

NR Band 77-High Band (IC)												
BW (MHz)	SCS (kHz)	Modulation		RB allocation	RB Size	RB Offset	Conducted Output Power					
							662666 (3 939.99 MHz)					
									(dB m)	(W)		
80	30	DFT-S OFDM	BPSK	Inner_1RB Left	1	1	-	-	23.78	0.239	-	-
			QPSK		1	1	-	-	23.66	0.232	-	-
			16QAM		1	1	-	-	22.36	0.172	-	-
			64QAM		1	1	-	-	21.17	0.131	-	-
			256QAM		1	1	-	-	18.99	0.079	-	-
			BPSK	Inner_1RB Right	1	215	-	-	23.62	0.230	-	-
			QPSK		1	215	-	-	23.59	0.229	-	-
			BPSK	Inner_Full	108	54	-	-	23.63	0.231	-	-
			QPSK		108	54	-	-	23.66	0.232	-	-
			BPSK	Outer_Full	216	0	-	-	23.39	0.218	-	-
			QPSK		216	0	-	-	22.91	0.195	-	-
			BPSK	Edge_1RB Left	1	0	-	-	23.13	0.206	-	-
			QPSK		1	0	-	-	22.63	0.183	-	-
			BPSK	Edge_Full Left	2	0	-	-	23.23	0.210	-	-
			QPSK		2	0	-	-	22.72	0.187	-	-
			BPSK	Edge_1RB Right	1	216	-	-	23.04	0.201	-	-
			QPSK		1	216	-	-	22.53	0.179	-	-
			BPSK	Edge_Full Right	2	215	-	-	23.13	0.206	-	-
			QPSK		2	215	-	-	22.61	0.182	-	-
			CP OFDM	QPSK	Inner_1RB Left	1	1	-	-	22.33	0.171	-
	16QAM	1	1	-		-	21.56	0.143	-	-		

ENDC

2A-n77A-Low Band (FCC)												
BW (MHz)	SCS (kHz)	Modulation		RB allocation	RB Size	RB Offset	Conducted Output Power					
							633334 (3 500.01 MHz)					
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
100	30	DFT-S OFDM	BPSK	Inner_1RB	1	1	-	-	23.43	0.220	-	-
			QPSK	Left	1	1	-	-	23.41	0.219	-	-
			BPSK	Inner_1RB	1	271	-	-	22.86	0.193	-	-
			QPSK	Right	1	271	-	-	22.92	0.196	-	-
2A-n77A-High Band (FCC)												
BW (MHz)	SCS (kHz)	Modulation		RB allocation	RB Size	RB Offset	Conducted Output Power					
							650000 (3 750.00 MHz)		656000 (3 840.00 MHz)		662000 (3 930.00 MHz)	
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
100	30	DFT-S OFDM	BPSK	Inner_1RB	1	1	23.25	0.211	23.43	0.220	23.31	0.214
			QPSK	Left	1	1	23.11	0.205	23.37	0.217	23.21	0.209
			BPSK	Inner_1RB	1	271	22.76	0.189	22.81	0.191	22.88	0.194
			QPSK	Right	1	271	22.73	0.187	22.82	0.191	22.80	0.191
2A-n78A-Low Band (FCC)												
BW (MHz)	SCS (kHz)	Modulation		RB allocation	RB Size	RB Offset	Conducted Output Power					
							633334 (3 500.01 MHz)					
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
100	30	DFT-S OFDM	BPSK	Inner_1RB	1	1	-	-	23.41	0.219	-	-
			QPSK	Left	1	1	-	-	23.41	0.219	-	-
			BPSK	Inner_1RB	1	271	-	-	22.86	0.193	-	-
			QPSK	Right	1	271	-	-	22.89	0.195	-	-
2A-n78A-High Band (FCC)												
BW (MHz)	SCS (kHz)	Modulation		RB allocation	RB Size	RB Offset	Conducted Output Power					
							650000 (3 750.00 MHz)					
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
100	30	DFT-S OFDM	BPSK	Inner_1RB	1	1			23.66	0.232		
			QPSK	Left	1	1			23.60	0.229		
			BPSK	Inner_1RB	1	271			23.02	0.200		
			QPSK	Right	1	271			22.33	0.171		

2A-n77A-Low Band (IC)												
BW (MHz)	SCS (kHz)	Modulation		RB allocation	RB Size	RB Offset	Conducted Output Power					
							633334 (3 500.01 MHz)		645000 (3 675.00 MHz)		656666 (3 849.99 MHz)	
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
100	30	DFT-S OFDM	BPSK	Inner_1RB	1	1	23.35	0.216	23.50	0.224	23.41	0.219
			QPSK	Left	1	1	23.24	0.211	23.49	0.223	23.43	0.220
			BPSK	Inner_1RB	1	271	22.89	0.195	23.05	0.202	23.11	0.205
			QPSK	Right	1	271	22.95	0.197	23.09	0.204	23.05	0.202
2A-n77A-High Band (IC)												
BW (MHz)	SCS (kHz)	Modulation		RB allocation	RB Size	RB Offset	Conducted Output Power					
							662666 (3 939.99 MHz)					
									(dB m)	(W)		
80	30	DFT-S OFDM	BPSK	Inner_1RB	1	1			23.58	0.228		
			QPSK	Left	1	1			23.55	0.226		
			BPSK	Inner_1RB	1	215			23.36	0.217		
			QPSK	Right	1	215			23.33	0.215		
2A-n78A-Low Band (IC)												
BW (MHz)	SCS (kHz)	Modulation		RB allocation	RB Size	RB Offset	Conducted Output Power					
							633334 (3 500.01 MHz)		641666 (3 624.99 MHz)		650000 (3 750.00 MHz)	
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
100	30	DFT-S OFDM	BPSK	Inner_1RB	1	1	23.30	0.214	23.35	0.216	23.16	0.207
			QPSK	Left	1	1	23.25	0.211	23.31	0.214	23.10	0.204
			BPSK	Inner_1RB	1	271	23.01	0.200	22.85	0.193	22.95	0.197
			QPSK	Right	1	271	23.05	0.202	22.88	0.194	22.80	0.191

Note ;

The ENDC combination were compared at the bandwidth of the worst output of the SA mode, and only the data of the worst ENDC combination were reported.

4. Occupied Bandwidth

4.1. Limit

CFR 47, Section FCC §2.1049 and IC RSS-Gen Issue 5 6.7.

4.2. Test Procedure

FCC

The test follows section 5.4.4 of ANSI C63.26-2015.

- a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation. products including the emission skirts (typically a span of $1.5 \times \text{OBW}$ is sufficient).
- b. The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1 % to 5 % of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- d. Set the detection mode to peak, and the trace mode to max-hold.
- e. If the instrument does not have a 99 % OBW function, recover the trace data points and sum directly in linear power terms. Place the recovered amplitude data points, beginning at the lowest frequency, in a running sum until 0.5 % of the total is reached. Record that frequency as the lower OBW frequency. Repeat the process until 99.5 % of the total is reached and record that frequency as the upper OBW frequency. The 99 % power OBW can be determined by computing the difference these two frequencies.
- f. The OBW shall be reported and plot(s) of the measuring instrument display shall be provided with the test report. The frequency and amplitude axis and scale shall be clearly labeled. Tabular data can be reported in addition to the plot(s).

IC

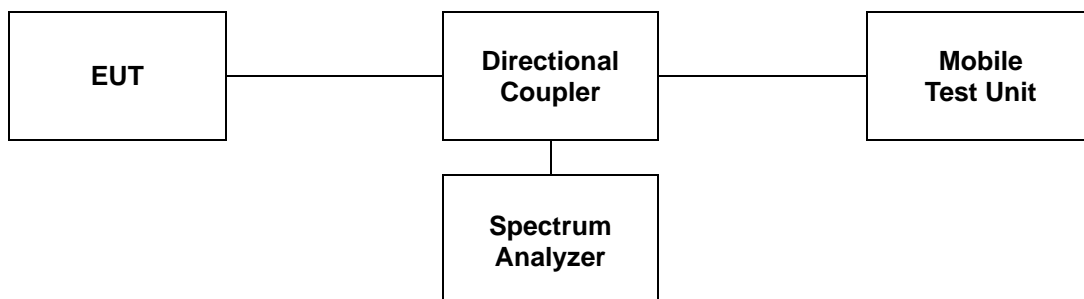
The test follows section 6.7 of RSS-Gen Issue 5.

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99 % emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99 % emission bandwidth).



4.3 Test Results

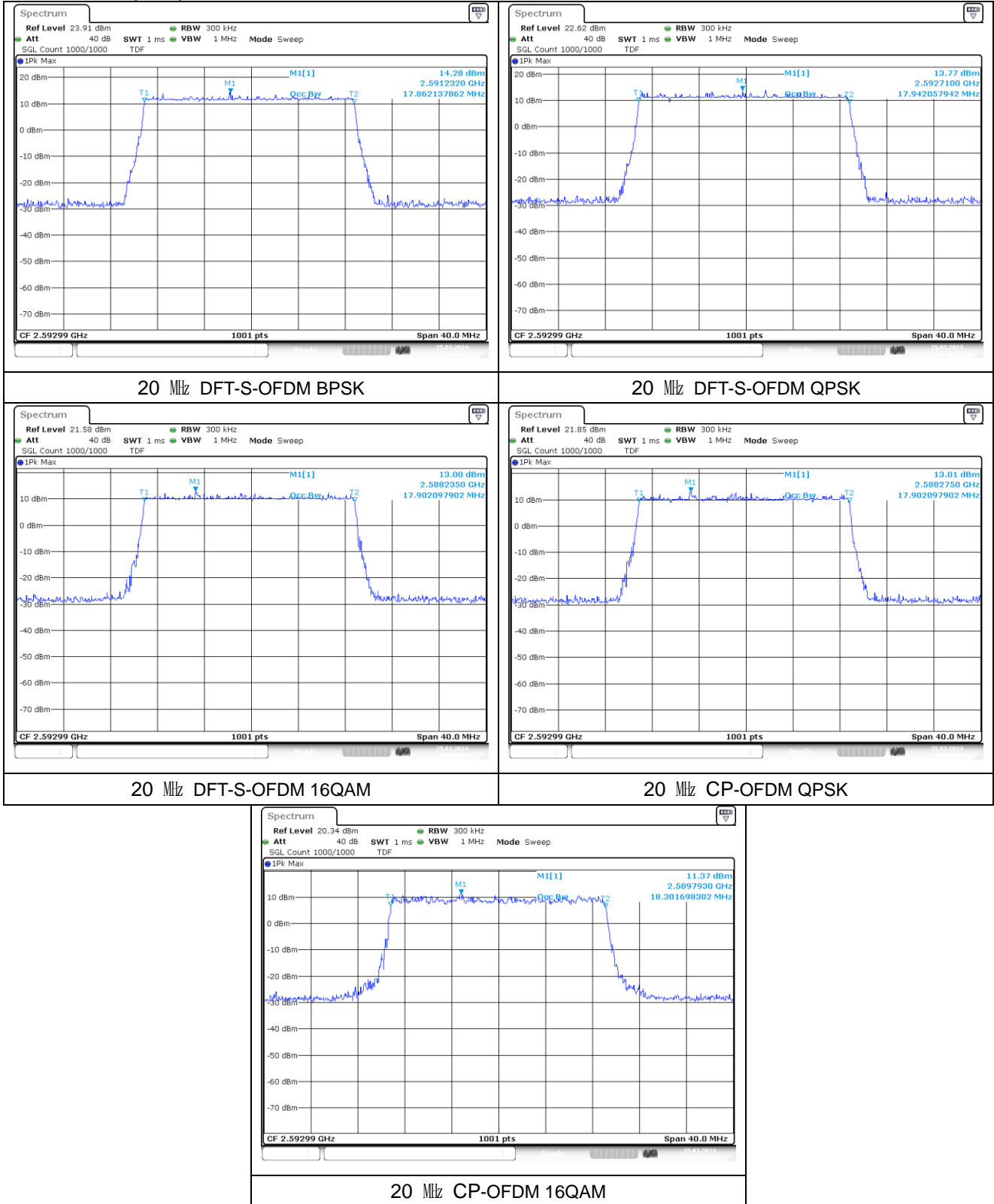
Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)				
				DFT-S-OFDM BPSK	DFT-S-OFDM QPSK	DFT-S-OFDM 16QAM	CP-OFDM QPSK	CP-OFDM 16QAM
41 (FCC)	30	20	2 592.99	17.862	17.942	17.902	17.902	18.302
		30		26.793	26.853	26.853	27.512	27.512
		40		35.884	35.724	35.724	37.802	37.962
		50		45.654	45.654	45.654	47.453	47.453
		60		57.782	57.902	58.142	57.902	57.902
		70		64.336	64.196	64.336	67.413	67.413
		80		77.043	77.043	77.043	77.363	77.522
		90		86.673	86.494	86.853	87.393	87.393
		100		96.503	96.304	96.304	97.502	97.502
Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)				
				DFT-S-OFDM BPSK	DFT-S-OFDM QPSK	DFT-S-OFDM 16QAM	CP-OFDM QPSK	CP-OFDM 16QAM
41 (IC)	30	20	2 595	17.862	17.902	17.942	18.222	18.222
		30		26.793	26.793	26.853	27.512	27.453
		40		35.804	35.804	35.724	37.882	37.962
		50		45.654	45.854	45.654	47.453	47.552
		60		57.662	57.902	57.902	57.902	57.782
		70		64.336	64.196	64.336	67.413	67.413
		80		77.043	77.203	77.043	77.363	77.522
		90		86.673	86.673	86.853	87.393	87.393
		100		96.503	96.304	96.304	97.502	97.502
Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)				
				DFT-S-OFDM BPSK	DFT-S-OFDM QPSK	DFT-S-OFDM 16QAM	CP-OFDM QPSK	CP-OFDM 16QAM
48 (IC)	30	20	3 624.99	17.982	17.942	17.942	18.262	18.302
		30		26.793	26.853	26.853	27.932	27.872
		40		35.964	35.804	35.804	38.042	37.882
Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)				
				DFT-S-OFDM BPSK	DFT-S-OFDM QPSK	DFT-S-OFDM 16QAM	CP-OFDM QPSK	CP-OFDM 16QAM
77/78 Low-Band (FCC)	30	20	3 500.01	17.902	17.942	17.902	18.262	18.262
		30		26.853	26.793	26.853	27.512	27.512
		40		35.884	35.804	35.724	37.962	37.962
		50		45.754	45.754	45.754	47.453	47.552
		60		58.022	57.902	58.142	57.782	57.902
		70		64.196	64.476	64.476	67.413	67.692
		80		77.043	77.363	77.043	77.522	77.522
		90		86.853	86.673	87.033	87.572	87.393
		100		96.703	96.503	96.503	97.502	97.502

