

TEST REPORT

of

FCC Part 2 Subpart J and Part 96 Subpart E

FCC ID: YZP-AN2000

Equipment Under Test : Telematics Module

Model Name : LTD-AN2000

Variant Model Name(s) : -

Applicant : LG Innotek Co., Ltd.

Manufacturer : LG Innotek Co., Ltd.

Date of Receipt : 2025.11.06

Date of Test(s) : 2025.11.17 ~ 2026.03.27

Date of Issue : 2026.04.02

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.
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We are responsible for all the information of this test report except for the data(※) provided by the customer.

Tested by:



Dave Kim

Technical
Manager:



Jinhyoung Cho

SGS Korea Co., Ltd. Gunpo Laboratory

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- Designation number: KR0150

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1.2. Details of Applicant

Applicant : LG Innotek Co., Ltd.

Address : 30, Magokjungang 10-ro, Gangseo-gu, Seoul, Korea, 07796

Contact Person : Jeong, In-chang

Phone No. : +82 62 950 0332

1.3. Details of Manufacturer

Company : Same as applicant

Address : Same as applicant

1.4. Description of EUT

Kind of Product	Telematics Module
Model Name	LTD-AN2000
Serial Number	Conducted: C1 Radiated: R1
Power Supply	DC 4.0 V
Rated Power	LTE Band 48: 21 dBm NR Band 48: 21 dBm
Frequency Range	LTE Band 48: 3 550 ~ 3 700 MHz NR Band 48: 3 550 ~ 3 700 MHz
Modulation Technique	BPSK, QPSK, 16QAM, 64QAM, 256QAM
Antenna Type	Ant. 1: Dipole Antenna Ant. 2: Dipole Antenna
Antenna Gain*	Refer to the clause 1.13
H/W Version	06
S/W Version	SMP1750BJKA02-5035573_QB6279223

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	R&S	SMA100B	106887	10/20/2025	Annual	10/20/2026
Spectrum Analyzer	R&S	FSV30	100955	04/28/2025	Annual	04/28/2026
Spectrum Analyzer	R&S	FSW43	100637	08/07/2025	Annual	08/07/2026
Spectrum Analyzer	Agilent	N9020A	MY53421758	09/10/202	Annual	09/10/2026
Spectrum Analyzer	Agilent	N9030A	US51350132	12/03/2025	Annual	12/03/2026
Communication test station	Anritsu	MT8000A	6261949671	11/03/2025	Annual	11/03/2026
Communication Analyzer	Anritsu	MT8821C	6262192291	02/25/2026	Annual	02/25/2027
Temperature Chamber	ESPEC CORP.	SU-242	93013003	09/18/2025	Annual	09/18/2026
Low Pass Filter	Mini-Circuits	NLP-1200+	V 8979400903-1	05/23/2025	Annual	05/23/2026
High Pass Filter	Wainwright Instrument GmbH	WLKX10-4600-5060-18000-40ST	1	10/22/2025	Annual	10/22/2026
High Pass Filter	Wainwright Instrument GmbH	WLKX10-6320-8000-26500-40CC	6	10/22/2025	Annual	10/22/2026
Power Splitter	Weinschel	1534	499	10/24/2025	Annual	10/24/2026
BRIDGE COUPLER	MARKI MICROWAVE INC	CBR16-0012	1542	05/15/2025	Annual	05/15/2026
Directional Coupler	KRYTAR	152613	122660	07/02/2025	Annual	07/02/2026
DC Power Supply	Agilent	U8002A	MY49030063	01/19/2026	Annual	01/19/2027
DC Power Supply	R&S	HMP2020	102133	04/28/2025	Annual	04/28/2026
Preamplifier	H.P.	8447F	2944A03909	08/07/2025	Annual	08/07/2026
Preamplifier	R&S	SCU 18F	101058	02/27/2025	Annual	02/27/2026
Preamplifier	R&S	SCU 18F	100959	01/05/2026	Annual	01/05/2027
Preamplifier	TESTEK	TK-PA1840H	130016	03/06/2026	Annual	03/06/2027
Test Receiver	R&S	ESU26	100109	01/21/2026	Annual	01/21/2027
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	10/01/2025	Biennial	10/01/2027
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	01126	03/09/2026	Biennial	03/09/2028
Horn Antenna	R&S	HF906	100326	03/03/2026	Annual	03/03/2027
Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA 9170	9170-540	12/05/2025	Annual	12/05/2026
Antenna Master	Innco systems GmbH	MA4640-XP-ET	MA4640/536/383 30516/L	N.C.R.	N/A	N.C.R.
Turn Table	Innco systems GmbH	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Controller	Innco systems GmbH	CONTROLLER CO3000-4P	CO3000/963/383 30516/L	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L x W x H (9.6 m x 6.4 m x 6.6 m)	N/A	N.C.R.	N/A	N.C.R.
Coaxial Cable	SENSORVIEW	NMST-13A26-NMST-5 m	TPC2402190004	10/13/2025	Semi-Annual	04/13/2026
Coaxial Cable	SENSORVIEW	NMST-13A26-NMST-10 m	TPC2402190001	10/13/2025	Semi-Annual	04/13/2026
Coaxial Cable	Qualwave	QT50P-40-KK-1.5	24270074	10/10/2025	Semi-Annual	04/10/2026
Coaxial Cable	RADIAL	TESTPRO 3	182290	10/10/2025	Semi-Annual	04/10/2026
Coaxial Cable	RADIAL	TESTPRO 3	182291	10/10/2025	Semi-Annual	04/10/2026

Note;

- For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 2 and 96		
Section in FCC	Test Item(s)	Result
§2.1046 §96.41(b)	E.I.R.P.	Pass
§96.41(e)(ii)	Radiated Spurious Emissions	Pass
§2.1046	Conducted Output Power	Pass
§2.1049	Occupied Bandwidth	Pass
§96.41(g)	Peak-Average Ratio	Pass
§96.41(e)(ii)	Spurious Emission at Antenna Terminal	Pass
§96.41(e)(ii) §96.41(e)(3)(i)	Band Edge and Adjacent Channel Leakage Ratio	Pass
§2.1055	Frequency Stability	Pass

1.7. Sample Calculation for Offset

Where relevant, the following sample calculation is provided:

1.7.1. Conducted Test

Offset value (dB) = Directional Coupler (dB) + Cable loss (dB)

1.7.2. Radiation test

- E.I.R.P. (dB m) = Measured level (dB μ V) + Antenna factor (dB/m) + Cable loss (dB) + 20 Log D - 104.8;
where D is the measurement distance in meters.
- E.R.P. (dB m) = E.I.R.P. (dB m) - 2.15 (dB)

1.8. Manufacturer Declaration

The EUT is equipped with two antennas. Antenna 1 serves as the primary antenna for frequencies below 3 GHz, while providing support as a secondary antenna and enabling MIMO operation for frequency at or above 3 GHz. Antenna 2 acts as the primary for frequencies above 3 GHz.

MIMO operation is supported specifically for NR bands above 3 GHz. For LTE, the device supports SISO operation only. Additionally, in 5G NR MIMO mode, only CP-OFDM is supported.

1.9. Worst Case Configuration and Mode

LTE

The worst-case is based on the conducted output power measurement investigation results. All testing was performed using QPSK, 16QAM, 64QAM and 256QAM modulations. However, the spurious radiated emission and spurious at antenna terminal were only performed on bandwidth and RB offset (with RB size 1) with the highest conducted power.

The radiation test of the EUT was investigated in three orthogonal orientations X, Y, and Z, and the worst case data is reported.

5G NR

The worst-case was determined based on conducted output power investigation. While testing was generally performed across all modulations (BSPK, QPSK, 16QAM, 64QAM, and 256QAM), certain test items were conducted using specific modulations as required by the relevant standards. If both SA and NSA were supported, SA was tested as worst case and NSA was tested only radiated spurious emission for worst conducted output power combination.

However, the spurious radiated emission and spurious at antenna terminal were only performed on bandwidth and RB offset (with RB size 1) with the highest conducted power.

The radiation test of the EUT was investigated in three orthogonal orientations X, Y, and Z, and the worst case data is reported.

1.10. Measurement Configuration

LTE_SISO

Test Items	Band	Test Channel			Bandwidth (MHz)				Modulation				RB #		
		Low	Mid	High	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full
Conducted Output Power	LTE 48	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Frequency Stability	LTE 48	-	V	-	V	-	-	-	V	-	-	-	-	-	V
Occupied Bandwidth	LTE 48	V	V	V	V	V	V	V	V	V	-	-	-	-	V
Peak-to-Average Ratio	LTE 48	V	V	V	V	V	V	V	V	V	V	V	-	-	V
Band edge	LTE 48	V	V	V	V	V	V	V	V	V	-	-	V	-	V
Adjacent Channel Leakage Ratio	LTE 48	V	V	V	V	V	V	V	V	V	-	-	V	-	V
Spurious at antenna terminal & Radiated Spurious Emissions	LTE 48	V	V	V	Worst case										

NR_SISO

Test Items	Band	Test Channel			Bandwidth (MHz)														Modulation DFTS-OFDM				Modulation CP-OFDM				RB #		
		Low	Mid	High	10	15	20	25	30	35	40	50	60	70	80	90	100	BPSK	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	1	Half	Full
Conducted Output Power	n48	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	-	-	V	V	V
Frequency Stability	n48	-	V	-	V	V	V	V	V	V	V	V	V	V	V	V	V	-	V	-	-	-	-	-	-	-	-	-	V
Occupied Bandwidth	n48	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	-	-	V	V	-	-	-	-	V
Peak-to-Average Ratio	n48	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	-	-	V
Band edge	n48	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	-	V	-	-	V	V	-	-	V	-	V
Adjacent Channel Leakage Ratio	n48	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	-	V	-	-	V	V	-	-	V	-	V
Spurious at antenna terminal & Radiated Spurious Emissions	n48	V	V	V	Worst case																								

NR_MIMO

Test Items	Band	Test Channel			Bandwidth (MHz)														Modulation CP-OFDM				RB #		
		Low	Mid	High	10	15	20	25	30	35	40	50	60	70	80	90	100	QPSK	16QAM	64QAM	256QAM	1	Half	Full	
Conducted Output Power	n48	V	V	V	V	V	V		V		V							V	V	V	V	V	V	V	
Frequency Stability	n48	-	V	-	V	V	V		V		V							V	-	-	-	-	-	V	
Occupied Bandwidth	n48	V	V	V	V	V	V		V		V							V	V	-	-	-	-	V	
Peak-to-Average Ratio	n48	V	V	V	V	V	V		V		V							V	V	V	V	-	-	V	
Band edge	n48	V	V	V	V	V	V		V		V							V	V	-	-	V	-	V	
Adjacent Channel Leakage Ratio	n48	V	V	V	V	V	V		V		V							V	V	-	-	V	-	V	
Spurious at antenna terminal & Radiated Spurious Emissions	n48	V	V	V	Worst case																				

Radiated Spurious Emission Test

Ant.	NR Band	SCS (kHz)	Bandwidth (MHz)	Modulation	Resource Block Allocation
					RBs allocated
SISO	LTE band 48	30	20	16QAM	1
SISO	NR band 48	30	20	DFTS OFDM - BPSK	1
MIMO	NR band 48	30	40	CP OFDM - QPSK	1

1.11. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty	
Conducted Output Power	1.43 dB	
Occupied Bandwidth	0.04 MHz	
Conducted Spurious Emissions	1.19 dB	
Peak to Average Ratio	0.65 dB	
Frequency Stability	107 Hz	
Radiated Emission, 9 kHz to 30 MHz	H	3.60 dB
	V	3.60 dB
Radiated Emission, below 1 GHz	H	5.50 dB
	V	5.10 dB
Radiated Emission, above 1 GHz	H	3.50 dB
	V	3.40 dB

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicate a 95 % level of confidence.

1.12. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL006829	2026.04.02	Initial

1.13. Antenna Information

Ant. No.	Ant. Type	Support Band		
		LTE	NR	WCDMA
Ant. 1	Dipole	2, 4, 5, 7, 12, 13, 14, 17, 25, 26, 41, 66, 71	2, 5, 7, 12, 25, 26, 41, 48, 66, 71, 77, 78	II, IV, V
Ant. 2	Dipole	48	48, 77, 78	

Band	Operating Frequency (MHz)	Antenna Peak Gain (dB i)		
		Ant.1	Ant. 2	Ant. 1+2
WCDMA II LTE 25/2 NR 25/2	1 850 ~ 1 915	0.46		
WCDMA IV LTE 66/4 NR 66	1 710 ~ 1 780	-0.37		
WCDMA V LTE 26/5 NR 26/5	824 ~ 849	0.60		
LTE 7 NR 7	2 500 ~ 2 570	0.22		
LTE 12/17 NR 12	699 ~ 716	-4.13		
LTE 13	777 ~ 787	-1.27		
LTE 14	788 ~ 798	0.13		
LTE 26	814 ~ 824	0.60		
LTE 71 NR 71	663 ~ 698	-7.25		
LTE 41 NR 41	2 496 ~ 2 690(FCC) 2 500 ~ 2 690(IC)	0.34		
LTE 48 NR 48	3 550 ~ 3 700	-2.11	-2.11	0.90
NR 77/78_FCC	3 450 ~ 3 550	-2.07	-2.07	0.94
	3 700 ~ 3 980	-2.44	-2.44	0.57
NR 77/78_IC	3 450 ~ 3 900	-2.07	-2.07	0.94
	3 900 ~ 3 980	-2.44	-2.44	0.57

Remark;

1) According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)d)(i),
 Port 1 + Port 2 Antenna Gain = $10 * \log[(10^{G_1/20} + 10^{G_2/20})^2 / N_{ANT}]$

Where,

G_1 = antenna gain of port 1,
 G_2 = antenna gain of port 2,
 N_{ANT} = the number of antennas

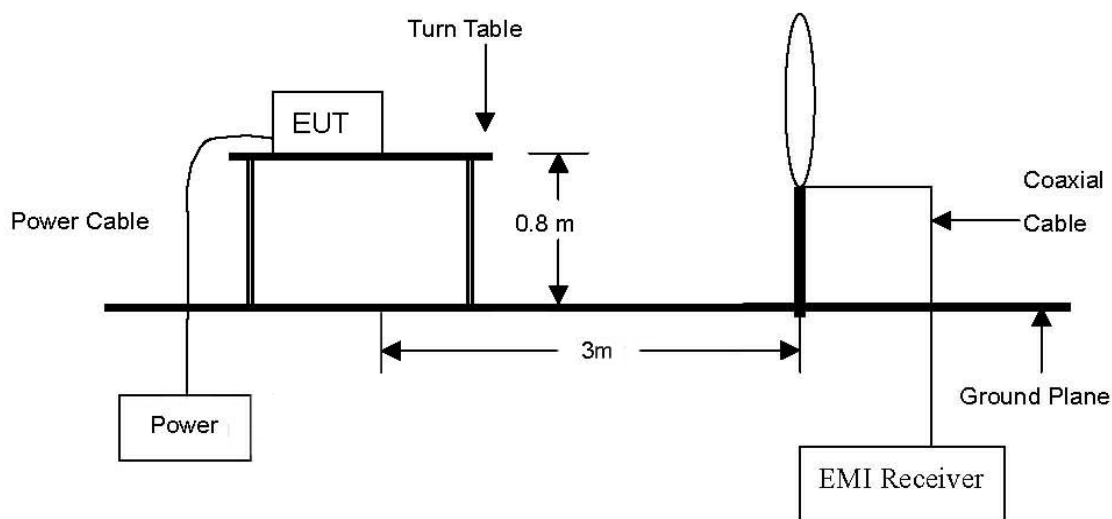
1.14. Emission Designator and Max Power

Band	Band width (MHz)	Modulation		Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)	E.I.R.P. Average (dB m)	E.I.R.P. Average (W)	Emission Designator		
LTE 48	5	QPSK		3 552.5	3 697.5	20.40	-2.11	18.29	0.067	4M52G7D		
		16QAM				20.66		18.55	0.072	4M51D7D		
	10	QPSK		3 555.0	3 695.0	20.38		18.27	0.067	8M94G7D		
		16QAM				20.58		18.47	0.070	8M94D7D		
	15	QPSK		3 557.5	3 692.5	20.46		18.35	0.068	13M5G7D		
		16QAM				20.64		18.53	0.071	13M5D7D		
	20	QPSK		3 560.0	3 690.0	20.46		18.35	0.068	18M0G7D		
		16QAM				20.68		18.57	0.072	17M9D7D		
NR Band	Band width (MHz)	Modulation		Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)	E.I.R.P. Average (dB m)	E.I.R.P. Average (W)	Emission Designator		
n48 SISO	10	DFTS-OFDM	BPSK	3 555.00	3 694.98	20.99	-2.11	18.88	0.077	8M61G7D		
			QPSK			20.99		18.88	0.077	8M61G7D		
			16QAM			20.95		18.84	0.077	8M61D7D		
		CP-OFDM	QPSK			20.90		18.79	0.076	8M61G7D		
			16QAM			20.89		18.78	0.076	8M59D7D		
			15			DFTS-OFDM		BPSK	3 557.52	3 692.49	21.13	19.02
	QPSK	21.09		18.98	0.079			13M0G7D				
	16QAM	20.99		18.88	0.077			13M0D7D				
	CP-OFDM	QPSK		20.97	18.86	0.077		13M6G7D				
		16QAM		20.95	18.84	0.077		13M7D7D				
		20		DFTS-OFDM	BPSK	3 560.01		3 690.00			21.18	19.07
	QPSK		21.00		18.89				0.077	17M9G7D		
	16QAM		20.96		18.85				0.077	17M9D7D		
	CP-OFDM		QPSK	20.92	18.81				0.076	18M3G7D		
			16QAM	20.86	18.75				0.075	18M3D7D		
			30	DFTS-OFDM	BPSK				3 565.02	3 684.99	20.99	18.88
	QPSK	20.99			18.88	0.077		26M9G7D				
	16QAM	20.75			18.64	0.073		26M9D7D				
	CP-OFDM	QPSK		20.70	18.59	0.072		27M9G7D				
		16QAM		20.75	18.64	0.073		27M9D7D				
		40		DFTS-OFDM	BPSK	3 570.00		3 679.98			20.99	18.88
	QPSK		21.00		18.89				0.077	35M8G7D		
	16QAM		20.80		18.69				0.074	35M8D7D		
	CP-OFDM		QPSK	20.82	18.71				0.074	37M9G7D		
			16QAM	20.75	18.64				0.073	37M9D7D		
			NR Band	Band width (MHz)	Modulation				Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)
	n48 MIMO	10	CP-OFDM	QPSK	3 555.00	3 694.98		20.99	0.90	21.89	0.155	8M59G7D
				16QAM				20.93		21.83	0.152	8M61D7D
		15	CP-OFDM	QPSK	3 557.52	3 692.49		21.04		21.94	0.156	13M7G7D
				16QAM				20.95		21.85	0.153	13M7D7D
		20	CP-OFDM	QPSK	3 560.01	3 690.00		21.08		21.98	0.158	18M3G7D
16QAM				20.92			21.82	0.152		18M3D7D		
30		CP-OFDM	QPSK	3 565.02	3 684.99	21.13	22.03	0.160		27M9G7D		
			16QAM			21.02	21.92	0.156		27M9D7D		
40		CP-OFDM	QPSK	3 570.00	3 679.98	21.15	22.05	0.160		37M9G7D		
			16QAM			21.07	21.97	0.157		38M0D7D		

