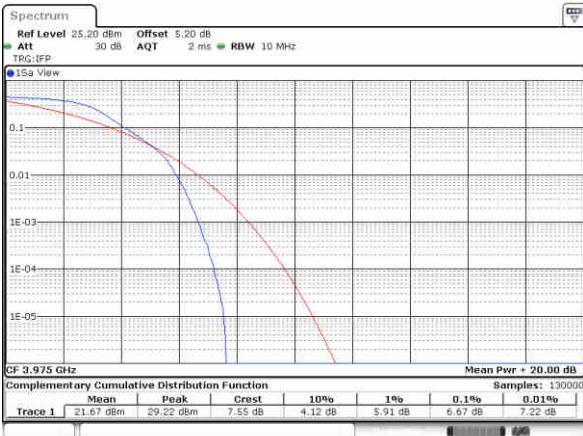
Middle Channel / Full RB

Middle Channel / Full RB



Highest Channel / Full RB

Highest Channel / Full RB





**26dB Bandwidth**

Mode	FR1 n77 : 26dB BW(MHz) / CP-OFDM							
BW	10MHz	10MHz	10MHz	10MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	9.09	9.29	9.21	9.09				

Mode	FR1 n77 : 26dB BW(MHz) / CP-OFDM							
BW	15MHz	15MHz	15MHz	15MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	14.42	14.51	14.33	14.51				

Mode	FR1 n77 : 26dB BW(MHz) / CP-OFDM							
BW	20MHz	20MHz	20MHz	20MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	19.02	19.14	19.54	19.06				

Mode	FR1 n77 : 26dB BW(MHz) / CP-OFDM							
BW	40MHz	40MHz	40MHz	40MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	40.28	40.20	40.28	40.36				

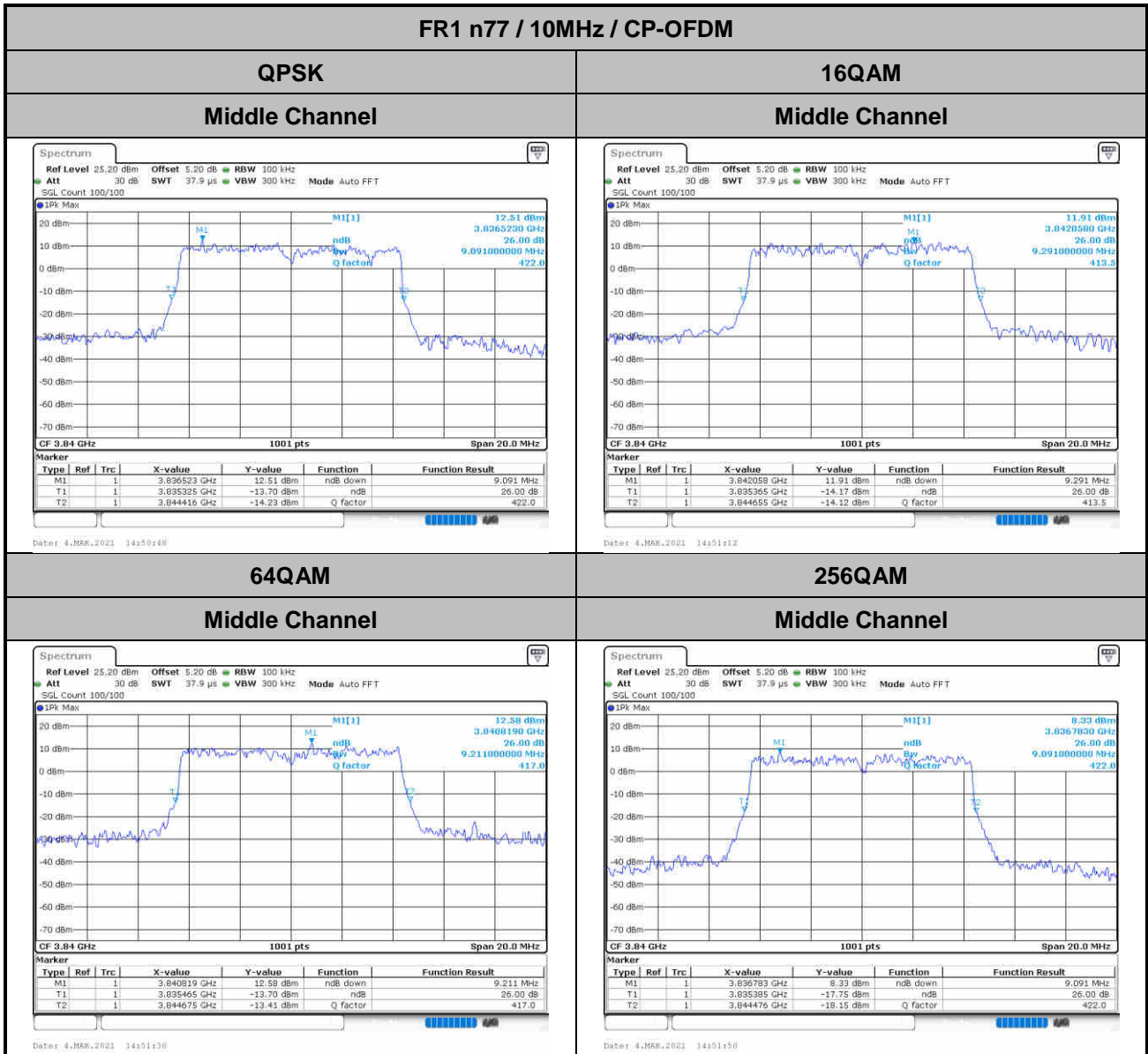
Mode	FR1 n77 : 26dB BW(MHz) / CP-OFDM							
BW	50MHz	50MHz	50MHz	50MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	49.75	49.75	49.55	49.95				

