

5. Peak-Average Ratio

5.1. Limit

IC

- RSS-199 Issue 3

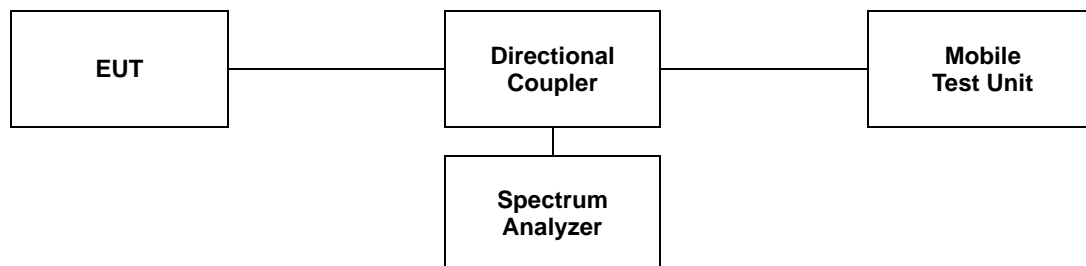
4.4, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

5.2. Test Procedure

The test follows section 5.2.3.4 of ANSI C63.26-2015.

See instrumentation-specific application literature for further guidance regarding use of the CCDF capability. The following guidelines are offered for performing a CCDF measurement.

- a. Set resolution/measurement bandwidth \geq OBW or specified reference bandwidth.
- b. Set the number of counts to a value that stabilizes the measured CCDF curve.
- c. Set the measurement interval as follows:
 - 1) For continuous transmissions, set to greater of $[10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$ or 1 ms.
 - 2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
 - 3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.
- d. Record the maximum PAPR level associated with a probability of 0.1 %.
- e. The peak power level is calculated from the sum of the PAPR value from step d) to the measured average power.



5.3 Test Results

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

SISO

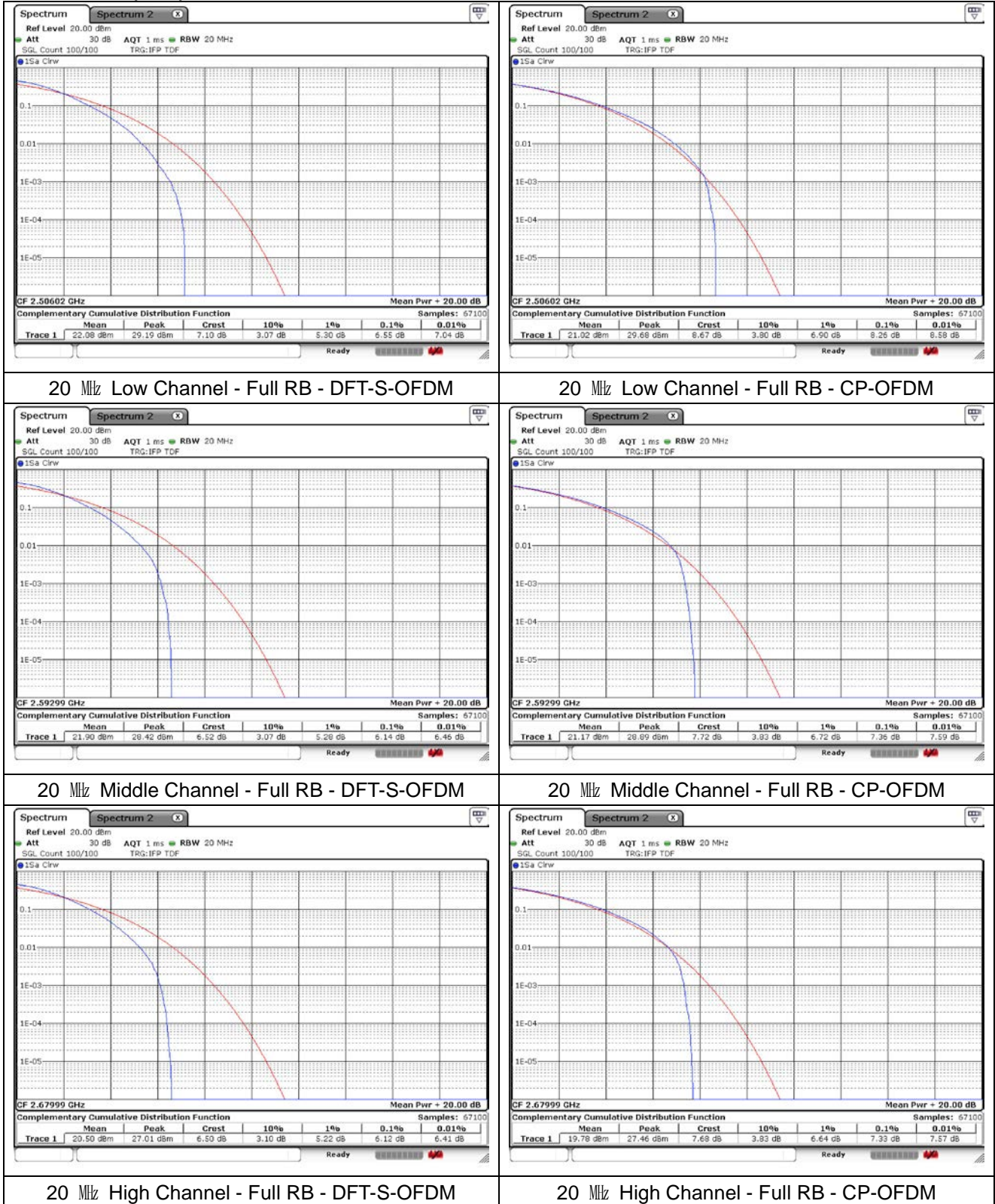
Band	SCS (kHz)	BW (MHz)	Mode	Frequency (MHz)	PAR (dB)			
					DFT-S-OFDM	CP-OFDM		
41 (FCC)	30	20	64QAM	2 506.02	6.55	8.26		
				2 592.99	6.14	7.36		
				2 679.99	6.12	7.33		
		30	64QAM	2 511.00	6.41	8.09		
				2 592.99	6.23	7.62		
				2 674.98	6.14	7.57		
		40	64QAM	2 516.01	6.29	8.14		
				2 592.99	6.20	7.68		
				2 670.00	6.12	7.65		
		50	64QAM	2 521.02	6.32	8.09		
				2 592.99	6.29	7.97		
				2 664.99	6.32	7.91		
		60	64QAM	2 526.00	6.81	8.20		
				2 592.99	6.78	8.20		
				2 659.98	6.78	8.26		
		80	64QAM	2 536.02	7.13	8.43		
				2 592.99	7.13	8.20		
				2 649.99	7.13	8.32		
		90	64QAM	2 541.00	7.39	8.49		
				2 592.99	7.39	8.38		
				2 644.98	7.42	8.26		
		100	64QAM	2 546.01	7.57	8.67		
				2 592.99	7.57	8.58		
				2 640.00	7.54	8.58		
		Band	SCS (kHz)	BW (MHz)	Mode	Frequency (MHz)	PAR (dB)	
		41 (IC)	30	20	64QAM	2 510.01	6.52	8.26
						2 595.00	6.17	7.39
						2 679.99	6.12	7.33
				30	64QAM	2 515.02	6.38	8.12
						2 595.00	6.17	7.59
2 674.98	6.14					7.57		
40	64QAM			2 520.00	6.32	8.06		
				2 595.00	6.17	7.74		
				2 670.00	6.12	7.65		
50	64QAM			2 525.01	6.35	8.09		
				2 595.00	6.38	7.91		
				2 664.99	6.32	7.91		
60	64QAM			2 530.02	6.81	8.49		
				2 595.00	6.84	8.23		
				2 659.98	6.78	8.26		
80	64QAM			2 540.01	7.16	8.43		
				2 595.00	7.16	8.32		
				2 649.99	7.13	8.32		
90	64QAM			2 545.02	7.45	8.55		
				2 595.00	7.42	8.41		
				2 644.98	7.42	8.26		
100	64QAM			2 550.00	7.30	8.58		
				2 595.00	7.30	8.35		
				2 640.00	7.54	8.58		

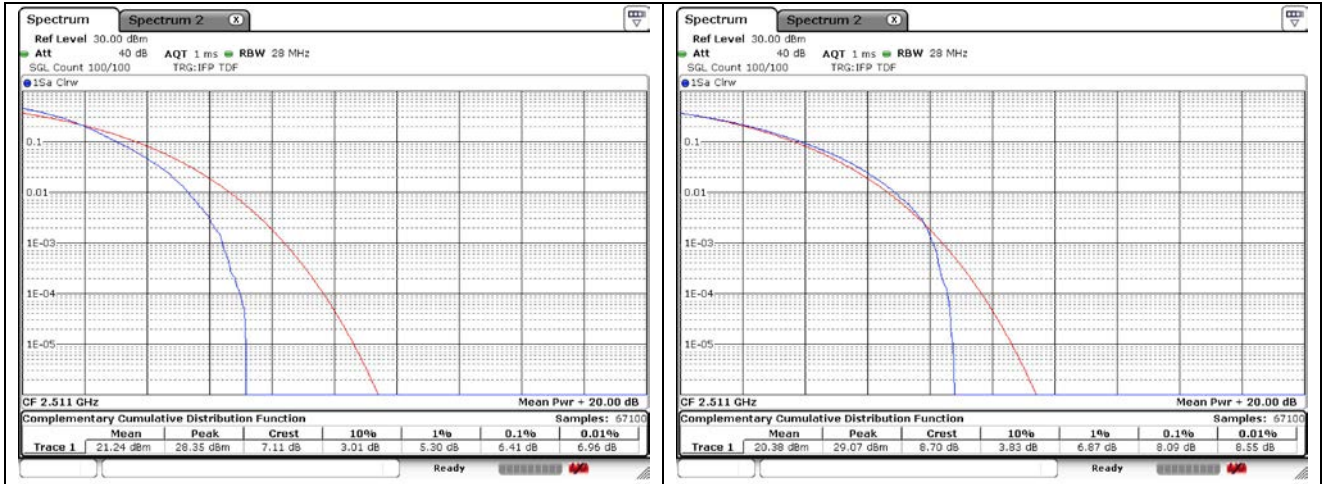
MIMO

Band	SCS (kHz)	BW (MHz)	Mode	Frequency (MHz)	PAR (dB)	
					CP-OFDM	
					Port 1	Port 2
41 (FCC)	30	20	64QAM	2 506.02	8.09	8.23
				2 592.99	8.03	8.29
				2 679.99	7.71	8.23
		30	64QAM	2 511.00	8.20	8.38
				2 592.99	8.17	8.38
				2 674.98	7.91	8.46
		40	64QAM	2 516.01	8.17	8.58
				2 592.99	8.06	8.78
				2 670.00	7.91	8.61
		50	64QAM	2 521.02	8.46	8.23
				2 592.99	8.32	8.43
				2 664.99	8.23	8.46
		60	64QAM	2 526.00	8.55	8.46
				2 592.99	8.52	8.61
				2 659.98	8.55	8.61
		80	64QAM	2 536.02	8.43	8.35
				2 592.99	8.17	8.32
				2 649.99	8.32	8.32
		90	64QAM	2 541.00	8.72	8.58
				2 592.99	8.55	8.55
				2 644.98	8.46	8.67
		100	64QAM	2 546.01	8.52	8.75
				2 592.99	8.26	8.81
				2 640.00	8.20	8.75
Band	SCS (kHz)	BW (MHz)	Mode	Frequency (MHz)	PAR (dB)	
					CP-OFDM	
					Port 1	Port 2
41 (IC)	30	20	64QAM	2 510.01	8.14	8.06
				2 595.00	7.86	8.32
				2 679.99	7.71	8.23
		30	64QAM	2 515.02	8.23	8.29
				2 595.00	8.20	8.43
				2 674.98	7.91	8.46
		40	64QAM	2 520.00	8.14	8.52
				2 595.00	8.06	8.61
				2 670.00	7.91	8.61
		50	64QAM	2 525.01	8.46	8.26
				2 595.00	8.41	8.35
				2 664.99	8.23	8.46
		60	64QAM	2 530.02	8.55	8.49
				2 595.00	8.52	8.61
				2 659.98	8.55	8.61
		80	64QAM	2 540.01	8.43	8.32
				2 595.00	8.38	8.32
				2 649.99	8.32	8.32
		90	64QAM	2 545.02	8.81	8.67
				2 595.00	8.58	8.58
				2 644.98	8.46	8.67
		100	64QAM	2 550.00	8.55	8.84
				2 595.00	8.29	8.78
				2 640.00	8.20	8.75

- Test plots

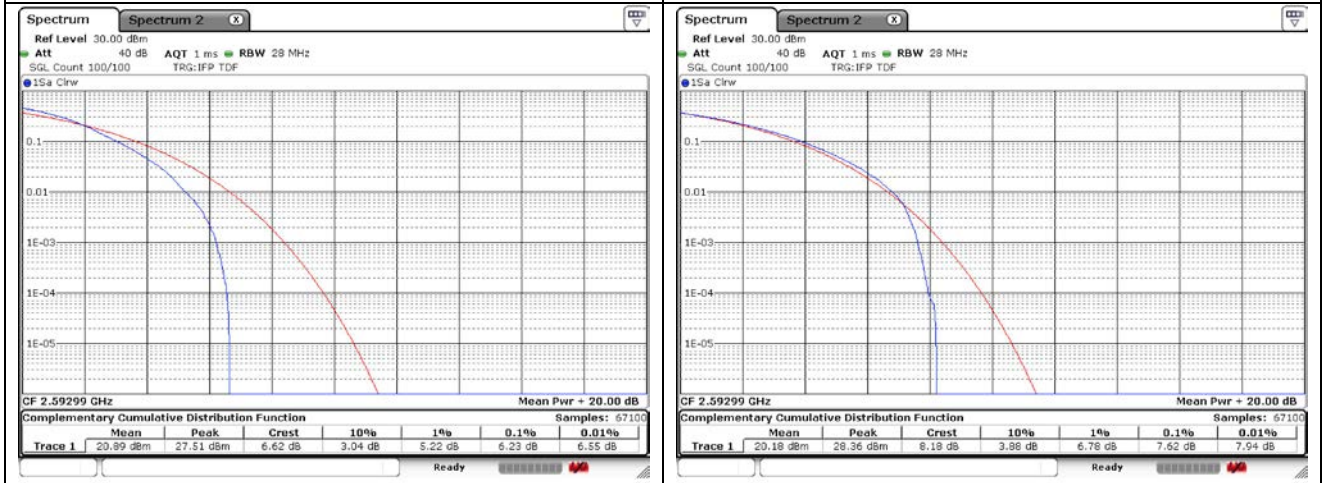
NR band 41 (FCC)_SISO





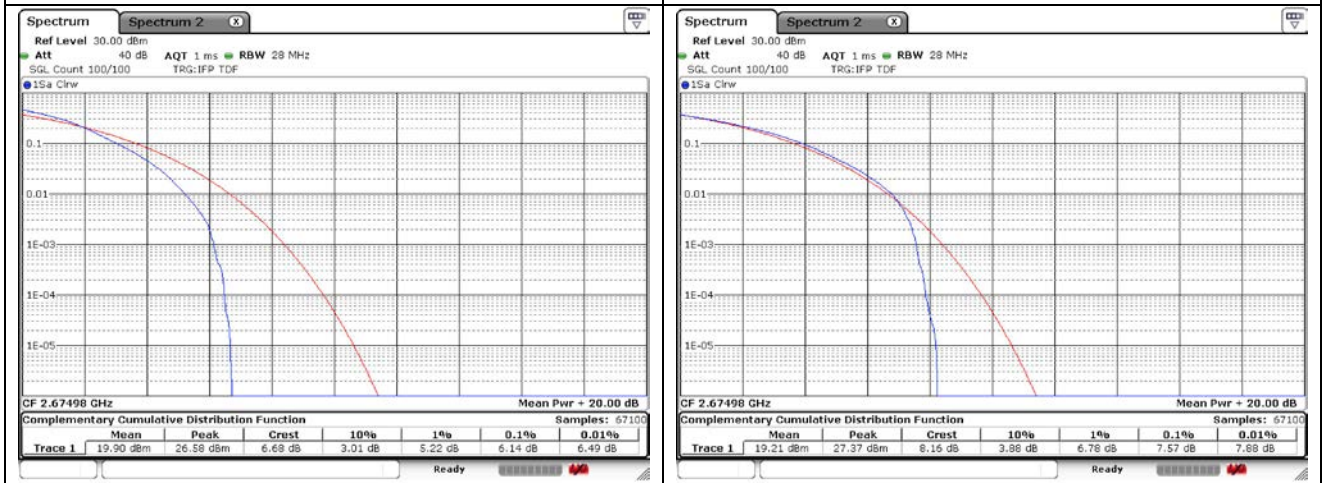
30 MHz Low Channel - Full RB - DFT-S-OFDM