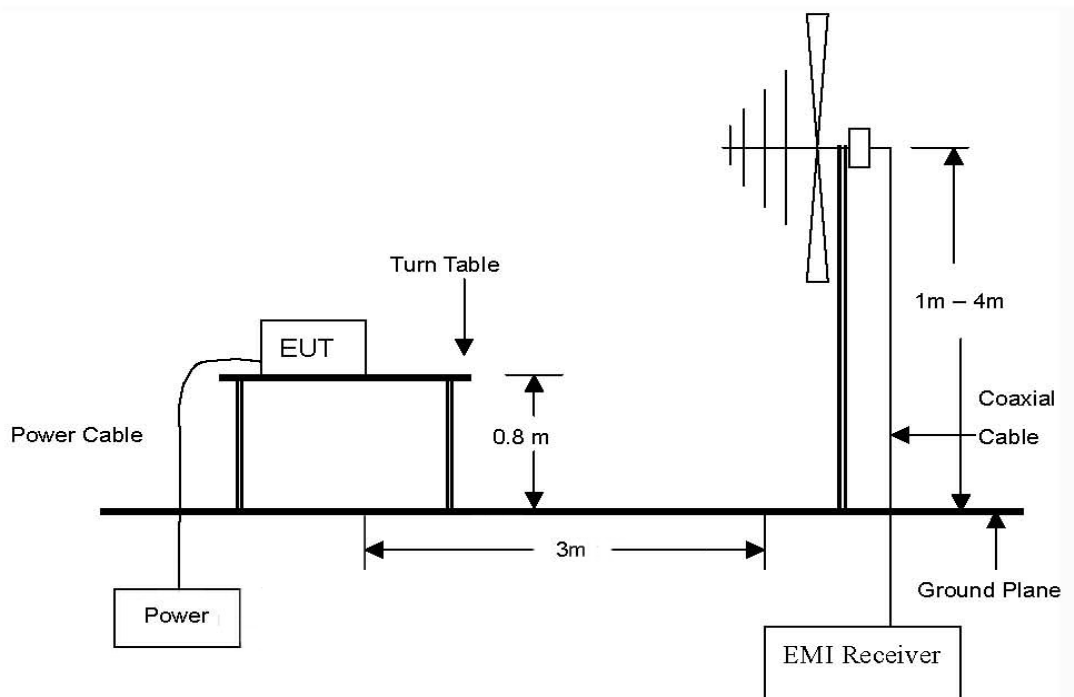
2. E.R.P. / E.I.R.P. & Radiated Spurious Emissions

2.1. Test setup

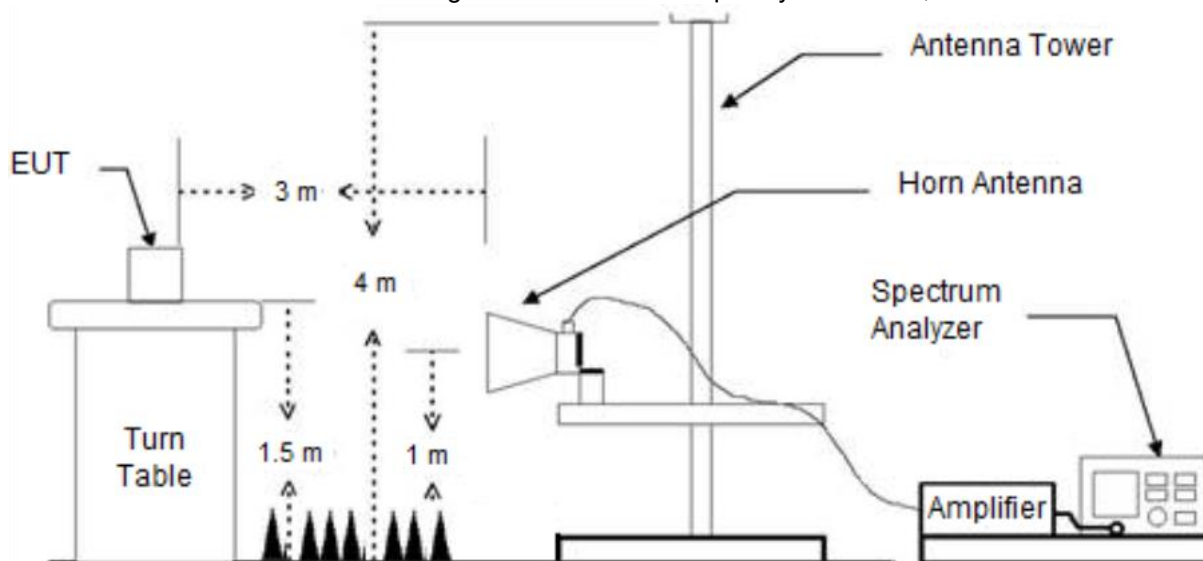
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.



2.2. Limit

2.2.1. Limit of E.I.R.P.

- §96.41(b), unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):

Device	Maximum EIRP (dBm/10megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD ¹	47	37

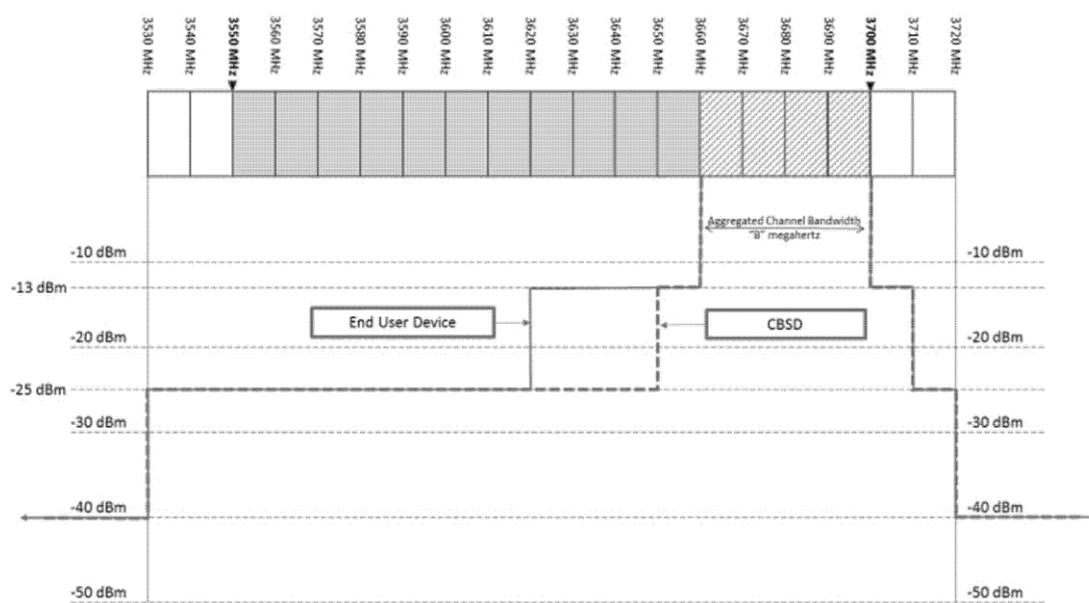
¹Category B CBSDs will only be authorized for use after an ESC is approved and commercially deployed consistent with §§ 96.15 and 96.67.

2.2.2. Limit of Radiated Spurious Emissions

- §96.41(e), 3.5GHz Emissions and Interference Limits

(1) General protection levels.

Figure 1 to paragraph (e) – Protection levels



(i) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dB m/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dB m/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dB m/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dB m/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

(2) **Additional protection levels.** Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3 540 MHz or above 3 710 MHz shall not exceed -25 dB m/MHz, and the conducted power of emissions below 3 530 MHz or above 3 720 MHz shall not exceed -40 dB m/MHz.

2.3. Test Procedure

2.3.1. E.R.P. or E.I.R.P. from conducted RF output power

According to subclause 5.2.5.5 of ANSI C63.26-2015 E.R.P. and E.I.R.P. are defined as the product of the power supplied to the antenna and its gain.

The relevant equation for determining the E.R.P. or E.I.R.P. from the conducted RF output power measured using the guidance provided above is:

$$\text{E.R.P. or E.I.R.P.} = P_{\text{Meas}} + G_T$$

where:

E.R.P. or E.I.R.P. = effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas} , typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

2.3.2. Radiated Spurious Emissions

The test based on ANSI C63.26-2015 and KDB 971168 D01 Power Meas License Digital Systems v03r01.

1. On a test site, the EUT shall be placed at 0.8 m or 1.5 m height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. Radiated spurious emissions measurement method was set as follows:
RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz, VBW $\geq 3 \times$ RBW,
Detector = RMS, trace mode = max hold, per the guidelines of KDB 971168 D01 Power Meas License Digital Systems v03r01.
5. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.
7. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
9. The maximum signal level detected by the measuring receiver shall be noted.
10. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
11. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
12. The measurement shall be repeated with the test antenna orientated for horizontal polarization.

2.4. Test results

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

2.4.1. E.I.R.P.

Band	Band width	Frequency (MHz)	Modulation	Conducted Power (dB m/10 MHz)	Antenna Gain (dB i)	Maximum E.I.R.P. (dB m/10 MHz)	Limit
LTE 48	5	3 552.5	QPSK	19.31	-2.11	17.20	23 (dB m/10 MHz)
			16QAM	19.62		17.51	
		3 625.0	QPSK	19.08		16.97	
			16QAM	19.78		17.67	
		3 697.5	QPSK	19.24		17.13	
			16QAM	20.12		18.01	
	10	3 555.0	QPSK	19.29		17.18	
			16QAM	19.45		17.34	
		3 625.0	QPSK	19.12		17.01	
			16QAM	19.52		17.41	
		3 695.0	QPSK	19.28		17.17	
			16QAM	19.77		17.66	
	15	3 557.5	QPSK	19.14		17.03	
			16QAM	19.60		17.49	
		3 625.0	QPSK	19.23		17.12	
			16QAM	19.89		17.78	
		3 692.5	QPSK	19.28		17.17	
			16QAM	20.04		17.93	
	20	3 560.0	QPSK	19.49		17.38	
			16QAM	20.02		17.91	
		3 625.0	QPSK	19.13		17.02	
			16QAM	19.51		17.40	
		3 690.0	QPSK	19.17		17.06	
			16QAM	19.72		17.61	

Band	Band Width	Frequency (MHz)	Modulation		Conducted Power (dB m/10 MHz)	Antenna Gain (dB i)	Maximum E.I.R.P. (dB m/10 MHz)	Limit
NR 48 SISO	10	3 555.00	DFTS-OFDM	BPSK	20.84	-2.11	18.73	23 (dB m/10 MHz)
				16QAM	20.10		17.99	
			CP-OFDM	QPSK	20.40		18.29	
				16QAM	20.71		18.60	
		3 624.99	DFTS-OFDM	BPSK	20.36		18.25	
				16QAM	19.94		17.83	
			CP-OFDM	QPSK	20.30		18.19	
				16QAM	19.99		17.88	
		3 694.98	DFTS-OFDM	BPSK	20.10		17.99	
				16QAM	19.68		17.57	
			CP-OFDM	QPSK	19.43		17.32	
				16QAM	19.86		17.75	
	15	3 557.52	DFTS-OFDM	BPSK	20.90		18.79	
				16QAM	20.51		18.40	
			CP-OFDM	QPSK	20.93		18.82	
				16QAM	20.62		18.51	
		3 624.99	DFTS-OFDM	BPSK	20.40		18.29	
				16QAM	19.76		17.65	
			CP-OFDM	QPSK	20.43		18.32	
				16QAM	20.02		17.91	
		3 692.49	DFTS-OFDM	BPSK	20.10		17.99	
				16QAM	19.83		17.72	
			CP-OFDM	QPSK	20.07		17.96	
				16QAM	19.64		17.53	
	20	3 560.01	DFTS-OFDM	BPSK	20.91		18.80	
				16QAM	20.08		17.97	
			CP-OFDM	QPSK	20.52		18.41	
				16QAM	20.29		18.18	
		3 624.99	DFTS-OFDM	BPSK	20.36		18.25	
				16QAM	19.84		17.73	
			CP-OFDM	QPSK	20.56		18.45	
				16QAM	19.78		17.67	
		3 690.00	DFTS-OFDM	BPSK	20.25		18.14	
				16QAM	19.46		17.35	
			CP-OFDM	QPSK	20.00		17.89	
				16QAM	19.65		17.54	

Band	Band Width	Frequency (MHz)	Modulation		Conducted Power (dB m/10 MHz)	Antenna Gain (dB i)	Maximum E.I.R.P. (dB m/10 MHz)	Limit
NR 48 SISO	30	3 565.02	DFTS-OFDM	BPSK	20.98	-2.11	18.87	23 (dB m/10 MHz)
				16QAM	20.70		18.59	
			CP-OFDM	QPSK	20.96		18.85	
				16QAM	20.73		18.62	
		3 624.99	DFTS-OFDM	BPSK	20.16		18.05	
				16QAM	19.90		17.79	
			CP-OFDM	QPSK	20.13		18.02	
				16QAM	19.70		17.59	
		3 684.99	DFTS-OFDM	BPSK	19.91		17.80	
				16QAM	19.51		17.40	
			CP-OFDM	QPSK	19.65		17.54	
				16QAM	19.41		17.30	
	40	3 570.00	DFTS-OFDM	BPSK	20.79		18.68	
				16QAM	20.40		18.29	
			CP-OFDM	QPSK	20.43		18.32	
				16QAM	20.42		18.31	
		3 624.99	DFTS-OFDM	BPSK	20.06		17.95	
				16QAM	19.83		17.72	
			CP-OFDM	QPSK	19.99		17.88	
				16QAM	19.73		17.62	
		3 679.98	DFTS-OFDM	BPSK	19.80		17.69	
				16QAM	19.43		17.32	
			CP-OFDM	QPSK	19.72		17.61	
				16QAM	19.54		17.43	

Band	Band Width	Frequency (MHz)	Modulation		Conducted Power (dB m/10 MHz)			Antenna Gain (dB i)	Maximum E.I.R.P. (dB m/10 MHz)	Limit
					Ant.1	Ant.2	Ant.1+Ant.2			
NR 48 MIMO	10	3 555.00	CP-OFDM	QPSK	17.52	17.48	20.51	0.90	21.41	23 (dB m/10 MHz)
				16QAM	17.46	17.48	20.48		21.38	
		3 624.99	CP-OFDM	QPSK	17.64	17.03	20.36		21.26	
				16QAM	17.71	16.89	20.33		21.23	
		3 694.98	CP-OFDM	QPSK	18.12	16.75	20.50		21.40	
				16QAM	18.17	16.63	20.48		21.38	
	15	3 557.52	CP-OFDM	QPSK	17.68	17.51	20.61		21.51	
				16QAM	17.63	17.39	20.52		21.42	
		3 624.99	CP-OFDM	QPSK	17.83	17.08	20.48		21.38	
				16QAM	17.75	16.85	20.33		21.23	
		3 692.49	CP-OFDM	QPSK	17.79	16.78	20.32		21.22	
				16QAM	18.11	16.25	20.29		21.19	
	20	3 560.01	CP-OFDM	QPSK	17.62	17.61	20.63		21.53	
				16QAM	17.46	17.34	20.41		21.31	
		3 624.99	CP-OFDM	QPSK	17.83	17.06	20.47		21.37	
				16QAM	18.02	16.92	20.52		21.42	
		3 690.00	CP-OFDM	QPSK	18.08	16.76	20.48		21.38	
				16QAM	18.10	16.90	20.55		21.45	
	30	3 565.02	CP-OFDM	QPSK	17.68	17.36	20.53		21.43	
				16QAM	17.65	17.15	20.42		21.32	
		3 624.99	CP-OFDM	QPSK	17.83	16.85	20.38		21.28	
				16QAM	17.78	16.57	20.23		21.13	
		3 684.99	CP-OFDM	QPSK	18.00	16.50	20.32		21.22	
				16QAM	17.85	16.29	20.15		21.05	
	40	3 570.00	CP-OFDM	QPSK	17.68	17.54	20.62		21.52	
				16QAM	17.64	17.46	20.56		21.46	
		3 624.99	CP-OFDM	QPSK	17.77	16.99	20.41		21.31	
				16QAM	17.87	16.72	20.34		21.24	
		3 679.98	CP-OFDM	QPSK	18.02	16.61	20.38		21.28	
				16QAM	17.93	16.21	20.16		21.06	

Remark;

- E.I.R.P. (dB m/10 MHz) = Maximum Conducted Power (dB m/10 MHz) + Antenna Gain (dB i)
- Powers are summed up in linear using the measure-and-sum technique defined in ANSI C63.26-2015 6.4.
MIMO output power: $10 \log \{10^{(\text{Port 1 power} / 10)} + 10^{(\text{Port 2 power} / 10)}\}$

2.4.2. Radiated spurious emissions

LTE band 48 (20 MHz – 16QAM)

Frequency (MHz)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (3 560.0 MHz)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 625.0 MHz)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 690.0 MHz)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

NR band 48_SISO (20 MHz - DFT-OFDM BPSK)

Frequency (MHz)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (3 560.01 MHz)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 624.99 MHz)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 690.00 MHz)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

NR band 48_MIMO (40 MHz - CP-OFDM QPSK)

Frequency (MHz)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (3 570.00 MHz)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (3 624.99 MHz)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
High Channel (3 679.98 MHz)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

Remark;

1. AF = Antenna Factor, CL = Cable Loss, CF = Conversion Factor.
2. $E \text{ (dB}\mu\text{V/m)} = \text{Measured Level (dB}\mu\text{V)} + \text{Antenna Factor (dB/m)} + \text{AMP (dB)} + \text{Cable Loss (dB)}$.
3. $E.I.R.P. \text{ (dB m)} = E \text{ (dB}\mu\text{V/m)} + \text{CF (dB)}$.
4. $E.I.R.P. \text{ (dB m)} = E \text{ (dB}\mu\text{V/m)} + \text{CF (dB)} - 2.15 \text{ (dB)}$; where E.R.P. and E.I.R.P. are expressed in consistent units.
5. $CF \text{ (dB)} = 20 \log D - 104.8$; where D is the measurement distance in meters, According to KDB 971168 D01 v03r01 5.8.4.
6. The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

3. Conducted Output Power

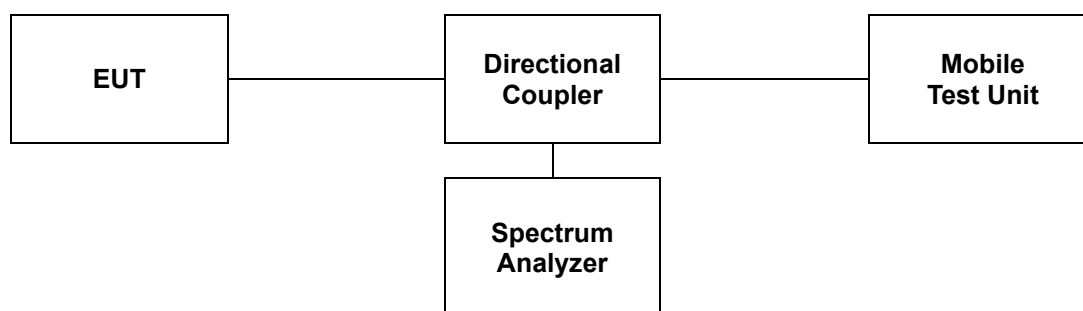
3.1. Limit

CFR 47, Section FCC §2.1046.

3.2. Test Procedure

Output power shall be measured at the RF output terminals for all configurations.

1. The RF output of the transmitter was connected to the input of the mobile test unit in order to establish communication with the EUT.
2. The EUT was set up for the max. output power with pseudo random data modulation by using mobile test unit parameters.
3. This EUT was tested under all configurations and the highest power was investigated and reported.