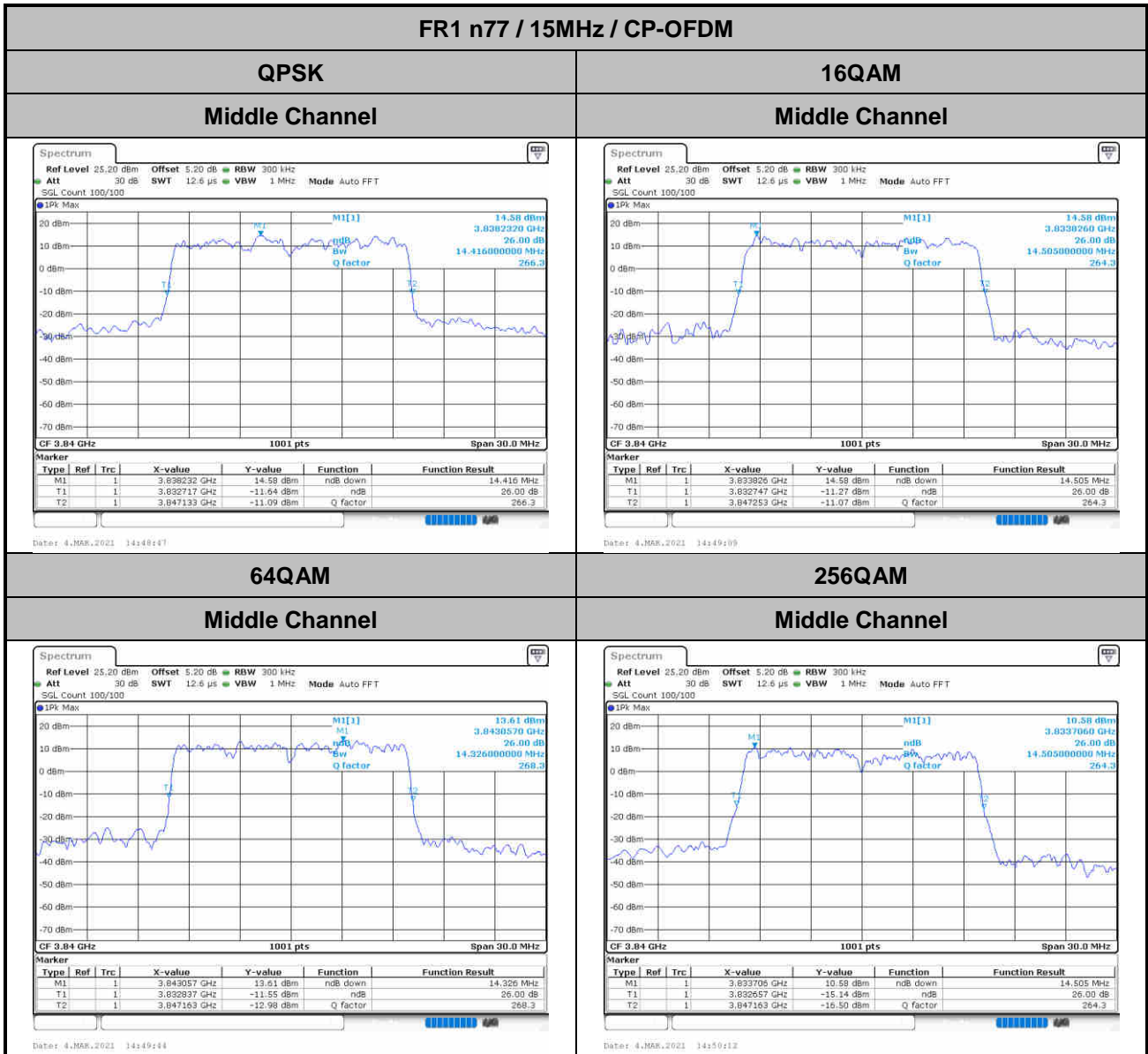
Mode	FR1 n77 : 26dB BW(MHz) / CP-OFDM							
BW	60MHz	60MHz	60MHz	60MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	60.54	60.18	60.66	60.30				