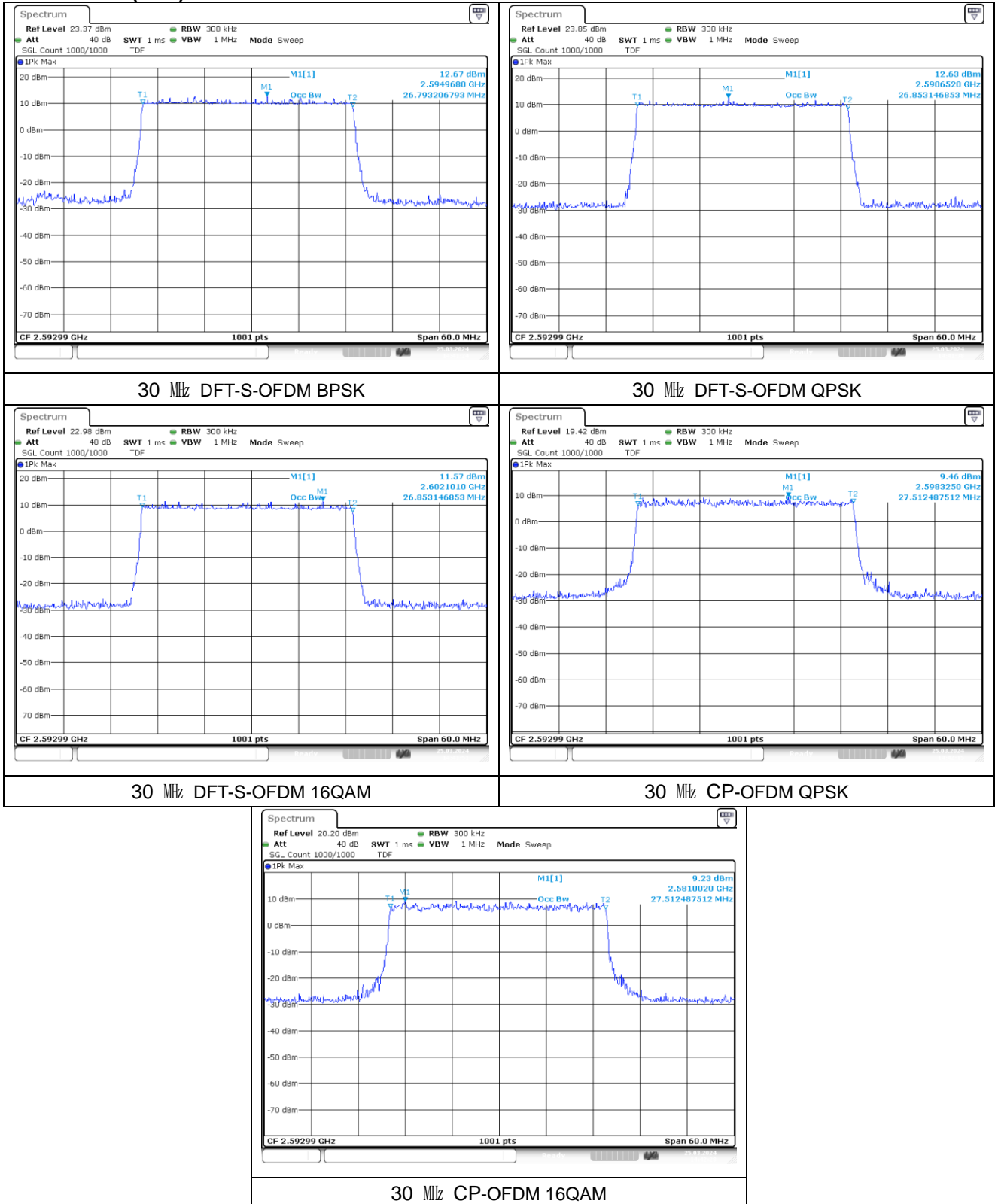
Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)				
				DFT-S-OFDM BPSK	DFT-S-OFDM QPSK	DFT-S-OFDM 16QAM	CP-OFDM QPSK	CP-OFDM 16QAM
77/78 High-Band (FCC)	30	20	3 840	17.902	17.862	17.942	18.302	18.262
		30		26.793	26.853	26.853	27.572	27.453
		40		35.884	35.804	35.804	37.882	37.962
		50		45.754	45.854	45.754	47.453	47.552
		60		57.902	58.022	58.142	57.782	58.022
		70		64.336	64.336	64.476	67.413	67.692
		80		77.203	77.203	77.203	77.522	77.682
		90		86.853	86.673	87.033	87.393	87.393
		100		96.503	96.503	96.503	97.502	97.502
Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)				
				DFT-S-OFDM BPSK	DFT-S-OFDM QPSK	DFT-S-OFDM 16QAM	CP-OFDM QPSK	CP-OFDM 16QAM
77/78 Low-Band IC	30	20	3 675	18.022	17.982	17.942	18.262	18.262
		30		26.853	26.853	26.853	27.872	27.872
		40		35.884	35.804	35.804	37.962	37.882
		50		45.754	45.854	45.754	47.552	47.652
		60		58.022	58.142	58.262	58.022	58.142
		70		64.476	64.476	64.476	67.552	67.552
		80		77.043	77.363	77.203	77.522	77.522
		90		86.853	86.673	87.033	87.393	87.752
		100		96.503	96.104	96.503	97.502	97.303
Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)				
				DFT-S-OFDM BPSK	DFT-S-OFDM QPSK	DFT-S-OFDM 16QAM	CP-OFDM QPSK	CP-OFDM 16QAM
77 High-Band IC	30	20	3 939.99	17.942	17.942	17.942	18.262	18.302
		30		26.793	26.853	26.853	27.872	27.872
		40		35.884	35.804	36.724	37.882	37.802
		50		45.754	45.854	45.754	47.552	47.453
		60		58.022	58.022	58.142	58.022	57.902
		70		64.336	64.336	64.476	67.413	67.413
		80		77.203	77.203	77.043	77.363	77.363

- Test plots

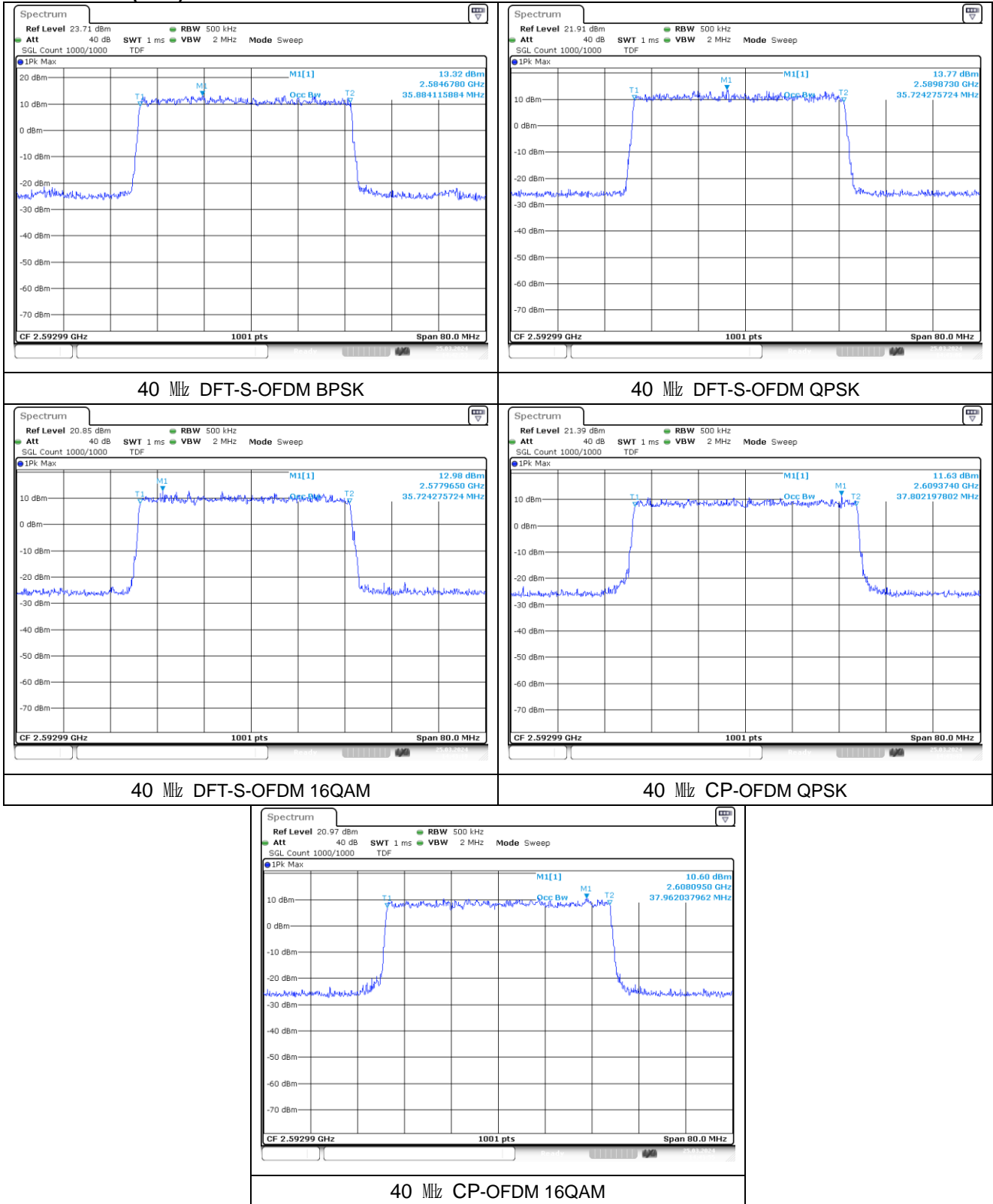
NR band 41 (FCC)



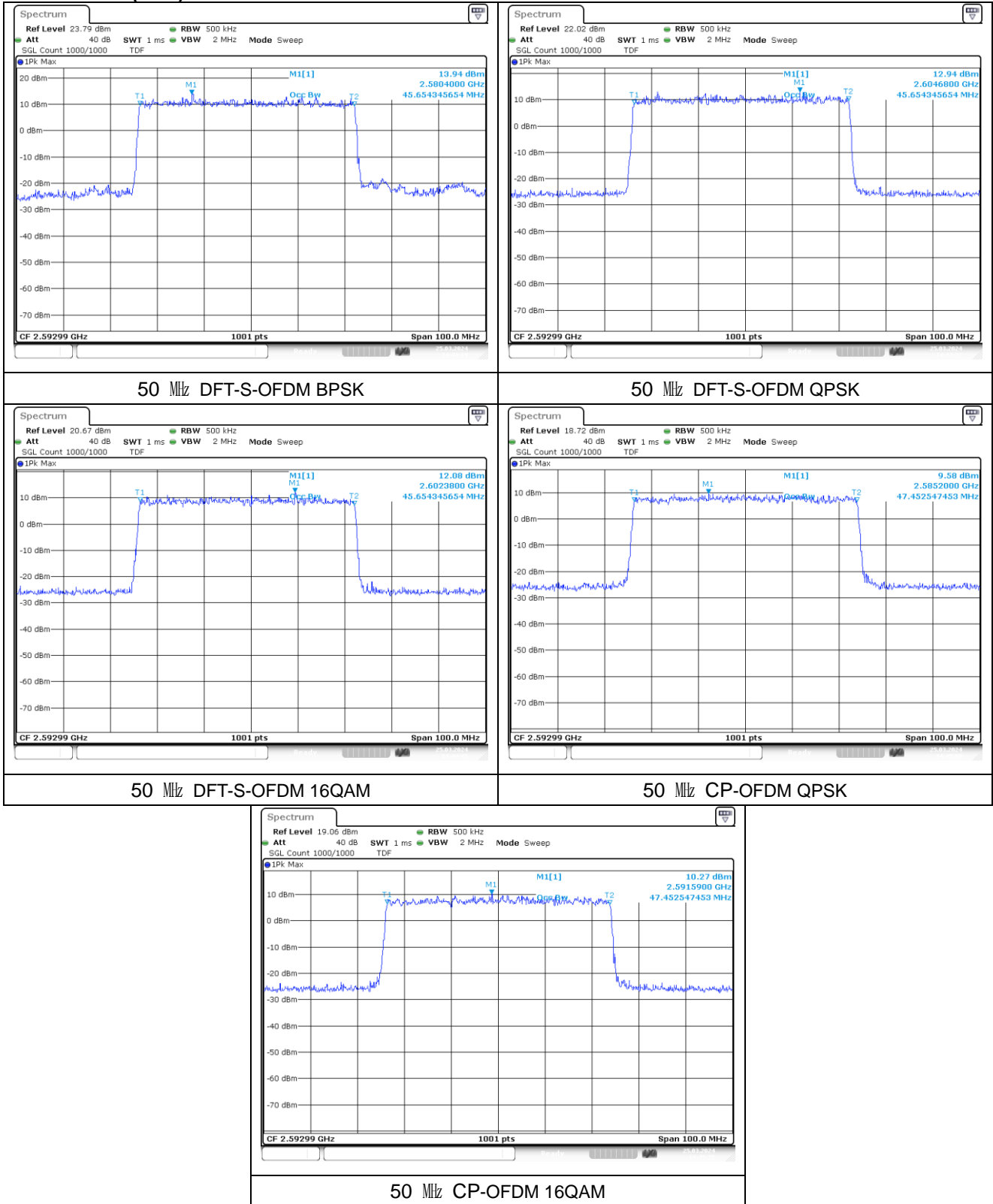
NR band 41 (FCC)