3.3. Test Result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 %

LTE 48											
Ant. Gain						-2.11 dB i					
Limit: 23 (dB m/10 MHz)											
BW (MHz)	Modulation	RB Size	RB Offset	55265 (3 552.5 MHz)		55990 (3 625.0 MHz)		56715 (3 697.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	20.38	0.109	20.11	0.103	19.96	0.099	18.29	0.067
		1	12	20.36	0.109	20.04	0.101	19.94	0.099		
		1	24	20.40	0.110	20.06	0.101	19.95	0.099		
		12	0	20.33	0.108	20.06	0.101	19.94	0.099		
		12	6	20.33	0.108	20.04	0.101	19.93	0.098		
		12	13	20.34	0.108	20.05	0.101	19.95	0.099		
	16QAM	25	0	20.37	0.109	20.04	0.101	19.90	0.098	18.55	0.072
		1	0	20.59	0.115	20.32	0.108	20.18	0.104		
		1	12	20.66	0.116	20.34	0.108	20.34	0.108		
		1	24	20.60	0.115	20.26	0.106	20.21	0.105		
		12	0	20.31	0.107	20.05	0.101	19.99	0.100		
		12	6	20.29	0.107	20.04	0.101	19.98	0.100		
	64QAM	12	13	20.33	0.108	20.05	0.101	20.00	0.100		
		25	0	20.44	0.111	20.12	0.103	20.01	0.100		
		1	0	20.21	0.105	20.09	0.102	19.93	0.098		
		1	12	20.11	0.103	20.02	0.100	19.92	0.098		
		1	24	20.25	0.106	20.03	0.101	19.94	0.099		
		12	0	19.32	0.086	19.16	0.082	18.97	0.079		
	256QAM	12	6	19.30	0.085	19.14	0.082	18.95	0.079		
		12	13	19.34	0.086	19.16	0.082	18.96	0.079		
		25	0	19.38	0.087	19.15	0.082	19.04	0.080		
		1	0	17.34	0.054	17.15	0.052	16.99	0.050		
		1	12	17.20	0.052	17.13	0.052	16.98	0.050		
		1	24	17.40	0.055	17.16	0.052	16.98	0.050		
		12	0	17.50	0.056	17.18	0.052	17.05	0.051		
		12	6	17.50	0.056	17.17	0.052	17.06	0.051		
		12	13	17.52	0.056	17.18	0.052	17.05	0.051		
		25	0	17.46	0.056	17.14	0.052	17.05	0.051		

LTE 48													
Ant. Gain						-2.11 dB i							
Limit: 23 (dB m/10 MHz)													
BW (MHz)	Modulation	RB Size	RB Offset	55290 (3 555.0 MHz)		55990 (3 625.0 MHz)		56690 (3 695.0 MHz)		E.I.R.P			
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)		
10	QPSK	1	0	20.35	0.108	20.09	0.102	19.93	0.098	18.27	0.067		
		1	25	20.31	0.107	19.98	0.100	19.90	0.098				
		1	49	20.38	0.109	20.02	0.100	19.96	0.099				
		25	0	20.34	0.108	20.05	0.101	19.92	0.098				
		25	12	20.33	0.108	20.03	0.101	19.92	0.098				
		25	25	20.36	0.109	20.02	0.100	19.95	0.099				
	16QAM	50	0	20.32	0.108	20.03	0.101	19.89	0.097	18.47	0.070		
		1	0	20.54	0.113	20.27	0.106	20.12	0.103				
		1	25	20.54	0.113	20.19	0.104	20.19	0.104				
		1	49	20.58	0.114	20.23	0.105	20.19	0.104				
		25	0	20.37	0.109	20.09	0.102	19.97	0.099				
		25	12	20.36	0.109	20.06	0.101	20.00	0.100				
	64QAM	25	25	20.40	0.110	20.06	0.101	19.99	0.100			18.47	0.070
		50	0	20.35	0.108	20.08	0.102	19.94	0.099				
		1	0	20.30	0.107	20.05	0.101	19.88	0.097				
		1	25	20.30	0.107	19.95	0.099	19.88	0.097				
		1	49	20.32	0.108	19.97	0.099	19.92	0.098				
		25	0	19.34	0.086	19.06	0.081	18.93	0.078				
	256QAM	25	12	19.32	0.086	19.05	0.080	18.96	0.079	18.47	0.070		
		25	25	19.35	0.086	19.03	0.080	18.95	0.079				
		50	0	19.41	0.087	19.14	0.082	19.02	0.080				
		1	0	17.38	0.055	17.10	0.051	16.96	0.050				
		1	25	17.34	0.054	16.98	0.050	16.91	0.049				
		1	49	17.39	0.055	17.01	0.050	16.99	0.050				
		25	0	17.42	0.055	17.12	0.052	17.00	0.050				
		25	12	17.41	0.055	17.11	0.051	17.04	0.051				
	256QAM	25	25	17.43	0.055	17.09	0.051	17.04	0.051	18.47	0.070		
		50	0	17.45	0.056	17.17	0.052	17.07	0.051				
LTE 48													
Ant. Gain						-2.11 dB i							
Limit: 23 (dB m/10 MHz)													
BW (MHz)	Modulation	RB Size	RB Offset	55315 (3 557.5 MHz)		55990 (3 625.0 MHz)		56665 (3 692.5 MHz)		E.I.R.P			
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)		
15	QPSK	1	0	20.35	0.108	20.08	0.102	19.95	0.099	18.35	0.068		
		1	36	20.32	0.108	19.99	0.100	19.92	0.098				
		1	74	20.46	0.111	20.00	0.100	19.96	0.099				
		36	0	20.34	0.108	20.02	0.100	19.93	0.098				
		36	18	20.36	0.109	20.01	0.100	19.93	0.098				
		36	37	20.38	0.109	20.01	0.100	19.94	0.099				
	16QAM	75	0	20.36	0.109	20.03	0.101	19.90	0.098	18.53	0.071		
		1	0	20.58	0.114	20.34	0.108	20.15	0.104				
		1	36	20.51	0.112	20.20	0.105	20.08	0.102				
		1	74	20.64	0.116	20.24	0.106	20.20	0.105				
		36	0	20.31	0.107	20.03	0.101	19.97	0.099				
		36	18	20.34	0.108	20.02	0.100	19.96	0.099				
	64QAM	36	37	20.36	0.109	20.03	0.101	19.95	0.099			18.53	0.071
		75	0	20.36	0.109	20.04	0.101	19.93	0.098				
		1	0	20.27	0.106	20.03	0.101	19.85	0.097				
		1	36	20.21	0.105	20.05	0.101	19.86	0.097				
		1	74	20.36	0.109	20.06	0.101	19.89	0.097				
		36	0	19.36	0.086	19.03	0.080	18.91	0.078				
	256QAM	36	18	19.38	0.087	19.07	0.081	18.93	0.078	18.53	0.071		
		36	37	19.40	0.087	19.05	0.080	18.94	0.078				
		75	0	19.40	0.087	19.04	0.080	18.97	0.079				
		1	0	17.35	0.054	17.13	0.052	16.96	0.050				
		1	36	17.33	0.054	17.11	0.051	16.95	0.050				
		1	74	17.46	0.056	17.09	0.051	16.96	0.050				
		36	0	17.42	0.055	17.14	0.052	17.01	0.050				
		36	18	17.46	0.056	17.12	0.052	17.02	0.050				
	256QAM	36	37	17.49	0.056	17.09	0.051	17.01	0.050	18.53	0.071		
		75	0	17.43	0.055	17.14	0.052	17.03	0.050				

LTE 48											
Ant. Gain						-2.11 dB i					
Limit: 23 (dB m/10 MHz)											
BW (MHz)	Modulation	RB Size	RB Offset	55340 (3 560.0 MHz)		55990 (3 625.0 MHz)		56640 (3 690.0 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
20	QPSK	1	0	20.36	0.109	20.07	0.102	19.96	0.099	18.35	0.068
		1	50	20.33	0.108	20.06	0.101	19.96	0.099		
		1	99	20.46	0.111	20.04	0.101	19.94	0.099		
		50	0	20.34	0.108	20.06	0.101	19.95	0.099		
		50	25	20.34	0.108	20.05	0.101	19.92	0.098		
		50	50	20.39	0.109	20.03	0.101	19.94	0.099		
	100	0	20.37	0.109	20.02	0.100	19.91	0.098			
	16QAM	1	0	20.56	0.114	20.38	0.109	20.16	0.104	18.57	0.072
		1	50	20.54	0.113	20.38	0.109	20.06	0.101		
		1	99	20.68	0.117	20.25	0.106	20.19	0.104		
		50	0	20.35	0.108	20.08	0.102	19.94	0.099		
		50	25	20.38	0.109	20.04	0.101	19.94	0.099		
		50	50	20.42	0.110	20.01	0.100	19.95	0.099		
	64QAM	100	0	20.41	0.110	20.06	0.101	19.92	0.098		
		1	0	20.29	0.107	20.04	0.101	19.89	0.097	18.57	0.072
		1	50	20.33	0.108	20.03	0.101	19.90	0.098		
		1	99	20.39	0.109	20.03	0.101	19.91	0.098		
		50	0	19.43	0.088	19.06	0.081	18.93	0.078		
		50	25	19.43	0.088	19.04	0.080	18.95	0.079		
	50	50	19.49	0.089	19.06	0.081	18.93	0.078			
	256QAM	100	0	19.40	0.087	19.02	0.080	18.94	0.078		
		1	0	17.38	0.055	17.11	0.051	16.97	0.050	18.57	0.072
		1	50	17.37	0.055	17.08	0.051	16.98	0.050		
		1	99	17.48	0.056	17.12	0.052	16.94	0.049		
		50	0	17.47	0.056	17.11	0.051	17.05	0.051		
		50	25	17.47	0.056	17.09	0.051	17.02	0.050		
		50	50	17.51	0.056	17.06	0.051	17.04	0.051		
		100	0	17.45	0.056	17.03	0.050	17.02	0.050		

NR Band 48_SISO														
Ant. Gain							-2.11 dBi							
Limit: 23 (dB m/10 MHz)														
SCS (kHz)	BW (MHz)	Modulation		RB allocation	RB Size	RB Offset	637000 (3555.0 MHz)		641666 (3624.99 MHz)		646332 (3694.98 MHz)		E.I.R.P.	
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
30	10	DFT-SOFDM	BPSK	Inner_1RB Left	1	1	20.91	0.123	20.65	0.116	20.32	0.108	18.88	0.077
			QPSK		1	1	20.89	0.123	20.62	0.115	20.26	0.106		
			16QAM		1	1	<u>20.95</u>	<u>0.124</u>	20.79	0.120	20.45	0.111		
			64QAM		1	1	20.29	0.107	20.03	0.101	19.66	0.092		
			256QAM		1	1	18.38	0.069	18.11	0.065	17.66	0.058		
			BPSK	Inner_1RB Right	1	22	<u>20.99</u>	<u>0.126</u>	20.59	0.115	20.33	0.108		
			QPSK		1	22	20.97	0.125	20.55	0.114	20.31	0.107		
			BPSK	Inner_Full	12	6	20.97	0.125	20.61	0.115	20.33	0.108		
			QPSK		12	6	<u>20.99</u>	<u>0.126</u>	20.63	0.116	20.34	0.108		
			BPSK	Outer_Full	24	0	20.97	0.125	20.63	0.116	20.32	0.108		
			QPSK		24	0	20.98	0.125	20.63	0.116	20.32	0.108		
			BPSK	Edge_1RB Left	1	0	20.90	0.123	20.63	0.116	20.31	0.107		
			QPSK		1	0	20.91	0.123	20.62	0.115	20.24	0.106		
			BPSK	Edge_Full Left	2	0	20.91	0.123	20.62	0.115	20.24	0.106		
			QPSK		2	0	20.90	0.123	20.64	0.116	20.28	0.107		
			BPSK	Edge_1RB Right	1	23	20.99	0.126	20.58	0.114	20.35	0.108		
			QPSK		1	23	20.97	0.125	20.57	0.114	20.30	0.107		
			BPSK	Edge_Full Right	2	22	20.98	0.125	20.59	0.115	20.33	0.108		
			QPSK		2	22	20.98	0.125	20.59	0.115	20.32	0.108		
			CP-OFDM	QPSK	Inner_1RB Left	1	1	<u>20.90</u>	<u>0.123</u>	20.59	0.115	20.27		
		16QAM		1		1	<u>20.89</u>	<u>0.123</u>	20.59	0.115	20.31	0.107		

NR Band 48_SISO														
Ant. Gain							-2.11 dB i							
Limit: 23 (dB m/10 MHz)														
SCS (kHz)	BW (MHz)	Modulation		RB allocation	RB Size	RB Offset	637168 (3 557.5 MHz)		641666 (3 625.0 MHz)		646166 (3 692.5 MHz)		E.I.R.P.	
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
30	15	DFT-SOFDM	BPSK	Inner_1RB Left	1	1	20.93	0.124	20.67	0.117	20.26	0.106	19.02	0.080
			QPSK		1	1	20.93	0.124	20.64	0.116	20.21	0.105		
			16QAM		1	1	<u>20.99</u>	<u>0.126</u>	20.79	0.120	20.37	0.109		
			64QAM		1	1	20.41	0.110	20.03	0.101	19.61	0.091		
			256QAM		1	1	18.39	0.069	18.13	0.065	17.72	0.059		
			BPSK	Inner_1RB Right	1	36	<u>21.13</u>	<u>0.130</u>	20.59	0.115	20.31	0.107		
			QPSK		1	36	<u>21.09</u>	<u>0.129</u>	20.53	0.113	20.26	0.106		
			BPSK	Inner_Full	18	9	21.00	0.126	20.62	0.115	20.25	0.106		
			QPSK		18	9	21.01	0.126	20.61	0.115	20.26	0.106		
			BPSK	Outer_Full	36	0	21.01	0.126	20.62	0.115	20.27	0.106		
			QPSK		36	0	21.00	0.126	20.60	0.115	20.26	0.106		
			BPSK	Edge_1RB Left	1	0	20.93	0.124	20.67	0.117	20.26	0.106		
			QPSK		1	0	20.91	0.123	20.63	0.116	20.21	0.105		
			BPSK	Edge_Full Left	2	0	20.98	0.125	20.66	0.116	20.25	0.106		
			QPSK		2	0	20.94	0.124	20.66	0.116	20.25	0.106		
			BPSK	Edge_1RB Right	1	37	21.07	0.128	20.58	0.114	20.30	0.107		
			QPSK		1	37	21.04	0.127	20.53	0.113	20.28	0.107		
			BPSK	Edge_Full Right	2	36	21.07	0.128	20.59	0.115	20.33	0.108		
			QPSK		2	36	21.09	0.129	20.57	0.114	20.31	0.107		
		CP-OFDM	QPSK	Inner_1RB Left	1	1	<u>20.97</u>	<u>0.125</u>	20.75	0.119	20.26	0.106	18.86	0.077
			16QAM		1	1	<u>20.95</u>	<u>0.124</u>	20.64	0.116	20.31	0.107		

NR Band 48_SISO														
Ant. Gain							-2.11 dB i							
Limit: 23 (dB m/10 MHz)														
SCS (kHz)	BW (MHz)	Modulation		RB allocation	RB Size	RB Offset	637334 (3 560.0 MHz)		641666 (3 625.0 MHz)		646000 (3 690.0 MHz)		E.I.R.P.	
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
30	20	DFT-SOFDM	BPSK	Inner_1RB Left	1	1	20.85	0.122	20.58	0.114	20.08	0.102	19.07	0.081
			QPSK		1	1	20.80	0.120	20.54	0.113	20.06	0.101		
			16QAM		1	1	<u>20.96</u>	<u>0.125</u>	20.66	0.116	20.22	0.105		
			64QAM		1	1	20.24	0.106	19.92	0.098	19.48	0.089		
			256QAM		1	1	18.38	0.069	18.10	0.065	17.64	0.058		
			BPSK	Inner_1RB Right	1	49	<u>21.18</u>	<u>0.131</u>	20.42	0.110	20.14	0.103		
			QPSK		1	49	<u>21.00</u>	<u>0.126</u>	20.39	0.109	20.13	0.103		
			BPSK	Inner_Full	25	12	20.90	0.123	20.46	0.111	20.11	0.103		
			QPSK		25	12	20.92	0.124	20.46	0.111	20.10	0.102		
			BPSK	Outer_Full	50	0	20.91	0.123	20.46	0.111	20.09	0.102		
			QPSK		50	0	20.91	0.123	20.46	0.111	20.10	0.102		
			BPSK	Edge_1RB Left	1	0	20.81	0.121	20.55	0.114	20.12	0.103		
			QPSK		1	0	20.79	0.120	20.54	0.113	20.06	0.101		
			BPSK	Edge_Full Left	2	0	20.82	0.121	20.58	0.114	20.07	0.102		
			QPSK		2	0	20.82	0.121	20.58	0.114	20.07	0.102		
			BPSK	Edge_1RB Right	1	50	21.01	0.126	20.41	0.110	20.15	0.104		
			QPSK		1	50	20.95	0.124	20.41	0.110	20.13	0.103		
			BPSK	Edge_Full Right	2	49	20.98	0.125	20.41	0.110	20.16	0.104		
			QPSK		2	49	20.98	0.125	20.41	0.110	20.16	0.104		
		CP-OFDM	QPSK	Inner_1RB Left	1	1	<u>20.92</u>	<u>0.124</u>	20.44	0.111	20.17	0.104	18.81	0.076
			16QAM		1	1	<u>20.86</u>	<u>0.122</u>	20.57	0.114	20.00	0.100		

NR Band 48_SISO														
Ant. Gain							-2.11 dB i							
Limit: 23 (dB m/10 MHz)														
SCS (kHz)	BW (MHz)	Modulation		RB allocation	RB Size	RB Offset	637668 (3 565.0 MHz)		641666 (3 625.0 MHz)		645666 (3 685.0 MHz)		E.I.R.P.	
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
30	30	DFT-SOFDM	BPSK	Inner_1RB Left	1	1	20.70	0.117	20.68	0.117	20.34	0.108	18.88	0.077
			QPSK		1	1	20.71	0.118	20.63	0.116	20.32	0.108		
			16QAM		1	1	<u>20.75</u>	<u>0.119</u>	20.71	0.118	20.37	0.109		
			64QAM		1	1	20.09	0.102	20.02	0.100	19.61	0.091		
			256QAM		1	1	18.20	0.066	18.12	0.065	17.79	0.060		
			BPSK	Inner_1RB Right	1	76	20.98	0.125	20.40	0.110	20.22	0.105		
			QPSK		1	76	20.93	0.124	20.39	0.109	20.15	0.104		
			BPSK	Inner_Full	36	18	20.86	0.122	20.47	0.111	20.19	0.104		
			QPSK		36	18	20.86	0.122	20.46	0.111	20.18	0.104		
			BPSK	Outer_Full	75	0	20.85	0.122	20.46	0.111	20.18	0.104		
			QPSK		75	0	20.87	0.122	20.46	0.111	20.18	0.104		
			BPSK	Edge_1RB Left	1	0	20.69	0.117	20.64	0.116	20.34	0.108		
			QPSK		1	0	20.66	0.116	20.62	0.115	20.28	0.107		
			BPSK	Edge_Full Left	2	0	20.73	0.118	20.66	0.116	20.27	0.106		
			QPSK		2	0	20.73	0.118	20.65	0.116	20.29	0.107		
			BPSK	Edge_1RB Right	1	77	<u>20.99</u>	<u>0.126</u>	20.40	0.110	20.18	0.104		
			QPSK		1	77	20.95	0.124	20.38	0.109	20.15	0.104		
			BPSK	Edge_Full Right	2	76	20.97	0.125	20.42	0.110	20.14	0.103		
			QPSK		2	76	<u>20.99</u>	<u>0.126</u>	20.41	0.110	20.17	0.104		
		CP-OFDM	QPSK	Inner_1RB Left	1	1	<u>20.70</u>	<u>0.117</u>	20.61	0.115	20.11	0.103	18.64	0.073
			16QAM		1	1	<u>20.75</u>	<u>0.119</u>	20.66	0.116	20.45	0.111		