Mode	FR1 n77 : 26dB BW(MHz) / CP-OFDM							
BW	80MHz	80MHz	80MHz	80MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	80.08	80.24	79.92	79.92				



Mode	FR1 n77 : 26dB BW(MHz) / CP-OFDM							
BW	100MHz	100MHz	100MHz	100MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	100.10	100.90	100.30	100.50				







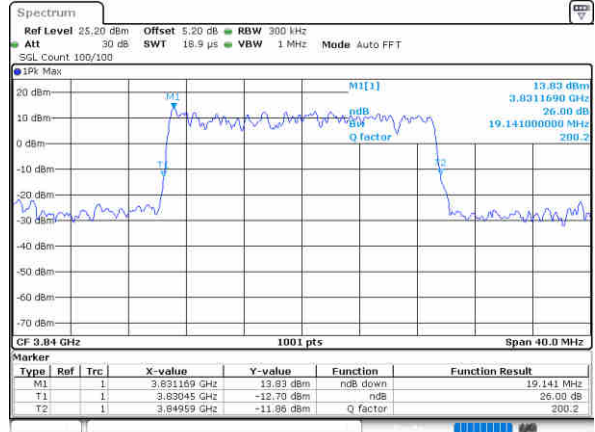
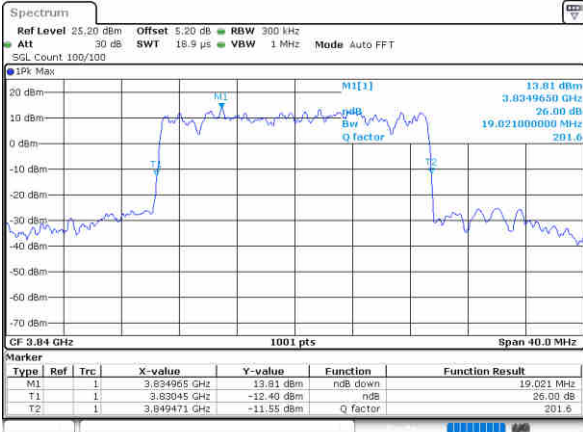
FR1 n77 / 20MHz / CP-OFDM