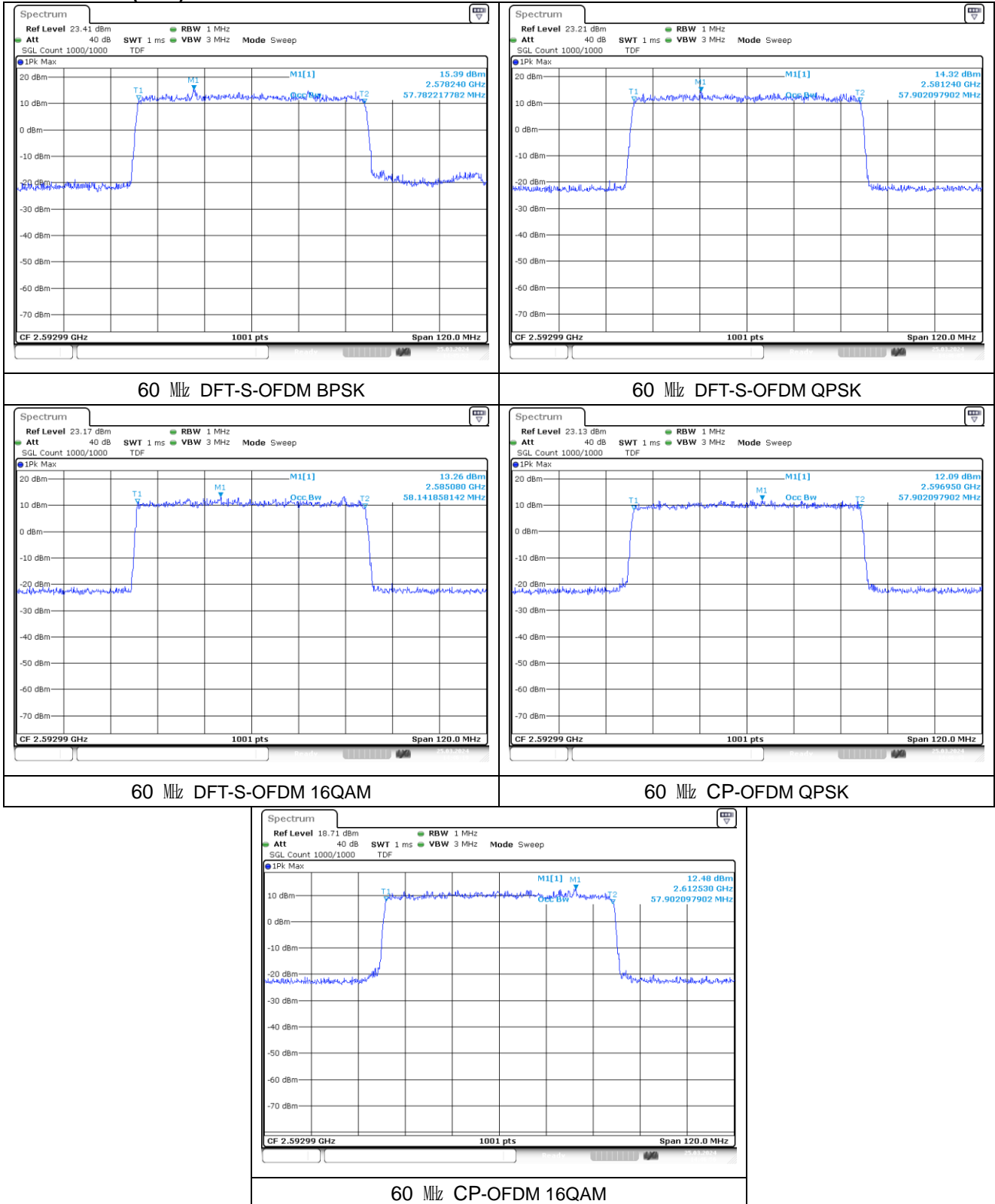
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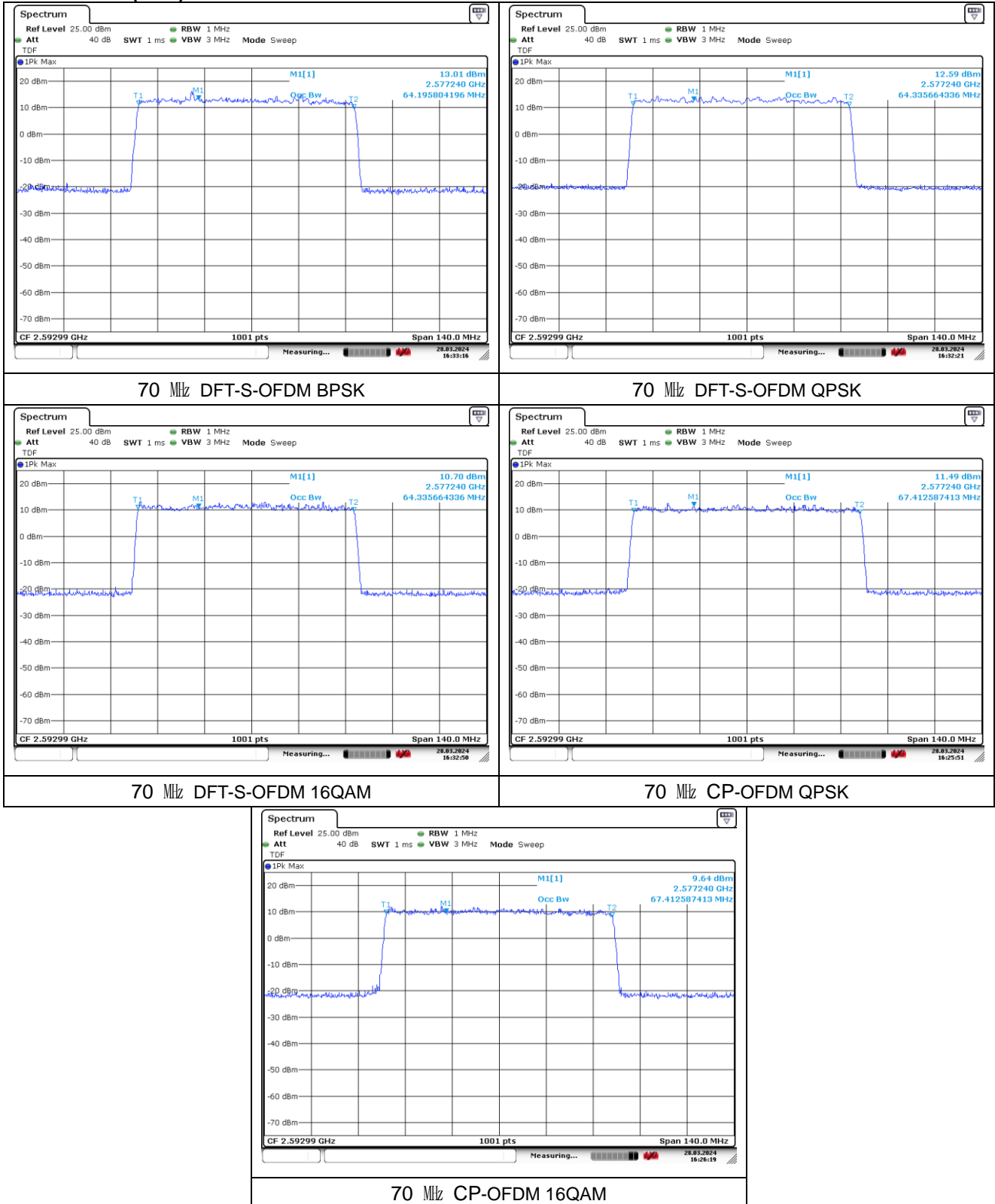
NR band 41 (FCC)



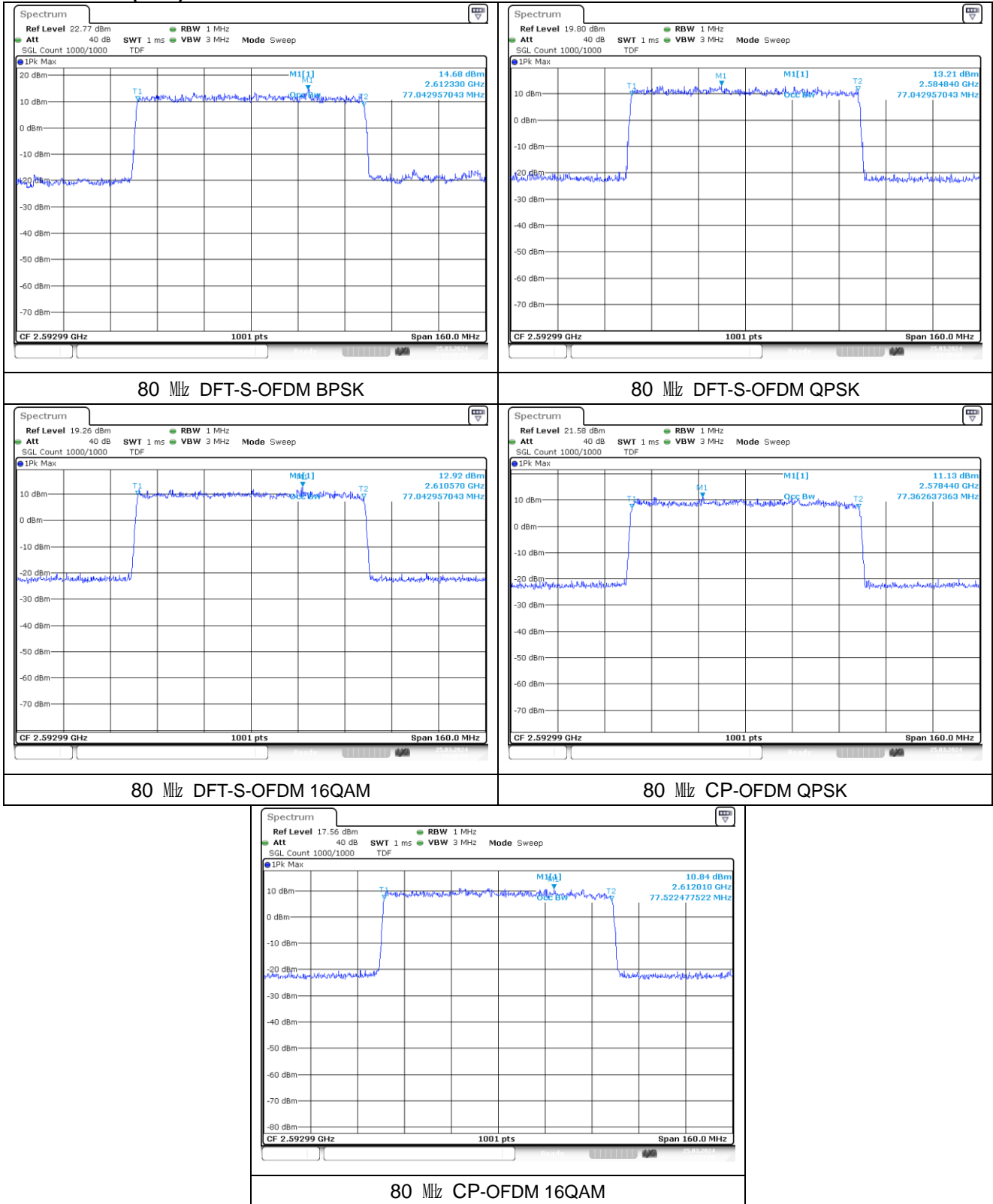
NR band 41 (FCC)