NR Band 48_SISO														
Ant. Gain							-2.11 dB i							
Limit: 23 (dB m/10 MHz)														
SCS (kHz)	BW (MHz)	Modulation		RB allocation	RB Size	RB Offset	638000 (3 570.0 MHz)		641666 (3 625.0 MHz)		645332 (3 680.0 MHz)		E.I.R.P.	
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
30	40	DFT-SOFDM	BPSK	Inner_1RB Left	1	1	20.74	0.119	20.71	0.118	20.36	0.109	18.89	0.077
			QPSK		1	1	20.73	0.118	20.69	0.117	20.30	0.107		
			16QAM		1	1	<u>20.80</u>	<u>0.120</u>	20.75	0.119	20.40	0.110		
			64QAM		1	1	20.19	0.104	20.16	0.104	19.68	0.093		
			256QAM		1	1	18.26	0.067	18.31	0.068	17.81	0.060		
			BPSK	Inner_1RB Right	1	104	20.97	0.125	20.40	0.110	20.14	0.103		
			QPSK		1	104	20.96	0.125	20.39	0.109	20.11	0.103		
			BPSK	Inner_Full	50	25	20.98	0.125	20.47	0.111	20.15	0.104		
			QPSK		50	25	<u>21.00</u>	<u>0.126</u>	20.47	0.111	20.14	0.103		
			BPSK	Outer_Full	100	0	20.98	0.125	20.44	0.111	20.14	0.103		
			QPSK		100	0	20.99	0.126	20.44	0.111	20.15	0.104		
			BPSK	Edge_1RB Left	1	0	20.77	0.119	20.72	0.118	20.32	0.108		
			QPSK		1	0	20.76	0.119	20.71	0.118	20.29	0.107		
			BPSK	Edge_Full Left	2	0	20.78	0.120	20.76	0.119	20.32	0.108		
			QPSK		2	0	20.79	0.120	20.75	0.119	20.33	0.108		
			BPSK	Edge_1RB Right	1	105	20.97	0.125	20.42	0.110	20.16	0.104		
			QPSK		1	105	20.96	0.125	20.40	0.110	20.16	0.104		
			BPSK	Edge_Full Right	2	104	<u>20.99</u>	<u>0.126</u>	20.39	0.109	20.15	0.104		
			QPSK		2	104	20.99	0.126	20.41	0.110	20.13	0.103		
			CP-OFDM	QPSK	Inner_1RB Left	1	1	<u>20.82</u>	<u>0.121</u>	20.73	0.118	20.43		
		16QAM		1		1	<u>20.75</u>	<u>0.119</u>	20.67	0.117	20.28	0.107		

NR Band 48_MIMO														
Ant. Gain							Ant. 1: -2.11 dB i			Ant. 2: -2.11 dB i			Ant. 1+2: 0.90 dB i	
Limit: 23 (dB m/10 Mhz)														
SCS (kHz)	BW (Mhz)	Modulation		RB allocation	RB Size	RB Offset	637000 (3555.0 Mhz)		641666 (3624.99 Mhz)		646332 (3694.98 Mhz)		E.I.R.P.	
							Ant. 1+ Ant. 2							
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
30	10	CP-OFDM	QPSK	Inner_1RB Left	1	1	20.90	0.123	20.97	0.125	20.95	0.124	21.89	0.155
			16QAM		1	1	20.83	0.121	20.90	0.123	<u>20.93</u>	<u>0.124</u>		
			64QAM		1	1	19.26	0.084	19.55	0.090	19.43	0.088		
			256QAM		1	1	16.38	0.043	16.43	0.044	16.46	0.044		
			QPSK	Inner_1RB Right	1	187	<u>20.99</u>	<u>0.126</u>	20.97	0.125	20.96	0.125		
			QPSK	Outer_Full	189	0	19.92	0.098	19.99	0.100	19.99	0.100		
NR Band 48_MIMO														
Ant. Gain							Ant. 1: -2.11 dB i			Ant. 2: -2.11 dB i			Ant. 1+2: 0.90 dB i	
Limit: 23 (dB m/10 Mhz)														
SCS (kHz)	BW (Mhz)	Modulation		RB allocation	RB Size	RB Offset	637168 (3 557.5 Mhz)		641666 (3 625.0 Mhz)		646166 (3 692.5 Mhz)		E.I.R.P.	
							Ant. 1+ Ant. 2							
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
30	15	CP-OFDM	QPSK	Inner_1RB Left	1	1	20.91	0.123	21.00	0.126	20.89	0.123	21.94	0.156
			16QAM		1	1	20.85	0.122	<u>20.95</u>	<u>0.124</u>	20.78	0.120		
			64QAM		1	1	19.37	0.086	19.57	0.091	19.24	0.084		
			256QAM		1	1	16.45	0.044	19.44	0.088	16.36	0.043		
			QPSK	Inner_1RB Right	1	187	<u>21.04</u>	<u>0.127</u>	20.97	0.125	20.93	0.124		
			QPSK	Outer_Full	189	0	19.98	0.100	19.99	0.100	19.92	0.098		
NR Band 48_MIMO														
Ant. Gain							Ant. 1: -2.11 dB i			Ant. 2: -2.11 dB i			Ant. 1+2: 0.90 dB i	
Limit: 23 (dB m/10 Mhz)														
SCS (kHz)	BW (Mhz)	Modulation		RB allocation	RB Size	RB Offset	637334 (3 560.0 Mhz)		641666 (3 625.0 Mhz)		646000 (3 690.0 Mhz)		E.I.R.P.	
							Ant. 1+ Ant. 2							
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
30	20	CP-OFDM	QPSK	Inner_1RB Left	1	1	20.97	0.125	21.02	0.126	20.82	0.121	21.98	0.158
			16QAM		1	1	<u>20.92</u>	<u>0.124</u>	20.91	0.123	20.75	0.119		
			64QAM		1	1	19.29	0.085	19.36	0.086	19.16	0.082		
			256QAM		1	1	16.49	0.045	16.54	0.045	19.29	0.085		
			QPSK	Inner_1RB Right	1	187	<u>21.08</u>	<u>0.128</u>	20.93	0.124	20.86	0.122		
			QPSK	Outer_Full	189	0	20.03	0.101	19.97	0.099	19.86	0.097		

NR Band 48_MIMO														
Ant. Gain							Ant. 1: -2.11 dB i		Ant. 2: -2.11 dB i		Ant. 1+2: 0.90 dB i			
Limit: 23 (dB m/10 MHz)														
SCS (kHz)	BW (MHz)	Modulation		RB allocation	RB Size	RB Offset	637668 (3 565.0 MHz)		641666 (3 625.0 MHz)		645666 (3 685.0 MHz)		E.I.R.P.	
							Ant. 1+ Ant. 2						(dB m)	(W)
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)		
30	30	CP-OFDM	QPSK	Inner_1RB Left	1	1	20.86	0.122	21.08	0.128	20.95	0.124	22.03	0.160
			16QAM		1	1	20.79	0.120	<u>21.02</u>	<u>0.126</u>	20.92	0.124		
			64QAM		1	1	19.18	0.083	19.41	0.087	19.39	0.087		
			256QAM		1	1	16.35	0.043	16.58	0.045	16.44	0.044		
			QPSK	Inner_1RB Right	1	187	<u>21.13</u>	<u>0.130</u>	21.00	0.126	20.96	0.125		
			QPSK	Outer_Full	189	0	20.00	0.100	19.98	0.100	19.93	0.098		
NR Band 48_MIMO														
Ant. Gain							Ant. 1: -2.11 dB i		Ant. 2: -2.11 dB i		Ant. 1+2: 0.90 dB i			
Limit: 23 (dB m/10 MHz)														
SCS (kHz)	BW (MHz)	Modulation		RB allocation	RB Size	RB Offset	638000 (3 570.0 MHz)		641666 (3 625.0 MHz)		645332 (3 680.0 MHz)		E.I.R.P.	
							Ant. 1+ Ant. 2						(dB m)	(W)
							(dB m)	(W)	(dB m)	(W)	(dB m)	(W)		
30	40	CP-OFDM	QPSK	Inner_1RB Left	1	1	20.92	0.124	20.88	0.122	20.84	0.121	22.05	0.160
			16QAM		1	1	20.94	0.124	<u>21.07</u>	0.128	20.84	0.121		
			64QAM		1	1	19.40	0.087	19.56	0.090	19.29	0.085		
			256QAM		1	1	16.43	0.044	16.63	0.046	16.34	0.043		
			QPSK	Inner_1RB Right	1	187	<u>21.15</u>	<u>0.130</u>	18.06	0.064	20.84	0.121		
			QPSK	Outer_Full	189	0	20.15	0.104	19.91	0.098	19.80	0.095		

Note;

- Powers are summed up in linear using the measure-and-sum technique defined in ANSI C63.26-2015 6.4.
- MIMO output power: $10 \log \{10^{(\text{Port 1 power} / 10)} + 10^{(\text{Port 2 power} / 10)}\}$

4. Occupied Bandwidth

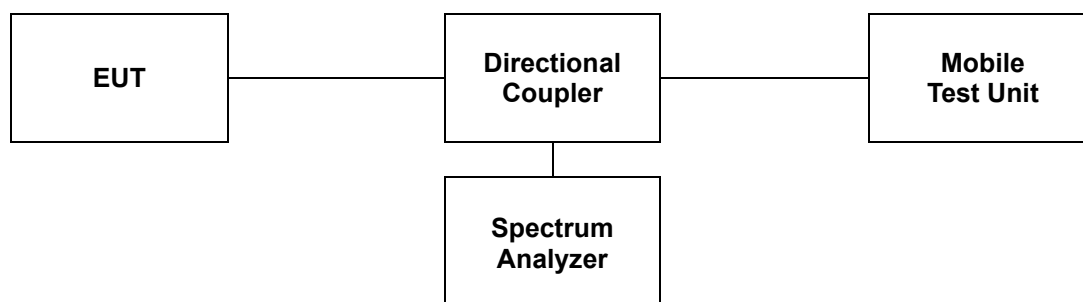
4.1. Limit

CFR 47, Section FCC §2.1049.

4.2. Test Procedure

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).



4.3 Test Results

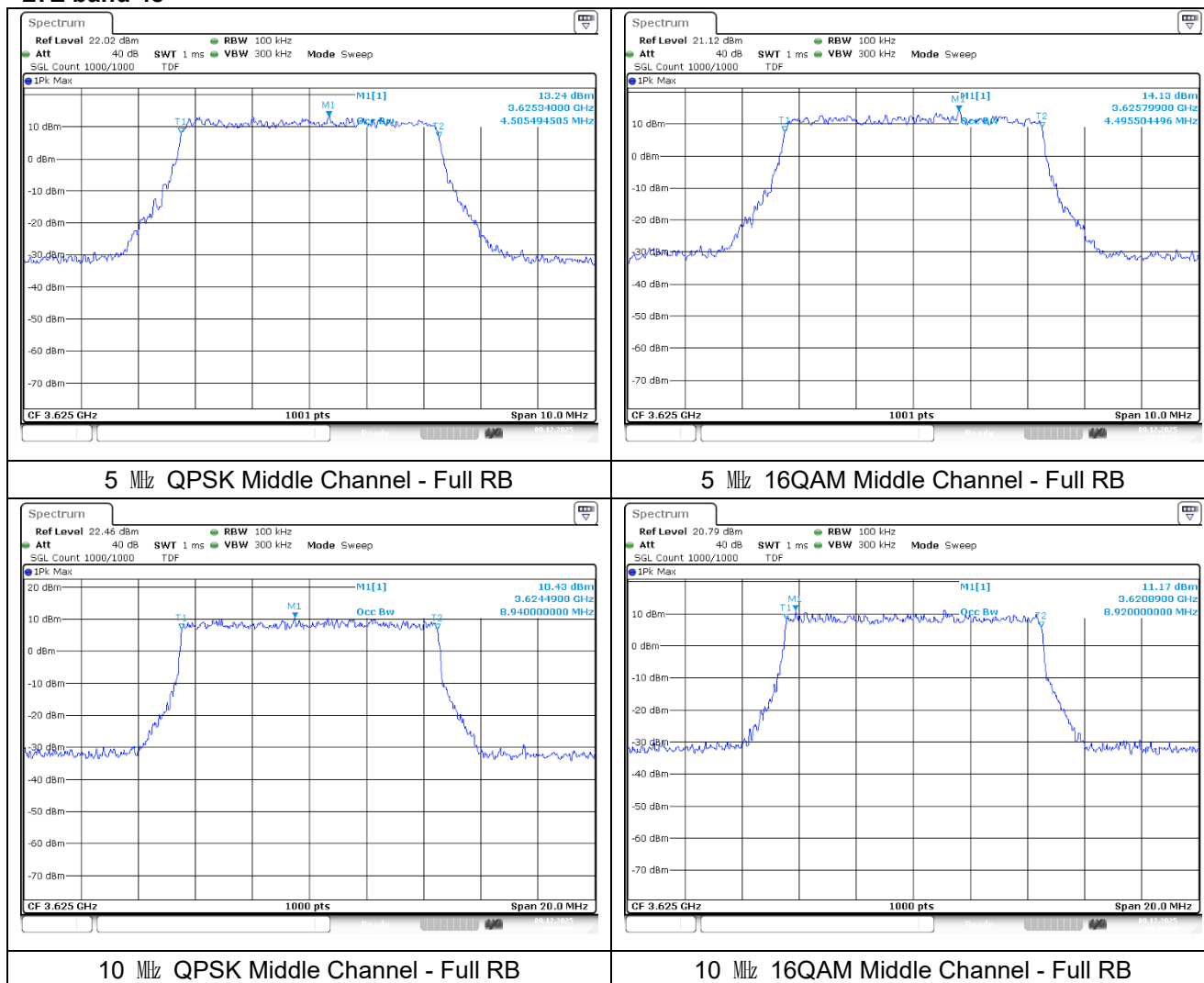
Ambient temperature : (23 ± 1) °C

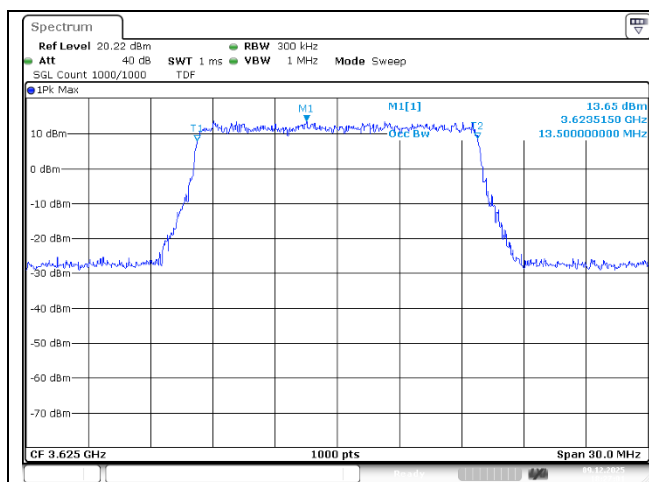
Relative humidity : 47 %

Band	Bandwidth (MHz)		Frequency (MHz)	Occupied Bandwidth (MHz)				
				QPSK		16QAM		
LTE 48	5		3 552.5		4.496		4.505	
			3 625.0		4.505		4.496	
			3 697.5		4.515		4.505	
	10		3 555.0		8.940		8.940	
			3 625.0		8.940		8.920	
			3 695.0		8.940		8.940	
	15		3 557.5		13.440		13.470	
			3 625.0		13.500		13.500	
			3 692.5		13.500		13.530	
	20		3 560.0		17.960		17.880	
			3 625.0		17.960		17.920	
			3 690.0		17.960		17.920	
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
NR 48 SISO	30	10	3 555.00	8.611	8.611	8.611	8.611	8.571
			3 624.99	8.611	8.611	8.591	8.591	8.591
			3 694.98	8.611	8.611	8.611	8.611	8.591
		15	3 557.52	12.977	12.977	12.977	13.606	13.726
			3 624.99	12.977	12.977	12.947	13.636	13.726
			3 692.49	12.947	12.977	12.977	13.636	13.726
		20	3 560.01	17.942	17.902	17.902	18.302	18.262
			3 624.99	17.902	17.902	17.942	18.302	18.302
			3 690.00	17.982	17.902	17.942	18.302	18.302
		30	3 565.02	26.853	26.793	26.793	27.812	27.932
			3 624.99	26.853	26.793	26.793	27.872	27.872
			3 684.99	26.853	26.853	26.853	27.872	27.872
		40	3 570.00	35.804	35.804	35.724	37.802	37.802
			3 624.99	35.804	35.804	35.804	37.802	37.882
			3 679.98	35.804	35.804	35.804	37.882	37.882
Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)				
				Port 1		Port 2		
				CP-OFDM QPSK	CP-OFDM 16QAM	CP-OFDM QPSK	CP-OFDM 16QAM	
NR 48 MIMO	30	10	3 555.00	8.591	8.611	8.591	8.591	
			3 624.99	8.571	8.611	8.591	8.591	
			3 694.98	8.591	8.591	8.591	8.571	
		15	3 557.52	13.666	13.666	13.696	13.696	
			3 624.99	13.666	13.636	13.696	13.696	
			3 692.49	13.693	13.636	13.666	13.666	
		20	3 560.01	18.302	18.262	18.342	18.342	
			3 624.99	18.262	18.222	18.342	18.302	
			3 690.00	18.262	18.262	18.262	18.262	
		30	3 565.02	27.932	27.872	27.932	27.872	
			3 624.99	27.872	27.872	27.872	27.932	
			3 684.99	27.872	27.812	27.872	27.872	
		40	3 570.00	37.802	37.802	37.882	37.802	
			3 624.99	37.882	37.882	37.882	37.882	
			3 679.98	37.802	37.962	37.882	37.882	