30 MHz Low Channel - Full RB - CP-OFDM



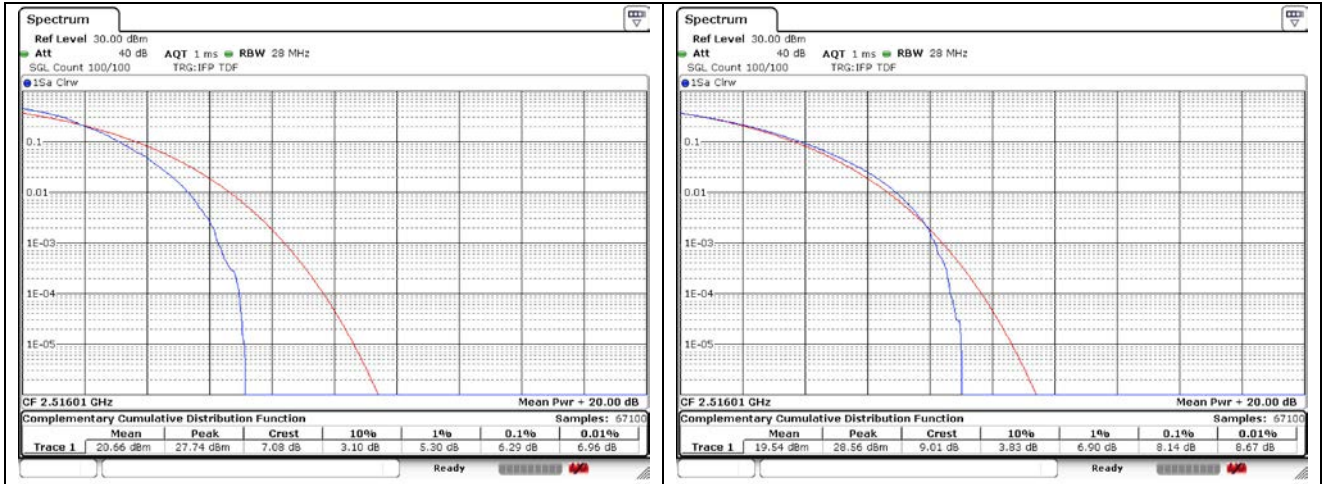
30 MHz Middle Channel - Full RB - DFT-S-OFDM

30 MHz Middle Channel - Full RB - CP-OFDM



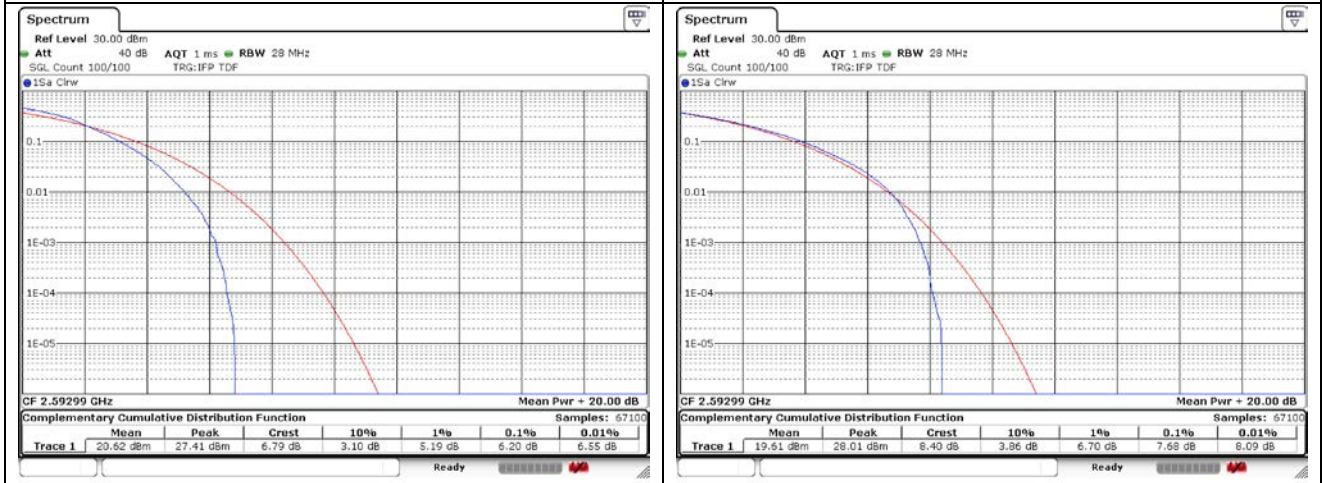
30 MHz High Channel - Full RB - DFT-S-OFDM

30 MHz High Channel - Full RB - CP-OFDM



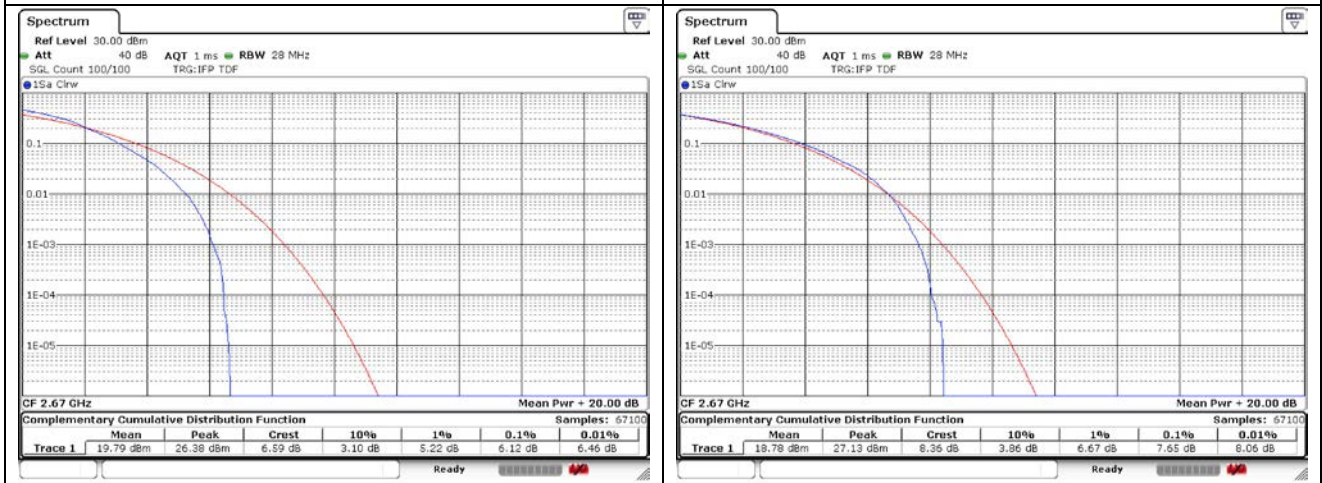
40 MHz Low Channel - Full RB - DFT-S-OFDM

40 MHz Low Channel - Full RB - CP-OFDM



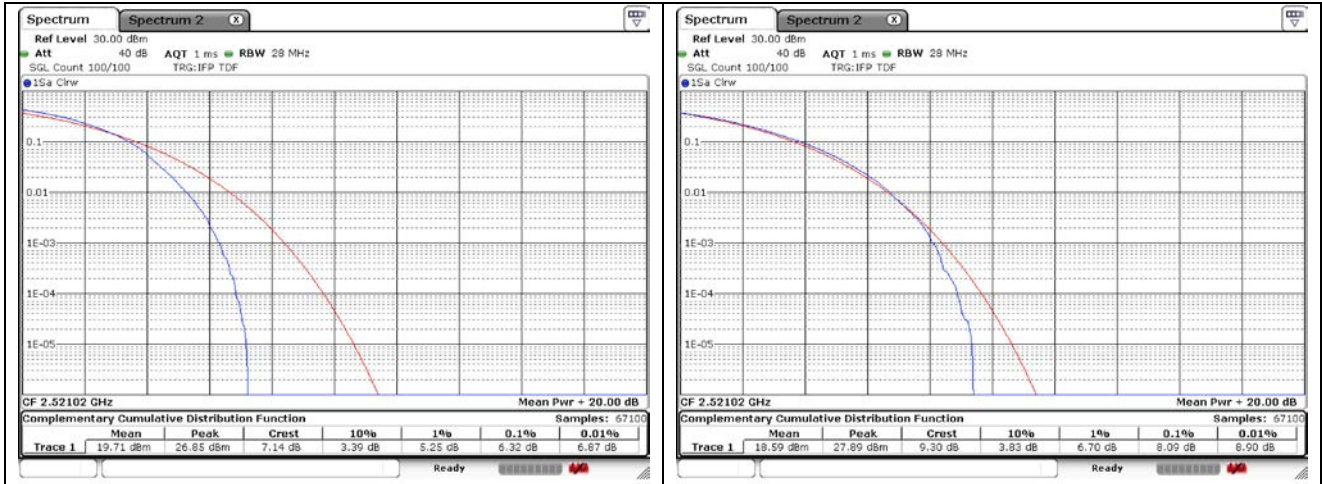
40 MHz Middle Channel - Full RB - DFT-S-OFDM

40 MHz Middle Channel - Full RB - CP-OFDM



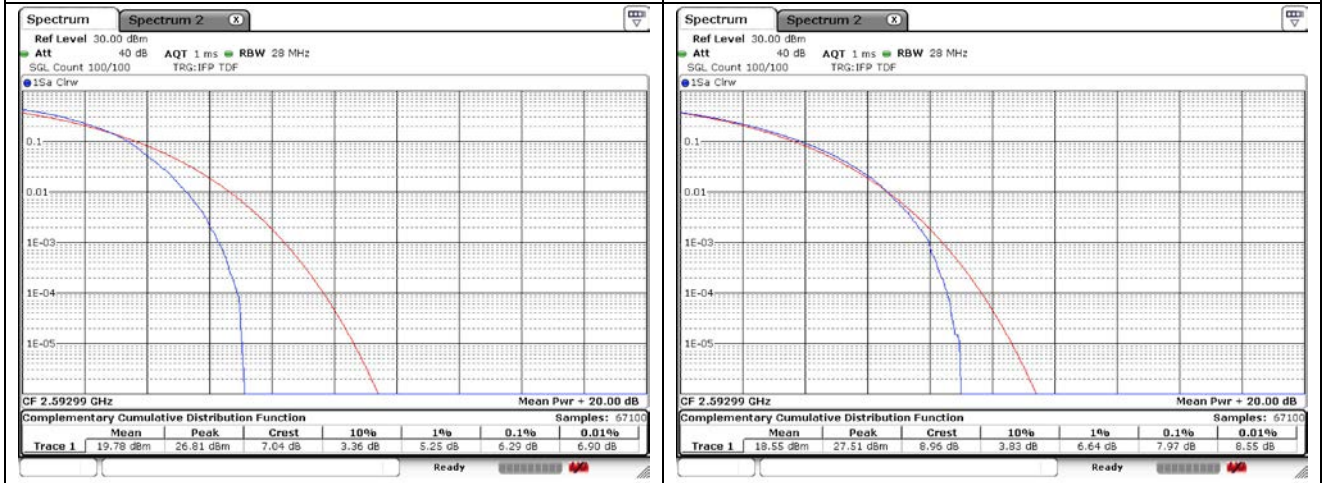
40 MHz High Channel - Full RB - DFT-S-OFDM

40 MHz High Channel - Full RB - CP-OFDM



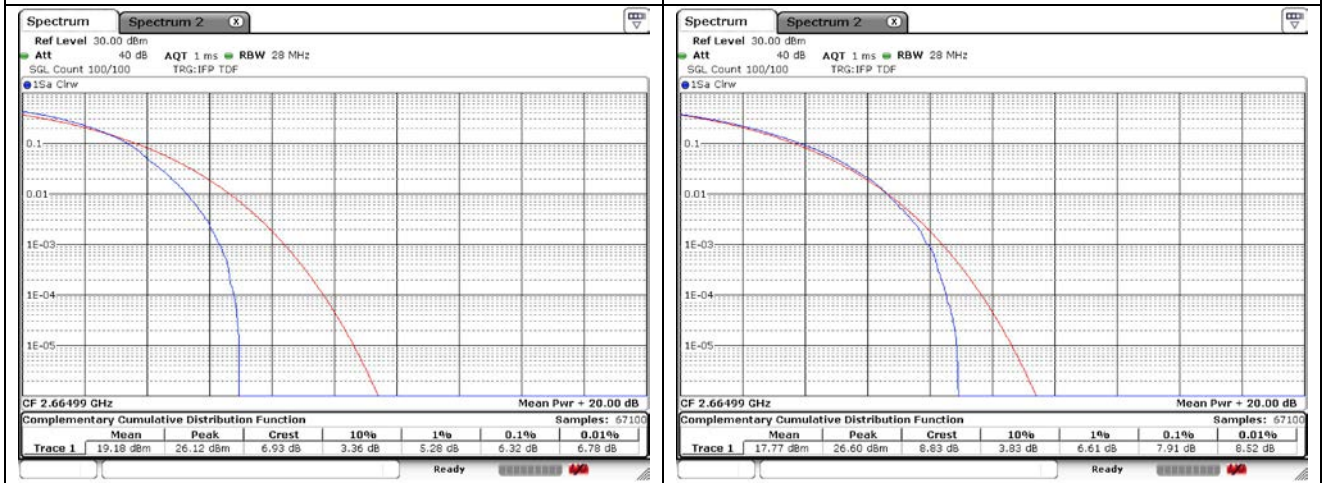
50 MHz Low Channel - Full RB - DFT-S-OFDM

50 MHz Low Channel - Full RB - CP-OFDM



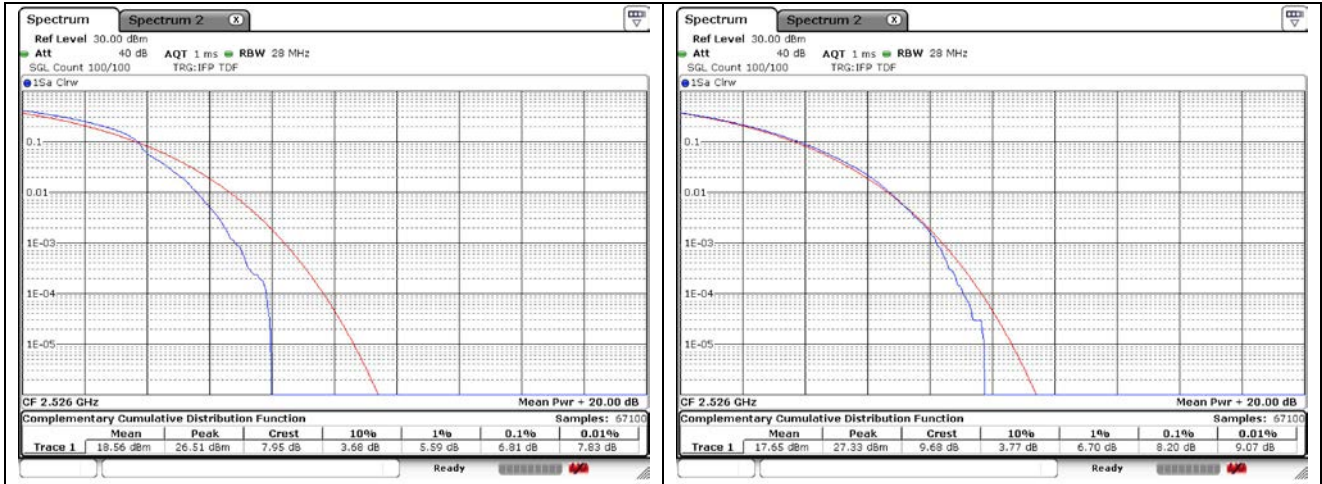
50 MHz Middle Channel - Full RB - DFT-S-OFDM