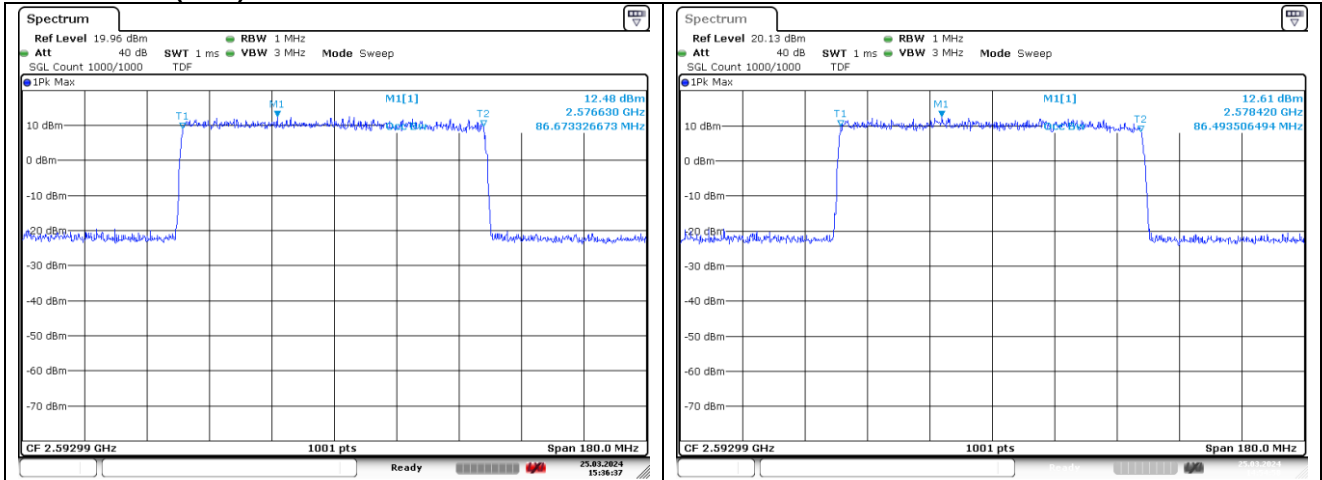
NR band 41 (FCC)



NR band 41 (FCC)

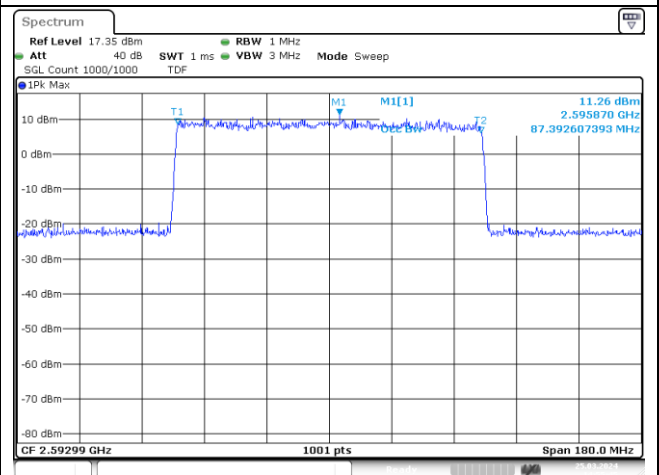
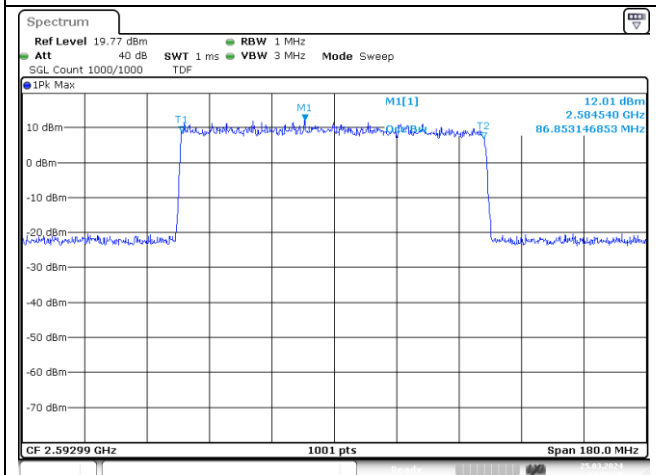


NR band 41 (FCC)



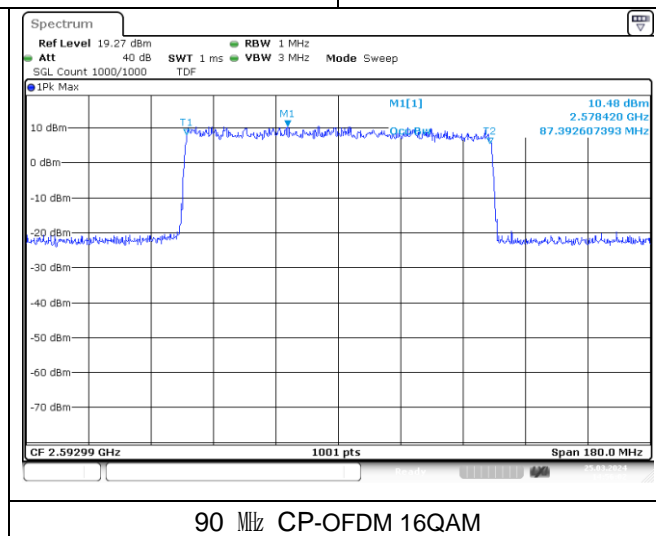
90 MHz DFT-S-OFDM BPSK

90 MHz DFT-S-OFDM QPSK



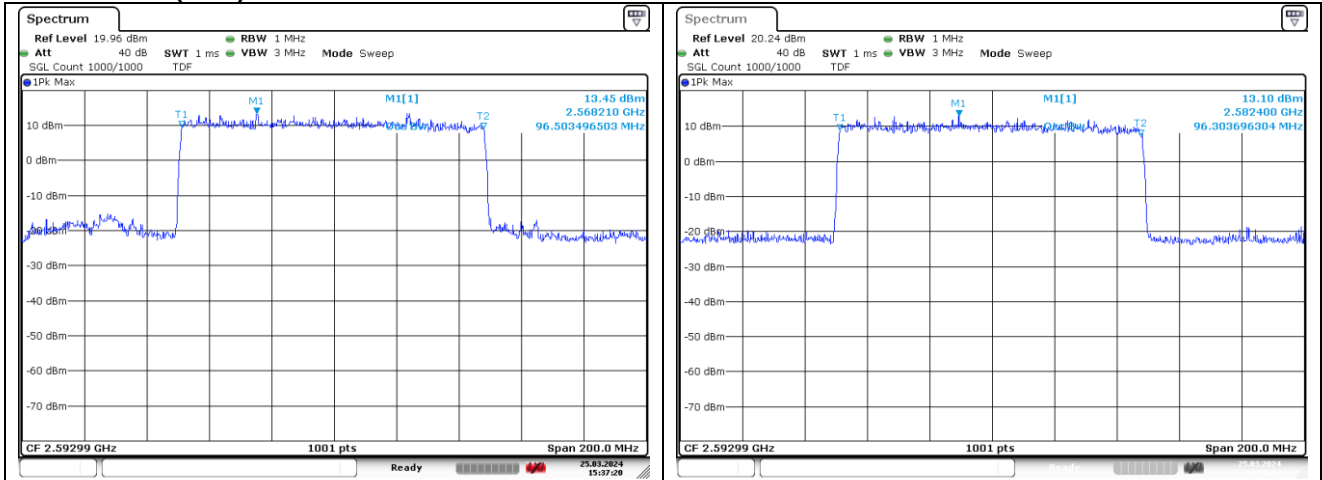
90 MHz DFT-S-OFDM 16QAM

90 MHz CP-OFDM QPSK



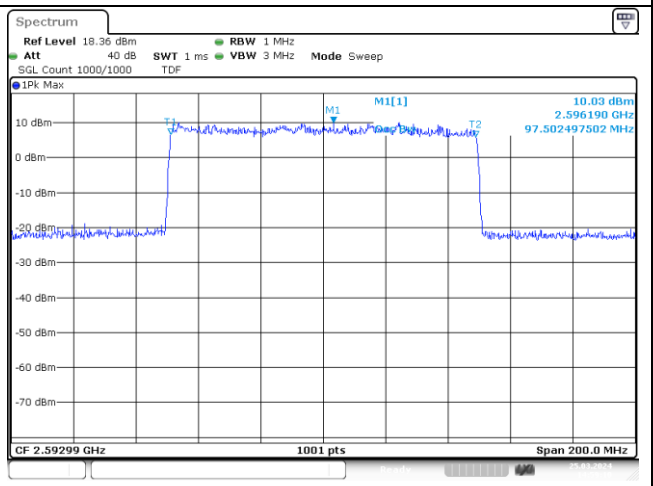
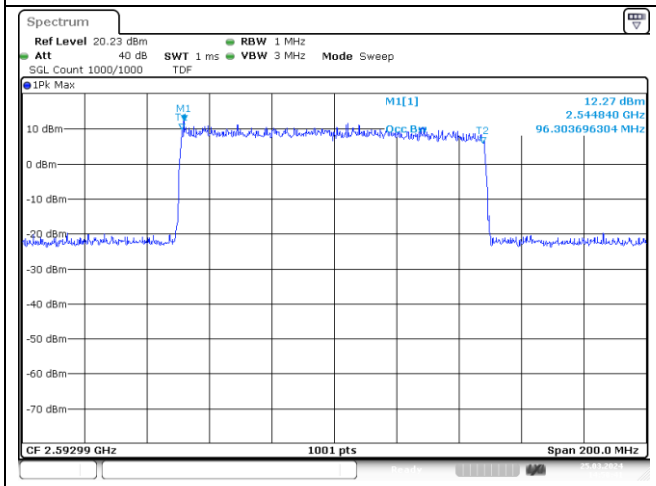
90 MHz CP-OFDM 16QAM

NR band 41 (FCC)