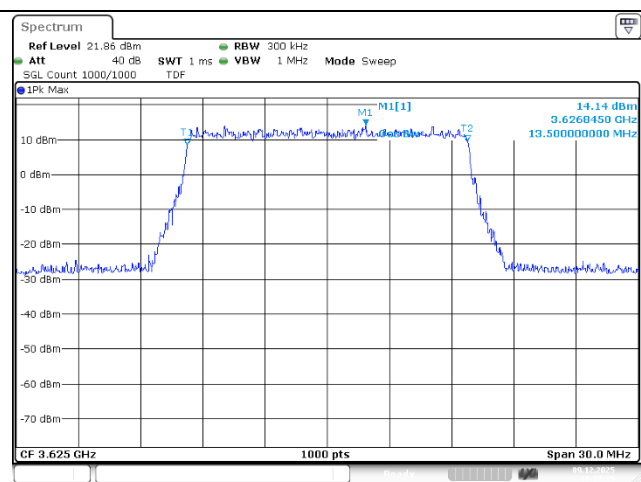
- Test plots

LTE band 48

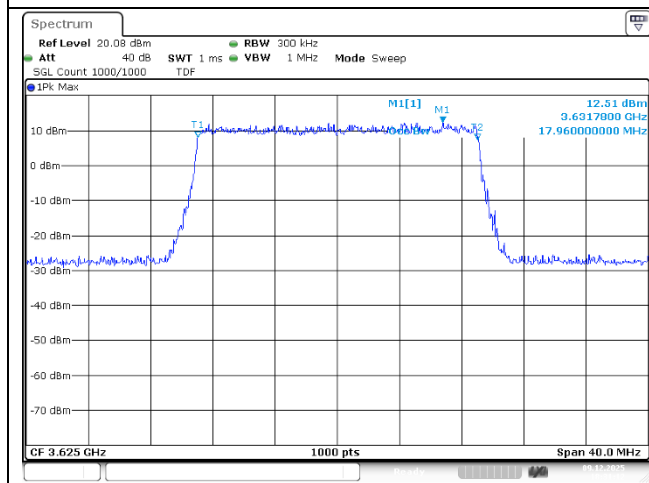




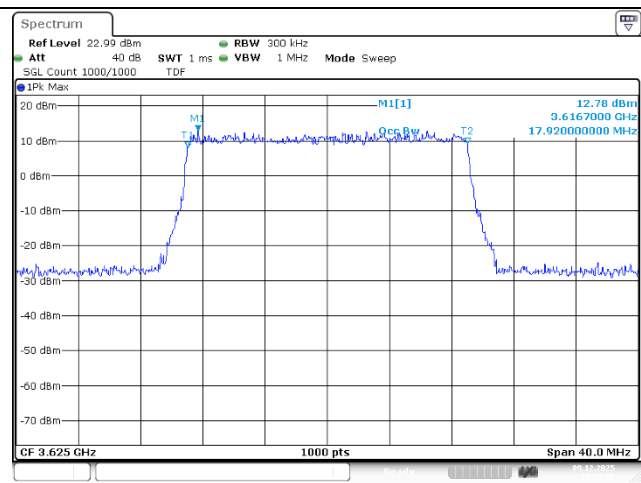
15 MHz QPSK Middle Channel - Full RB



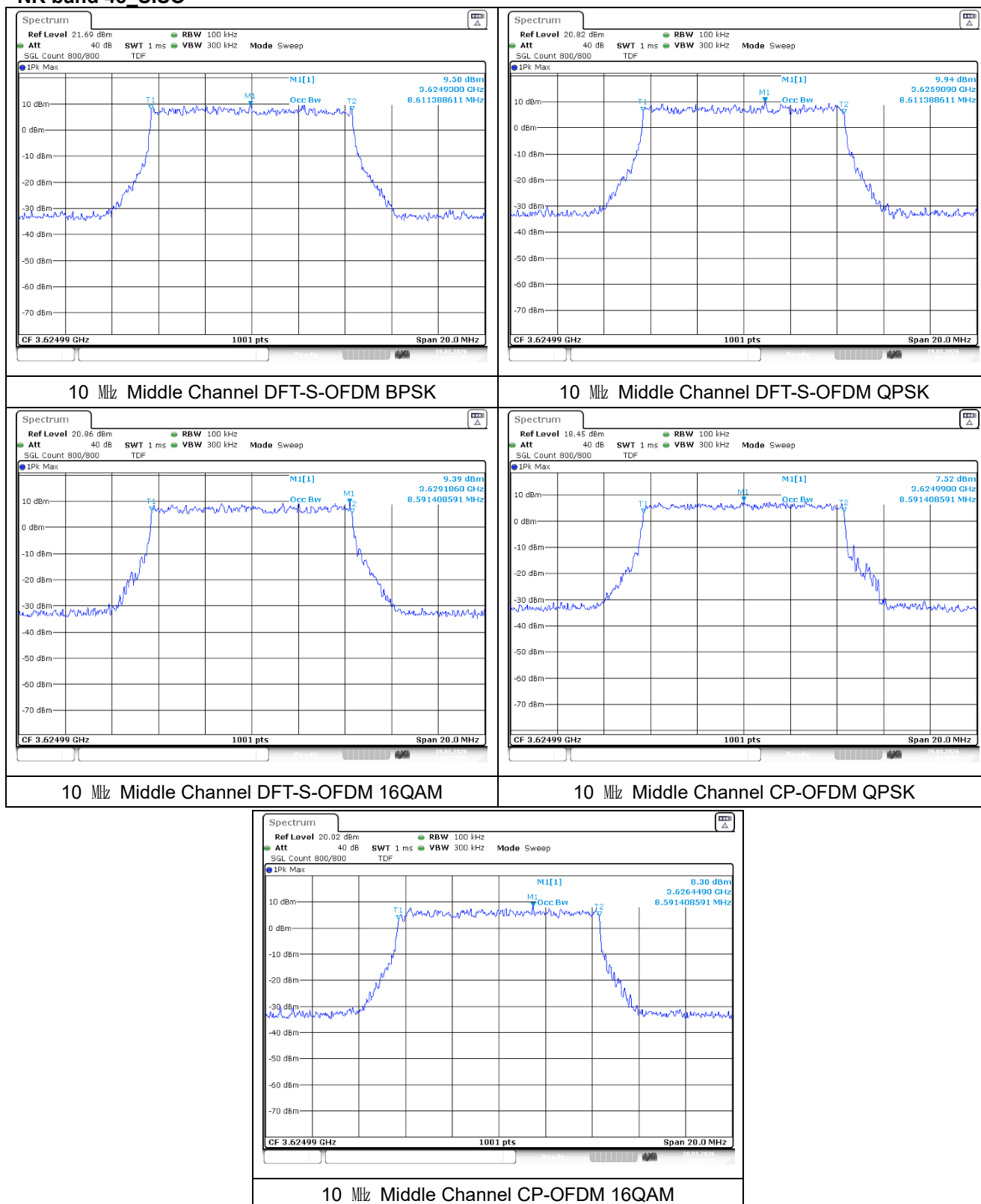
15 MHz 16QAM Middle Channel - Full RB

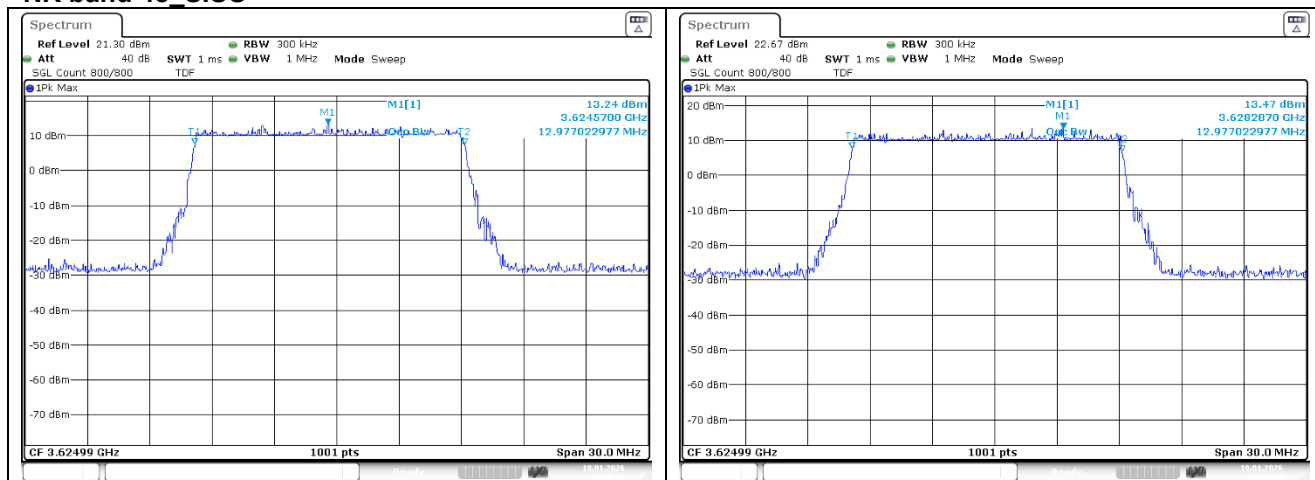
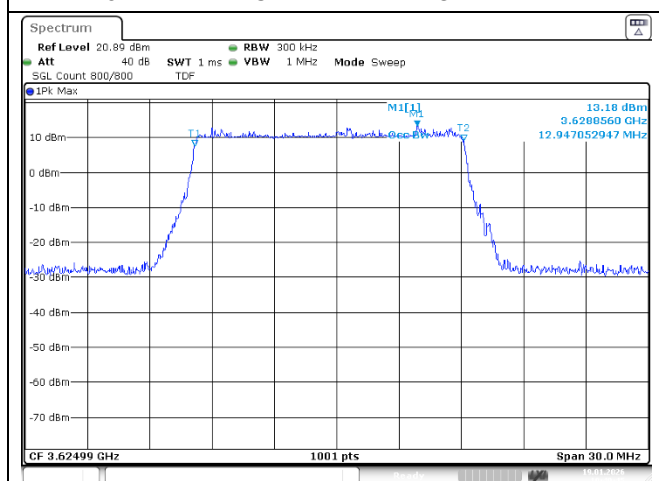
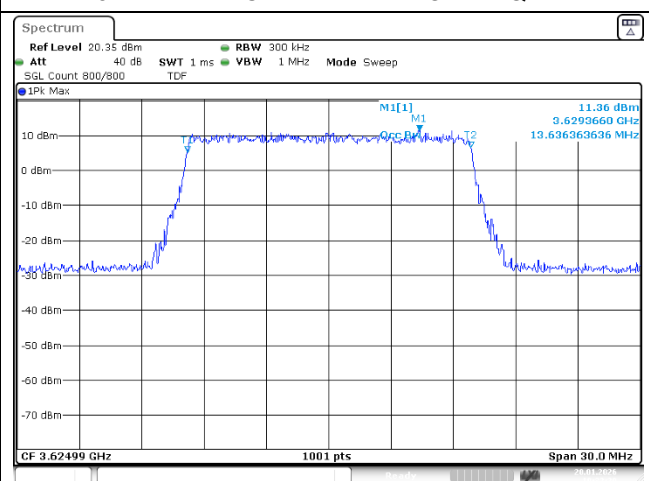
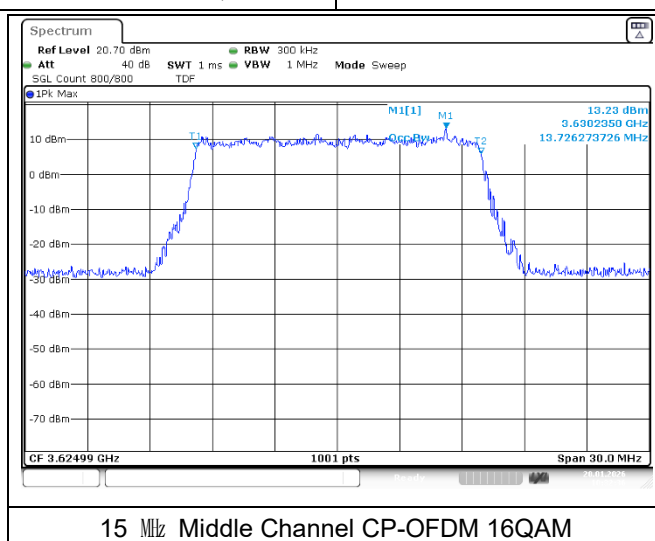