50 MHz Middle Channel - Full RB - CP-OFDM



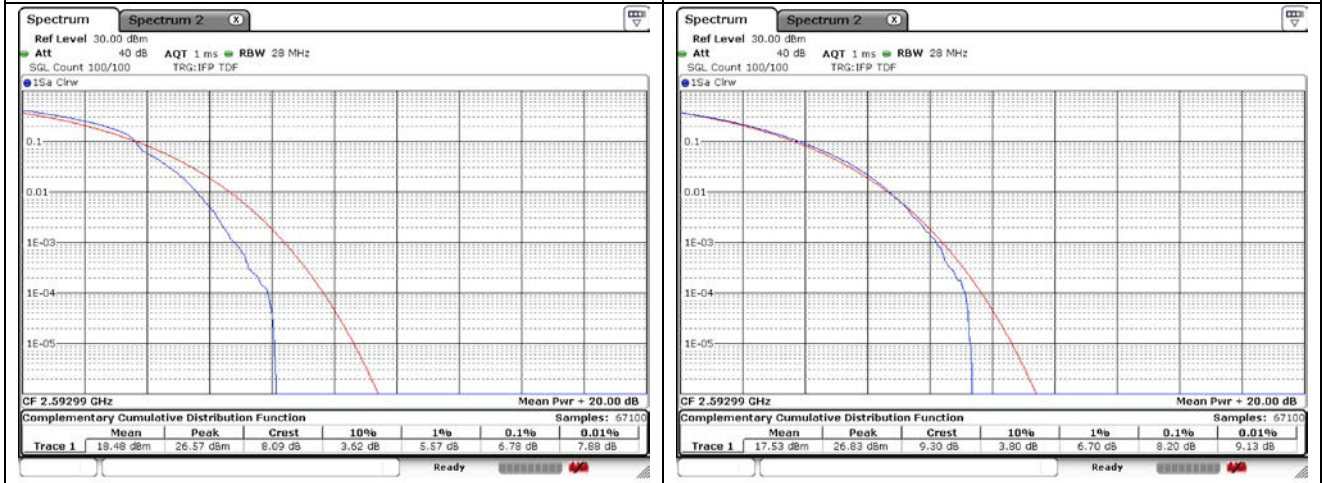
50 MHz High Channel - Full RB - DFT-S-OFDM

50 MHz High Channel - Full RB - CP-OFDM



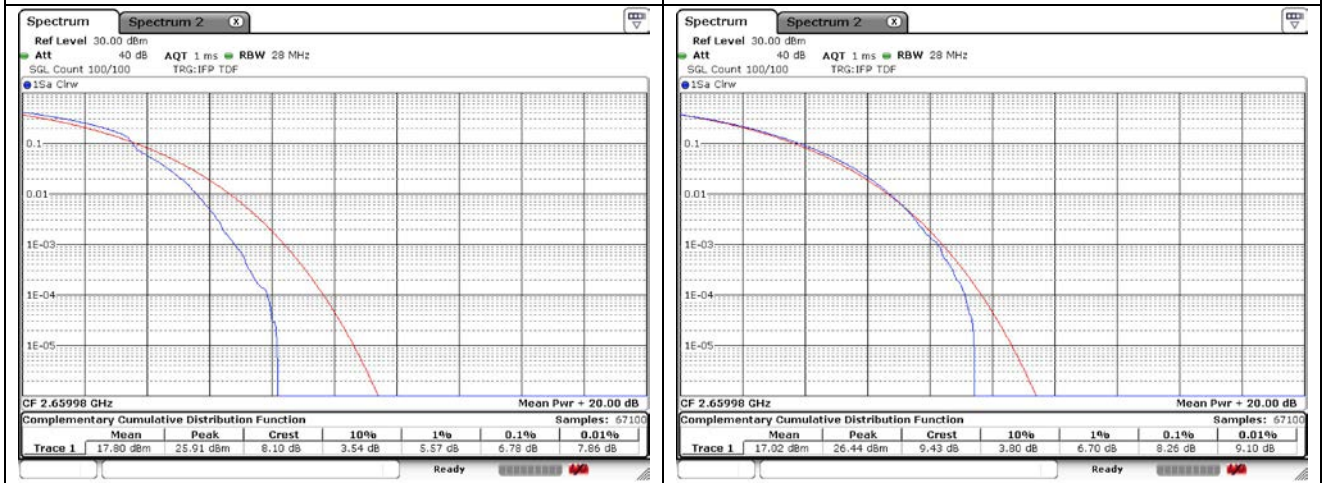
60 MHz Low Channel - Full RB - DFT-S-OFDM

60 MHz Low Channel - Full RB - CP-OFDM



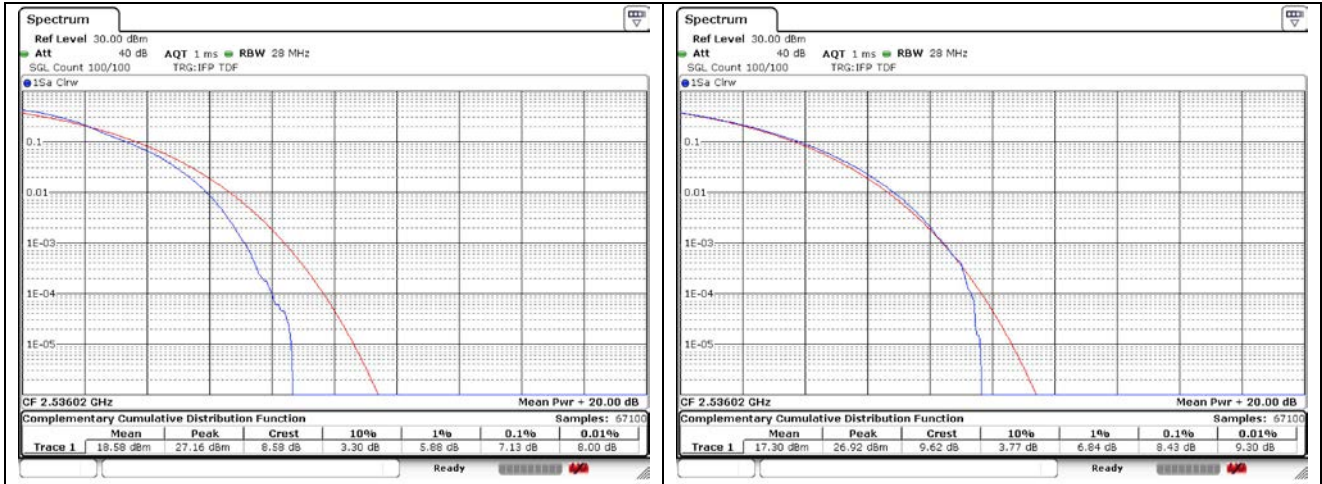
60 MHz Middle Channel - Full RB - DFT-S-OFDM

60 MHz Middle Channel - Full RB - CP-OFDM



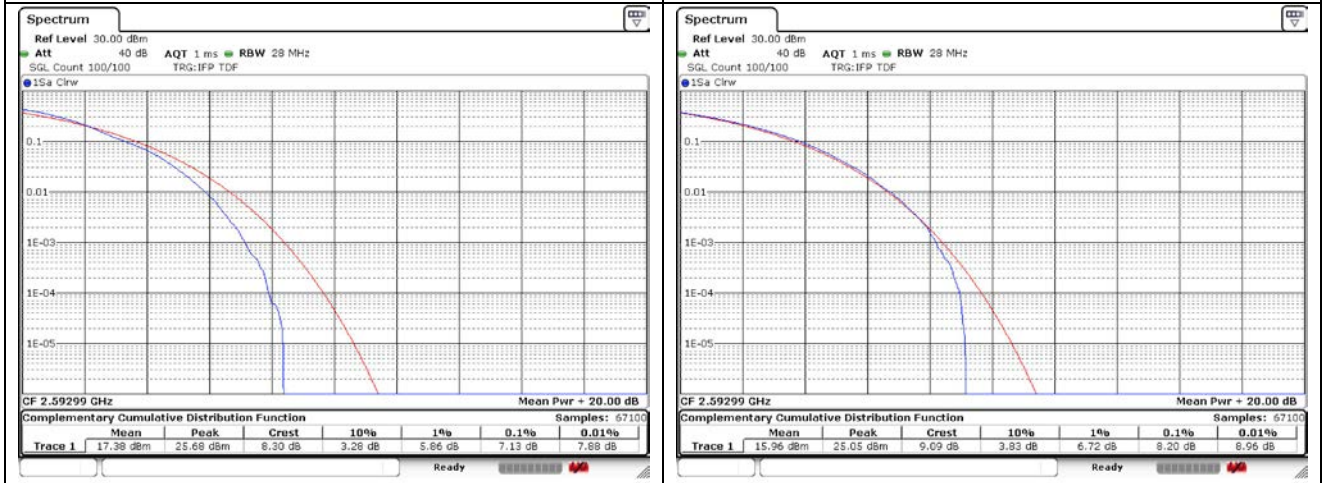
60 MHz High Channel - Full RB - DFT-S-OFDM

60 MHz High Channel - Full RB - CP-OFDM



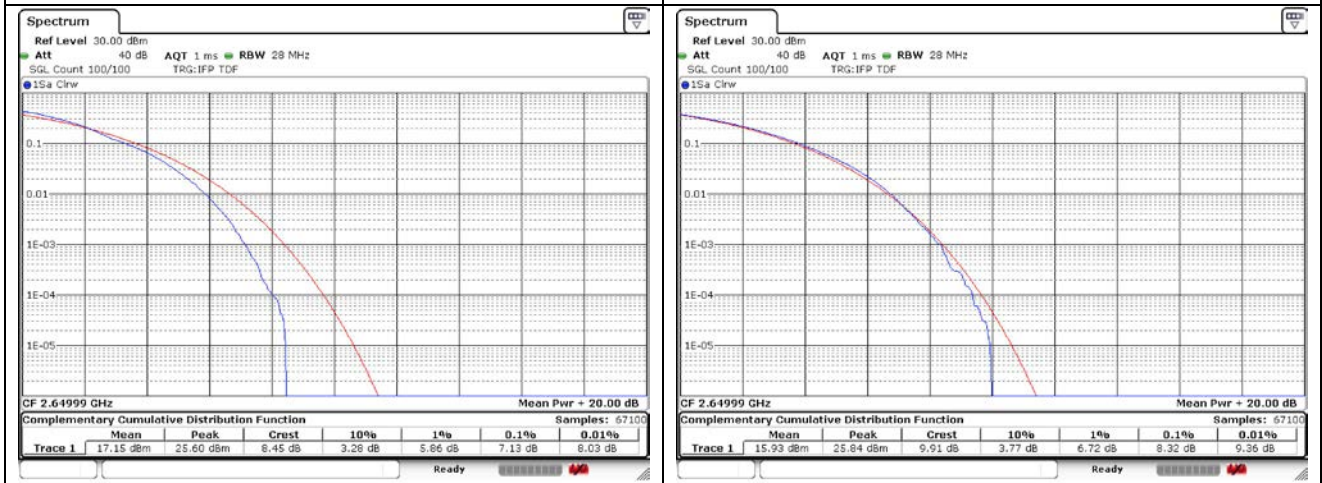
80 MHz Low Channel - Full RB - DFT-S-OFDM

80 MHz Low Channel - Full RB - CP-OFDM



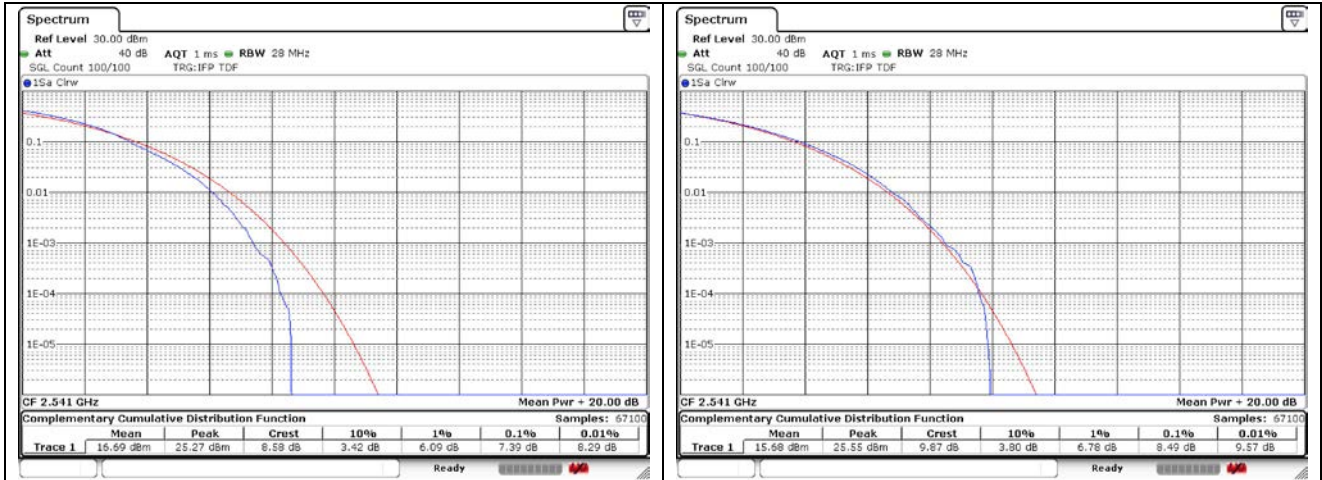
80 MHz Middle Channel - Full RB - DFT-S-OFDM

80 MHz Middle Channel - Full RB - CP-OFDM



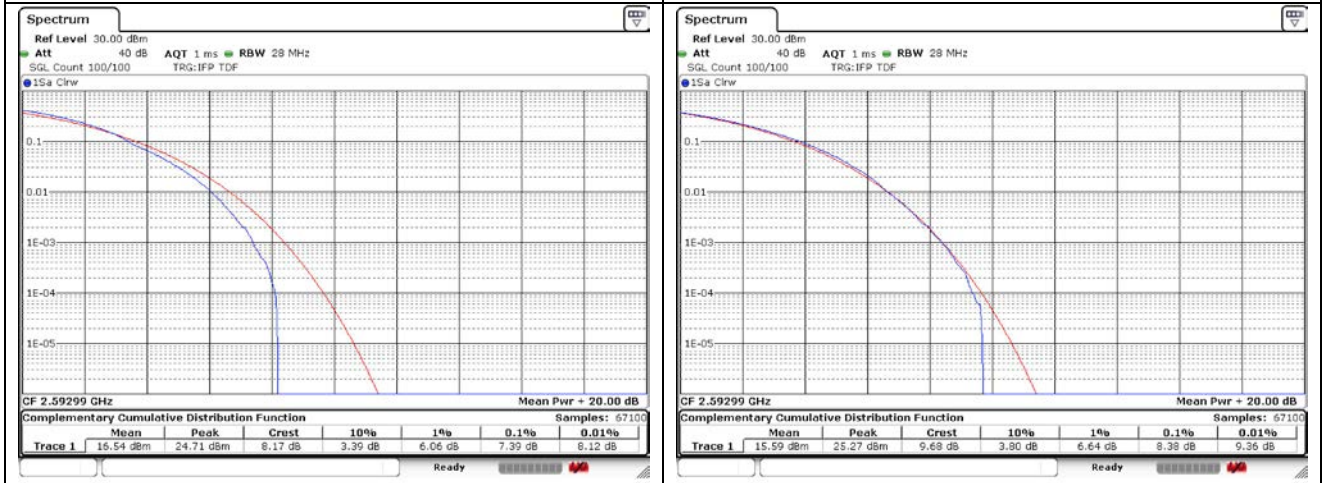
80 MHz High Channel - Full RB - DFT-S-OFDM

80 MHz High Channel - Full RB - CP-OFDM



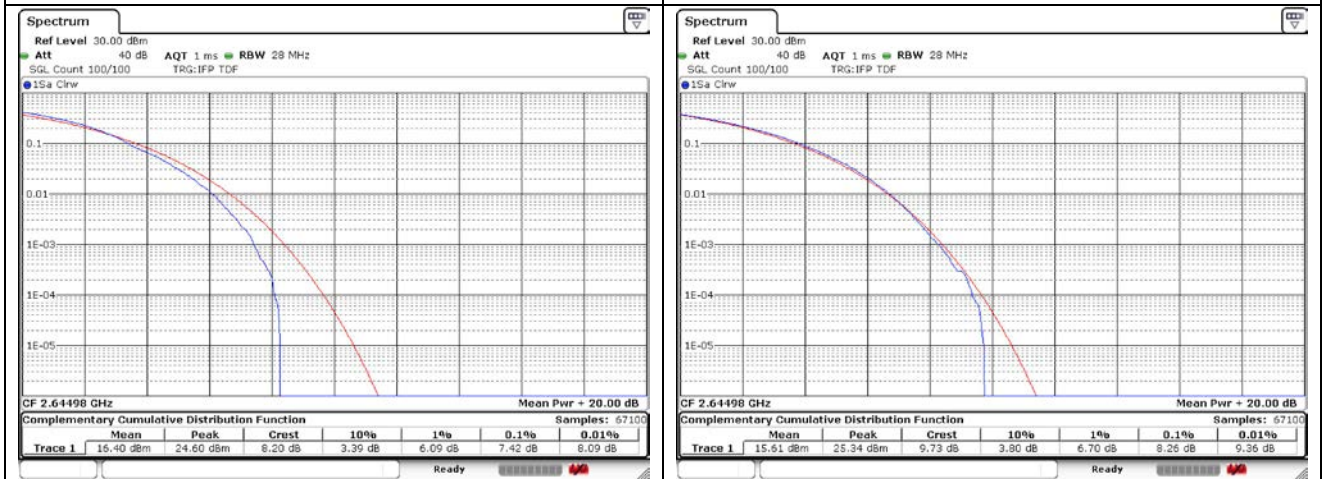
90 MHz Low Channel - Full RB - DFT-S-OFDM