QPSK

16QAM

Middle Channel

Middle Channel



Date: 4.MAR.2021 14:46:33

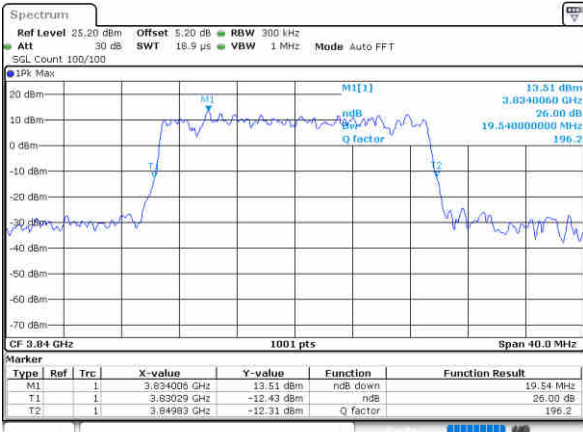
Date: 4.MAR.2021 14:46:51

64QAM

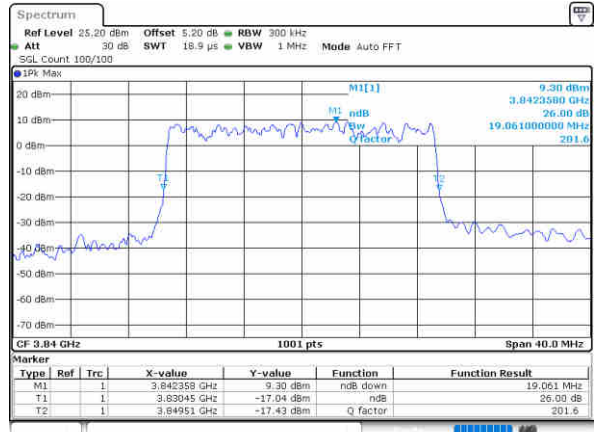
256QAM

Middle Channel

Middle Channel

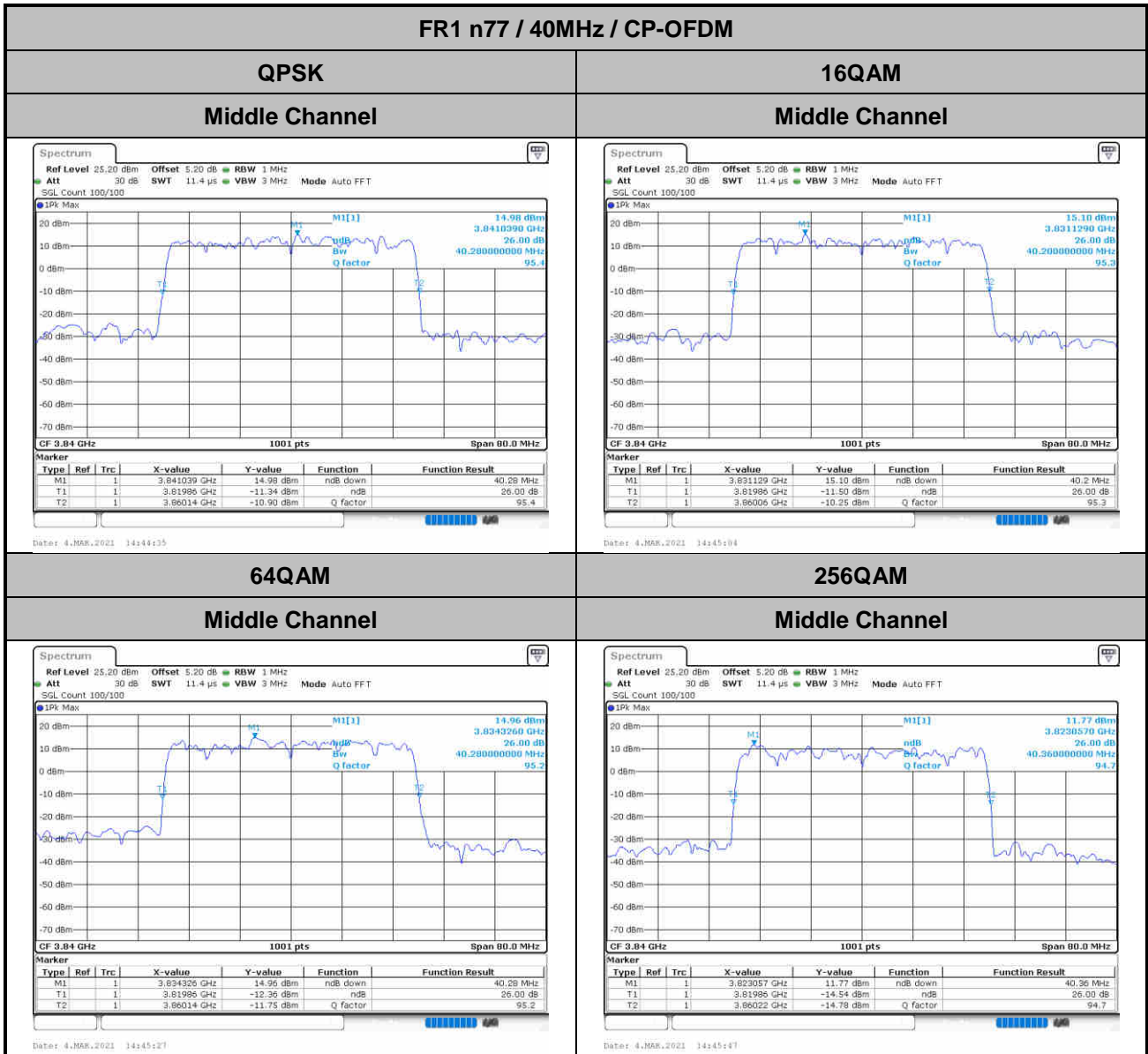