20 MHz QPSK Middle Channel - Full RB

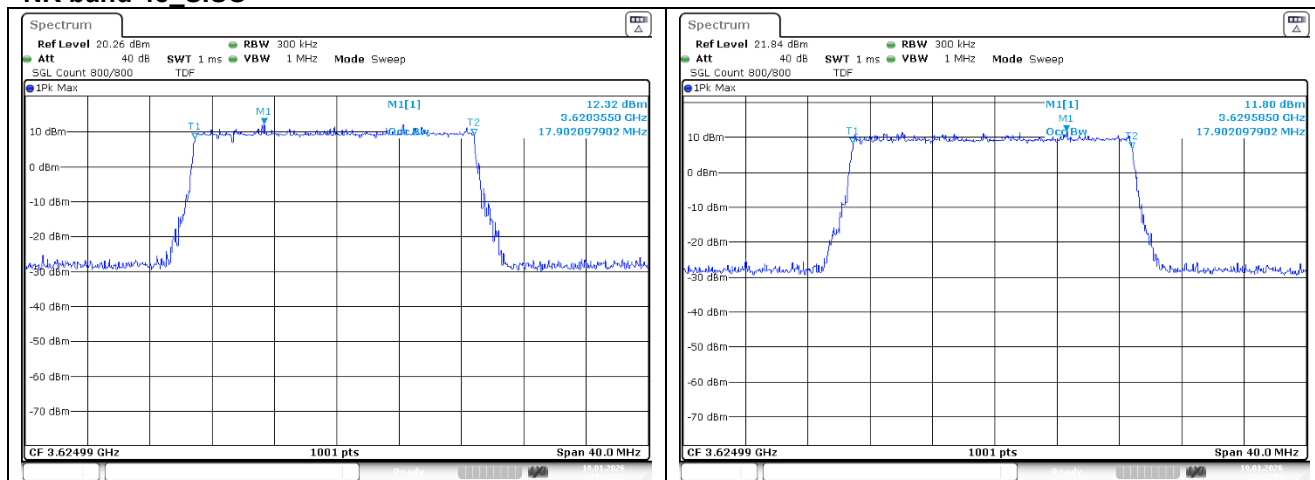


20 MHz 16QAM Middle Channel - Full RB

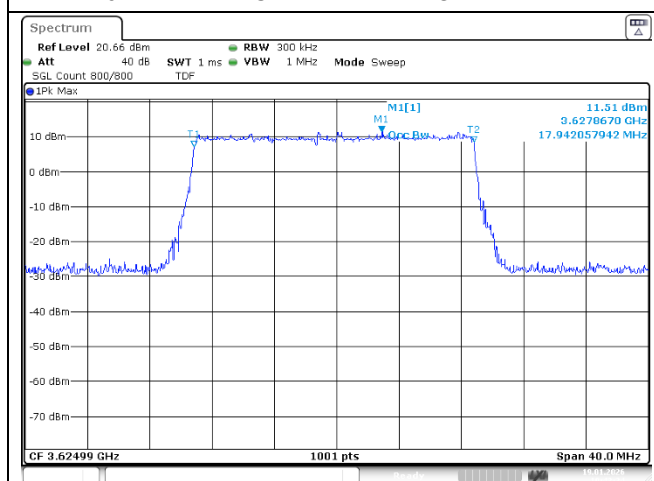
NR band 48_SISO


NR band 48_SISO

15 MHz Middle Channel DFT-S-OFDM BPSK

15 MHz Middle Channel DFT-S-OFDM QPSK

15 MHz Middle Channel DFT-S-OFDM 16QAM

15 MHz Middle Channel CP-OFDM QPSK
15 MHz Middle Channel CP-OFDM 16QAM

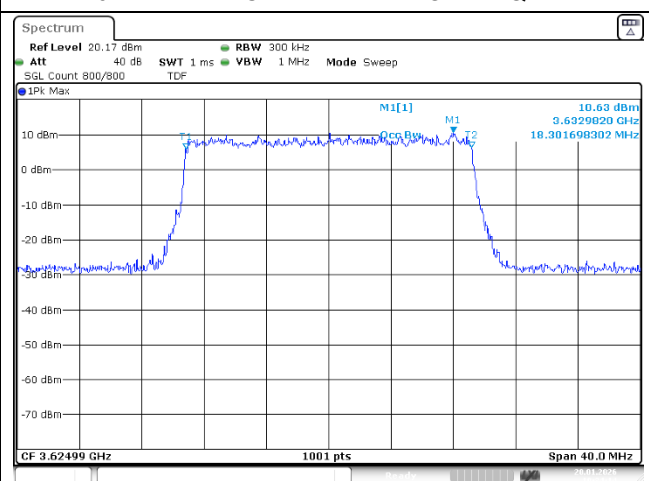
NR band 48_SISO



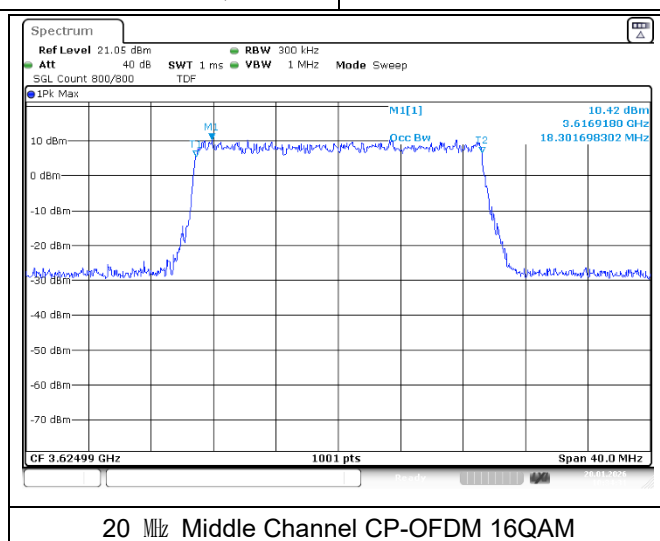
20 MHz Middle Channel DFT-S-OFDM BPSK



20 MHz Middle Channel DFT-S-OFDM QPSK



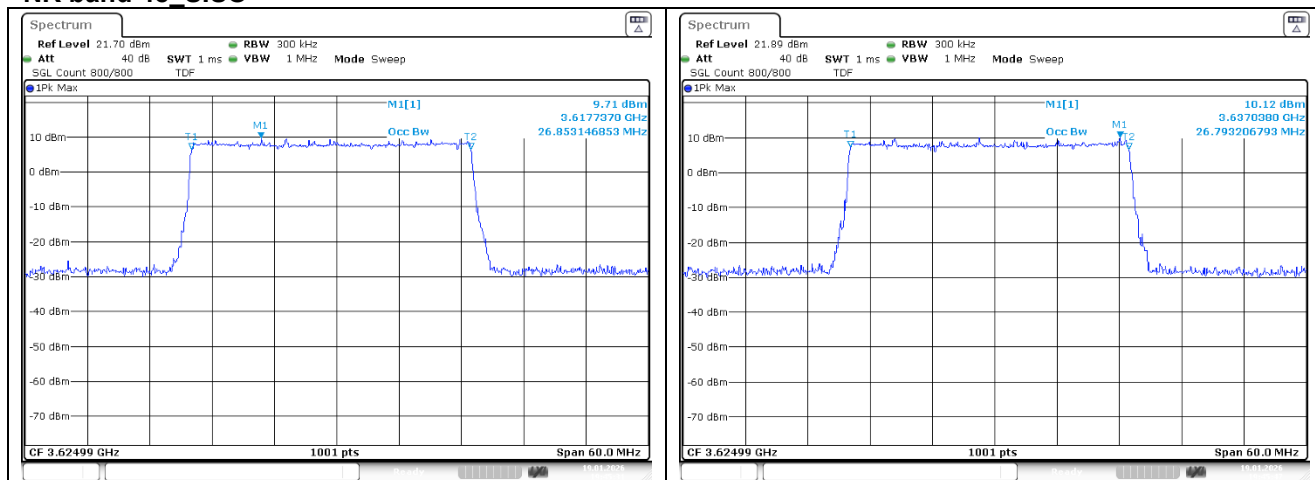
20 MHz Middle Channel DFT-S-OFDM 16QAM



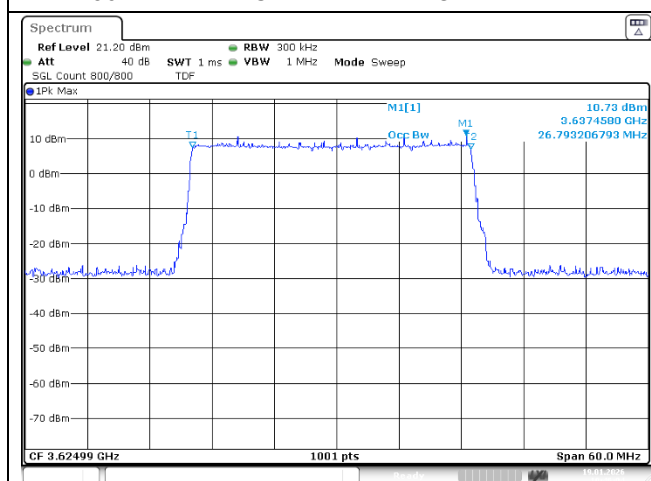
20 MHz Middle Channel CP-OFDM QPSK

20 MHz Middle Channel CP-OFDM 16QAM

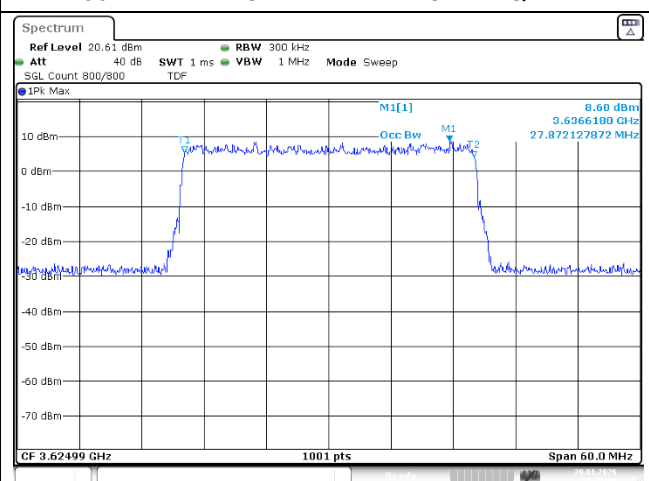
NR band 48_SISO



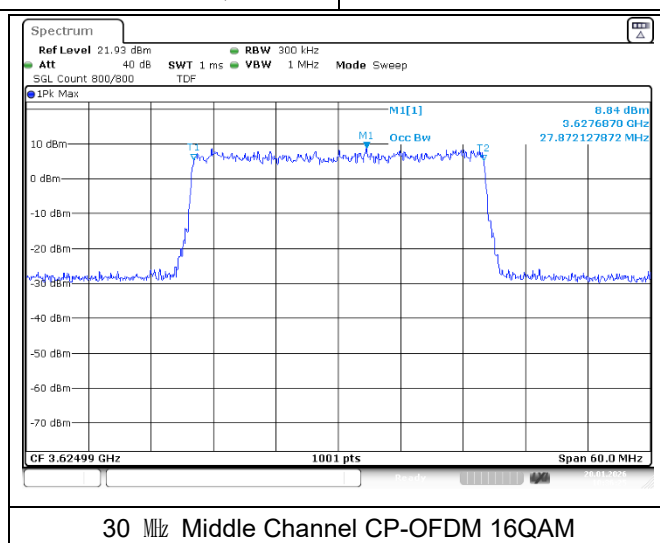
30 MHz Middle Channel DFT-S-OFDM BPSK



30 MHz Middle Channel DFT-S-OFDM QPSK



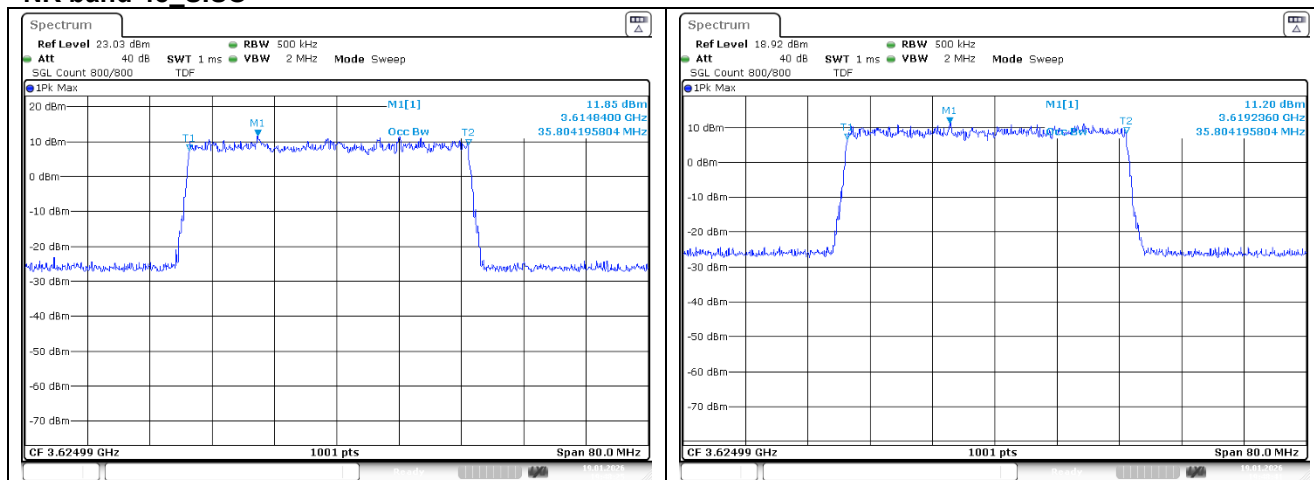
30 MHz Middle Channel DFT-S-OFDM 16QAM



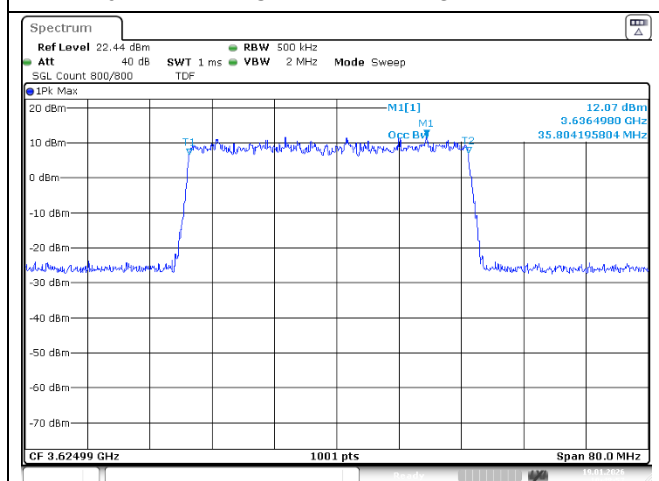
30 MHz Middle Channel CP-OFDM QPSK

30 MHz Middle Channel CP-OFDM 16QAM

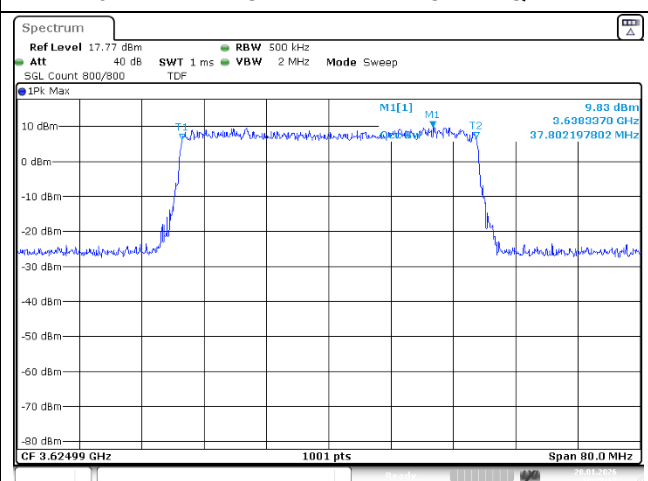
NR band 48_SISO



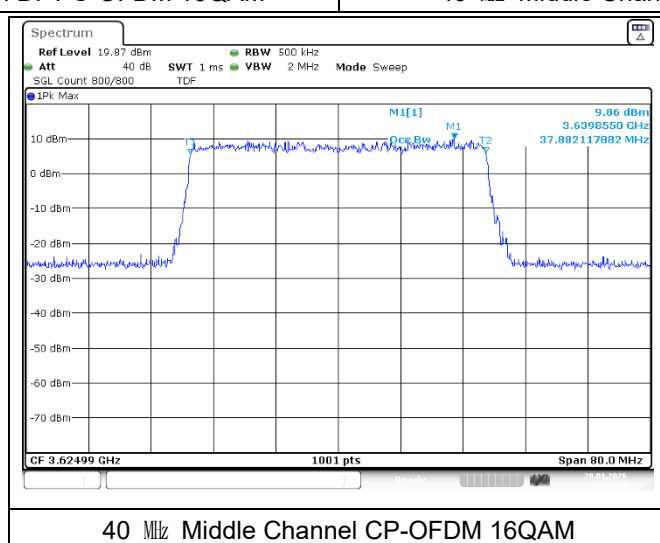
40 MHz Middle Channel DFT-S-OFDM BPSK



40 MHz Middle Channel DFT-S-OFDM QPSK

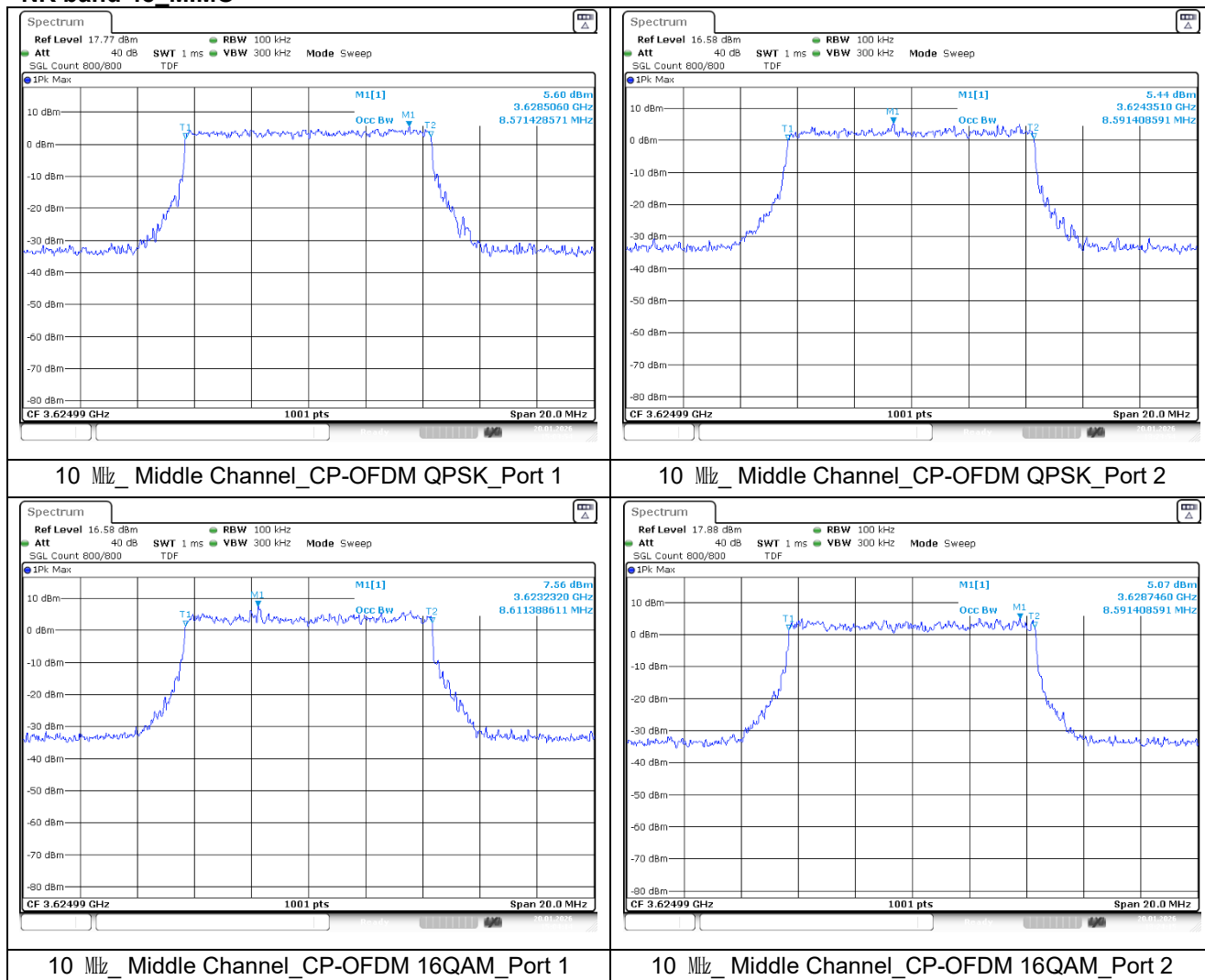


40 MHz Middle Channel DFT-S-OFDM 16QAM

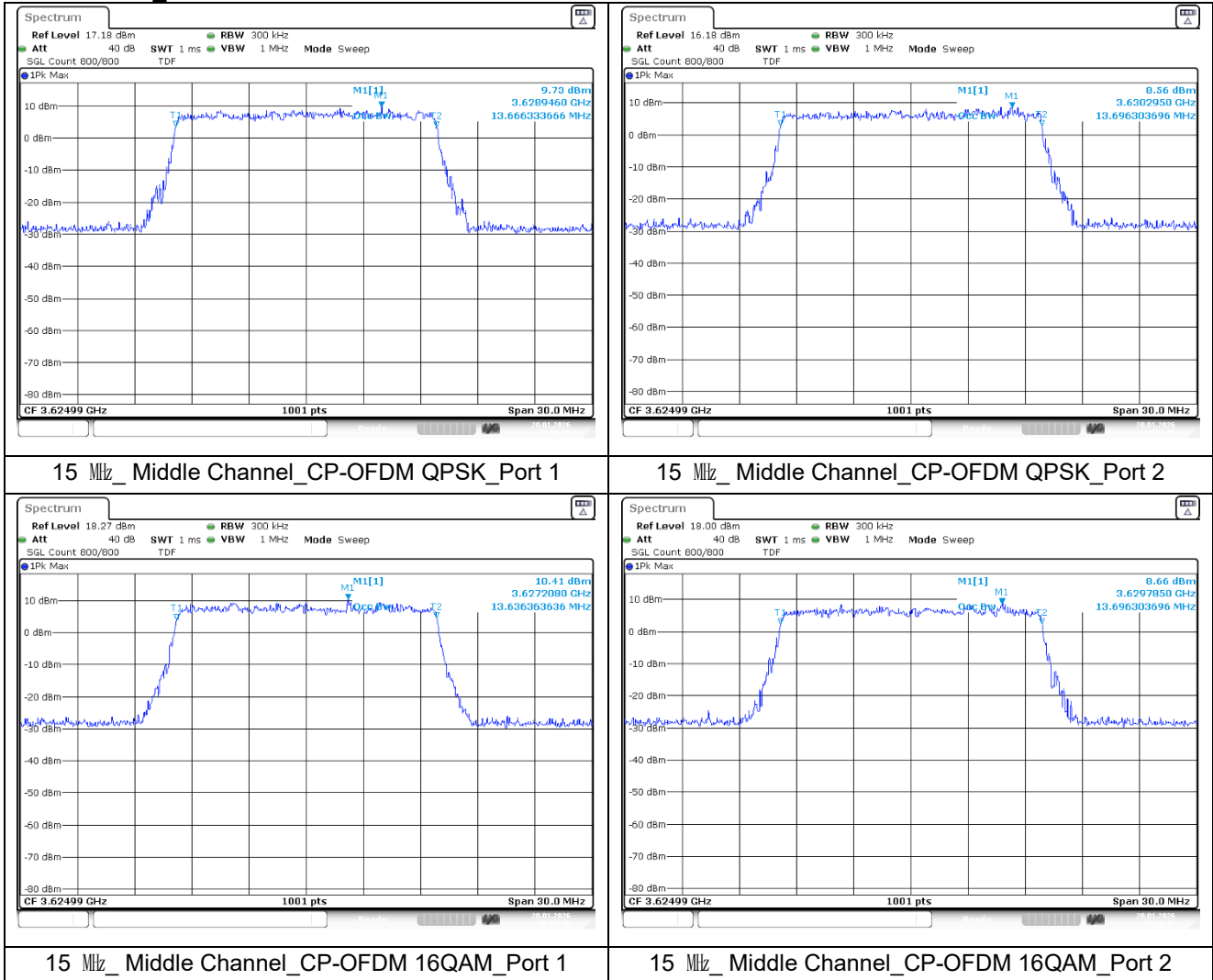


40 MHz Middle Channel CP-OFDM QPSK

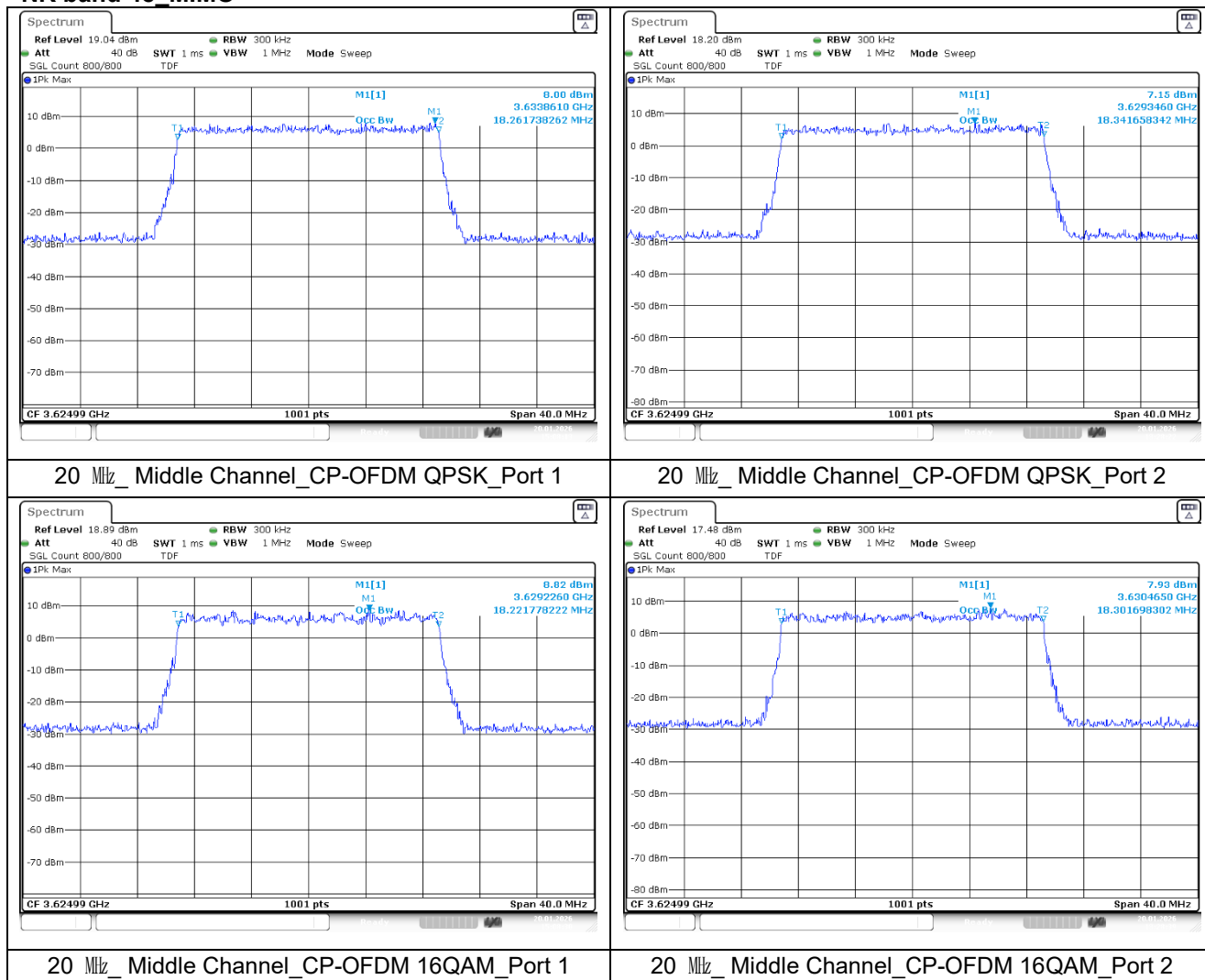
NR band 48_MIMO



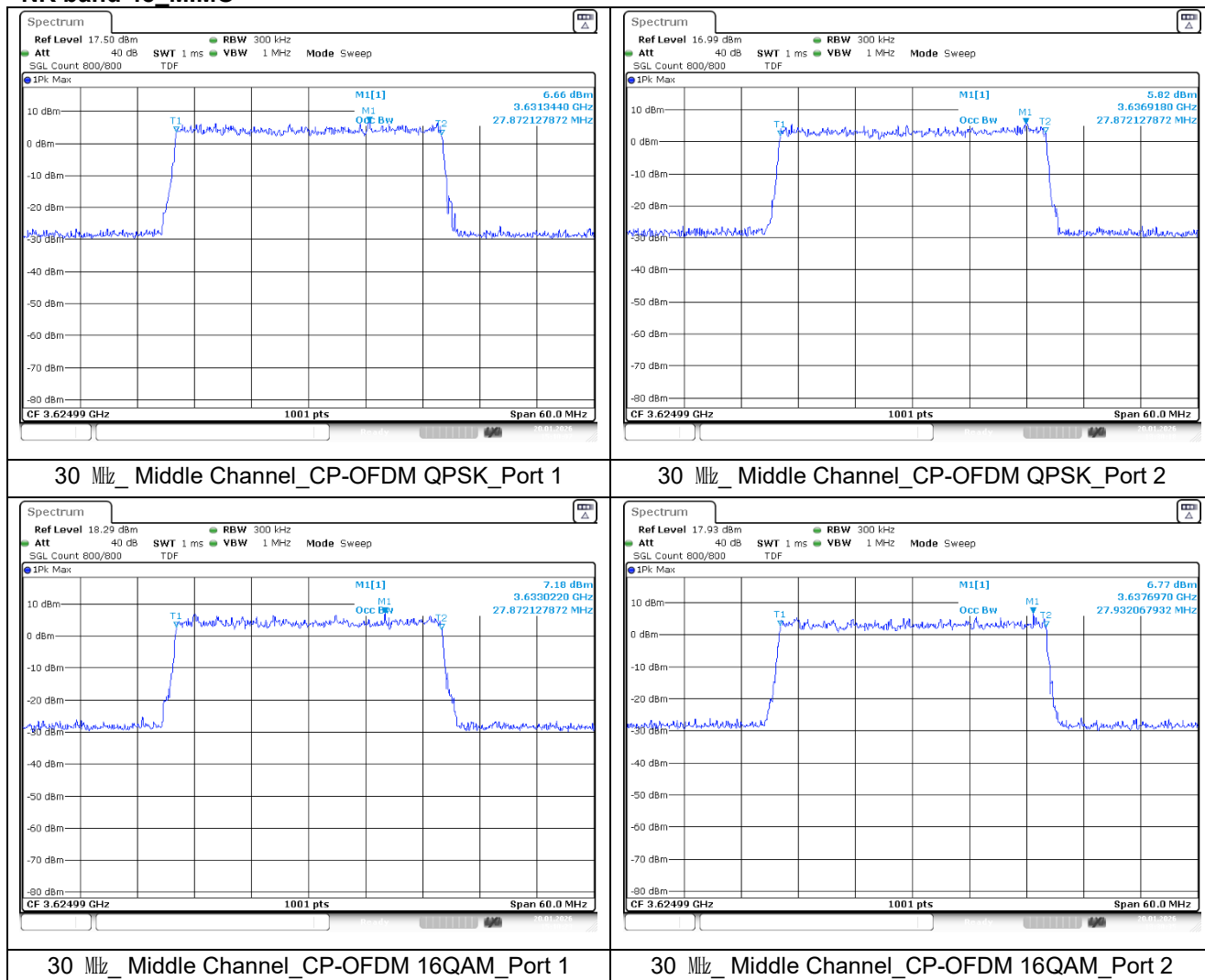
NR band 48_MIMO



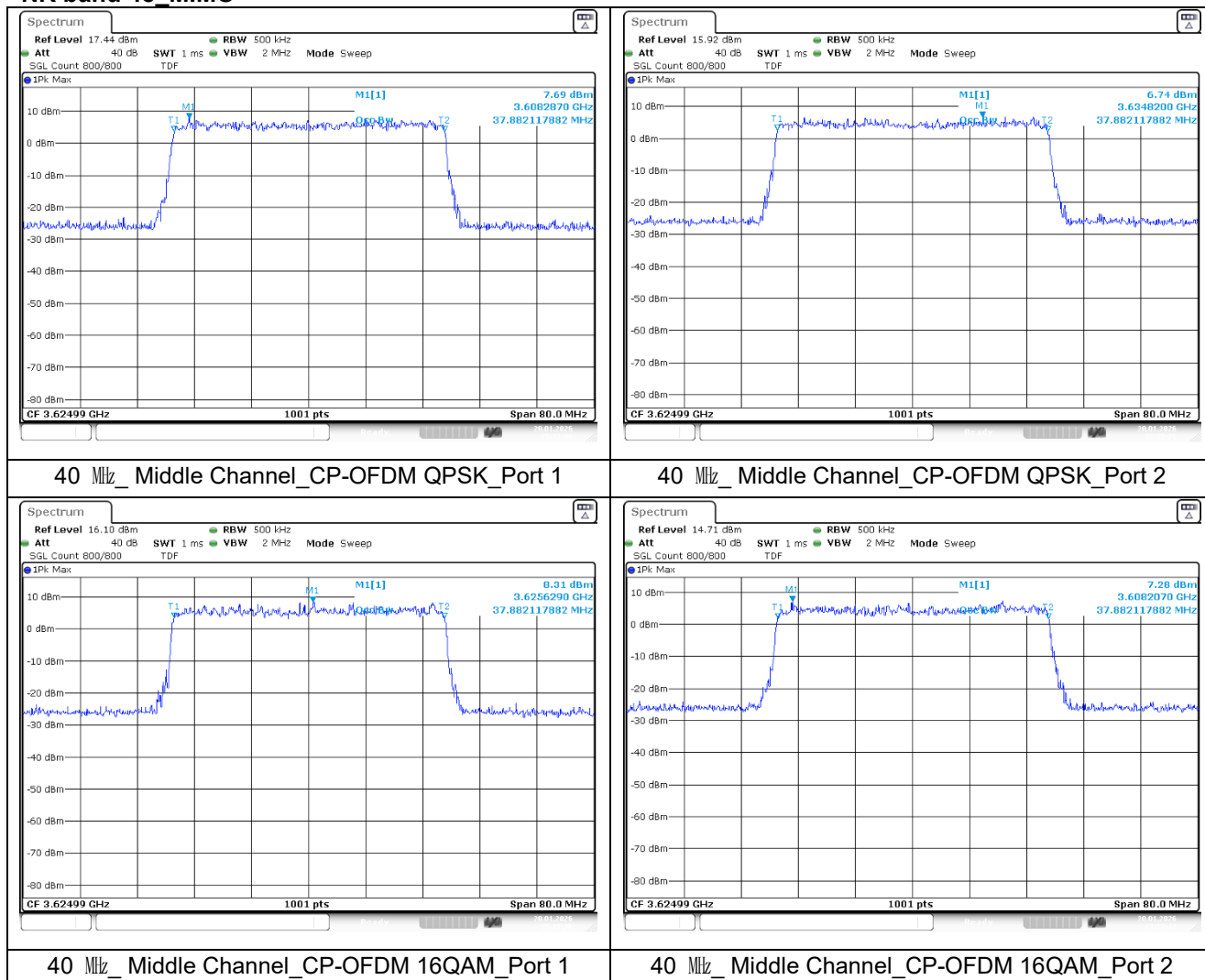
NR band 48_MIMO



NR band 48_MIMO



NR band 48_MIMO



5. Peak-Average Ratio

5.1. Limit

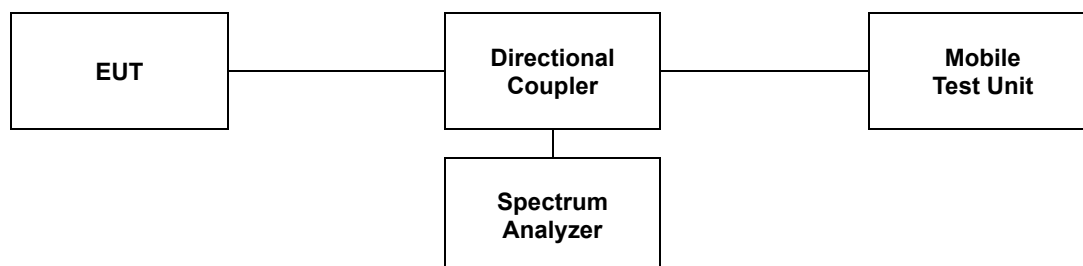
- §96.41(g), The peak-to-average power ratio (PAPR) of any CBSD transmitter output power must not exceed 13 dB. PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities or another Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected 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.

- Set resolution/measurement bandwidth $\geq$ OBW or specified reference bandwidth.
- Set the number of counts to a value that stabilizes the measured CCDF curve.
- Set the measurement interval as follows:
 - For continuous transmissions, set to greater of $[10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$ or 1 ms.
 - 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.
 - 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.
- Record the maximum PAPR level associated with a probability of 0.1 %.
- The peak power level is calculated from the sum of the PAPR value from step d) to the measured average power.