90 MHz Low Channel - Full RB - CP-OFDM



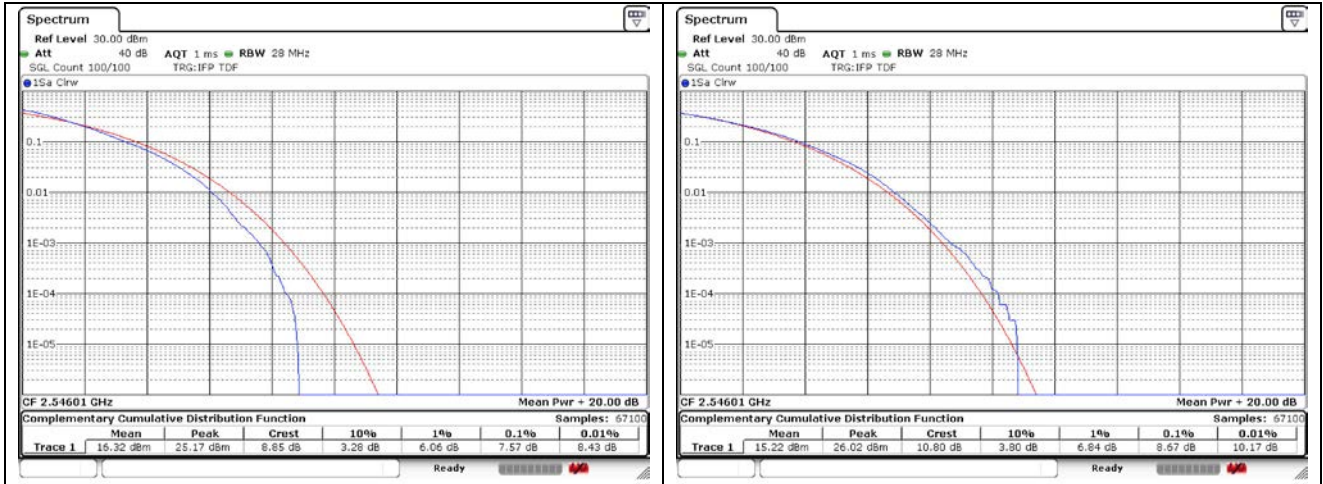
90 MHz Middle Channel - Full RB - DFT-S-OFDM

90 MHz Middle Channel - Full RB - CP-OFDM



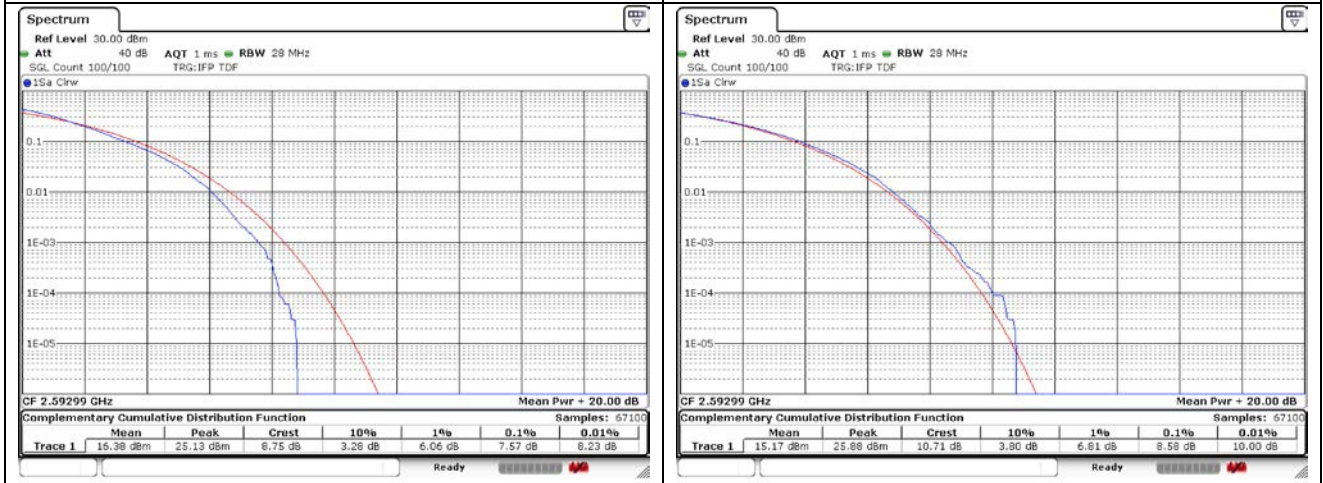
90 MHz High Channel - Full RB - DFT-S-OFDM

90 MHz High Channel - Full RB - CP-OFDM



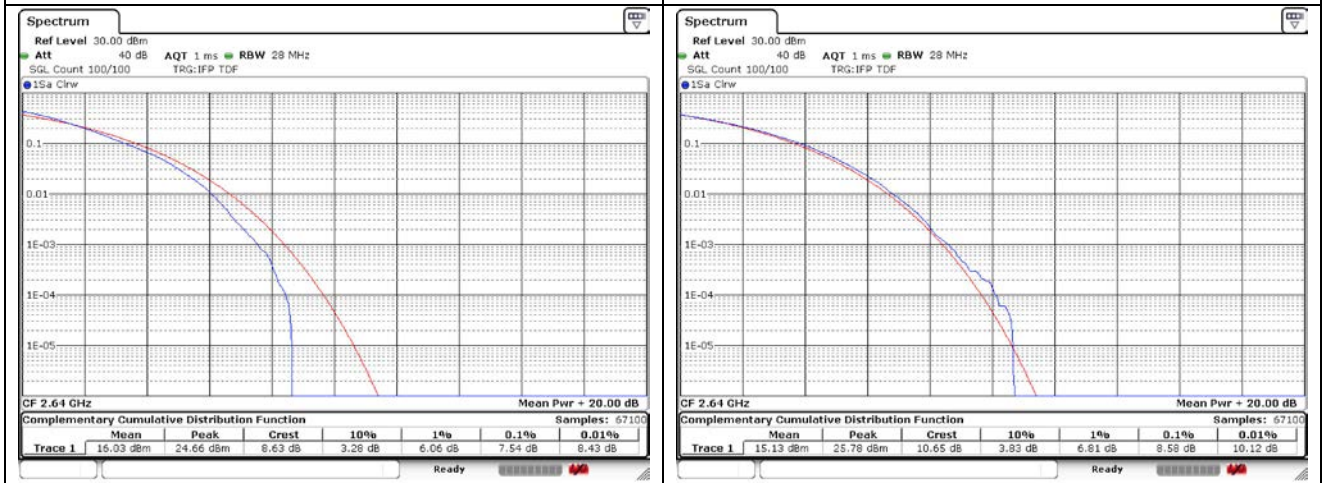
100 MHz Low Channel - Full RB - DFT-S-OFDM

100 MHz Low Channel - Full RB - CP-OFDM



100 MHz Middle Channel - Full RB - DFT-S-OFDM

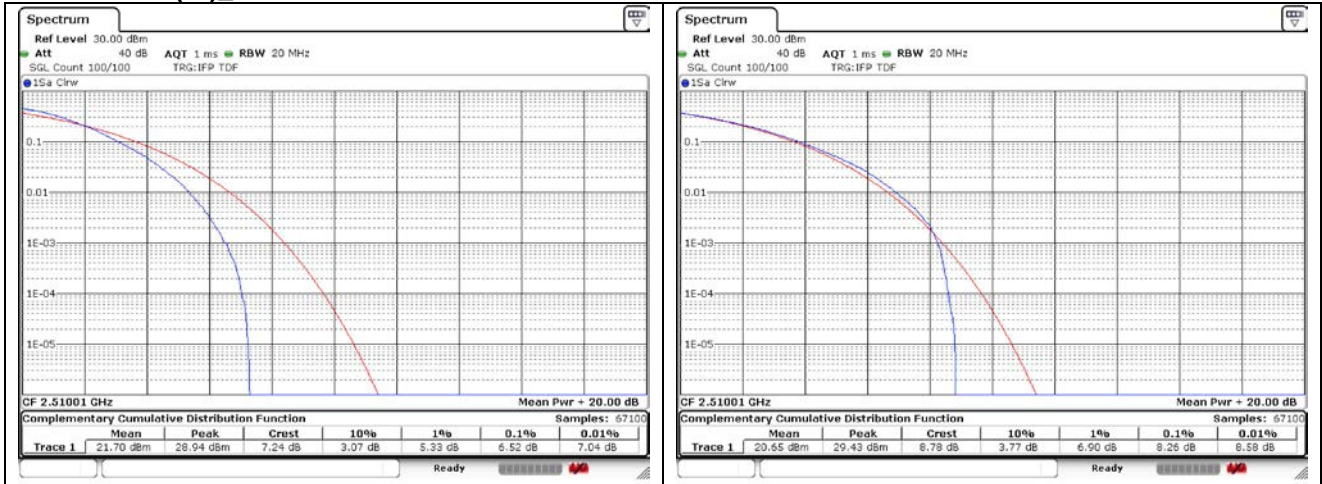
100 MHz Middle Channel - Full RB - CP-OFDM



100 MHz High Channel - Full RB - DFT-S-OFDM

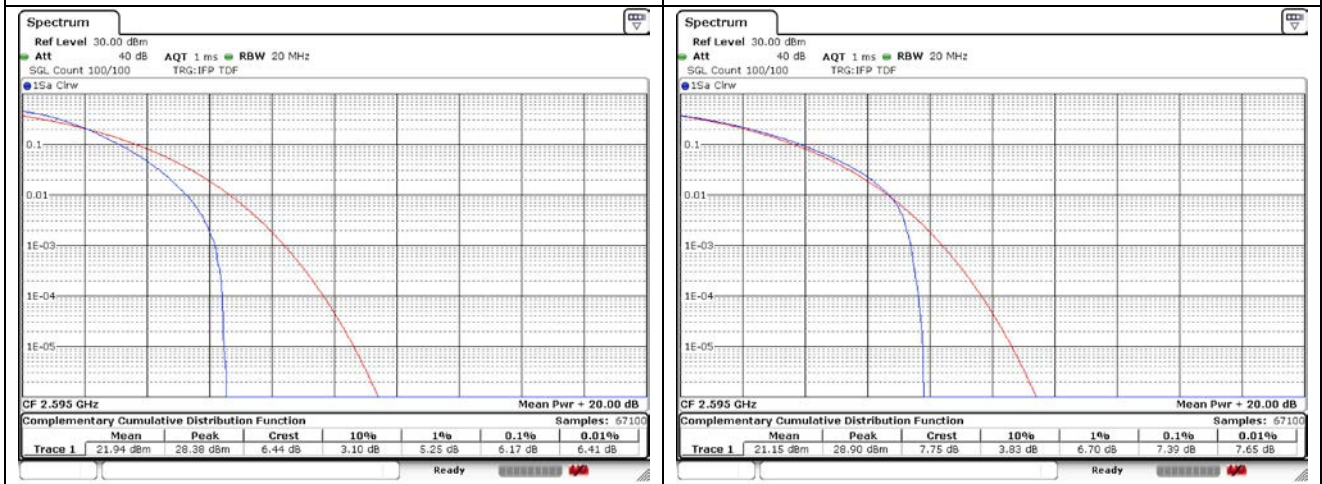
100 MHz High Channel - Full RB - CP-OFDM

NR band 41 (IC) SISO



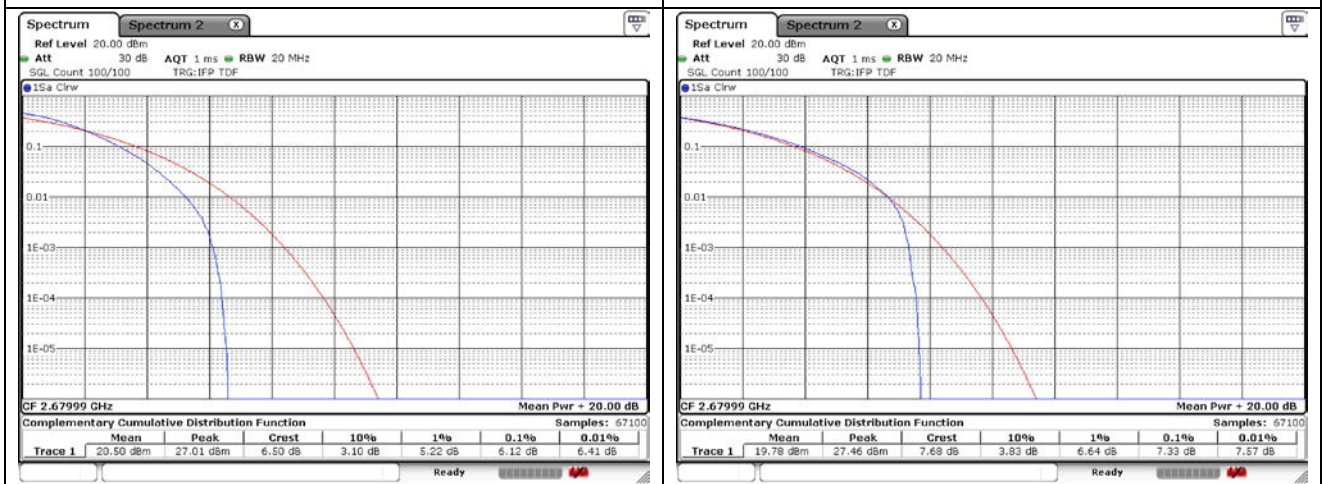
20 MHz Low Channel - Full RB - DFT-S-OFDM

20 MHz Low Channel - Full RB - CP-OFDM



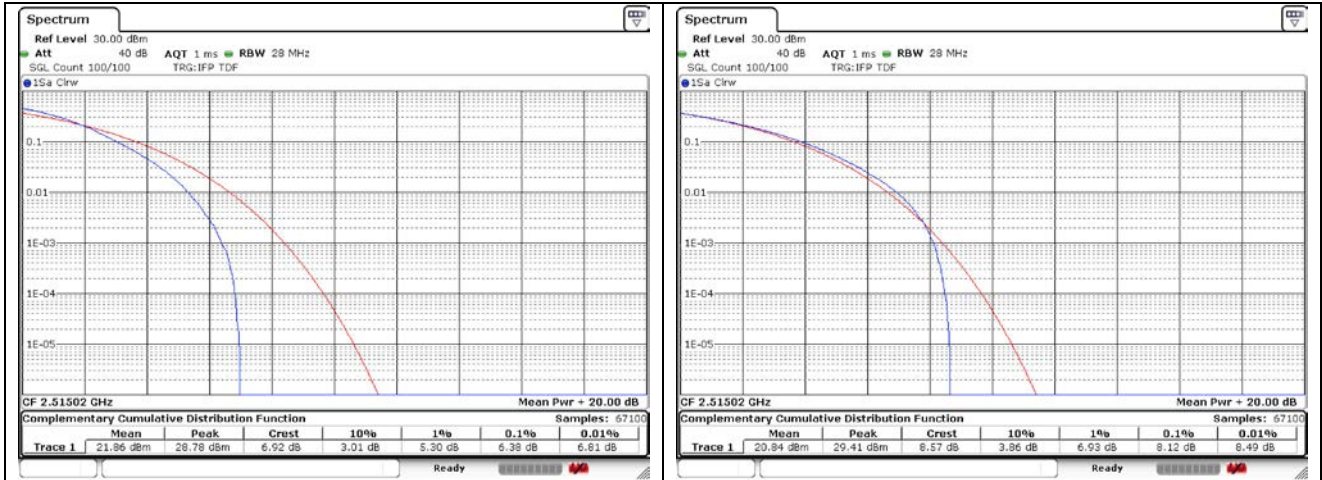
20 MHz Middle Channel - Full RB - DFT-S-OFDM