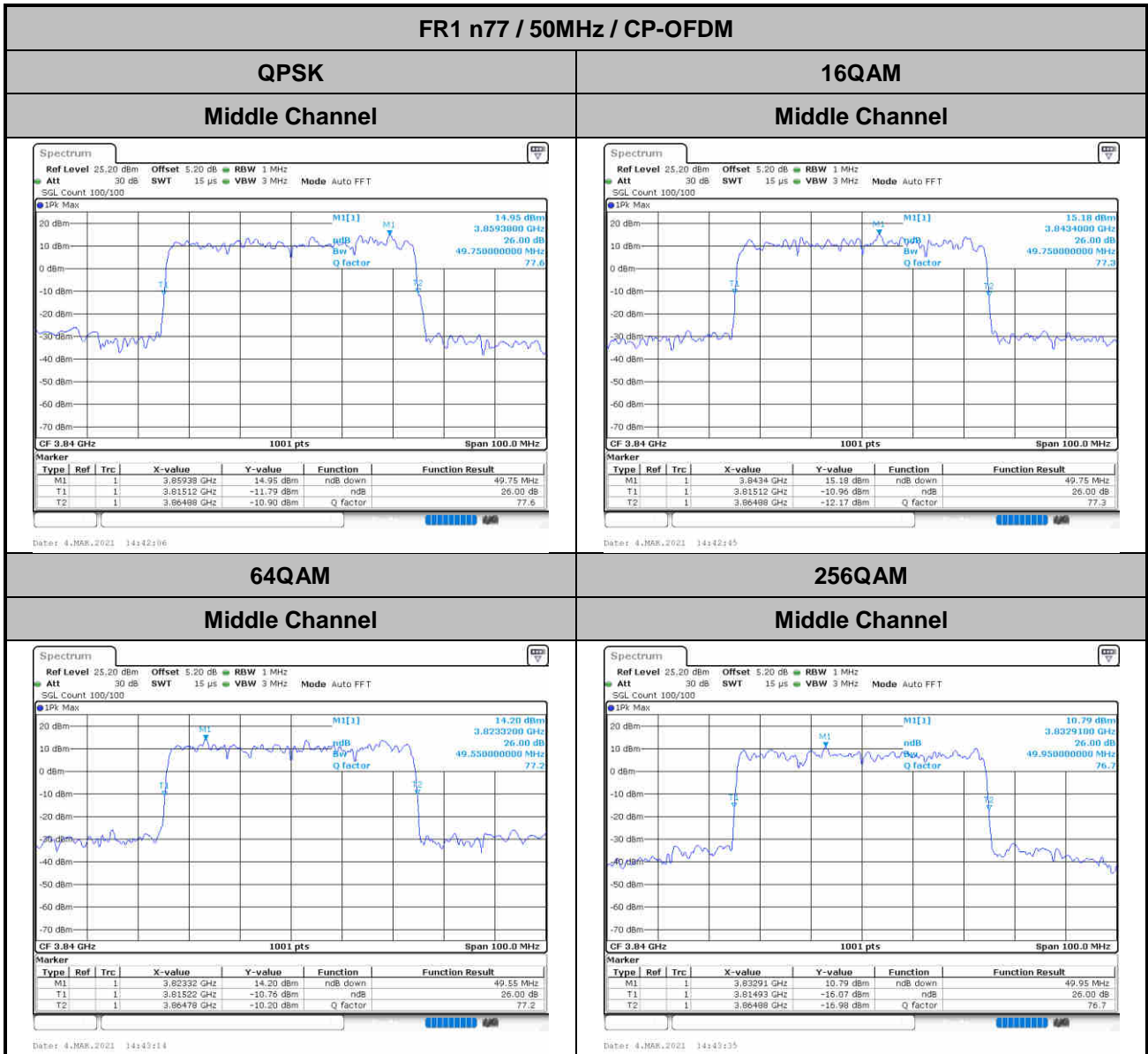
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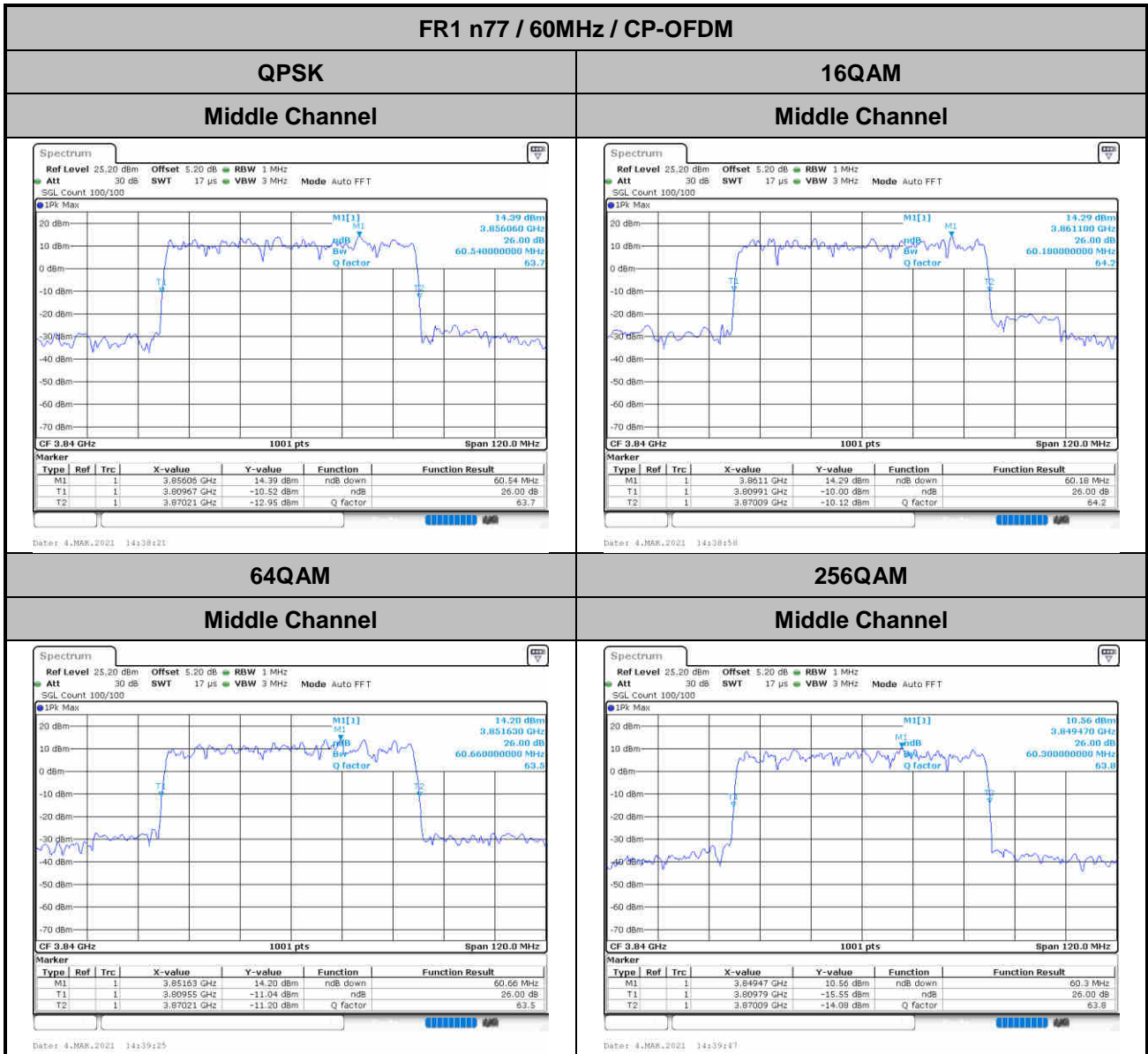