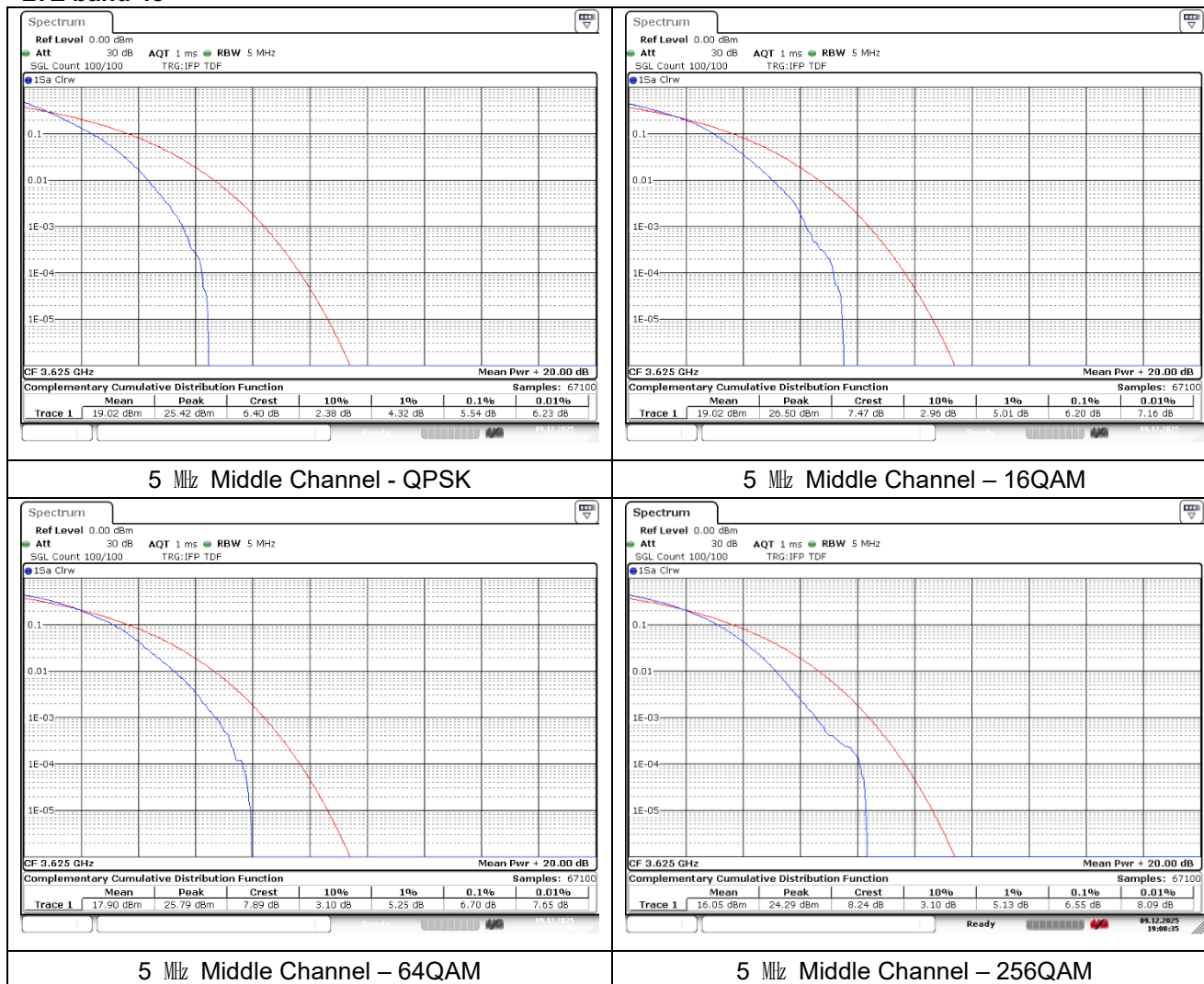
5.3 Test Results

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

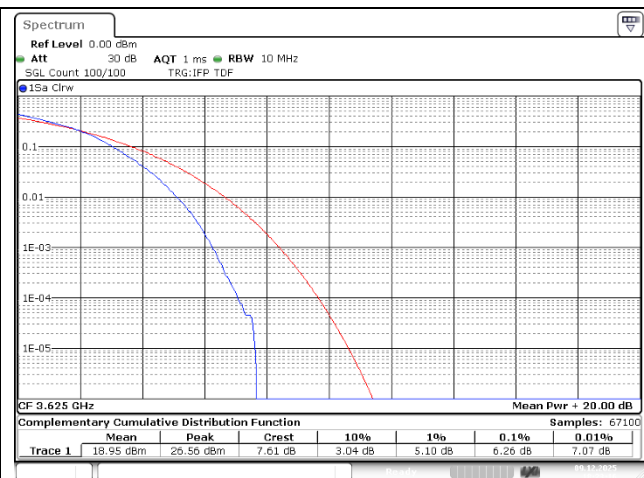
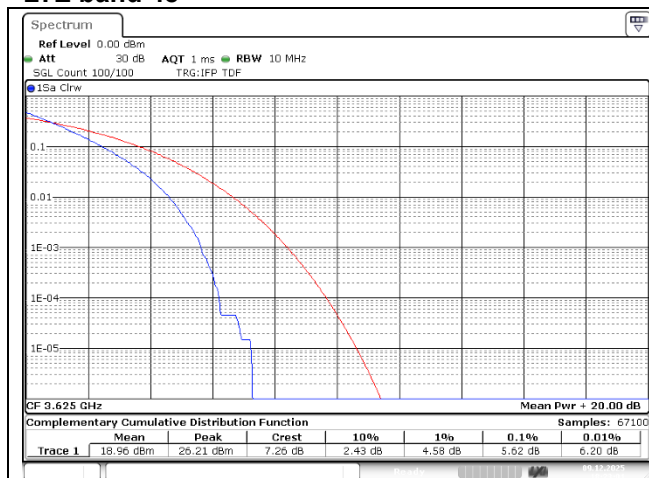
Band	Bandwidth h (MHz)		Frequency (MHz)		PAR (dB)							
					QPSK		16QAM		64QAM		256QAM	
LTE 48	5		3 552.5		5.74		6.23		6.46		6.46	
			3 625.0		5.54		6.20		6.70		6.55	
			3 697.5		5.77		6.20		6.46		6.52	
	10		3 555.0		5.65		6.29		6.61		6.41	
			3 625.0		5.62		6.26		6.55		6.38	
			3 695.0		5.65		6.20		6.58		6.41	
	15		3 557.5		5.77		6.38		6.67		6.58	
			3 625.0		5.57		6.35		6.70		6.58	
			3 692.5		5.71		6.32		6.70		6.55	
20		3 560.0		5.74		6.32		6.61		6.46		
		3 625.0		5.51		6.26		6.61		6.52		
		3 690.0		5.54		6.32		6.61		6.61		
Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	PAR (dB)								
				DFT-S-OFDM					CP-OFDM			
				BPSK	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
NR 48 SISO	30	10	3 555.00	4.80	5.96	6.52	6.70	6.98	8.36	8.44	8.44	8.26
			3 624.99	4.58	5.82	6.70	6.48	6.90	8.46	8.56	8.38	8.46
			3 694.98	4.64	6.06	6.74	6.48	6.80	8.42	8.56	8.40	8.60
		15	3 557.52	4.54	6.04	6.56	6.50	6.62	8.34	8.70	8.40	8.38
			3 624.99	4.64	6.12	6.24	6.72	6.62	8.58	8.64	8.50	8.14
			3 692.49	4.56	6.00	6.64	6.54	6.64	8.28	8.74	8.56	8.42
		20	3 560.01	4.86	6.10	6.84	6.96	6.72	8.30	8.74	8.58	8.64
			3 624.99	4.74	6.16	6.90	6.66	6.64	8.38	8.76	8.62	8.46
			3 690.00	4.62	5.96	6.62	6.76	6.56	8.42	8.86	8.58	8.68
		30	3 565.02	4.92	5.84	6.56	6.80	6.58	8.54	8.62	8.62	8.46
			3 624.99	4.80	5.78	6.56	6.88	6.72	8.68	8.66	8.54	8.52
			3 684.99	4.86	5.94	6.60	6.86	6.52	8.56	8.60	8.64	8.38
		40	3 570.00	4.74	5.88	6.44	6.78	6.64	8.52	8.46	8.50	8.26
			3 624.99	4.76	6.08	6.52	6.70	6.68	8.50	8.56	8.44	8.44
			3 679.98	4.78	5.94	6.44	6.70	6.68	8.54	8.52	8.58	8.24
		Band	SCS (kHz)	BW (MHz)	Frequency (MHz)	PAR (dB)						
Port 1						Port 2						
QPSK	16QAM					64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	
NR 48 MIMO	30	10	3 555.00	8.32	8.42	8.24	8.32	8.36	8.44	8.48	8.88	
			3 624.99	8.46	8.46	8.06	8.04	8.28	8.36	8.34	8.40	
			3 694.98	8.50	8.54	8.04	8.16	8.38	8.34	8.46	8.48	
		15	3 557.52	8.26	8.44	8.34	8.28	8.56	8.64	8.54	8.54	
			3 624.99	8.36	8.28	8.26	8.58	8.62	8.42	8.56	8.44	
			3 692.49	8.22	8.14	8.28	8.40	8.68	8.30	8.50	8.44	
		20	3 560.01	8.32	8.40	8.20	8.58	8.68	8.70	8.50	8.58	
			3 624.99	8.32	8.38	8.26	8.62	8.56	8.64	8.56	8.58	
			3 690.00	8.22	8.46	8.24	8.62	8.60	8.62	8.28	8.54	
		30	3 565.02	8.46	8.56	8.52	8.40	8.56	8.42	8.44	8.38	
			3 624.99	8.66	8.60	8.66	8.30	8.62	8.34	8.24	8.32	
			3 684.99	8.68	8.44	8.60	8.36	8.88	8.54	8.32	8.32	
		40	3 570.00	8.44	8.60	8.42	8.36	8.52	8.50	8.24	8.42	
			3 624.99	8.32	8.62	8.44	8.30	8.60	8.56	8.24	8.20	
			3 679.98	8.30	8.46	8.46	8.30	8.42	8.46	8.12	8.16	