20 MHz Middle Channel - Full RB - CP-OFDM



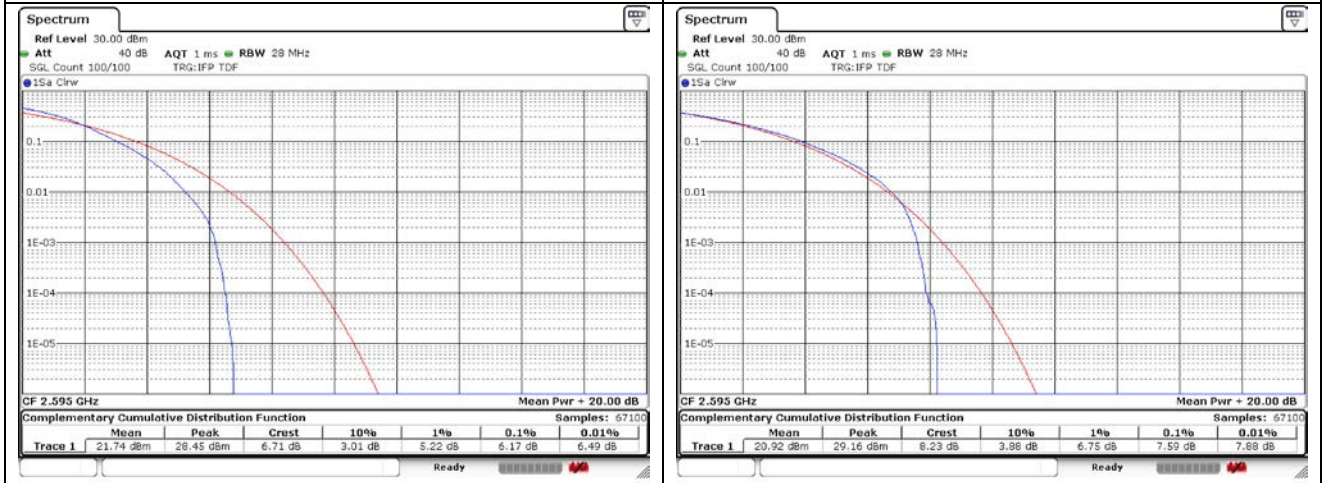
20 MHz High Channel - Full RB - DFT-S-OFDM

20 MHz High Channel - Full RB - CP-OFDM



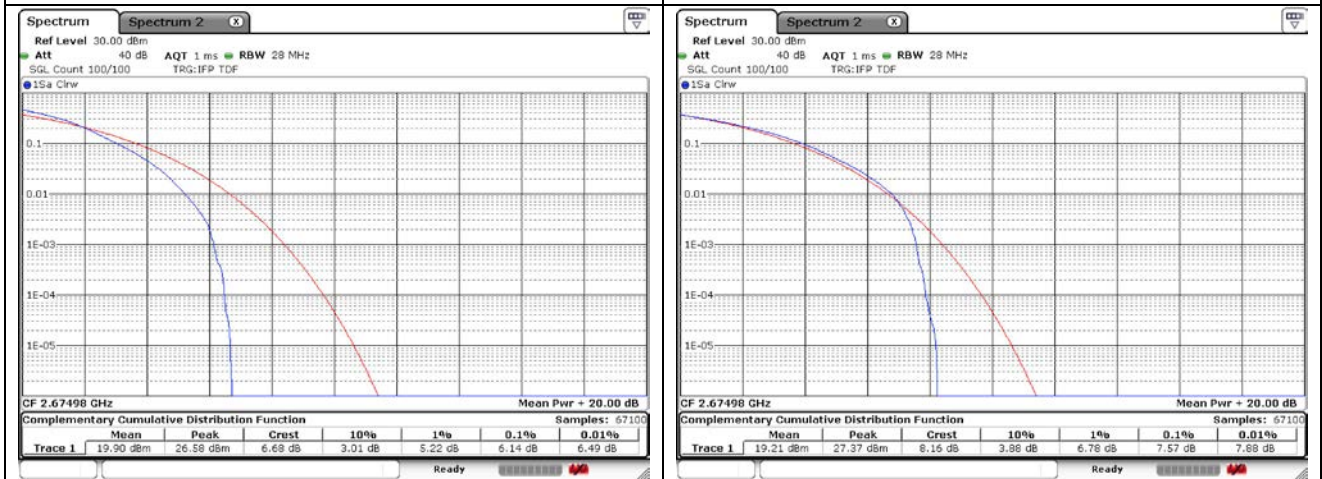
30 MHz Low Channel - Full RB - DFT-S-OFDM

30 MHz Low Channel - Full RB - CP-OFDM



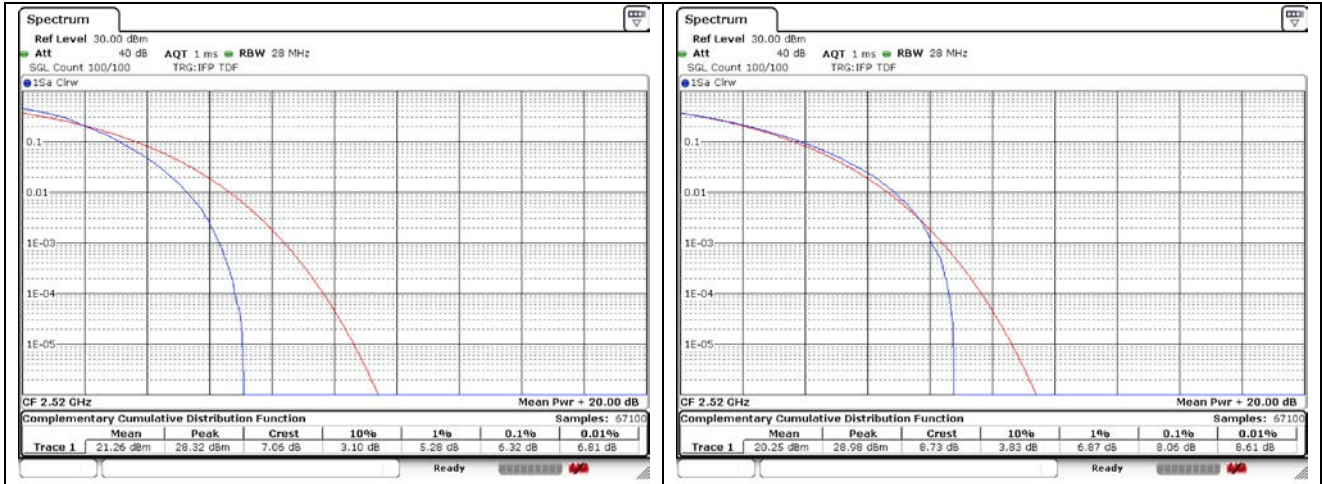
30 MHz Middle Channel - Full RB - DFT-S-OFDM

30 MHz Middle Channel - Full RB - CP-OFDM



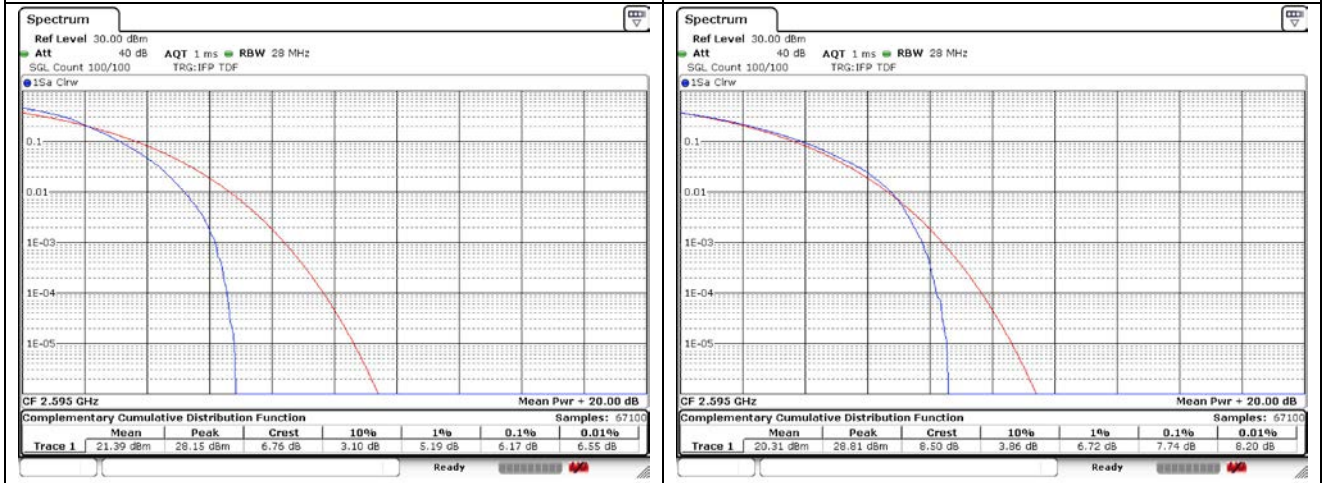
30 MHz High Channel - Full RB - DFT-S-OFDM

30 MHz High Channel - Full RB - CP-OFDM



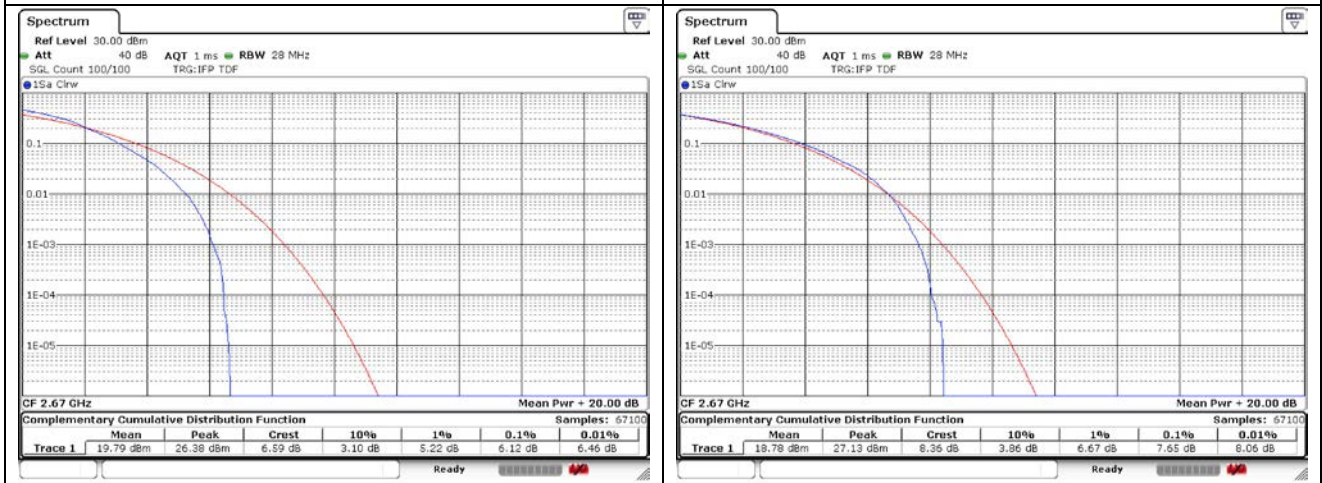
40 MHz Low Channel - Full RB - DFT-S-OFDM

40 MHz Low Channel - Full RB - CP-OFDM



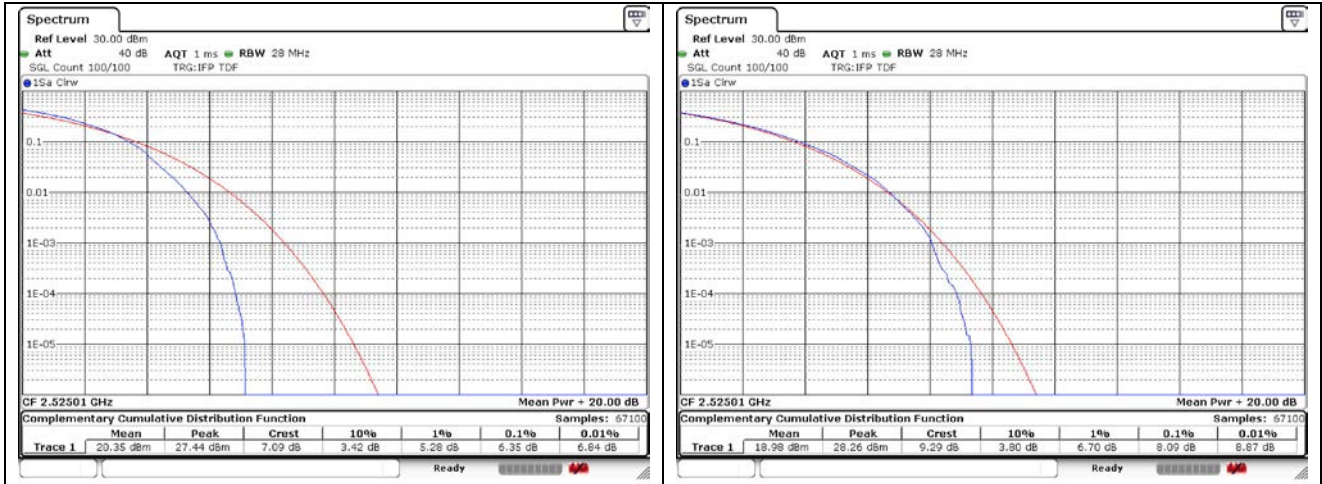
40 MHz Middle Channel - Full RB - DFT-S-OFDM

40 MHz Middle Channel - Full RB - CP-OFDM



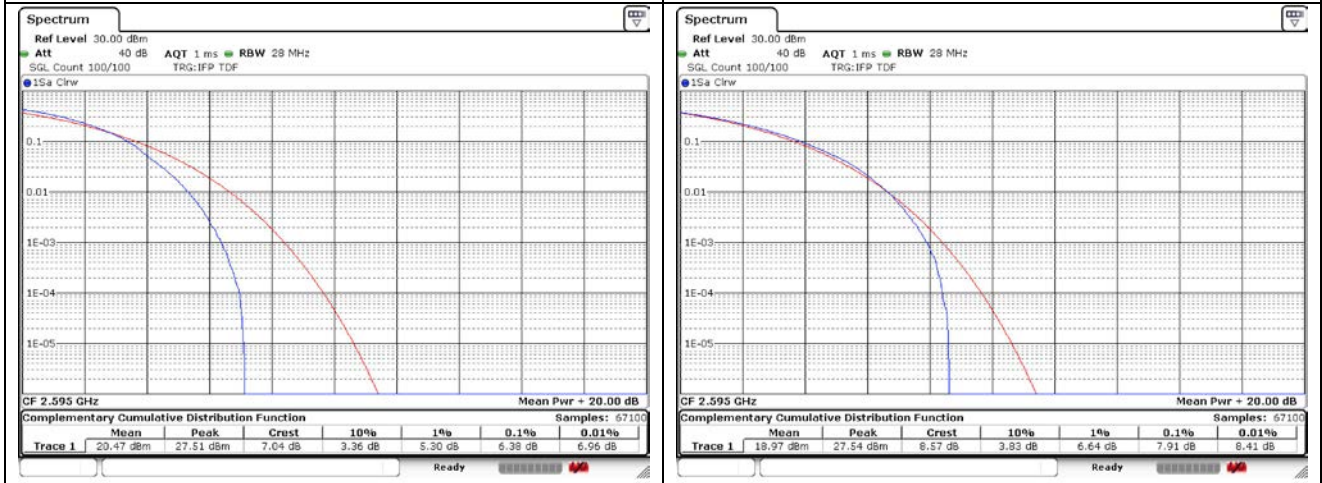
40 MHz High Channel - Full RB - DFT-S-OFDM

40 MHz High Channel - Full RB - CP-OFDM



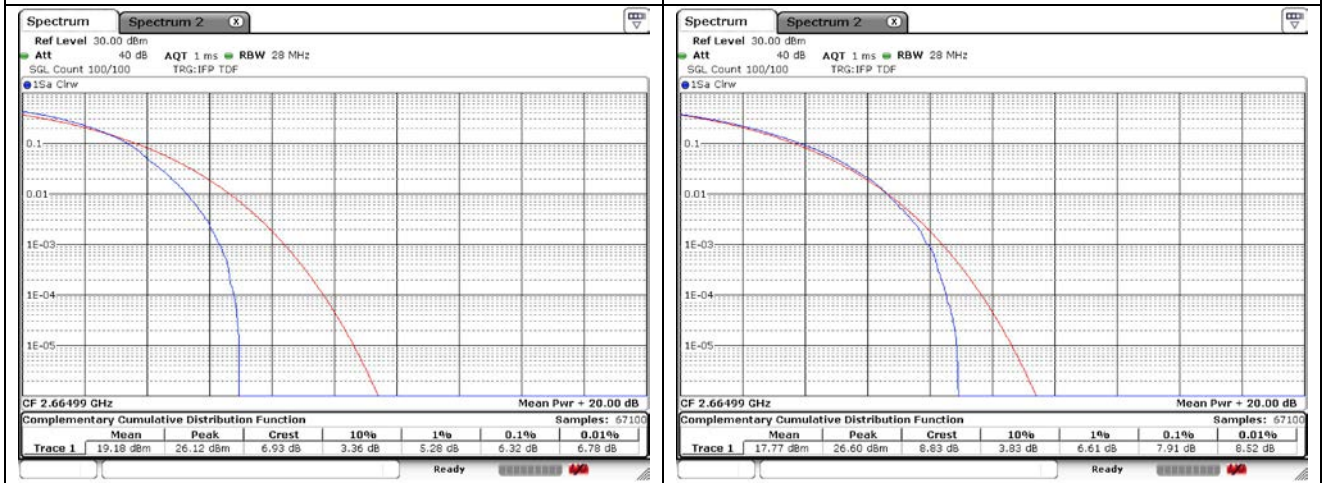
50 MHz Low Channel - Full RB - DFT-S-OFDM