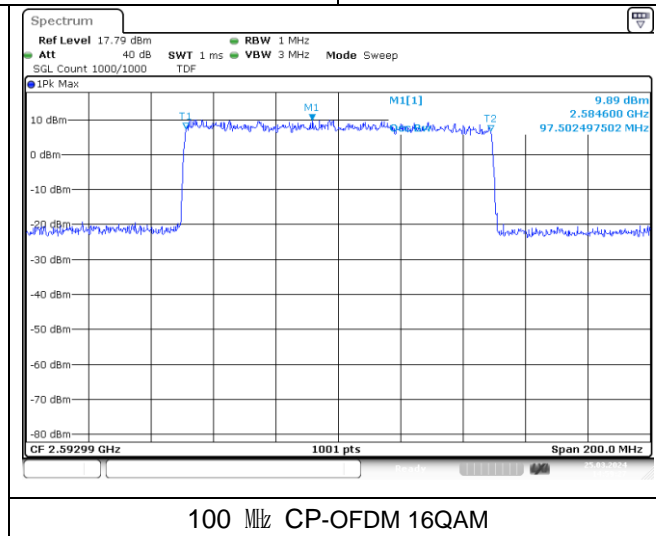
100 MHz DFT-S-OFDM BPSK

100 MHz DFT-S-OFDM QPSK



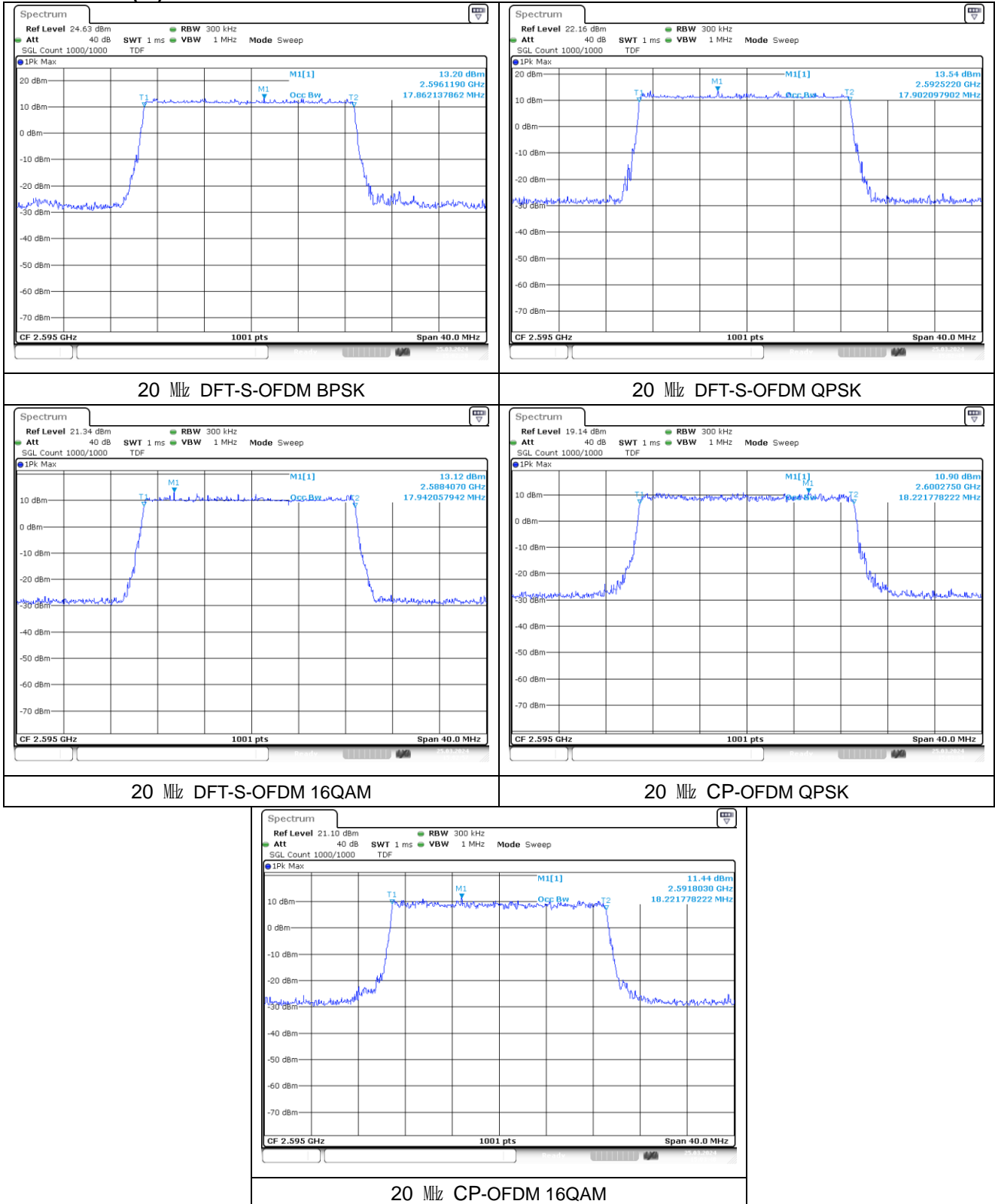
100 MHz DFT-S-OFDM 16QAM

100 MHz CP-OFDM QPSK

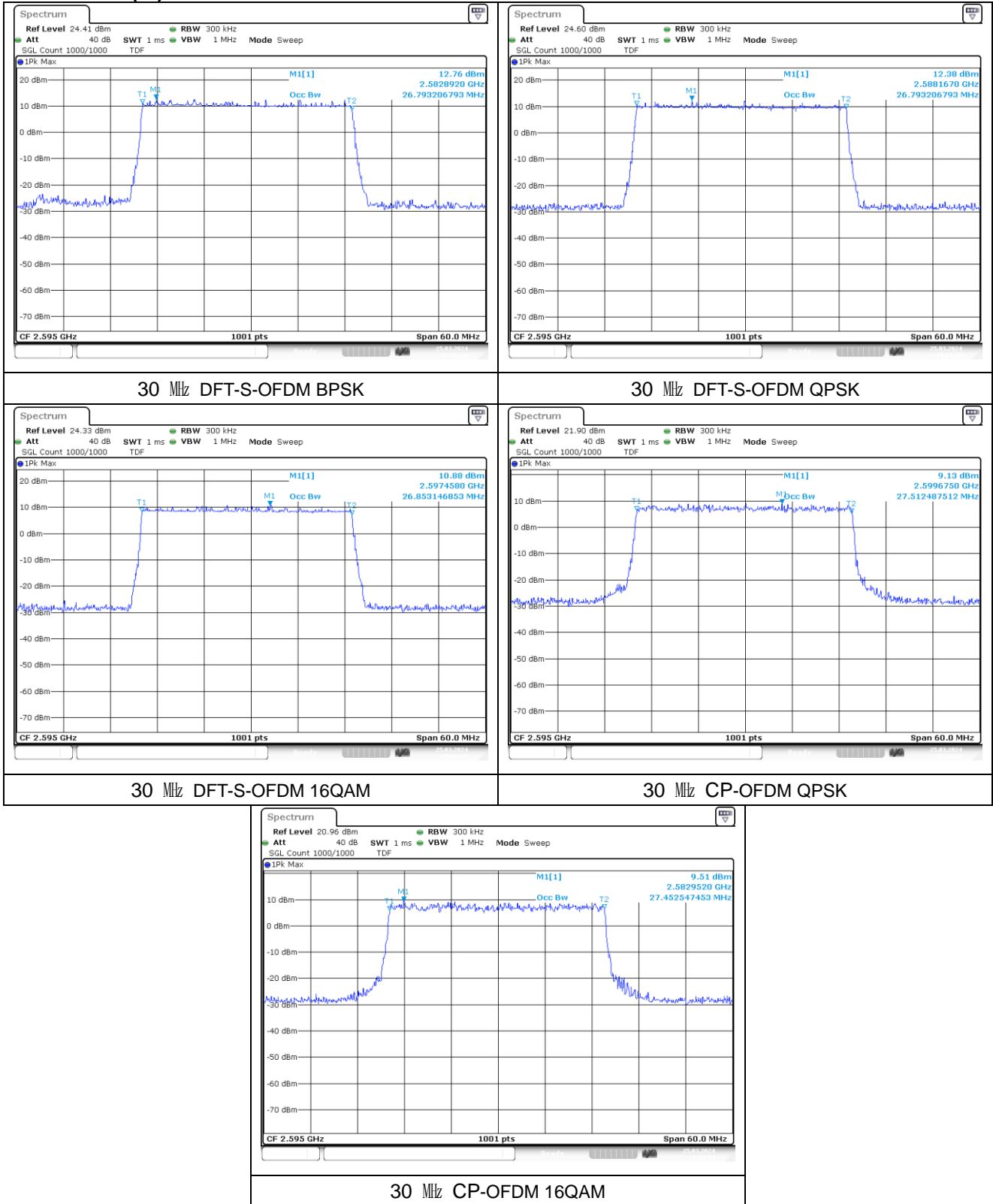


100 MHz CP-OFDM 16QAM

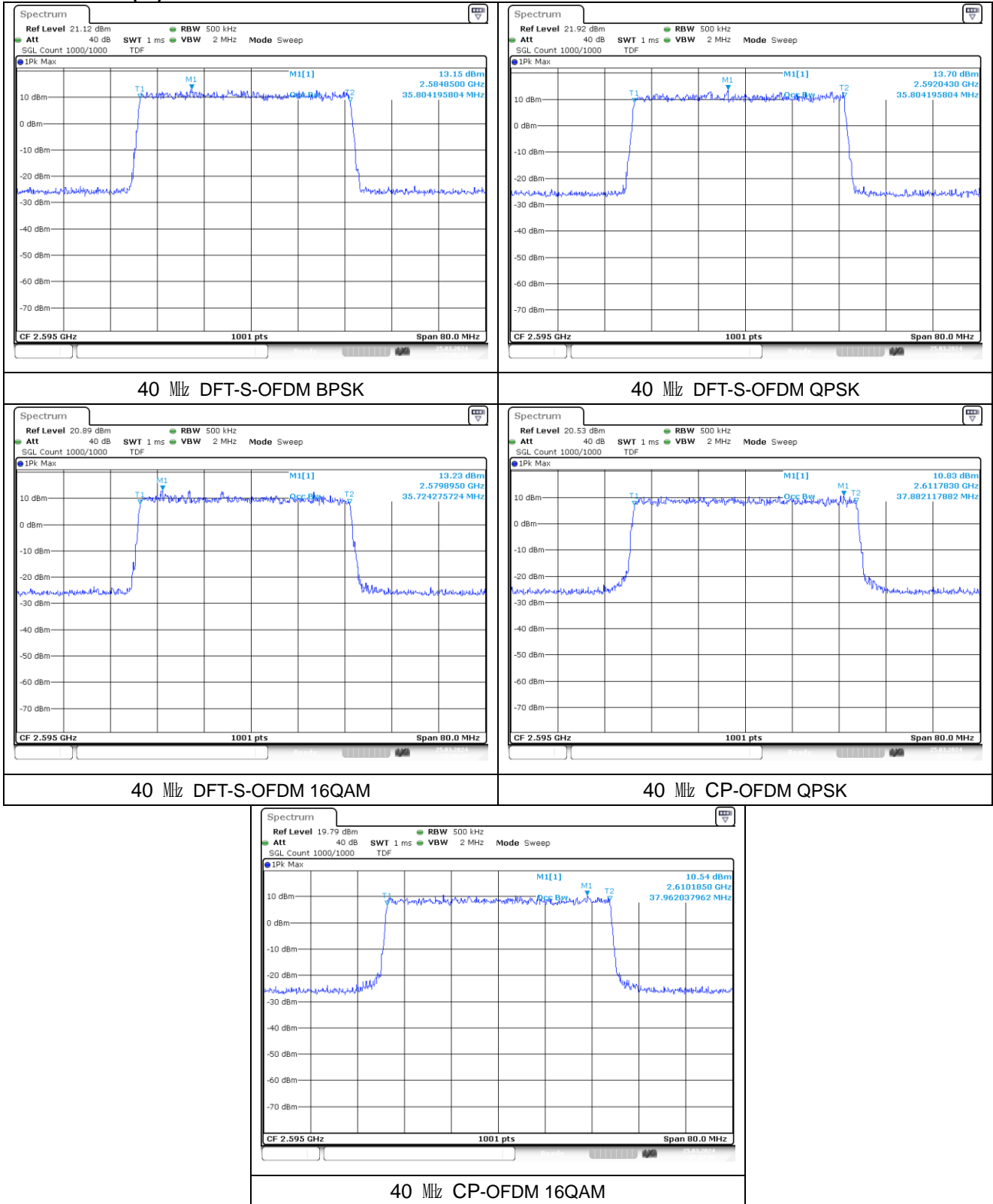
NR band 41 (IC)



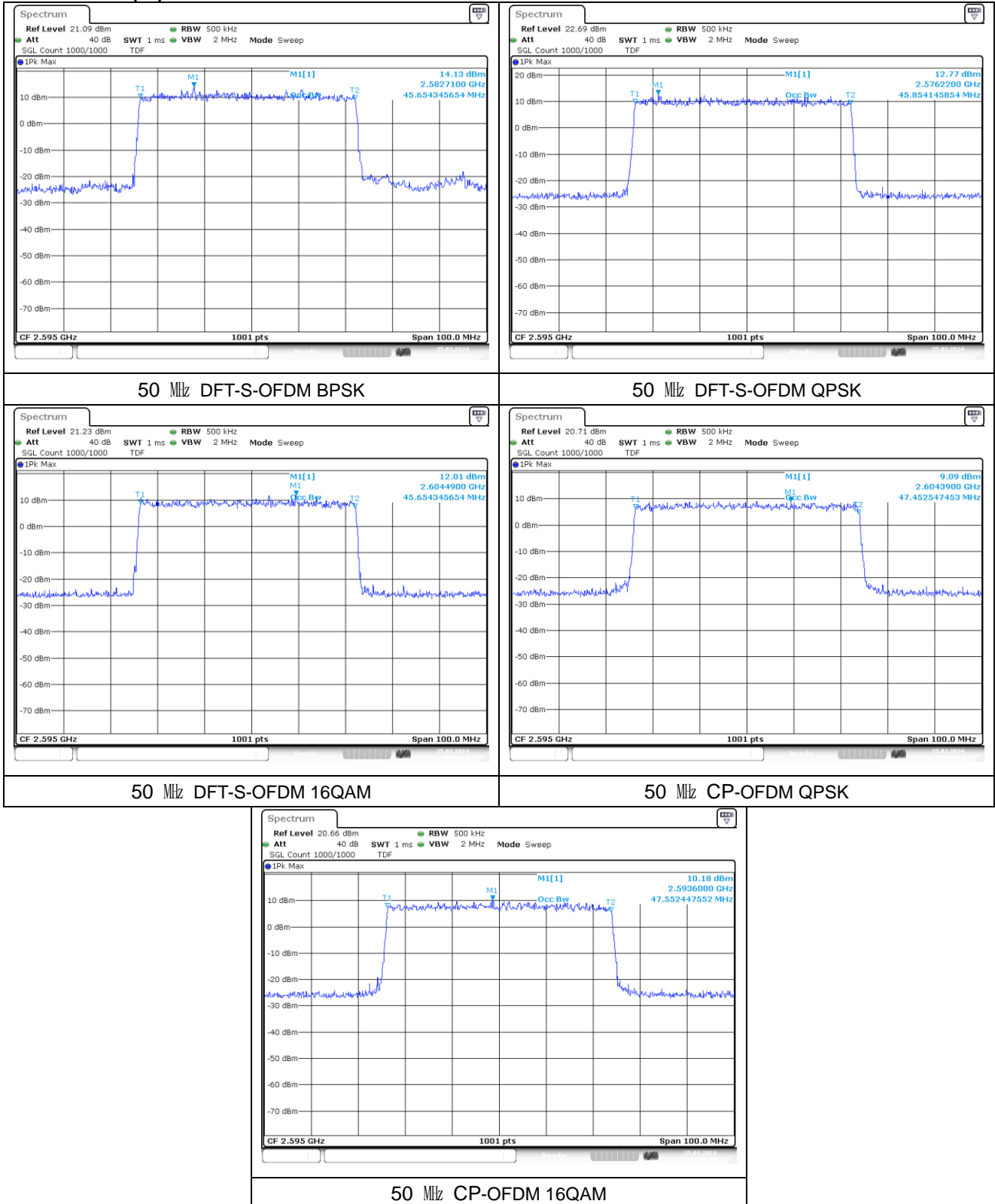
NR band 41 (IC)