- Test plots

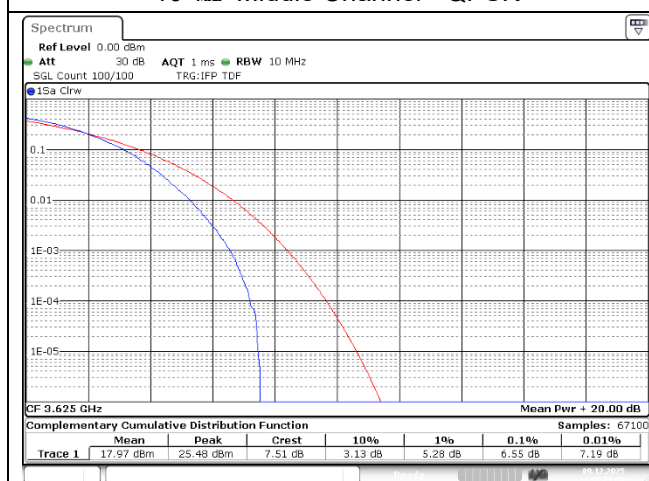
LTE band 48



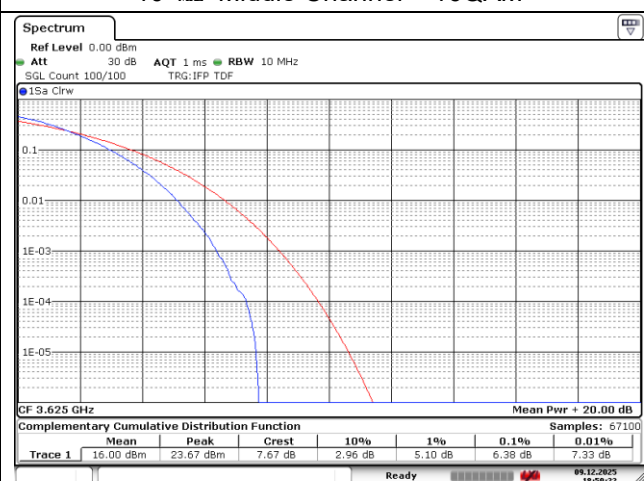
LTE band 48



10 MHz Middle Channel - QPSK



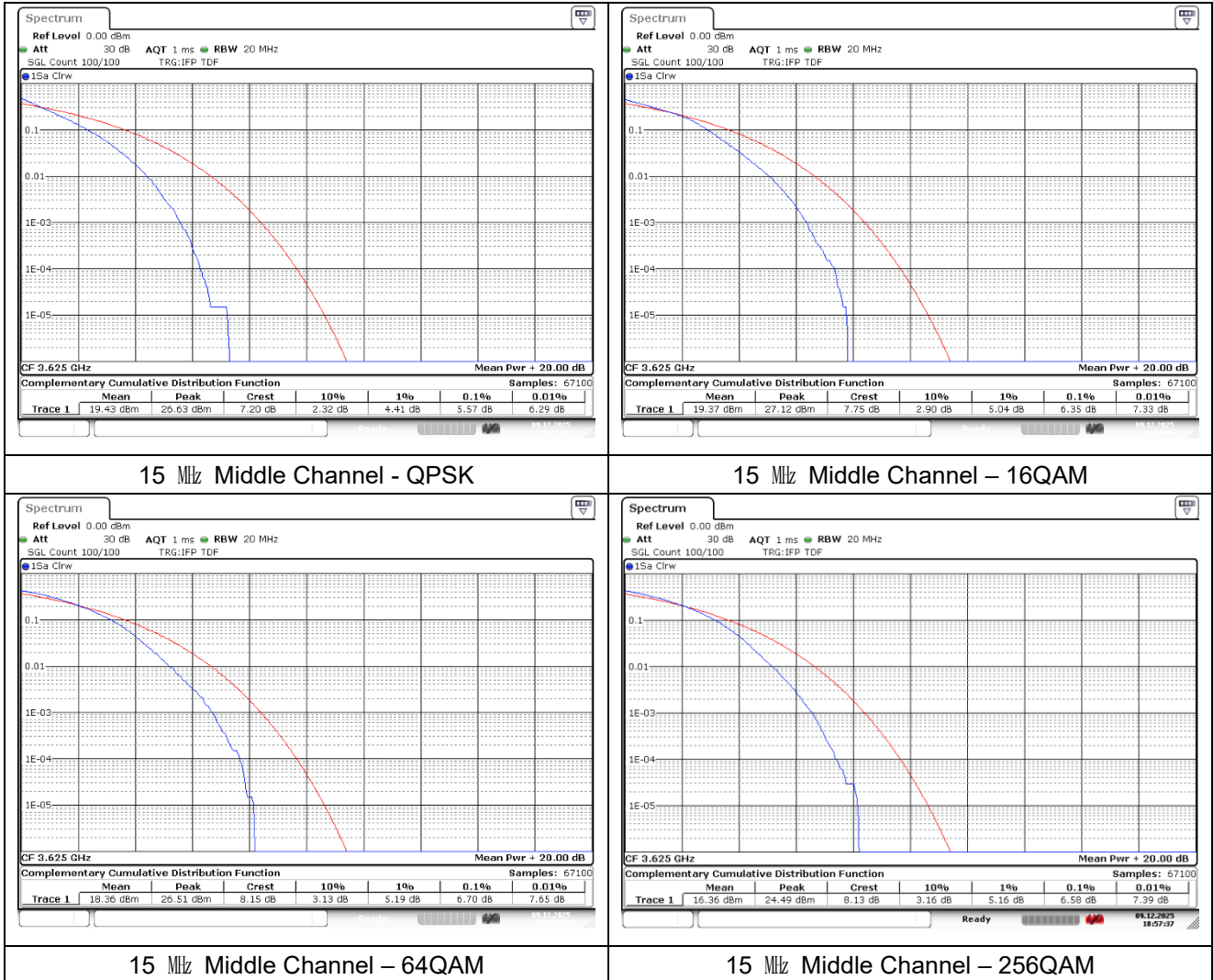
10 MHz Middle Channel - 16QAM



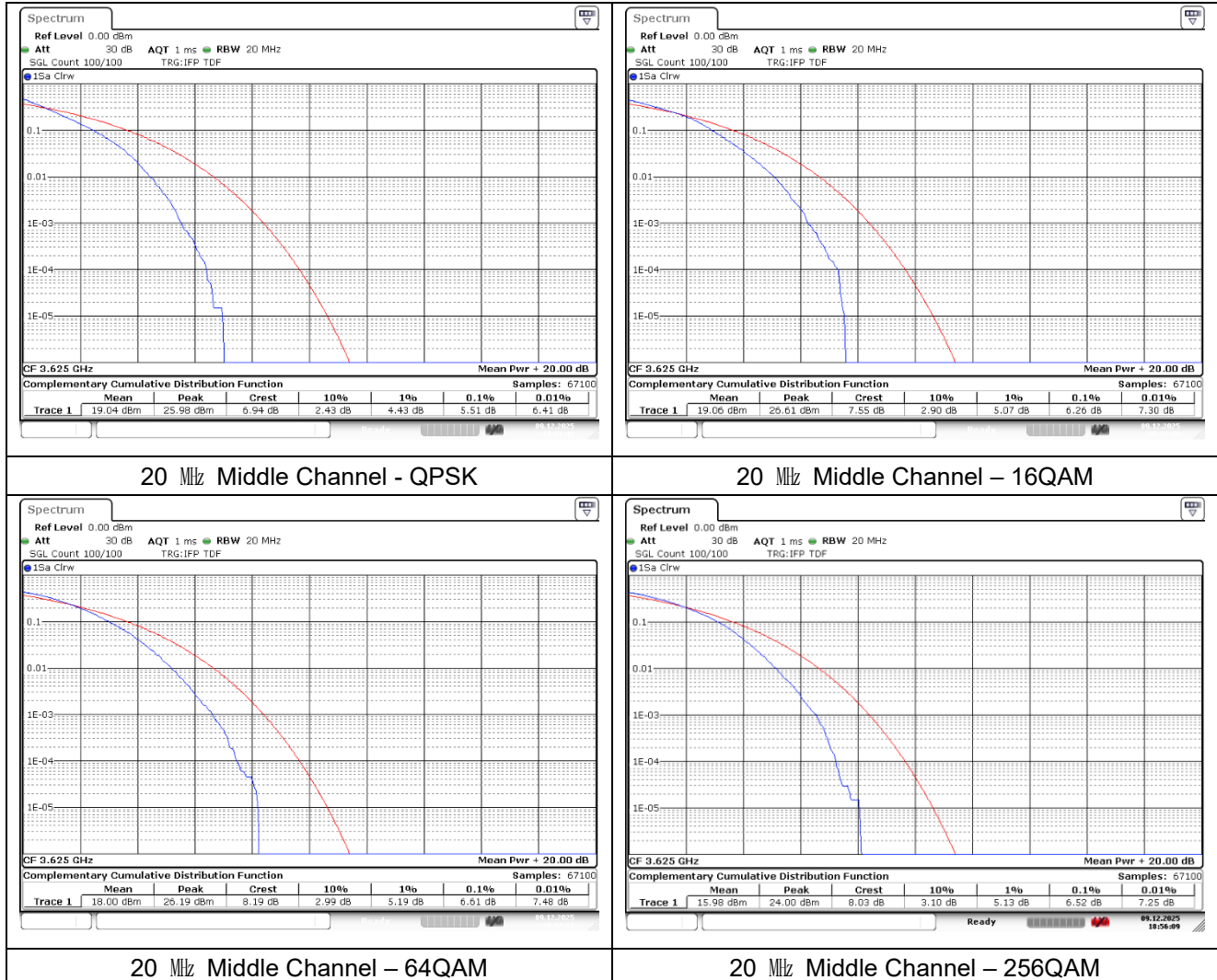
10 MHz Middle Channel - 64QAM

10 MHz Middle Channel - 256QAM

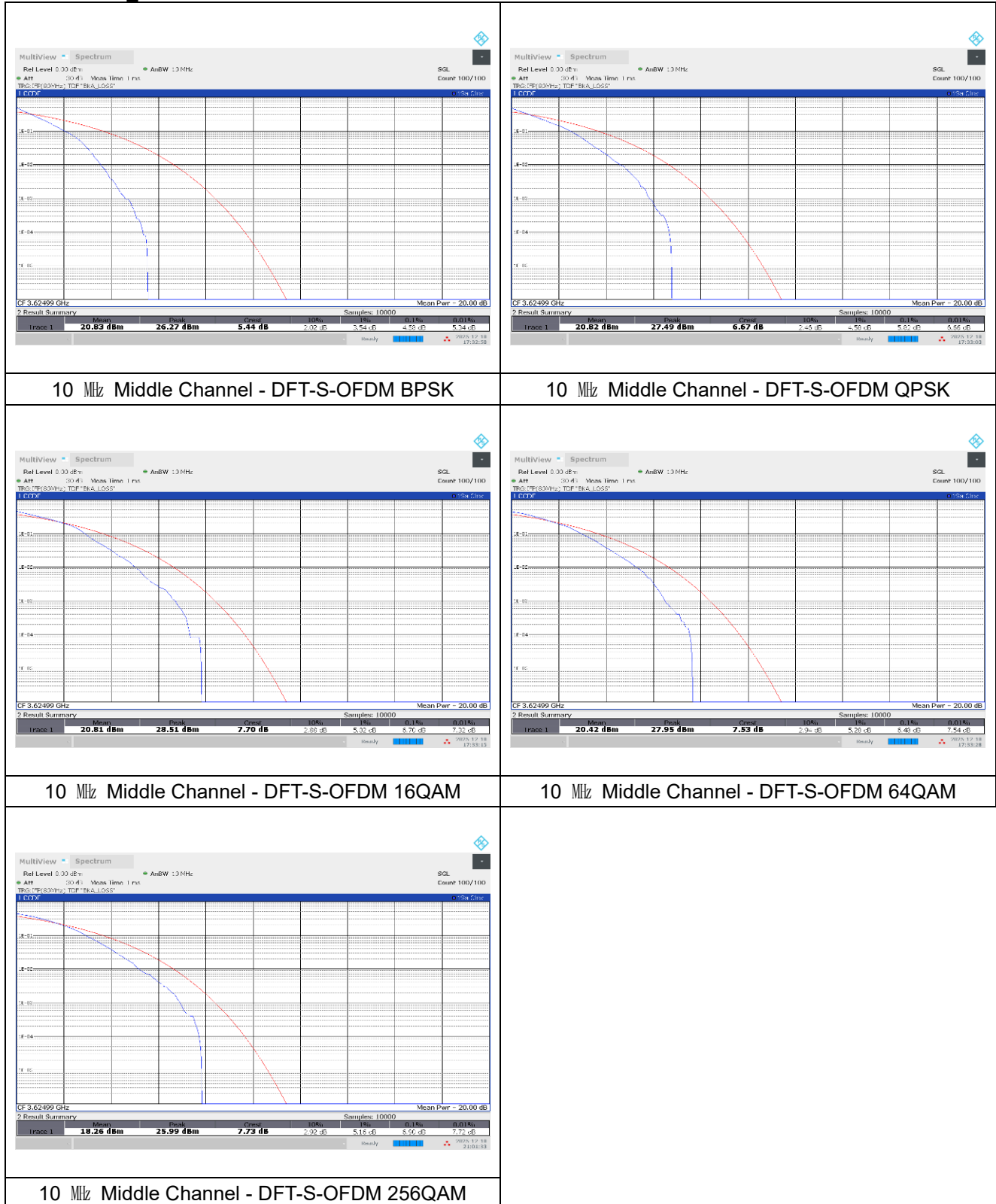
LTE band 48



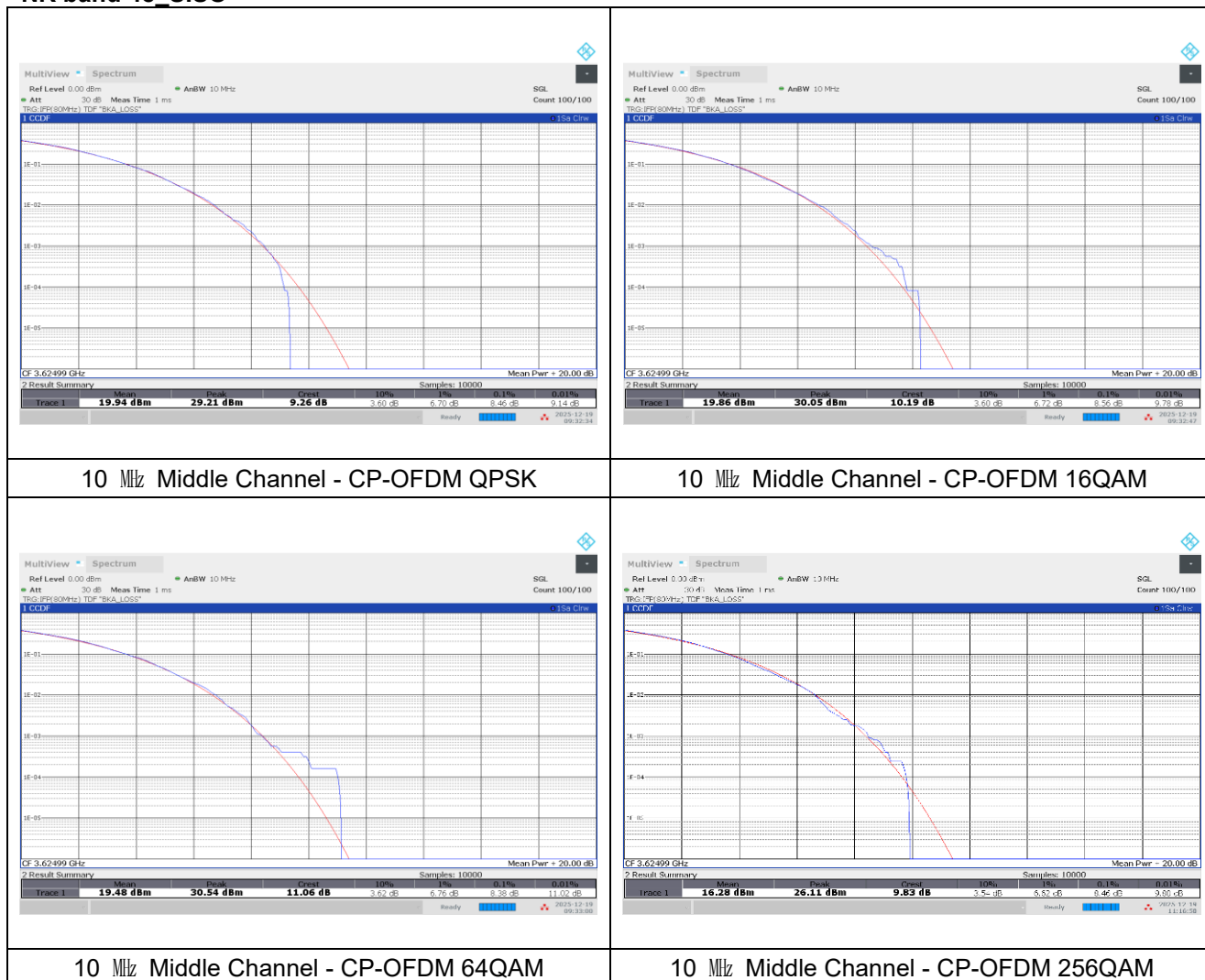
LTE band 48



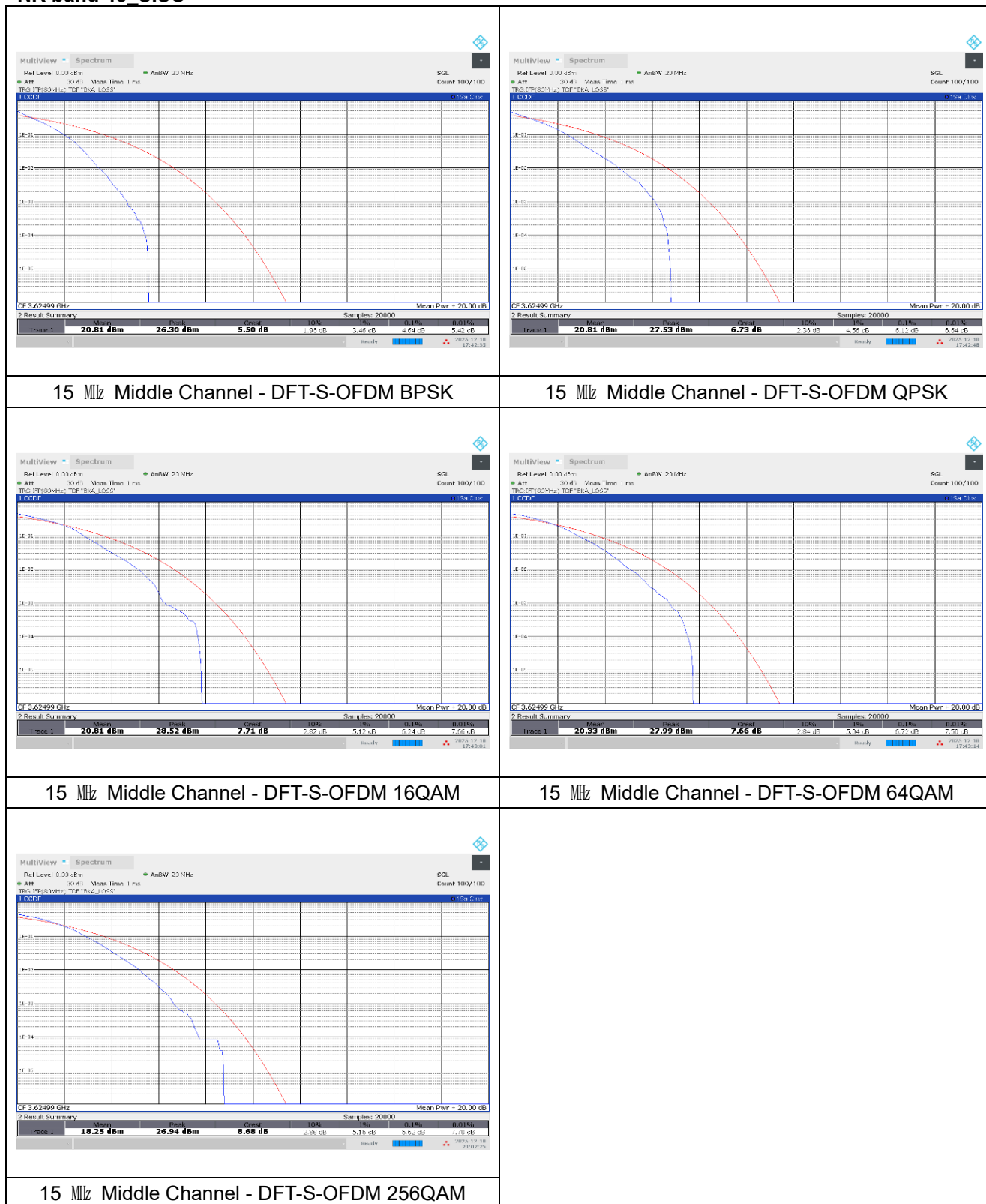
NR band 48_SISO



NR band 48_SISO



NR band 48_SISO



NR band 48_SISO