50 MHz Low Channel - Full RB - CP-OFDM



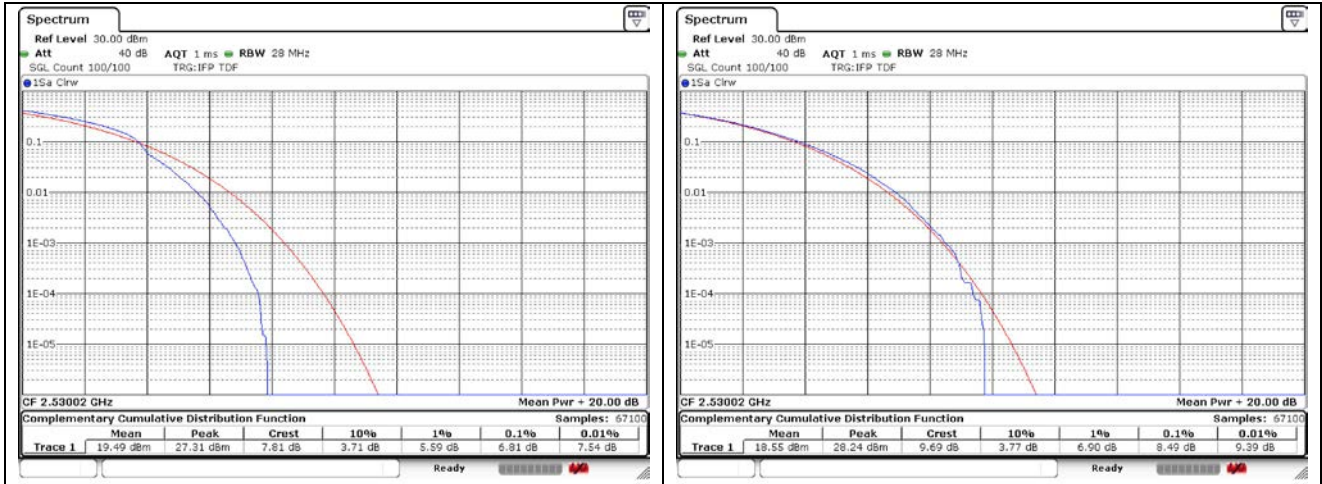
50 MHz Middle Channel - Full RB - DFT-S-OFDM

50 MHz Middle Channel - Full RB - CP-OFDM



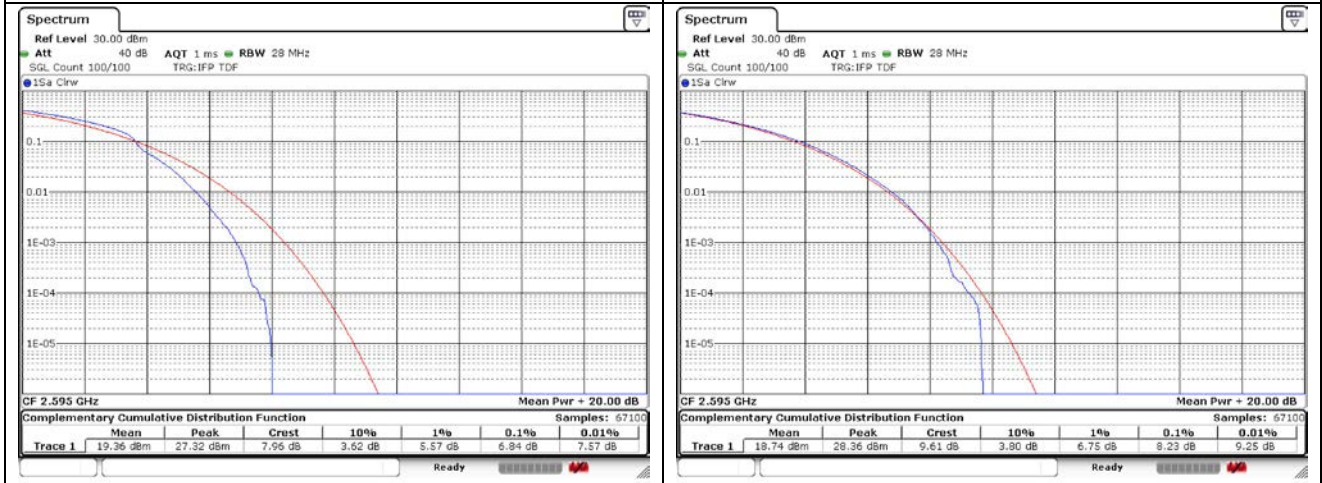
50 MHz High Channel - Full RB - DFT-S-OFDM

50 MHz High Channel - Full RB - CP-OFDM



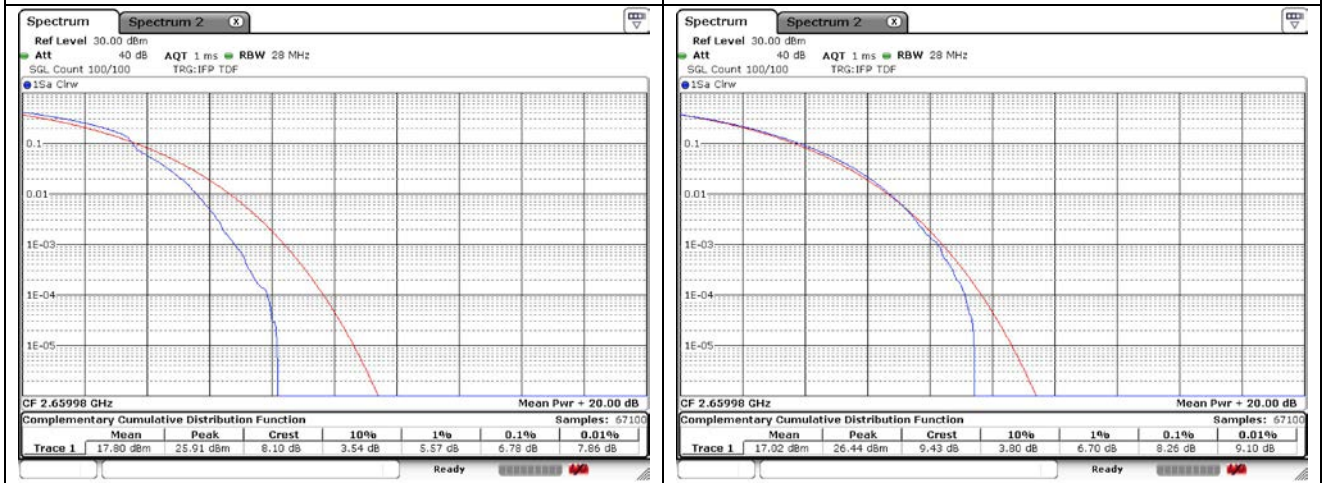
60 MHz Low Channel - Full RB - DFT-S-OFDM

60 MHz Low Channel - Full RB - CP-OFDM



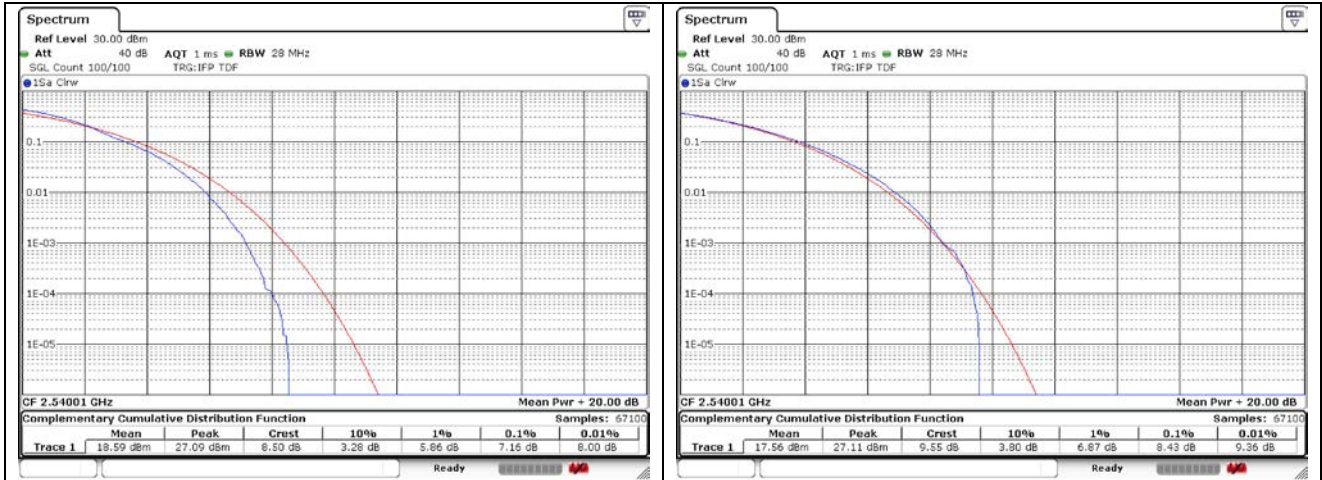
60 MHz Middle Channel - Full RB - DFT-S-OFDM

60 MHz Middle Channel - Full RB - CP-OFDM



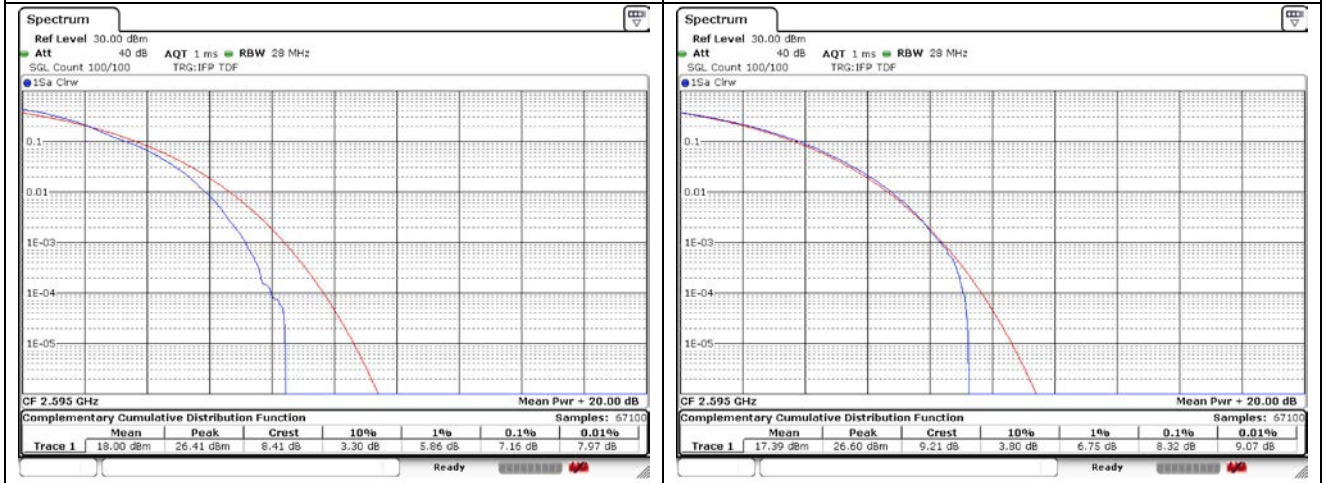
60 MHz High Channel - Full RB - DFT-S-OFDM

60 MHz High Channel - Full RB - CP-OFDM



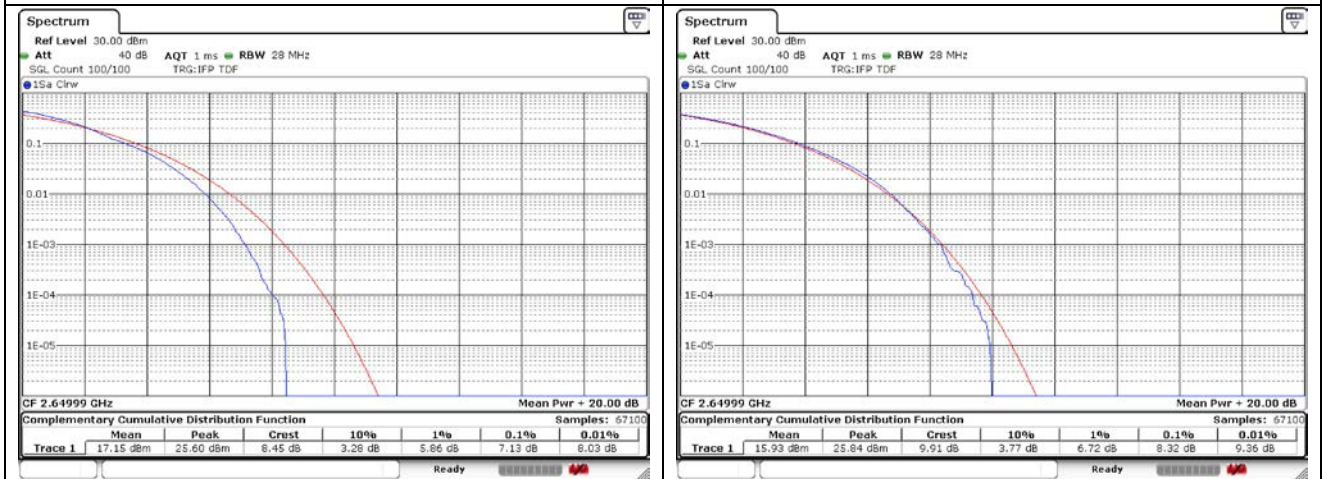
80 MHz Low Channel - Full RB - DFT-S-OFDM

80 MHz Low Channel - Full RB - CP-OFDM



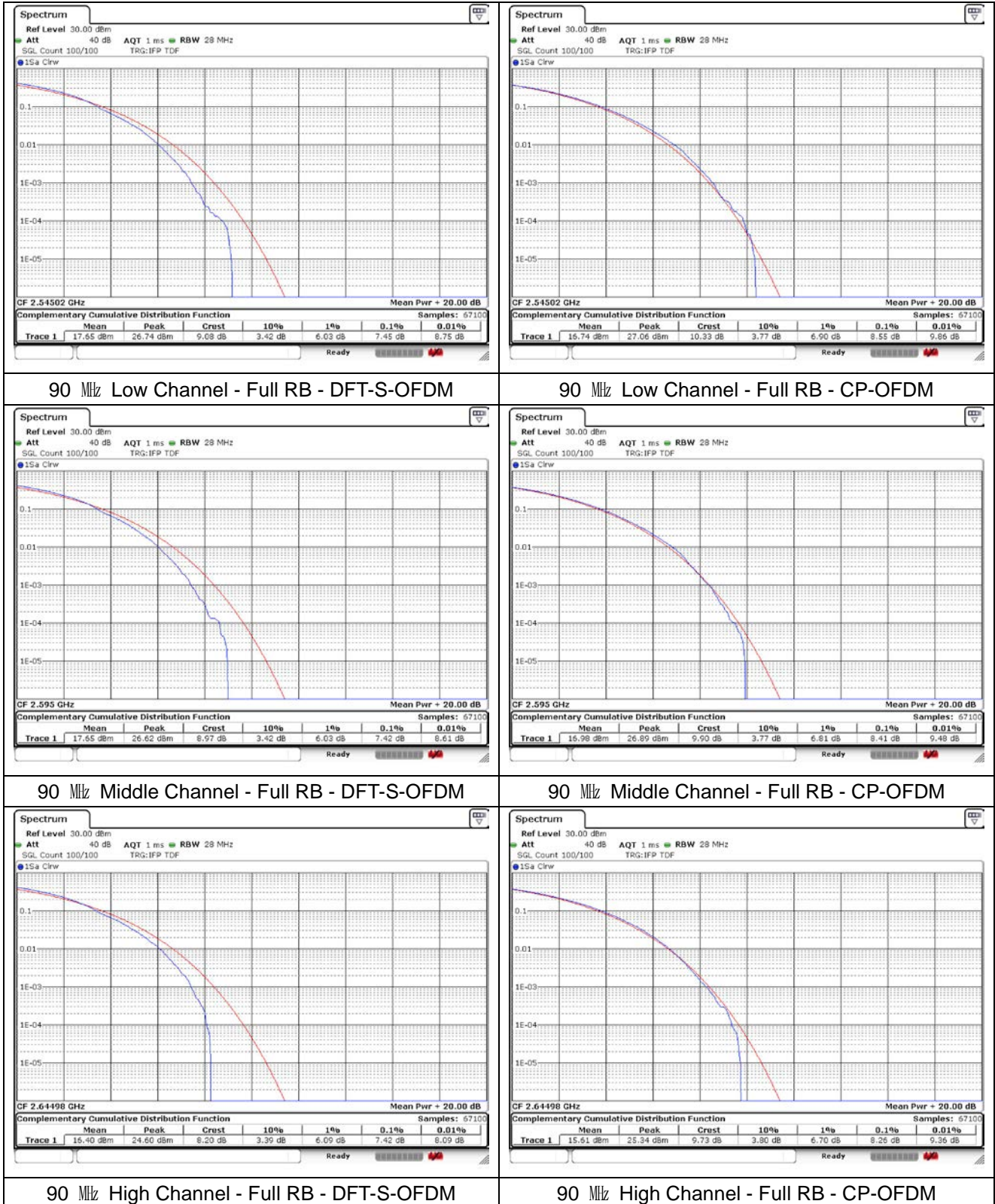
80 MHz Middle Channel - Full RB - DFT-S-OFDM