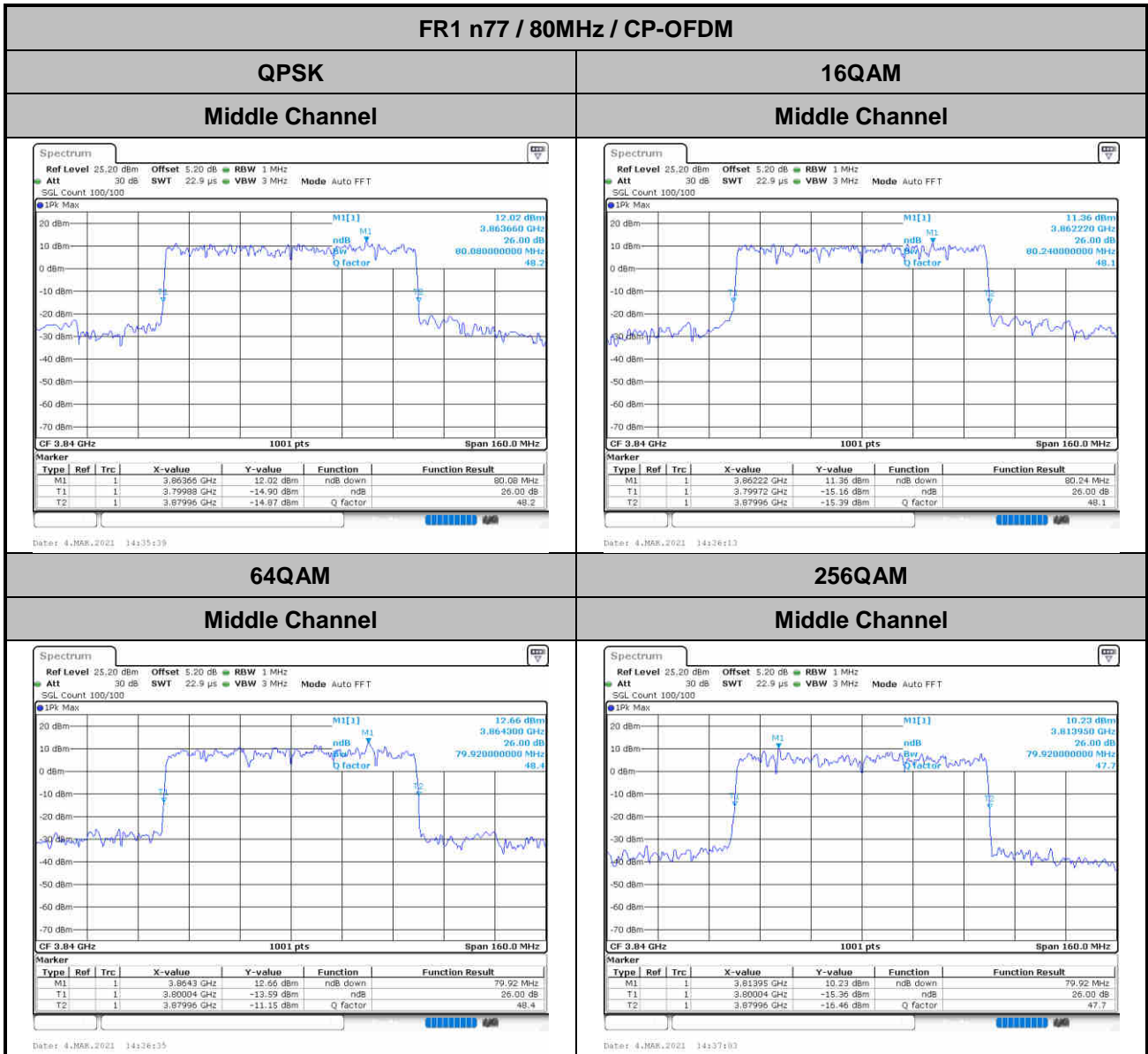
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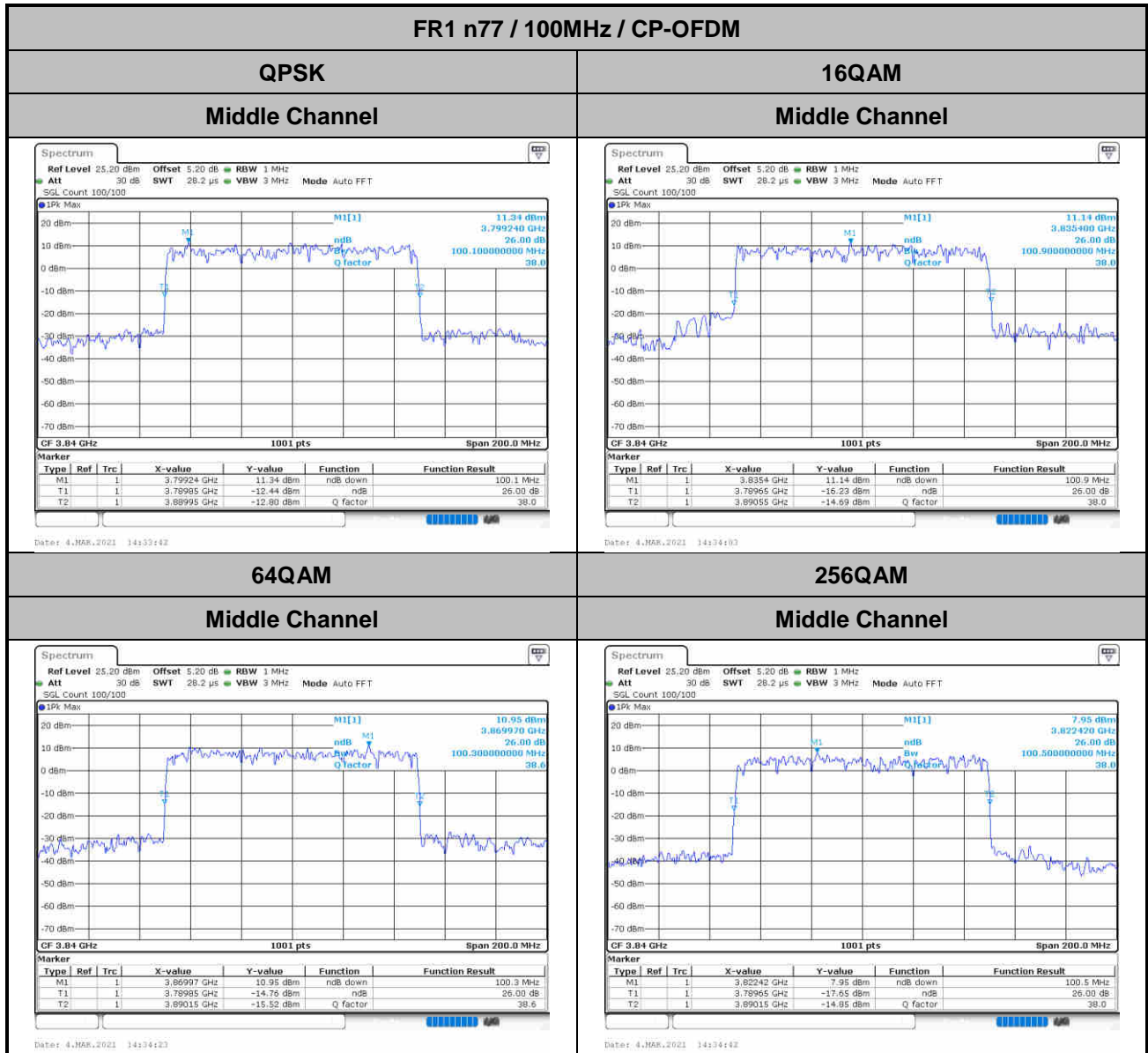