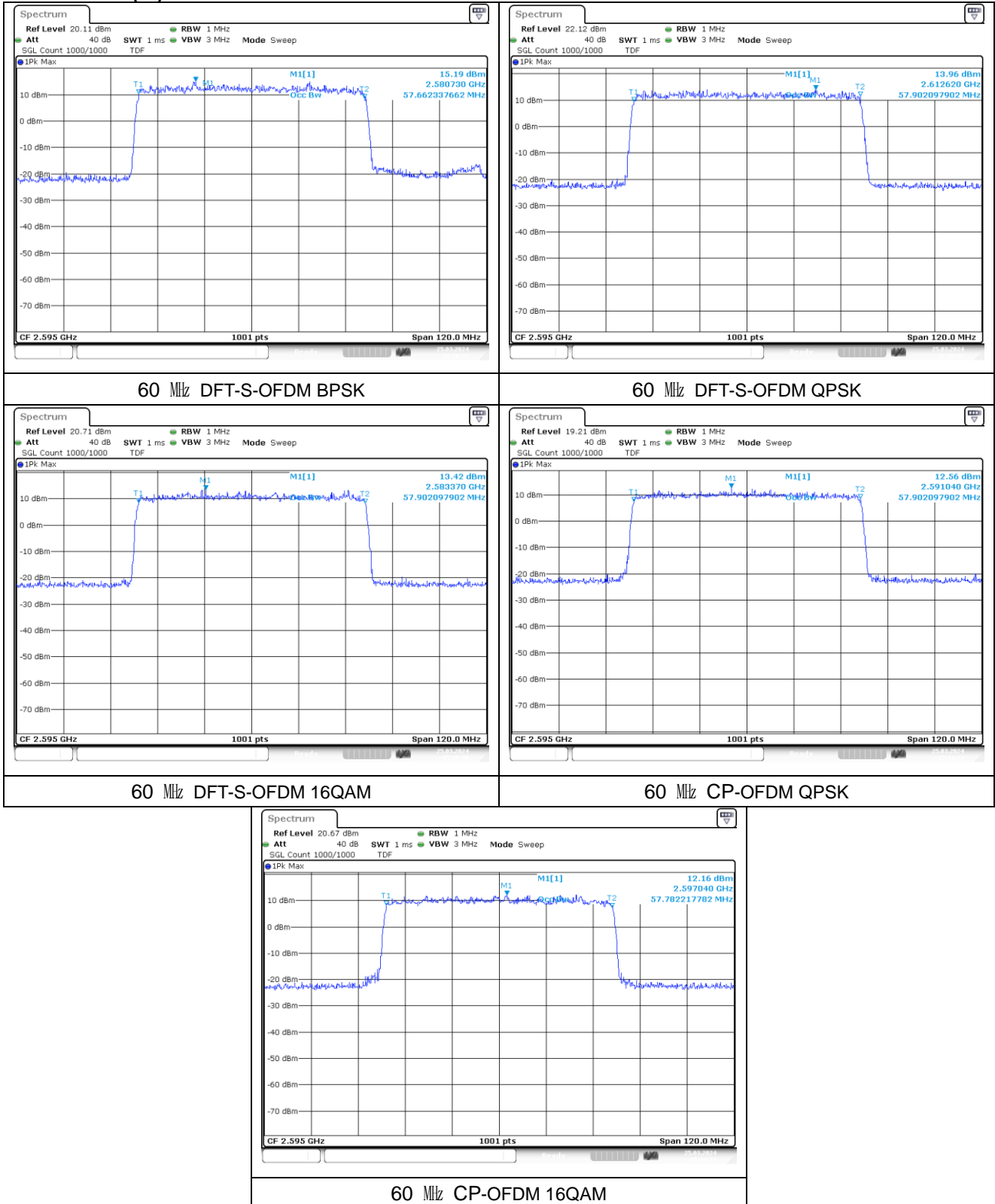
NR band 41 (IC)



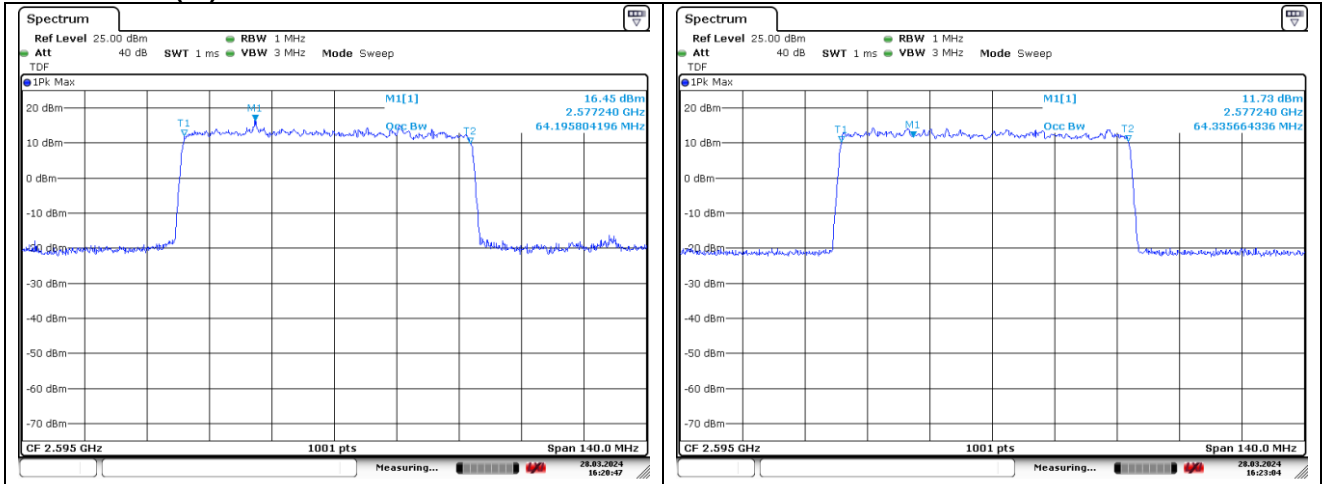
NR band 41 (IC)



NR band 41 (IC)

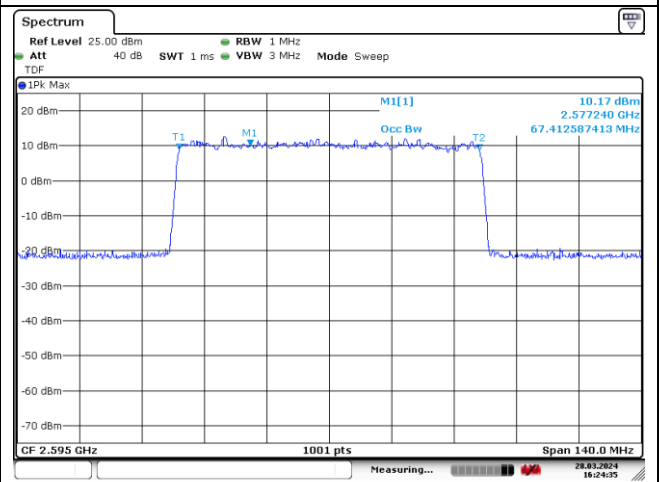
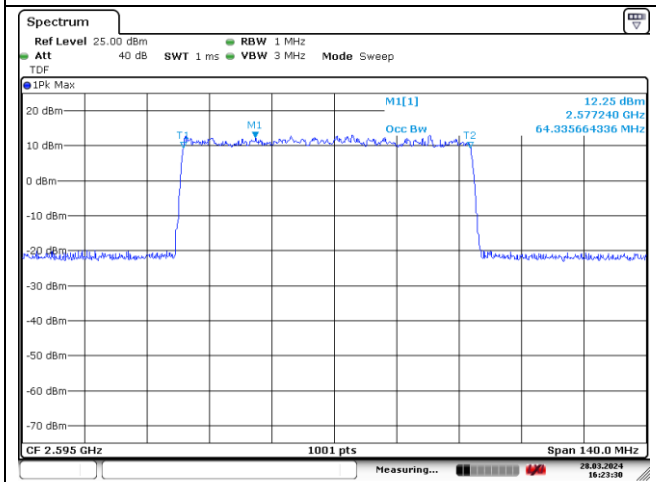


NR band 41 (IC)