80 MHz Middle Channel - Full RB - CP-OFDM



80 MHz High Channel - Full RB - DFT-S-OFDM

80 MHz High Channel - Full RB - CP-OFDM



90 MHz Low Channel - Full RB - DFT-S-OFDM

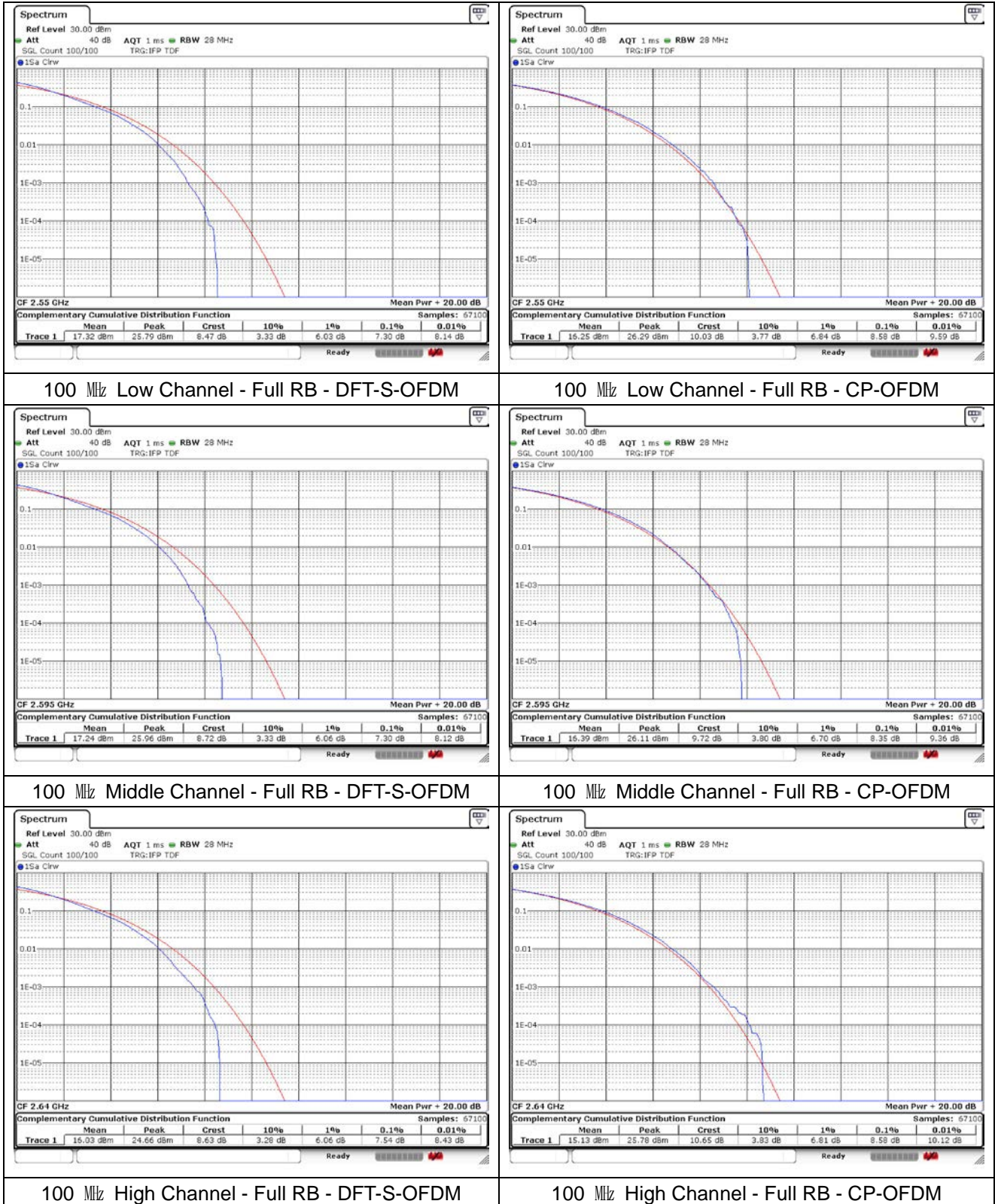
90 MHz Low Channel - Full RB - CP-OFDM

90 MHz Middle Channel - Full RB - DFT-S-OFDM

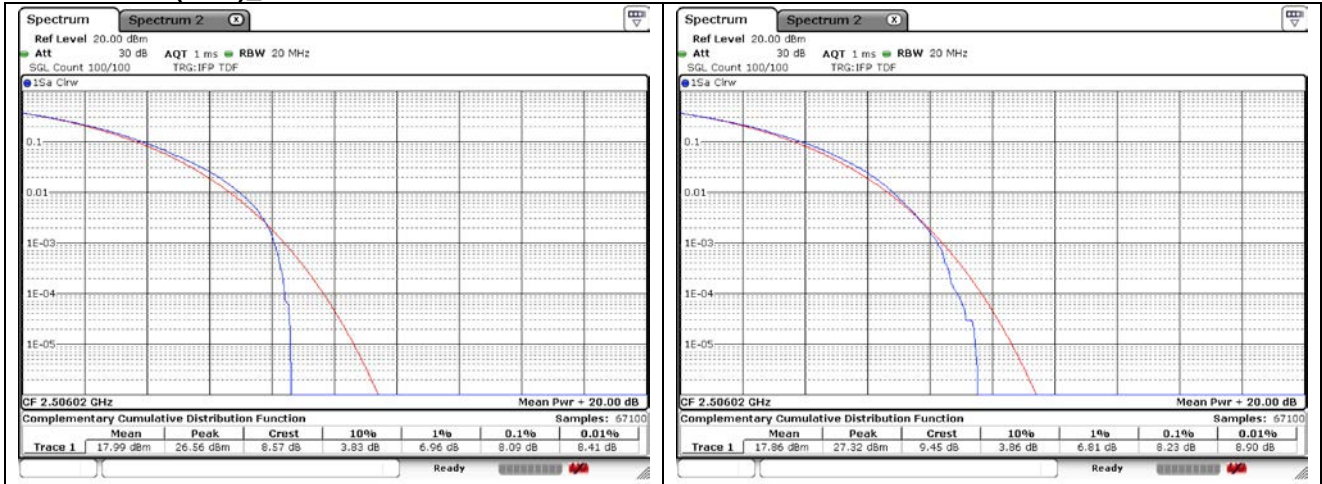
90 MHz Middle Channel - Full RB - CP-OFDM

90 MHz High Channel - Full RB - DFT-S-OFDM

90 MHz High Channel - Full RB - CP-OFDM

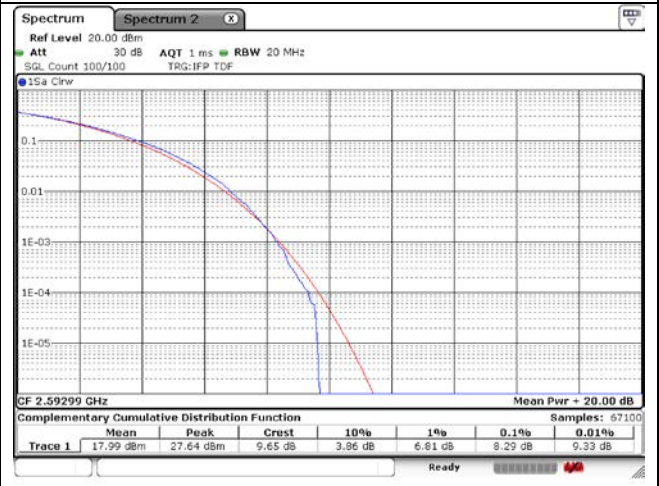
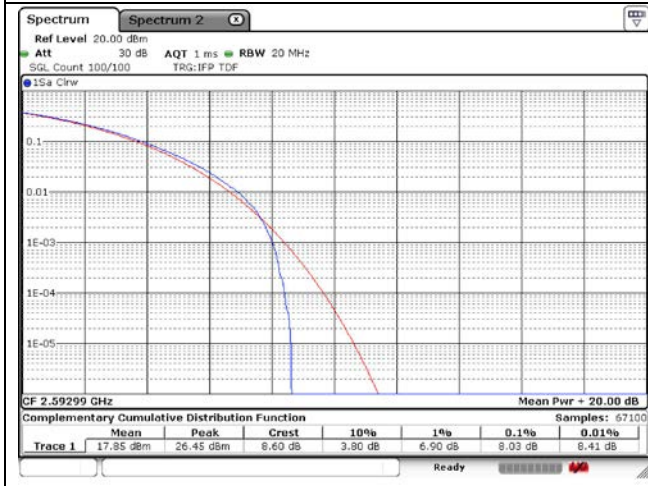


NR band 41 (FCC) MIMO



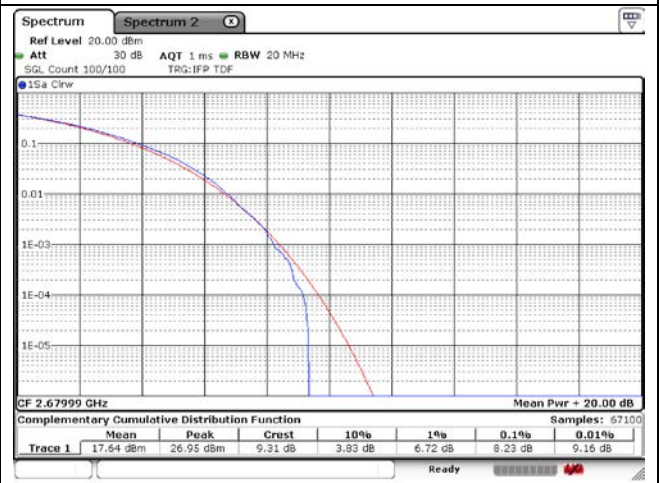
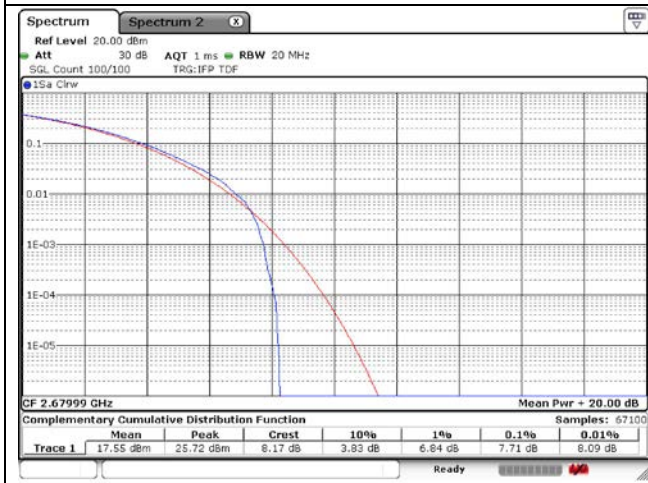
20 MHz Low Channel - Full RB - CP-OFDM_Port 1

20 MHz Low Channel - Full RB - CP-OFDM_Port 2



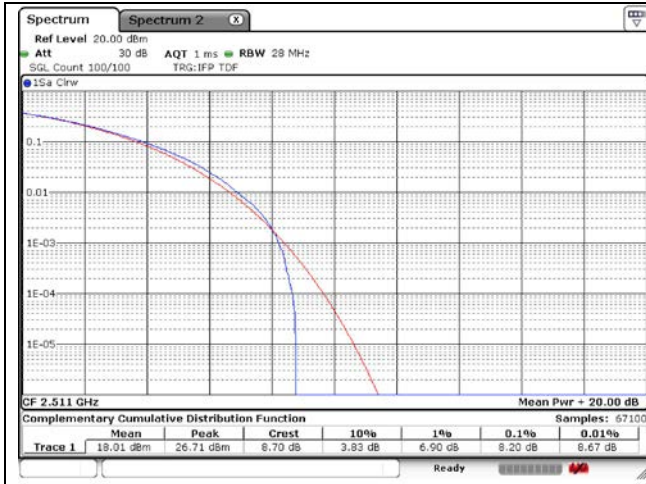
20 MHz Middle Channel - Full RB - CP-OFDM_Port 1

20 MHz Middle Channel - Full RB - CP-OFDM_Port 2

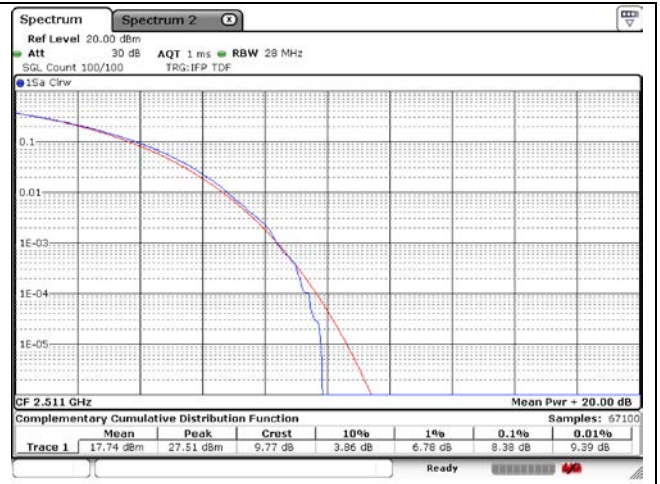


20 MHz High Channel - Full RB - CP-OFDM_Port 1

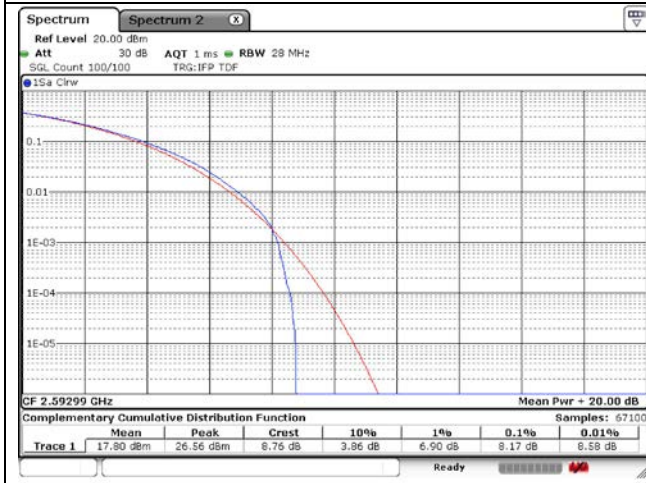
20 MHz High Channel - Full RB - CP-OFDM_Port 2