### Occupied Bandwidth

Mode	FR1 n77 : OBW(MHz) / CP-OFDM							
BW	10MHz	10MHz	10MHz	10MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	8.55	8.55	8.55	8.55				

Mode	FR1 n77 : OBW(MHz) / CP-OFDM							
BW	15MHz	15MHz	15MHz	15MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	13.61	13.61	13.67	13.64				

Mode	FR1 n77 : OBW(MHz) / CP-OFDM							
BW	20MHz	20MHz	20MHz	20MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	18.26	18.30	18.18	18.26				

Mode	FR1 n77 : OBW(MHz) / CP-OFDM							
BW	40MHz	40MHz	40MHz	40MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	38.12	38.12	38.20	38.12				

Mode	FR1 n77 : OBW(MHz) / CP-OFDM							
BW	50MHz	50MHz	50MHz	50MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	47.65	47.35	47.55	47.15				

Mode	FR1 n77 : OBW(MHz) / CP-OFDM							
BW	60MHz	60MHz	60MHz	60MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	57.54	57.78	57.66	57.90				

Mode	FR1 n77 : OBW(MHz) / CP-OFDM							
BW	80MHz	80MHz	80MHz	80MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	77.84	77.20	77.20	77.52				



Mode	FR1 n77 : OBW(MHz) / CP-OFDM							
BW	100MHz	100MHz	100MHz	100MHz				
Mod.	QPSK	16QAM	64QAM	256QAM				
Middle CH	97.50	97.30	97.30	97.50				