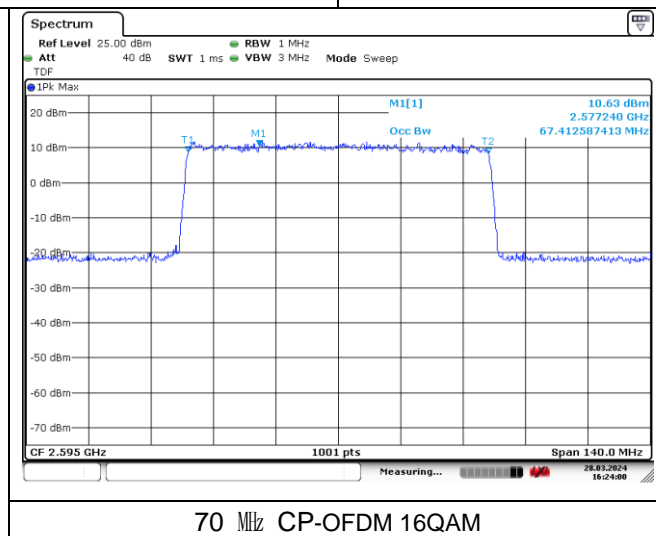
70 MHz DFT-S-OFDM BPSK

70 MHz DFT-S-OFDM QPSK



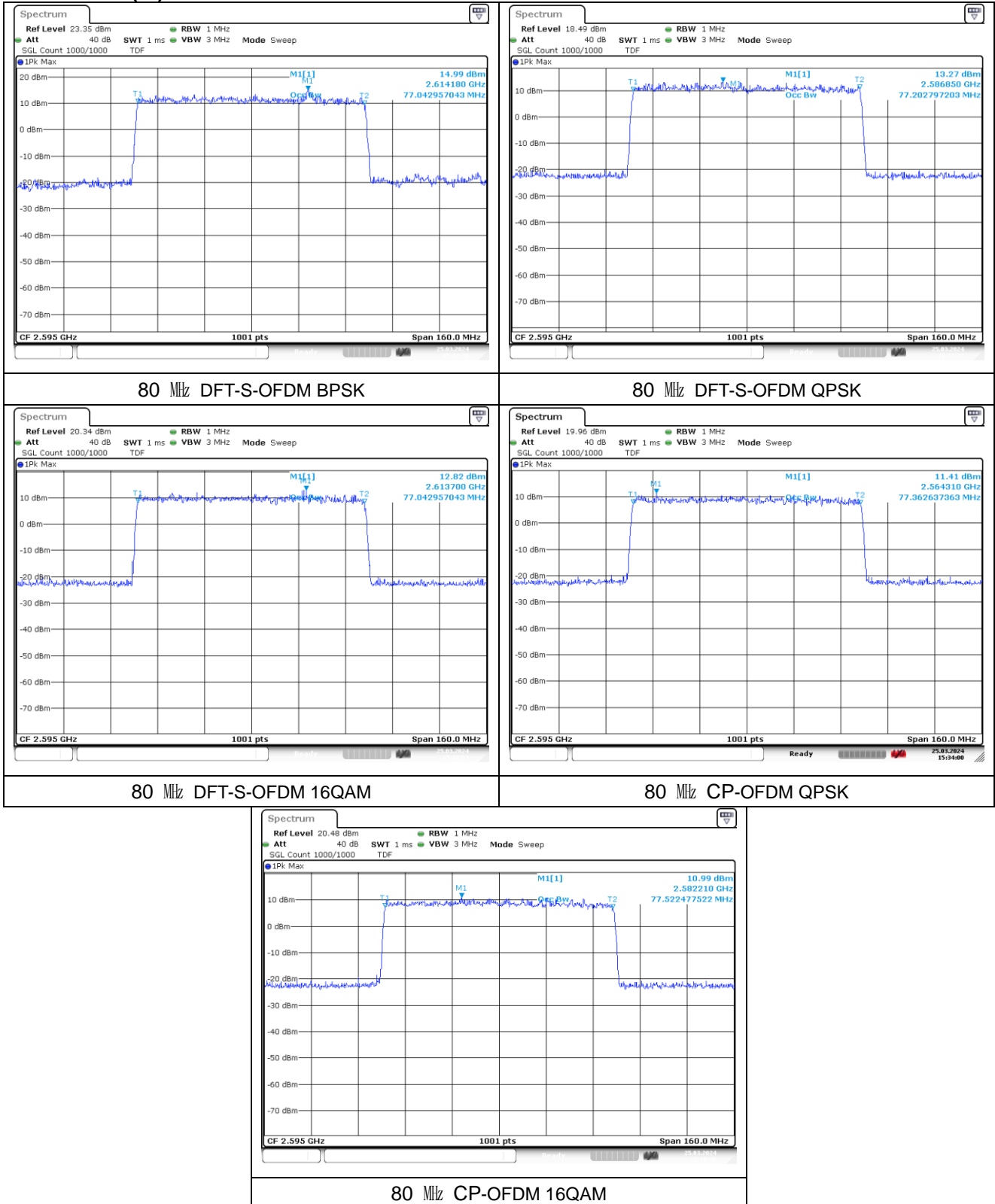
70 MHz DFT-S-OFDM 16QAM

70 MHz CP-OFDM QPSK

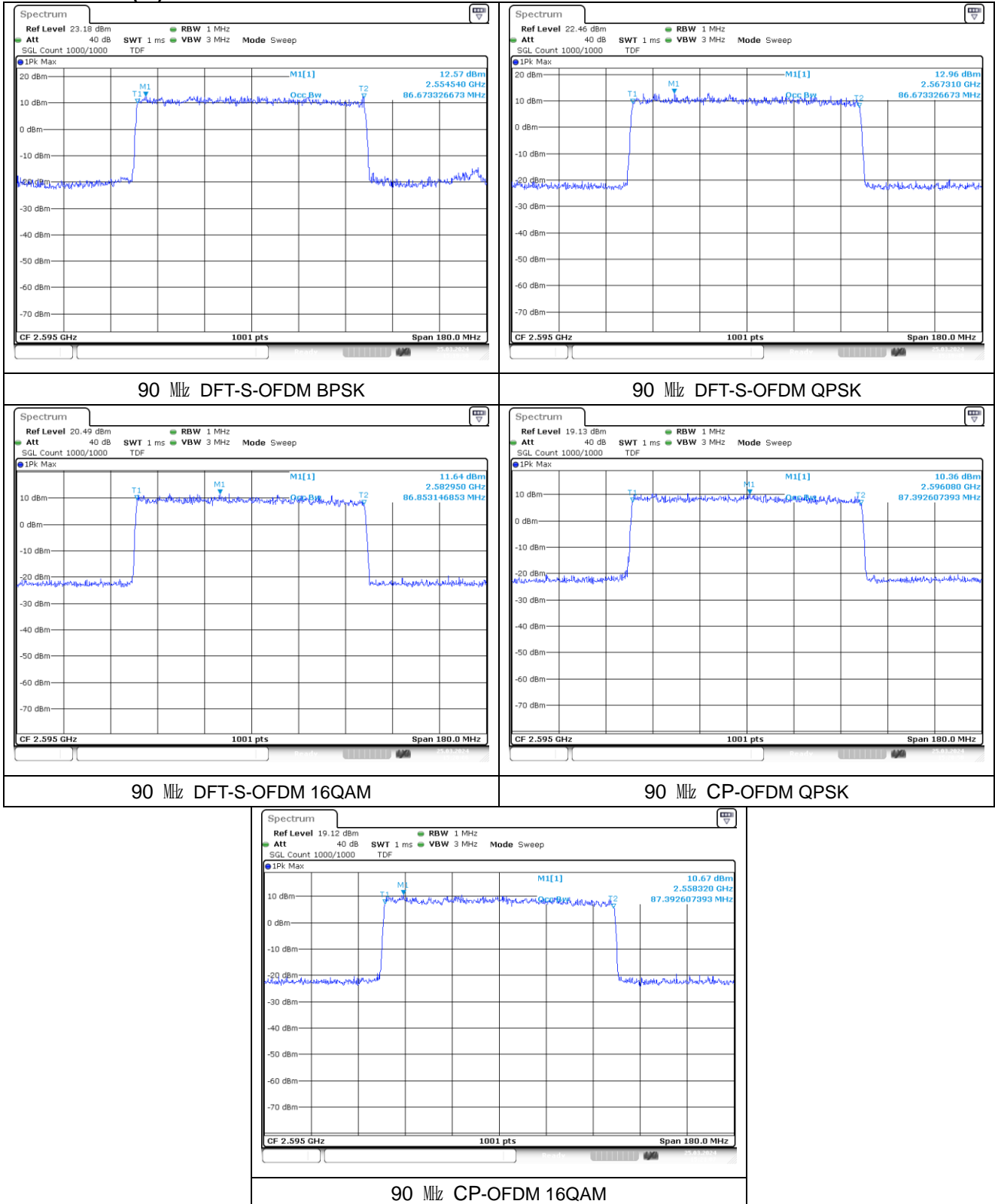


70 MHz CP-OFDM 16QAM

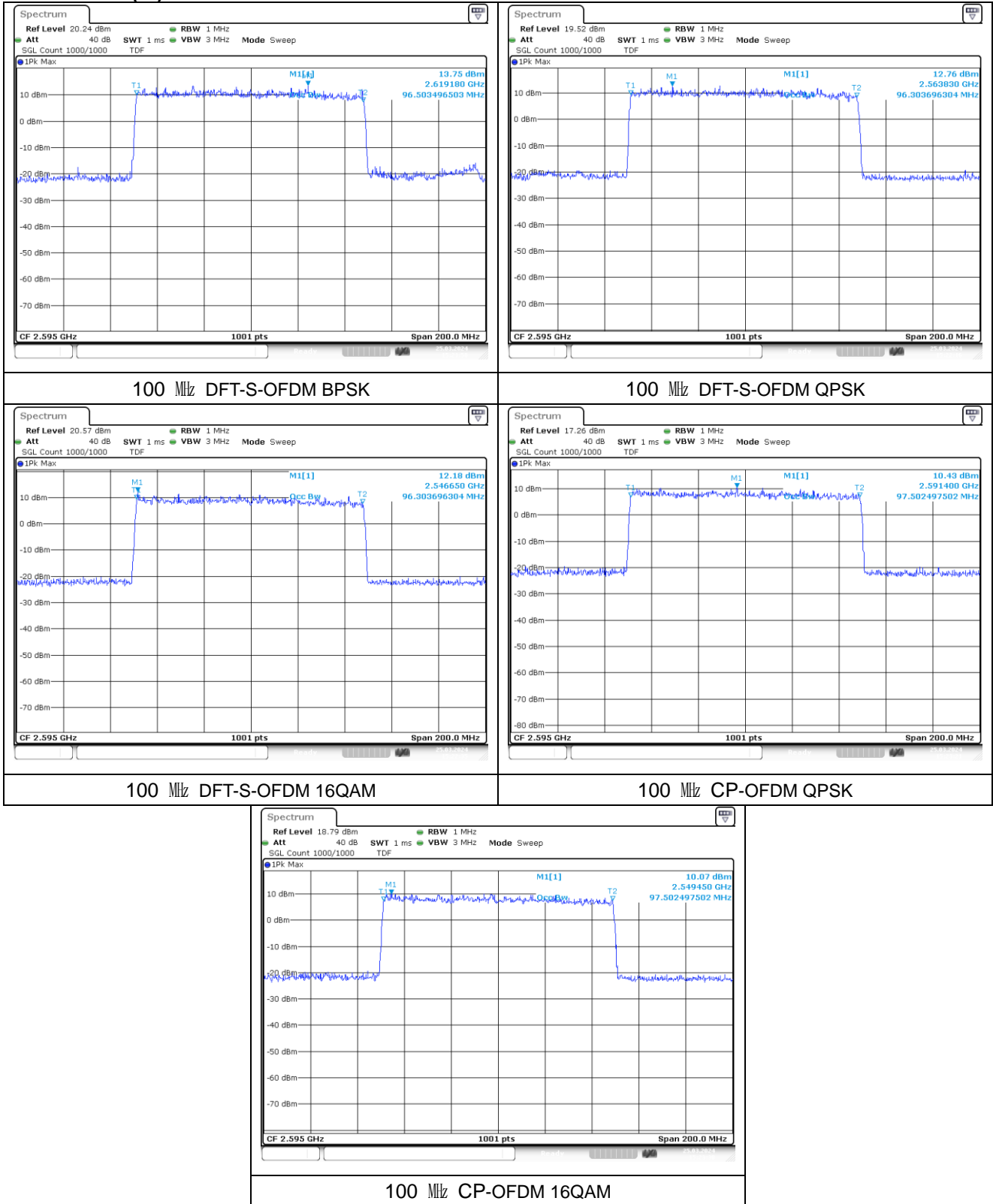
NR band 41 (IC)



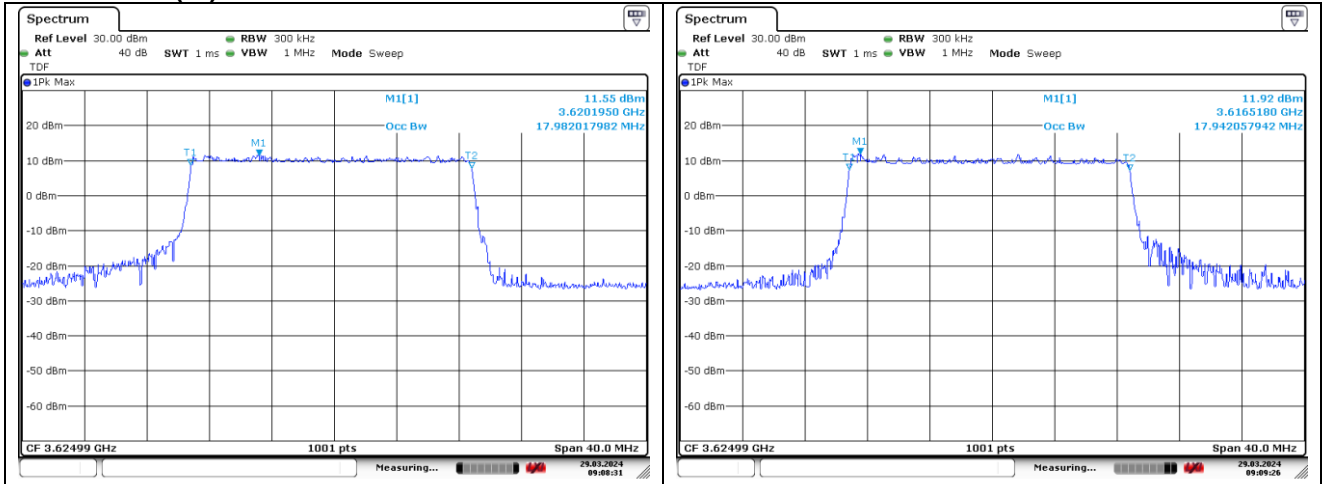
NR band 41 (IC)



NR band 41 (IC)

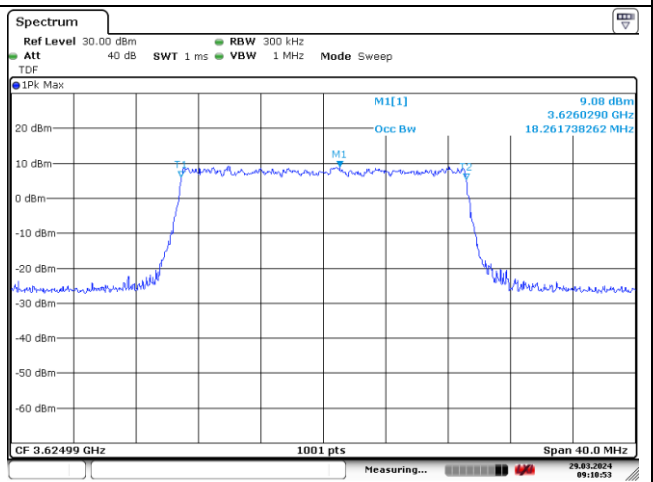
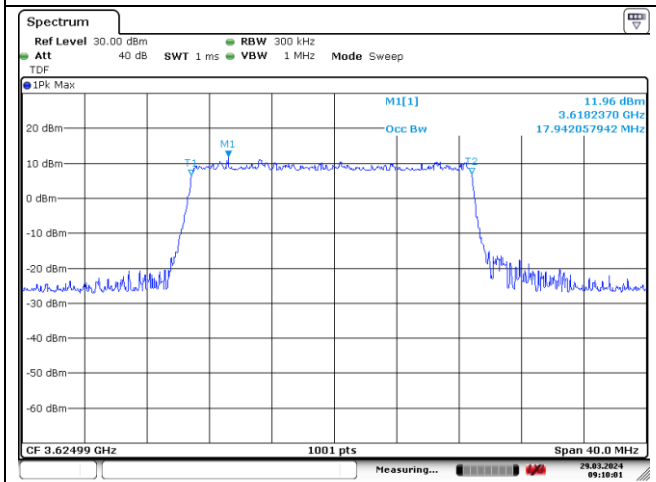


NR band 48 (IC)