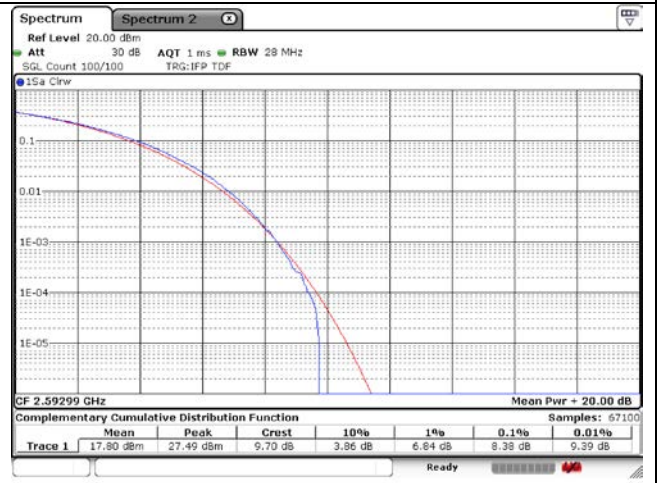
30 MHz Low Channel - Full RB - CP-OFDM_Port 1



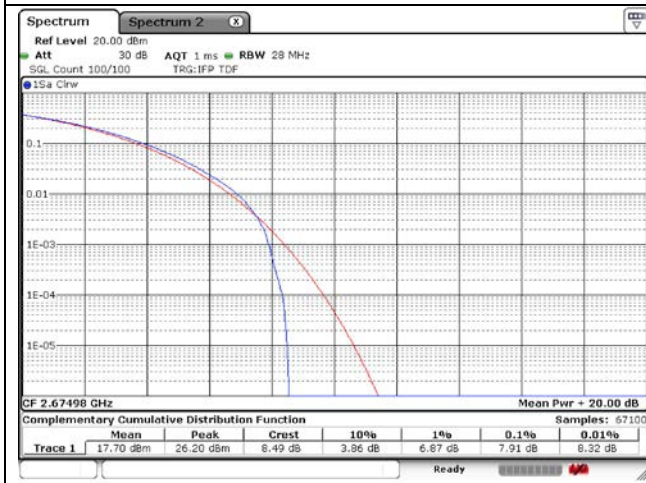
30 MHz Low Channel - Full RB - CP-OFDM_Port 2



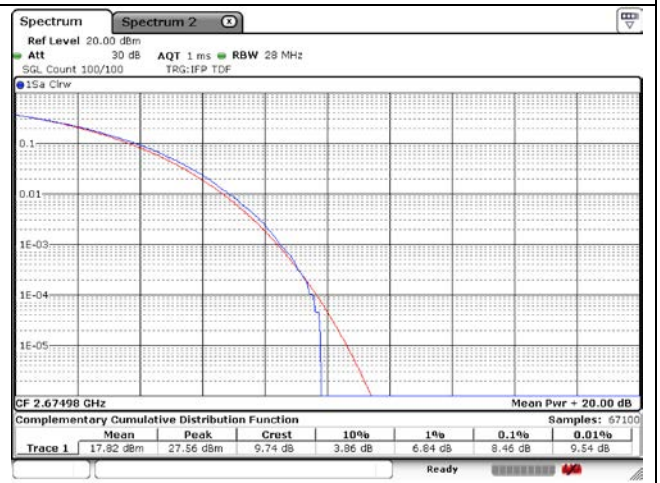
30 MHz Middle Channel - Full RB - CP-OFDM_Port 1



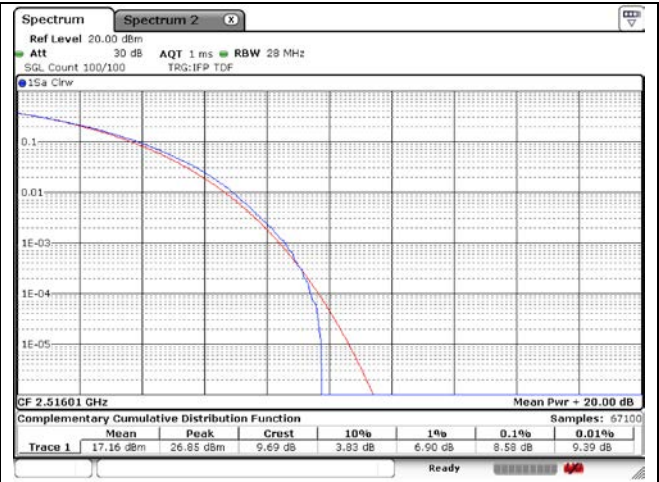
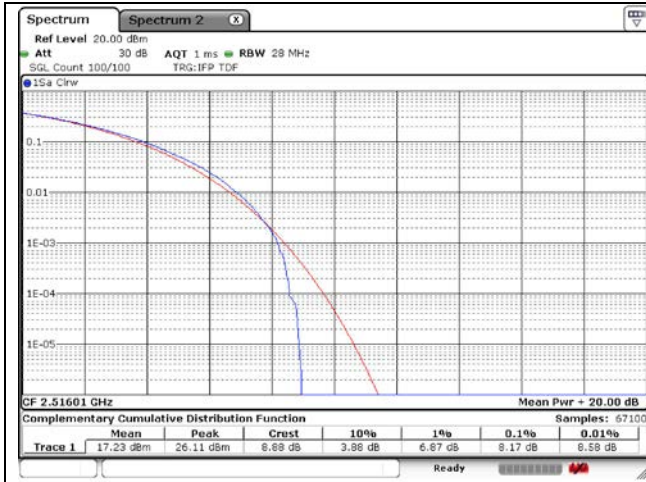
30 MHz Middle Channel - Full RB - CP-OFDM_Port 2



30 MHz High Channel - Full RB - CP-OFDM_Port 1

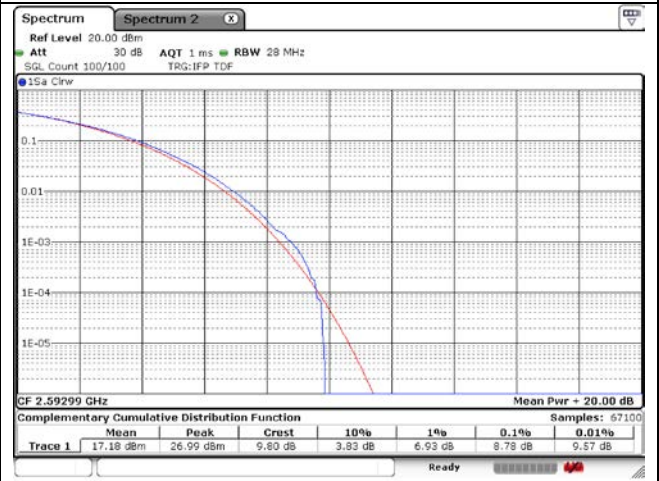
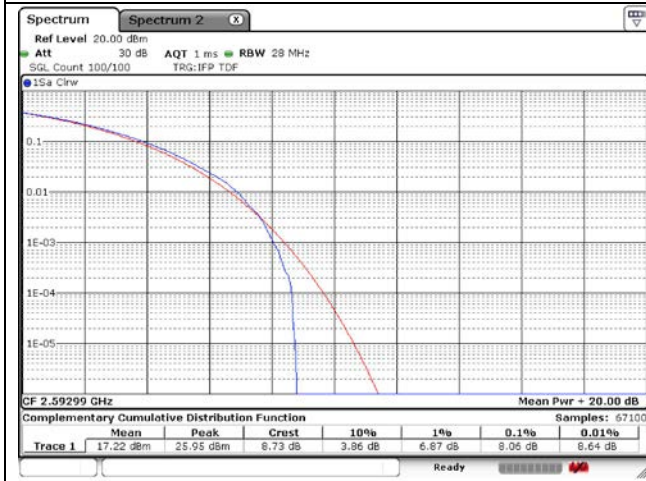


30 MHz High Channel - Full RB - CP-OFDM_Port 2



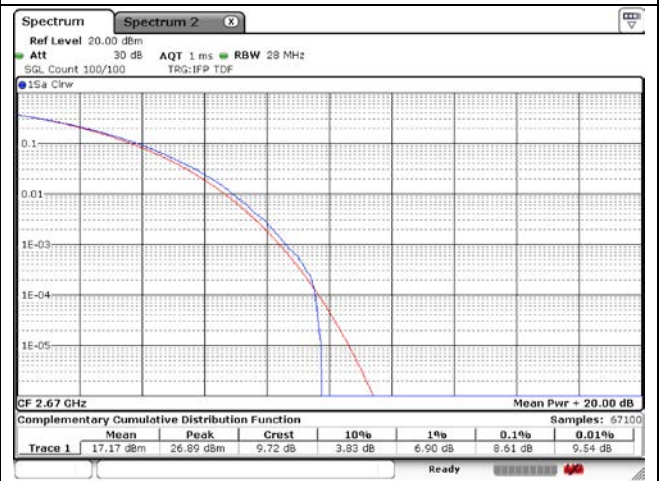
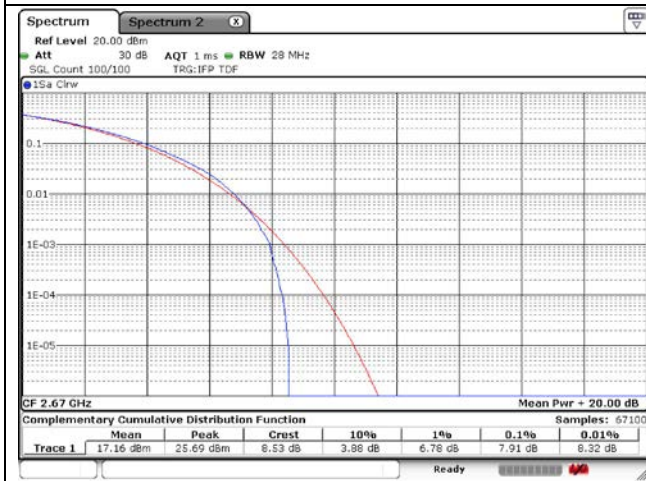
40 MHz Low Channel - Full RB - CP-OFDM_Port 1

40 MHz Low Channel - Full RB - CP-OFDM_Port 2



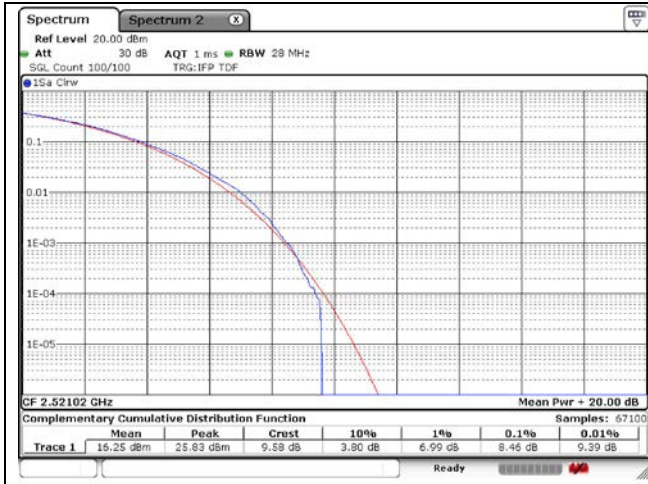
40 MHz Middle Channel - Full RB - CP-OFDM_Port 1

40 MHz Middle Channel - Full RB - CP-OFDM_Port 2

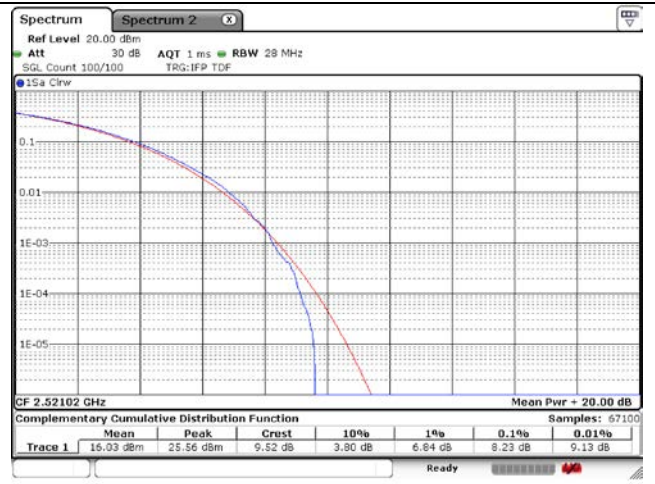


40 MHz High Channel - Full RB - CP-OFDM_Port 1

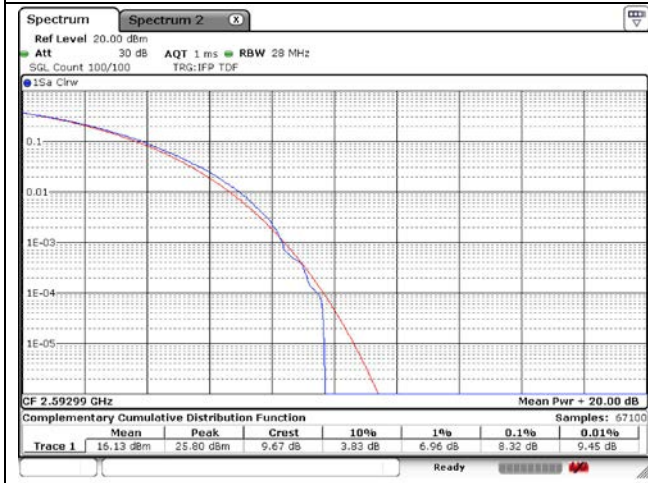
40 MHz High Channel - Full RB - CP-OFDM_Port 2



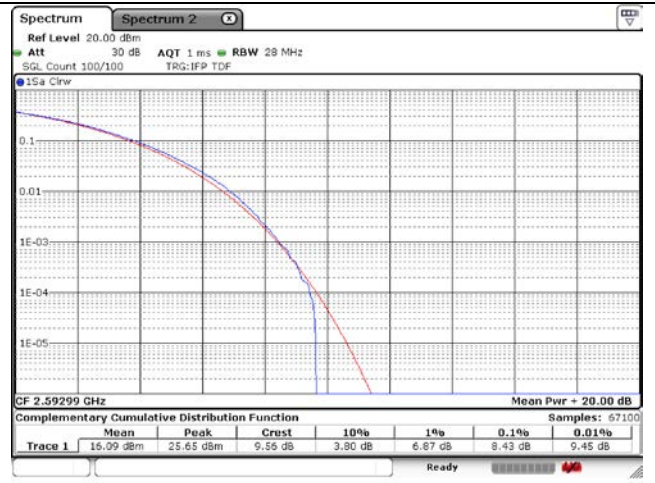
50 MHz Low Channel - Full RB - CP-OFDM_Port 1



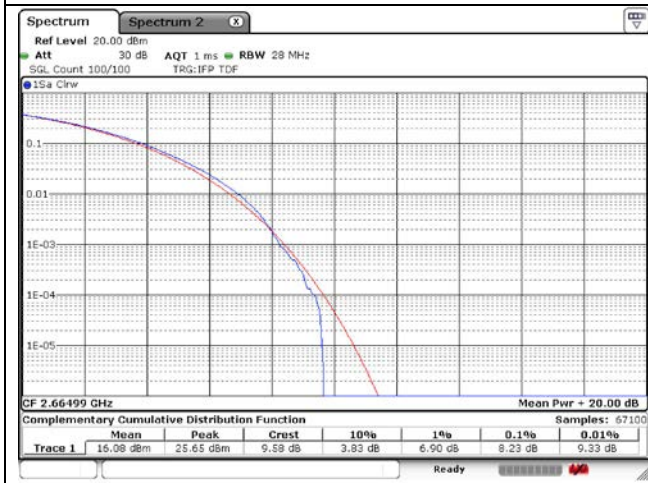
50 MHz Low Channel - Full RB - CP-OFDM_Port 2



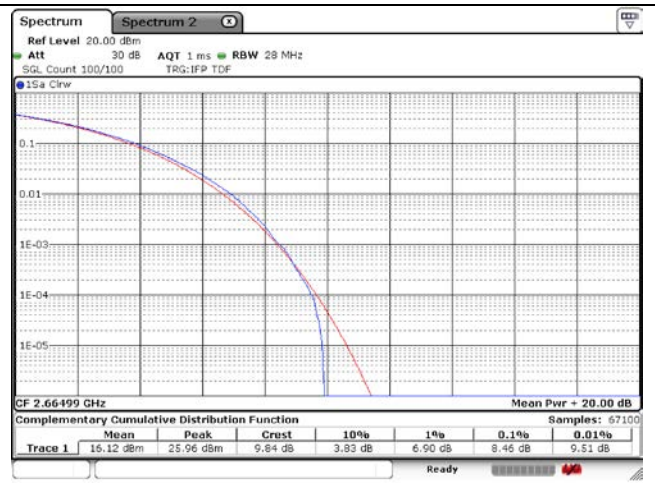
50 MHz Middle Channel - Full RB - CP-OFDM_Port 1



50 MHz Middle Channel - Full RB - CP-OFDM_Port 2



50 MHz High Channel - Full RB - CP-OFDM_Port 1



50 MHz High Channel - Full RB - CP-OFDM_Port 2