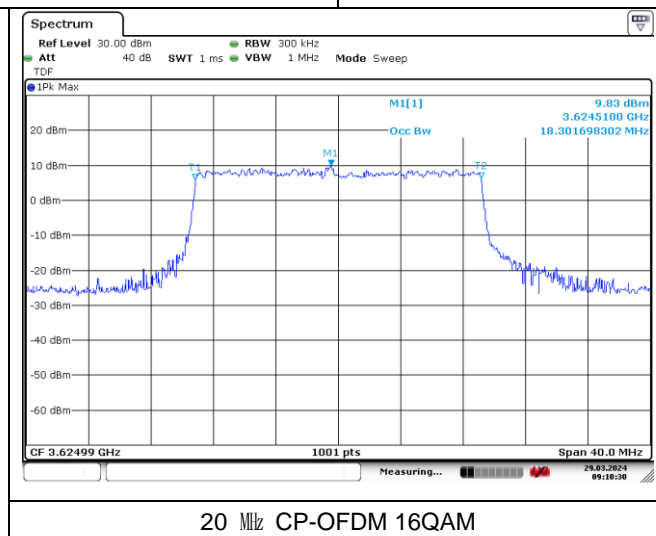
20 MHz DFT-S-OFDM BPSK

20 MHz DFT-S-OFDM QPSK



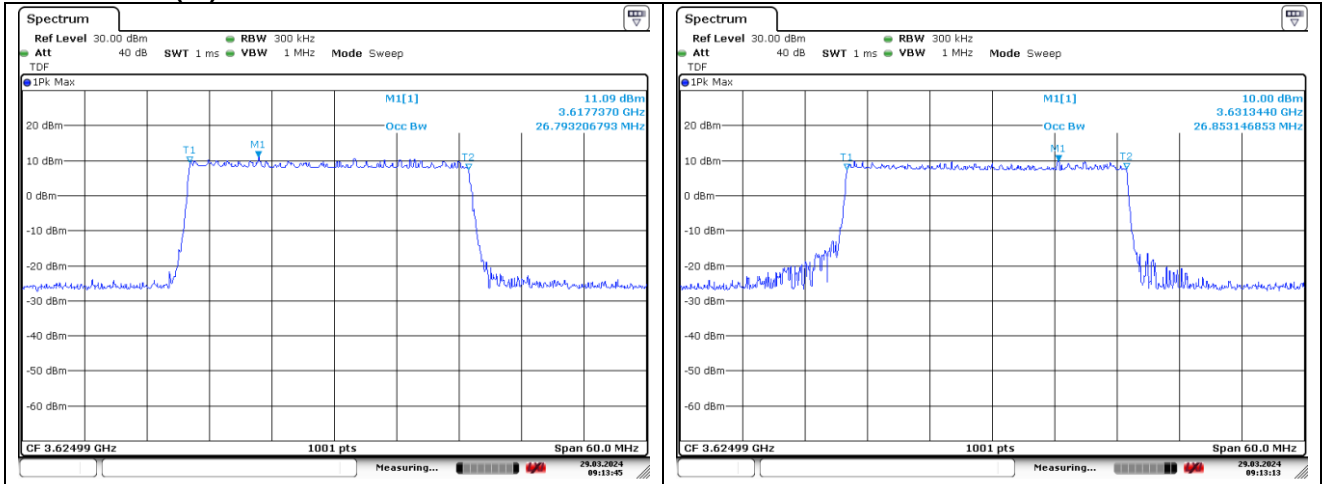
20 MHz DFT-S-OFDM 16QAM

20 MHz CP-OFDM QPSK



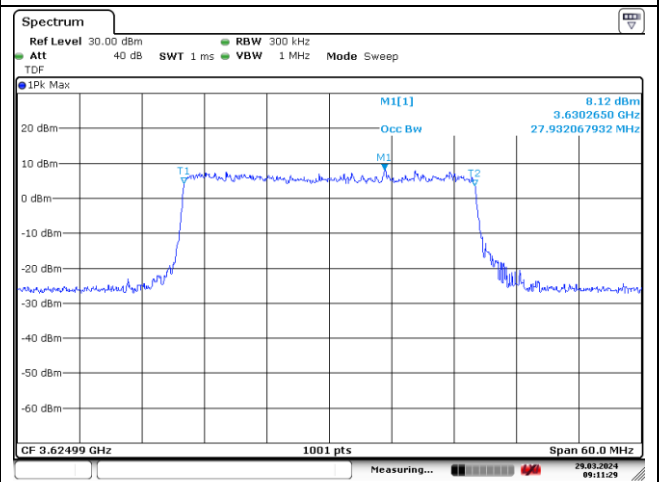
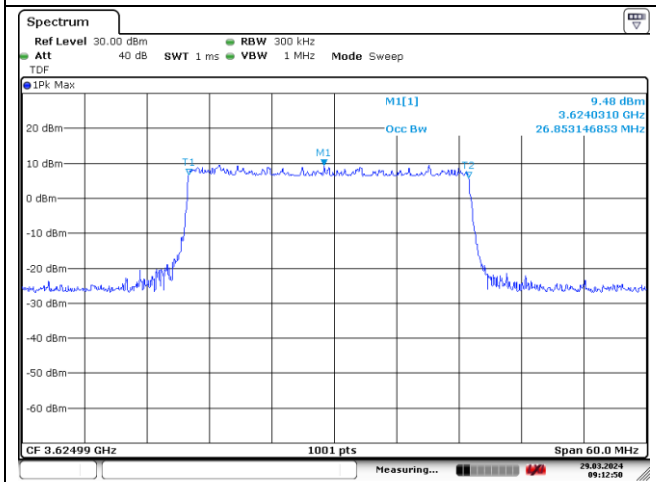
20 MHz CP-OFDM 16QAM

NR band 48 (IC)



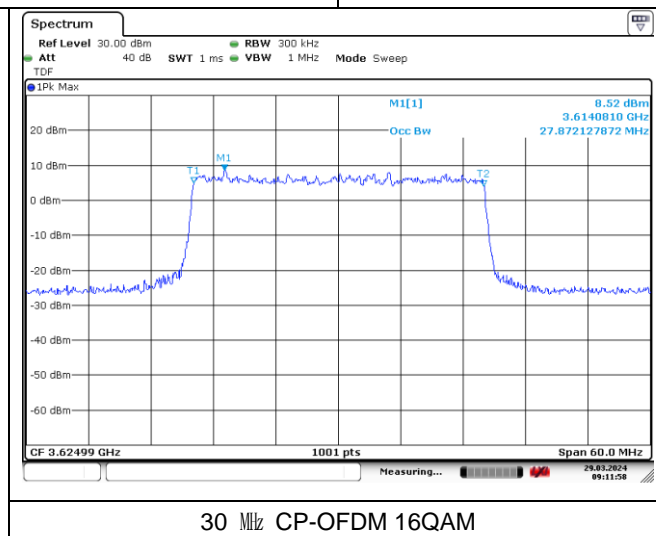
30 MHz DFT-S-OFDM BPSK

30 MHz DFT-S-OFDM QPSK



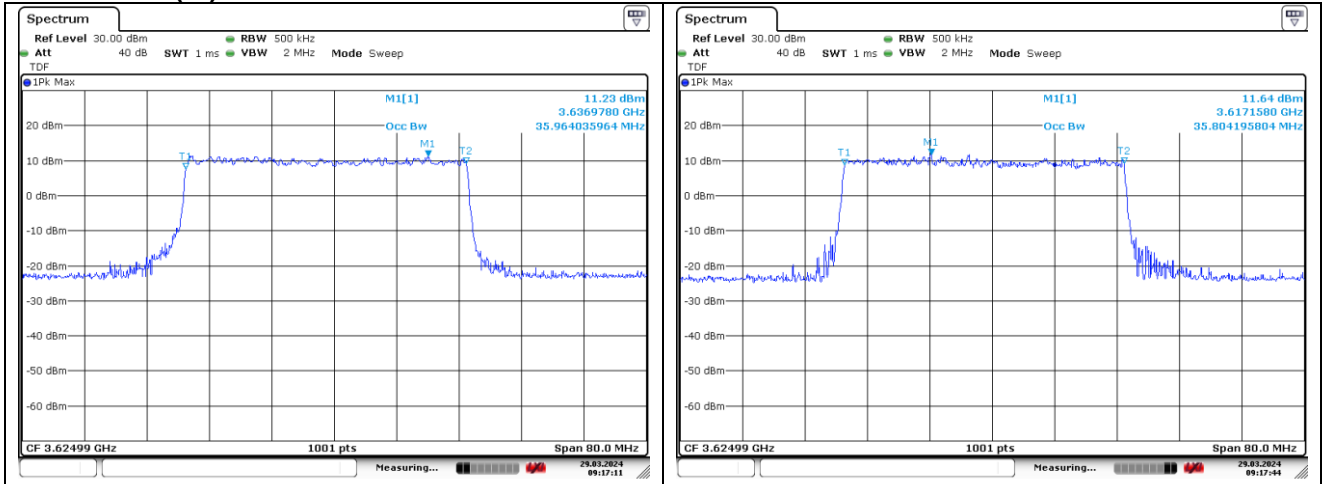
30 MHz DFT-S-OFDM 16QAM

30 MHz CP-OFDM QPSK



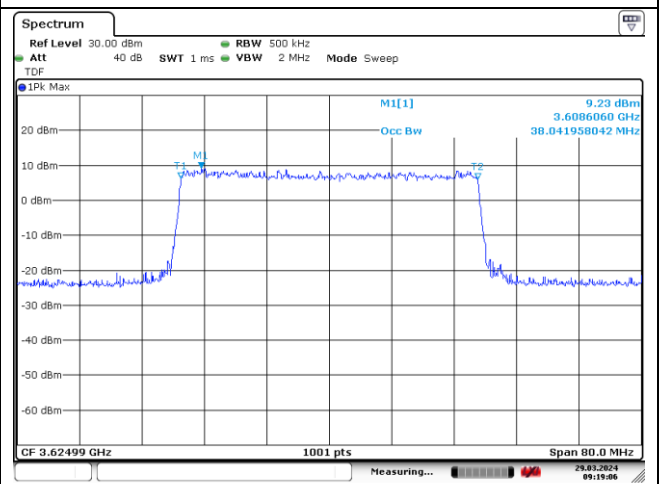
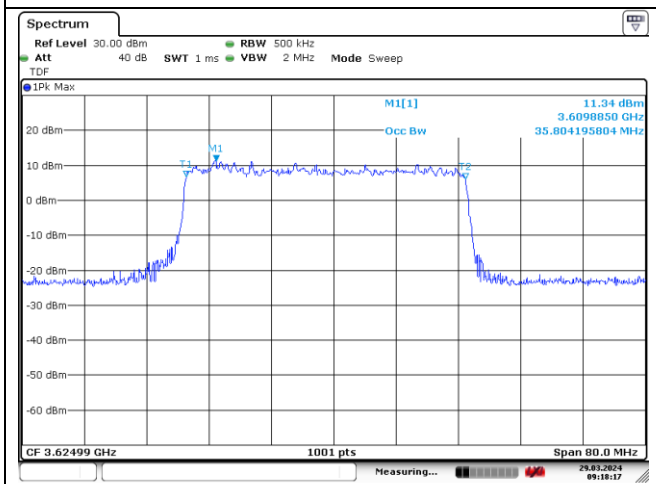
30 MHz CP-OFDM 16QAM

NR band 48 (IC)



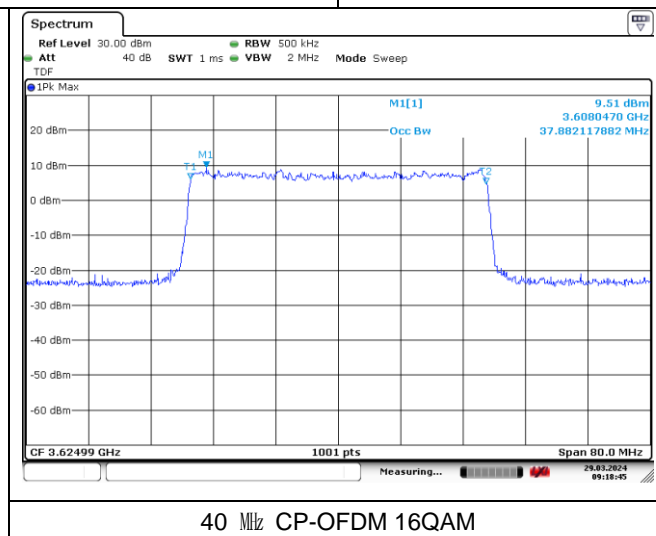
40 MHz DFT-S-OFDM BPSK

40 MHz DFT-S-OFDM QPSK



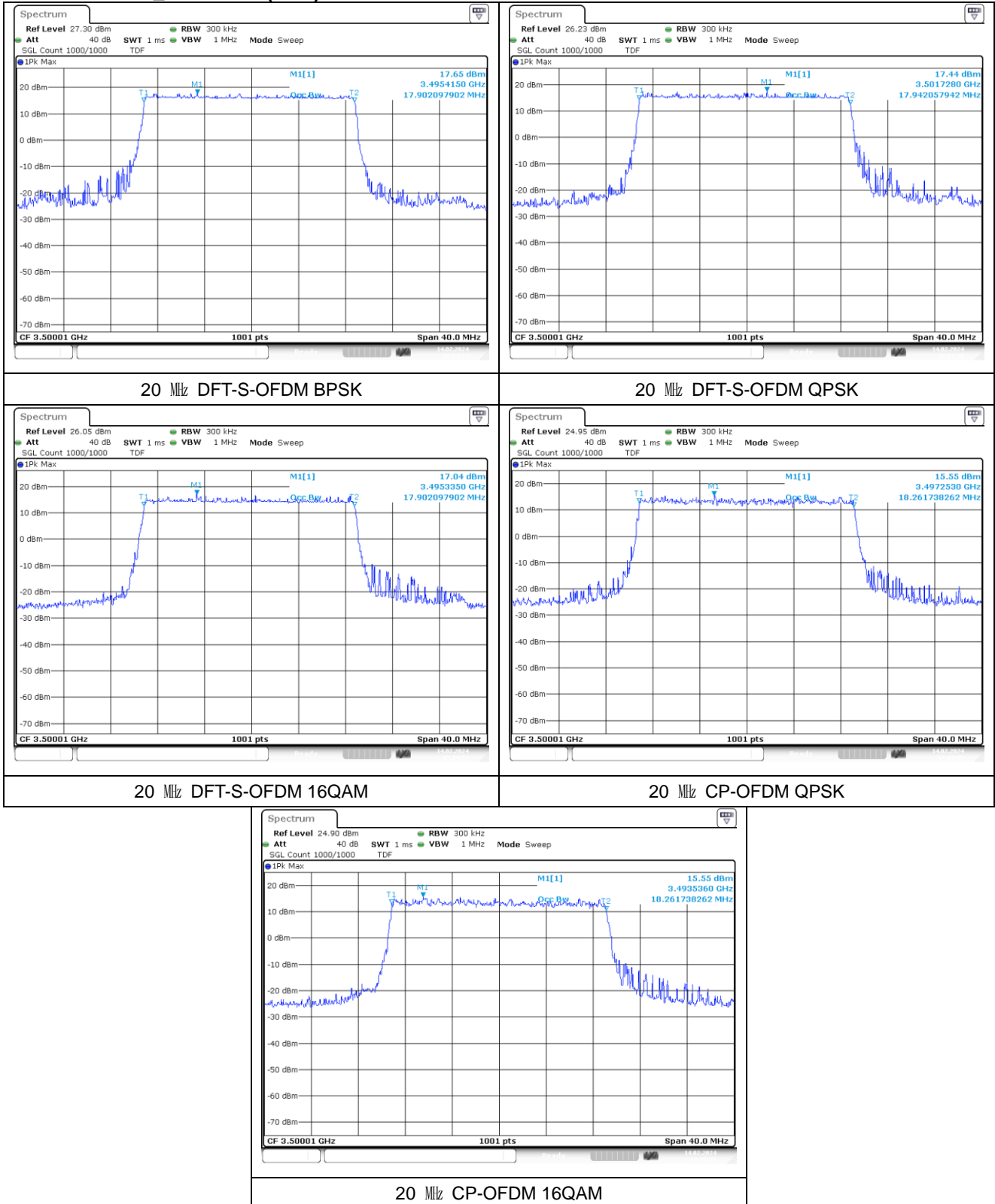
40 MHz DFT-S-OFDM 16QAM

40 MHz CP-OFDM QPSK



40 MHz CP-OFDM 16QAM

NR band 77/78_Low Band (FCC)



NR band 77/78_Low Band (FCC)

